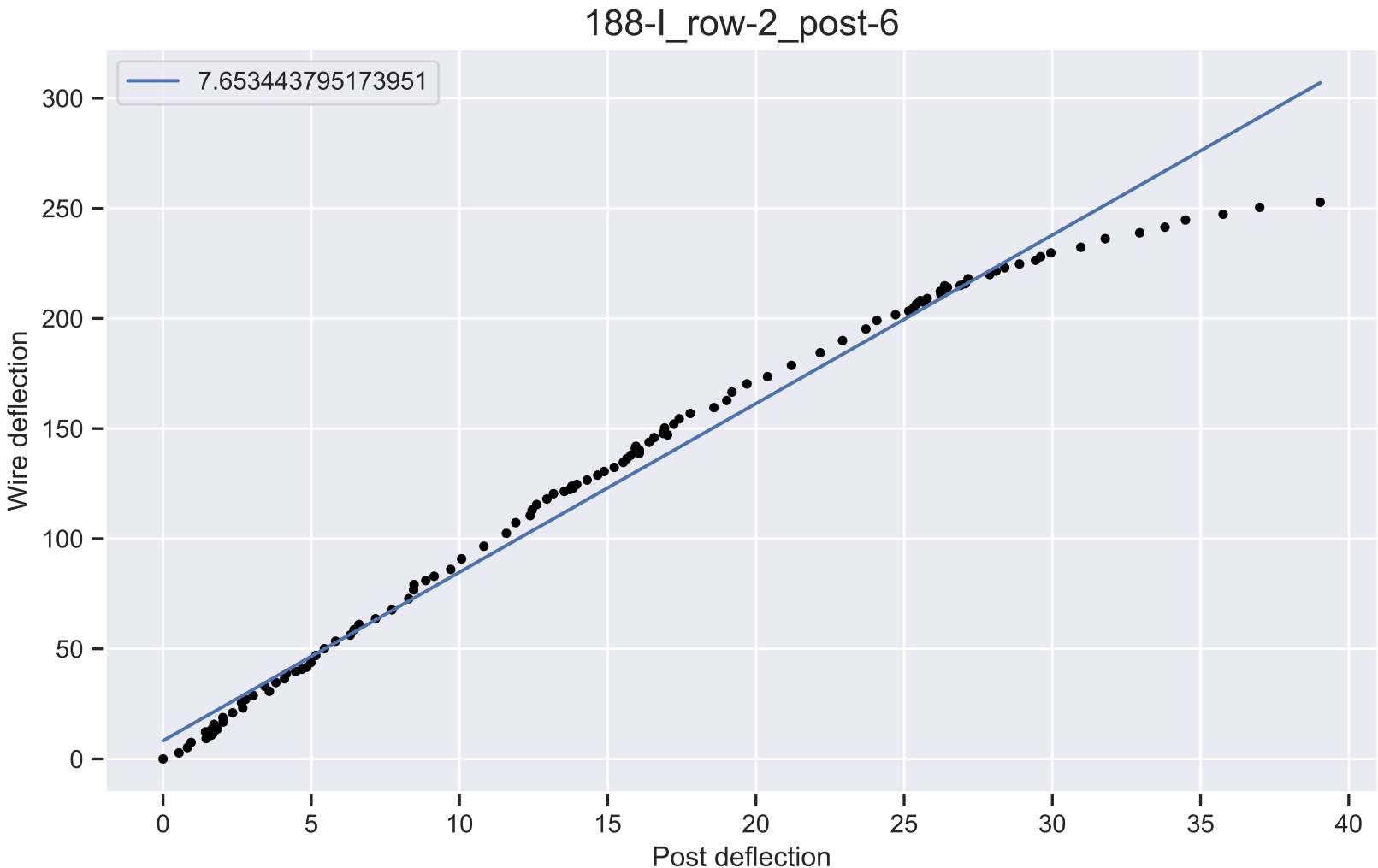
188-I_row-2_post-6
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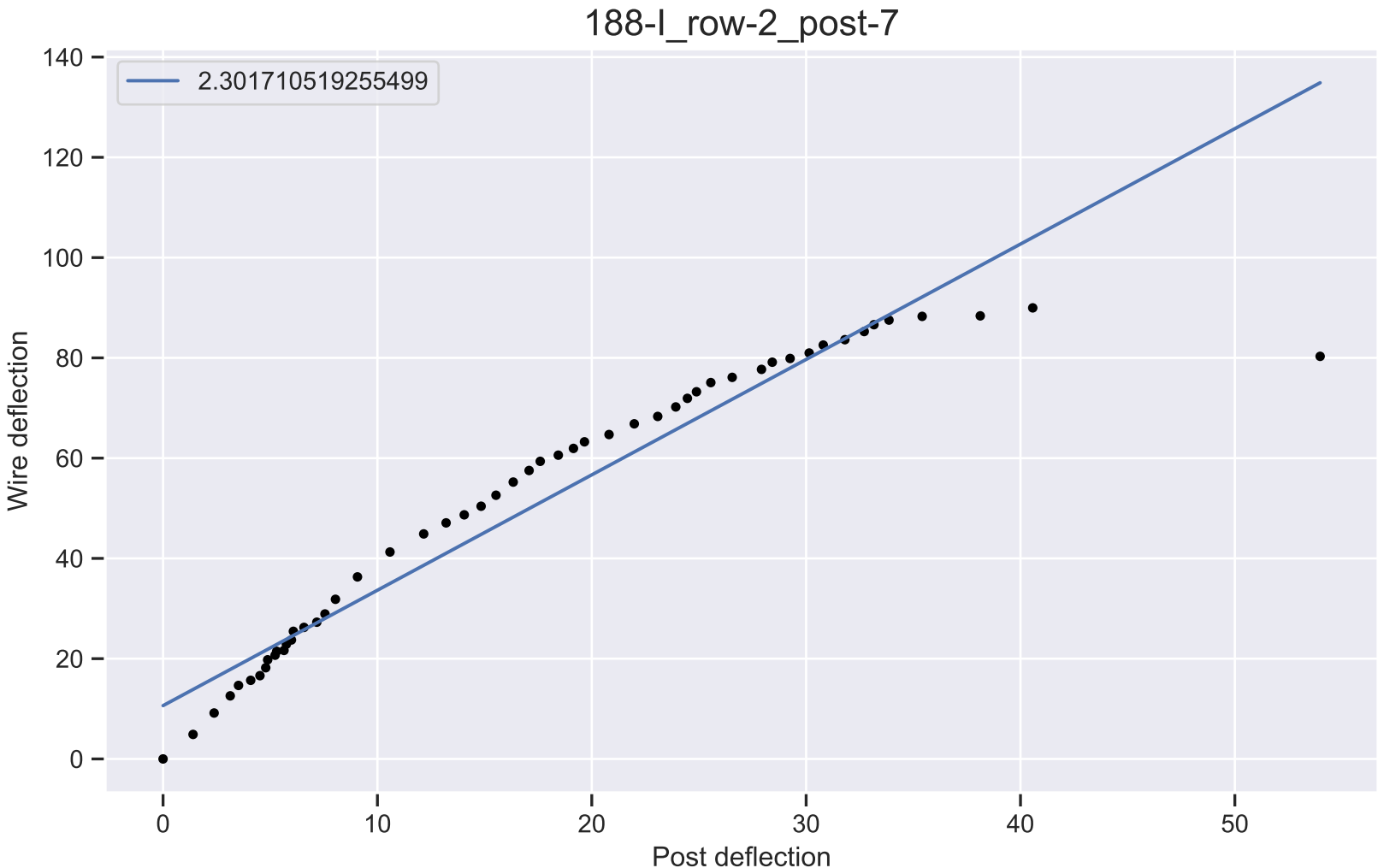
188-I_row-2_post-7
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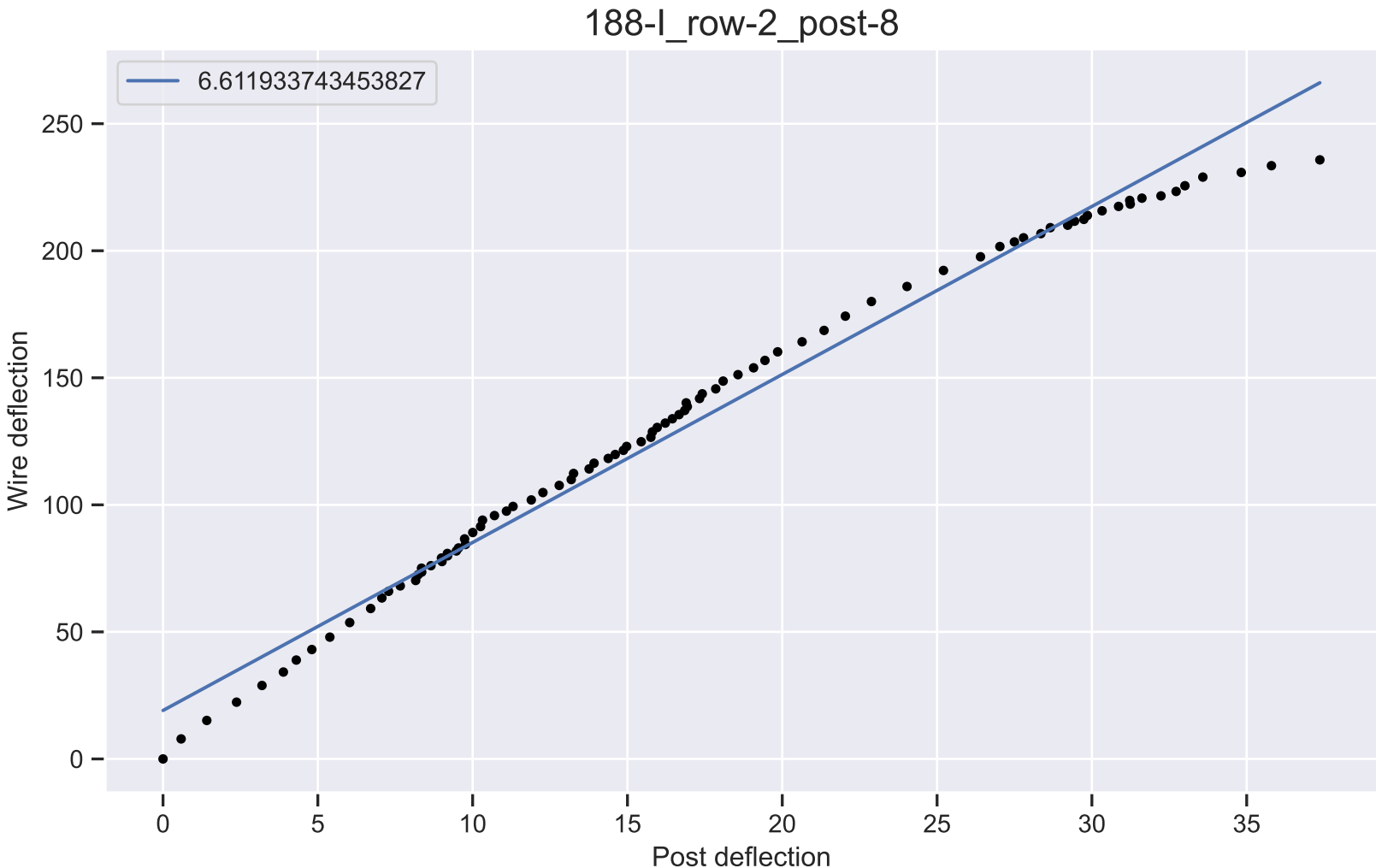
188-I_row-2_post-8
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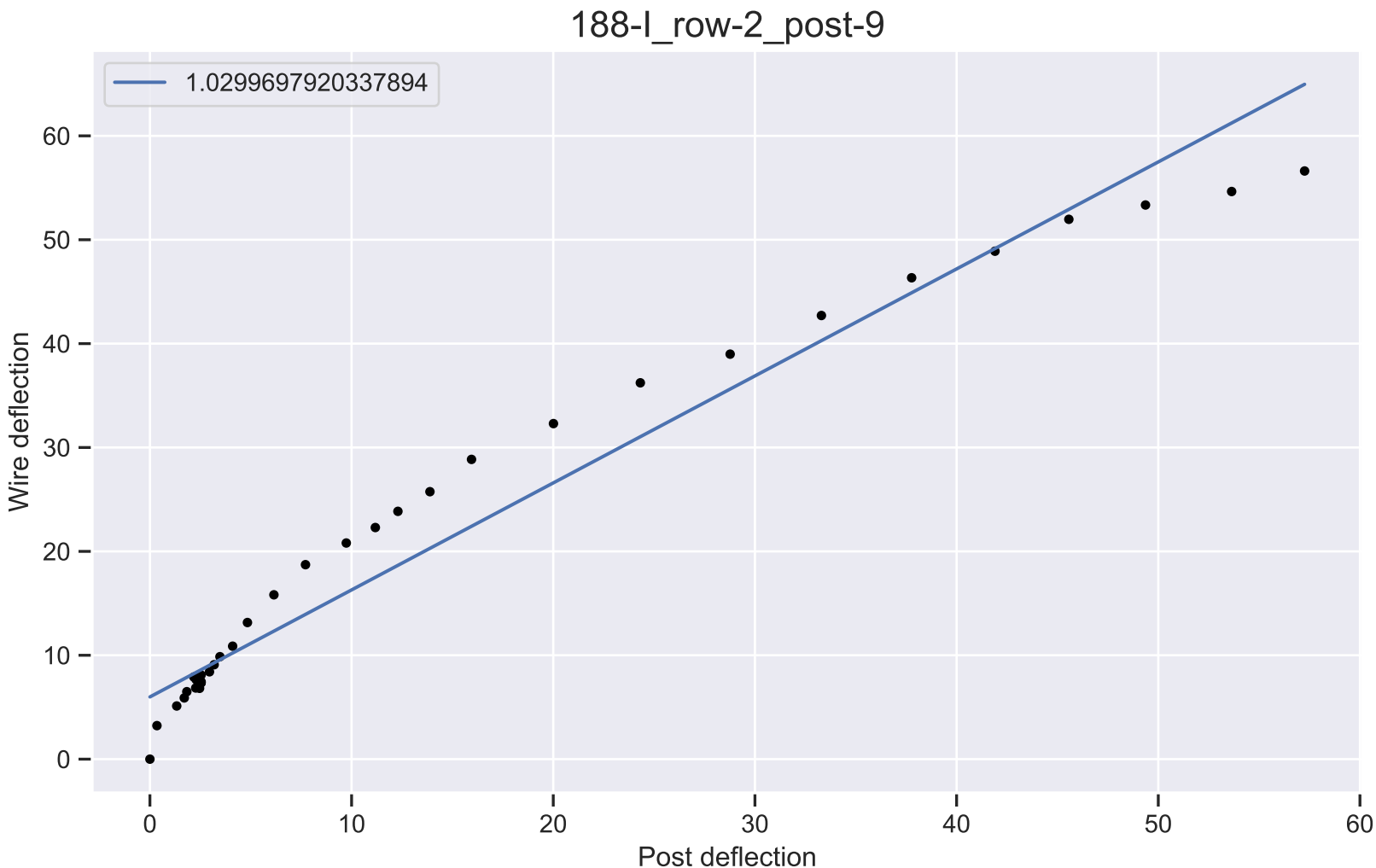
188-I_row-2_post-9
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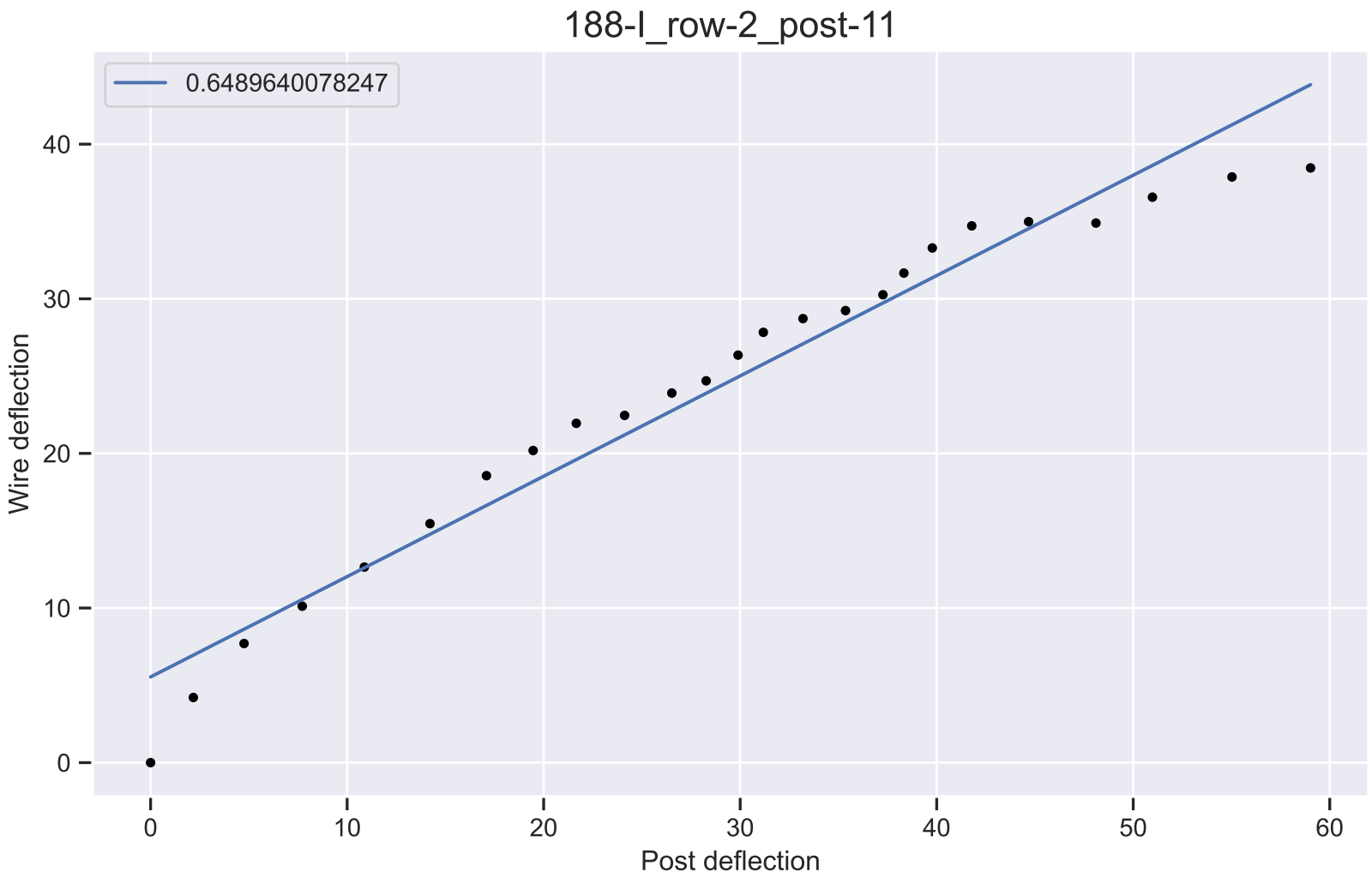
188-I_row-2_post-11
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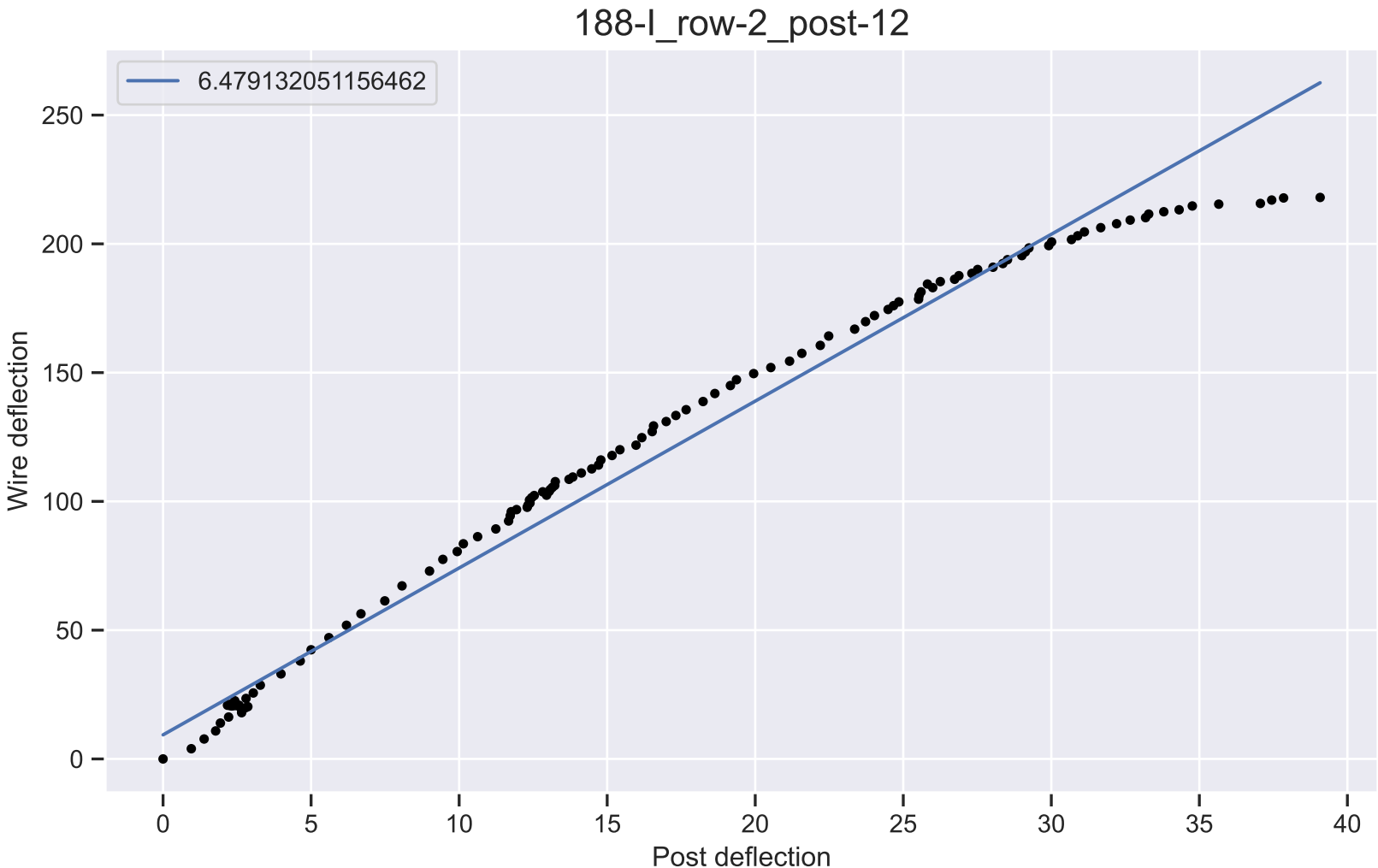
188-I_row-2_post-12
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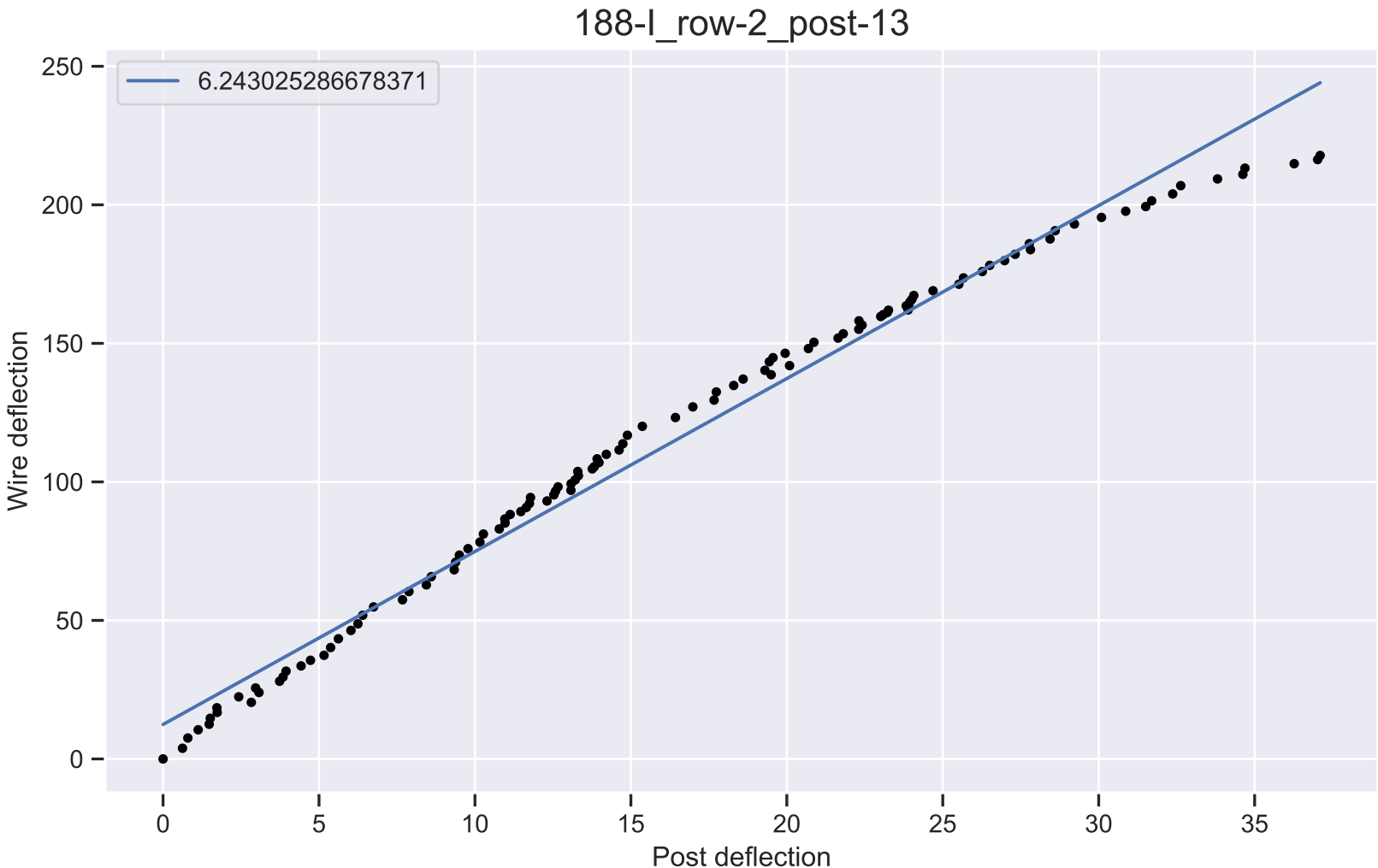
188-I_row-2_post-13
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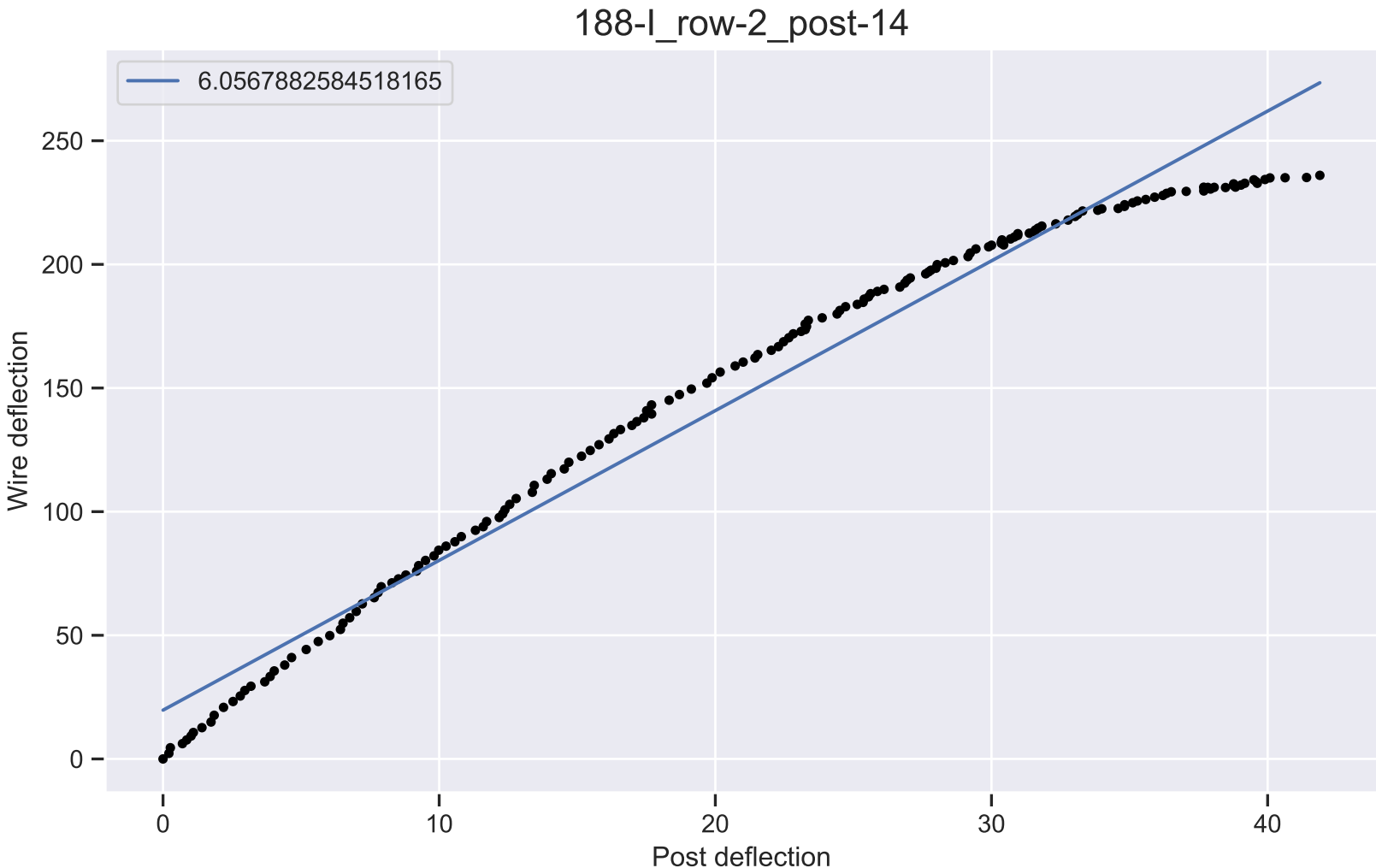
188-I_row-2_post-14
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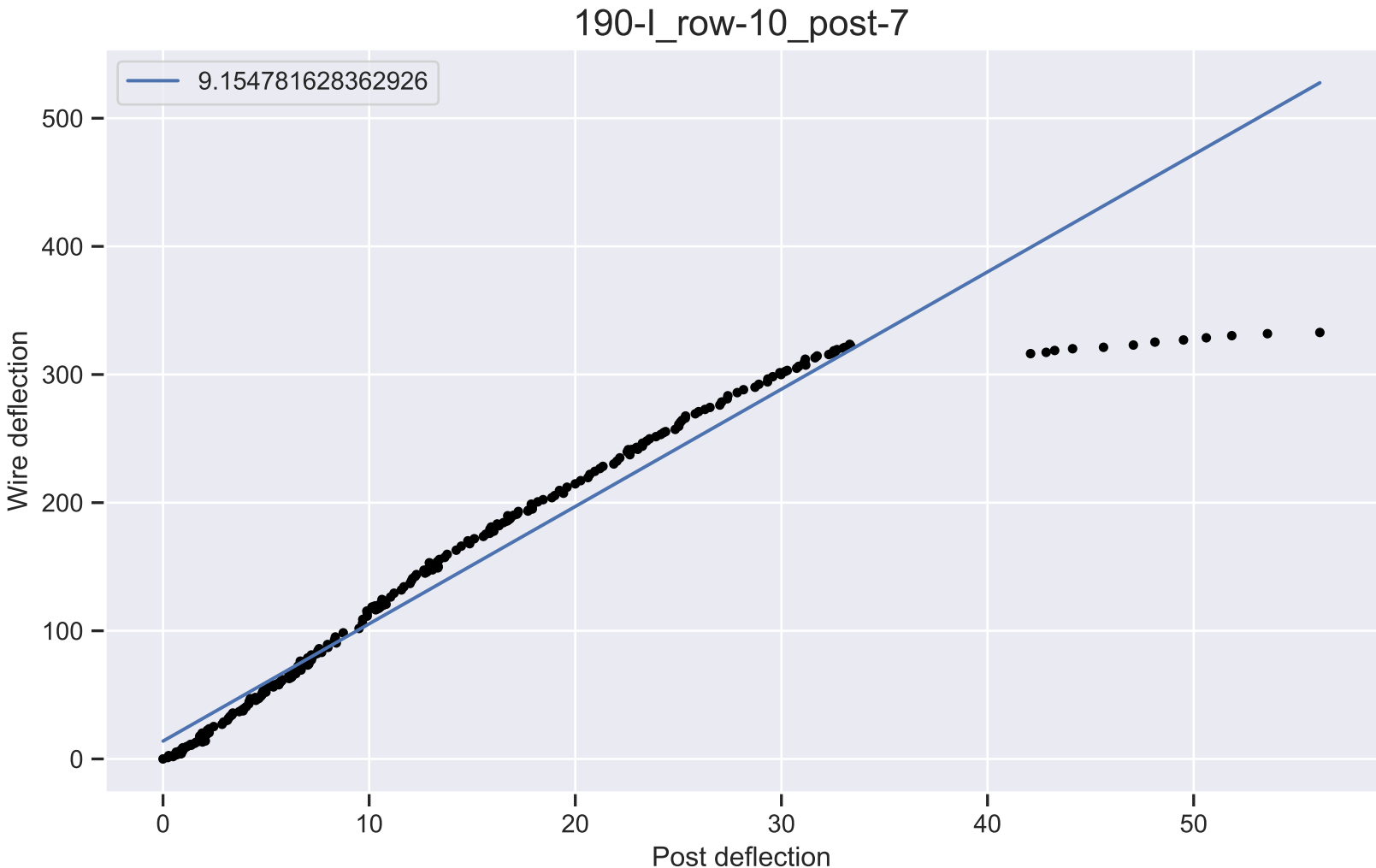
190-I_row-10_post-7
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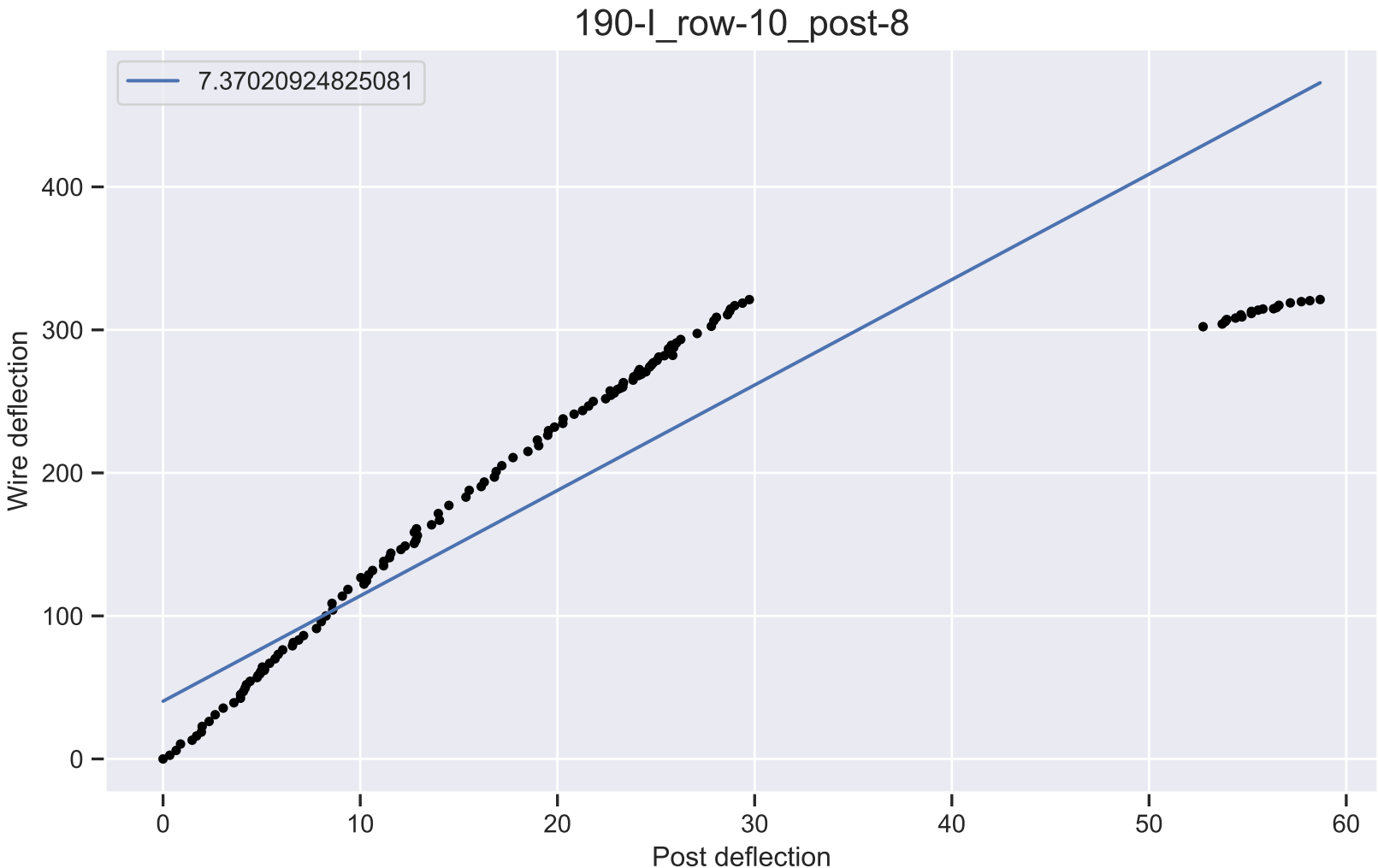
190-I_row-10_post-8
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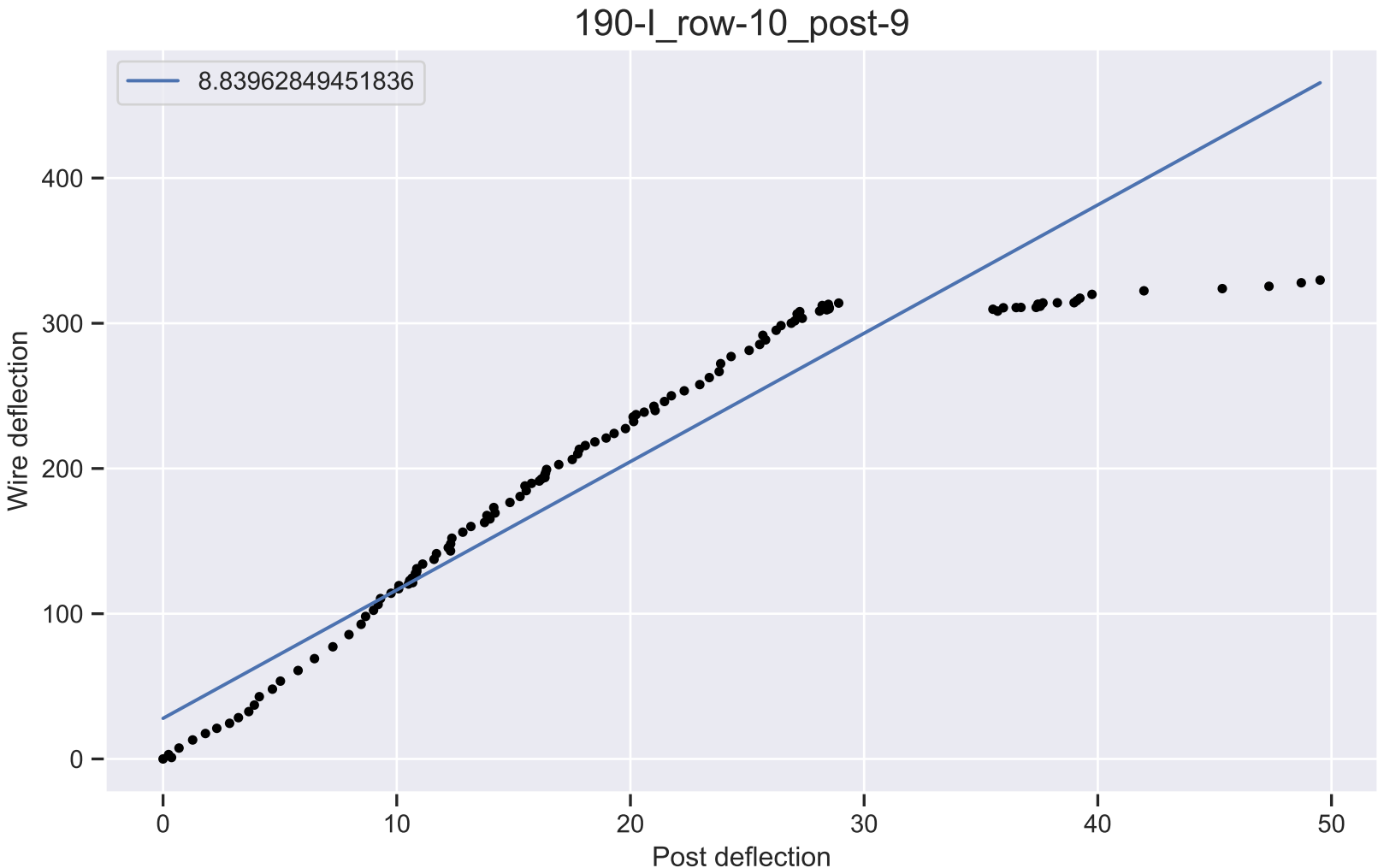
190-I_row-10_post-9
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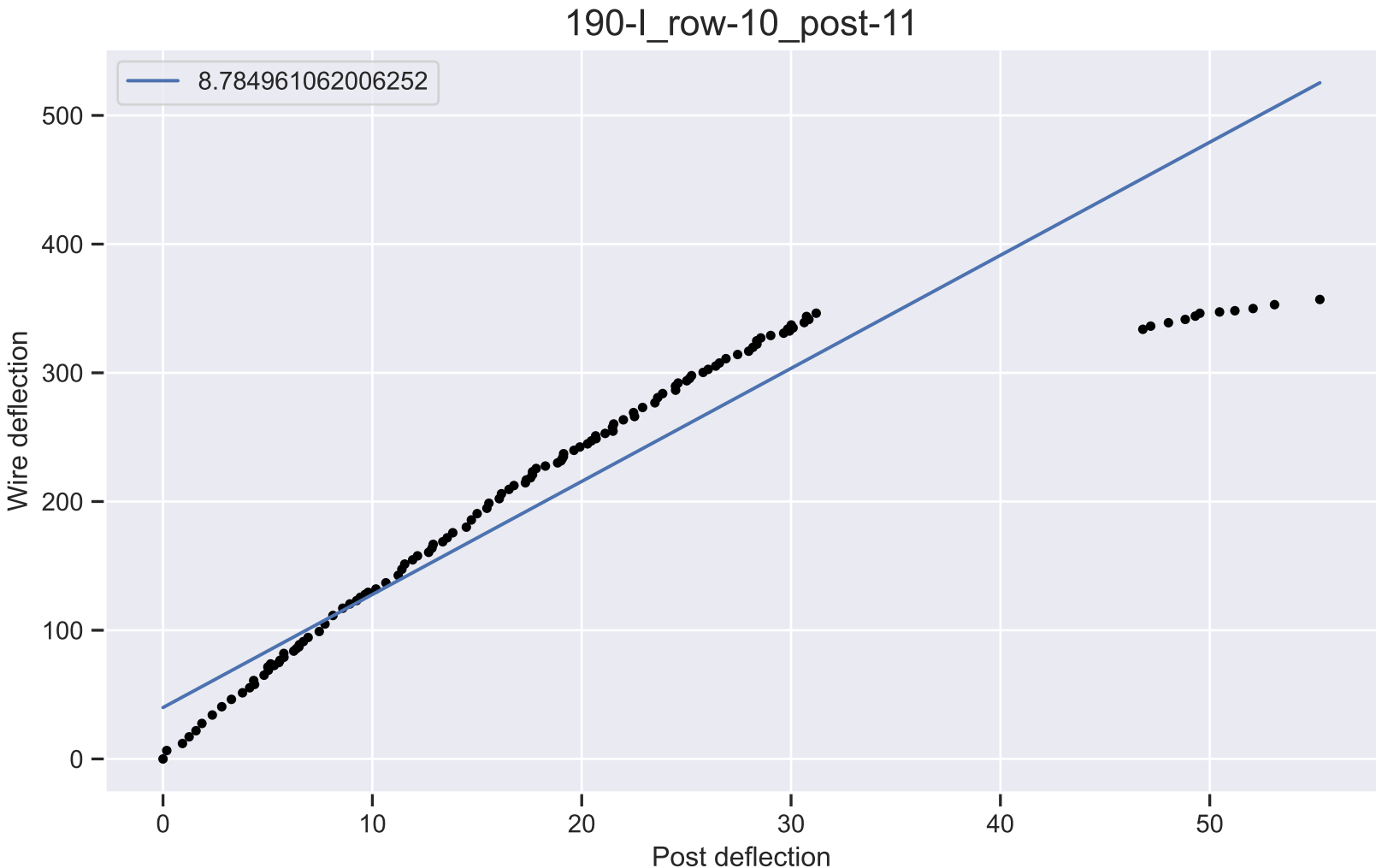
190-I_row-10_post-11
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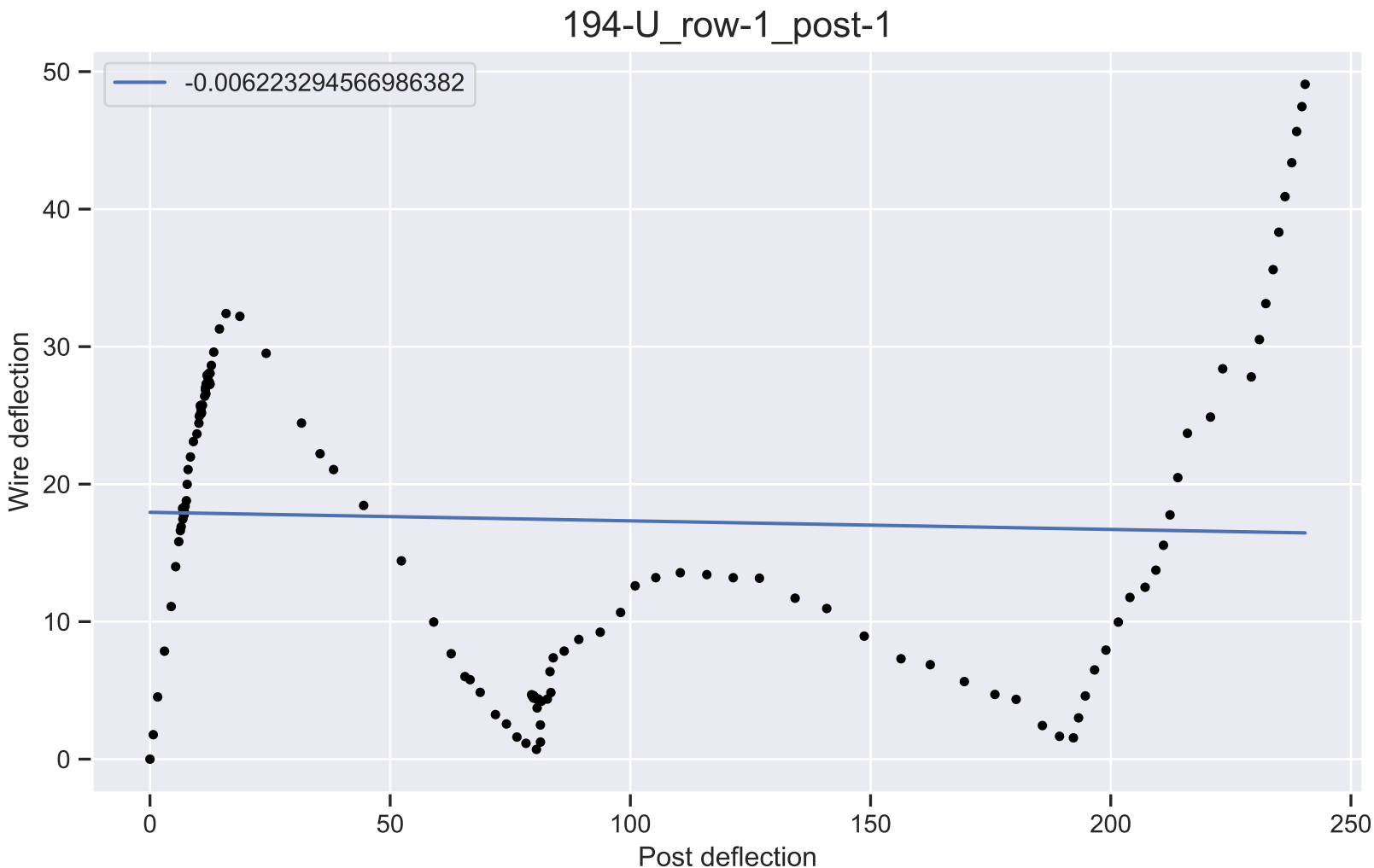
194-U_row-1_post-1
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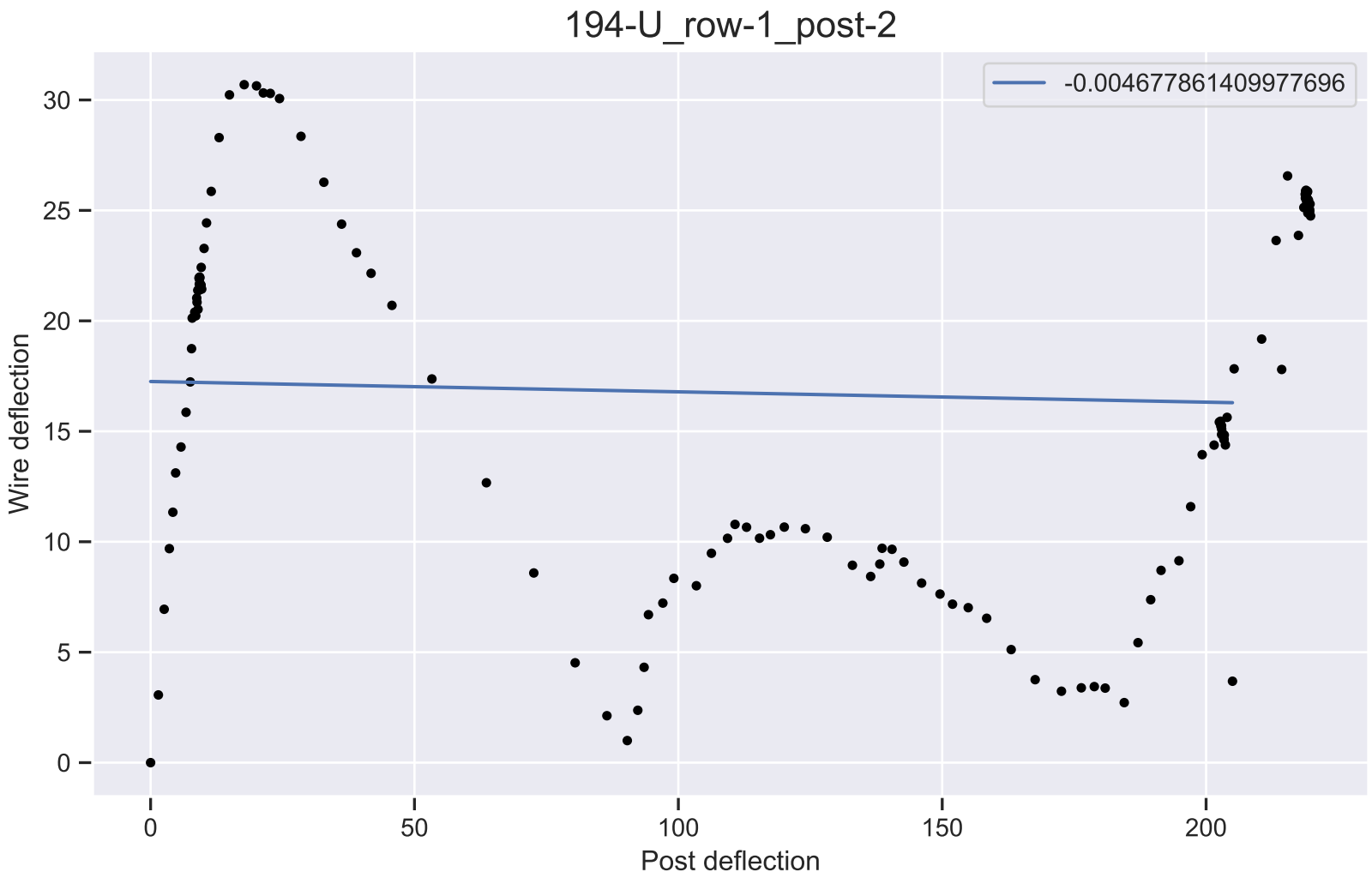
194-U_row-1_post-2
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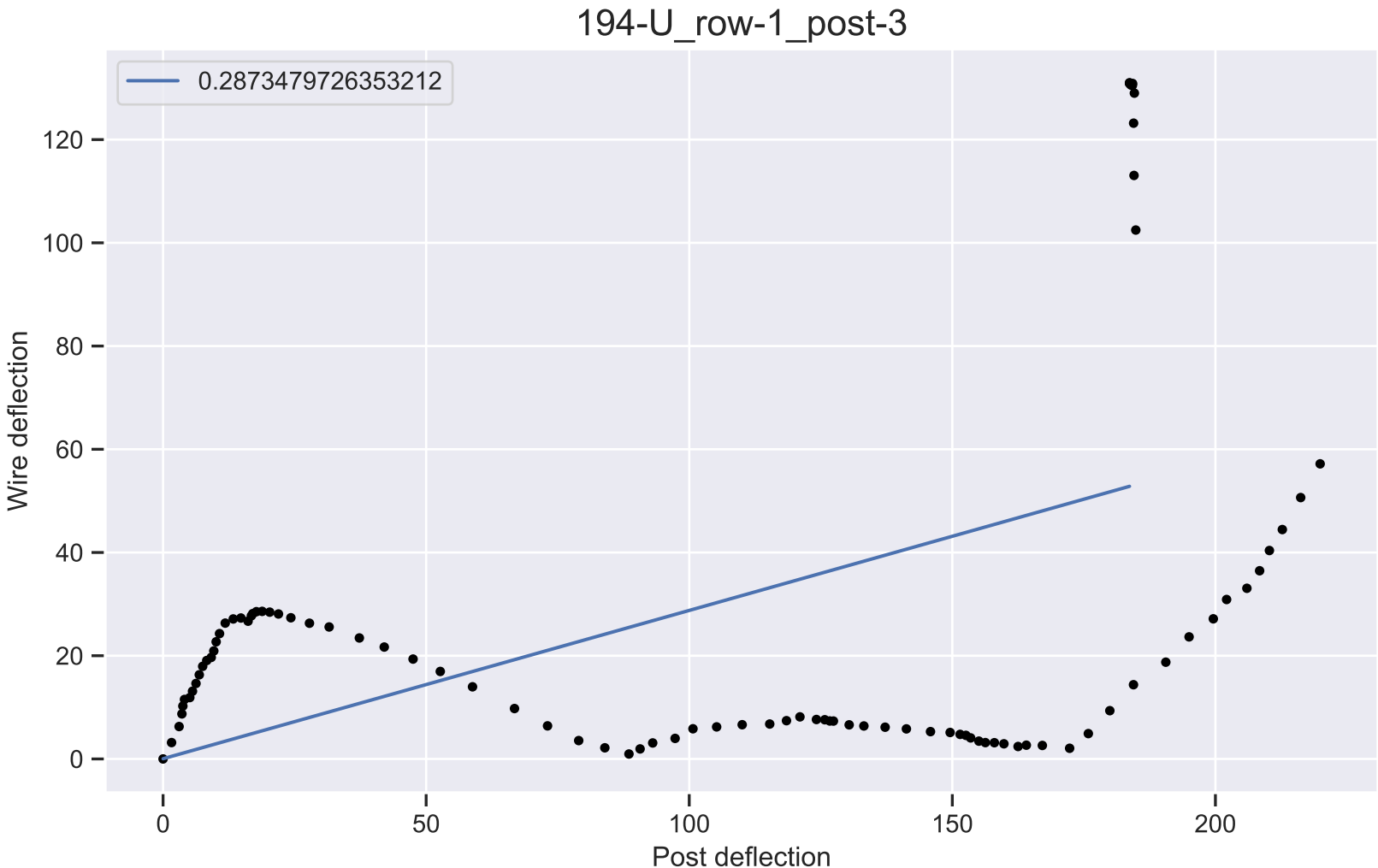
194-U_row-1_post-3
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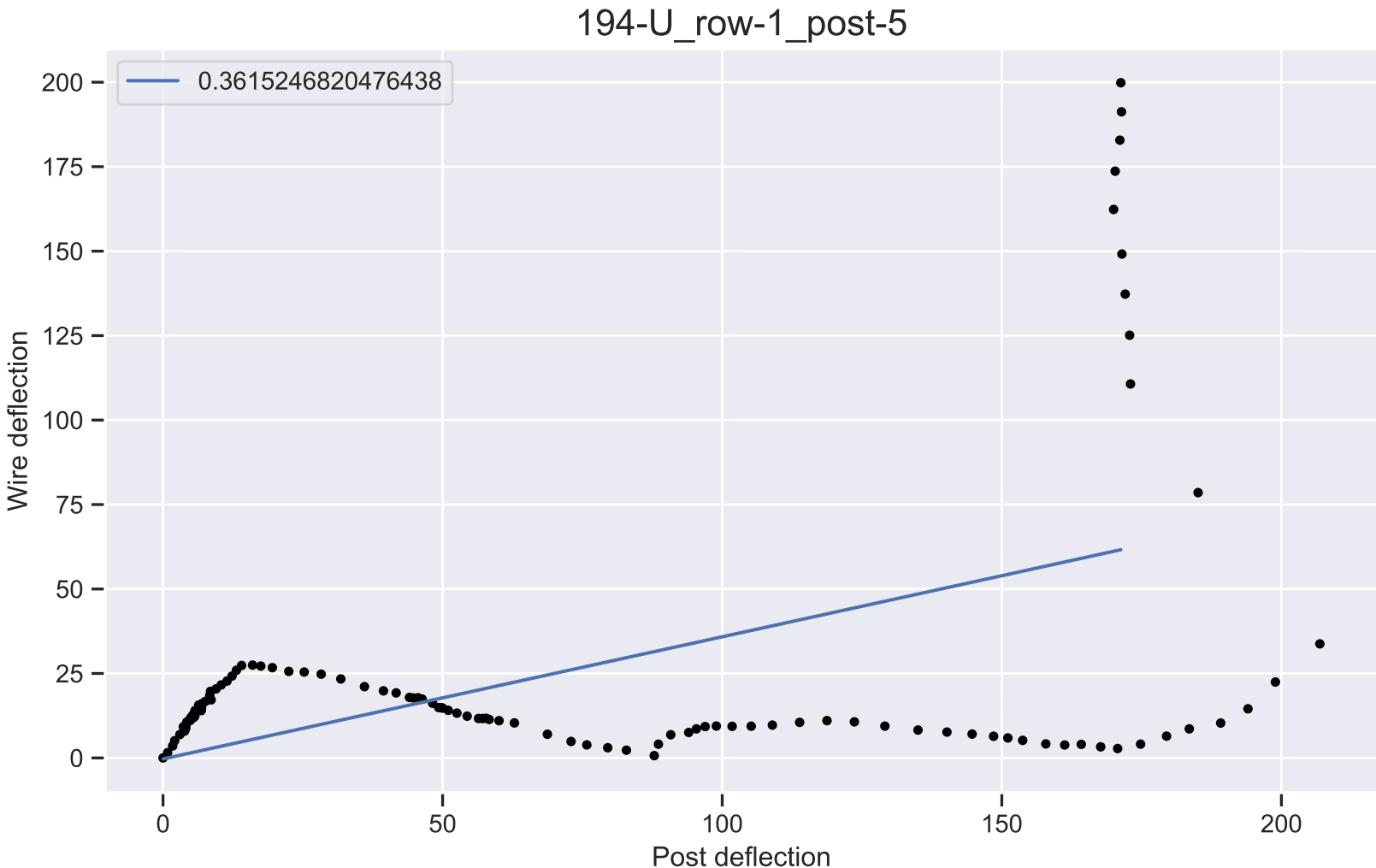
194-U_row-1_post-5
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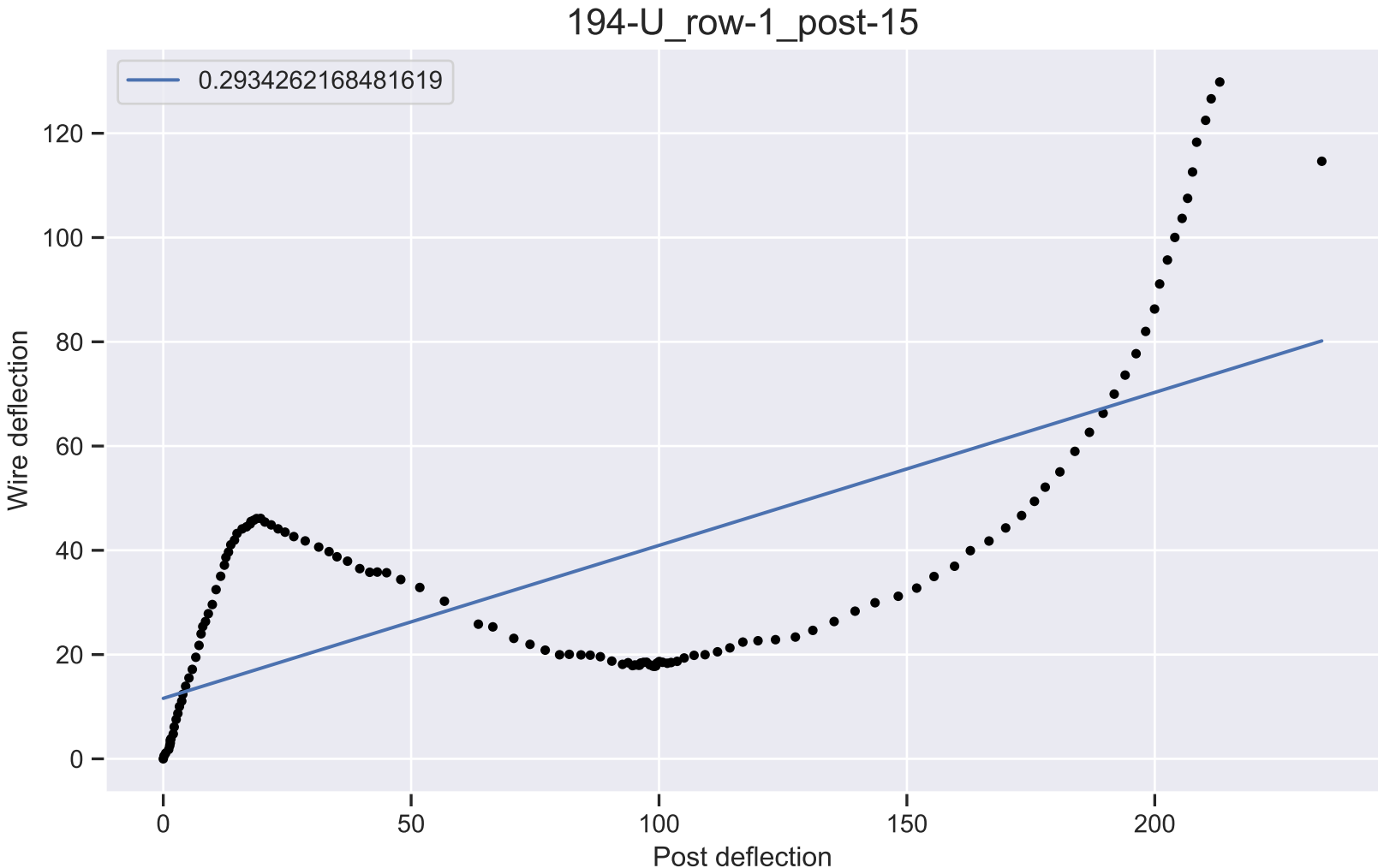
194-U_row-1_post-15
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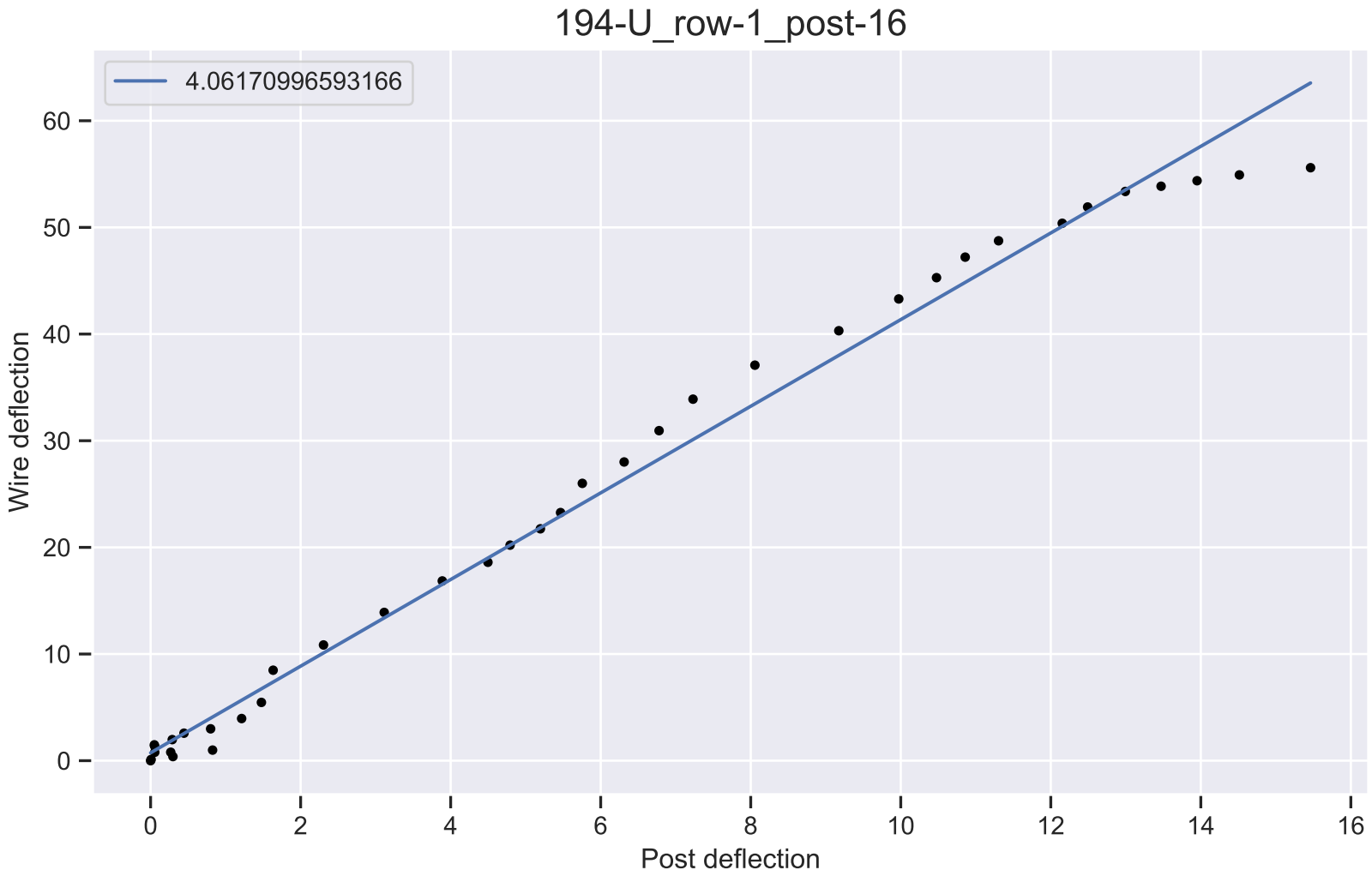
194-U_row-1_post-16
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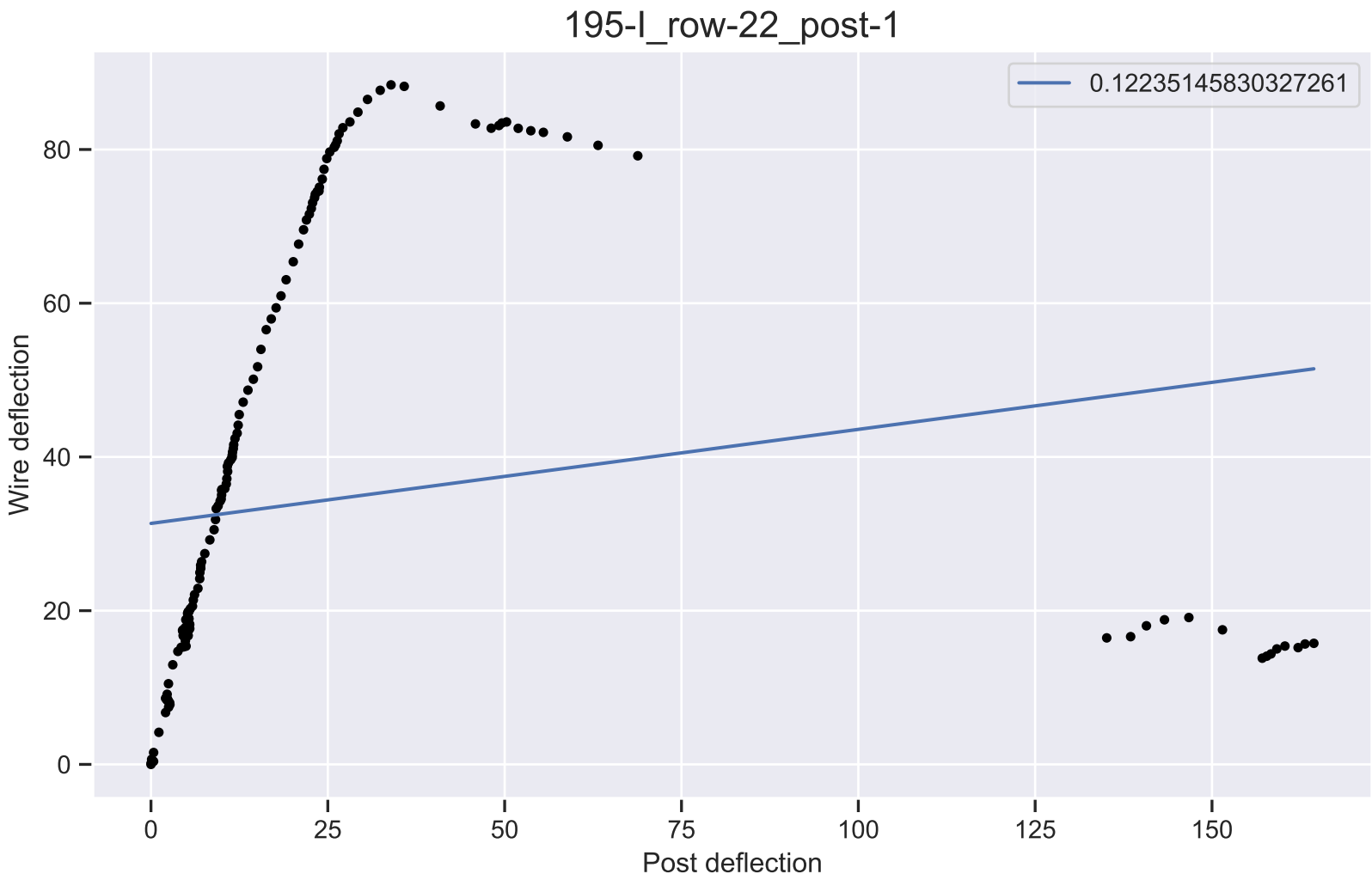
195-I_row-22_post-1
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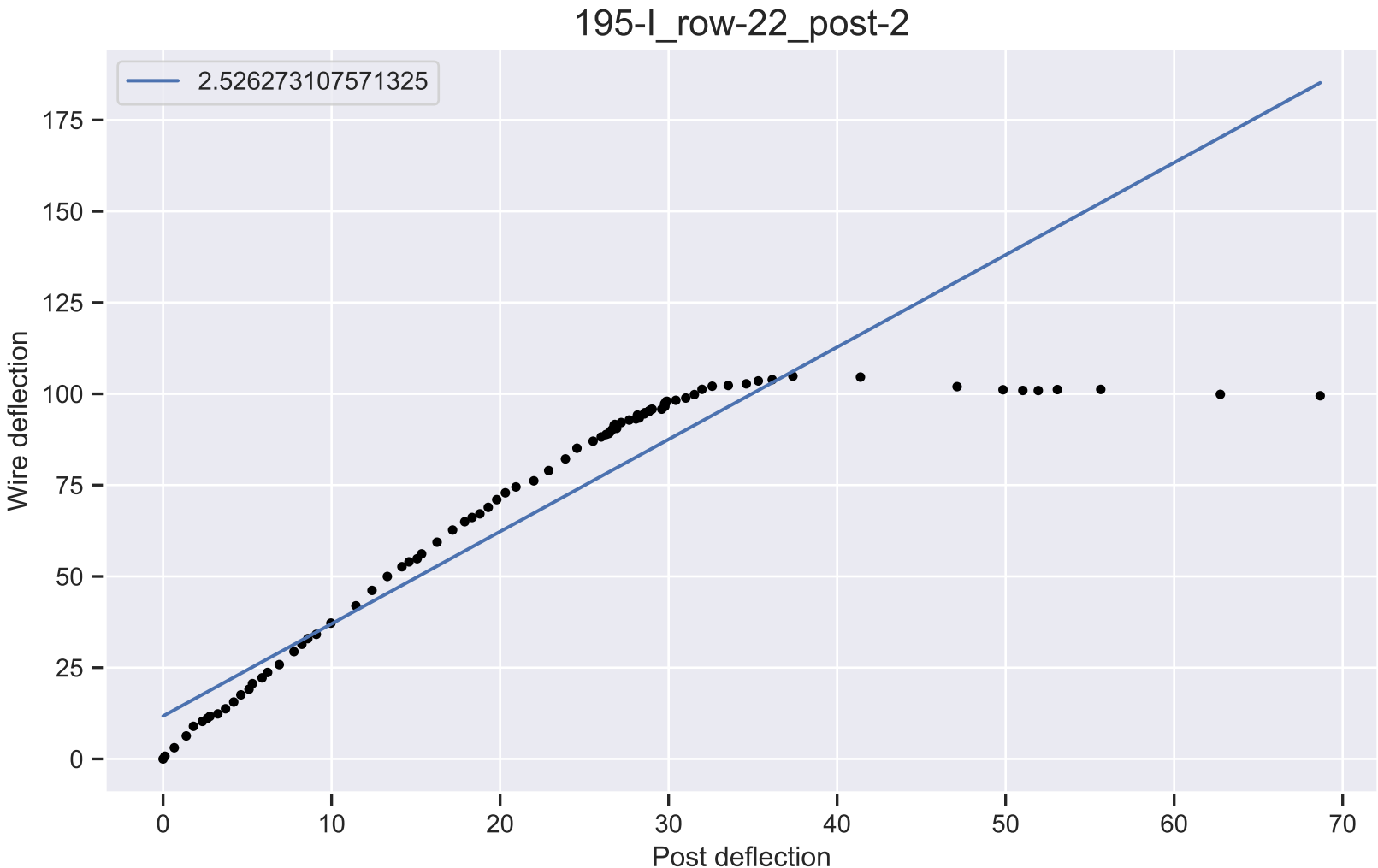
195-I_row-22_post-2
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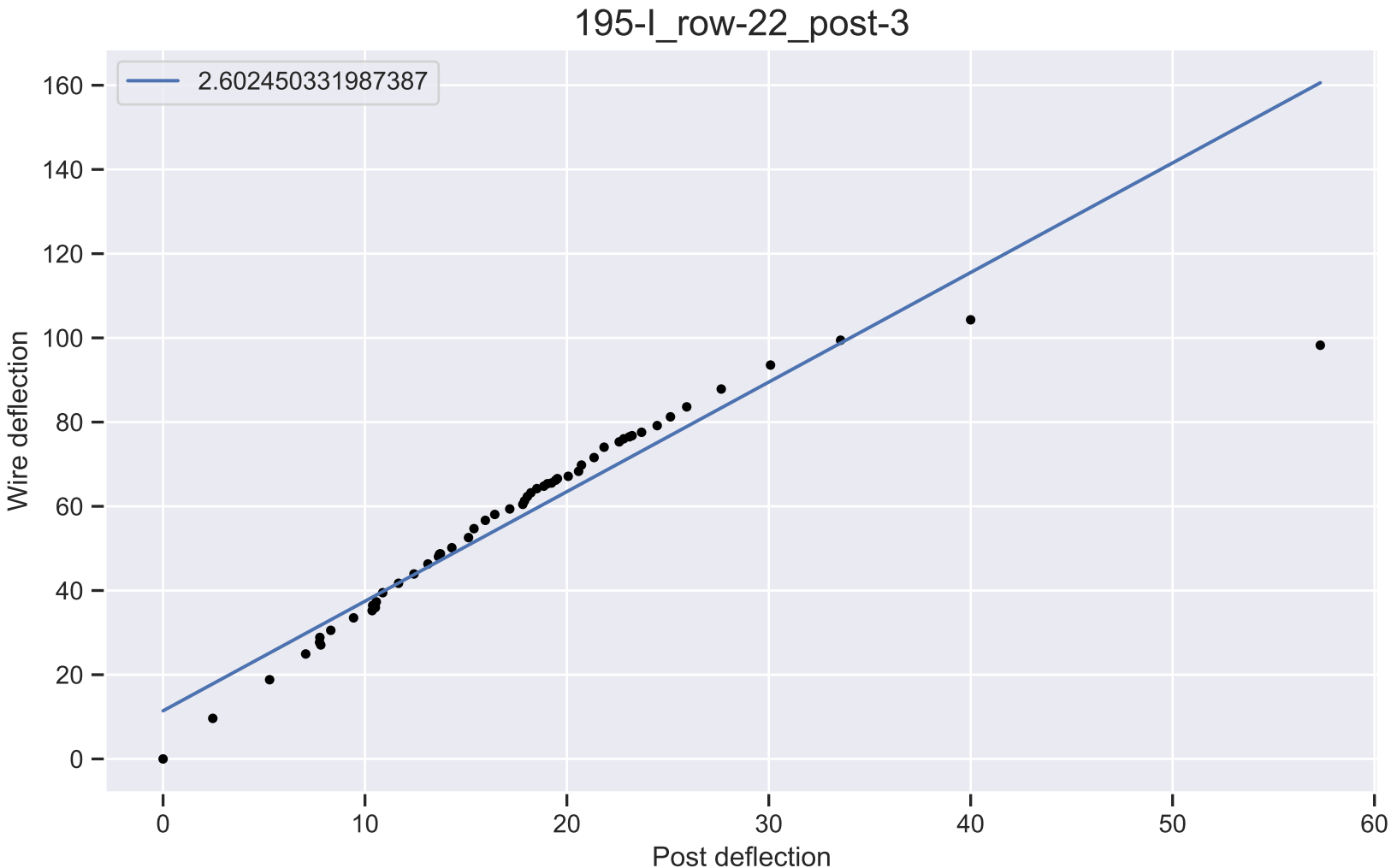
195-I_row-22_post-3
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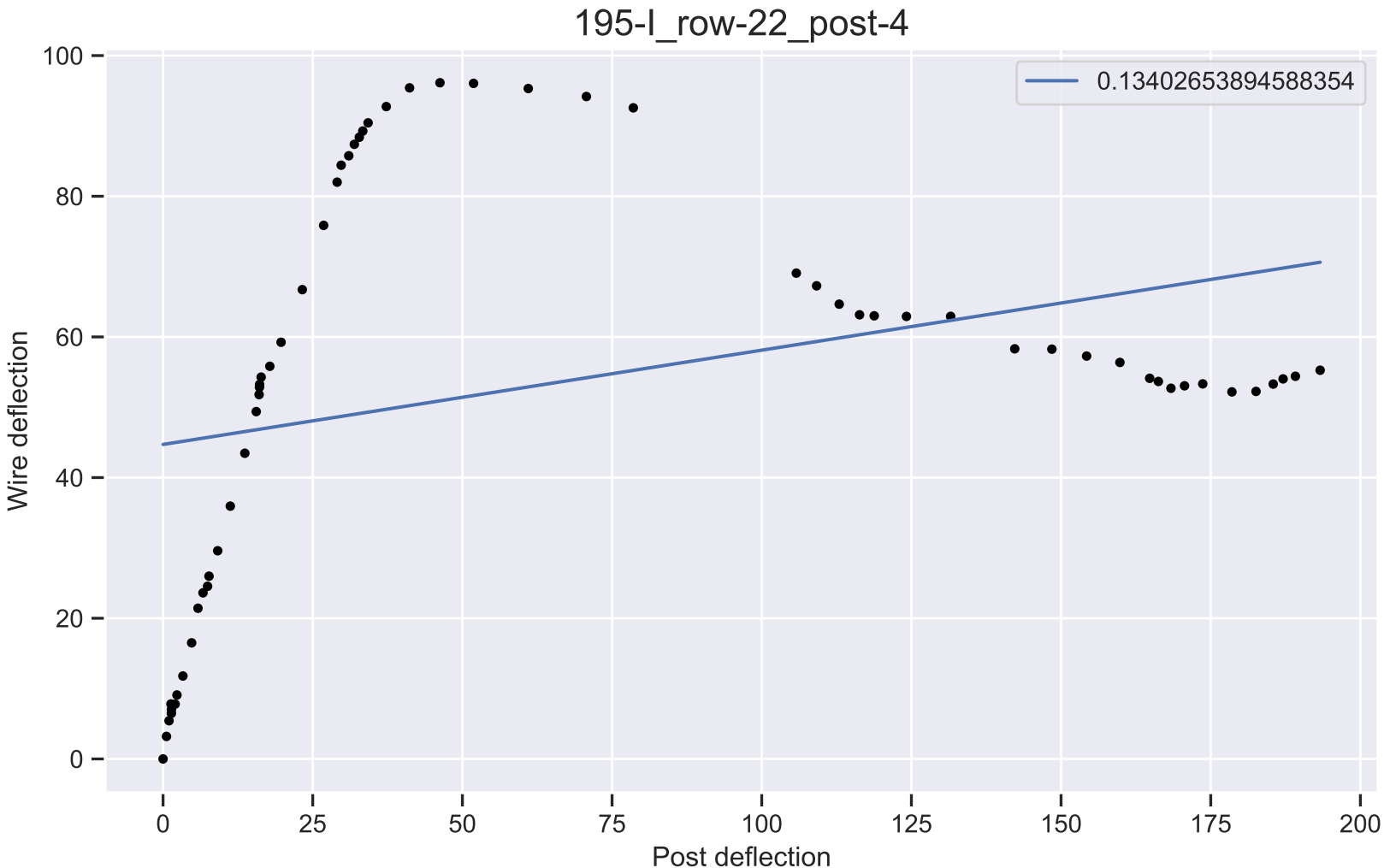
195-I_row-22_post-4
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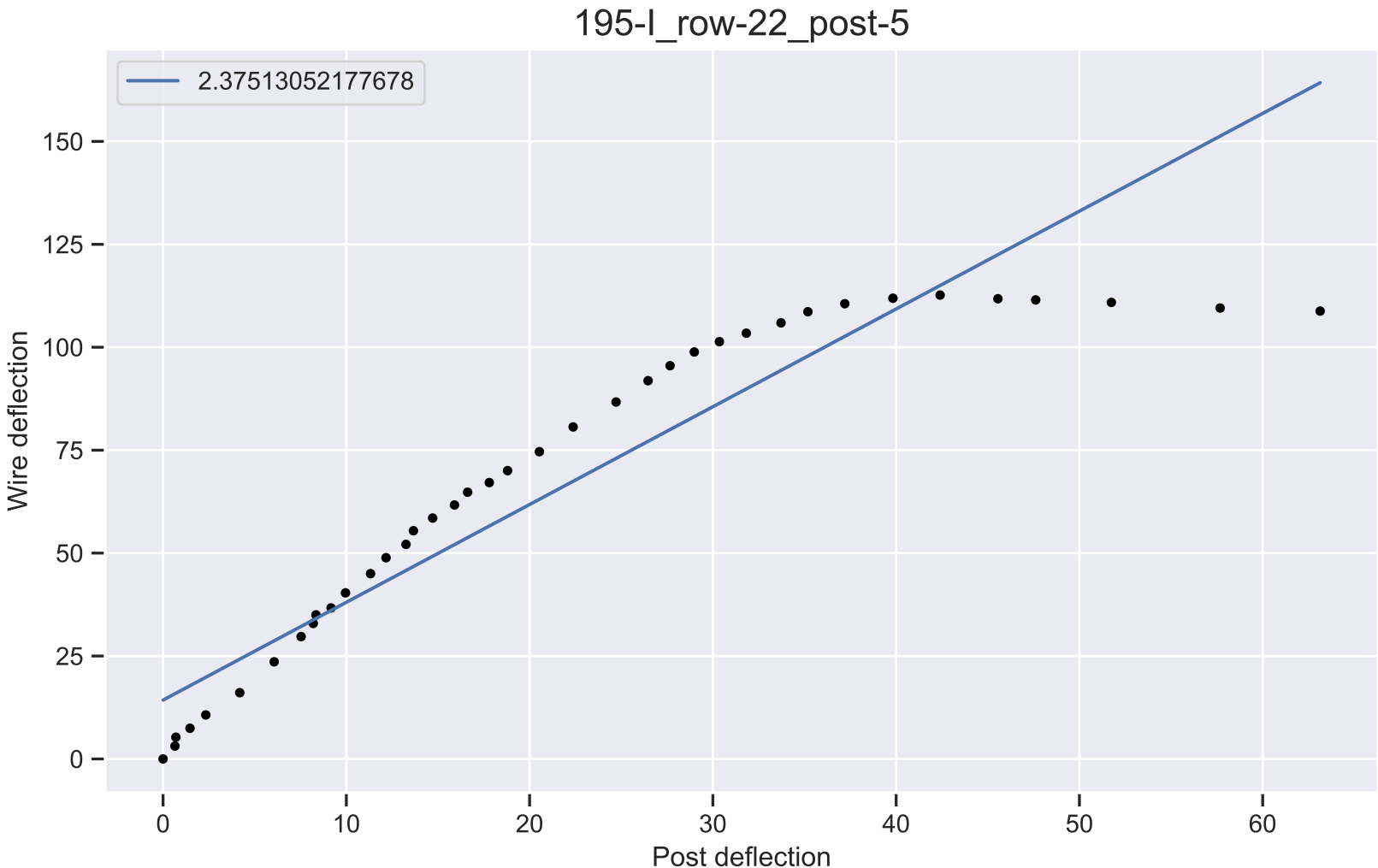
195-I_row-22_post-5
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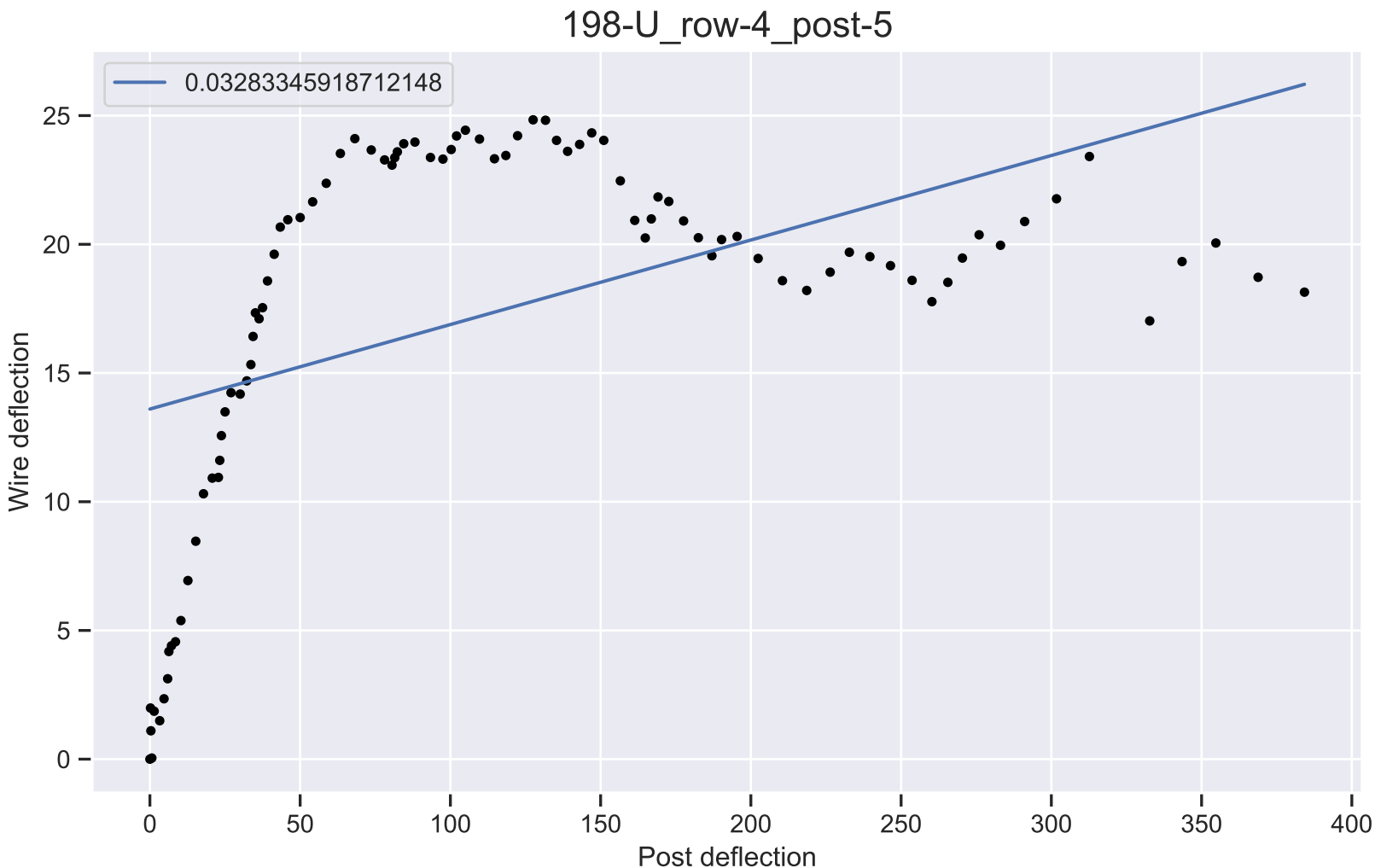
198-U_row-4_post-5
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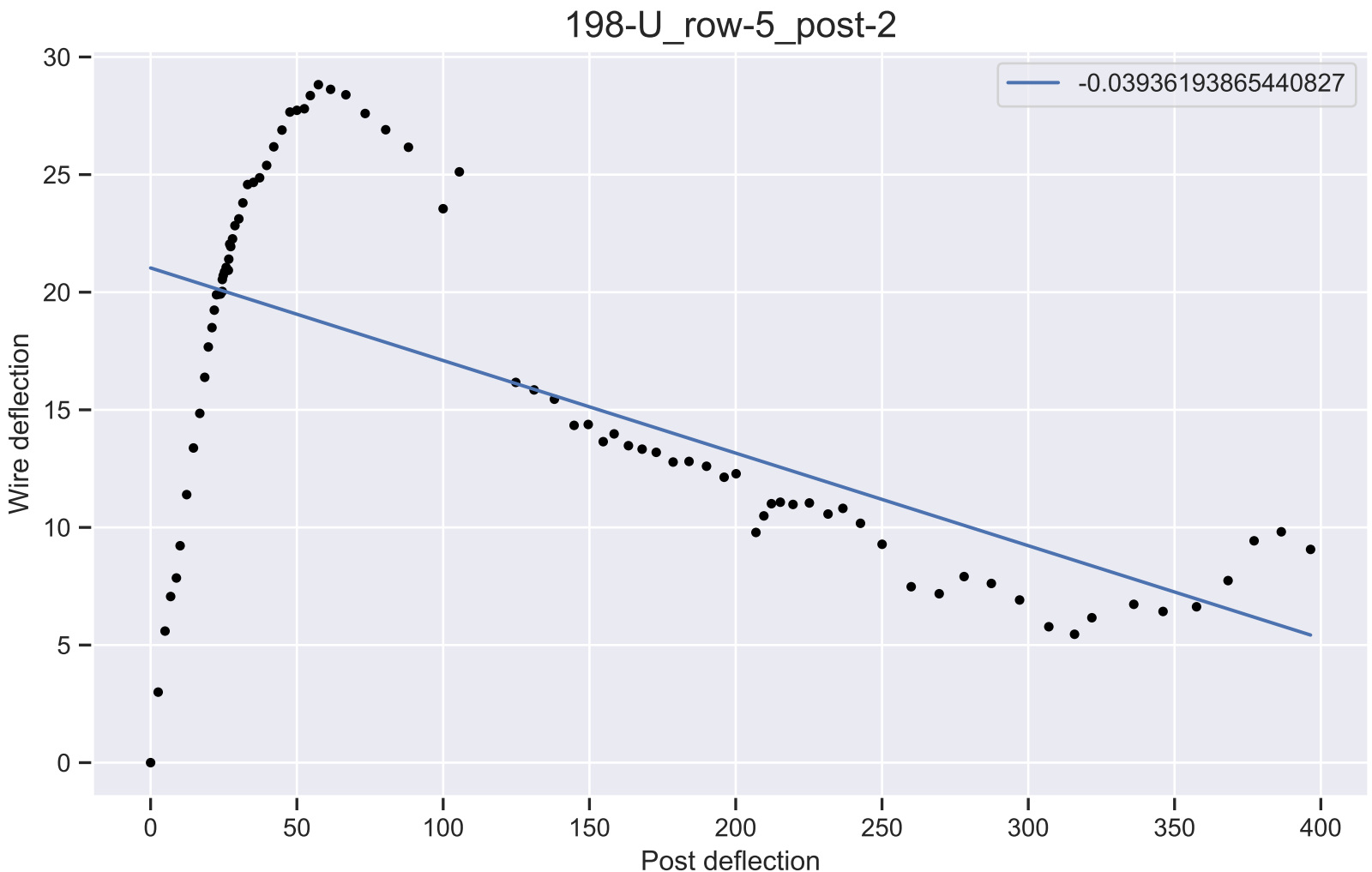
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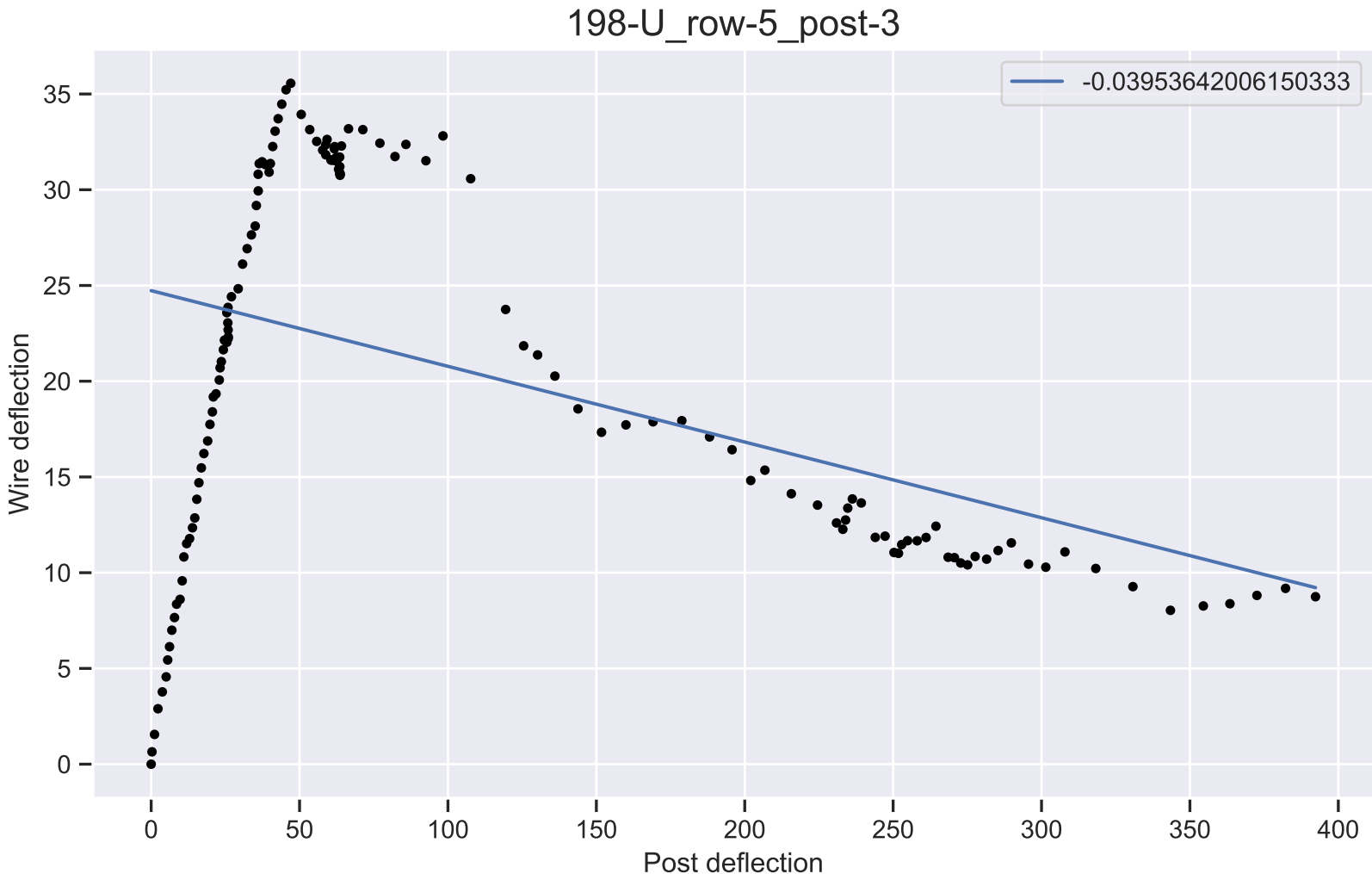
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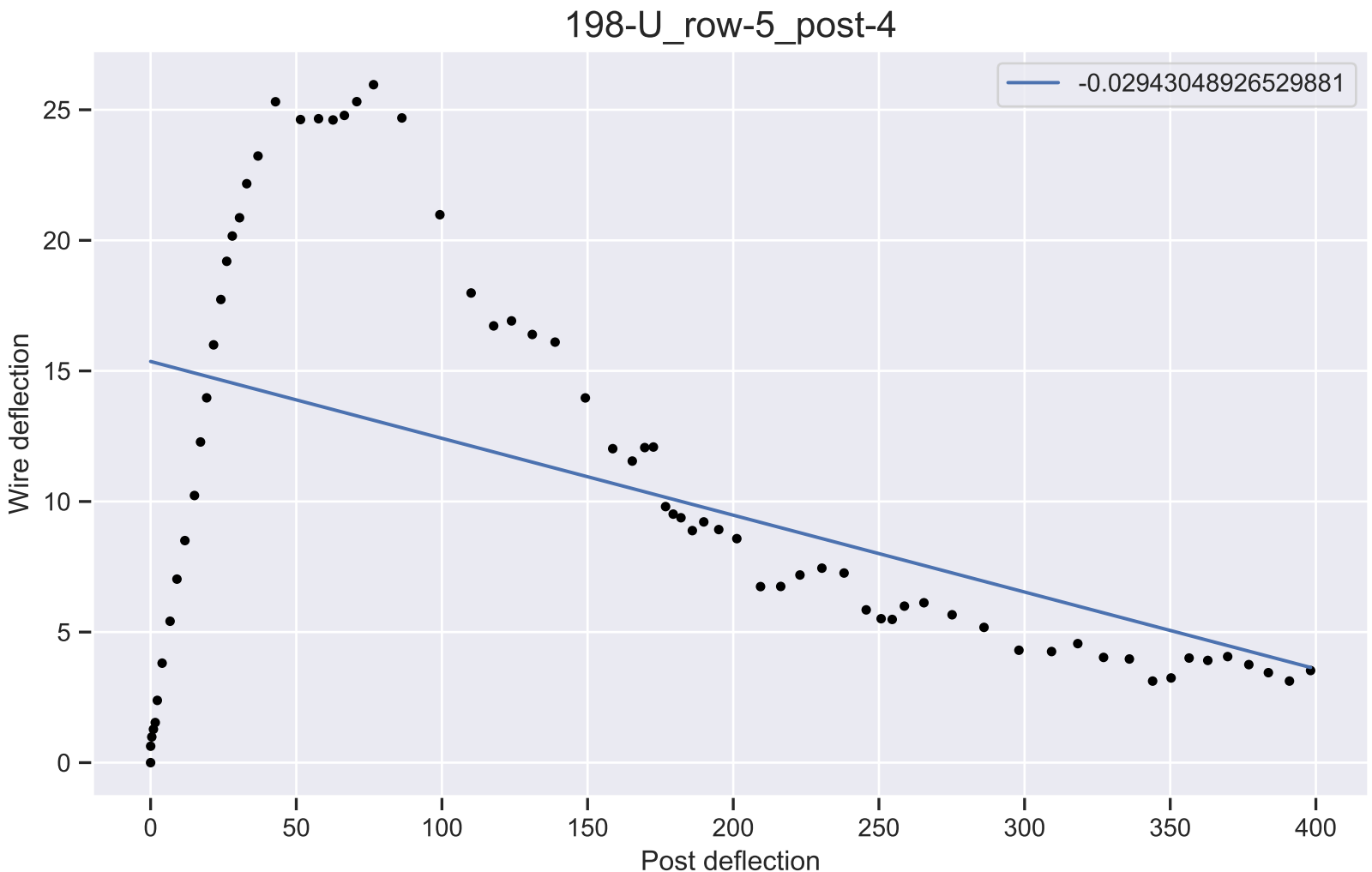
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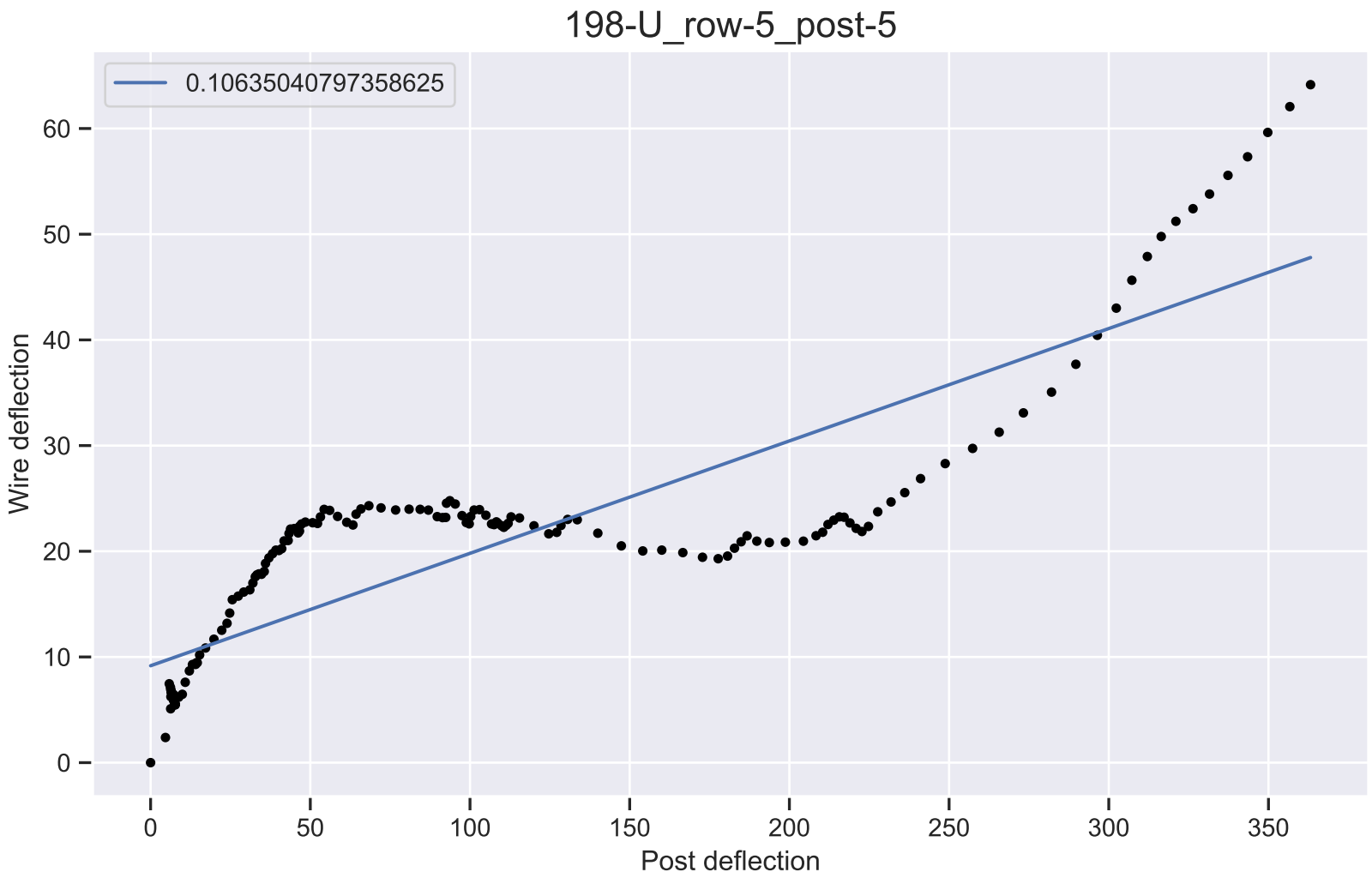
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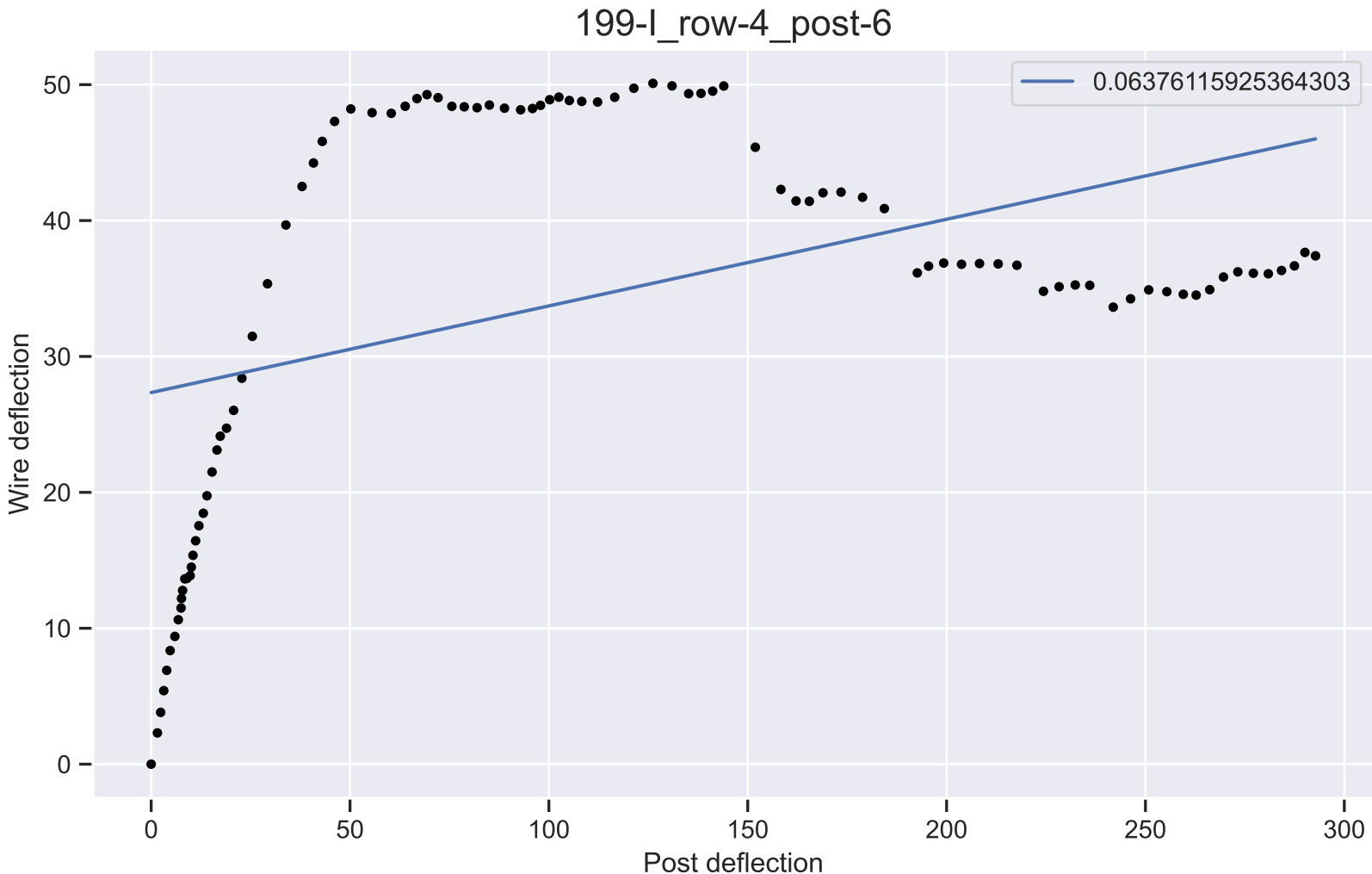
199-I_row-4_post-6
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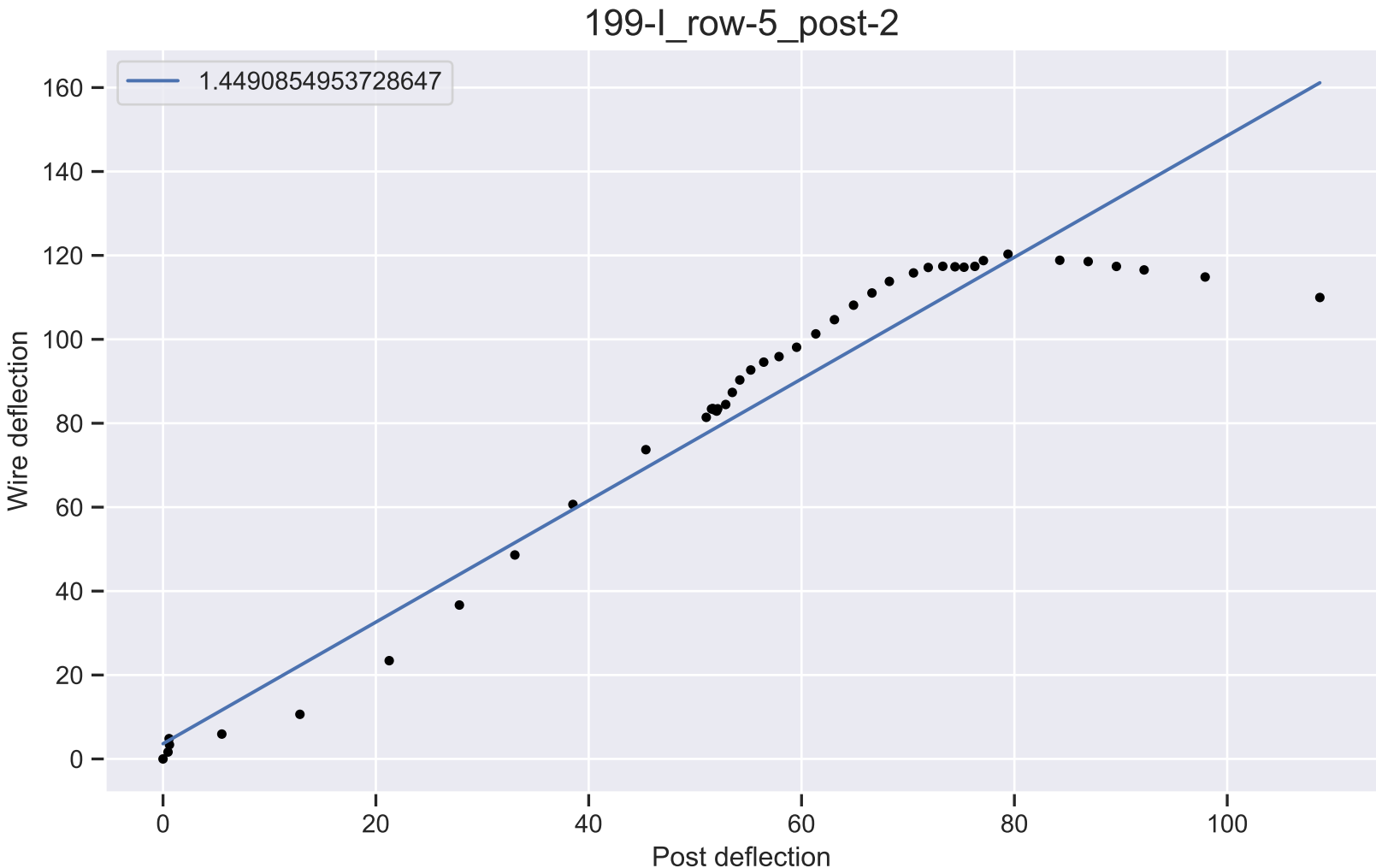
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Post deflection
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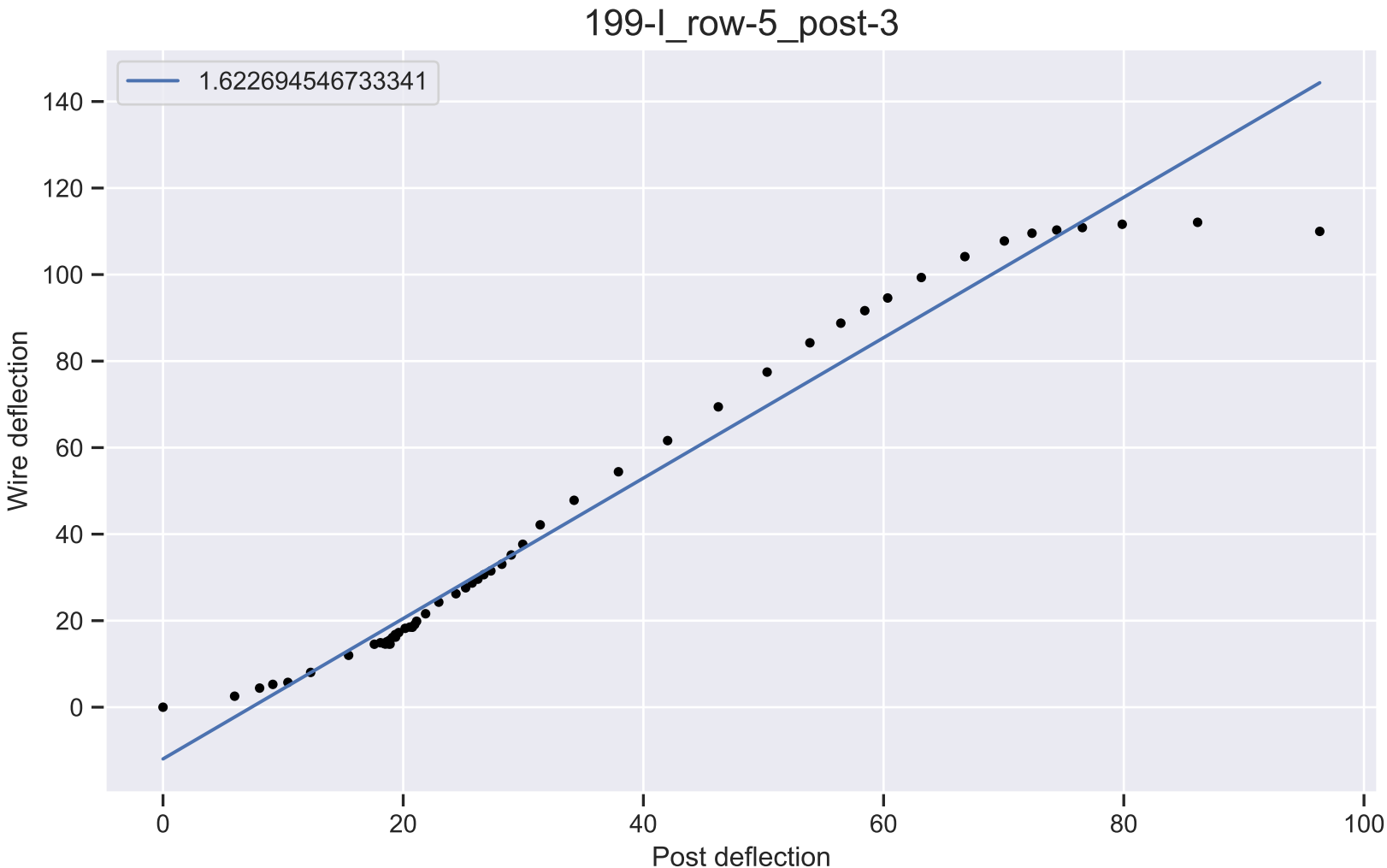
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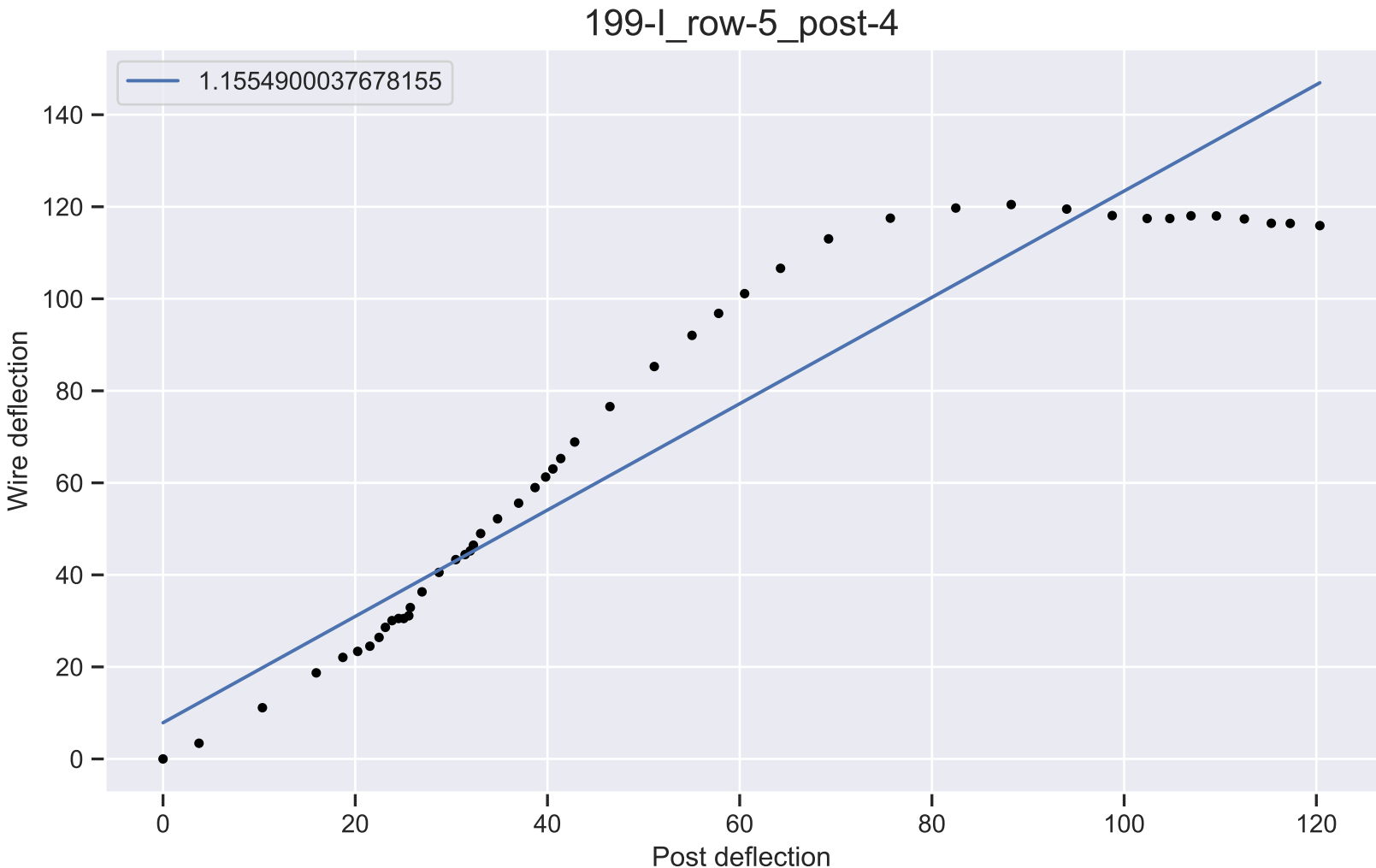
199-l_row-5_post-4
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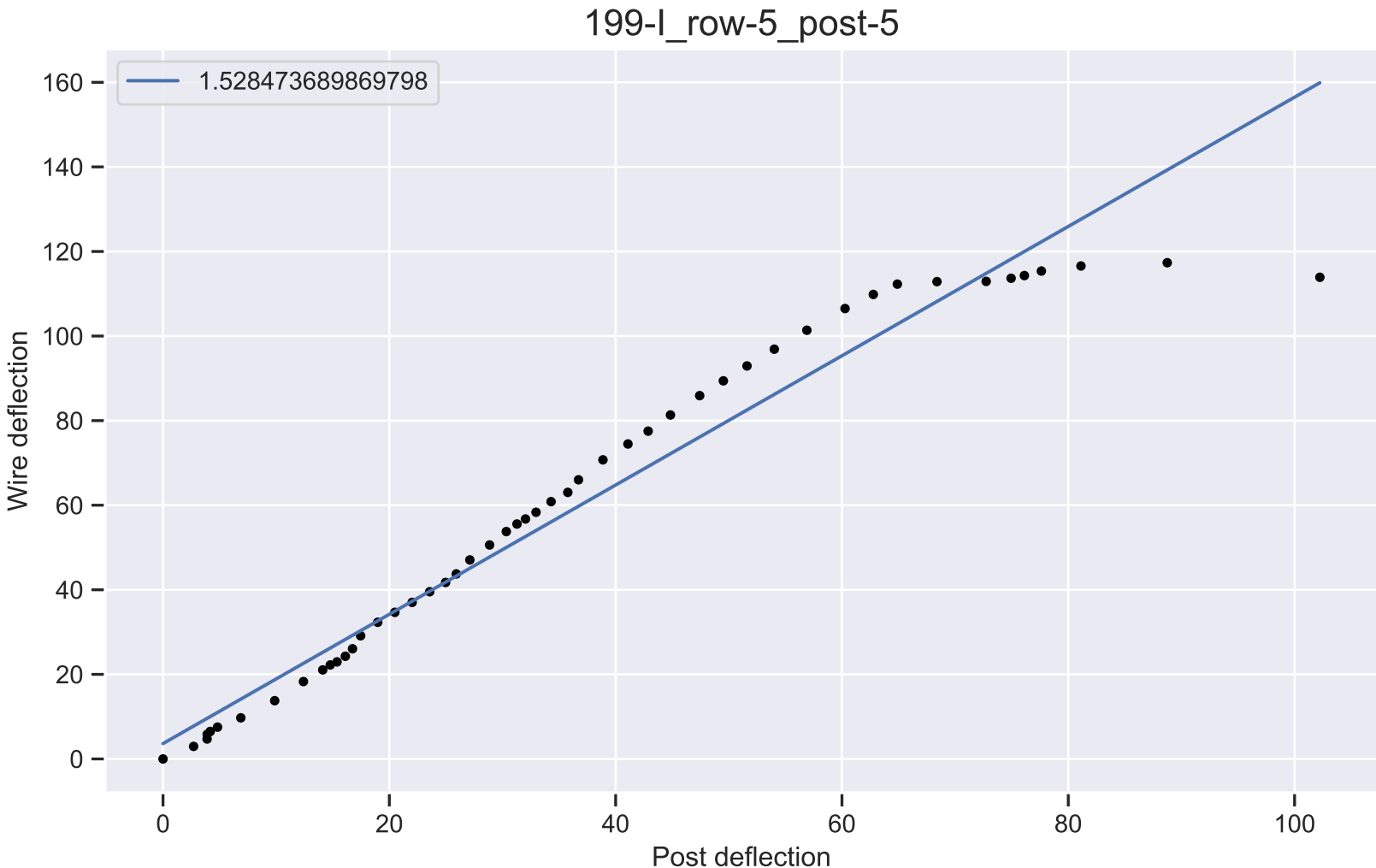
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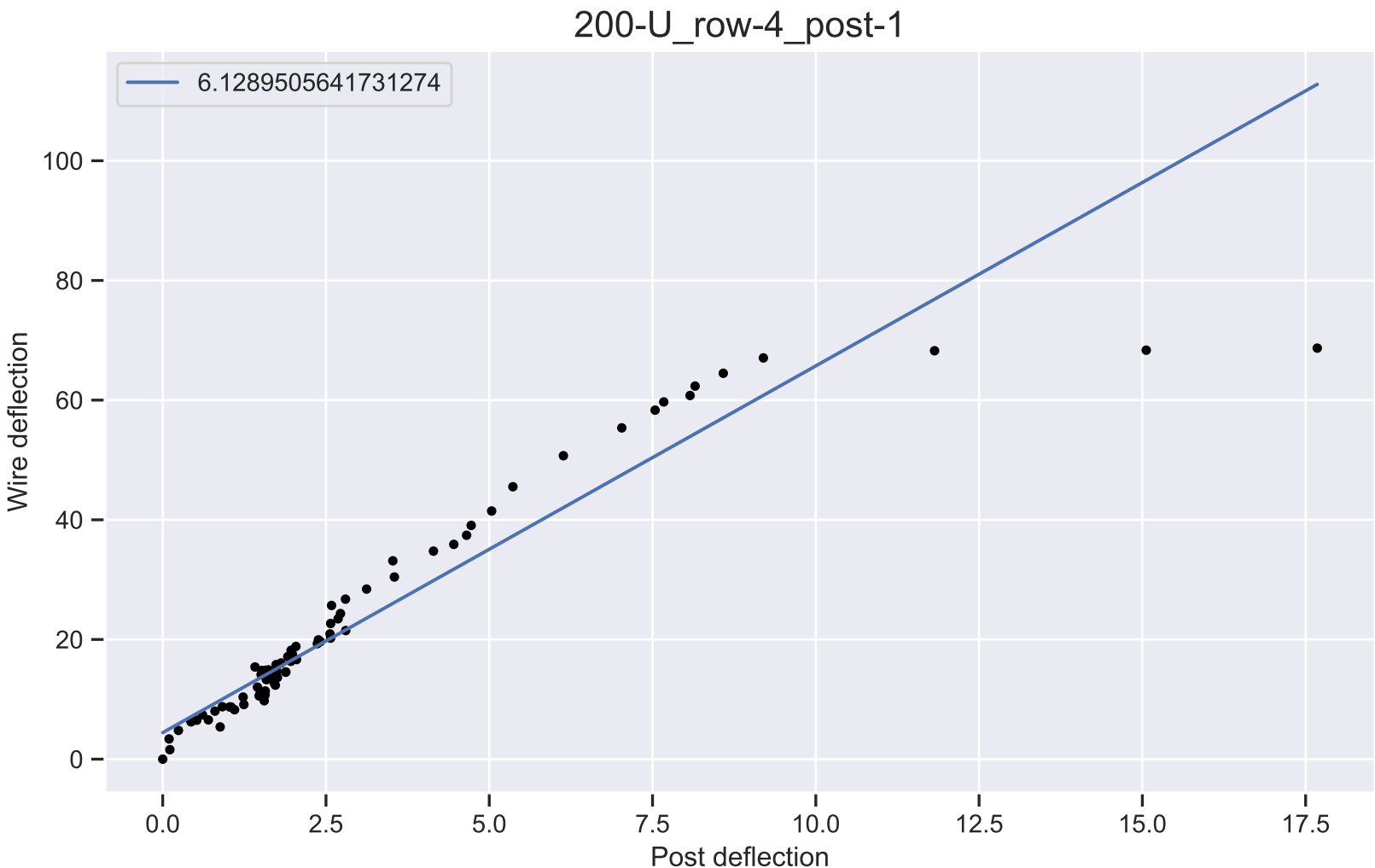
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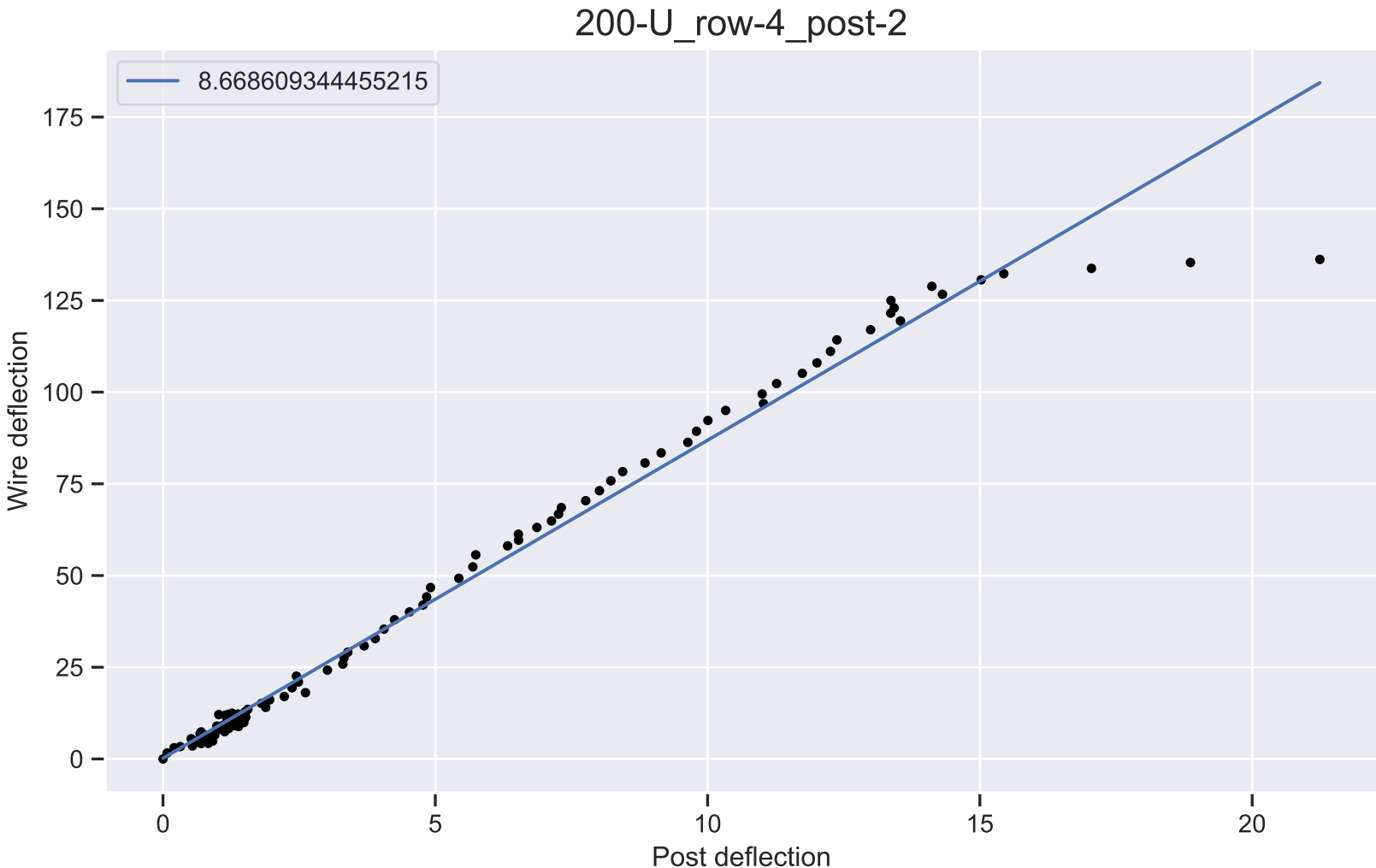
17.5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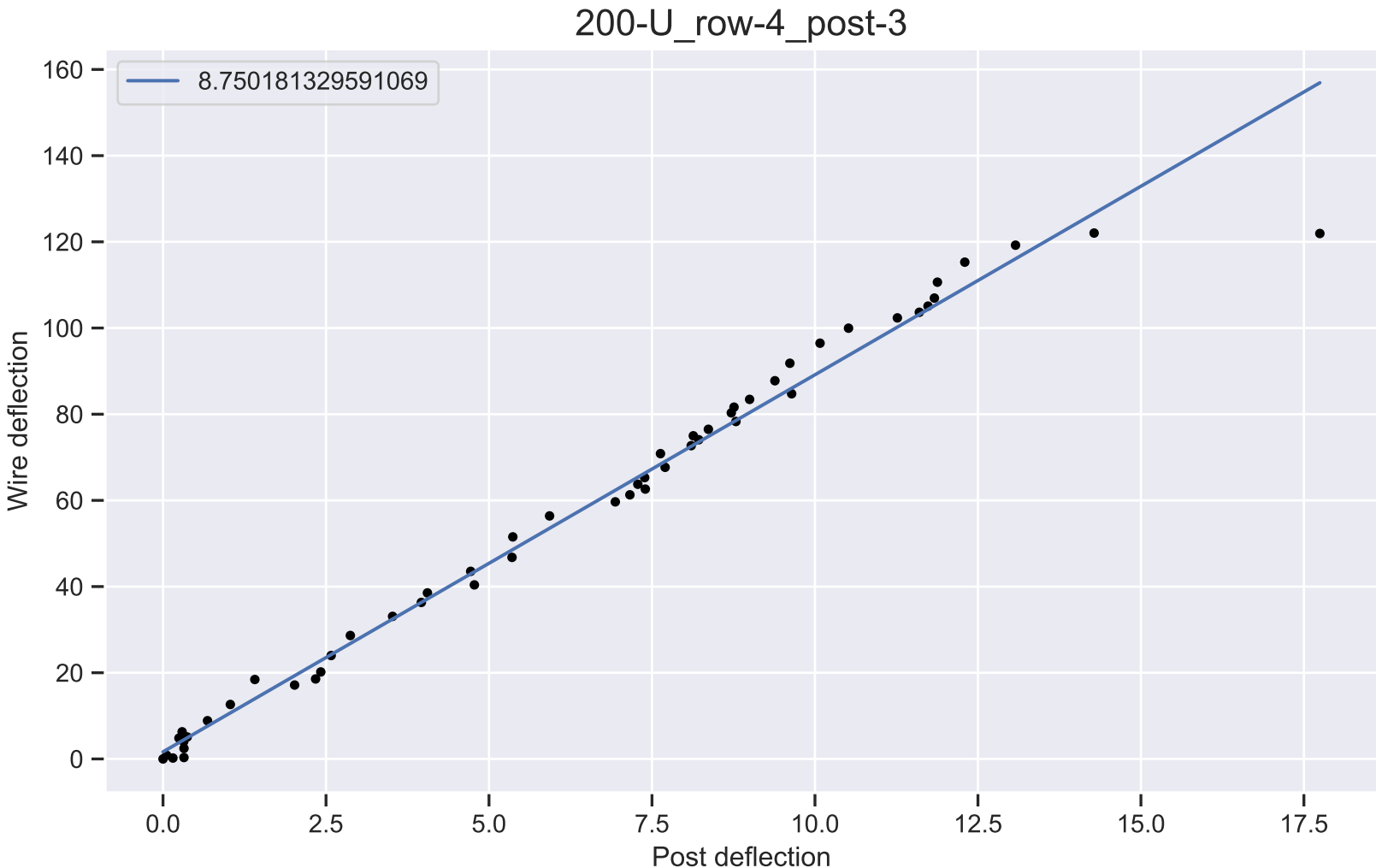
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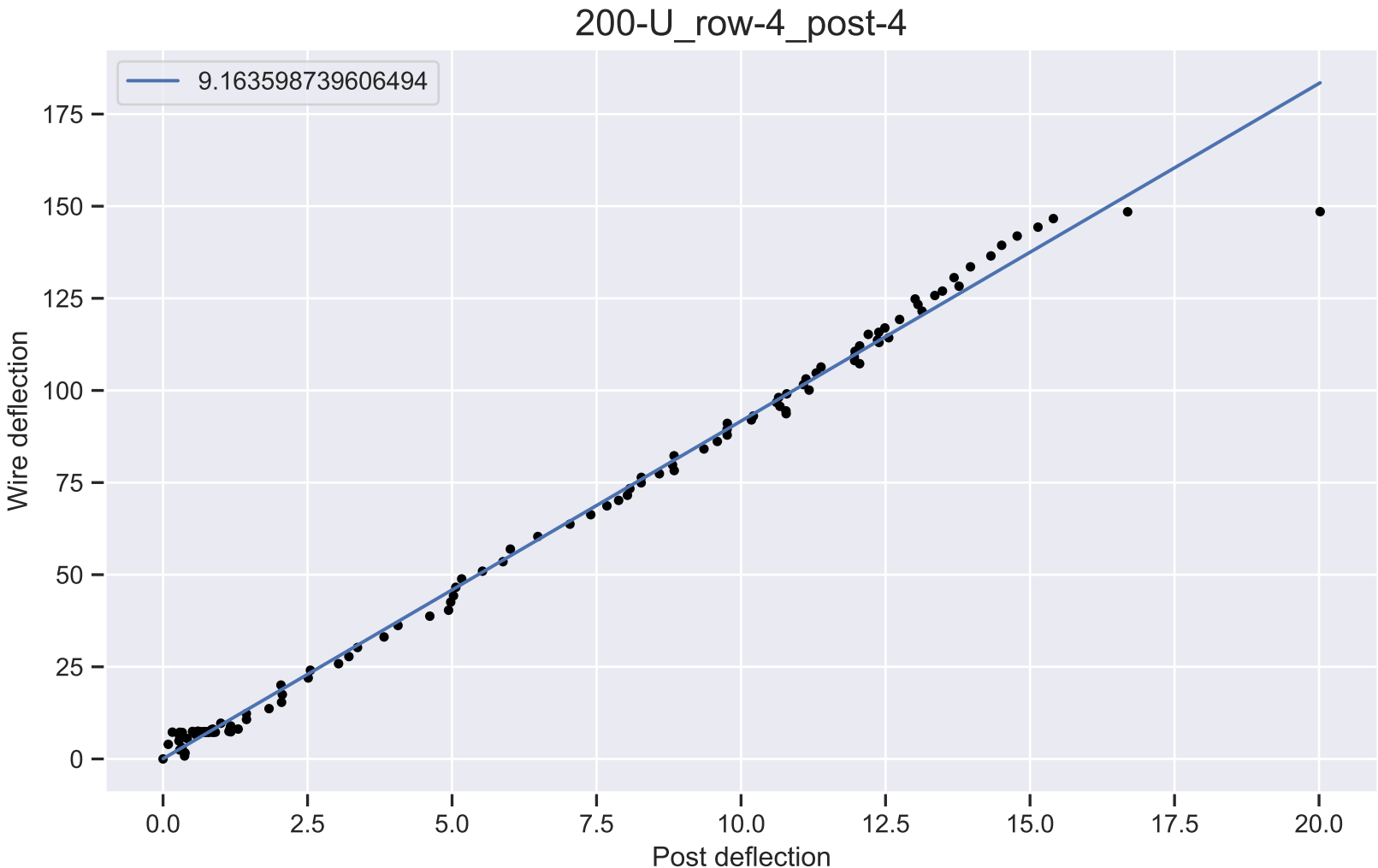
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Wire deflection
Post deflection
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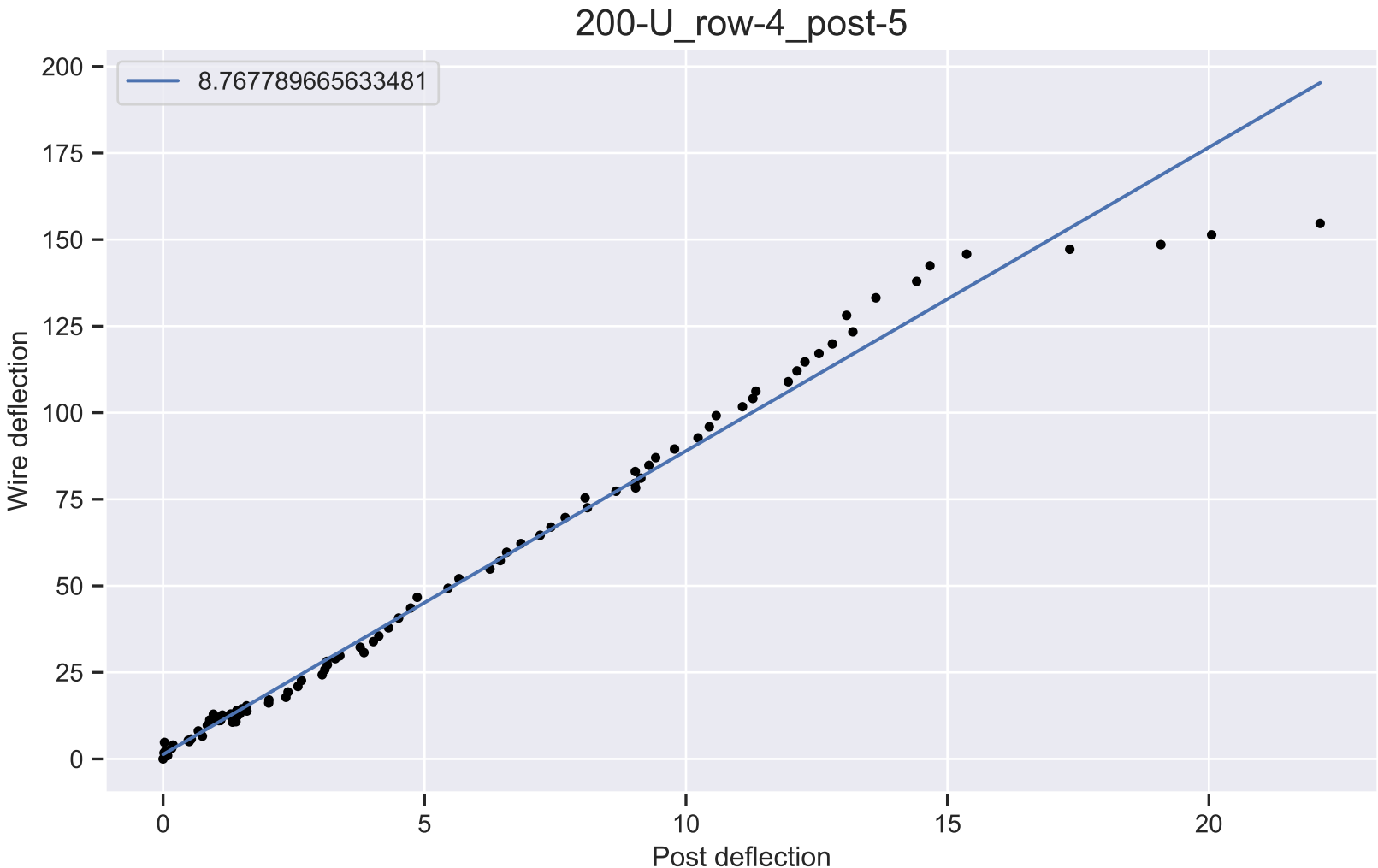
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Wire deflection
Post deflection
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15
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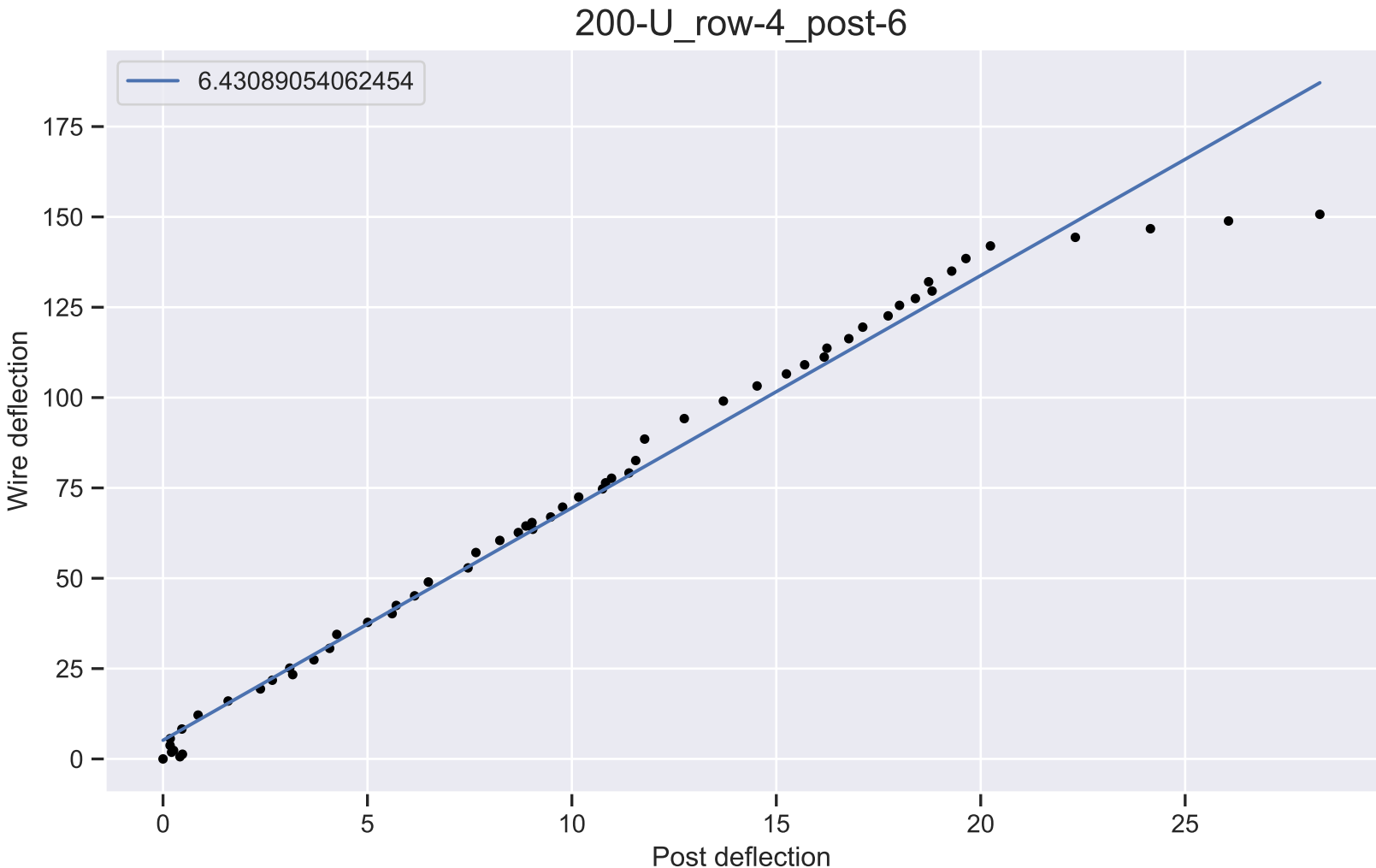
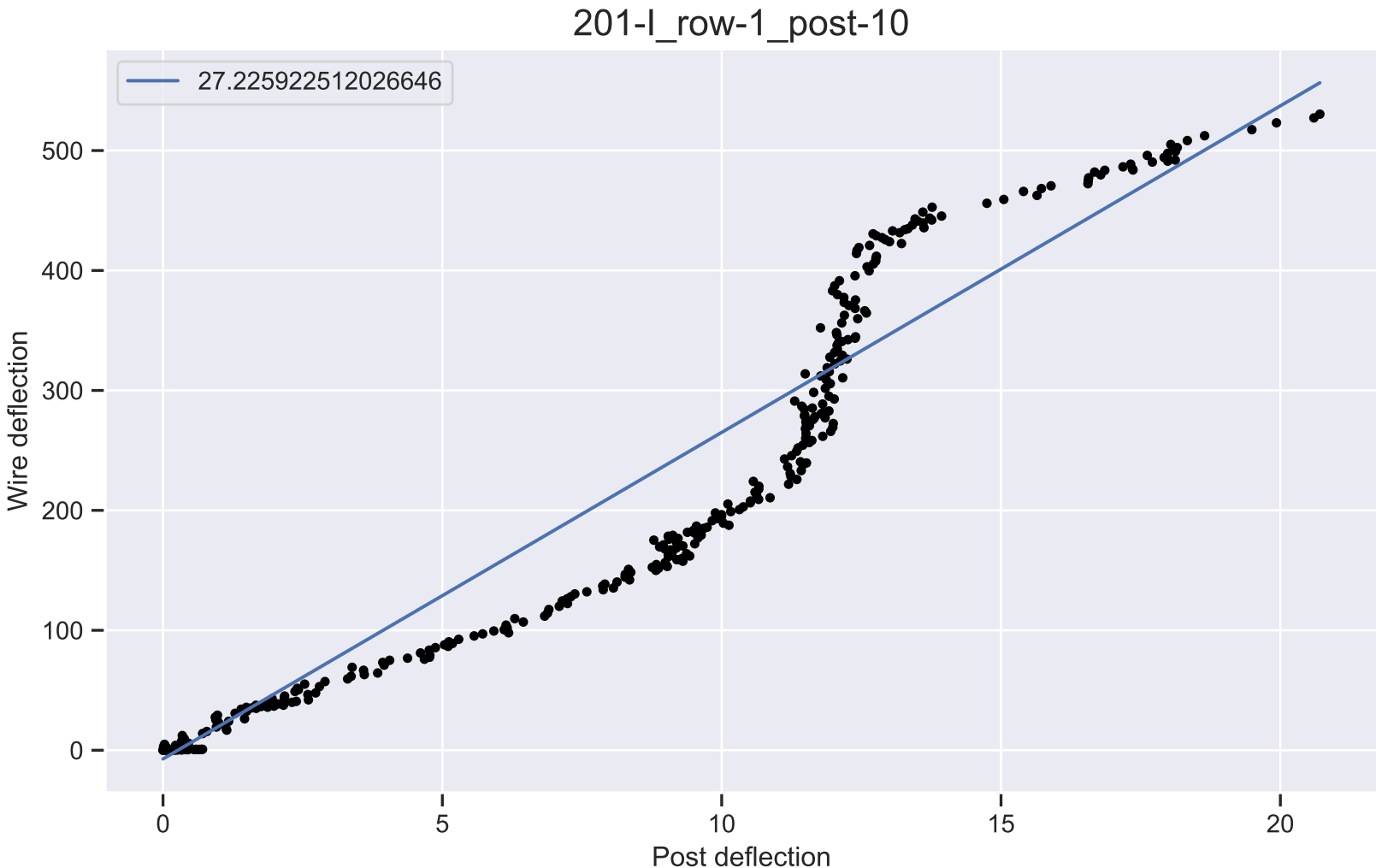
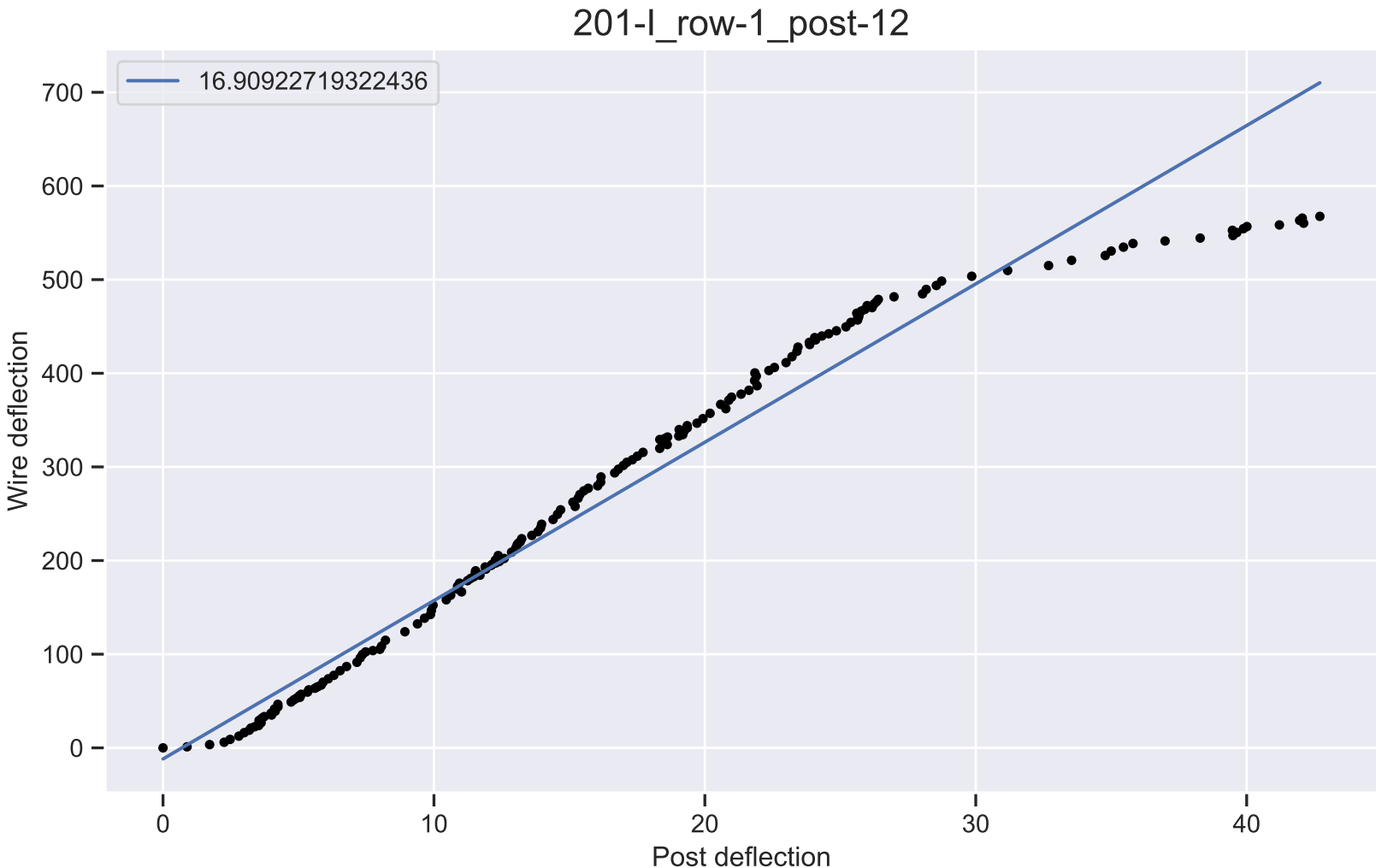
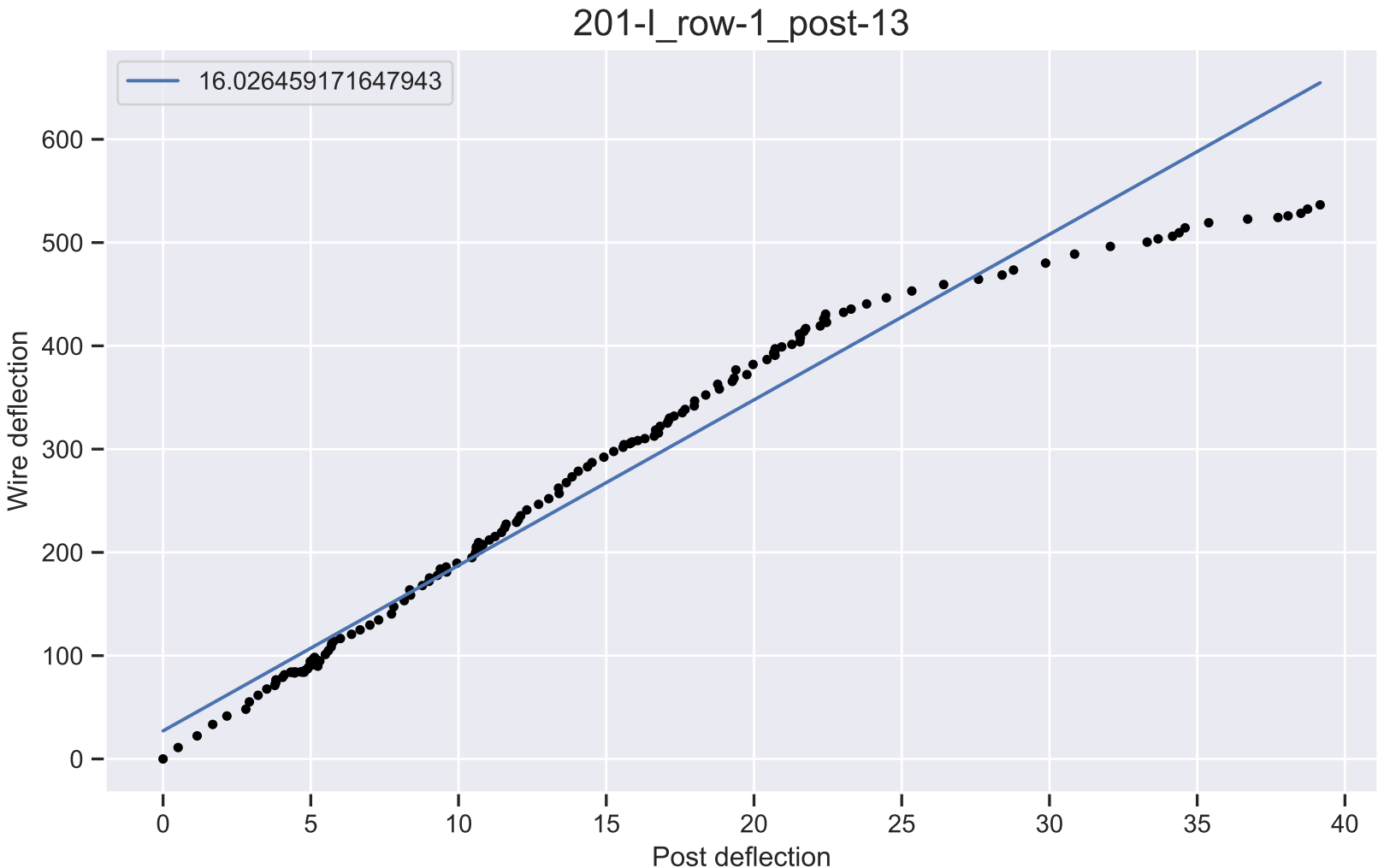
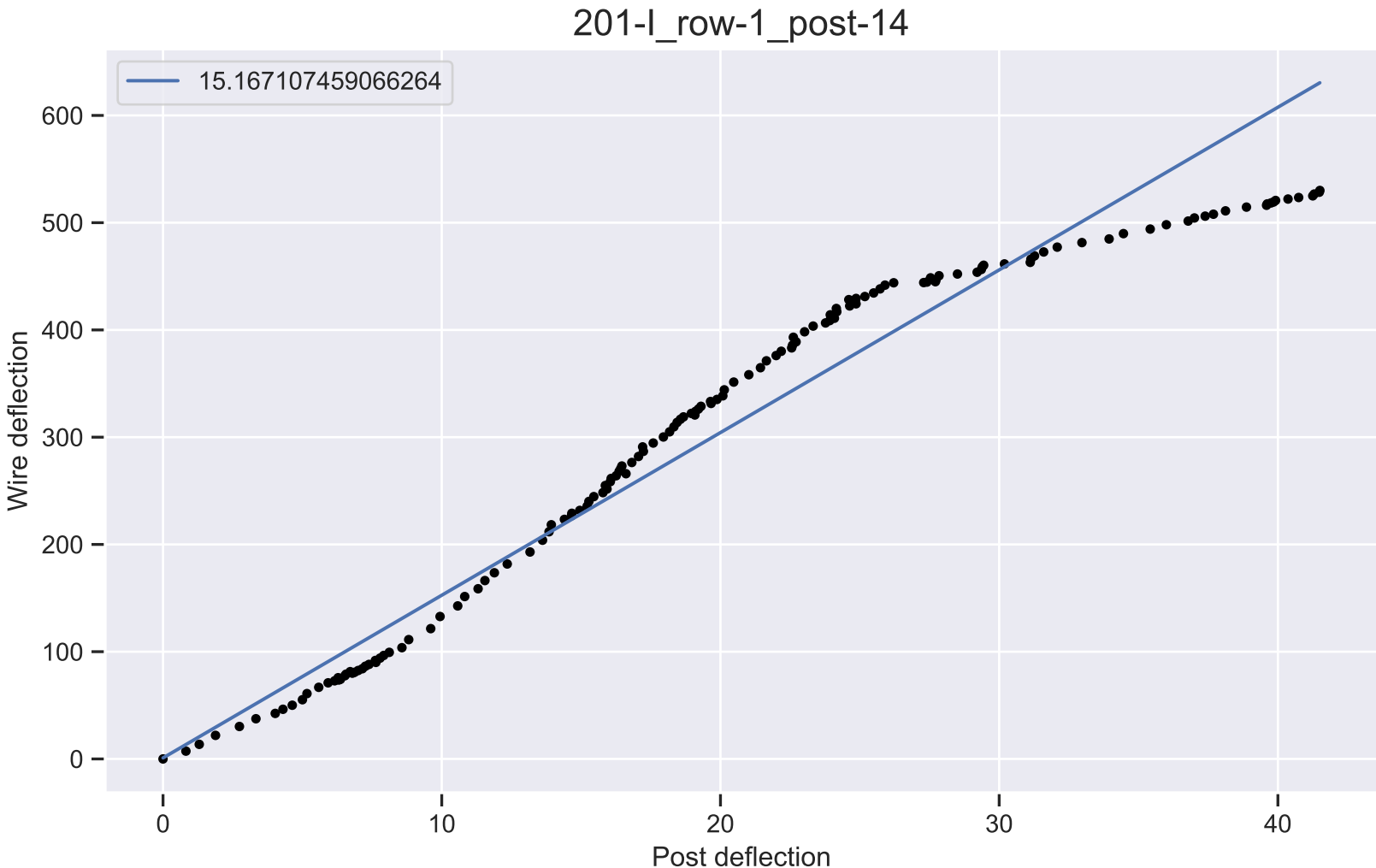
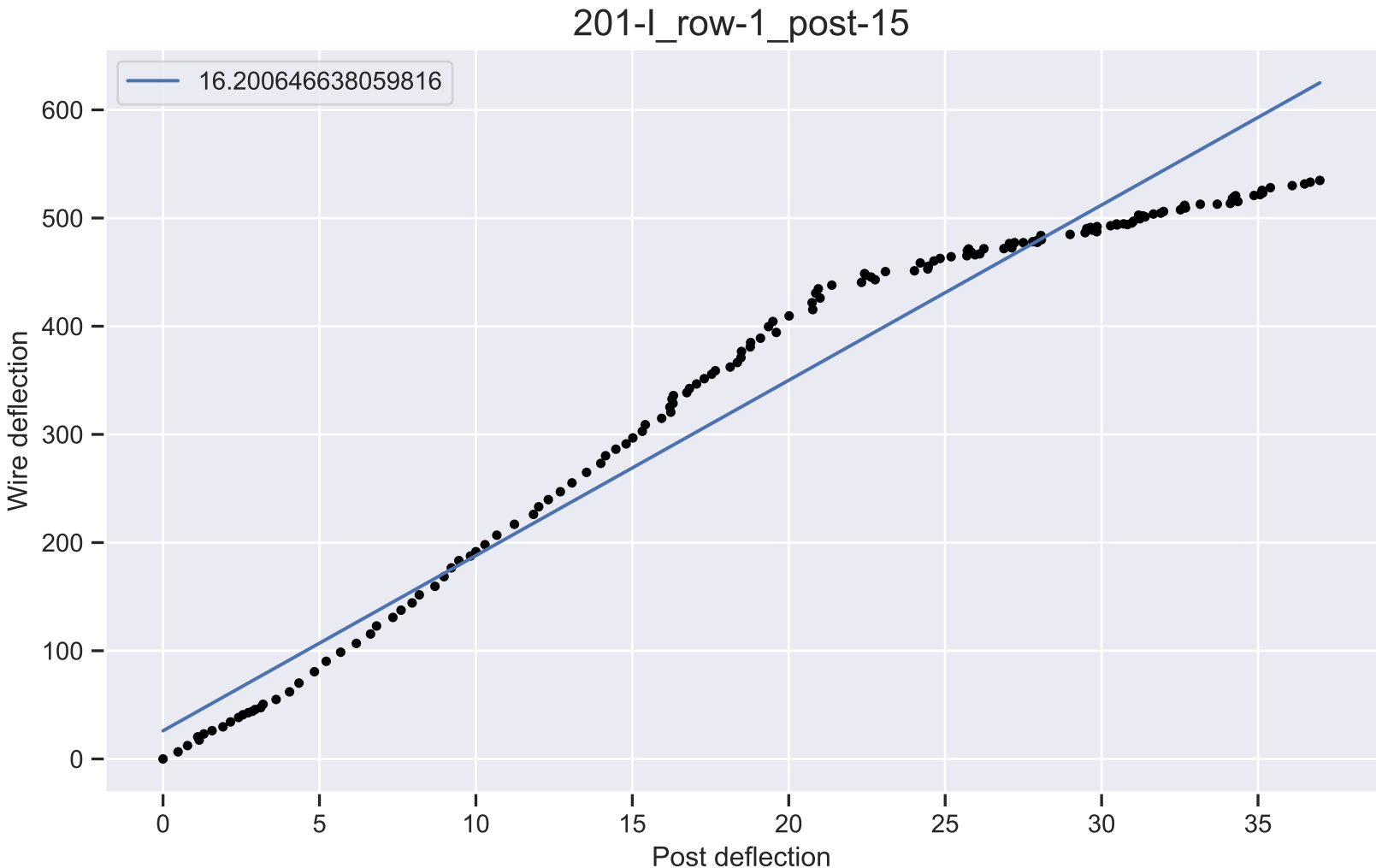

200-U_row-4_post-6
6.43089054062454
Wire deflection
Post deflection
0
25
50
75
100
125
150
175
0
5
10
15
20
25

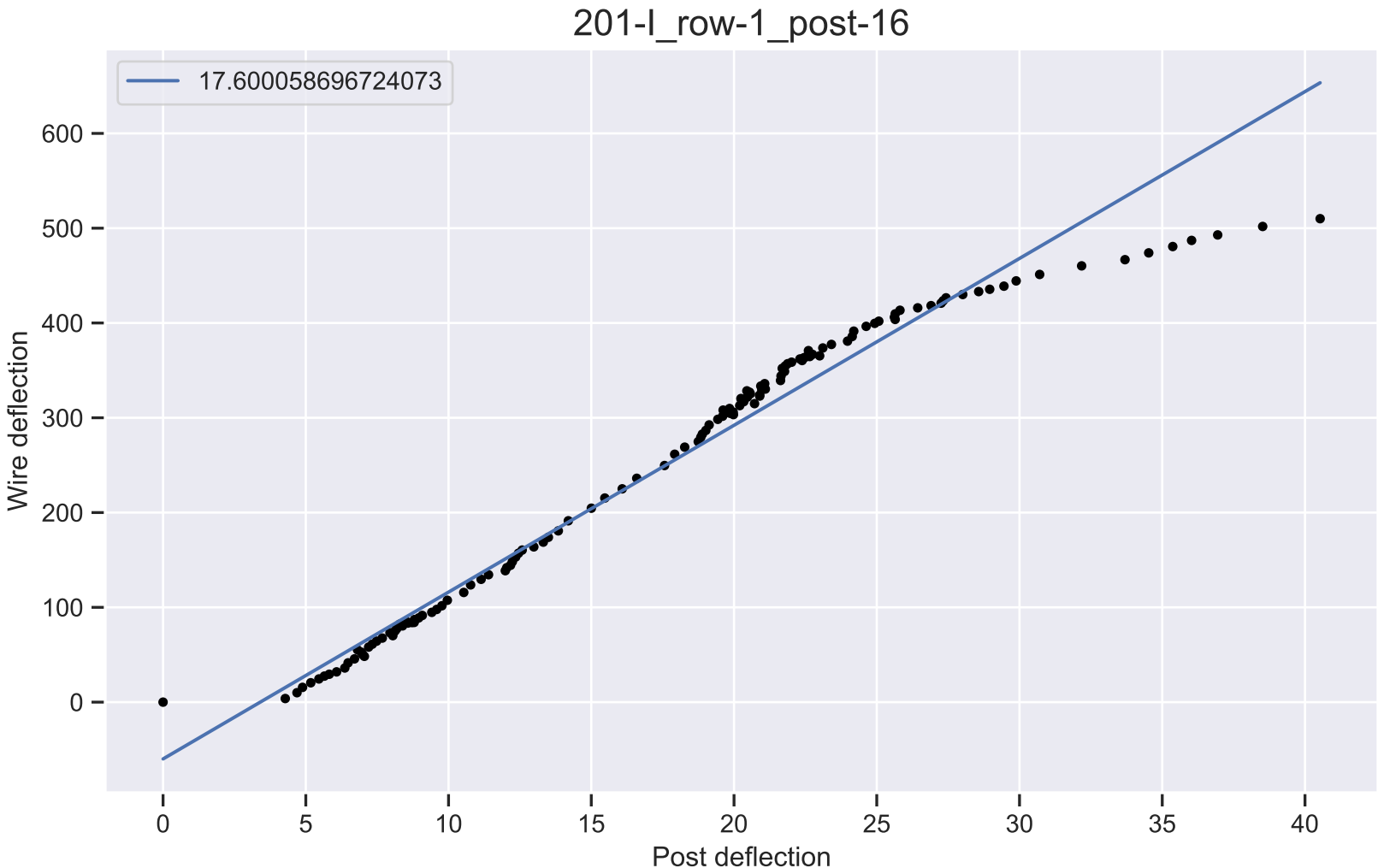

201-I_row-1_post-10
27.225922512026646
Wire deflection
Post deflection
0
100
200
300
400
500
0
5
10
15
20

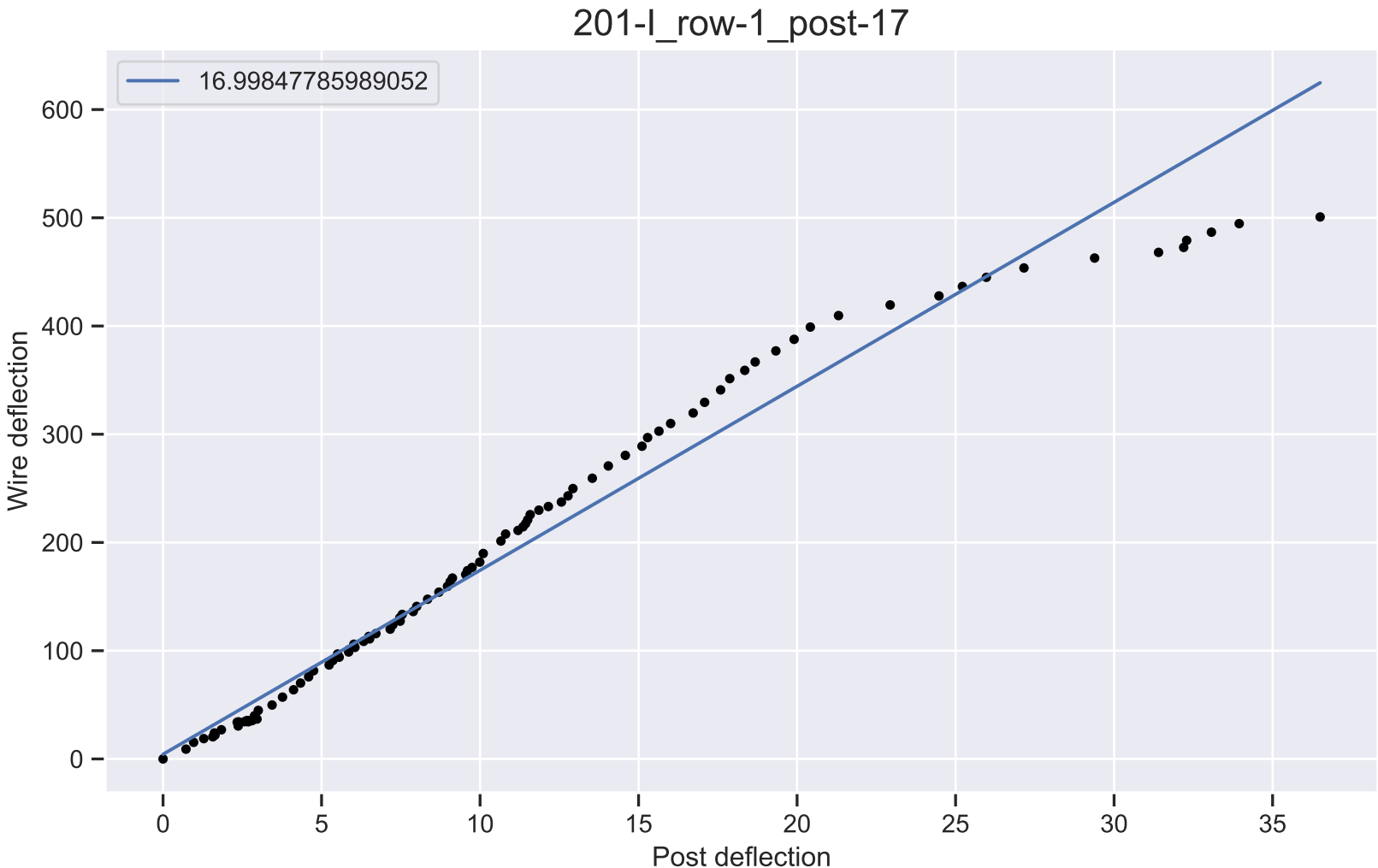

201-I_row-1_post-12
16.90922719322436
Wire deflection
Post deflection
0
100
200
300
400
500
600
700
0
10
20
30
40

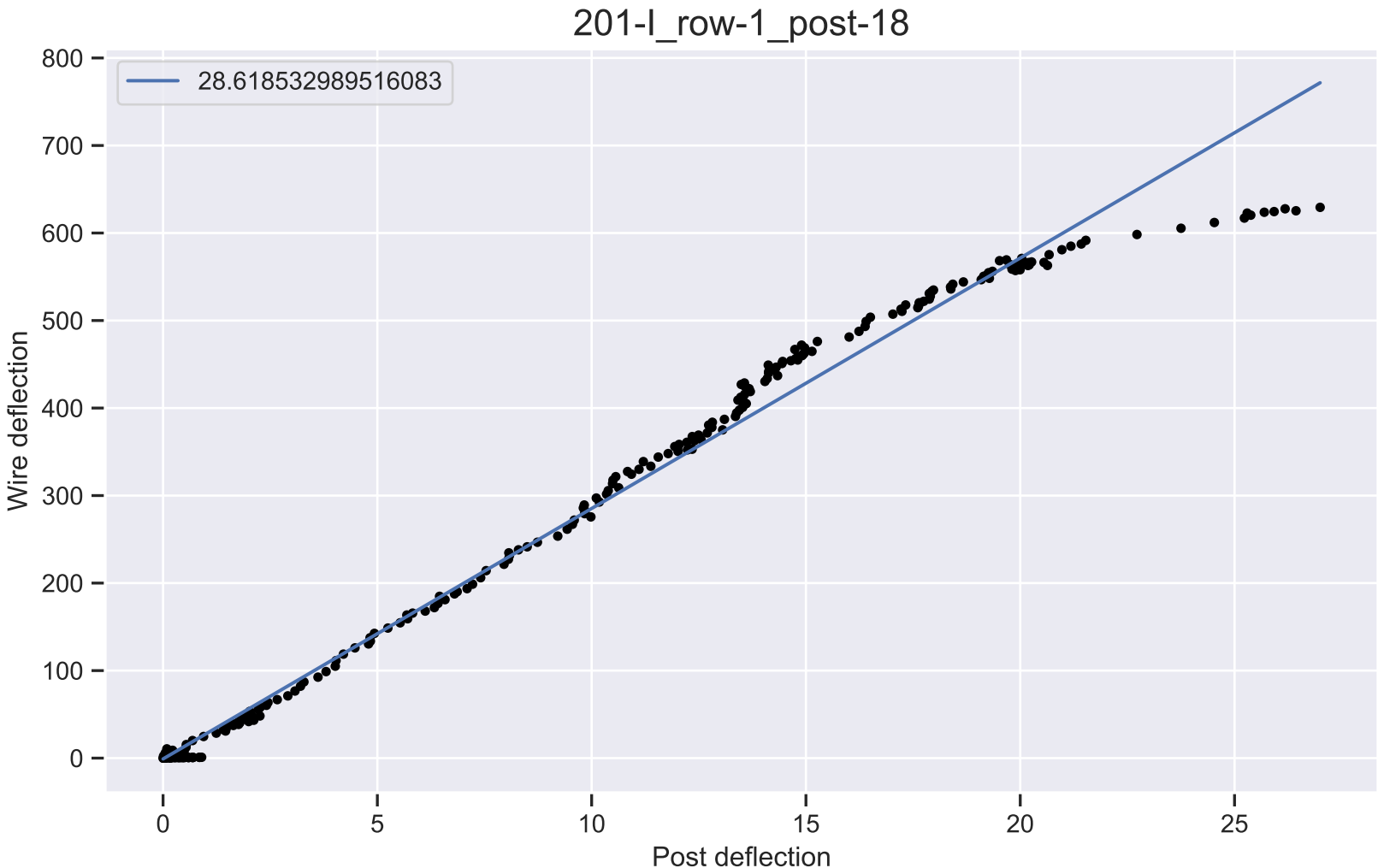

201-I_row-1_post-13
16.026459171647943
Wire deflection
Post deflection
0
100
200
300
400
500
600
0
5
10
15
20
25
30
35
40

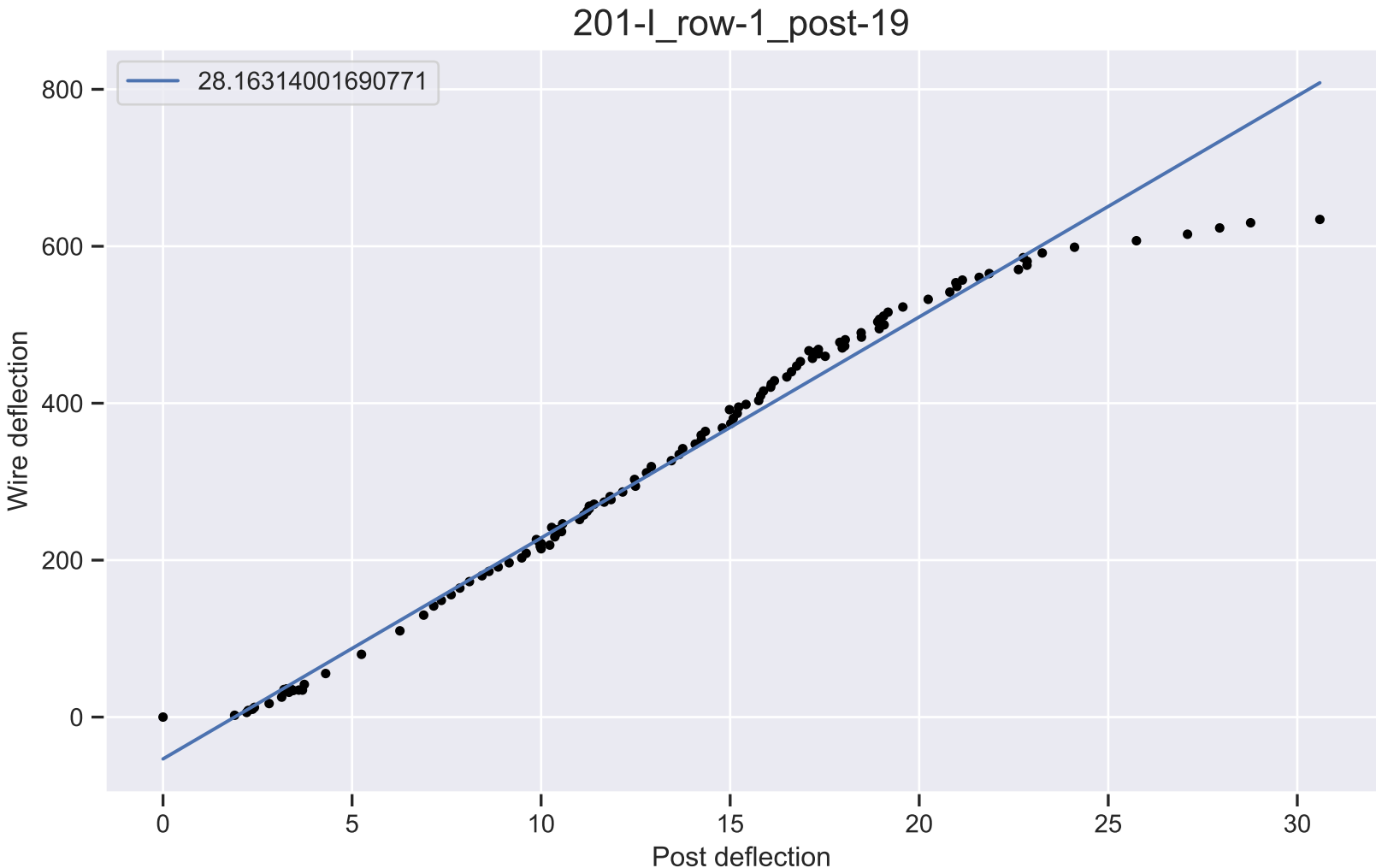

201-I_row-1_post-14
15.167107459066264
Wire deflection
Post deflection
0
100
200
300
400
500
600
0
10
20
30
40

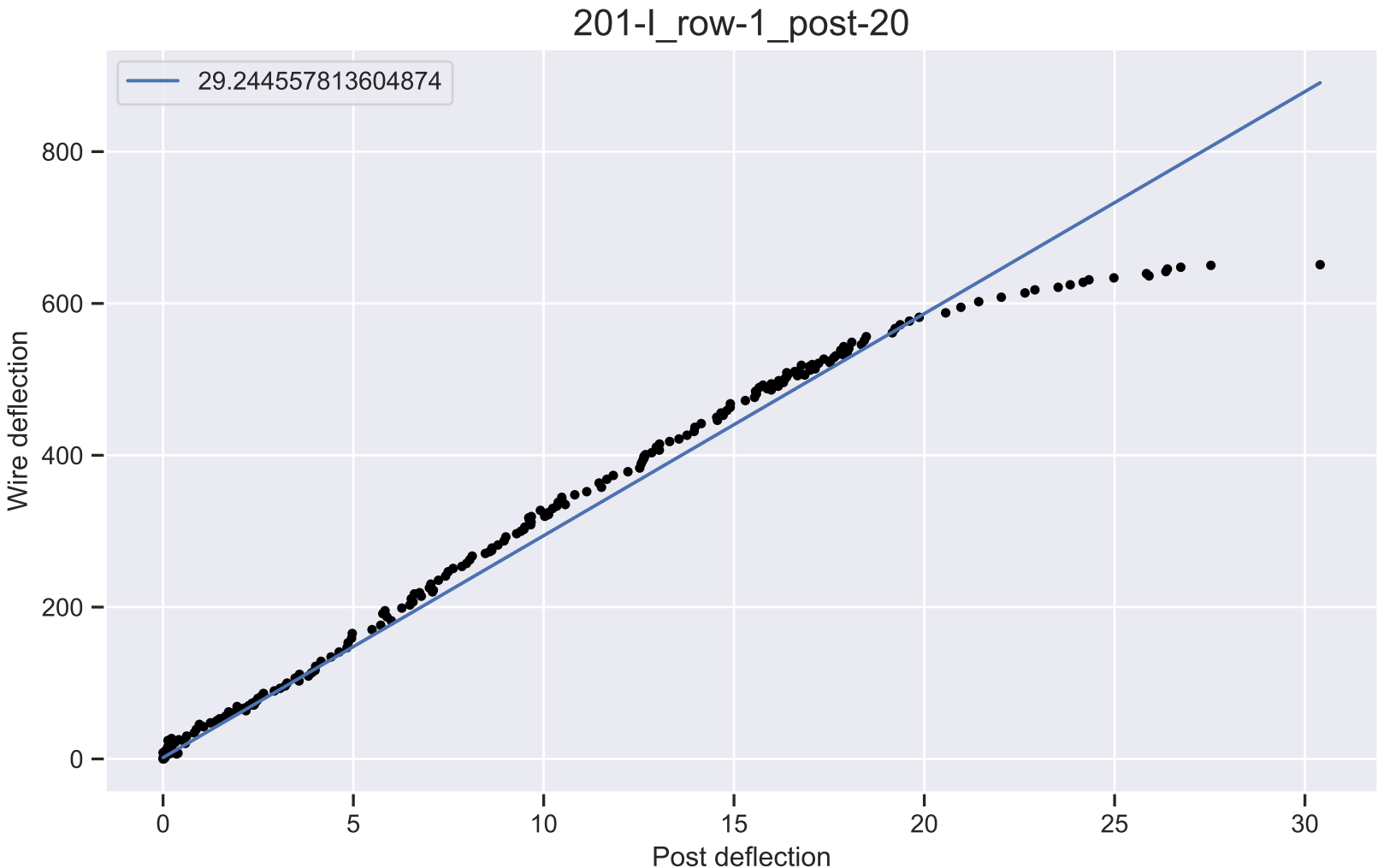

201-I_row-1_post-15
16.200646638059816
Wire deflection
Post deflection
0
100
200
300
400
500
600
0
5
10
15
20
25
30
35

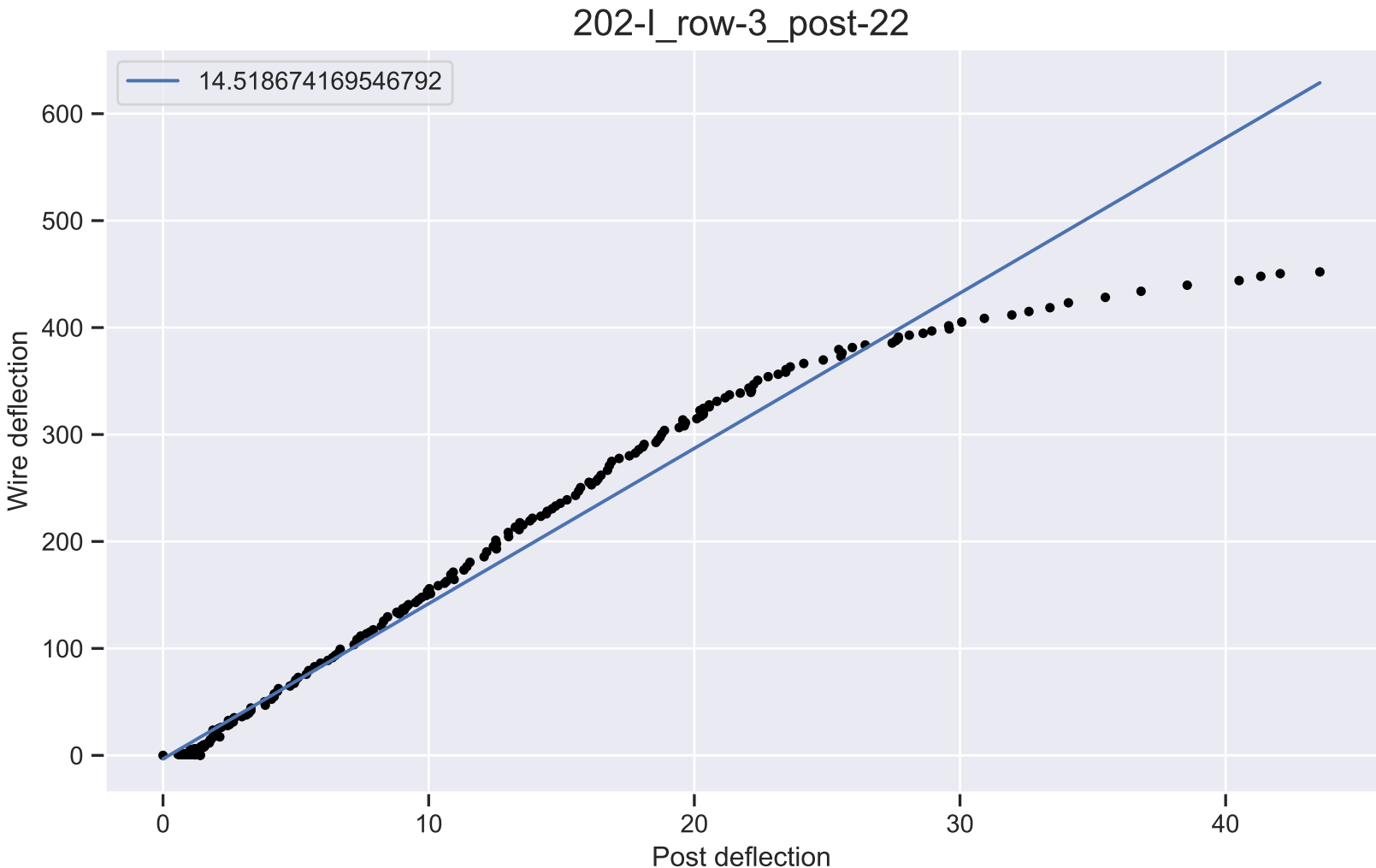

201-I_row-1_post-16
17.600058696724073
Wire deflection
Post deflection
600
500
400
300
200
100
0
0
5
10
15
20
25
30
35
40

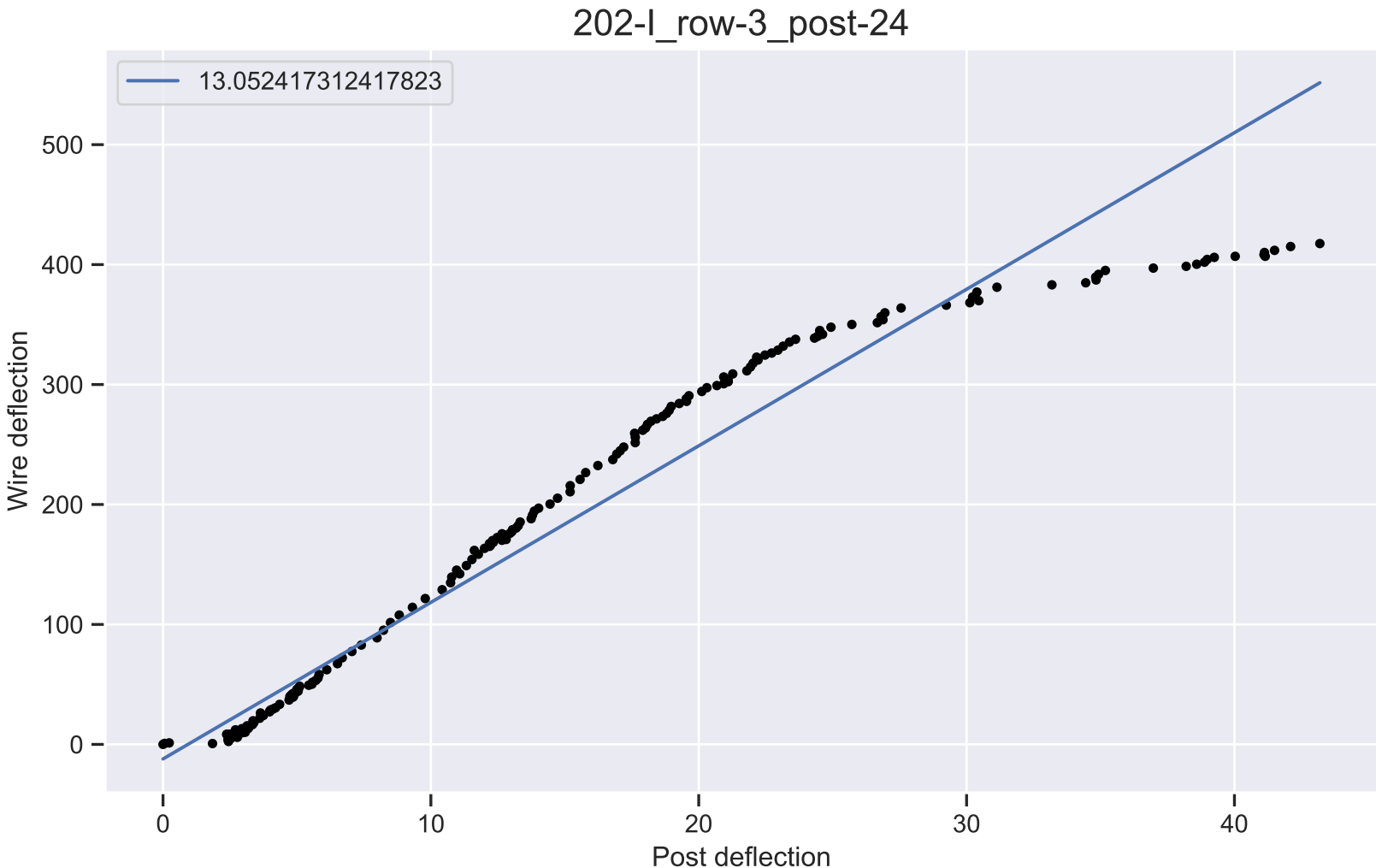

201-I_row-1_post-17
16.99847785989052
Wire deflection
Post deflection
0
100
200
300
400
500
600
0
5
10
15
20
25
30
35

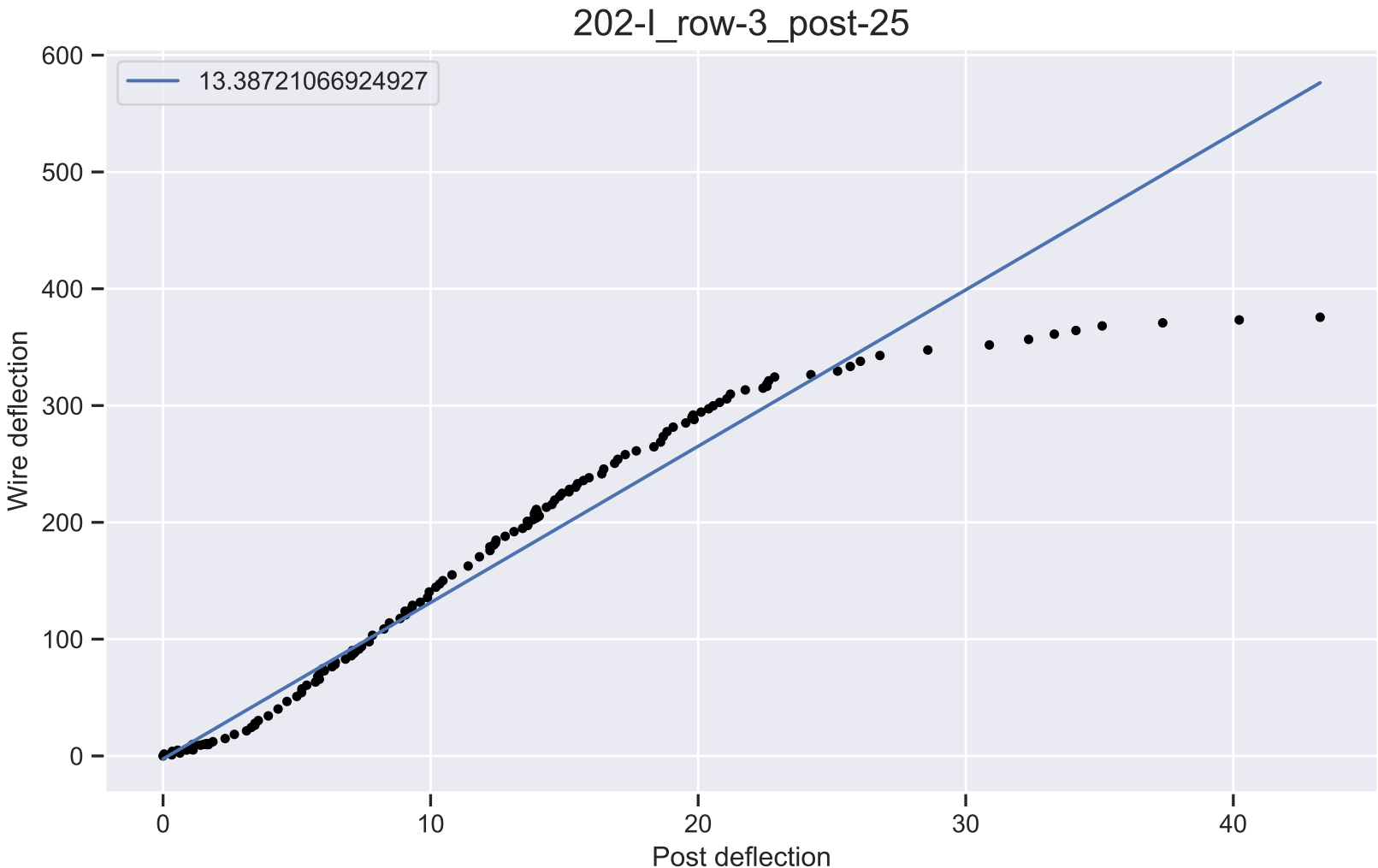

201-I_row-1_post-18
28.618532989516083
Wire deflection
Post deflection
800
700
600
500
400
300
200
100
0
0
5
10
15
20
25

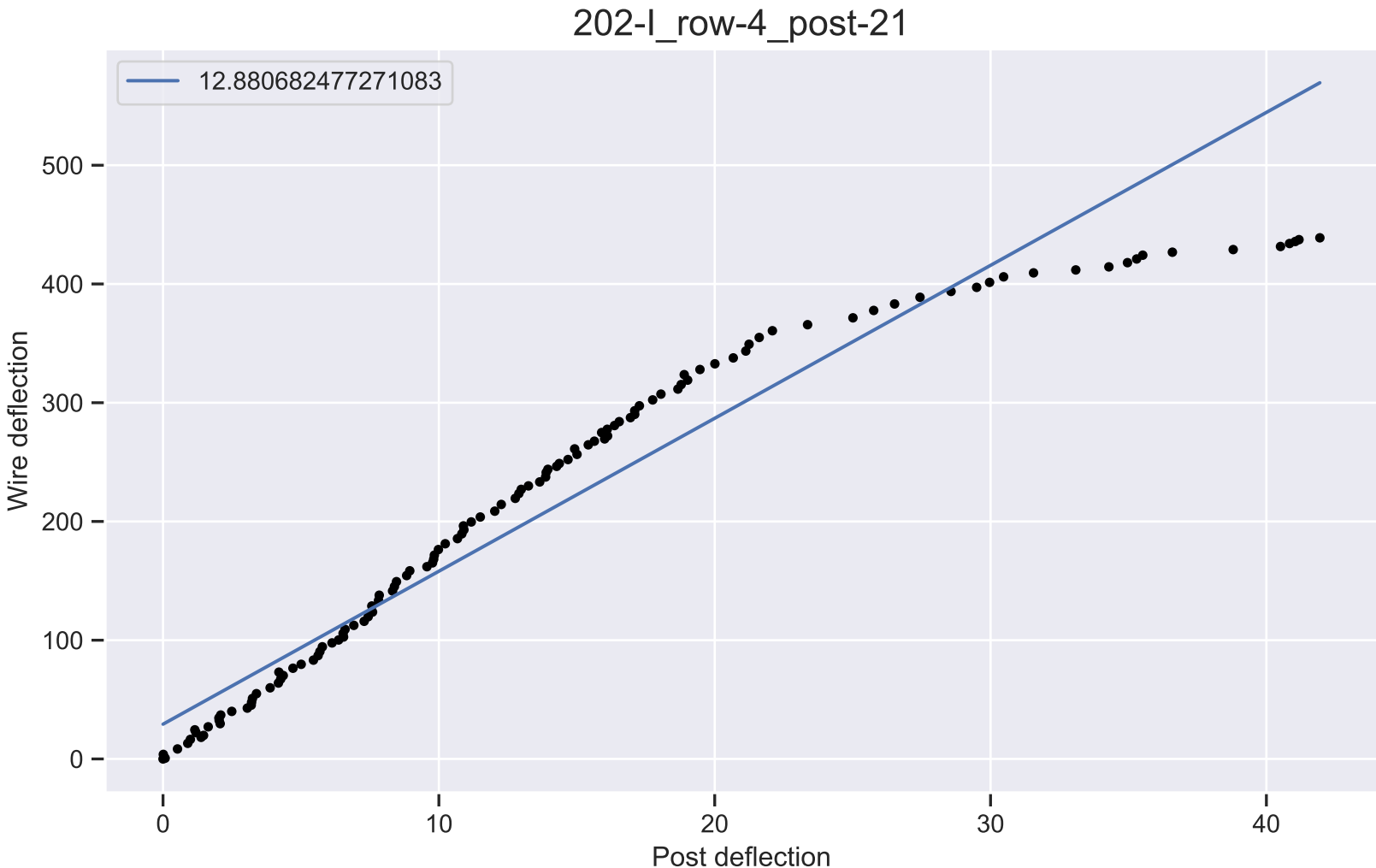

201-I_row-1_post-19
28.16314001690771
800
600
400
200
0
Wire deflection
0
5
10
15
20
25
30
Post deflection

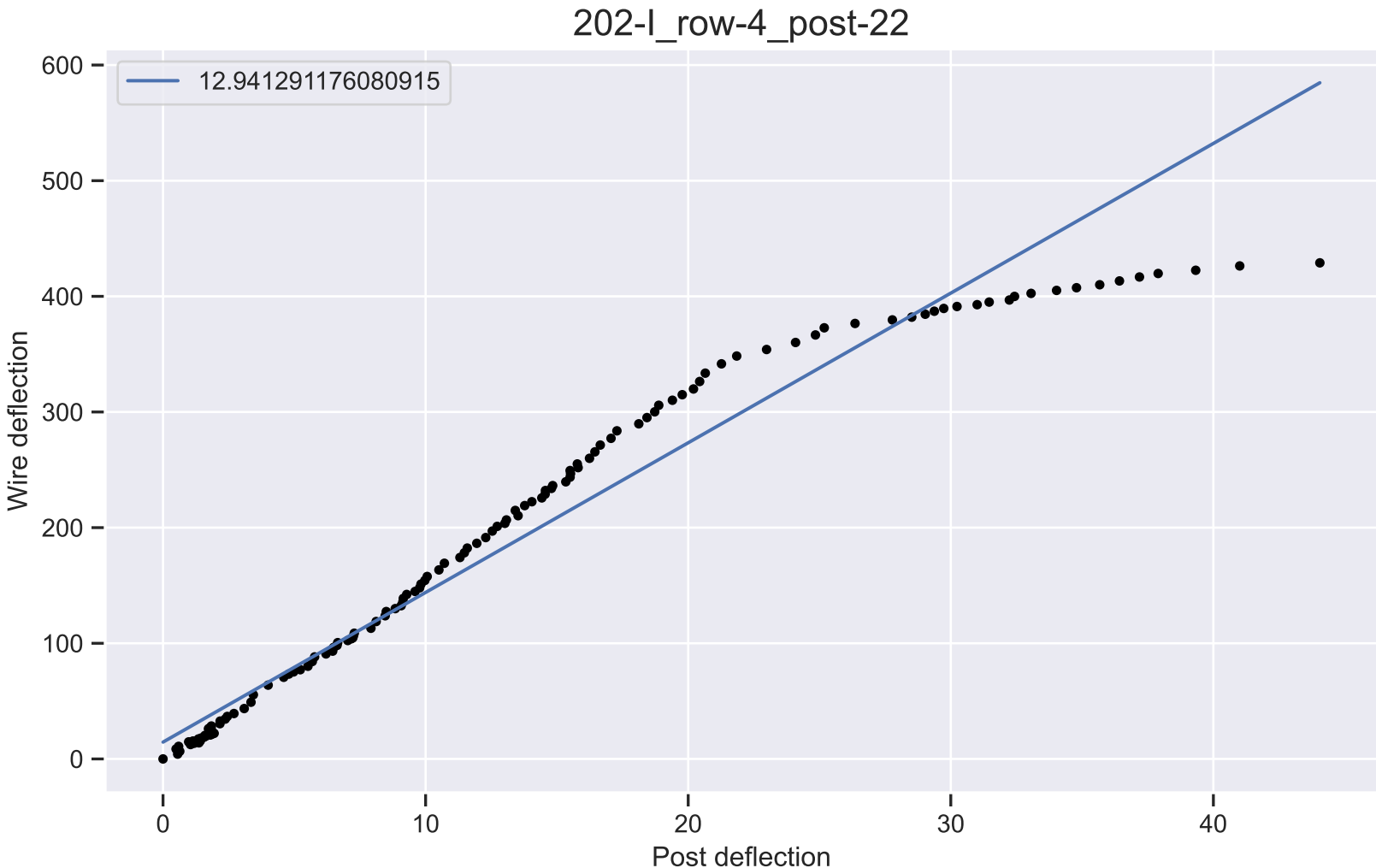

201-I_row-1_post-20
29.244557813604874
800
600
400
200
0
Wire deflection
0
5
10
15
20
25
30
Post deflection

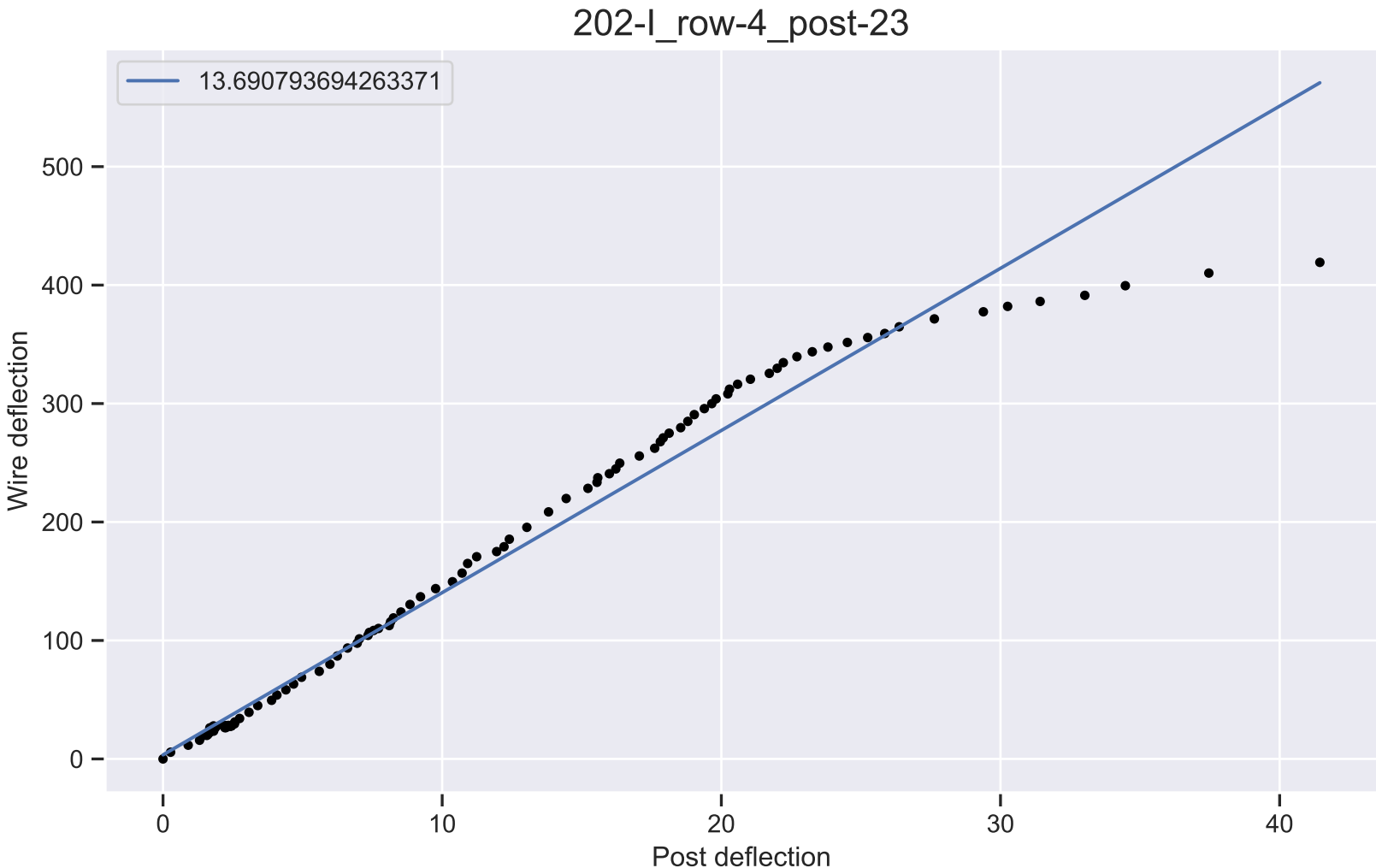

202-I_row-3_post-22
14.518674169546792
Wire deflection
Post deflection
0
100
200
300
400
500
600
0
10
20
30
40

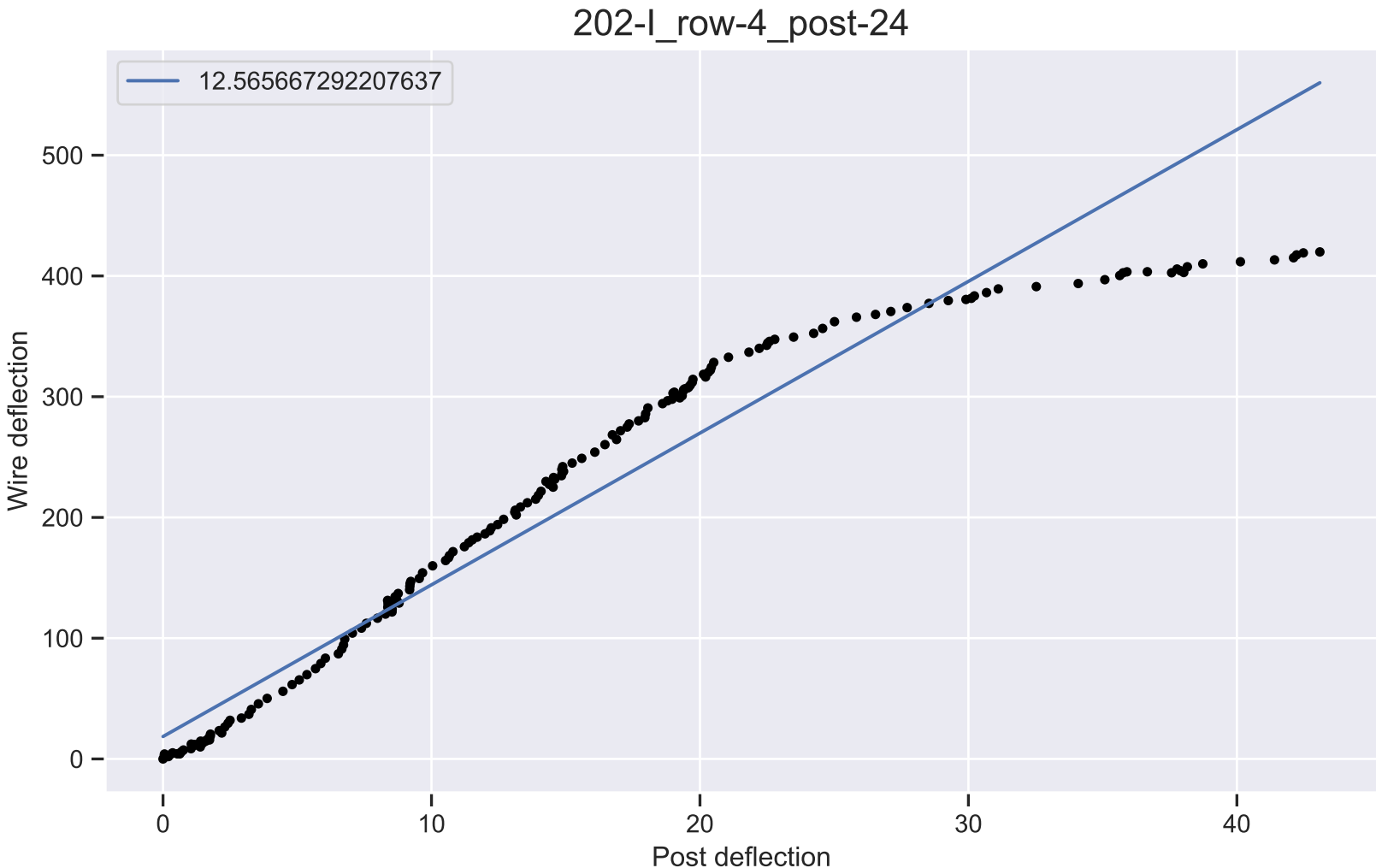

202-I_row-3_post-24
13.052417312417823
Wire deflection
Post deflection
0
100
200
300
400
500
0
10
20
30
40

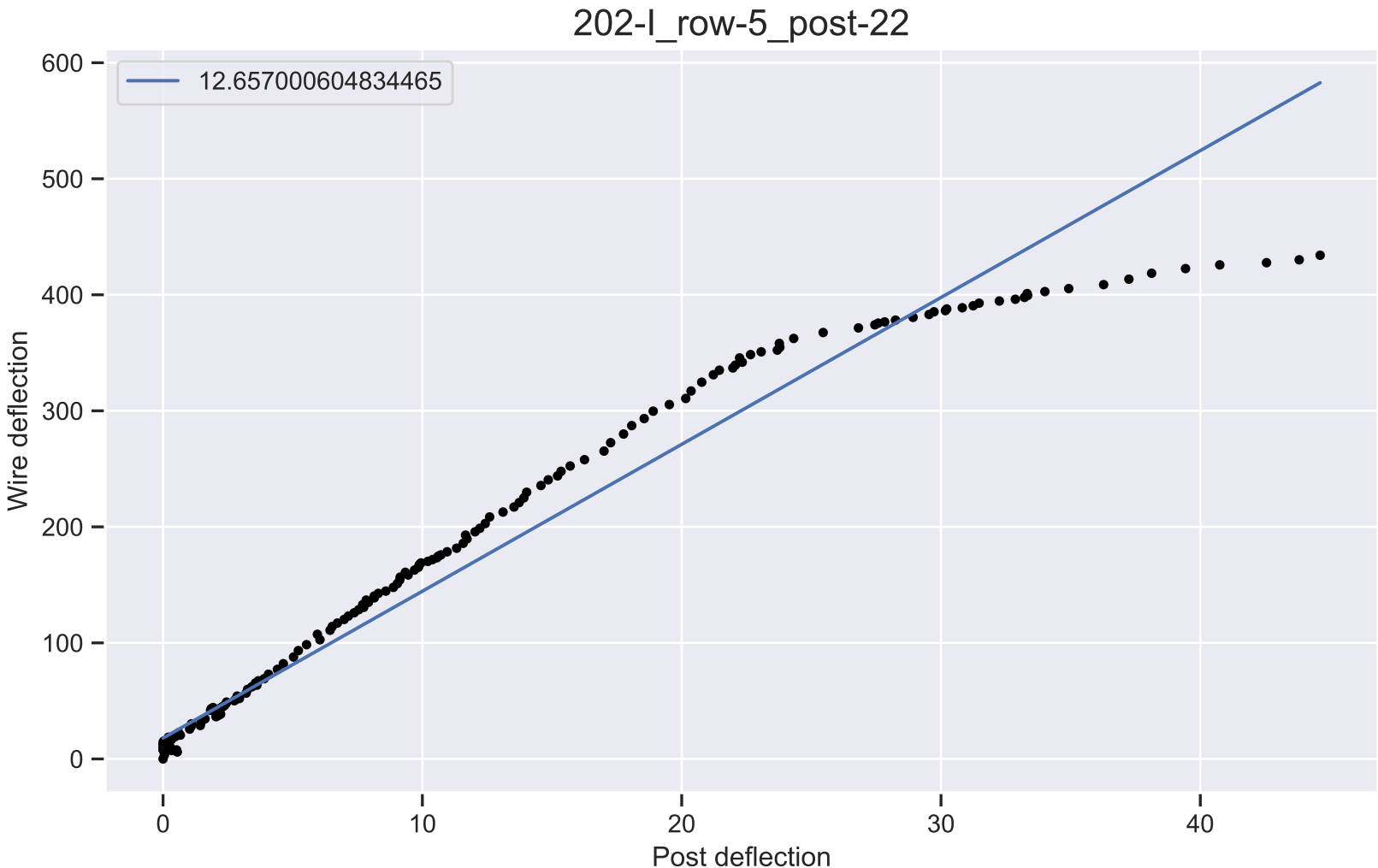

202-I_row-3_post-25
13.38721066924927
Wire deflection
Post deflection
600
500
400
300
200
100
0
0
10
20
30
40

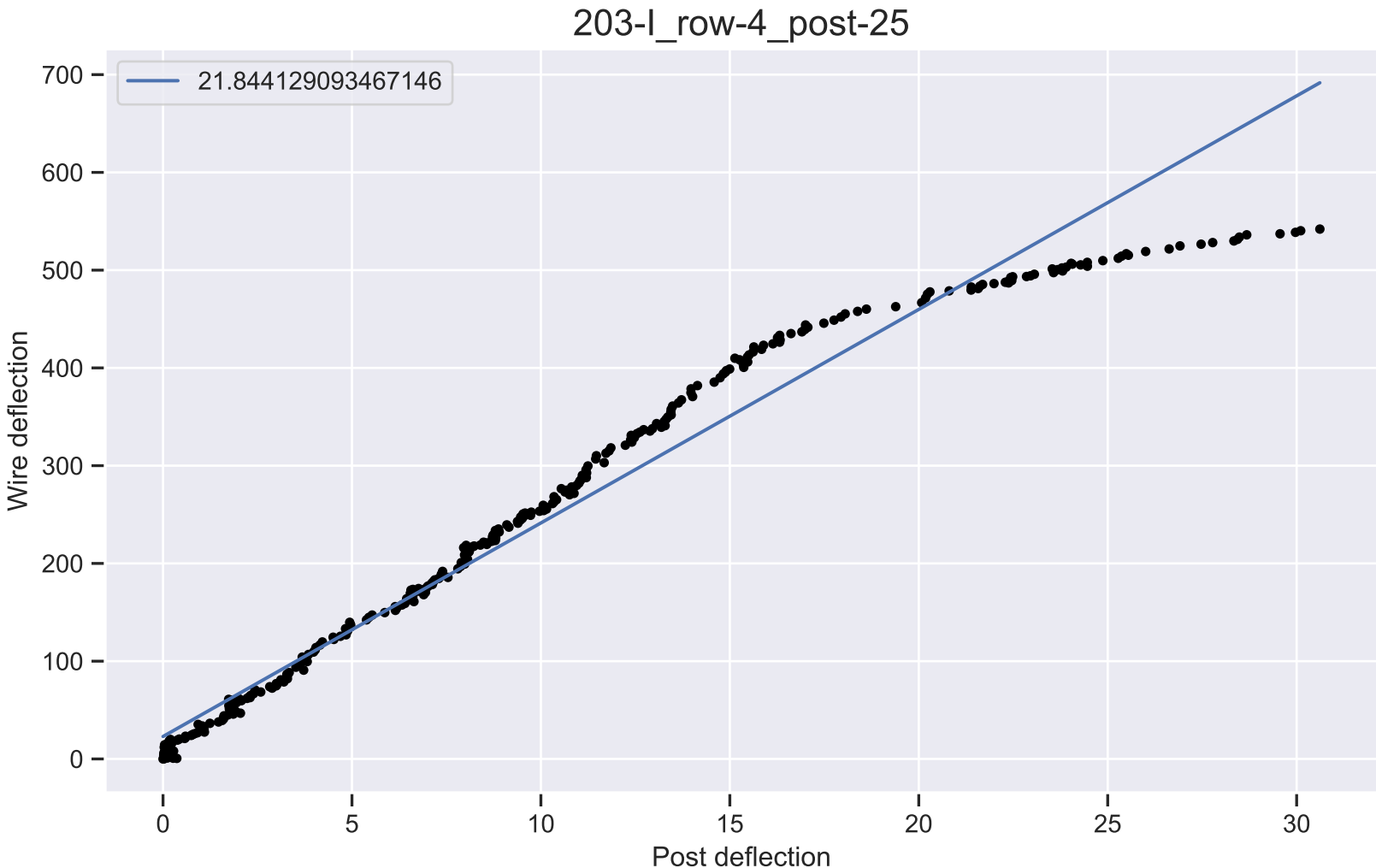

202-I_row-4_post-21
12.880682477271083
Wire deflection
Post deflection
0
100
200
300
400
500
0
10
20
30
40

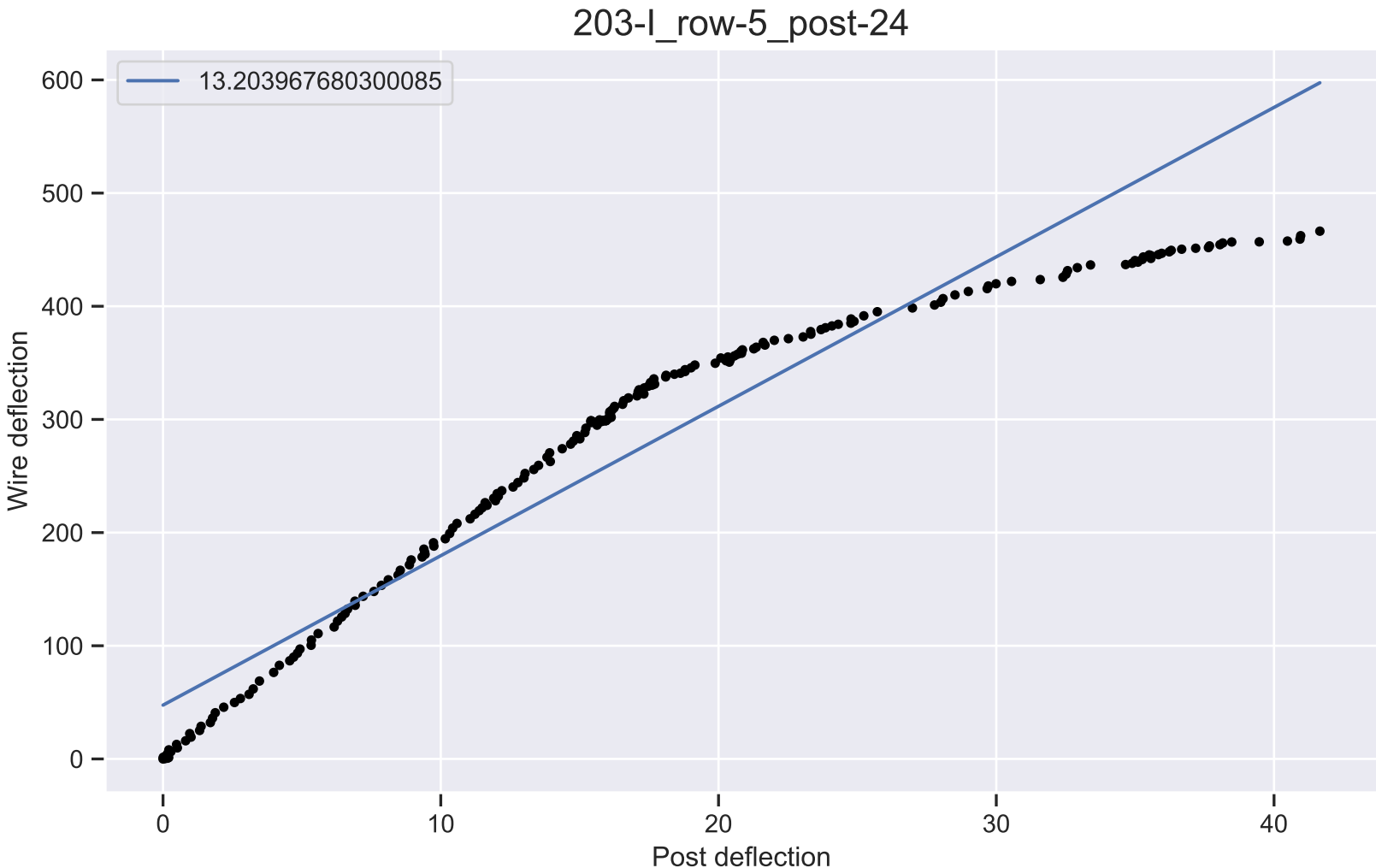

202-I_row-4_post-22
12.941291176080915
600
500
400
300
200
100
0
Wire deflection
0
10
20
30
40
Post deflection

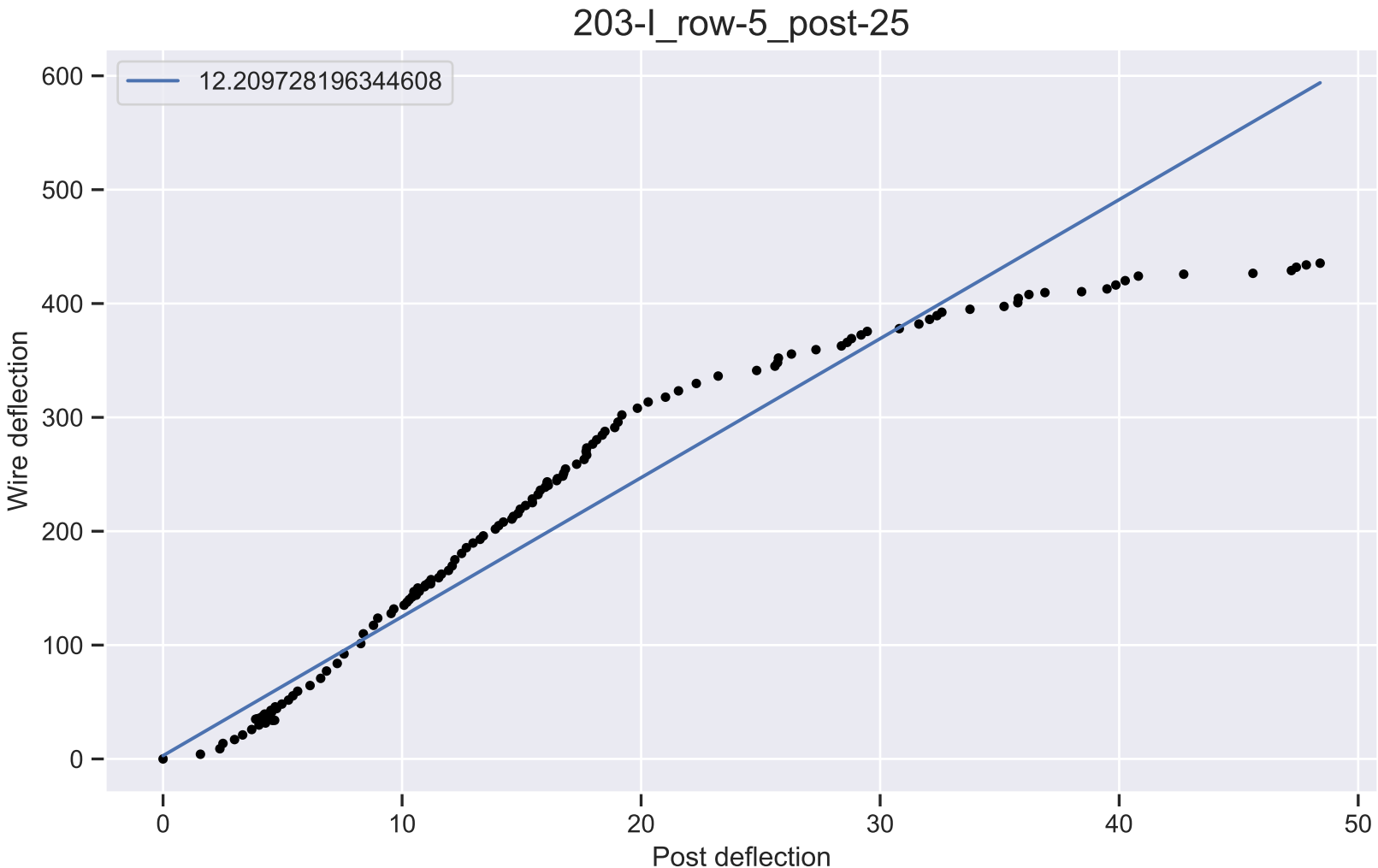

202-I_row-4_post-23
13.690793694263371
Wire deflection
Post deflection
0
100
200
300
400
500
0
10
20
30
40

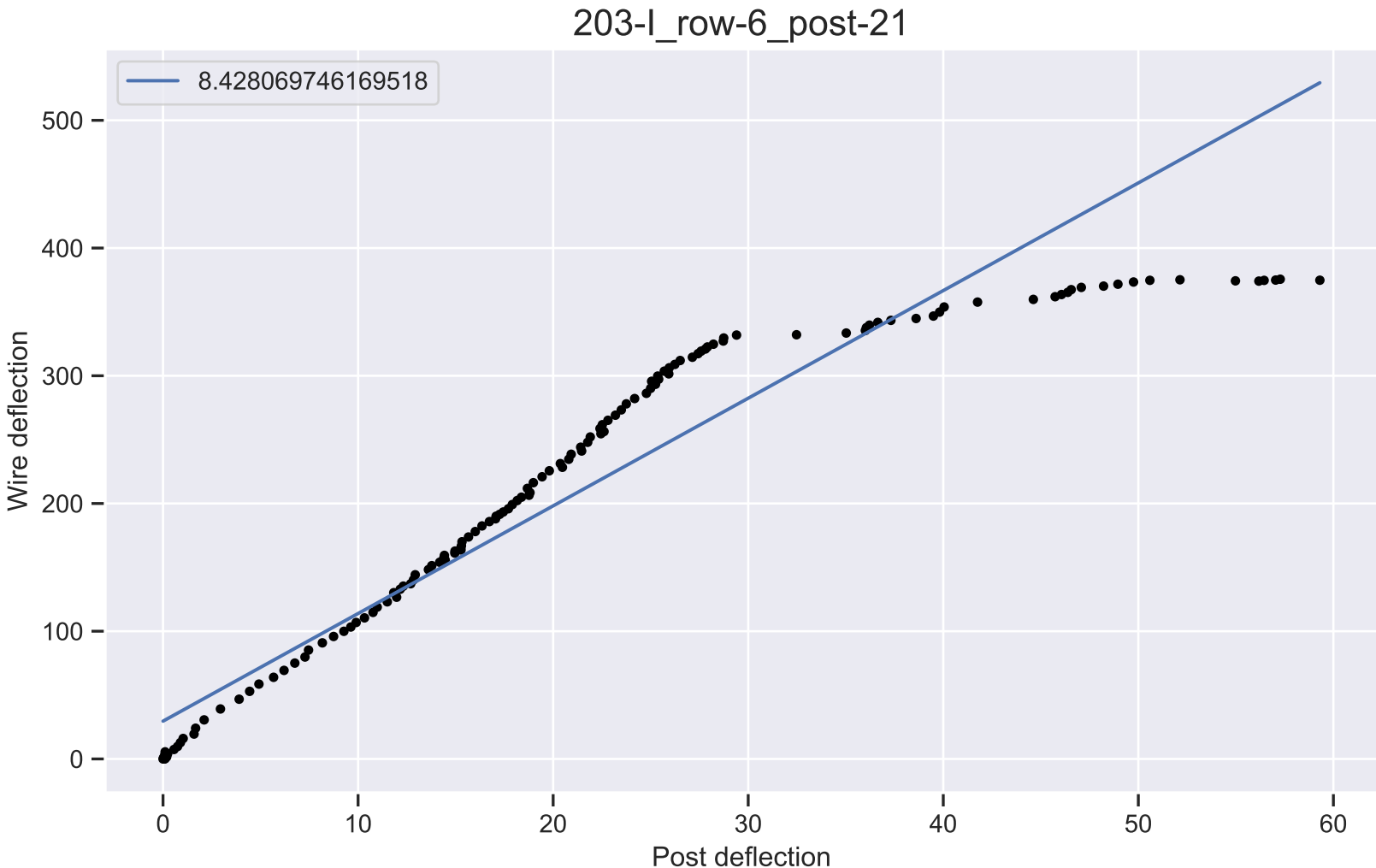

202-I_row-4_post-24
12.565667292207637
Wire deflection
Post deflection
0
100
200
300
400
500
0
10
20
30
40

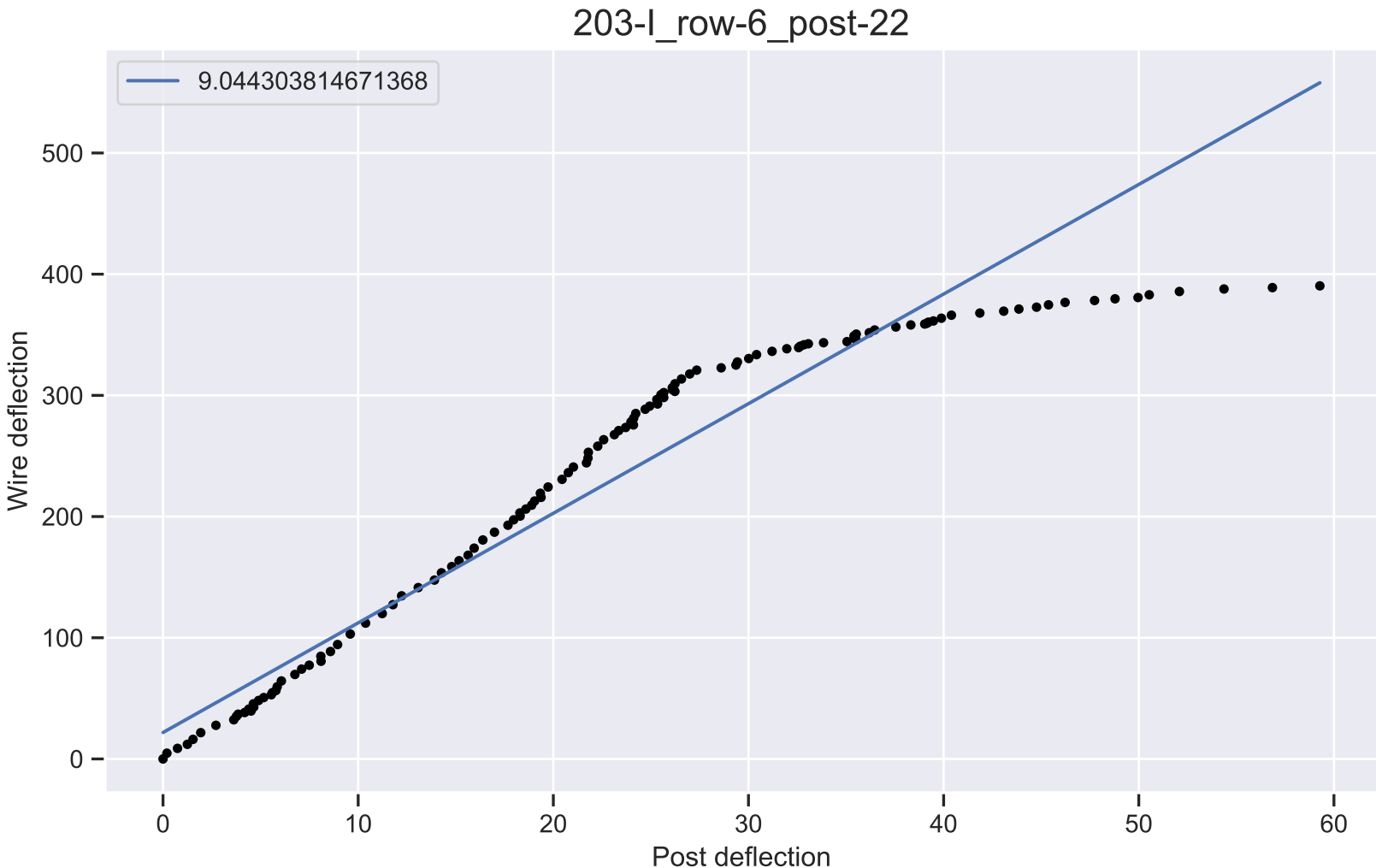

202-I_row-5_post-22
12.657000604834465
600
500
400
300
200
100
0
Wire deflection
0
10
20
30
40
Post deflection

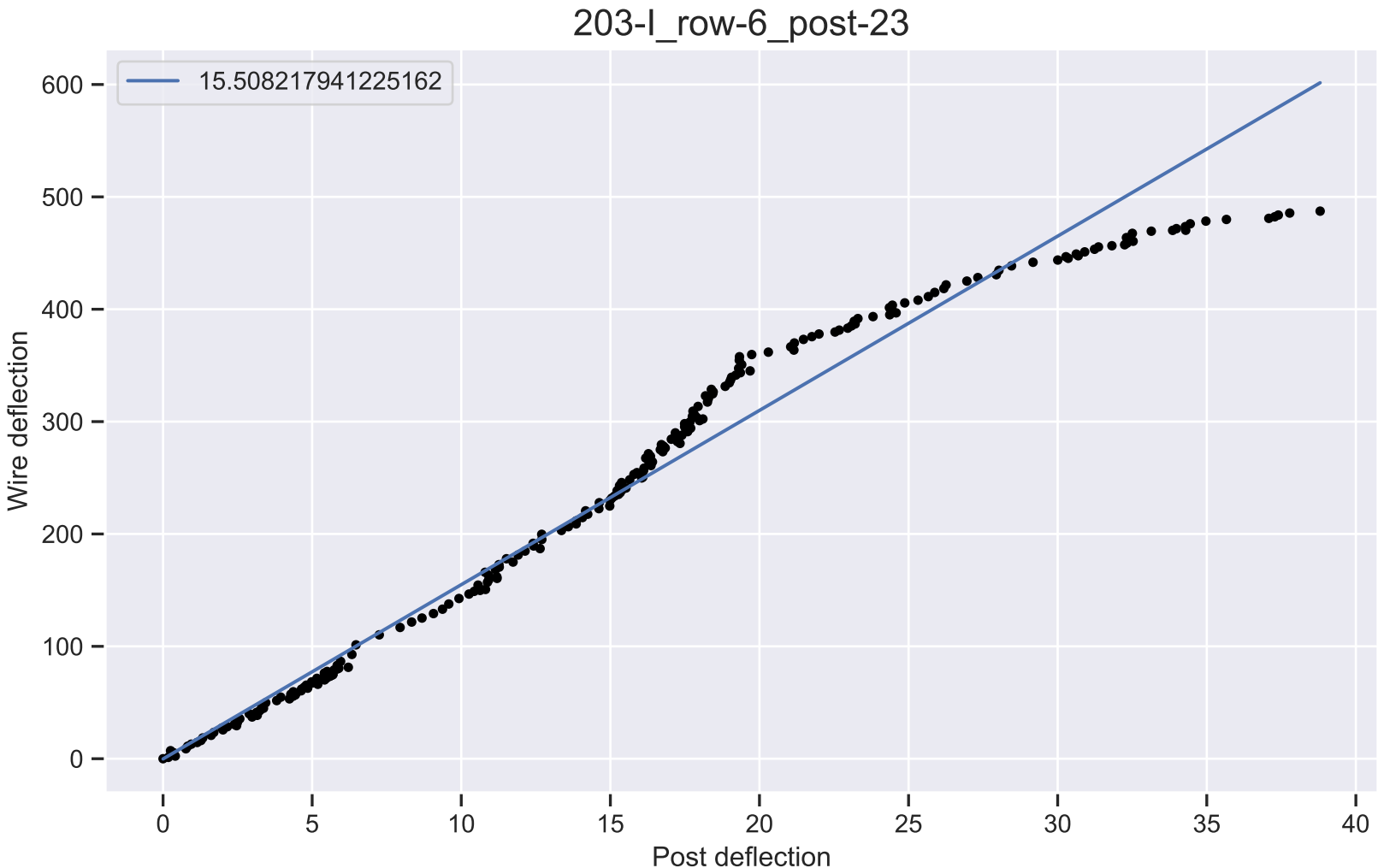

203-I_row-4_post-25
21.844129093467146
Wire deflection
Post deflection
0
100
200
300
400
500
600
700
0
5
10
15
20
25
30

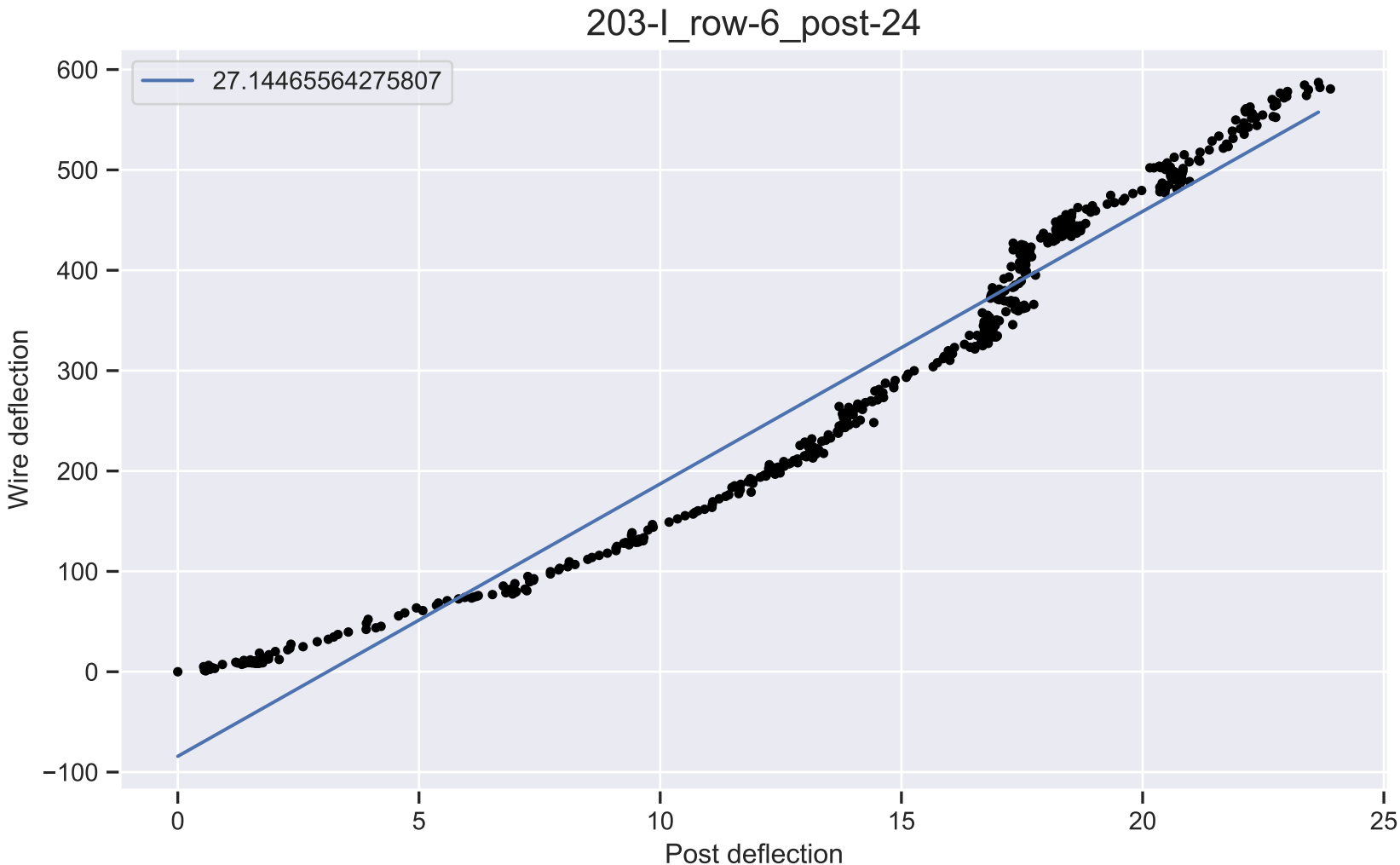

203-I_row-5_post-24
13.203967680300085
600
500
400
300
200
100
0
Wire deflection
0
10
20
30
40
Post deflection

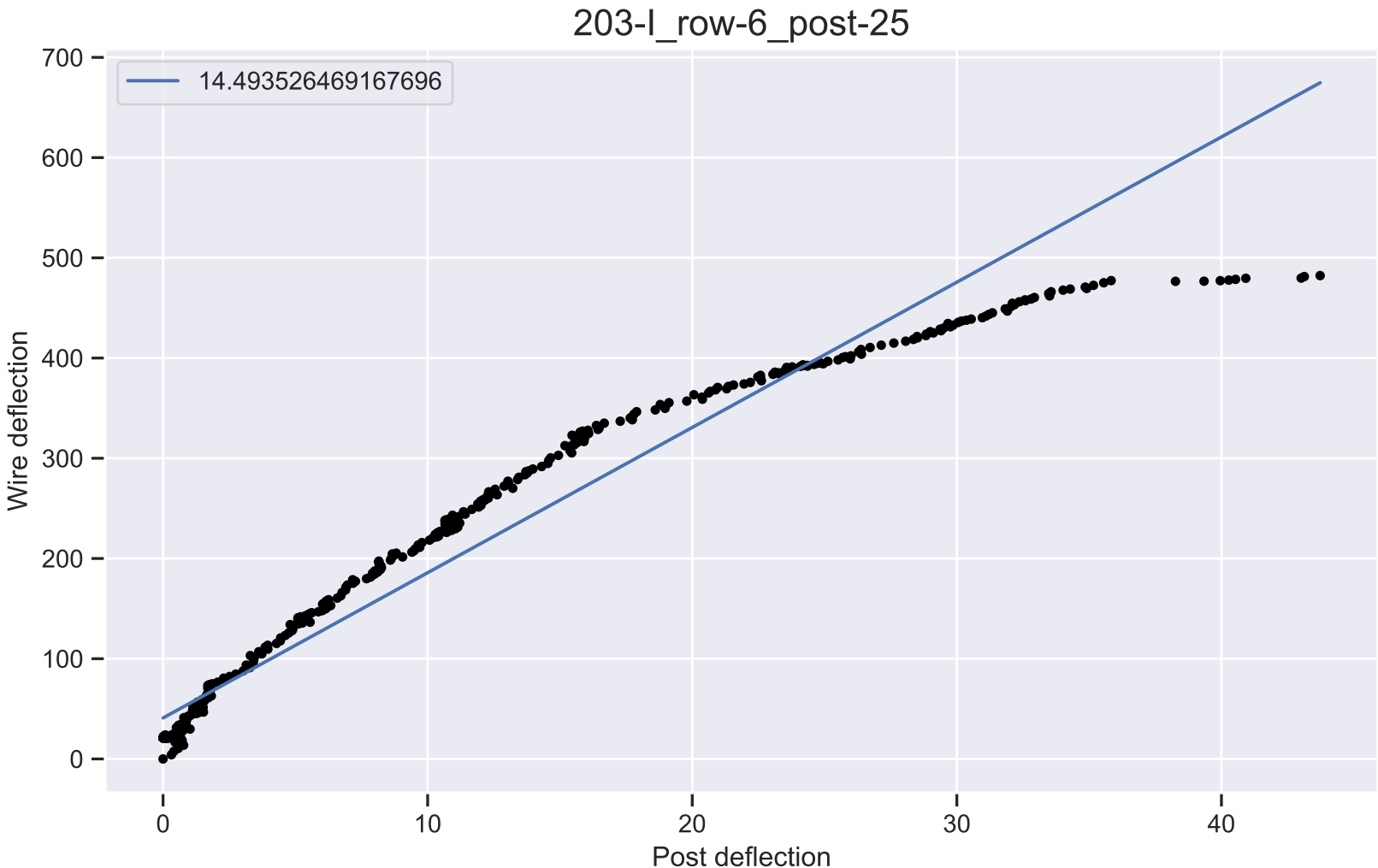

203-I_row-5_post-25
12.209728196344608
Wire deflection
Post deflection
600
500
400
300
200
100
0
0
10
20
30
40
50

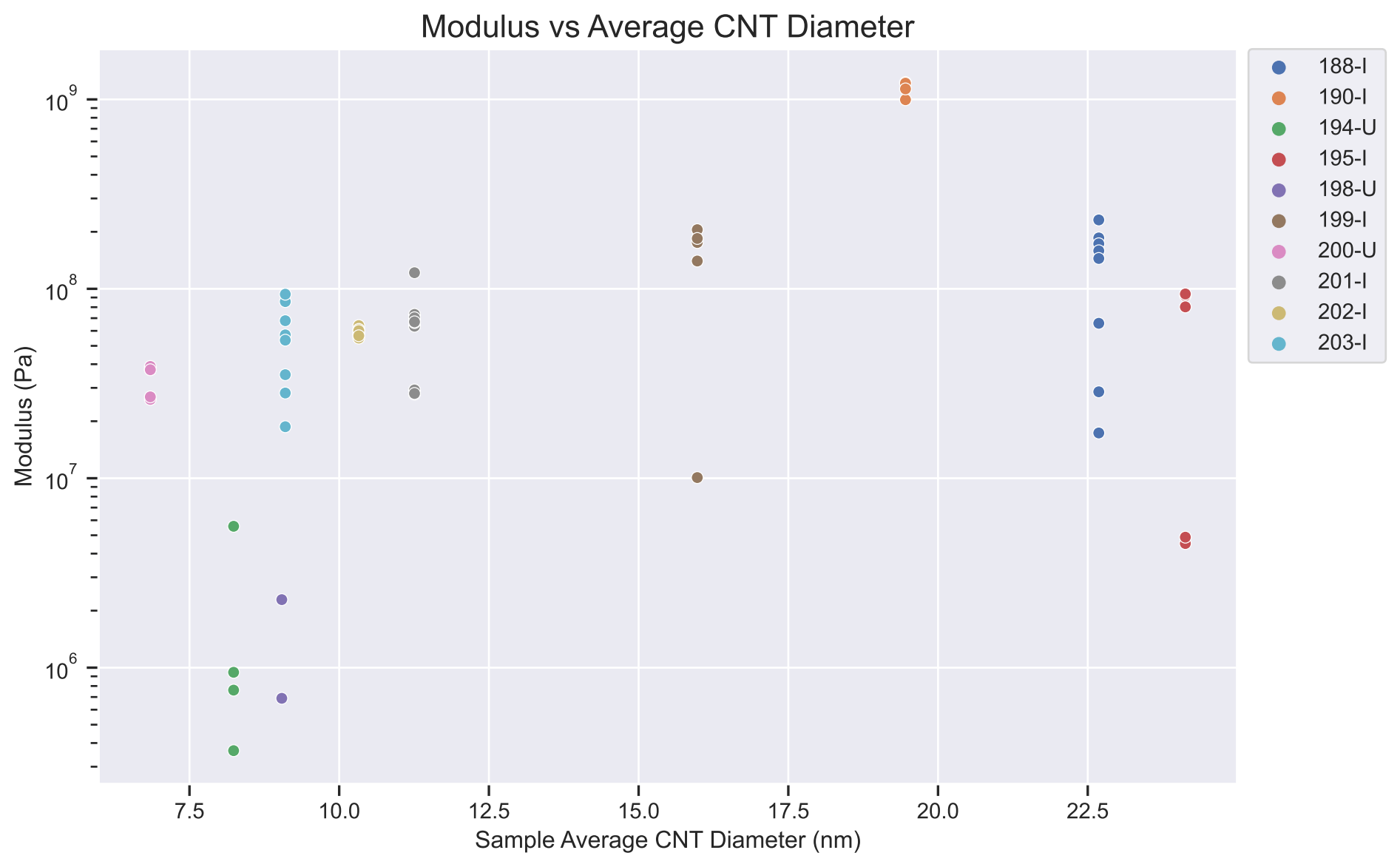

203-I_row-6_post-21
8.428069746169518
Wire deflection
Post deflection
0
100
200
300
400
500
0
10
20
30
40
50
60

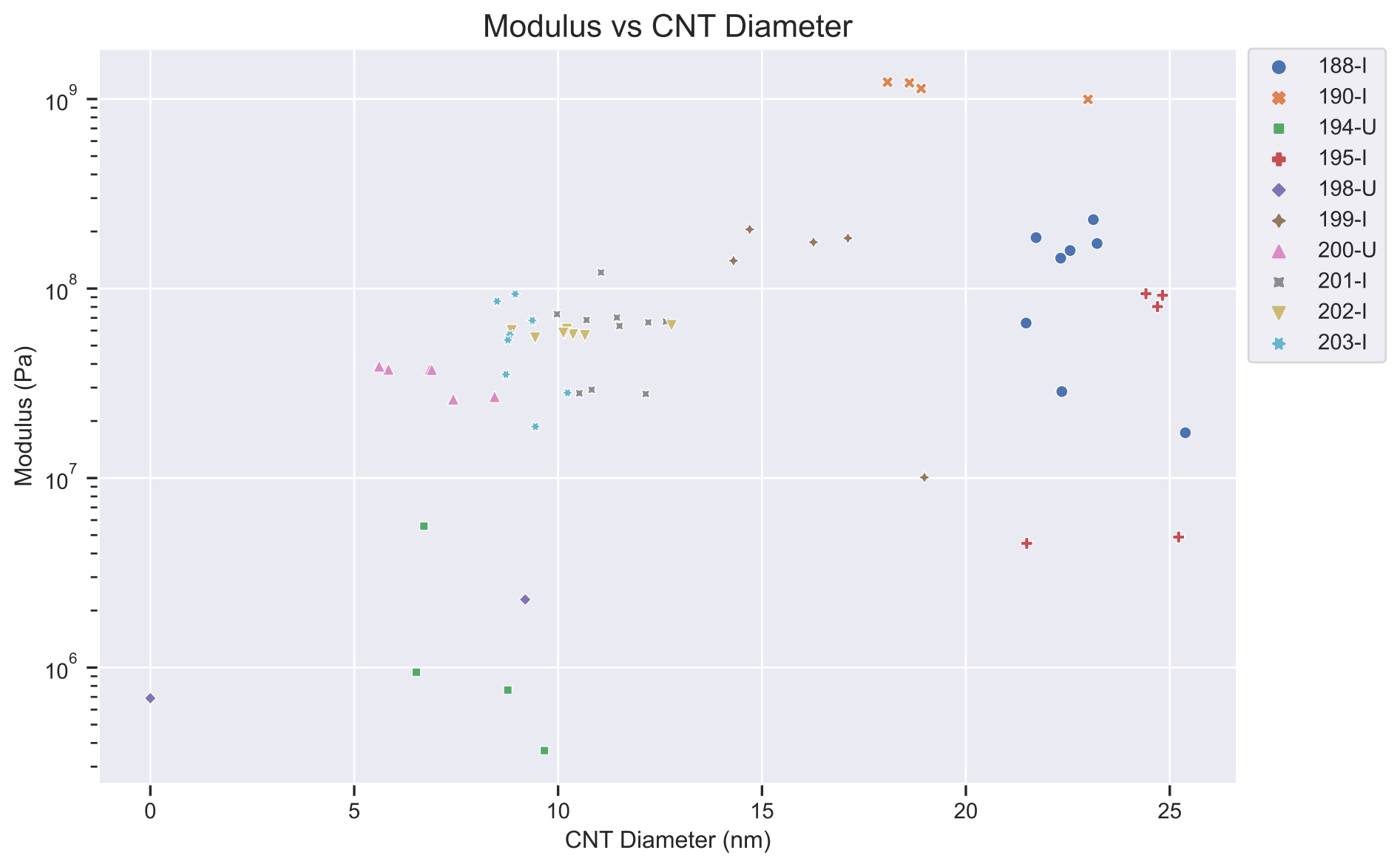

203-I_row-6_post-22
9.044303814671368
Wire deflection
Post deflection
0
100
200
300
400
500
0
10
20
30
40
50
60

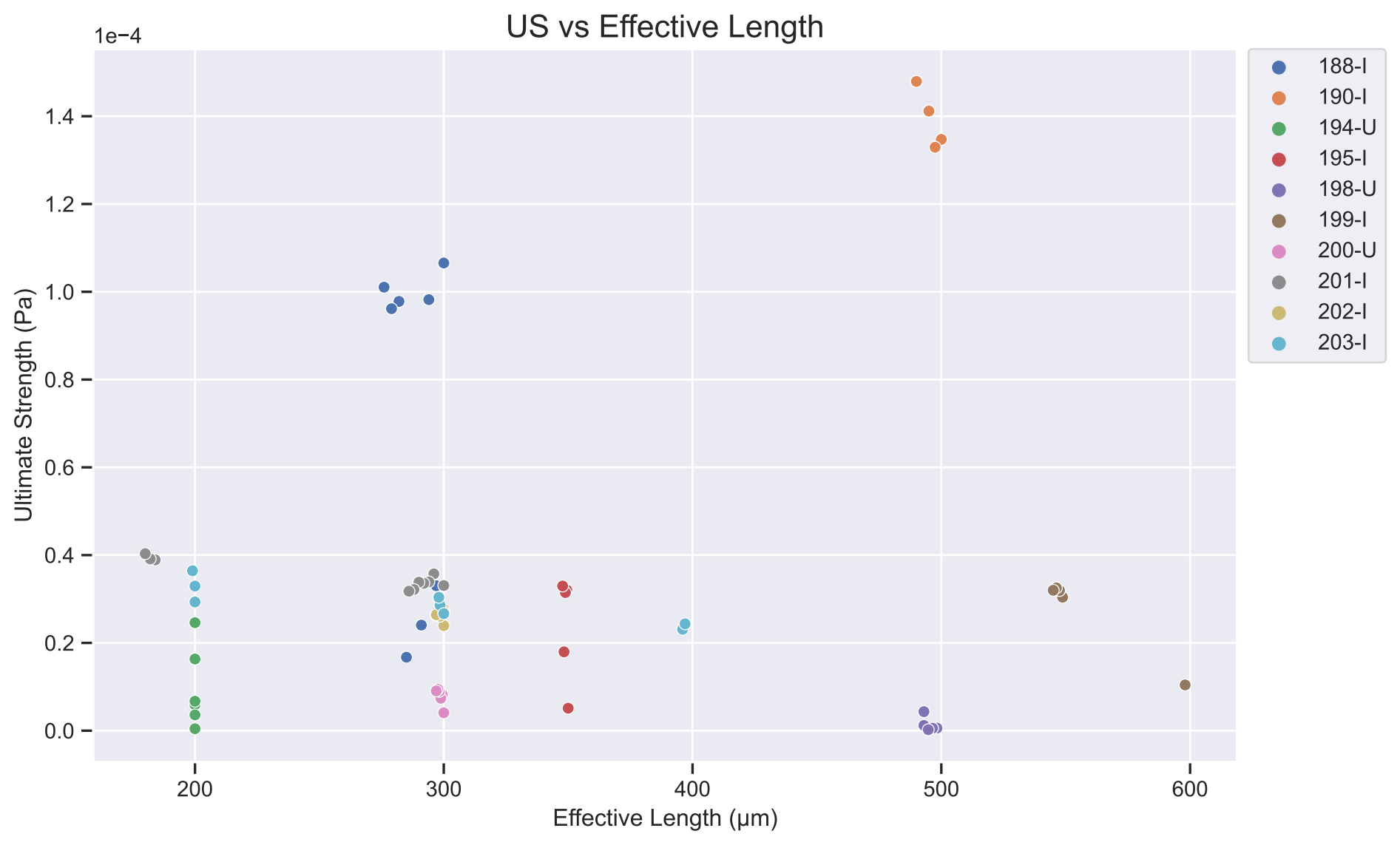

203-I_row-6_post-23
15.508217941225162
Wire deflection
Post deflection
0
100
200
300
400
500
600
0
5
10
15
20
25
30
35
40

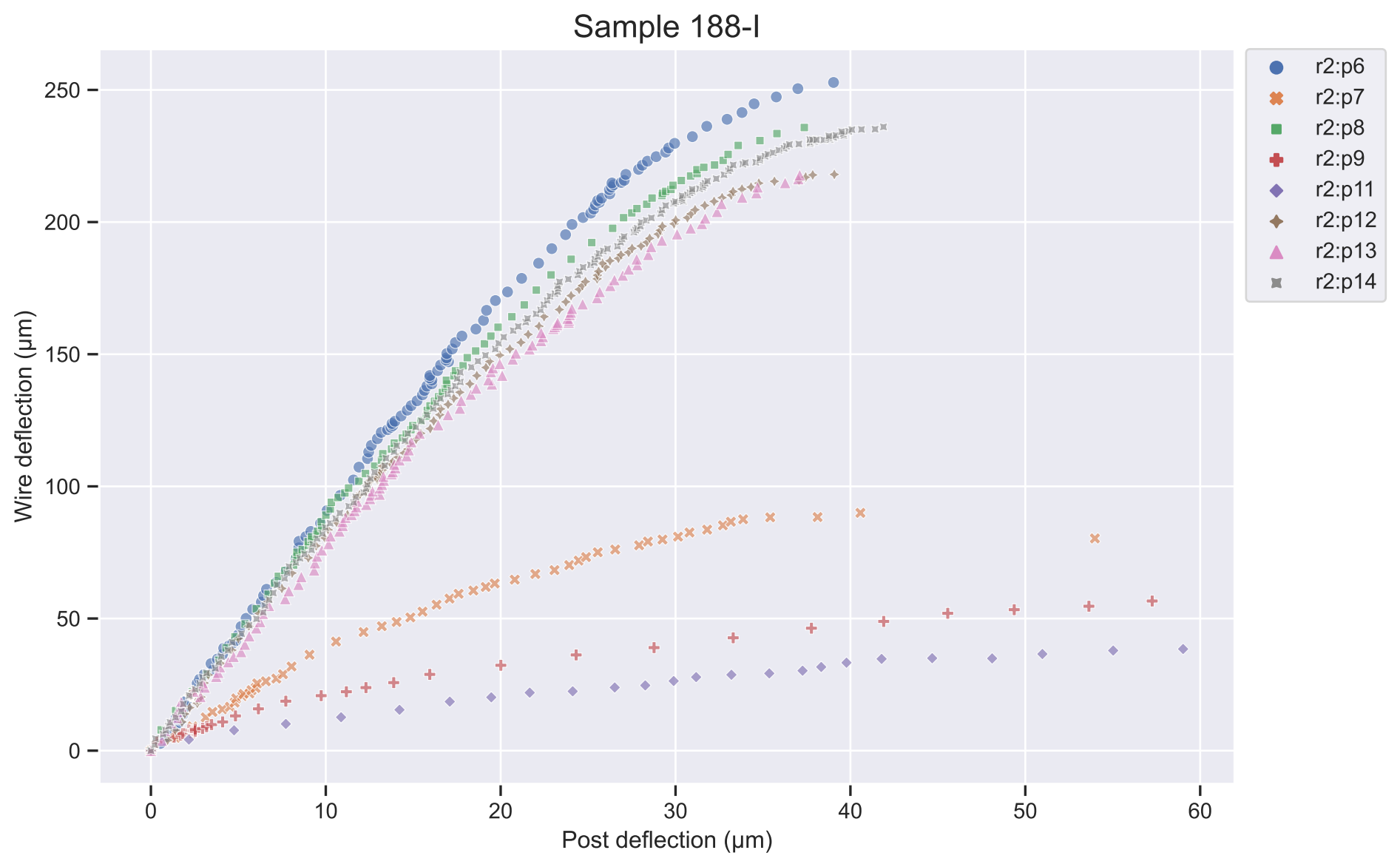

203-I_row-6_post-24
27.14465564275807
600
500
400
300
200
100
0
−100
Wire deflection
0
5
10
15
20
25
Post deflection

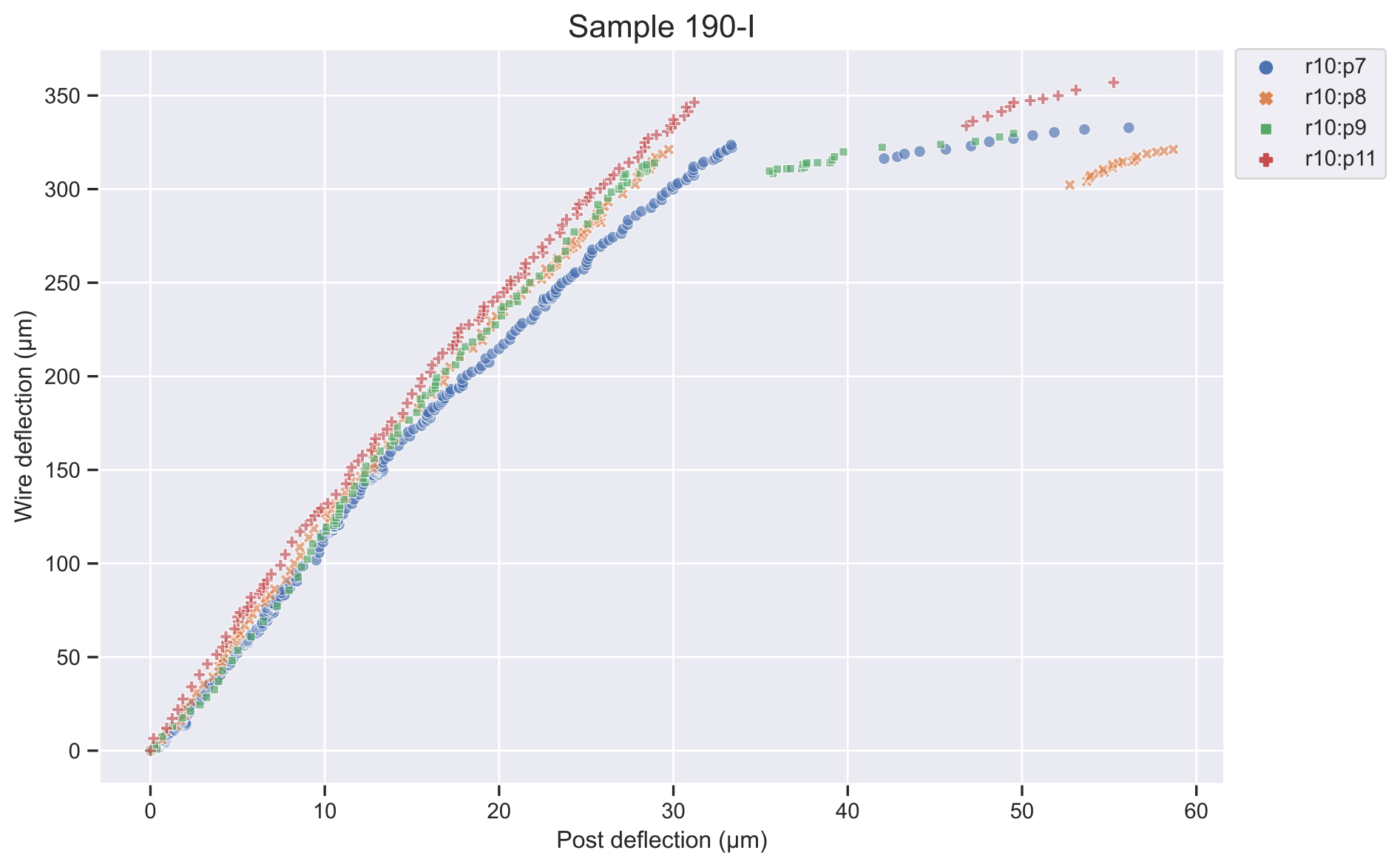

203-I_row-6_post-25
14.493526469167696
Wire deflection
Post deflection
0
100
200
300
400
500
600
700
0
10
20
30
40

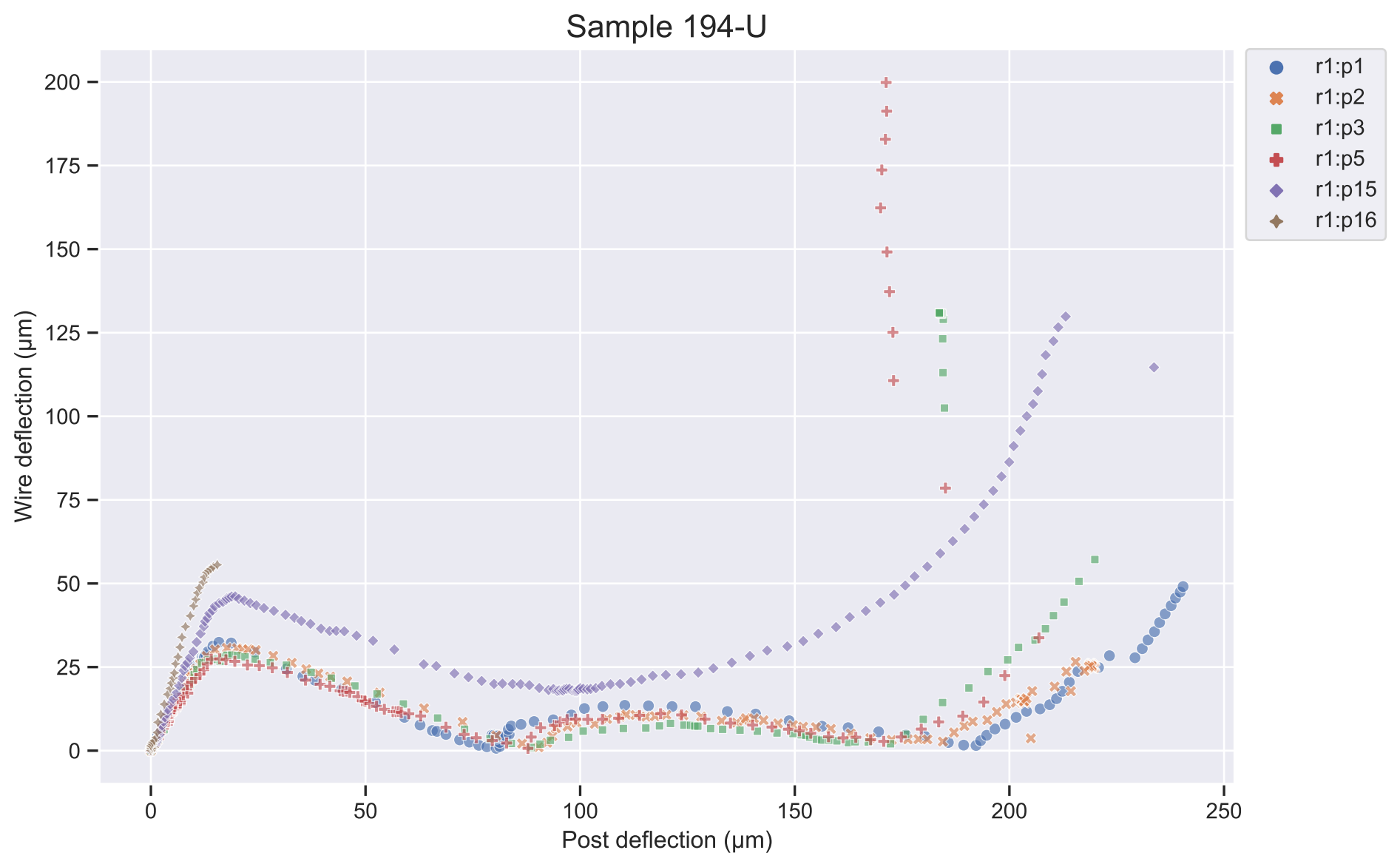

Modulus vs Average CNT Diameter
Modulus (Pa)
10^9
10^8
10^7
10^6
7.5
10.0
12.5
15.0
17.5
20.0
22.5
Sample Average CNT Diameter (nm)
188-I
190-I
194-U
195-I
198-U
199-I
200-U
201-I
202-I
203-I

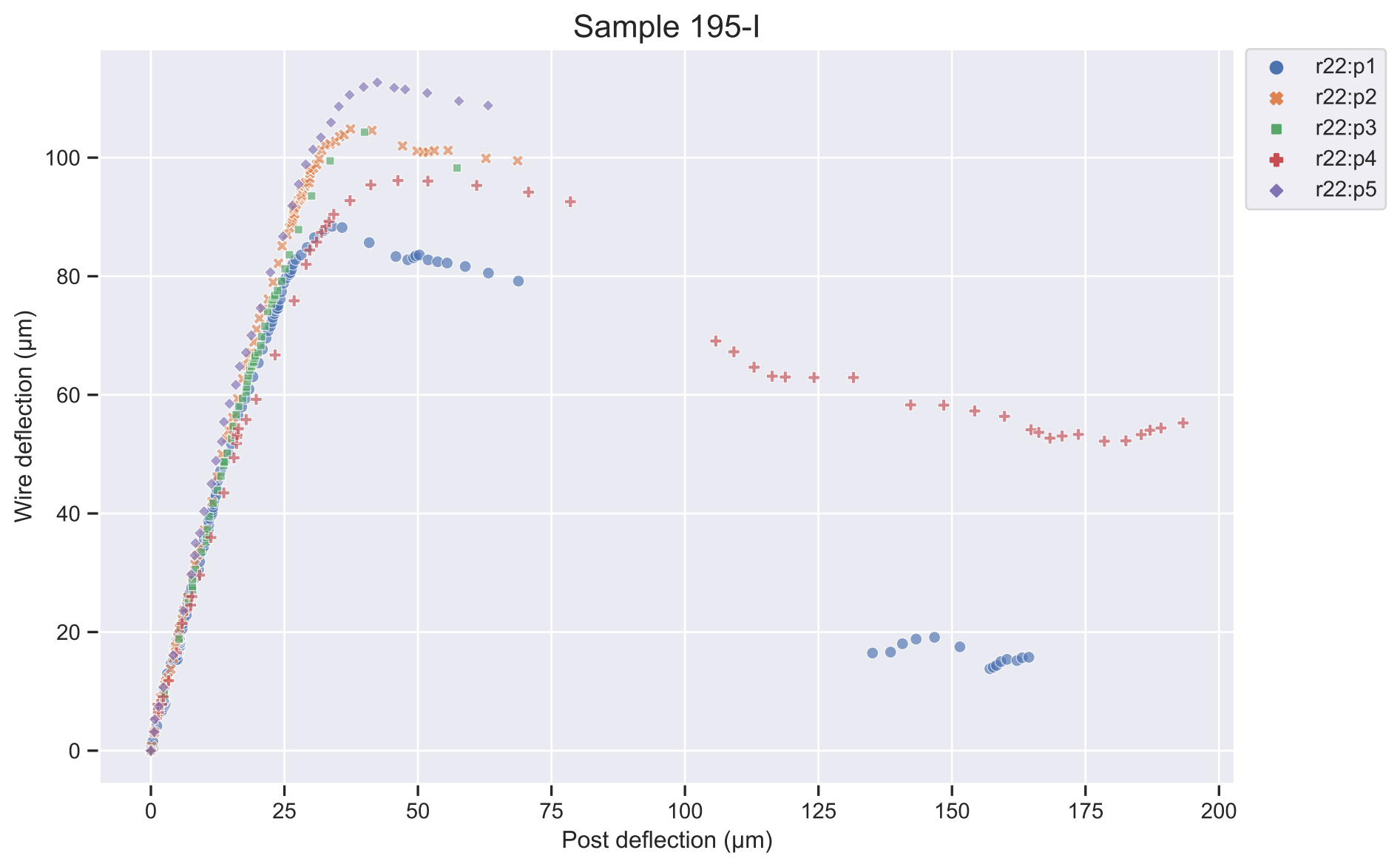

Modulus vs CNT Diameter
Modulus (Pa)
10^9
10^8
10^7
10^6
0
5
10
15
20
25
CNT Diameter (nm)
188-I
190-I
194-U
195-I
198-U
199-I
200-U
201-I
202-I
203-I


US vs Effective Length
1e−4
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Ultimate Strength (Pa)
200
300
400
500
600
Effective Length (μm)
188-I
190-I
194-U
195-I
198-U
199-I
200-U
201-I
202-I
203-I

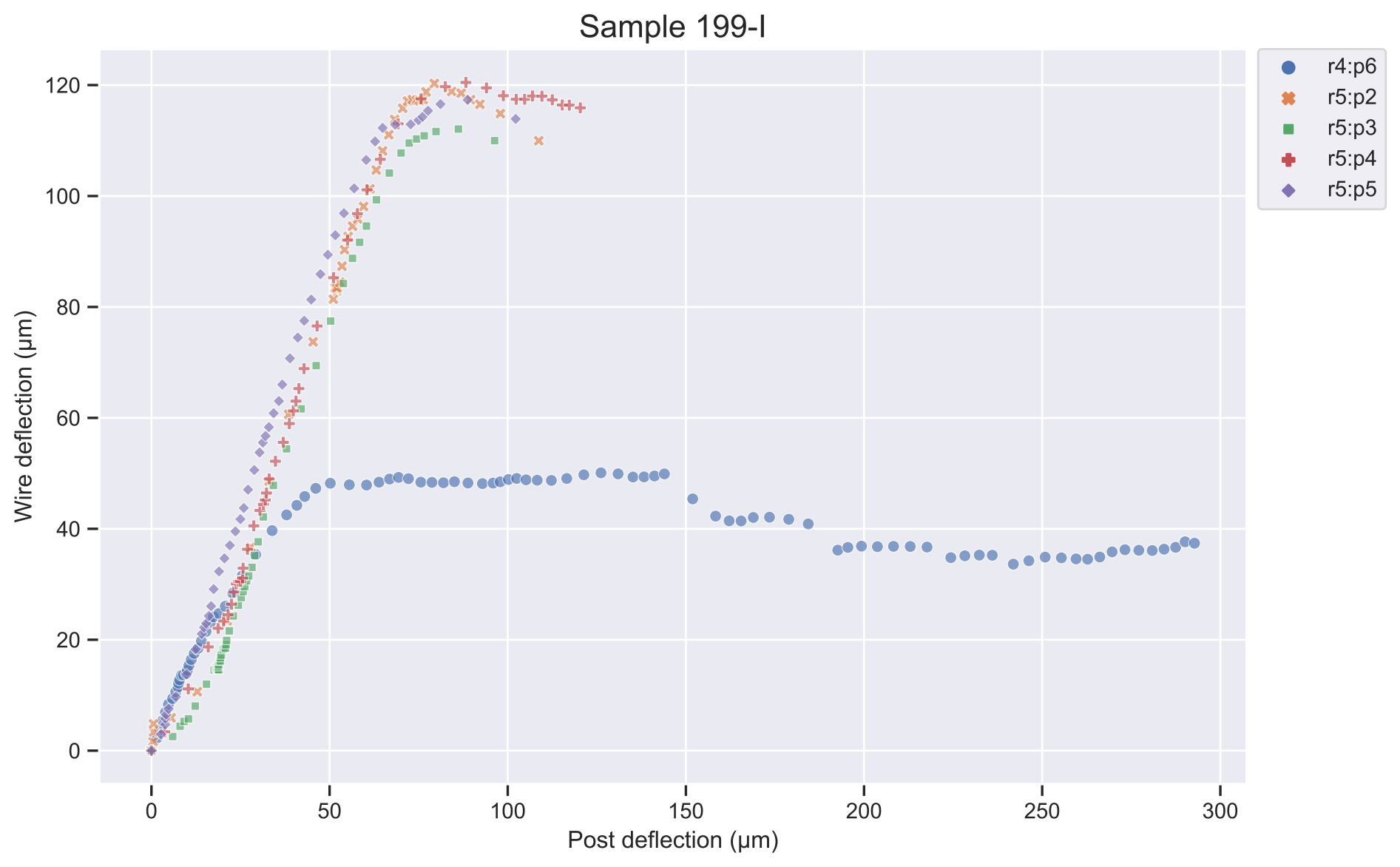

Sample 188-I
Wire deflection (µm)
Post deflection (µm)
0
50
100
150
200
250
0
10
20
30
40
50
60
r2:p6
r2:p7
r2:p8
r2:p9
r2:p11
r2:p12
r2:p13
r2:p14

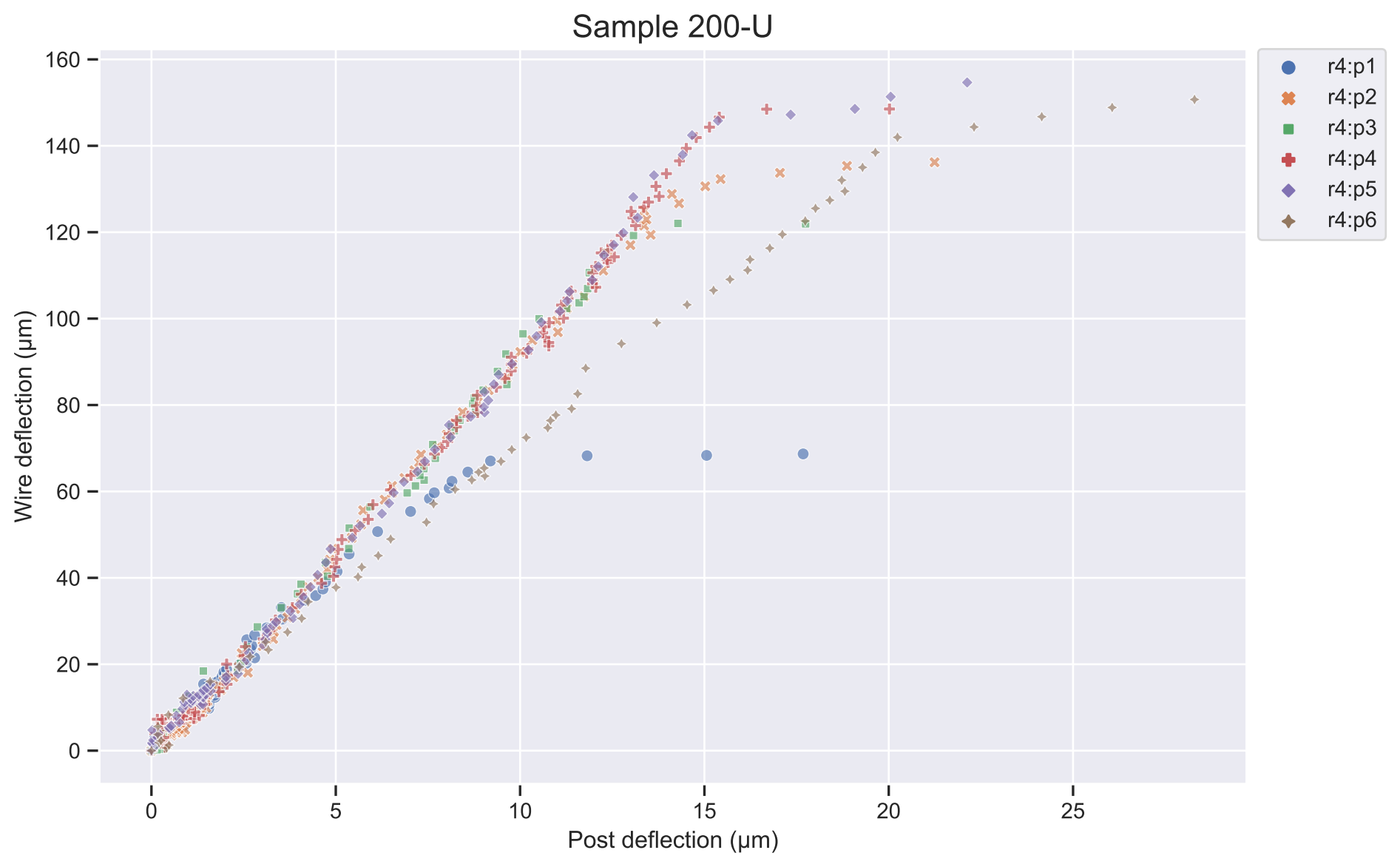

Sample 190-I
r10:p7
r10:p8
r10:p9
r10:p11
Wire deflection (µm)
Post deflection (µm)
0
50
100
150
200
250
300
350
0
10
20
30
40
50
60


Sample 194-U
Wire deflection (µm)
Post deflection (µm)
0
25
50
75
100
125
150
175
200
0
50
100
150
200
250
r1:p1
r1:p2
r1:p3
r1:p5
r1:p15
r1:p16

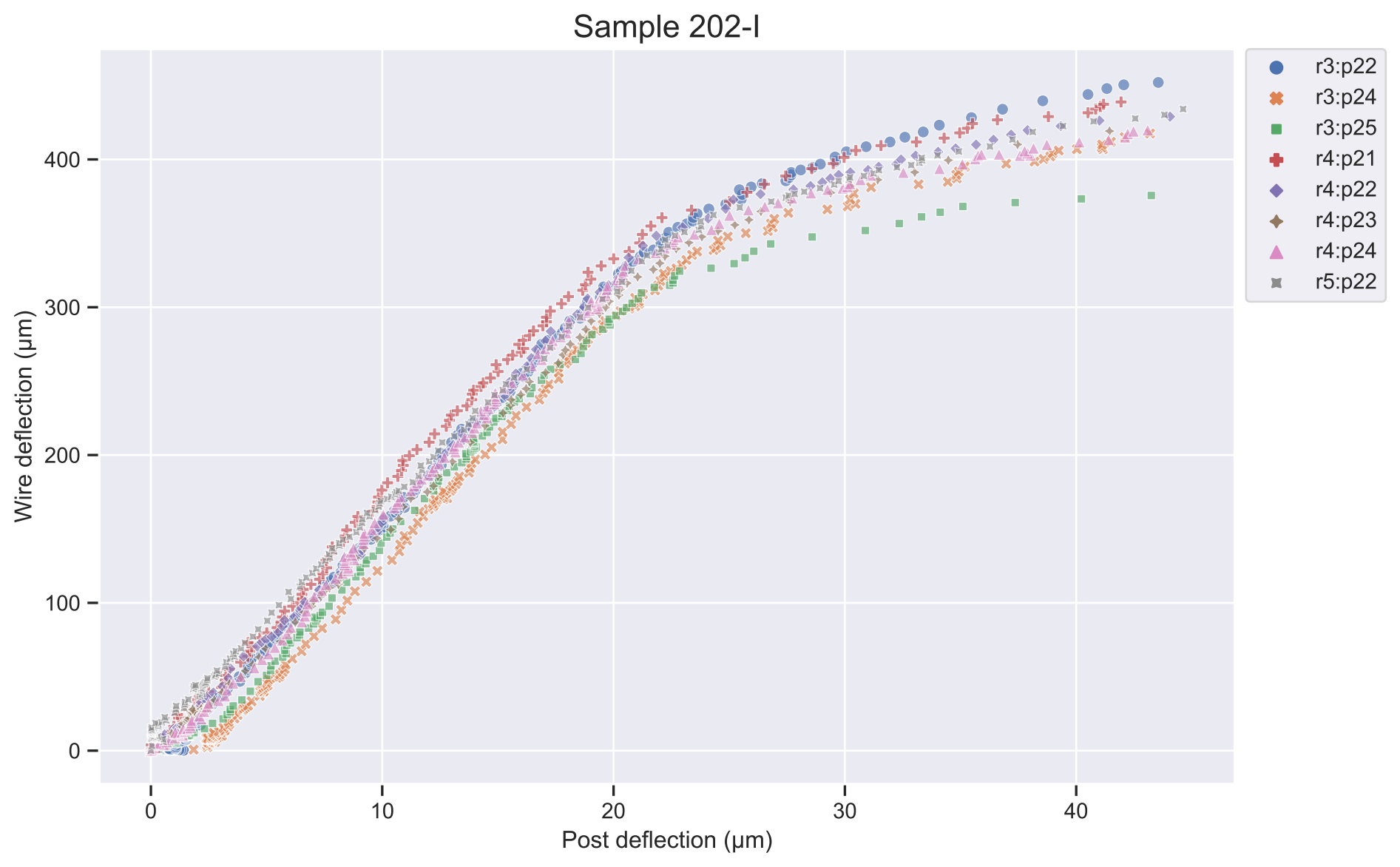

Sample 195-I
r22:p1
r22:p2
r22:p3
r22:p4
r22:p5
Wire deflection (µm)
Post deflection (µm)
0
20
40
60
80
100
0
25
50
75
100
125
150
175
200

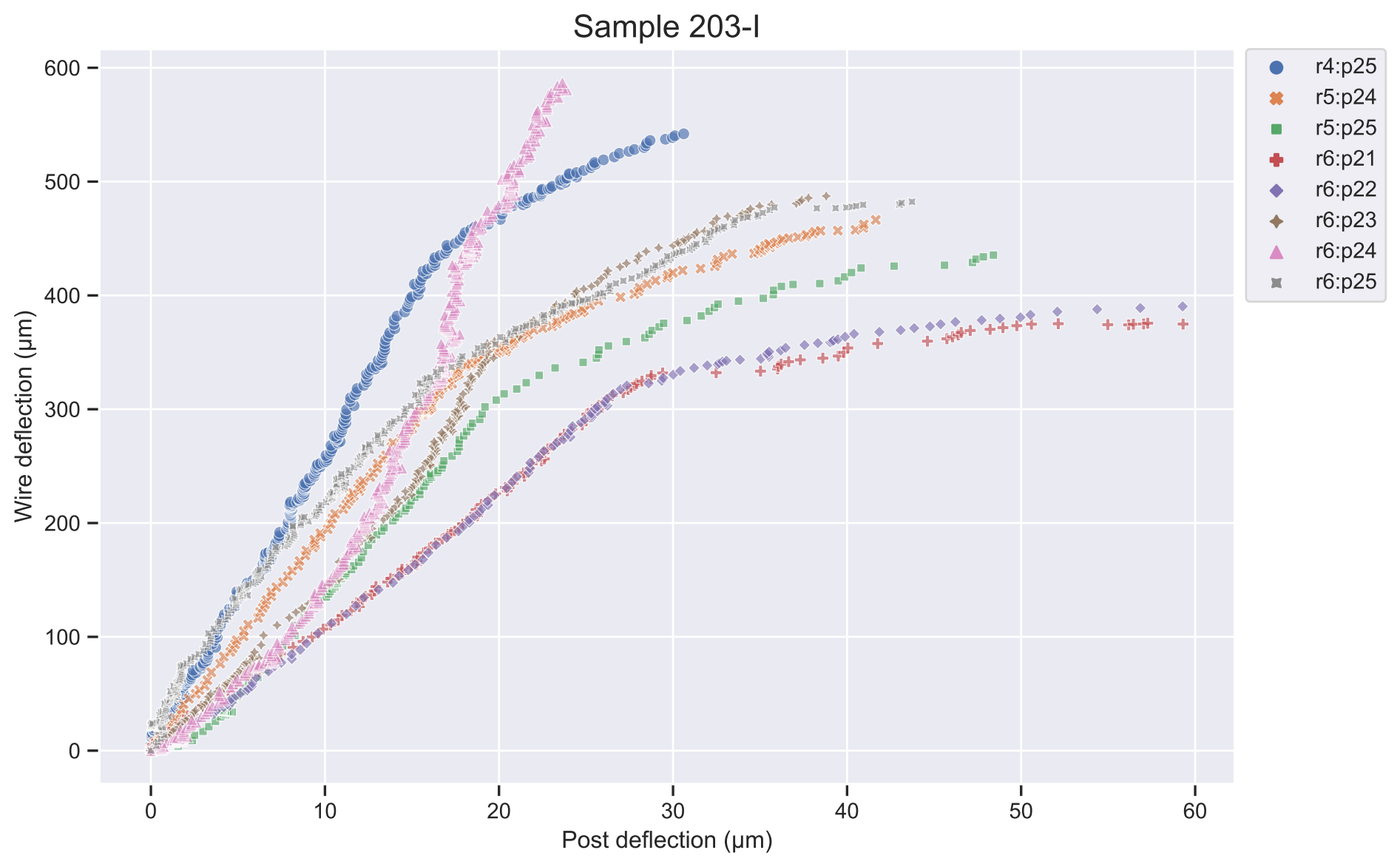
Sample 198-U
r4:p5
r5:p2
r5:p3
r5:p4
r5:p5
Wire deflection (µm)
Post deflection (µm)
0
10
20
30
40
50
60
0
50
100
150
200
250
300
350
400


Sample 199-I
r4:p6
r5:p2
r5:p3
r5:p4
r5:p5
Wire deflection (µm)
Post deflection (µm)
0
20
40
60
80
100
120
0
50
100
150
200
250
300


Sample 200-U
Wire deflection (µm)
Post deflection (µm)
0
20
40
60
80
100
120
140
160
0
5
10
15
20
25
r4:p1
r4:p2
r4:p3
r4:p4
r4:p5
r4:p6

Sample 201-I
Wire deflection (µm)
Post deflection (µm)
0
100
200
300
400
500
600
0
10
20
30
40
r1:p10
r1:p12
r1:p13
r1:p14
r1:p15
r1:p16
r1:p17
r1:p18
r1:p19
r1:p20


Sample 202-I
Wire deflection (µm)
0
100
200
300
400
Post deflection (µm)
0
10
20
30
40
r3:p22
r3:p24
r3:p25
r4:p21
r4:p22
r4:p23
r4:p24
r5:p22


Sample 203-I
Wire deflection (µm)
Post deflection (µm)
0
100
200
300
400
500
600
0
10
20
30
40
50
60
r4:p25
r5:p24
r5:p25
r6:p21
r6:p22
r6:p23
r6:p24
r6:p25