

REPORT NUMBER: CAL-02-18

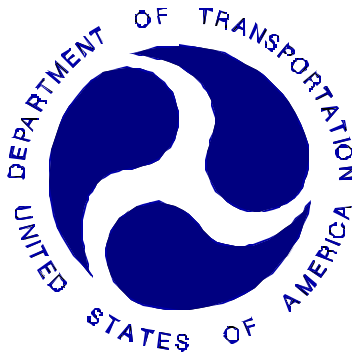
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

GENERAL MOTORS CORP
2003 CADILLAC CTS
4-DOOR SEDAN

NHTSA NUMBER: M30101

VERIDIAN TEST NUMBER: 8642-NCAP-18

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225



May 31, 2002

FINAL REPORT

PREPARED FOR:

U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
Mail Code: NPS-10
400 Seventh Street, SW, Room No. 5313
Washington, DC 20590



NCAP Frontal Barrier Impact Test Data Summary

Vehicle: 2003 Cadillac CTS 4-Door Sedan

NHTSA No: M30101

Test Date: May 31, 2002

Test Speed: 56.65 kph

Vehicle Test Weight

Weight as Delivered: = 1645.0 kg

Weight as Tested: = 1851.0 kg

Injury Criteria:

| ATD Position | HIC | Clip (g's) | Chest Disp (mm) | Left Femur (N) | Right Femur (N) |
|------------------------|------------|-------------------|------------------------|-----------------------|------------------------|
| Driver (150) | 521.8 | 46.3 | 33.1 | 3762.3 | 4906.7 |
| Passenger (245) | 661.3 | 54.8 | 25.1 | 2225.4 | 1777.4 |

DUMMY MAXIMUM AND MINIMUM VALUES

Vehicle Year/Make/Model/Body Style: 2003 Cadillac CTS 4-Door Sedan

NHTSA Test No.: M30101 Test Date: May 31, 2002

| DESCRIPTION | Unit | MAXIMUM VALUE | | | | | | | |
|--------------------------|------|---------------|-------|--------|-------|-----------|-------|--------|-------|
| | | Driver | | | | Passenger | | | |
| | | Pos | msec | Neg | msec | Pos | msec | Neg | msec |
| Head 9 Array X Arm Y | g | 5.0 | 144.4 | -6.6 | 72.7 | 6.2 | 63.6 | -21.9 | 54.0 |
| Head 9 Array X Arm Z | g | 25.1 | 46.5 | -8.7 | 128.5 | 30.1 | 62.7 | -7.5 | 154.7 |
| Head 9 Array Y Arm X | g | 8.9 | 260.7 | -57.1 | 77.2 | 14.7 | 260.4 | -60.9 | 82.0 |
| Head 9 Array Y Arm Z | g | 23.2 | 67.1 | -6.7 | 91.2 | 24.9 | 75.5 | -11.0 | 99.4 |
| Head 9 Array Z Arm X | g | 11.2 | 239.6 | -65.0 | 77.6 | 26.4 | 254.7 | -70.7 | 81.6 |
| Head 9 Array Z Arm Y | g | 9.0 | 127.4 | -9.0 | 72.9 | 8.4 | 64.4 | -23.8 | 84.2 |
| Head X | g | 8.8 | 293.0 | -58.0 | 77.5 | 15.0 | 260.5 | -61.1 | 81.9 |
| Head Y | g | 6.0 | 124.7 | -6.8 | 72.3 | 4.4 | 59.4 | -19.4 | 84.8 |
| Head Z | g | 21.3 | 67.0 | -7.6 | 91.4 | 26.7 | 74.1 | -8.1 | 99.3 |
| Head Resultant | g | 59.2 | 75.4 | 0.0 | -8.6 | 65.4 | 81.4 | 0.0 | -26.6 |
| Redundant Head X | g | 8.8 | 292.1 | -58.5 | 77.9 | 15.1 | 259.4 | -60.9 | 81.6 |
| Redundant Head Y | g | 5.9 | 124.1 | -7.9 | 71.9 | 3.9 | 60.2 | -18.7 | 88.1 |
| Redundant Head Z | g | 21.4 | 67.0 | -7.3 | 90.8 | 26.4 | 75.2 | -8.8 | 98.7 |
| Redundant Head Resultant | g | 59.7 | 76.2 | 0.0 | -10.4 | 65.1 | 80.5 | 0.0 | -26.3 |
| Upper Neck Fx | N | 1083.6 | 77.4 | -542.7 | 138.0 | 645.6 | 75.0 | -421.4 | 145.2 |
| Upper Neck Fy | N | 174.8 | 121.5 | -75.9 | 86.5 | 256.0 | 72.0 | -114.3 | 132.1 |
| Upper Neck Fz | N | 1266.8 | 66.5 | -159.2 | 91.7 | 1184.5 | 74.0 | -395.1 | 99.5 |
| Upper Neck F Resultant | N | 1589.6 | 66.5 | 1.2 | -27.6 | 1359.9 | 74.1 | 1.8 | -9.9 |
| Upper Neck Mx | N-m | 17.3 | 129.9 | -10.7 | 98.9 | 7.9 | 103.9 | -25.8 | 57.6 |
| Upper Neck My | N-m | 76.9 | 65.2 | -18.9 | 107.8 | 38.8 | 153.5 | -19.1 | 104.7 |
| Upper Neck Mz | N-m | 9.3 | 153.2 | -11.9 | 115.4 | 9.8 | 94.6 | -8.0 | 150.4 |
| Upper Neck M Resultant | N-m | 77.1 | 65.2 | 0.0 | -19.7 | 39.9 | 153.4 | 0.0 | -5.1 |
| Chest X | g | 3.0 | 137.2 | -45.1 | 72.0 | 4.1 | 299.9 | -51.9 | 70.5 |
| Chest Y | g | 9.3 | 70.7 | -3.4 | 45.1 | 1.5 | 48.2 | -11.1 | 70.9 |
| Chest Z | g | 10.9 | 66.9 | -3.3 | 102.7 | 20.5 | 75.7 | -5.4 | 114.0 |
| Chest Resultant | g | 46.7 | 71.9 | 0.0 | -8.5 | 55.0 | 72.0 | 0.0 | -7.8 |

DUMMY MAXIMUM AND MINIMUM VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2003 Cadillac CTS 4-Door Sedan

NHTSA Test No.: M30101 Test Date: May 31, 2002

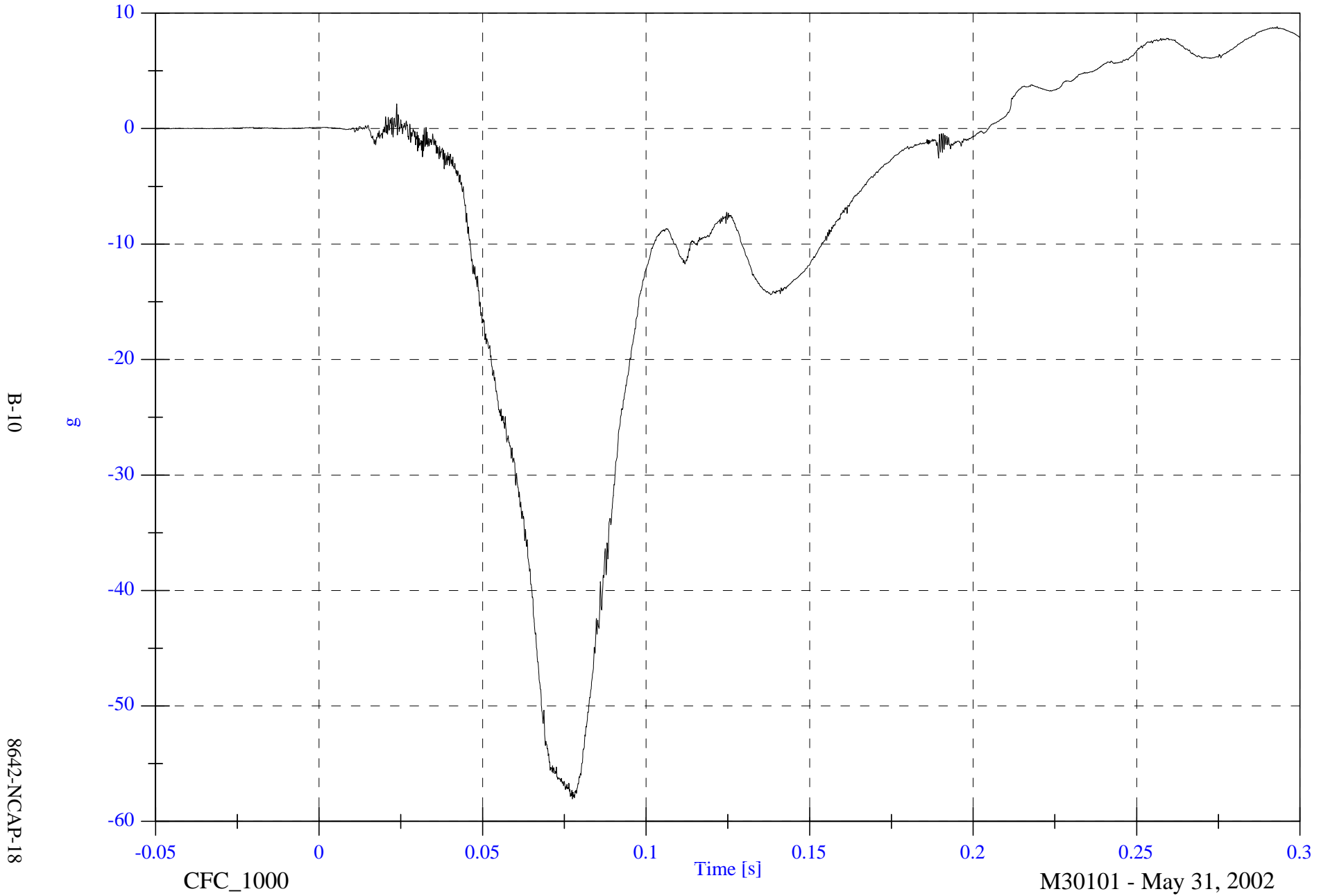
| DESCRIPTION | Unit | MAXIMUM VALUE | | | | | | | |
|---------------------------|------|---------------|-------|---------|-------|-----------|-------|---------|-------|
| | | Driver | | | | Passenger | | | |
| | | Pos | msec | Neg | msec | Pos | msec | Neg | msec |
| Redundant Chest X | g | 2.9 | 255.5 | -45.6 | 72.3 | 3.9 | 299.9 | -53.6 | 70.4 |
| Redundant Chest Y | g | 9.4 | 70.8 | -3.6 | 45.4 | 1.9 | 47.8 | -11.2 | 70.9 |
| Redundant Chest Z | g | 11.0 | 68.2 | -3.5 | 102.6 | 20.7 | 75.7 | -5.5 | 111.4 |
| Redundant Chest Resultant | g | 47.1 | 72.2 | 0.0 | -25.7 | 56.3 | 70.7 | 0.0 | -26.3 |
| Chest Displacement | mm | 0.0 | 2.6 | -33.1 | 86.4 | 0.0 | 6.8 | -25.1 | 72.9 |
| Pelvic X | g | 4.7 | 209.3 | -59.8 | 48.8 | 4.3 | 113.1 | -52.0 | 67.2 |
| Pelvic Y | g | 9.0 | 64.3 | -6.3 | 47.8 | 4.2 | 36.8 | -6.9 | 59.0 |
| Pelvic Z | g | 4.1 | 226.4 | -25.4 | 68.3 | 3.2 | 228.9 | -27.6 | 70.0 |
| Pelvic Resultant | g | 61.4 | 48.9 | 0.0 | -48.4 | 57.0 | 67.9 | 0.0 | -45.4 |
| Left Femur | N | 399.2 | 29.4 | -3762.3 | 49.5 | 341.9 | 23.6 | -2225.4 | 65.8 |
| Right Femur | N | 412.4 | 15.5 | -4906.7 | 49.2 | 548.5 | 30.5 | -1777.4 | 71.1 |
| Left Upper Tibia Mx | N-m | 19.8 | 123.7 | -39.5 | 83.6 | 76.3 | 65.0 | -11.1 | 165.3 |
| Left Upper Tibia My | N-m | 38.2 | 48.0 | -62.7 | 40.2 | 41.3 | 37.1 | -73.6 | 61.3 |
| Left Lower Tibia Fz | N | 151.5 | 119.8 | -1853.9 | 42.9 | 260.3 | 32.1 | -2099.2 | 75.2 |
| Left Lower Tibia Mx | N-m | 57.2 | 62.0 | -20.2 | 46.9 | 19.3 | 77.3 | -5.0 | 53.4 |
| Left Lower Tibia My | N-m | 35.6 | 50.9 | -50.8 | 40.8 | 26.2 | 52.5 | -30.4 | 46.6 |
| Right Upper Tibia Mx | N-m | 48.2 | 42.3 | -12.6 | 121.3 | 17.1 | 151.6 | -40.5 | 46.7 |
| Right Upper Tibia My | N-m | 41.5 | 106.8 | -78.0 | 61.5 | 25.0 | 32.9 | -82.4 | 72.3 |
| Right Lower Tibia Fz | N | 100.4 | 124.1 | -3991.0 | 48.0 | 137.1 | 32.8 | -2214.1 | 73.4 |
| Right Lower Tibia Mx | N-m | 13.9 | 41.6 | -66.4 | 56.8 | 65.4 | 71.6 | -21.1 | 46.2 |
| Right Lower Tibia My | N-m | 93.9 | 48.5 | -33.2 | 37.2 | 13.0 | 86.3 | -115.4 | 40.9 |
| Left Foot Aft Ax | g | 40.8 | 52.0 | -96.5 | 41.9 | 22.2 | 50.8 | -88.1 | 40.2 |
| Left Foot Aft Az | g | 13.5 | 50.9 | -55.6 | 44.2 | 12.6 | 34.7 | -45.3 | 51.2 |
| Left Foot Fore Az | g | 73.1 | 51.0 | -142.2 | 42.0 | 63.8 | 34.6 | -121.7 | 44.5 |
| Right Foot Aft Ax | g | 51.2 | 48.3 | -77.3 | 34.1 | 9.2 | 85.5 | -76.2 | 47.0 |
| Right Foot Aft Az | g | 10.9 | 240.9 | -91.5 | 39.4 | 20.2 | 37.5 | -41.4 | 50.6 |
| Right Foot Fore Az | g | 41.5 | 43.5 | -168.4 | 36.8 | 74.2 | 34.4 | -93.8 | 48.2 |

2002 NCAP Test 18 2003 Cadillac CTS

Max: 8.8 [g] at 0.293 [s]

Min: -58.0 [g] at 0.078 [s]

P1 Head CG x

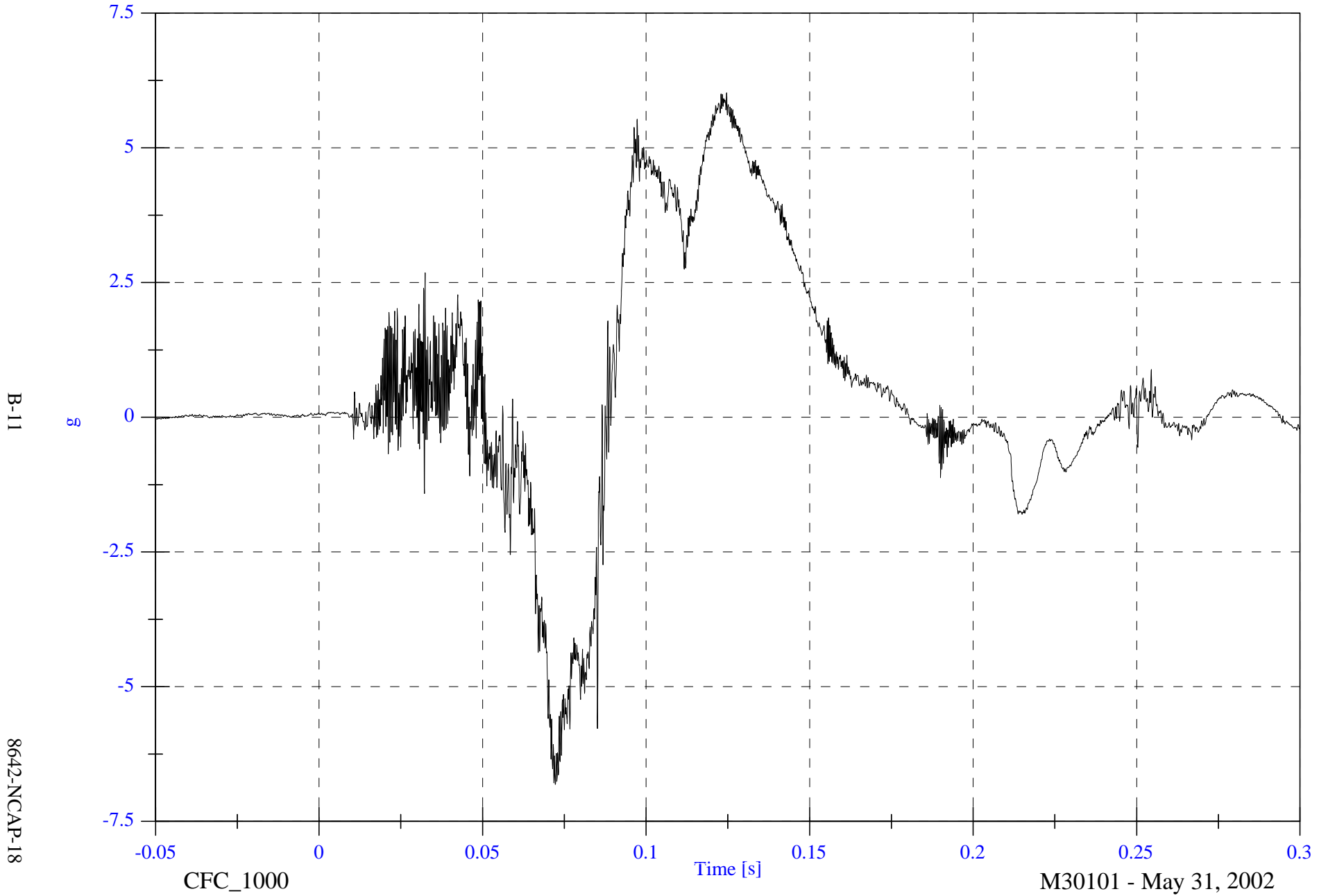


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Max: 6.0 [g] at 0.125 [s]

Min: -6.8 [g] at 0.072 [s]

P1 Head CG y



B-11

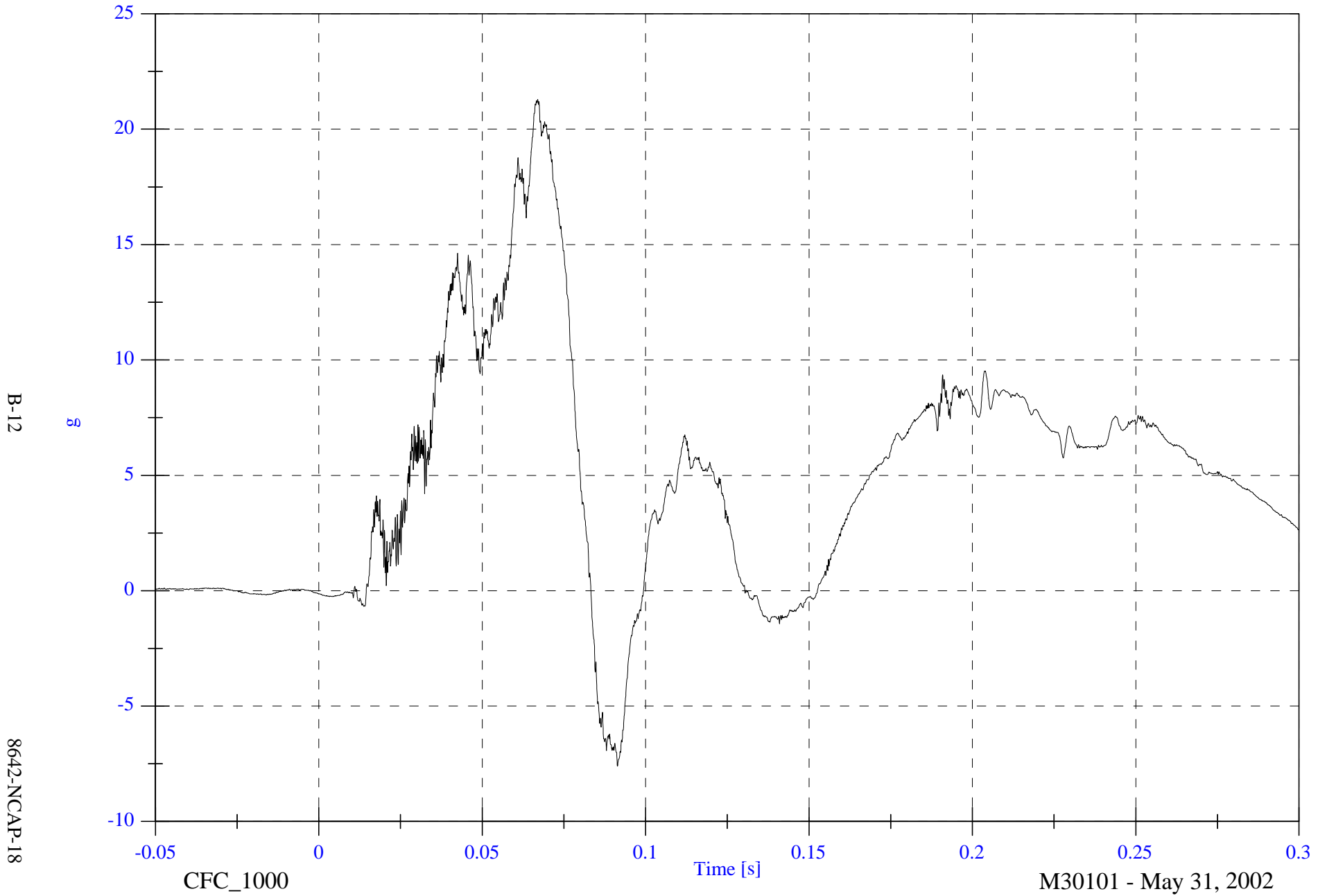
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2002 NCAP Test 18 2003 Cadillac CTS

Max: 21.3 [g] at 0.067 [s]

Min: -7.6 [g] at 0.091 [s]

P1 Head CG z



2002 NCAP Test 18 2003 Cadillac CTS

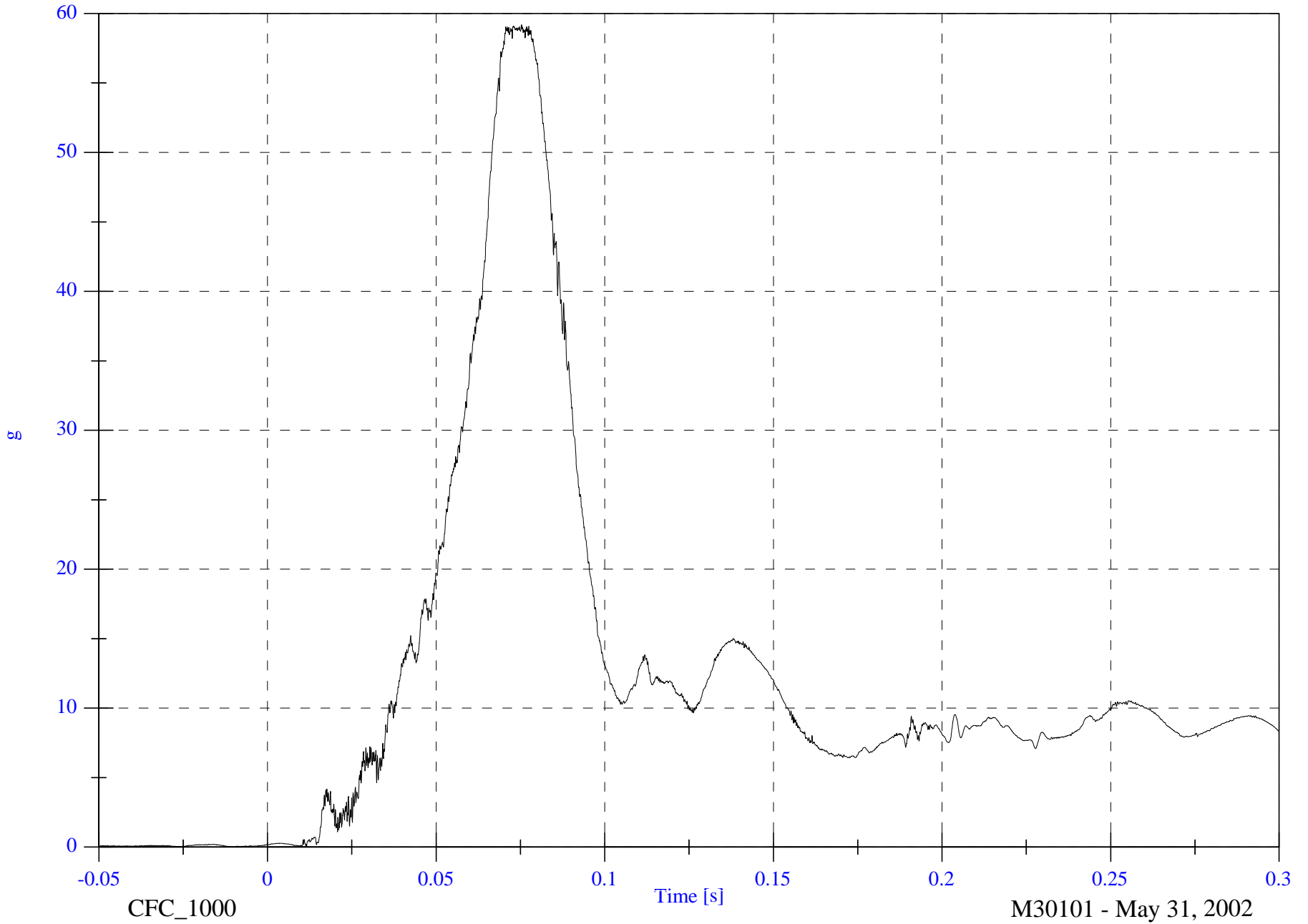
P1 Head CG Resultant

Max: 59.2 [g] at 0.075 [s]

Min: 0.0 [g] at -0.009 [s]

B-13

8642-NCAP-18

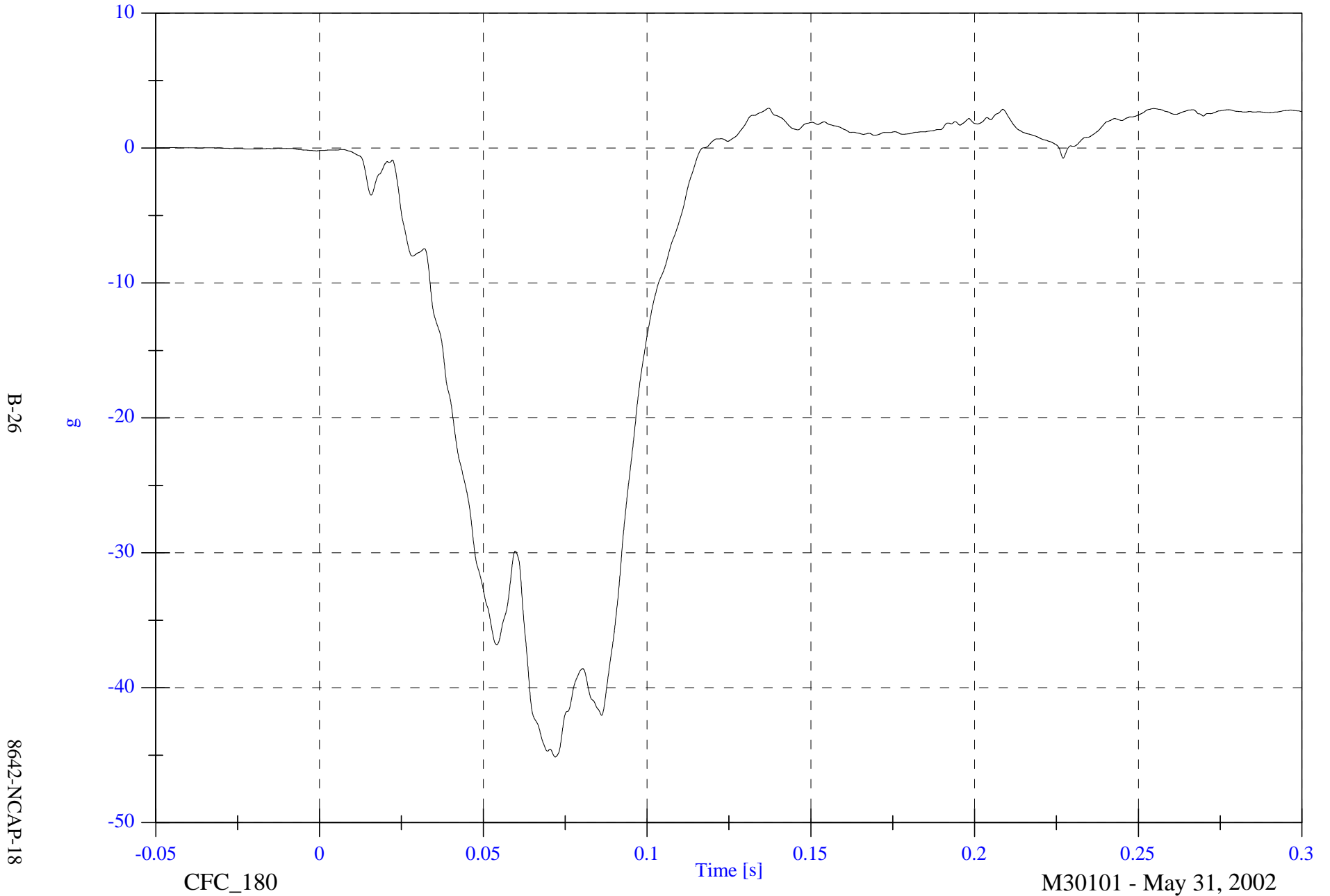


2002 NCAP Test 18 2003 Cadillac CTS

Max: 3.0 [g] at 0.137 [s]

Min: -45.1 [g] at 0.072 [s]

P1 Chest x

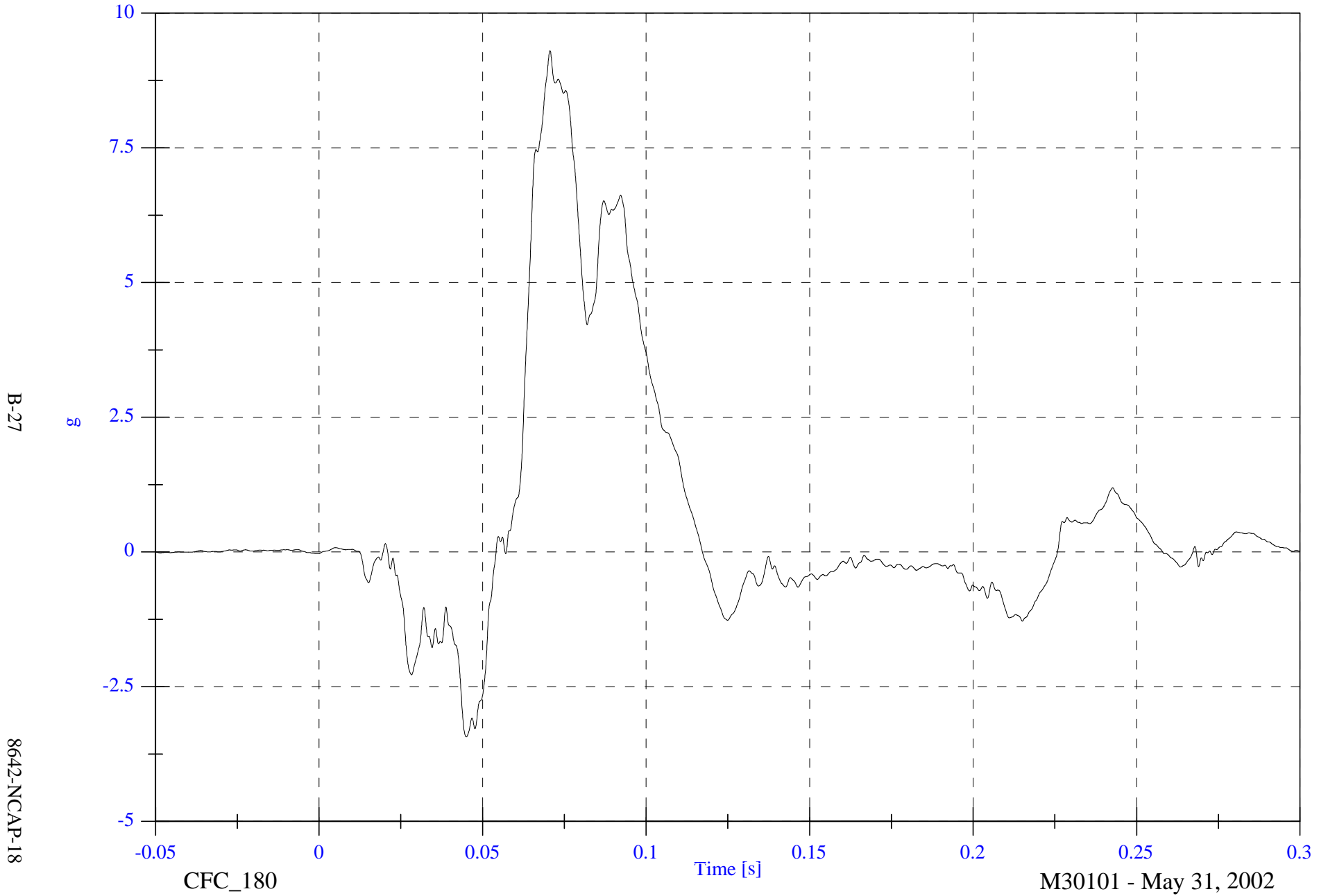


2002 NCAP Test 18 2003 Cadillac CTS

Max: 9.3 [g] at 0.071 [s]

Min: -3.4 [g] at 0.045 [s]

P1 Chest y

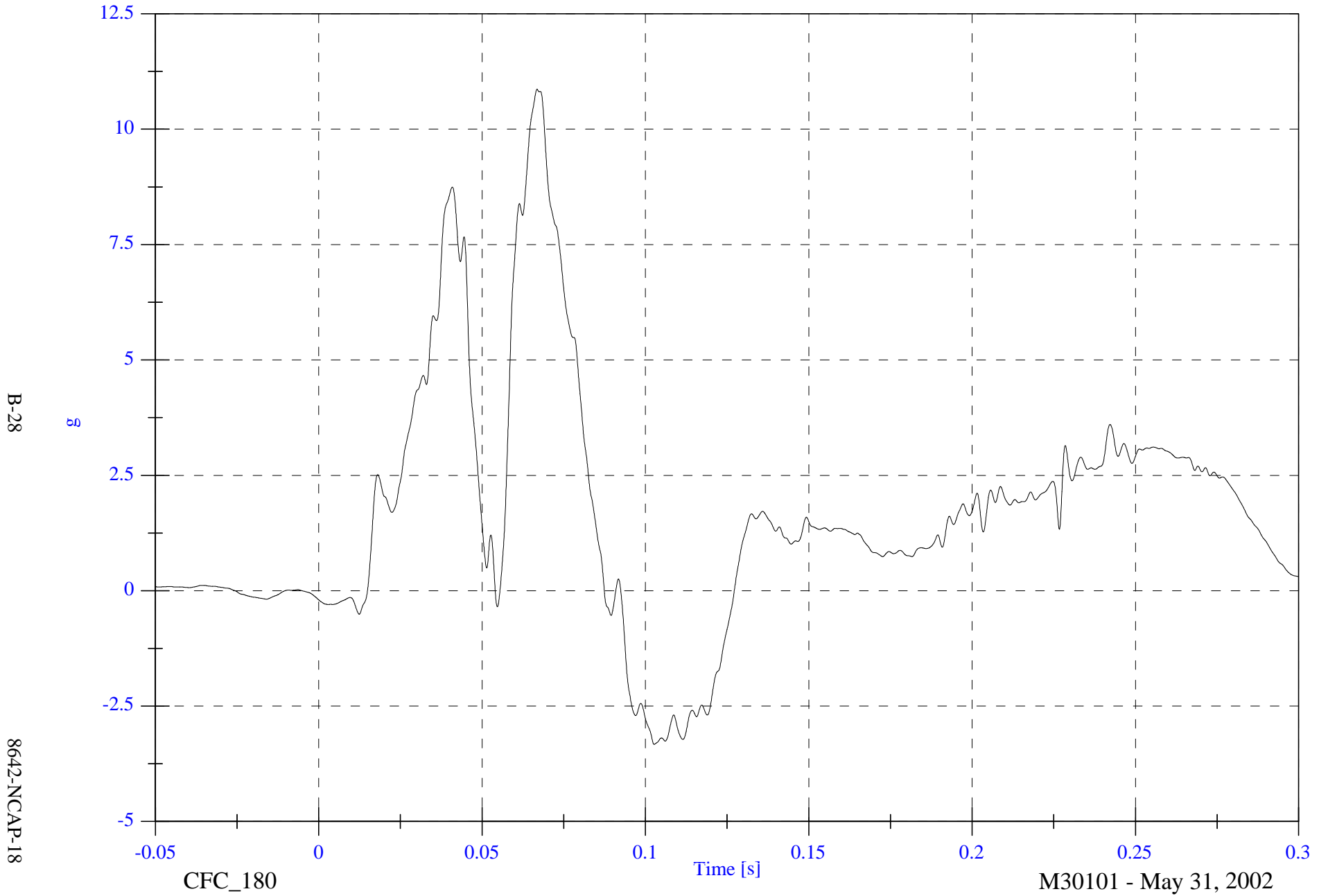


2002 NCAP Test 18 2003 Cadillac CTS

Max: 10.9 [g] at 0.067 [s]

Min: -3.3 [g] at 0.103 [s]

P1 Chest z

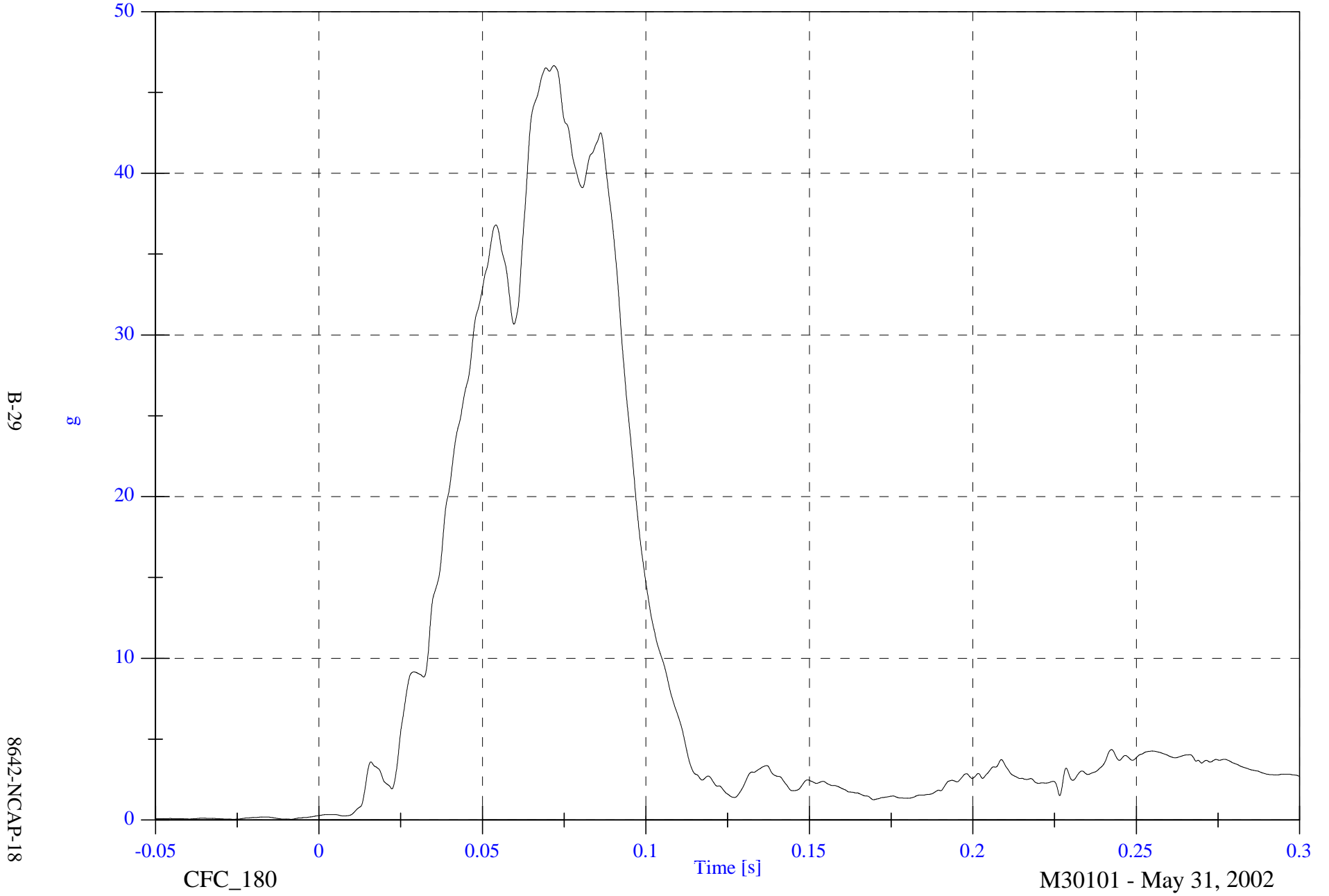


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P1 Chest Resultant

Max: 46.7 [g] at 0.072 [s]

Min: 0.0 [g] at -0.008 [s]



2002 NCAP Test 18 2003 Cadillac CTS

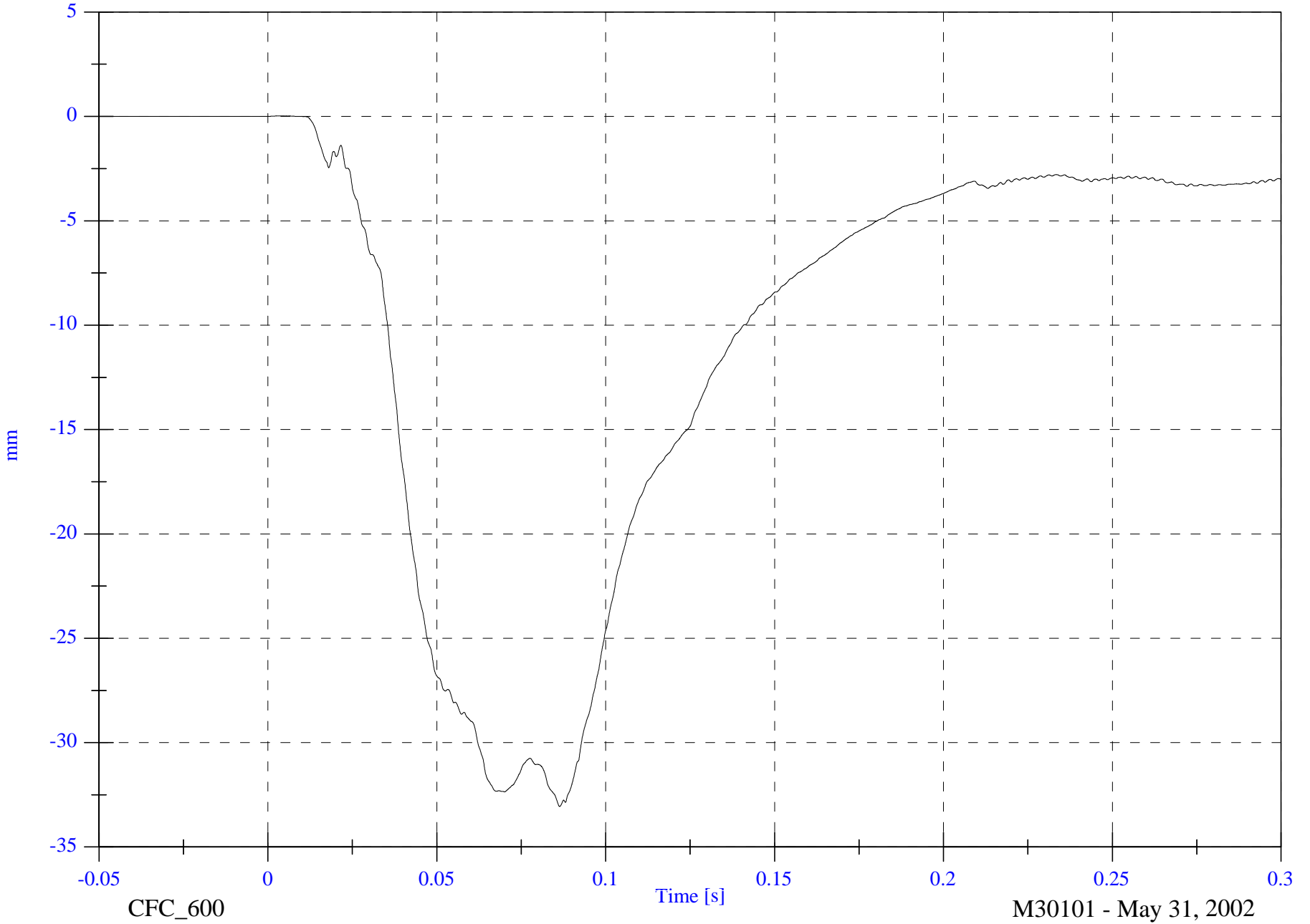
P1 Chest Compression

Max: 0.0 [mm] at 0.003 [s]

Min: -33.1 [mm] at 0.086 [s]

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CFC_600

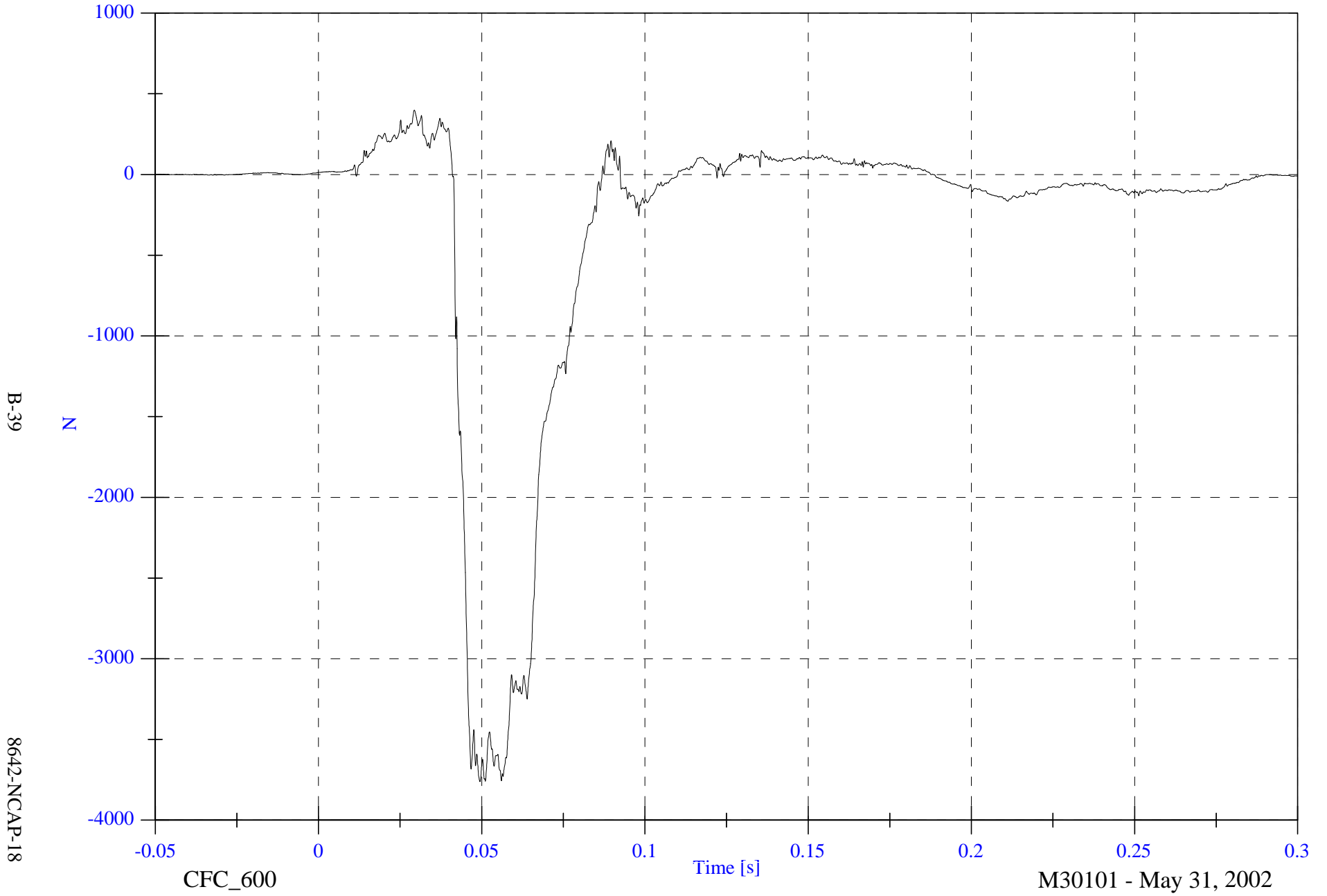
Time [s]

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Max: 399.2 [N] at 0.029 [s]
Min: -3762.3 [N] at 0.050 [s]

P1 Left Femur



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CFC_600

Time [s]

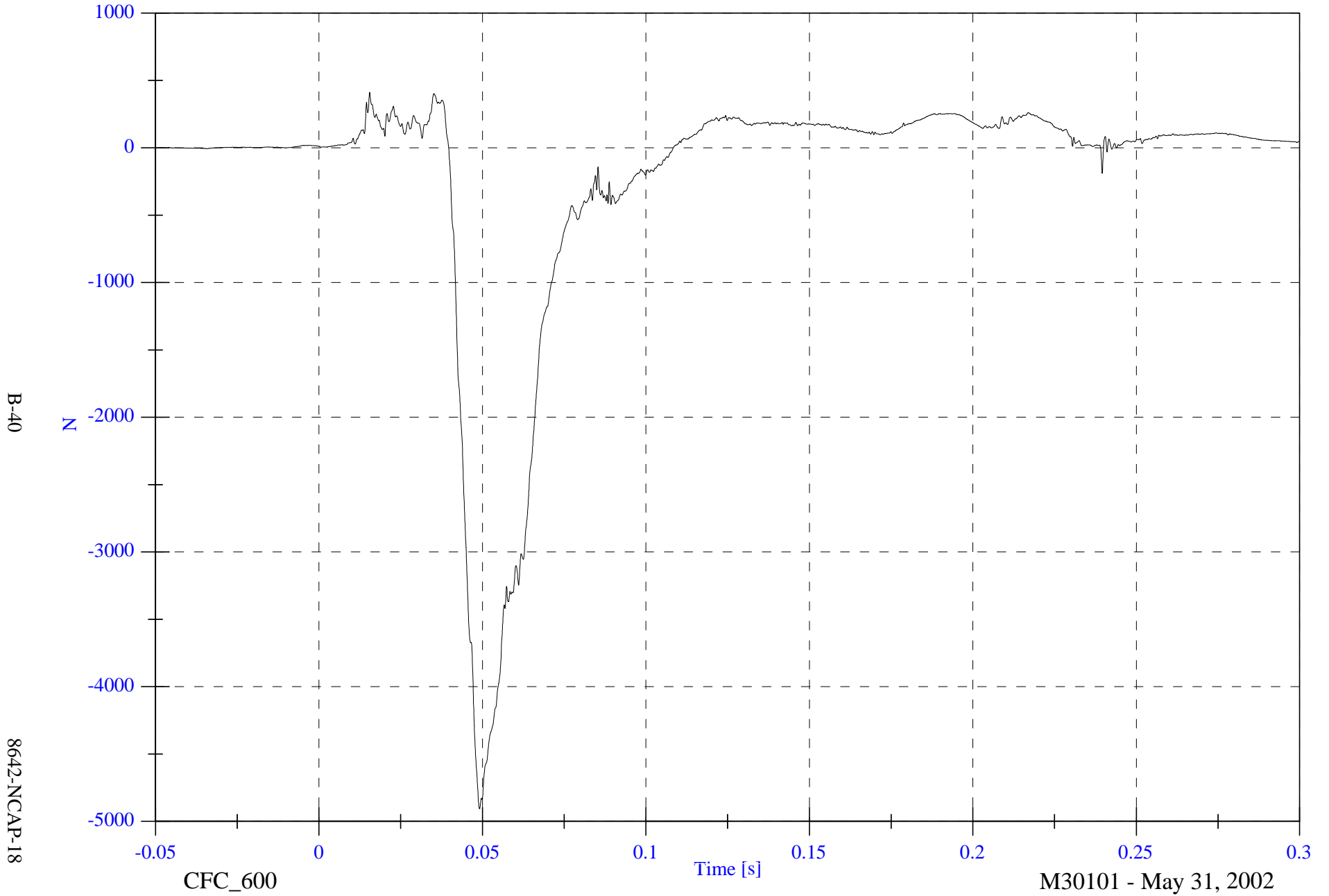
M30101 - May 31, 2002

2002 NCAP Test 18 2003 Cadillac CTS

P1 Right Femur

Max: 412.4 [N] at 0.016 [s]

Min: -4906.7 [N] at 0.049 [s]

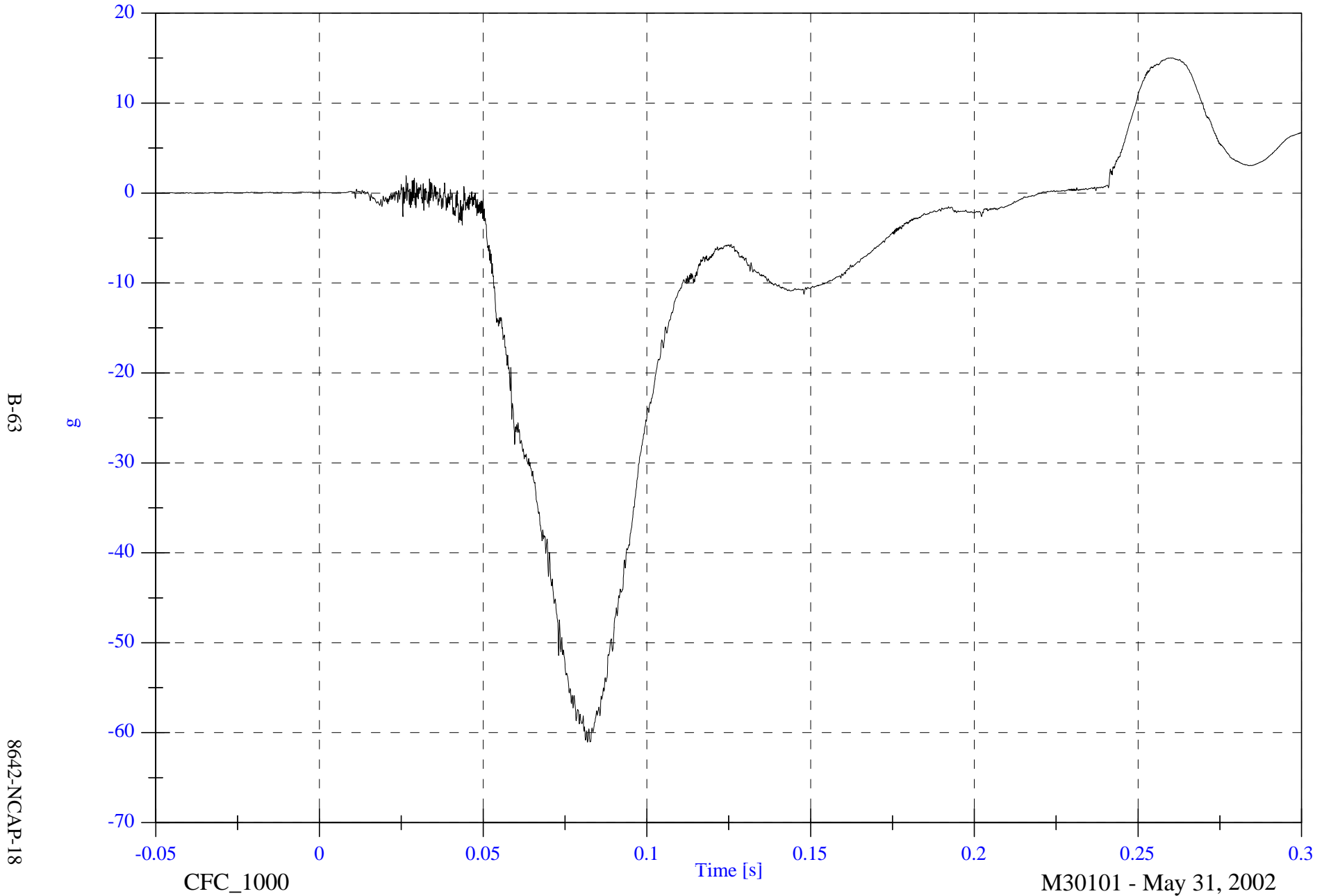


2002 NCAP Test 18 2003 Cadillac CTS

P2 Head CG x

Max: 15.0 [g] at 0.261 [s]

Min: -61.1 [g] at 0.082 [s]

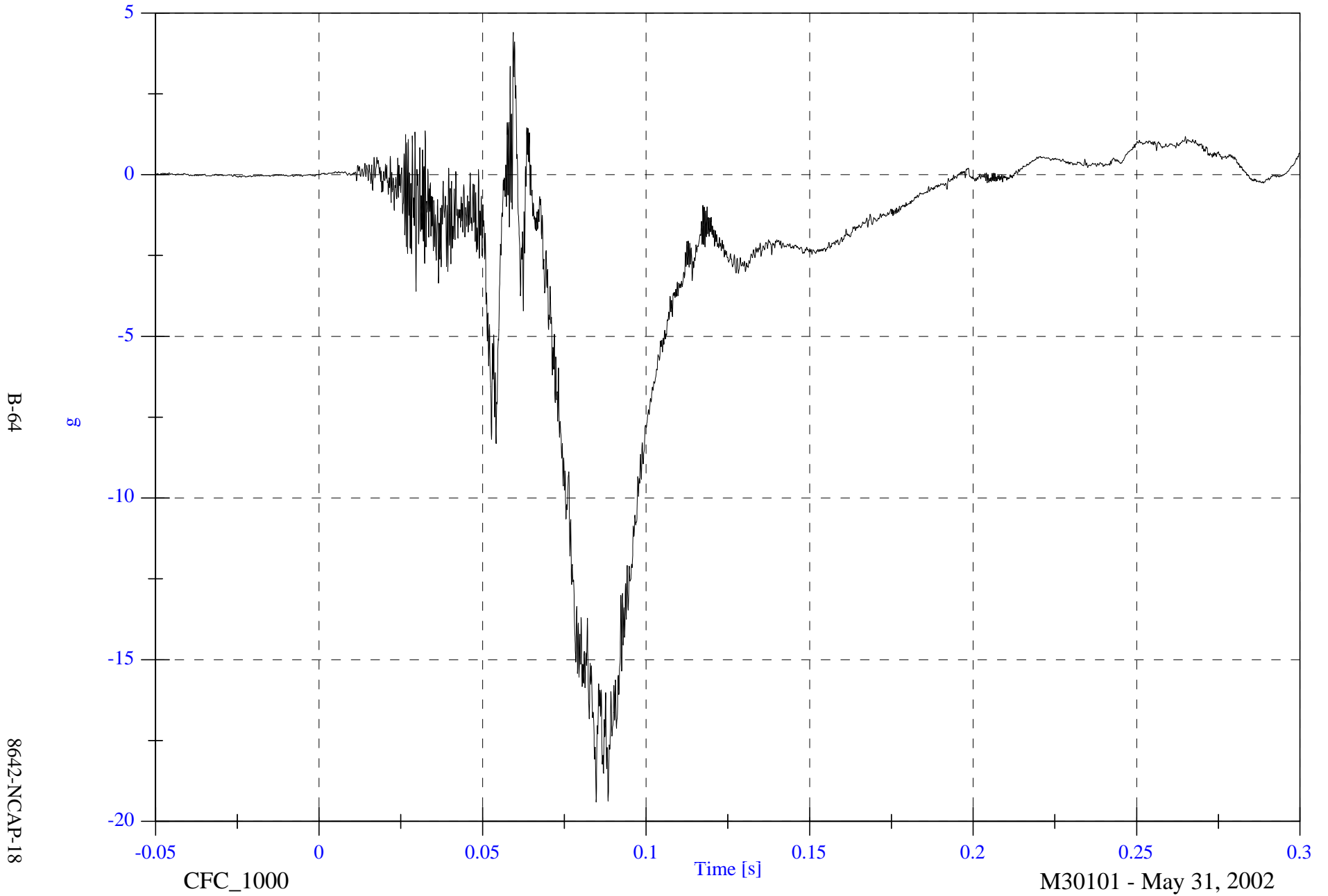


2002 NCAP Test 18 2003 Cadillac CTS

Max: 4.4 [g] at 0.059 [s]

Min: -19.4 [g] at 0.085 [s]

P2 Head CG y

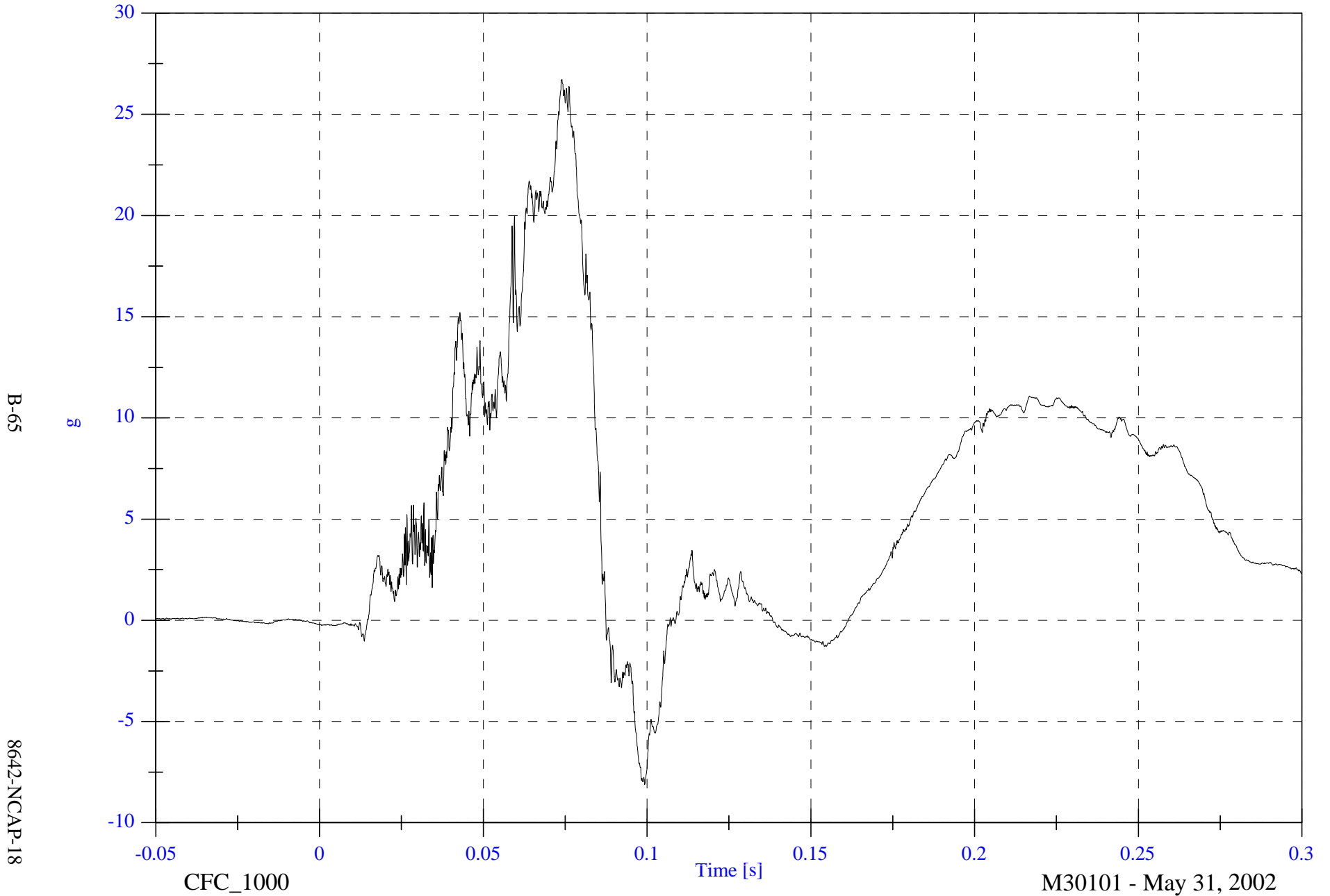


2002 NCAP Test 18 2003 Cadillac CTS

Max: 26.7 [g] at 0.074 [s]

Min: -8.1 [g] at 0.099 [s]

P2 Head CG z

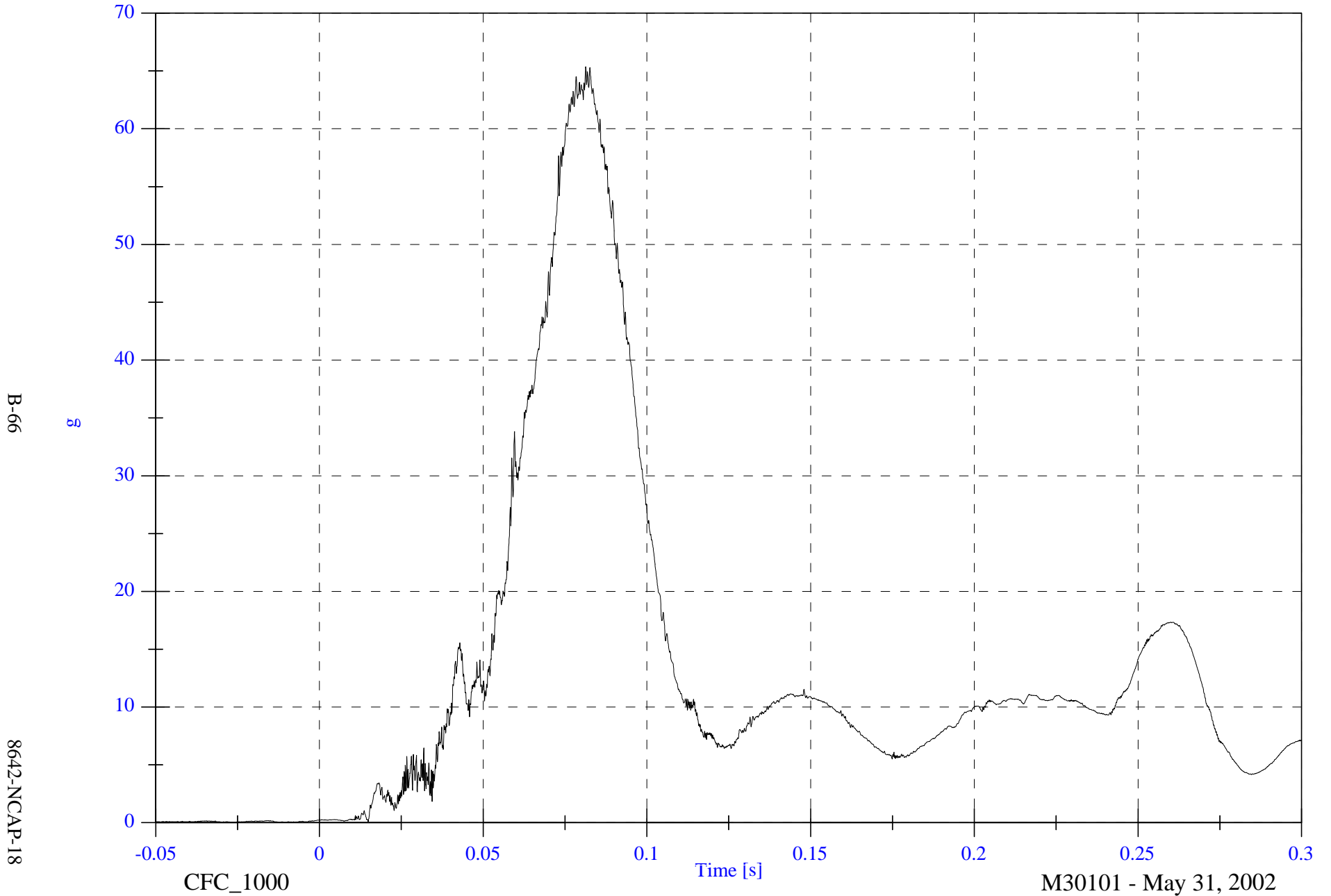


2002 NCAP Test 18 2003 Cadillac CTS

Max: 65.4 [g] at 0.081 [s]

Min: 0.0 [g] at -0.027 [s]

P2 Head CG Resultant



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CFC_1000

Time [s]

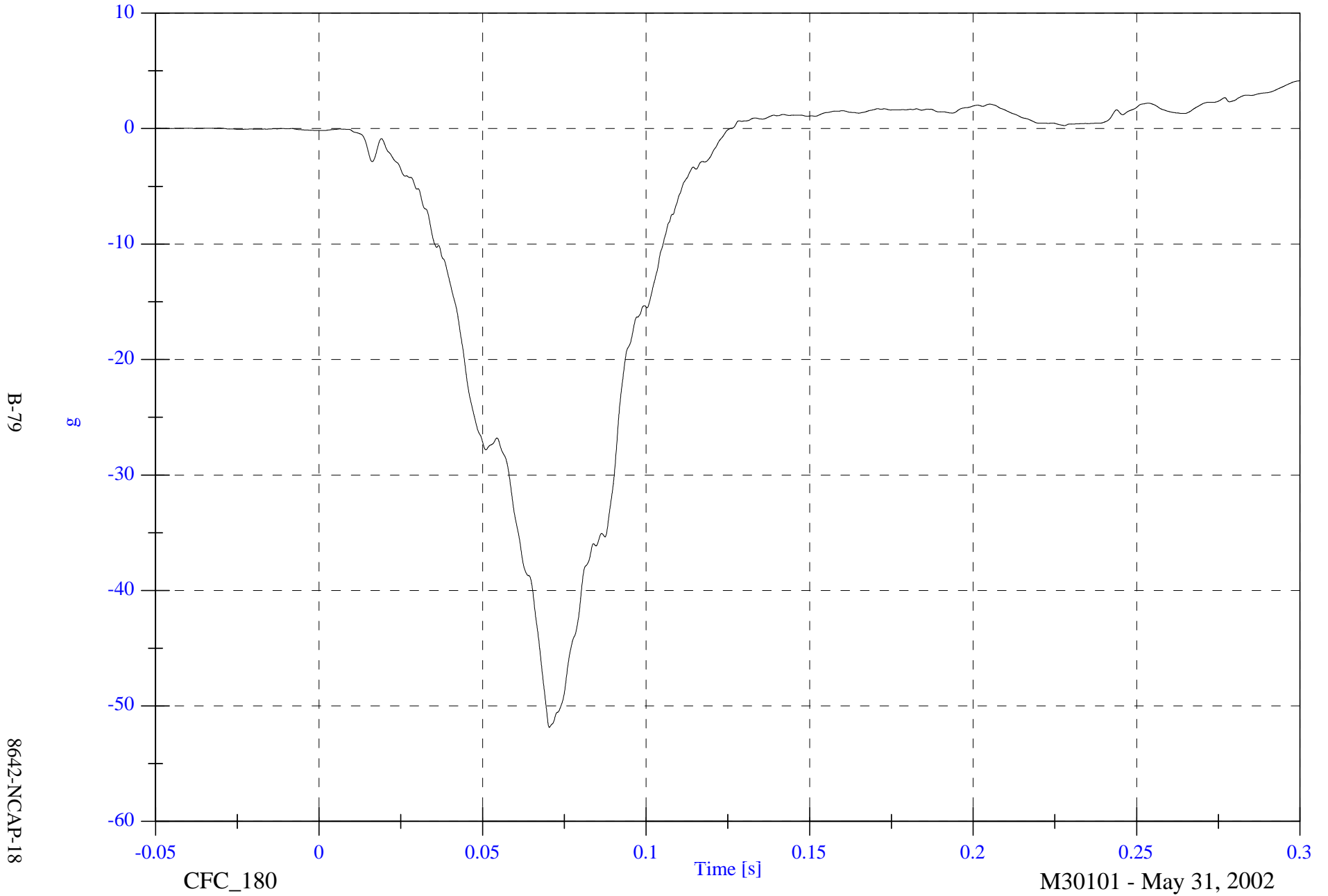
M30101 - May 31, 2002

2002 NCAP Test 18 2003 Cadillac CTS

Max: 4.1 [g] at 0.300 [s]

Min: -51.9 [g] at 0.070 [s]

P2 Chest x



B-79

g

8642-NCAP-18

CFC_180

Time [s]

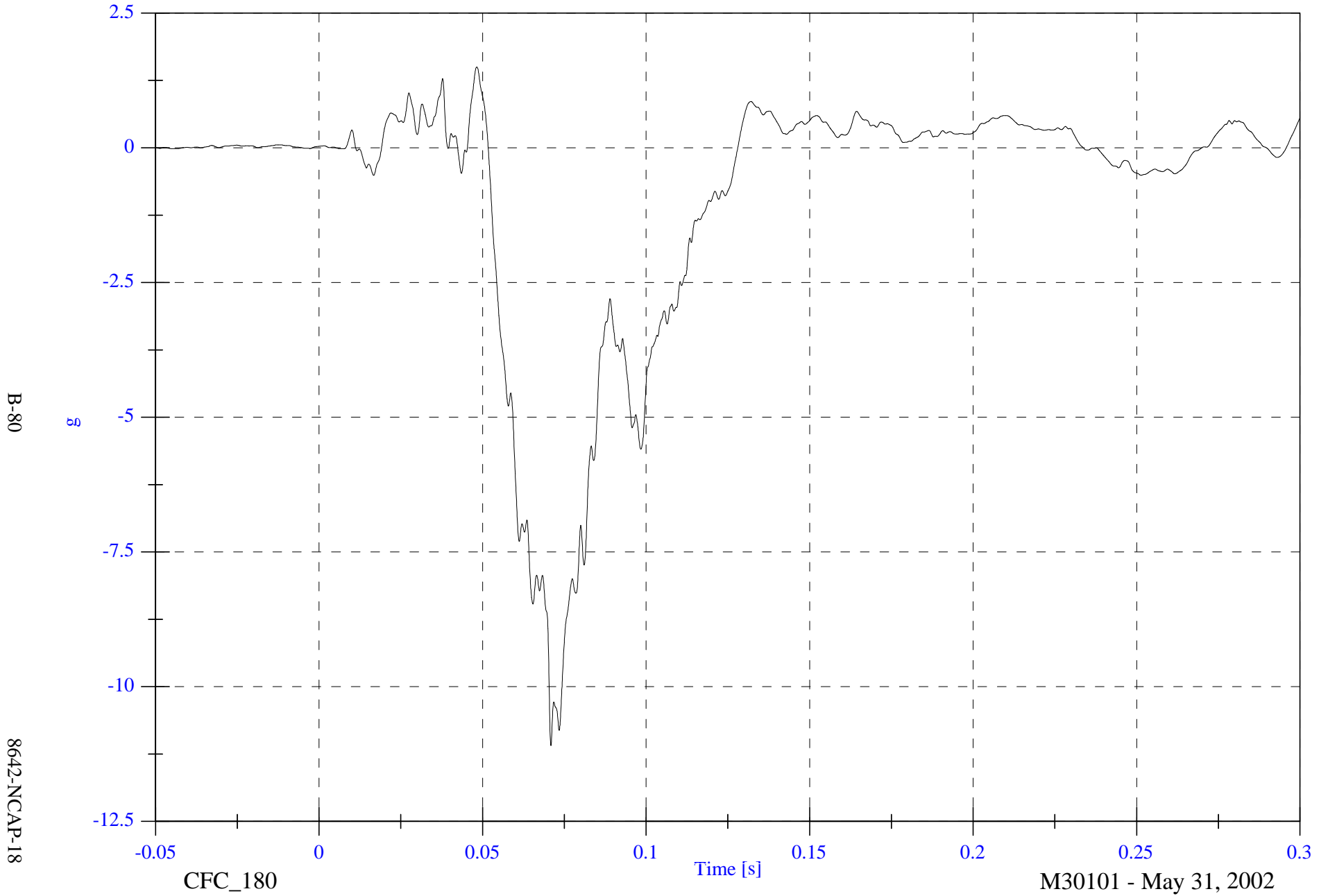
M30101 - May 31, 2002

2002 NCAP Test 18 2003 Cadillac CTS

Max: 1.5 [g] at 0.048 [s]

Min: -11.1 [g] at 0.071 [s]

P2 Chest y

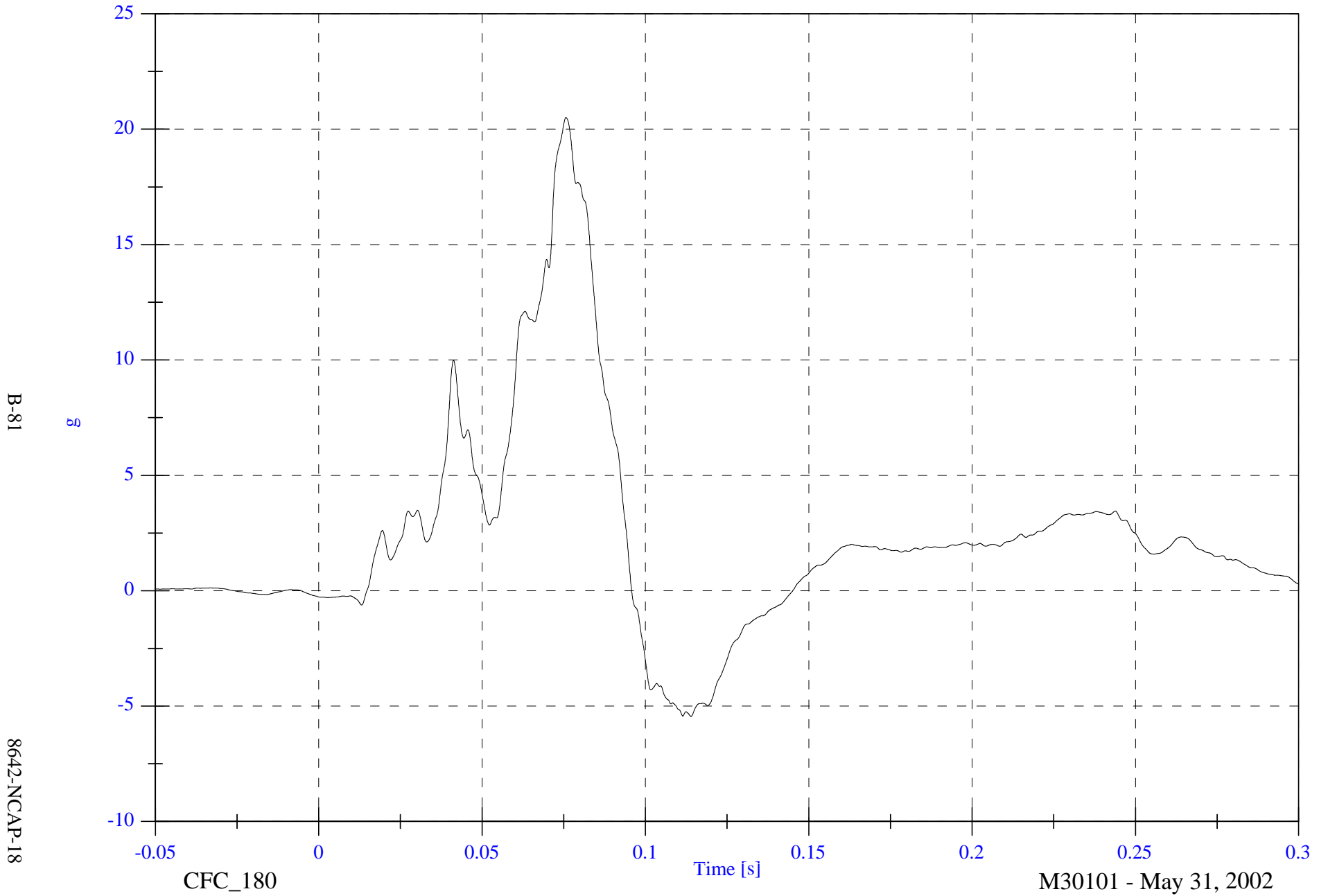


2002 NCAP Test 18 2003 Cadillac CTS

Max: 20.5 [g] at 0.076 [s]

Min: -5.4 [g] at 0.114 [s]

P2 Chest z



2002 NCAP Test 18 2003 Cadillac CTS

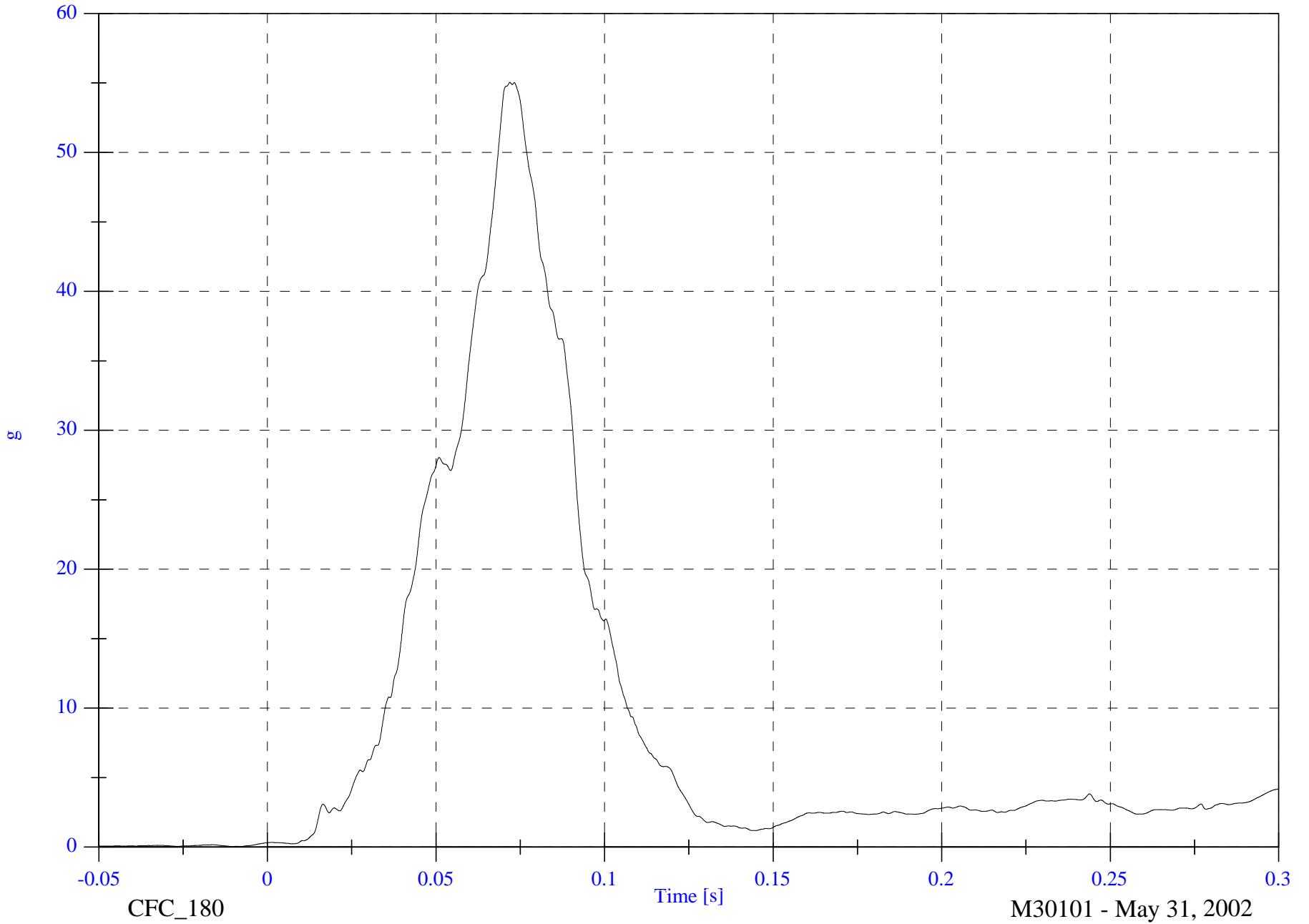
P2 Chest Resultant

Max: 55.0 [g] at 0.072 [s]

Min: 0.0 [g] at -0.008 [s]

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CFC_180

Time [s]

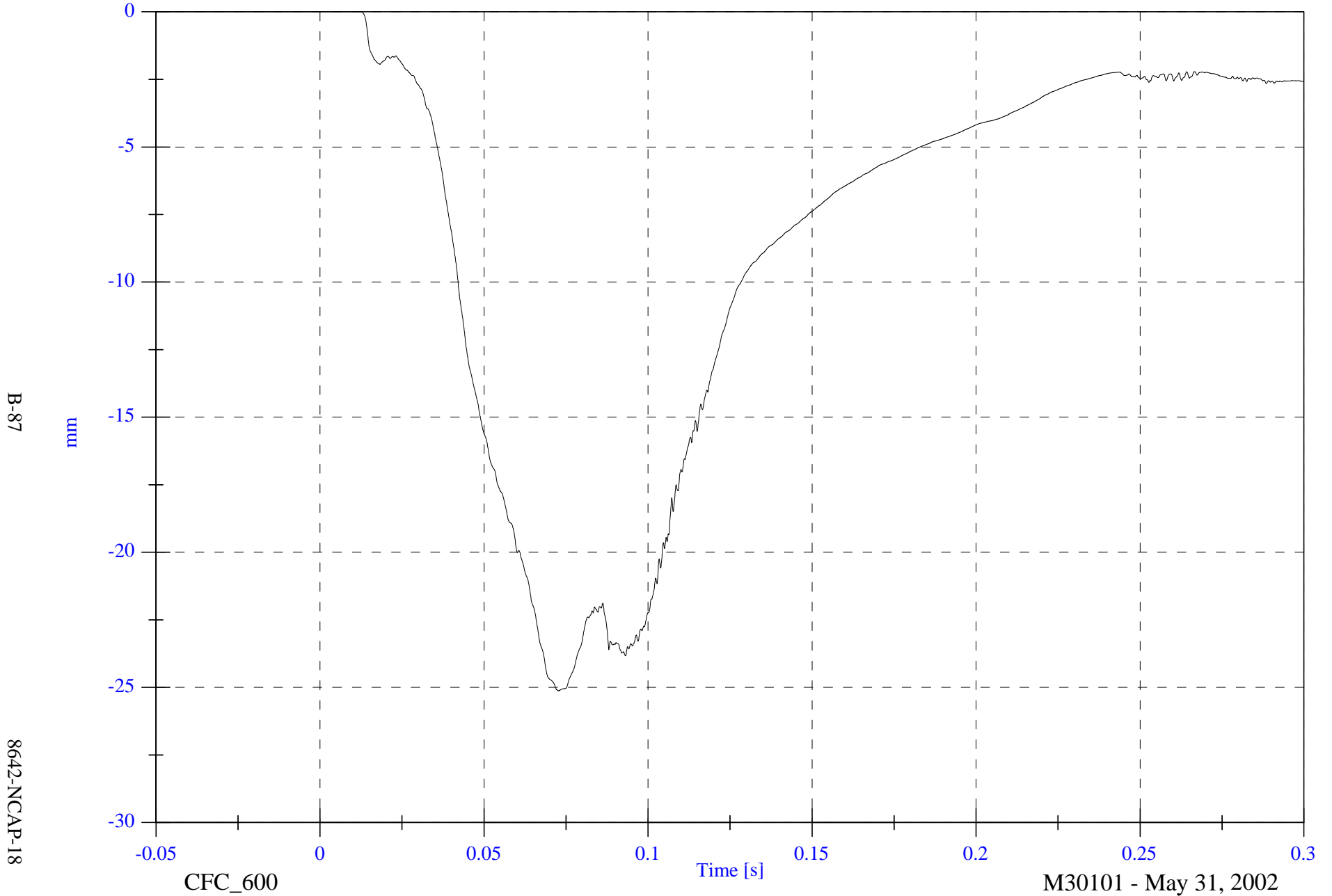
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2002 NCAP Test 18 2003 Cadillac CTS

Max: 0.0 [mm] at 0.007 [s]

Min: -25.1 [mm] at 0.073 [s]

P2 Chest Compression



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CFC_600

Time [s]

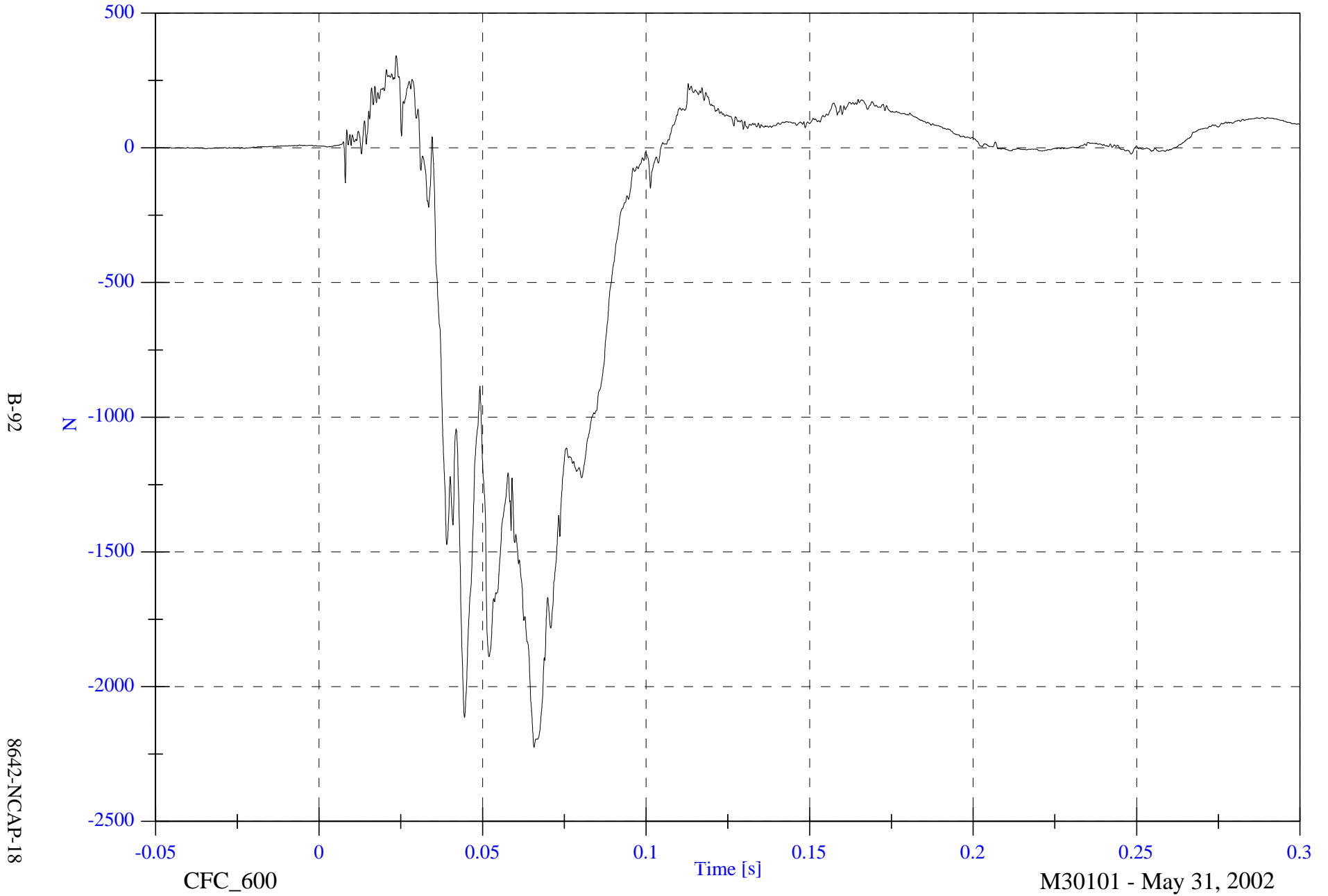
M30101 - May 31, 2002

2002 NCAP Test 18 2003 Cadillac CTS

P2 Left Femur

Max: 341.9 [N] at 0.024 [s]

Min: -2225.4 [N] at 0.066 [s]



2002 NCAP Test 18 2003 Cadillac CTS

Max: 548.5 [N] at 0.030 [s]

Min: -1777.4 [N] at 0.071 [s]

P2 Right Femur

