VH Stage 3-1 Operational Data Plots

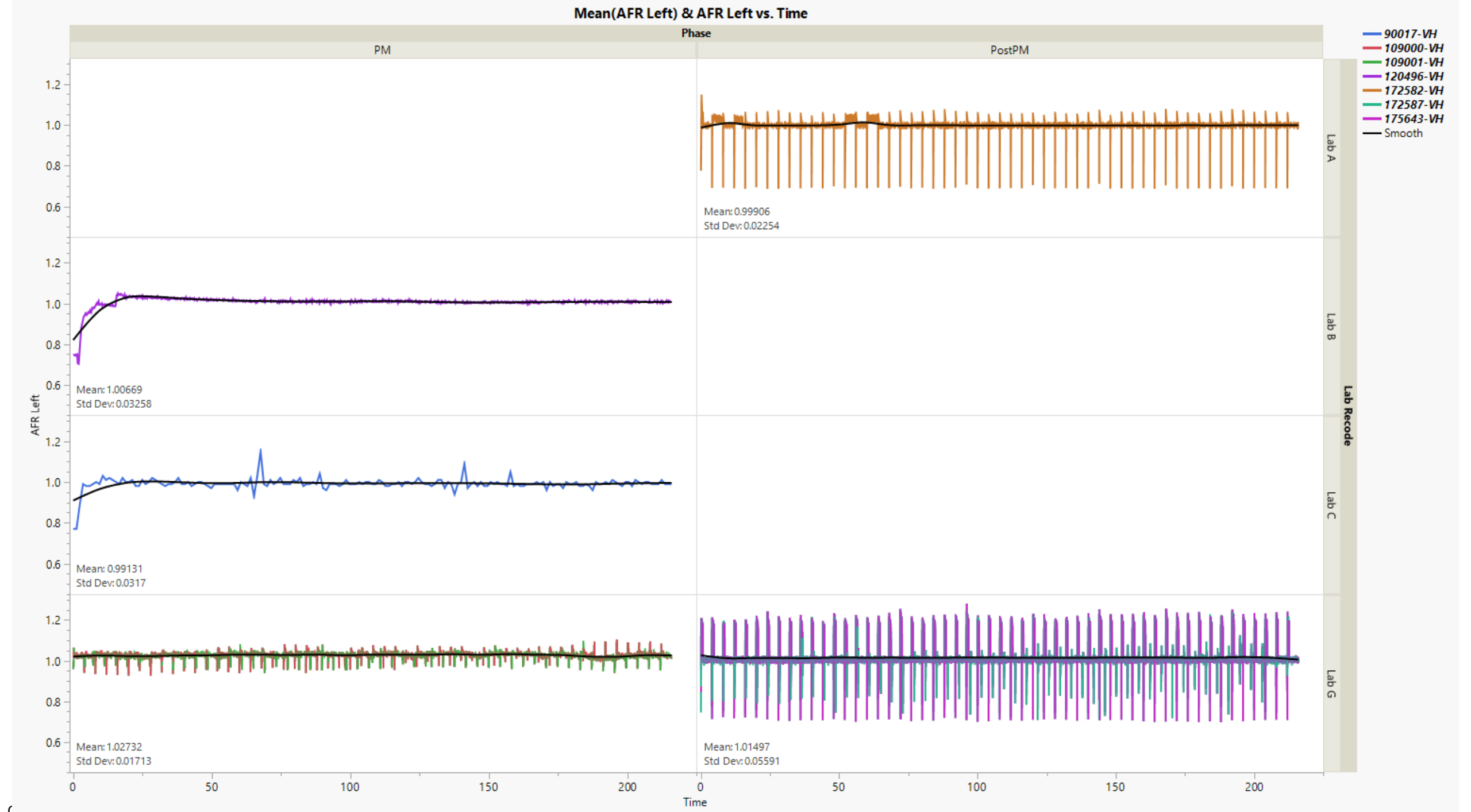
By: Todd Dvorak

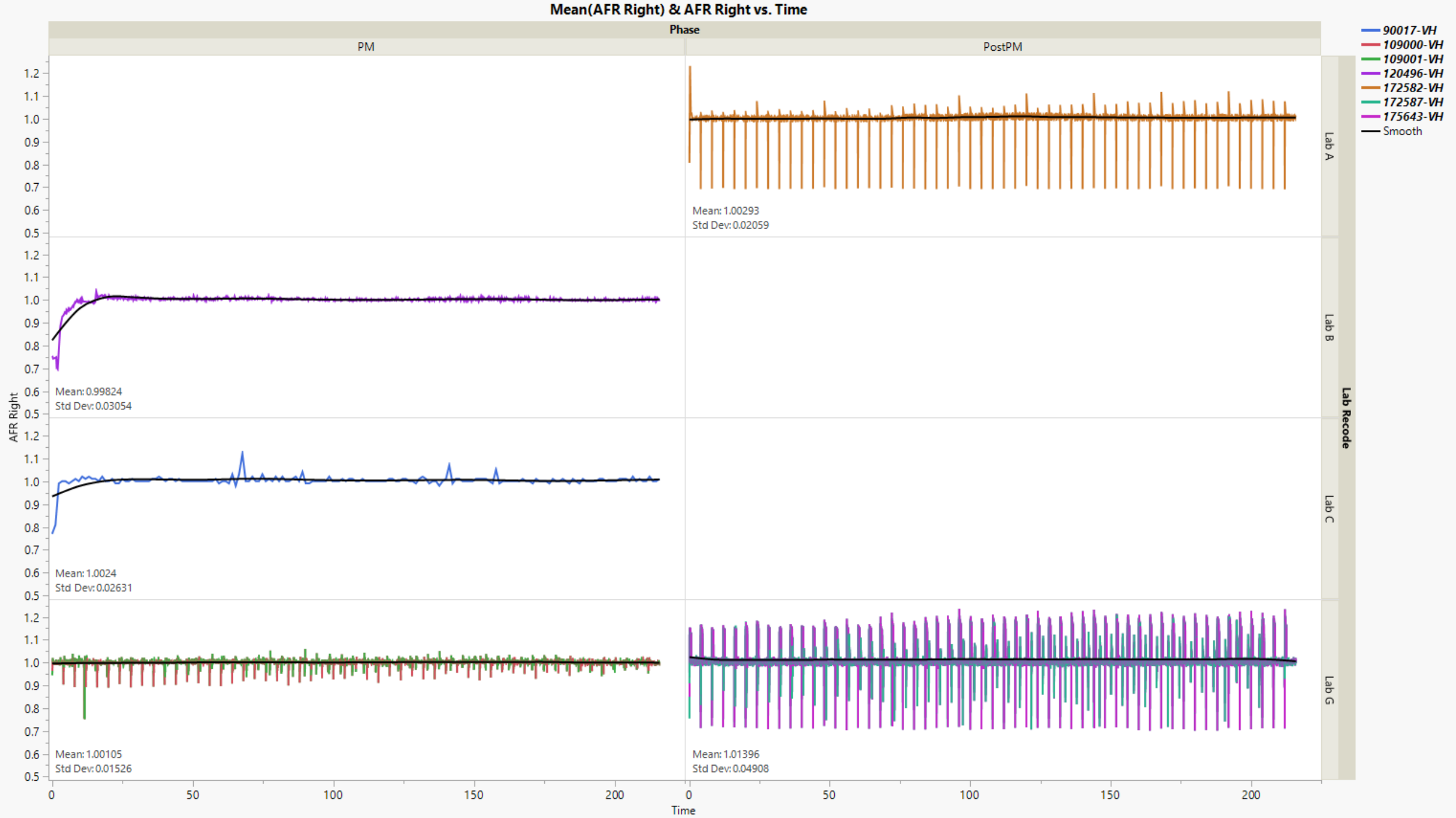
08-05-24

Classified as Confidential

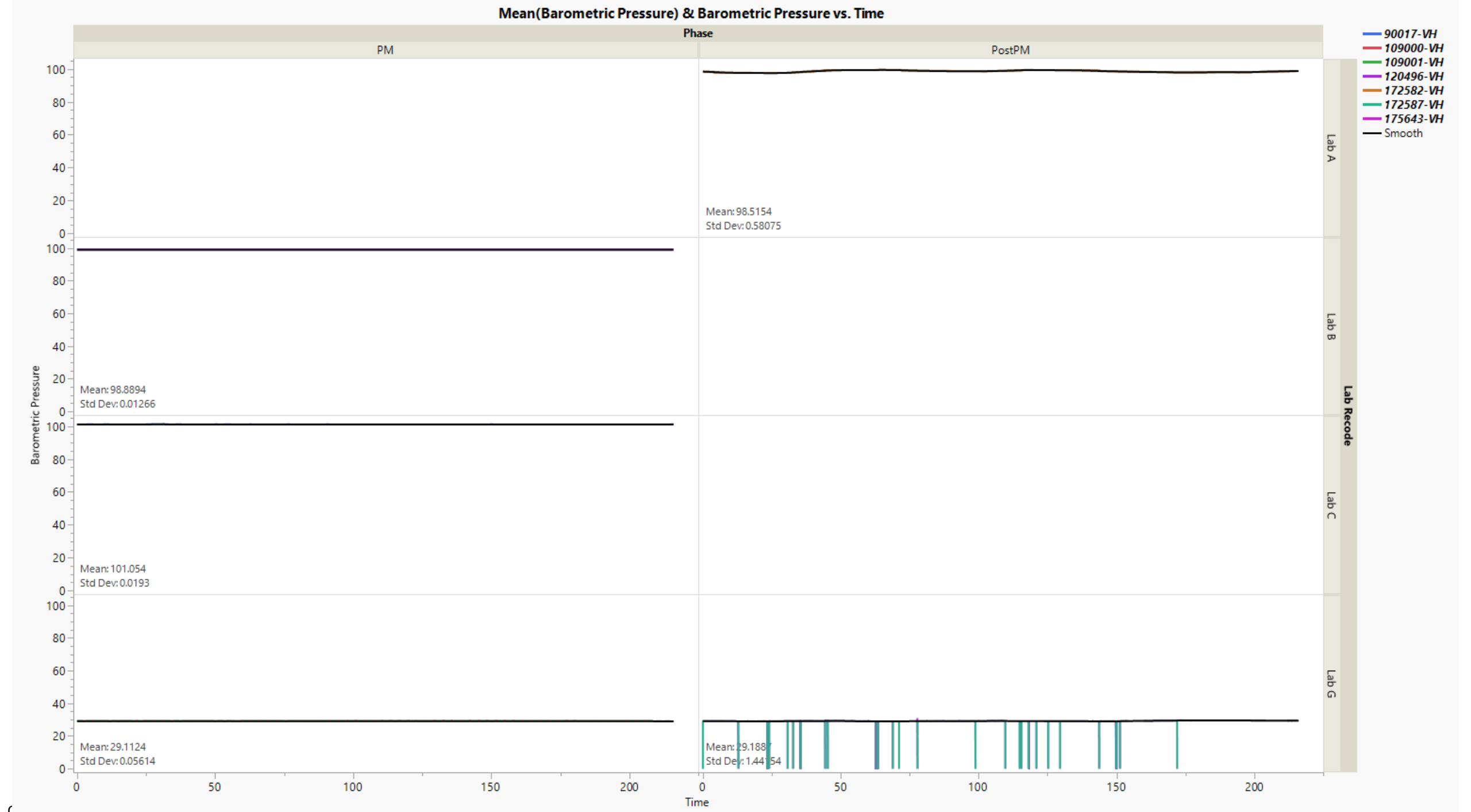
RO 940 Data Plots

Classified as Confidential

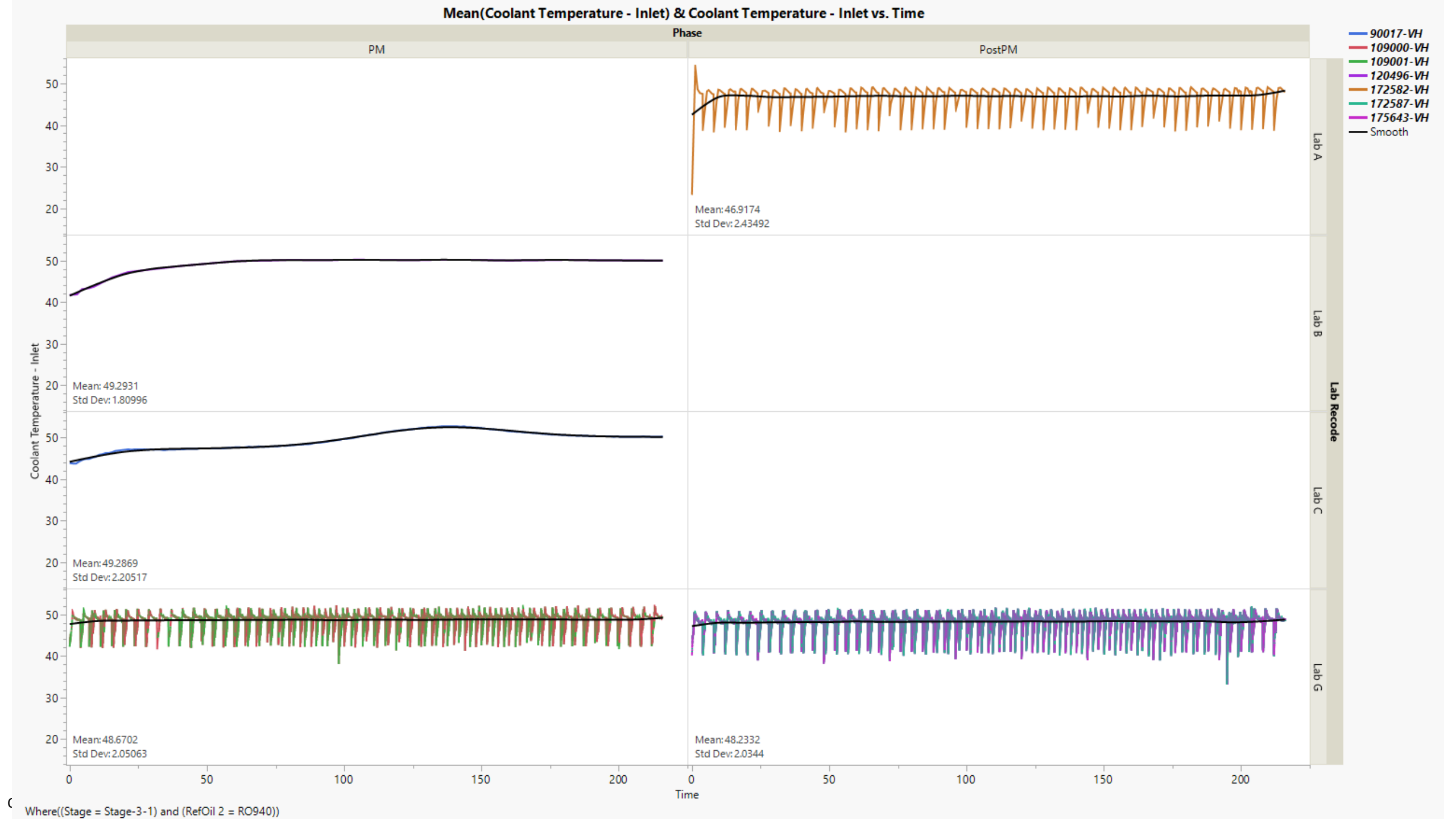

Mean(AFR Left) & AFR Left vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
AFR Left
Time
Mean: 0.99906
Std Dev: 0.02254
Mean: 1.00669
Std Dev: 0.03258
Mean: 0.99131
Std Dev: 0.0317
Mean: 1.02732
Std Dev: 0.01713
Mean: 1.01497
Std Dev: 0.05591
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

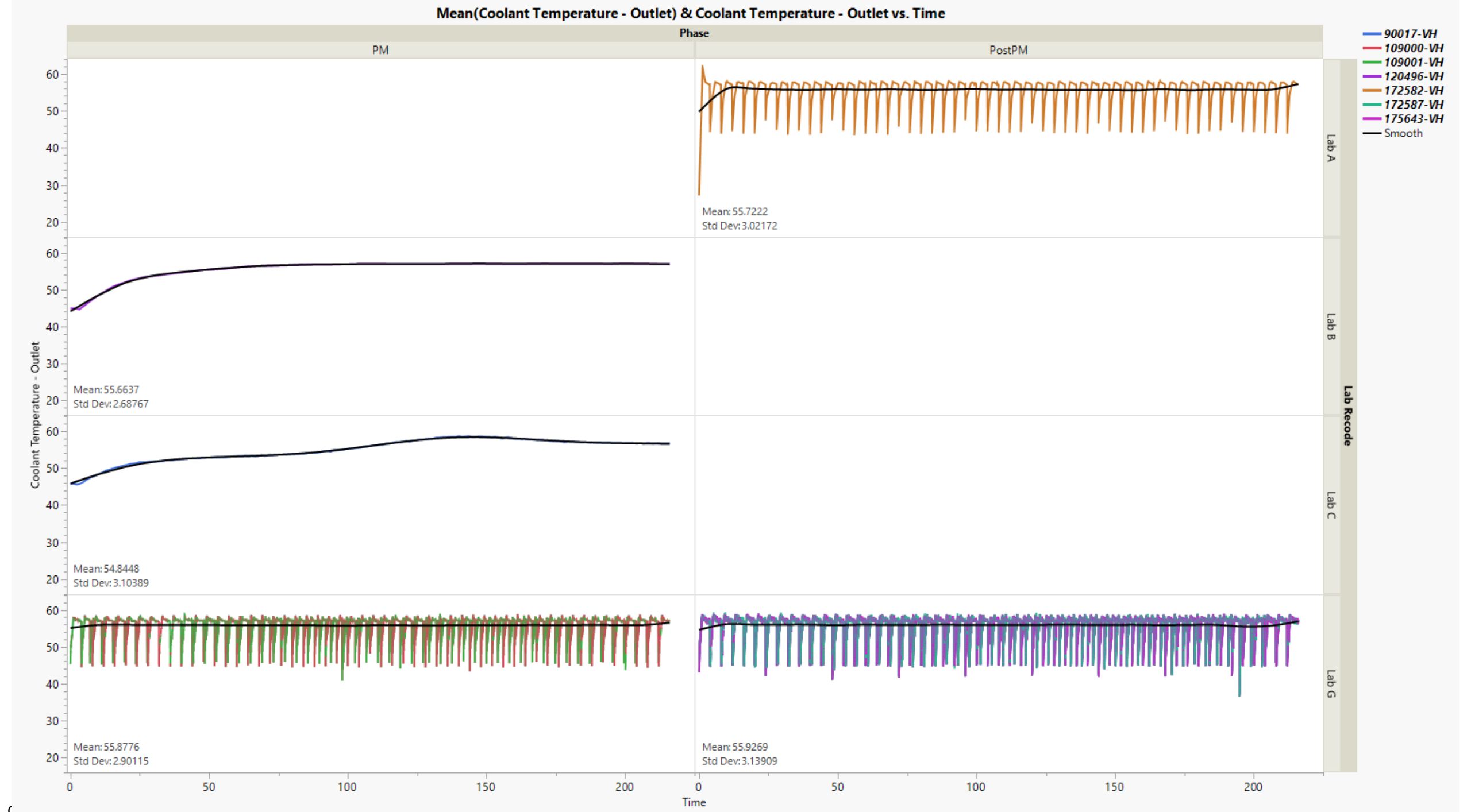


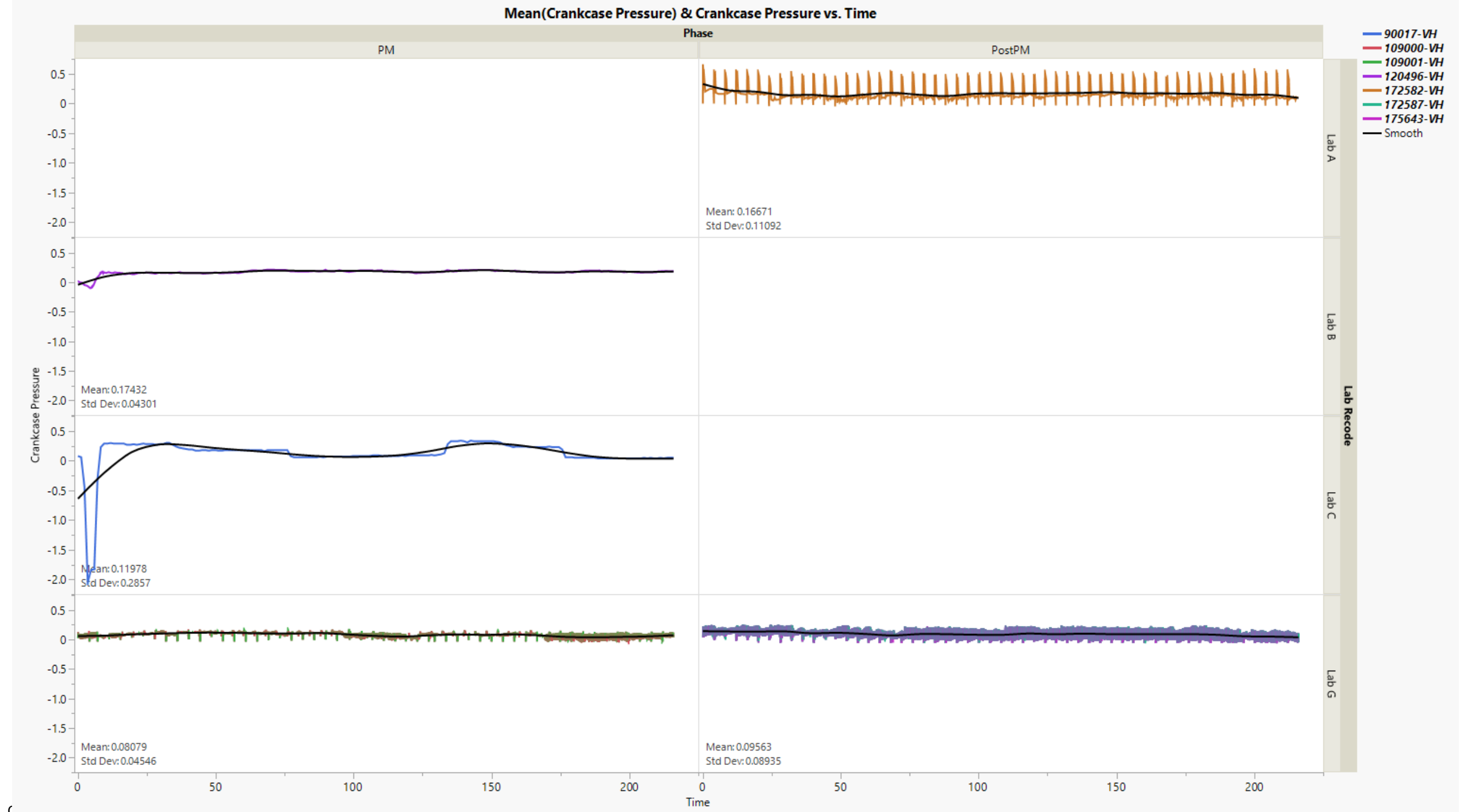
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

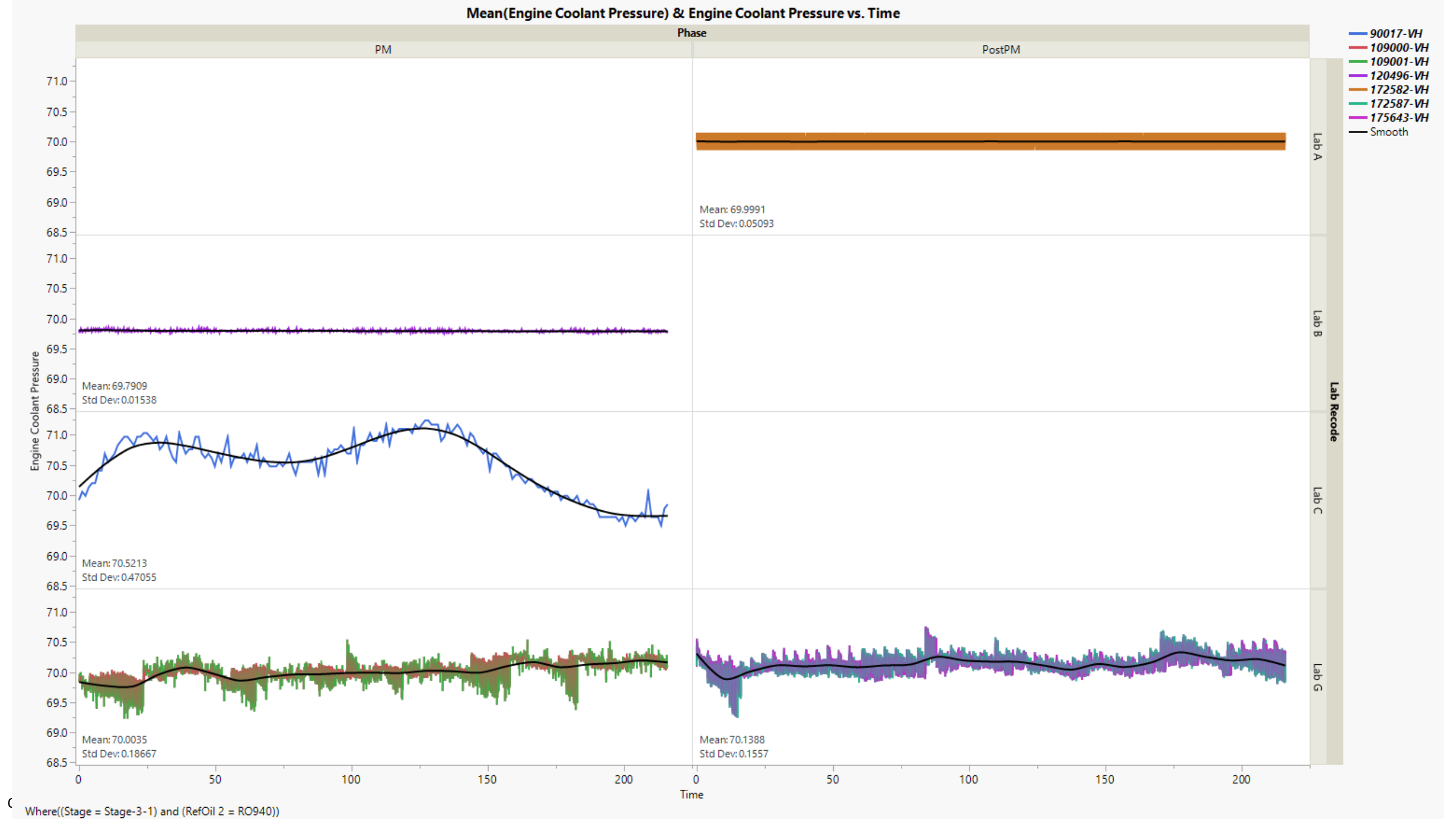


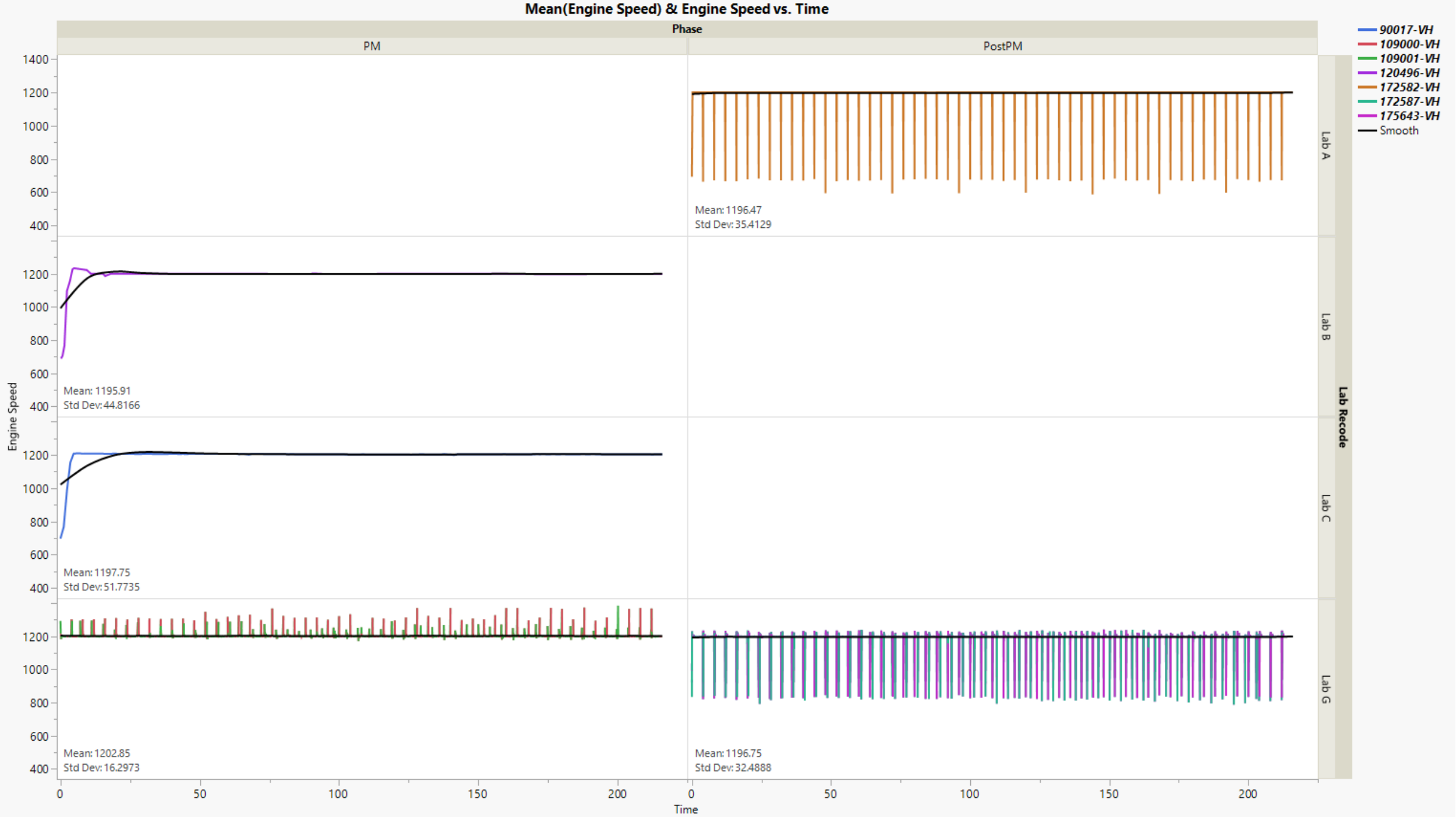
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))


Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Coolant Temperature - Inlet
Time
Mean: 46.9174
Std Dev: 2.43492
Mean: 49.2931
Std Dev: 1.80996
Mean: 49.2869
Std Dev: 2.20517
Mean: 48.6702
Std Dev: 2.05063
Mean: 48.2332
Std Dev: 2.0344
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

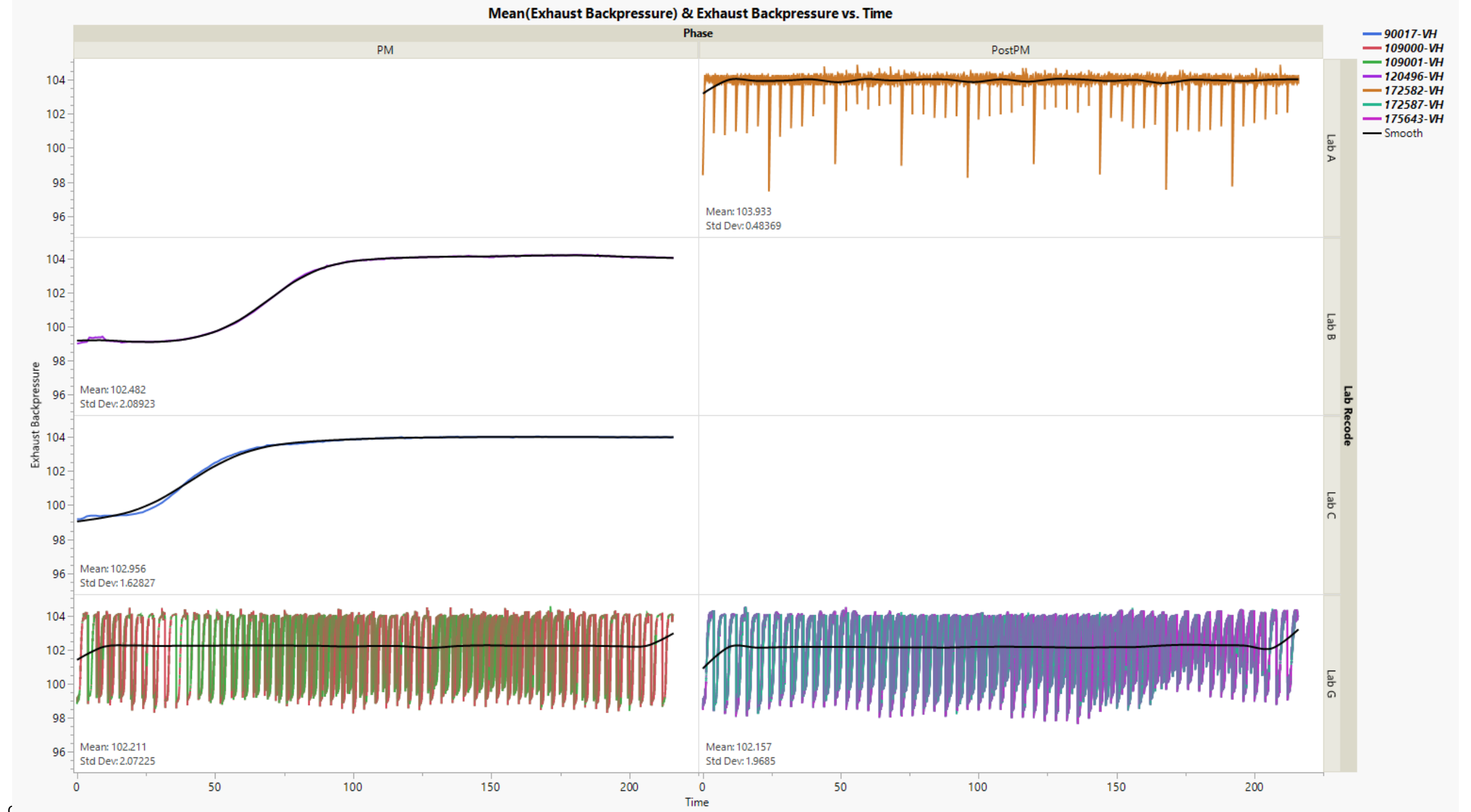

Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Coolant Temperature - Outlet
Time
Mean: 55.7222
Std Dev: 3.02172
Mean: 55.6637
Std Dev: 2.68767
Mean: 54.8448
Std Dev: 3.10389
Mean: 55.8776
Std Dev: 2.90115
Mean: 55.9269
Std Dev: 3.13909
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

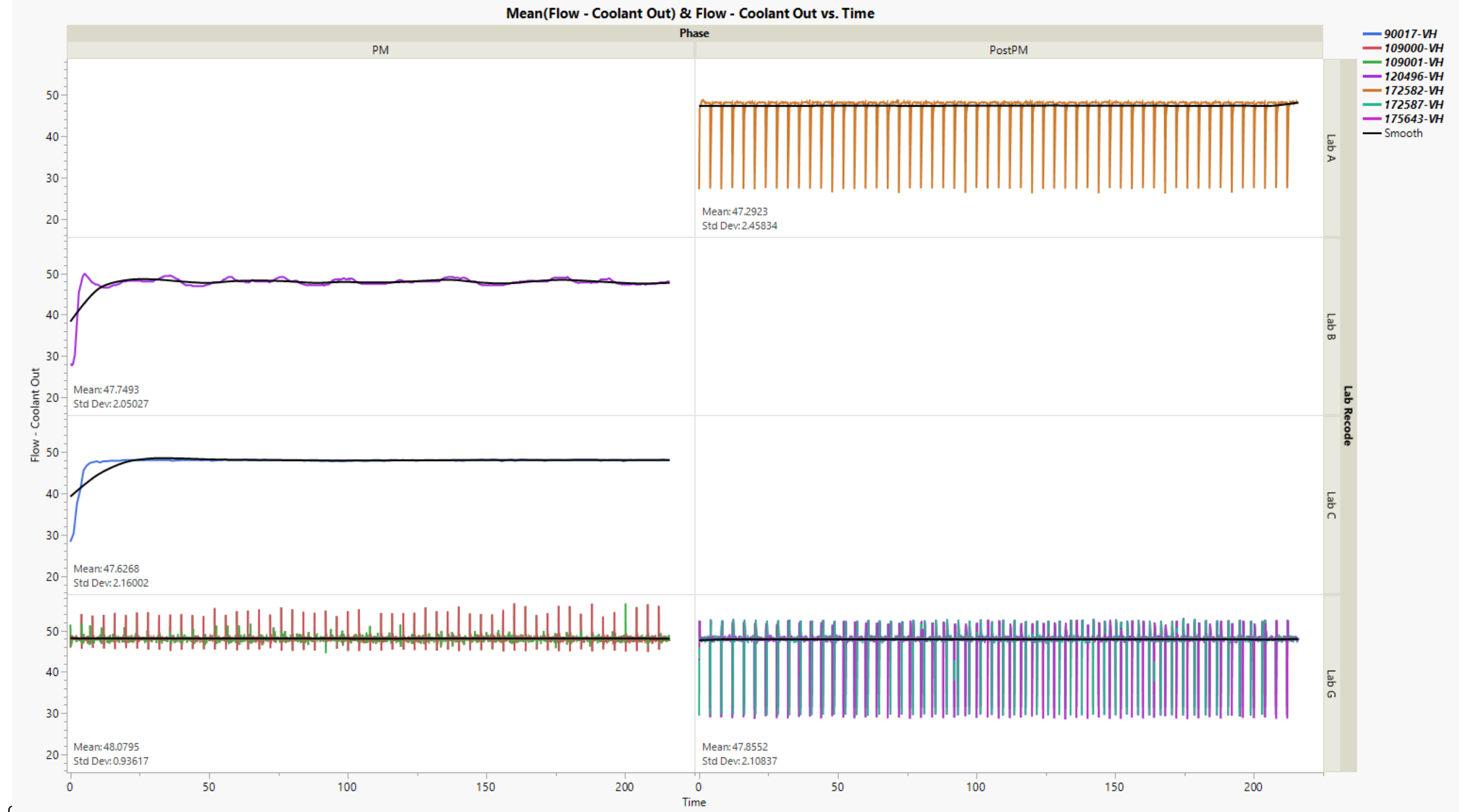

Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Crankcase Pressure
Time
Mean: 0.16671
Std Dev: 0.11092
Mean: 0.17432
Std Dev: 0.04301
Mean: 0.11978
Std Dev: 0.2857
Mean: 0.08079
Std Dev: 0.04546
Mean: 0.09563
Std Dev: 0.08935
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

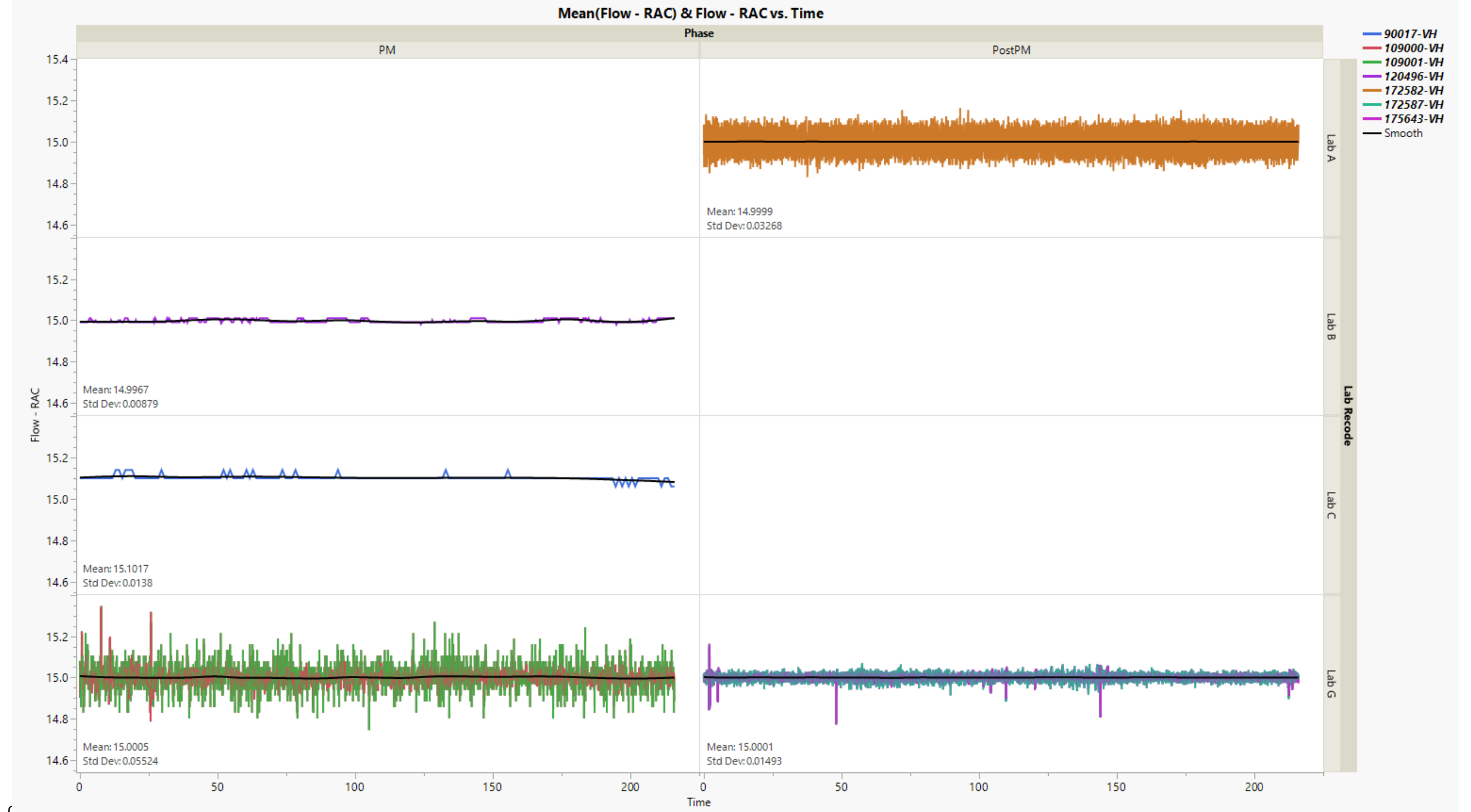

Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 69.9991
Std Dev: 0.05093
Mean: 69.7909
Std Dev: 0.01538
Mean: 70.5213
Std Dev: 0.47055
Mean: 70.0035
Std Dev: 0.18667
Mean: 70.1388
Std Dev: 0.1557
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

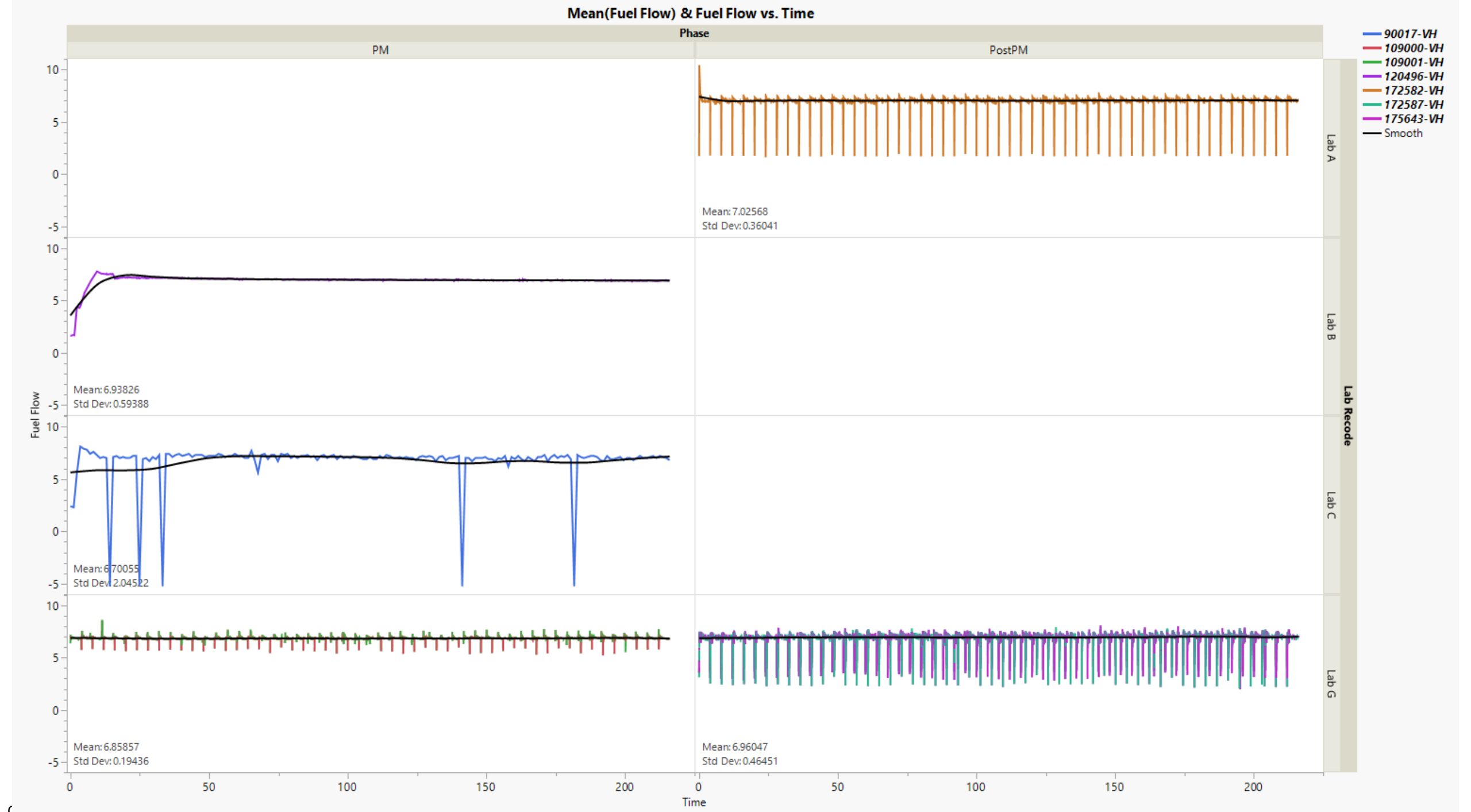


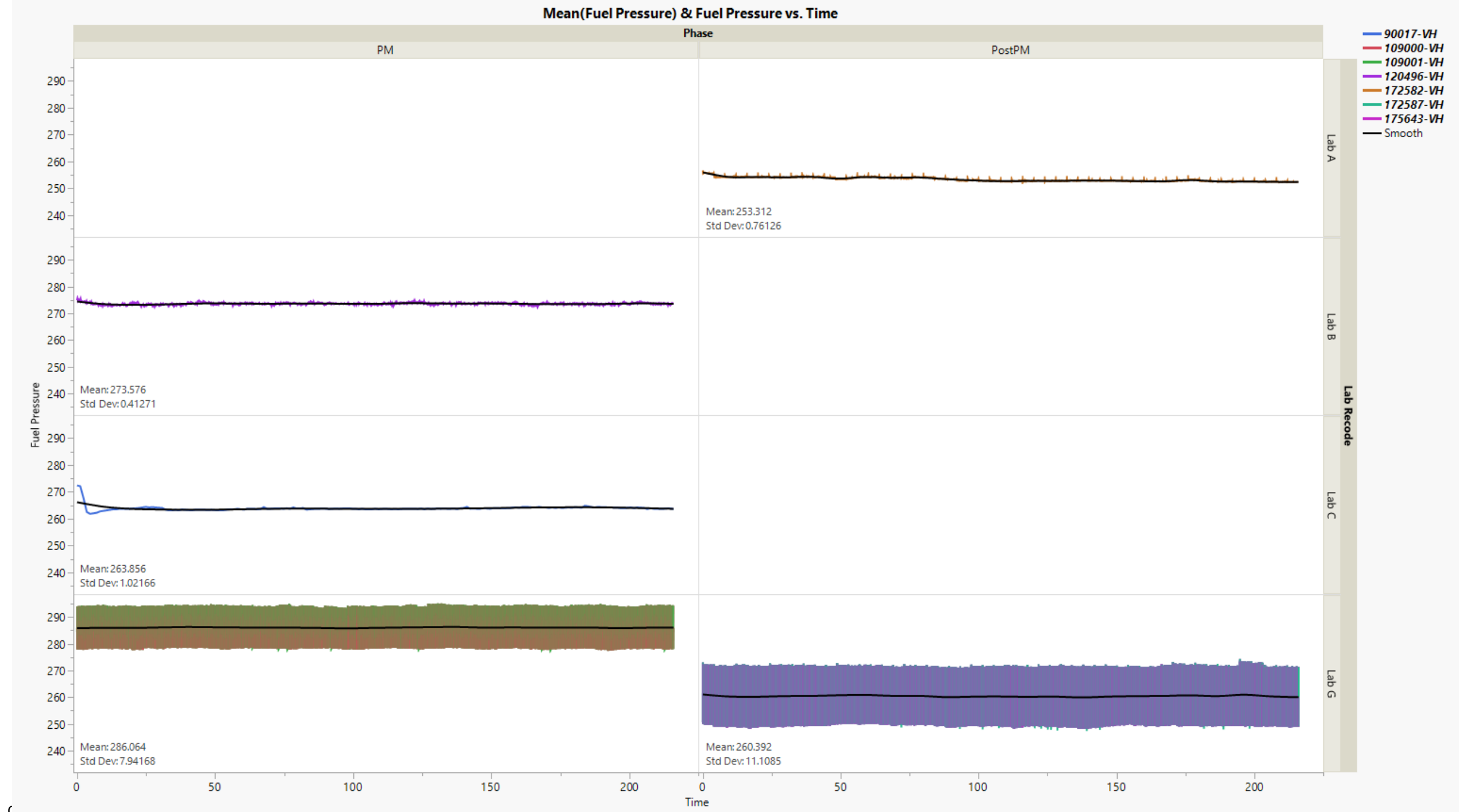
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

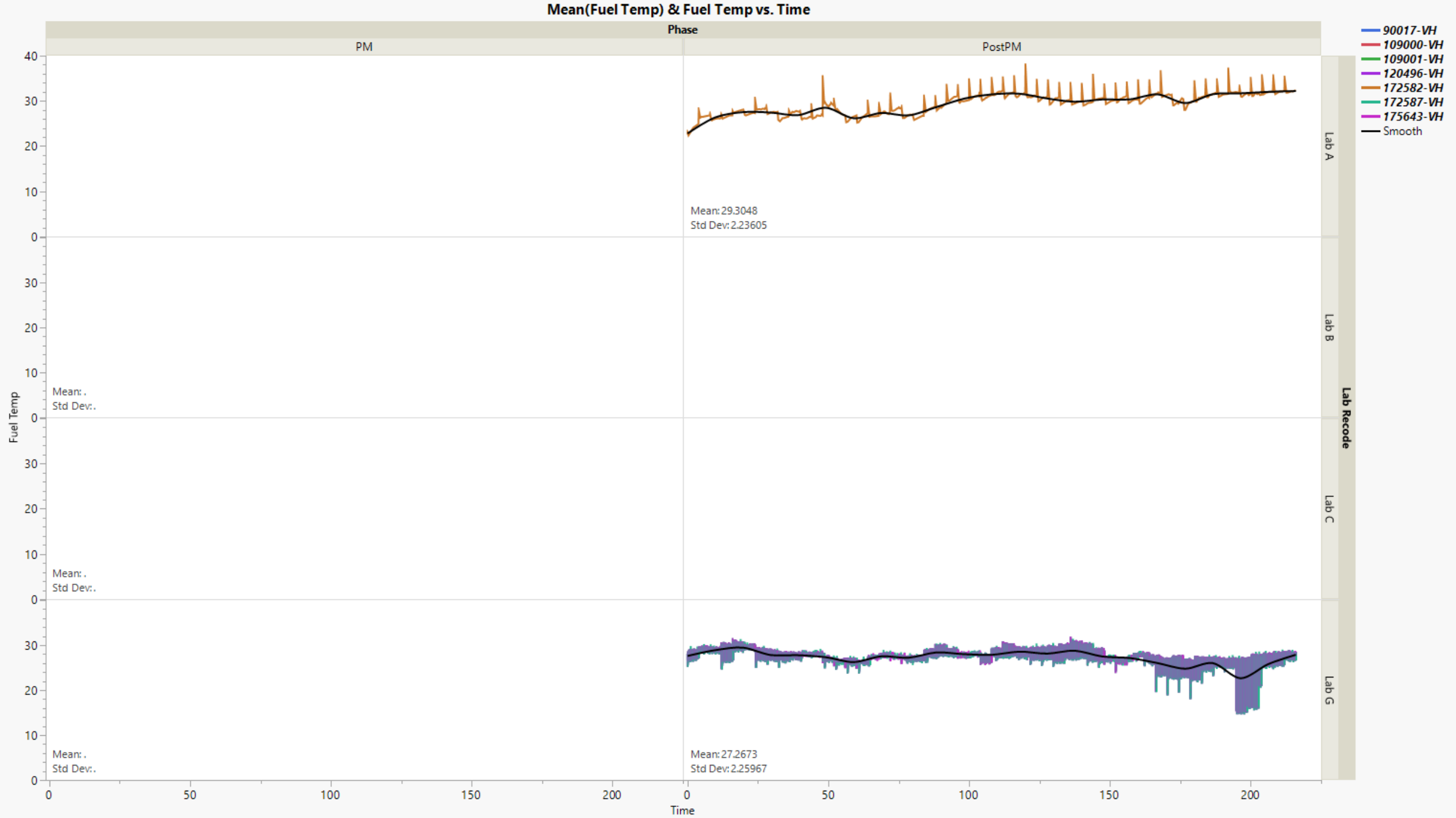

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 103.933
Std Dev: 0.48369
Mean: 102.482
Std Dev: 2.08923
Mean: 102.956
Std Dev: 1.62827
Mean: 102.211
Std Dev: 2.07225
Mean: 102.157
Std Dev: 1.9685
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))


Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Flow - Coolant Out
Time
Mean: 47.2923
Std Dev: 2.45834
Mean: 47.7493
Std Dev: 2.05027
Mean: 47.6268
Std Dev: 2.16002
Mean: 48.0795
Std Dev: 0.93617
Mean: 47.8552
Std Dev: 2.10837
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

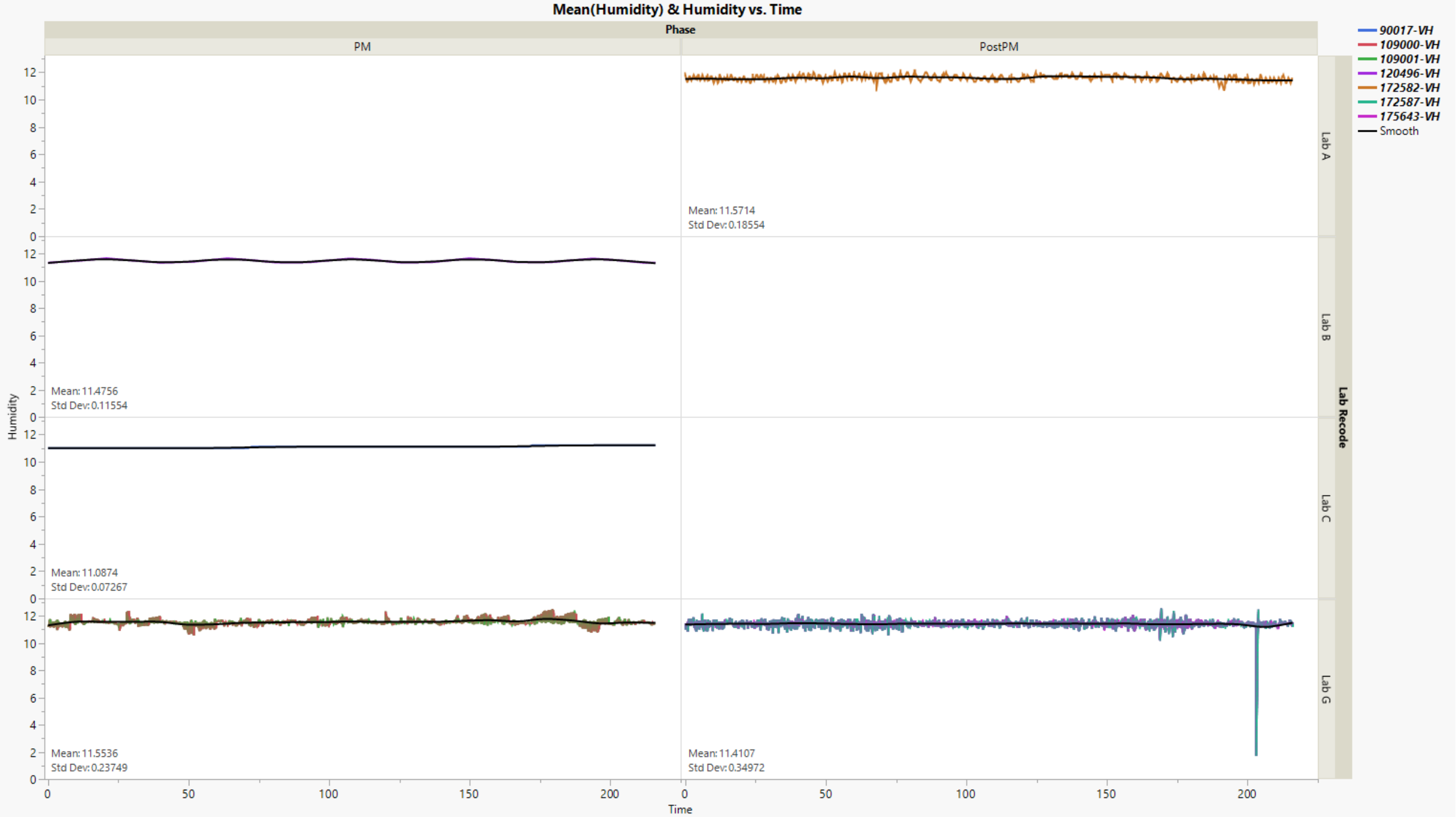

Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Flow - RAC
Time
Mean: 14.9999
Std Dev: 0.03268
Mean: 14.9967
Std Dev: 0.00879
Mean: 15.1017
Std Dev: 0.0138
Mean: 15.0005
Std Dev: 0.05524
Mean: 15.0001
Std Dev: 0.01493
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))


Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Fuel Flow
Time
Mean: 7.02568
Std Dev: 0.36041
Mean: 6.93826
Std Dev: 0.59388
Mean: 6.70055
Std Dev: 2.04522
Mean: 6.85857
Std Dev: 0.19436
Mean: 6.96047
Std Dev: 0.46451
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

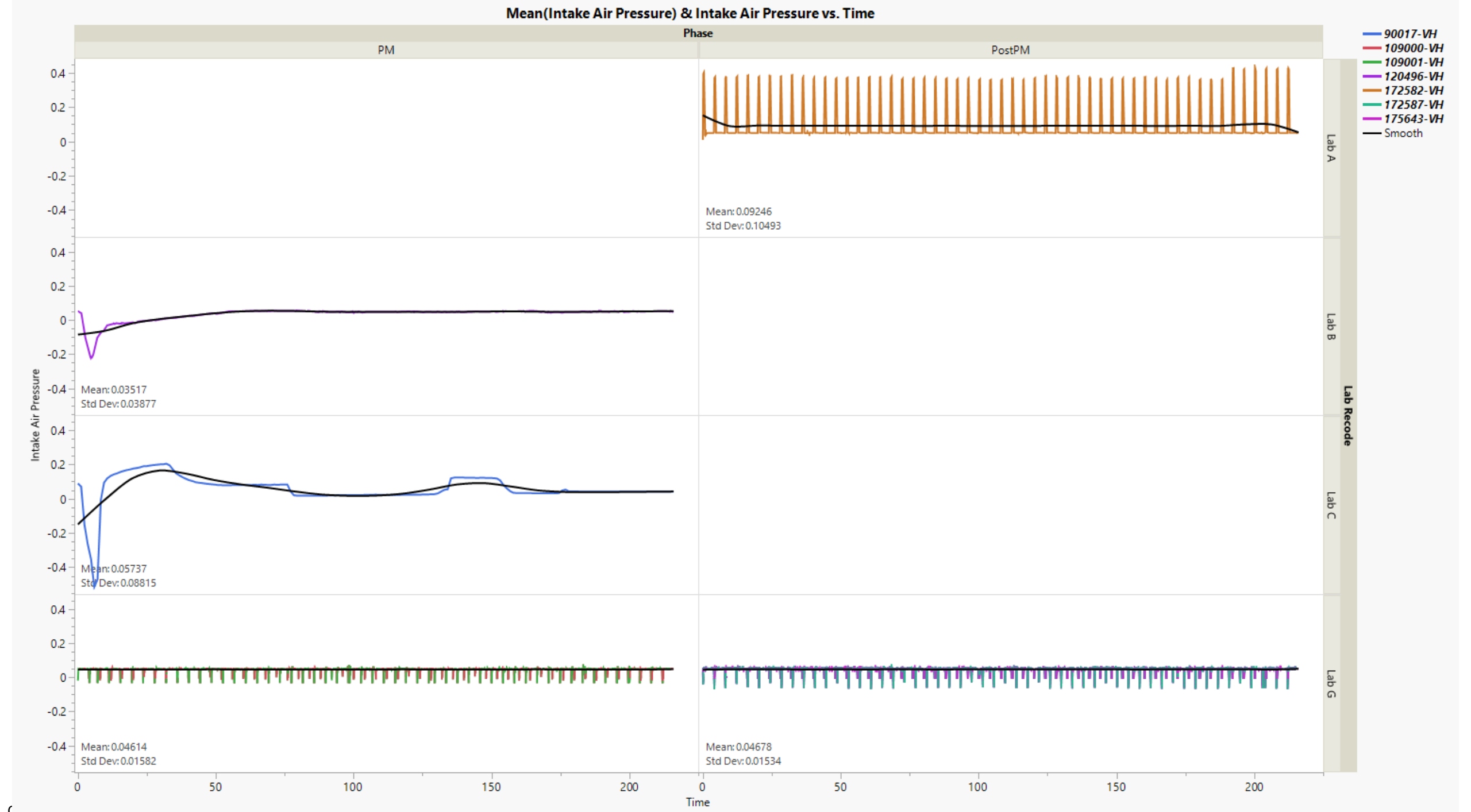

Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Fuel Pressure
Time
Mean: 253.312
Std Dev: 0.76126
Mean: 273.576
Std Dev: 0.41271
Mean: 263.856
Std Dev: 1.02166
Mean: 286.064
Std Dev: 7.94168
Mean: 260.392
Std Dev: 11.1085
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

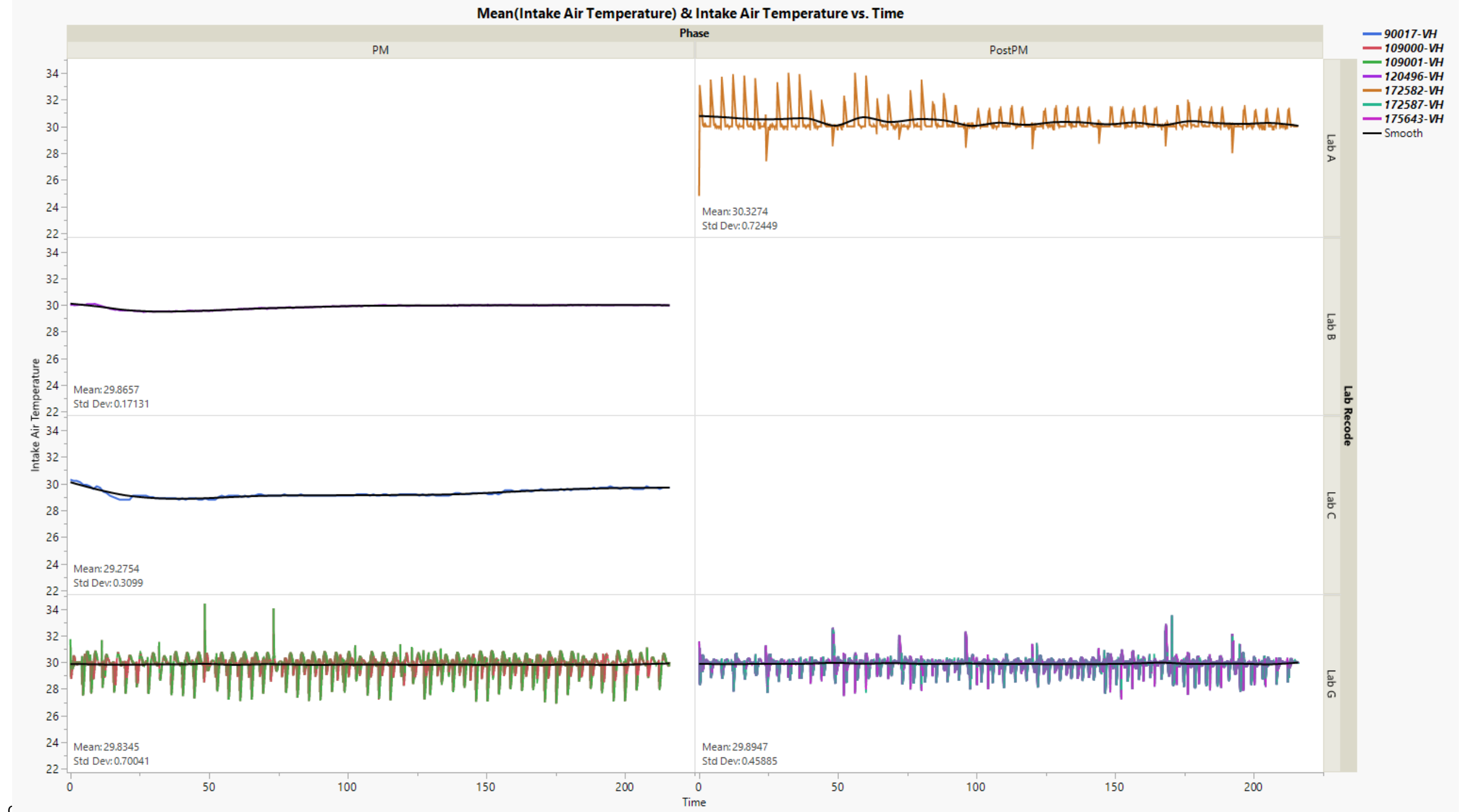


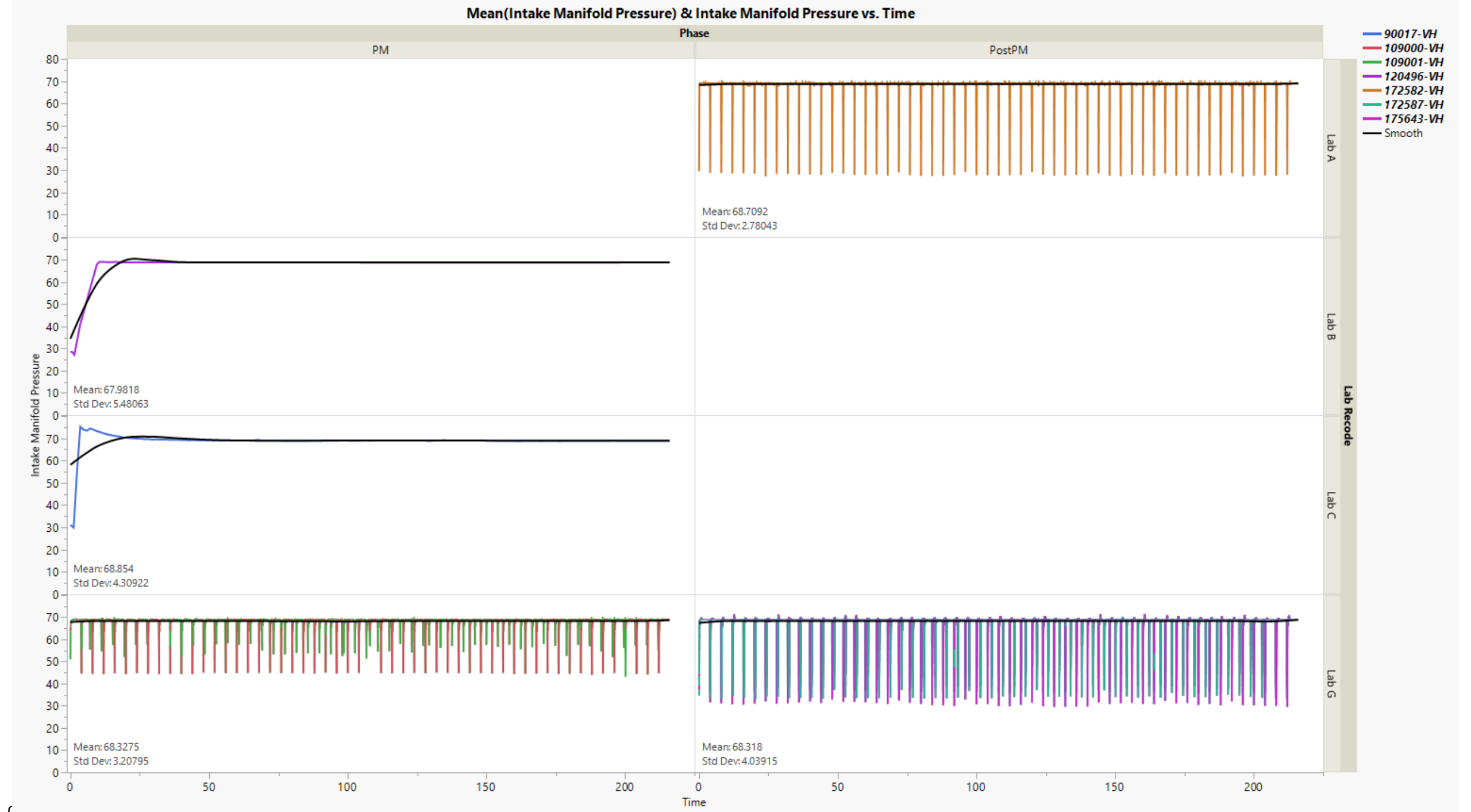
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

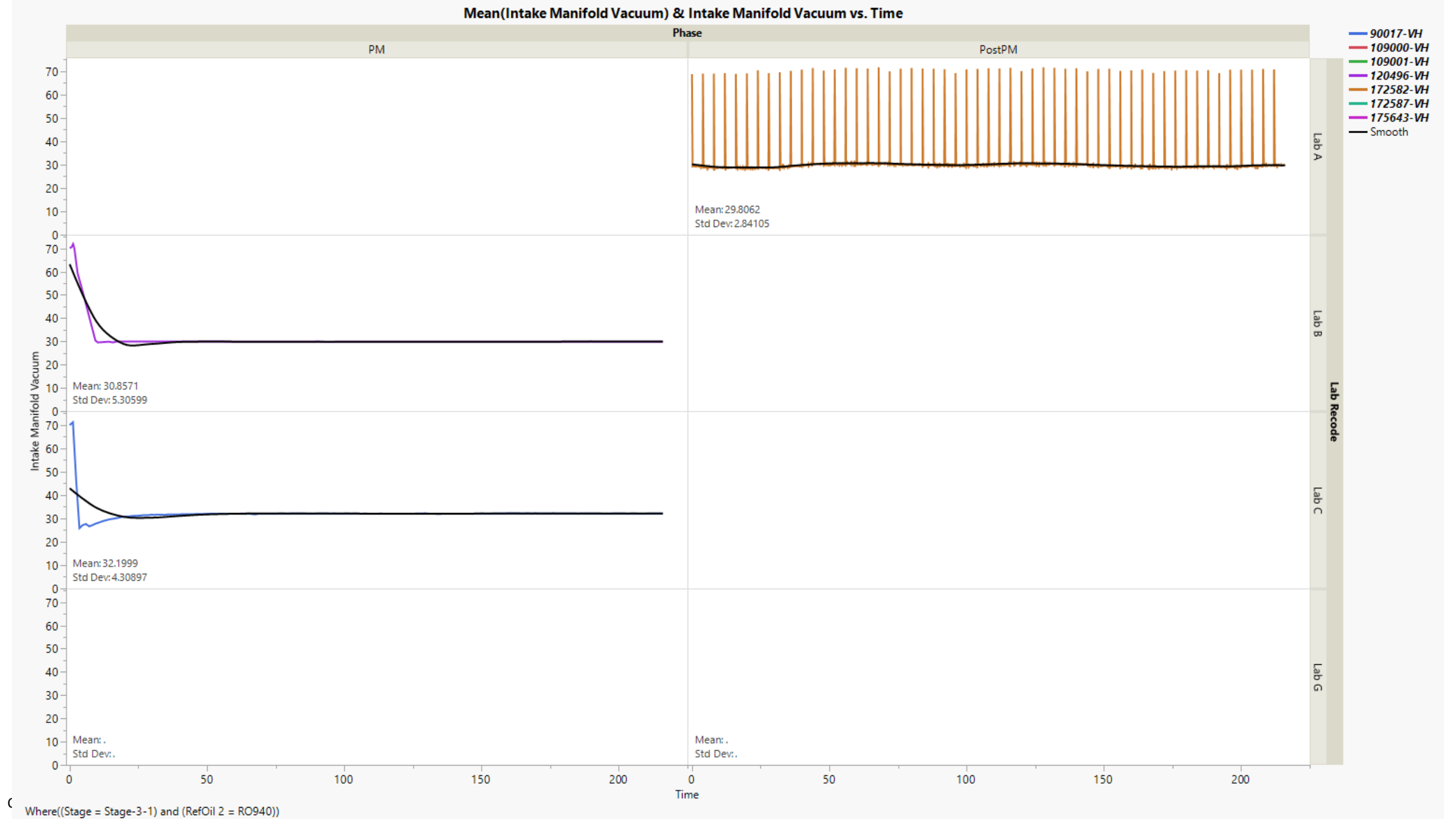


Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

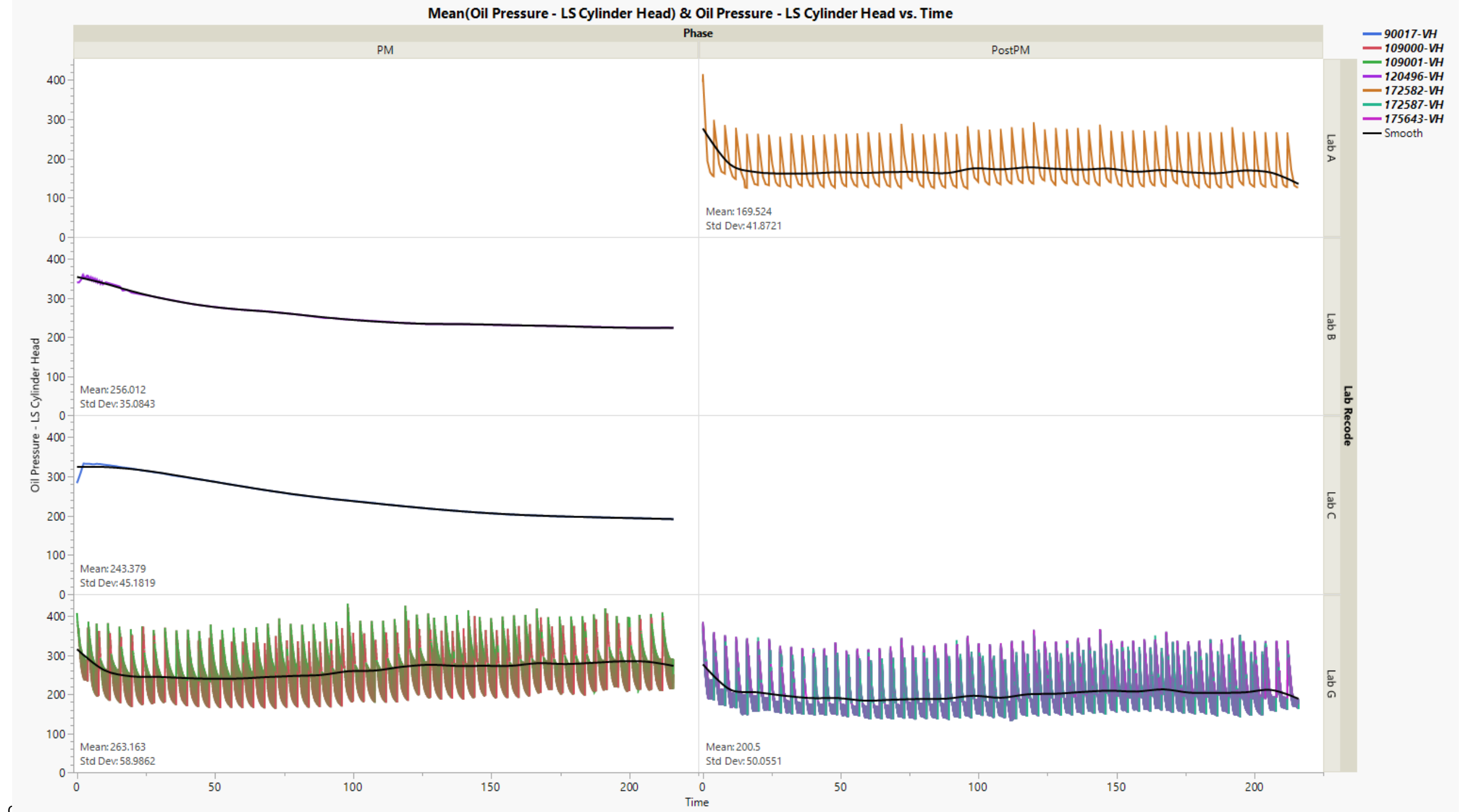

Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Intake Air Pressure
Time
Mean: 0.09246
Std Dev: 0.10493
Mean: 0.03517
Std Dev: 0.03877
Mean: 0.05737
Std Dev: 0.08815
Mean: 0.04614
Std Dev: 0.01582
Mean: 0.04678
Std Dev: 0.01534
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))


Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 30.3274
Std Dev: 0.72449
Mean: 29.8657
Std Dev: 0.17131
Mean: 29.2754
Std Dev: 0.3099
Mean: 29.8345
Std Dev: 0.70041
Mean: 29.8947
Std Dev: 0.45885
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

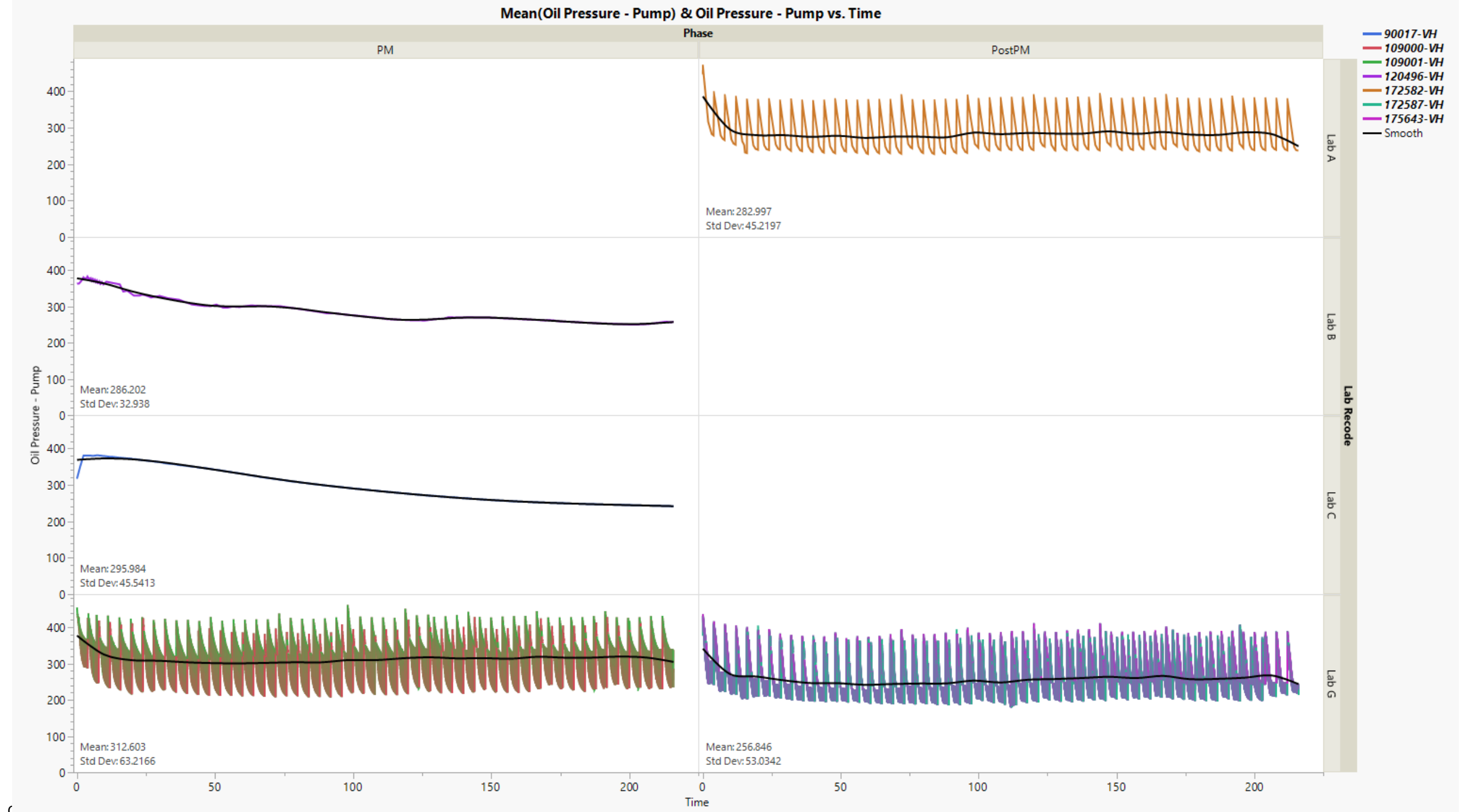

Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Intake Manifold Pressure
Time
Mean: 68.7092
Std Dev: 2.78043
Mean: 67.9818
Std Dev: 5.48063
Mean: 68.854
Std Dev: 4.30922
Mean: 68.3275
Std Dev: 3.20795
Mean: 68.318
Std Dev: 4.03915
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

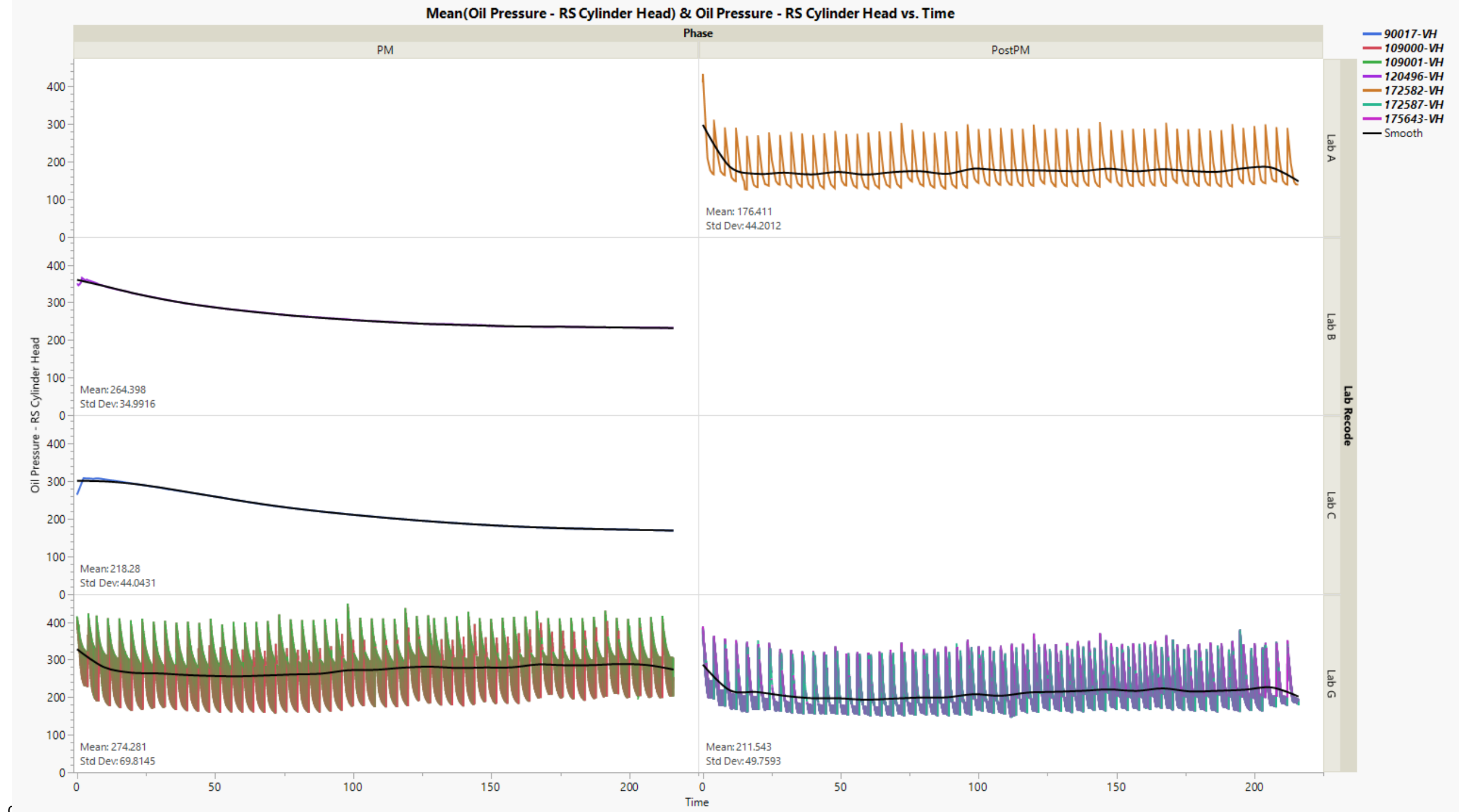


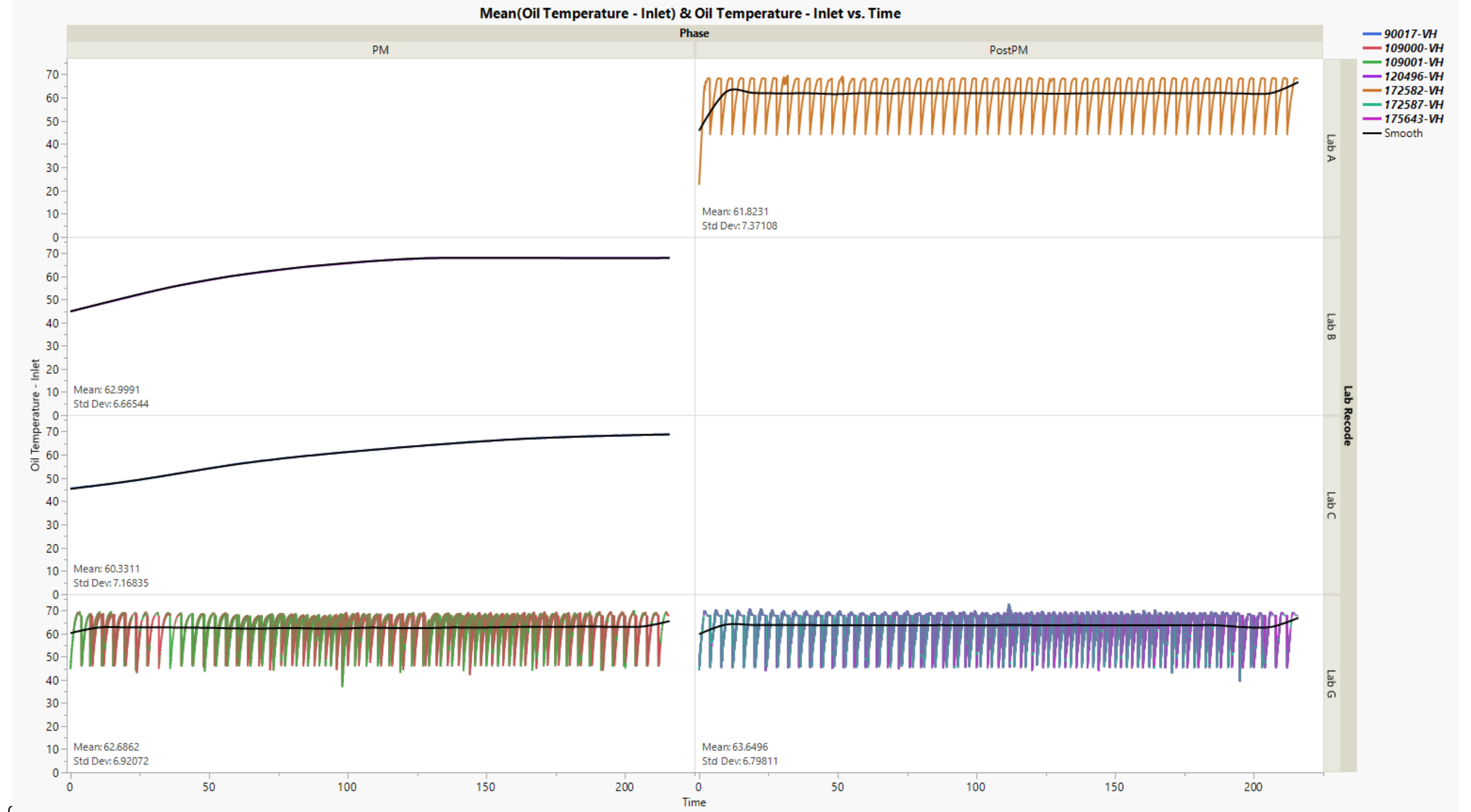
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

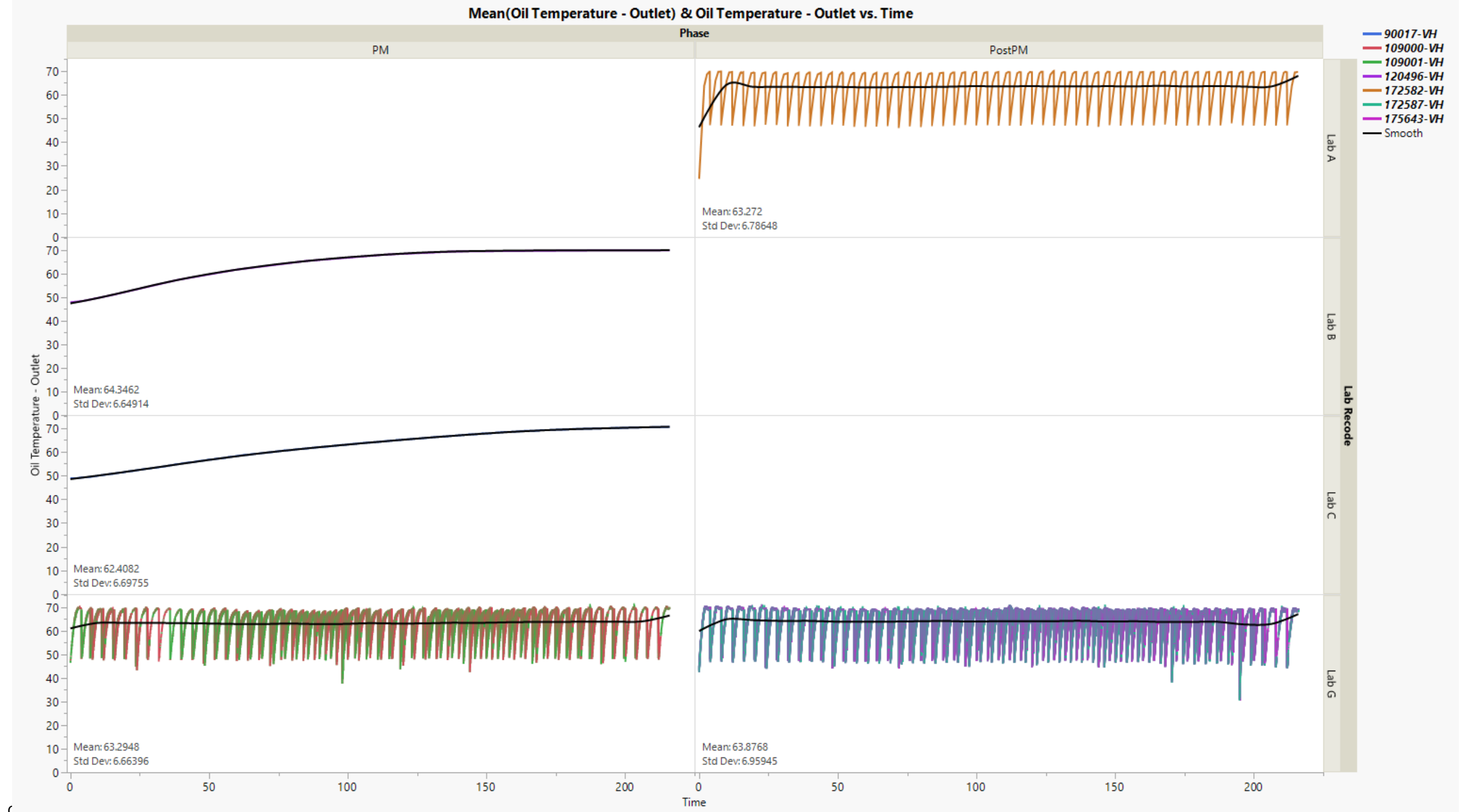


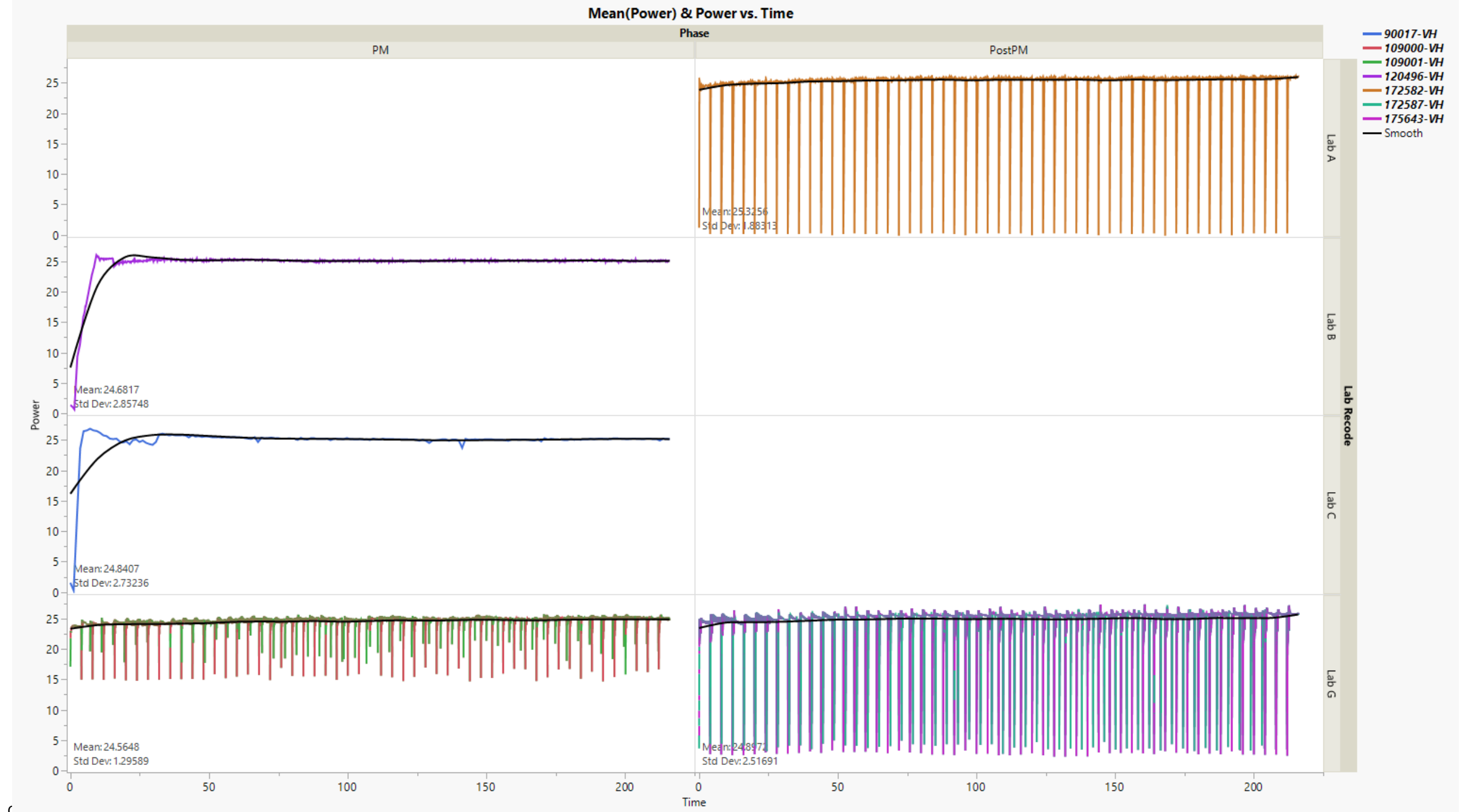
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

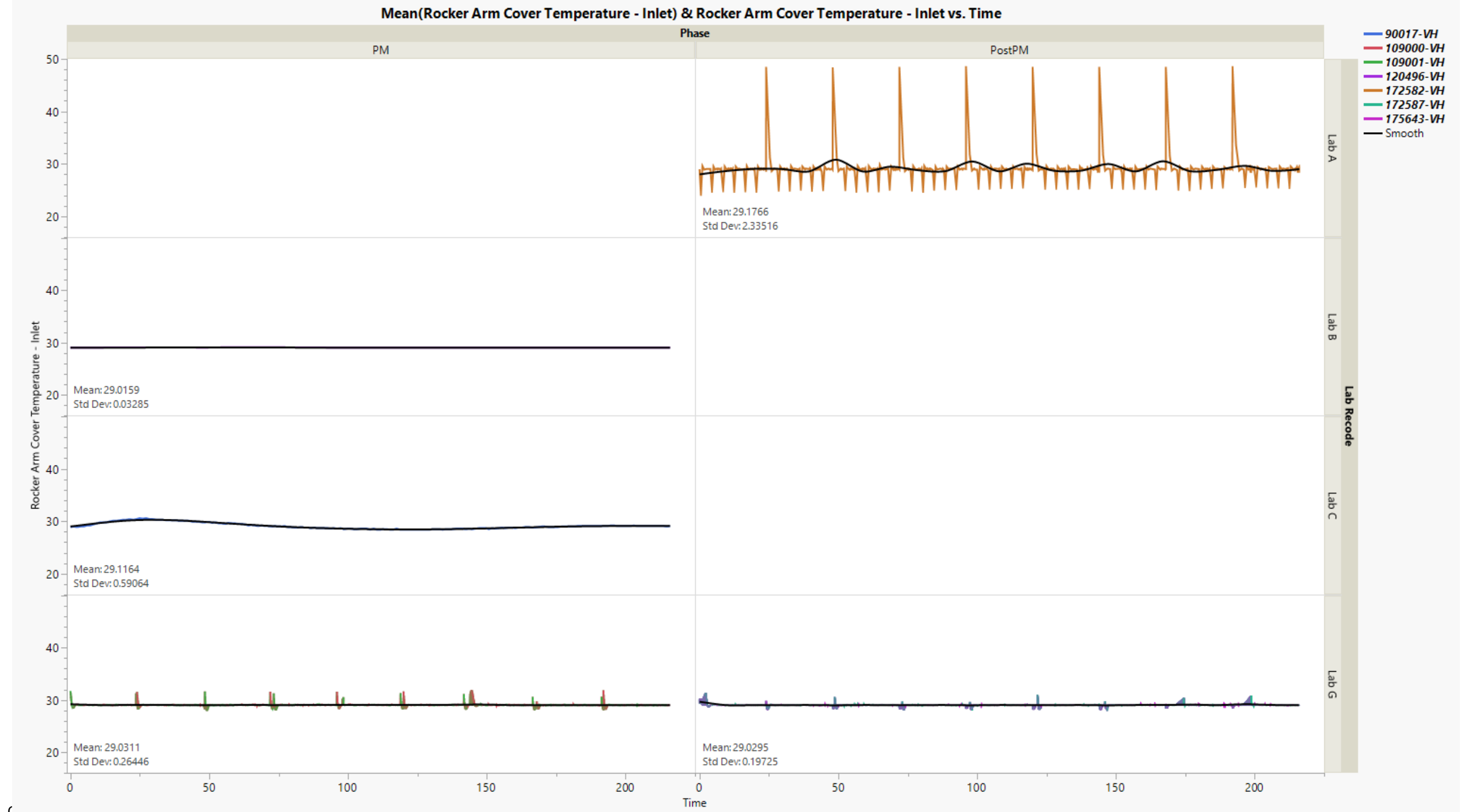

Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Oil Pressure - Pump
Time
Mean: 282.997
Std Dev: 45.2197
Mean: 286.202
Std Dev: 32.938
Mean: 295.984
Std Dev: 45.5413
Mean: 312.603
Std Dev: 63.2166
Mean: 256.846
Std Dev: 53.0342
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

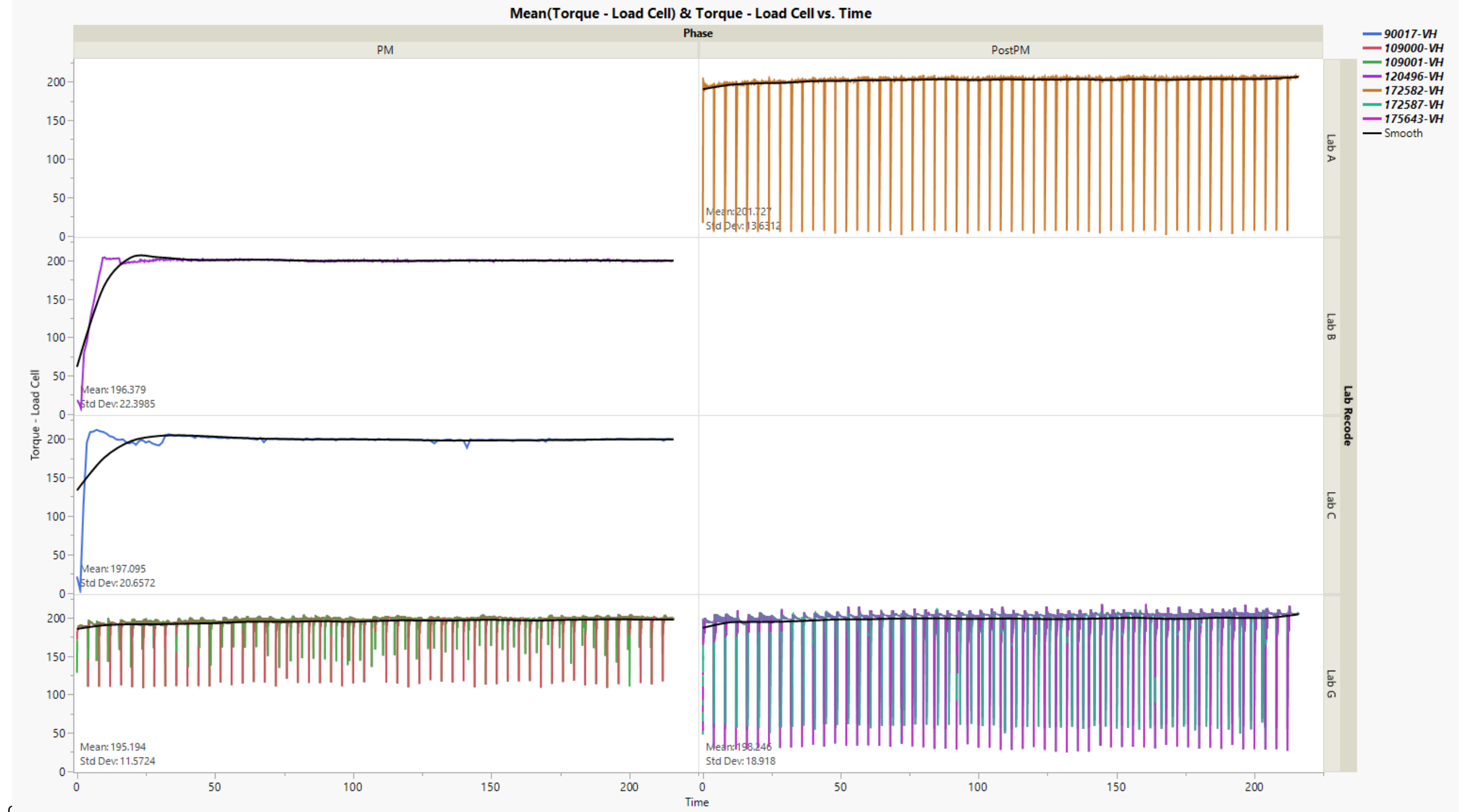

Mean(Oil Pressure - RS Cylinder Head) & Oil Pressure - RS Cylinder Head vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Oil Pressure - RS Cylinder Head
Time
Mean: 176.411
Std Dev: 44.2012
Mean: 264.398
Std Dev: 34.9916
Mean: 218.28
Std Dev: 44.0431
Mean: 274.281
Std Dev: 69.8145
Mean: 211.543
Std Dev: 49.7593
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))


Mean(Oil Temperature - Inlet) & Oil Temperature - Inlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Oil Temperature - Inlet
Time
Mean: 61.8231
Std Dev: 7.37108
Mean: 62.9991
Std Dev: 6.66544
Mean: 60.3311
Std Dev: 7.16835
Mean: 62.6862
Std Dev: 6.92072
Mean: 63.6496
Std Dev: 6.79811
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Oil Temperature - Outlet
Time
Mean: 63.272
Std Dev: 6.78648
Mean: 64.3462
Std Dev: 6.64914
Mean: 62.4082
Std Dev: 6.69755
Mean: 63.2948
Std Dev: 6.66396
Mean: 63.8768
Std Dev: 6.95945
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))


Mean(Power) & Power vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Power
Time
Mean: 25.3256
Std Dev: 1.88313
Mean: 24.6817
Std Dev: 2.85748
Mean: 24.8407
Std Dev: 2.73236
Mean: 24.5648
Std Dev: 1.29589
Mean: 24.8971
Std Dev: 2.51691
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

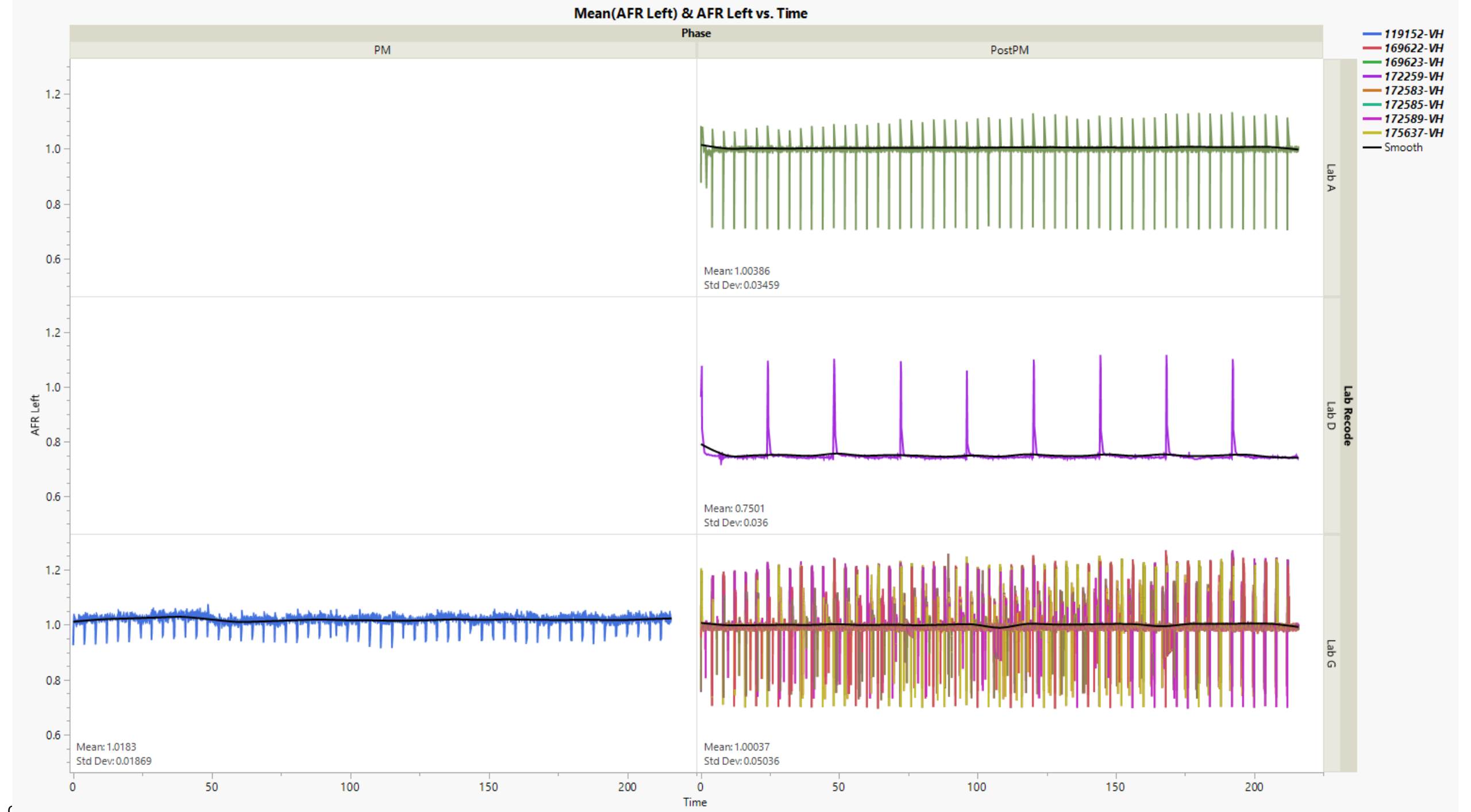

Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Rocker Arm Cover Temperature - Inlet
Time
Mean: 29.1766
Std Dev: 2.33516
Mean: 29.0159
Std Dev: 0.03285
Mean: 29.1164
Std Dev: 0.59064
Mean: 29.0311
Std Dev: 0.26446
Mean: 29.0295
Std Dev: 0.19725
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

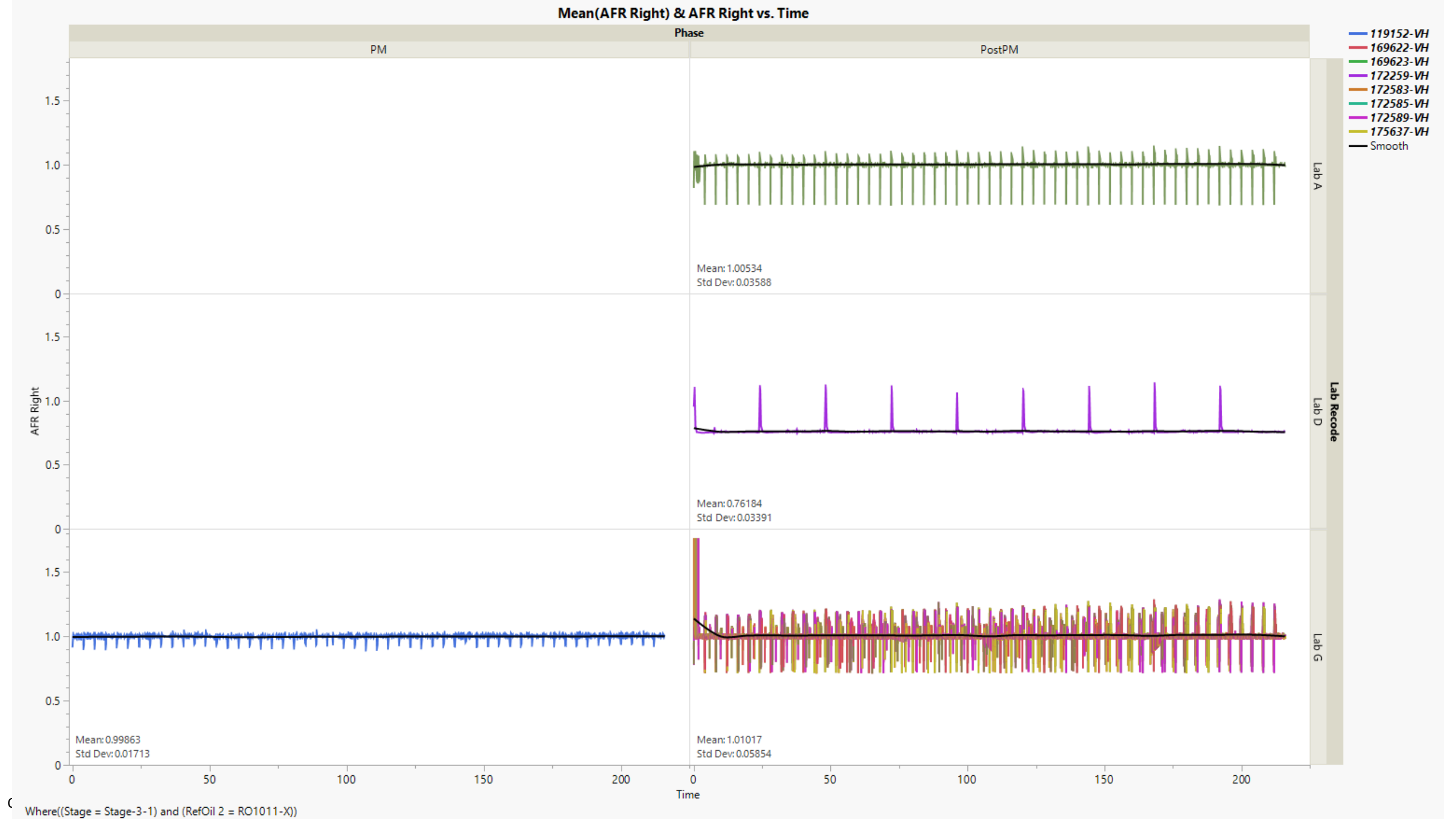


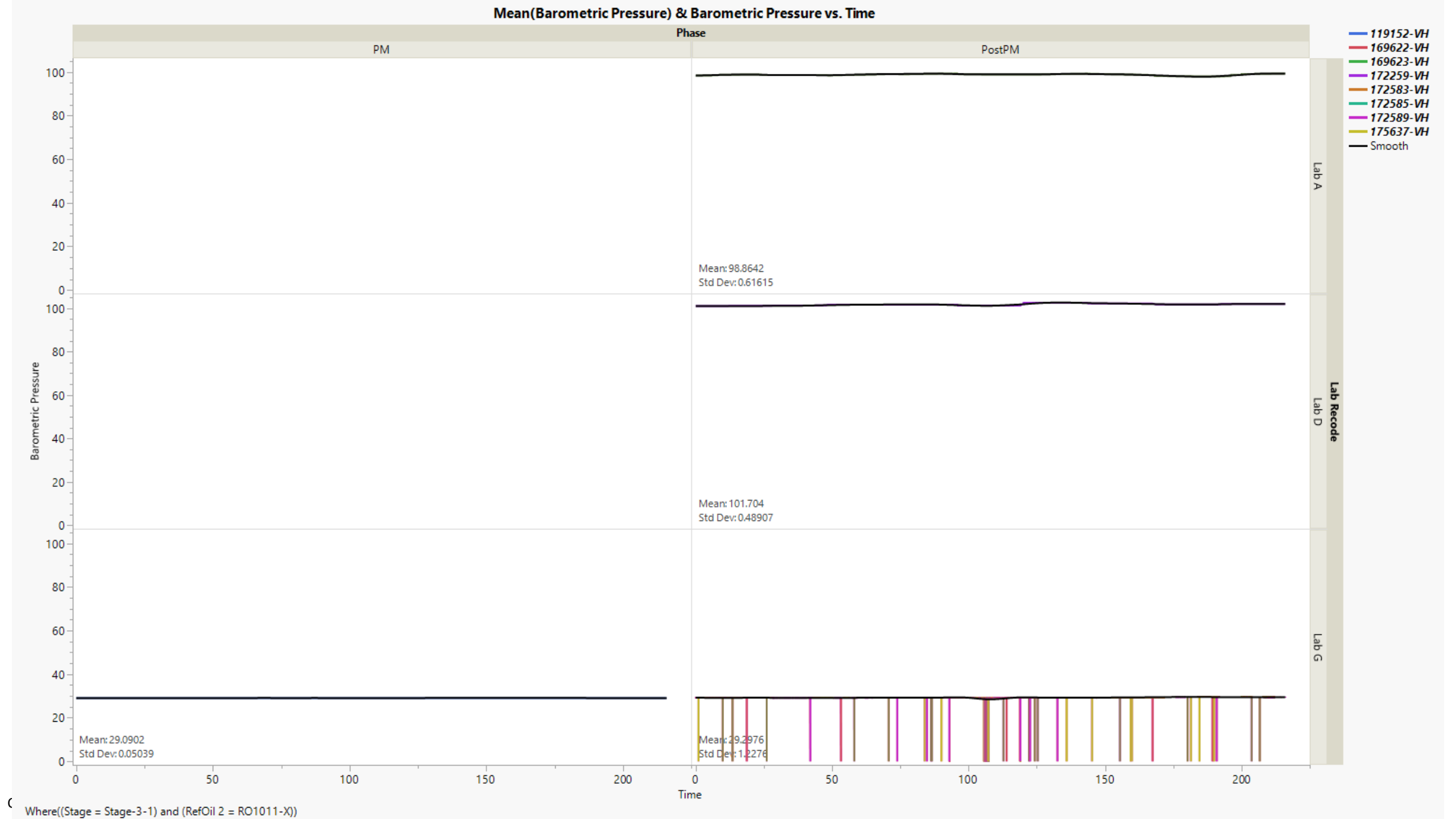
Where((Stage = Stage-3-1) and (RefOil 2 = RO940))

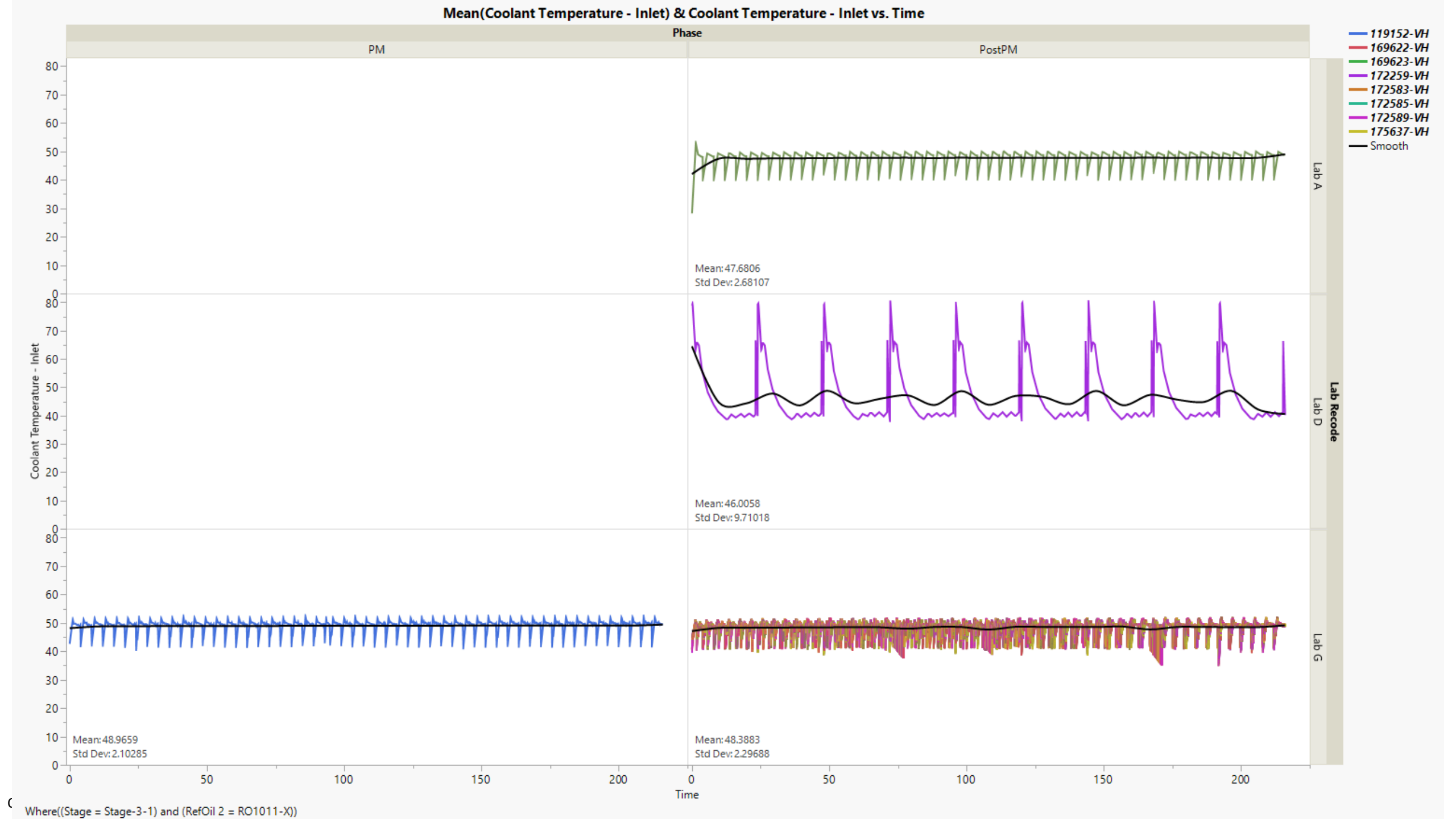
RO 1011 Data Plots

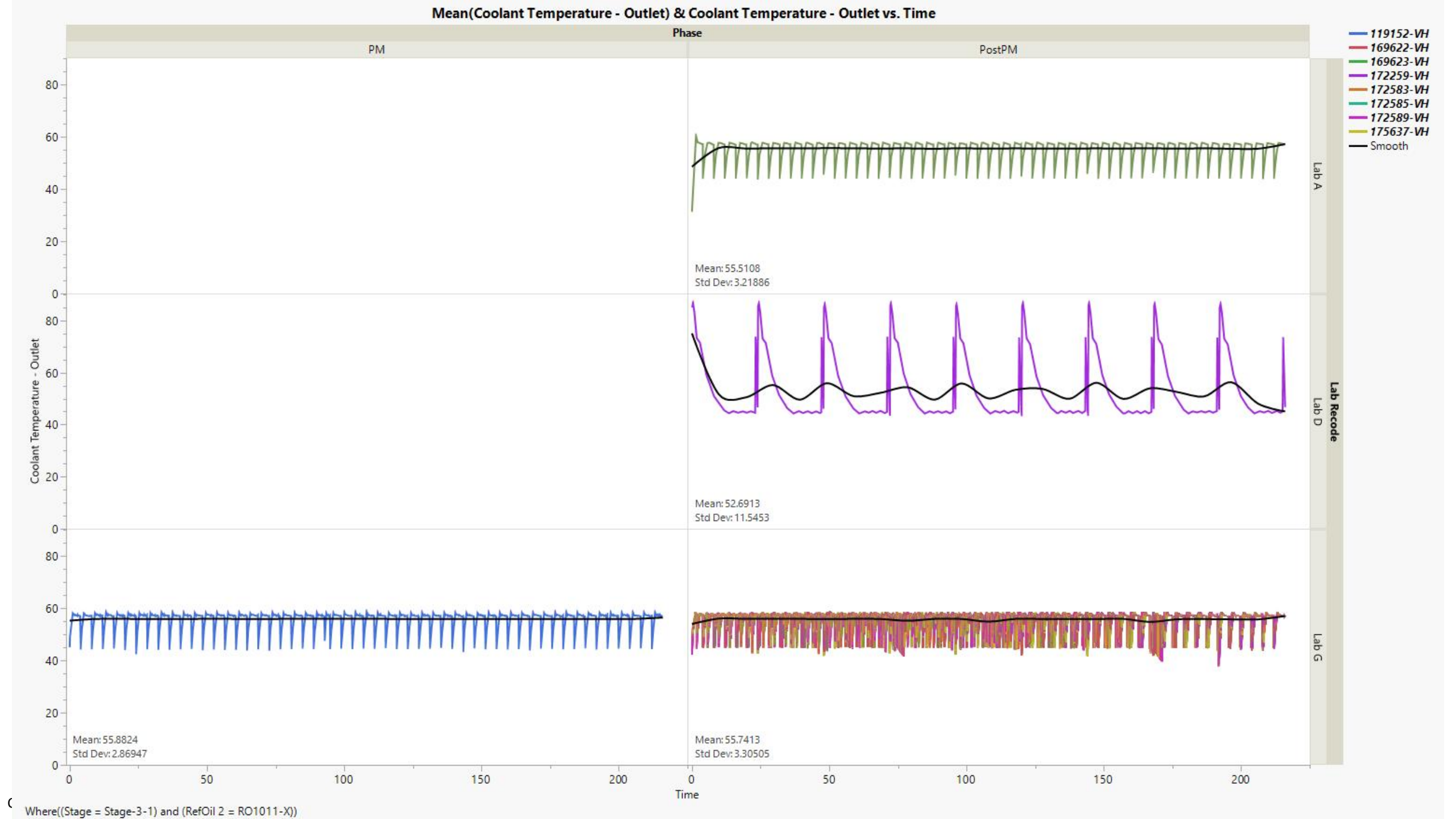
Classified as Confidential


Mean(AFR Left) & AFR Left vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
AFR Left
Time
Mean: 1.00386
Std Dev: 0.03459
Mean: 0.7501
Std Dev: 0.036
Mean: 1.0183
Std Dev: 0.01869
Mean: 1.00037
Std Dev: 0.05036
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))


Mean(AFR Right) & AFR Right vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
AFR Right
Time
Mean: 1.00534
Std Dev: 0.03588
Mean: 0.76184
Std Dev: 0.03391
Mean: 0.99863
Std Dev: 0.01713
Mean: 1.01017
Std Dev: 0.05854
0
0.5
1.0
1.5
50
100
150
200
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

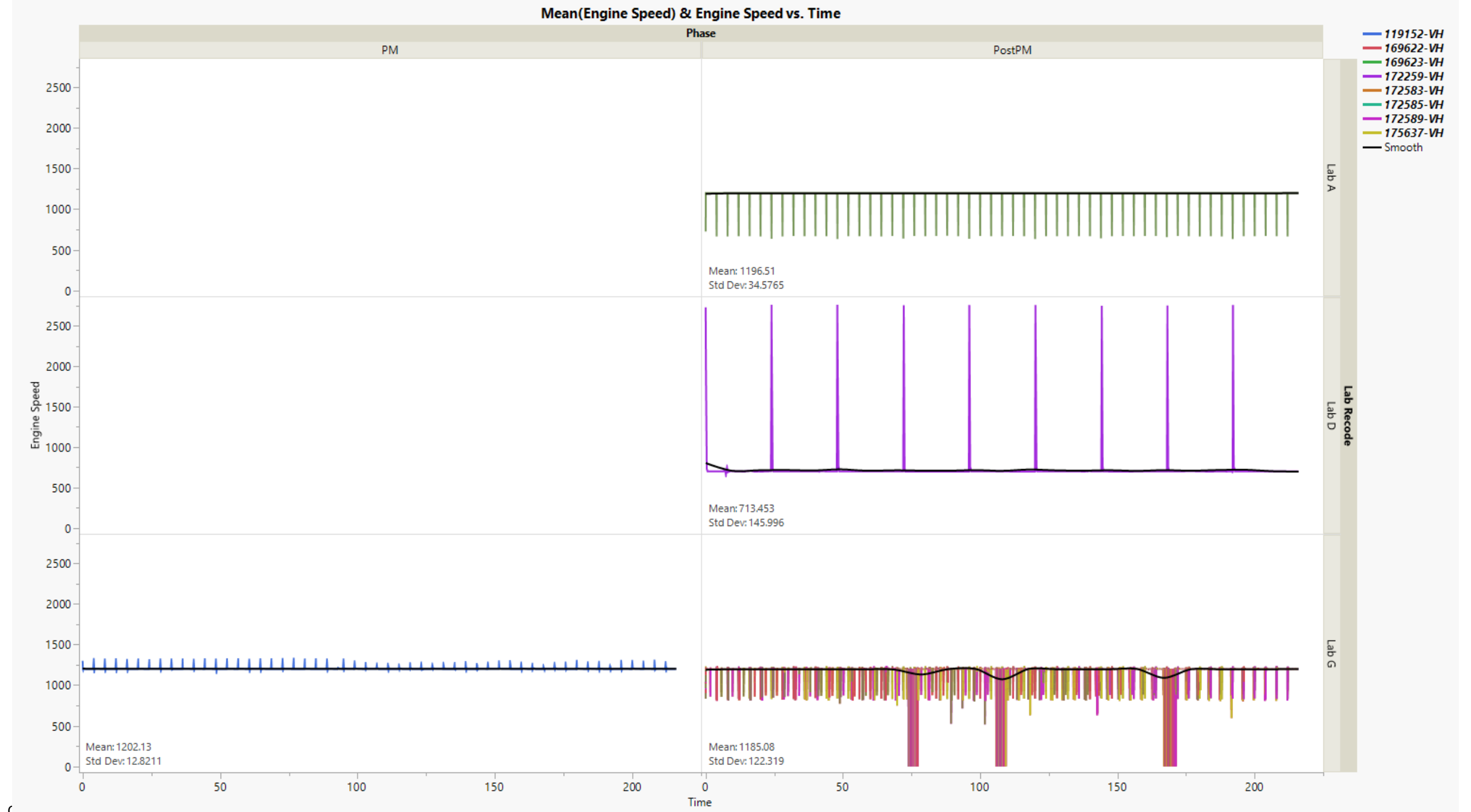

Mean(Barometric Pressure) & Barometric Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Barometric Pressure
Time
Mean: 98.8642
Std Dev: 0.61615
Mean: 101.704
Std Dev: 0.48907
Mean: 29.0902
Std Dev: 0.05039
Mean: 29.2976
Std Dev: 1.2276
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

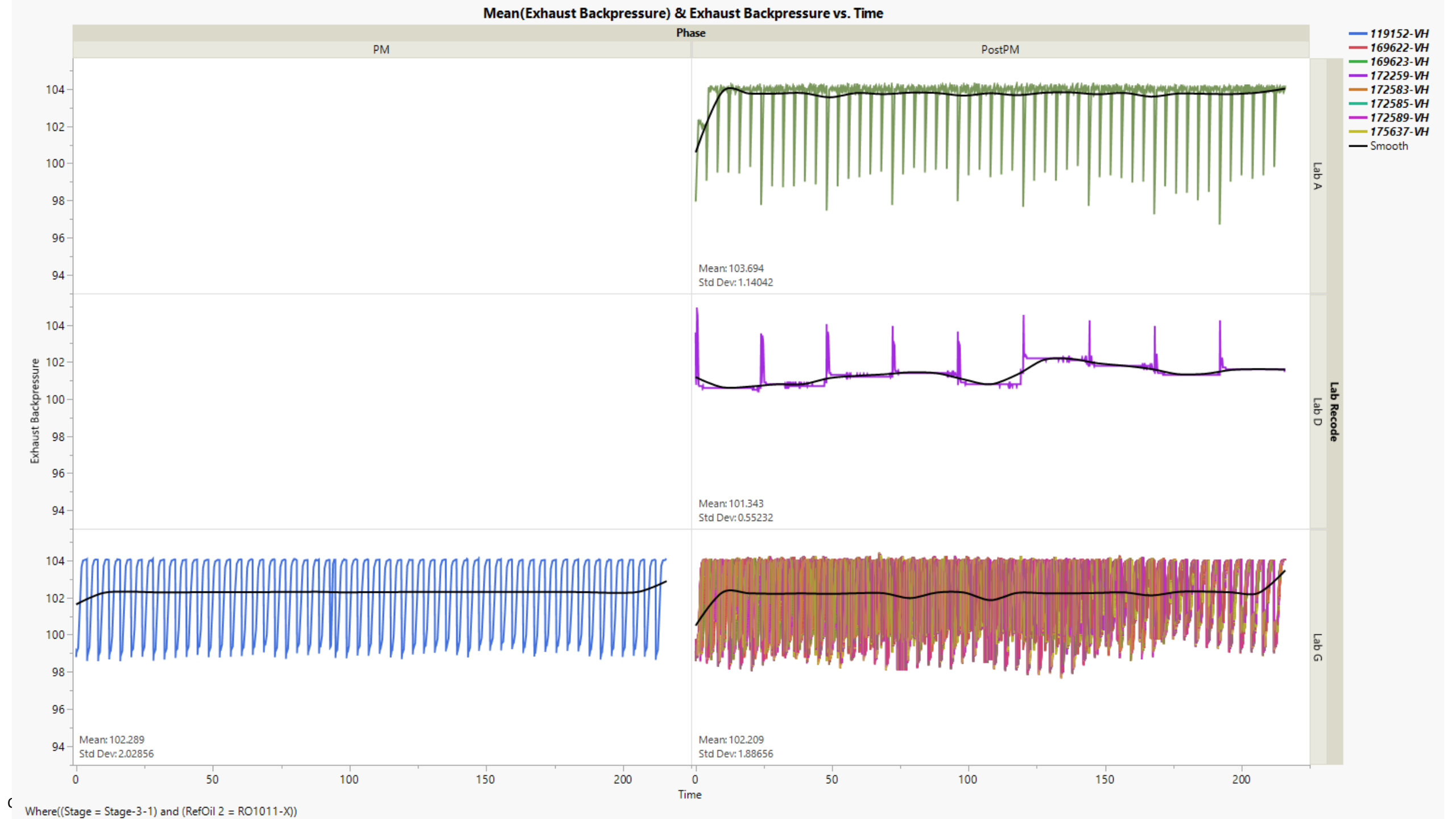

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Coolant Temperature - Inlet
Time
Mean: 47.6806
Std Dev: 2.68107
Mean: 46.0058
Std Dev: 9.71018
Mean: 48.9659
Std Dev: 2.10285
Mean: 48.3883
Std Dev: 2.29688
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))


Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Coolant Temperature - Outlet
Time
Mean: 55.5108
Std Dev: 3.21886
Mean: 52.6913
Std Dev: 11.5453
Mean: 55.8824
Std Dev: 2.86947
Mean: 55.7413
Std Dev: 3.30505
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

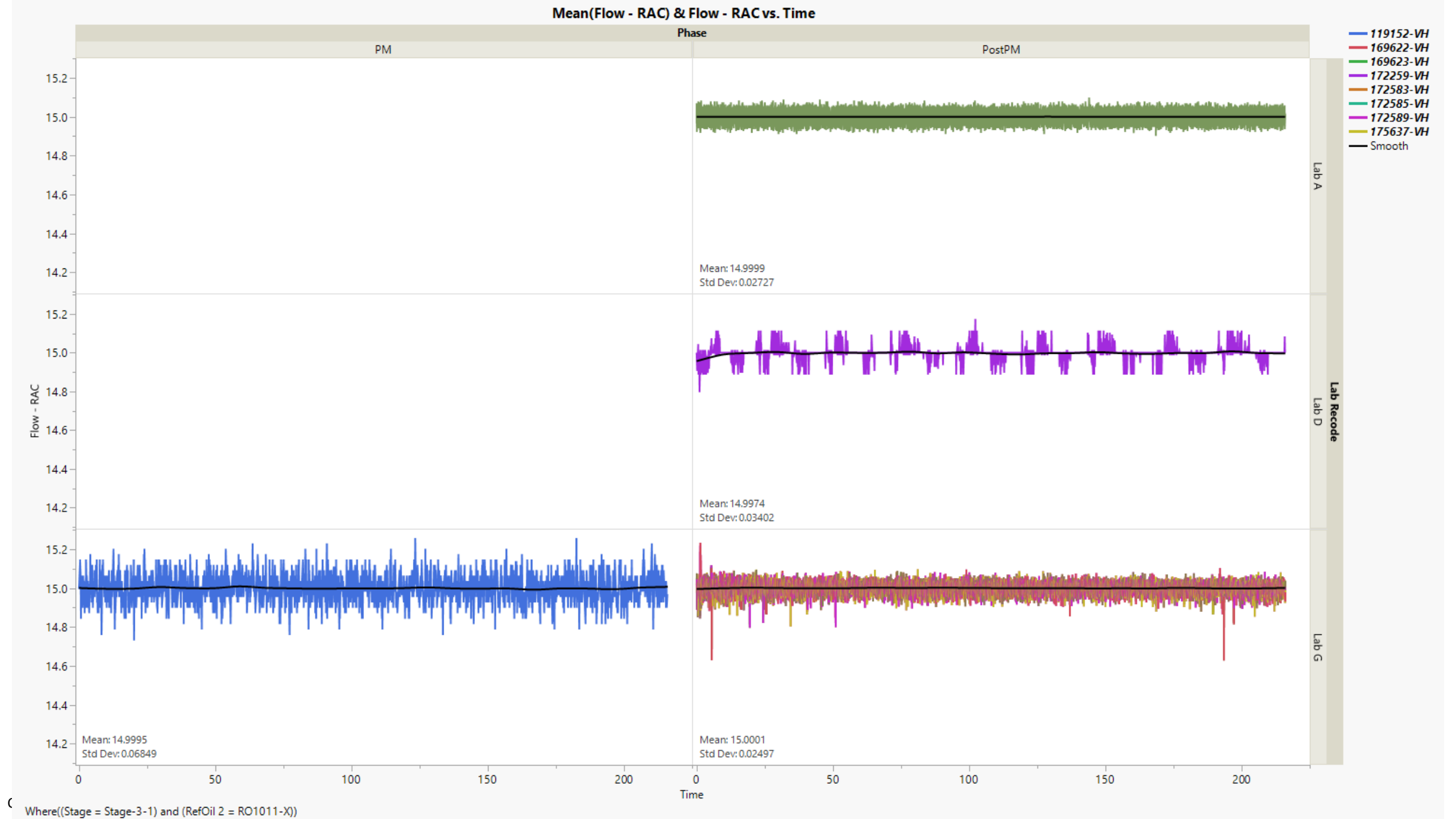
Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Crankcase Pressure
Time
Mean: 0.97944
Std Dev: 1.69553
Mean: 0.0154
Std Dev: 0.02625
Mean: 0.05925
Std Dev: 0.03404
Mean: 0.13619
Std Dev: 0.22057
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 69.9993
Std Dev: 0.03984
Mean: 70.0813
Std Dev: 0.08054
Mean: 69.9377
Std Dev: 0.18571
Mean: 70.117
Std Dev: 0.19708
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

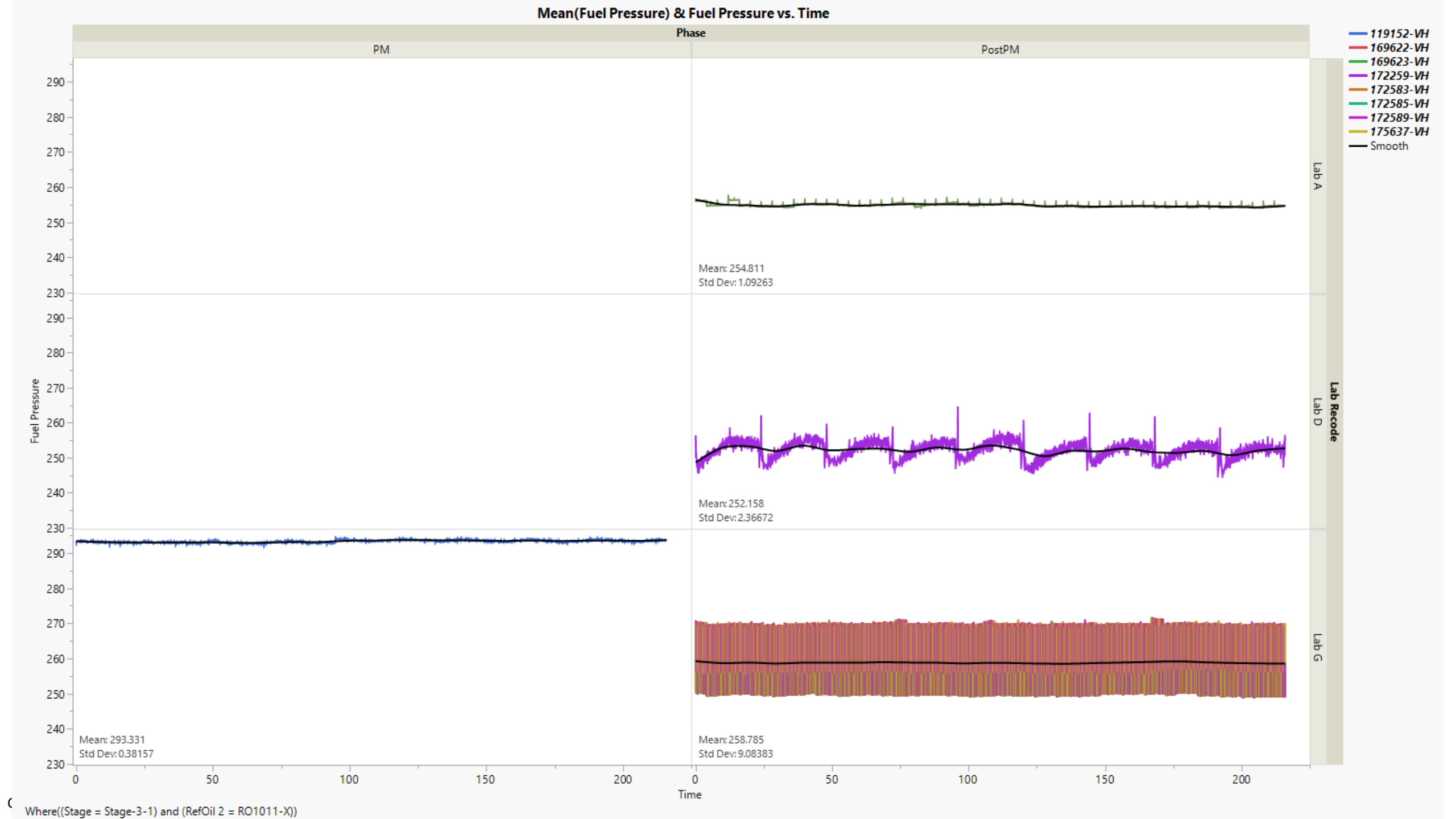

Mean(Engine Speed) & Engine Speed vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Speed
Time
Mean: 1196.51
Std Dev: 34.5765
Mean: 713.453
Std Dev: 145.996
Mean: 1202.13
Std Dev: 12.8211
Mean: 1185.08
Std Dev: 122.319
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

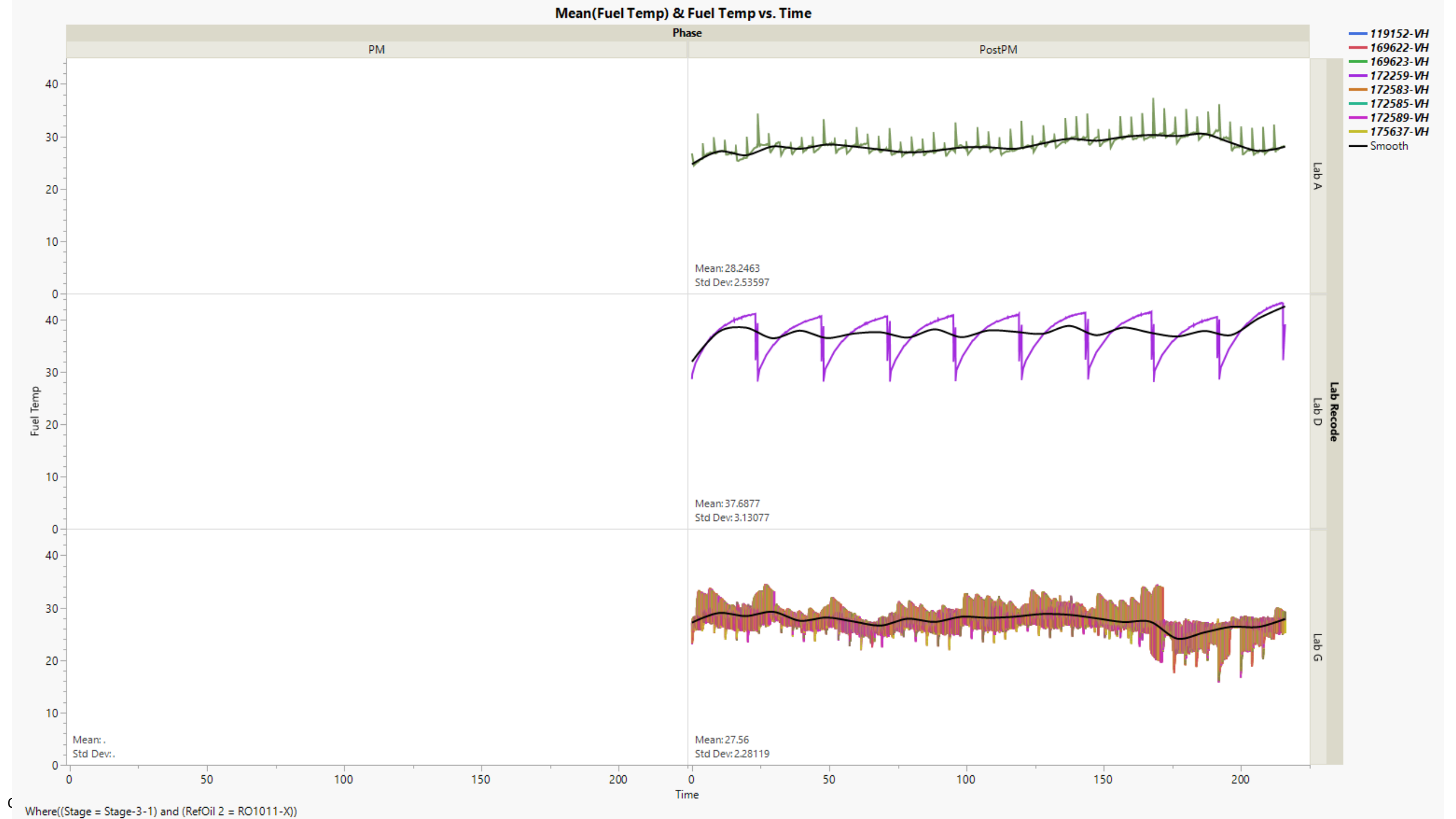

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 103.694
Std Dev: 1.14042
Mean: 101.343
Std Dev: 0.55232
Mean: 102.289
Std Dev: 2.02856
Mean: 102.209
Std Dev: 1.88656
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - Coolant Out
Time
Mean: 47.3908
Std Dev: 2.33193
Mean: 31.3373
Std Dev: 14.4979
Mean: 48.0351
Std Dev: 0.54443
Mean: 47.3829
Std Dev: 5.11443
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))


Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - RAC
Time
Mean: 14.9999
Std Dev: 0.02727
Mean: 14.9974
Std Dev: 0.03402
Mean: 14.9995
Std Dev: 0.06849
Mean: 15.0001
Std Dev: 0.02497
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

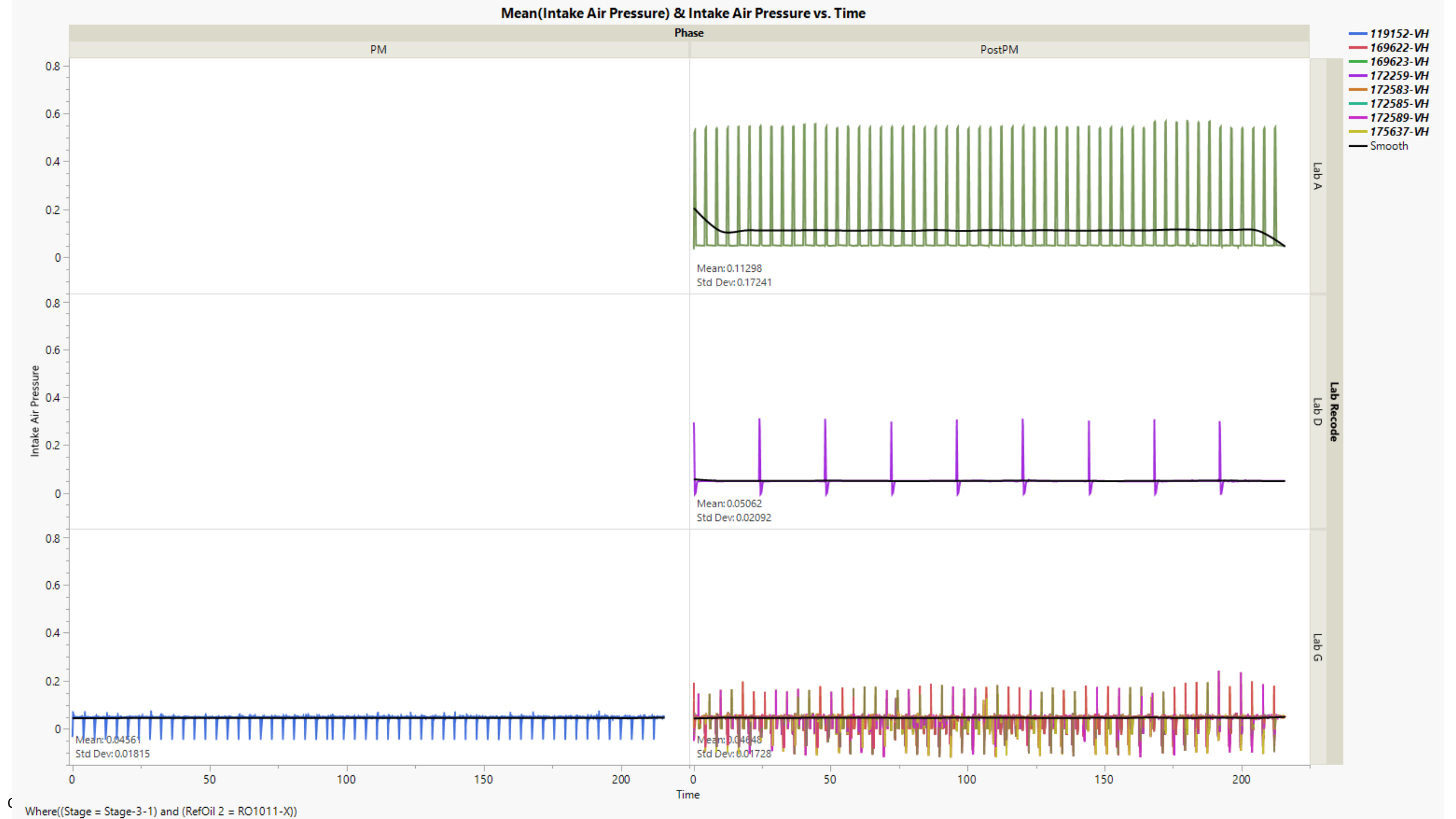
Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Flow
Time
Mean: 6.90853
Std Dev: 0.5748
Mean: 1.98309
Std Dev: 0.34589
Mean: 7.03931
Std Dev: 0.20679
Mean: 6.93278
Std Dev: 0.82013
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

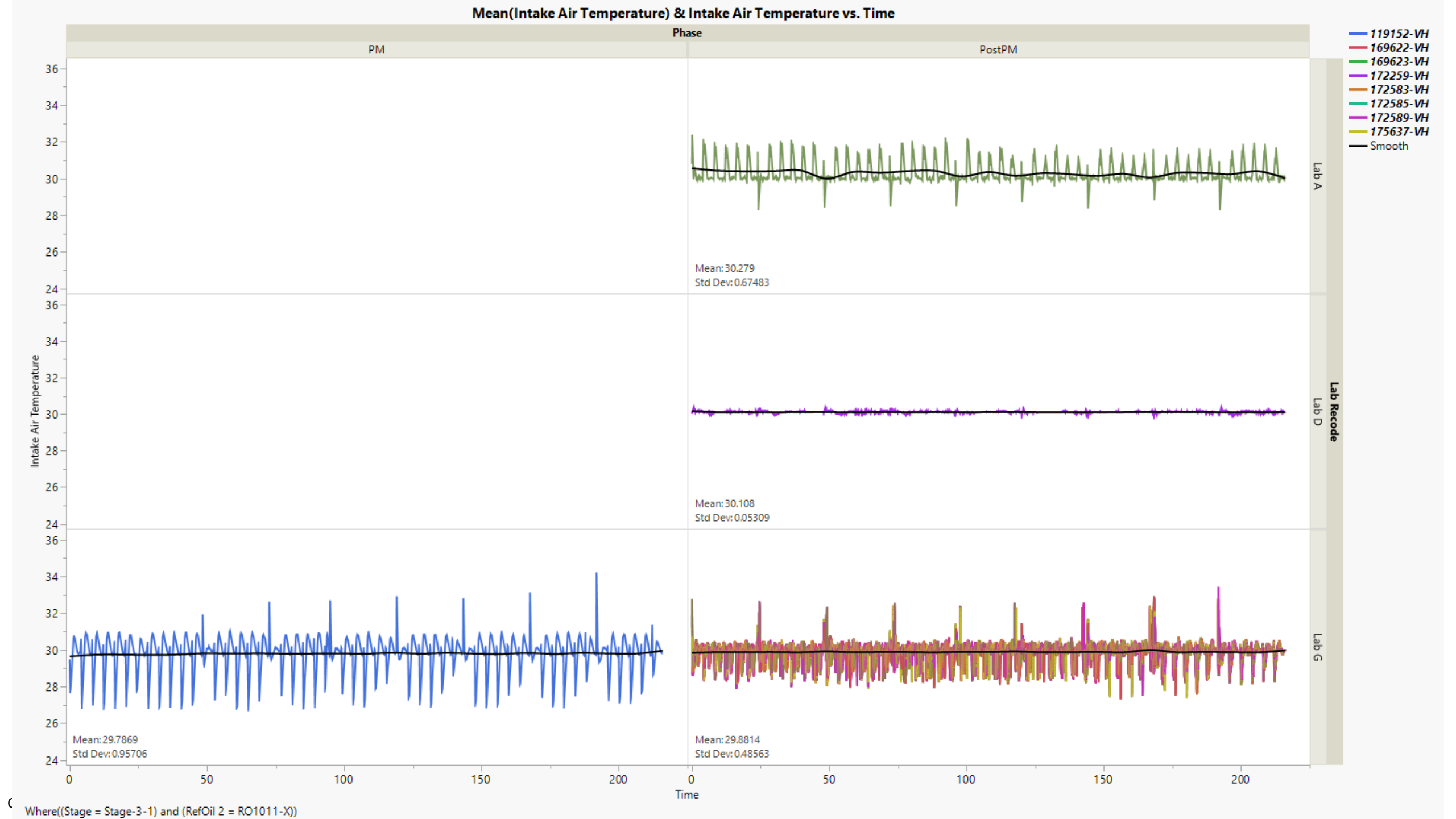

Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Pressure
Time
Mean: 254.811
Std Dev: 1.09263
Mean: 252.158
Std Dev: 2.36672
Mean: 293.331
Std Dev: 0.38157
Mean: 258.785
Std Dev: 9.08383
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

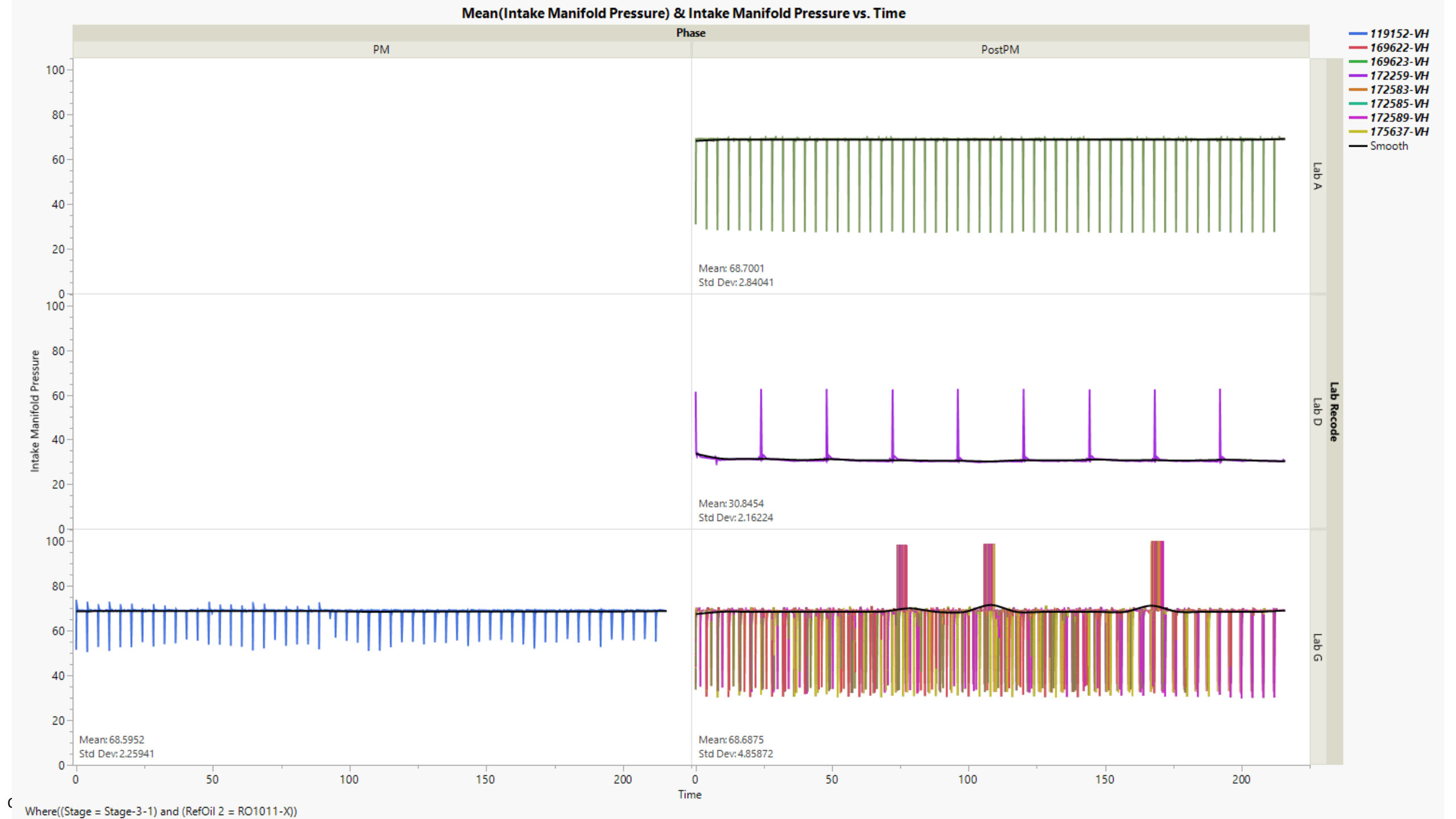


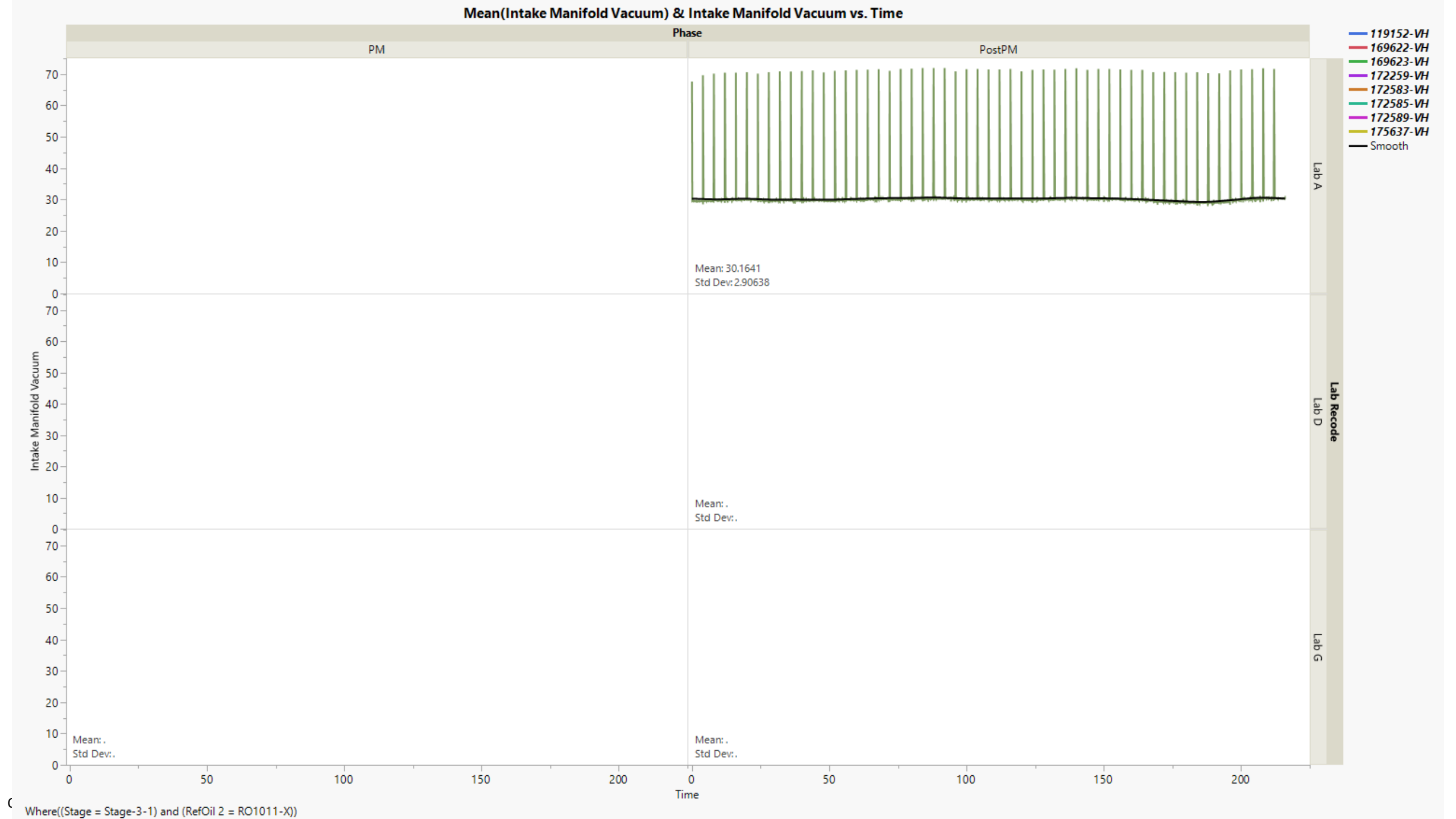
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

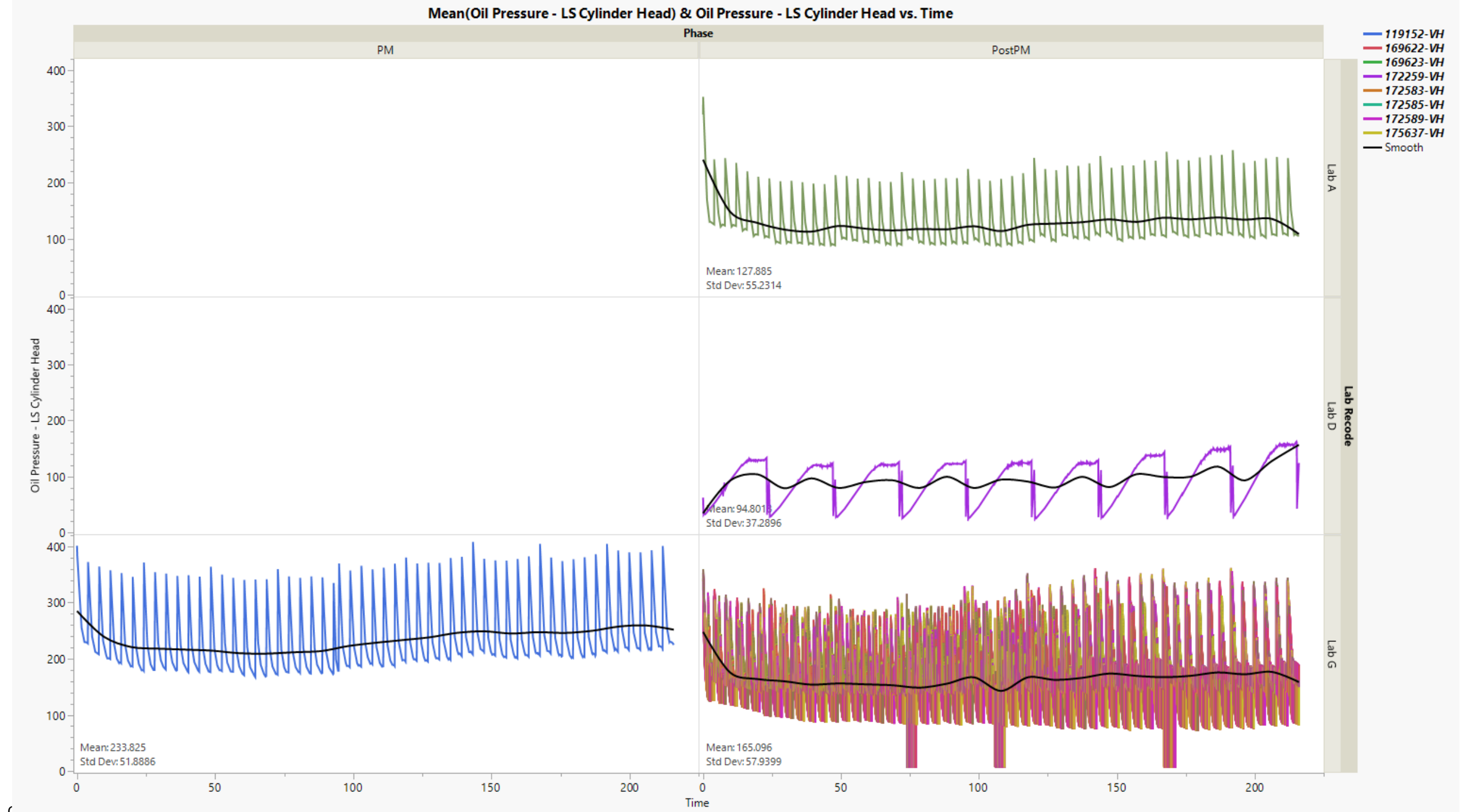
Mean(Humidity) & Humidity vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Humidity
Time
Mean: 11.5766
Std Dev: 0.21004
Mean: 11.3676
Std Dev: 0.12835
Mean: 11.6531
Std Dev: 0.46137
Mean: 11.4011
Std Dev: 0.22836
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))


Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Pressure
Time
Mean: 0.11298
Std Dev: 0.17241
Mean: 0.05062
Std Dev: 0.02092
Mean: 0.04561
Std Dev: 0.01815
Mean: 0.04648
Std Dev: 0.01728
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

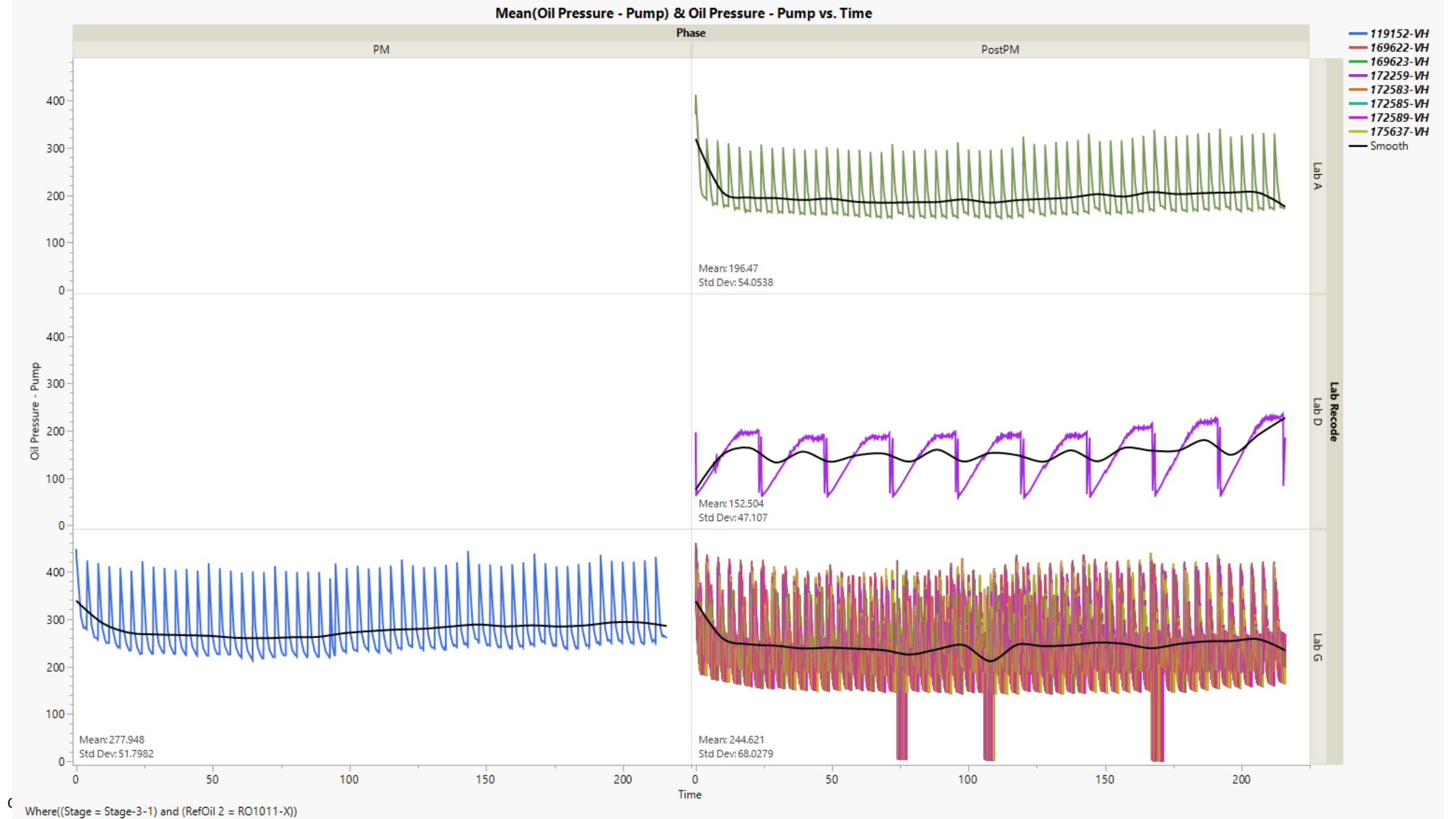

Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 30.279
Std Dev: 0.67483
Mean: 30.108
Std Dev: 0.05309
Mean: 29.7869
Std Dev: 0.95706
Mean: 29.8814
Std Dev: 0.48563
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

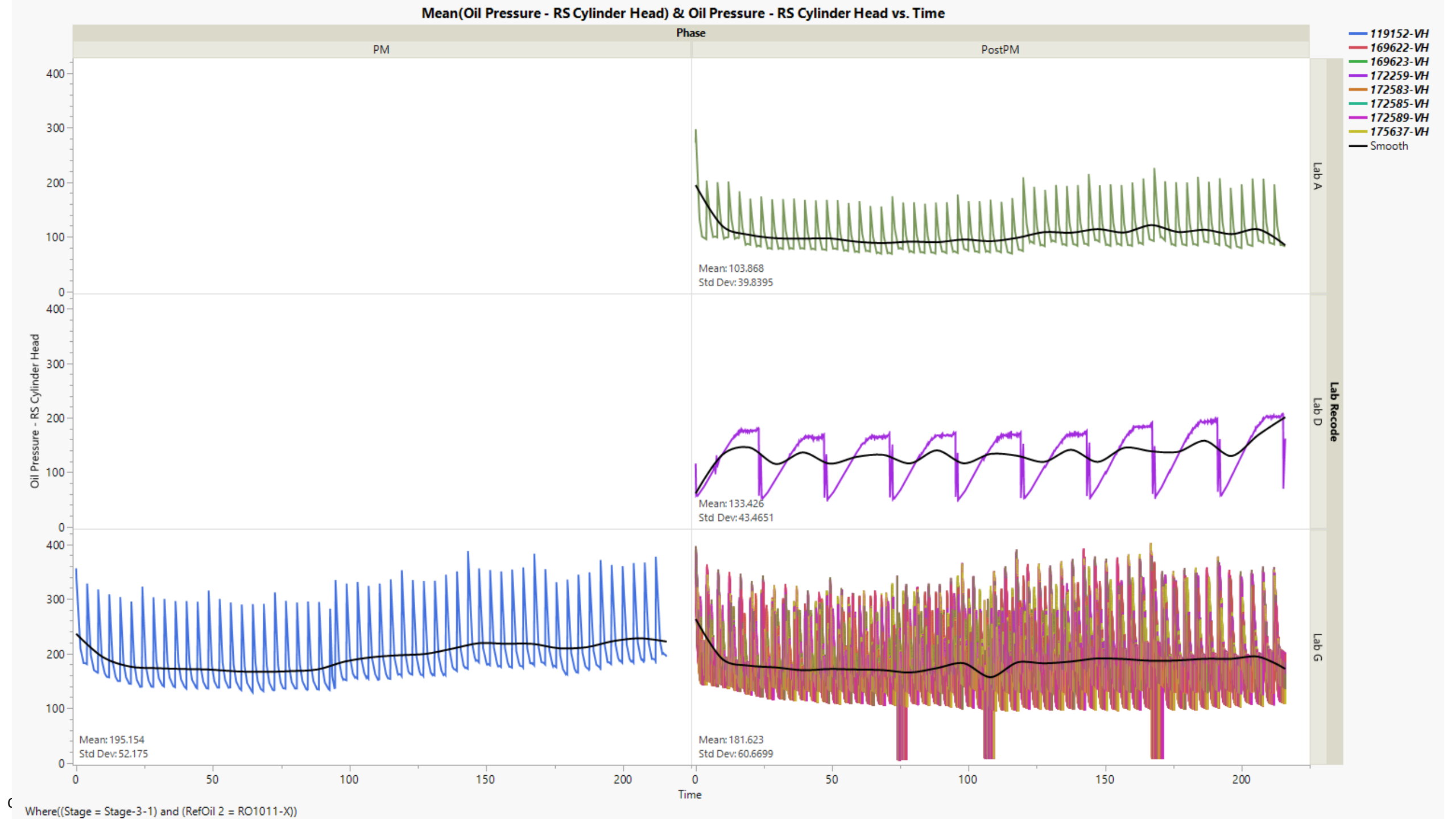

Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Pressure
Time
Mean: 68.7001
Std Dev: 2.84041
Mean: 30.8454
Std Dev: 2.16224
Mean: 68.5952
Std Dev: 2.25941
Mean: 68.6875
Std Dev: 4.85872
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

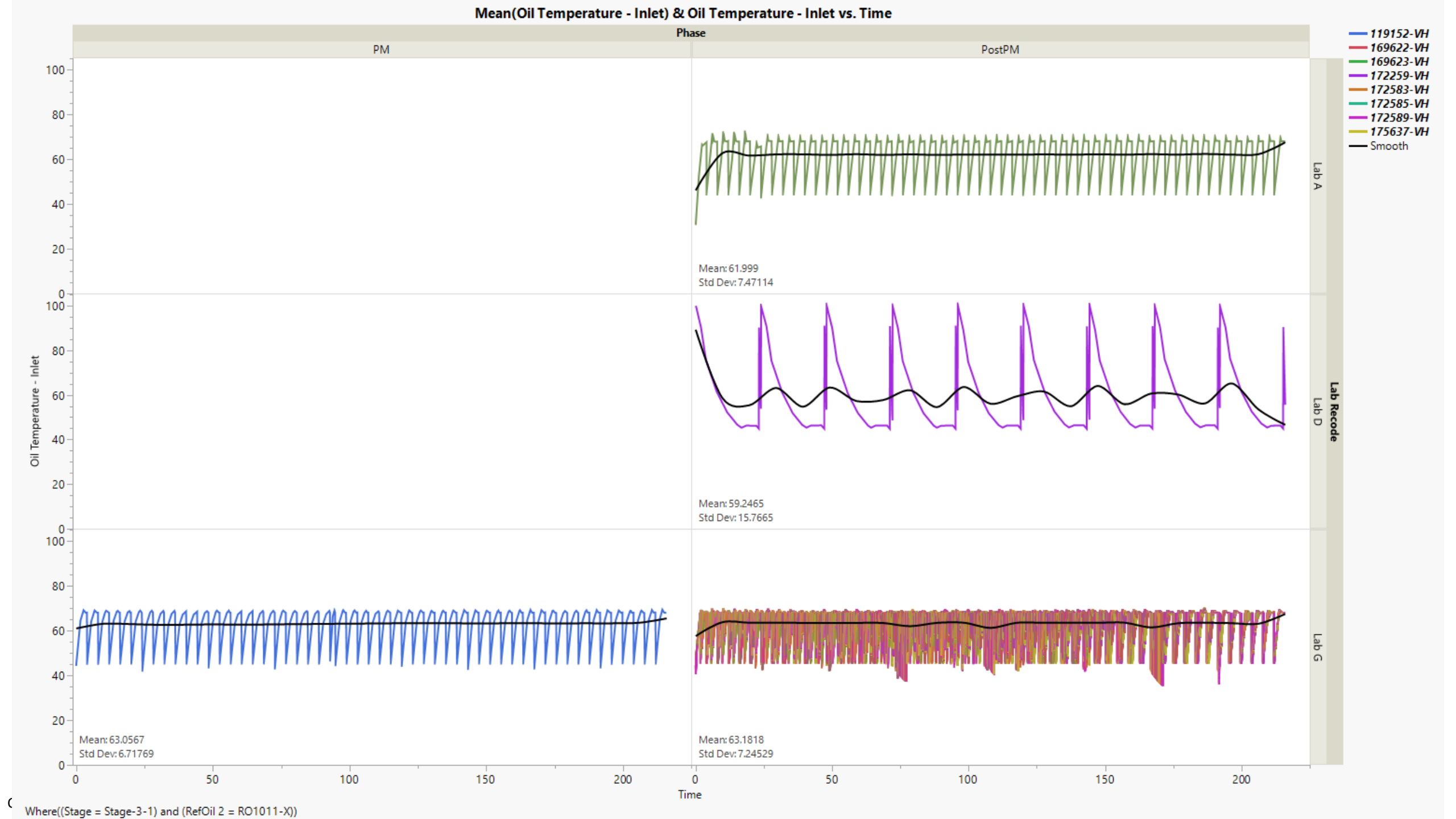

Mean(Intake Manifold Vacuum) & Intake Manifold Vacuum vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Vacuum
Time
Mean: 30.1641
Std Dev: 2.90638
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
0
10
20
30
40
50
60
70
0
50
100
150
200
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

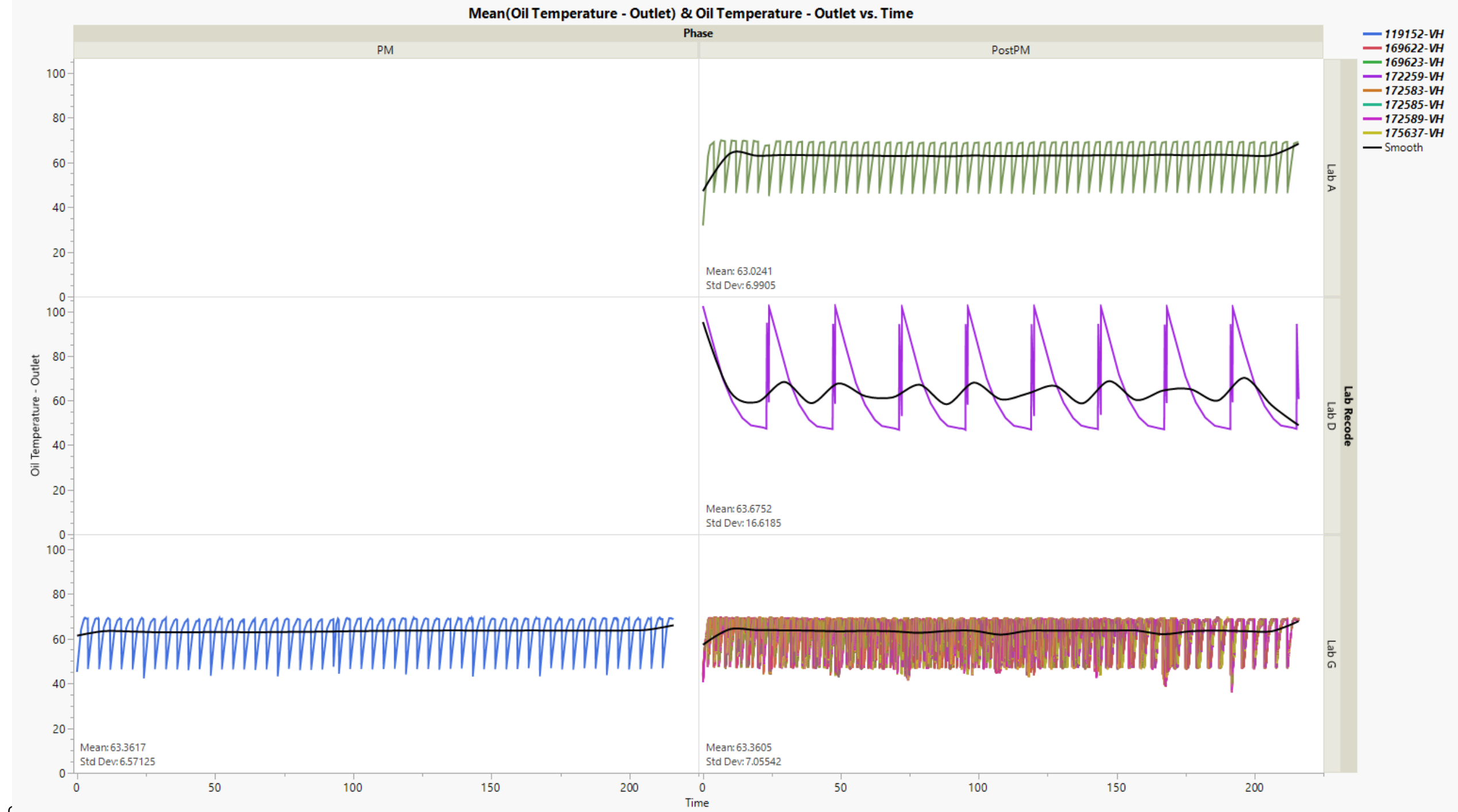


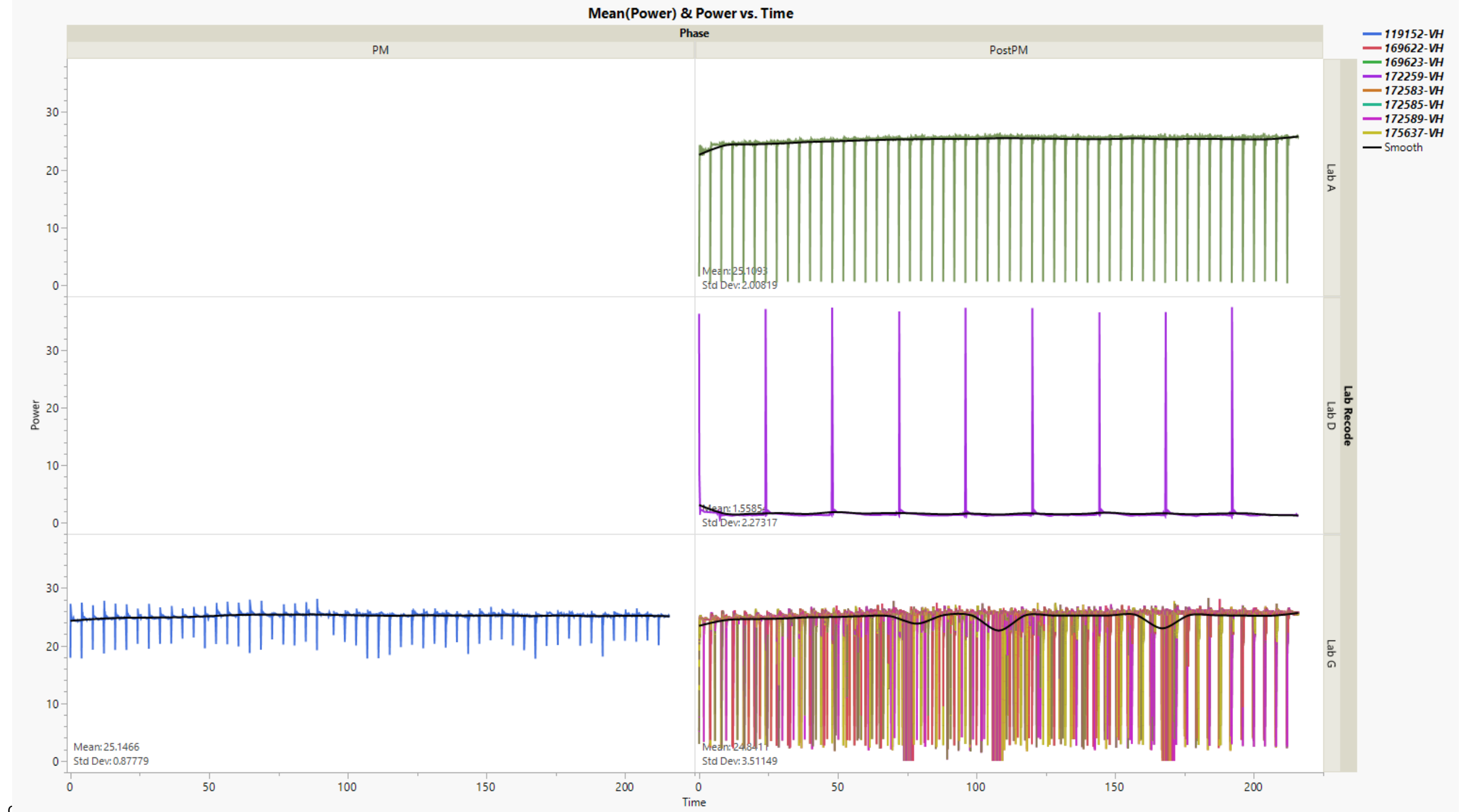
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))


Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Pressure - Pump
Time
Mean: 196.47
Std Dev: 54.0538
Mean: 152.504
Std Dev: 47.107
Mean: 277.948
Std Dev: 51.7982
Mean: 244.621
Std Dev: 68.0279
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))


Mean(Oil Pressure - RS Cylinder Head) & Oil Pressure - RS Cylinder Head vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Pressure - RS Cylinder Head
Time
Mean: 103.868
Std Dev: 39.8395
Mean: 133.426
Std Dev: 43.4651
Mean: 195.154
Std Dev: 52.175
Mean: 181.623
Std Dev: 60.6699
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

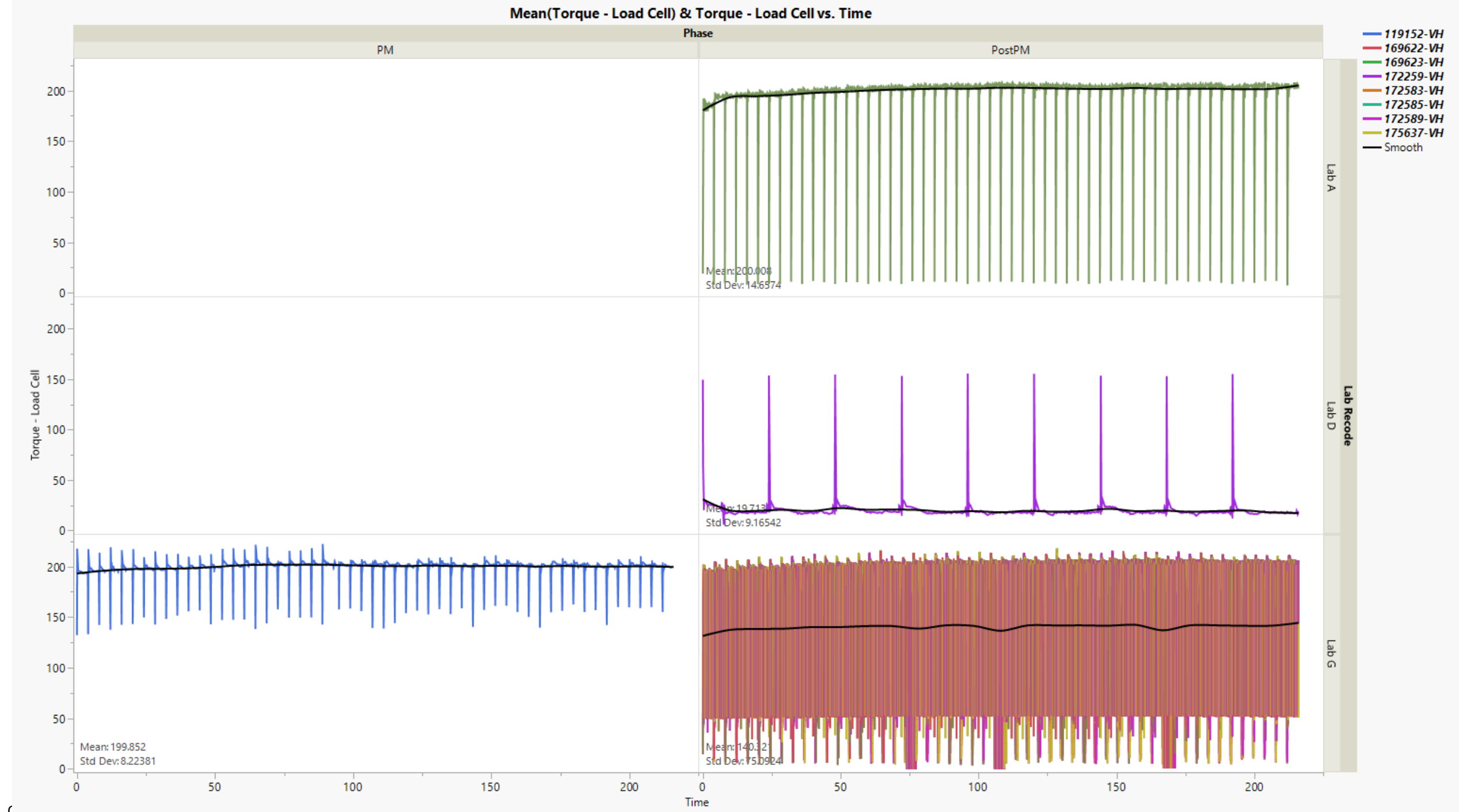

Mean(Oil Temperature - Inlet) & Oil Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Inlet
Time
Mean: 61.999
Std Dev: 7.47114
Mean: 59.2465
Std Dev: 15.7665
Mean: 63.0567
Std Dev: 6.71769
Mean: 63.1818
Std Dev: 7.24529
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Outlet
Time
Mean: 63.0241
Std Dev: 6.9905
Mean: 63.6752
Std Dev: 16.6185
Mean: 63.3617
Std Dev: 6.57125
Mean: 63.3605
Std Dev: 7.05542
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
172589-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Rocker Arm Cover Temperature - Inlet
Mean: 28.9465
Std Dev: 2.23385
Mean: 50.8587
Std Dev: 19.2678
Mean: 29.0249
Std Dev: 0.30289
Mean: 29.0296
Std Dev: 0.18248
Time
Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-3-1) and (RefOil 2 = RO1011-X))

VH – Stage 3 Operational Data Plots

By: Todd Dvorak

08-05-24

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RO 940 Data Plots

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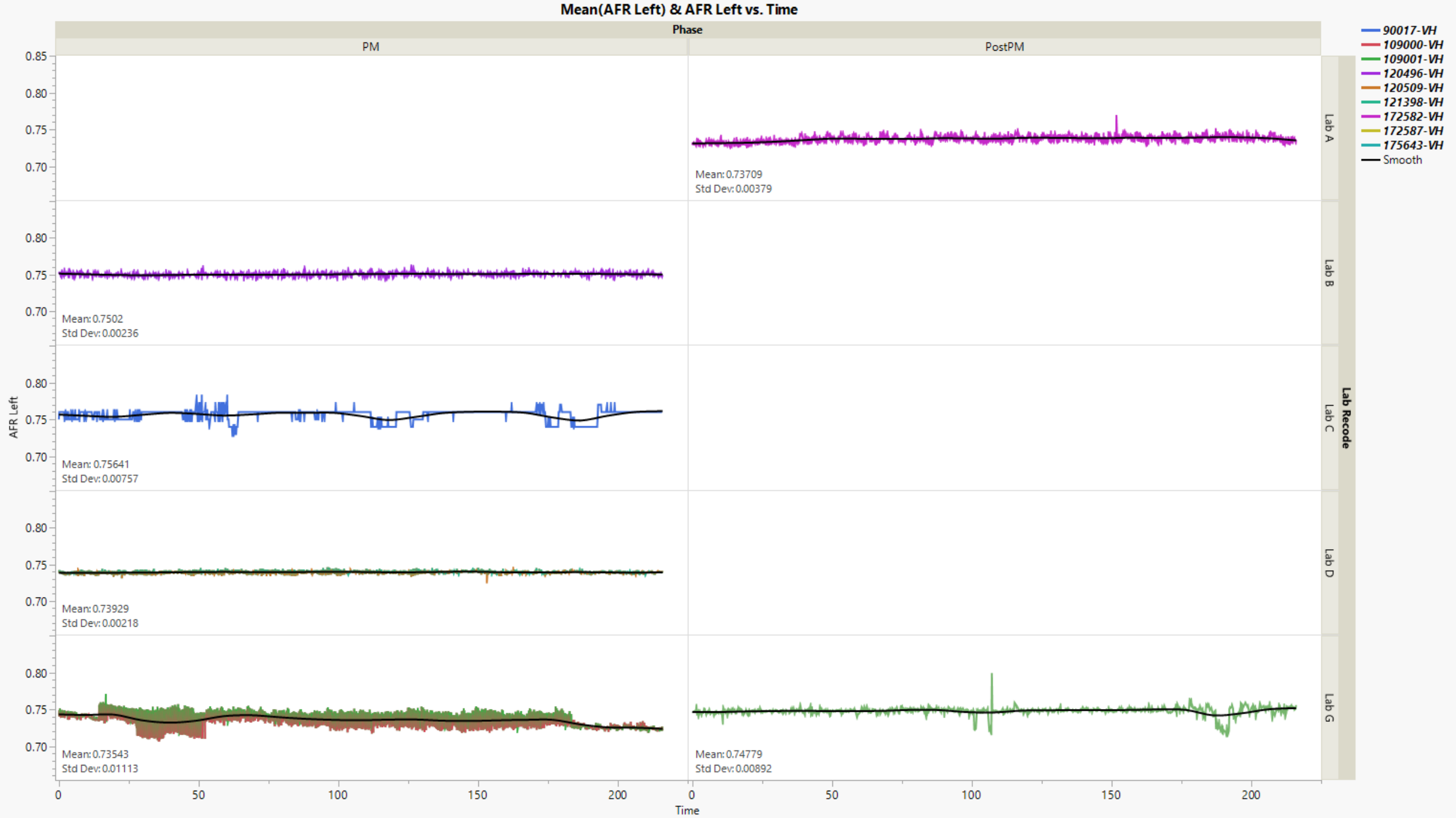
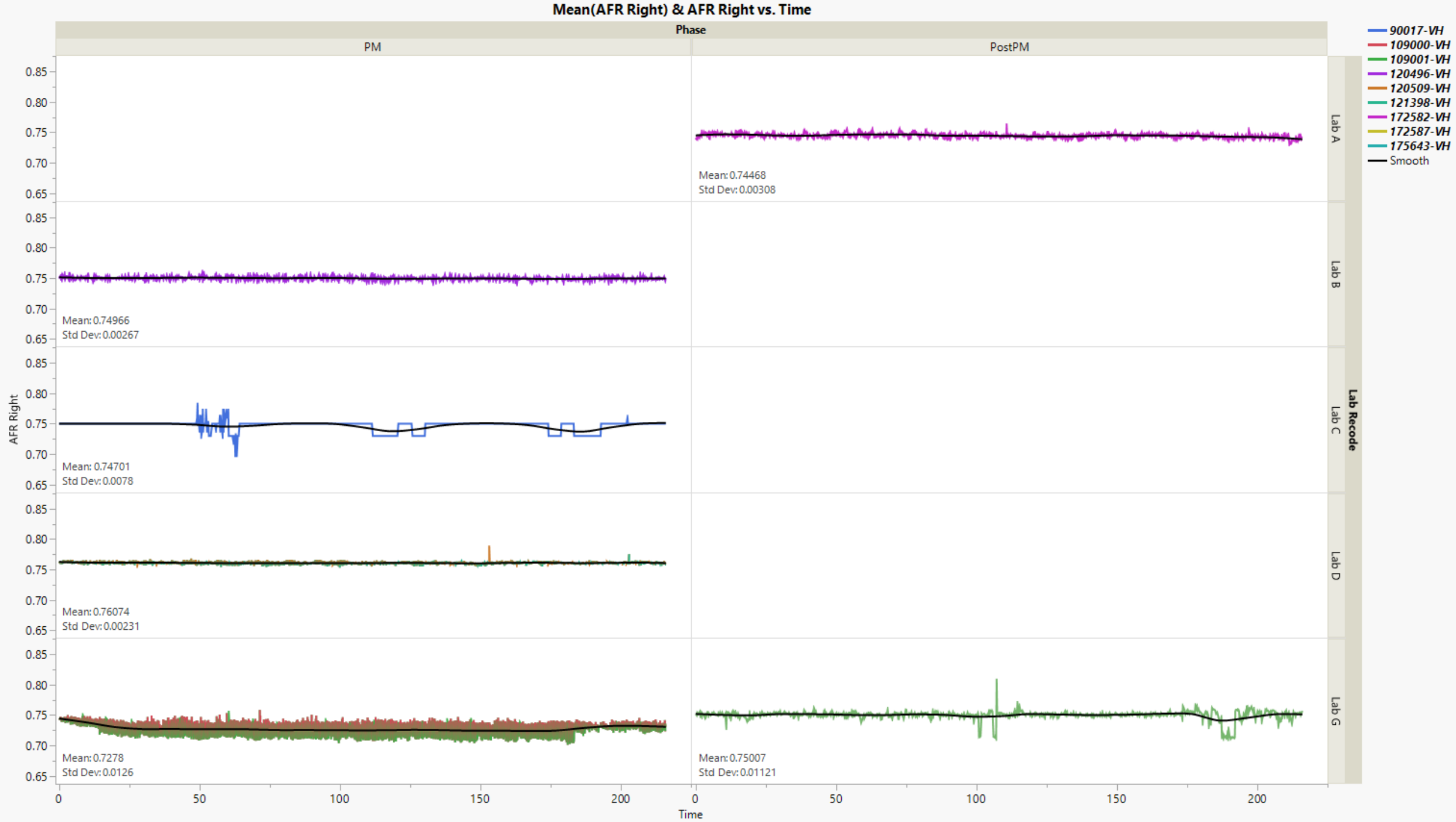
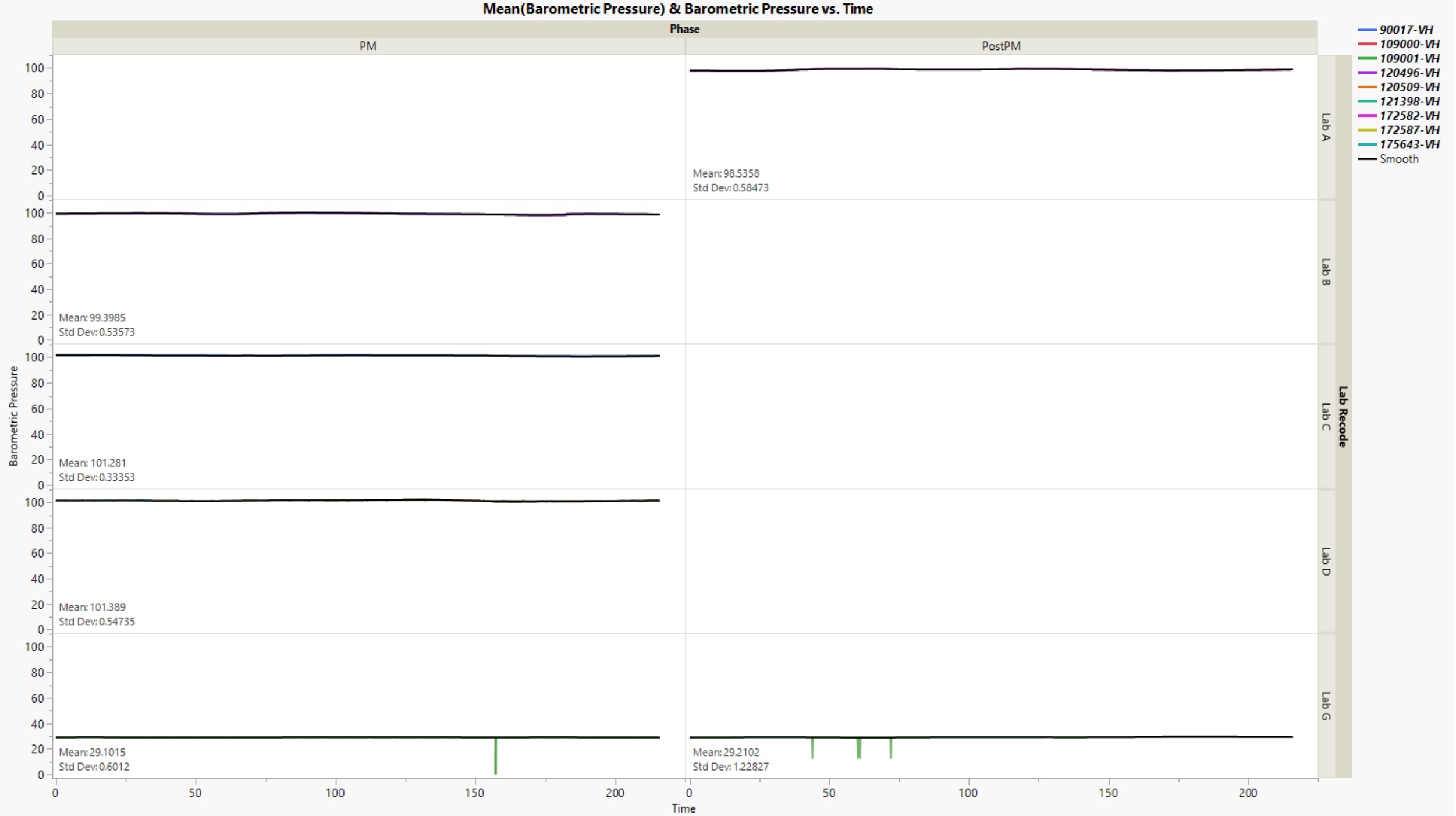
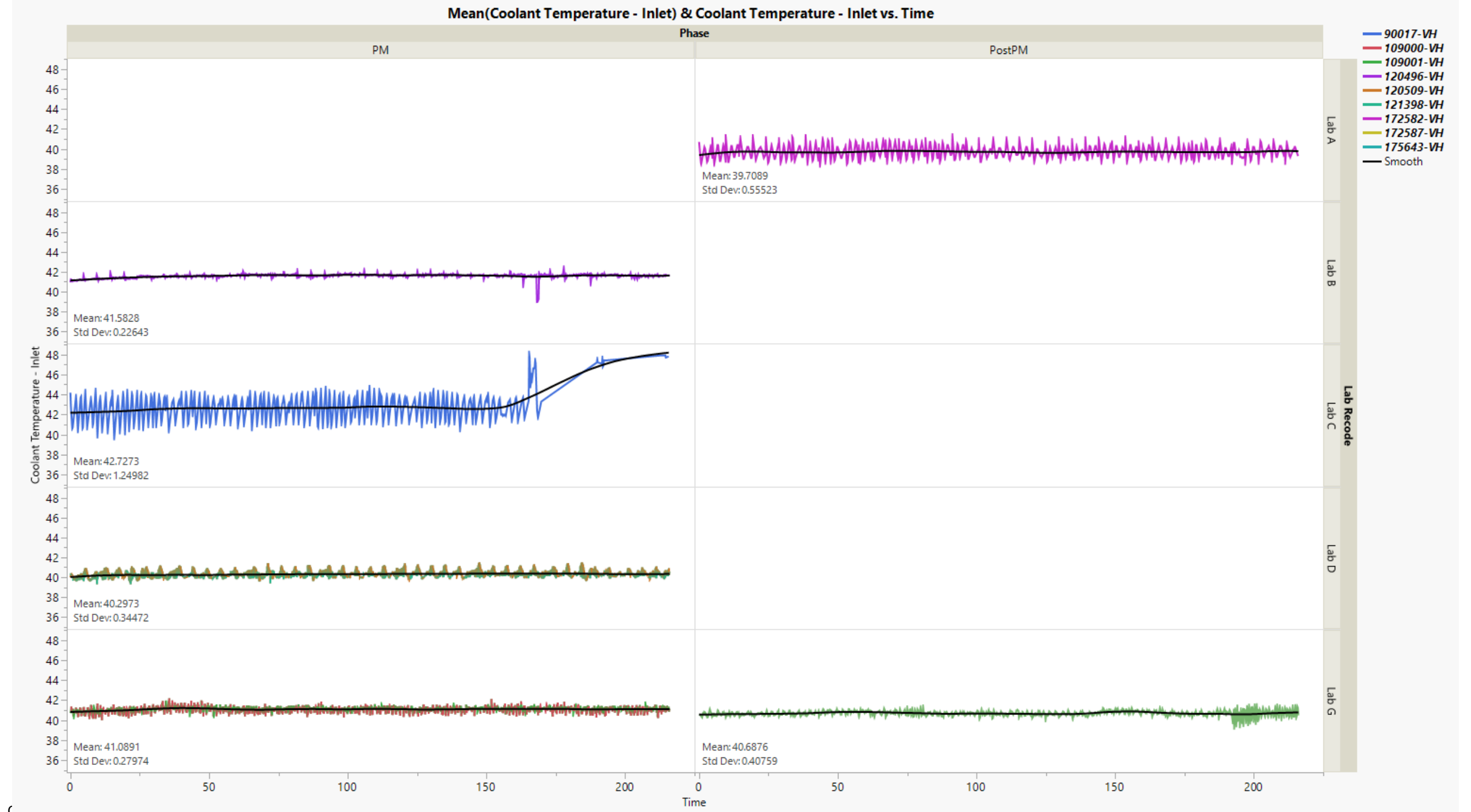

Mean(AFR Left) & AFR Left vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
AFR Left
Time
Mean: 0.73709
Std Dev: 0.00379
Mean: 0.7502
Std Dev: 0.00236
Mean: 0.75641
Std Dev: 0.00757
Mean: 0.73929
Std Dev: 0.00218
Mean: 0.73543
Std Dev: 0.01113
Mean: 0.74779
Std Dev: 0.00892
Where((Stage = Stage-3) and (RefOil 2 = RO940))



Where((Stage = Stage-3) and (RefOil 2 = RO940))



Where((Stage = Stage-3) and (RefOil 2 = RO940))

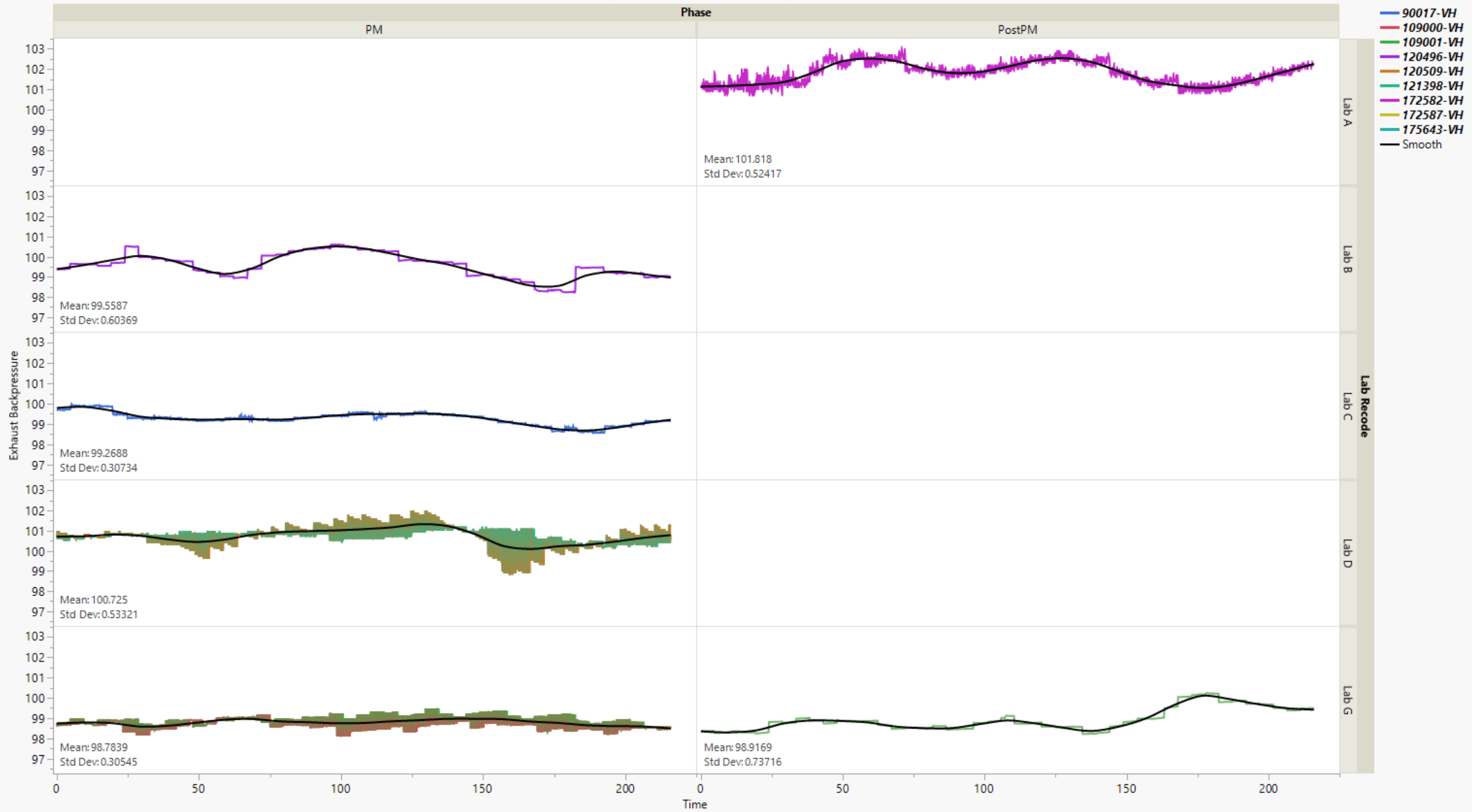

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Coolant Temperature - Inlet
Time
Mean: 39.7089
Std Dev: 0.55523
Mean: 41.5828
Std Dev: 0.22643
Mean: 42.7273
Std Dev: 1.24982
Mean: 40.2973
Std Dev: 0.34472
Mean: 41.0891
Std Dev: 0.27974
Mean: 40.6876
Std Dev: 0.40759
Where((Stage = Stage-3) and (RefOil 2 = RO940))

Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Coolant Temperature - Outlet
Time
Mean: 45.0065
Std Dev: 0.46282
Mean: 45.0097
Std Dev: 0.10844
Mean: 44.9589
Std Dev: 0.19195
Mean: 45.1591
Std Dev: 0.26112
Mean: 44.9812
Std Dev: 0.23001
Mean: 44.9687
Std Dev: 0.23759
Where((Stage = Stage-3) and (RefOil 2 = RO940))

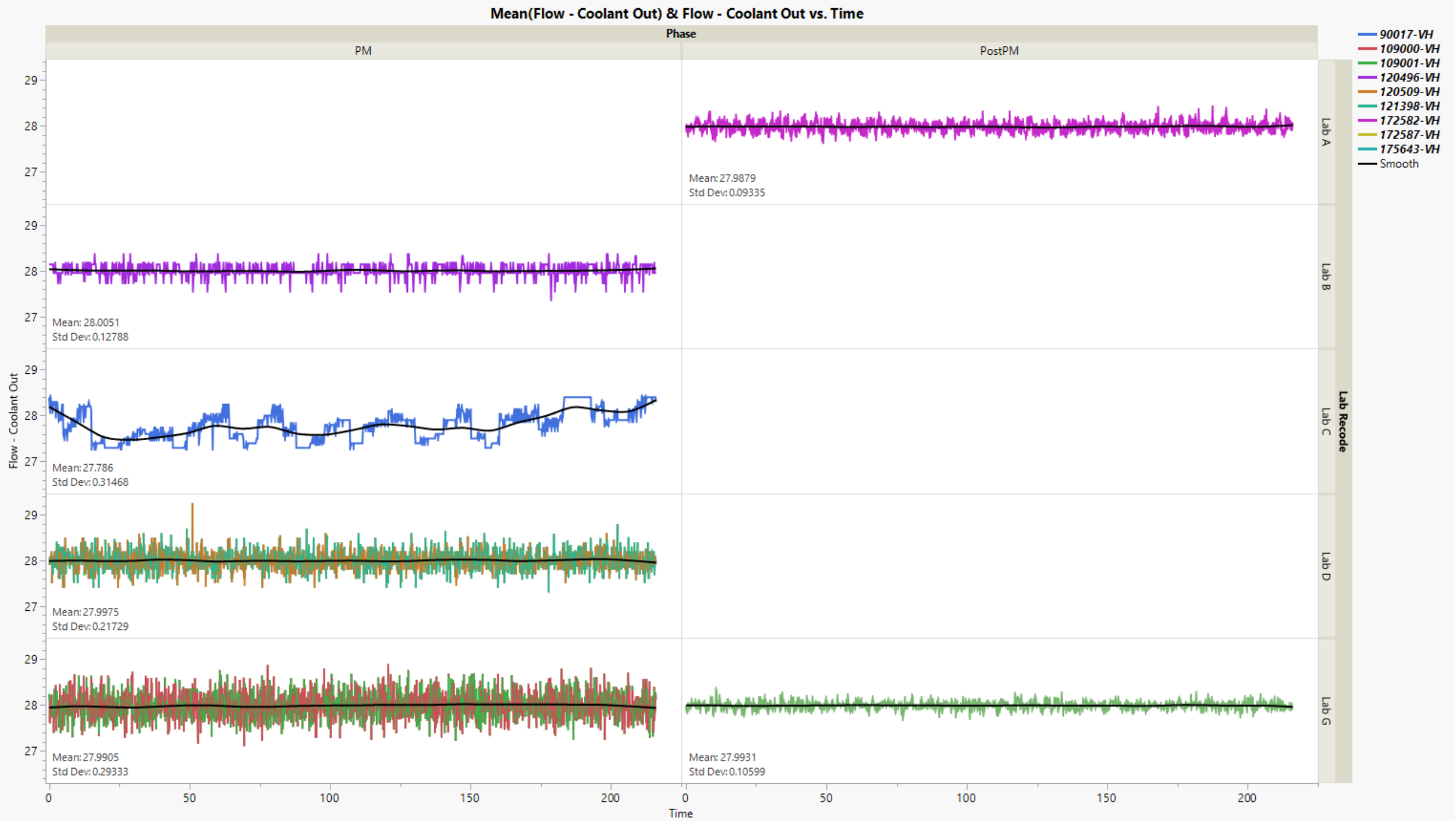
Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Crankcase Pressure
Time
Mean: 0.01556
Std Dev: 0.01234
Mean: 0.00384
Std Dev: 0.04633
Mean: 0.0569
Std Dev: 0.02356
Mean: 0.03734
Std Dev: 0.00679
Mean: 0.02719
Std Dev: 0.00698
Mean: 0.02507
Std Dev: 0.01157
Where((Stage = Stage-3) and (RefOil 2 = RO940))

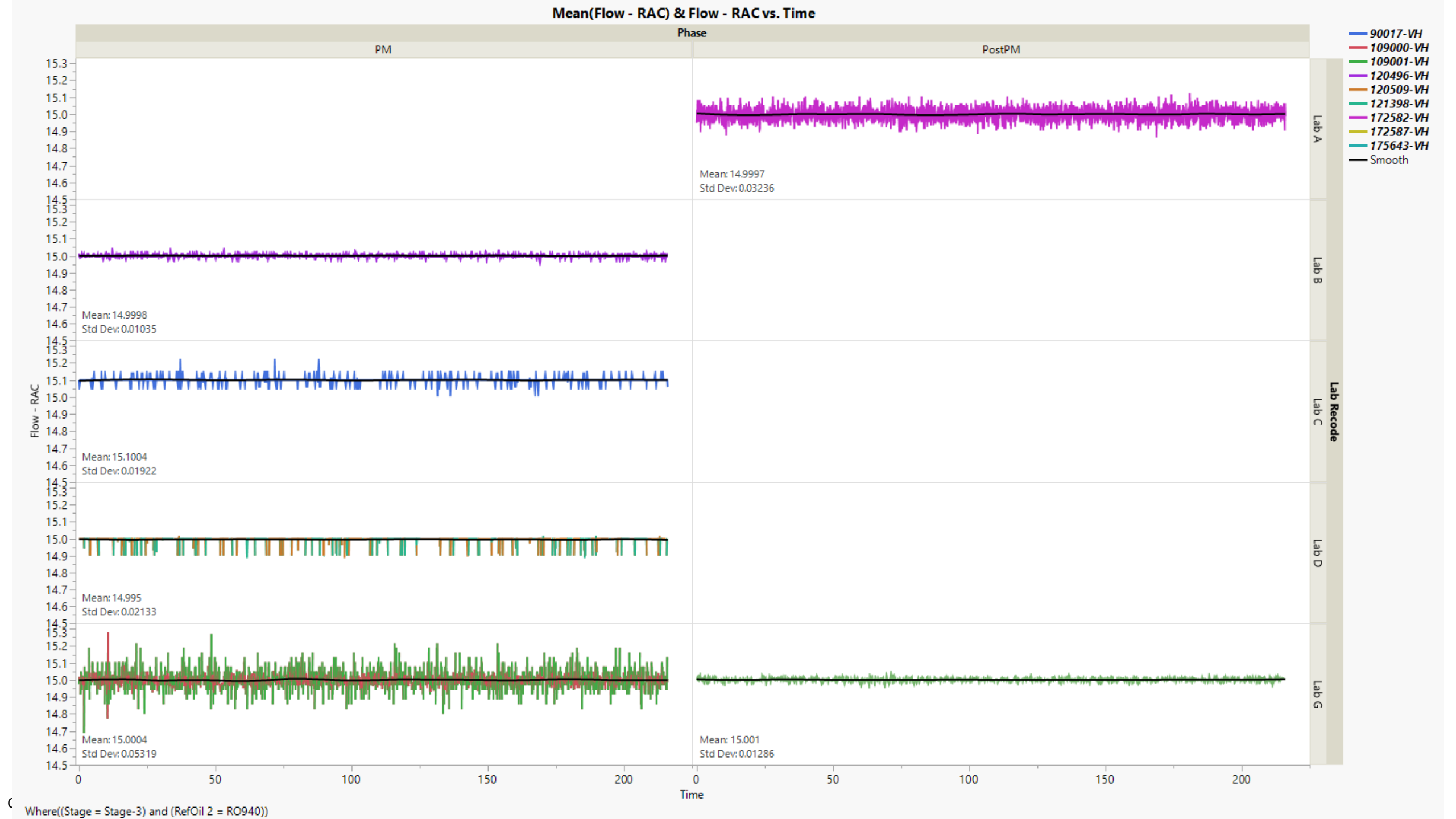
Where((Stage = Stage-3) and (RefOil 2 = RO940))

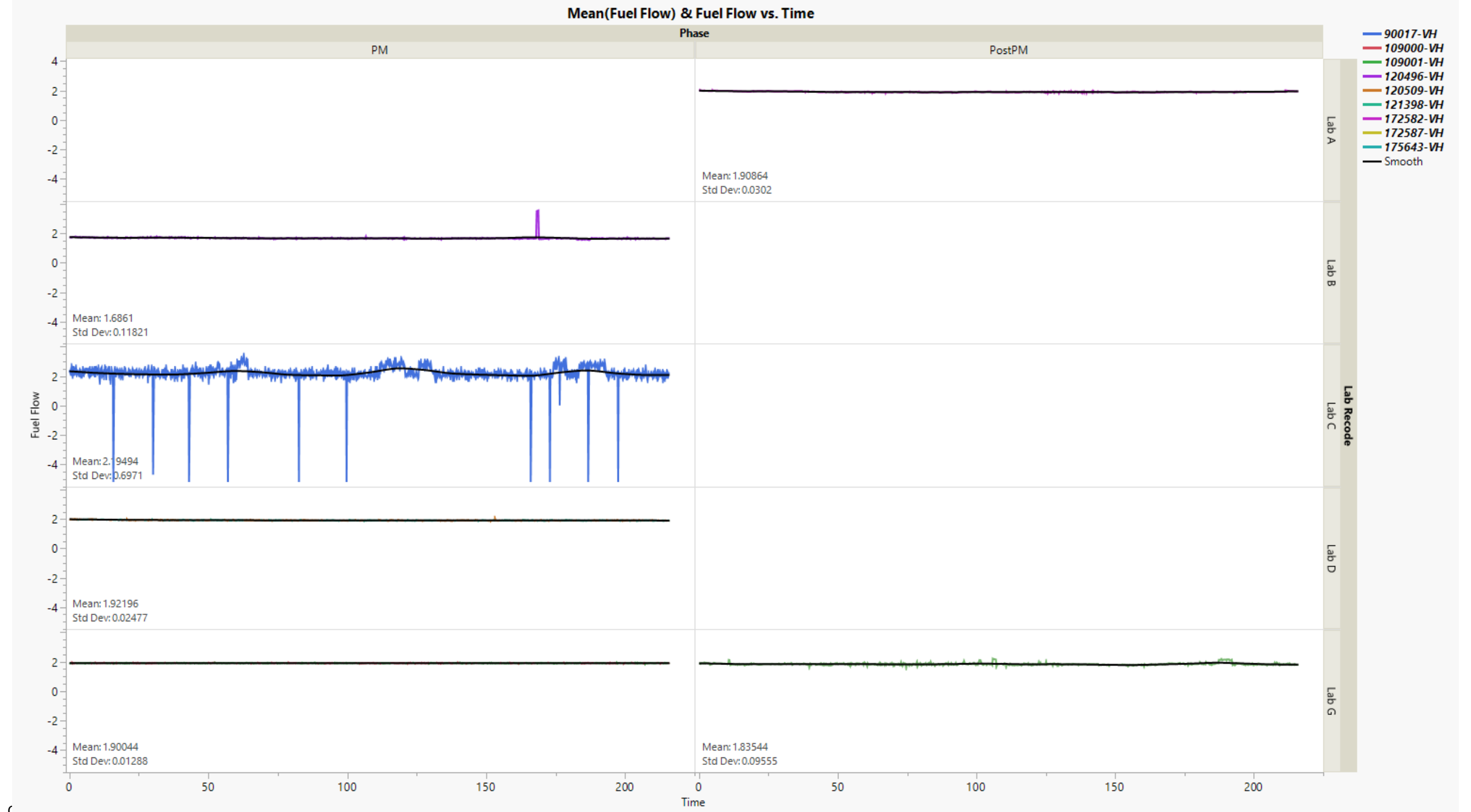
Where((Stage = Stage-3) and (RefOil 2 = RO940))



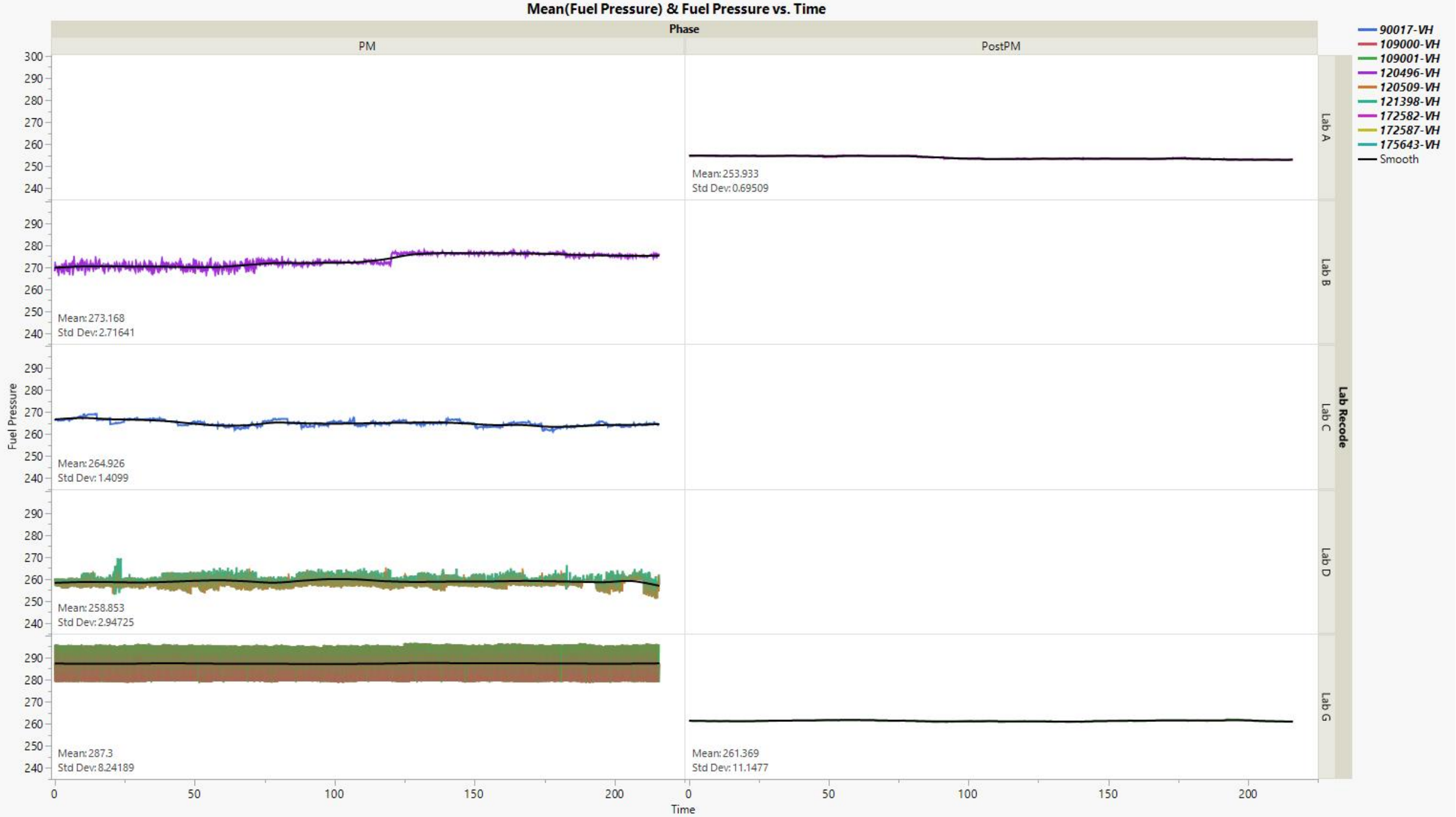
Where((Stage = Stage-3) and (RefOil 2 = RO940))


Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 27.9879
Std Dev: 0.09335
Mean: 28.0051
Std Dev: 0.12788
Mean: 27.786
Std Dev: 0.31468
Mean: 27.9975
Std Dev: 0.21729
Mean: 27.9905
Std Dev: 0.29333
Mean: 27.9931
Std Dev: 0.10599
Flow - Coolant Out
Time
29
28
27
0
50
100
150
200
Where((Stage = Stage-3) and (RefOil 2 = RO940))

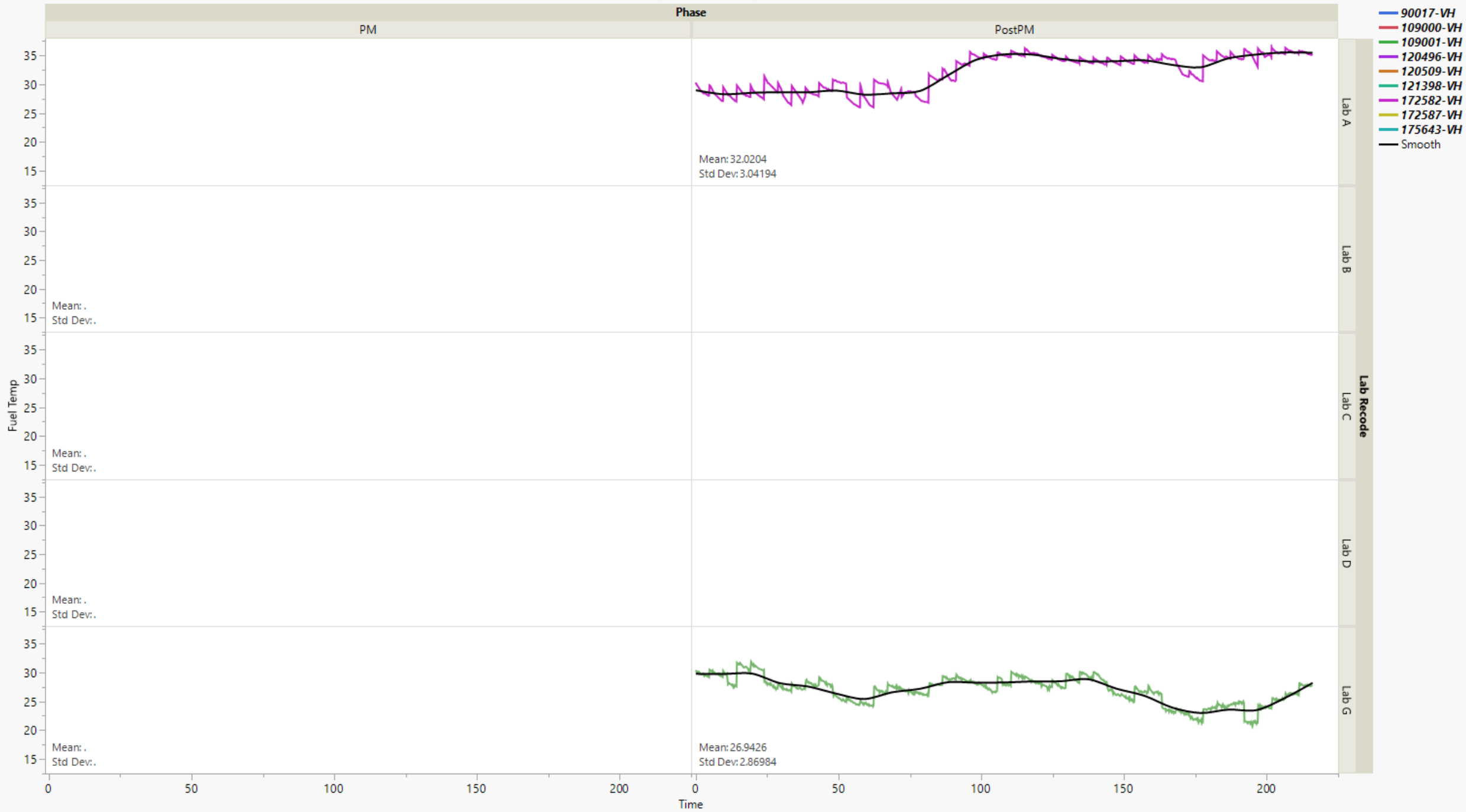

Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
Flow - RAC
Time
Mean: 14.9997
Std Dev: 0.03236
Mean: 14.9998
Std Dev: 0.01035
Mean: 15.1004
Std Dev: 0.01922
Mean: 14.995
Std Dev: 0.02133
Mean: 15.0004
Std Dev: 0.05319
Mean: 15.001
Std Dev: 0.01286
Where((Stage = Stage-3) and (RefOil 2 = RO940))

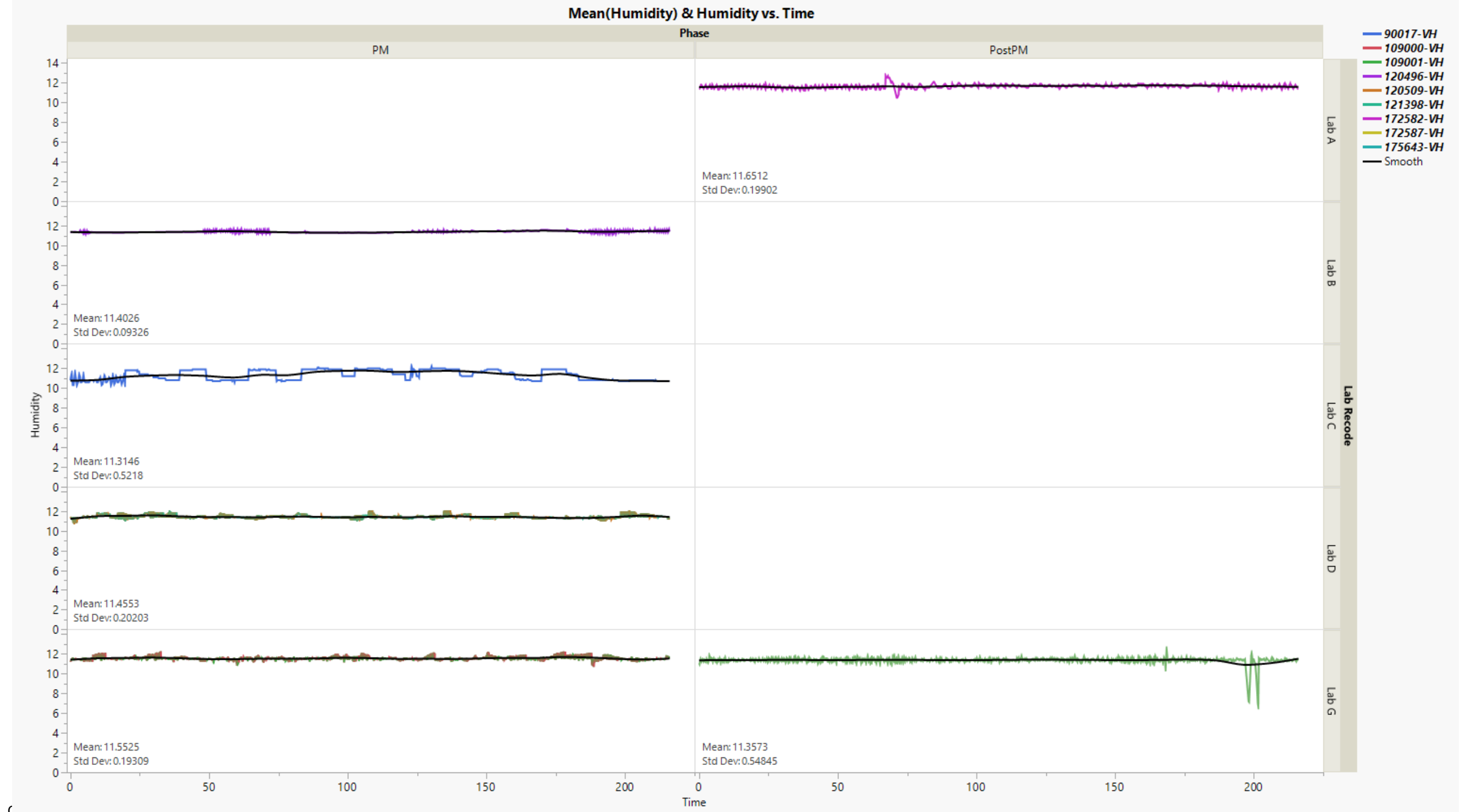


Where((Stage = Stage-3) and (RefOil 2 = RO940))

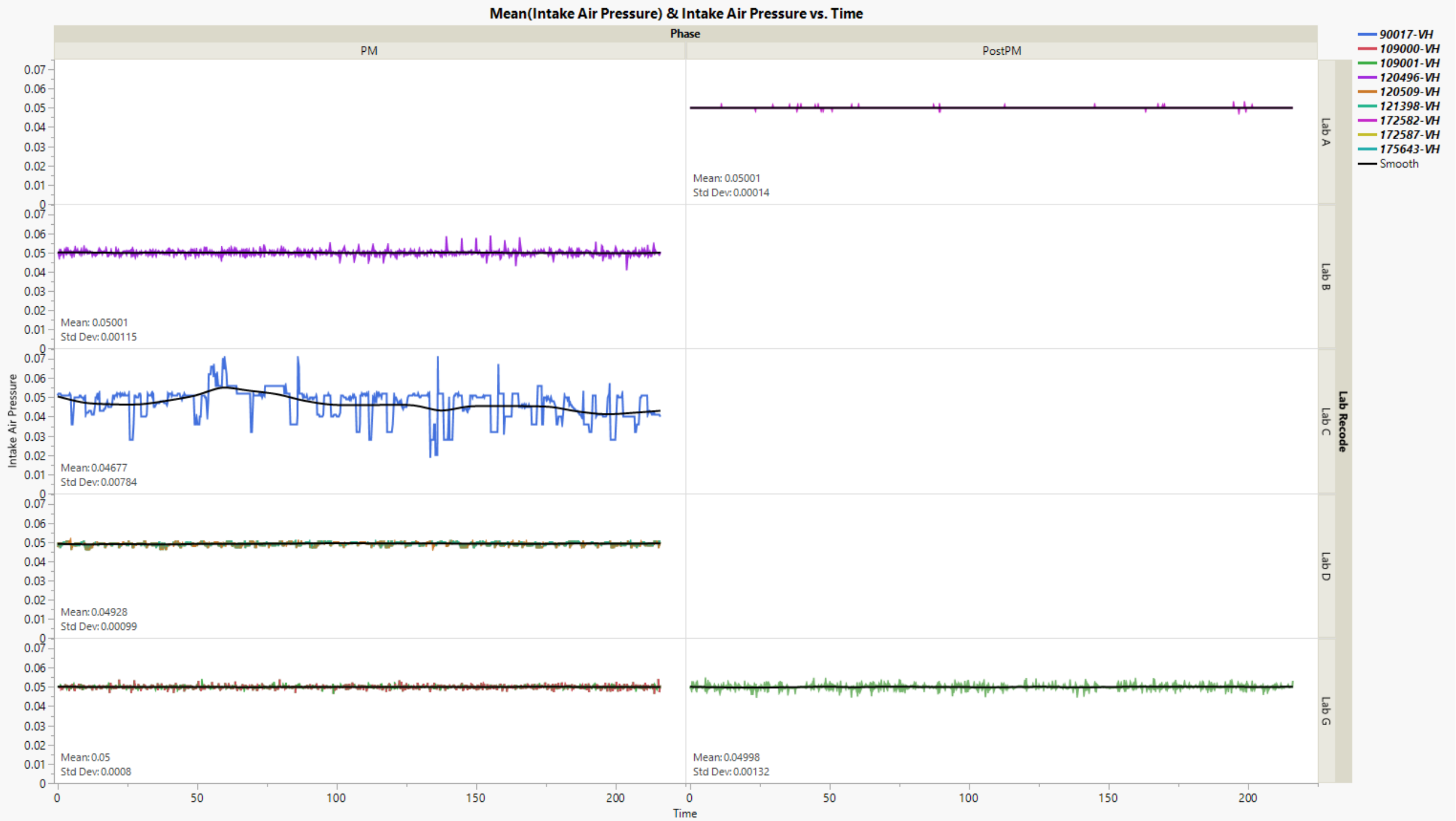


Where((Stage = Stage-3) and (RefOil 2 = RO940))

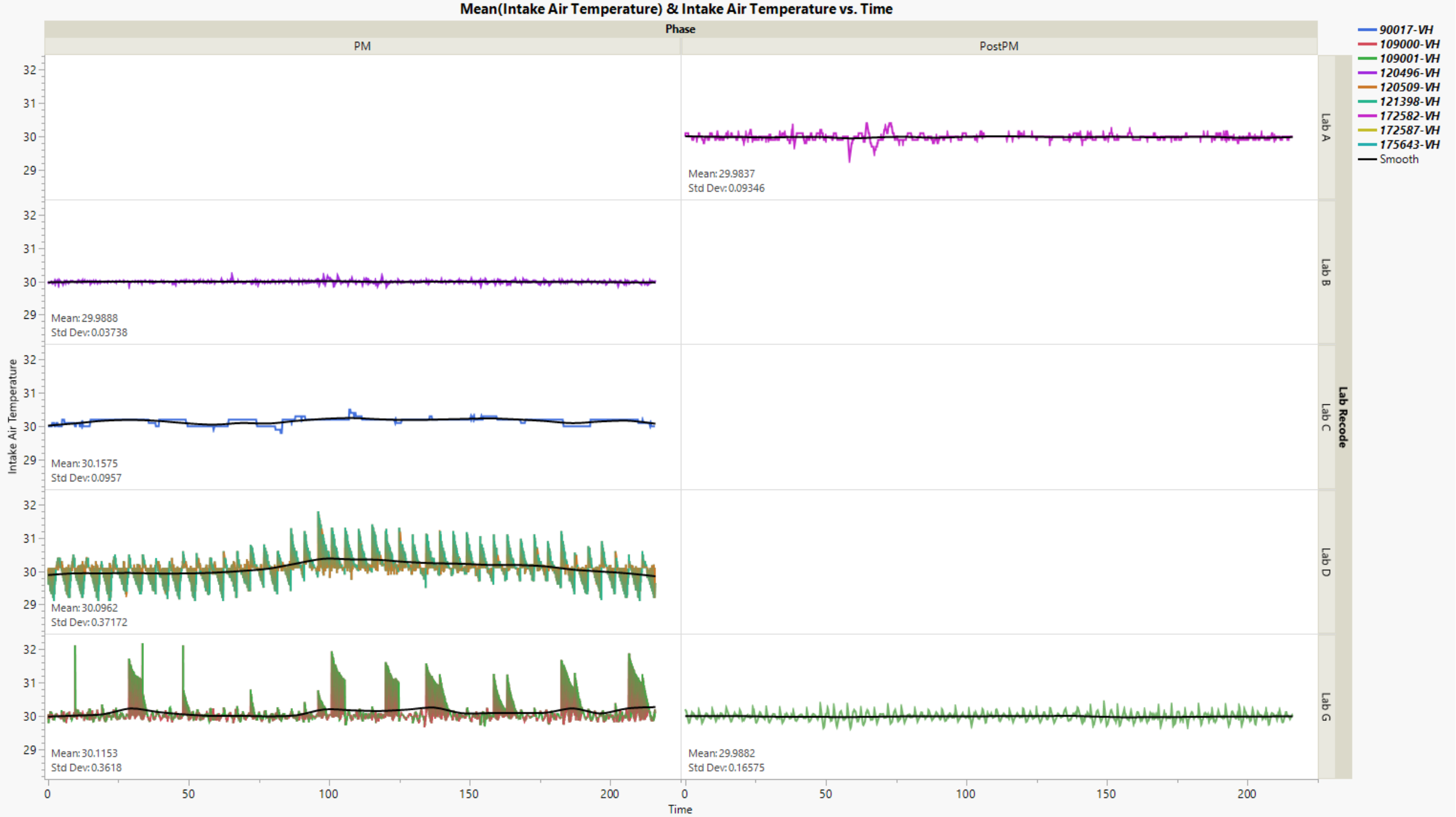

Mean(Fuel Temp) & Fuel Temp vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 32.0204
Std Dev: 3.04194
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: 26.9426
Std Dev: 2.86984
Fuel Temp
Time
Where((Stage = Stage-3) and (RefOil 2 = RO940))

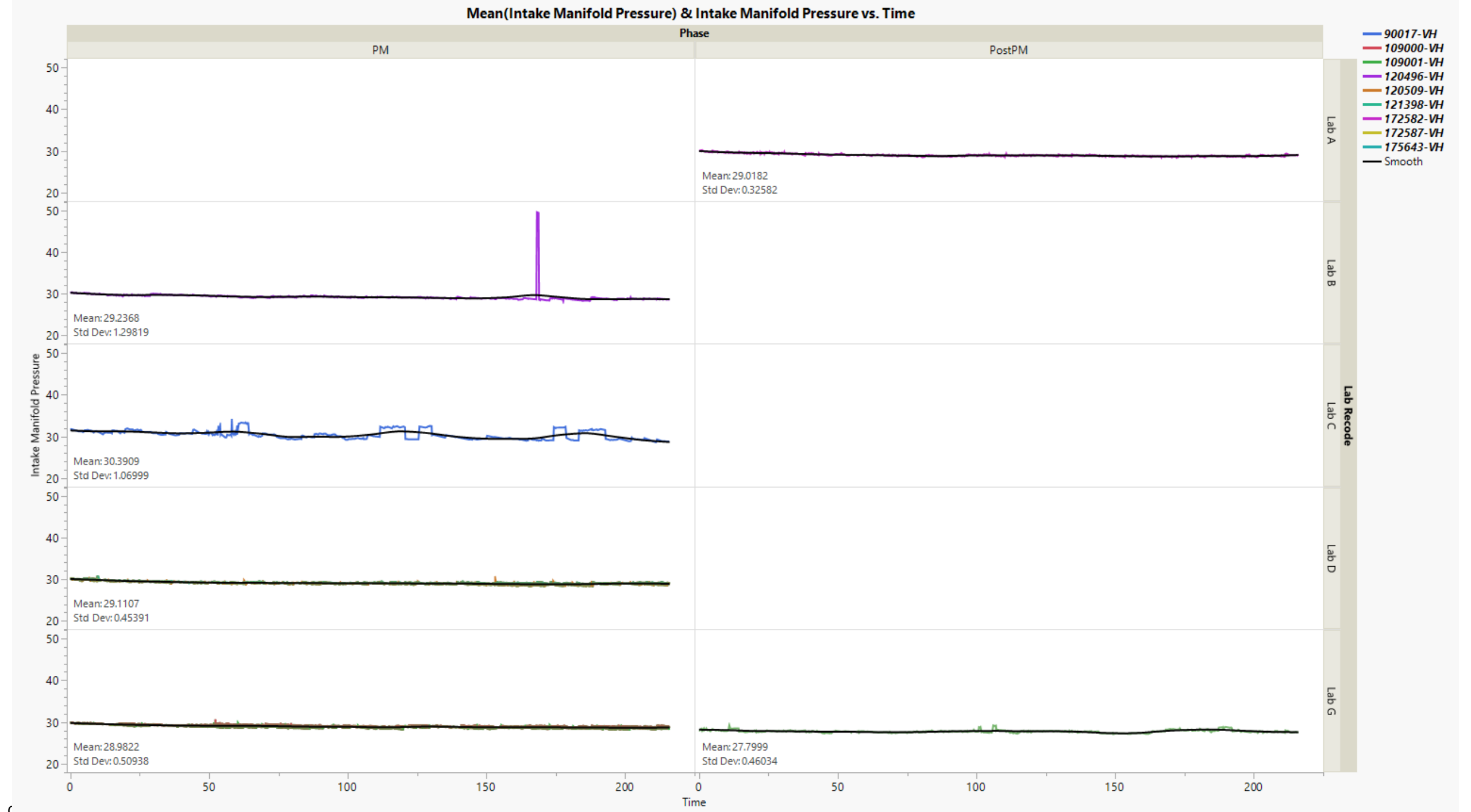


Where((Stage = Stage-3) and (RefOil 2 = RO940))

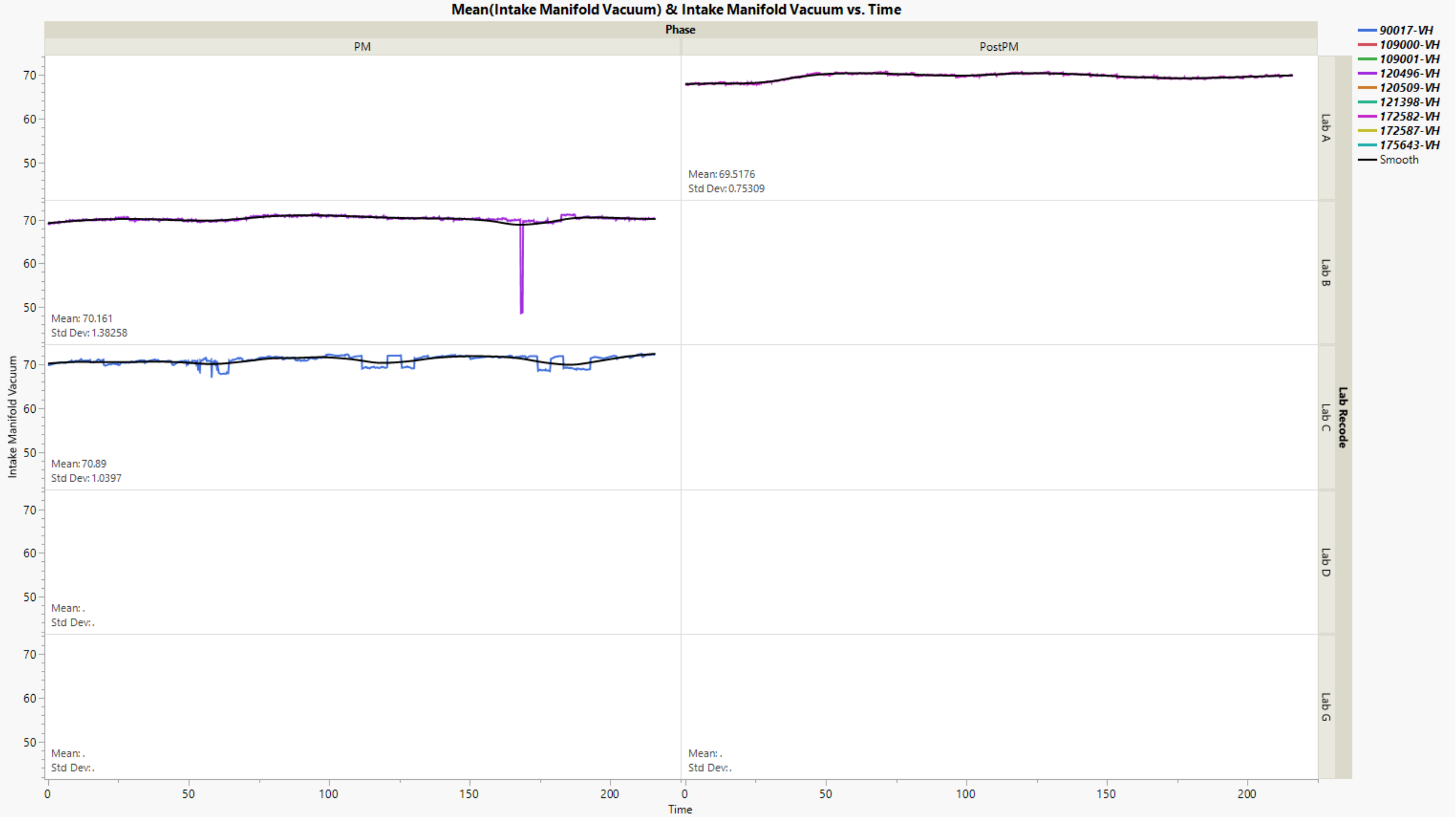


Where((Stage = Stage-3) and (RefOil 2 = RO940))


Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Intake Air Temperature
Time
Mean: 29.9837
Std Dev: 0.09346
Mean: 29.9888
Std Dev: 0.03738
Mean: 30.1575
Std Dev: 0.0957
Mean: 30.0962
Std Dev: 0.37172
Mean: 30.1153
Std Dev: 0.3618
Mean: 29.9882
Std Dev: 0.16575
Where((Stage = Stage-3) and (RefOil 2 = RO940))

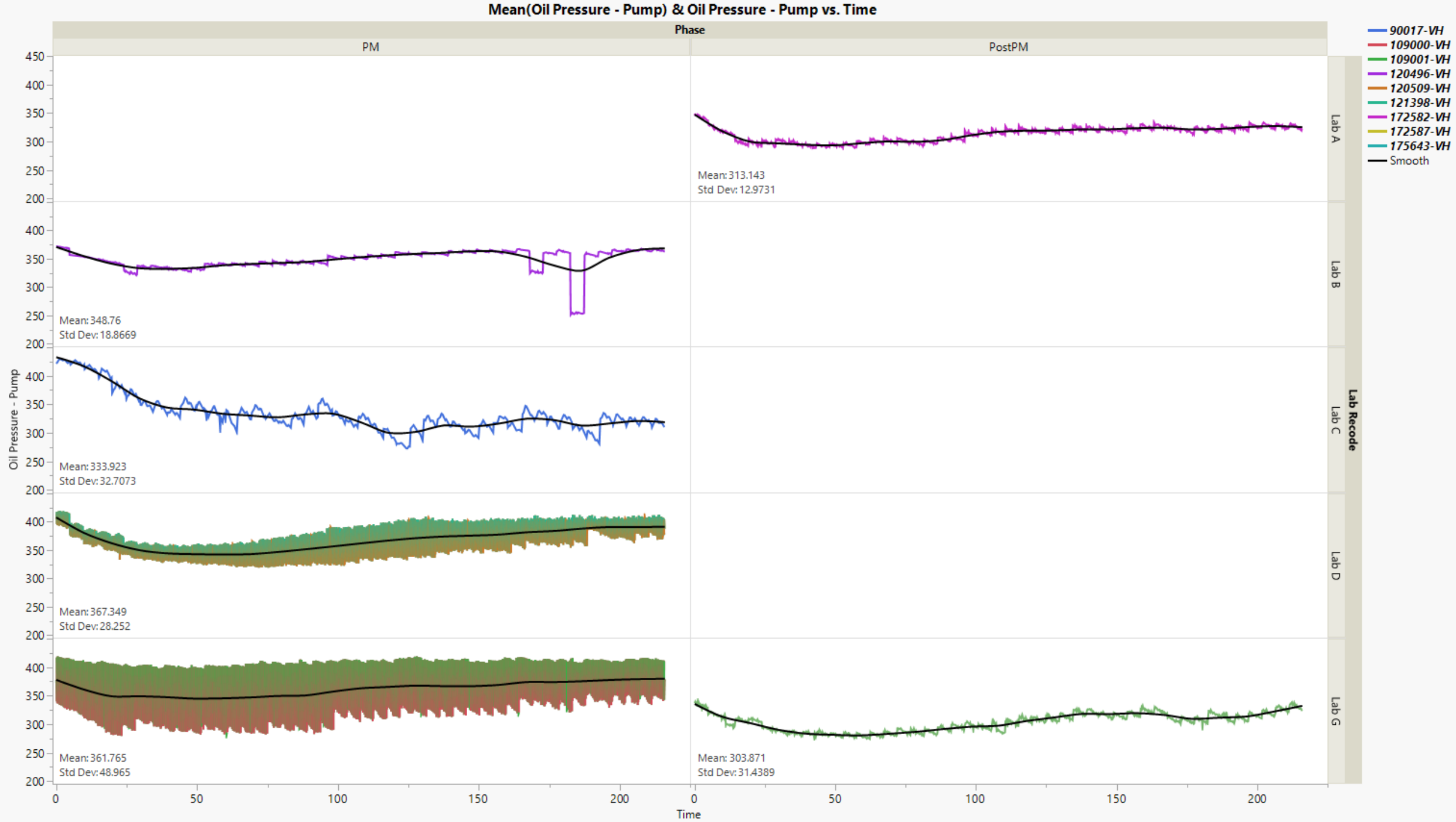


Where((Stage = Stage-3) and (RefOil 2 = RO940))

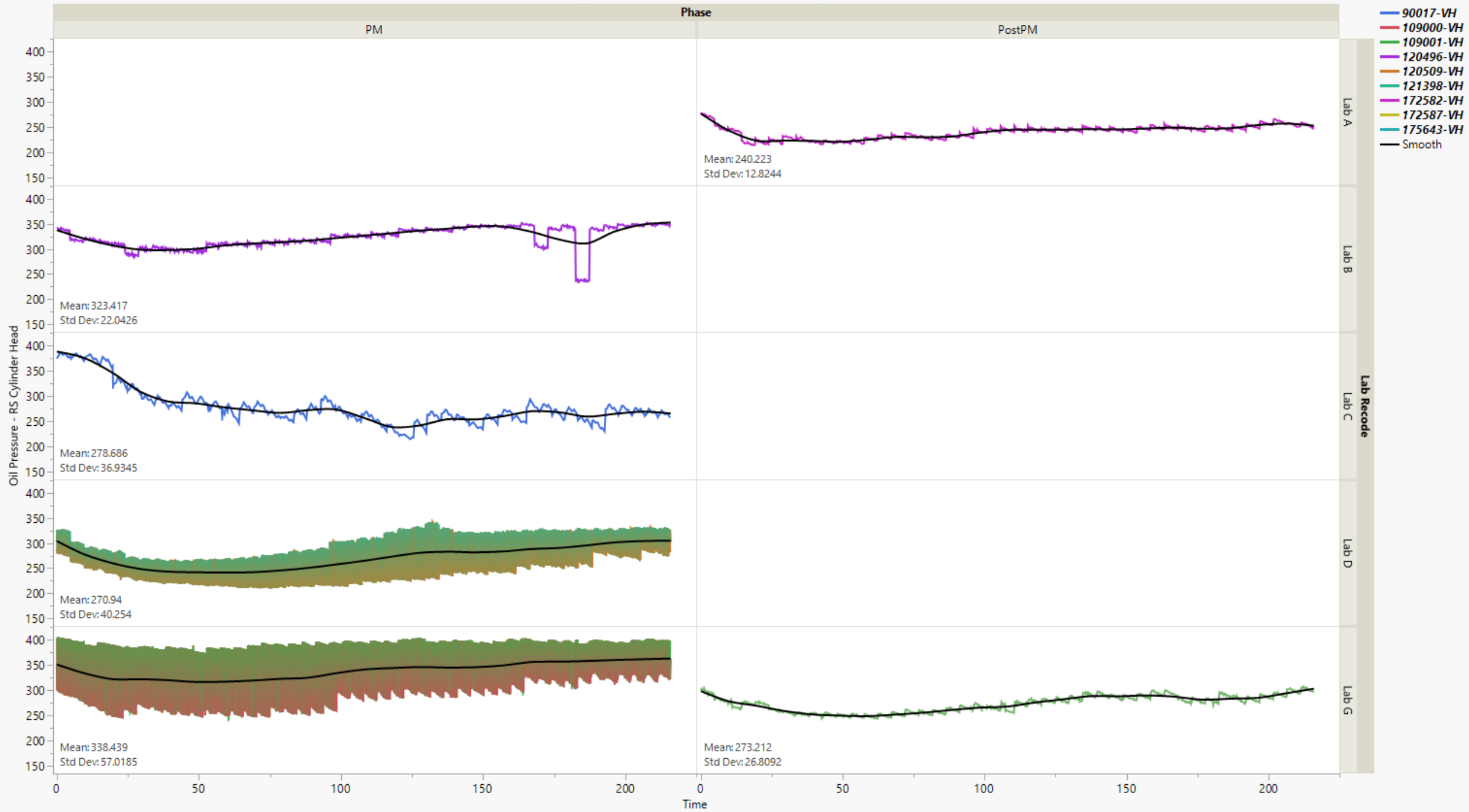


Where((Stage = Stage-3) and (RefOil 2 = RO940))

Where((Stage = Stage-3) and (RefOil 2 = RO940))

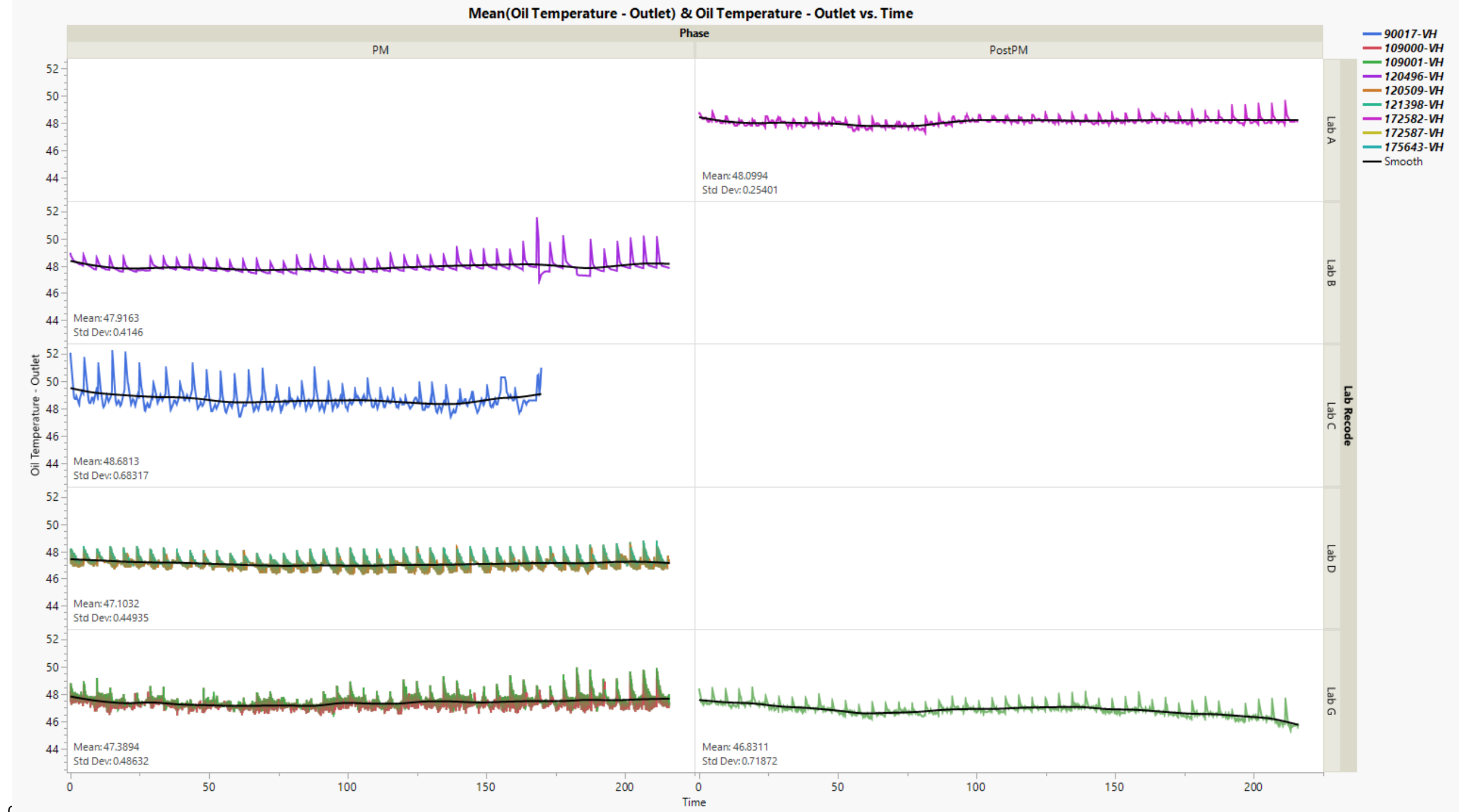


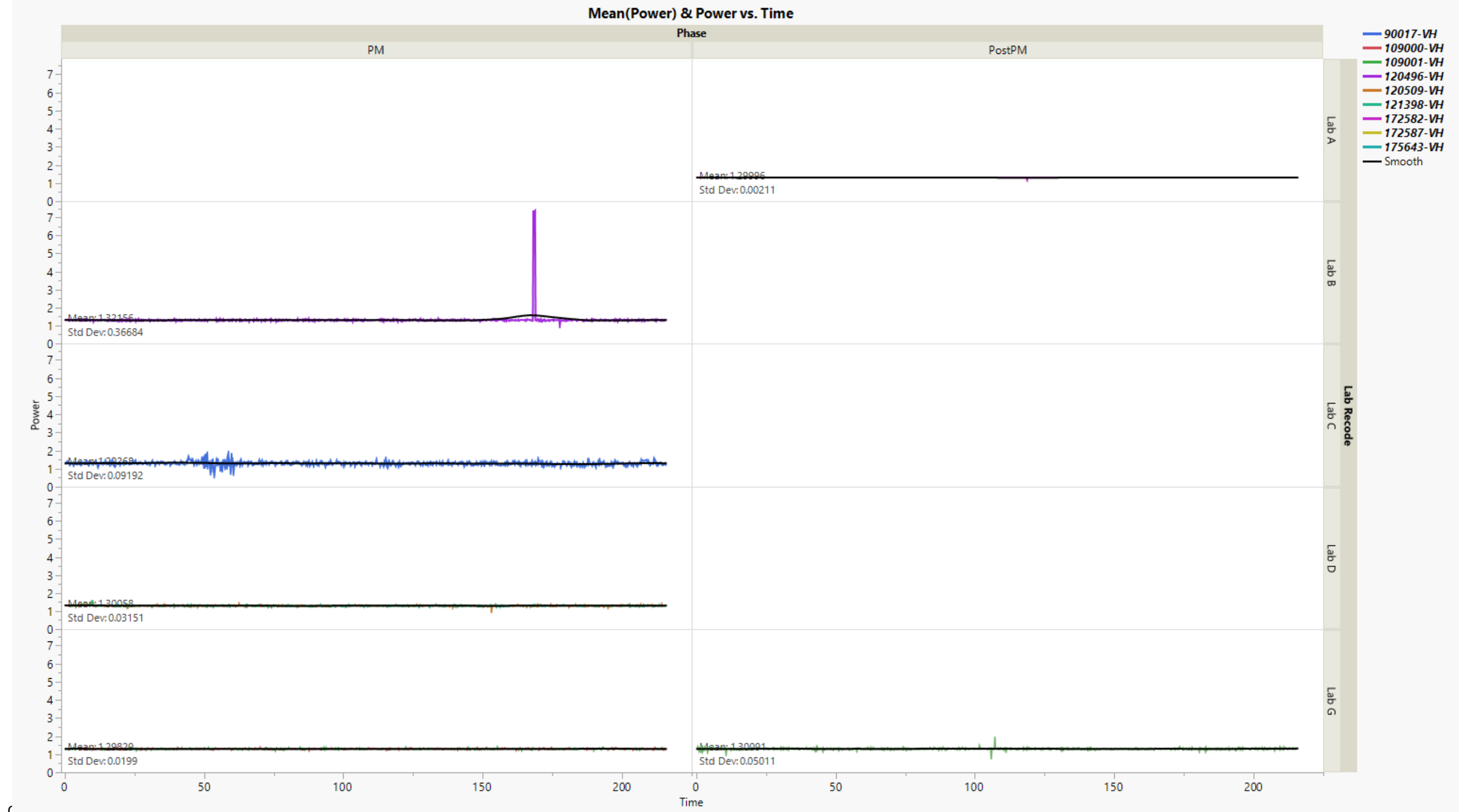
Where((Stage = Stage-3) and (RefOil 2 = RO940))



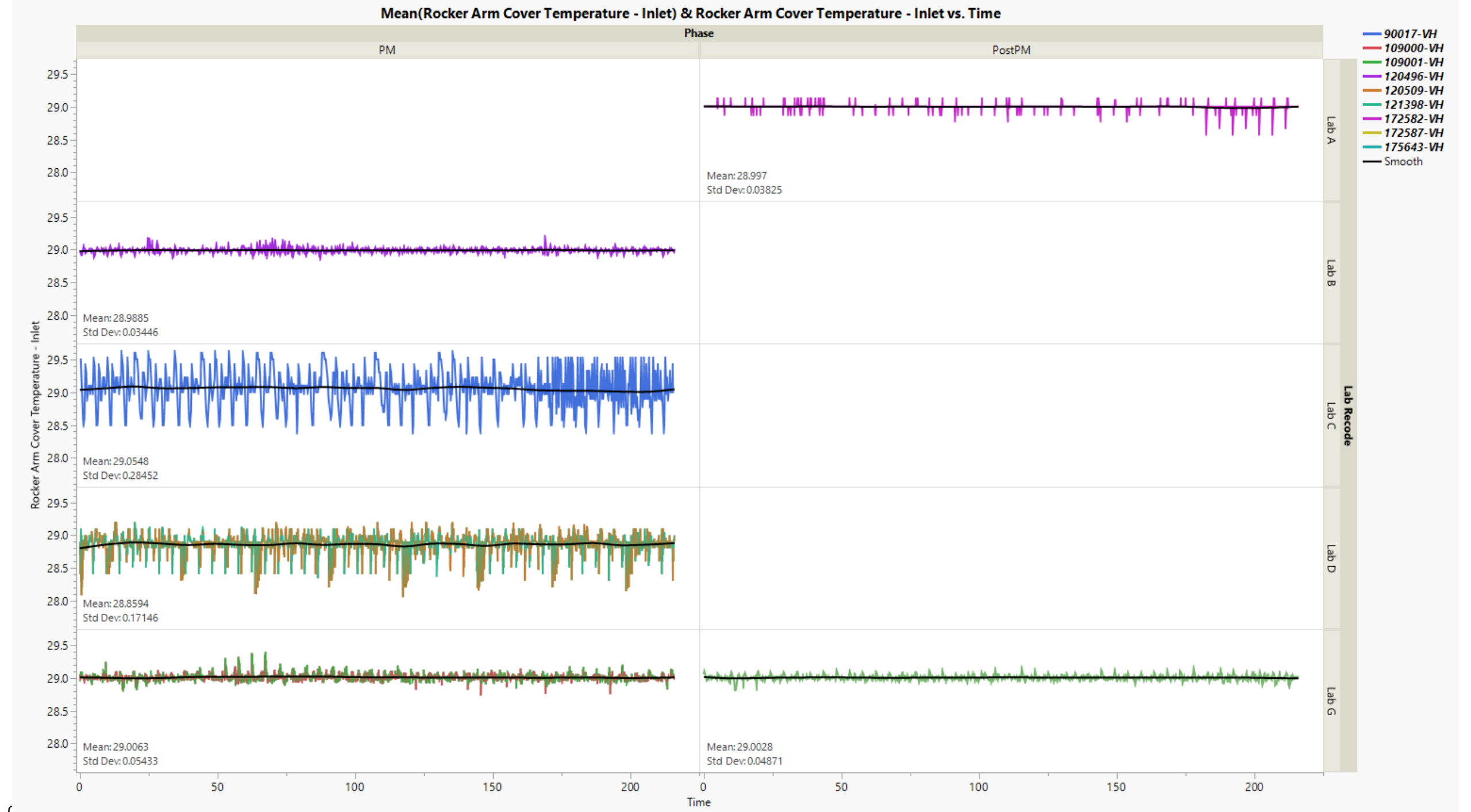
Where((Stage = Stage-3) and (RefOil 2 = RO940))

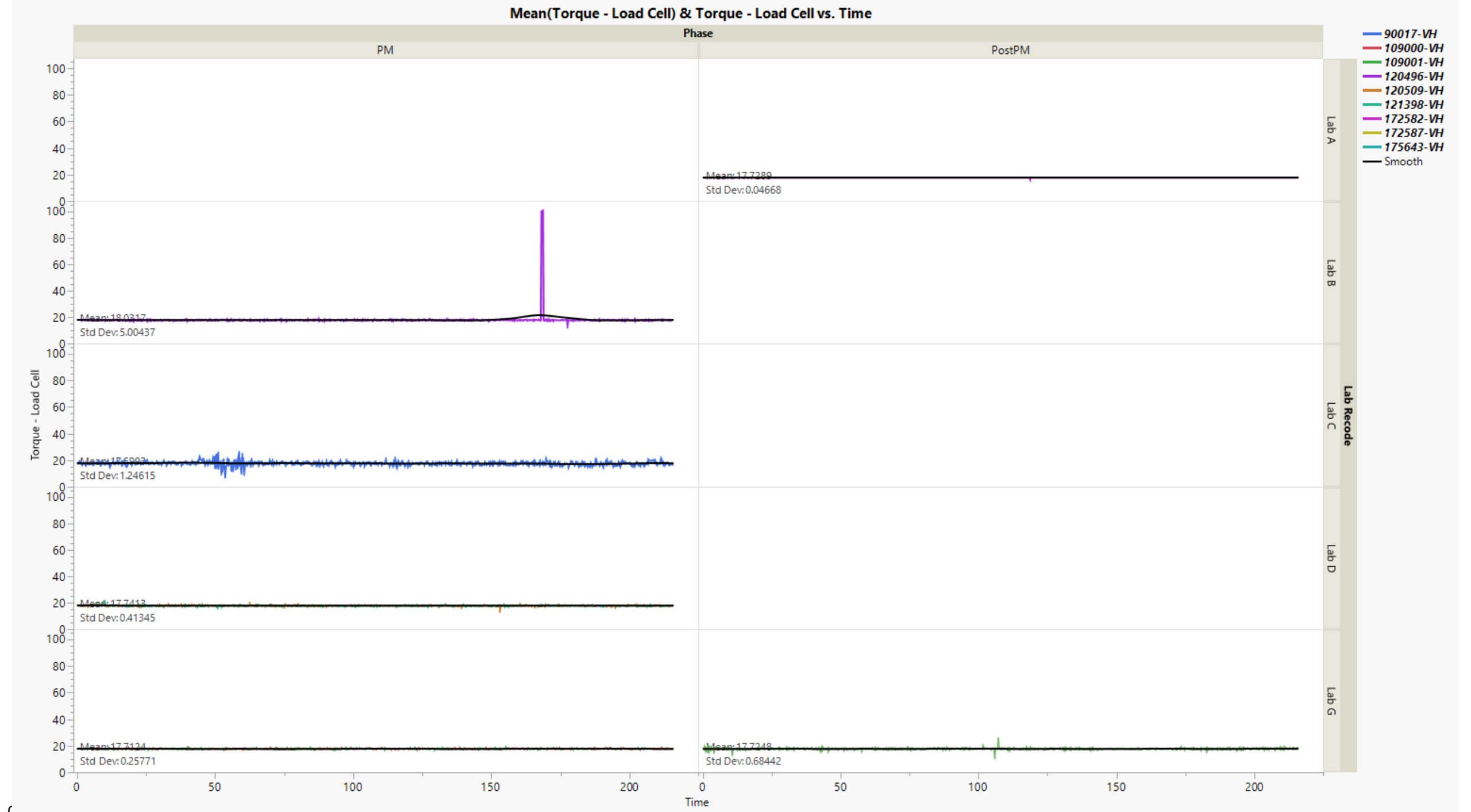
Where((Stage = Stage-3) and (RefOil 2 = RO940))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 48.0994
Std Dev: 0.25401
Mean: 47.9163
Std Dev: 0.4146
Mean: 48.6813
Std Dev: 0.68317
Mean: 47.1032
Std Dev: 0.44935
Mean: 47.3894
Std Dev: 0.48632
Mean: 46.8311
Std Dev: 0.71872
Oil Temperature - Outlet
Time
Where((Stage = Stage-3) and (RefOil 2 = RO940))



Where((Stage = Stage-3) and (RefOil 2 = RO940))


Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
Rocker Arm Cover Temperature - Inlet
Time
Lab Recode
Lab A
Lab B
Lab C
Lab D
Lab G
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 28.997
Std Dev: 0.03825
Mean: 28.9885
Std Dev: 0.03446
Mean: 29.0548
Std Dev: 0.28452
Mean: 28.8594
Std Dev: 0.17146
Mean: 29.0063
Std Dev: 0.05433
Mean: 29.0028
Std Dev: 0.04871
Where((Stage = Stage-3) and (RefOil 2 = RO940))



Where((Stage = Stage-3) and (RefOil 2 = RO940))

RO 1011 Data Plots

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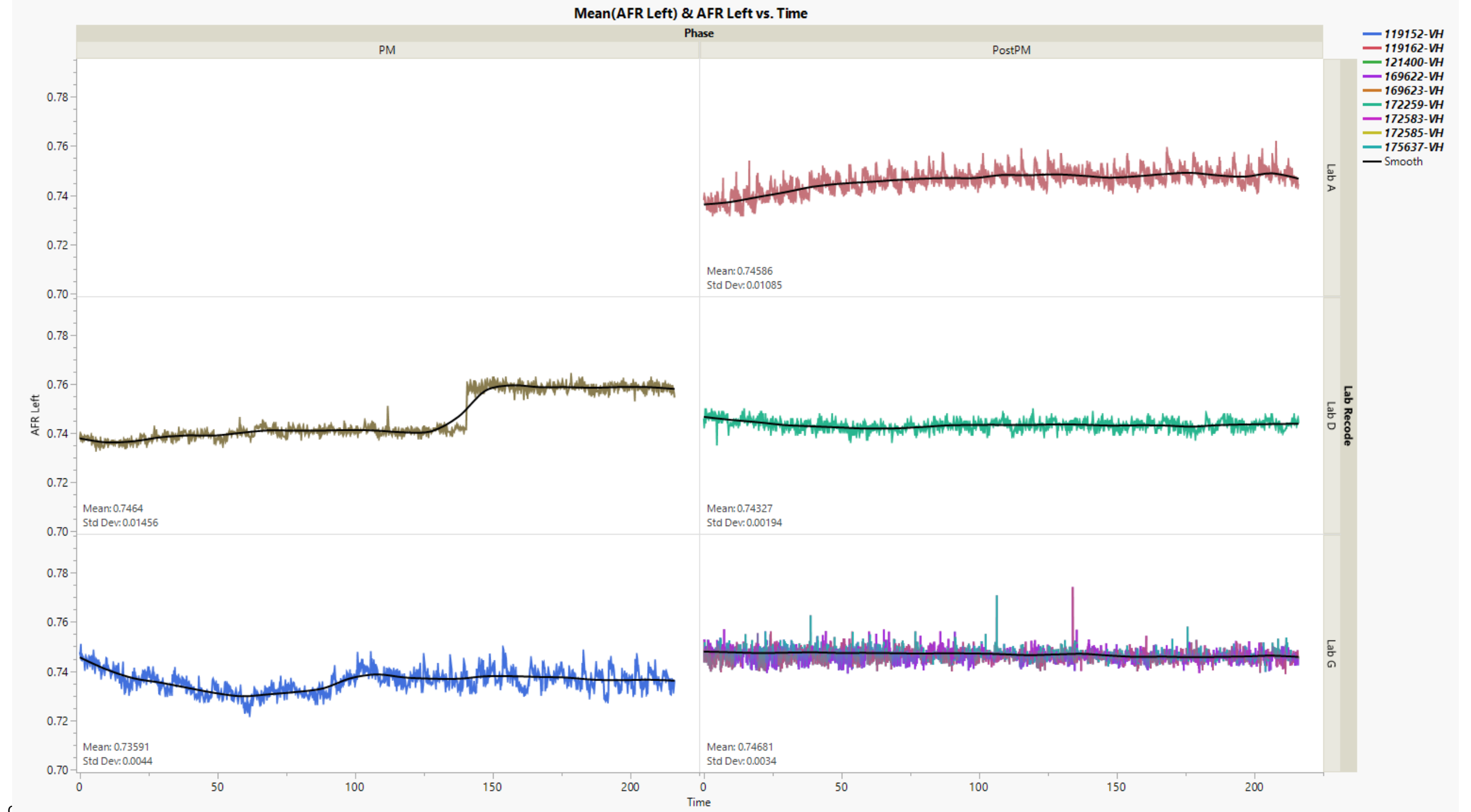
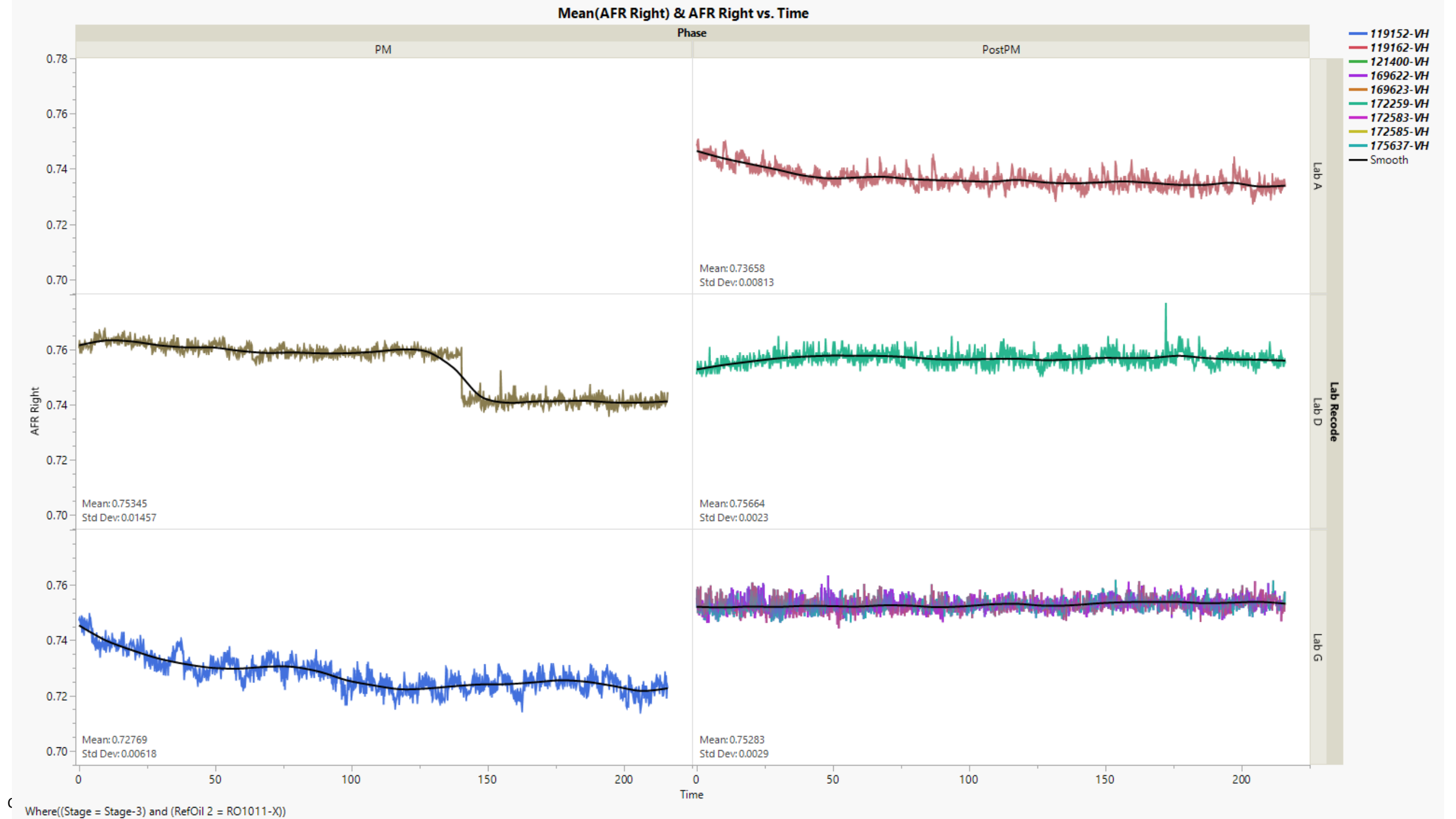
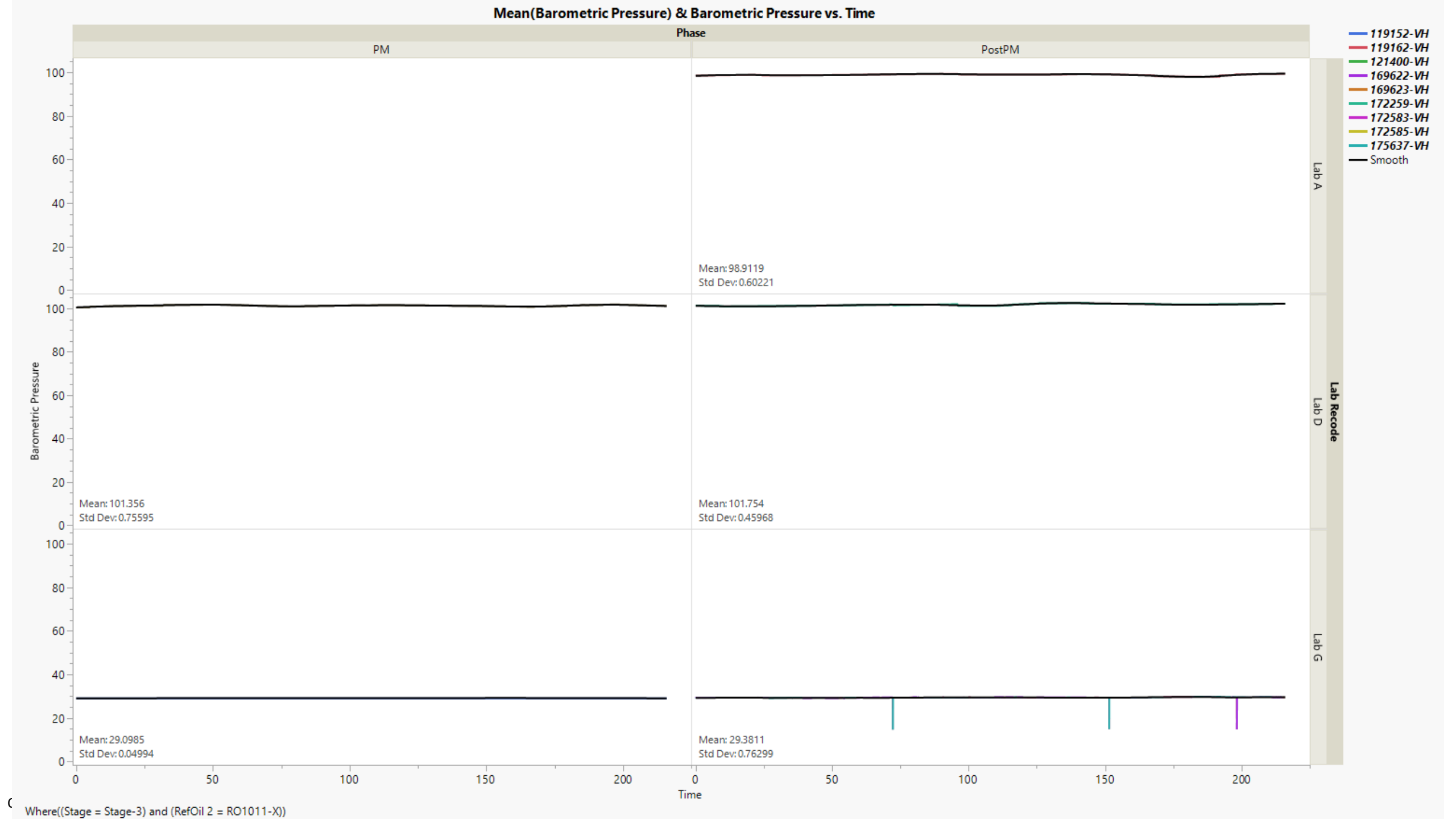
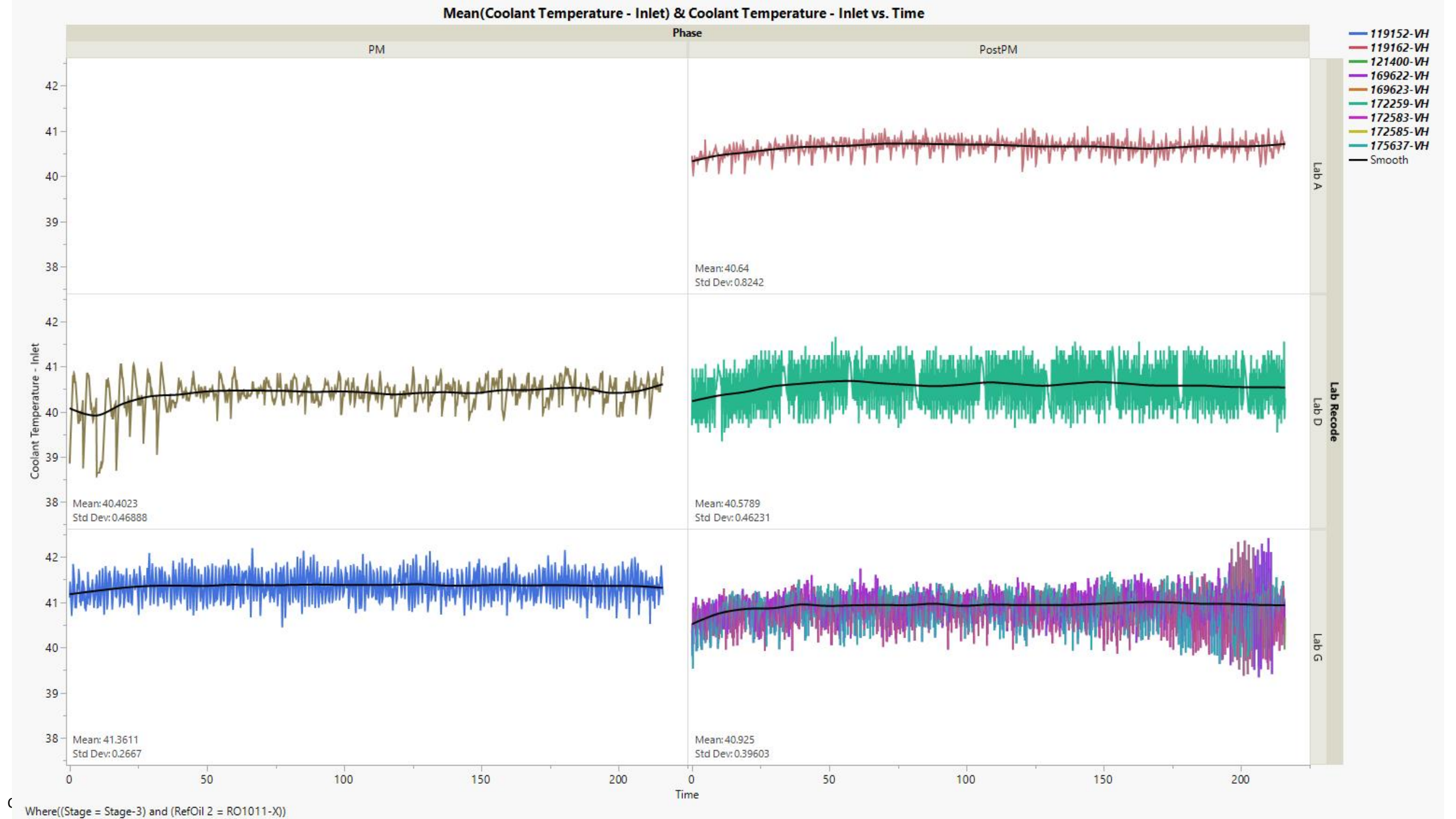


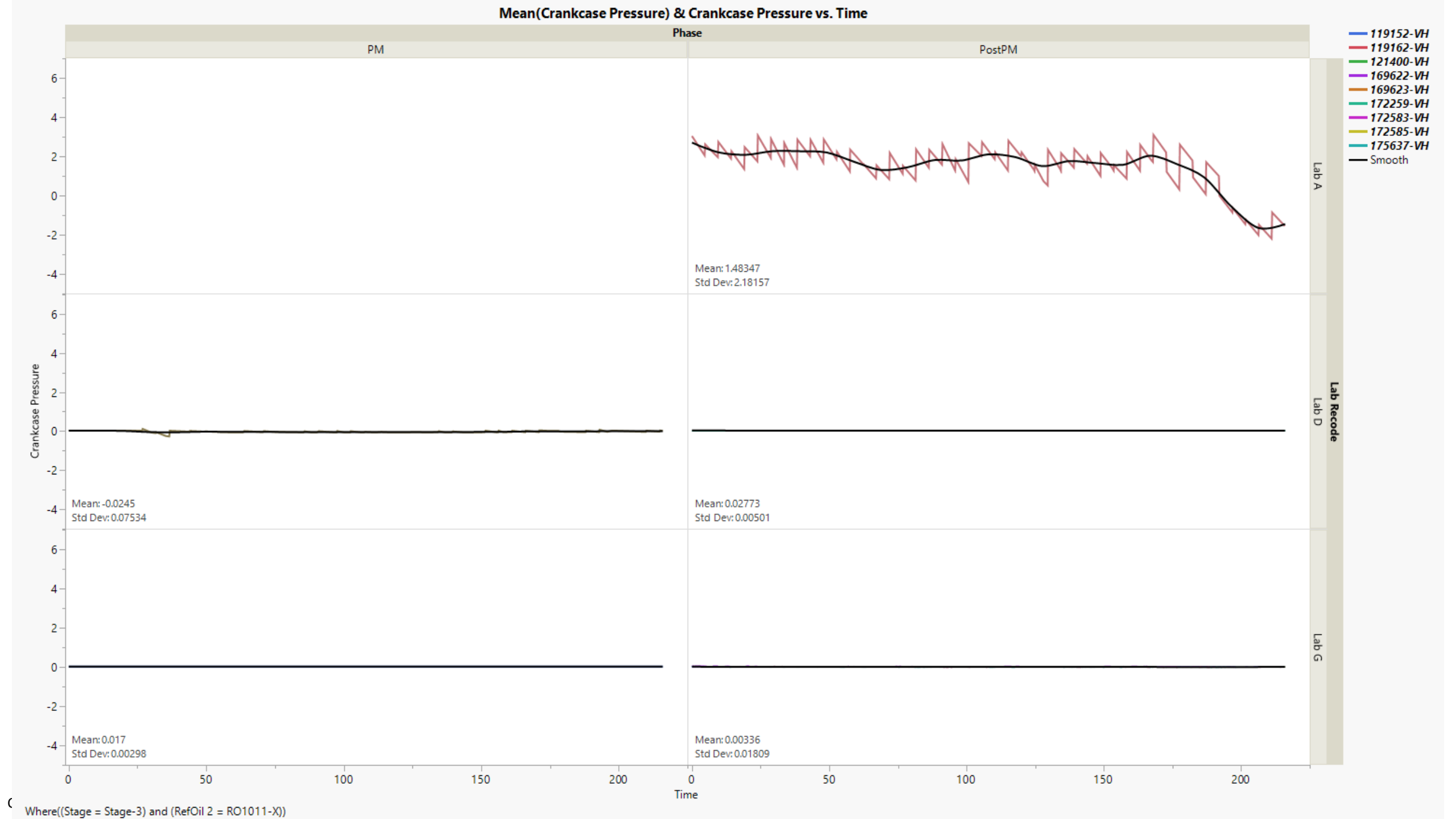
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

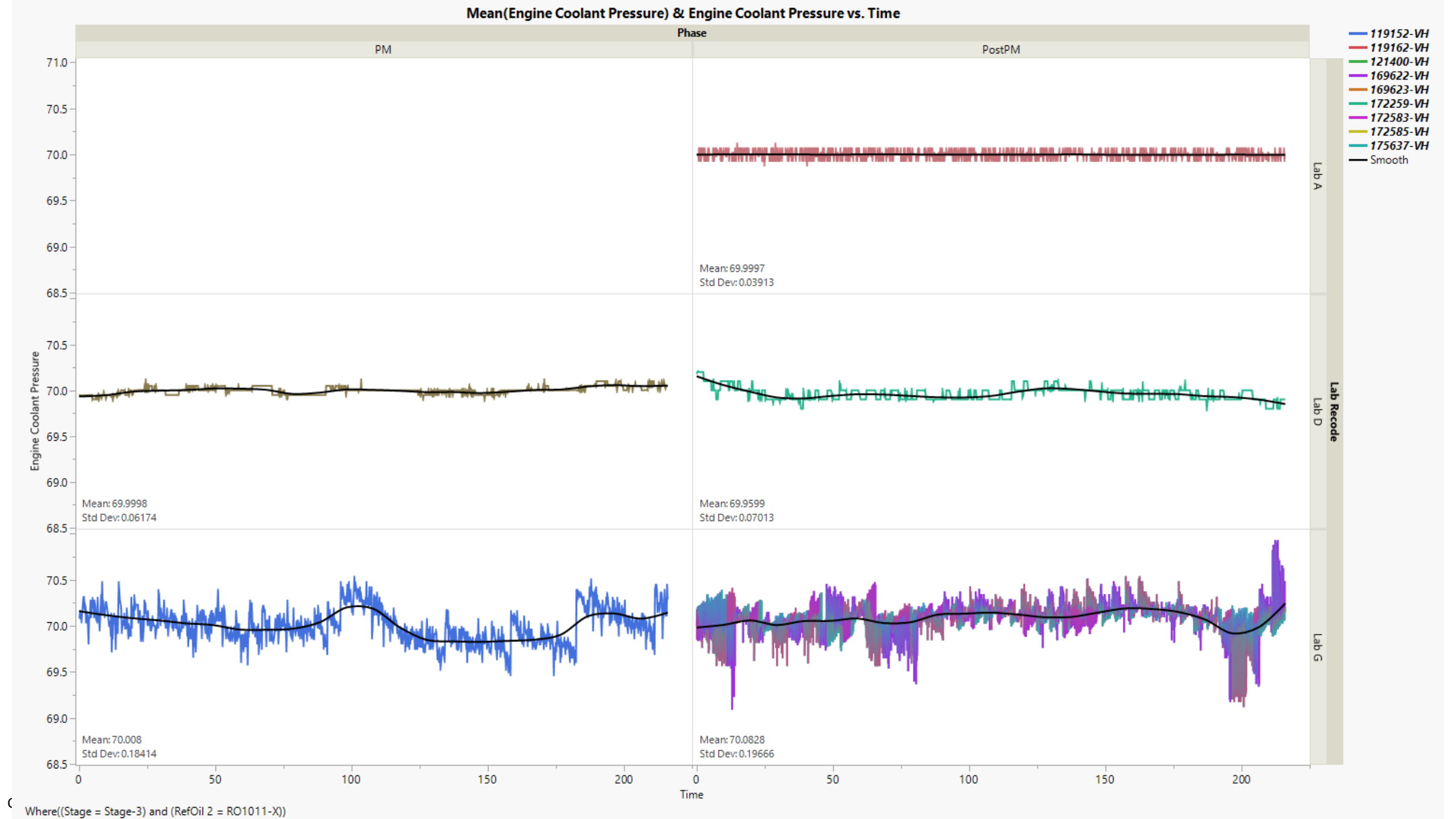

Mean(AFR Right) & AFR Right vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
AFR Right
Time
Mean: 0.73658
Std Dev: 0.00813
Mean: 0.75345
Std Dev: 0.01457
Mean: 0.75664
Std Dev: 0.0023
Mean: 0.72769
Std Dev: 0.00618
Mean: 0.75283
Std Dev: 0.0029
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

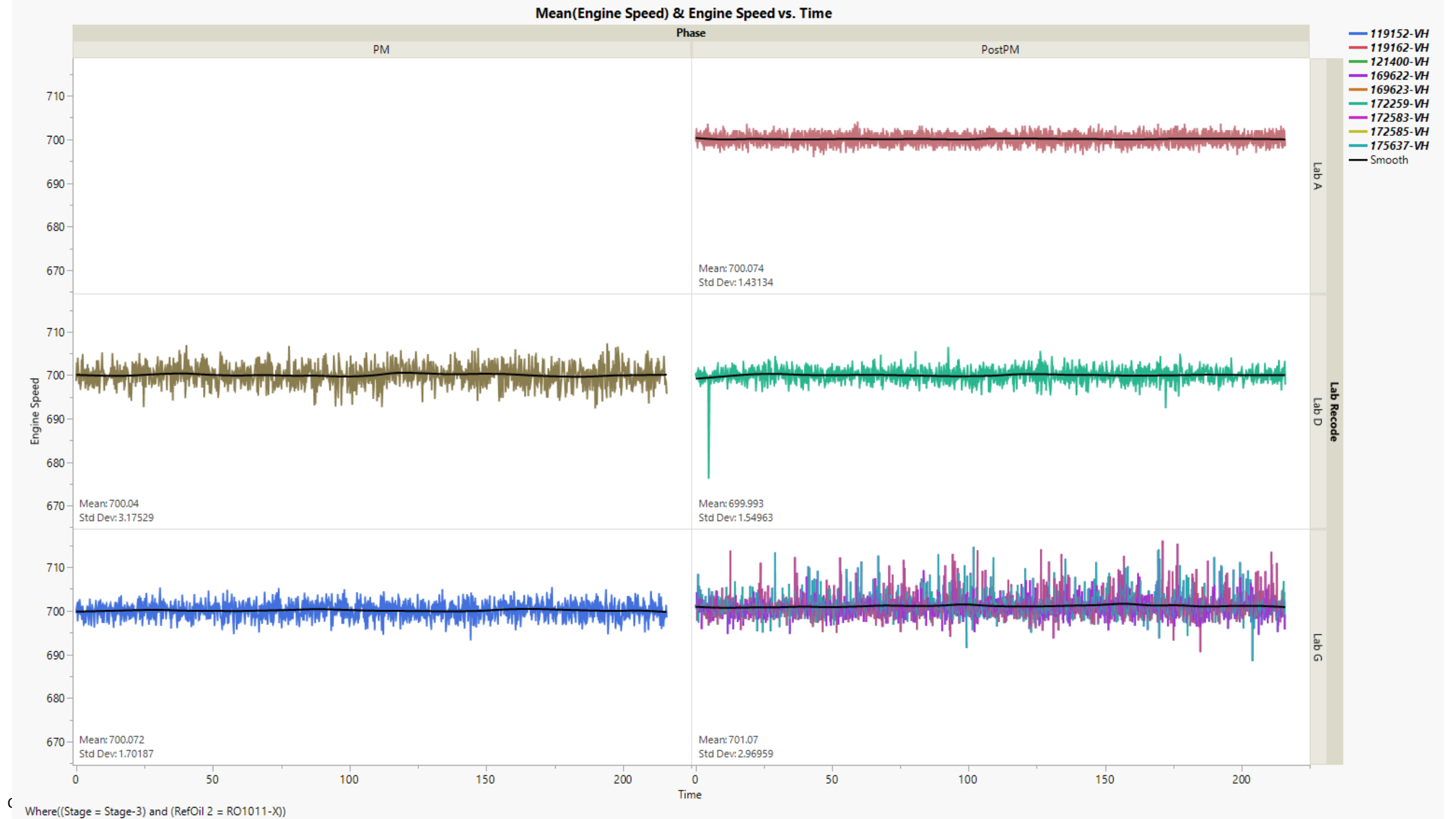

Mean(Barometric Pressure) & Barometric Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Barometric Pressure
Time
Mean: 98.9119
Std Dev: 0.60221
Mean: 101.356
Std Dev: 0.75595
Mean: 101.754
Std Dev: 0.45968
Mean: 29.0985
Std Dev: 0.04994
Mean: 29.3811
Std Dev: 0.76299
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

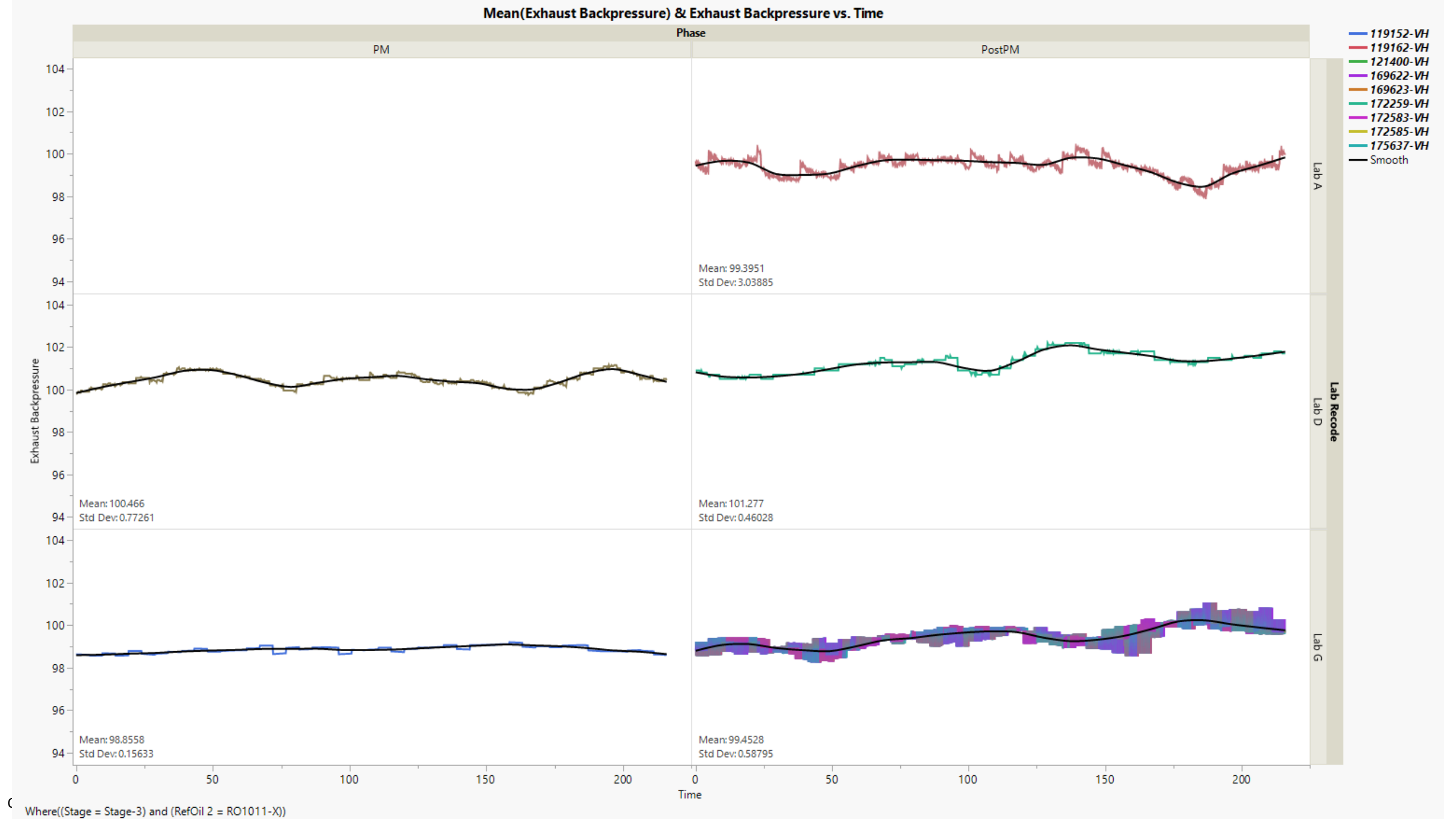

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Coolant Temperature - Inlet
Time
Mean: 40.64
Std Dev: 0.8242
Mean: 40.4023
Std Dev: 0.46888
Mean: 40.5789
Std Dev: 0.46231
Mean: 41.3611
Std Dev: 0.2667
Mean: 40.925
Std Dev: 0.39603
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

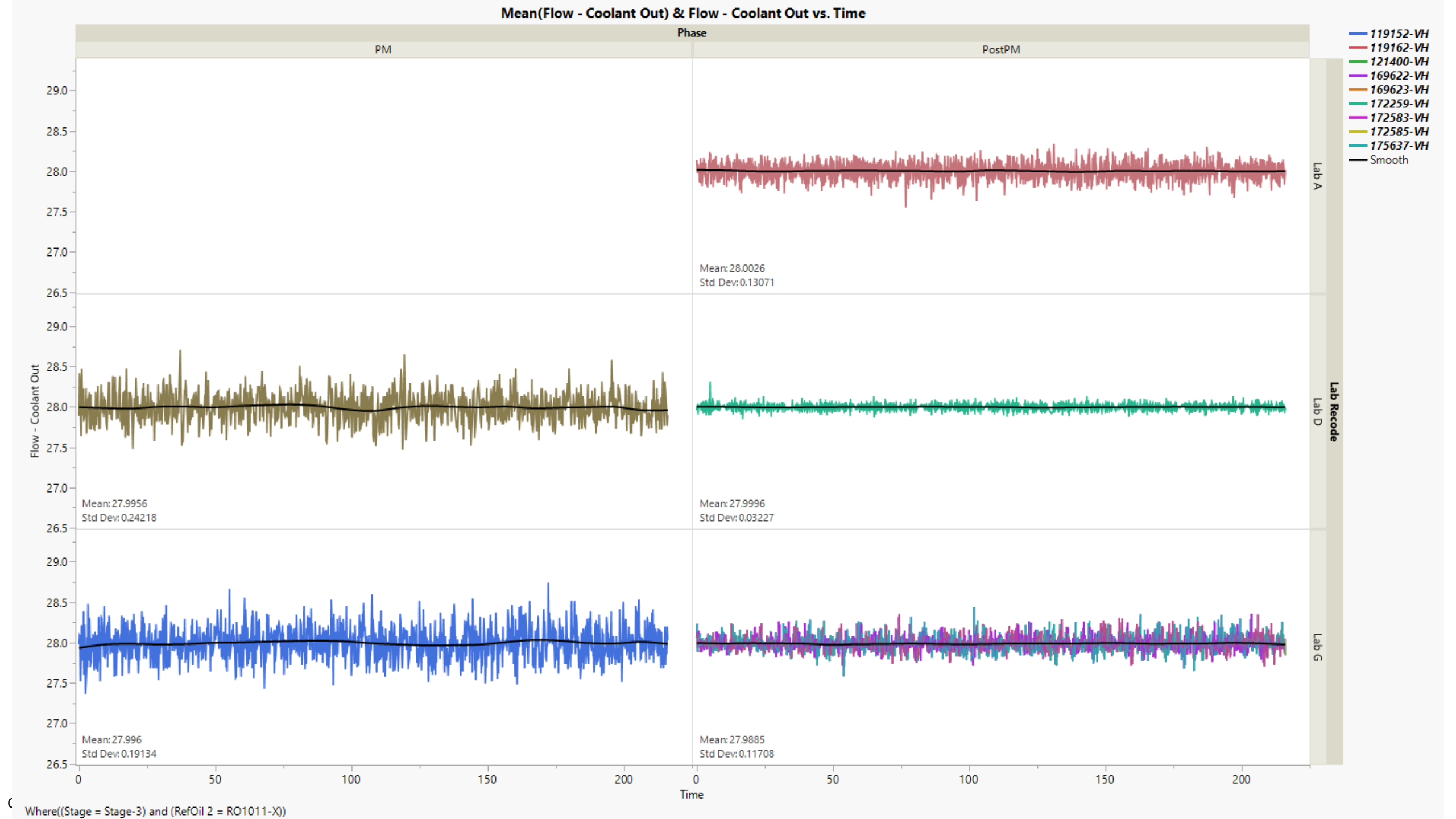
Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Coolant Temperature - Outlet
Time
Mean: 44.9861
Std Dev: 0.14381
Mean: 45.0453
Std Dev: 0.43895
Mean: 44.8902
Std Dev: 0.26227
Mean: 44.9967
Std Dev: 0.18327
Mean: 44.9808
Std Dev: 0.21586
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

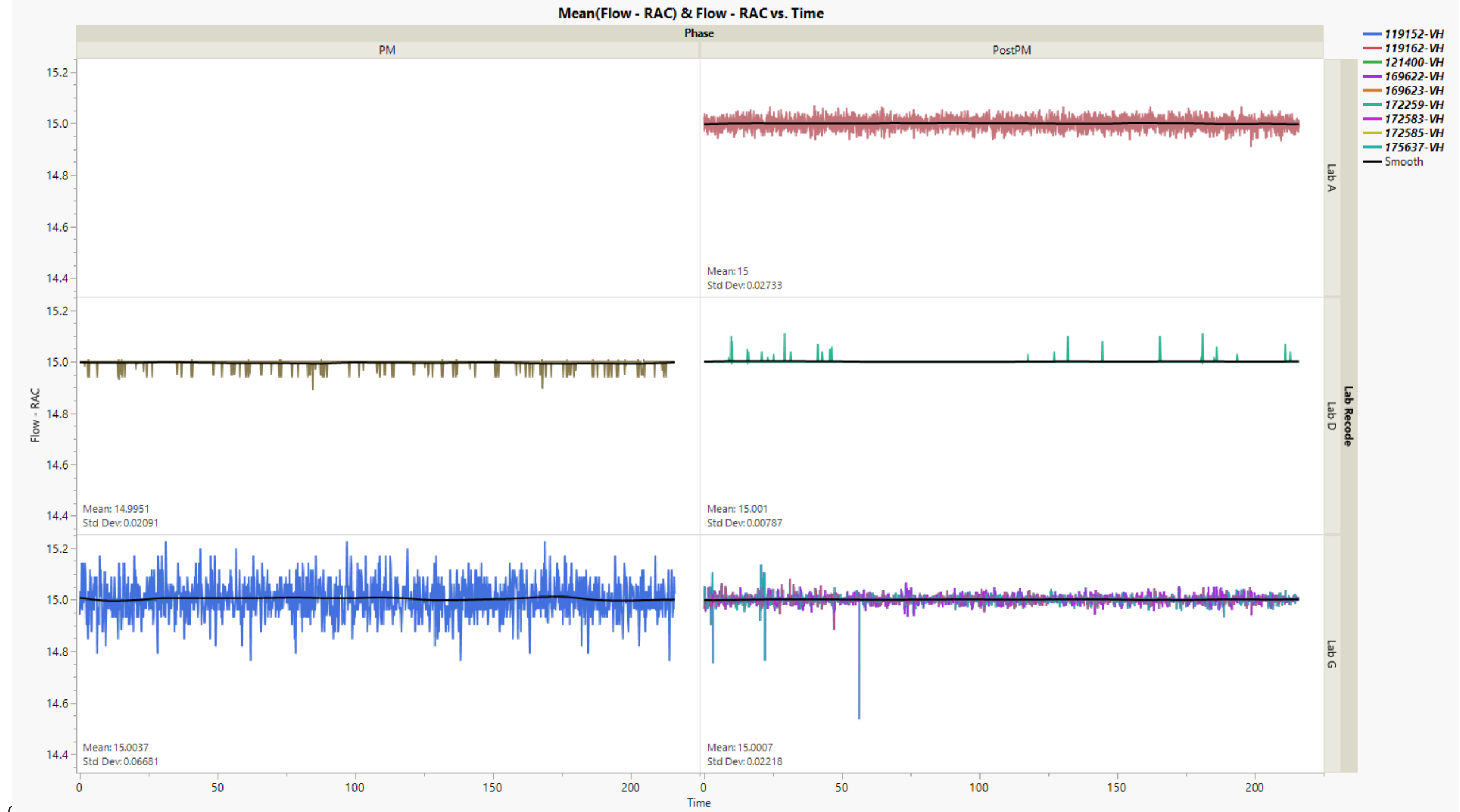

Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Crankcase Pressure
Time
Mean: 1.48347
Std Dev: 2.18157
Mean: -0.0245
Std Dev: 0.07534
Mean: 0.02773
Std Dev: 0.00501
Mean: 0.017
Std Dev: 0.00298
Mean: 0.00336
Std Dev: 0.01809
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 69.9997
Std Dev: 0.03913
Mean: 69.9998
Std Dev: 0.06174
Mean: 69.9599
Std Dev: 0.07013
Mean: 70.008
Std Dev: 0.18414
Mean: 70.0828
Std Dev: 0.19666
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

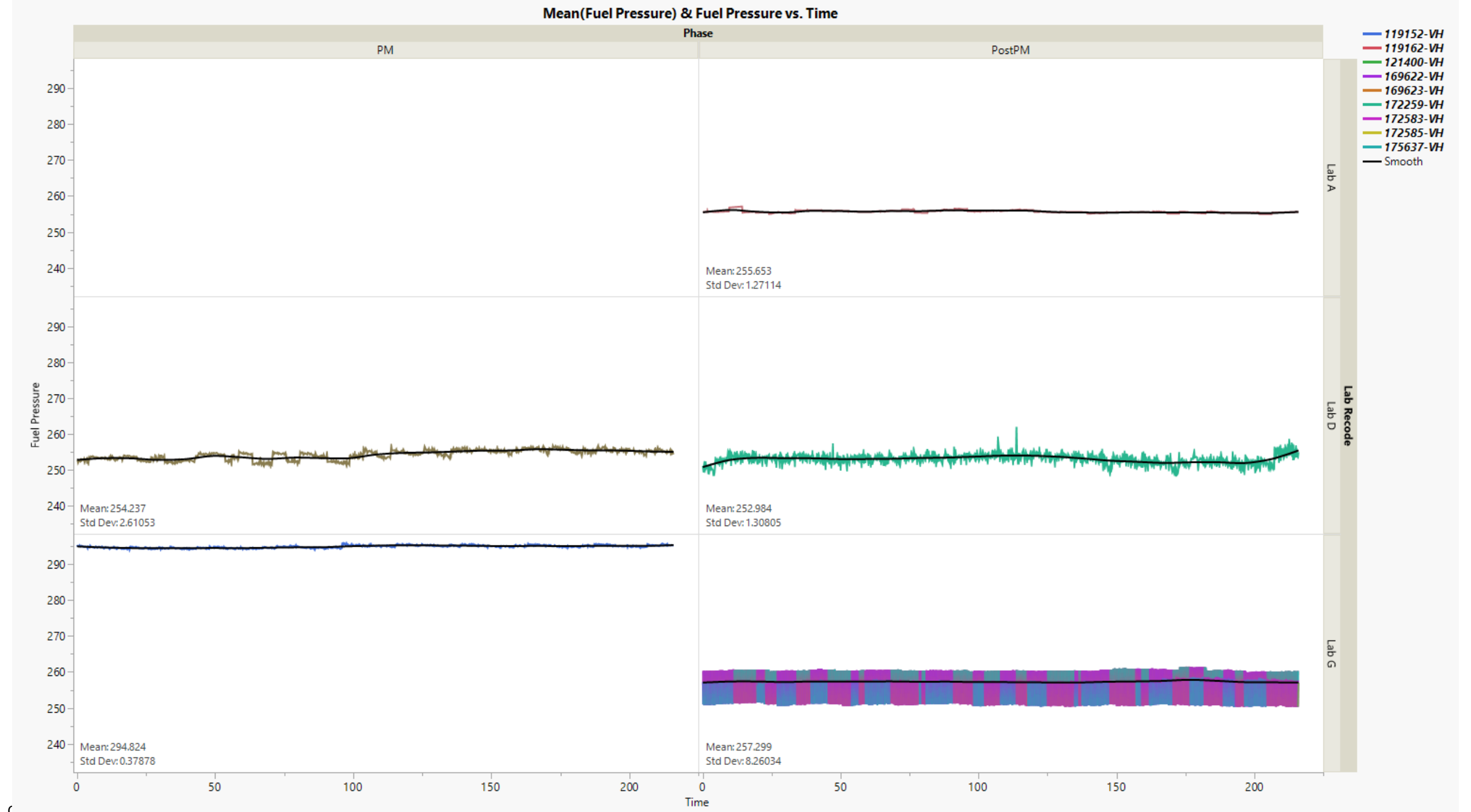

Mean(Engine Speed) & Engine Speed vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Engine Speed
Time
Mean: 700.074
Std Dev: 1.43134
Mean: 700.04
Std Dev: 3.17529
Mean: 699.993
Std Dev: 1.54963
Mean: 700.072
Std Dev: 1.70187
Mean: 701.07
Std Dev: 2.96959
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 99.3951
Std Dev: 3.03885
Mean: 100.466
Std Dev: 0.77261
Mean: 101.277
Std Dev: 0.46028
Mean: 98.8558
Std Dev: 0.15633
Mean: 99.4528
Std Dev: 0.58795
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

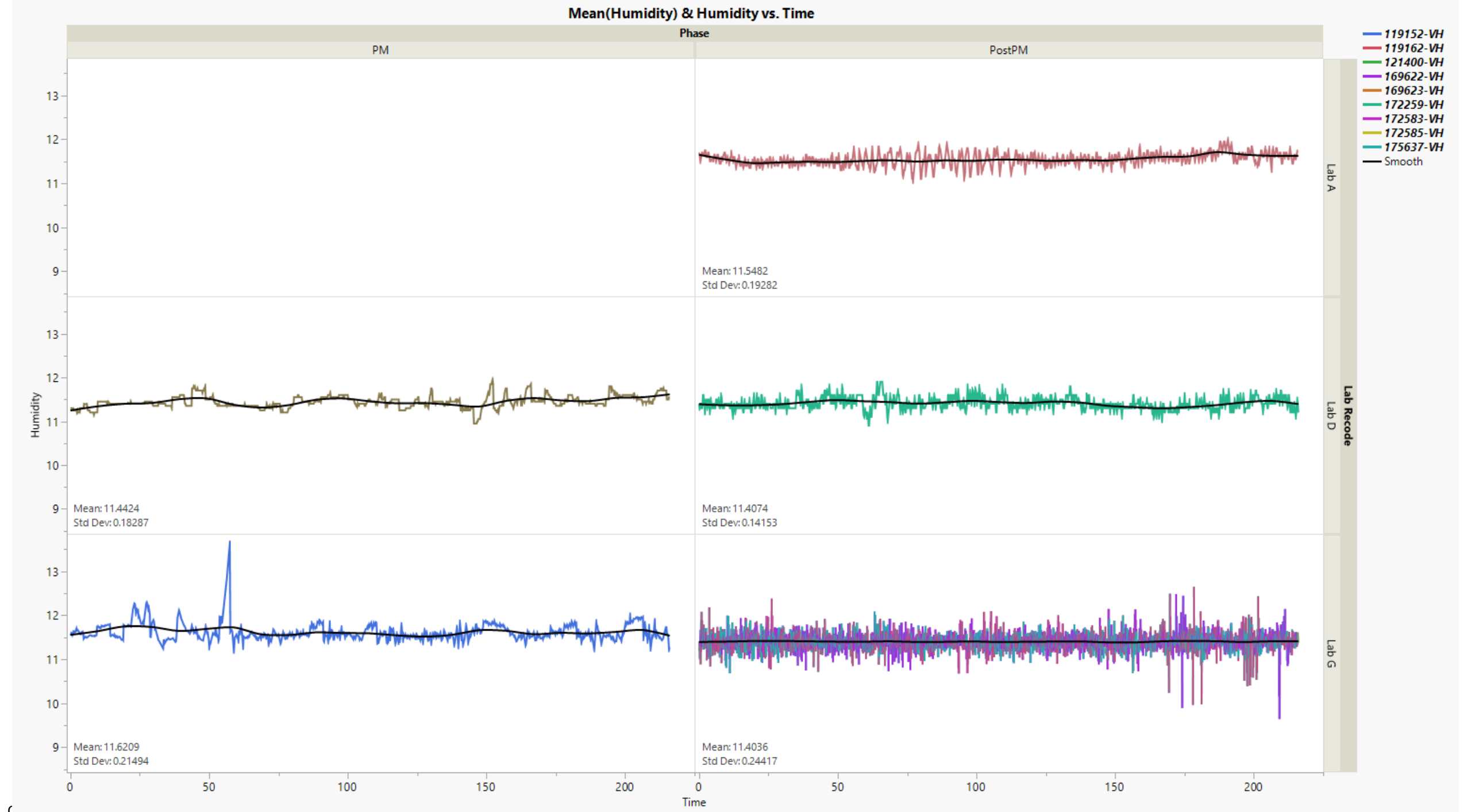

Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - Coolant Out
Time
Mean: 28.0026
Std Dev: 0.13071
Mean: 27.9956
Std Dev: 0.24218
Mean: 27.9996
Std Dev: 0.03227
Mean: 27.996
Std Dev: 0.19134
Mean: 27.9885
Std Dev: 0.11708
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

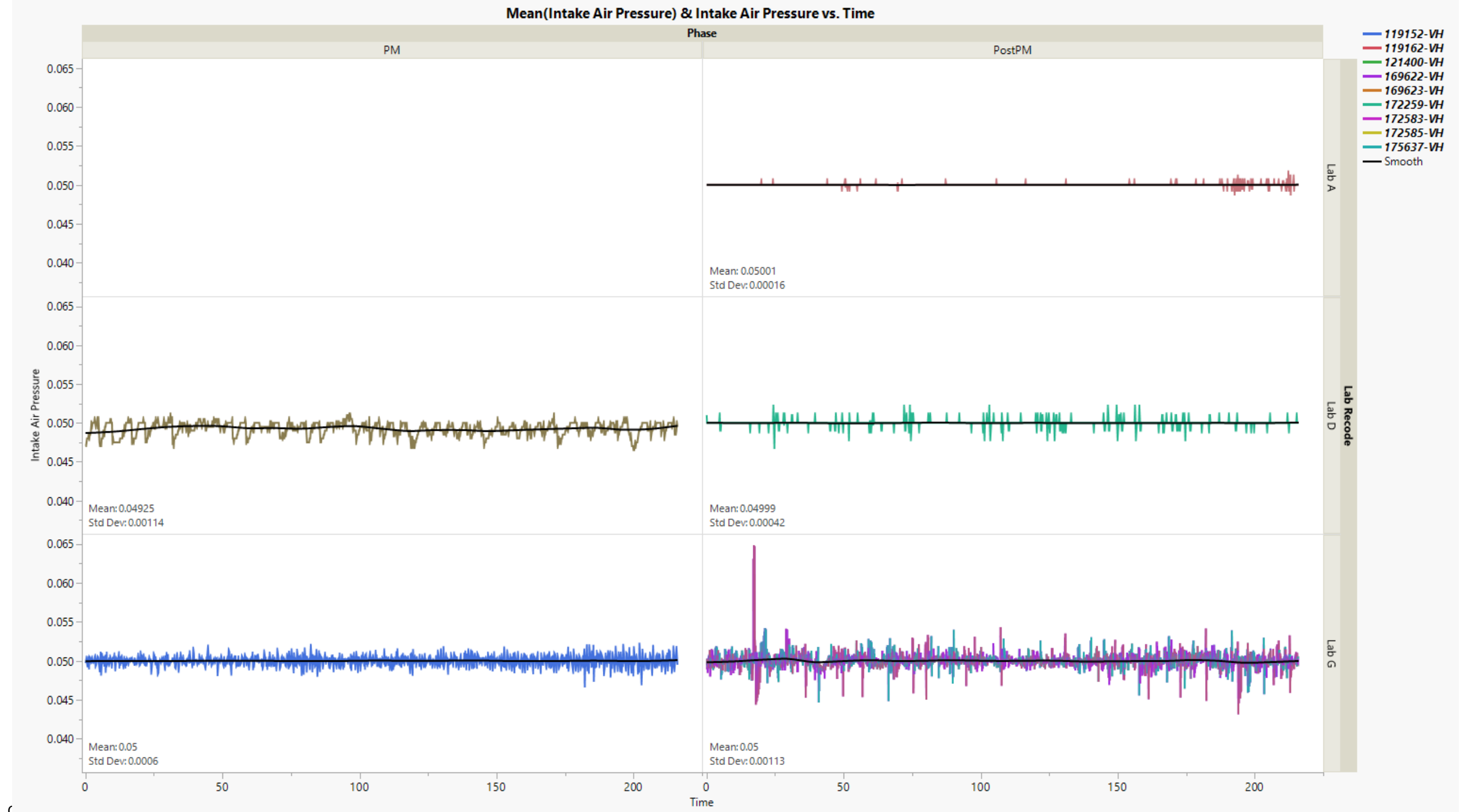

Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - RAC
Time
Mean: 15
Std Dev: 0.02733
Mean: 14.9951
Std Dev: 0.02091
Mean: 15.001
Std Dev: 0.00787
Mean: 15.0037
Std Dev: 0.06681
Mean: 15.0007
Std Dev: 0.02218
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

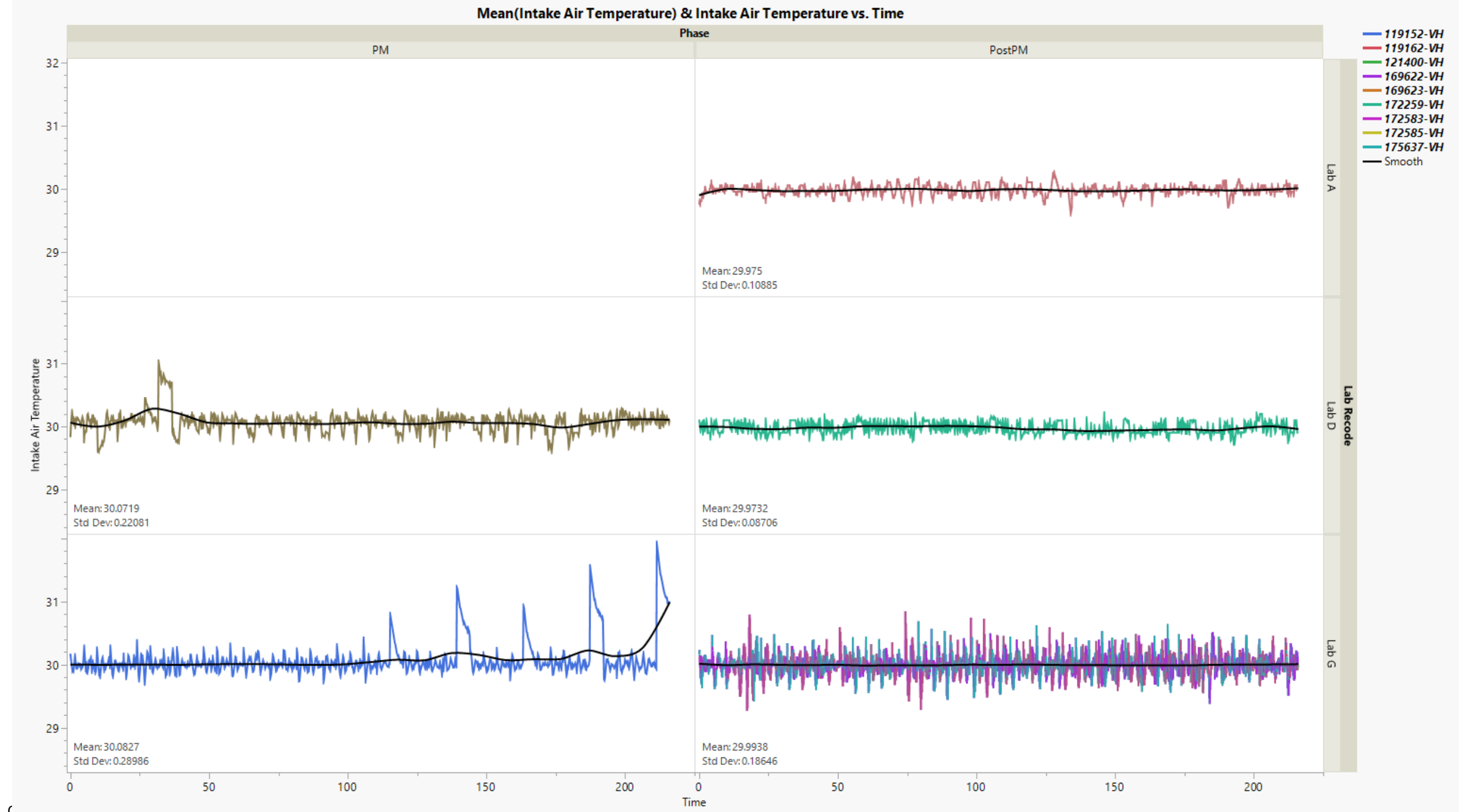
Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Flow
Time
Mean: 1.91054
Std Dev: 0.06129
Mean: 1.92858
Std Dev: 0.04223
Mean: 2.03819
Std Dev: 0.02716
Mean: 1.90008
Std Dev: 0.01454
Mean: 1.86204
Std Dev: 0.05654
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

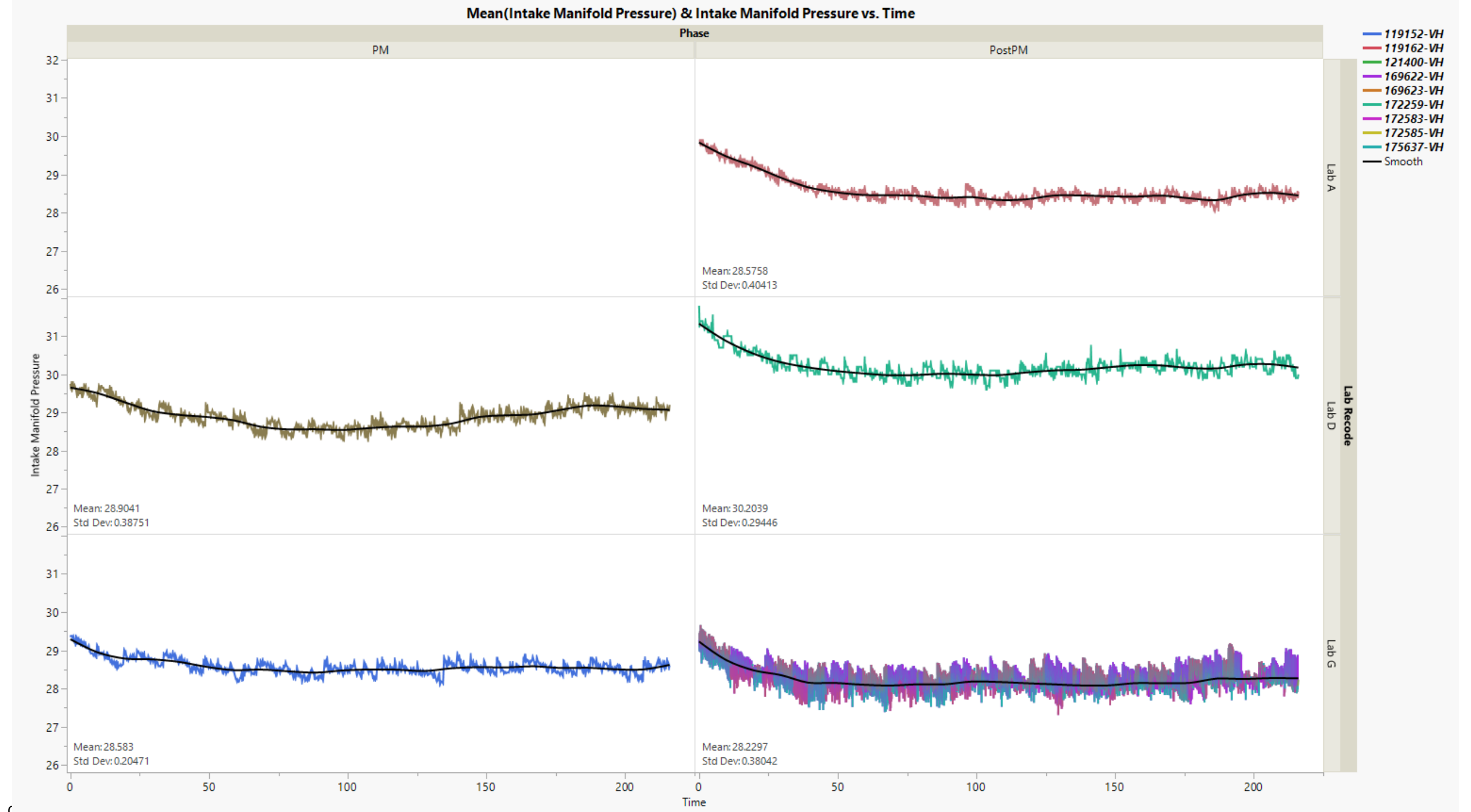

Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Pressure
Time
Mean: 255.653
Std Dev: 1.27114
Mean: 254.237
Std Dev: 2.61053
Mean: 252.984
Std Dev: 1.30805
Mean: 294.824
Std Dev: 0.37878
Mean: 257.299
Std Dev: 8.26034
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

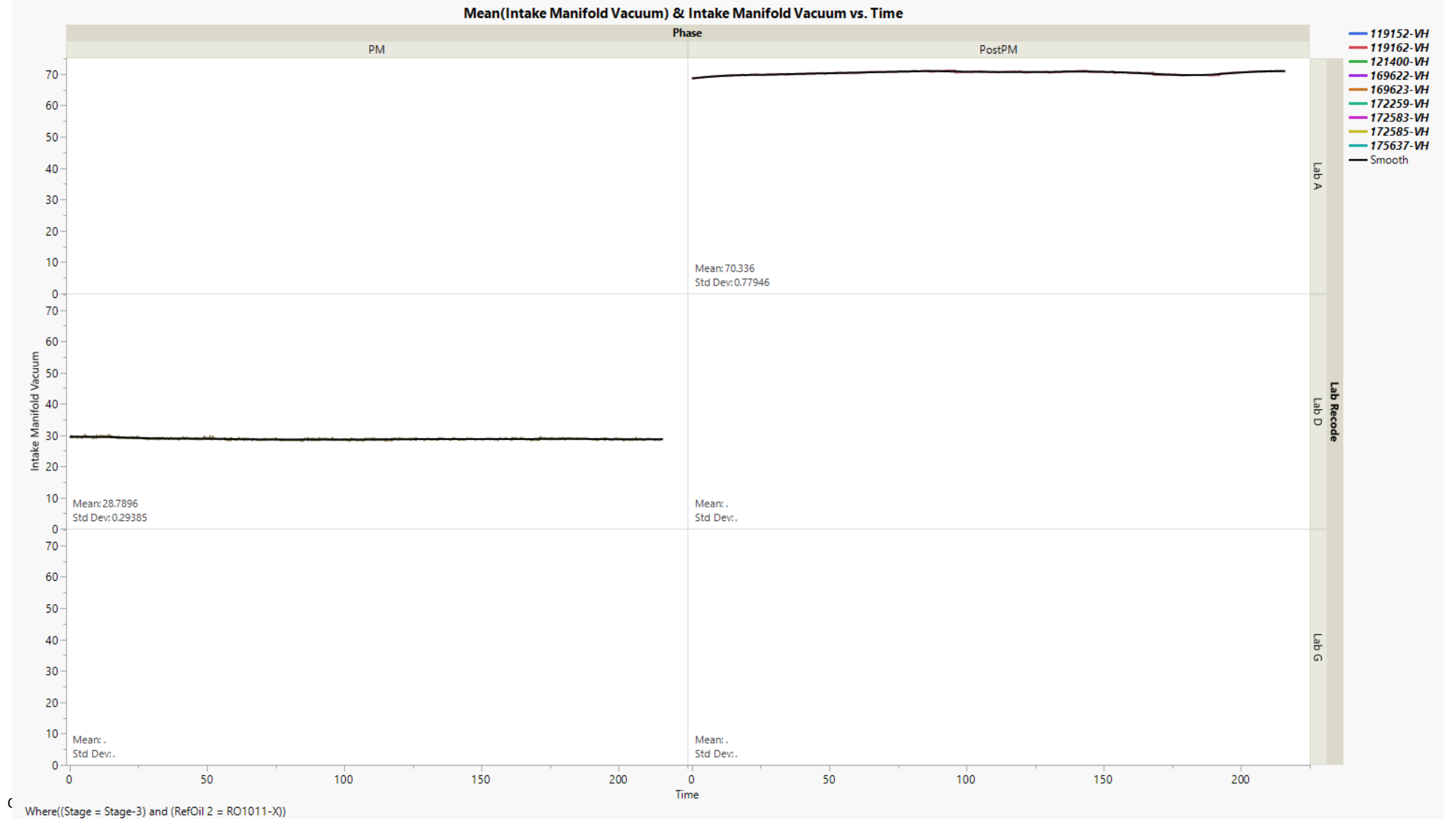
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Humidity) & Humidity vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Humidity
Time
Mean: 11.5482
Std Dev: 0.19282
Mean: 11.4424
Std Dev: 0.18287
Mean: 11.4074
Std Dev: 0.14153
Mean: 11.6209
Std Dev: 0.21494
Mean: 11.4036
Std Dev: 0.24417
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

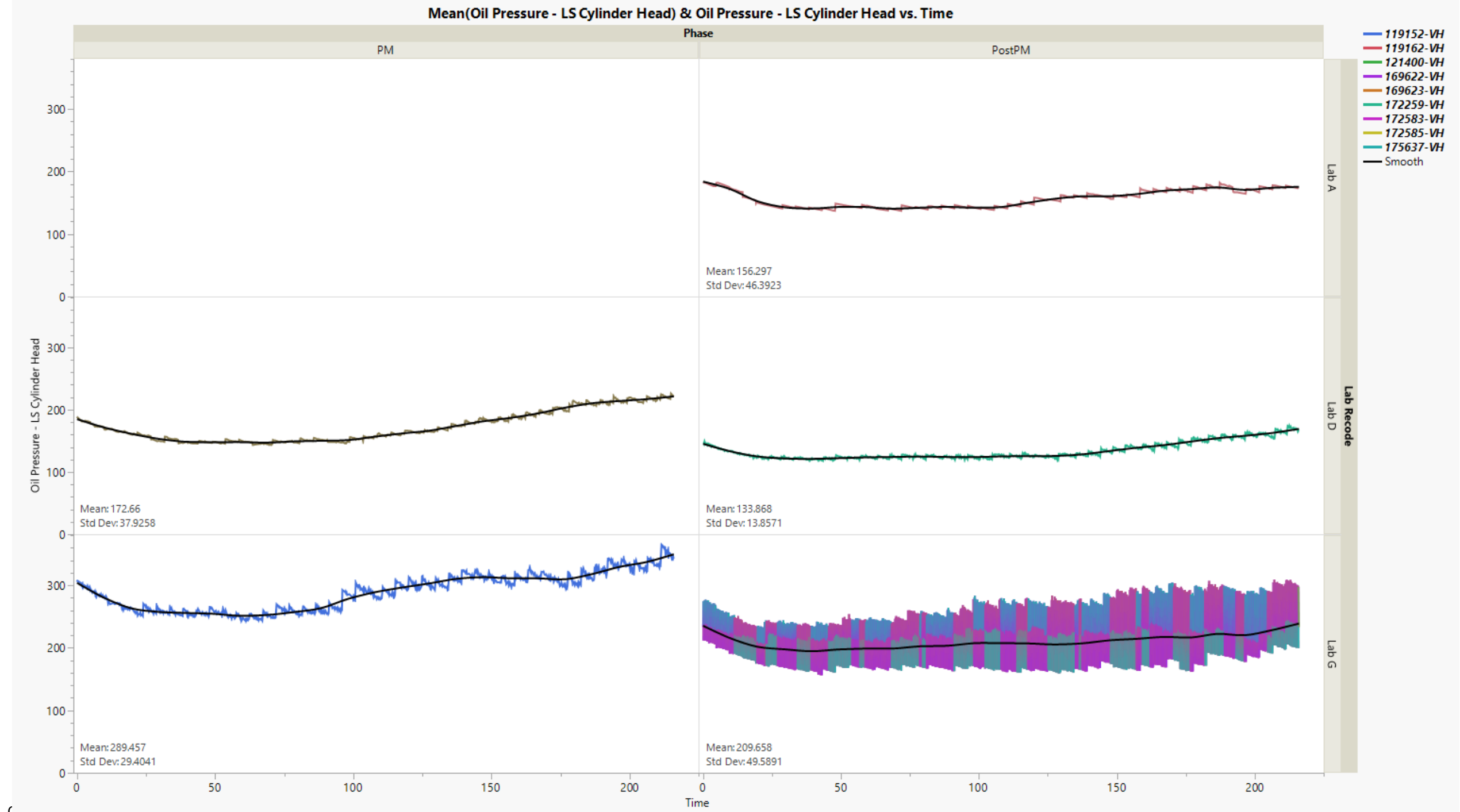

Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Intake Air Pressure
0.065
0.060
0.055
0.050
0.045
0.040
Mean: 0.05001
Std Dev: 0.00016
Mean: 0.04925
Std Dev: 0.00114
Mean: 0.04999
Std Dev: 0.00042
Mean: 0.05
Std Dev: 0.0006
Mean: 0.05
Std Dev: 0.00113
0
50
100
150
200
Time
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 29.975
Std Dev: 0.10885
Mean: 30.0719
Std Dev: 0.22081
Mean: 29.9732
Std Dev: 0.08706
Mean: 30.0827
Std Dev: 0.28986
Mean: 29.9938
Std Dev: 0.18646
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

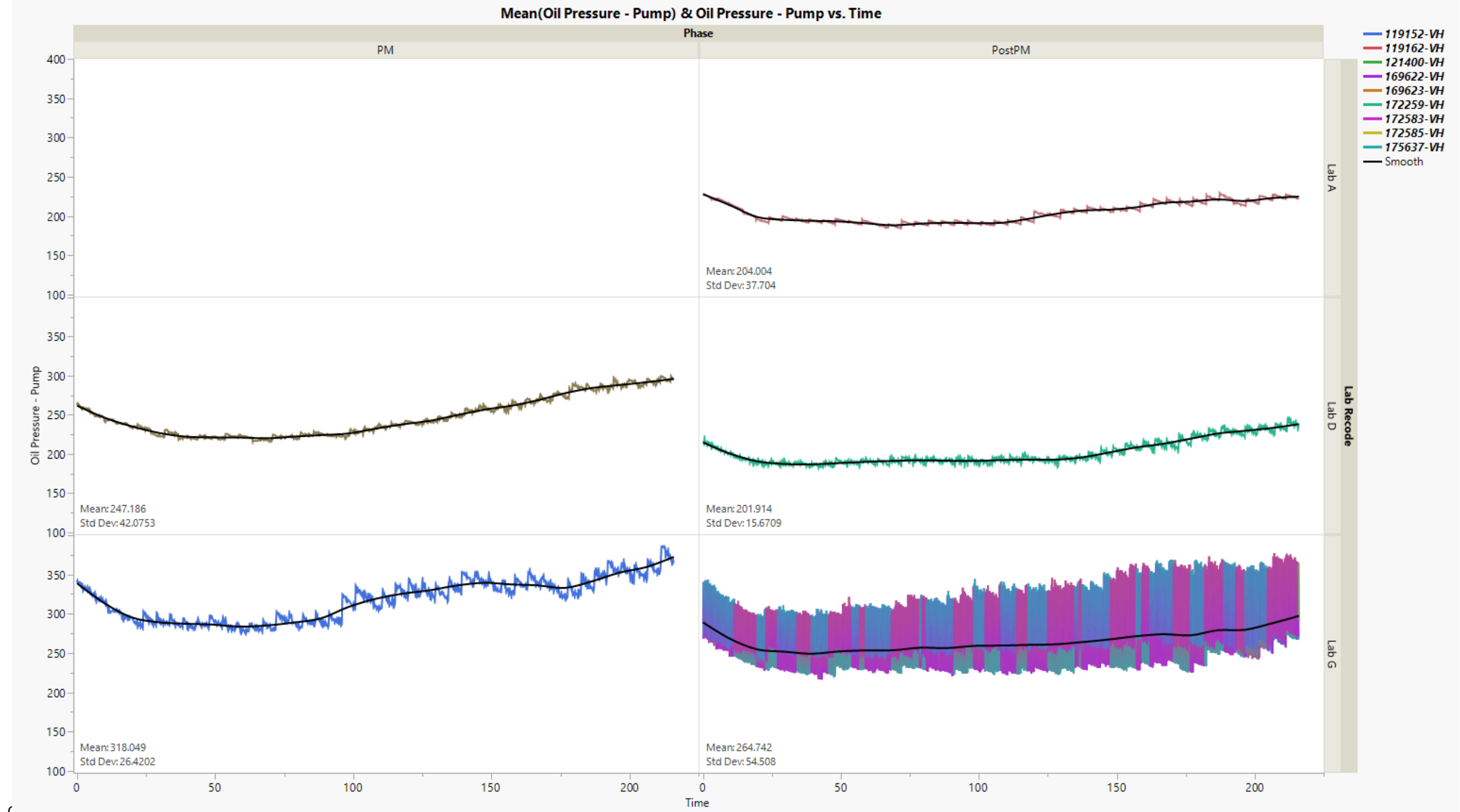

Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Intake Manifold Pressure
Time
Mean: 28.5758
Std Dev: 0.40413
Mean: 28.9041
Std Dev: 0.38751
Mean: 30.2039
Std Dev: 0.29446
Mean: 28.583
Std Dev: 0.20471
Mean: 28.2297
Std Dev: 0.38042
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

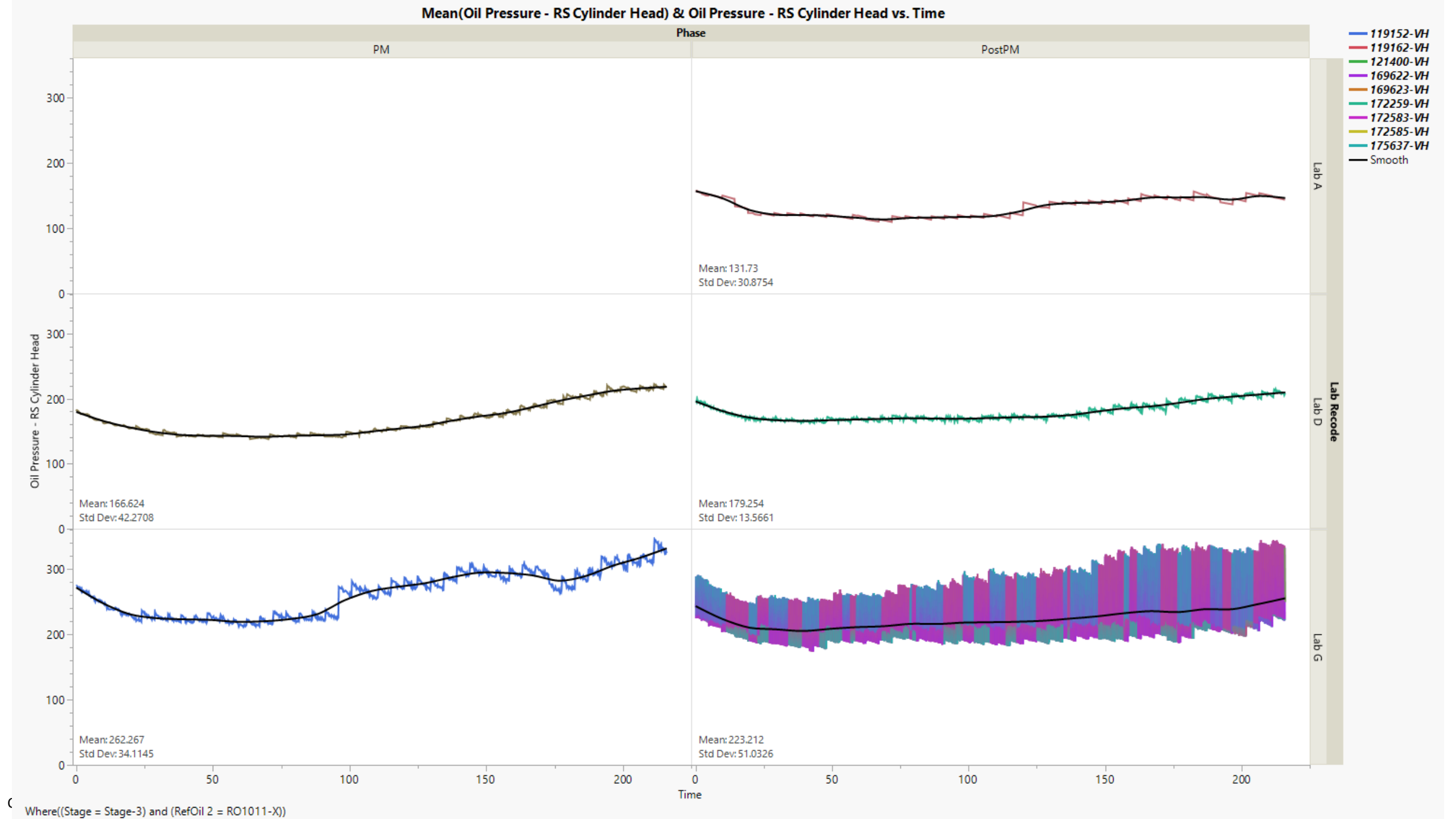


Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

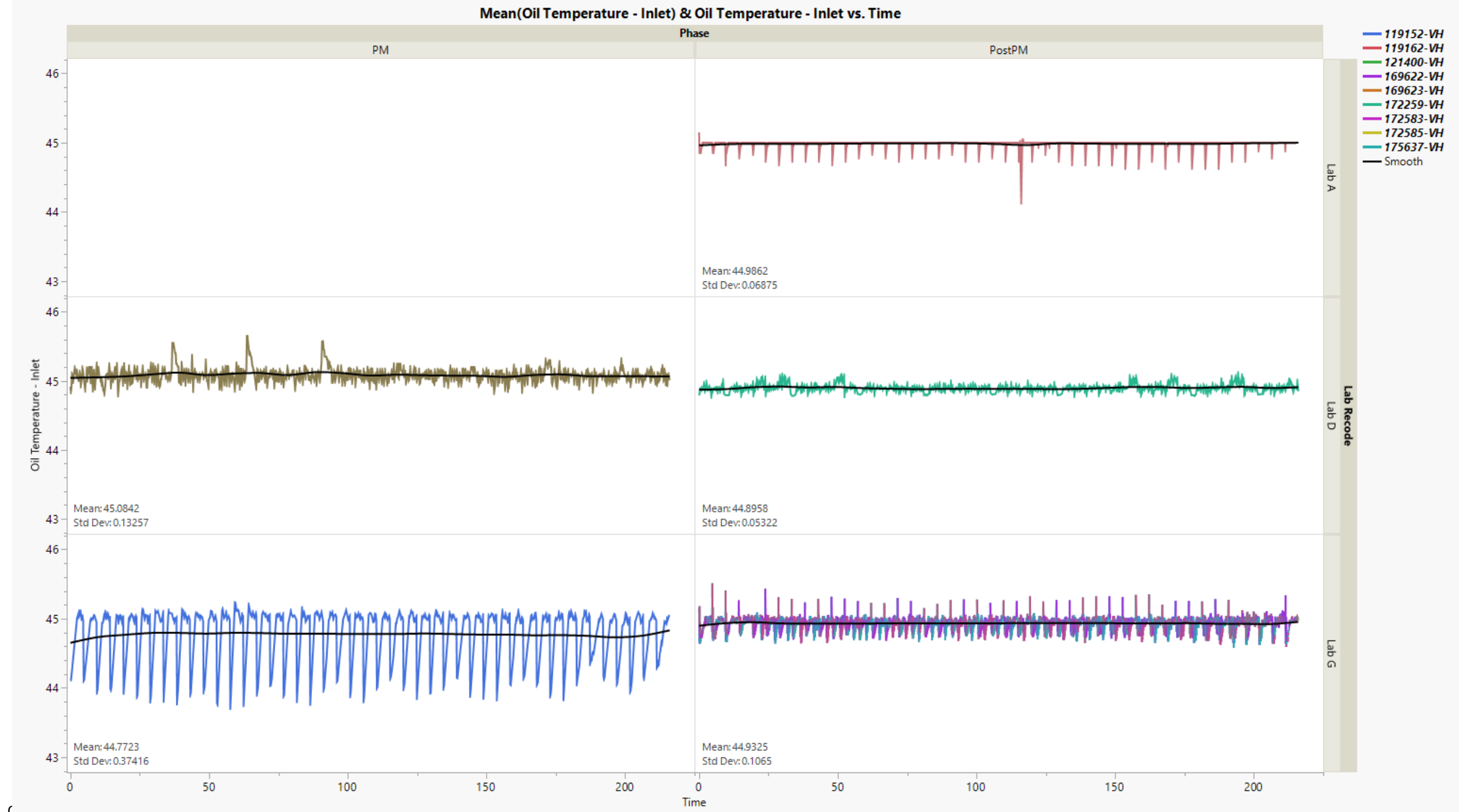


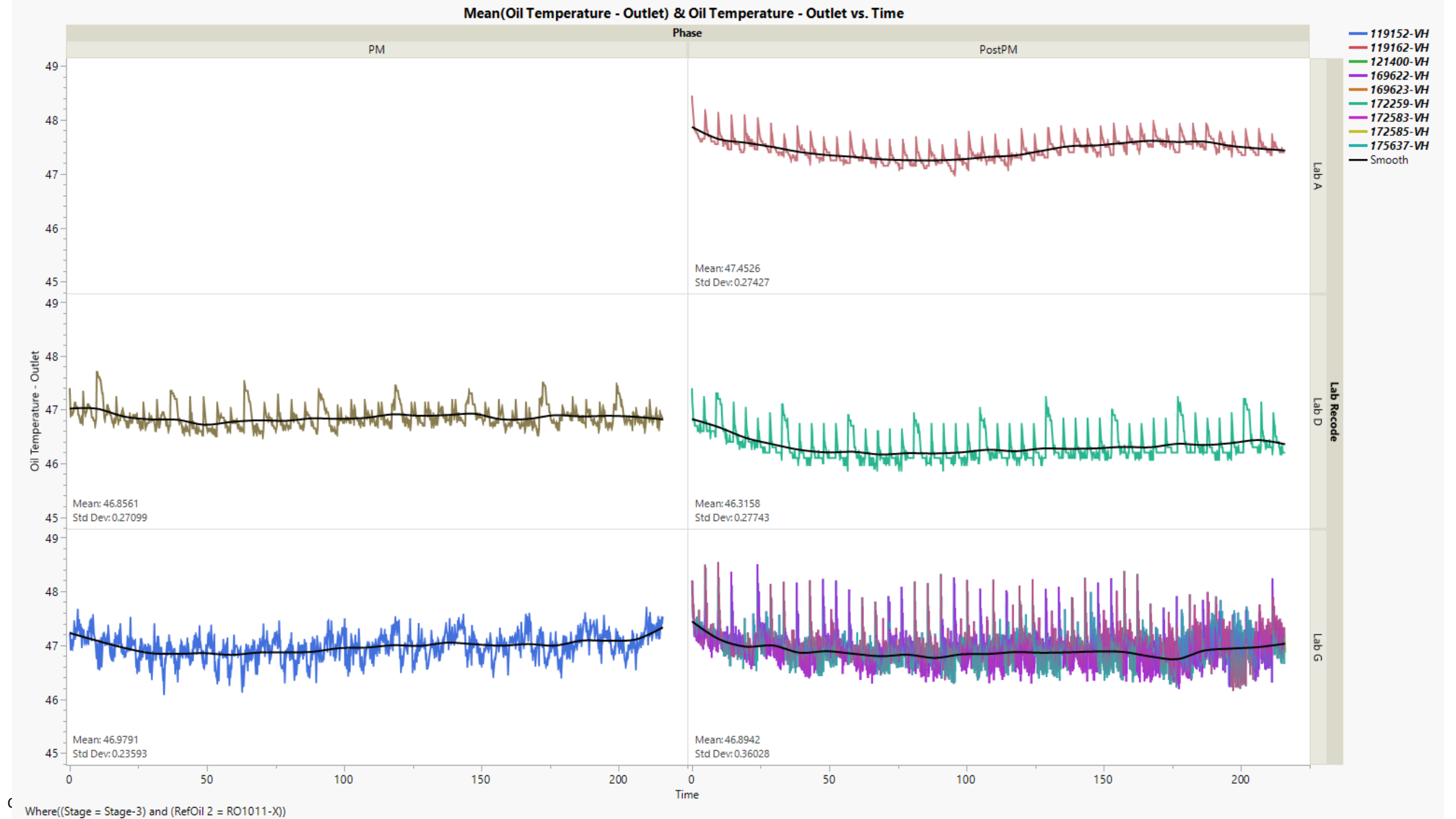
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

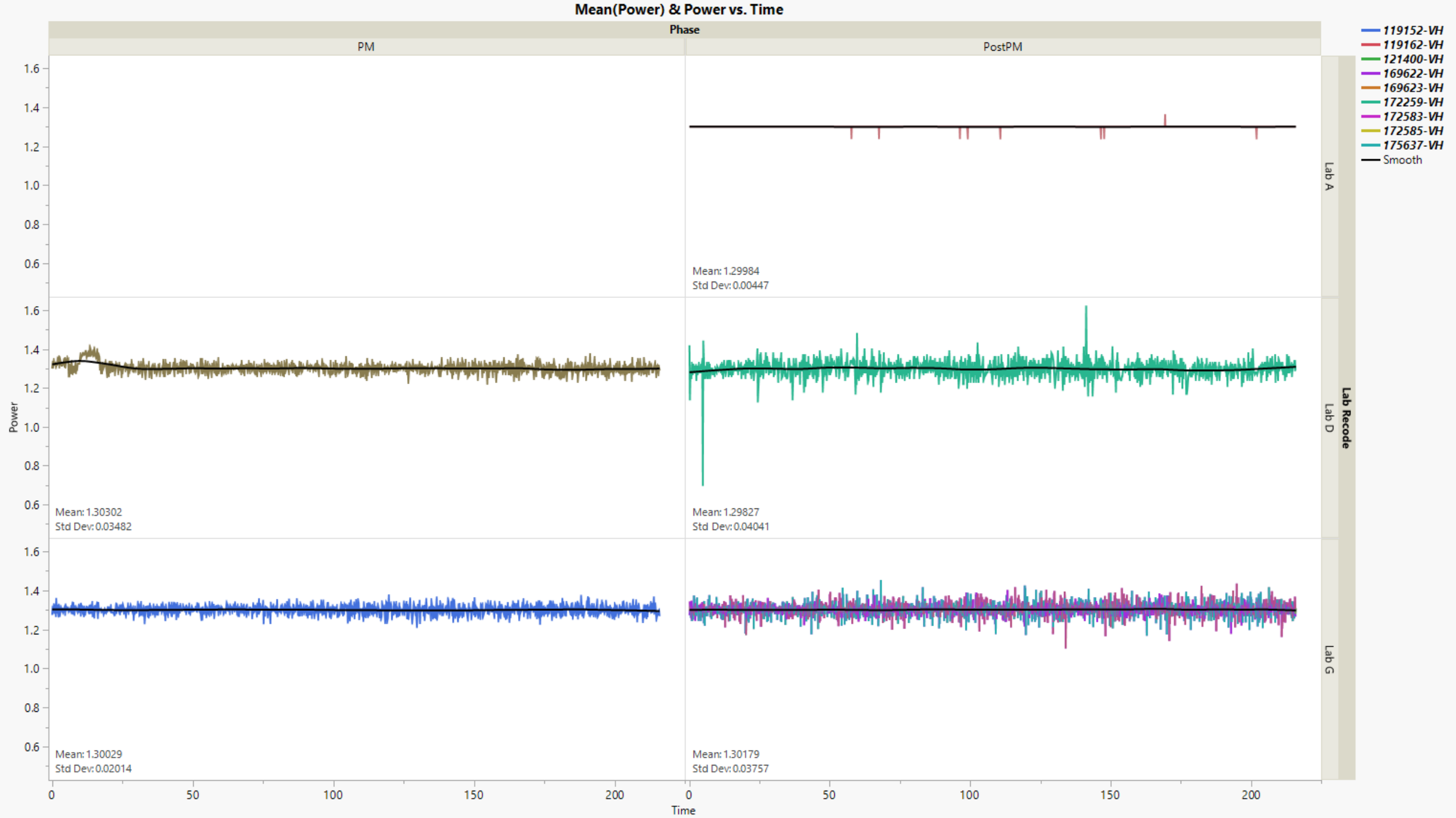

Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Pressure - Pump
Time
Mean: 204.004
Std Dev: 37.704
Mean: 247.186
Std Dev: 42.0753
Mean: 201.914
Std Dev: 15.6709
Mean: 318.049
Std Dev: 26.4202
Mean: 264.742
Std Dev: 54.508
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

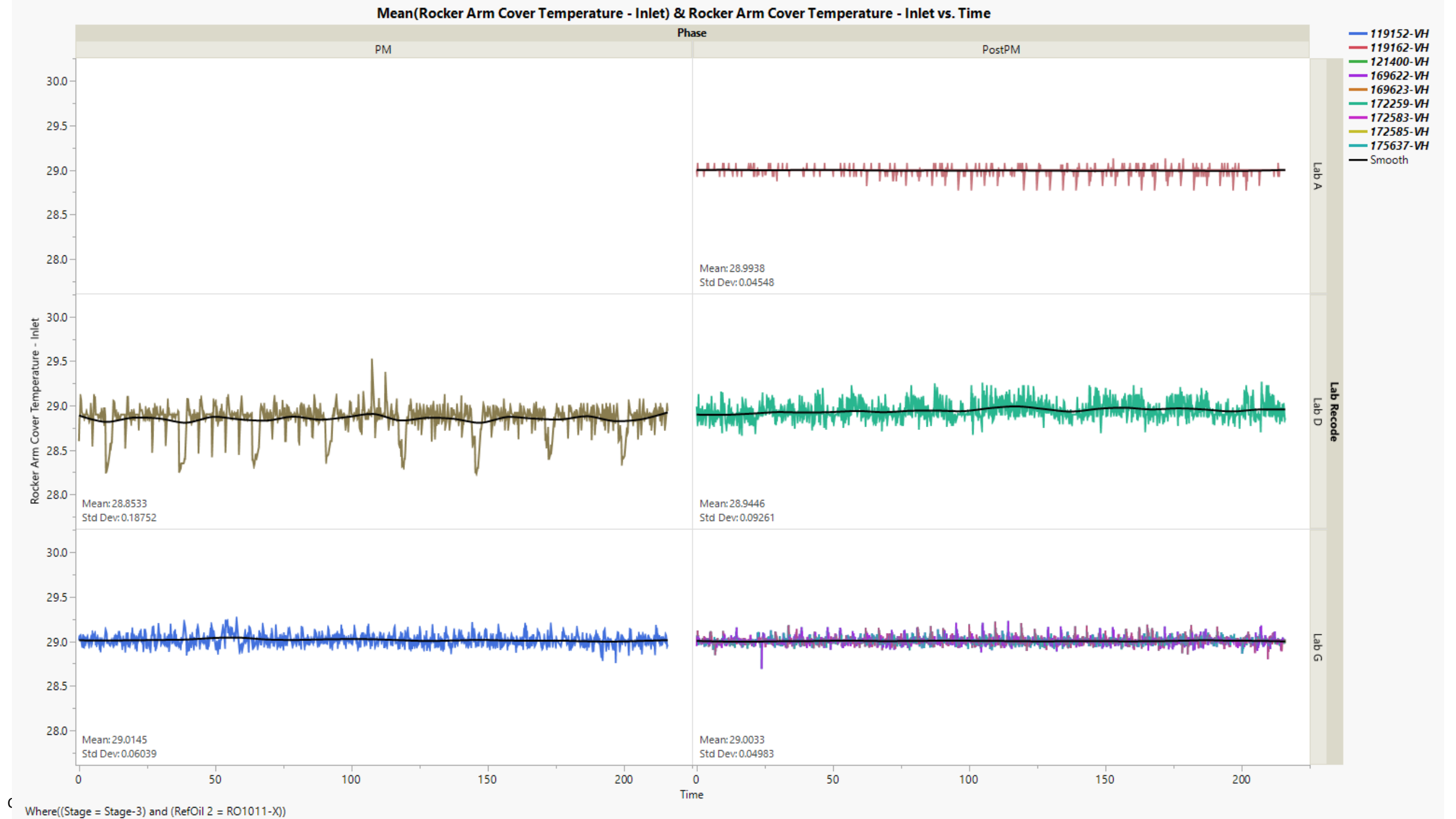


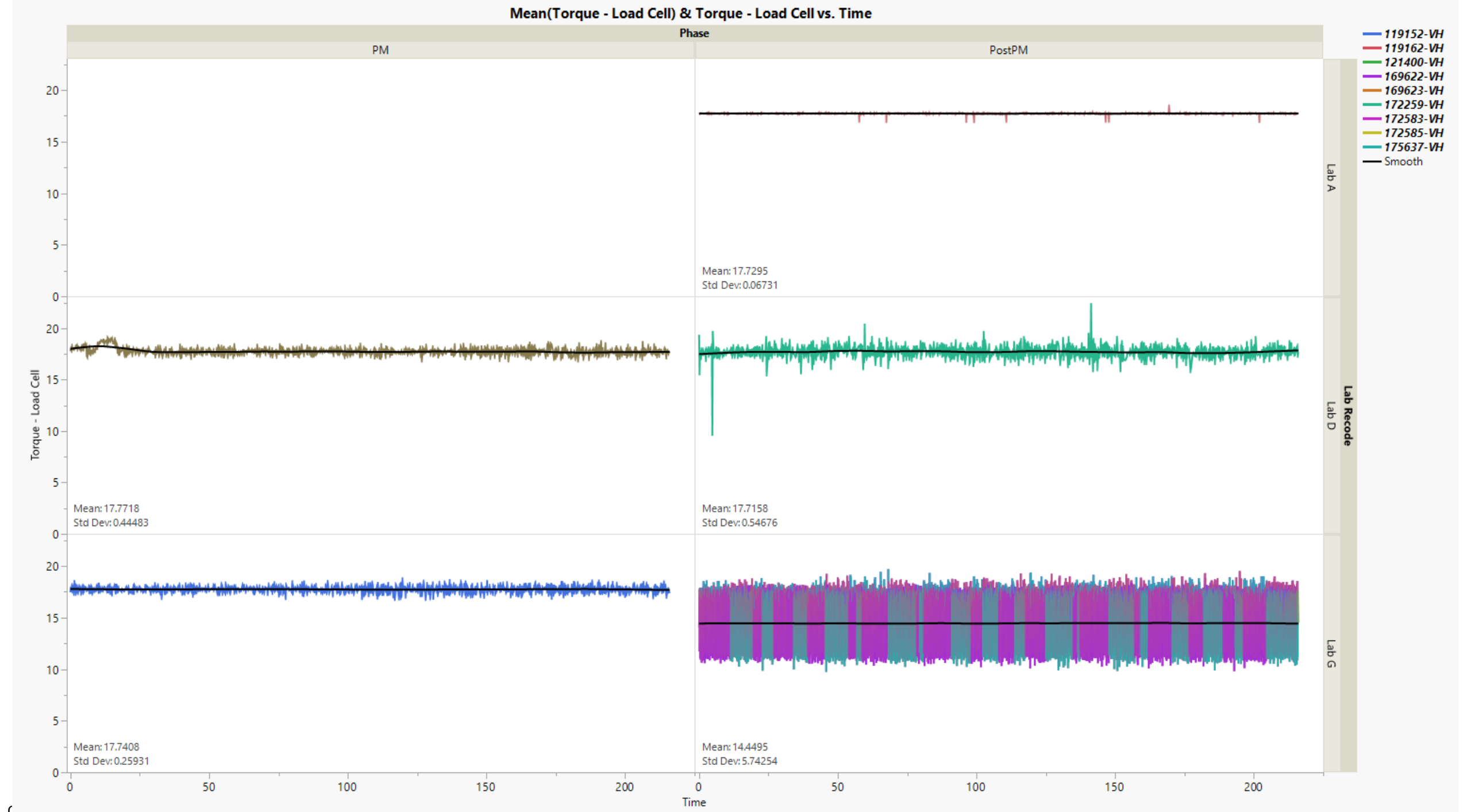
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Oil Temperature - Inlet) & Oil Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Inlet
Time
Mean: 44.9862
Std Dev: 0.06875
Mean: 45.0842
Std Dev: 0.13257
Mean: 44.8958
Std Dev: 0.05322
Mean: 44.7723
Std Dev: 0.37416
Mean: 44.9325
Std Dev: 0.1065
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Outlet
Time
Mean: 47.4526
Std Dev: 0.27427
Mean: 46.8561
Std Dev: 0.27099
Mean: 46.3158
Std Dev: 0.27743
Mean: 46.9791
Std Dev: 0.23593
Mean: 46.8942
Std Dev: 0.36028
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Power) & Power vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Power
Time
Mean: 1.29984
Std Dev: 0.00447
Mean: 1.30302
Std Dev: 0.03482
Mean: 1.29827
Std Dev: 0.04041
Mean: 1.30029
Std Dev: 0.02014
Mean: 1.30179
Std Dev: 0.03757
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))


Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Rocker Arm Cover Temperature - Inlet
Time
Mean: 28.9938
Std Dev: 0.04548
Mean: 28.8533
Std Dev: 0.18752
Mean: 28.9446
Std Dev: 0.09261
Mean: 29.0145
Std Dev: 0.06039
Mean: 29.0033
Std Dev: 0.04983
Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-3) and (RefOil 2 = RO1011-X))

VH Stage 2-3 Operational Data Plots

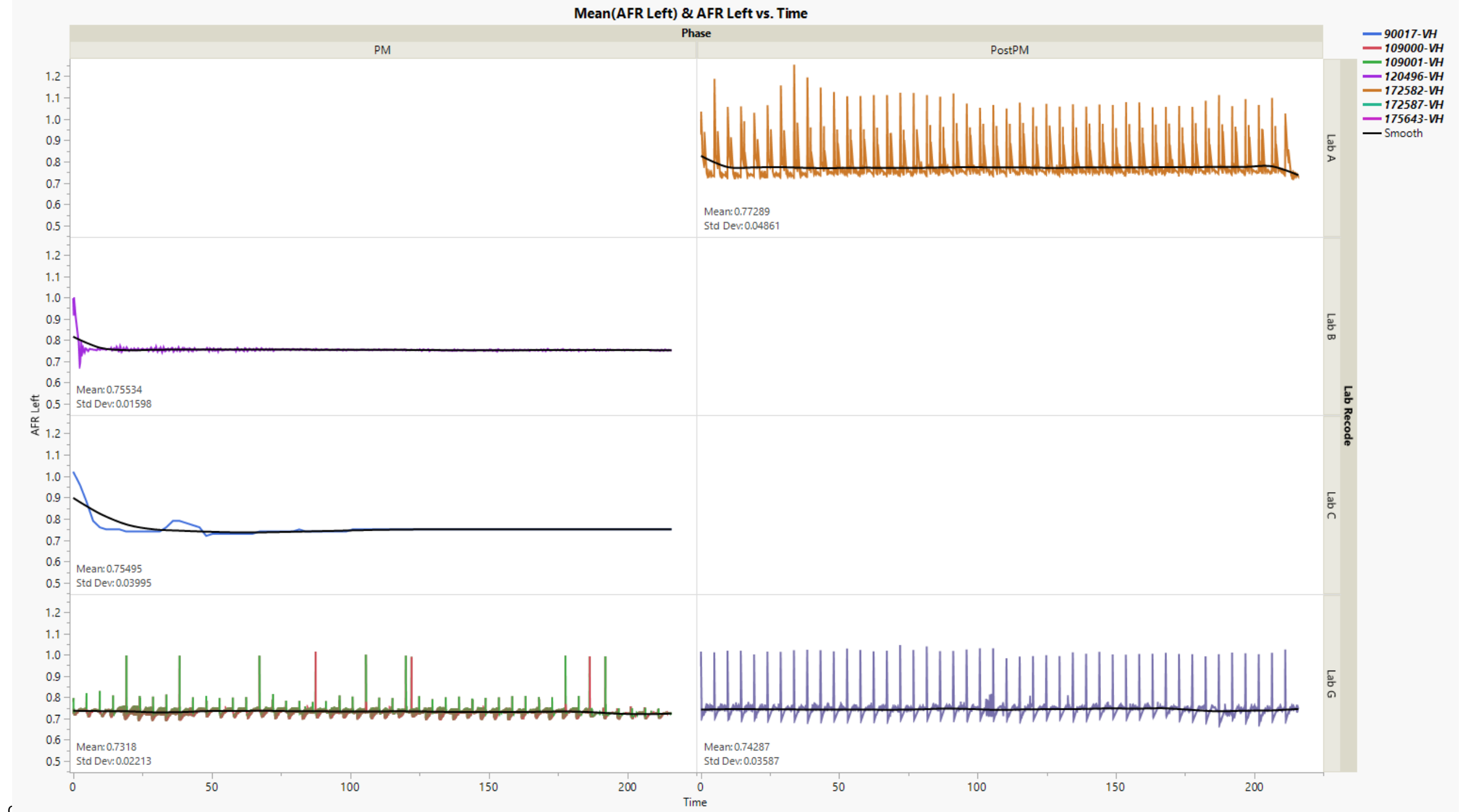
By: Todd Dvorak

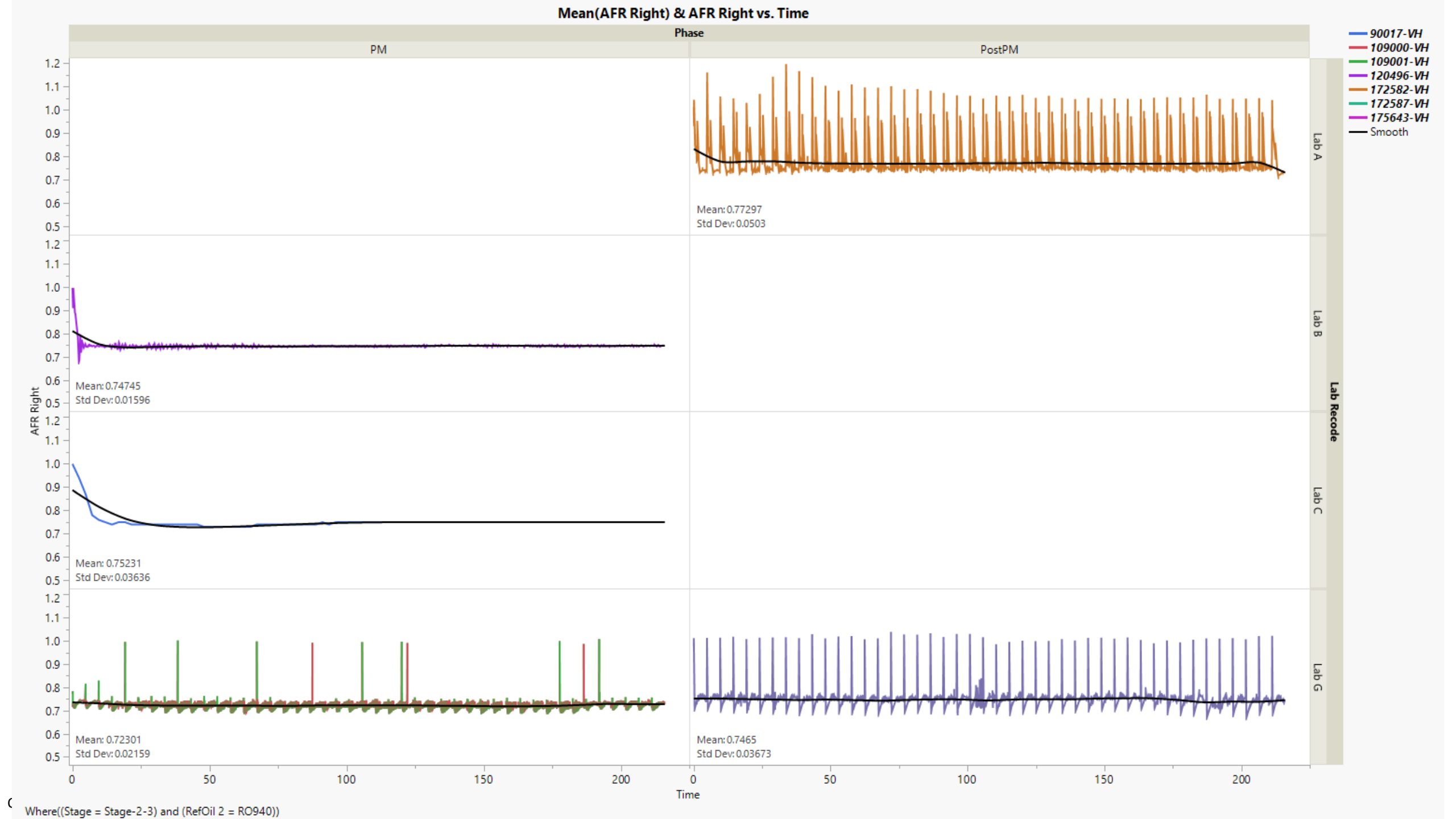
08-05-24

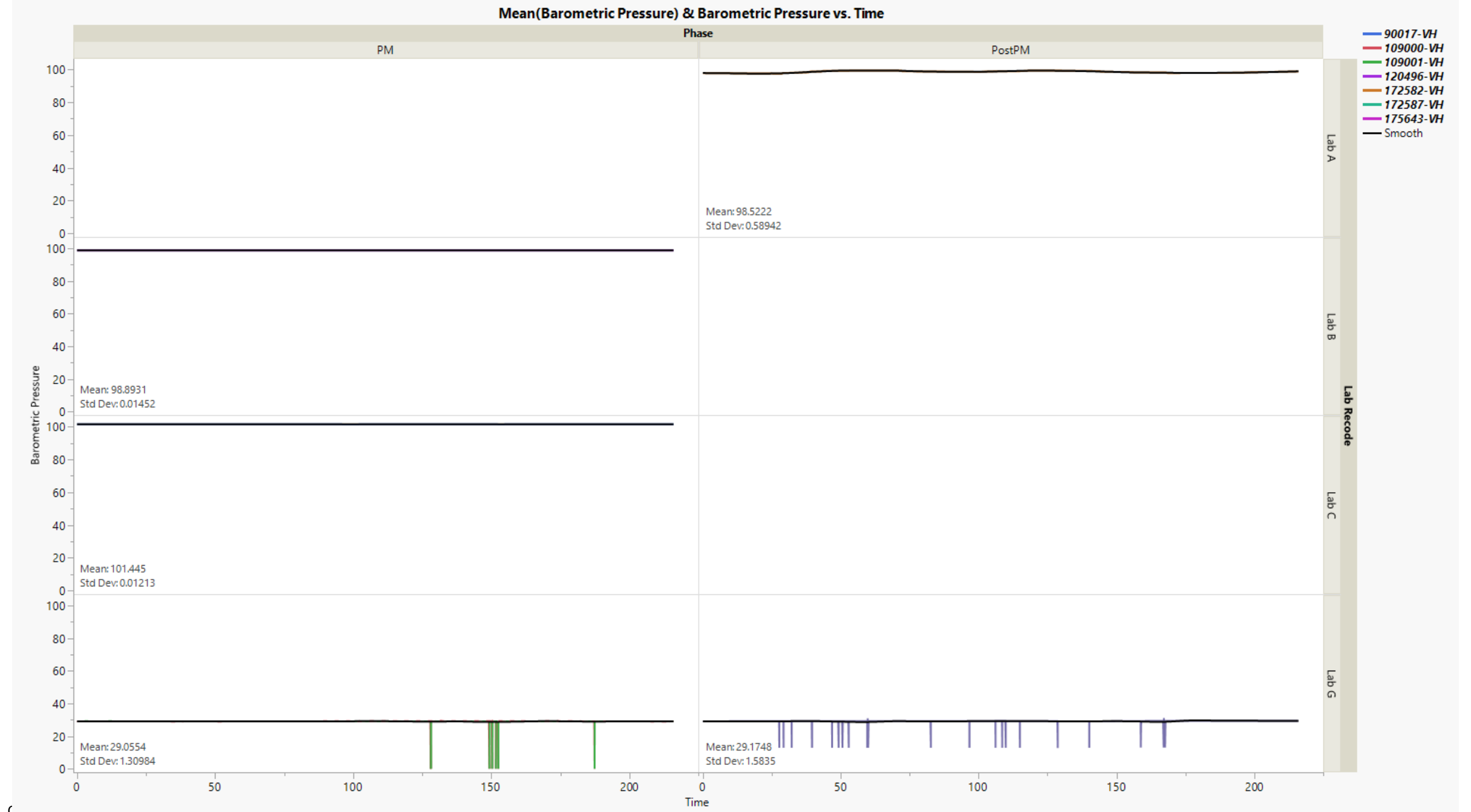
Classified as Confidential

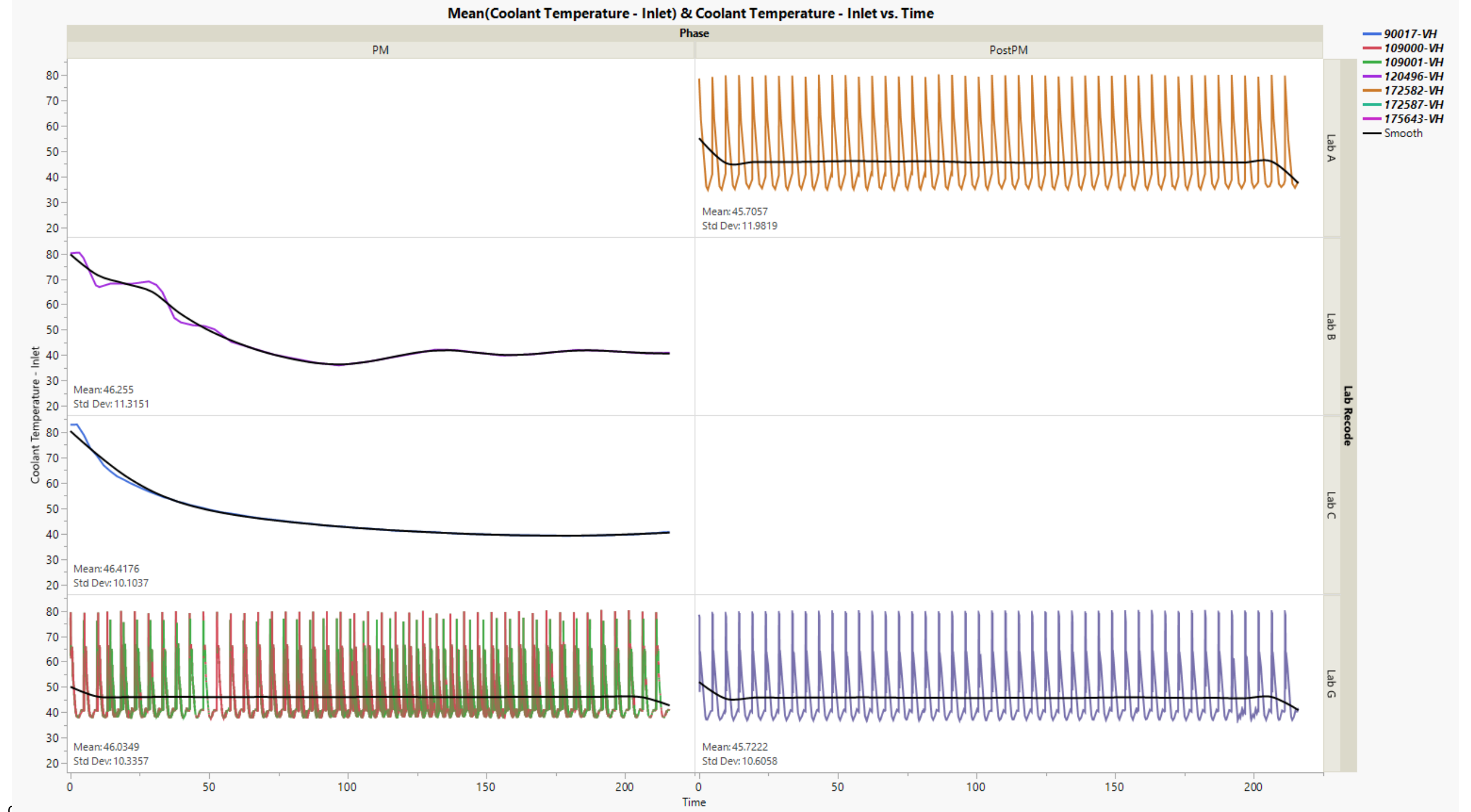
RO 940 Data Plots

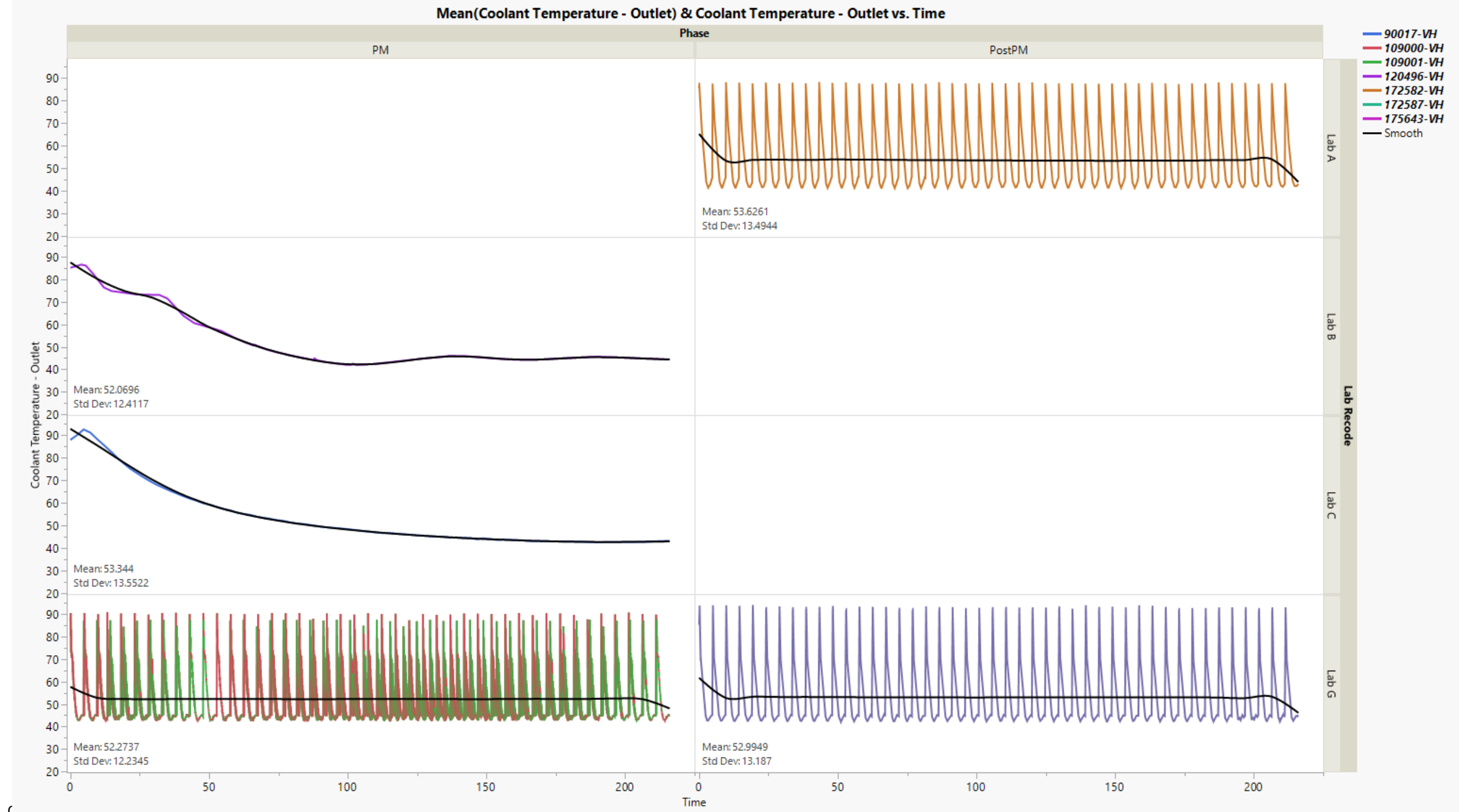
Classified as Confidential


Mean(AFR Left) & AFR Left vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
AFR Left
Time
Mean: 0.77289
Std Dev: 0.04861
Mean: 0.75534
Std Dev: 0.01598
Mean: 0.75495
Std Dev: 0.03995
Mean: 0.7318
Std Dev: 0.02213
Mean: 0.74287
Std Dev: 0.03587
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

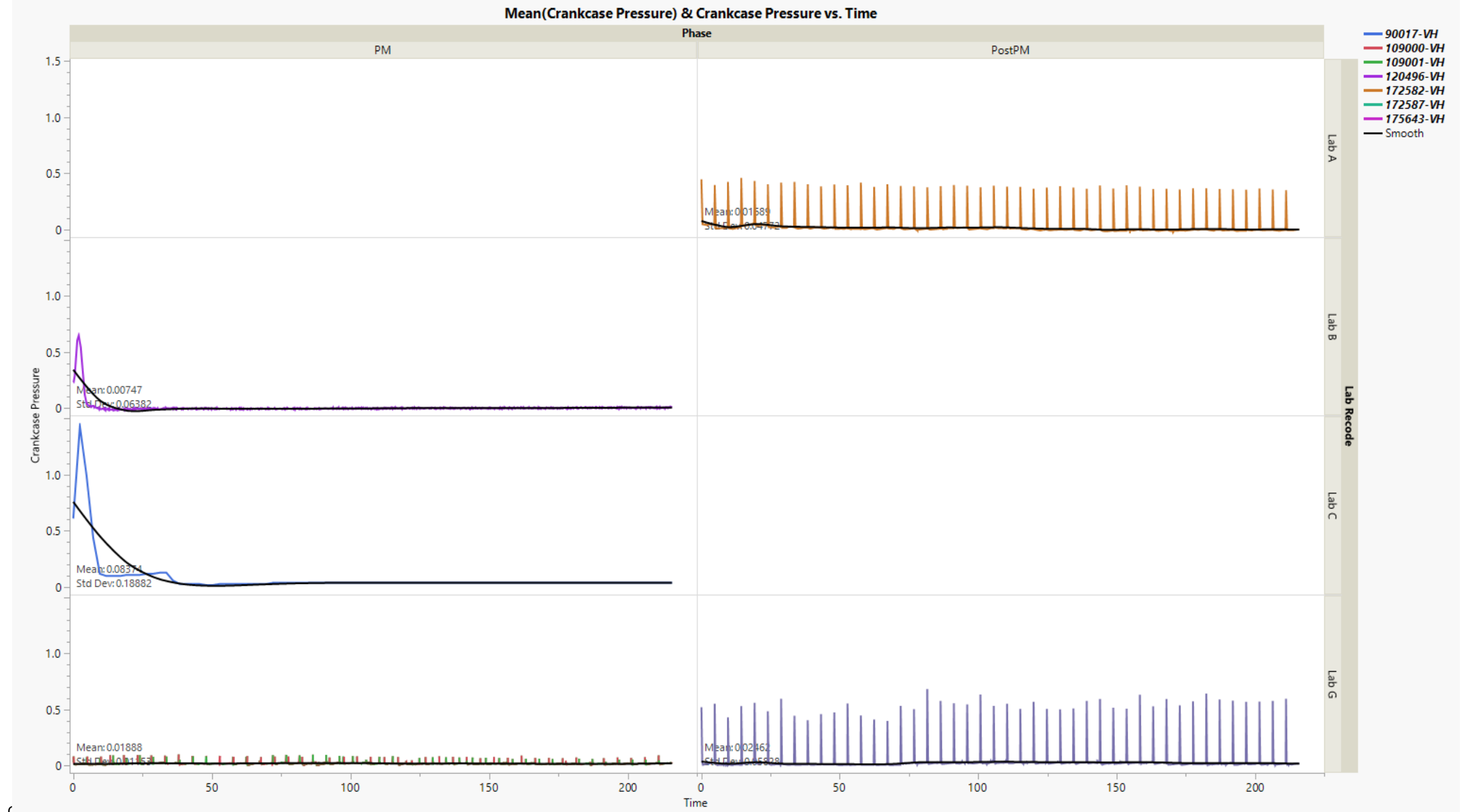

Mean(AFR Right) & AFR Right vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
AFR Right
Time
Mean: 0.77297
Std Dev: 0.0503
Mean: 0.74745
Std Dev: 0.01596
Mean: 0.75231
Std Dev: 0.03636
Mean: 0.72301
Std Dev: 0.02159
Mean: 0.7465
Std Dev: 0.03673
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))


Mean(Barometric Pressure) & Barometric Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Barometric Pressure
Time
Mean: 98.5222
Std Dev: 0.58942
Mean: 98.8931
Std Dev: 0.01452
Mean: 101.445
Std Dev: 0.01213
Mean: 29.0554
Std Dev: 1.30984
Mean: 29.1748
Std Dev: 1.5835
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

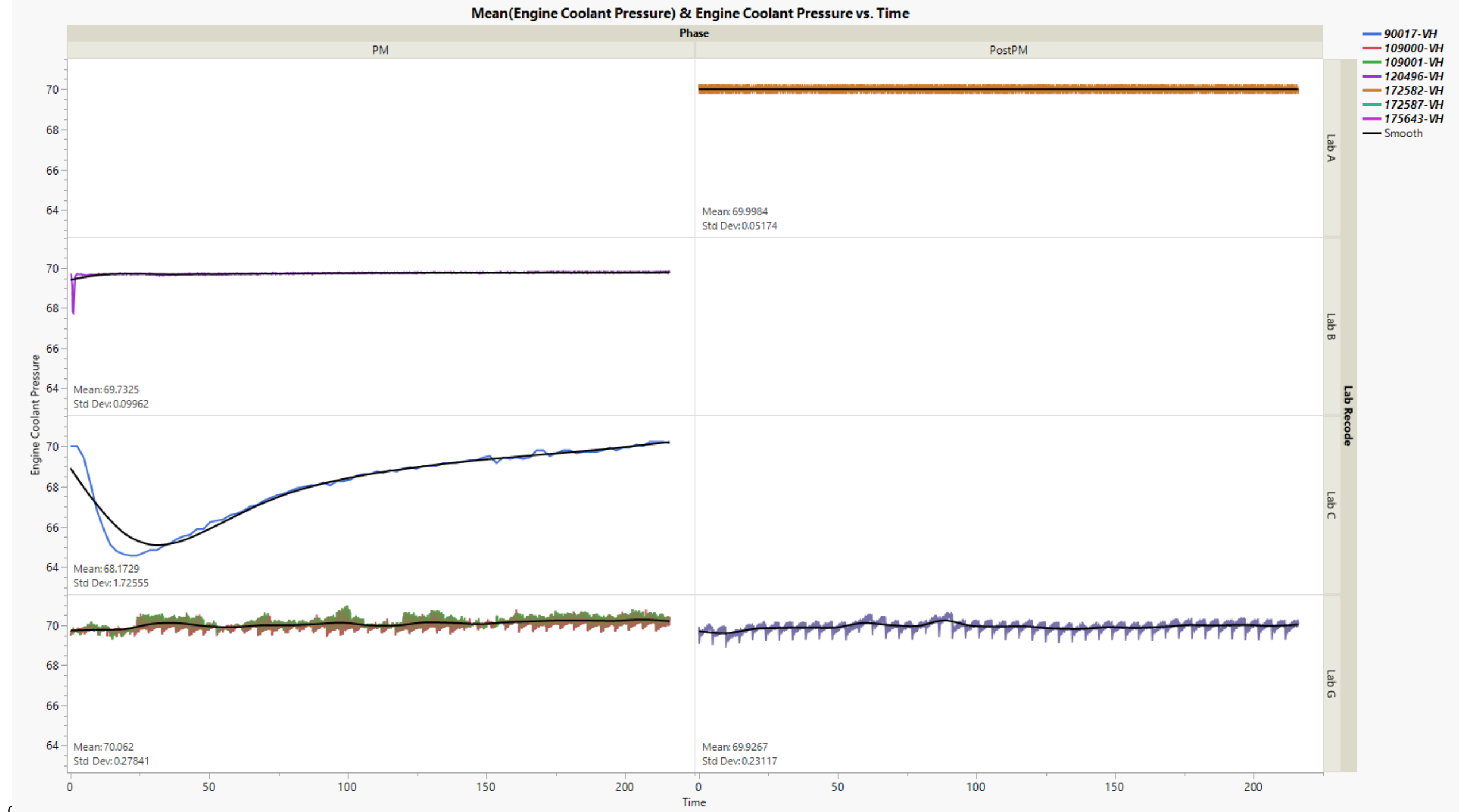

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Coolant Temperature - Inlet
Time
Mean: 45.7057
Std Dev: 11.9819
Mean: 46.255
Std Dev: 11.3151
Mean: 46.4176
Std Dev: 10.1037
Mean: 46.0349
Std Dev: 10.3357
Mean: 45.7222
Std Dev: 10.6058
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

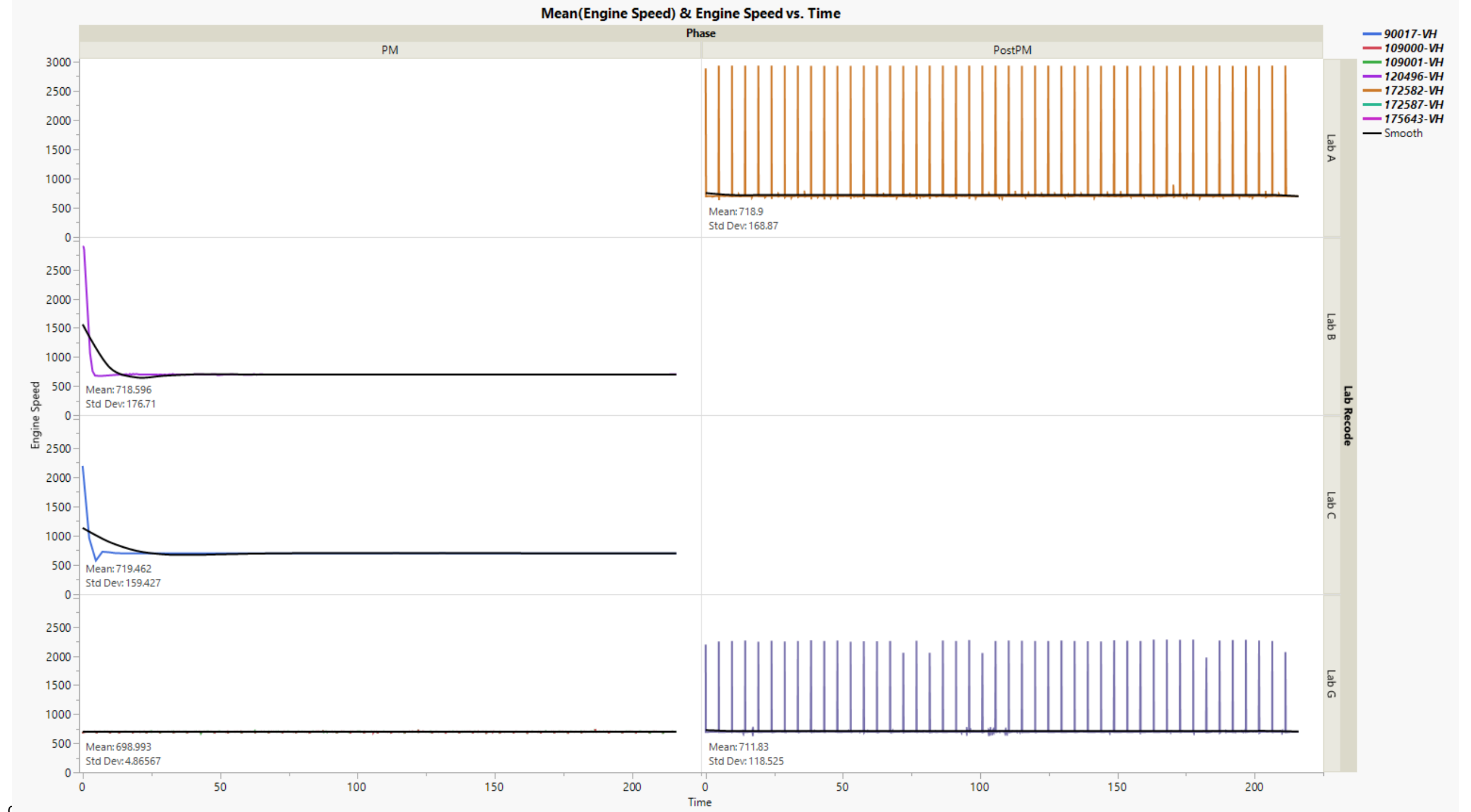


Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

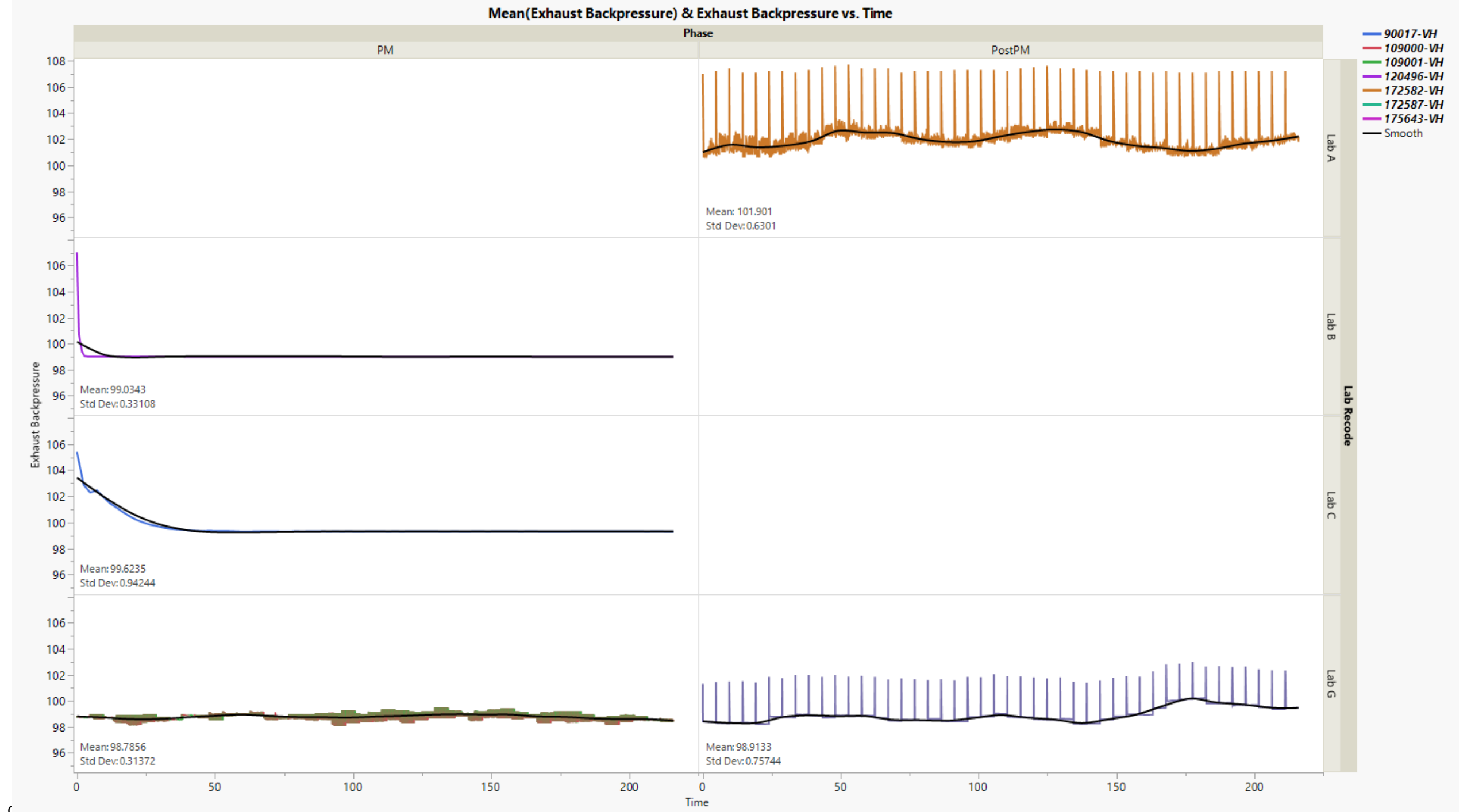


Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

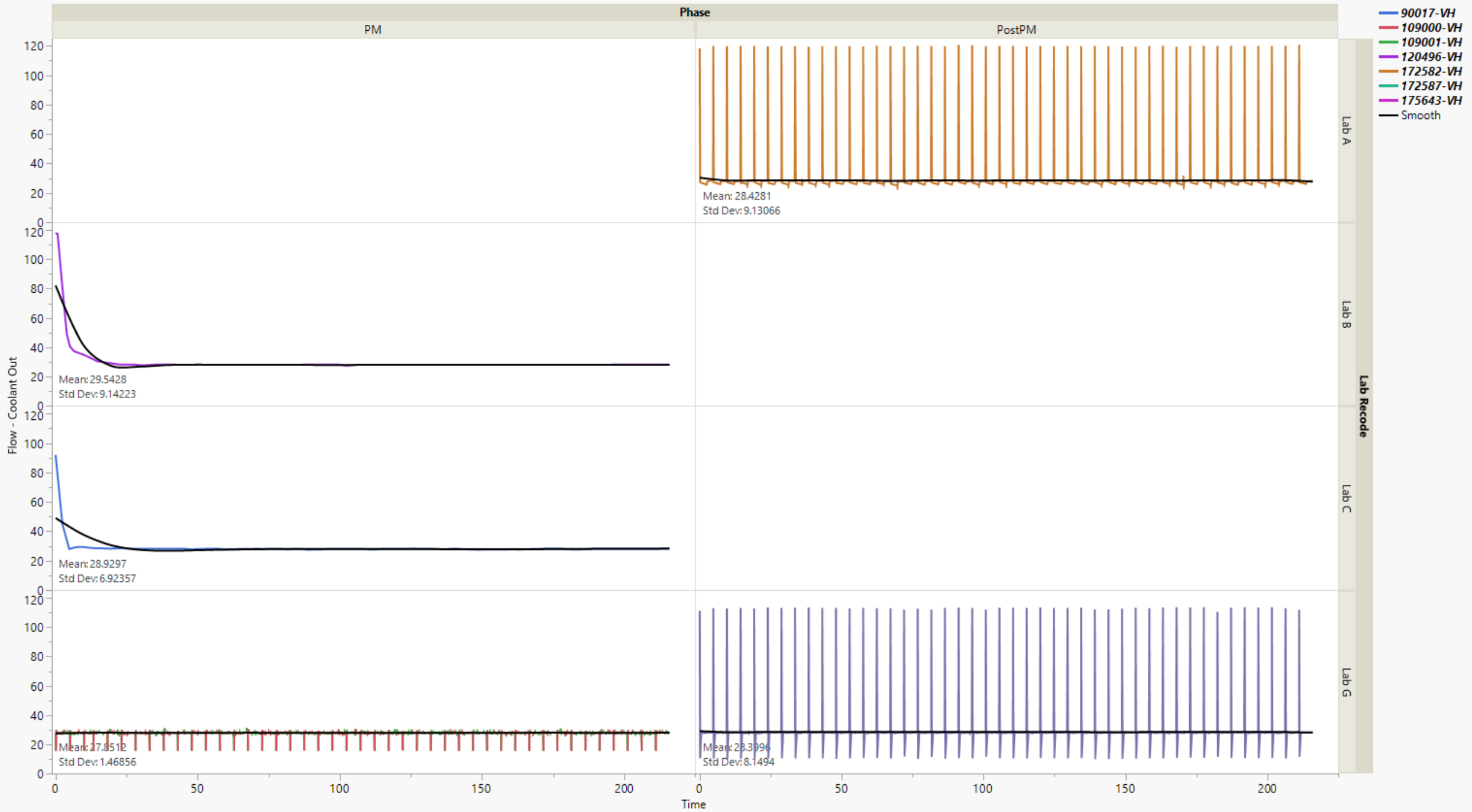

Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 69.9984
Std Dev: 0.05174
Mean: 69.7325
Std Dev: 0.09962
Mean: 68.1729
Std Dev: 1.72555
Mean: 70.062
Std Dev: 0.27841
Mean: 69.9267
Std Dev: 0.23117
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



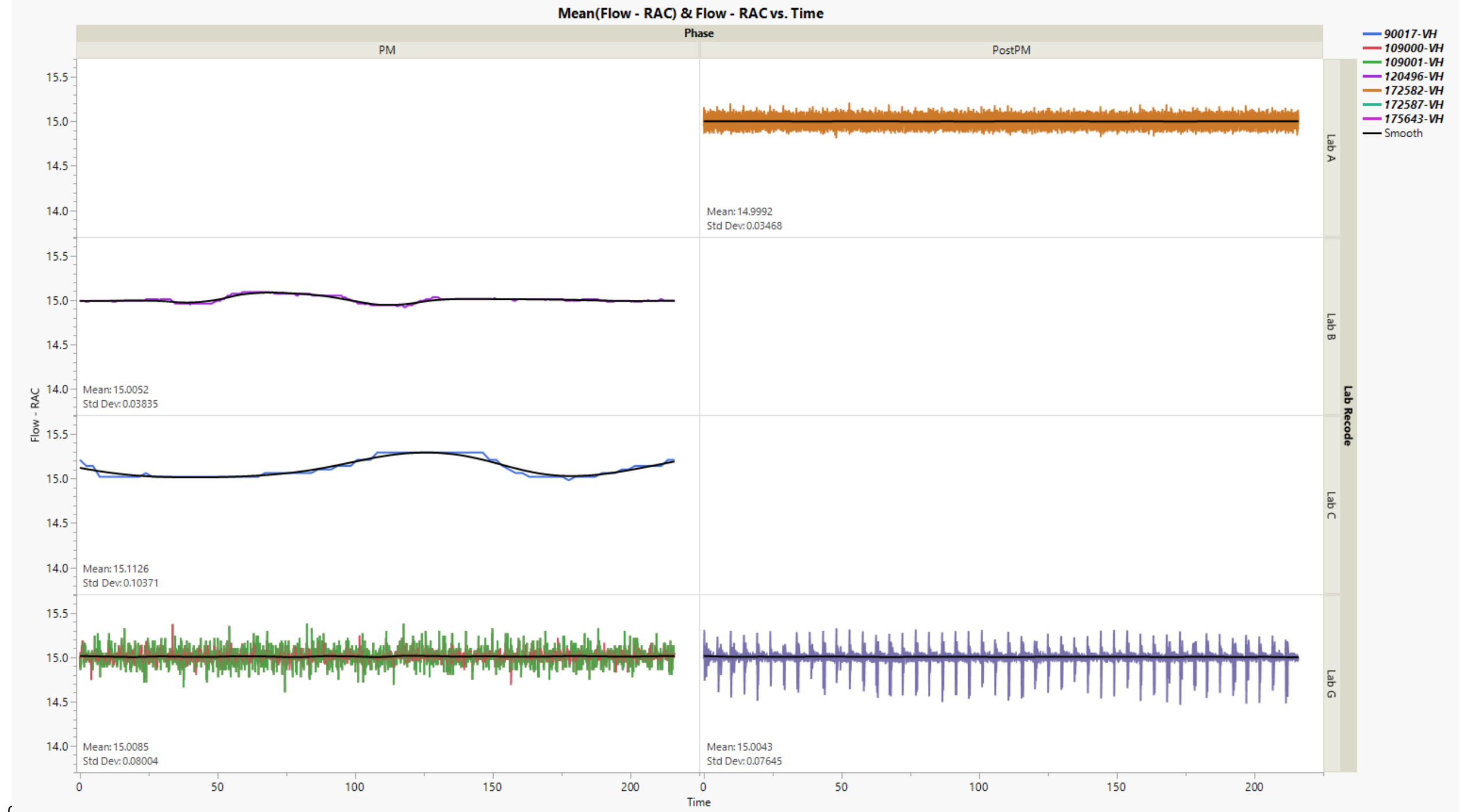
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



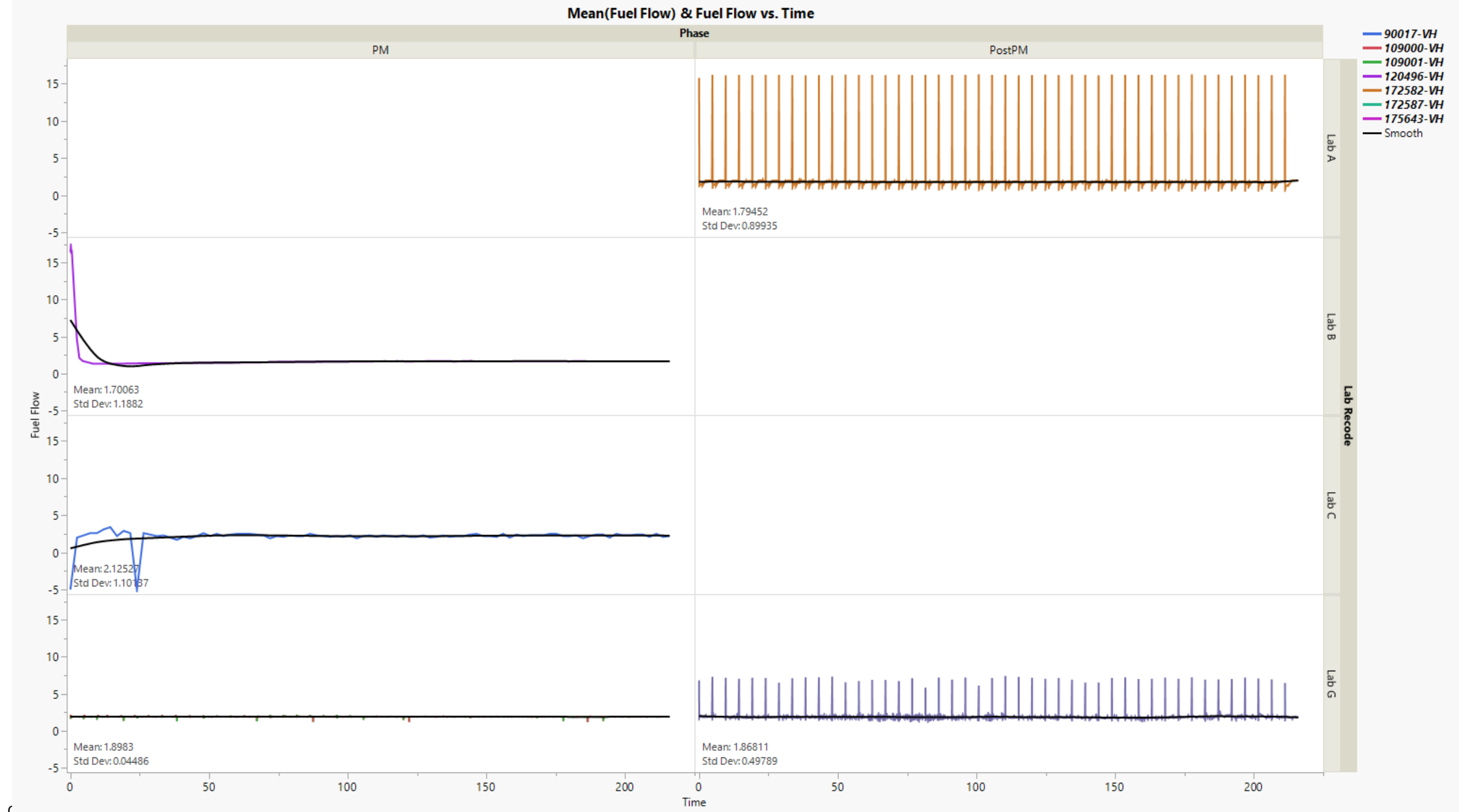
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

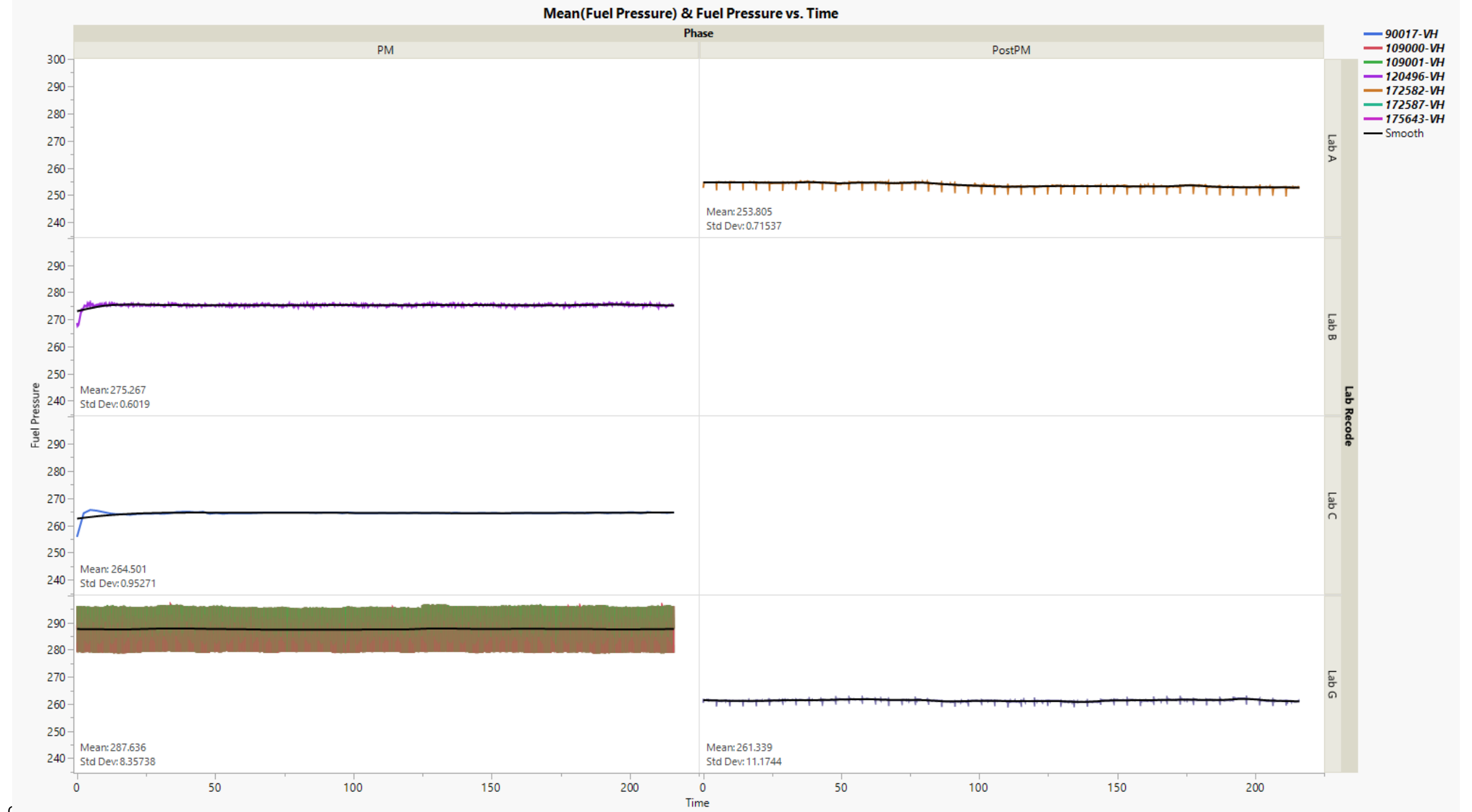


Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

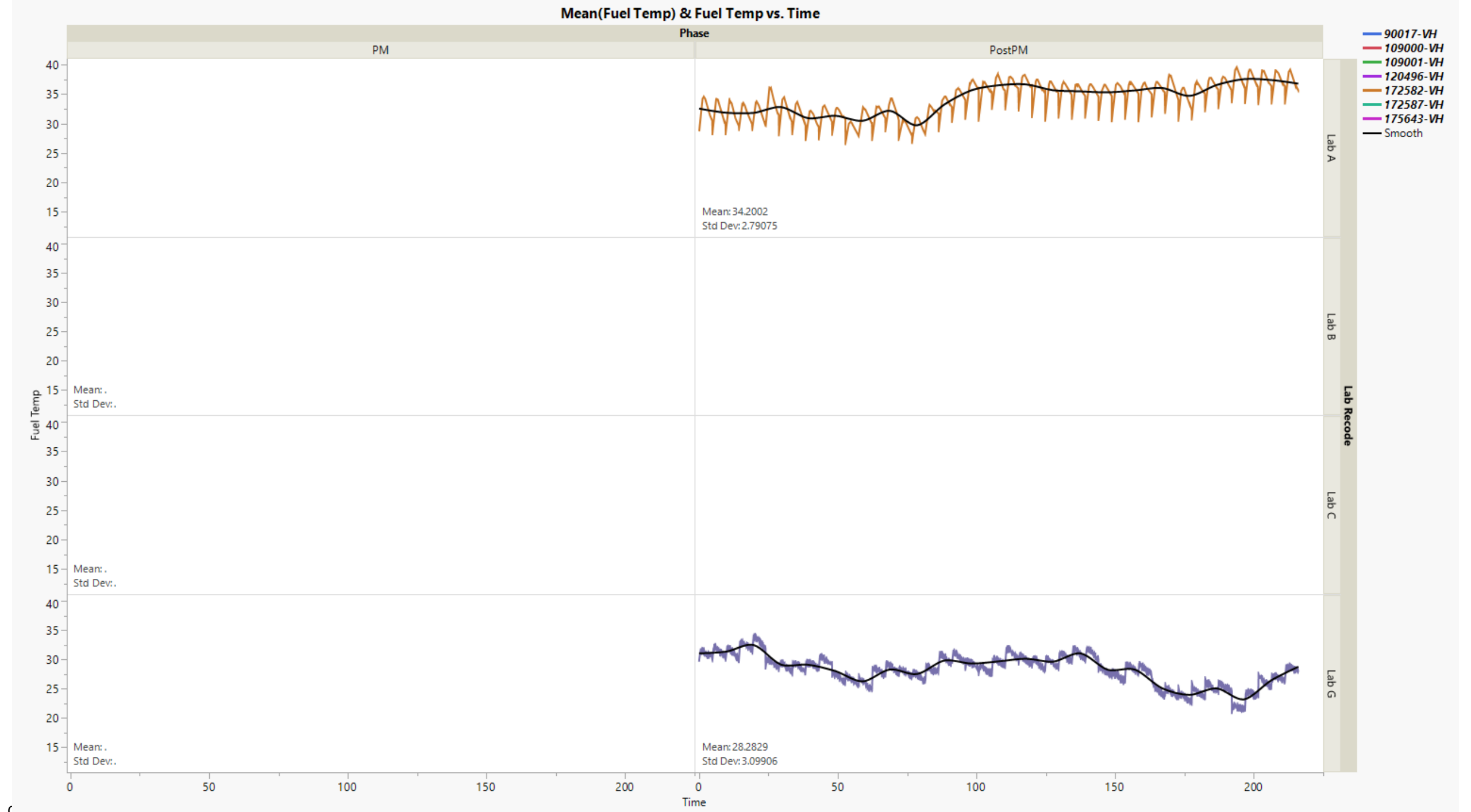


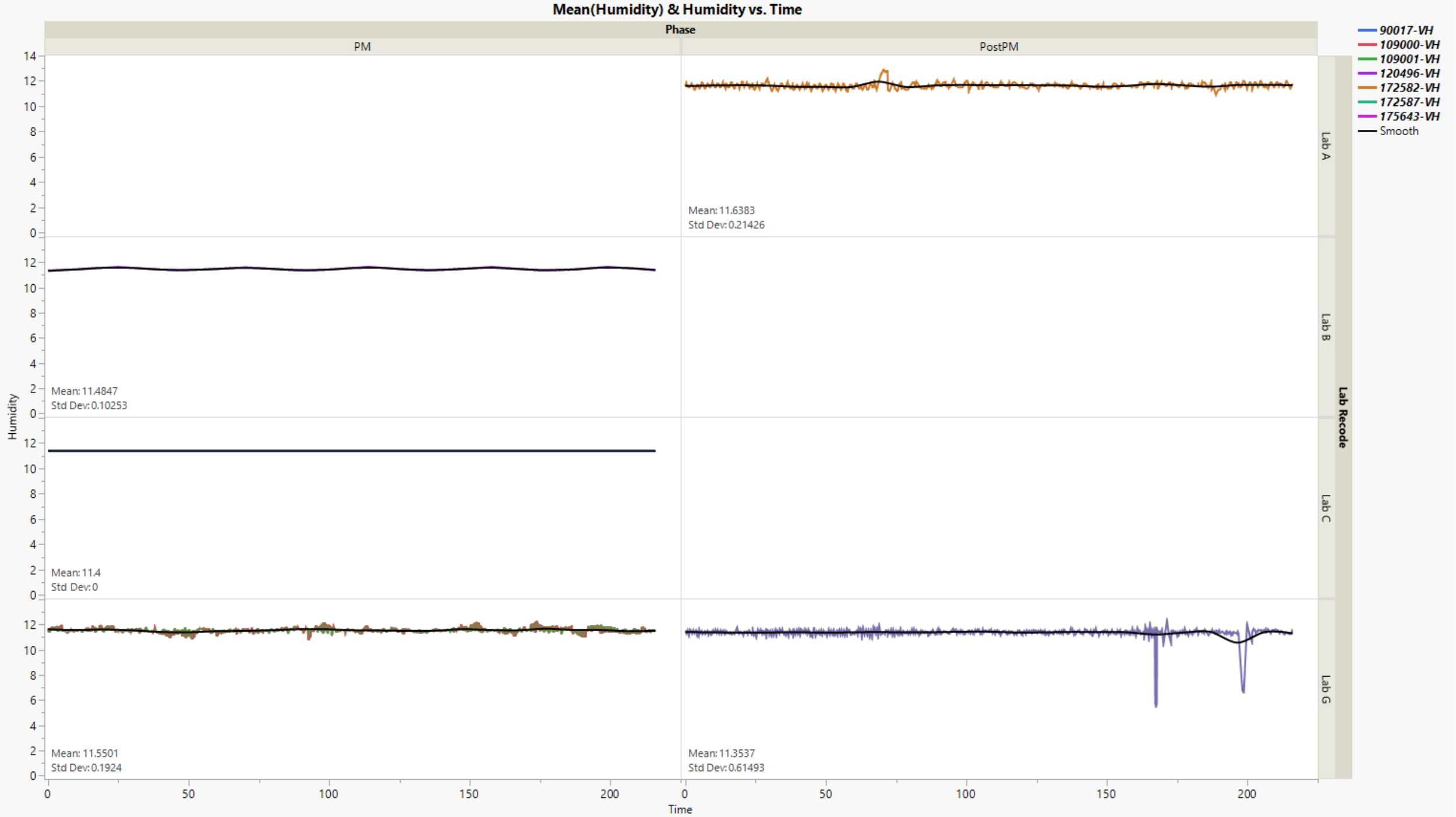
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

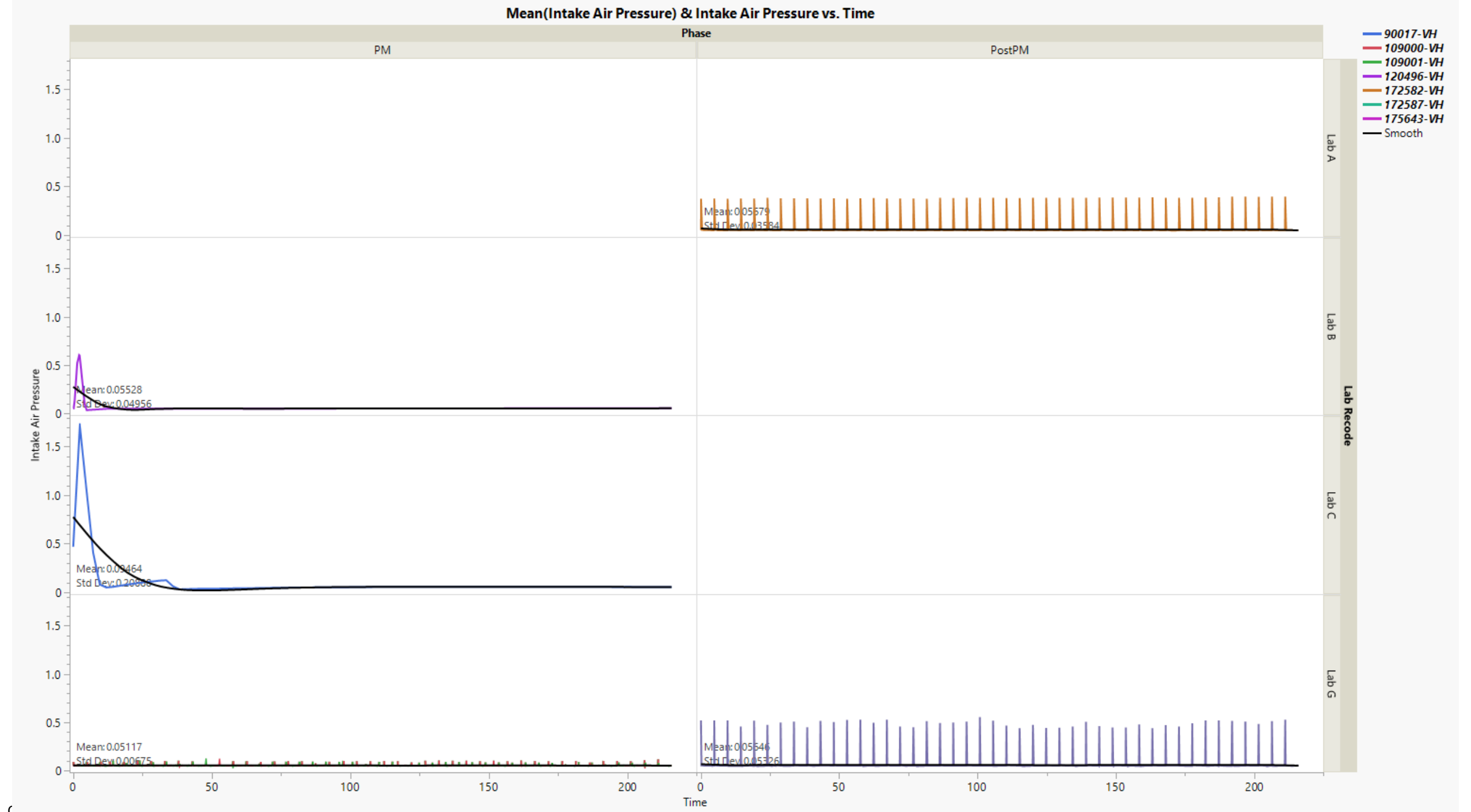

Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Fuel Flow
Time
Mean: 1.79452
Std Dev: 0.89935
Mean: 1.70063
Std Dev: 1.1882
Mean: 2.12527
Std Dev: 1.10137
Mean: 1.8983
Std Dev: 0.04486
Mean: 1.86811
Std Dev: 0.49789
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



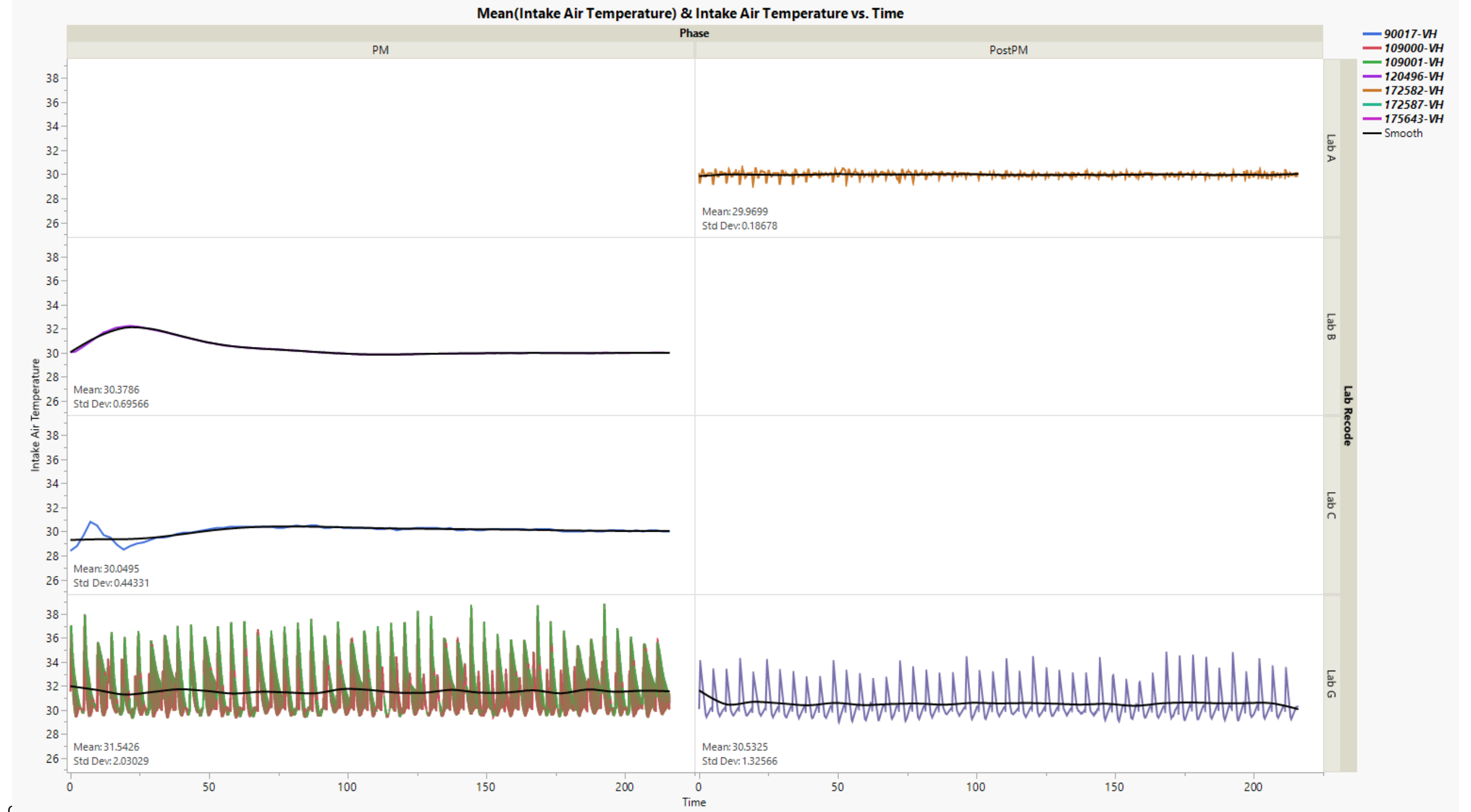
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

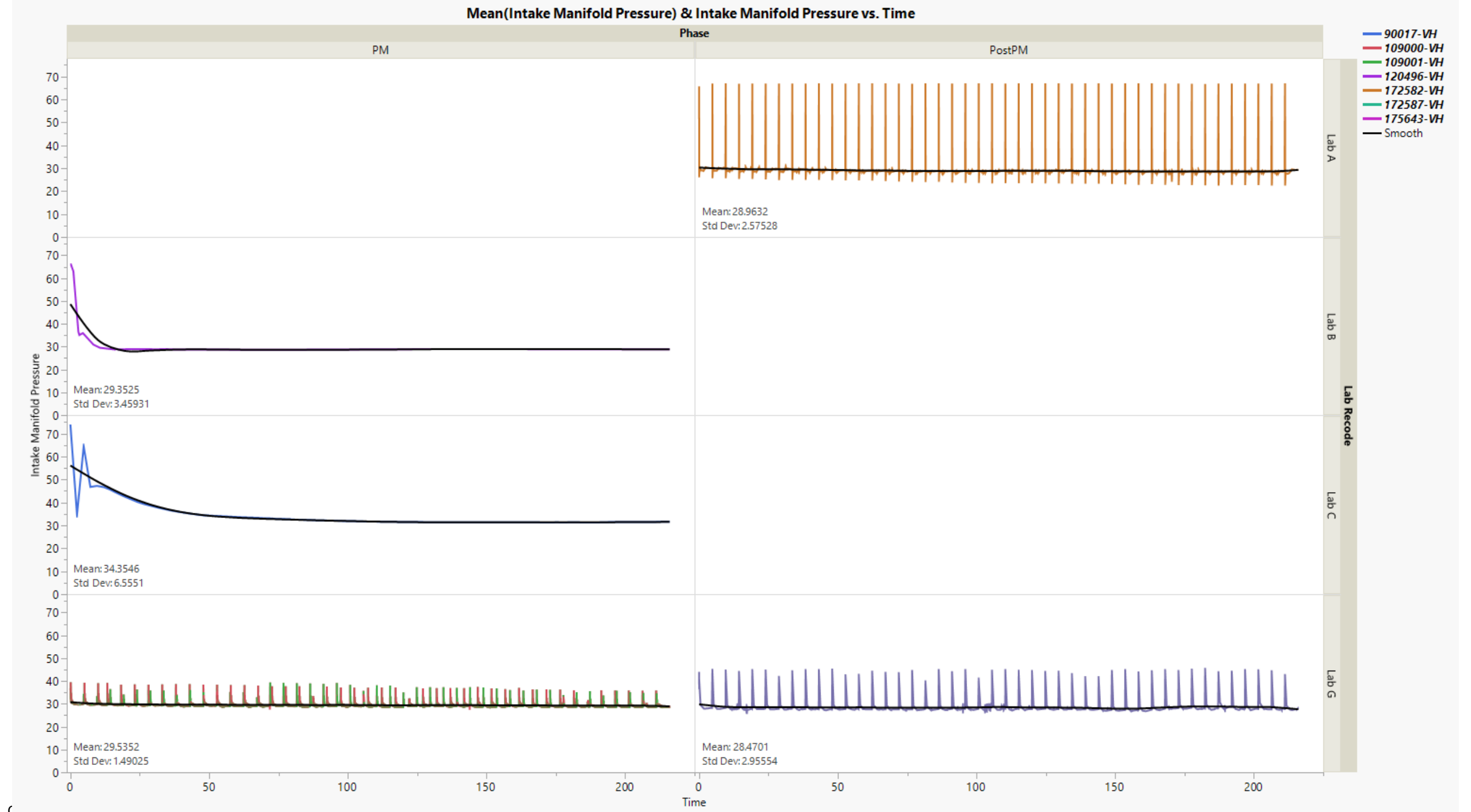

Mean(Fuel Temp) & Fuel Temp vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Fuel Temp
Time
Mean: 34.2002
Std Dev: 2.79075
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: 28.2829
Std Dev: 3.09906
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

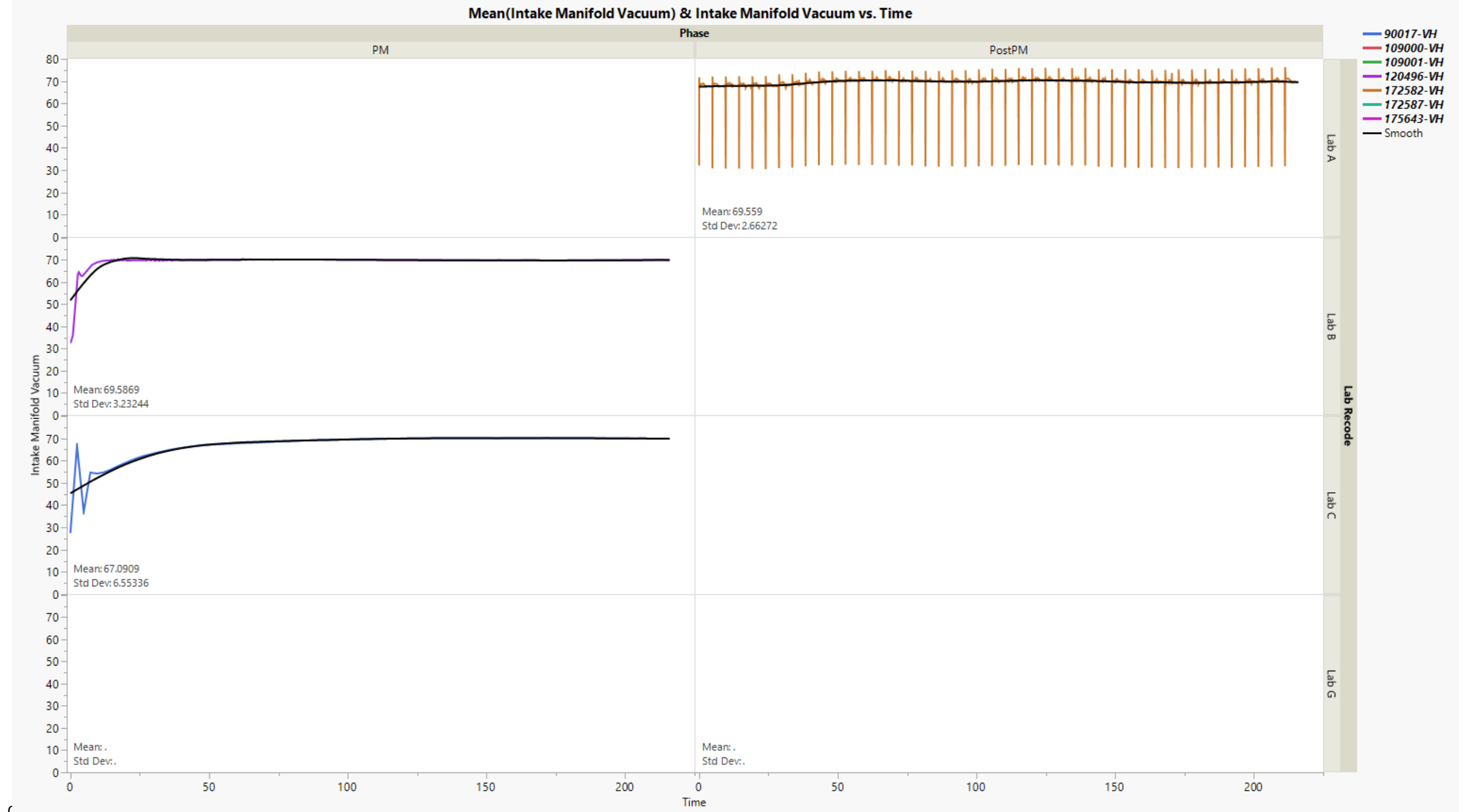

Mean(Humidity) & Humidity vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Humidity
Time
Mean: 11.6383
Std Dev: 0.21426
Mean: 11.4847
Std Dev: 0.10253
Mean: 11.4
Std Dev: 0
Mean: 11.5501
Std Dev: 0.1924
Mean: 11.3537
Std Dev: 0.61493
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



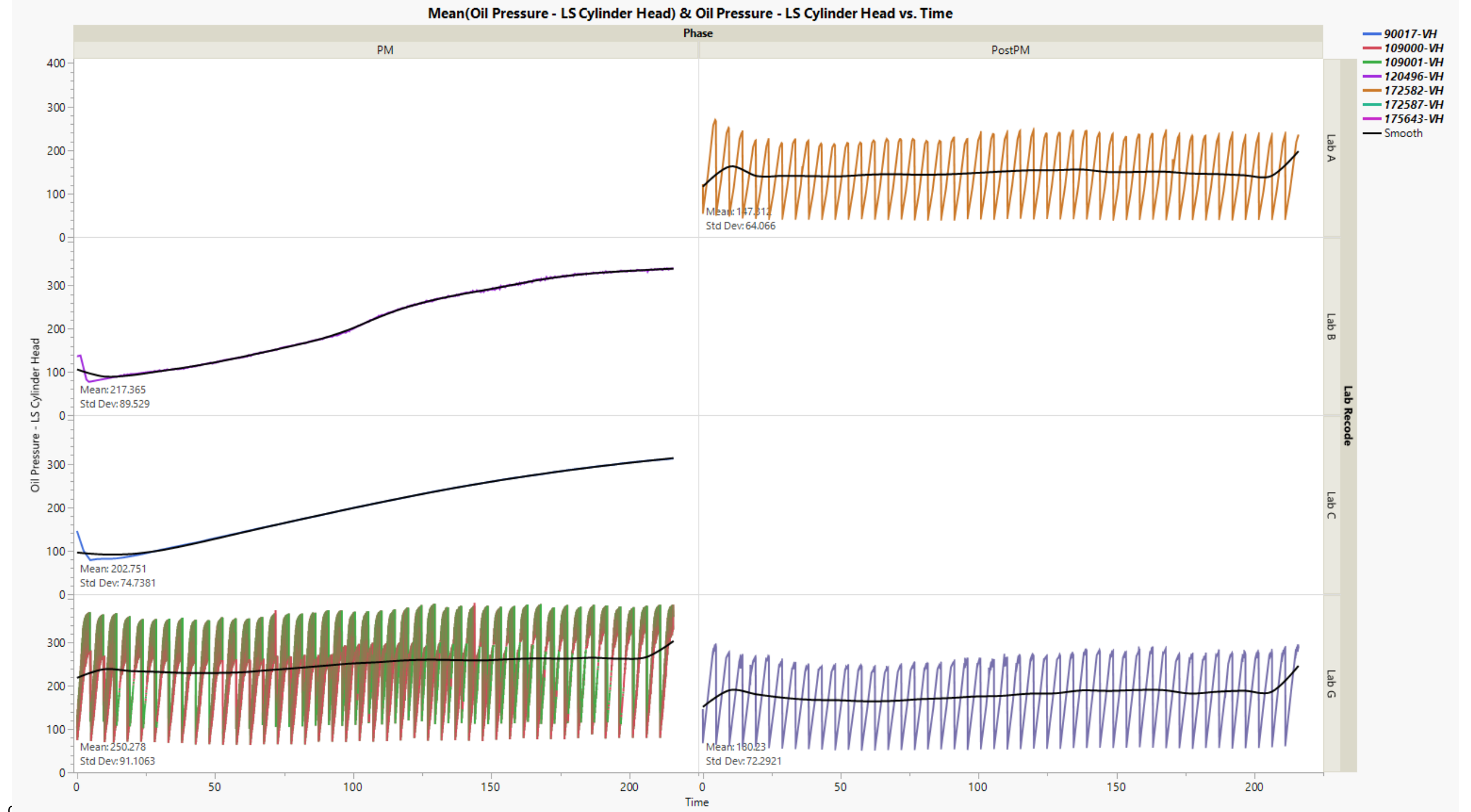
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))


Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 29.9699
Std Dev: 0.18678
Mean: 30.3786
Std Dev: 0.69566
Mean: 30.0495
Std Dev: 0.44331
Mean: 31.5426
Std Dev: 2.03029
Mean: 30.5325
Std Dev: 1.32566
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

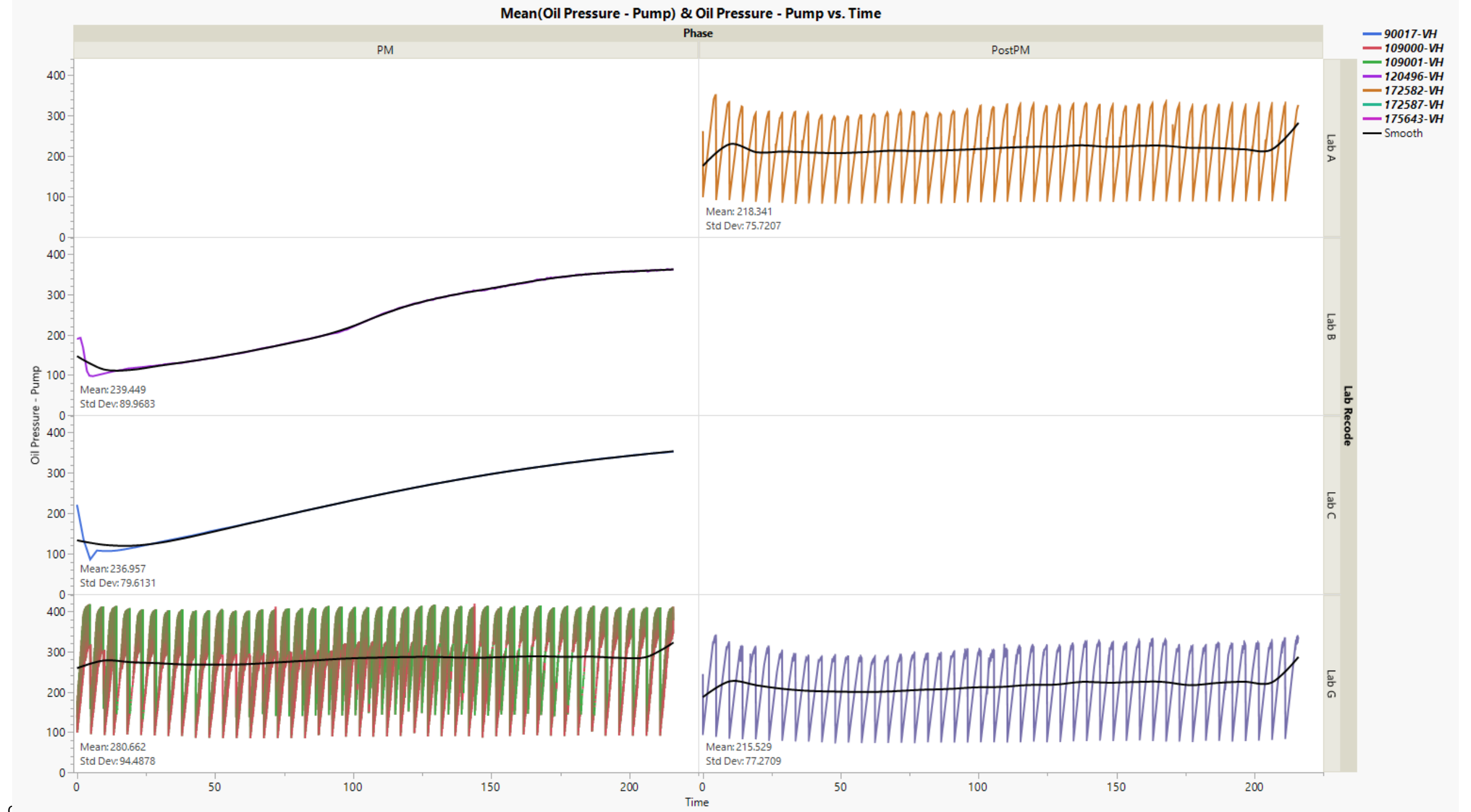

Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Intake Manifold Pressure
Time
Mean: 28.9632
Std Dev: 2.57528
Mean: 29.3525
Std Dev: 3.45931
Mean: 34.3546
Std Dev: 6.5551
Mean: 29.5352
Std Dev: 1.49025
Mean: 28.4701
Std Dev: 2.95554
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

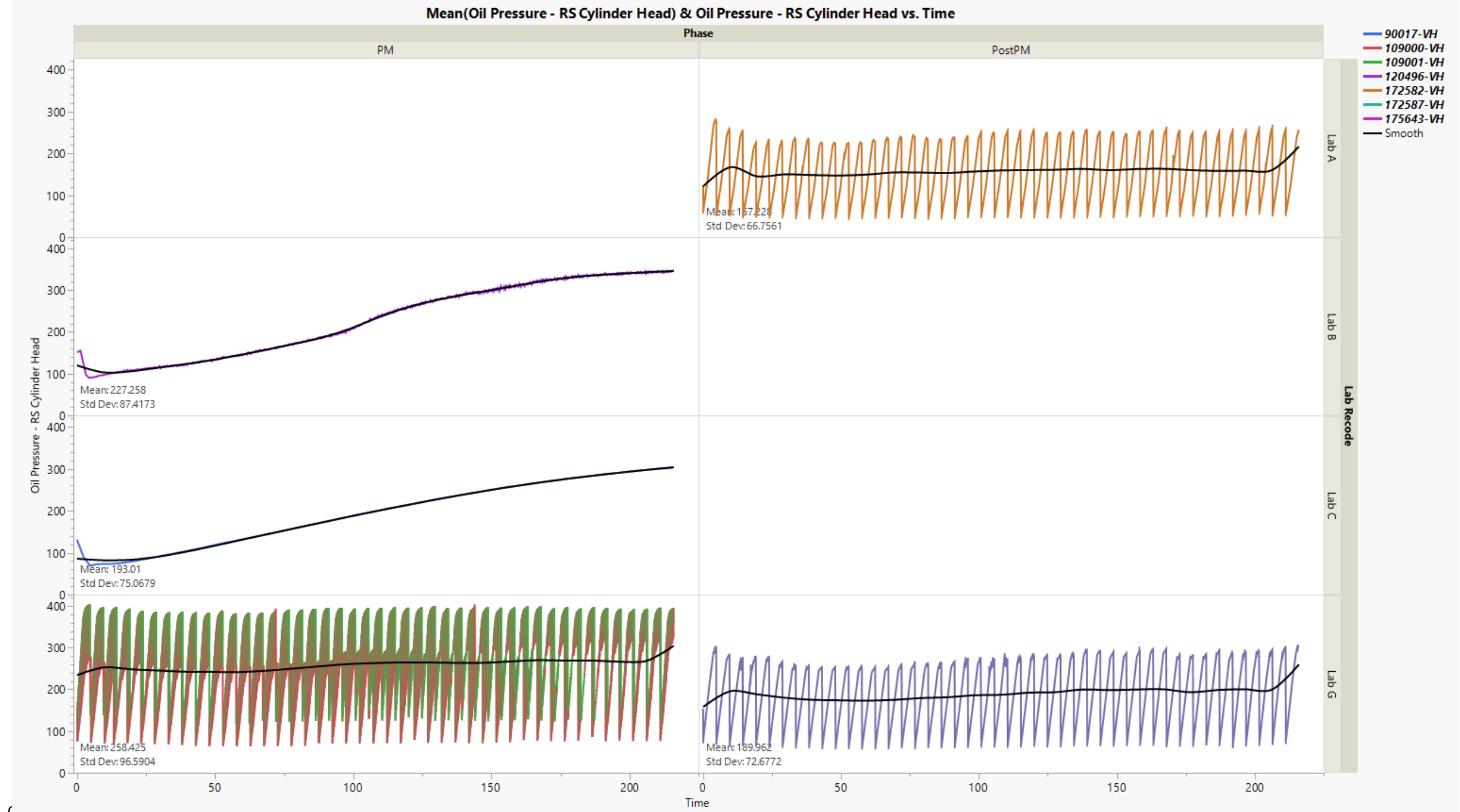


Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

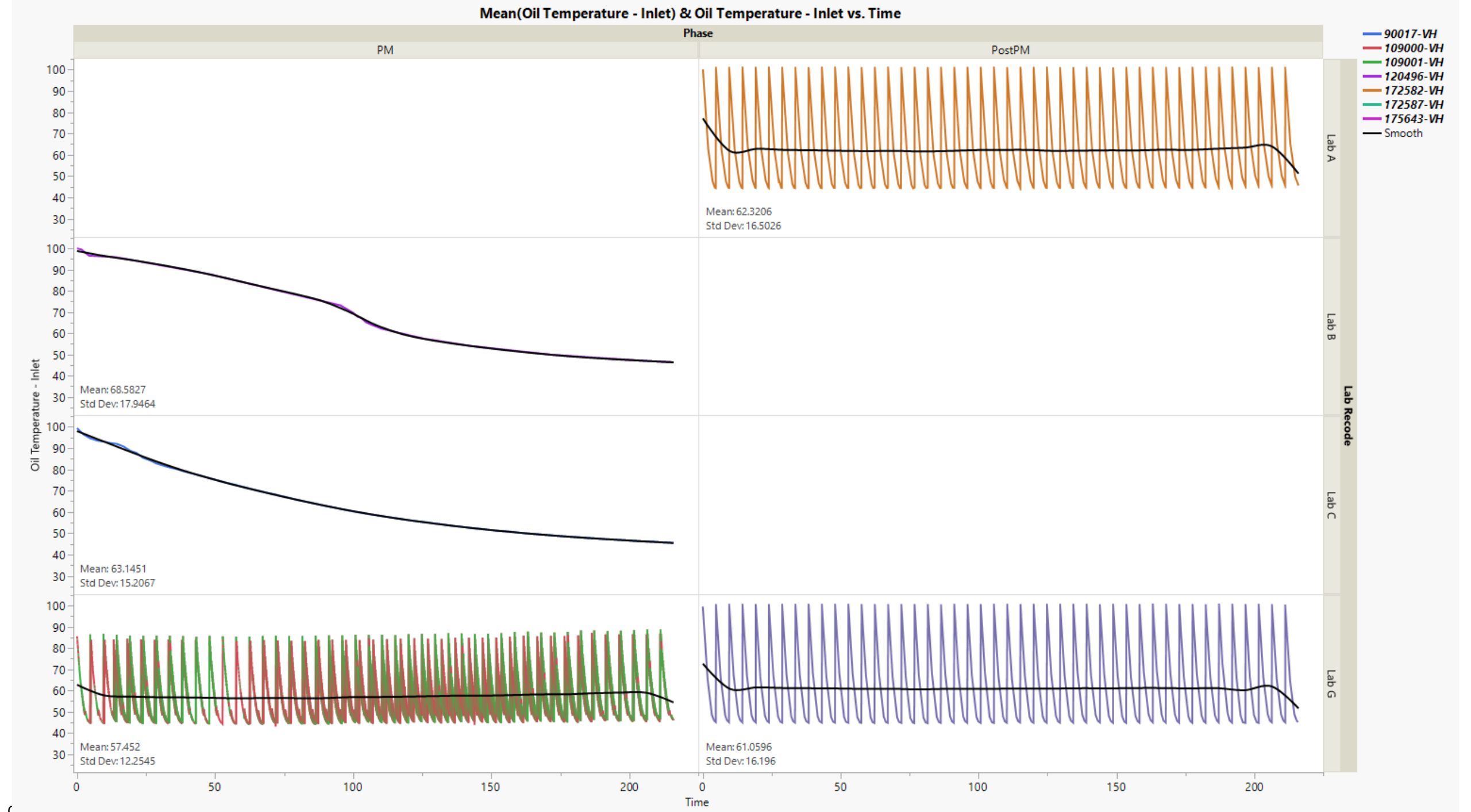


Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

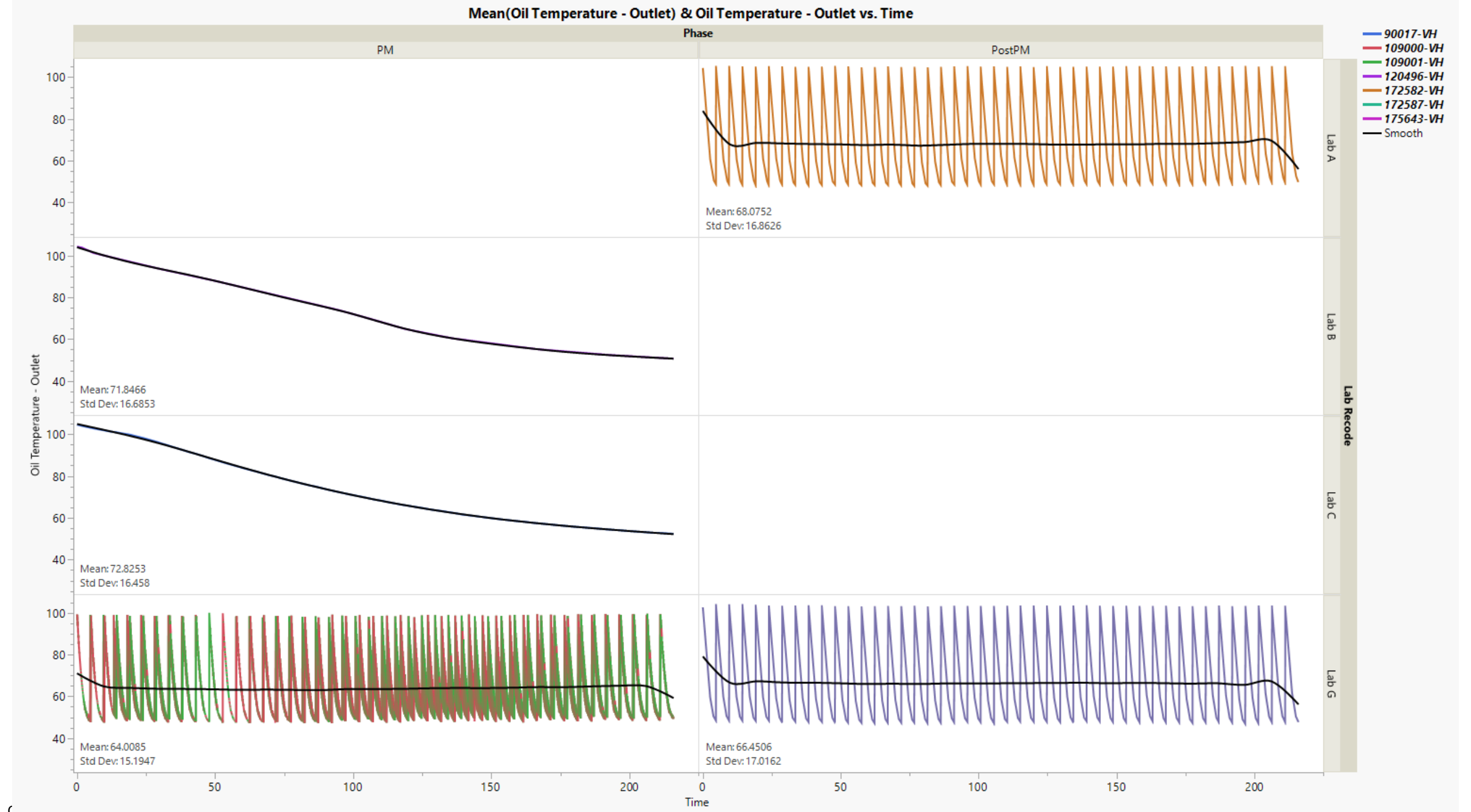

Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Oil Pressure - Pump
Time
Mean: 218.341
Std Dev: 75.7207
Mean: 239.449
Std Dev: 89.9683
Mean: 236.957
Std Dev: 79.6131
Mean: 280.662
Std Dev: 94.4878
Mean: 215.529
Std Dev: 77.2709
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



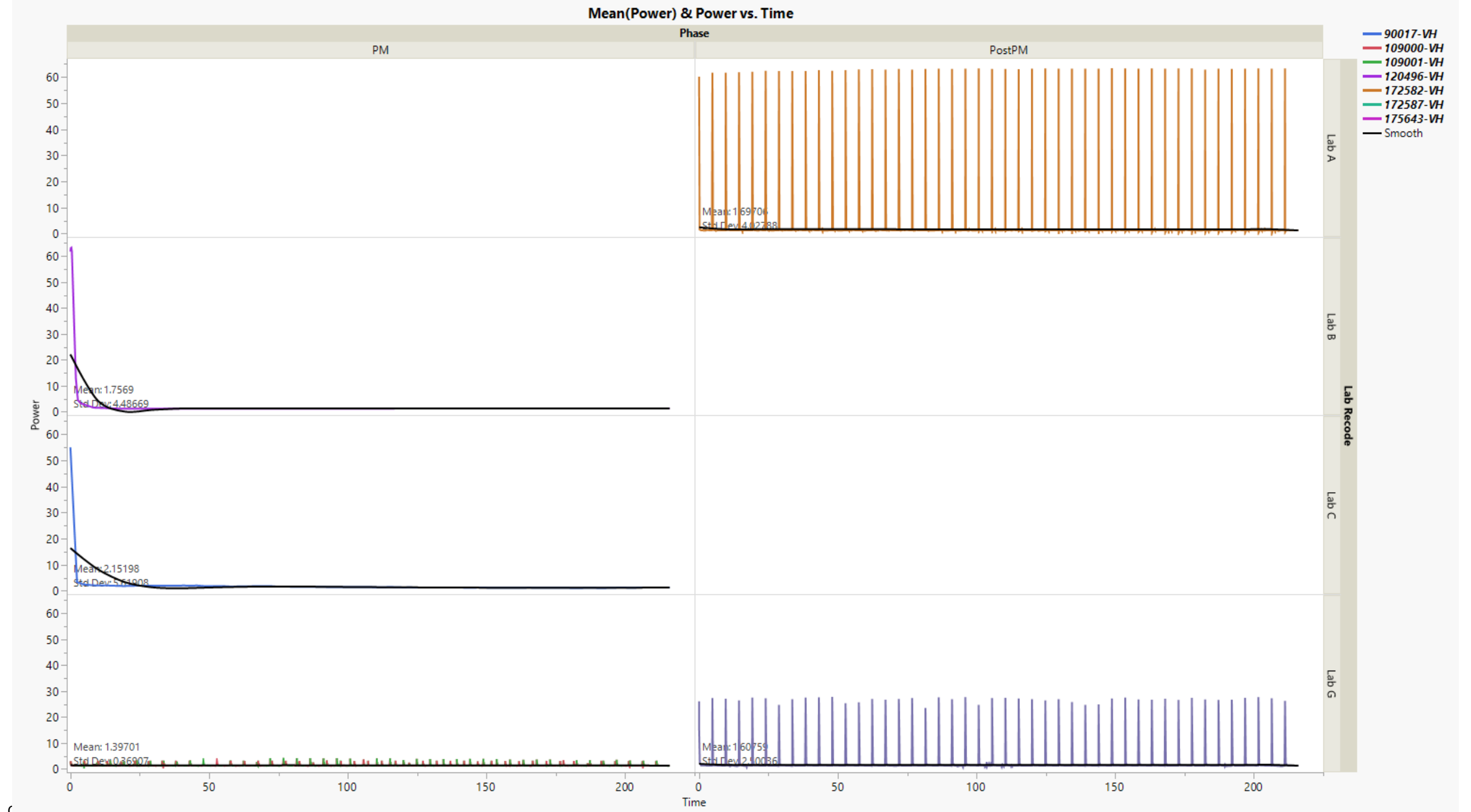
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



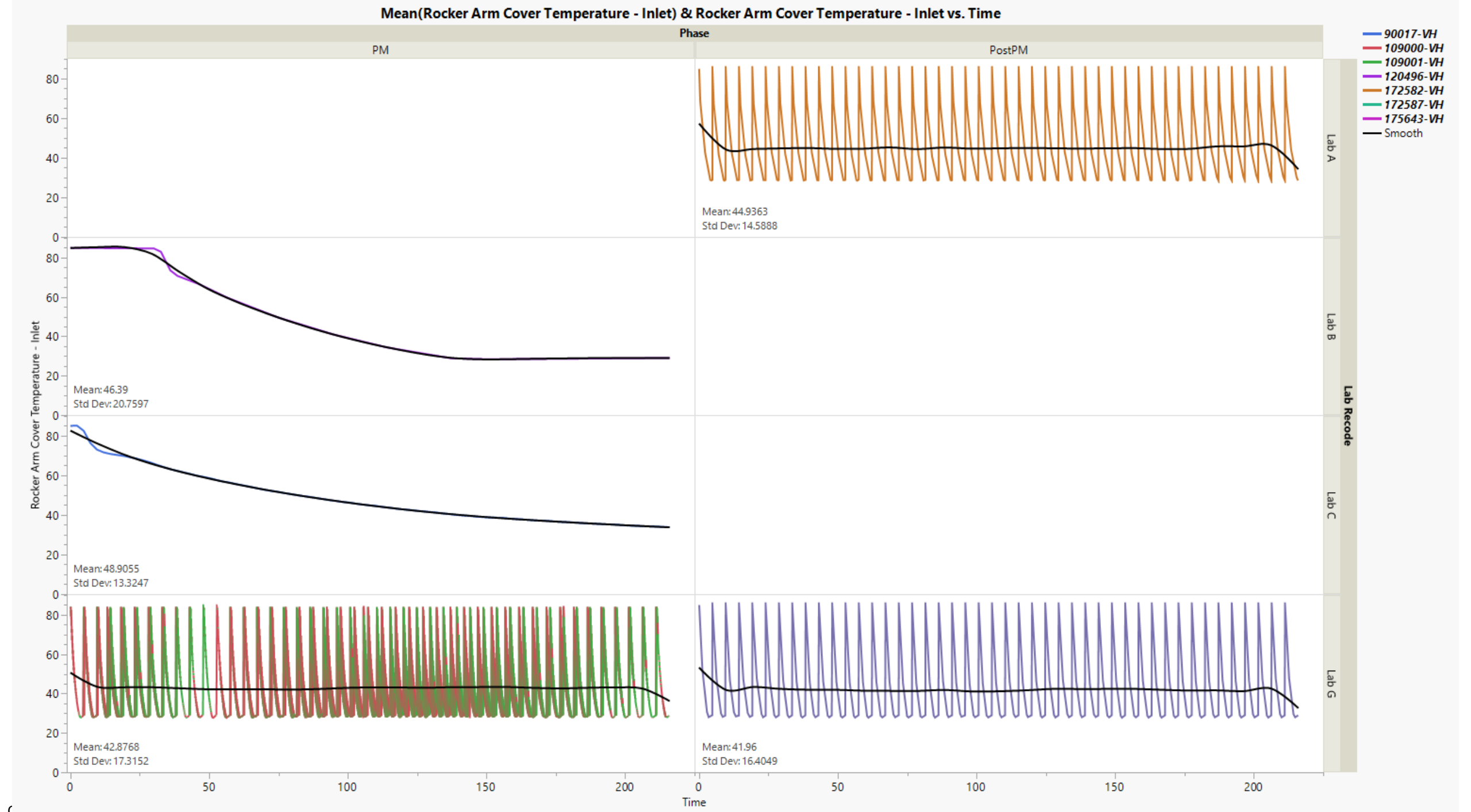
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



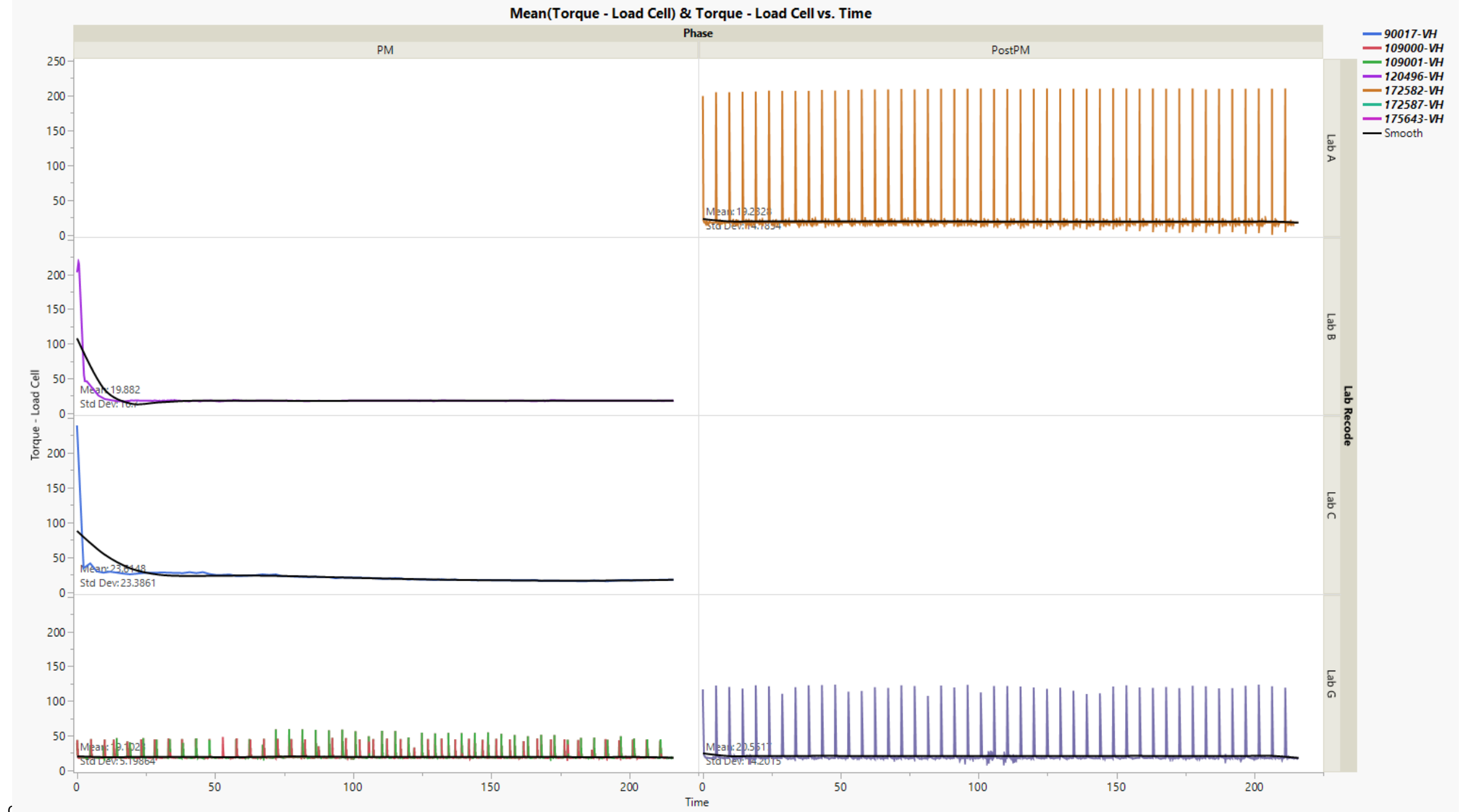
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



Where((Stage = Stage-2-3) and (RefOil 2 = RO940))



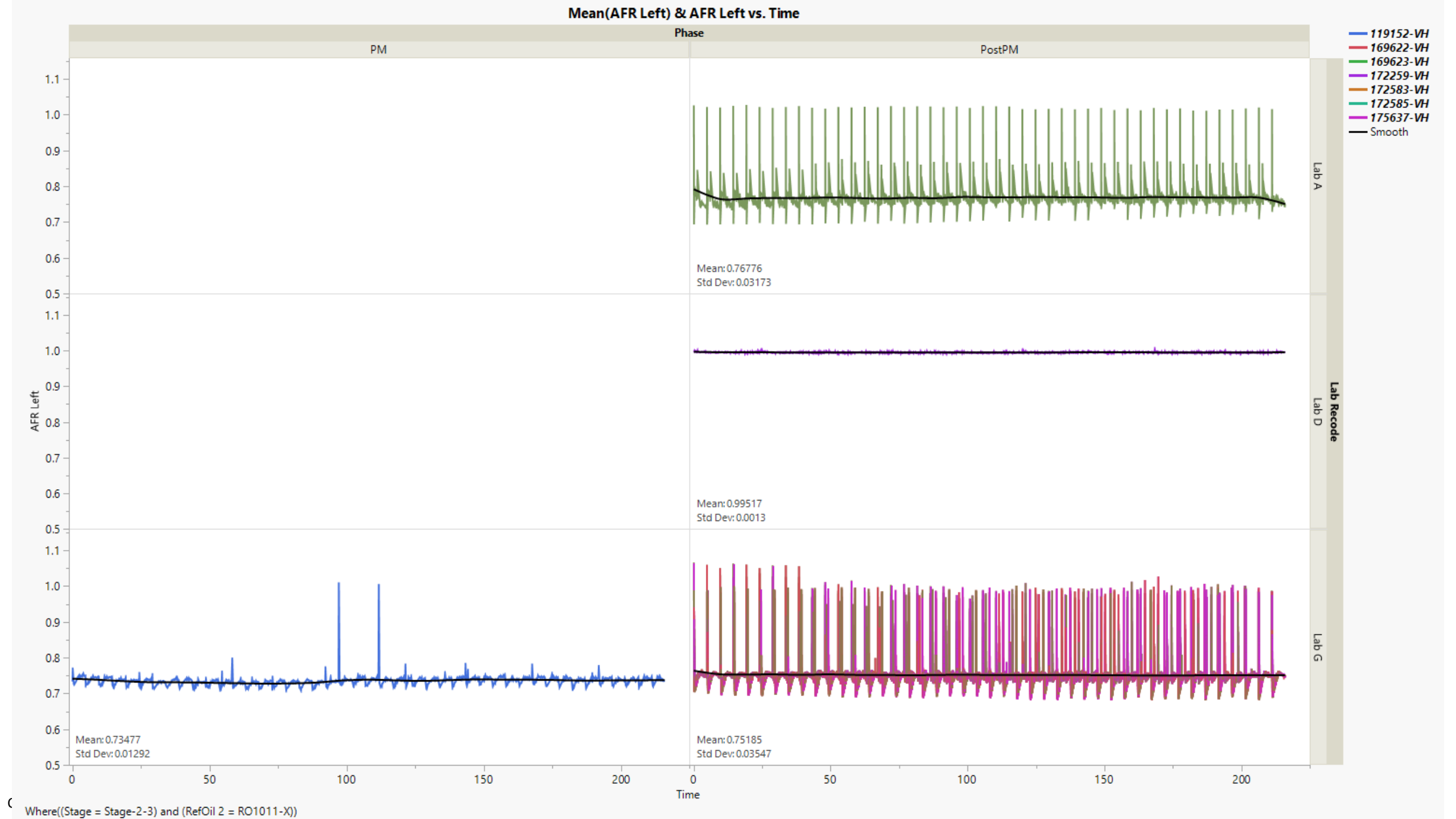
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

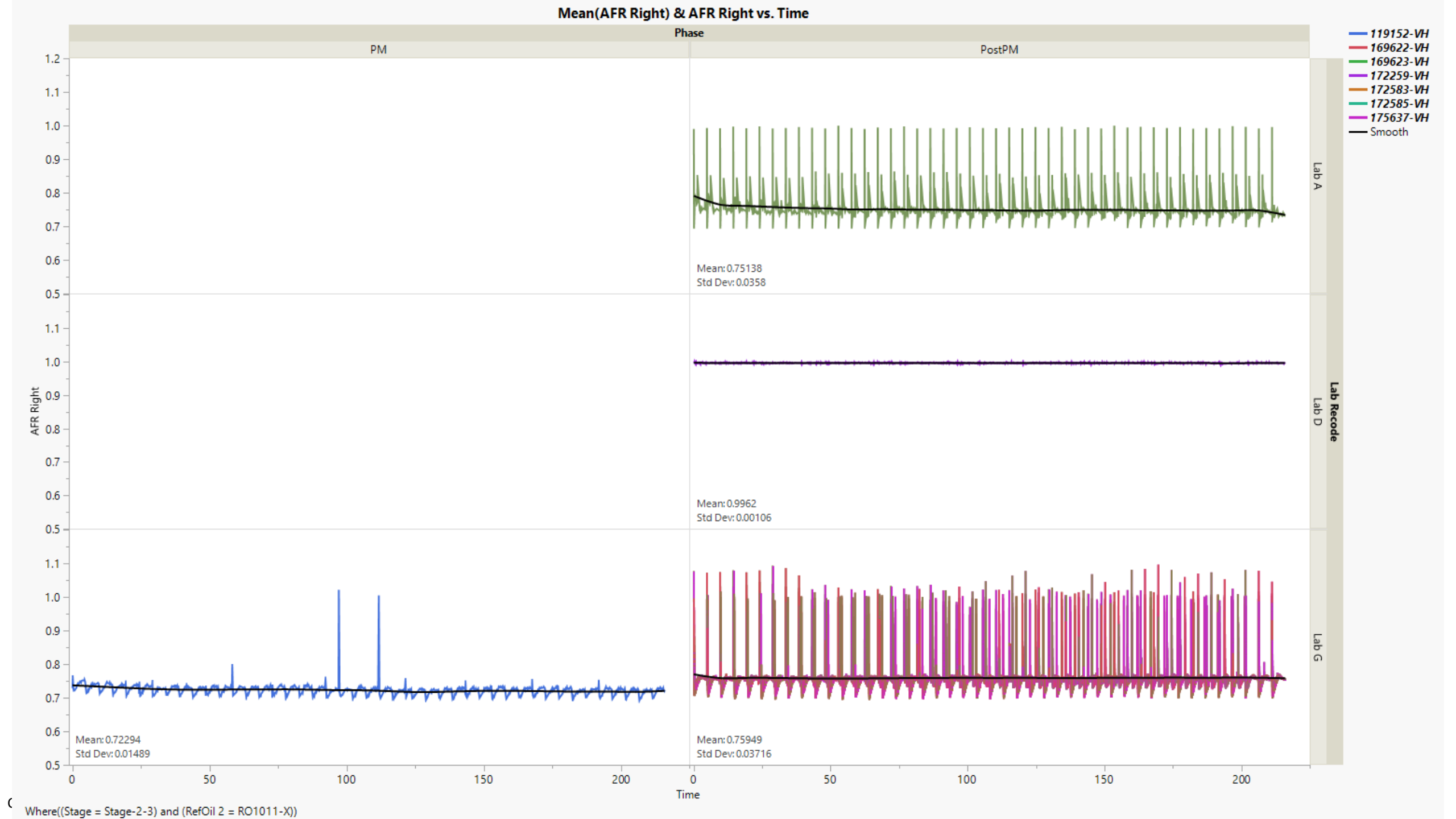


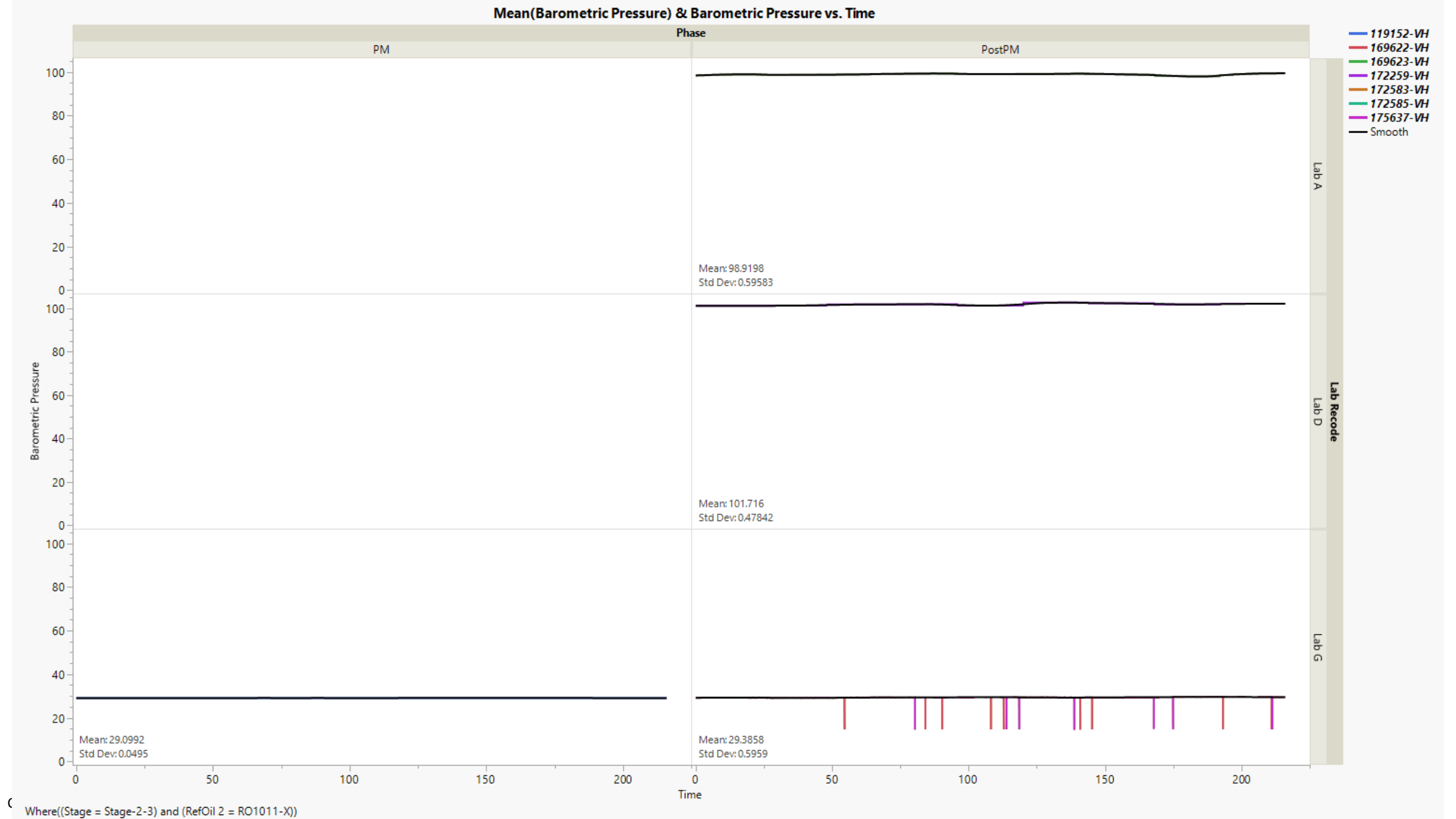
Where((Stage = Stage-2-3) and (RefOil 2 = RO940))

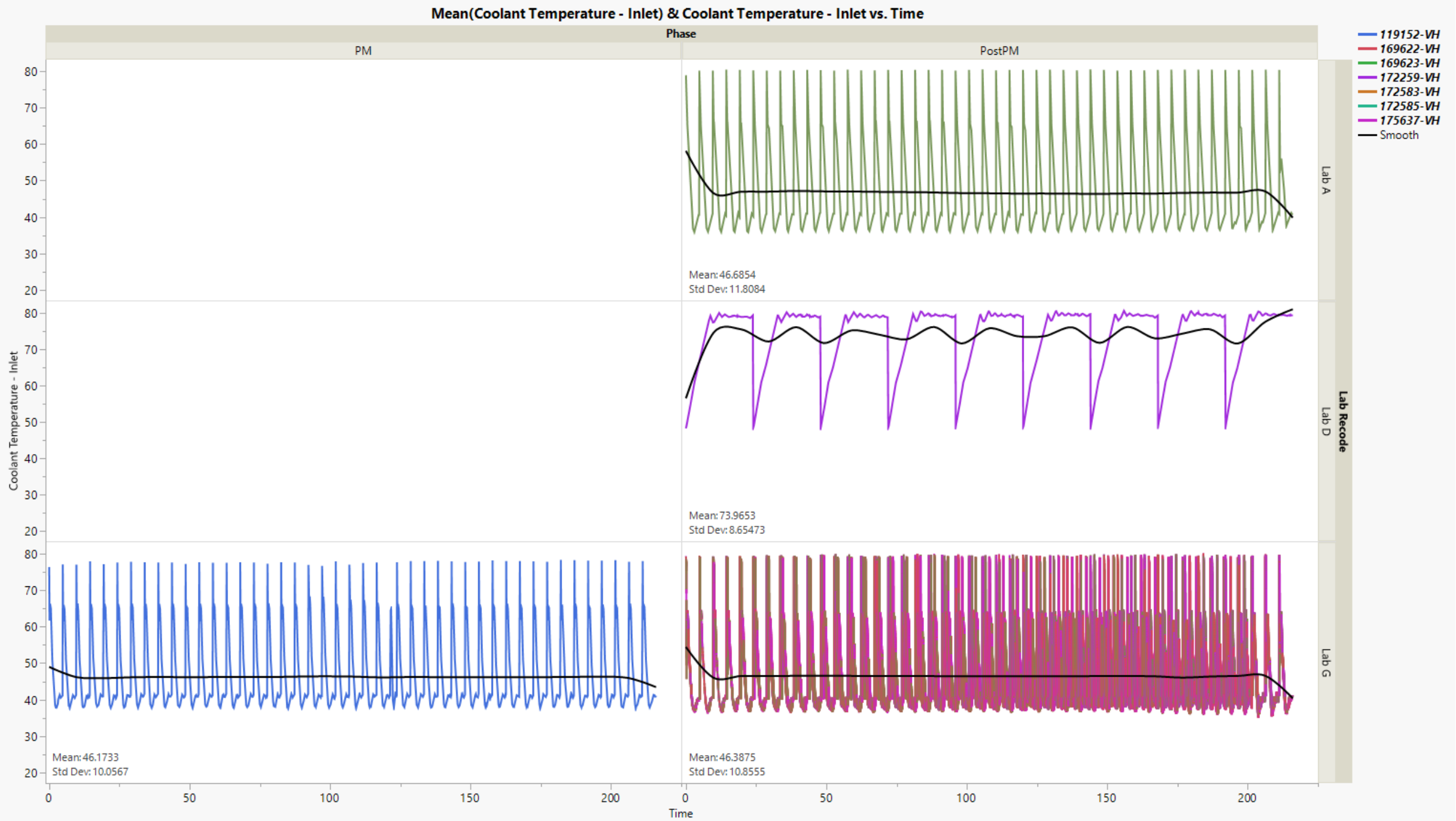
RO 1011 Data Plots

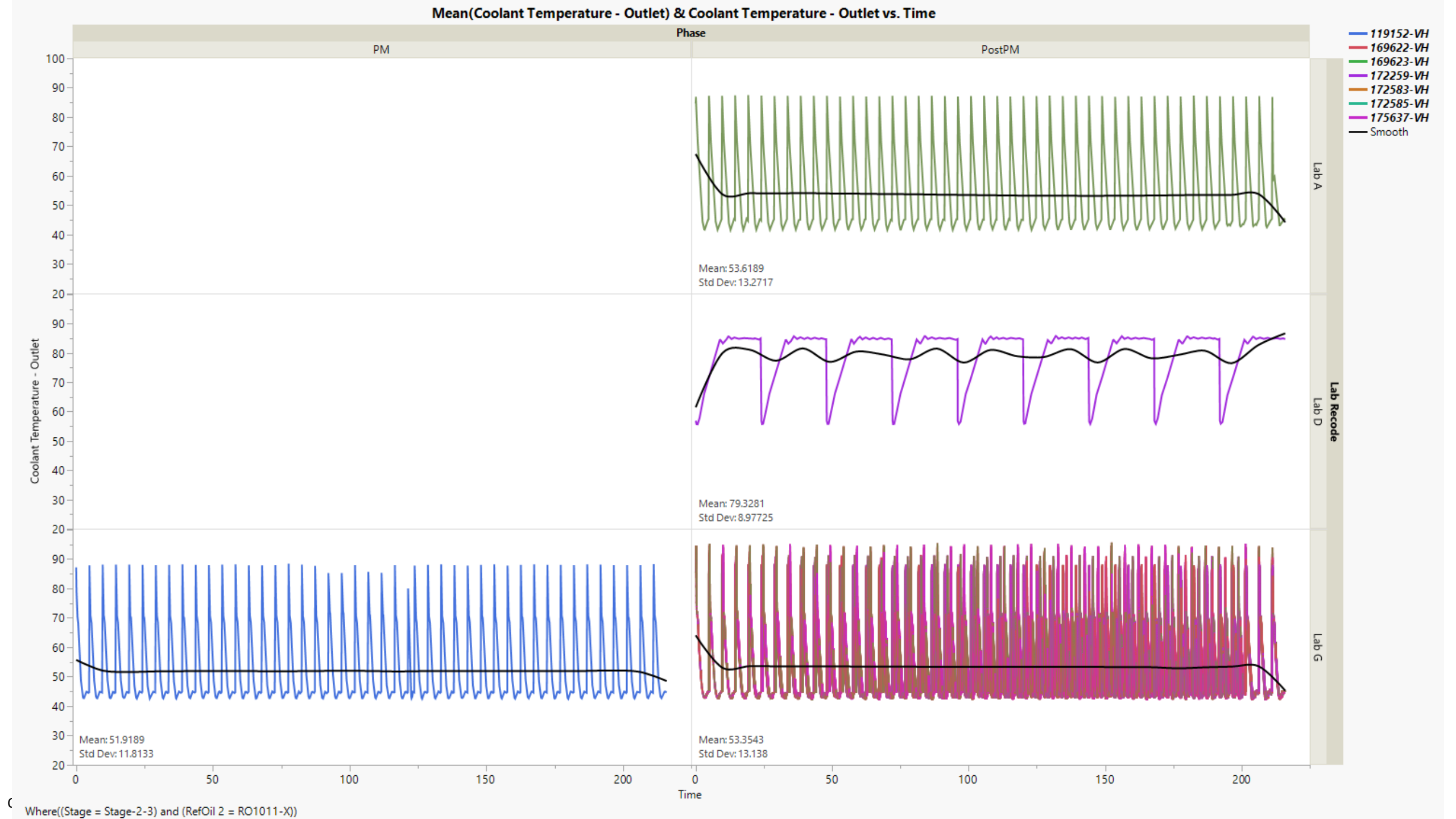
Classified as Confidential

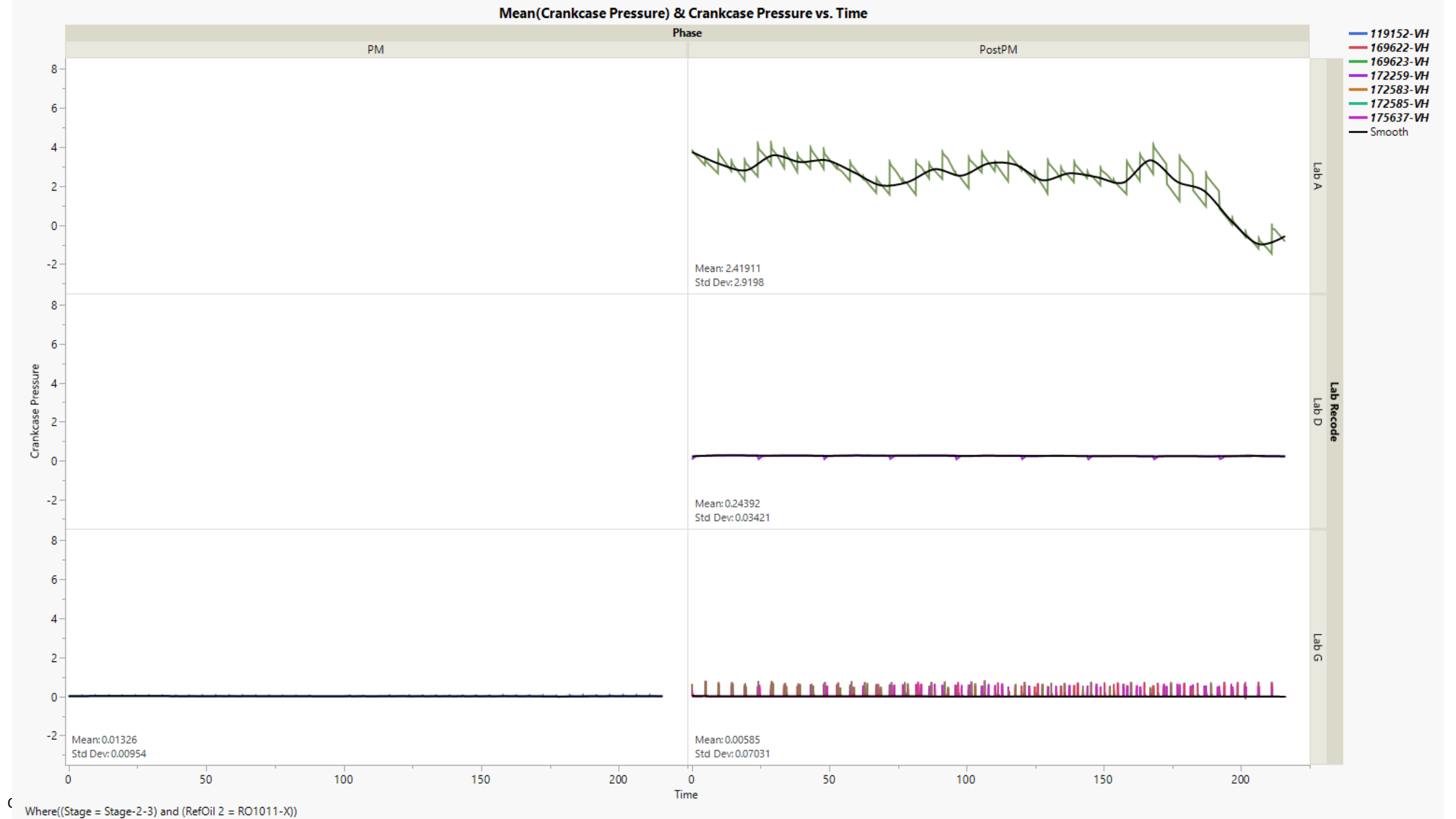

Mean(AFR Left) & AFR Left vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
AFR Left
Time
Mean: 0.76776
Std Dev: 0.03173
Mean: 0.99517
Std Dev: 0.0013
Mean: 0.73477
Std Dev: 0.01292
Mean: 0.75185
Std Dev: 0.03547
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

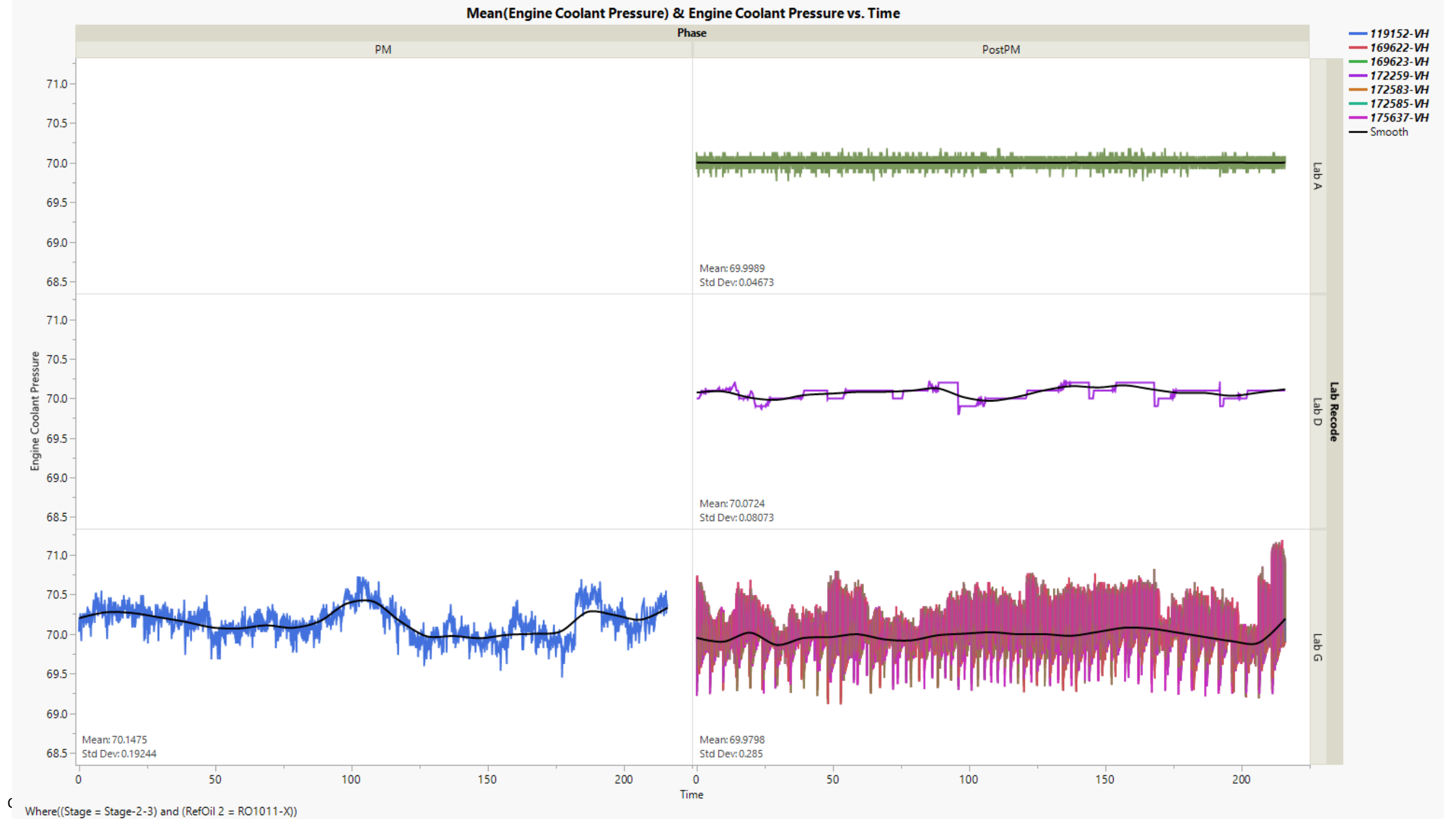

Mean(AFR Right) & AFR Right vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
AFR Right
Time
Mean: 0.75138
Std Dev: 0.0358
Mean: 0.9962
Std Dev: 0.00106
Mean: 0.72294
Std Dev: 0.01489
Mean: 0.75949
Std Dev: 0.03716
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

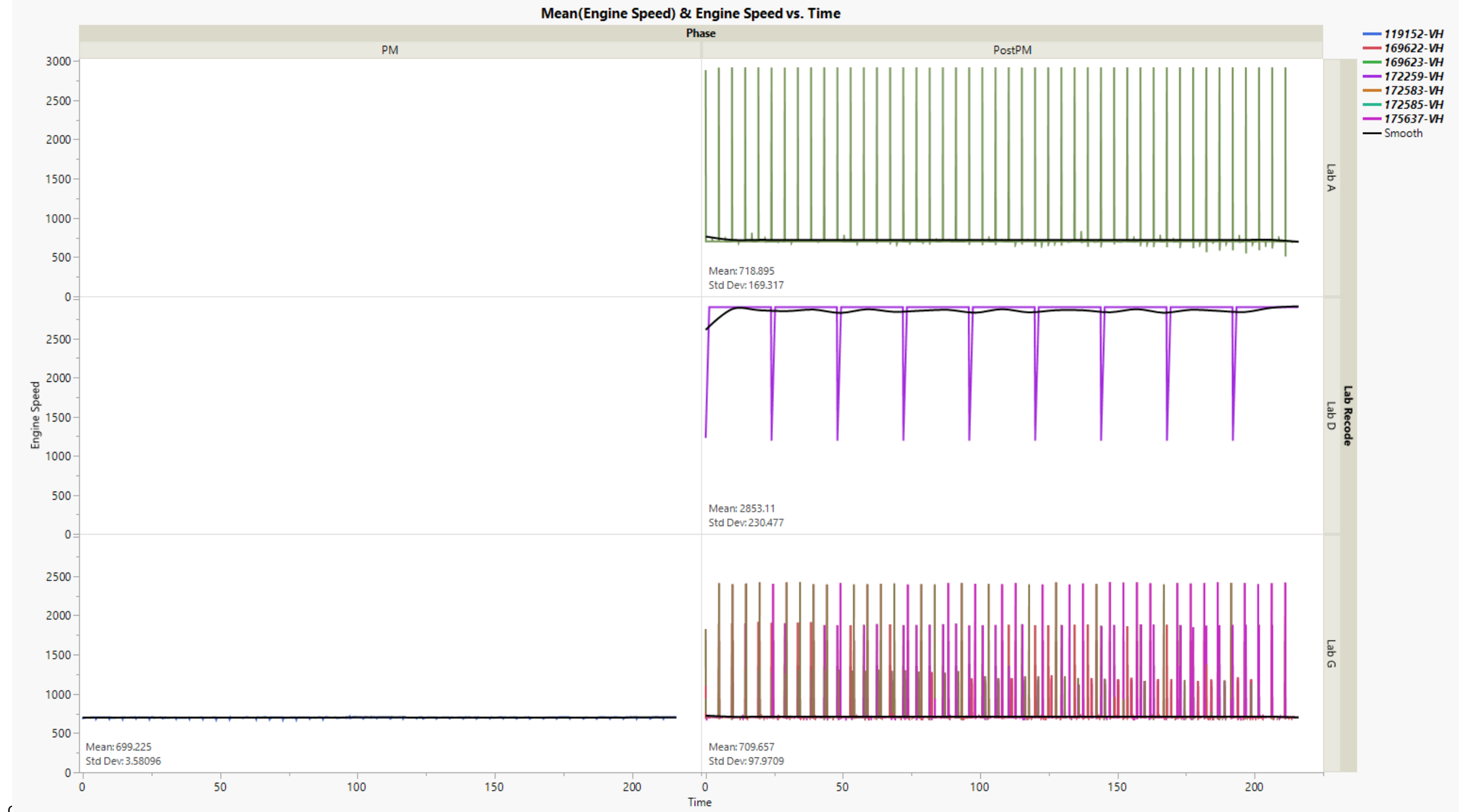

Mean(Barometric Pressure) & Barometric Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Barometric Pressure
Time
Mean: 98.9198
Std Dev: 0.59583
Mean: 101.716
Std Dev: 0.47842
Mean: 29.0992
Std Dev: 0.0495
Mean: 29.3858
Std Dev: 0.5959
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

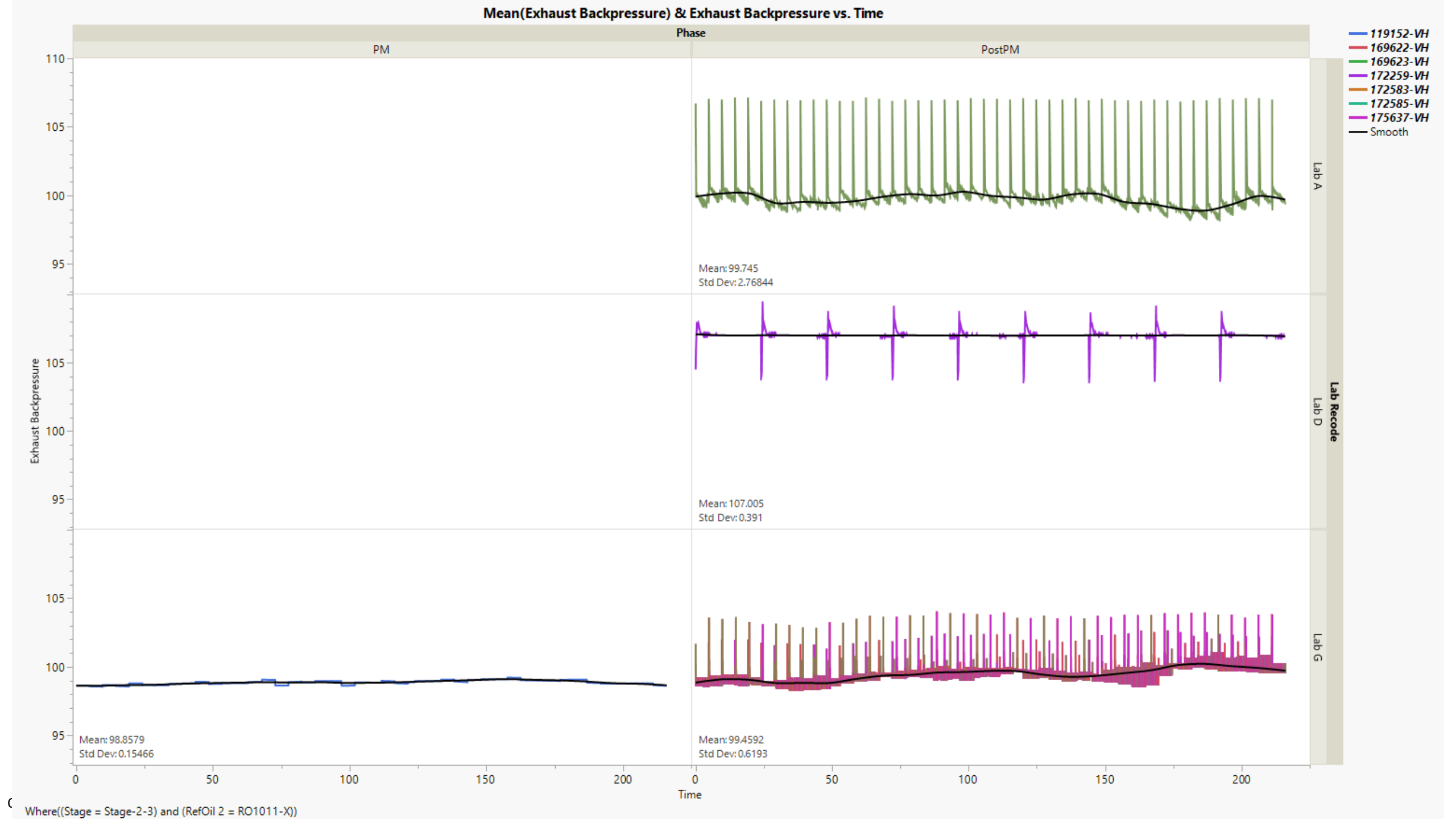

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Mean: 46.6854
Std Dev: 11.8084
Mean: 73.9653
Std Dev: 8.65473
Mean: 46.1733
Std Dev: 10.0567
Mean: 46.3875
Std Dev: 10.8555
Coolant Temperature - Inlet
Time
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))


Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Coolant Temperature - Outlet
Time
Mean: 53.6189
Std Dev: 13.2717
Mean: 79.3281
Std Dev: 8.97725
Mean: 51.9189
Std Dev: 11.8133
Mean: 53.3543
Std Dev: 13.138
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

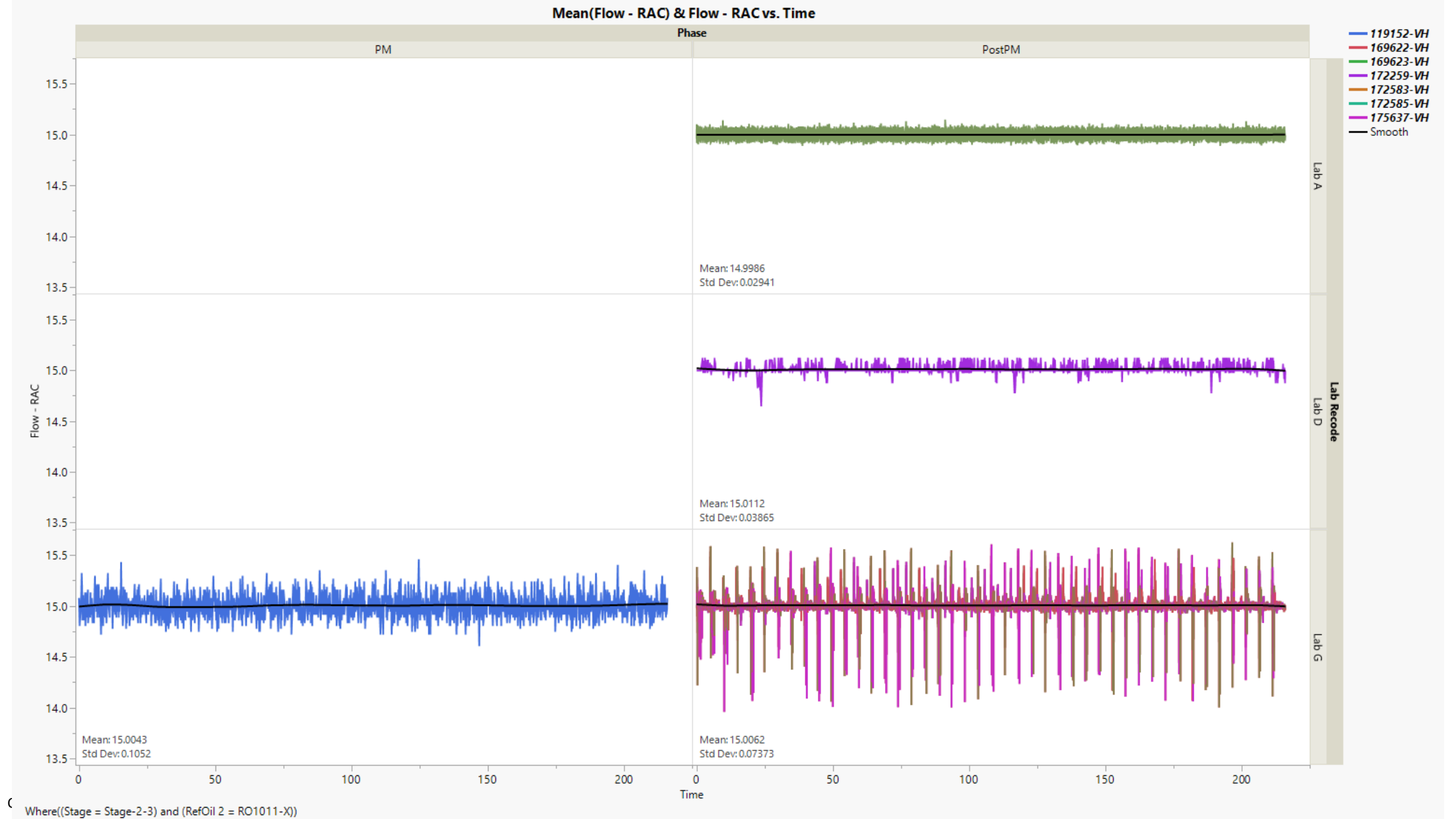

Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Crankcase Pressure
Time
Mean: 2.41911
Std Dev: 2.9198
Mean: 0.24392
Std Dev: 0.03421
Mean: 0.01326
Std Dev: 0.00954
Mean: 0.00585
Std Dev: 0.07031
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

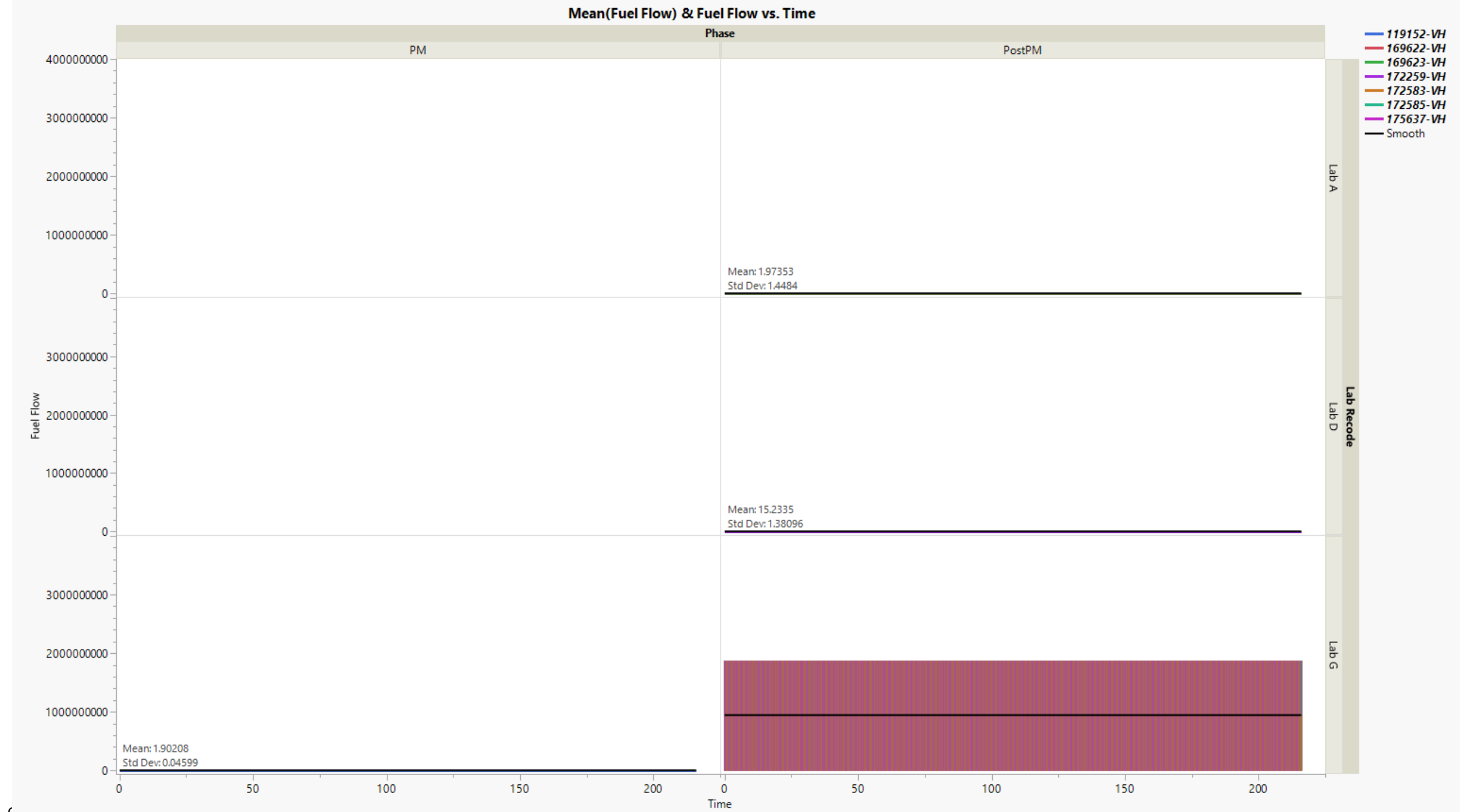

Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 69.9989
Std Dev: 0.04673
Mean: 70.0724
Std Dev: 0.08073
Mean: 70.1475
Std Dev: 0.19244
Mean: 69.9798
Std Dev: 0.285
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))


Mean(Engine Speed) & Engine Speed vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Speed
Time
Mean: 718.895
Std Dev: 169.317
Mean: 2853.11
Std Dev: 230.477
Mean: 699.225
Std Dev: 3.58096
Mean: 709.657
Std Dev: 97.9709
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

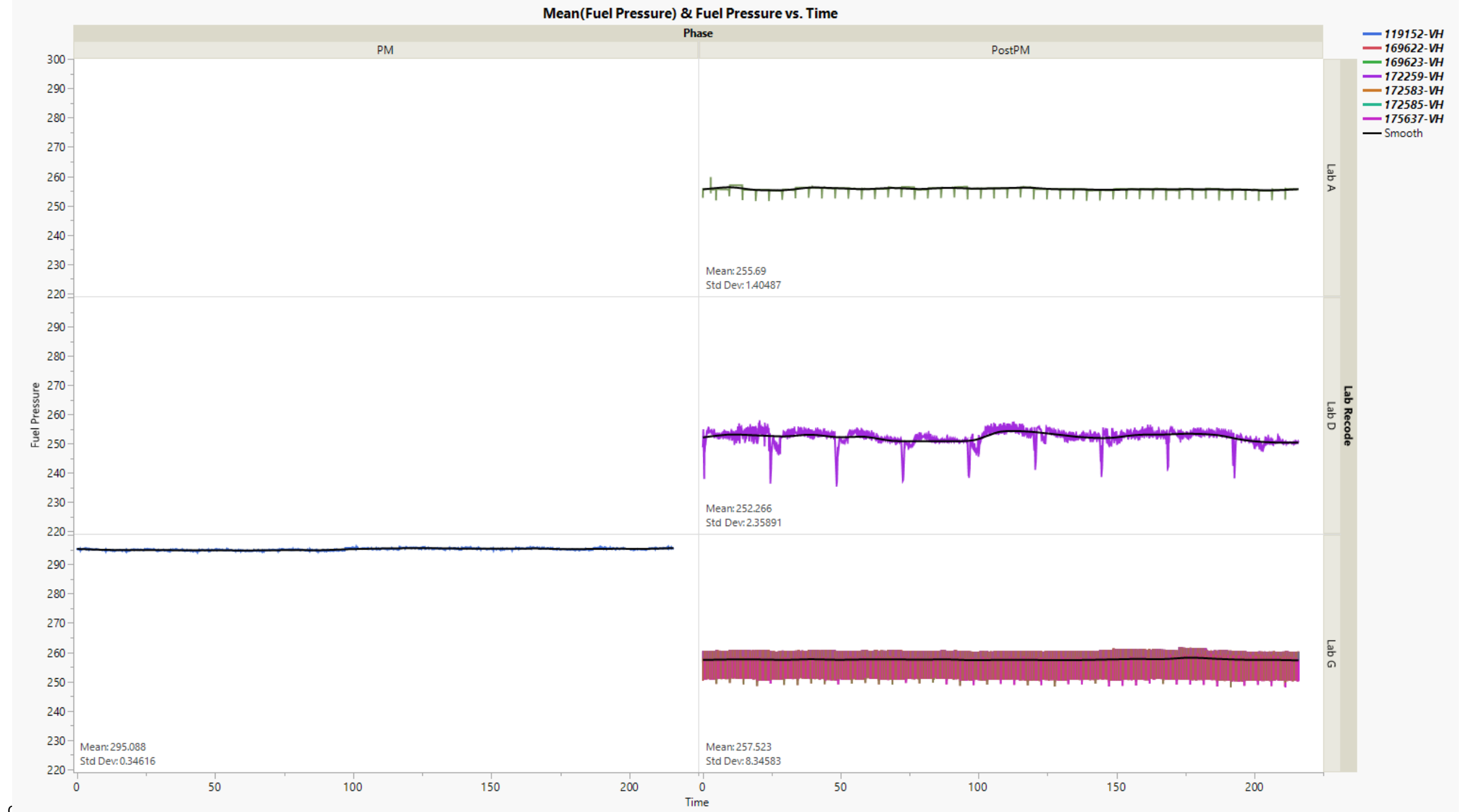

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 99.745
Std Dev: 2.76844
Mean: 107.005
Std Dev: 0.391
Mean: 98.8579
Std Dev: 0.15466
Mean: 99.4592
Std Dev: 0.6193
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

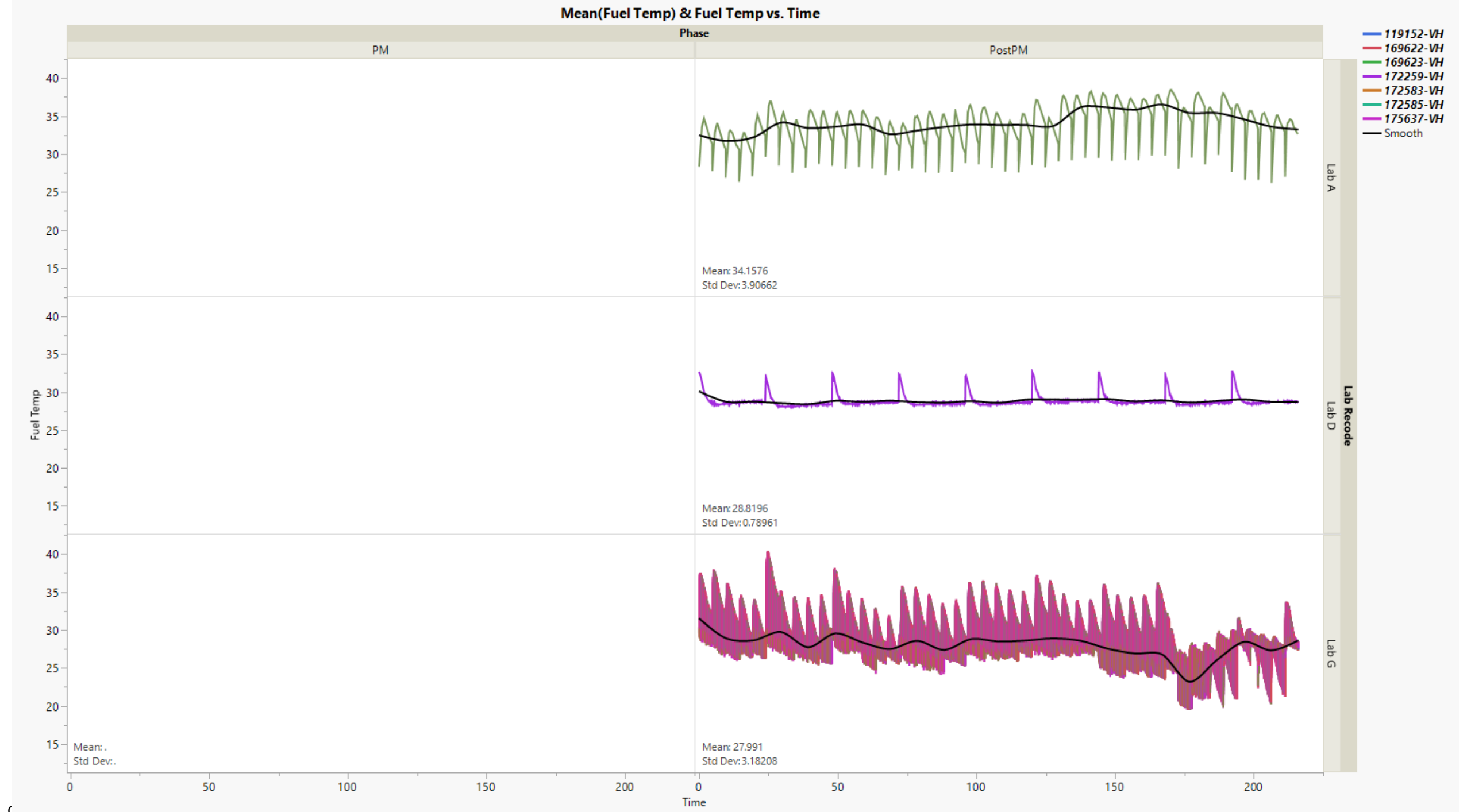

Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - RAC
Time
Mean: 14.9986
Std Dev: 0.02941
Mean: 15.0112
Std Dev: 0.03865
Mean: 15.0043
Std Dev: 0.1052
Mean: 15.0062
Std Dev: 0.07373
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

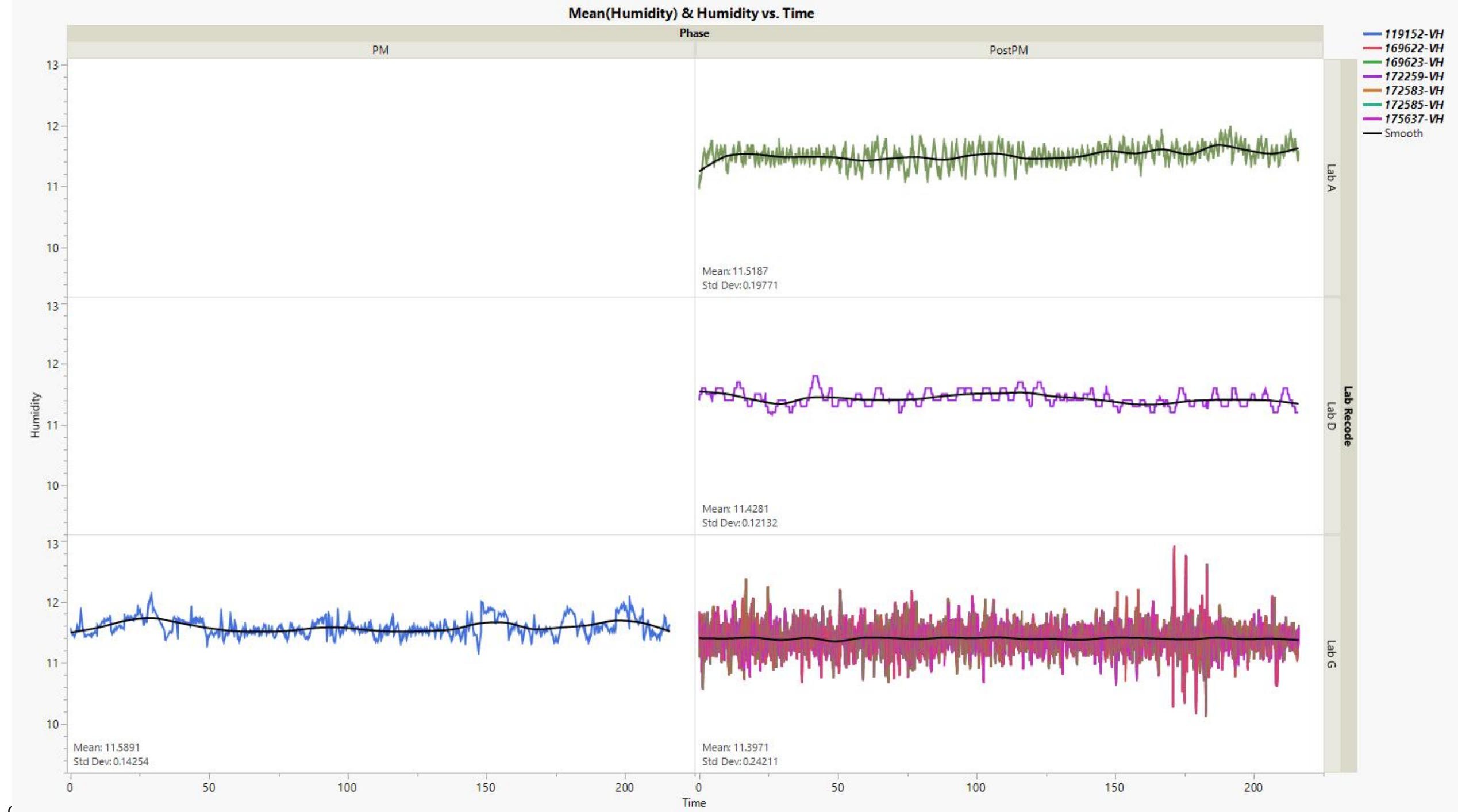


Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

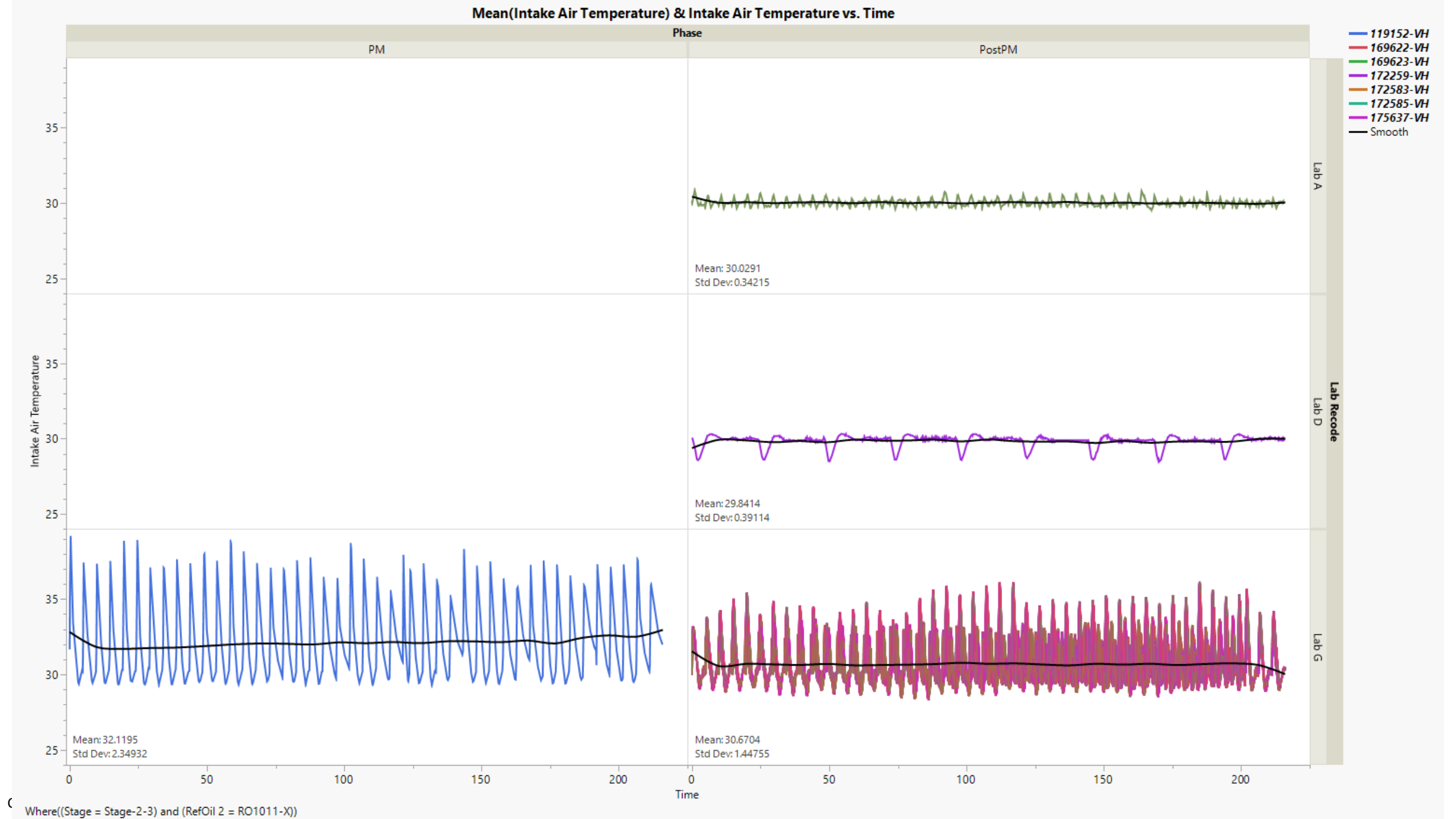


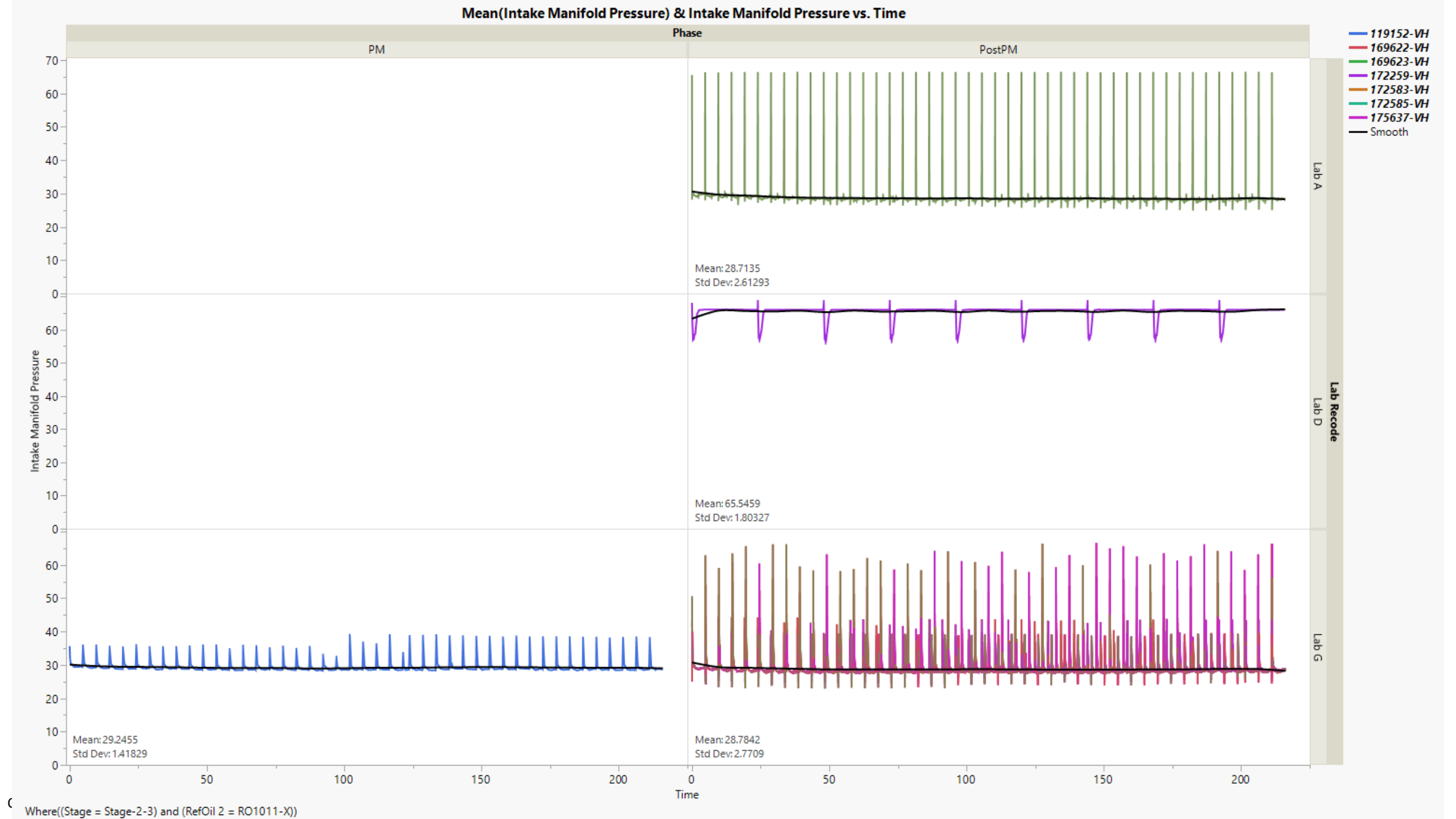
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

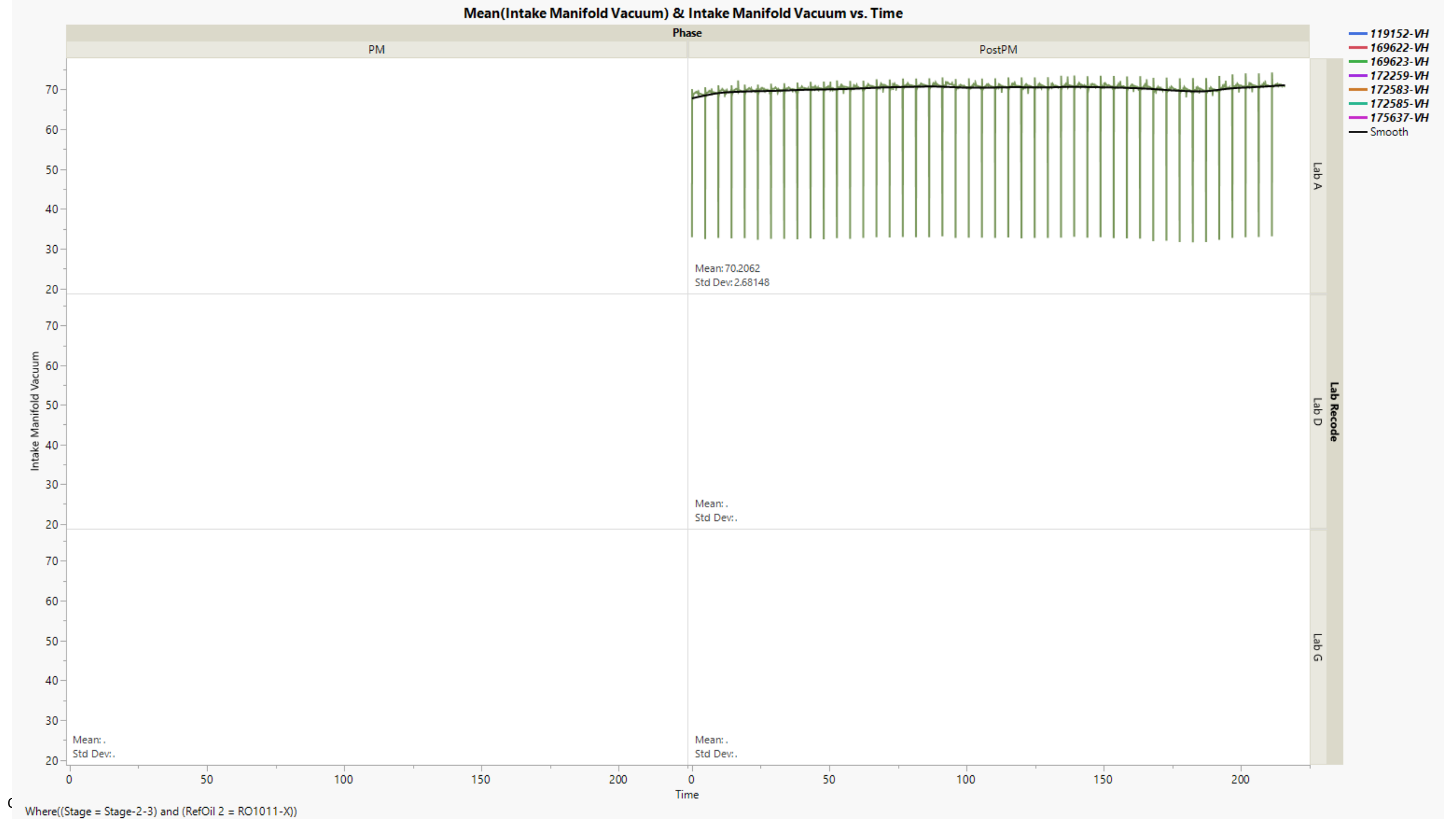

Mean(Fuel Temp) & Fuel Temp vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Temp
Time
Mean: 34.1576
Std Dev: 3.90662
Mean: 28.8196
Std Dev: 0.78961
Mean: .
Std Dev: .
Mean: 27.991
Std Dev: 3.18208
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

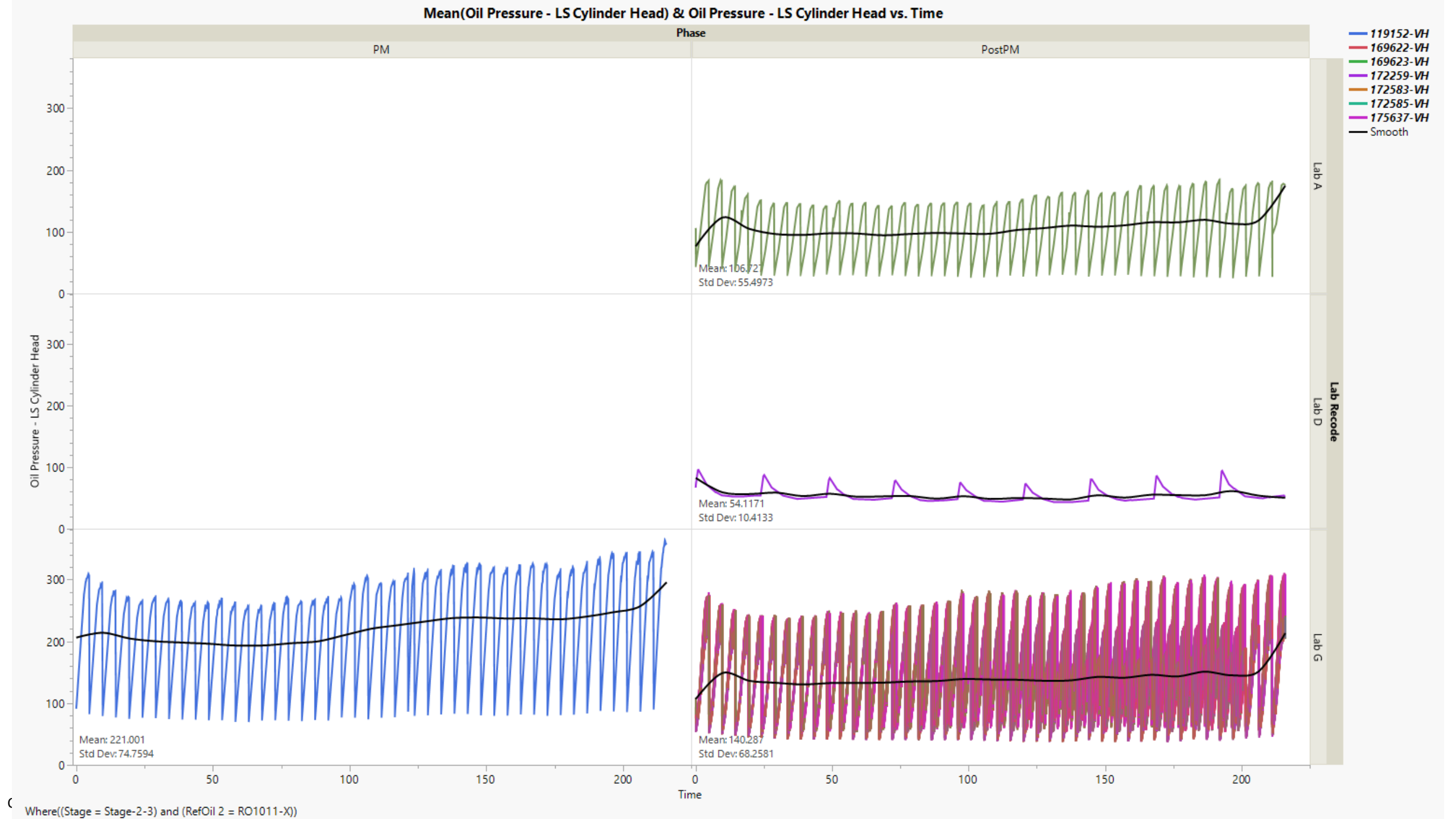

Mean(Humidity) & Humidity vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Humidity
Time
Mean: 11.5187
Std Dev: 0.19771
Mean: 11.4281
Std Dev: 0.12132
Mean: 11.5891
Std Dev: 0.14254
Mean: 11.3971
Std Dev: 0.24211
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Pressure
Mean: 0.0554
Std Dev: 0.0336
Mean: 0.04861
Std Dev: 0.00619
Mean: 0.05081
Std Dev: 0.00467
Mean: 0.05591
Std Dev: 0.05041
0
0.2
0.4
0.6
0.8
0
50
100
150
200
Time
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))


Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 30.0291
Std Dev: 0.34215
Mean: 29.8414
Std Dev: 0.39114
Mean: 32.1195
Std Dev: 2.34932
Mean: 30.6704
Std Dev: 1.44755
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

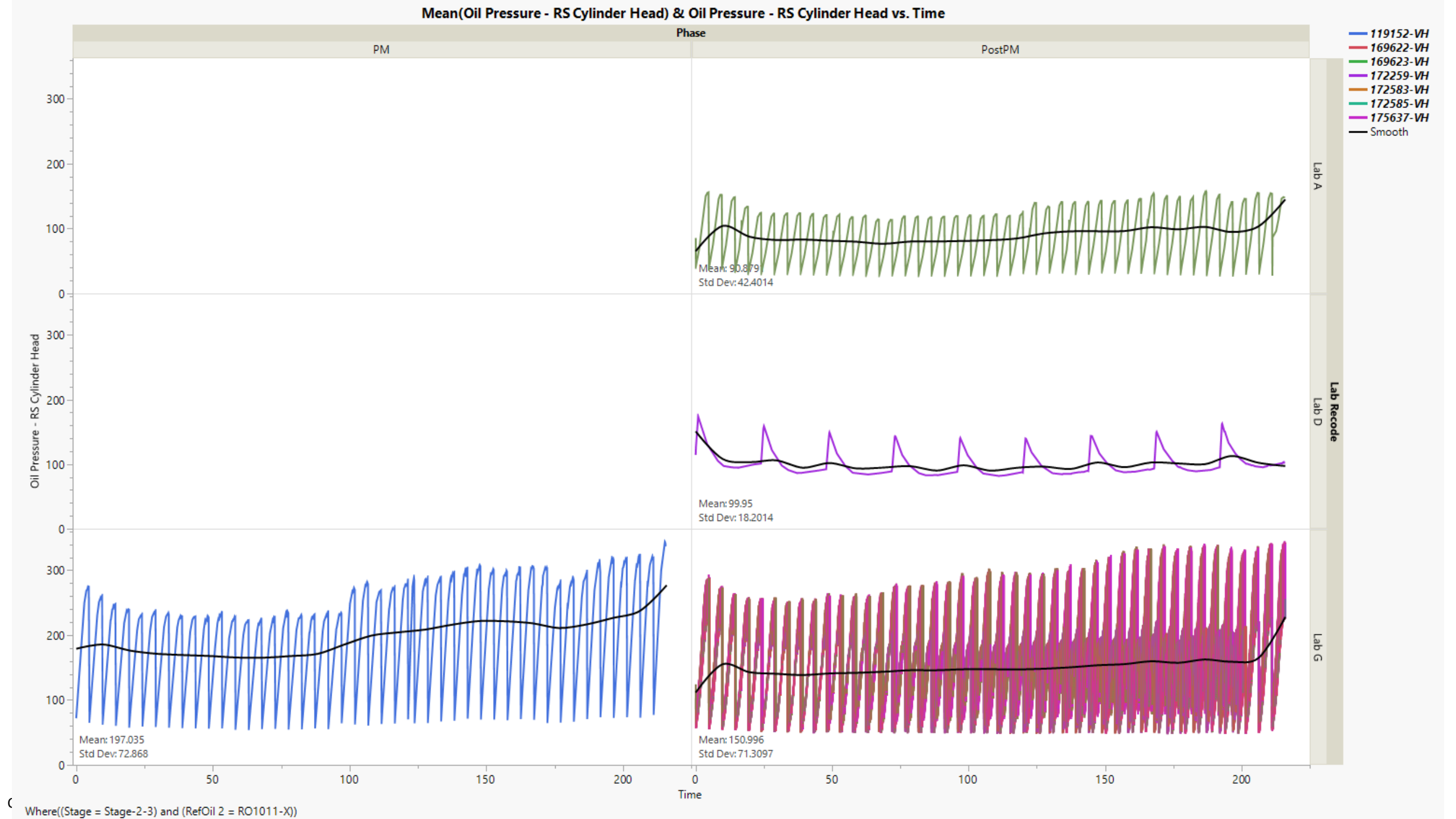

Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Pressure
Time
Mean: 28.7135
Std Dev: 2.61293
Mean: 65.5459
Std Dev: 1.80327
Mean: 29.2455
Std Dev: 1.41829
Mean: 28.7842
Std Dev: 2.7709
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))


Mean(Intake Manifold Vacuum) & Intake Manifold Vacuum vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Vacuum
Time
Mean: 70.2062
Std Dev: 2.68148
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

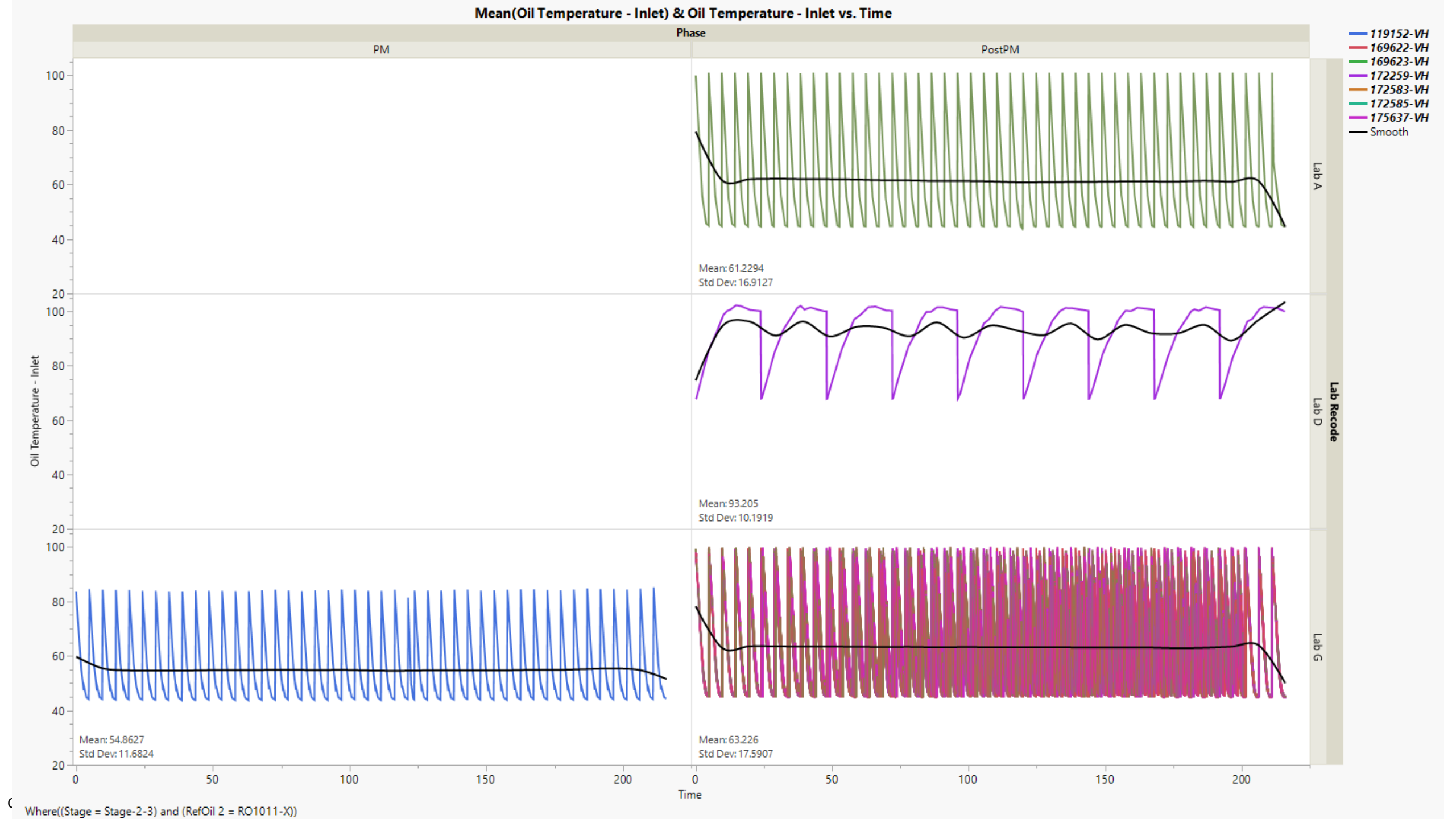


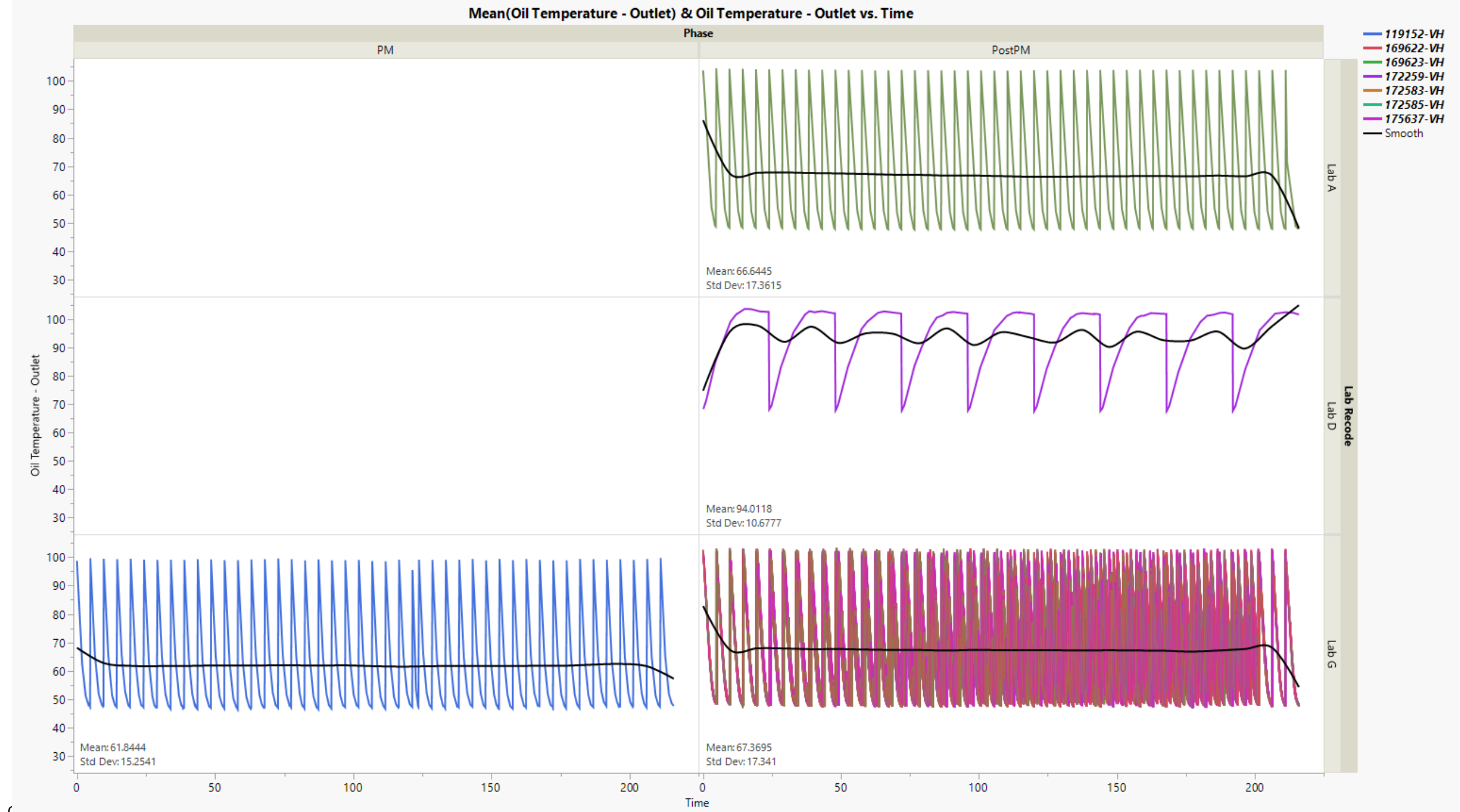
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

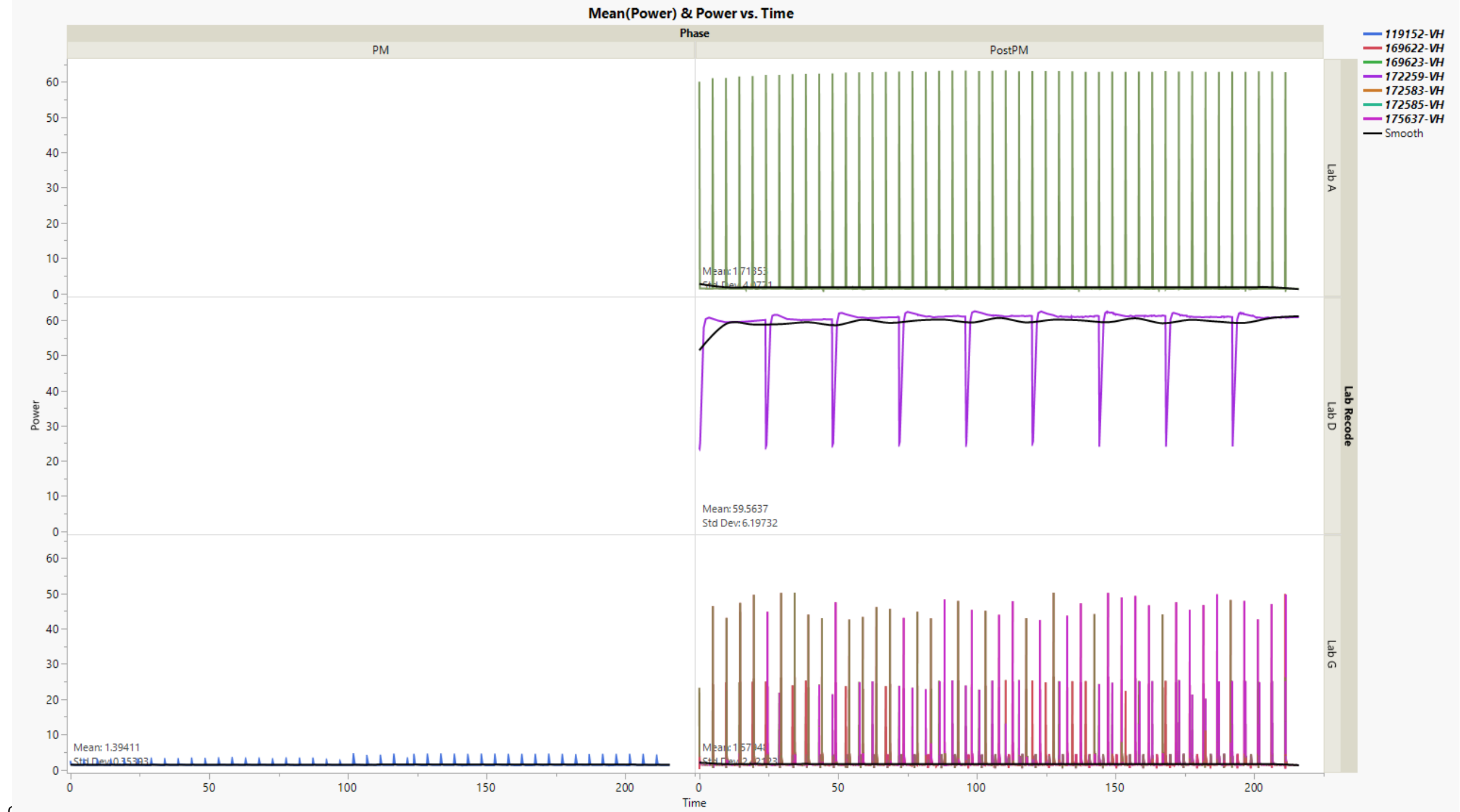
Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Pressure - Pump
Time
Mean: 147.416
Std Dev: 57.4098
Mean: 192.907
Std Dev: 19.852
Mean: 248.32
Std Dev: 75.2447
Mean: 185.852
Std Dev: 77.3008
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))



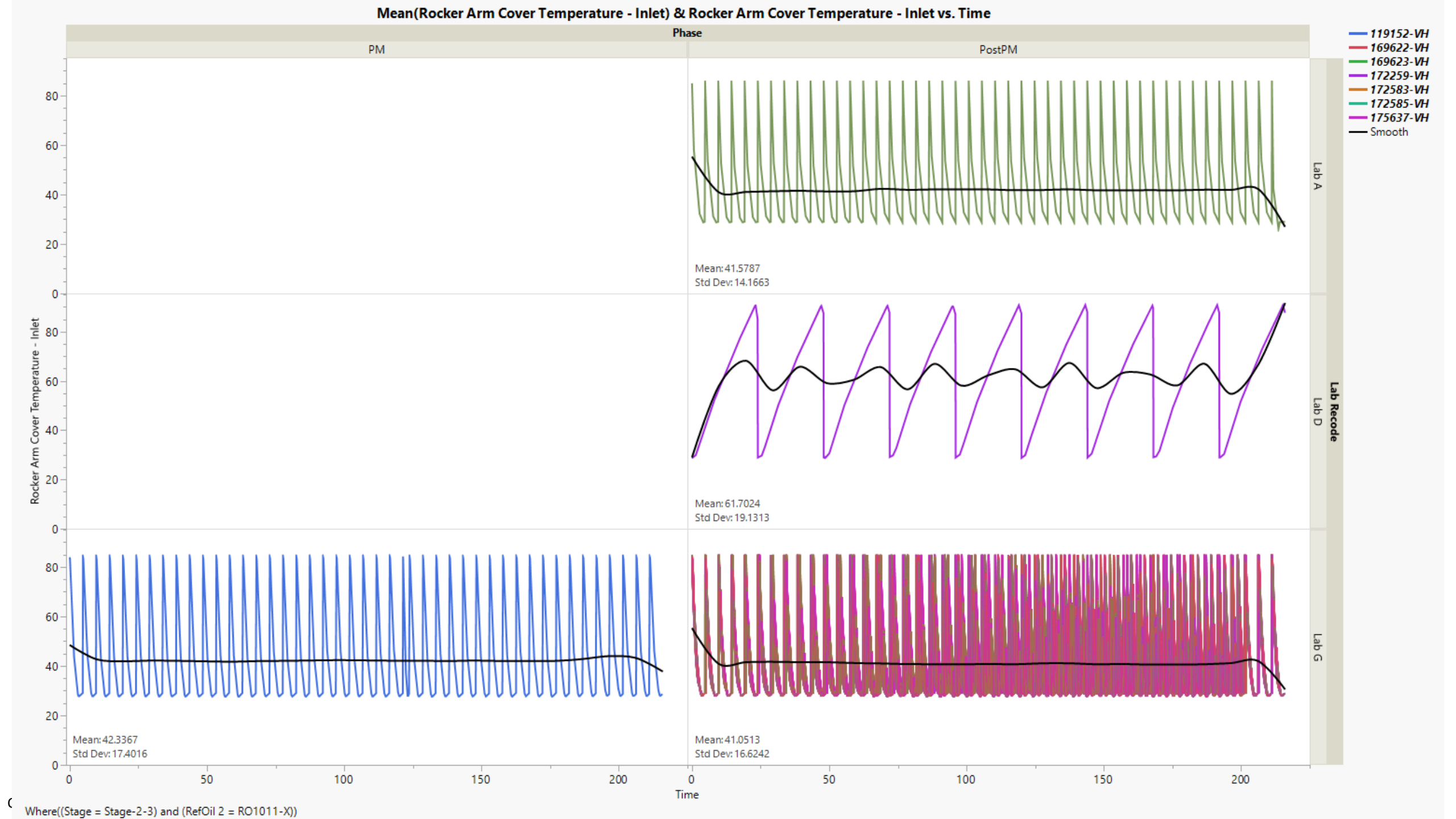
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))


Mean(Oil Temperature - Inlet) & Oil Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Inlet
Time
Mean: 61.2294
Std Dev: 16.9127
Mean: 93.205
Std Dev: 10.1919
Mean: 54.8627
Std Dev: 11.6824
Mean: 63.226
Std Dev: 17.5907
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

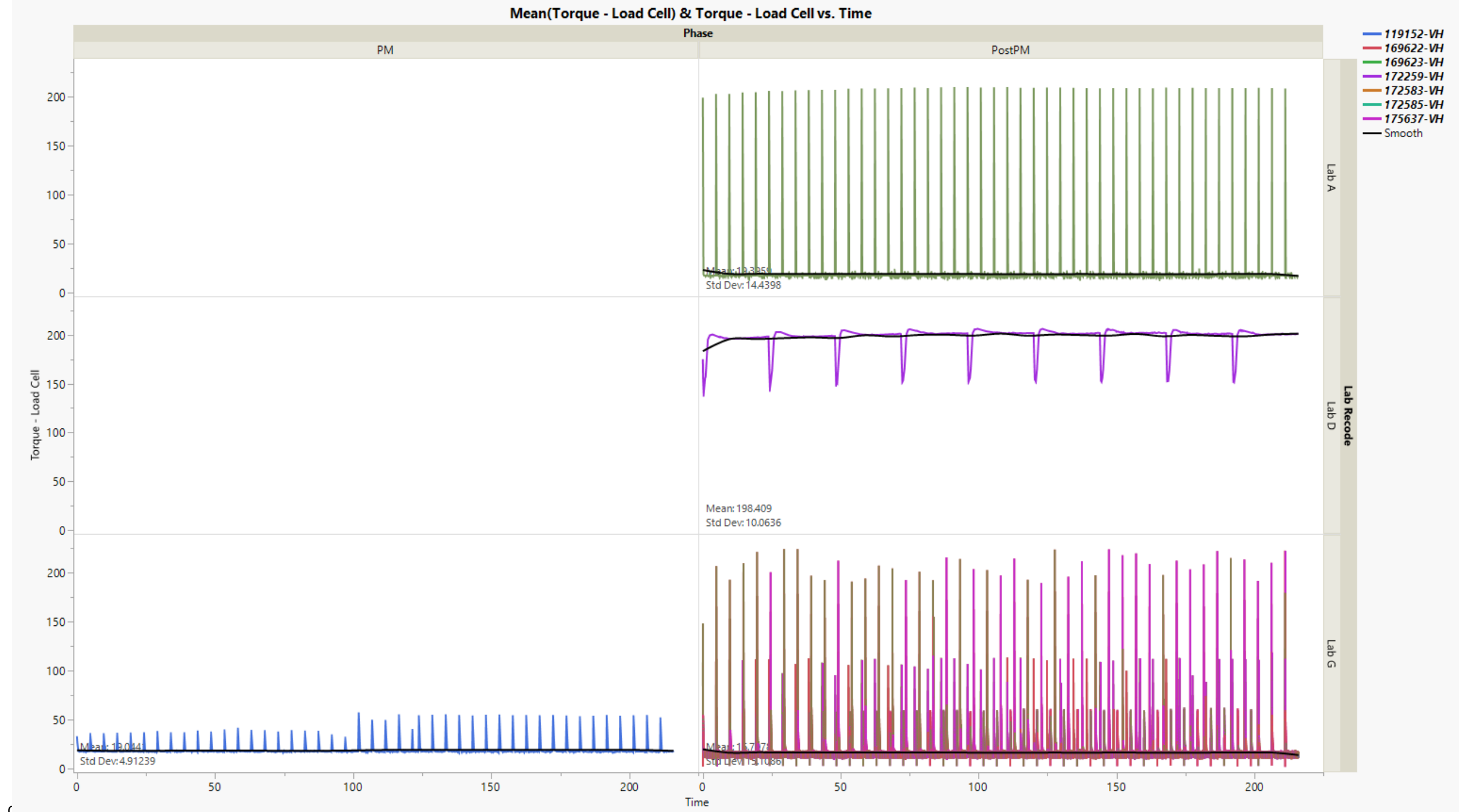

Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Outlet
Time
Mean: 66.6445
Std Dev: 17.3615
Mean: 94.0118
Std Dev: 10.6777
Mean: 61.8444
Std Dev: 15.2541
Mean: 67.3695
Std Dev: 17.341
Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-2-3) and (RefOil 2 = RO1011-X))

VH – Stage 2 Operational Data Plots

By: Todd Dvorak

08-05-24

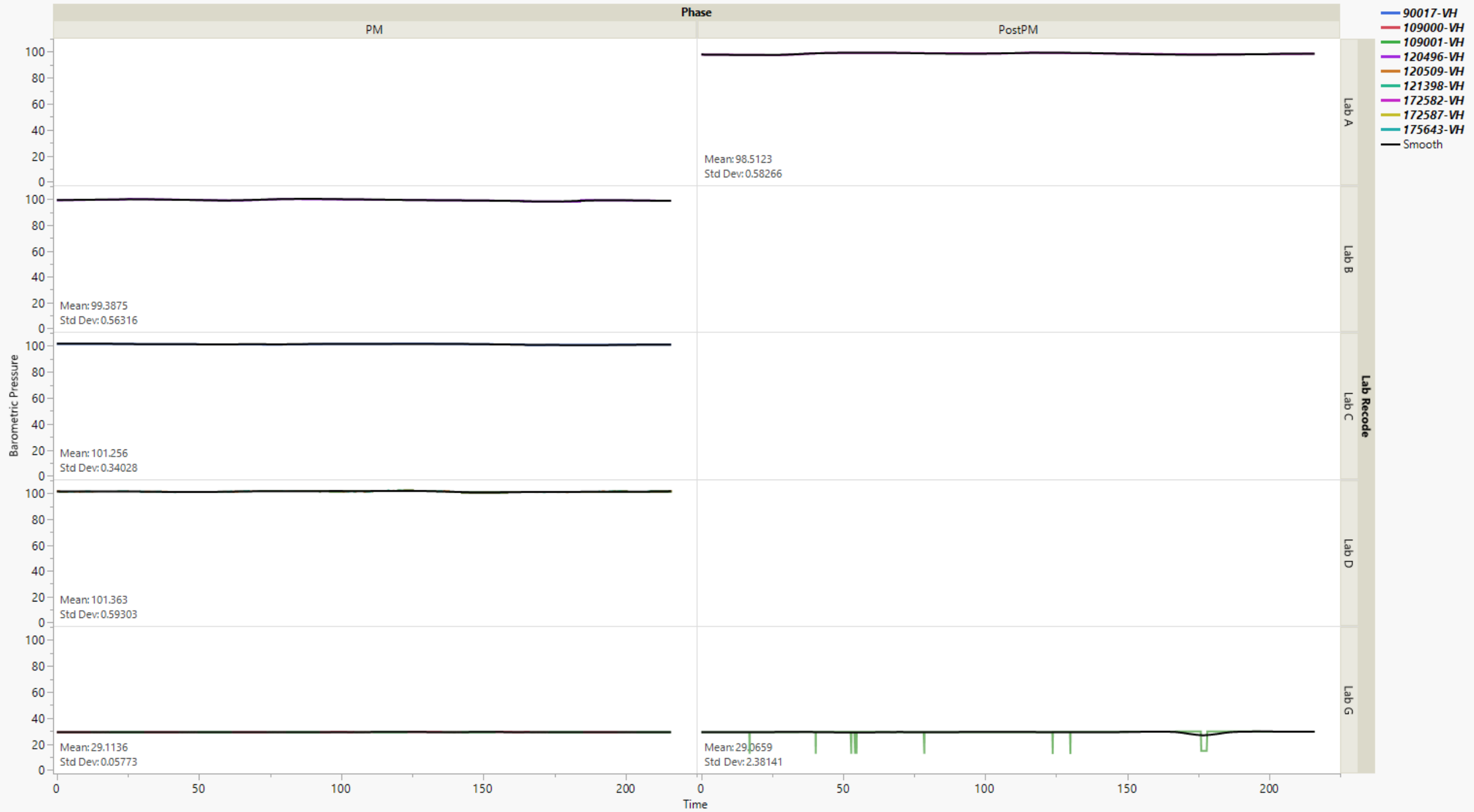
Classified as Confidential

RO 940 Data Plots

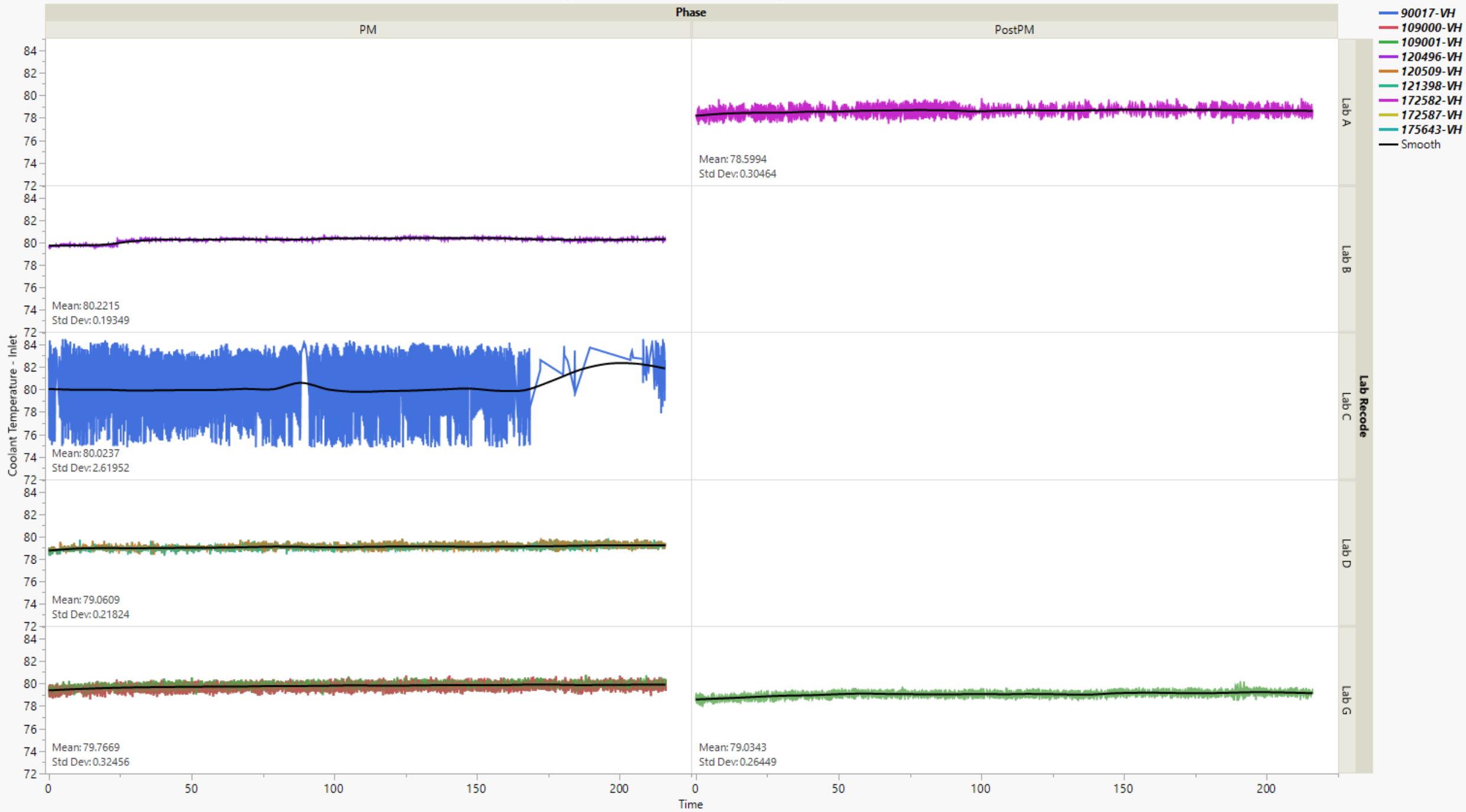
Classified as Confidential

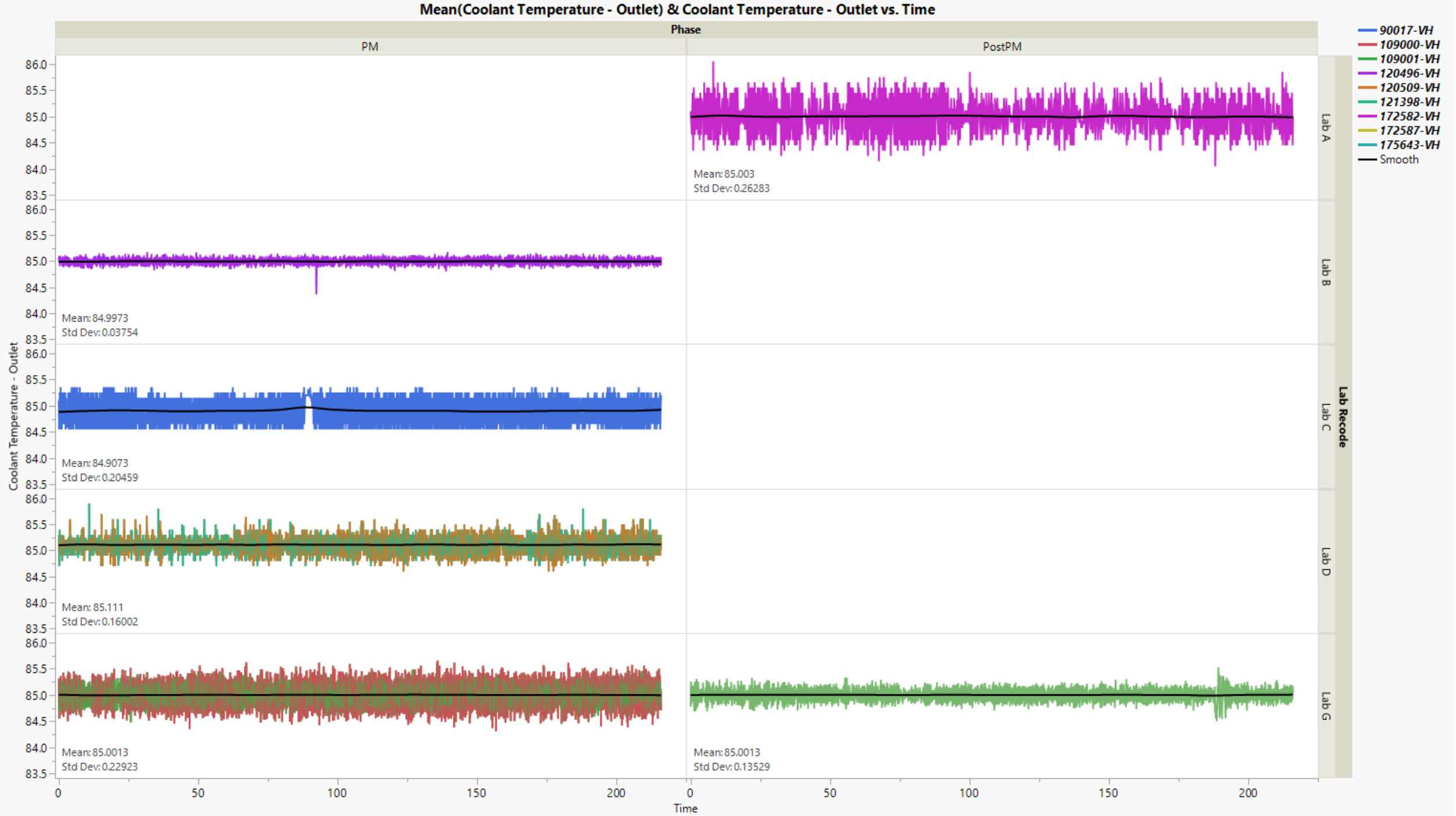
Where((Stage = Stage-2) and (RefOil 2 = RO940))

Where((Stage = Stage-2) and (RefOil 2 = RO940))

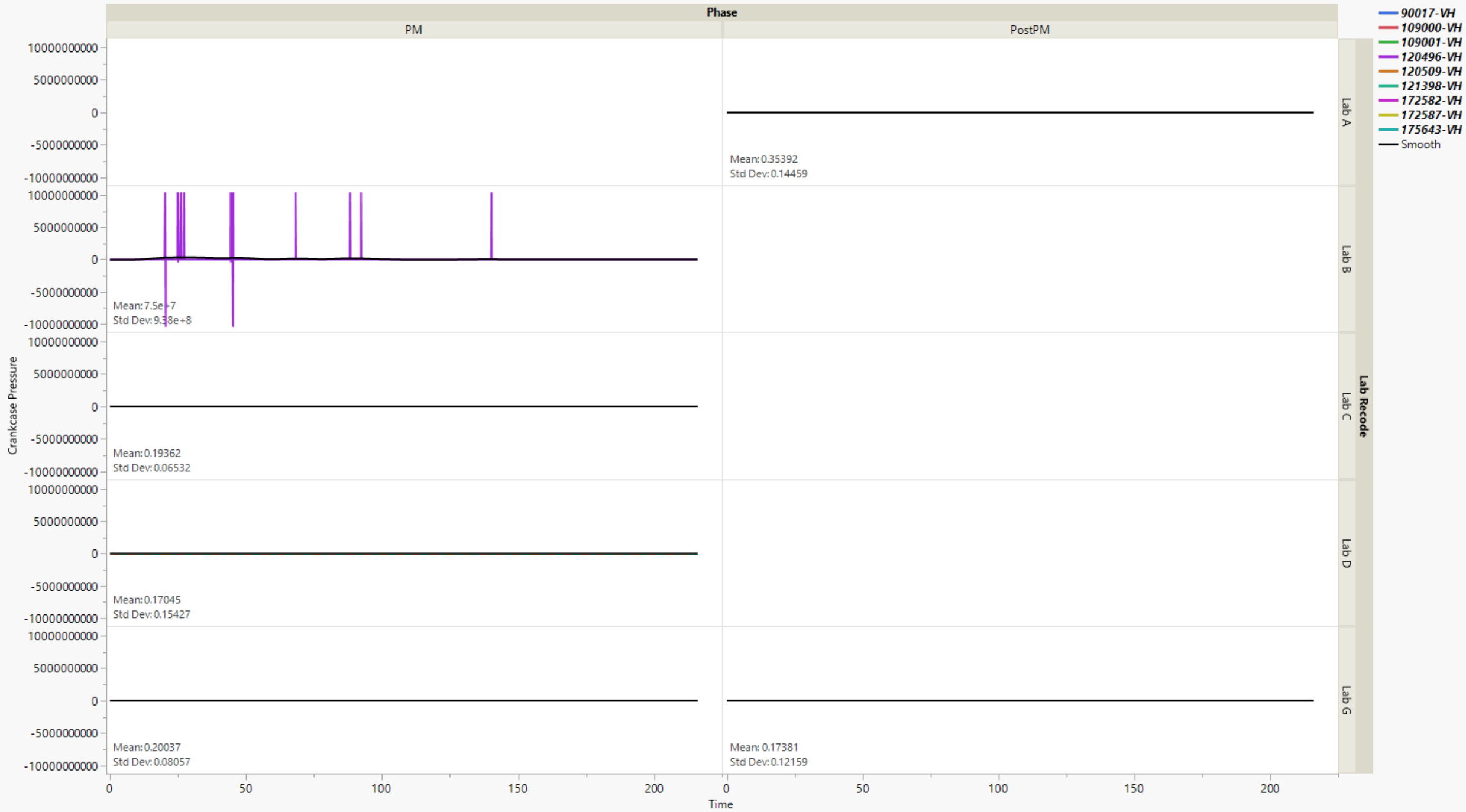


Where((Stage = Stage-2) and (RefOil 2 = RO940))

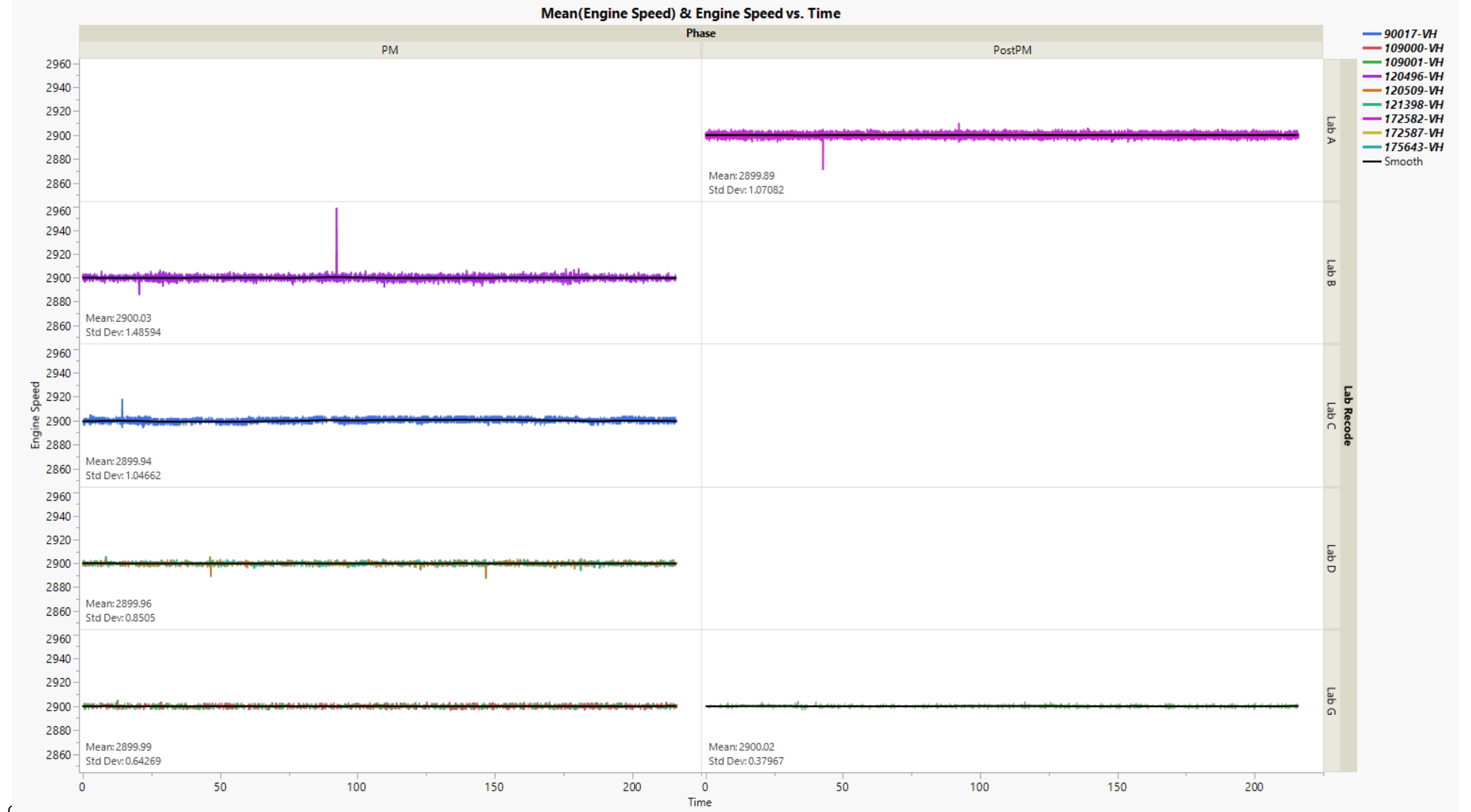

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 78.5994
Std Dev: 0.30464
Mean: 80.2215
Std Dev: 0.19349
Mean: 80.0237
Std Dev: 2.61952
Mean: 79.0609
Std Dev: 0.21824
Mean: 79.7669
Std Dev: 0.32456
Mean: 79.0343
Std Dev: 0.26449
Coolant Temperature - Inlet
Time
Where((Stage = Stage-2) and (RefOil 2 = RO940))



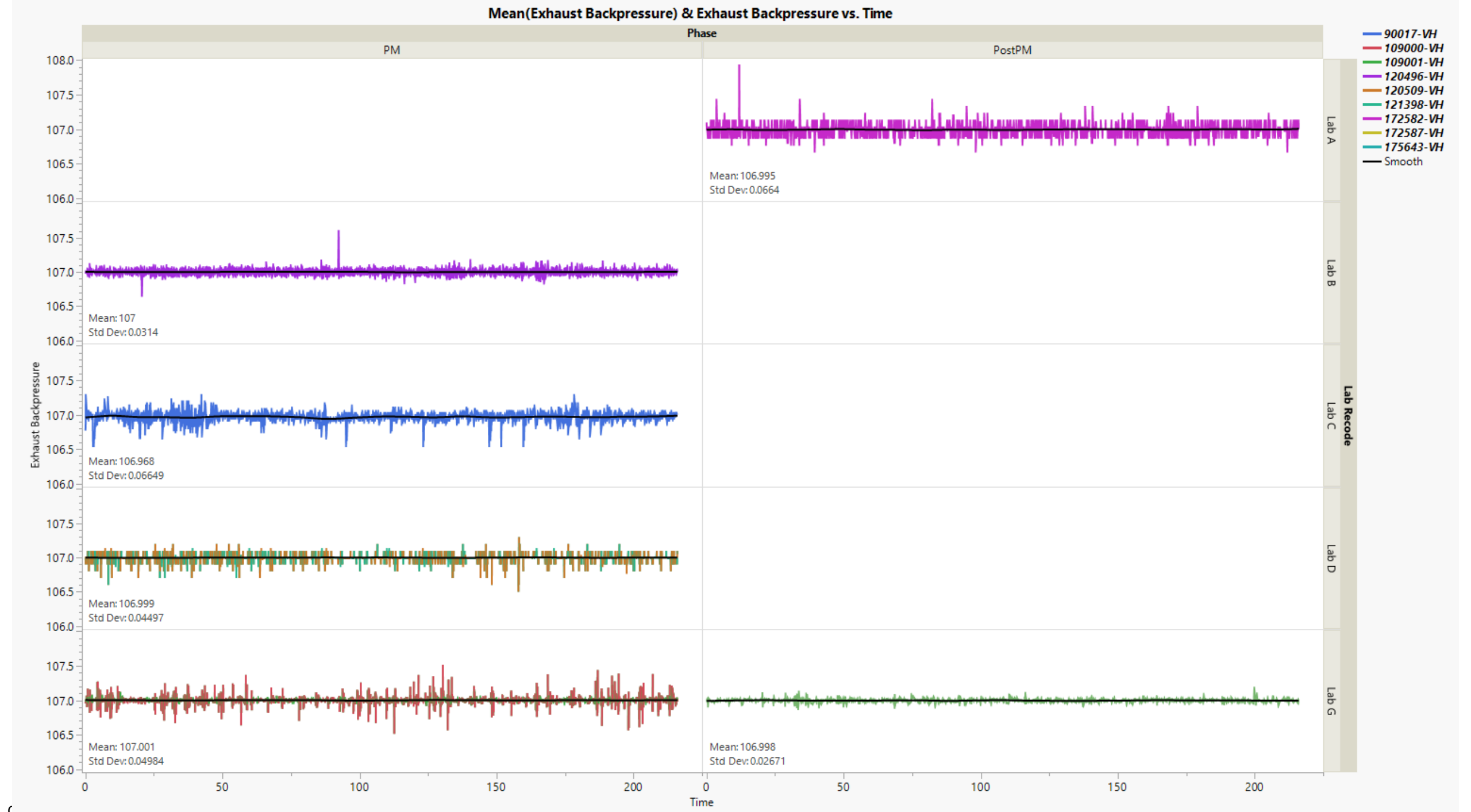
Where((Stage = Stage-2) and (RefOil 2 = RO940))


Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Crankcase Pressure
10000000000
5000000000
0
-5000000000
-10000000000
Mean: 0.35392
Std Dev: 0.14459
Mean: 7.5e+7
Std Dev: 9.38e+8
Mean: 0.19362
Std Dev: 0.06532
Mean: 0.17045
Std Dev: 0.15427
Mean: 0.20037
Std Dev: 0.08057
Mean: 0.17381
Std Dev: 0.12159
0
50
100
150
200
Time
Where((Stage = Stage-2) and (RefOil 2 = RO940))

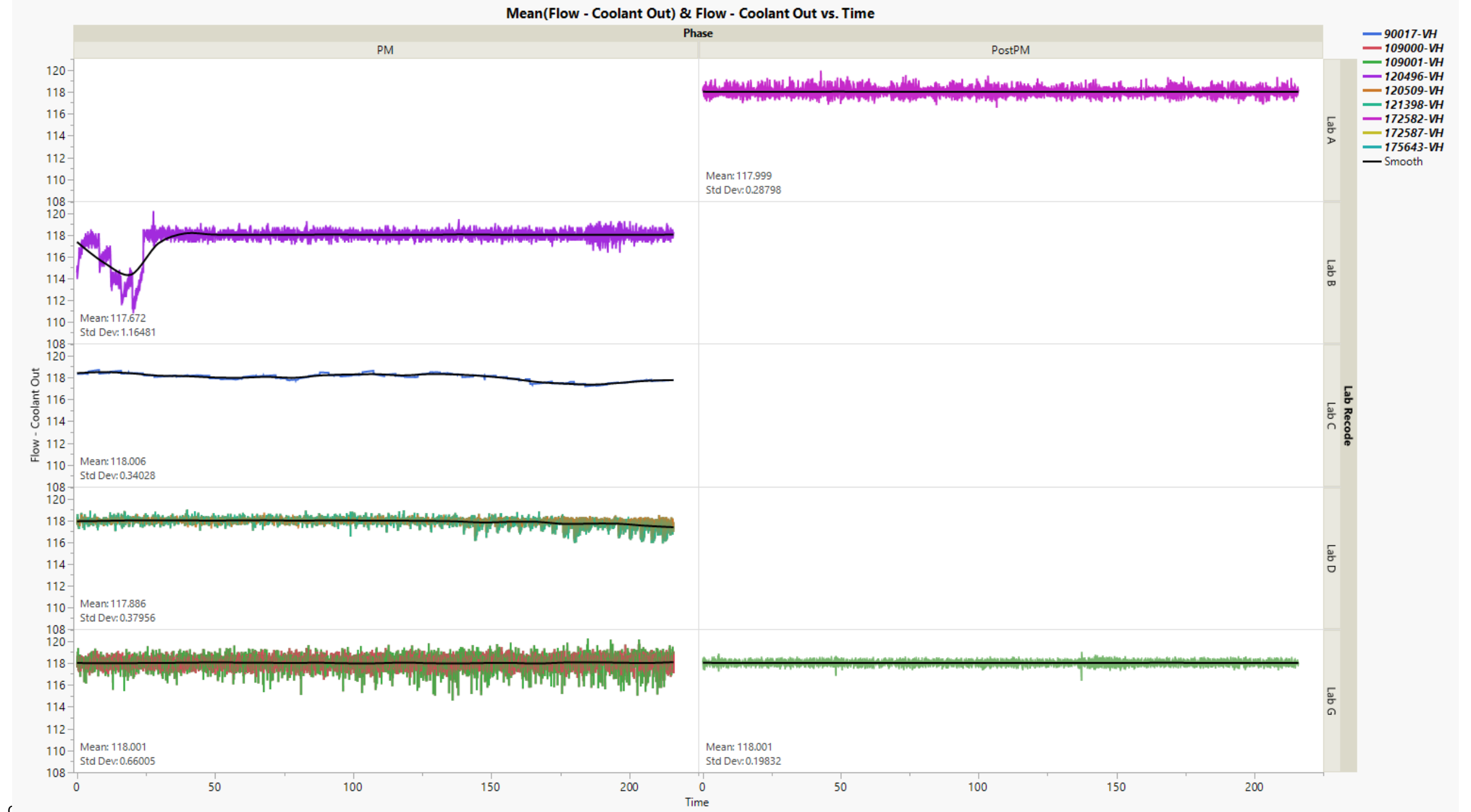
Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Engine Coolant Pressure
Time
Mean: 70.0002
Std Dev: 0.03436
Mean: 69.8159
Std Dev: 0.10457
Mean: 70.0692
Std Dev: 0.18625
Mean: 69.9397
Std Dev: 0.12026
Mean: 69.9977
Std Dev: 0.22777
Mean: 69.8414
Std Dev: 0.14631
Where((Stage = Stage-2) and (RefOil 2 = RO940))



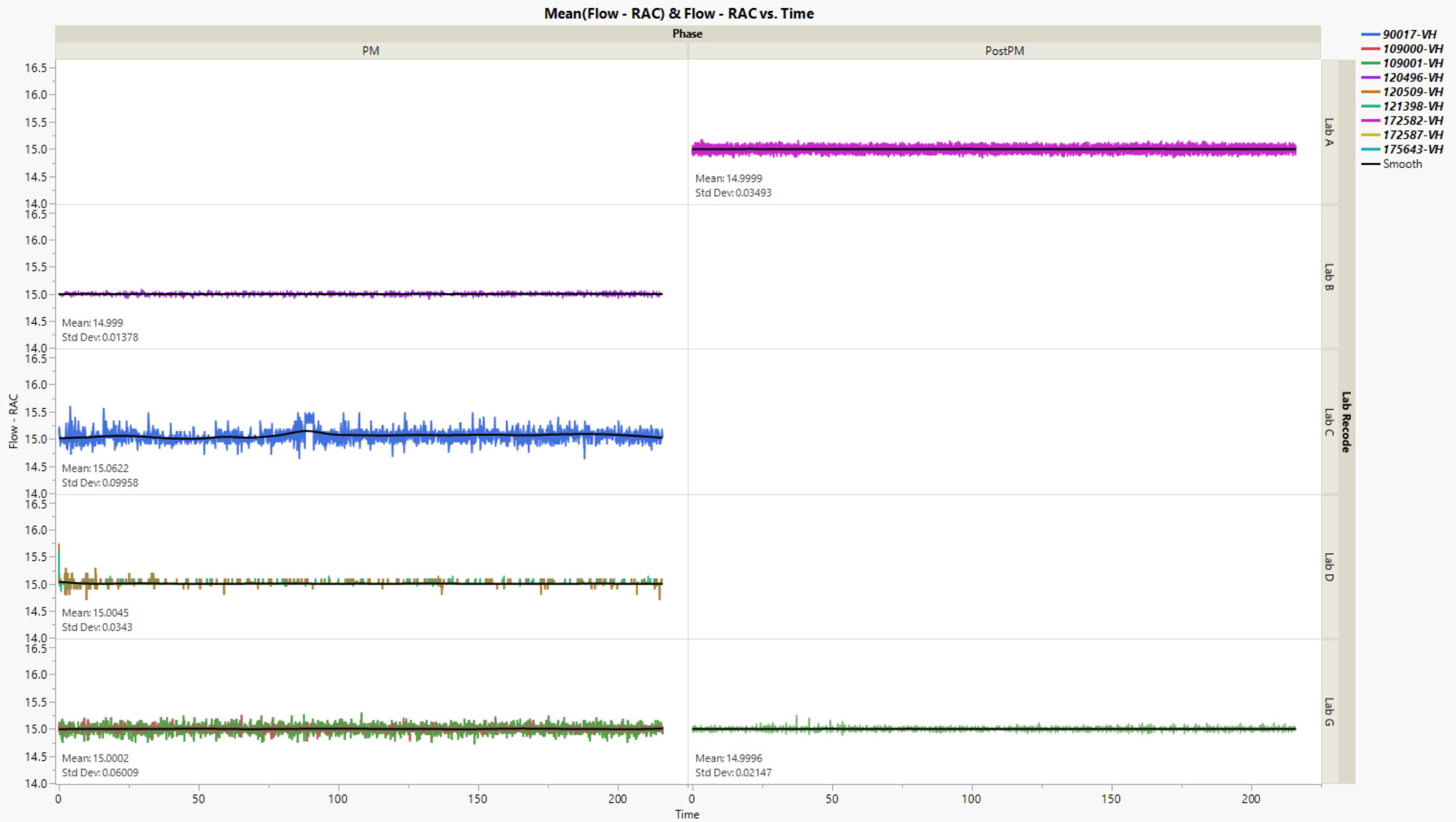
Where((Stage = Stage-2) and (RefOil 2 = RO940))



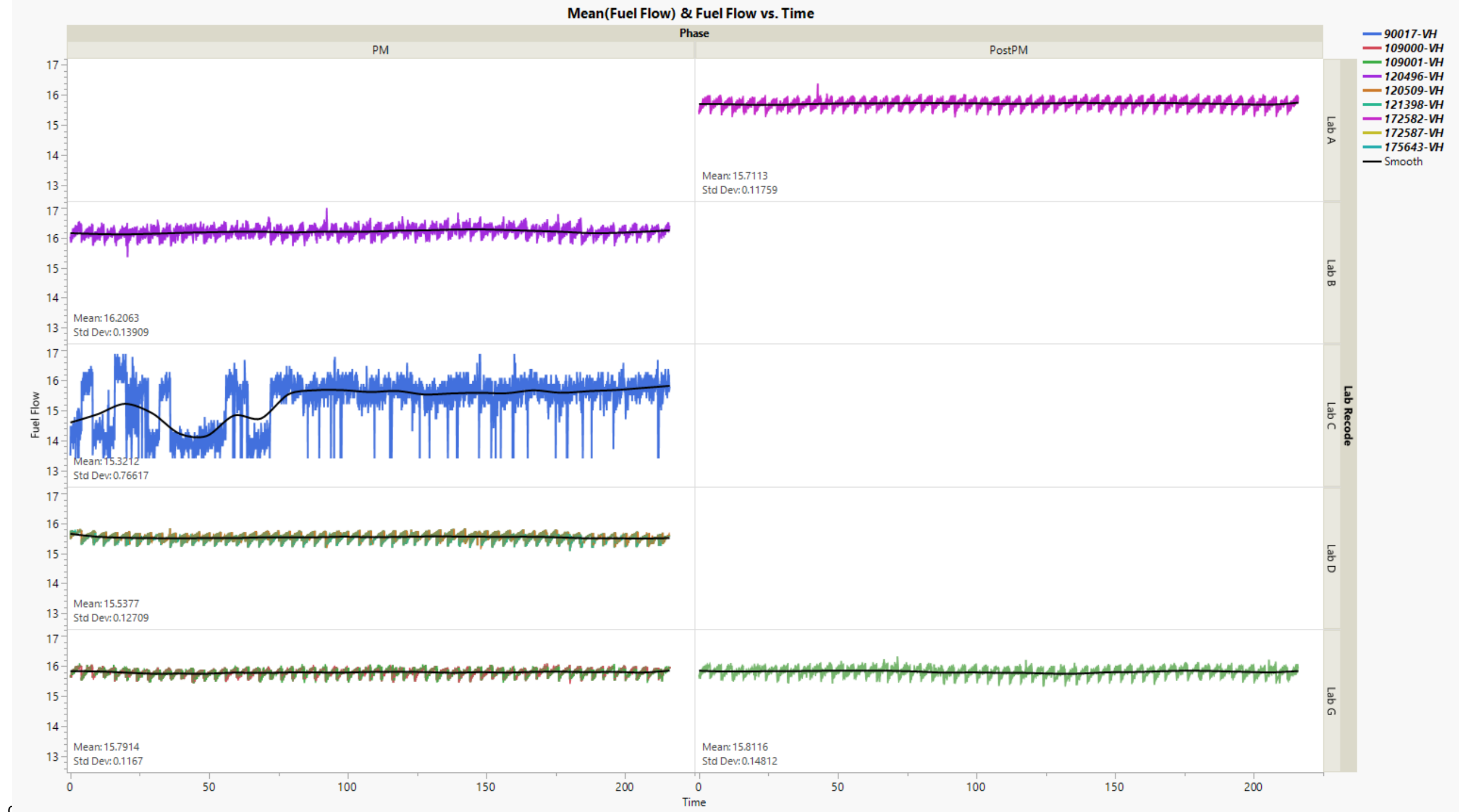
Where((Stage = Stage-2) and (RefOil 2 = RO940))



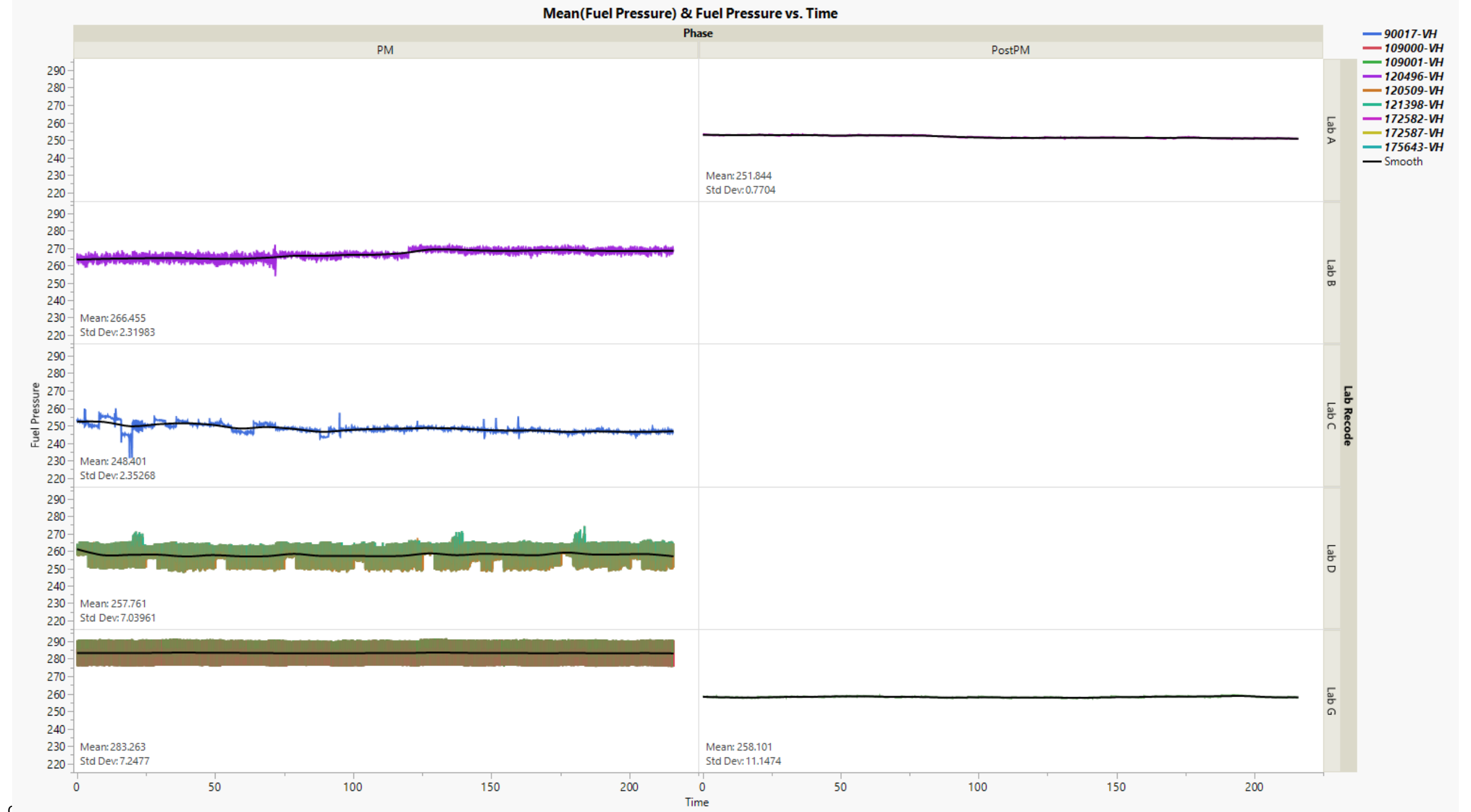
Where((Stage = Stage-2) and (RefOil 2 = RO940))



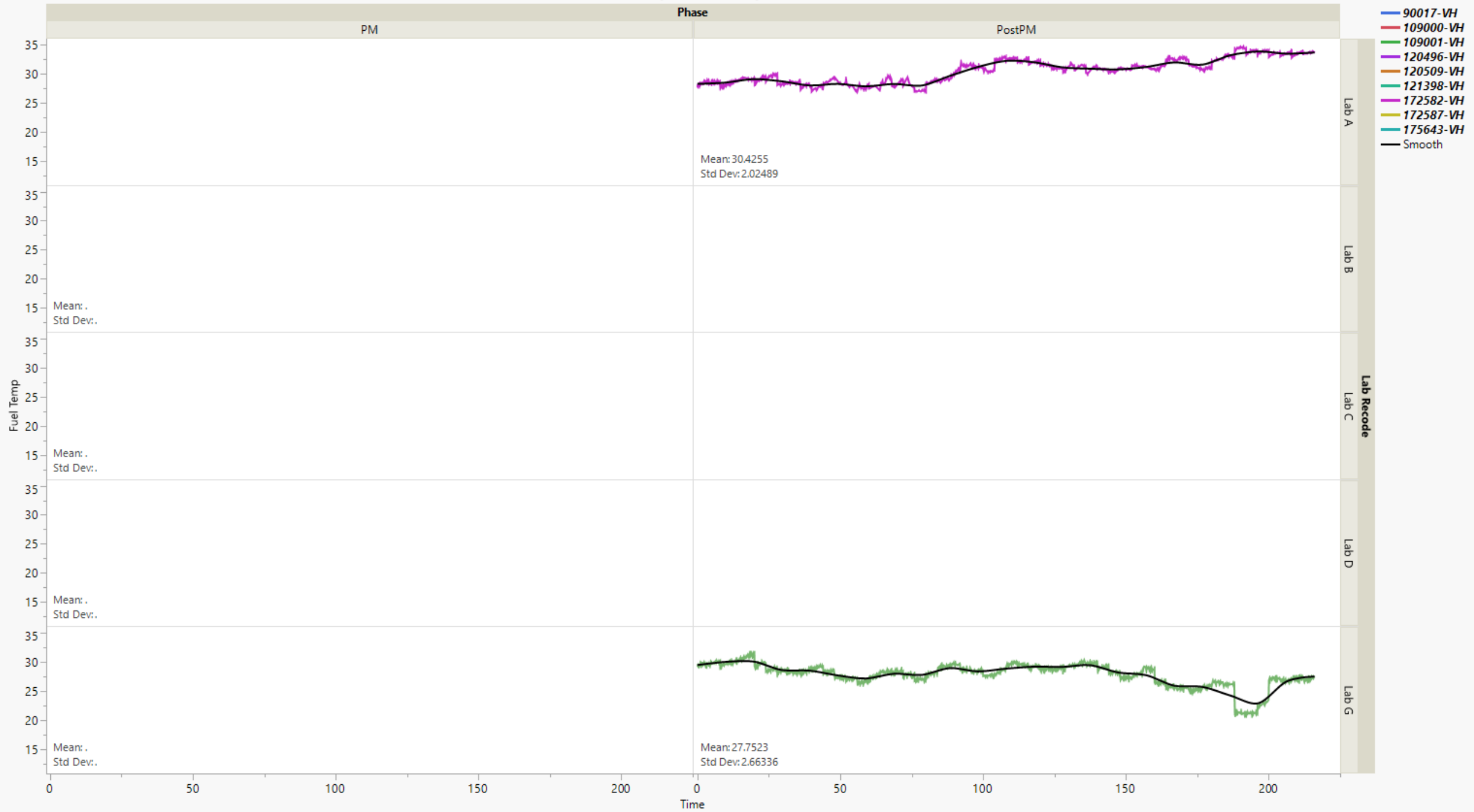
Where((Stage = Stage-2) and (RefOil 2 = RO940))



Where((Stage = Stage-2) and (RefOil 2 = RO940))

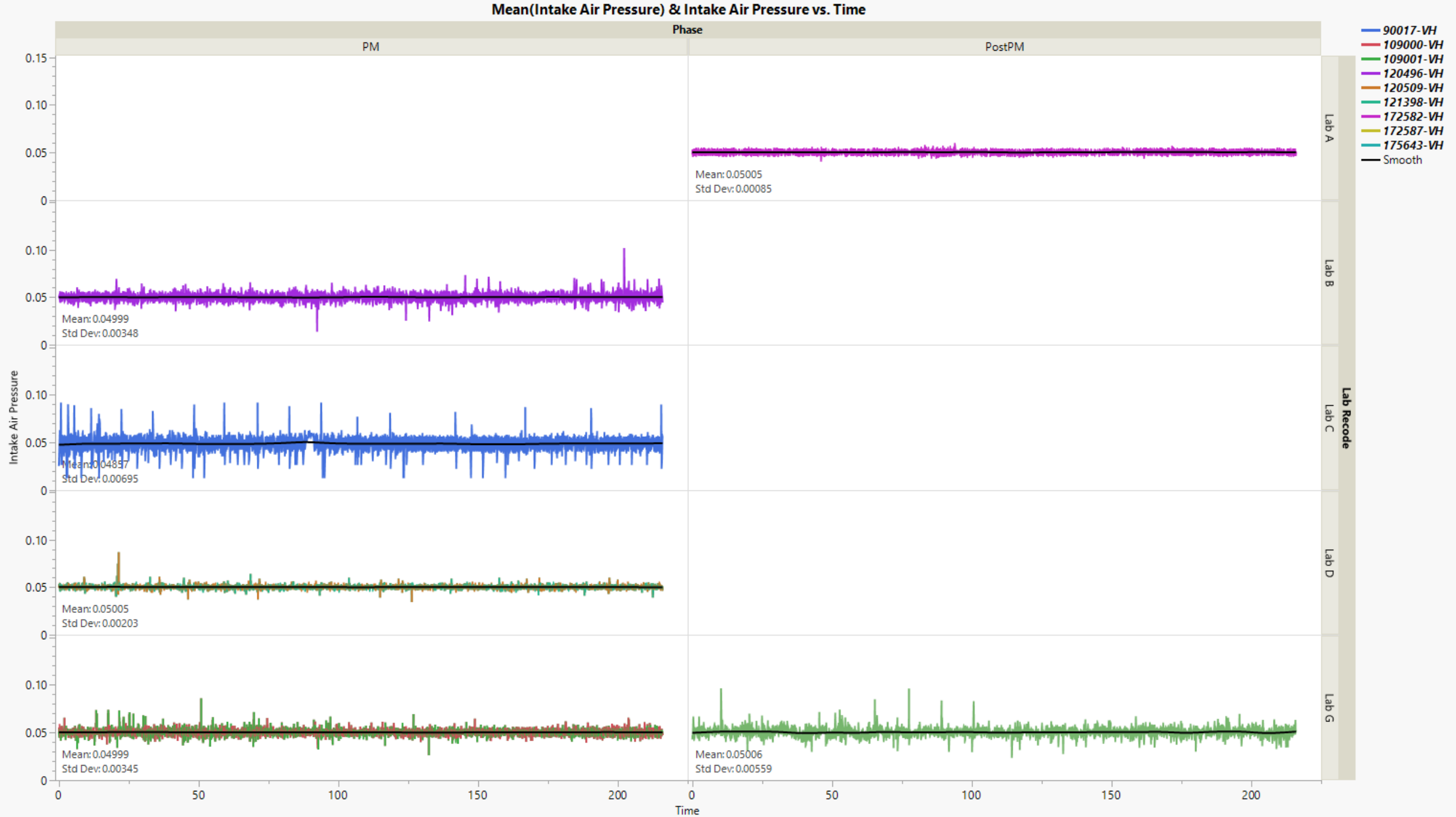


Where((Stage = Stage-2) and (RefOil 2 = RO940))

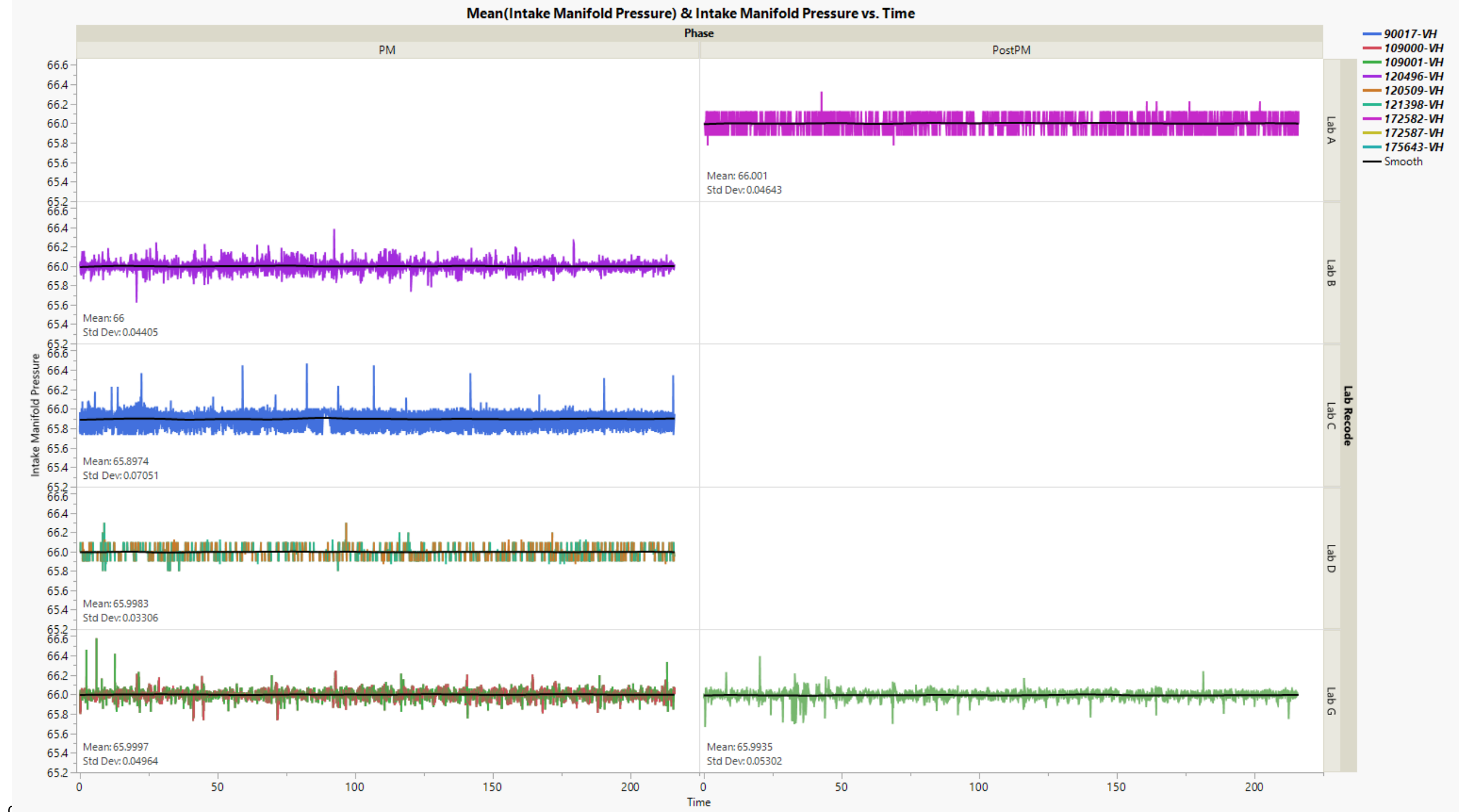


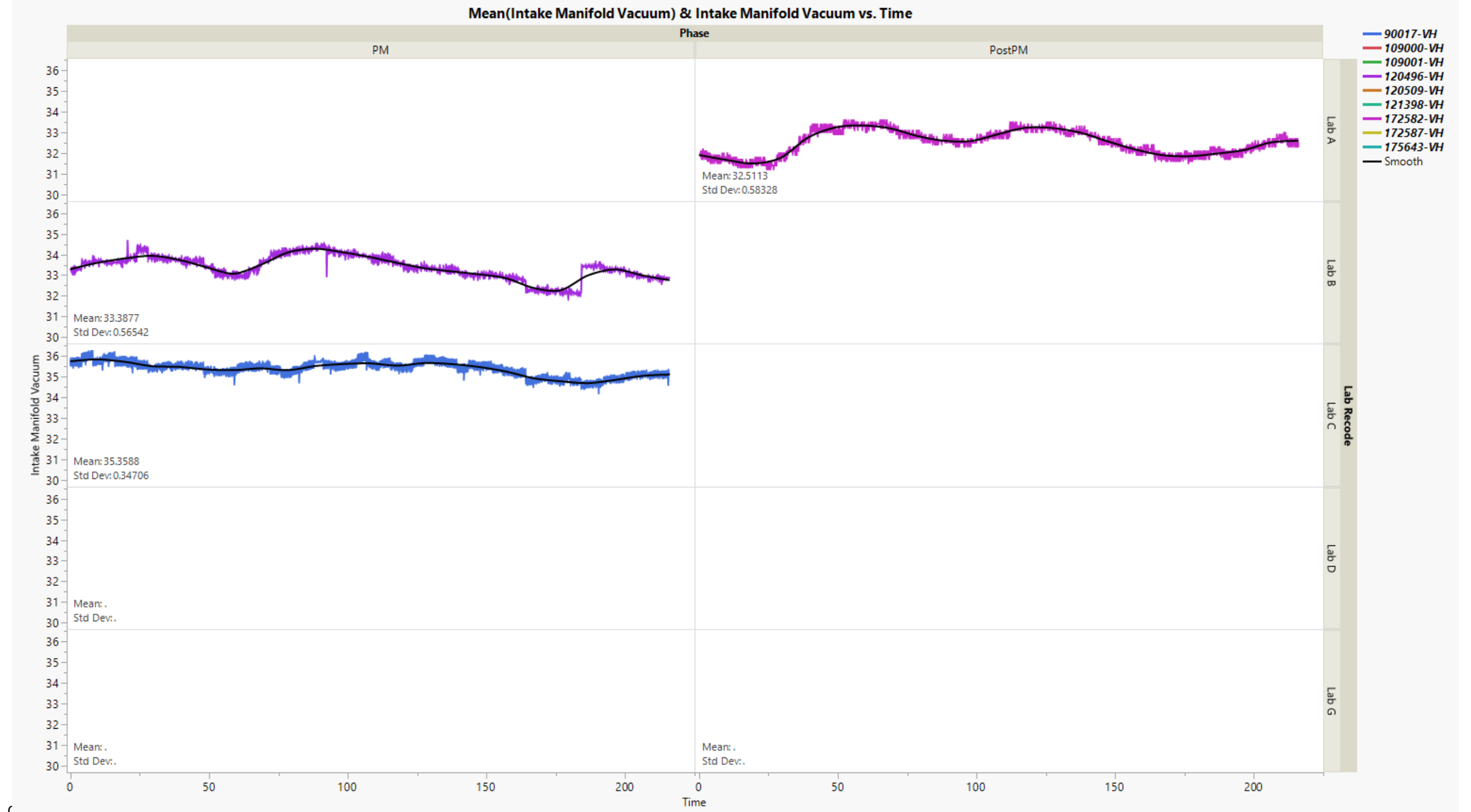
Where((Stage = Stage-2) and (RefOil 2 = RO940))

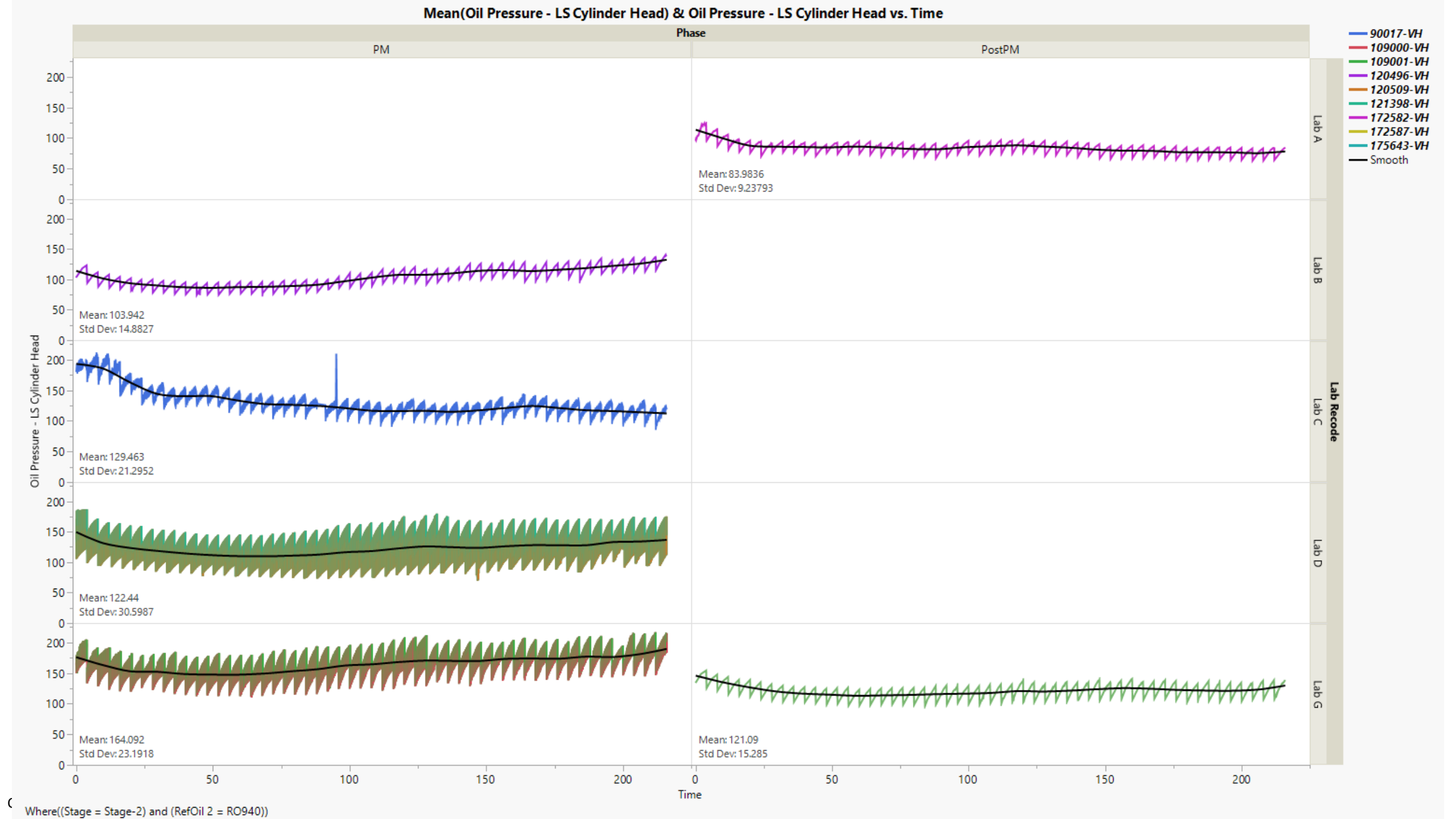
Where((Stage = Stage-2) and (RefOil 2 = RO940))


Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
Intake Air Pressure
Time
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Mean: 0.05005
Std Dev: 0.00085
Lab B
Mean: 0.04999
Std Dev: 0.00348
Lab C
Mean: 0.04857
Std Dev: 0.00695
Lab D
Mean: 0.05005
Std Dev: 0.00203
Lab G
Mean: 0.04999
Std Dev: 0.00345
Mean: 0.05006
Std Dev: 0.00559
Where((Stage = Stage-2) and (RefOil 2 = RO940))

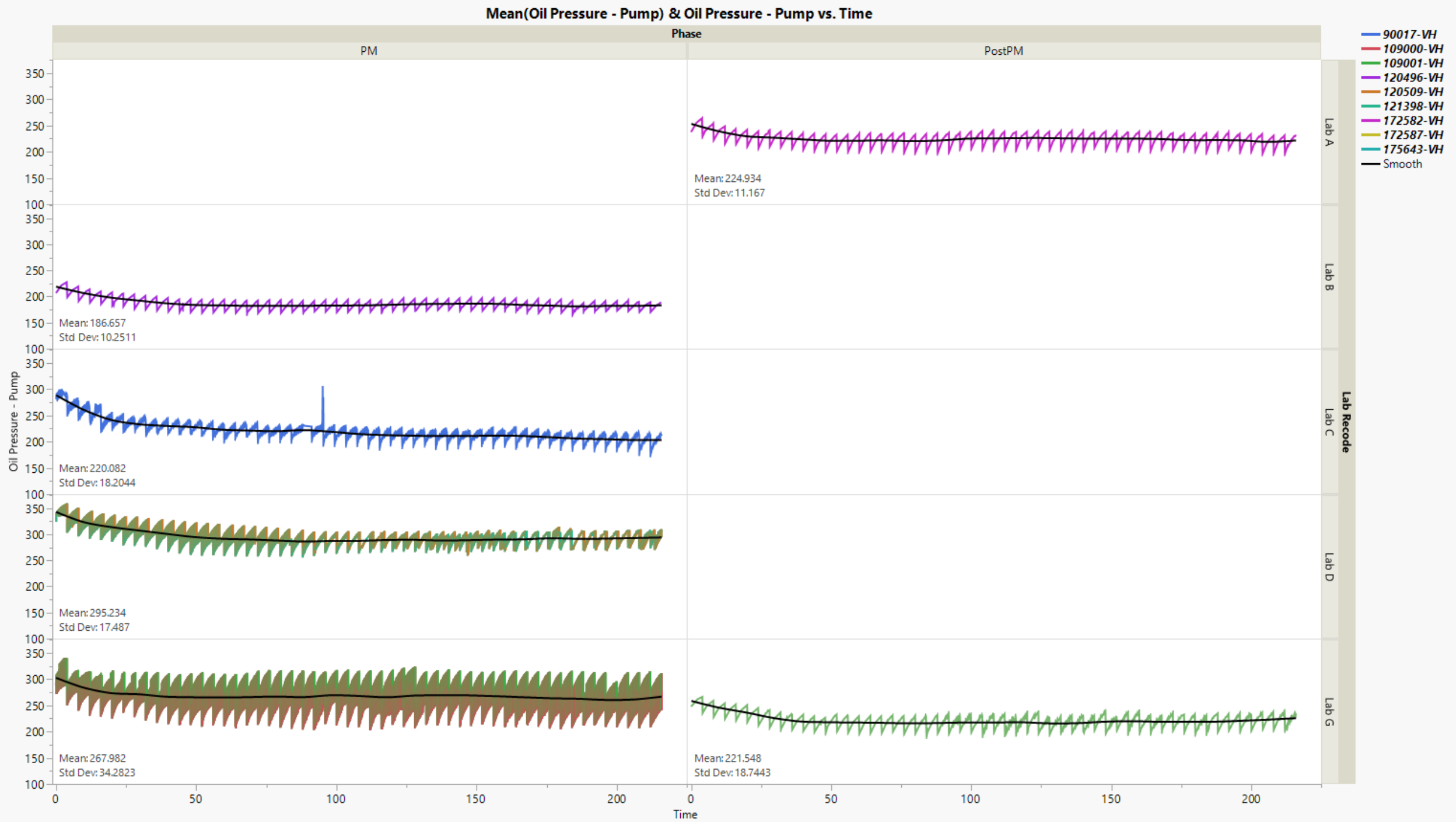
Where((Stage = Stage-2) and (RefOil 2 = RO940))


Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 66.001
Std Dev: 0.04643
Mean: 66
Std Dev: 0.04405
Mean: 65.8974
Std Dev: 0.07051
Mean: 65.9983
Std Dev: 0.03306
Mean: 65.9997
Std Dev: 0.04964
Mean: 65.9935
Std Dev: 0.05302
Intake Manifold Pressure
66.6
66.4
66.2
66.0
65.8
65.6
65.4
65.2
0
50
100
150
200
Time
Where((Stage = Stage-2) and (RefOil 2 = RO940))

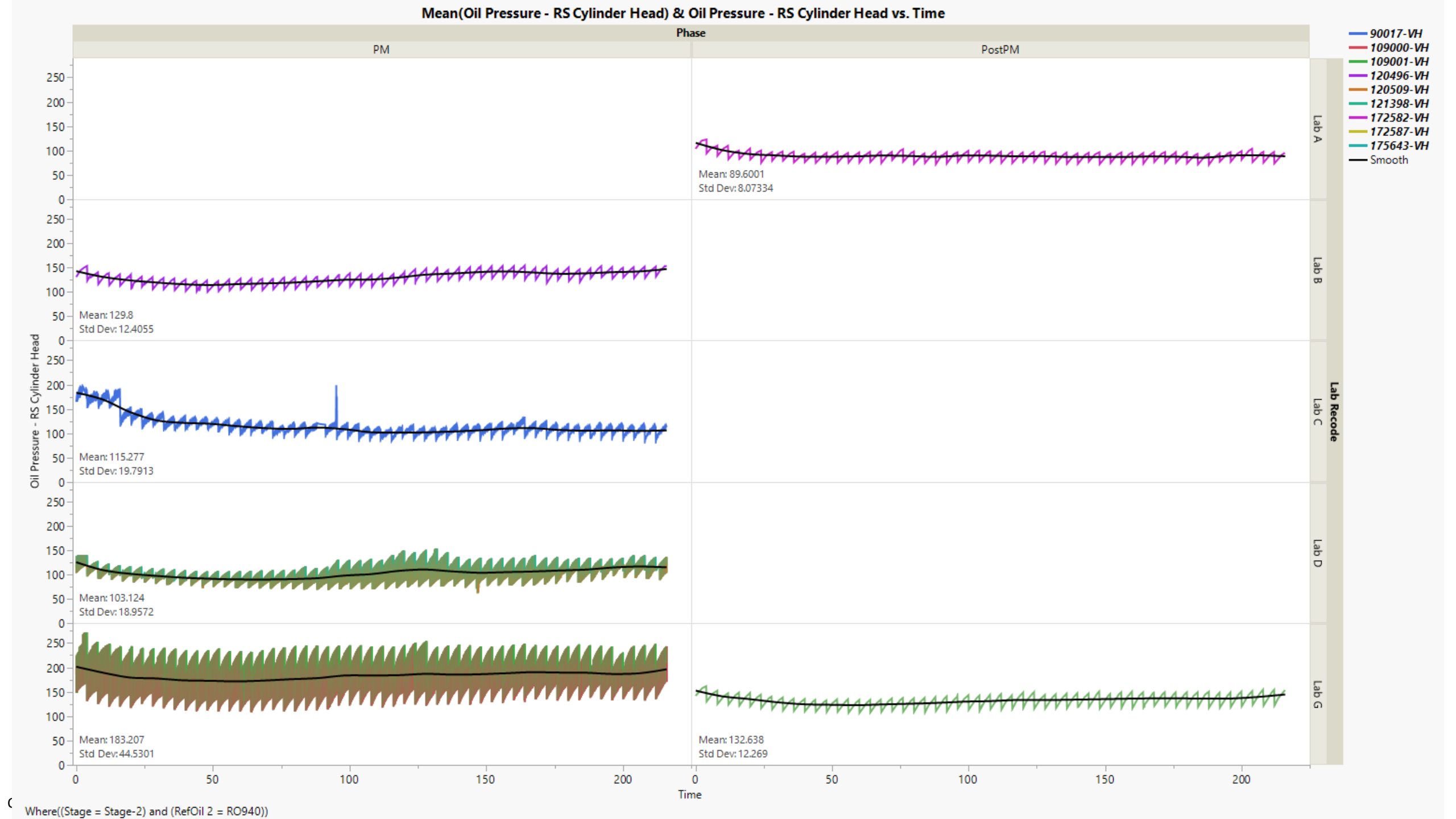

Mean(Intake Manifold Vacuum) & Intake Manifold Vacuum vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 32.5113
Std Dev: 0.58328
Mean: 33.3877
Std Dev: 0.56542
Mean: 35.3588
Std Dev: 0.34706
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Intake Manifold Vacuum
Time
Where((Stage = Stage-2) and (RefOil 2 = RO940))



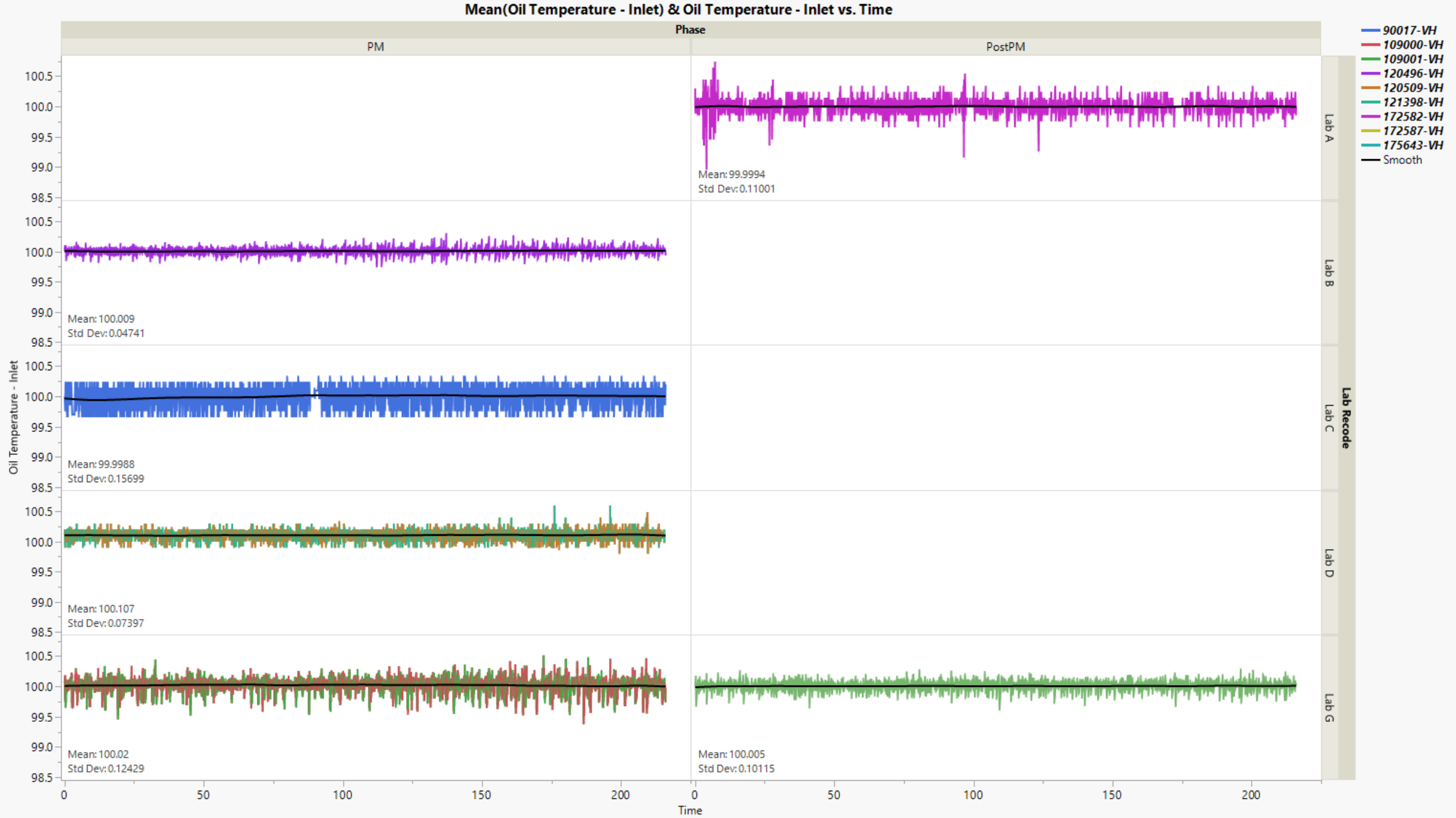
Where((Stage = Stage-2) and (RefOil 2 = RO940))



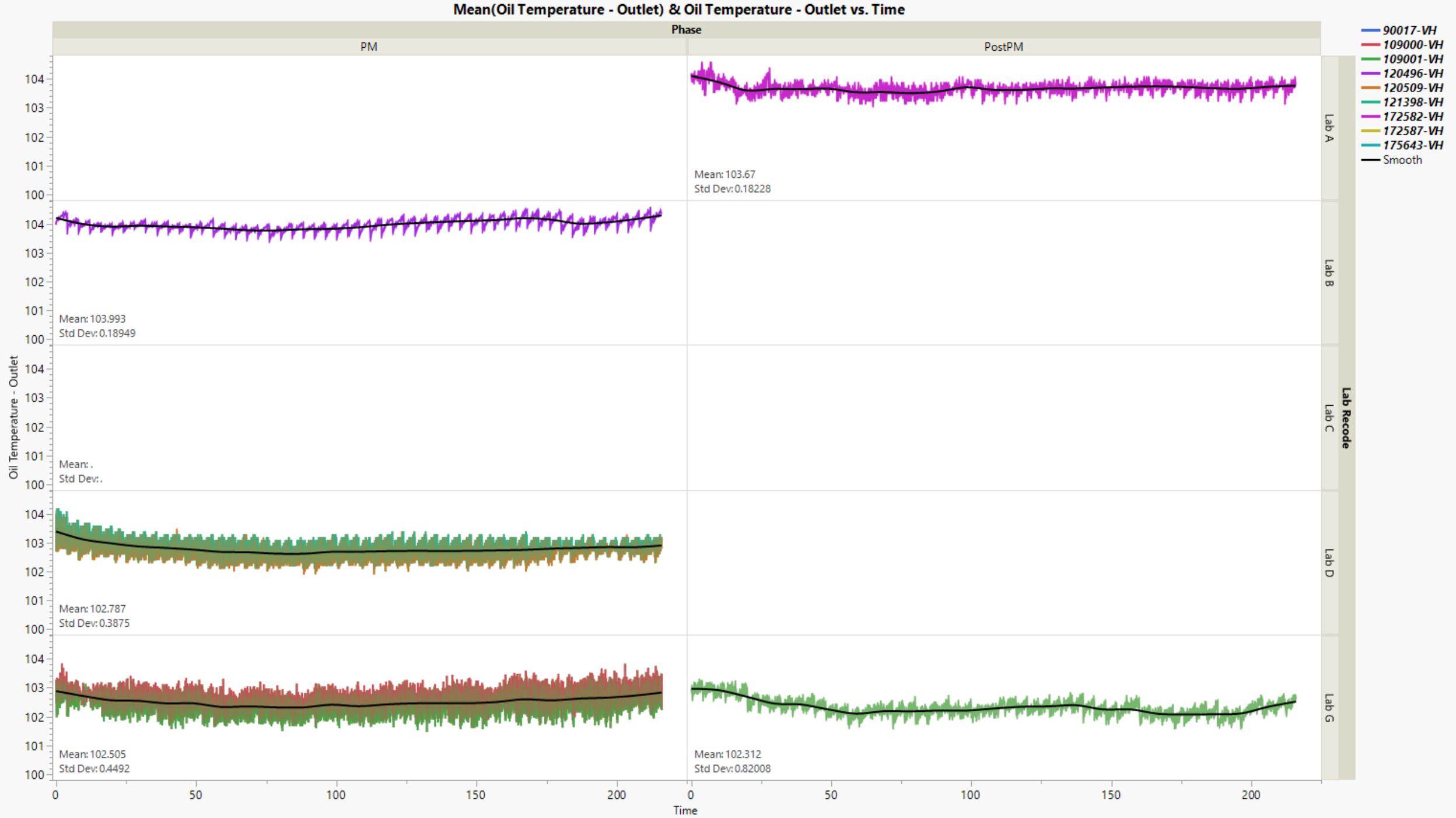
Where((Stage = Stage-2) and (RefOil 2 = RO940))

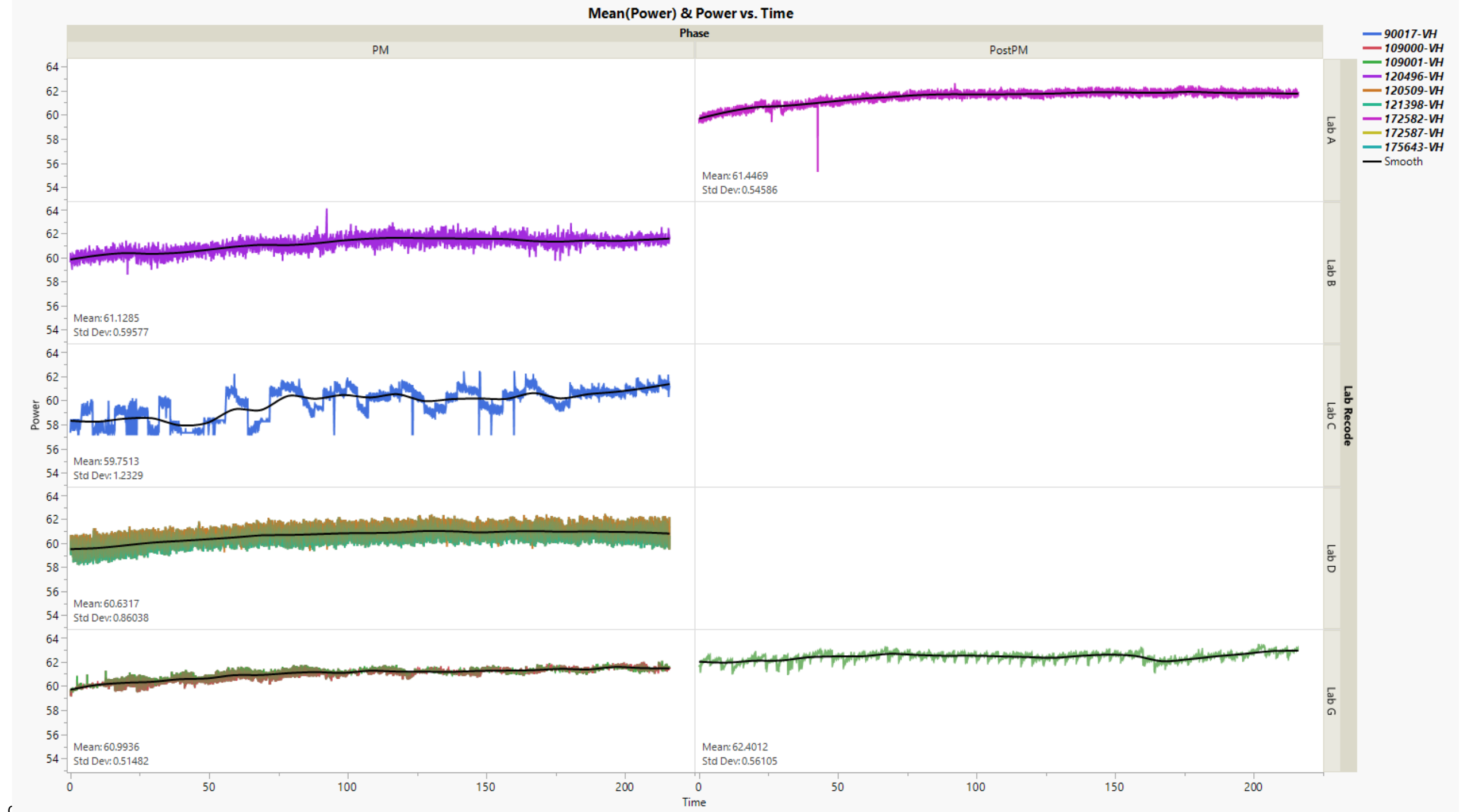


Where((Stage = Stage-2) and (RefOil 2 = RO940))



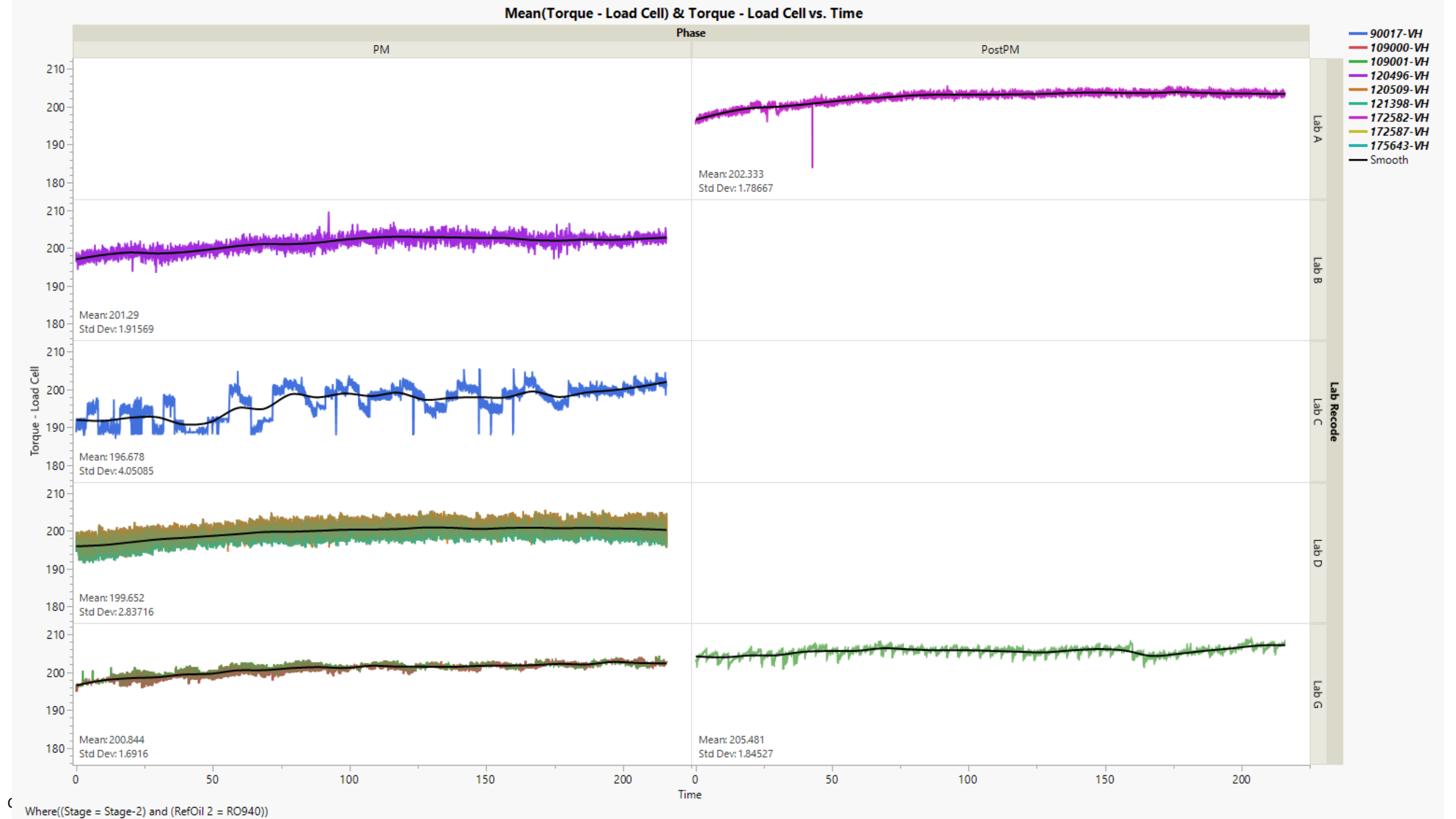
Where((Stage = Stage-2) and (RefOil 2 = RO940))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 103.67
Std Dev: 0.18228
Mean: 103.993
Std Dev: 0.18949
Mean: .
Std Dev: .
Mean: 102.787
Std Dev: 0.3875
Mean: 102.505
Std Dev: 0.4492
Mean: 102.312
Std Dev: 0.82008
Oil Temperature - Outlet
Time
Where((Stage = Stage-2) and (RefOil 2 = RO940))



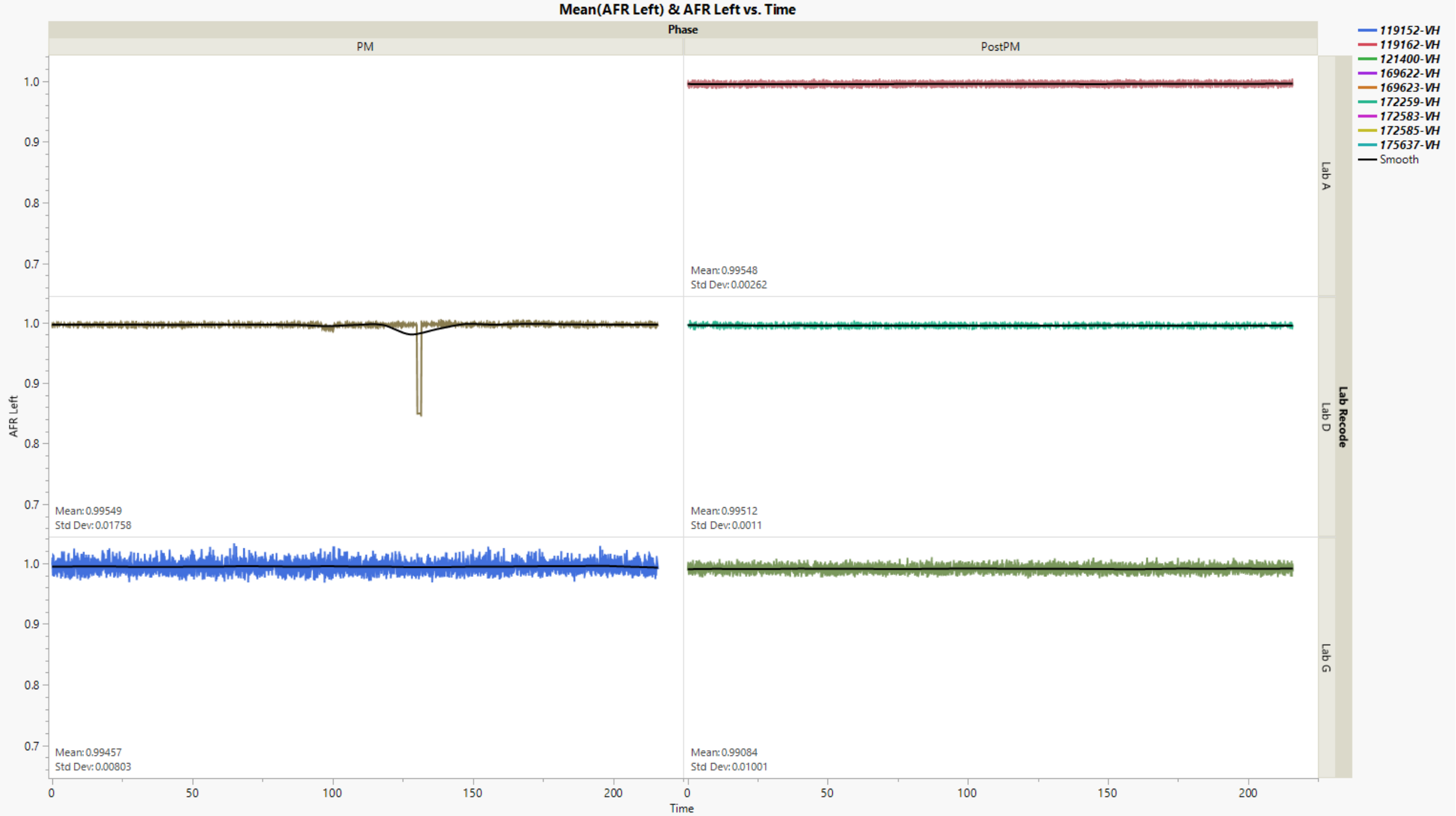
Where((Stage = Stage-2) and (RefOil 2 = RO940))

Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
Rocker Arm Cover Temperature - Inlet
Time
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 84.9957
Std Dev: 0.04852
Mean: 85.0083
Std Dev: 0.07559
Mean: 84.9588
Std Dev: 0.29784
Mean: 85.1017
Std Dev: 0.1308
Mean: 85.0776
Std Dev: 0.3399
Mean: 84.9963
Std Dev: 0.10506
Where((Stage = Stage-2) and (RefOil 2 = RO940))

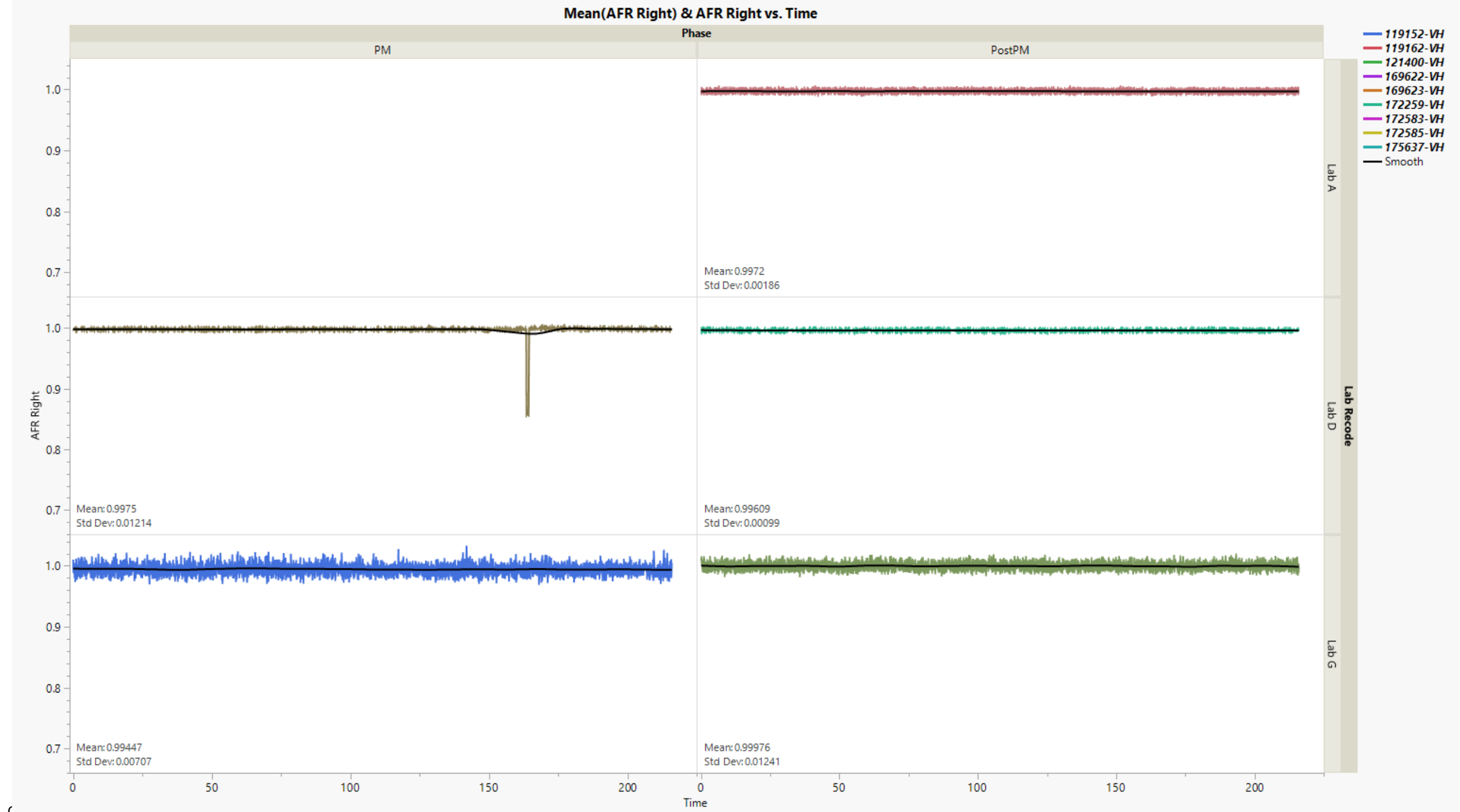

Mean(Torque - Load Cell) & Torque - Load Cell vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Torque - Load Cell
Time
Mean: 202.333
Std Dev: 1.78667
Mean: 201.29
Std Dev: 1.91569
Mean: 196.678
Std Dev: 4.05085
Mean: 199.652
Std Dev: 2.83716
Mean: 200.844
Std Dev: 1.6916
Mean: 205.481
Std Dev: 1.84527
Where((Stage = Stage-2) and (RefOil 2 = RO940))

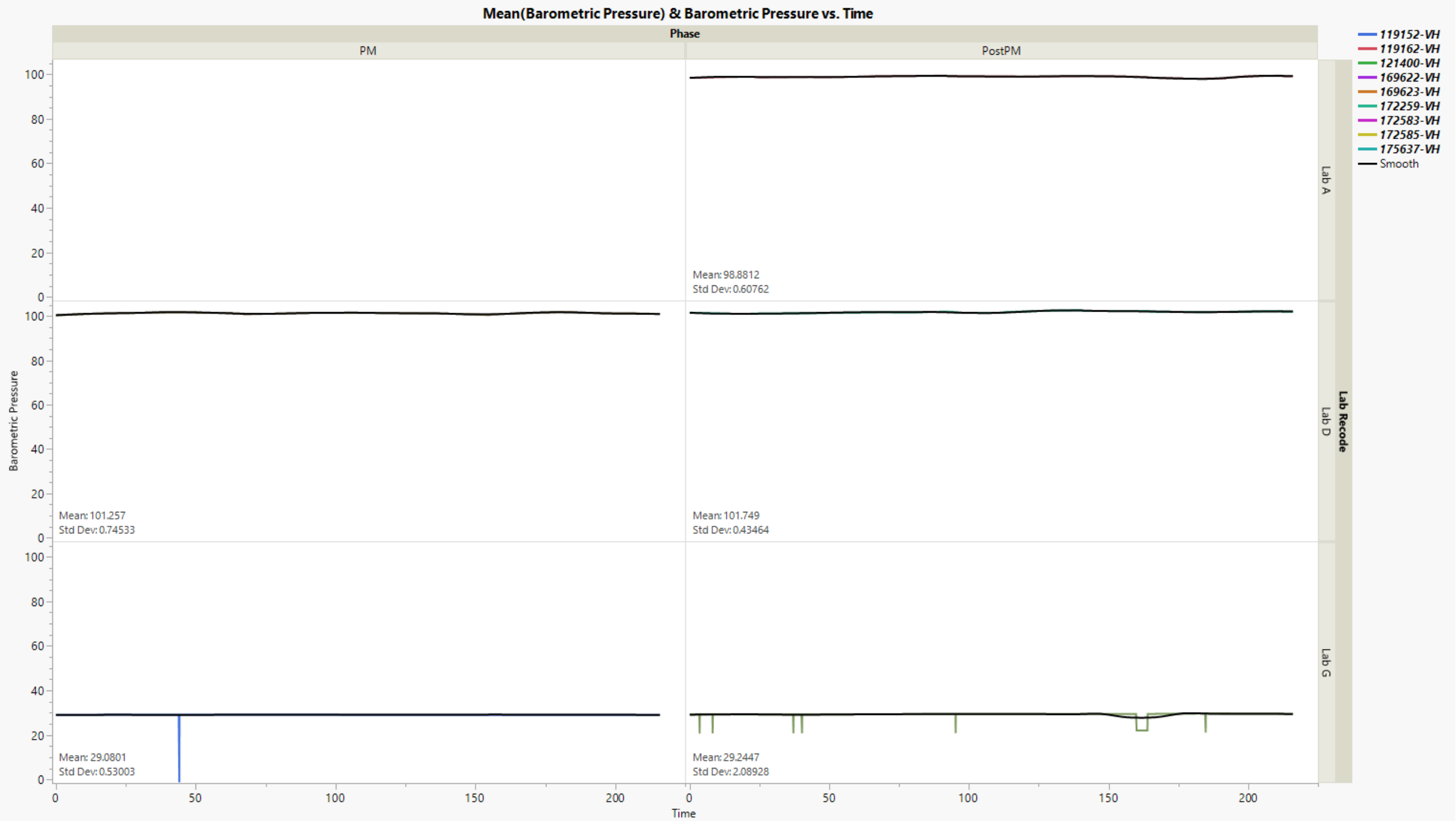
RO 1011 Data Plots

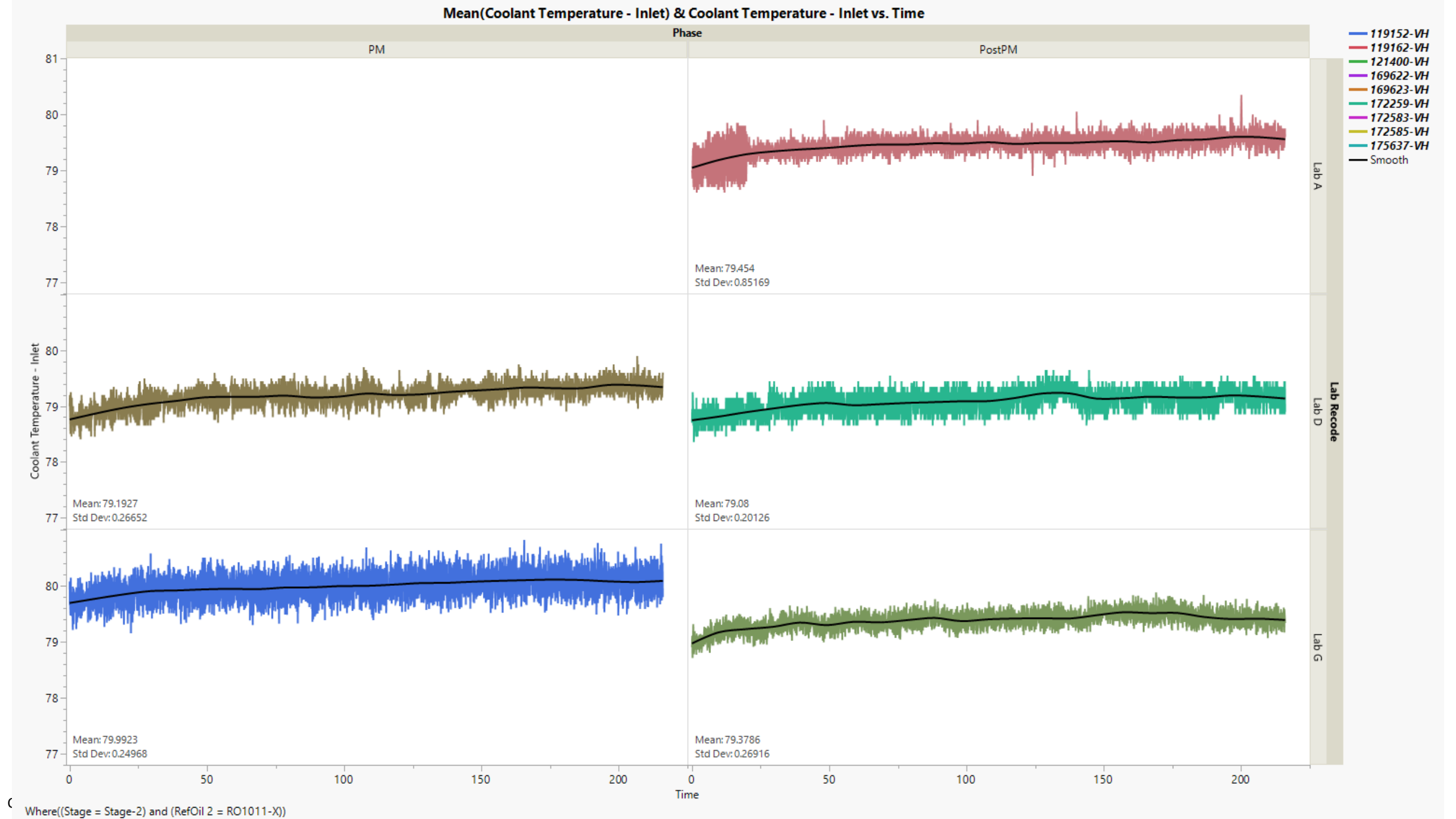
Classified as Confidential

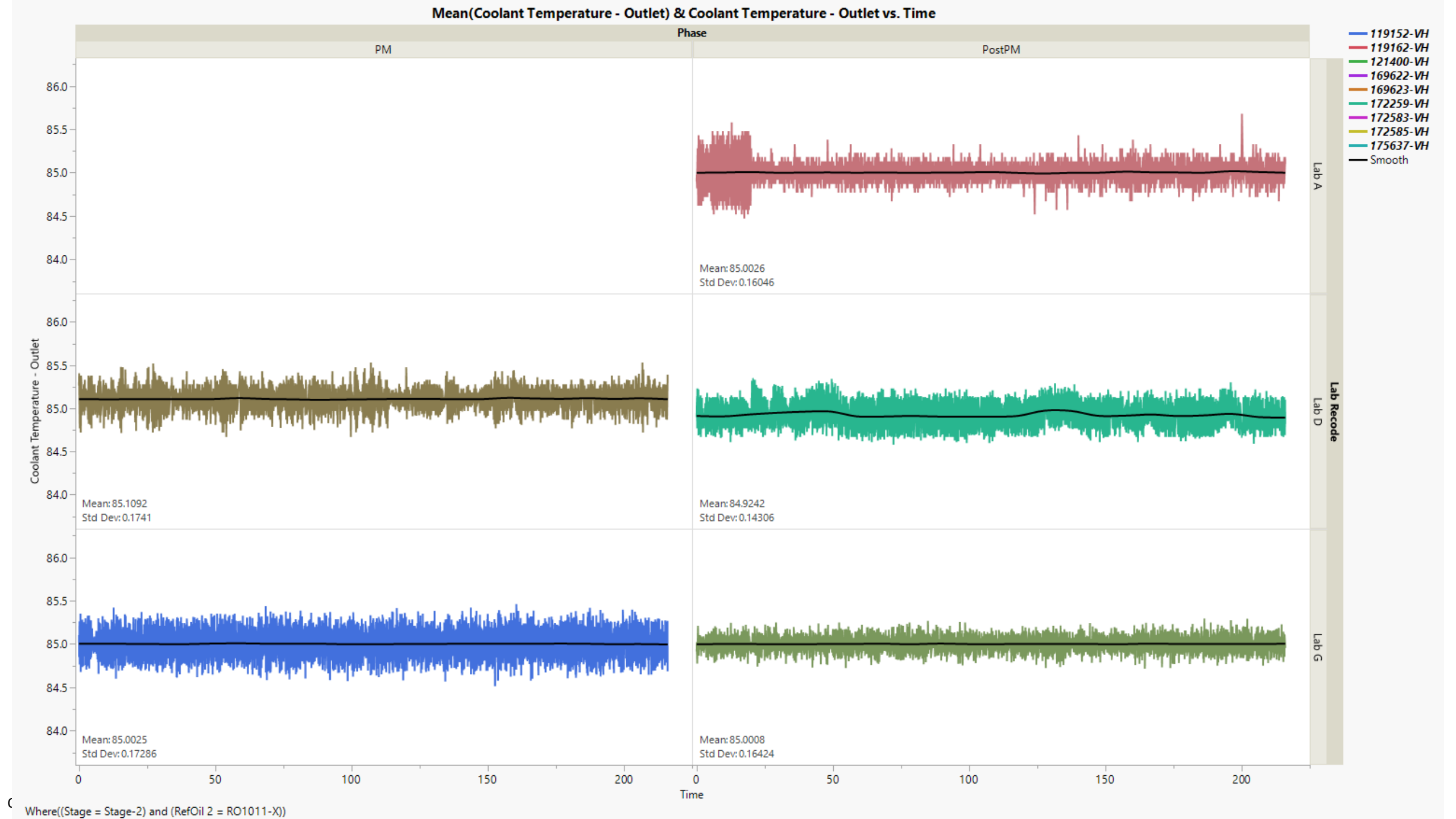


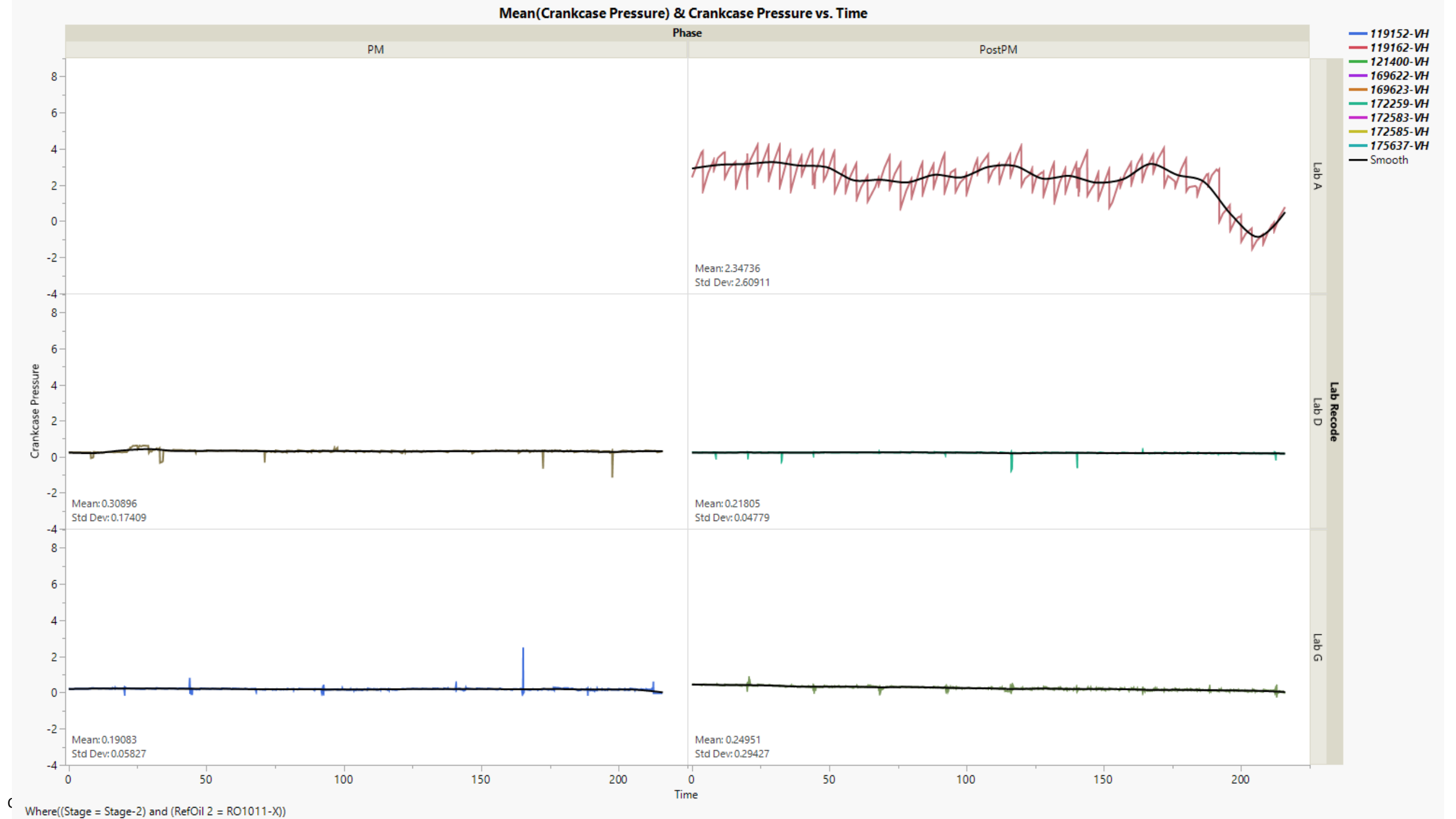
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

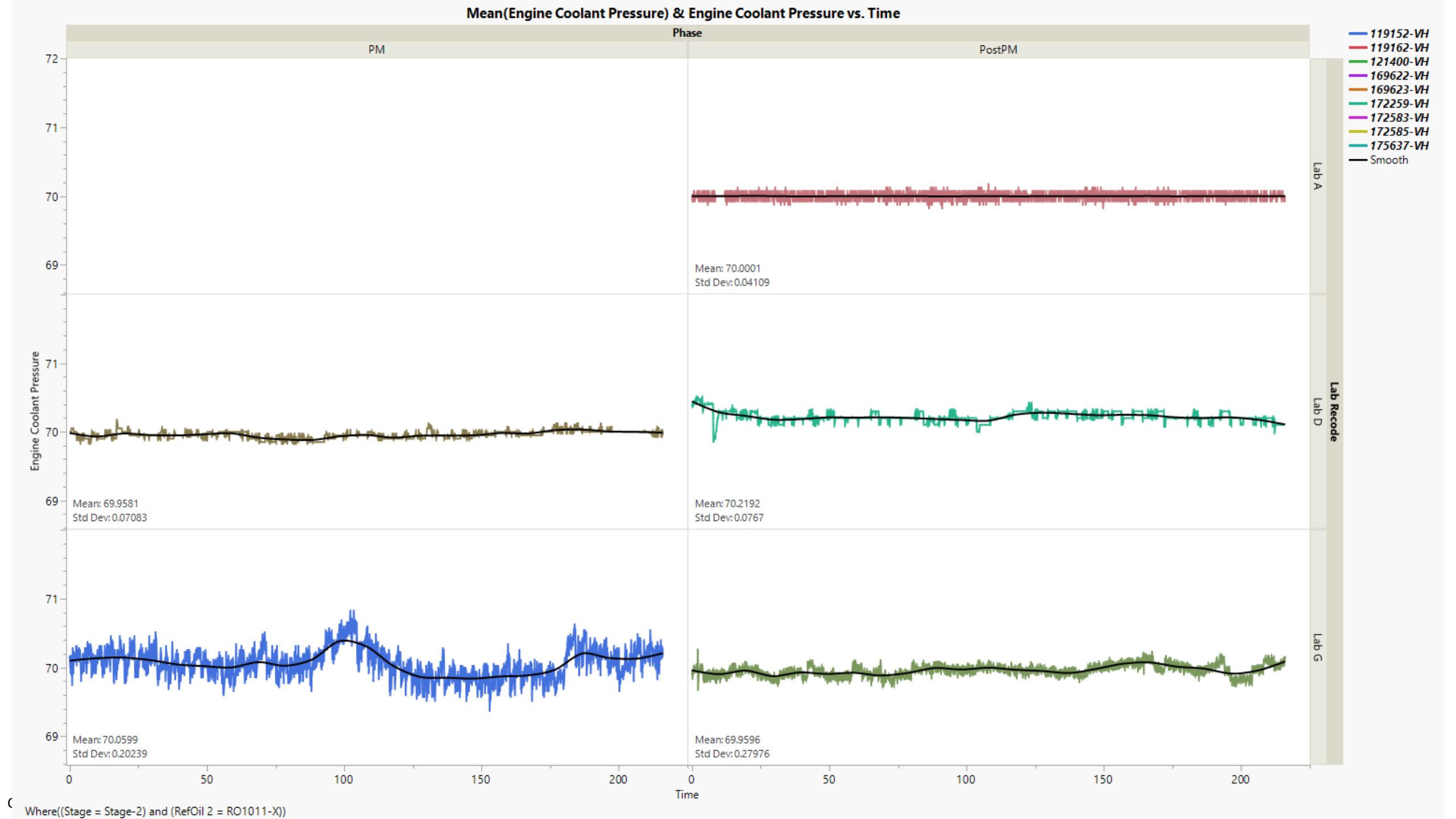

Mean(AFR Right) & AFR Right vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
AFR Right
Time
Mean: 0.9972
Std Dev: 0.00186
Mean: 0.9975
Std Dev: 0.01214
Mean: 0.99609
Std Dev: 0.00099
Mean: 0.99447
Std Dev: 0.00707
Mean: 0.99976
Std Dev: 0.01241
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

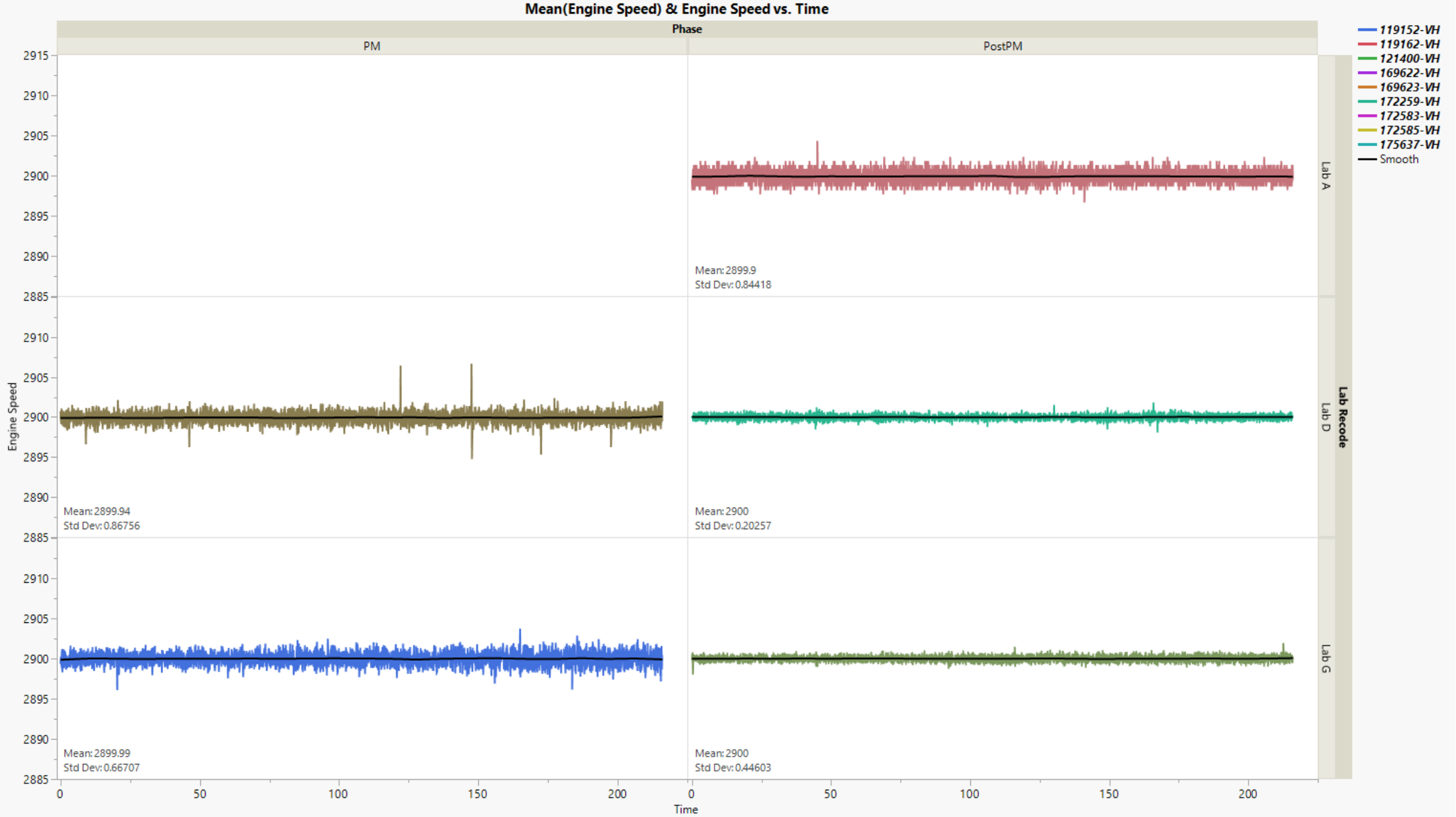

Mean(Barometric Pressure) & Barometric Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Barometric Pressure
Time
Mean: 98.8812
Std Dev: 0.60762
Mean: 101.257
Std Dev: 0.74533
Mean: 101.749
Std Dev: 0.43464
Mean: 29.0801
Std Dev: 0.53003
Mean: 29.2447
Std Dev: 2.08928
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

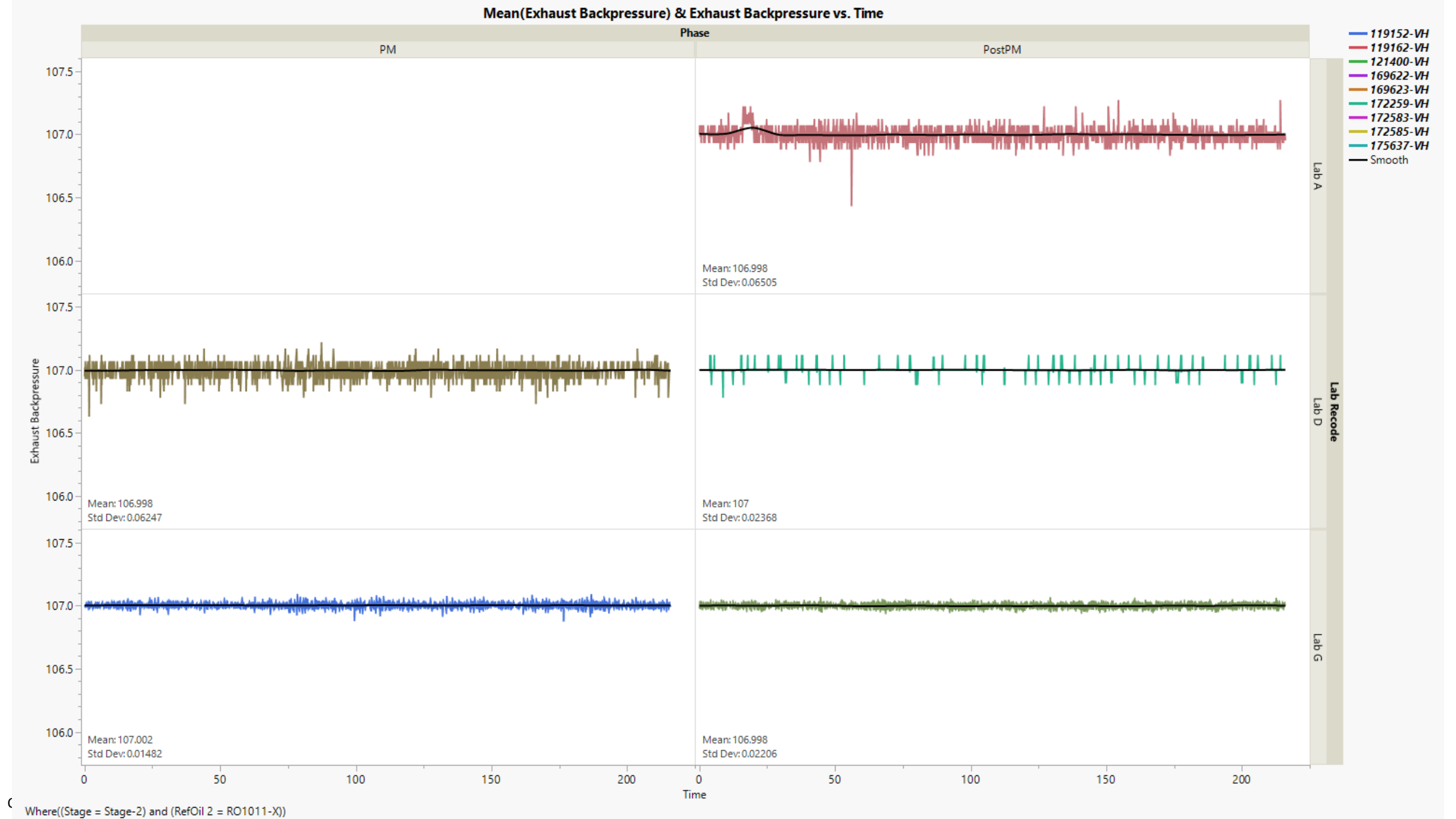

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Coolant Temperature - Inlet
Time
Mean: 79.454
Std Dev: 0.85169
Mean: 79.1927
Std Dev: 0.26652
Mean: 79.08
Std Dev: 0.20126
Mean: 79.9923
Std Dev: 0.24968
Mean: 79.3786
Std Dev: 0.26916
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

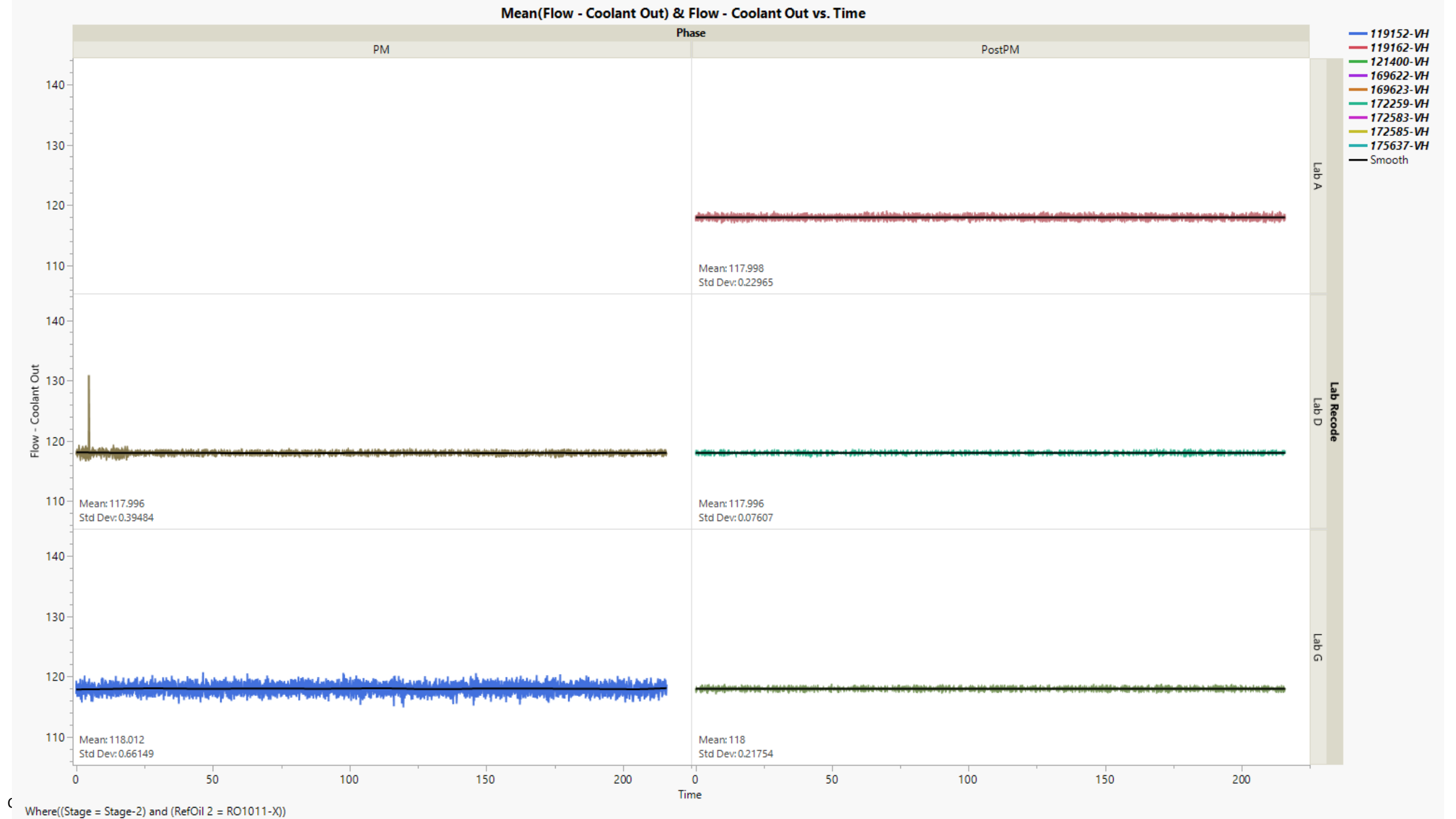

Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Coolant Temperature - Outlet
Time
Mean: 85.0026
Std Dev: 0.16046
Mean: 85.1092
Std Dev: 0.1741
Mean: 84.9242
Std Dev: 0.14306
Mean: 85.0025
Std Dev: 0.17286
Mean: 85.0008
Std Dev: 0.16424
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

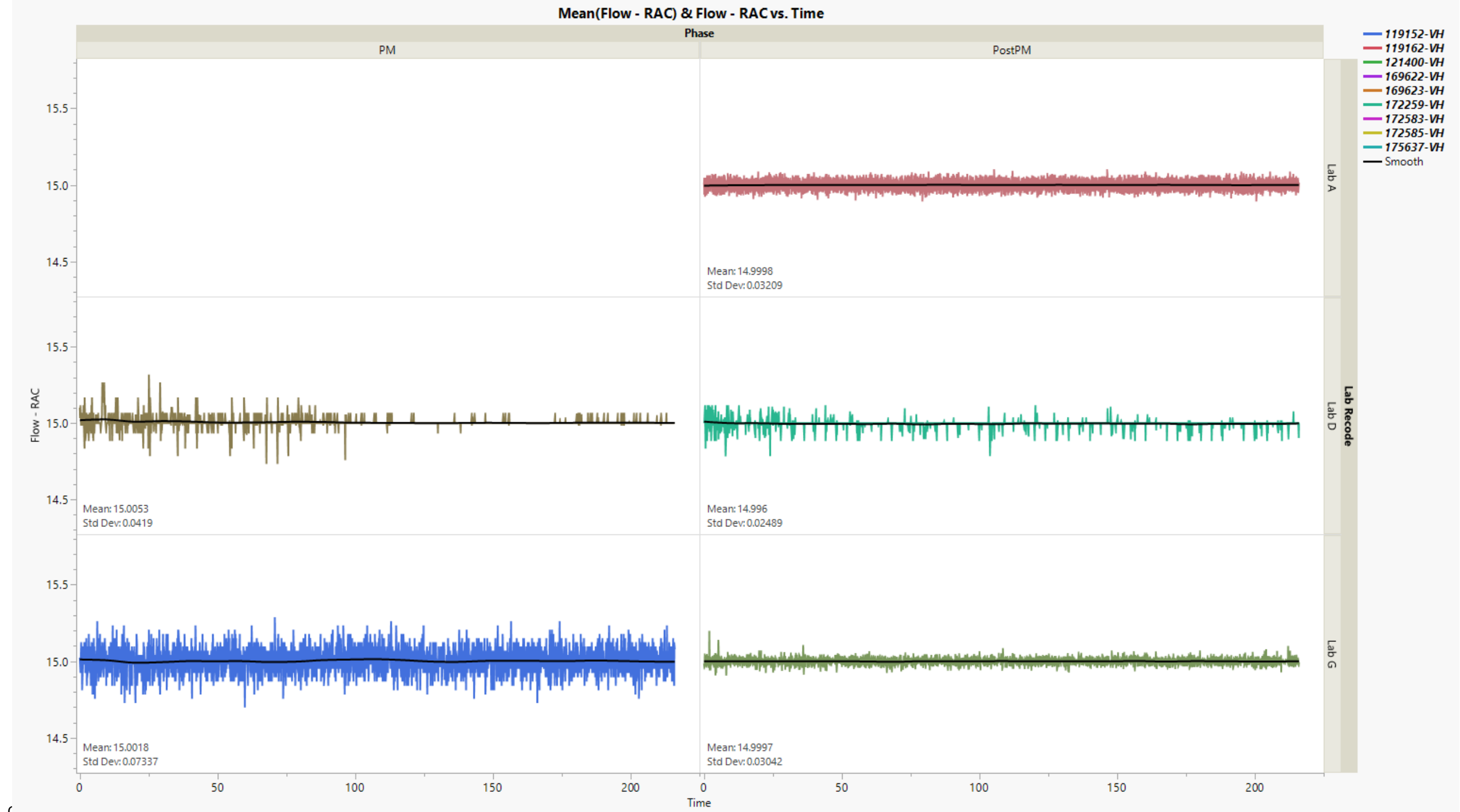

Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Crankcase Pressure
Time
Mean: 2.34736
Std Dev: 2.60911
Mean: 0.30896
Std Dev: 0.17409
Mean: 0.21805
Std Dev: 0.04779
Mean: 0.19083
Std Dev: 0.05827
Mean: 0.24951
Std Dev: 0.29427
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))


Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Engine Coolant Pressure
Time
Mean: 70.0001
Std Dev: 0.04109
Mean: 69.9581
Std Dev: 0.07083
Mean: 70.2192
Std Dev: 0.0767
Mean: 70.0599
Std Dev: 0.20239
Mean: 69.9596
Std Dev: 0.27976
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

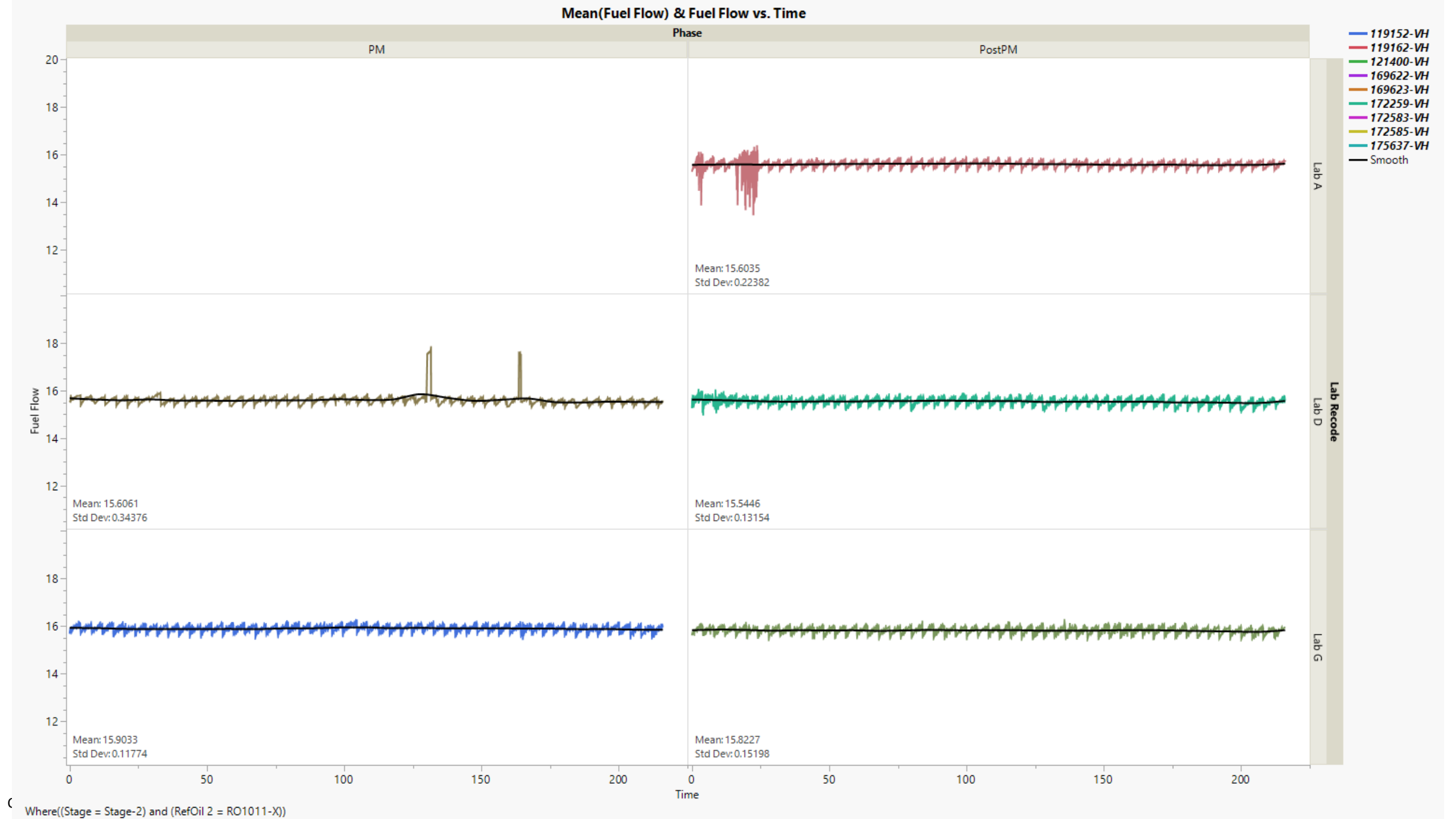

Mean(Engine Speed) & Engine Speed vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Speed
Time
Mean: 2899.9
Std Dev: 0.84418
Mean: 2899.94
Std Dev: 0.86756
Mean: 2900
Std Dev: 0.20257
Mean: 2899.99
Std Dev: 0.66707
Mean: 2900
Std Dev: 0.44603
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

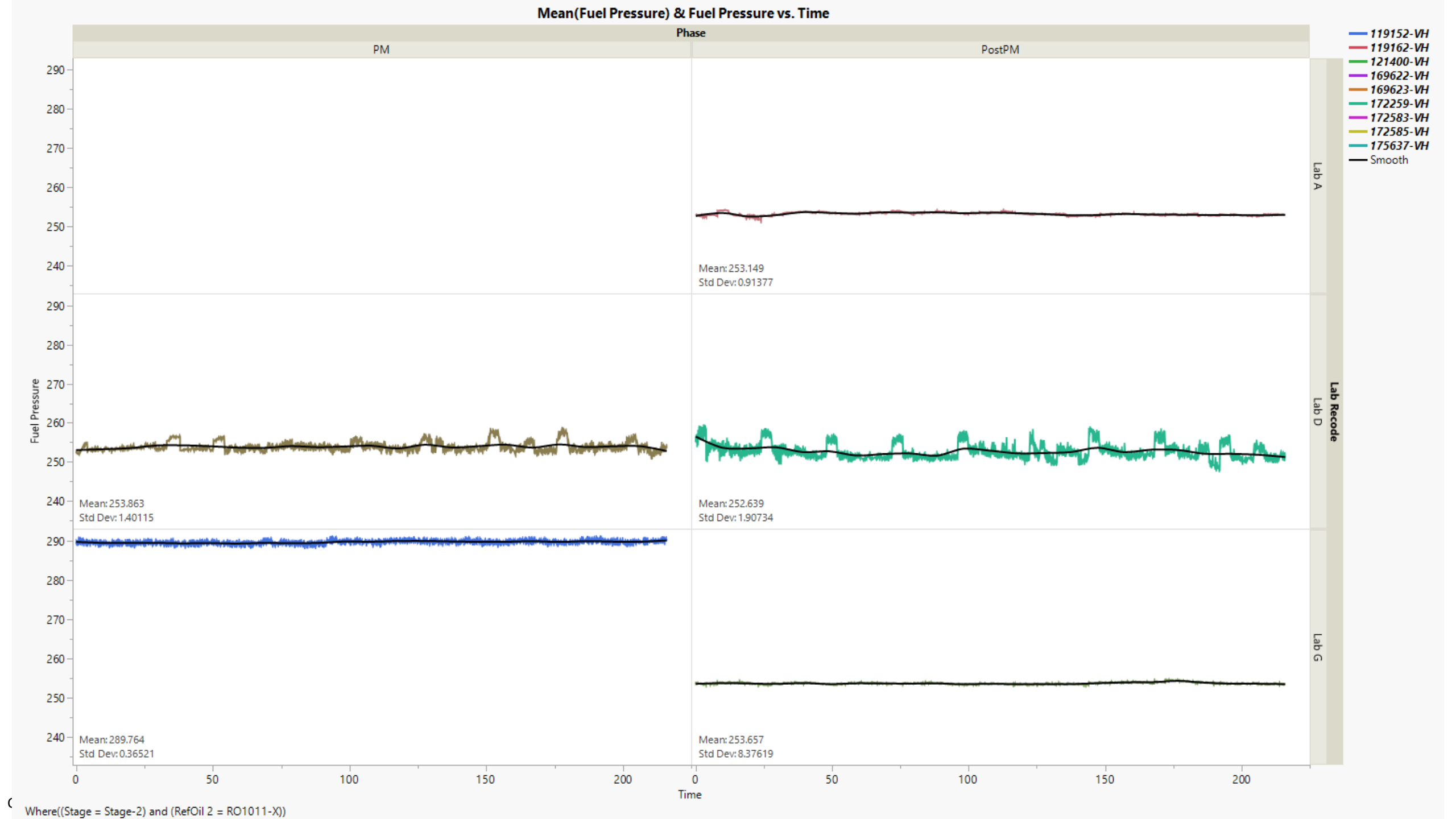

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 106.998
Std Dev: 0.06505
Mean: 106.998
Std Dev: 0.06247
Mean: 107
Std Dev: 0.02368
Mean: 107.002
Std Dev: 0.01482
Mean: 106.998
Std Dev: 0.02206
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

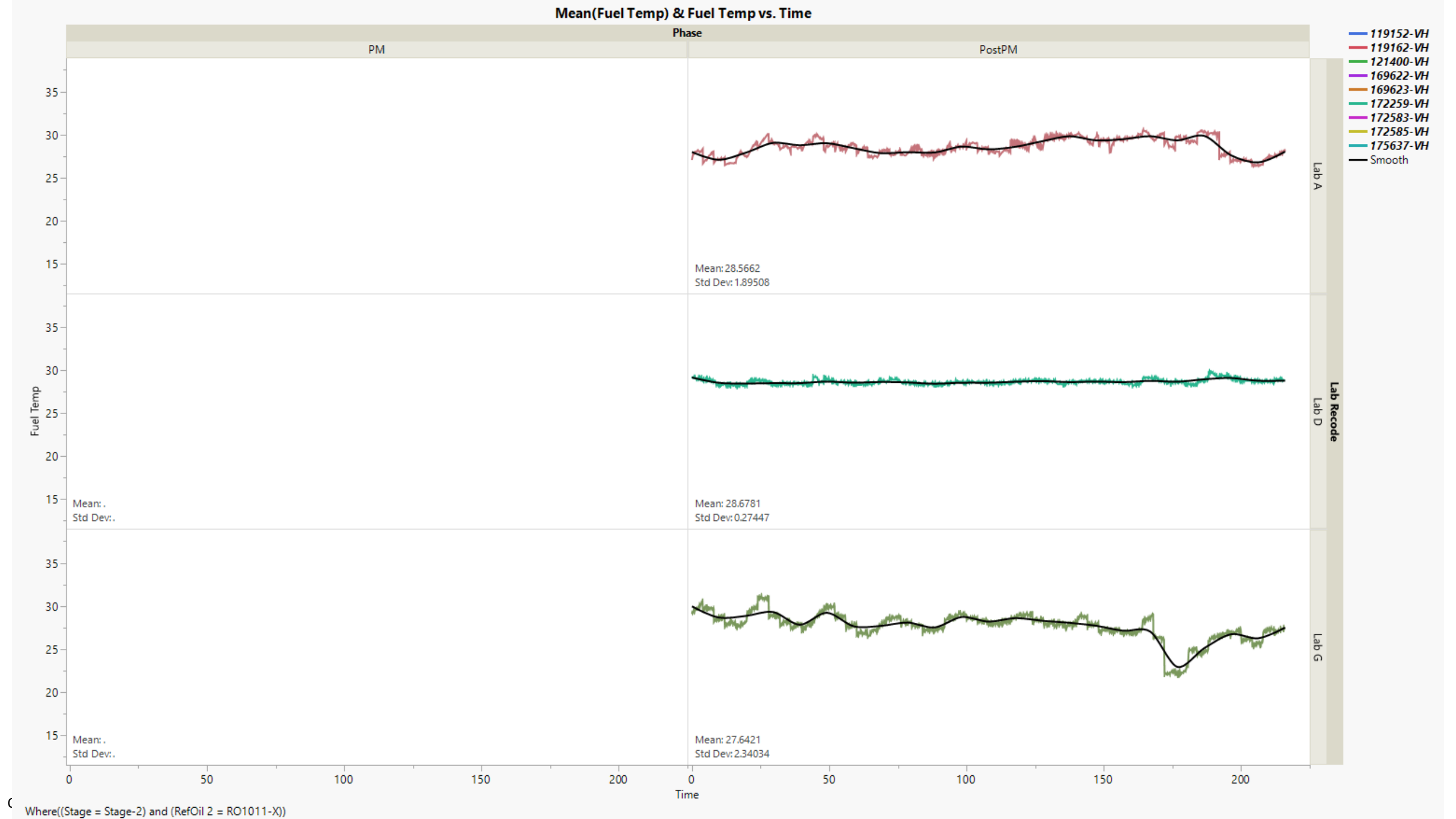

Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - Coolant Out
Time
Mean: 117.998
Std Dev: 0.22965
Mean: 117.996
Std Dev: 0.39484
Mean: 117.996
Std Dev: 0.07607
Mean: 118.012
Std Dev: 0.66149
Mean: 118
Std Dev: 0.21754
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

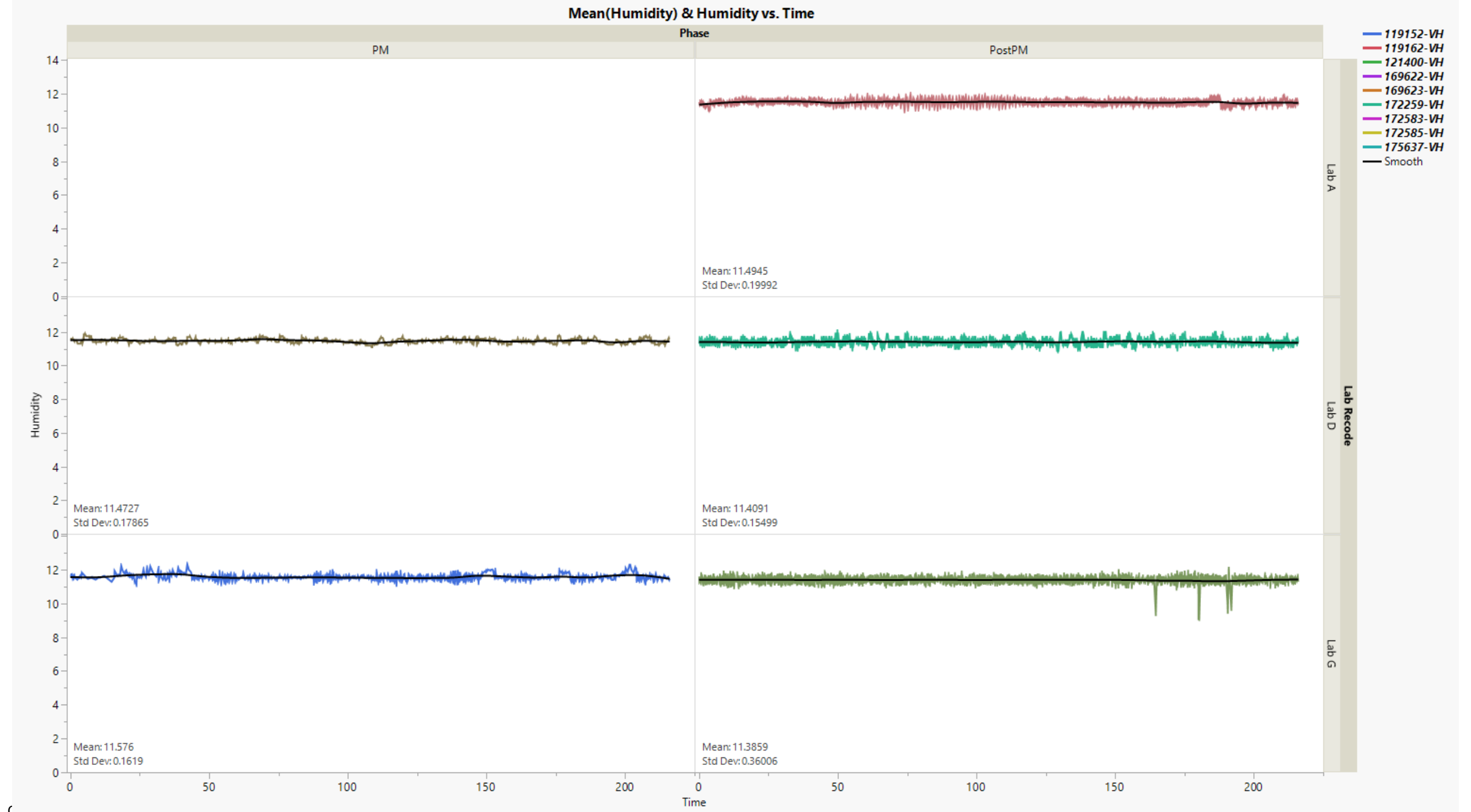


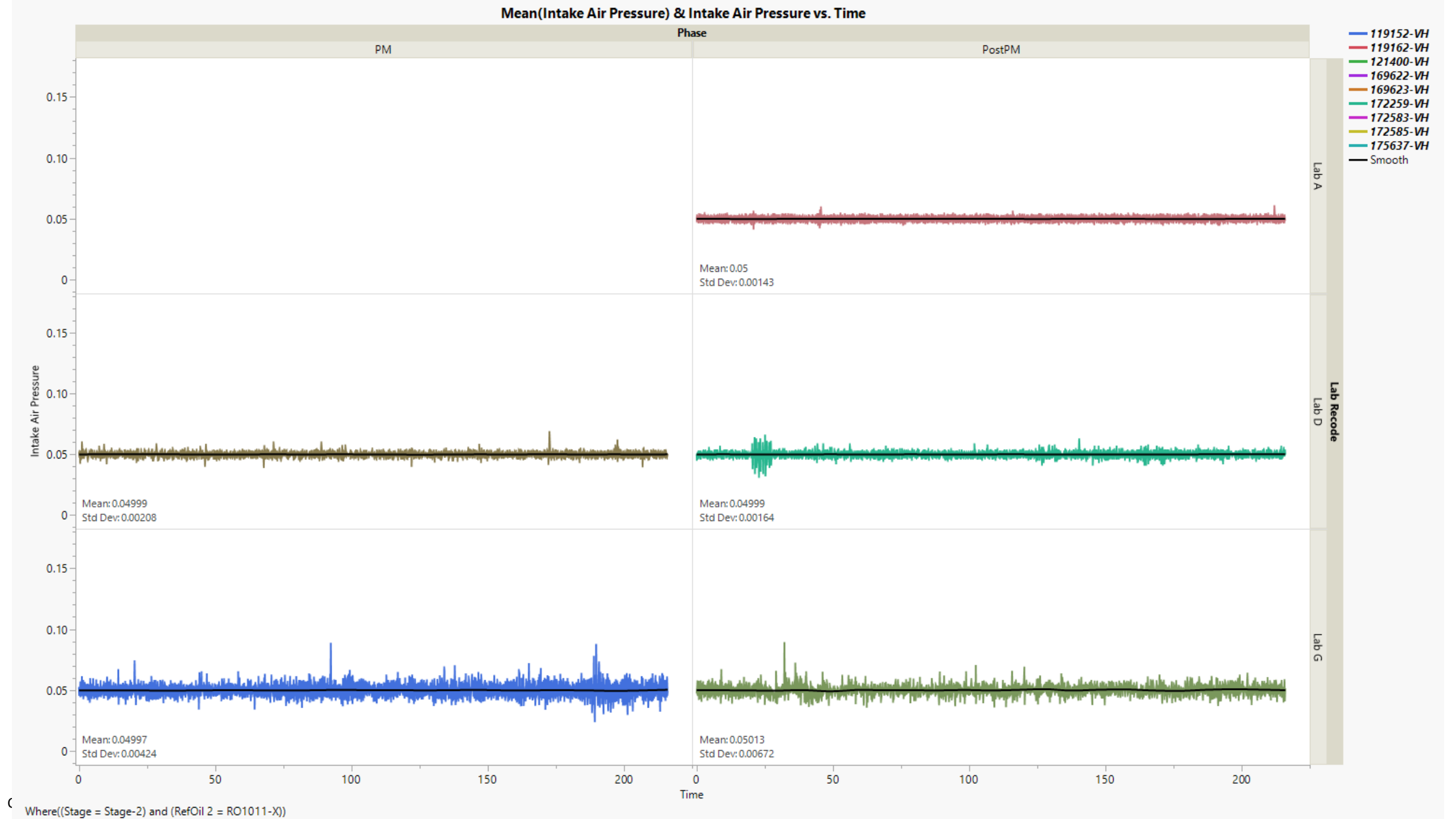
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

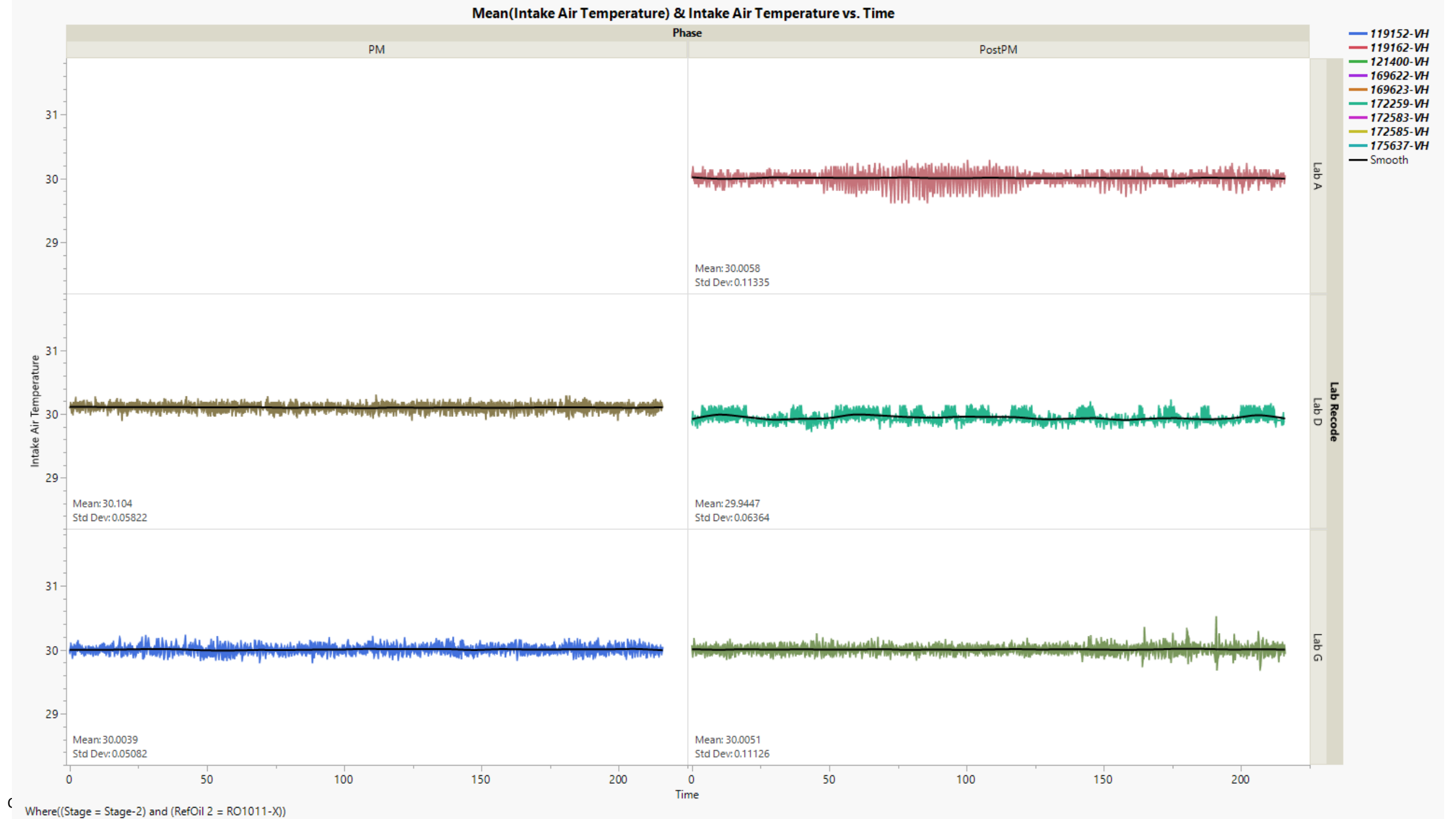

Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Flow
Time
Mean: 15.6035
Std Dev: 0.22382
Mean: 15.6061
Std Dev: 0.34376
Mean: 15.5446
Std Dev: 0.13154
Mean: 15.9033
Std Dev: 0.11774
Mean: 15.8227
Std Dev: 0.15198
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

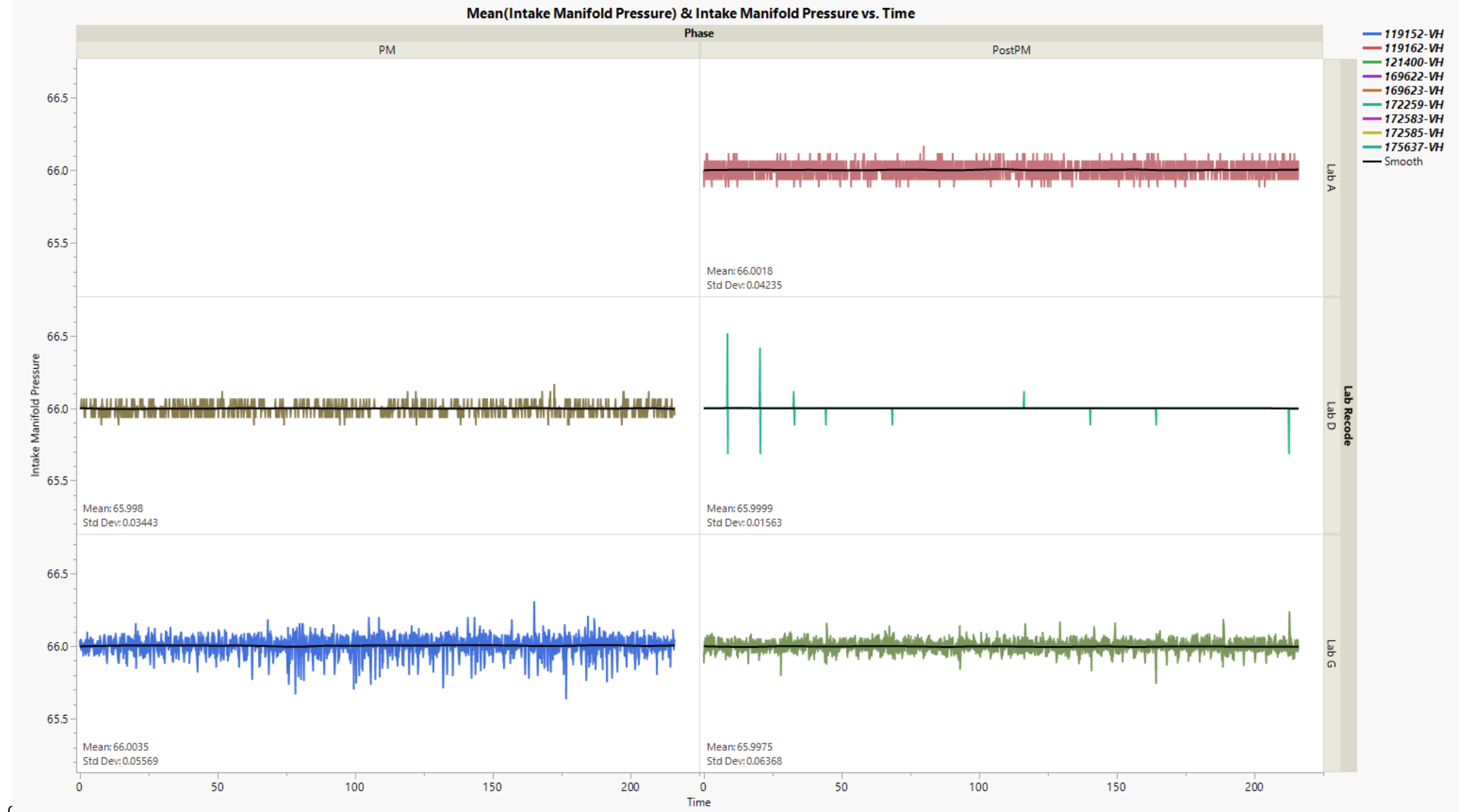

Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Pressure
Time
Mean: 253.149
Std Dev: 0.91377
Mean: 253.863
Std Dev: 1.40115
Mean: 252.639
Std Dev: 1.90734
Mean: 289.764
Std Dev: 0.36521
Mean: 253.657
Std Dev: 8.37619
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

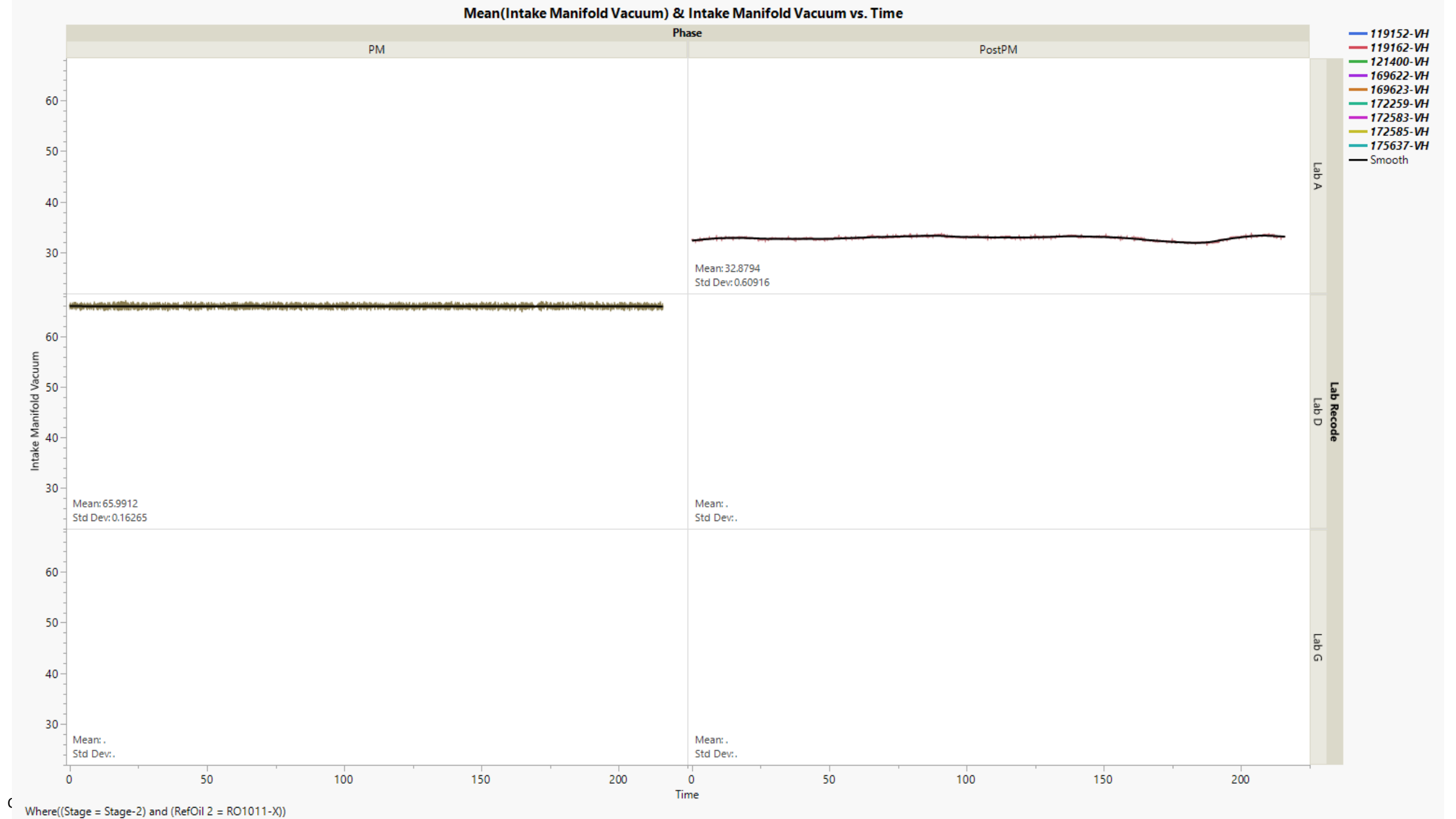

Mean(Fuel Temp) & Fuel Temp vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Temp
Time
Mean: 28.5662
Std Dev: 1.89508
Mean: .
Std Dev: .
Mean: 28.6781
Std Dev: 0.27447
Mean: .
Std Dev: .
Mean: 27.6421
Std Dev: 2.34034
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

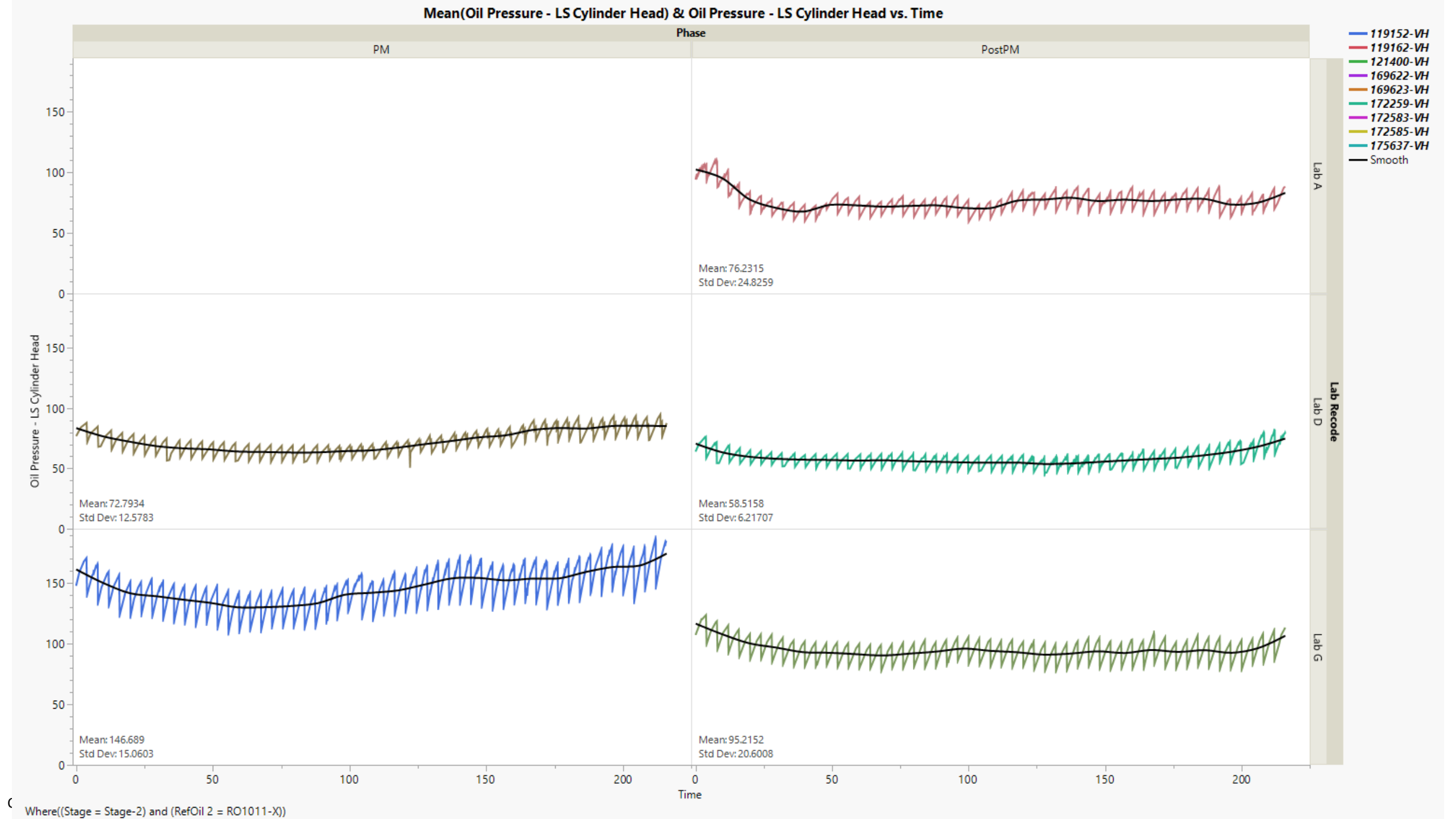

Mean(Humidity) & Humidity vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Humidity
Time
Mean: 11.4945
Std Dev: 0.19992
Mean: 11.4727
Std Dev: 0.17865
Mean: 11.4091
Std Dev: 0.15499
Mean: 11.576
Std Dev: 0.1619
Mean: 11.3859
Std Dev: 0.36006
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))


Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Pressure
Time
Mean: 0.05
Std Dev: 0.00143
Mean: 0.04999
Std Dev: 0.00208
Mean: 0.04999
Std Dev: 0.00164
Mean: 0.04997
Std Dev: 0.00424
Mean: 0.05013
Std Dev: 0.00672
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

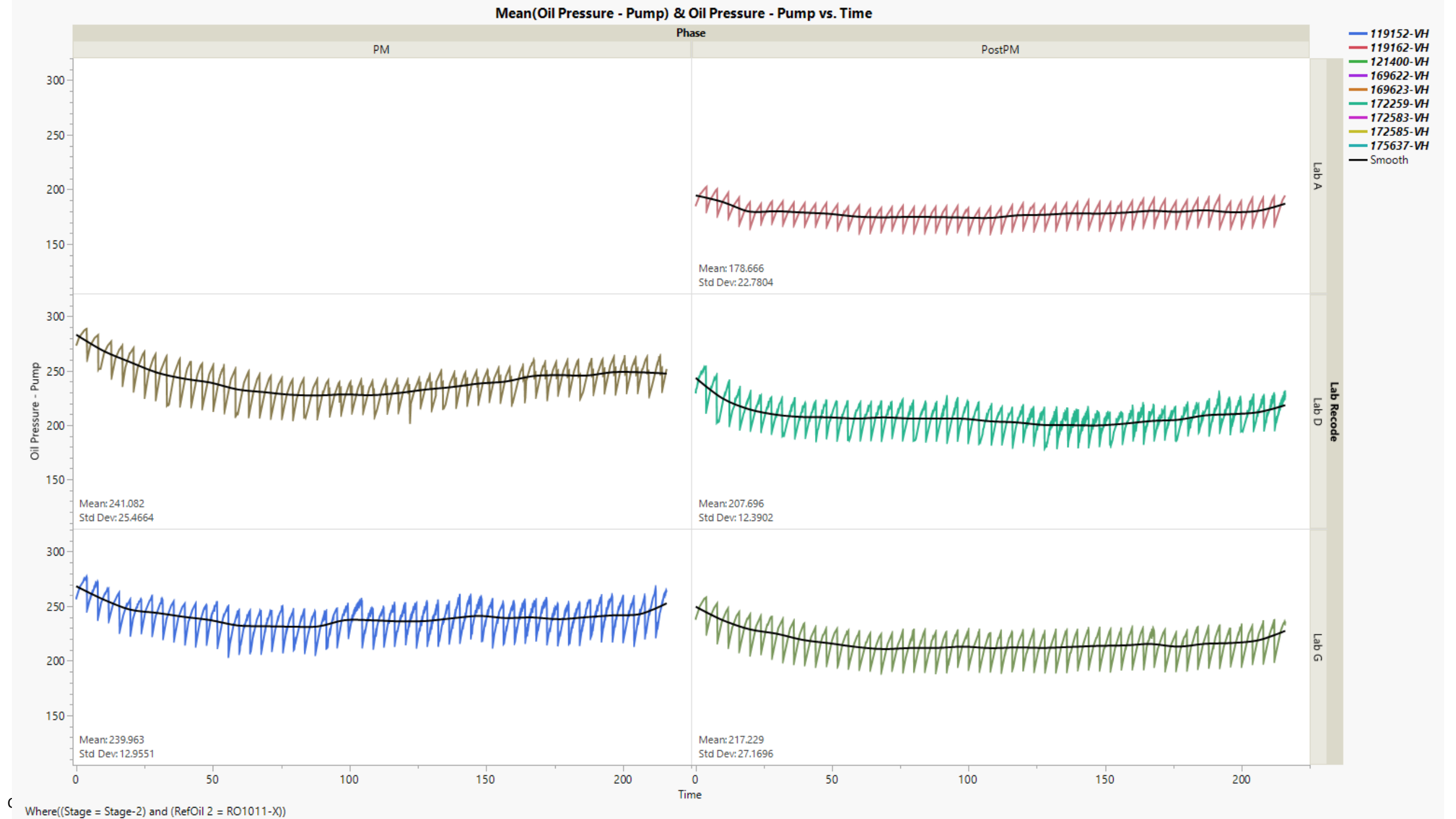

Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 30.0058
Std Dev: 0.11335
Mean: 30.104
Std Dev: 0.05822
Mean: 29.9447
Std Dev: 0.06364
Mean: 30.0039
Std Dev: 0.05082
Mean: 30.0051
Std Dev: 0.11126
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))


Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Pressure
66.5
66.0
65.5
Mean: 66.0018
Std Dev: 0.04235
Mean: 65.998
Std Dev: 0.03443
Mean: 65.9999
Std Dev: 0.01563
Mean: 66.0035
Std Dev: 0.05569
Mean: 65.9975
Std Dev: 0.06368
0
50
100
150
200
Time
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

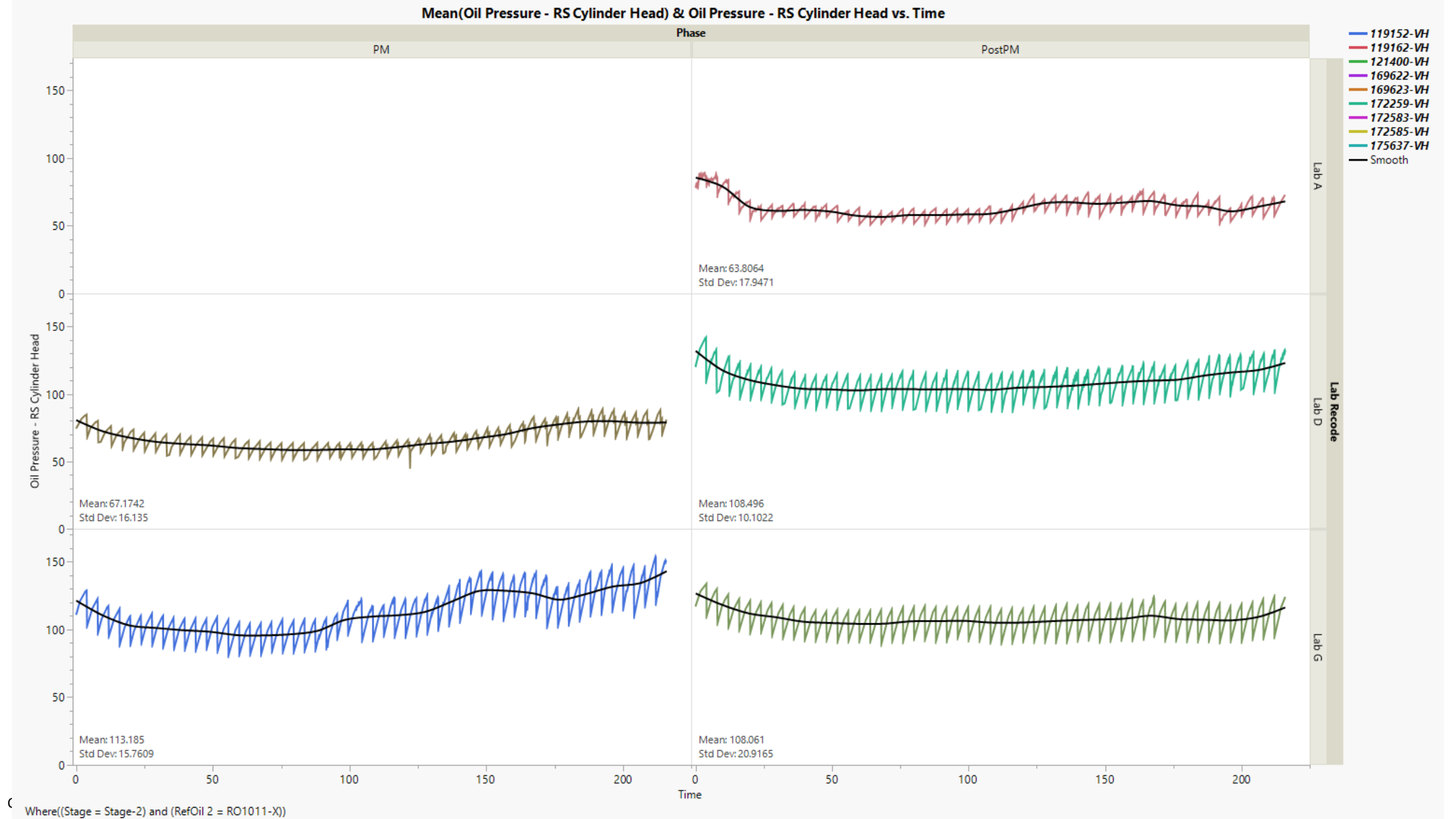

Mean(Intake Manifold Vacuum) & Intake Manifold Vacuum vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Vacuum
Time
Mean: 32.8794
Std Dev: 0.60916
Mean: 65.9912
Std Dev: 0.16265
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))



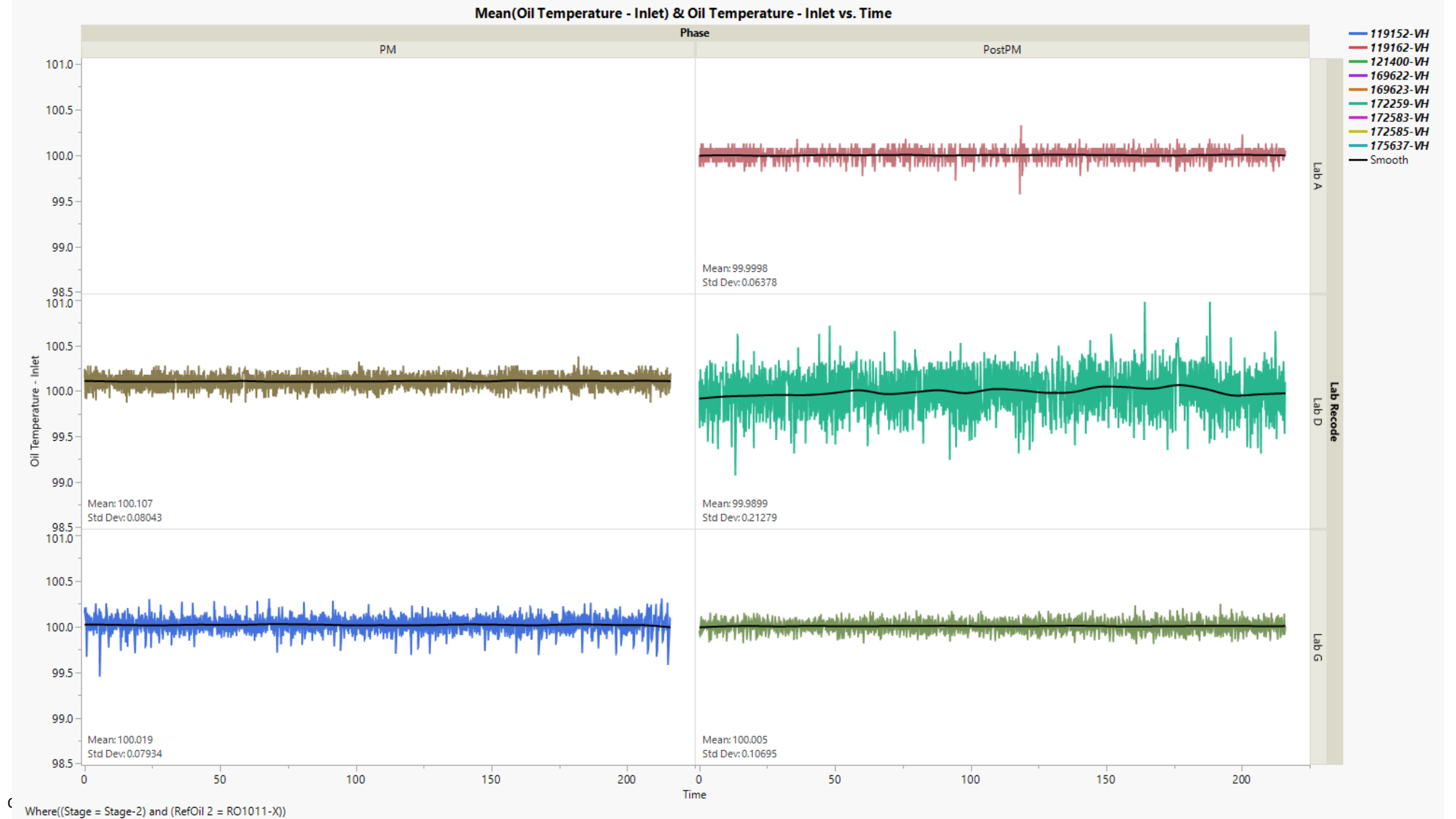
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

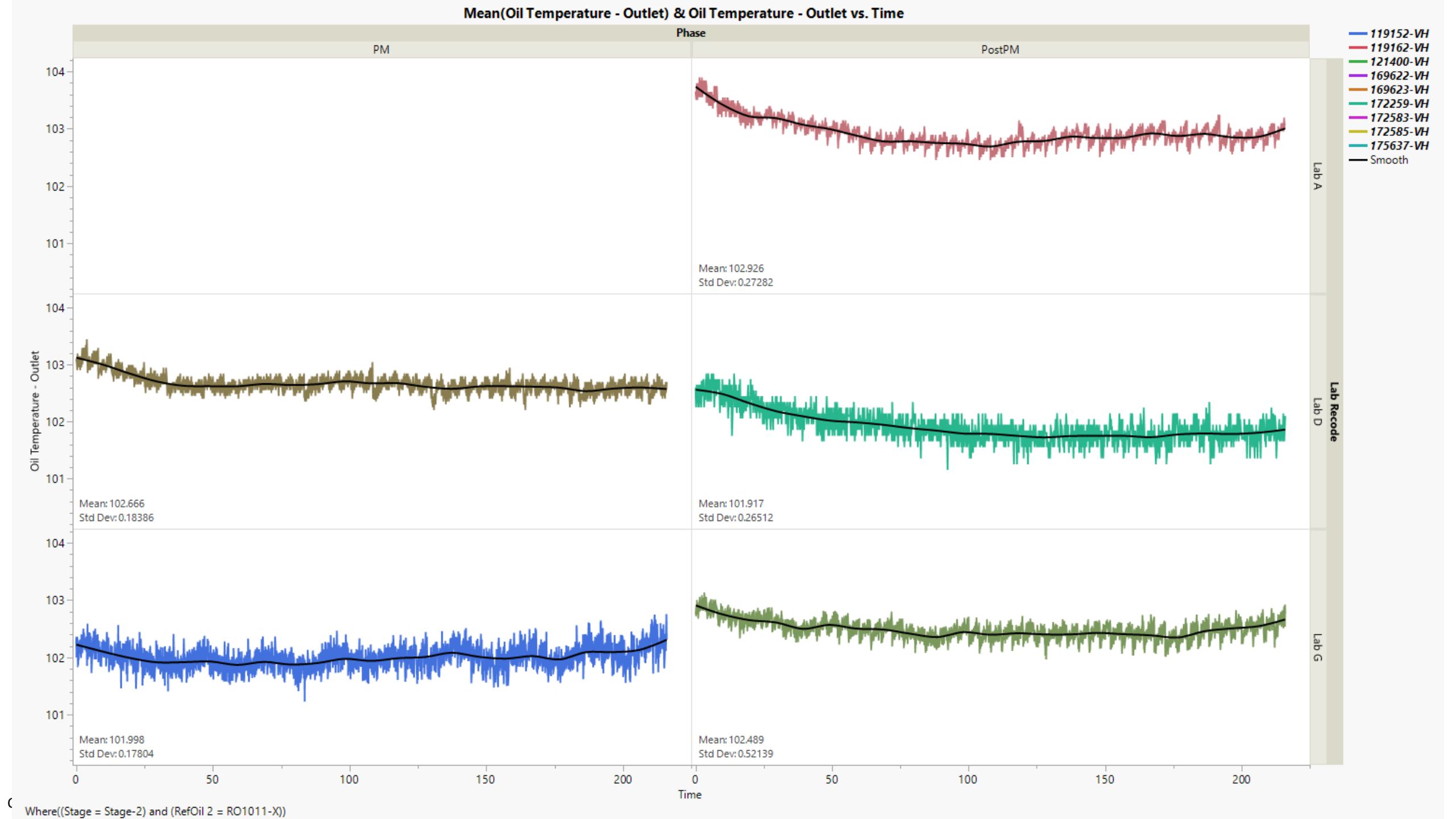


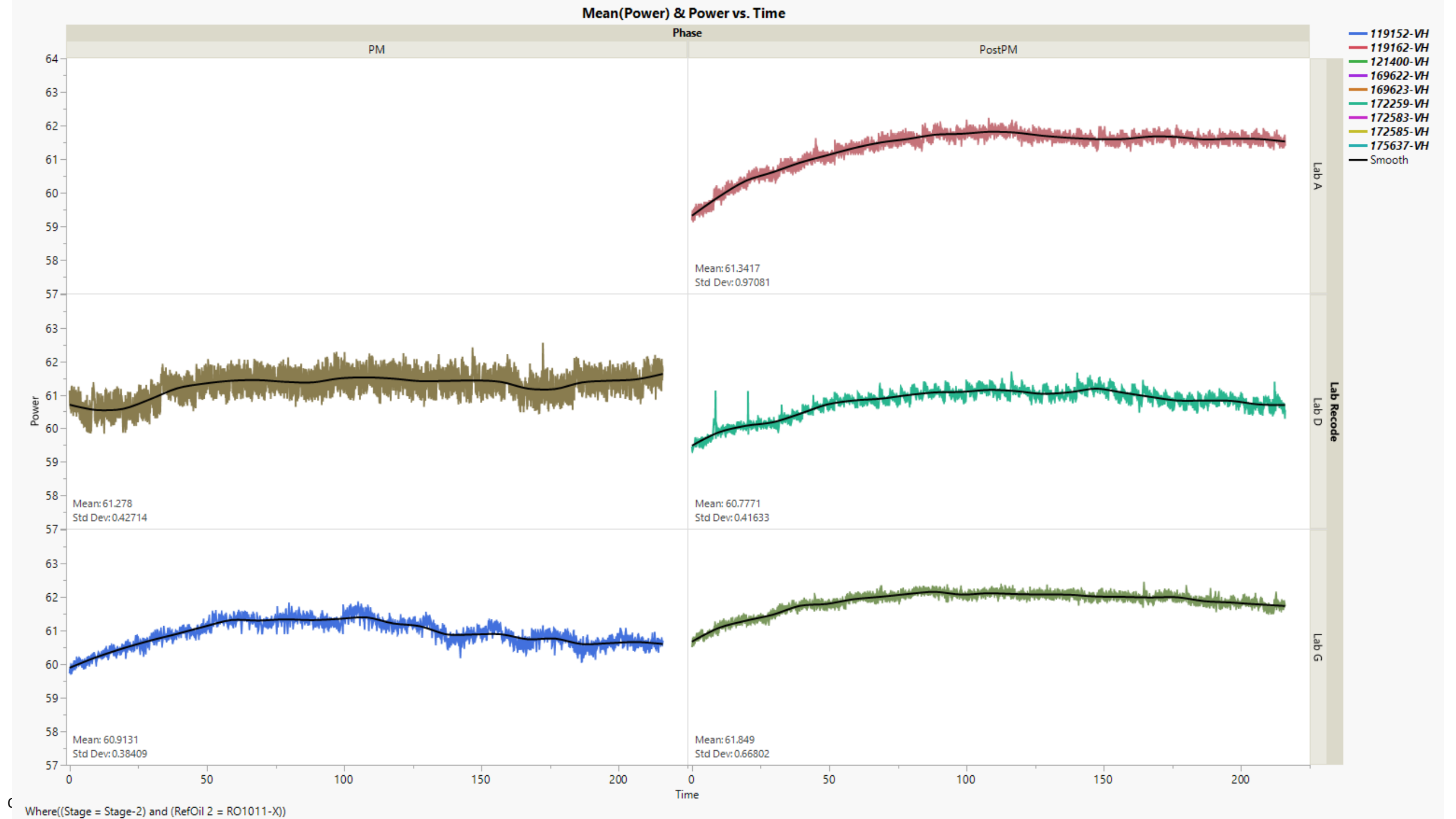
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

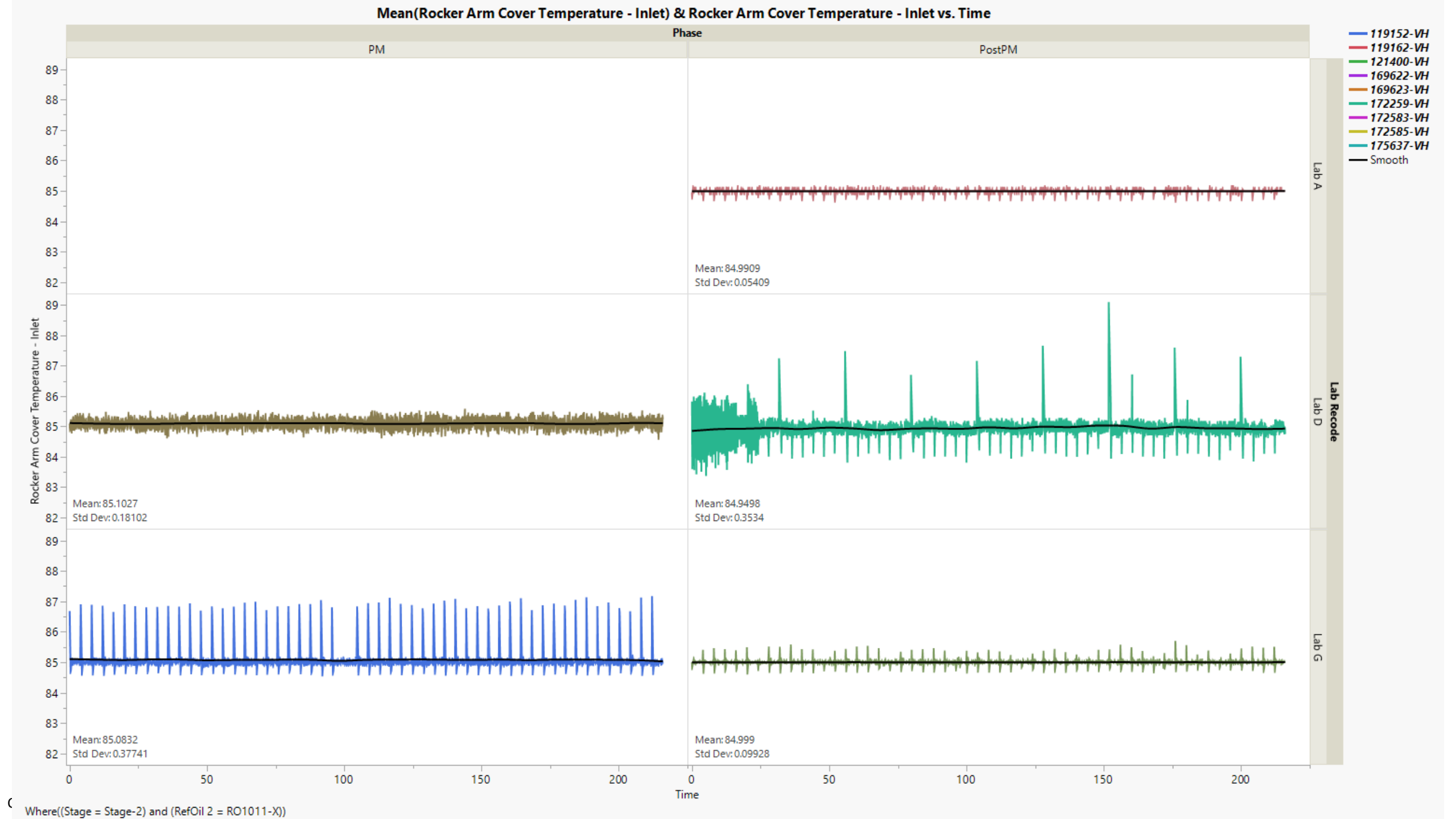


Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

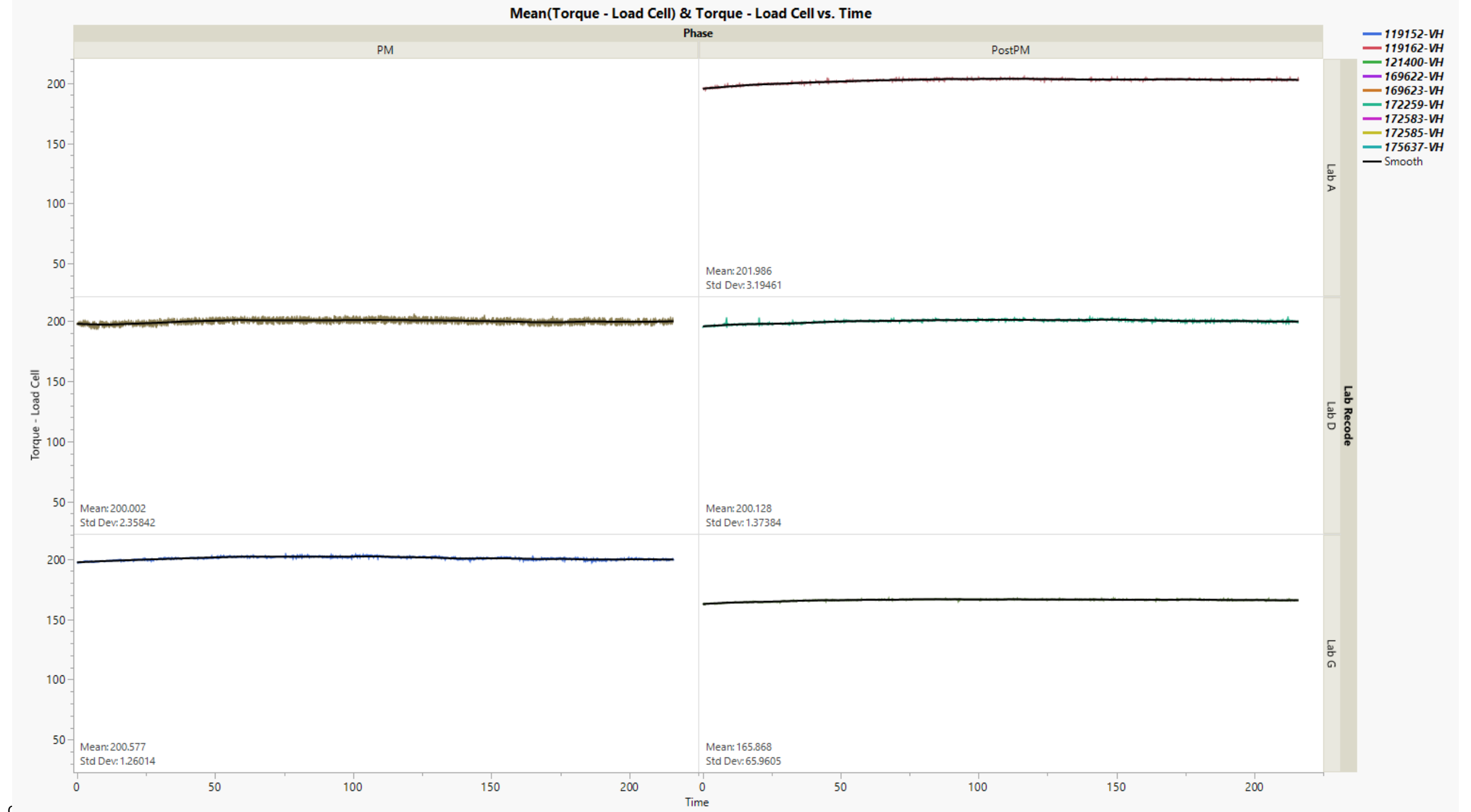

Mean(Oil Temperature - Inlet) & Oil Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Inlet
Time
Mean: 99.9998
Std Dev: 0.06378
Mean: 100.107
Std Dev: 0.08043
Mean: 99.9899
Std Dev: 0.21279
Mean: 100.019
Std Dev: 0.07934
Mean: 100.005
Std Dev: 0.10695
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Oil Temperature - Outlet
Time
Mean: 102.926
Std Dev: 0.27282
Mean: 102.666
Std Dev: 0.18386
Mean: 101.917
Std Dev: 0.26512
Mean: 101.998
Std Dev: 0.17804
Mean: 102.489
Std Dev: 0.52139
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))


Mean(Power) & Power vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Power
Time
Mean: 61.3417
Std Dev: 0.97081
Mean: 61.278
Std Dev: 0.42714
Mean: 60.7771
Std Dev: 0.41633
Mean: 60.9131
Std Dev: 0.38409
Mean: 61.849
Std Dev: 0.66802
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))


Mean(Torque - Load Cell) & Torque - Load Cell vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Torque - Load Cell
Time
Mean: 201.986
Std Dev: 3.19461
Mean: 200.002
Std Dev: 2.35842
Mean: 200.128
Std Dev: 1.37384
Mean: 200.577
Std Dev: 1.26014
Mean: 165.868
Std Dev: 65.9605
Where((Stage = Stage-2) and (RefOil 2 = RO1011-X))

VH Stage 1-2 Operational Data Plots

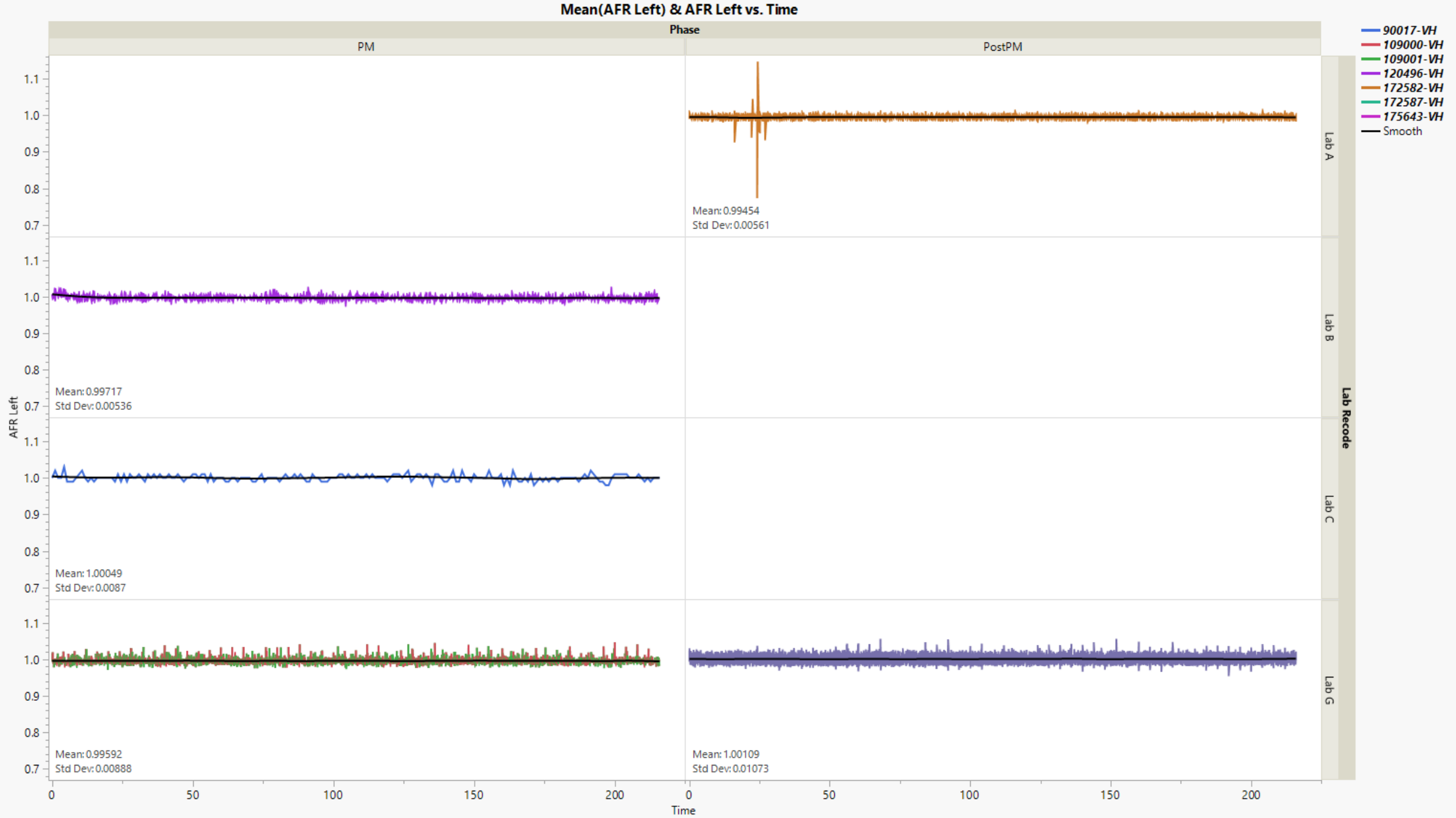
By: Todd Dvorak

08-05-24

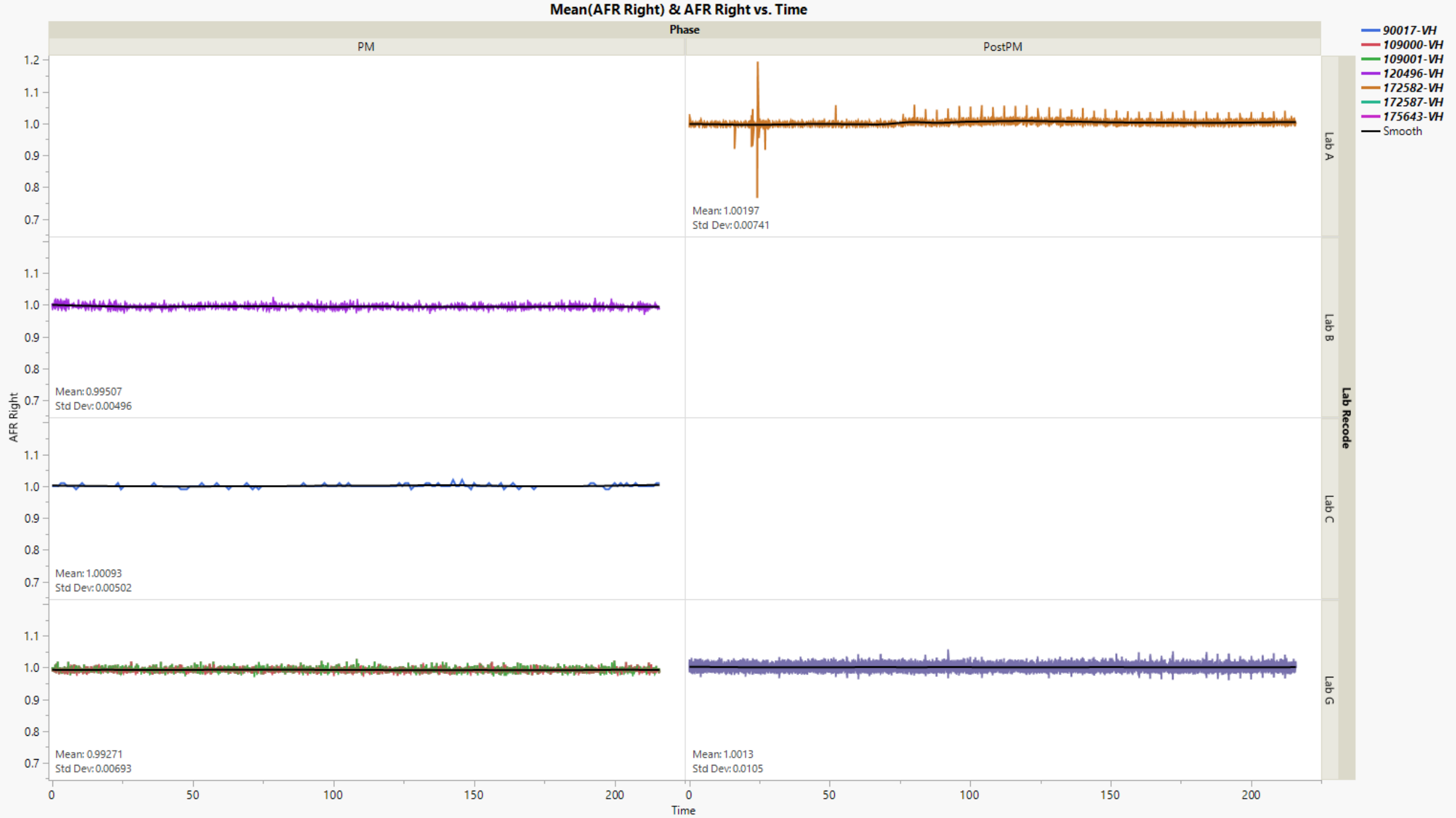
Classified as Confidential

RO 940 Data Plots

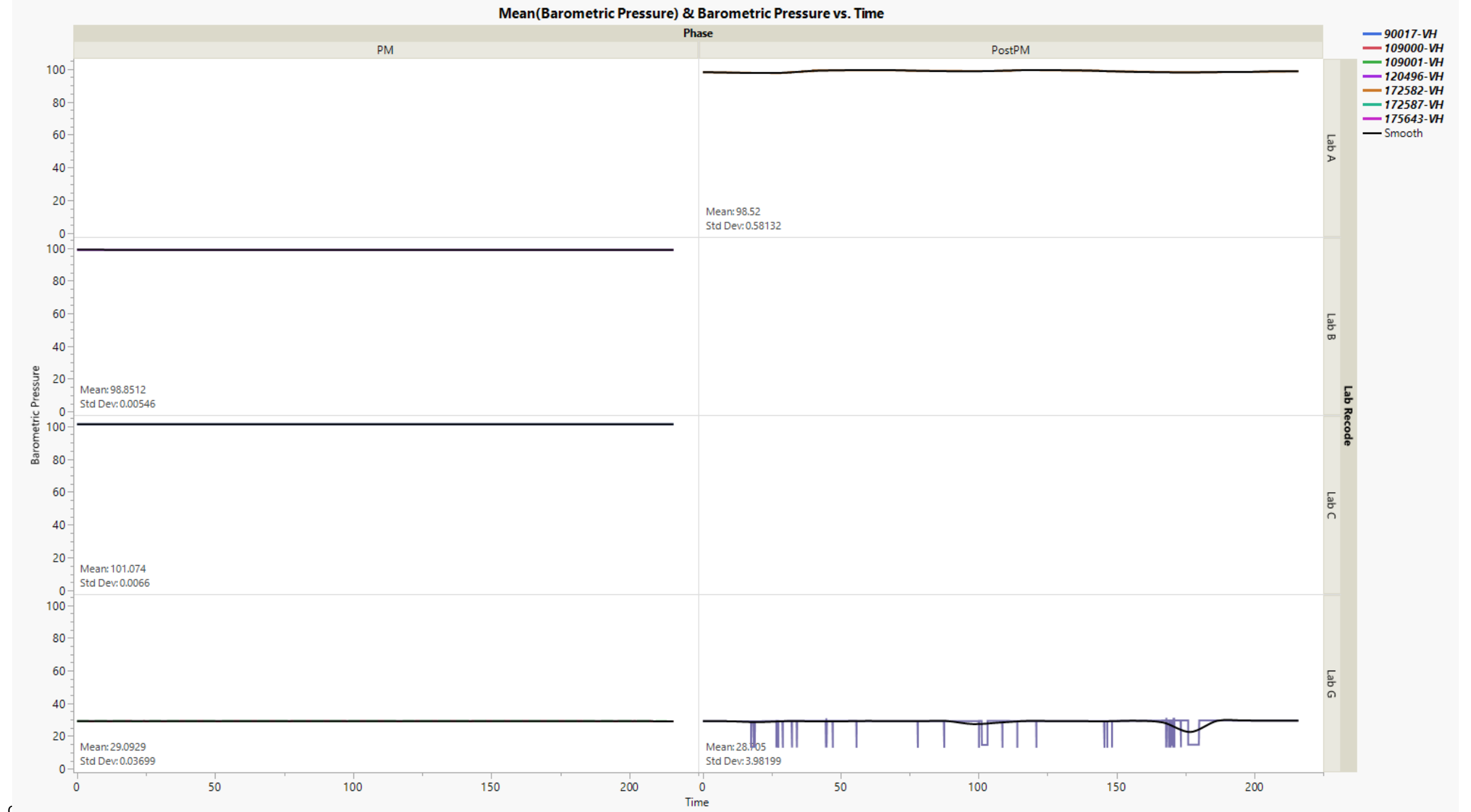
Classified as Confidential

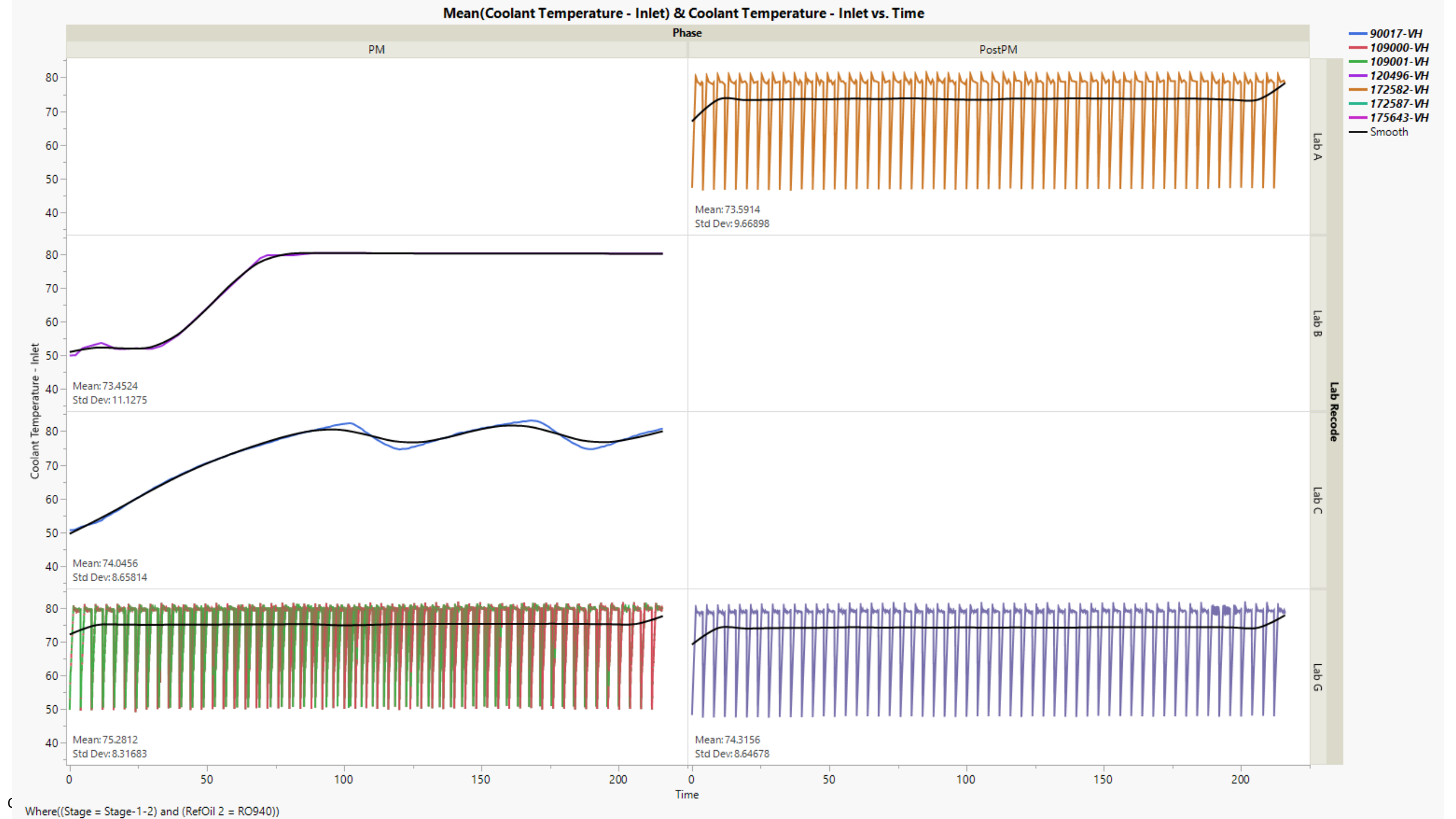


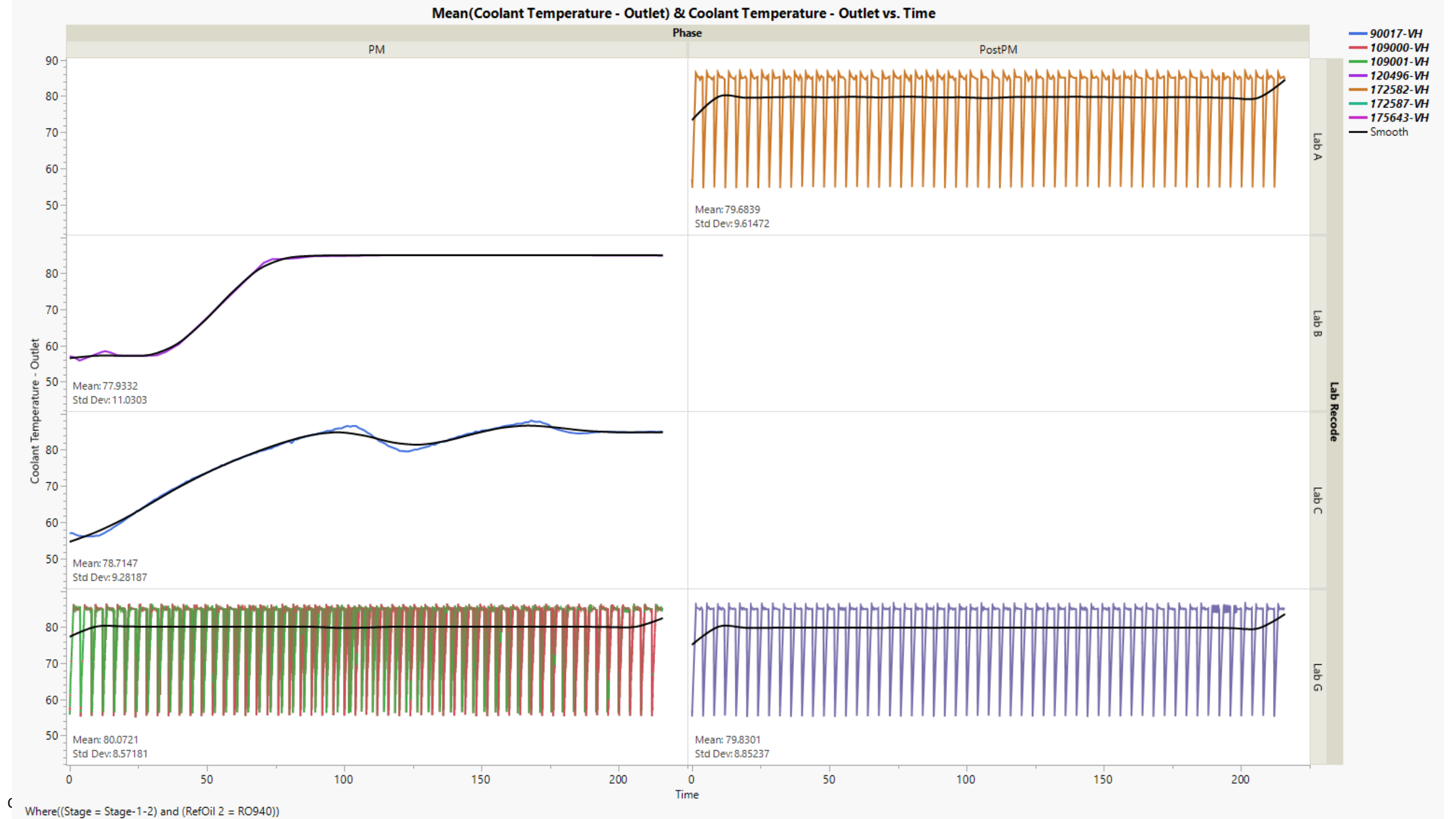
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

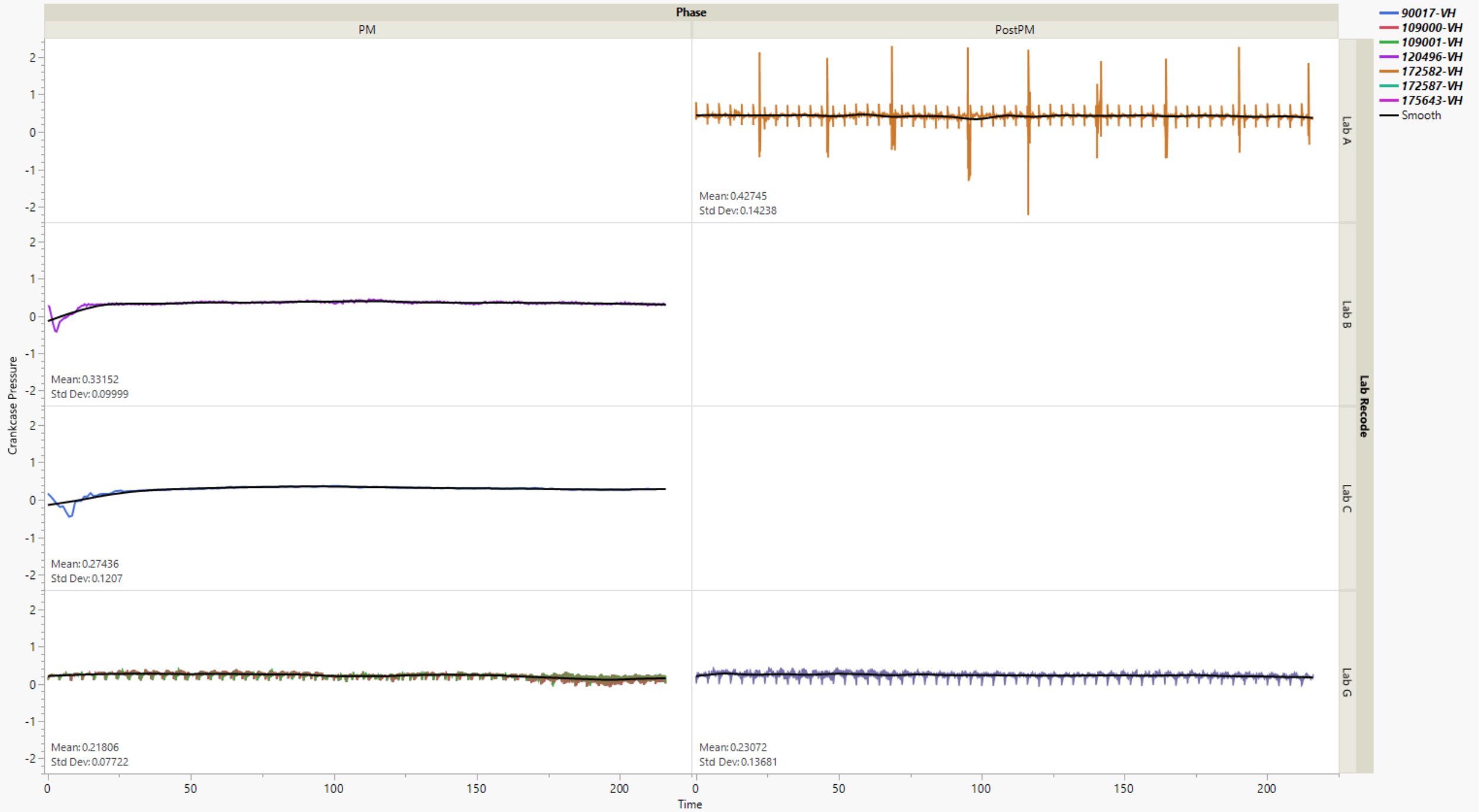


Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

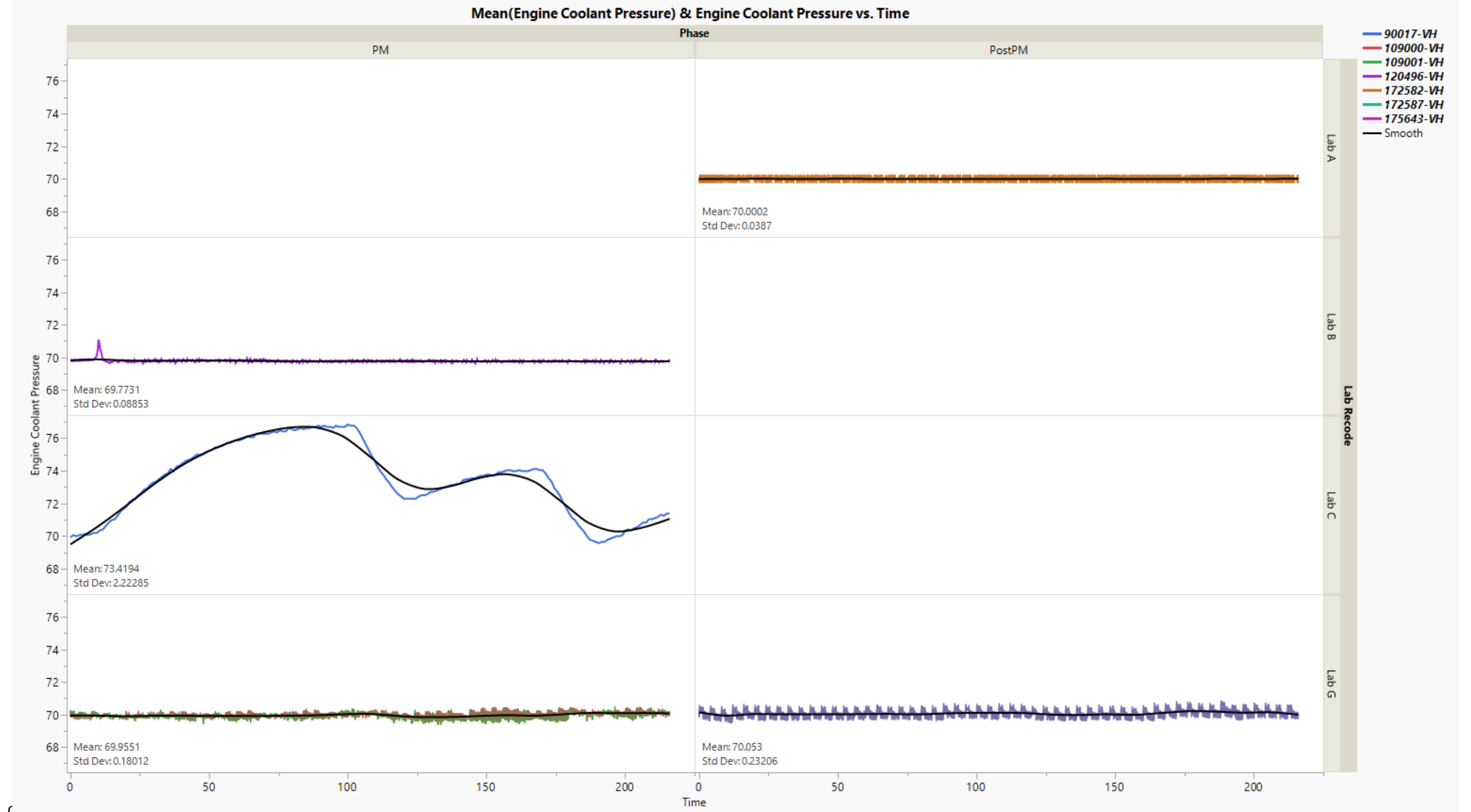

Mean(Barometric Pressure) & Barometric Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Barometric Pressure
Time
Mean: 98.52
Std Dev: 0.58132
Mean: 98.8512
Std Dev: 0.00546
Mean: 101.074
Std Dev: 0.0066
Mean: 29.0929
Std Dev: 0.03699
Mean: 28.7105
Std Dev: 3.98199
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

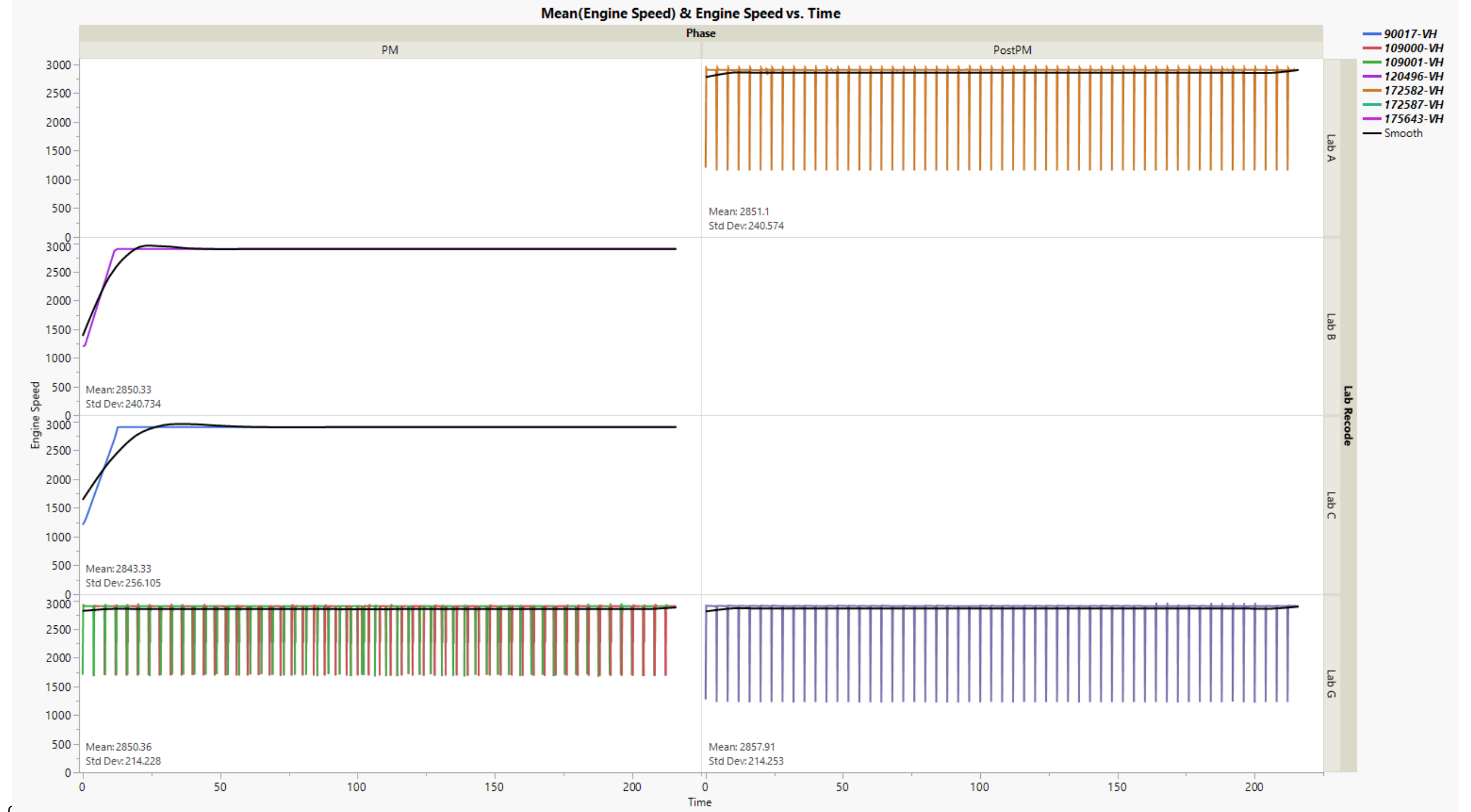

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Coolant Temperature - Inlet
Time
Mean: 73.5914
Std Dev: 9.66898
Mean: 73.4524
Std Dev: 11.1275
Mean: 74.0456
Std Dev: 8.65814
Mean: 75.2812
Std Dev: 8.31683
Mean: 74.3156
Std Dev: 8.64678
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))


Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Coolant Temperature - Outlet
Time
Mean: 79.6839
Std Dev: 9.61472
Mean: 77.9332
Std Dev: 11.0303
Mean: 78.7147
Std Dev: 9.28187
Mean: 80.0721
Std Dev: 8.57181
Mean: 79.8301
Std Dev: 8.85237
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

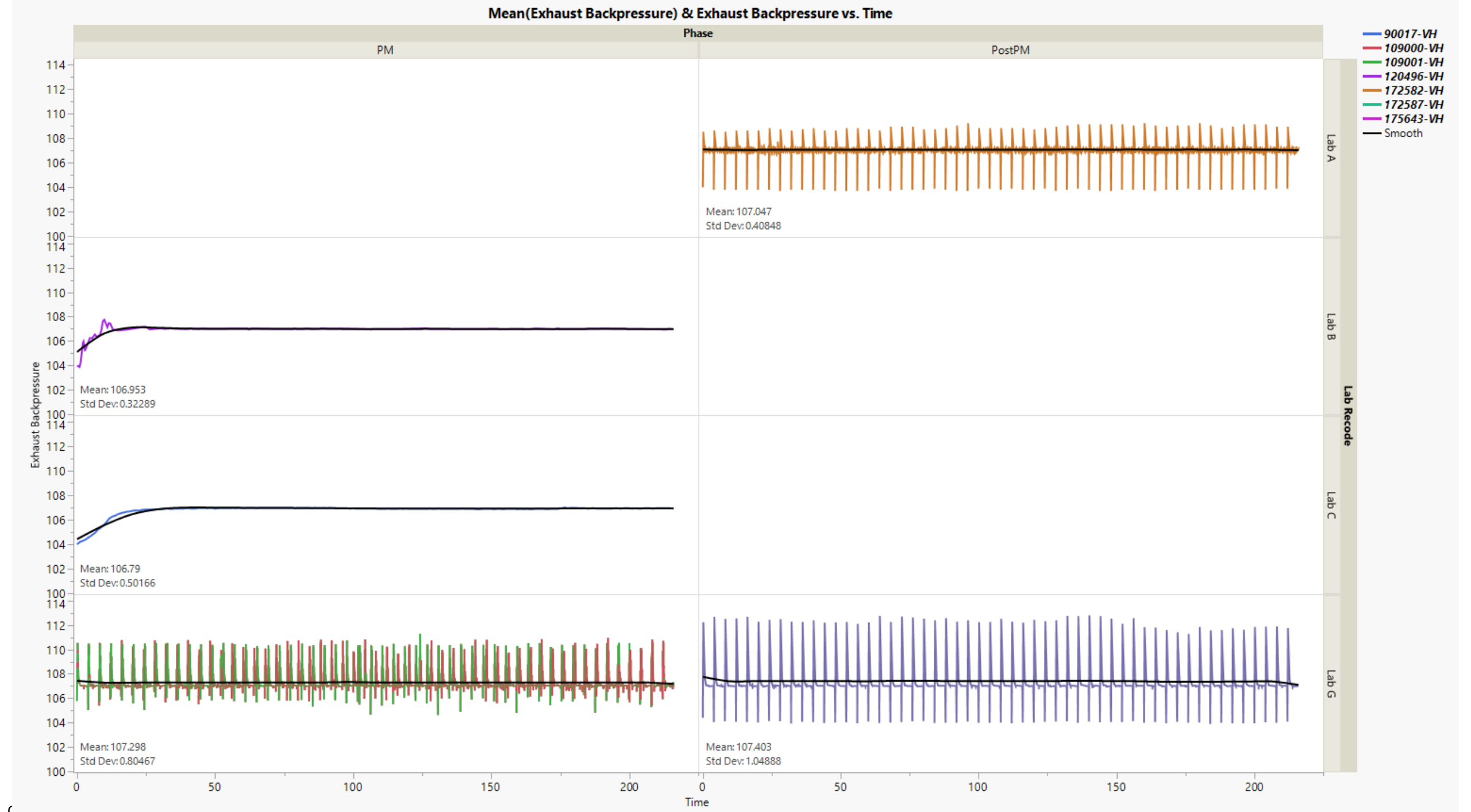


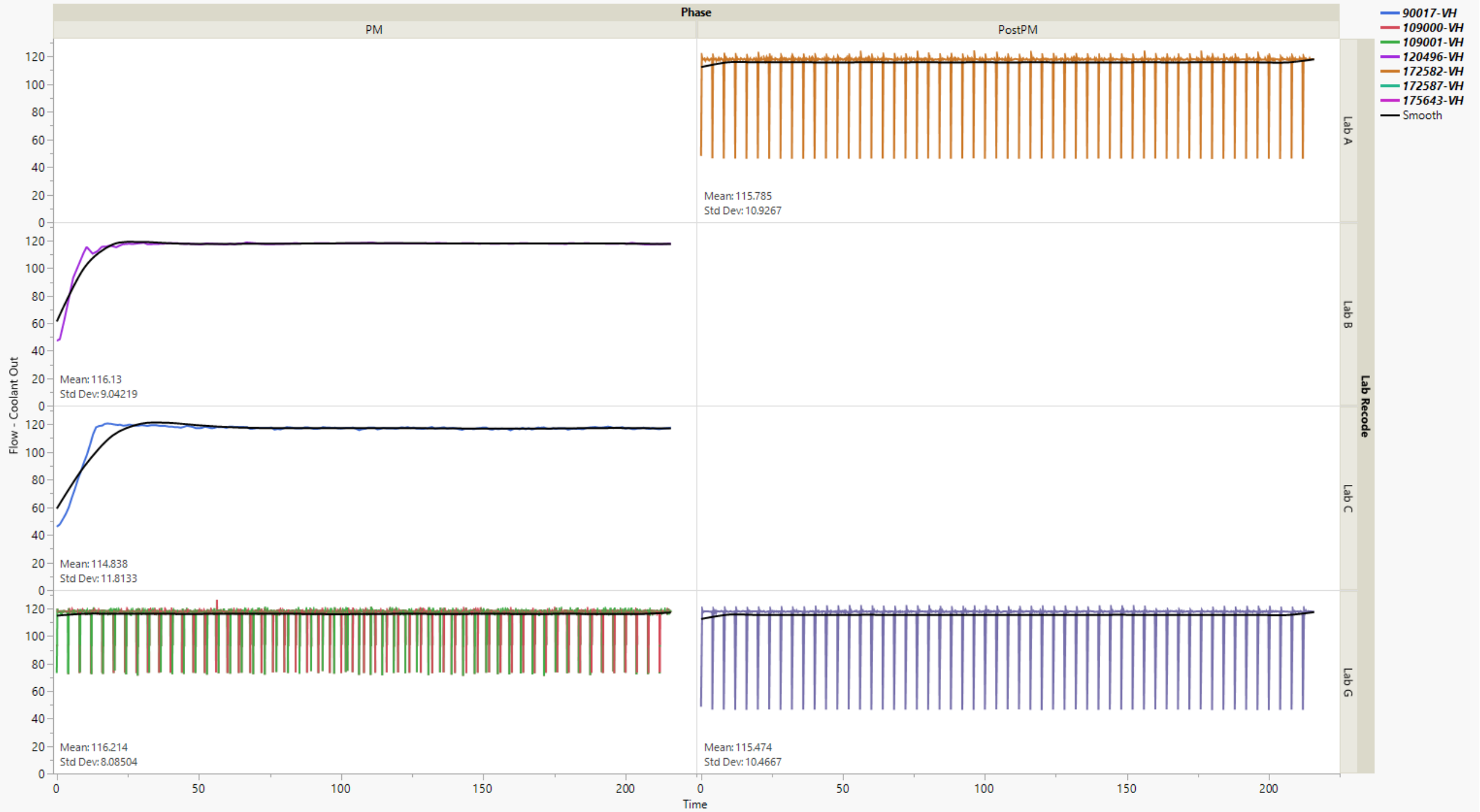
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

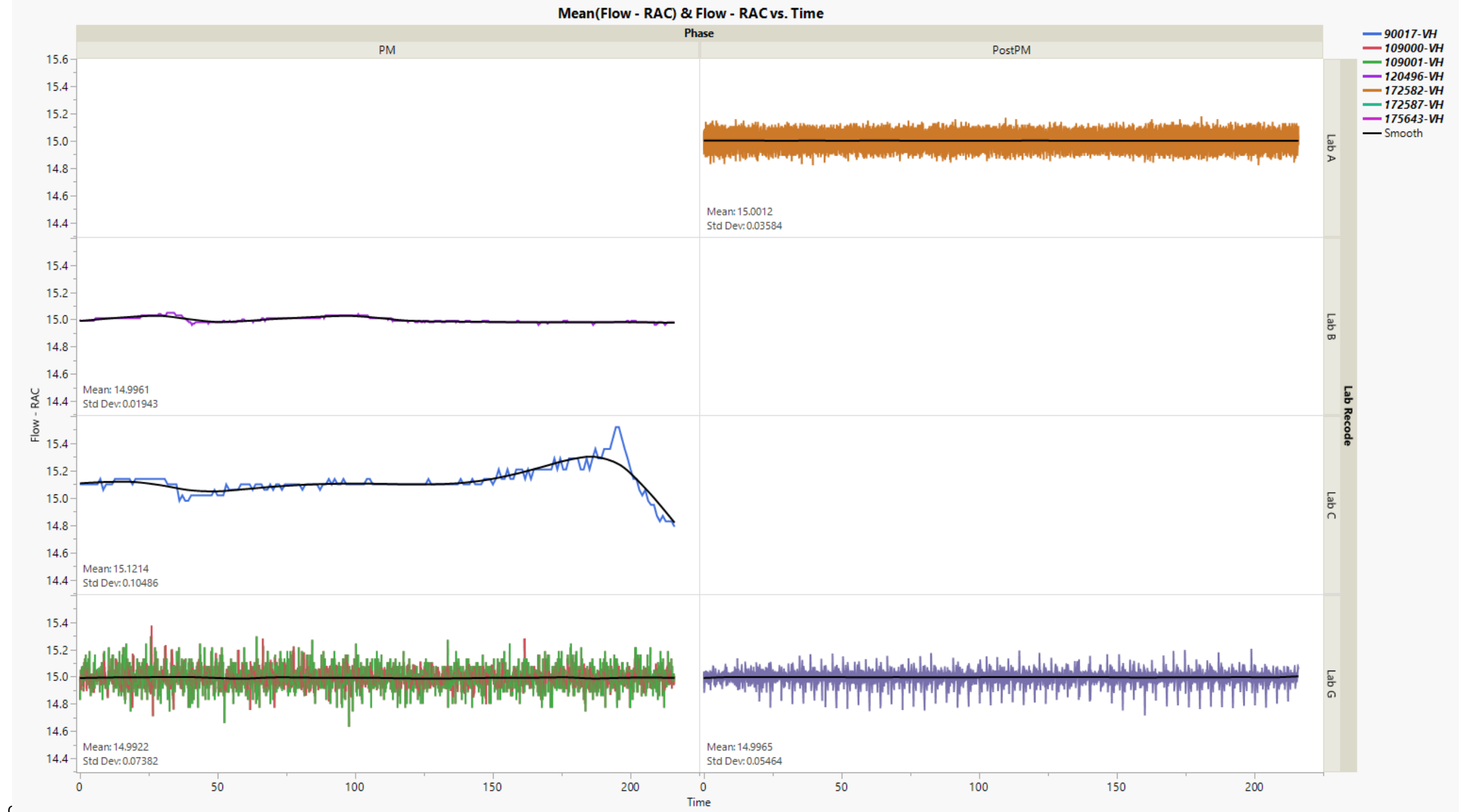

Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 70.0002
Std Dev: 0.0387
Mean: 69.7731
Std Dev: 0.08853
Mean: 73.4194
Std Dev: 2.22285
Mean: 69.9551
Std Dev: 0.18012
Mean: 70.053
Std Dev: 0.23206
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

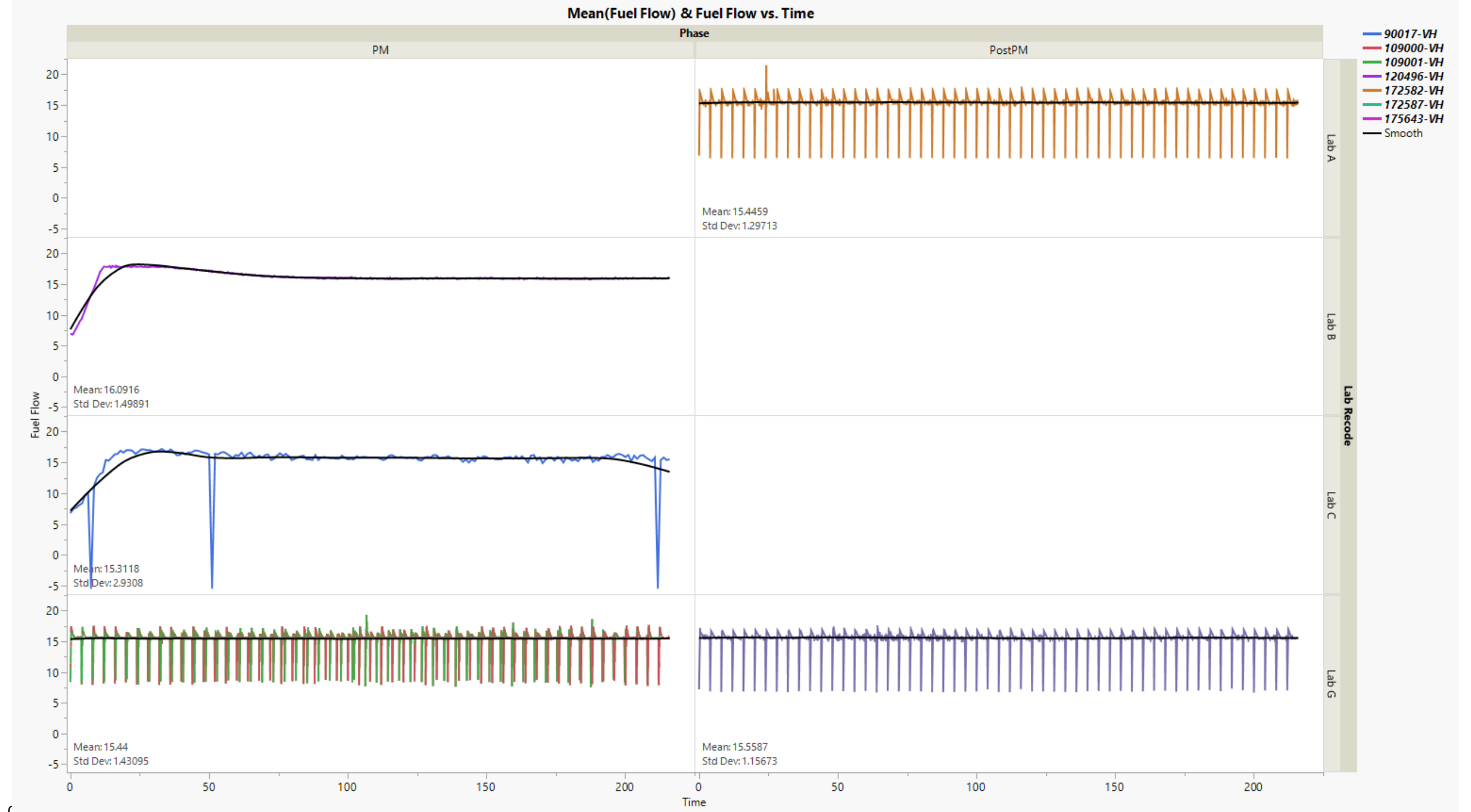


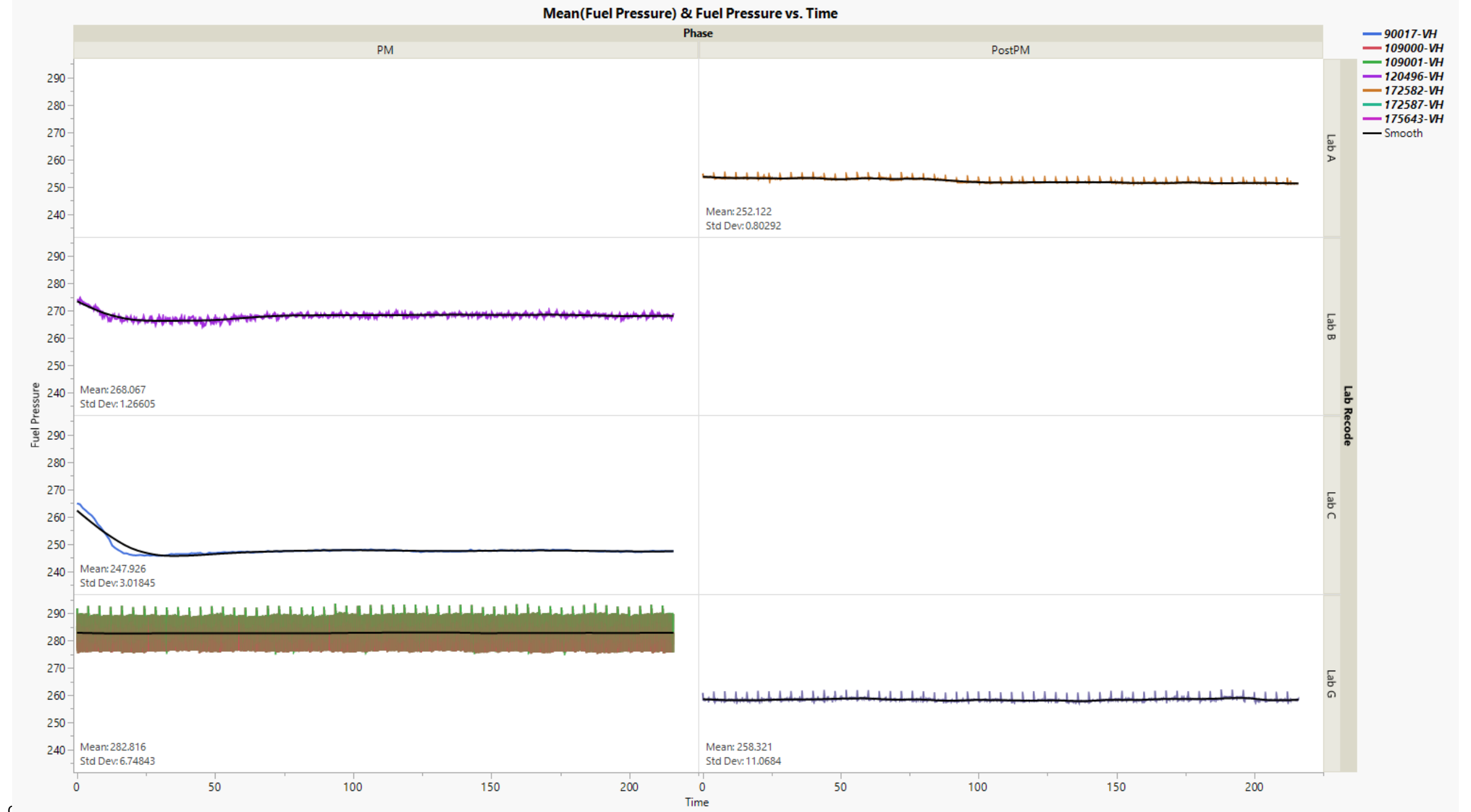
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

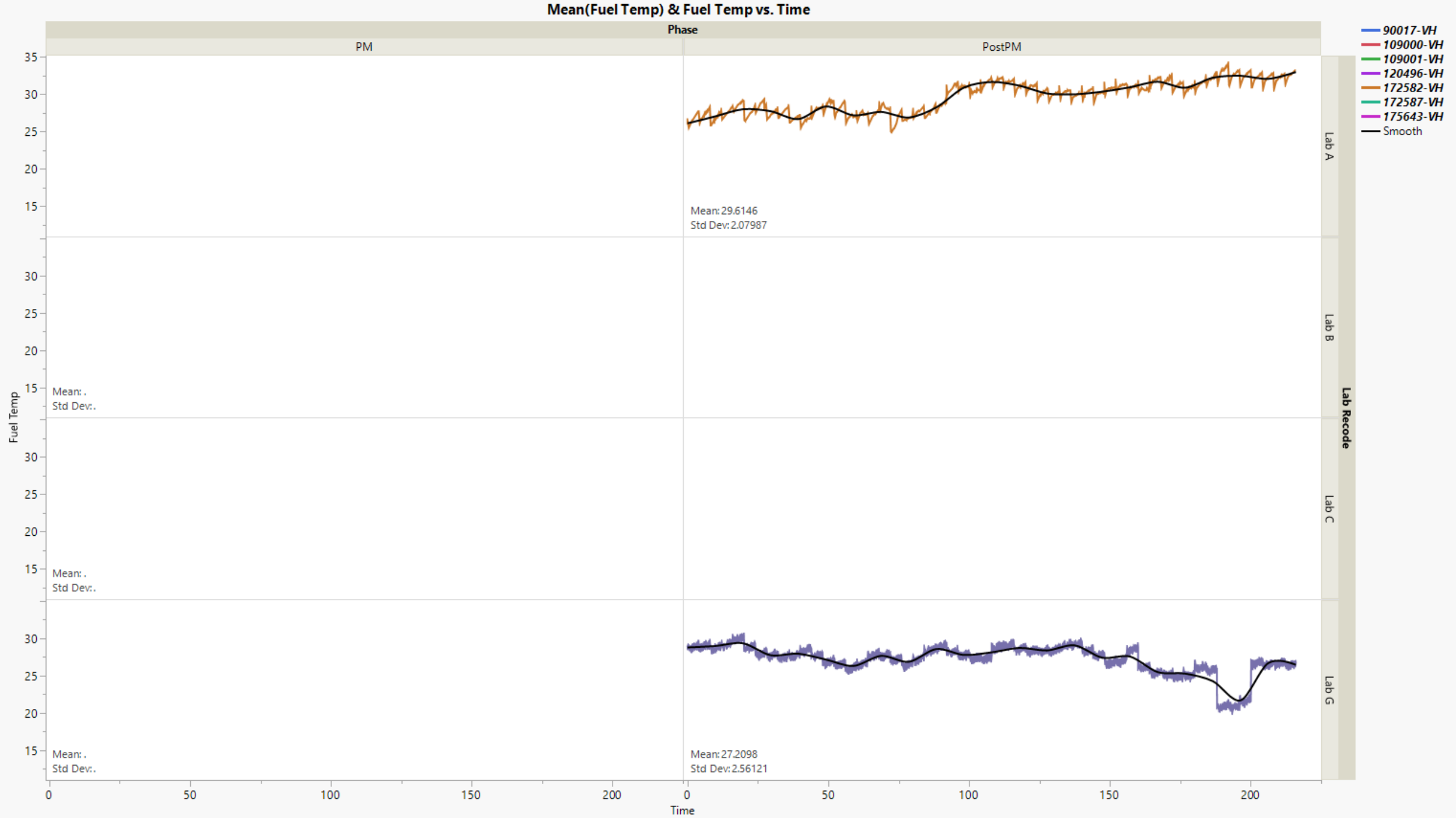

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 107.047
Std Dev: 0.40848
Mean: 106.953
Std Dev: 0.32289
Mean: 106.79
Std Dev: 0.50166
Mean: 107.298
Std Dev: 0.80467
Mean: 107.403
Std Dev: 1.04888
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))


Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Flow - Coolant Out
Time
Mean: 115.785
Std Dev: 10.9267
Mean: 116.13
Std Dev: 9.04219
Mean: 114.838
Std Dev: 11.8133
Mean: 116.214
Std Dev: 8.08504
Mean: 115.474
Std Dev: 10.4667
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

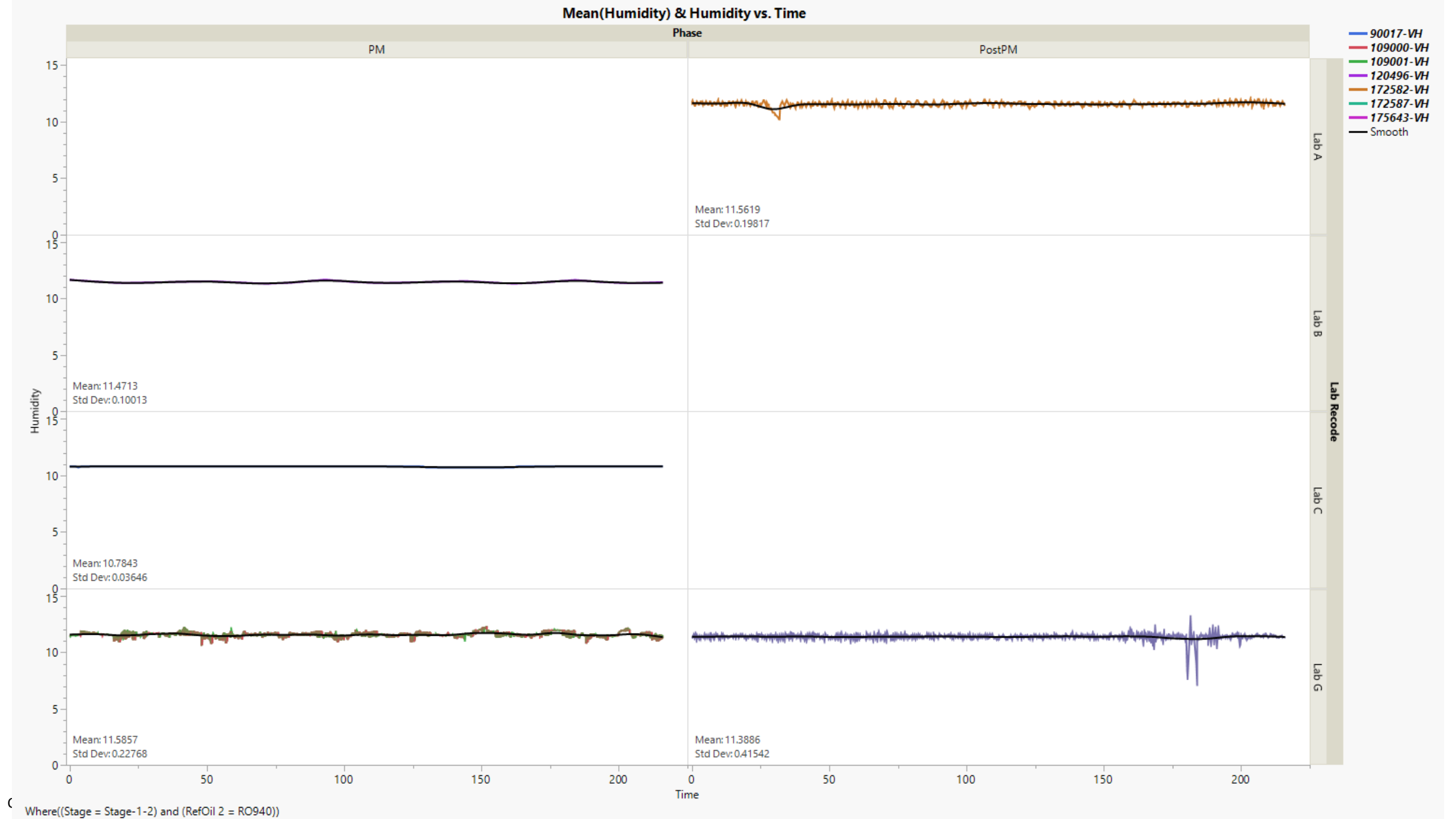

Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Flow - RAC
Time
Mean: 15.0012
Std Dev: 0.03584
Mean: 14.9961
Std Dev: 0.01943
Mean: 15.1214
Std Dev: 0.10486
Mean: 14.9922
Std Dev: 0.07382
Mean: 14.9965
Std Dev: 0.05464
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

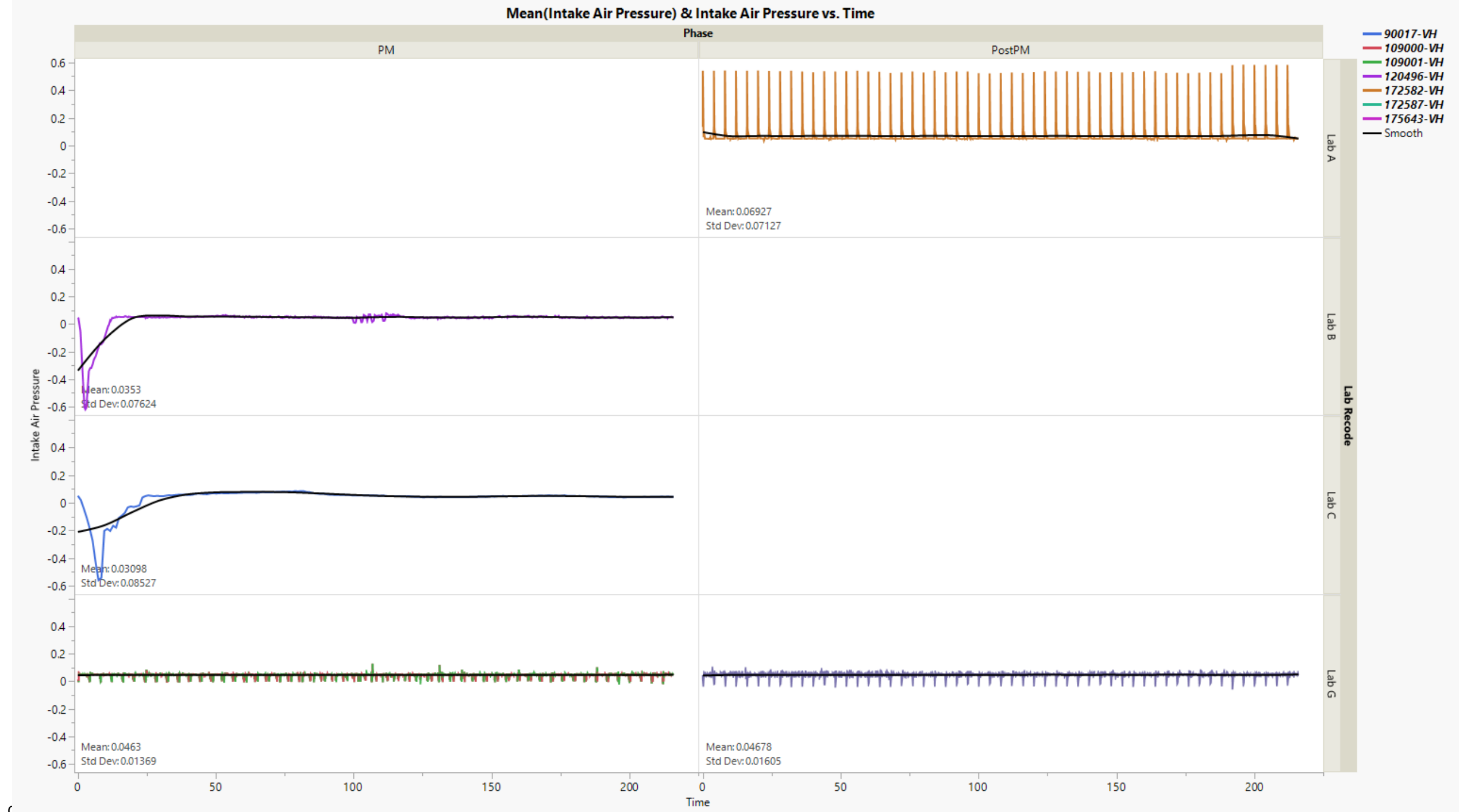

Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Fuel Flow
Time
Mean: 15.4459
Std Dev: 1.29713
Mean: 16.0916
Std Dev: 1.49891
Mean: 15.3118
Std Dev: 2.9308
Mean: 15.44
Std Dev: 1.43095
Mean: 15.5587
Std Dev: 1.15673
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

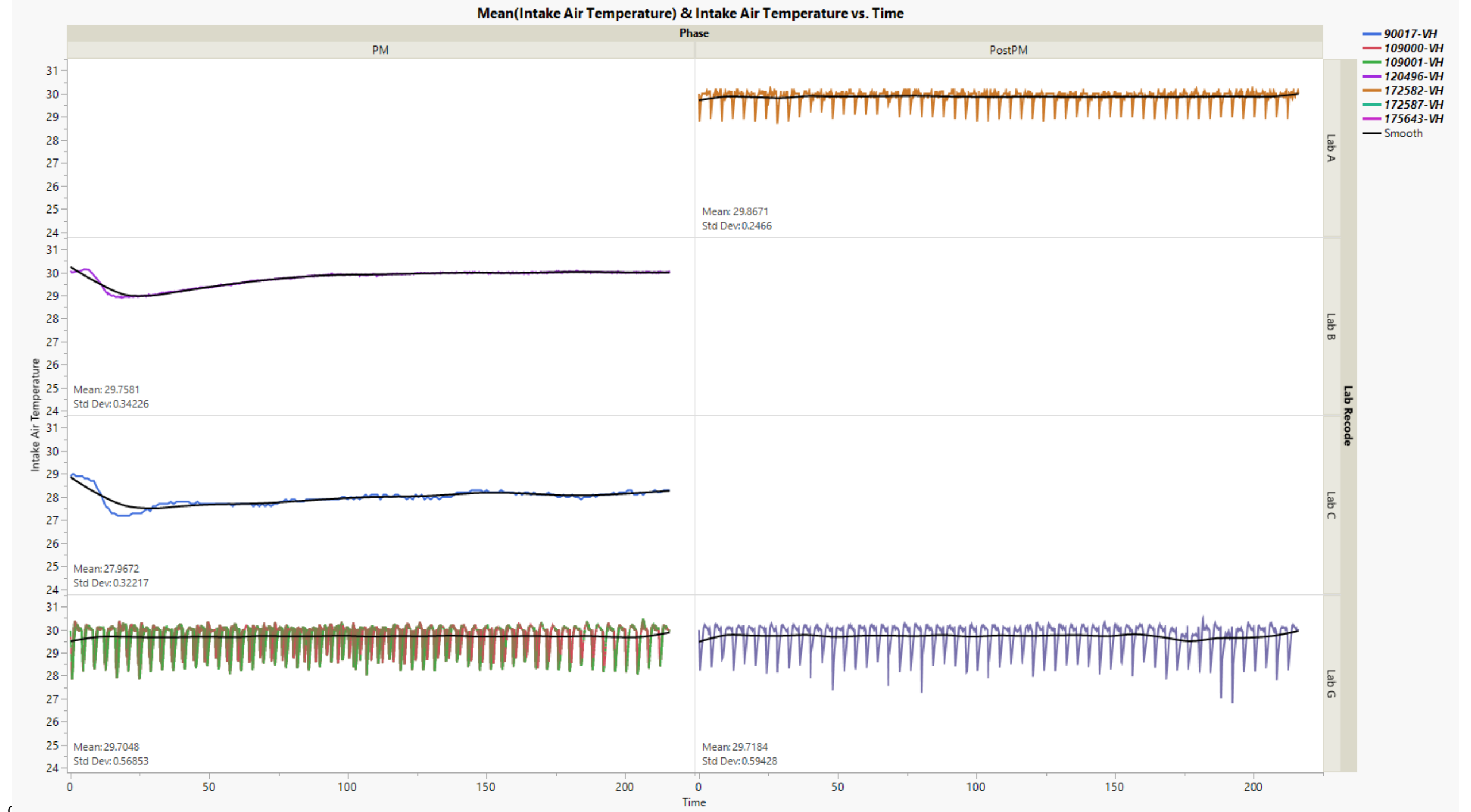

Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Fuel Pressure
Time
Mean: 252.122
Std Dev: 0.80292
Mean: 268.067
Std Dev: 1.26605
Mean: 247.926
Std Dev: 3.01845
Mean: 282.816
Std Dev: 6.74843
Mean: 258.321
Std Dev: 11.0684
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

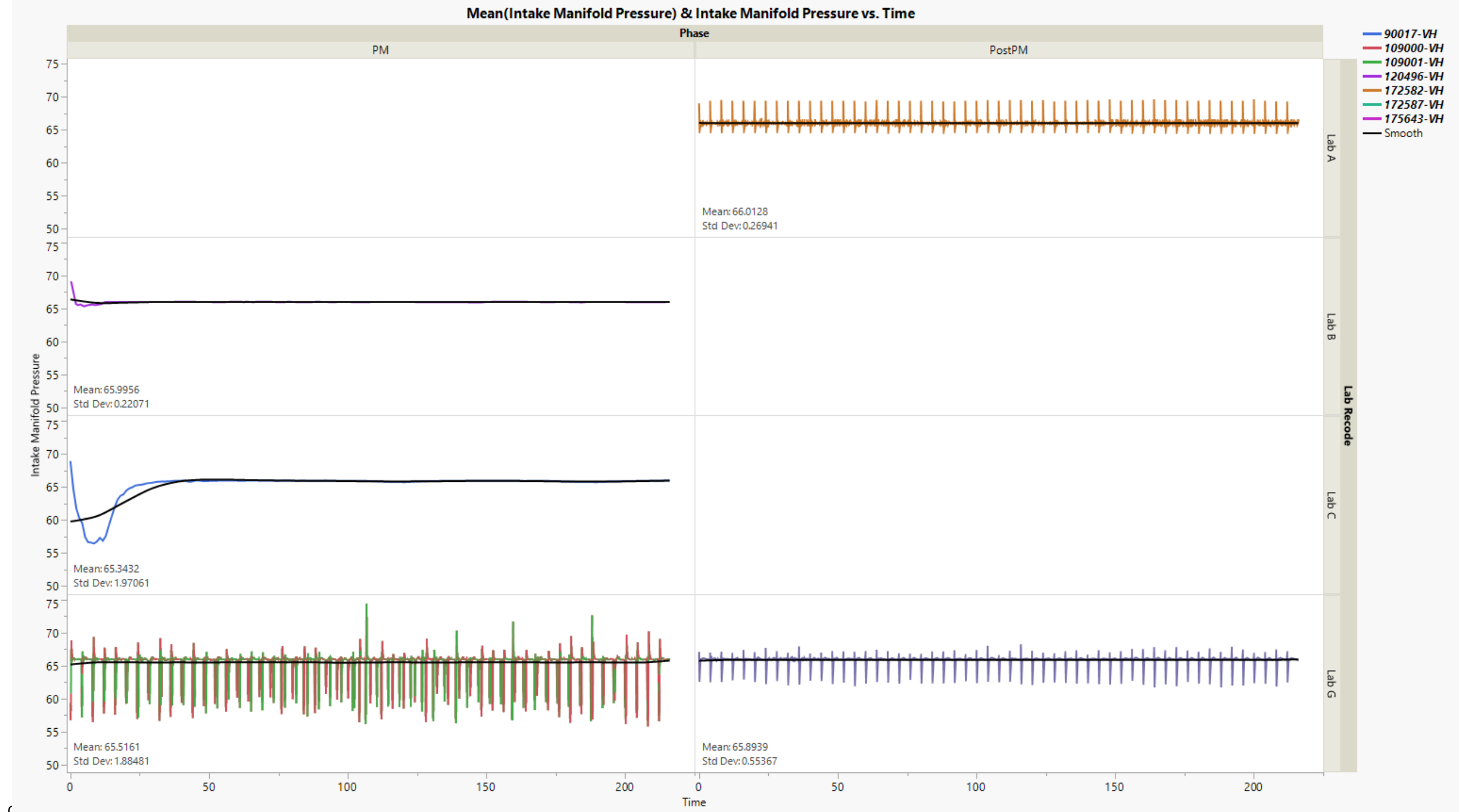


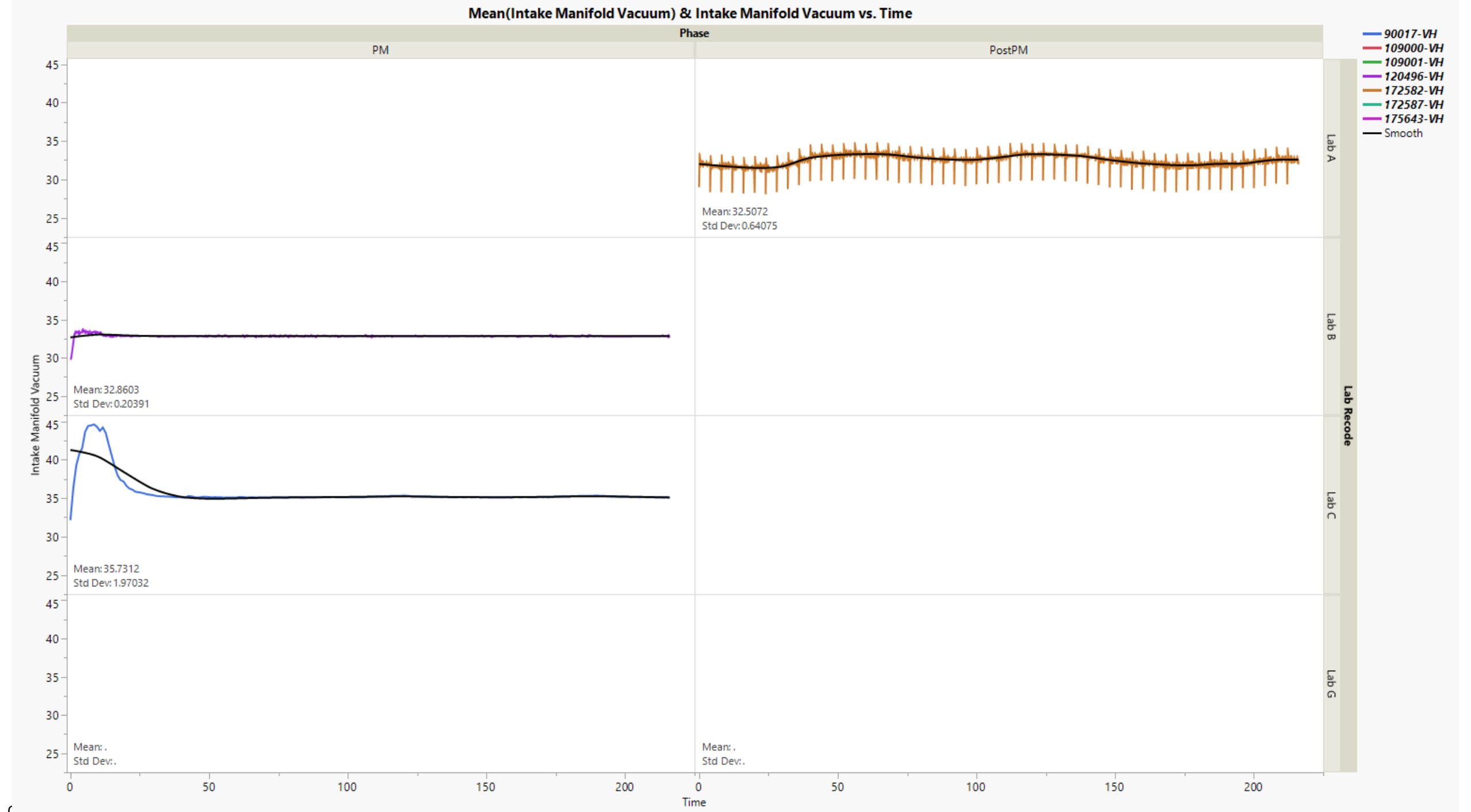
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))


Mean(Humidity) & Humidity vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Humidity
Time
Mean: 11.5619
Std Dev: 0.19817
Mean: 11.4713
Std Dev: 0.10013
Mean: 10.7843
Std Dev: 0.03646
Mean: 11.5857
Std Dev: 0.22768
Mean: 11.3886
Std Dev: 0.41542
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

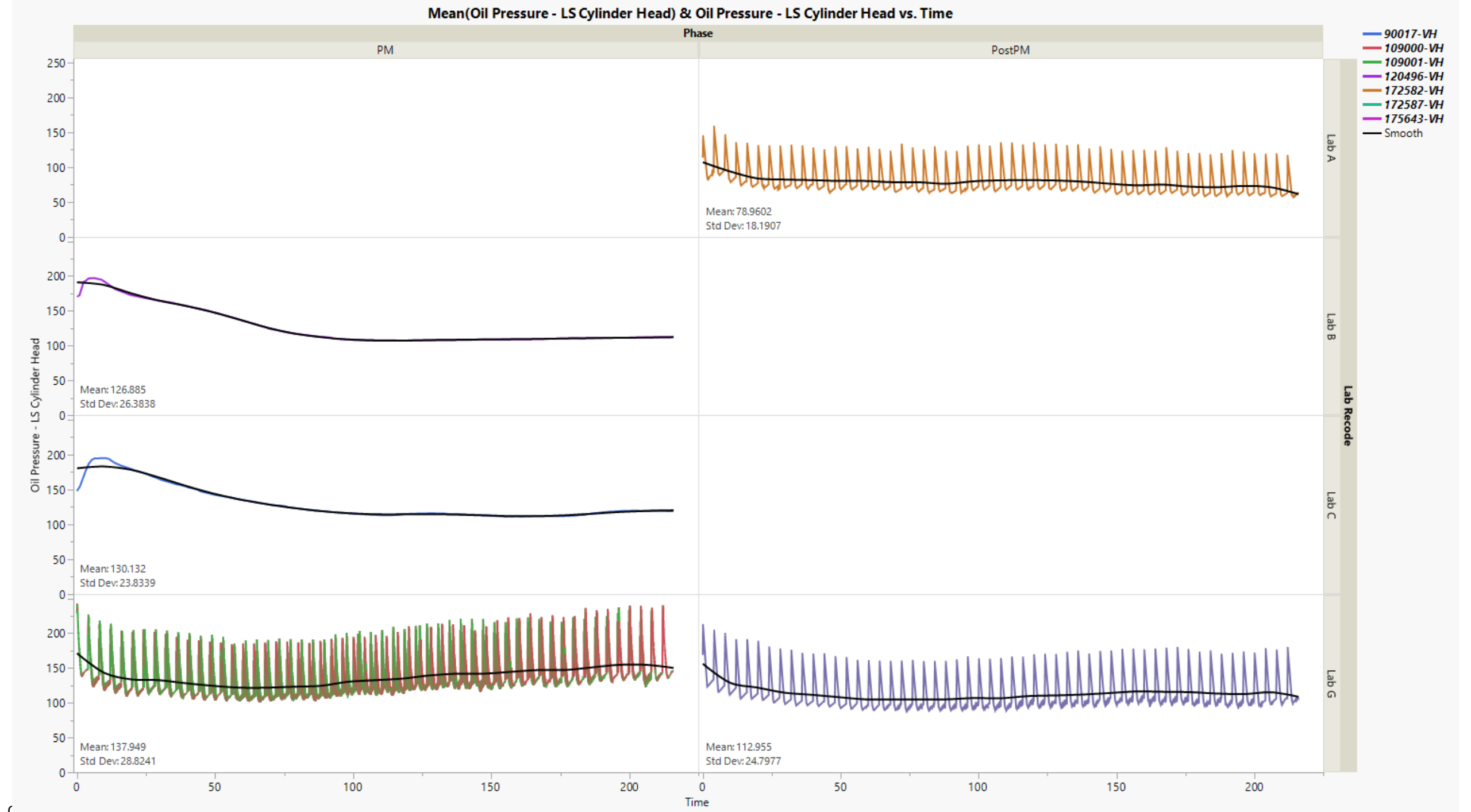

Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Intake Air Pressure
Time
Mean: 0.06927
Std Dev: 0.07127
Mean: 0.0353
Std Dev: 0.07624
Mean: 0.03098
Std Dev: 0.08527
Mean: 0.0463
Std Dev: 0.01369
Mean: 0.04678
Std Dev: 0.01605
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))


Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 29.8671
Std Dev: 0.2466
Mean: 29.7581
Std Dev: 0.34226
Mean: 27.9672
Std Dev: 0.32217
Mean: 29.7048
Std Dev: 0.56853
Mean: 29.7184
Std Dev: 0.59428
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

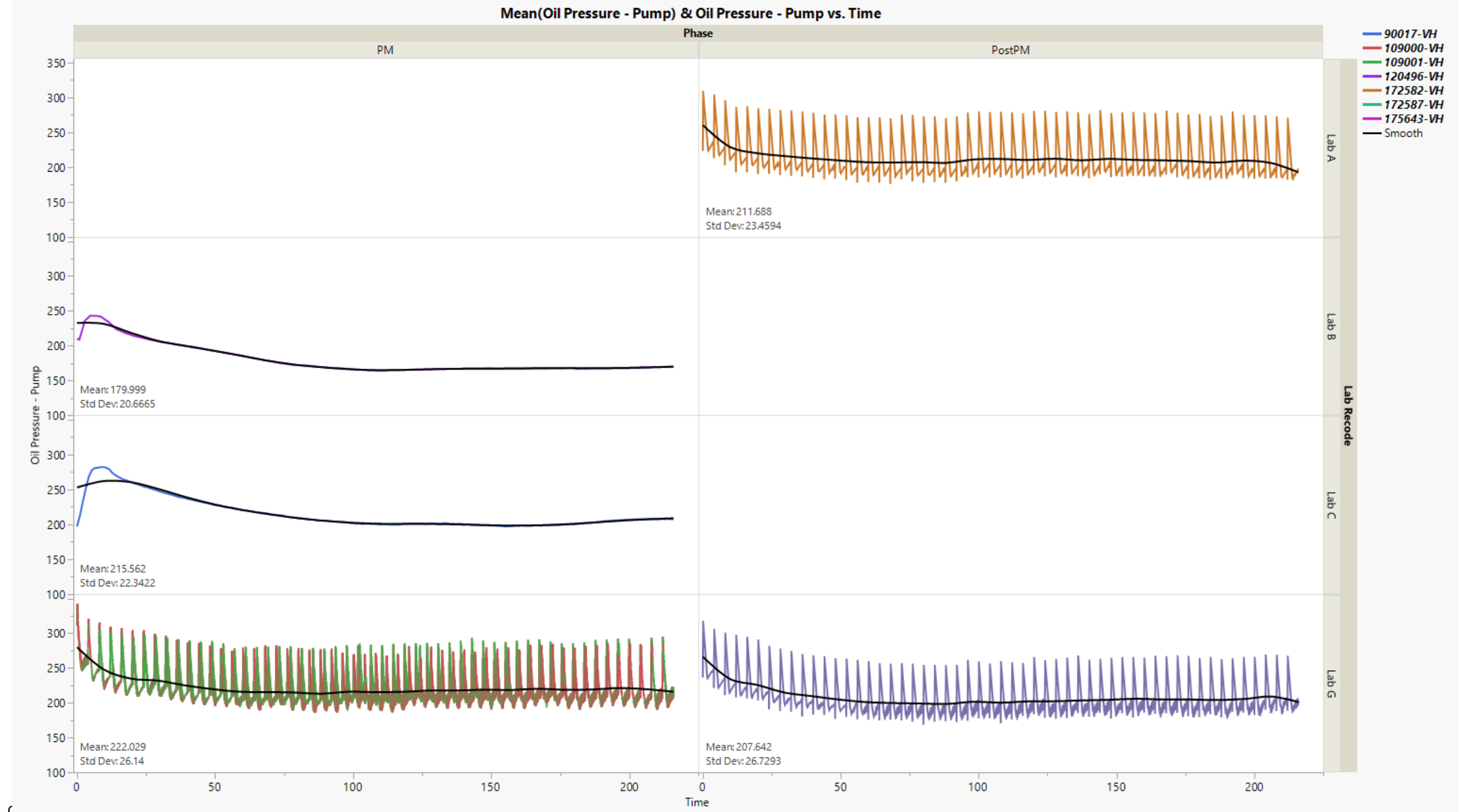

Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Intake Manifold Pressure
Time
Mean: 66.0128
Std Dev: 0.26941
Mean: 65.9956
Std Dev: 0.22071
Mean: 65.3432
Std Dev: 1.97061
Mean: 65.5161
Std Dev: 1.88481
Mean: 65.8939
Std Dev: 0.55367
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

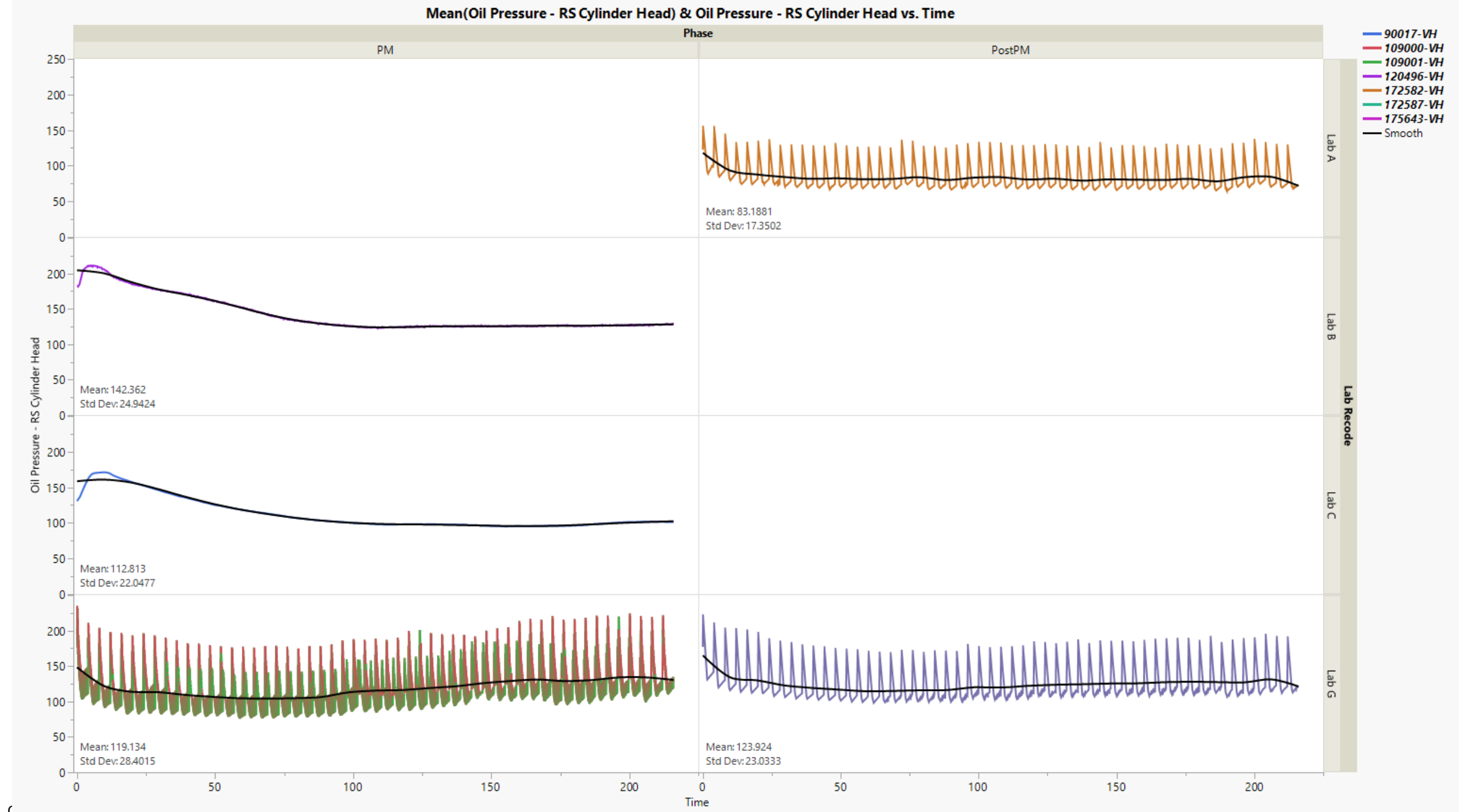


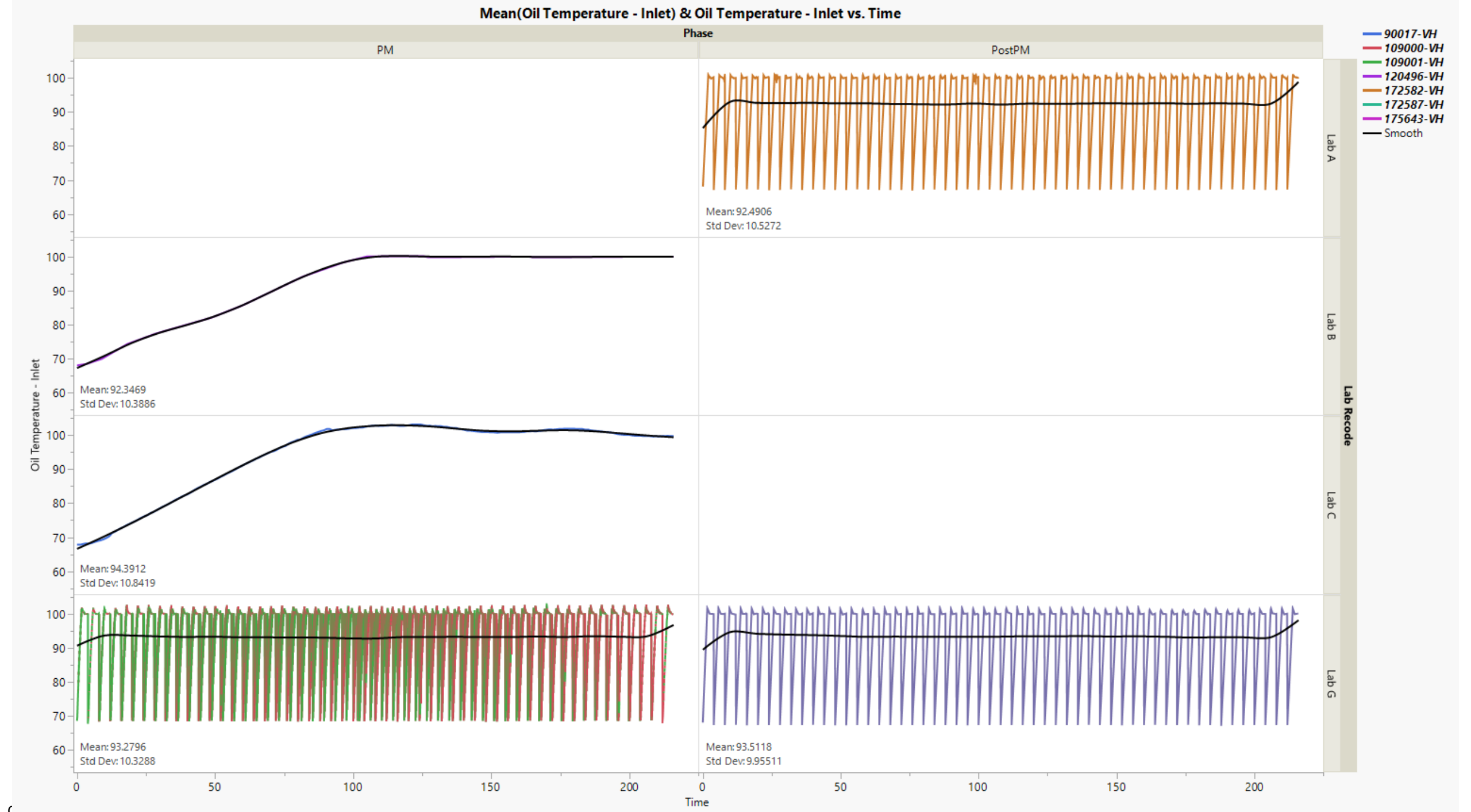
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))



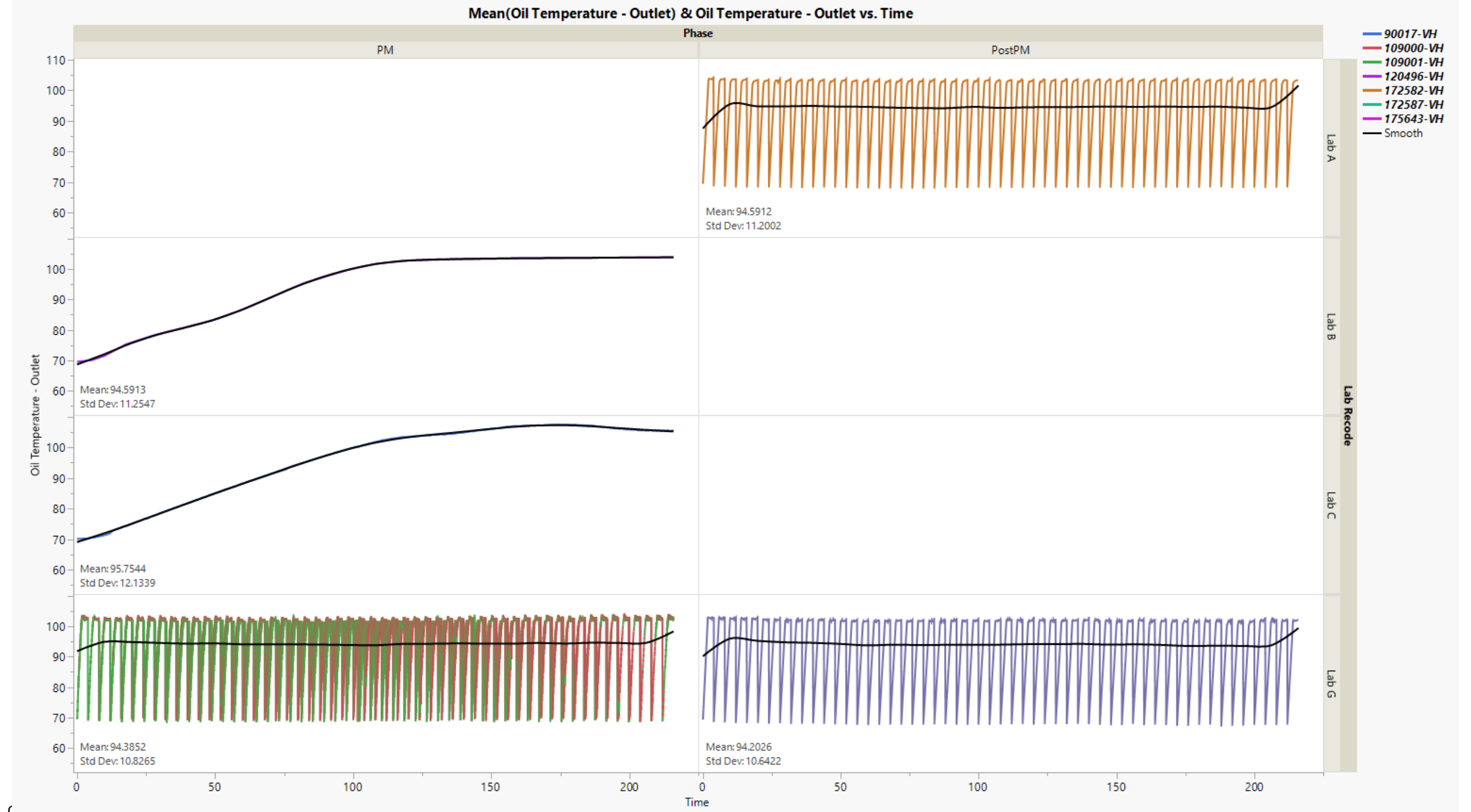
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))


Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Oil Pressure - Pump
Time
Mean: 211.688
Std Dev: 23.4594
Mean: 179.999
Std Dev: 20.6665
Mean: 215.562
Std Dev: 22.3422
Mean: 222.029
Std Dev: 26.14
Mean: 207.642
Std Dev: 26.7293
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

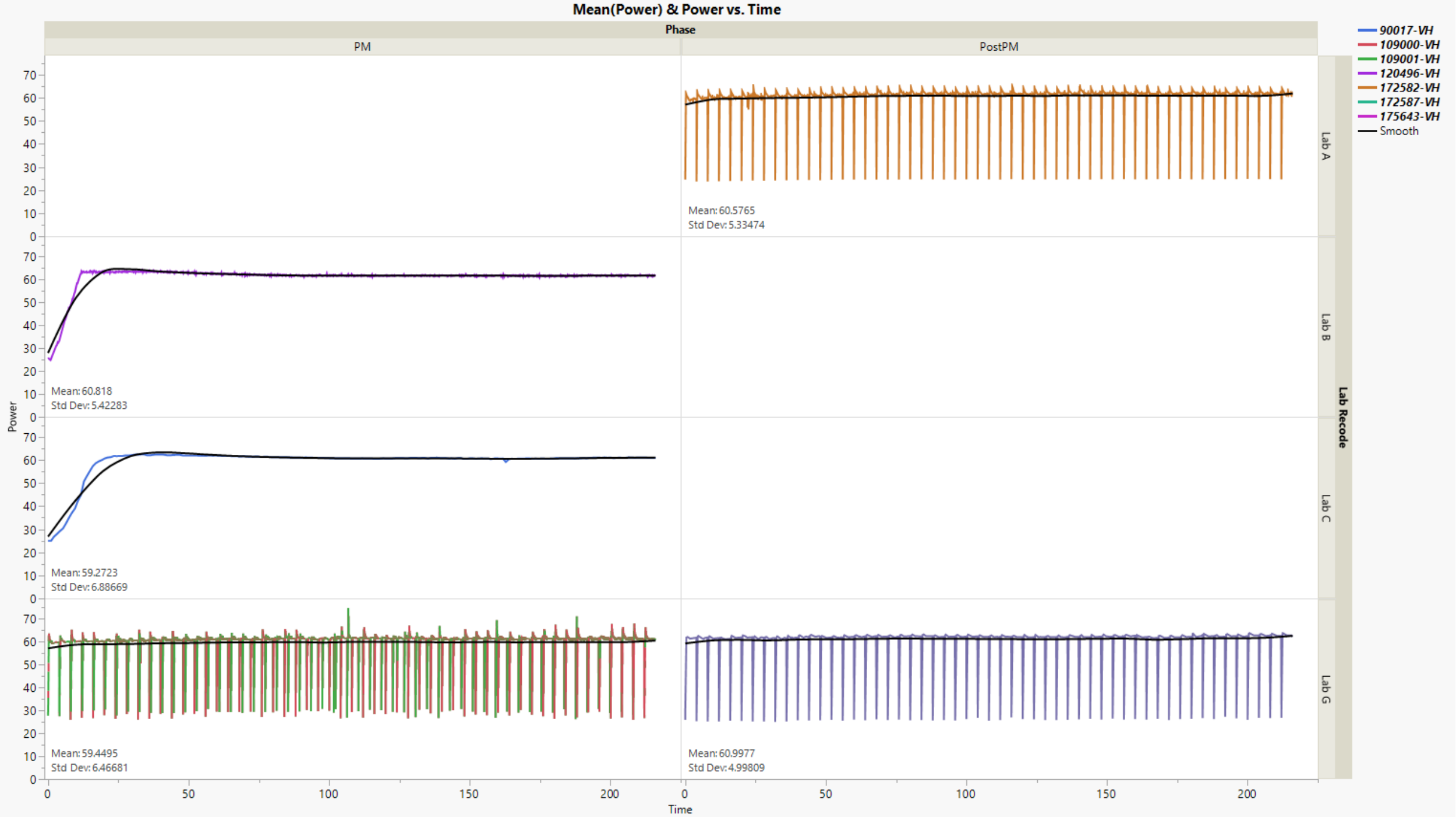

Mean(Oil Pressure - RS Cylinder Head) & Oil Pressure - RS Cylinder Head vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Oil Pressure - RS Cylinder Head
Time
Mean: 83.1881
Std Dev: 17.3502
Mean: 142.362
Std Dev: 24.9424
Mean: 112.813
Std Dev: 22.0477
Mean: 119.134
Std Dev: 28.4015
Mean: 123.924
Std Dev: 23.0333
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))



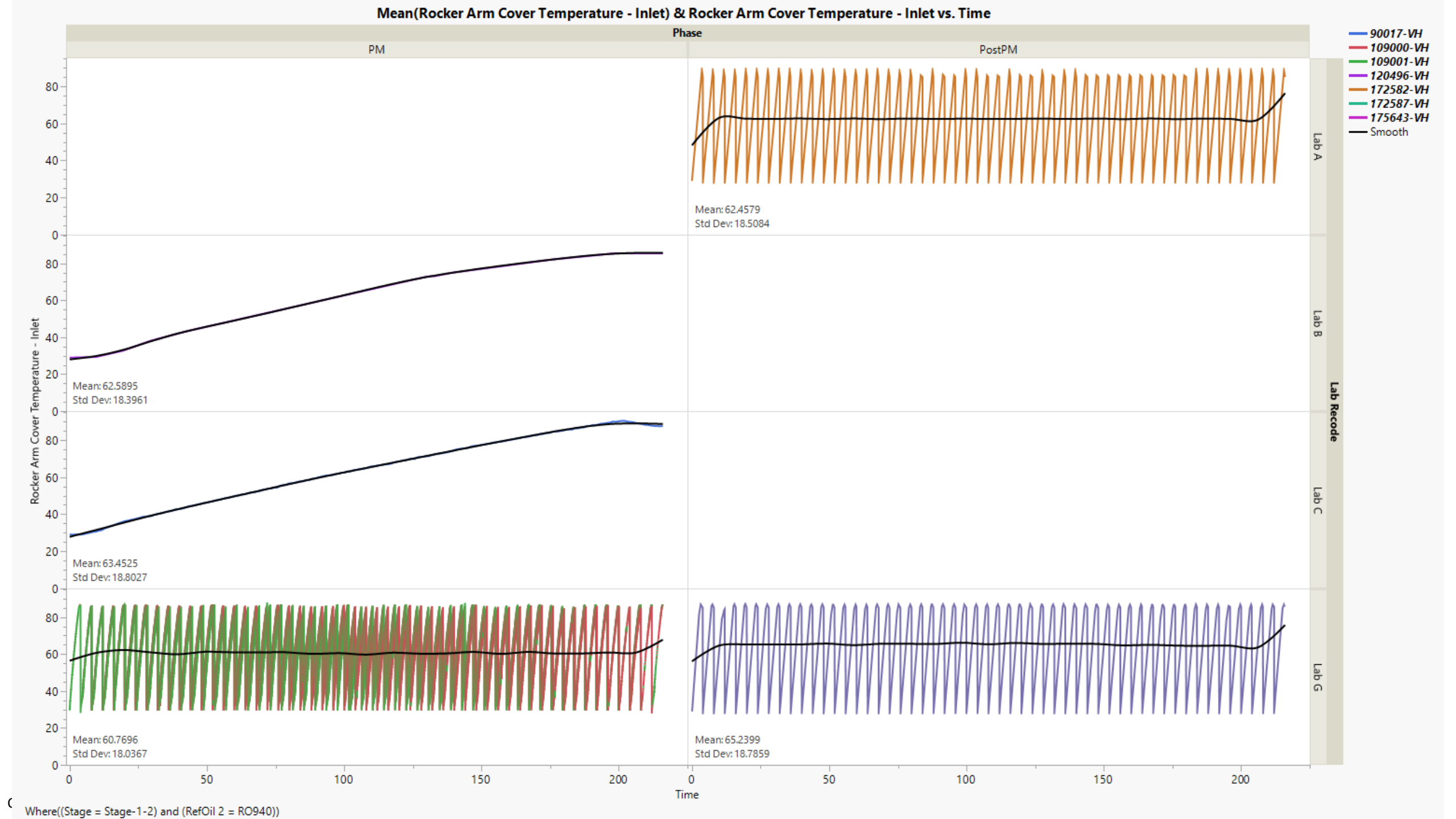
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

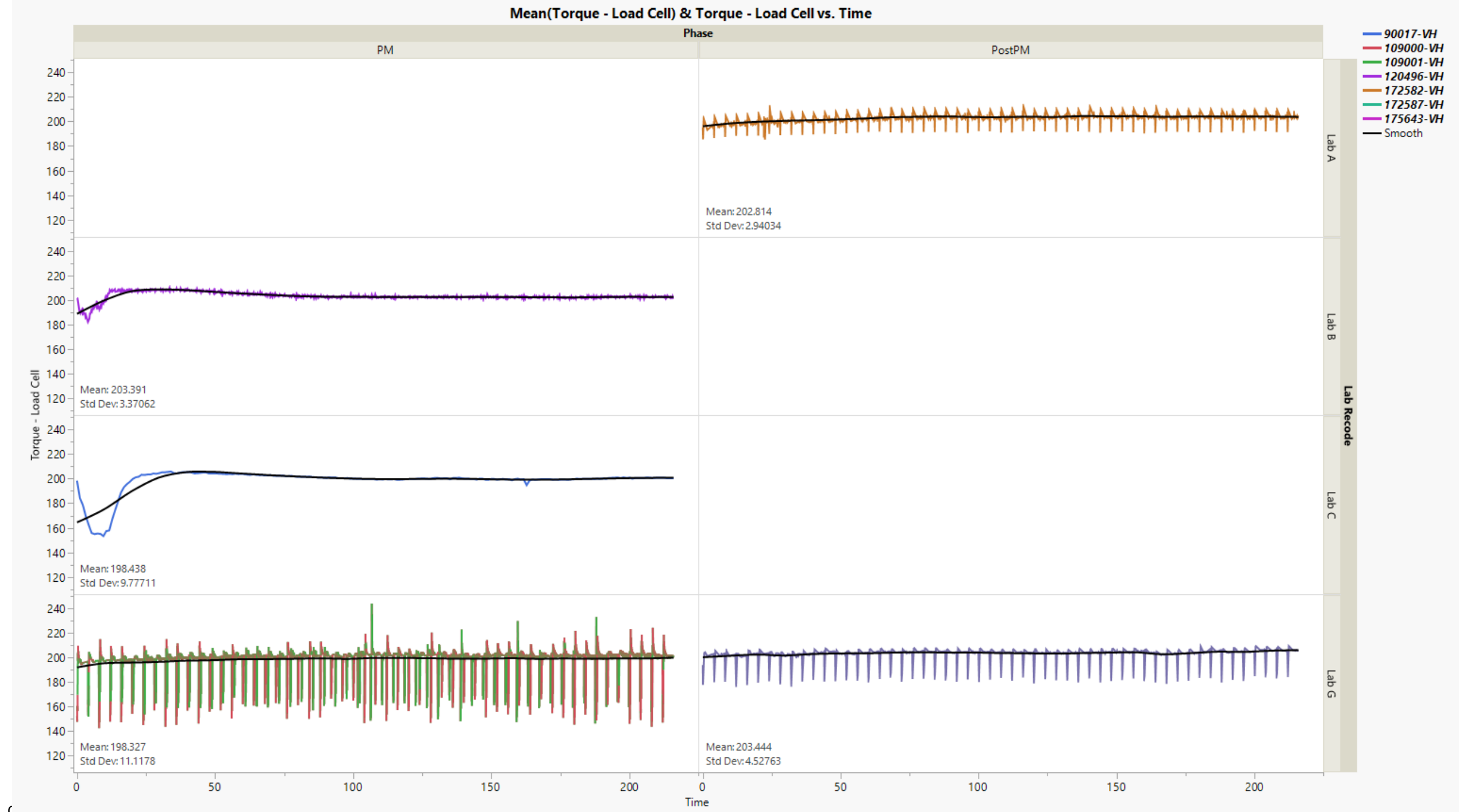


Where((Stage = Stage-1-2) and (RefOil 2 = RO940))



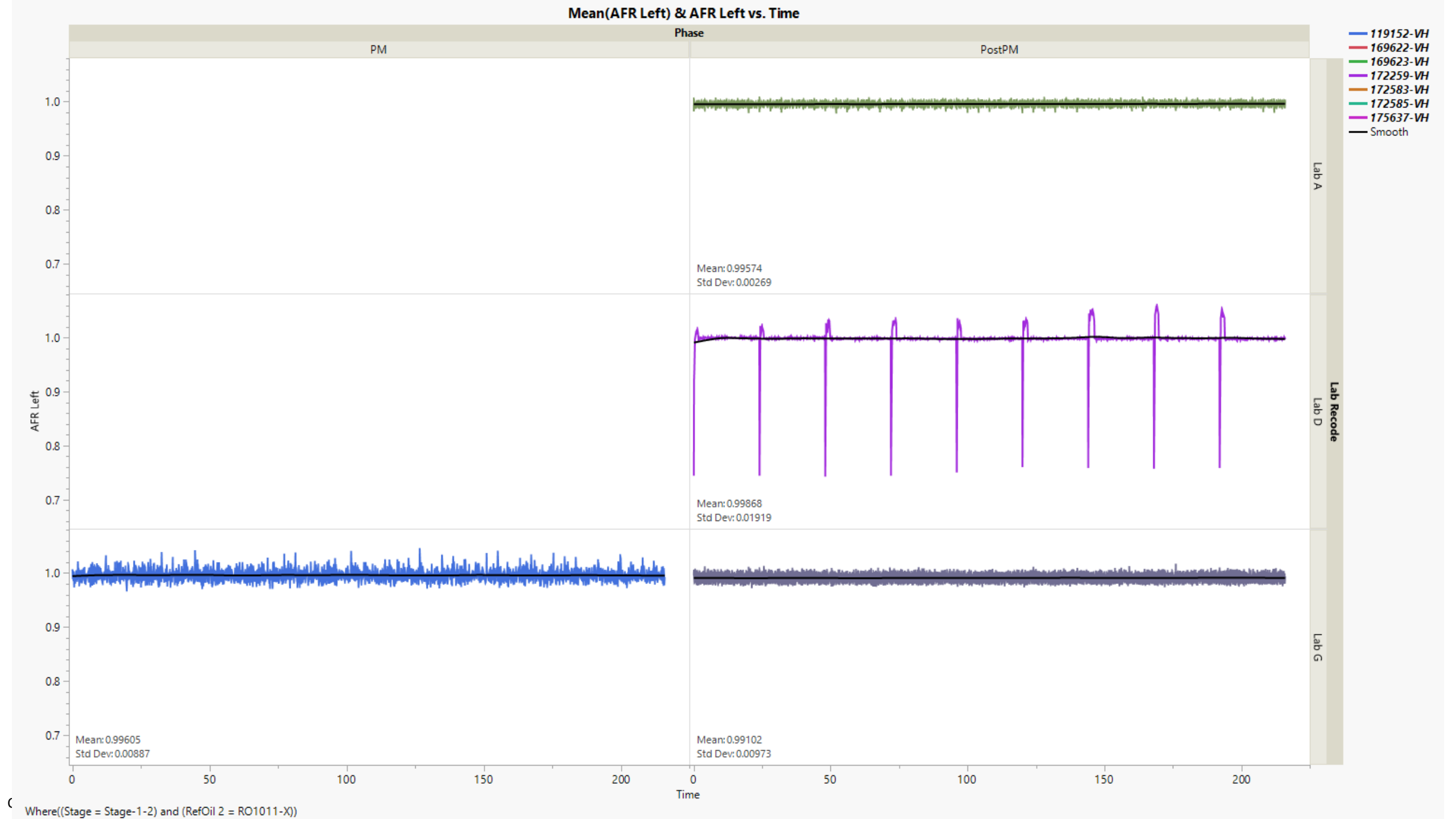
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

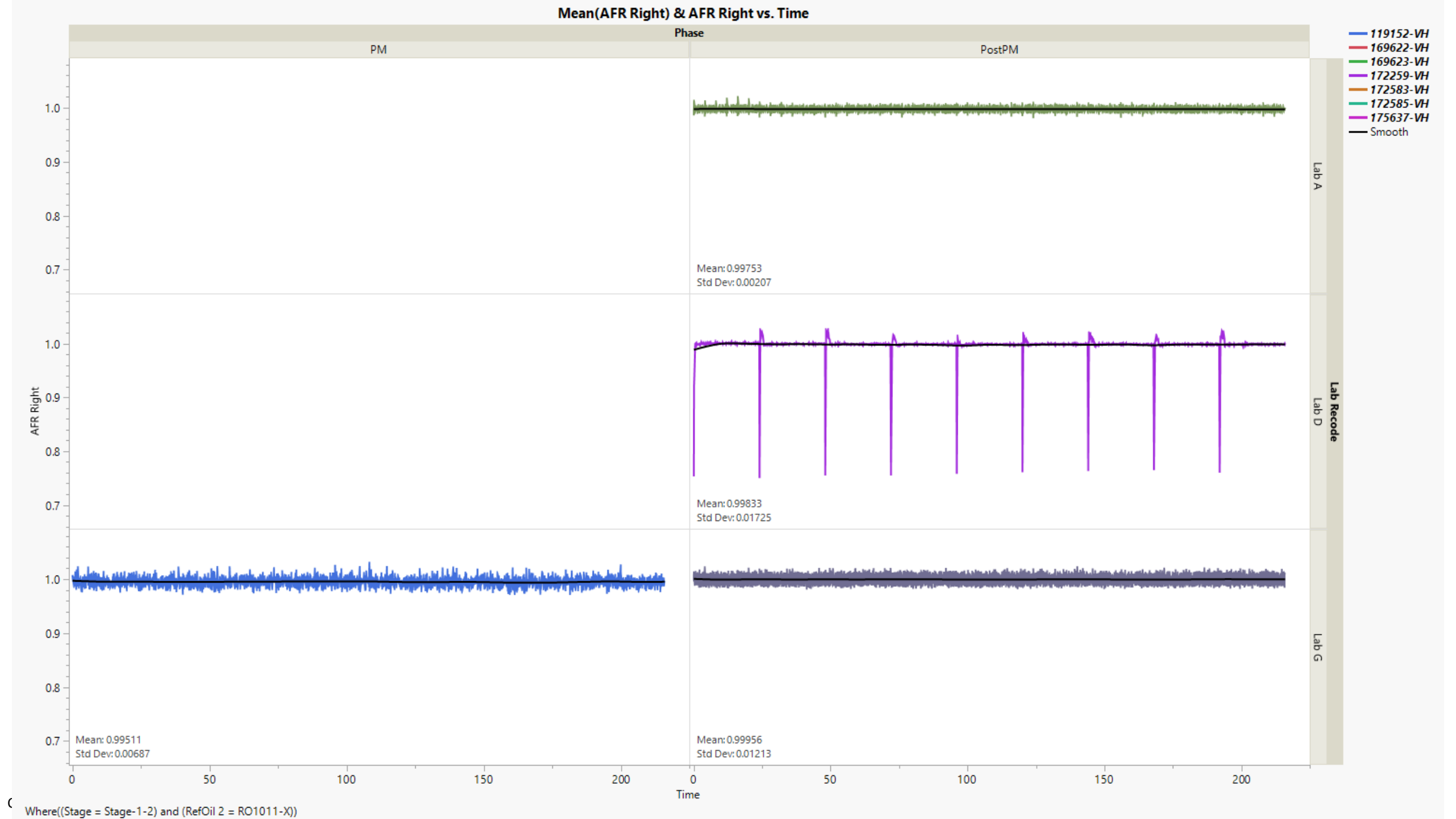

Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Rocker Arm Cover Temperature - Inlet
Time
Mean: 62.4579
Std Dev: 18.5084
Mean: 62.5895
Std Dev: 18.3961
Mean: 63.4525
Std Dev: 18.8027
Mean: 60.7696
Std Dev: 18.0367
Mean: 65.2399
Std Dev: 18.7859
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

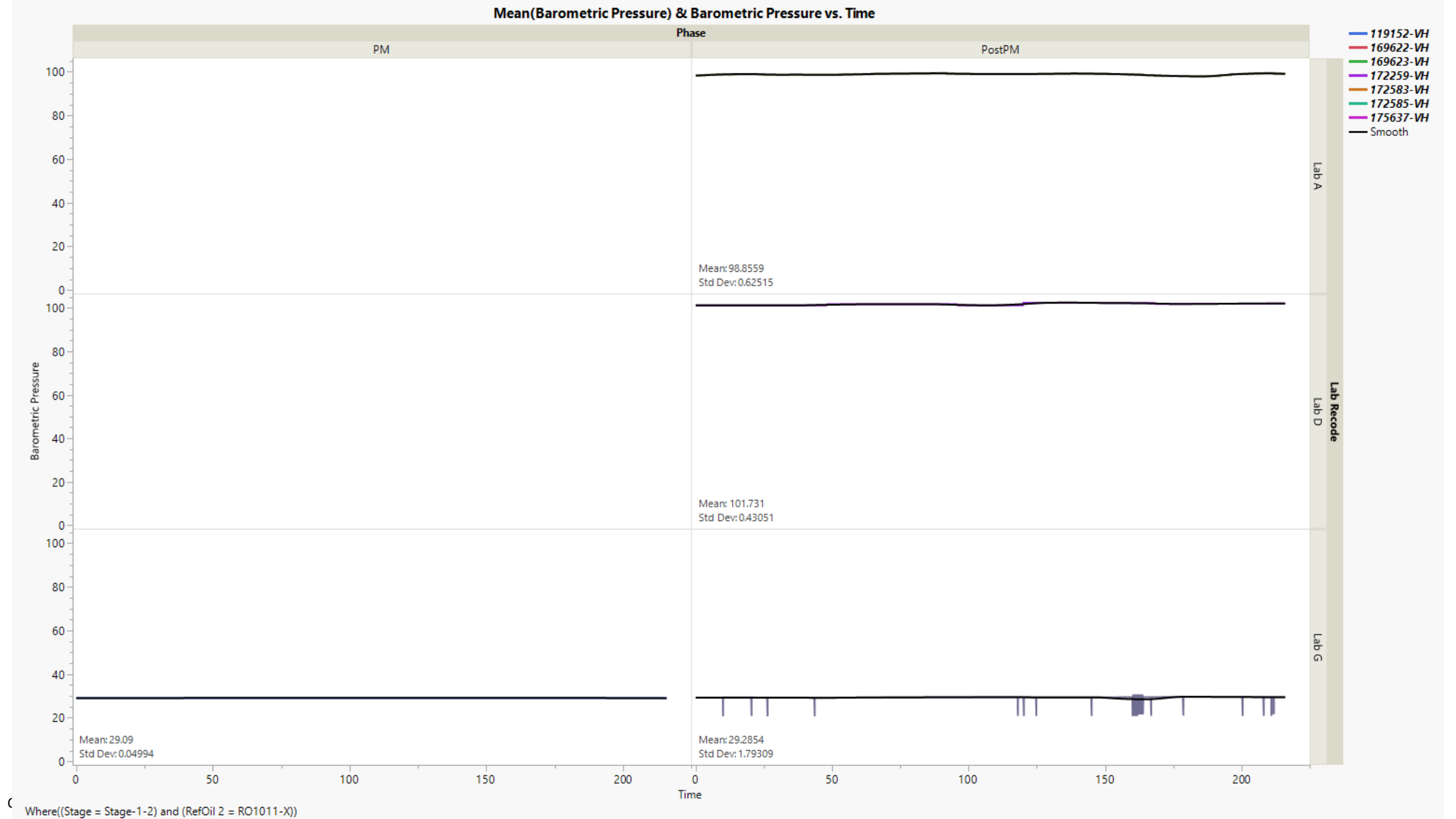

Mean(Torque - Load Cell) & Torque - Load Cell vs. Time
Phase
PM
PostPM
90017-VH
109000-VH
109001-VH
120496-VH
172582-VH
172587-VH
175643-VH
Smooth
Lab A
Lab B
Lab C
Lab G
Lab Recode
Torque - Load Cell
Time
Mean: 202.814
Std Dev: 2.94034
Mean: 203.391
Std Dev: 3.37062
Mean: 198.438
Std Dev: 9.77711
Mean: 198.327
Std Dev: 11.1178
Mean: 203.444
Std Dev: 4.52763
Where((Stage = Stage-1-2) and (RefOil 2 = RO940))

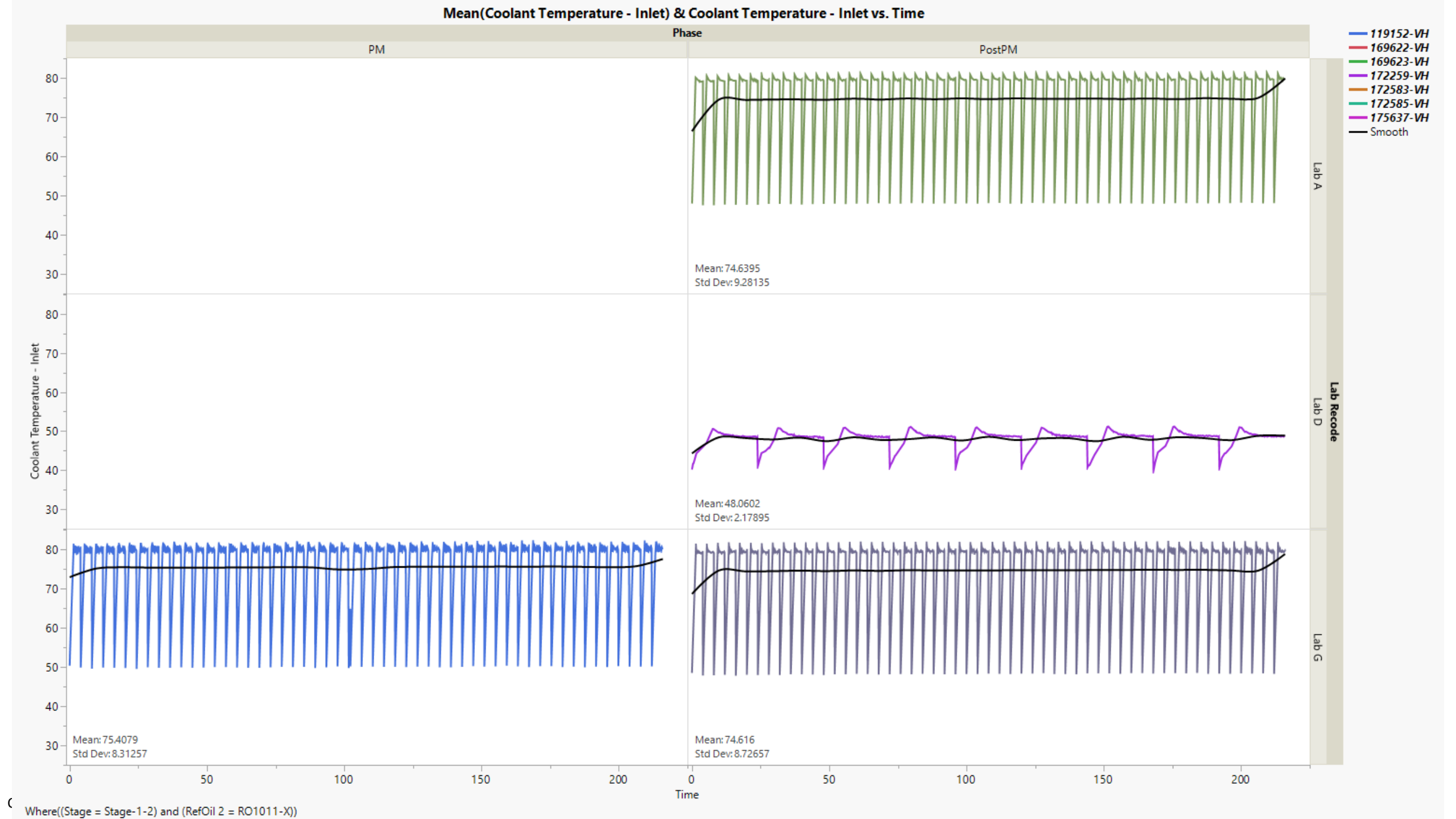
RO 1011 Data Plots

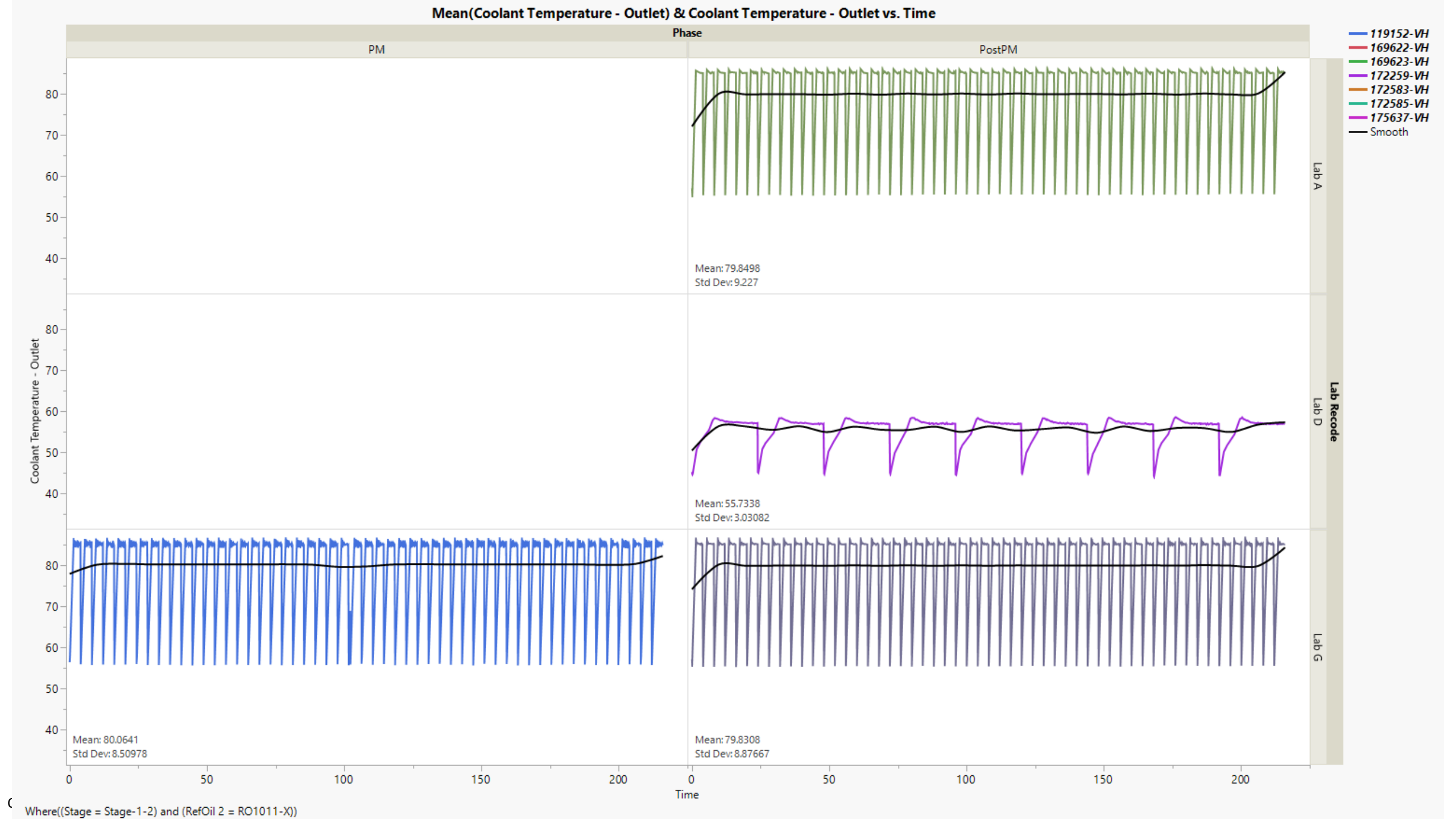
Classified as Confidential

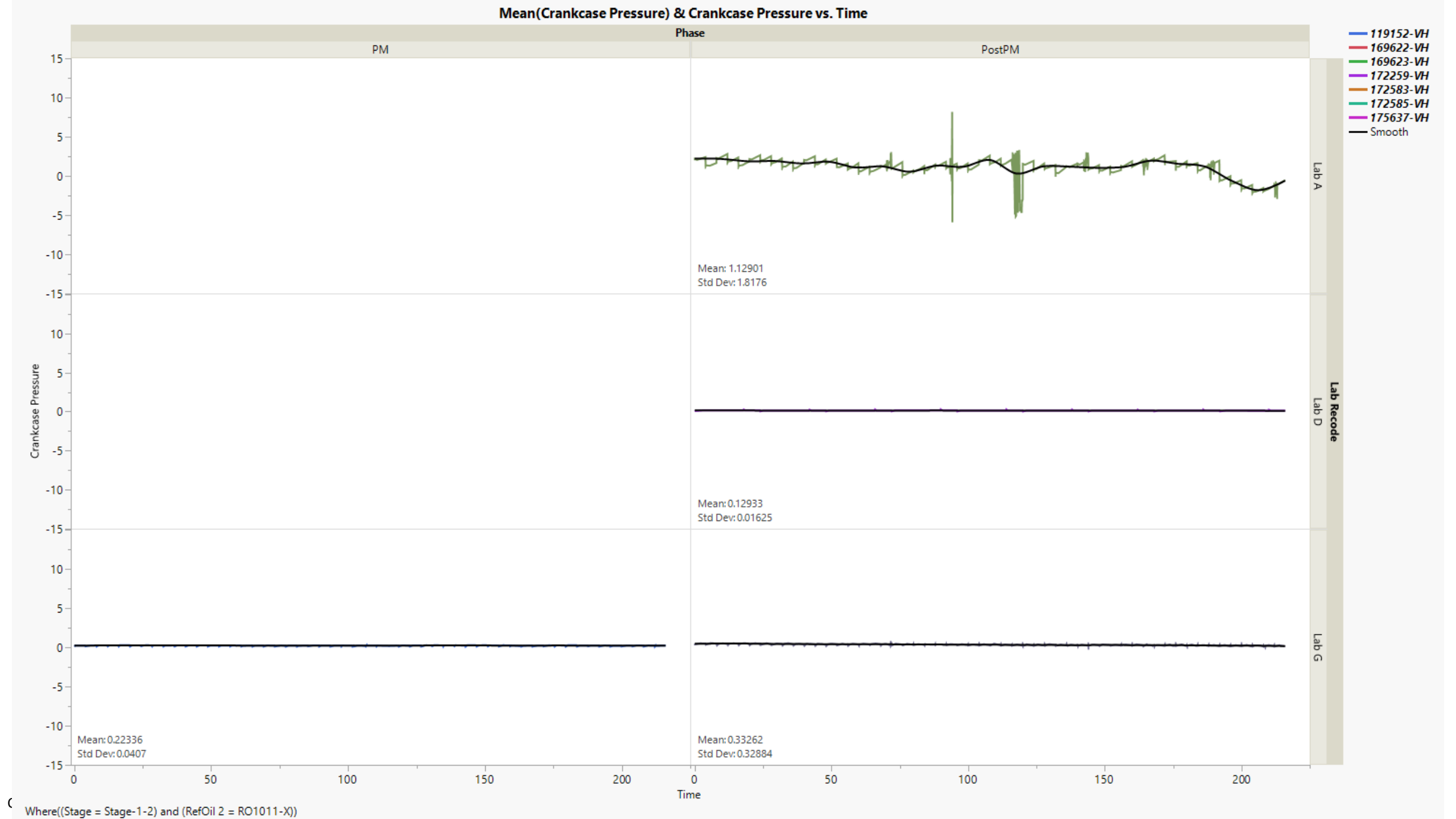

Mean(AFR Left) & AFR Left vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
AFR Left
Time
Mean: 0.99574
Std Dev: 0.00269
Mean: 0.99868
Std Dev: 0.01919
Mean: 0.99605
Std Dev: 0.00887
Mean: 0.99102
Std Dev: 0.00973
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

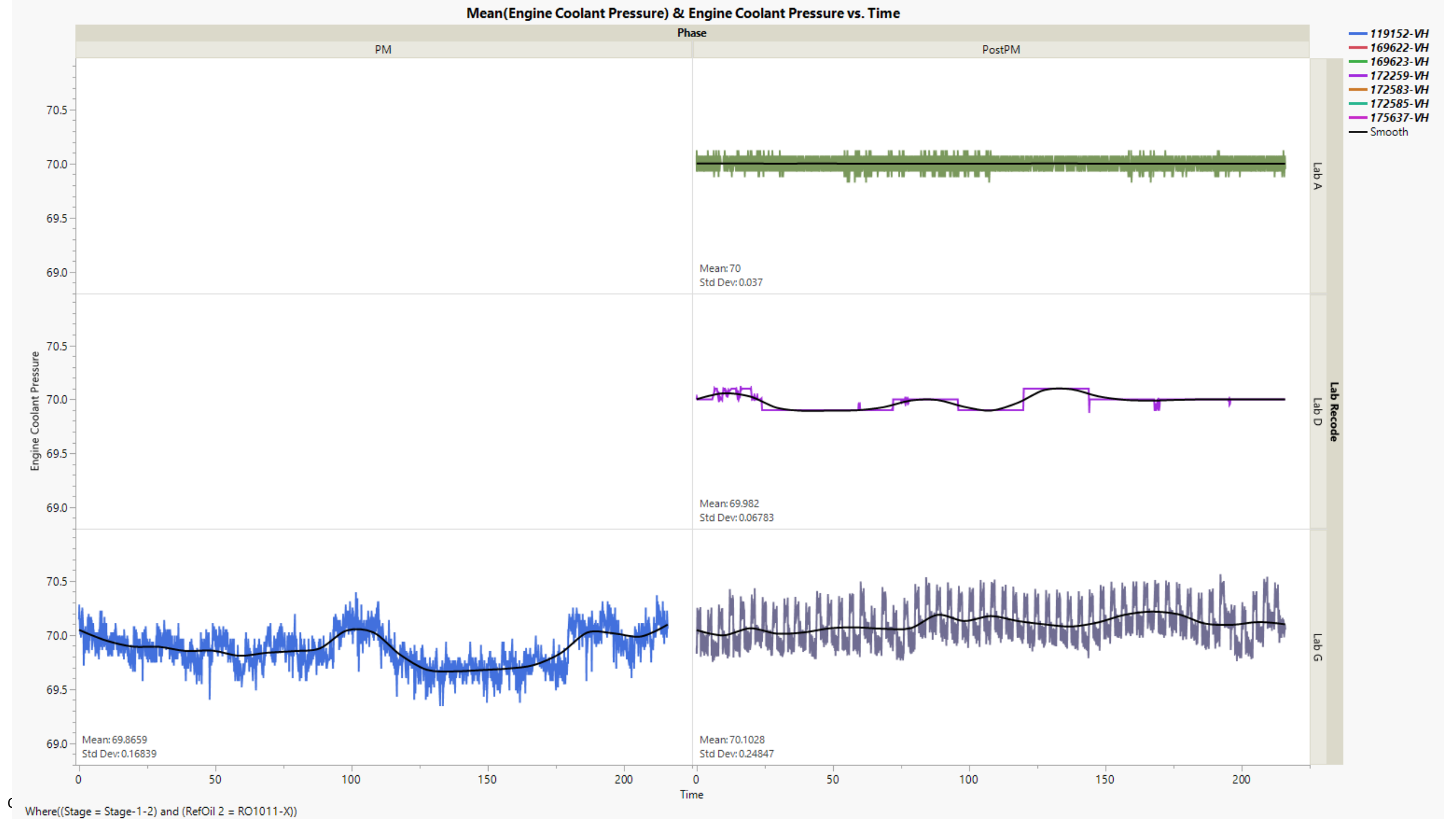

Mean(AFR Right) & AFR Right vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
AFR Right
Time
Mean: 0.99753
Std Dev: 0.00207
Mean: 0.99833
Std Dev: 0.01725
Mean: 0.99511
Std Dev: 0.00687
Mean: 0.99956
Std Dev: 0.01213
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

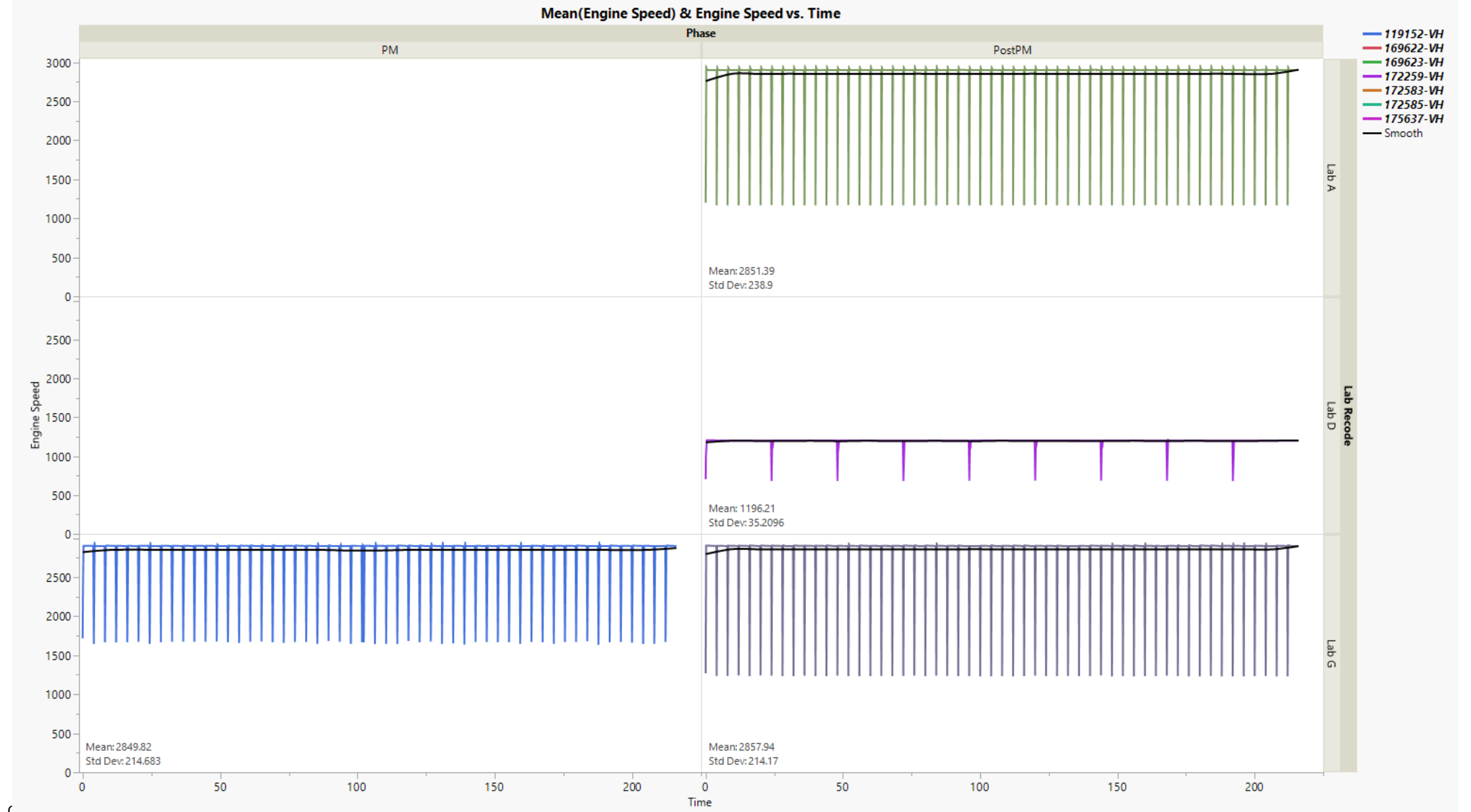

Mean(Barometric Pressure) & Barometric Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Barometric Pressure
Time
Mean: 98.8559
Std Dev: 0.62515
Mean: 101.731
Std Dev: 0.43051
Mean: 29.09
Std Dev: 0.04994
Mean: 29.2854
Std Dev: 1.79309
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

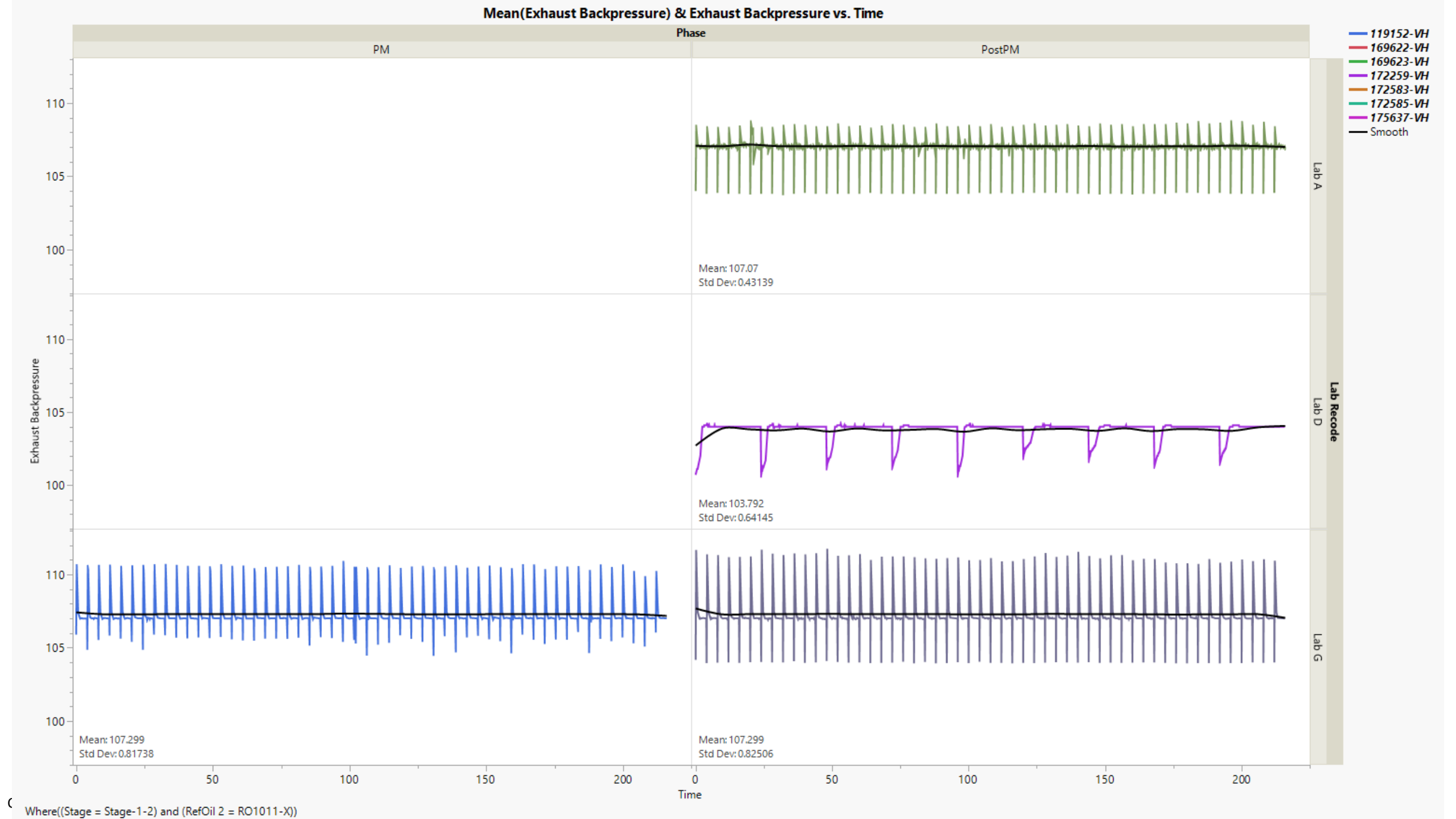

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Coolant Temperature - Inlet
Time
Mean: 74.6395
Std Dev: 9.28135
Mean: 48.0602
Std Dev: 2.17895
Mean: 75.4079
Std Dev: 8.31257
Mean: 74.616
Std Dev: 8.72657
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

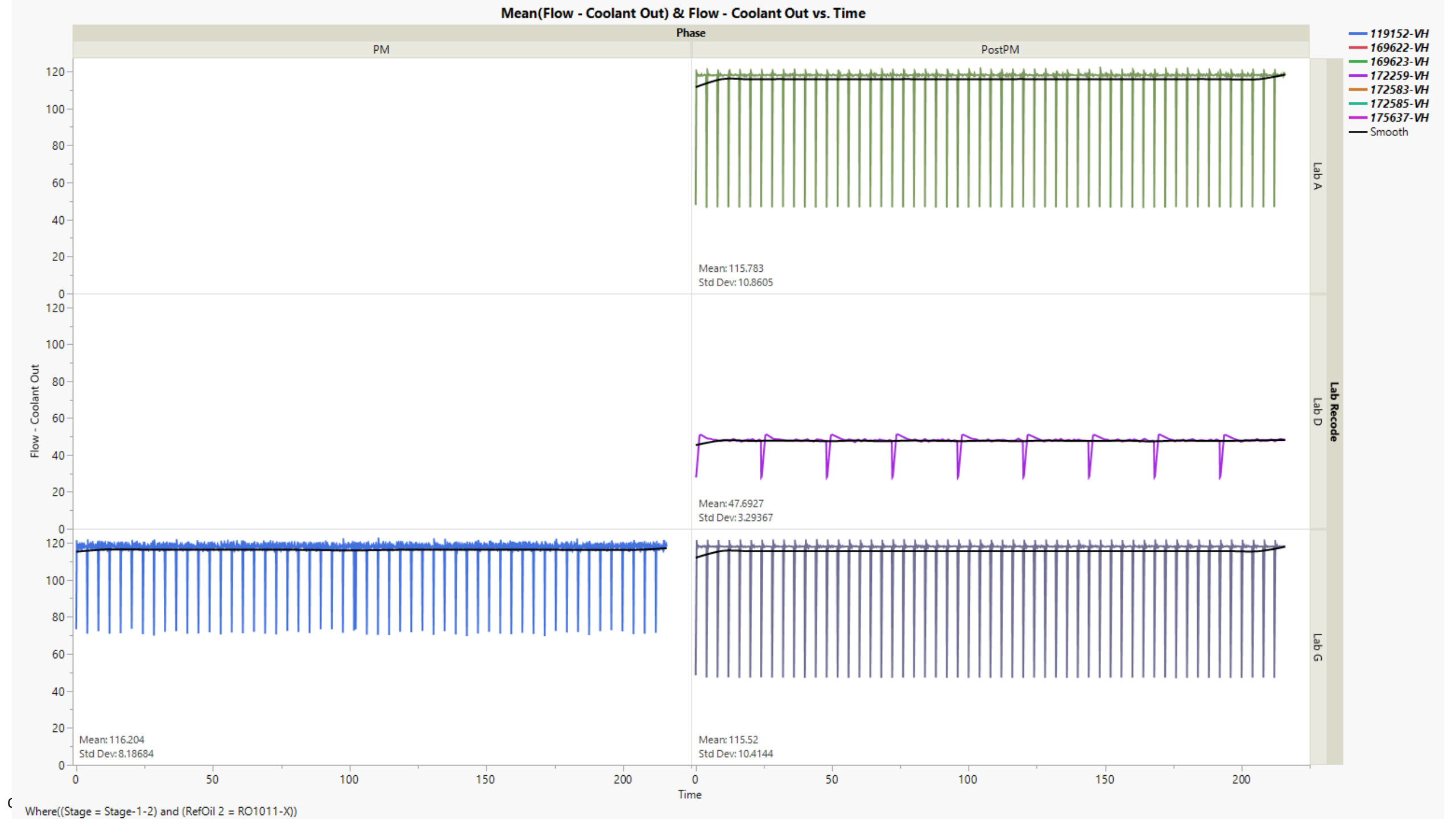

Mean(Coolant Temperature - Outlet) & Coolant Temperature - Outlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Coolant Temperature - Outlet
Time
Mean: 79.8498
Std Dev: 9.227
Mean: 55.7338
Std Dev: 3.03082
Mean: 80.0641
Std Dev: 8.50978
Mean: 79.8308
Std Dev: 8.87667
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

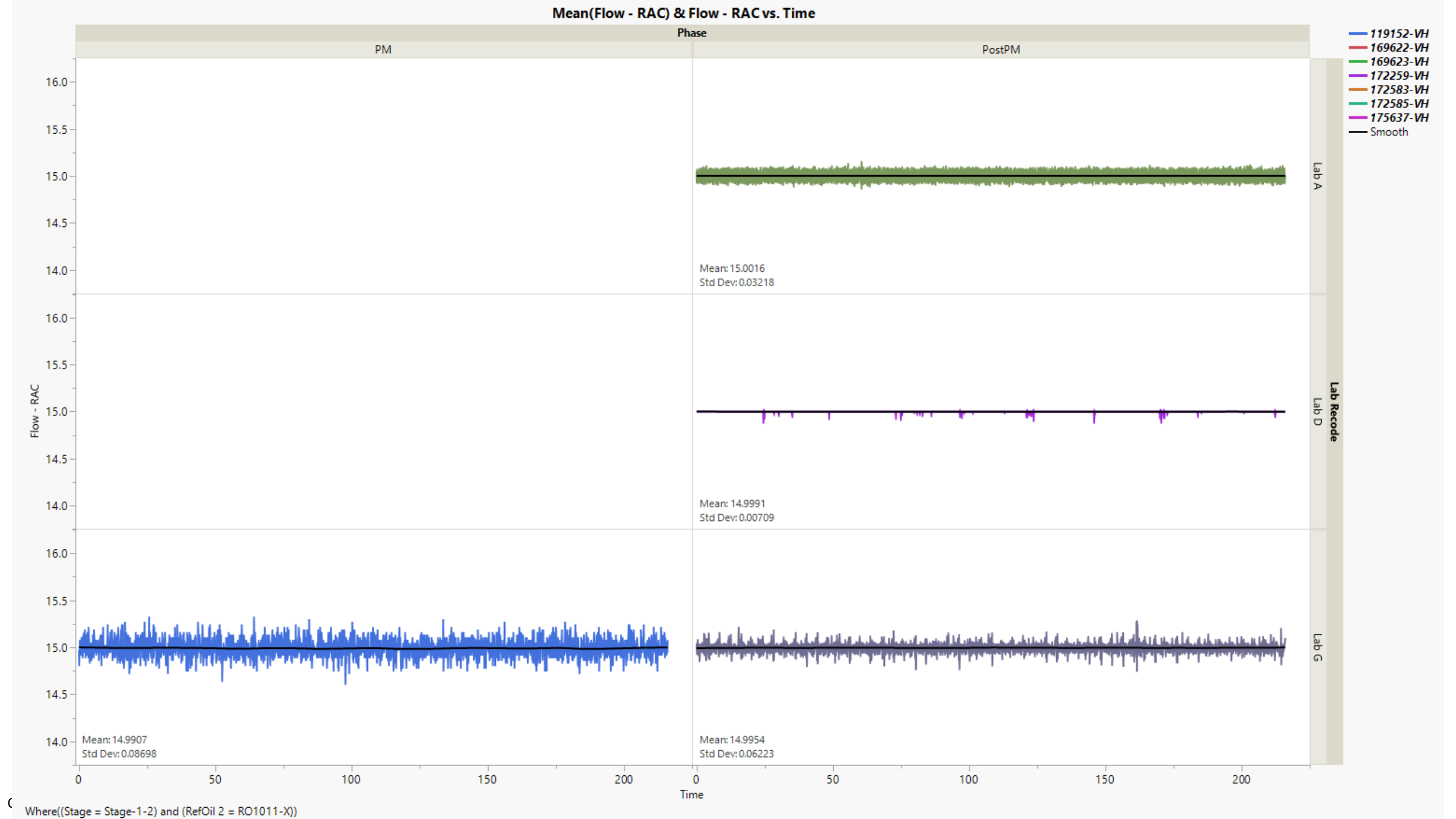

Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Crankcase Pressure
Time
Mean: 1.12901
Std Dev: 1.8176
Mean: 0.12933
Std Dev: 0.01625
Mean: 0.22336
Std Dev: 0.0407
Mean: 0.33262
Std Dev: 0.32884
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

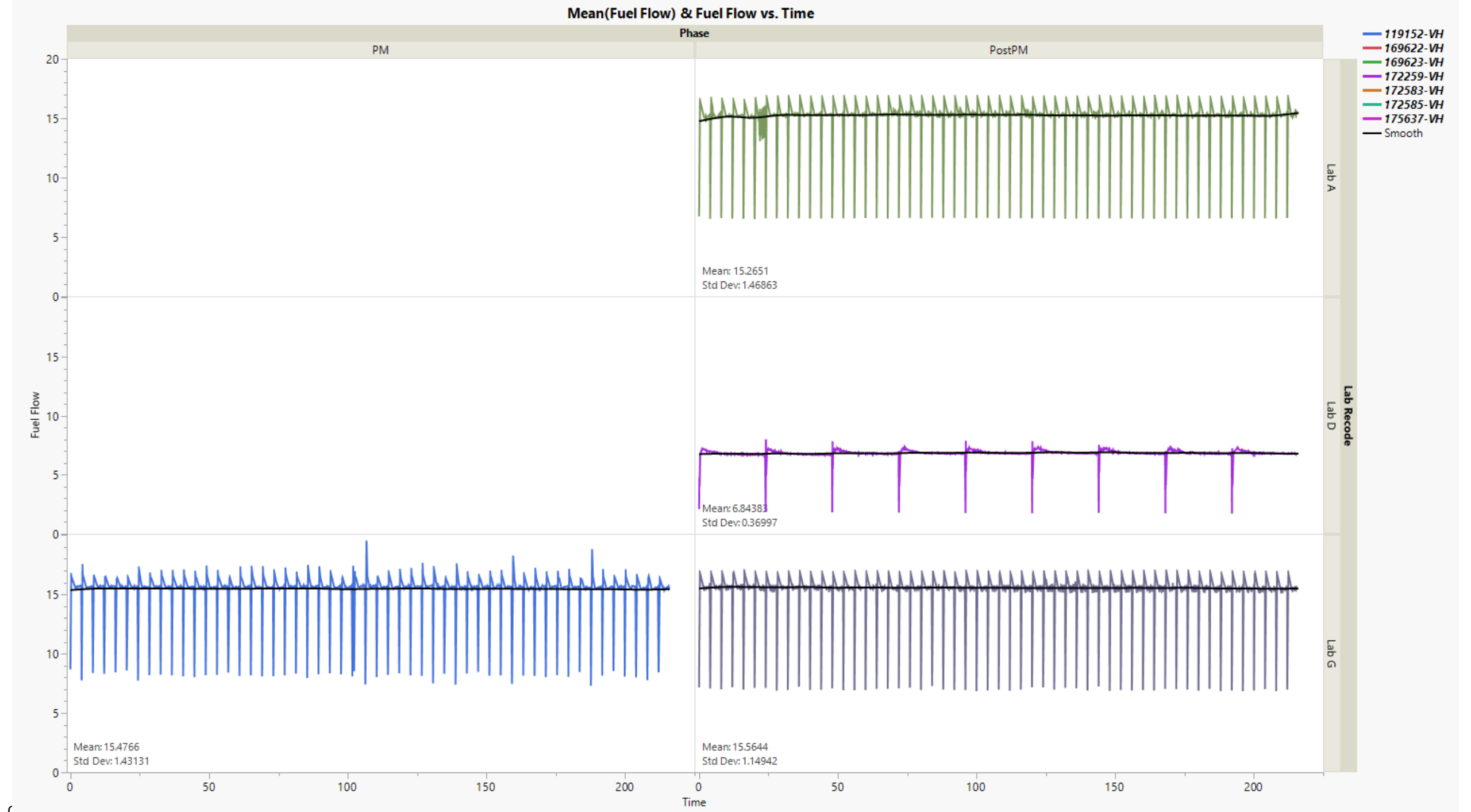

Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 70
Std Dev: 0.037
Mean: 69.982
Std Dev: 0.06783
Mean: 69.8659
Std Dev: 0.16839
Mean: 70.1028
Std Dev: 0.24847
70.5
70.0
69.5
69.0
0
50
100
150
200
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))


Mean(Engine Speed) & Engine Speed vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Speed
Time
Mean: 2851.39
Std Dev: 238.9
Mean: 1196.21
Std Dev: 35.2096
Mean: 2849.82
Std Dev: 214.683
Mean: 2857.94
Std Dev: 214.17
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

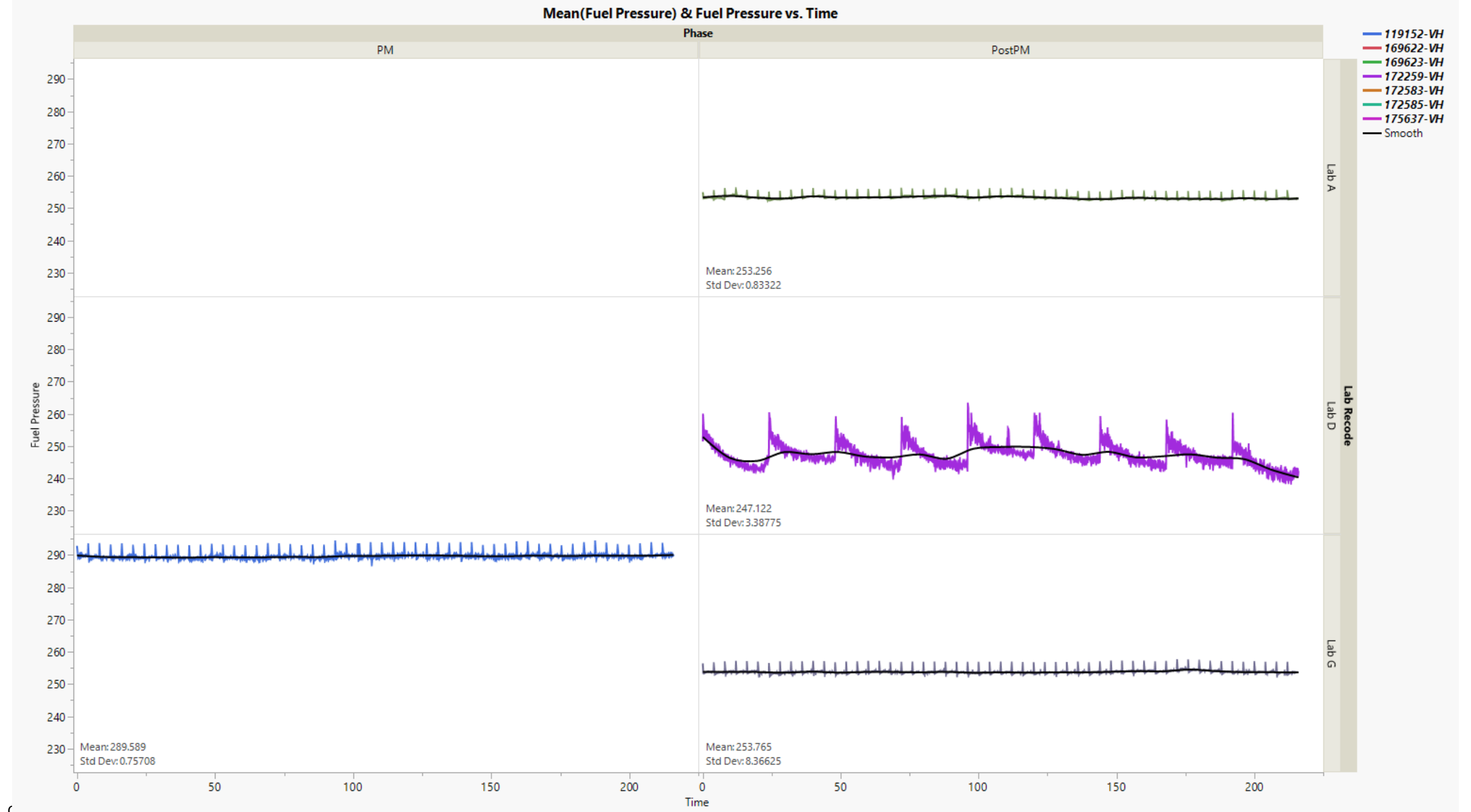

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 107.07
Std Dev: 0.43139
Mean: 103.792
Std Dev: 0.64145
Mean: 107.299
Std Dev: 0.81738
Mean: 107.299
Std Dev: 0.82506
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

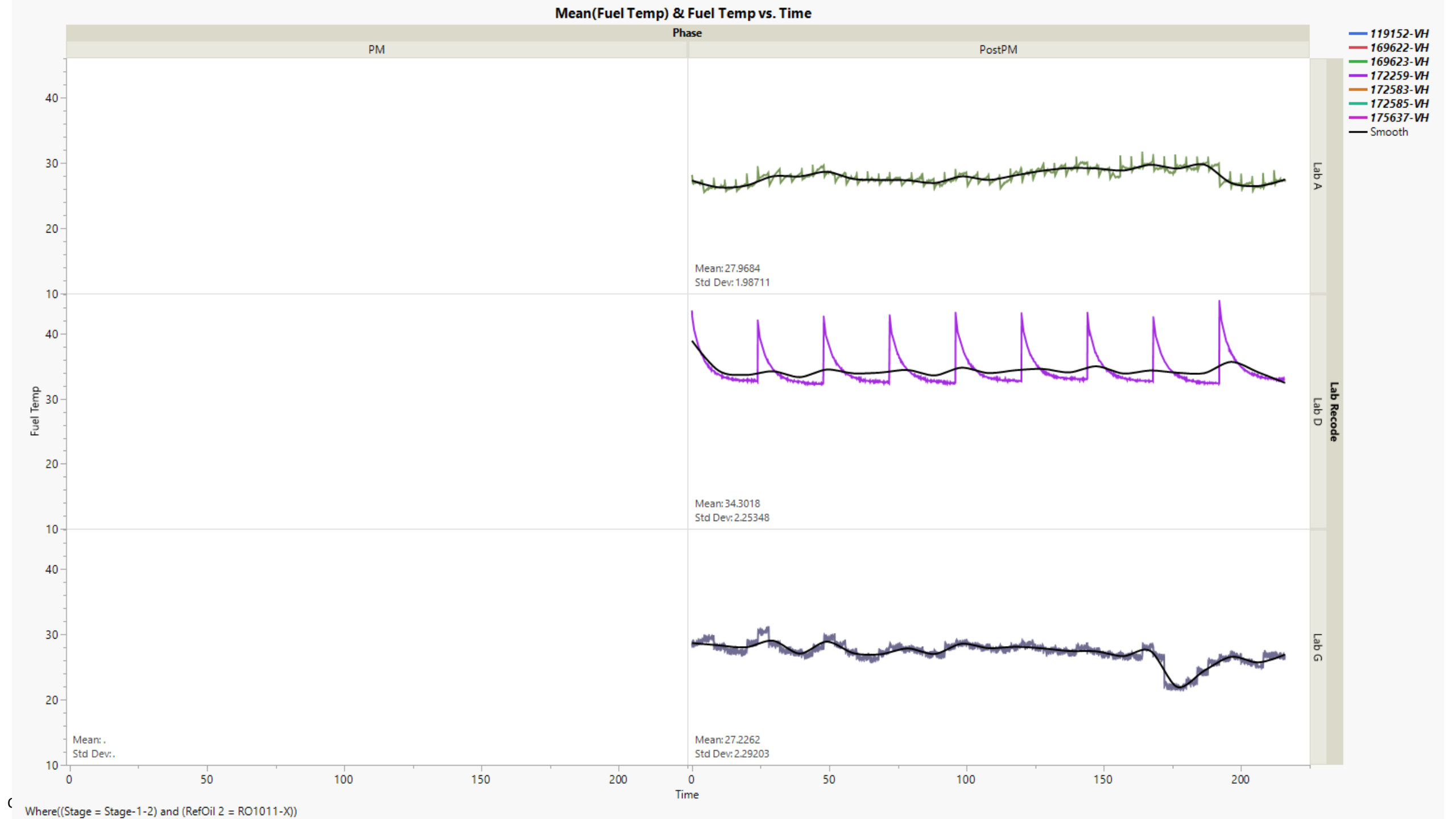

Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - Coolant Out
Time
Mean: 115.783
Std Dev: 10.8605
Mean: 47.6927
Std Dev: 3.29367
Mean: 116.204
Std Dev: 8.18684
Mean: 115.52
Std Dev: 10.4144
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

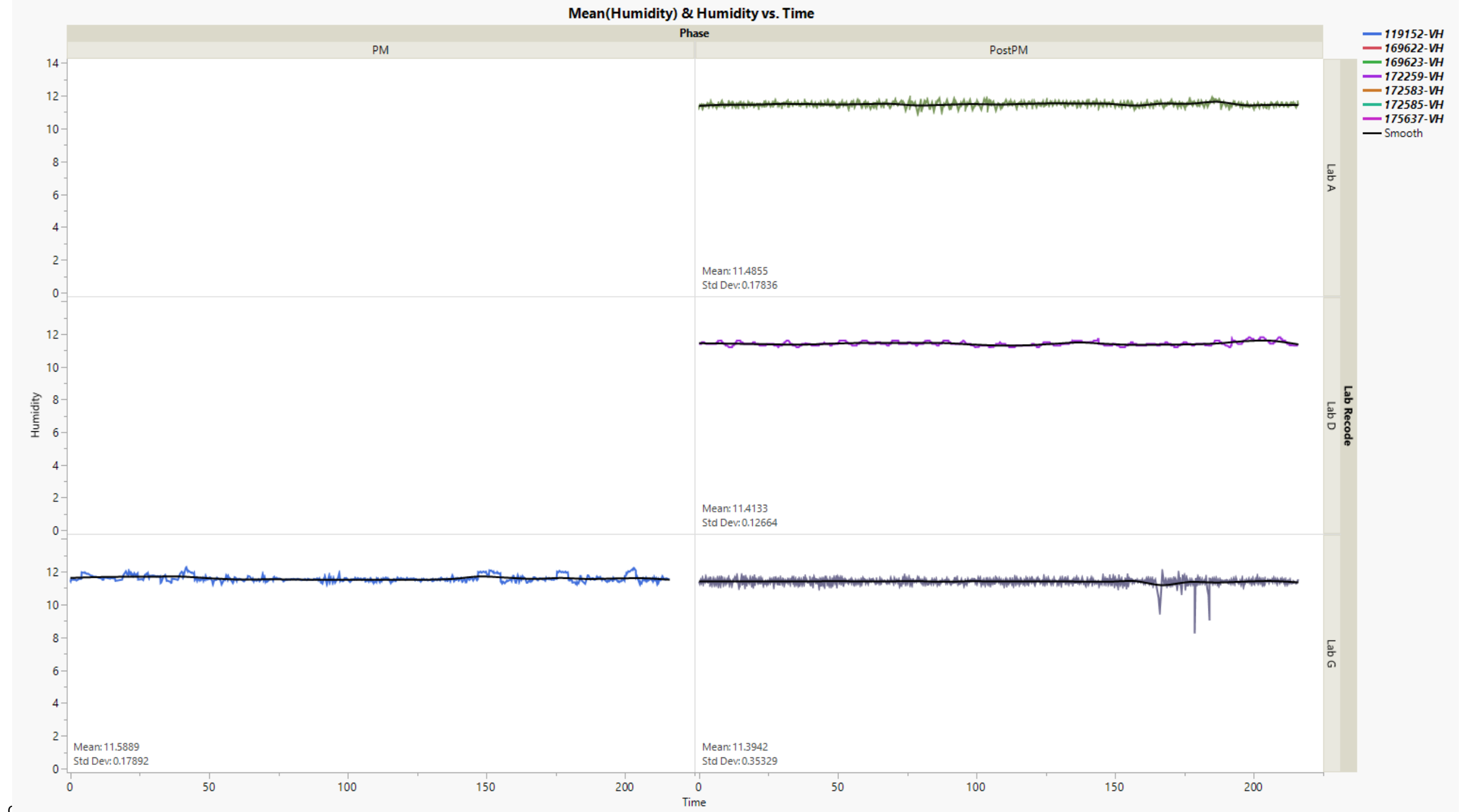

Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - RAC
Time
Mean: 15.0016
Std Dev: 0.03218
Mean: 14.9991
Std Dev: 0.00709
Mean: 14.9907
Std Dev: 0.08698
Mean: 14.9954
Std Dev: 0.06223
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

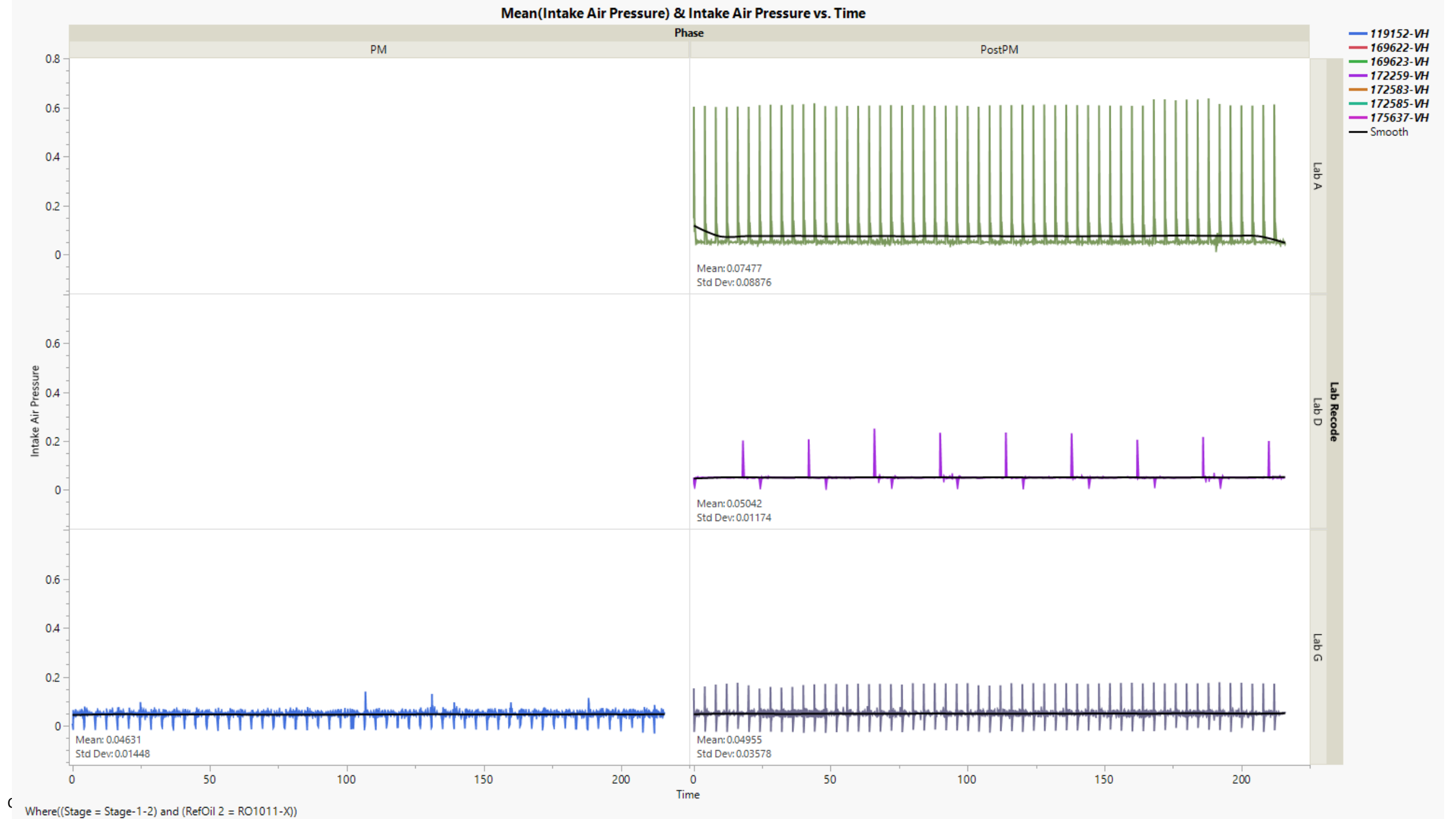


Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

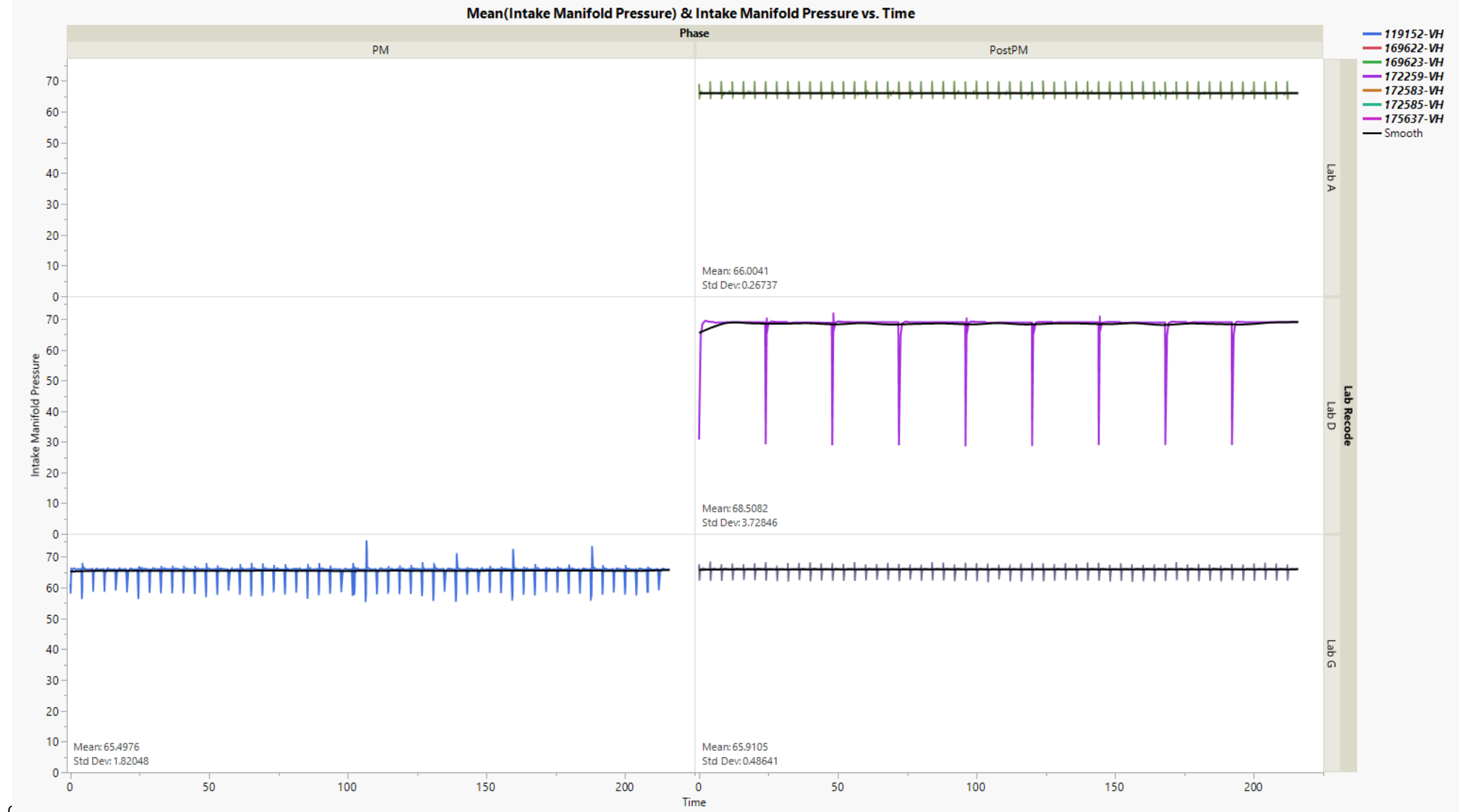

Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Pressure
Time
Mean: 253.256
Std Dev: 0.83322
Mean: 247.122
Std Dev: 3.38775
Mean: 289.589
Std Dev: 0.75708
Mean: 253.765
Std Dev: 8.36625
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))


Mean(Fuel Temp) & Fuel Temp vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Mean: 27.9684
Std Dev: 1.98711
Mean: 34.3018
Std Dev: 2.25348
Mean: .
Std Dev: .
Mean: 27.2262
Std Dev: 2.29203
Fuel Temp
Time
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

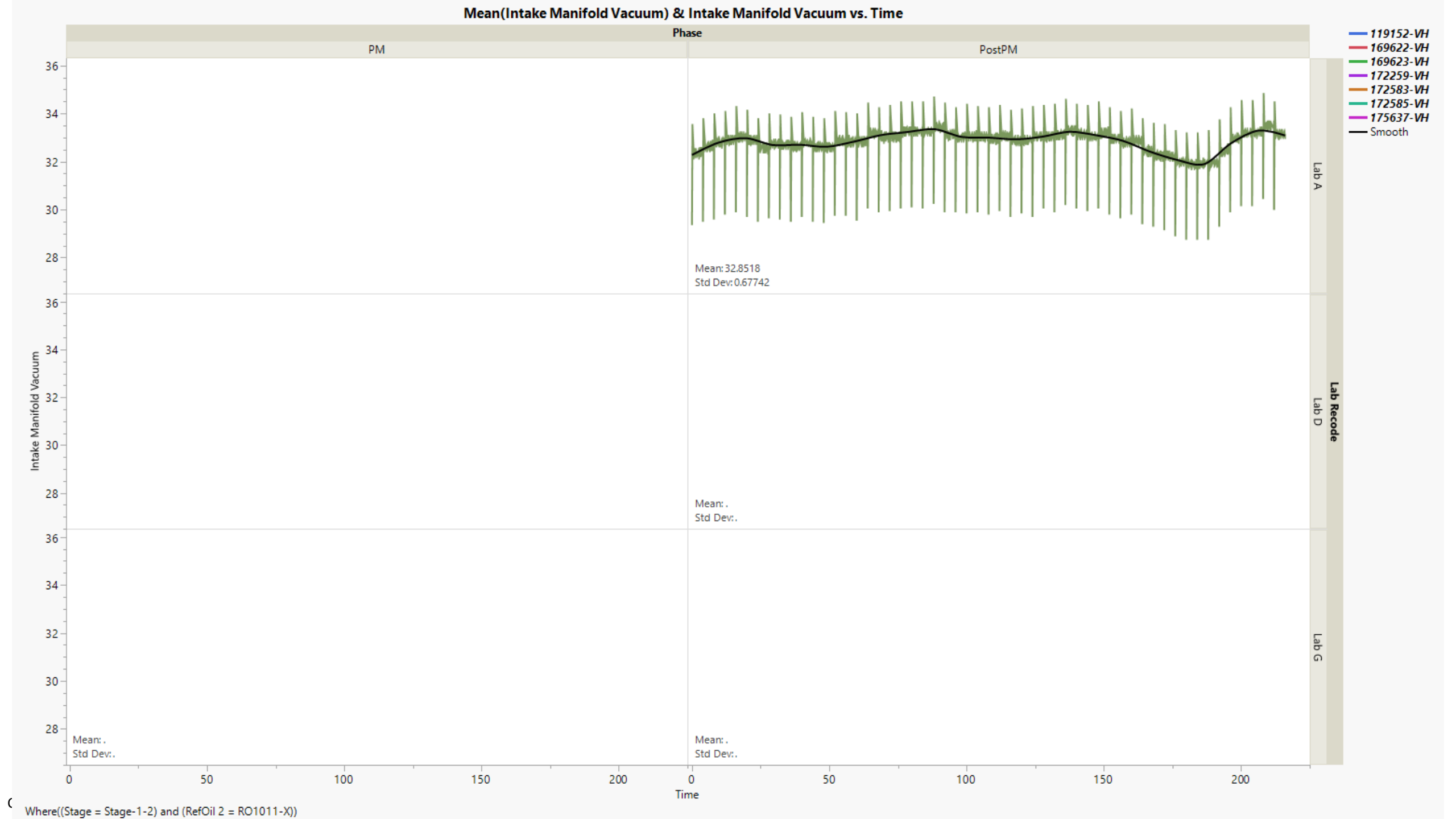

Mean(Humidity) & Humidity vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Humidity
Time
Mean: 11.4855
Std Dev: 0.17836
Mean: 11.4133
Std Dev: 0.12664
Mean: 11.5889
Std Dev: 0.17892
Mean: 11.3942
Std Dev: 0.35329
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

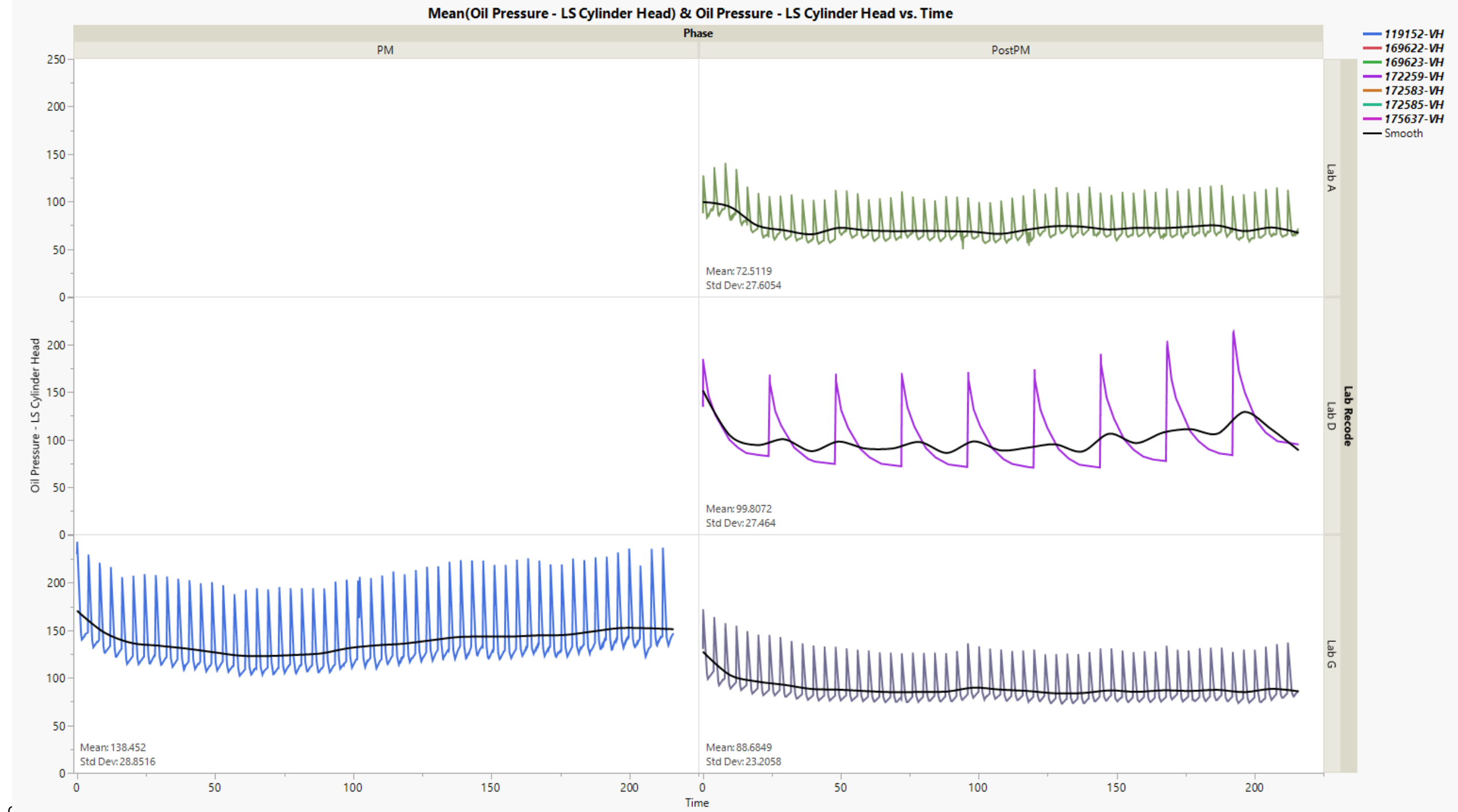

Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Pressure
Time
Mean: 0.07477
Std Dev: 0.08876
Mean: 0.05042
Std Dev: 0.01174
Mean: 0.04631
Std Dev: 0.01448
Mean: 0.04955
Std Dev: 0.03578
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

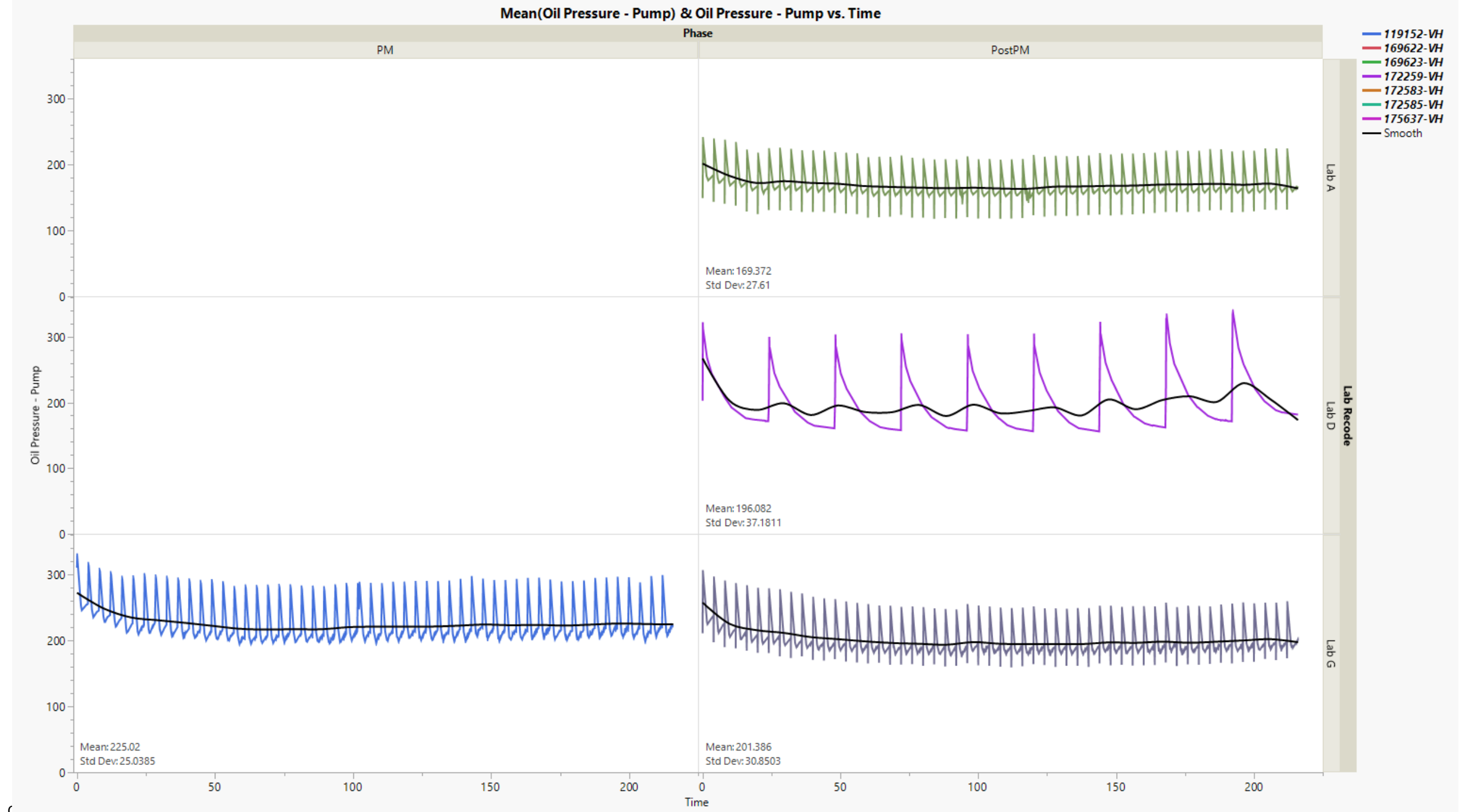
Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Temperature
Time
Mean: 29.8414
Std Dev: 0.33875
Mean: 29.9954
Std Dev: 0.34583
Mean: 29.6312
Std Dev: 0.64552
Mean: 29.7136
Std Dev: 0.60283
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))



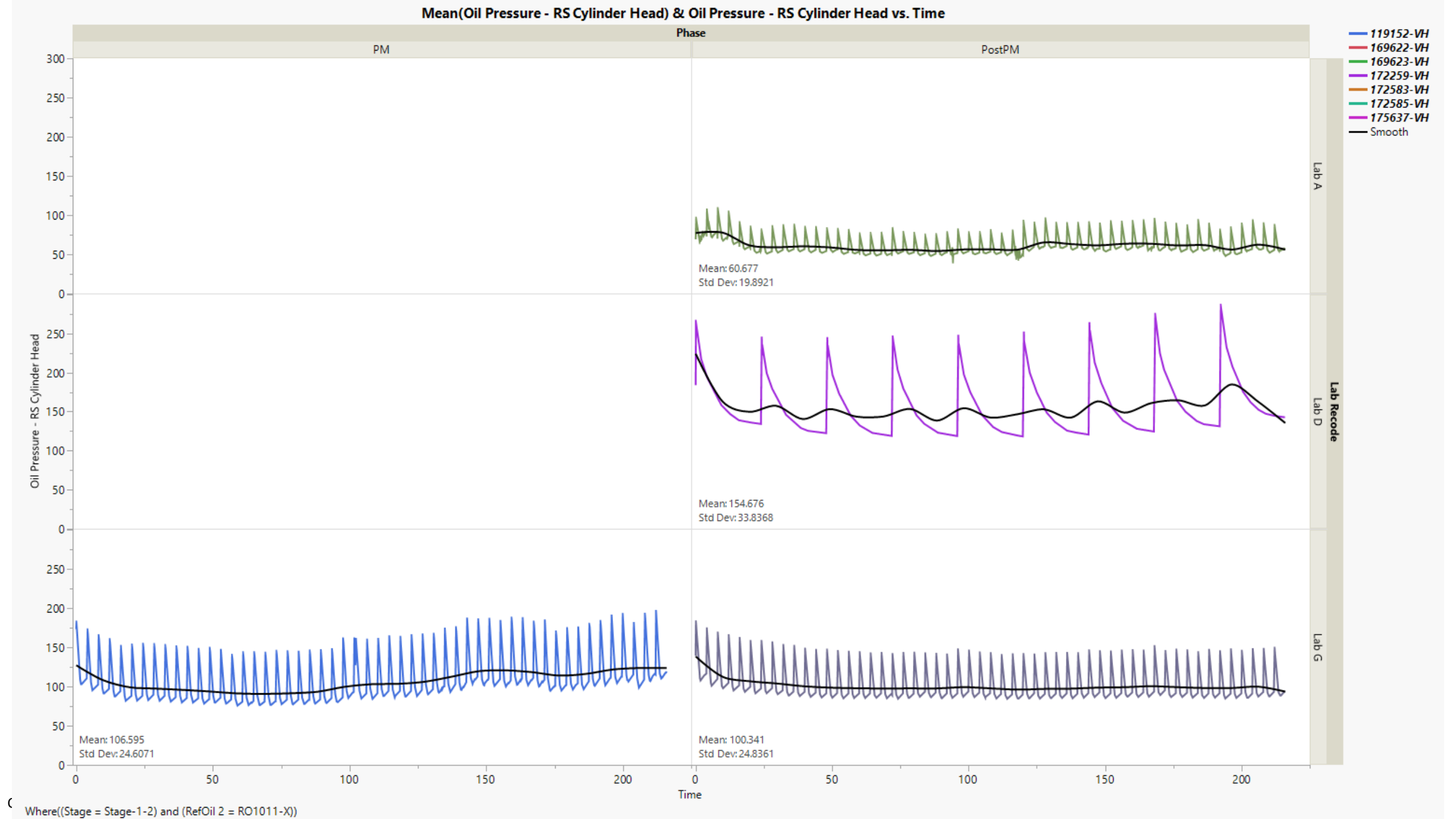
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

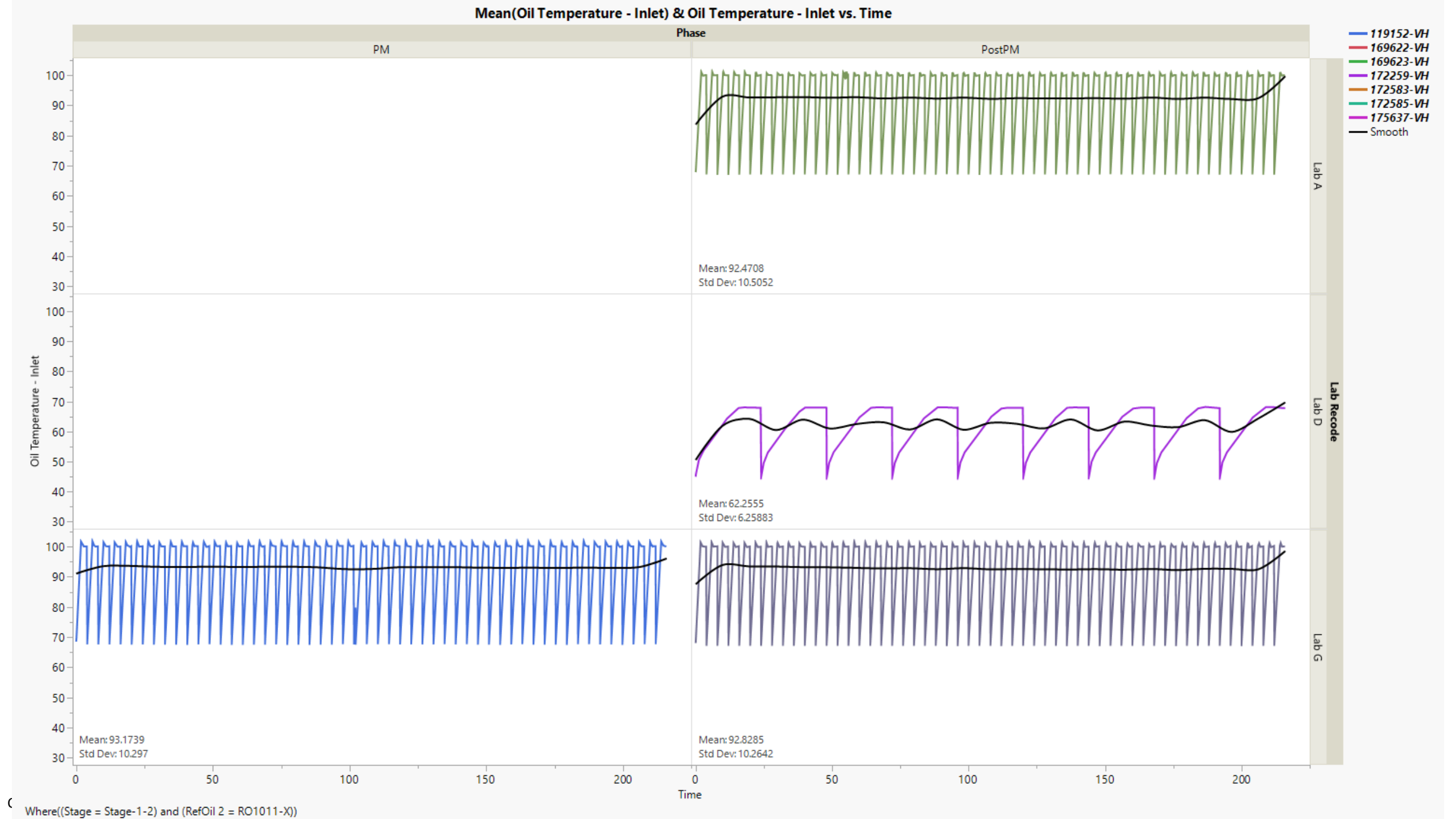

Mean(Intake Manifold Vacuum) & Intake Manifold Vacuum vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Vacuum
Time
Mean: 32.8518
Std Dev: 0.67742
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

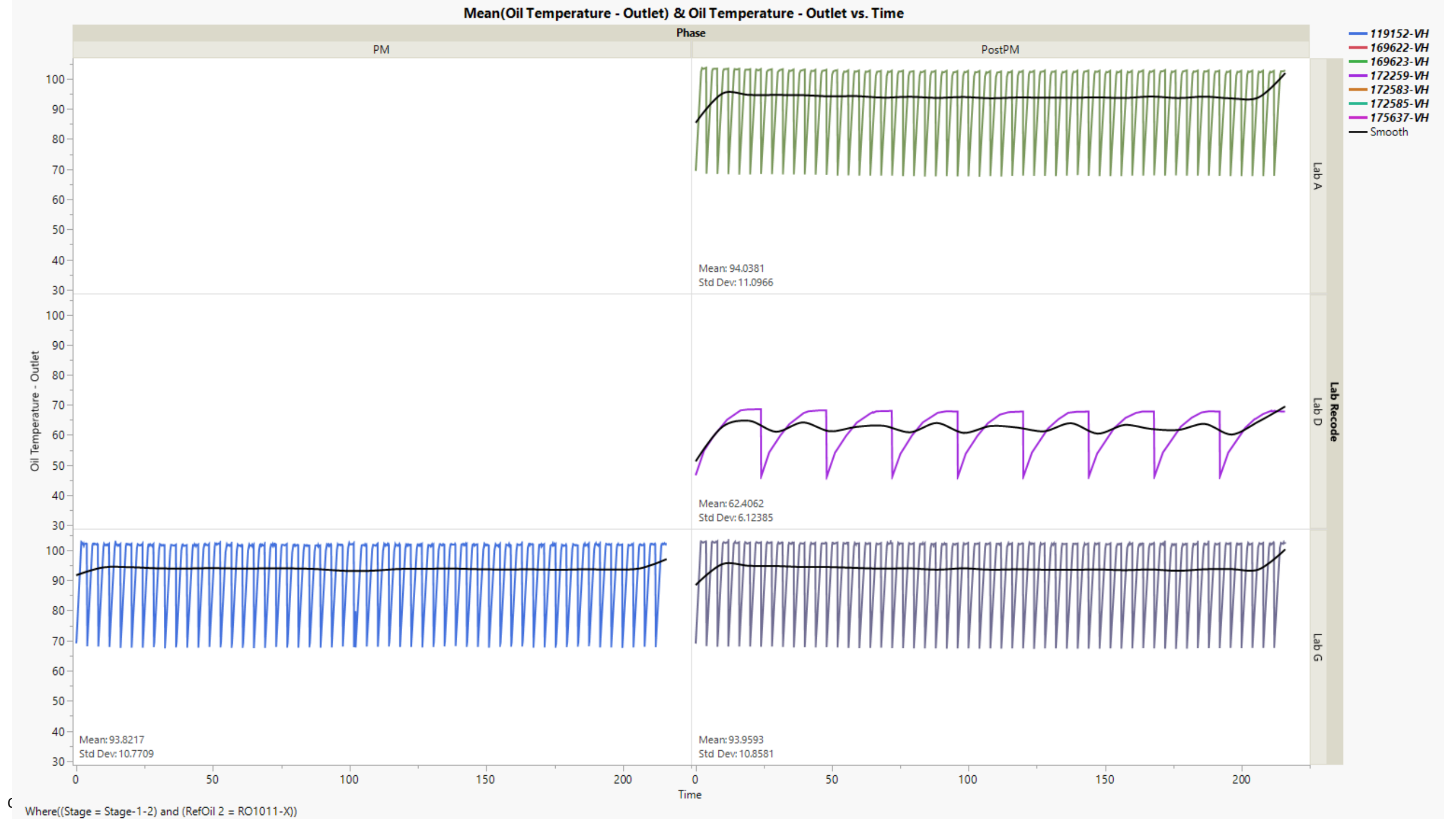

Mean(Oil Pressure - LS Cylinder Head) & Oil Pressure - LS Cylinder Head vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Pressure - LS Cylinder Head
Mean: 72.5119
Std Dev: 27.6054
Mean: 99.8072
Std Dev: 27.464
Mean: 138.452
Std Dev: 28.8516
Mean: 88.6849
Std Dev: 23.2058
Time
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))



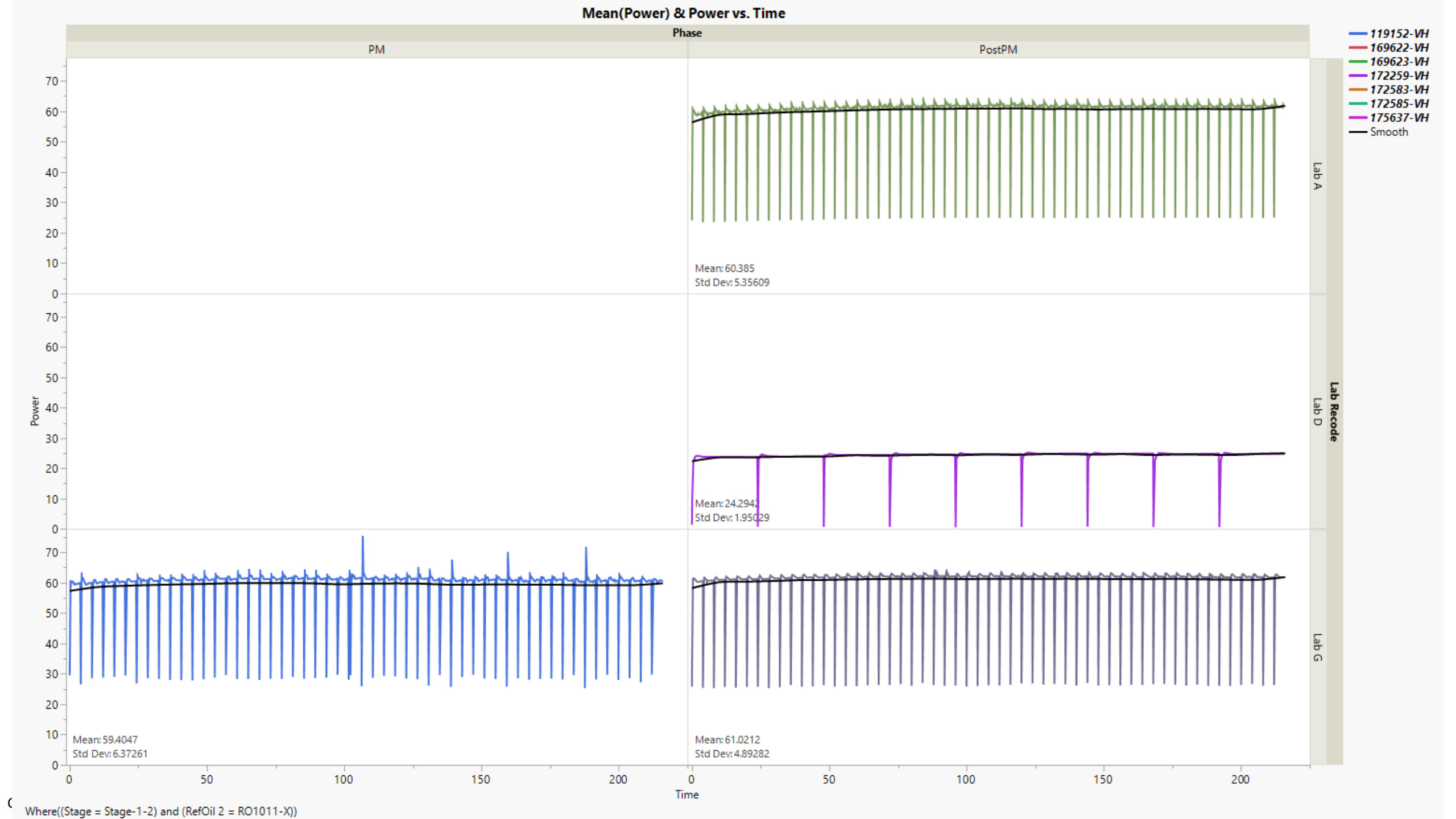
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

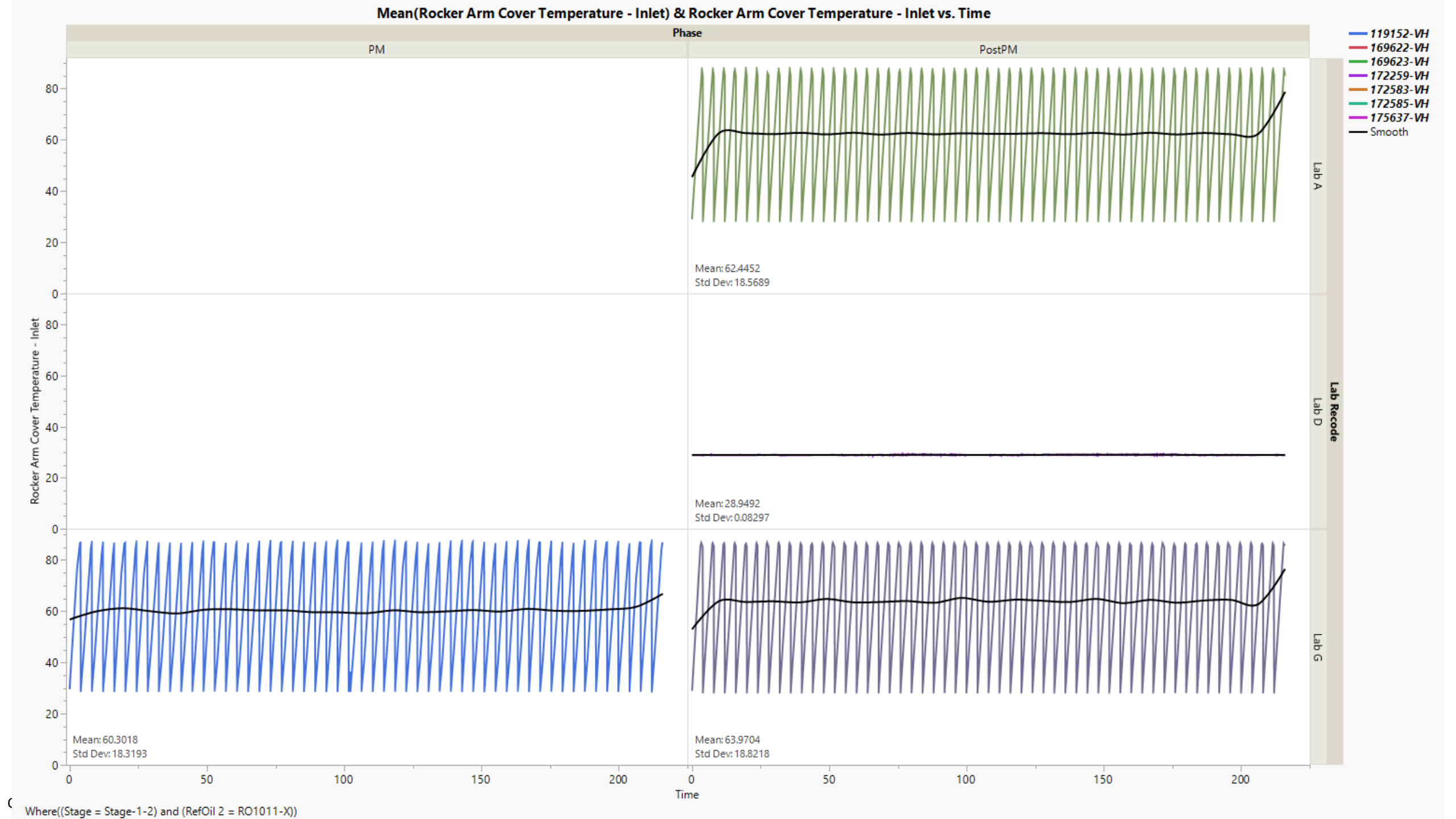

Mean(Oil Pressure - RS Cylinder Head) & Oil Pressure - RS Cylinder Head vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Pressure - RS Cylinder Head
Time
Mean: 60.677
Std Dev: 19.8921
Mean: 154.676
Std Dev: 33.8368
Mean: 106.595
Std Dev: 24.6071
Mean: 100.341
Std Dev: 24.8361
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

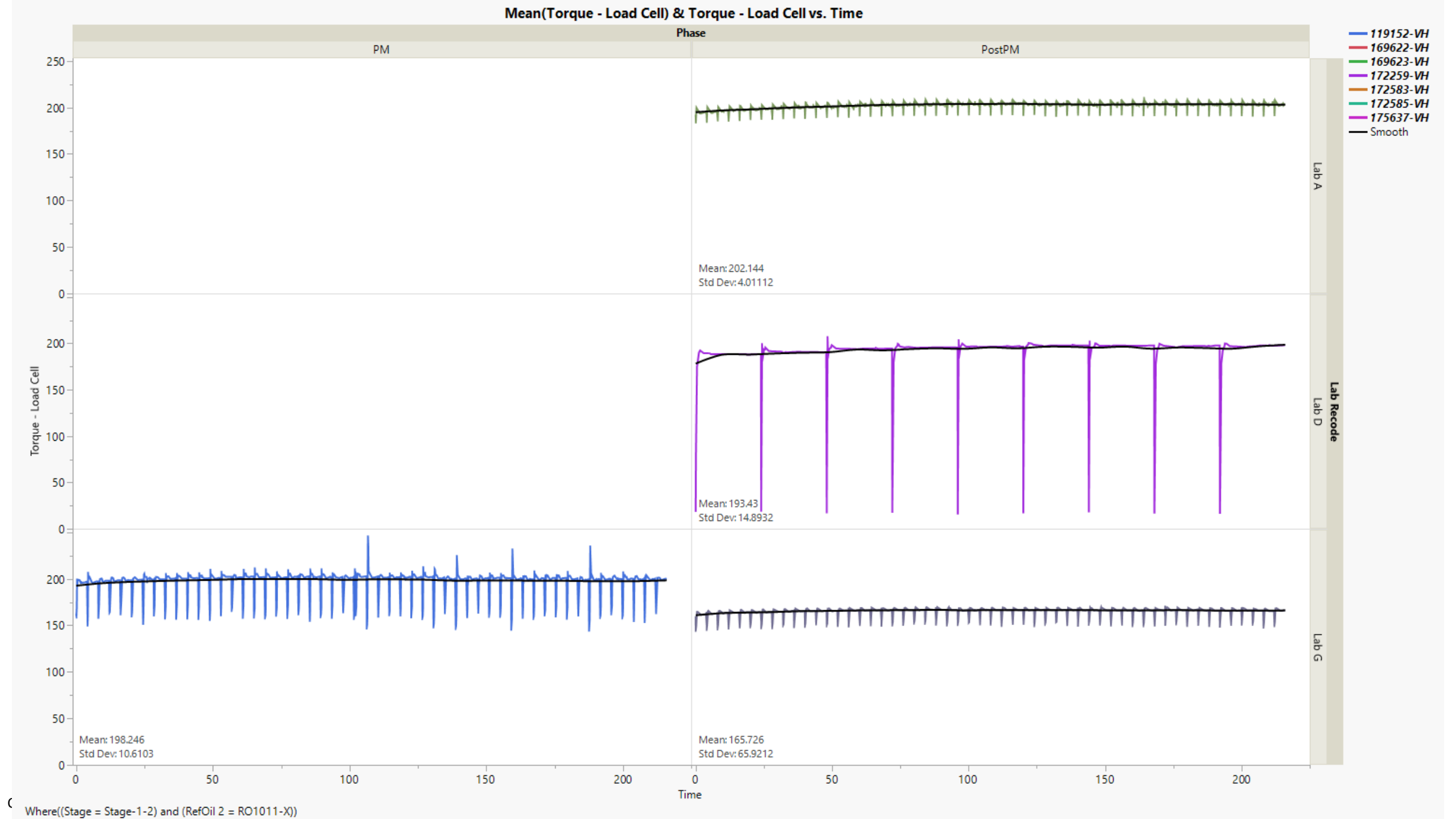

Mean(Oil Temperature - Inlet) & Oil Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Temperature - Inlet
Time
Mean: 92.4708
Std Dev: 10.5052
Mean: 62.2555
Std Dev: 6.25883
Mean: 93.1739
Std Dev: 10.297
Mean: 92.8285
Std Dev: 10.2642
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))



Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))


Mean(Power) & Power vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Power
Time
Mean: 60.385
Std Dev: 5.35609
Mean: 24.2942
Std Dev: 1.95029
Mean: 59.4047
Std Dev: 6.37261
Mean: 61.0212
Std Dev: 4.89282
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))


Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Rocker Arm Cover Temperature - Inlet
Mean: 62.4452
Std Dev: 18.5689
Mean: 28.9492
Std Dev: 0.08297
Mean: 60.3018
Std Dev: 18.3193
Mean: 63.9704
Std Dev: 18.8218
Time
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))


Mean(Torque - Load Cell) & Torque - Load Cell vs. Time
Phase
PM
PostPM
119152-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Torque - Load Cell
Time
Mean: 202.144
Std Dev: 4.01112
Mean: 193.43
Std Dev: 14.8932
Mean: 198.246
Std Dev: 10.6103
Mean: 165.726
Std Dev: 65.9212
Where((Stage = Stage-1-2) and (RefOil 2 = RO1011-X))

VH – Stage 1 Operational Data Plots

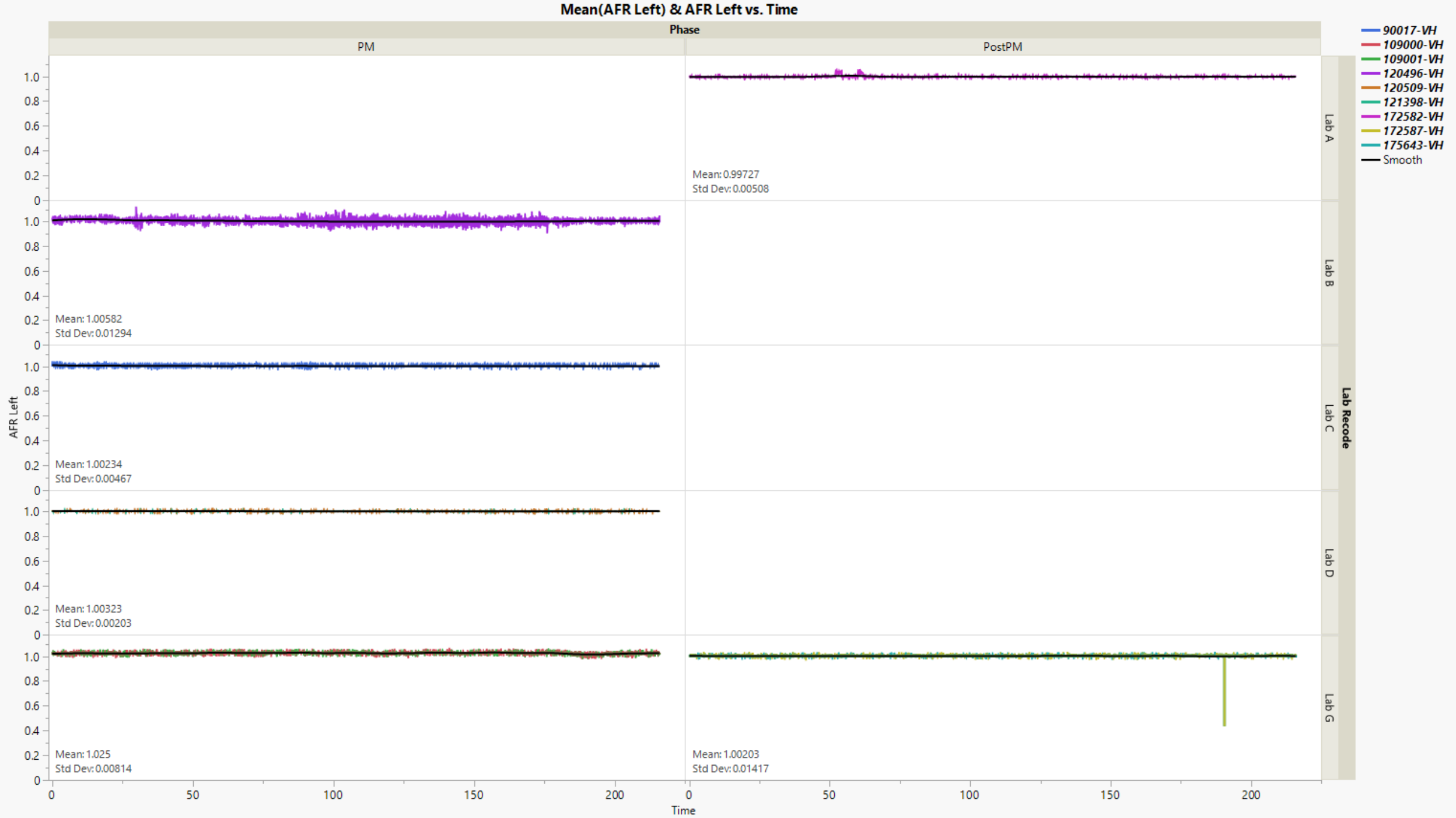
By: Todd Dvorak

08-05-24

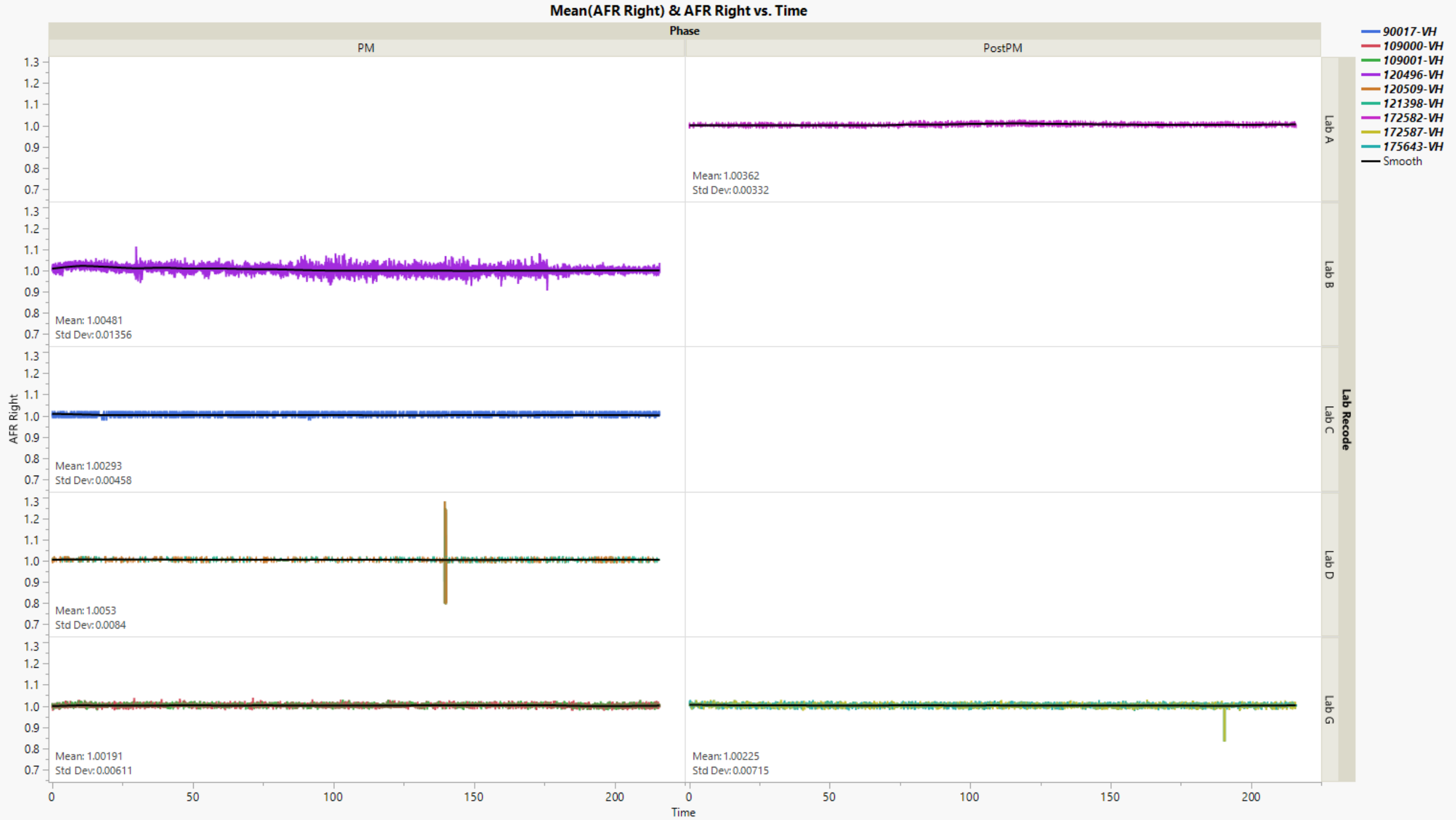
Classified as Confidential

RO 940 Data Plots

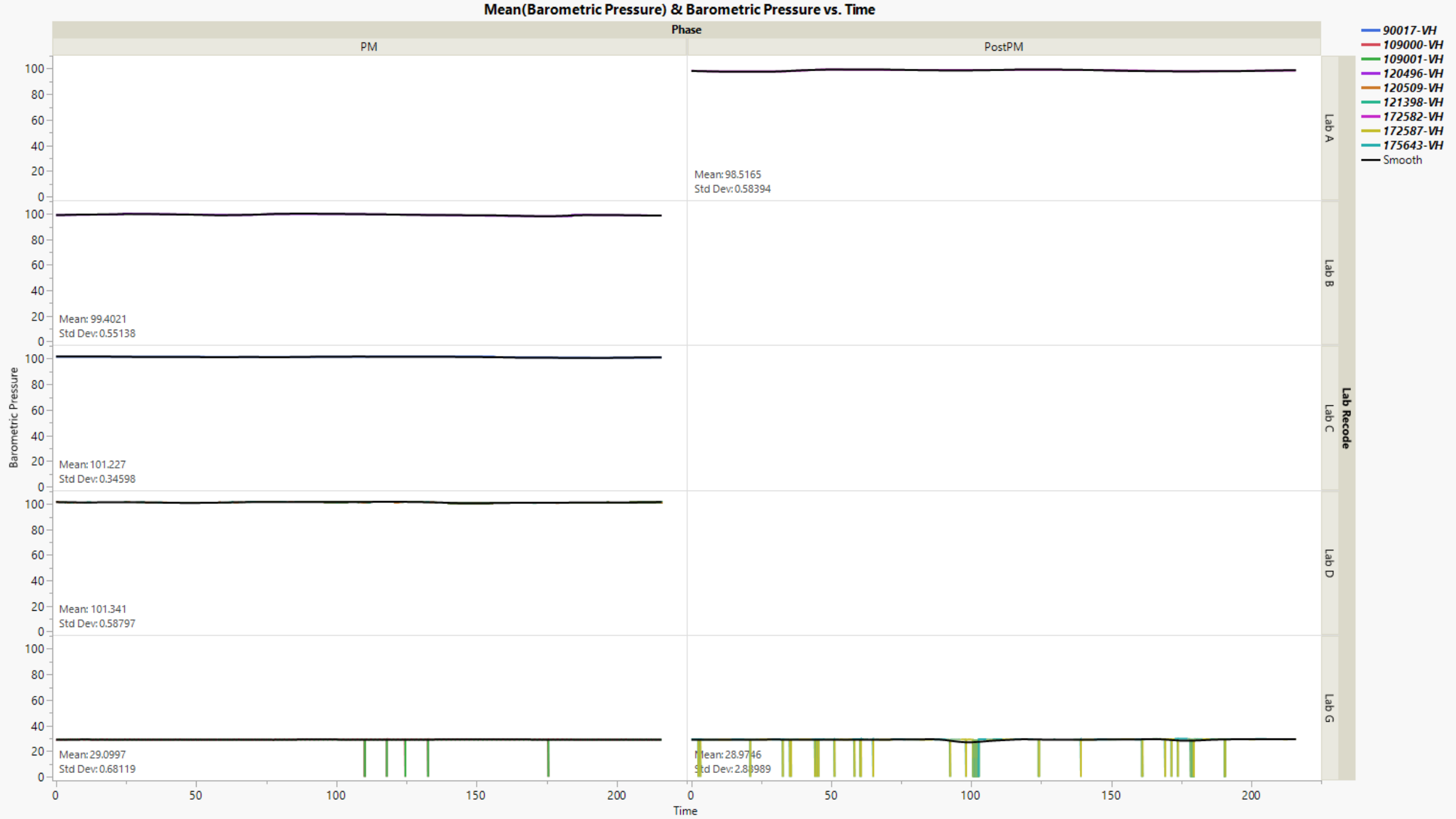
Classified as Confidential



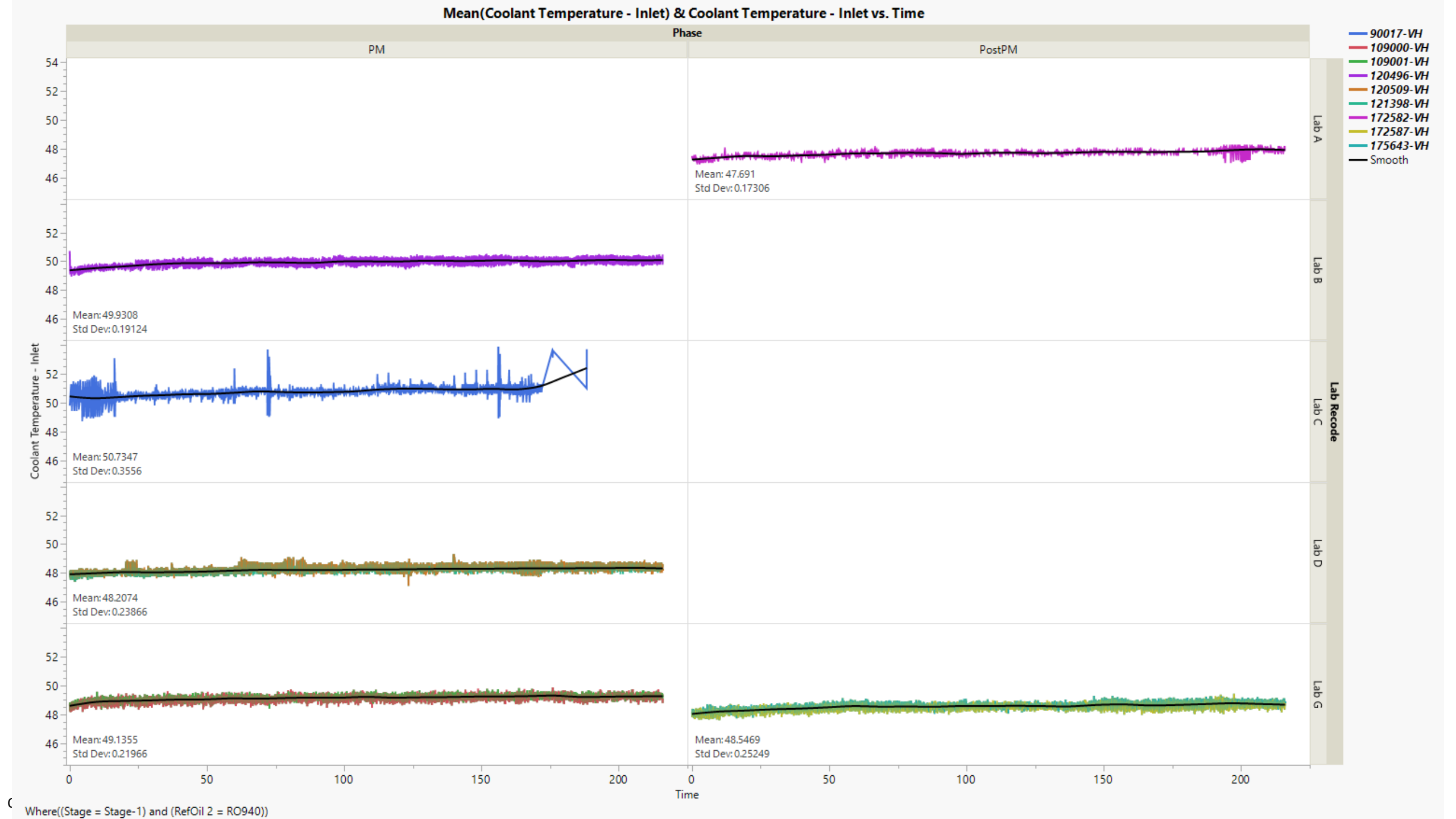
Where((Stage = Stage-1) and (RefOil 2 = RO940))



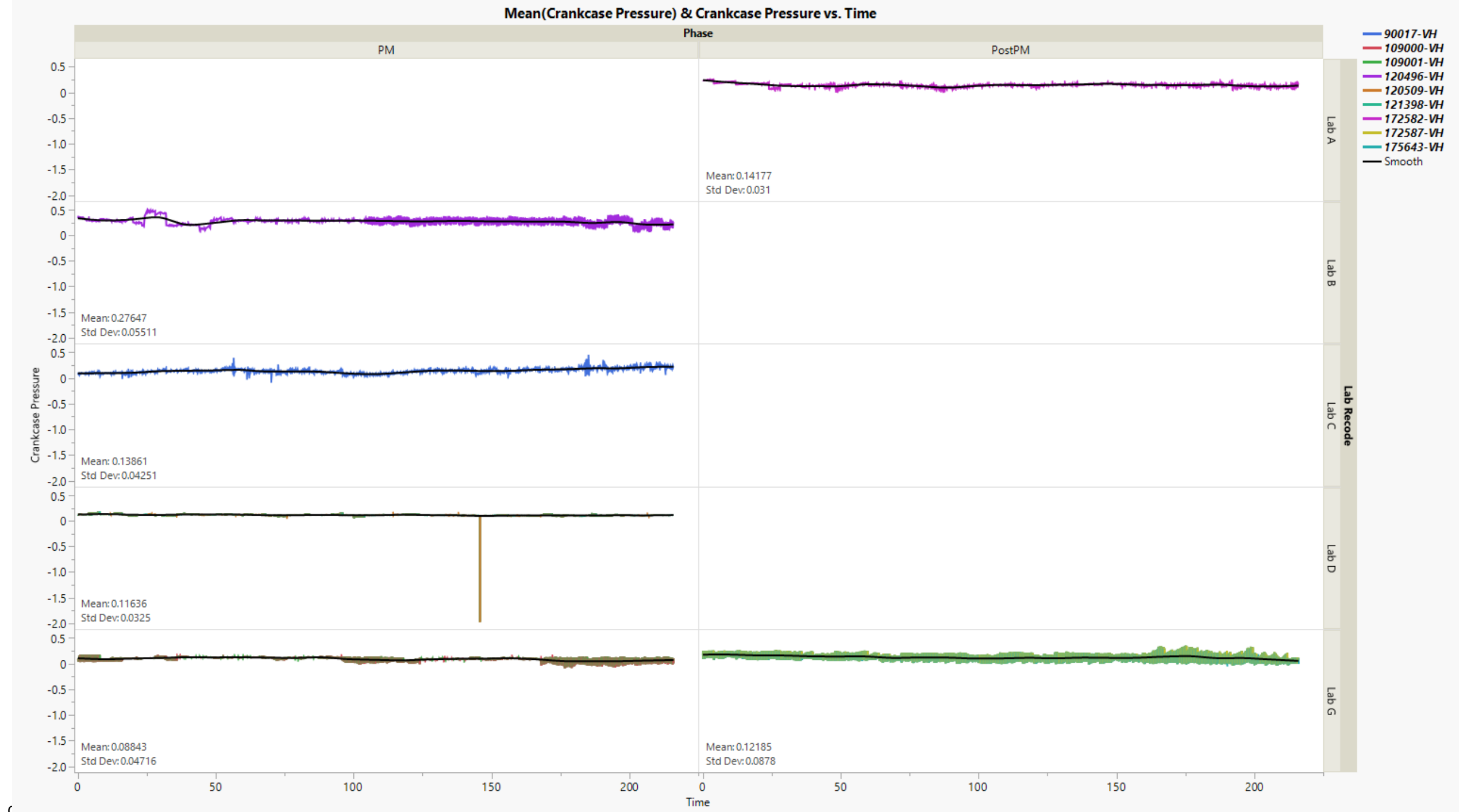
Where((Stage = Stage-1) and (RefOil 2 = RO940))

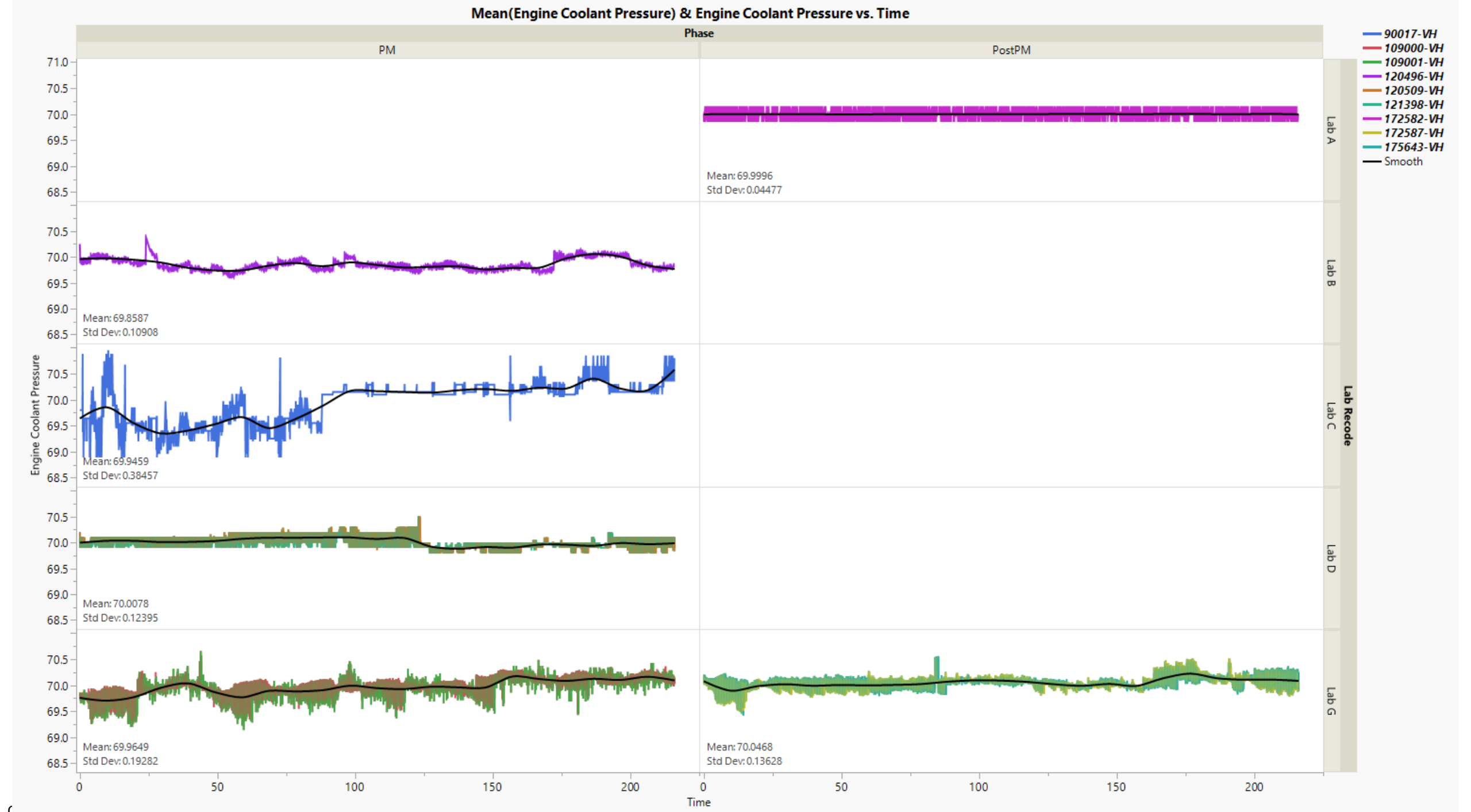


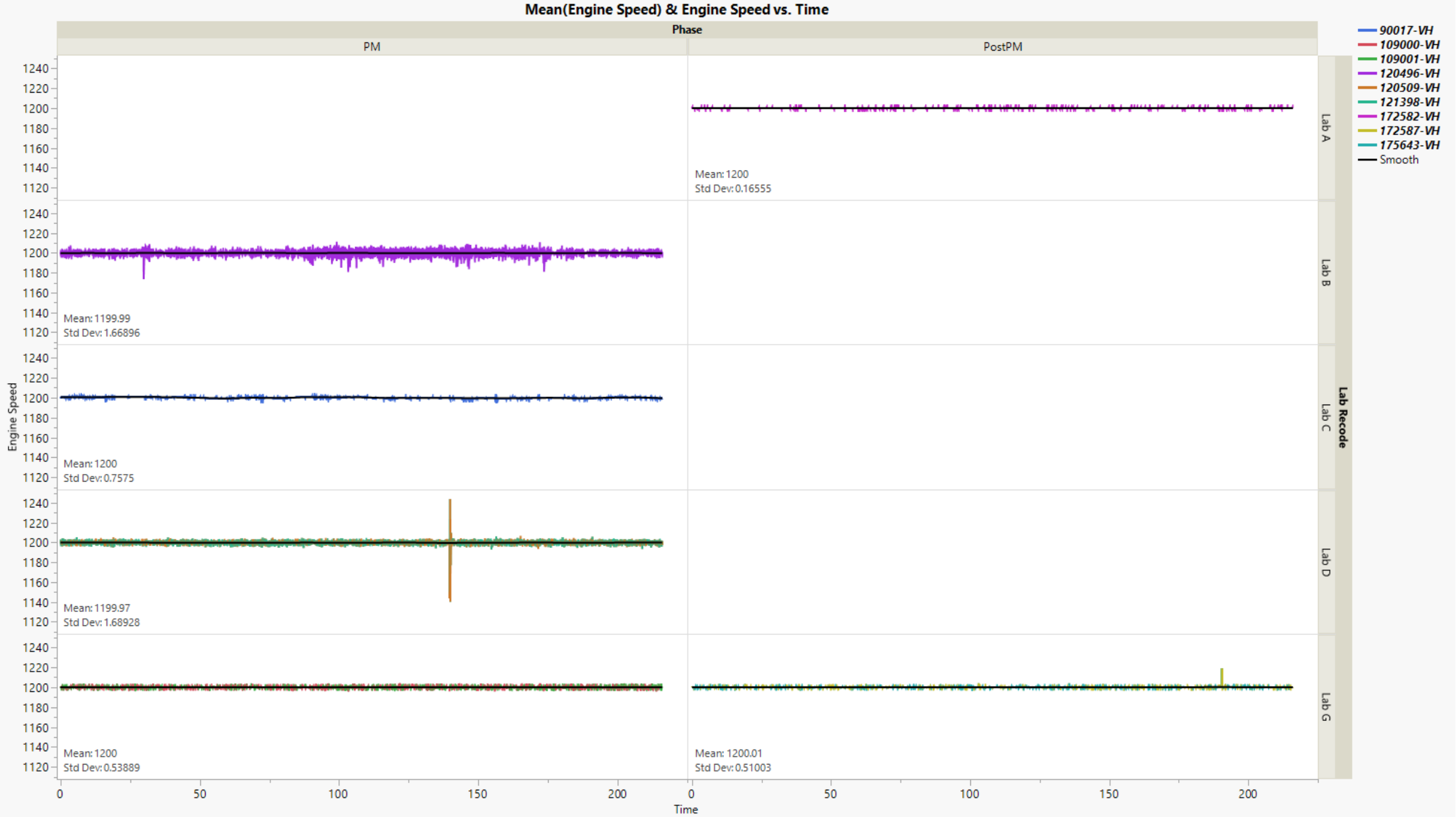
Where((Stage = Stage-1) and (RefOil 2 = RO940))


Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Coolant Temperature - Inlet
Time
Mean: 47.691
Std Dev: 0.17306
Mean: 49.9308
Std Dev: 0.19124
Mean: 50.7347
Std Dev: 0.3556
Mean: 48.2074
Std Dev: 0.23866
Mean: 49.1355
Std Dev: 0.21966
Mean: 48.5469
Std Dev: 0.25249
Where((Stage = Stage-1) and (RefOil 2 = RO940))

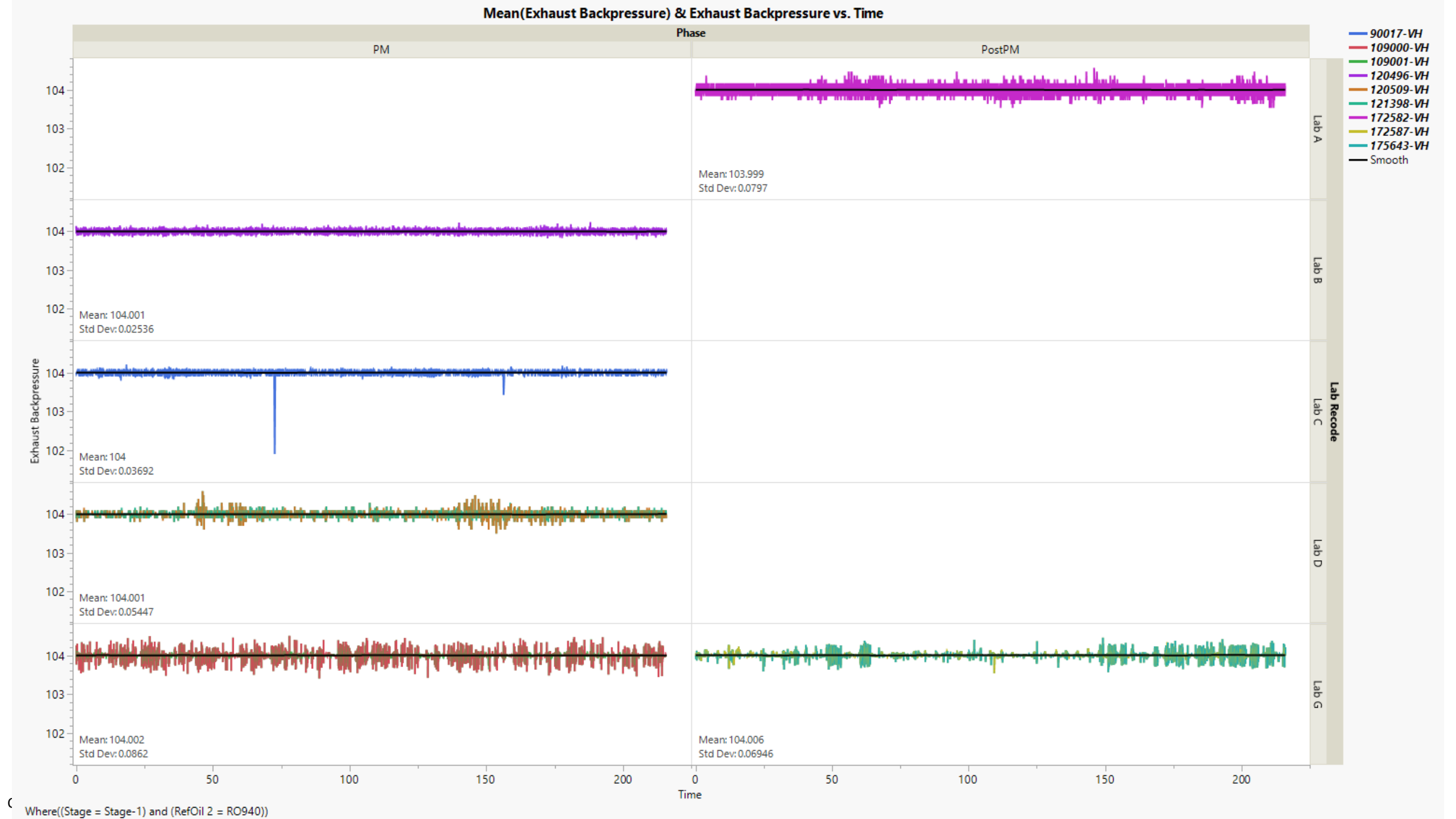
Where((Stage = Stage-1) and (RefOil 2 = RO940))

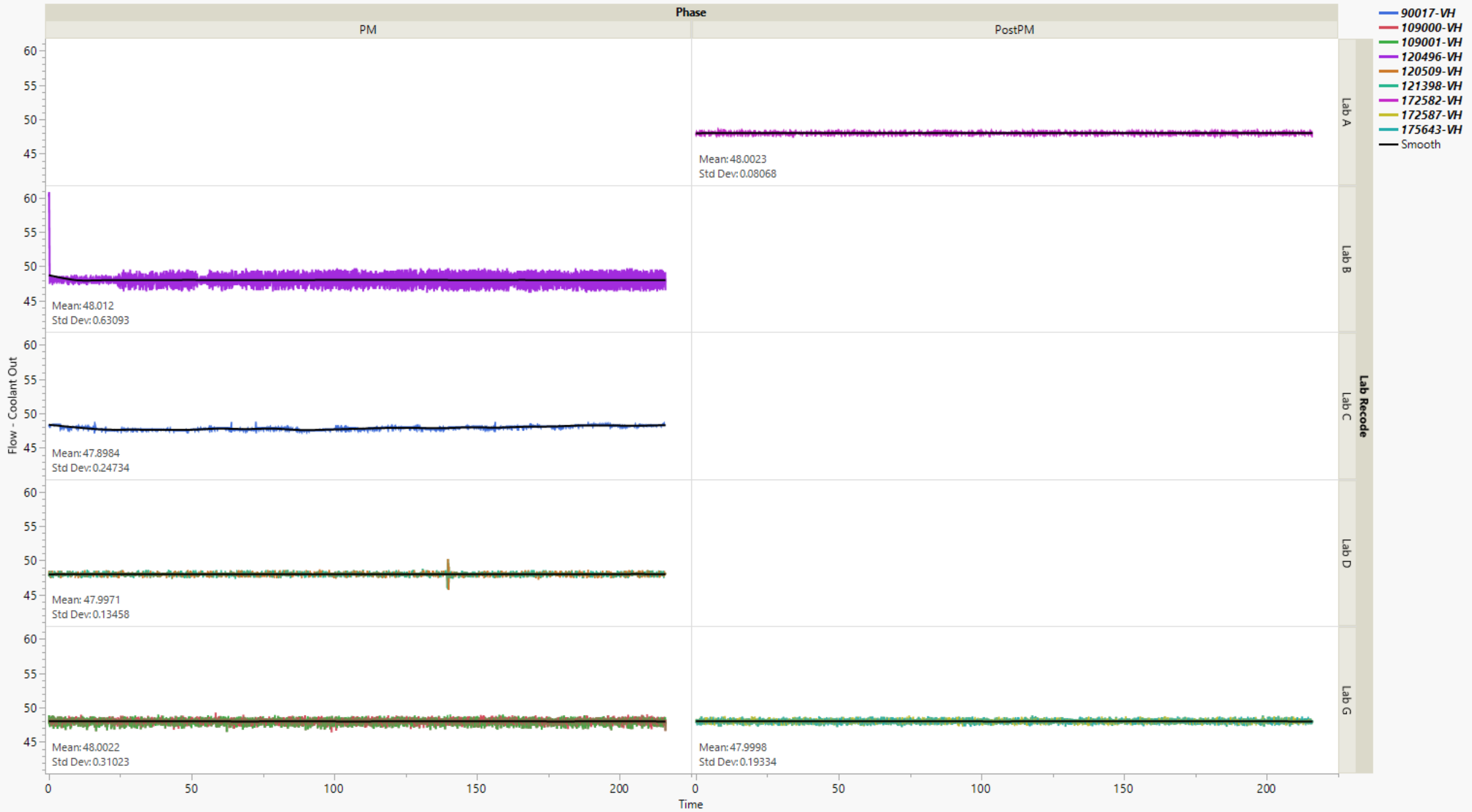

Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Crankcase Pressure
Time
Mean: 0.14177
Std Dev: 0.031
Mean: 0.27647
Std Dev: 0.05511
Mean: 0.13861
Std Dev: 0.04251
Mean: 0.11636
Std Dev: 0.0325
Mean: 0.08843
Std Dev: 0.04716
Mean: 0.12185
Std Dev: 0.0878
Where((Stage = Stage-1) and (RefOil 2 = RO940))


Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Engine Coolant Pressure
Time
Mean: 69.9996
Std Dev: 0.04477
Mean: 69.8587
Std Dev: 0.10908
Mean: 69.9459
Std Dev: 0.38457
Mean: 70.0078
Std Dev: 0.12395
Mean: 69.9649
Std Dev: 0.19282
Mean: 70.0468
Std Dev: 0.13628
Where((Stage = Stage-1) and (RefOil 2 = RO940))

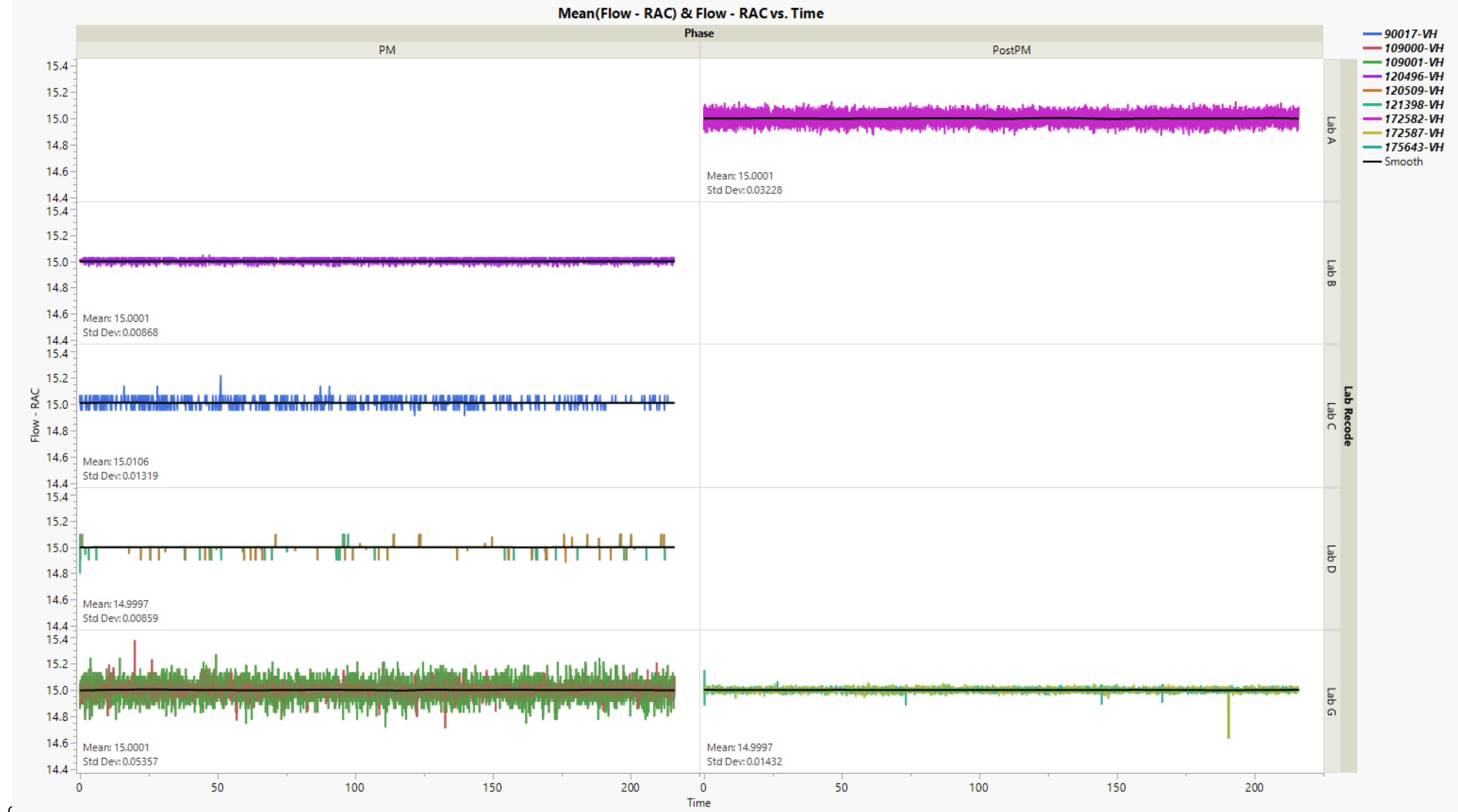


Where((Stage = Stage-1) and (RefOil 2 = RO940))

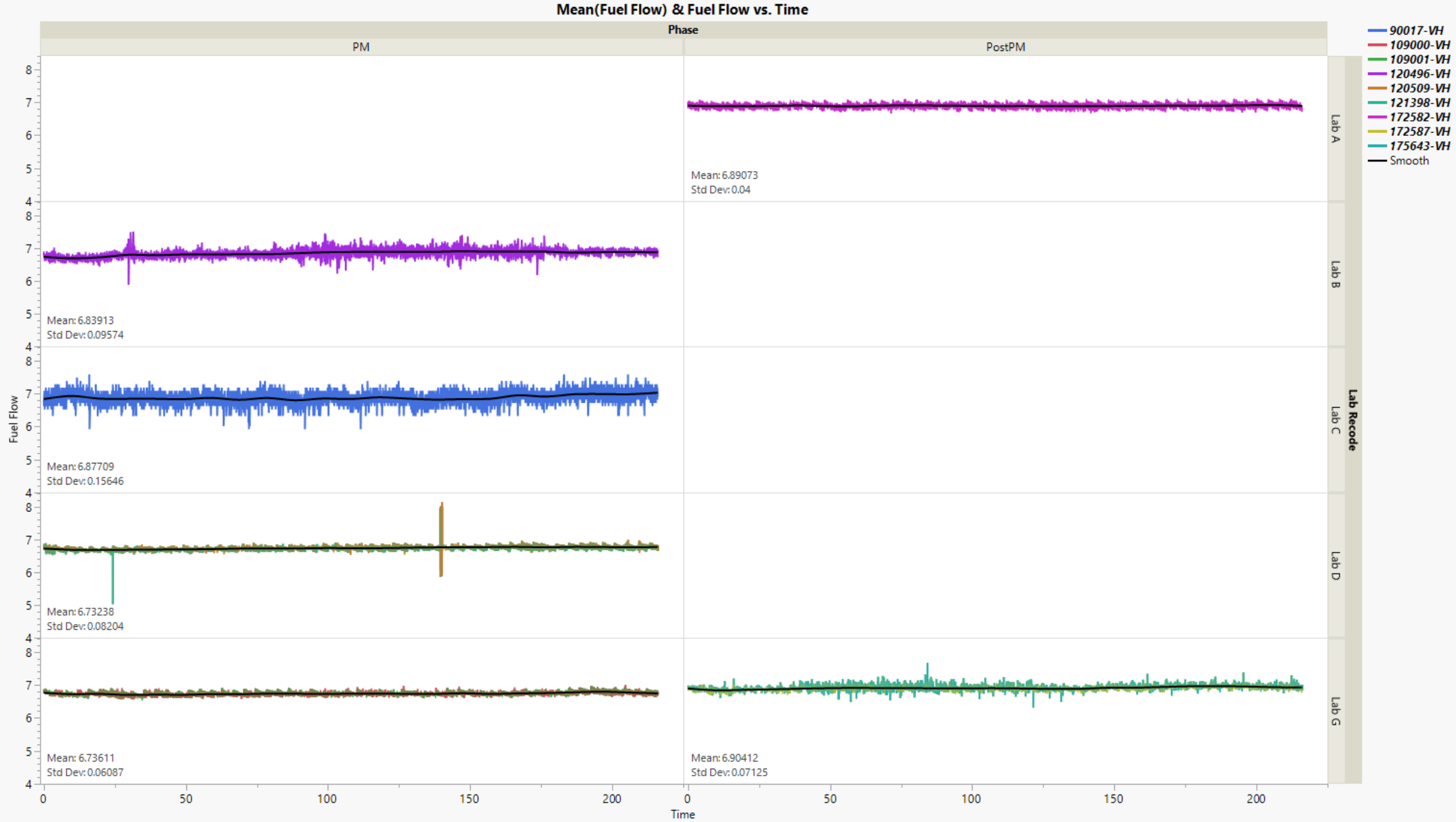

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Exhaust Backpressure
Time
Mean: 103.999
Std Dev: 0.0797
Mean: 104.001
Std Dev: 0.02536
Mean: 104
Std Dev: 0.03692
Mean: 104.001
Std Dev: 0.05447
Mean: 104.002
Std Dev: 0.0862
Mean: 104.006
Std Dev: 0.06946
Where((Stage = Stage-1) and (RefOil 2 = RO940))

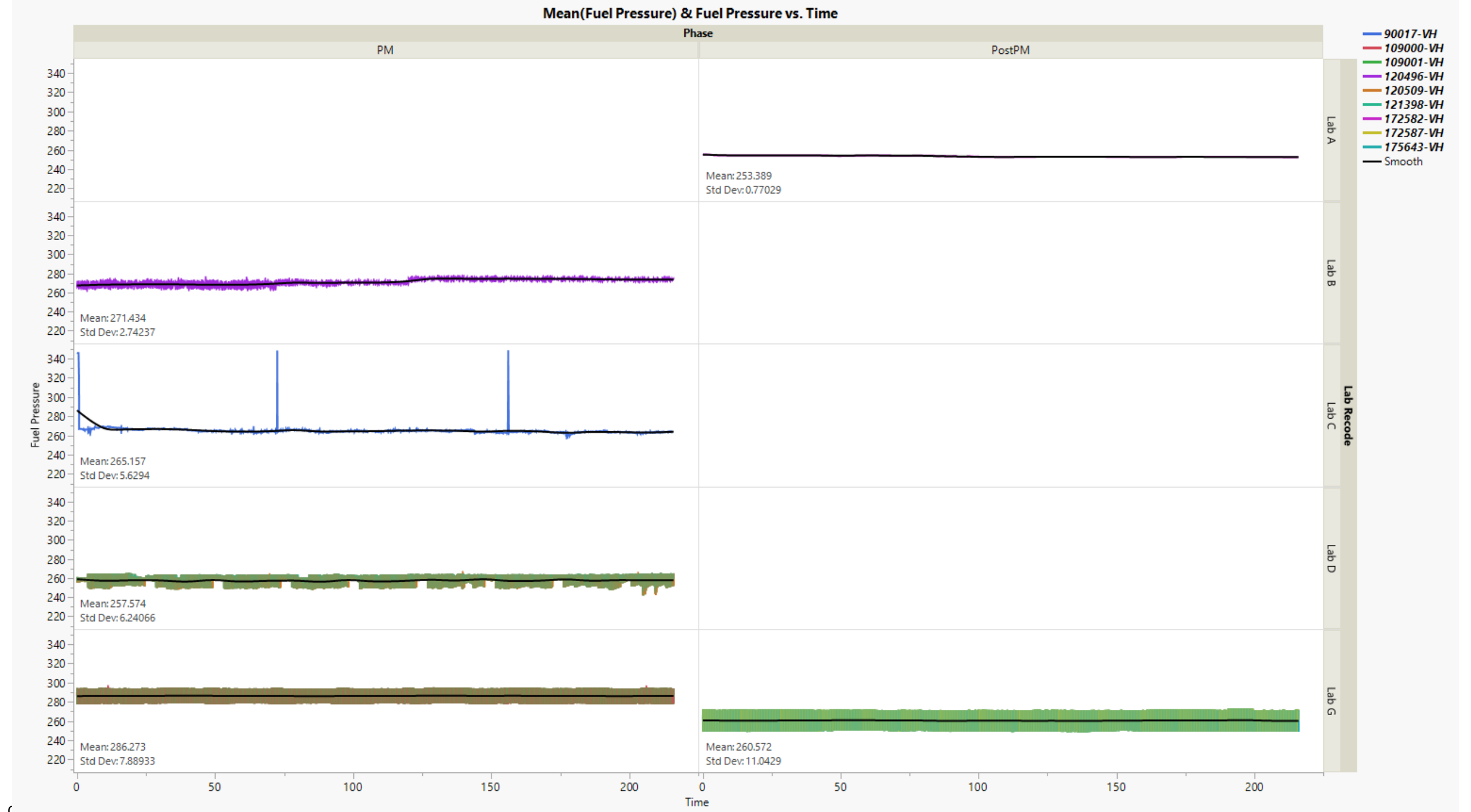


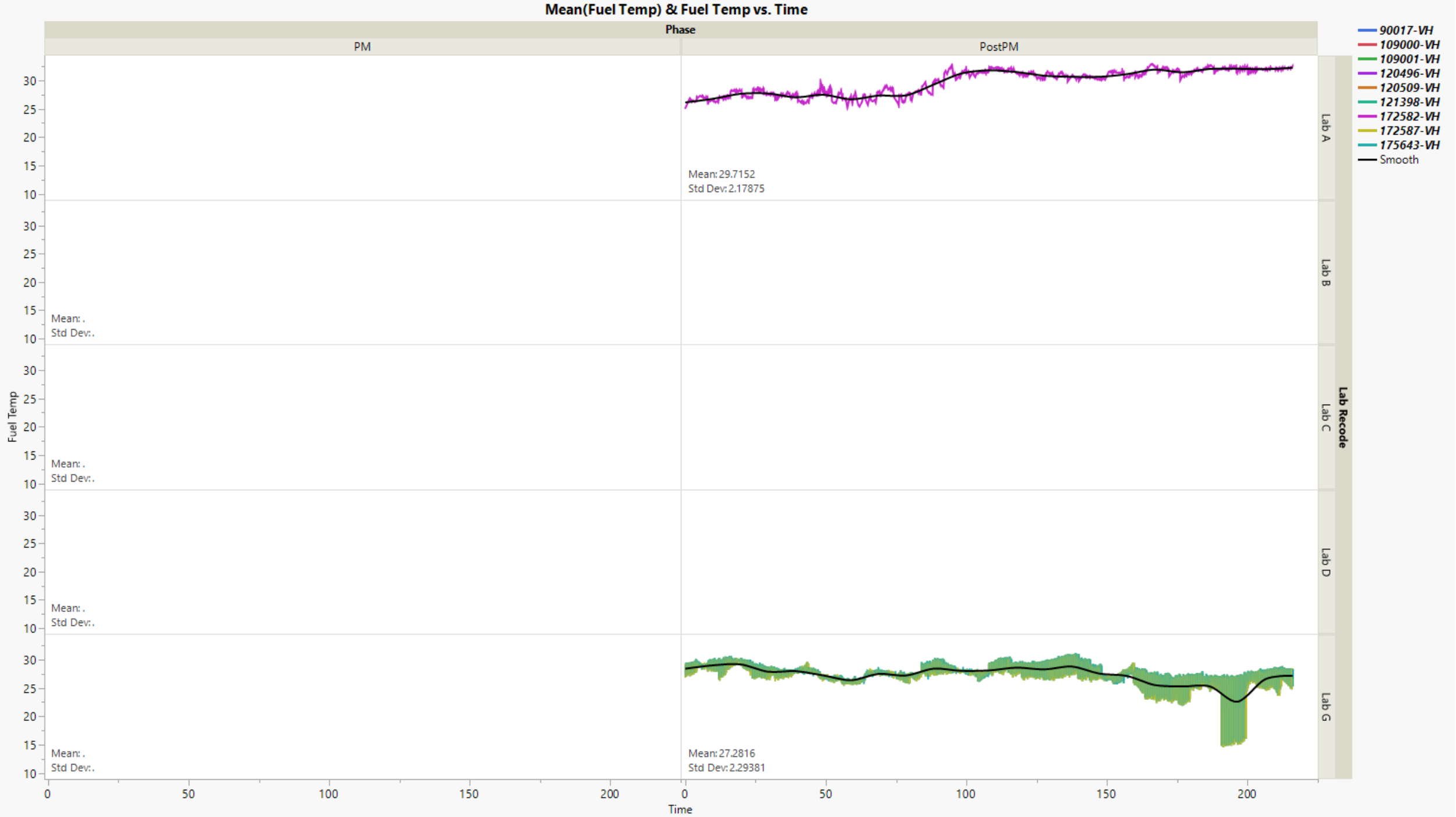
Where((Stage = Stage-1) and (RefOil 2 = RO940))



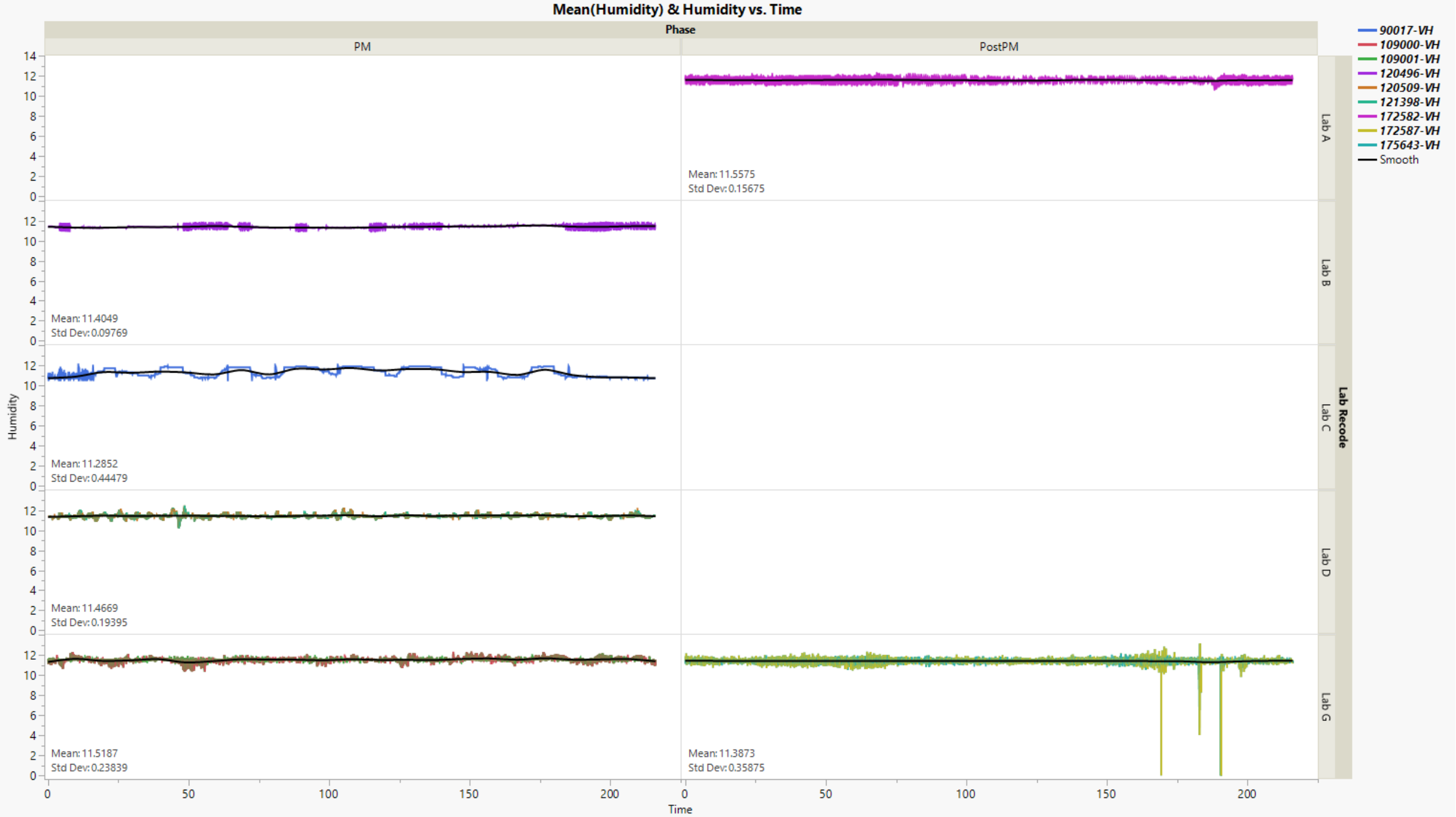
Where((Stage = Stage-1) and (RefOil 2 = RO940))


Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 6.89073
Std Dev: 0.04
Mean: 6.83913
Std Dev: 0.09574
Mean: 6.87709
Std Dev: 0.15646
Mean: 6.73238
Std Dev: 0.08204
Mean: 6.73611
Std Dev: 0.06087
Mean: 6.90412
Std Dev: 0.07125
Fuel Flow
Time
Where((Stage = Stage-1) and (RefOil 2 = RO940))


Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Fuel Pressure
Time
Mean: 253.389
Std Dev: 0.77029
Mean: 271.434
Std Dev: 2.74237
Mean: 265.157
Std Dev: 5.6294
Mean: 257.574
Std Dev: 6.24066
Mean: 286.273
Std Dev: 7.88933
Mean: 260.572
Std Dev: 11.0429
Where((Stage = Stage-1) and (RefOil 2 = RO940))



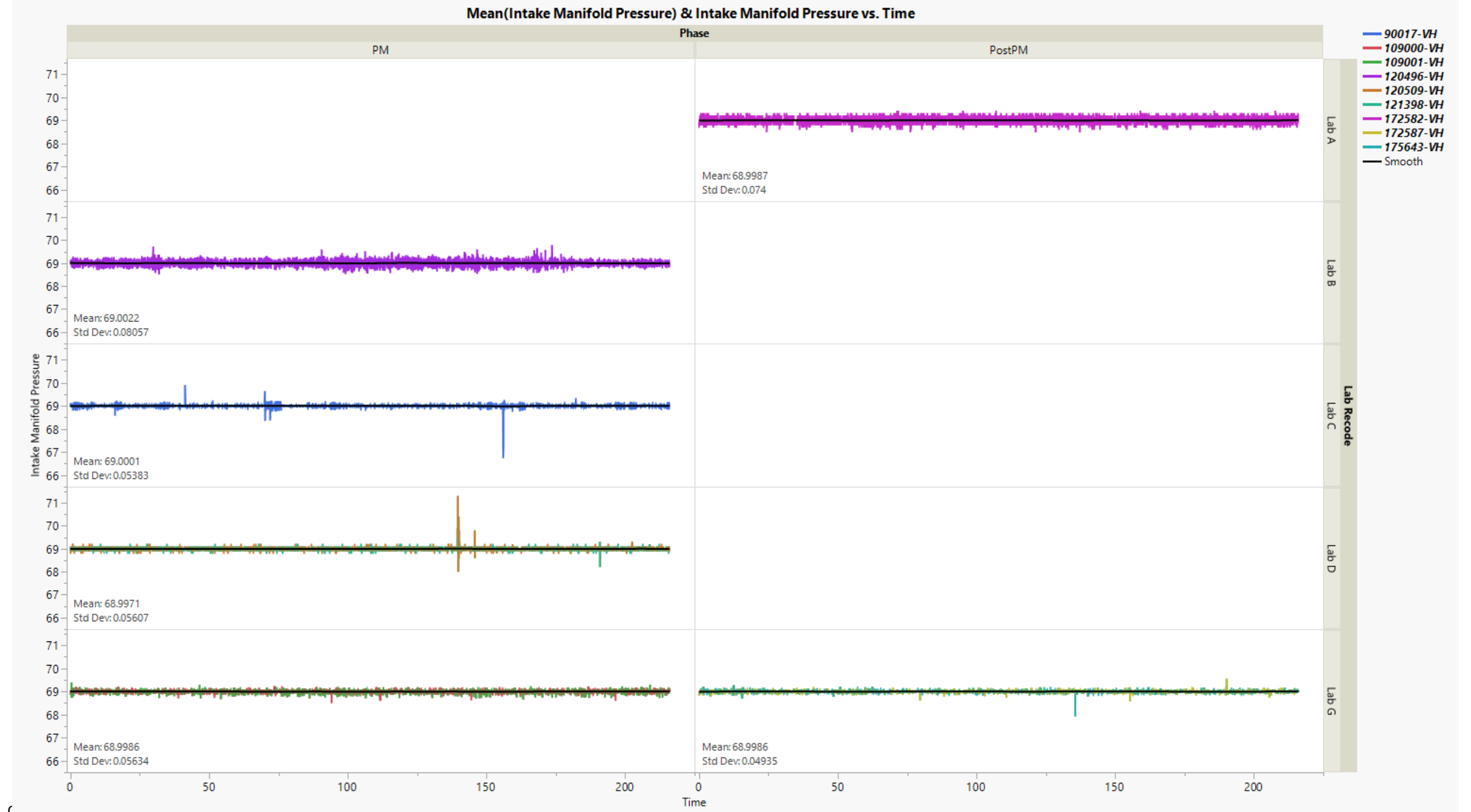
Where((Stage = Stage-1) and (RefOil 2 = RO940))



Where((Stage = Stage-1) and (RefOil 2 = RO940))

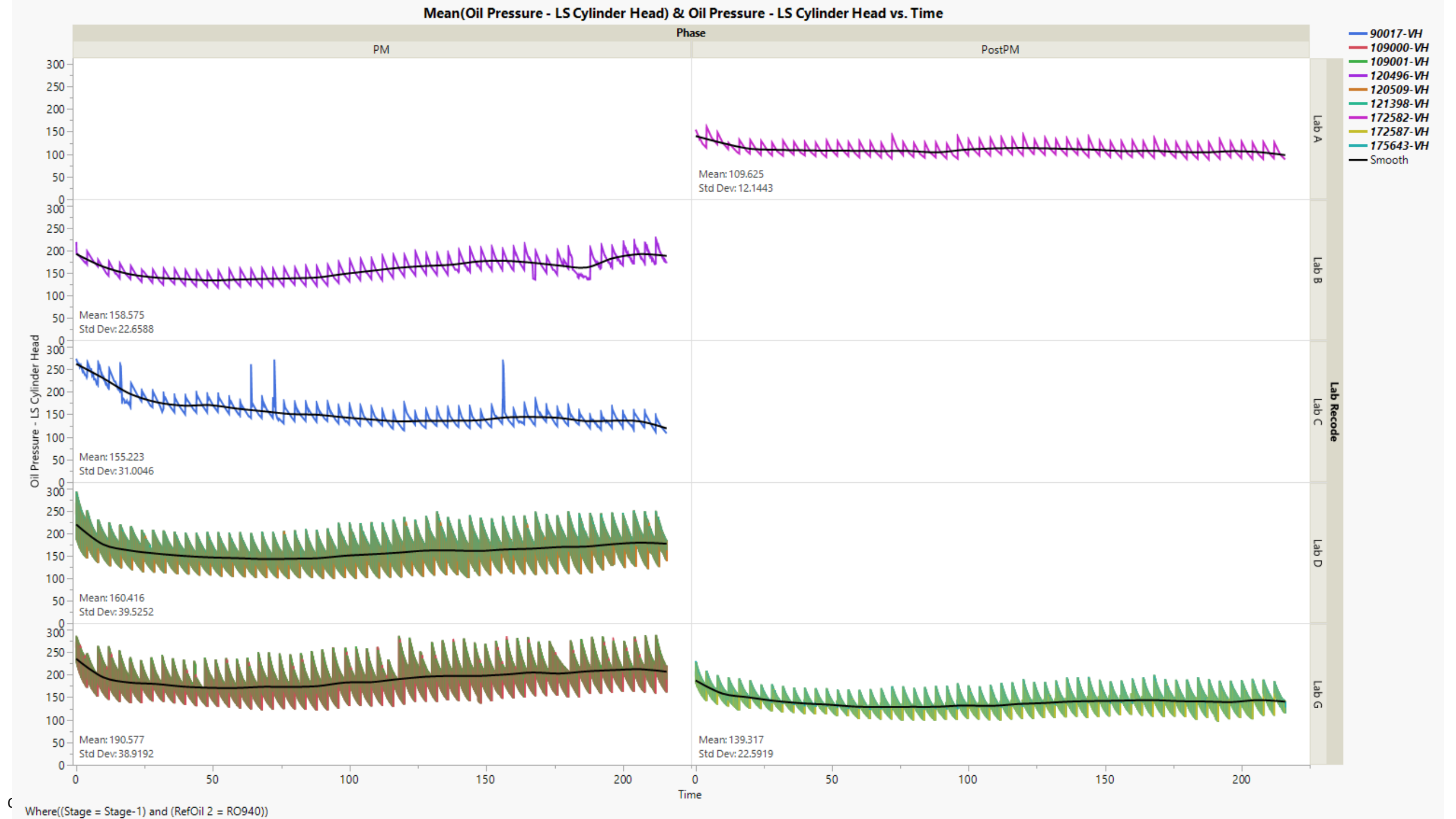
Where((Stage = Stage-1) and (RefOil 2 = RO940))

Where((Stage = Stage-1) and (RefOil 2 = RO940))

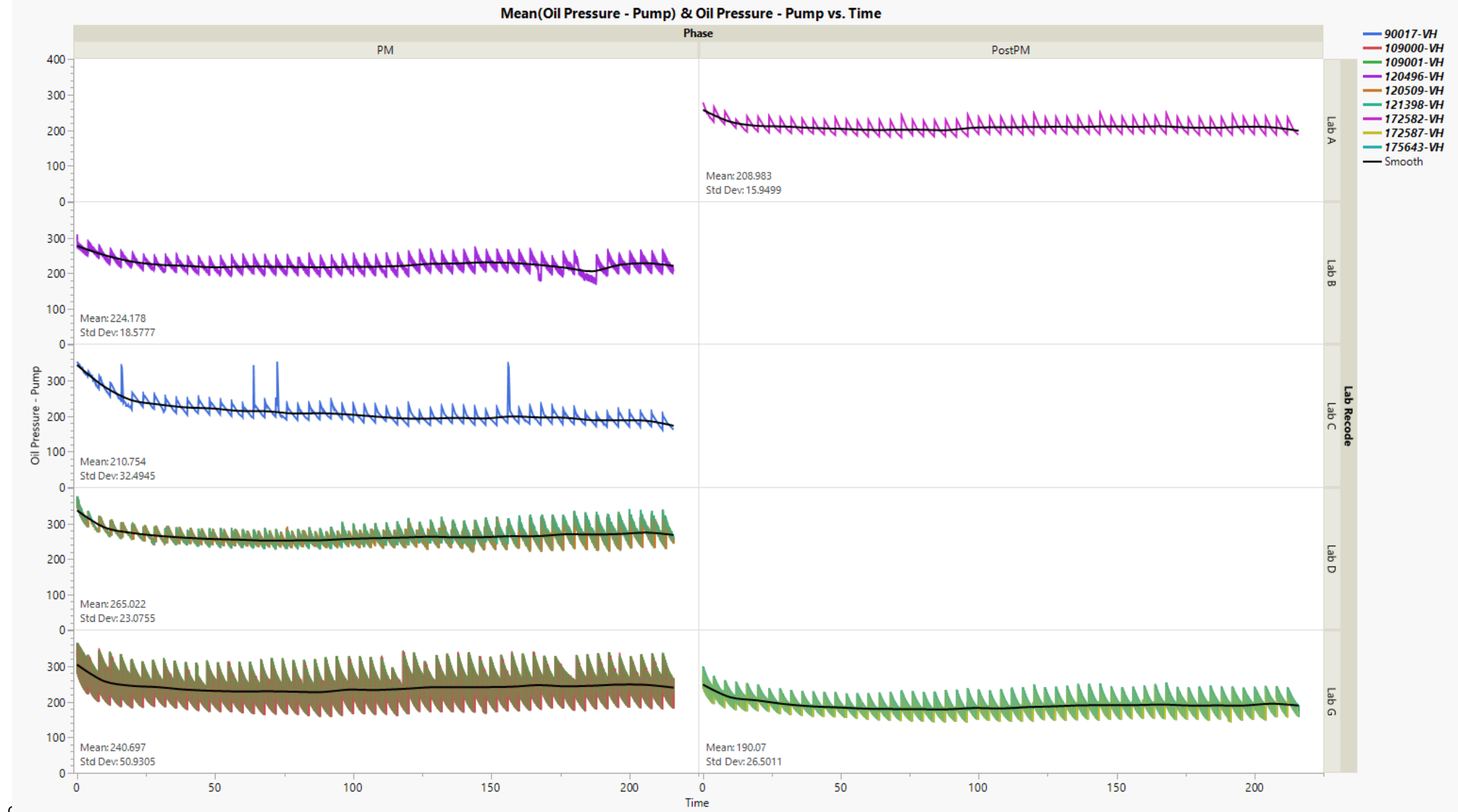


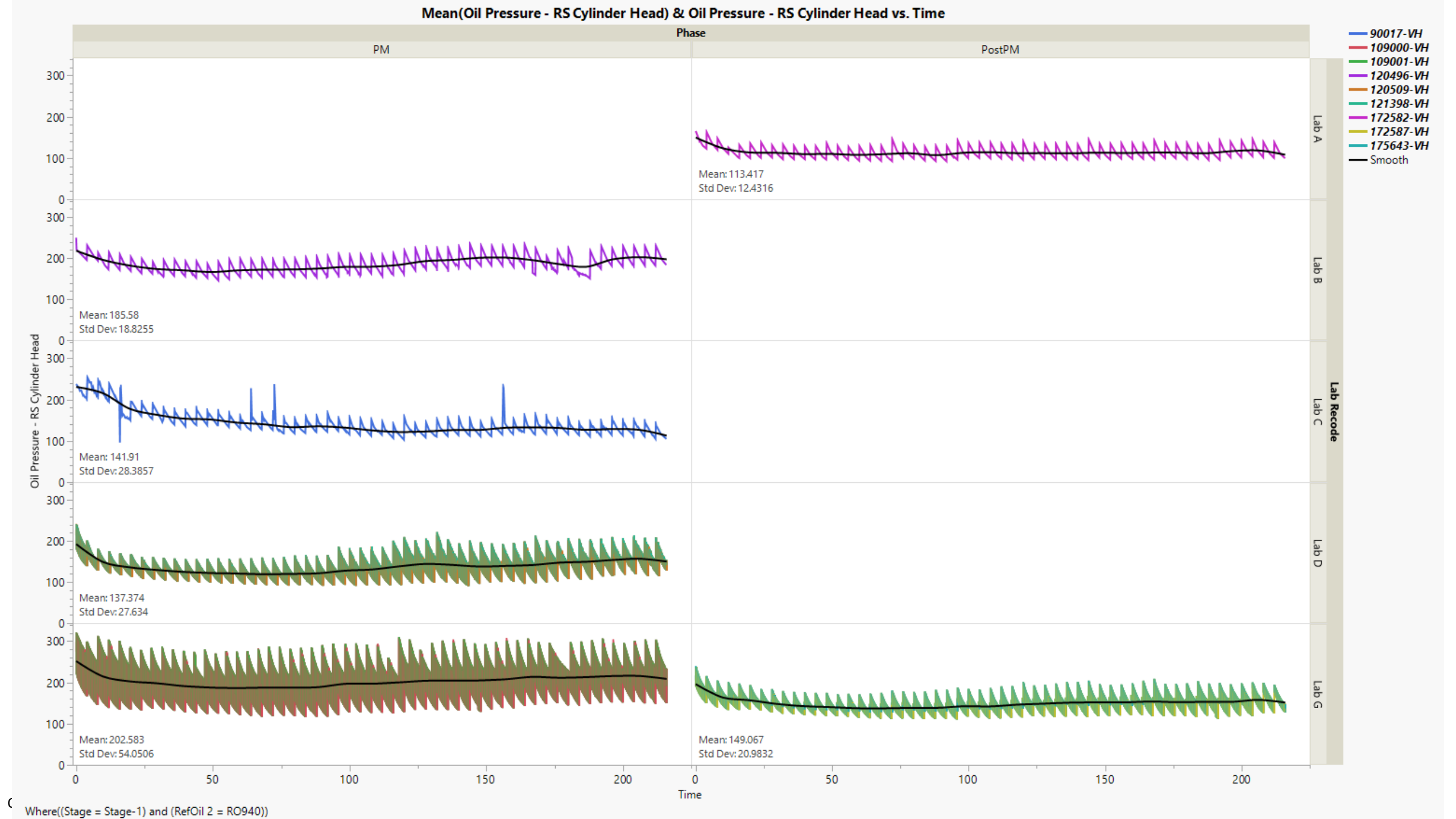
Where((Stage = Stage-1) and (RefOil 2 = RO940))

Mean(Intake Manifold Vacuum) & Intake Manifold Vacuum vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 29.5178
Std Dev: 0.58752
Mean: 30.3992
Std Dev: 0.56144
Mean: 32.2271
Std Dev: 0.35124
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Intake Manifold Vacuum
Time
Where((Stage = Stage-1) and (RefOil 2 = RO940))

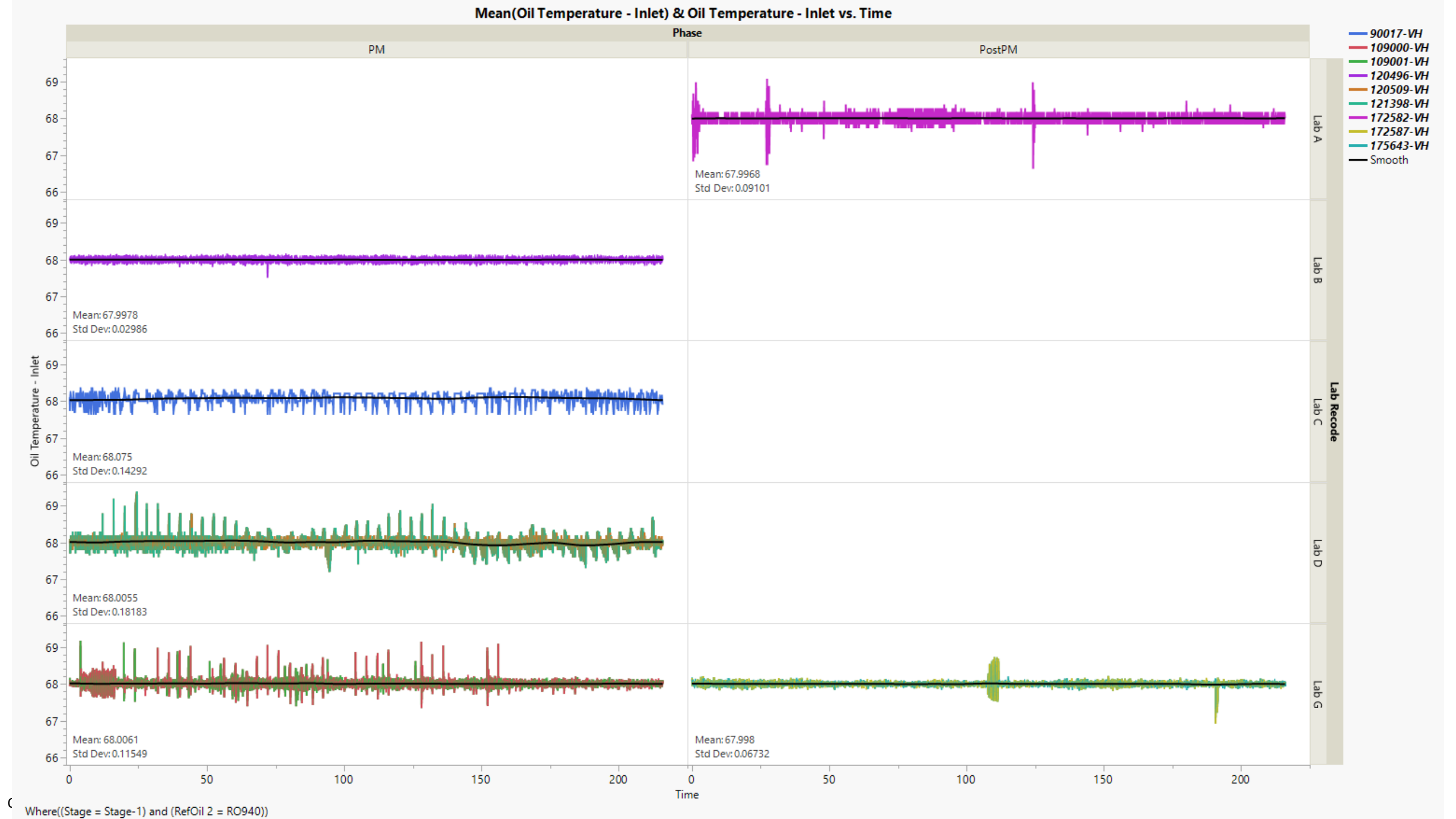


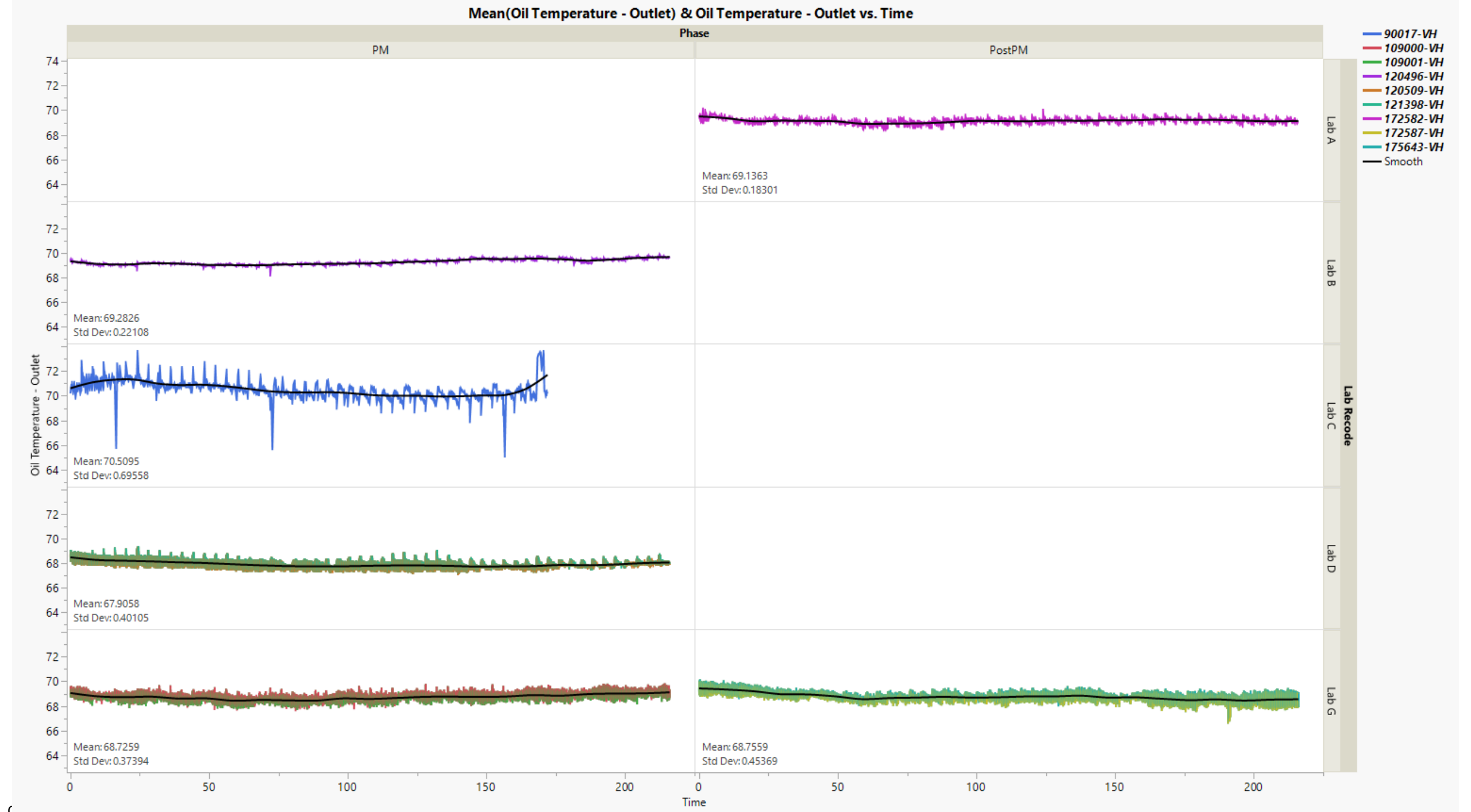
Where((Stage = Stage-1) and (RefOil 2 = RO940))

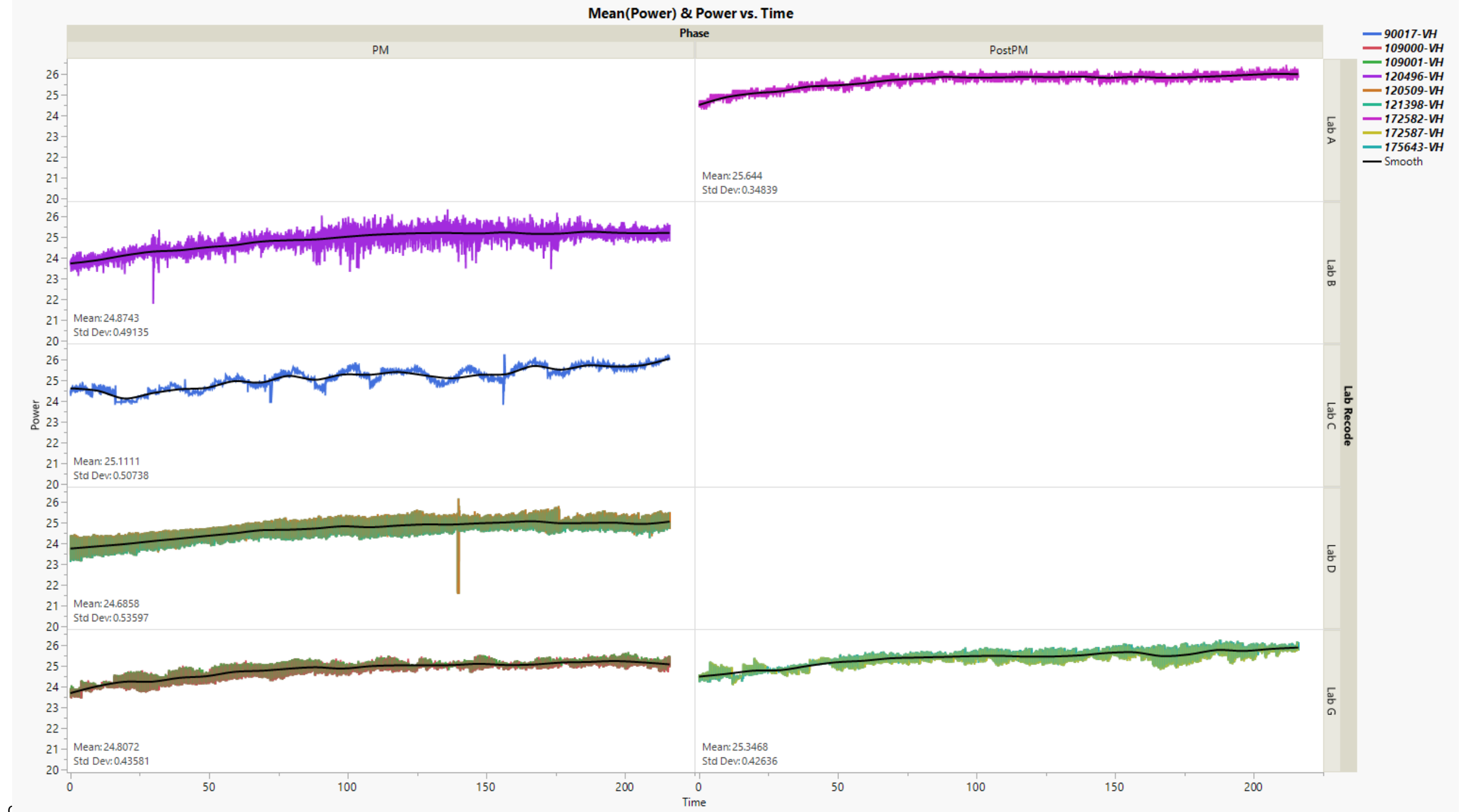

Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Oil Pressure - Pump
Time
Mean: 208.983
Std Dev: 15.9499
Mean: 224.178
Std Dev: 18.5777
Mean: 210.754
Std Dev: 32.4945
Mean: 265.022
Std Dev: 23.0755
Mean: 240.697
Std Dev: 50.9305
Mean: 190.07
Std Dev: 26.5011
Where((Stage = Stage-1) and (RefOil 2 = RO940))



Where((Stage = Stage-1) and (RefOil 2 = RO940))

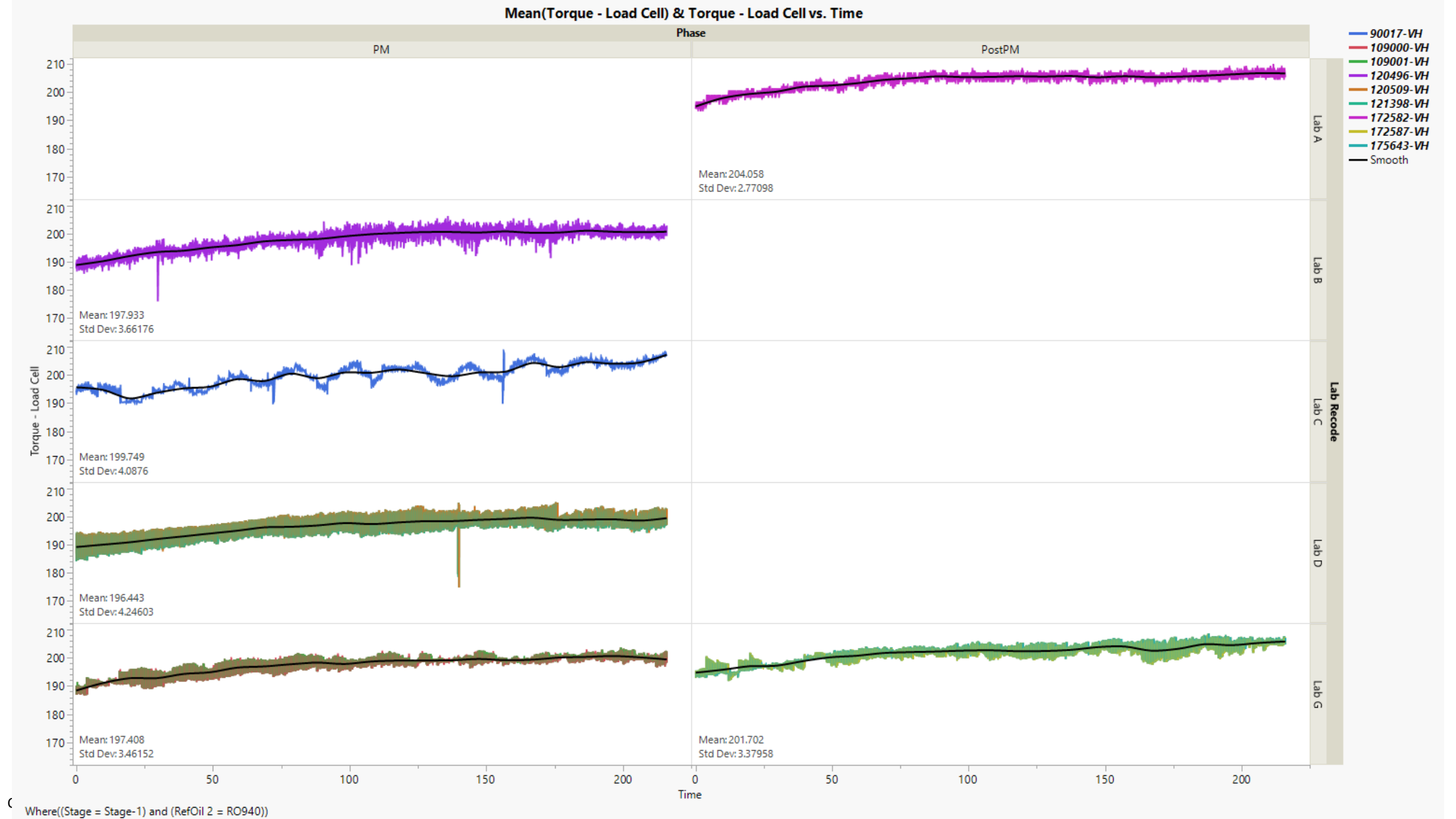

Mean(Oil Temperature - Inlet) & Oil Temperature - Inlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 67.9968
Std Dev: 0.09101
Mean: 67.9978
Std Dev: 0.02986
Mean: 68.075
Std Dev: 0.14292
Mean: 68.0055
Std Dev: 0.18183
Mean: 68.0061
Std Dev: 0.11549
Mean: 67.998
Std Dev: 0.06732
Oil Temperature - Inlet
Time
Where((Stage = Stage-1) and (RefOil 2 = RO940))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Mean: 69.1363
Std Dev: 0.18301
Mean: 69.2826
Std Dev: 0.22108
Mean: 70.5095
Std Dev: 0.69558
Mean: 67.9058
Std Dev: 0.40105
Mean: 68.7259
Std Dev: 0.37394
Mean: 68.7559
Std Dev: 0.45369
Oil Temperature - Outlet
Time
Where((Stage = Stage-1) and (RefOil 2 = RO940))



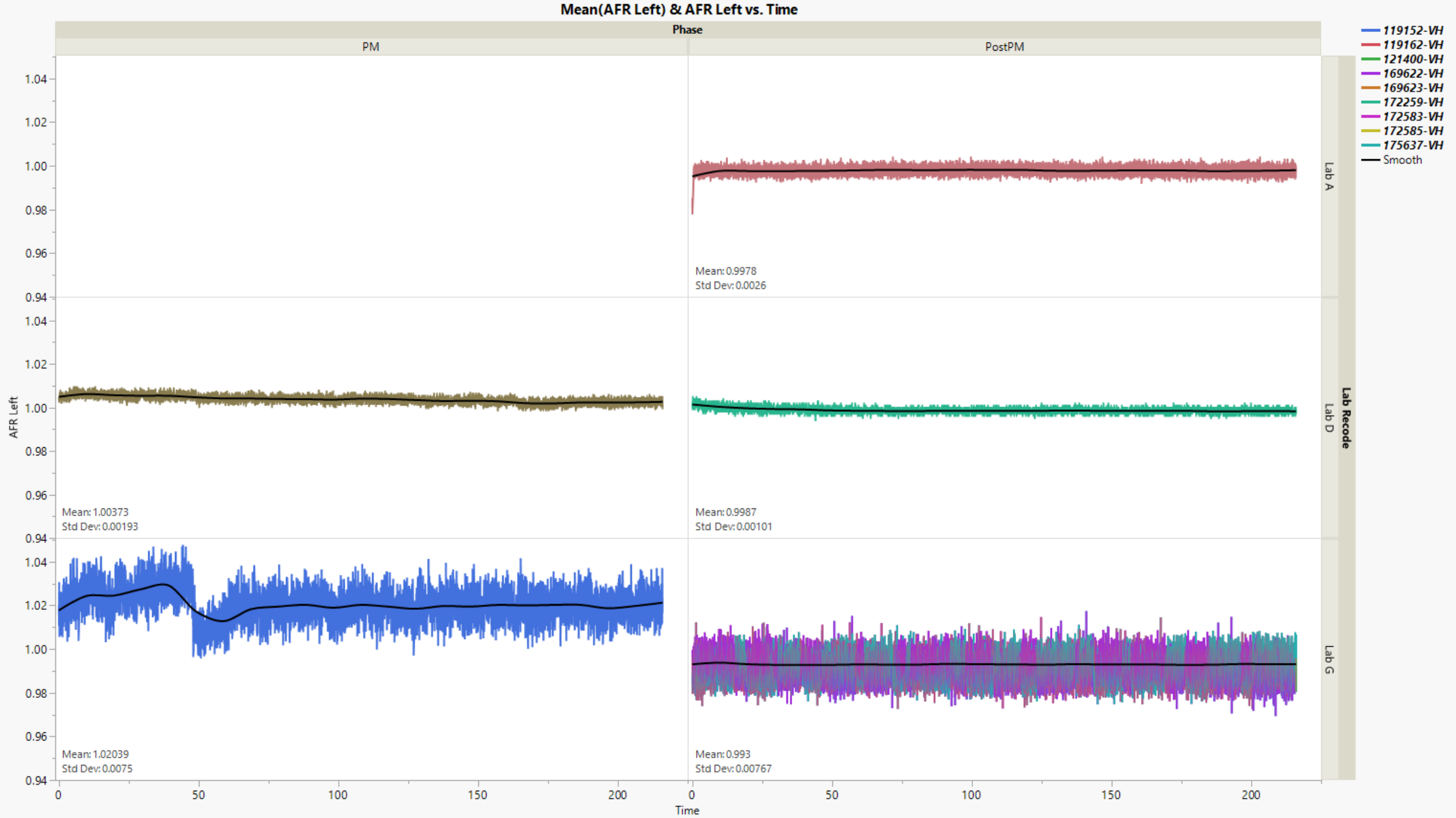
Where((Stage = Stage-1) and (RefOil 2 = RO940))

Where((Stage = Stage-1) and (RefOil 2 = RO940))

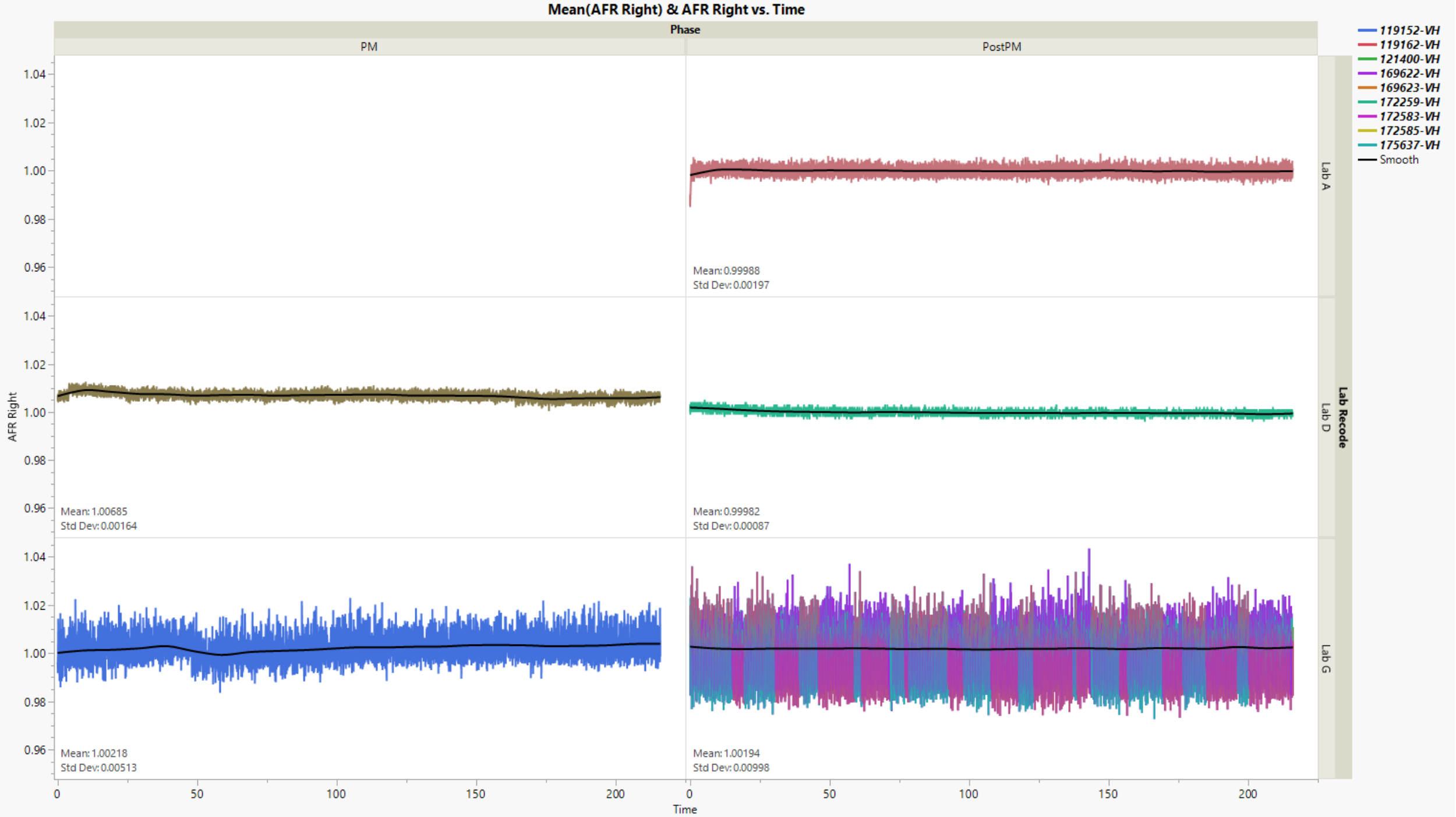

Mean(Torque - Load Cell) & Torque - Load Cell vs. Time
Phase
PM
PostPM
Lab A
Lab B
Lab C
Lab D
Lab G
Lab Recode
90017-VH
109000-VH
109001-VH
120496-VH
120509-VH
121398-VH
172582-VH
172587-VH
175643-VH
Smooth
Torque - Load Cell
Time
Mean: 204.058
Std Dev: 2.77098
Mean: 197.933
Std Dev: 3.66176
Mean: 199.749
Std Dev: 4.0876
Mean: 196.443
Std Dev: 4.24603
Mean: 197.408
Std Dev: 3.46152
Mean: 201.702
Std Dev: 3.37958
Where((Stage = Stage-1) and (RefOil 2 = RO940))

RO 1011 Data Plots

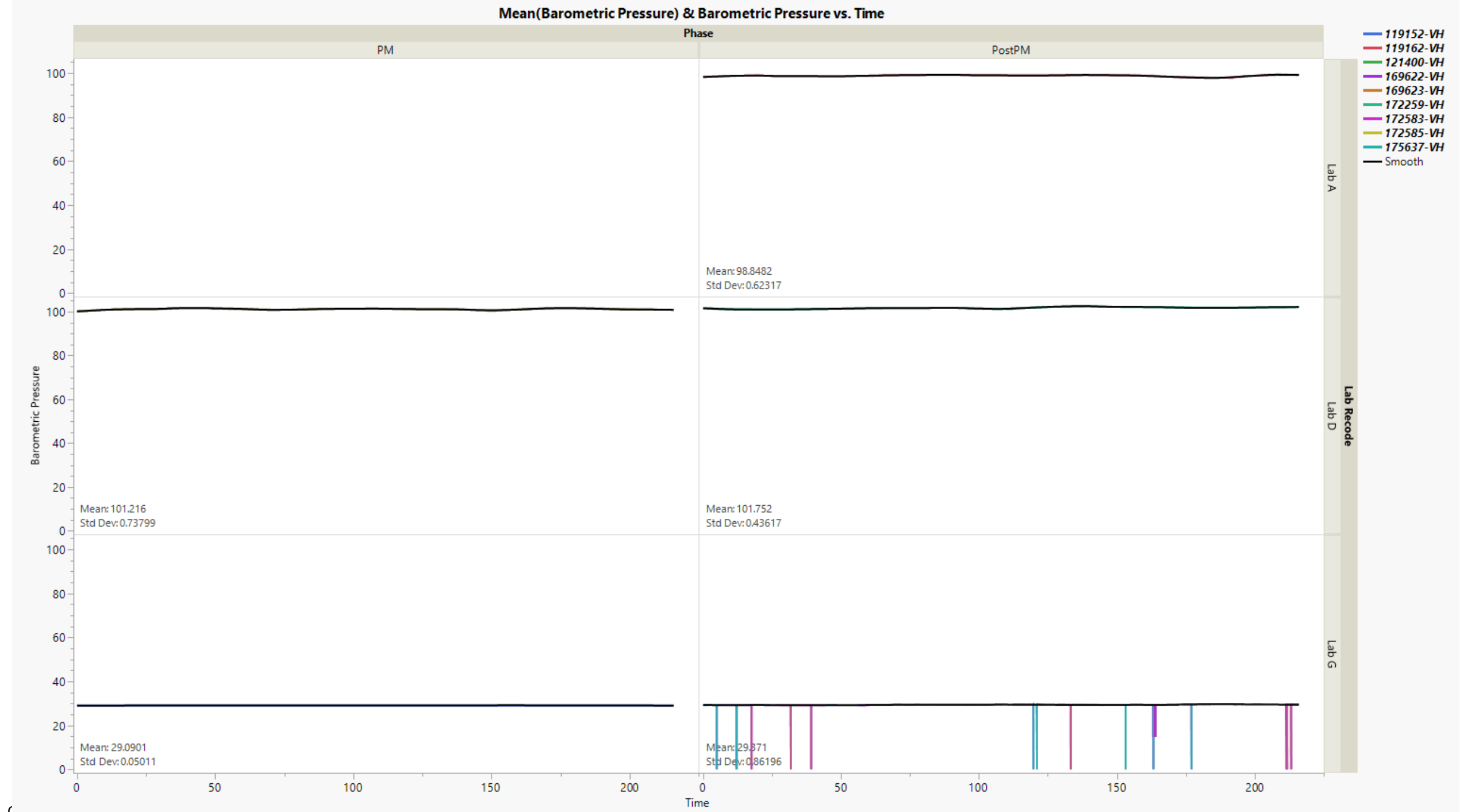
Classified as Confidential



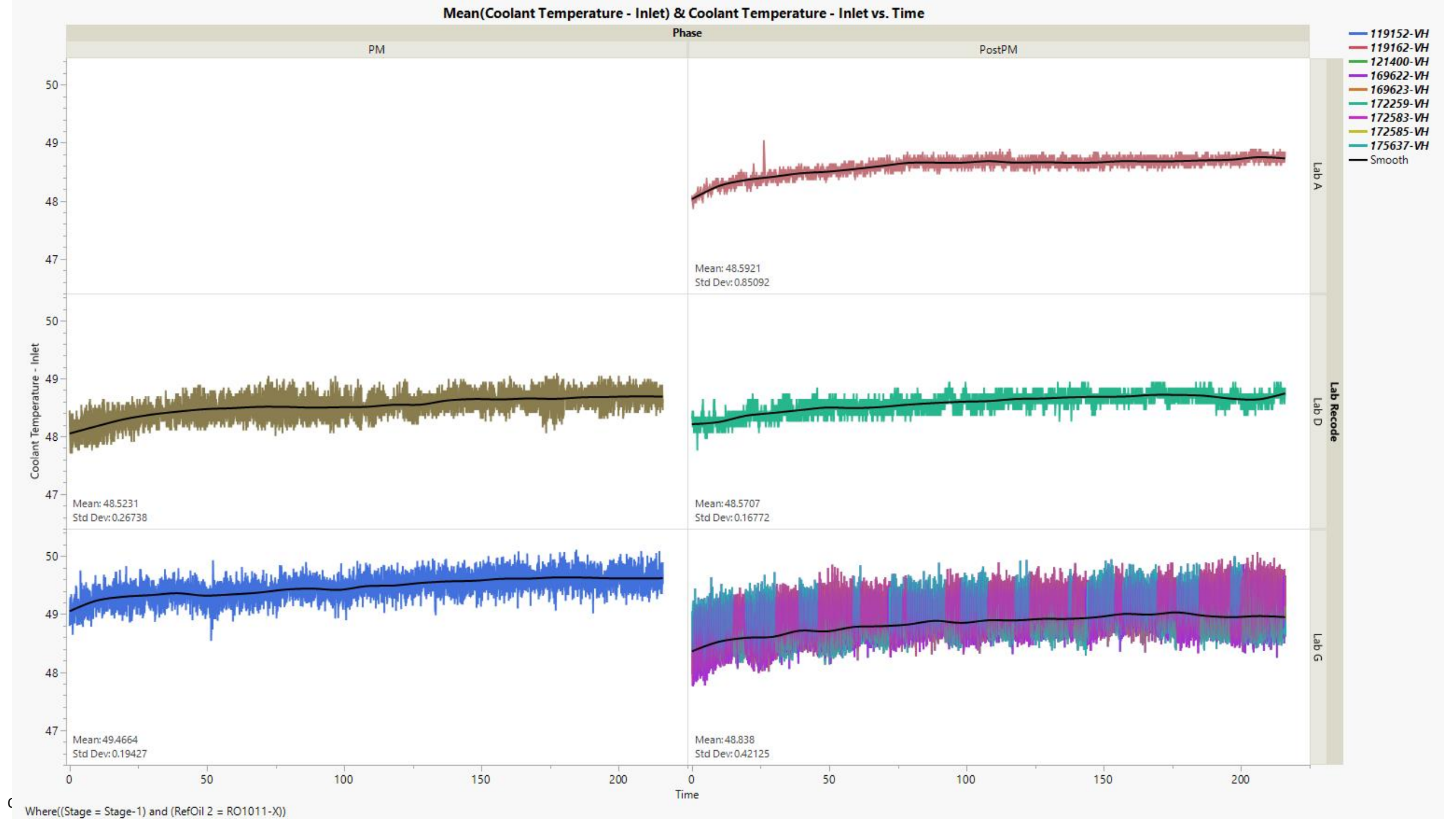
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

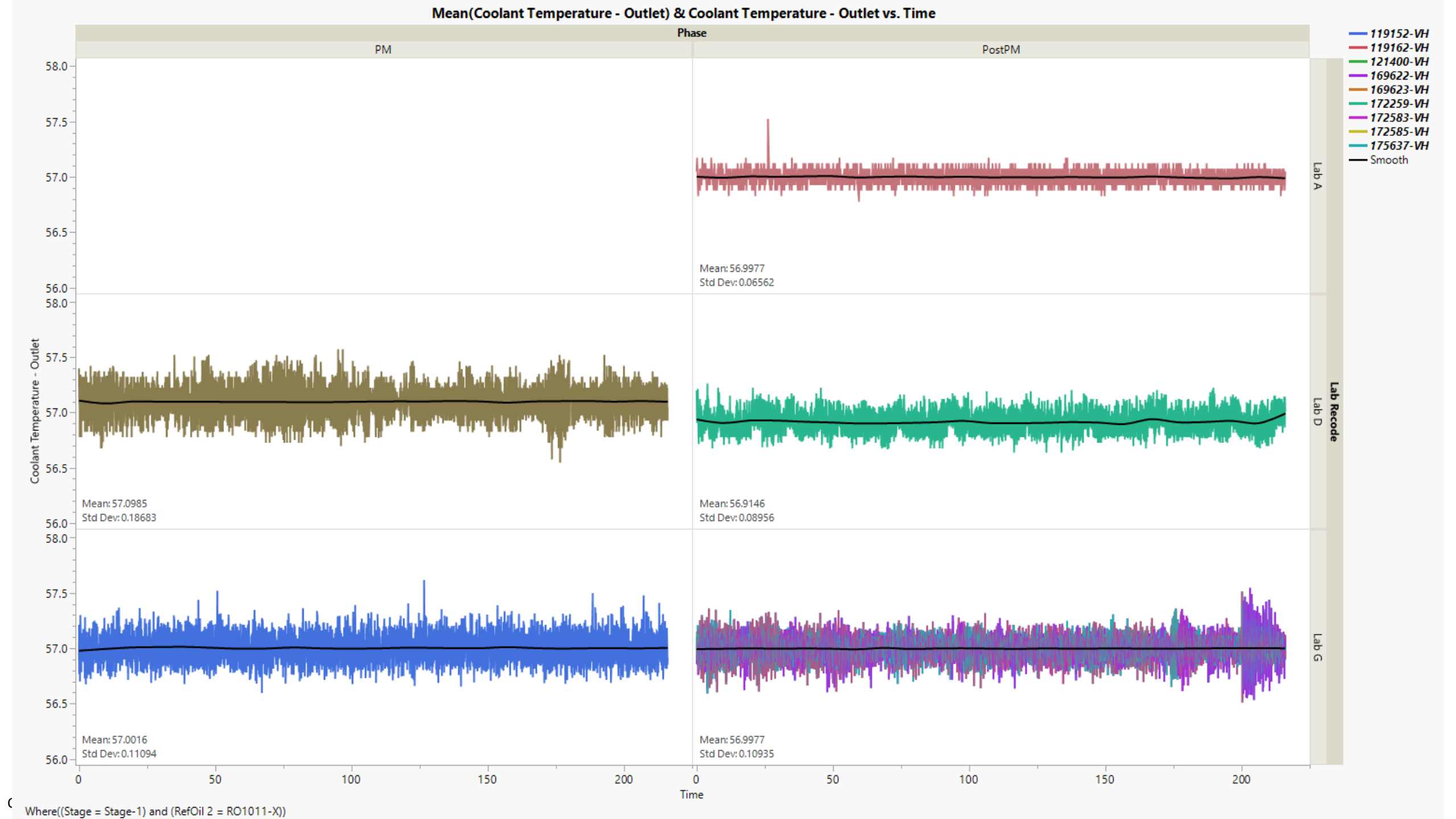


Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

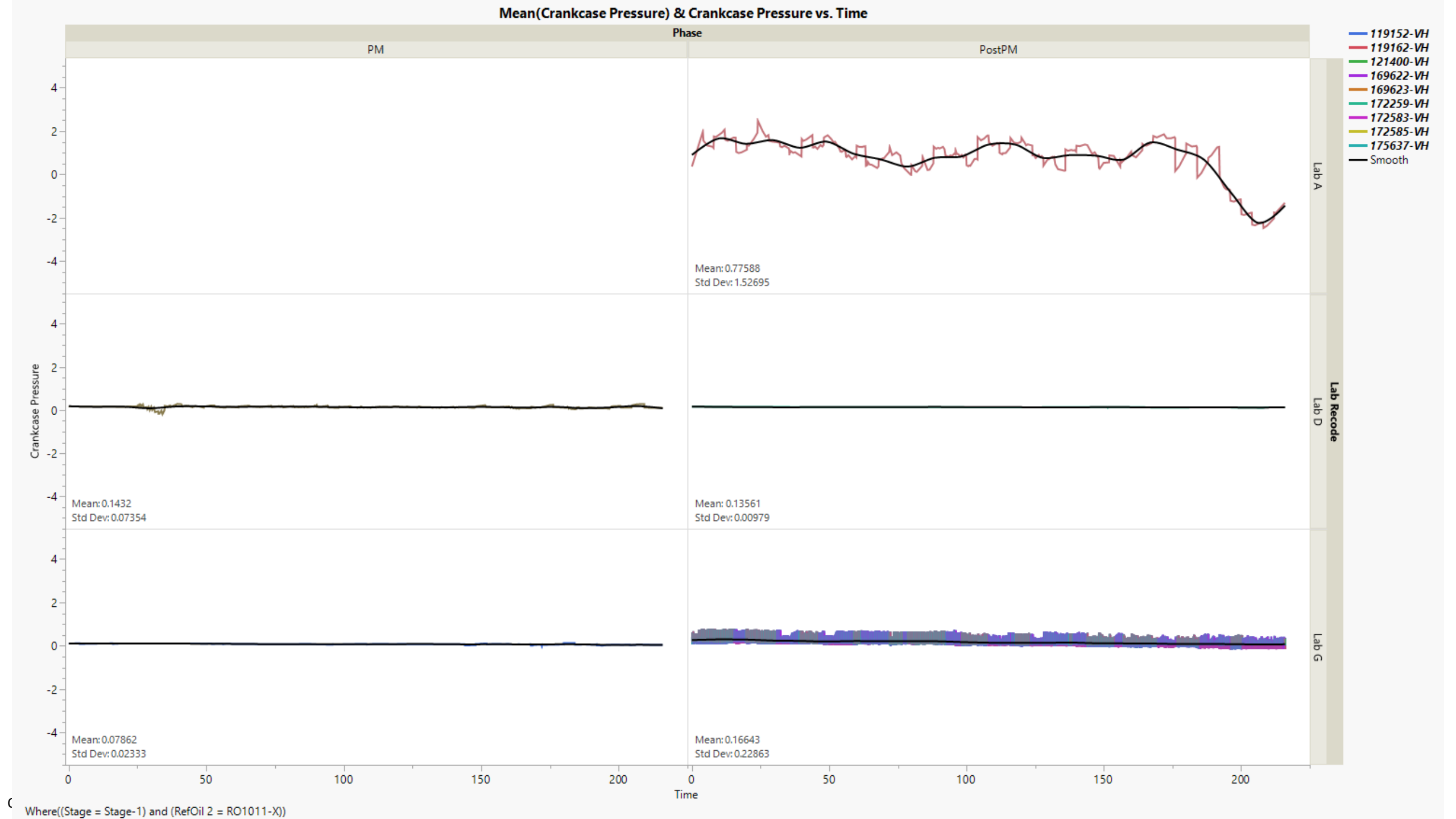


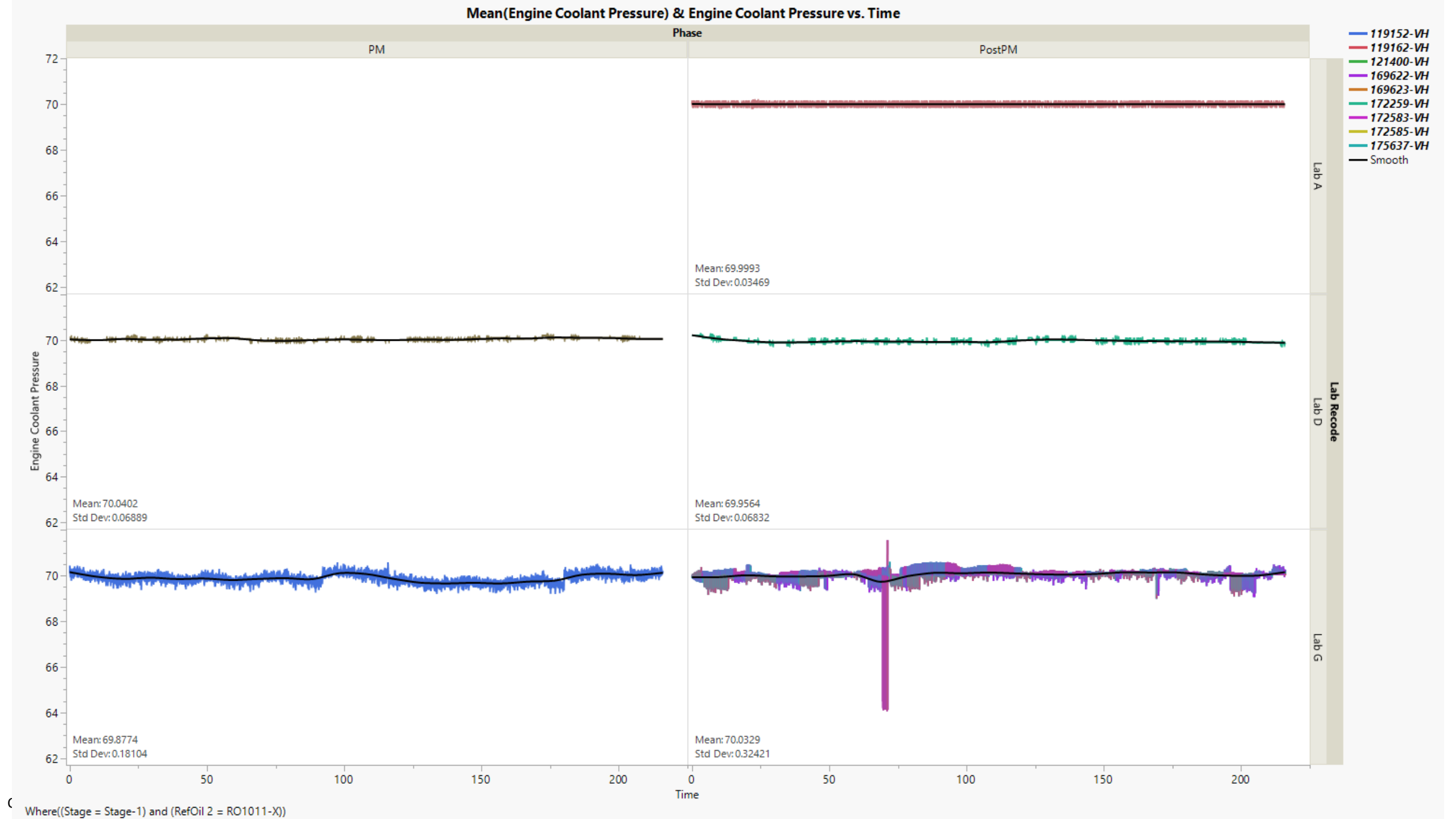
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

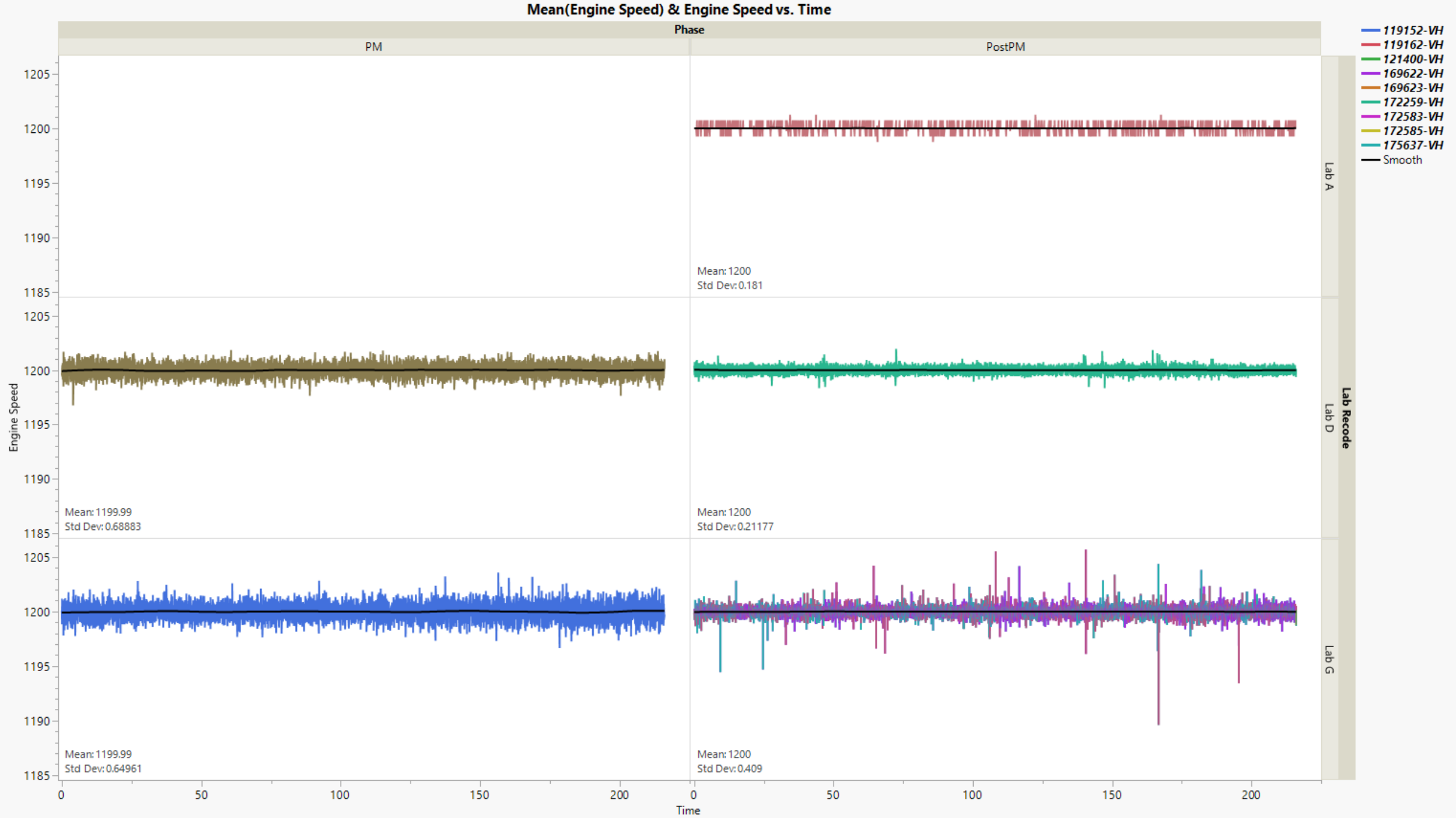

Mean(Coolant Temperature - Inlet) & Coolant Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Coolant Temperature - Inlet
Time
Mean: 48.5921
Std Dev: 0.85092
Mean: 48.5231
Std Dev: 0.26738
Mean: 48.5707
Std Dev: 0.16772
Mean: 49.4664
Std Dev: 0.19427
Mean: 48.838
Std Dev: 0.42125
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))



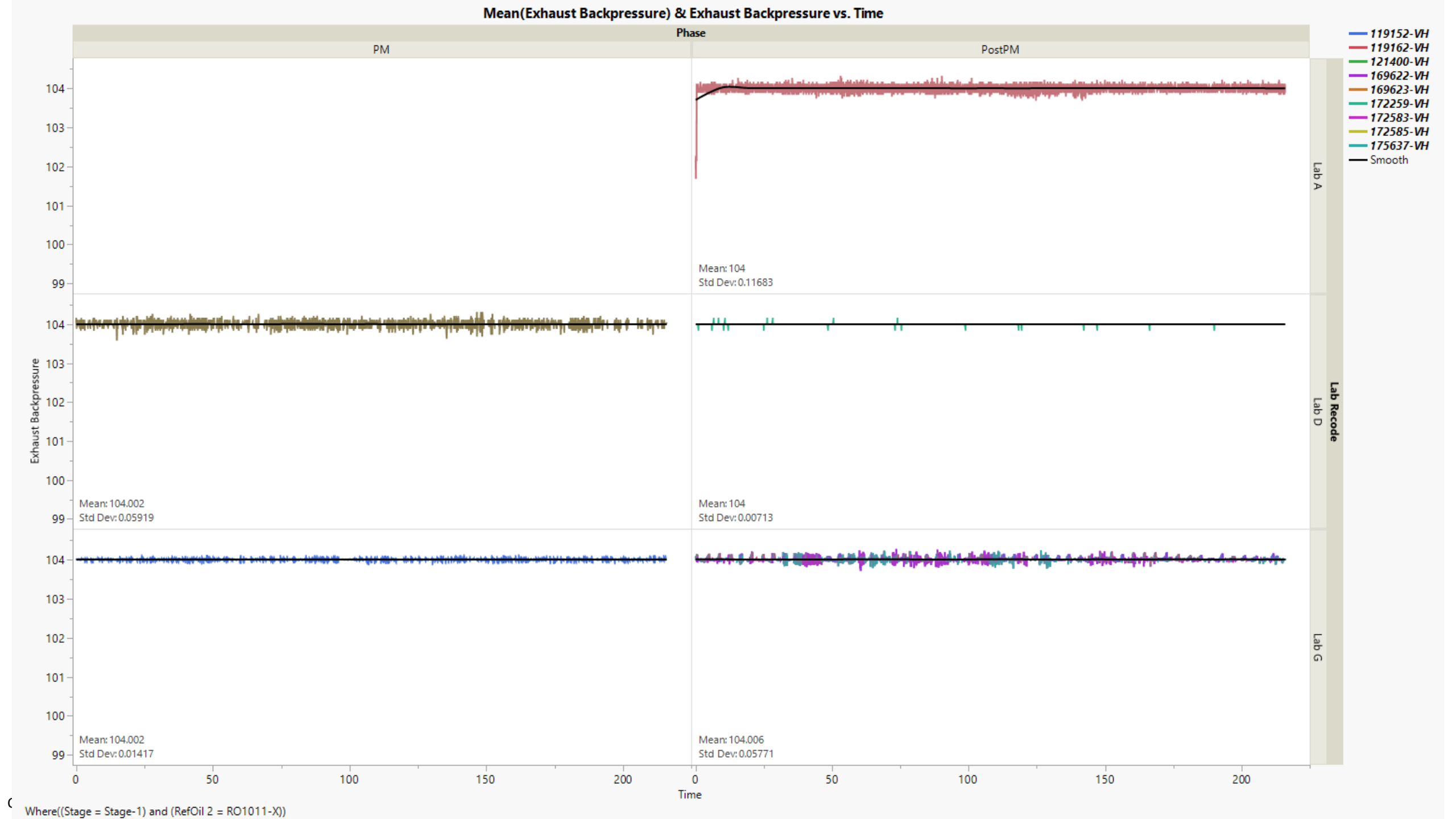
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

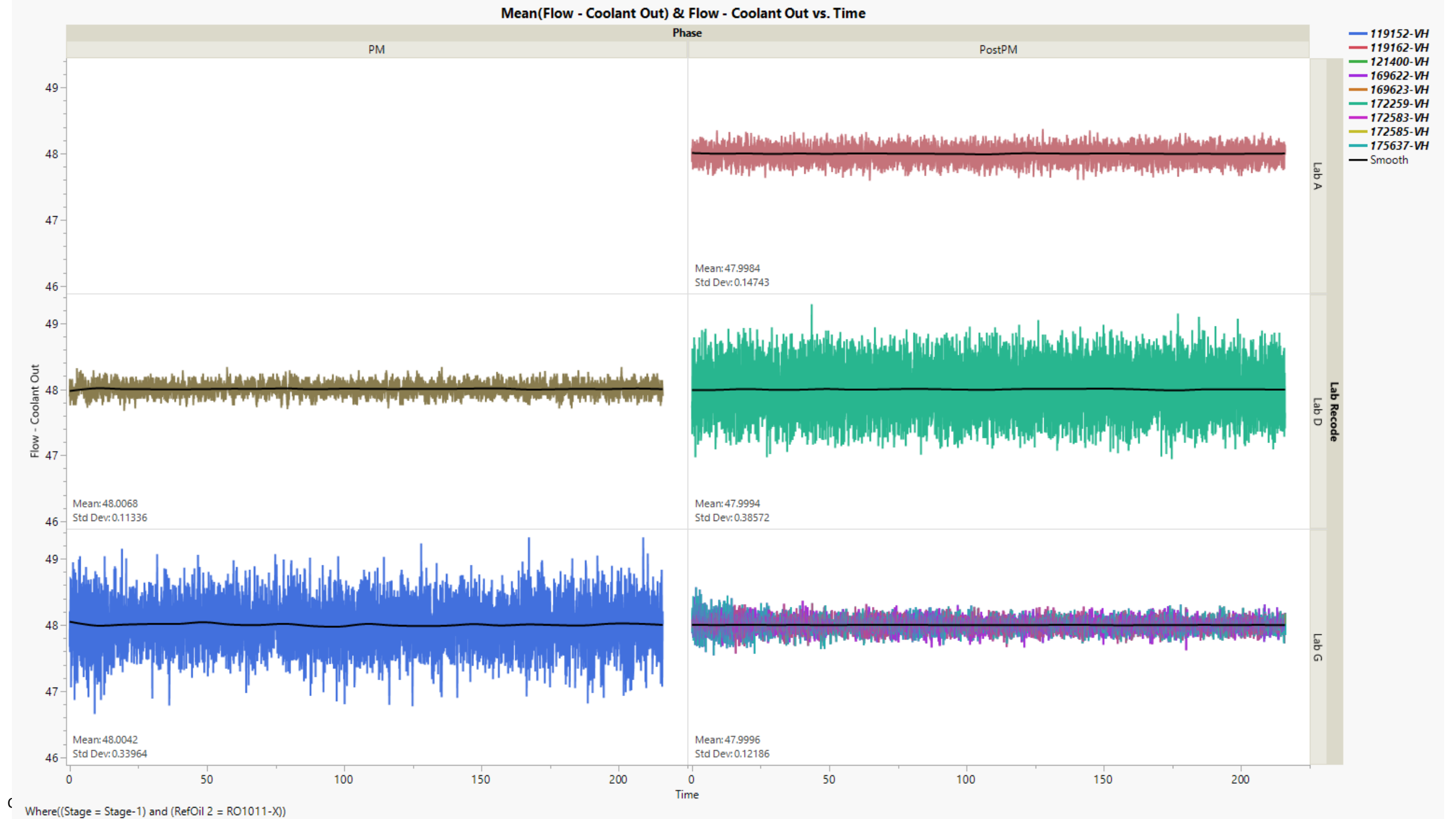

Mean(Crankcase Pressure) & Crankcase Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Crankcase Pressure
Time
Mean: 0.77588
Std Dev: 1.52695
Mean: 0.1432
Std Dev: 0.07354
Mean: 0.13561
Std Dev: 0.00979
Mean: 0.07862
Std Dev: 0.02333
Mean: 0.16643
Std Dev: 0.22863
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))


Mean(Engine Coolant Pressure) & Engine Coolant Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Engine Coolant Pressure
Time
Mean: 69.9993
Std Dev: 0.03469
Mean: 70.0402
Std Dev: 0.06889
Mean: 69.9564
Std Dev: 0.06832
Mean: 69.8774
Std Dev: 0.18104
Mean: 70.0329
Std Dev: 0.32421
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

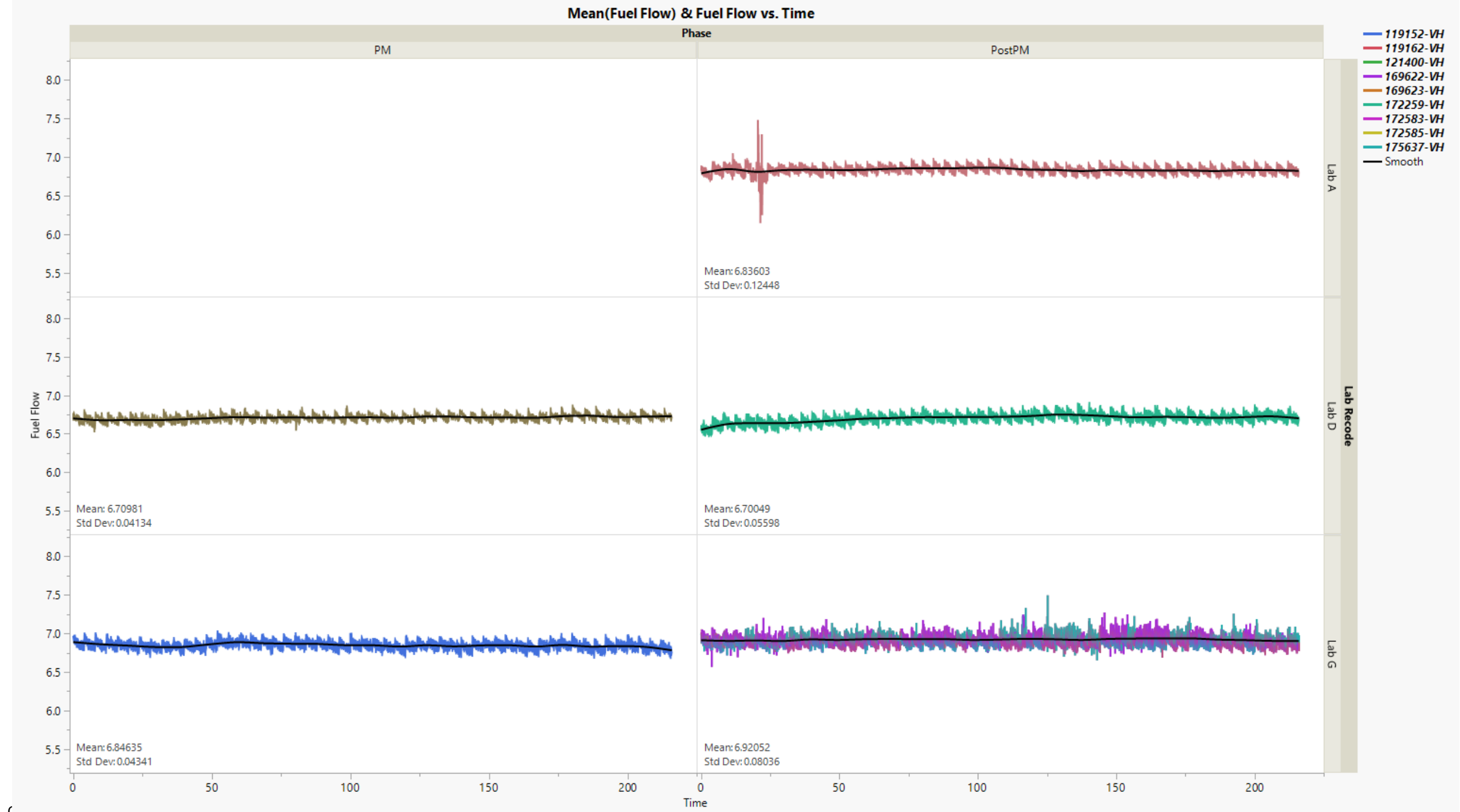


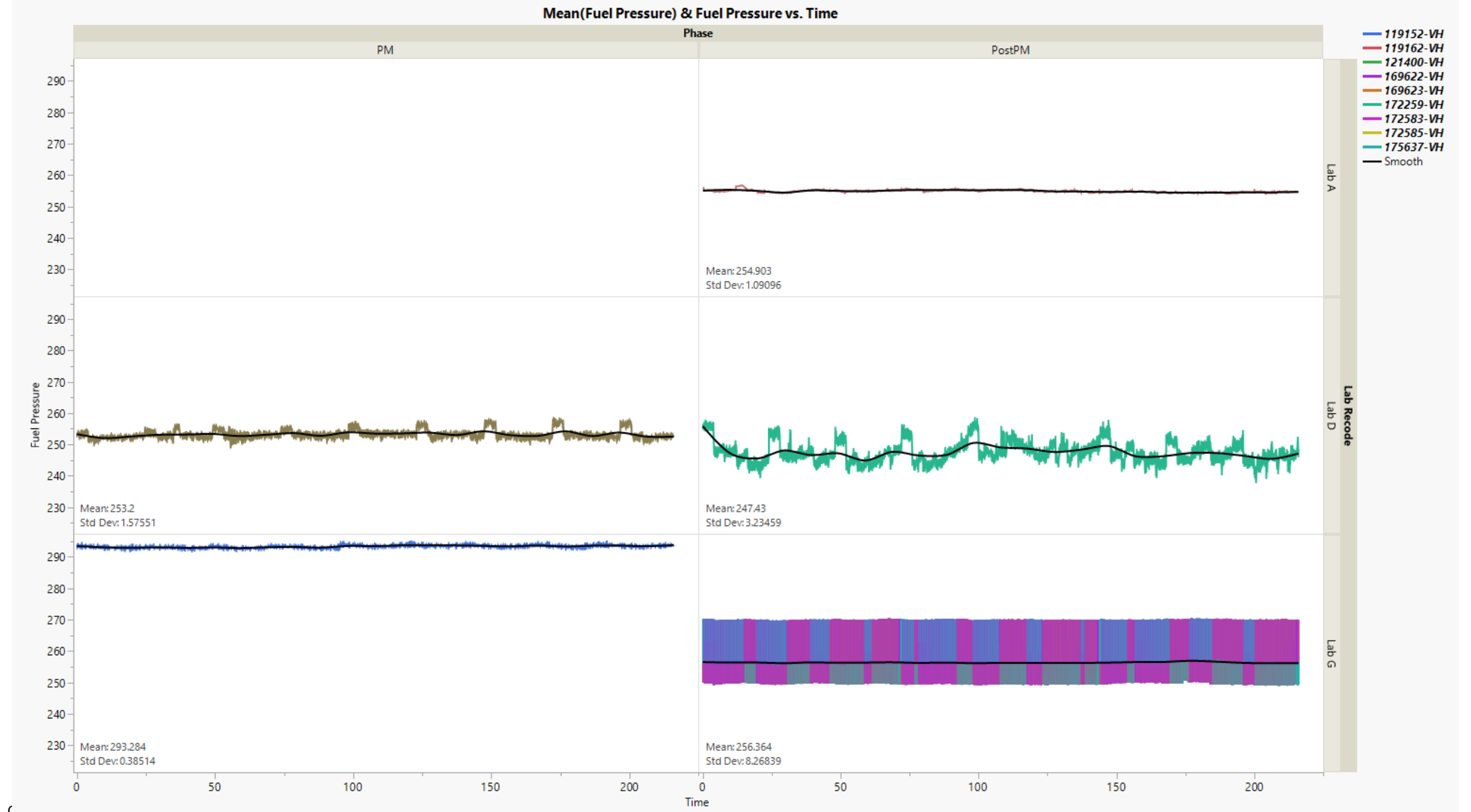
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

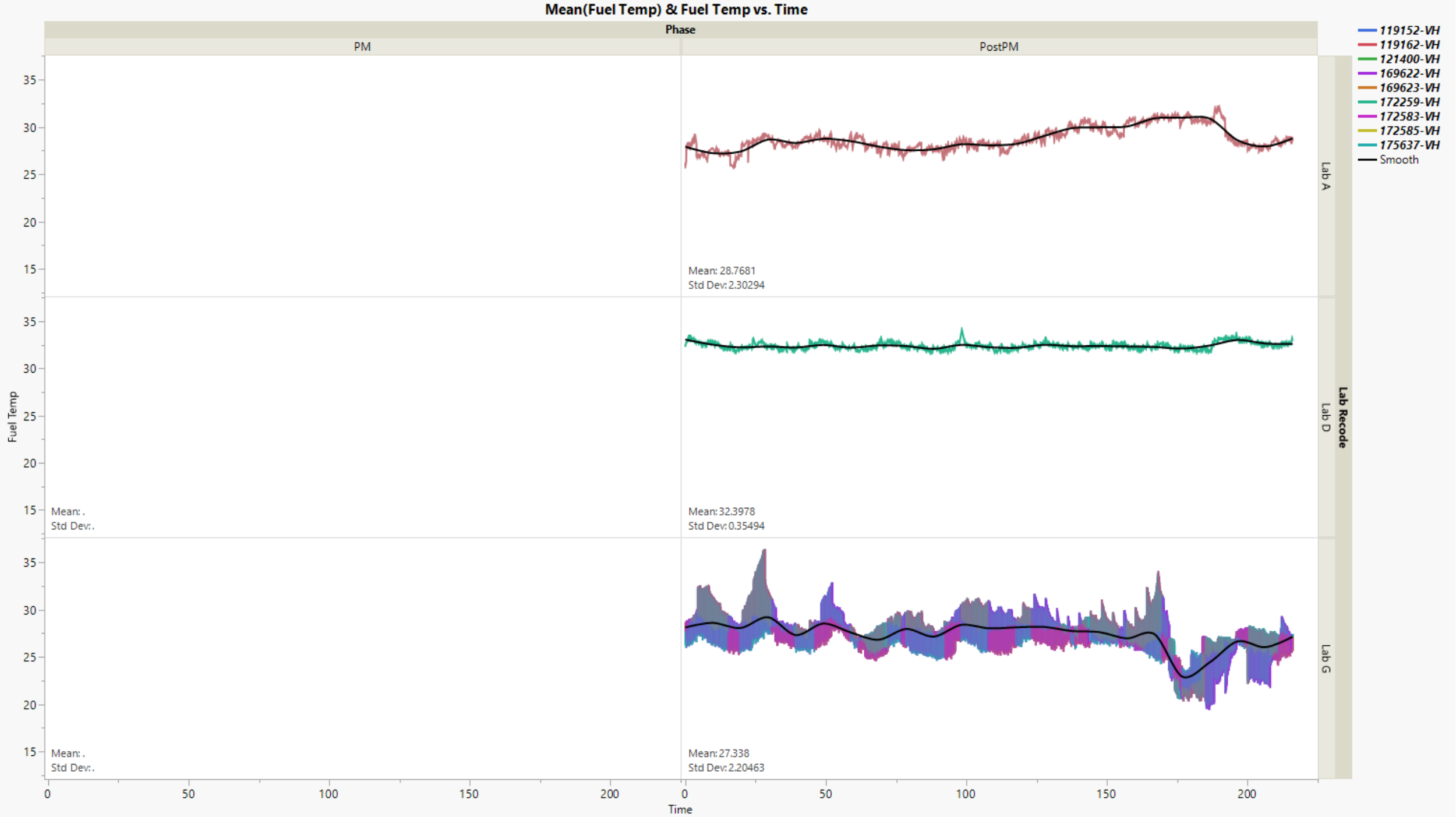

Mean(Exhaust Backpressure) & Exhaust Backpressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Exhaust Backpressure
Time
Mean: 104
Std Dev: 0.11683
Mean: 104.002
Std Dev: 0.05919
Mean: 104
Std Dev: 0.00713
Mean: 104.002
Std Dev: 0.01417
Mean: 104.006
Std Dev: 0.05771
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

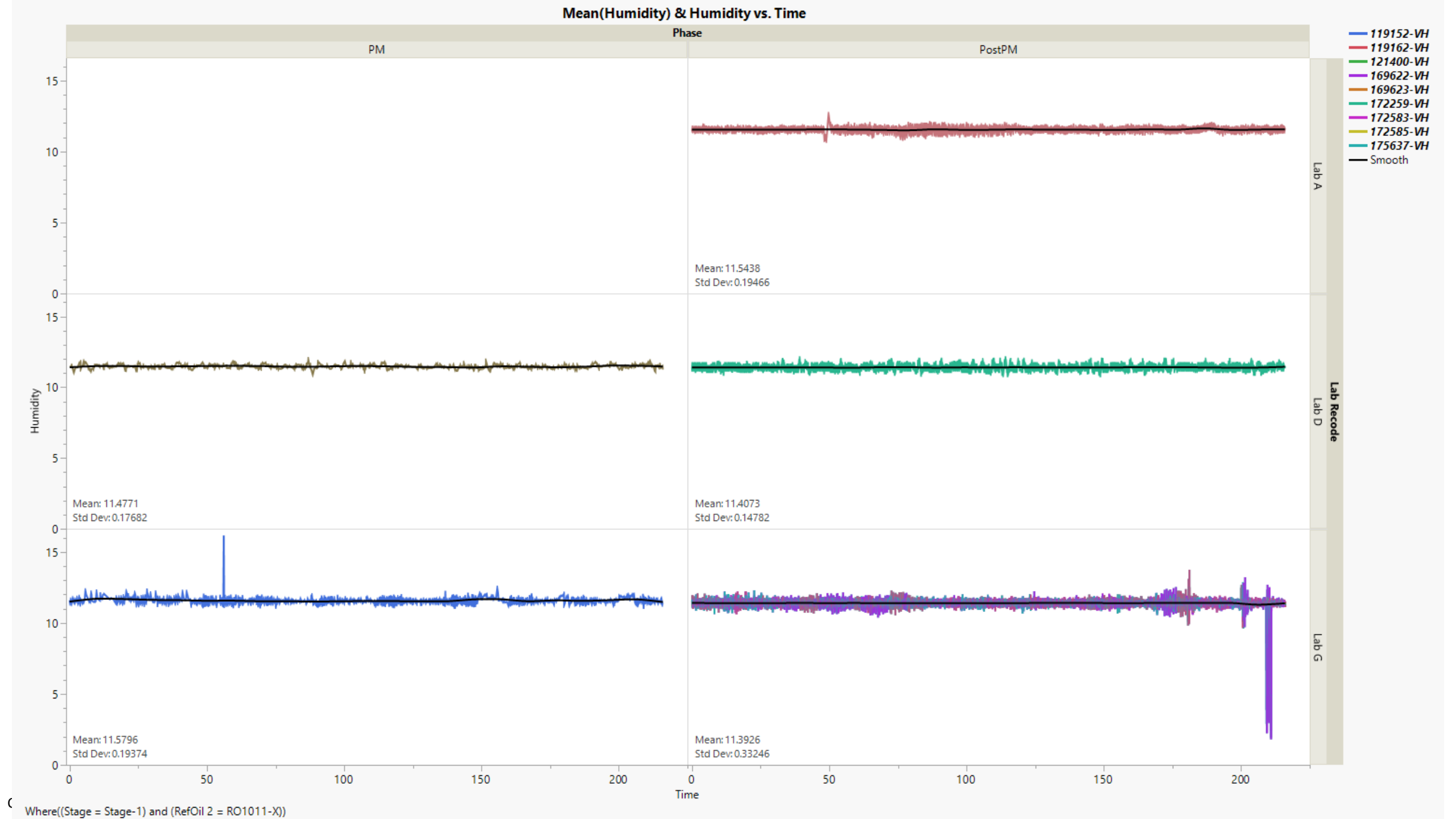

Mean(Flow - Coolant Out) & Flow - Coolant Out vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Flow - Coolant Out
Time
Mean: 47.9984
Std Dev: 0.14743
Mean: 48.0068
Std Dev: 0.11336
Mean: 47.9994
Std Dev: 0.38572
Mean: 48.0042
Std Dev: 0.33964
Mean: 47.9996
Std Dev: 0.12186
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

Mean(Flow - RAC) & Flow - RAC vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Flow - RAC
16.0
15.5
15.0
14.5
Mean: 14.9998
Std Dev: 0.02695
Mean: 14.9994
Std Dev: 0.00881
Mean: 15
Std Dev: 0.00326
Mean: 14.9995
Std Dev: 0.06524
Mean: 15.0001
Std Dev: 0.02209
0
50
100
150
200
Time
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))


Mean(Fuel Flow) & Fuel Flow vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Flow
Time
Mean: 6.83603
Std Dev: 0.12448
Mean: 6.70981
Std Dev: 0.04134
Mean: 6.70049
Std Dev: 0.05598
Mean: 6.84635
Std Dev: 0.04341
Mean: 6.92052
Std Dev: 0.08036
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

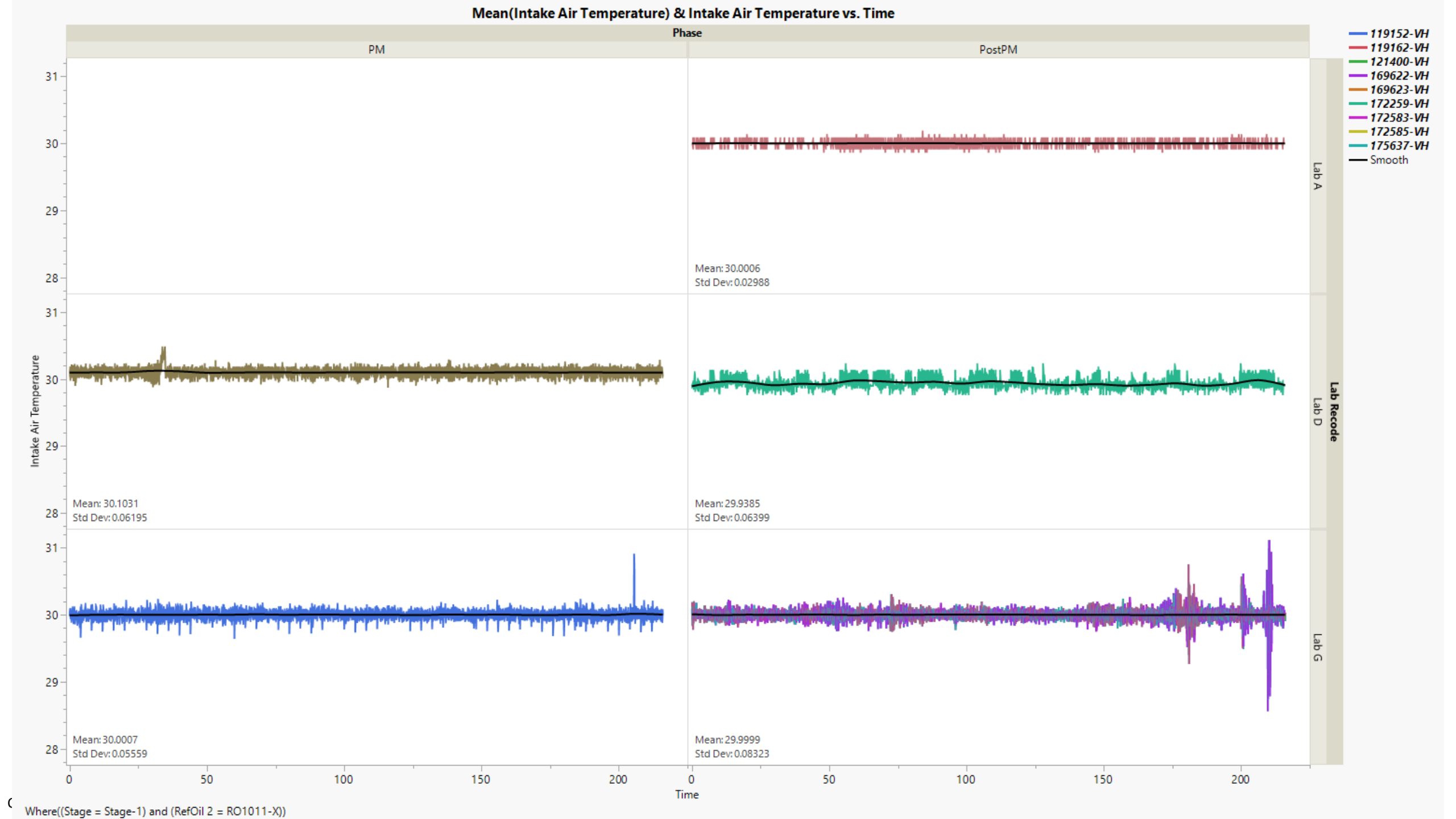

Mean(Fuel Pressure) & Fuel Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Pressure
Time
Mean: 254.903
Std Dev: 1.09096
Mean: 253.2
Std Dev: 1.57551
Mean: 247.43
Std Dev: 3.23459
Mean: 293.284
Std Dev: 0.38514
Mean: 256.364
Std Dev: 8.26839
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

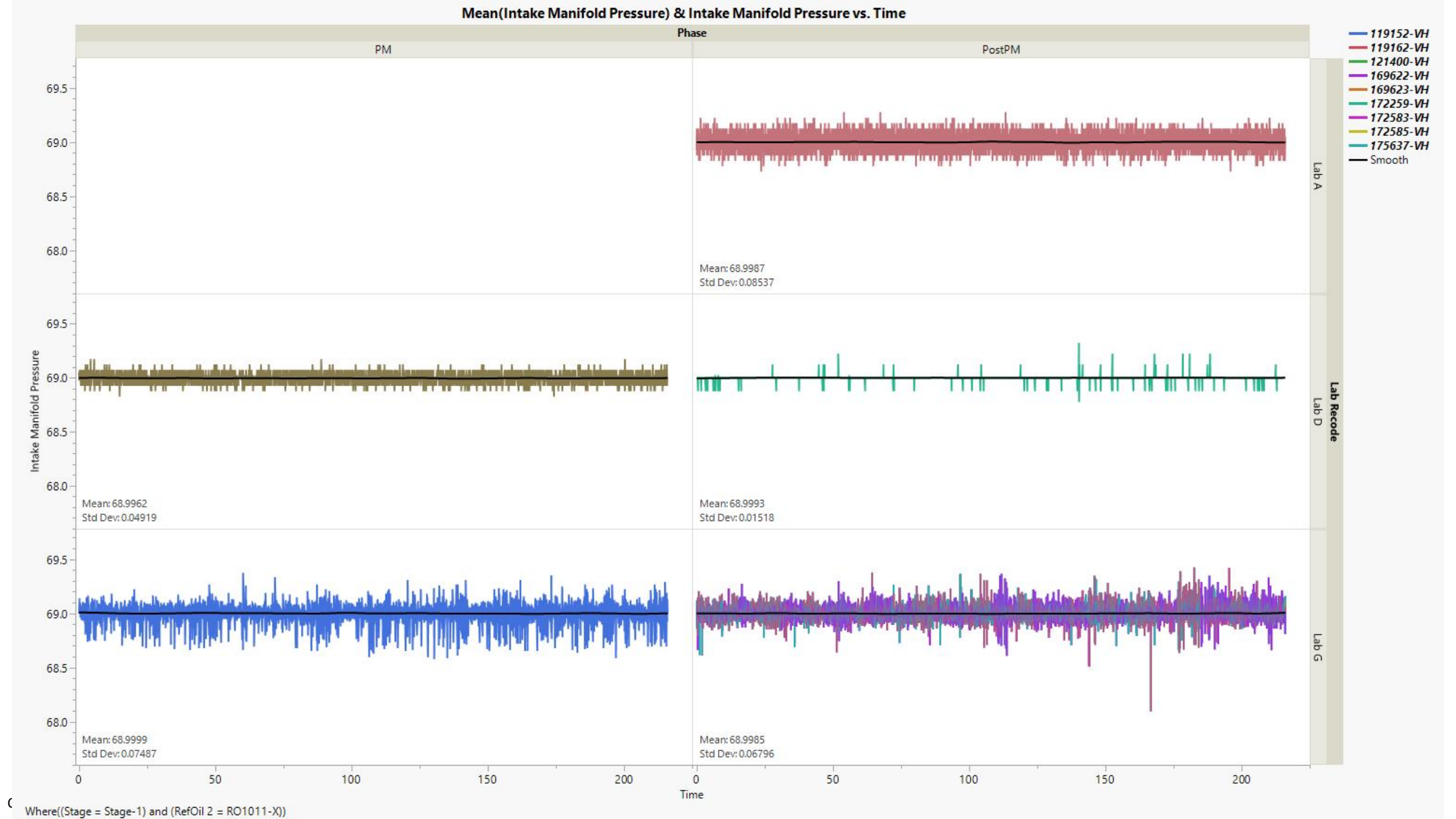

Mean(Fuel Temp) & Fuel Temp vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Fuel Temp
Time
Mean: 28.7681
Std Dev: 2.30294
Mean: .
Std Dev: .
Mean: 32.3978
Std Dev: 0.35494
Mean: .
Std Dev: .
Mean: 27.338
Std Dev: 2.20463
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

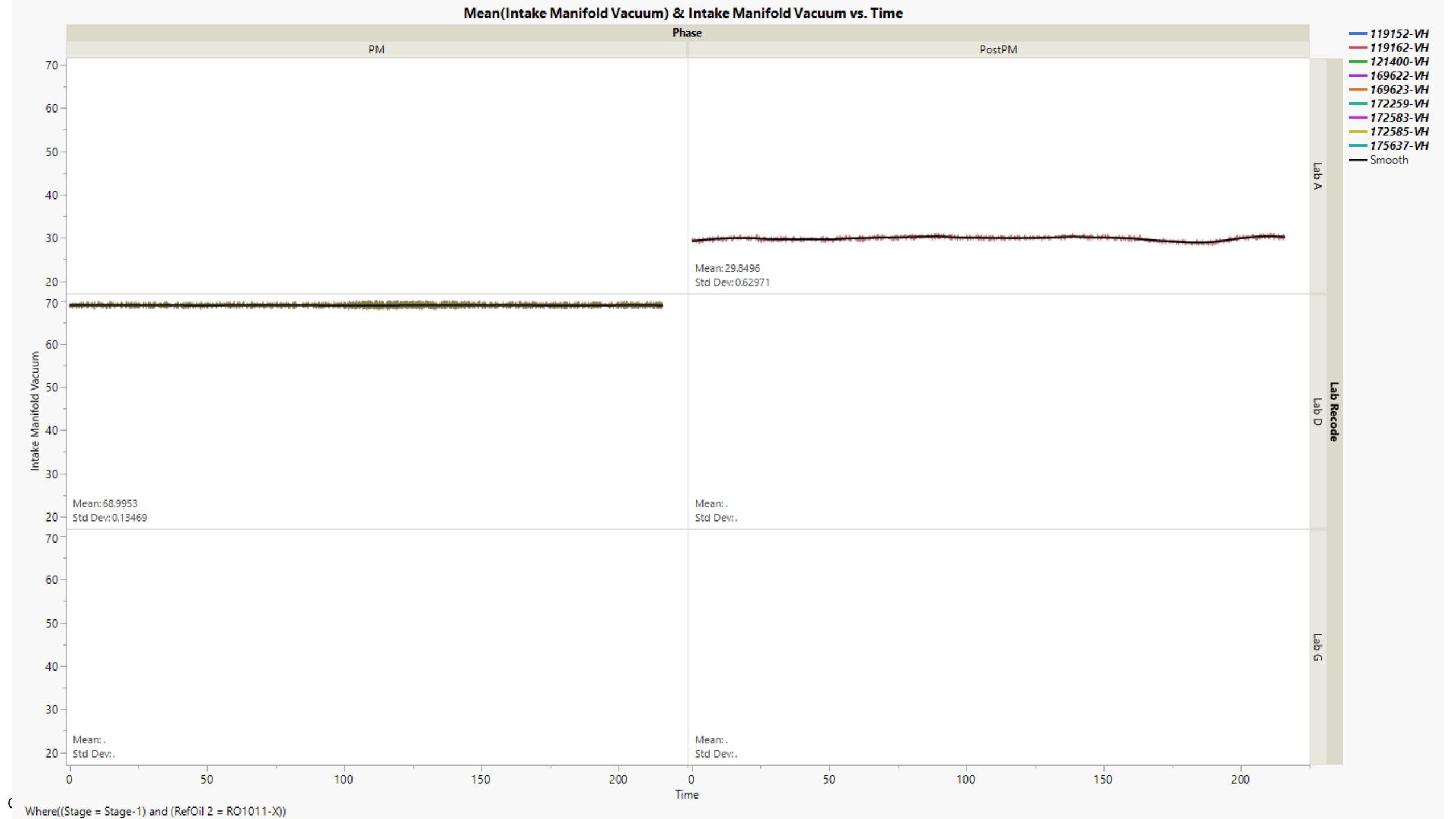


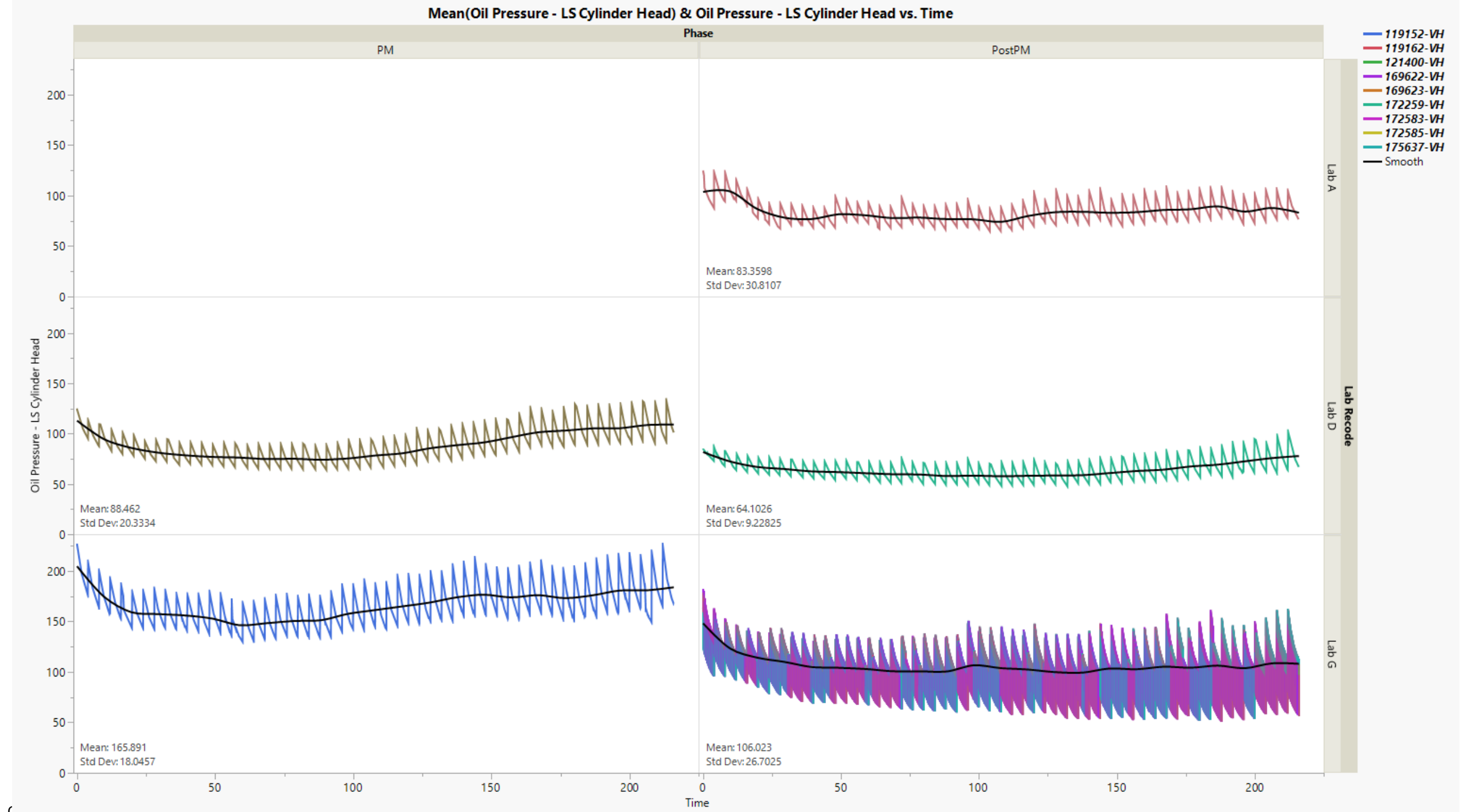
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

Mean(Intake Air Pressure) & Intake Air Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Air Pressure
Time
Mean: 0.05001
Std Dev: 0.00057
Mean: 0.04999
Std Dev: 0.0012
Mean: 0.05001
Std Dev: 0.00103
Mean: 0.04998
Std Dev: 0.0015
Mean: 0.05006
Std Dev: 0.00279
0
0.02
0.04
0.06
0.08
0
50
100
150
200
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

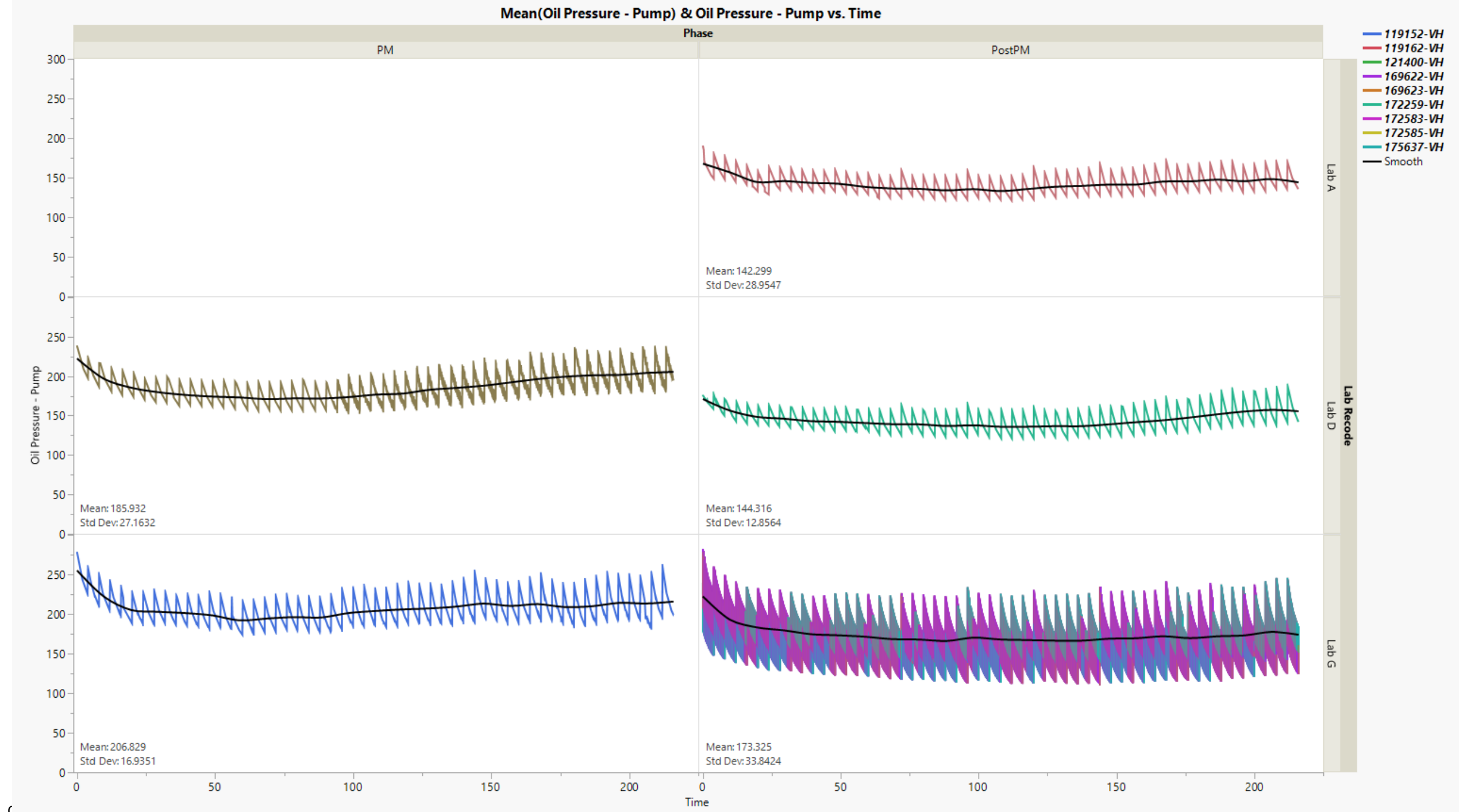

Mean(Intake Air Temperature) & Intake Air Temperature vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Intake Air Temperature
Time
Mean: 30.0006
Std Dev: 0.02988
Mean: 30.1031
Std Dev: 0.06195
Mean: 29.9385
Std Dev: 0.06399
Mean: 30.0007
Std Dev: 0.05559
Mean: 29.9999
Std Dev: 0.08323
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

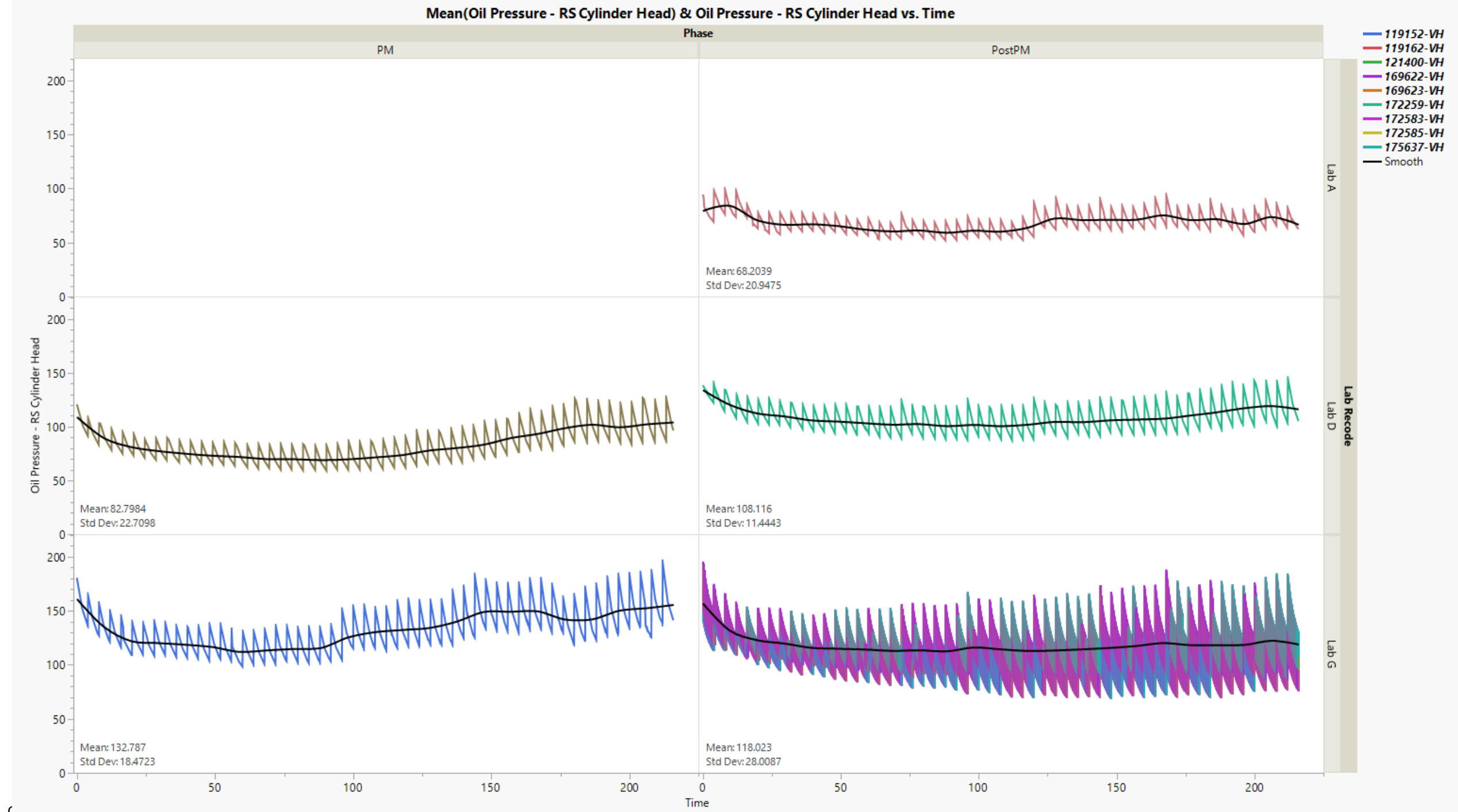

Mean(Intake Manifold Pressure) & Intake Manifold Pressure vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Pressure
Time
Mean: 68.9987
Std Dev: 0.08537
Mean: 68.9962
Std Dev: 0.04919
Mean: 68.9993
Std Dev: 0.01518
Mean: 68.9999
Std Dev: 0.07487
Mean: 68.9985
Std Dev: 0.06796
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))


Mean(Intake Manifold Vacuum) & Intake Manifold Vacuum vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Intake Manifold Vacuum
Time
Mean: 29.8496
Std Dev: 0.62971
Mean: 68.9953
Std Dev: 0.13469
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Mean: .
Std Dev: .
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

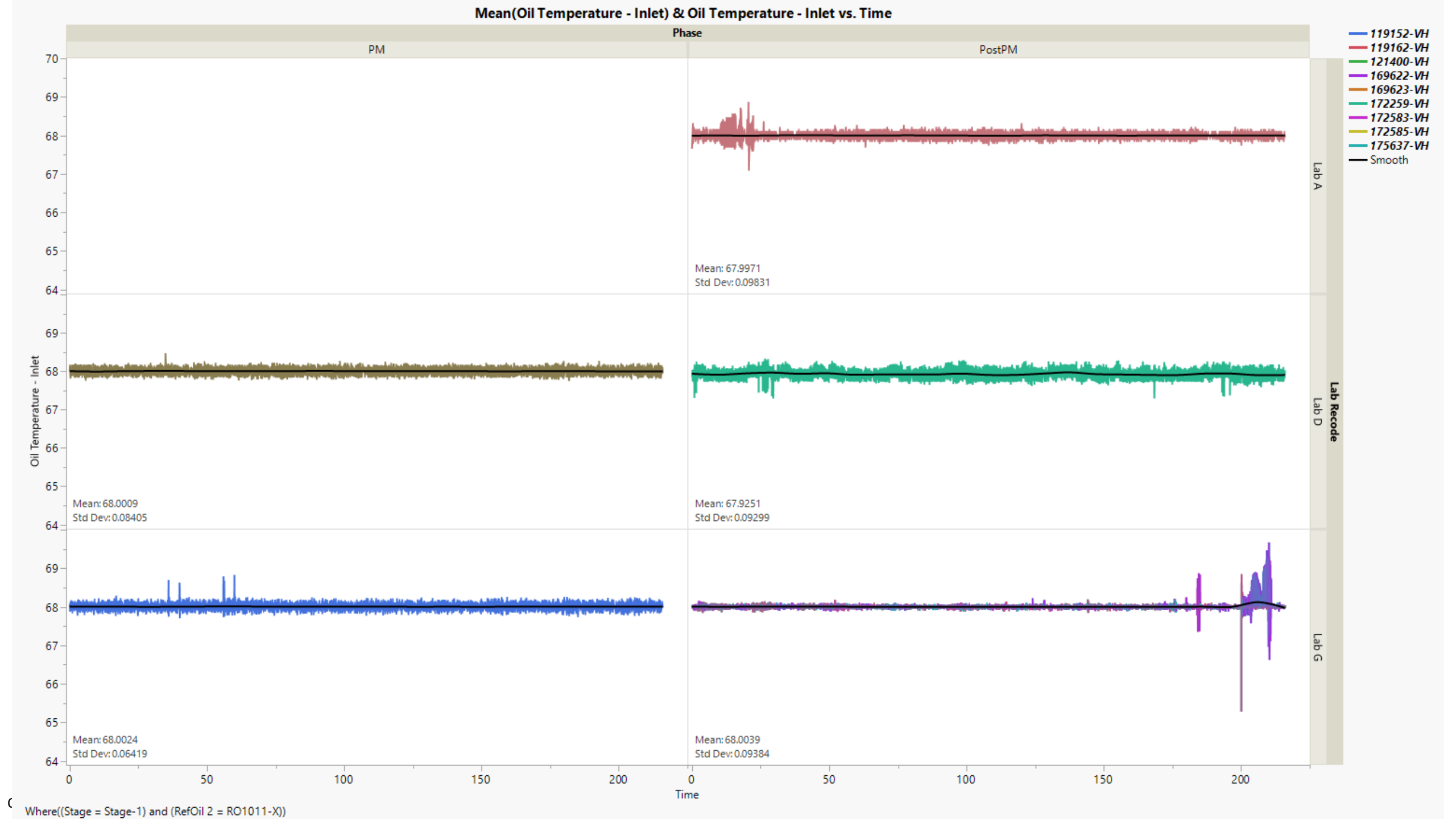


Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

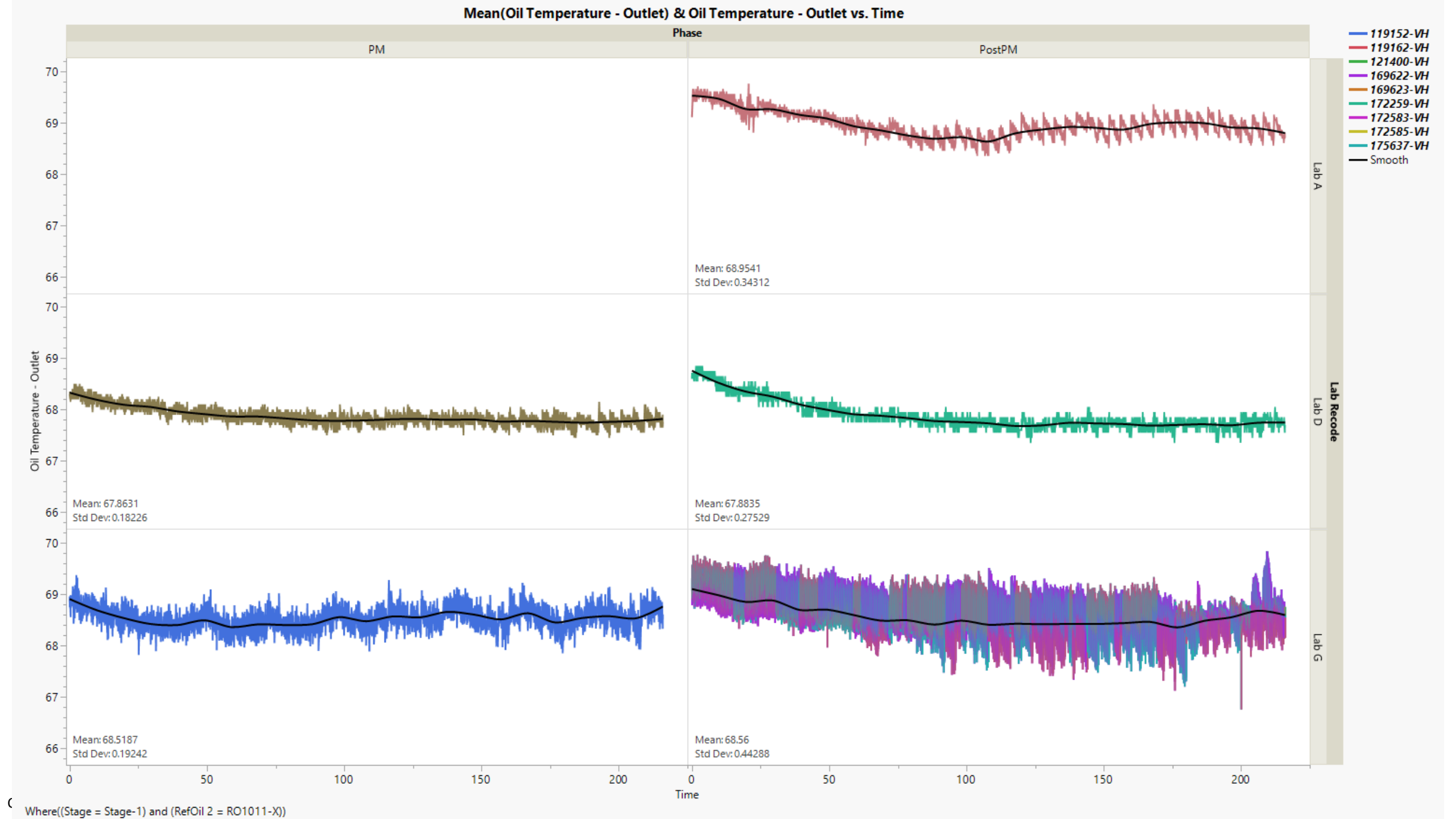

Mean(Oil Pressure - Pump) & Oil Pressure - Pump vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Oil Pressure - Pump
Time
Mean: 142.299
Std Dev: 28.9547
Mean: 185.932
Std Dev: 27.1632
Mean: 144.316
Std Dev: 12.8564
Mean: 206.829
Std Dev: 16.9351
Mean: 173.325
Std Dev: 33.8424
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

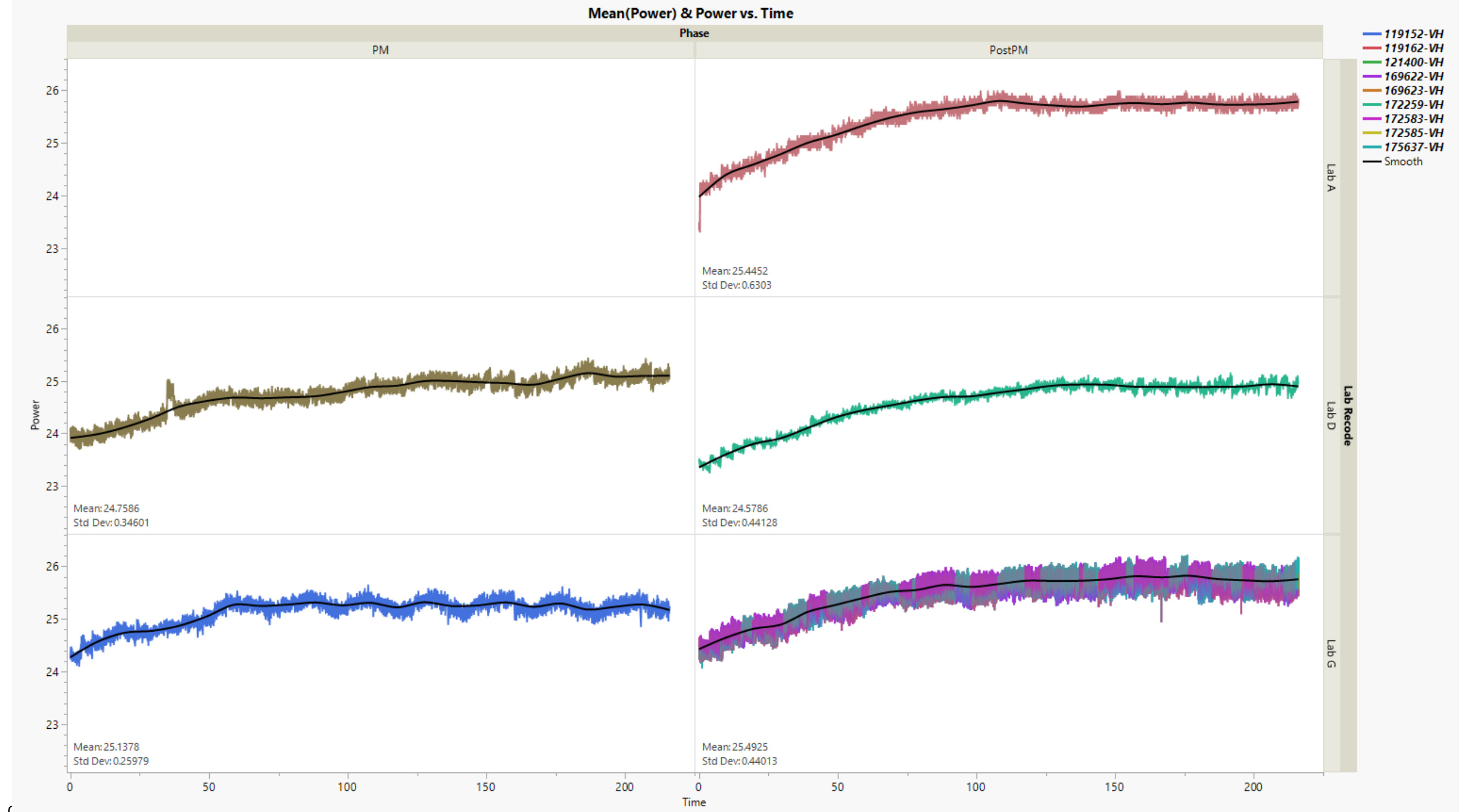


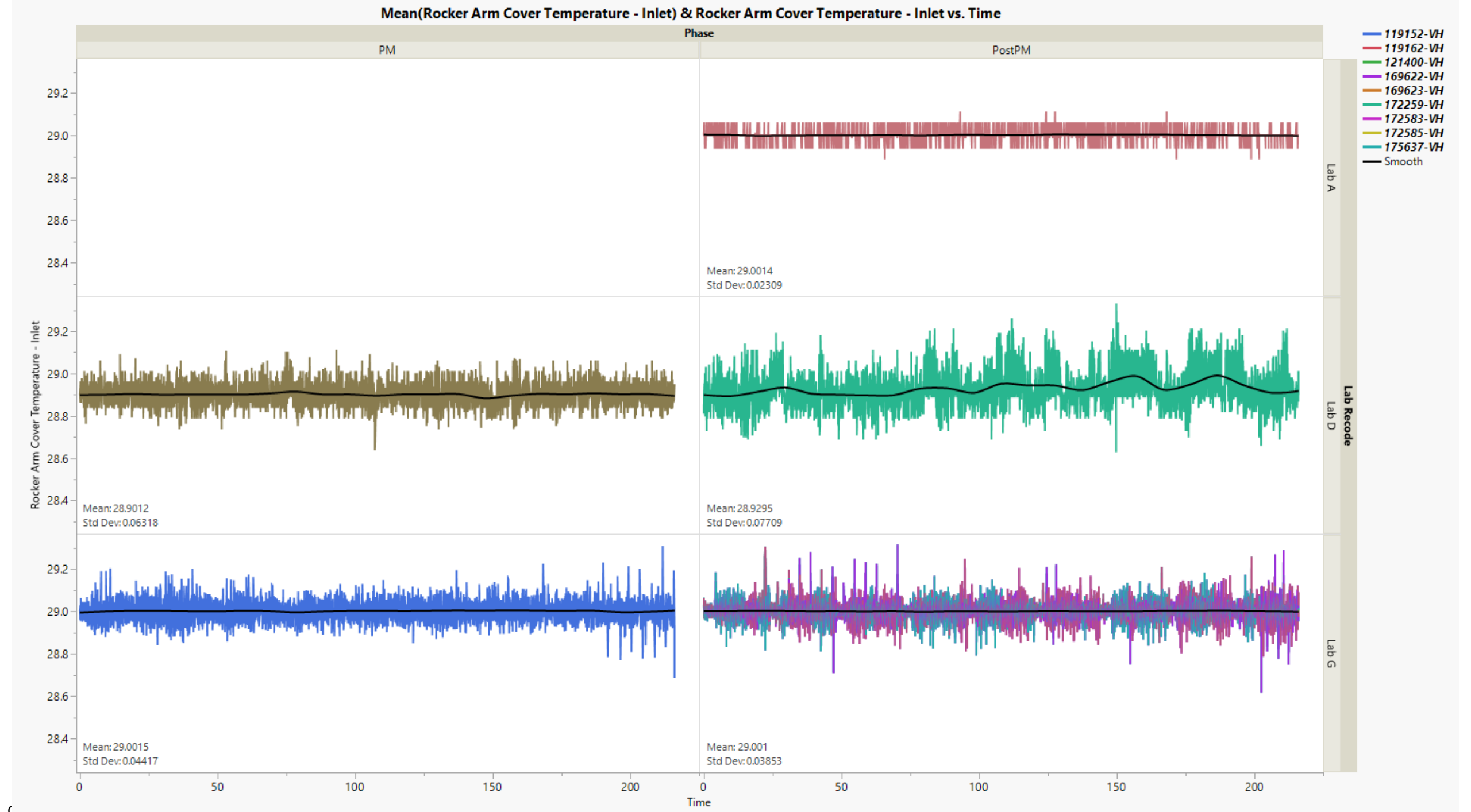
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

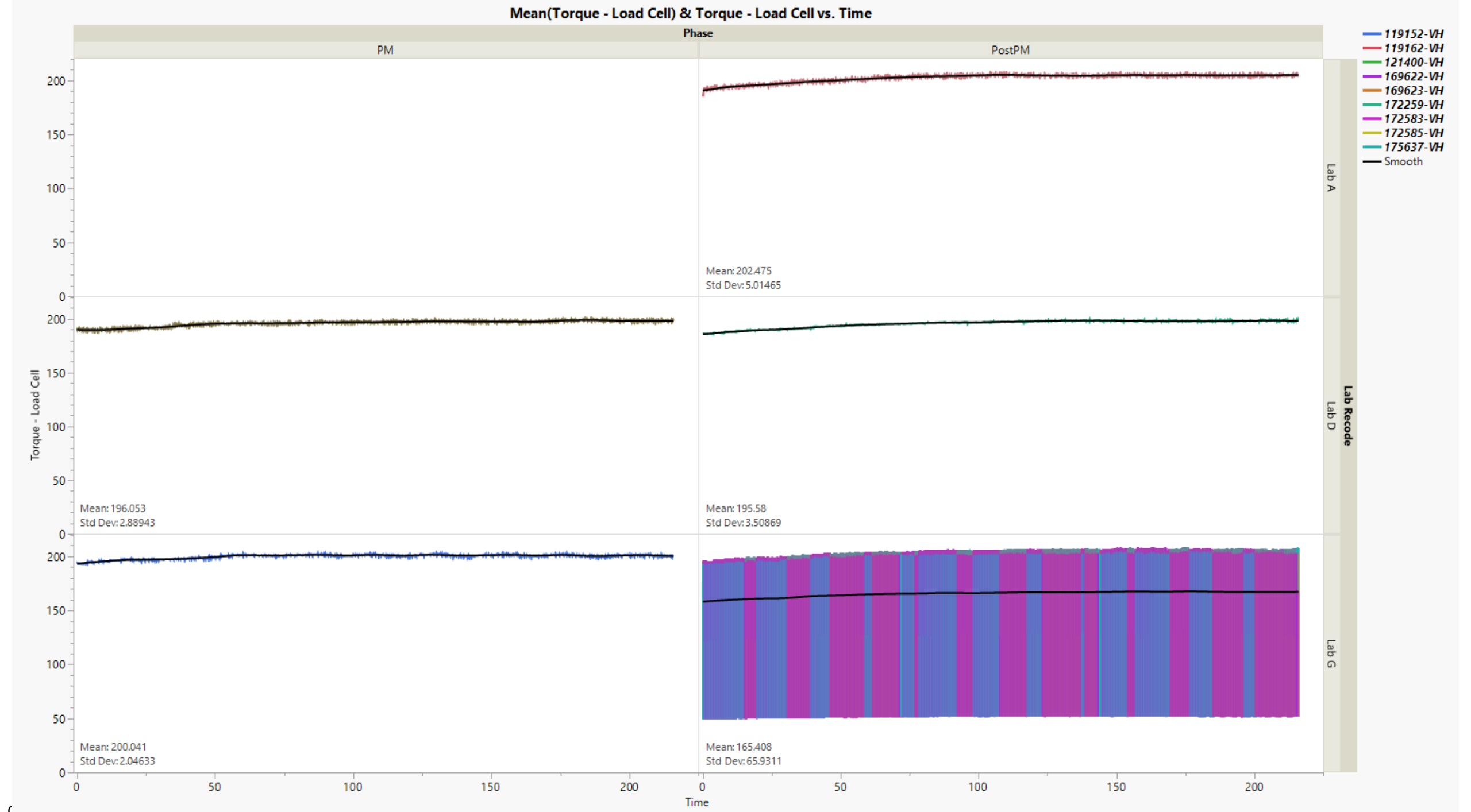


Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))


Mean(Oil Temperature - Outlet) & Oil Temperature - Outlet vs. Time
Phase
PM
PostPM
Lab A
Lab D
Lab G
Lab Recode
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Oil Temperature - Outlet
Time
Mean: 68.9541
Std Dev: 0.34312
Mean: 67.8631
Std Dev: 0.18226
Mean: 67.8835
Std Dev: 0.27529
Mean: 68.5187
Std Dev: 0.19242
Mean: 68.56
Std Dev: 0.44288
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))


Mean(Power) & Power vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Power
Time
Mean: 25.4452
Std Dev: 0.6303
Mean: 24.7586
Std Dev: 0.34601
Mean: 24.5786
Std Dev: 0.44128
Mean: 25.1378
Std Dev: 0.25979
Mean: 25.4925
Std Dev: 0.44013
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))


Mean(Rocker Arm Cover Temperature - Inlet) & Rocker Arm Cover Temperature - Inlet vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Rocker Arm Cover Temperature - Inlet
Time
Mean: 29.0014
Std Dev: 0.02309
Mean: 28.9012
Std Dev: 0.06318
Mean: 28.9295
Std Dev: 0.07709
Mean: 29.0015
Std Dev: 0.04417
Mean: 29.001
Std Dev: 0.03853
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))


Mean(Torque - Load Cell) & Torque - Load Cell vs. Time
Phase
PM
PostPM
119152-VH
119162-VH
121400-VH
169622-VH
169623-VH
172259-VH
172583-VH
172585-VH
175637-VH
Smooth
Lab A
Lab D
Lab G
Lab Recode
Torque - Load Cell
Time
Mean: 202.475
Std Dev: 5.01465
Mean: 196.053
Std Dev: 2.88943
Mean: 195.58
Std Dev: 3.50869
Mean: 200.041
Std Dev: 2.04633
Mean: 165.408
Std Dev: 65.9311
0
50
100
150
200
Where((Stage = Stage-1) and (RefOil 2 = RO1011-X))

VH Build – Operational Data Review

By: Todd Dvorak

08-06-24

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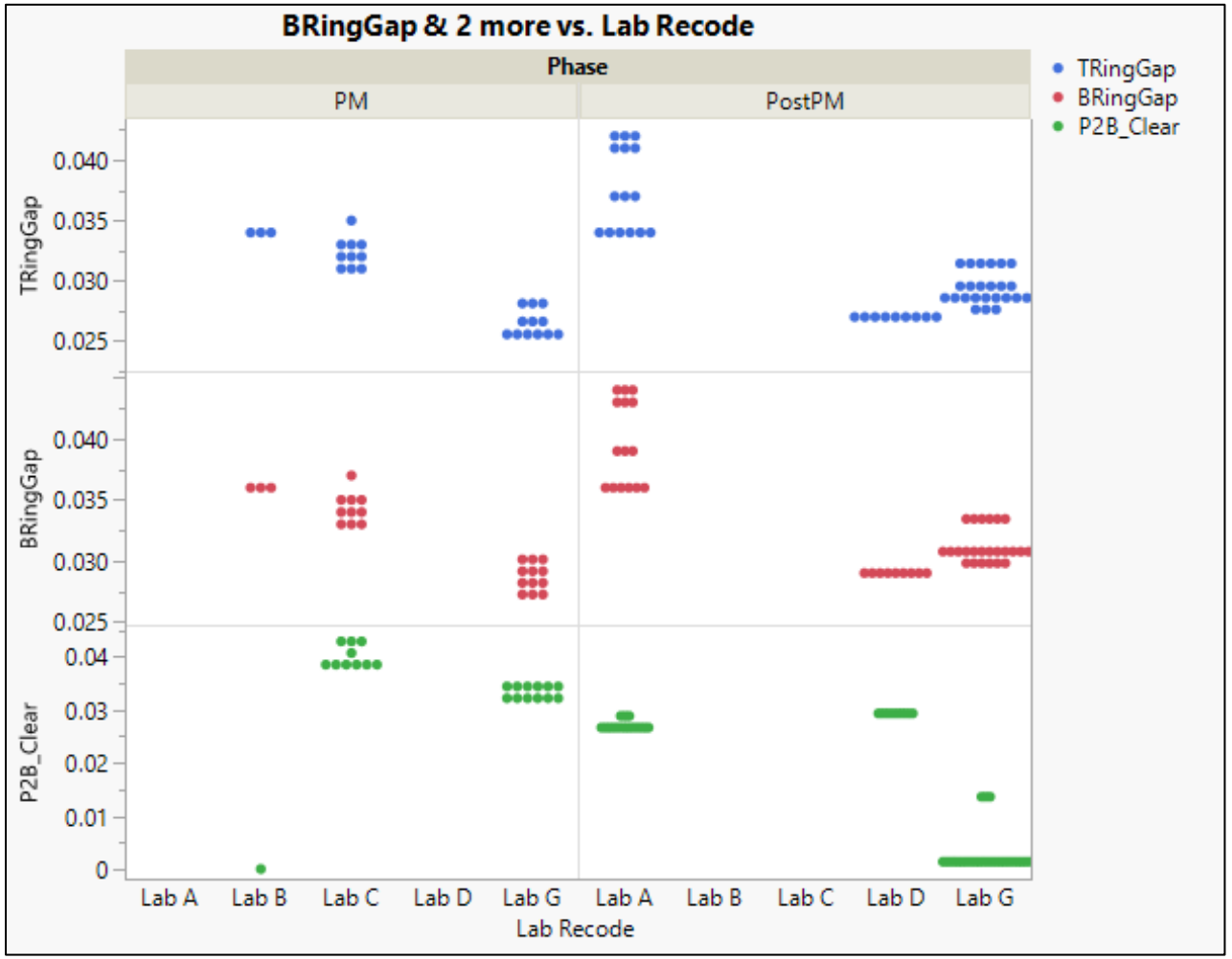
Piston Ring Gap & Bore Clearance Summary



Lab Recode	Phase	Mean(TRingGap)	Mean(BRingGap)	Mean(P2B_Clear)
Lab A	PostPM	0.038	0.040	0.027
Lab B	PM	0.034	0.036	0.000
Lab C	PM	0.032	0.034	0.040
Lab D	PM			
Lab D	PostPM	0.027	0.029	0.029
Lab G	PM	0.026	0.028	0.033
Lab G	PostPM	0.029	0.031	0.003

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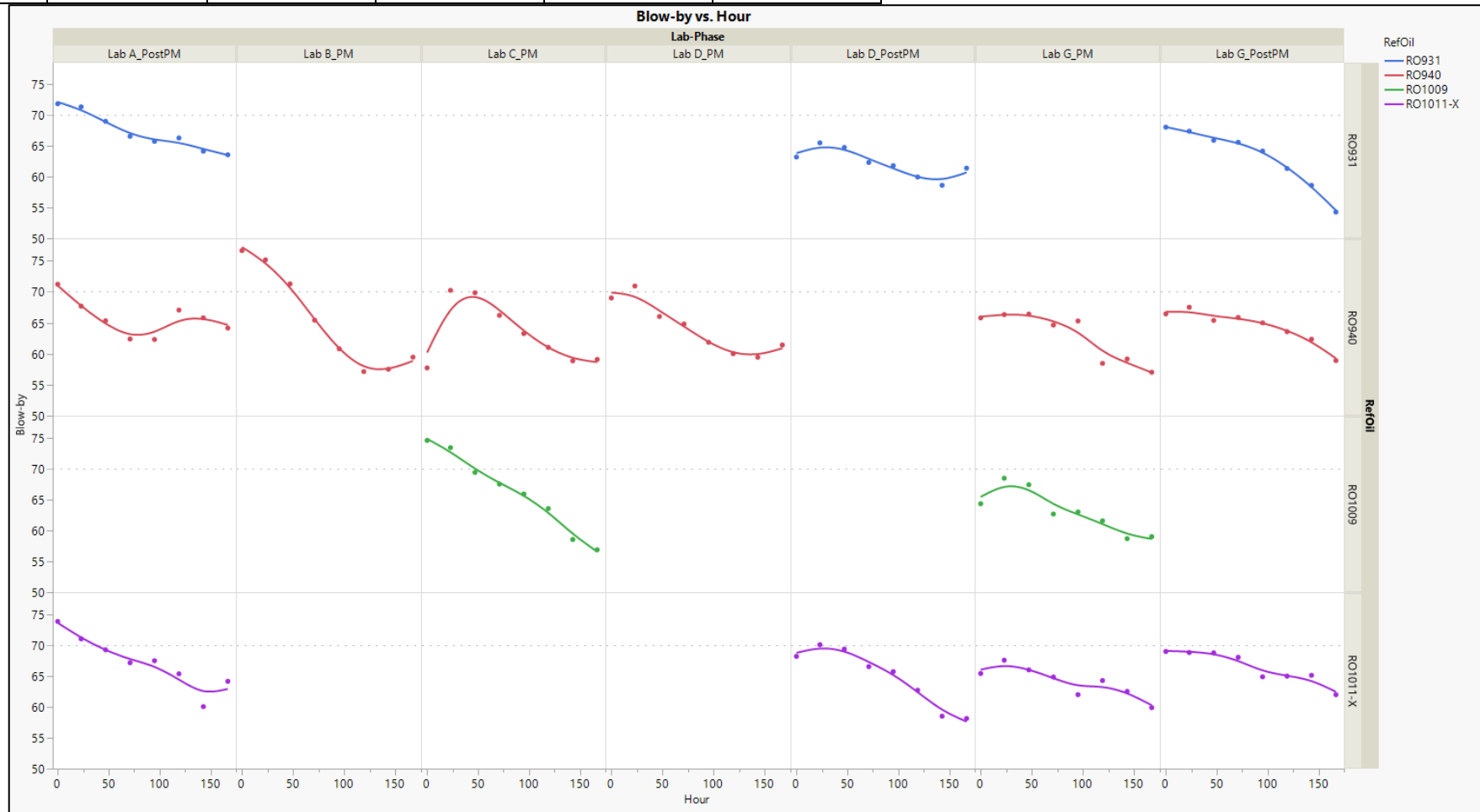
RefOil	Lab-Phase	Mean(BlowbyBreakIn)	Mean(Blowby23HR)	Mean(Blowby47HR)	Mean(Blowby71HR)	Mean(Blowby95HR)	Mean(Blowby119HR)	Mean(Blowby143HR)	Mean(Blowby167HR)
RO931	Lab A_PostPM	71.8	71.3	69.0	66.6	65.7	66.3	64.2	63.6
RO931	Lab D_PostPM	63.2	65.5	64.7	62.3	61.8	60.0	58.6	61.4
RO931	Lab G_PostPM	68.0	67.4	65.9	65.6	64.2	61.3	58.6	54.3
RO940	Lab A_PostPM	71.2	67.7	65.3	62.4	62.3	67.1	65.8	64.2
RO940	Lab B_PM	76.7	75.2	71.3	65.4	60.8	57.1	57.5	59.5
RO940	Lab C_PM	57.7	70.2	69.9	66.2	63.3	61.0	58.9	59.1
RO940	Lab D_PM	69.0	70.9	66.0	64.8	61.9	60.0	59.5	61.4
RO940	Lab G_PM	65.8	66.3	66.4	64.6	65.3	58.5	59.2	57.0
RO940	Lab G_PostPM	66.4	67.5	65.4	65.9	65.0	63.6	62.4	58.9
RO1009	Lab C_PM	74.6	73.5	69.4	67.5	65.9	63.6	58.6	56.9
RO1009	Lab G_PM	64.4	68.5	67.5	62.7	63.0	61.6	58.7	59.0
RO1011-X	Lab A_PostPM	73.9	71.1	69.3	67.2	67.5	65.4	60.1	64.2
RO1011-X	Lab D_PostPM	68.2	70.1	69.4	66.6	65.8	62.7	58.5	58.2
RO1011-X	Lab G_PM	65.5	67.6	66.0	64.9	62.0	64.3	62.5	59.9
RO1011-X	Lab G_PostPM	69.0	68.8	68.8	68.1	64.9	65.0	65.1	62.0

Blow-by Data



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RefOil	Lab-Phase	Mean(OilCon24HR)	Mean(OilCon48HR)	Mean(OilCon72HR)	Mean(OilCon96HR)	Mean(OilCon120HR)	Mean(OilCon144HR)	Mean(OilCon168HR)	Mean(OilCon192HR)
RO931	Lab A_PostPM	-52.0	11.0	168.5	251.0	251.5	199.0	283.0	283.0
RO931	Lab D_PostPM	-62.5	53.0	137.0	105.5	115.0	157.0	230.5	188.5
RO931	Lab G_PostPM	0.5	32.0	208.3	175.0	199.0	132.8	181.5	237.5
RO940	Lab A_PostPM	-10.0	263.0	221.0	262.0	283.0	367.0	285.0	283.0
RO940	Lab B_PM	-52.0	53.0	158.0	137.0	220.0	199.0	220.0	283.0
RO940	Lab C_PM	-10.0	11.0	74.0	158.0	200.0	157.0	262.0	10.0
RO940	Lab D_PM	-31.0	126.0	431.0	179.0	31.0	157.0	262.0	178.0
RO940	Lab G_PM	53.0	21.5	74.0	378.5	273.5	126.5	220.0	209.5
RO940	Lab G_PostPM	11.0	95.0	206.2	192.0	230.5	202.7	279.5	130.0
RO1009	Lab C_PM	-13.0	275.0	172.6	166.6	133.0	157.0	166.0	163.3
RO1009	Lab G_PM	53.0	11.0	179.0	179.0	178.0	94.0	283.0	94.0
RO1011-X	Lab A_PostPM	-31.0	168.5	105.5	168.0	136.0	188.5	136.0	157.0
RO1011-X	Lab D_PostPM	32.0	95.0	284.0	178.0	241.0	-74.0	158.0	199.0
RO1011-X	Lab G_PM	-0.3	-0.7	-0.5	242.0	116.0	220.0	94.0	31.0
RO1011-X	Lab G_PostPM	-36.3	74.0	210.5	225.5	115.0	129.0	172.8	151.8

OilCon Data

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Workbook	Phase	Lab Recode	TestKey	IND	RefOil	Lab 2
PM_TK090017.xlsx	PM	Lab C	90017-VH	RO940	RO940	E
PM_TK100682.xlsx	PM	Lab C	100682-VH	RO1009	RO1009	E
PM_TK109000.xlsx	PM	Lab G	109000-VH	RO940	RO940	G
PM_TK109001.xlsx	PM	Lab G	109001-VH	RO940	RO940	G
PM_TK118176.xlsx	PM	Lab G	118176-VH	RO1009	RO1009	G
PM_TK119152.xlsx	PM	Lab G	119152-VH	RO1011	RO1011-X	G
PM_TK119160.xlsx	PM	Lab D	119160-VH	RO1009	RO1009	D
PM_TK119162.xlsx	PM	Lab D	119162-VH	RO1011	RO1011-X	D
PM_TK120496.xlsx	PM	Lab B	120496-VH	RO940	RO940	B
PM_TK120505.xlsx	PM	Lab C	120505-VH	RO1009	RO1009	E
PM_TK120507.xlsx	PM	Lab D	120507-VH	RO1009	RO1009	D
PM_TK120509.xlsx	PM	Lab D	120509-VH	RO940	RO940	D
PM_TK121398.xlsx	PM	Lab D	121398-VH	RO940	RO940	D
PM_TK121400.xlsx	PM	Lab D	121400-VH	RO1011	RO1011-X	D
PM_TK122524.xlsx	PM	Lab C	122524-VH	RO1009	RO1009	E
PostPM_TK166515.xlsx	PostPM	Lab A	166515-VH	RO931	RO931	A
PostPM_TK166686.xlsx	PostPM	Lab D	166686-VH	RO931	RO931	D
PostPM_TK169622.xlsx	PostPM	Lab G	169622-VH	RO 1011-1	RO1011-X	G
PostPM_TK169623.xlsx	PostPM	Lab G	169623-VH	RO 1011-1	RO1011-X	G
PostPM_TK171799.xlsx	PostPM	Lab D	171799-VH	RO931	RO931	D
PostPM_TK172259.xlsx	PostPM	Lab D	172259-VH	RO 1011-1	RO1011-X	D
PostPM_TK172582.xlsx	PostPM	Lab A	172582-VH	RO940	RO940	A
PostPM_TK172583.xlsx	PostPM	Lab A	172583-VH	RO 1011-1	RO1011-X	A
PostPM_TK172585.xlsx	PostPM	Lab A	172585-VH	RO 1011-1	RO1011-X	A
PostPM_TK172587.xlsx	PostPM	Lab G	172587-VH	RO940	RO940	G
PostPM_TK175288.xlsx	PostPM	Lab G	169622-VH	RO 1011-1	RO1011-X	G
PostPM_TK175289.xlsx	PostPM	Lab G	172589-VH	RO931	RO931	G
PostPM_TK175637.xlsx	PostPM	Lab G	175637-VH	RO 1011-1	RO1011-X	G
PostPM_TK175640.xlsx	PostPM	Lab G	175640-VH	RO931	RO931	G
PostPM_TK175643.xlsx	PostPM	Lab G	175643-VH	RO940	RO940	G
PostPM_TK175648.xlsx	PostPM	Lab A	175648-VH	RO931	RO931	A
PM_TK090017.xlsx	PM	Lab C	90017-VH		RO940	E
PM_TK109000.xlsx	PM	Lab G	109000-VH		RO940	G
PM_TK109001.xlsx	PM	Lab G	109001-VH		RO940	G
PM_TK118176.xlsx	PM	Lab G	118176-VH		RO1009	G
PM_TK119152.xlsx	PM	Lab G	119152-VH		RO1011-X	G
PM_TK120496.xlsx	PM	Lab B	120496-VH		RO940	B
PM_TK120505.xlsx	PM	Lab C	120505-VH		RO1009	E
PM_TK122524.xlsx	PM	Lab C	122524-VH		RO1009	E
PostPM_TK166515.xlsx	PostPM	Lab A	166515-VH		RO931	A
PostPM_TK166686.xlsx	PostPM	Lab D	166686-VH		RO931	D
PostPM_TK169622.xlsx	PostPM	Lab G	169622-VH		RO1011-X	G
PostPM_TK169623.xlsx	PostPM	Lab G	169623-VH		RO1011-X	G
PostPM_TK171799.xlsx	PostPM	Lab D	171799-VH		RO931	D
PostPM_TK172259.xlsx	PostPM	Lab D	172259-VH		RO1011-X	D
PostPM_TK172582.xlsx	PostPM	Lab A	172582-VH		RO940	A

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PostPM_TK172583.xlsx	PostPM	Lab A	172583-VH		RO1011-X	A
PostPM_TK172585.xlsx	PostPM	Lab A	172585-VH		RO1011-X	A
PostPM_TK172587.xlsx	PostPM	Lab G	172587-VH		RO940	G
PostPM_TK175288.xlsx	PostPM	Lab G	169622-VH		RO1011-X	G
PostPM_TK175289.xlsx	PostPM	Lab G	172589-VH		RO931	G
PostPM_TK175637.xlsx	PostPM	Lab G	175637-VH		RO1011-X	G
PostPM_TK175640.xlsx	PostPM	Lab G	175640-VH		RO940	G
PostPM_TK175643.xlsx	PostPM	Lab G	175643-VH		RO931	G
PostPM_TK175648.xlsx	PostPM	Lab A	175648-VH		RO931	A
PM_TK090017.xlsx	PM	Lab C	90017-VH	RO940	RO940	E
PM_TK109000.xlsx	PM	Lab G	109000-VH	RO940	RO940	G
PM_TK109001.xlsx	PM	Lab G	109001-VH	RO940	RO940	G
PM_TK118176.xlsx	PM	Lab G	118176-VH	RO1009	RO1009	G
PM_TK119152.xlsx	PM	Lab G	119152-VH	RO1011	RO1011-X	G
PM_TK120496.xlsx	PM	Lab B	120496-VH	RO940	RO940	B
PM_TK120505.xlsx	PM	Lab C	120505-VH	RO1009	RO1009	E
PM_TK122524.xlsx	PM	Lab C	122524-VH	RO1009	RO1009	E
PostPM_TK166515.xlsx	PostPM	Lab A	166515-VH	RO931	RO931	A
PostPM_TK166686.xlsx	PostPM	Lab D	166686-VH	RO931	RO931	D
PostPM_TK169622.xlsx	PostPM	Lab G	169622-VH	RO 1011-1	RO1011-X	G
PostPM_TK169623.xlsx	PostPM	Lab G	169623-VH	RO 1011-1	RO1011-X	G
PostPM_TK171799.xlsx	PostPM	Lab D	171799-VH	RO931	RO931	D
PostPM_TK172259.xlsx	PostPM	Lab D	172259-VH	RO 1011-1	RO1011-X	D
PostPM_TK172582.xlsx	PostPM	Lab A	172582-VH	RO940	RO940	A
PostPM_TK172583.xlsx	PostPM	Lab A	172583-VH	RO 1011-1	RO1011-X	A
PostPM_TK172585.xlsx	PostPM	Lab A	172585-VH	RO 1011-1	RO1011-X	A
PostPM_TK172587.xlsx	PostPM	Lab G	172587-VH	RO940	RO940	G
PostPM_TK175288.xlsx	PostPM	Lab G	169622-VH	RO 1011-1	RO1011-X	G
PostPM_TK175289.xlsx	PostPM	Lab G	172589-VH	RO931	RO931	G
PostPM_TK175637.xlsx	PostPM	Lab G	175637-VH	RO 1011-1	RO1011-X	G
PostPM_TK175640.xlsx	PostPM	Lab G	175640-VH	RO931	RO931	G
PostPM_TK175643.xlsx	PostPM	Lab G	175643-VH	RO940	RO940	G
PostPM_TK175648.xlsx	PostPM	Lab A	175648-VH	RO931	RO931	A

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TK-IND-Lab	TestID	TestStand	OilCode	EOTDate
TK90017-RO940- E	5-0-1	5	CMIR-90017 / IND-940	9/2/2016
TK100682-RO1009- E	5-0-5	5	100682	2/16/2017
TK109000-RO940- G	109000	98-00-0019	REO940	7/24/2016
TK109001-RO940- G	109001	86-00-0001	REO940	9/17/2016
TK118176-RO1009- G	118176	98-0-0018	REO1009	7/6/2016
TK119152-RO1011- G	119152	98-00-0020	REO1011	8/4/2016
TK119160-RO1009- D	CB109-04-0009	CB109	119160	04/31/2017
TK119162-RO1011- D	CB109-01-0006	CB109	119162	2/12/2017
TK120496-RO940- B	TRN91RH7B	262	REO940	10/20/2016
TK120505-RO1009- E	5-0-4	5	120505	11/4/2016
TK120507-RO1009- D1	CB109-00-0003	CB109-00-0003	120509	11/5/2016
TK120509-RO940- D1	CB109-00-0002	CB109	120507	9/28/2016
TK121398-RO940- D	CB109-03-0008	CB109	121398	3/17/2017
TK121400-RO1011- D	CB109-02-0007	CB109	121400	2/24/2017
TK122524-RO1009- E	5-0-4	5	1009	12/1/2016
TK166515-RO931- A	9/11/1995	Stand 9 / LTMSAPP 2	REO931	11/21/2022
TK166686-RO931- D	C113B-11-0037	C113B	REO931	12/11/2022
TK169622-RO 1011-1- G	169622	86	REO1011-1	11/21/2022
TK169623-RO 1011-1- G	169623	97	REO1011-1	12/26/2022
TK171799-RO931- D	C113B-00-0038	C113B	REO931	12/23/2022
TK172259-RO 1011-1- D	C113B-10-0036	C113B	REO1011-1	11/24/2022
TK172582-RO940- A	12/12/1982	Stand 12 / LTMSAPP 3	REO940	12/7/2022
TK172583-RO 1011-1- A	12/11/1981	Stand 12 / LTMSAPP 3	REO1011-1	11/25/2022
TK172585-RO 1011-1- A	9-0-97	Stand 9 / LTMSAPP 2	REO1011-1	12/23/2022
TK172587-RO940- G	172587	97	REO940	12/2/2022
TK175288-RO 1011-1- G	VH86-14-0127	86	REO1011-1	11/21/2022
TK175289-RO931- G	172589	86	REO931	12/2/2022
TK175637-RO 1011-1- G	175637	98	REO1011-1	12/24/2022
TK175640-RO931- G	17563	86	REO940	12/26/2024
TK175643-RO940- G	175640	87	REO931	12/25/2022
TK175648-RO931- A	12-0-83	Stand 12 / LTMSAPP 3	REO931	12/24/2022
TK90017-RO940- E	5-0-1	5	CMIR-90017 / IND-940	3555619200
TK109000-RO940- G	109000	98-00-0019	REO940	3552163200
TK109001-RO940- G	109001	86-00-0001	REO940	3556915200
TK118176-RO1009- G	118176	98-0-0018	REO1009	3550608000
TK119152-RO1011- G	119152	98-00-0020	REO1011	3553113600
TK120496-RO940- B	TRN91RH7B	262	REO940	3559766400
TK120505-RO1009- E	5-0-4	5	120505	3561062400
TK122524-RO1009- E	5-0-4	5	1009	3563395200
TK166515-RO931- A	9/11/1995	Stand 9 / LTMSAPP 2	REO931	3751833600
TK166686-RO931- D	C113B-11-0037	C113B	REO931	3753561600
TK169622-RO 1011-1- G	169622	86	REO1011-1	3751833600
TK169623-RO 1011-1- G	169623	97	REO1011-1	3754857600
TK171799-RO931- D	C113B-00-0038	C113B	REO931	3754598400
TK172259-RO 1011-1- D	C113B-10-0036	C113B	REO1011-1	3752092800
TK172582-RO940- A	12/12/1982	Stand 12 / LTMSAPP 3	REO940	3753216000

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TK172583-RO 1011-1- A	12/11/1981	Stand 12 / LTMSAPP 3	REO1011-1	3752179200
TK172585-RO 1011-1- A	9-0-97	Stand 9 / LTMSAPP 2	REO1011-1	3754598400
TK172587-RO940- G	172587	97	REO940	3752784000
TK175288-RO 1011-1- G	VH86-14-0127	86	REO1011-1	3751833600
TK175289-RO931- G	172589	86	REO931	3752784000
TK175637-RO 1011-1- G	175637	98	REO1011-1	3754684800
TK175640-RO931- G	17563	86	REO940	3818016000
TK175643-RO940- G	175640	87	REO931	3754771200
TK175648-RO931- A	12-0-83	Stand 12 / LTMSAPP 3	REO931	3754684800
TK90017-RO940- E	5-0-1	5	CMIR-90017 / IND-940	3555619200
TK109000-RO940- G	109000	98-00-0019	REO940	3552163200
TK109001-RO940- G	109001	86-00-0001	REO940	3556915200
TK118176-RO1009- G	118176	98-0-0018	REO1009	3550608000
TK119152-RO1011- G	119152	98-00-0020	REO1011	3553113600
TK120496-RO940- B	TRN91RH7B	262	REO940	3559766400
TK120505-RO1009- E	5-0-4	5	120505	3561062400
TK122524-RO1009- E	5-0-4	5	1009	3563395200
TK166515-RO931- A	9/11/1995	Stand 9 / LTMSAPP 2	REO931	3751833600
TK166686-RO931- D	C113B-11-0037	C113B	REO931	3753561600
TK169622-RO 1011-1- G	169622	86	REO1011-1	3751833600
TK169623-RO 1011-1- G	169623	97	REO1011-1	3754857600
TK171799-RO931- D	C113B-00-0038	C113B	REO931	3754598400
TK172259-RO 1011-1- D	C113B-10-0036	C113B	REO1011-1	3752092800
TK172582-RO940- A	12/12/1982	Stand 12 / LTMSAPP 3	REO940	3753216000
TK172583-RO 1011-1- A	12/11/1981	Stand 12 / LTMSAPP 3	REO1011-1	3752179200
TK172585-RO 1011-1- A	9-0-97	Stand 9 / LTMSAPP 2	REO1011-1	3754598400
TK172587-RO940- G	172587	97	REO940	3752784000
TK175288-RO 1011-1- G	VH86-14-0127	86	REO1011-1	3751833600
TK175289-RO931- G	172589	86	REO931	3752784000
TK175637-RO 1011-1- G	175637	98	REO1011-1	3754684800
TK175640-RO931- G	17563	86	REO940	3818016000
TK175643-RO940- G	175640	87	REO931	3754771200
TK175648-RO931- A	12-0-83	Stand 12 / LTMSAPP 3	REO931	3754684800

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Engine	Lab-Phase	BlowbyBreakIn	Blowby23HR	Blowby47HR	Blowby71HR	Blowby95HR
VH-AS2016-1	Lab C_PM	57.73	70.24	69.85	66.21	63.26
2016-1	Lab C_PM	67.44	74.05	73.21	69.04	65.37
VH	Lab G_PM	69.24	69.16	66.55	67.36	65.93
VH	Lab G_PM	62.36	63.49	66.26	61.91	64.66
VH	Lab G_PM	64.36	68.5	67.45	62.69	63.04
VH	Lab G_PM	65.45	67.6	66.03	64.89	62.02
17-02-01	Lab D_PM					
17-01-01	Lab D_PM					
VH	Lab B_PM	76.66	75.16	71.28	65.42	60.81
VH-AS2016-1	Lab C_PM	80.54	73.1	67.92	67.57	66.03
001-002	Lab D_PM					
2	Lab D_PM	69.01	70.94	66.02	64.81	61.86
17-01-02	Lab D_PM					
16-02-04	Lab D_PM					
VH-AS2016-2	Lab C_PM	71.1	73.63	69.7	67.03	66.03
VH	Lab A_PostPM	71.5	71.98	70.27	67.62	66.94
VH	Lab D_PostPM	63.9	67.77	64.88	62.97	63.09
VH	Lab G_PostPM	66.65	68.12	67.31	65.62	57.35
VH	Lab G_PostPM	69.22	69.72	70.18	70.28	69.45
VH	Lab D_PostPM	62.49	63.23	64.61	61.67	60.51
VH	Lab D_PostPM	68.22	70.12	69.41	66.56	65.75
VH	Lab A_PostPM	71.22	67.69	65.33	62.39	62.32
VH	Lab A_PostPM	70.29	69.22	69.5	67.87	67.39
VH	Lab A_PostPM	77.49	72.91	69.07	66.5	67.64
VH	Lab G_PostPM	66.21	65.53	65.12	64.83	64.84
VH	Lab G_PostPM	67.91	68.31	68.54	68.24	67.72
VH	Lab G_PostPM	68.37	66.06	65.99	65.73	66.22
VH	Lab G_PostPM	72.29	69.23	69.16	68.18	65.1
VH	Lab G_PostPM	68.73	67.95	65.98	63.98	59.05
VH	Lab G_PostPM	65.65	70.26	65.51	68.36	68.19
VH	Lab A_PostPM	72.17	70.69	67.7	65.49	64.53
VH-AS2016-1	Lab C_PM	57.73	70.24	69.85	66.21	63.26
VH	Lab G_PM	69.24	69.16	66.55	67.36	65.93
VH	Lab G_PM	62.36	63.49	66.26	61.91	64.66
VH	Lab G_PM	64.36	68.5	67.45	62.69	63.04
VH	Lab G_PM	65.45	67.6	66.03	64.89	62.02
VH	Lab B_PM	76.66	75.16	71.28	65.42	60.81
VH-AS2016-1	Lab C_PM	80.54	73.1	67.92	67.57	66.03
VH-AS2016-2	Lab C_PM	71.1	73.63	69.7	67.03	66.03
VH	Lab A_PostPM	71.5	71.98	70.27	67.62	66.94
VH	Lab D_PostPM	63.9	67.77	64.88	62.97	63.09
VH	Lab G_PostPM	66.65	68.12	67.31	65.62	57.35
VH	Lab G_PostPM	69.22	69.72	70.18	70.28	69.45
VH	Lab D_PostPM	62.49	63.23	64.61	61.67	60.51
VH	Lab D_PostPM	68.22	70.12	69.41	66.56	65.75
VH	Lab A_PostPM	71.22	67.69	65.33	62.39	62.32

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VH	Lab A_PostPM	70.29	69.22	69.5	67.87	67.39
VH	Lab A_PostPM	77.49	72.91	69.07	66.5	67.64
VH	Lab G_PostPM	66.21	65.53	65.12	64.83	64.84
VH	Lab G_PostPM	67.91	68.31	68.54	68.24	67.72
VH	Lab G_PostPM	68.37	66.06	65.99	65.73	66.22
VH	Lab G_PostPM	72.29	69.23	69.16	68.18	65.1
VH	Lab G_PostPM	68.73	67.95	65.98	63.98	59.05
VH	Lab G_PostPM	65.65	70.26	65.51	68.36	68.19
VH	Lab A_PostPM	72.17	70.69	67.7	65.49	64.53
VH-AS2016-1	Lab C_PM	57.73	70.24	69.85	66.21	63.26
VH	Lab G_PM	69.24	69.16	66.55	67.36	65.93
VH	Lab G_PM	62.36	63.49	66.26	61.91	64.66
VH	Lab G_PM	64.36	68.5	67.45	62.69	63.04
VH	Lab G_PM	65.45	67.6	66.03	64.89	62.02
VH	Lab B_PM	76.66	75.16	71.28	65.42	60.81
VH-AS2016-1	Lab C_PM	80.54	73.1	67.92	67.57	66.03
VH-AS2016-2	Lab C_PM	71.1	73.63	69.7	67.03	66.03
VH	Lab A_PostPM	71.5	71.98	70.27	67.62	66.94
VH	Lab D_PostPM	63.9	67.77	64.88	62.97	63.09
VH	Lab G_PostPM	66.65	68.12	67.31	65.62	57.35
VH	Lab G_PostPM	69.22	69.72	70.18	70.28	69.45
VH	Lab D_PostPM	62.49	63.23	64.61	61.67	60.51
VH	Lab D_PostPM	68.22	70.12	69.41	66.56	65.75
VH	Lab A_PostPM	71.22	67.69	65.33	62.39	62.32
VH	Lab A_PostPM	70.29	69.22	69.5	67.87	67.39
VH	Lab A_PostPM	77.49	72.91	69.07	66.5	67.64
VH	Lab G_PostPM	66.21	65.53	65.12	64.83	64.84
VH	Lab G_PostPM	67.91	68.31	68.54	68.24	67.72
VH	Lab G_PostPM	68.37	66.06	65.99	65.73	66.22
VH	Lab G_PostPM	72.29	69.23	69.16	68.18	65.1
VH	Lab G_PostPM	68.73	67.95	65.98	63.98	59.05
VH	Lab G_PostPM	65.65	70.26	65.51	68.36	68.19
VH	Lab A_PostPM	72.17	70.69	67.7	65.49	64.53

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Blowby119HR	Blowby143HR	Blowby167HR	OilCon24HR	OilCon48HR	OilCon72HR	OilCon96HR
61.04	58.87	59.1	-10	11	74	158
63.12	63.58	62.23	32	-31	74	221
60.67	60.25	57.81	137	11	11	578
56.25	58.09	56.25	-31	32	137	179
61.59	58.7	59.03	53	11	179	179
64.3	62.54	59.91	-0.31	-0.73	-0.52	242
57.14	57.51	59.47	-52	53	158	137
62.38	61.5	54.13	179	368	325	115
60.02	59.45	61.43	-31	126	431	179
64.93	53.95	57.9	-220	284	53	200
66.1	66.95	64.36	-52	-31	158	260
62.75	61.01	58.14	-73	95	116	95
62.4	69.64	59.09	-52	95	221	178
68.59	67.99	67.26	-52	158	158	178
57.17	56.22	64.66	-52	11	158	116
62.74	58.52	58.15	32	95	284	178
67.06	65.81	64.16	-10	263	221	262
67.21	54.8	60.53	-52	263	116	178
63.57	65.33	67.82	-10	74	95	158
63.81	63.81	61.93	-31	158	200	178
66.75	57.74	59.5	-52	-52	305	200
62.92	60.48	54.58	-52	74	179	158
62.32	65.22	62.2	11	95	158	346
56.16	52.58	52.06	53	-52	263	178
66.95	65.06	57.8	53	74	187	220
66.47	61.35	62.76	-52	53	179	242
61.04	58.87	59.1	-10	11	74	158
60.67	60.25	57.81	137	11	11	578
56.25	58.09	56.25	-31	32	137	179
61.59	58.7	59.03	53	11	179	179
64.3	62.54	59.91	-0.31	-0.73	-0.52	242
57.14	57.51	59.47	-52	53	158	137
62.38	61.5	54.13	179	368	325	115
64.93	53.95	57.9	-220	284	53	200
66.1	66.95	64.36	-52	-31	158	260
62.75	61.01	58.14	-73	95	116	95
62.4	69.64	59.09	-52	95	221	178
68.59	67.99	67.26	-52	158	158	178
57.17	56.22	64.66	-52	11	158	116
62.74	58.52	58.15	32	95	284	178
67.06	65.81	64.16	-10	263	221	262

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67.21	54.8	60.53	-52	263	116	178
63.57	65.33	67.82	-10	74	95	158
63.81	63.81	61.93	-31	158	200	178
66.75	57.74	59.5	-52	-52	305	200
62.92	60.48	54.58	-52	74	179	158
62.32	65.22	62.2	11	95	158	346
56.16	52.58	52.06	53	-52	263	178
66.95	65.06	57.8	53	74	187	220
66.47	61.35	62.76	-52	53	179	242
61.04	58.87	59.1	-10	11	74	158
60.67	60.25	57.81	137	11	11	578
56.25	58.09	56.25	-31	32	137	179
61.59	58.7	59.03	53	11	179	179
64.3	62.54	59.91	-0.31	-0.73	-0.52	242
57.14	57.51	59.47	-52	53	158	137
62.38	61.5	54.13	179	368	325	115
64.93	53.95	57.9	-220	284	53	200
66.1	66.95	64.36	-52	-31	158	260
62.75	61.01	58.14	-73	95	116	95
62.4	69.64	59.09	-52	95	221	178
68.59	67.99	67.26	-52	158	158	178
57.17	56.22	64.66	-52	11	158	116
62.74	58.52	58.15	32	95	284	178
67.06	65.81	64.16	-10	263	221	262
67.21	54.8	60.53	-52	263	116	178
63.57	65.33	67.82	-10	74	95	158
63.81	63.81	61.93	-31	158	200	178
66.75	57.74	59.5	-52	-52	305	200
62.92	60.48	54.58	-52	74	179	158
62.32	65.22	62.2	11	95	158	346
56.16	52.58	52.06	53	-52	263	178
66.95	65.06	57.8	53	74	187	220
66.47	61.35	62.76	-52	53	179	242

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OilCon120HR	OilCon144HR	OilCon168HR	OilCon192HR	TRingGap	BRingGap	P2B_Clear
200	157	262	10	0.033	0.035	0.038075
52	220	598	12	0.035	0.037	0.03937
243	117	220	241	0.02525	0.02725	0.03429
304	136	220	178	0.026625	0.028625	0.032385
178	94	283	94	0.028125	0.030125	0.0320675
116	220	94	31	0.025875	0.027875	0.0346075
220	199	220	283	0.034	0.036	0
157	94	115	178	0.032	0.034	0.042545
31	157	262	178			
136	199	73	199	0.031	0.033	0.0390525
199	220	325	346	0.037	0.039	0.028625
94	220	241	136	0.027	0.029	0.0302625
115	115	178	136	0.028375	0.030375	0.0014
94	178	157	94	0.0285	0.0305	0.0013875
136	94	220	241	0.027	0.029	0.0286125
241	-74	158	199	0.027	0.029	0.029225
283	367	285	283	0.034	0.036	0.026875
94	199	136	178	0.034	0.036	0.026375
178	178	136	136	0.042	0.044	0.02675
283	241	388	117	0.03125	0.03325	0.0013375
178	73	199	199	0.031625	0.033625	0.00135
157	73	178	283	0.029	0.031	0.001325
73	150	157	178	0.028	0.03	0.013625
304	221	199	241	0.029125	0.031125	0.001425
115	136	157	94	0.027625	0.029625	0.001325
304	178	241	220	0.041	0.043	0.02675
200	157	262	10	0.033	0.035	0.038075
243	117	220	241	0.02525	0.02725	0.03429
304	136	220	178	0.026625	0.028625	0.032385
178	94	283	94	0.028125	0.030125	0.0320675
116	220	94	31	0.025875	0.027875	0.0346075
220	199	220	283	0.034	0.036	
157	94	115	178	0.032	0.034	0.042545
136	199	73	199	0.031	0.033	0.0390525
199	220	325	346	0.037	0.039	0.028625
94	220	241	136	0.027	0.029	0.0302625
115	115	178	136	0.028375	0.030375	0.0014
94	178	157	94	0.0285	0.0305	0.0013875
136	94	220	241	0.027	0.029	0.0286125
241	-74	158	199	0.027	0.029	0.029225
283	367	285	283	0.034	0.036	0.026875

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94	199	136	178	0.034	0.036	0.026375
178	178	136	136	0.042	0.044	0.02675
283	241	388	117	0.03125	0.03325	0.0013375
178	73	199	199	0.031625	0.033625	0.00135
157	73	178	283	0.029	0.031	0.001325
73	150	157	178	0.028	0.03	0.013625
304	221	199	241	0.029125	0.031125	0.001425
115	136	157	94	0.027625	0.029625	0.001325
304	178	241	220	0.041	0.043	0.02675
200	157	262	10	0.033	0.035	0.038075
243	117	220	241	0.02525	0.02725	0.03429
304	136	220	178	0.026625	0.028625	0.032385
178	94	283	94	0.028125	0.030125	0.0320675
116	220	94	31	0.025875	0.027875	0.0346075
220	199	220	283	0.034	0.036	
157	94	115	178	0.032	0.034	0.042545
136	199	73	199	0.031	0.033	0.0390525
199	220	325	346	0.037	0.039	0.028625
94	220	241	136	0.027	0.029	0.0302625
115	115	178	136	0.028375	0.030375	0.0014
94	178	157	94	0.0285	0.0305	0.0013875
136	94	220	241	0.027	0.029	0.0286125
241	-74	158	199	0.027	0.029	0.029225
283	367	285	283	0.034	0.036	0.026875
94	199	136	178	0.034	0.036	0.026375
178	178	136	136	0.042	0.044	0.02675
283	241	388	117	0.03125	0.03325	0.0013375
178	73	199	199	0.031625	0.033625	0.00135
157	73	178	283	0.029	0.031	0.001325
73	150	157	178	0.028	0.03	0.013625
304	221	199	241	0.029125	0.031125	0.001425
115	136	157	94	0.027625	0.029625	0.001325
304	178	241	220	0.041	0.043	0.02675

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