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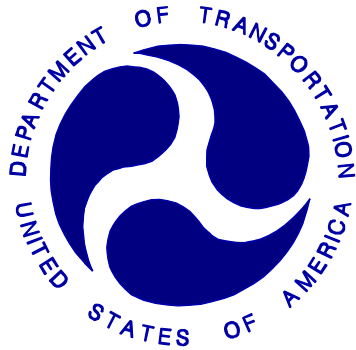
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**GENERAL MOTORS OF CANADA LTD.
2001 CHEVROLET IMPALA
4-DOOR SEDAN**

NHTSA NUMBER: M10102

VERIDIAN TEST NUMBER: 8602-1

VERIDIAN ENGINEERING
TRANSPORTATION SCIENCES CENTER
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November 13, 2000

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
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Washington, DC 20590

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COTR, New Car Assessment Program (NCAP)
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TECHNICAL REPORT STANDARD TITLE PAGE

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| 16. <i>Abstract</i> A frontal load cell barrier test of a 2001 Chevrolet Impala 4-Door Sedan was performed at Veridian Engineering crash test facility in Buffalo, New York, on November 13, 2000. The impact velocity was 56.16 kph and the temperature at the barrier face was 21.1 °C. The maximum post-test vehicle crush was 689 mm. The test vehicle was equipped with 3-point restraint systems, knee bolsters, and airbags at both the driver and right outboard passenger seating positions. With respect to FMVSS 208 "Occupant Crash Protection - Injury Criteria" both the driver and passenger appeared to comply with head, chest, and femur requirements. | | | | | |
| ATD Position | HIC | Clip (g's) | Chest Disp (mm) | Left Femur (N) | Right Femur (N) |
| Driver (061) | 342.6 | 34.5 | 30.3 | 5690.1 | 6247.4 |
| Passenger (245) | 400.9 | 39.7 | 31.3 | 3696.0 | 4044.6 |
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SECTION 1

PURPOSE AND SUMMARY OF TEST M10102

PURPOSE

This 56.16 kph frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-96-D-02010. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for an impact speed in excess of the current 48.3 kph requirements.

The 56.16 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Indicant Test procedure.

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2001 Chevrolet Impala 4-Door Sedan at a velocity of 56.16 kph. The test was performed at Veridian Engineering on November 13, 2000. Pre- and post-test photographs of the vehicle and dummies can be found in Appendix A.

The frontal barrier impact event was documented by 1 real-time camera and 16 high-speed cameras. Camera locations and other pertinent camera information can be found in this report.

Two Part 572E, 50th percentile male anthropomorphic test devices (ATDs), were placed in the driver and right-front passenger seating positions according to dummy placement instructions specified in the Laboratory Indicant Test Procedure.

Both ATDs were fully instrumented with head, chest, and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 245) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 133 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

The driver's HIC was 342.6. The maximum chest deceleration over 3 milliseconds was 34.5 g's and maximum chest deflection was 30.3 mm. Compressive femur loads were 5690.1 Newtons on the left and 6247.4 Newtons on the right.

The right front passenger's HIC was 400.9. Maximum chest deceleration over 3 milliseconds was 39.7 g's and maximum chest deflection was 31.3 mm. Compressive femur loads were 3696.0 Newtons on the left and 4044.6 Newtons on the right.

SECTION 2

GENERAL TEST AND VEHICLE PARAMETER DATA

DATA SHEET NO. 1 CRASH TEST SUMMARY

Vehicle NHTSA No. : M10102 Test Mode : 56.3 kph Frontal Barrier

Test Date : November 13, 2000 Time: 14:55 Temperature : 16.2 °C

Vehicle Make/Model/Body Style : 2001 Chevrolet Impala 4-Door Sedan

Vehicle Test Weight : 1788.0 kg

Vehicle/Barrier Impact Angle : 0 °

Impact Velocity : 56.16 kph

Maximum Static Crush : 665 mm

Vehicle Rebound : 312 mm

DUMMIES:

DRIVER

PASSENGER

Type : 572E 572E

Restraint System : Airbag, 3-Point Active Seat Belt, Knee Bolster Airbag, 3-Point Active Seat Belt, Knee Bolster

Number of Data Channels : 133

Number of Cameras : 1 Real Time

 16 High Speed

DOOR OPENING DATA : Closed / Operable - Left Front

 Closed / Operable - Right Front

Front Seat(s) Data :

DRIVER

PASSENGER

Seat Track Failure :(mm of shift) 0 0

Seat Back Failure : None None

VISIBLE DUMMY CONTACT POINTS :

DRIVER

PASSENGER

Head : Face to upper center of airbag; Back of head to outer half of head restraint Face to right one-third of airbag; Back of head to outer half of head restraint

Abdomen : None None

Chest: Airbag Airbag

Knees: Left knee to bolster left of steering column; Right knee to bolster right of steering column Left knee to left edge of glove compartment; Right knee to center of glove compartment

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA

TEST VEHICLE INFORMATION :

Year/Make/Model/Body Style : 2001 Chevrolet Impala 4-Door Sedan
NHTSA No. : M10102 ; VIN: 2G1WF52E819168080 ; Color : Blue
Engine Data: 6 cylinders; - CID; 3.4 Liters; - cc
Placement : - Longitudinal or In-Line; X Transverse or Lateral
Transmission Data : 4 speeds; - Manual; X Automatic; - Overdrive
Final Drive : - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive
Major Options : X A/C; X Pwr.Strg.; X Pwr. Brakes
X Pwr. Windows; X Pwr. Door Locks; X Tilt Wheel
Date Received : 11/07/00 ; Odometer Reading 124 km
Selling Dealer : Riverside Chevrolet-Geo LLC
& Address: PO Box 25, Scottsville, NY 14546

DATA FROM TIRE VEHICLE'S CERTIFICATION LABEL:

Vehicle Manufactured by : General Motors of Canada Ltd.
Date of Manufacture 09/00
GVWR : 2061 kg; GAWR: 1116 kg FRONT; 945 kg REAR

DATA FROM TIRE PLACARD:

Tire Pressure with Maximum Capacity Vehicle Load : 240 kpa FRONT
240 kpa REAR
Recommended Tire Size : P225/60R16
* Recommended Cold Tire Pressure : 210 kpa FRONT; 210 kpa REAR
Size of Tires on Test Vehicle: P225/60R16 ; Manufacturer: Uniroyal
Vehicle Capacity Data :
Type of Front Seats: - Bench; X Bucket; - Split Bench
Number of Occupants: 3 Front; 3 Rear; 6 Total
Vehicle Capacity Weight (VCW) = 488.0 kg
No. of Occupants x 68 kg = 408.2 kg
Rated Cargo/Luggage Weight (RCLW) = 79.8 kg

*Tire pressure used for test

DATA SHEET NO. 2 GENERAL TEST AND VEHICLE PARAMETER DATA (cont.)

WEIGHT OF TEST VEHICLE AS RECEIVED FROM DEALER (with maximum fluids)= UDW:

| | | | | | | | |
|------------------------------------|---|---------------|----|------------------------|---|--------------|----|
| Right Front | = | <u>489.0</u> | kg | Right Rear | = | <u>301.5</u> | kg |
| Left Front | = | <u>479.5</u> | kg | Left Rear | = | <u>293.0</u> | kg |
| TOTAL FRONT | = | <u>968.5</u> | kg | TOTAL REAR | = | <u>594.5</u> | kg |
| TOTAL DELIVERED WEIGHT | = | <u>1563.0</u> | kg | | | | |
| % of Total Front of Vehicle Weight | = | <u>62.0</u> | % | % of Total Rear Weight | = | <u>38.0</u> | % |

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT :

| | | | |
|-------------------------------------|---|---------------|----|
| Total Delivered Weight (UDW) | = | <u>1563.0</u> | kg |
| Rated Cargo/Luggage Weight (RCLW) | = | <u>79.8</u> | kg |
| Weight of 2 p.572 Dummies @ 76 each | = | <u>152.0</u> | kg |
| TARGET TEST WEIGHT | = | <u>1794.8</u> | kg |

WEIGHT OF TEST VEHICLE WITH TWO DUMMIES AND 73 KG OF CARGO WEIGHT:

| | | | | | | | |
|--|---|---------------|----|------------------------|---|---|----|
| Right Front | = | <u>520.0</u> | kg | Right Rear | = | <u>379.0</u> | kg |
| Left Front | = | <u>508.0</u> | kg | Left Rear | = | <u>381.0</u> | kg |
| TOTAL FRONT | = | <u>1028.0</u> | kg | TOTAL REAR | = | <u>760.0</u> | kg |
| TOTAL TEST WEIGHT | = | <u>1788.0</u> | kg | | | | |
| % of Total Front Weight | = | <u>57.5</u> | % | % of Total Rear Weight | = | <u>42.5</u> | % |
| Weight of Ballast Secured in Vehicle Trunk Area | = | <u>0</u> | kg | | | | |
| Vehicle Components Removed for Weight Reduction: | | | | | | <u>Rear compartment trim, rear speakers</u> | |

VEHICLE ATTITUDE (all dimension in millimeters):

| | | | | | | | | |
|------------------------------|----|---------------|------------------------------------|------------|----|------------|----|------------|
| AS DELIVERED : | RF | <u>752</u> | LF | <u>753</u> | RR | <u>754</u> | LR | <u>754</u> |
| FULLY LOADED : | RF | <u>740</u> | LF | <u>739</u> | RR | <u>720</u> | LR | <u>720</u> |
| AS TESTED : | RF | <u>743</u> | LF | <u>743</u> | RR | <u>720</u> | LR | <u>722</u> |
| Vehicle's Wheel Base : | | <u>2809</u> | mm | | | | | |
| Location of Vehicle's C.G. : | | <u>1194.0</u> | mm rearward of front wheel center. | | | | | |

FUEL SYSTEM DATA :

| | | | |
|---|---|-------------|---|
| Fuel System Capacity From Owner's Manual | = | <u>64</u> | liters |
| Usable Capacity Figure Furnished by COTR | = | <u>65.1</u> | liters |
| Test Volume Range (92 to 94% of Usable Capacity) | = | <u>59.9</u> | to <u>61.2</u> liters |
| ACTUAL TEST VOLUME | = | <u>60.2</u> | liters (with entire fuel system filled) |
| Test Fluid Type: | <u>Stoddard Solution</u> | ; | Spec. Grav. = <u>0.764</u> |
| | Kinematic Viscosity = | <u>0.96</u> | centistokes; Color = <u>Orange</u> |
| Type of Fuel Pump: | Electric- <u>X</u> | ; | Mechanical- <u>-</u> |
| Does Electric Pump operate with ignition switch "ON" & engine "OFF" | | | Yes- <u>X</u> No- <u>-</u> |
| Details of Fuel System | <u>Fuel tank: Located forward of the rear axle; Fuel filler located on the left quarter panel aft of the rear axle; Fuel lines: Routed along the inboard side of the left frame rail.</u> | | |

DATA SHEET NO. 3 POST IMPACT DATA

TYPE OF TEST:

Type of Test : Frontal Barrier Impact Angle : 0°
Test Date : November 13, 2000 Time: 14:55 Temperature: 16.2 °C
Vehicle NHTSA No. : M10102
Required Impact Velocity Range : 55.5 to 57.1 kph

BARRIER IMPACT VELOCITY : (Speed traps within 5 feet of impact plane.)

Trap No. 1 = 56.16 kph; Trap No. 2 = 56.16 kph
Distance from vehicle to barrier : (1) entering trap = 813 mm
(2) exiting trap = 305 mm

VEHICLE STATIC CRUSH: (mm) (For frontal and rear impacts only.)

Vehicle Length:

Pre-Test Right = 4978 ; C/L = 5089 ; Left = 4976
Post-Test Right = 4421 ; C/L = 4400 ; Left = 4470
Crush Right = 557 ; C/L = 689 ; Left = 506
AVERAGE = 584 mm

VEHICLE REBOUND: (From rigid barrier only.)

Distance from front of test vehicle to impact point :

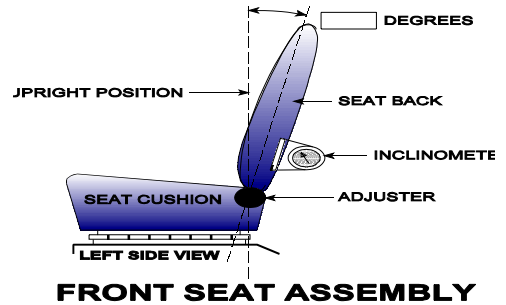
Right = 312 ; C/L = 327 ; Left = 298
AVERAGE = 312 mm

DATA SHEET NO. 4 TEST VEHICLE INFORMATION

VEHICLE IDENTIFICATION:

Model Year : 2001 Vehicle Model: Chevrolet Impala Body Style : 4-Door Sedan

1. Nominal Design Riding Position for adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.



Seat back angle for driver's seat: 26.5

Measurement instructions: With the vehicles sills level, set the seat back so that an inclinometer placed on the outer frame member approximately 240 mm above the seat back pivot point reads 26.5 degrees.

Seat back angle for passenger's seat: 26.5

Measurement instructions: With the vehicles sills level, the seat back was positioned so that an inclinometer placed on the outer frame member approximately 240 mm above the seat back pivot point read 26.5 degrees.

2. Seat Fore and Aft Positioning

Positioning of the driver's seat: The seat was placed in its mid-travel position.

Positioning of the passenger's seat: The seat was placed in its mid-travel position.

3. Fuel Tank Capacity Data

3.1 A. "Usable Capacity" of the standard equipment fuel tank is 65.1 liters

B. "Usable Capacity" of the optional equipment fuel tank is - liters

C. "Usable Capacity" of the vehicle(s) used for certification testing to requirements of FMVSS 301 = 65.1 liters

3.2 Amount of Stoddard solvent added to vehicle(s) used for certification test(s) = 60.2 liters

3.3 Is vehicle equipped with electric fuel pump? Yes- X ; No- -

If YES, explain the vehicle operating conditions under which the fuel pump will pump fuel.

With the ignition on, the fuel pump operated for approximately 3 seconds then stopped. With the engine running, the fuel pump operated continuously.

DATA SHEET NO. 4 TEST VEHICLE INFORMATION (cont.)

4. STEERING COLUMN ADJUSTMENTS :

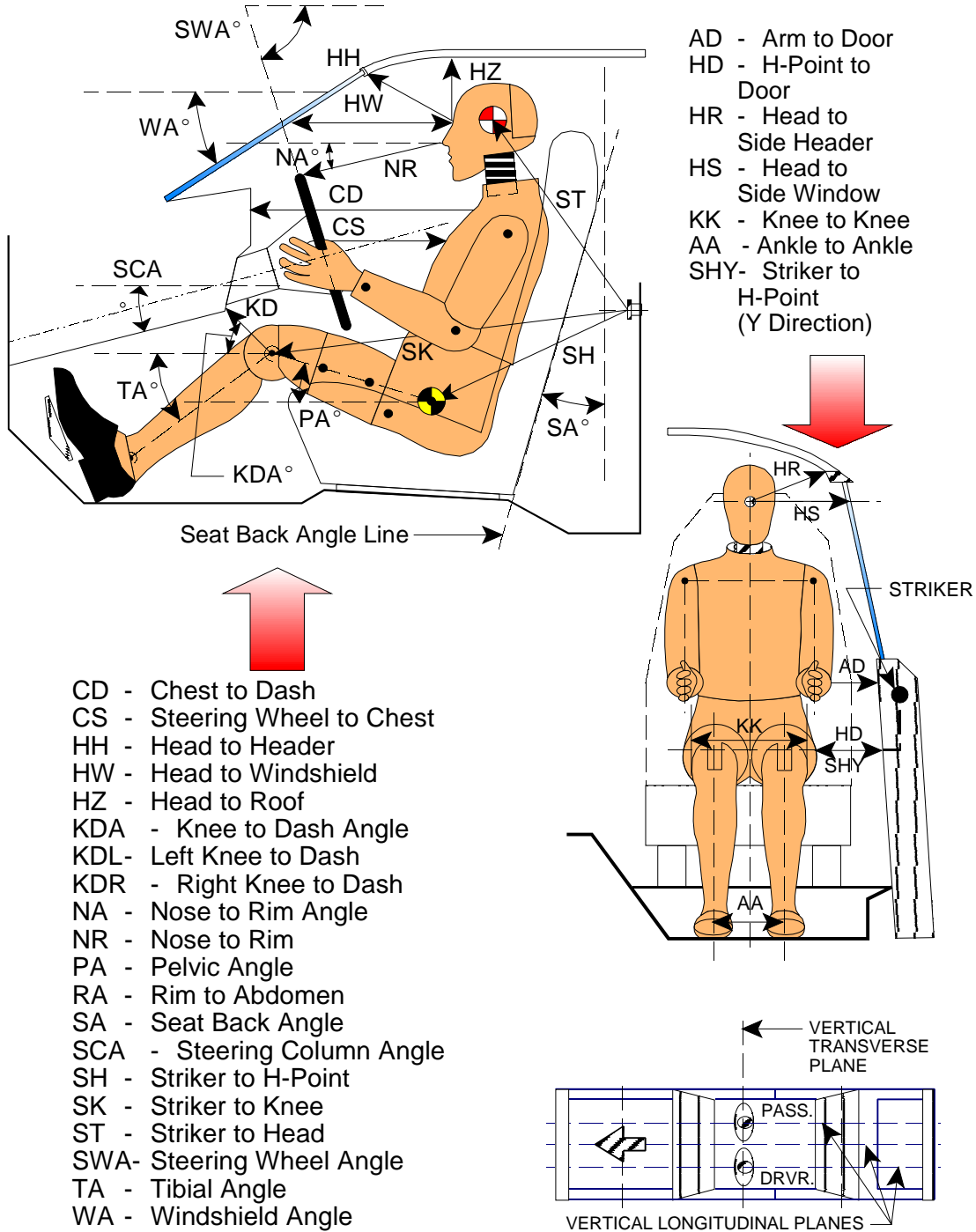
Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when it is moved through its full range of driving positions. If the tested vehicle has any of these adjustments, does your company use any specific procedures to determine the geometric center.

Operational Instructions: The steering column was placed in mid-position. The column was placed in detent 2, where the uppermost detent was defined as 0 and the lowermost detent was defined as 4.

5. SEAT BELT UPPER ANCHORAGE

Nominal design riding position: The D-ring was placed in detent 1, where the uppermost detent was defined as 0 and the lowermost detent was defined as 3.

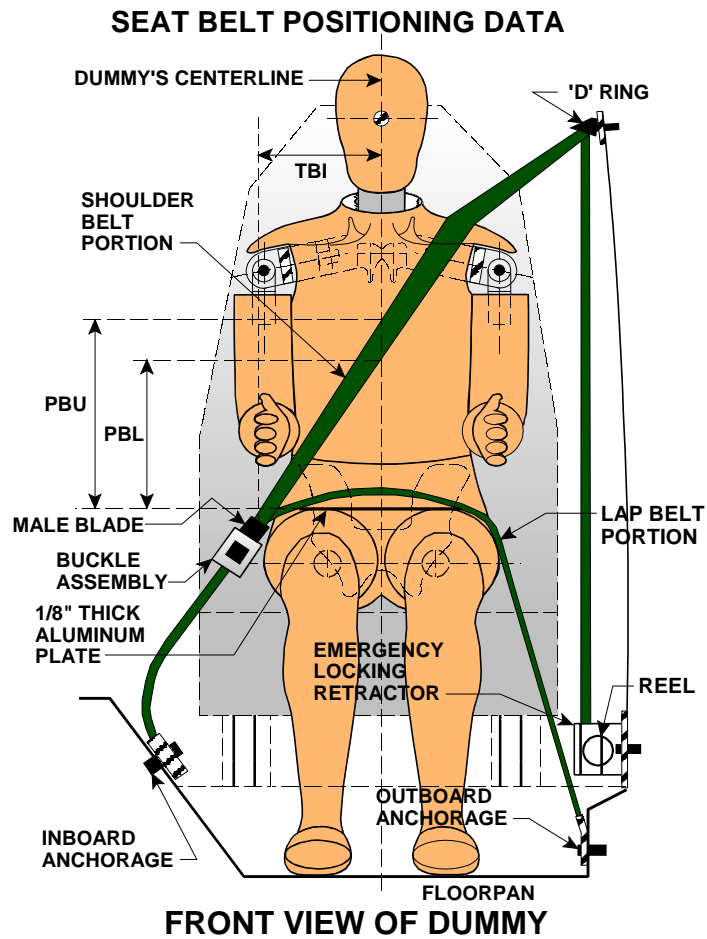
DUMMY MEASUREMENT FOR FRONT SEAT PASSENGERS



DATA SHEET NO. 5 FRONT SEAT DUMMY POSITIONING MEASUREMENTS IN VEHICLE (cont.)

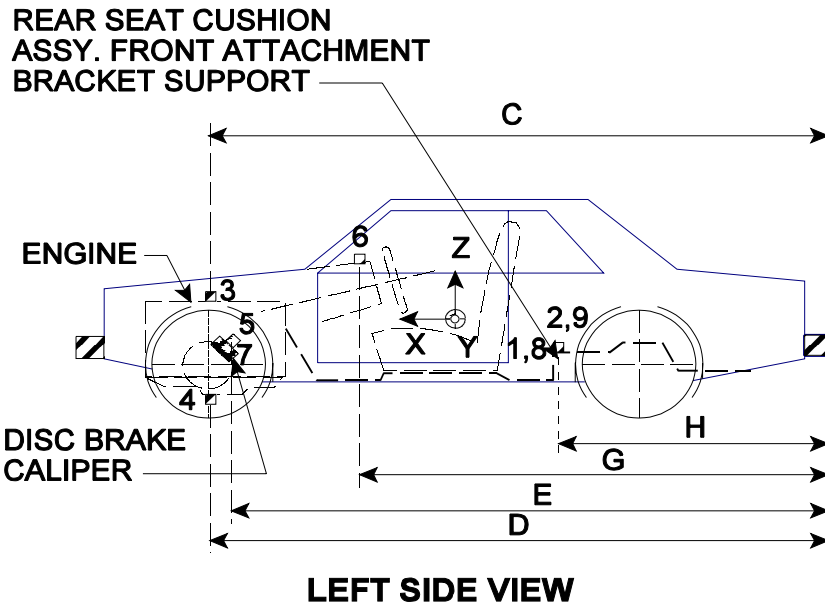
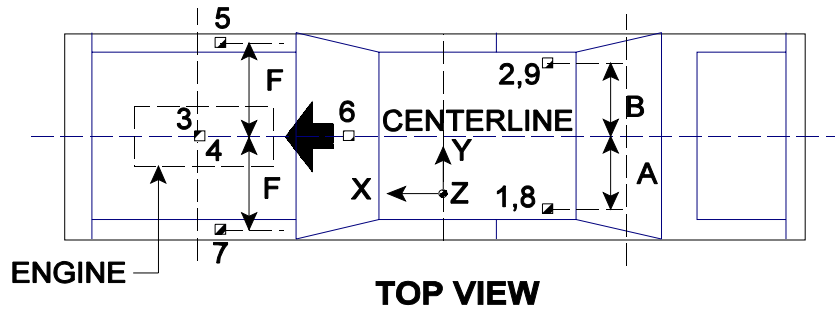
| | DRIVER (Serial #061) | | | PASS. (Serial # 245) | | |
|------------------|----------------------|-------------|----------|----------------------|-------------|----------|
| WA ^o | 27 deg. | | | N/A | | |
| SWA ^o | 69 deg. | | | N/A | | |
| SCA ^o | 21 deg. | | | N/A | | |
| SA ^o | 26.5 deg. | | | 26.5 deg. | | |
| HZ | 196 | | | 185 | | |
| HH | 332 | | | 342 | | |
| HW | 646 | | | 639 | | |
| HR | 229 | | | 237 | | |
| NR | 377 | Angle | 12 deg. | N/A | | |
| CD | 515 | | | 514 | | |
| CS | 281 | | | N/A | | |
| RA | 181 | | | N/A | | |
| KDL | 171 | Angle (KDA) | 48 deg. | 151 | | |
| KDR | 162 | | | 165 | Angle (KDA) | 53 deg. |
| PA ^o | 24.5 deg. | | | 24.5 deg. | | |
| TA ^o | 41 deg. | | | 41 deg. | | |
| KK | 340 | | | 268 | | |
| AA | 262 | | | 188 | | |
| ST | 562 | Angle | 4 deg. | 572 | Angle | 5 deg. |
| SK | 584 | Angle | 91 deg. | 583 | Angle | 91 deg. |
| SH | 221 | Angle | 121 deg. | 225 | Angle | 116 deg. |
| SHY | 241 | | | 227 | | |
| HS | 352 | | | 352 | | |
| HD | 209 | | | 195 | | |
| AD | 130 | | | 125 | | |

Dimensions in millimeters



| | DRIVER DUMMY (mm) | PASSENGER DUMMY (mm) |
|---|----------------------|-------------------------|
| PBU -- Top surface of alum. plate to upper edge | 240 | 245 |
| PBL-- Top surface of alum. plate to belt lower edge | 329 | 329 |
| <u>LAP BELT TENSION</u> | 10 N | 10 N |
| <u>SHOULDER BELT TENSION</u> | Retractor | Retractor |

VEHICLE ACCELEROMETER LOCATION AND DATA SUMMARY



Note: Vehicle accelerometer location and data summary shown in DATA SHEET NO. 7

DATA SHEET NO. 7 VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY (cont.)

| DIMENSION | PRE-TEST LENGTH (mm) |
|---------------------------------|----------------------|
| A Left Rear Seat Crossmember Y | -643 |
| B Right Rear Seat Crossmember Y | 643 |
| C Top of Engine X | 4356 |
| D Bottom of Engine X | 3986 |
| E Disc Brake Calipers X | 3981 |
| F Disc Brake Calipers Y | ±660 |
| G Instrument Panel X | 3475 |
| H Rear Seat Crossmembers X | 2030 |

| LOCATION NUMBER | DESCRIPTION | MAXIMUM VALUE (g's) | | | |
|-----------------|--------------------------------------|---------------------|-------|--------|-------|
| | | Pos. | msec. | Neg. | msec. |
| 1 | Rear Seat X-Member @ Left Side | 2.2 | 158.3 | -36.4 | 58.6 |
| 2 | Rear Seat X-Member @ Right Side | 2.6 | 158.7 | -35.4 | 59.0 |
| 3 | Top of Engine Block | 49.9 | 53.5 | -99.3 | 40.4 |
| 4 | Bottom of Engine | 34.2 | 60.3 | -31.8 | 31.3 |
| 5 † | Disc Brake Caliper @ Right Side | 55.8 | 77.7 | -329.9 | 71.5 |
| 6 | Instrument Panel | 15.7 | 85.7 | -51.6 | 70.6 |
| 7 | Disc Brake Caliper @Left Side | 29.5 | 70.3 | -90.4 | 62.3 |
| 8 | Rear Seat X-Member @ Left-Redundant | 2.1 | 158.3 | -34.6 | 58.7 |
| 9 | Rear Seat X-Member @ Right-Redundant | 2.6 | 158.8 | -35.2 | 59.1 |

† Data is invalid after 97 milliseconds.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES

Vehicle Year/Make/Model/Body Style: 2001 Chevrolet Impala 4-Door Sedan

NHTSA Test No.: M10102 Test Date: November 13, 2000

| | | MAXIMUM VALUE | | | | | | | |
|---------------------------|------|---------------|-------|--------|-------|-----------|-------|--------|-------|
| | | Driver | | | | Passenger | | | |
| DESCRIPTION | Unit | Pos | msec | Neg | msec | Pos | msec | Neg | msec |
| Head X | g | 12.0 | 245.0 | -42.7 | 80.9 | 11.6 | 248.4 | -50.4 | 86.6 |
| Head Y | g | 2.4 | 244.8 | -12.0 | 92.9 | 4.4 | 65.4 | -6.1 | 105.8 |
| Head Z | g | 17.9 | 78.2 | -4.2 | 104.5 | 28.3 | 85.0 | -14.2 | 129.1 |
| Head Resultant | g | 46.8 | 80.8 | - | - | 57.4 | 86.5 | - | - |
| Redundant Head X | g | 12.2 | 245.5 | -43.2 | 81.0 | 11.7 | 248.2 | -50.6 | 87.3 |
| Redundant Head Y | g | 2.3 | 244.4 | -12.0 | 92.1 | 4.7 | 65.0 | -5.7 | 106.3 |
| Redundant Head Z | g | 18.7 | 81.2 | -4.2 | 104.6 | 28.7 | 88.6 | -4.0 | 113.0 |
| Redundant Head Resultant | g | 47.6 | 81.0 | - | - | 57.6 | 87.4 | - | - |
| Upper Neck Fx | N | 579.0 | 93.4 | -270.6 | 167.4 | 423.8 | 88.2 | -379.9 | 153.2 |
| Upper Neck Fy | N | 176.6 | 99.6 | -67.9 | 137.3 | 57.8 | 60.7 | -179.0 | 83.1 |
| Upper Neck Fz | N | 1329.1 | 77.8 | -126.8 | 284.1 | 631.7 | 74.8 | -206.2 | 285.8 |
| Upper Neck F Resultant | N | 1401.6 | 77.8 | - | - | 645.7 | 74.8 | - | - |
| Upper Neck Mx | N-m | 5.5 | 107.7 | -10.6 | 64.2 | 16.7 | 104.1 | -10.7 | 140.9 |
| Upper Neck My | N-m | 50.2 | 71.1 | -24.6 | 111.9 | 45.6 | 83.9 | -52.8 | 110.3 |
| Upper Neck Mz | N-m | 12.7 | 113.7 | -6.8 | 167.8 | 15.0 | 117.3 | -9.0 | 166.5 |
| Upper Neck M Resultant | N-m | 51.6 | 71.1 | - | - | 54.8 | 110.3 | - | - |
| Chest X | g | 3.3 | 276.9 | -35.3 | 69.3 | 3.0 | 275.1 | -38.7 | 101.8 |
| Chest Y | g | 1.0 | 149.0 | -7.8 | 63.1 | 2.0 | 66.5 | -7.0 | 105.9 |
| Chest Z | g | 8.8 | 79.7 | -5.6 | 58.9 | 14.9 | 87.1 | -7.7 | 103.2 |
| Chest Resultant | g | 35.4 | 69.4 | - | - | 41.0 | 87.3 | - | - |
| Redundant Chest X | g | 3.2 | 277.0 | -34.4 | 70.0 | 3.1 | 275.0 | -39.6 | 101.8 |
| Redundant Chest Y | g | 1.0 | 149.0 | -7.9 | 63.1 | 2.0 | 66.2 | -6.9 | 107.0 |
| Redundant Chest Z | g | 8.5 | 79.8 | -6.0 | 58.9 | 14.6 | 86.7 | -8.6 | 103.2 |
| Redundant Chest Resultant | g | 34.6 | 69.9 | - | - | 41.2 | 87.4 | - | - |
| Chest Displacement | mm | 0.0 | -44.2 | -30.3 | 102.3 | 0.0 | -30.4 | -31.3 | 100.7 |

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2001 Chevrolet Impala 4-Door Sedan

NHTSA Test No.: M10102 Test Date: November 13, 2000

| | | MAXIMUM VALUE | | | | | | | |
|----------------------|------|---------------|-------|---------|-------|-----------|-------|---------|-------|
| | | Driver | | | | Passenger | | | |
| DESCRIPTION | Unit | Pos | msec | Neg | msec | Pos | msec | Neg | msec |
| Pelvic X | g | 2.8 | 139.7 | -63.3 | 60.9 | 2.8 | 136.2 | -51.3 | 72.1 |
| Pelvic Y | g | 6.8 | 107.5 | -15.5 | 61.3 | 4.6 | 62.0 | -6.6 | 80.6 |
| Pelvic Z | g | 3.9 | 33.4 | -15.9 | 109.1 | 2.7 | 285.1 | -17.4 | 104.9 |
| Pelvic Resultant | g | 65.9 | 61.3 | - | - | 52.7 | 72.1 | - | - |
| Left Femur | N | 457.1 | 46.2 | -5690.1 | 67.6 | 1118.7 | 92.4 | -3696.0 | 71.7 |
| Right Femur | N | 557.7 | 96.0 | -6247.4 | 60.7 | 418.0 | 57.2 | -4044.6 | 78.5 |
| Left Upper Tibia Mx | N-m | 23.1 | 100.4 | -35.3 | 34.8 | 20.5 | 70.5 | -11.1 | 108.5 |
| Left Upper Tibia My | N-m | 20.2 | 137.9 | -138.0 | 65.8 | 6.1 | 152.1 | -110.2 | 76.8 |
| Left Lower Tibia Fz | N | 80.4 | 168.8 | -4004.7 | 33.7 | 116.0 | 268.2 | -3240.9 | 42.4 |
| Left Lower Tibia Mx | N-m | 76.8 | 34.0 | -10.7 | 119.1 | 13.4 | 70.1 | -10.2 | 87.7 |
| Left Lower Tibia My | N-m | 42.0 | 33.8 | -45.2 | 61.3 | 32.1 | 72.8 | -63.6 | 61.5 |
| Right Upper Tibia Mx | N-m | 16.9 | 75.9 | -15.8 | 59.4 | 40.0 | 64.4 | -26.2 | 78.2 |
| Right Upper Tibia My | N-m | 17.6 | 142.9 | -175.3 | 72.5 | 51.4 | 65.9 | -57.8 | 42.0 |
| Right Lower Tibia Fz | N | 518.7 | 87.0 | -4494.9 | 73.3 | 81.5 | 159.7 | -1923.7 | 42.8 |
| Right Lower Tibia Mx | N-m | 11.6 | 48.2 | -26.4 | 122.7 | 2.5 | 21.8 | -65.3 | 76.6 |
| Right Lower Tibia My | N-m | 25.1 | 36.0 | -49.8 | 70.2 | 52.1 | 90.7 | -25.4 | 59.0 |
| Left Foot Aft Ax | g | 21.3 | 35.7 | -80.9 | 62.2 | 49.6 | 73.4 | -134.2 | 62.3 |
| Left Foot Aft Az | g | 47.7 | 33.6 | -73.6 | 30.6 | 20.7 | 93.4 | -53.7 | 72.2 |
| Left Foot Fore Az | g | 144.6 | 33.8 | -136.6 | 30.5 | 67.1 | 63.2 | -206.5 | 59.7 |
| Right Foot Aft Ax | g | 23.9 | 34.7 | -108.3 | 70.6 | 11.5 | 81.0 | -68.4 | 64.0 |
| Right Foot Aft Az | g | 16.8 | 95.3 | -104.8 | 71.6 | 8.8 | 82.9 | -48.0 | 63.5 |
| Right Foot Fore Az | g | 71.8 | 66.7 | -144.4 | 72.0 | 24.7 | 91.9 | -72.2 | 39.4 |
| Lap Belt Load | N | 2271.9 | 68.0 | -1.4 | -50.0 | 3453.0 | 74.3 | -5.6 | -50.0 |
| Torso Belt | N | 5466.3 | 100.9 | -26.7 | 248.0 | 4823.0 | 97.6 | -20.3 | 282.0 |

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)

Vehicle Year/Make/Model/Body Style: 2001 Chevrolet Impala 4-Door Sedan

NHTSA Test No.: M10102 Test Date: November 13, 2000

| HEAD INJURY CRITERIA (HIC) | | | | |
|----------------------------|-------|-----------------------|-----------------------|--|
| | HIC** | t ₁ (msec) | t ₂ (msec) | Average Acceleration t ₁ to t ₂ |
| Position #1 - Driver | 342.6 | 63.0 | 99.0 | 39.0 |
| Position #2 - Passenger | 400.9 | 71.0 | 107.0 | 41.6 |

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

| CLIP SUMMARY* | | | | |
|-------------------------|------------|-----------------------|-----------------------|-------|
| | CLIP (g's) | t ₁ (msec) | t ₂ (msec) | CSI |
| Position #1 - Driver | 34.5 | 68.4 | 71.4 | 290.3 |
| Position #2 - Passenger | 39.7 | 85.9 | 88.9 | 322.6 |

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 8 DUMMY INJURY CRITERIA VALUES (cont.)
REDUNDANT DATA

Vehicle Year/Make/Model/Body Style: 2001 Chevrolet Impala 4-Door Sedan

NHTSA Test No.: M10102 Test Date: November 13, 2000

| HEAD INJURY CRITERIA (HIC) REDUNDANT | | | | |
|---|-------|-----------------------|-----------------------|--|
| | HIC** | t ₁ (msec) | t ₂ (msec) | Average Acceleration t ₁ to t ₂ |
| Position #1 - Driver | 352.6 | 63.0 | 99.0 | 39.5 |
| Position #2 - Passenger | 399.3 | 71.1 | 107.1 | 41.5 |

** HIC is as defined in FMVSS 208. The maximum time interval from t₁ to t₂ is 36 milliseconds.

| CLIP SUMMARY* REDUNDANT | | | | |
|--------------------------------|------------|-----------------------|-----------------------|-------|
| | CLIP (g's) | t ₁ (msec) | t ₂ (msec) | CSI |
| Position #1 - Driver | 33.6 | 68.6 | 71.6 | 275.3 |
| Position #2 - Passenger | 40.2 | 86.0 | 89.0 | 339.0 |

* The maximum chest resultant acceleration is defined as the maximum acceleration which exceeds 0.003 seconds in duration.

DATA SHEET NO. 9 SEAT BELT PERFORMANCE ASSESSMENT TEST DATA

BELT LENGTH DATA:

Belt length from trim panel exit
to bolt hole anchor point for
continuous webbing systems.

Driver

Passenger

1676

1653

Shoulder belt length as measured
on Part 572 Dummy.

831

816

Lap belt length as measured
on Part 572 Dummy.

665

655

SHOULDER BELT SPOOL-OFF DATA:

As determined by film analysis.

178

228

As determined mechanically.

184

228

As determined electronically.

187

233

BELT STRETCH DATA:

Measured electronically between shoulder
belt load cell and the "D" ring.

20 mm/M

20 mm/M

Measured mechanically.

10 mm/M

10 mm/M

Dimensions in millimeters

DATA SHEET NO.10 SUMMARY OF FMVSS 212 DATA

FMVSS NO. 212 - "WINDSHIELD MOUNTING" DATA

DETAILS OF WINDSHIELD MOUNTING SUCH AS RETENTION METHOD, TRIM TYPE, ETC.:

Windshield is bonded in place and covered with a 18 mm molding.

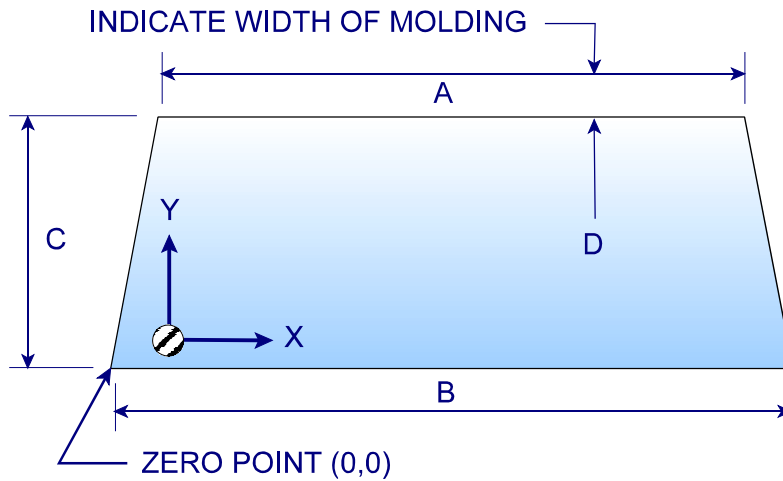
FMVSS 212 REQUIREMENTS:

The Post-Test periphery retention amount must be at least 75% of the Pre-Test periphery measurement for vehicles NOT equipped with automatic restraints, and 50% for each side of the windshield for vehicles equipped with automatic restraint systems for front occupants,

FMVSS 212 TEST DATA

| | WINDSHIELD PERIPHERY | | % OF RETENTION |
|------------|----------------------|---------------|----------------|
| | PRE-TEST (mm) | POST-TEST(mm) | |
| RIGHT SIDE | 2190 | 2190 | 100 |
| LEFT SIDE | 2190 | 2190 | 100 |
| TOTAL | 4380 | 4380 | 100 |

AREA OF RETENTION FAILURE: None



| DIMENSIONS (mm) | |
|-----------------|------|
| A | 1240 |
| B | 1700 |
| C | 720 |
| D | 18 |

FRONT VIEW OF WINDSHIELD

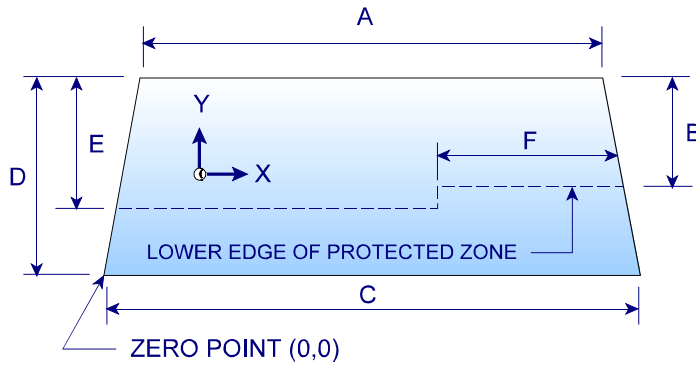
FAILURE DETAILS: None

DATA SHEET NO. 11 FMVSS NO. 219 (PARTIAL) - "WINDSHIELD ZONE INTRUSION" DATA

PROTECTED ZONE LOWER EDGE REQUIREMENT:

The lower edge of the protected zone is determined by placing a 165 mm diameter rigid sphere weighing 6.8 kg in a position such that it simultaneously contacts the inner surface of the windshield and the top surface of the instrument panel including padding. The locus of points is drawn on the inner surface of the windshield contacted by the sphere across the width of the instrument panel. From the outermost contactable points extend the locus line horizontally to the edges of the windshield, then draw a line on the inner surface of the windshield below and 13 mm distant from the locus line. The LOWER EDGE OF THE PROTECTED ZONE is the longitudinal projection of this line onto the outer surface of the windshield.

FMVSS 219 TEST DATA:



| DIMENSIONS (mm) | |
|-----------------|------|
| A | 1240 |
| B | 420 |
| C | 1700 |
| D | 720 |
| E | 465 |
| F | 615 |

FRONT VIEW OF WINDSHIELD

DETAILS OF WINDSHIELD GLASS PENETRATION GREATER THAN 6 mm: None

(Show location of penetration on the above sketch)

| | COORDINATES | |
|----|-------------|---|
| | X | Y |
| 1. | - | - |
| 2. | - | - |
| 3. | - | - |
| 4. | - | - |

DATA SHEET NO. 12 FMVSS NO. 301-75 "FUEL SYSTEM INTEGRITY" POST IMPACT TEST DATA

NHTSA TEST No.: M10102 TEST DATE: November 13, 2000

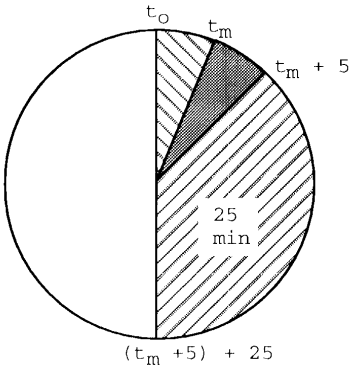
VEHICLE MAKE/MODEL: 2001 Chevrolet Impala

The test vehicle was filled from 92% to 94% of the manufacture's "usable" capacity. The electric fuel pump was operating if it will operate without engine operation. Two Part 572 anthropomorphic test devices were located at each of the front designated seating positions.

=====

TEST VEHICLE IMPACT TYPE: X Frontal (56 kph)
- Oblique (48 kph) with _____ deg. barrier face first contacting _____
 (driver/passenger) side
- Rear Moving Barrier (48 kph)
- Lateral Moving Barrier (32 kph)

FUEL SPILLAGE MEASUREMENT:



1. From impact until vehicle motion ceases
2. For 5 minute period after vehicle motion ceases
3. For next 25 minutes

| ACTUAL | MAX ALLOWED |
|--------|-------------|
| 0 | 28 g |
| 0 | 141 g |
| 0 | 28 g/min. |

SOLVENT SPILLAGE DETAILS:

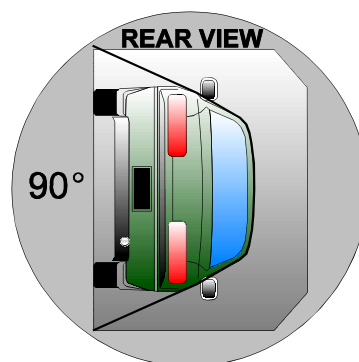
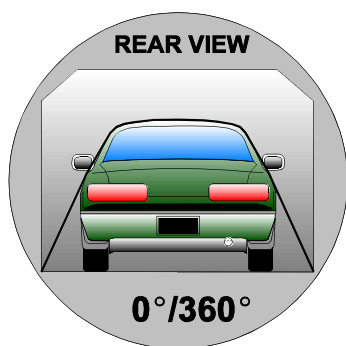
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET

Vehicle: 2001 Chevrolet Impala

NHTSA No. M10102

0 - 90 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

| | | | | |
|--|----------|---------|----------|---------|
| Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes) | <u>1</u> | minutes | <u>7</u> | seconds |
| FMVSS 301 Position Hold Time + | <u>5</u> | minutes | <u>0</u> | seconds |
| TOTAL | <u>6</u> | minutes | <u>7</u> | seconds |
| Next whole minute interval | <u>7</u> | minutes | | |

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

| | | | |
|--|----------|----------|------------------------|
| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|--|----------|----------|------------------------|

(2) Maximum Allowable Solvent Spillage

| | | | |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

| | | | |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

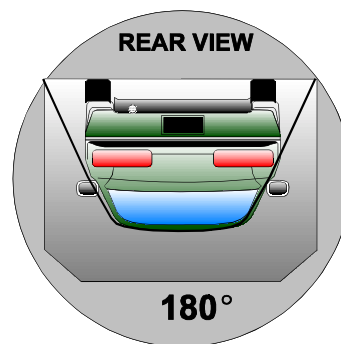
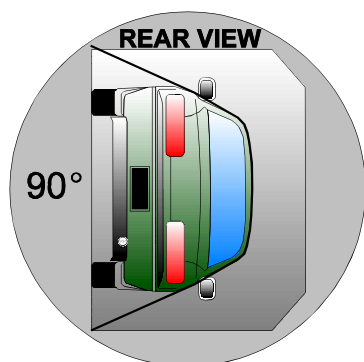
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Chevrolet Impala

NHTSA No. M10102

90 - 180 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

| | | | | |
|--|----------|---------|----------|---------|
| Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes) | <u>1</u> | minutes | <u>3</u> | seconds |
| FMVSS 301 Position Hold Time + | <u>5</u> | minutes | <u>0</u> | seconds |
| TOTAL | <u>6</u> | minutes | <u>3</u> | seconds |
| Next whole minute interval | <u>7</u> | minutes | | |

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

| | | | |
|--|----------|----------|------------------------|
| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|--|----------|----------|------------------------|

(2) Maximum Allowable Solvent Spillage

| | | | |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

| | | | |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

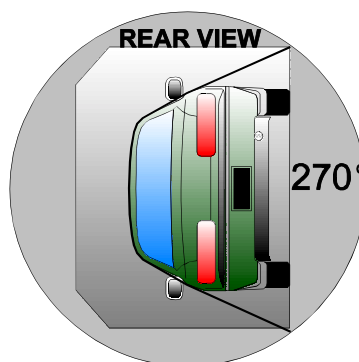
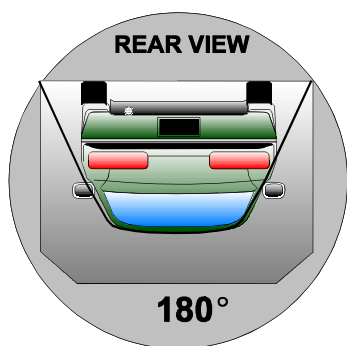
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Chevrolet Impala

NHTSA No. M10102

180 - 270 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

| | | |
|--|------------------|-------------------|
| Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes) | <u>1</u> minutes | <u>11</u> seconds |
| FMVSS 301 Position Hold Time + | <u>5</u> minutes | <u>0</u> seconds |
| TOTAL | <u>6</u> minutes | <u>11</u> seconds |
| Next whole minute interval | <u>7</u> minutes | |

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

| | | | |
|--|----------|----------|------------------------|
| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|--|----------|----------|------------------------|

(2) Maximum Allowable Solvent Spillage

| | | | |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

| | | | |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

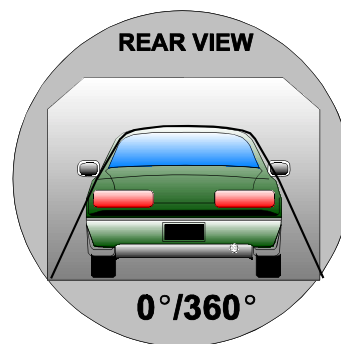
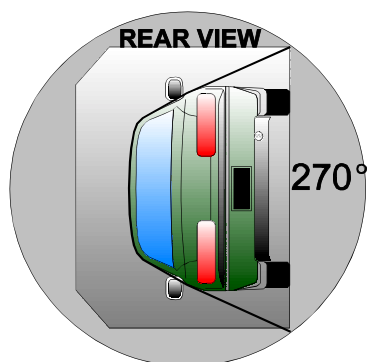
DATA SHEET 13

FMVSS NO. 301 STATIC ROLLOVER DATA SHEET (CONTINUED)

Vehicle: 2001 Chevrolet Impala

NHTSA No. M10102

270 - 360 Degrees



I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD :

| | | |
|--|------------------|------------------|
| Rollover Fixture 90° Rotation Time (Spec. Range = 1 to 3 minutes) | <u>1</u> minutes | <u>6</u> seconds |
| FMVSS 301 Position Hold Time + | <u>5</u> minutes | <u>0</u> seconds |
| TOTAL | <u>6</u> minutes | <u>6</u> seconds |
| Next whole minute interval | <u>7</u> minutes | |

II. FMVSS 301 REQUIREMENTS :

(1) Time Period

| | | | |
|--|----------|----------|------------------------|
| First 5 minutes FROM onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|--|----------|----------|------------------------|

(2) Maximum Allowable Solvent Spillage

| | | | |
|-------|------|------|------|
| 142 g | 28 g | 28 g | 28 g |
|-------|------|------|------|

III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

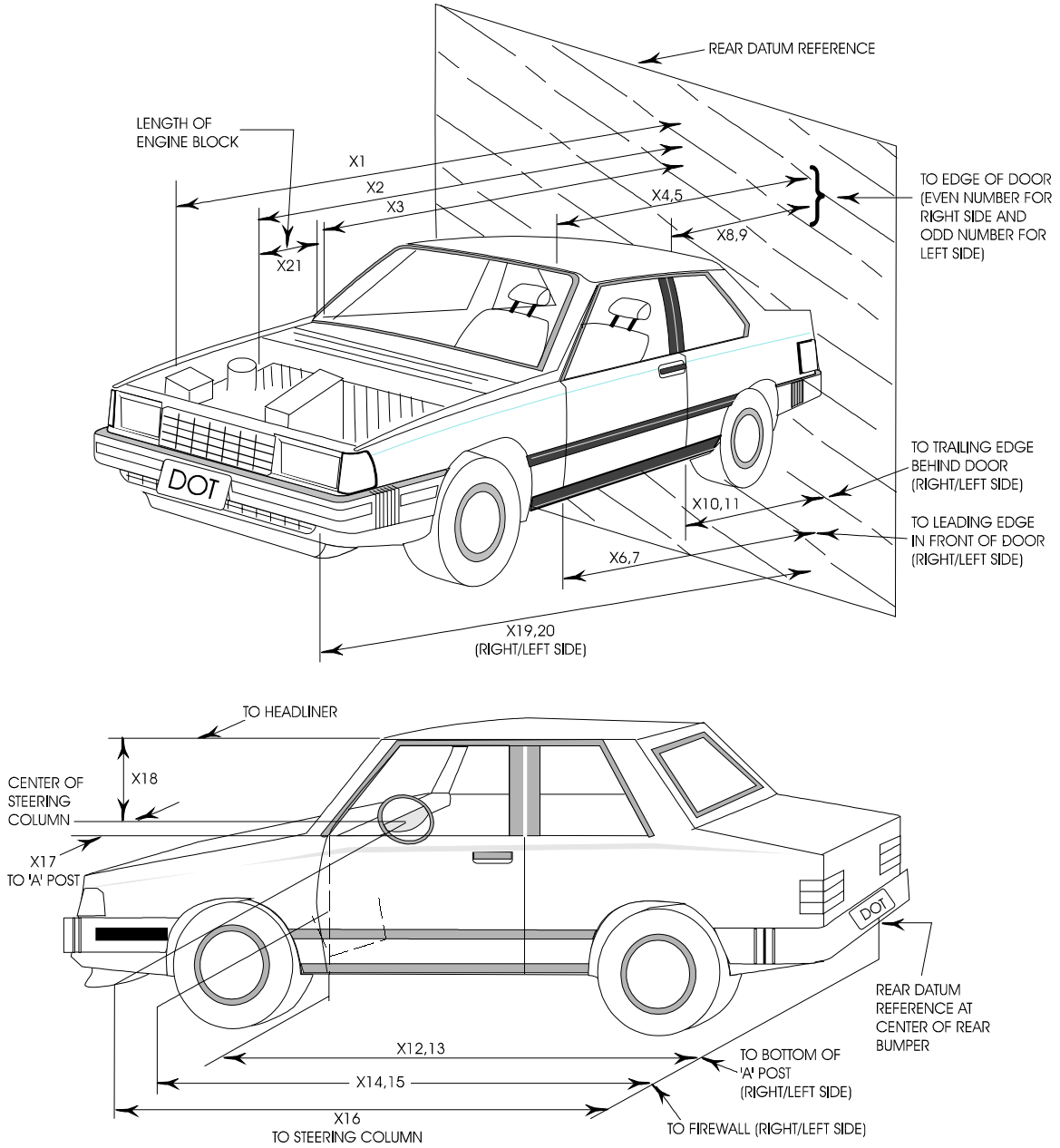
| | | | |
|-----|-----|-----|-----|
| 0 g | 0 g | 0 g | N/A |
|-----|-----|-----|-----|

Note: Record spillage for whole minute intervals only as determined above.

IV. SOLVENT SPILLAGE LOCATION(S) :

None

DATA SHEET NO. 14 TEST VEHICLE MEASUREMENTS

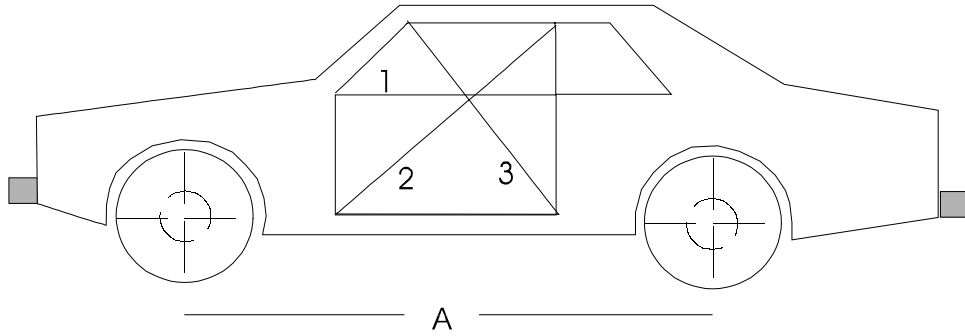


DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)

| No. | | Pre-Test | Post-Test | Difference |
|-----|--|----------|-----------|------------|
| X1 | Total Length of Vehicle at Centerline | 5089 | 4400 | 689 |
| X2 | Rear Surface of Vehicle to Front of Engine | 4429 | 4132 | 297 |
| X3 | Rear Surface of Vehicle to Firewall | 3788 | 3703 | 85 |
| X4 | Rear Surface of Vehicle to Upper Leading Edge of Right Door | 3495 | 3500 | -5 |
| X5 | Rear Surface of Vehicle to Upper Leading Edge of Left Door | 3494 | 3495 | -1 |
| X6 | Rear Surface of Vehicle to Lower Leading Edge of Right Door | 3475 | 3486 | -11 |
| X7 | Rear Surface of Vehicle to Lower Leading Edge of Left Door | 3480 | 3474 | 6 |
| X8 | Rear Surface of Vehicle to Upper Trailing Edge of Right Door | 2406 | 2412 | -6 |
| X9 | Rear Surface of Vehicle to Upper Trailing Edge of Left Door | 2408 | 2405 | 3 |
| X10 | Rear Surface of Vehicle to Lower Trailing Edge of Right Door | 2397 | 2406 | -9 |
| X11 | Rear Surface of Vehicle to Lower Trailing Edge of Left Door | 2402 | 2399 | 3 |
| X12 | Rear Surface of Vehicle to Bottom of "A" Post of Right Side | 3629 | 3618 | 11 |
| X13 | Rear Surface of Vehicle to Bottom of "A" Post of Left Side | 3625 | 3604 | 21 |
| X14 | Rear Surface of Vehicle to Firewall, Right Side | 3861 | 3785 | 76 |
| X15 | Rear Surface of Vehicle to Firewall, Left Side | 3859 | 3843 | 16 |
| X16 | Rear Surface of Vehicle to Steering Column | 3004 | 3037 | -33 |
| X17 | Center of Steering Column to "A" Post | 300 | 294 | 6 |
| X18 | Center of Steering Column to Headliner | 424 | 350 | 74 |
| X19 | Rear Surface of Vehicle to Right Side of Front Bumper | 4978 | 4421 | 557 |
| X20 | Rear Surface of Vehicle to Left Side of Front Bumper | 4976 | 4470 | 506 |
| X21 | Length of Engine Block | 429 | 429 | 0 |
| RD | Rear Surface of Vehicle to Right Side of Dash Panel | 3179 | 3180 | -1 |
| CD | Rear Surface of Vehicle to Center of Dash Panel | 3176 | 3192 | -16 |
| LD | Rear Surface of Vehicle to Left Side of Dash Panel | 3165 | 3142 | 23 |

All Dimensions in mm

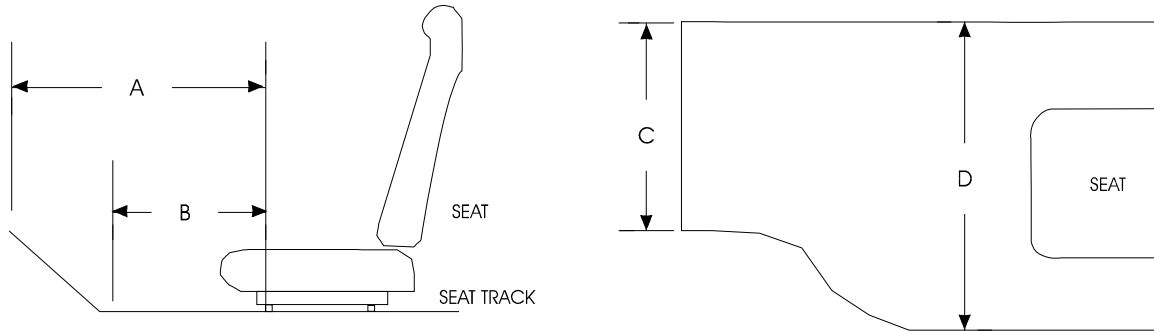
DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
 VEHICLE INTRUSION MEASUREMENTS
 DOOR OPENING WIDTH



| UNITS (mm) | LEFT | | | RIGHT | | |
|-------------|------|------|-----|-------|------|-----|
| MEASUREMENT | 1 | 2 | 3 | 1 | 2 | 3 |
| BEFORE TEST | 975 | 1434 | 938 | 976 | 1435 | 941 |
| AFTER TEST | 974 | 1437 | 940 | 976 | 1438 | 938 |
| DIFFERENCE | 1 | -3 | -2 | 0 | -3 | 3 |

| UNITS (mm) | A = WHEELBASE LEFT | A = WHEELBASE RIGHT |
|-------------|--------------------|---------------------|
| BEFORE TEST | 2809 | 2808 |
| AFTER TEST | 2723 | 2664 |
| DIFFERENCE | 86 | 144 |

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
STATIC FOOTWELL DEFORMATION



DRIVER

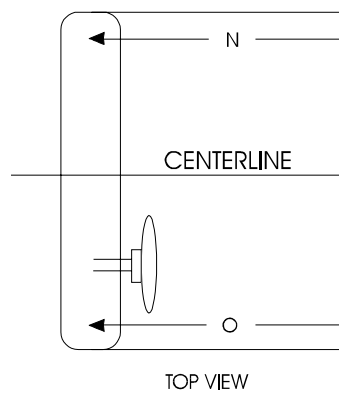
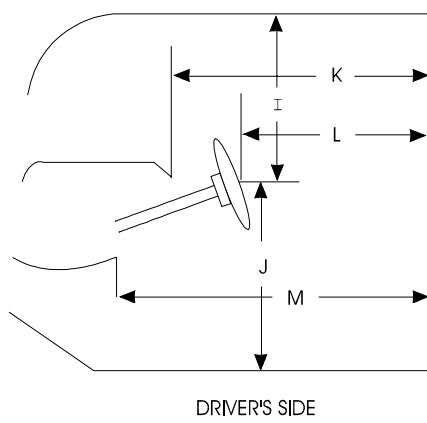
| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A | 764 | 683 | 81 |
| B | 617 | 573 | 44 |
| C | 430 | 456 | -26 |
| D | 477 | 469 | 8 |

PASSENGER

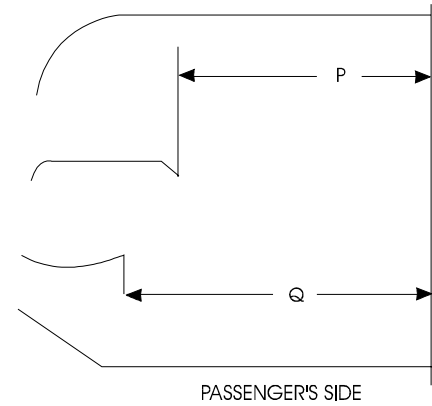
| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A | 783 | 715 | 68 |
| B | 598 | 548 | 50 |
| C | 466 | 435 | 31 |
| D | 472 | 460 | 12 |

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
VEHICLE INTRUSION MEASUREMENTS
STATIC PASSENGER COMPARTMENT INTRUSION



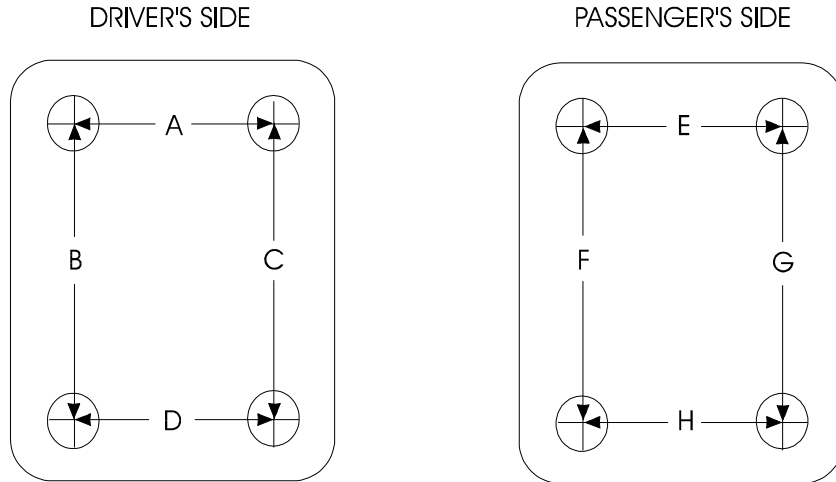
MEASUREMENTS
FROM C-PILLAR
BELT ANCHORAGE



| Measurement | Pre-Test | Post-Test | Difference |
|---------------|----------|-----------|------------|
| I | 424 | 350 | 74 |
| J | 661 | 785 | -124 |
| K | 1996 | 2008 | -12 |
| L | 1789 | 1825 | -36 |
| M | 1988 | 1964 | 24 |
| N | 1964 | 1963 | 1 |
| O | 1950 | 1930 | 20 |
| P = K (PASS.) | 2017 | 2023 | -6 |
| Q = M (PASS.) | 2023 | 2019 | 4 |

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
FLOORBOARD DEFORMATION

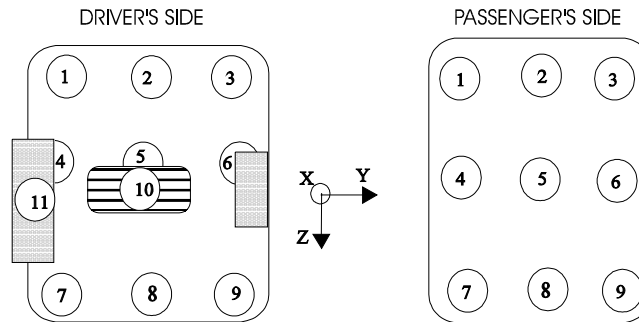


TOP VIEW THROUGH FLOOR PAN

| Measurement | Pre-Test | Post-Test | Difference |
|-------------|----------|-----------|------------|
| A | 300 | 286 | 14 |
| B | 500 | 487 | 13 |
| C | 500 | 434 | 66 |
| D | 300 | 300 | 0 |
| E | 300 | 282 | 18 |
| F | 500 | 429 | 71 |
| G | 500 | 485 | 15 |
| H | 300 | 300 | 0 |

Units = mm

DATA SHEET NO.14 VEHICLE MEASUREMENTS (cont.)
TOE-PAN INTRUSION



Driver Side Floorpan Measurements

| Floorpan Location | X Deformation (mm) | | | Z Deformation (mm) | | |
|-------------------|--------------------|-----------|------------|--------------------|-----------|------------|
| | Pre-Test | Post-Test | Difference | Pre-Test | Post-Test | Difference |
| 1 | 3720 | 3669 | 51 | -512 | -533 | 21 |
| 2 | 3734 | 3663 | 71 | -502 | -508 | 6 |
| 3 | 3733 | 3662 | 71 | -499 | -500 | 1 |
| 4 | 3668 | 3625 | 43 | -398 | -404 | 6 |
| 5 | 3684 | 3636 | 48 | -370 | -393 | 23 |
| 6 | 3678 | 3634 | 44 | -371 | -385 | 14 |
| 7 | 3583 | 3559 | 24 | -302 | -309 | 7 |
| 8 | 3587 | 3553 | 34 | -303 | -301 | -2 |
| 9 | 3578 | 3518 | 60 | -305 | -291 | -14 |
| 10 | 3544 | 3454 | 90 | -483 | -497 | 14 |
| 11 | 3562 | 3526 | 36 | -419 | -415 | -4 |

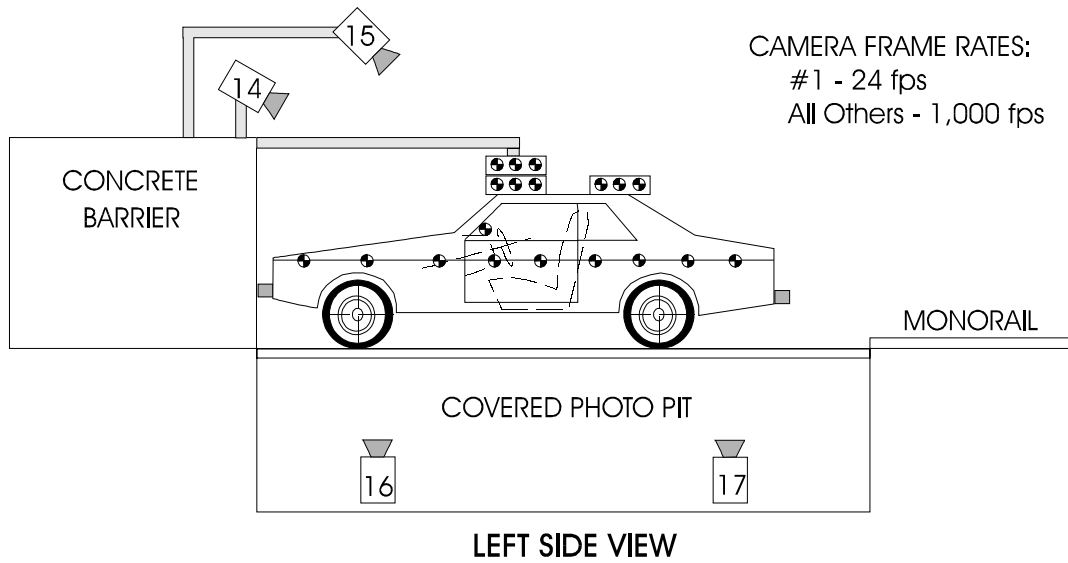
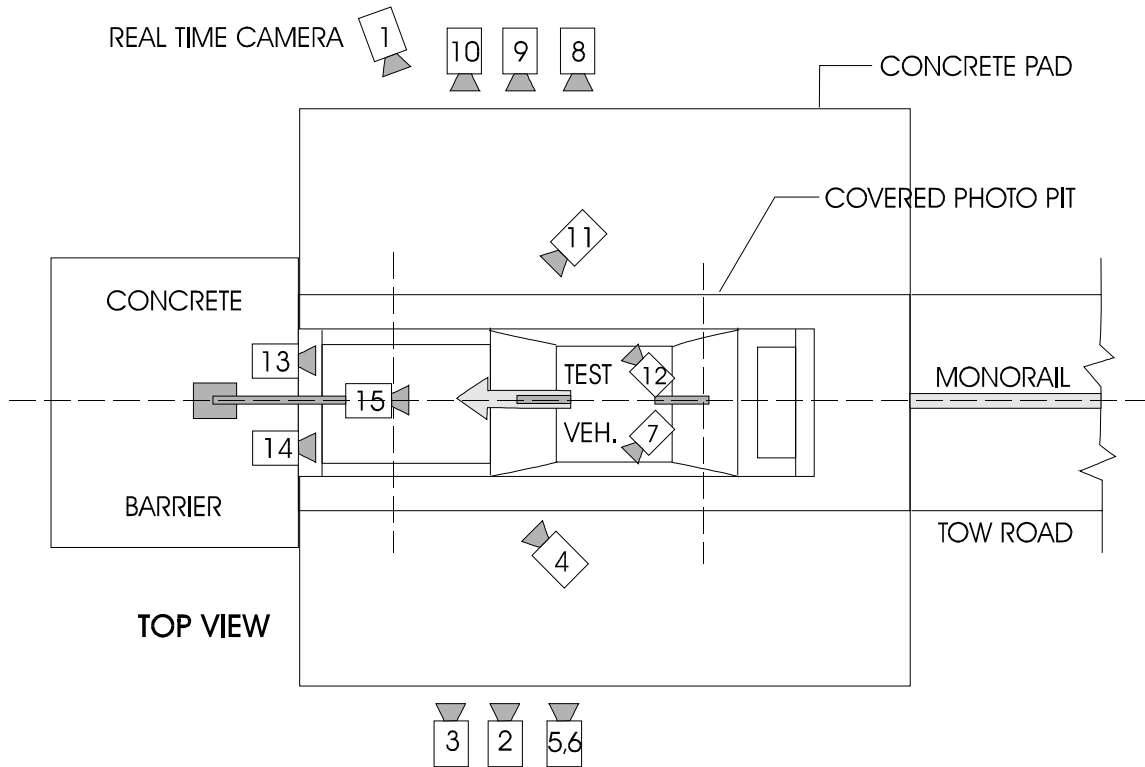
Passenger Side Floorpan Measurements

| Floorpan Location | X Deformation (mm) | | | Z Deformation (mm) | | |
|-------------------|--------------------|-----------|------------|--------------------|-----------|------------|
| | Pre-Test | Post-Test | Difference | Pre-Test | Post-Test | Difference |
| 1 | 3752 | 3647 | 105 | -438 | -497 | 59 |
| 2 | 3754 | 3700 | 54 | -446 | -489 | 43 |
| 3 | 3590 | 3563 | 27 | -470 | -492 | 22 |
| 4 | 3639 | 3575 | 64 | -375 | -418 | 43 |
| 5 | 3648 | 3594 | 54 | -368 | -424 | 56 |
| 6 | 3545 | 3521 | 24 | -365 | -381 | 16 |
| 7 | 3563 | 3512 | 51 | -276 | -318 | 42 |
| 8 | 3568 | 3532 | 36 | -271 | -309 | 38 |
| 9 | 3492 | 3483 | 9 | -266 | -275 | 9 |

Reference: X = Rear Bumper; Z = Ground

DATA SHEET NO.15 HIGH-SPEED CAMERA LOCATIONS

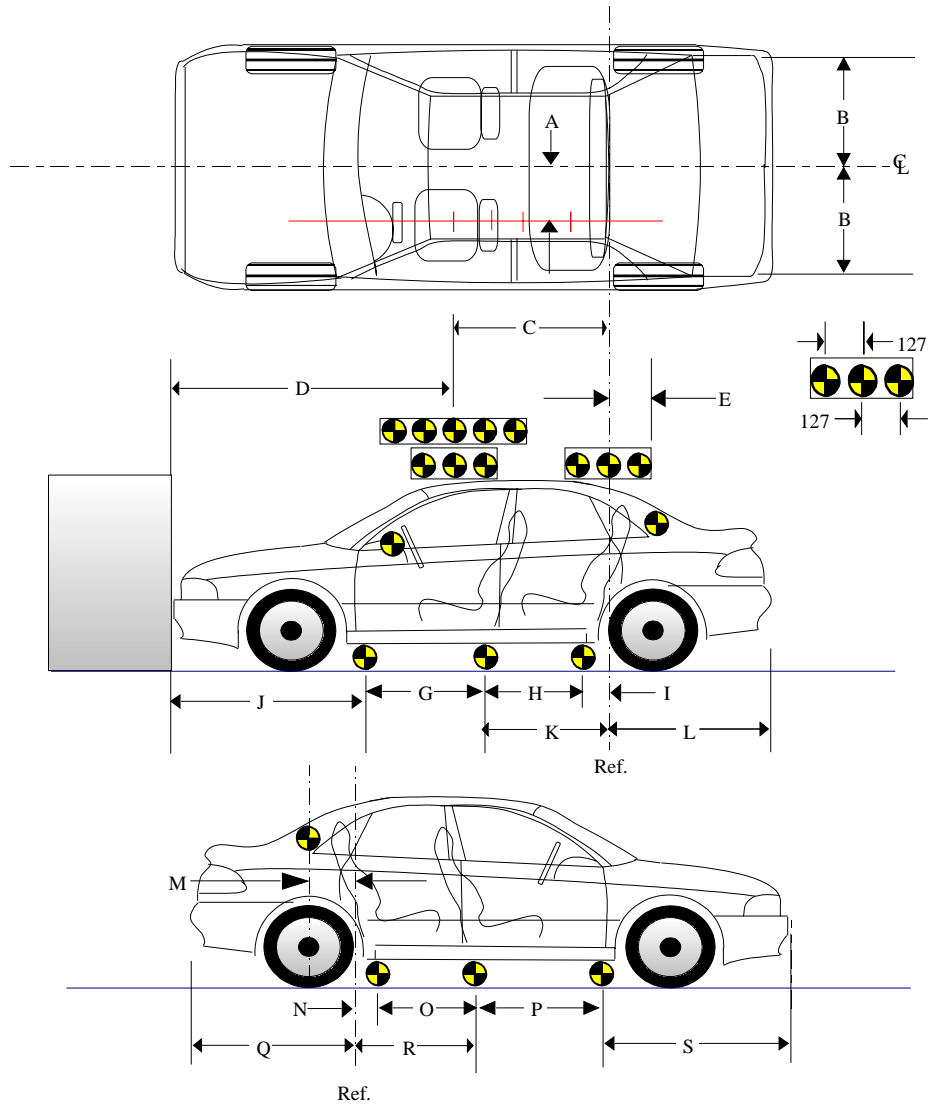
NOTE: Camera information shown in DATA SHEET NO. 15.



DATA SHEET NO. 16 VEHICLE REFERENCE PHOTO TARGET LOCATIONS

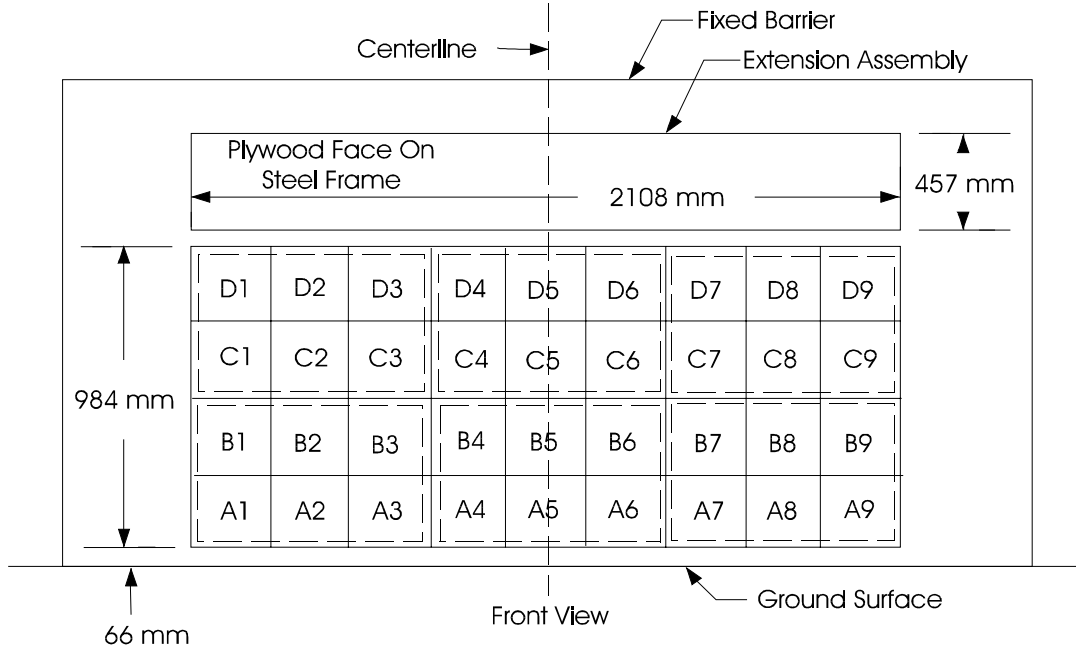
(Dimensions in millimeters)

| | |
|---|------|
| A | 356 |
| B | 671 |
| C | 907 |
| D | 2591 |
| E | 378 |
| F | 1589 |
| G | 947 |
| H | 951 |
| I | 117 |
| J | 1521 |
| K | 1068 |
| L | 1554 |
| M | 377 |
| N | 115 |
| O | 946 |
| P | 958 |
| Q | 1550 |
| R | 1061 |
| S | 1520 |



DATA SHEET NO. 17 LOAD CELL LOCATIONS ON FIXED BARRIER

- 36 Load Cells
- 4 Rows
- 9 Columns
- 6 Groupings (6 cells/group)



6 GROUPS OF 6 LOAD CELLS EACH

| | | |
|-----------------------|-----------------------|-----------------------|
| Group 4 C1 thru D3 | Group 5 C4 thru D6 | Group 6 C7 thru D9 |
| Group 1 A1 thru B3 | Group 2 A4 thru B6 | Group 3 A7 thru B9 |

The following data is presented in Appendix B:

- (1) Data from 36 individual load cells
- (2) Total or Sum of 36 individual load cells
- (3) Data from 6 Groupings shown above (6 cells/group)

DATA SHEET NO. 18 POST TEST AIR BAG DATA

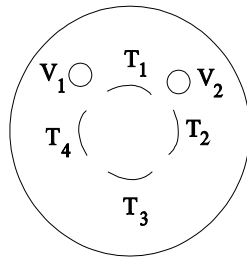
NHTSA No. : M10102; Test Date: November 13, 2000; Technician: Lawrence Q. Valvo

Vehicle Model Year/Make/Model: 2001 Chevrolet Impala

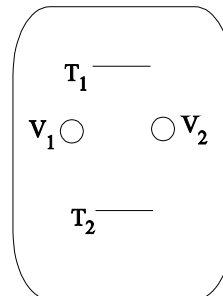
- A. No. of vent holes: 2 -Driver 2 -Passenger
- B. Size of vent holes: (mm²) 962 -Driver 1590 -Passenger
- C. Total vent area: (mm²) 1924 -Driver 3180 -Passenger
- D. Deflated air bag length and width dimensions or, if round, diameter. (mm)
- Driver: - -Length; 650 -Diameter; 290 -Depth
- Passenger: 650 -Height; 375 -Width; 570 -Depth
- E. Is the air bag tethered?
- Driver: X -Yes; - -No; If yes, record length of tether- 300
- Passenger: X -Yes; - -No; If yes, record length of tether- 580

Sketch the air bag showing the location of the vent holes, how the bag is tethered, and where the bag is tethered. Also describe how the tethers are attached to the bag and the steering wheel.
(Note: Not to scale; V_n = Vent hole_n, T_n = Tether_n).

Driver



Passenger



- F. Record part numbers and manufacturer name of the air bag and gas generator.

Driver: Air bag: 16824055-01; GMX-35; TRCA00520154
 Generator: AB6303Q2STKGZF

Passenger: Air bag: 121504-11; GTXL8N02BJV
 Generator: AL630812257W0833; 10426308; GLY L9D 40 BUK

DATA SHEET NO. 19 ACCIDENT INVESTIGATION DIVISION DATA

FOR 56.3 KPH FRONTAL BARRIER IMPACT

Vehicle Make/Model/Body Style: Chevrolet Impala 4-Door Sedan

NHTSA Test No.: M10102 VIN: 2G1WF52E819168080

Model Year: 2001 Build Date: 09/00 Test Date: November 13, 2000

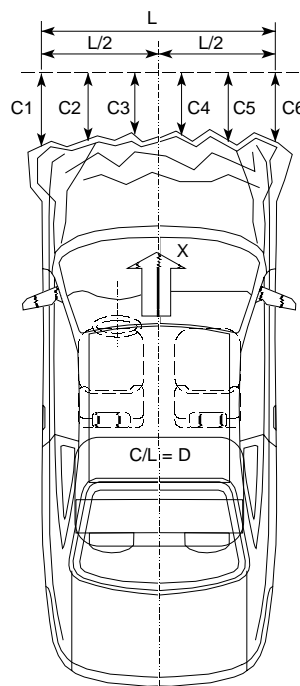
Vehicle Size Category: Large Test Weight: 1788.0 kg

Vehicle Wheelbase: 2809 mm; Front Overhang: 1071 mm; Overall Width: 1854 mm

Collision Deformation Classification (CDC) Code: 12FDEW3

Crush Depth Dimensions:

| | PRE | POST | DIFF | |
|------|------|------|------|----|
| C1 = | 4906 | 4441 | 465 | mm |
| C2 = | 5021 | 4473 | 548 | mm |
| C3 = | 5078 | 4440 | 638 | mm |
| C4 = | 5078 | 4413 | 665 | mm |
| C5 = | 5023 | 4414 | 609 | mm |
| C6 = | 4905 | 4400 | 505 | mm |



Midpoint of Damage: $D = \frac{\text{Vehicle Centerline}}{\text{(Longitudinal)}}$

Length of Damaged Region:

L1= 1854 mm
 L2= 927 mm
 L3= 618 mm

APPENDIX A
PHOTOGRAPHS

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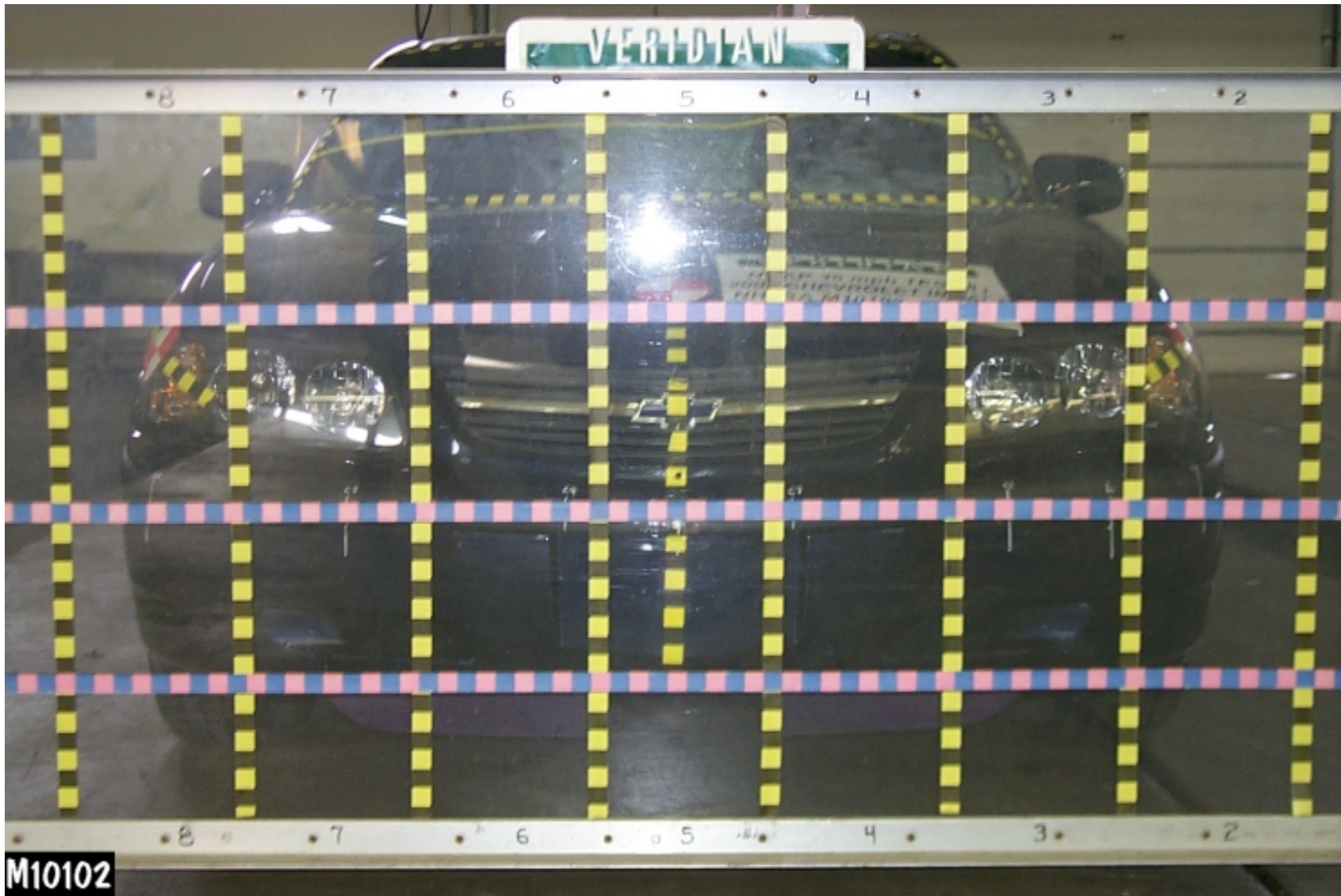


Figure A-1: LOAD CELL LOCATIONS.



Figure A-2: PRE-TEST FRONT VIEW



M10102

Figure A-3: POST-TEST FRONT VIEW.



Figure A-4: PRE-TEST LEFT SIDE VIEW



M10102

Figure A-5: POST-TEST LEFT SIDE VIEW



M10102

Figure A-6: PRE-TEST RIGHT SIDE VIEW



Figure A-7: POST-TEST RIGHT SIDE VIEW



Figure A-8: PRE-TEST RIGHT FRONT THREE-QUARTER VIEW



M10102

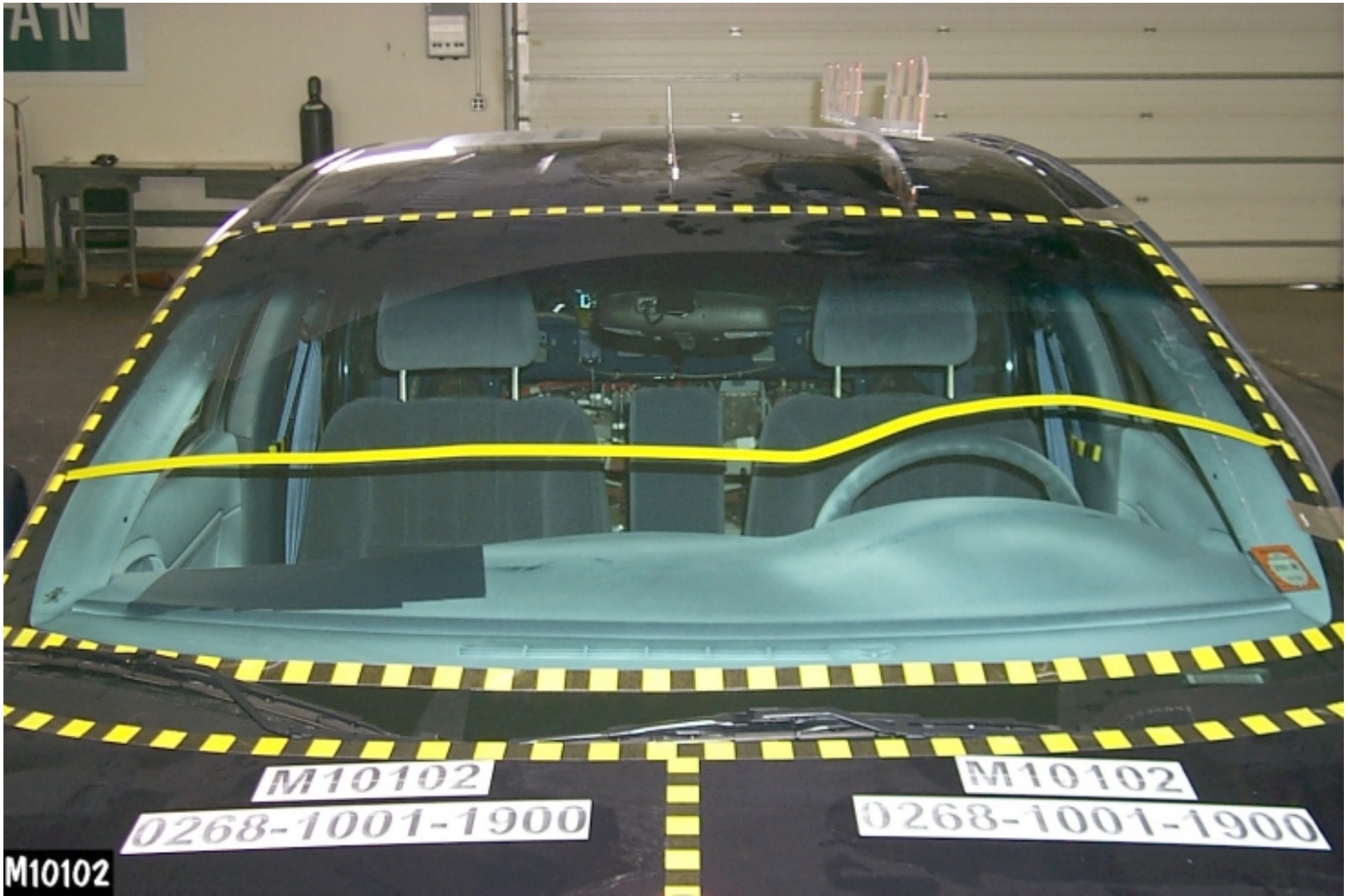
Figure A-9: POST-TEST RIGHT FRONT THREE-QUARTER VIEW



Figure A-10: PRE-TEST LEFT REAR THREE-QUARTER VIEW



Figure A-11: POST-TEST LEFT REAR THREE-QUARTER VIEW



A-14

8602-1

Figure A-12: PRE-TEST WINDSHIELD VIEW



Figure A-13: POST-TEST WINDSHIELD VIEW



A-16

8602-1

Figure A-14: PRE-TEST ENGINE COMPARTMENT VIEW



Figure A-15: FUEL CAP VIEW



A-18

8602-1

Figure A-16: PRE-TEST FRONT UNDERBODY VIEW



Figure A-17: POST-TEST FRONT UNDERBODY VIEW



A-20

8602-1

Figure A-18: PRE-TEST FRONT SIDE UNDERBODY VIEW



A-21

8602-1

M10102

Figure A-19: POST-TEST FRONT SIDE UNDERBODY VIEW



M10102

Figure A-20: PRE-TEST REAR UNDERBODY VIEW



A-23

8602-1

M10102

Figure A-21: POST-TEST REAR UNDERBODY VIEW



A-24

8602-1

Figure A-22: PRE-TEST DRIVER POSITION VIEW



A-25

8602-1

Figure A-23: POST-TEST DRIVER POSITION VIEW



A-26

8602-1

Figure A-24: PRE-TEST PASSENGER POSITION VIEW



A-27

8602-1

Figure A-25: POST-TEST PASSENGER POSITION VIEW



Figure A-26: PRE-TEST DRIVER AND INTERIOR VIEW



Figure A-27: POST-TEST DRIVER AND INTERIOR VIEW



Figure A-28: PRE-TEST PASSENGER AND INTERIOR VIEW



A-31

8602-1

Figure A-29: POST-TEST PASSENGER AND INTERIOR VIEW



Figure A-30: PRE-TEST DRIVER HEAD LOCATION



Figure A-31: POST-TEST DRIVER HEAD LOCATION



Figure A-32: PRE-TEST PASSENGER HEAD LOCATION



A-35

8602-1

Figure A-33: POST-TEST PASSENGER HEAD LOCATION



Figure A-34: PRE-TEST DRIVER FLOOR PAN VIEW



Figure A-35: POST-TEST DRIVER FLOOR PAN VIEW

A-38

8602-1

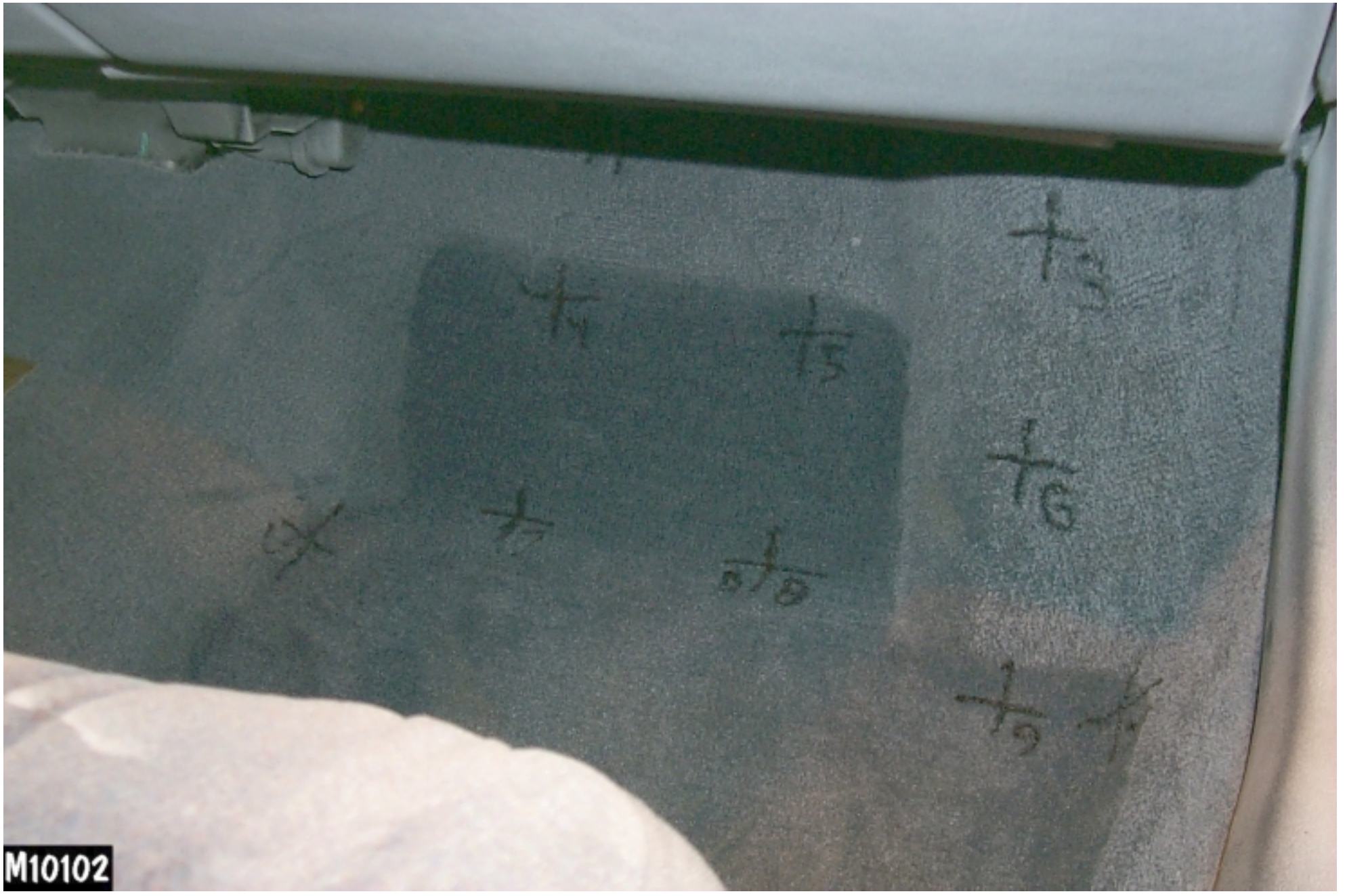


Figure A-36: PRE-TEST PASSENGER FLOOR PAN VIEW

A-39

8602-1



Figure A-37: POST-TEST PASSENGER FLOOR PAN VIEW



A-40

8602-1

Figure A-38: ROLLOVER VIEW



Figure A-39: IMPACT VIEW

APPENDIX B

DUMMY, VEHICLE AND LOAD CELL BARRIER RESPONSE DATA

**Hybrid III Dummy Sign Conventions
Load Cells and Special Transducers**

| Transducer | SAE Sign Convention (positive unless noted) |
|---|--|
| Upper Neck Load Cell | Fx Head rearward Fy Head left Fz Neck in tension Mx Left ear to left shoulder My Chin to chest (flexion) Mz Chin to left shoulder (look left) |
| Chest Displacement Potentiometer | Compression is negative |
| Pelvic Load Cell (Lower Lumbar) | Fx Chest rearward Fy Chest left Fz Spine in tension |
| Femur Load Cell | Compression is negative |
| Upper Tibia Load Cell (right and left leg) | Mx Support tibia at ends, load left side center My Support tibia at ends, load front (shin) center |
| Lower Tibia Load Cell (right and left leg) | Fz Tibia in tension Mx Support tibia at ends, load left side center My Support tibia at ends, load front (shin) center |

DATA CHANNEL FILTER CLASS SUMMARY

NHTSA TEST NO. M10102

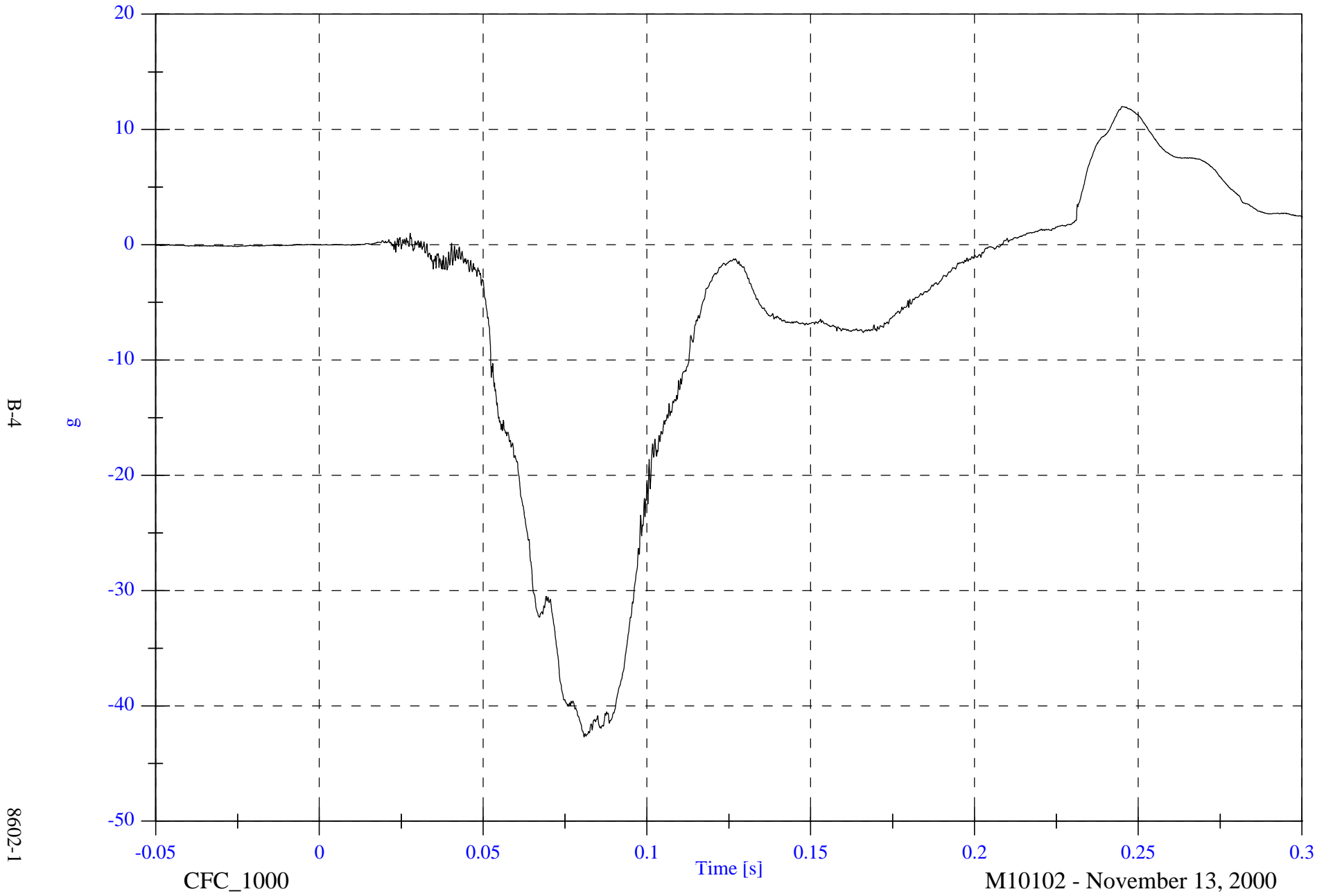
| DATA TYPE | SAE FILTER CLASS (Hz) |
|-----------------------------------|------------------------------|
| Dummy Head Accelerations | 1000 |
| Dummy Chest Accelerations | 180 |
| Dummy Chest Displacements | 60 |
| Dummy Femur Forces | 600 |
| Dummy Belt Loads | 60 |
| Dummy Belt Displacements | 180 |
| Dummy Neck Forces | 1000 |
| Dummy Neck Moments | 600 |
| Vehicle Accelerations | 60 |
| Vehicle Velocity Integrations | 180 |
| Vehicle Displacement Integrations | 180 |
| Load Cell Barrier Forces | 60 |

NCAP Test 1 - 2001 Chevrolet Impala

P1 Head x

Max: 12.0 [g] at 0.245 [s]

Min: -42.7 [g] at 0.081 [s]



B-4

g

8602-1

CFC_1000

Time [s]

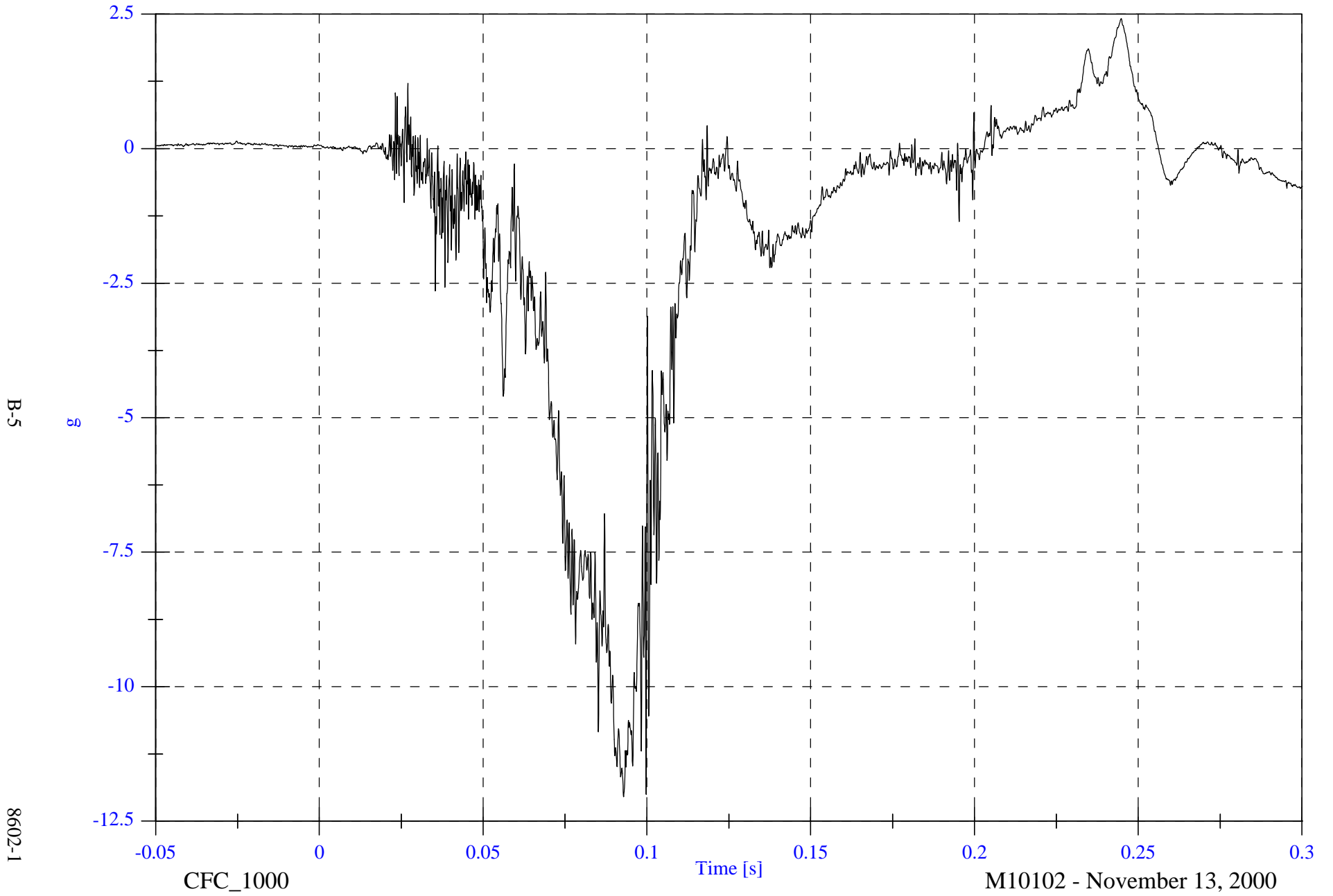
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 2.4 [g] at 0.245 [s]

Min: -12.0 [g] at 0.093 [s]

P1 Head y



NCAP Test 1 - 2001 Chevrolet Impala

P1 Head z

Max: 17.9 [g] at 0.078 [s]
Min: -4.2 [g] at 0.104 [s]



B-6

g

8602-1

CFC_1000

Time [s]

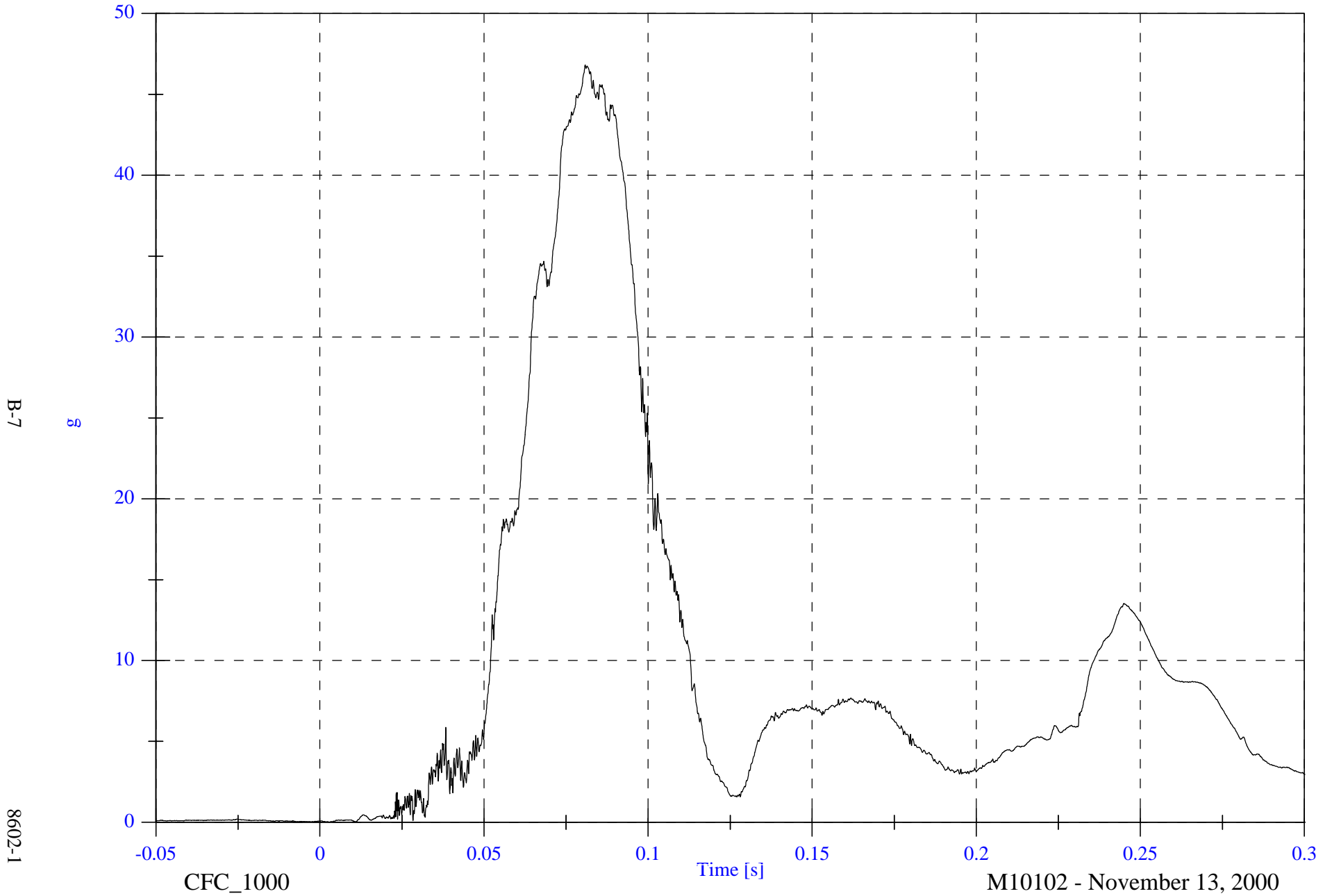
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Head Resultant

Max: 46.8 [g] at 0.081 [s]

Min: 0.0 [g] at 0.003 [s]



B-7

g

8602-1

CFC_1000

Time [s]

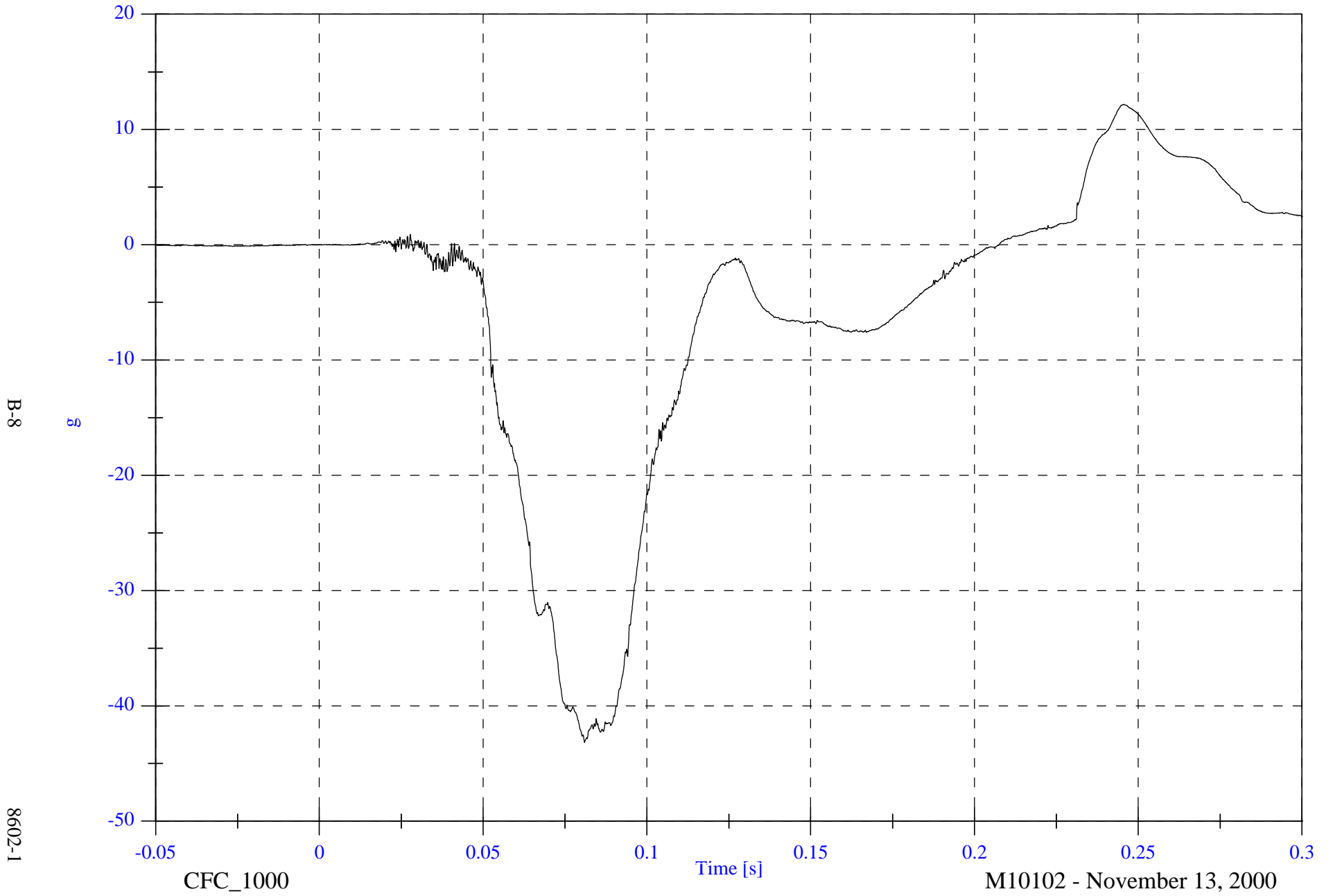
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Head Red x

Max: 12.2 [g] at 0.246 [s]

Min: -43.2 [g] at 0.081 [s]

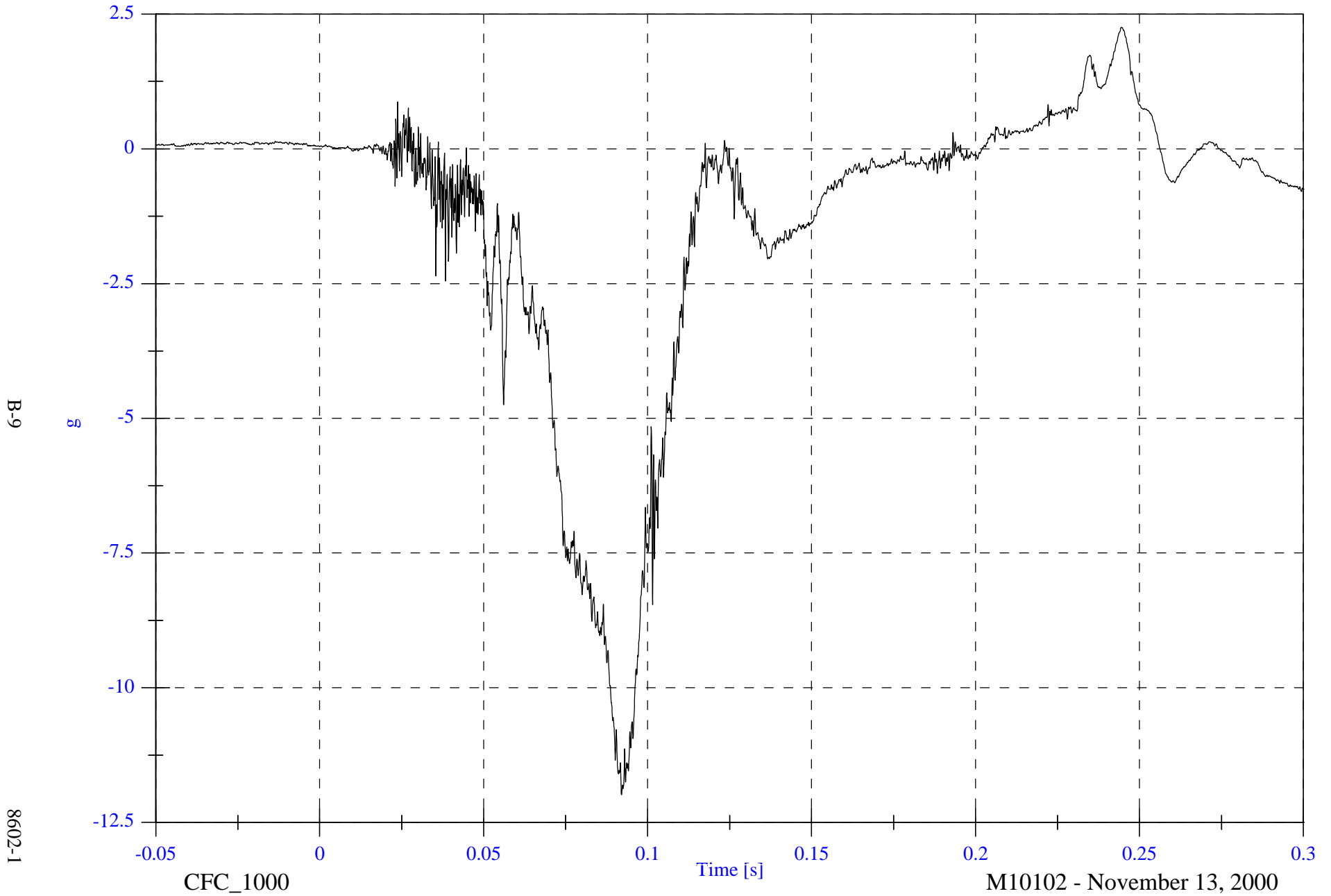


NCAP Test 1 - 2001 Chevrolet Impala

P1 Head Red y

Max: 2.3 [g] at 0.244 [s]

Min: -12.0 [g] at 0.092 [s]

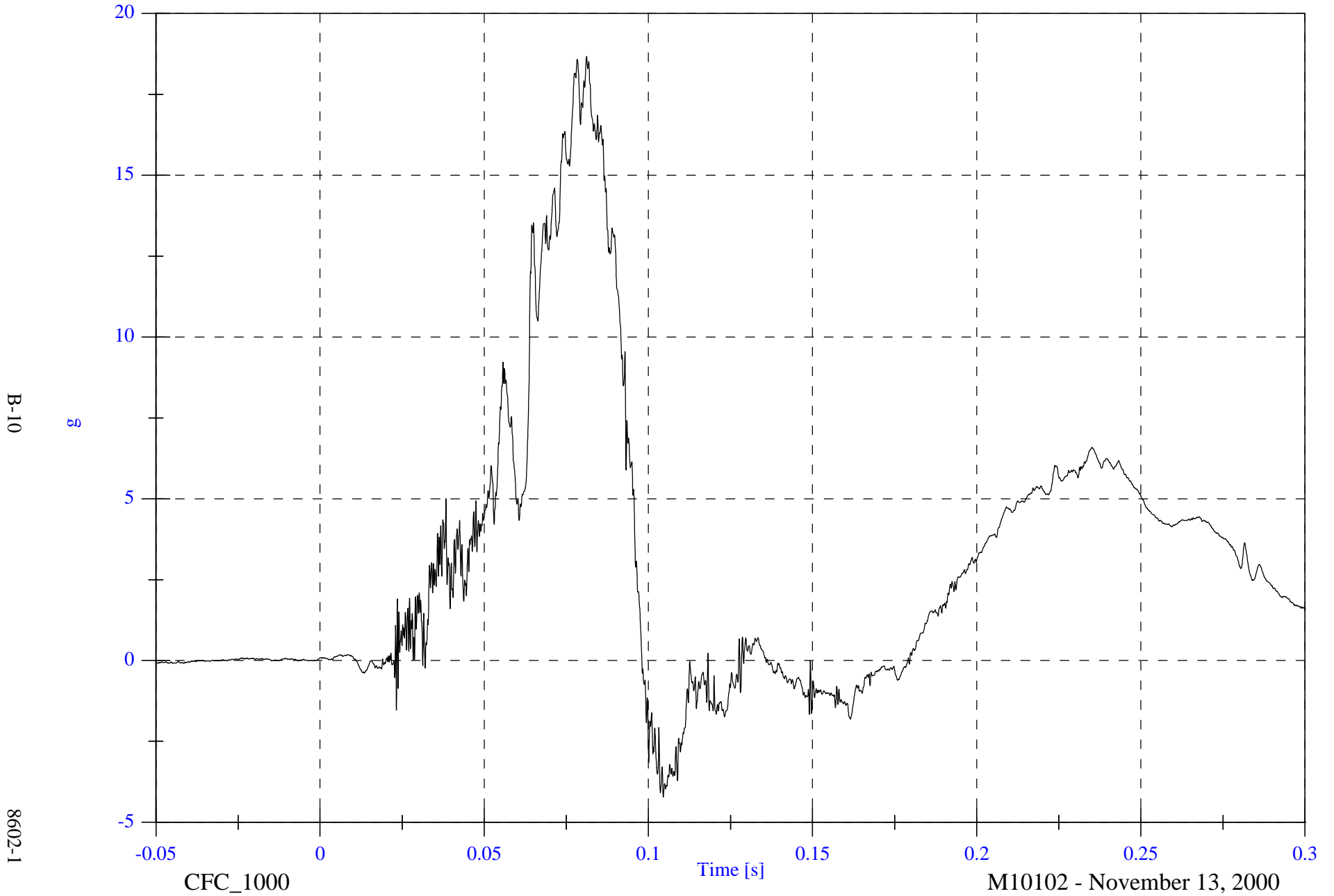


NCAP Test 1 - 2001 Chevrolet Impala

P1 Head Red z

Max: 18.7 [g] at 0.081 [s]

Min: -4.2 [g] at 0.105 [s]



B-10

8602-1

CFC_1000

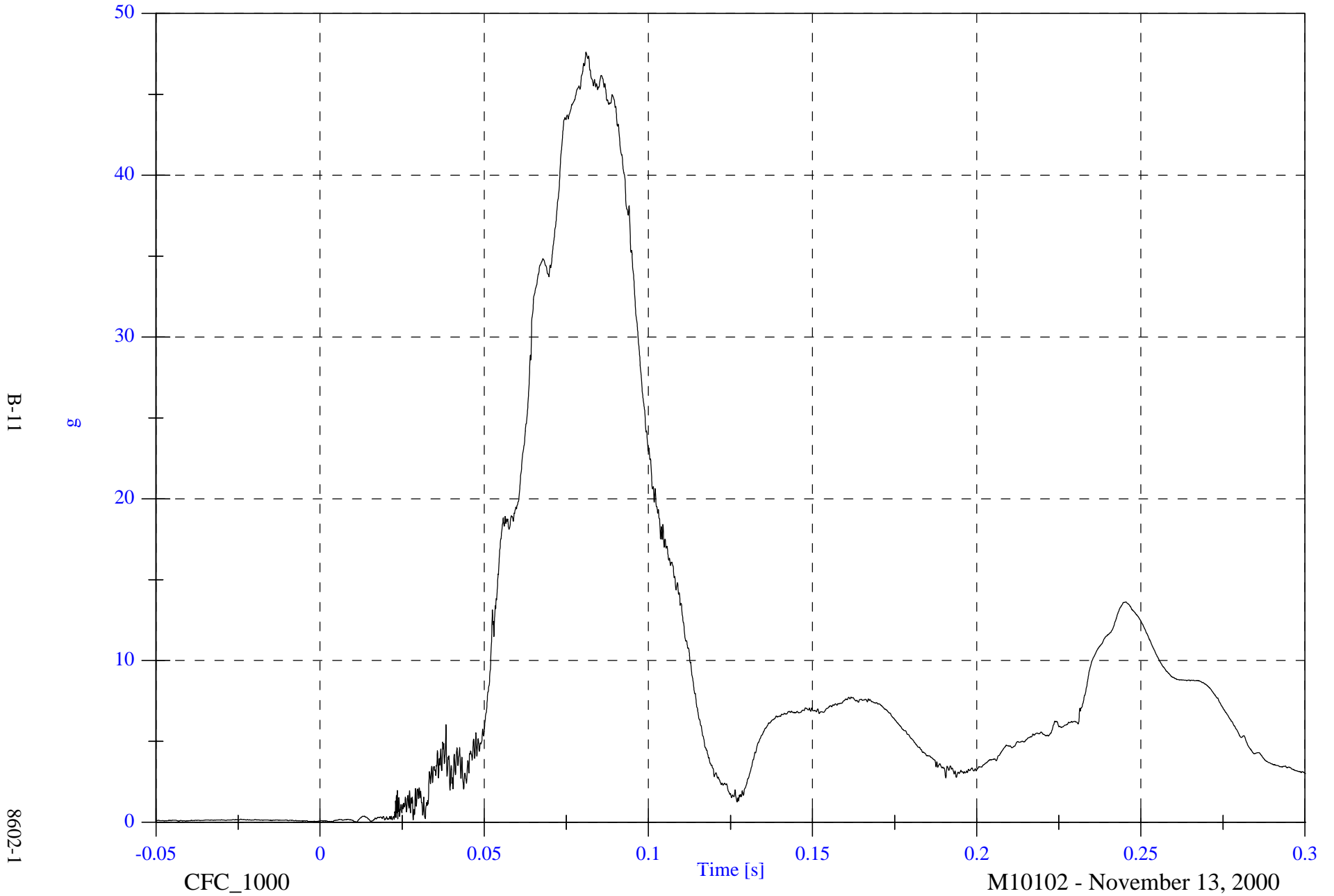
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Head Red Resultant

Max: 47.6 [g] at 0.081 [s]

Min: 0.0 [g] at 0.011 [s]

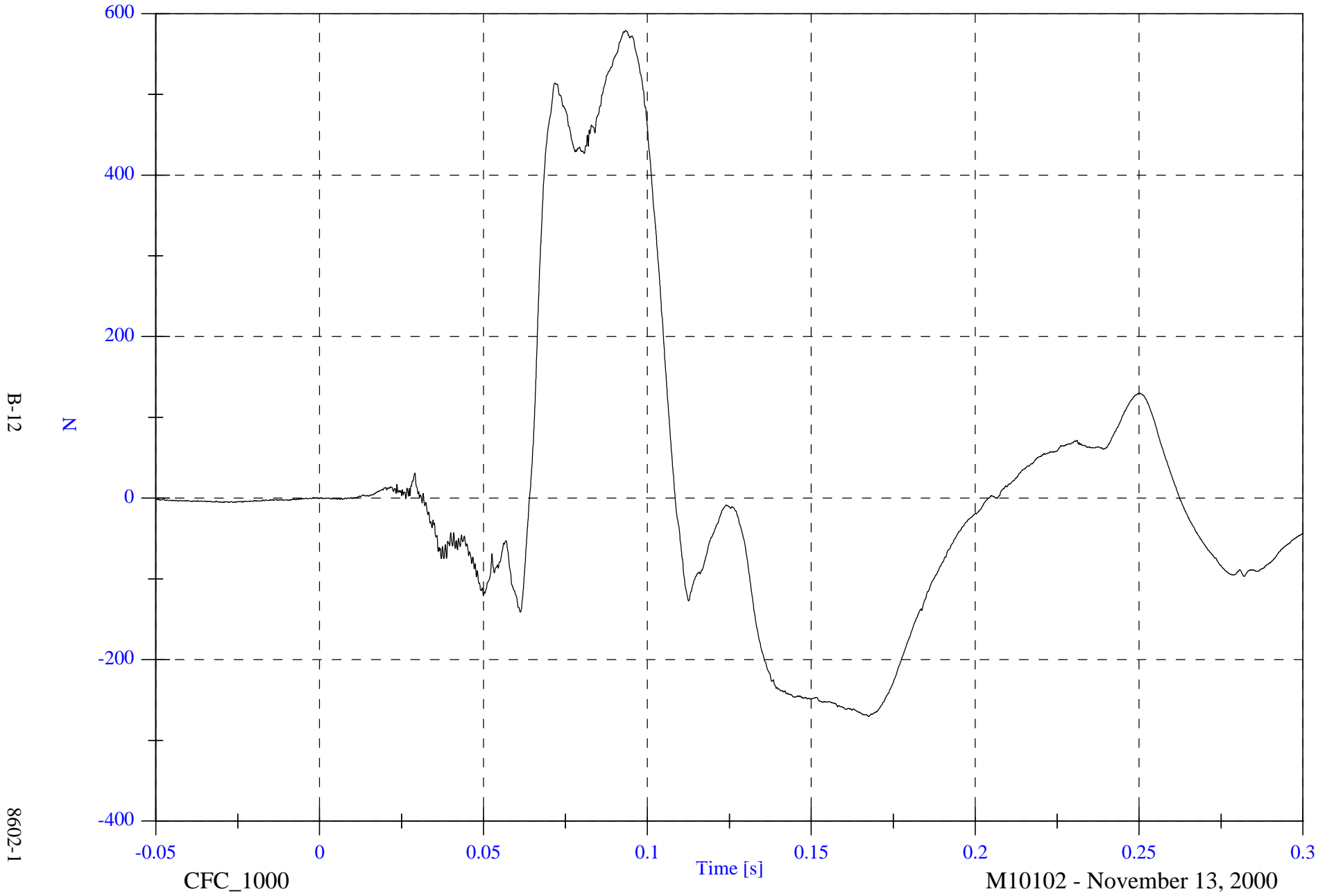


NCAP Test 1 - 2001 Chevrolet Impala

P1 Upper Neck Fx

Max: 579.0 [N] at 0.093 [s]

Min: -270.6 [N] at 0.167 [s]



B-12

8602-1

CFC_1000

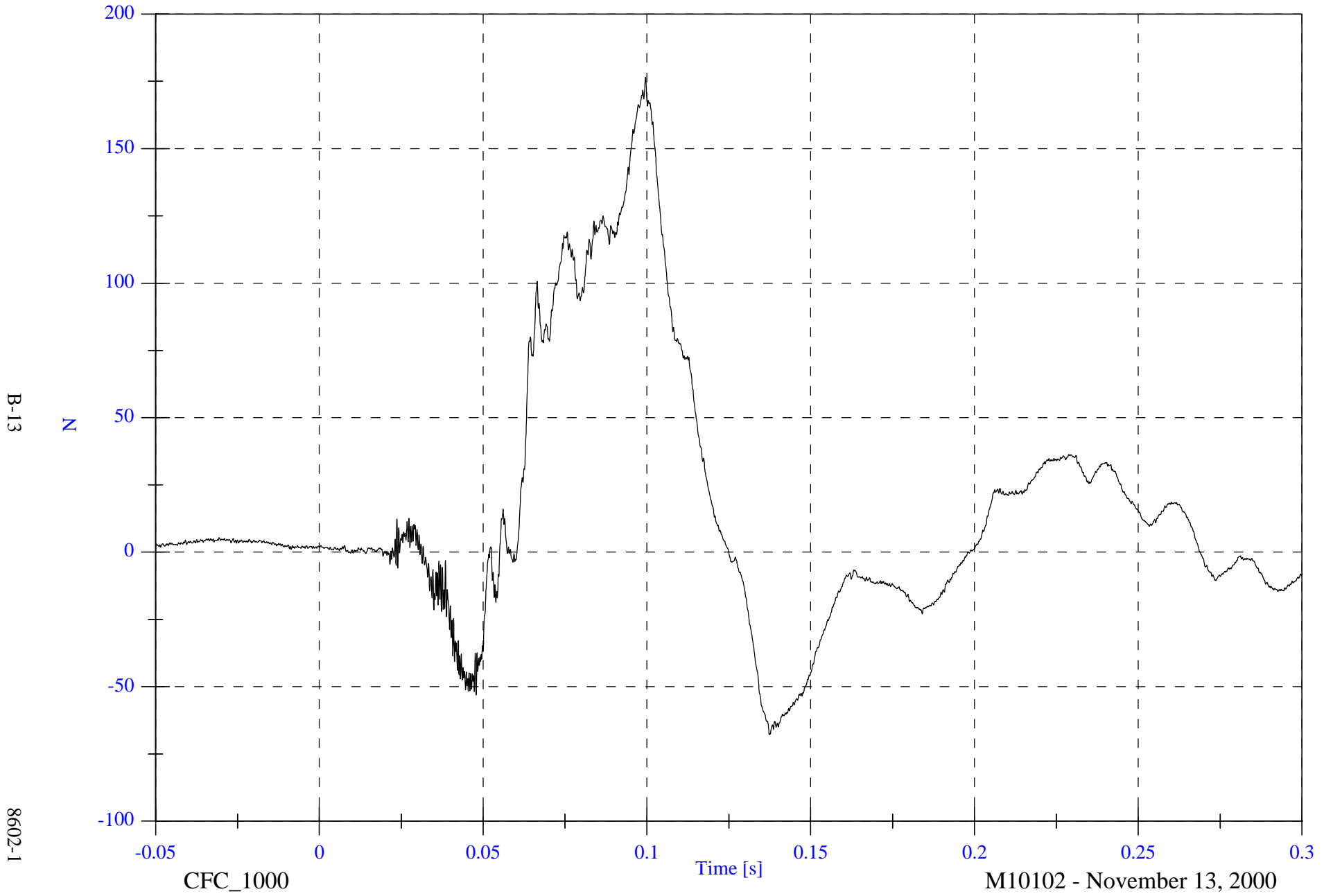
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 176.6 [N] at 0.100 [s]

Min: -67.9 [N] at 0.137 [s]

P1 Upper Neck Fy

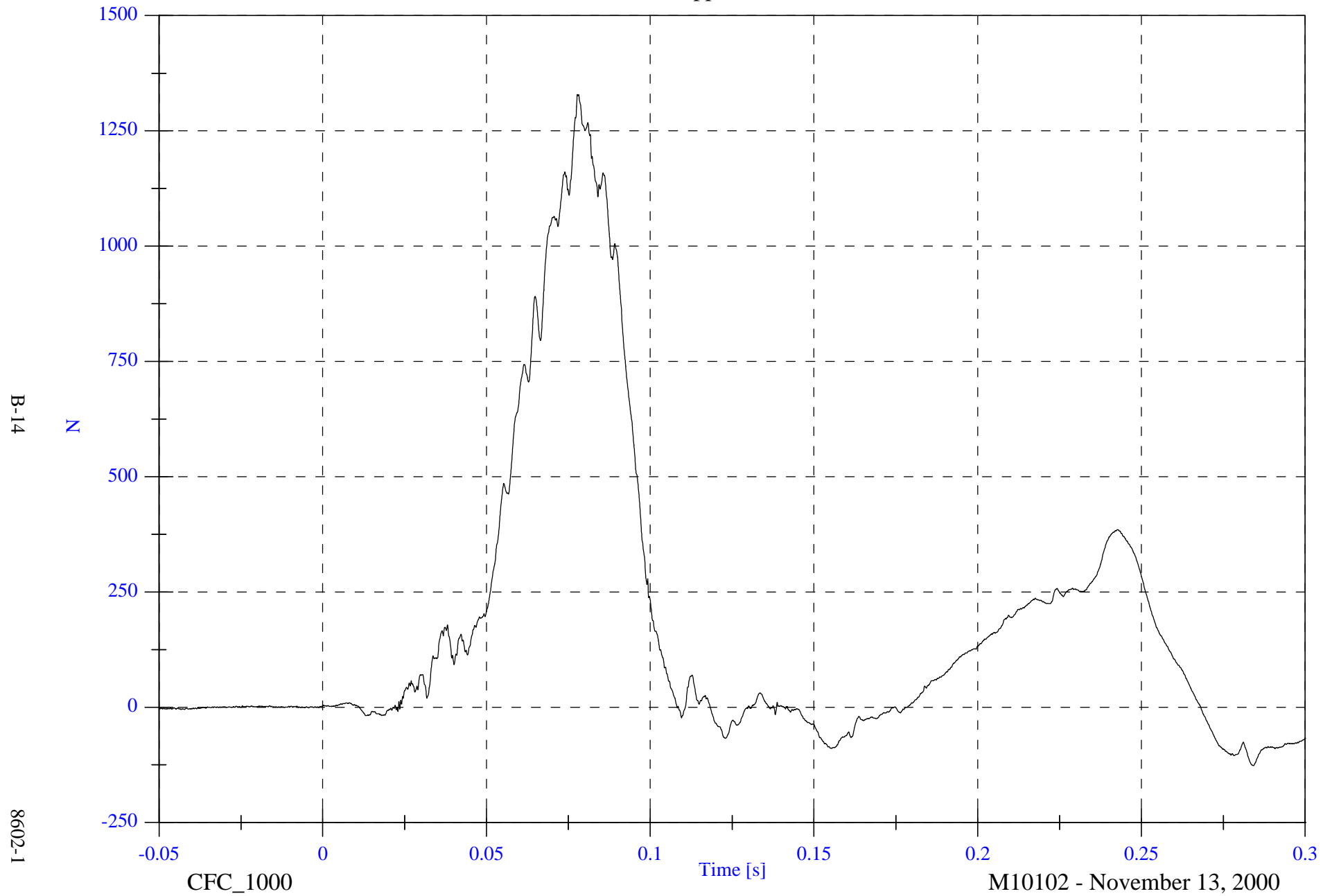


NCAP Test 1 - 2001 Chevrolet Impala

P1 Upper Neck Fz

Max: 1329.1 [N] at 0.078 [s]

Min: -126.8 [N] at 0.284 [s]



B-14

N

8602-1

CFC_1000

Time [s]

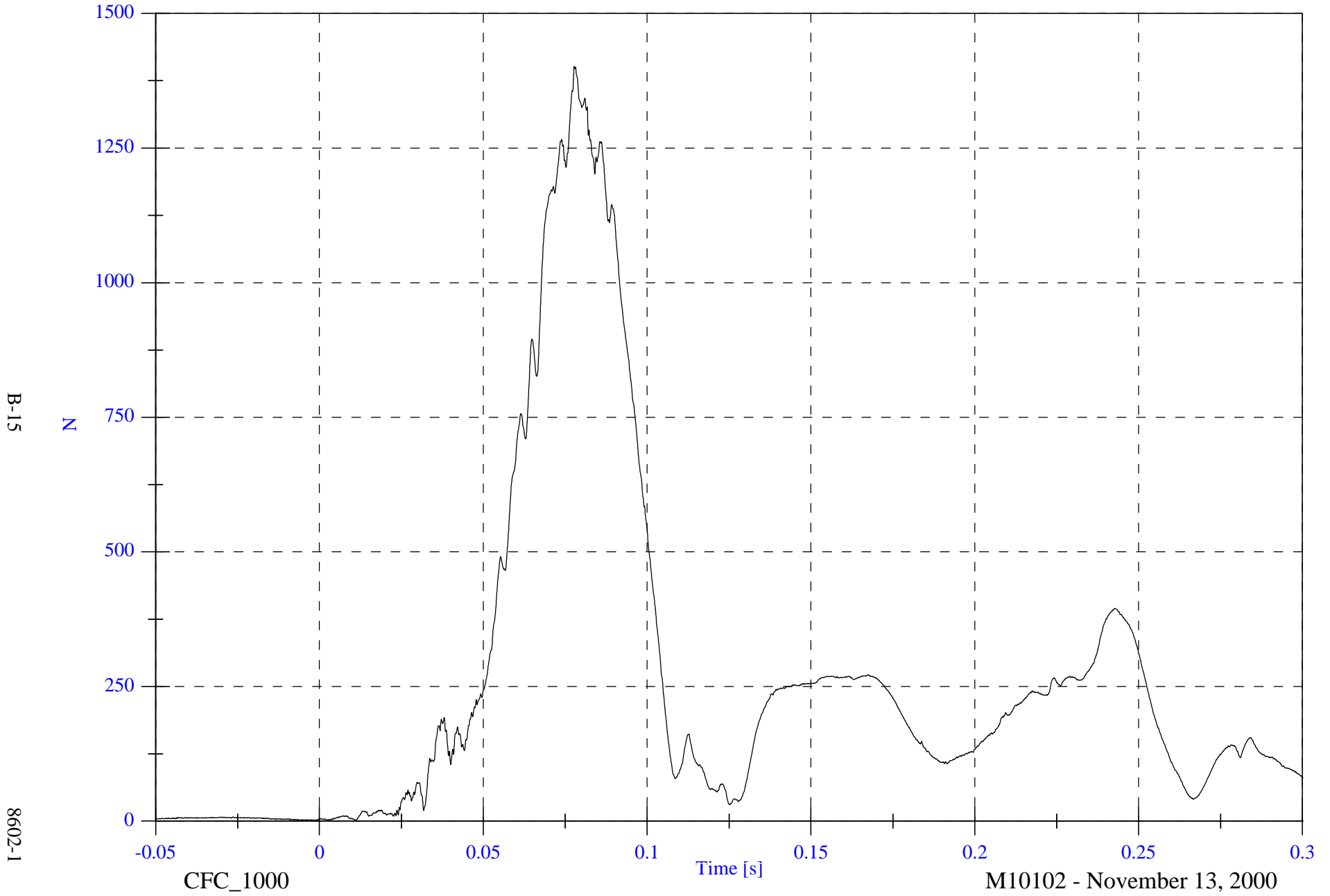
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Upper Neck F Resultant

Max: 1401.6 [N] at 0.078 [s]

Min: 0.8 [N] at 0.011 [s]



B-15

8602-1

CFC_1000

Time [s]

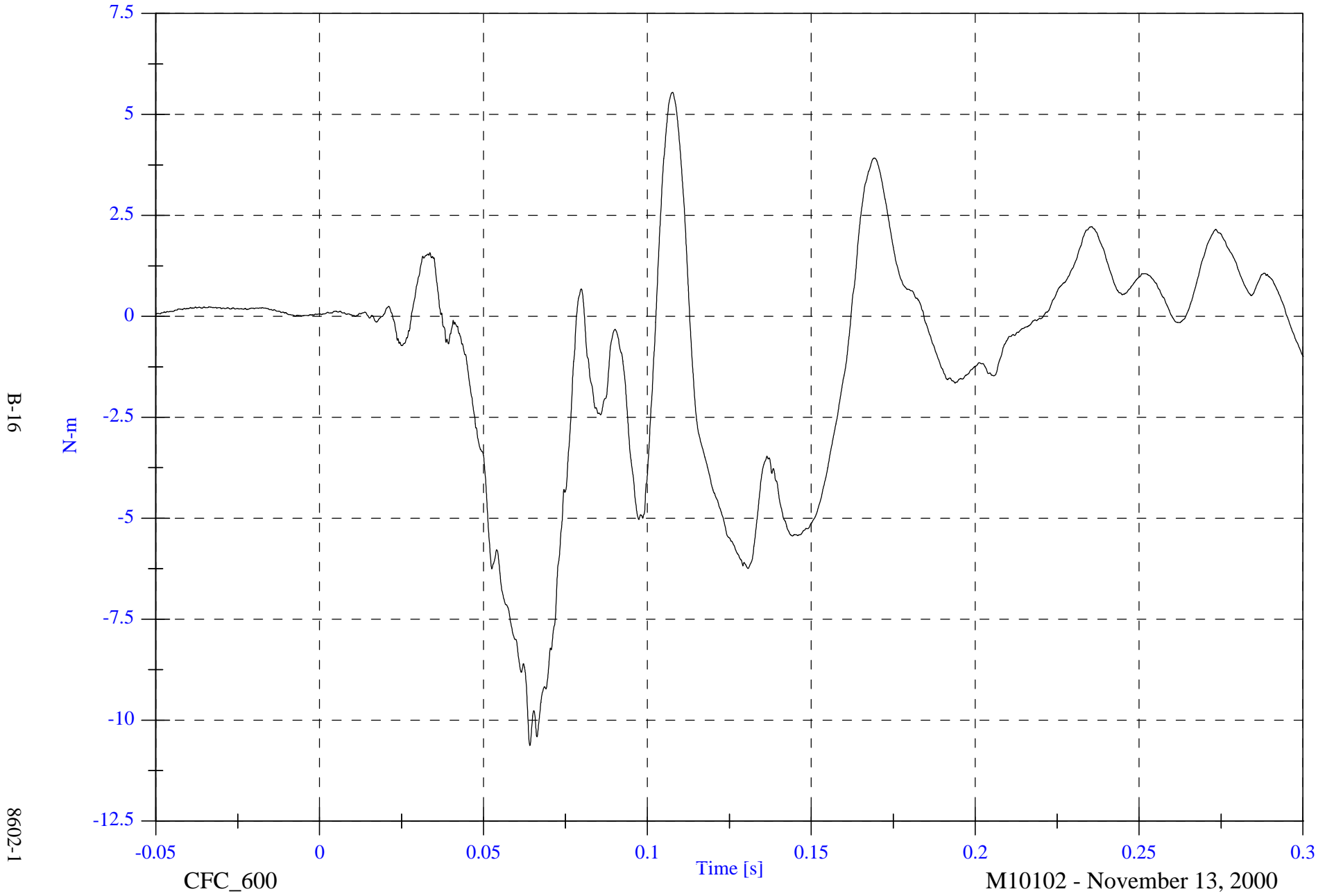
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Upper Neck Mx

Max: 5.5 [N-m] at 0.108 [s]

Min: -10.6 [N-m] at 0.064 [s]



B-16

8602-1

CFC_600

Time [s]

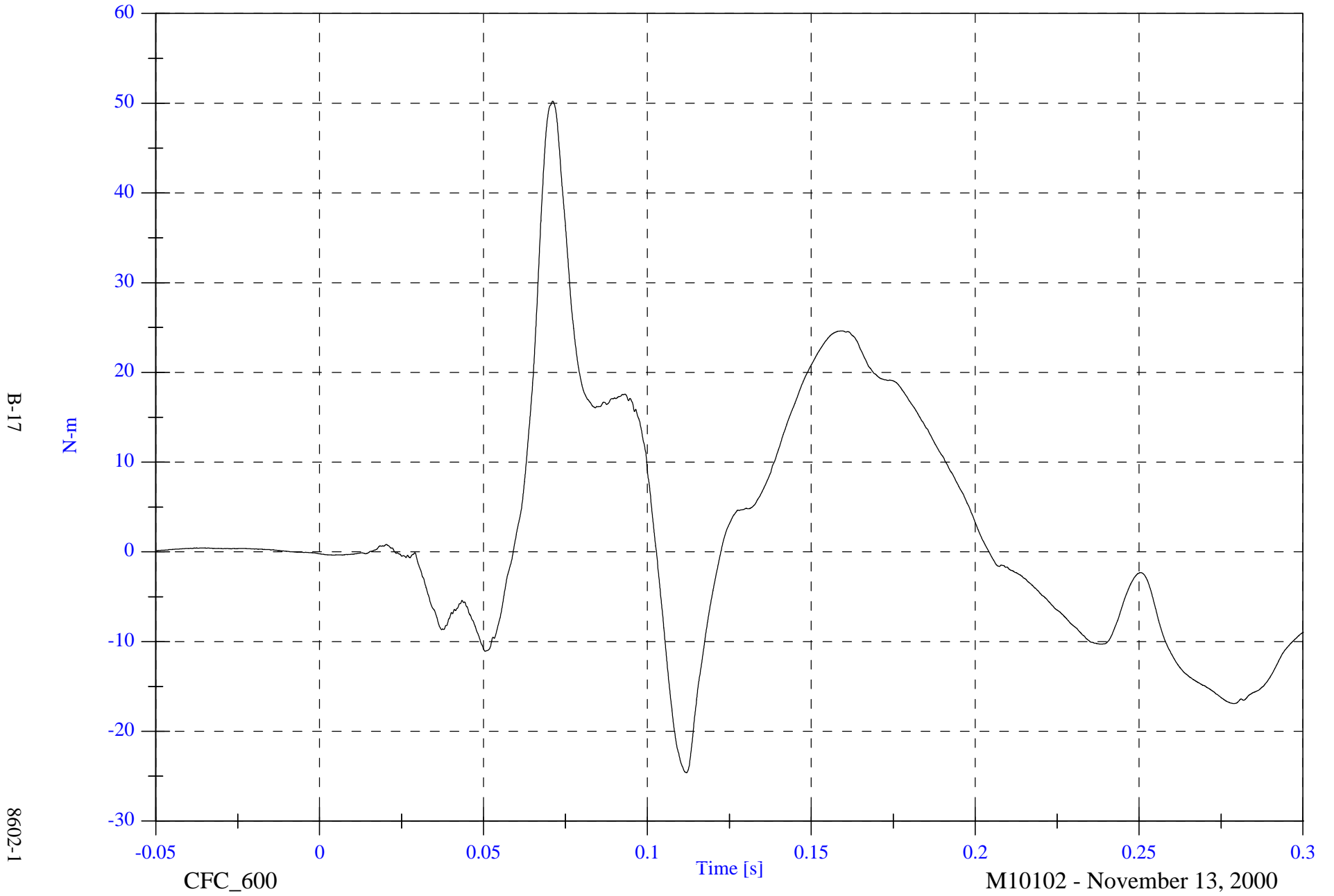
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Upper Neck My

Max: 50.2 [N-m] at 0.071 [s]

Min: -24.6 [N-m] at 0.112 [s]



B-17

8602-1

CFC_600

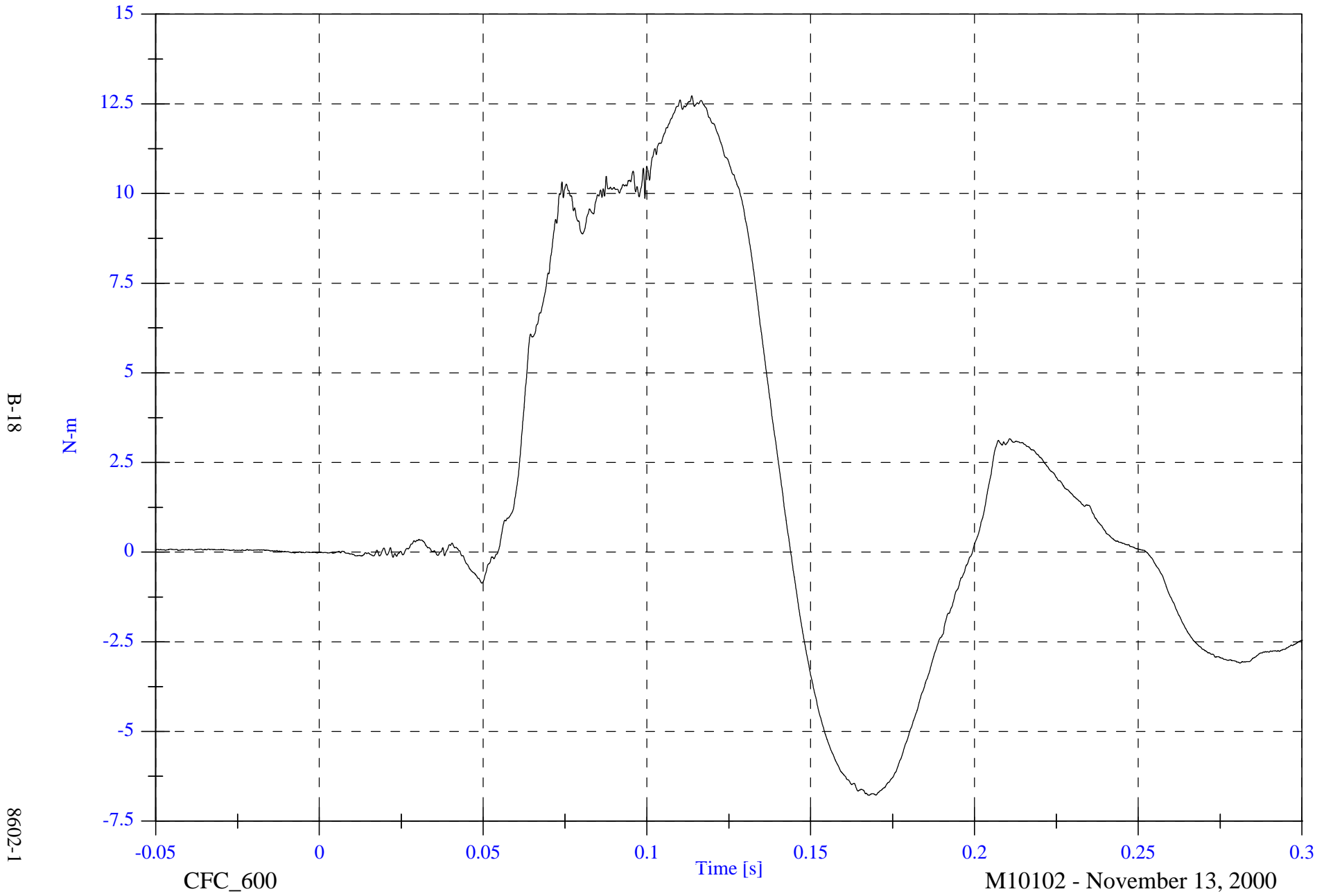
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 12.7 [N-m] at 0.114 [s]

P1 Upper Neck Mz

Min: -6.8 [N-m] at 0.168 [s]



B-18

8602-1

CFC_600

Time [s]

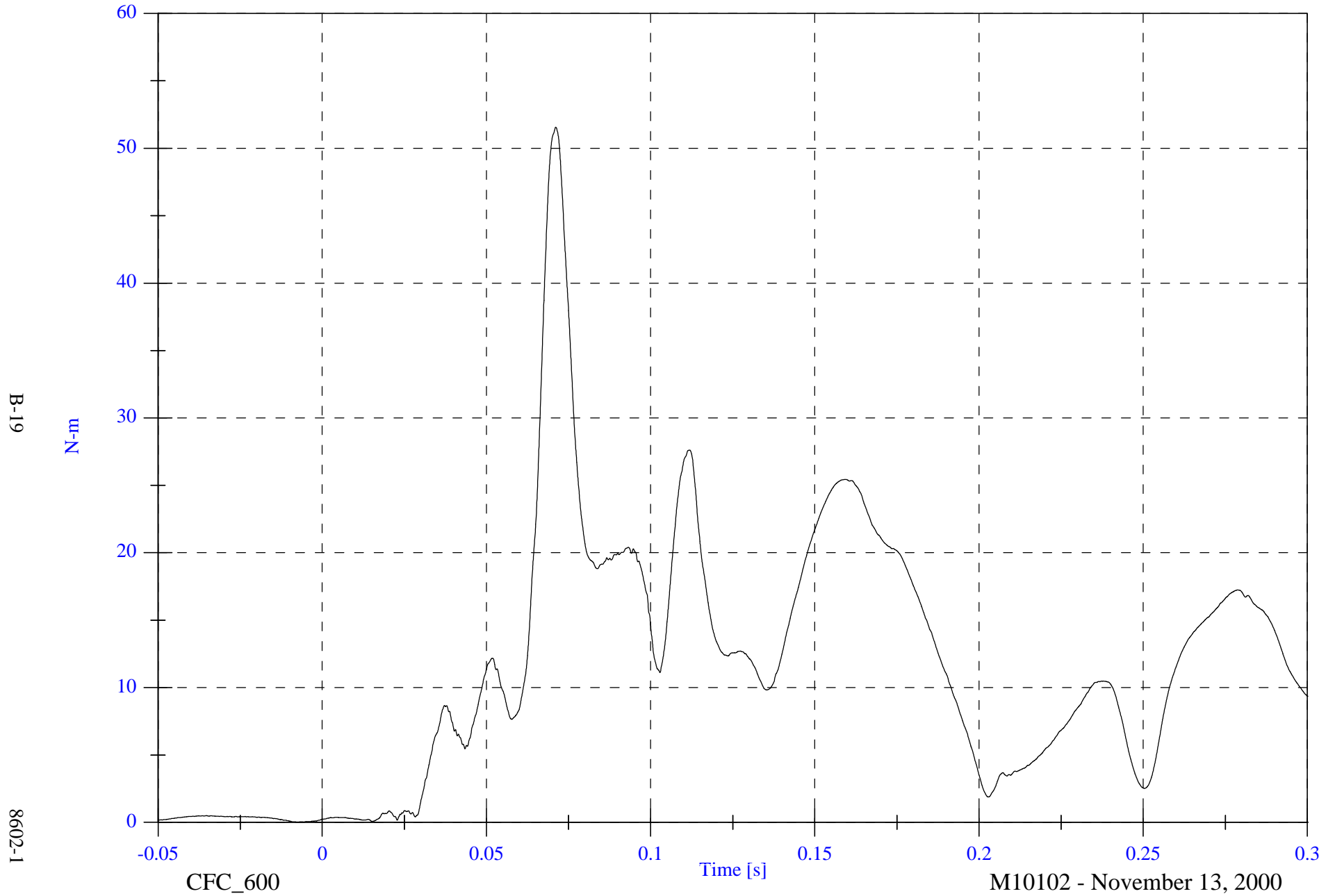
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Upper Neck M Resultant

Max: 51.6 [N-m] at 0.071 [s]

Min: 0.0 [N-m] at -0.007 [s]



B-19

N-m

8602-1

CFC_600

Time [s]

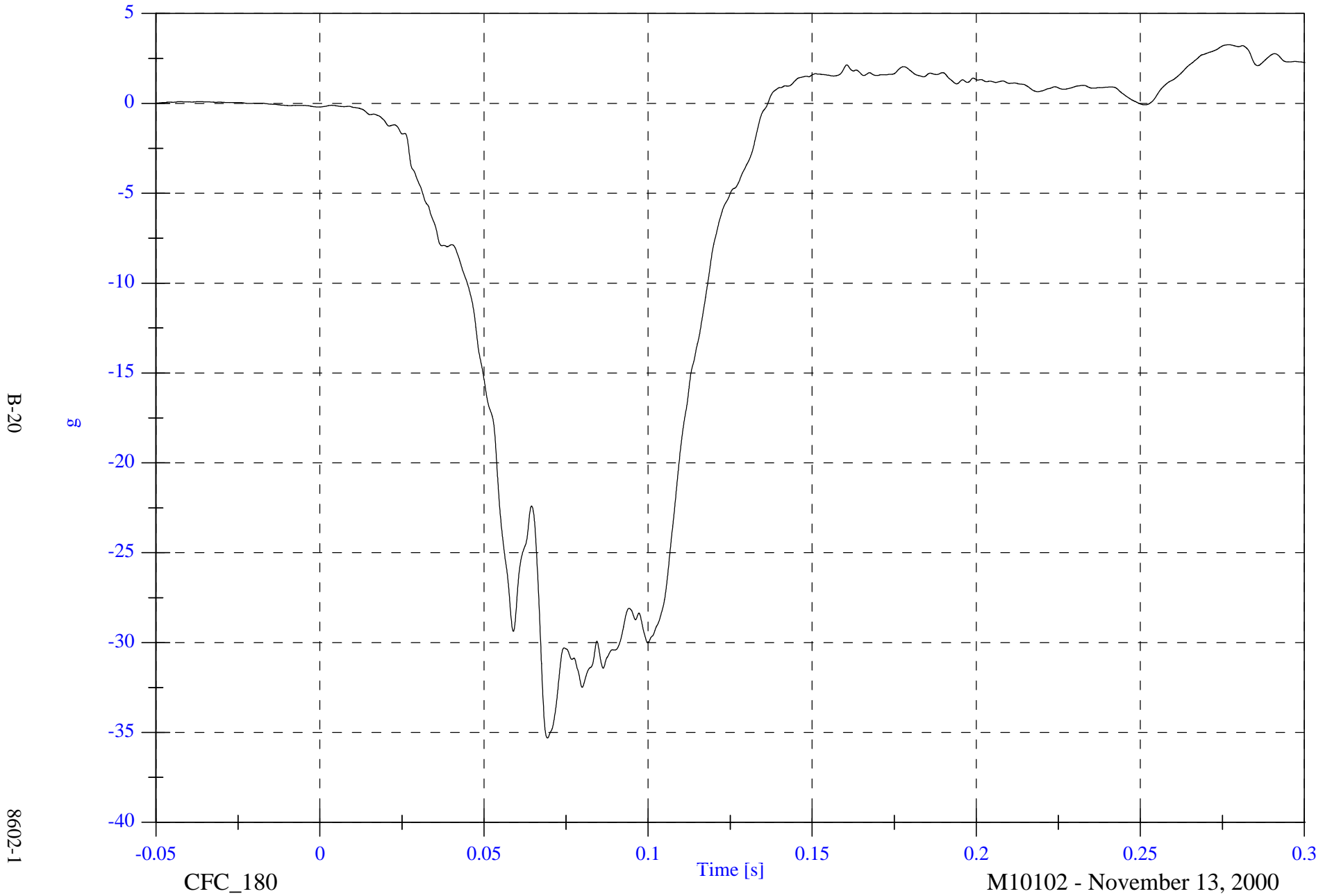
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Chest x

Max: 3.3 [g] at 0.277 [s]

Min: -35.3 [g] at 0.069 [s]



B-20

g

8602-1

CFC_180

Time [s]

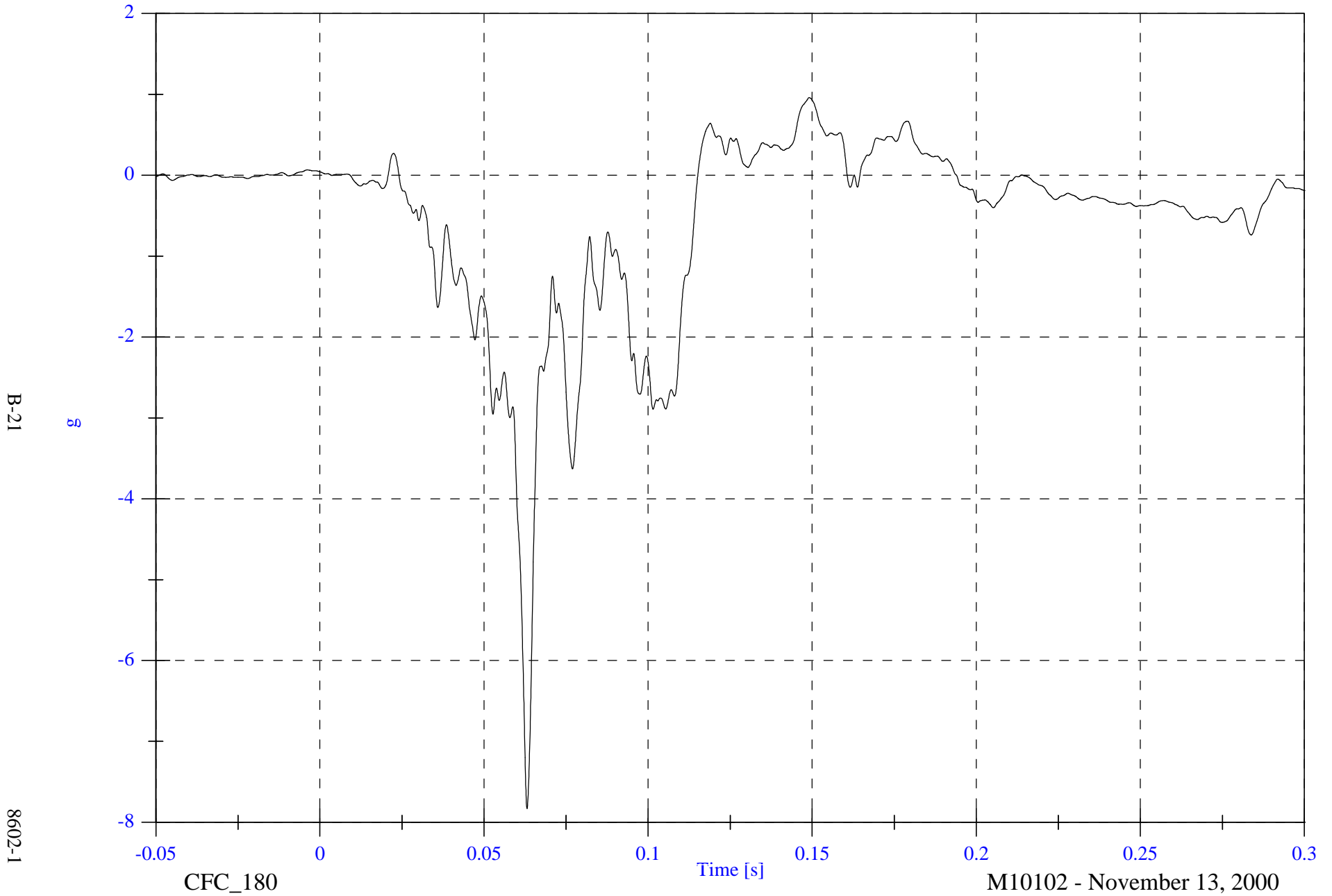
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 1.0 [g] at 0.149 [s]

Min: -7.8 [g] at 0.063 [s]

P1 Chest y



B-21

8602-1

CFC_180

Time [s]

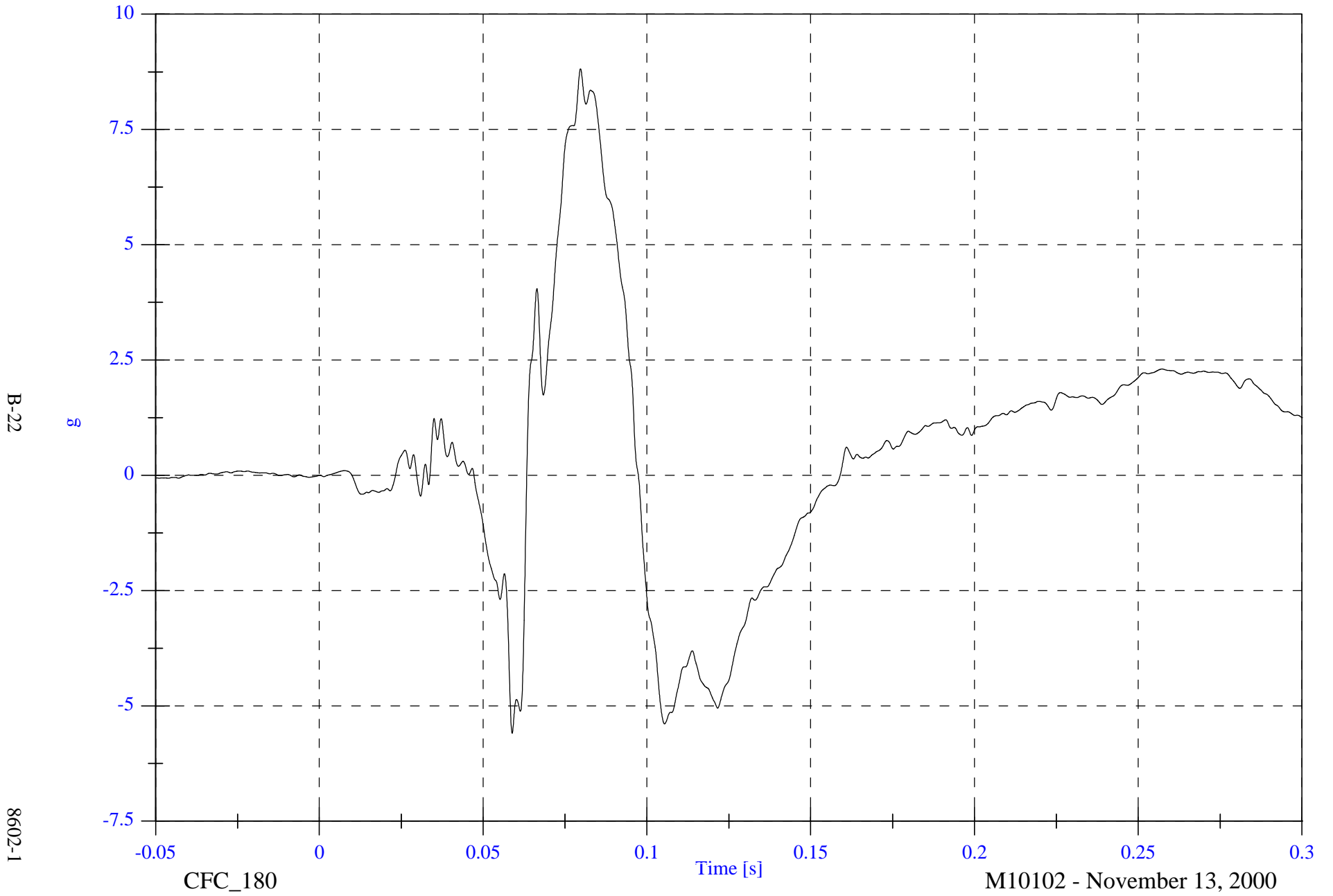
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Chest z

Max: 8.8 [g] at 0.080 [s]

Min: -5.6 [g] at 0.059 [s]



B-22

8602-1

CFC_180

Time [s]

M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

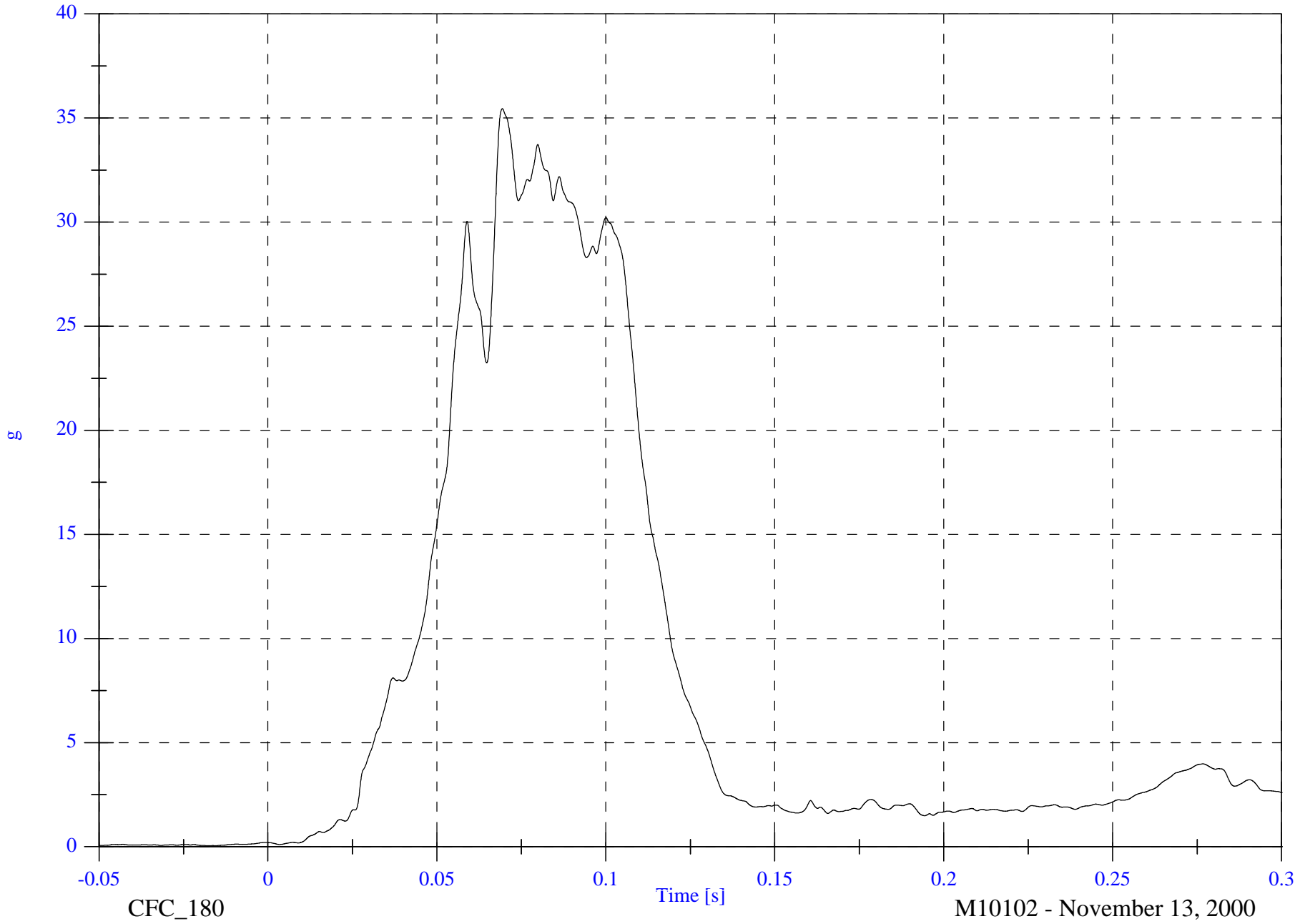
P1 Chest Resultant

Max: 35.4 [g] at 0.069 [s]

Min: 0.0 [g] at -0.015 [s]

B-23

8602-1

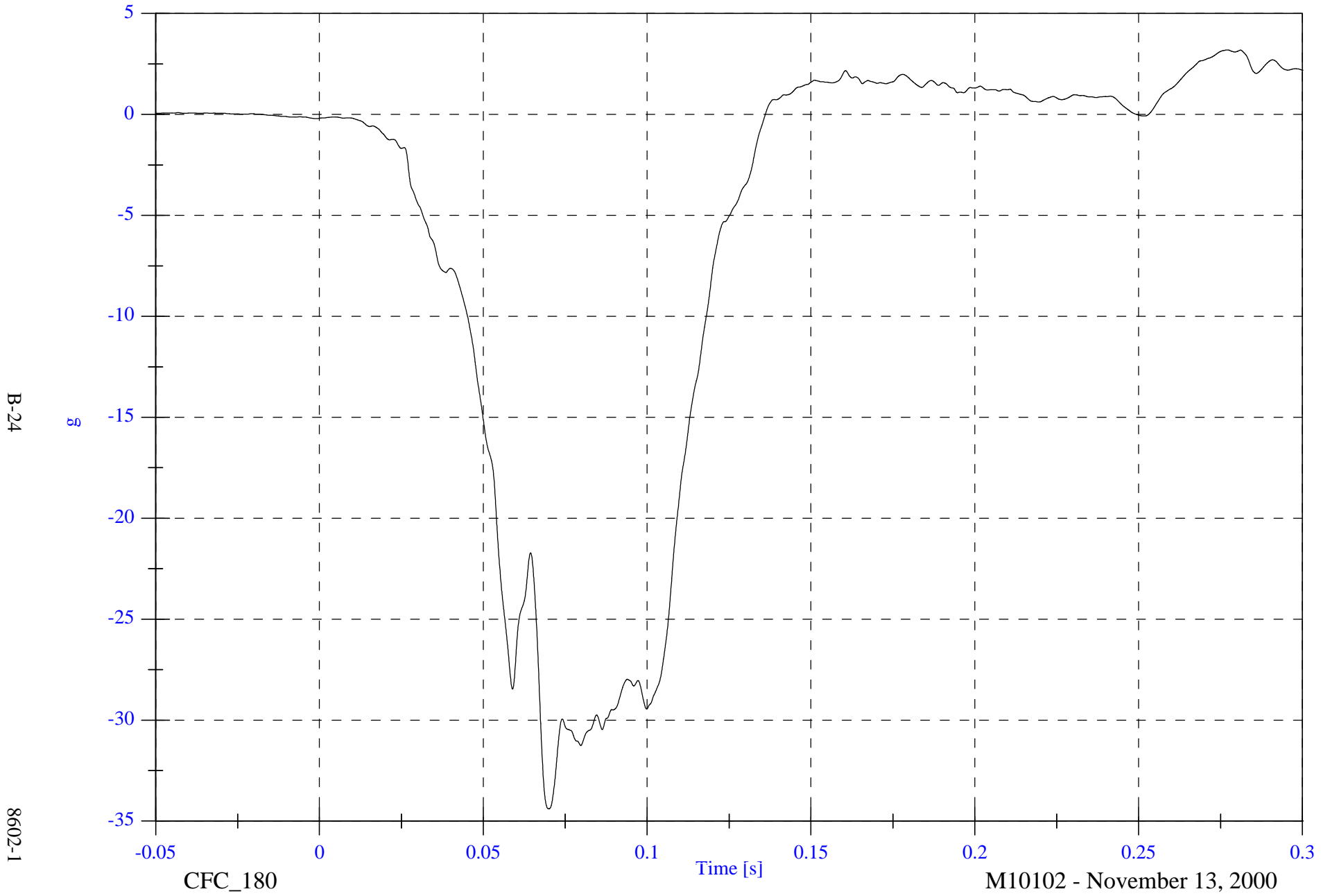


NCAP Test 1 - 2001 Chevrolet Impala

P1 Chest Red x

Max: 3.2 [g] at 0.277 [s]

Min: -34.4 [g] at 0.070 [s]



NCAP Test 1 - 2001 Chevrolet Impala

Max: 1.0 [g] at 0.149 [s]

Min: -7.9 [g] at 0.063 [s]

P1 Chest Red y



B-25

8602-1

CFC_180

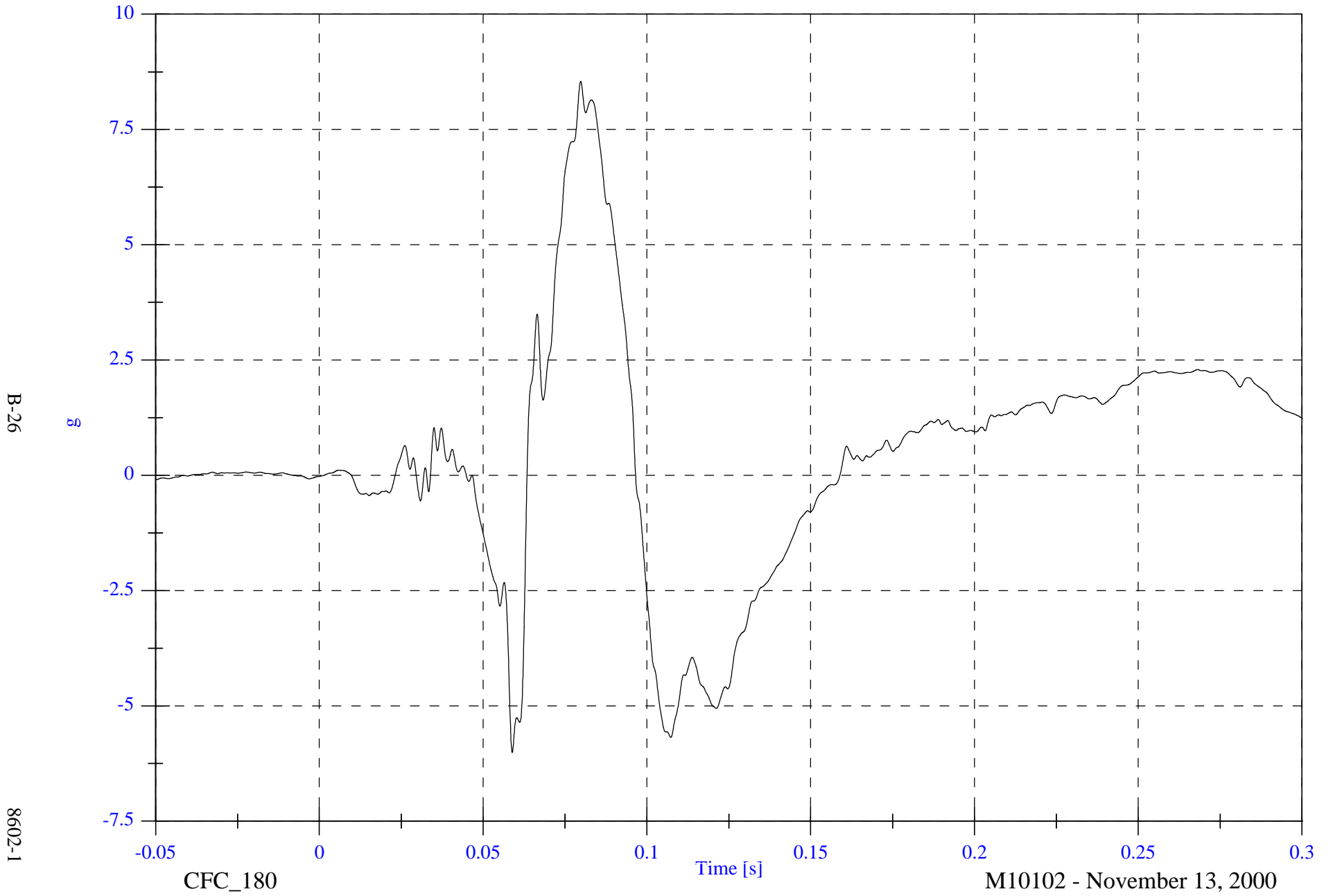
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Chest Red z

Max: 8.5 [g] at 0.080 [s]

Min: -6.0 [g] at 0.059 [s]



B-26

8602-1

CFC_180

Time [s]

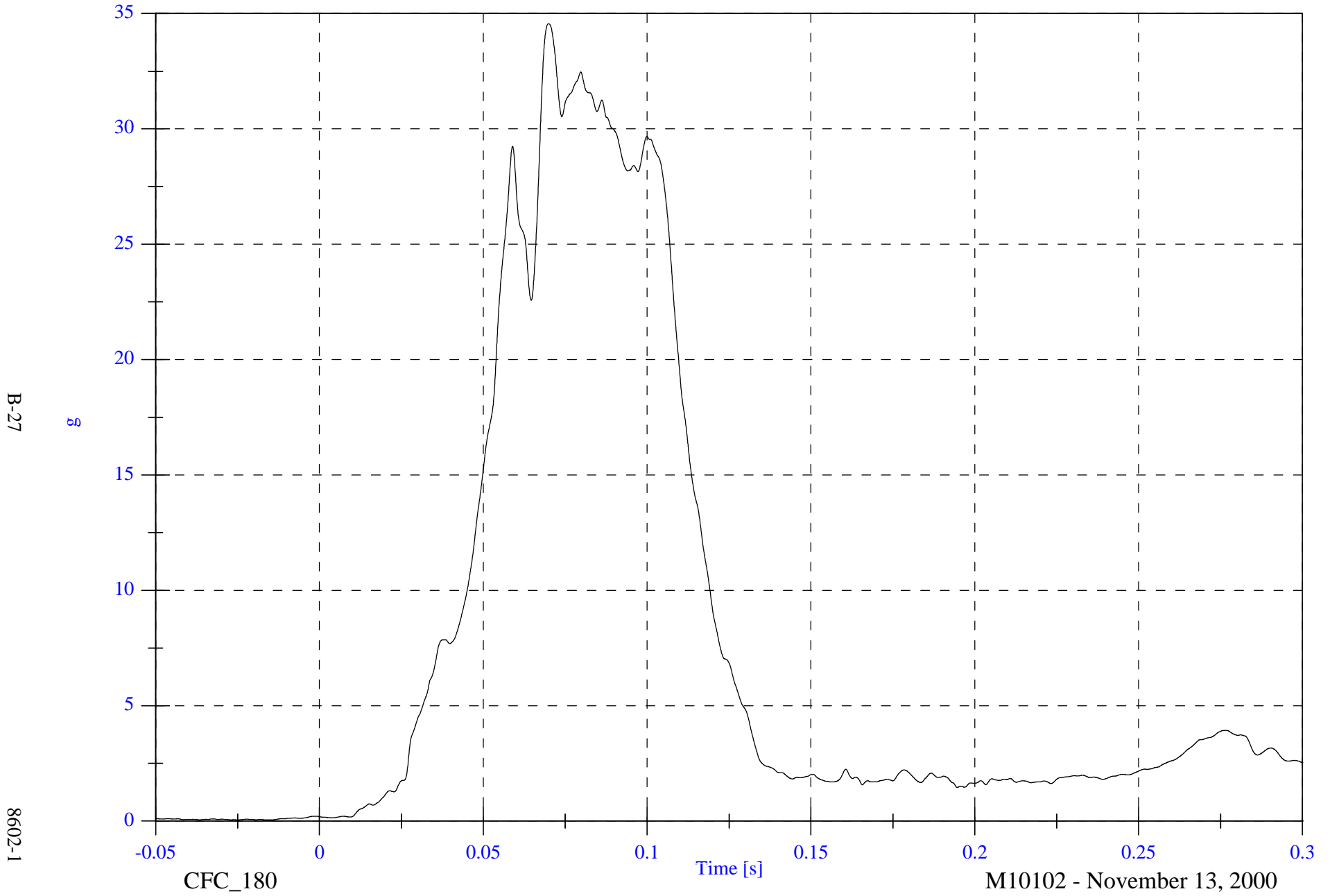
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Chest Red Resultant

Max: 34.6 [g] at 0.070 [s]

Min: 0.1 [g] at -0.016 [s]

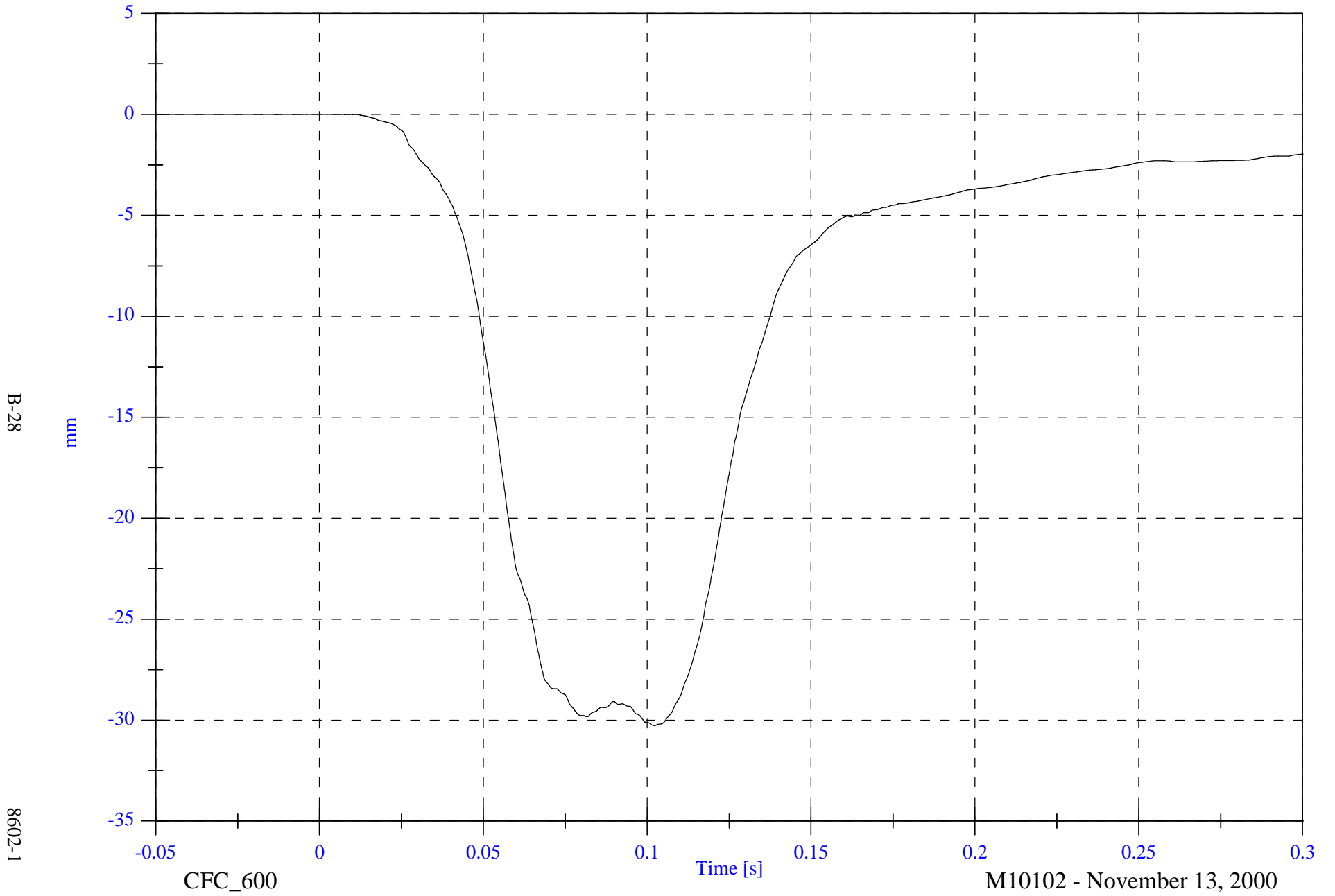


NCAP Test 1 - 2001 Chevrolet Impala

Max: 0.0 [mm] at -0.044 [s]

P1 Chest Compression x

Min: -30.3 [mm] at 0.102 [s]



B-28

8602-1

CFC_600

Time [s]

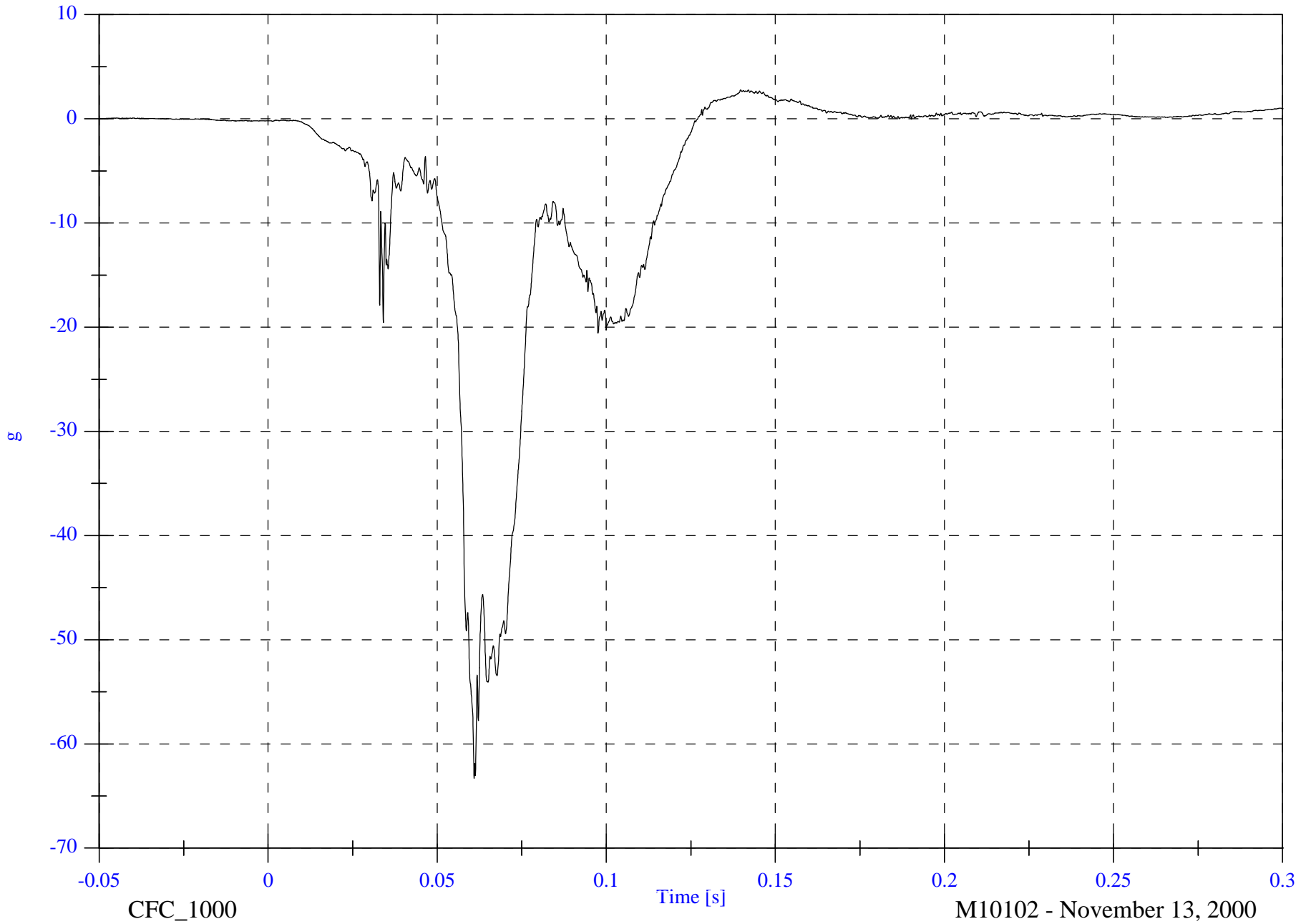
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 2.8 [g] at 0.140 [s]

Min: -63.3 [g] at 0.061 [s]

P1 Pelvic x



B-29

8602-1

CFC_1000

Time [s]

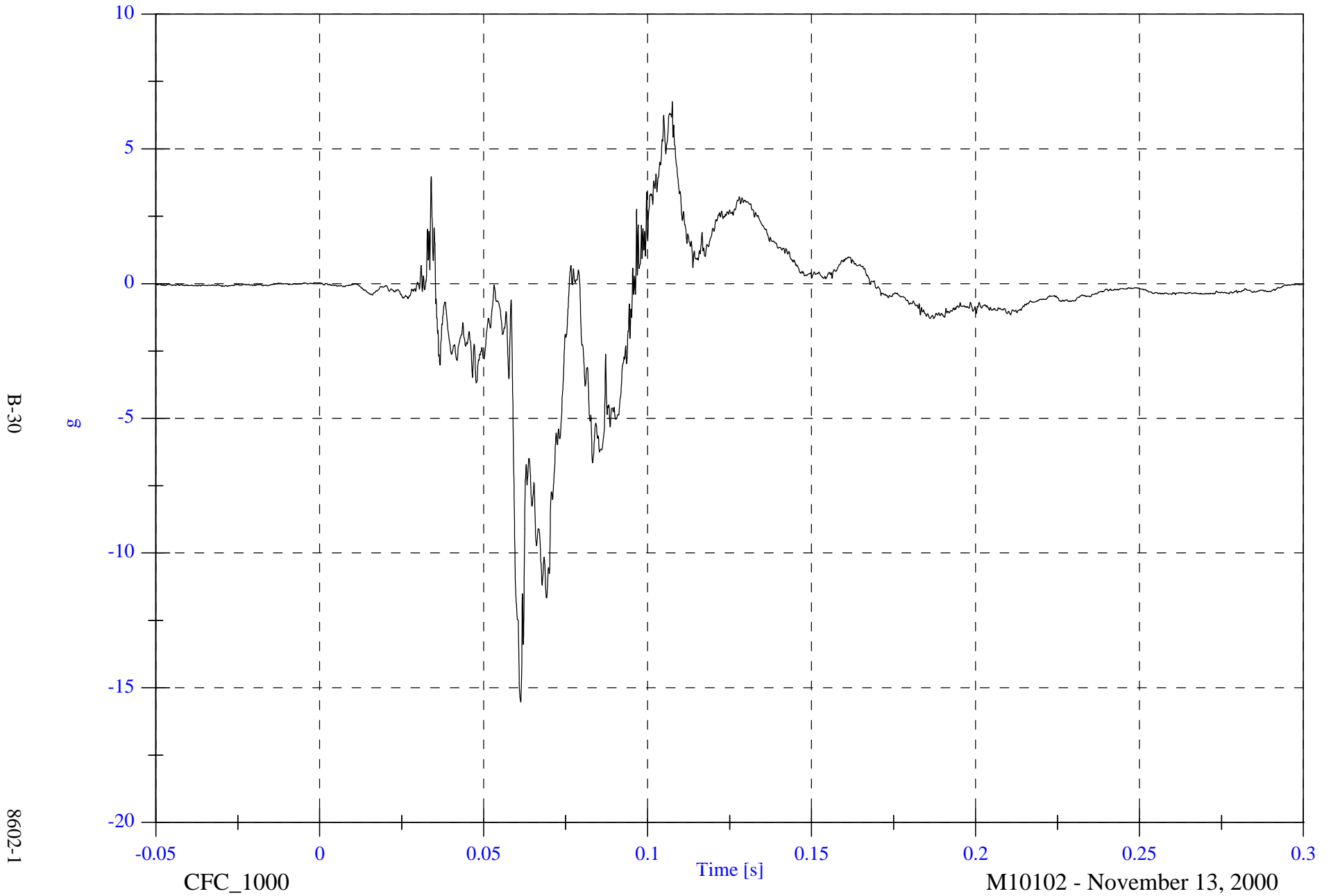
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 6.8 [g] at 0.108 [s]

Min: -15.5 [g] at 0.061 [s]

P1 Pelvic y

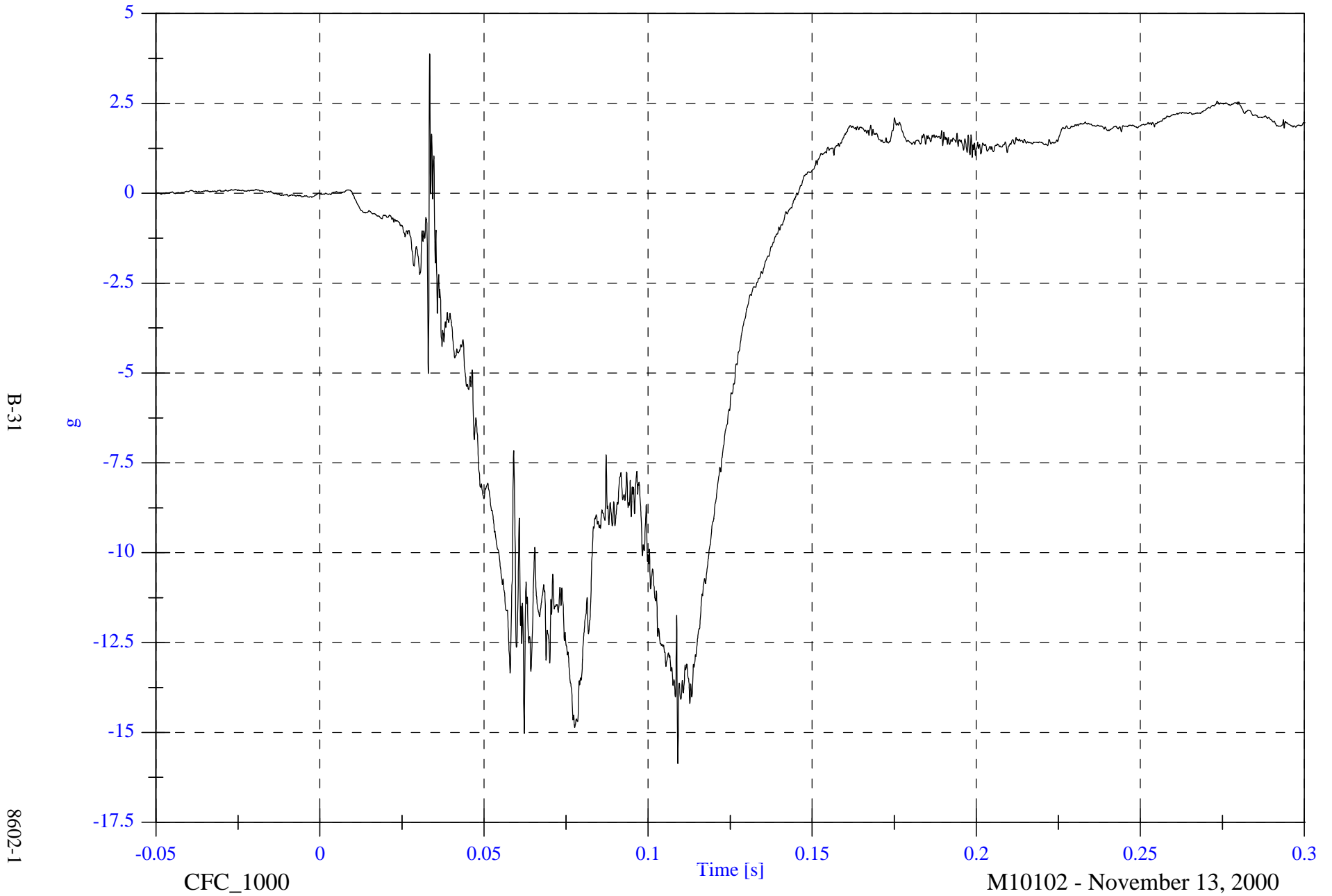


NCAP Test 1 - 2001 Chevrolet Impala

P1 Pelvic z

Max: 3.9 [g] at 0.033 [s]

Min: -15.9 [g] at 0.109 [s]



NCAP Test 1 - 2001 Chevrolet Impala

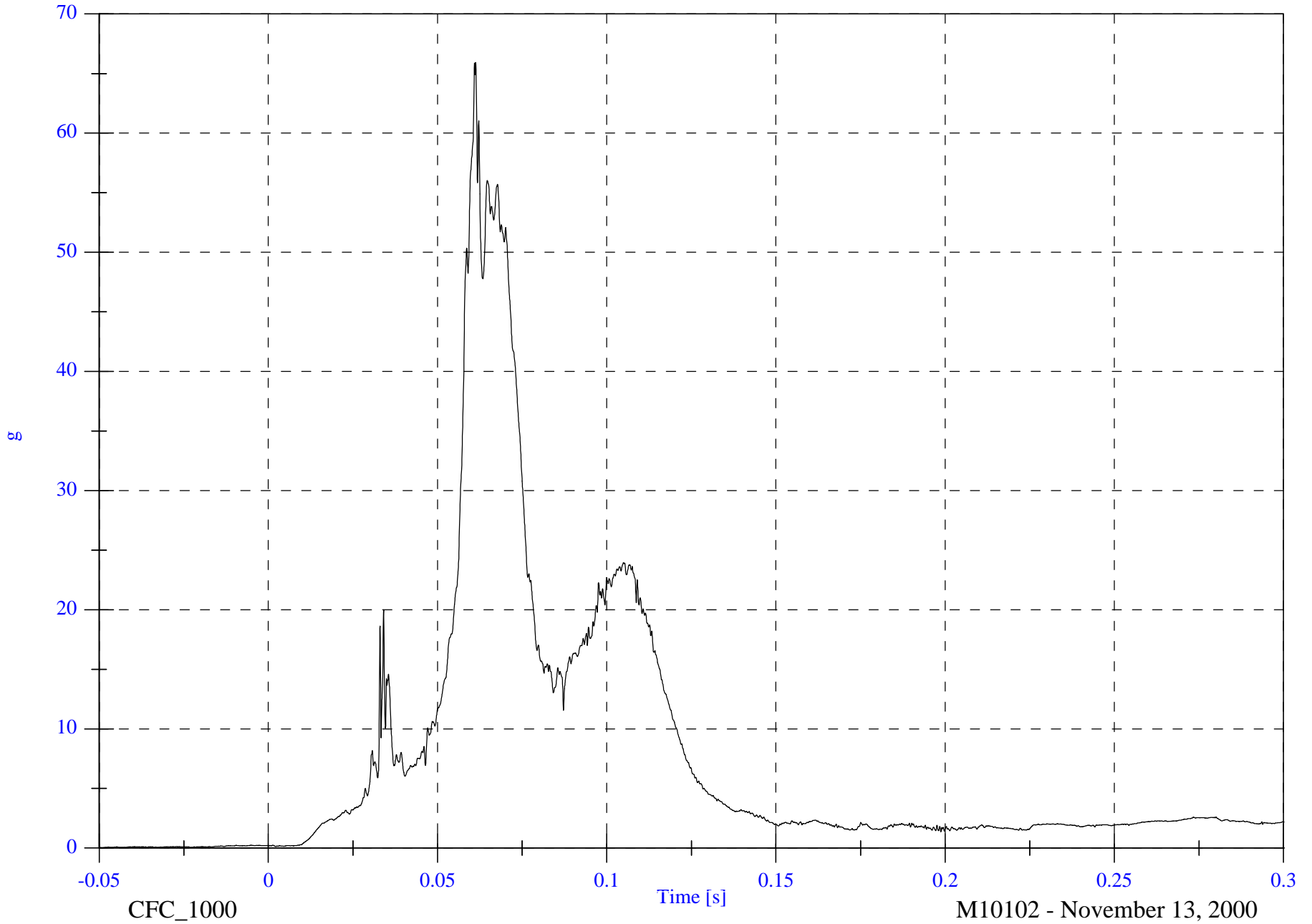
P1 Pelvic Resultant

Max: 65.9 [g] at 0.061 [s]

Min: 0.0 [g] at -0.049 [s]

B-32

8602-1



CFC_1000

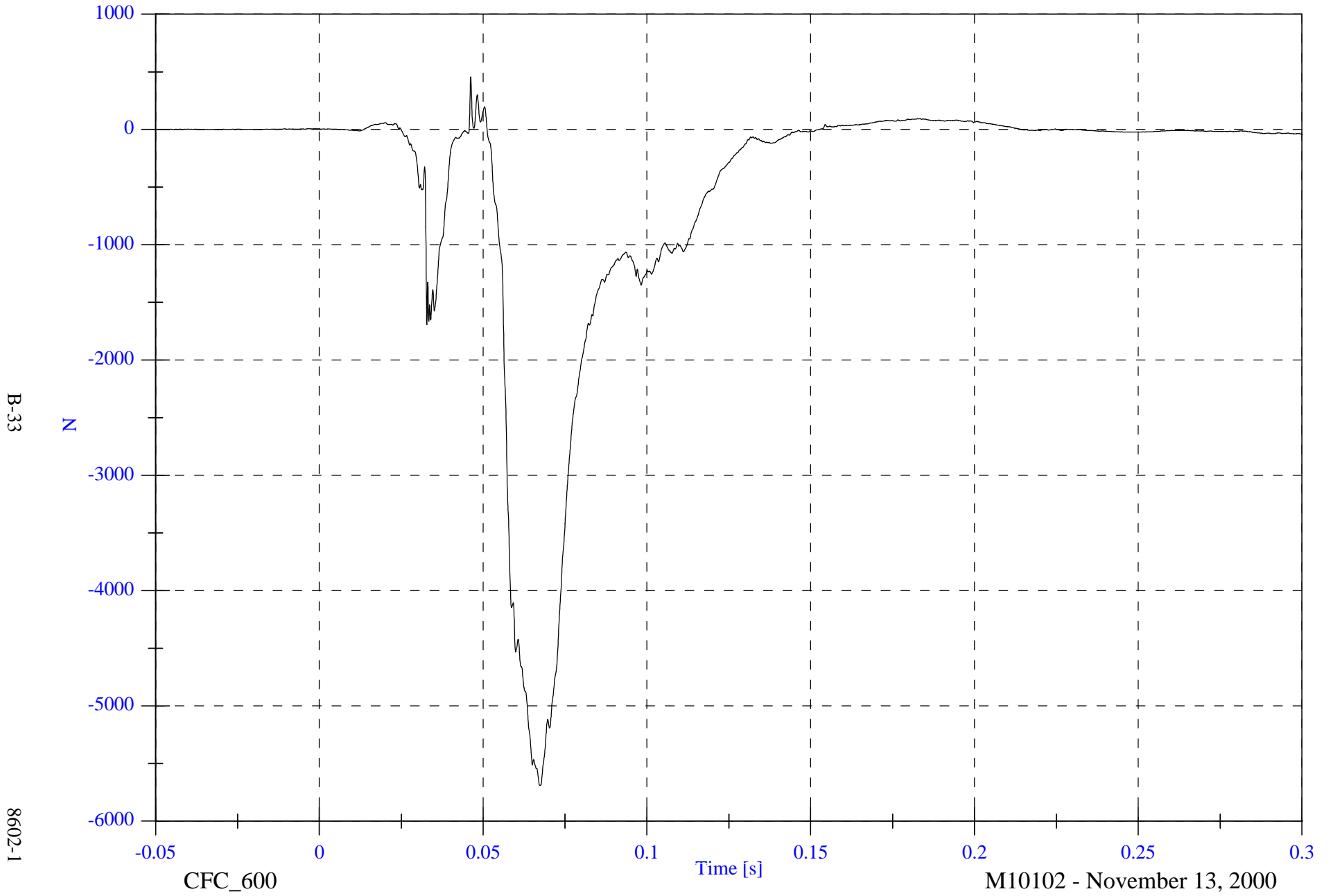
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Femur z

Max: 457.1 [N] at 0.046 [s]

Min: -5690.1 [N] at 0.068 [s]

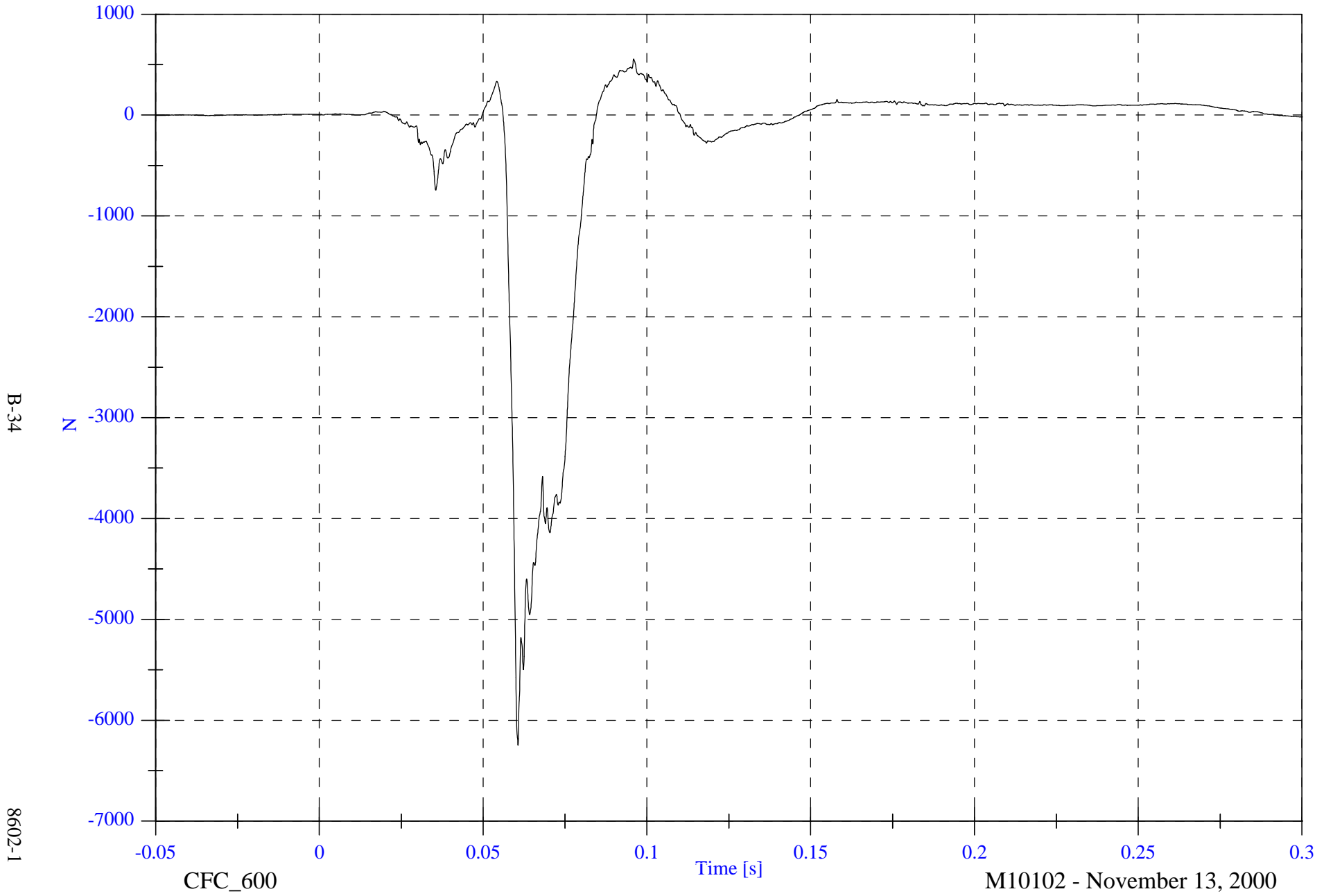


NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Femur z

Max: 557.7 [N] at 0.096 [s]

Min: -6247.4 [N] at 0.061 [s]



B-34

8602-1

CFC_600

Time [s]

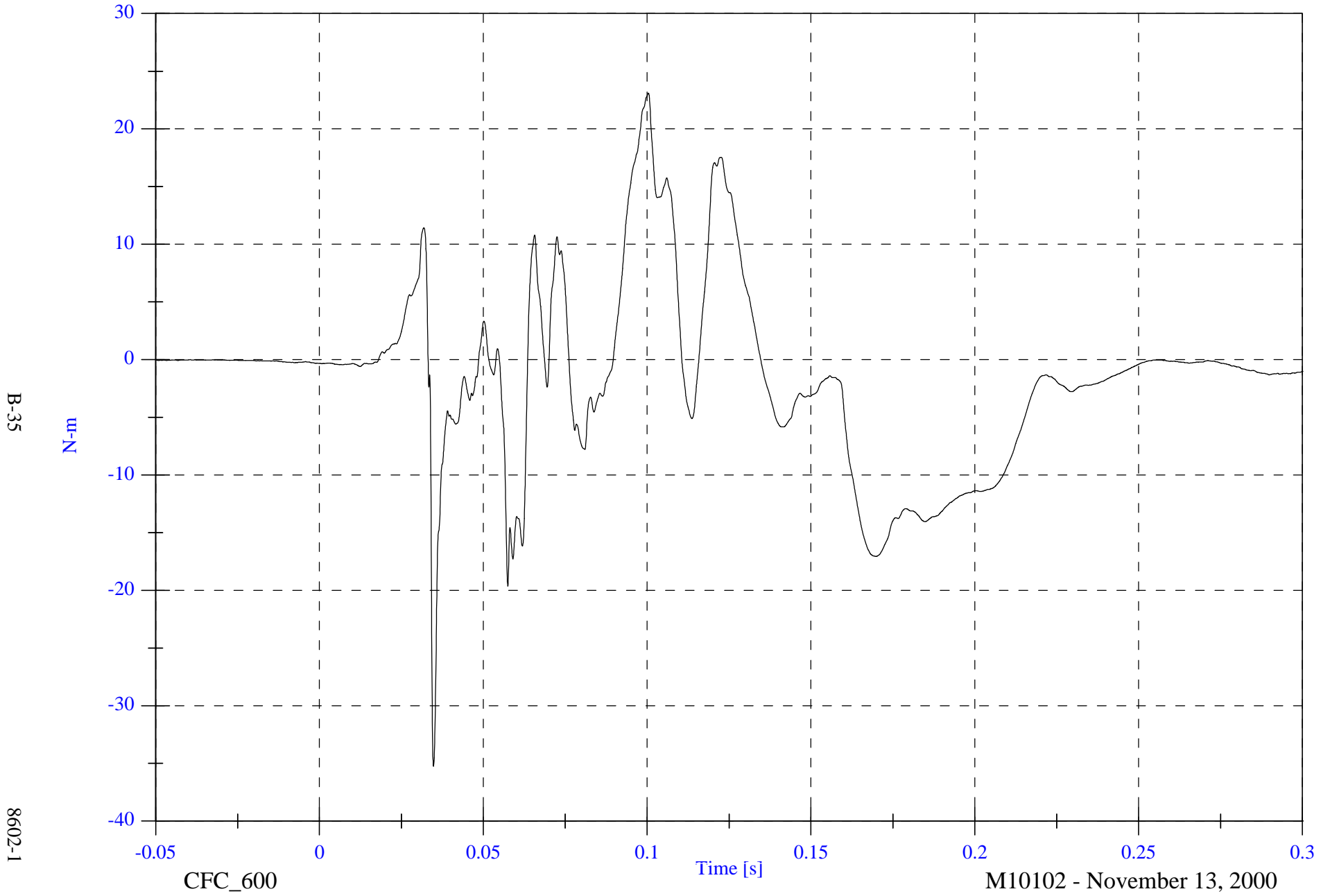
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Upper Tibia Mx

Max: 23.1 [N-m] at 0.100 [s]

Min: -35.3 [N-m] at 0.035 [s]

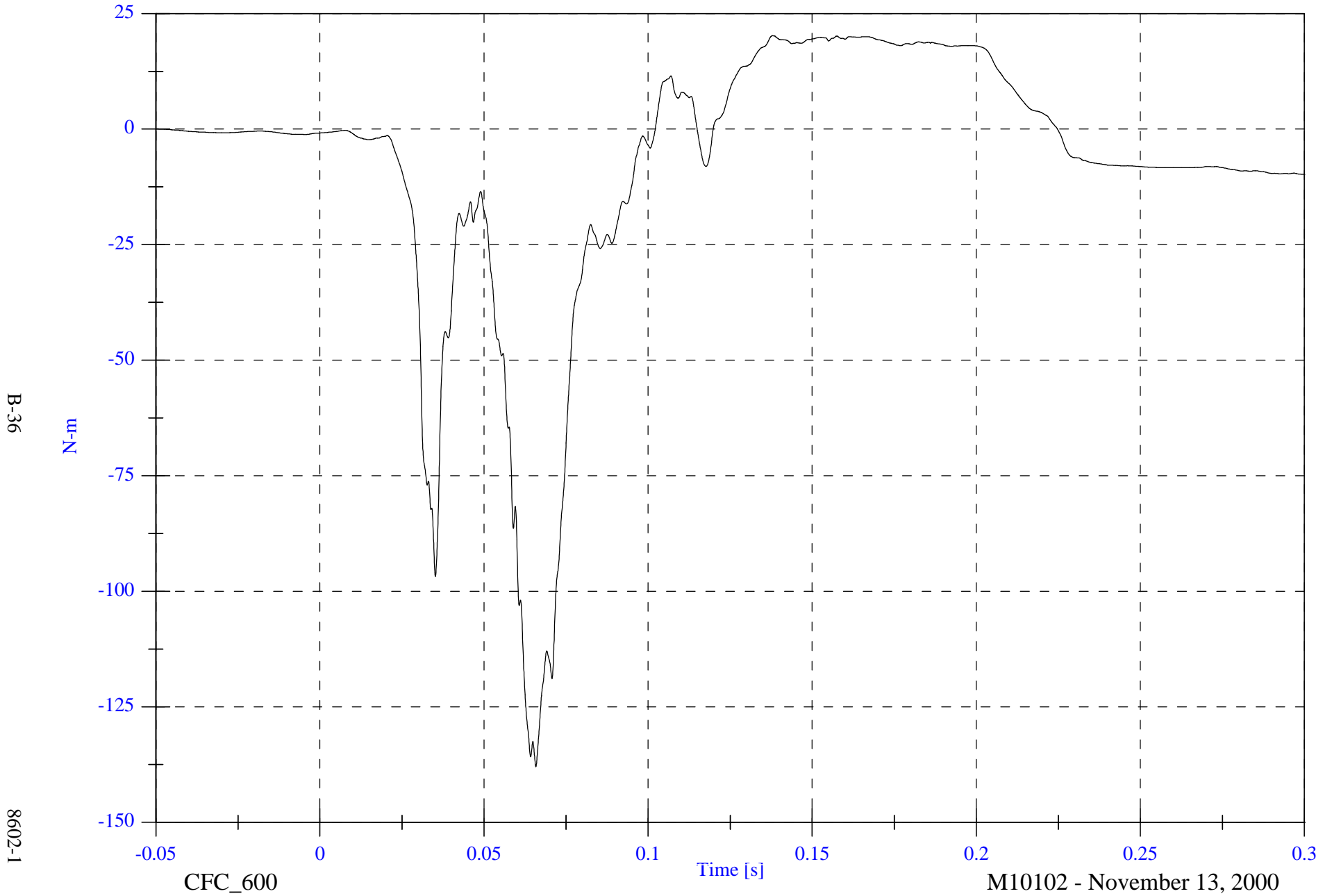


NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Upper Tibia My

Max: 20.2 [N-m] at 0.138 [s]

Min: -138.0 [N-m] at 0.066 [s]



B-36

8602-1

CFC_600

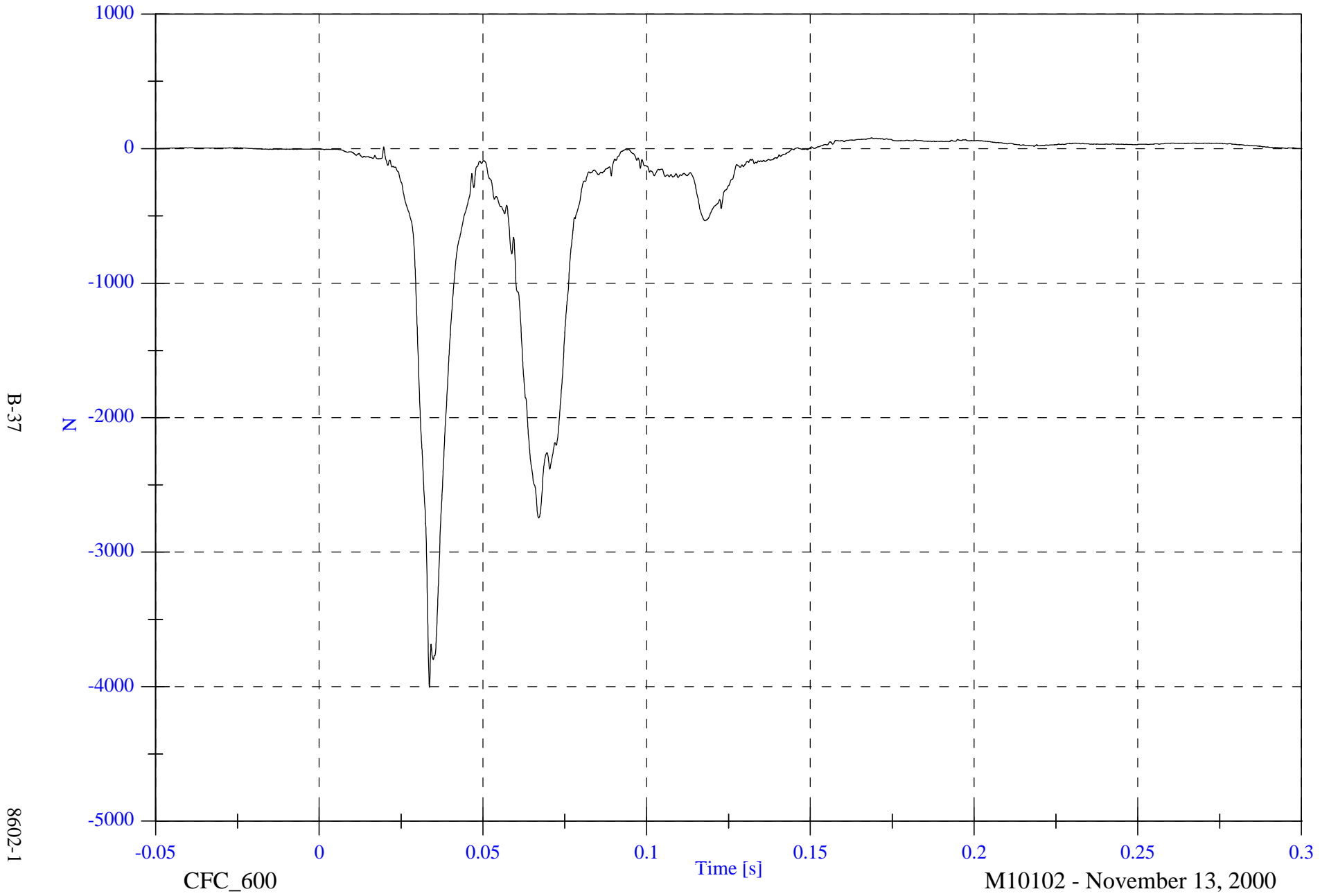
Time [s]

M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Lower Tibia Fz

Max: 80.4 [N] at 0.169 [s]
Min: -4004.7 [N] at 0.034 [s]



B-37

8602-1

CFC_600

Time [s]

M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

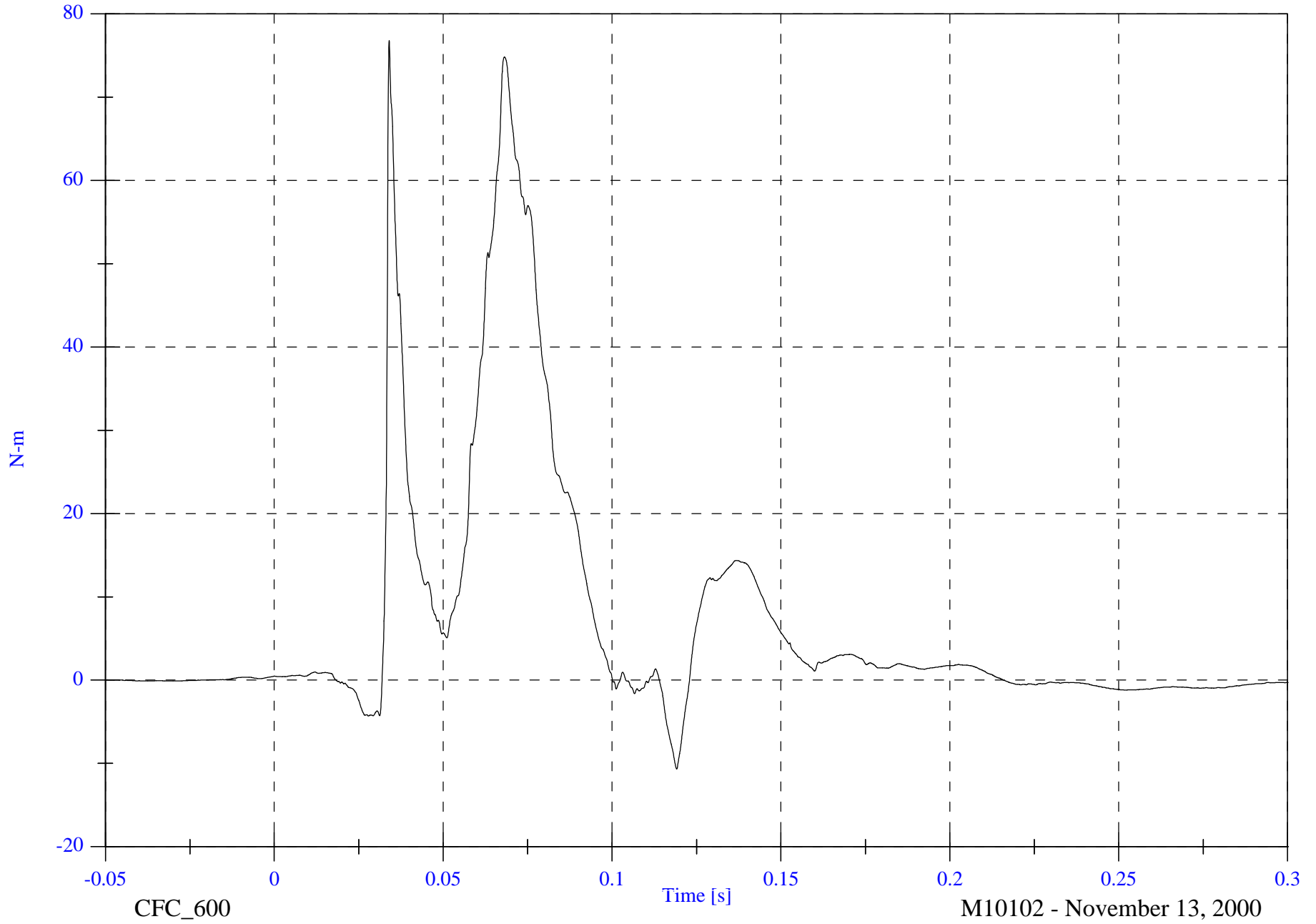
P1 Left Lower Tibia Mx

Max: 76.8 [N-m] at 0.034 [s]

Min: -10.7 [N-m] at 0.119 [s]

B-38

8602-1



CFC_600

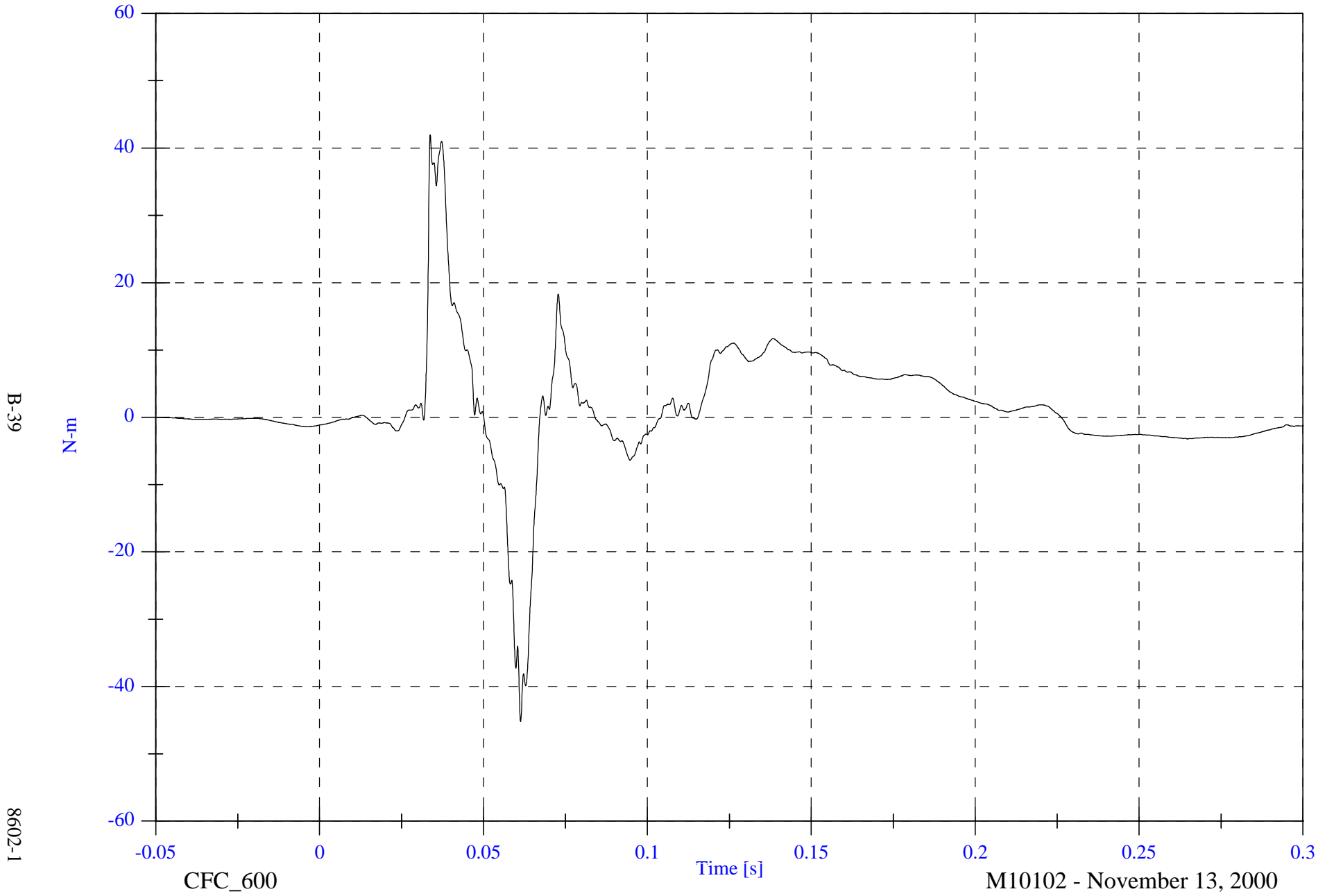
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Lower Tibia My

Max: 42.0 [N-m] at 0.034 [s]

Min: -45.2 [N-m] at 0.061 [s]



B-39

8602-1

CFC_600

Time [s]

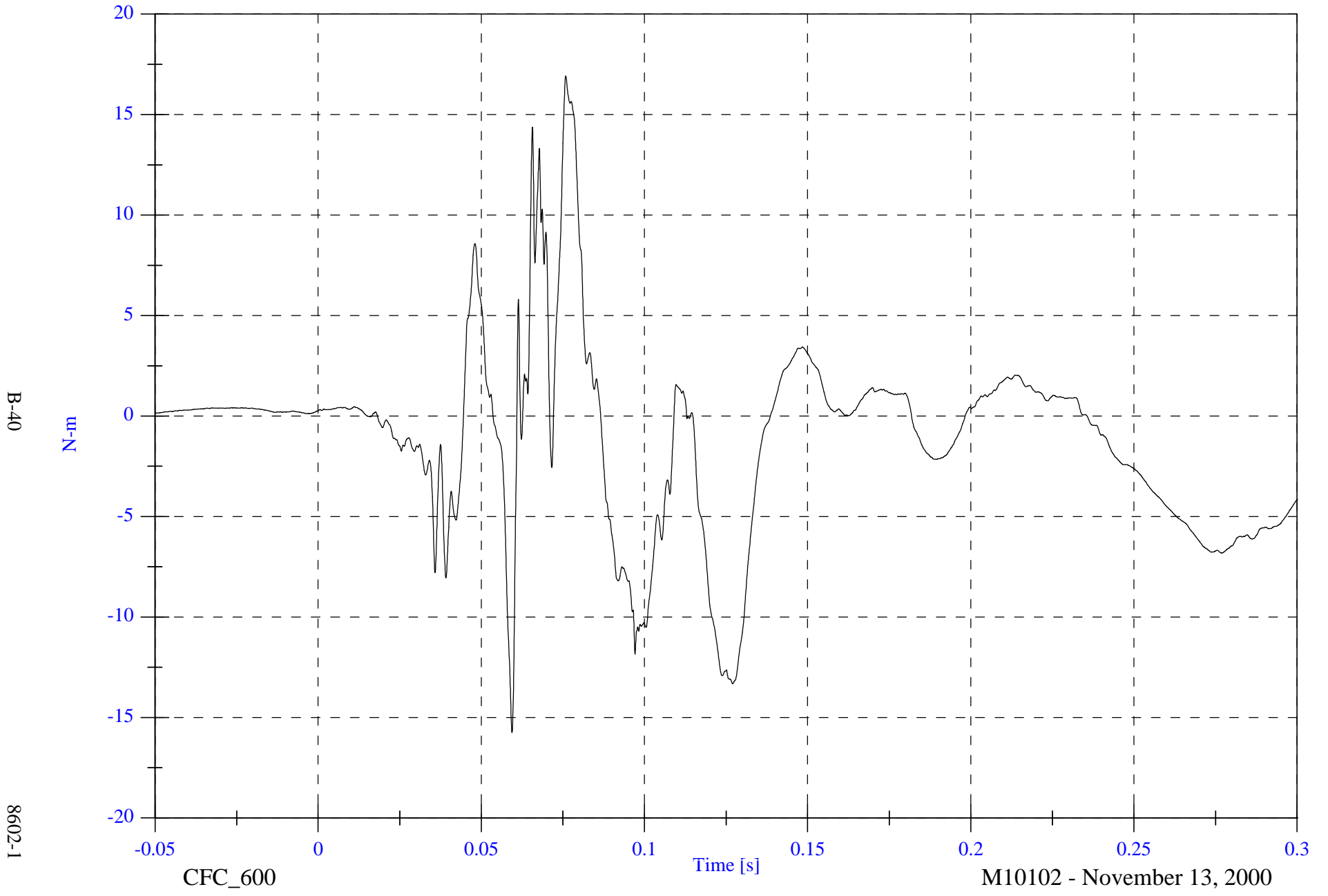
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Upper Tibia Mx

Max: 16.9 [N-m] at 0.076 [s]

Min: -15.8 [N-m] at 0.059 [s]



B-40

8602-1

CFC_600

Time [s]

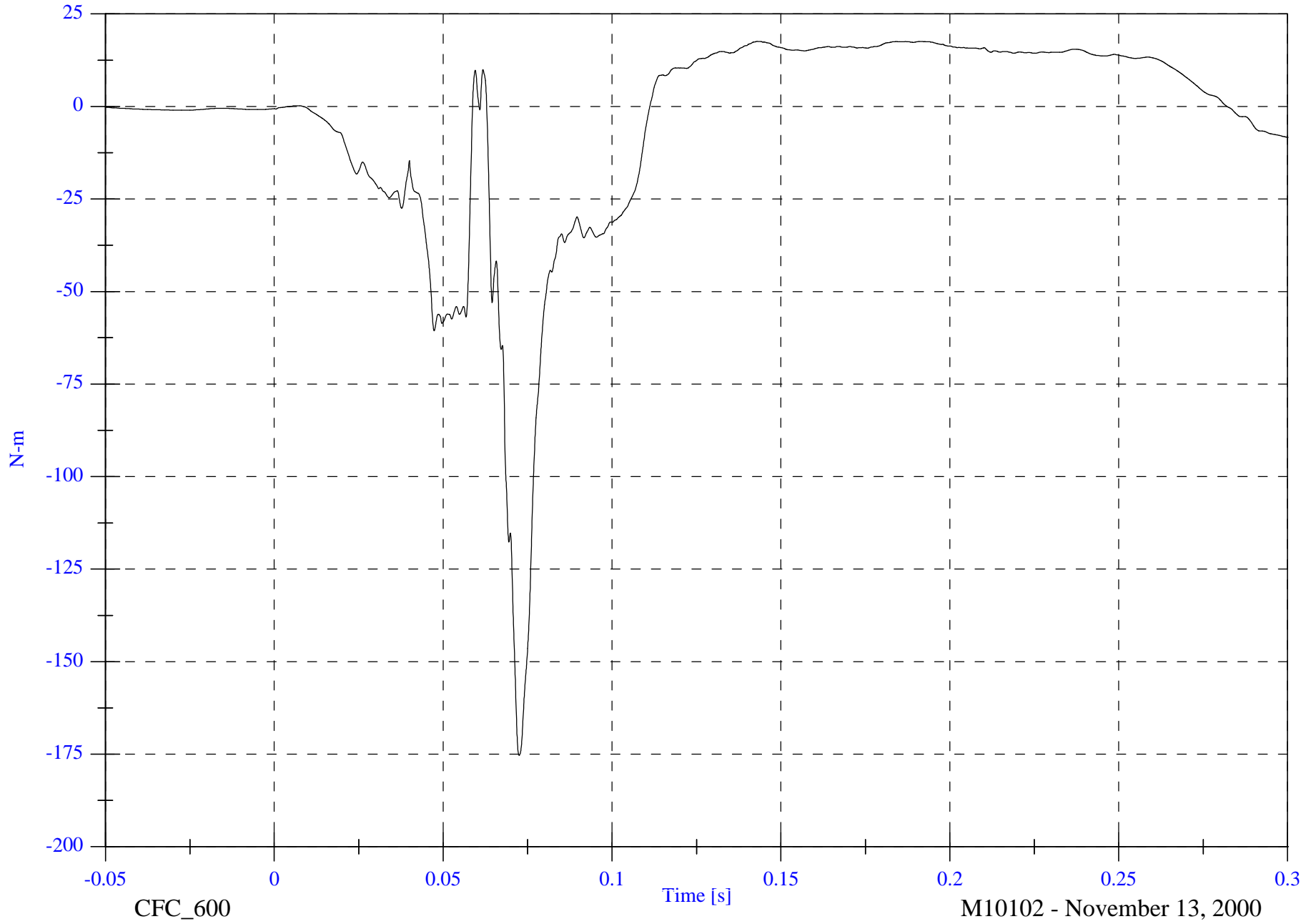
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Upper Tibia My

Max: 17.6 [N-m] at 0.143 [s]

Min: -175.3 [N-m] at 0.073 [s]



B-41

8602-1

CFC_600

Time [s]

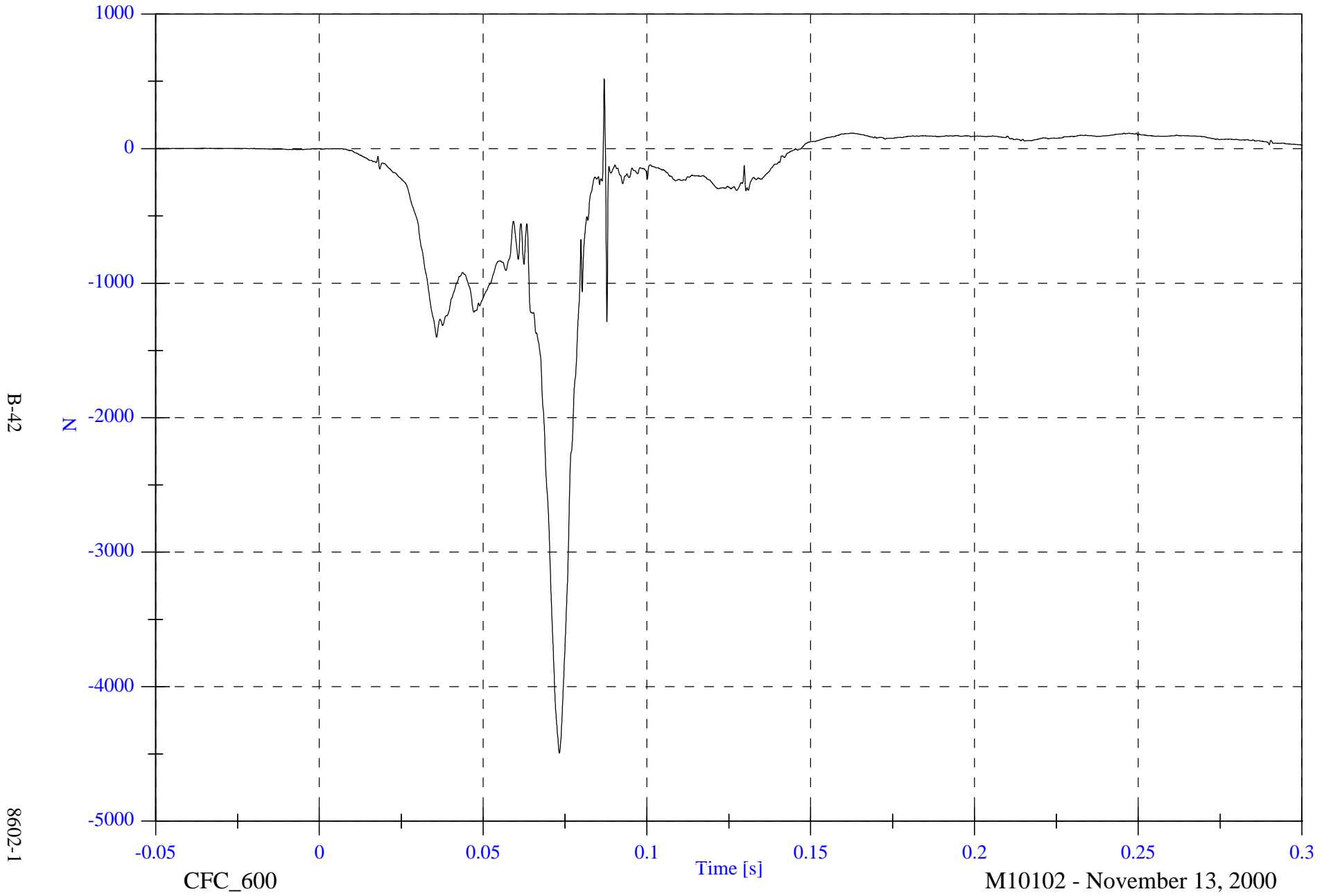
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Lower Tibia Fz

Max: 518.7 [N] at 0.087 [s]

Min: -4494.9 [N] at 0.073 [s]

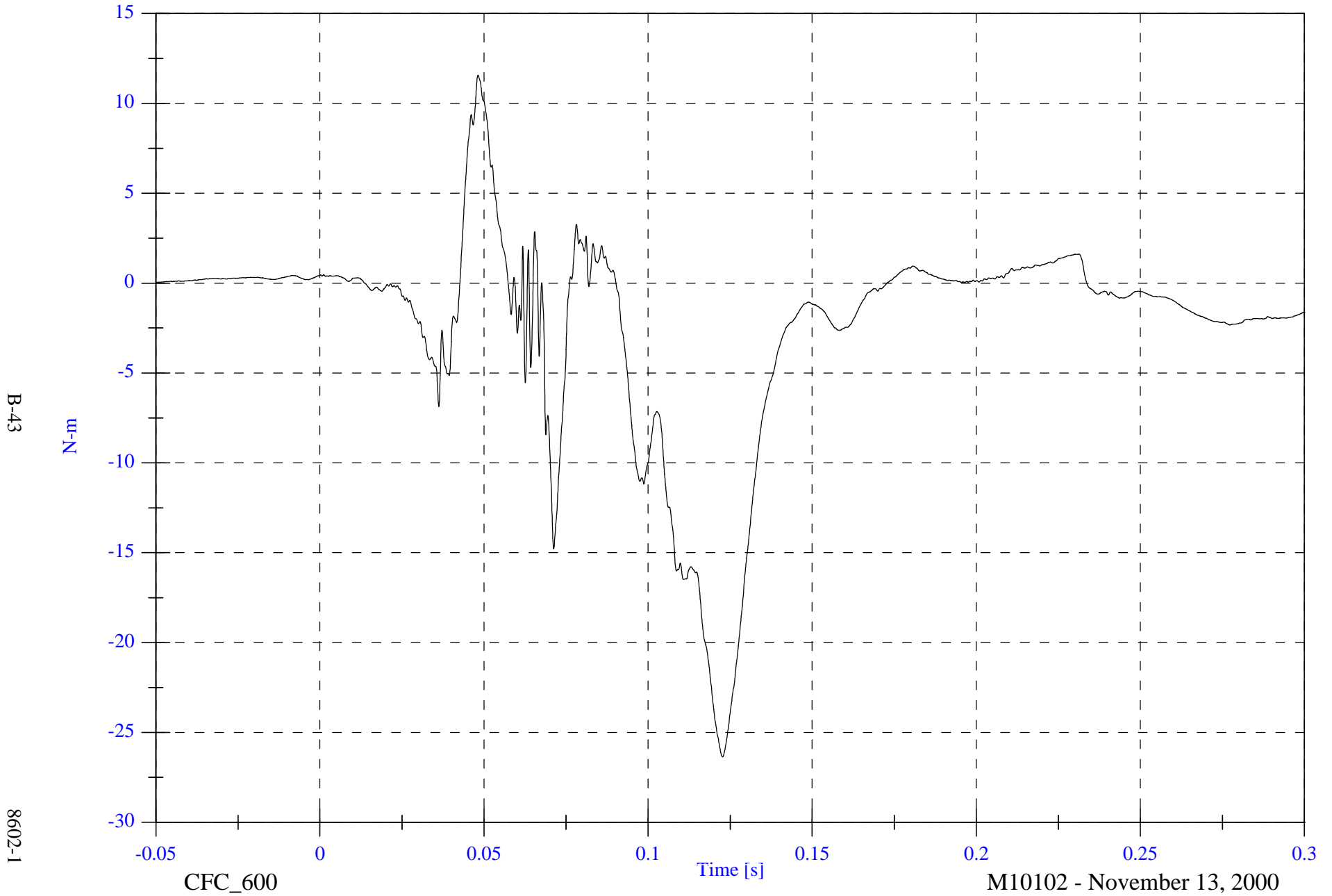


NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Lower Tibia Mx

Max: 11.6 [N-m] at 0.048 [s]

Min: -26.4 [N-m] at 0.123 [s]



B-43

8602-1

CFC_600

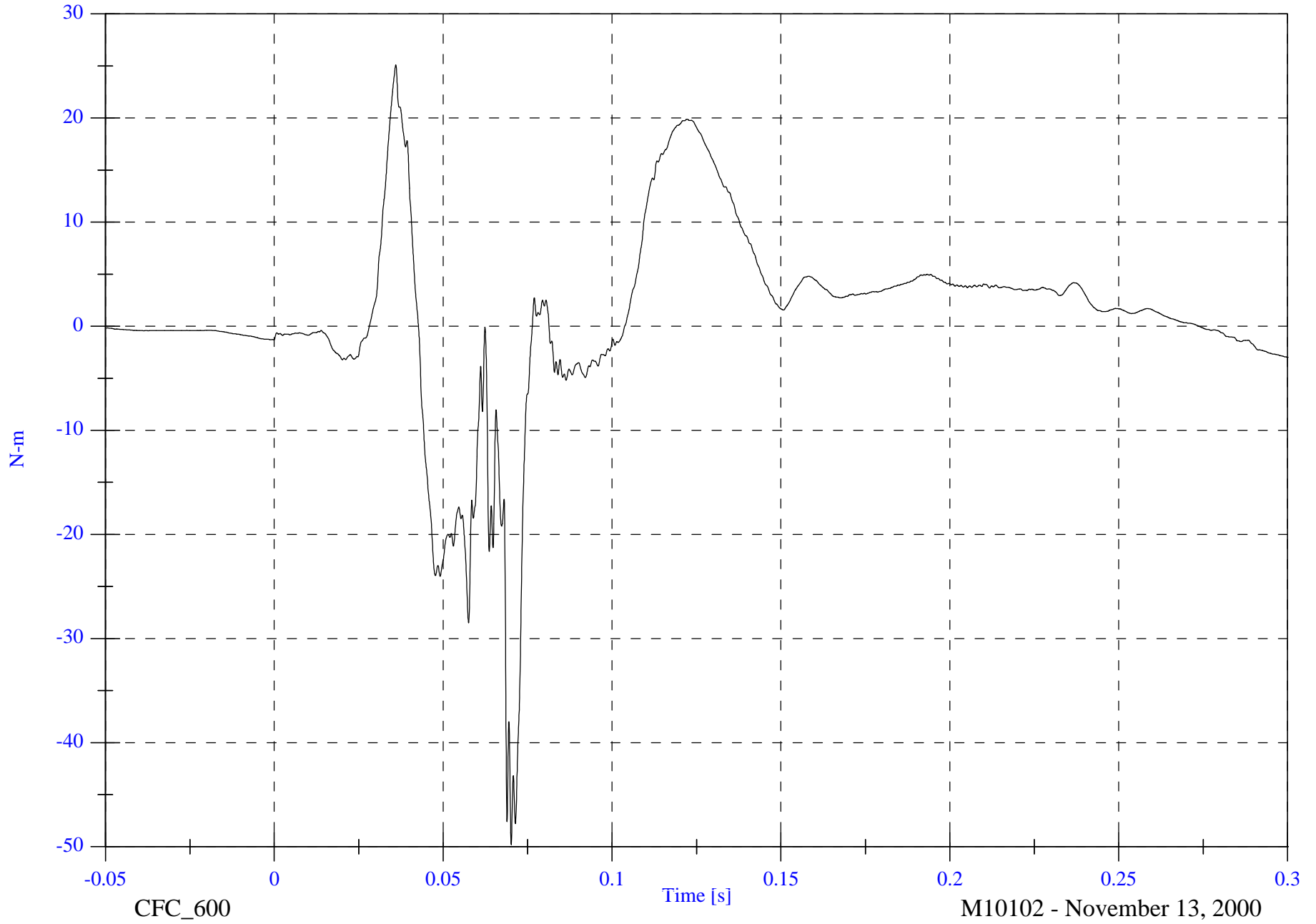
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Lower Tibia My

Max: 25.1 [N-m] at 0.036 [s]

Min: -49.8 [N-m] at 0.070 [s]



B-44

8602-1

CFC_600

Time [s]

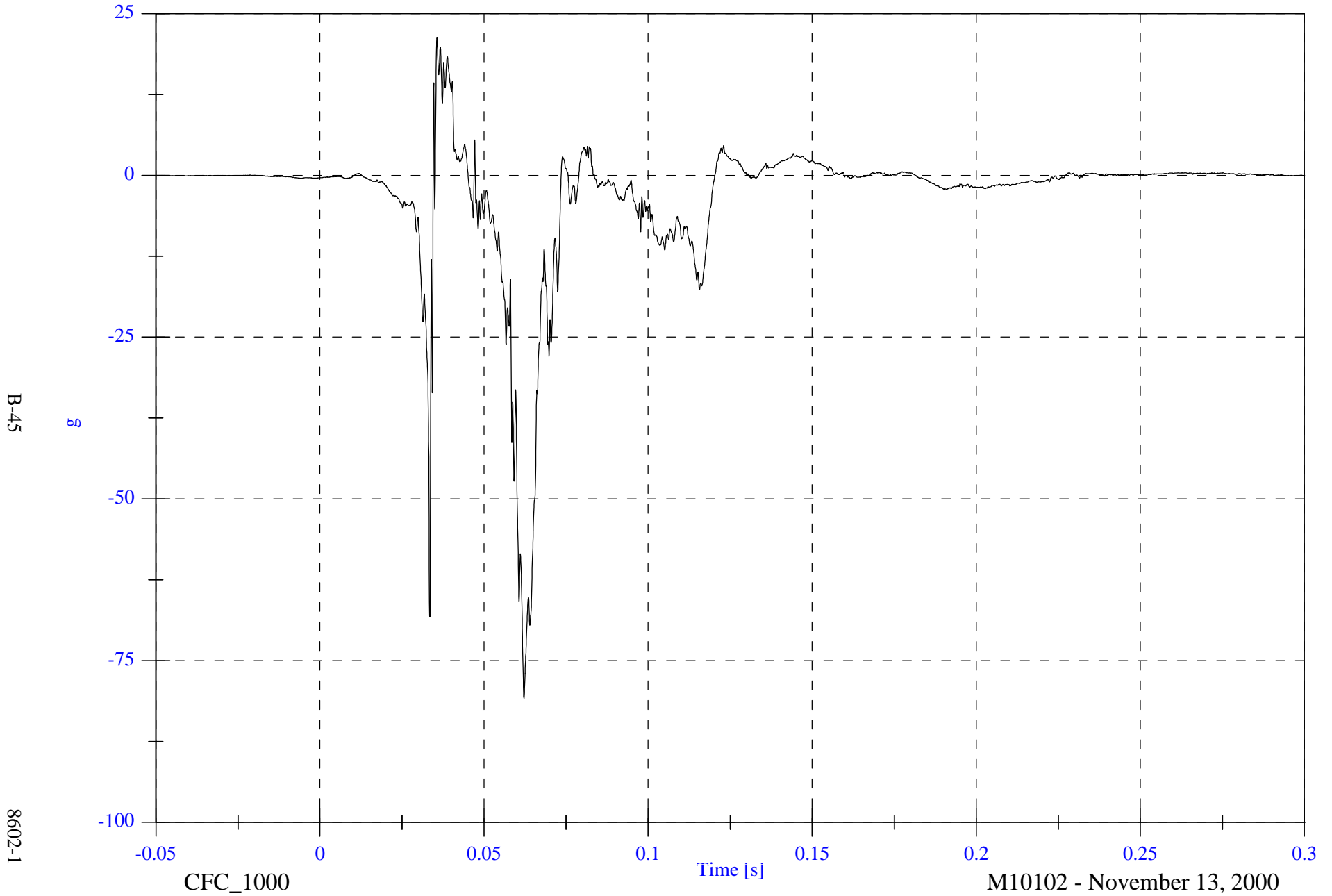
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Foot Aft x

Max: 21.3 [g] at 0.036 [s]

Min: -80.9 [g] at 0.062 [s]

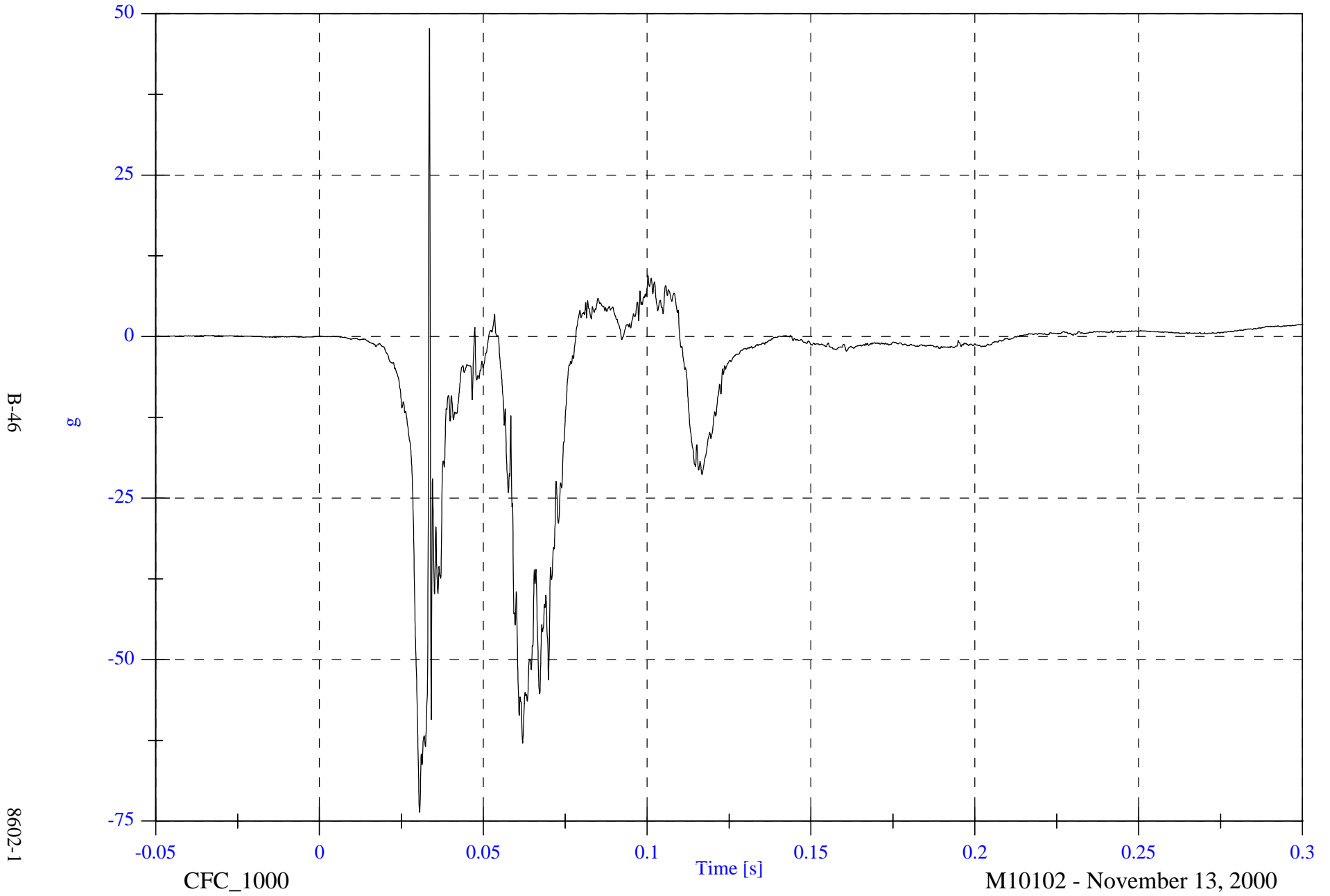


NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Foot Aft z

Max: 47.7 [g] at 0.034 [s]

Min: -73.6 [g] at 0.031 [s]



B-46

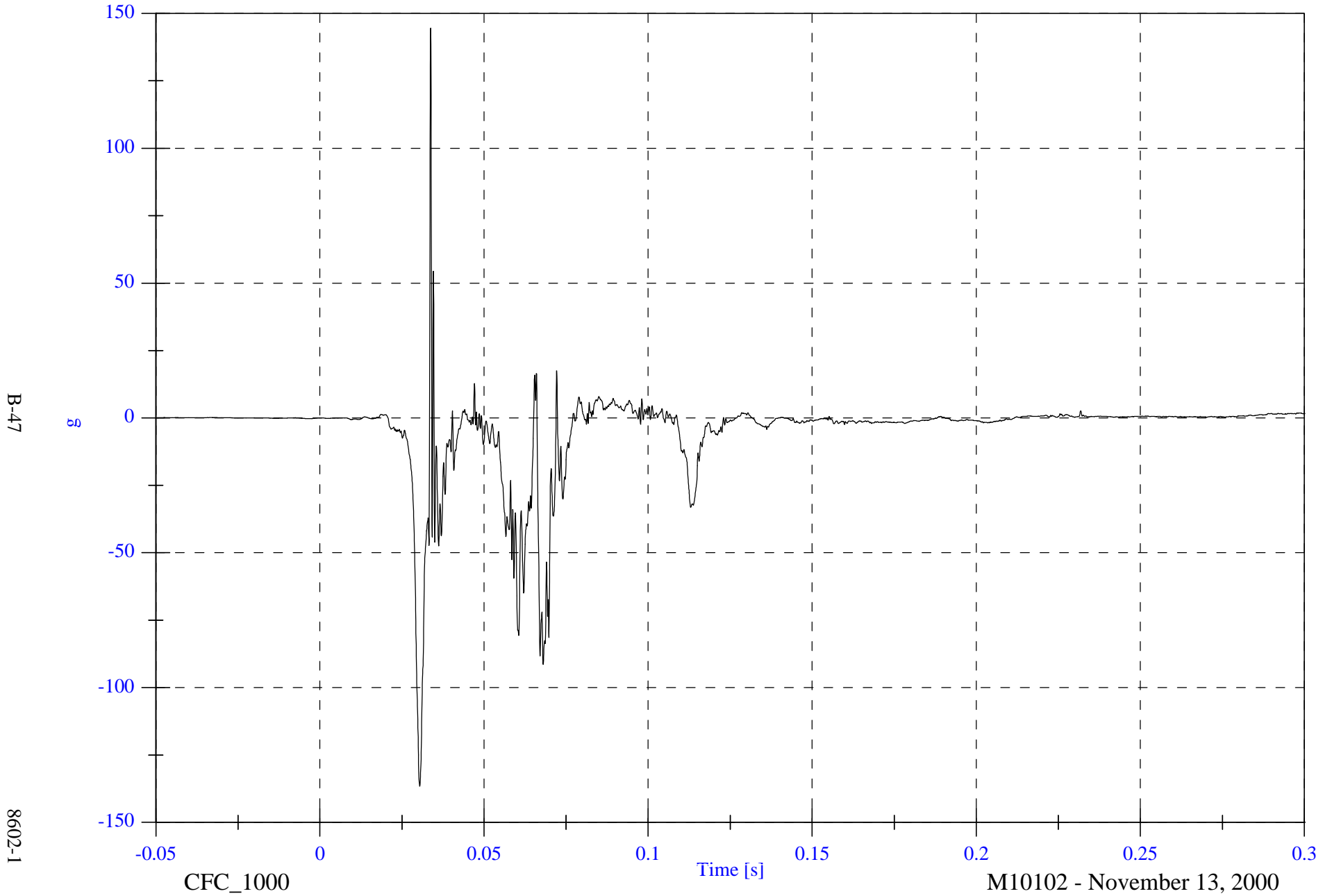
8602-1

NCAP Test 1 - 2001 Chevrolet Impala

P1 Left Foot Fore z

Max: 144.6 [g] at 0.034 [s]

Min: -136.6 [g] at 0.030 [s]

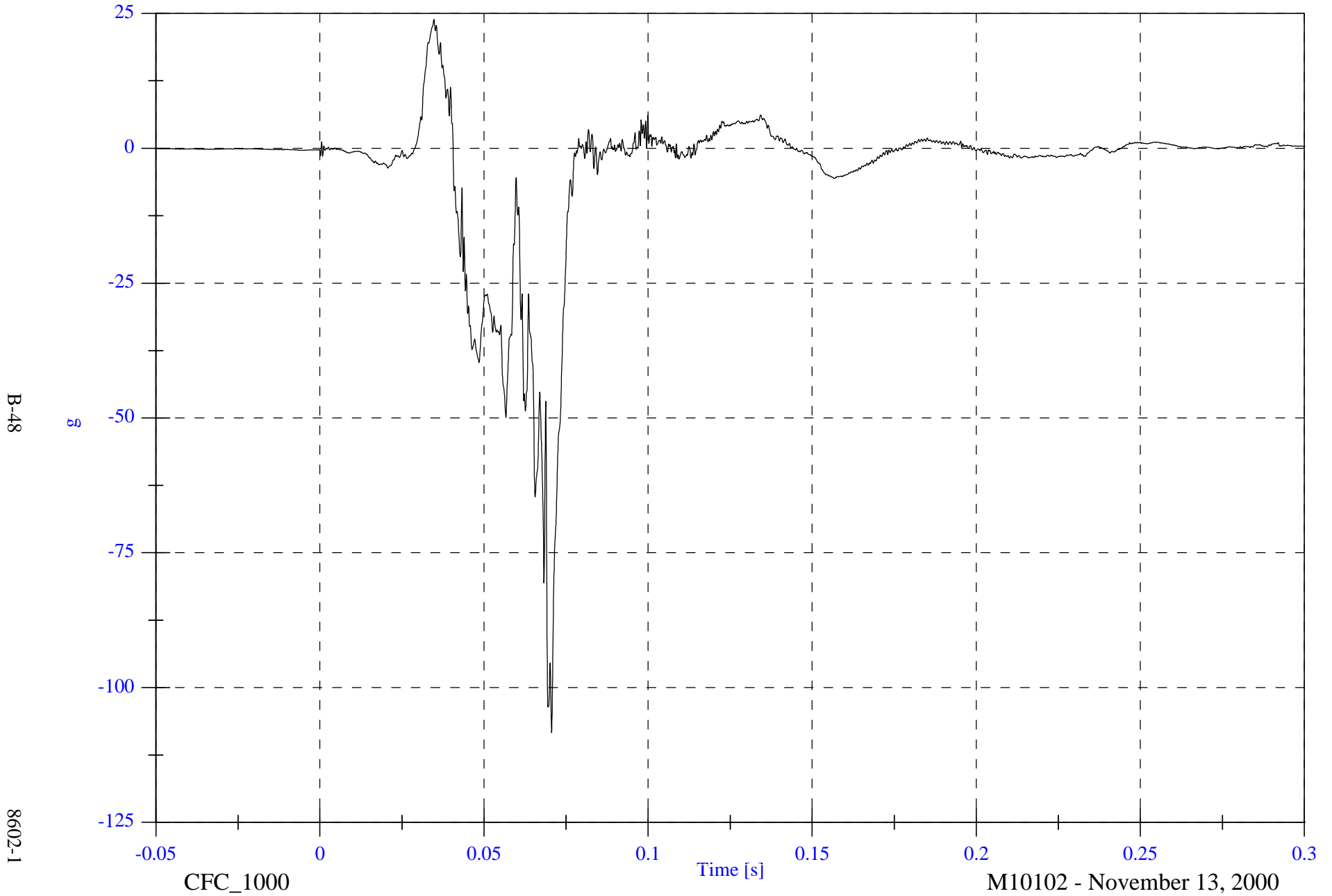


NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Foot Aft x

Max: 23.9 [g] at 0.035 [s]

Min: -108.3 [g] at 0.071 [s]

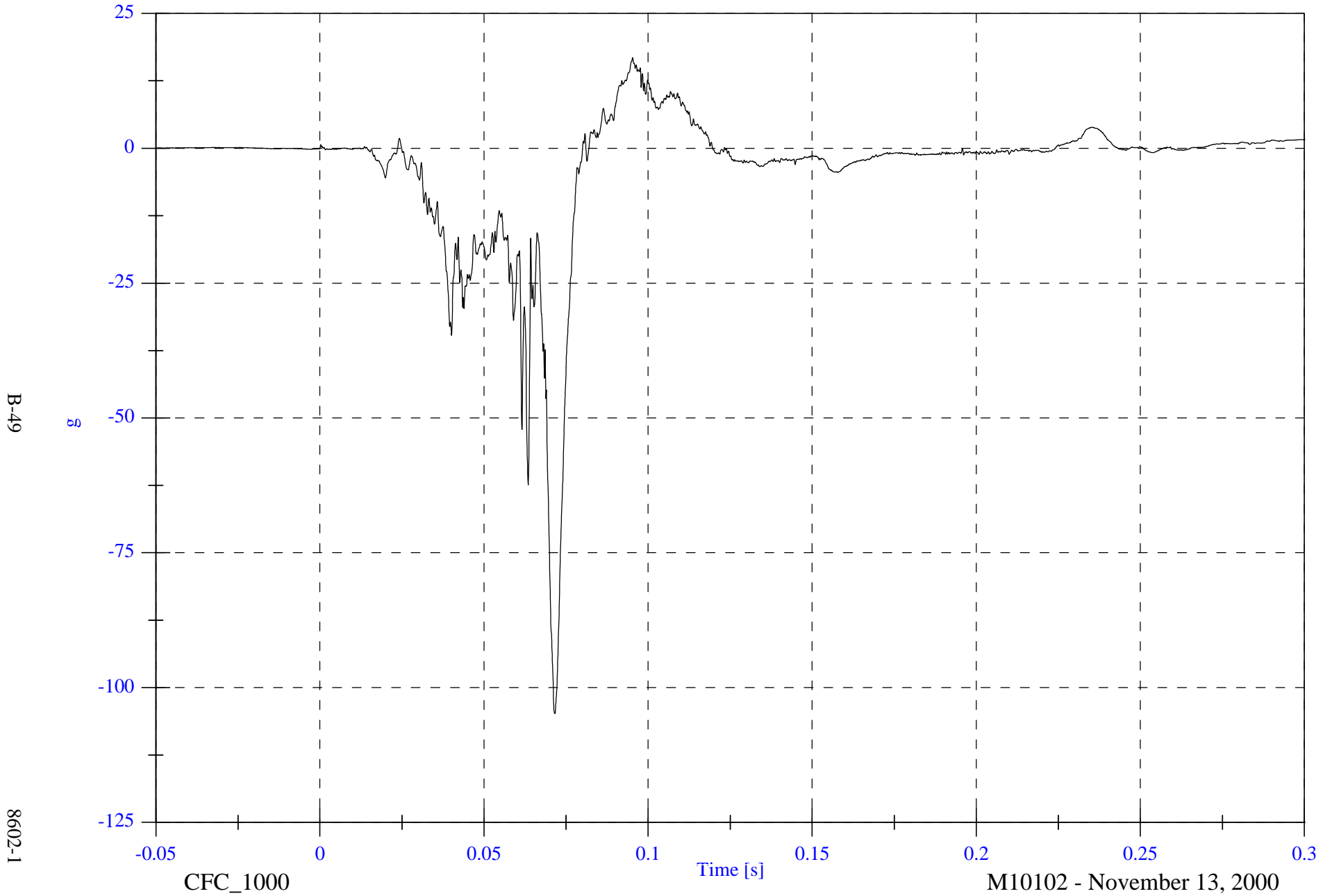


NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Foot Aft z

Max: 16.8 [g] at 0.095 [s]

Min: -104.8 [g] at 0.072 [s]

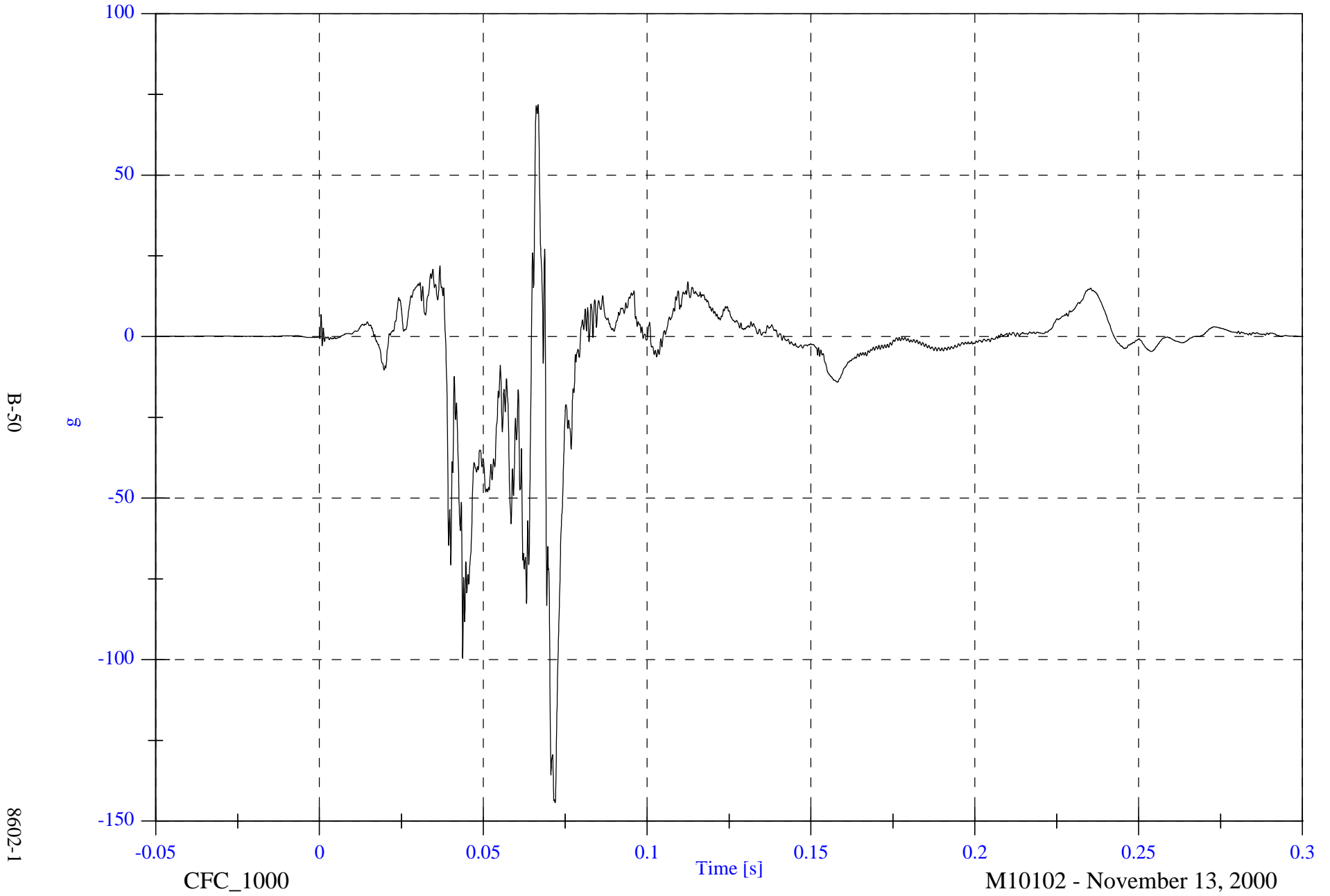


NCAP Test 1 - 2001 Chevrolet Impala

P1 Right Foot Fore z

Max: 71.8 [g] at 0.067 [s]

Min: -144.4 [g] at 0.072 [s]



B-50

g

8602-1

CFC_1000

Time [s]

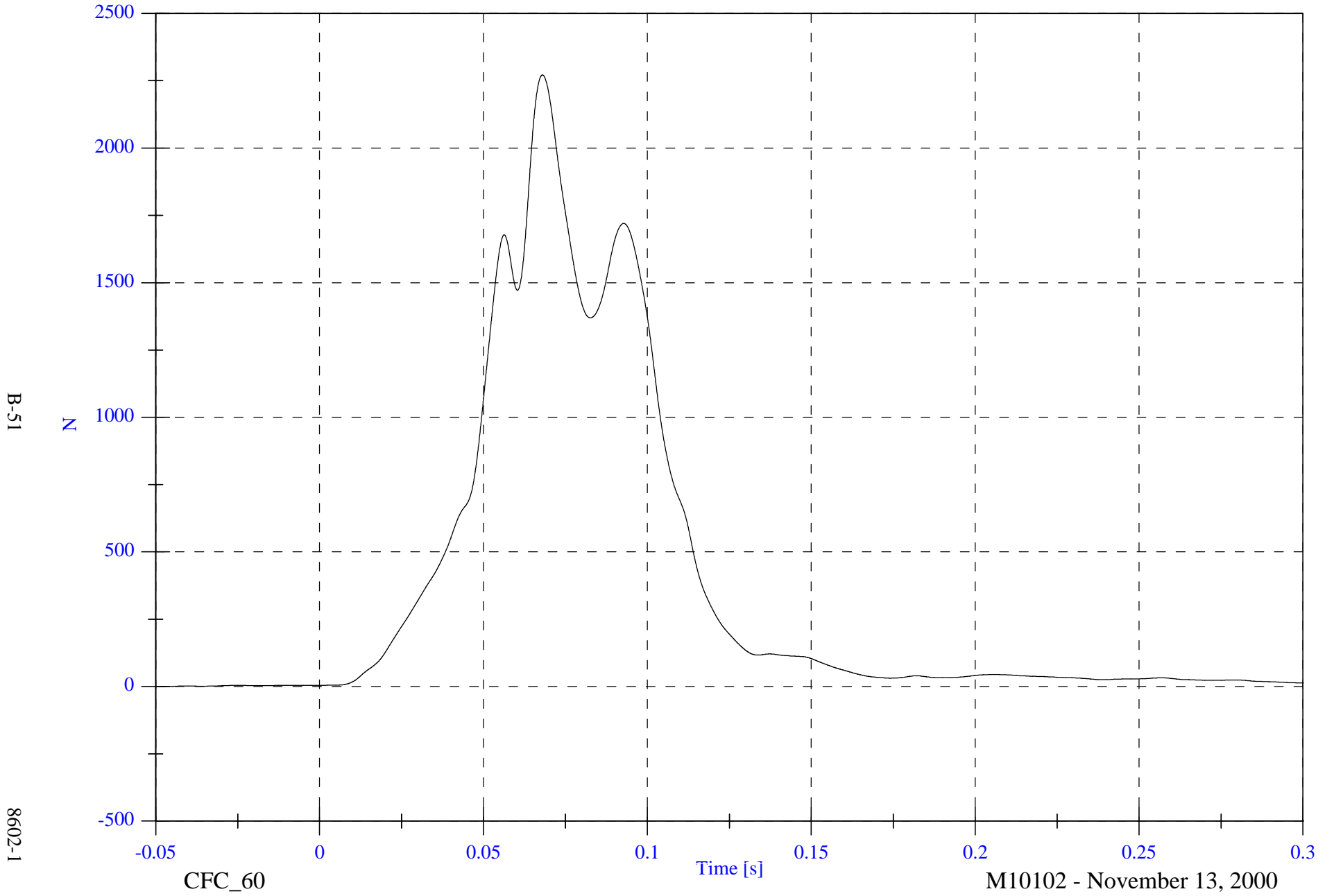
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Lap Belt Force

Max: 2271.9 [N] at 0.068 [s]

Min: -1.4 [N] at -0.050 [s]



B-51

N

8602-1

CFC_60

Time [s]

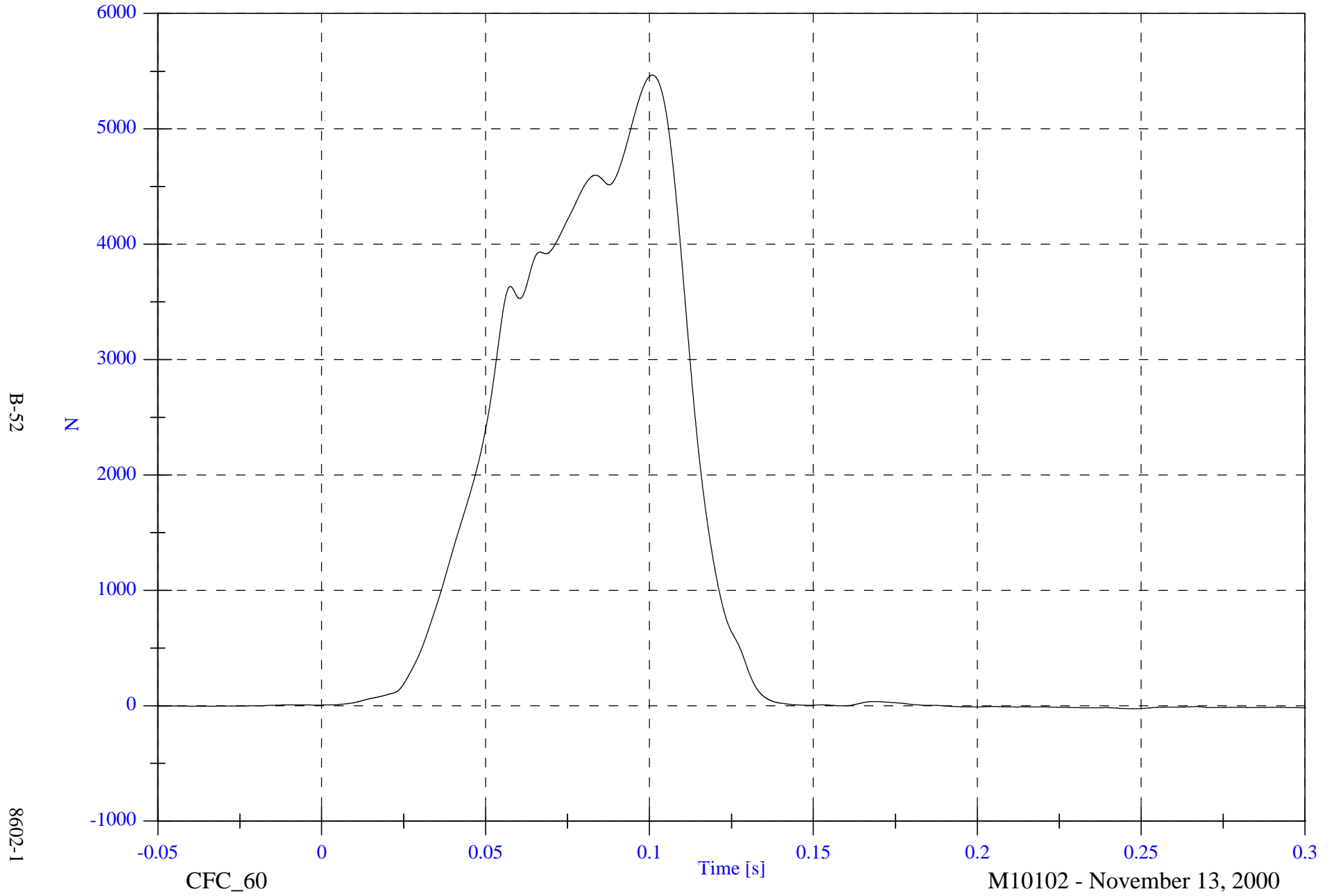
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Shoulder Belt Force

Max: 5466.3 [N] at 0.101 [s]

Min: -26.7 [N] at 0.248 [s]

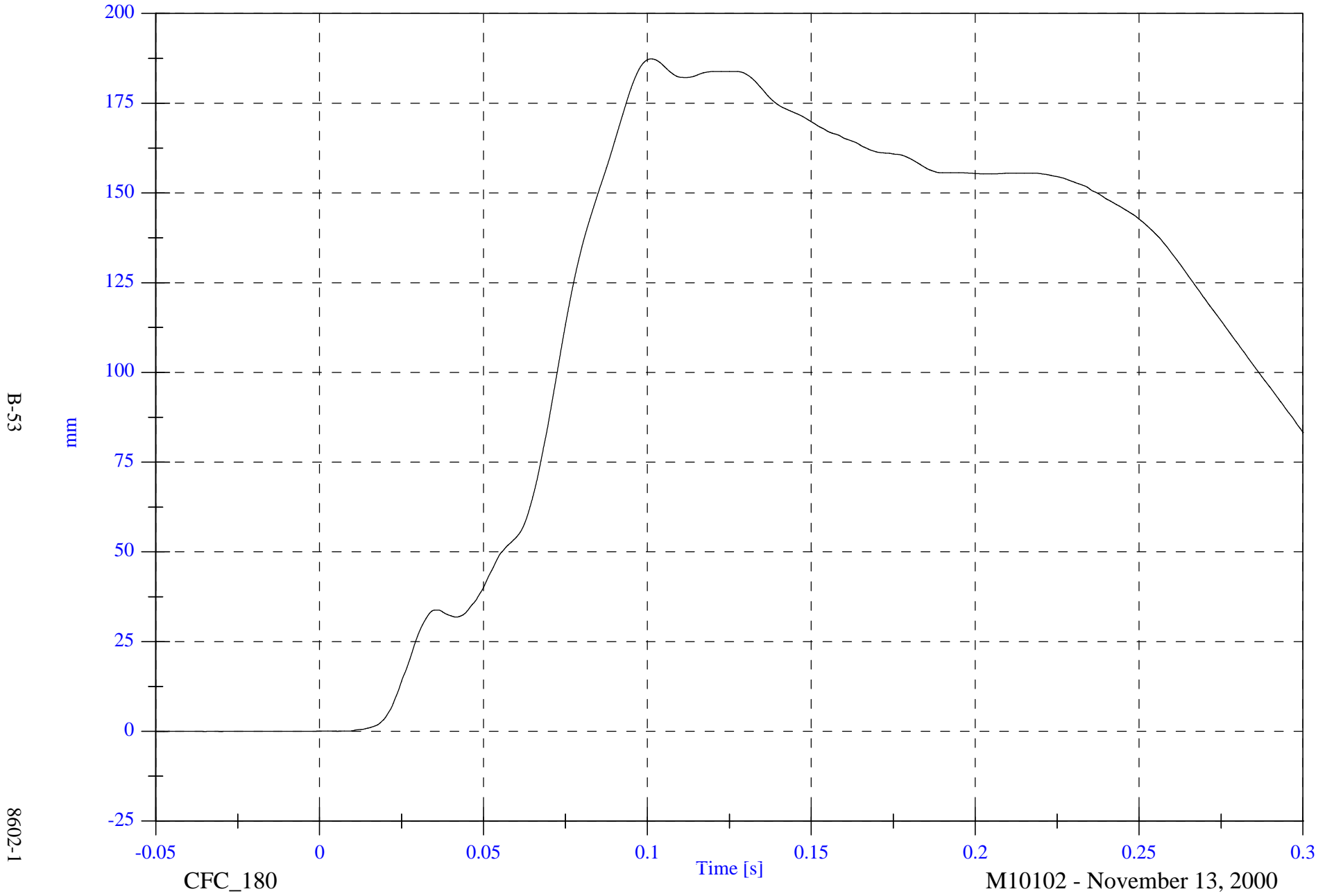


NCAP Test 1 - 2001 Chevrolet Impala

P1 Shoulder Belt Spoolout

Max: 187.4 [mm] at 0.101 [s]

Min: -0.0 [mm] at -0.047 [s]



B-53

8602-1

CFC_180

Time [s]

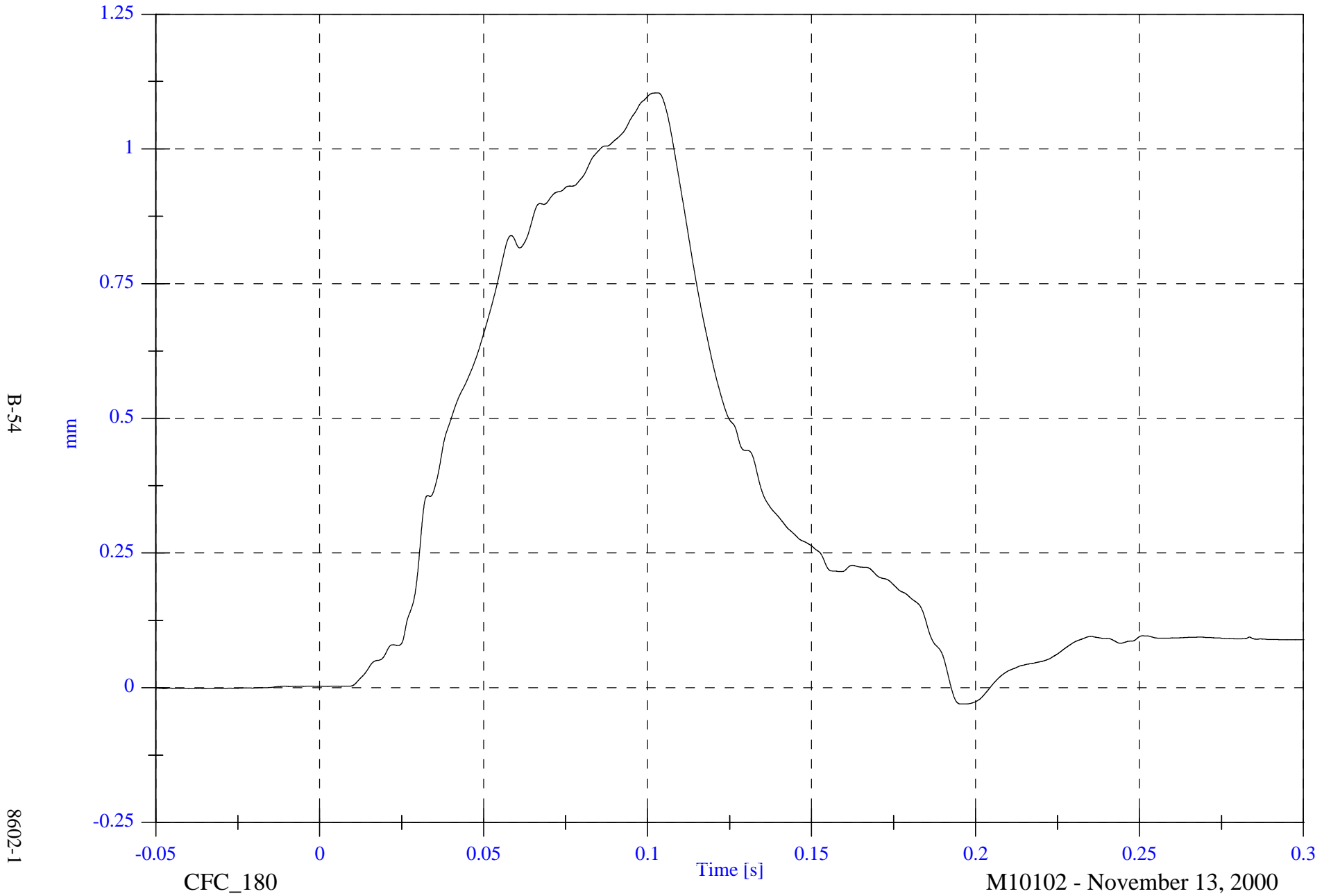
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P1 Shoulder Belt Elongation

Max: 1.1 [mm] at 0.103 [s]

Min: -0.0 [mm] at 0.196 [s]



B-54

8602-1

CFC_180

Time [s]

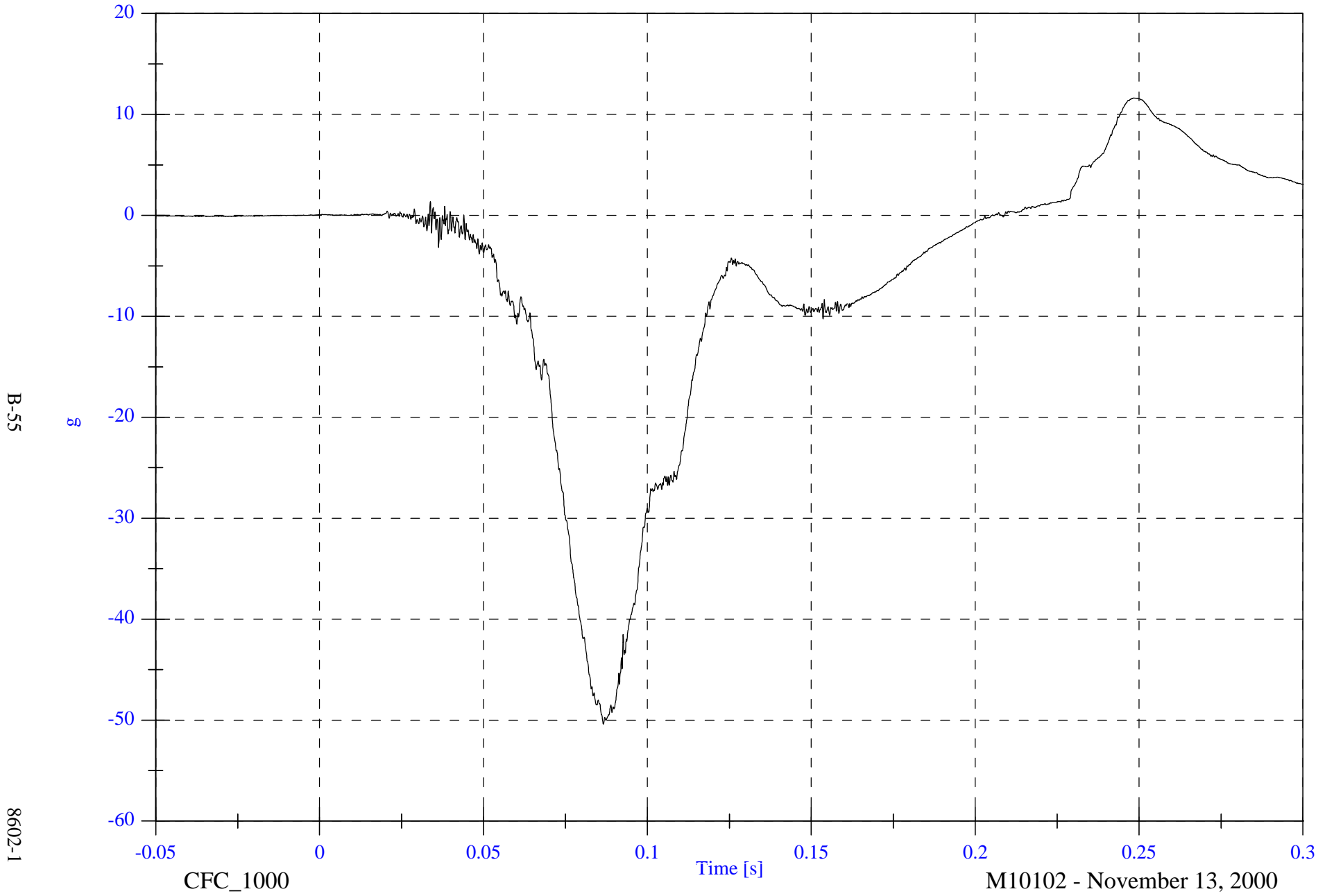
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Head x

Max: 11.6 [g] at 0.248 [s]

Min: -50.4 [g] at 0.087 [s]



B-55

8602-1

CFC_1000

Time [s]

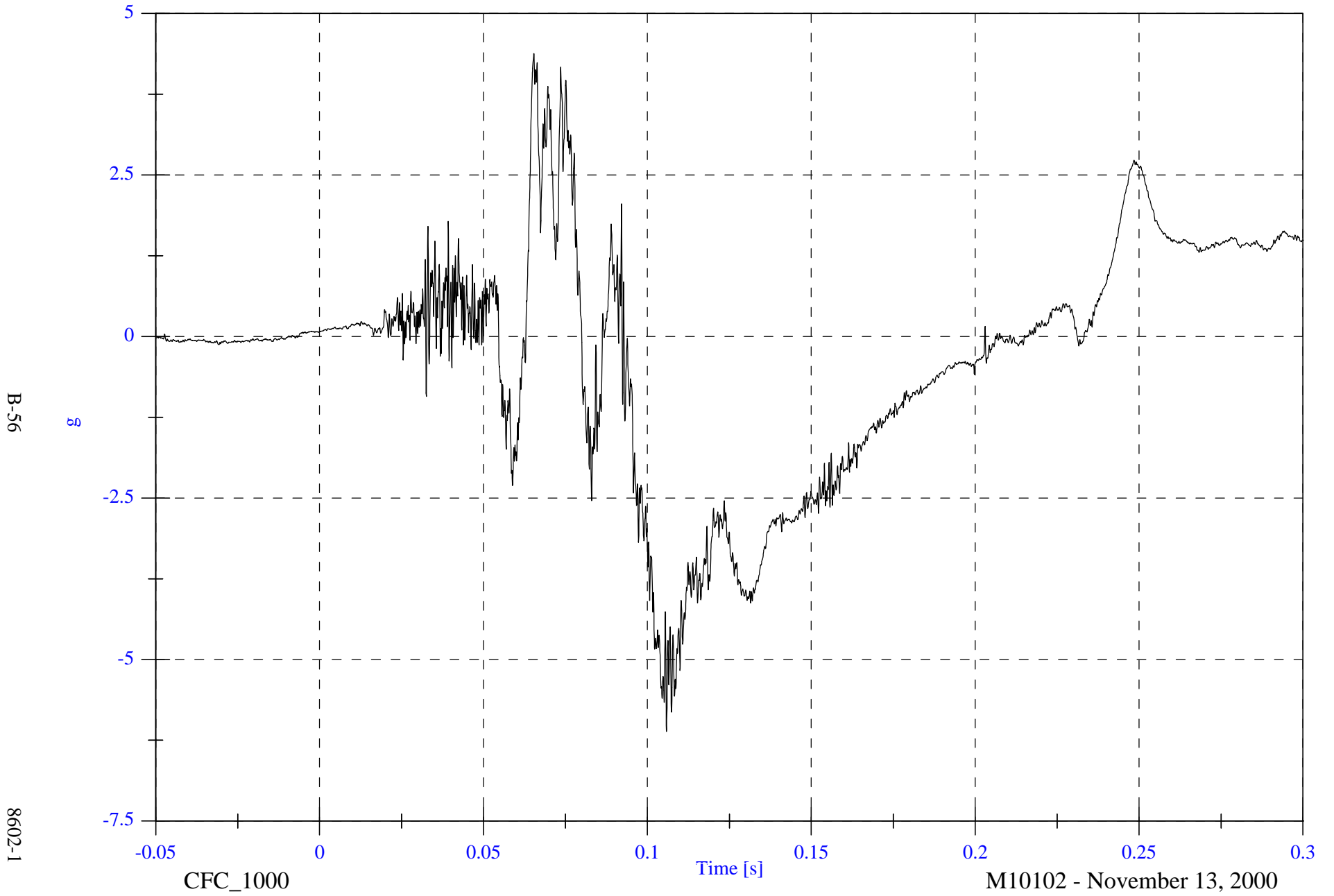
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Head y

Max: 4.4 [g] at 0.065 [s]

Min: -6.1 [g] at 0.106 [s]

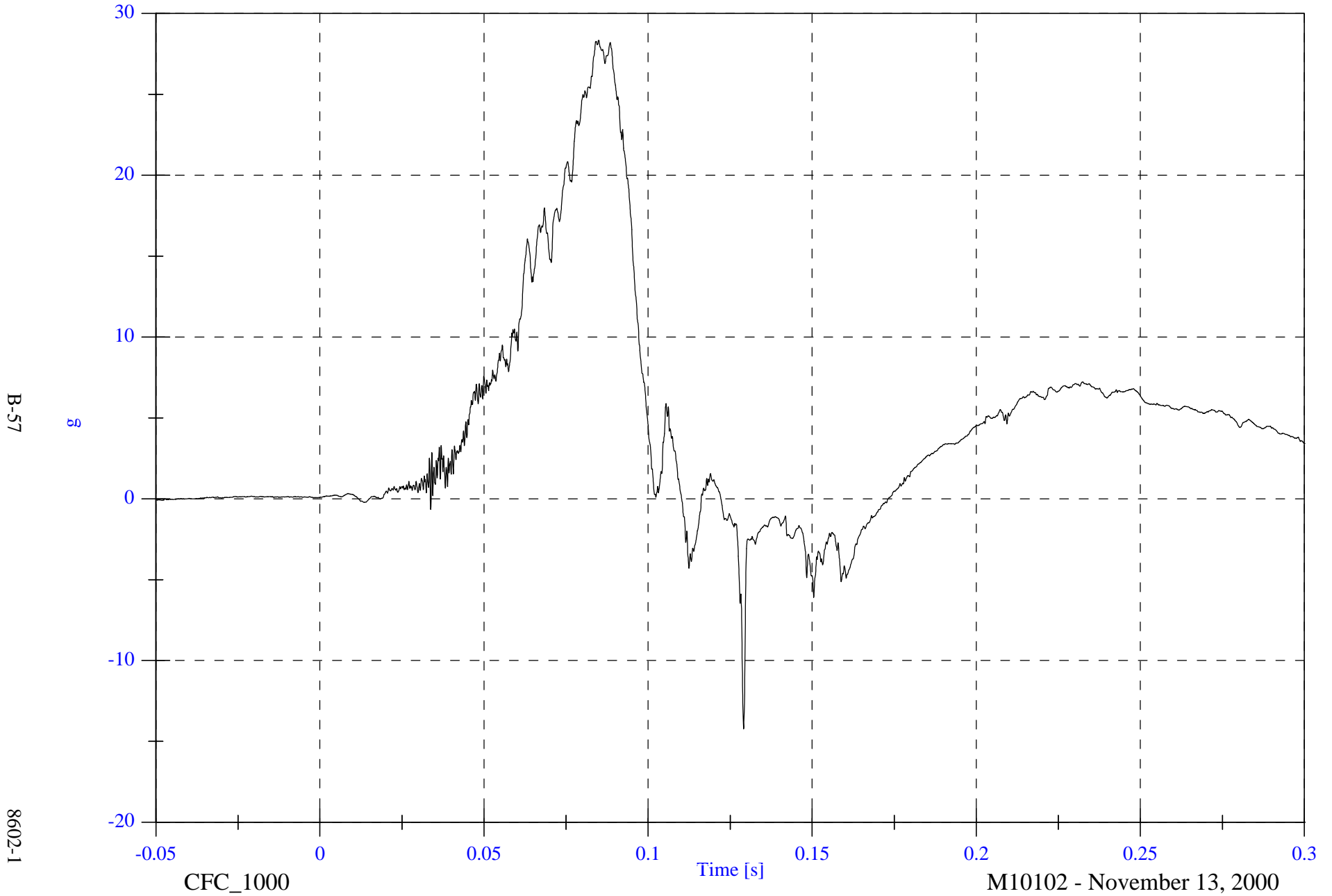


NCAP Test 1 - 2001 Chevrolet Impala

P2 Head z

Max: 28.3 [g] at 0.085 [s]

Min: -14.2 [g] at 0.129 [s]

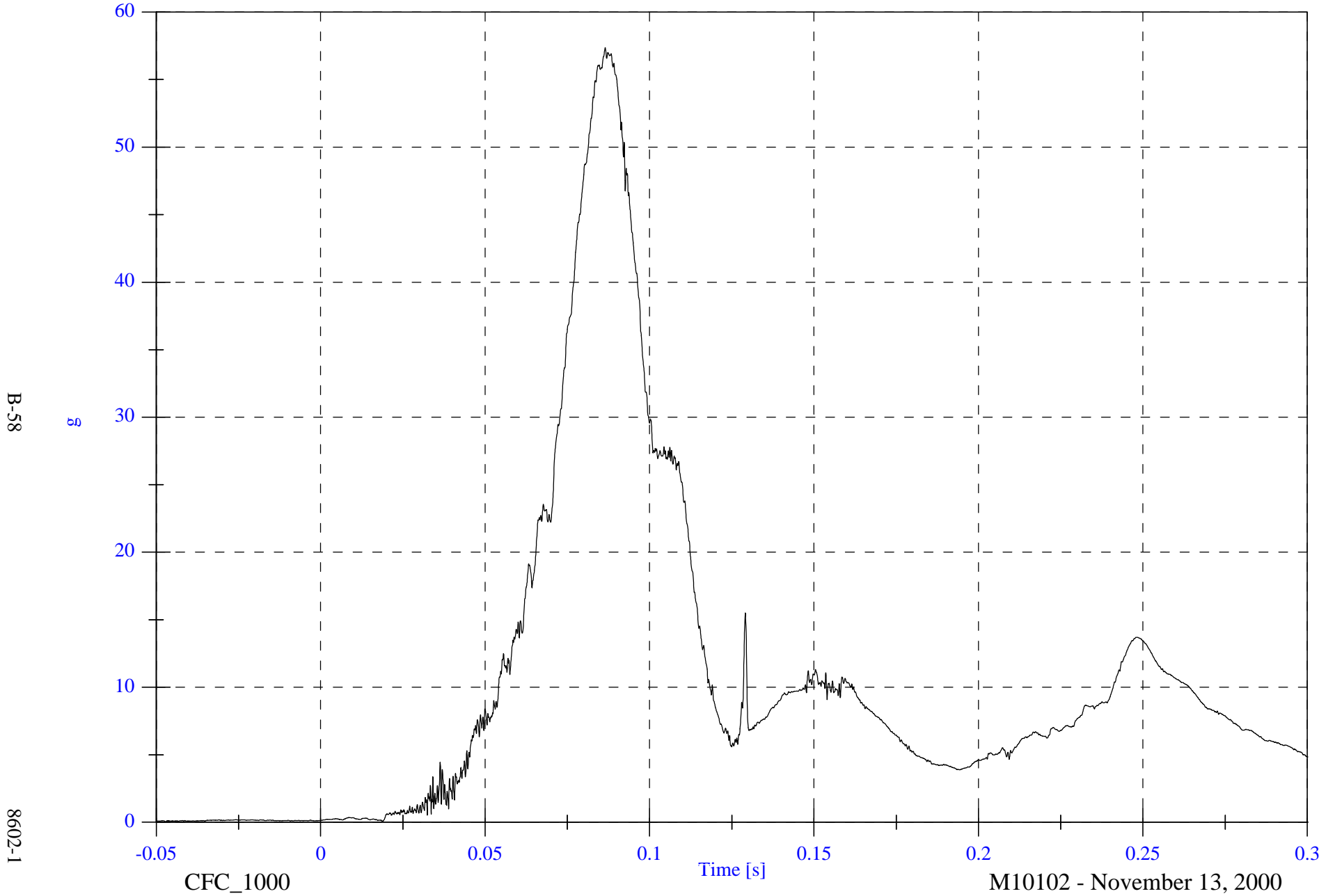


NCAP Test 1 - 2001 Chevrolet Impala

P2 Head Resultant

Max: 57.4 [g] at 0.087 [s]

Min: 0.0 [g] at -0.047 [s]



B-58

8602-1

CFC_1000

Time [s]

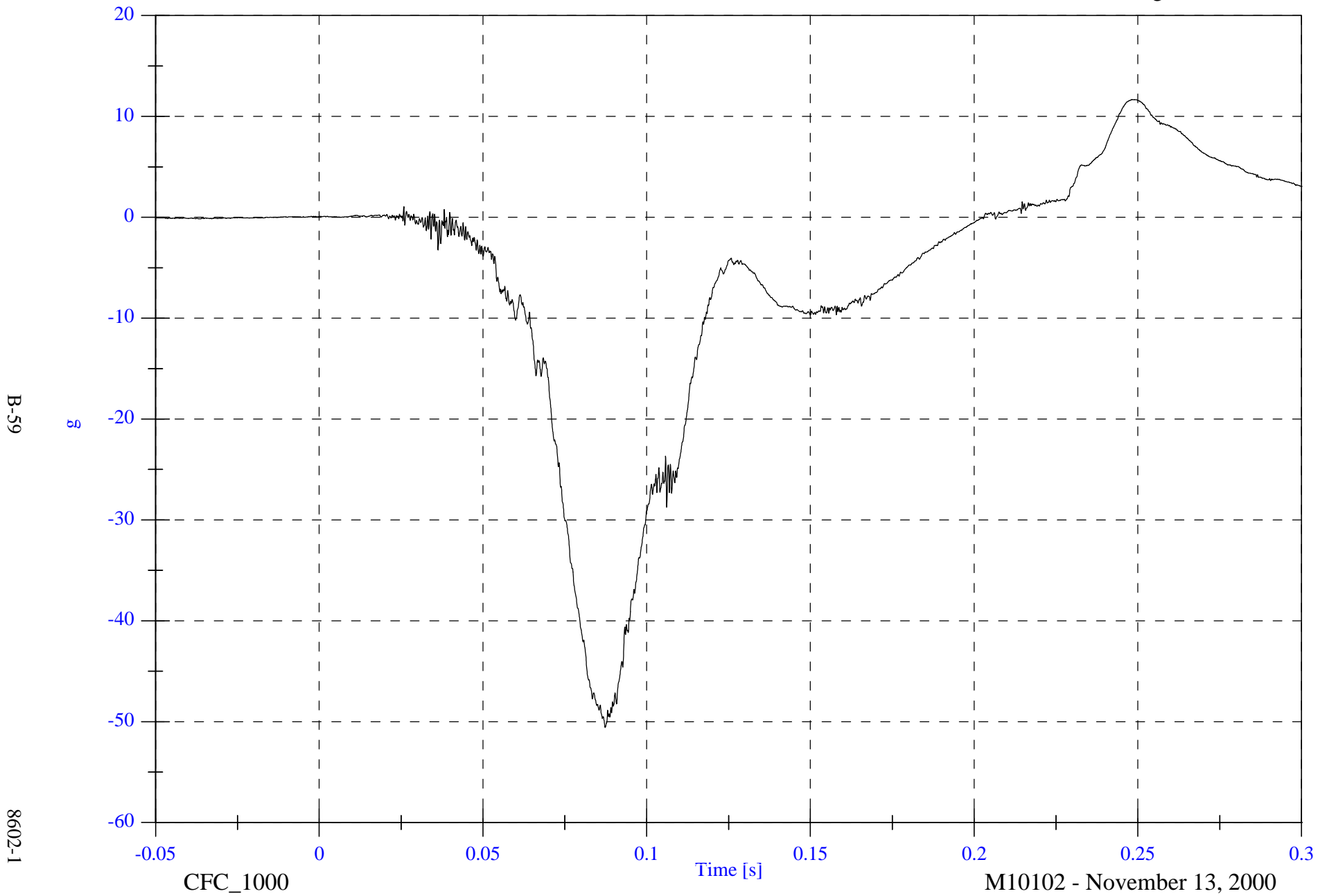
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Head Red x

Max: 11.7 [g] at 0.248 [s]

Min: -50.6 [g] at 0.087 [s]



NCAP Test 1 - 2001 Chevrolet Impala

P2 Head Red y

Max: 4.7 [g] at 0.065 [s]

Min: -5.7 [g] at 0.106 [s]

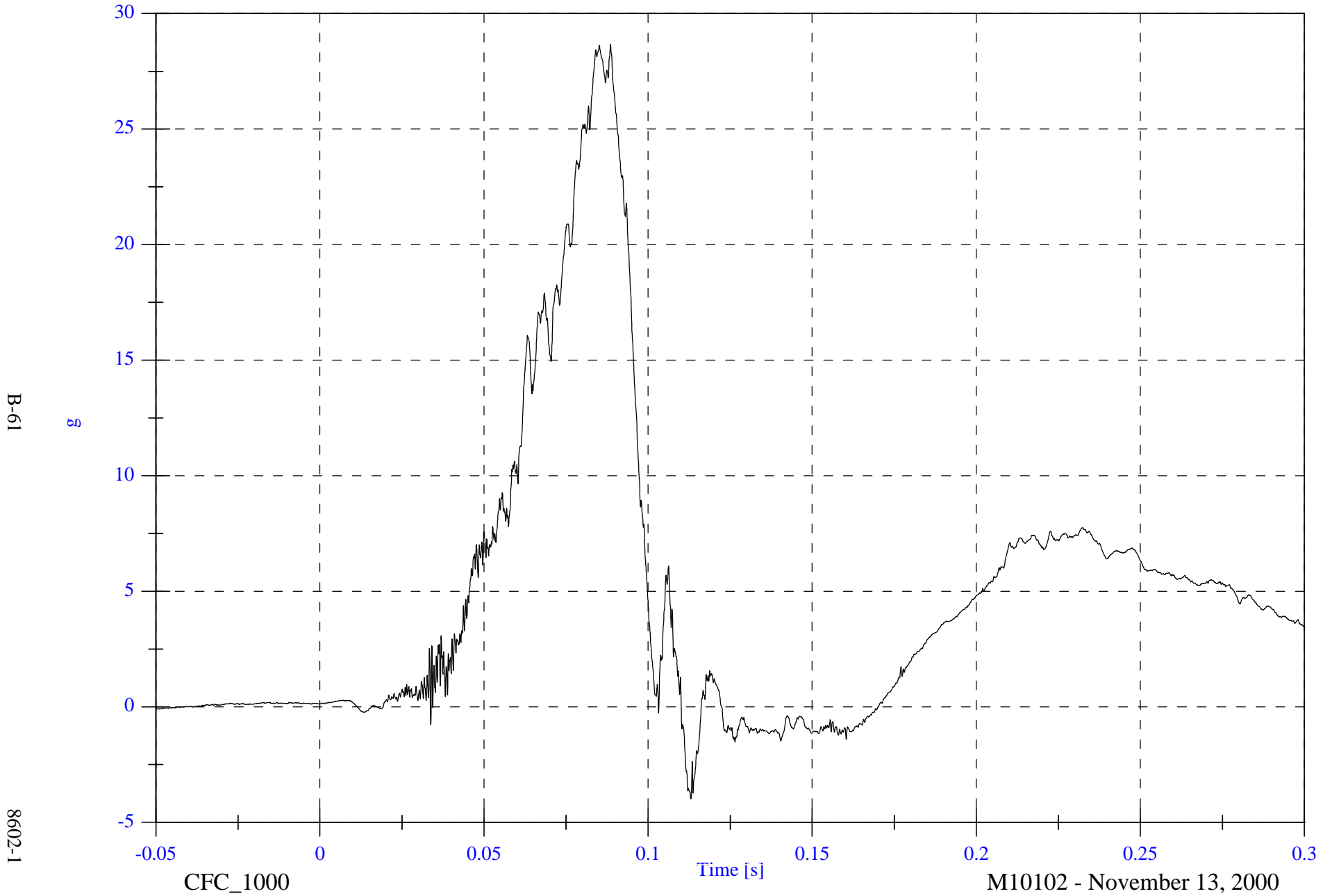


NCAP Test 1 - 2001 Chevrolet Impala

P2 Head Red z

Max: 28.7 [g] at 0.089 [s]

Min: -4.0 [g] at 0.113 [s]



B-61

g

8602-1

CFC_1000

Time [s]

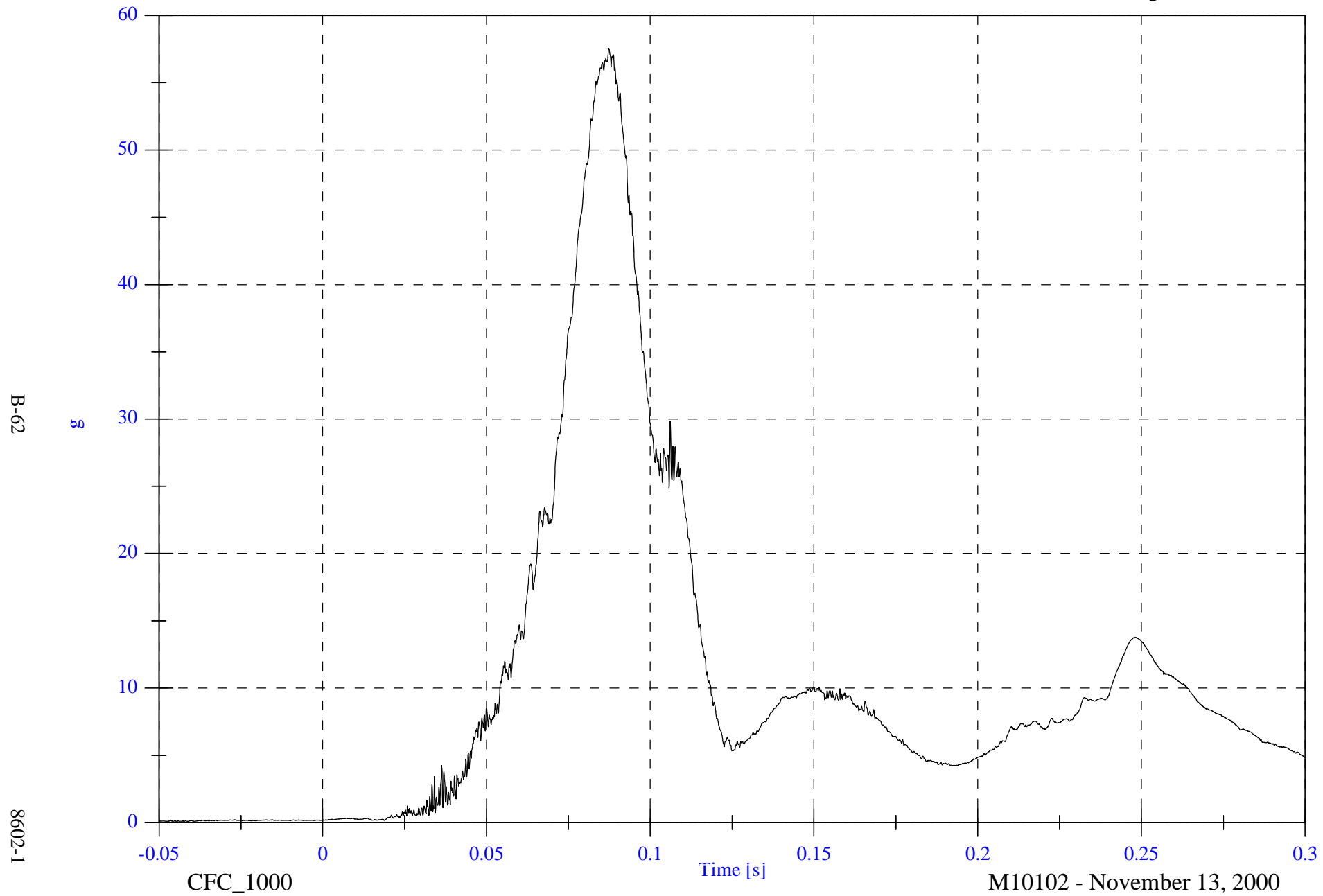
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Head Red Resultant

Max: 57.6 [g] at 0.087 [s]

Min: 0.1 [g] at -0.047 [s]



B-62

8602-1

CFC_1000

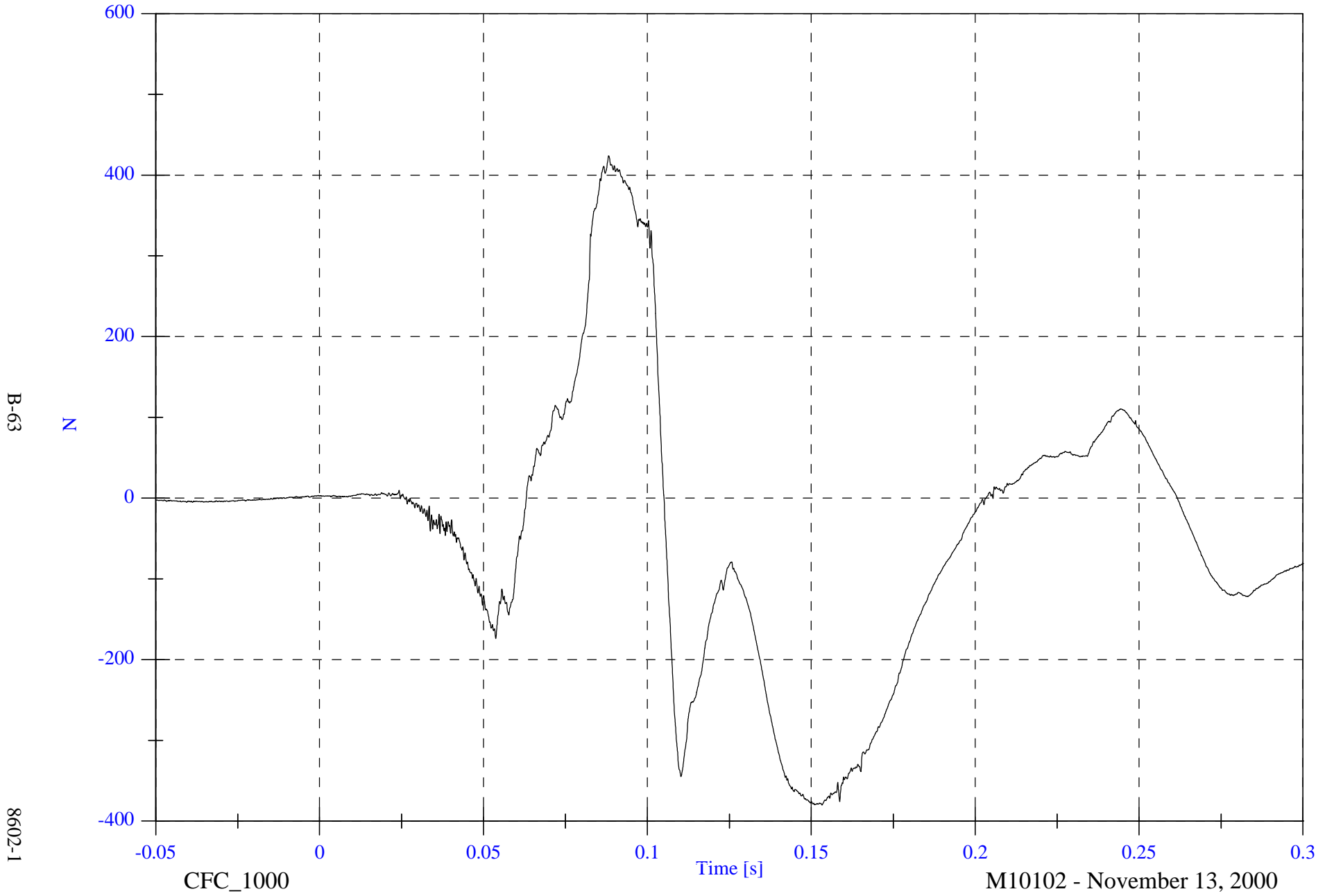
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Upper Neck Fx

Max: 423.8 [N] at 0.088 [s]

Min: -379.9 [N] at 0.153 [s]

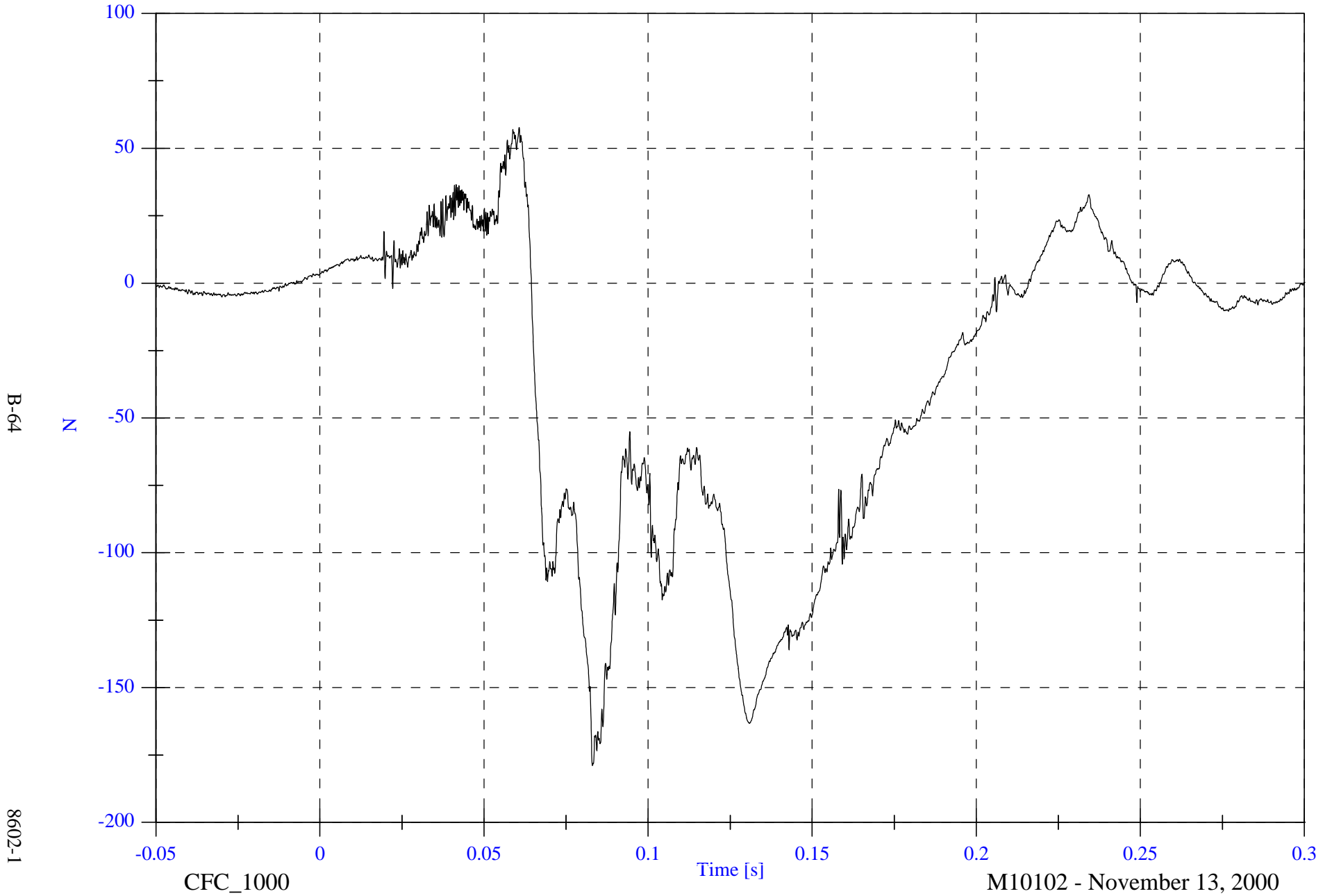


NCAP Test 1 - 2001 Chevrolet Impala

P2 Upper Neck Fy

Max: 57.8 [N] at 0.061 [s]

Min: -179.0 [N] at 0.083 [s]



B-64

8602-1

CFC_1000

M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Upper Neck Fz

Max: 631.7 [N] at 0.075 [s]

Min: -206.2 [N] at 0.286 [s]



B-65

8602-1

CFC_1000

Time [s]

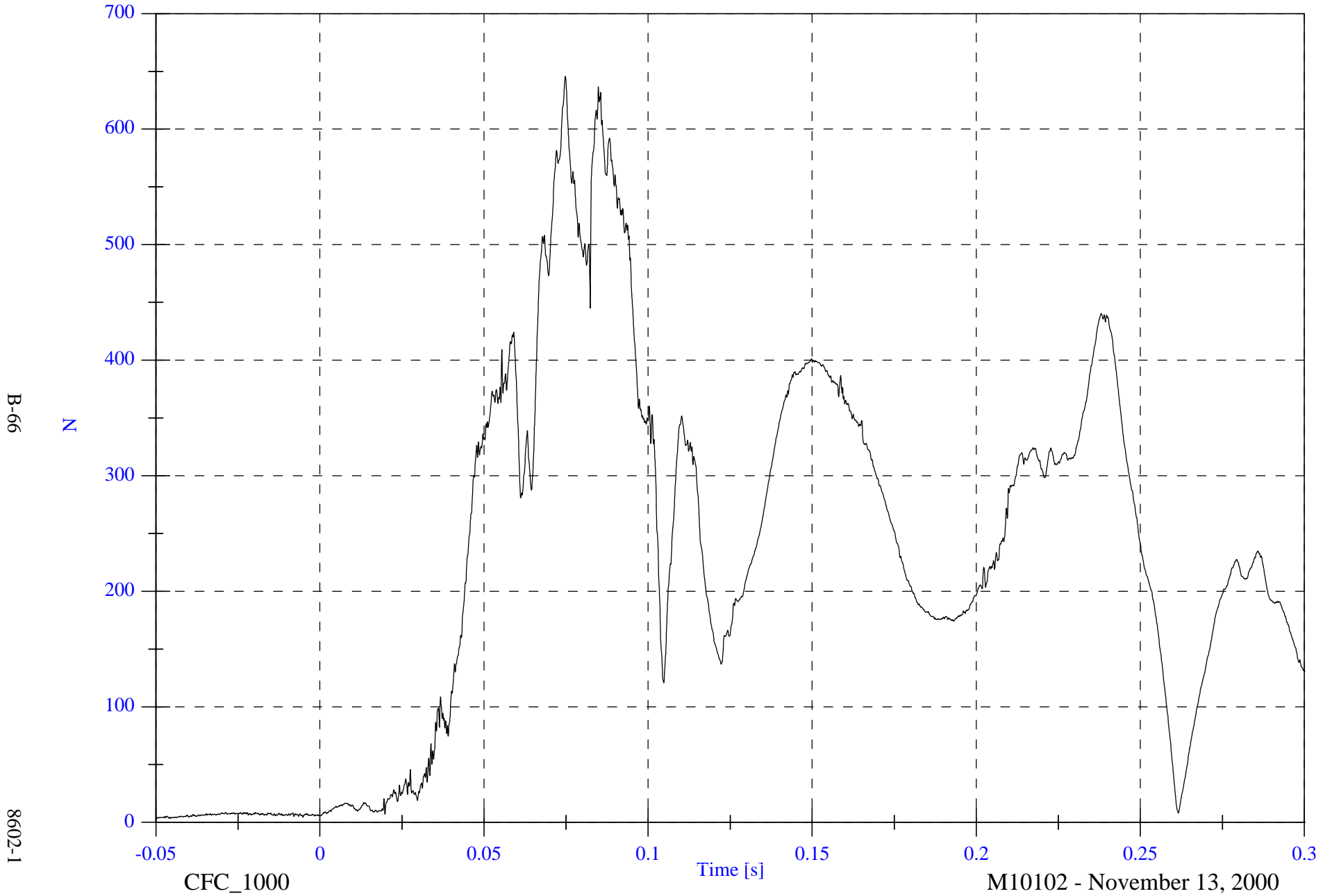
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Upper Neck F Resultant

Max: 645.7 [N] at 0.075 [s]

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



B-66

8602-1

CFC_1000

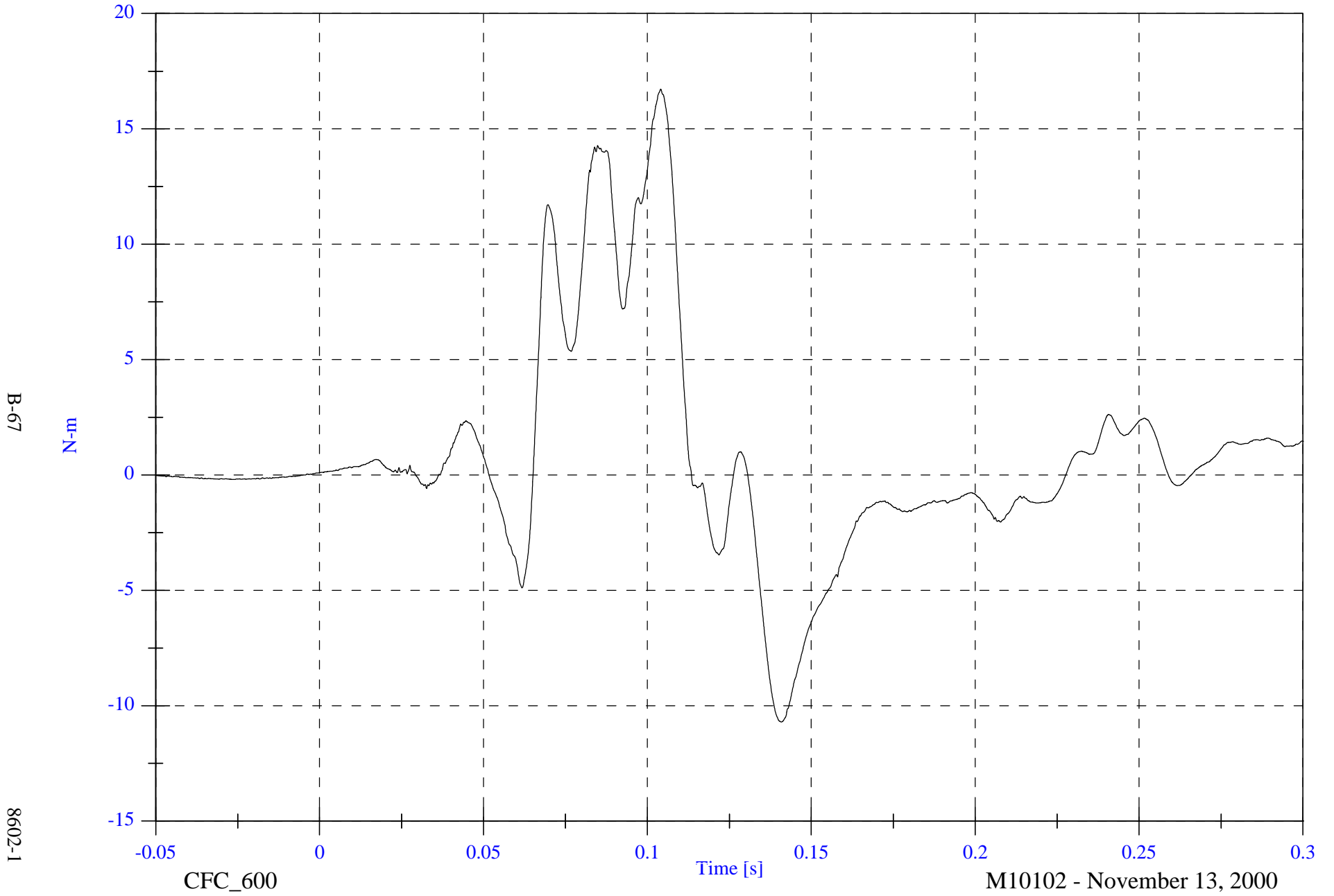
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Upper Neck Mx

Max: 16.7 [N-m] at 0.104 [s]

Min: -10.7 [N-m] at 0.141 [s]

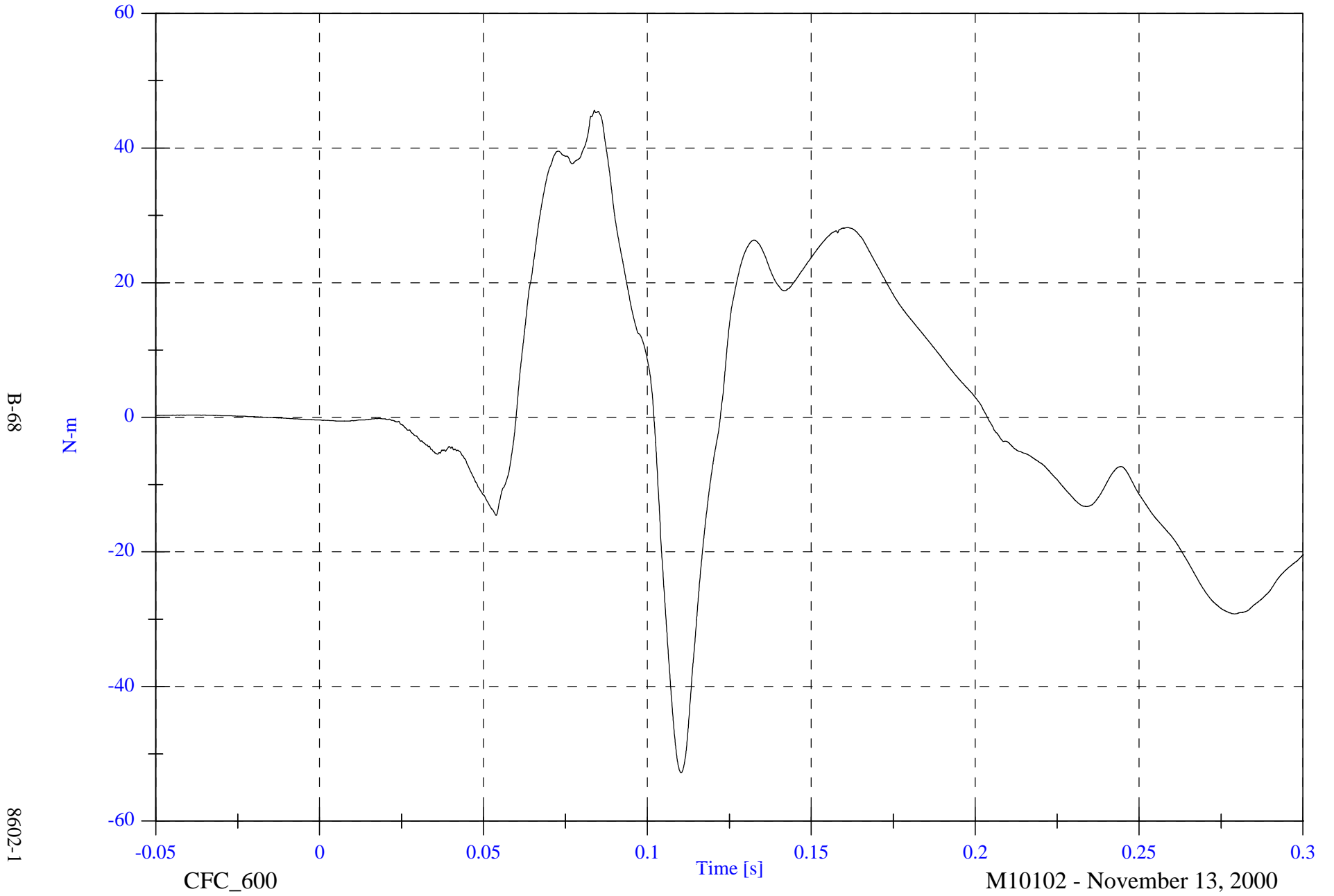


NCAP Test 1 - 2001 Chevrolet Impala

P2 Upper Neck My

Max: 45.6 [N-m] at 0.084 [s]

Min: -52.8 [N-m] at 0.110 [s]



B-68

8602-1

CFC_600

Time [s]

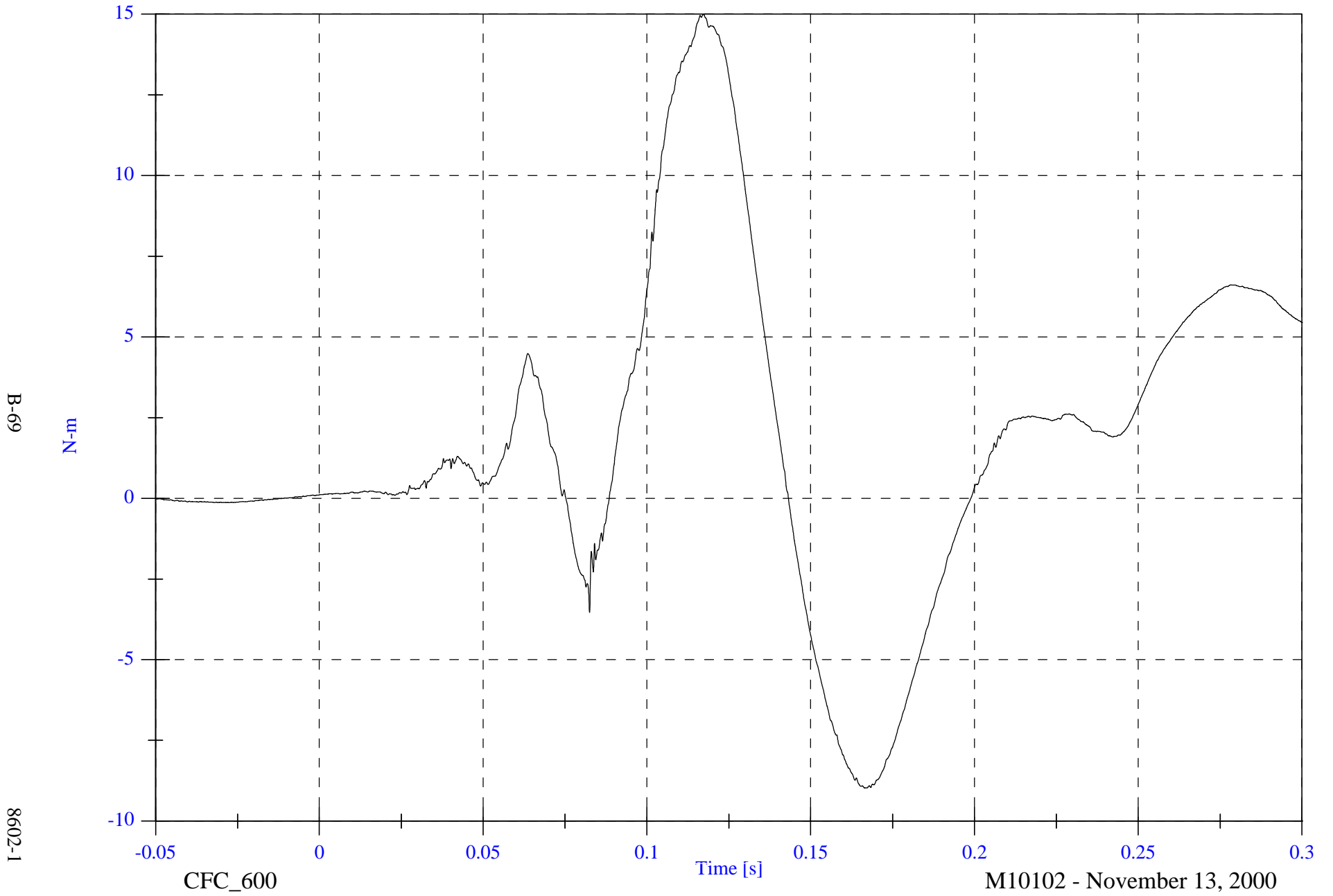
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 15.0 [N-m] at 0.117 [s]

Min: -9.0 [N-m] at 0.167 [s]

P2 Upper Neck Mz



B-69

8602-1

CFC_600

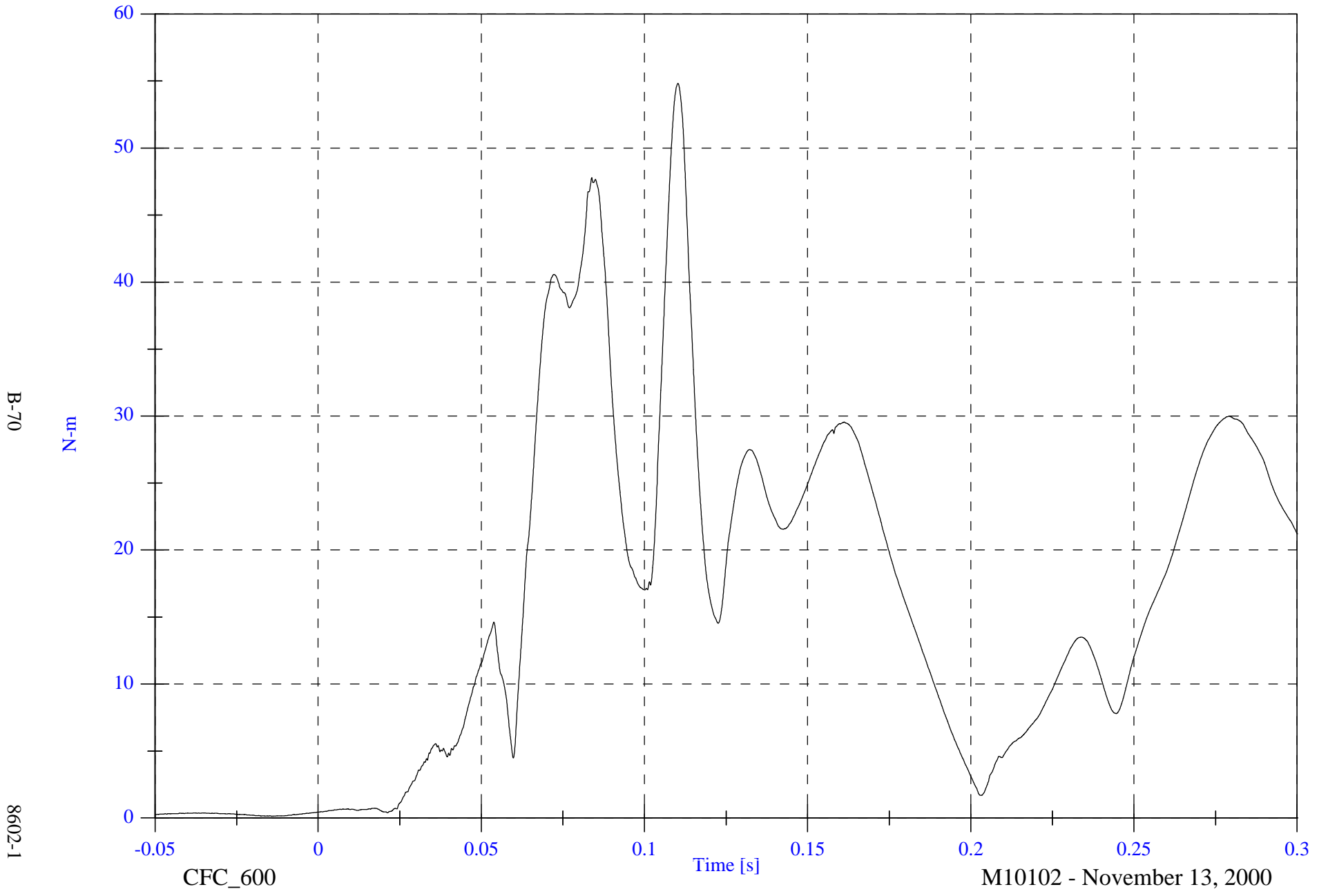
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Upper Neck M Resultant

Max: 54.8 [N-m] at 0.110 [s]

Min: 0.1 [N-m] at -0.014 [s]



B-70

N-m

8602-1

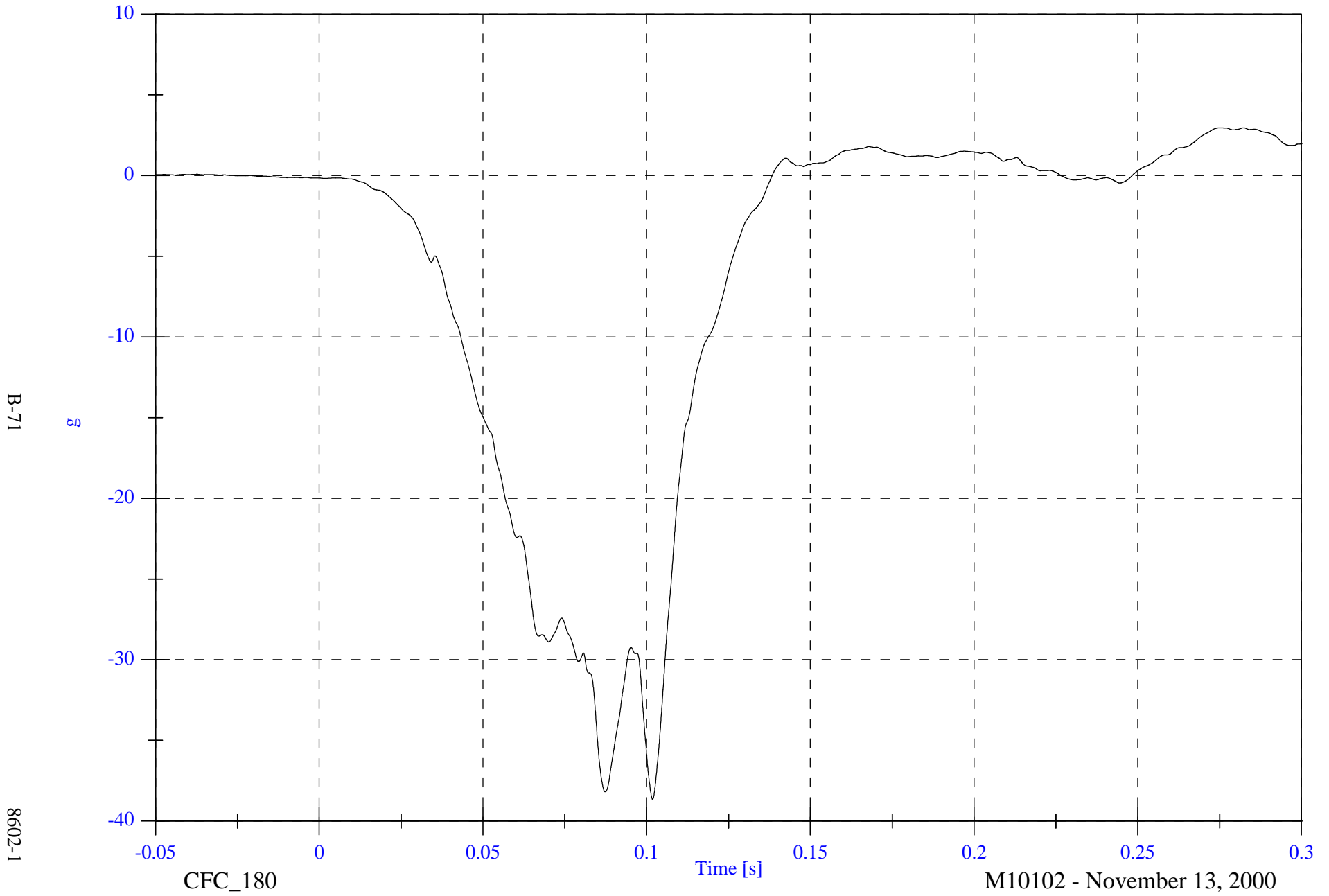
-0.05 0 0.05 0.1 0.15 0.2 0.25 0.3
CFC_600 Time [s] M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest x

Max: 3.0 [g] at 0.275 [s]

Min: -38.7 [g] at 0.102 [s]



B-71

8602-1

CFC_180

Time [s]

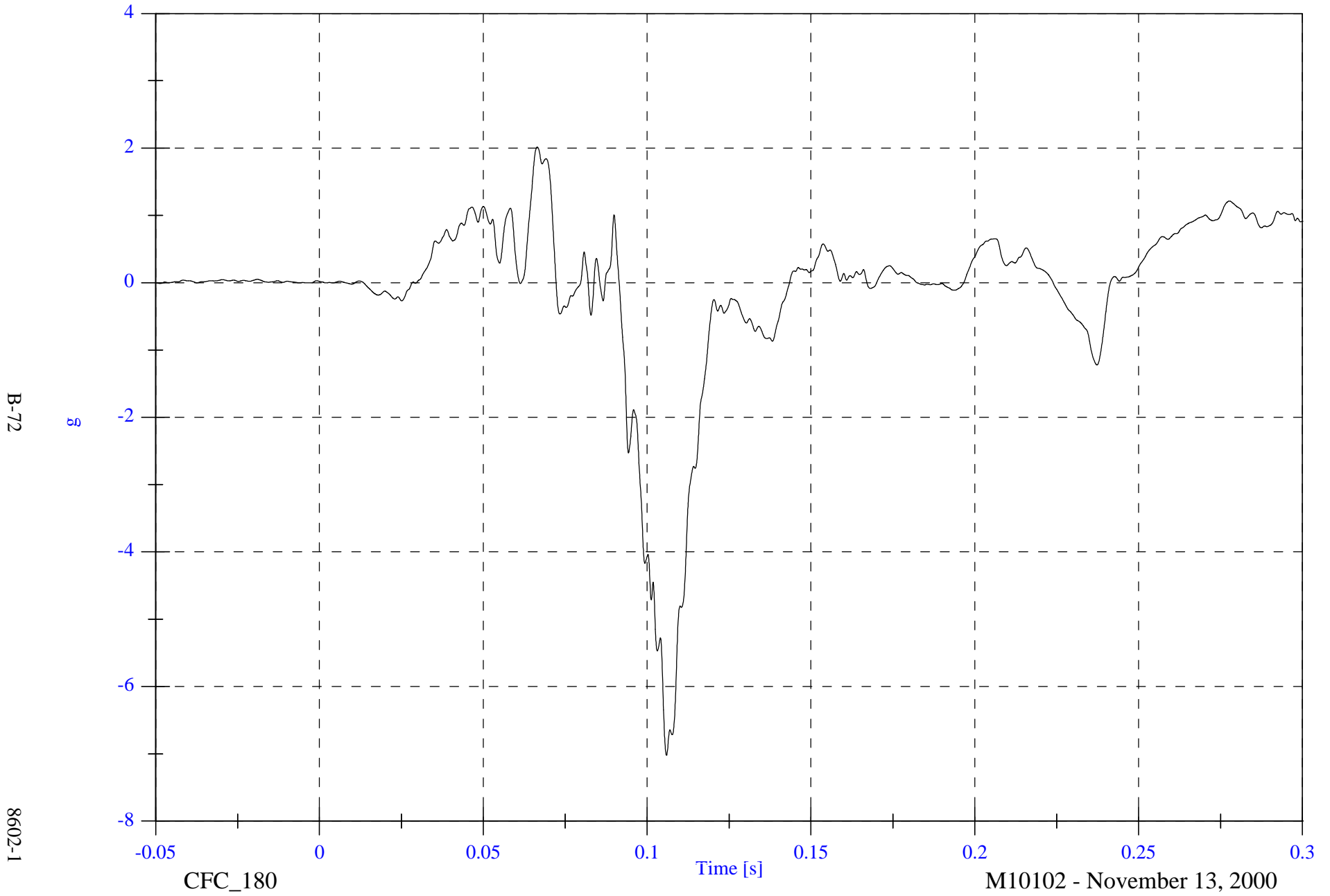
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest y

Max: 2.0 [g] at 0.066 [s]

Min: -7.0 [g] at 0.106 [s]

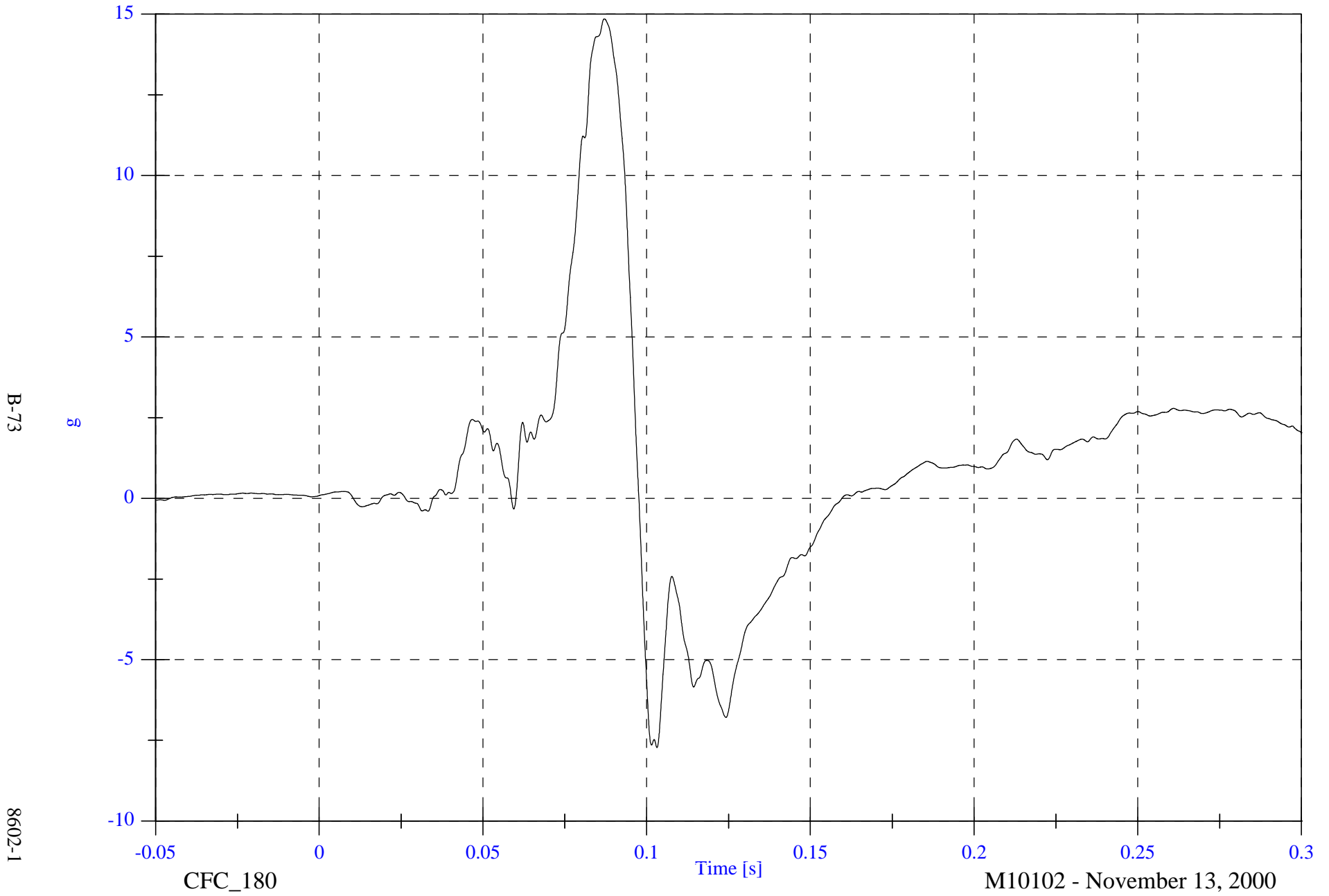


NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest z

Max: 14.9 [g] at 0.087 [s]

Min: -7.7 [g] at 0.103 [s]



B-73

8602-1

CFC_180

Time [s]

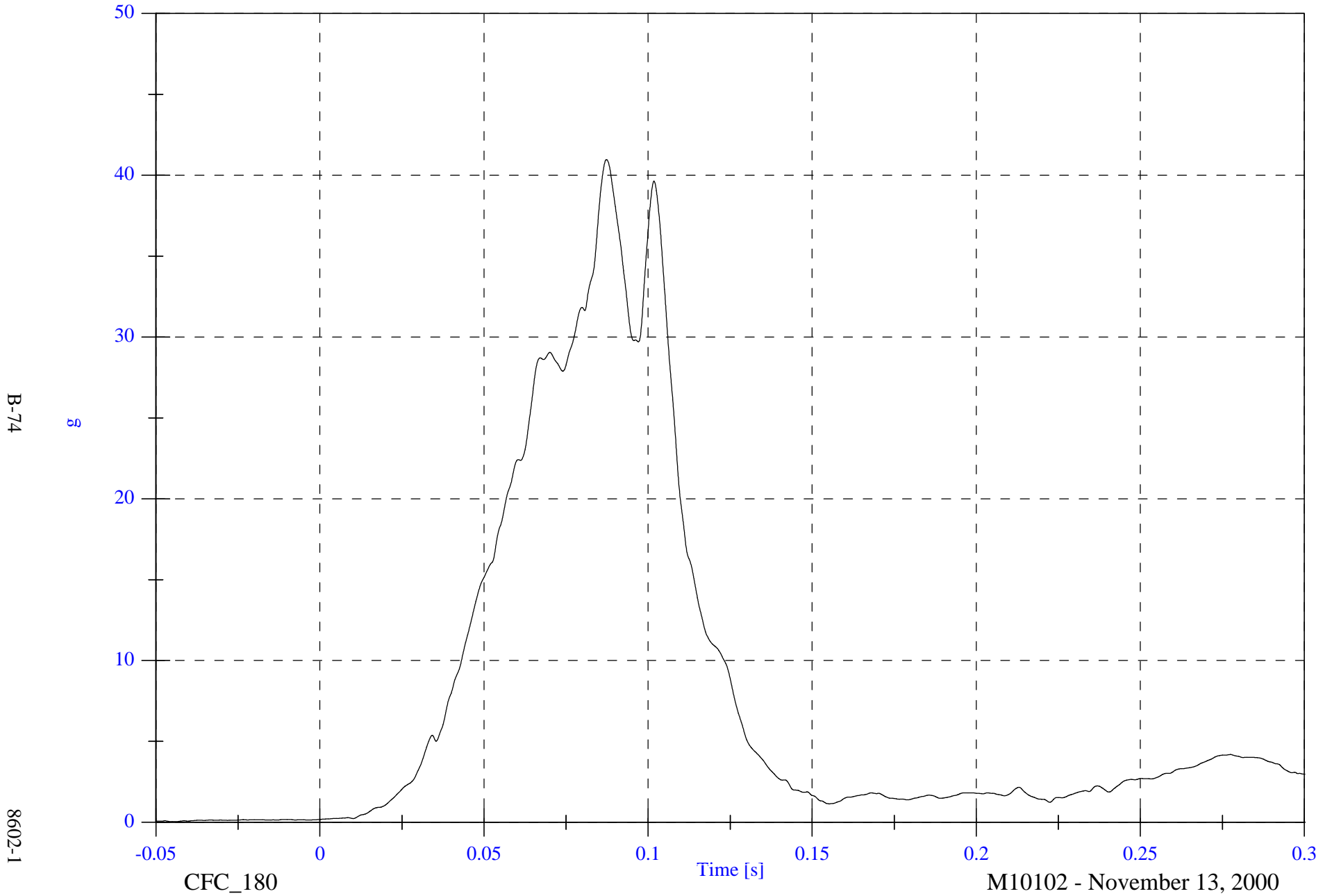
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest Resultant

Max: 41.0 [g] at 0.087 [s]

Min: 0.0 [g] at -0.045 [s]

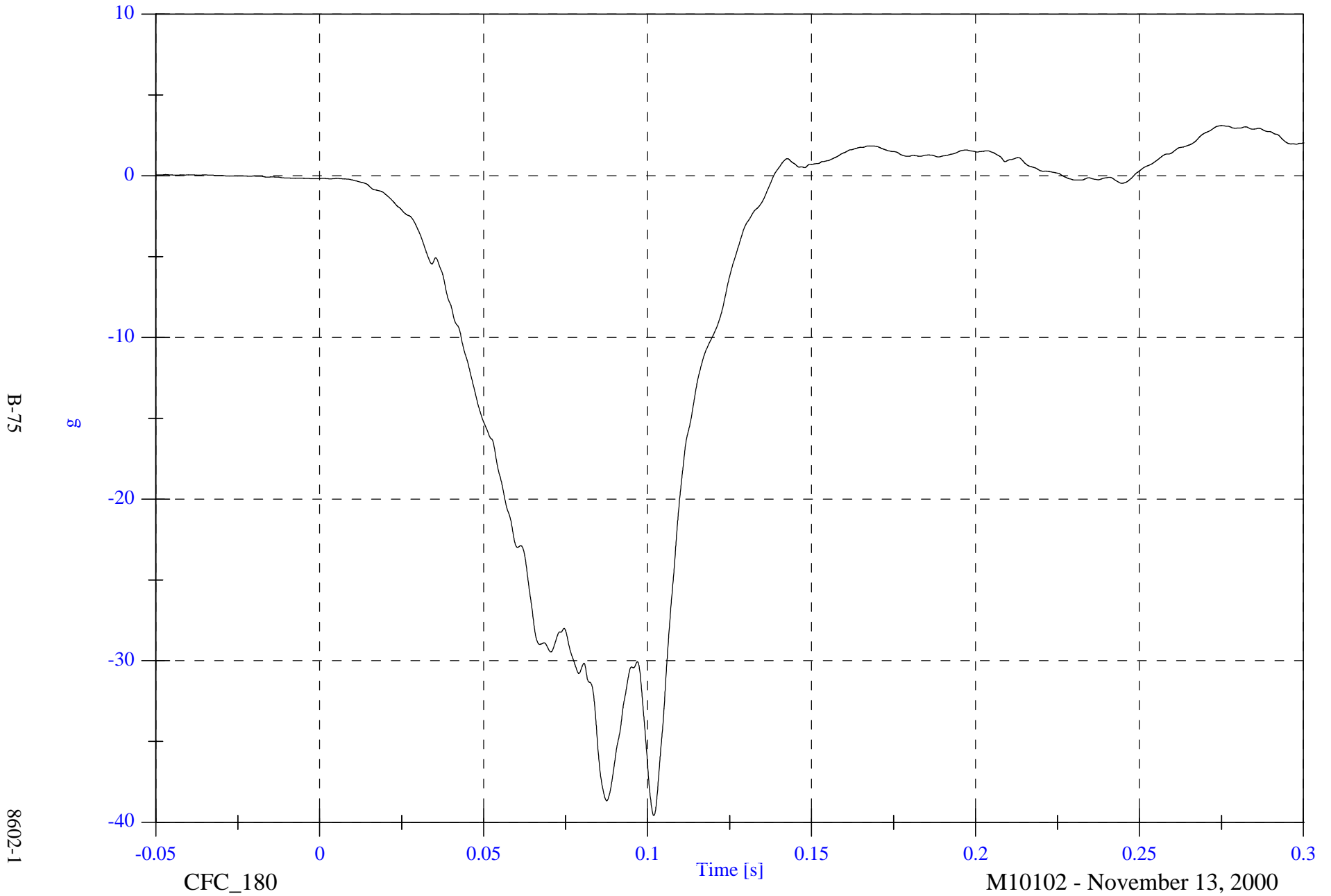


NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest Red x

Max: 3.1 [g] at 0.275 [s]

Min: -39.6 [g] at 0.102 [s]



B-75

g

8602-1

CFC_180

Time [s]

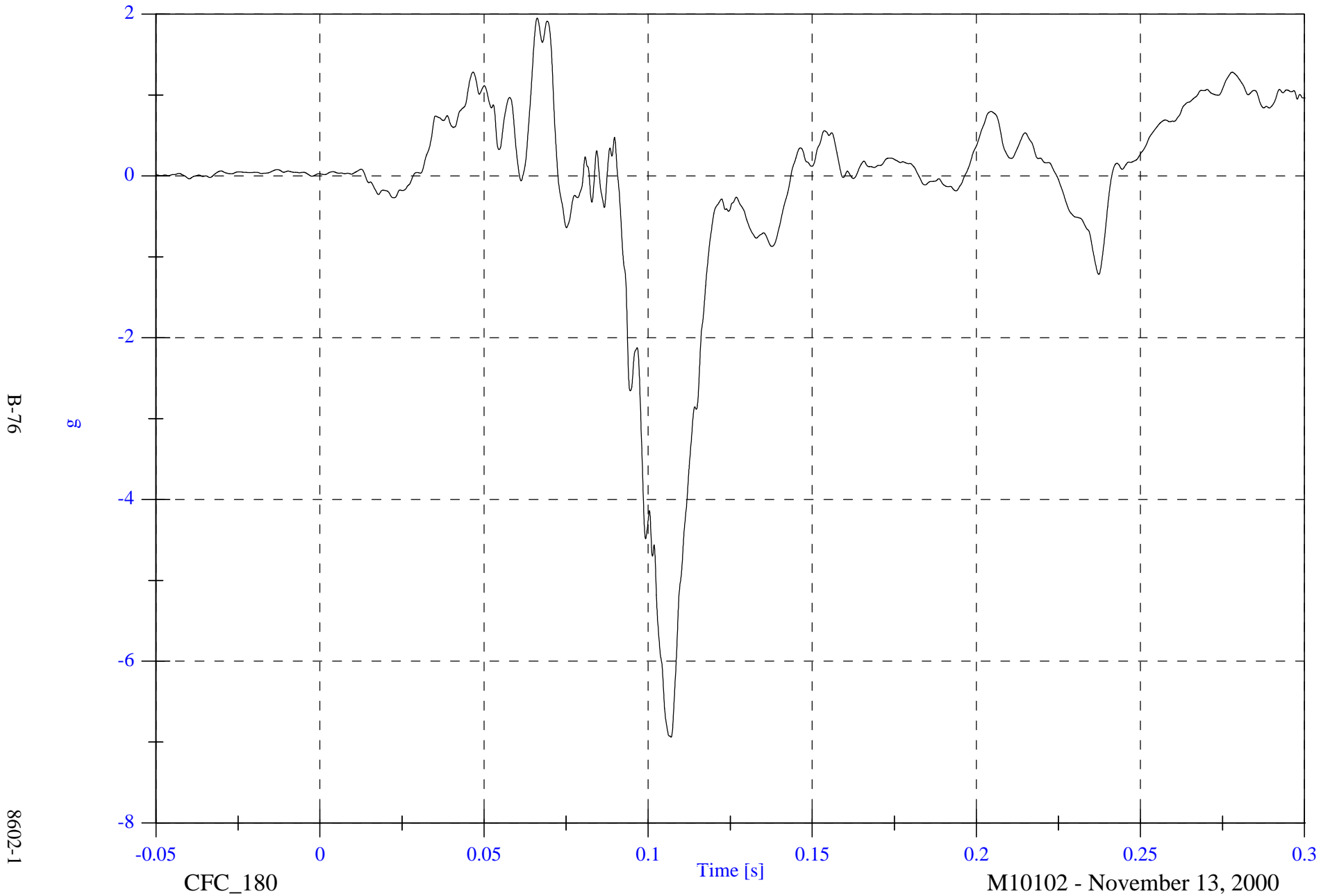
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest Red y

Max: 2.0 [g] at 0.066 [s]

Min: -6.9 [g] at 0.107 [s]



B-76

g

8602-1

CFC_180

Time [s]

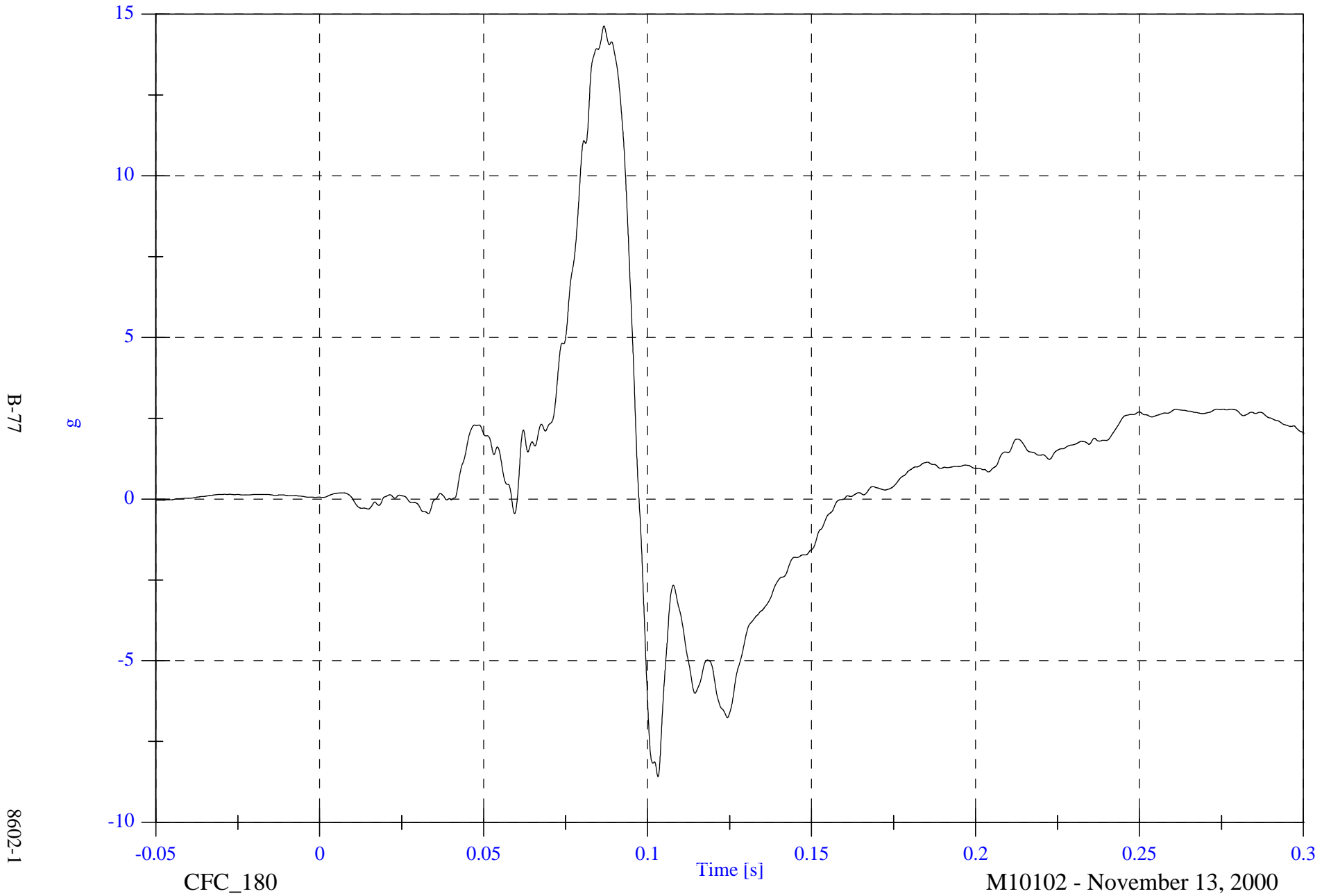
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest Red z

Max: 14.6 [g] at 0.087 [s]

Min: -8.6 [g] at 0.103 [s]



B-77

8602-1

CFC_180

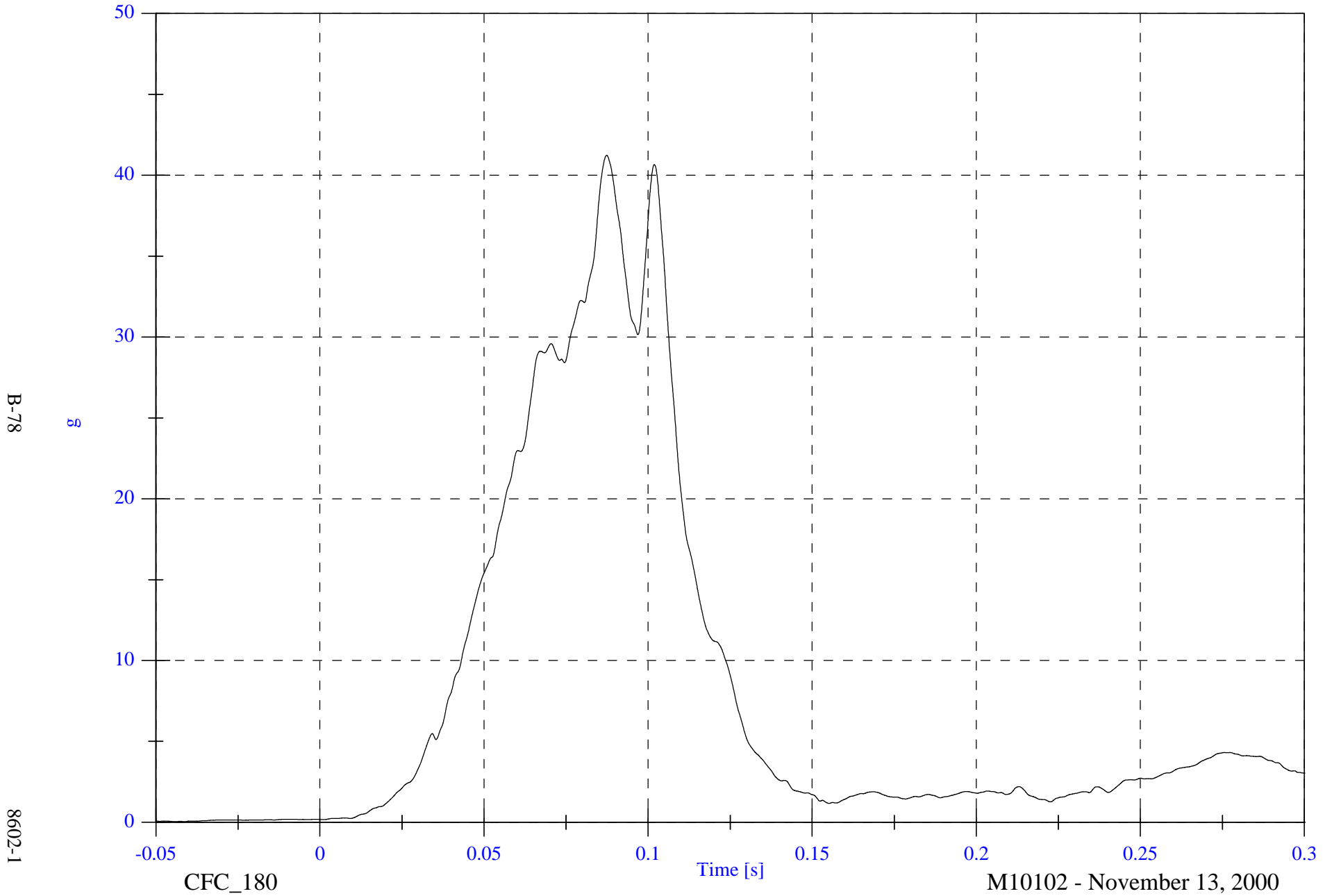
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest Red Resultant

Max: 41.2 [g] at 0.087 [s]

Min: 0.1 [g] at -0.044 [s]

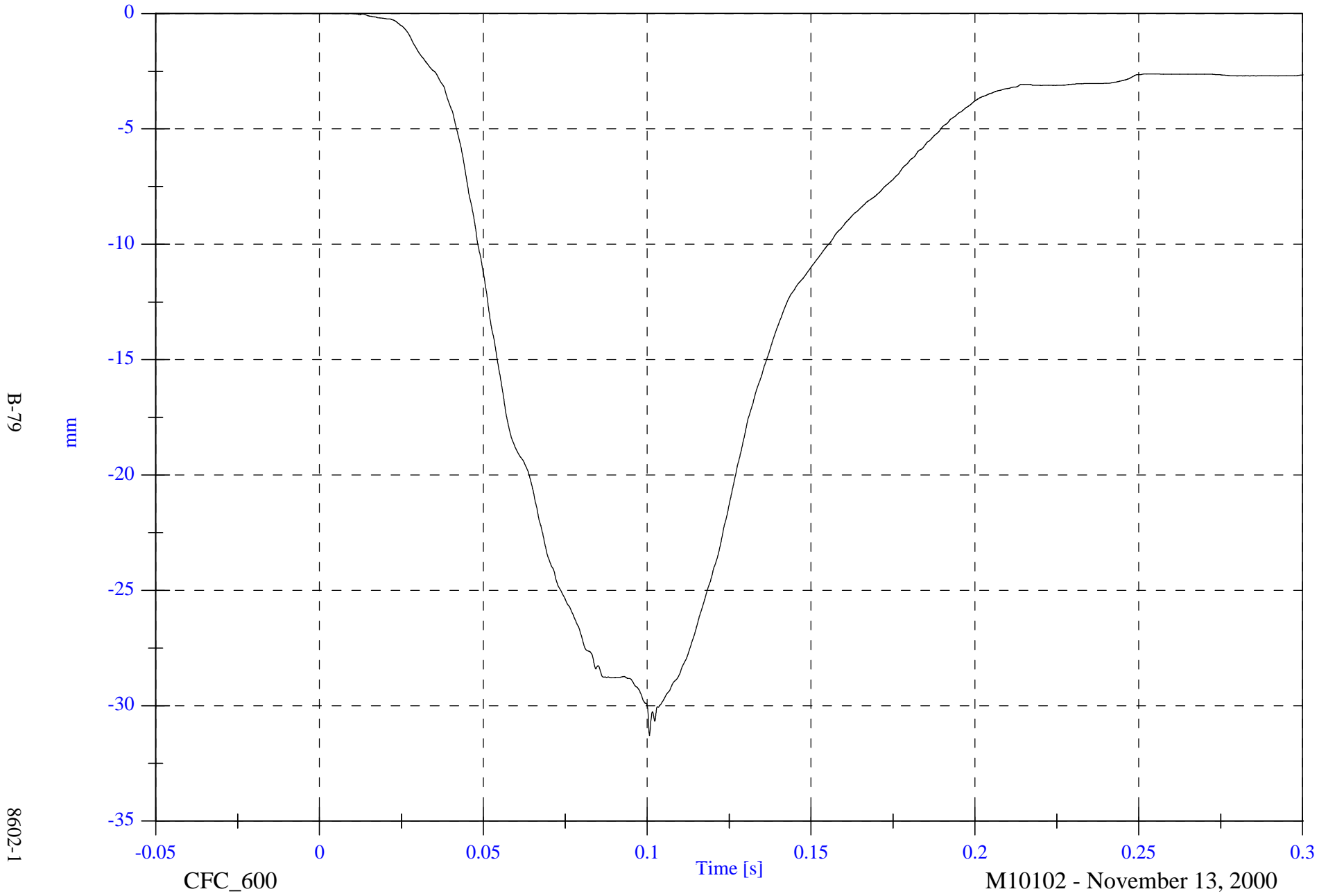


NCAP Test 1 - 2001 Chevrolet Impala

P2 Chest Compression

Max: 0.0 [mm] at -0.030 [s]

Min: -31.3 [mm] at 0.101 [s]



B-79

8602-1

CFC_600

Time [s]

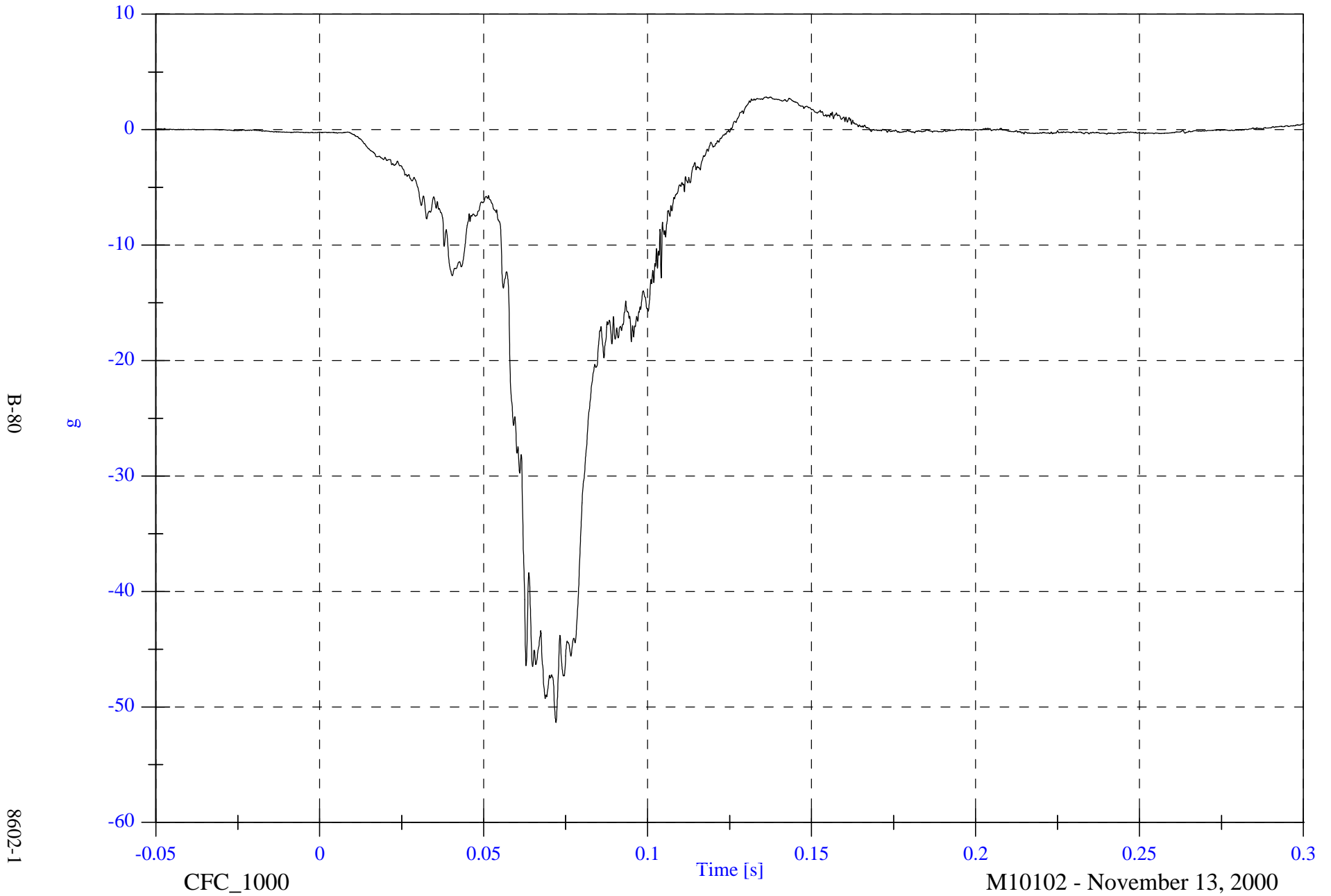
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 2.8 [g] at 0.136 [s]

Min: -51.3 [g] at 0.072 [s]

P2 Pelvic x



B-80

g

8602-1

CFC_1000

Time [s]

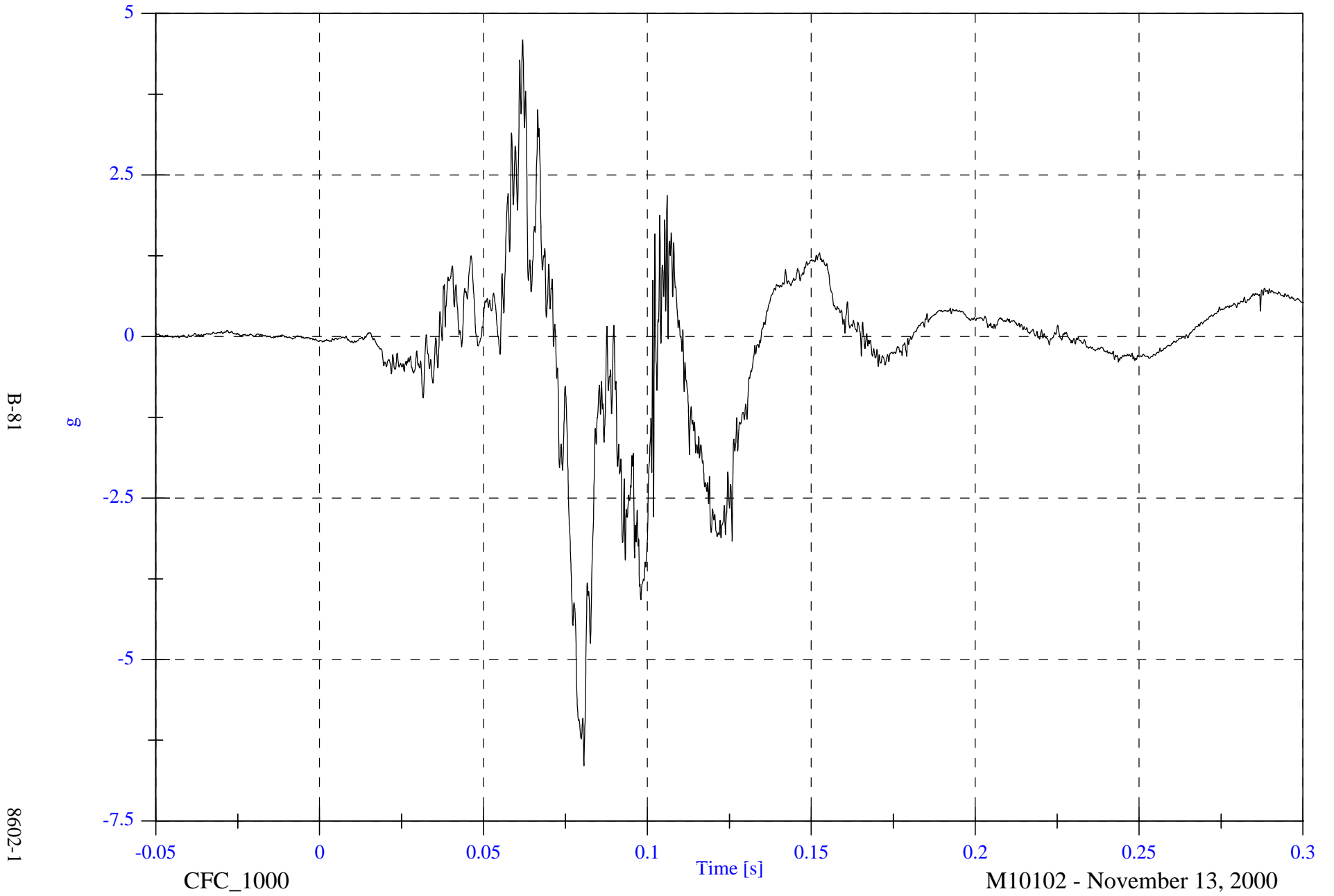
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Pelvic y

Max: 4.6 [g] at 0.062 [s]

Min: -6.6 [g] at 0.081 [s]

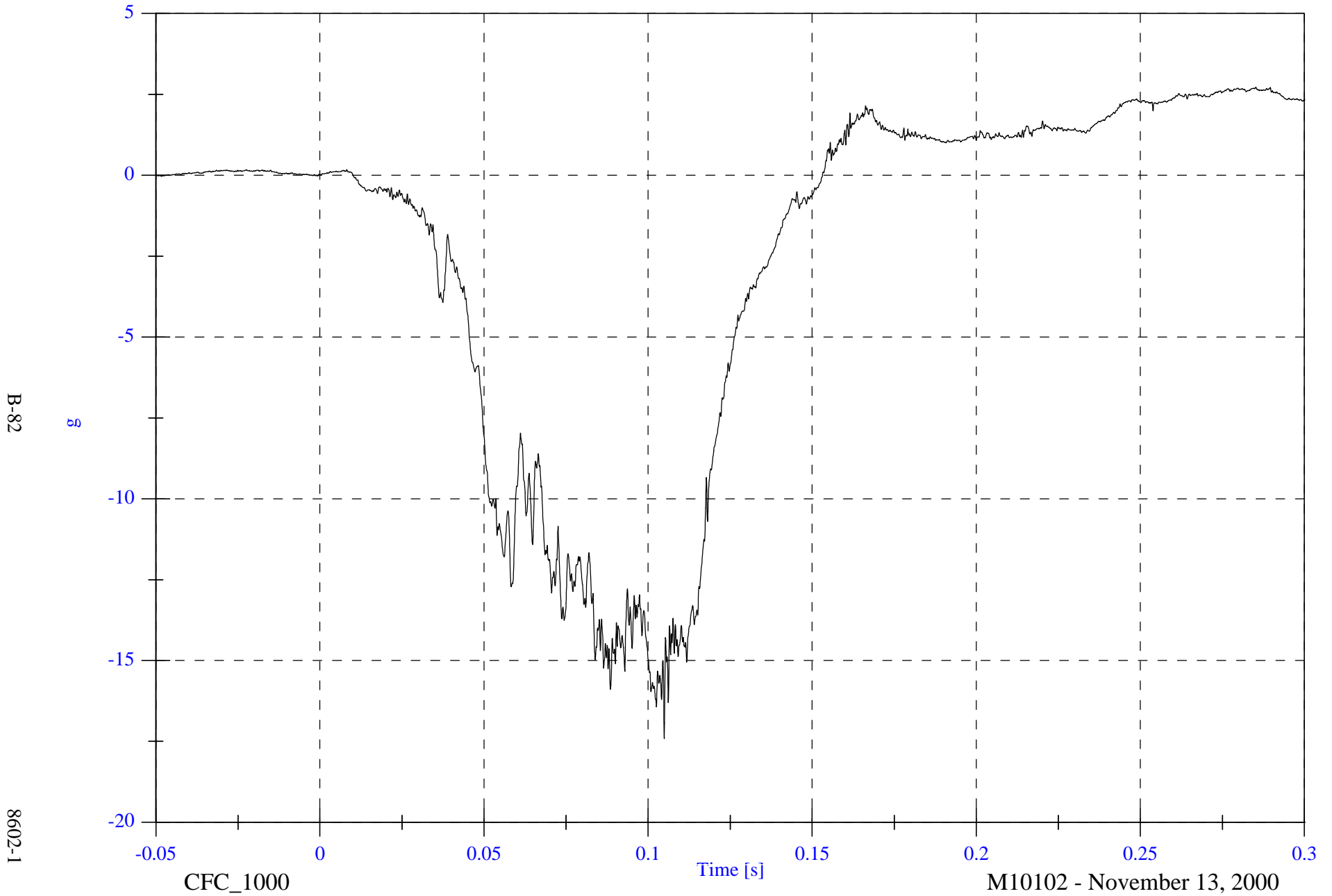


NCAP Test 1 - 2001 Chevrolet Impala

Max: 2.7 [g] at 0.285 [s]

P2 Pelvic z

Min: -17.4 [g] at 0.105 [s]



NCAP Test 1 - 2001 Chevrolet Impala

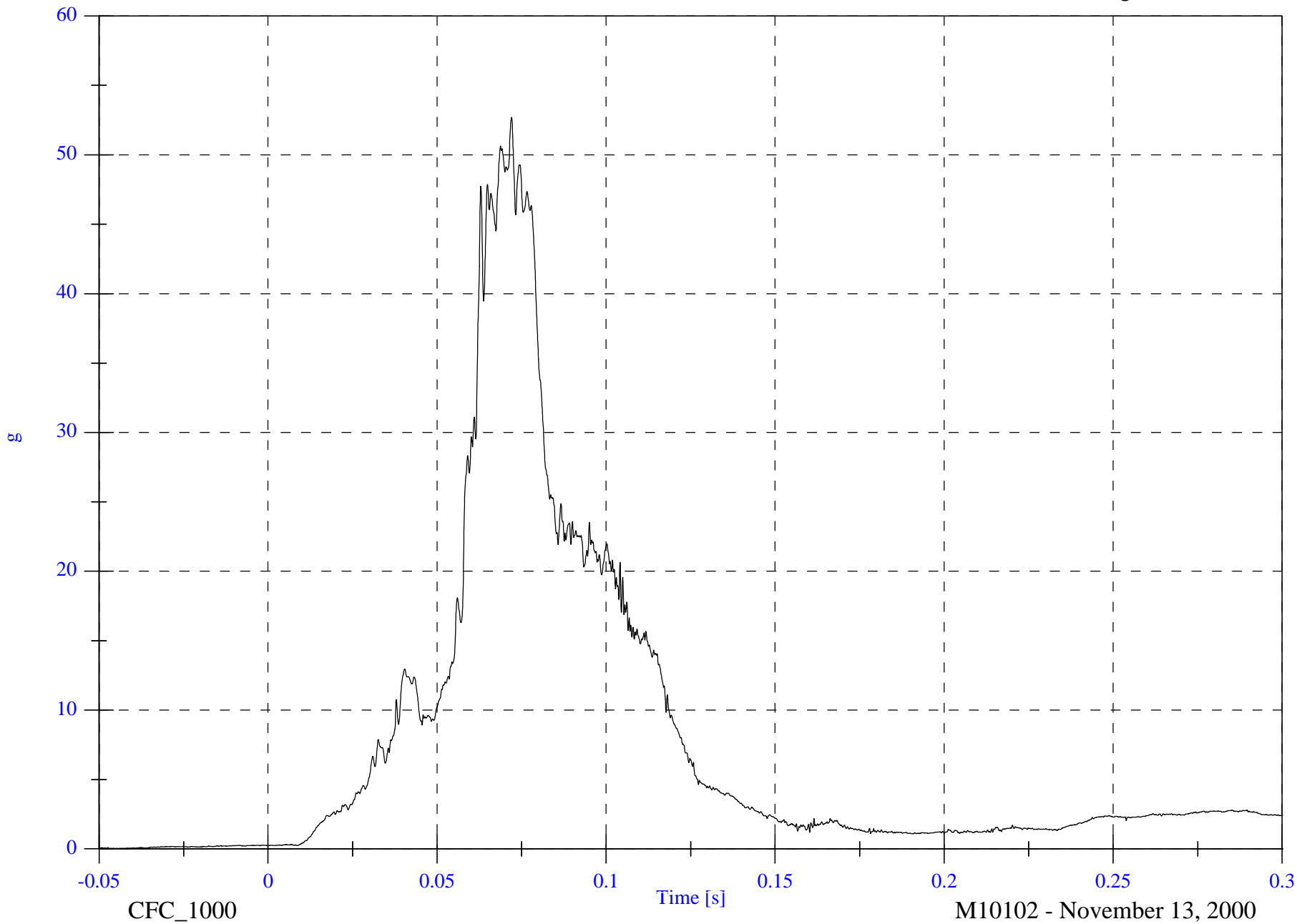
P2 Pelvic Resultant

Max: 52.7 [g] at 0.072 [s]

Min: 0.0 [g] at -0.044 [s]

B-83

8602-1

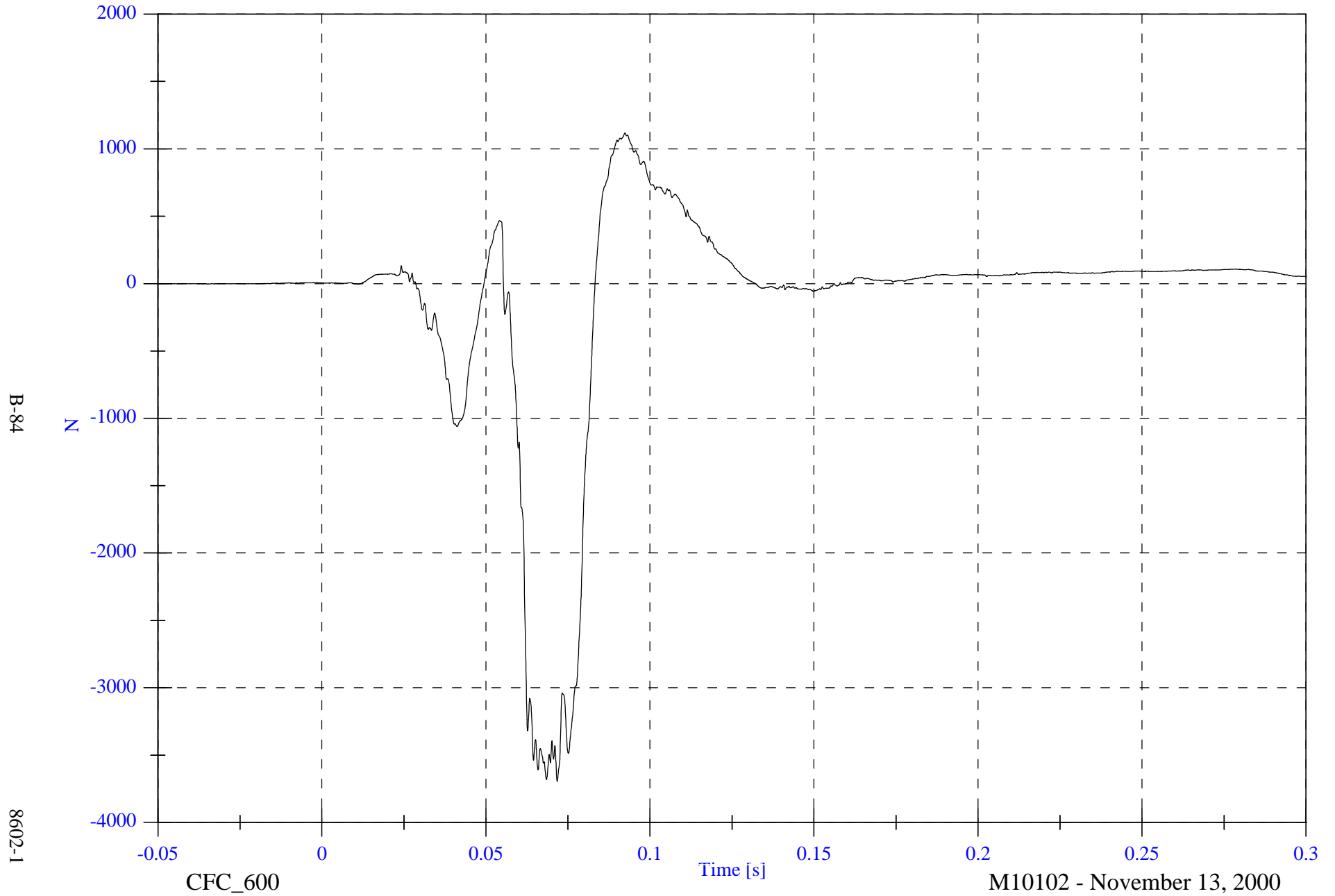


NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Femur

Max: 1118.7 [N] at 0.092 [s]

Min: -3696.0 [N] at 0.072 [s]



B-84

8602-1

CFC_600

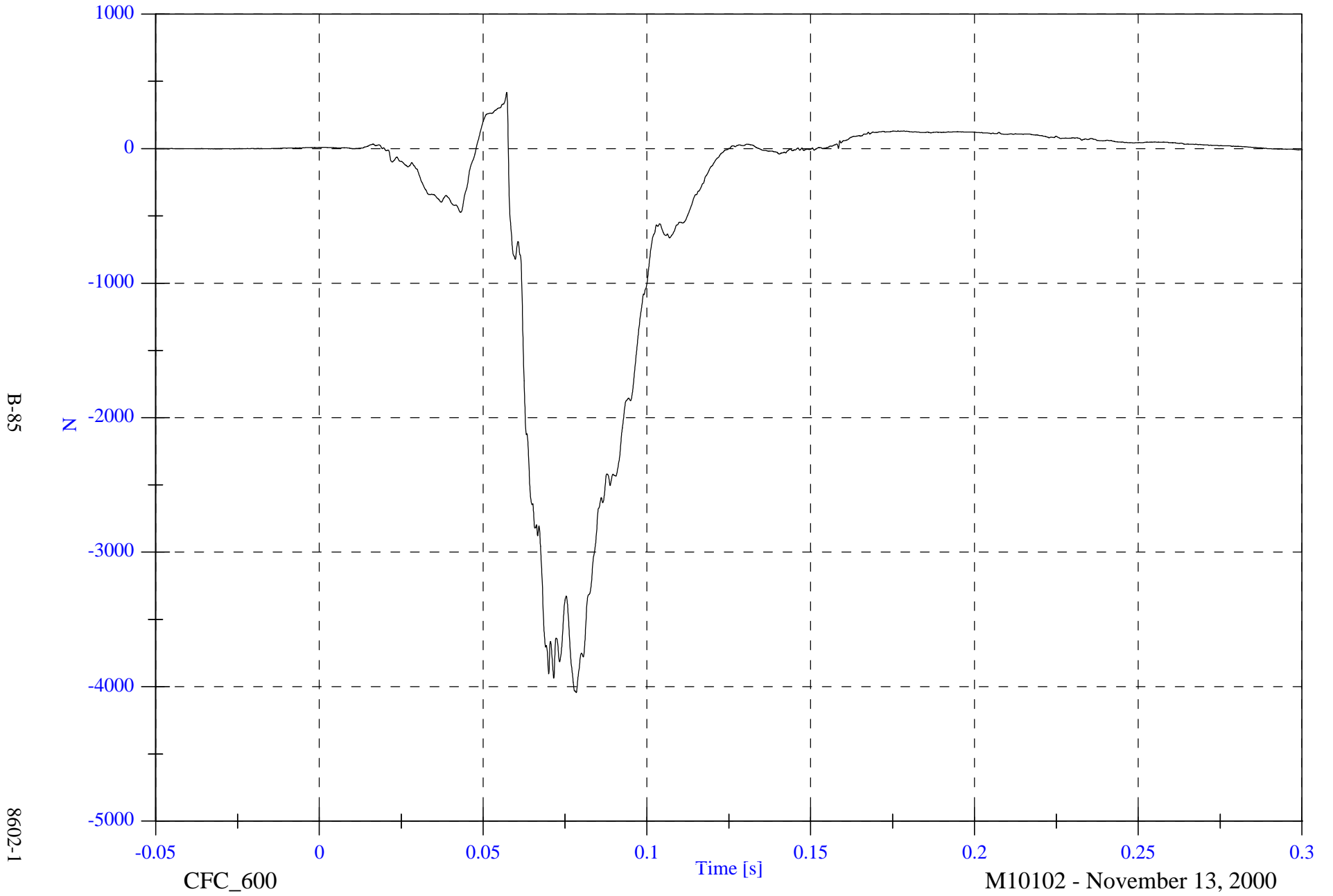
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Femur

Max: 418.0 [N] at 0.057 [s]

Min: -4044.6 [N] at 0.078 [s]



B-85

8602-1

CFC_600

Time [s]

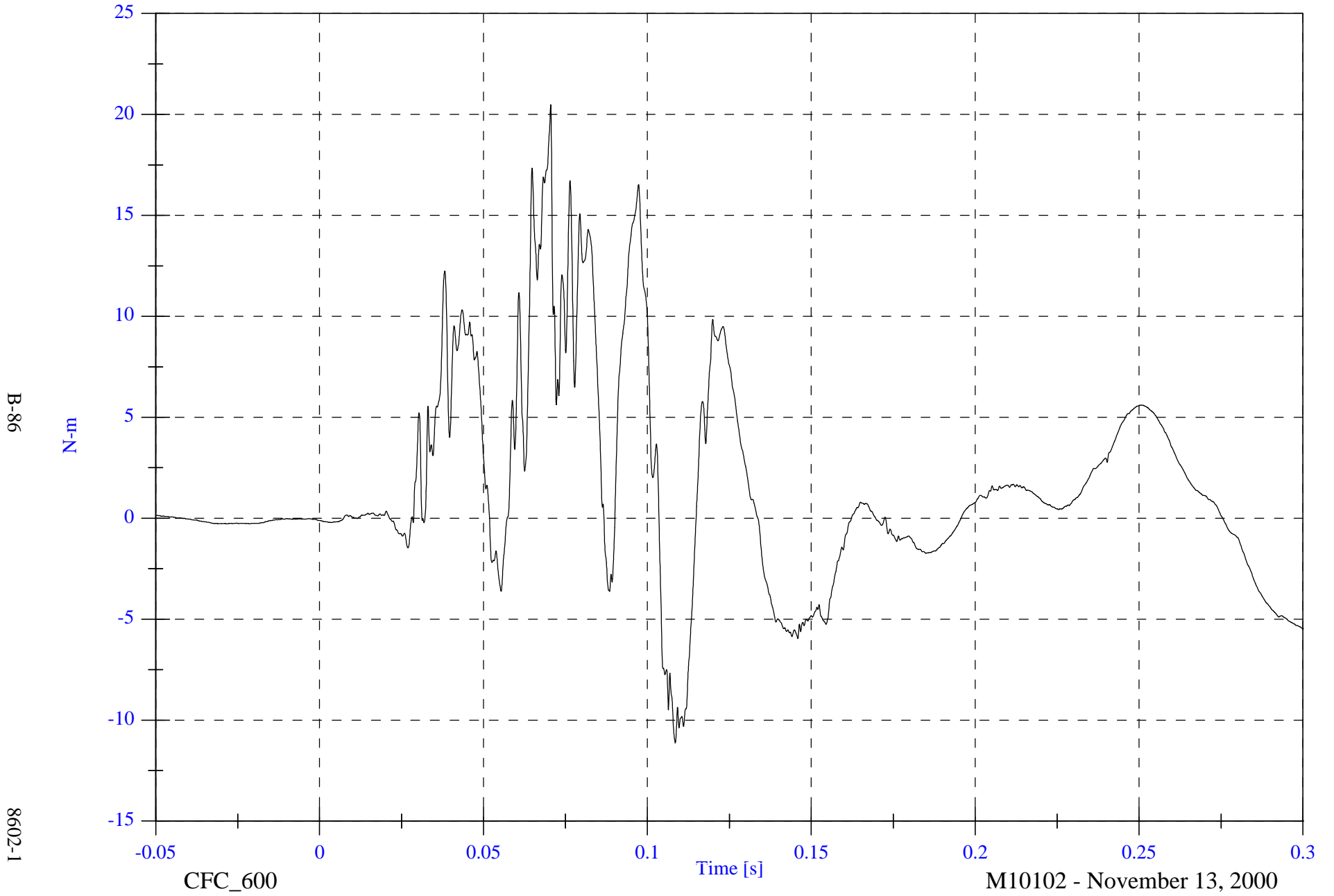
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Upper Tibia Mx

Max: 20.5 [N-m] at 0.071 [s]

Min: -11.1 [N-m] at 0.109 [s]



B-86

8602-1

CFC_600

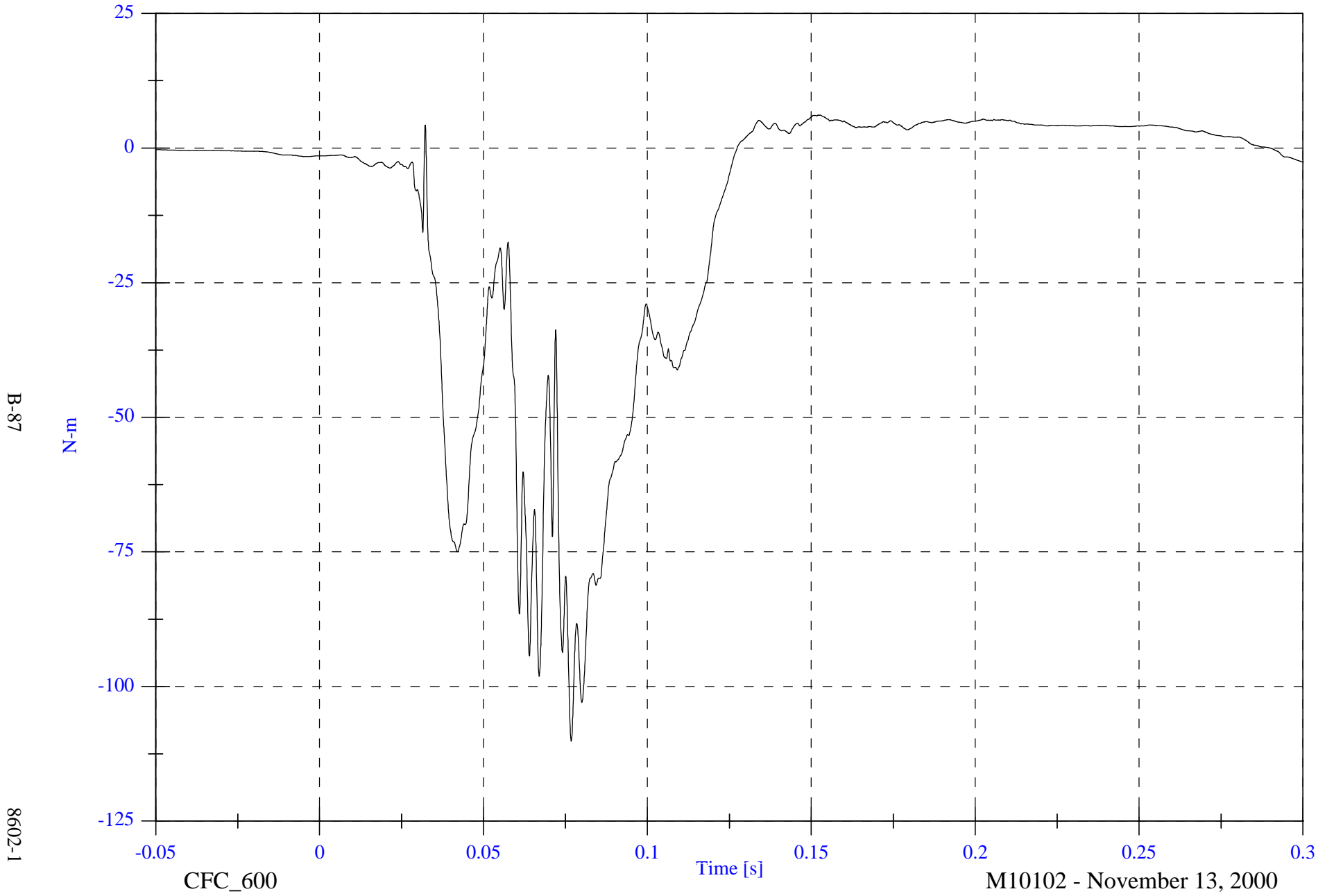
Time [s]

M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Upper Tibia My

Max: 6.1 [N-m] at 0.152 [s]
Min: -110.2 [N-m] at 0.077 [s]



B-87

8602-1

CFC_600

Time [s]

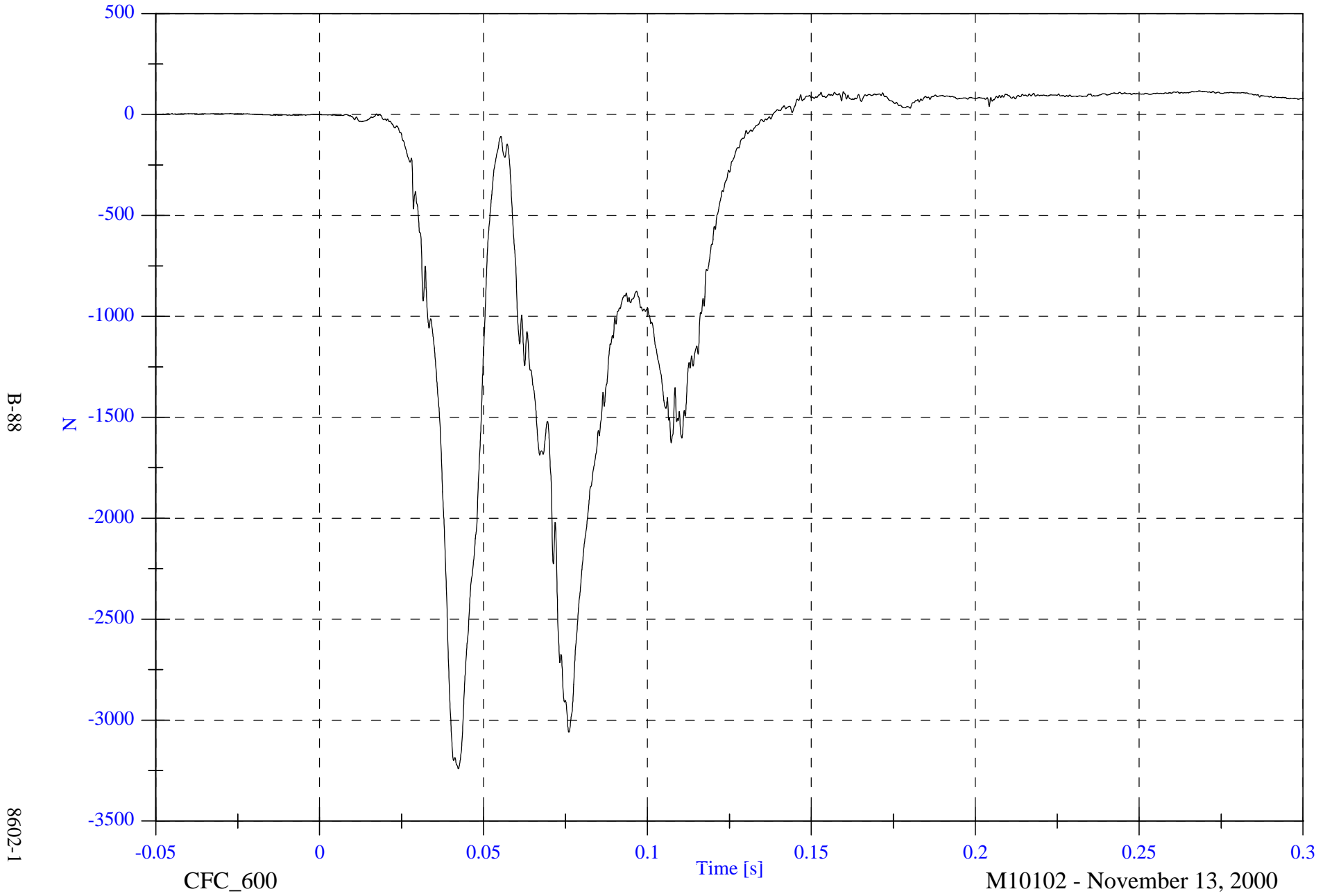
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Lower Tibia Fz

Max: 116.0 [N] at 0.268 [s]

Min: -3240.9 [N] at 0.042 [s]



B-88

8602-1

CFC_600

Time [s]

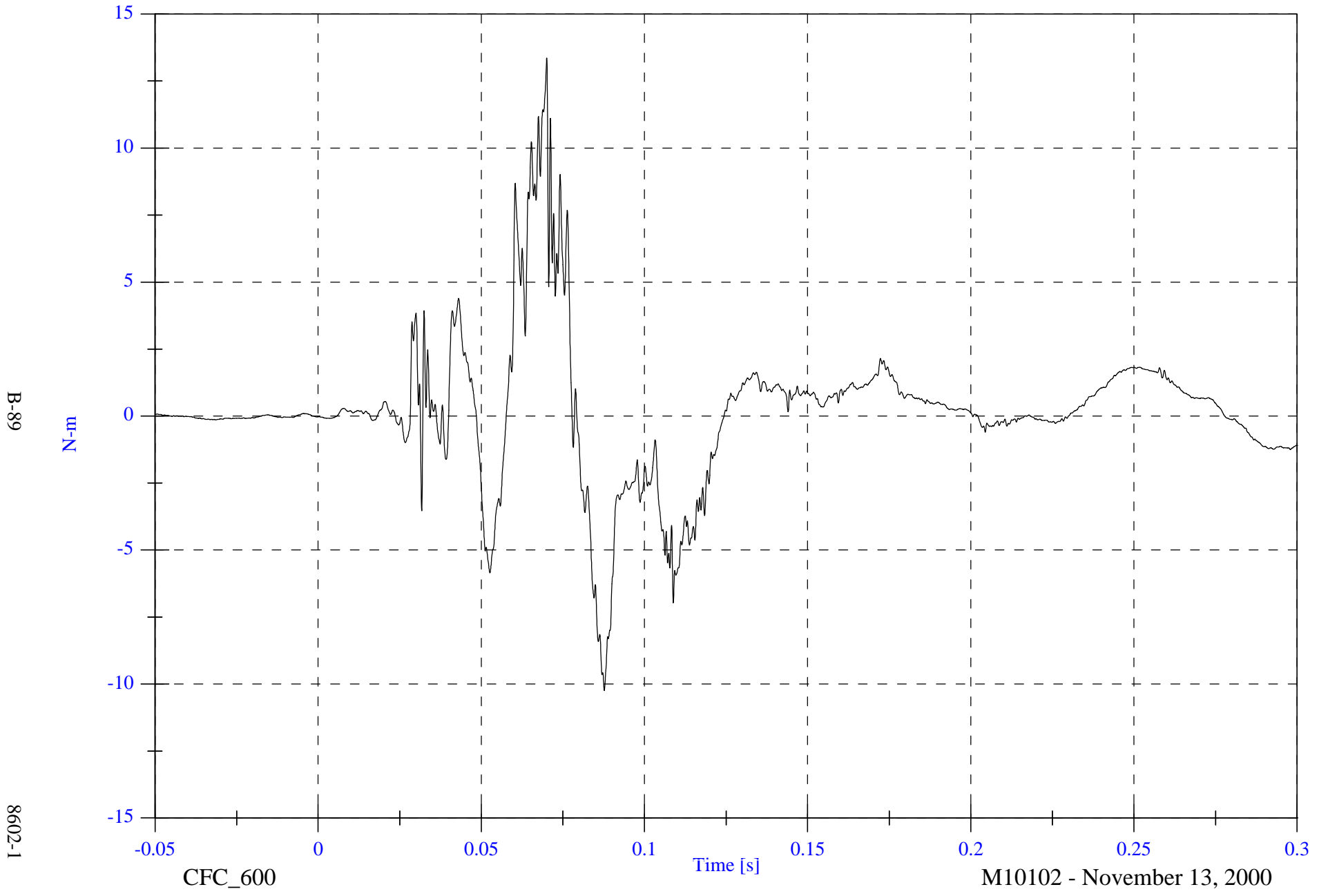
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Lower Tibia Mx

Max: 13.4 [N-m] at 0.070 [s]

Min: -10.2 [N-m] at 0.088 [s]



B-89

8602-1

CFC_600

Time [s]

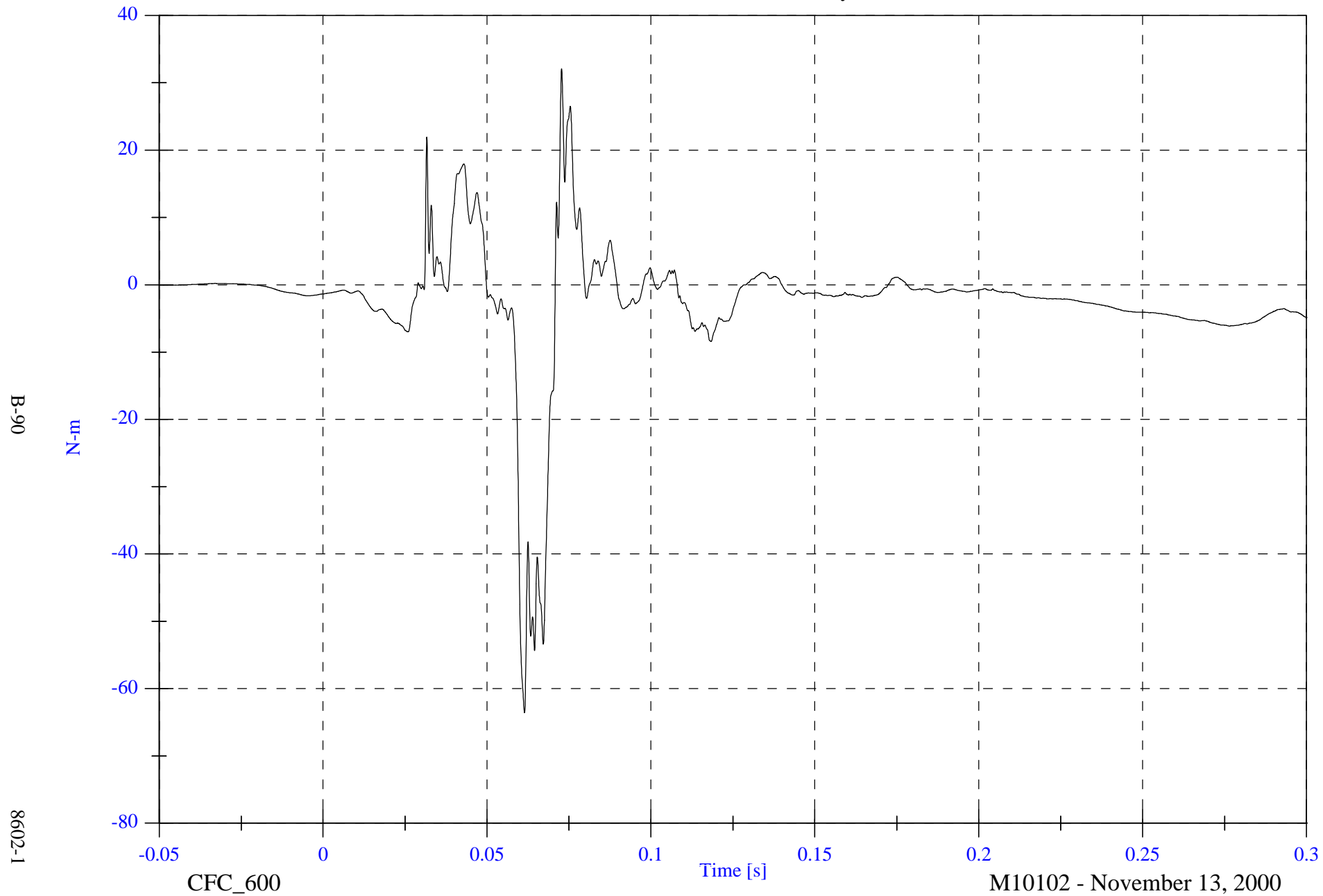
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 32.1 [N-m] at 0.073 [s]

P2 Left Lower Tibia My

Min: -63.6 [N-m] at 0.061 [s]



B-90

N-m

8602-1

CFC_600

Time [s]

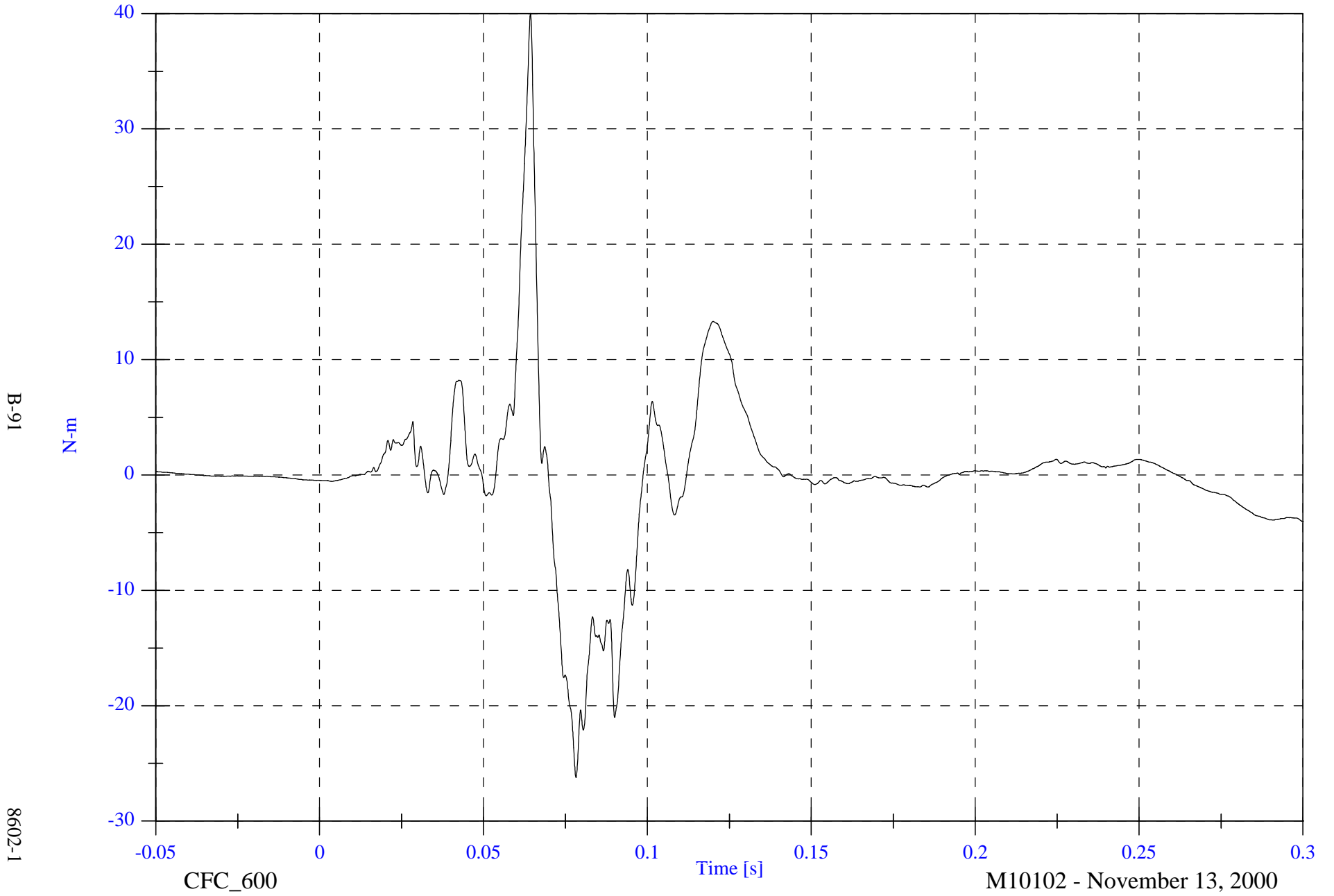
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Upper Tibia Mx

Max: 40.0 [N-m] at 0.064 [s]

Min: -26.2 [N-m] at 0.078 [s]



B-91

8602-1

CFC_600

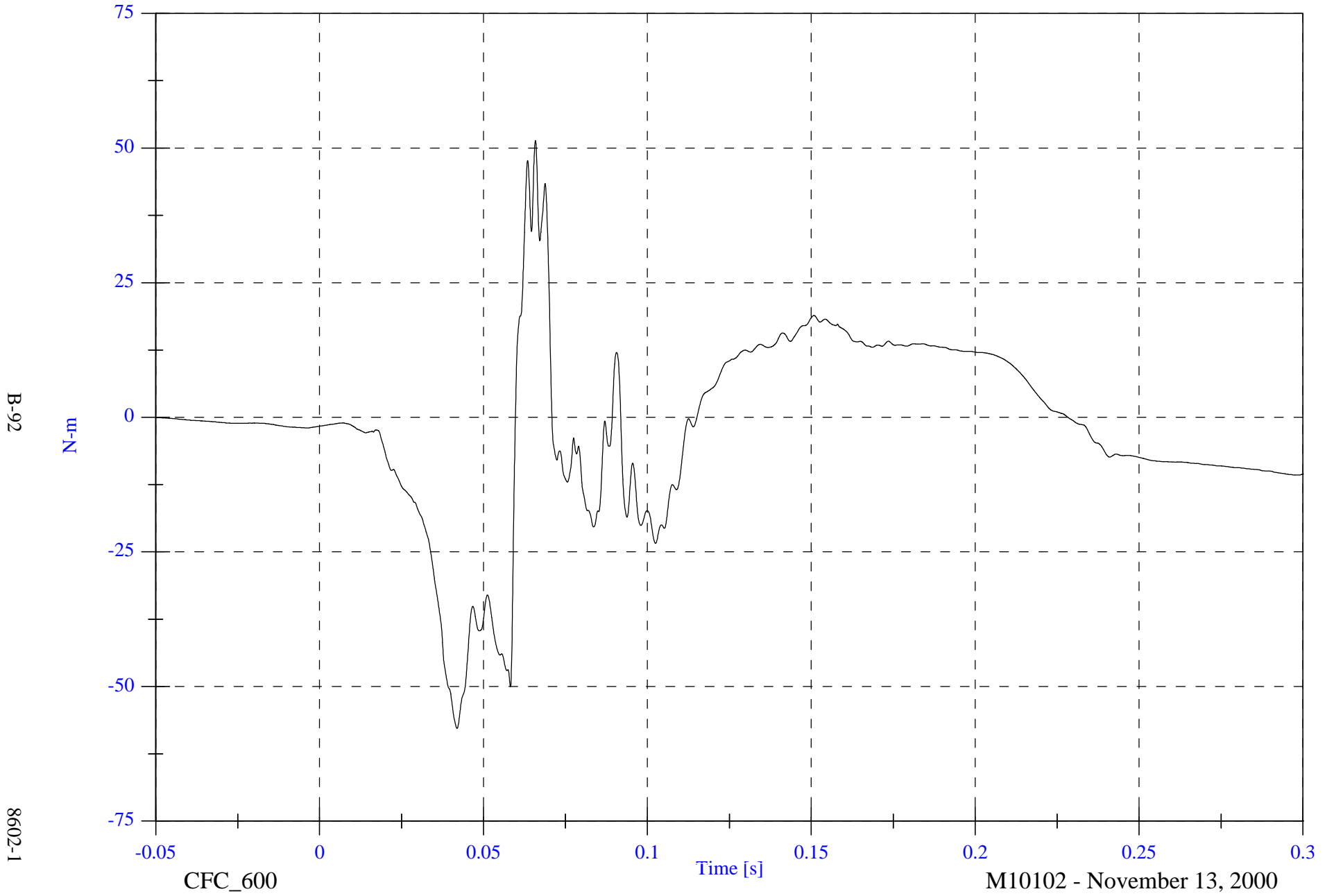
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Upper Tibia My

Max: 51.4 [N-m] at 0.066 [s]

Min: -57.8 [N-m] at 0.042 [s]



B-92

8602-1

CFC_600

Time [s]

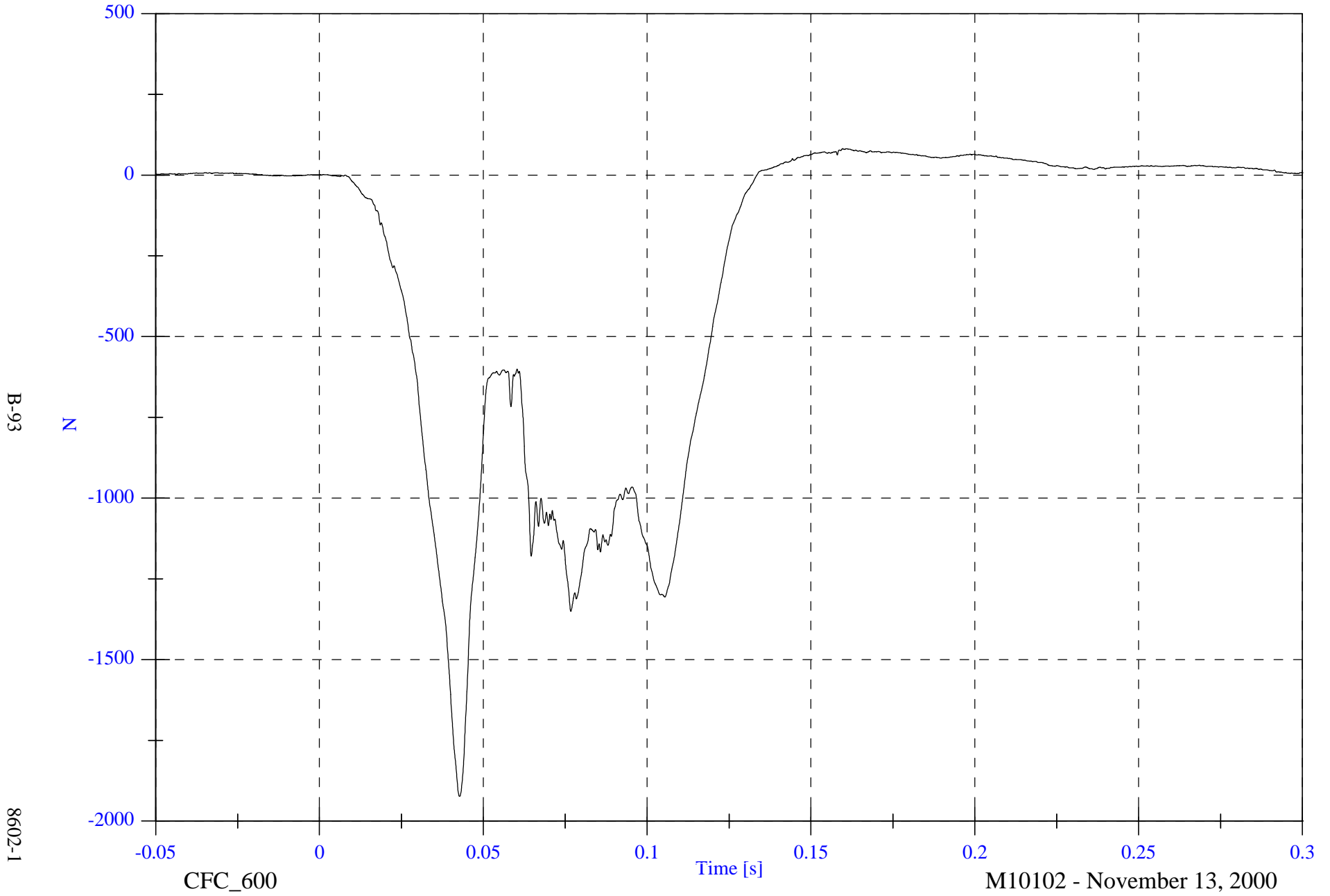
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Lower Tibia Fz

Max: 81.5 [N] at 0.160 [s]

Min: -1923.7 [N] at 0.043 [s]



B-93

8602-1

CFC_600

Time [s]

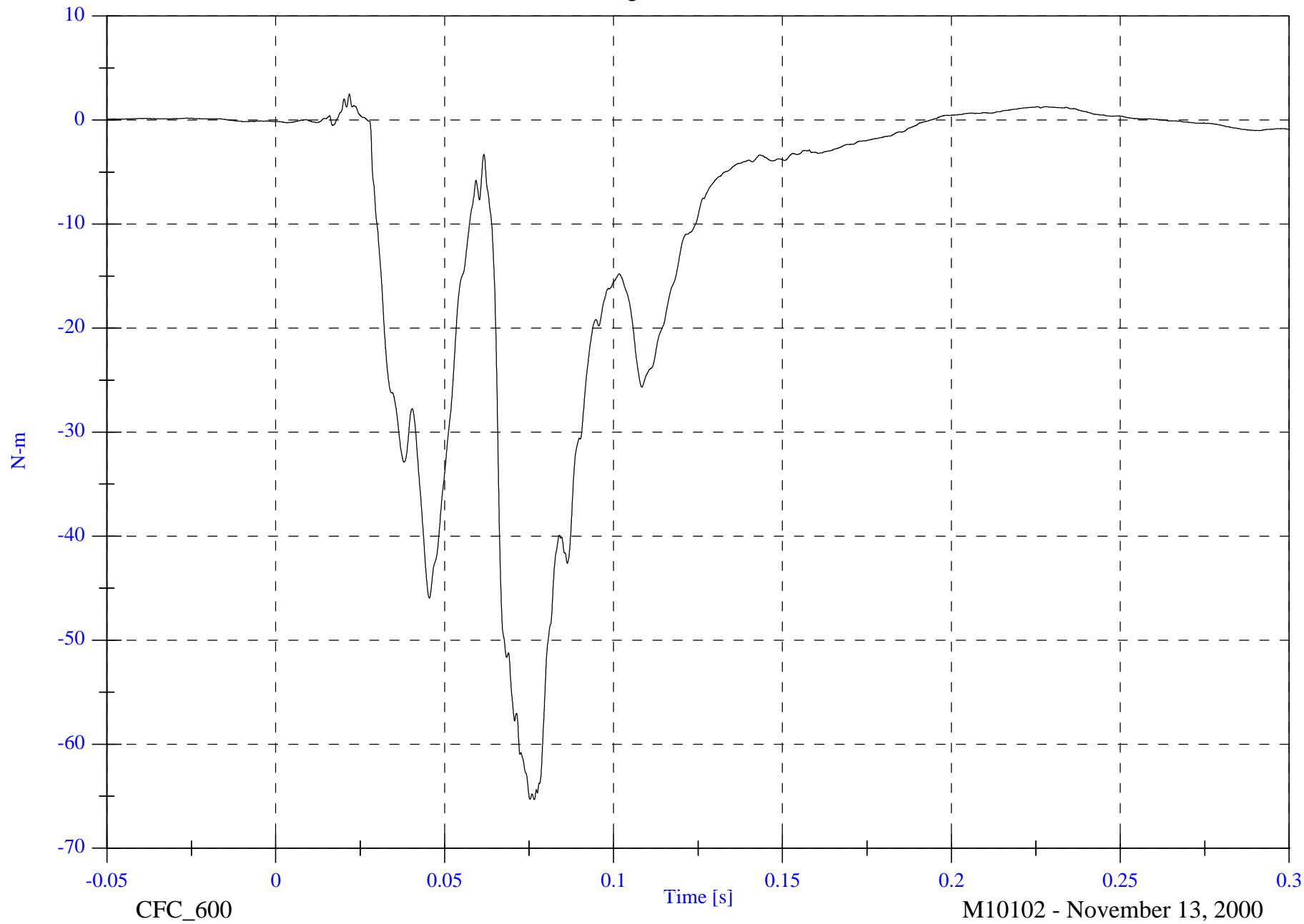
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Lower Tibia Mx

Max: 2.5 [N-m] at 0.022 [s]

Min: -65.3 [N-m] at 0.077 [s]



B-94

8602-1

CFC_600

Time [s]

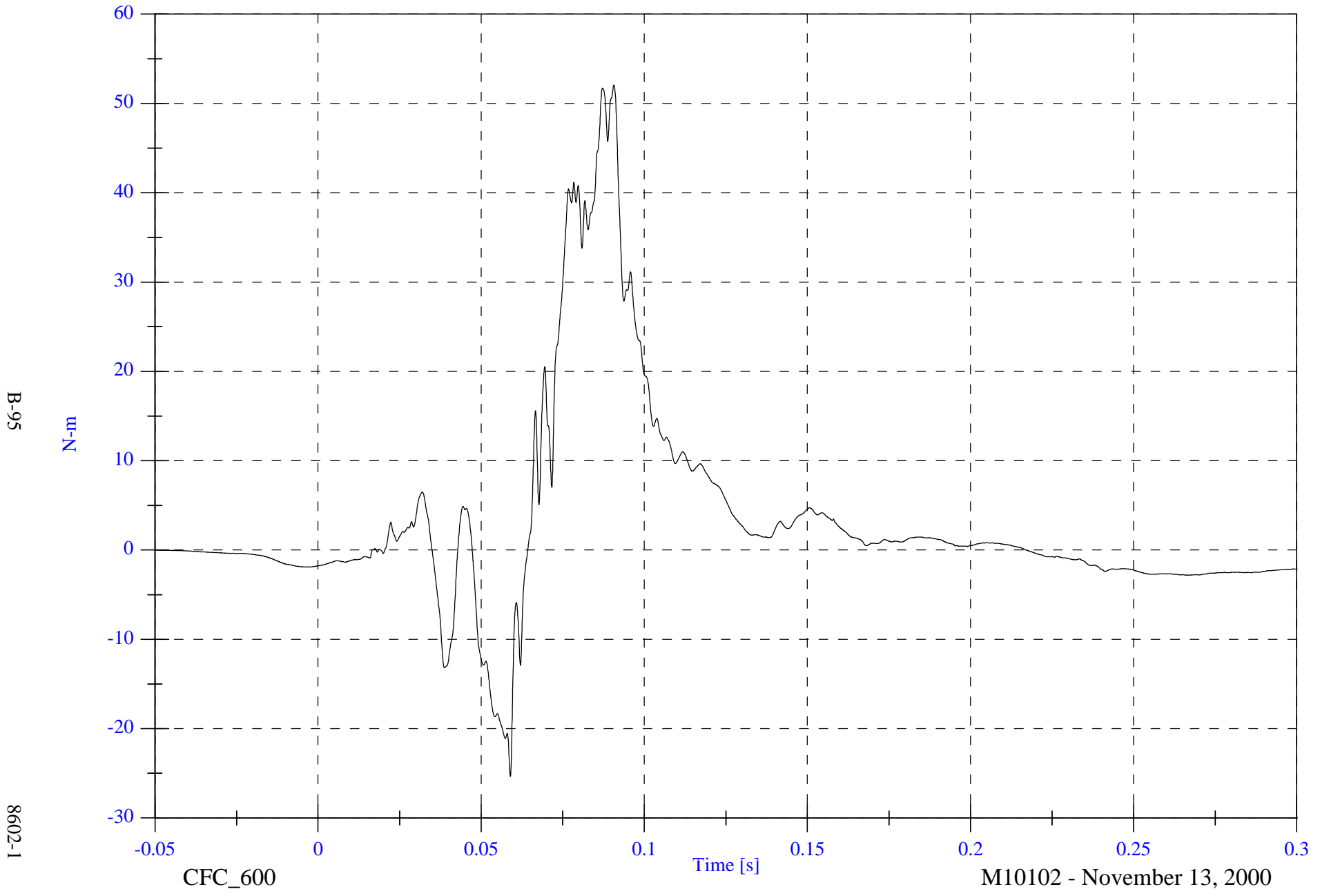
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Lower Tibia My

Max: 52.1 [N-m] at 0.091 [s]

Min: -25.4 [N-m] at 0.059 [s]



B-95

8602-1

CFC_600

Time [s]

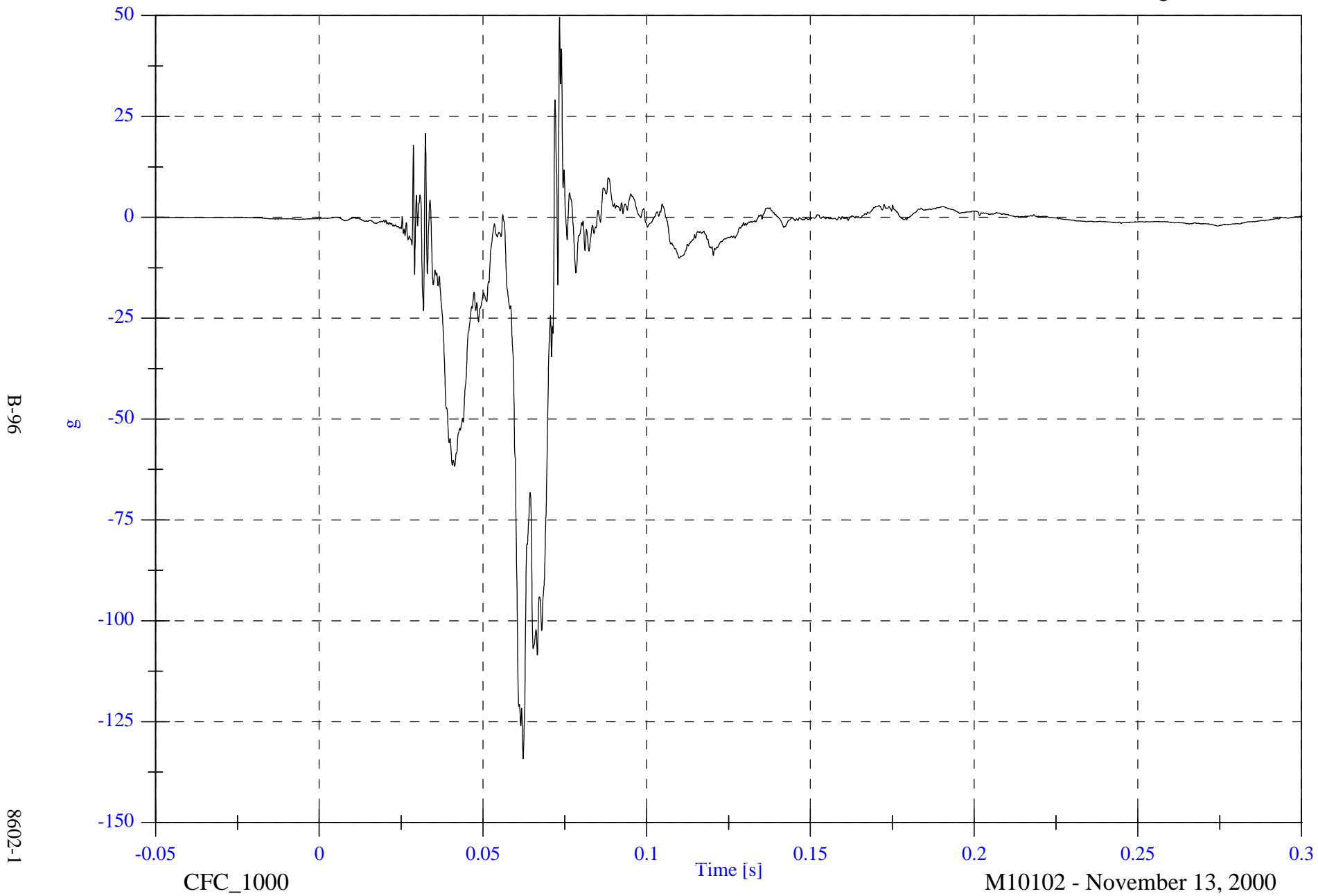
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Foot Aft x

Max: 49.6 [g] at 0.073 [s]

Min: -134.2 [g] at 0.062 [s]

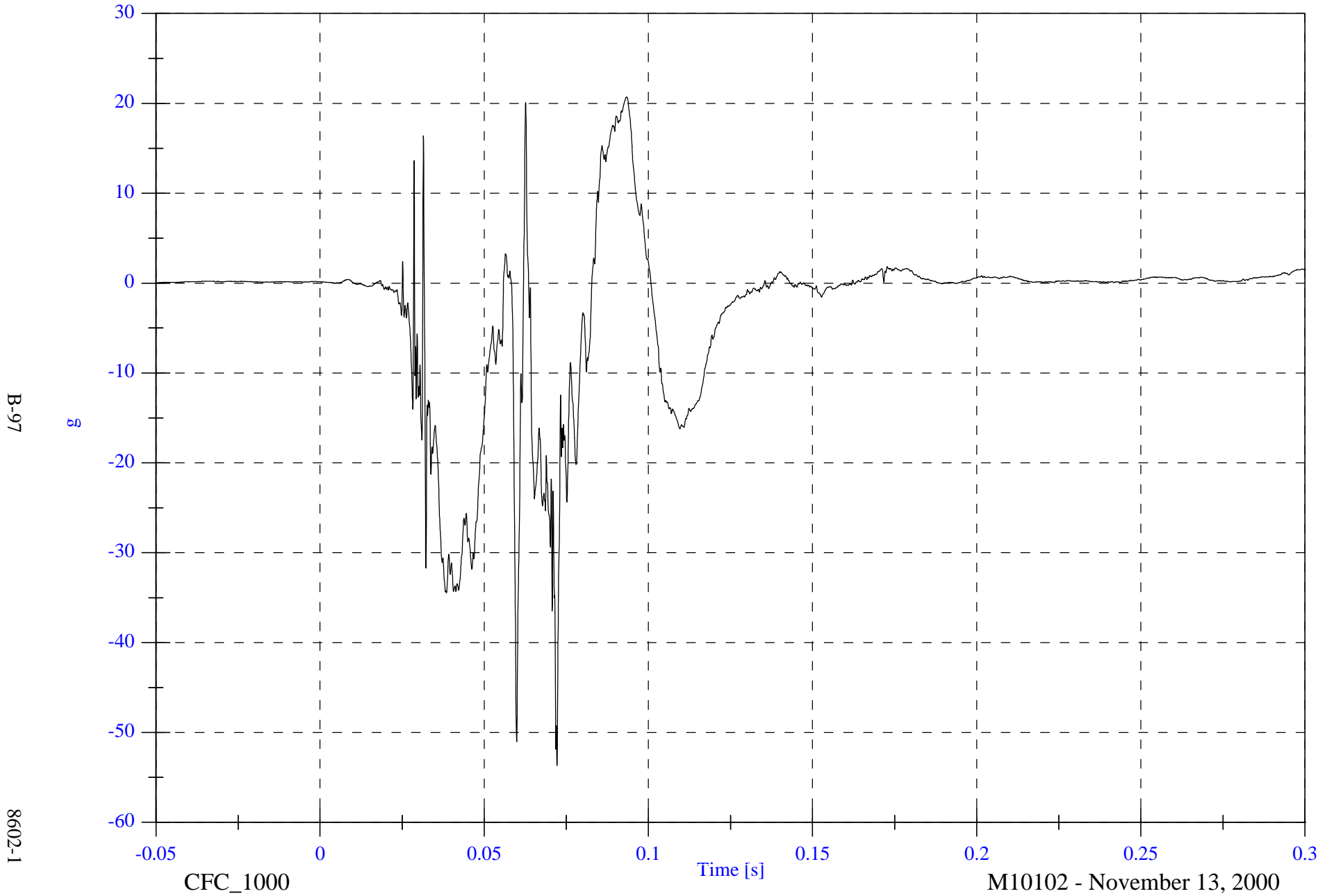


NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Foot Aft z

Max: 20.7 [g] at 0.093 [s]

Min: -53.7 [g] at 0.072 [s]

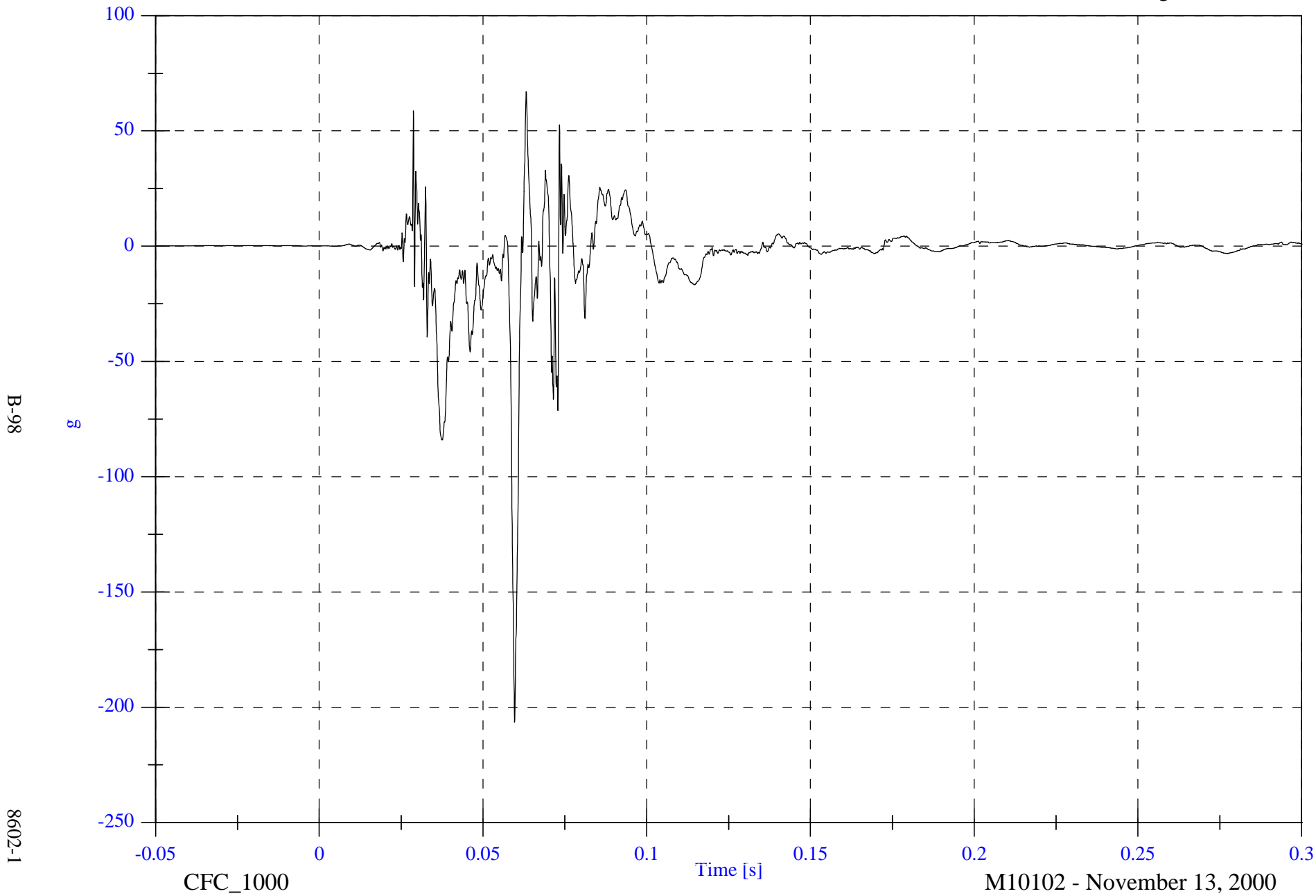


NCAP Test 1 - 2001 Chevrolet Impala

P2 Left Foot Fore z

Max: 67.1 [g] at 0.063 [s]

Min: -206.5 [g] at 0.060 [s]



B-98

8602-1

CFC_1000

Time [s]

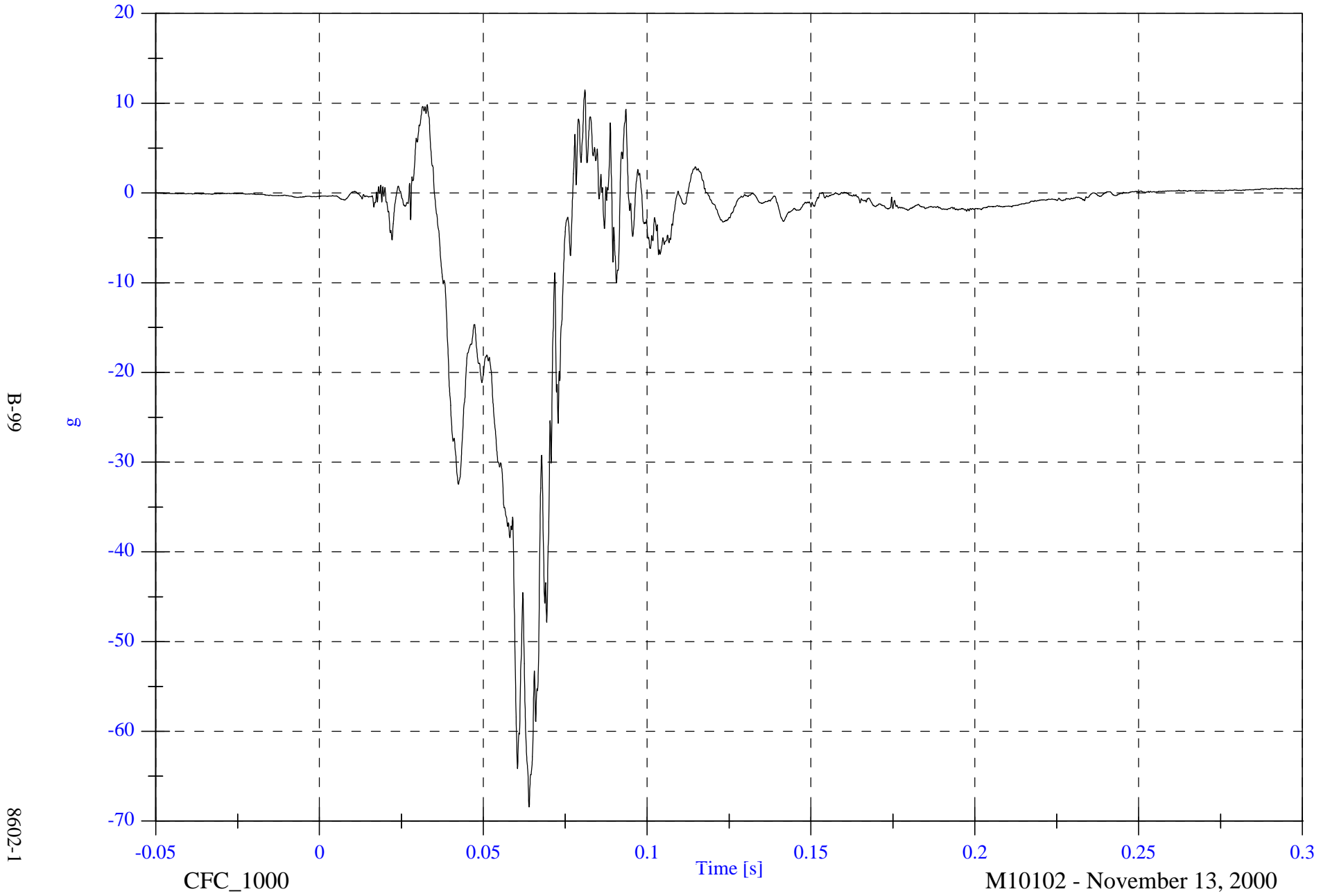
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Foot Aft x

Max: 11.5 [g] at 0.081 [s]

Min: -68.4 [g] at 0.064 [s]



B-99

g

8602-1

CFC_1000

Time [s]

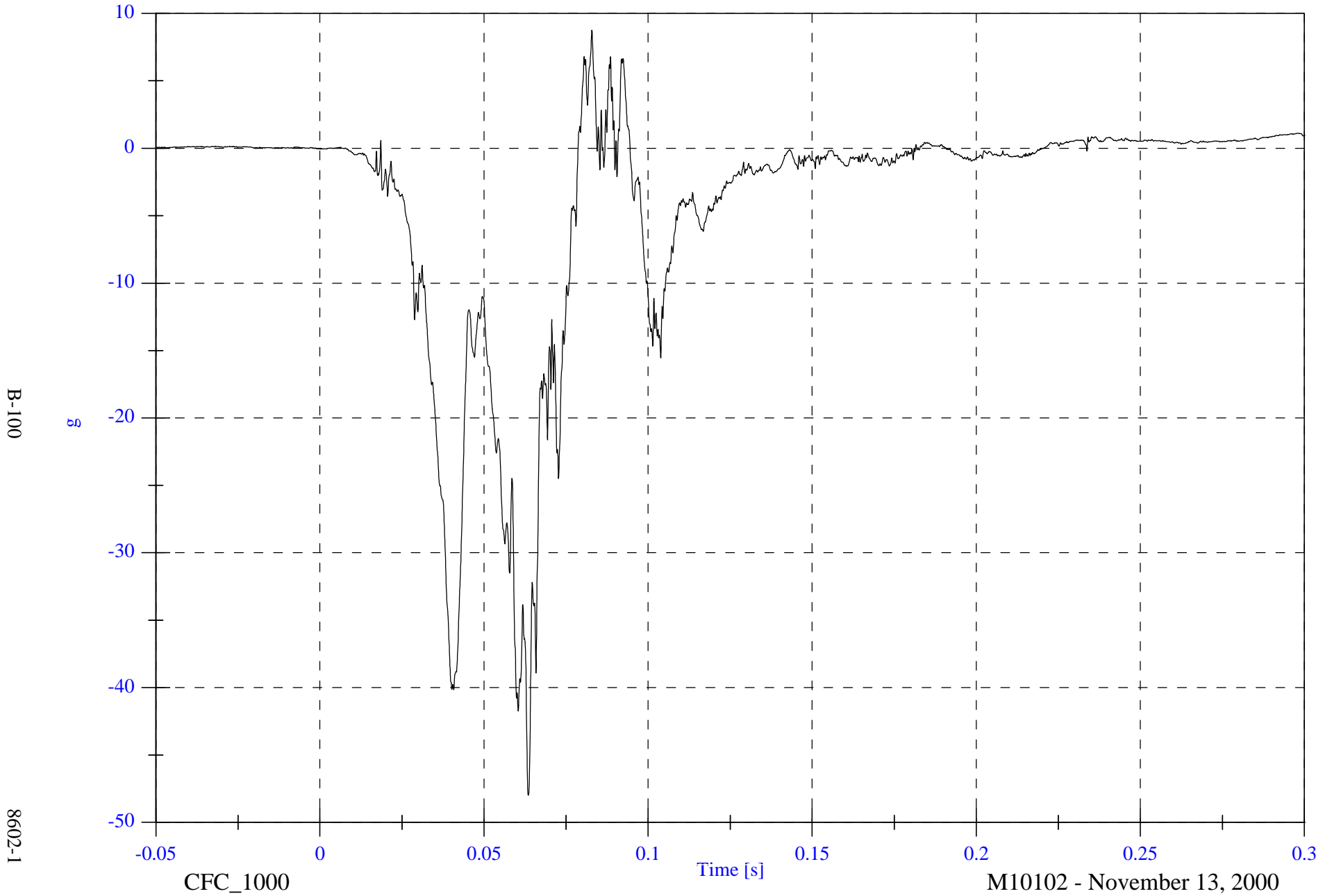
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Foot Aft z

Max: 8.8 [g] at 0.083 [s]

Min: -48.0 [g] at 0.063 [s]



B-100

8602-1

CFC_1000

Time [s]

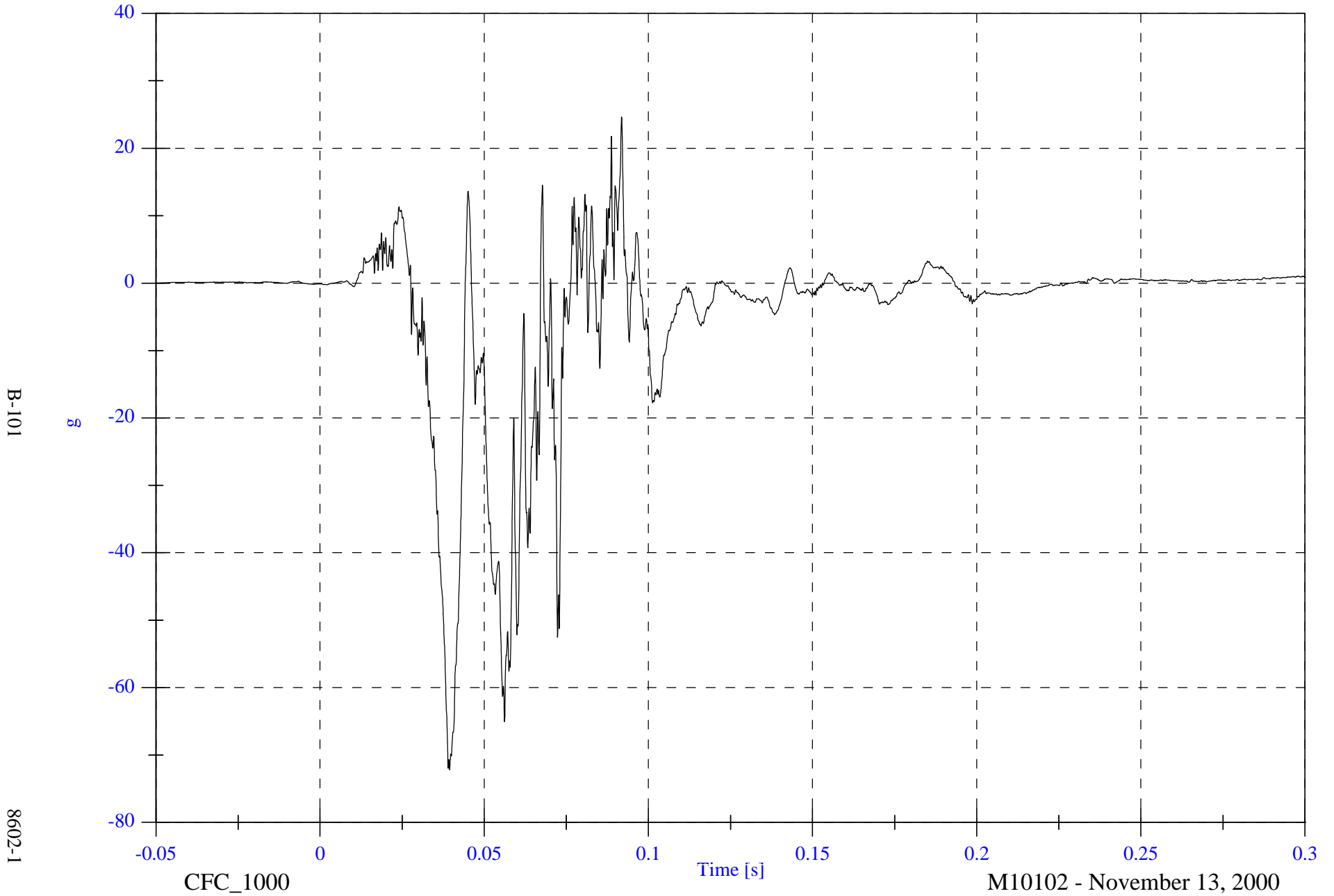
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Right Foot Fore x

Max: 24.7 [g] at 0.092 [s]

Min: -72.2 [g] at 0.039 [s]



B-101

8602-1

CFC_1000

Time [s]

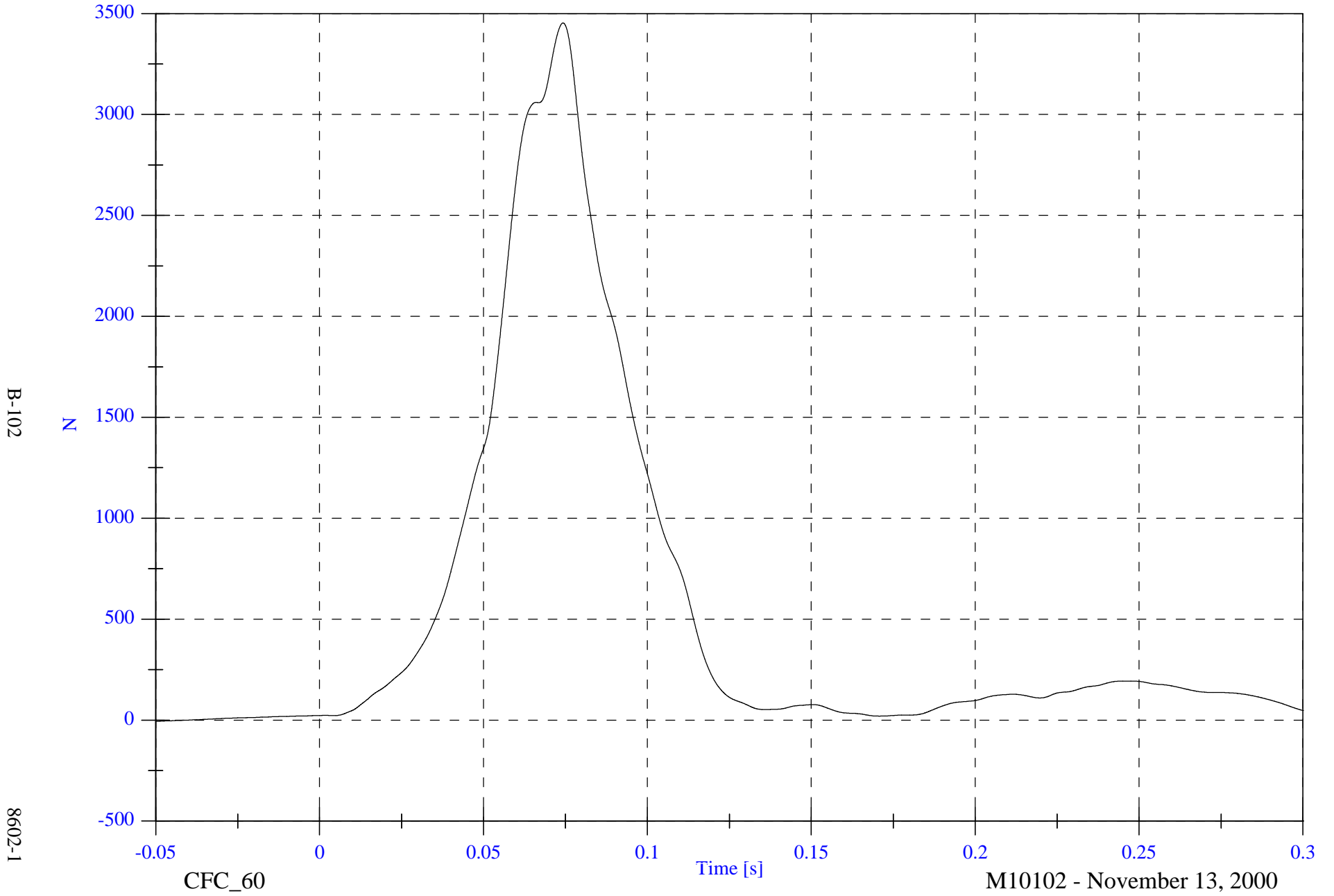
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Lap Belt Force

Max: 3453.0 [N] at 0.074 [s]

Min: -5.6 [N] at -0.050 [s]



B-102

8602-1

CFC_60

Time [s]

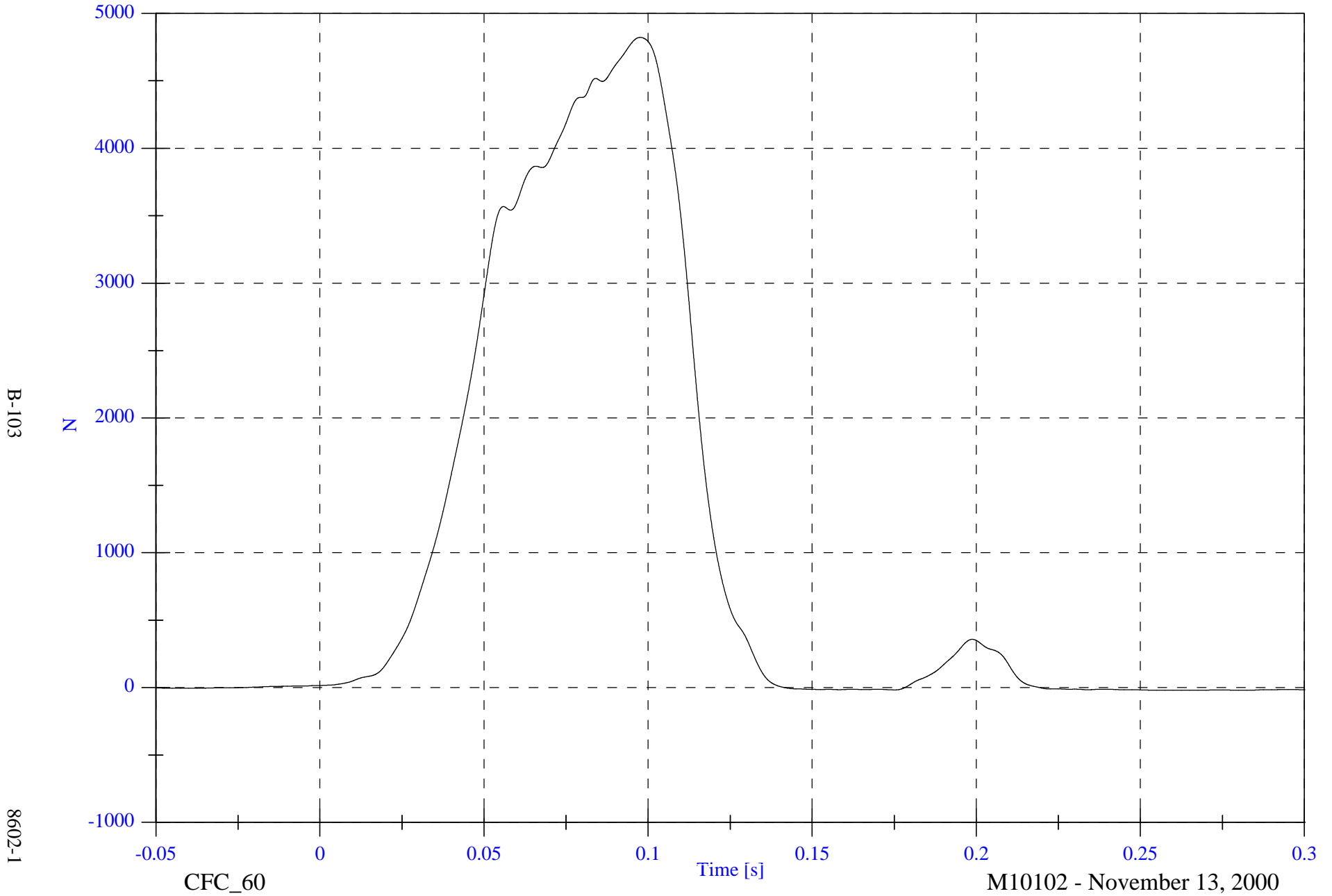
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Shoulder Belt Force

Max: 4823.0 [N] at 0.098 [s]

Min: -20.3 [N] at 0.282 [s]



B-103

8602-1

CFC_60

Time [s]

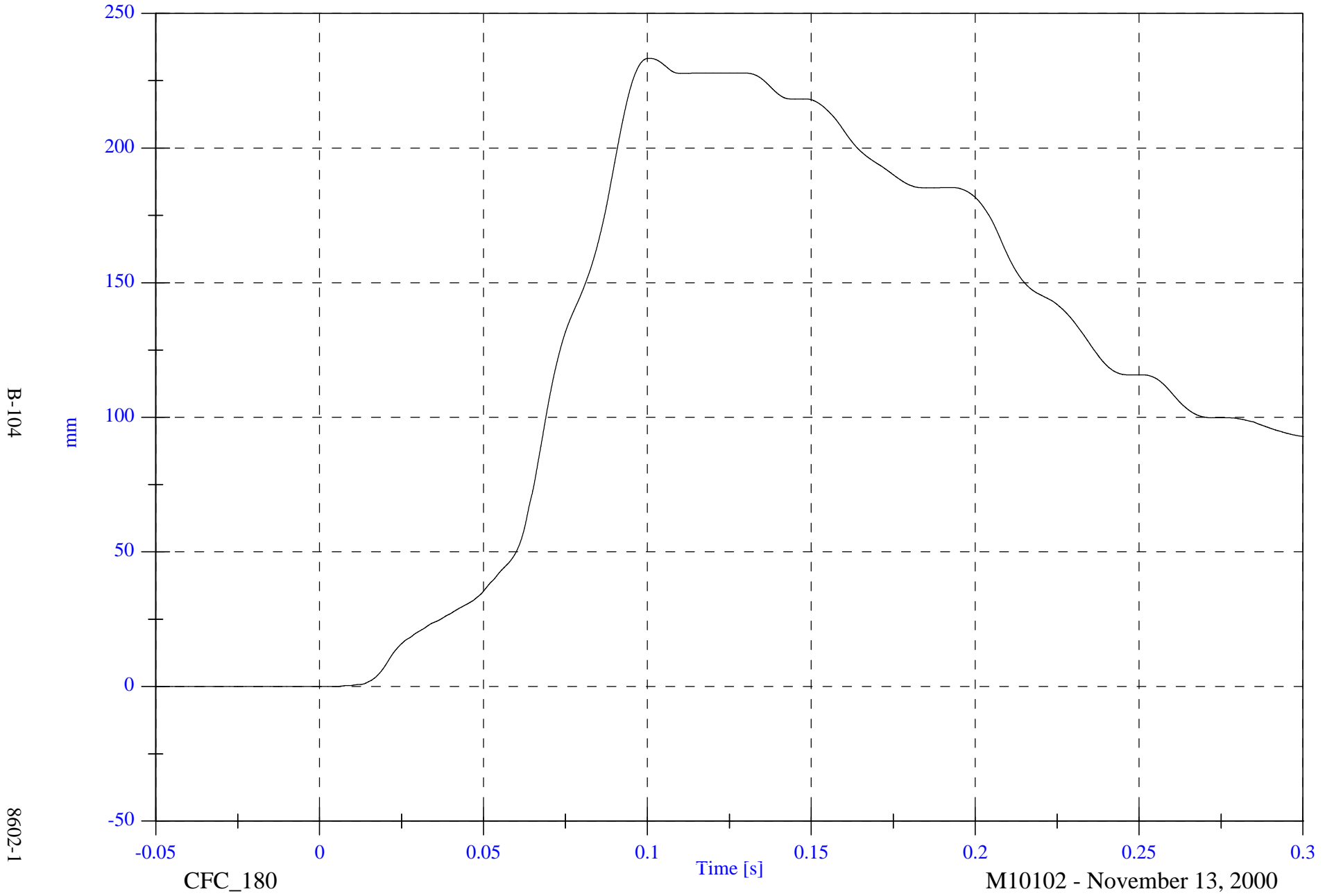
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Shoulder Belt Spoolout

Max: 233.3 [mm] at 0.101 [s]

Min: -0.0 [mm] at -0.024 [s]



B-104

8602-1

CFC_180

Time [s]

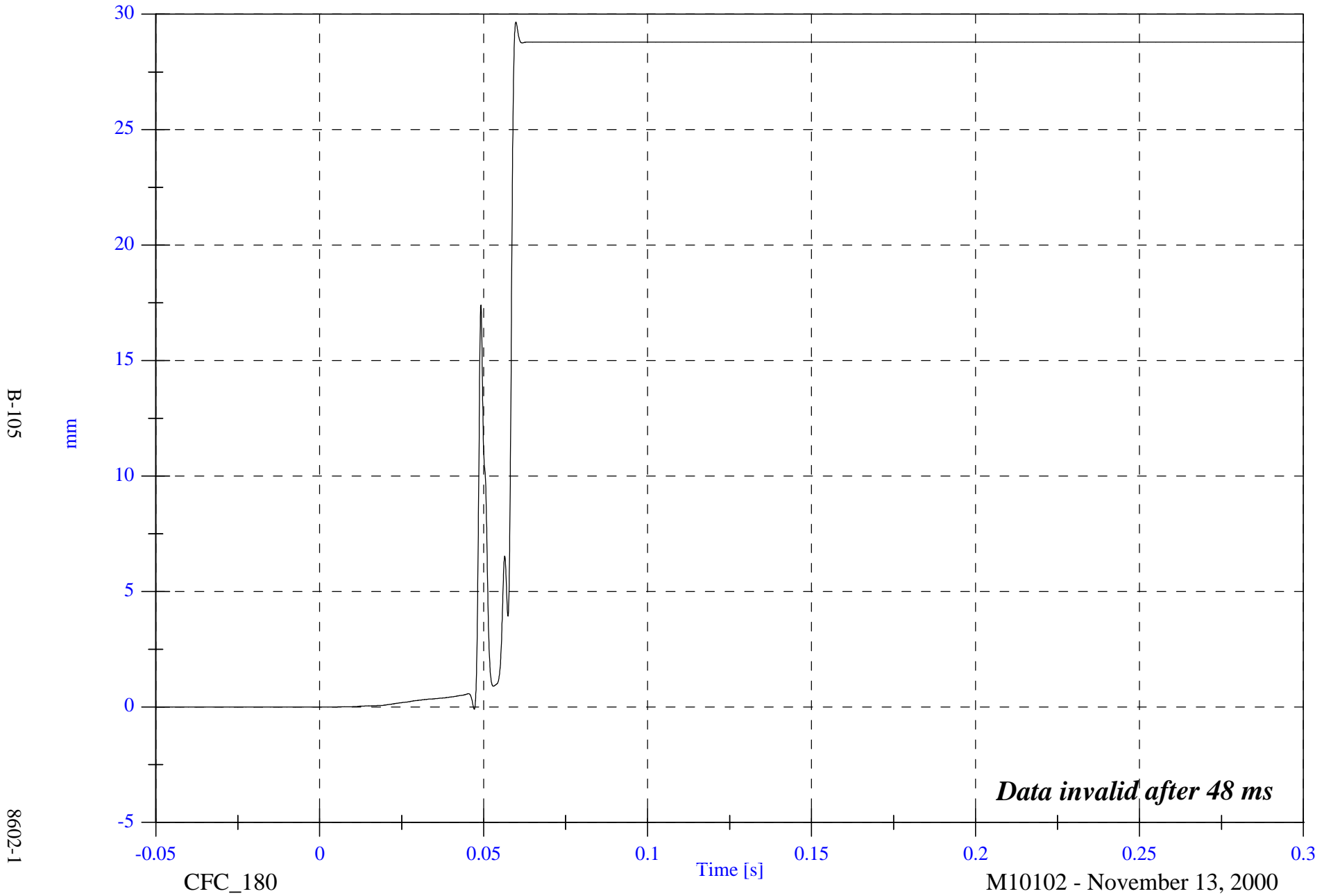
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

P2 Shoulder Belt Elongation

Max: 29.7 [mm] at 0.060 [s]

Min: -0.1 [mm] at 0.047 [s]



B-105

8602-1

CFC_180

Time [s]

Data invalid after 48 ms

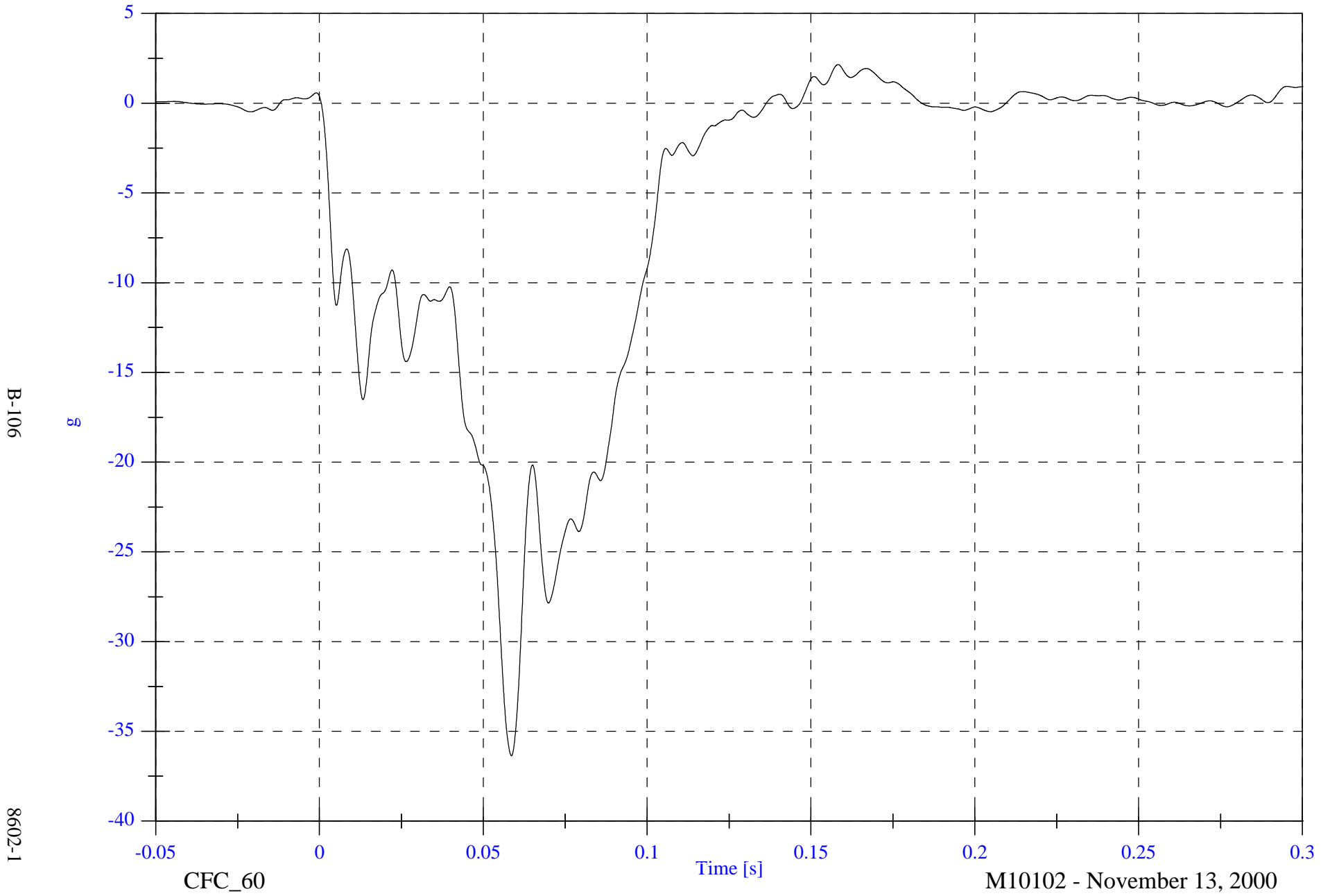
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Left Rear #1x

Max: 2.2 [g] at 0.158 [s]

Min: -36.4 [g] at 0.059 [s]



B-106

8602-1

CFC_60

Time [s]

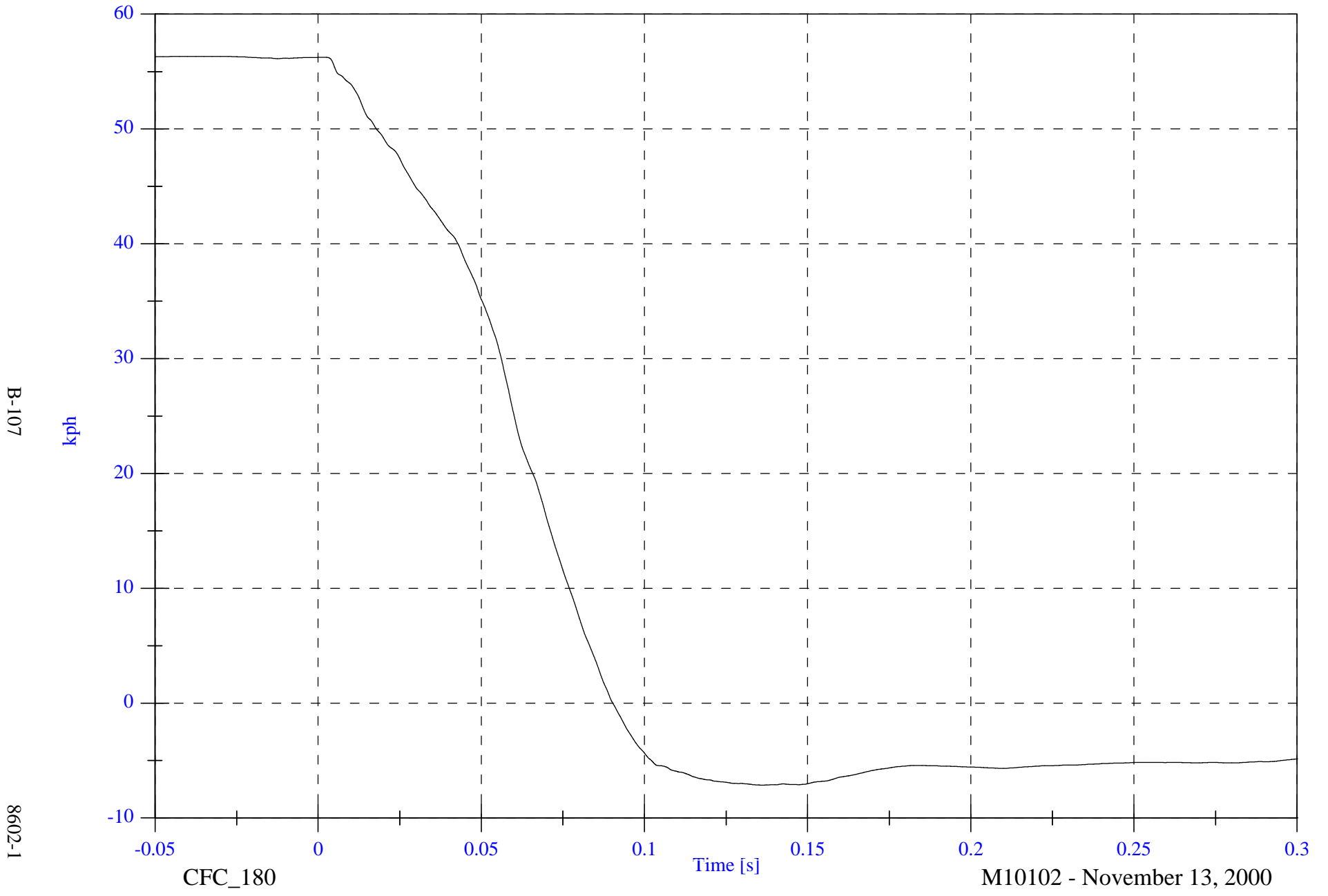
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 56.3 [kph] at -0.040 [s]

Left Rear #1x Velocity

Min: -7.1 [kph] at 0.136 [s]



B-107

8602-1

CFC_180

Time [s]

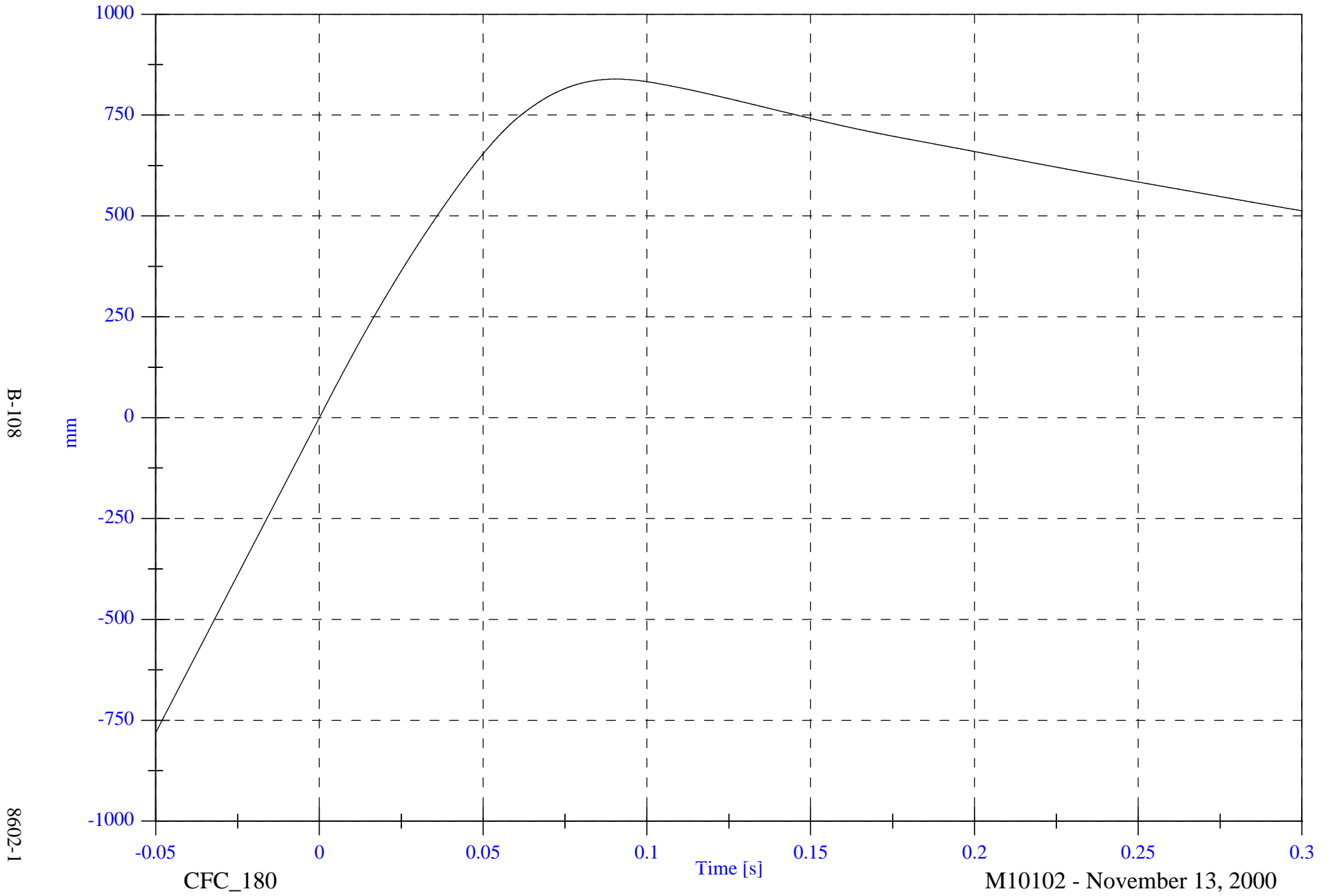
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Left Rear #1x Displacement

Max: 839.1 [mm] at 0.090 [s]

Min: -781.3 [mm] at -0.050 [s]



B-108

8602-1

CFC_180

Time [s]

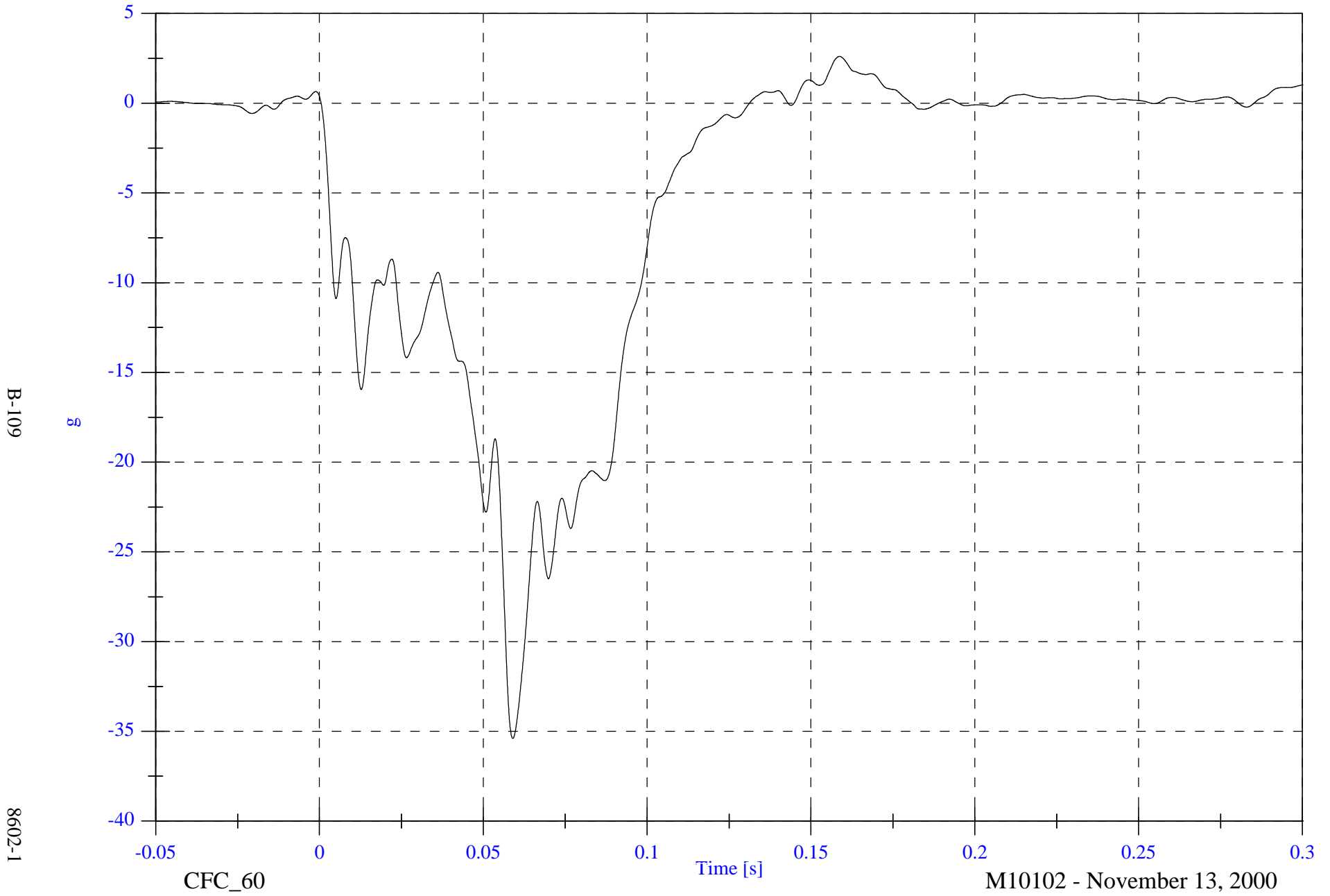
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Right Rear #2x

Max: 2.6 [g] at 0.159 [s]

Min: -35.4 [g] at 0.059 [s]



B-109

8602-1

CFC_60

Time [s]

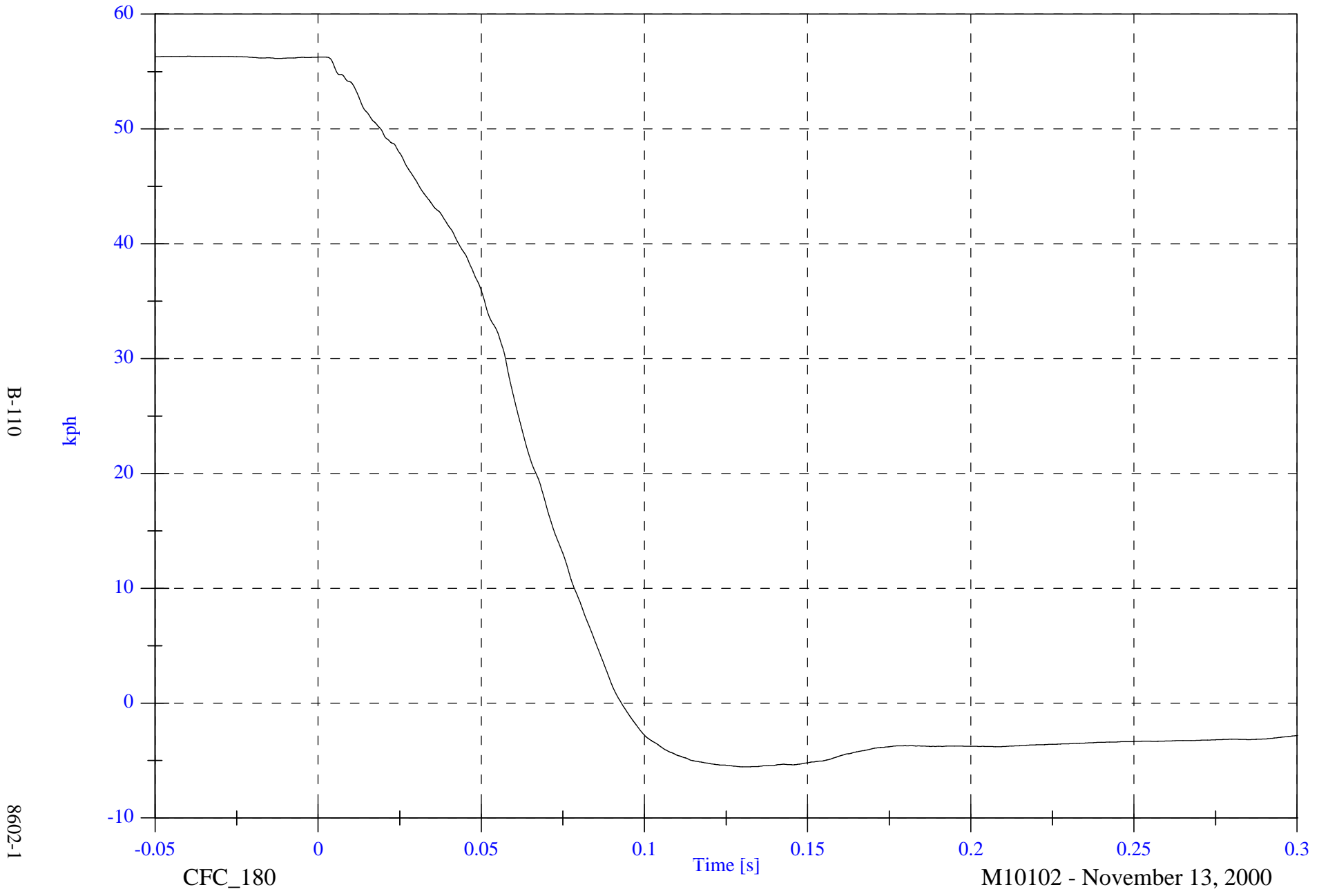
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 56.3 [kph] at -0.040 [s]

Right Rear #2x Velocity

Min: -5.6 [kph] at 0.131 [s]



B-110

8602-1

CFC_180

Time [s]

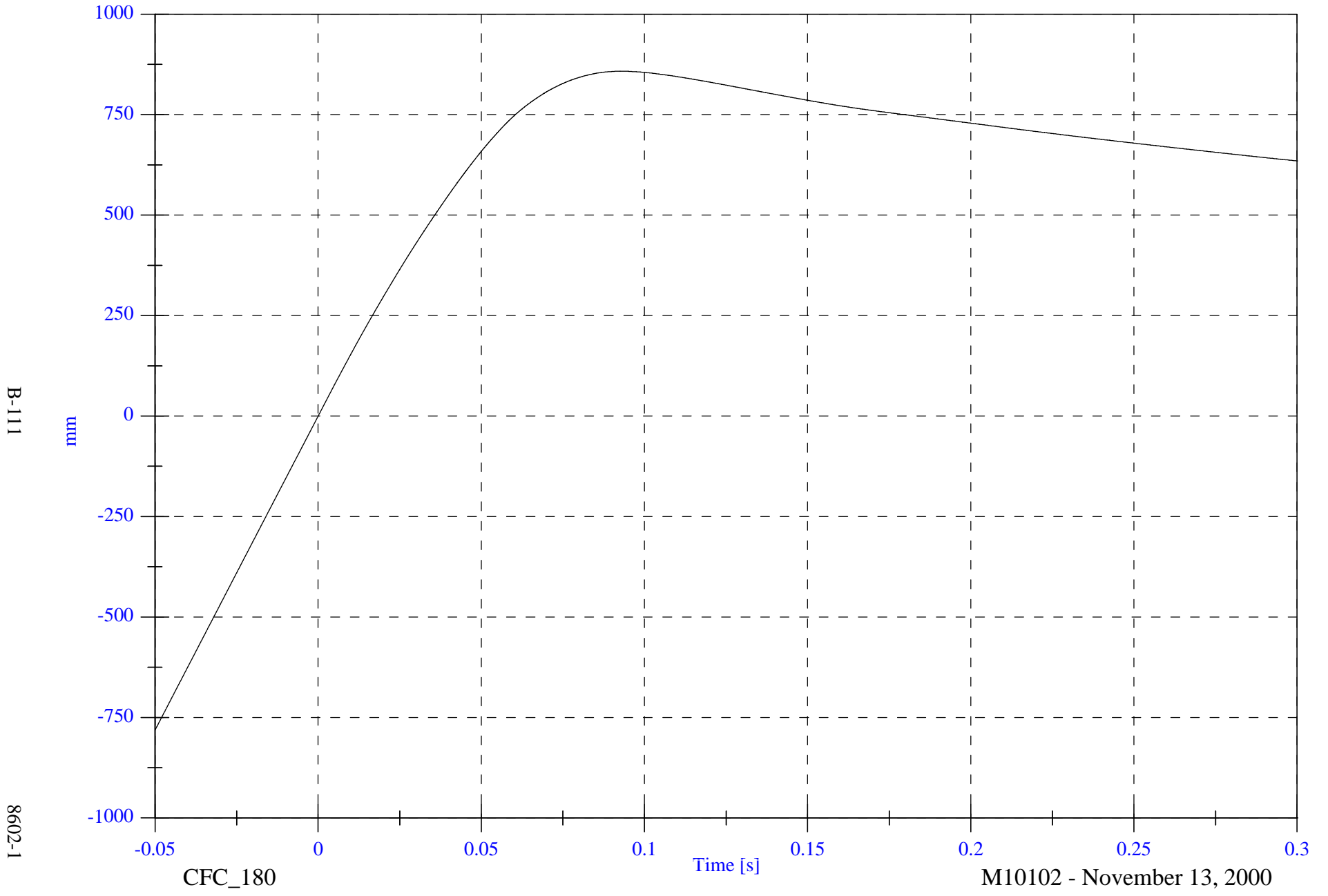
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Right Rear #2x Displacement

Max: 857.8 [mm] at 0.093 [s]

Min: -781.4 [mm] at -0.050 [s]



B-111

8602-1

CFC_180

Time [s]

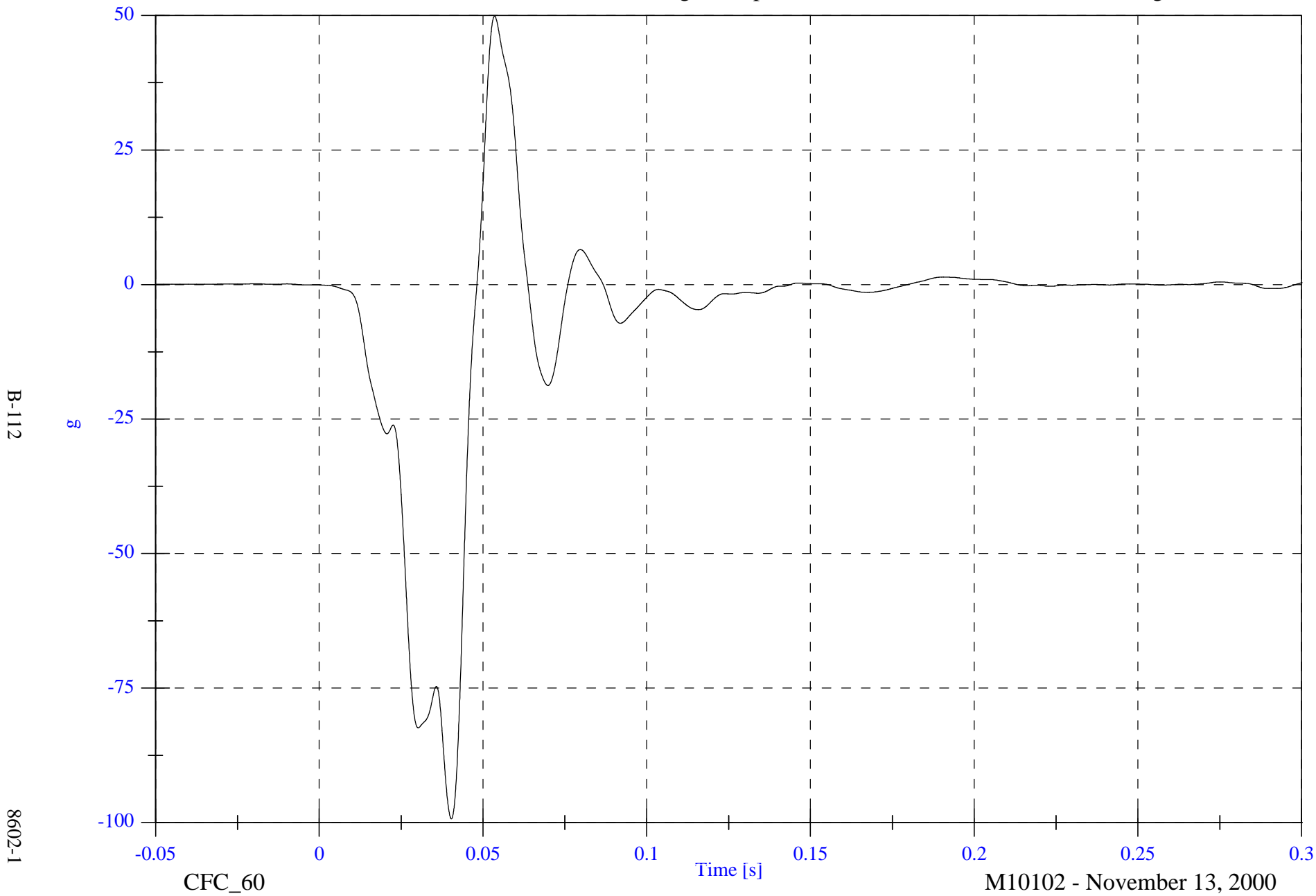
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Engine Top #3x

Max: 49.9 [g] at 0.054 [s]

Min: -99.3 [g] at 0.040 [s]



B-112

8602-1

CFC_60

Time [s]

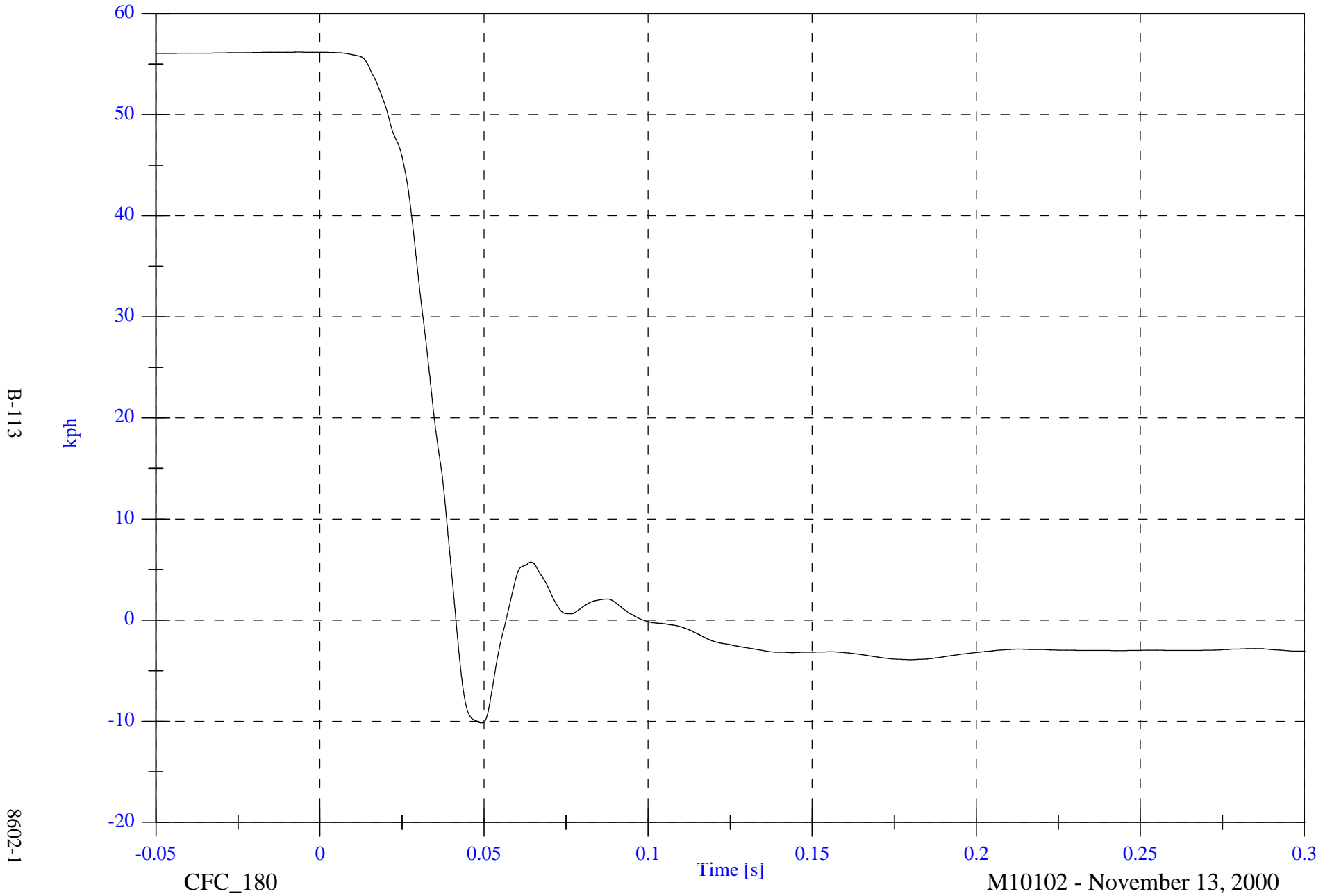
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Engine Top #3x Velocity

Max: 56.2 [kph] at -0.006 [s]

Min: -10.2 [kph] at 0.049 [s]



B-113

8602-1

CFC_180

Time [s]

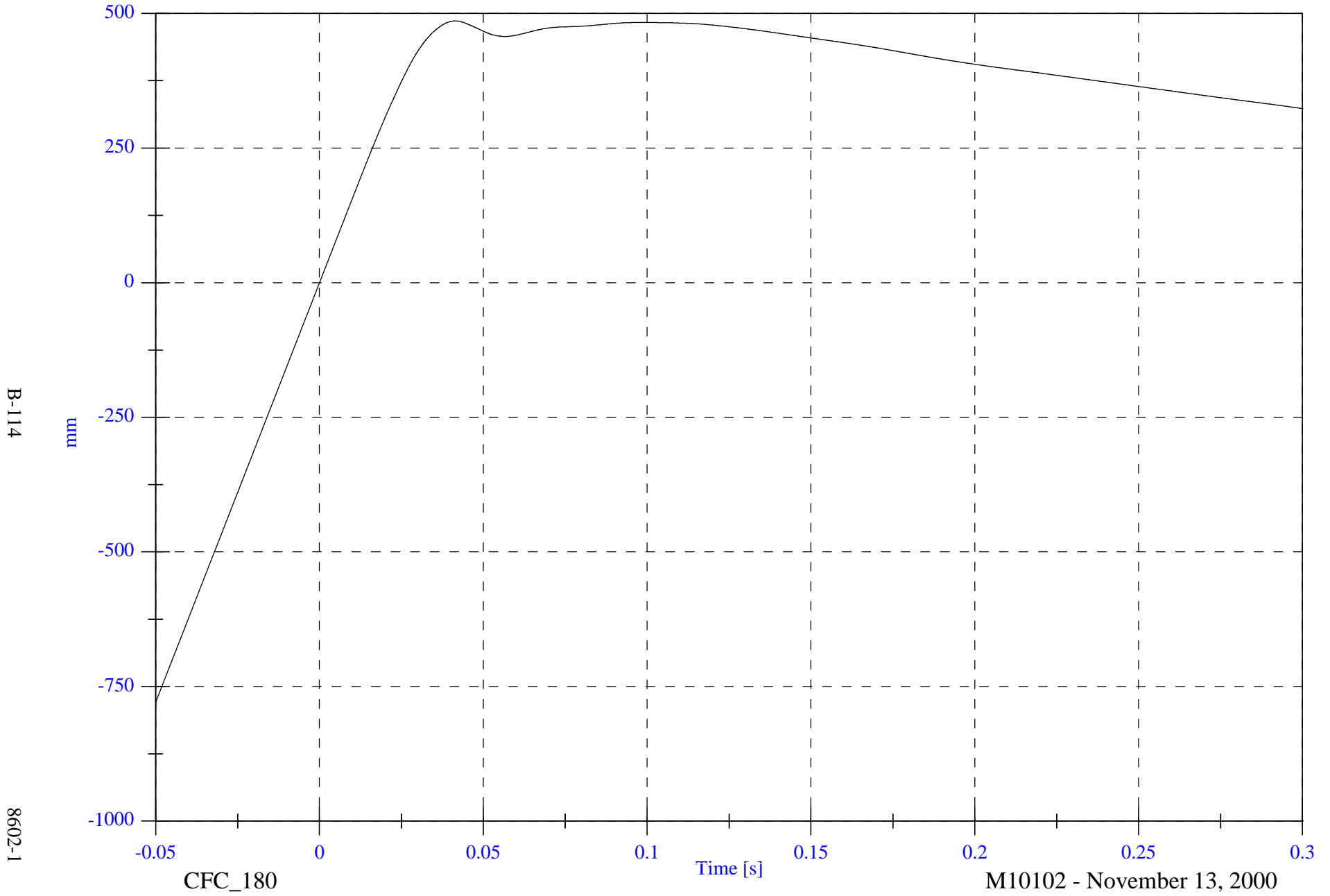
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Engine Top #3x Displacement

Max: 486.1 [mm] at 0.041 [s]

Min: -779.4 [mm] at -0.050 [s]



B-114

8602-1

CFC_180

Time [s]

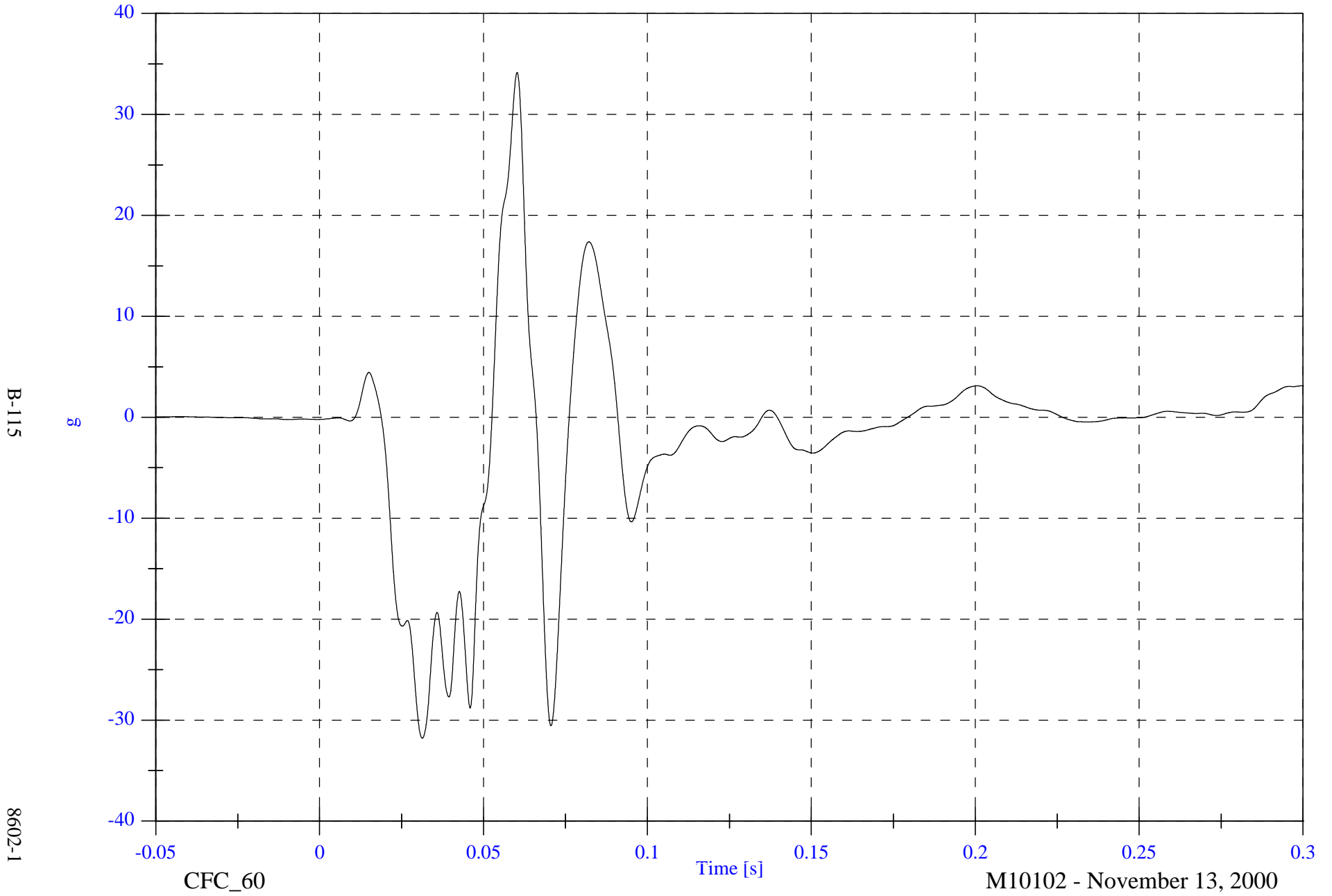
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Engine Bottom #4x

Max: 34.2 [g] at 0.060 [s]

Min: -31.8 [g] at 0.031 [s]



B-115

8602-1

CFC_60

Time [s]

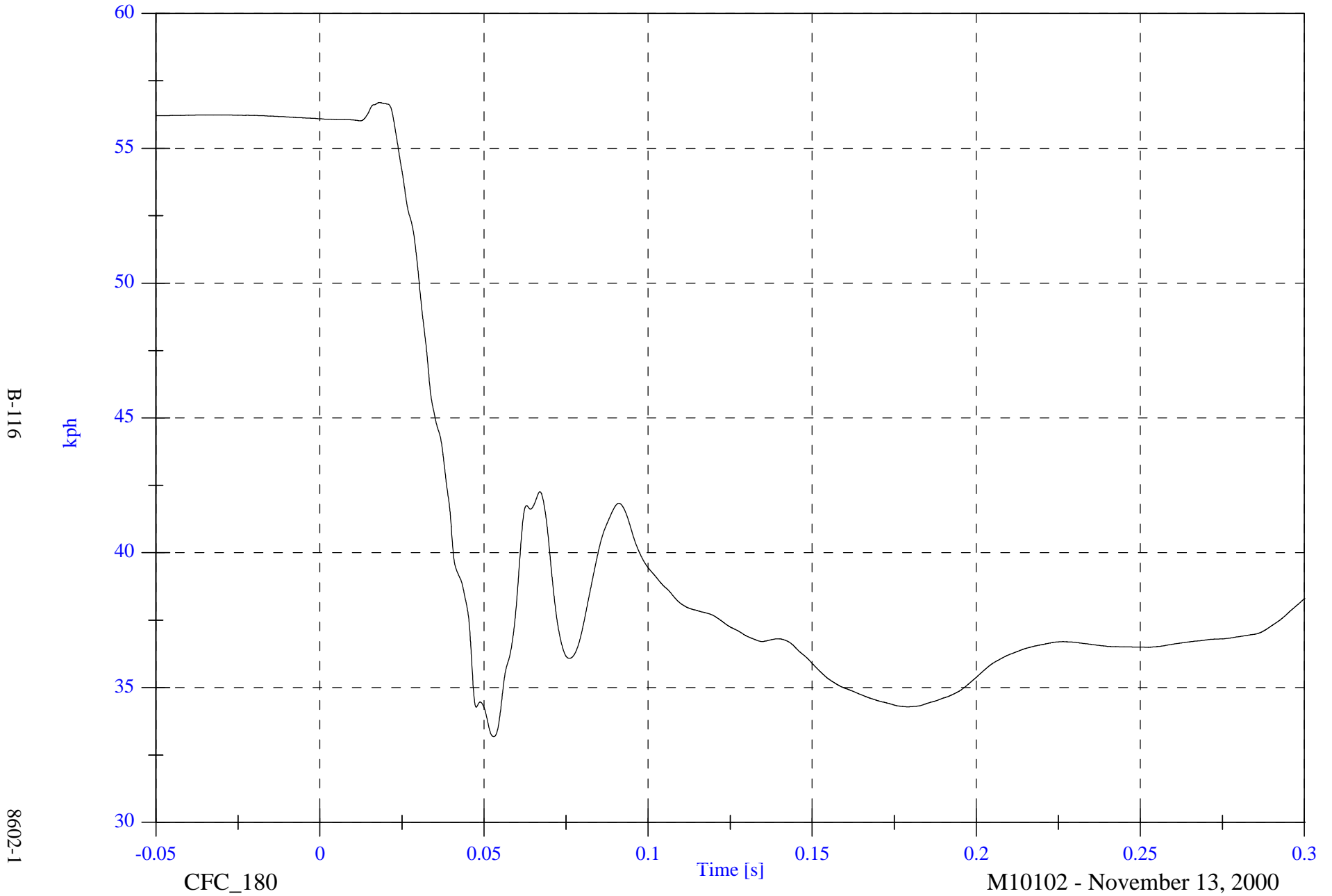
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Engine Bottom #4x Velocity

Max: 56.7 [kph] at 0.018 [s]

Min: 33.2 [kph] at 0.053 [s]



B-116

8602-1

CFC_180

Time [s]

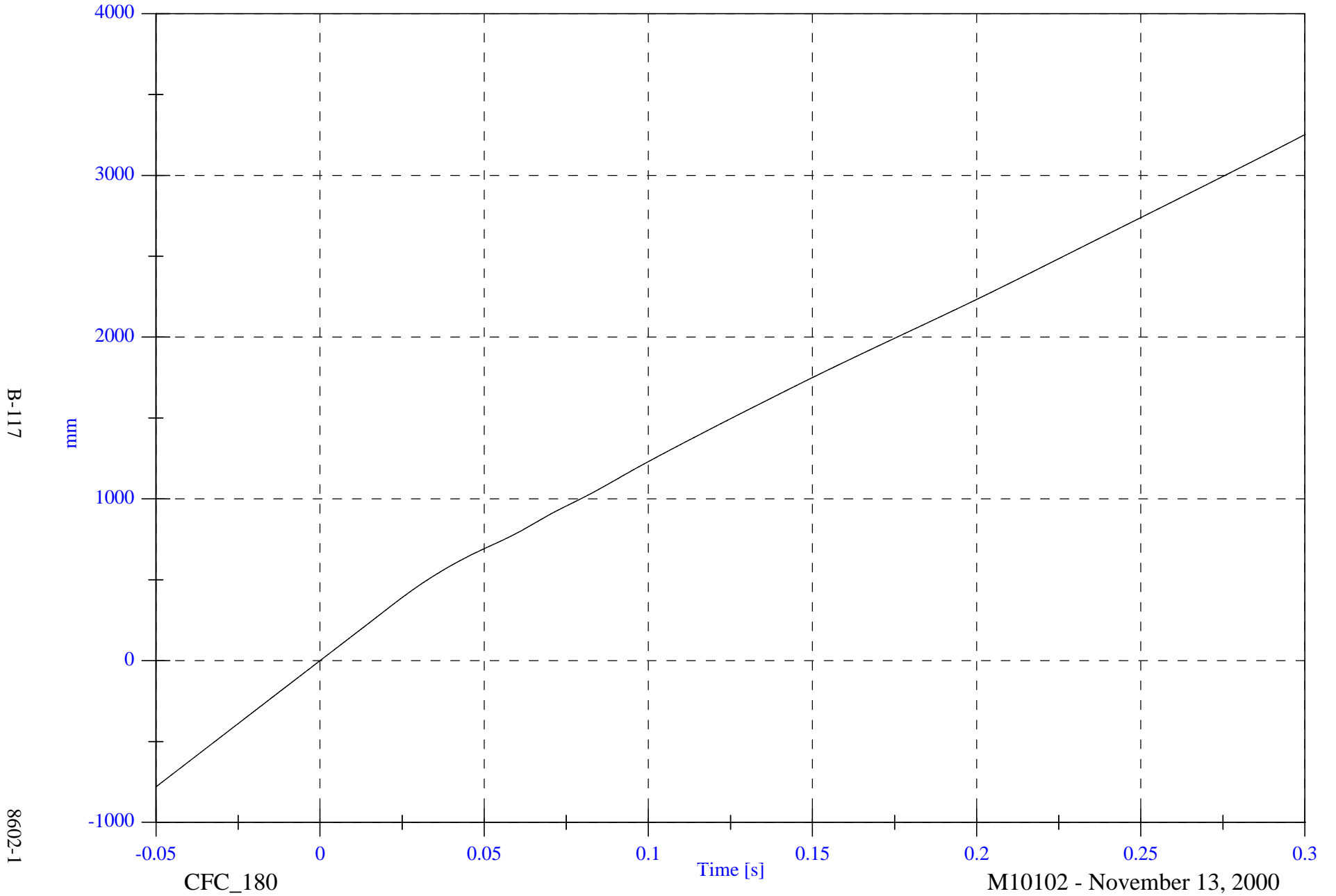
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Engine Bottom #4x Displacement

Max: 3251.3 [mm] at 0.300 [s]

Min: -780.6 [mm] at -0.050 [s]



B-117

8602-1

CFC_180

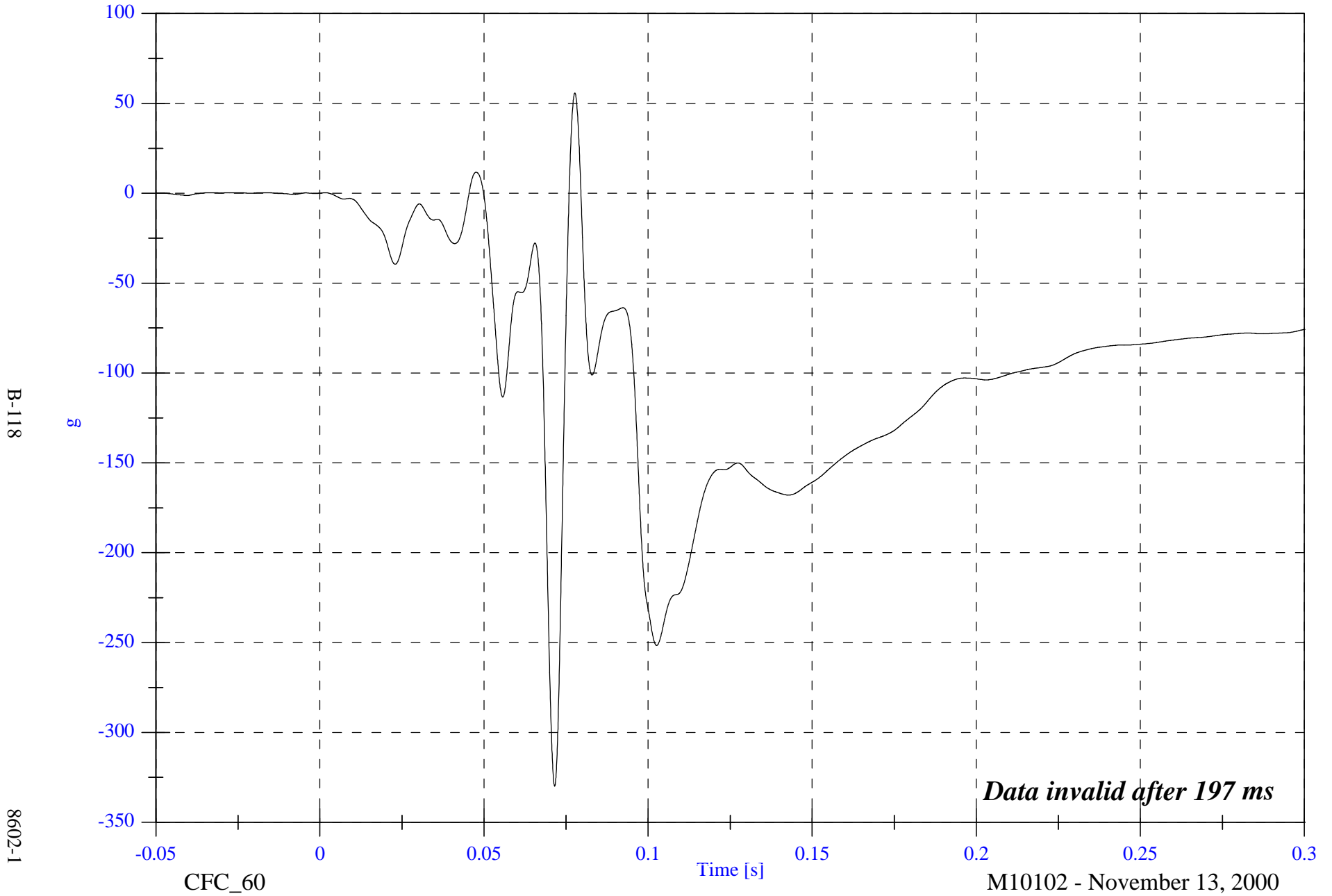
Time [s]

M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Right Caliper #5x

Max: 55.8 [g] at 0.078 [s]
Min: -329.9 [g] at 0.072 [s]



B-118

8602-1

CFC_60

Time [s]

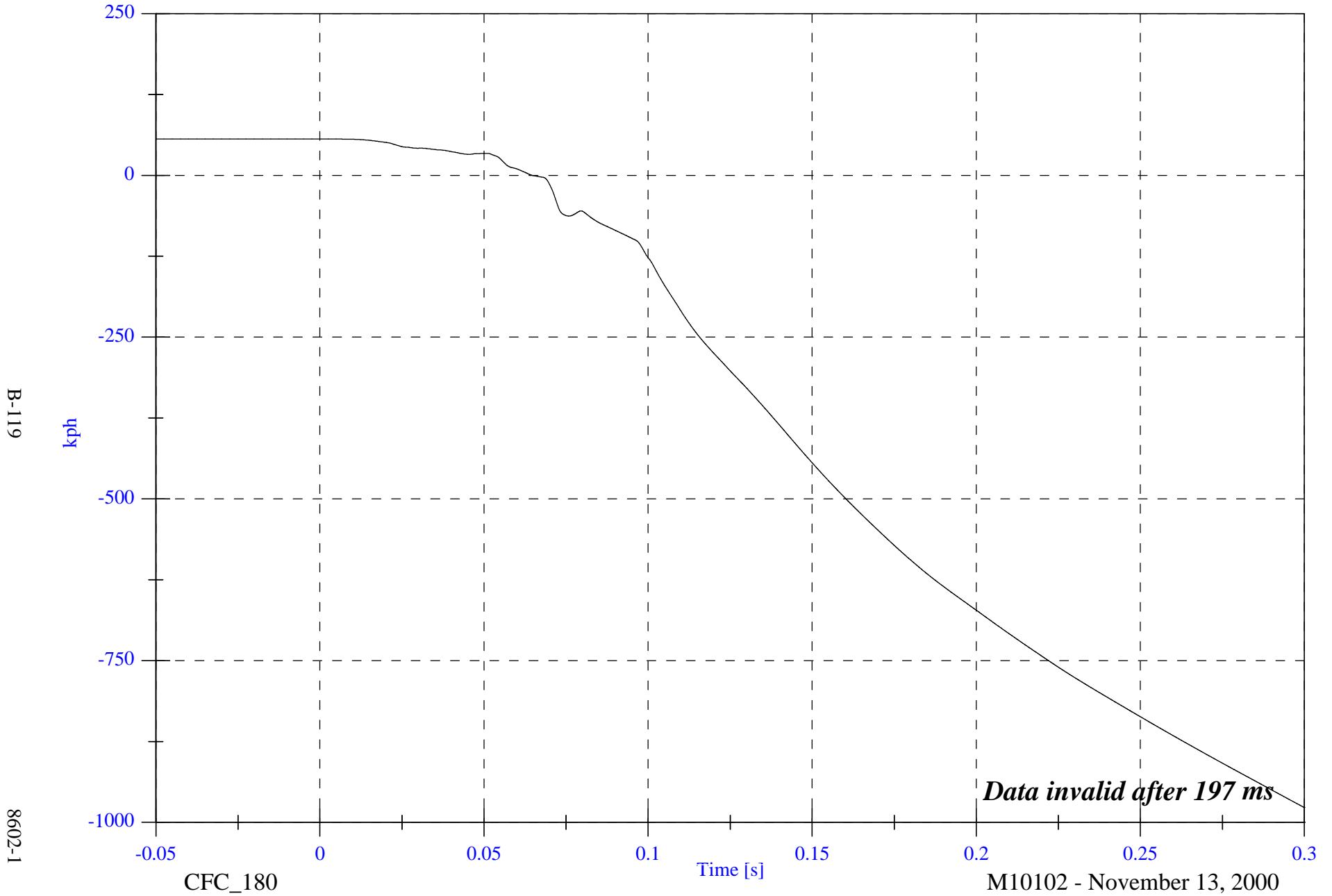
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Right Caliper #5x Velocity

Max: 56.3 [kph] at -0.046 [s]

Min: -977.0 [kph] at 0.300 [s]



B-119

8602-1

CFC_180

Time [s]

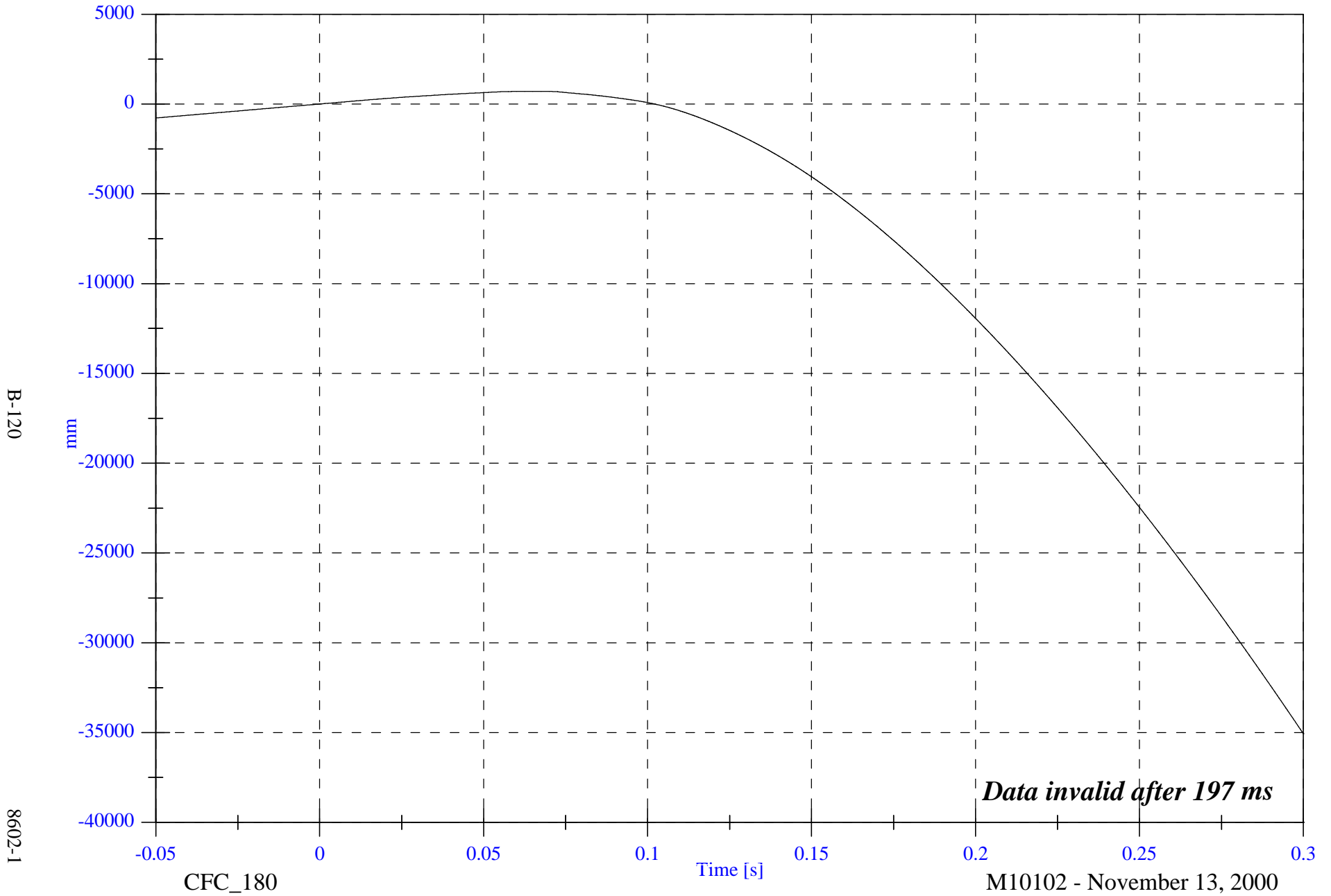
M10102 - November 13, 2000

Data invalid after 197 ms

NCAP Test 1 - 2001 Chevrolet Impala

Right Caliper #5x Displacement

Max: 705.8 [mm] at 0.065 [s]
Min: -35060.7 [mm] at 0.300 [s]



B-120

8602-1

CFC_180

Time [s]

M10102 - November 13, 2000

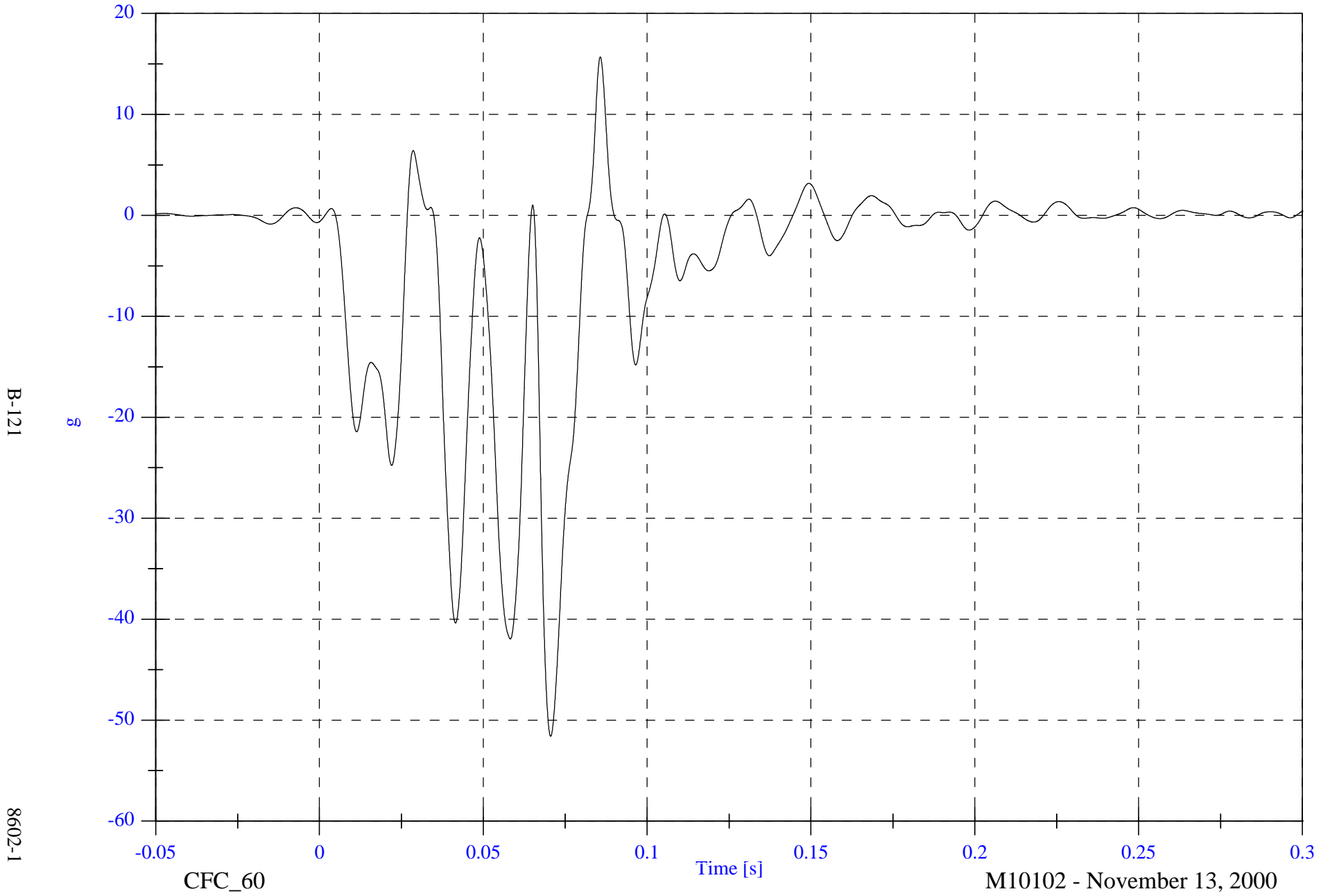
Data invalid after 197 ms

NCAP Test 1 - 2001 Chevrolet Impala

Instrument Panel #6x

Max: 15.7 [g] at 0.086 [s]

Min: -51.6 [g] at 0.071 [s]



B-121

8602-1

CFC_60

Time [s]

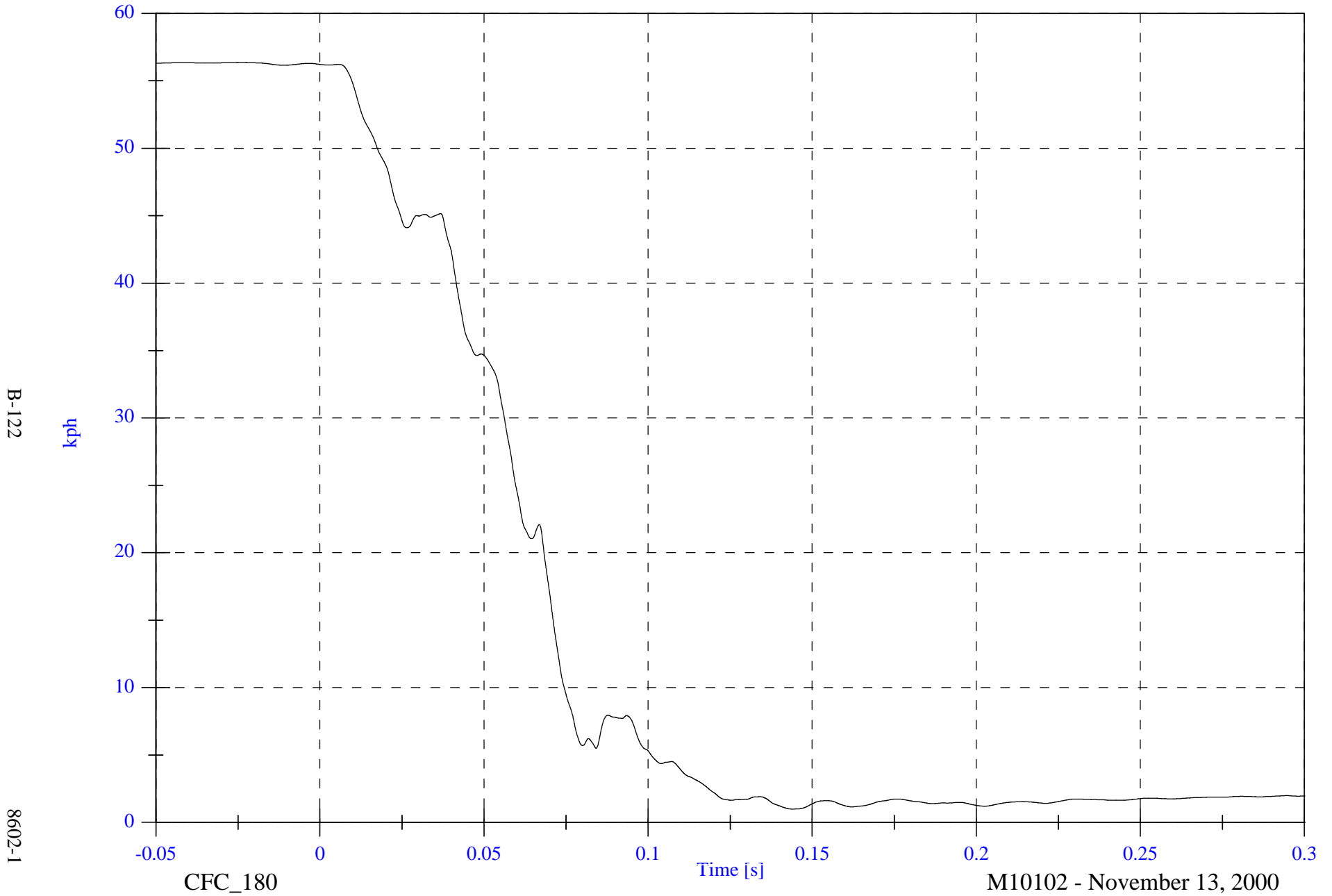
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 56.4 [kph] at -0.024 [s]

Instrument Panel #6x Velocity

Min: 1.0 [kph] at 0.144 [s]



B-122

8602-1

CFC_180

Time [s]

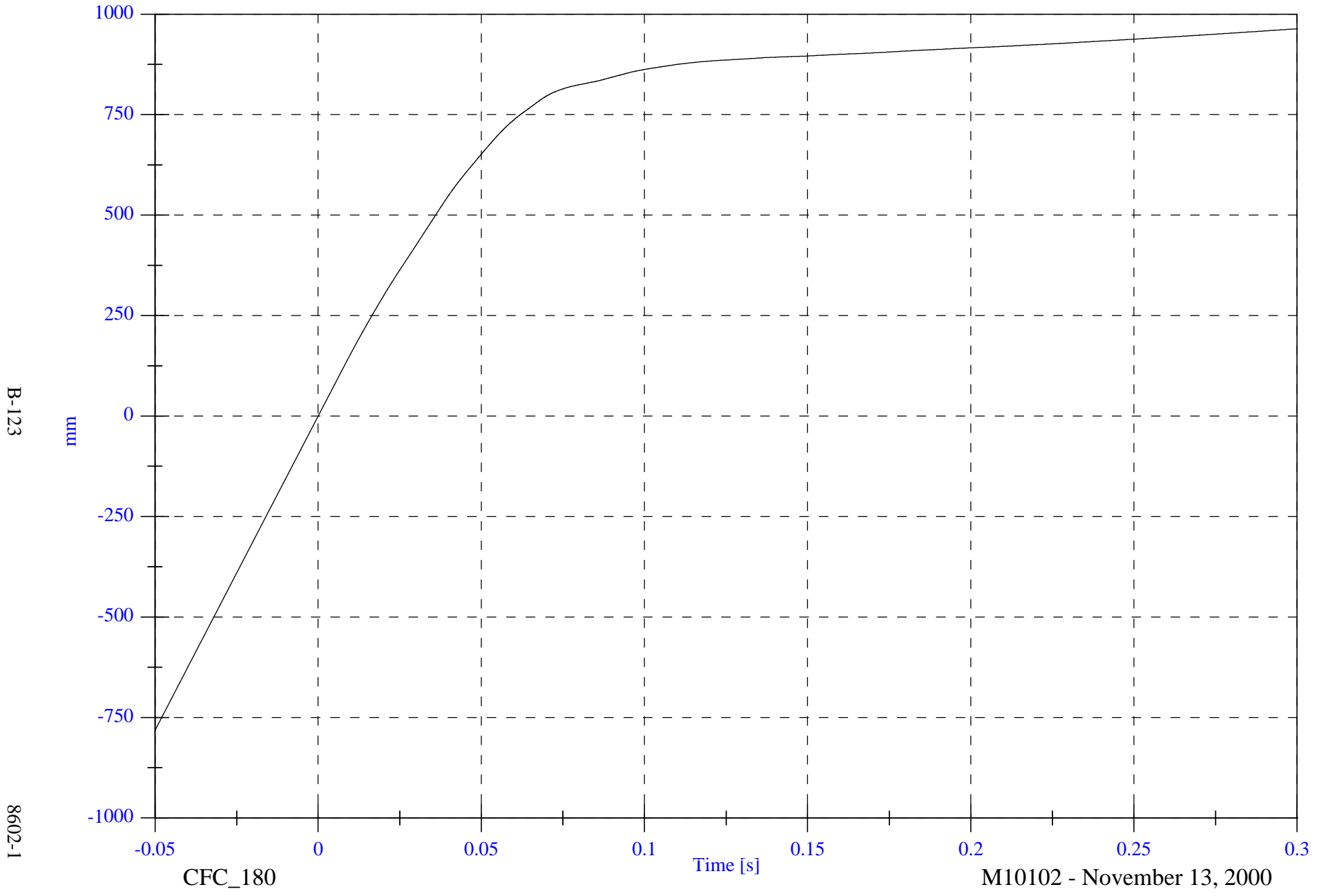
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Instrument Panel #6x Displacement

Max: 963.5 [mm] at 0.300 [s]

Min: -782.0 [mm] at -0.050 [s]



B-123

8602-1

CFC_180

Time [s]

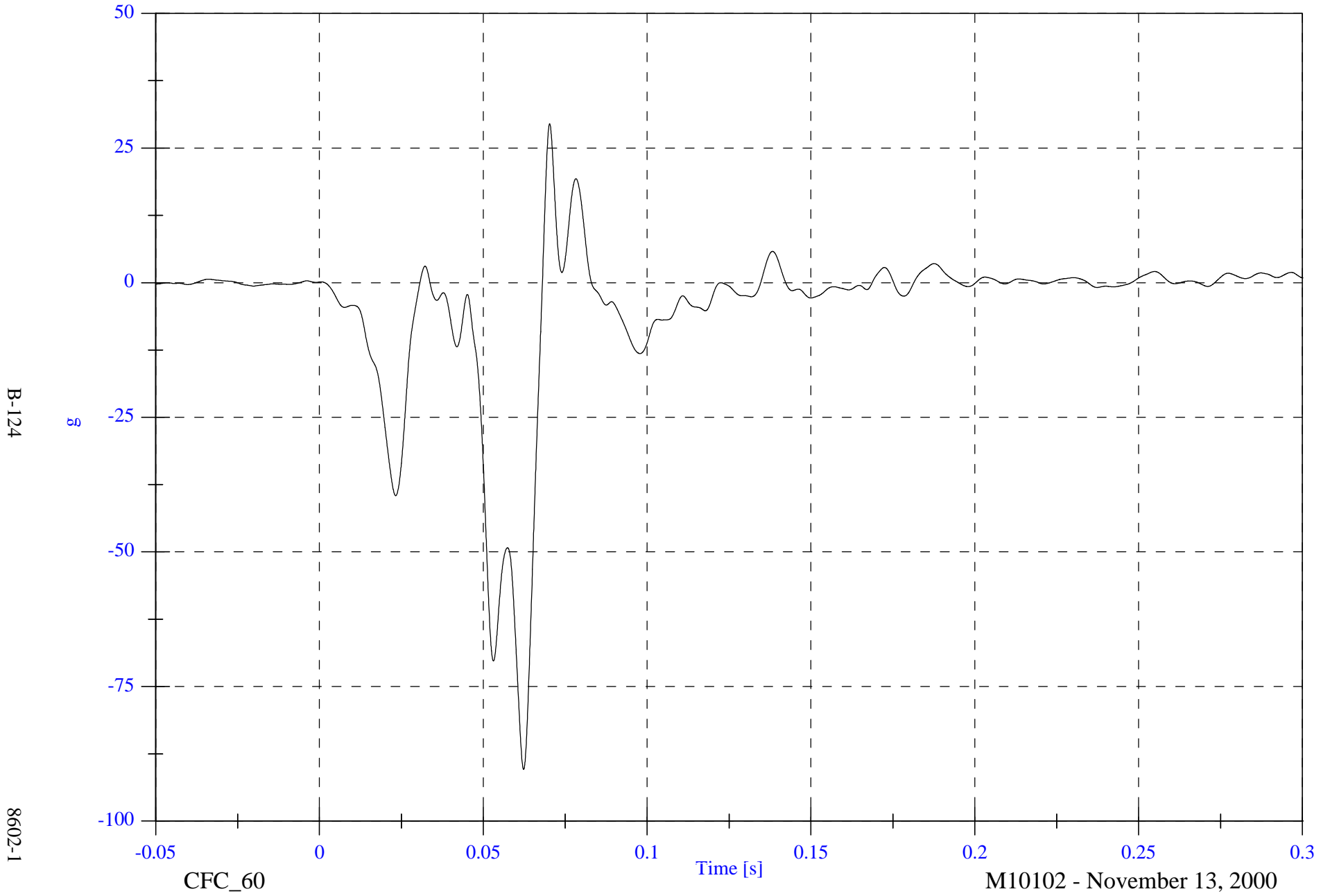
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Left Caliper #7x

Max: 29.5 [g] at 0.070 [s]

Min: -90.4 [g] at 0.062 [s]



B-124

8602-1

CFC_60

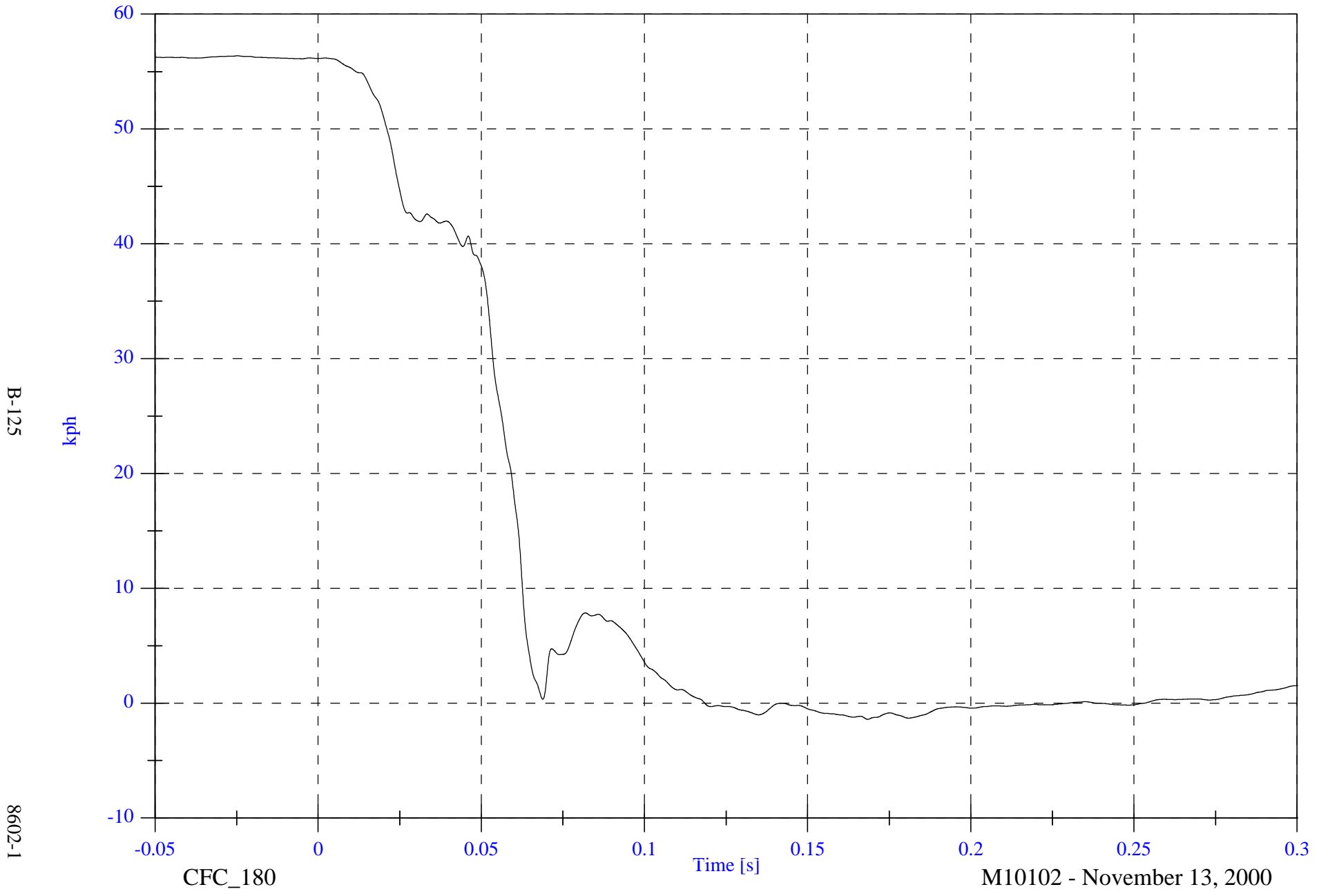
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 56.4 [kph] at -0.025 [s]

Left Caliper #7x Velocity

Min: -1.4 [kph] at 0.168 [s]



B-125

8602-1

CFC_180

Time [s]

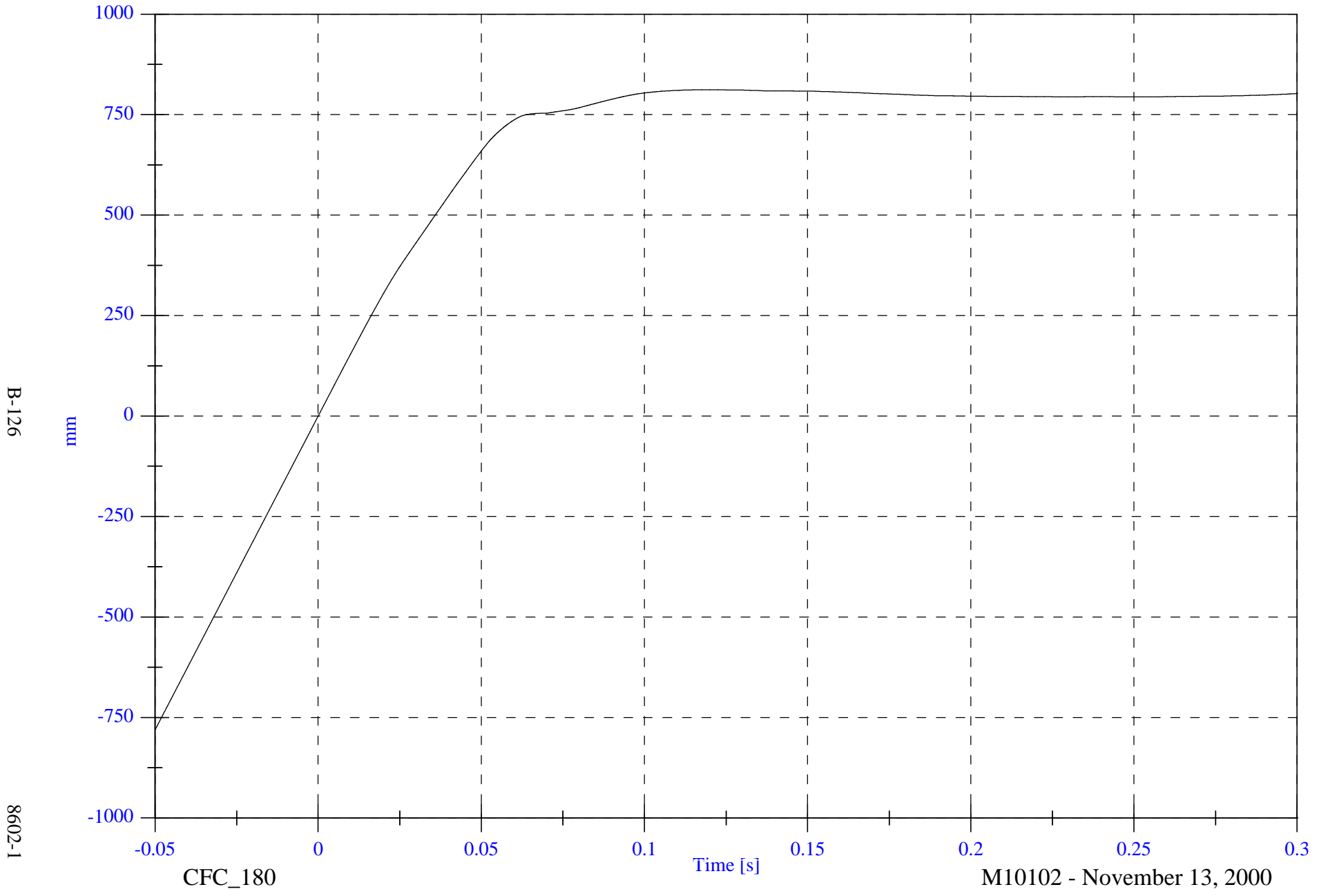
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Left Caliper #7x Displacement

Max: 811.8 [mm] at 0.118 [s]

Min: -780.9 [mm] at -0.050 [s]



B-126

8602-1

CFC_180

Time [s]

M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Left Rear Red #8x

Max: 2.1 [g] at 0.158 [s]

Min: -34.6 [g] at 0.059 [s]

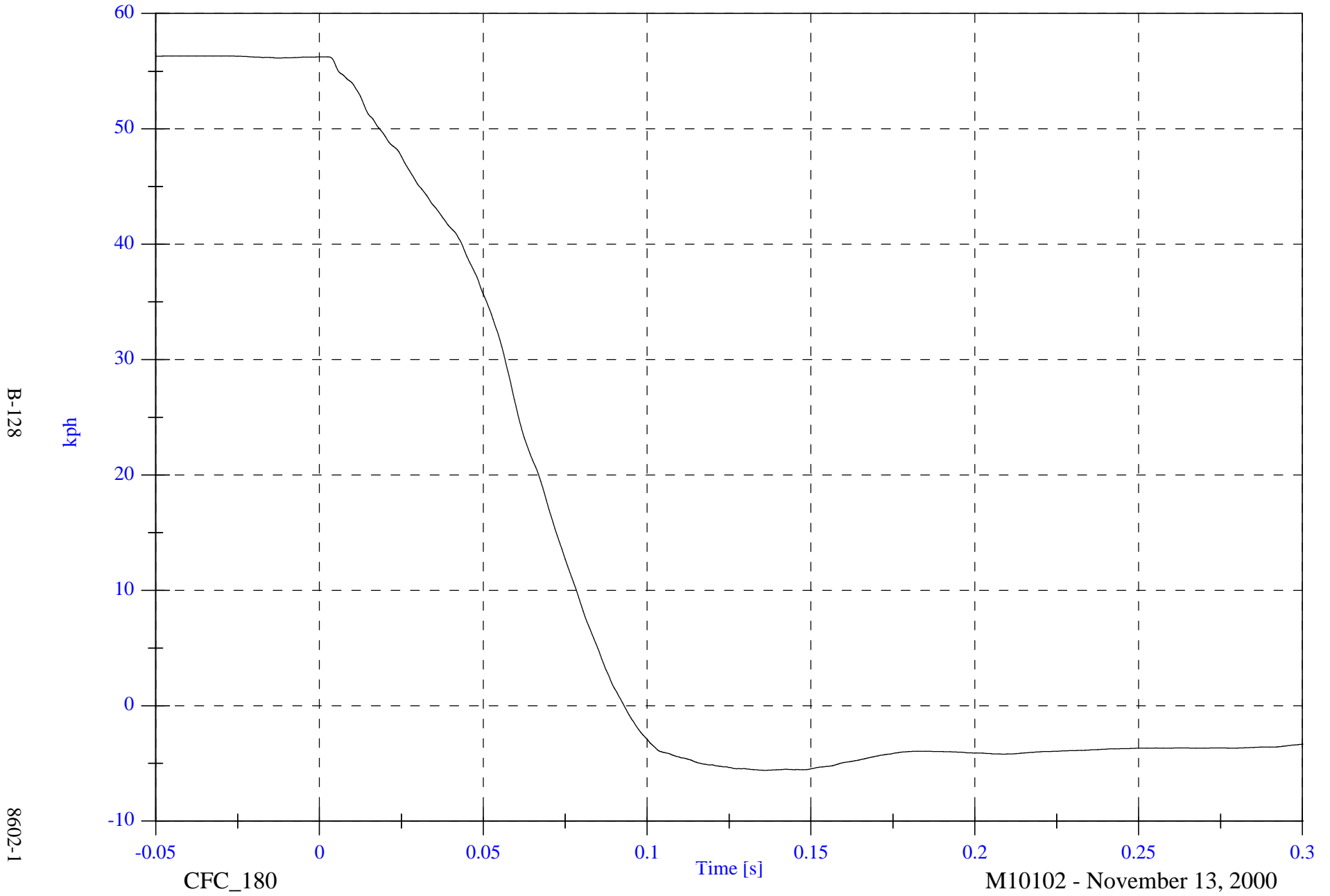


NCAP Test 1 - 2001 Chevrolet Impala

Left Rear Red #8x Velocity

Max: 56.3 [kph] at -0.038 [s]

Min: -5.6 [kph] at 0.136 [s]



B-128

8602-1

CFC_180

Time [s]

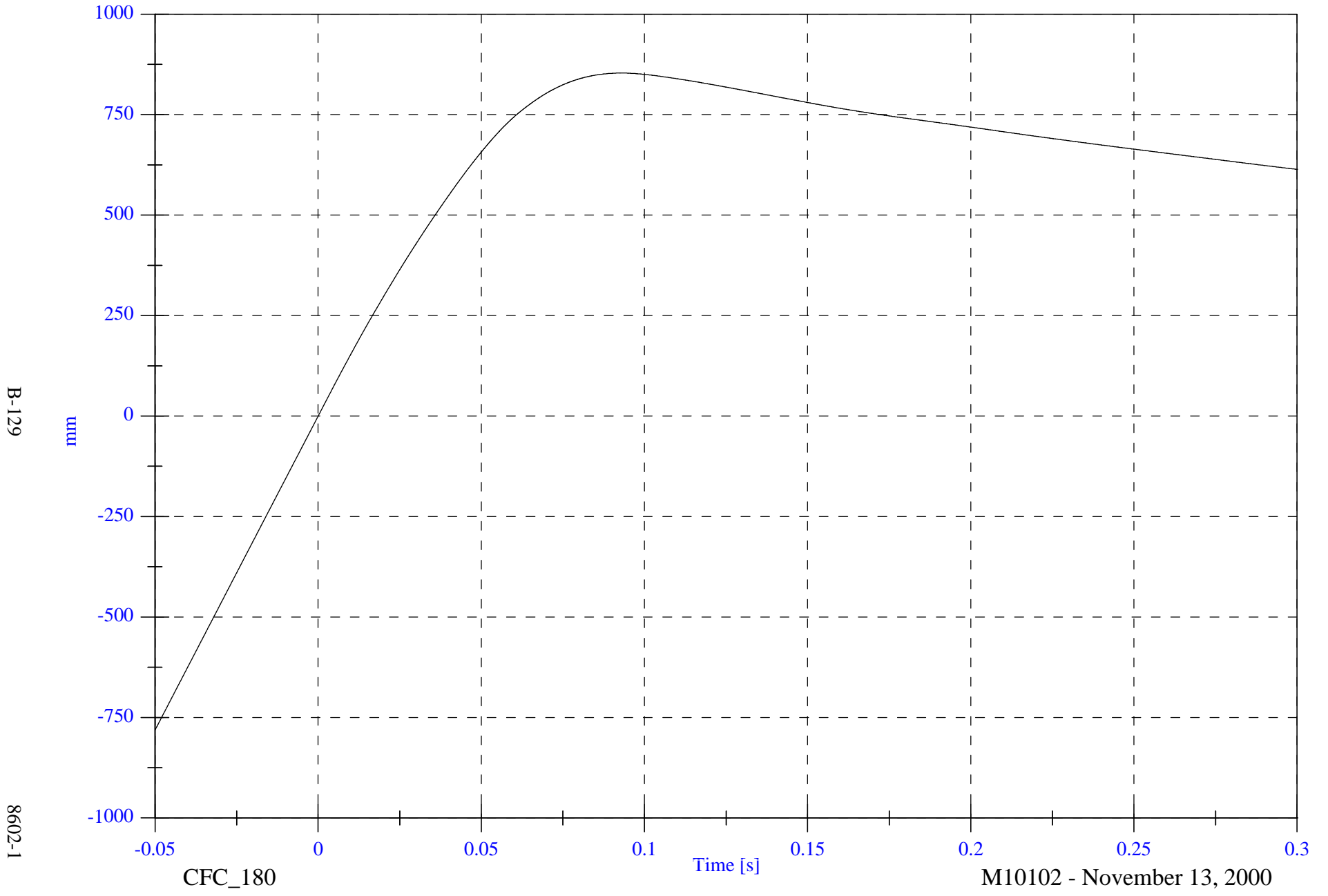
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Left Rear Red #8x Displacement

Max: 853.2 [mm] at 0.093 [s]

Min: -781.4 [mm] at -0.050 [s]



B-129

8602-1

CFC_180

Time [s]

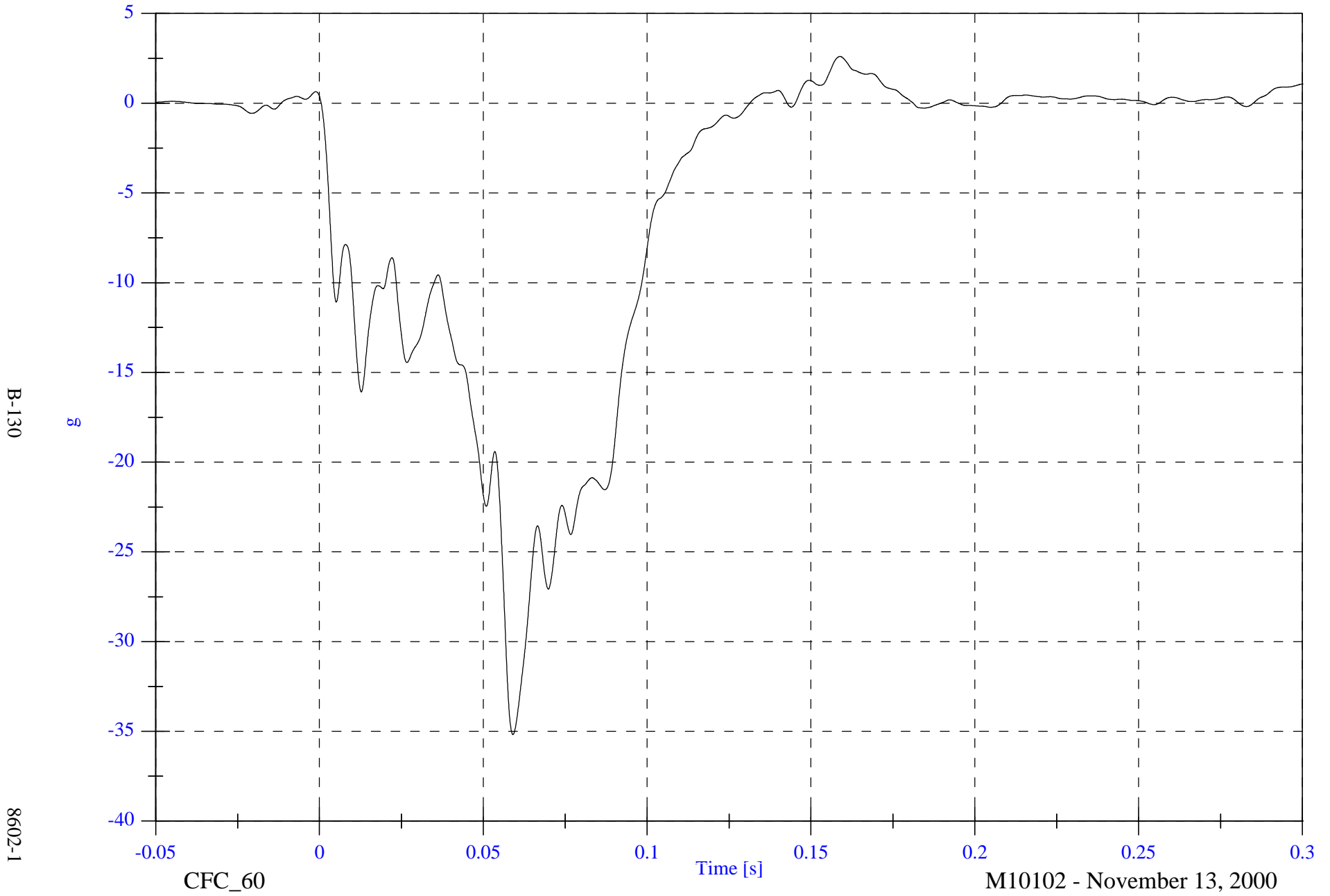
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Right Rear Red #9x

Max: 2.6 [g] at 0.159 [s]

Min: -35.2 [g] at 0.059 [s]

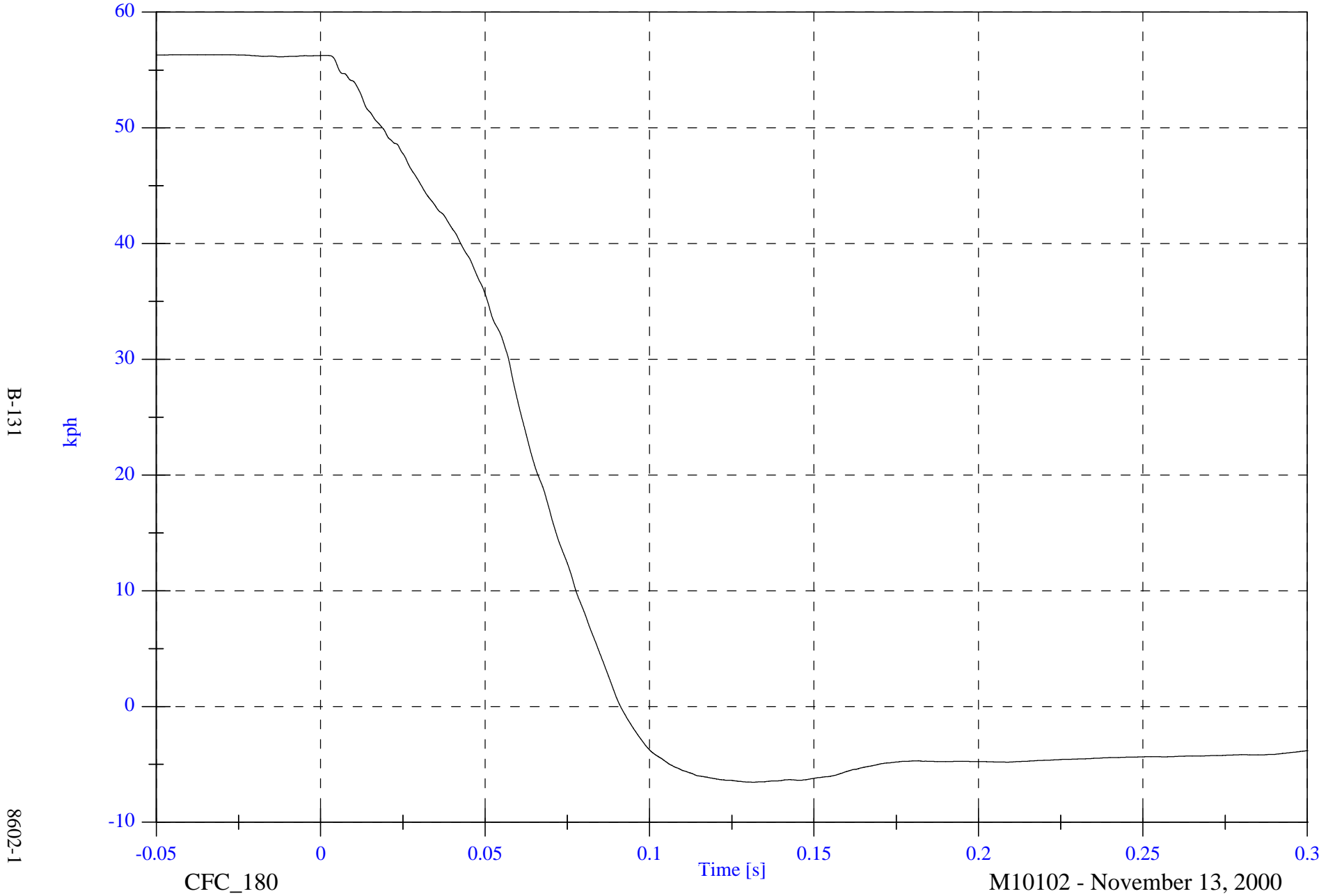


NCAP Test 1 - 2001 Chevrolet Impala

Right Rear Red #9x Velocity

Max: 56.3 [kph] at -0.038 [s]

Min: -6.5 [kph] at 0.131 [s]



B-131

8602-1

CFC_180

Time [s]

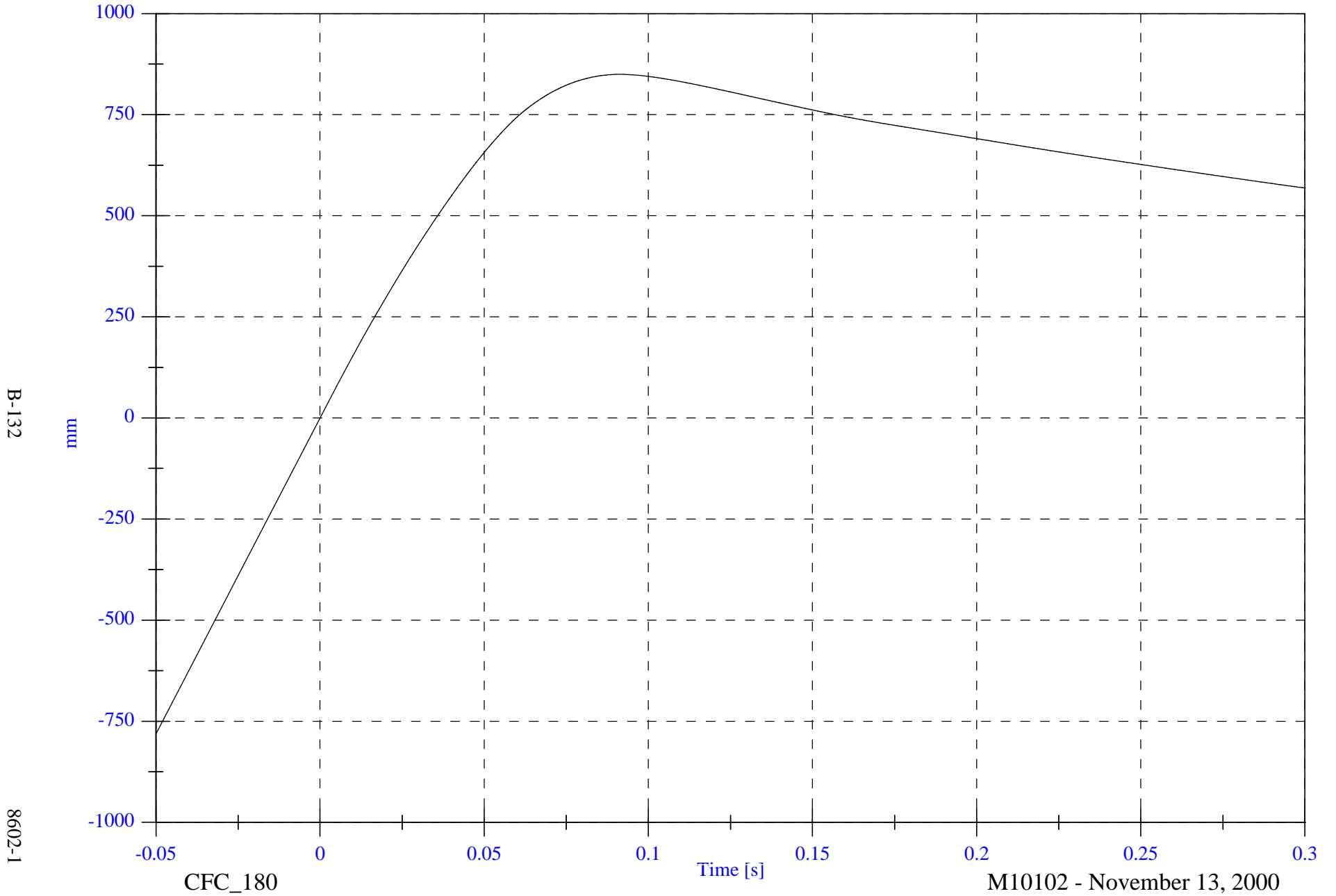
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Right Rear Red #9x Displacement

Max: 849.5 [mm] at 0.091 [s]

Min: -781.4 [mm] at -0.050 [s]



B-132

8602-1

CFC_180

Time [s]

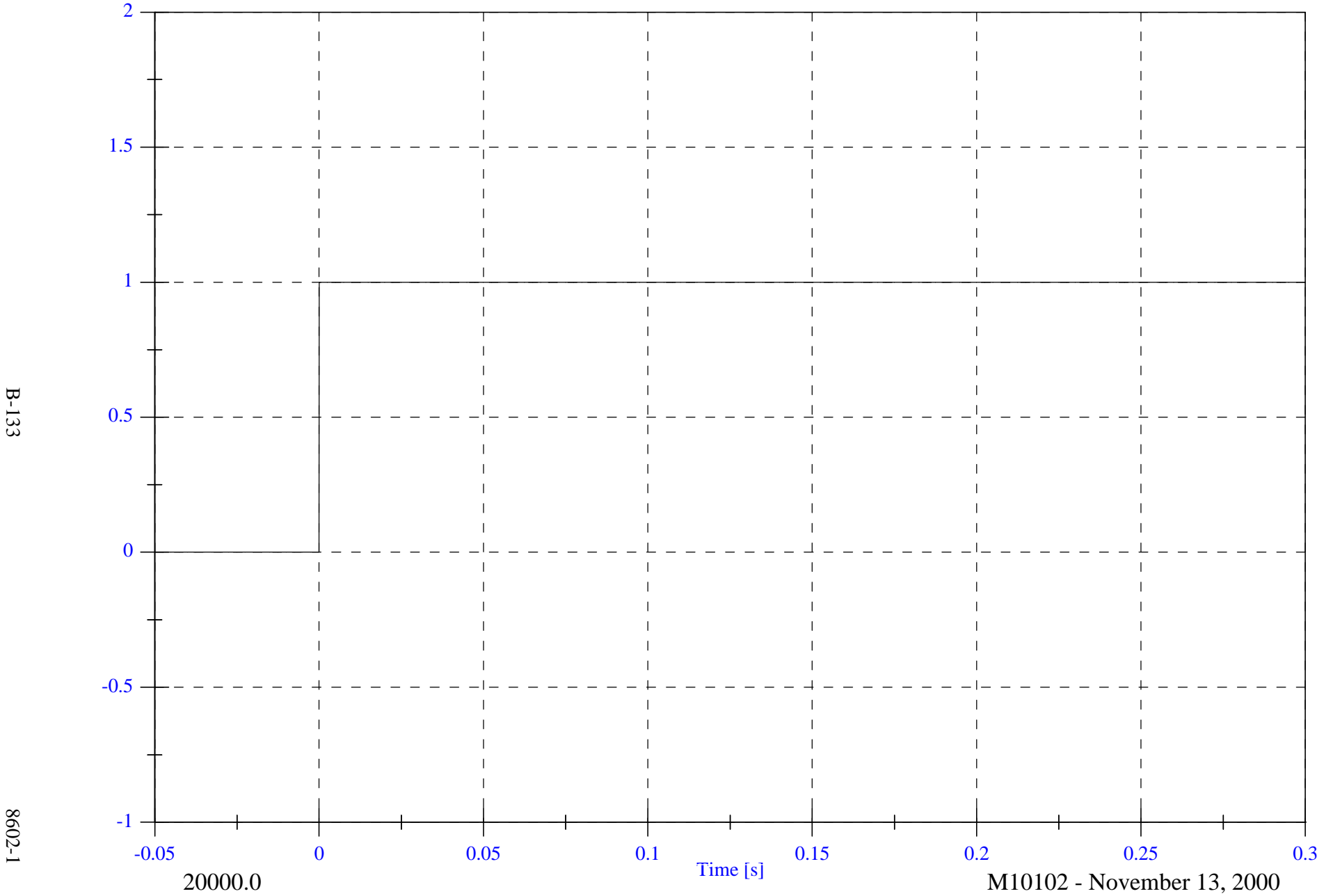
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Contact Time

Max: 1.0 [] at 0.000 [s]

Min: 0.0 [] at -0.050 [s]



B-133

8602-1

20000.0

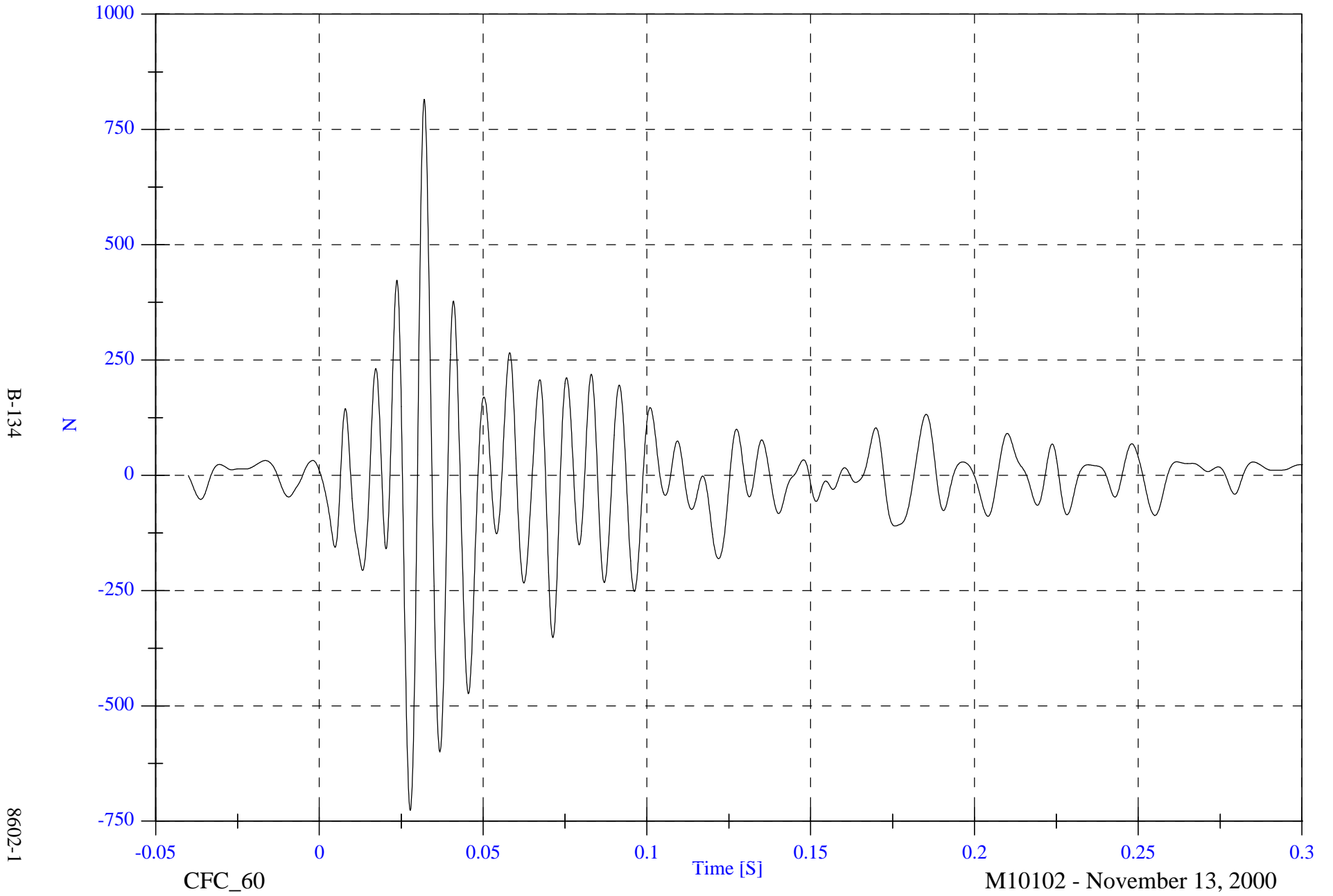
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A1 Fx

Max: 815.4 [N] at 0.032 [S]

Min: -726.7 [N] at 0.028 [S]



B-134

8602-1

CFC_60

Time [S]

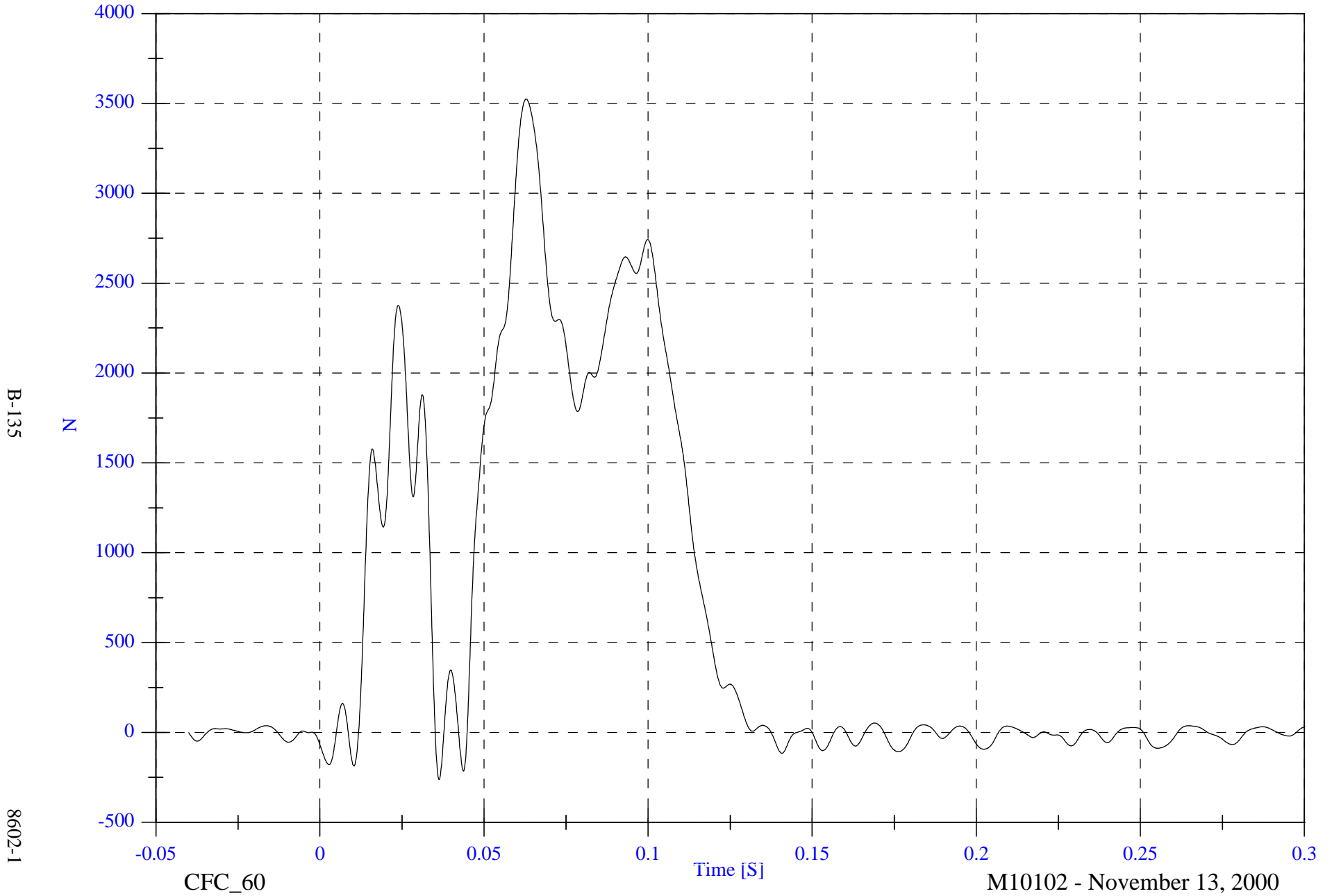
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A2 Fx

Max: 3524.5 [N] at 0.063 [S]

Min: -261.6 [N] at 0.036 [S]



B-135

8602-1

CFC_60

Time [S]

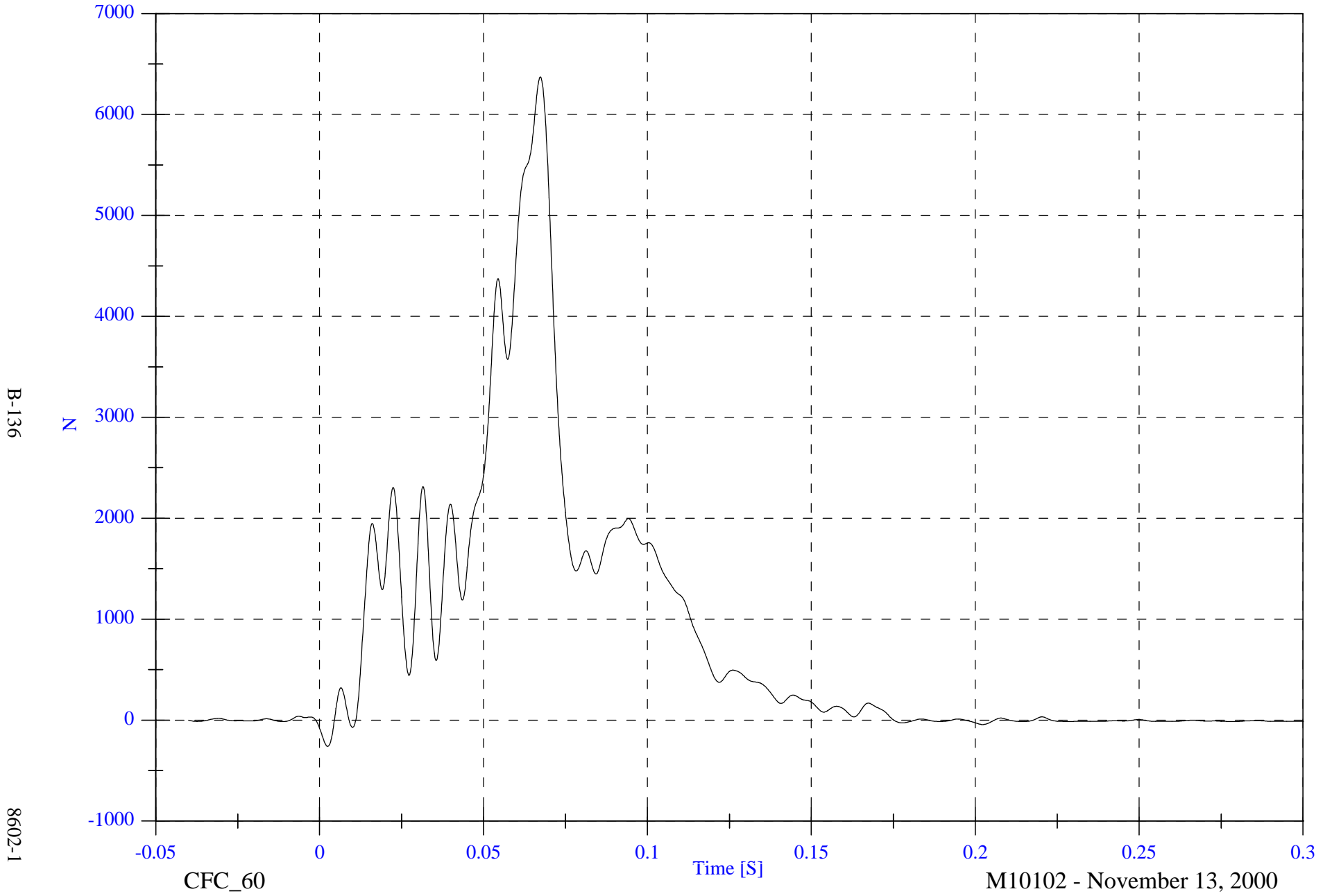
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A3 Fx

Max: 6371.3 [N] at 0.067 [S]

Min: -260.4 [N] at 0.002 [S]



B-136

8602-1

CFC_60

Time [S]

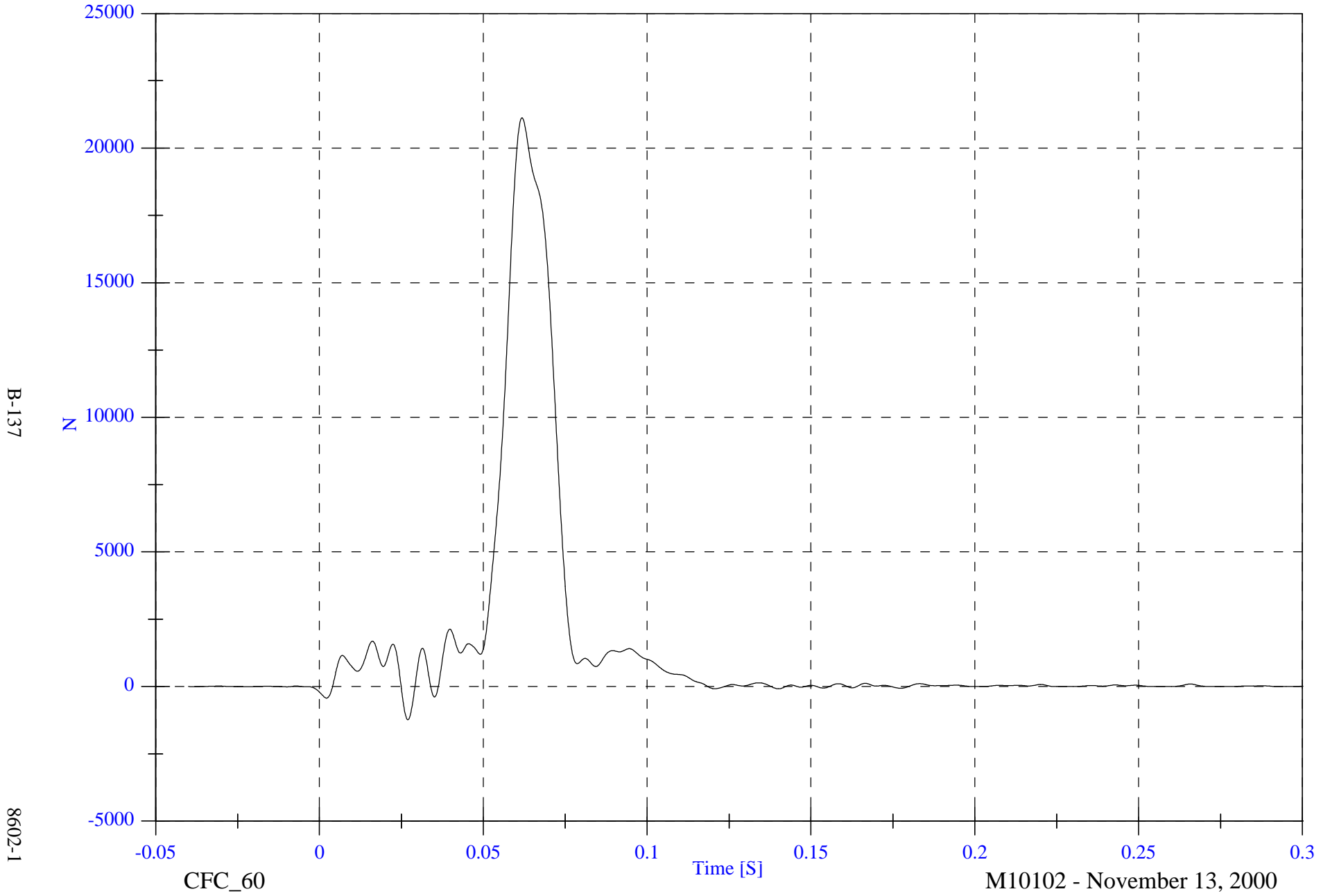
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A4 Fx

Max: 21129.1 [N] at 0.062 [S]

Min: -1235.5 [N] at 0.027 [S]



B-137

8602-1

CFC_60

Time [S]

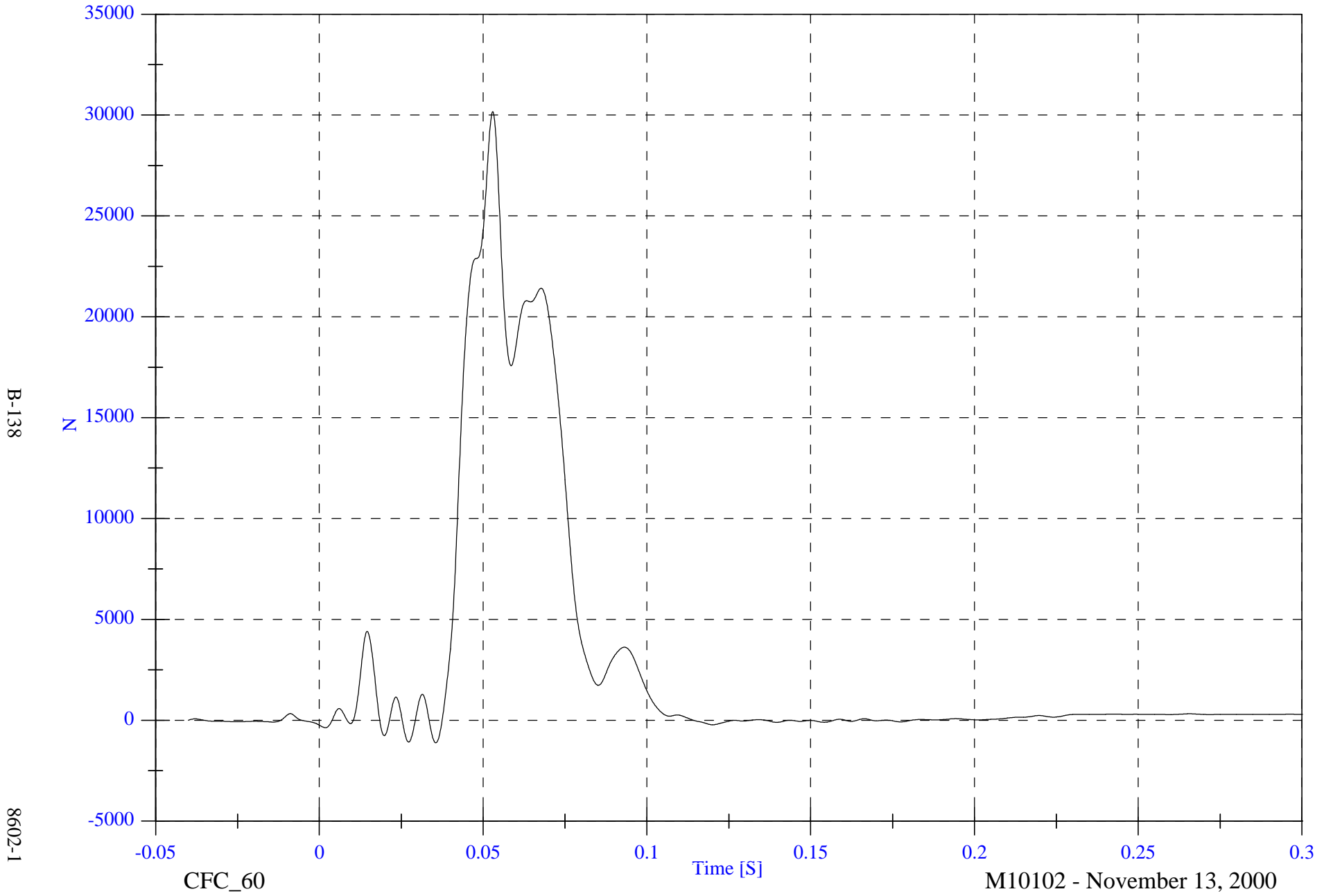
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A5 Fx

Max: 30164.3 [N] at 0.053 [S]

Min: -1116.8 [N] at 0.035 [S]



B-138

8602-1

CFC_60

Time [S]

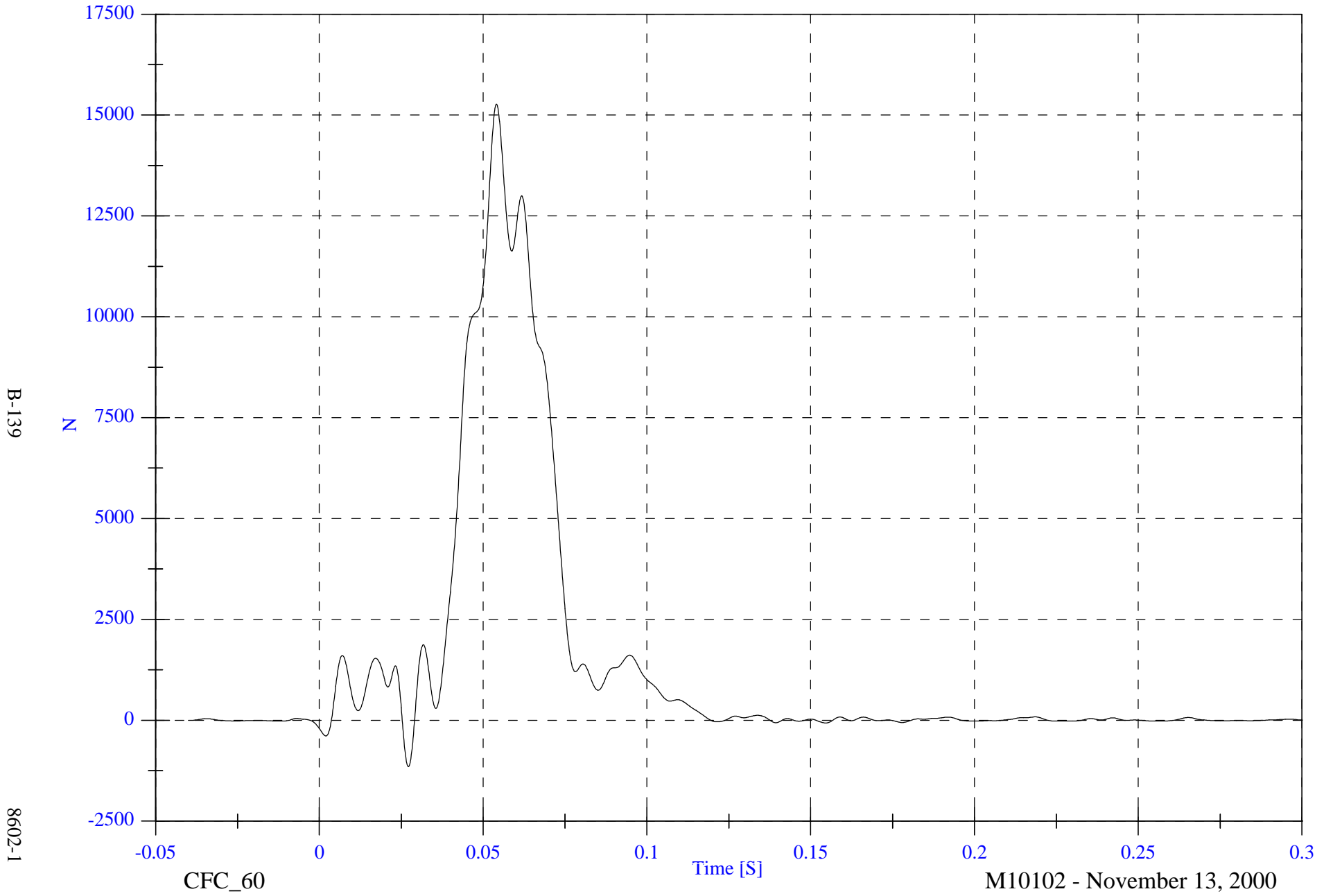
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A6 Fx

Max: 15269.7 [N] at 0.054 [S]

Min: -1150.5 [N] at 0.027 [S]



B-139

8602-1

CFC_60

Time [S]

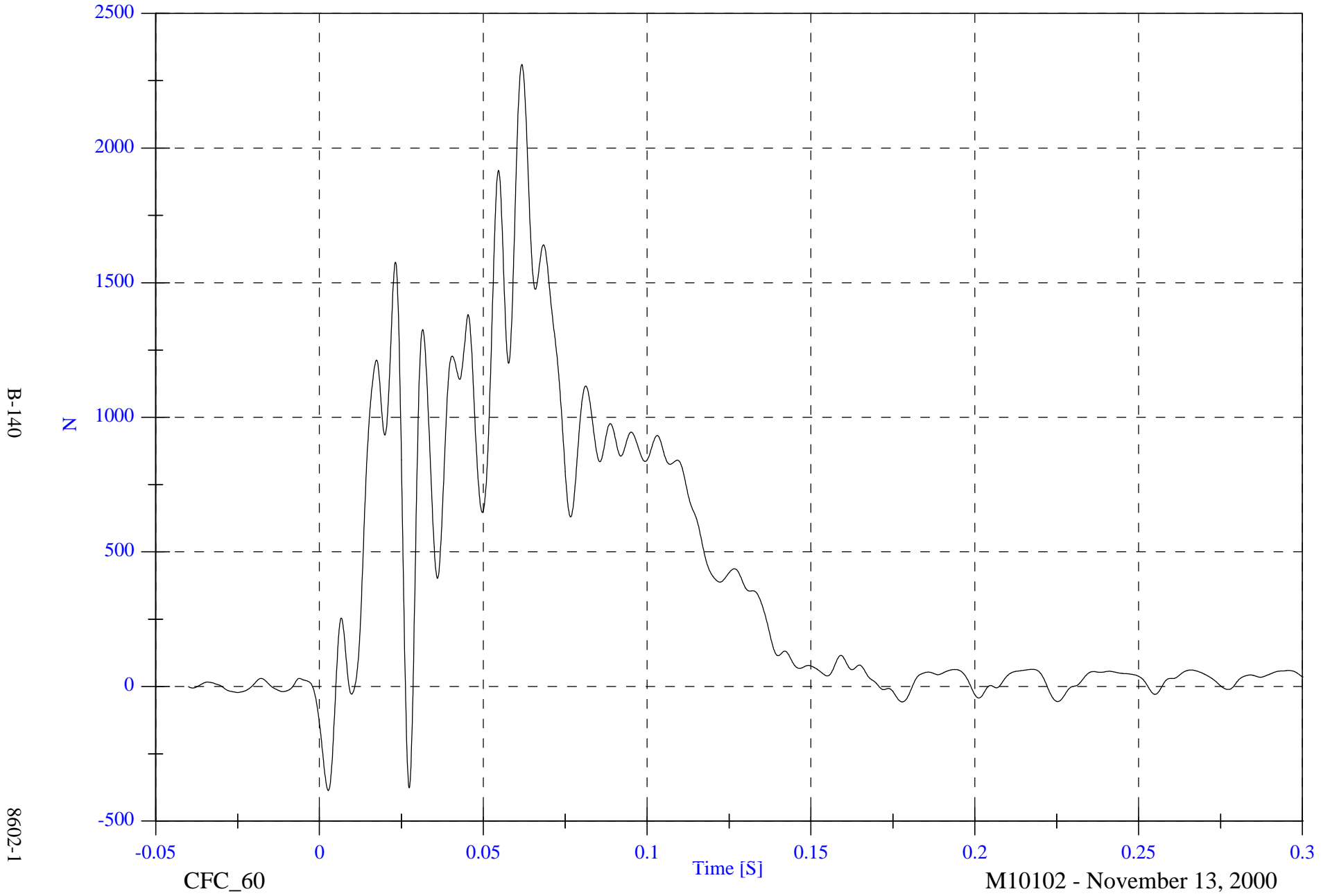
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A7 Fx

Max: 2311.1 [N] at 0.062 [S]

Min: -386.9 [N] at 0.003 [S]



B-140

8602-1

CFC_60

Time [S]

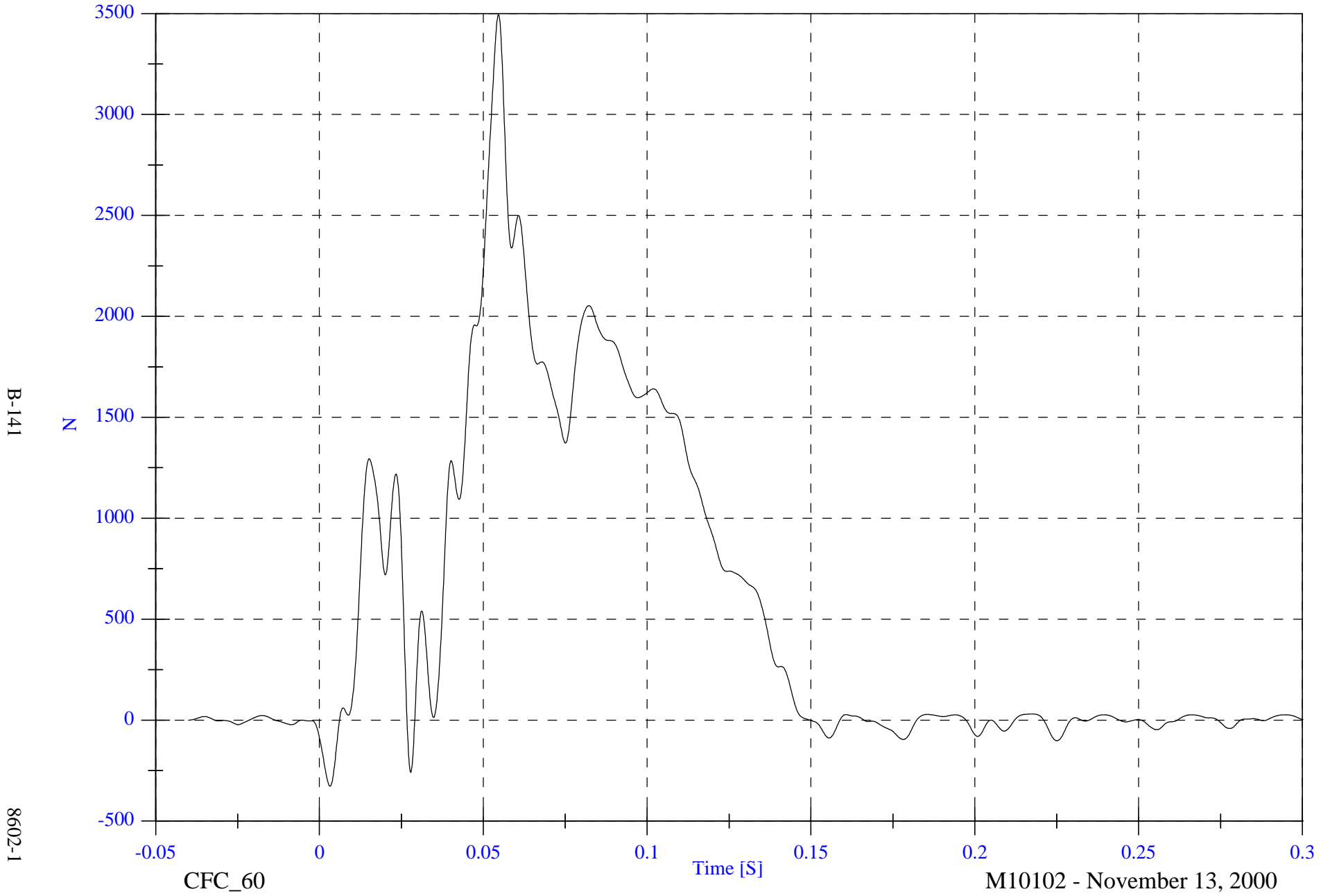
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A8 Fx

Max: 3495.0 [N] at 0.055 [S]

Min: -327.5 [N] at 0.003 [S]



B-141

8602-1

CFC_60

Time [S]

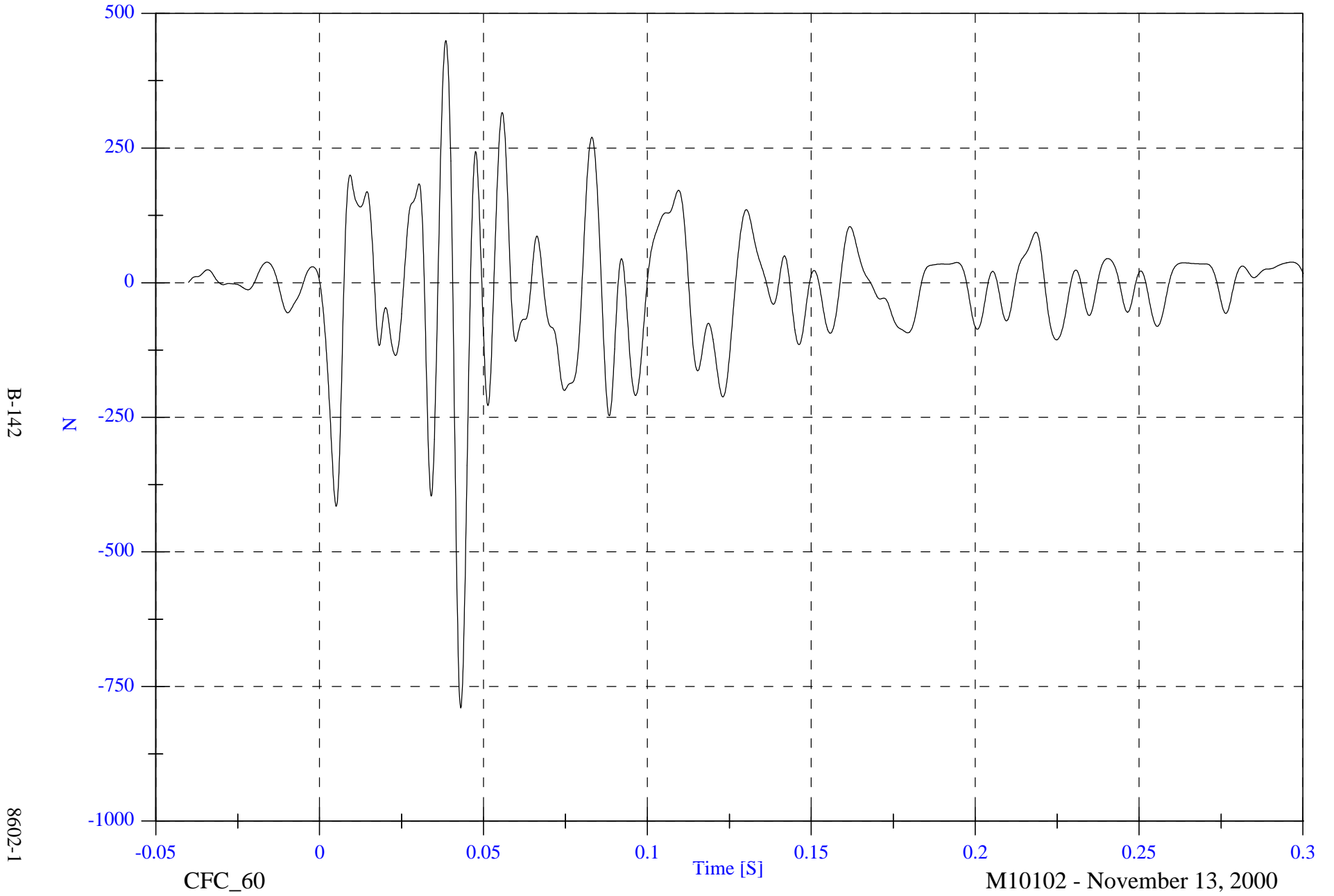
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell A9 Fx

Max: 449.6 [N] at 0.038 [S]

Min: -790.2 [N] at 0.043 [S]



B-142

8602-1

CFC_60

Time [S]

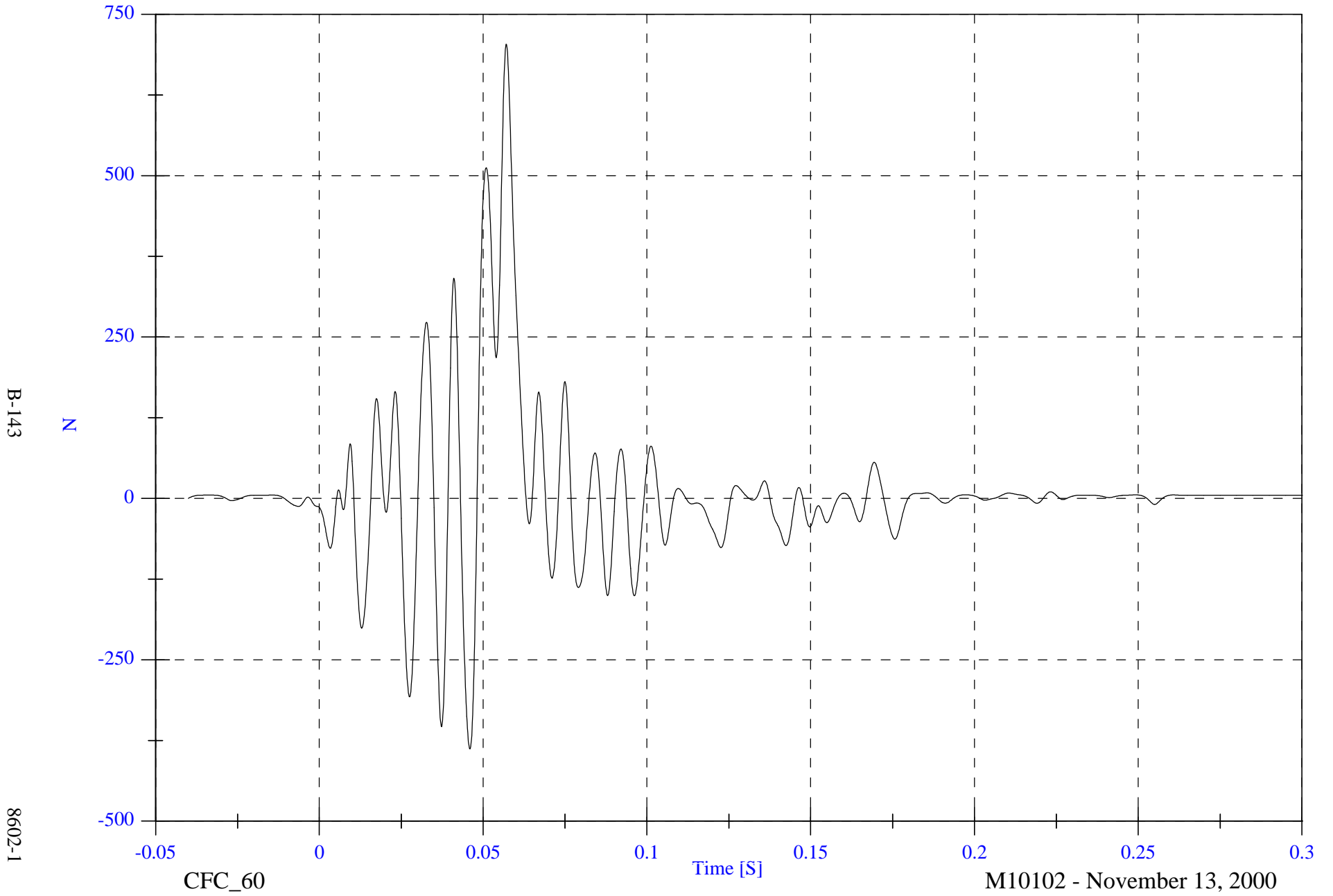
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B1 Fx

Max: 703.6 [N] at 0.057 [S]

Min: -388.4 [N] at 0.046 [S]



B-143

8602-1

CFC_60

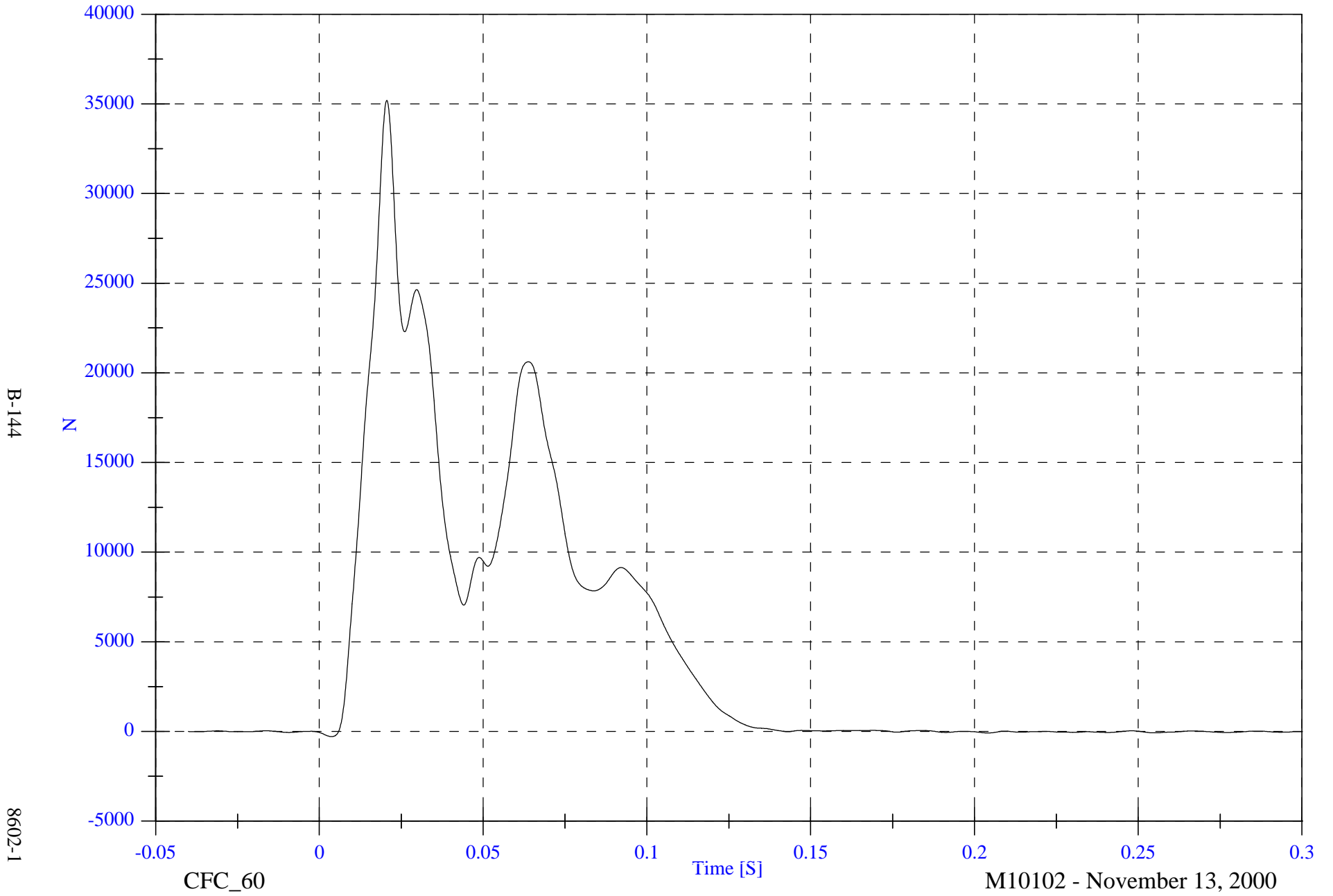
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B2 Fx

Max: 35196.4 [N] at 0.021 [S]

Min: -284.2 [N] at 0.004 [S]



B-144

8602-1

CFC_60

Time [S]

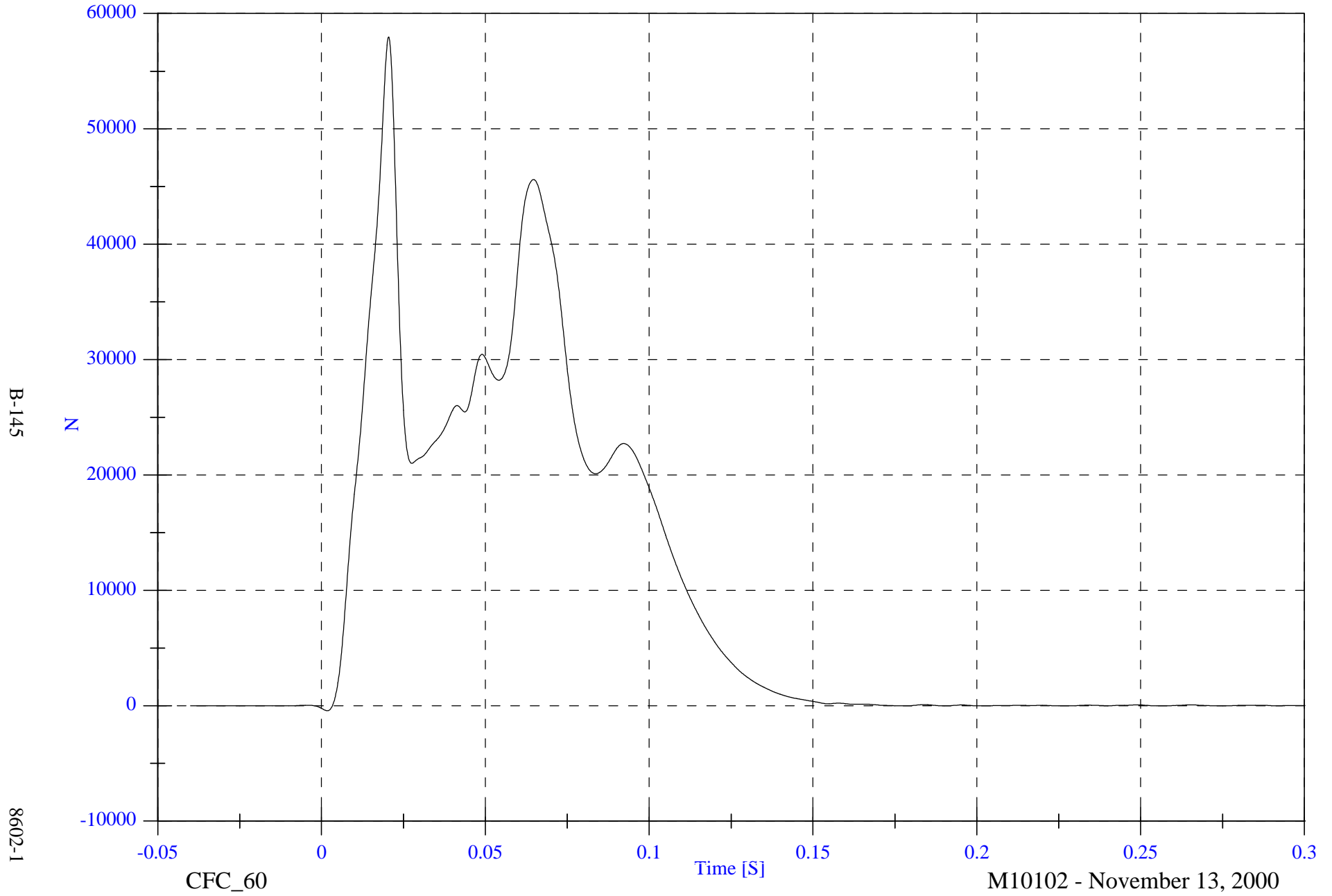
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B3 Fx

Max: 57970.1 [N] at 0.020 [S]

Min: -435.4 [N] at 0.002 [S]



B-145

8602-1

CFC_60

Time [S]

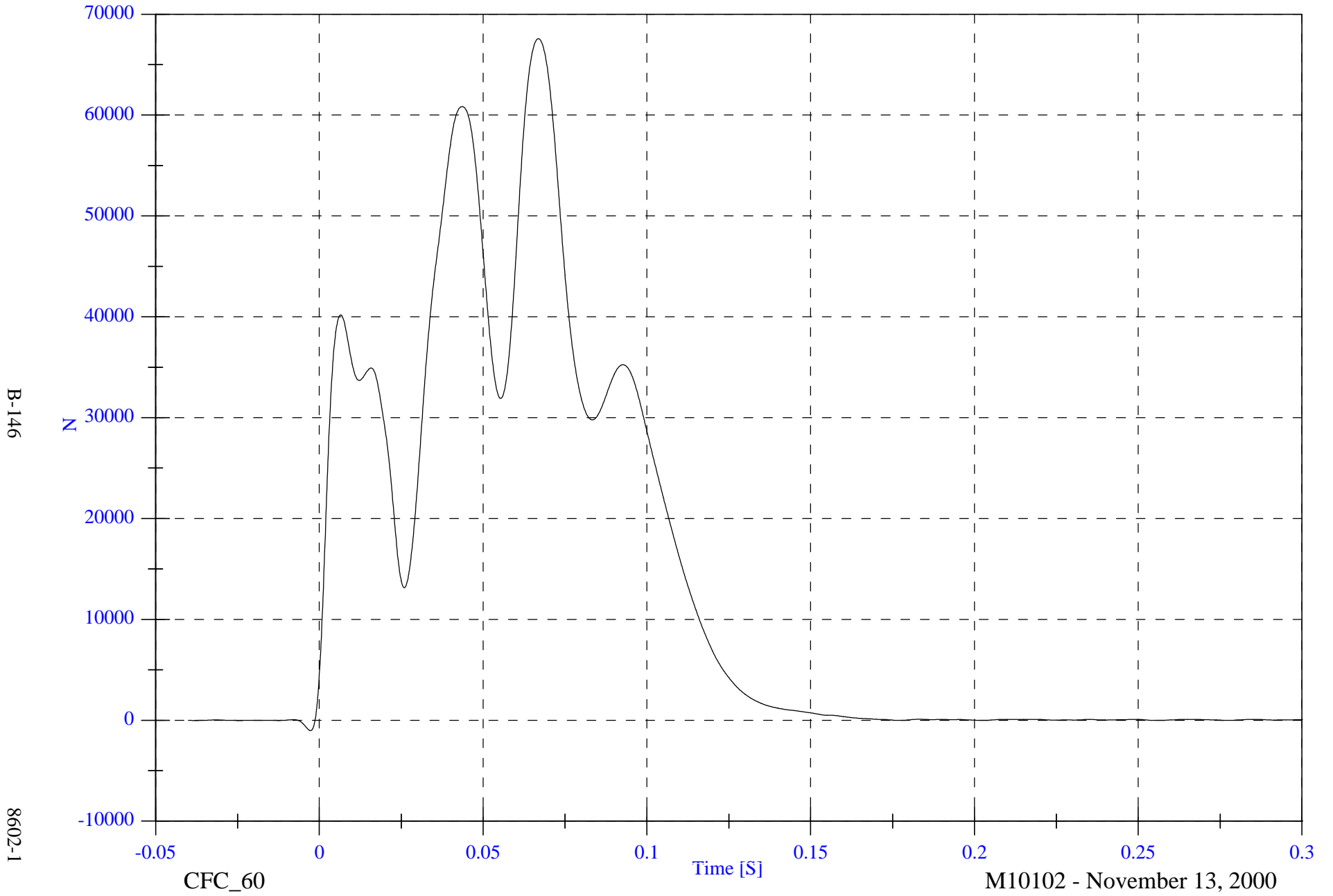
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B4 Fx

Max: 67572.0 [N] at 0.067 [S]

Min: -1027.1 [N] at -0.003 [S]



B-146

8602-1

CFC_60

Time [S]

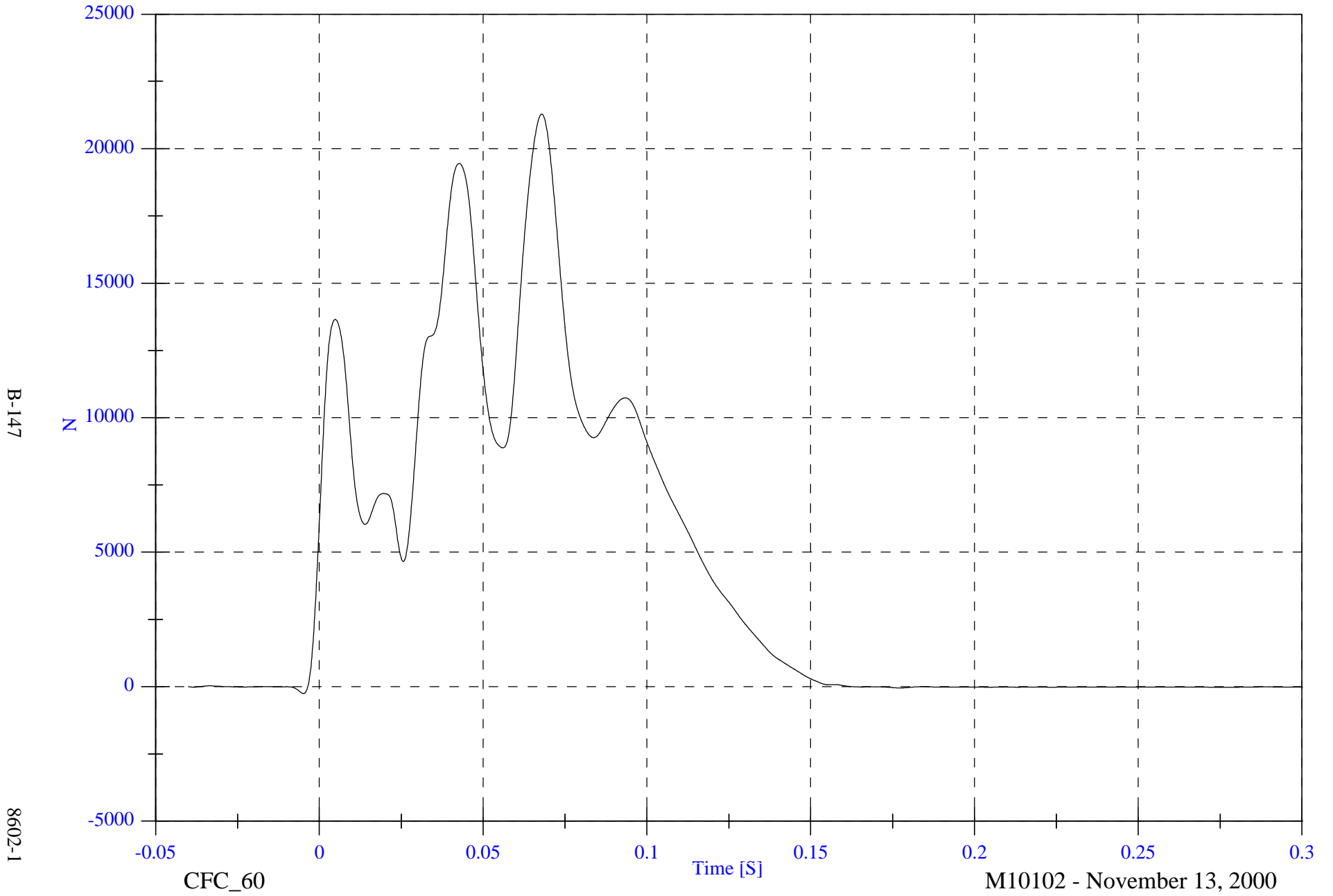
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B5 Fx

Max: 21286.9 [N] at 0.068 [S]

Min: -256.6 [N] at -0.005 [S]



B-147

8602-1

CFC_60

Time [S]

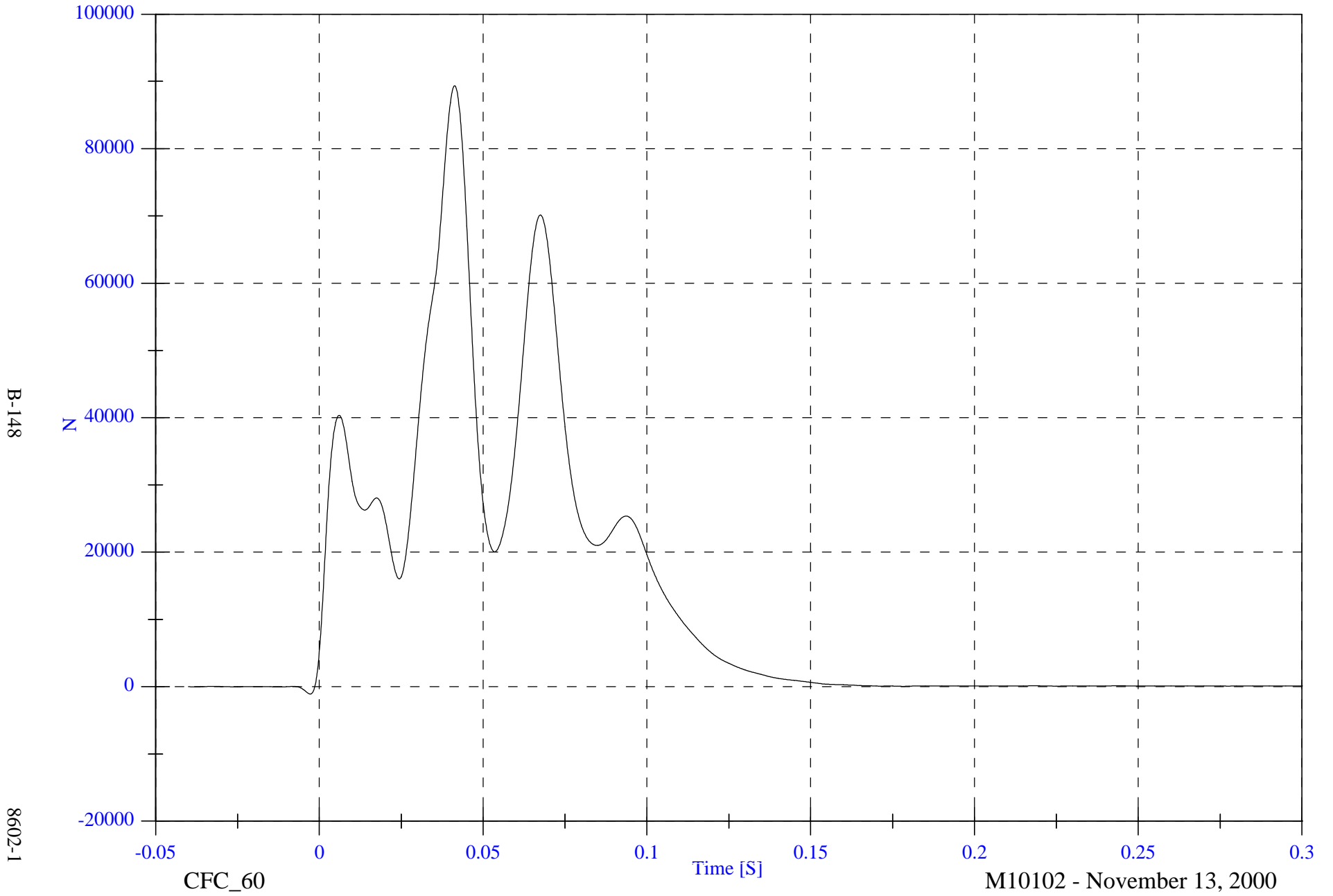
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B6 Fx

Max: 89365.5 [N] at 0.041 [S]

Min: -1097.8 [N] at -0.003 [S]



B-148

8602-1

CFC_60

Time [S]

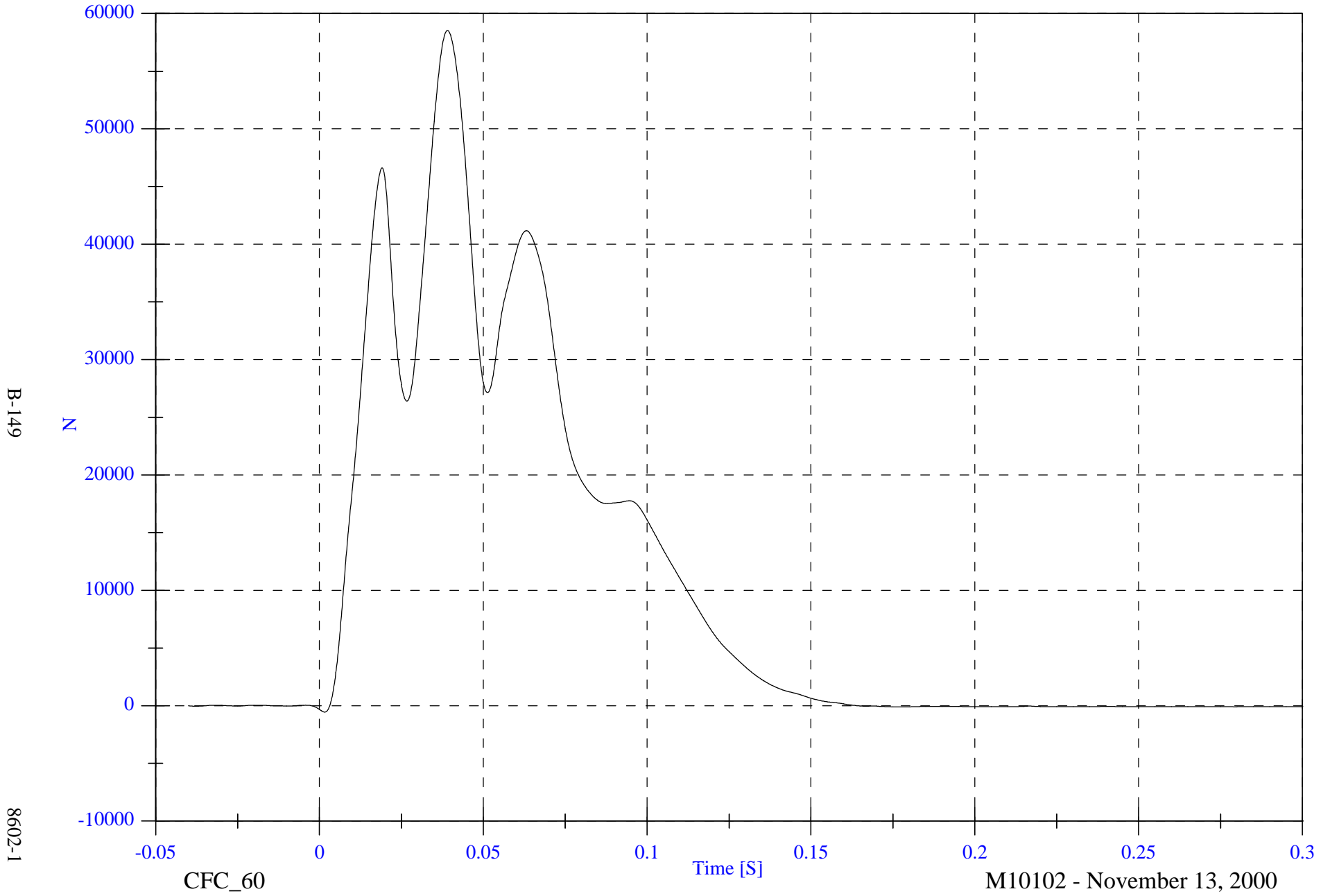
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B7 Fx

Max: 58526.0 [N] at 0.039 [S]

Min: -550.6 [N] at 0.002 [S]



B-149

8602-1

CFC_60

Time [S]

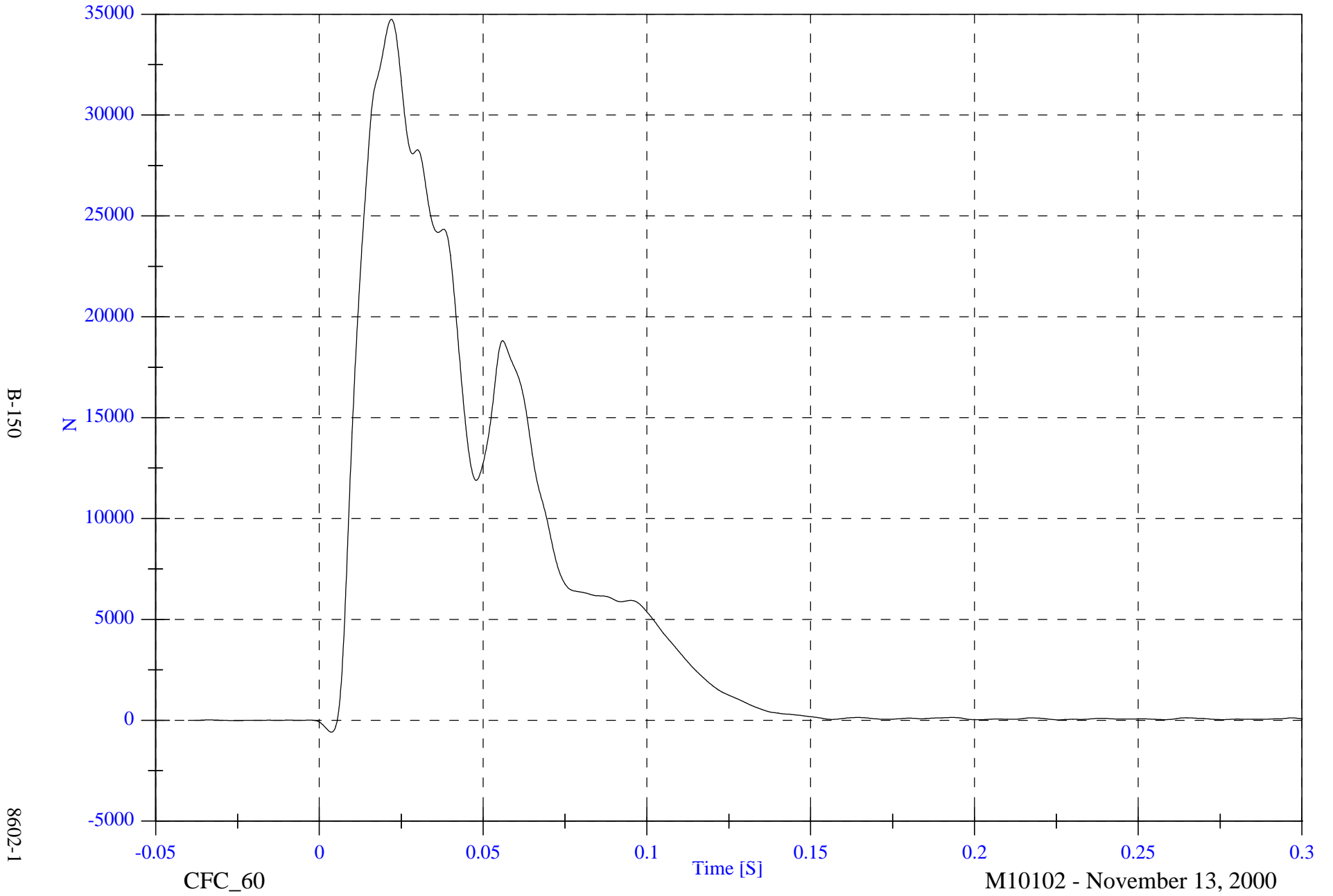
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B8 Fx

Max: 34743.0 [N] at 0.022 [S]

Min: -584.8 [N] at 0.004 [S]



B-150

8602-1

CFC_60

Time [S]

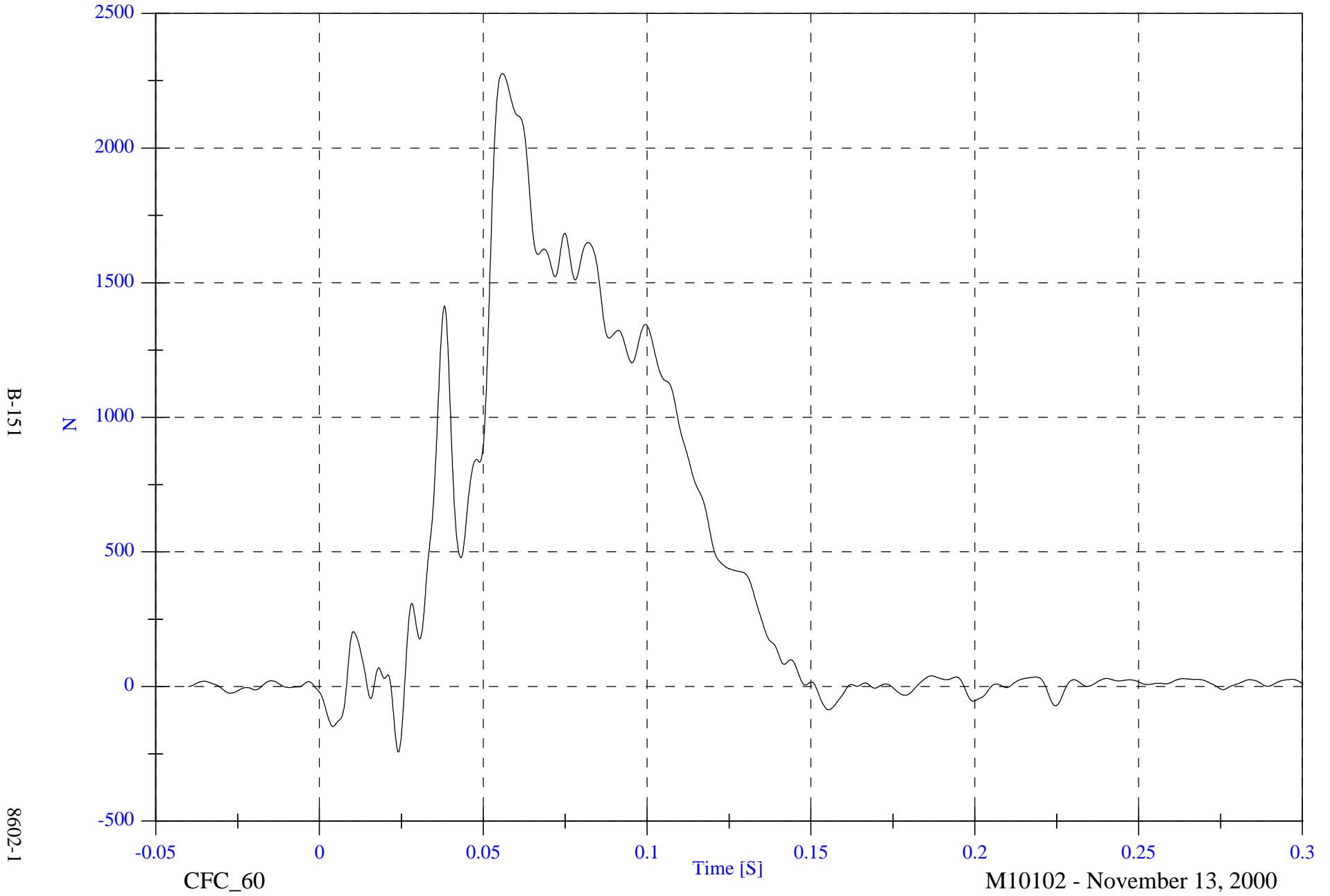
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell B9 Fx

Max: 2276.5 [N] at 0.056 [S]

Min: -243.7 [N] at 0.024 [S]



B-151

8602-1

CFC_60

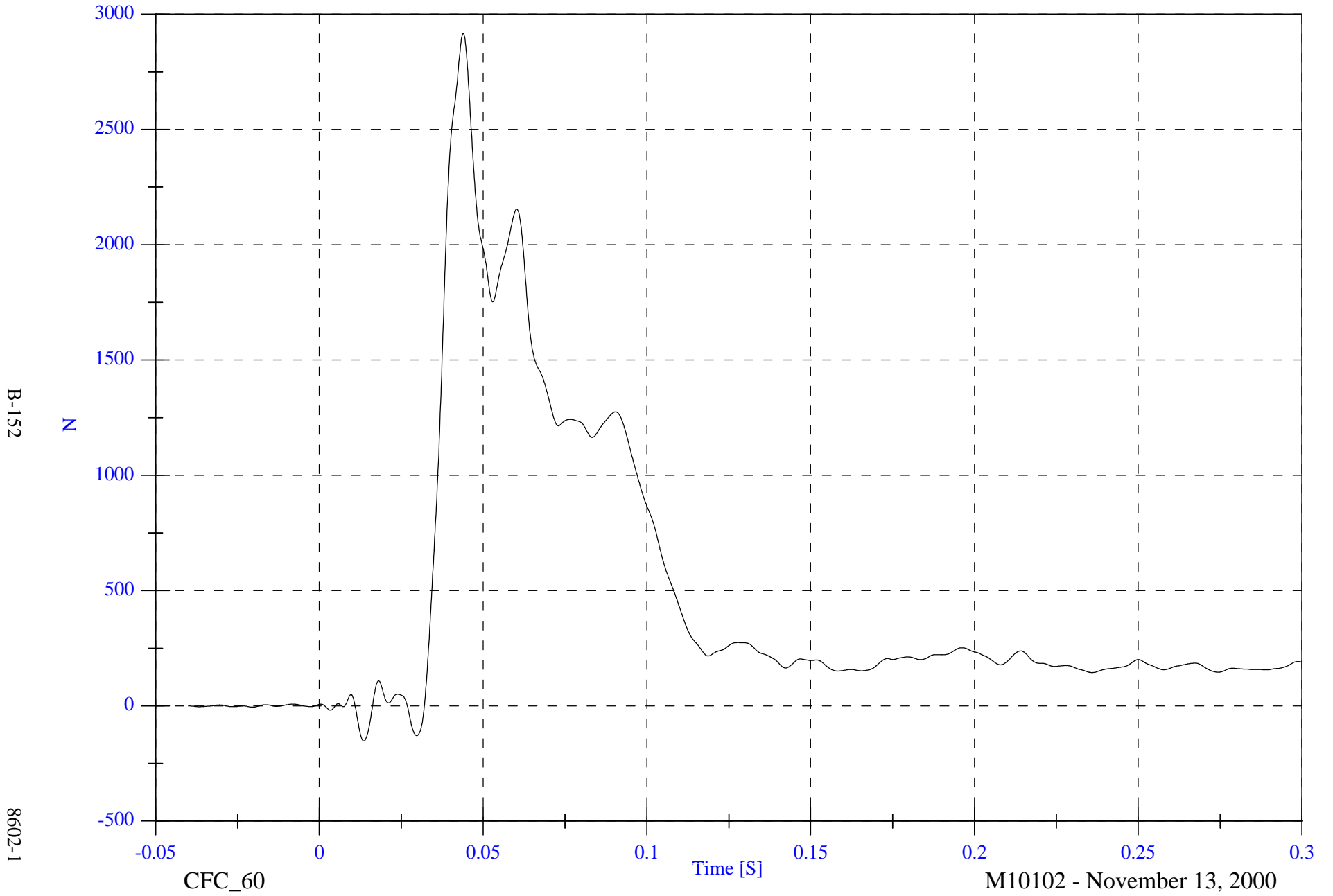
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C1 Fx

Max: 2917.2 [N] at 0.044 [S]

Min: -152.4 [N] at 0.014 [S]



B-152

8602-1

CFC_60

Time [S]

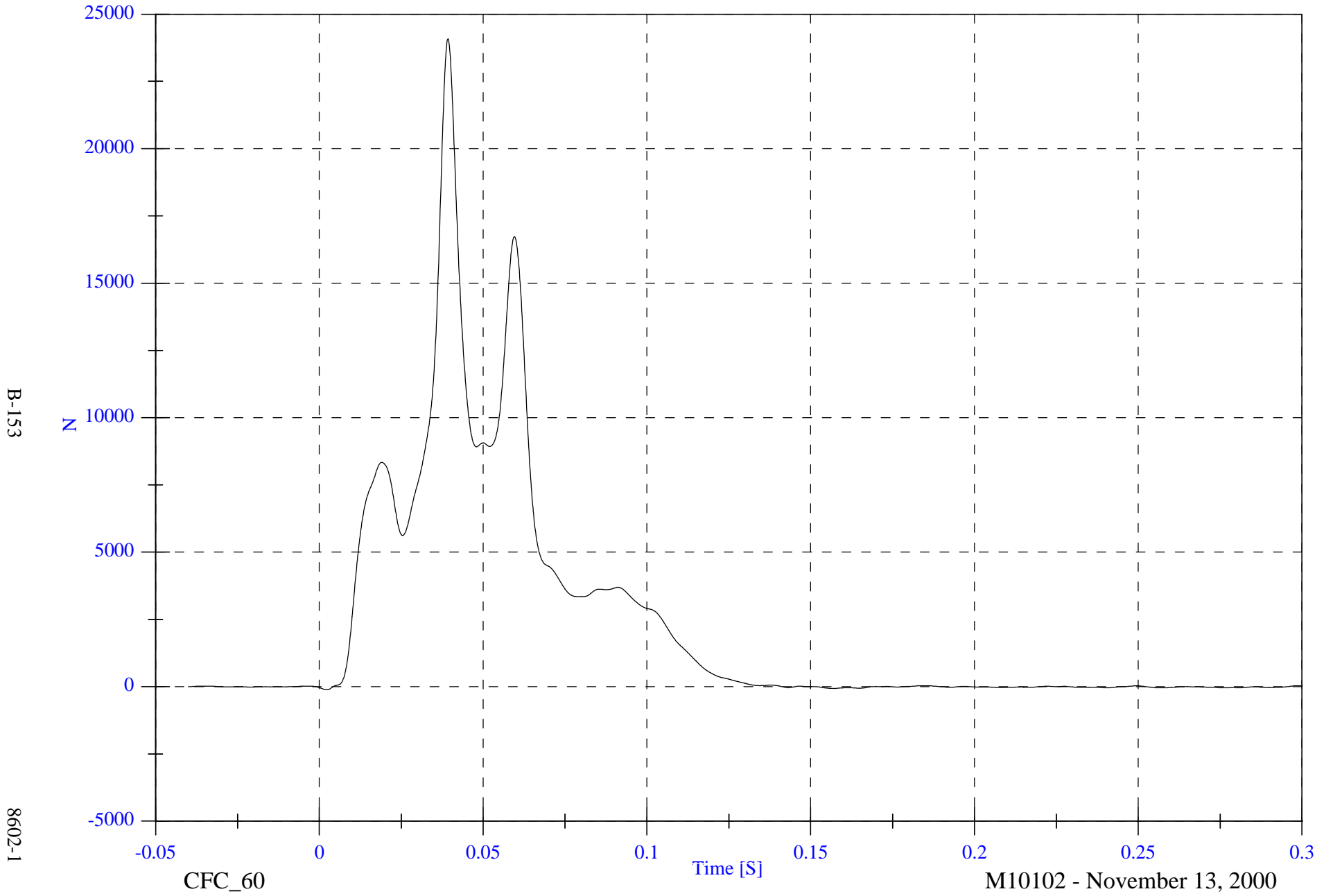
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C2 Fx

Max: 24087.3 [N] at 0.039 [S]

Min: -117.0 [N] at 0.002 [S]



B-153

8602-1

CFC_60

Time [S]

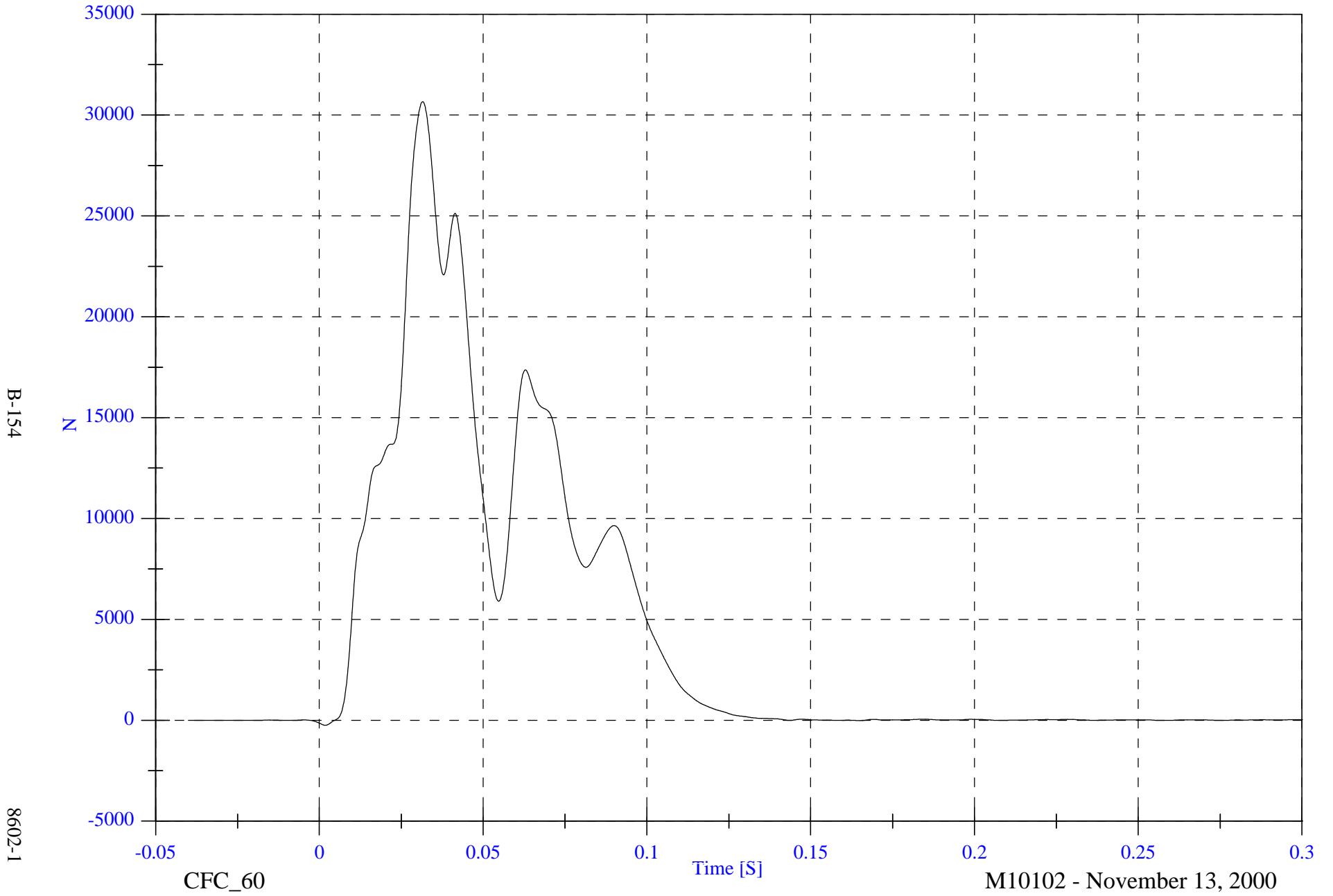
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C3 Fx

Max: 30664.7 [N] at 0.031 [S]

Min: -247.0 [N] at 0.002 [S]



B-154

8602-1

CFC_60

Time [S]

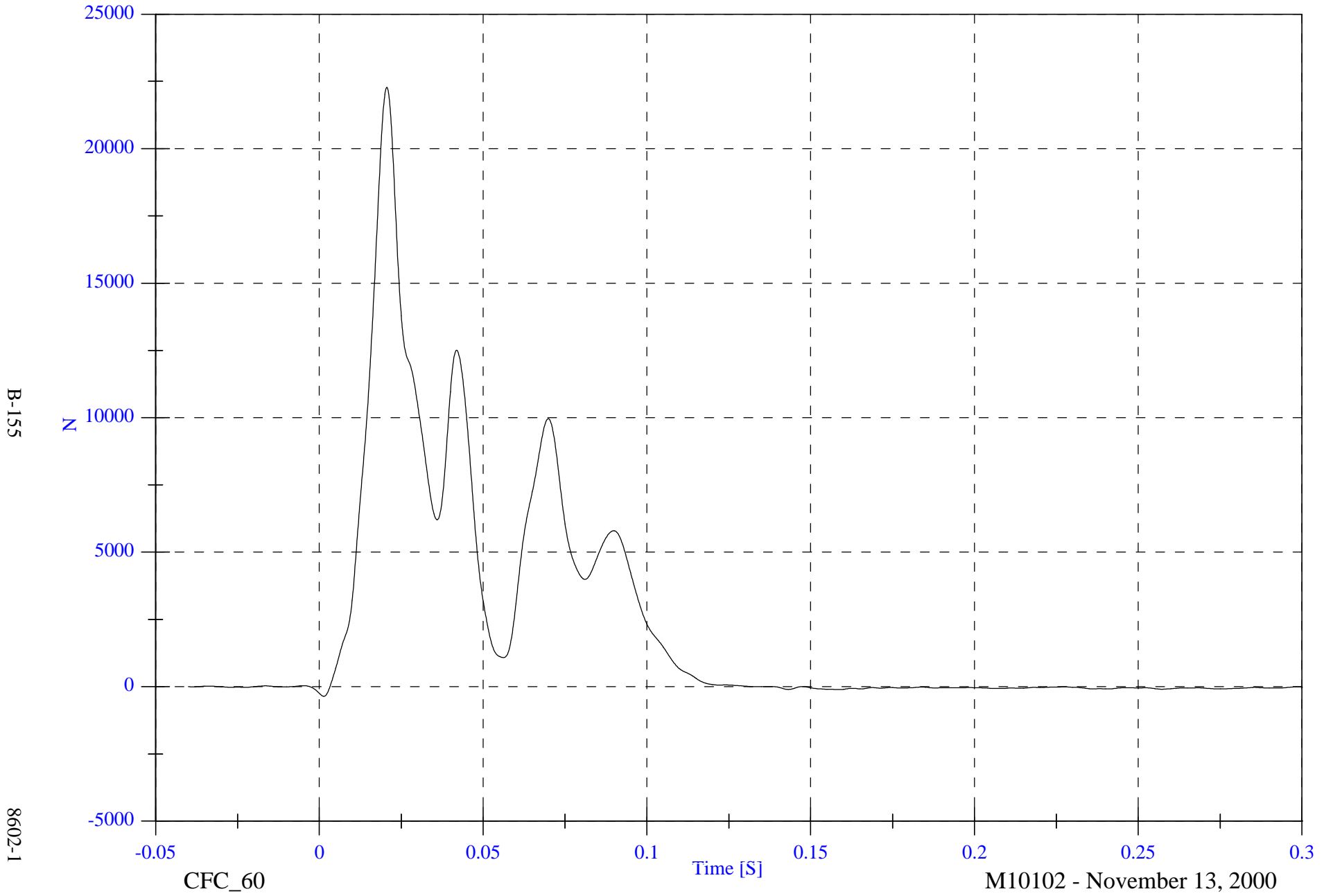
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C4 Fx

Max: 22281.2 [N] at 0.021 [S]

Min: -357.7 [N] at 0.001 [S]



B-155

8602-1

CFC_60

Time [S]

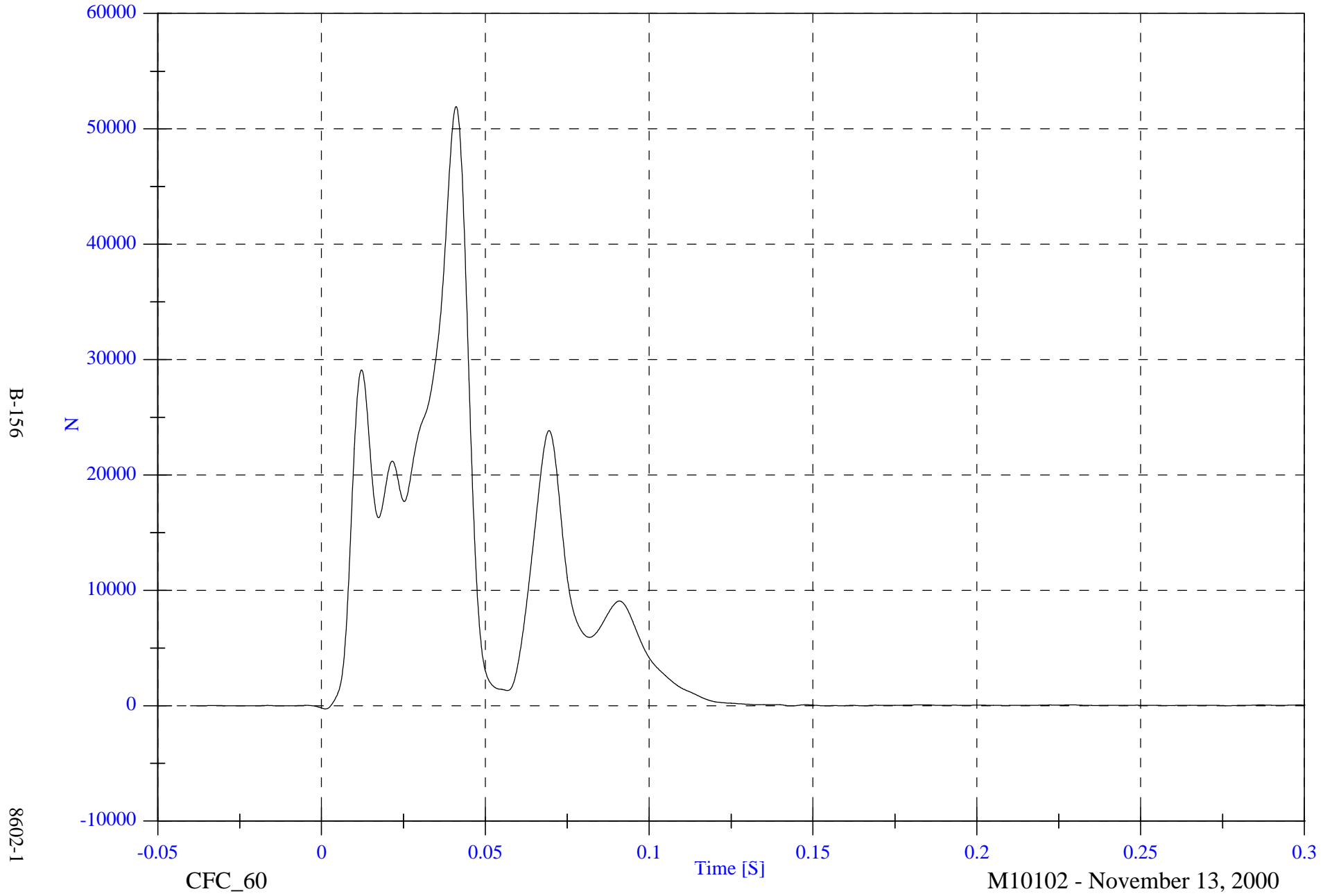
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C5 Fx

Max: 51931.6 [N] at 0.041 [S]

Min: -277.1 [N] at 0.001 [S]



B-156

8602-1

CFC_60

Time [S]

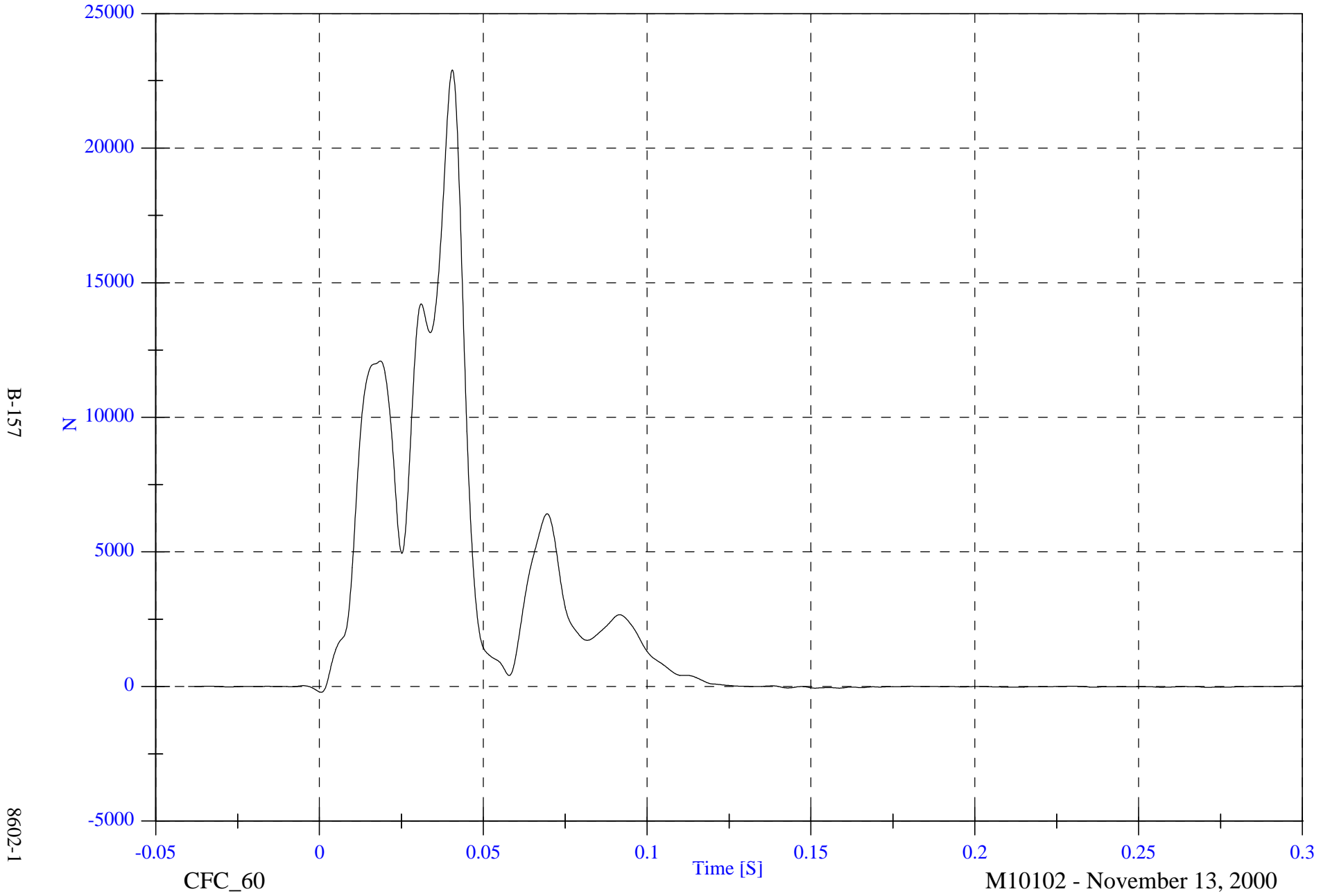
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C6 Fx

Max: 22902.9 [N] at 0.040 [S]

Min: -215.5 [N] at 0.000 [S]



B-157

8602-1

CFC_60

Time [S]

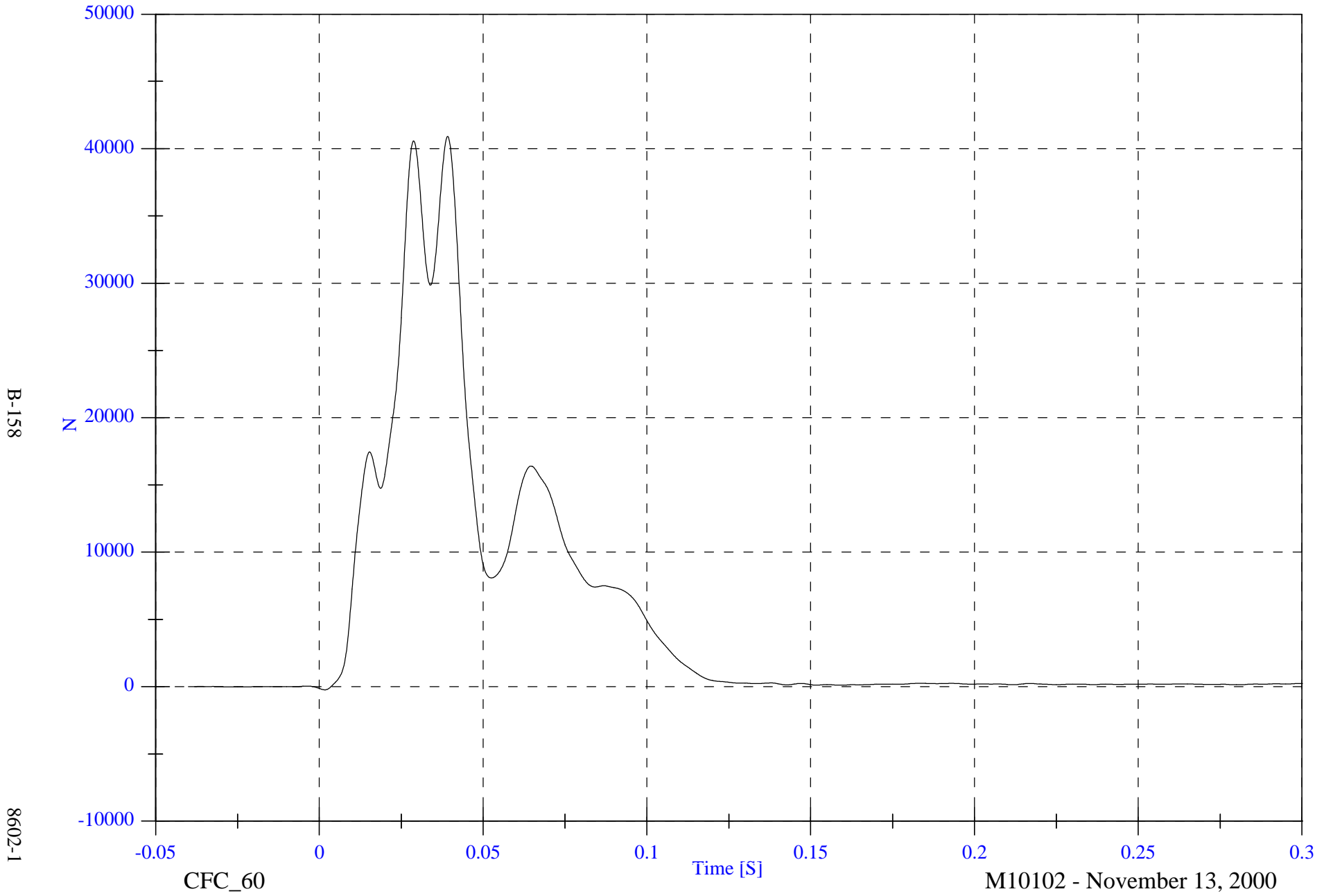
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C7 Fx

Max: 40903.6 [N] at 0.039 [S]

Min: -236.9 [N] at 0.002 [S]



B-158

8602-1

CFC_60

Time [S]

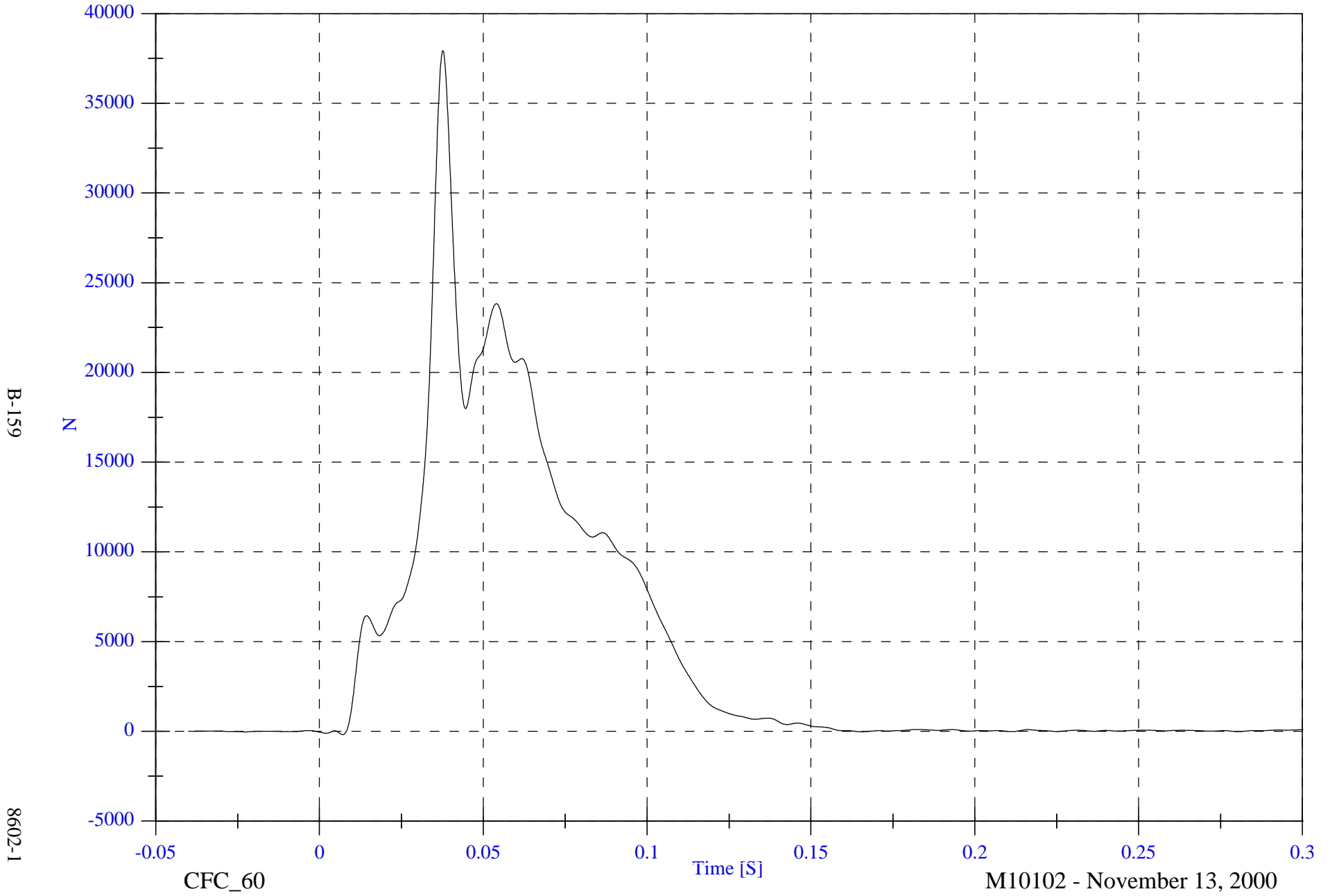
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C8 Fx

Max: 37925.4 [N] at 0.038 [S]

Min: -180.2 [N] at 0.007 [S]



B-159

8602-1

CFC_60

Time [S]

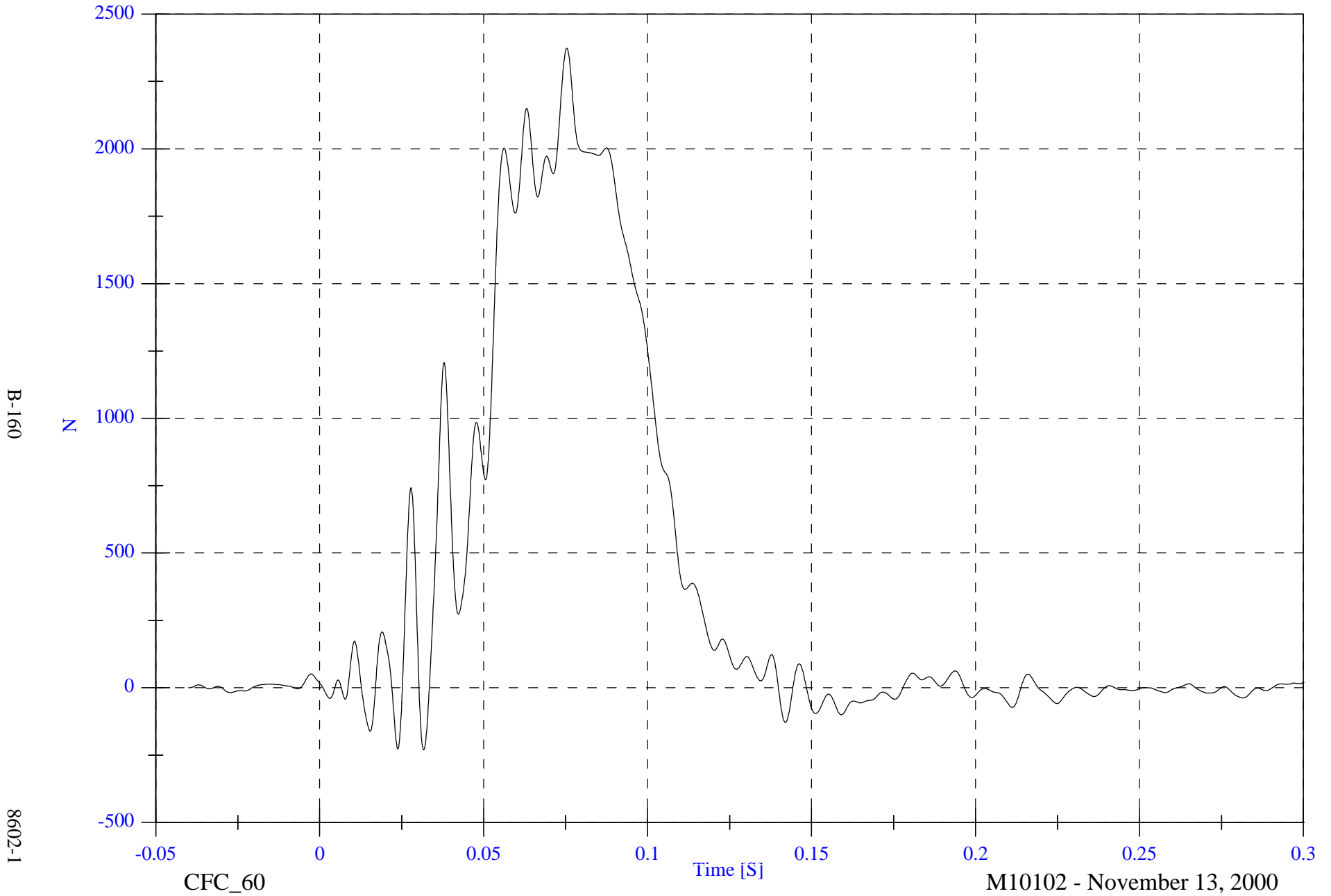
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell C9 Fx

Max: 2373.9 [N] at 0.075 [S]

Min: -230.6 [N] at 0.032 [S]



B-160

8602-1

CFC_60

Time [S]

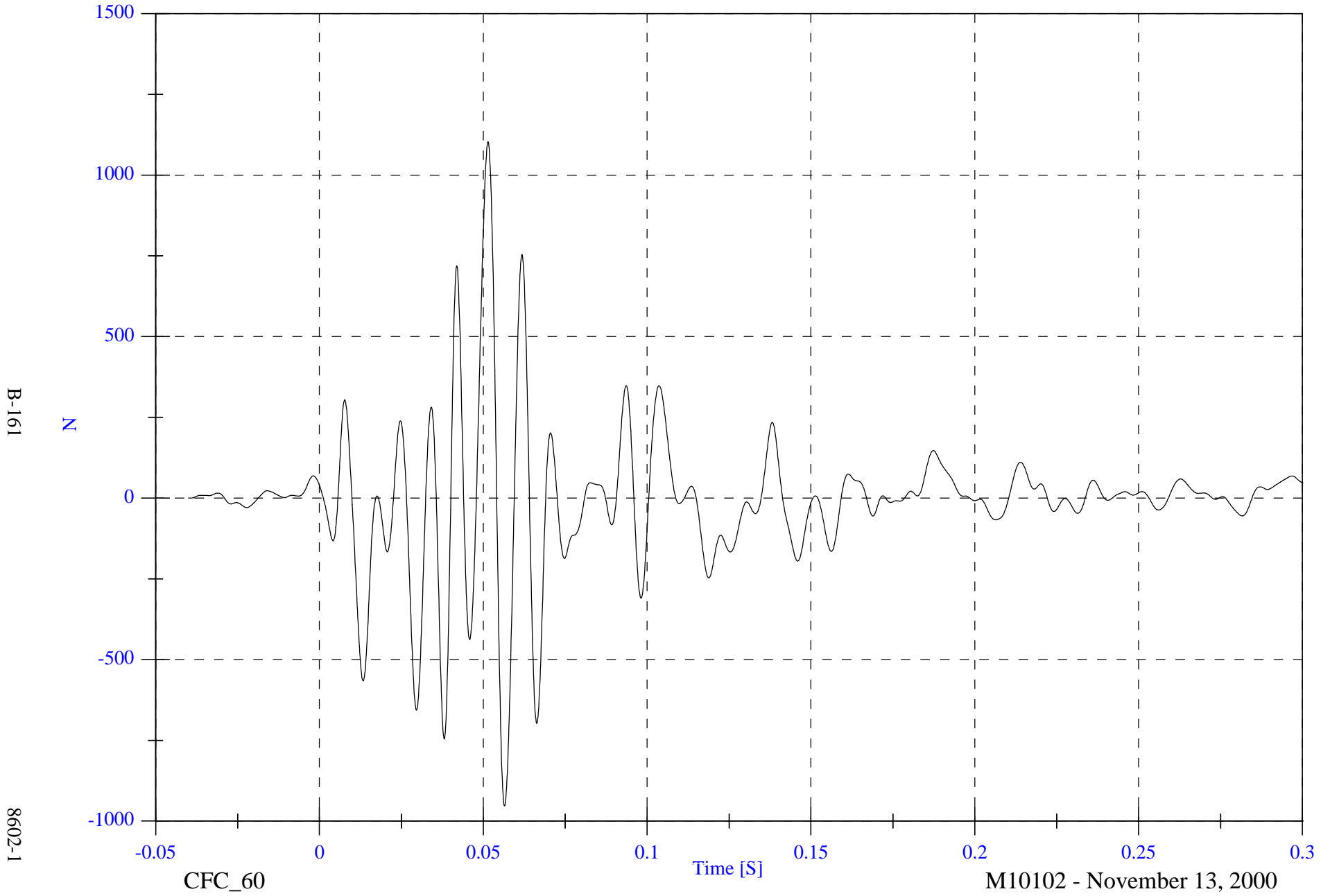
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D1 Fx

Max: 1103.5 [N] at 0.051 [S]

Min: -953.0 [N] at 0.056 [S]

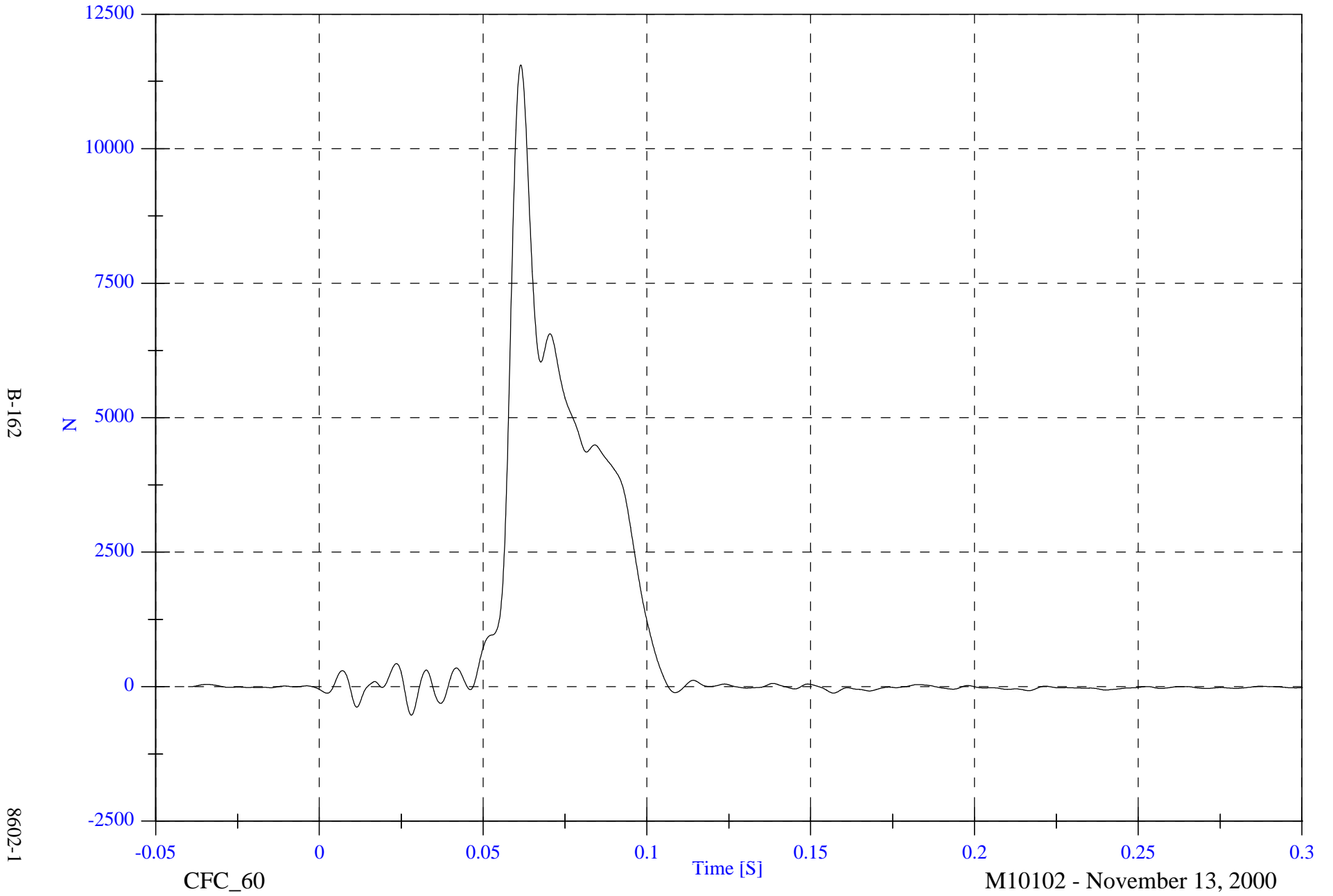


NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D2 Fx

Max: 11555.8 [N] at 0.061 [S]

Min: -529.7 [N] at 0.028 [S]



B-162

8602-1

CFC_60

Time [S]

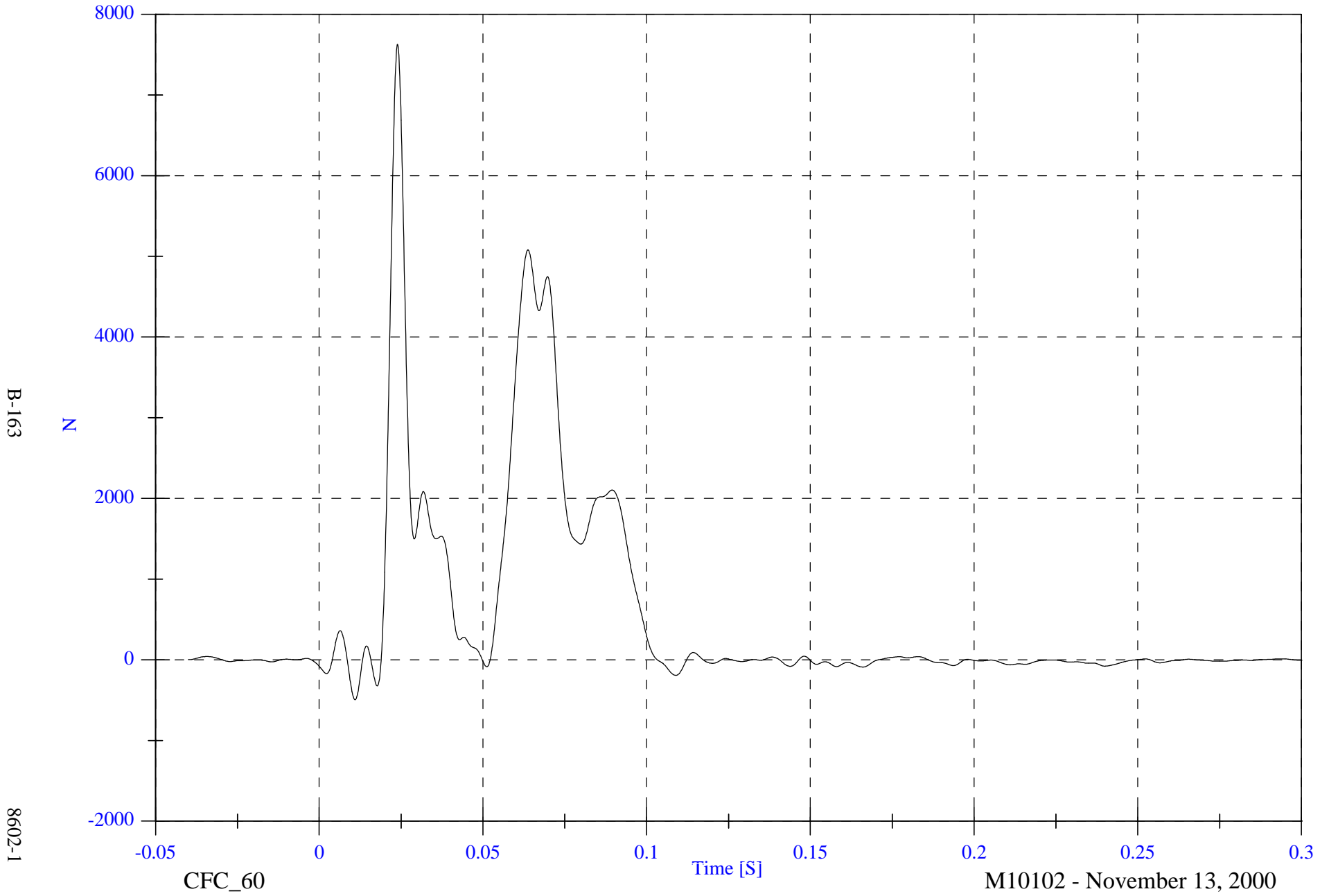
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D3 Fx

Max: 7627.3 [N] at 0.024 [S]

Min: -495.5 [N] at 0.011 [S]



B-163

8602-1

CFC_60

Time [S]

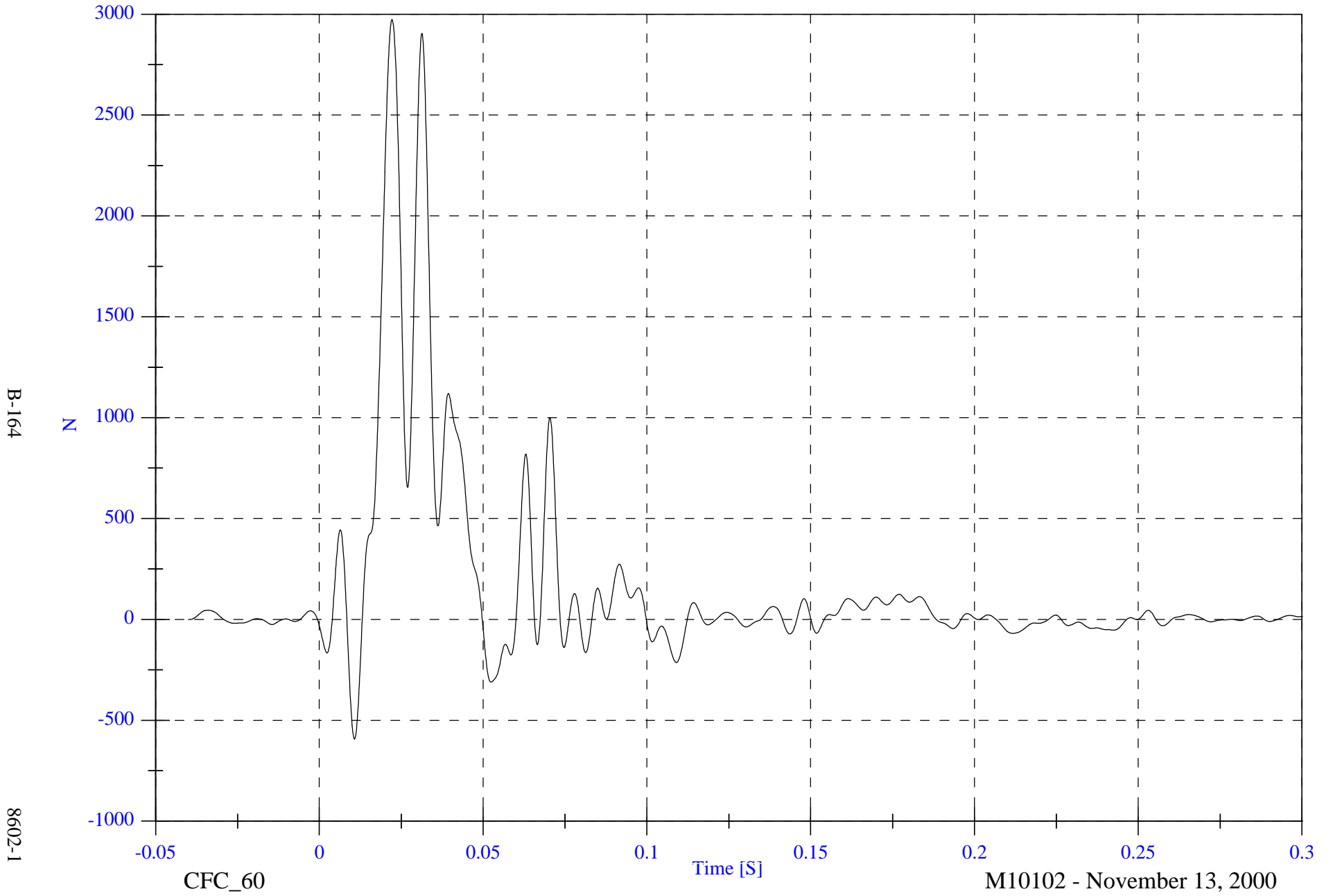
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D4 Fx

Max: 2973.5 [N] at 0.022 [S]

Min: -593.9 [N] at 0.011 [S]



B-164

8602-1

CFC_60

Time [S]

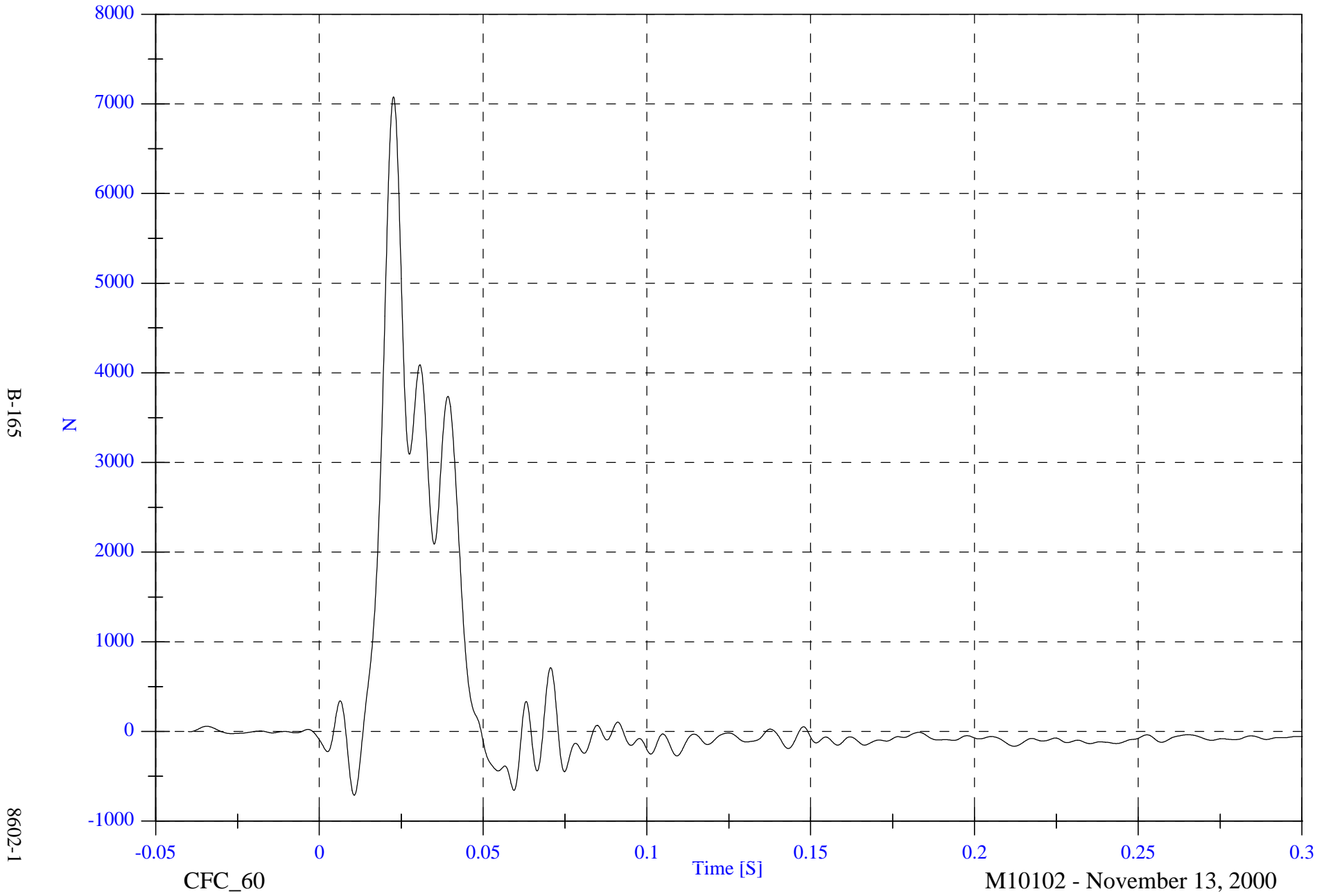
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D5 Fx

Max: 7077.6 [N] at 0.023 [S]

Min: -712.2 [N] at 0.011 [S]



B-165

8602-1

CFC_60

Time [S]

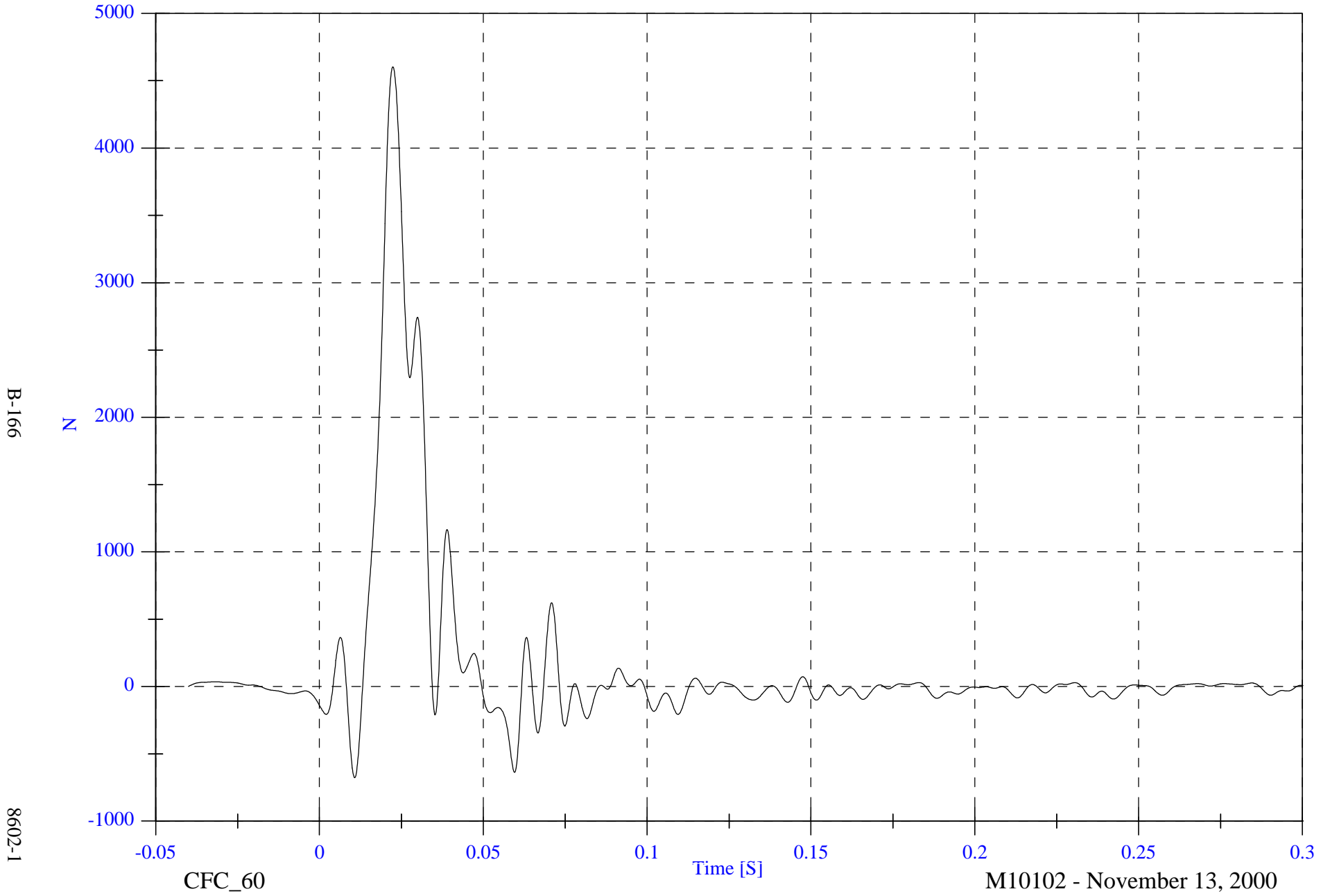
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D6 Fx

Max: 4603.7 [N] at 0.022 [S]

Min: -678.2 [N] at 0.011 [S]



B-166

8602-1

CFC_60

Time [S]

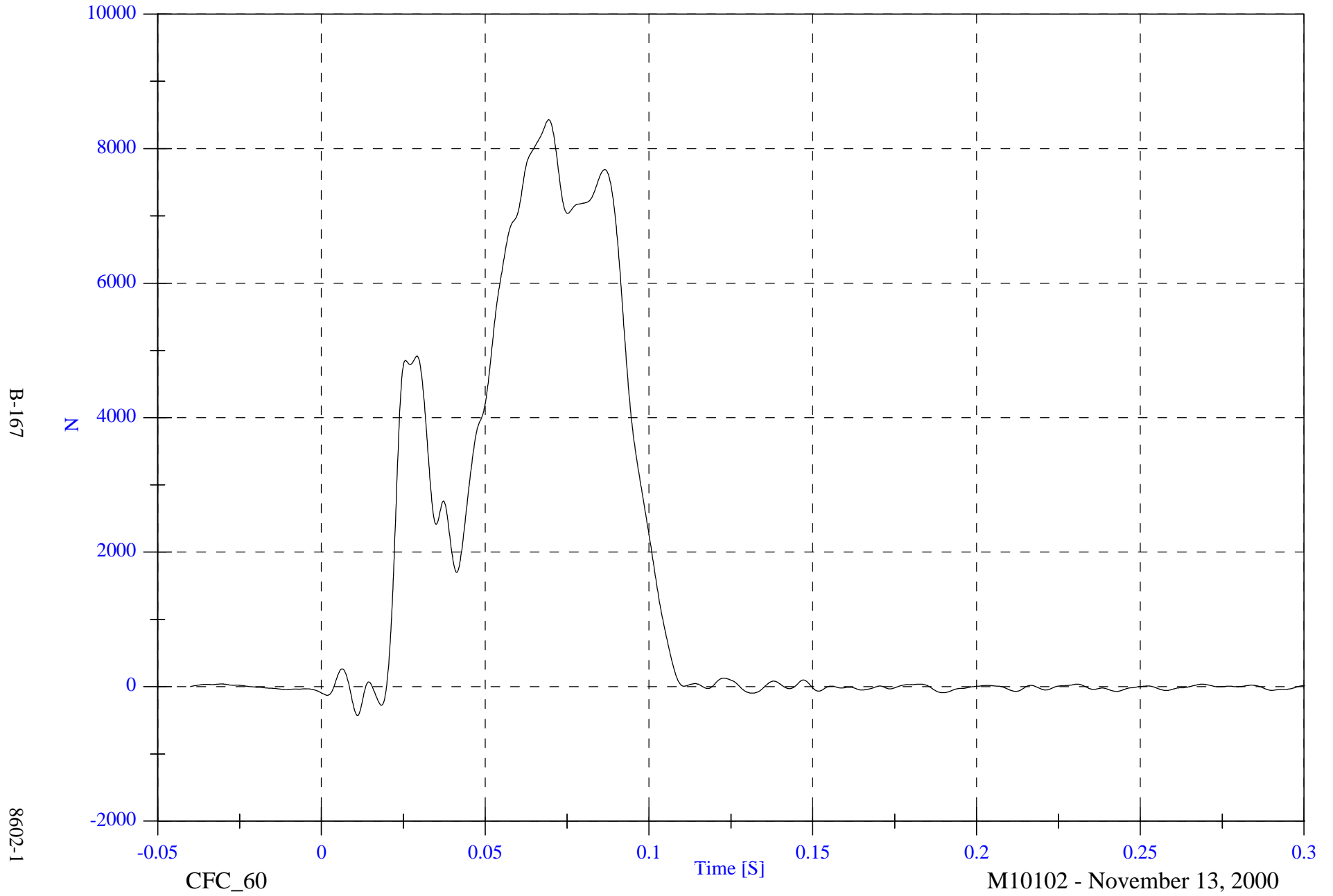
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D7 Fx

Max: 8430.8 [N] at 0.069 [S]

Min: -429.3 [N] at 0.011 [S]

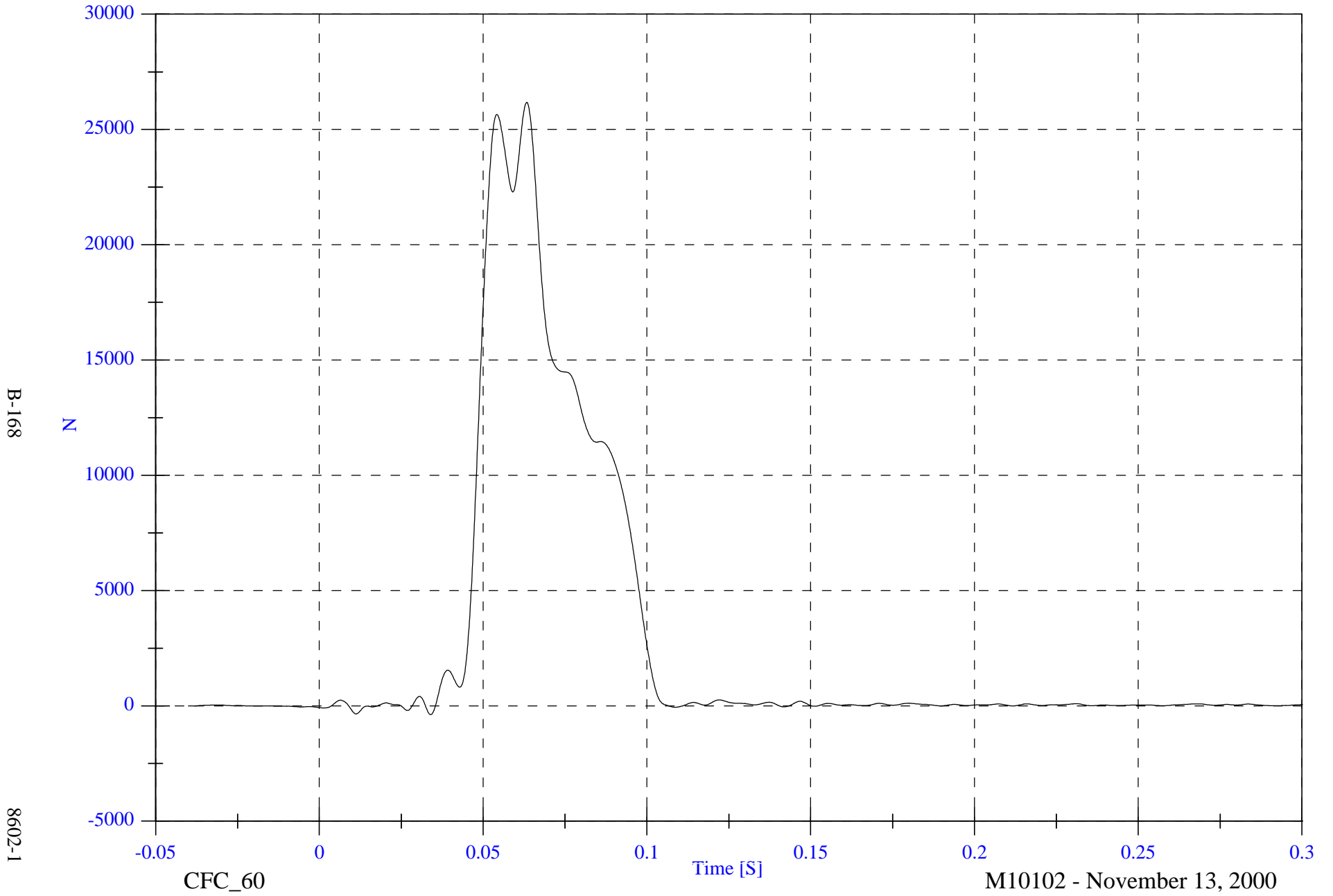


NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D8 Fx

Max: 26176.5 [N] at 0.063 [S]

Min: -381.6 [N] at 0.034 [S]

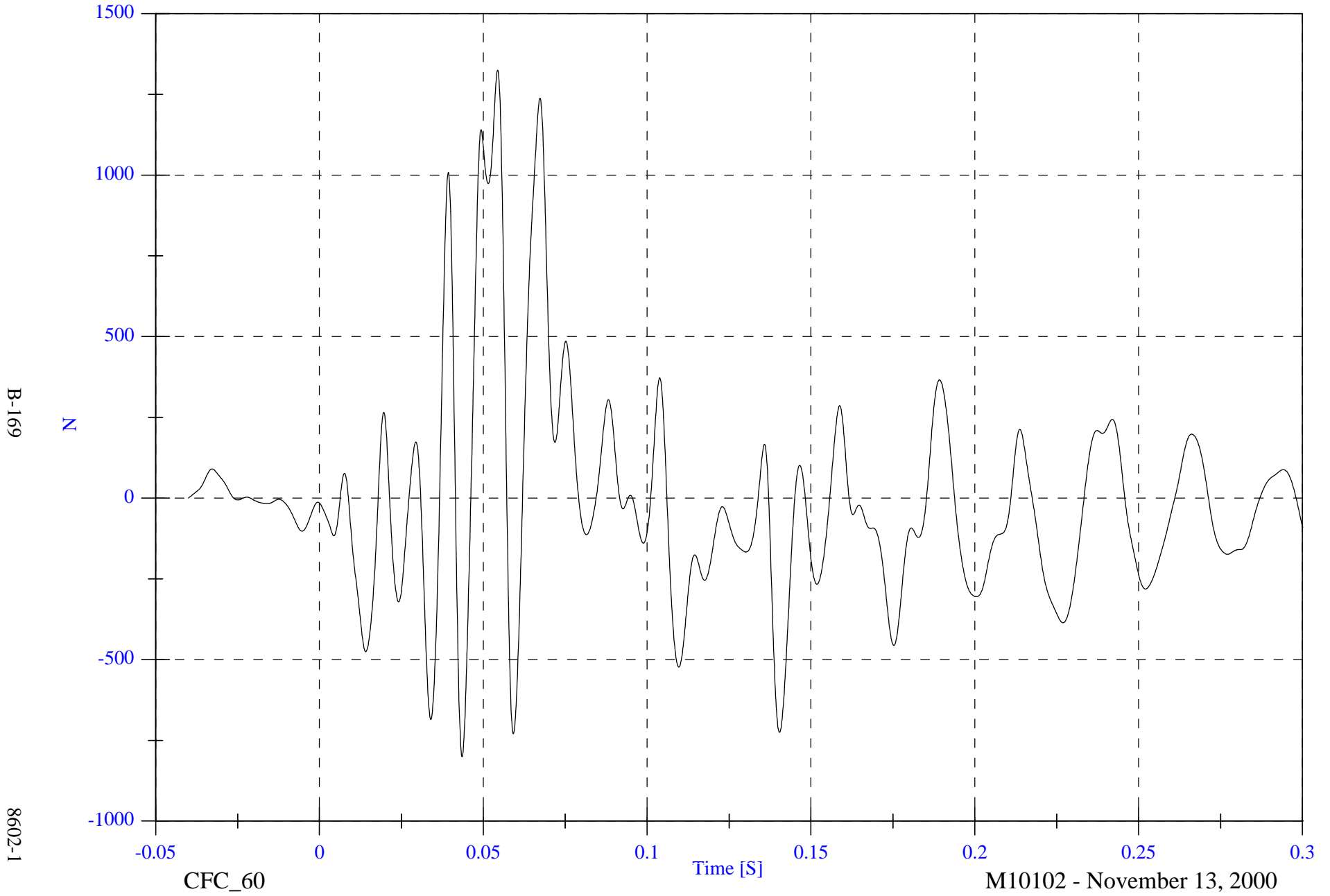


NCAP Test 1 - 2001 Chevrolet Impala

Barrier Load Cell D9 Fx

Max: 1324.9 [N] at 0.054 [S]

Min: -801.0 [N] at 0.043 [S]



B-169

8602-1

CFC_60

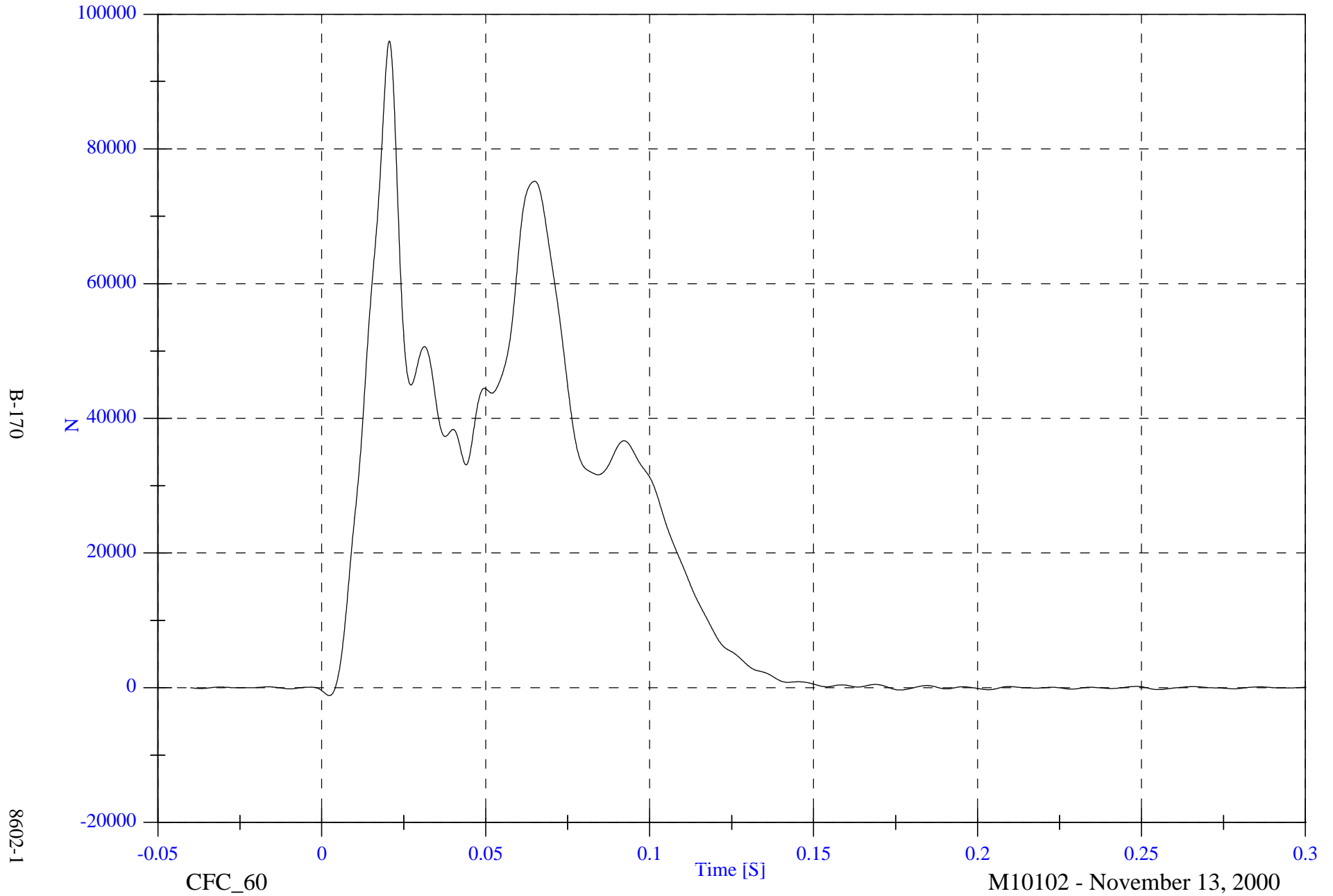
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Group 1 Load Cell Sum (A1,A2,A3,B1,B2,B3)

Max: 96027.2 [N] at 0.021 [S]

Min: -1169.2 [N] at 0.002 [S]



B-170

8602-1

CFC_60

Time [S]

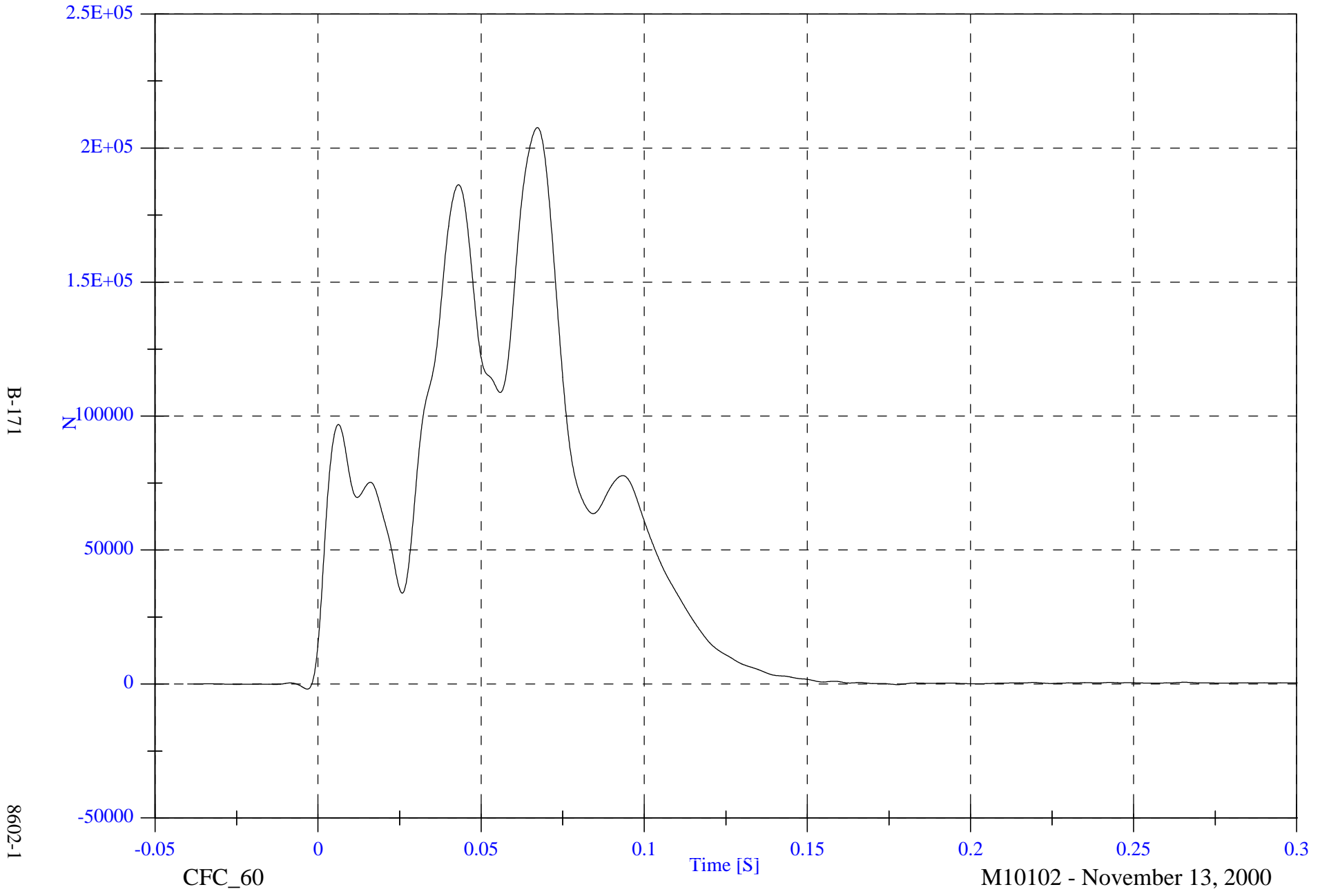
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Group 2 Load Cell Sum (A4,A5,A6,B4,B5,B6)

Max: 207651.5 [N] at 0.067 [S]

Min: -1889.7 [N] at -0.003 [S]

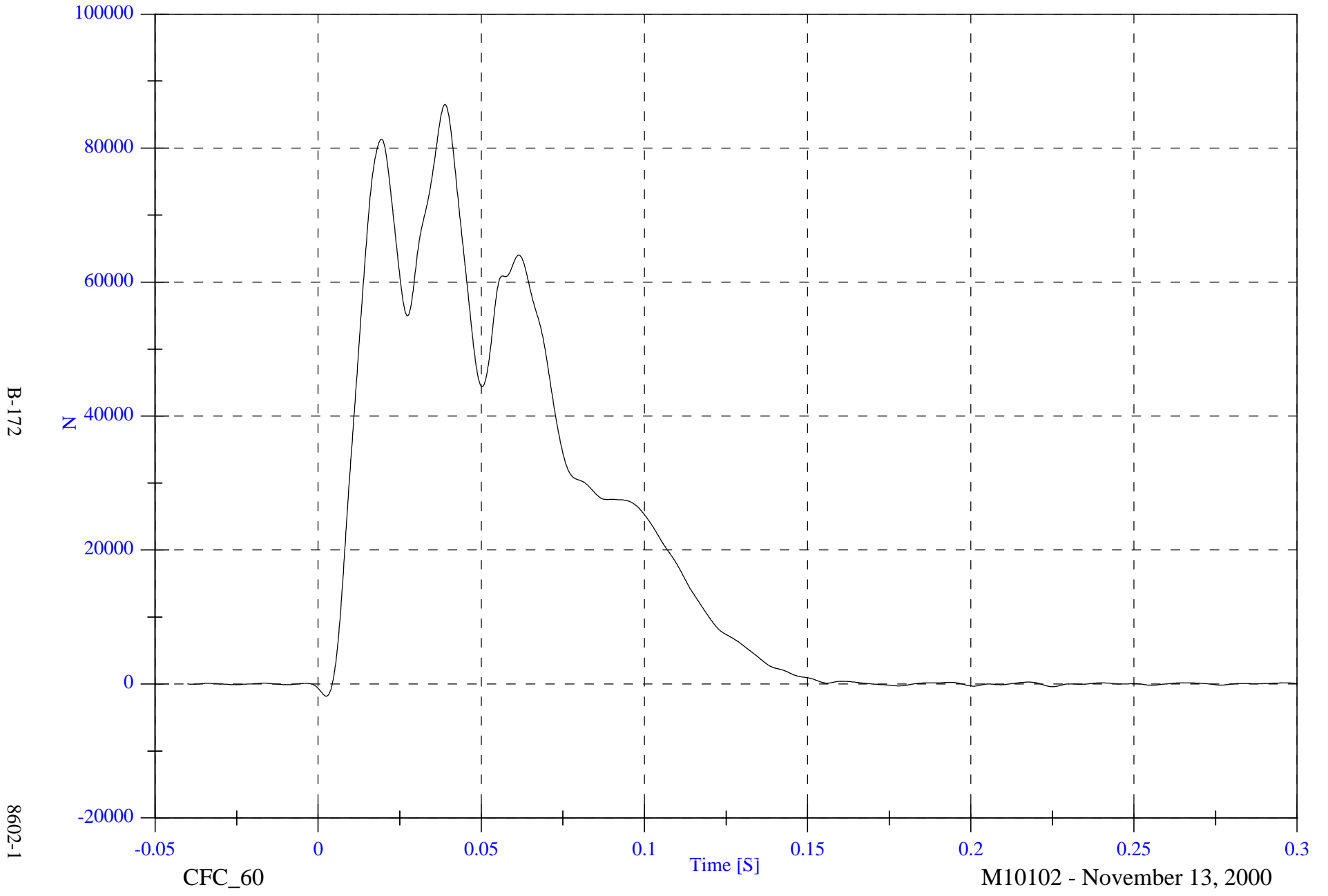


NCAP Test 1 - 2001 Chevrolet Impala

Group 3 Load Cell Sum (A7,A8,A9,B7,B8,B9)

Max: 86508.5 [N] at 0.039 [S]

Min: -1818.3 [N] at 0.002 [S]



B-172

8602-1

CFC_60

Time [S]

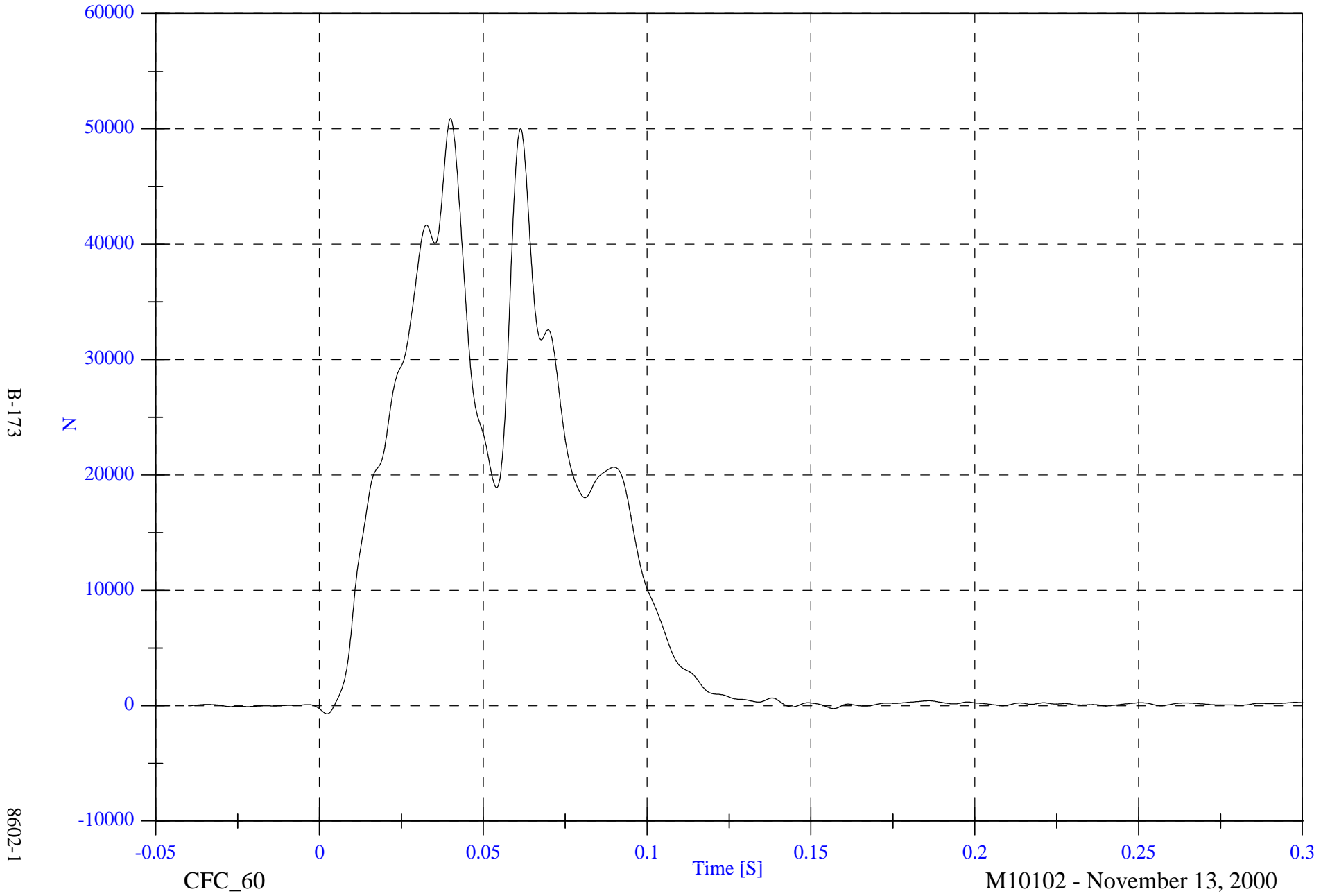
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Group 4 Load Cell Sum (C1,C2,C3,D1,D2,D3)

Max: 50894.2 [N] at 0.040 [S]

Min: -706.1 [N] at 0.002 [S]



B-173

8602-1

CFC_60

Time [S]

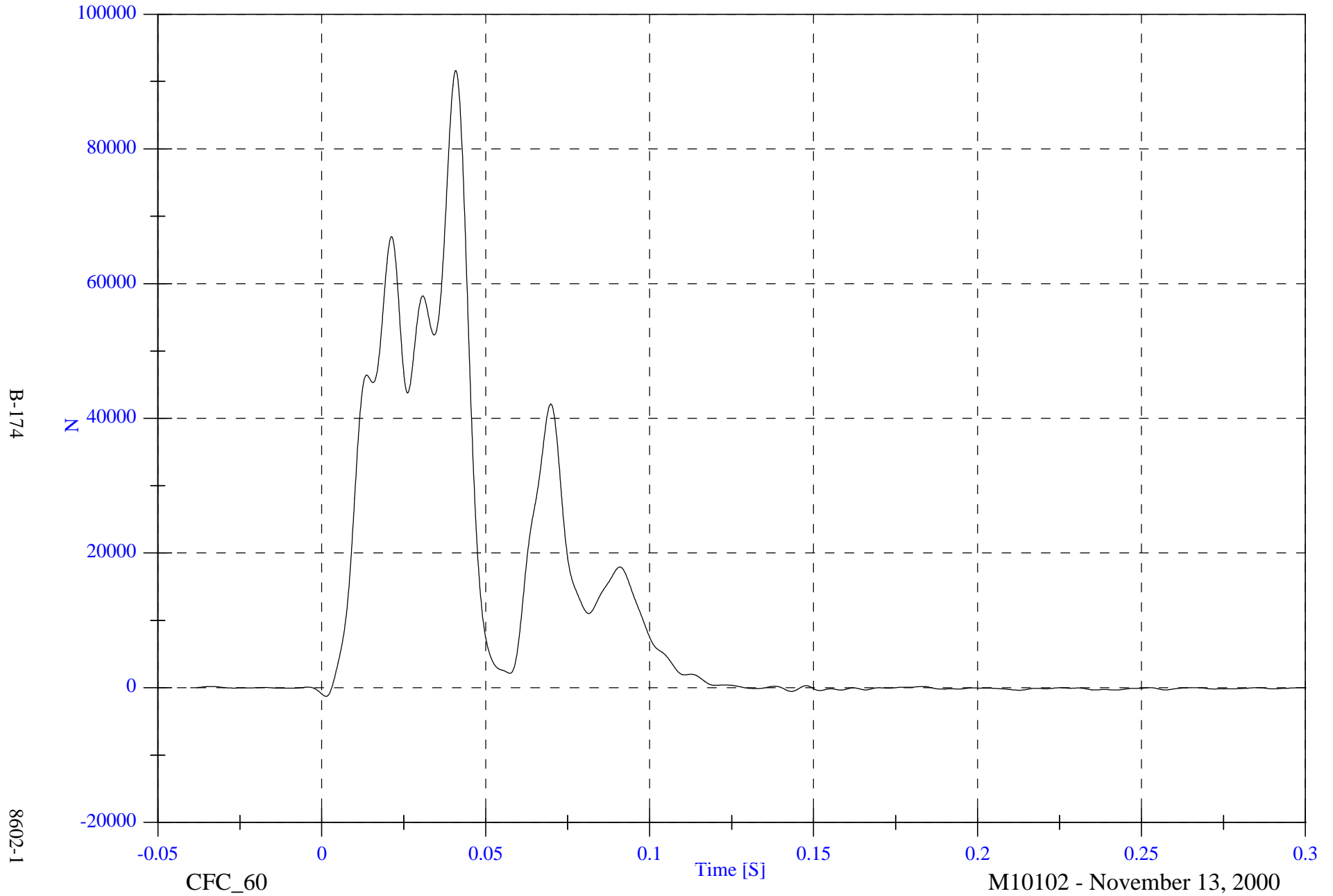
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Group 5 Load Cell Sum (C4,C5,C6,D4,D5,D6)

Max: 91636.0 [N] at 0.041 [S]

Min: -1281.8 [N] at 0.001 [S]



B-174

8602-1

CFC_60

Time [S]

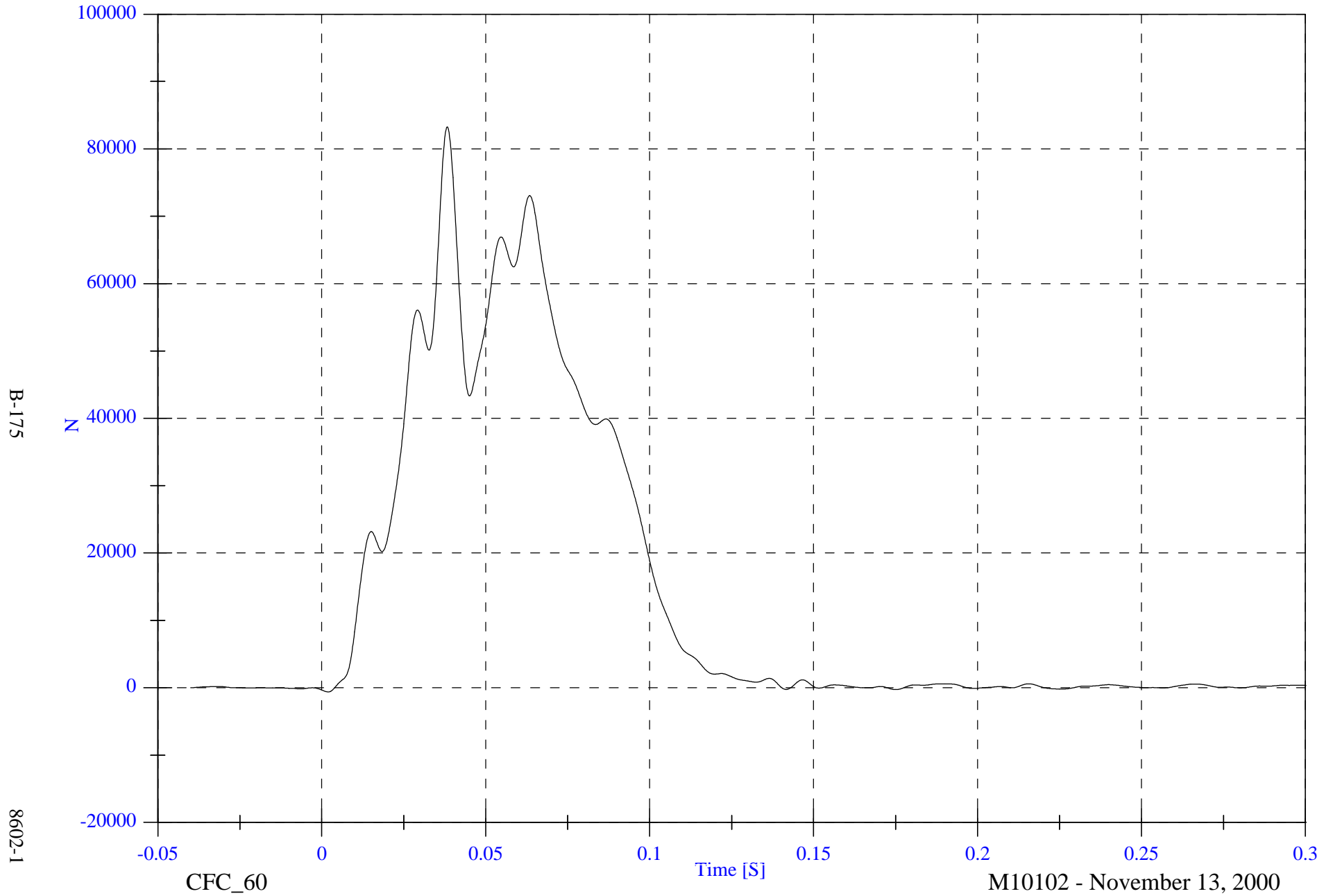
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Group 6 Load Cell Sum (C7,C8,C9,D7,D8,D9)

Max: 83276.3 [N] at 0.038 [S]

Min: -629.6 [N] at 0.002 [S]



B-175

8602-1

CFC_60

Time [S]

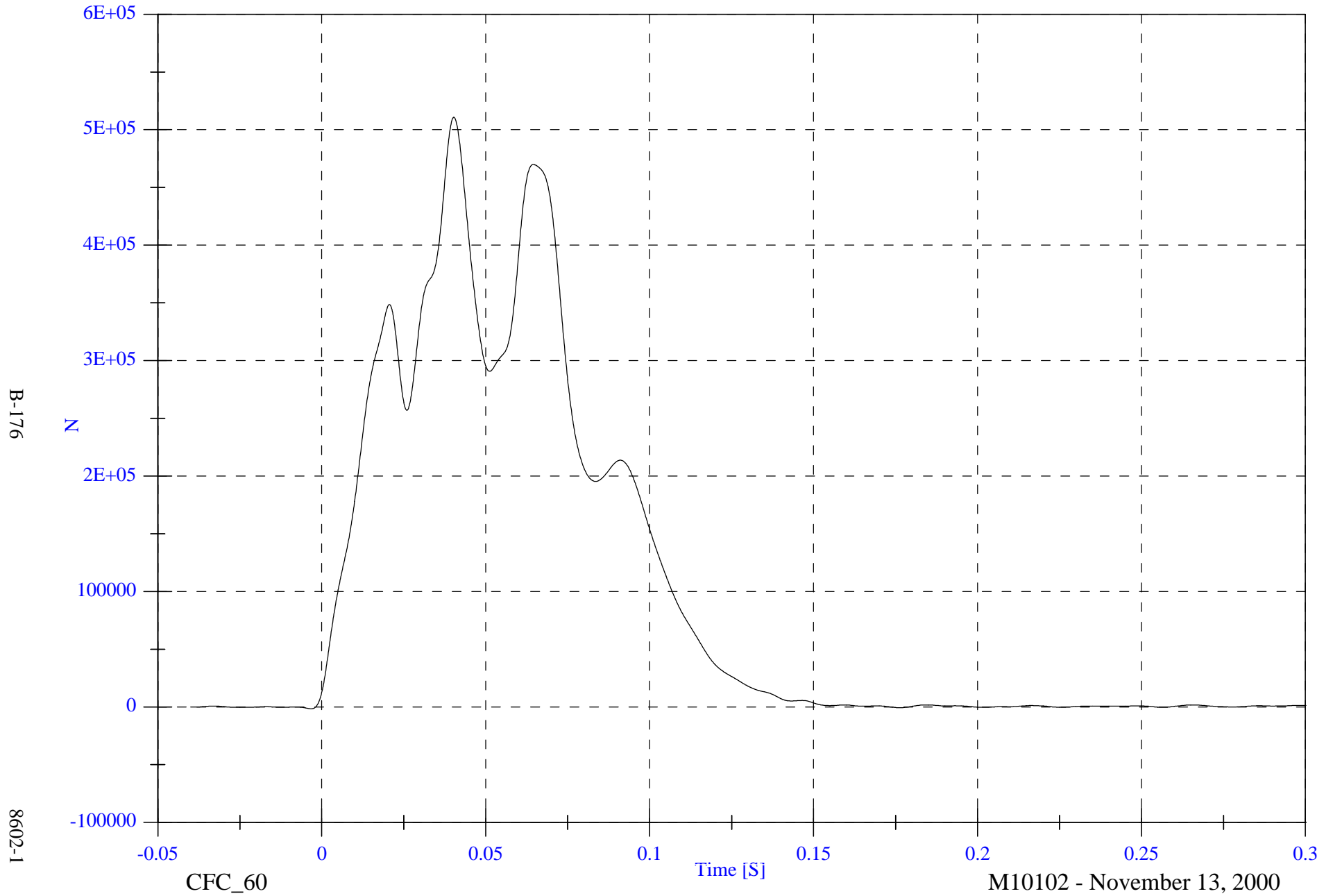
M10102 - November 13, 2000

NCAP Test 1 - 2001 Chevrolet Impala

Max: 510776.0 [N] at 0.040 [S]

Total Load Cell Sum (All 6 Groups)

Min: -1570.1 [N] at -0.003 [S]



B-176

N

8602-1

CFC_60

Time [S]

M10102 - November 13, 2000

APPENDIX C

**PART 572B/E DUMMY CONFIGURATION
AND PERFORMANCE VERIFICATION DATA SHEETS**

Appendix C contains the results from certification tests performed on the 50th percentile male anthropomorphic test devices utilized for this crash test. The results indicate that the dummies meet all of the performance requirements of the six standard tests as specified in 49 CFR Part 572, Federal Register, Volume 42, No. 25, dated February 7, 1977.

The tests were conducted at the Dummy Certification Test Facility of Veridian Engineering. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

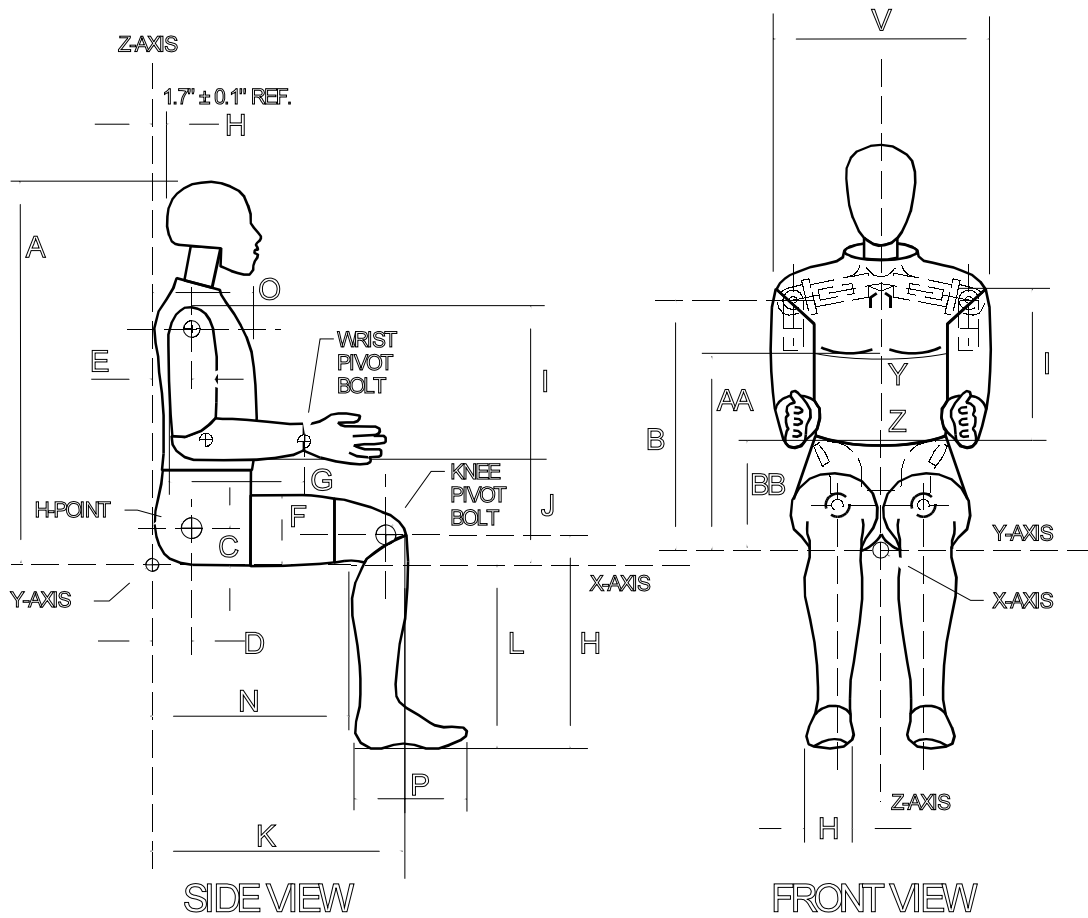
| <u>Position No./Location</u> | <u>Serial No.</u> | <u>Completion Date</u> |
|------------------------------|-------------------|------------------------|
| #1/Driver | 061 | 11/9/2000 |
| #2/Right Front Passenger | 245 | 11/9/2000 |

Electronic Test Equipment

The complement of signal conditioning, recording and display equipment, in conjunction with dummy certification testing, can be found in New Car Assessment and Standards Indicant Testing Final Report No. 6525-V-1.

DUMMY CONFIGURATION DIMENSIONS

EXTERNAL DIMENSIONS
SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude. (REF: S572.31(A)(6))

PART 572E
HEAD DROP TEST

Dummy Serial Number 061
Sequential Test Number 2.1
Date October 22, 2000
Workfile 061200.hdp

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---------------------------------|---------------|--------------|
| Temperature | 66-78 Deg F | 71.0 |
| Relative Humidity | 10% - 70% | 31.0 |
| Peak Resultant Acceleration | 225-275 G's | 242.84 |
| Peak Lateral Acceleration | 15 G's Max | 3.64 |
| Is Acceleration Curve Unimodal? | YES | YES |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

| | | |
|------------------------|------------------|------------------------|
| Dummy Serial Number | 061 | |
| Sequential Test Number | 2.1 | |
| Date | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile | 061200.nfl | |

| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|---|-------|--------------------|--------------|
| Temperature | | 69-72 Deg F | 70.0 |
| Relative Humidity | | 10% - 70% | 31.0 |
| Impact Velocity | | 22.60 - 23.40 Ft/s | 23.19 |
| Pendulum Deceleration | 10 ms | 22.50 - 27.50 G's | 22.76 |
| | 20 ms | 17.60 - 22.60 G's | 20.41 |
| | 30 ms | 12.50 - 18.50 G's | 16.37 |
| Max Pendulum G's Above 30 ms | | 29 G's Max | 16.37 |
| Deceleration - Time Curve Decay Time to 5 G's | | 34 - 42 ms | 39.00 |
| D Plane Rotation | Max | 64 - 78 Deg | 70.65 |
| | Time | 57 - 64 ms | 57.38 |
| Moment About Occipital Condyle | Max | 65 - 80 Ft-Lbs | 74.01 |
| | Time | 47 - 58 ms | 52.62 |
| Rotation Angle - Time Curve Decay Time to Zero | | 113 - 128 ms | 124.12 |
| Positive Moment - Time Curve Decay Time to Zero | | 97 - 107 ms | 99.75 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

| | | |
|------------------------|------------------|------------------------|
| Dummy Serial Number | 061 | |
| Sequential Test Number | 2.1 | |
| Date | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile | 061200.nex | |

| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|---|-------|----------------------|--------------|
| Temperature | | 69-72 Deg F | 70.0 |
| Relative Humidity | | 10% - 70% | 31.0 |
| Impact Velocity | | 19.50 - 20.30 Ft/s | 19.90 |
| Pendulum Deceleration | 10 ms | 17.20 - 21.20 G's | 17.92 |
| | 20 ms | 14.00 - 19.00 G's | 16.46 |
| | 30 ms | 11.00 - 16.00 G's | 14.16 |
| Max Pendulum G's Above 30 ms | | 22 G's Max | 14.16 |
| Deceleration - Time Curve Decay Time to 5 G's | | 38 - 46 ms | 41.38 |
| D Plane Rotation | Max | 81 - 106 Deg | 96.35 |
| | Time | 72 - 82 ms | 74.12 |
| Moment About Occipital Condyle | Max | -59.0 - -39.0 Ft-Lbs | -49.61 |
| | Time | 65 - 79 ms | 69.75 |
| Rotation Angle - Time Curve Decay Time to Zero | | 147 - 174 ms | 149.12 |
| Positive Moment - Time Curve Decay Time to Zero | | 120 - 148 ms | 137.38 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 061
Sequential Test Number 2.1
Date October 23, 2000
Workfile 061200.th3

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-------------------------|------------------|--------------|
| Temperature | 69-72 Deg F | 70.0 |
| Relative Humidity | 10% - 70% | 32.0 |
| Pendulum Velocity | 21.6 - 22.4 Ft/s | 21.8 |
| Maximum Deflection | 2.50 - 2.86 in | 2.59 |
| Maximum Resistive Force | 1160 - 1325 Lbs | 1197.66 |
| Internal Hysteresis | 69 - 85 % | 74.34 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 061
 Sequential Test Number 2.1
 Date November 9, 2000
 Workfile 061200.lf/061200.rf

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|------------------------|-----------------|--------------|
| LEFT KNEE | | |
| Temperature | 66 - 78 Deg F | 71.0 |
| Relative Humidity | 10% - 70% | 32.0 |
| Probe Velocity | 6.8 - 7.0 Ft/s | 6.9 |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1236.73 |
| RIGHT KNEE | | |
| Temperature | 66 - 78 Deg F | 71.0 |
| Relative Humidity | 10% - 70% | 32.0 |
| Probe Velocity | 6.8 - 7.0 Ft/s | 6.9 |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1245.82 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 061
 Sequential Test Number 2.1
 Date 11/09/2000

| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|-----------------------------------|----|----------------|--------------|
| Temperature | | | 70 |
| Relative Humidity | | | 32 |
| Location for Chest Circumference | AA | 16.9 - 17.1 in | 17.0 |
| Location for Waist Circumference | BB | 8.9 - 9.1 in | 9.0 |
| Chest Circumference (With Jacket) | Y | 38.2 - 39.4 in | 39.2 |
| Waist Circumference | Z | 32.9 - 34.1 in | 33.5 |
| Chest Depth | O | 8.4 - 9.0 in | 8.5 |
| H-Point Height | C | 3.3 - 3.5 in | 3.4 |
| H-Point from Backline | D | 5.3 - 5.5 in | 5.4 |
| Skull Cap to Backline | H | 1.6 - 1.8 in | 1.7 |
| Total Sitting Height | A | 34.6 - 35.0 in | 34.8 |
| Thigh Clearance | F | 5.5 - 6.1 in | 6.1 |
| Buttock Knee Length | K | 22.8 - 23.8 in | 23.4 |
| Buttock Popliteal Length | N | 17.8 - 18.8 in | 18.3 |
| Popliteal Height | L | 16.9 - 17.9 in | 17.7 |
| Knee Pivot Height | M | 19.1 - 19.7 in | 19.4 |
| Foot Length | P | 9.9 - 10.5 in | 10.1 |
| Foot Breadth | W | 3.6 - 4.2 in | 3.8 |
| Shoulder Pivot from Backline | E | 3.3 - 3.7 in | 3.5 |
| Shoulder Breadth | V | 16.6 - 17.2 in | 16.8 |
| Shoulder Pivot Height | B | 19.9 - 20.5 in | 20.2 |
| Elbow Rest Height | J | 7.5 - 8.3 in | 7.7 |
| Shoulder - Elbow Length | I | 13.0 - 13.6 in | 13.4 |
| Back of Elbow to Wrist Pivot | G | 11.4 - 12.0 in | 11.6 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
HEAD DROP TEST

Dummy Serial Number 245
Sequential Test Number 4.1
Date October 22, 2000
Workfile 245400.hdp

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|---------------------------------|---------------|--------------|
| Temperature | 66-78 Deg F | 71.0 |
| Relative Humidity | 10% - 70% | 31.0 |
| Peak Resultant Acceleration | 225-275 G's | 250.99 |
| Peak Lateral Acceleration | 15 G's Max | 9.16 |
| Is Acceleration Curve Unimodal? | YES | YES |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK FLEXION TEST

| | | |
|------------------------|------------------|------------------------|
| Dummy Serial Number | 245 | |
| Sequential Test Number | 4.1 | |
| Date | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile | 245400.nfl | |

| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|---|-------|--------------------|--------------|
| Temperature | | 69-72 Deg F | 70.0 |
| Relative Humidity | | 10% - 70% | 30.0 |
| Impact Velocity | | 22.60 - 23.40 Ft/s | 22.80 |
| Pendulum Deceleration | 10 ms | 22.50 - 27.50 G's | 22.99 |
| | 20 ms | 17.60 - 22.60 G's | 20.58 |
| | 30 ms | 12.50 - 18.50 G's | 15.75 |
| Max Pendulum G's Above 30 ms | | 29 G's Max | 15.75 |
| Deceleration - Time Curve Decay Time to 5 G's | | 34 - 42 ms | 37.88 |
| D Plane Rotation | Max | 64 - 78 Deg | 72.70 |
| | Time | 57 - 64 ms | 62.88 |
| Moment About Occipital Condyle | Max | 65 - 80 Ft-Lbs | 79.87 |
| | Time | 47 - 58 ms | 53.12 |
| Rotation Angle - Time Curve Decay Time to Zero | | 113 - 128 ms | 125.38 |
| Positive Moment - Time Curve Decay Time to Zero | | 97 - 107 ms | 99.38 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
NECK EXTENSION TEST

| | | |
|------------------------|------------------|------------------------|
| Dummy Serial Number | 245 | |
| Sequential Test Number | 4.1 | |
| Date | October 22, 2000 | 6 Axis Neck Transducer |
| Workfile | 245400.nex | |

| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|---|-------|----------------------|--------------|
| Temperature | | 69-72 Deg F | 70.0 |
| Relative Humidity | | 10% - 70% | 30.0 |
| Impact Velocity | | 19.50 - 20.30 Ft/s | 19.90 |
| Pendulum Deceleration | 10 ms | 17.20 - 21.20 G's | 18.46 |
| | 20 ms | 14.00 - 19.00 G's | 17.29 |
| | 30 ms | 11.00 - 16.00 G's | 13.38 |
| Max Pendulum G's Above 30 ms | | 22 G's Max | 13.38 |
| Deceleration - Time Curve Decay Time to 5 G's | | 38 - 46 ms | 44.75 |
| D Plane Rotation | Max | 81 - 106 Deg | 98.28 |
| | Time | 72 - 82 ms | 74.38 |
| Moment About Occipital Condyle | Max | -59.0 - -39.0 Ft-Lbs | -54.89 |
| | Time | 65 - 79 ms | 67.00 |
| Rotation Angle - Time Curve Decay Time to Zero | | 147 - 174 ms | 151.38 |
| Positive Moment - Time Curve Decay Time to Zero | | 120 - 148 ms | 133.00 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
THORAX IMPACT TEST

Dummy Serial Number 245
Sequential Test Number 4.1
Date October 23, 2000
Workfile 245400.th3

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|-------------------------|------------------|--------------|
| Temperature | 69-72 Deg F | 70.0 |
| Relative Humidity | 10% - 70% | 32.0 |
| Pendulum Velocity | 21.6 - 22.4 Ft/s | 21.7 |
| Maximum Deflection | 2.50 - 2.86 in | 2.59 |
| Maximum Resistive Force | 1160 - 1325 Lbs | 1203.30 |
| Internal Hysteresis | 69 - 85 % | 72.12 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
KNEE IMPACT TEST

Dummy Serial Number 245
 Sequential Test Number 4.1
 Date November 9, 2000
 Workfile 245400.lf/245400.rf

| TEST PARAMETER | SPECIFICATION | TEST RESULTS |
|------------------------|-----------------|--------------|
| LEFT KNEE | | |
| Temperature | 66 - 78 Deg F | 71.0 |
| Relative Humidity | 10% - 70% | 32.0 |
| Probe Velocity | 6.8 - 7.0 Ft/s | 7.0 |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1293.26 |
| RIGHT KNEE | | |
| Temperature | 66 - 78 Deg F | 71.0 |
| Relative Humidity | 10% - 70% | 32.0 |
| Probe Velocity | 6.8 - 7.0 Ft/s | 7.0 |
| Peak Knee Impact Force | 1060 - 1300 Lbs | 1270.77 |

Remarks:

Laboratory Technician: B. Swiecicki

PART 572E
EXTERNAL DIMENSIONS

Dummy Serial Number 245
 Sequential Test Number 4.1
 Date 11/9/2000

| TEST PARAMETER | | SPECIFICATION | TEST RESULTS |
|-----------------------------------|----|----------------|--------------|
| Temperature | | | 70 |
| Relative Humidity | | | 32 |
| Location for Chest Circumference | AA | 16.9 - 17.1 in | 17.0 |
| Location for Waist Circumference | BB | 8.9 - 9.1 in | 9.0 |
| Chest Circumference (With Jacket) | Y | 38.2 - 39.4 in | 39.0 |
| Waist Circumference | Z | 32.9 - 34.1 in | 33.6 |
| Chest Depth | O | 8.4 - 9.0 in | 8.4 |
| H-Point Height | C | 3.3 - 3.5 in | 3.2 |
| H-Point from Backline | D | 5.3 - 5.5 in | 5.4 |
| Skull Cap to Backline | H | 1.6 - 1.8 in | 1.7 |
| Total Sitting Height | A | 34.6 - 35.0 in | 34.8 |
| Thigh Clearance | F | 5.5 - 6.1 in | 6.0 |
| Buttock Knee Length | K | 22.8 - 23.8 in | 23.4 |
| Buttock Popliteal Length | N | 17.8 - 18.8 in | 18.3 |
| Popliteal Height | L | 16.9 - 17.9 in | 17.5 |
| Knee Pivot Height | M | 19.1 - 19.7 in | 19.2 |
| Foot Length | P | 9.9 - 10.5 in | 10.2 |
| Foot Breadth | W | 3.6 - 4.2 in | 3.8 |
| Shoulder Pivot from Backline | E | 3.3 - 3.7 in | 3.6 |
| Shoulder Breadth | V | 16.6 - 17.2 in | 16.8 |
| Shoulder Pivot Height | B | 19.9 - 20.5 in | 20.2 |
| Elbow Rest Height | J | 7.5 - 8.3 in | 8.0 |
| Shoulder - Elbow Length | I | 13.0 - 13.6 in | 13.2 |
| Back of Elbow to Wrist Pivot | G | 11.4 - 12.0 in | 11.6 |

Remarks:

Laboratory Technician: B. Swiecicki

APPENDIX D

DUMMY, VEHICLE AND LABORATORY INSTRUMENT CALIBRATION

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

| DRIVER DUMMY (S/N 061) | Manufacturer | Serial # | Calibration | | |
|------------------------|--------------|----------|-------------|---------|----------|
| | | | Last | Next | |
| Head | X | ENDEVCO | AC-J33019 | 6/19/00 | 12/18/00 |
| | Y | ENDEVCO | AC-J33127 | 6/14/00 | 12/13/00 |
| | Z | ENDEVCO | AC-J32782 | 6/21/00 | 12/20/00 |
| Head | X (R) | ENDEVCO | AC-J31060 | 6/5/00 | 12/4/00 |
| | Y (R) | ENDEVCO | AC-J31050 | 6/5/00 | 12/4/00 |
| | Z (R) | ENDEVCO | AC-J32143 | 6/5/00 | 12/4/00 |
| Neck Load Cell | X | DENTON | LC-205FX | 8/28/00 | 2/26/01 |
| | Y | DENTON | LC-205FY | 8/28/00 | 2/26/01 |
| | Z | DENTON | LC-205FZ | 8/28/00 | 2/26/01 |
| Neck Moment | X | DENTON | LC-205MX | 8/28/00 | 2/26/01 |
| | Y | DENTON | LC-205MY | 8/28/00 | 2/26/01 |
| | Z | DENTON | LC-205MZ | 8/28/00 | 2/26/01 |
| Chest | X | ENDEVCO | AC-J33351 | 6/14/00 | 12/13/00 |
| | Y | ENDEVCO | AC-J32787 | 6/14/00 | 12/13/00 |
| | Z | ENDEVCO | AC-J32838 | 6/14/00 | 12/13/00 |
| Chest | X (R) | ENDEVCO | AC-J32791 | 6/14/00 | 12/13/00 |
| | Y (R) | ENDEVCO | AC-J33156 | 6/14/00 | 12/13/00 |
| | Z (R) | ENDEVCO | AC-J33020 | 6/15/00 | 12/14/00 |
| Chest Deflection Gauge | SERVO | DS-061 | 11/10/00 | 5/11/01 | |
| Hybrid III Use Only | | | | | |
| Pelvic | X | ENDEVCO | AC-J32383 | 8/4/00 | 2/2/01 |
| | Y | ENDEVCO | AC-J32186 | 8/4/00 | 2/2/01 |
| | Z | ENDEVCO | AC-J32098 | 8/4/00 | 2/2/01 |

INSTRUMENT CALIBRATION FOR DRIVER DUMMY

(6 Month Calibration Minimum)

| DRIVER DUMMY (S/N 061) | Manufacturer | Serial # | Calibration | | |
|--------------------------|--------------|----------|-------------|----------|---------|
| | | | Last | Next | |
| Left Femur Load Cell | GSE | LC-954 | 6/1/00 | 11/30/00 | |
| Right Femur Load Cell | GSE | LC-955 | 6/1/00 | 11/30/00 | |
| Left Upper Tibia | Mx | DENTON | LC-045MX | 11/4/00 | 5/5/01 |
| | My | DENTON | LC-045MY | 11/4/00 | 5/5/01 |
| Left Lower Tibia | Fz | DENTON | LC-125FZ | 11/4/00 | 5/5/01 |
| | Mx | DENTON | LC-125MX | 11/4/00 | 5/5/01 |
| | My | DENTON | LC-125MY | 11/4/00 | 5/5/01 |
| Right Upper Tibia | Mx | DENTON | LC-038MX | 11/9/00 | 5/10/01 |
| | My | DENTON | LC-038MY | 11/9/00 | 5/10/01 |
| Right Lower Tibia | Fz | DENTON | LC-124FZ | 11/9/00 | 5/10/01 |
| | Mx | DENTON | LC-124MX | 11/9/00 | 5/10/01 |
| | My | DENTON | LC-124MY | 11/9/00 | 5/10/01 |
| Left Foot Rear | X | ENDEVCO | AC-P16951 | 10/2/00 | 4/2/01 |
| | Z | ENDEVCO | AC-P17152 | 10/2/00 | 4/2/01 |
| Left Foot Front | Z | ENDEVCO | AC-P16975 | 10/2/00 | 4/2/01 |
| Right Foot Rear | X | ENDEVCO | AC-J31042 | 11/7/00 | 5/8/01 |
| | Z | ENDEVCO | AC-J32176 | 11/7/00 | 5/8/01 |
| Right Foot Front | Z | ENDEVCO | AC-J31009 | 11/8/00 | 5/9/01 |
| Lap Belt Load Cells | LEBOW | LC-706 | 6/1/00 | 11/30/00 | |
| Shoulder Belt Load Cells | LEBOW | LC-707 | 6/1/00 | 11/30/00 | |
| Spool-Out Potentiometer | PATRIOT | DS-M97 | 6/20/00 | 12/19/00 | |
| Belt Stretch Transducer | CAL | DS-E5 | 8/7/00 | 2/5/01 | |

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

| PASSENGER DUMMY (S/N 245) | Manufacturer | Serial # | Calibration | | |
|---|--------------|----------|-------------|---------|----------|
| | | | Last | Next | |
| Head | X | ENDEVCO | AC-J32184 | 6/5/00 | 12/4/00 |
| | Y | ENDEVCO | AC-J32185 | 6/5/00 | 12/4/00 |
| | Z | ENDEVCO | AC-J31011 | 6/5/00 | 12/4/00 |
| Head | X (R) | ENDEVCO | AC-J31020 | 6/5/00 | 12/4/00 |
| | Y (R) | ENDEVCO | AC-J31101 | 6/5/00 | 12/4/00 |
| | Z (R) | ENDEVCO | AC-J31059 | 6/5/00 | 12/4/00 |
| Neck Load Cell | X | DENTON | LC-076FX | 8/28/00 | 2/26/01 |
| | Y | DENTON | LC-076FY | 8/28/00 | 2/26/01 |
| | Z | DENTON | LC-076FZ | 8/28/00 | 2/26/01 |
| Neck Moment | X | DENTON | LC-076MX | 8/28/00 | 2/26/01 |
| | Y | DENTON | LC-076MY | 8/28/00 | 2/26/01 |
| | Z | DENTON | LC-076MZ | 8/28/00 | 2/26/01 |
| Chest | X | ENDEVCO | AC-J34019 | 6/19/00 | 12/18/00 |
| | Y | ENDEVCO | AC-J33018 | 6/19/00 | 12/18/00 |
| | Z | ENDEVCO | AC-J32783 | 6/19/00 | 12/18/00 |
| Chest | X (R) | ENDEVCO | AC-J31066 | 8/4/00 | 2/2/01 |
| | Y (R) | ENDEVCO | AC-J31021 | 8/4/00 | 2/2/01 |
| | Z (R) | ENDEVCO | AC-J31022 | 8/4/00 | 2/2/01 |
| Chest Deflection Gauge Hybrid III Use Only | | SERVO | DS-245 | 6/6/00 | 12/5/00 |
| | | | | | |
| Pelvic | X | ENDEVCO | AC-J31034 | 5/26/00 | 11/24/00 |
| | Y | ENDEVCO | AC-J31058 | 5/26/00 | 11/24/00 |
| | Z | ENDEVCO | AC-J31010 | 5/26/00 | 11/24/00 |

INSTRUMENT CALIBRATION FOR PASSENGER DUMMY

(6 Month Calibration Minimum)

| PASSENGER DUMMY (S/N 245) | Manufacturer | Serial # | Calibration | | |
|---------------------------|--------------|----------|-------------|----------|----------|
| | | | Last | Next | |
| Left Femur Load Cell | GSE | LC-723 | 6/1/00 | 11/30/00 | |
| Right Femur Load Cell | GSE | LC-419 | 6/1/00 | 11/30/00 | |
| Left Upper Tibia | Mx | DENTON | LC-016MX | 11/9/00 | 5/10/01 |
| | My | DENTON | LC-016MY | 11/9/00 | 5/10/01 |
| Left Lower Tibia | Fz | DENTON | LC-123FZ | 11/9/00 | 5/10/01 |
| | Mx | DENTON | LC-123MX | 11/9/00 | 5/10/01 |
| | My | DENTON | LC-123MY | 11/9/00 | 5/10/01 |
| Right Upper Tibia | Mx | DENTON | LC-023MX | 11/9/00 | 5/10/01 |
| | My | DENTON | LC-023MY | 11/9/00 | 5/10/01 |
| Right Lower Tibia | Fz | DENTON | LC-111FZ | 11/9/00 | 5/10/01 |
| | Mx | DENTON | LC-111MX | 11/9/00 | 5/10/01 |
| | My | DENTON | LC-111MY | 11/9/00 | 5/10/01 |
| Left Foot Rear | X | ENDEVCO | AC-APA30 | 7/6/00 | 1/4/01 |
| | Z | ENDEVCO | AC-J31026 | 9/21/00 | 3/22/01 |
| Left Foot Front | Z | ENDEVCO | AC-J32831 | 7/6/00 | 1/4/01 |
| Right Foot Rear | X | ENDEVCO | AC-J32832 | 6/14/00 | 12/13/00 |
| | Z | ENDEVCO | AC-J33376 | 7/6/00 | 1/4/01 |
| Right Foot Front | Z | ENDEVCO | AC-J18400 | 9/28/00 | 3/29/01 |
| Lap Belt Load Cells | LEBOW | LC-711 | 6/1/00 | 11/30/00 | |
| Shoulder Belt Load Cells | LEBOW | LC-712 | 6/1/00 | 11/30/00 | |
| Spool-Out Potentiometer | PATRIOT | DS-M96 | 7/17/00 | 1/15/01 | |
| Belt Stretch Transducer | CAL | DS-E3 | 8/8/00 | 2/6/01 | |

INSTRUMENT CALIBRATION FOR VEHICLE ACCELEROMETERS

(6 Month Calibration Minimum)

| | Manufacturer | Serial # | Calibration | |
|---------------------------------|--------------|-----------|-------------|----------|
| | | | Last | Next |
| Left Seat Rear Crossmember | ICS | AC-X33 | 8/11/00 | 2/9/01 |
| Right Rear Seat Crossmember | ICS | AC-D88 | 8/14/00 | 2/12/01 |
| Top of Engine | ENDEVCO | AC-AY60 | 8/25/00 | 2/23/01 |
| Bottom of Engine | ENDEVCO | AC-B10951 | 9/28/00 | 3/29/01 |
| Right Disc Brake Caliper | ENTRAN | AC-Z02 | 6/12/00 | 12/11/00 |
| Instrument Panel | ENDEVCO | AC-A14077 | 8/7/00 | 2/5/01 |
| Left Disc Brake Caliper | ENTRAN | AC-D03 | 8/31/00 | 3/1/01 |
| Left Seat Rear Crossmember (R) | ICS | AC-X88 | 8/14/00 | 2/12/01 |
| Right Seat Rear Crossmember (R) | ICS | AC-D30 | 8/25/00 | 2/23/01 |