



BioRID II Corridor Analysis for GTR7 TEG meeting Sep. 12, 2019

Agenda

- Background
- Review data from each test
 - Dummy Certification without Headrest Analysis
 - Jacket Analysis
 - Pelvis Analysis
 - Sled and Track Verification Analysis

Background

- At the meeting GTR7 TEG meeting on Aug. 27, 2019
 - Document TEG ID 18-3 covered data collection and analysis to review all BioRID II corridors
 - » Explained data collection and analysis
 - » Presented results for all test parameters
 - It was requested to update the analysis and presentation with the following changes
 - » Recalculate all parameters with outliers removed
 - » Update all parameters with
 - › current corridors with % corridor width
 - › Mean and +/- 2 standard deviation lines with % width
 - › +/- 10 % lines around population mean
 - » Create a table of these values
 - » Determine actual pass rate of dummies for each parameter
 - » Determine overall pass rate of dummies considering all parameters with +/- 2 standard deviation and +/- 10%

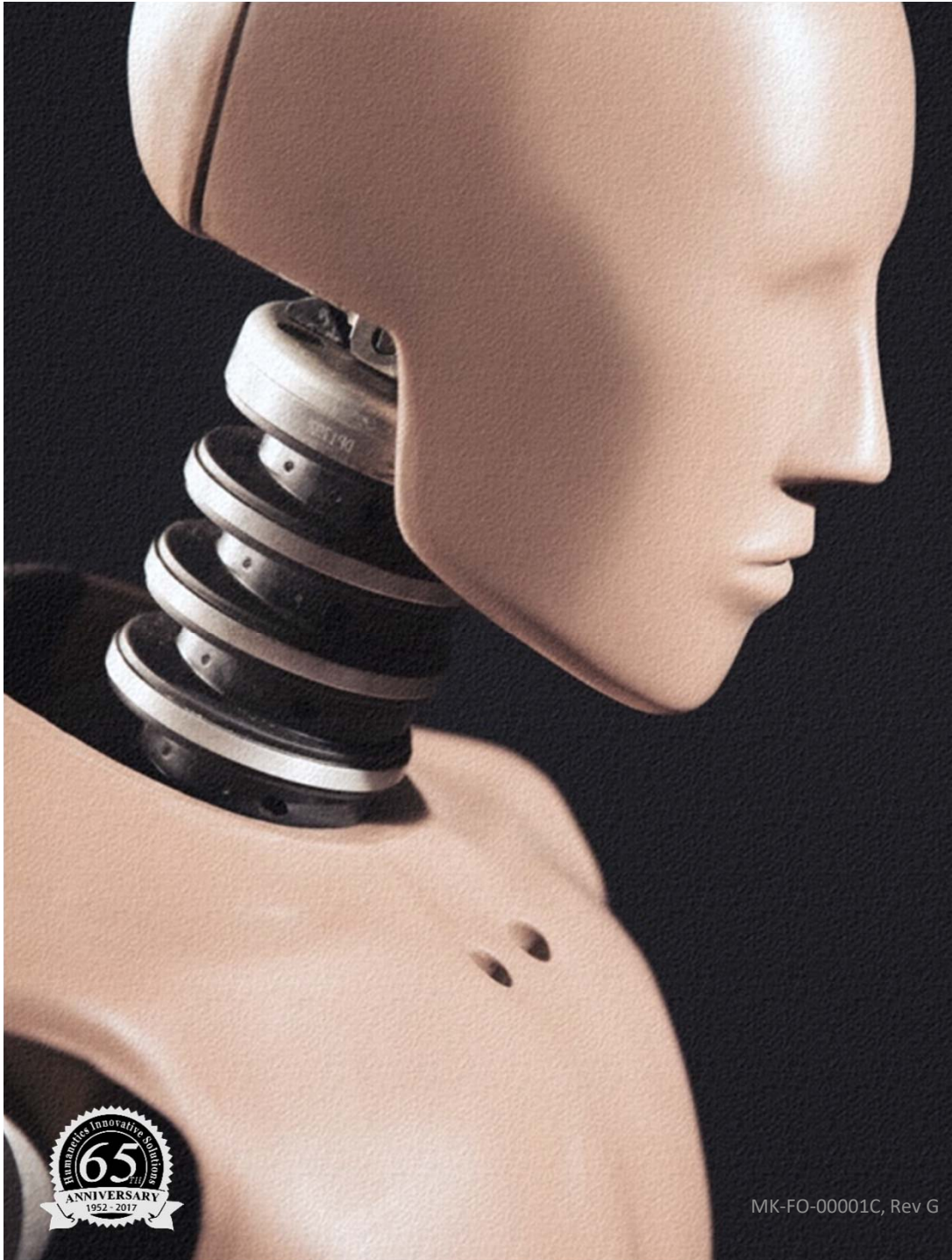
Background

- Note on Outlier removal

- Outliers from initial analysis shown in TEG ID 18-3 removed.
- If outliers show up after removing initial outliers, these are NOT removed – only one round of outlier removal is done
- Outliers are removed from all parameters calculated from a single channel

- » Example:

- › for Upper Neck My there are 4 parameters
 - Max Upper Neck My
 - Time at Max Upper Neck My
 - Min Upper Neck My
 - Time at Min Upper neck My
- › For points with outliers showing up in initial analysis on any of the four parameters, the value is removed from all 4 parameters before redoing analysis

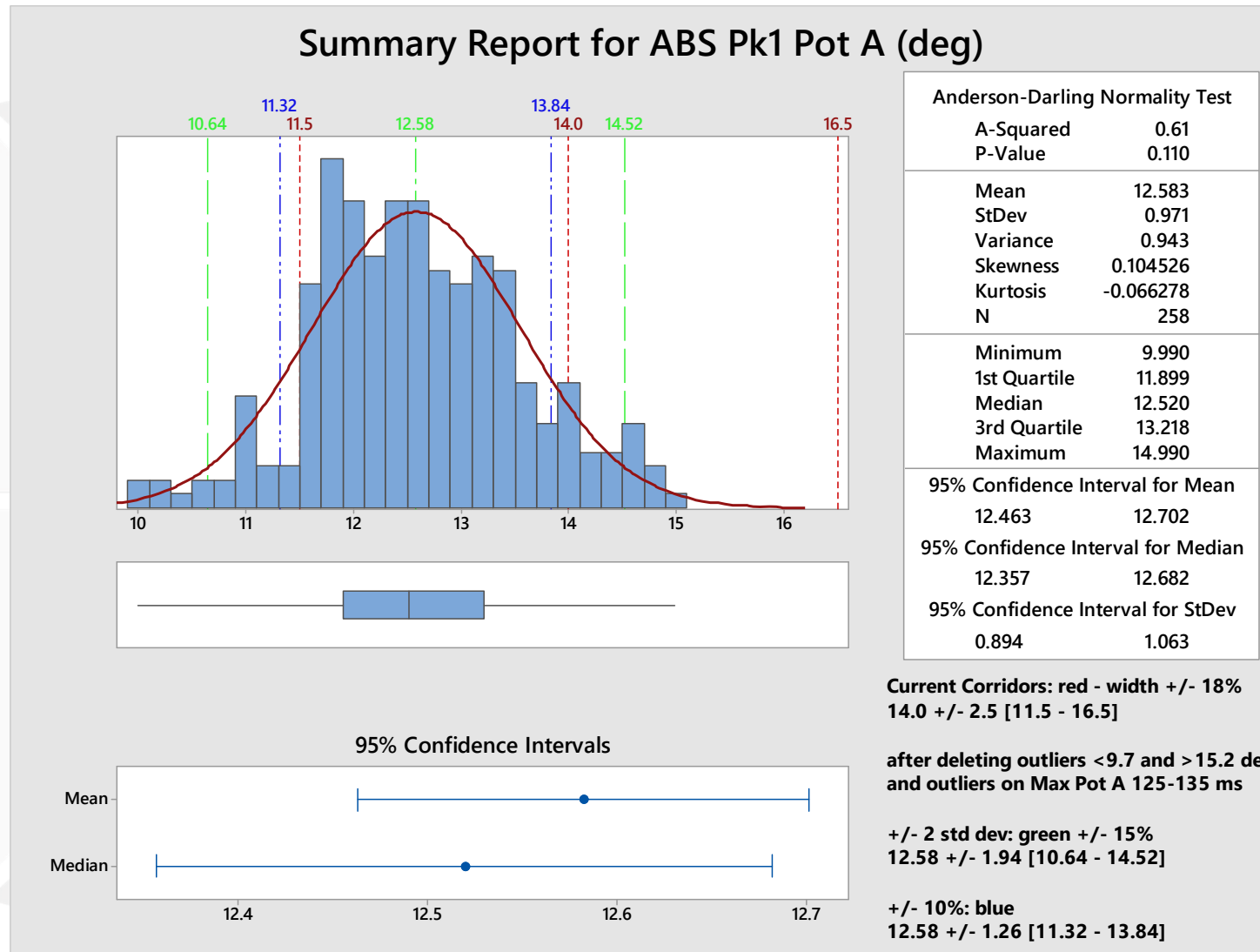


Dummy Certification without Headrest Analysis

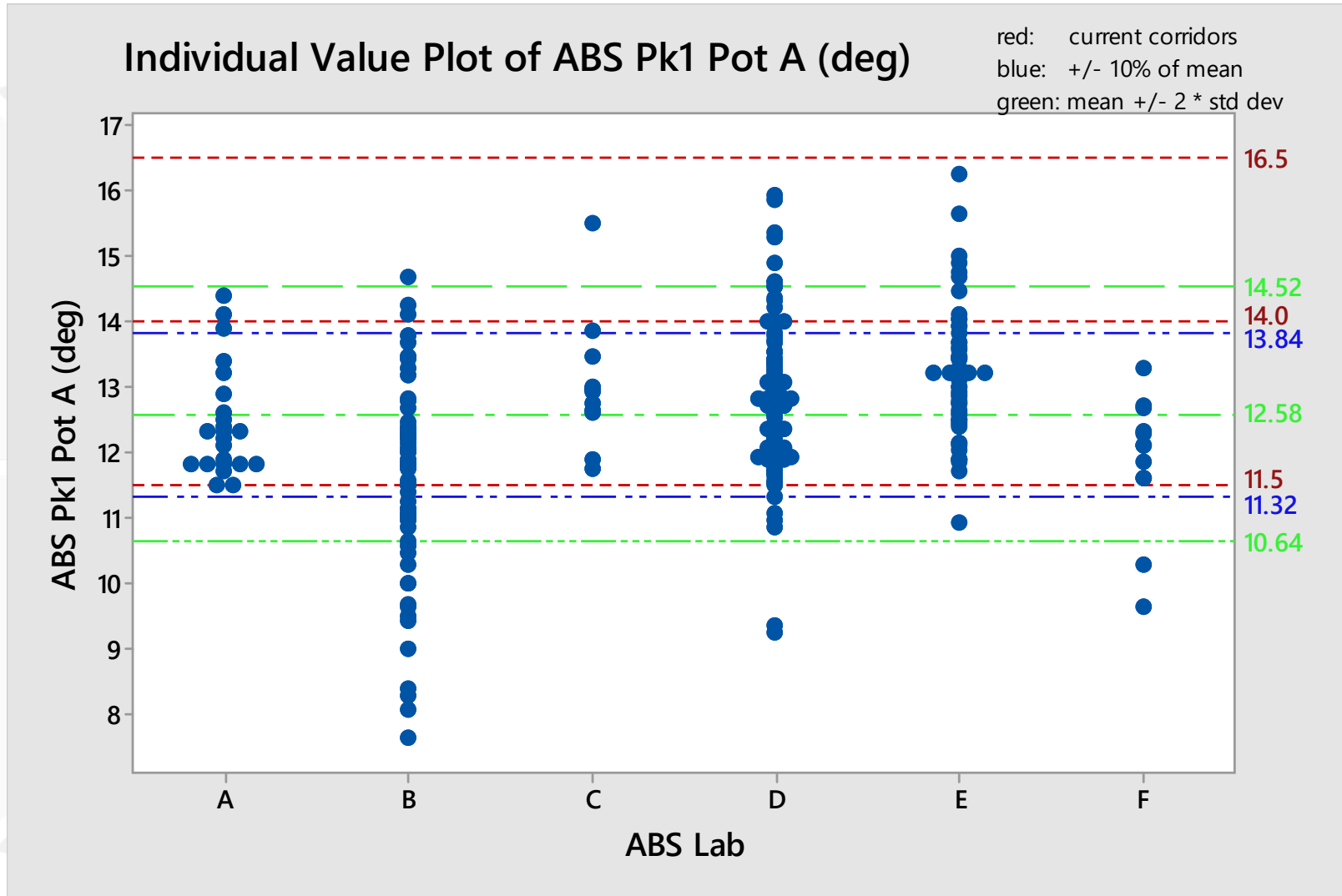


MK-FO-00001C, Rev G

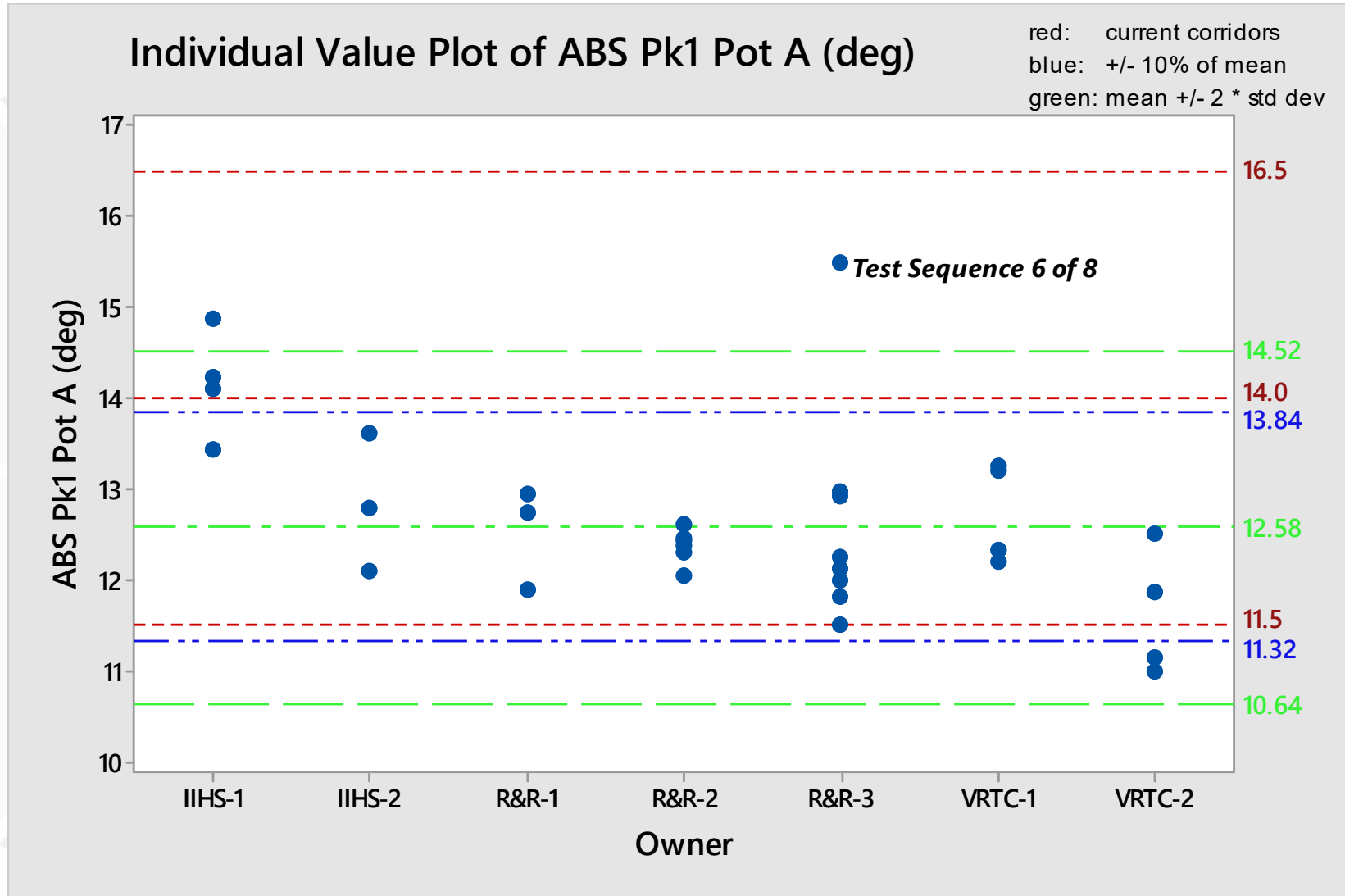
Analysis Dummy Certification - First Peak Pot A



Analysis Dummy Certification - First Peak Pot A

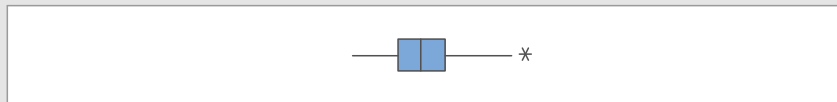
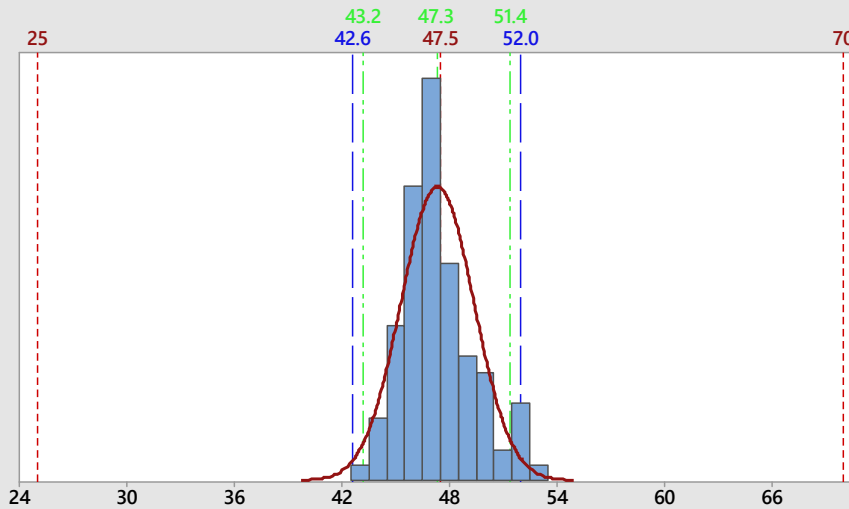


Analysis Dummy Certification - First Peak Pot A

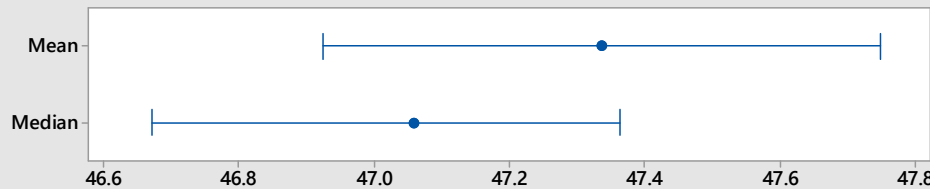


Analysis Dummy Certification - First Peak Pot A Time

Summary Report for ABS Pk1 Pot A (ms)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 1.57
P-Value <0.005

Mean 47.336
StDev 2.038
Variance 4.154
Skewness 0.709436
Kurtosis 0.215449
N 97

Minimum 43.270
1st Quartile 45.796
Median 47.060
3rd Quartile 48.396
Maximum 52.900

95% Confidence Interval for Mean

46.925 47.747

95% Confidence Interval for Median

46.673 47.363

95% Confidence Interval for StDev

1.786 2.374

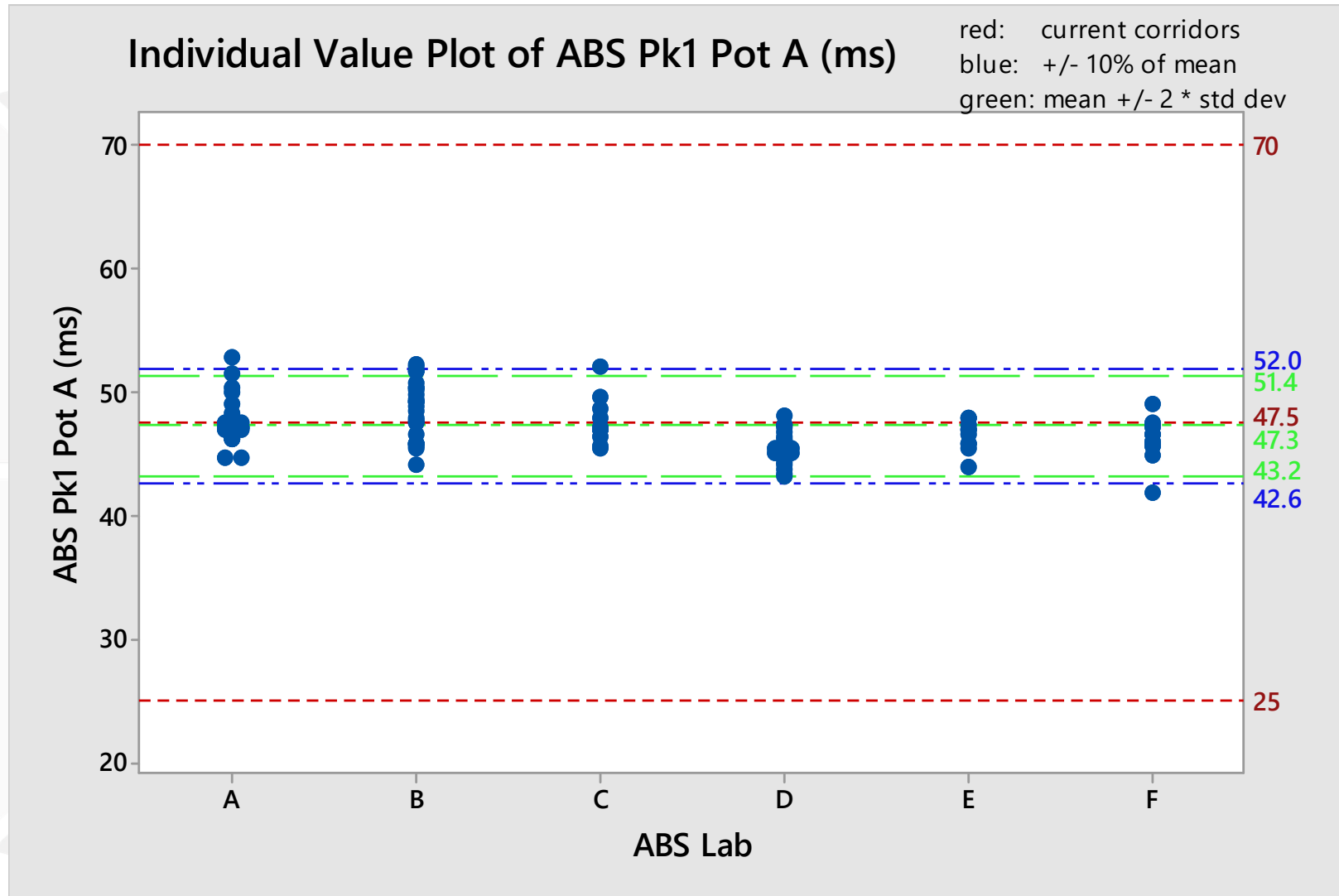
**Current Corridors: red - width +/- 47%
47.5 +/- 22.5 [25 - 70]**

**after deleting Pot A outliers
and outliers on Max Pot A 125-135 ms**

**+/- 2 std dev: green +/- 8.7%
47.3 +/- 4.1 [43.2 - 51.4]**

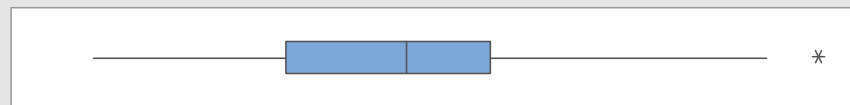
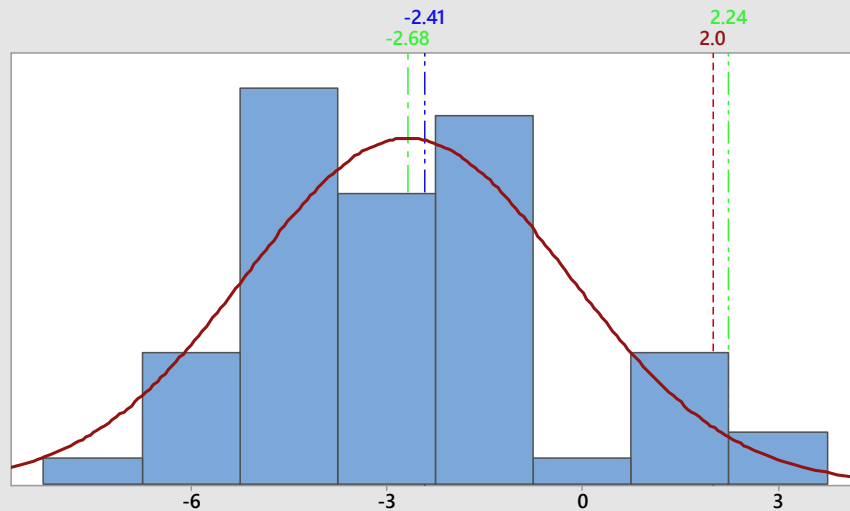
**+/- 10%: blue
47.3 +/- 4.7 [42.6 - 52.0]**

Analysis Dummy Certification - First Peak Pot A Time

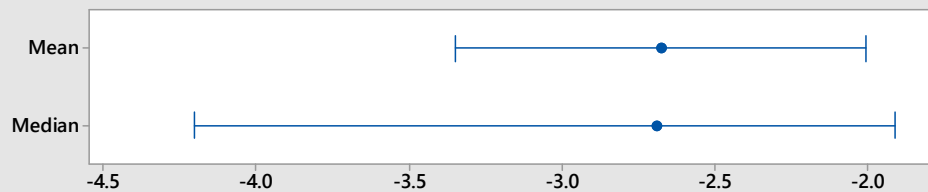


Analysis Dummy Certification - Pot A Tunnel 125-135 ms MAX

Summary Report for ABS Max Pot A 125-135 ms



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 0.66
P-Value 0.081

Mean -2.6768
StDev 2.4612
Variance 6.0573
Skewness 0.539670
Kurtosis 0.026445
N 54

Minimum -7.4800
1st Quartile -4.5391
Median -2.6883
3rd Quartile -1.3986
Maximum 3.6300

95% Confidence Interval for Mean
-3.3486 -2.0051

95% Confidence Interval for Median
-4.2024 -1.9099

95% Confidence Interval for StDev
2.0689 3.0383

**Current Corridors: red - +157%
tunnel upper limit +2**

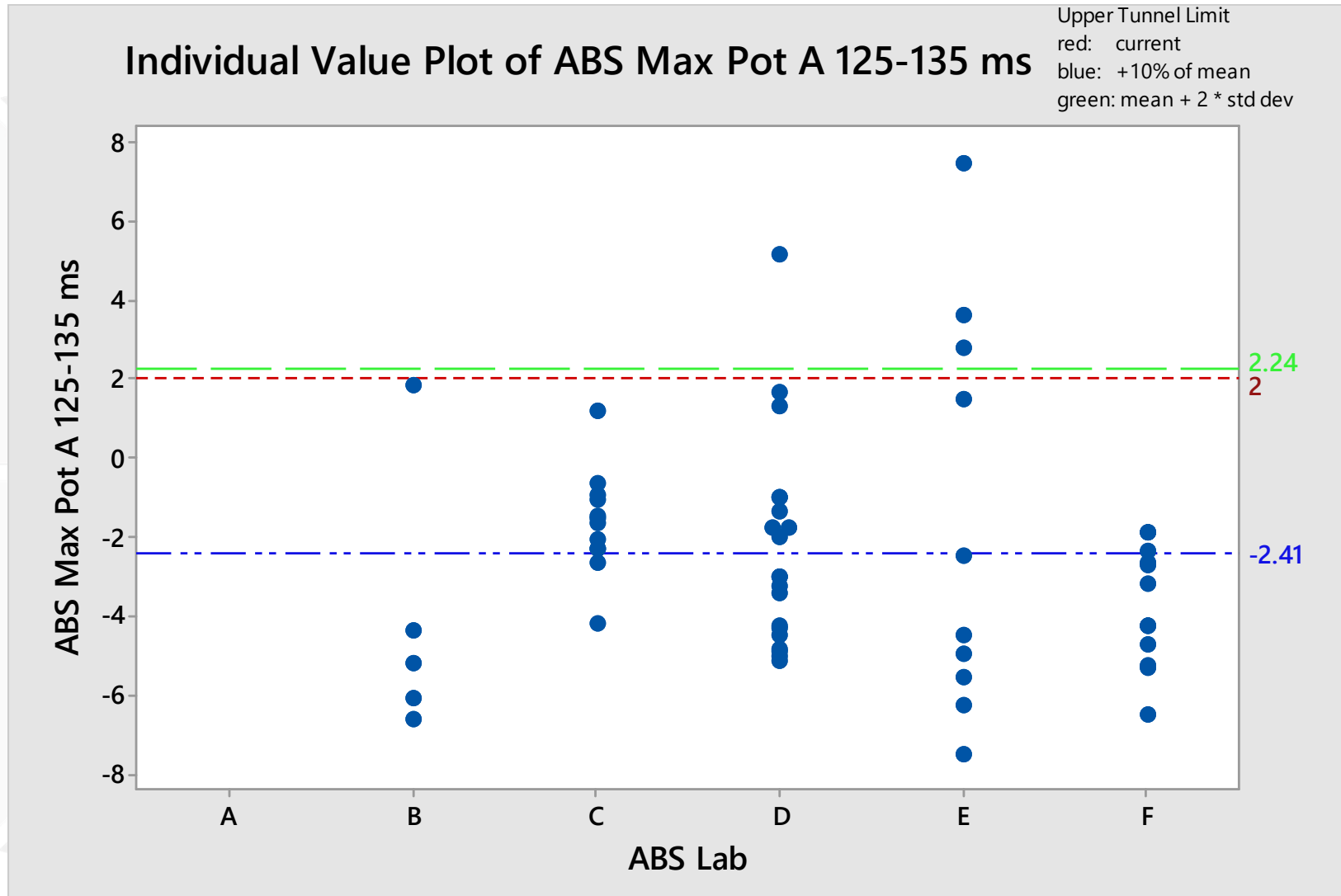
**after deleting Pot A outliers
and outliers on Max Pot A 125-135 ms**

**+/- 2 std dev: green +184%
-2.68 + 4.92 [N/A - 2.24]**

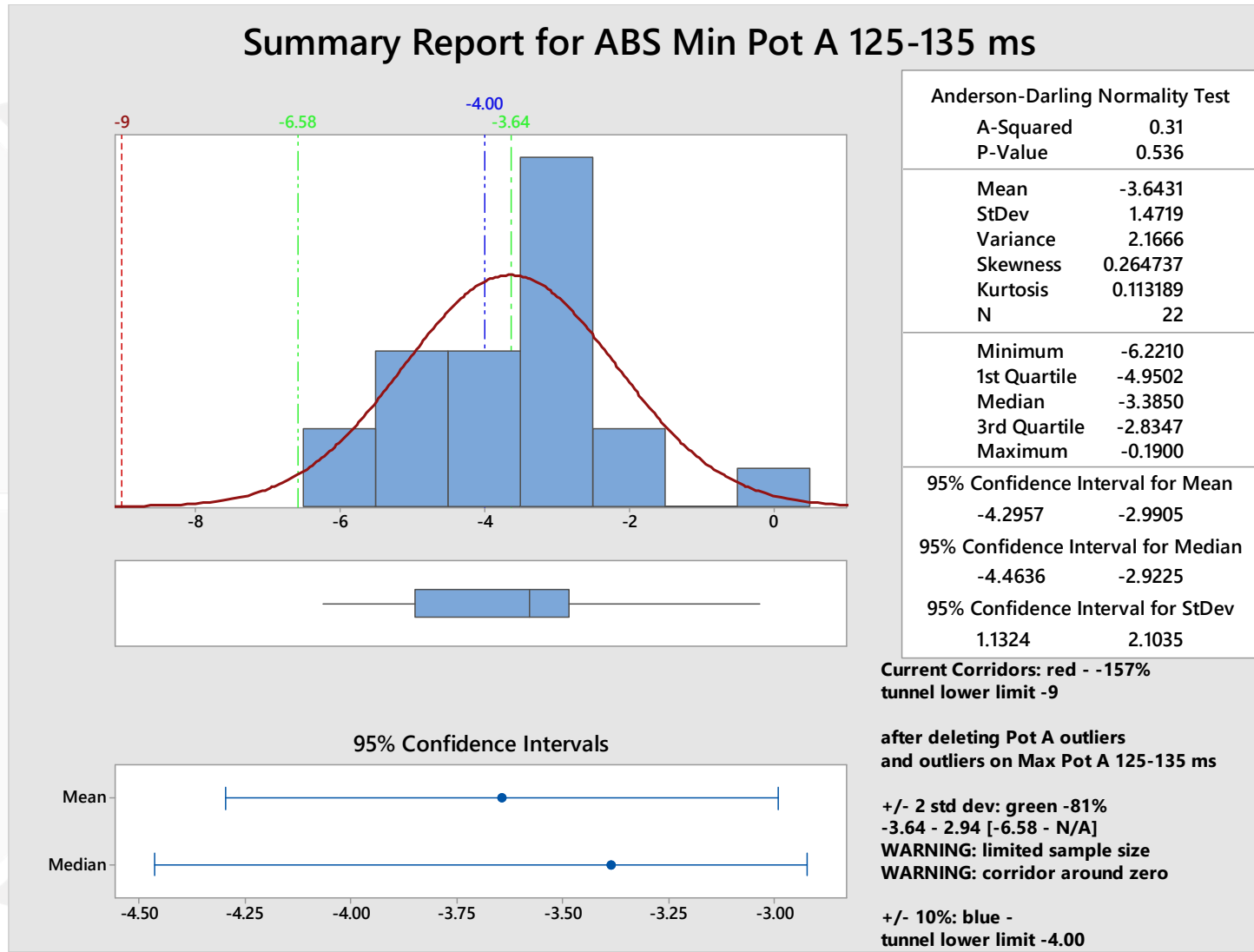
**WARNING: limited sample size
WARNING: corridor around zero**

**+/- 10%: blue -
tunnel upper limit -2.41**

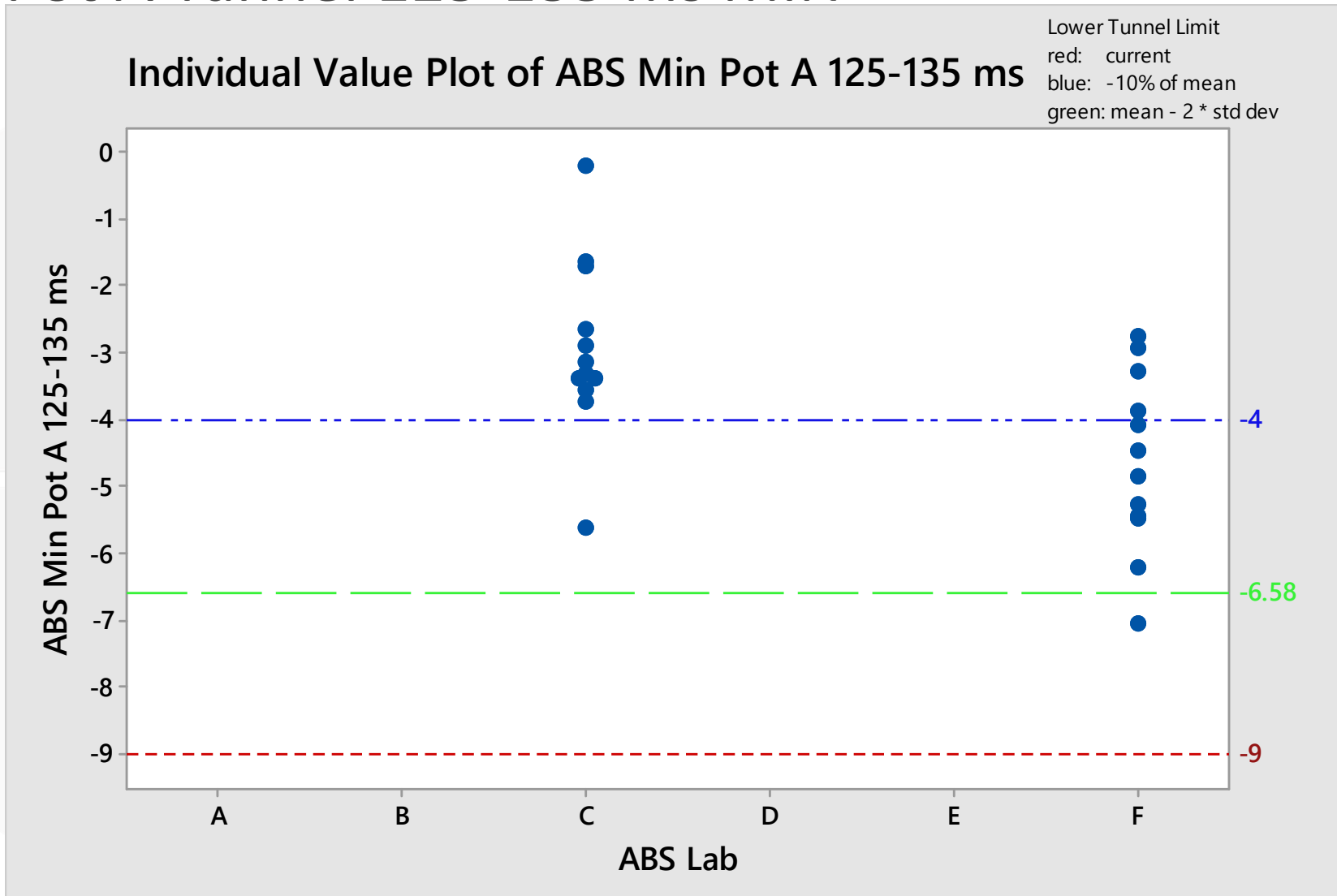
Analysis Dummy Certification - Pot A Tunnel 125-135 ms MAX



Analysis Dummy Certification - Pot A Tunnel 125-135 ms MIN

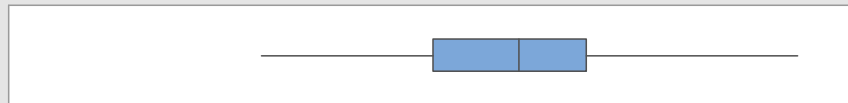
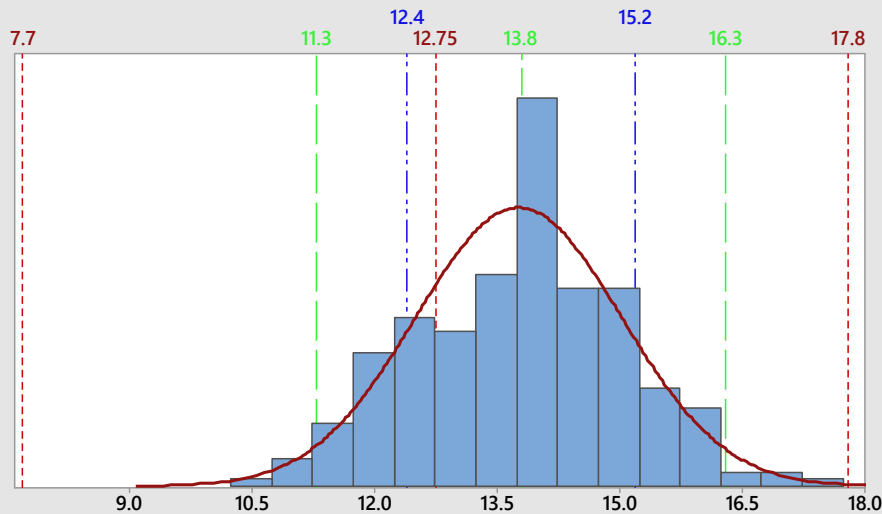


Analysis Dummy Certification - Pot A Tunnel 125-135 ms MIN

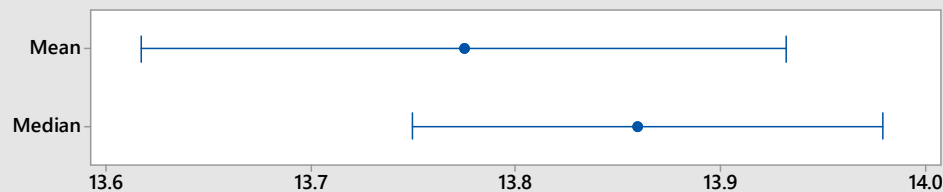


Analysis Dummy Certification - Max Upper Neck My (Nm)

Summary Report for ABS Max UpMy (Nm)



95% Confidence Intervals



Anderson-Darling Normality Test	
A-Squared	0.42
P-Value	0.330
Mean	13.775
StDev	1.263
Variance	1.595
Skewness	-0.029347
Kurtosis	-0.186962
N	250
Minimum	10.690
1st Quartile	12.800
Median	13.860
3rd Quartile	14.671
Maximum	17.277
95% Confidence Interval for Mean	
	13.618 13.932
95% Confidence Interval for Median	
	13.750 13.980
95% Confidence Interval for StDev	
	1.161 1.384

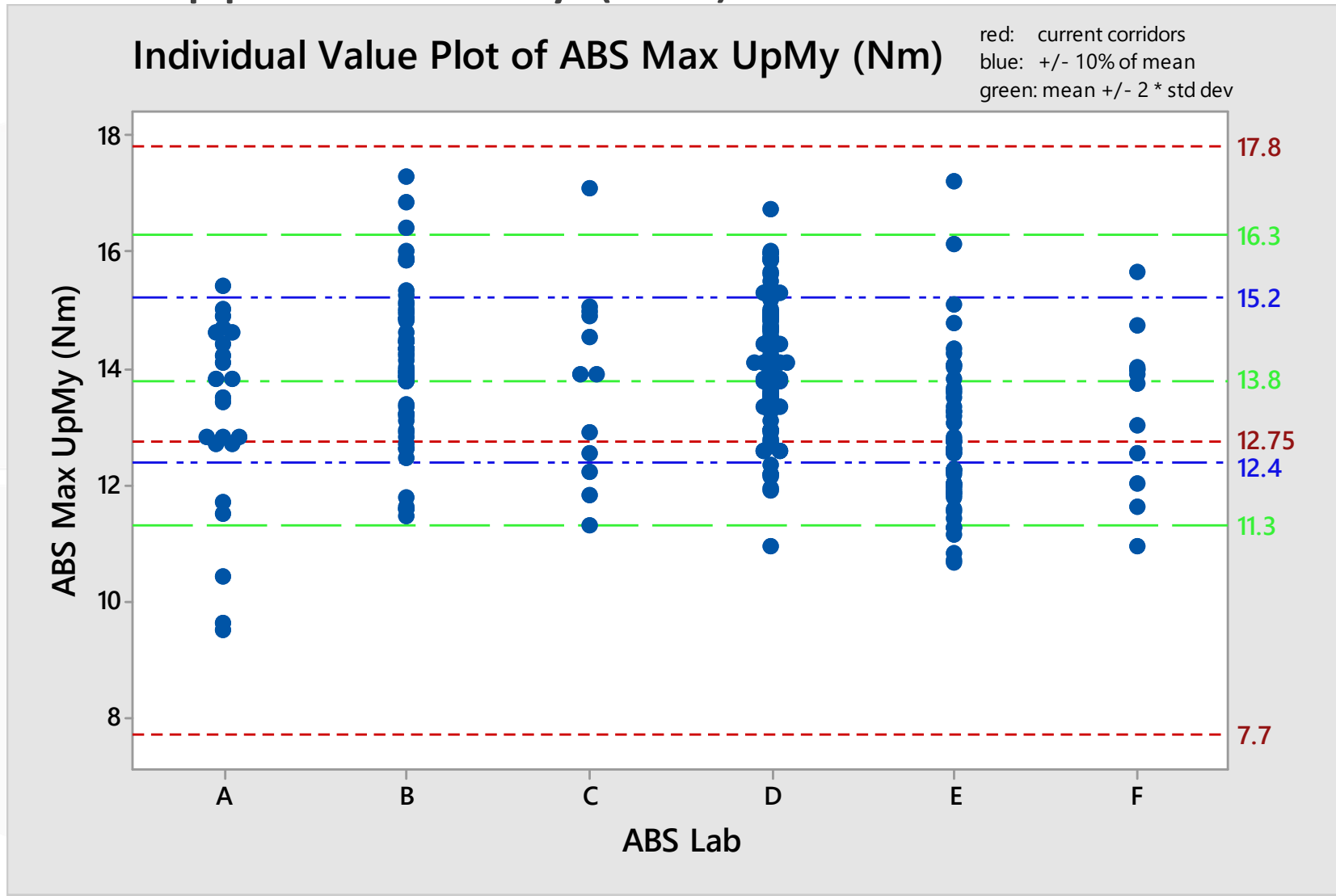
Current Corridors: red - width +/- 40%
12.75 +/- 5.05 [7.70 - 17.80]

after deleting outliers on all four Upper Neck My parameters

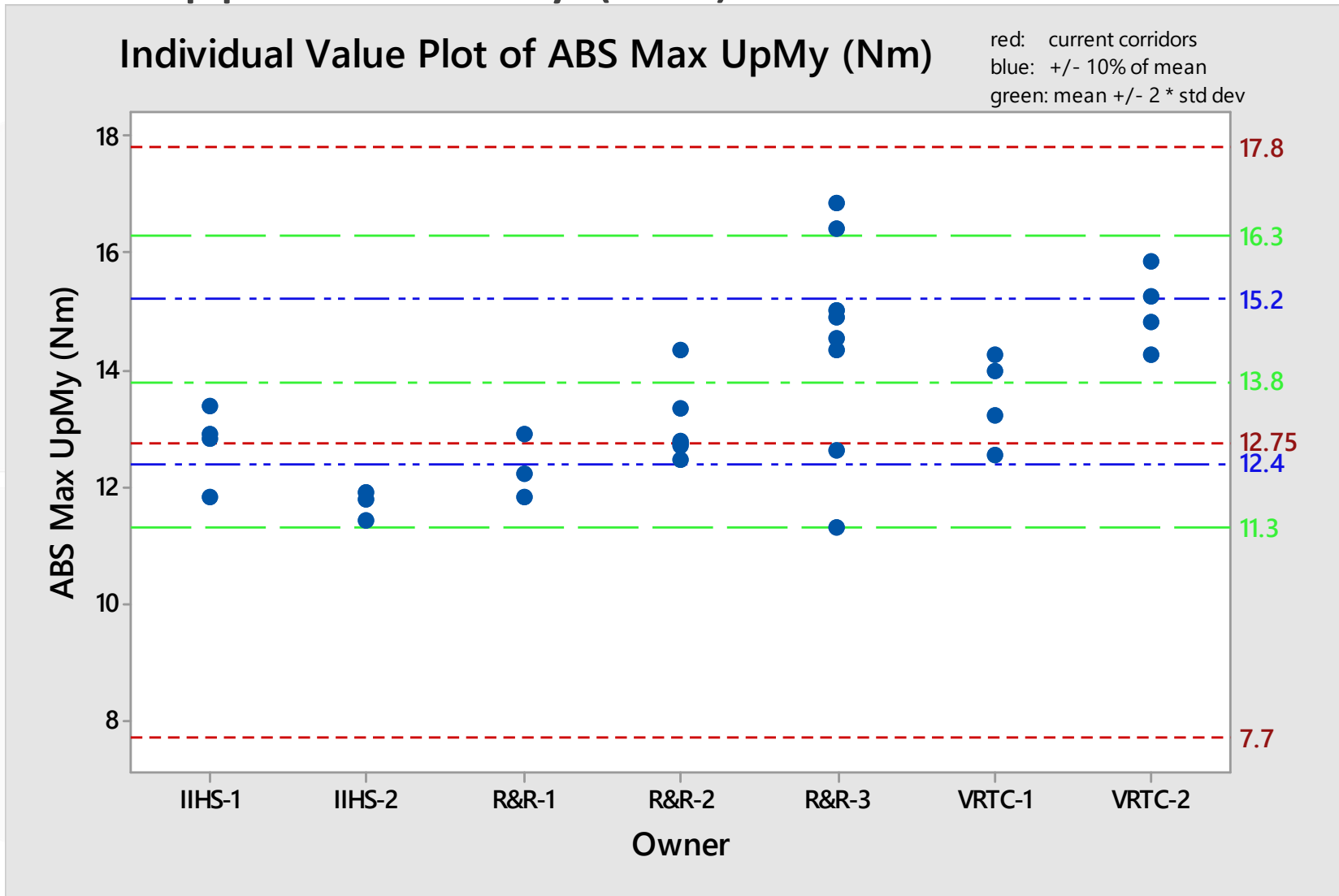
+/- 2 std dev: green +/- 18%
13.8 +/- 2.5 [11.3 - 16.3]

+/- 10%: blue
13.8 +/- 1.4 [12.4 - 15.2]

Analysis Dummy Certification - Max Upper Neck My (Nm)

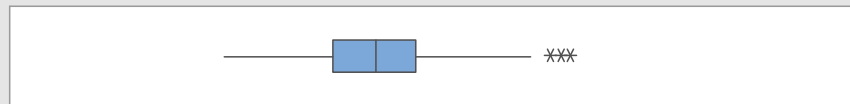
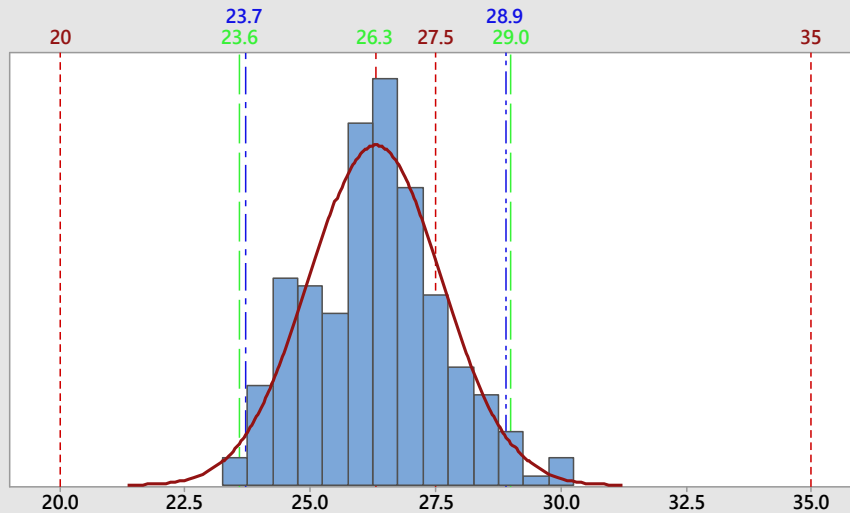


Analysis Dummy Certification - Max Upper Neck My (Nm)

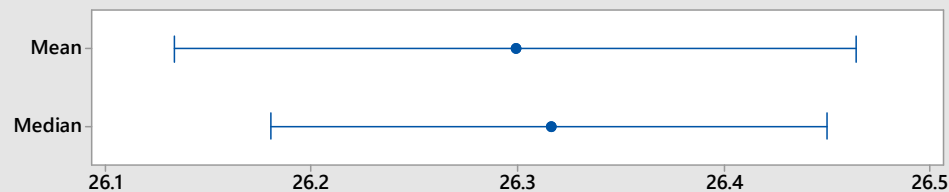


Analysis Dummy Certification - Time at Max Upper Neck My (ms)

Summary Report for ABS Max UpMy (ms)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 0.65
P-Value 0.088

Mean 26.299
StDev 1.326
Variance 1.758
Skewness 0.195447
Kurtosis -0.061791
N 250

Minimum 23.290
1st Quartile 25.461
Median 26.317
3rd Quartile 27.100
Maximum 30.200

95% Confidence Interval for Mean

26.134 26.464

95% Confidence Interval for Median

26.180 26.450

95% Confidence Interval for StDev

1.219 1.453

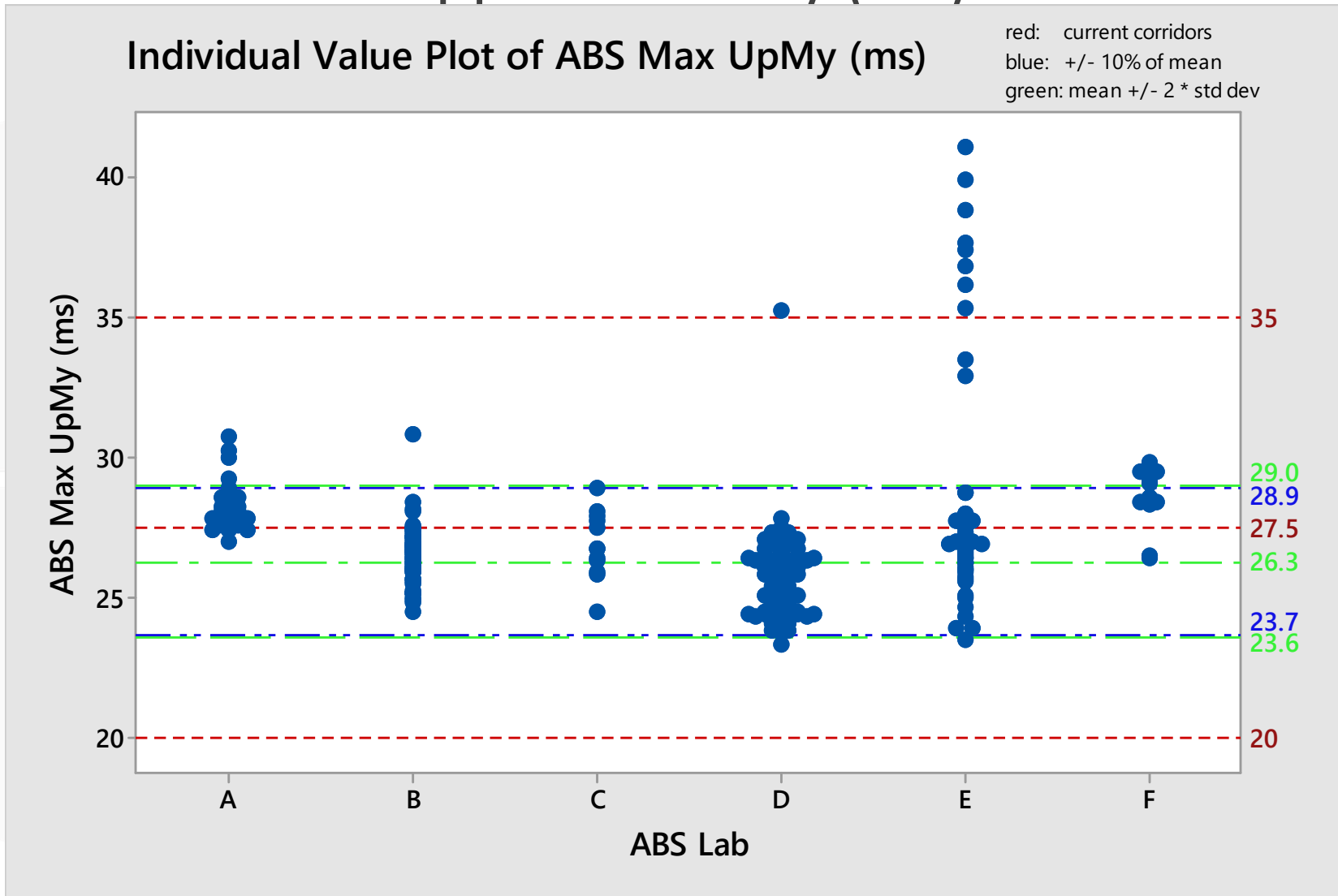
Current Corridors: red - width +/- 27%
27.5 +/- 7.5 [20.0 - 35.0]

**after deleting outliers on all four
Upper Neck My parameters**

+/- 2 std dev: green +/- 10.3%
26.3 +/- 2.7 [23.6 - 29.0]

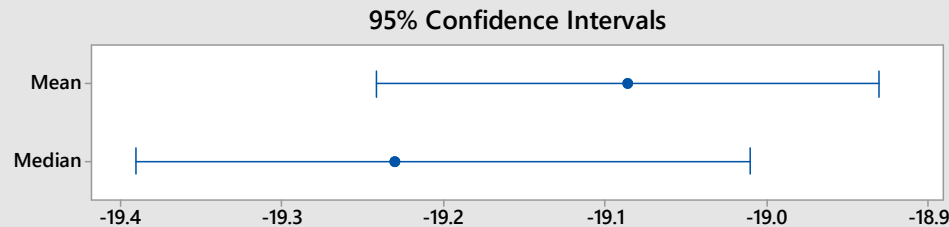
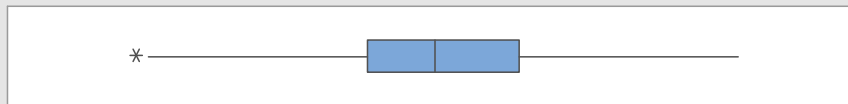
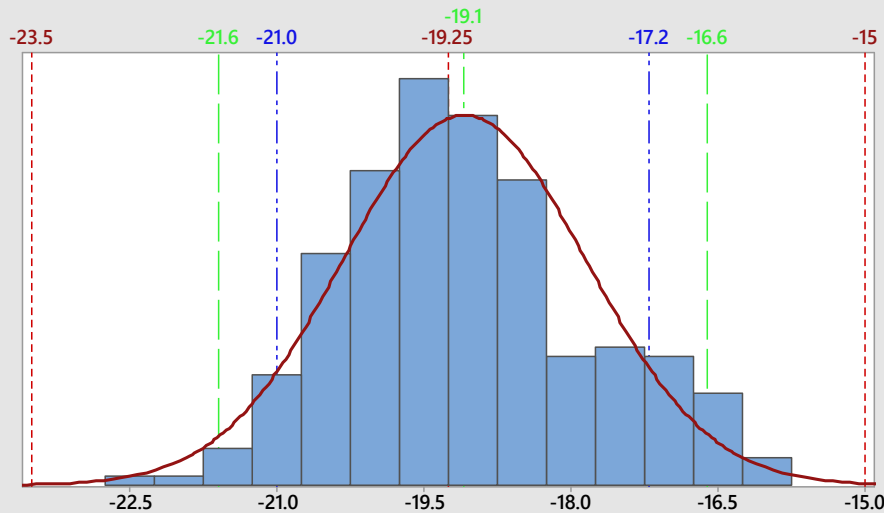
+/- 10%: blue
26.3 +/- 2.6 [23.7 - 28.9]

Analysis Dummy Certification - Time at Max Upper Neck My (ms)



Analysis Dummy Certification - Min Upper Neck My (Nm)

Summary Report for ABS Min UpMy (Nm)



Anderson-Darling Normality Test	
A-Squared	1.27
P-Value	<0.005
Mean	-19.086
StDev	1.246
Variance	1.553
Skewness	0.264665
Kurtosis	-0.275193
N	250
Minimum	-22.290
1st Quartile	-19.925
Median	-19.230
3rd Quartile	-18.370
Maximum	-16.136
95% Confidence Interval for Mean	
	-19.241 -18.931
95% Confidence Interval for Median	
	-19.390 -19.010
95% Confidence Interval for StDev	
	1.146 1.366

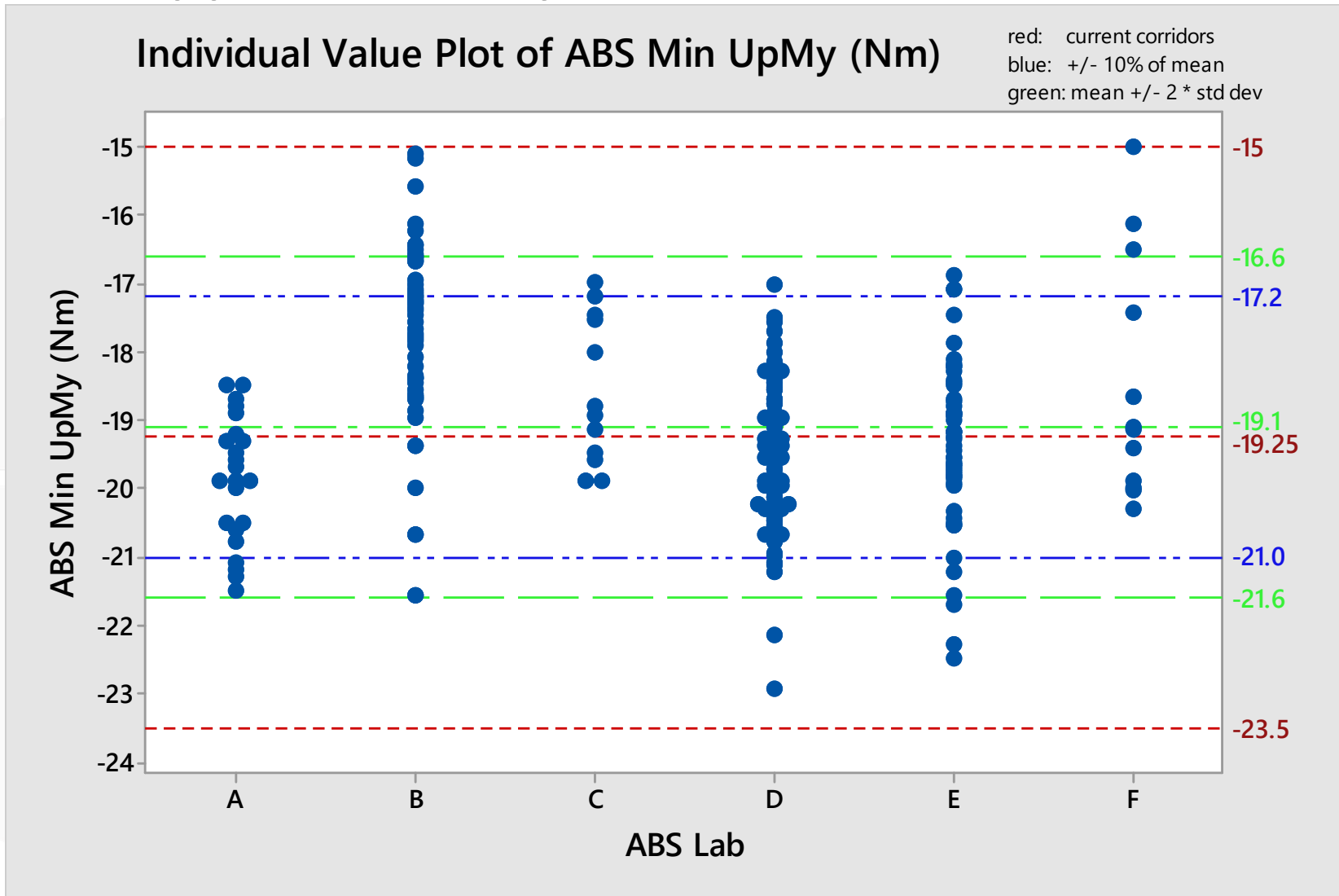
Current Corridors: red - width +/- 22%
-19.25 +/- 4.25 [-23.50 - -15.00]

**after deleting outliers on all four
 Upper Neck My parameters**

+/- 2 std dev: green +/- 13%
-19.1 +/- 2.5 [-21.6 - -16.6]

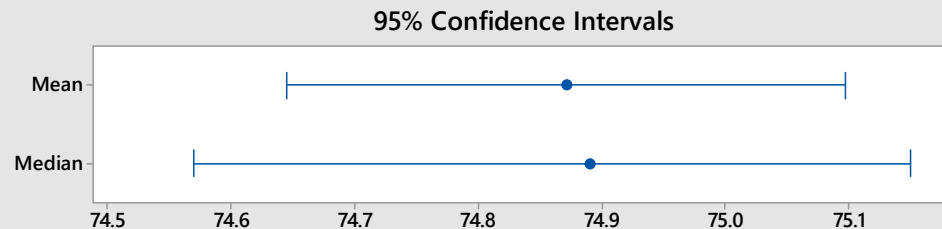
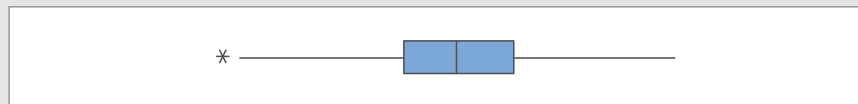
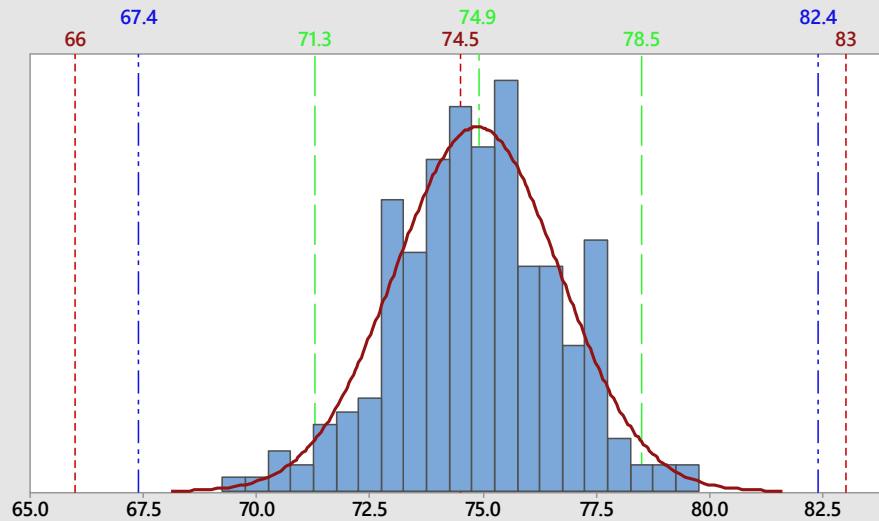
+/- 10%: blue
-19.1 +/- 1.9 [-21.0 - -17.2]

Analysis Dummy Certification - Min Upper Neck My (Nm)



Analysis Dummy Certification - Time at Min Upper Neck My (ms)

Summary Report for ABS Min UpMy (ms)



Anderson-Darling Normality Test	
A-Squared	0.22
P-Value	0.821
Mean	74.871
StDev	1.814
Variance	3.291
Skewness	-0.0973098
Kurtosis	0.0073650
N	250
Minimum	69.700
1st Quartile	73.700
Median	74.890
3rd Quartile	76.125
Maximum	79.700
95% Confidence Interval for Mean	
	74.645 75.097
95% Confidence Interval for Median	
	74.570 75.150
95% Confidence Interval for StDev	
	1.668 1.989

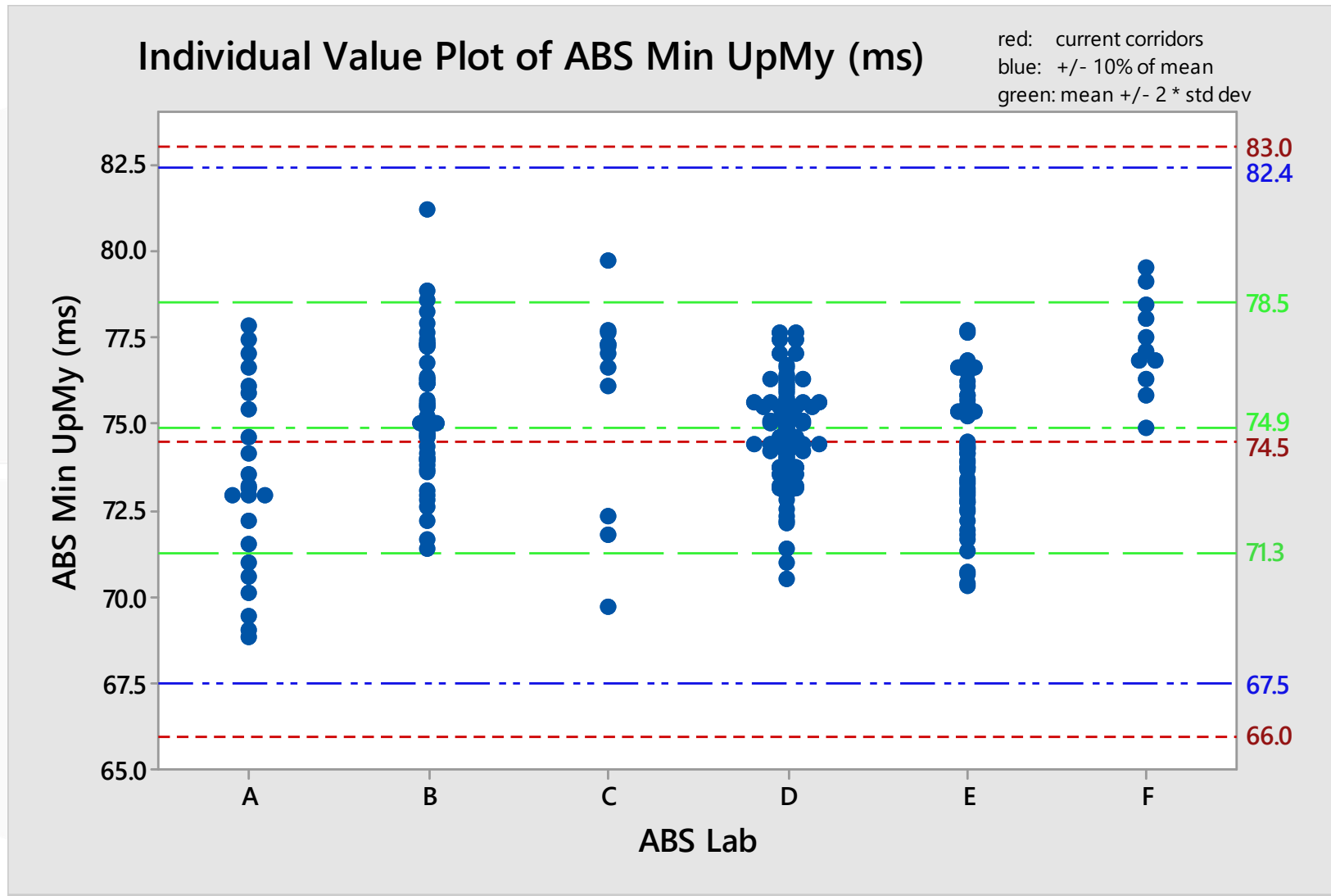
Current Corridors: red - width +/- 11%
74.5 +/- 8.5 [66.0 - 83.0]

**after deleting outliers on all four
Upper Neck My parameters**

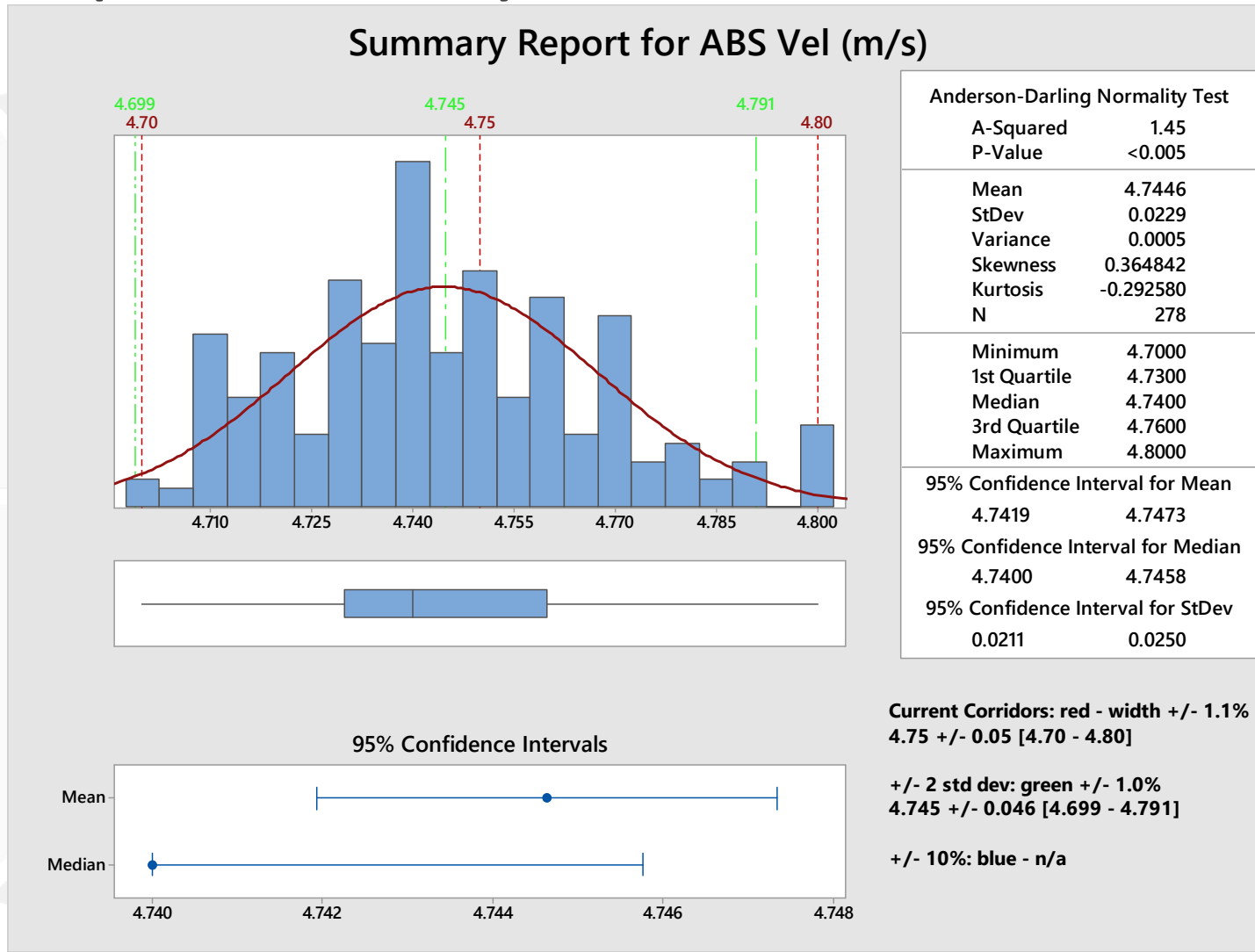
+/- 2 std dev: green +/- 4.8%
74.9 +/- 3.6 [71.3 - 78.5]

+/- 10%: blue
74.9 +/- 7.5 [67.4 - 82.4]

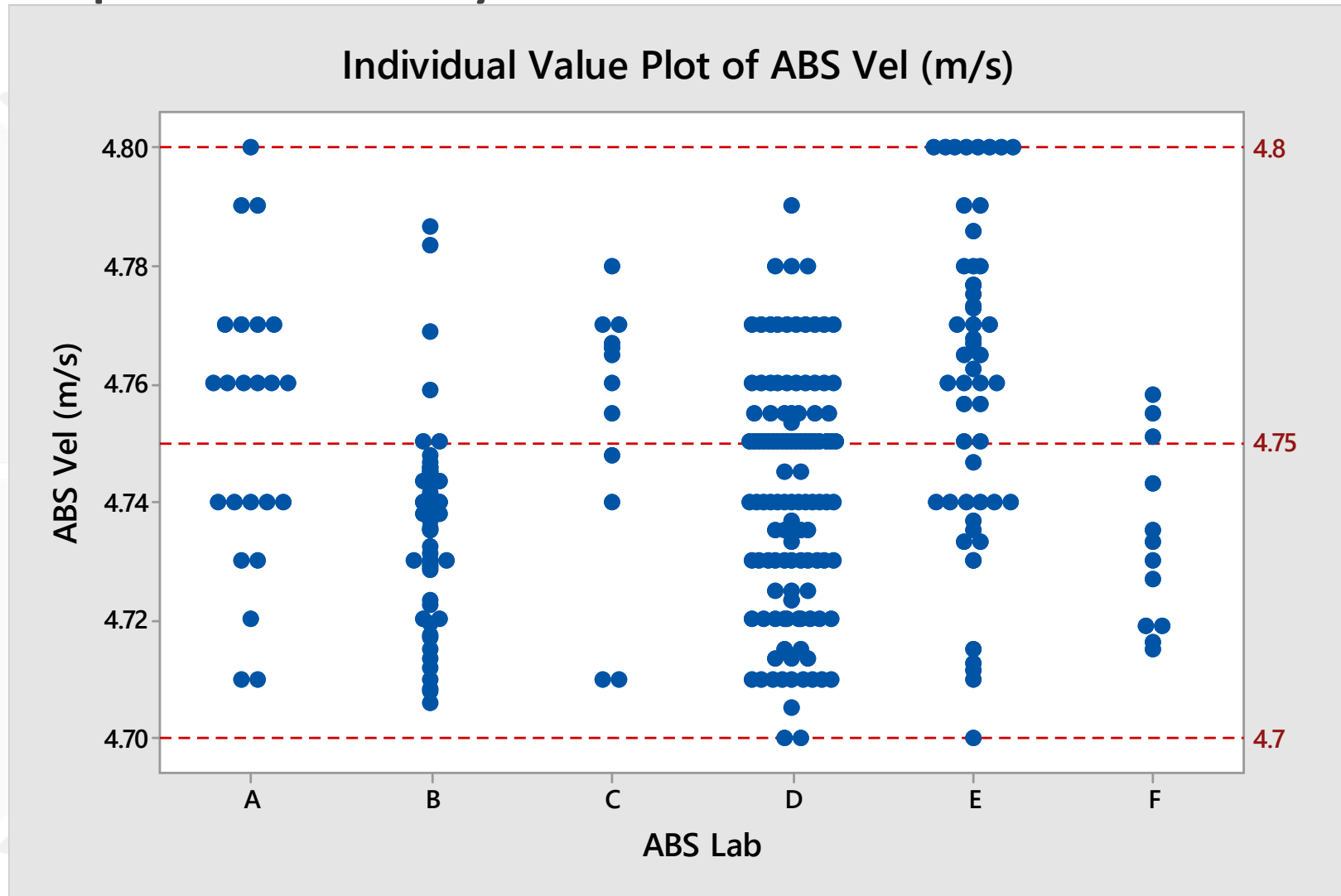
Analysis Dummy Certification - Time at Min Upper Neck My (ms)



Analysis Dummy Certification - Impact Velocity

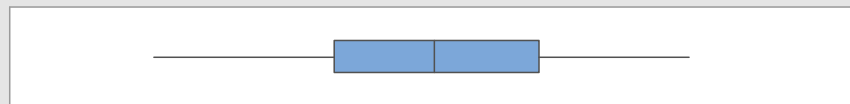
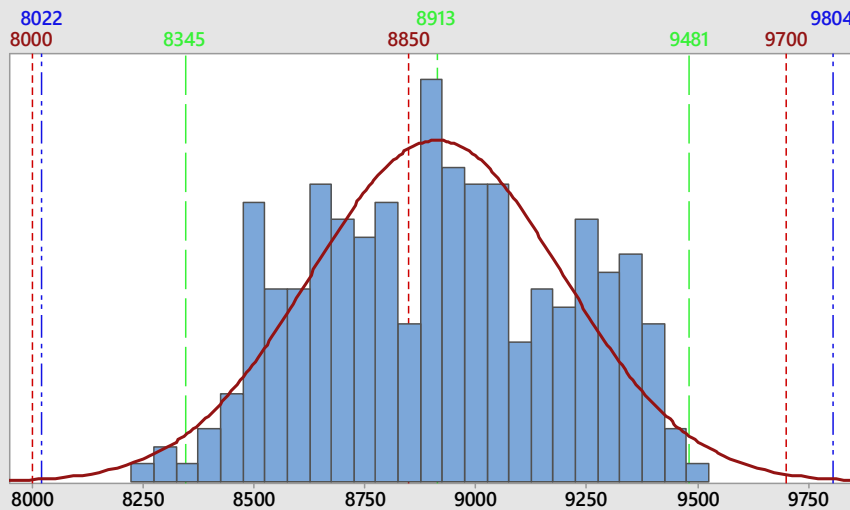


Analysis Dummy Certification - Impact Velocity

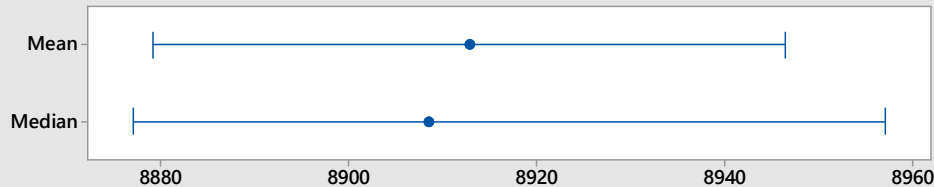


Analysis Dummy Certification - Pendulum Force

Summary Report for ABS Force (N)



95% Confidence Intervals



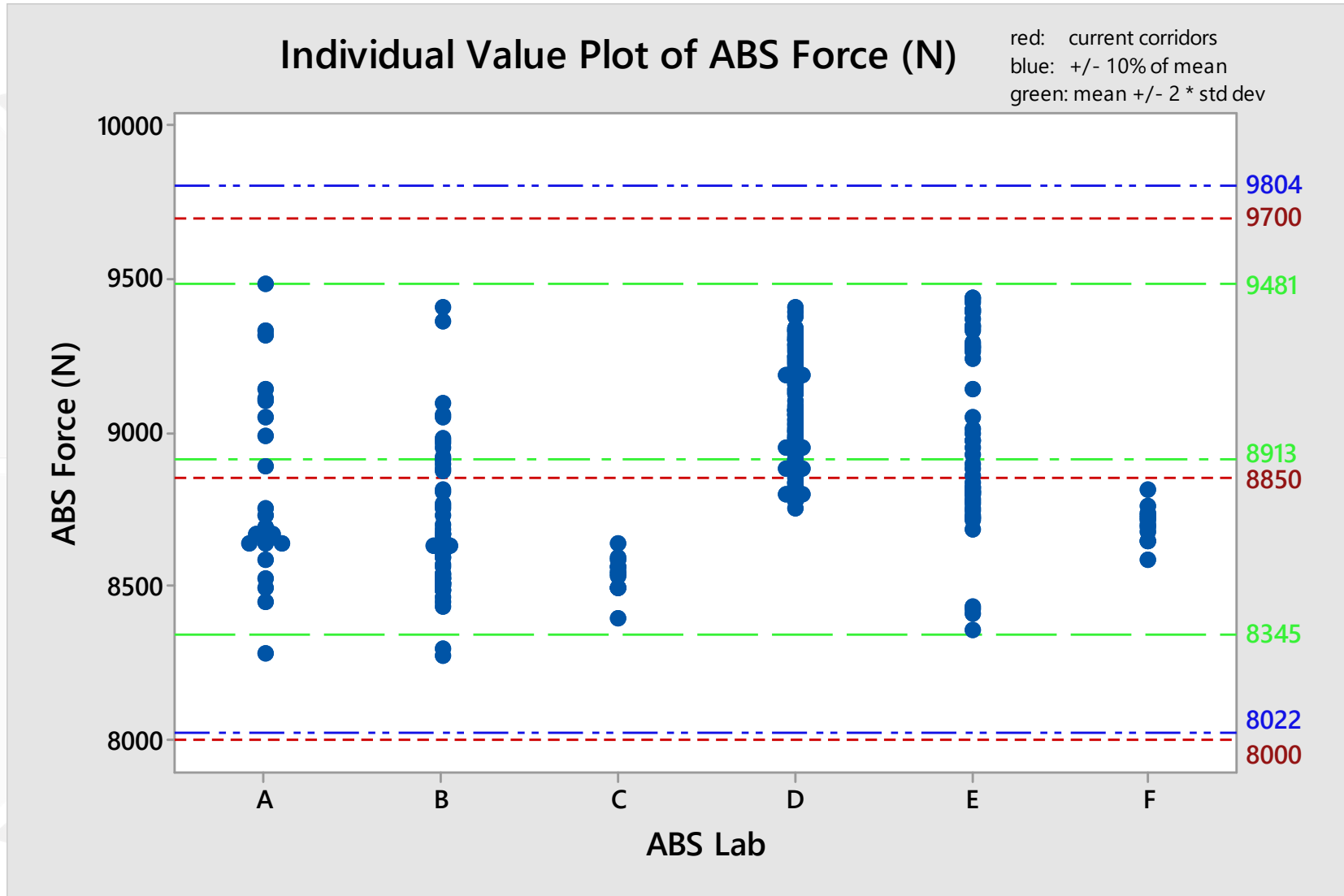
Anderson-Darling Normality Test	
A-Squared	1.52
P-Value	<0.005
Mean	8912.8
StDev	284.2
Variance	80770.1
Skewness	-0.001911
Kurtosis	-0.926543
N	278
Minimum	8273.0
1st Quartile	8680.0
Median	8908.5
3rd Quartile	9141.4
Maximum	9480.0
95% Confidence Interval for Mean	
	8879.2 8946.3
95% Confidence Interval for Median	
	8877.0 8957.1
95% Confidence Interval for StDev	
	262.4 310.0

Current Corridors: red - width +/- 9.6%
 8850 +/- 850 [8000 - 9700]

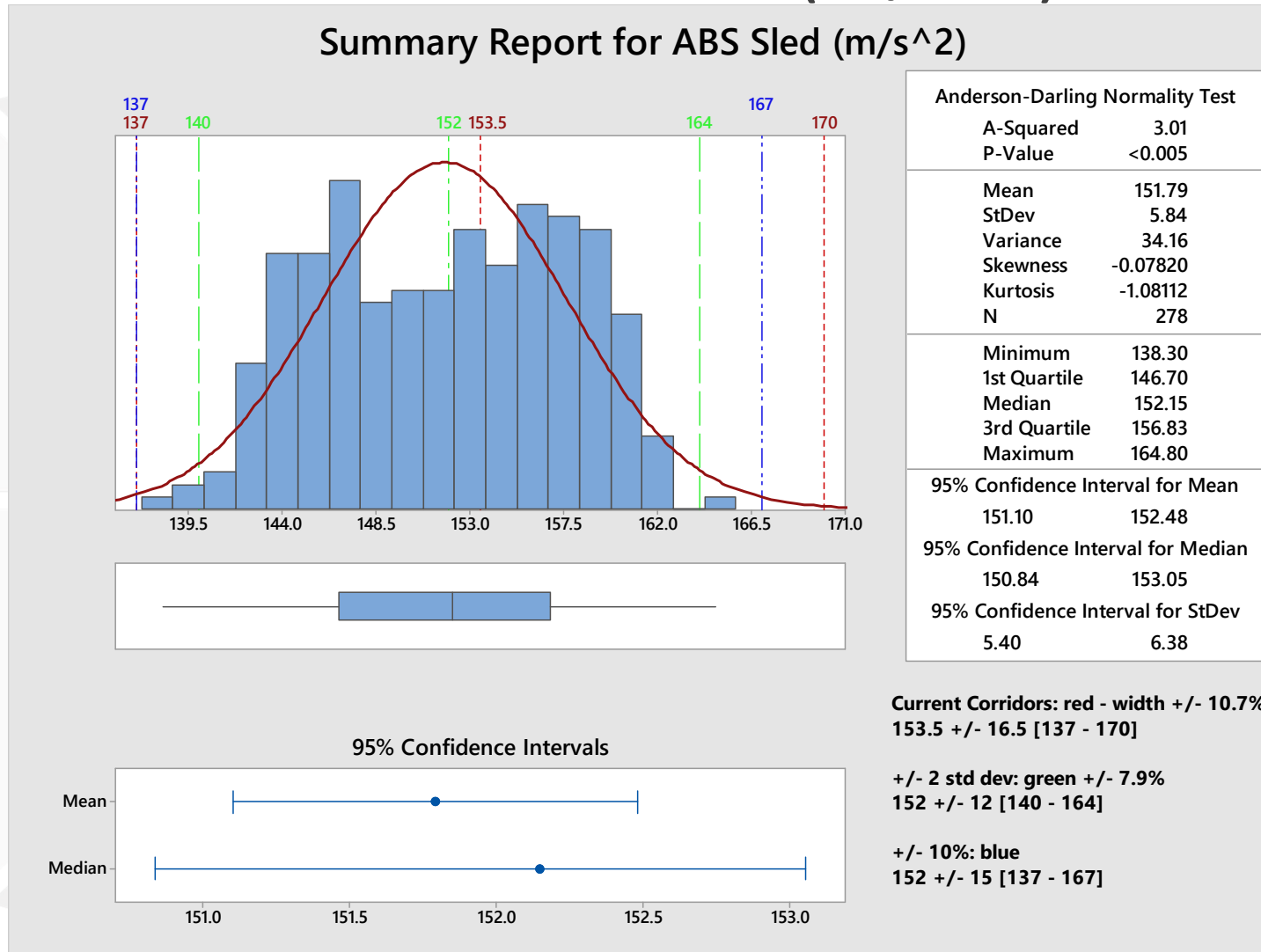
+/- 2 std dev: green +/- 5.6%
 8913 +/- 568 [8345 - 9481]

+/- 10%: blue
 8913 +/- 891 [8022 - 9804]

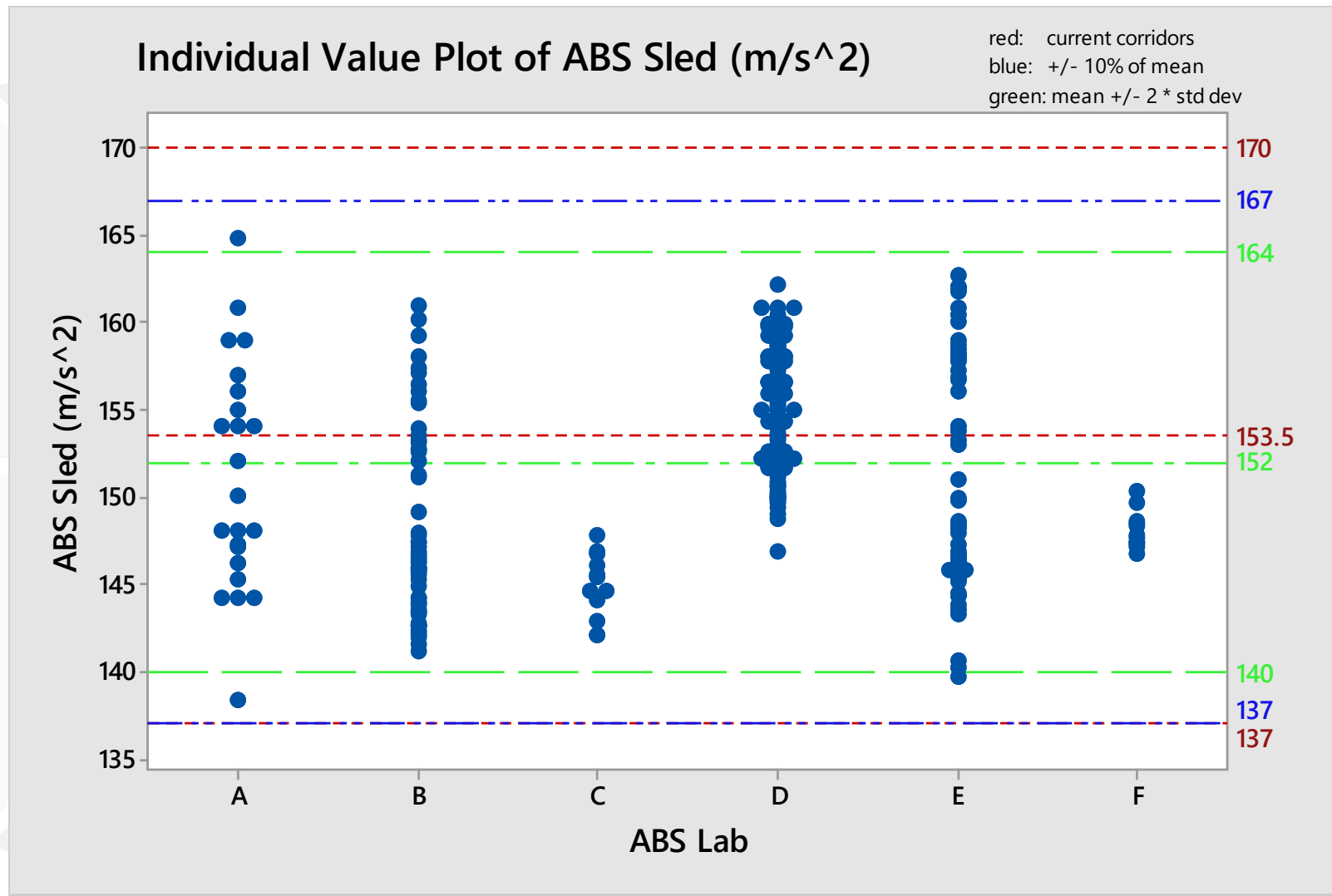
Analysis Dummy Certification - Pendulum Force



Analysis Dummy Certification - Peak Sled Acceleration (m/s²)

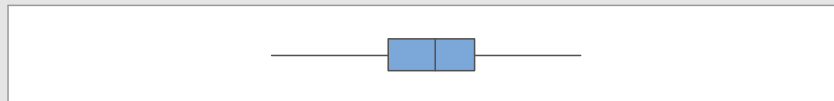
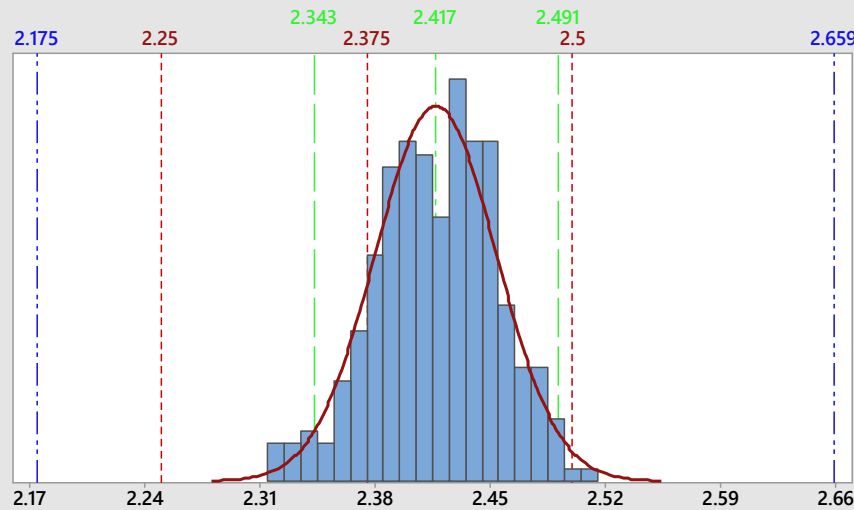


Analysis Dummy Certification - Peak Sled Acceleration (m/s²)

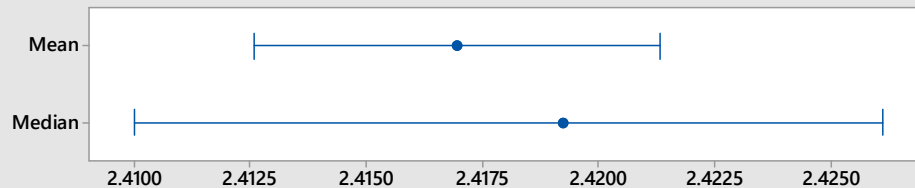


Analysis Dummy Certification - Sled Velocity Peak 1 (m/s)

Summary Report for ABS Sled Vel1 (m/s)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 0.54
P-Value 0.160

Mean 2.4170
StDev 0.0368
Variance 0.0014
Skewness -0.191619
Kurtosis -0.261887
N 275

Minimum 2.3200
1st Quartile 2.3910
Median 2.4192
3rd Quartile 2.4436
Maximum 2.5083

95% Confidence Interval for Mean

2.4126 2.4213

95% Confidence Interval for Median

2.4100 2.4261

95% Confidence Interval for StDev

0.0340 0.0402

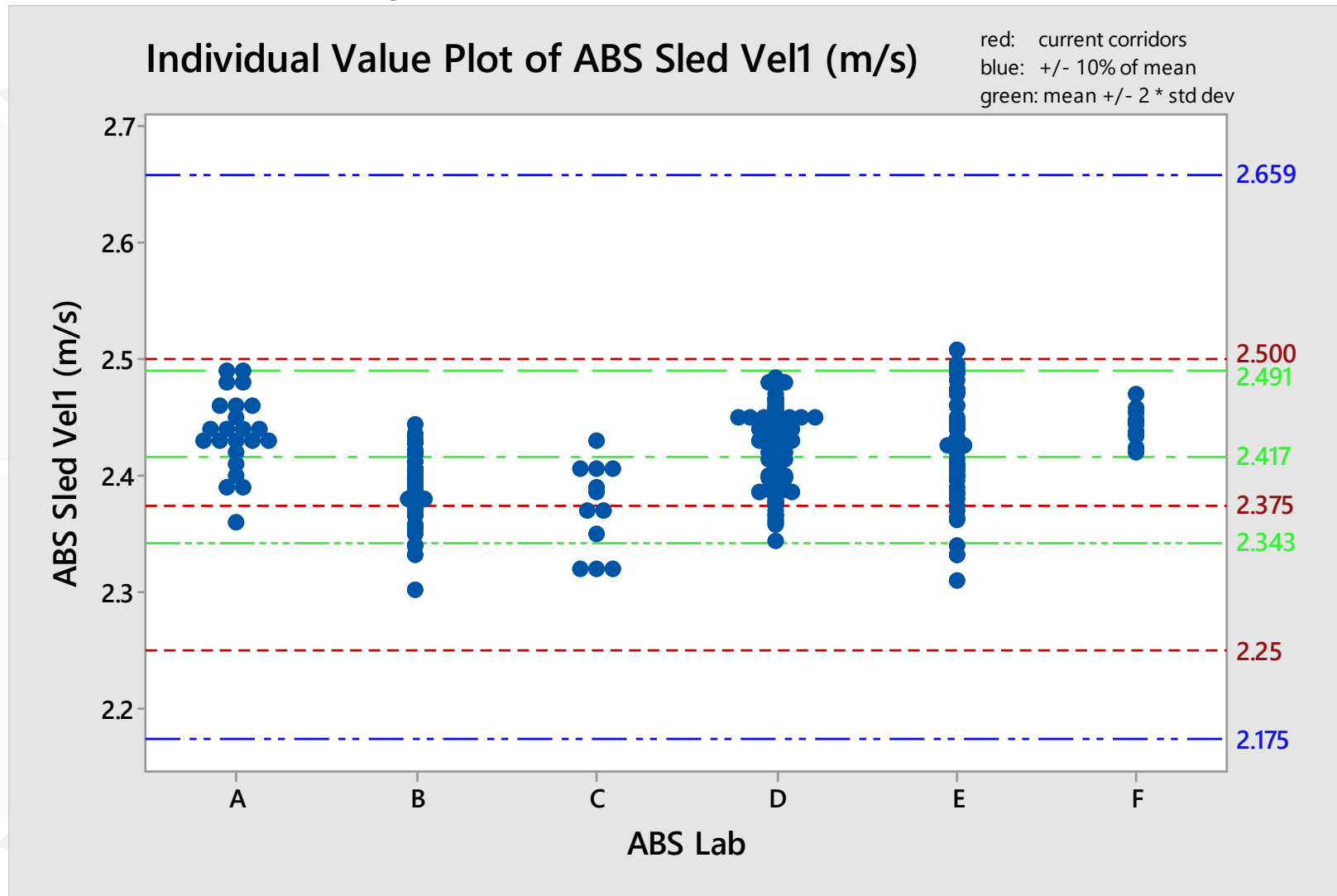
Current Corridors: red - width +/- 5.3%
2.375 +/- 0.125 [2.250 - 2.500]

after deleting outliers (3) on sled velocity parameters

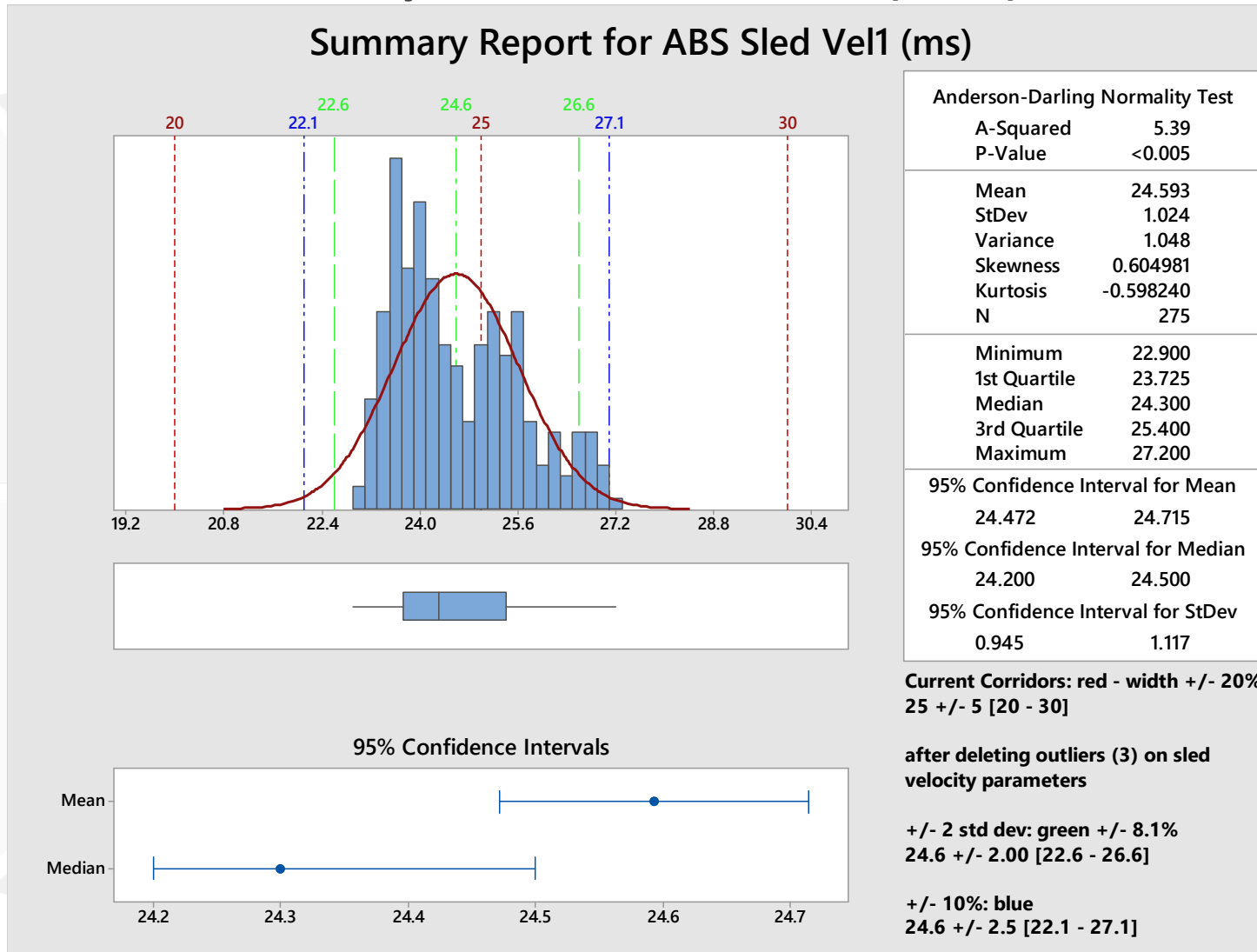
+/- 2 std dev: green +/- 3.1%
2.417 +/- 0.074 [2.343 - 2.491]

+/- 10%: blue
2.417 +/- 0.242 [2.175 - 2.659]

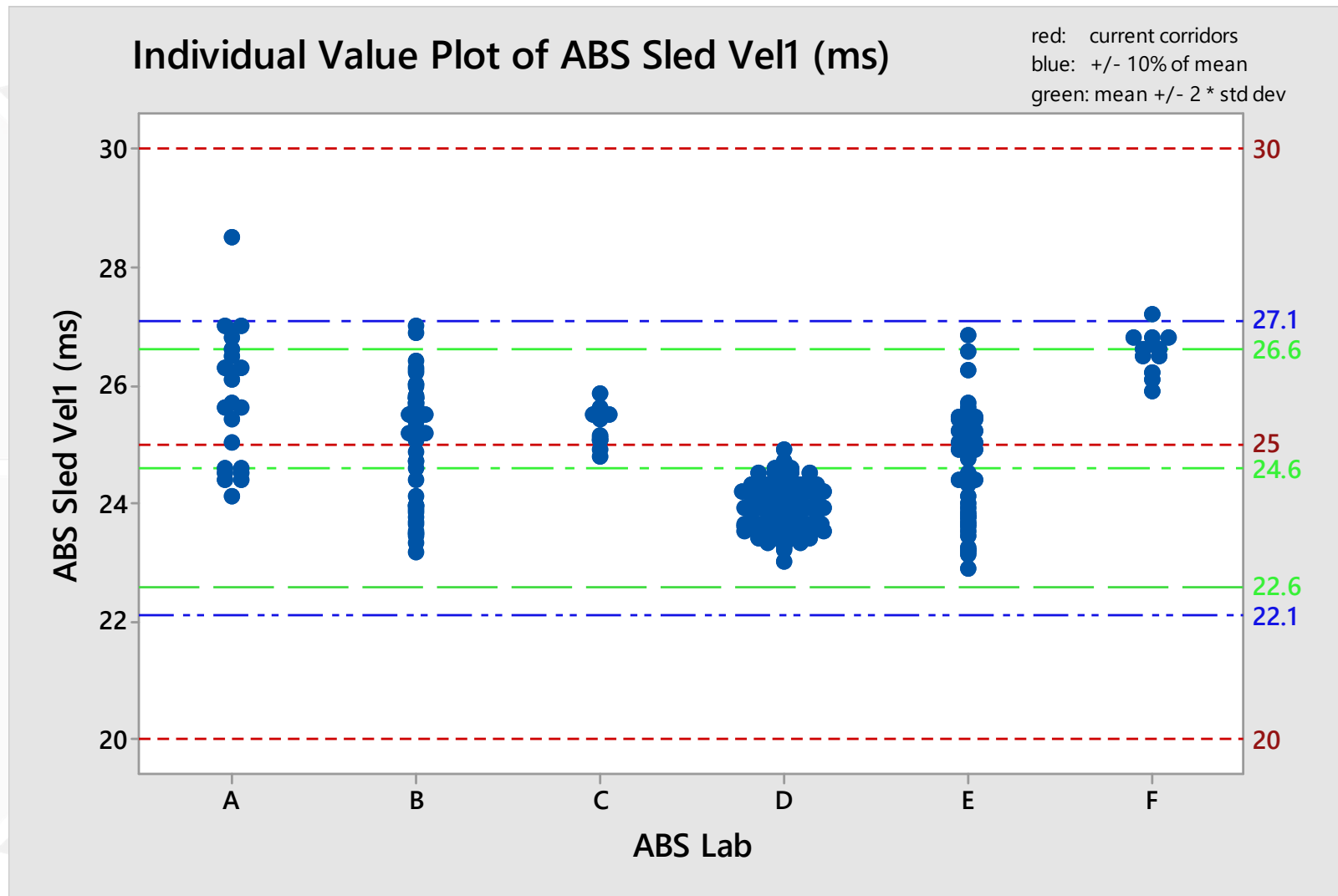
Analysis Dummy Certification - Sled Velocity Peak 1 (m/s)



Analysis Dummy Certification - Sled Velocity Peak 1 Time (ms)

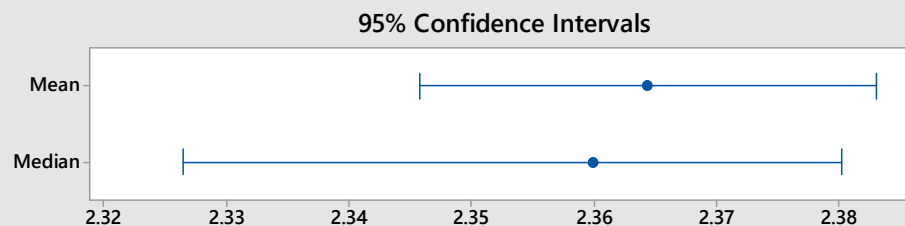
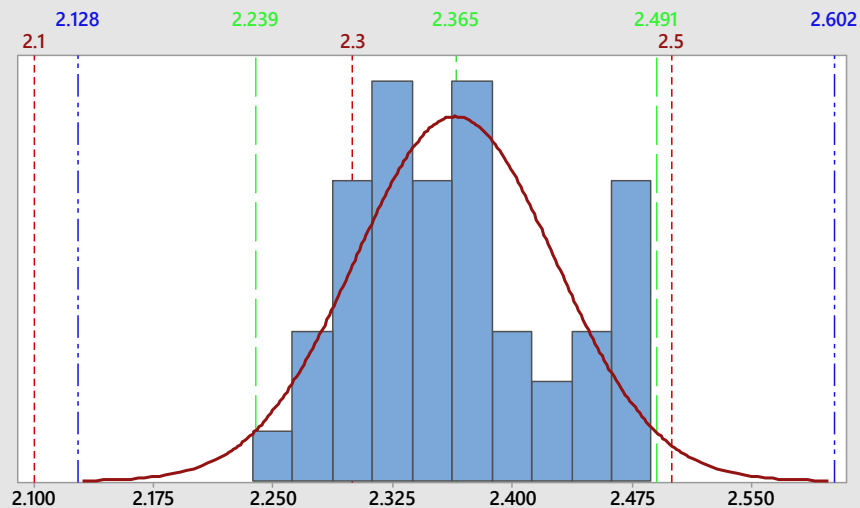


Analysis Dummy Certification - Sled Velocity Peak 1 Time (ms)



Analysis Dummy Certification - Sled Velocity Tunnel @ 135 ms (m/s)

Summary Report for ABS SledVel@135 (m/s)



Anderson-Darling Normality Test

A-Squared	0.70
P-Value	0.064

Mean	2.3645
StDev	0.0629
Variance	0.0040
Skewness	0.346898
Kurtosis	-0.820581
N	46

Minimum	2.2450
1st Quartile	2.3200
Median	2.3600
3rd Quartile	2.4118
Maximum	2.4811

95% Confidence Interval for Mean

2.3458	2.3831
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95% Confidence Interval for Median

2.3265	2.3802
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95% Confidence Interval for StDev

0.0522	0.0793
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Current Corridors: red - width +/- 8.7%
2.30 +/- 0.20 [2.10 - 2.50]

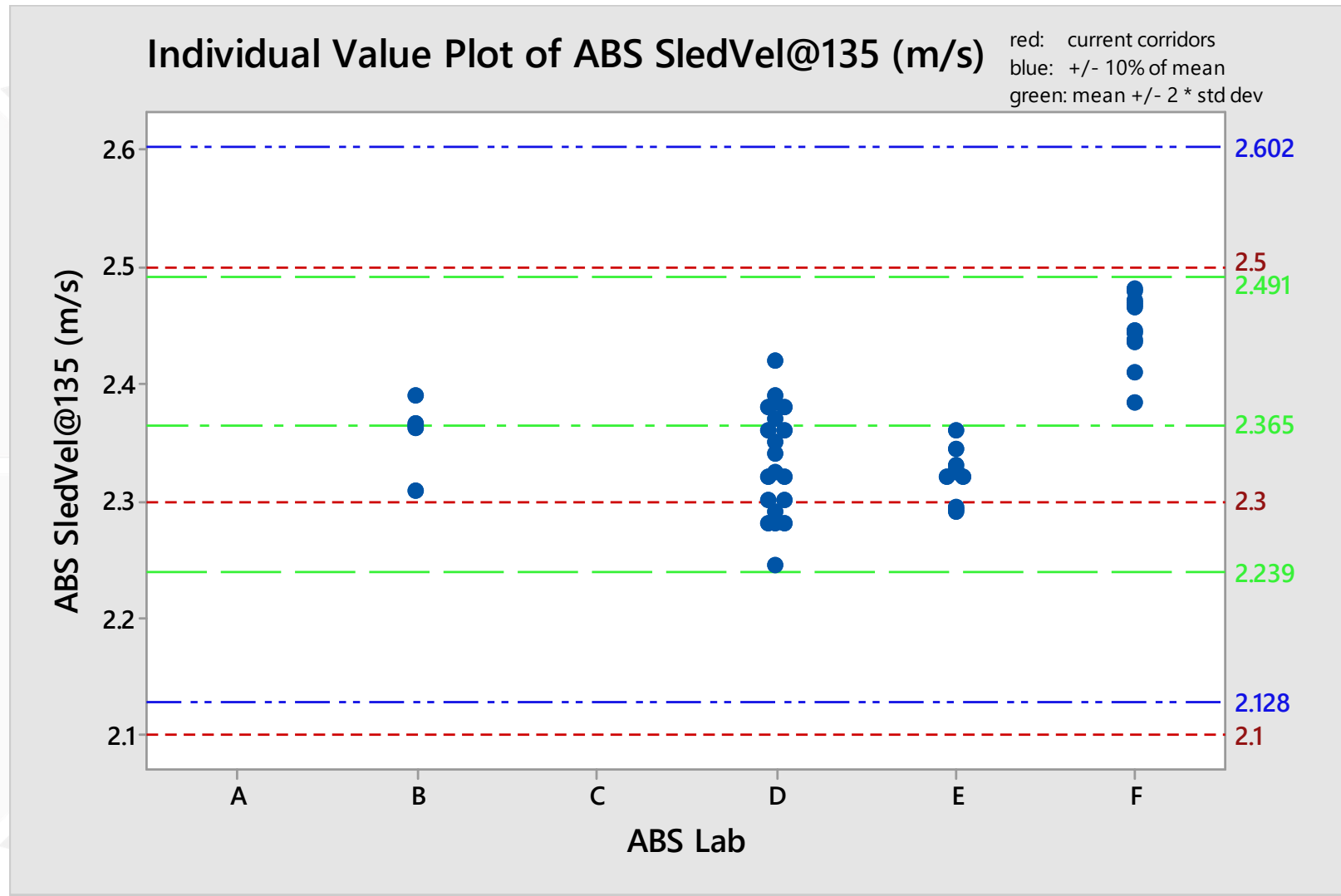
after deleting outliers (3) on sled velocity parameters

+/- 2 std dev: green +/- 5.3%
2.365 +/- 0.126 [2.239 - 2.491]

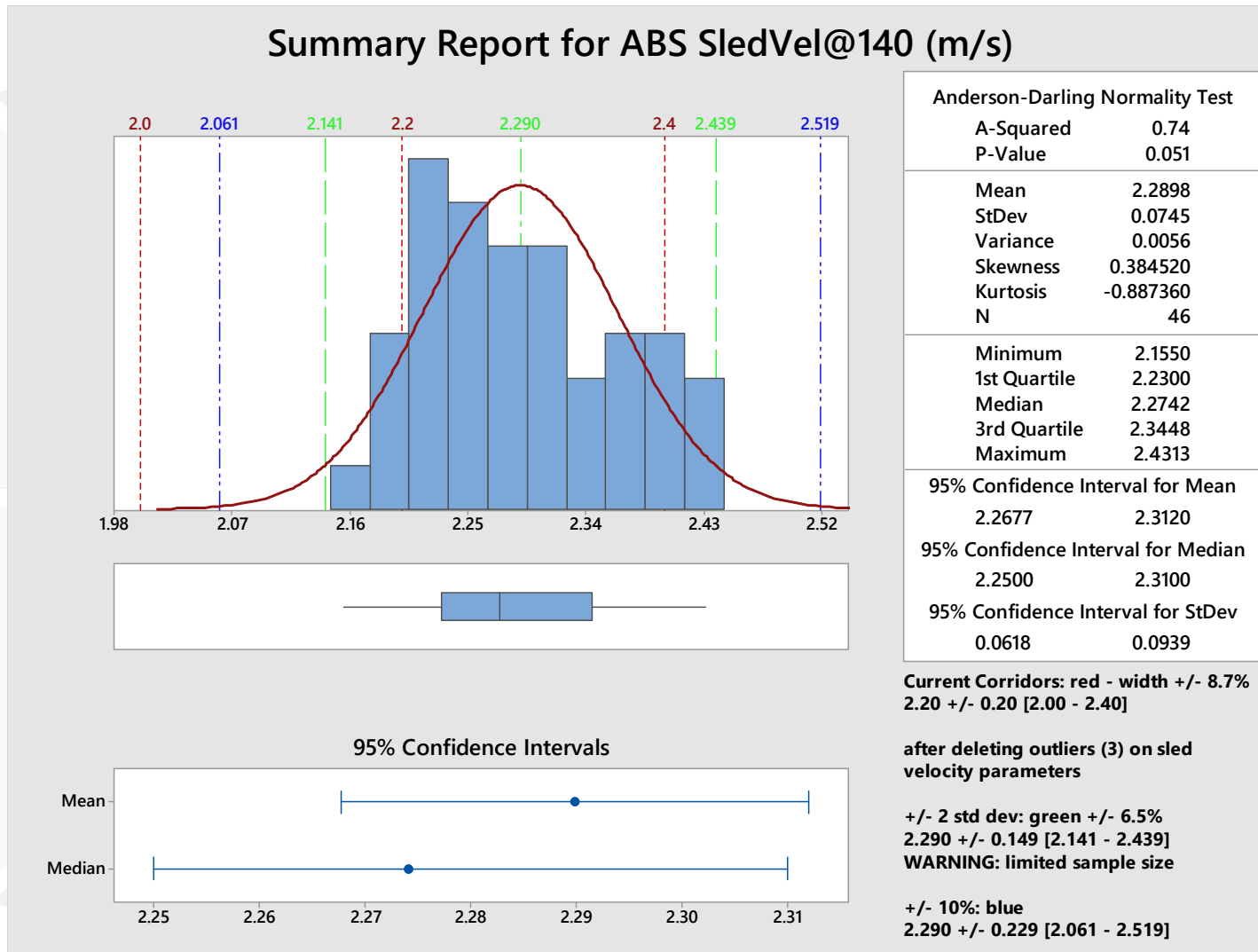
WARNING: limited sample size

+/- 10%: blue
2.365 +/- 0.237 [2.128 - 2.602]

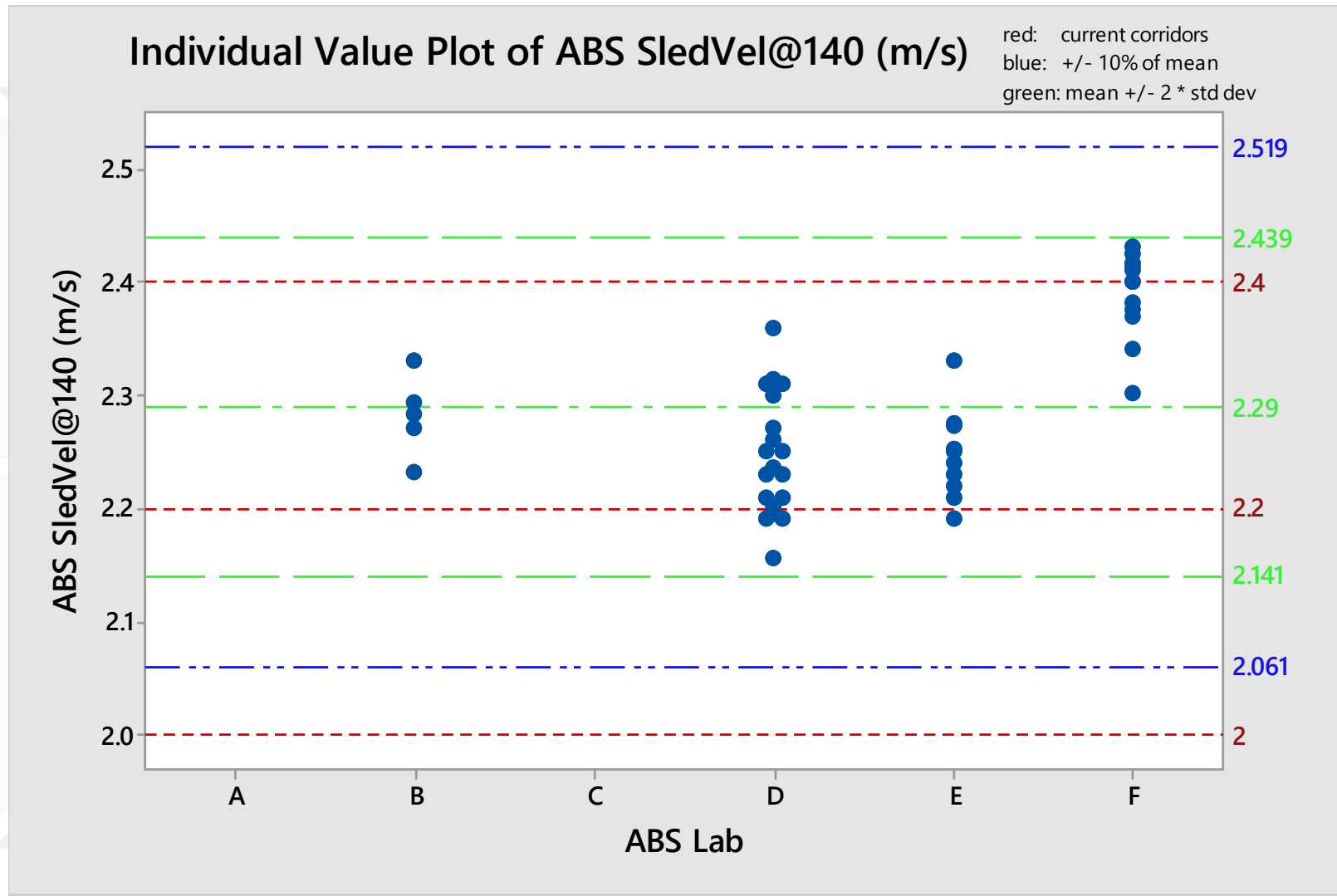
Analysis Dummy Certification - Sled Velocity Tunnel @ 135 ms (m/s)



Analysis Dummy Certification - Sled Velocity Tunnel @ 140 ms (m/s)

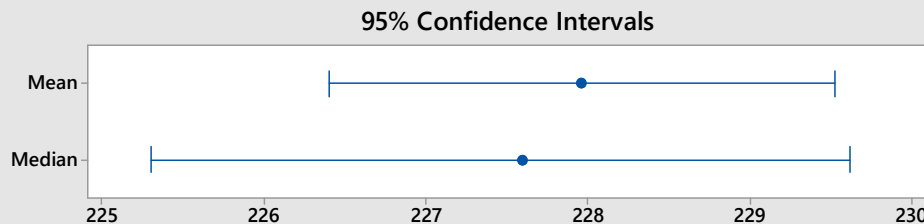
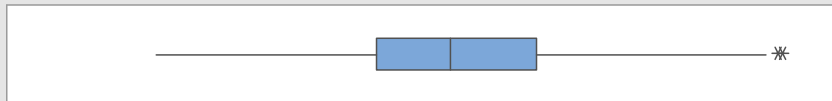
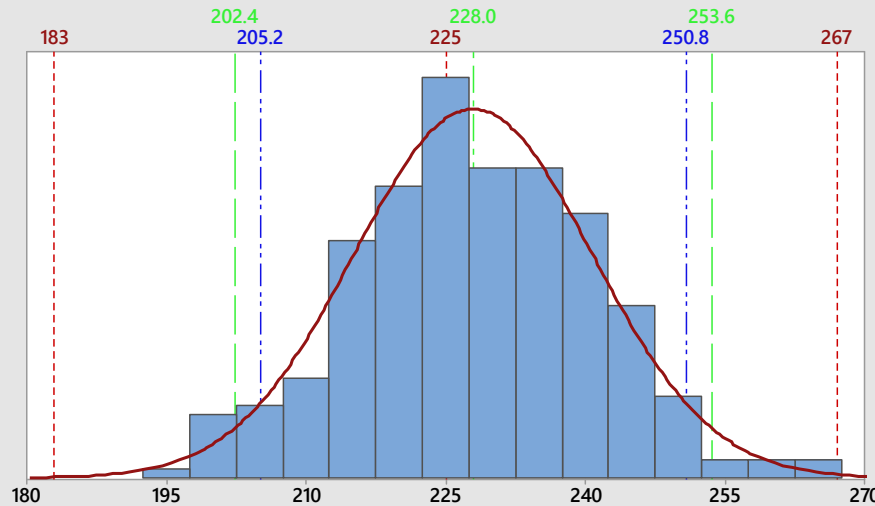


Analysis Dummy Certification - Sled Velocity Tunnel @ 140 ms (m/s)



Analysis Dummy Certification - T1 Acceleration (m/s²)

Summary Report for ABS T1 Accel (m/s²)



Anderson-Darling Normality Test

A-Squared	0.21
P-Value	0.848

Mean	227.96
StDev	12.80
Variance	163.91
Skewness	0.0558085
Kurtosis	-0.0917667
N	260

Minimum	196.10
1st Quartile	219.66
Median	227.60
3rd Quartile	236.90
Maximum	263.28

95% Confidence Interval for Mean
226.40 229.53

95% Confidence Interval for Median
225.31 229.62

95% Confidence Interval for StDev
11.79 14.01

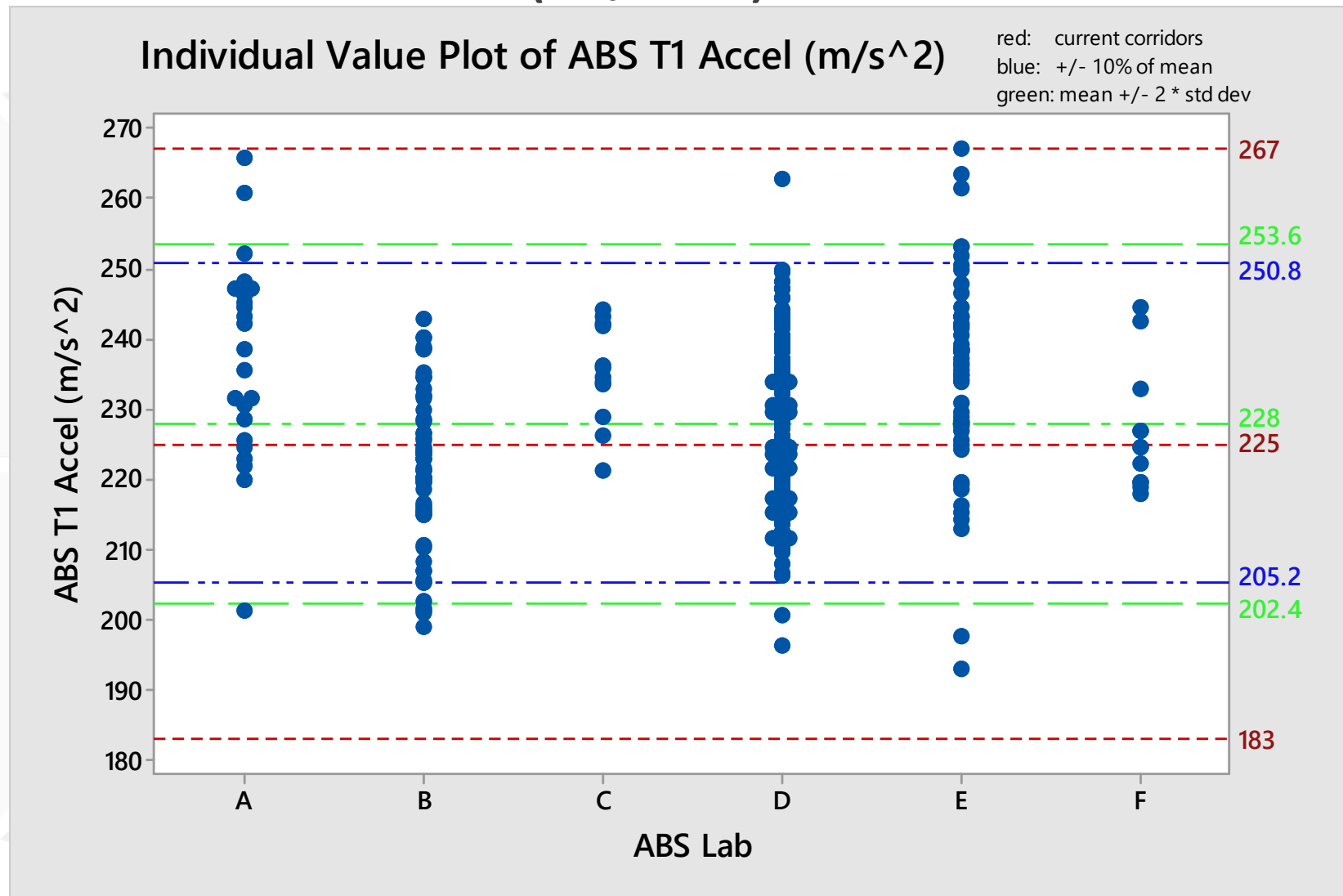
Current Corridors: red - width +/- 18.7%
225 +/- 42 [183 - 267]

after deleting outliers (18) on T1 accel and T1 accel time parameters

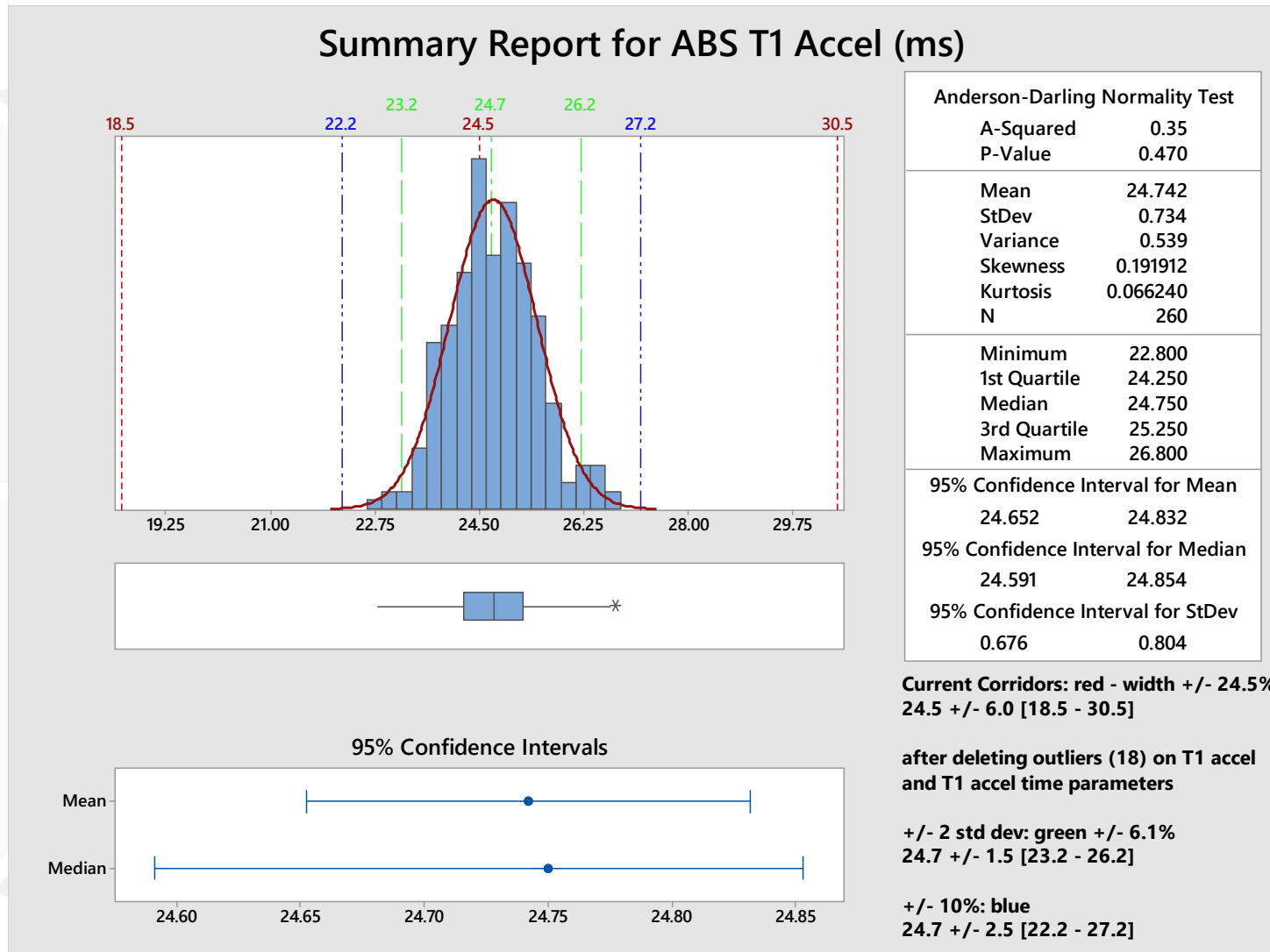
+/- 2 std dev: green +/- 11.2%
228.0 +/- 25.6 [202.4 - 253.6]

+/- 10%: blue
228.0 +/- 22.8 [205.2 - 250.8]

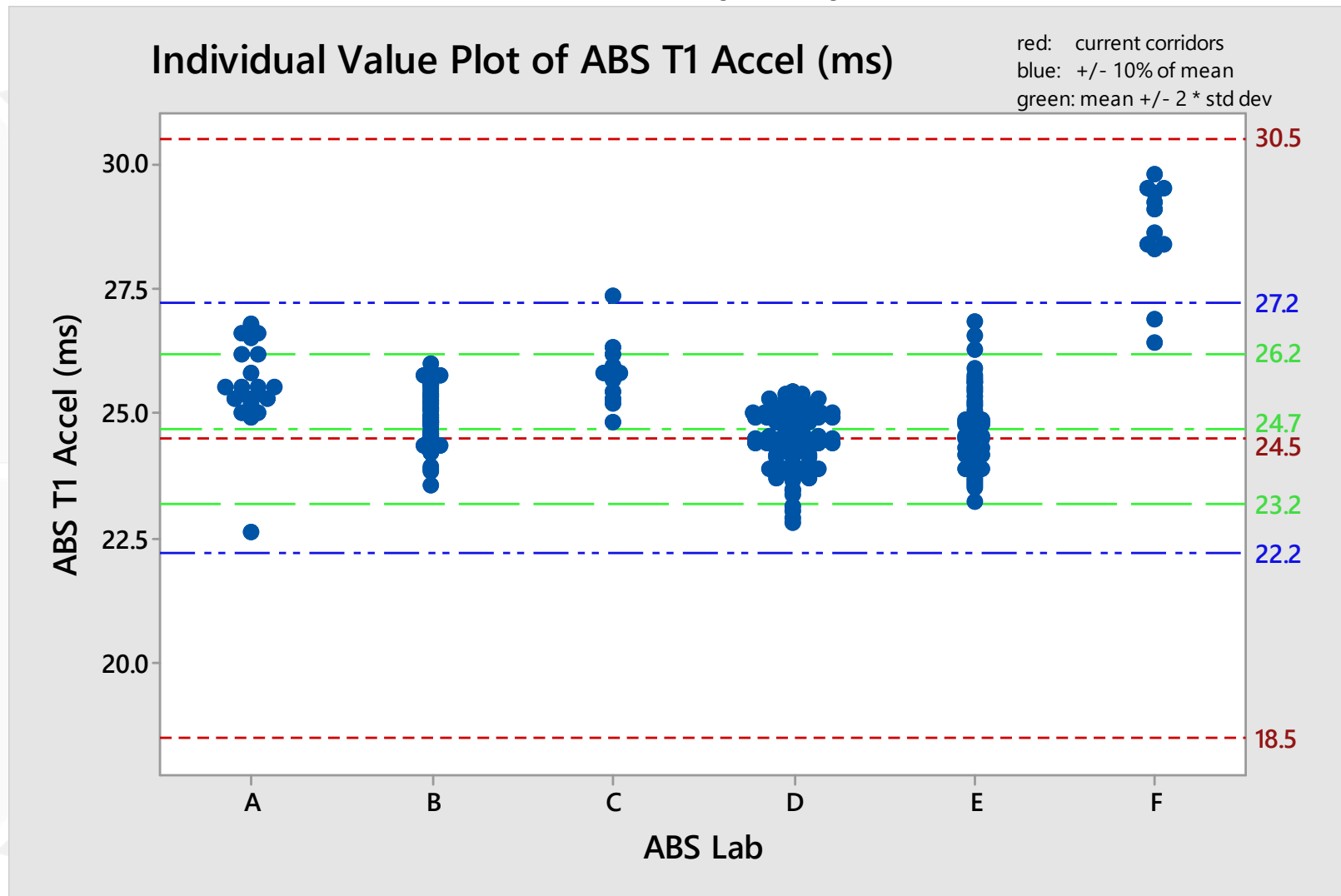
Analysis Dummy Certification - T1 Acceleration (m/s²)



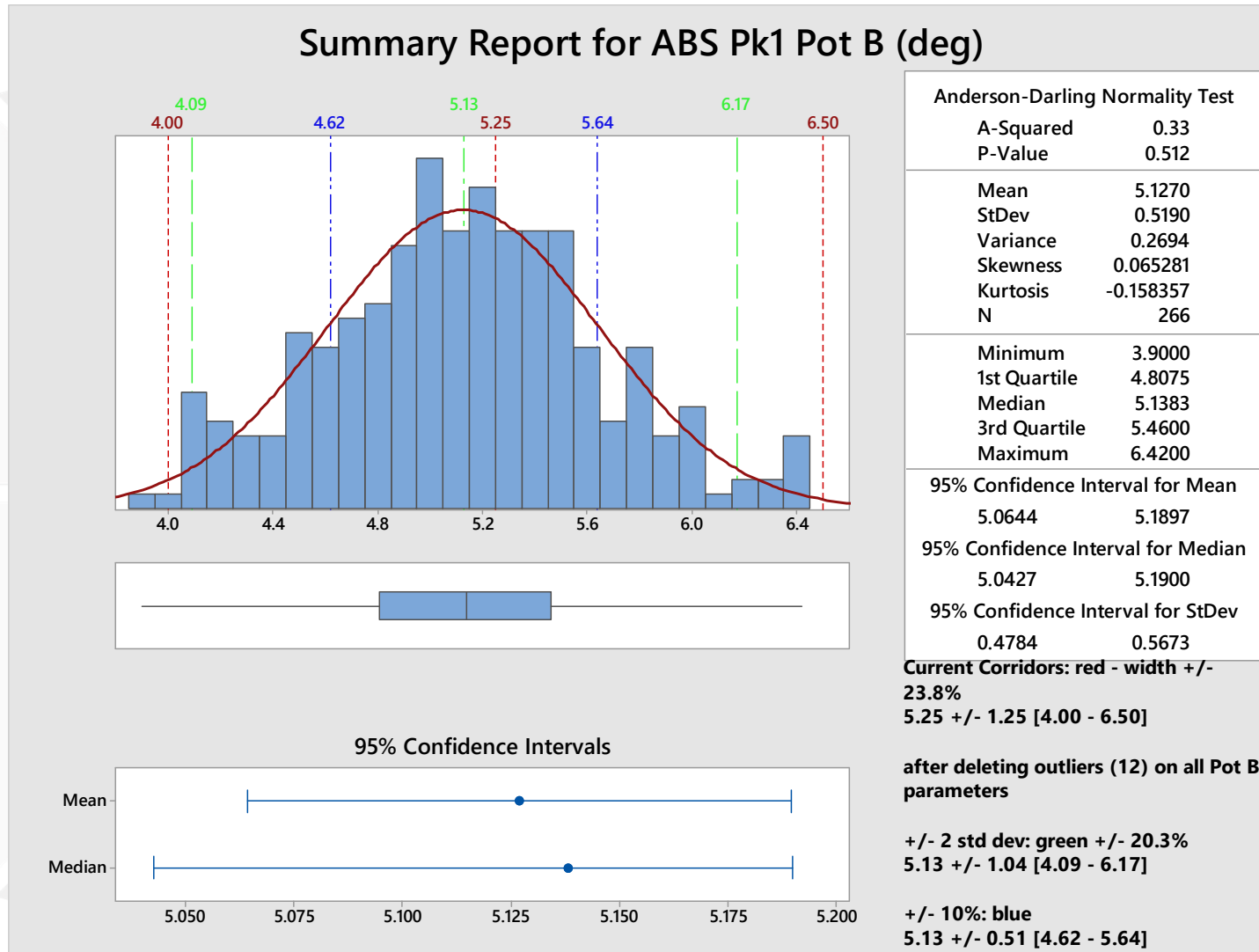
Analysis Dummy Certification - T1 Acceleration Time (ms)



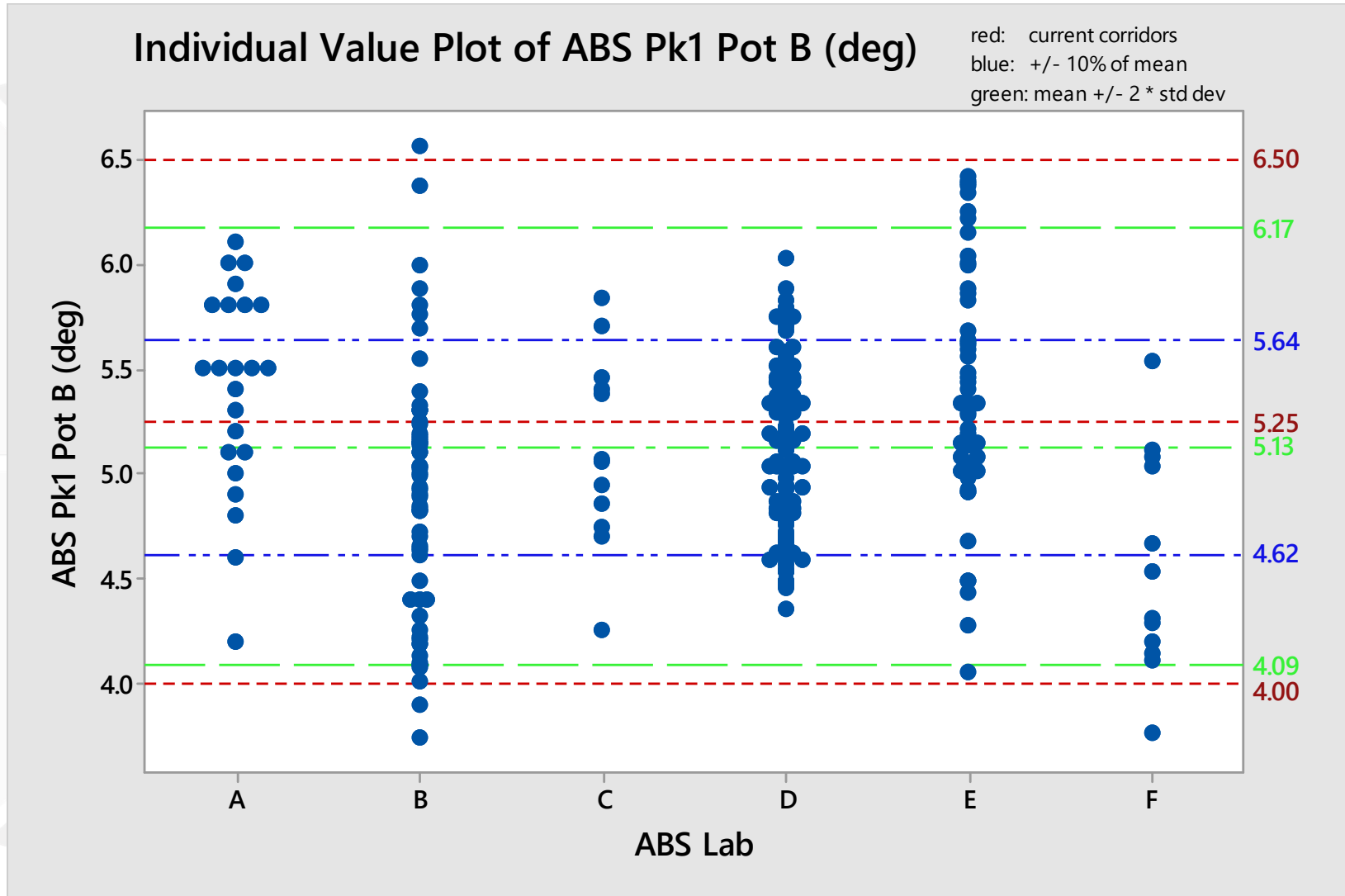
Analysis Dummy Certification - T1 Acceleration Time (ms)



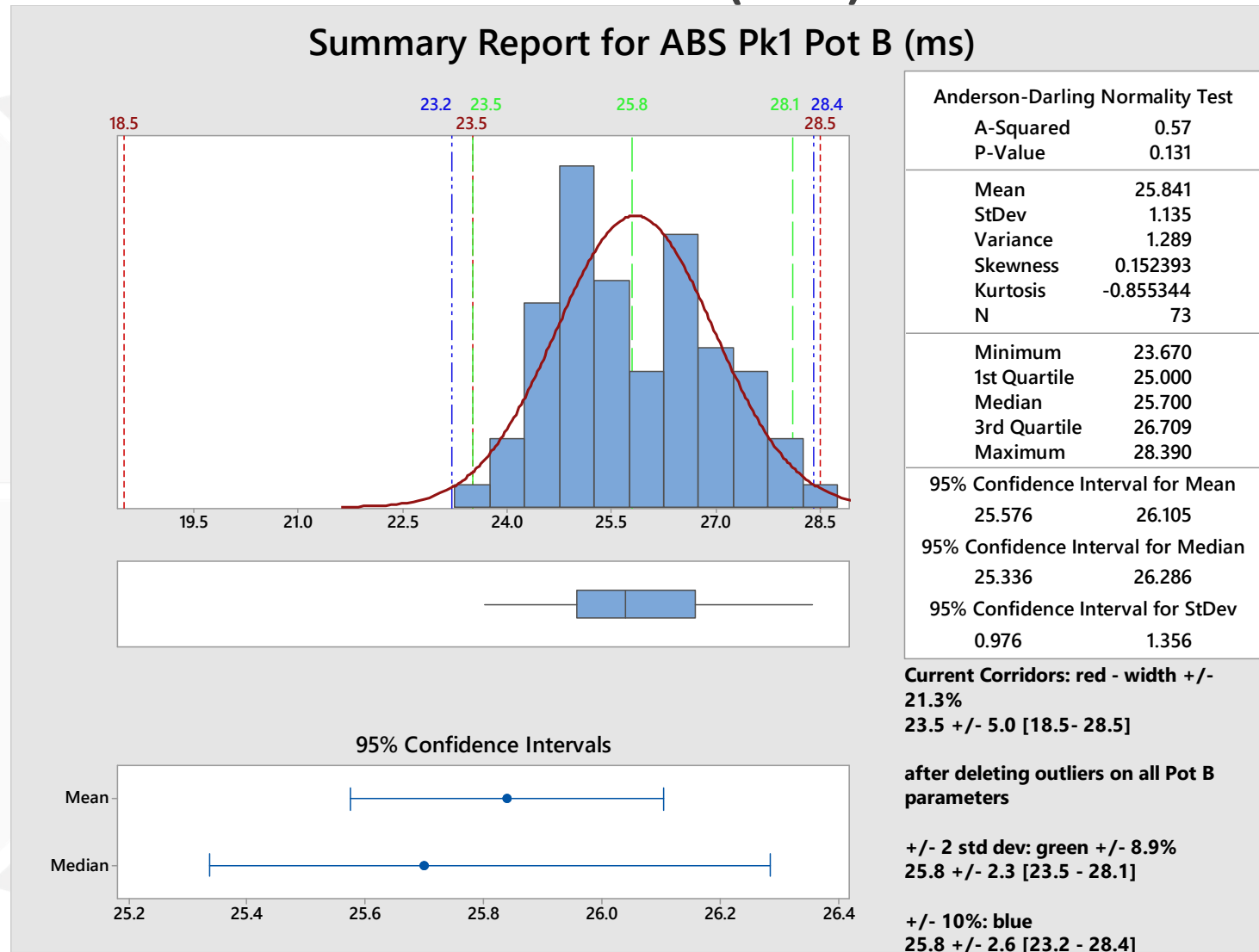
Analysis Dummy Certification - First Peak Pot B (deg)



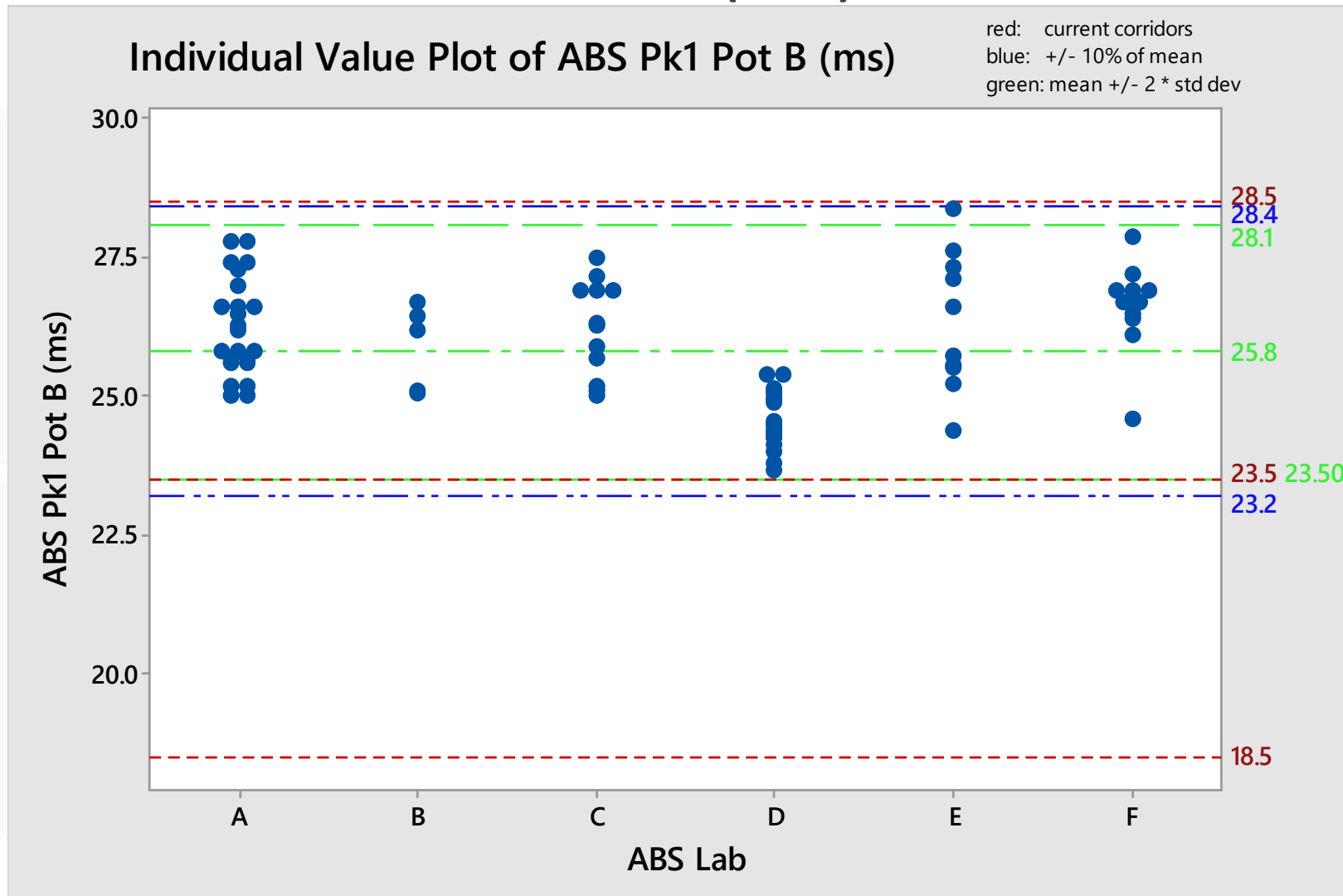
Analysis Dummy Certification - First Peak Pot B (deg)



Analysis Dummy Certification - First Peak Pot B Time (ms)

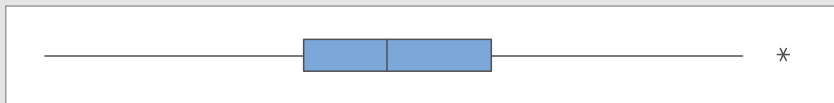
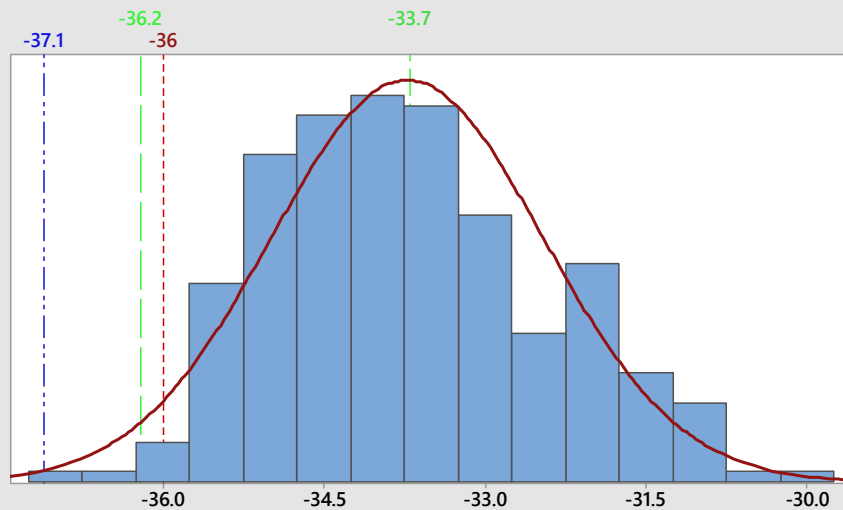


Analysis Dummy Certification - First Peak Pot B Time (ms)

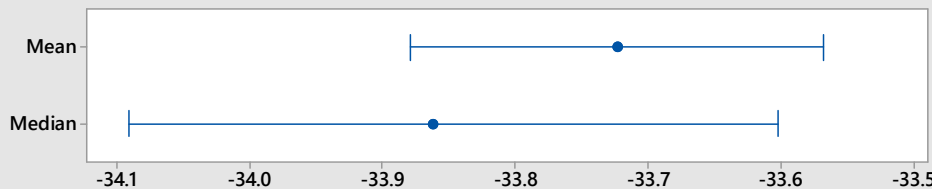


Analysis Dummy Certification - Min Pot B (deg)

Summary Report for ABS Min Pot B (deg)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 1.21
P-Value <0.005

Mean -33.723
StDev 1.269
Variance 1.610
Skewness 0.306811
Kurtosis -0.401066
N 258

Minimum -37.050
1st Quartile -34.643
Median -33.861
3rd Quartile -32.888
Maximum -30.180

95% Confidence Interval for Mean

-33.879 -33.568

95% Confidence Interval for Median

-34.091 -33.602

95% Confidence Interval for StDev

1.168 1.389

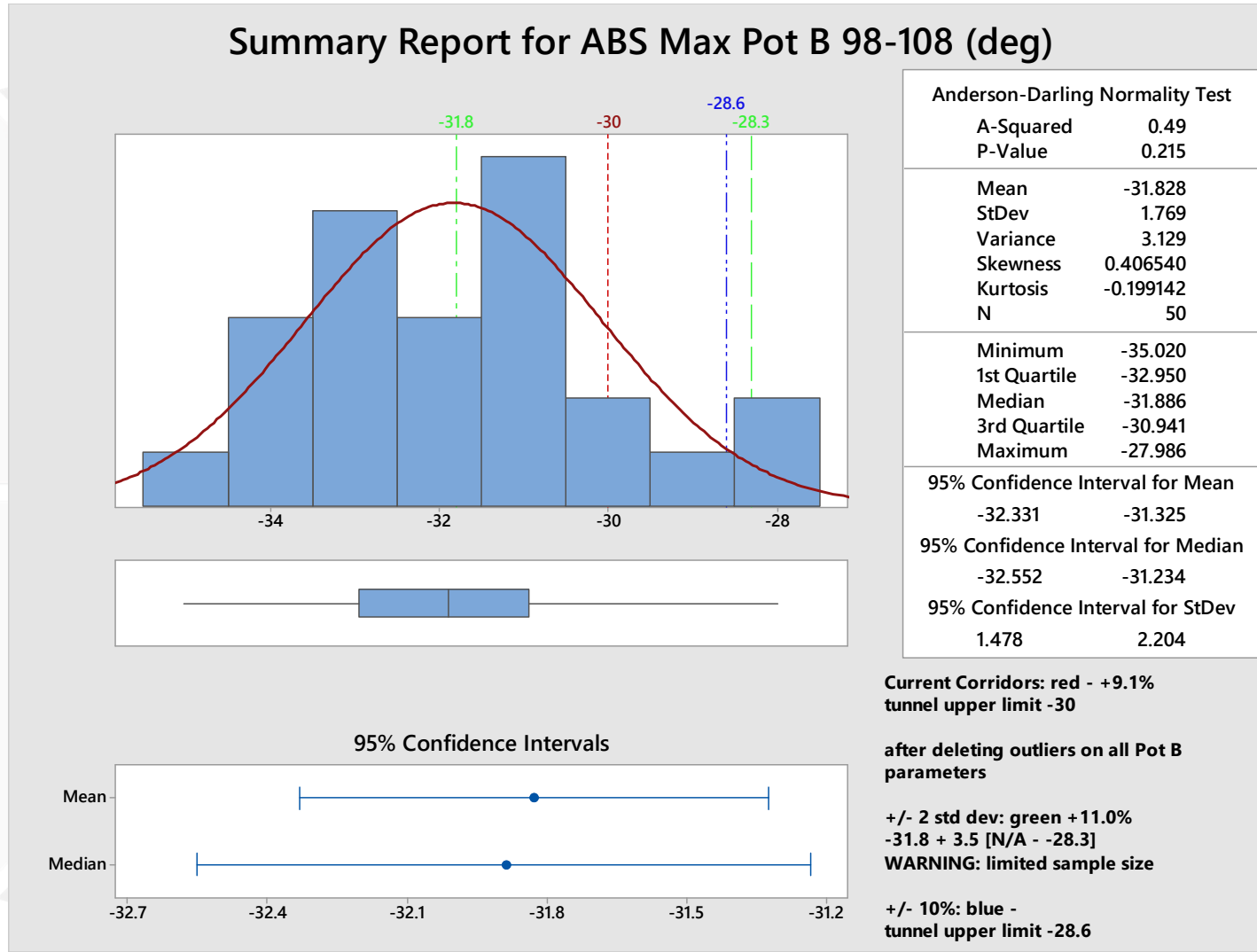
**Current Corridors: red - 9.1%
tunnel lower limit -36**

**after deleting outliers on all Pot B
parameters**

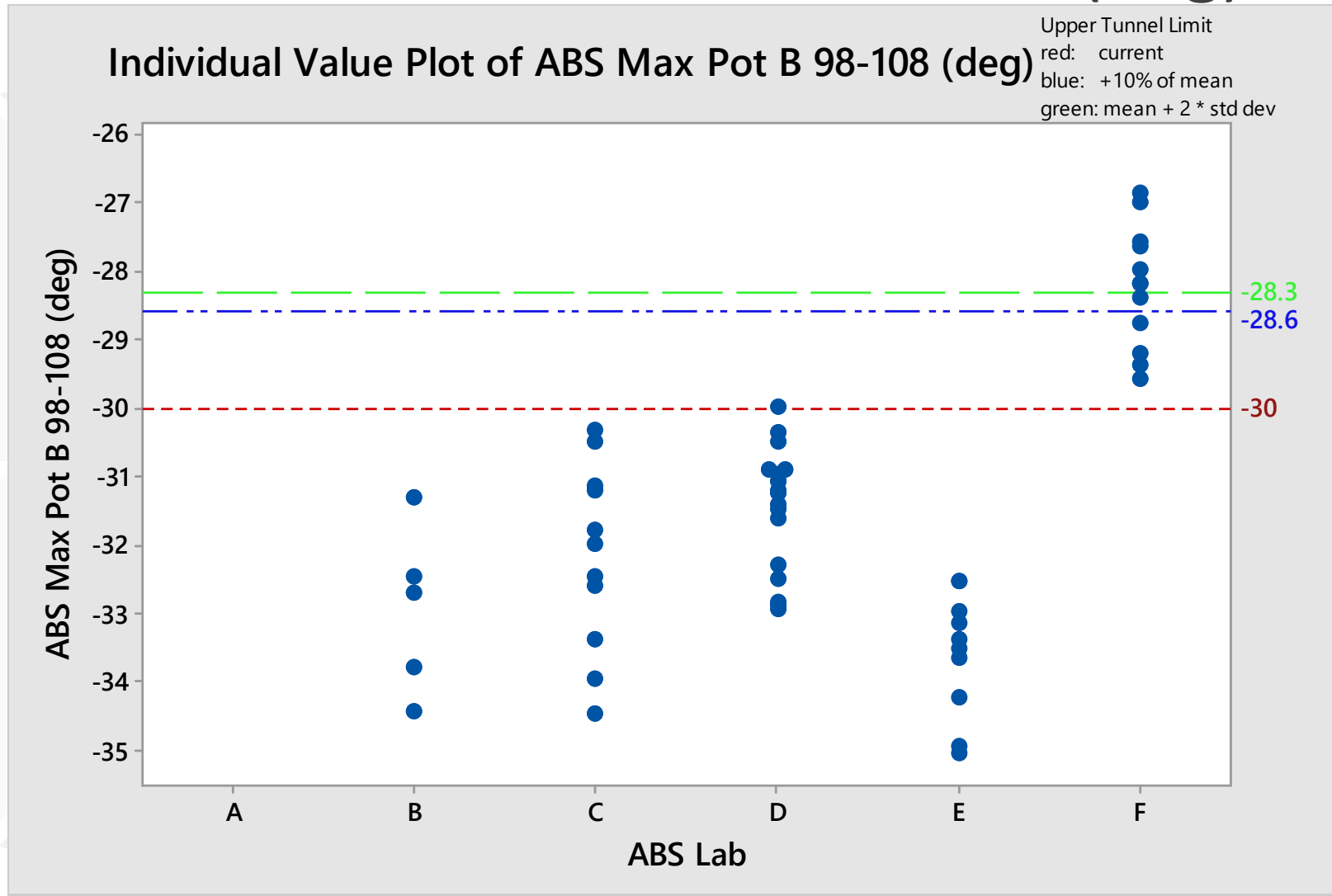
**+/- 2 std dev: green +/- 7.4%
-33.7 - 2.5 [-36.2 - N/A]**

**+/- 10%: blue -
tunnel lower limit -37.1**

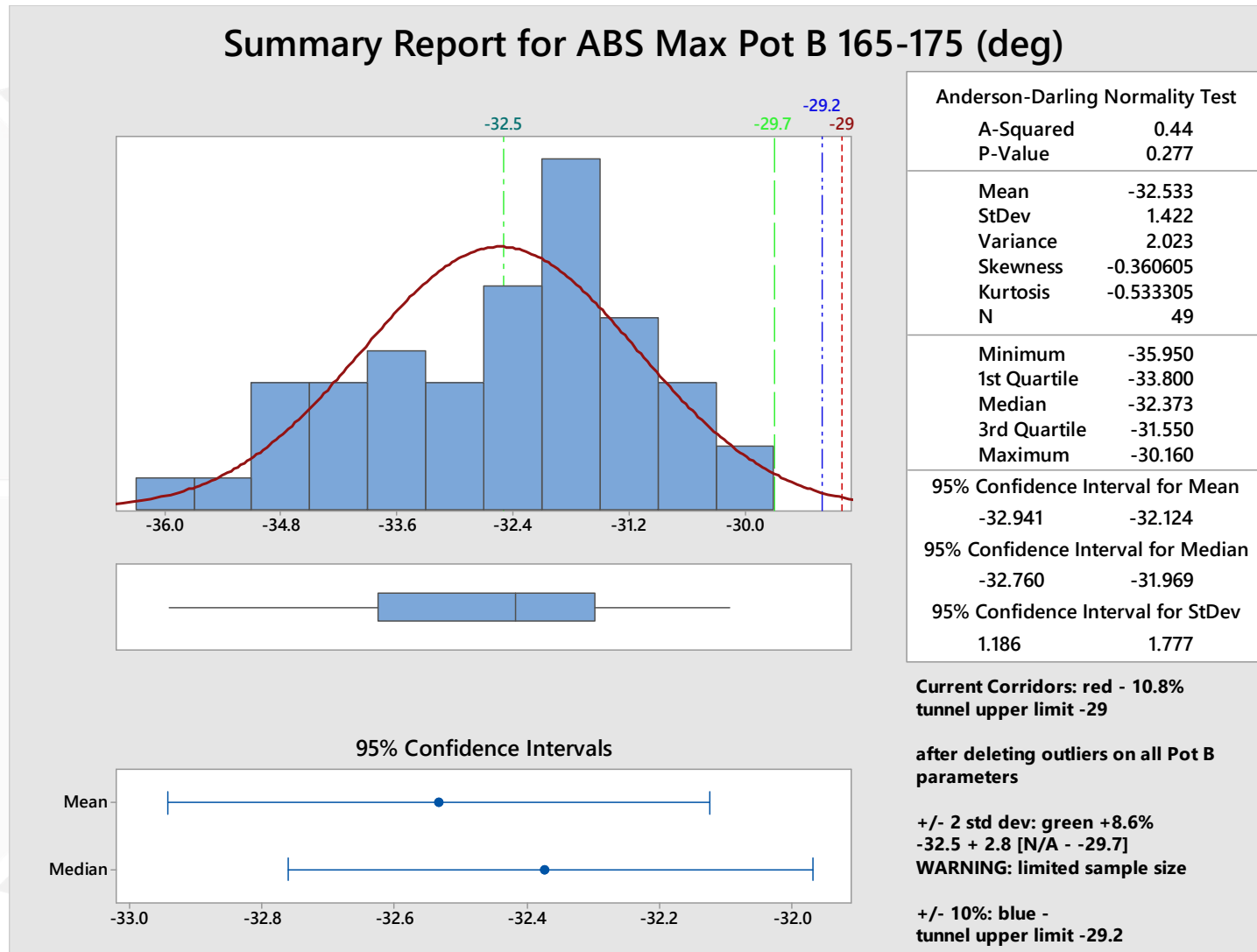
Analysis Dummy Certification - Max Pot B in Tunnel 1 98-108 ms (deg)



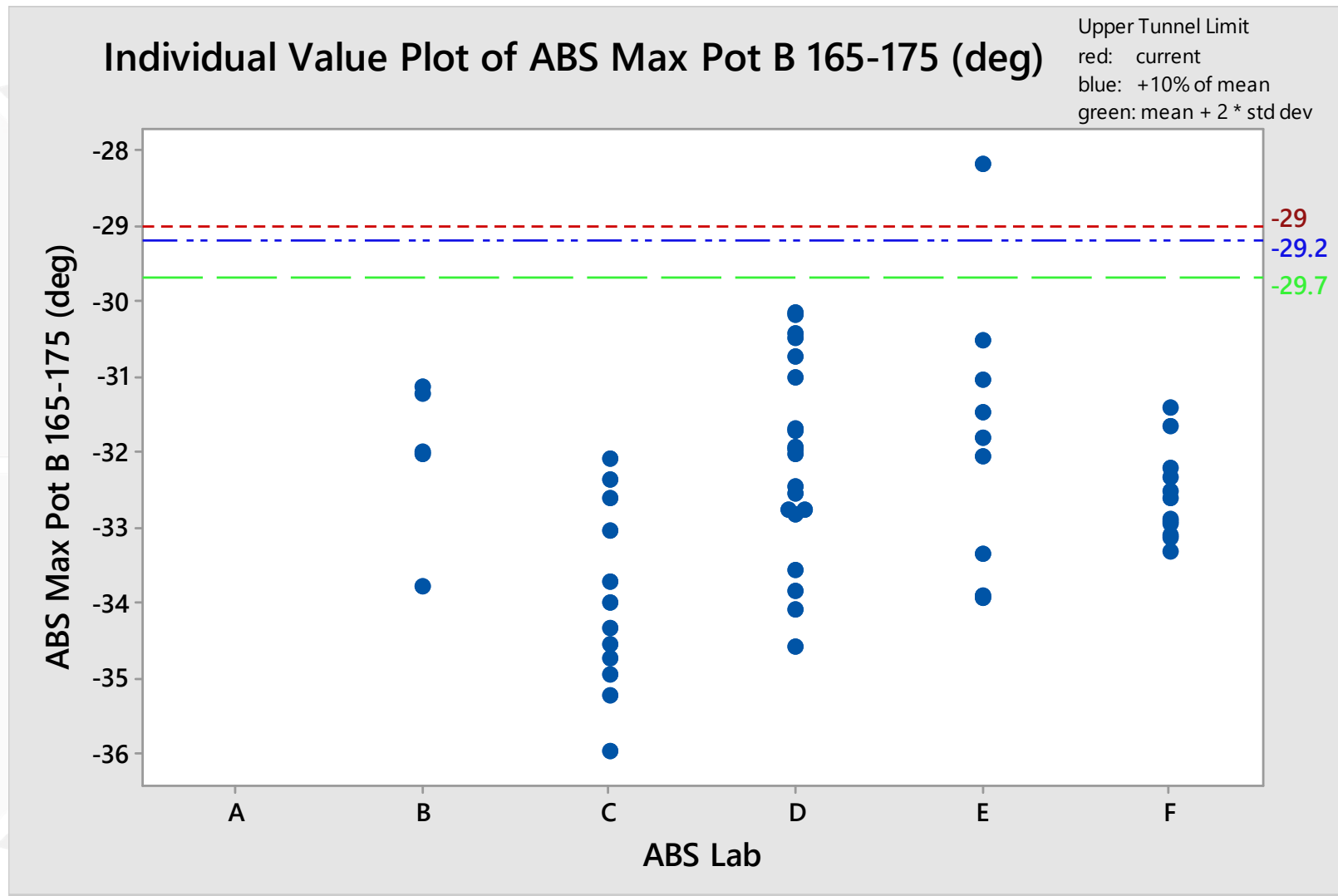
Analysis Dummy Certification - Max Pot B in Tunnel 1 98-108 ms (deg)



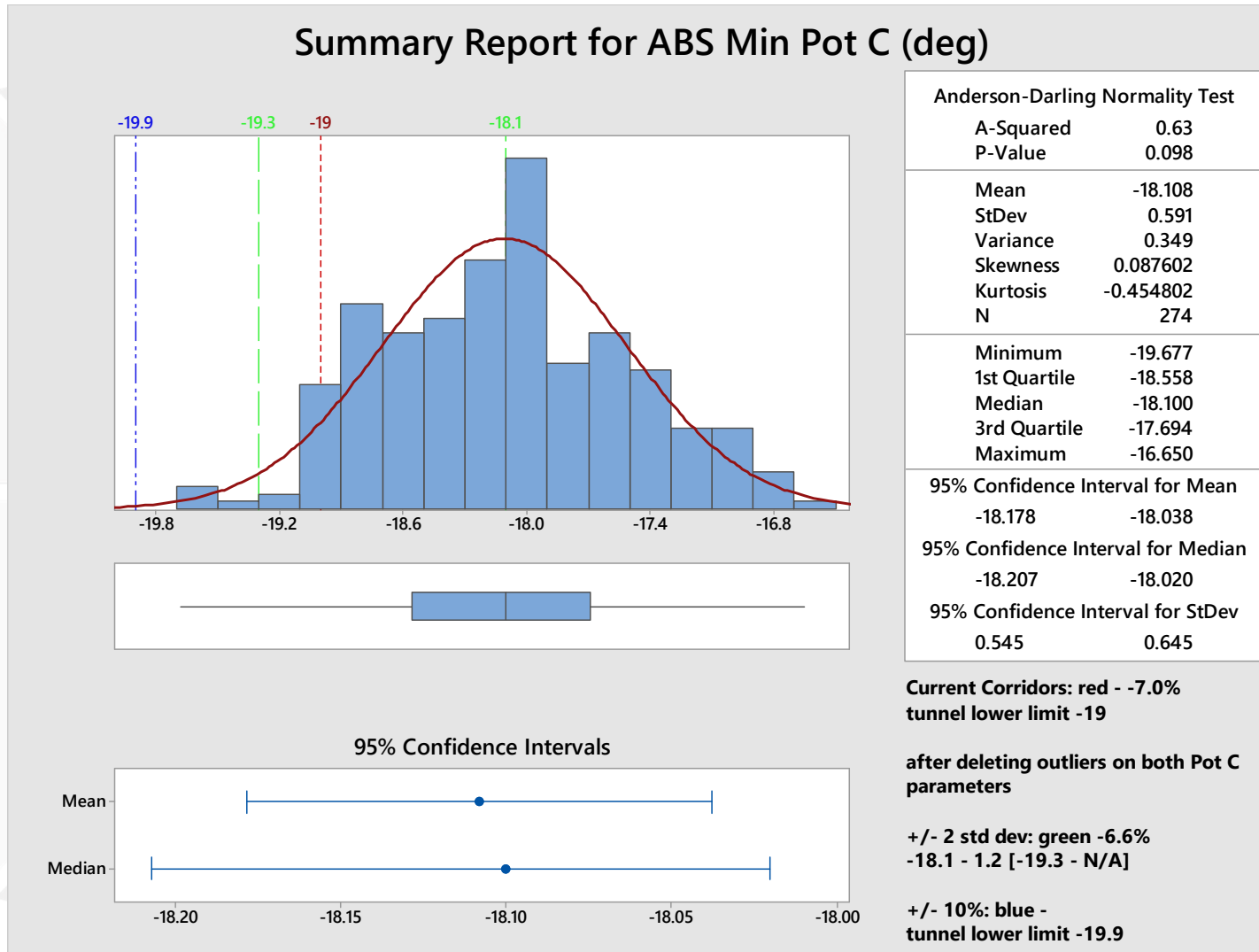
Analysis Dummy Certification - Max Pot B in Tunnel 1 165-175 ms (deg)



Analysis Dummy Certification - Max Pot B in Tunnel 1 165-175 ms (deg)

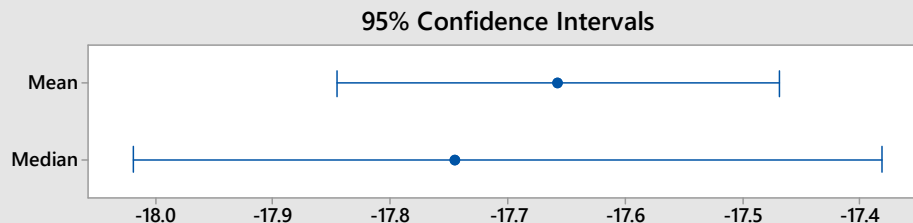
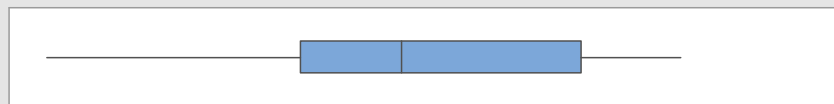
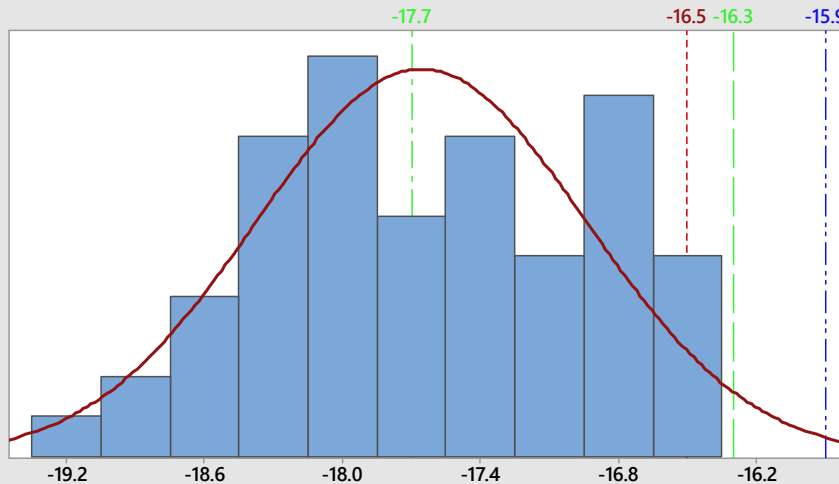


Analysis Dummy Certification - Min Pot C (deg)



Analysis Dummy Certification - Max Pot C in Tunnel 73-78 ms (deg)

Summary Report for ABS Max Pot C 73-78 (deg)



Anderson-Darling Normality Test	
A-Squared	0.71
P-Value	0.059
Mean	-17.657
StDev	0.718
Variance	0.515
Skewness	-0.166101
Kurtosis	-0.898649
N	58
Minimum	-19.285
1st Quartile	-18.185
Median	-17.745
3rd Quartile	-16.965
Maximum	-16.530
95% Confidence Interval for Mean	
	-17.846 -17.468
95% Confidence Interval for Median	
	-18.019 -17.381
95% Confidence Interval for StDev	
	0.607 0.878

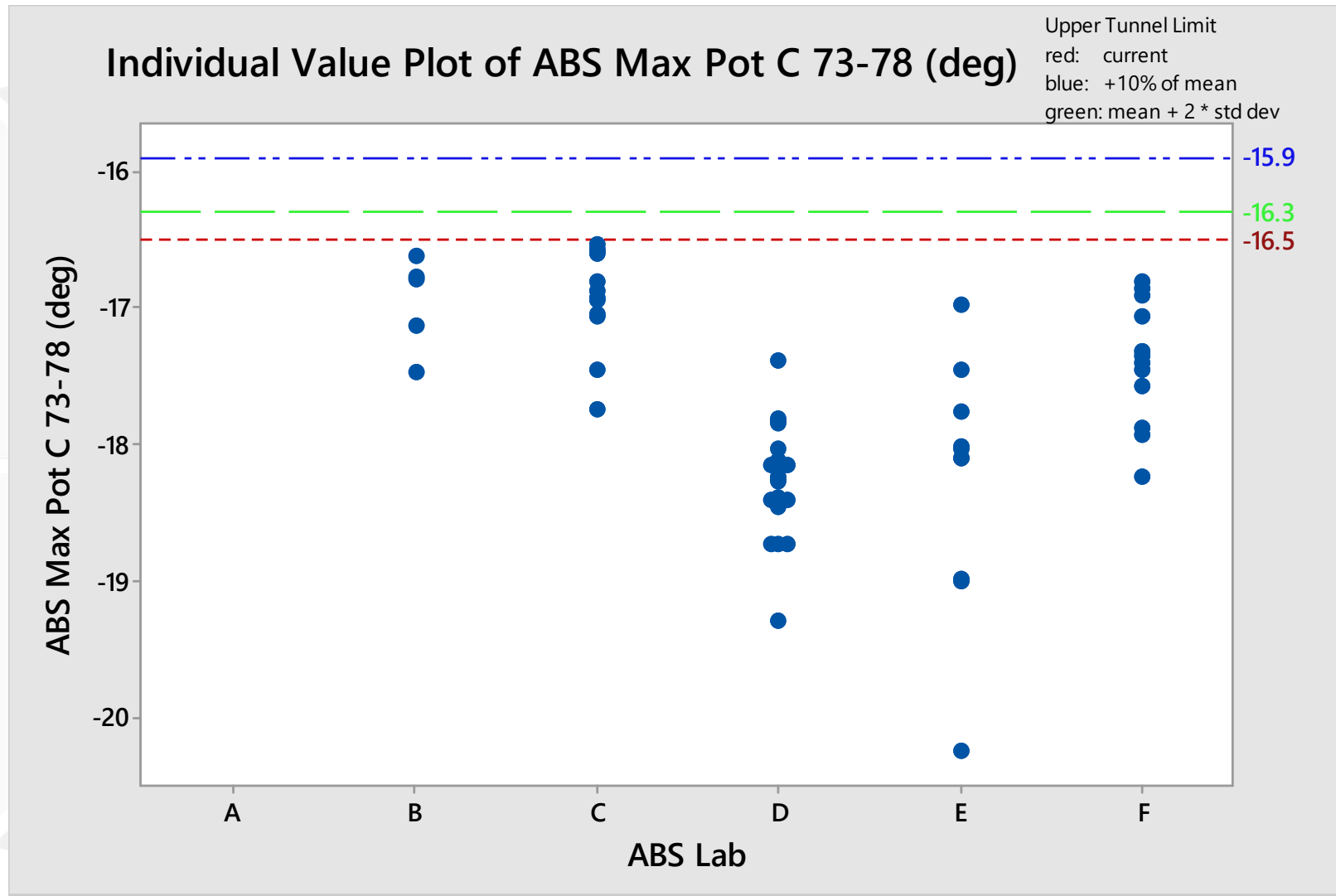
**Current Corridors: red - +7.0%
tunnel upper limit -16.5**

**after deleting outliers on both Pot C
parameters**

**+/- 2 std dev: green +7.9%
-17.7 + 1.4 [N/A - -16.3]**

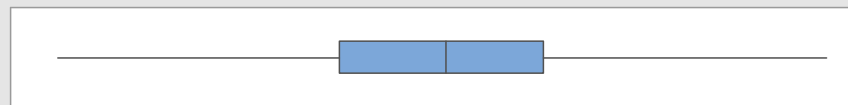
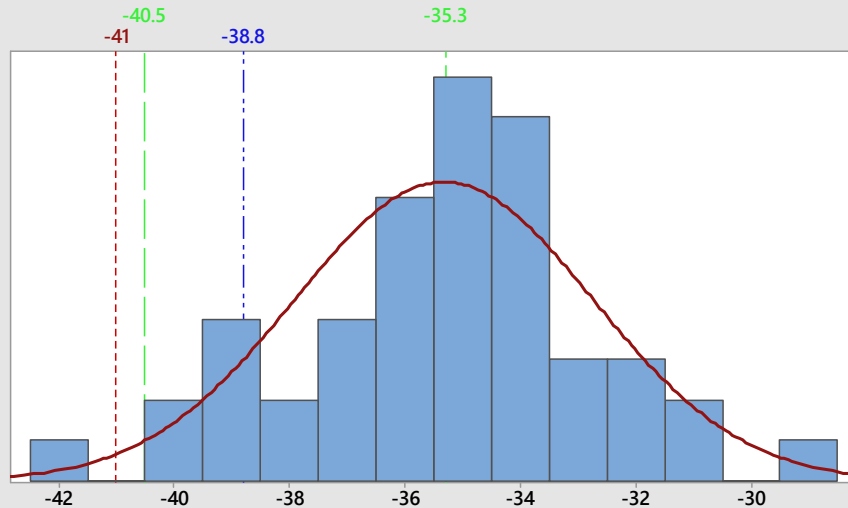
**+/- 10%: blue -
tunnel upper limit -15.9**

Analysis Dummy Certification - Max Pot C in Tunnel 73-78 ms (deg)

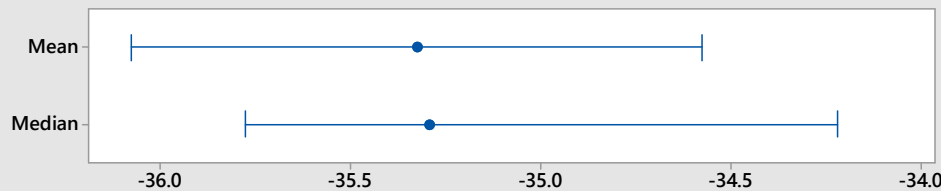


Analysis Dummy Certification - Min Total Head Rot. in Tunnel 100-190 ms (deg)

Summary Report for ABS Min TotHead 100-190 (deg)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 0.31
P-Value 0.536

Mean -35.324
StDev 2.588
Variance 6.697
Skewness -0.223834
Kurtosis 0.445528
N 48

Minimum -42.025
1st Quartile -37.144
Median -35.290
3rd Quartile -33.589
Maximum -28.690

95% Confidence Interval for Mean
-36.076 -34.573

95% Confidence Interval for Median
-35.775 -34.219

95% Confidence Interval for StDev
2.154 3.241

**Current Corridors: red - -24.2%
tunnel lower limit -41**

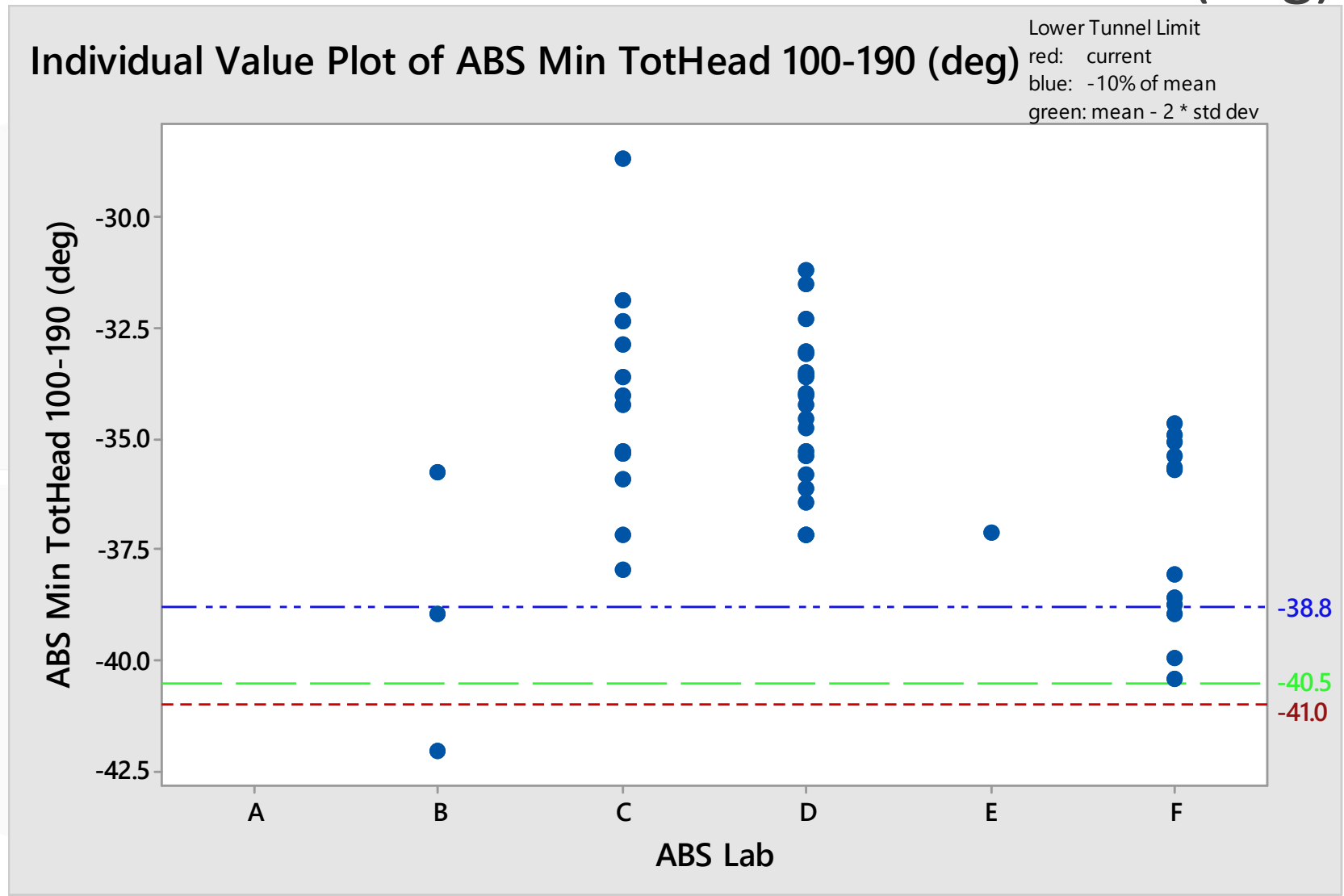
no outliers to delete

**+/- 2 std dev: green -14.7%
-35.3 - 5.2 [-40.5 - N/A]**

WARNING: limited sample size

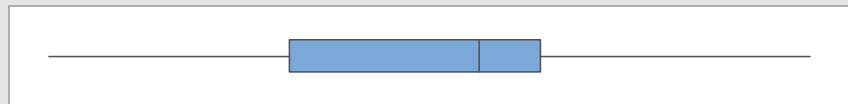
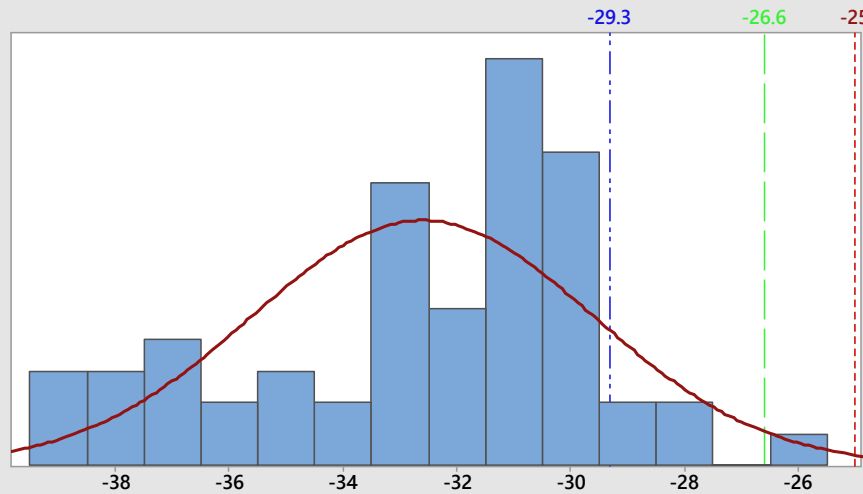
**+/- 10%: blue -
tunnel lower limit -38.8**

Analysis Dummy Certification - Min Total Head Rot. in Tunnel 100-190 ms (deg)

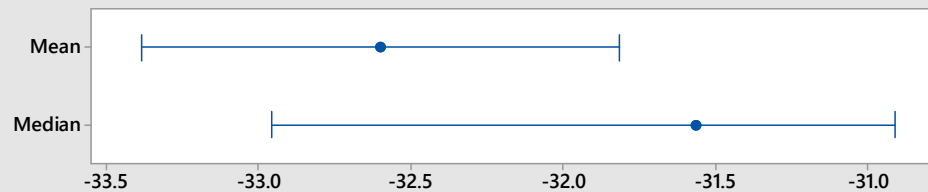


Analysis Dummy Certification - Max Total Head Rot. in Tunnel 100-110 ms (deg)

Summary Report for ABS Max TotHead 100-110 (deg)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 1.63
P-Value <0.005

Mean -32.601
StDev 3.008
Variance 9.047
Skewness -0.538362
Kurtosis -0.317987
N 59

Minimum -39.140
1st Quartile -34.900
Median -31.564
3rd Quartile -30.485
Maximum -25.760

95% Confidence Interval for Mean

-33.385 -31.817

95% Confidence Interval for Median

-32.958 -30.910

95% Confidence Interval for StDev

2.546 3.675

**Current Corridors: red - +24.2%
tunnel upper limit -25**

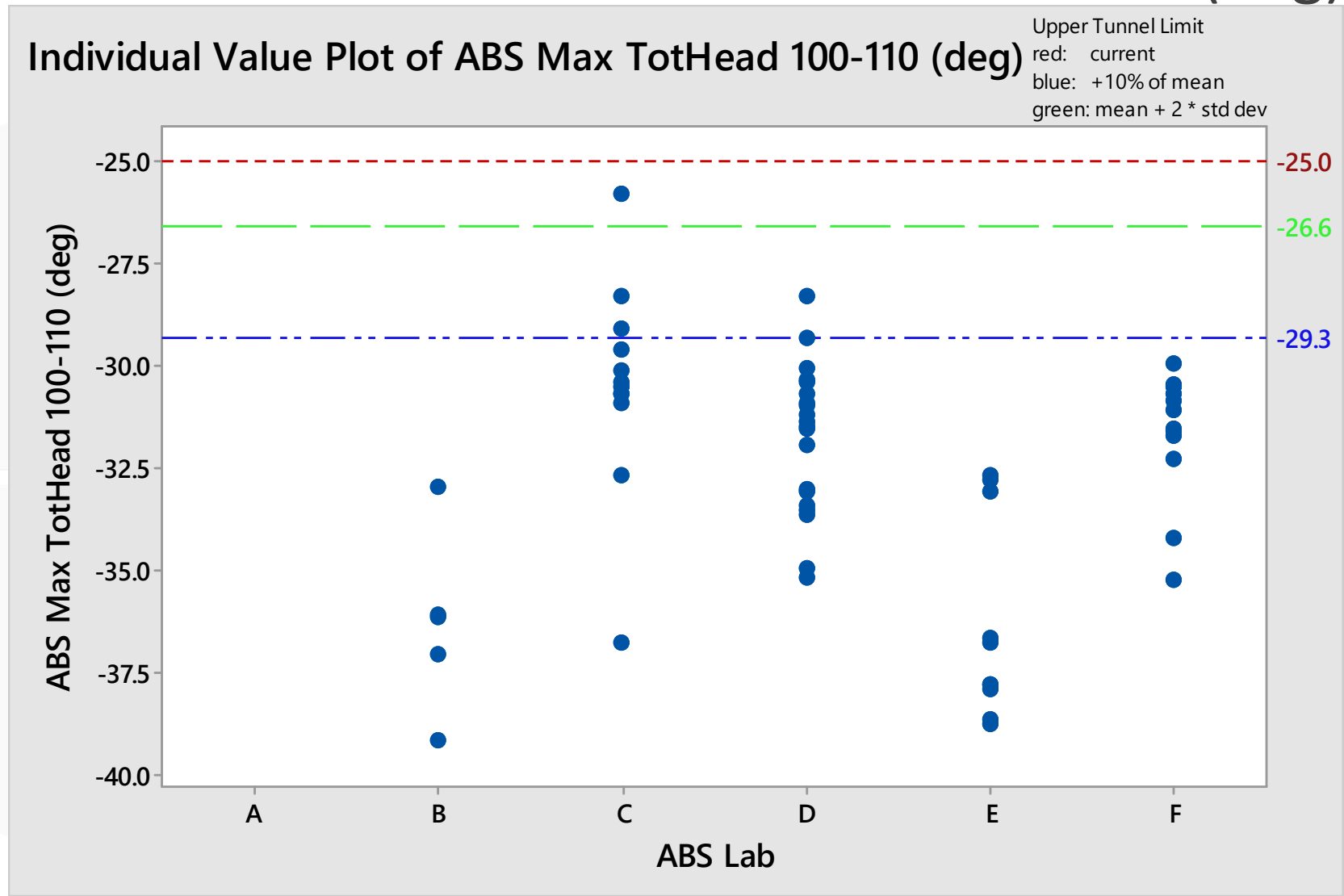
no outliers to delete

**+/- 2 std dev: green +18.4%
-32.6 + 6.0 [N/A - -26.6]**

WARNING: limited sample size

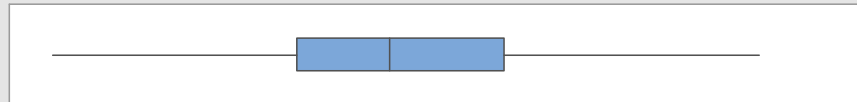
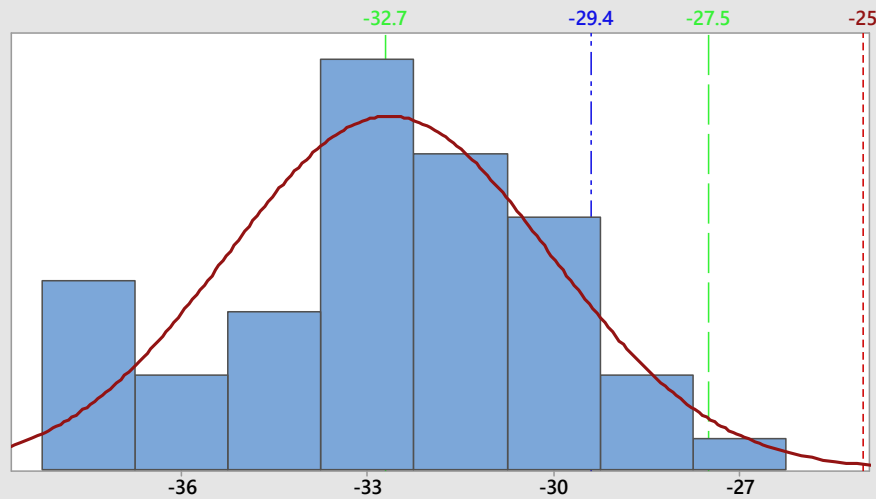
**+/- 10%: blue -
tunnel upper limit -29.3**

Analysis Dummy Certification - Max Total Head Rot. in Tunnel 100-110 ms (deg)

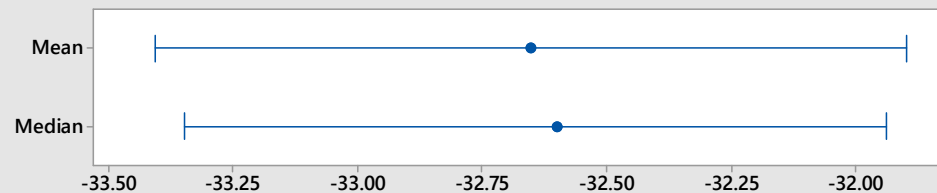


Analysis Dummy Certification - Max Total Head Rot. in Tunnel 170-180 ms (deg)

Summary Report for ABS Max TotHead 170-180 (deg)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared	0.26
P-Value	0.705

Mean	-32.652
StDev	2.622
Variance	6.874
Skewness	-0.122399
Kurtosis	-0.190967
N	49

Minimum	-38.047
1st Quartile	-34.109
Median	-32.600
3rd Quartile	-30.762
Maximum	-26.650

95% Confidence Interval for Mean
-33.405 -31.899

95% Confidence Interval for Median
-33.346 -31.940

95% Confidence Interval for StDev
2.186 3.275

**Current Corridors: red - +24.2%
tunnel upper limit -25**

no outliers to delete

+/- 2 std dev: green +15.9%

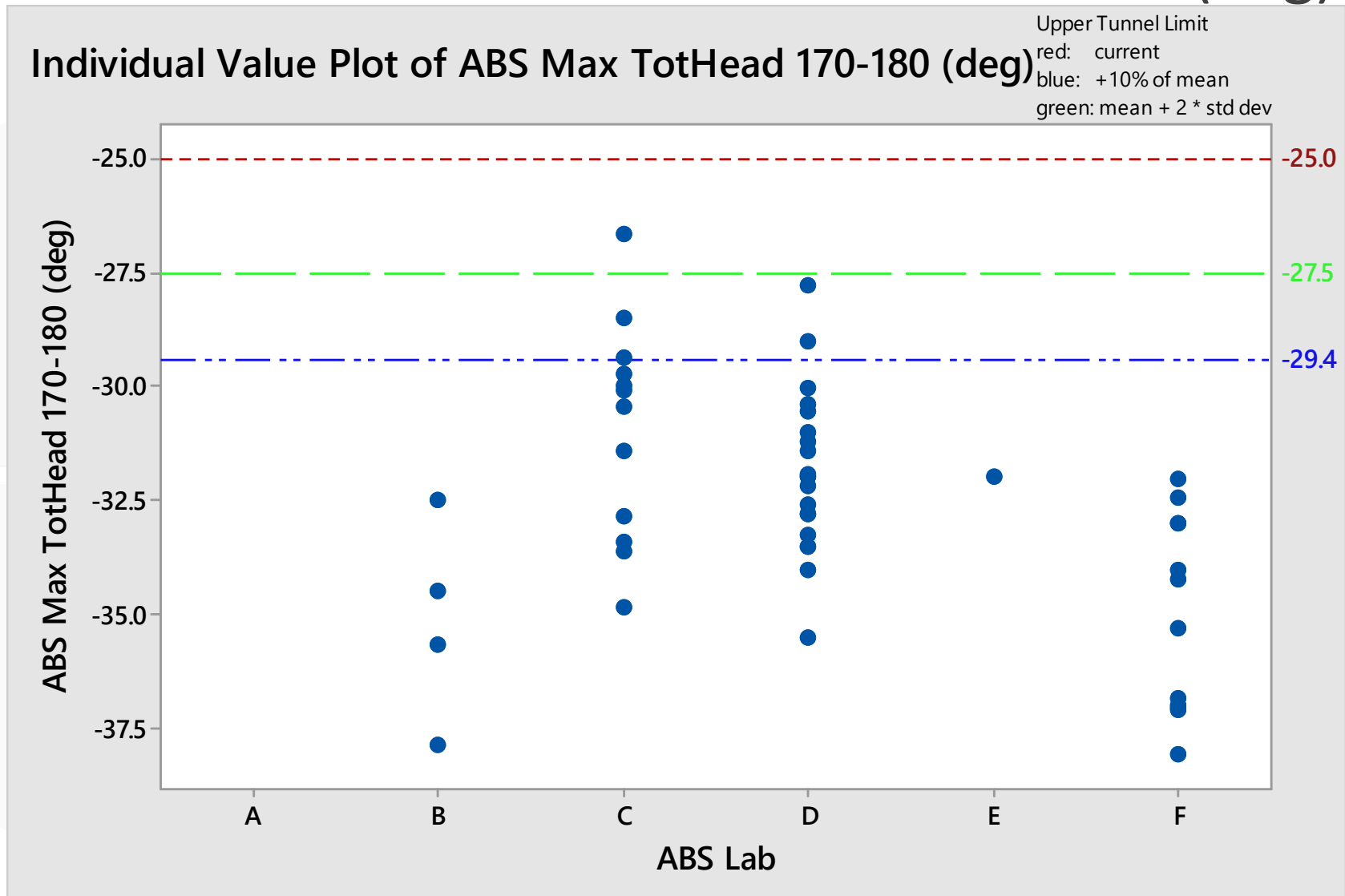
-32.7 + 5.2 [N/A - -27.5]

WARNING: limited sample size

+/- 10%: blue -

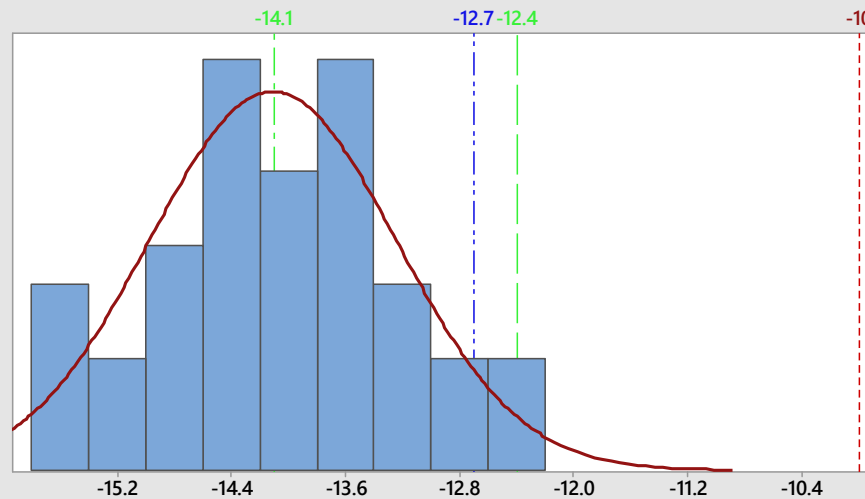
tunnel upper limit -29.4

Analysis Dummy Certification - Max Total Head Rot. in Tunnel 170-180 ms (deg)

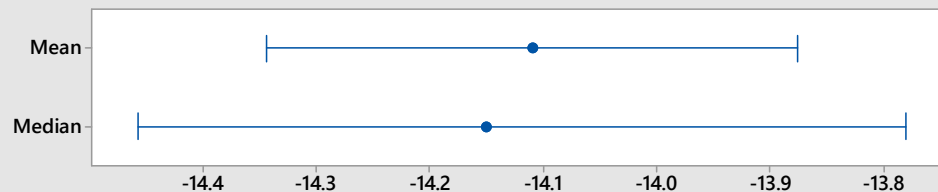


Analysis Dummy Certification - Max Thoracic Rot. in Tunnel 125-135 ms (deg)

Summary Report for ABS Max ThorRot 125-135 (deg)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared	0.22
P-Value	0.831

Mean	-14.109
StDev	0.865
Variance	0.748
Skewness	-0.051607
Kurtosis	-0.324747
N	55

Minimum	-15.790
1st Quartile	-14.607
Median	-14.150
3rd Quartile	-13.522
Maximum	-12.213

95% Confidence Interval for Mean
-14.343 -13.875

95% Confidence Interval for Median
-14.457 -13.780

95% Confidence Interval for StDev
0.728 1.066

**Current Corridors: red - +35.5%
tunnel upper limit -10**

**after deleting outliers on both
total thorax rotation parameters**

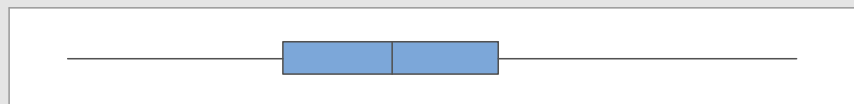
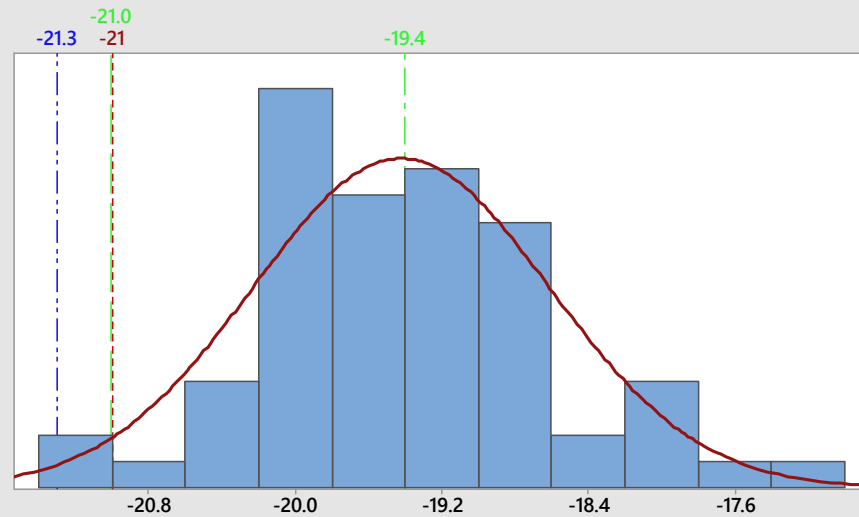
**+/- 2 std dev: green +12.1%
-14.1 + 1.7 [N/A - 12.4]**

WARNING: limited sample size

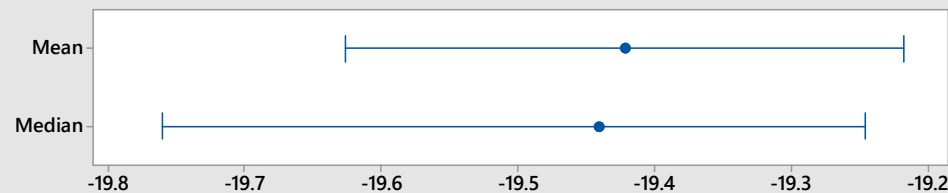
**+/- 10%: blue -
tunnel upper limit -12.7**

Analysis Dummy Certification - Min Thoracic Rotation in Tunnel (deg)

Summary Report for ABS Min ThorRot (deg)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared	0.31
P-Value	0.557

Mean	-19.422
StDev	0.811
Variance	0.659
Skewness	0.278140
Kurtosis	0.180232
N	63

Minimum	-21.212
1st Quartile	-20.037
Median	-19.440
3rd Quartile	-18.860
Maximum	-17.238

95% Confidence Interval for Mean

-19.626	-19.218
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95% Confidence Interval for Median

-19.761	-19.245
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95% Confidence Interval for StDev

0.690	0.984
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**Current Corridors: red - -35.5%
tunnel lower limit -21**

**after deleting outliers on both
total thorax rotation parameters**

+/- 2 std dev: green -8.2%

-19.4 - 1.6 [-21.0 - N/A]

WARNING: limited sample size

+/- 10%: blue -

tunnel lower limit -21.3

Possible Corridor Summary

Parameter	Current Lower	Current Mid Point	Current Upper	+/- % Width	Number of data points	Mean - 2 * Std Dev	Mean - 10%	Mean Value from Population	Mean + 10%	Mean + 2 * Std Dev	+/- 2 * Std Dev % Width	Count Orig. Param.	Pass Rate Orig. Param.	Pass Rate +/- 2*SD Param.	Pass Rate +/- 10% Param.
Temperature (deg C)	19	22	25	13.6%		no change									
Humidity (% RH)	10	40	70	75.0%		no change									
Impact Velocity (m/s)	4.70	4.75	4.80	1.1%		no change									
First Peak Pot A (deg)	11.5	14.0	16.5	17.9%	258	10.64	11.32	12.58	13.84	14.52	15.4%	278	87%	87%	76%
First Peak Pot A Time (ms)	25	47.5	70	47.4%	97	43.2	42.6	47.3	52.0	51.4	8.7%	103	100%	92%	96%
Pot A tunnel	FAIL	n/a	PASS												
Max Pot A in tunnel 125-135 ms (deg)			2.0	157%	54			-2.68	-2.41	2.24	184%	59	93%	93%	54%
Min Pot A in tunnel 125-135 ms (deg)	-9.0			-157%	22	-6.58	-4.00	-3.64			-81%	24	100%	96%	63%
Max Upper Neck My	7.70	12.75	17.80	39.6%	250	11.3	12.4	13.80	15.2	16.3	18.1%	275	100%	94%	70%
Time at Max Upper Neck My	20.0	27.5	35.0	27.3%	250	23.6	23.7	26.3	28.9	29.0	10.3%	275	97%	91%	91%
Min Upper Neck My	-23.50	-19.25	-15.00	22.1%	250	-21.6	-21.0	-19.1	-17.2	-16.6	-13.1%	275	100%	94%	83%
Time at Min Upper Neck My	66.0	74.5	83.0	11.4%	250	71.3	67.5	74.9	82.4	78.5	4.8%	275	99%	92%	99%
Peak Pendulum Force (N)	8000	8850	9700	9.6%	278	8345	8022	8913	9804	9481	6.4%	278	100%	99%	100%
Peak Sled Acceleration (m/s^2)	137.0	153.5	170.0	10.7%	278	140	137	152	167	164	7.9%	278	100%	99%	100%
Sled Velocity Peak 1 (m/s)	2.250	2.375	2.500	5.3%	275	2.343	2.175	2.417	2.659	2.491	3.1%	278	100%	95%	100%
Sled Velocity Peak 1 Time (ms)	20	25	30	20.0%	275	22.6	22.1	24.6	27.1	26.6	8.1%	278	100%	95%	99%
Sled Velocity Tunnel	FAIL	n/a	PASS												
Sled Velocity @ 135 ms (m/s)	2.10	2.30	2.50	8.7%	46	2.239	2.128	2.365	2.602	2.491	5.3%	47	100%	100%	100%
Sled Velocity @ 140 ms (m/s)	2.00	2.20	2.40	9.1%	46	2.141	2.061	2.290	2.519	2.439	6.5%	47	87%	100%	100%
Peak T1 Acceleration (m/s^2)	183	225	267	18.7%	260	202.4	205.2	228.0	250.8	253.6	11.2%	278	100%	95%	92%
Peak T1 Acceleration Time (ms)	18.5	24.5	30.5	24.5%	260	23.2	22.2	24.7	27.2	26.2	6.1%	278	100%	90%	96%
First Peak Pot B (deg)	4.00	5.25	6.50	23.8%	266	4.09	4.62	5.13	5.64	6.17	20.3%	278	99%	94%	68%
First Peak Pot B Time (ms)	18.5	23.5	28.5	21.3%	73	23.5	23.2	25.8	28.4	28.1	8.9%	82	100%	99%	100%
Min Pot B (deg)	-36			9.1%	258	-36.2	-37.1	-33.7			-7.4%	270	96%	97%	97%
Pot B tunnel 1	FAIL	n/a	PASS												
Max Pot B in tunnel 1 98-108 ms (deg)			-30	9.1%	50			-31.8	-28.6	-28.3	11.0%	59	78%	88%	86%
Pot B tunnel 2	FAIL	n/a	PASS												
Max Pot B in tunnel 1 165-175 ms (deg)			-29	10.8%	49			-32.5	-29.2	-29.7	8.6%	58	98%	98%	98%
Min Pot C (deg)	-19.0			7.0%	274	-19.3	-19.9	-18.1			-6.6%	278	95%	98%	99%
Pot C tunnel	FAIL	n/a	PASS												
Max Pot C in tunnel 73-78 ms (deg)			-16.5	7.0%	58			-17.7	-15.9	-16.3	7.9%	59	100%	100%	100%
Total Head Rotation Tunnel	FAIL	n/a	PASS												
Min Total Head Rotation in Tunnel 100-190 ms (deg)	-41			24.2%	48	-40.5	-38.8	-35.3			-14.7%	48	98%	98%	90%
Max Total Head Rotation in Tunnel 100-110 ms (deg)			-25	24.2%	59			-32.6	-29.3	-26.6	18.4%	59	100%	98%	92%
Max Total Head Rotation in Tunnel 170-180 ms (deg)			-25	24.2%	49			-32.7	-29.4	-27.5	15.9%	49	100%	98%	90%
Max Thoracic Rotation Tunnel	FAIL	n/a	PASS												
Max Thoracic Rotation in Tunnel 125-135 ms (deg)			-10	35.5%	55			-14.1	-12.7	-12.4	12.1%	59	100%	93%	90%
Min Thoracic Rotation in Tunnel (deg)	-21			35.5%	63	-21.0	-21.3	-19.4			-8.2%	66	95%	95%	98%

“Overall Pass Rate” Notes

- Determining these rates
 - For each ABS, it is called a failure if any of the parameters had a “Fail” for any corridor
 - If an ABS had data missing for any parameters, it had “n/a” for those corridors and could not fail them
- For parameters with small sample sizes, there are many missing failures
 - Overall there were 278 ABS points
 - If a parameter only had 50 points and a failure rate of 5%, then $.05 * (278-50) = 11$ failures are missing from that parameter
 - This means the pass rates are OVERINFLATED due to many parameters having sample sizes less than 278
- There were only 12 ABS points with all 28 parameter values present

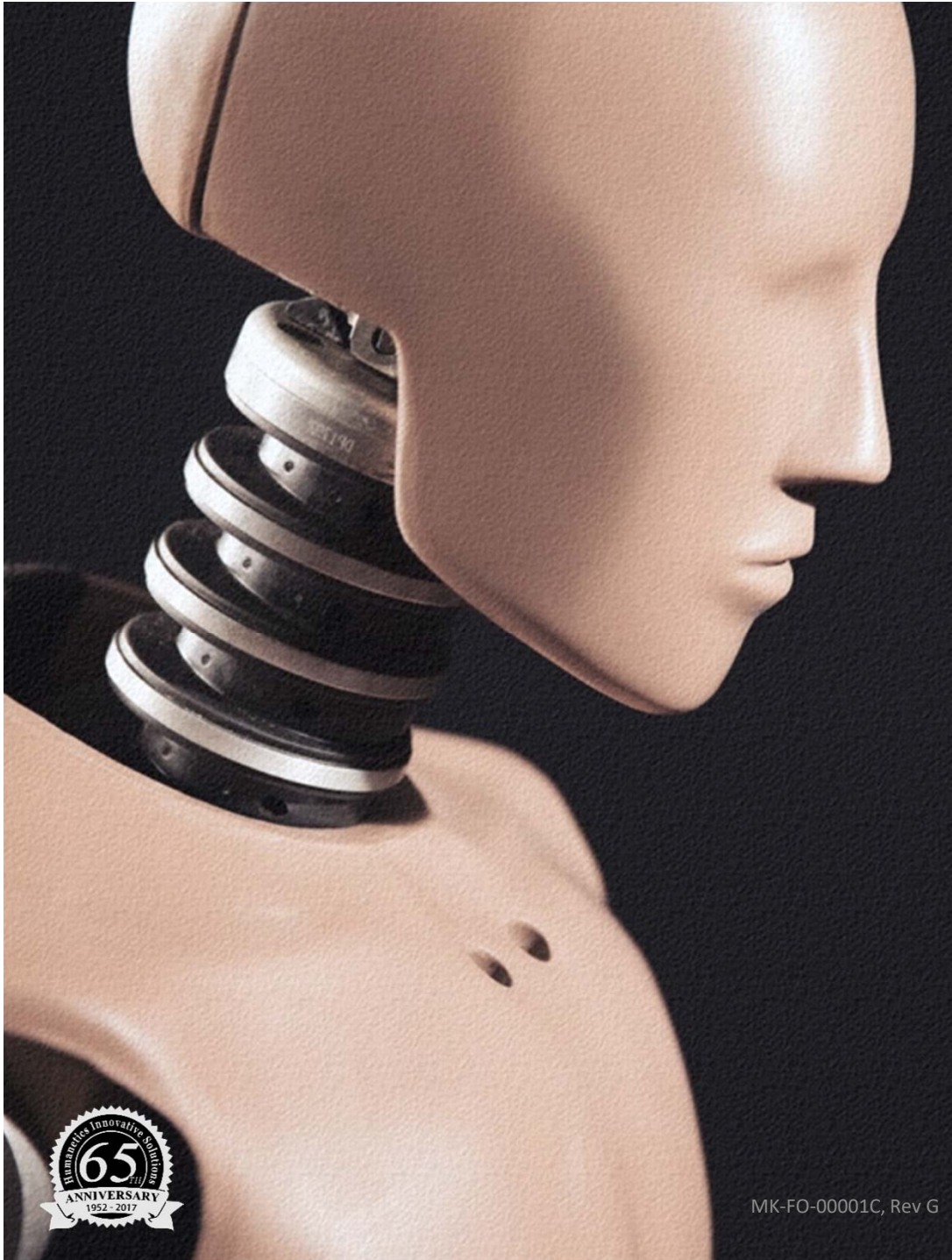
Overall Pass Rate Estimates

Parameter	Count Orig. Param.	Pass Rate Orig. Param.	Pass Rate +/- 2*SD Param.	Pass Rate +/- 10% Param.
Pass Rate All Parameters	278	75%	55%	32%
Probability Estimate of Passing All Parameters		43%	26%	4%
Probability of Passing if all 28 were normally distributed, random, independent variables		$=.95^{28} =$	24%	

“Pass Rate All Parameters” is probably significantly overinflated.

“Probability Estimate of Passing All Parameters” is calculated by multiplying together the pass rates of all of the individual parameters. This assumes the parameters are all completely independent variables.

Jacket Test Analysis



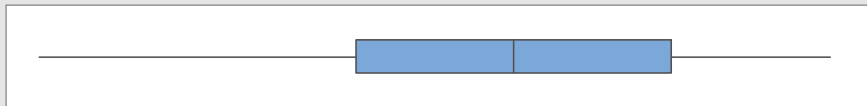
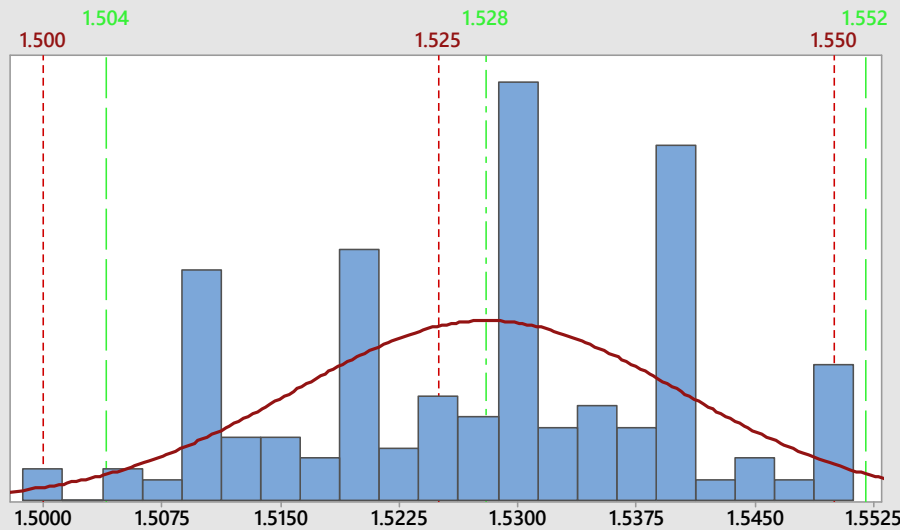
MK-FO-00001C, Rev G

Notes on Analysis Changes

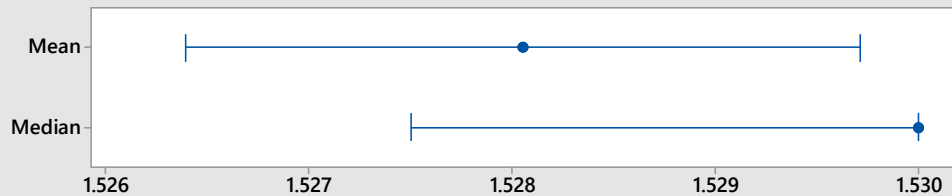
- Since Aug. 27 meeting additional information was received allowing the adding in of data sent by JARI. This included 2 more labs and 5 parts
- In the previous Average By Part (ABP), there were 2 problems
 - Parts tested in more than 1 lab had all labs averaged together
 - The average for a part showed up in the first lab that tested it in individual value plots
 - It did not allow to show aging effects over time
- For this analysis
 - Average By Test Sequences (ABS) was done instead of ABP
 - JARI data included

Jacket Analysis – Impact Velocity

Summary Report for ABS Velocity (m/s)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 2.39
P-Value <0.005

Mean 1.5281
StDev 0.0122
Variance 0.0002
Skewness -0.157283
Kurtosis -0.731040
N 211

Minimum 1.5000
1st Quartile 1.5200
Median 1.5300
3rd Quartile 1.5400
Maximum 1.5500

95% Confidence Interval for Mean

1.5264 1.5297

95% Confidence Interval for Median

1.5275 1.5300

95% Confidence Interval for StDev

0.0112 0.0135

Current Corridors: red - width

+/- 1.6%

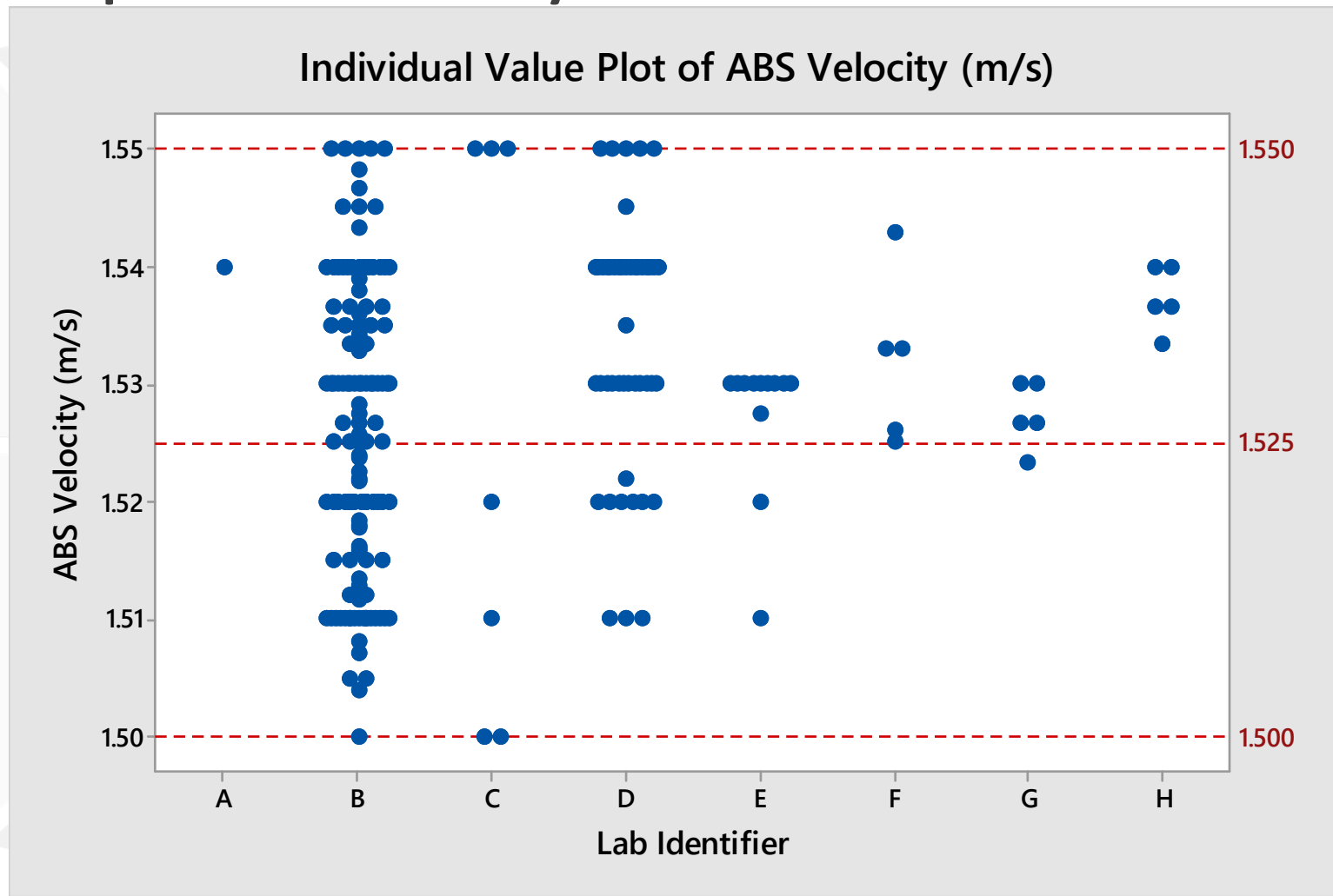
1.525 +/- 0.025 [1.50 - 1.55]

+/- 2 std dev: green +/- 1.6%

1.528 +/- 0.024 [1.504 - 1.552]

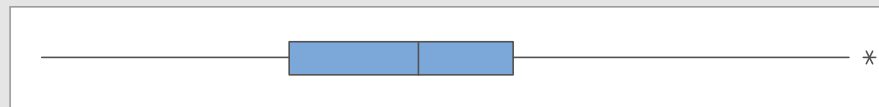
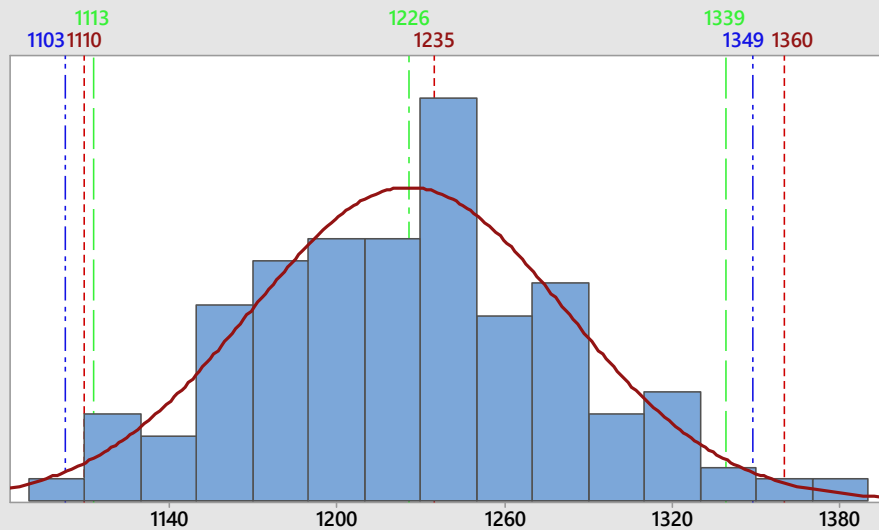
+/- 10%: blue - N/A

Jacket Analysis – Individual Value Plot Impact Velocity

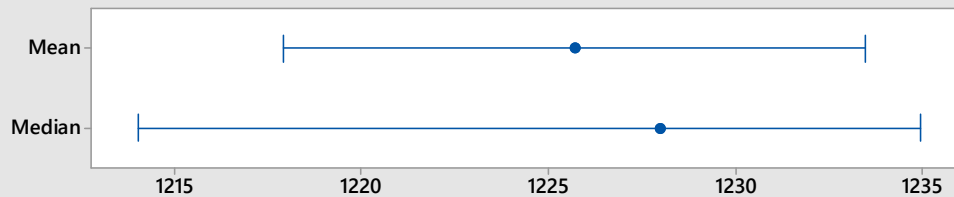


Jacket Analysis – Pendulum Force

Summary Report for ABS Pendulum Force (N) [Outliers Deleted]



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 0.31
P-Value 0.560

Mean 1225.7
StDev 56.3
Variance 3169.7
Skewness 0.237023
Kurtosis -0.106720
N 203

Minimum 1094.3
1st Quartile 1182.3
Median 1228.0
3rd Quartile 1262.0
Maximum 1388.0

95% Confidence Interval for Mean

1217.9 1233.5

95% Confidence Interval for Median

1214.0 1235.0

95% Confidence Interval for StDev

51.3 62.4

Current Corridors: red - width

+/-10%

1235 +/- 125 [1110 - 1360]

All original Force outliers deleted.

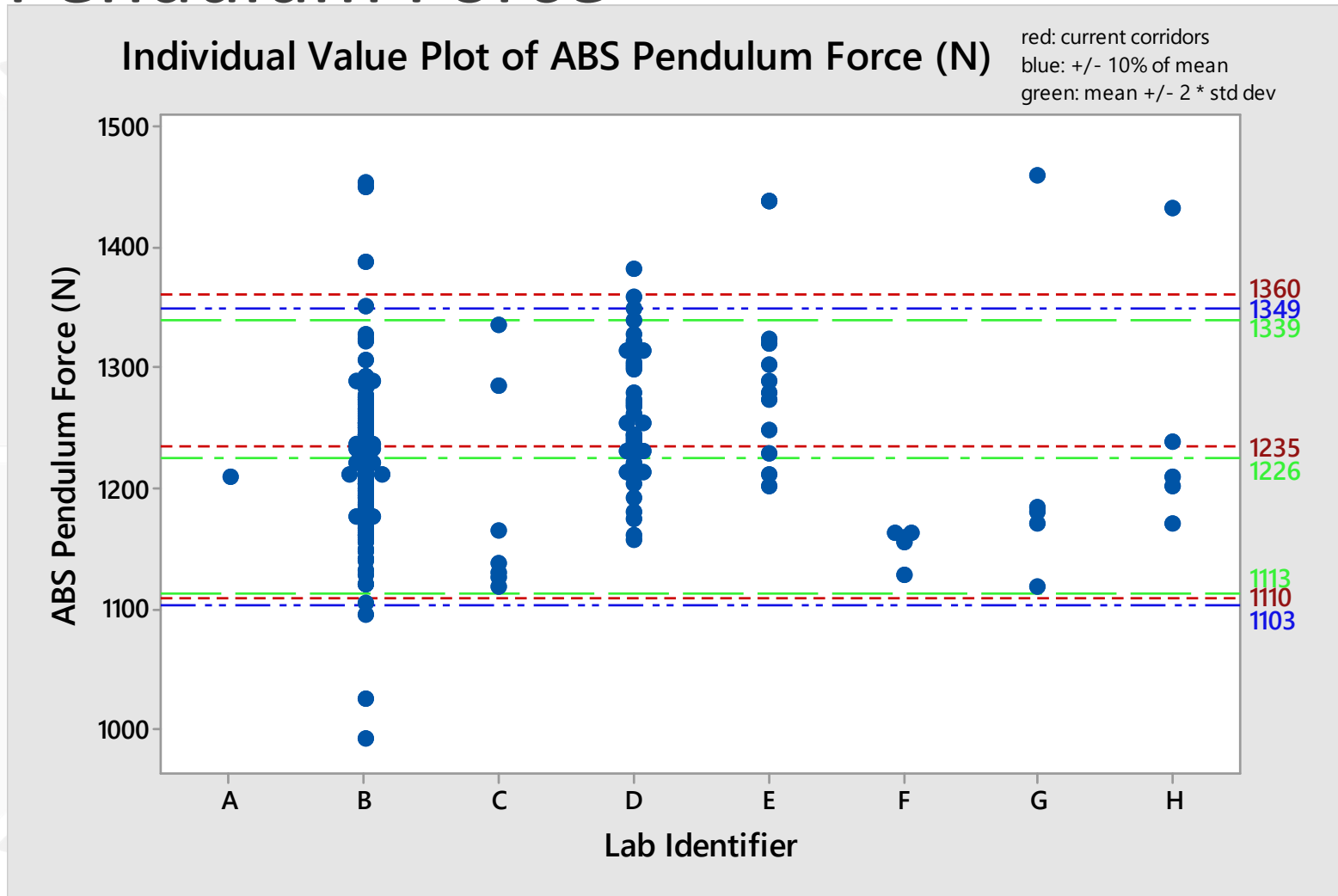
+/- 2 std dev: green +/- 9.2%

1226 +/- 113 [1113 - 1339]

+/- 10%: blue

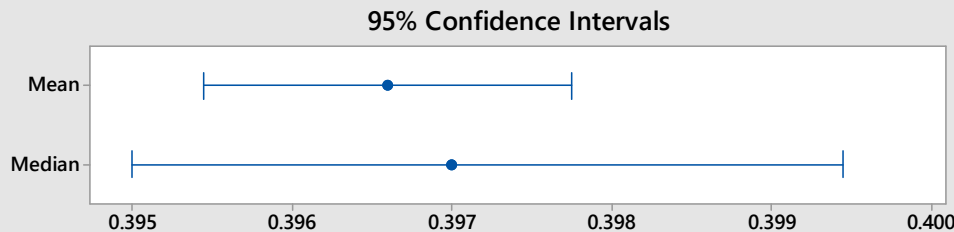
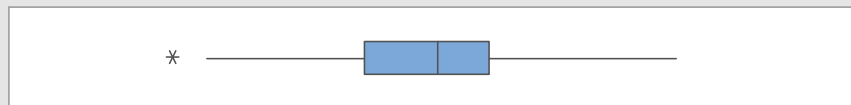
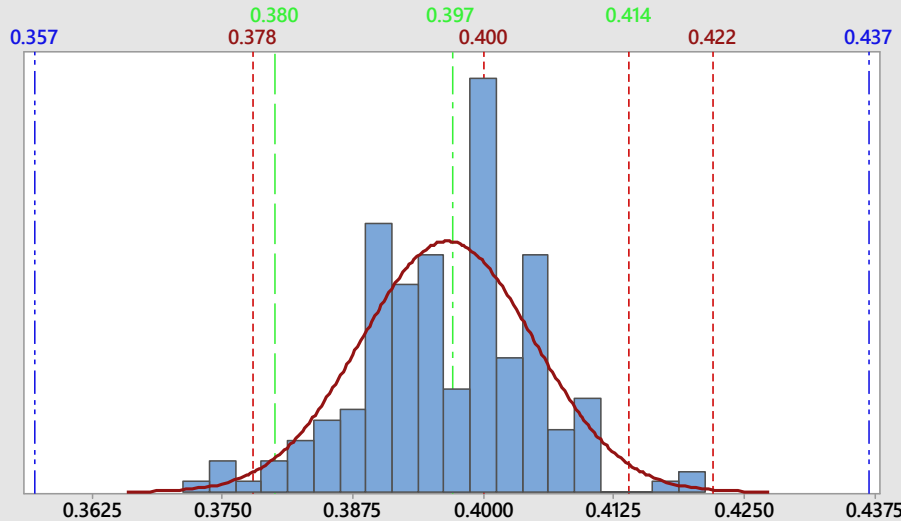
1226 +/- 123 [1103 - 1349]

Jacket Analysis – Individual Value Plot Pendulum Force



Jacket Analysis – Sled Velocity

Summary Report for ABS Sled Velocity (m/s) [Outliers Deleted]



Anderson-Darling Normality Test

A-Squared 0.82
P-Value 0.034

Mean 0.39659
StDev 0.00827
Variance 0.00007
Skewness -0.197902
Kurtosis 0.311395
N 201

Minimum 0.37167
1st Quartile 0.39000
Median 0.39700
3rd Quartile 0.40200
Maximum 0.42000

95% Confidence Interval for Mean
0.39544 0.39774

95% Confidence Interval for Median
0.39500 0.39944

95% Confidence Interval for StDev
0.00754 0.00917

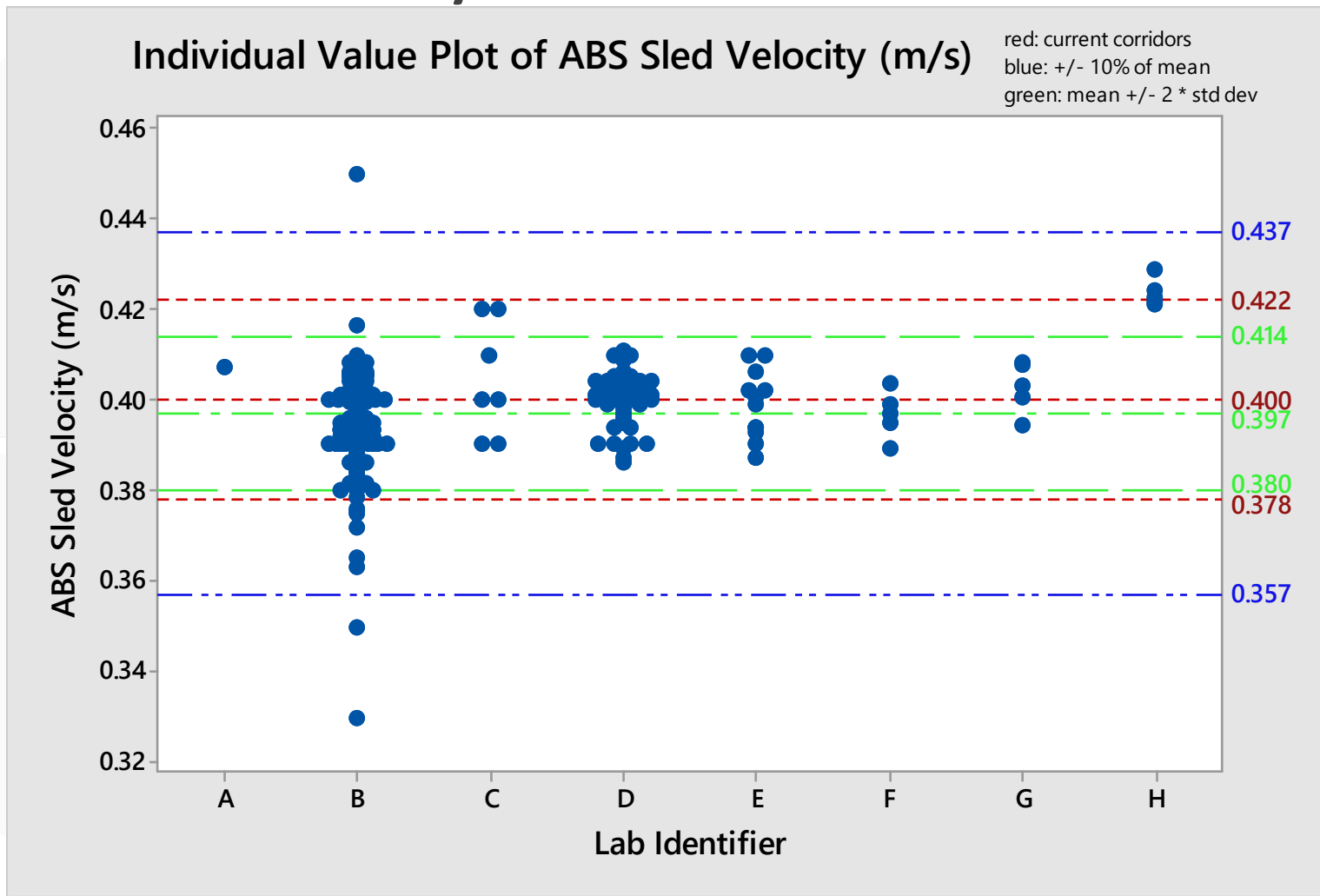
Current Corridors: red - width +/-5.5%
0.400 +/- 0.022 [0.378 - 0.422]

All original Sled Velocity outliers deleted.

+/- 2 std dev: green +/- 4.3%
0.397 +/- 0.017 [0.380 - 0.414]

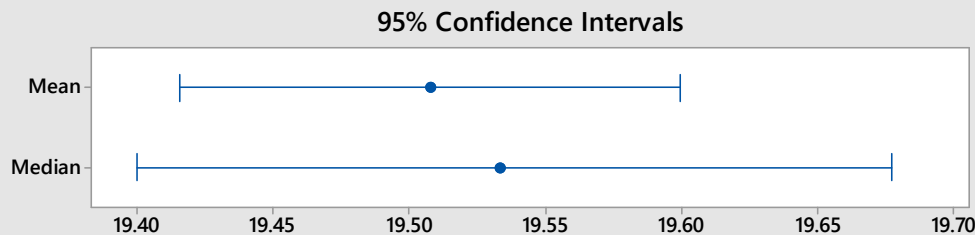
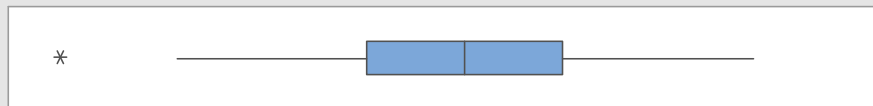
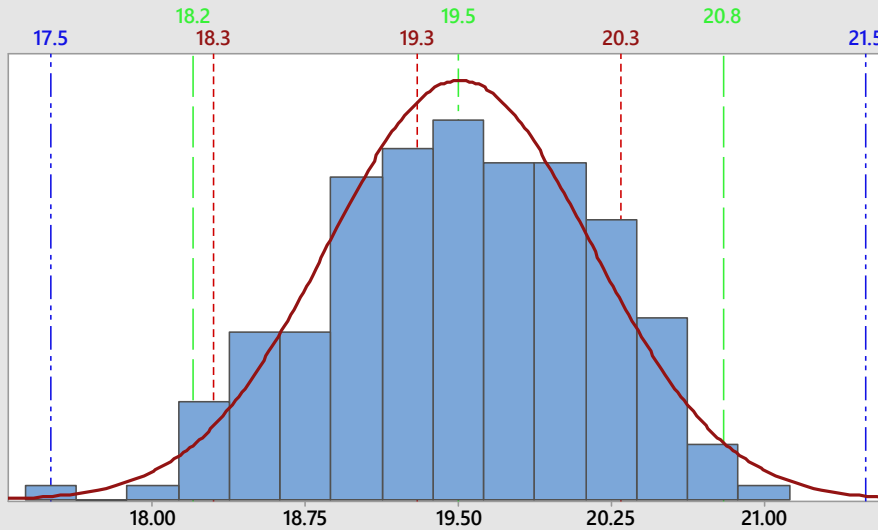
+/- 10%: blue
0.397 +/- 0.040 [0.357 - 0.437]

Jacket Analysis – Individual Value Plot Sled Velocity



Jacket Analysis – Jacket Compression

Summary Report for ABS Part Compression (mm) [Outliers Deleted]



Anderson-Darling Normality Test	
A-Squared	0.50
P-Value	0.204
Mean	19.508
StDev	0.648
Variance	0.419
Skewness	-0.218662
Kurtosis	-0.448144
N	194
Minimum	17.550
1st Quartile	19.050
Median	19.533
3rd Quartile	20.009
Maximum	20.950
95% Confidence Interval for Mean	
	19.416 19.599
95% Confidence Interval for Median	
	19.400 19.677
95% Confidence Interval for StDev	
	0.589 0.719

Current Corridors: red - width +/-5.2%
19.3 +/- 1.0 [18.3 - 20.3]

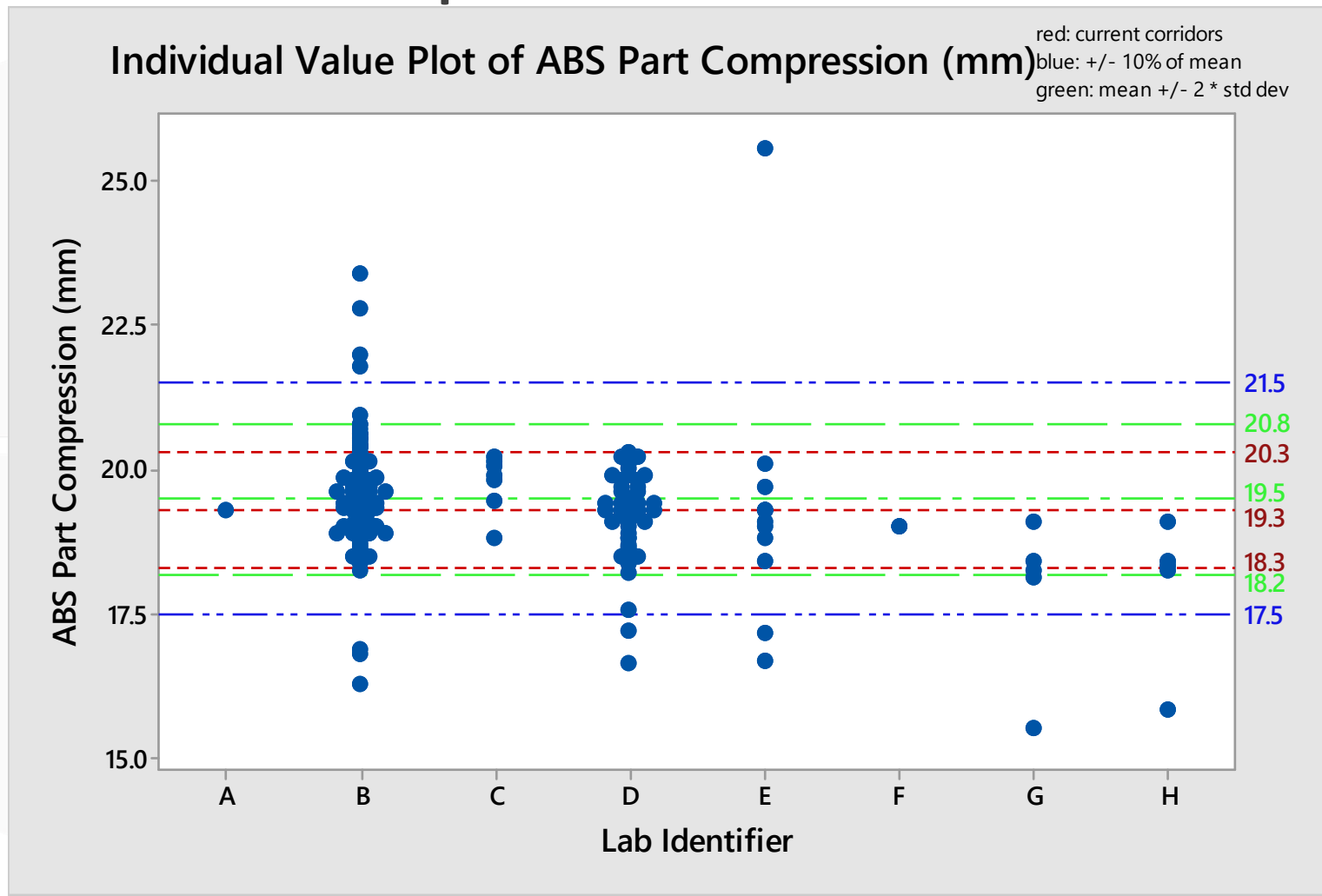
All original Compression outliers deleted.

+/- 2 std dev: green +/- 6.7%
19.5 +/- 1.3 [18.2 - 20.8]

+/- 10%: blue
19.5 +/- 2.0 [17.5 - 21.5]

Jacket Analysis – Individual Value Plot

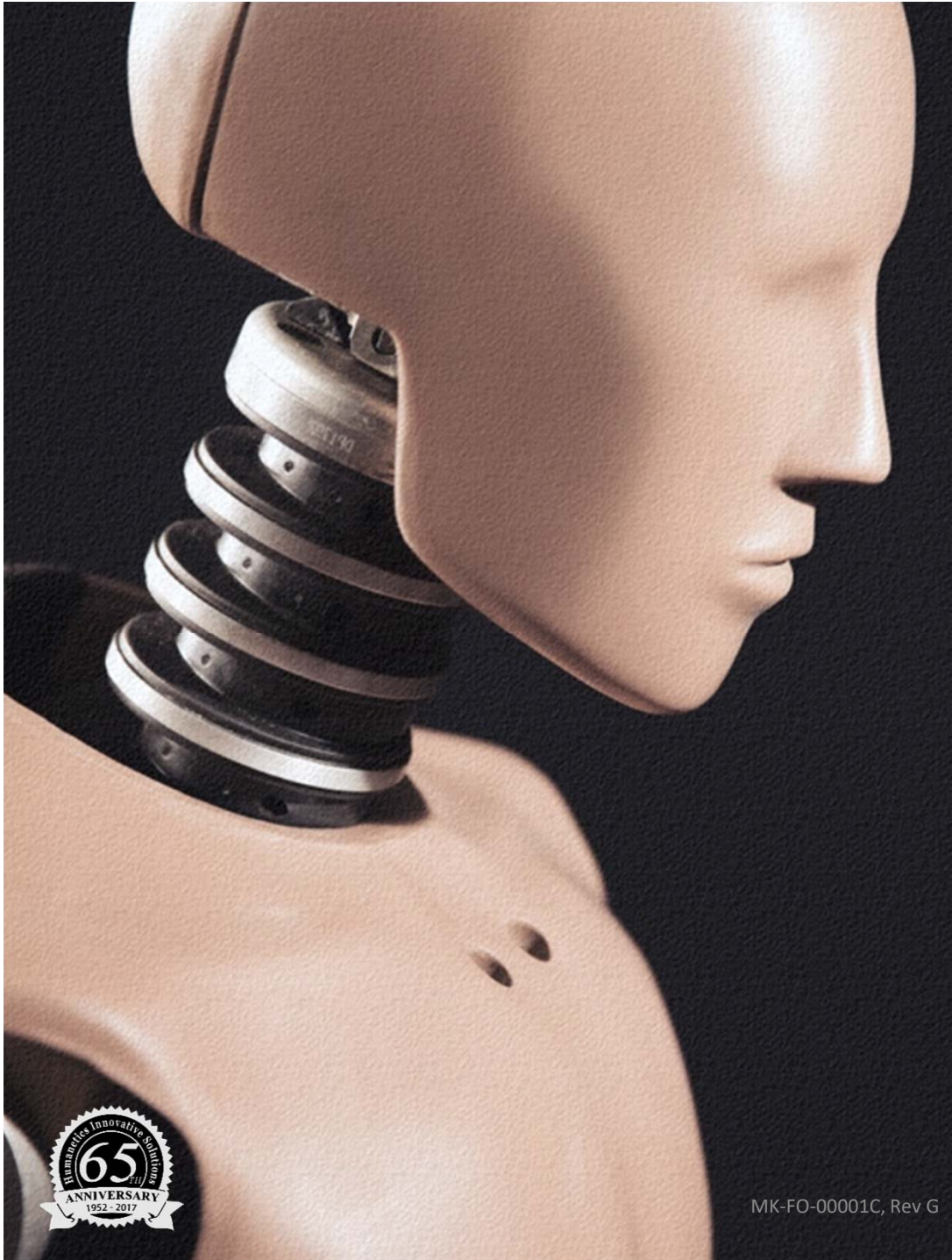
Jacket Compression



Jacket Test – Possible Corridors

Parameter	Lower	Mid Point	Upper	+/- % Width	Number of data points	Mean - 2 * Std Dev	Mean - 10%	Mean Value from Population	Mean + 10%	Mean + 2 * Std Dev	+/- 2 * Std Dev % Width	Count Orig. Param.	Pass Rate Orig. Param.	Pass Rate +/- 2*SD Param.	Pass Rate +/- 10% Param.
Impact Velocity	1.500	1.525	1.550	1.6%				<i>no change</i>							
Peak Pendulum Force	1110	1235	1360	10%	203	1113	1103	1226	1349	1339	9.2%	211	94%	93%	93%
Peak Sled Velocity	0.378	0.400	0.422	5.5%	201	0.380	0.357	0.397	0.437	0.414	4.3%	211	94%	91%	99%
Peak Part Compression	18.3	19.3	20.3	5.2%	194	18.2	17.5	19.5	21.5	20.8	6.7%	208	81%	92%	93%
Temperature	19	22	25	14%				<i>no change</i>							
Humidity	10	40	70	75%				<i>no change</i>							
Pass Rate All Parameters:												208	77%	83%	91%

Pelvis Test Analysis

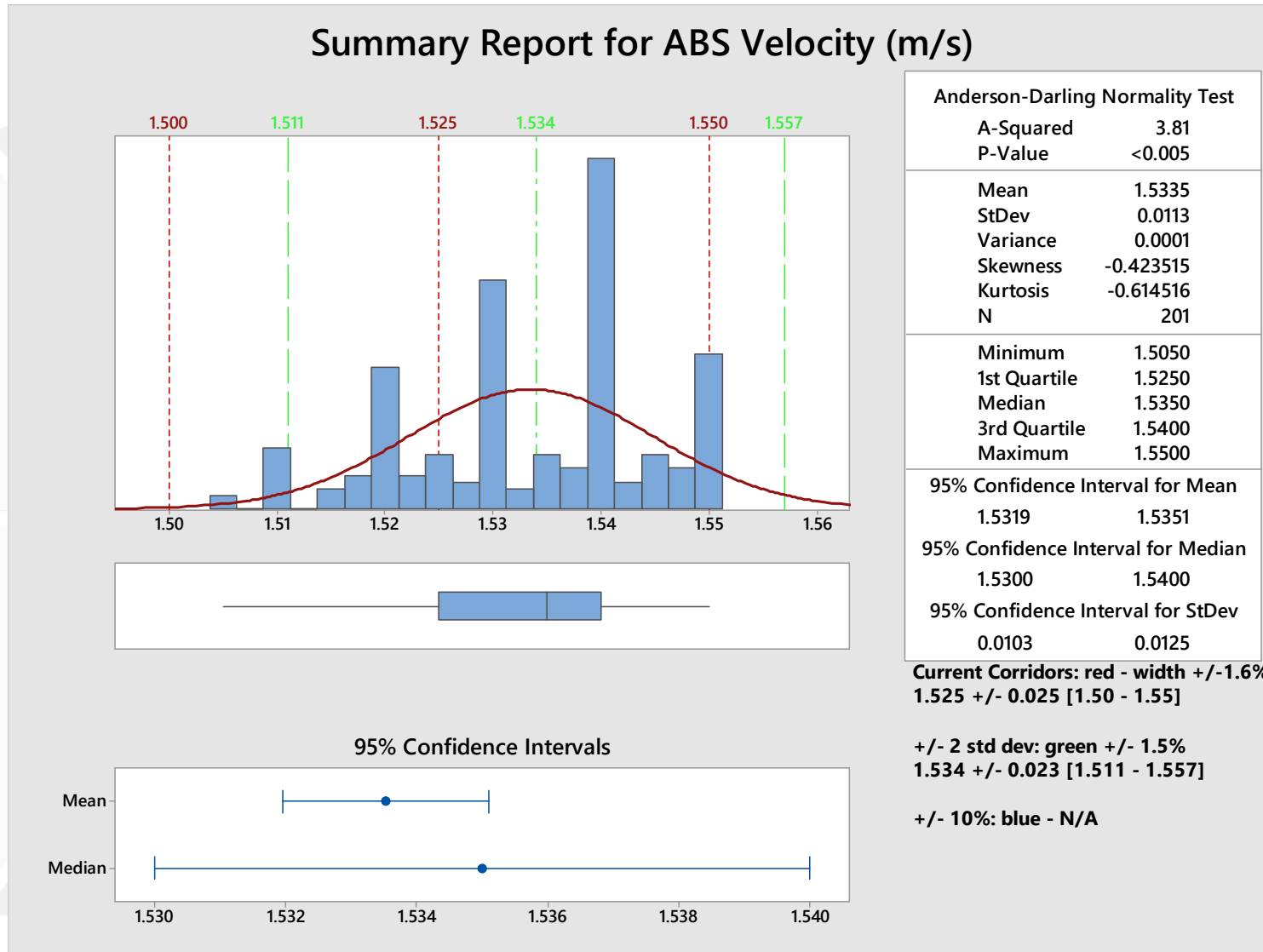


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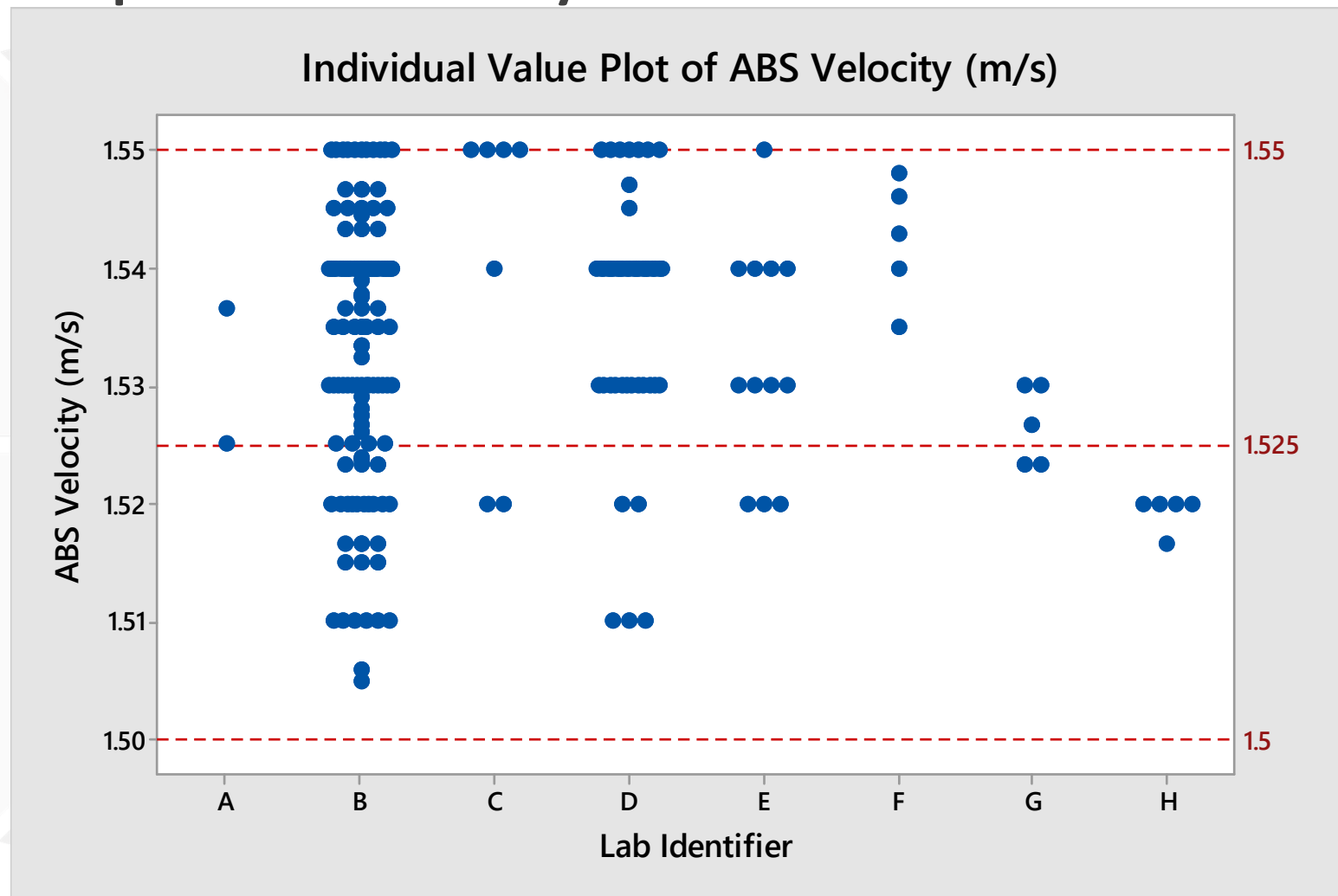
Notes on Analysis Changes

- Since Aug. 27 meeting additional information was received allowing the adding in of data sent by JARI. This included 2 more labs and 5 parts
- In the previous Average By Part (ABP), there were 2 problems
 - Parts tested in more than 1 lab had all labs averaged together
 - The average for a part showed up in the first lab that tested it in individual value plots
 - It did not allow to show aging effects on the pelvis over time
- For this analysis
 - Average By Test Sequences (ABS) was done instead of ABP
 - JARI data included
 - Histograms shown both with and without outlier removal
 - » (Due to JAMA opinion that outliers should be kept for this test)

Pelvis Analysis – Impact Velocity

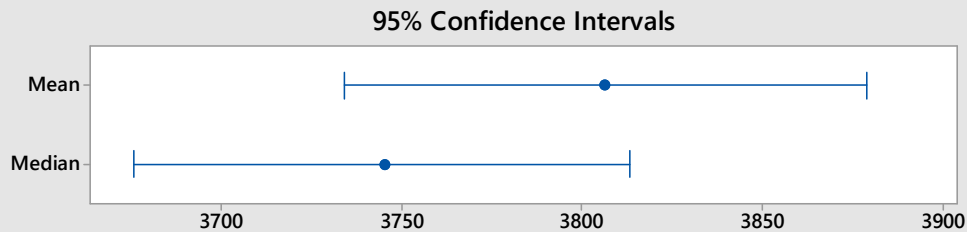
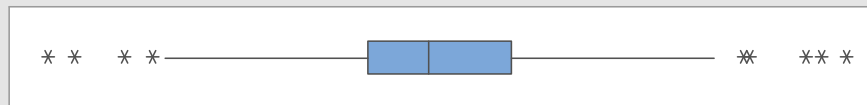
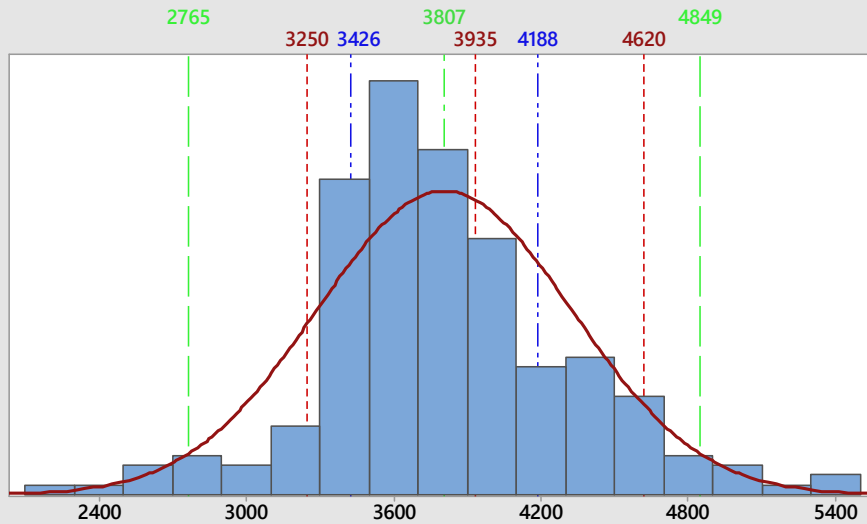


Pelvis Analysis – Individual Value Plot Impact Velocity



Pelvis Analysis – Pendulum Force

Summary Report for ABS Pendulum Force (N)



Anderson-Darling Normality Test

A-Squared 1.75
P-Value <0.005

Mean 3806.5
StDev 520.7
Variance 271104.7
Skewness 0.22331
Kurtosis 1.09071
N 201

Minimum 2194.0
1st Quartile 3497.0
Median 3745.5
3rd Quartile 4082.5
Maximum 5447.0

95% Confidence Interval for Mean

3734.1 3879.0

95% Confidence Interval for Median

3675.9 3813.3

95% Confidence Interval for StDev

474.3 577.2

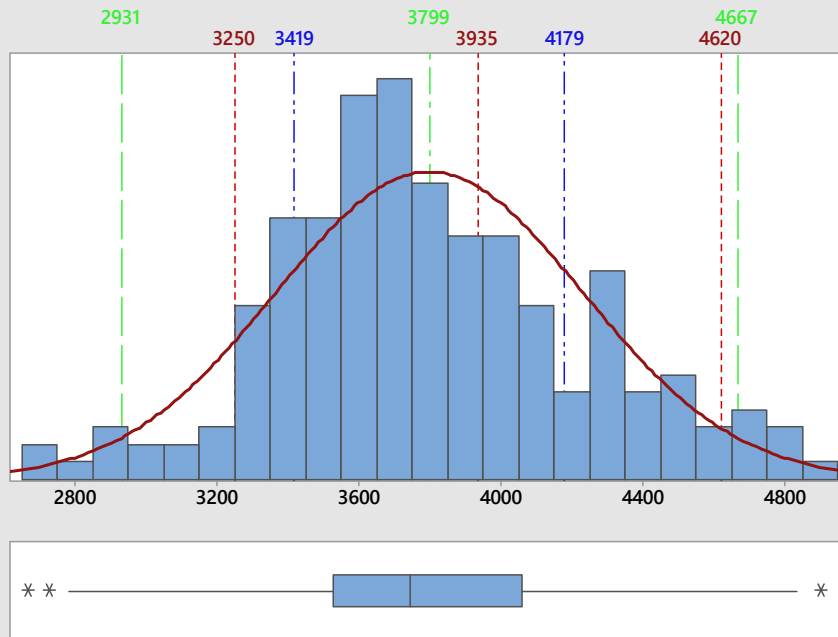
Current Corridors: red - width +/-17%
3935 +/- 685 [3250 - 4620]

+/- 2 std dev: green +/- 27%
3807 +/- 1042 [2765 - 4849]

+/- 10%: blue
3807 +/- 381 [3426 - 4188]

Pelvis Analysis – Pendulum Force [Outliers removed]

Summary Report for ABS Pendulum Force (N) [Outliers Deleted]



Anderson-Darling Normality Test

A-Squared	1.15
P-Value	0.005
Mean	3798.7
StDev	434.0
Variance	188368.5
Skewness	0.231910
Kurtosis	0.029391
N	192
Minimum	2668.5
1st Quartile	3527.4
Median	3744.4
3rd Quartile	4058.6
Maximum	4904.0
95% Confidence Interval for Mean	3736.9 3860.5
95% Confidence Interval for Median	3675.5 3808.9
95% Confidence Interval for StDev	394.5 482.4

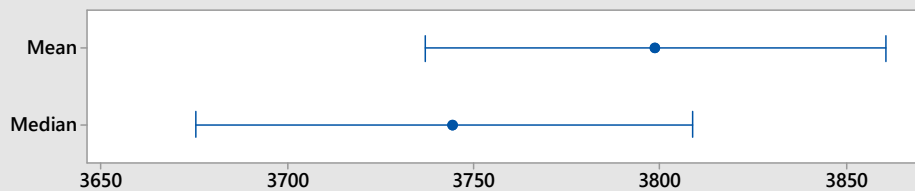
Current Corridors: red - width +/--17%
3935 +/-- 685 [3250 - 4620]

All original Force Outliers Deleted.

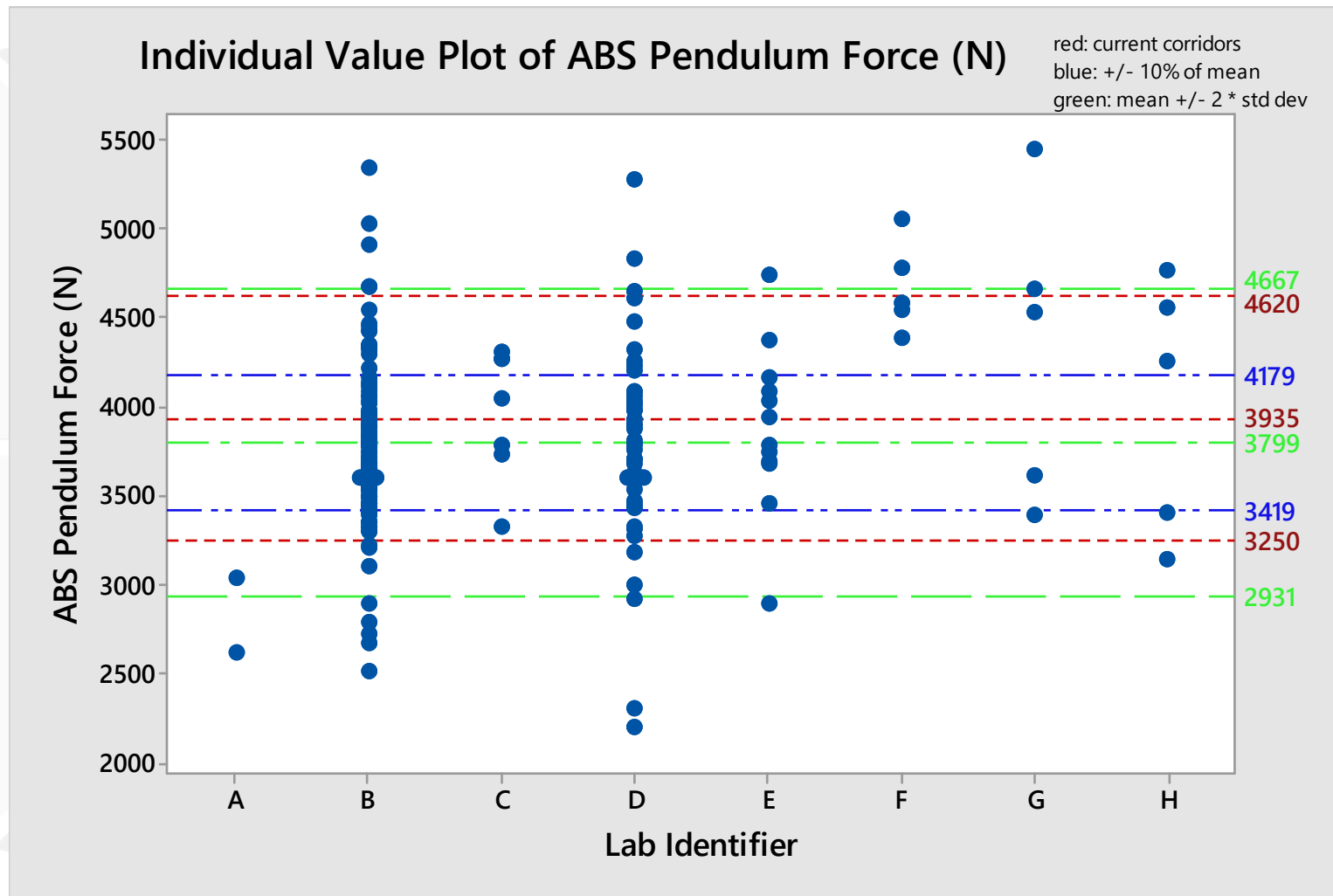
+/- 2 std dev: green +/-- 23%
3799 +/-- 868 [2931 - 4667]

+/- 10%: blue
3799 +/-- 380 [3419 - 4179]

95% Confidence Intervals

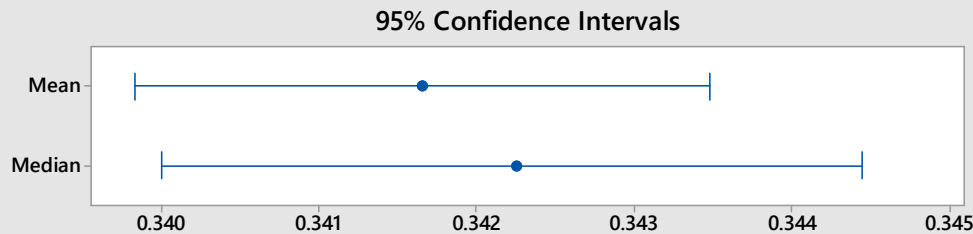
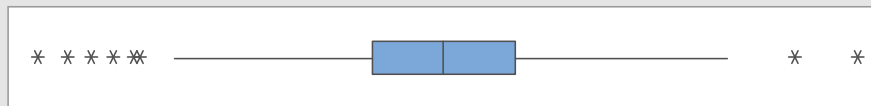
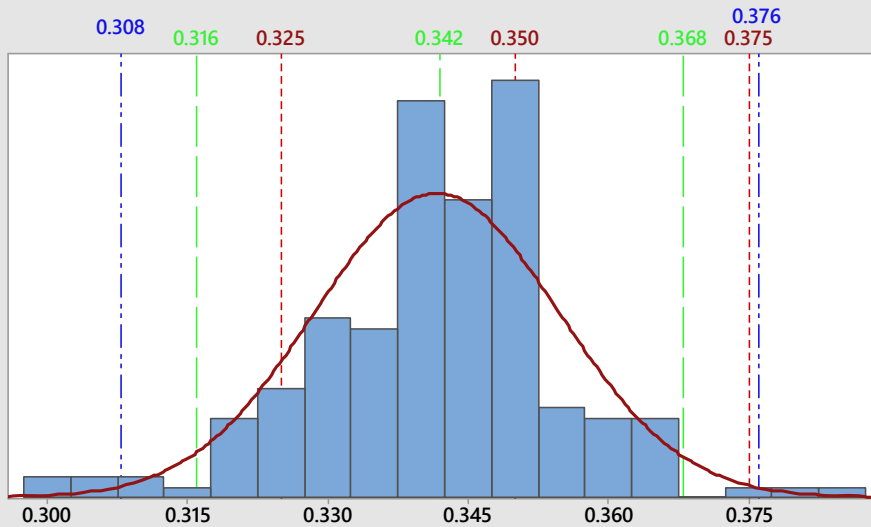


Pelvis Analysis – Individual Value Plot Pendulum Force



Pelvis Analysis – Sled Velocity

Summary Report for ABS Sled Velocity (m/s)



Anderson-Darling Normality Test

A-Squared 1.49
P-Value <0.005

Mean 0.34166
StDev 0.01311
Variance 0.00017
Skewness -0.26818
Kurtosis 1.33467
N 201

Minimum 0.29900
1st Quartile 0.33483
Median 0.34225
3rd Quartile 0.35000
Maximum 0.38667

95% Confidence Interval for Mean

0.33983 0.34348

95% Confidence Interval for Median

0.34000 0.34444

95% Confidence Interval for StDev

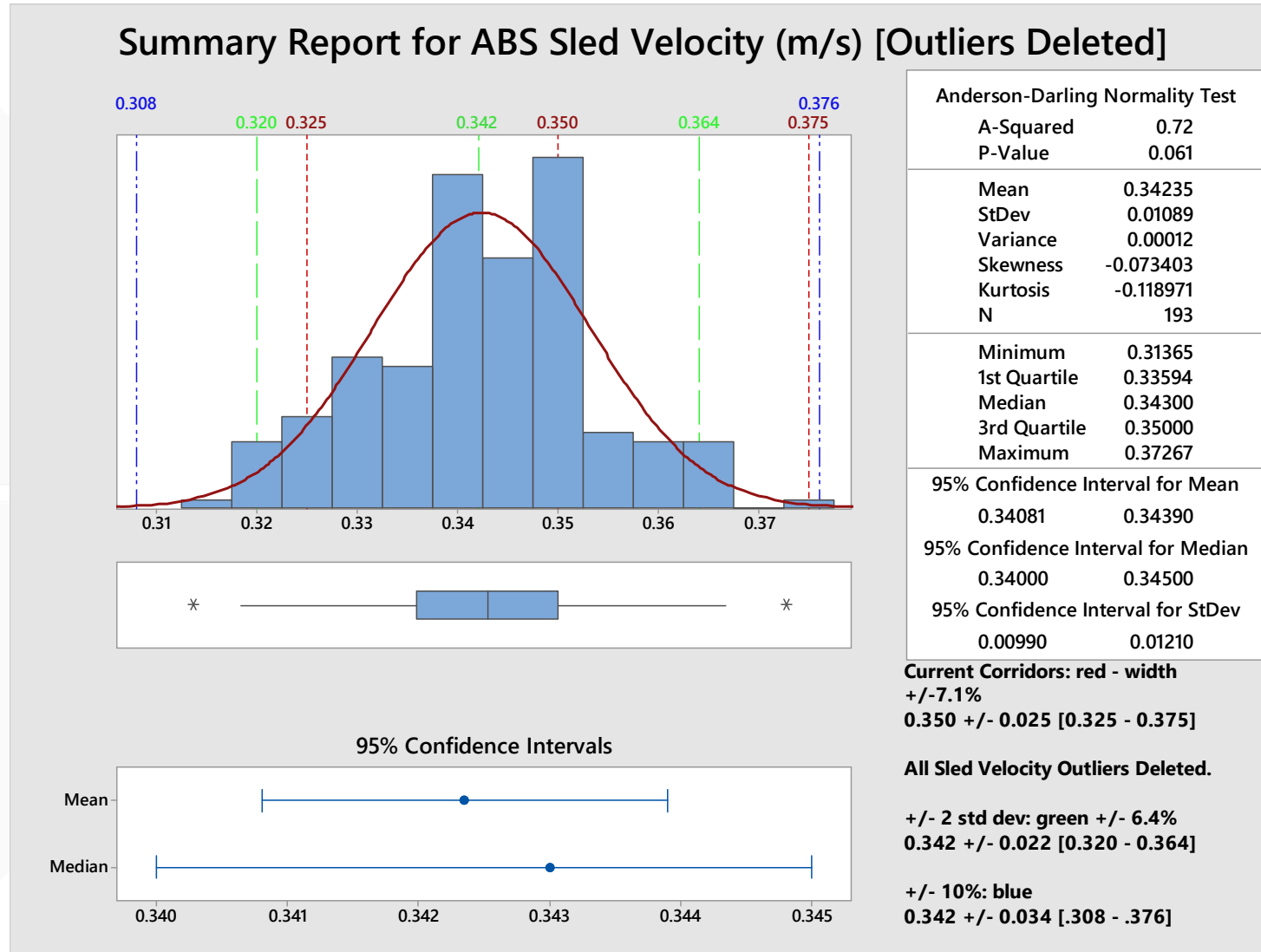
0.01194 0.01453

Current Corridors: red - width +/-7.1%
0.350 +/- 0.025 [0.325 - 0.375]

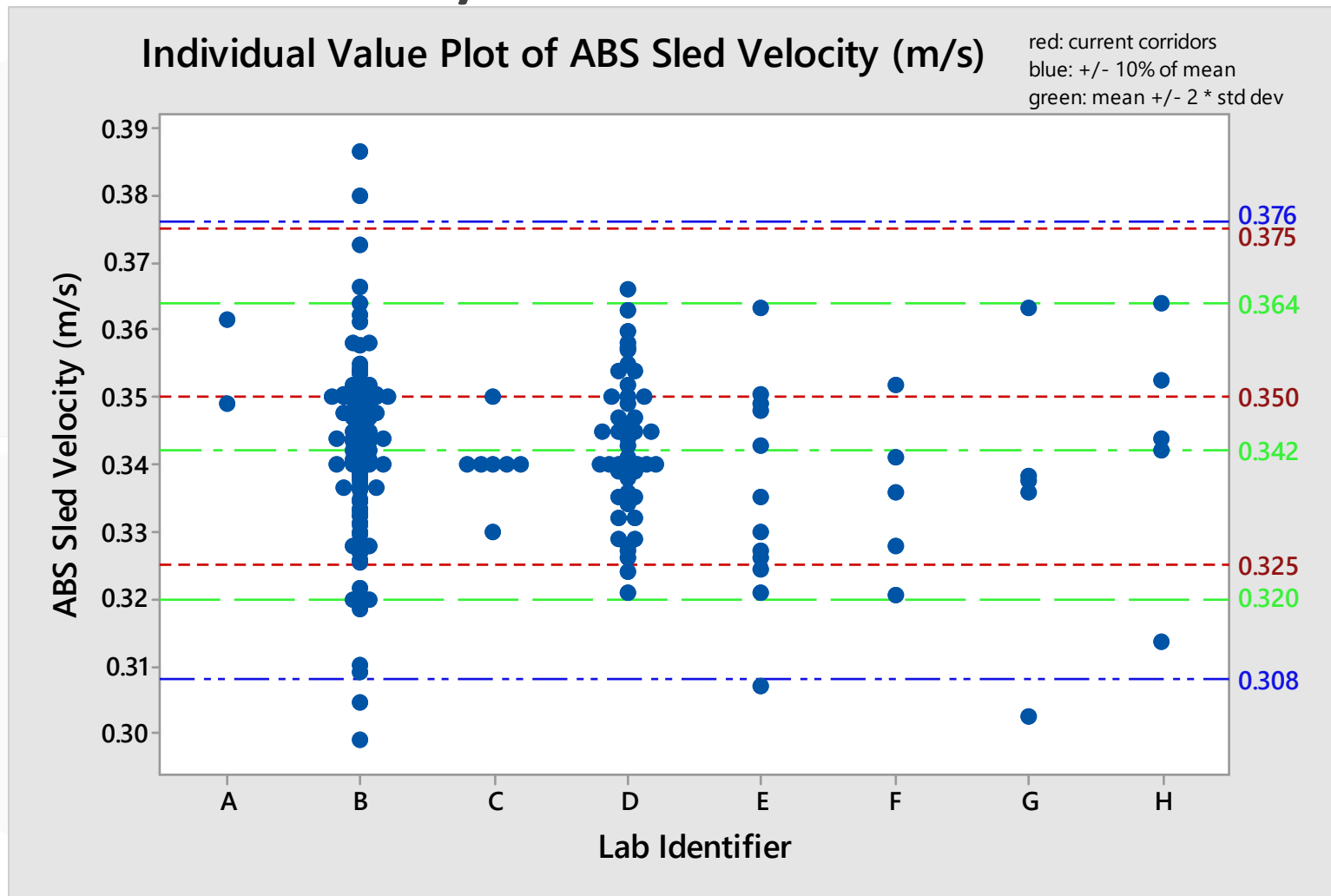
+/- 2 std dev: green +/- 7.6%
0.342 +/- 0.026 [0.316 - 0.368]

+/- 10%: blue
0.342 +/- 0.034 [.308 - .376]

Pelvis Analysis – Sled Velocity [Outliers removed]

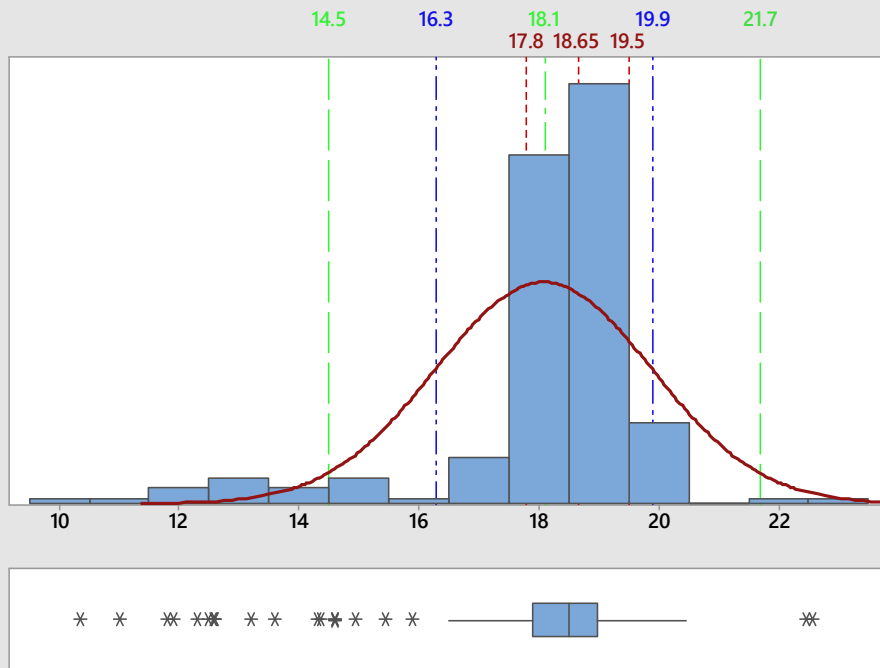


Pelvis Analysis – Individual Value Plot Sled Velocity



Pelvis Analysis – Pelvis Compression

Summary Report for ABS Part Compression (mm)



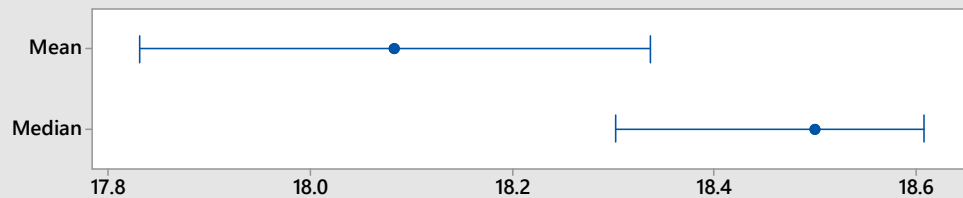
Anderson-Darling Normality Test	
A-Squared	16.98
P-Value	<0.005
Mean	18.083
StDev	1.806
Variance	3.261
Skewness	-2.03811
Kurtosis	5.29057
N	198
Minimum	10.361
1st Quartile	17.900
Median	18.500
3rd Quartile	18.977
Maximum	22.580
95% Confidence Interval for Mean	
	17.830 18.336
95% Confidence Interval for Median	
	18.302 18.609
95% Confidence Interval for StDev	
	1.644 2.004

Current Corridors: red - width +/-4.6%
18.65 +/- 0.85 [17.80 - 19.50]

+/- 2 std dev: green +/- 20%
18.1 +/- 3.6 [14.5 - 21.7]

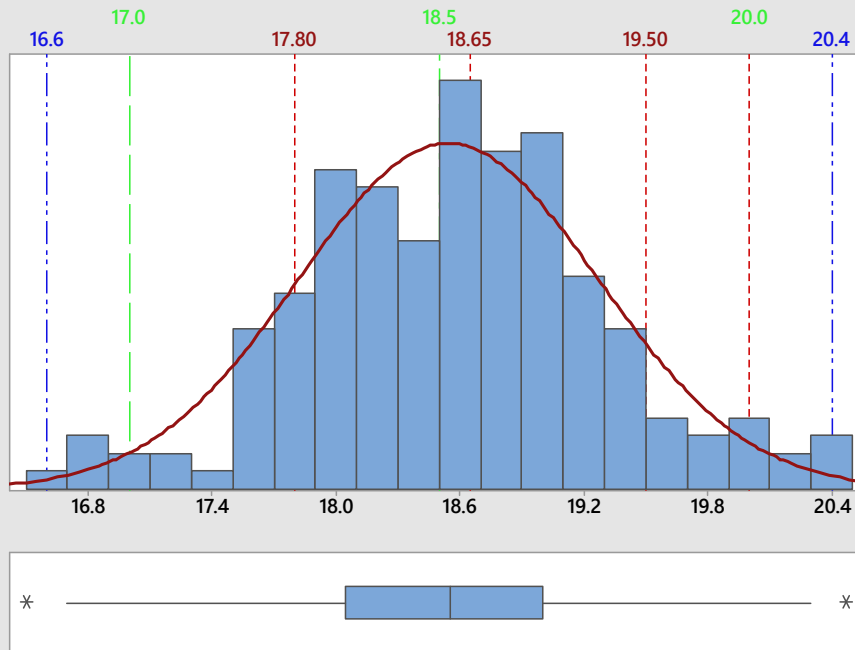
+/- 10%: blue
18.1 +/- 1.8 [16.3 - 19.9]

95% Confidence Intervals



Pelvis Analysis – Pelvis Compression [Outliers removed]

Summary Report for ABS Part Compression (mm) [Outliers Deleted]



Anderson-Darling Normality Test

A-Squared 0.49
P-Value 0.217

Mean 18.544
StDev 0.726
Variance 0.528
Skewness 0.031755
Kurtosis 0.341094
N 177

Minimum 16.500
1st Quartile 18.050
Median 18.550
3rd Quartile 19.000
Maximum 20.467

95% Confidence Interval for Mean

18.436 18.652

95% Confidence Interval for Median

18.432 18.700

95% Confidence Interval for StDev

0.658 0.811

Current Corridors: red - width +/--4.6%

18.65 +/- 0.85 [17.80 - 19.50]

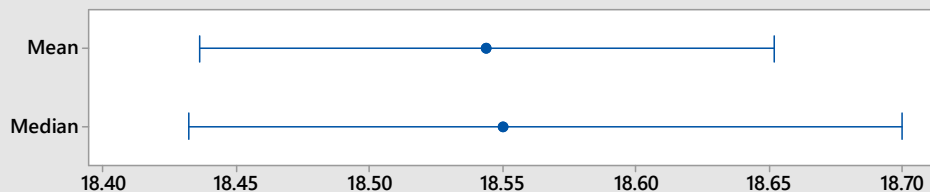
+/- 2 std dev: green +/- 8.1%

18.5 +/- 1.5 [17.0 - 20.0]

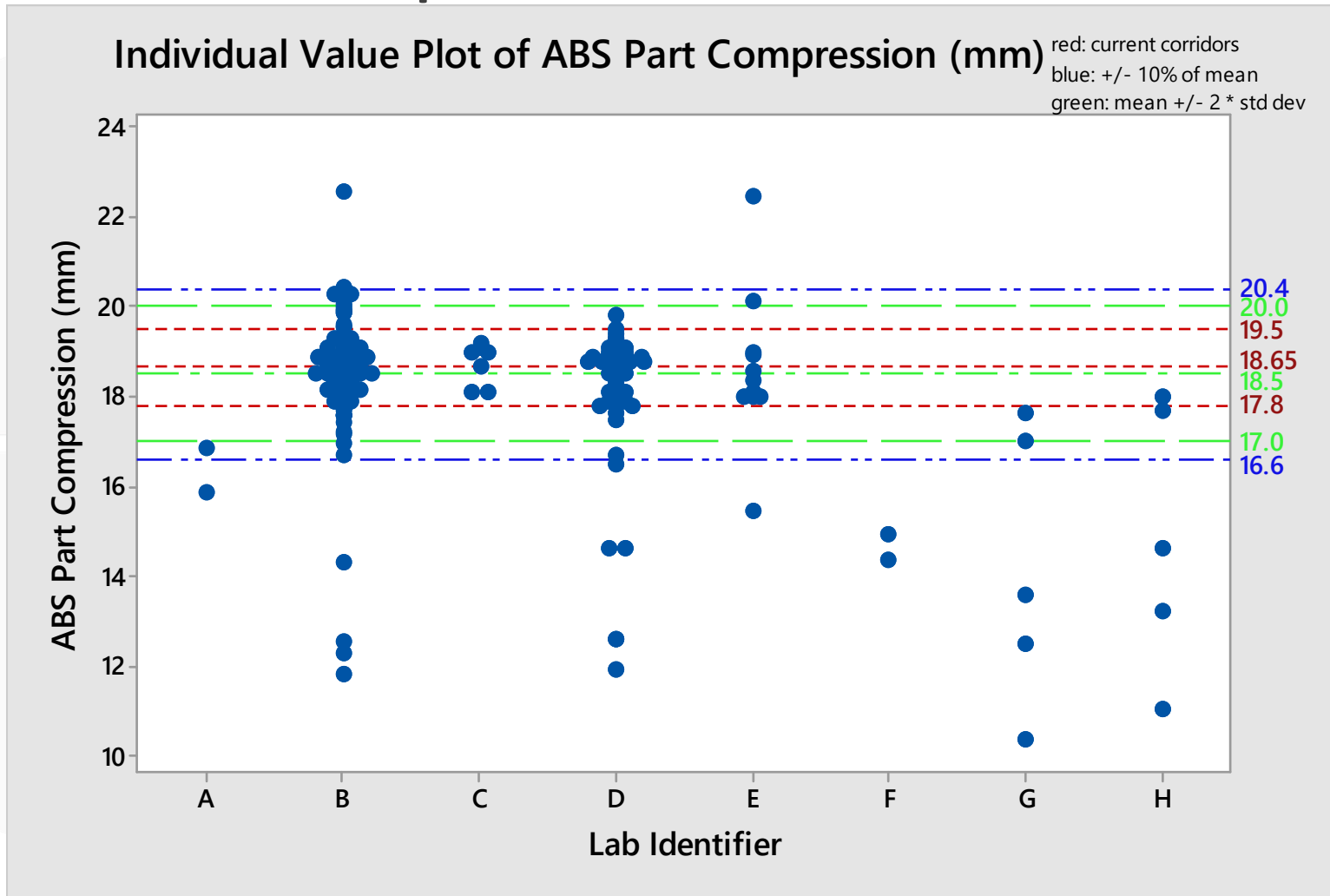
+/- 10%: blue

18.5 +/- 1.9 [16.6 - 20.4]

95% Confidence Intervals



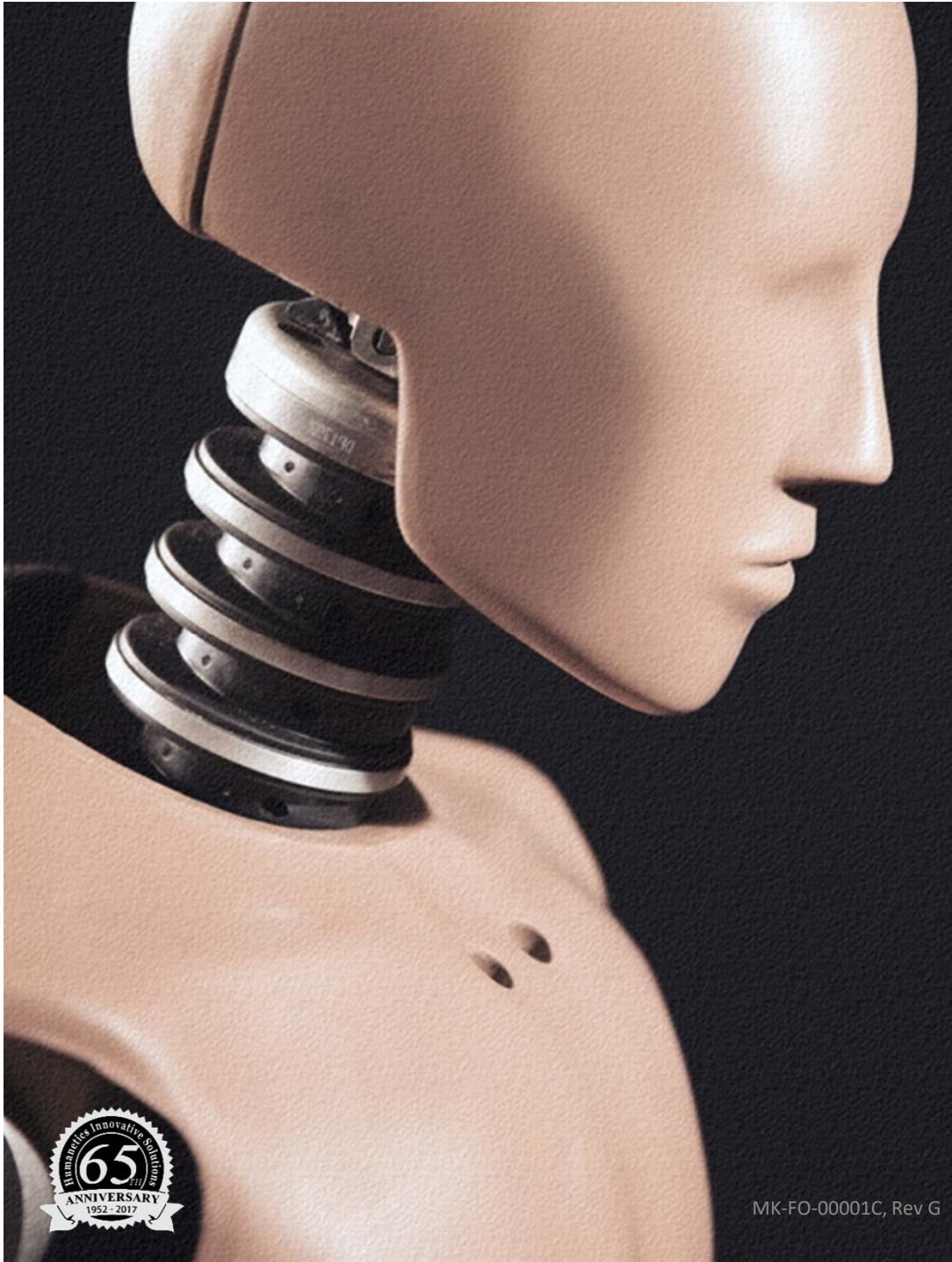
Pelvis Analysis – Individual Value Plot Pelvis Compression



Pelvis Test – Possible Corridors

Parameter	Lower	Mid Point	Upper	+/- % Width	Number of data points	Mean - 2 * Std Dev	Mean - 10%	Mean Value from Population	Mean + 10%	Mean + 2 * Std Dev	+/- 2 * Std Dev % Width	Count Orig. Param.	Pass Rate Orig. Param.	Pass Rate +/- 2*SD Param.	Pass Rate +/- 10% Param.
Impact Velocity	1.500	1.525	1.550	1.6%				<i>no change</i>							
Peak Pendulum Force	3250	3935	4620	17%	192	2931	3419	3799	4179	4667	23%	201	85%	89%	61%
Peak Sled Velocity	0.325	0.350	0.375	7.1%	193	0.320	0.308	0.342	0.376	0.364	6.4%	201	91%	93%	97%
Peak Part Compression	17.80	18.65	19.50	4.6%	177	17.0	16.6	18.5	20.4	20.0	8.1%	198	72%	84%	88%
Temperature	19	22	25	14%				<i>no change</i>							
Humidity	10	40	70	75%				<i>no change</i>							
Pass Rate All Parameters:												198	65%	77%	58%

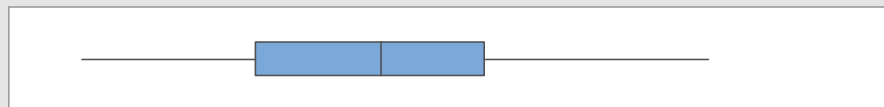
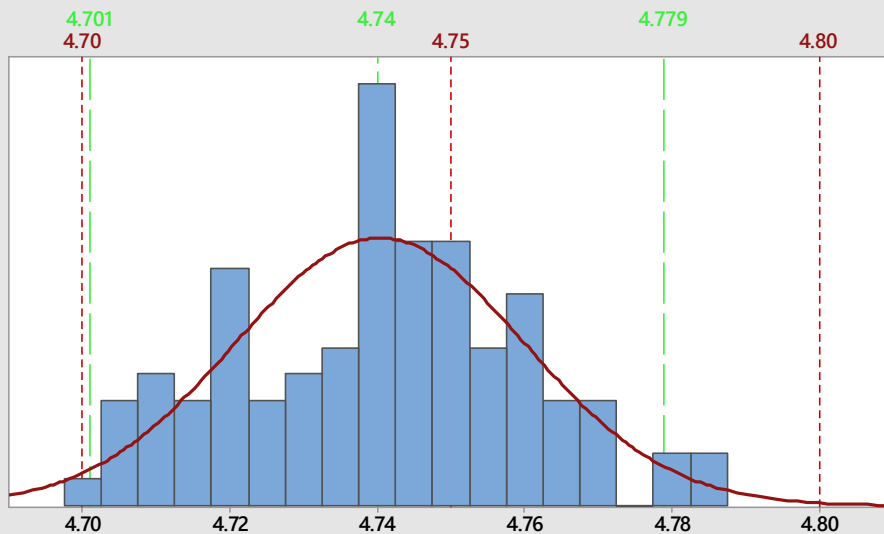
Sled and Track Certification Test Analysis



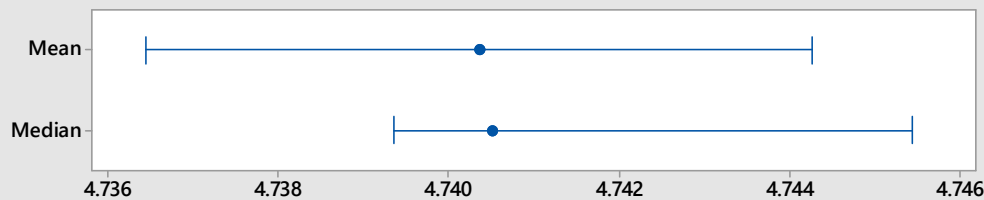
MK-FO-00001C, Rev G

Sled Test Analysis – Impact Velocity

Summary Report for ABP Vel (m/s)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 0.52
P-Value 0.187

Mean 4.7404
StDev 0.0197
Variance 0.0004
Skewness -0.000846
Kurtosis -0.486325
N 100

Minimum 4.7000
1st Quartile 4.7235
Median 4.7405
3rd Quartile 4.7546
Maximum 4.7850

95% Confidence Interval for Mean

4.7365 4.7443

95% Confidence Interval for Median

4.7394 4.7454

95% Confidence Interval for StDev

0.0173 0.0228

Current Corridors: red - width +/- 6.5%

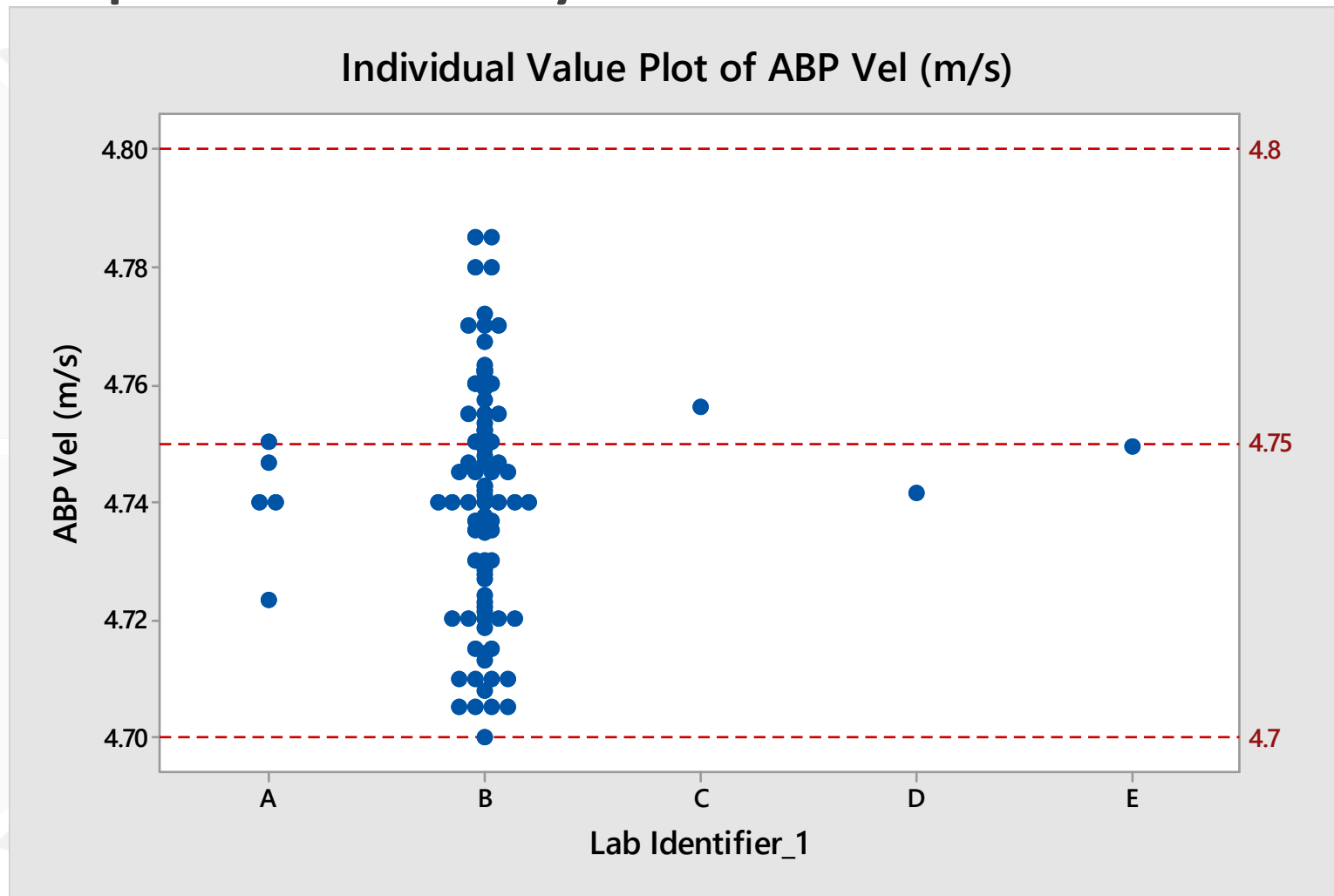
4.75 +/- 0.05 [4.70 - 4.80]

+/- 2 std dev: green +/- 0.8%

4.740 +/- 0.039 [4.701 - 4.779]

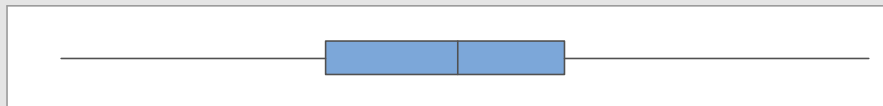
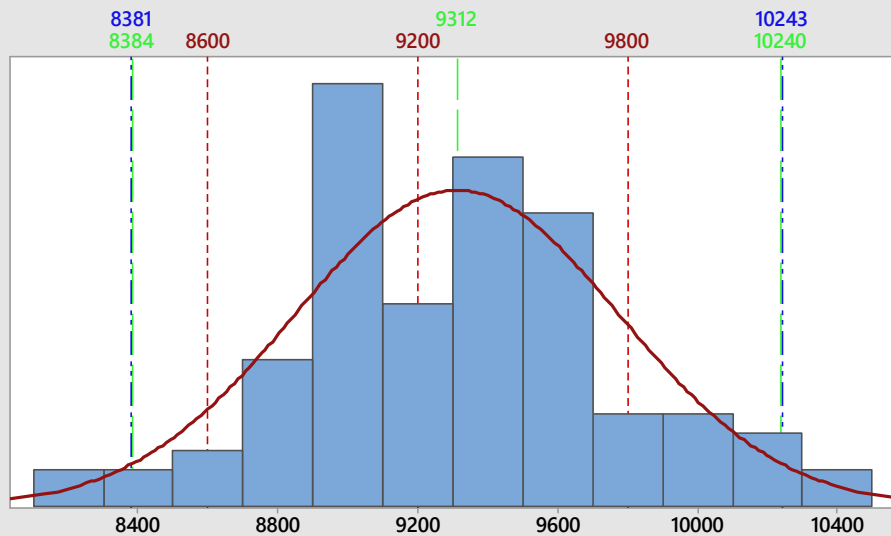
+/- 10%: blue - n/a

Sled Analysis – Individual Value Plot Impact Velocity

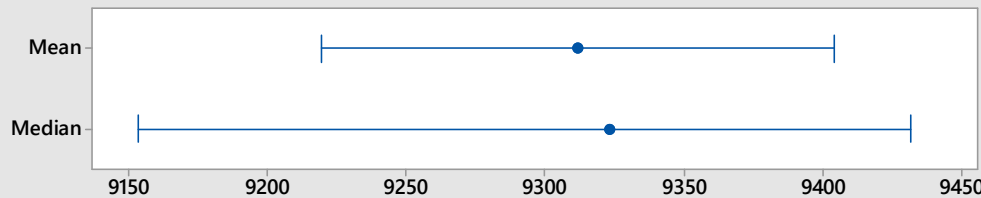


Sled Test Analysis – Pendulum Force

Summary Report for ABP Pend (N)



95% Confidence Intervals



Anderson-Darling Normality Test

A-Squared 0.39
P-Value 0.371

Mean 9311.9
StDev 464.1
Variance 215348.2
Skewness 0.199057
Kurtosis -0.002146
N 100

Minimum 8188.4
1st Quartile 8946.4
Median 9323.3
3rd Quartile 9625.9
Maximum 10499.1

95% Confidence Interval for Mean

9219.8 9404.0

95% Confidence Interval for Median

9153.7 9431.6

95% Confidence Interval for StDev

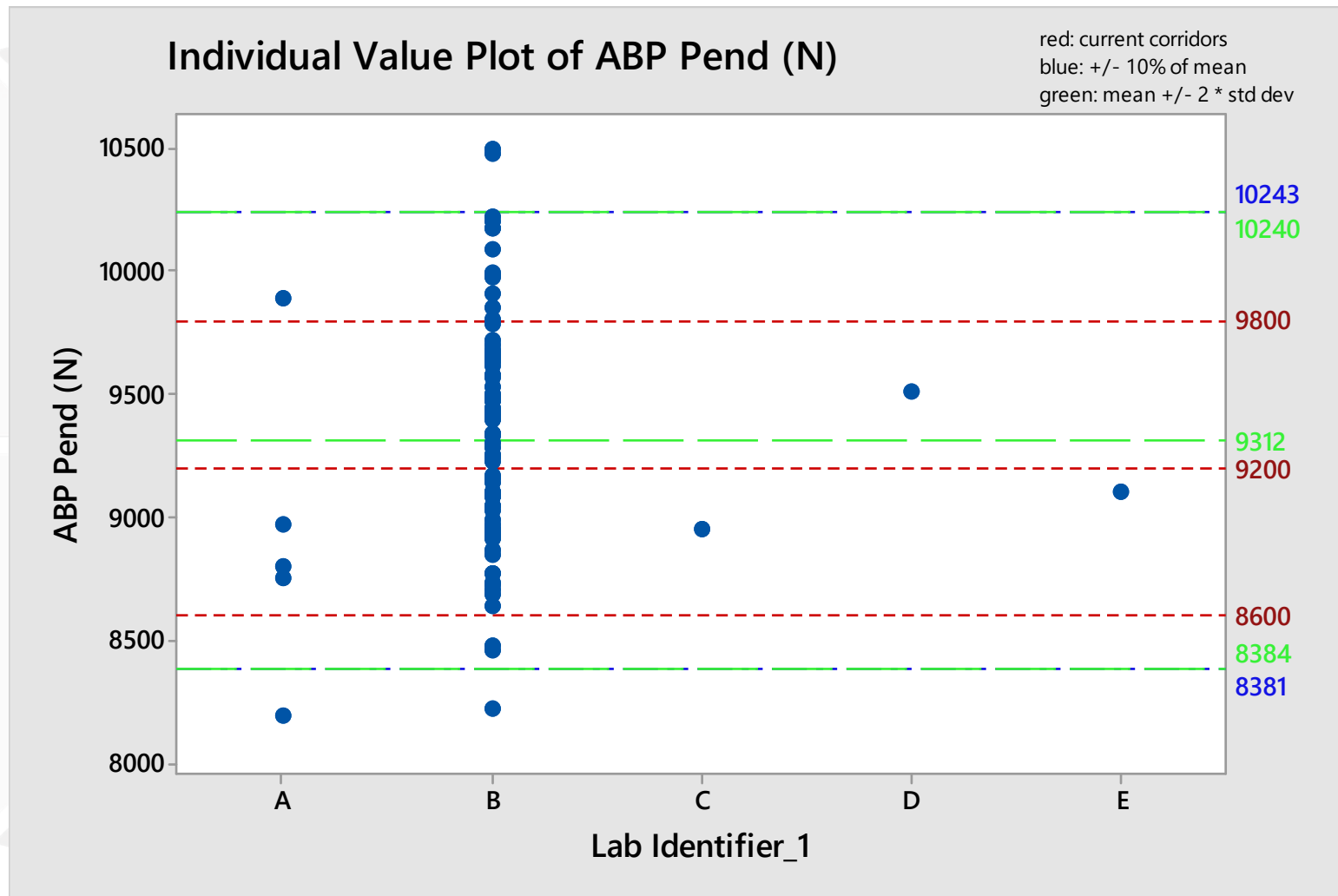
407.4 539.1

Current Corridors: red - width +/- 6.5%
9200 +/- 600 [8600 - 9800]

+/- 2 std dev: green +/- 10%
9312 +/- 928 [8384 - 10240]

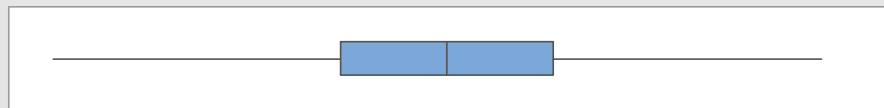
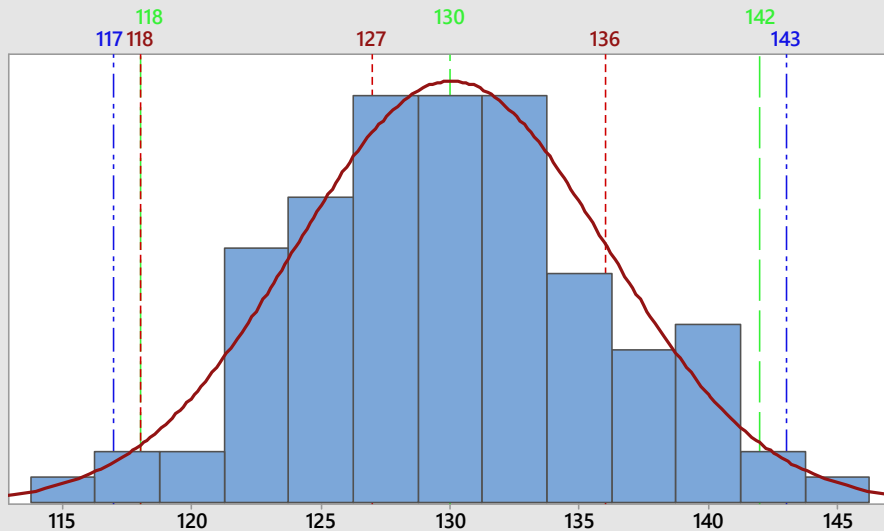
+/- 10%: blue
9312 +/- 931 [8381 - 10243]

Pelvis Analysis – Individual Value Plot Pendulum Force



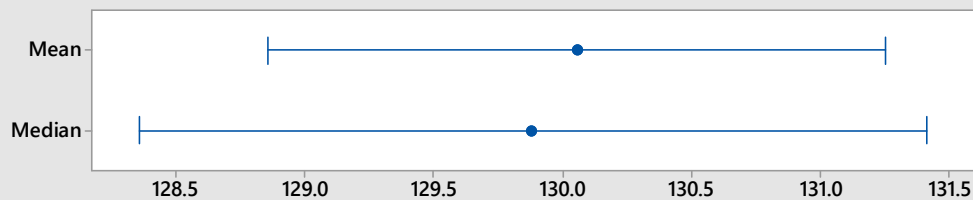
Sled Test Analysis – Sled Acceleration

Summary Report for ABP Sled Accel (m/s²)



Anderson-Darling Normality Test	
A-Squared	0.15
P-Value	0.968
Mean	130.06
StDev	6.03
Variance	36.33
Skewness	0.097921
Kurtosis	-0.264837
N	100
Minimum	114.63
1st Quartile	125.76
Median	129.88
3rd Quartile	133.98
Maximum	144.39
95% Confidence Interval for Mean	
	128.86 131.25
95% Confidence Interval for Median	
	128.36 131.41
95% Confidence Interval for StDev	
	5.29 7.00

95% Confidence Intervals

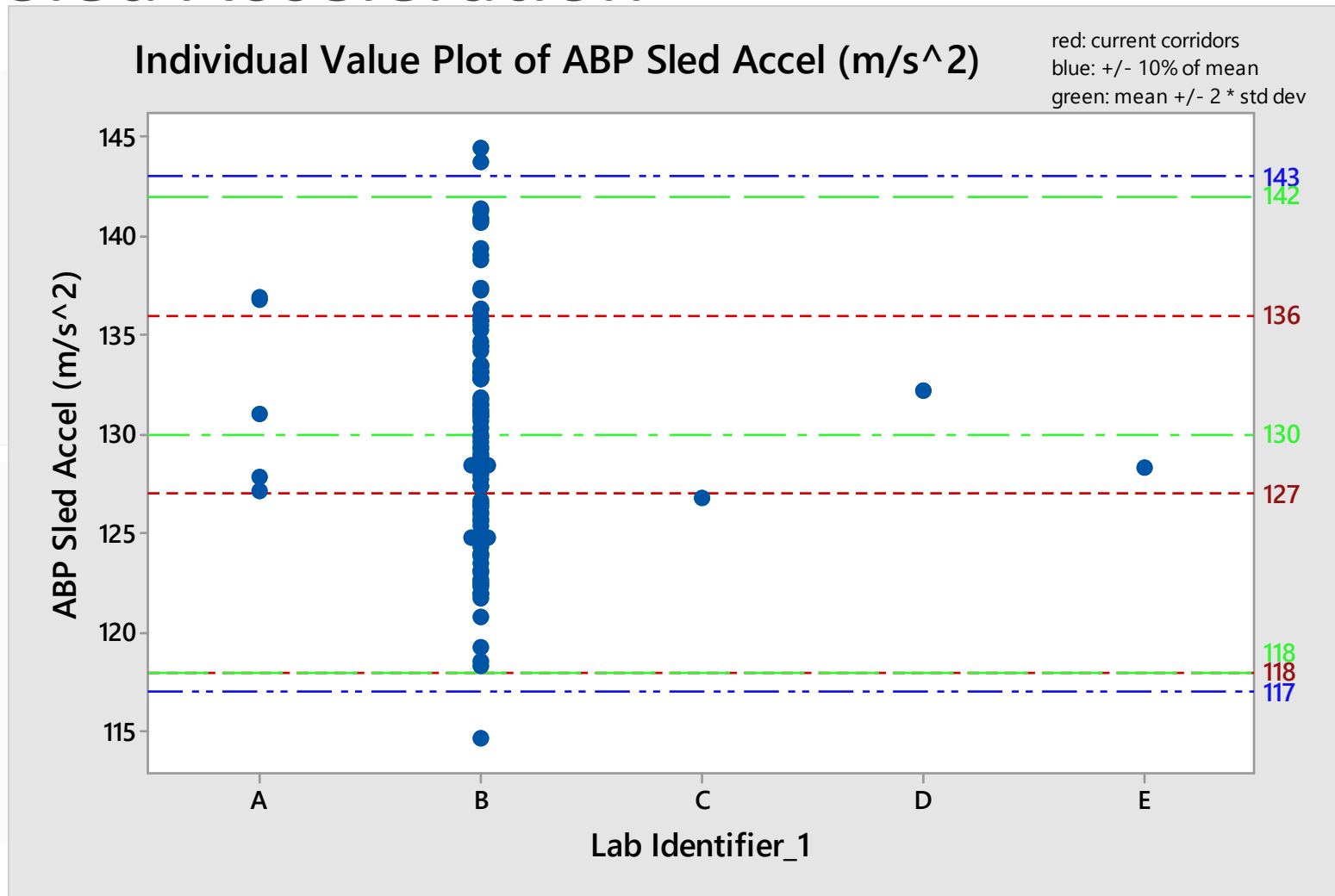


Current Corridors: red - width +/- 7.1%
 127 +/- 9 [118 - 136]

+/- 2 std dev: green +/- 9.2%
 130 +/- 12 [118 - 142]

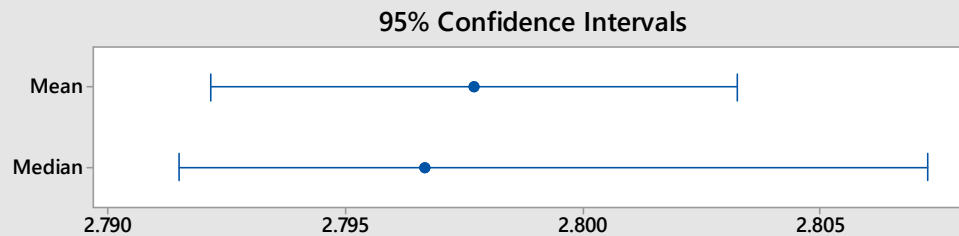
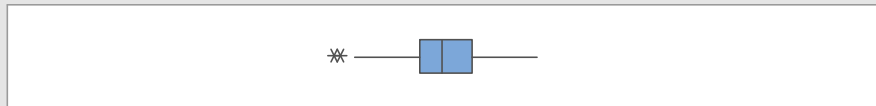
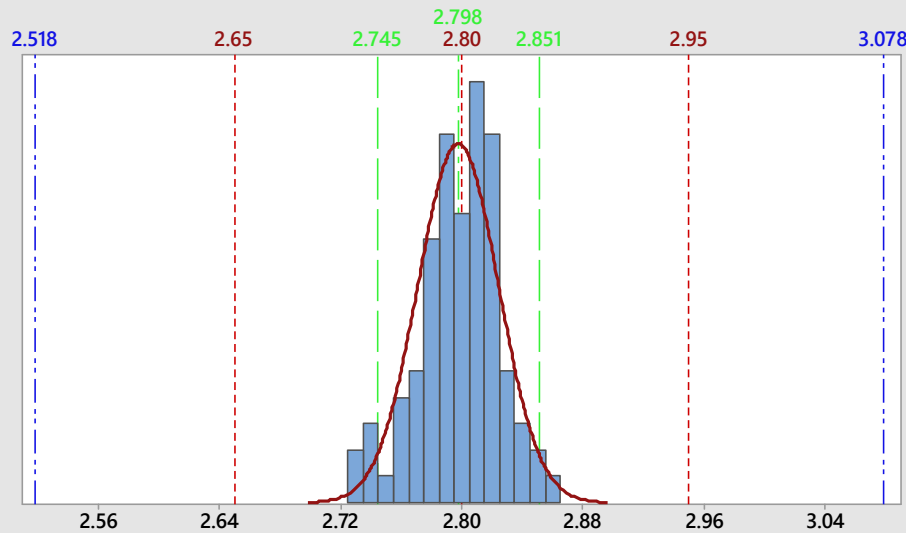
+/- 10%: blue
 130 +/- 13 [117 - 143]

Sled Analysis – Individual Value Plot Sled Acceleration



Sled Test Analysis – Sled Velocity

Summary Report for ABP Sled (m/s) [outliers deleted]



Anderson-Darling Normality Test	
A-Squared	0.45
P-Value	0.273
Mean	2.7977
StDev	0.0266
Variance	0.0007
Skewness	-0.404928
Kurtosis	0.269074
N	91
Minimum	2.7260
1st Quartile	2.7825
Median	2.7967
3rd Quartile	2.8170
Maximum	2.8600
95% Confidence Interval for Mean	
	2.7922 2.8032
95% Confidence Interval for Median	
	2.7915 2.8073
95% Confidence Interval for StDev	
	0.0232 0.0312

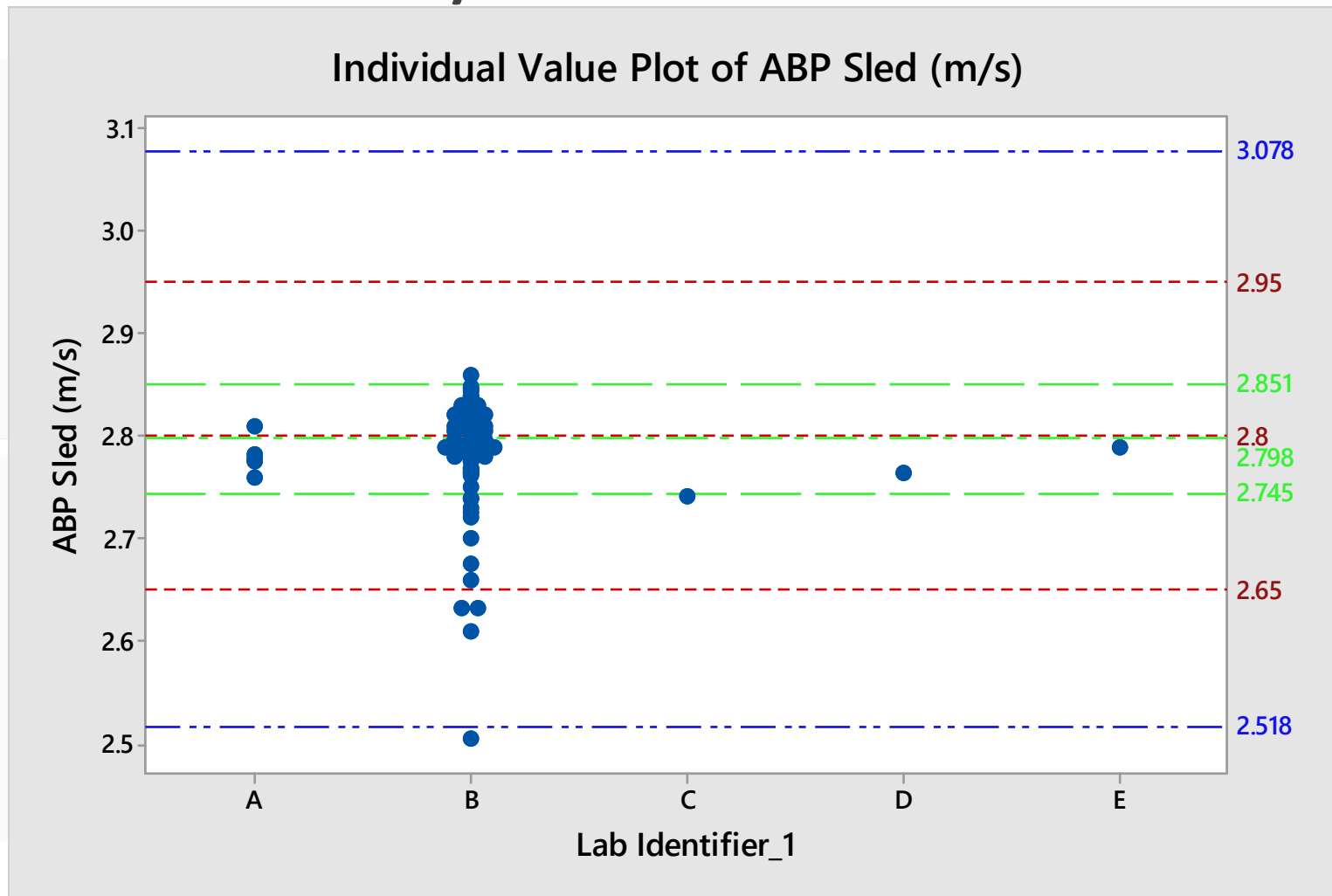
Current Corridors: red - width +/- 5.4%
2.80 +/- 0.15 [2.65 - 2.95]

after deleting all outliers from original sled velocity data.

+/- 2 std dev: green +/- 1.9%
2.798 +/- 0.053 [2.745 - 2.851]

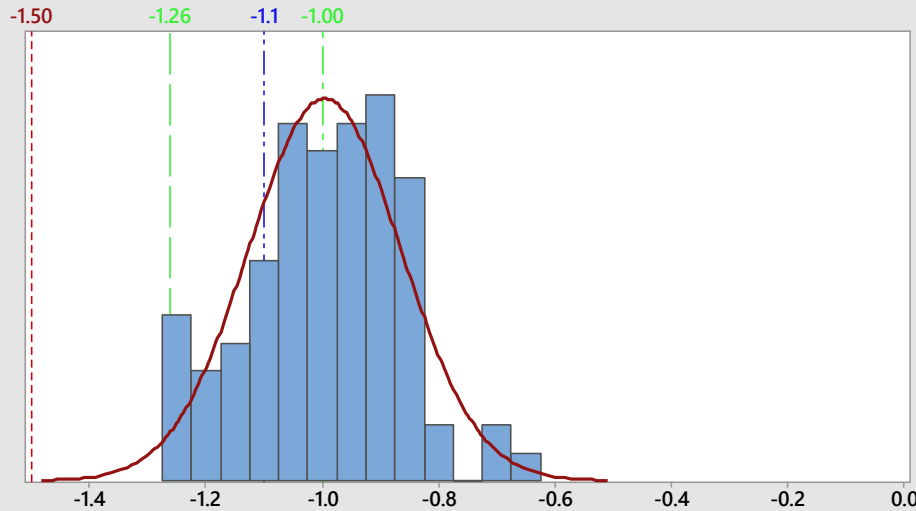
+/- 10%: blue
2.798 +/- 0.280 [2.518 - 3.078]

Sled Analysis – Individual Value Plot Sled Velocity

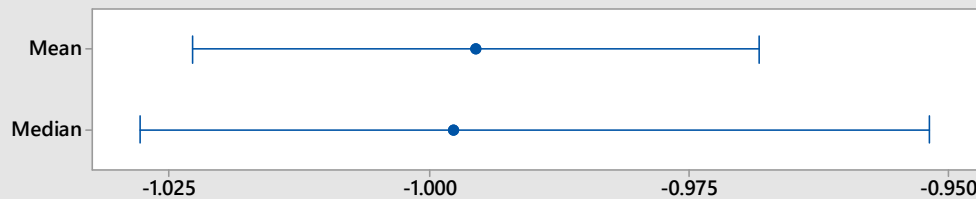


Sled Test Analysis – Sled Velocity Decay

Summary Report for ABP Decay (m/s)/s



95% Confidence Intervals



Anderson-Darling Normality Test	
A-Squared	0.43
P-Value	0.300
Mean	-0.99545
StDev	0.13072
Variance	0.01709
Skewness	-0.053583
Kurtosis	-0.193444
N	91
Minimum	-1.27490
1st Quartile	-1.07540
Median	-0.99762
3rd Quartile	-0.89200
Maximum	-0.65750
95% Confidence Interval for Mean	
	-1.02268 -0.96823
95% Confidence Interval for Median	
	-1.02783 -0.95184
95% Confidence Interval for StDev	
	0.11410 0.15306

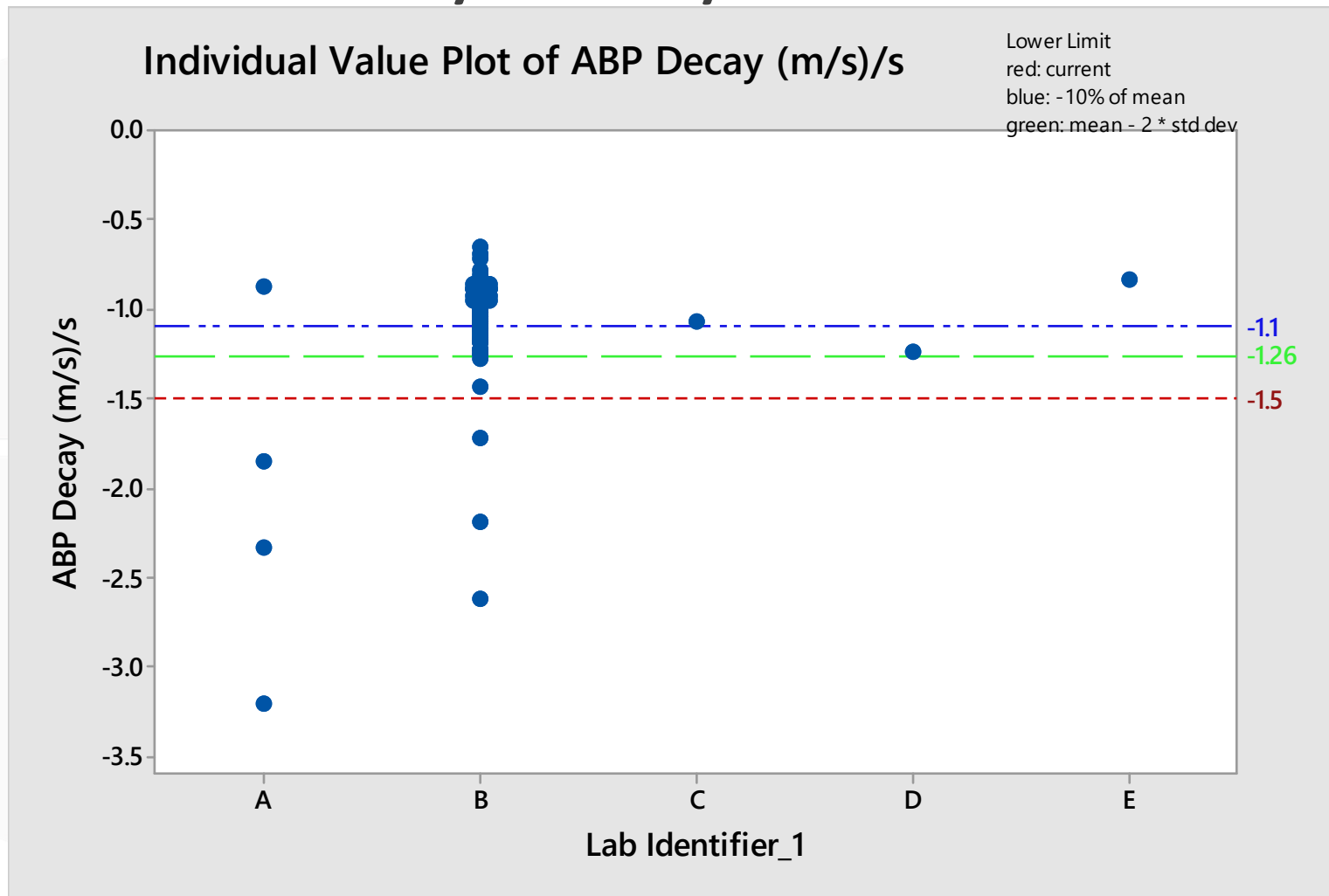
Current Corridors: red
Lower limit -1.50

after deleting all outliers from original sled decay data.

+/- 2 std dev: green - 26%
-1.00 - 0.26 [-1.26 - N/A]

+/- 10%: blue
Lower Limit -1.1

Sled Analysis – Individual Value Plot Sled Velocity Decay



Sled Test – Possible Corridors

Parameter	Lower	Mid Point	Upper	+/- % Width	Number of data points	Mean - 2 * Std Dev	Mean - 10%	Mean Value from Population	Mean + 10%	Mean + 2 * Std Dev	+/- 2 * Std Dev % Width	Count Orig. Param.	Pass Rate Orig. Param.	Pass Rate +/- 2*SD Param.	Pass Rate +/- 10% Param.
Impact Velocity	4.70	4.75	4.80	1.1%				<i>no change</i>							
Peak Pendulum Force	8600	9200	9800	6.5%	100	8384	8381	9312	10243	10240	10%	99	82%	96%	96%
Peak Sled Acceleration (m/s^2)	118	127	136	7.1%	100	118	117	130	143	142	9.2%	99	83%	97%	97%
Peak Sled Velocity	2.65	2.80	2.95	5.4%	91	2.745	2.518	2.798	3.078	2.851	1.9%	99	96%	86%	99%
Velocity Decay from 50 to 150 ms ((m/s)/s)	-1.5				91	-1.26	-1.10	-1.00			-26%	98	94%	92%	74%
Temperature	19	22	25	14%				<i>no change</i>							
Humidity	10	40	70	75%				<i>no change</i>							
Pass Rate All Parameters:												98	70%	76%	71%

Questions?

For additional information after meeting,
contact Paul Depinet
pdepinet@humaneticsatd.com

