

REPORT NUMBER: 8745-01

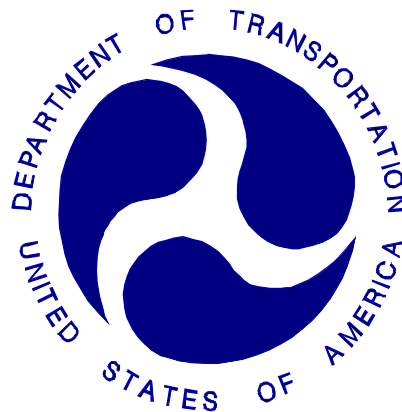
**NEW CAR ASSESSMENT PROGRAM  
SIDE IMPACT TEST**

GENERAL MOTORS CORPORATION  
2004 CHEVROLET MALIBU  
4-DOOR SEDAN

NHTSA NUMBER: G40101

GENERAL DYNAMICS TEST NUMBER: 8745-01

ADVANCED INFORMATION ENGINEERING SERVICES  
A GENERAL DYNAMICS COMPANY  
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BUFFALO, NEW YORK 14225



May 20, 2004

**FINAL REPORT**

U. S. DEPARTMENT OF TRANSPORTATION  
National Highway Traffic Safety Administration  
Rulemaking  
Office of Crashworthiness Standards  
Mail Code: NVS-111  
400 Seventh Street, SW, Room No. 5313  
Washington, DC 20590

This Final Test Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration. This document is disseminated under the sponsorship of the U.S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its contents or use thereof.

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# **TECHNICAL REPORT STANDARD TITLE PAGE**

| 1. Report No.<br>8745-01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                     | 2. Government Accession No.                         |                                                                                                                                                                                                                                                                                                    | 3. Recipient's Catalog No.                                      |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
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| 4. Title and Subtitle<br>Final Report of new Car Assessment Program Side Impact Testing of a 2004 Chevrolet Malibu 4-Door Sedan<br>NHTSA No.: G40101                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                     |                                                     |                                                                                                                                                                                                                                                                                                    | 5. Report Date<br>May 20, 2004                                  |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
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| 9. Performing Organization Name and Address<br>General Dynamics Transportation Sciences Center<br>P.O. Box 400<br>Buffalo, New York 14225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                                                     |                                                                                                                                                                                                                                                                                                    | 10. Work Unit No.                                               |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
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| 12. Sponsoring Agency Name and Address<br>U.S. Department of Transportation<br>National Highway Traffic Safety Administration<br>Office of Crashworthiness Standards<br>Mail Code: NVS-111<br>400 Seventh SW, Room 5313<br>Washington, D.C. 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                                     |                                                                                                                                                                                                                                                                                                    | 13. Type of Report and Period Covered<br>Final Report, May 2004 |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
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| 15. Supplementary Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                     |                                                     |                                                                                                                                                                                                                                                                                                    |                                                                 |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
| 16. Abstract<br><p>A 55/28 kph 90° Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2004 Chevrolet Malibu 4-Door Sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted at the General Dynamics Advanced Information Engineering Services Crash Test Facility in Buffalo, New York, on May 20, 2004.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 62.12 kph, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21.1°C. The target vehicle post-test maximum crush was 295 mm at level 2.</p> <p>The test or target vehicle's performance is given below:</p> <table border="0"> <thead> <tr> <th></th> <th align="center"><u>Front SID H3</u></th> <th></th> <th align="center"><u>Rear SID H3</u></th> <th></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td align="center">57.5</td> <td align="center">g's</td> <td align="center">42.3</td> <td align="center">g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td align="center">49</td> <td align="center">g's</td> <td align="center">48.3</td> <td align="center">g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td align="center">80.3</td> <td align="center">g's</td> <td align="center">52.2</td> <td align="center">g's</td> </tr> <tr> <td>Thoracic Trauma Index (TTI):</td> <td align="center">69</td> <td align="center">g's</td> <td align="center">50</td> <td align="center">g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td align="center">88</td> <td align="center">g's</td> <td align="center">59</td> <td align="center">g's</td> </tr> </tbody> </table> <p>The driver door (vehicle struck side) did not separate from the body at the hinges or latches. The left rear door (vehicle struck side) did not separate from the body at the hinges, however the door unlatched but remained closed throughout the event. The opposite side doors did not open during the event and remained operable.</p> |                     |                                                     |                                                                                                                                                                                                                                                                                                    |                                                                 |  |  | <u>Front SID H3</u> |  | <u>Rear SID H3</u> |  | Left Upper Rib Acceleration: | 57.5 | g's | 42.3 | g's | Left Lower Rib Acceleration: | 49 | g's | 48.3 | g's | Lower Spine Acceleration: | 80.3 | g's | 52.2 | g's | Thoracic Trauma Index (TTI): | 69 | g's | 50 | g's | Pelvis Acceleration (PEV): | 88 | g's | 59 | g's |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | <u>Front SID H3</u> |                                                     | <u>Rear SID H3</u>                                                                                                                                                                                                                                                                                 |                                                                 |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
| Left Upper Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 57.5                | g's                                                 | 42.3                                                                                                                                                                                                                                                                                               | g's                                                             |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
| Left Lower Rib Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 49                  | g's                                                 | 48.3                                                                                                                                                                                                                                                                                               | g's                                                             |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
| Lower Spine Acceleration:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | 80.3                | g's                                                 | 52.2                                                                                                                                                                                                                                                                                               | g's                                                             |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
| Thoracic Trauma Index (TTI):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 69                  | g's                                                 | 50                                                                                                                                                                                                                                                                                                 | g's                                                             |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
| Pelvis Acceleration (PEV):                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 88                  | g's                                                 | 59                                                                                                                                                                                                                                                                                                 | g's                                                             |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
| 17. Key Words<br>New Car Assessment Program (NCAP)<br>Side Impact<br>MDB<br>Side Impact Dummy Hybrid III (SID H3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                     |                                                     | 18. Distribution Statement<br><u>Copies of this report are available from:</u><br>National Highway Traffic Safety Administration<br>Technical Reference Division<br>Room 5111 (NAD-52)<br>400 Seventh St., S.W.<br>Washington, D.C. 20590<br>Telephone No. (202) 366-4946<br>ATTN: Robert Hornicle |                                                                 |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |
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| 22. Price                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                     |                                                     |                                                                                                                                                                                                                                                                                                    |                                                                 |  |  |                     |  |                    |  |                              |      |     |      |     |                              |    |     |      |     |                           |      |     |      |     |                              |    |     |    |     |                            |    |     |    |     |

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## **SECTION 1**

### **PURPOSE AND TEST PROCEDURE**

This side impact test is part of the FY2004 New Car Assessment Program Side Impact Protection sponsored by the National Highway Traffic Safety Administration (NHTSA). The purpose of this test was to generate comparative side impact performance in a 2004 Chevrolet Malibu 4-Door Sedan. The test was conducted in accordance with the Office of Crashworthiness Standards' Laboratory Test Procedure dated July 1997.

## SECTION 2

### SUMMARY OF SIDE IMPACT TEST

A 2004 Chevrolet Malibu 4-Door Sedan was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 62.12 kph (38.6 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the General Dynamics Advanced Information Engineering Services in Buffalo, New York on May 20, 2004. Pre- and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the Side Impact Hybrid III Dummies (SID H3s) are included in Appendix A.

Two restrained Side Impact Hybrid III Dummies (SID H3s) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OCWS Side Impact Laboratory Test Procedure which is dated July, 1997. The side impact test was documented by one real-time camera and 10 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID H3s were instrumented with the following accelerometers:

1. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
3. Lower Thoracic Spine (T<sub>12</sub>) uniaxial and redundant accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)
5. Head triaxial accelerometers (X-, Y- and Z-direction)
6. Upper neck force and moment (X-, Y and Z-direction) load cells

A summary of the Side Impact Hybrid III Dummy (SID H3) configuration and verification test data can be found in Appendix C. A total of 65 channels of data were recorded. Appendix B contains the vehicle, MDB and dummy response data traces.

The following table summarizes the results of the test.

| Injury Criteria | Front SID H3 | Rear SID H3 |
|-----------------|--------------|-------------|
| TTI (g)         | 69           | 50          |
| PEV (g)         | 88           | 59          |

#### AIR BAG DEPLOYMENT STATUS

|                  | DRIVER         | FRONT PASSENGER | REAR PASSENGER |
|------------------|----------------|-----------------|----------------|
| Front Air Bag    | Did Not Deploy | Deployed        | -              |
| Knee Bolster Bag | -              | -               | -              |
| Side Air Bag     | -              | -               | -              |
| Side Curtain Bag | -              | -               | -              |

#### AUTOMATIC DOOR LOCK SUMMARY

|                                  |                                                                                               |
|----------------------------------|-----------------------------------------------------------------------------------------------|
| ADL Equipped Test Vehicle:       | Yes                                                                                           |
| ADL Activation Status:           | Automatic door locking can not be deactivated. Automatic door unlocking modes may be changed. |
| Struck Side Door Lock Condition: | Unlocked†                                                                                     |

† The test was conducted with the doors unlocked. However, this was a laboratory error. According to the Side NCAP laboratory test procedure, the test should have been conducted with the struck side doors locked, as this vehicle comes equipped with standard ADLs that cannot be deactivated by reading the owner's manual.

## **SECTION 3**

### **SUMMARY OF TEST RESULTS**

## DATA SHEET 1

### GENERAL TEST AND VEHICLE PARAMETER DATA

#### TEST VEHICLE INFORMATION:

Year/Make/Model/Body Style: 2004 Chevrolet Malibu 4-Door Sedan

Vehicle Body Color: Blue VIN: 1G1ZS52F64F211389

Vehicle NHTSA No.: G40101 Month & Year of Manufacture: 04/04

Engine Data: 4 Cylinders; - CID; 2.2 Liters; - cc

Engine Placement: - Longitudinal; or X Lateral

Transmission: 4 Speed; - Manual; X Automatic; X Overdrive

Final Drive: - Rear Wheel Drive; X Front Wheel Drive; - Four Wheel Drive

Odometer Reading 34 km

Supplemental Airbag Restraints:

Front Occupant: X Frontal; - Knee; - Side; - Curtain

Rear Occupant: - Frontal; - Knee; - Side; - Curtain

Options:

X ADL; X A/C; X Power Steering; X Power Brakes; X Power Windows

#### DATA FROM TIRE PLACARD

Recommended Tire Size: P205/65R15

\*Recommended Cold Tire Pressure: 210 kPa FRONT; 210 kPa REAR

#### DATA FROM TIRE SIDEWALL:

Size of Tires on Test Vehicle: P205/65R15 92S ; Manufacturer: Bridgestone B450

Tire Pressure with Maximum Capacity Vehicle Load: Front: 300 kPa; Rear: 300 kPa

Treadwear: 360 ; Traction: B ; Temperature: B

#### VEHICLE CAPACITY DATA:

Number of Occupants: 2 Front; 3 Rear; - 3rd Seat; 5 Total

Type of Front Seats: X Bucket; - Bench; - Split Bench

Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob

Vehicle Max Capacity Loading = 416 kg (A)

No. of Occupants x 68.04 kg. = 340.2 kg (B)

Vehicle Cargo Capacity = 75.8 kg (A-B)

#### TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front = 434.0 kg Left Rear = 288.0 kg

Right Front = 425.0 kg Right Rear = 274.5 kg

TOTAL FRONT = 859.0 kg TOTAL REAR = 562.5 kg

% of Total Weight = 60.4% % % of Total Weight = 39.6 %

TOTAL WEIGHT = 1421.5 kg

\* Tire pressure used in test.

**DATA SHEET 1 (continued)****GENERAL TEST VEHICLE PARAMETER DATA**Vehicle: 2004 Chevrolet Malibu 4-Door SedanNHTSA No. G40101**CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:**

|                                                      |   |               |            |
|------------------------------------------------------|---|---------------|------------|
| Total Test Vehicle Delivered Weight with Max. Fluids | = | <u>1421.5</u> | kg (A)     |
| Maximum Cargo Carrying Capacity of Test Vehicle      | = | <u>75.8</u>   | kg (B)     |
| Weight of instrumented SID H3 Dummies ( 2 X 81.2 kg) | = | <u>162.4</u>  | kg (C)     |
| TEST VEHICLE TARGET WEIGHT:                          | = | <u>1659.7</u> | kg (A+B+C) |

**FULLY LOADED TEST VEHICLE (UDVW + 1 or 2 SID H3(s) + CARGO):**

|                     |   |               |    |                   |   |              |    |
|---------------------|---|---------------|----|-------------------|---|--------------|----|
| Left Front          | = | <u>478.0</u>  | kg | Left Rear         | = | <u>407.5</u> | kg |
| Right Front         | = | <u>433.0</u>  | kg | Right Rear        | = | <u>347.5</u> | kg |
| TOTAL FRONT         | = | <u>911.0</u>  | kg | TOTAL REAR        | = | <u>755.0</u> | kg |
| % of Total Weight   | = | <u>54.7%</u>  | %  | % of Total Weight | = | <u>45.3%</u> | %  |
| TOTAL TEST WEIGHT = |   | <u>1666.0</u> | kg |                   |   |              |    |

**AS TESTED WEIGHT OF TEST VEHICLE (1 OR 2 SID H3(s) + CARGO + EQUIPMENT & INSTRUMENTATION):**

|                     |   |               |    |                   |   |              |    |
|---------------------|---|---------------|----|-------------------|---|--------------|----|
| Left Front          | = | <u>467.0</u>  | kg | Left Rear         | = | <u>402.5</u> | kg |
| Right Front         | = | <u>443.0</u>  | kg | Right Rear        | = | <u>338.5</u> | kg |
| TOTAL FRONT         | = | <u>910.0</u>  | kg | TOTAL REAR        | = | <u>741.0</u> | kg |
| % of Total Weight   | = | <u>55.1%</u>  | %  | % of Total Weight | = | <u>44.9%</u> | %  |
| TOTAL TEST WEIGHT = |   | <u>1651.0</u> | kg |                   |   |              |    |

**TEST VEHICLE ATTITUDE (all dimensions in millimeters):****AS DELIVERED:**

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>718</u> | Right Front | <u>723</u> | Left Rear | <u>704</u> | Right Rear | <u>709</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

**FULLY LOADED:**

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>698</u> | Right Front | <u>717</u> | Left Rear | <u>654</u> | Right Rear | <u>669</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

**READY FOR TEST:**

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>706</u> | Right Front | <u>719</u> | Left Rear | <u>657</u> | Right Rear | <u>670</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

Test Vehicle Wheelbase: 2699 millimetersC.G. = 1211 millimeters rearward of front wheel centerline**TOTAL VEHICLE LENGTH:**

|              |             |             |
|--------------|-------------|-------------|
| Right Side = | <u>4679</u> | millimeters |
| Left Side =  | <u>4677</u> | millimeters |
| Centerline = | <u>4785</u> | millimeters |

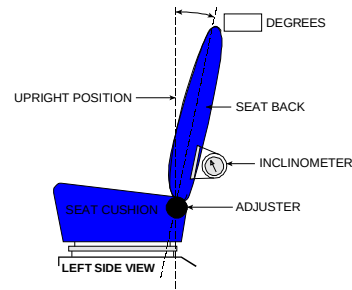
## DATA SHEET 1 (continued)

### GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101

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.



**FRONT SEAT ASSEMBLY**

FRONT SEAT CUSHION PLACEMENT: The seat was positioned following the Chief Counsel's Interpretation dated August 31, 1995. The seat was positioned in track detent 10 where the forward most is defined as 0.

Total Length of Adjustment Travel: 284 millimeters

Total Number of Adjustment Positions or Detents: 25 total positions (detents 0 through 24)

FRONT SEAT BACK ADJUSTMENT POSITION: Positioned so that the outboard lower seat frame is 19 degrees from vertical with the vehicle rocker panels level.

Seat Back Torso Angle: 24 degrees

SECOND POSITION SEAT:

Total Length of Fore/Aft Adjustment Travel: 0 millimeters

Seat Back Adjustment Position: Fixed

ADJUSTABLE STEERING COLUMN POSITION: Mid tilt and mid telescope.

WINDOW POSITIONS: Left Front: Closed Left Rear: Closed  
Right Front: Open Right Rear: Open

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

AUTOMATIC DOOR LOCKS: Is test vehicle equipped with ADLs? X Yes - No

Does vehicle owner's manual describe how to deactivate ADLs? - Yes X No - N/A

Comments: The test was conducted with the doors unlocked. However, this was a laboratory error. According to the Side NCAP laboratory test procedure, the test should have been conducted with the struck side doors locked, as this vehicle comes equipped with standard ADLs that cannot be deactivated by reading the owner's manual.

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

63.2 liters (Fuel Tank Usable Capacity)

58.3 liters used for test (92%-94% of Fuel Tank Usable Capacity)

LOCATION OF IMPACT POINT ON TEST VEHICLE SIDE TO BE IMPACTED:

Wheelbase = 2699 millimeters

Impact Point is 410 millimeters rearward of front axle centerline

(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 403 millimeters rearward of front axle centerline

## DATA SHEET 2

### TEST VEHICLE SUMMARY OF RESULTS

#### VEHICLE IDENTIFICATION:

Vehicle Year/Make/Model: 2004 Chevrolet Malibu

Body Style: 4-Door Sedan

VIN: 1G1ZS52F64F211389

NHTSA No.: G40101

Test Date: May 20, 2004

Overall Length = 4785 millimeters; Overall Width = 1769 millimeters

#### VEHICLE TEST WEIGHT (Pre-Test):

Left Front = 467.0 kg Left Rear = 402.5 kg

Right Front = 443.0 kg Right Rear = 338.5 kg

TOTAL FRONT = 910.0 kg TOTAL REAR = 741.0 kg

TOTAL VEHICLE WEIGHT 1651.0 kg

Wheelbase = 2699 millimeters

Longitudinal C.G. from Center of Front Axle = 1211 millimeters

Impact Angle with Respect to Impactor = 90 degrees

#### ACTUAL IMPACT POINT

Actual Impact Point is 7 mm forward of nominal impact ref. line (Lateral)

Actual Impact Point is 0 mm above/below nominal impact point (Vertical)

#### MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1 ( 240 mm above ground) = 117 millimeters

2. LEVEL 2 ( 463 mm above ground) = 295 millimeters

3. LEVEL 3 ( 601 mm above ground) = 284 millimeters

4. LEVEL 4 ( 848 mm above ground) = 275 millimeters

5. LEVEL 5 ( 1379 mm above ground) = 119 millimeters

Maximum Post-Test Intrusion = 295 millimeters

#### OCCUPANTS:

##### Front Passenger:

##### Rear Passenger:

Dummy Identification SID H3/269

SID H3/270

Restraints Used 3-point seat belt

3-point seat belt

#### INSTRUMENTATION:

Number of Vehicle Data Channels: = 26

Number of Cameras: Onboard = 3

Offboard = 8

TOTAL = 11

### DATA SHEET 3

#### MOVING DEFORMABLE BARRIER (MDB) SUMMARY

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore: 115A0204; 069B0304-2

---

POSITION OF IMPACT (MDB) ON MONORAIL:

Crabbed 27° to left

MDB DETAILS:

|                                                     |   |             |             |
|-----------------------------------------------------|---|-------------|-------------|
| Overall Width of Framework Carriage                 | = | <u>1250</u> | millimeters |
| Overall Length of MDB (incl. honeycomb impact face) | = | <u>4120</u> | millimeters |
| Wheelbase of Framework Carriage                     | = | <u>2590</u> | millimeters |
| Tread of Framework Carriage (Front & Rear)          | = | <u>1875</u> | millimeters |
| C.G. Location Rearward of Front Axle                | = | <u>1104</u> | millimeters |

MDB WEIGHT:

|                                              |   |               |         |            |   |              |    |
|----------------------------------------------|---|---------------|---------|------------|---|--------------|----|
| Left Front                                   | = | <u>409.5</u>  | kg      | Left Rear  | = | <u>281.5</u> | kg |
| Right Front                                  | = | <u>372.5</u>  | kg      | Right Rear | = | <u>299.0</u> | kg |
| TOTAL FRONT                                  | = | <u>782.0</u>  | kg      | TOTAL REAR | = | <u>580.5</u> | kg |
| TOTAL MDB WEIGHT                             | = | <u>1362.5</u> | kg      |            |   |              |    |
| Impact Angle (MDB C/L to Target Vehicle C/L) | = | <u>90</u>     | degrees |            |   |              |    |
| Impact Speed                                 | = | <u>62.12</u>  | kph     |            |   |              |    |

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

|                                    |   |            |             |
|------------------------------------|---|------------|-------------|
| 1. Row A at Center of Bumper Level | = | <u>170</u> | millimeters |
| 2. Row B at Top of Bumper Level    | = | <u>130</u> | millimeters |
| 3. Row C at Mid Level              | = | <u>165</u> | millimeters |
| 4. Row D at Top of Stack Level     | = | <u>189</u> | millimeters |

INSTRUMENTATION:

|                             |   |          |
|-----------------------------|---|----------|
| Number of MDB Data Channels | = | <u>5</u> |
|-----------------------------|---|----------|

**DATA SHEET 4****POST-TEST OBSERVATIONS**Vehicle: 2004 Chevrolet Malibu 4-Door SedanNHTSA No. G40101TEST DUMMY INFORMATION AND CONTACT POINTS:

| DESCRIPTION          | FRONT SEAT                                                                                           | REAR SEAT                            |
|----------------------|------------------------------------------------------------------------------------------------------|--------------------------------------|
| ATD Type/Serial No.  | SID H3/269                                                                                           | SID H3/270                           |
| Head Contact:        | Side of head to upper door trim, door sheet metal at the bottom of the window opening, and shoulder. | Top of head to upper C-pillar trim   |
| Upper Torso Contact: | Arm to door trim above arm rest                                                                      | Left arm to door trim above arm rest |
| Lower Torso Contact: | Pelvis to door trim below arm rest                                                                   | Pelvis to door trim below arm rest   |
| Left Knee Contact:   | Left knee to door trim                                                                               | Left knee to door trim               |
| Right Knee Contact:  | Right knee to left knee                                                                              | Right knee to left knee              |

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

| DESCRIPTION        | FRONT                         | REAR                            |
|--------------------|-------------------------------|---------------------------------|
| Left Side Doors    | Closed / Latched / Inoperable | Closed / Unlatched / Inoperable |
| Right Side Doors   | Closed / Latched / Operable   | Closed / Latched / Operable     |
| Hatch/Other Door   | -                             | -                               |
| Seat Movement (mm) | 0                             | -                               |
| Seat Back Failure  | None                          | None                            |

POST TEST STRUCTURAL OBSERVATIONS

| CRITICAL AREAS OF PERFORMANCE |                                                                                                                                                                                            |
|-------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pillar Performance            | Top of B-pillar spot welds separated from the lateral roof crossmember                                                                                                                     |
| Sill Separation               | None                                                                                                                                                                                       |
| Windshield Damage             | Windshield cracked along the driver side A-pillar                                                                                                                                          |
| Window Damage                 | Left side door windows shattered during the impact                                                                                                                                         |
| Other Notable Effects         | The P4 door unlatched during the impact and remained closed due to deformation. The distance from the outer door skin to the outer left quarter panel at the door latch height was 100 mm. |

AIR BAG DEPLOYMENT STATUS:

|                  | DRIVER | FRONT PASSENGER | REAR PASSENGER |
|------------------|--------|-----------------|----------------|
| Front Air Bag    | No     | Yes             | -              |
| Knee Bolster Bag | -      | -               | -              |
| Side Air Bag     | -      | -               | -              |
| Side Curtain Bag | -      | -               | -              |

MDB LEFT EDGE IMPACT DATA

| Measured Parameter | Units | Requirement | Value                  |
|--------------------|-------|-------------|------------------------|
| Horizontal Offset  | mm    | ± 50 mm     | 7 mm forward of target |
| Vertical Offset    | mm    | ± 20 mm     | 0 mm from target       |

## **SECTION 4**

### **OCCUPANT AND VEHICLE INFORMATION**

## DATA SHEET 5

### SID H3 INSTRUMENTATION DATA

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101

|                              |      | Front Dummy ID# 269 |             |                |             | Rear Dummy ID# 270 |             |                |             |
|------------------------------|------|---------------------|-------------|----------------|-------------|--------------------|-------------|----------------|-------------|
|                              |      | Pos. Direction      |             | Neg. Direction |             | Pos. Direction     |             | Neg. Direction |             |
|                              |      | Max (g)             | Time (msec) | Max (g)        | Time (msec) | Max (g)            | Time (msec) | Max (g)        | Time (msec) |
| <b>HEAD ACCELERATIONS:</b>   |      |                     |             |                |             |                    |             |                |             |
| Longitudinal                 | X    | 3.9                 | 17.9        | -118.8         | 68.3        | 11.5               | 47.0        | -16.4          | 79.4        |
| Lateral                      | Y    | 178.5               | 67.8        | -7.6           | 30.7        | 82.5               | 48.7        | -14.9          | 62.9        |
| Vertical                     | Z    | 65.6                | 47.7        | -9.9           | 69.5        | 30.4               | 49.3        | -39.5          | 61.1        |
| Resultant                    | R    | 213.5               | 68.2        | -              | -           | 87.1               | 49.1        | -              | -           |
| HIC                          |      | 1527.2              |             |                |             | 382.1              |             |                |             |
| <b>NECK FORCES:</b>          |      |                     |             |                |             |                    |             |                |             |
| Longitudinal                 | X    | 121.2               | 199.7       | -812.5         | 49.0        | 52.9†              | 107.6       | -36.7†         | 114.8       |
| Lateral                      | Y    | 641.9               | 62.2        | -324.9         | 30.8        | 216.1              | 132.1       | -554.0         | 61.6        |
| Vertical                     | Z    | 2759.4              | 48.7        | -184.2         | 15.8        | 703.0              | 42.6        | -1543.5        | 61.6        |
| Resultant                    | R    | 2918.9              | 48.7        | -              | -           | 1639.9†            | 61.6        | -              | -           |
| <b>NECK MOMENTS:</b>         |      |                     |             |                |             |                    |             |                |             |
| X                            |      | 71.2                | 66.2        | -92.7          | 38.7        | 12.8               | 150.0       | -139.5         | 56.9        |
| Y                            |      | 18.7                | 65.4        | -36.7          | 45.3        | 33.6               | 110.1       | -54.6          | 71.7        |
| Z                            |      | 18.1                | 64.4        | -14.5          | 35.2        | 24.1               | 98.6        | -20.0          | 57.4        |
| Resultant                    | R    | 95.0                | 38.9        | -              | -           | 141.9              | 57.0        | -              | -           |
| <b>RIB ACCELERATIONS:</b>    |      |                     |             |                |             |                    |             |                |             |
| Upper Rib Lateral            | Y    | 57.5                | 22.5        | -27.9          | 70.6        | 42.3               | 41.2        | -4.1           | 136.2       |
| Upper Rib Lateral            | Y(R) | 60.5                | 22.5        | -28.6          | 70.6        | 41.2               | 41.2        | -4.1           | 136.2       |
| Lower Rib Lateral            | Y    | 49.0                | 19.4        | -16.9          | 70.6        | 48.3               | 40.6        | -8.5           | 73.7        |
| Lower Rib Lateral            | Y(R) | 50.5                | 19.4        | -16.3          | 70.6        | 47.9               | 40.7        | -9.9           | 73.7        |
| <b>SPINE ACCELERATIONS:</b>  |      |                     |             |                |             |                    |             |                |             |
| Lower Lateral                | Y    | 80.3                | 27.5        | -22.7          | 63.7        | 52.2               | 48.1        | -3.5           | 78.7        |
| Lower Lateral                | Y(R) | 79.7                | 26.9        | -22.2          | 63.7        | 52.1               | 48.1        | -3.4           | 78.7        |
| <b>PELVIC ACCELERATIONS:</b> |      |                     |             |                |             |                    |             |                |             |
| Lateral                      | Y    | 88.5                | 26.2        | -17.5          | 50.6        | 59.5               | 35.6        | -5.3           | 68.1        |
| Lateral                      | Y(R) | 89.9                | 26.2        | -17.8          | 50.6        | 58.7               | 35.6        | -5.3           | 68.1        |

REFERENCE: Positive Direction: Longitudinal (X) = forward; Lateral (Y) = to right; Vertical (Z) = down

Note: Rib, Spine and Pelvis data has been FIR filtered, Y(R) denotes redundant Y direction accelerometer.

Head Accelerations and Neck Forces are filtered at SAE Class 1000, Neck Moments are filtered at SAE Class 600.

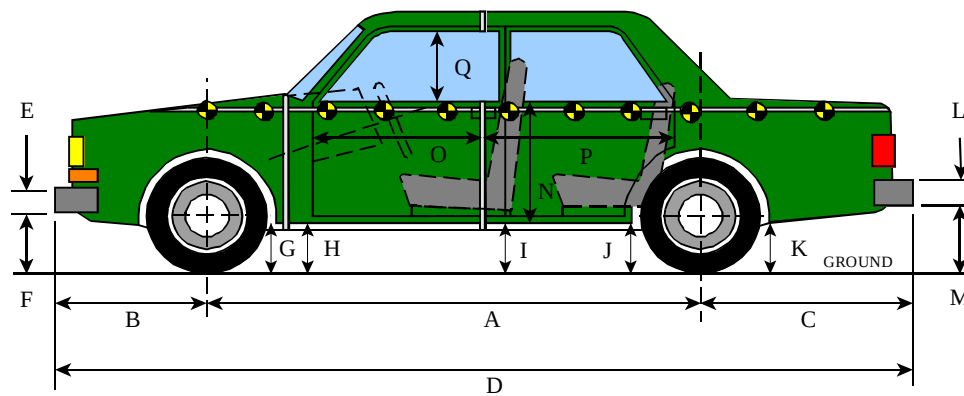
† P4 Upper Neck Fx data is questionable.

## DATA SHEET 6

### VEHICLE SIDE MEASUREMENTS

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



#### LEFT SIDE VIEW

NOTE: all dimensions are in millimeters with tolerance of  $\pm 3$  mm

|    | PRE-TEST<br>(as delivered) | PRE-TEST<br>(as tested) | POST-TEST<br>(as tested) | $\Delta$ CHANGE |
|----|----------------------------|-------------------------|--------------------------|-----------------|
| A  | 2703                       | 2699                    | 2664                     | -35             |
| B  | 975                        | 978                     | 1001                     | 23              |
| C  | 1107                       | 1108                    | 1101                     | -7              |
| D  | 4785                       | 4785                    | 4766                     | -19             |
| E  | 318                        | -                       | 319                      | 1               |
| F  | 232                        | 231                     | 257                      | 26              |
| G  | 214                        | 193                     | 194                      | 1               |
| H  | 212                        | 191                     | 189                      | -2              |
| I  | 214                        | 178                     | 166                      | -12             |
| J1 | 200                        | 158                     | 147                      | -11             |
| J2 | 215                        | 172                     | 148                      | -24             |
| K  | 257                        | 200                     | 218                      | 18              |
| L  | 278                        | -                       | 277                      | -1              |
| M  | 355                        | 291                     | 305                      | 14              |
| N  | 684                        | -                       | 610                      | -74             |
| O  | 769                        | -                       | 760                      | -9              |
| P  | 1180                       | -                       | 1076                     | -104            |
| Q  | 459                        | -                       | 442                      | -17             |
| R  | 4679                       | -                       | 4676                     | -3              |
| S  | 4677                       | -                       | 4644                     | -33             |
| T  | 1769                       | -                       | 1613                     | -156            |

D = Length at Centerline  
T = Width at B-Pillar

E&L = Bumper Thickness  
J1 = To Pinch Weld

R = Right Side Length  
J2 = To Sill

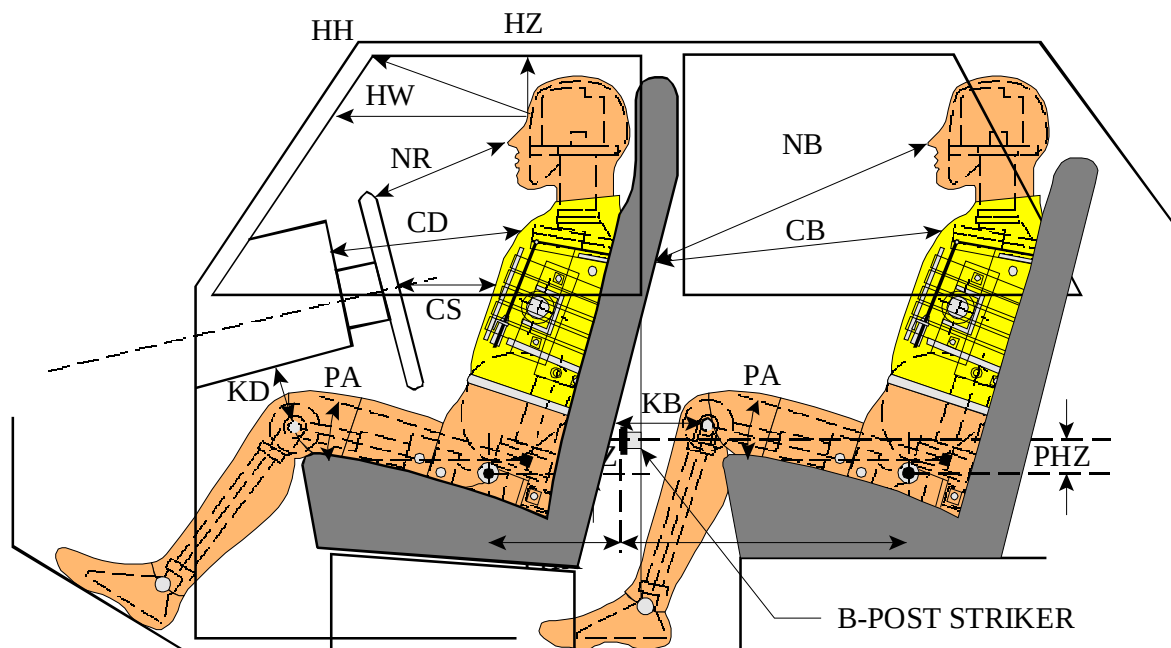
S = Left Side Length

## DATA SHEET 7

### SID H3 LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



### LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.  
REAR DUMMY PHX & PHZ  
MEASUREMENTS FOR A 4-DOOR  
VEHICLE WOULD USE THE C-POST  
STRIKER AS A REFERENCE POINT

NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm

|                     | DRIVER ID# 269 | LEFT REAR PASS. ID# 270 |
|---------------------|----------------|-------------------------|
| HH                  | 412            | N/A                     |
| HW                  | 747            | N/A                     |
| HZ                  | 208            | 156                     |
| NR/NB               | 454            | 623                     |
| CD/CB               | 574            | 567                     |
| CS                  | 338            | N/A                     |
| KDL(KDA°)/KBL(KDA°) | 174 / ( 35 °)  | 282 / ( 20 °)           |
| KDR(KBA°)/KBR(KBA°) | 178 / ( 40 °)  | 277 / ( 20 °)           |
| PA°                 | 23.2°          | 23.2°                   |
| PHX                 | 206            | 192                     |
| PHZ                 | 156            | 240                     |

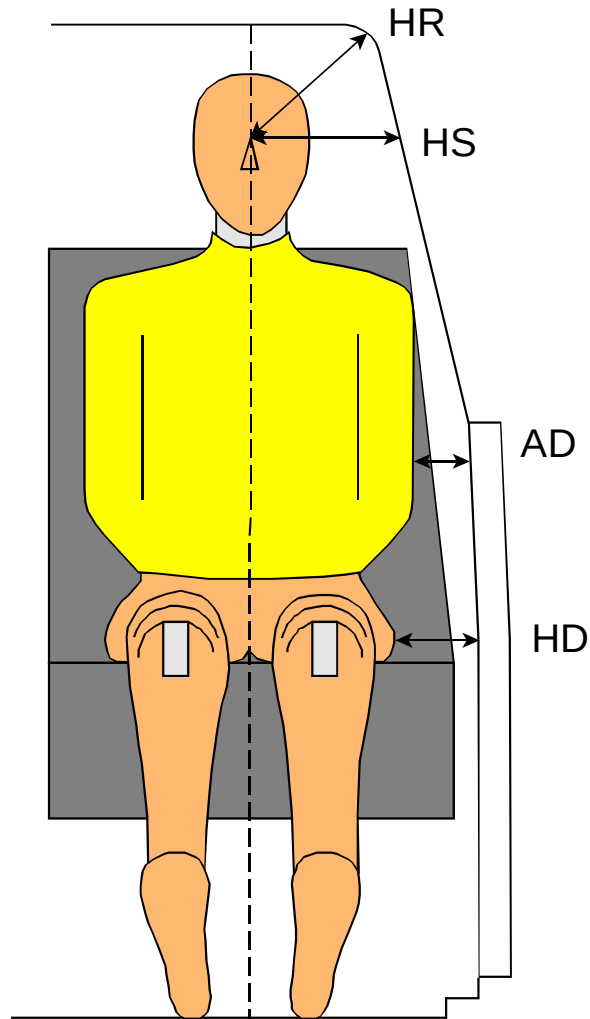
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

## DATA SHEET 8

### SID H3 LATERAL CLEARANCE DIMENSIONS

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm

|     | DRIVER ID # 269 |     |        |     | LEFT REAR PASS. ID # 270 |     |        |     |
|-----|-----------------|-----|--------|-----|--------------------------|-----|--------|-----|
| HR  | 241             |     |        |     | 221                      |     |        |     |
| HS  | 350             |     |        |     | 332                      |     |        |     |
| AD* | LOWER:          | 133 | UPPER: | 125 | LOWER:                   | 116 | UPPER: | 107 |
| HD  | 149             |     |        |     | 144                      |     |        |     |

\* Lower measurement is taken laterally at the center of the lower rib accelerometer height from the SID H3 arm to the closest part of the vehicle side.

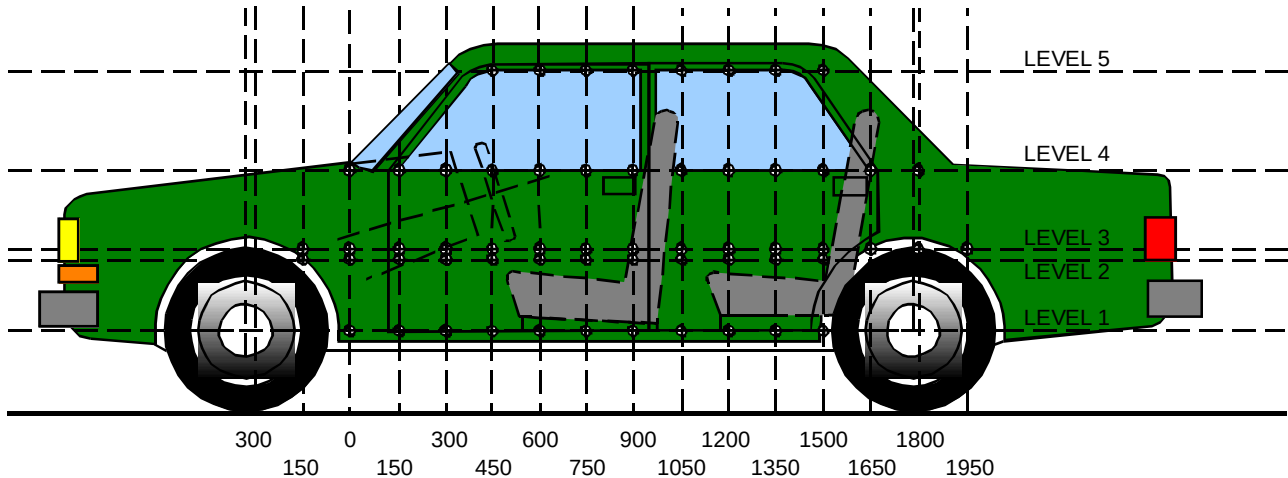
Upper measurement is taken laterally at the center of the upper rib accelerometer height from the SID H3 arm to the closest part of the vehicle side.

## DATA SHEET 9

### VEHICLE SIDE MEASUREMENTS

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



#### LEFT SIDE VIEW

NOTE: All measurements are in millimeters (mm)

LEVEL 5 - WINDOW TOP  
LEVEL 4 - WINDOW SILL  
LEVEL 3 - MID-DOOR  
LEVEL 2 - OCCUPANT H-POINT  
LEVEL 1 - AXLE CENTERLINE HEIGHT OR SILL TOP HEIGHT

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE "AS TESTED" CONFIGURATION.

Measurements Along the Vertical 750 mm Line Shown Above:

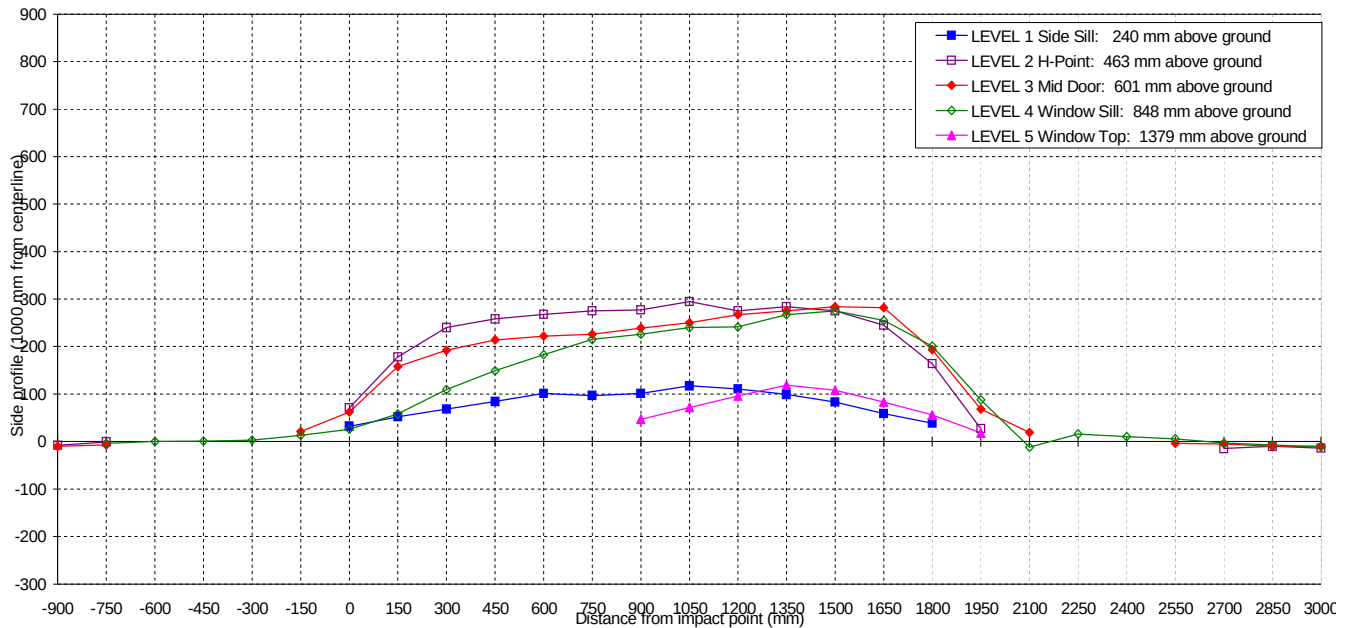
|                                                          |   |             |             |
|----------------------------------------------------------|---|-------------|-------------|
| Level 5 @ Window Top                                     | = | <u>1379</u> | millimeters |
| Level 4 @ Window Sill                                    | = | <u>848</u>  | millimeters |
| Level 3 @ Mid Door                                       | = | <u>601</u>  | millimeters |
| Level 2 @ Occupant H-Point                               | = | <u>463</u>  | millimeters |
| Level 1 @ Axle Centerline Height<br>(or Sill Top Height) | = | <u>240</u>  | millimeters |

# DATA SHEET 10

## VEHICLE EXTERIOR CRUSH PROFILES - ALL LEVELS

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



NOTE: All dimensions are in millimeters with a tolerance of  $\pm 3$  mm

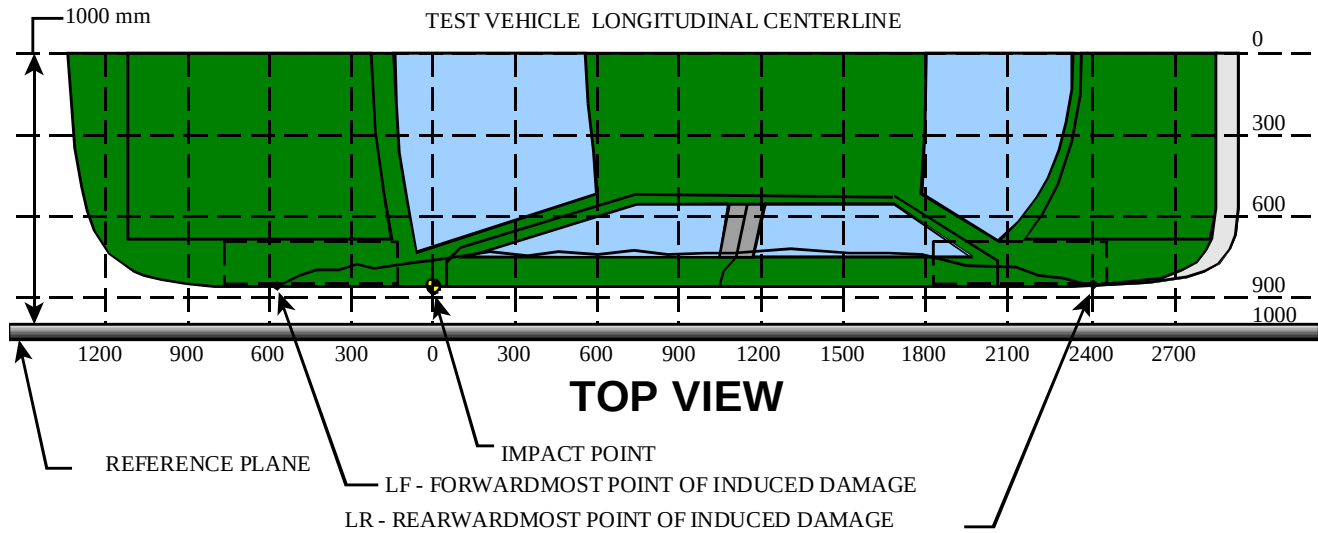
|                                   |             |       | DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT |      |      |      |      |      |     |     |     |     |     |     |     |      |      |      |      |      |      |      |      |      |      |      |      |      |      |     |
|-----------------------------------|-------------|-------|------------------------------------------------|------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|------|------|------|------|------|------|------|------|-----|
| LEVEL                             | HEIGHT (mm) |       | -900                                           | -750 | -600 | -450 | -300 | -150 | 0   | 150 | 300 | 450 | 600 | 750 | 900 | 1050 | 1200 | 1350 | 1500 | 1650 | 1800 | 1950 | 2100 | 2250 | 2400 | 2550 | 2700 | 2850 | 3000 |     |
| LEVEL 1<br><br>SIDE<br><br>SILL   | 240         | PRE   | --                                             | --   | --   | --   | --   | --   | 191 | 196 | 196 | 195 | 196 | 196 | 197 | 194  | 194  | 195  | 196  | 194  | 192  | --   | --   | --   | --   | --   | --   | --   | --   | --  |
|                                   |             | POST  | --                                             | --   | --   | --   | --   | --   | 223 | 248 | 264 | 279 | 297 | 293 | 298 | 311  | 305  | 294  | 279  | 253  | 231  | --   | --   | --   | --   | --   | --   | --   | --   | --  |
|                                   |             | CRUSH | N/A                                            | N/A  | N/A  | N/A  | N/A  | N/A  | 32  | 52  | 68  | 84  | 101 | 97  | 101 | 117  | 111  | 99   | 83   | 59   | 39   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A |
| LEVEL 2<br><br>H<br><br>POINT     | 463         | PRE   | 203                                            | 170  | --   | --   | --   | --   | 147 | 148 | 146 | 145 | 146 | 146 | 147 | 149  | 151  | 152  | 152  | 155  | 156  | 147  | --   | --   | --   | --   | --   | 181  | 195  | 208 |
|                                   |             | POST  | 195                                            | 169  | --   | --   | --   | --   | 218 | 326 | 386 | 403 | 414 | 421 | 424 | 444  | 426  | 436  | 427  | 400  | 320  | 174  | --   | --   | --   | --   | --   | 166  | 185  | 194 |
|                                   |             | CRUSH | -8                                             | -1   | N/A  | N/A  | N/A  | N/A  | 71  | 178 | 240 | 258 | 268 | 275 | 277 | 295  | 275  | 284  | 275  | 245  | 164  | 27   | N/A  | N/A  | N/A  | N/A  | N/A  | -15  | -10  | -14 |
| LEVEL 3<br><br>MID<br><br>DOOR    | 601         | PRE   | 210                                            | 176  | --   | --   | --   | 138  | 137 | 136 | 133 | 132 | 133 | 133 | 133 | 135  | 138  | 137  | 137  | 134  | 139  | 141  | 132  | --   | --   | 155  | 167  | 185  | 200  |     |
|                                   |             | POST  | 200                                            | 169  | --   | --   | --   | 159  | 199 | 294 | 325 | 346 | 355 | 359 | 372 | 385  | 405  | 412  | 421  | 416  | 333  | 209  | 151  | --   | --   | 151  | 162  | 175  | 190  |     |
|                                   |             | CRUSH | -10                                            | -7   | N/A  | N/A  | N/A  | 21   | 62  | 158 | 192 | 214 | 222 | 226 | 239 | 250  | 267  | 275  | 284  | 282  | 194  | 68   | 19   | N/A  | N/A  | -4   | -5   | -10  | -10  |     |
| LEVEL 4<br><br>WINDOW<br><br>SILL | 848         | PRE   | --                                             | 245  | 220  | 202  | 192  | 181  | 176 | 170 | 166 | 162 | 160 | 155 | 152 | 152  | 153  | 152  | 152  | 153  | 153  | 133  | 159  | 172  | 180  | 187  | 197  | 207  | 220  |     |
|                                   |             | POST  | --                                             | 241  | 220  | 203  | 195  | 194  | 202 | 228 | 275 | 311 | 343 | 370 | 378 | 392  | 394  | 419  | 427  | 408  | 354  | 221  | 147  | 188  | 190  | 193  | 194  | 200  | 209  |     |
|                                   |             | CRUSH | N/A                                            | -4   | 0    | 1    | 3    | 13   | 26  | 58  | 109 | 149 | 183 | 215 | 226 | 240  | 241  | 267  | 275  | 255  | 201  | 88   | -12  | 16   | 10   | 6    | -3   | -7   | -11  |     |
| LEVEL 5<br><br>WINDOW<br><br>TOP  | 1379        | PRE   | --                                             | --   | --   | --   | --   | --   | --  | --  | --  | --  | --  | --  | 429 | 415  | 412  | 411  | 413  | 416  | 426  | 518  | --   | --   | --   | --   | --   | --   | --   |     |
|                                   |             | POST  | --                                             | --   | --   | --   | --   | --   | --  | --  | --  | --  | --  | --  | 476 | 487  | 508  | 530  | 521  | 499  | 482  | 536  | --   | --   | --   | --   | --   | --   | --   | --  |
|                                   |             | CRUSH | N/A                                            | N/A  | N/A  | N/A  | N/A  | N/A  | N/A | N/A | N/A | N/A | N/A | N/A | N/A | 47   | 72   | 96   | 119  | 108  | 83   | 56   | 18   | N/A  | N/A  | N/A  | N/A  | N/A  | N/A  | N/A |

## DATA SHEET 11

### VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



MEASUREMENT CONVENTIONS:  
 Forward of the impact point (towards front of vehicle) is considered negative (—).  
 Rearward of the impact point (toward rearend of vehicle) is considered positive (+).

NOTE: All dimensions are in millimeters with tolerance of  $\pm 3$  mm.

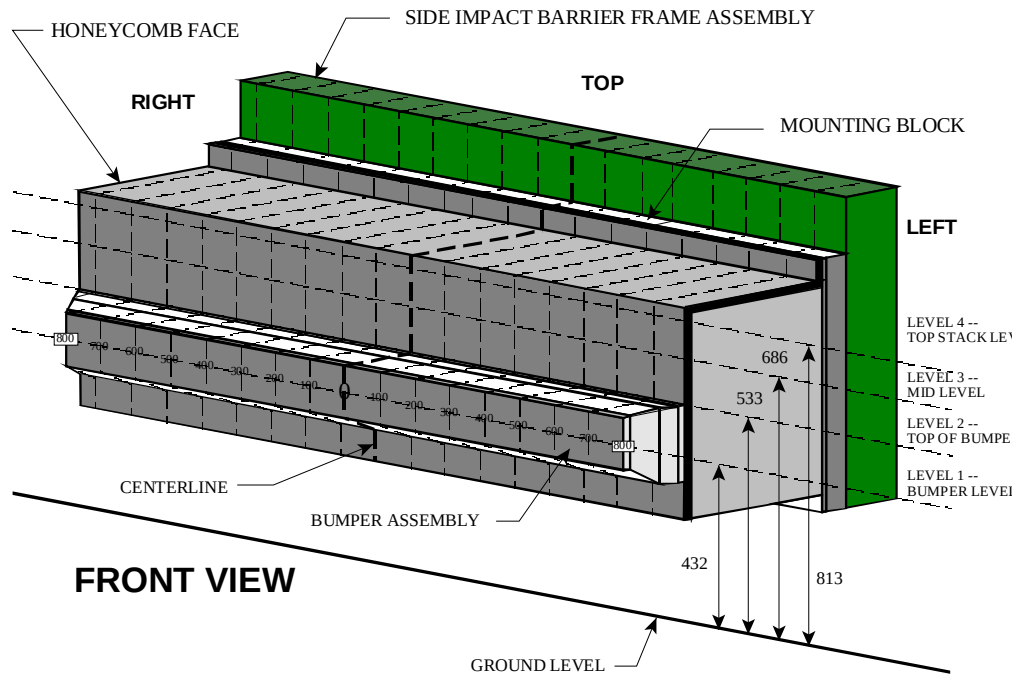
| DPD MEASUREMENTS |                | POST TEST (mm) | PRETEST (mm) | STATIC CRUSH (mm) |
|------------------|----------------|----------------|--------------|-------------------|
| 1                | (LR = 2100 mm) | 151            | 132          | 19                |
| 2                | 1600           | 418            | 135          | 283               |
| 3                | 1100           | 438            | 150          | 288               |
| 4                | 600            | 414            | 146          | 268               |
| 5                | 100            | 290            | 148          | 142               |
| 6                | (LF = -400 mm) | 200            | 199          | 1                 |

## DATA SHEET 12

### EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



NOTE: Dimensions are shown in millimeters, mm

NOTE: All dimensions are in millimeters with a tolerance of  $\pm 3$  mm

|                          |                    |       | DISTANCE RIGHT OF CENTER (mm) |     |     |     |     |     |     |     |     |     |     | DISTANCE LEFT OF CENTER (mm) |     |     |     |     |     |  |  |
|--------------------------|--------------------|-------|-------------------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------------------------------|-----|-----|-----|-----|-----|--|--|
| LEVEL                    | HEIGHT AT CL (mm)* |       | 800                           | 700 | 600 | 500 | 400 | 300 | 200 | 100 | 0   | 100 | 200 | 300                          | 400 | 500 | 600 | 700 | 800 |  |  |
| LEVEL 4<br>TOP<br>STACK  | 813                | PRE   | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 |  |  |
|                          |                    | POST  | 666                           | 628 | 625 | 624 | 618 | 634 | 642 | 647 | 647 | 636 | 644 | 648                          | 658 | 680 | 710 | 746 | 808 |  |  |
|                          |                    | CRUSH | 47                            | 9   | 6   | 5   | -1  | 15  | 23  | 28  | 28  | 17  | 25  | 29                           | 39  | 61  | 91  | 127 | 189 |  |  |
| LEVEL 3<br>MID<br>LEVEL  | 686                | PRE   | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 |  |  |
|                          |                    | POST  | 673                           | 631 | 621 | 622 | 626 | 637 | 641 | 632 | 631 | 632 | 636 | 642                          | 642 | 652 | 678 | 723 | 784 |  |  |
|                          |                    | CRUSH | 54                            | 12  | 2   | 3   | 7   | 18  | 22  | 13  | 12  | 13  | 17  | 23                           | 23  | 33  | 59  | 104 | 165 |  |  |
| LEVEL 2<br>TOP<br>BUMPER | 533                | PRE   | 619                           | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619 | 619                          | 619 | 619 | 619 | 619 | 619 |  |  |
|                          |                    | POST  | 715                           | 701 | 690 | 676 | 678 | 676 | 673 | 674 | 680 | 684 | 688 | 692                          | 693 | 700 | 710 | 725 | 749 |  |  |
|                          |                    | CRUSH | 96                            | 82  | 71  | 57  | 59  | 57  | 54  | 55  | 61  | 65  | 69  | 73                           | 74  | 81  | 91  | 106 | 130 |  |  |
| LEVEL 1<br>MID<br>BUMPER | 432                | PRE   | 535                           | 519 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518 | 518                          | 518 | 518 | 518 | 519 | 535 |  |  |
|                          |                    | POST  | 705                           | 658 | 627 | 608 | 605 | 613 | 601 | 603 | 606 | 610 | 615 | 618                          | 625 | 628 | 639 | 662 | 704 |  |  |
|                          |                    | CRUSH | 170                           | 139 | 109 | 90  | 87  | 95  | 83  | 85  | 88  | 92  | 97  | 100                          | 107 | 110 | 121 | 143 | 169 |  |  |

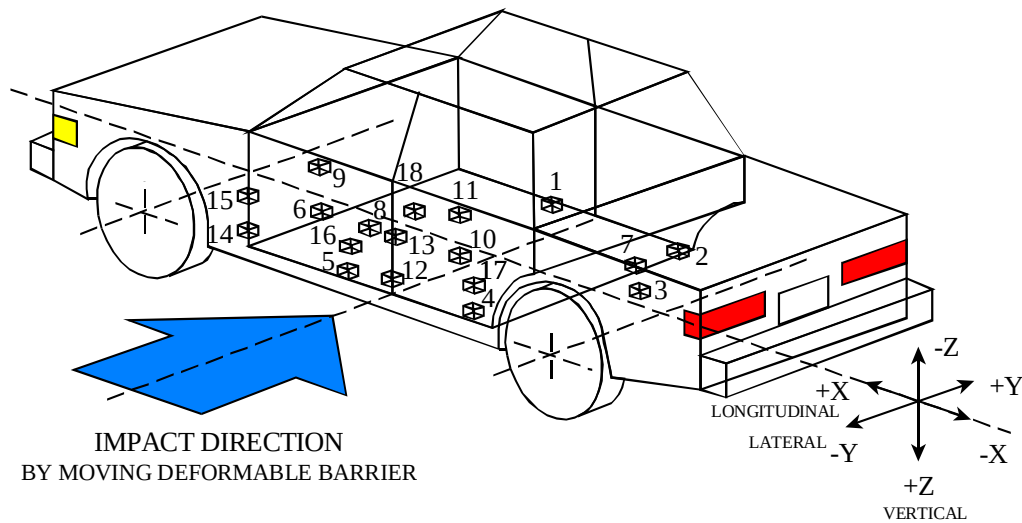
\*Heights measured above ground level.

## DATA SHEET 13

### TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



- |                                    |                                    |
|------------------------------------|------------------------------------|
| 1-Right Side Sill @ Front Seat     | 10-Midrear of Left Rear Door       |
| 2-Right Side Sill @ Rear Seat      | 11-Left Rear Door Upper Centerline |
| 3-Rear Floorpan Above Axle         | 12-Left Lower B-Pillar             |
| 4-Left Side Sill @ Rear Seat       | 13-Left Middle B-Pillar            |
| 5-Left Side Sill @ Front Seat      | 14-Left Lower A-Pillar             |
| 6-Left Front Door on Centerline    | 15-Left Middle A-Pillar            |
| 7-Right Rear Occupant Compartment  | 16-Front Seat Track                |
| 8-Midrear of Left Front Door       | 17-Rear Seat Track                 |
| 9-Left Front Door Upper Centerline | 18-Vehicle CG                      |

**DATA SHEET 13 (continued)**

**VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101

| Accel.<br>No. | Location                         | Coordinates (mm)±3<br>mm |      |      |              | Long. (x)   |                | Lat. (y)        |                | Vert. (z)    |                | Resultant  |                |
|---------------|----------------------------------|--------------------------|------|------|--------------|-------------|----------------|-----------------|----------------|--------------|----------------|------------|----------------|
|               |                                  |                          |      |      |              | Max<br>(g)  | Time<br>(msec) | Max<br>(g)      | Time<br>(msec) | Max<br>(g)   | Time<br>(msec) | Max<br>(g) | Time<br>(msec) |
|               |                                  | X*                       | Y*   | Z*   |              |             |                |                 |                |              |                |            |                |
| 1             | Right Side Sill at Front Seat    | 2827                     | 687  | -269 | pos.<br>neg. | 5.2<br>-8.1 | 58.0<br>12.7   | 24.9<br>-2.8    | 7.7<br>157.4   | 6.5<br>-8.6  | 40.7<br>9.3    | 25.9<br>-  | 7.9<br>-       |
| 2             | Right Side Sill at Rear Seat     | 2141                     | 658  | -214 | pos.<br>neg. | 5.4<br>-7.6 | 58.0<br>13.2   | 26.9<br>-2.2    | 20.4<br>156.5  | 6.4<br>-7.8  | 54.5<br>22.7   | 27.2<br>-  | 20.5<br>-      |
| 3             | Rear Floorpan Above Axle         | 1340                     | -20  | -410 | pos.<br>neg. | 2.9<br>-8.0 | 74.3<br>28.5   | 25.3<br>-3.5    | 27.5<br>122.4  | 8.4<br>-10.3 | 22.7<br>44.8   | 26.5<br>-  | 27.5<br>-      |
| 4             | Left Side Sill at Rear Seat      | 2149                     | -648 | -220 | pos.<br>neg. | -<br>-      | -<br>-         | 69.4<br>-14.2   | 7.4<br>23.2    | -<br>-       | -<br>-         | -<br>-     | -<br>-         |
| 5             | Left Side Sill at Front Seat     | 2910                     | -623 | -274 | pos.<br>neg. | -<br>-      | -<br>-         | 100.3<br>-54.0  | 4.2<br>14.9    | -<br>-       | -<br>-         | -<br>-     | -<br>-         |
| 6             | Left Front Door on Centerline    | 2710                     | -713 | -670 | pos.<br>neg. | -<br>-      | -<br>-         | 166.6<br>-74.8  | 8.1<br>20.4    | -<br>-       | -<br>-         | -<br>-     | -<br>-         |
| 7             | Right Rear Occupant Compartment  | 2021                     | 366  | -175 | pos.<br>neg. | -<br>-      | -<br>-         | 24.0<br>-2.0    | 19.9<br>156.7  | -<br>-       | -<br>-         | -<br>-     | -<br>-         |
| 8             | Midrear of Left Front Door       | 2565                     | -636 | -647 | pos.<br>neg. | -<br>-      | -<br>-         | 167.6<br>-107.6 | 7.9<br>20.3    | -<br>-       | -<br>-         | -<br>-     | -<br>-         |
| 9             | Left Front Door Upper Centerline | 2683                     | -699 | -863 | pos.<br>neg. | -<br>-      | -<br>-         | 252.9<br>-153.4 | 14.4<br>22.7   | -<br>-       | -<br>-         | -<br>-     | -<br>-         |
| 10            | Midrear of Left Rear Door        | 1665                     | -653 | -664 | Pos.<br>neg. | -<br>-      | -<br>-         | 143.7<br>-84.7  | 16.3<br>27.1   | -<br>-       | -<br>-         | -<br>-     | -<br>-         |
| 11            | Left Rear Door Upper Centerline  | 1752                     | -703 | -906 | pos.<br>neg. | -<br>-      | -<br>-         | 176.7<br>-189.1 | 17.1<br>30.6   | -<br>-       | -<br>-         | -<br>-     | -<br>-         |

\*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

4-11

8745-01

# DATA SHEET 13 (continued)

## VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101

| Accel.<br>No. | Location             | Coordinates (mm)±3<br>mm |      |      |      | Long. (x)  |                | Lat. (y)   |                | Vert. (z)  |                | Resultant  |                |
|---------------|----------------------|--------------------------|------|------|------|------------|----------------|------------|----------------|------------|----------------|------------|----------------|
|               |                      |                          |      |      |      | Max<br>(g) | Time<br>(msec) | Max<br>(g) | Time<br>(msec) | Max<br>(g) | Time<br>(msec) | Max<br>(g) | Time<br>(msec) |
|               |                      | X*                       | Y*   | Z*   |      |            |                |            |                |            |                |            |                |
| 12            | Left Lower B-Pillar  | 2259                     | -659 | -409 | pos. | -          | -              | 631.5†     | 99.9           | -          | -              | -          | -              |
|               |                      |                          |      |      | neg. | -          | -              | -355.7†    | 74.2           | -          | -              | -          | -              |
| 13            | Left Middle B-Pillar | 2200                     | -674 | -734 | pos. | -          | -              | 273.3††    | 5.5            | -          | -              | -          | -              |
|               |                      |                          |      |      | neg. | -          | -              | -291.8††   | 30.5           | -          | -              | -          | -              |
| 14            | Left Lower A-Pillar  | 3299                     | -648 | -380 | pos. | -          | -              | 130.2      | 4.3            | -          | -              | -          | -              |
|               |                      |                          |      |      | neg. | -          | -              | -81.8      | 51.4           | -          | -              | -          | -              |
| 15            | Left Middle A-Pillar | 3256                     | -661 | -950 | pos. | -          | -              | 24.2       | 7.4            | -          | -              | -          | -              |
|               |                      |                          |      |      | neg. | -          | -              | -15.6      | 54.7           | -          | -              | -          | -              |
| 16            | Front Seat Track     | 2378                     | -567 | -251 | pos. | -          | -              | 57.8‡      | 5.9            | -          | -              | -          | -              |
|               |                      |                          |      |      | neg. | -          | -              | -57.1‡     | 19.6           | -          | -              | -          | -              |
| 17            | Rear Seat Track      | 1241                     | -486 | -496 | pos. | -          | -              | 25.0       | 20.0           | -          | -              | -          | -              |
|               |                      |                          |      |      | neg. | -          | -              | -3.6       | 121.2          | -          | -              | -          | -              |
| 18            | Vehicle CG           | 2651                     | 68   | -414 | pos. | 22.3       | 20.7           | 90.2       | 19.8           | 36.0       | 24.0           | 102.5      | 19.9           |
|               |                      |                          |      |      | neg. | -26.3      | 25.0           | -46.7      | 23.7           | -44.9      | 19.8           | -          | -              |

\*Reference: X - Rear Bumper (+ Forward)

Y - Vehicle Centerline (+ To Right) Z - Ground Level (+ Down)

† Questionable Data: After 13 ms

†† Questionable Data: After 29 ms

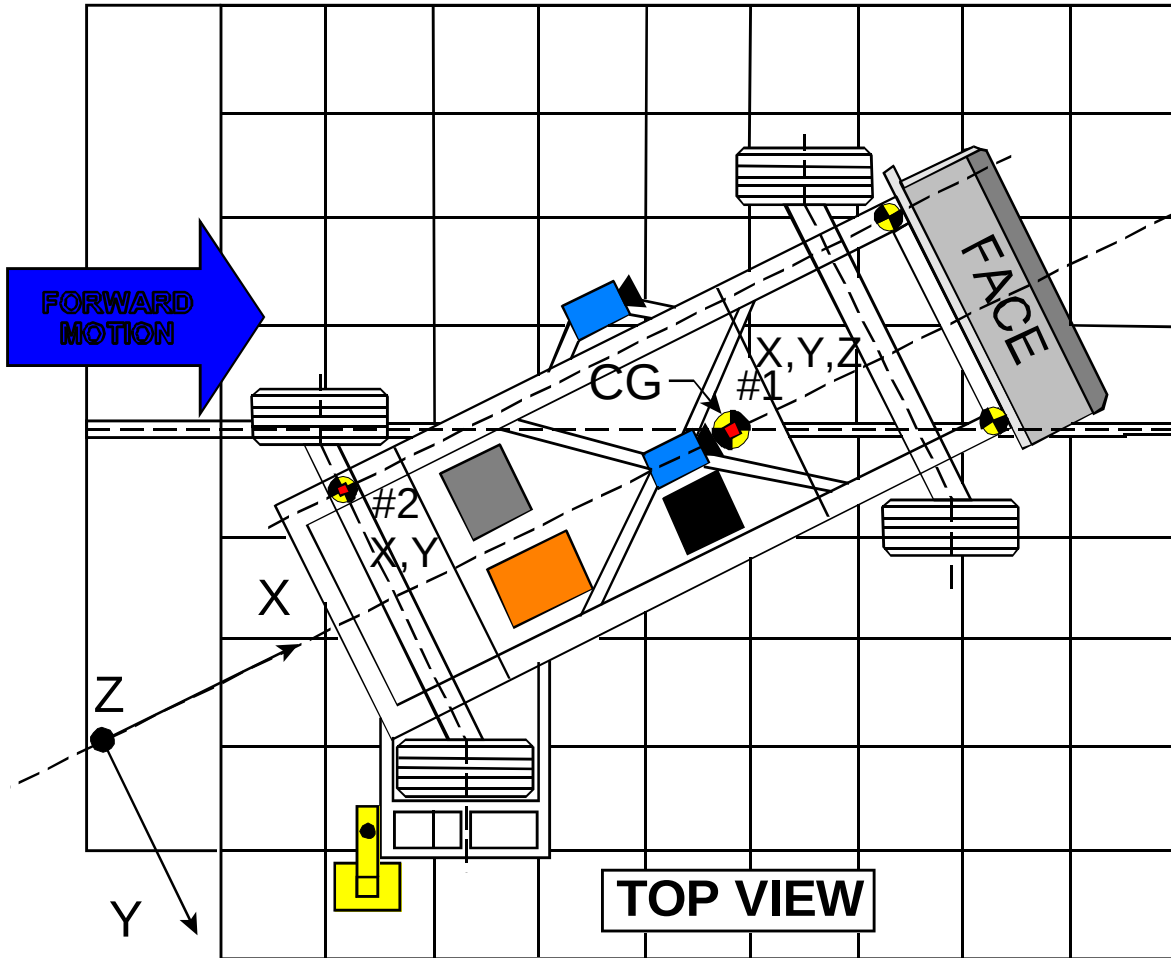
‡ Questionable Data: After 9 ms

# DATA SHEET 14

## MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



| Accel. No. | Location              | Coordinates (millimeters) |      |      | Pos. Direct. |             | Neg. Direct. |             |
|------------|-----------------------|---------------------------|------|------|--------------|-------------|--------------|-------------|
|            |                       | X*                        | Y*   | Z*   | Max (g)      | Time (msec) | Max (g)      | Time (msec) |
|            |                       |                           |      |      |              |             |              |             |
| 1          | MDB Center of Gravity |                           |      |      |              |             |              |             |
|            | Longitudinal... X     | 1859                      | 0    | -330 | 1.2          | 113.0       | -20.5        | 33.5        |
|            | Lateral..... Y        |                           |      |      | 0.6          | 56.7        | -7.6         | 25.2        |
|            | Vertical..... Z       |                           |      |      | 12.6         | 60.9        | -15.0        | 67.4        |
|            | Resultant..... R      |                           |      |      | 23.9         | 39.8        | -            | -           |
| 2          | Rear Frame Member     |                           |      |      |              |             |              |             |
|            | Longitudinal... X     | 386                       | -660 | -660 | 1.8          | 145.0       | -22.6        | 34.4        |
|            | Lateral..... Y        |                           |      |      | 4.8          | 18.6        | -1.5         | 177.5       |

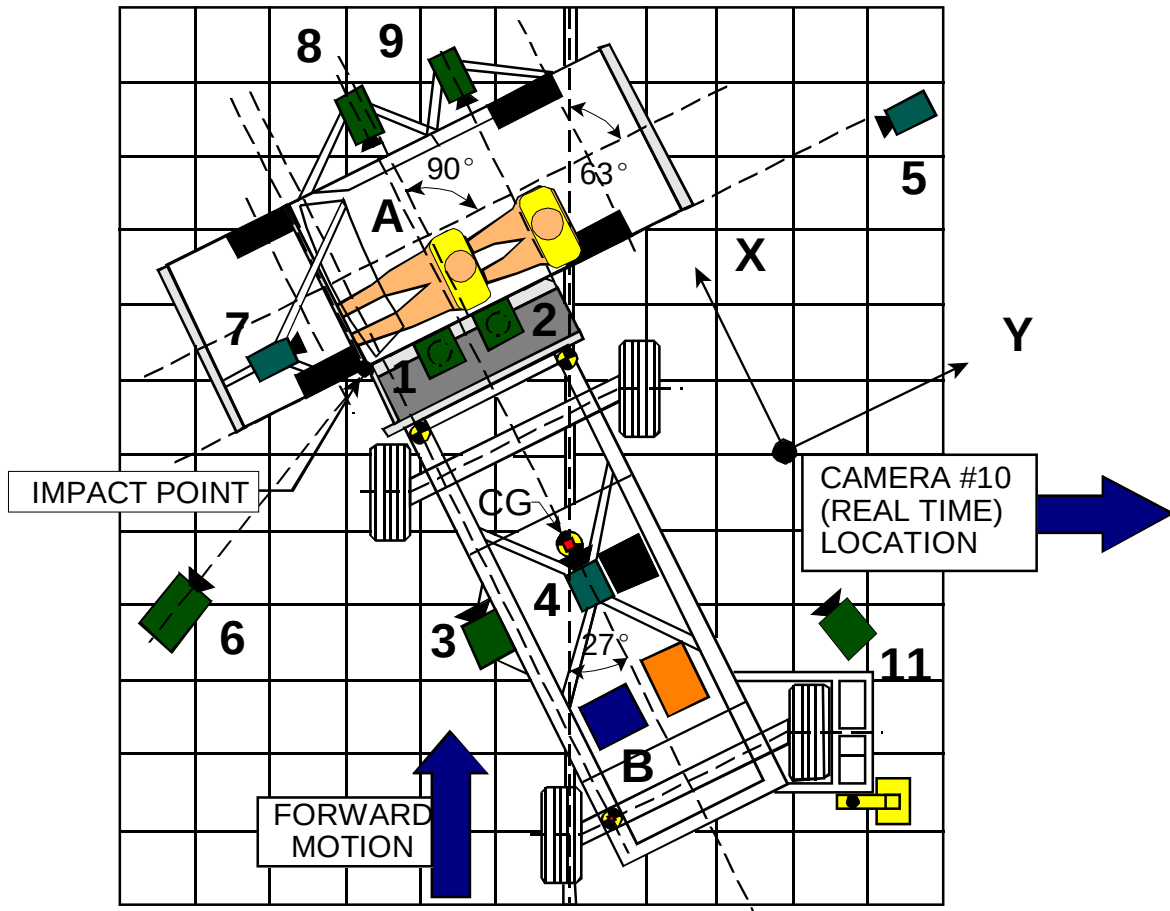
\*Reference: X = Rear Bumper (+ Forward)  
Y = Vehicle Centerline (+ To Right)  
Z = Ground Level (+ Down)  
All measurements accurate to within  $\pm 3$  mm.

# DATA SHEET 15

## HIGH SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No. G40101



| Camera No. | View                                     | Coordinates (millimeters) |       |       | Angle (deg.) | Lens (mm) | Film Speed (fps) |
|------------|------------------------------------------|---------------------------|-------|-------|--------------|-----------|------------------|
|            |                                          | X*                        | Y*    | Z*    |              |           |                  |
| 1          | Overhead view of test vehicle            | 102                       | 828   | -4880 | -90          | 8         | 1030             |
| 2          | Overhead closeup view of impact plane    | 225                       | 870   | -4880 | -90          | 12.5      | 1000             |
| 3          | MDB onboard closeup view of impact point | -1470                     | 0     | -847  | 0            | 13        | 1000             |
| 4          | MDB onboard view of driver dummy         | -1140                     | 838   | -1586 | -17          | 7.5       | 1005             |
| 5          | Right side ground level overall view     | 175                       | 9002  | -1092 | -3           | 25        | 1015             |
| 6          | Left side ground level overall view      | -1820                     | -1625 | -1082 | -8           | 13        | 1010             |
| 7          | Test vehicle onboard driver front view   | 485                       | -455  | -1257 | -12          | 13        | 1005             |
| 8          | Test vehicle onboard driver side view    | 1812                      | 848   | -1022 | -8           | 8         | 870              |
| 9          | Test vehicle onboard passenger side view | 1784                      | 1696  | -1015 | -6           | 8         | 1005             |
| 10         | Real time film coverage of test          | -                         | -     | -     | -            | -         | 24               |
| 11         | Secondary impact point view              | 3862                      | 3175  | -1038 | -3           | 25        | 990              |

\* Reference (from point of impact); all measurements accurate to within  $\pm 6$  mm.

X = (Impact Point) + Forward

Y = (Impact Point) + To Right

Z = (Ground Level) + Down

## **SECTION 5**

### **FUEL SYSTEM INTEGRITY**

## DATA SHEET 16

### FMVSS 301 FUEL SYSTEM INTEGRITY DATA

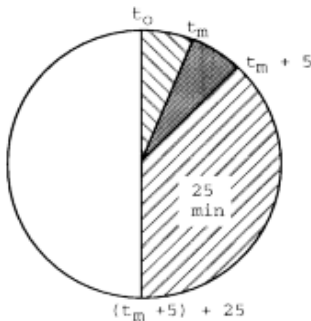
NHTSA No.: G40101 TEST DATE: May 20, 2004  
 Vehicle Mfgr./Make/Model: General Motors Corporation 2004 Chevrolet Malibu 4-Door Sedan

\*\*\*\*\*

**TEST VEHICLE IMPACT TYPE:**

- Frontal (48.28 kph)
- Oblique (48.28 kph) with      ° barrier face first  
 contacting the      side  
 (driver/passenger)
- Rear Moving Barrier (48.28 kph)
- Lateral Moving Barrier (32.19 kph)
- X   - Side Impact Moving Deformable Barrier (62.0 kph)  
 contacting the      driver side      side  
 (driver/passenger)

**FUEL SPILLAGE MEASUREMENT:**



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

| ACTUAL | MAX ALLOWED |
|--------|-------------|
| 0 g    | 28 g        |
| 0 g    | 142 g       |
| 0 g    | 28 g/1 min. |

**SOLVENT SPILLAGE DETAILS:**

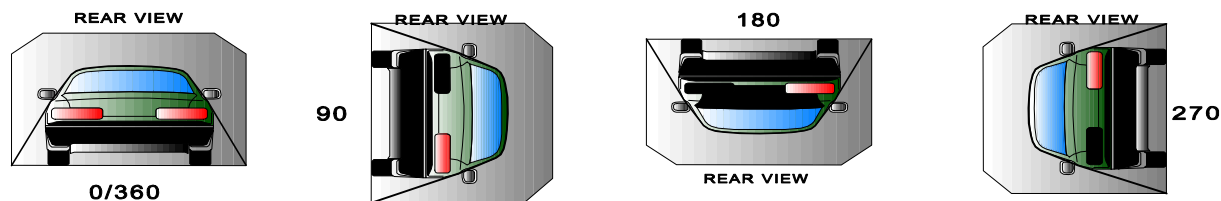
None

## DATA SHEET 17

### ROLLOVER DATA

Vehicle: 2004 Chevrolet Malibu 4-Door Sedan

NHTSA No.: G40101



#### I. DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

| Rollover Stage | Rotation Time (spec. 1 -3 min) |         |    |         | FMVSS 301 Hold Time |         | Total Time |         |    |         | Next Whole Minute Interval |         |
|----------------|--------------------------------|---------|----|---------|---------------------|---------|------------|---------|----|---------|----------------------------|---------|
| 0° - 90°       | 1                              | minutes | 14 | seconds | 5                   | minutes | 6          | minutes | 14 | seconds | 7                          | minutes |
| 90° - 180°     | 1                              | minutes | 13 | seconds | 5                   | minutes | 6          | minutes | 13 | seconds | 7                          | minutes |
| 180°-270°      | 1                              | minutes | 12 | seconds | 5                   | minutes | 6          | minutes | 12 | seconds | 7                          | minutes |
| 270°-360°      | 1                              | minutes | 15 | seconds | 5                   | minutes | 6          | minutes | 15 | seconds | 7                          | minutes |

#### II. FMVSS 301 REQUIREMENTS: (Maximum allowable solvent spillage):

| First 5 minutes from onset of rotation | 6th min. | 7th min. | 8th min. (if required) |
|----------------------------------------|----------|----------|------------------------|
| 142 g                                  | 28 g     | 28 g     | 28 g                   |

#### III. ACTUAL TEST VEHICLE SOLVENT SPILLAGE:

| Rollover Stage | First 5 minutes from onset of rotation (g) | 6th min. (g) | 7th min. (g) | 8th min. (if required) (g) |
|----------------|--------------------------------------------|--------------|--------------|----------------------------|
| 0° - 90°       | 0                                          | 0            | 0            | -                          |
| 90° - 180°     | 0                                          | 0            | 0            | -                          |
| 180°-270°      | 0                                          | 0            | 0            | -                          |
| 270°-360°      | 0                                          | 0            | 0            | -                          |

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

#### IV. SOLVENT SPILLAGE LOCATION(S):

| Rollover Stage | Spillage Location |
|----------------|-------------------|
| 0° - 90°       | None              |
| 90° - 180°     | None              |
| 180°-270°      | None              |
| 270°-360°      | None              |

## **APPENDIX A**

### **PHOTOGRAPHS**

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| Figure A- 13  | PRE-TEST RIGHT REAR VIEW OF TEST VEHICLE                         | A- 15       |
| Figure A- 14  | POST-TEST RIGHT REAR VIEW OF TEST VEHICLE                        | A- 16       |
| Figure A- 15  | PRE-TEST FRONTAL VIEW OF IMPACTOR FACE                           | A- 17       |
| Figure A- 16  | POST-TEST FRONTAL VIEW OF IMPACTOR FACE                          | A- 18       |
| Figure A- 17  | PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE                         | A- 19       |
| Figure A- 18  | POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE                        | A- 20       |
| Figure A- 19  | PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE                        | A- 21       |
| Figure A- 20  | POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE                       | A- 22       |
| Figure A- 21  | PRE-TEST TOP VIEW OF IMPACTOR FACE                               | A- 23       |
| Figure A- 22  | POST-TEST TOP VIEW OF IMPACTOR FACE                              | A- 24       |
| Figure A- 23  | PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE                | A- 25       |
| Figure A- 24  | POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE                       | A- 26       |
| Figure A- 25  | PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3         | A- 27       |
| Figure A- 26  | POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3        | A- 28       |
| Figure A- 27  | PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3          | A- 29       |
| Figure A- 28  | POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3         | A- 30       |
| Figure A- 29  | PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3          | A- 31       |
| Figure A- 30  | POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3         | A- 32       |
| Figure A- 31  | PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3           | A- 33       |
| Figure A- 32  | POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3          | A- 34       |
| Figure A- 33  | PRE-TEST INTERIOR OF FRONT DOOR                                  | A- 35       |
| Figure A- 34  | POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS | A- 36       |
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| Figure A- 36  | POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS  | A- 38       |
| Figure A- 37  | PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION    | A- 39       |
| Figure A- 38  | PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION   | A- 40       |
| Figure A- 39  | POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET                   | A- 41       |
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| Figure A- 43  | ROLLOVER 90 DEGREES                                              | A- 45       |
| Figure A- 44  | ROLLOVER 180 DEGREES                                             | A- 46       |
| Figure A- 45  | ROLLOVER 270 DEGREES                                             | A- 47       |
| Figure A- 46  | ROLLOVER 360 DEGREES                                             | A- 48       |



Figure A-1 PRE-TEST FRONTAL VIEW OF TEST VEHICLE



Figure A-2 POST-TEST FRONTAL VIEW OF TEST VEHICLE



Figure A-3 PRE-TEST REAR VIEW OF TEST VEHICLE



Figure A-4 POST-TEST REAR VIEW OF TEST VEHICLE



Figure A-5 PRE-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



Figure A-6 POST-TEST IMPACTED SIDE VIEW OF TEST VEHICLE



Figure A-7 PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE



Figure A-8 POST-TEST LEFT FRONT VIEW OF TEST VEHICLE



Figure A-9 PRE-TEST LEFT REAR VIEW OF TEST VEHICLE



Figure A-10 POST-TEST LEFT REAR VIEW OF TEST VEHICLE



Figure A-11 PRE-TEST RIGHT FRONT VIEW OF TEST VEHICLE



Figure A-12 POST-TEST RIGHT FRONT VIEW OF TEST VEHICLE



Figure A-13 PRE-TEST RIGHT REAR VIEW OF TEST VEHICLE



Figure A-14 POST-TEST RIGHT REAR VIEW OF TEST VEHICLE



Figure A-15 PRE-TEST FRONTAL VIEW OF IMPACTOR FACE



Figure A-16 POST-TEST FRONTAL VIEW OF IMPACTOR FACE



Figure A-17 PRE-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-18 POST-TEST LEFT SIDE VIEW OF IMPACTOR FACE



Figure A-19 PRE-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-20 POST-TEST RIGHT SIDE VIEW OF IMPACTOR FACE



Figure A-21 PRE-TEST TOP VIEW OF IMPACTOR FACE



Figure A-22 POST-TEST TOP VIEW OF IMPACTOR FACE

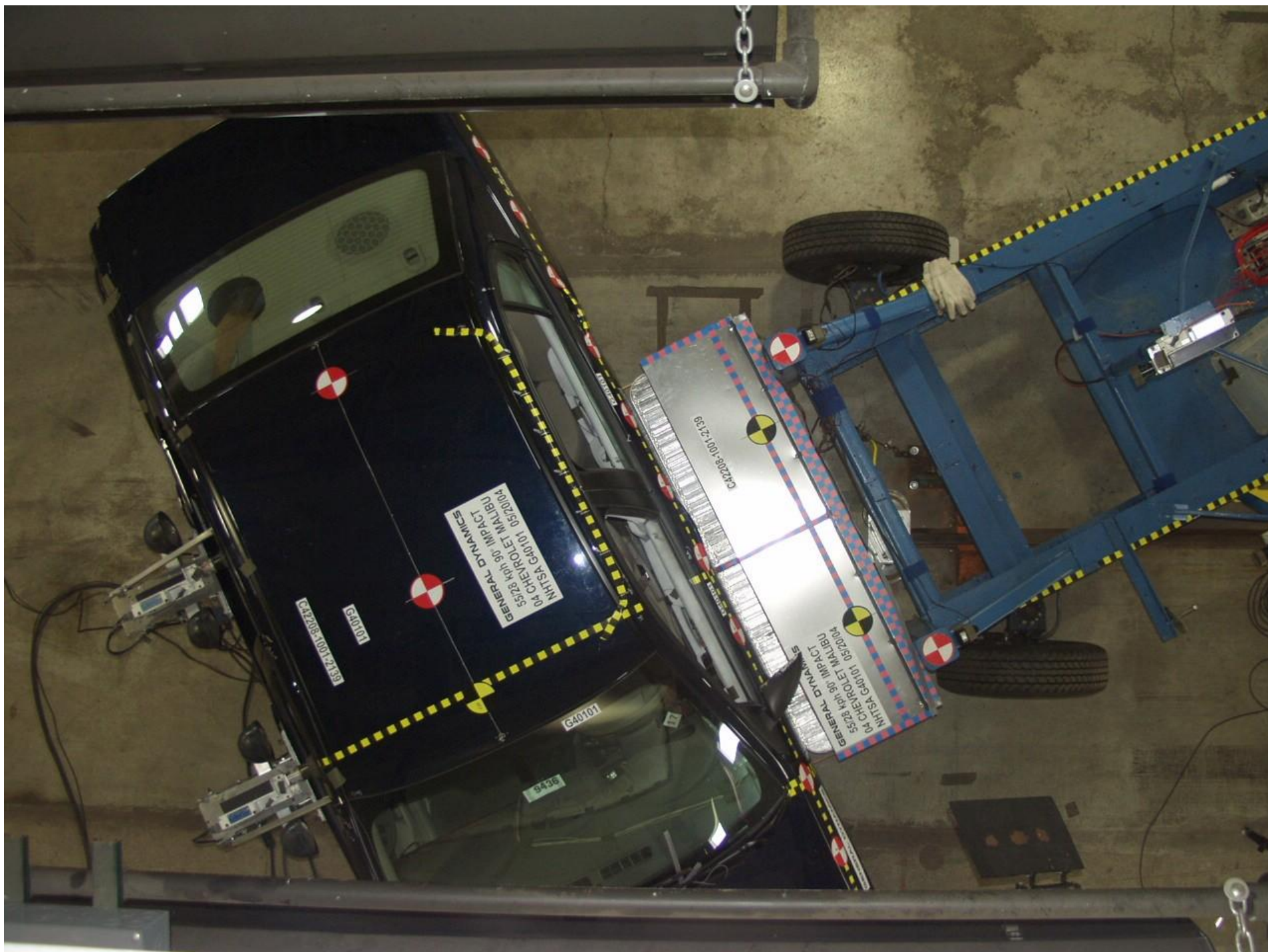


Figure A-23 PRE-TEST OVERHEAD VIEW OF ALIGNED MDB AND VEHICLE

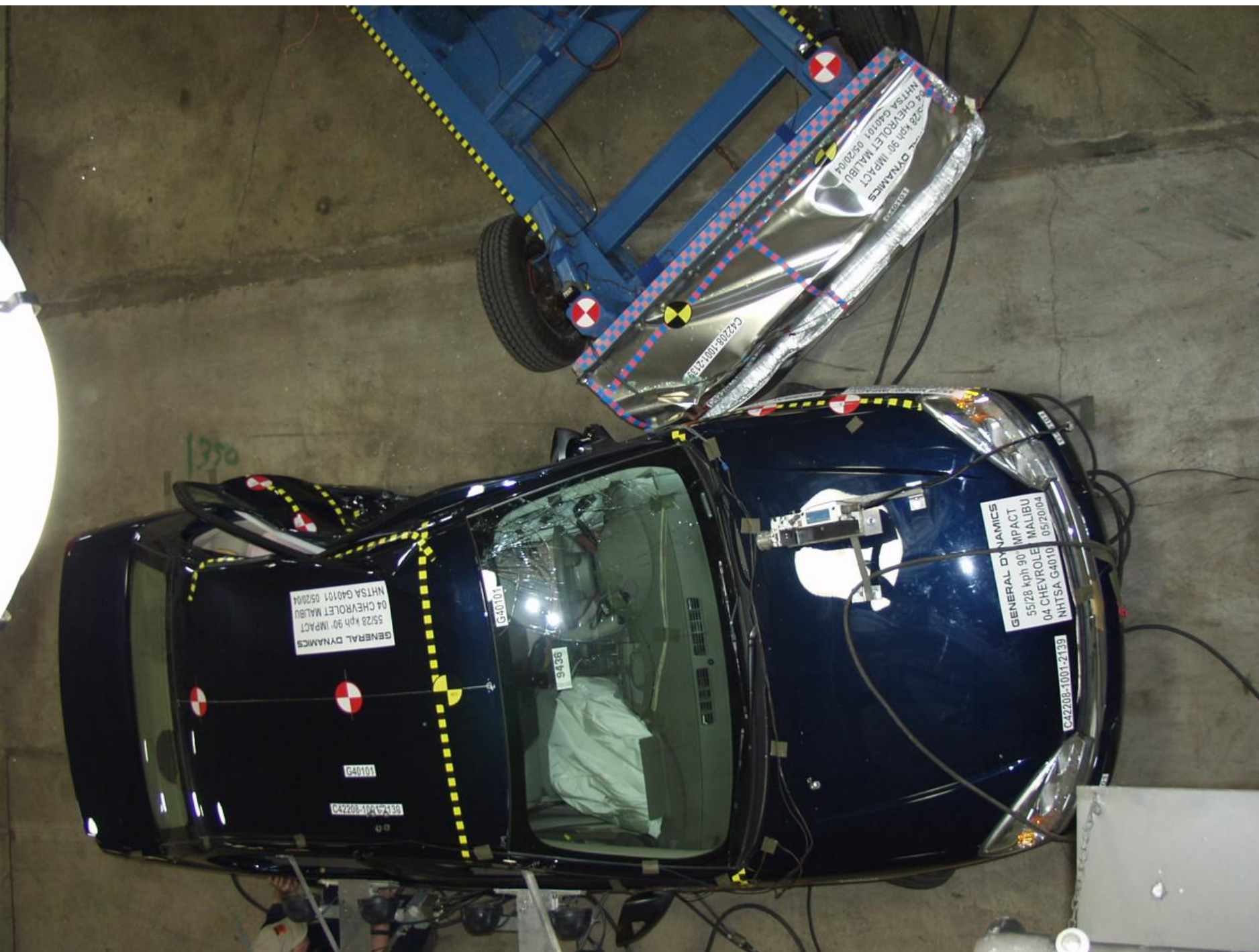


Figure A-24 POST-TEST OVERHEAD VIEW OF MDB AND VEHICLE



Figure A-25 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-26 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3

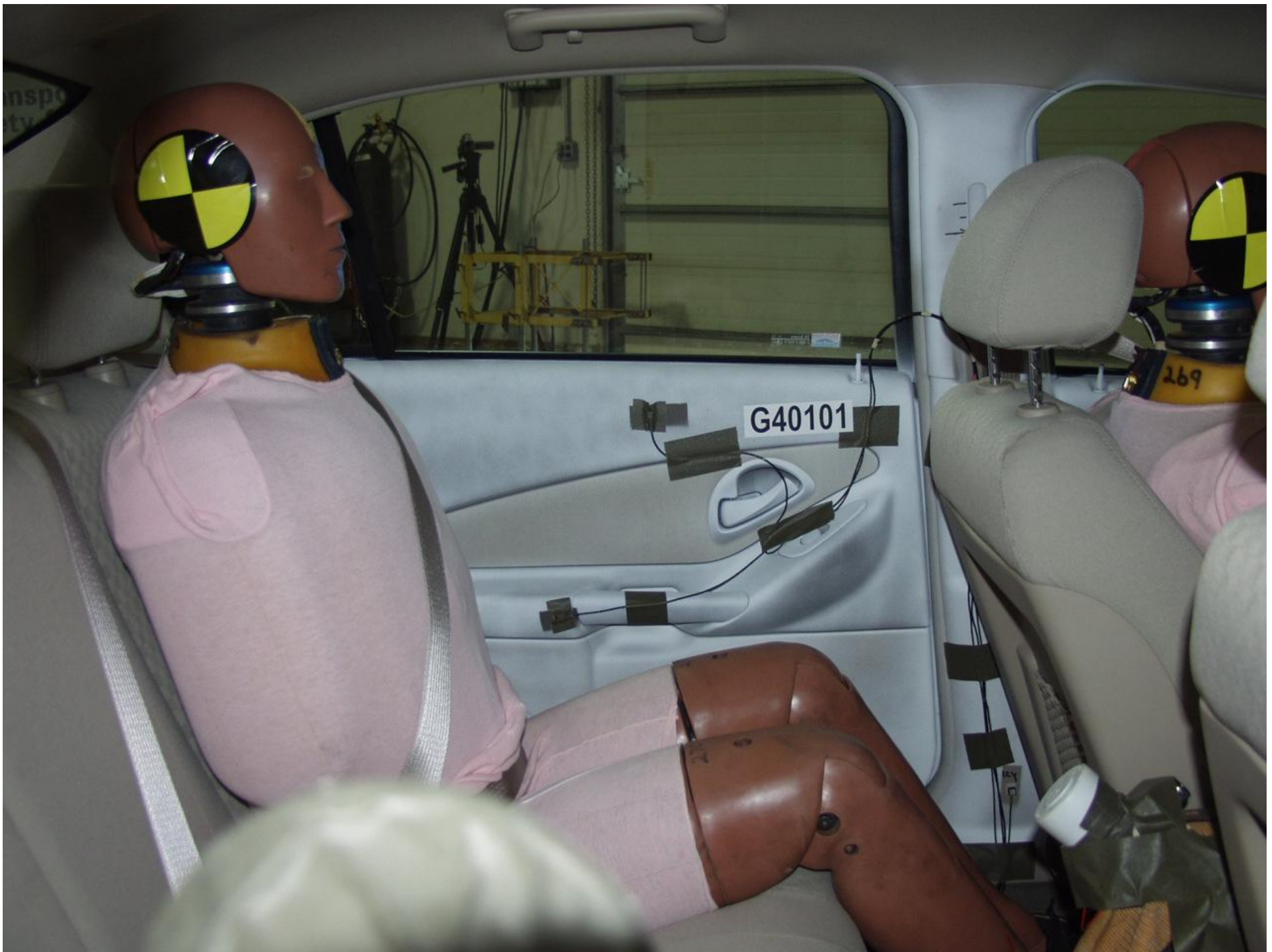


Figure A-27 PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-28 POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-29 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-30 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-31 PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-32 POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-33 PRE-TEST INTERIOR OF FRONT DOOR



Figure A-34 POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS



Figure A-35 PRE-TEST INTERIOR OF REAR DOOR



Figure A-36 POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS



Figure A-37 PRE-TEST LEFT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-38 PRE-TEST RIGHT SIDE VIEW OF MDB WITH IMPACTOR FACE IN POSITION



Figure A-39 POST-TEST CLOSE-UP VIEW OF IMPACT POINT TARGET



MFD BY GENERAL MOTORS CORP

DATE  
04/04

GVWR  
1855 KG  
4090 LB

GAWR FRT  
959 KG  
2114 LB

GAWR RR  
896 KG  
1976 LB

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR  
VEHICLE SAFETY, BUMPER, AND THEFT PREVENTION STANDARDS IN  
EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.

1G1ZS52F64F211389

TYPE: PASS CAR

Figure A-40 CLOSE-UP VIEW OF VEHICLE'S CERTIFICATION LABEL



## **TIRE AND LOADING INFORMATION**

**SEATING CAPACITY** : TOTAL 5 : FRONT 2 : CENTER 0 : REAR 3

The combined weight of occupants and cargo should never exceed 416 kg or 917 lbs.

| <b>ORIGINAL<br/>TIRE SIZE</b> | <b>COLD TIRE<br/>INFLATION PRESSURE</b> |                 |
|-------------------------------|-----------------------------------------|-----------------|
| P205/65R15                    | FRONT                                   | 210 kPa, 30 PSI |
| P205/65R15                    | REAR                                    | 210 kPa, 30 PSI |
| T125/70D15                    | SPARE                                   | 420 kPa, 60 PSI |

**SEE OWNER'S  
MANUAL FOR  
ADDITIONAL  
INFORMATION**

Figure A-41 CLOSE-UP VIEW OF VEHICLE'S TIRE PLACARD LABEL



Figure A-42 IMPACT PHOTO



Figure A-43 ROLLOVER 90 DEGREES



Figure A-44 ROLLOVER 180 DEGREES

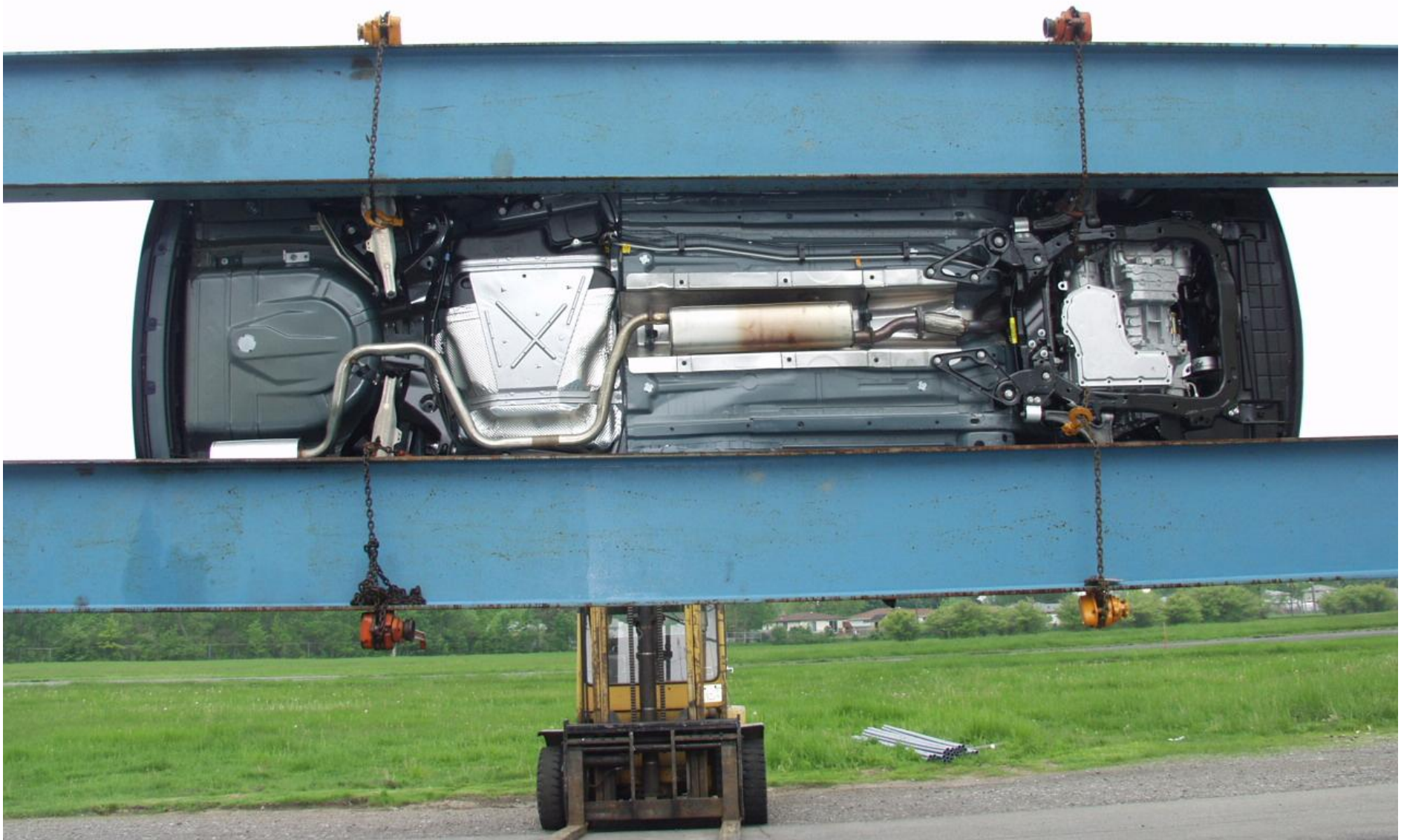


Figure A-45 ROLLOVER 270 DEGREES



Figure A-46 ROLLOVER 360 DEGREES

## **APPENDIX B**

### **VEHICLE, MDB AND SID HYBRID III RESPONSE DATA**

## TABLE OF DATA PLOTS

### DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS

ACCELERATION, FORCE AND MOMENT DATA - FILTER CLASS 1000, LOWER SPINE - FILTER CLASS 180  
INTEGRATION DATA - FILTER CLASS 180

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 1               | DRIVER HEAD (X) ACCELERATION VS TIME           | B- 6        |
| 2               | DRIVER HEAD (X) VELOCITY VS TIME               | B- 7        |
| 3               | DRIVER HEAD (Y) ACCELERATION VS TIME           | B- 8        |
| 4               | DRIVER HEAD (Y) VELOCITY VS TIME               | B- 9        |
| 5               | DRIVER HEAD (Z) ACCELERATION VS TIME           | B- 10       |
| 6               | DRIVER HEAD (Z) VELOCITY VS TIME               | B- 11       |
| 7               | DRIVER HEAD RESULTANT ACCELERATION VS TIME     | B- 12       |
| 8               | DRIVER UPPER NECK (X) FORCE VS TIME            | B- 13       |
| 9               | DRIVER UPPER NECK (Y) FORCE VS TIME            | B- 14       |
| 10              | DRIVER UPPER NECK (Z) FORCE VS TIME            | B- 15       |
| 11              | DRIVER UPPER NECK RESULTANT FORCE VS TIME      | B- 16       |
| 12              | DRIVER UPPER NECK (X) MOMENT VS TIME           | B- 17       |
| 13              | DRIVER UPPER NECK (Y) MOMENT VS TIME           | B- 18       |
| 14              | DRIVER UPPER NECK (Z) MOMENT VS TIME           | B- 19       |
| 15              | DRIVER UPPER NECK RESULTANT MOMENT VS TIME     | B- 20       |
| 16              | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 21       |
| 17              | DRIVER UPPER RIB (Y) VELOCITY VS TIME          | B- 22       |
| 18              | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 23       |
| 19              | DRIVER LOWER RIB (Y) VELOCITY VS TIME          | B- 24       |
| 20              | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 25       |
| 21              | DRIVER LOWER SPINE (Y) VELOCITY VS TIME        | B- 26       |
| 22              | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 27       |
| 23              | DRIVER PELVIC (Y) VELOCITY VS TIME             | B- 28       |
| 24              | PASSENGER HEAD (X) ACCELERATION VS TIME        | B- 29       |
| 25              | PASSENGER HEAD (X) VELOCITY VS TIME            | B- 30       |
| 26              | PASSENGER HEAD (Y) ACCELERATION VS TIME        | B- 31       |
| 27              | PASSENGER HEAD (Y) VELOCITY VS TIME            | B- 32       |
| 28              | PASSENGER HEAD (Z) ACCELERATION VS TIME        | B- 33       |
| 29              | PASSENGER HEAD (Z) VELOCITY VS TIME            | B- 34       |
| 30              | PASSENGER HEAD RESULTANT ACCELERATION VS TIME  | B- 35       |
| 31              | PASSENGER UPPER NECK (X) FORCE VS TIME         | B- 36       |
| 32              | PASSENGER UPPER NECK (Y) FORCE VS TIME         | B- 37       |
| 33              | PASSENGER UPPER NECK (Z) FORCE VS TIME         | B- 38       |
| 34              | PASSENGER UPPER NECK RESULTANT FORCE VS TIME   | B- 39       |
| 35              | PASSENGER UPPER NECK (X) MOMENT VS TIME        | B- 40       |
| 36              | PASSENGER UPPER NECK (Y) MOMENT VS TIME        | B- 41       |
| 37              | PASSENGER UPPER NECK (Z) MOMENT VS TIME        | B- 42       |
| 38              | PASSENGER UPPER NECK RESULTANT MOMENT VS TIME  | B- 43       |
| 39              | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 44       |
| 40              | PASSENGER UPPER RIB (Y) VELOCITY VS TIME       | B- 45       |
| 41              | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 46       |
| 42              | PASSENGER LOWER RIB (Y) VELOCITY VS TIME       | B- 47       |
| 43              | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 48       |
| 44              | PASSENGER LOWER SPINE (Y) VELOCITY VS TIME     | B- 49       |
| 45              | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 50       |
| 46              | PASSENGER PELVIC (Y) VELOCITY VS TIME          | B- 51       |

### DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS

ACCELERATION DATA - FIR FILTERED

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 47              | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 52       |
| 48              | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 53       |
| 49              | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 54       |
| 50              | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 55       |
| 51              | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 56       |
| 52              | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 57       |
| 53              | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 58       |
| 54              | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 59       |

**TEST VEHICLE INSTRUMENTATION PLOTS**  
ACCELERATION DATA - FILTER CLASS 60  
INTEGRATION DATA - FILTER CLASS 180

| <u>Plot No.</u> | <u>Data Plot Title</u>                                       | <u>Page</u> |
|-----------------|--------------------------------------------------------------|-------------|
| 55              | RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME       | B- 60       |
| 56              | RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY VS TIME           | B- 61       |
| 57              | RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME       | B- 62       |
| 58              | RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME           | B- 63       |
| 59              | RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME       | B- 64       |
| 60              | RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY VS TIME           | B- 65       |
| 61              | RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION VS TIME | B- 66       |
| 62              | RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME        | B- 67       |
| 63              | RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY VS TIME            | B- 68       |
| 64              | RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME        | B- 69       |
| 65              | RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME            | B- 70       |
| 66              | RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME        | B- 71       |
| 67              | RIGHT SIDE SILL AT REAR SEAT (Z) VELOCITY VS TIME            | B- 72       |
| 68              | RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION VS TIME  | B- 73       |
| 69              | REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME            | B- 74       |
| 70              | REAR FLOORPAN ABOVE AXLE (X) VELOCITY VS TIME                | B- 75       |
| 71              | REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME            | B- 76       |
| 72              | REAR FLOORPAN ABOVE AXLE (Y) VELOCITY VS TIME                | B- 77       |
| 73              | REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME            | B- 78       |
| 74              | REAR FLOORPAN ABOVE AXLE (Z) VELOCITY VS TIME                | B- 79       |
| 75              | REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION VS TIME      | B- 80       |
| 76              | LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME         | B- 81       |
| 77              | LEFT SIDE SILL AT REAR SEAT (Y) VELOCITY VS TIME             | B- 82       |
| 78              | LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME        | B- 83       |
| 79              | LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY VS TIME            | B- 84       |
| 80              | LEFT FRONT DOOR ON CENTERLINE (Y) ACCELERATION VS TIME       | B- 85       |
| 81              | LEFT FRONT DOOR ON CENTERLINE (Y) VELOCITY VS TIME           | B- 86       |
| 82              | RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME     | B- 87       |
| 83              | RIGHT REAR OCCUPANT COMPARTMENT (Y) VELOCITY VS TIME         | B- 88       |
| 84              | MID REAR OF LEFT FRONT DOOR (Y) ACCELERATION VS TIME         | B- 89       |
| 85              | MID REAR OF LEFT FRONT DOOR (Y) VELOCITY VS TIME             | B- 90       |
| 86              | LEFT FRONT DOOR UPPER CENTERLINE (Y) ACCELERATION VS TIME    | B- 91       |
| 87              | LEFT FRONT DOOR UPPER CENTERLINE (Y) VELOCITY VS TIME        | B- 92       |
| 88              | MID REAR OF LEFT REAR DOOR (Y) ACCELERATION VS TIME          | B- 93       |
| 89              | MID REAR OF LEFT REAR DOOR (Y) VELOCITY VS TIME              | B- 94       |
| 90              | LEFT REAR DOOR UPPER CENTERLINE (Y) ACCELERATION VS TIME     | B- 95       |
| 91              | LEFT REAR DOOR UPPER CENTERLINE (Y) VELOCITY VS TIME         | B- 96       |
| 92              | LOWER B-POST (Y) ACCELERATION VS TIME                        | B- 97       |
| 93              | LOWER B-POST (Y) VELOCITY VS TIME                            | B- 98       |
| 94              | UPPER B-POST (Y) ACCELERATION VS TIME                        | B- 99       |
| 95              | UPPER B-POST (Y) VELOCITY VS TIME                            | B- 100      |
| 96              | LOWER A-POST (Y) ACCELERATION VS TIME                        | B- 101      |

**TEST VEHICLE INSTRUMENTATION PLOTS**  
ACCELERATION DATA - FILTER CLASS 60  
INTEGRATION DATA - FILTER CLASS 180

| <u>Plot No.</u> | <u>Data Plot Title</u>                                      | <u>Page</u> |
|-----------------|-------------------------------------------------------------|-------------|
| 97              | LOWER A-POST (Y) VELOCITY VS TIME                           | B- 102      |
| 98              | UPPER A-POST (Y) ACCELERATION VS TIME                       | B- 103      |
| 99              | UPPER A-POST (Y) VELOCITY VS TIME                           | B- 104      |
| 100             | FRONT SEAT TRACK (Y) ACCELERATION VS TIME                   | B- 105      |
| 101             | FRONT SEAT TRACK (Y) VELOCITY VS TIME                       | B- 106      |
| 102             | REAR SEAT TRACK (Y) ACCELERATION VS TIME                    | B- 107      |
| 103             | REAR SEAT TRACK (Y) VELOCITY VS TIME                        | B- 108      |
| 104             | VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME          | B- 109      |
| 105             | VEHICLE CENTER OF GRAVITY (X) VELOCITY VS TIME              | B- 110      |
| 106             | VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME          | B- 111      |
| 107             | VEHICLE CENTER OF GRAVITY (Y) VELOCITY ACCELERATION VS TIME | B- 112      |
| 108             | VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME          | B- 113      |
| 109             | VEHICLE CENTER OF GRAVITY (Z) VELOCITY VS TIME              | B- 114      |
| 110             | VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME    | B- 115      |

**MDB INSTRUMENTATION PLOTS**  
ACCELERATION DATA - FILTER CLASS 60  
INTEGRATION DATA - FILTER CLASS 180

| <u>Plot No.</u> | <u>Data Plot Title</u>                               | <u>Page</u> |
|-----------------|------------------------------------------------------|-------------|
| 111             | MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME       | B- 116      |
| 112             | MDB CENTER OF GRAVITY (X) VELOCITY VS TIME           | B- 117      |
| 113             | MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME       | B- 118      |
| 114             | MDB CENTER OF GRAVITY (Y) VELOCITY VS TIME           | B- 119      |
| 115             | MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME       | B- 120      |
| 116             | MDB CENTER OF GRAVITY (Z) VELOCITY VS TIME           | B- 121      |
| 117             | MDB CENTER OF GRAVITY RESULTANT ACCELERATION VS TIME | B- 122      |
| 118             | MDB REAR (X) ACCELERATION VS TIME                    | B- 123      |
| 119             | MDB REAR (X) VELOCITY VS TIME                        | B- 124      |
| 120             | MDB REAR (Y) ACCELERATION VS TIME                    | B- 125      |
| 121             | MDB REAR (Y) VELOCITY VS TIME                        | B- 126      |

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)**  
ACCELERATION DATA - FILTER CLASS 1000, LOWER SPINE - FILTER CLASS 180  
INTEGRATION DATA - FILTER CLASS 180

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 122             | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 127      |
| 123             | DRIVER UPPER RIB (Y) VELOCITY VS TIME          | B- 128      |
| 124             | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 129      |
| 125             | DRIVER LOWER RIB (Y) VELOCITY VS TIME          | B- 130      |
| 126             | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 131      |
| 127             | DRIVER LOWER SPINE (Y) VELOCITY VS TIME        | B- 132      |
| 128             | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 133      |
| 129             | DRIVER PELVIC (Y) VELOCITY VS TIME             | B- 134      |
| 130             | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 135      |
| 131             | PASSENGER UPPER RIB (Y) VELOCITY VS TIME       | B- 136      |
| 132             | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 137      |
| 133             | PASSENGER LOWER RIB (Y) VELOCITY VS TIME       | B- 138      |
| 134             | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 139      |
| 135             | PASSENGER LOWER SPINE (Y) VELOCITY VS TIME     | B- 140      |
| 136             | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 141      |
| 137             | PASSENGER PELVIC (Y) VELOCITY VS TIME          | B- 142      |

**DRIVER & PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)**  
ACCELERATION DATA - FIR FILTERED

| <u>Plot No.</u> | <u>Data Plot Title</u>                         | <u>Page</u> |
|-----------------|------------------------------------------------|-------------|
| 138             | DRIVER UPPER RIB (Y) ACCELERATION VS TIME      | B- 143      |
| 139             | DRIVER LOWER RIB (Y) ACCELERATION VS TIME      | B- 144      |
| 140             | DRIVER LOWER SPINE (Y) ACCELERATION VS TIME    | B- 145      |
| 141             | DRIVER PELVIC (Y) ACCELERATION VS TIME         | B- 146      |
| 142             | PASSENGER UPPER RIB (Y) ACCELERATION VS TIME   | B- 147      |
| 143             | PASSENGER LOWER RIB (Y) ACCELERATION VS TIME   | B- 148      |
| 144             | PASSENGER LOWER SPINE (Y) ACCELERATION VS TIME | B- 149      |
| 145             | PASSENGER PELVIC (Y) ACCELERATION VS TIME      | B- 150      |

2004 Side NCAP - 2004 Chevrolet Malibu

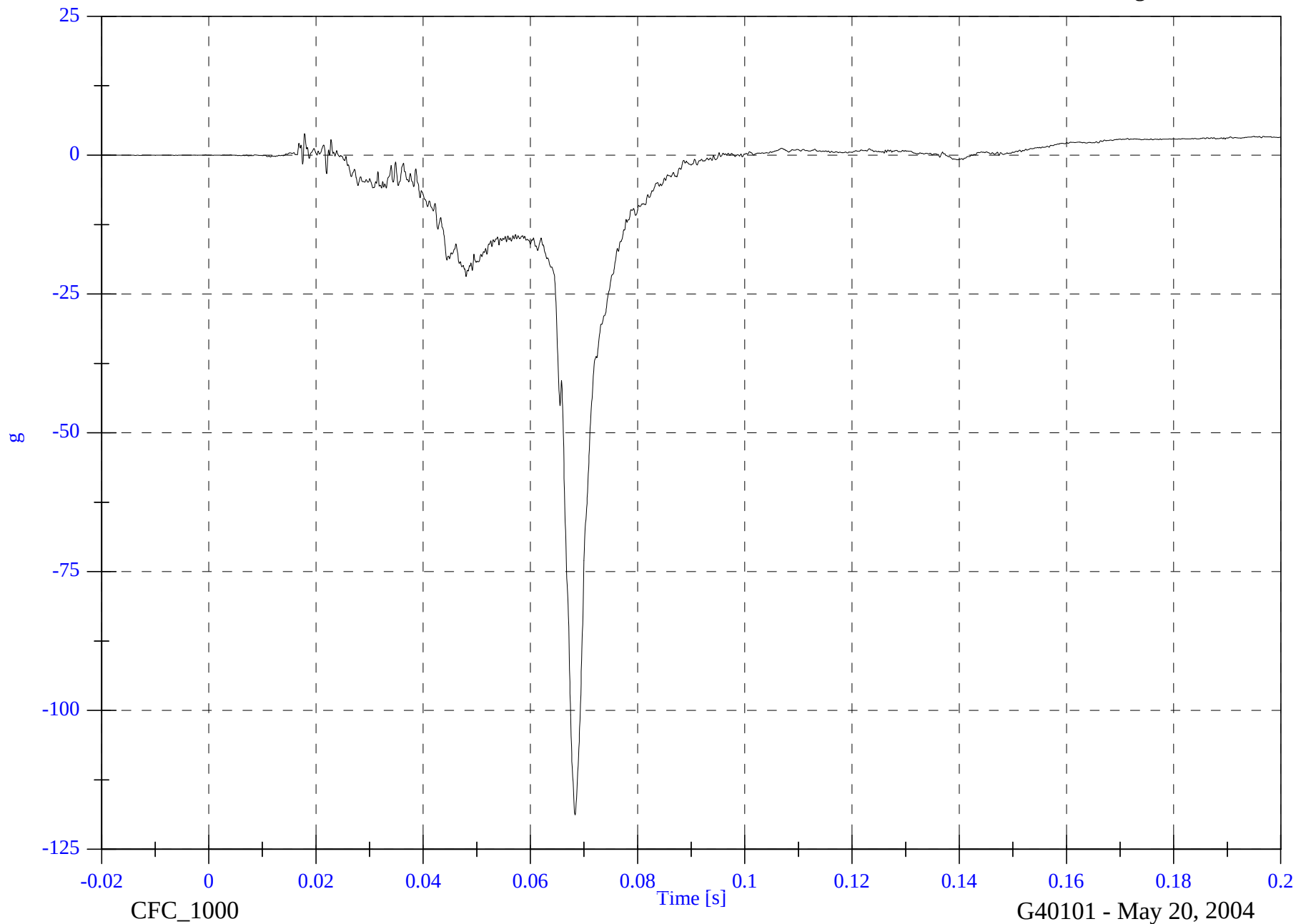
V2P1 Head x

Max: 3.9 [g] at 0.018 [s]

Min: -118.8 [g] at 0.068 [s]

B-6

8745-01

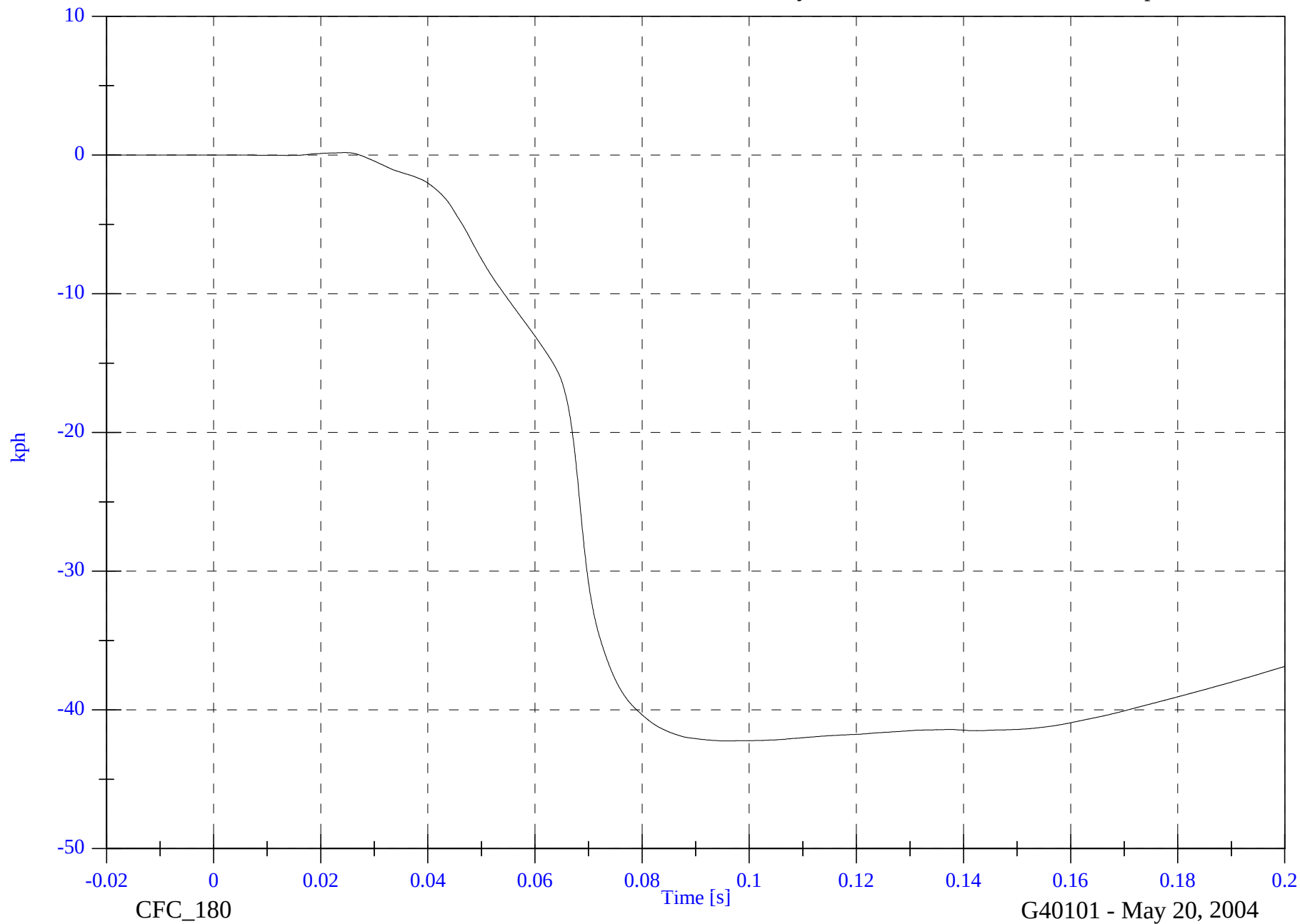


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Head x Velocity

Max: 0.2 [kph] at 0.024 [s]

Min: -42.2 [kph] at 0.096 [s]



B-7

8745-01

CFC\_180

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Head y

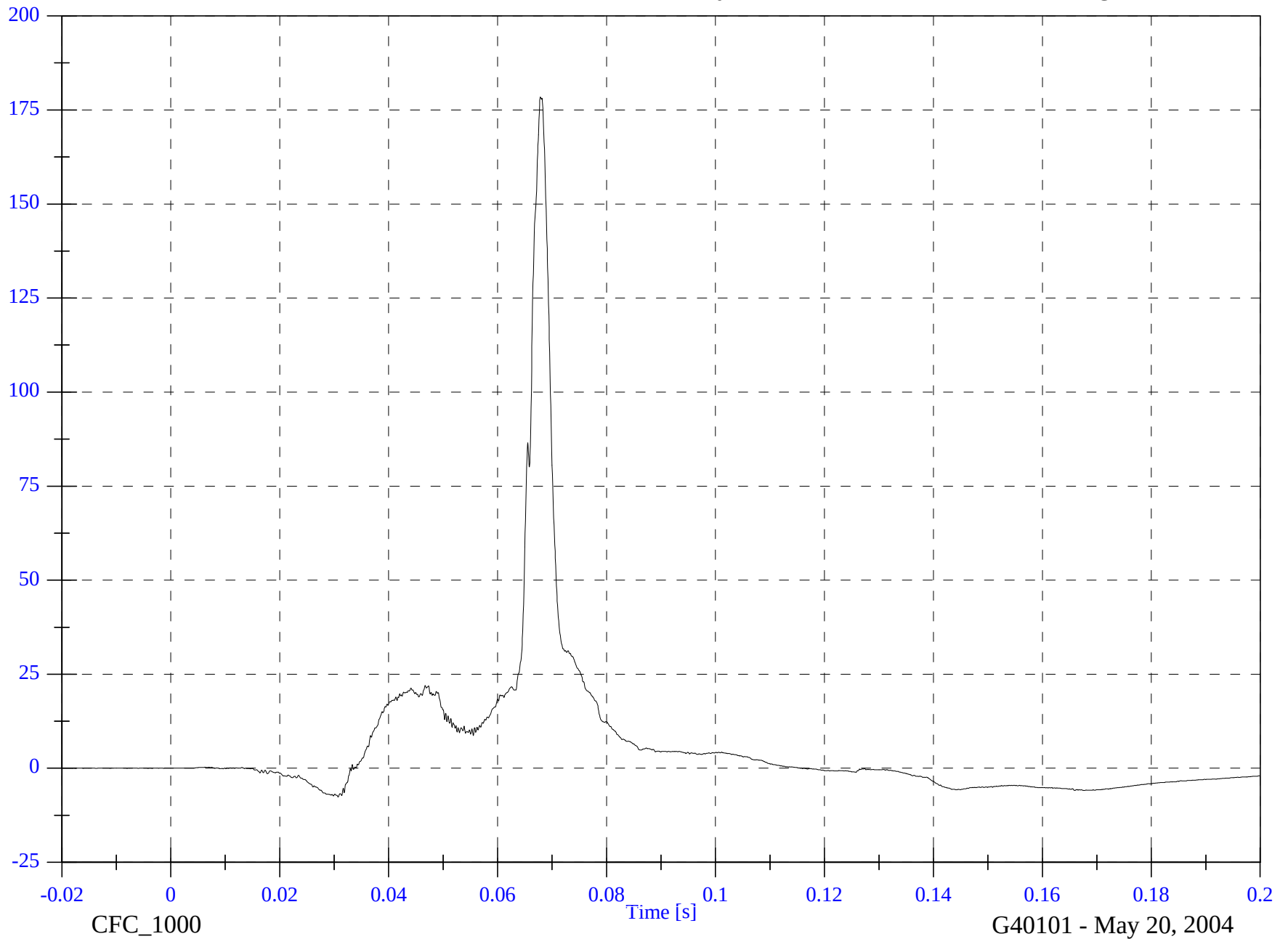
Max: 178.5 [g] at 0.068 [s]

Min: -7.6 [g] at 0.031 [s]

B-8

g

8745-01

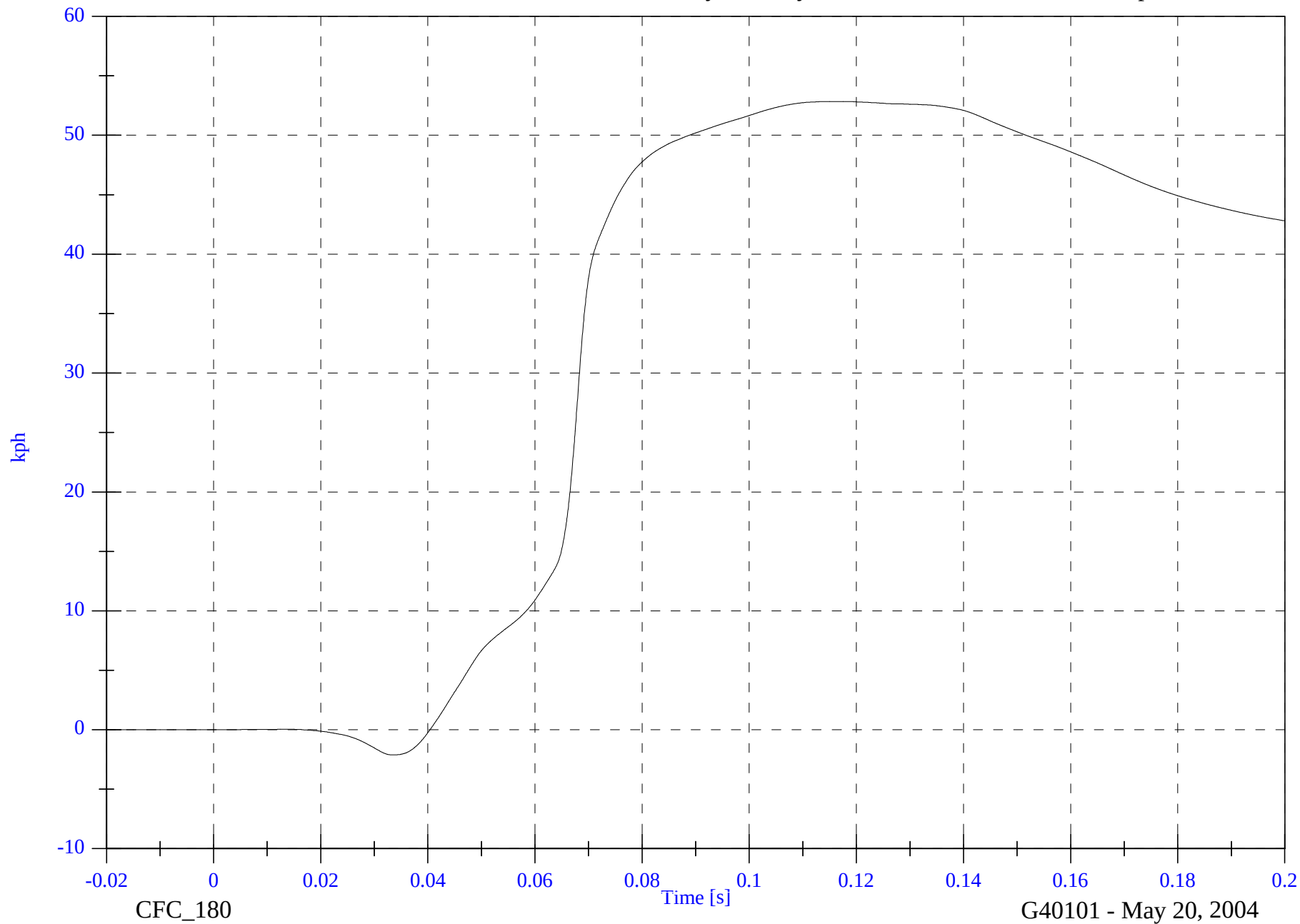


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Head y Velocity

Max: 52.8 [kph] at 0.116 [s]

Min: -2.1 [kph] at 0.034 [s]



B-9

8745-01

CFC\_180

Time [s]

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

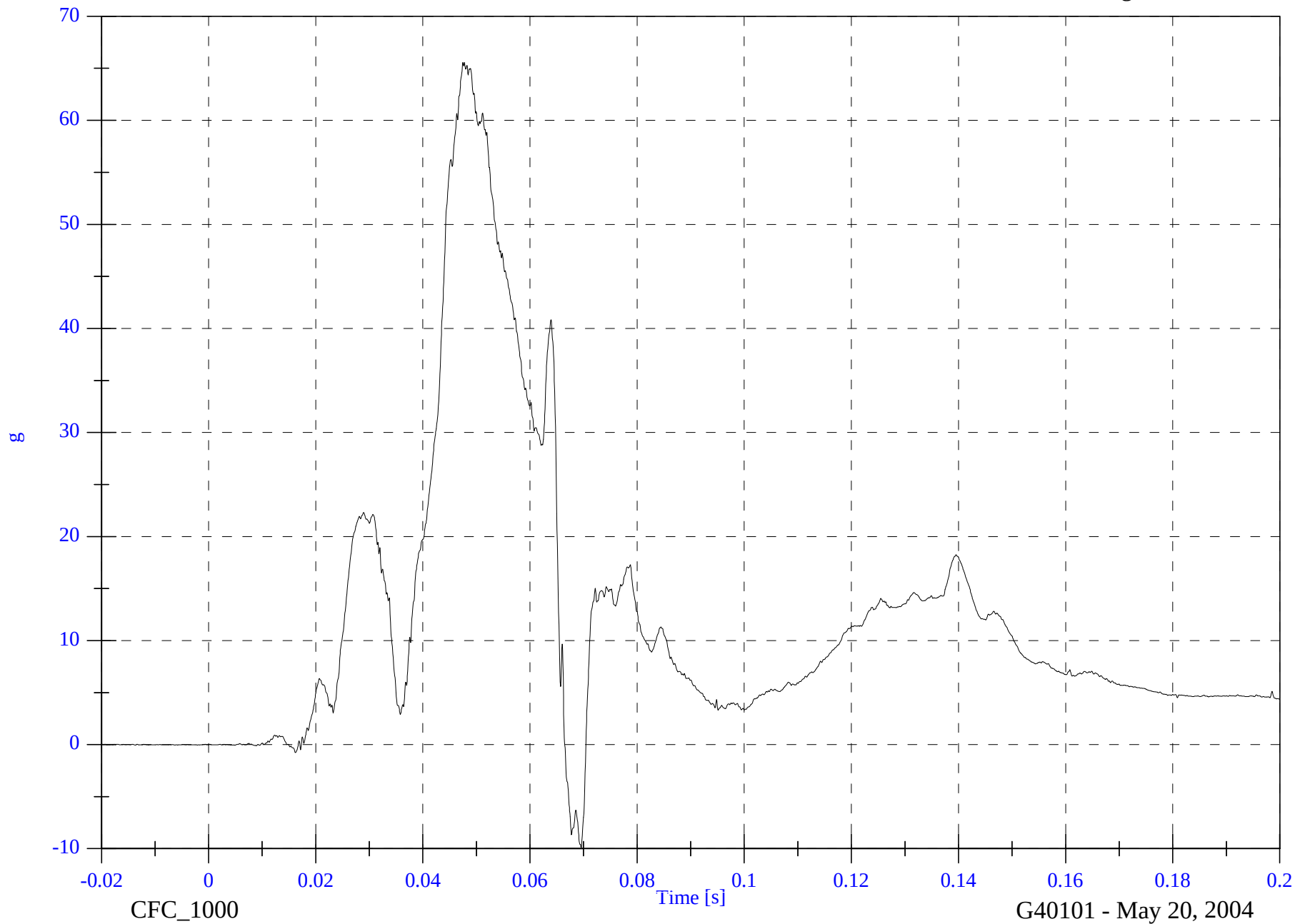
V2P1 Head z

Max: 65.6 [g] at 0.048 [s]

Min: -9.9 [g] at 0.070 [s]

B-10

8745-01

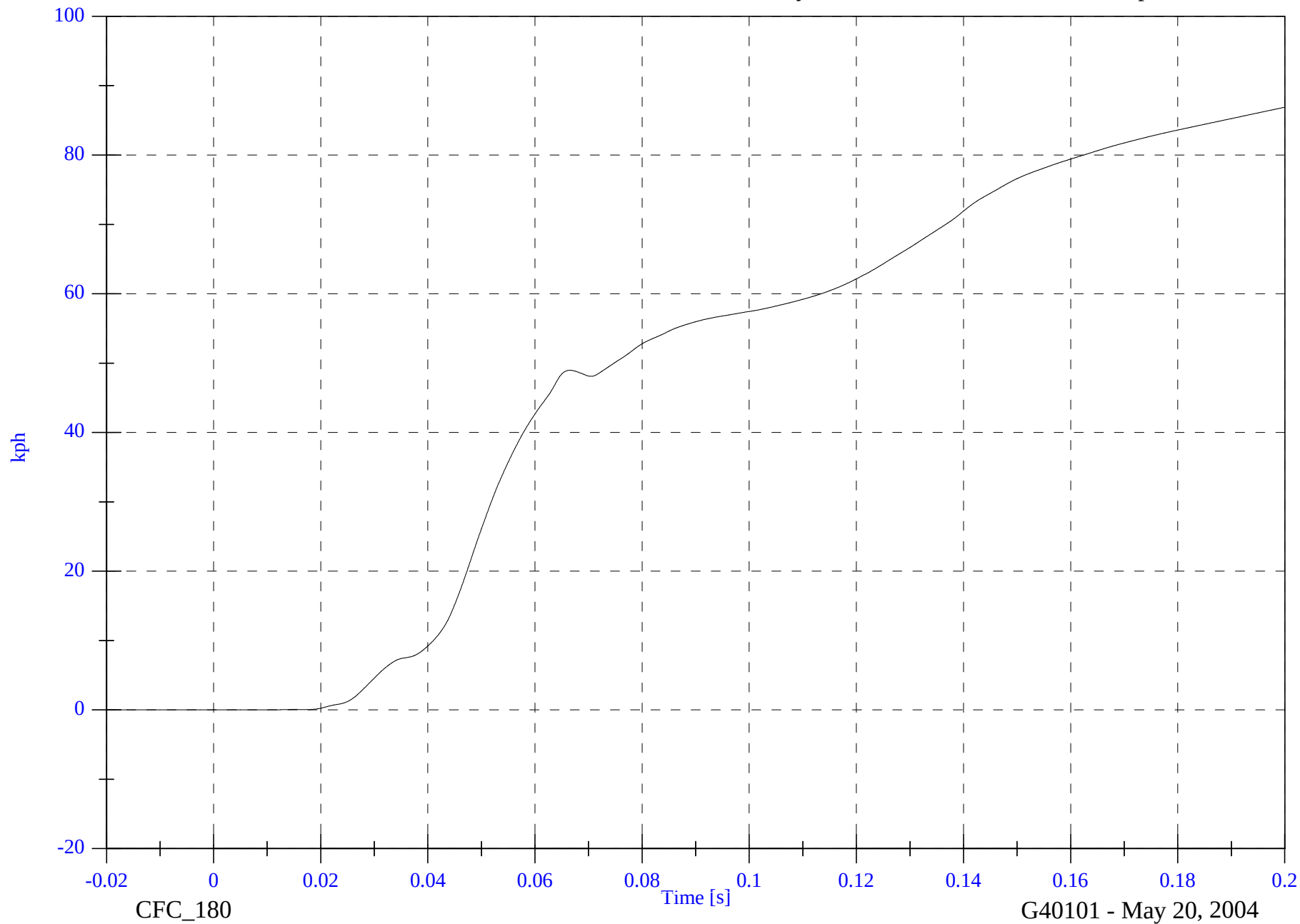


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Head z Velocity

Max: 86.9 [kph] at 0.200 [s]

Min: -0.0 [kph] at 0.005 [s]



B-11

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

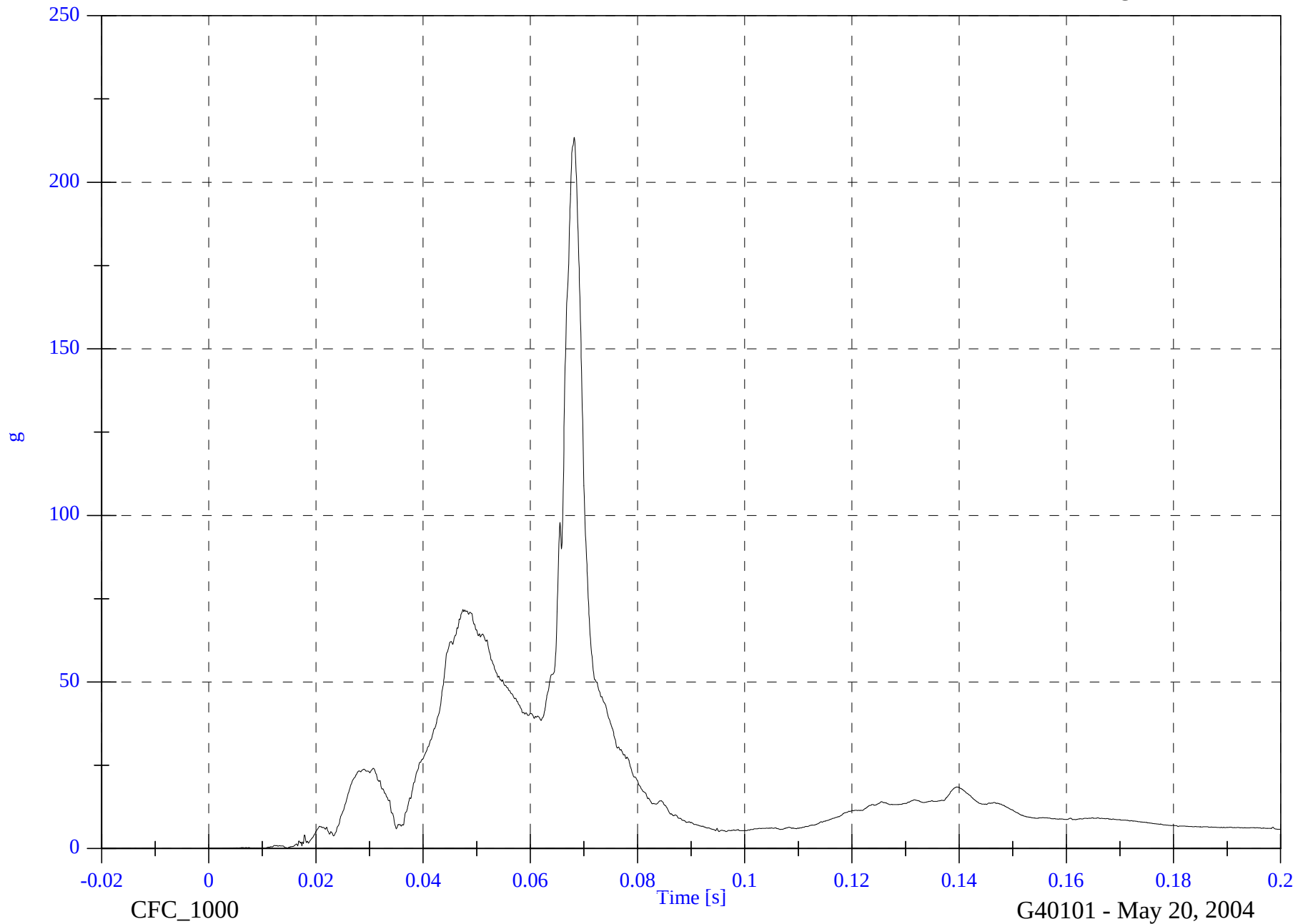
V2P1 Head Resultant

Max: 213.5 [g] at 0.068 [s]

Min: 0.0 [g] at -0.019 [s]

B-12

8745-01

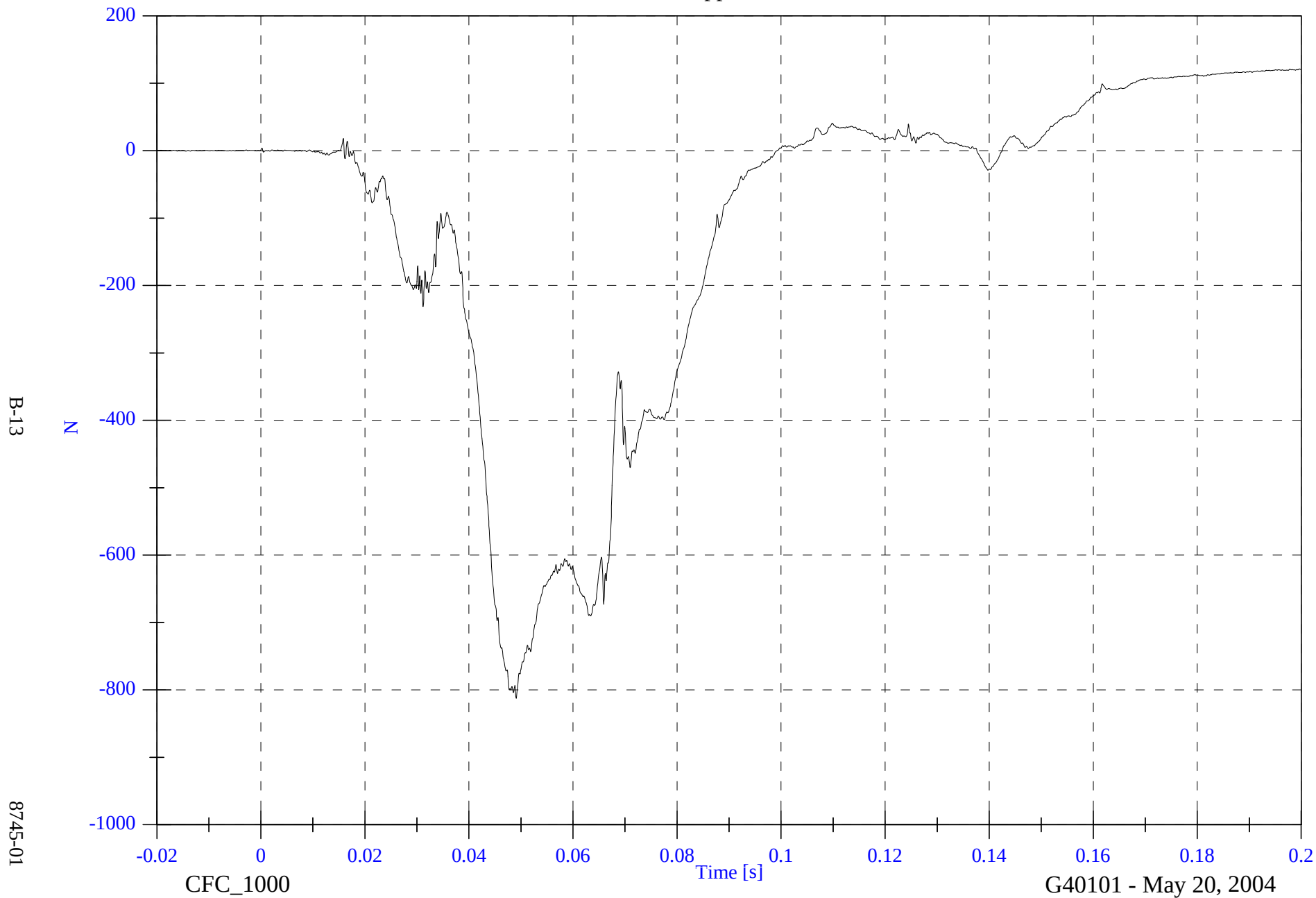


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Neck Fx

Max: 121.2 [N] at 0.200 [s]

Min: -812.5 [N] at 0.049 [s]

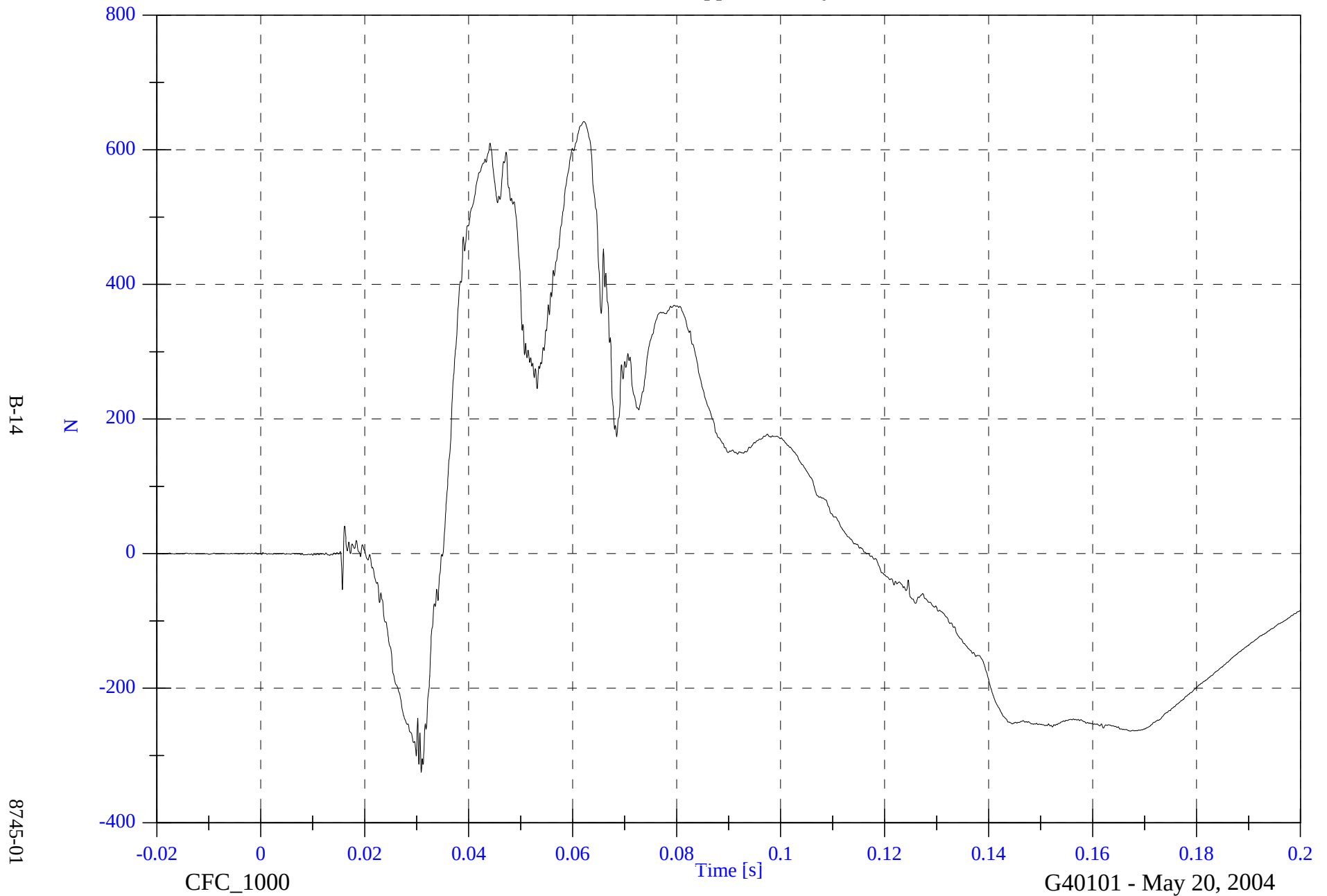


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Neck Fy

Max: 641.9 [N] at 0.062 [s]

Min: -324.9 [N] at 0.031 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Neck Fz

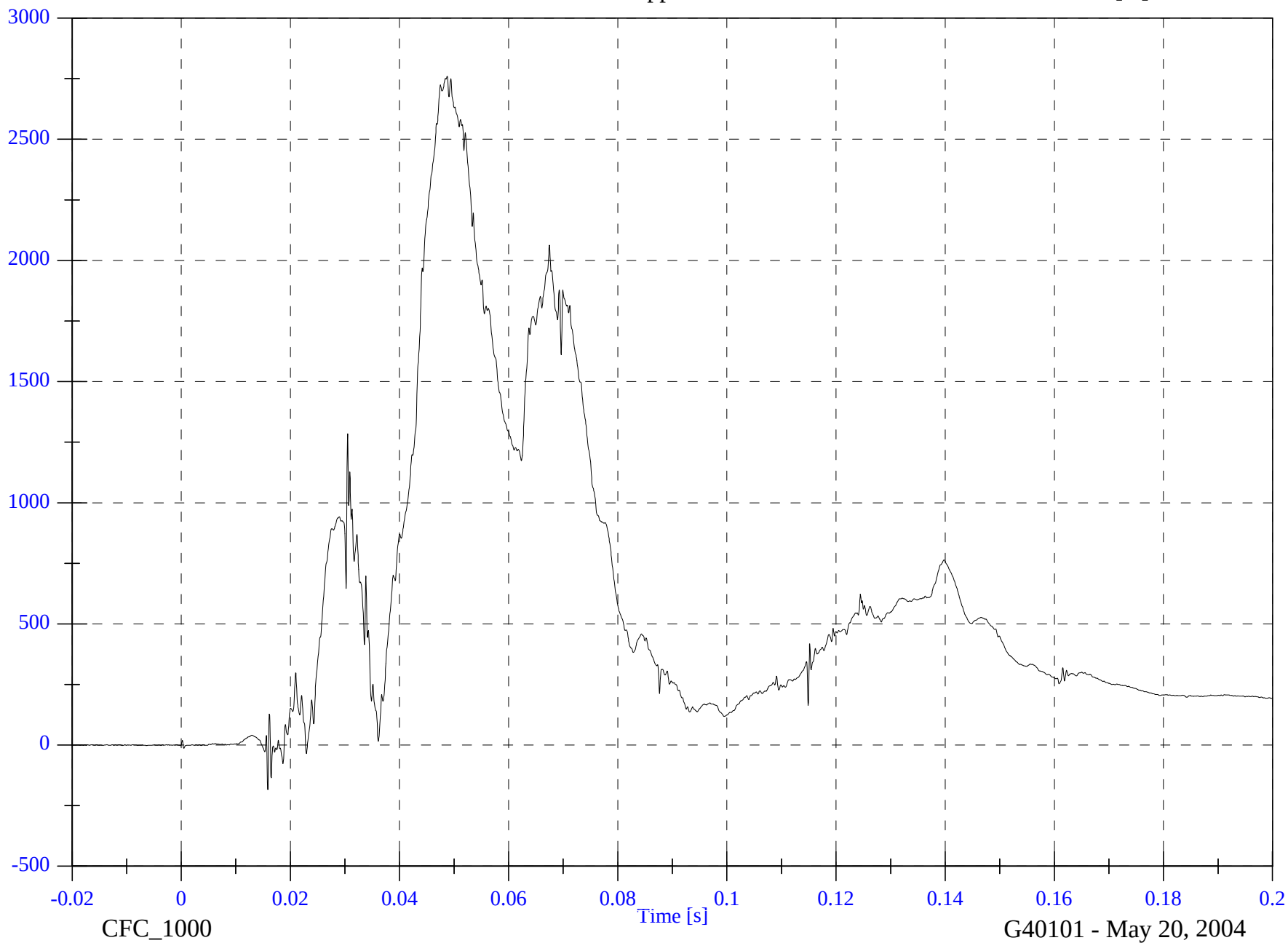
Max: 2759.4 [N] at 0.049 [s]

Min: -184.2 [N] at 0.016 [s]

B-15

N

8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

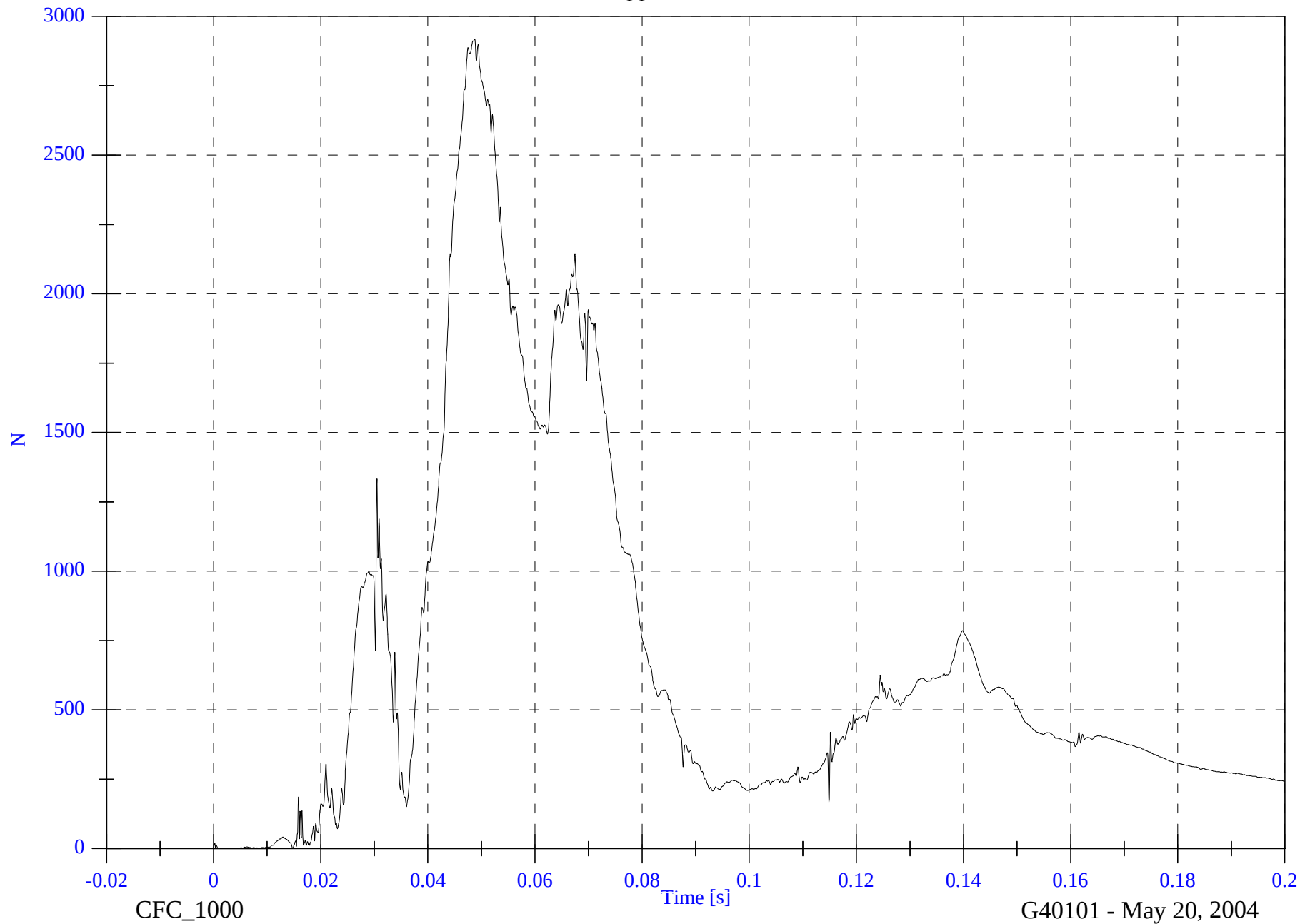
V2P1 Upper Neck F Resultant

Max: 2918.9 [N] at 0.049 [s]

Min: 0.1 [N] at -0.001 [s]

B-16

8745-01

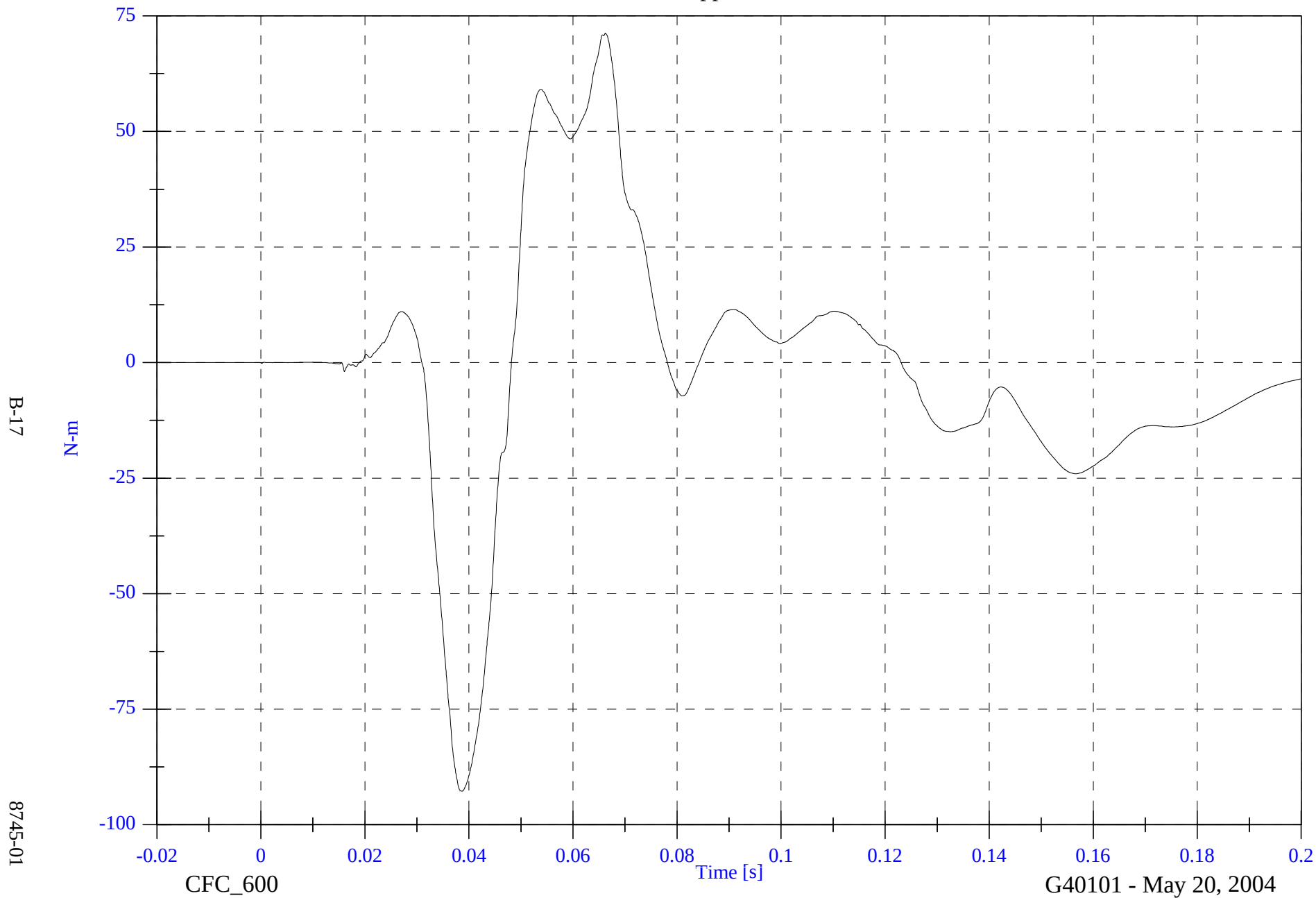


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Neck Mx

Max: 71.2 [N-m] at 0.066 [s]

Min: -92.7 [N-m] at 0.039 [s]

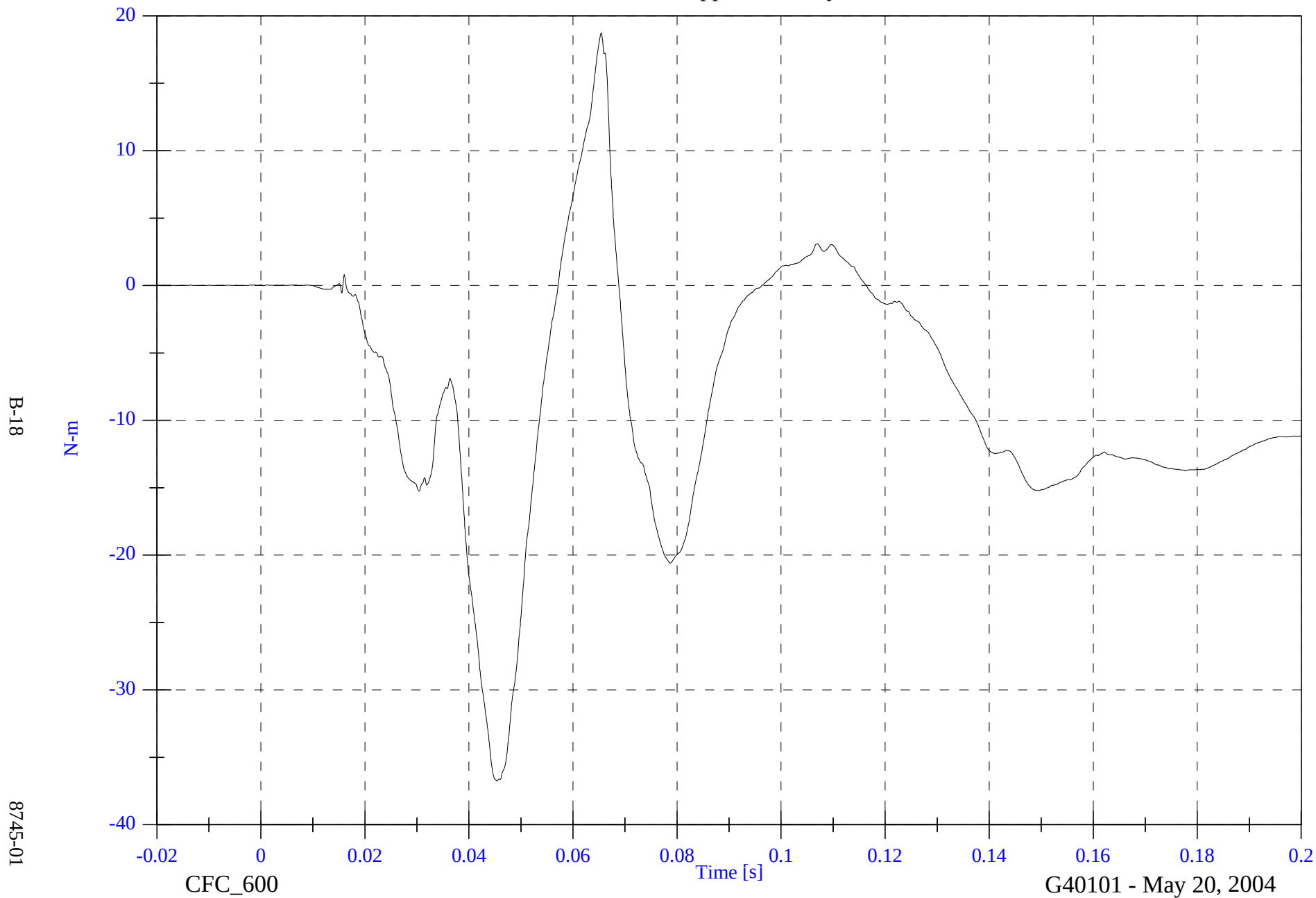


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Neck My

Max: 18.7 [N-m] at 0.065 [s]

Min: -36.7 [N-m] at 0.045 [s]

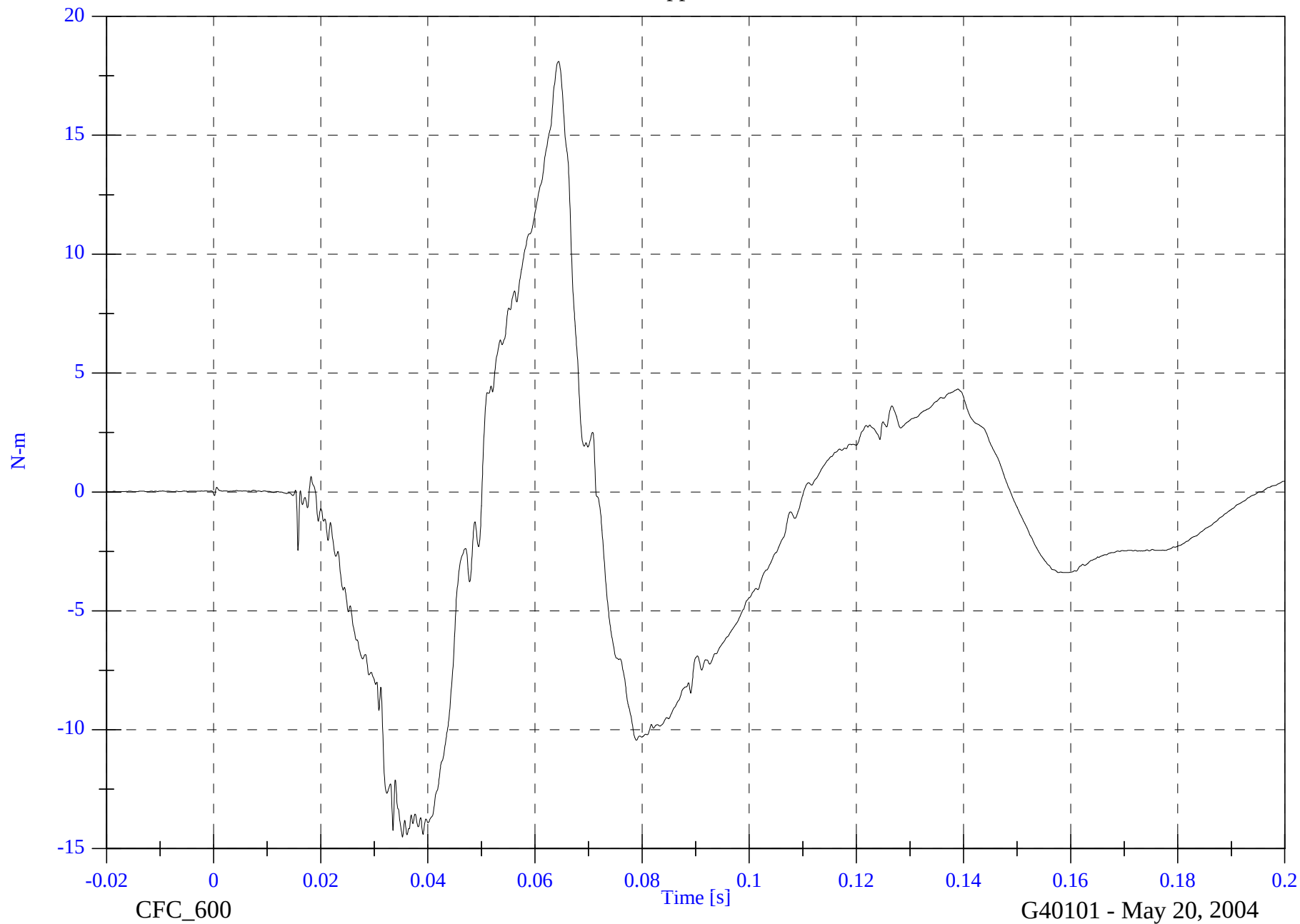


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Neck Mz

Max: 18.1 [N-m] at 0.064 [s]

Min: -14.5 [N-m] at 0.035 [s]



B-19

8745-01

CFC\_600

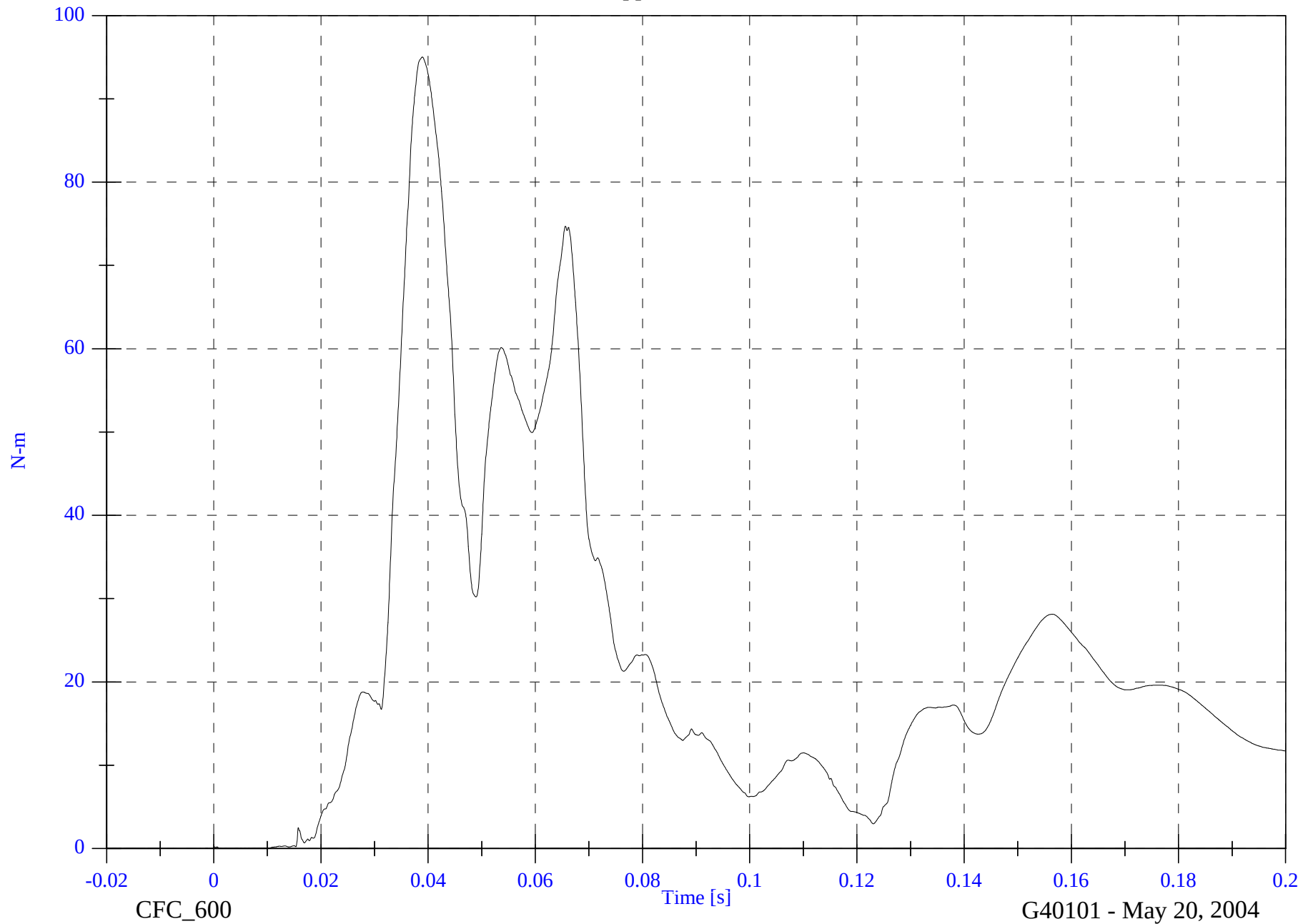
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Neck M Resultant

Max: 95.0 [N-m] at 0.039 [s]

Min: 0.0 [N-m] at -0.017 [s]



B-20

8745-01

CFC\_600

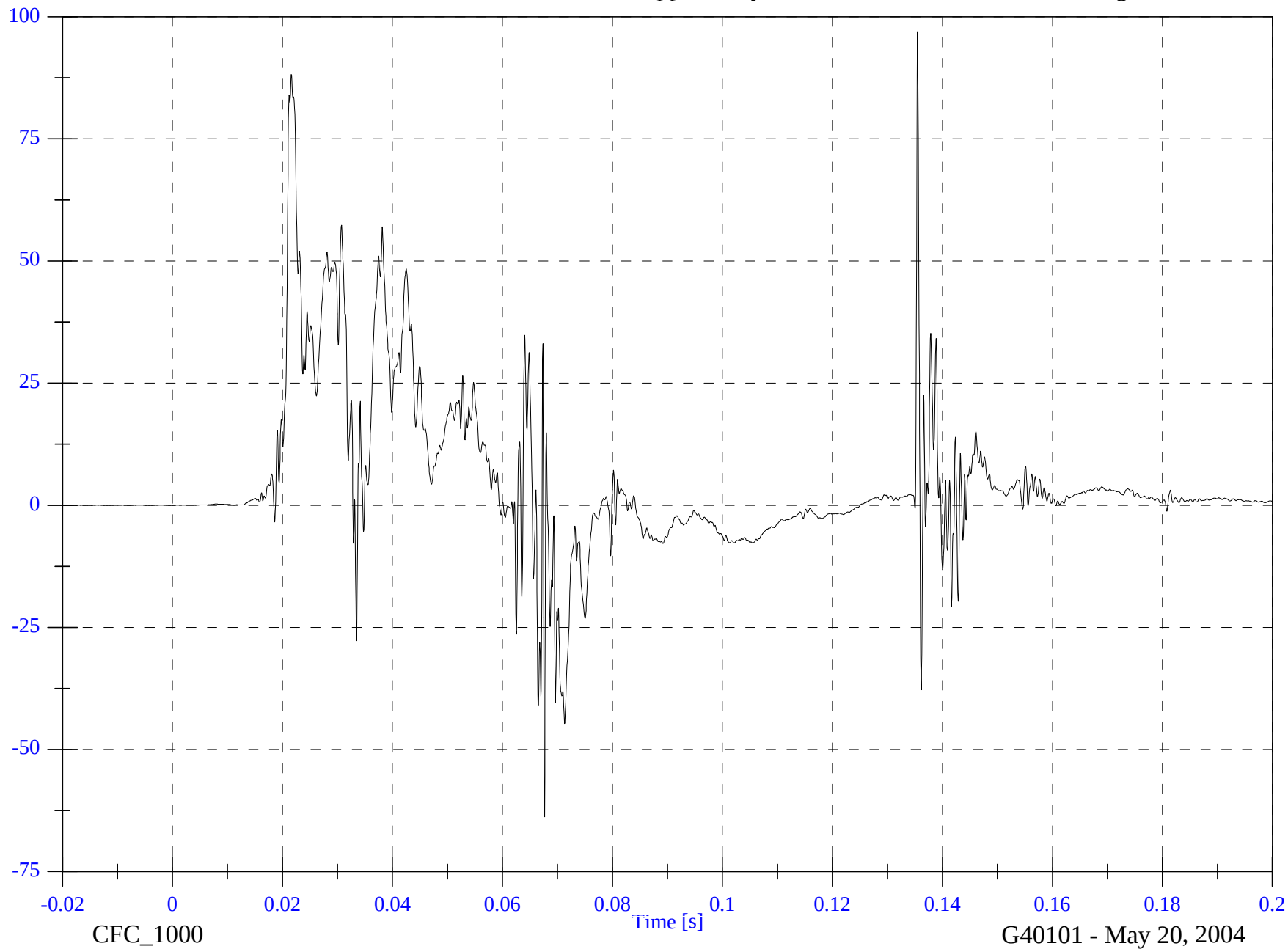
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Rib y

Max: 97.0 [g] at 0.135 [s]

Min: -63.8 [g] at 0.068 [s]



B-21

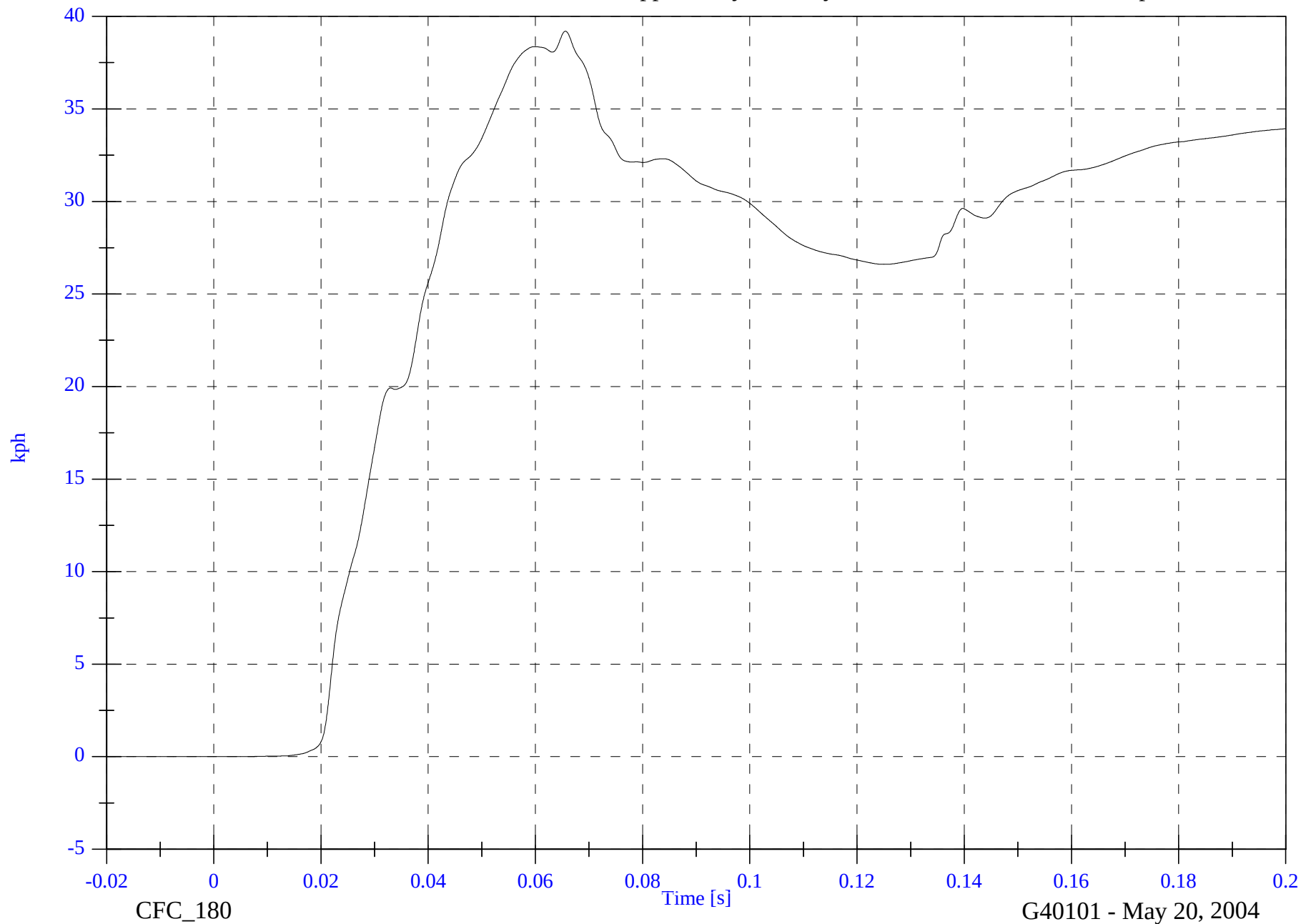
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Rib y Velocity

Max: 39.2 [kph] at 0.066 [s]

Min: -0.0 [kph] at -0.018 [s]



B-22

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

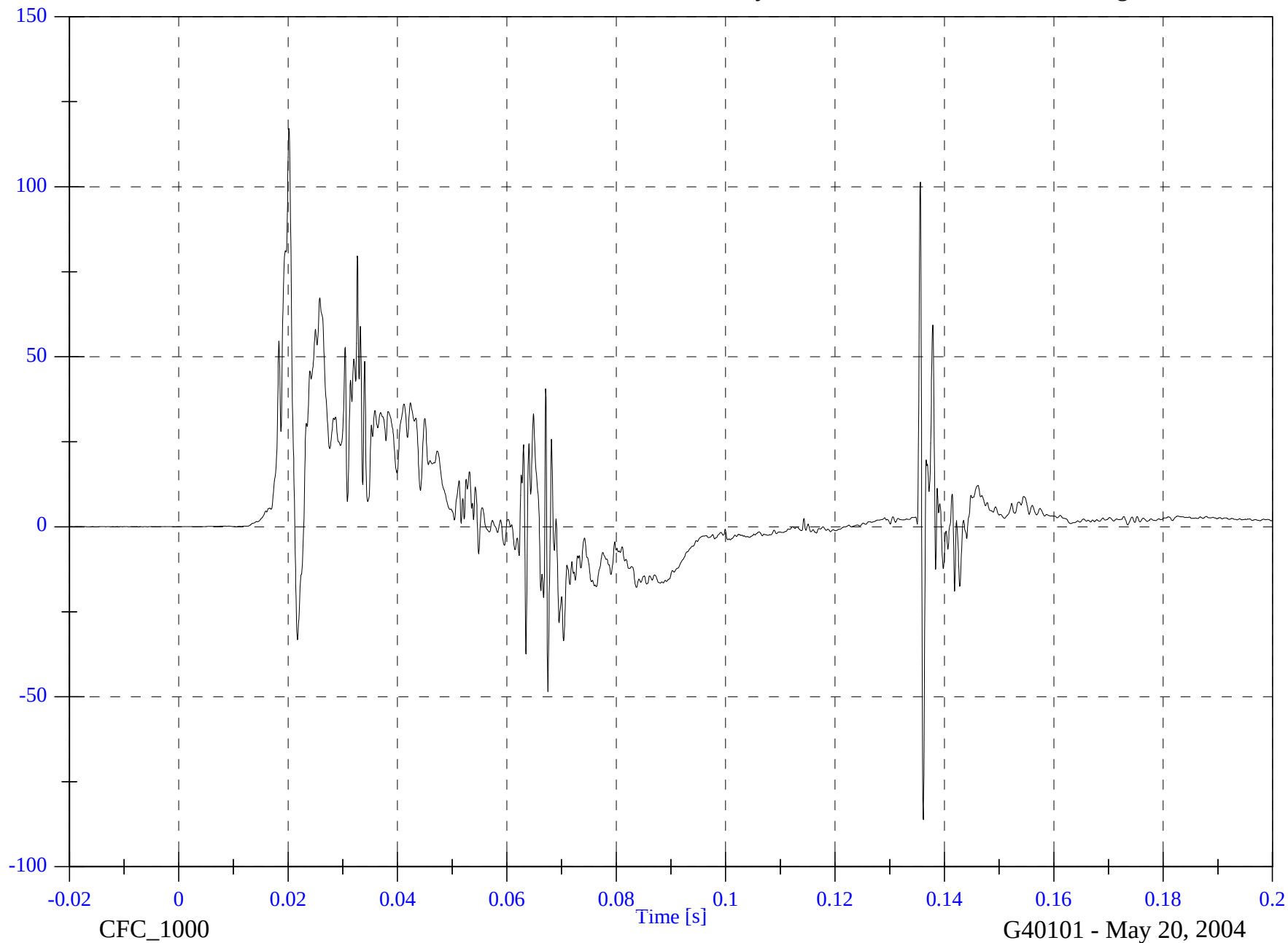
V2P1 Lower Rib y

Max: 117.1 [g] at 0.020 [s]

Min: -86.2 [g] at 0.136 [s]

B-23

8745-01

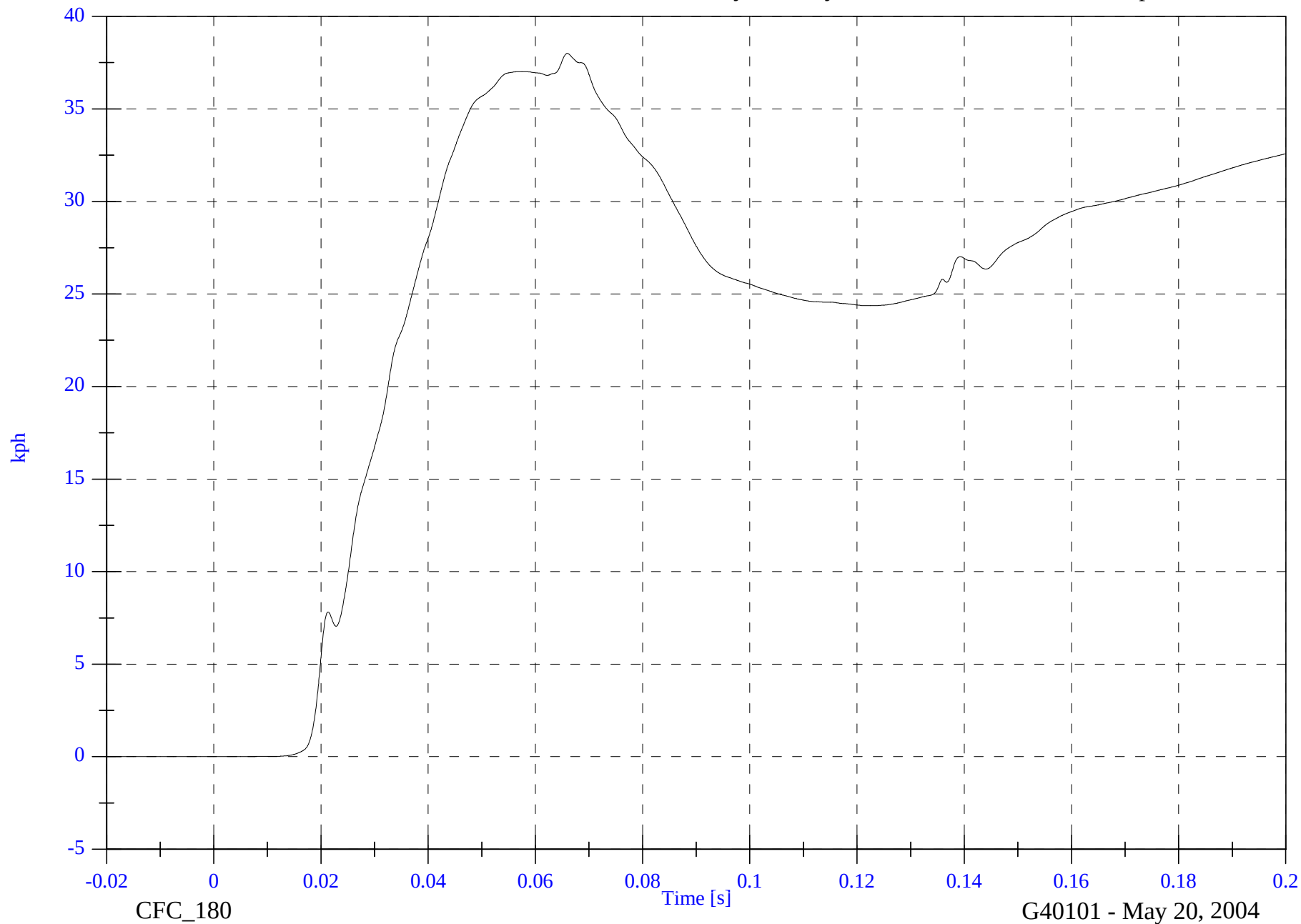


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Lower Rib y Velocity

Max: 38.0 [kph] at 0.066 [s]

Min: -0.0 [kph] at -0.020 [s]



B-24

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

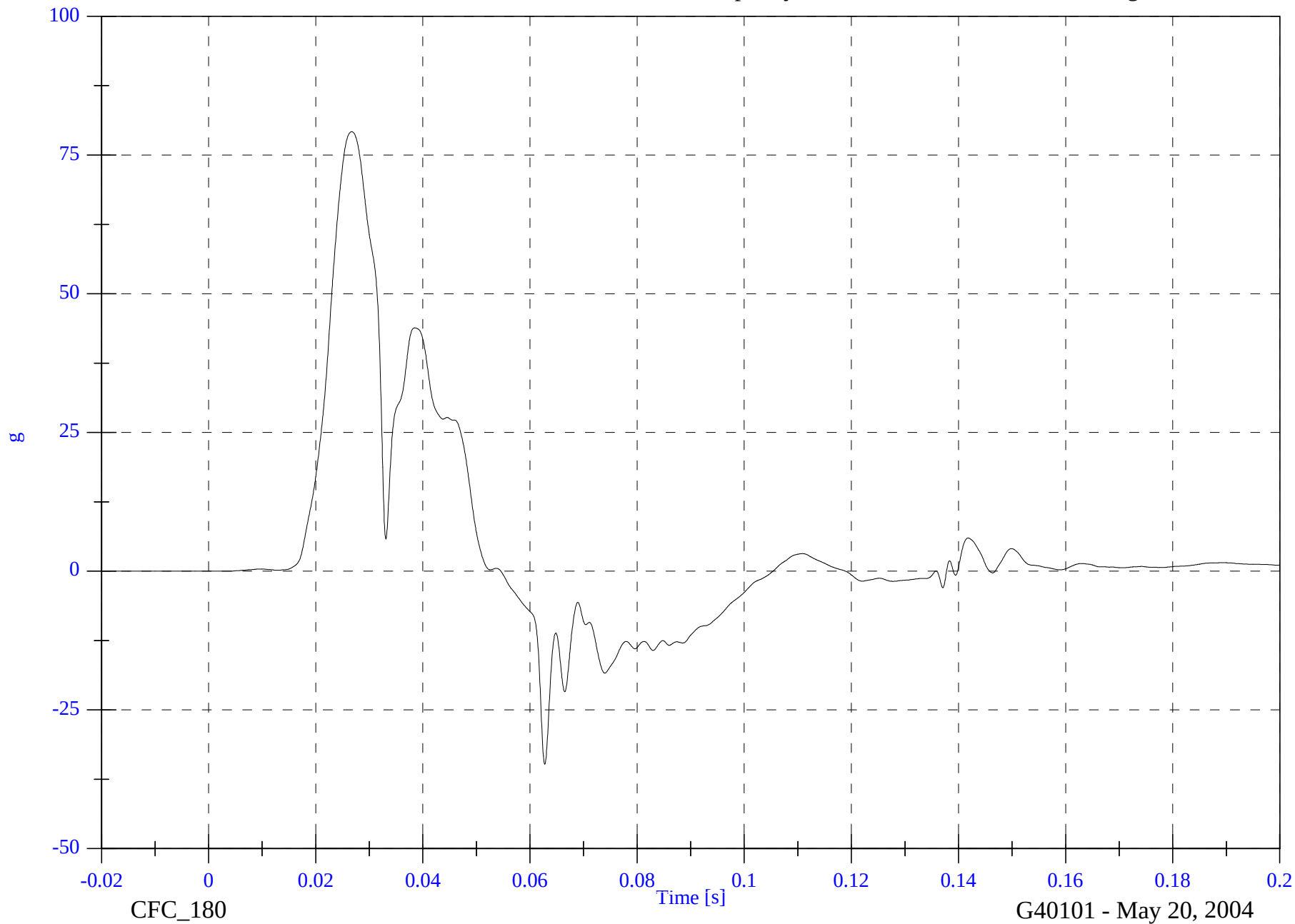
V2P1 Lower Spine y

Max: 79.2 [g] at 0.027 [s]

Min: -34.8 [g] at 0.063 [s]

B-25

8745-01

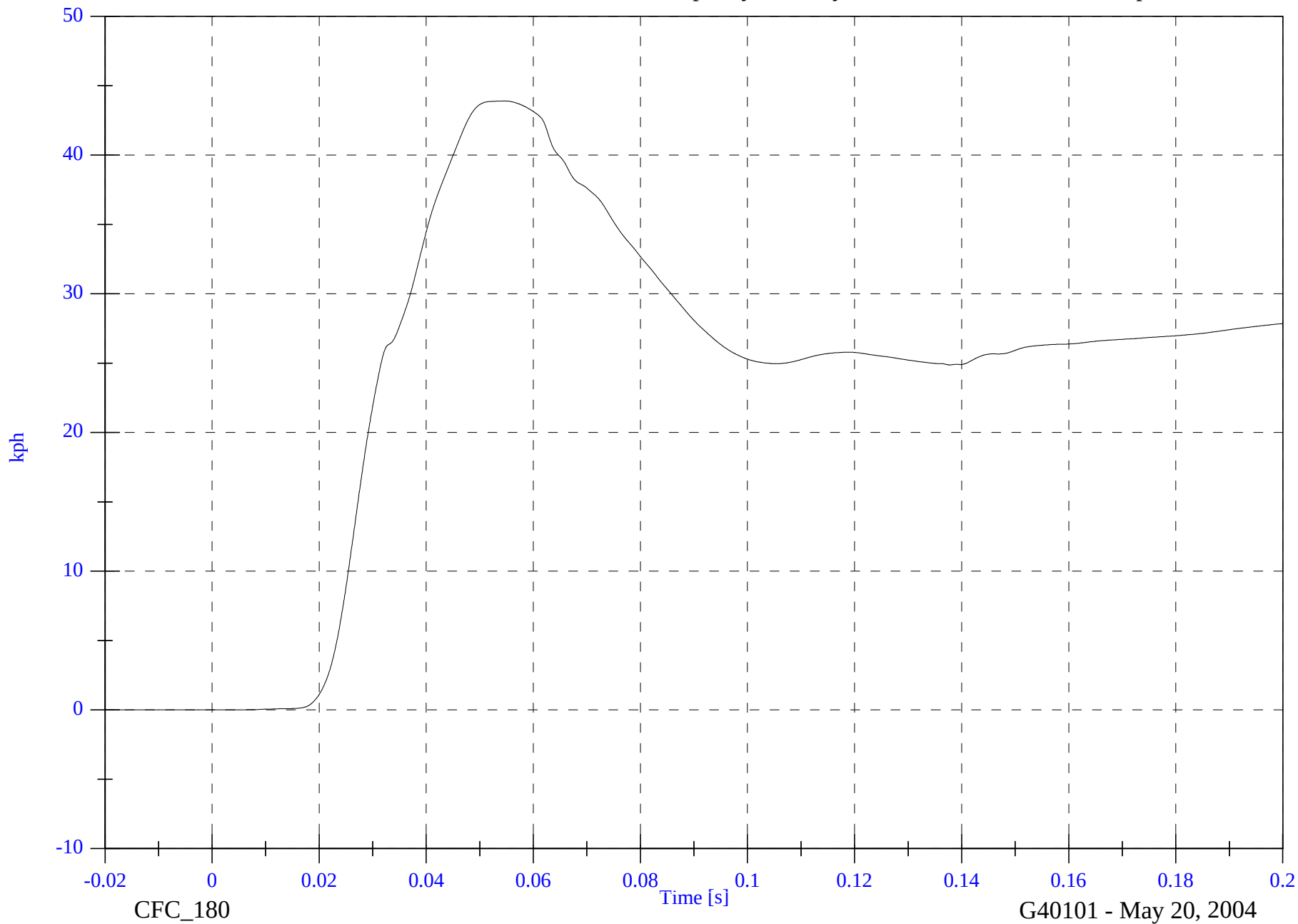


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Lower Spine y Velocity

Max: 43.9 [kph] at 0.055 [s]

Min: -0.0 [kph] at -0.020 [s]



B-26

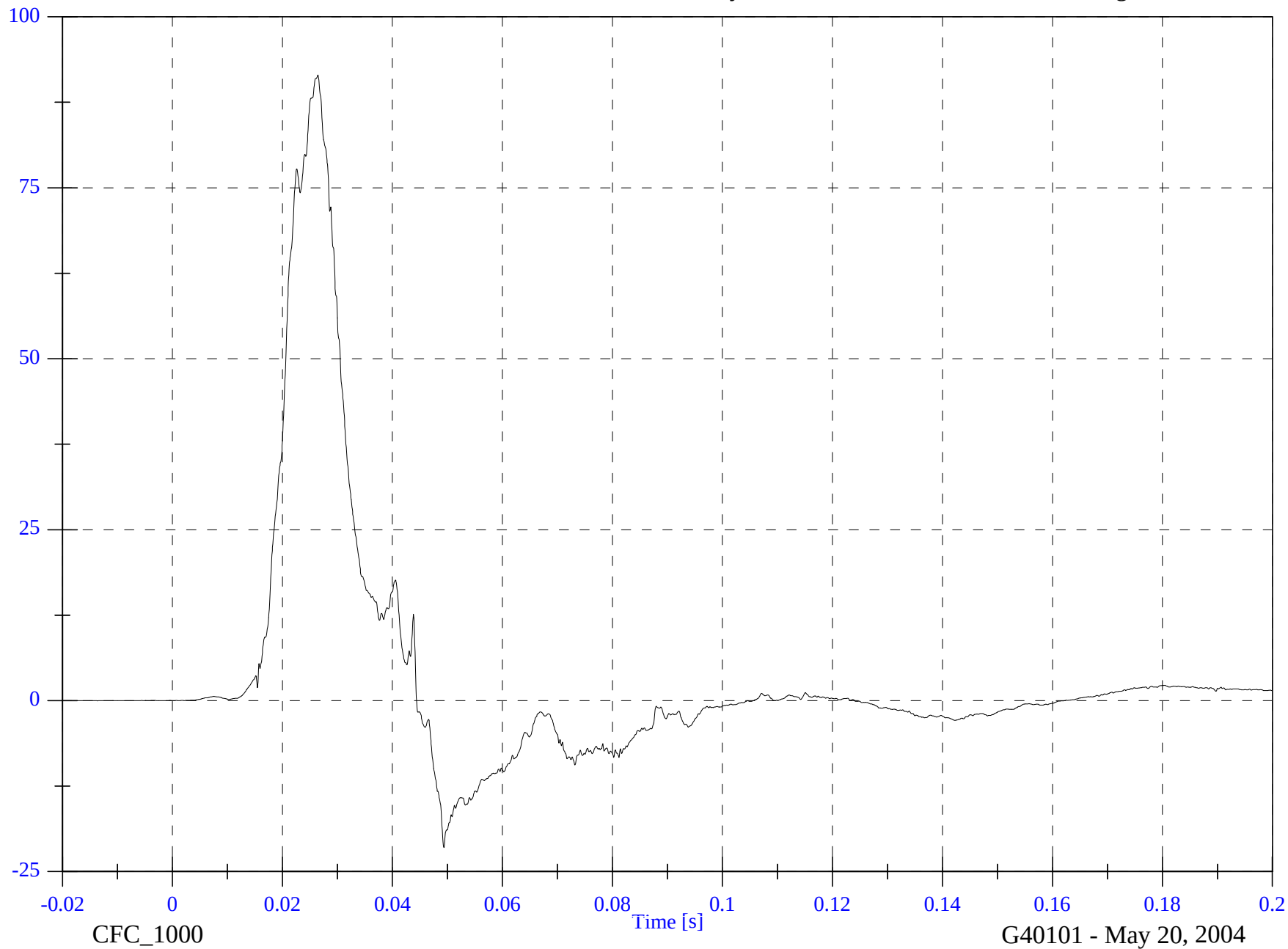
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Pelvic y

Max: 91.5 [g] at 0.026 [s]

Min: -21.5 [g] at 0.049 [s]



B-27

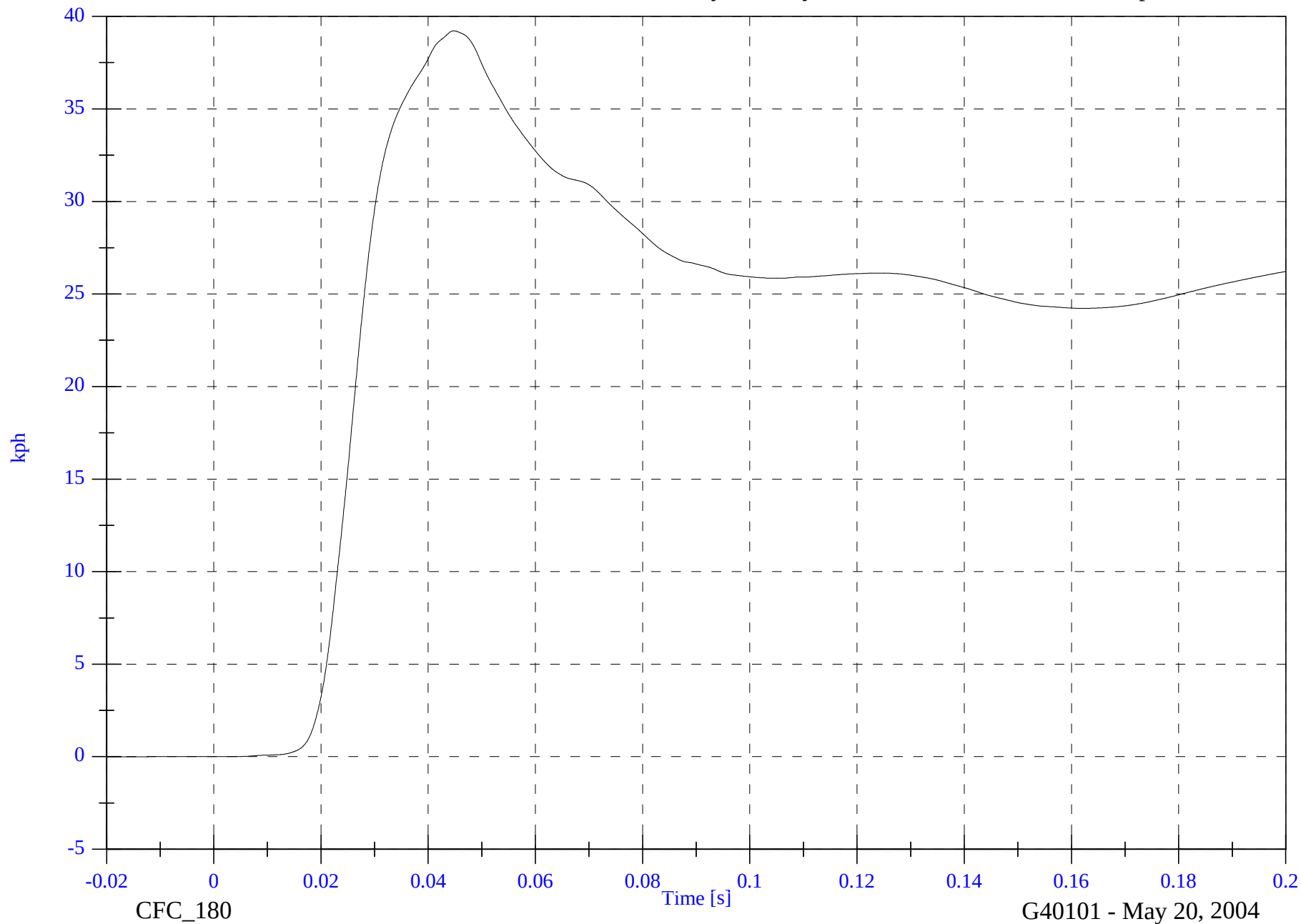
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Pelvic y Velocity

Max: 39.2 [kph] at 0.045 [s]

Min: -0.0 [kph] at -0.020 [s]



B-28

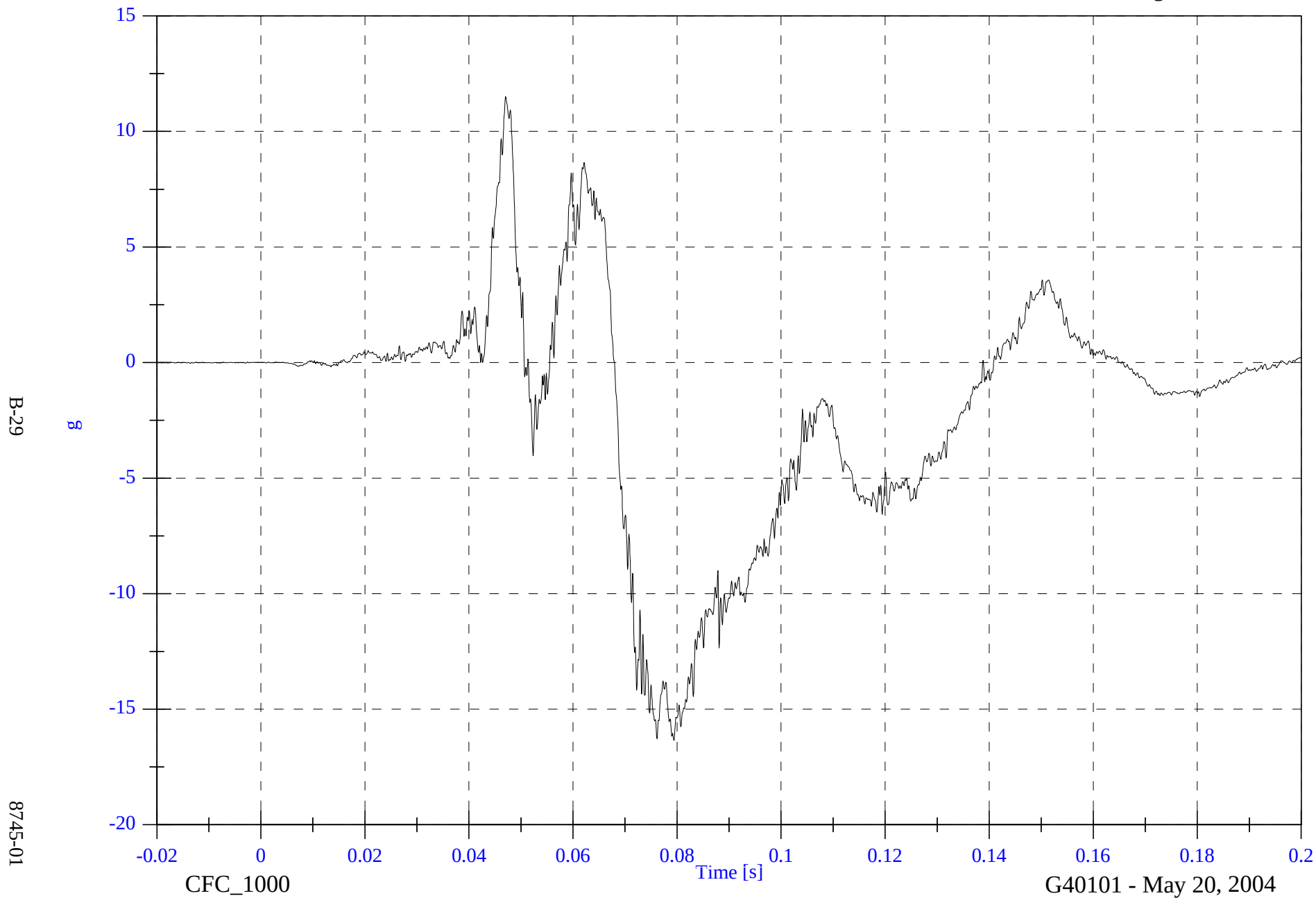
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Head x

Max: 11.5 [g] at 0.047 [s]

Min: -16.4 [g] at 0.079 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

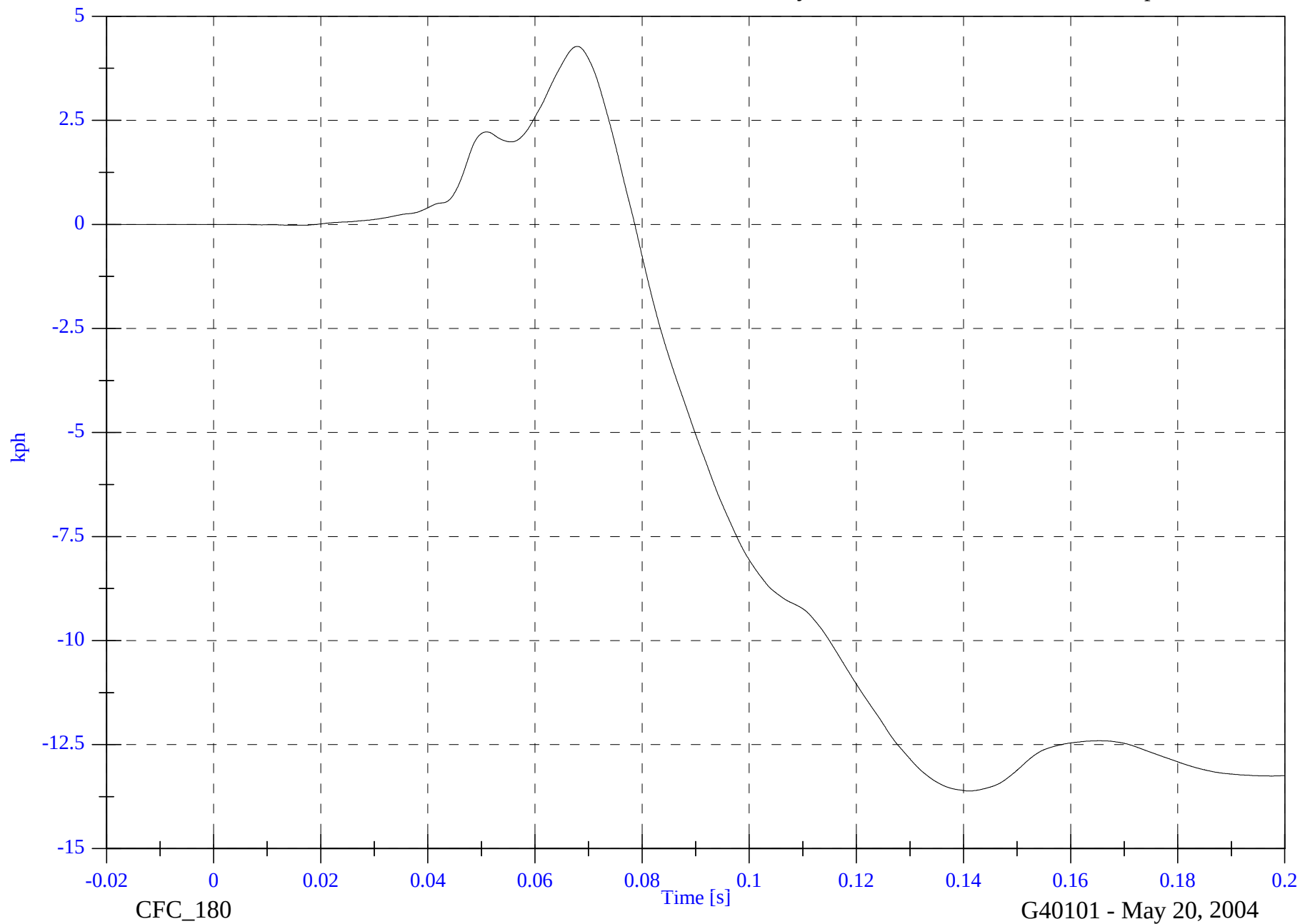
V2P4 Head x Velocity

Max: 4.3 [kph] at 0.068 [s]

Min: -13.6 [kph] at 0.141 [s]

B-30

8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

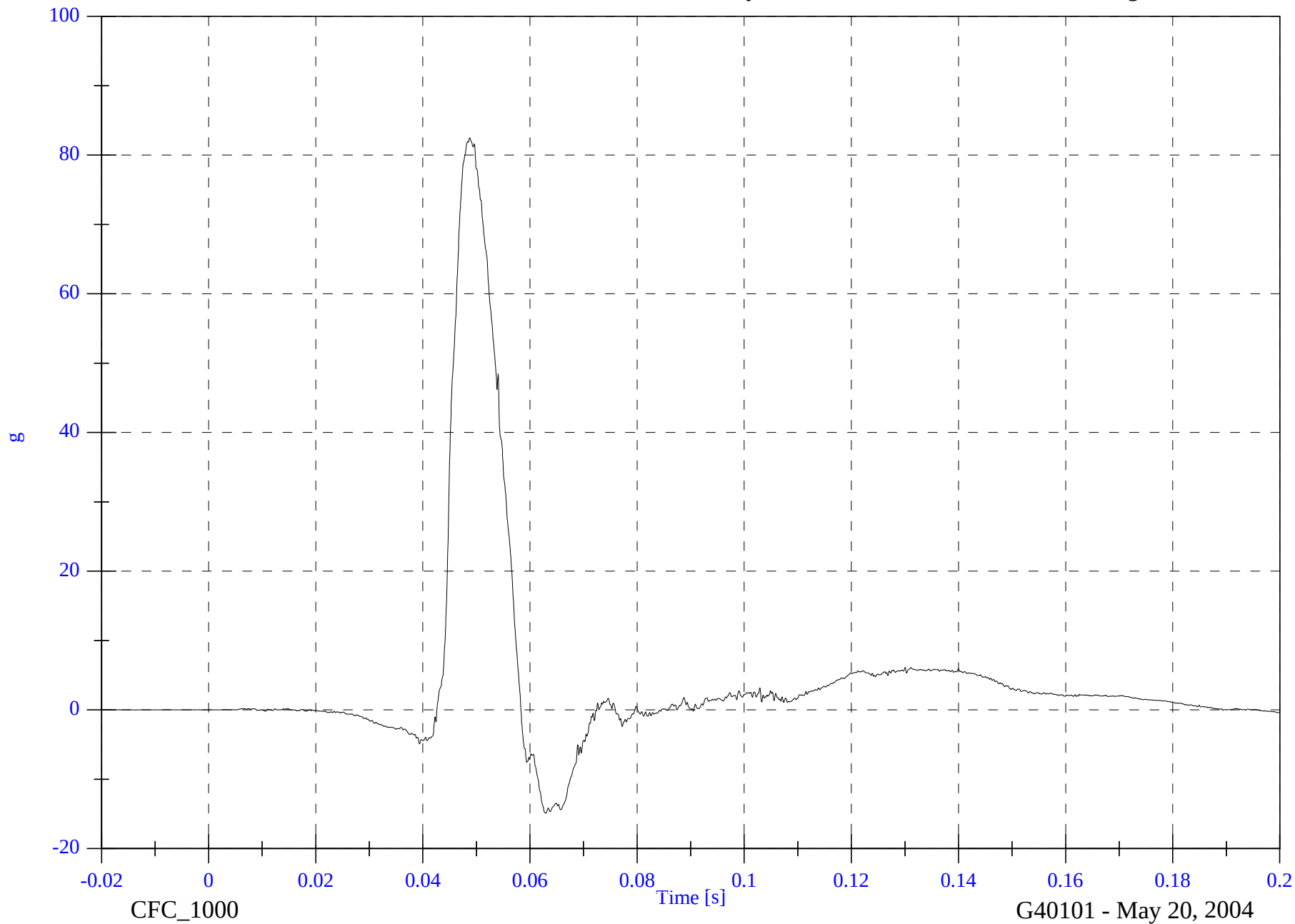
V2P4 Head y

Max: 82.5 [g] at 0.049 [s]

Min: -14.9 [g] at 0.063 [s]

B-31

8745-01

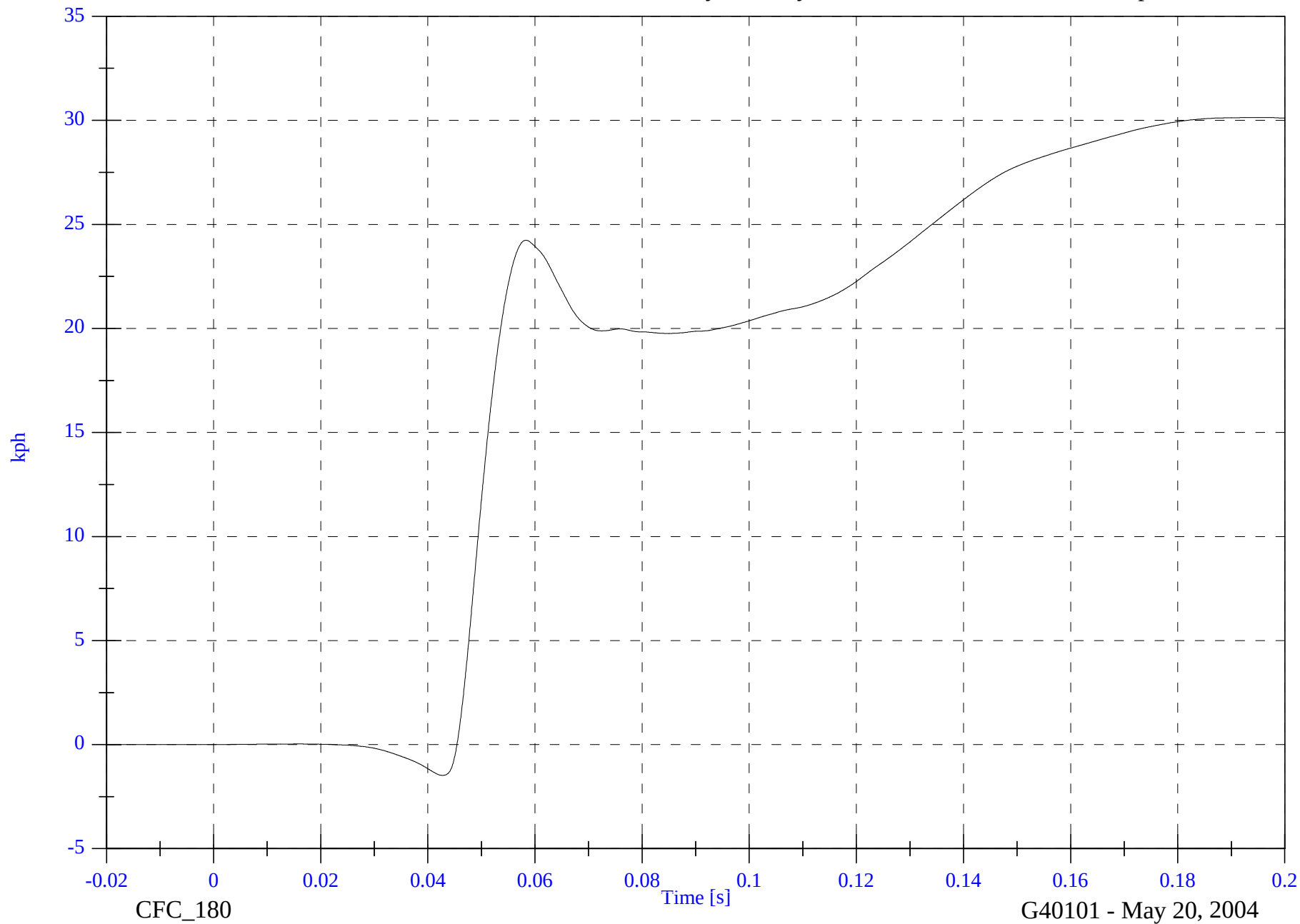


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Head y Velocity

Max: 30.1 [kph] at 0.196 [s]

Min: -1.5 [kph] at 0.043 [s]



B-32

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

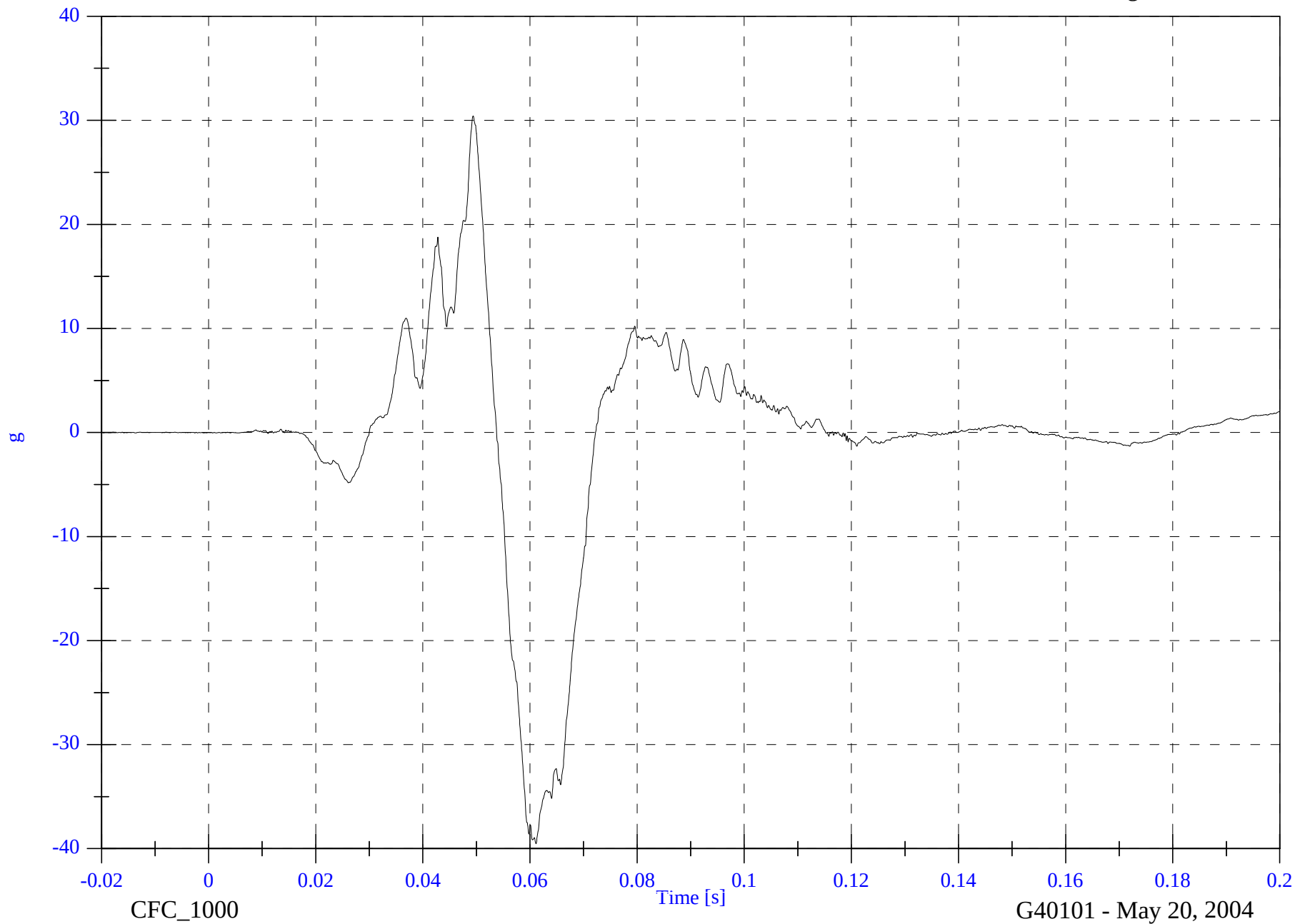
V2P4 Head z

Max: 30.4 [g] at 0.049 [s]

Min: -39.5 [g] at 0.061 [s]

B-33

8745-01

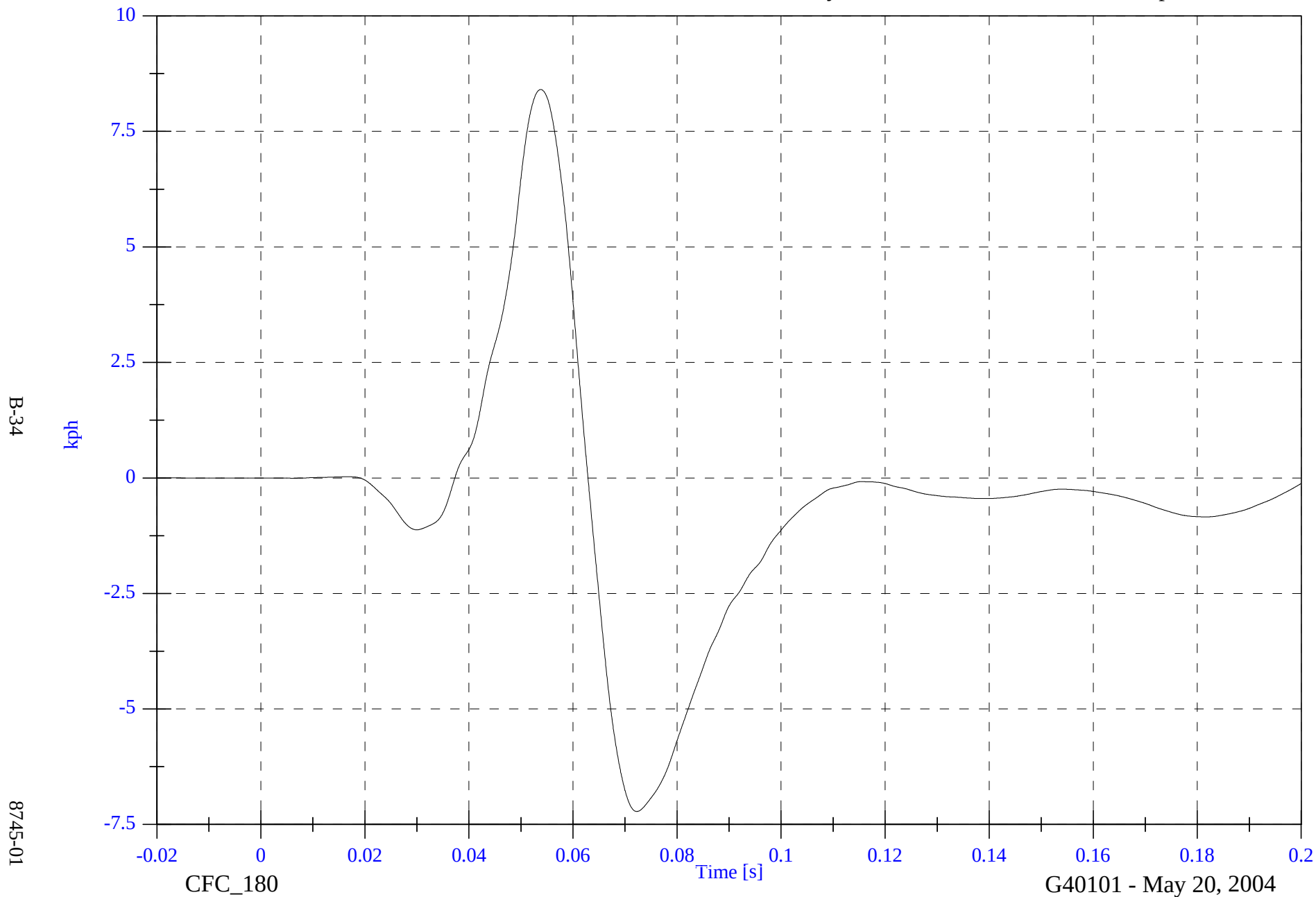


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Head z Velocity

Max: 8.4 [kph] at 0.054 [s]

Min: -7.2 [kph] at 0.072 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Head Resultant

Max: 87.1 [g] at 0.049 [s]

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



B-35

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Neck Fx

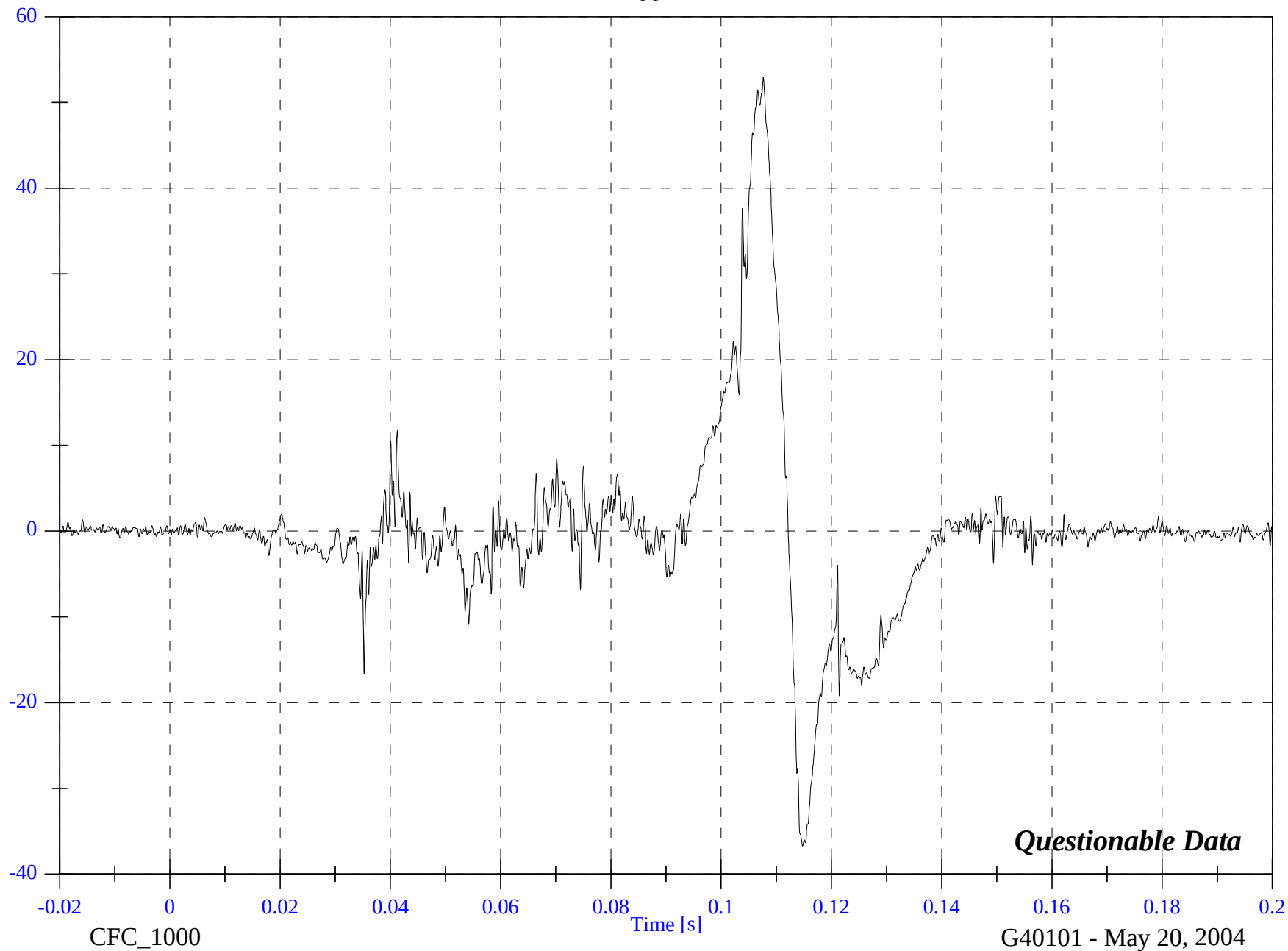
Max: 52.9 [N] at 0.108 [s]

Min: -36.7 [N] at 0.115 [s]

B-36

N

8745-01

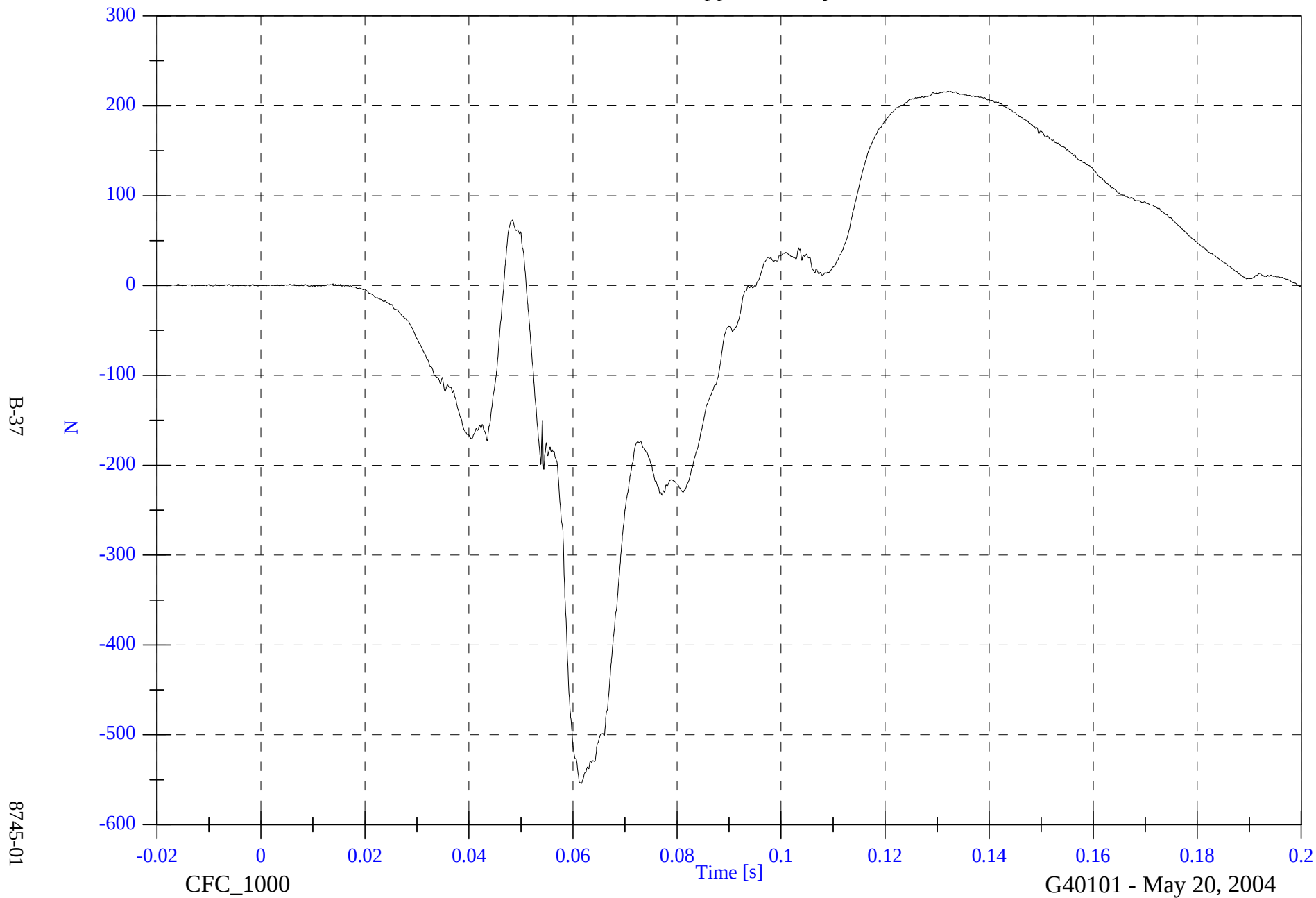


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Neck Fy

Max: 216.1 [N] at 0.132 [s]

Min: -554.0 [N] at 0.062 [s]

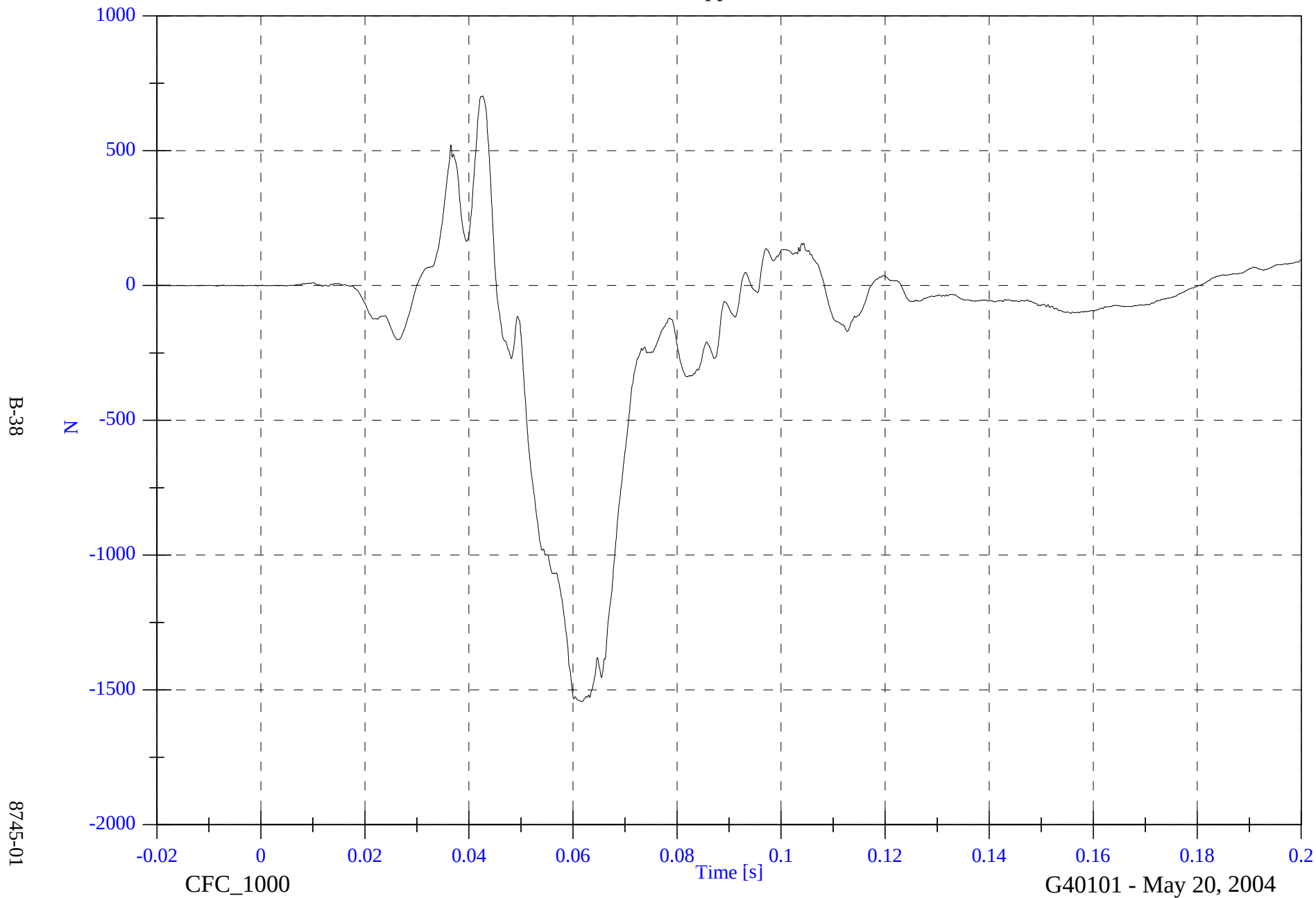


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Neck Fz

Max: 703.0 [N] at 0.043 [s]

Min: -1543.5 [N] at 0.062 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

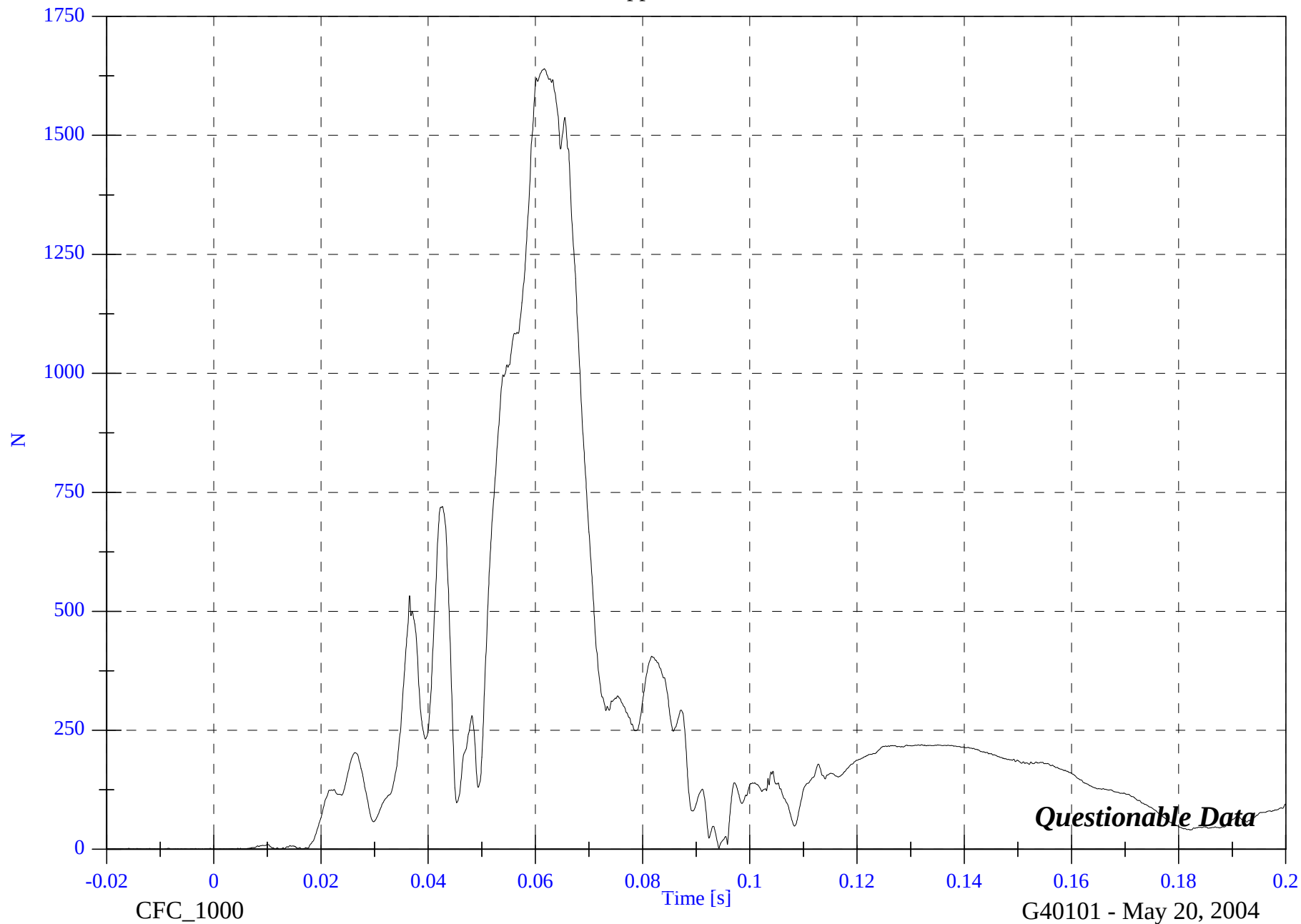
V2P4 Upper Neck F Resultant

Max: 1639.9 [N] at 0.062 [s]

Min: 0.1 [N] at 0.001 [s]

B-39

8745-01

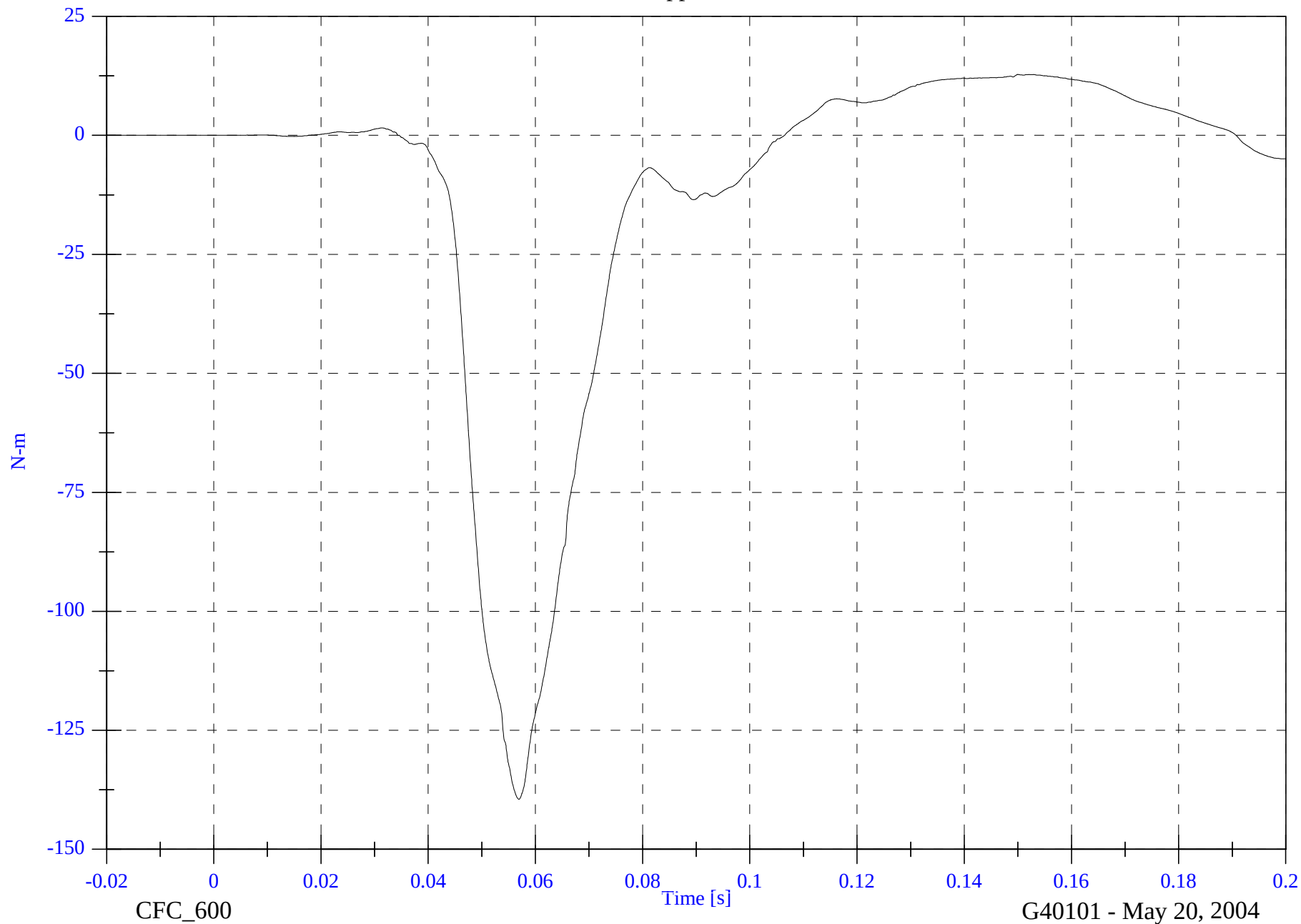


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Neck Mx

Max: 12.8 [N-m] at 0.150 [s]

Min: -139.5 [N-m] at 0.057 [s]



B-40

8745-01

CFC\_600

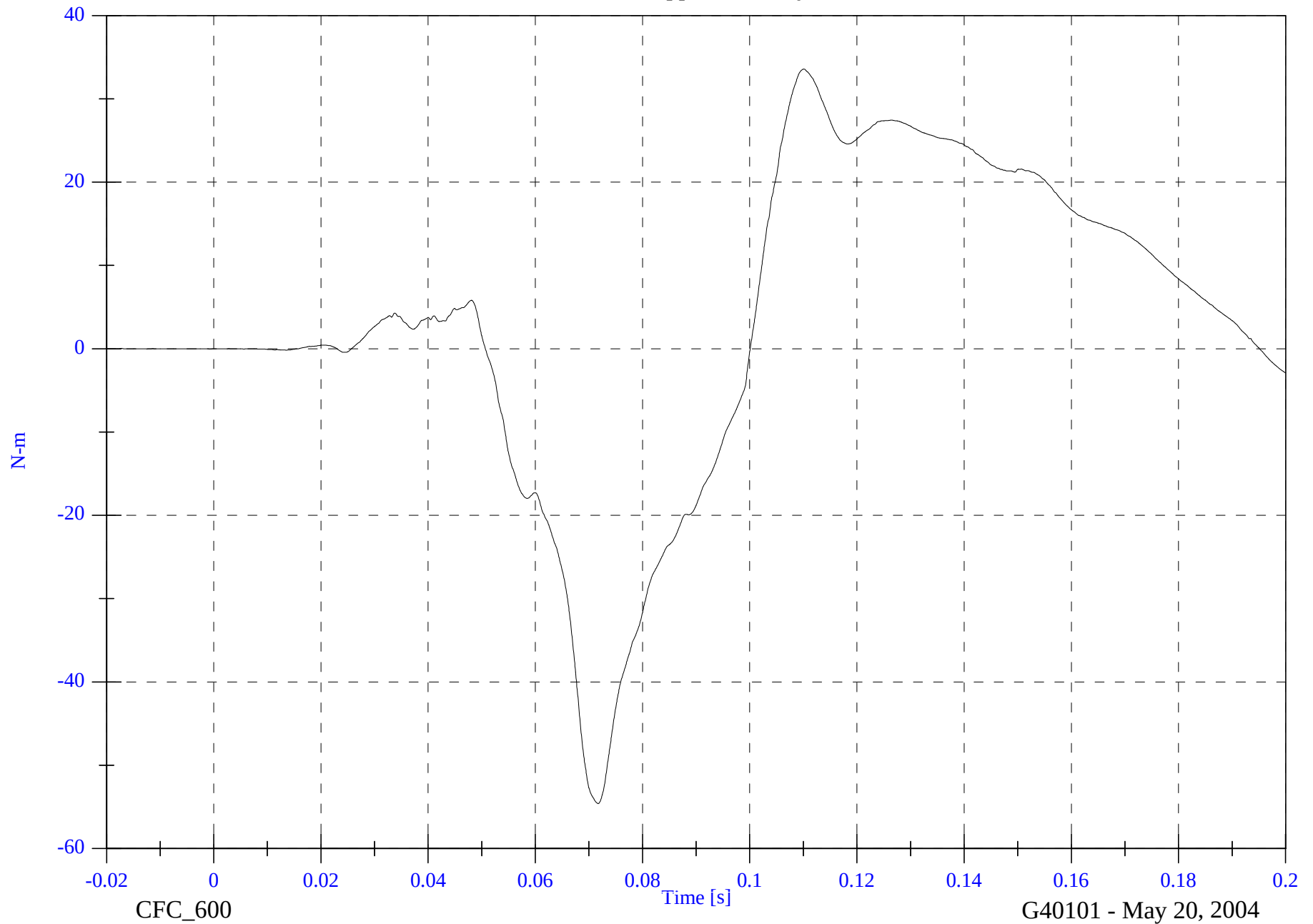
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Neck My

Max: 33.6 [N-m] at 0.110 [s]

Min: -54.6 [N-m] at 0.072 [s]

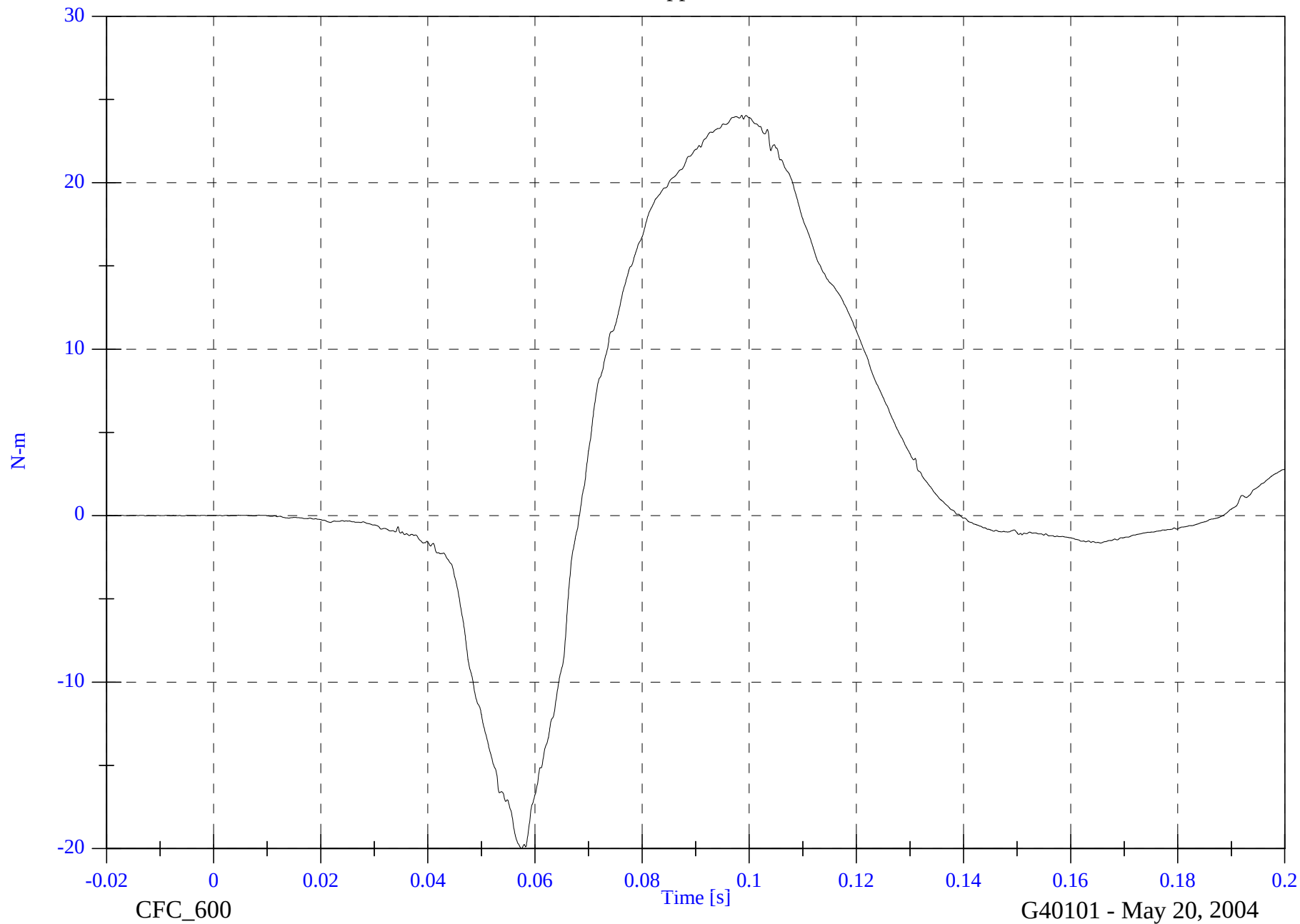


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Neck Mz

Max: 24.1 [N-m] at 0.099 [s]

Min: -20.0 [N-m] at 0.057 [s]



B-42

8745-01

CFC\_600

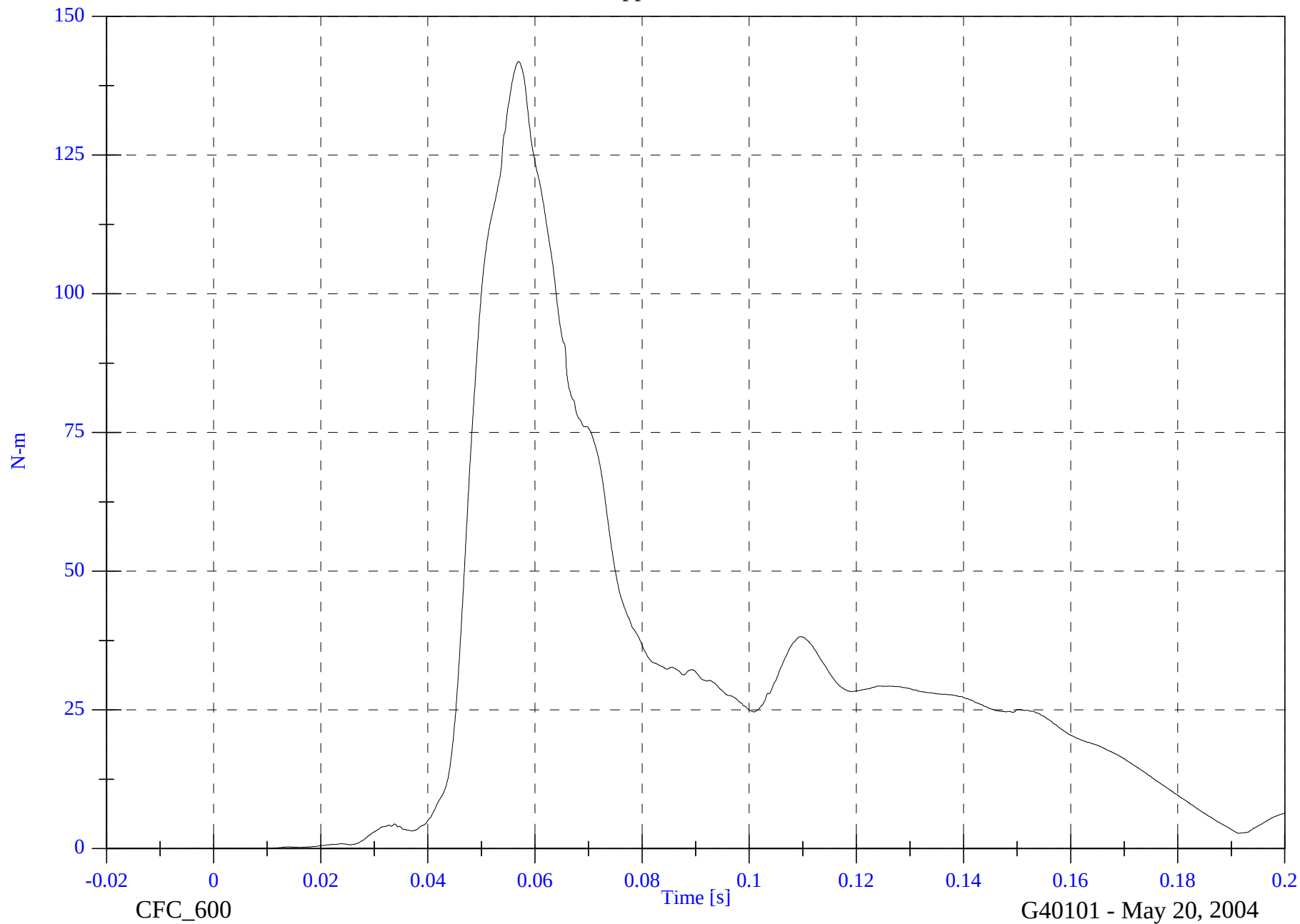
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Neck M Resultant

Max: 141.9 [N-m] at 0.057 [s]

Min: 0.0 [N-m] at -0.013 [s]



B-43

8745-01

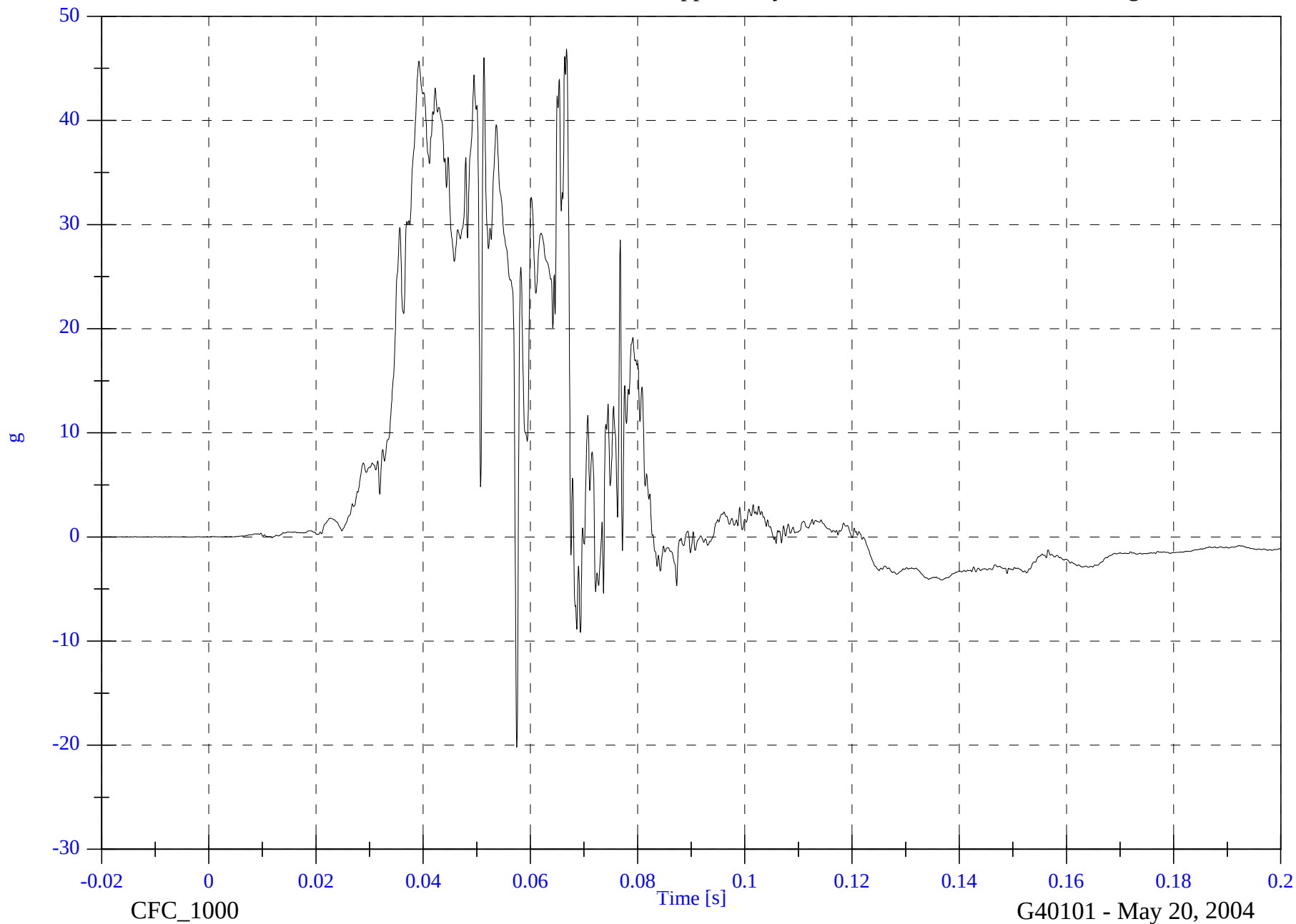
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Rib y

Max: 46.9 [g] at 0.067 [s]

Min: -20.2 [g] at 0.057 [s]



B-44

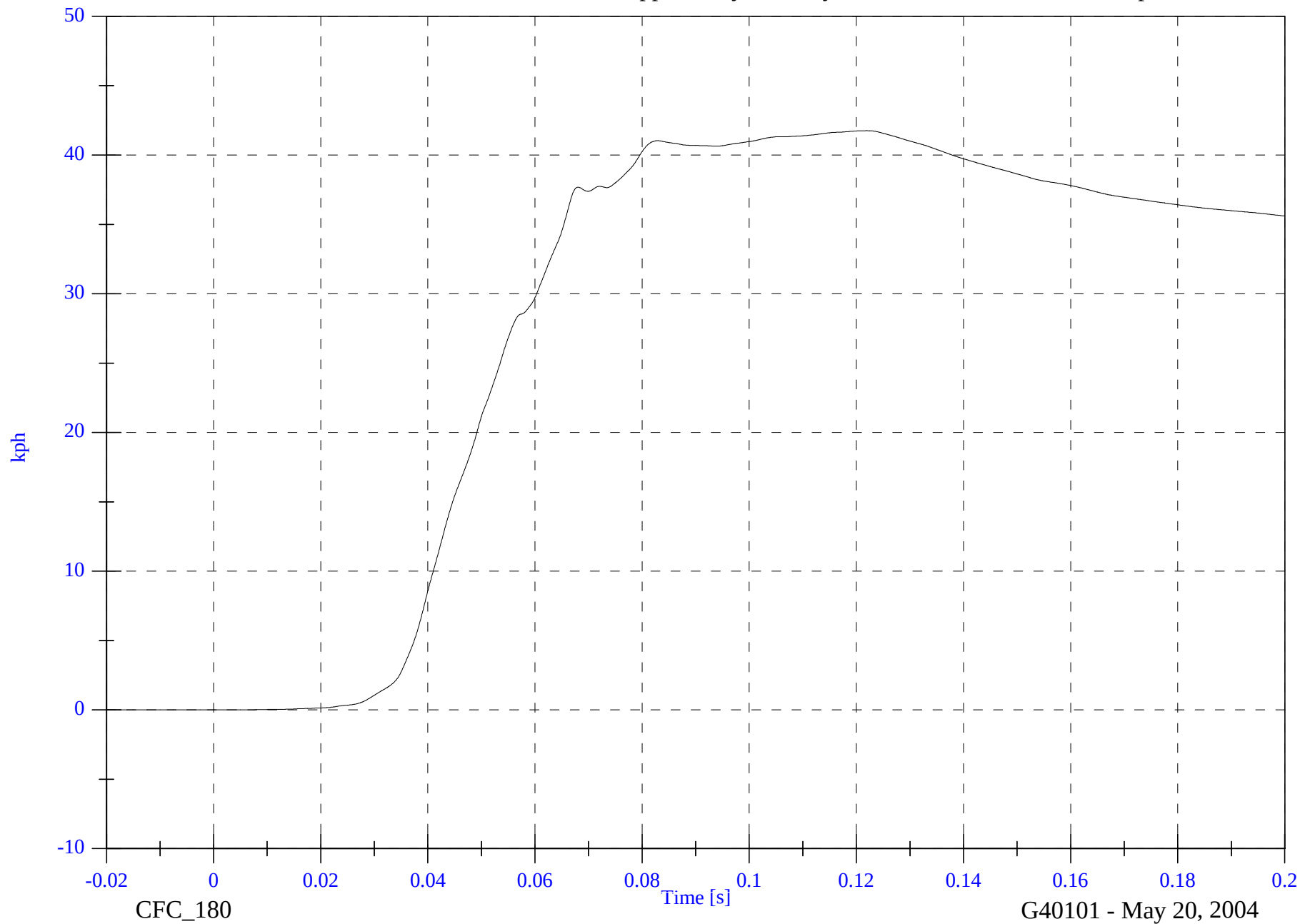
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Rib y Velocity

Max: 41.8 [kph] at 0.122 [s]

Min: -0.0 [kph] at -0.020 [s]



B-45

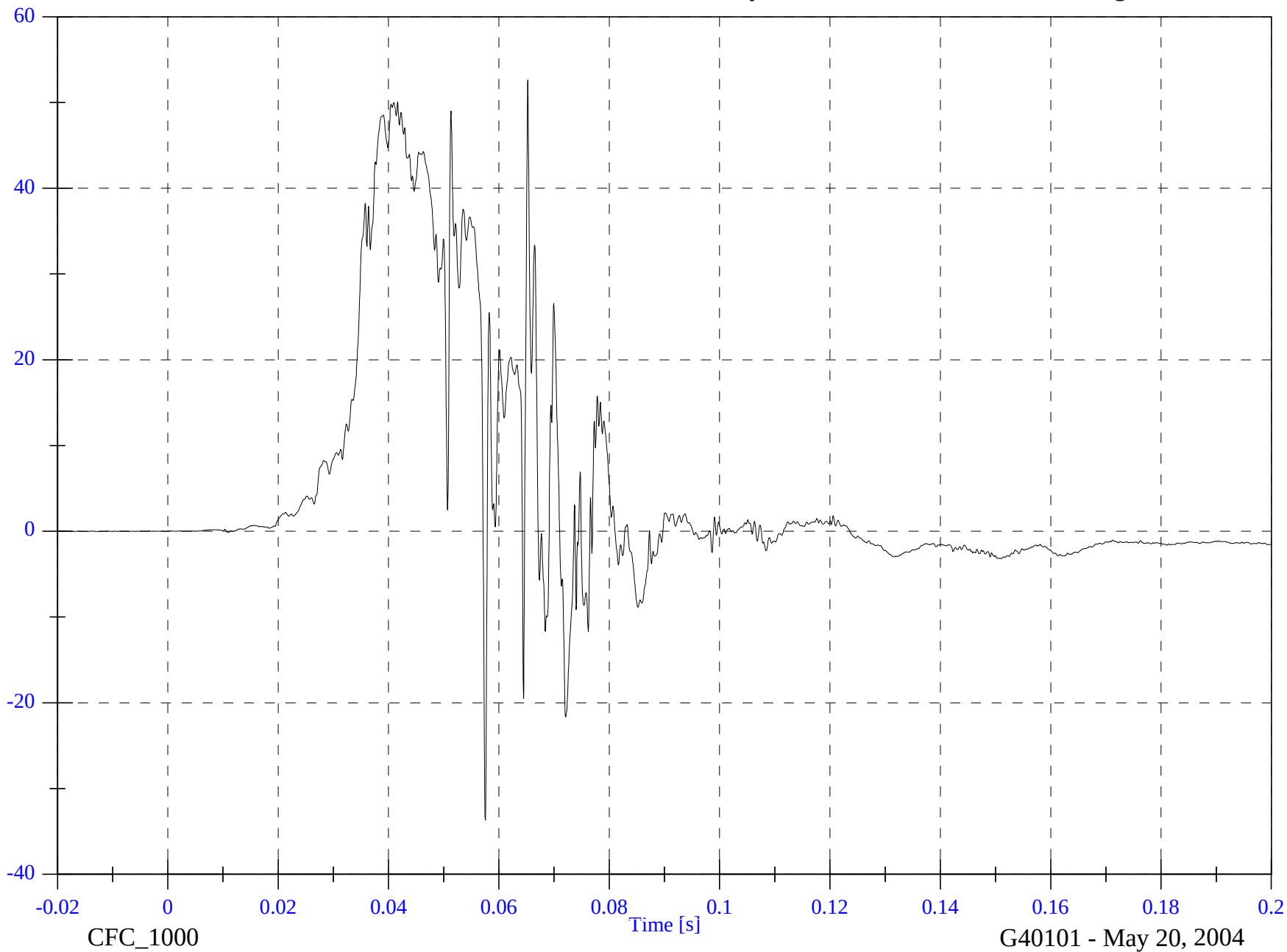
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Lower Rib y

Max: 52.7 [g] at 0.065 [s]

Min: -33.7 [g] at 0.058 [s]



B-46

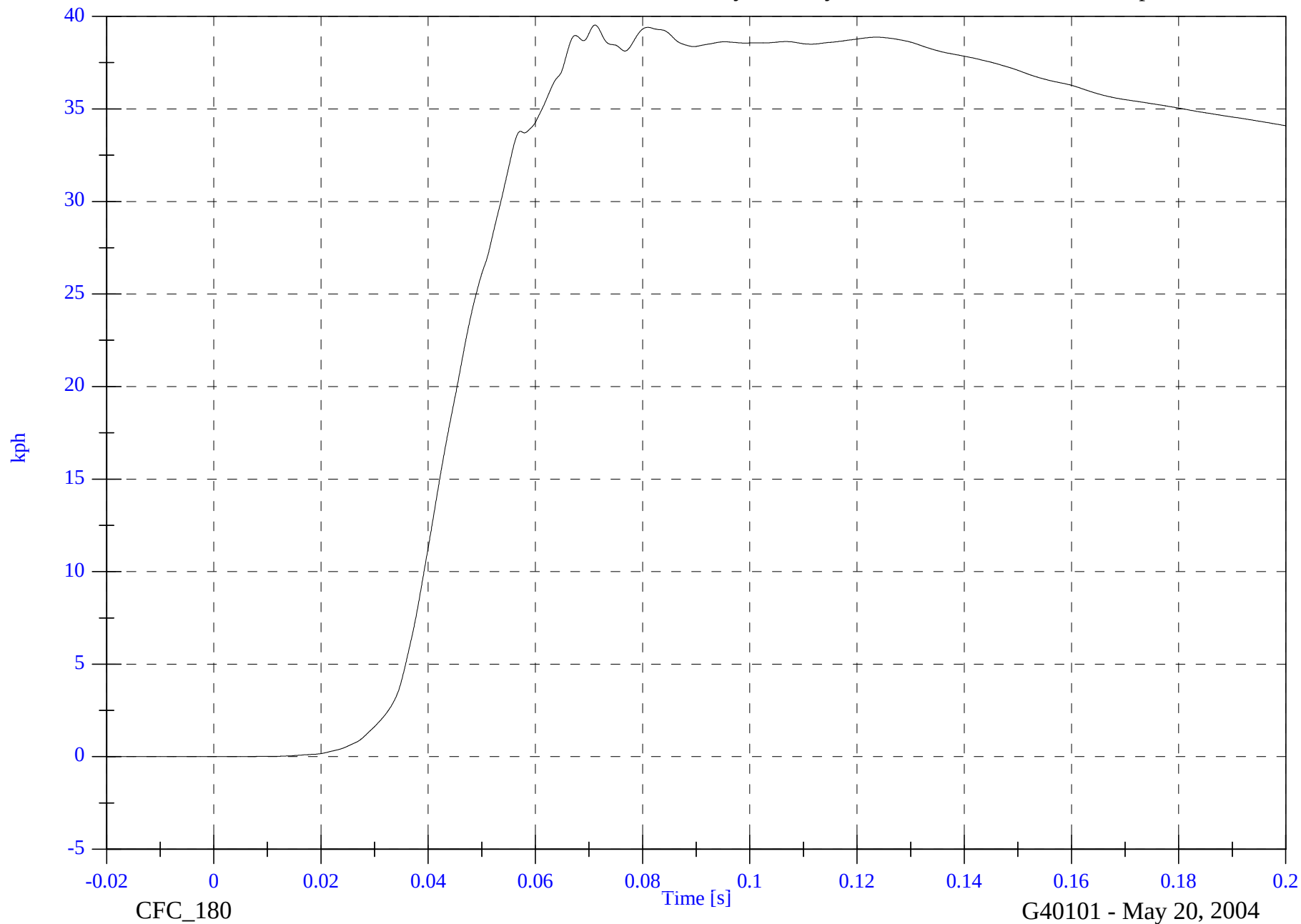
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Lower Rib y Velocity

Max: 39.5 [kph] at 0.071 [s]

Min: -0.0 [kph] at -0.020 [s]



B-47

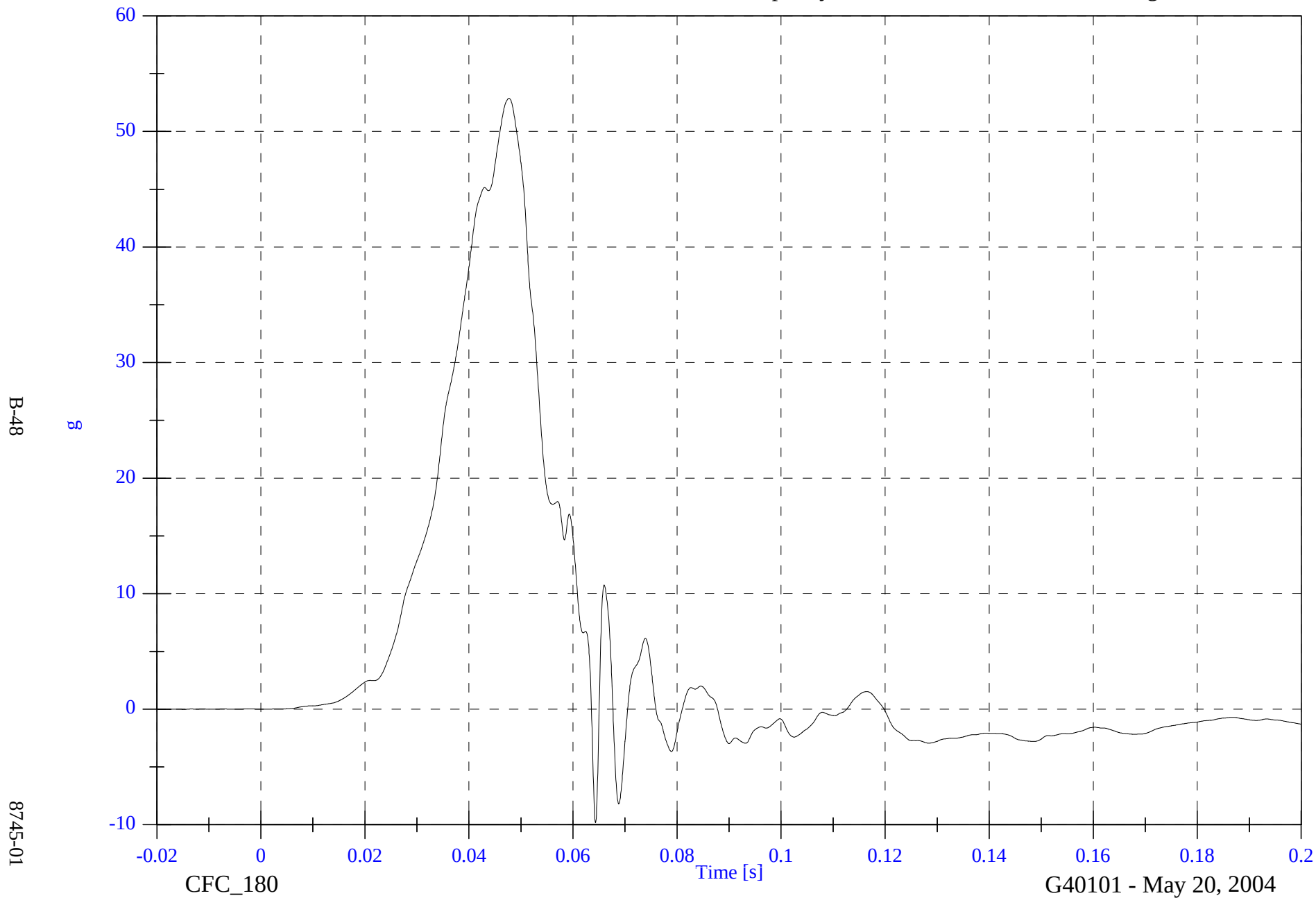
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Lower Spine y

Max: 52.9 [g] at 0.048 [s]

Min: -9.8 [g] at 0.064 [s]

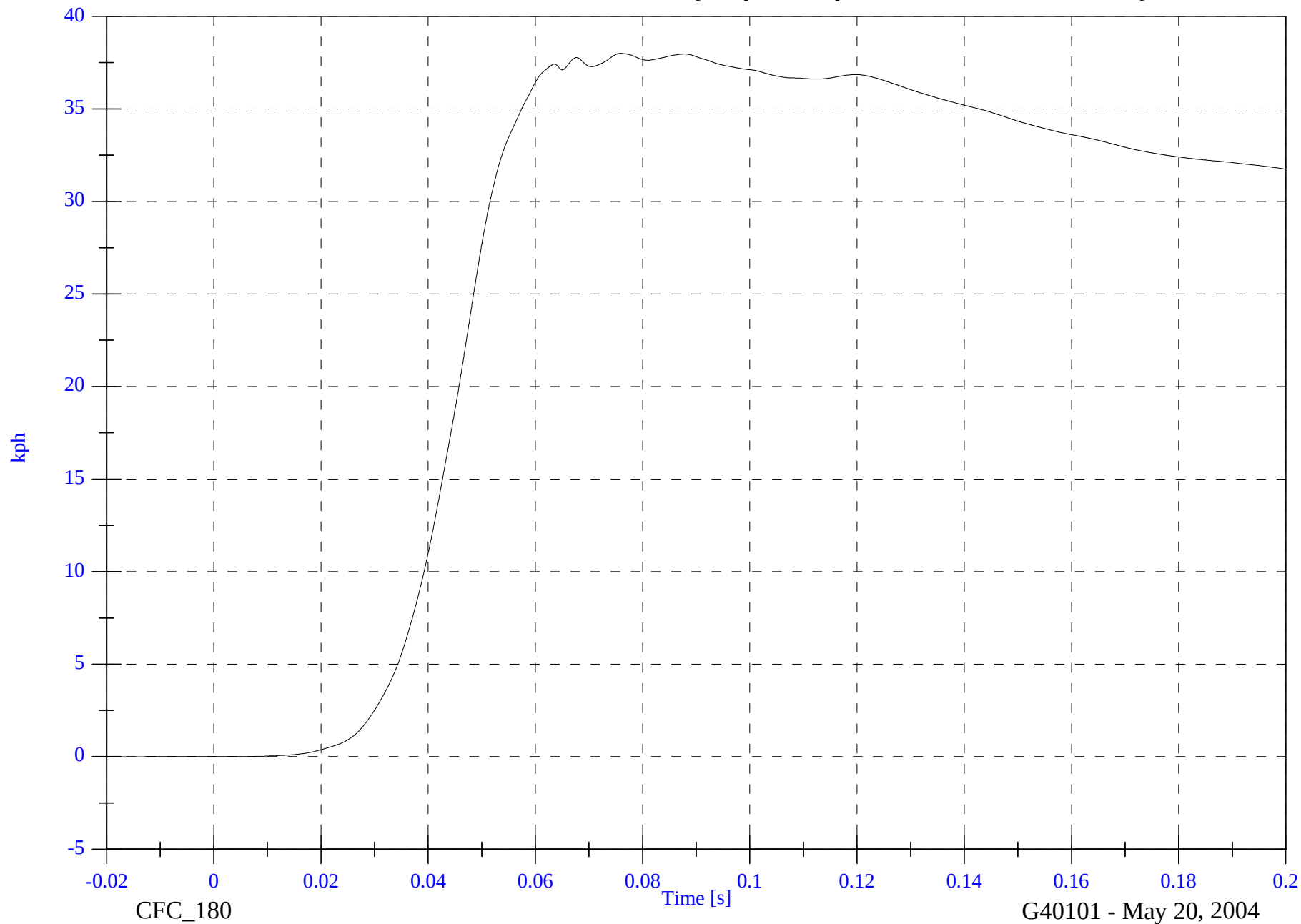


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Lower Spine y Velocity

Max: 38.0 [kph] at 0.076 [s]

Min: -0.0 [kph] at -0.017 [s]



B-49

8745-01

CFC\_180

Time [s]

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

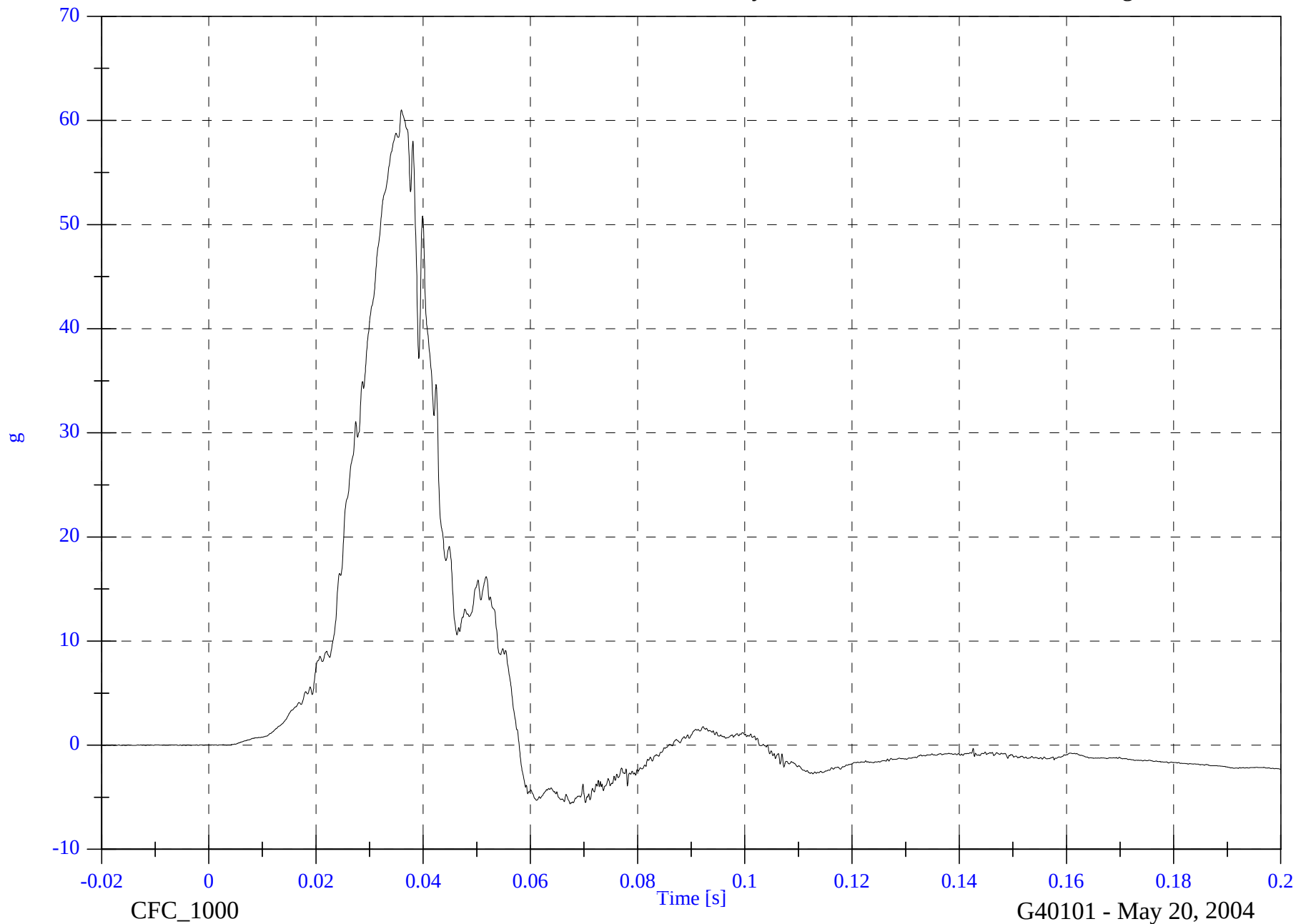
V2P4 Pelvic y

Max: 61.0 [g] at 0.036 [s]

Min: -5.6 [g] at 0.067 [s]

B-50

8745-01

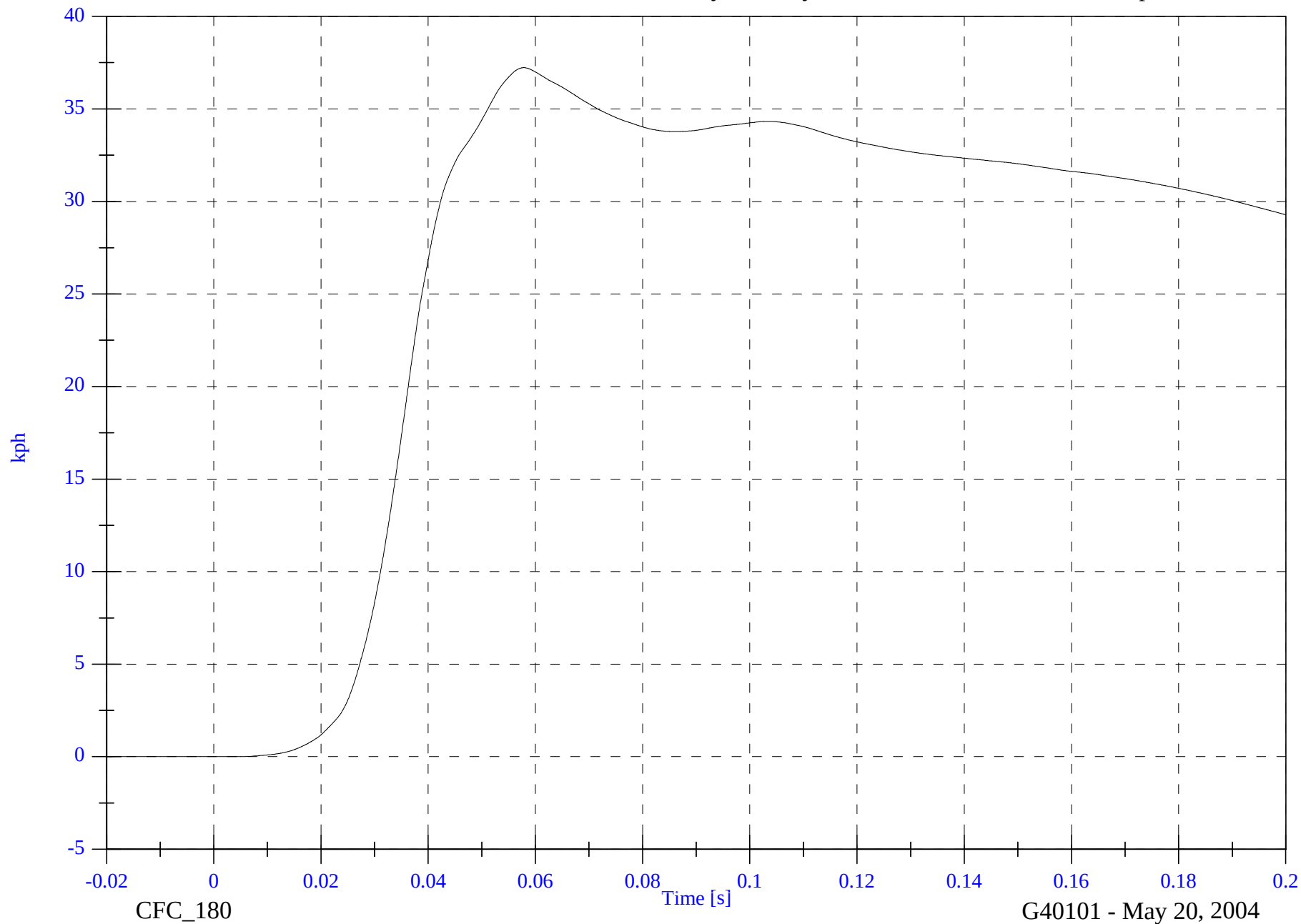


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Pelvic y Velocity

Max: 37.2 [kph] at 0.058 [s]

Min: -0.0 [kph] at -0.020 [s]



B-51

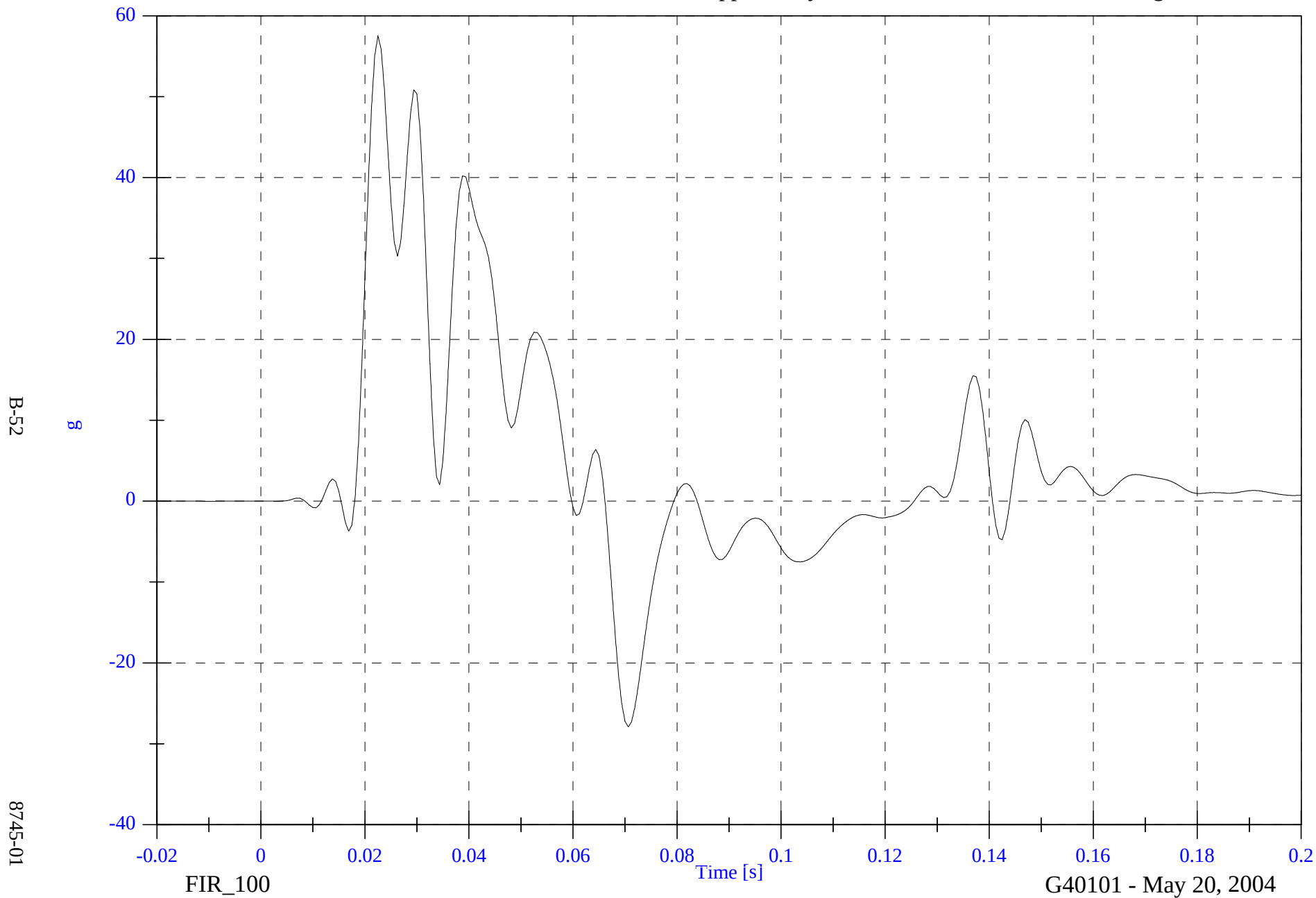
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Rib y

Max: 57.5 [g] at 0.022 [s]

Min: -27.9 [g] at 0.071 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

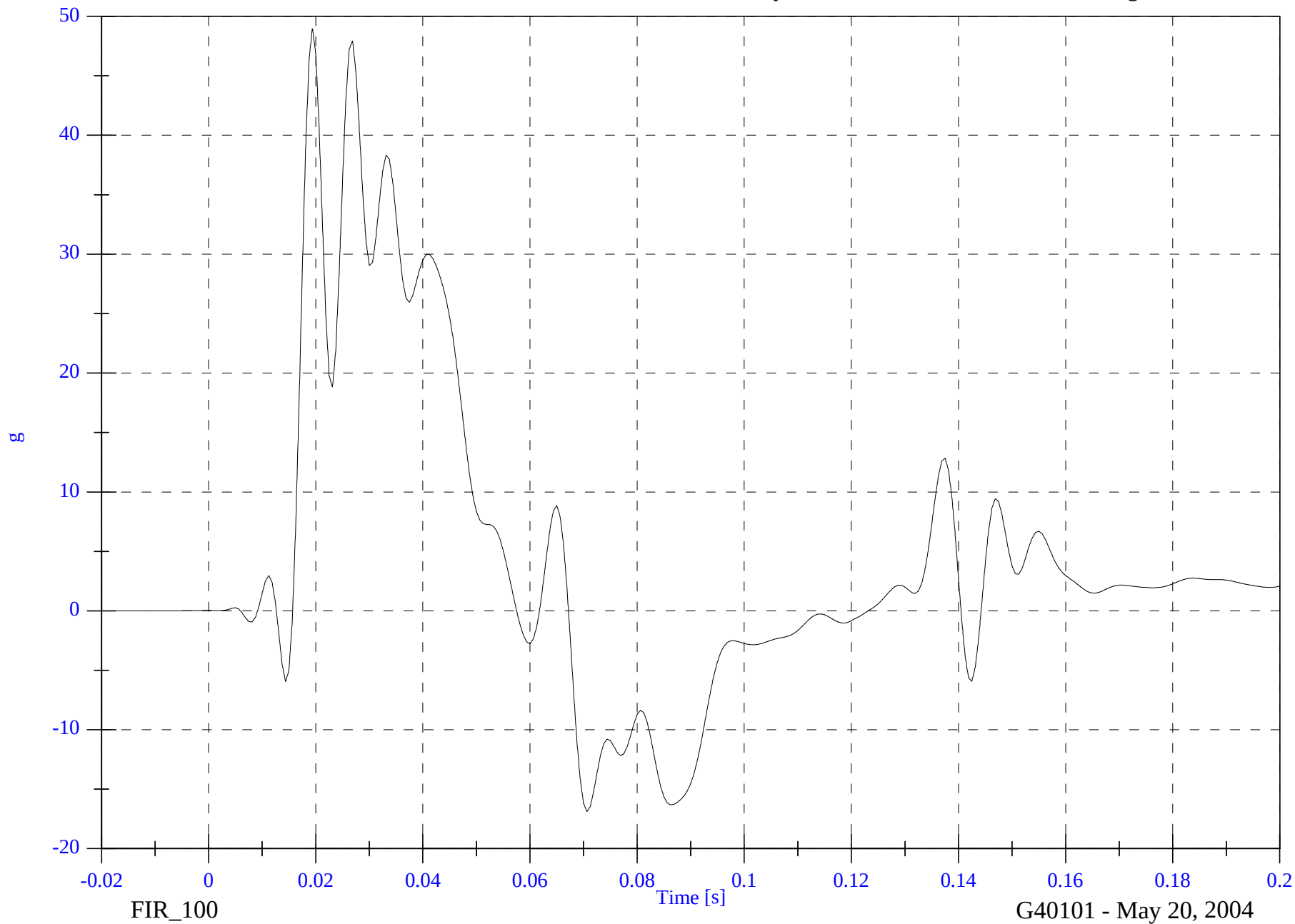
V2P1 Lower Rib y

Max: 49.0 [g] at 0.019 [s]

Min: -16.9 [g] at 0.071 [s]

B-53

8745-01

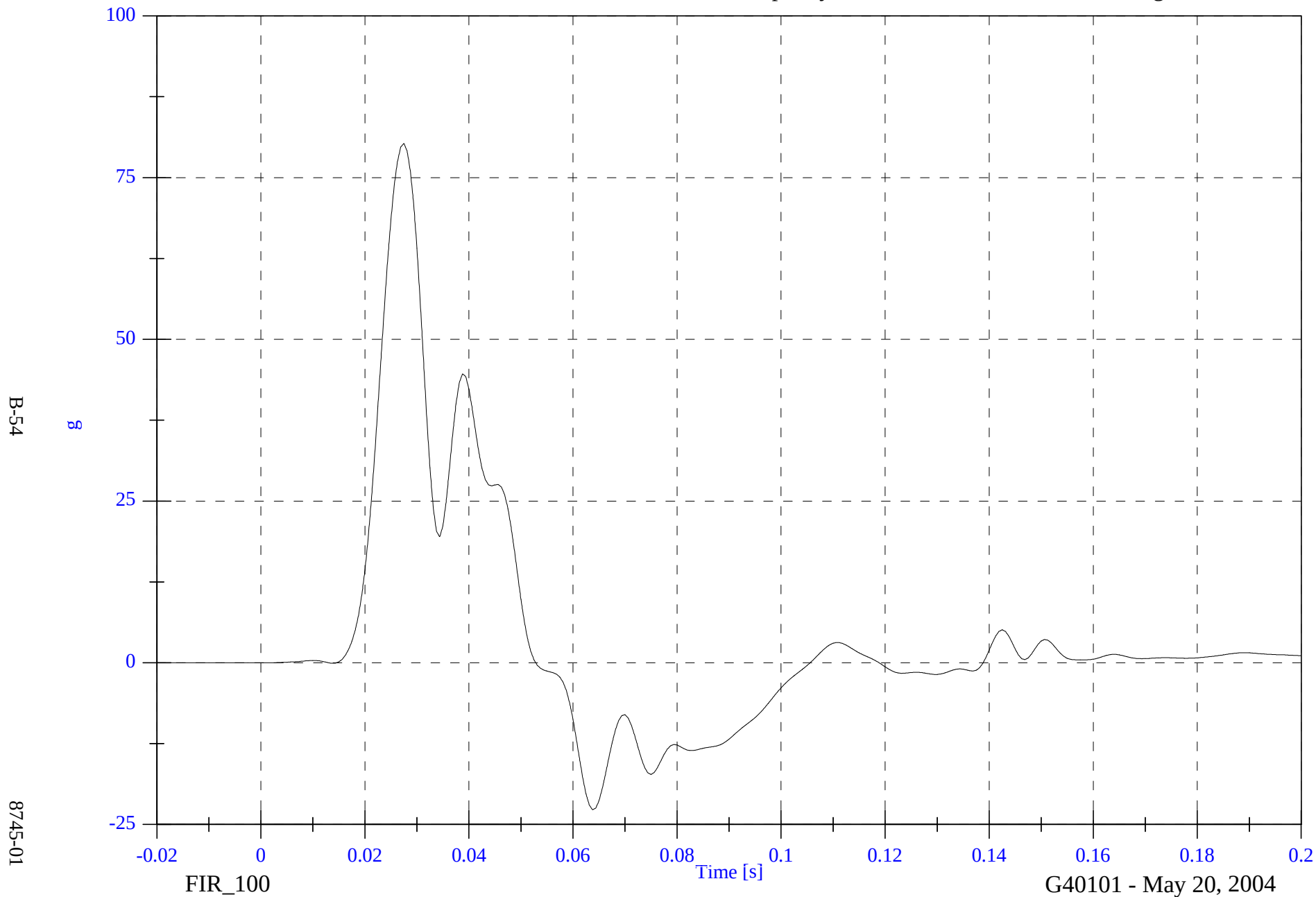


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Lower Spine y

Max: 80.3 [g] at 0.027 [s]

Min: -22.7 [g] at 0.064 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Pelvic y

Max: 88.5 [g] at 0.026 [s]

Min: -17.5 [g] at 0.051 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

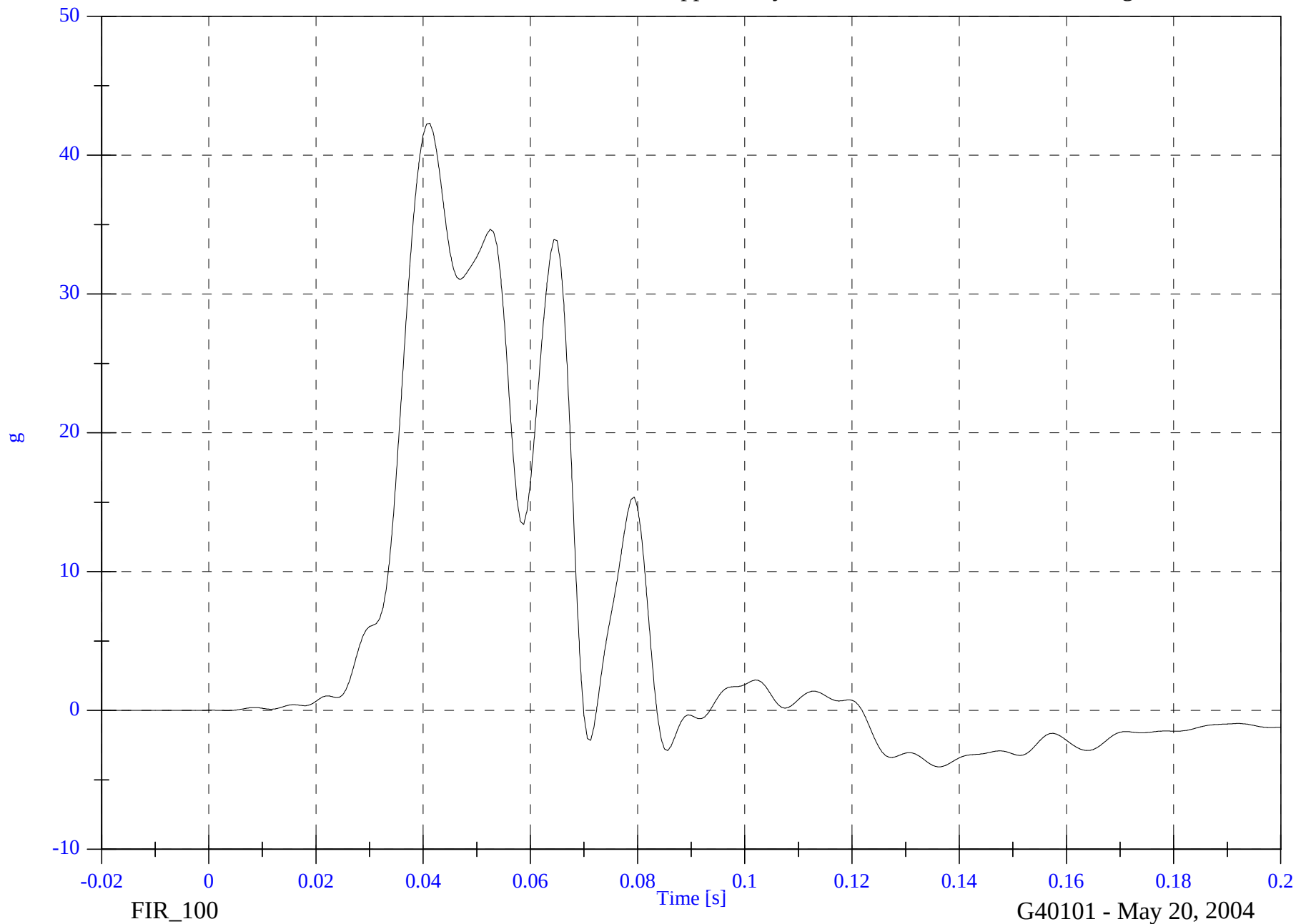
V2P4 Upper Rib y

Max: 42.3 [g] at 0.041 [s]

Min: -4.1 [g] at 0.136 [s]

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2004 Side NCAP - 2004 Chevrolet Malibu

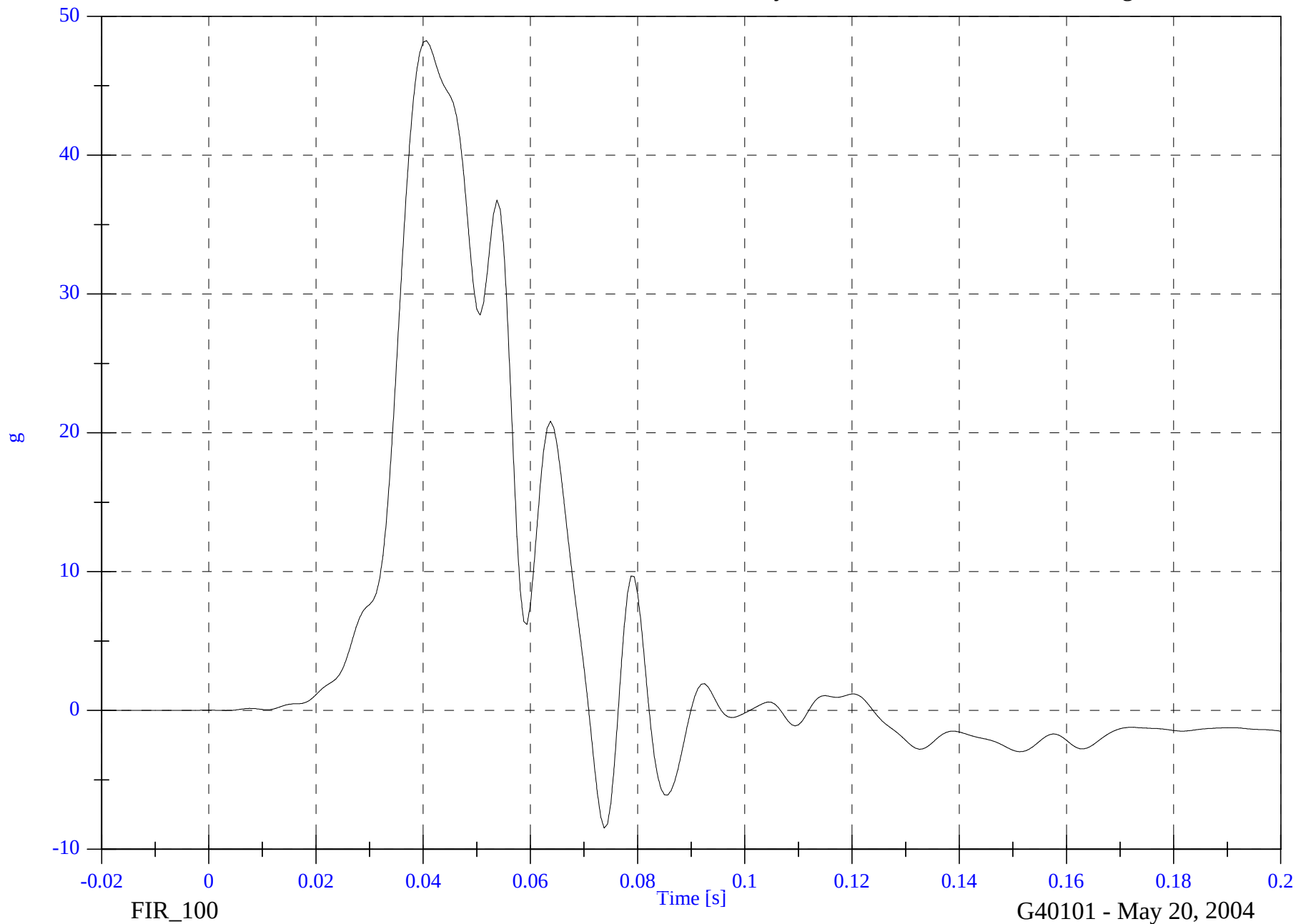
V2P4 Lower Rib y

Max: 48.3 [g] at 0.041 [s]

Min: -8.5 [g] at 0.074 [s]

B-57

8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

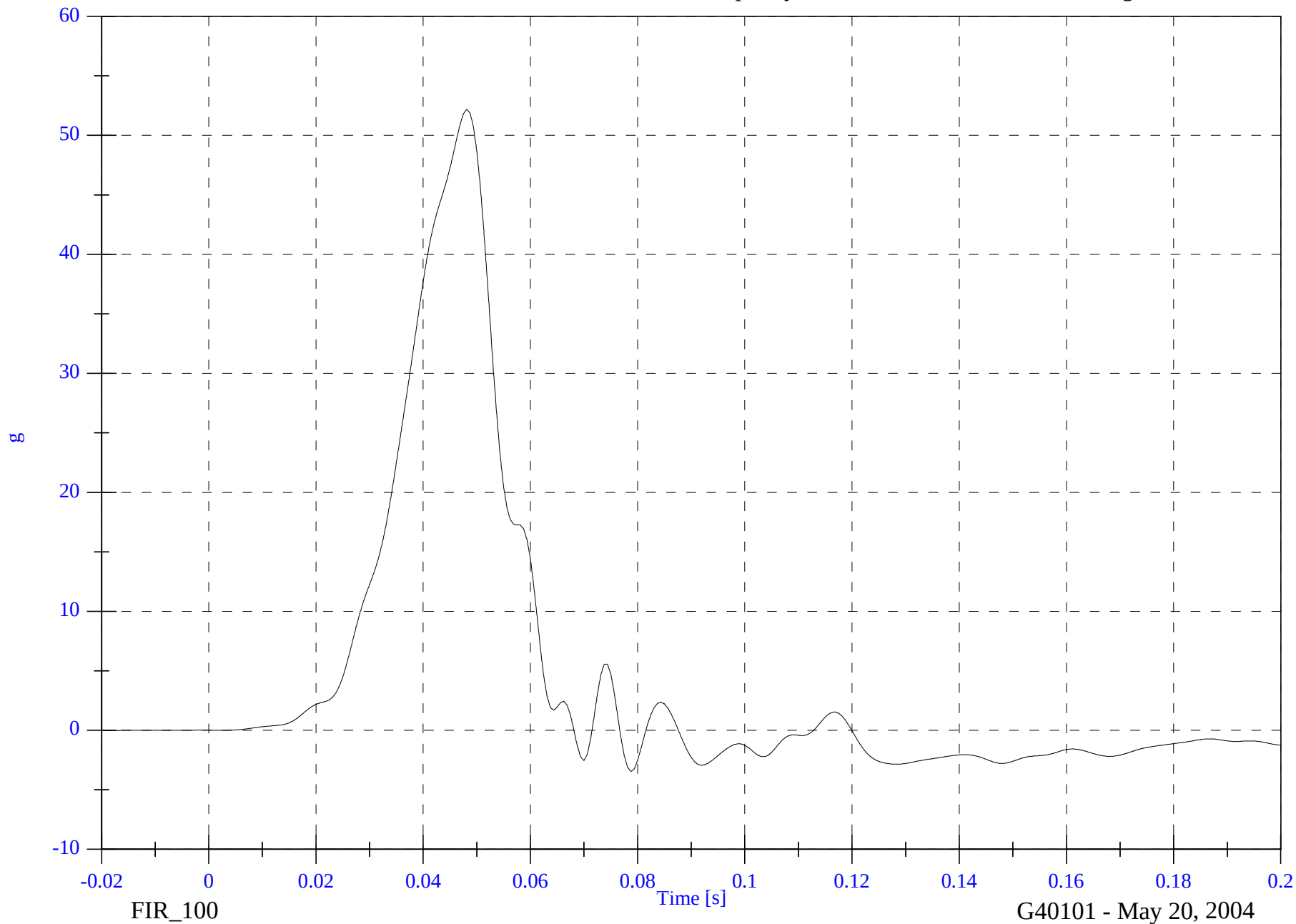
V2P4 Lower Spine y

Max: 52.2 [g] at 0.048 [s]

Min: -3.5 [g] at 0.079 [s]

B-58

8745-01

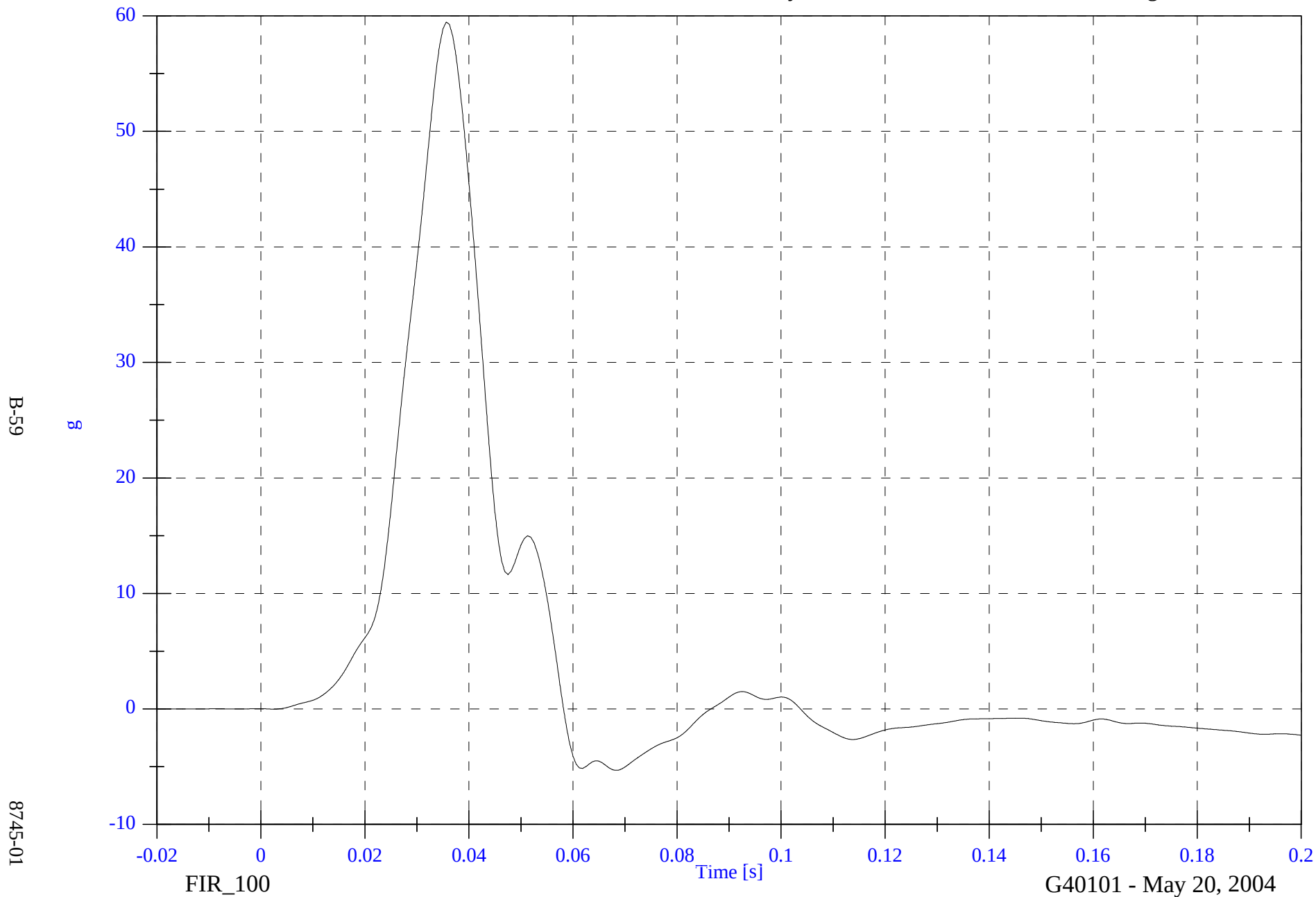


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Pelvic y

Max: 59.5 [g] at 0.036 [s]

Min: -5.3 [g] at 0.068 [s]

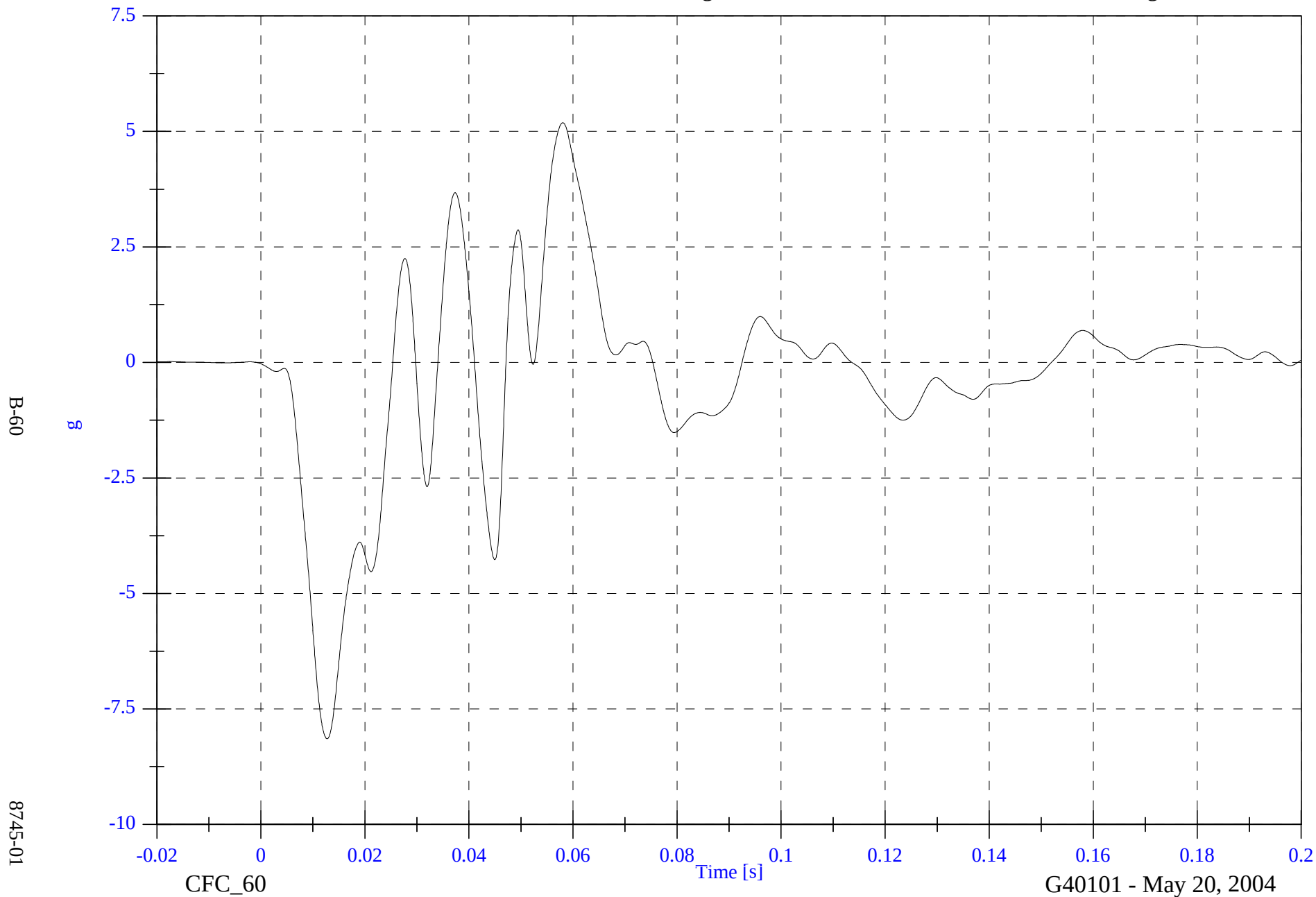


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A1 Right Front Sill X

Max: 5.2 [g] at 0.058 [s]

Min: -8.1 [g] at 0.013 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

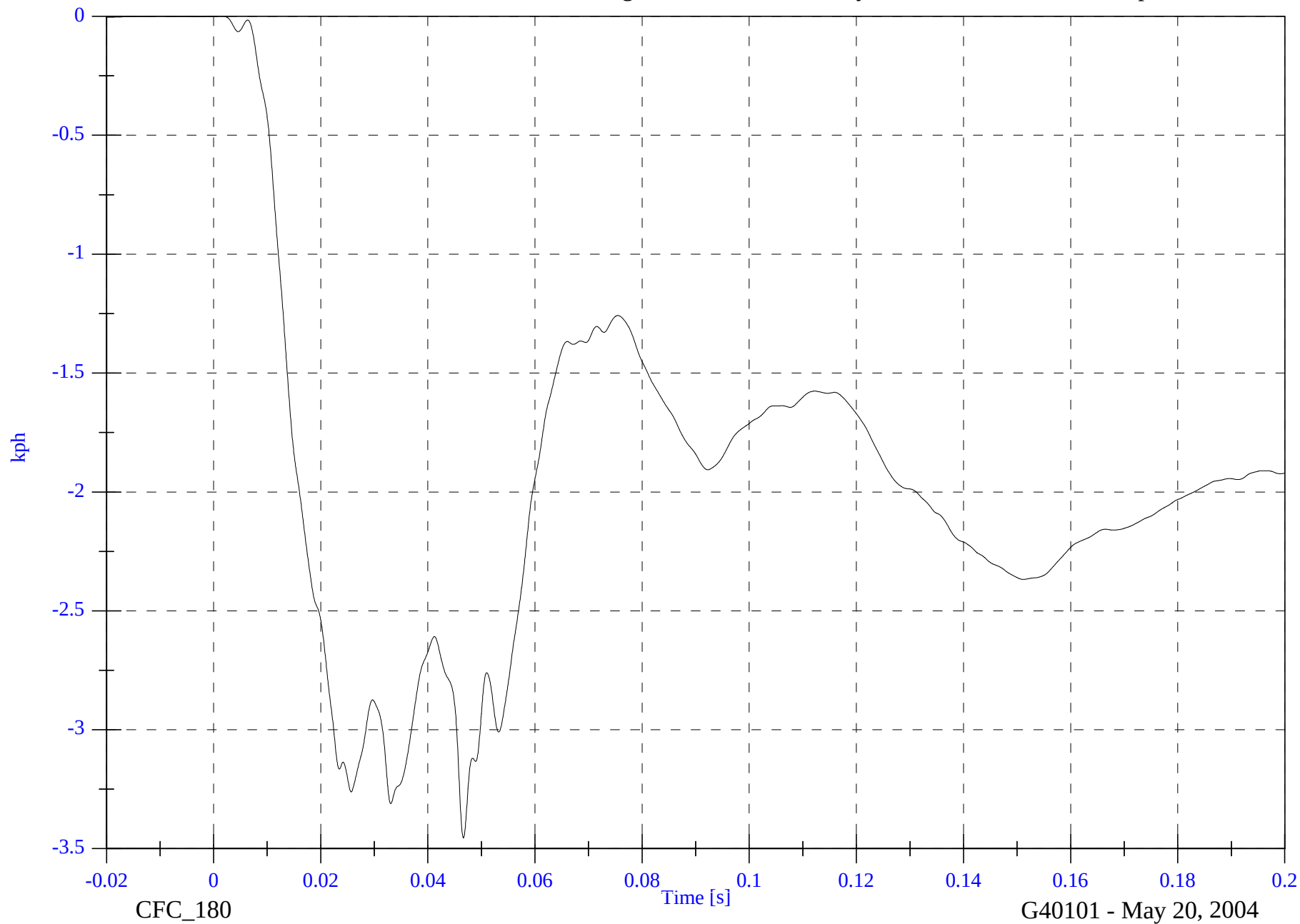
V2 A1 Right Front Sill X Velocity

Max: 0.0 [kph] at 0.002 [s]

Min: -3.5 [kph] at 0.047 [s]

B-61

8745-01

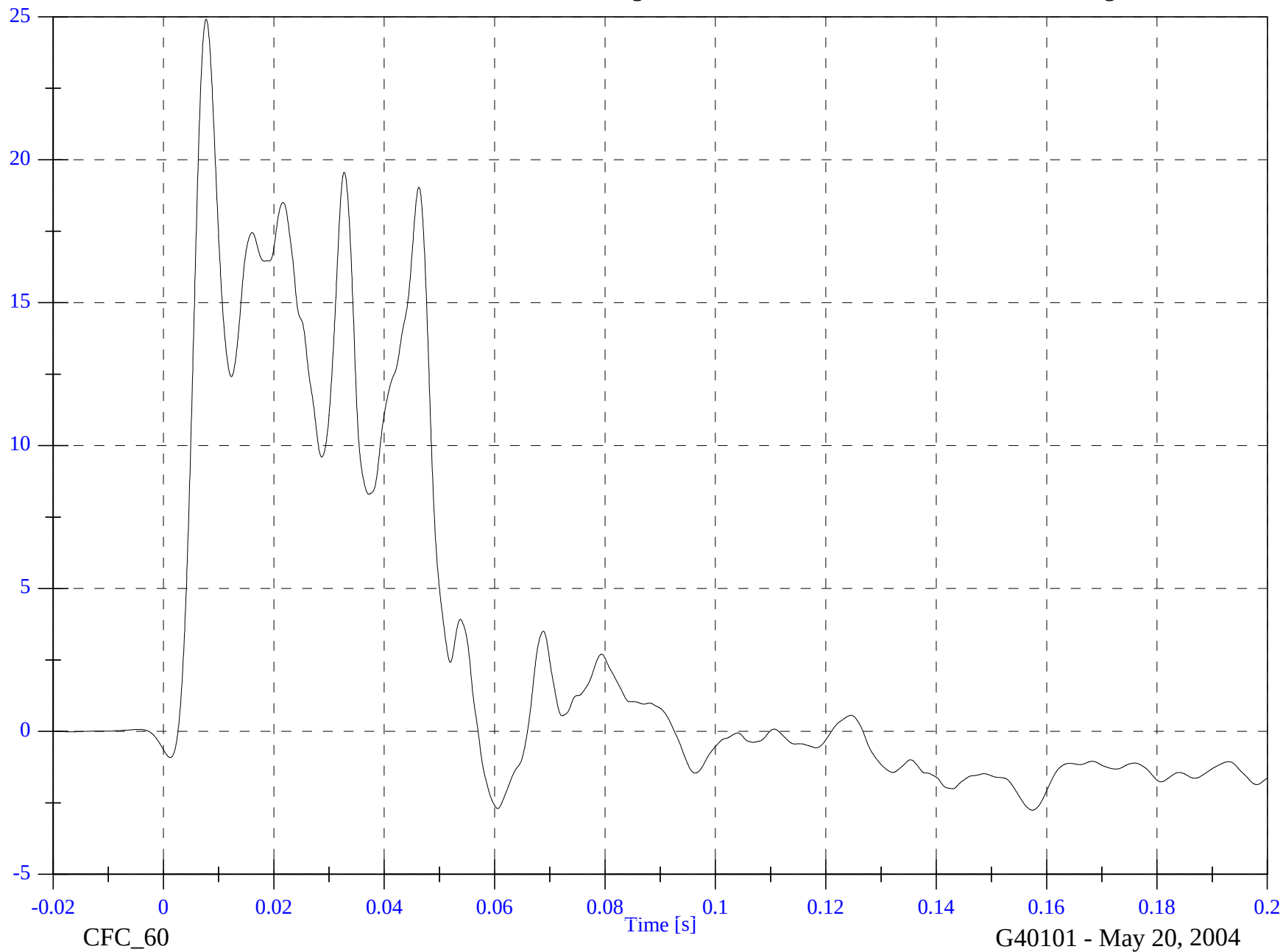


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A1 Right Front Sill Y

Max: 24.9 [g] at 0.008 [s]

Min: -2.8 [g] at 0.157 [s]



B-62

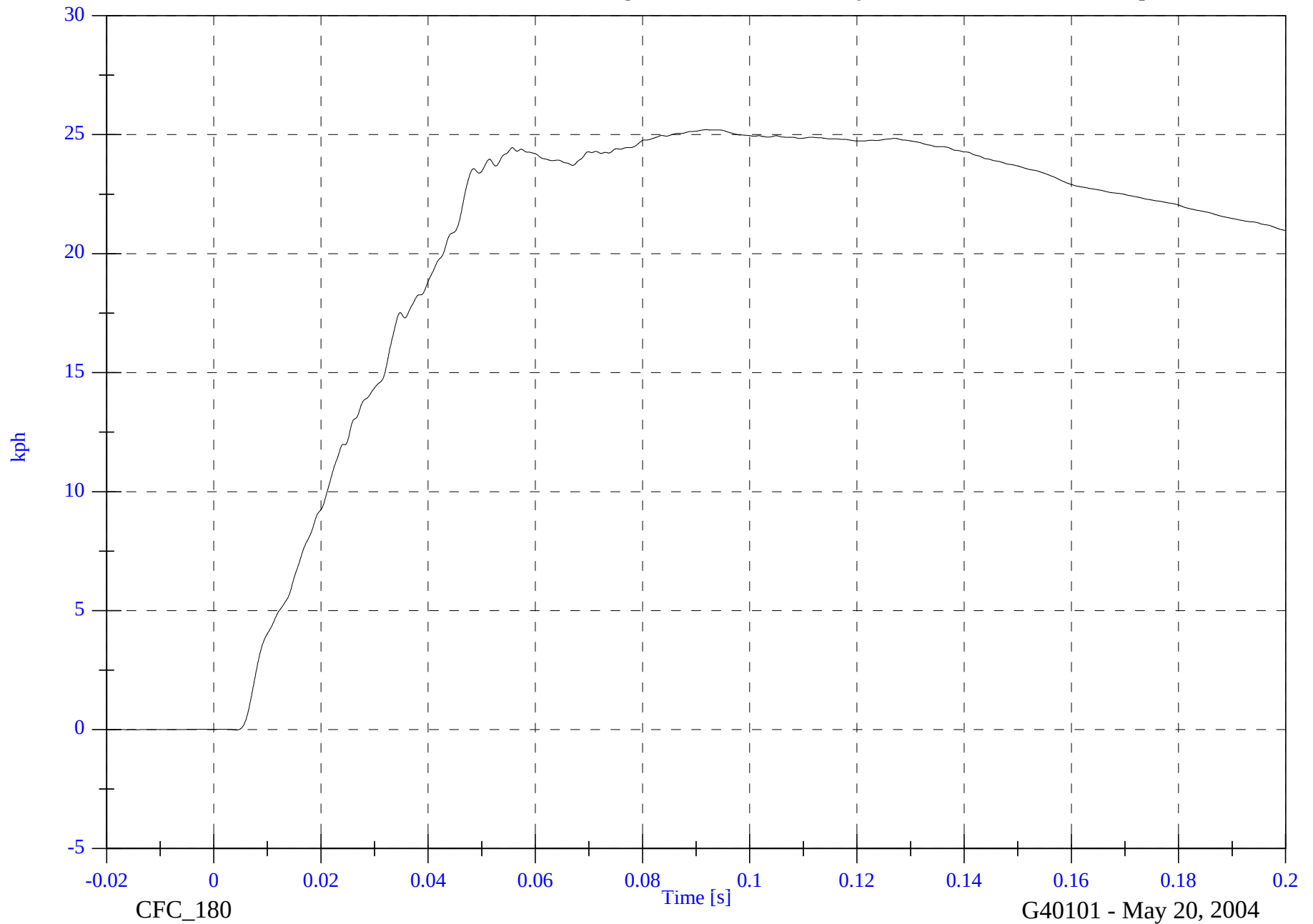
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A1 Right Front Sill Y Velocity

Max: 25.2 [kph] at 0.092 [s]

Min: -0.0 [kph] at 0.004 [s]



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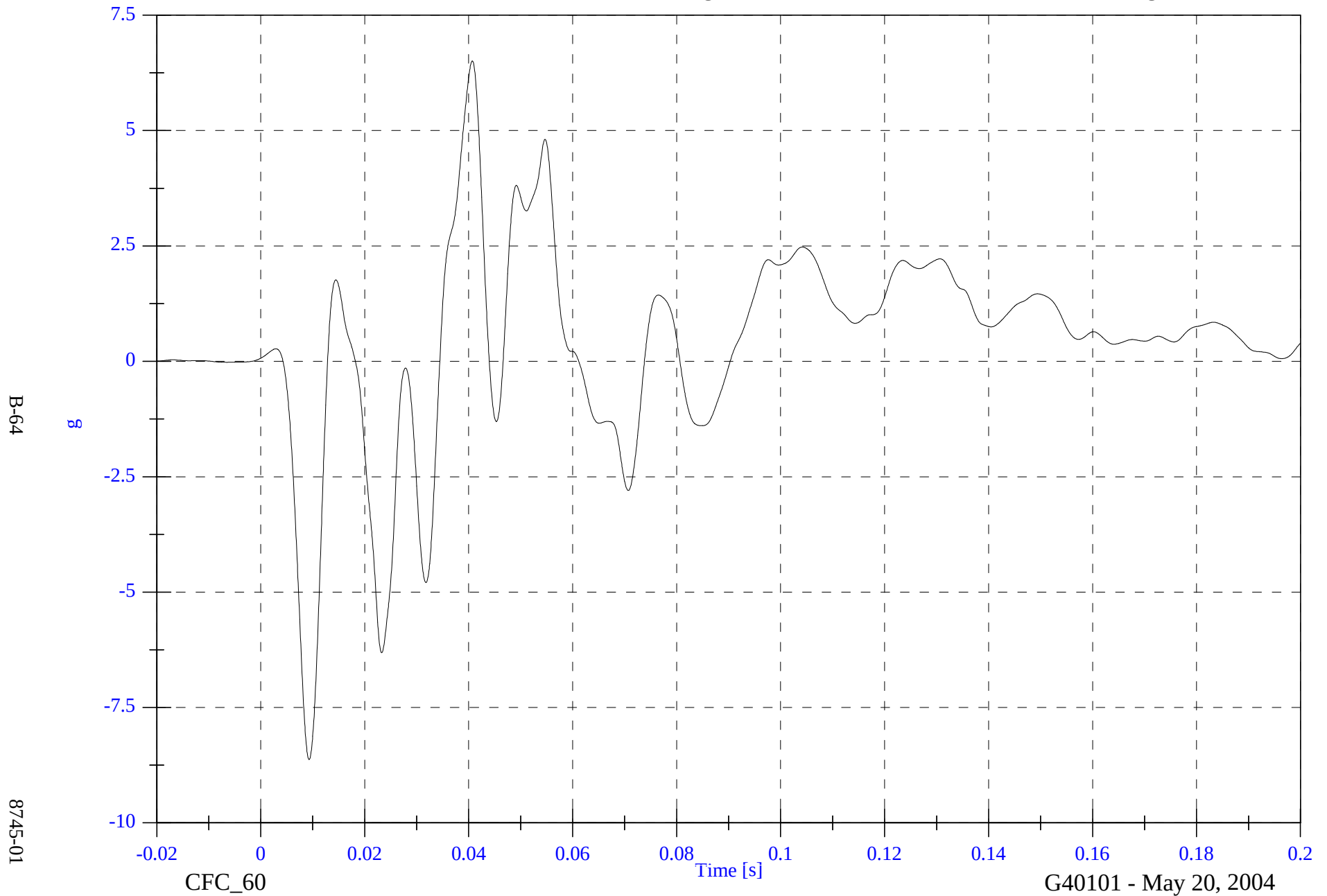
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A1 Right Front Sill Z

Max: 6.5 [g] at 0.041 [s]

Min: -8.6 [g] at 0.009 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

V2 A1 Right Front Sill Z Velocity

Max: 3.1 [kph] at 0.200 [s]

Min: -3.0 [kph] at 0.034 [s]



B-65

8745-01

CFC\_180

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

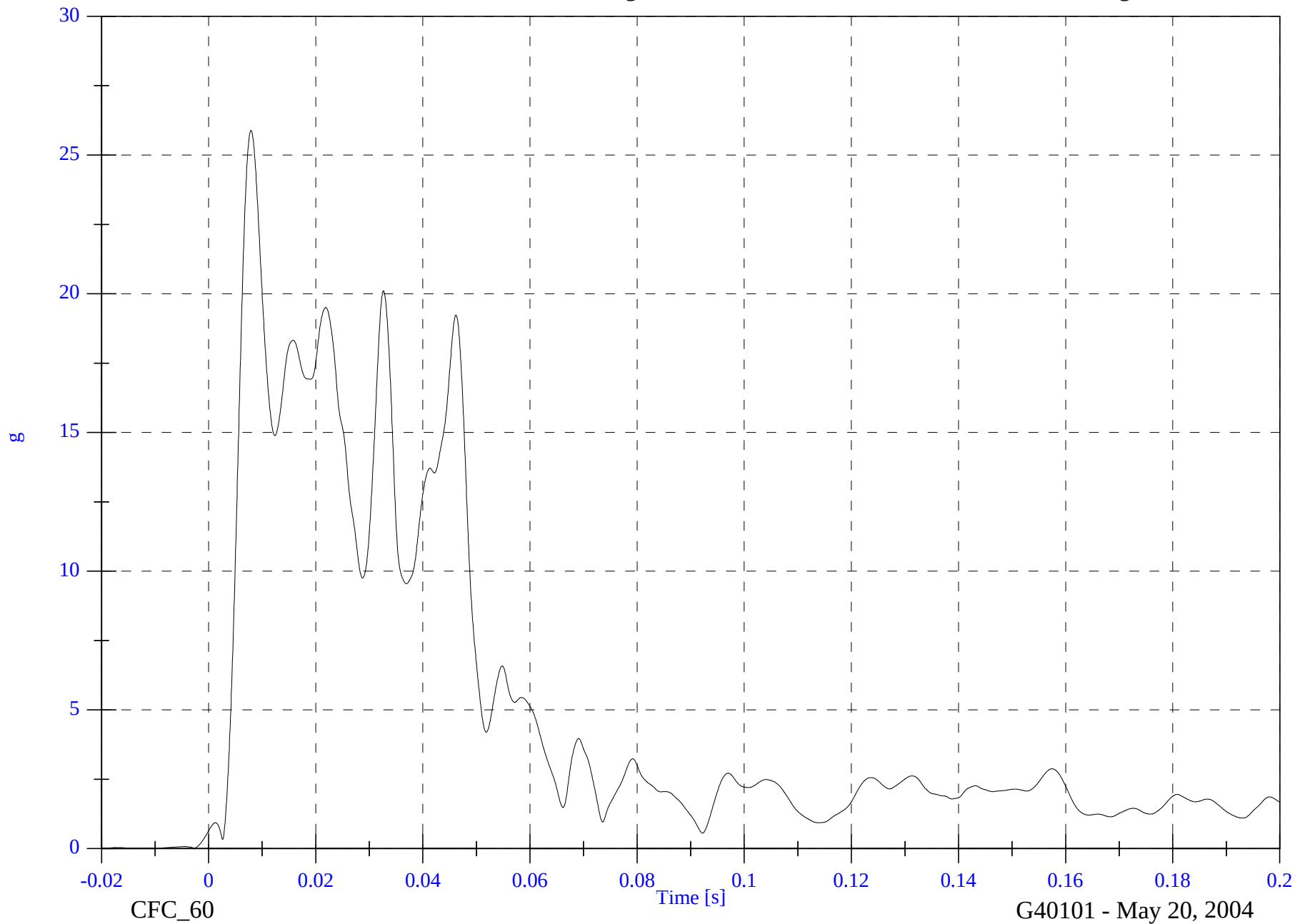
V2 A1 Right Front Sill Resultant

Max: 25.9 [g] at 0.008 [s]

Min: 0.0 [g] at -0.010 [s]

B-66

8745-01

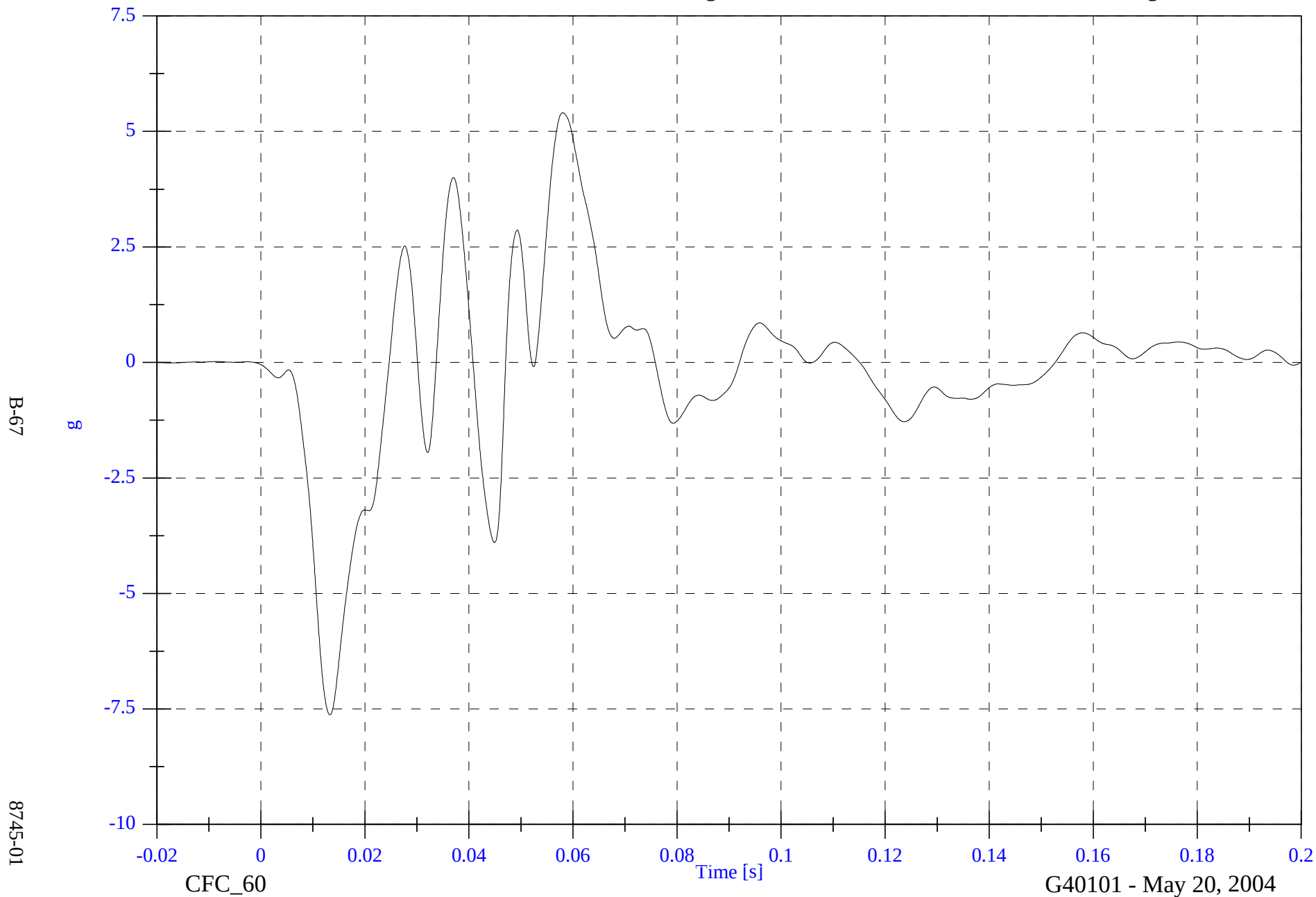


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A2 Right Rear Sill X

Max: 5.4 [g] at 0.058 [s]

Min: -7.6 [g] at 0.013 [s]

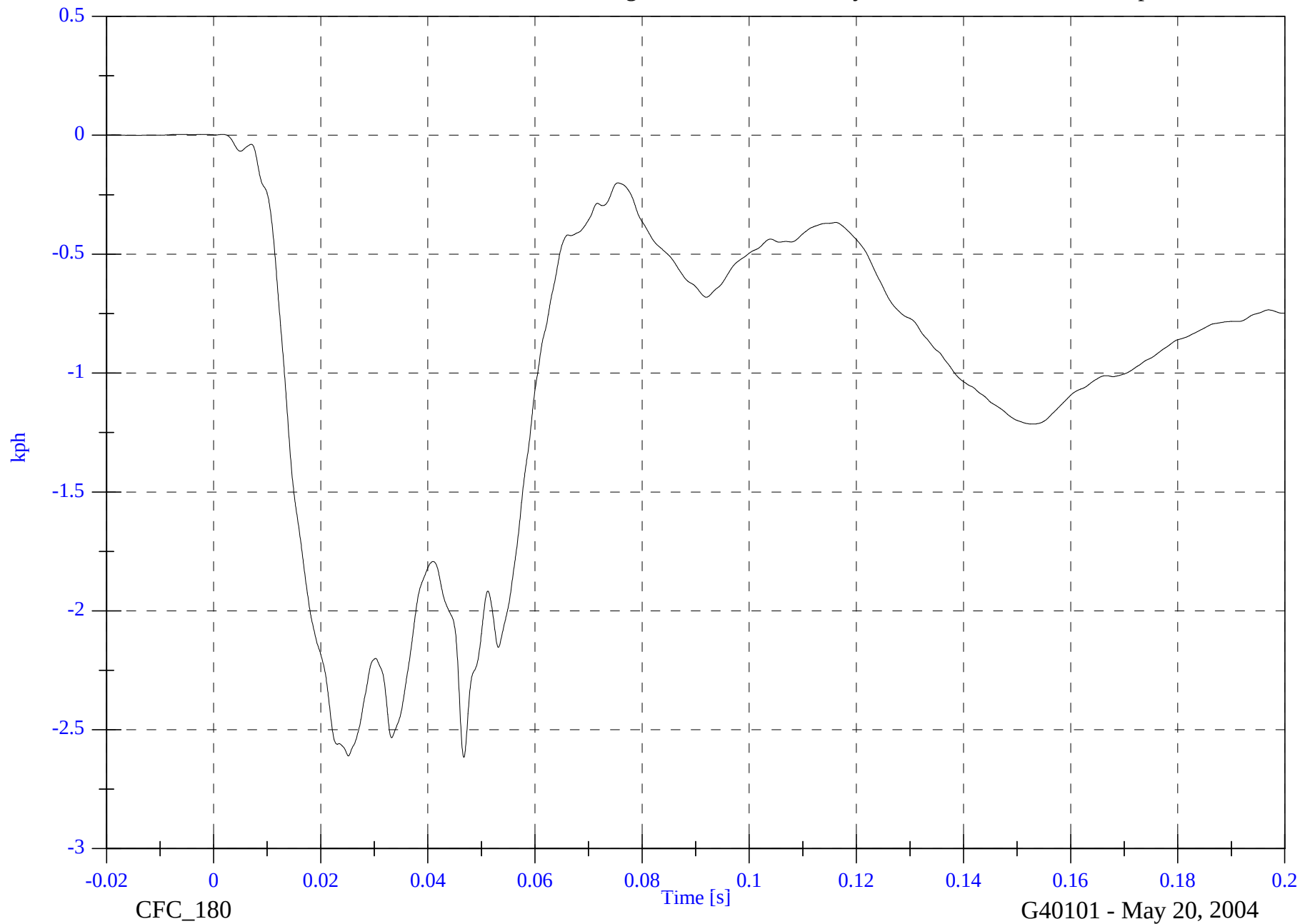


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A2 Right Rear Sill X Velocity

Max: 0.0 [kph] at -0.007 [s]

Min: -2.6 [kph] at 0.047 [s]



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8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

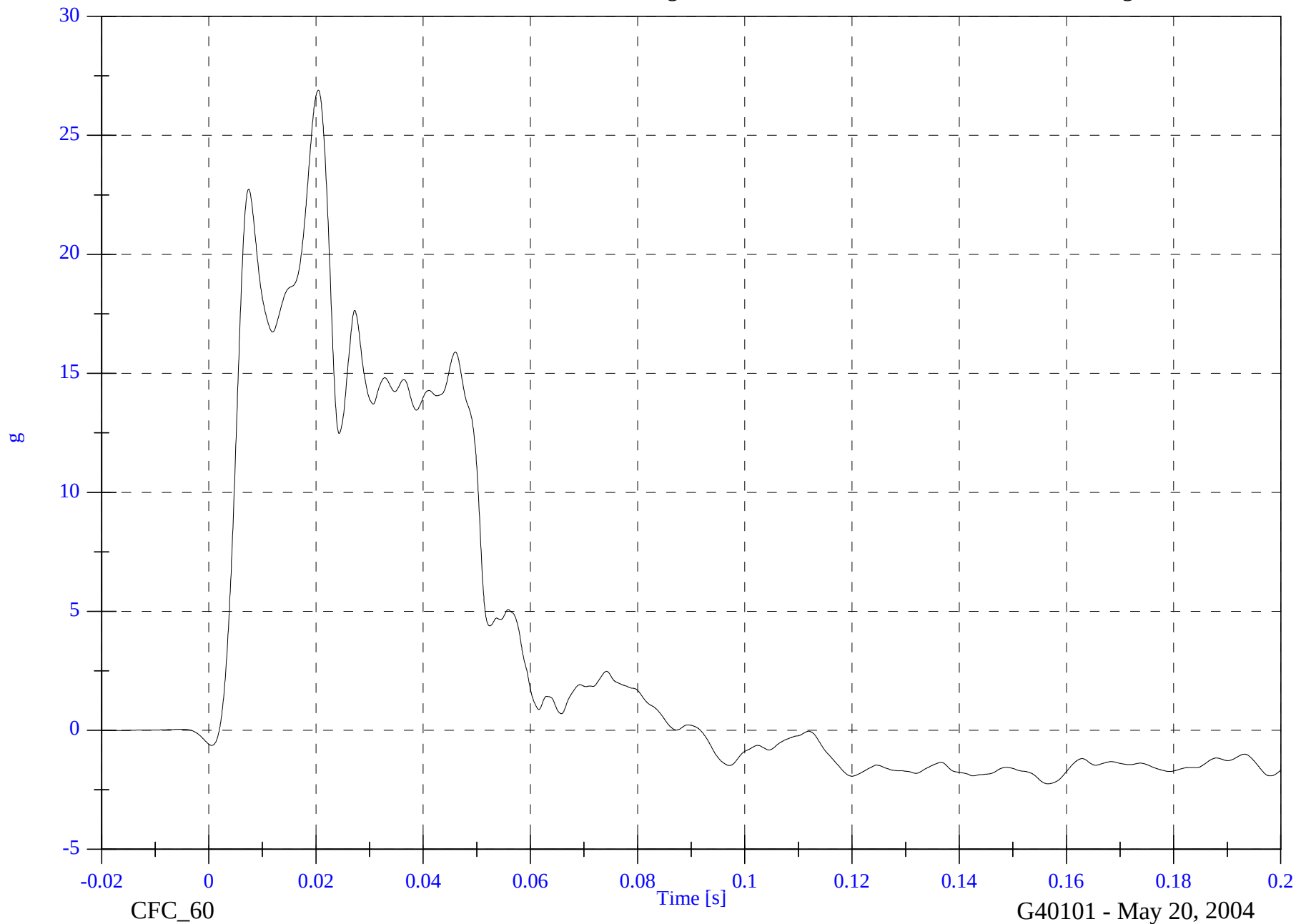
V2 A2 Right Rear Sill Y

Max: 26.9 [g] at 0.020 [s]

Min: -2.2 [g] at 0.157 [s]

B-69

8745-01

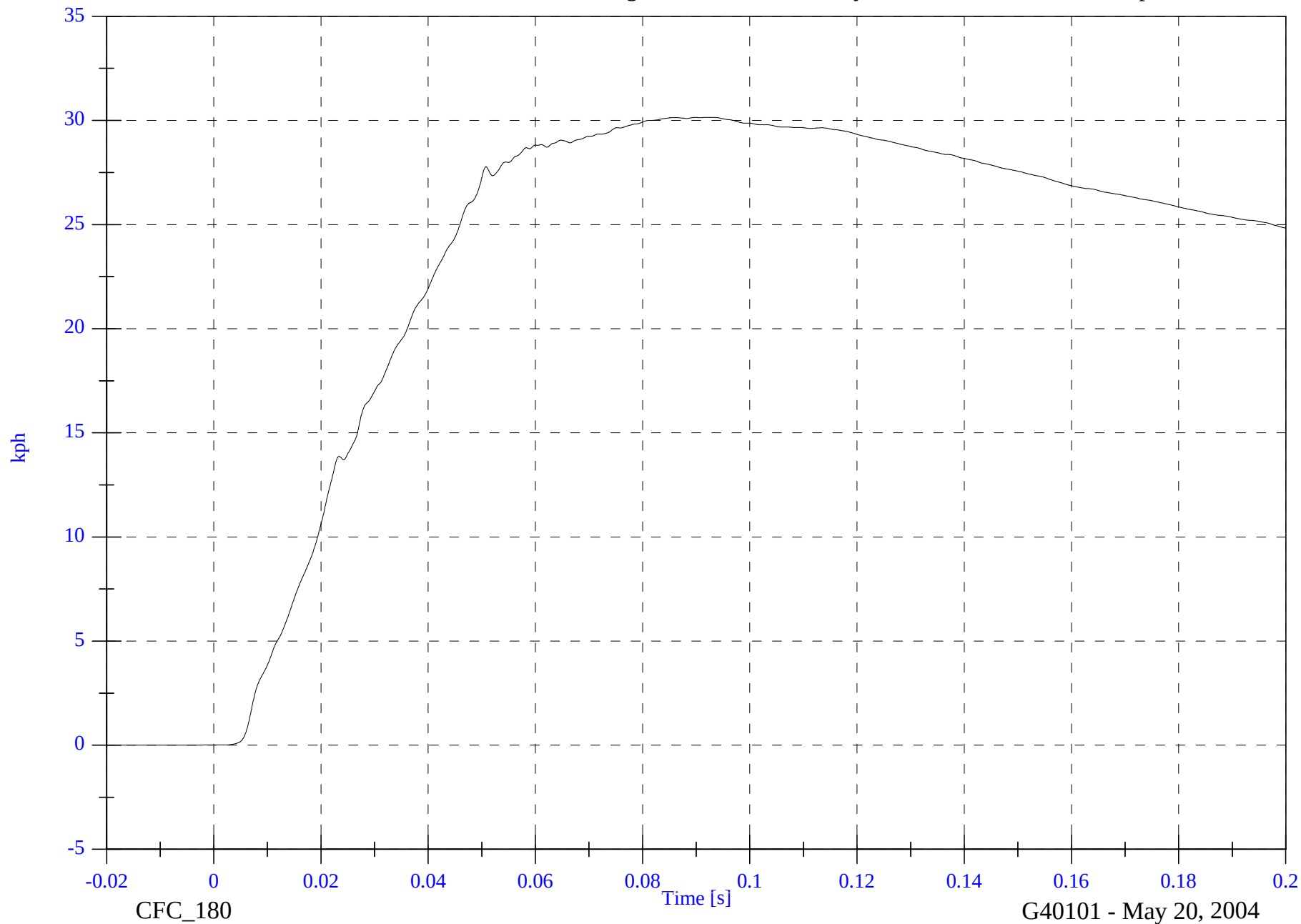


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A2 Right Rear Sill Y Velocity

Max: 30.1 [kph] at 0.092 [s]

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



B-70

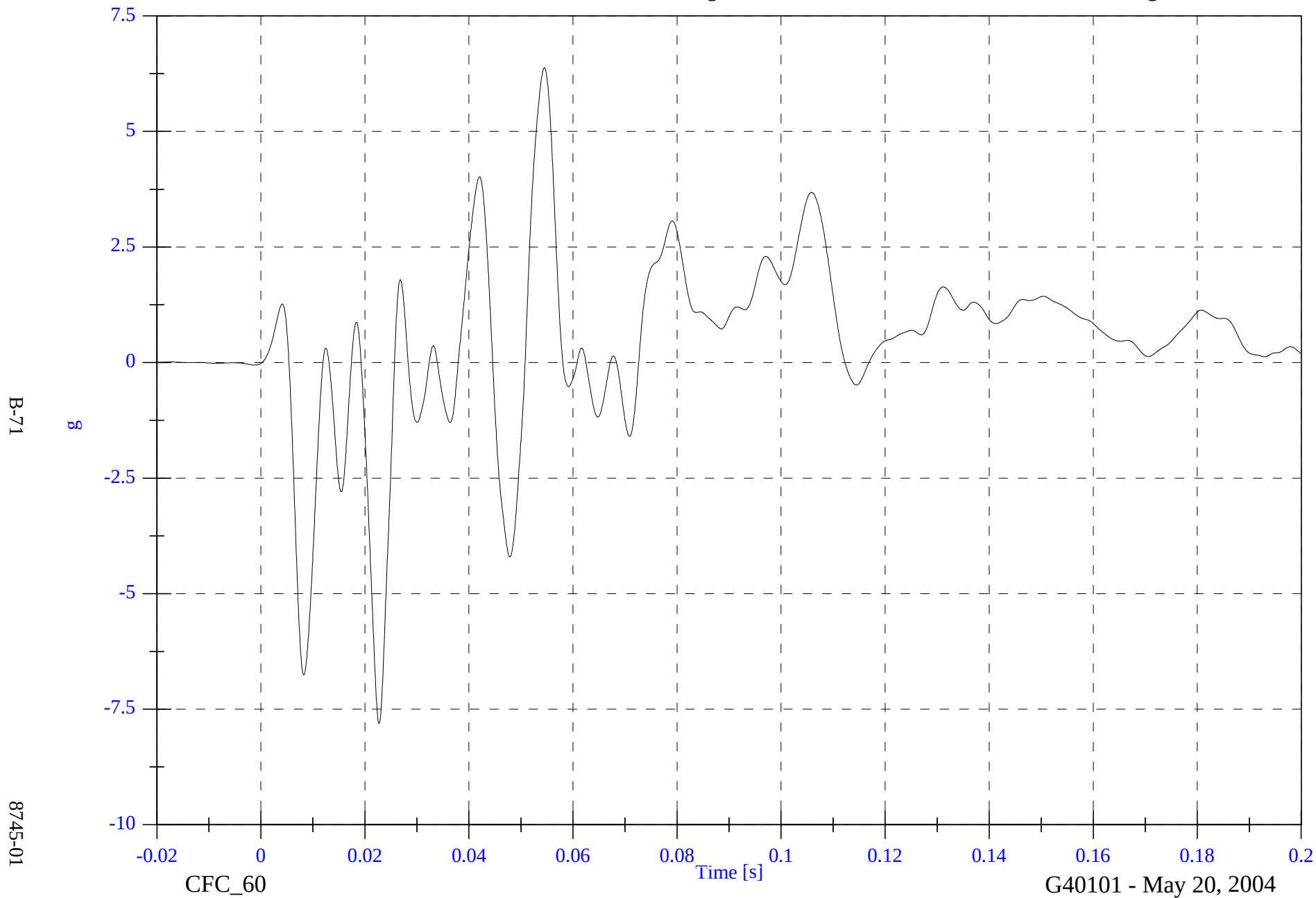
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A2 Right Rear Sill Z

Max: 6.4 [g] at 0.054 [s]

Min: -7.8 [g] at 0.023 [s]

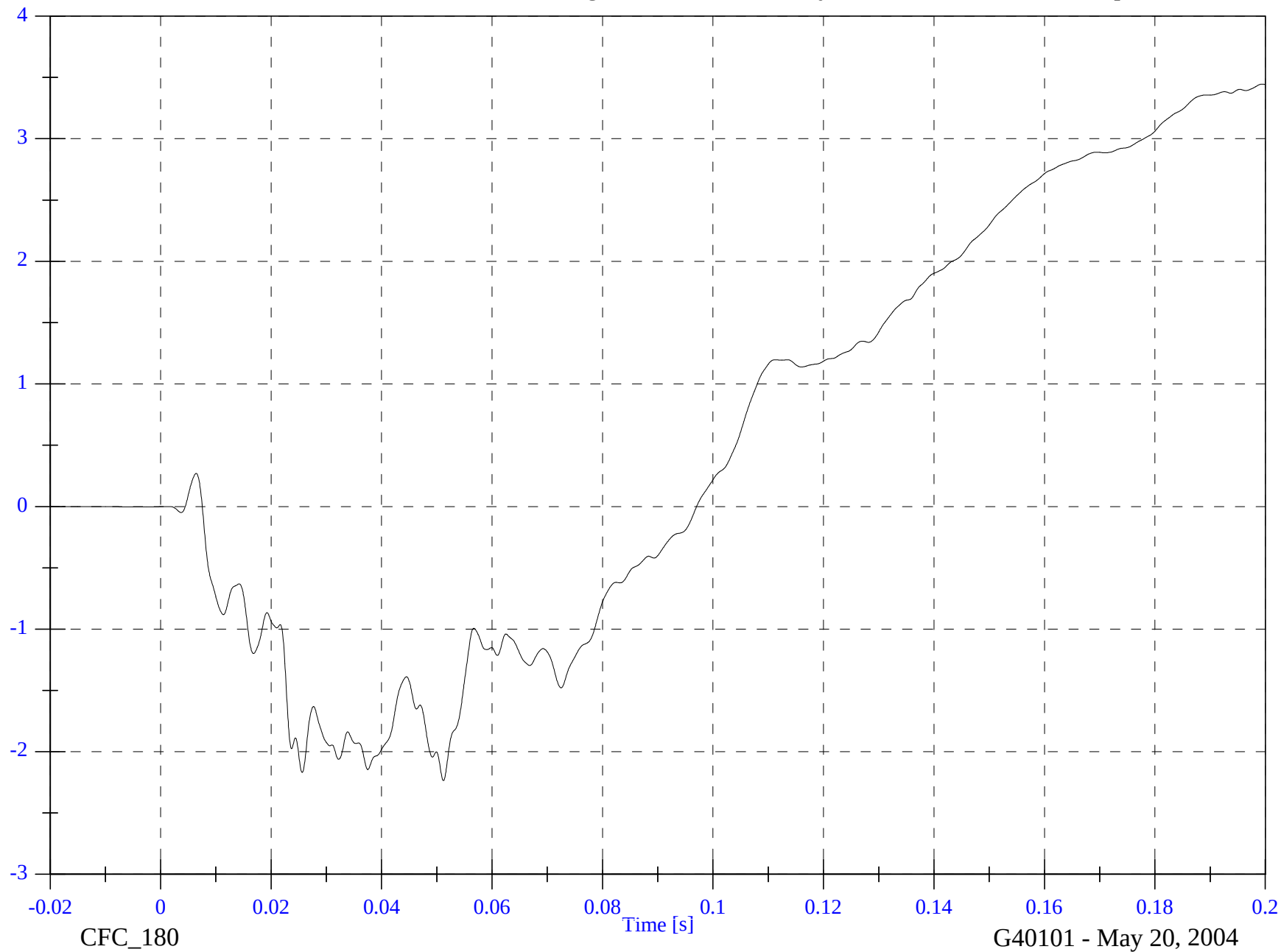


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A2 Right Rear Sill Z Velocity

Max: 3.4 [kph] at 0.199 [s]

Min: -2.2 [kph] at 0.051 [s]



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8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

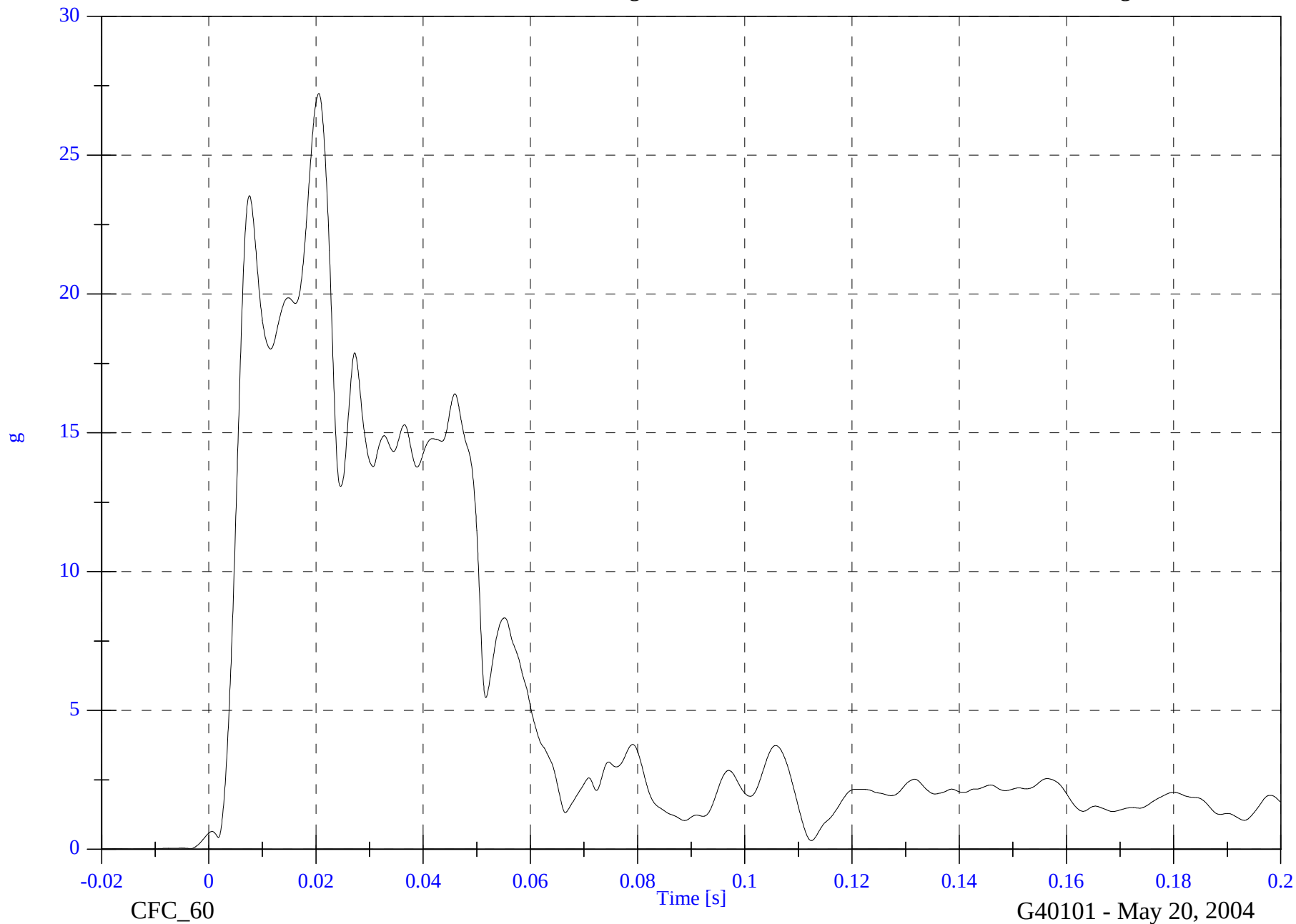
V2 A2 Right Rear Sill Resultant

Max: 27.2 [g] at 0.021 [s]

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

B-73

8745-01

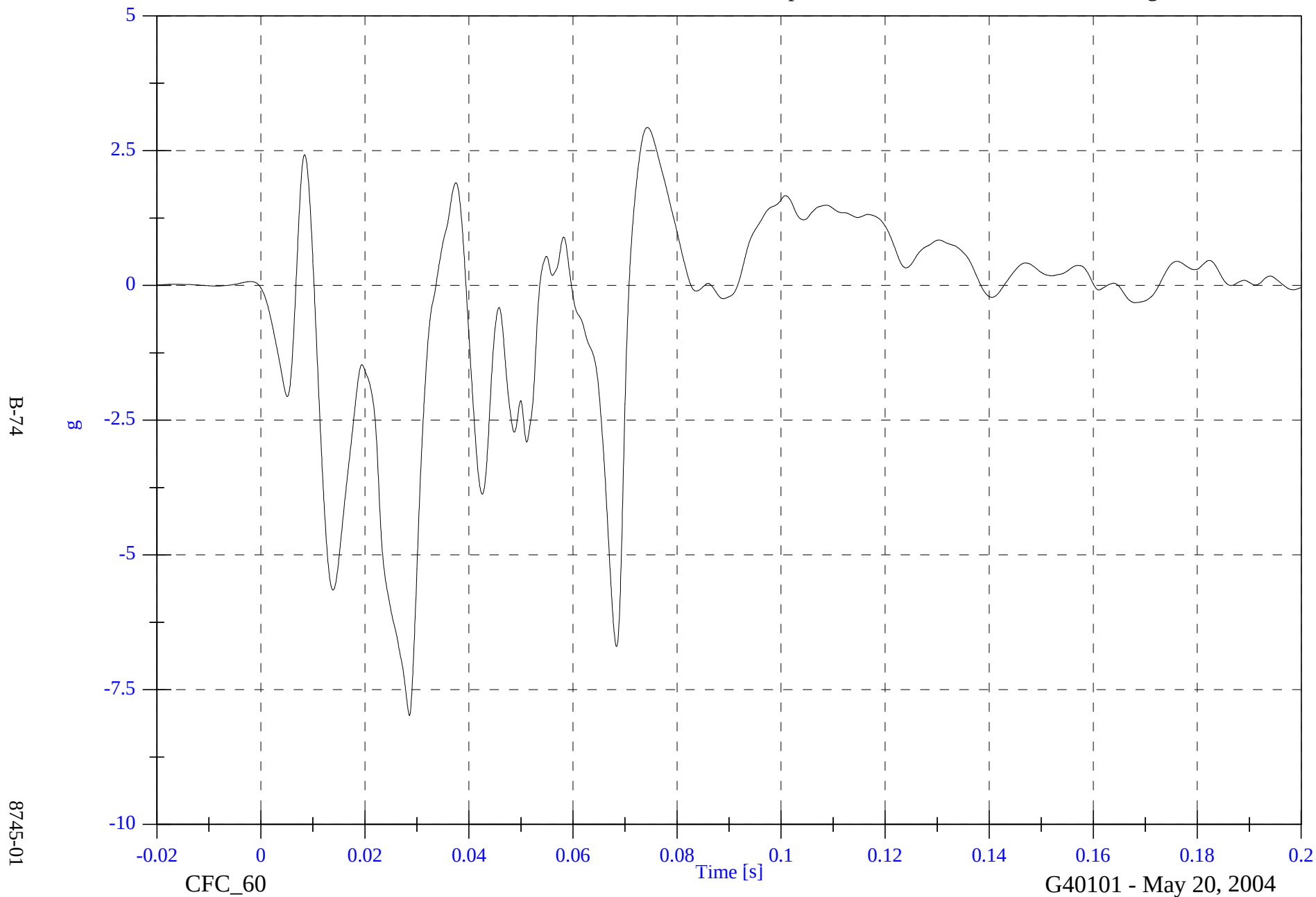


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A3 Rear Floorpan X

Max: 2.9 [g] at 0.074 [s]

Min: -8.0 [g] at 0.029 [s]

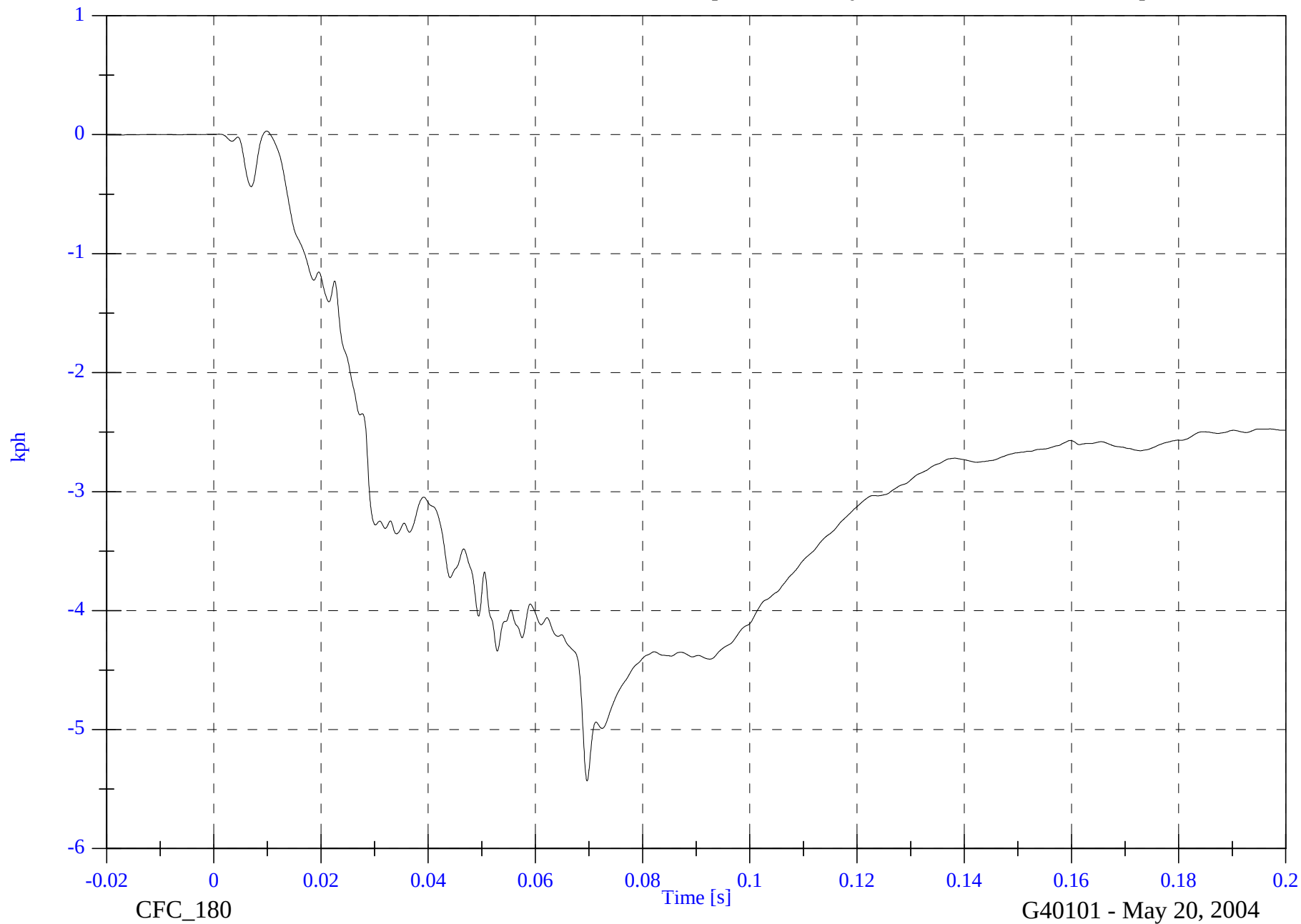


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A3 Rear Floorpan X Velocity

Max: 0.0 [kph] at 0.010 [s]

Min: -5.4 [kph] at 0.070 [s]



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8745-01

CFC\_180

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A3 Rear Floorpan Y

Max: 25.3 [g] at 0.027 [s]

Min: -3.5 [g] at 0.122 [s]

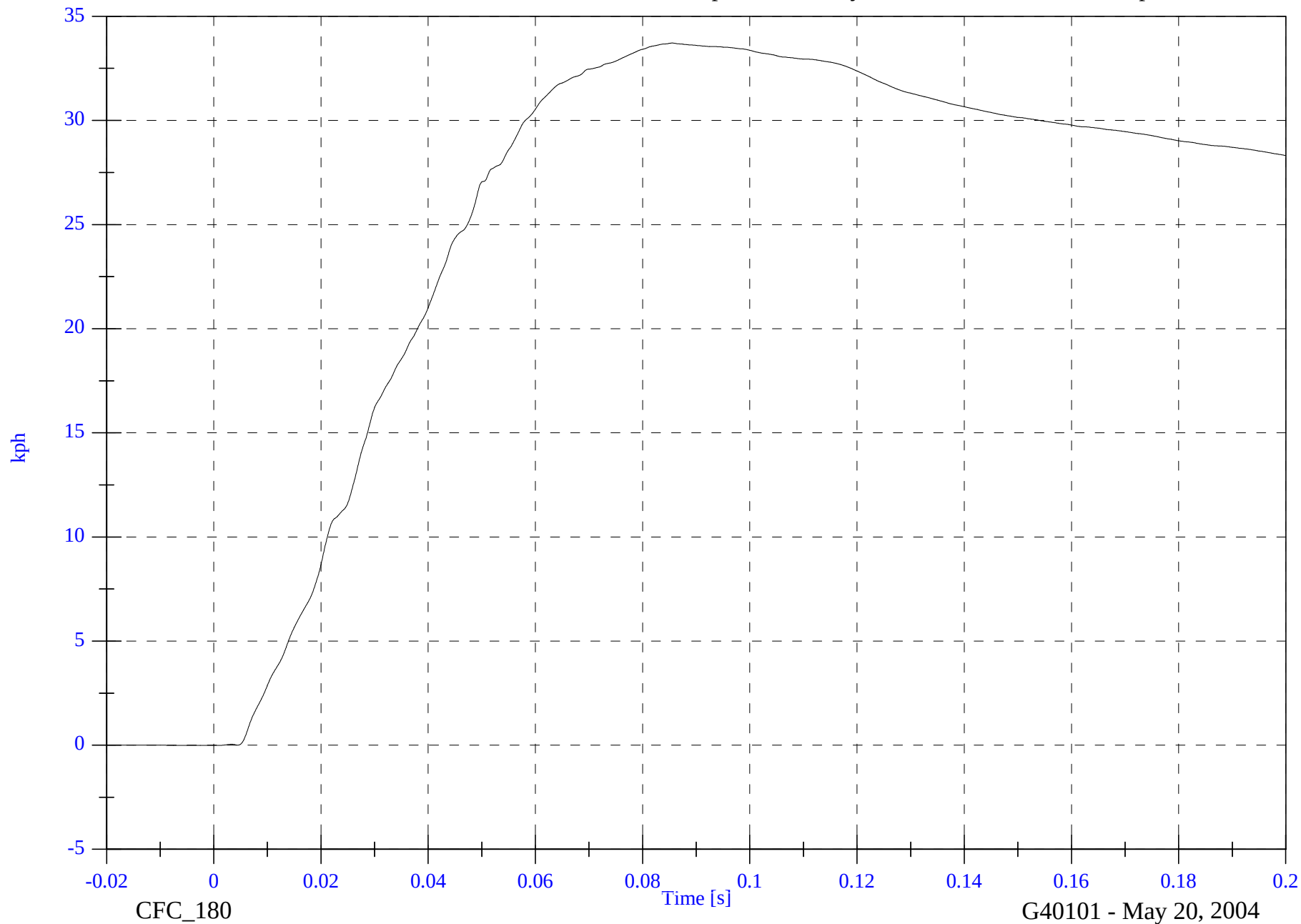


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A3 Rear Floorpan Y Velocity

Max: 33.7 [kph] at 0.085 [s]

Min: -0.0 [kph] at -0.001 [s]



B-77

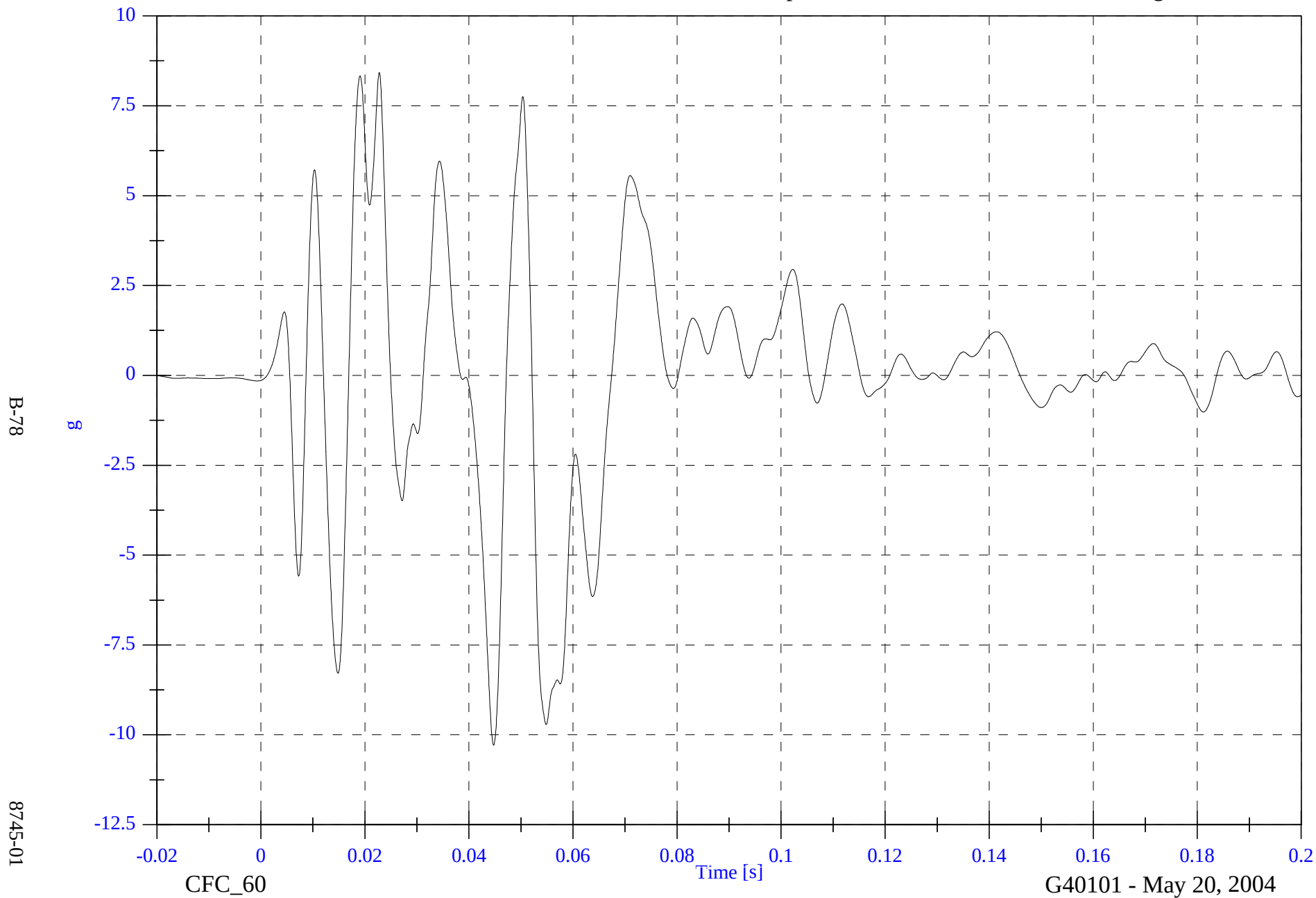
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A3 Rear Floorplan Z

Max: 8.4 [g] at 0.023 [s]

Min: -10.3 [g] at 0.045 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

V2 A3 Rear Floorplan Z Velocity

Max: 1.3 [kph] at 0.024 [s]

Min: -2.4 [kph] at 0.066 [s]



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8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

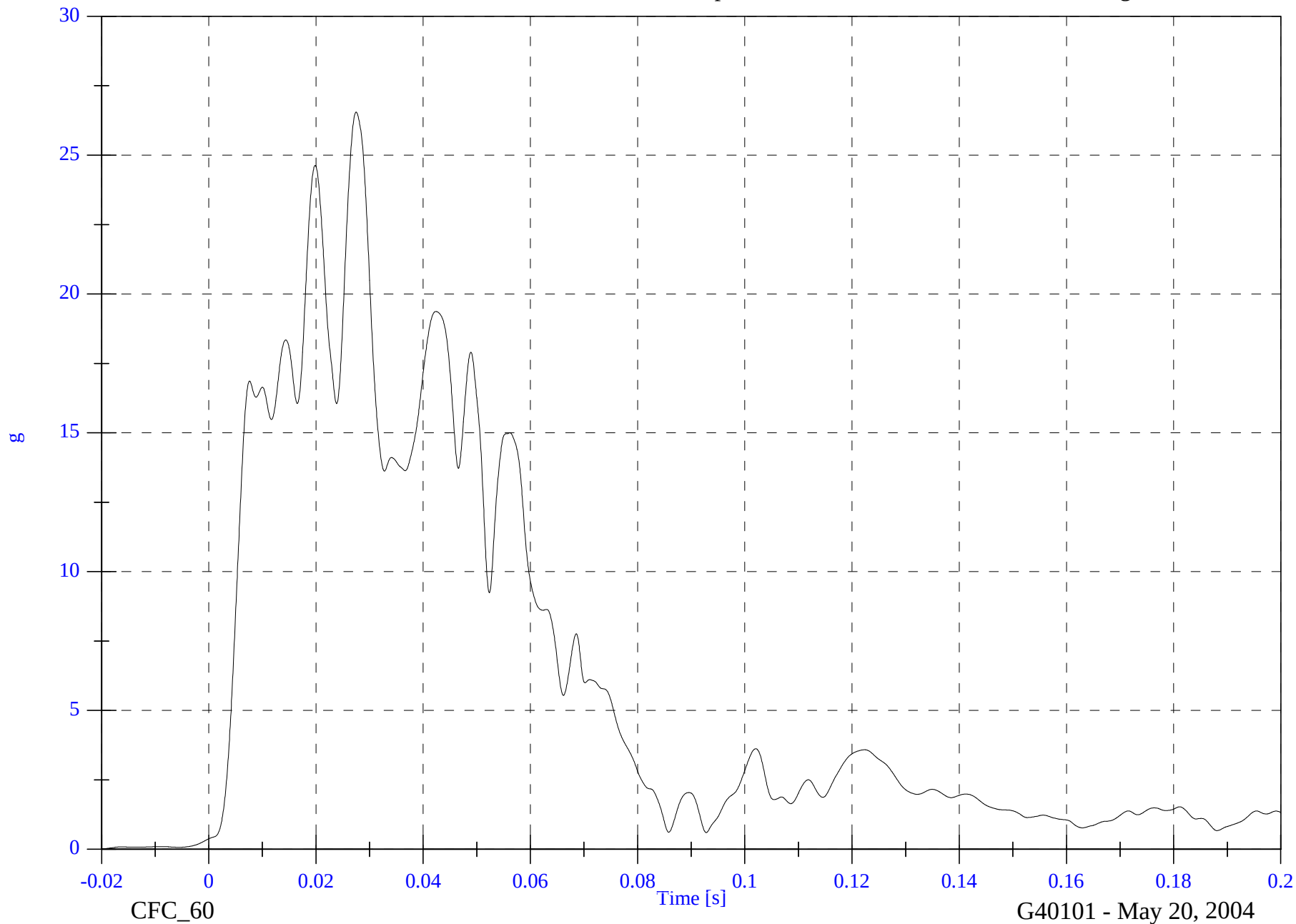
V2 A3 Rear Floorpan Resultant

Max: 26.5 [g] at 0.027 [s]

Min: 0.0 [g] at -0.020 [s]

B-80

8745-01

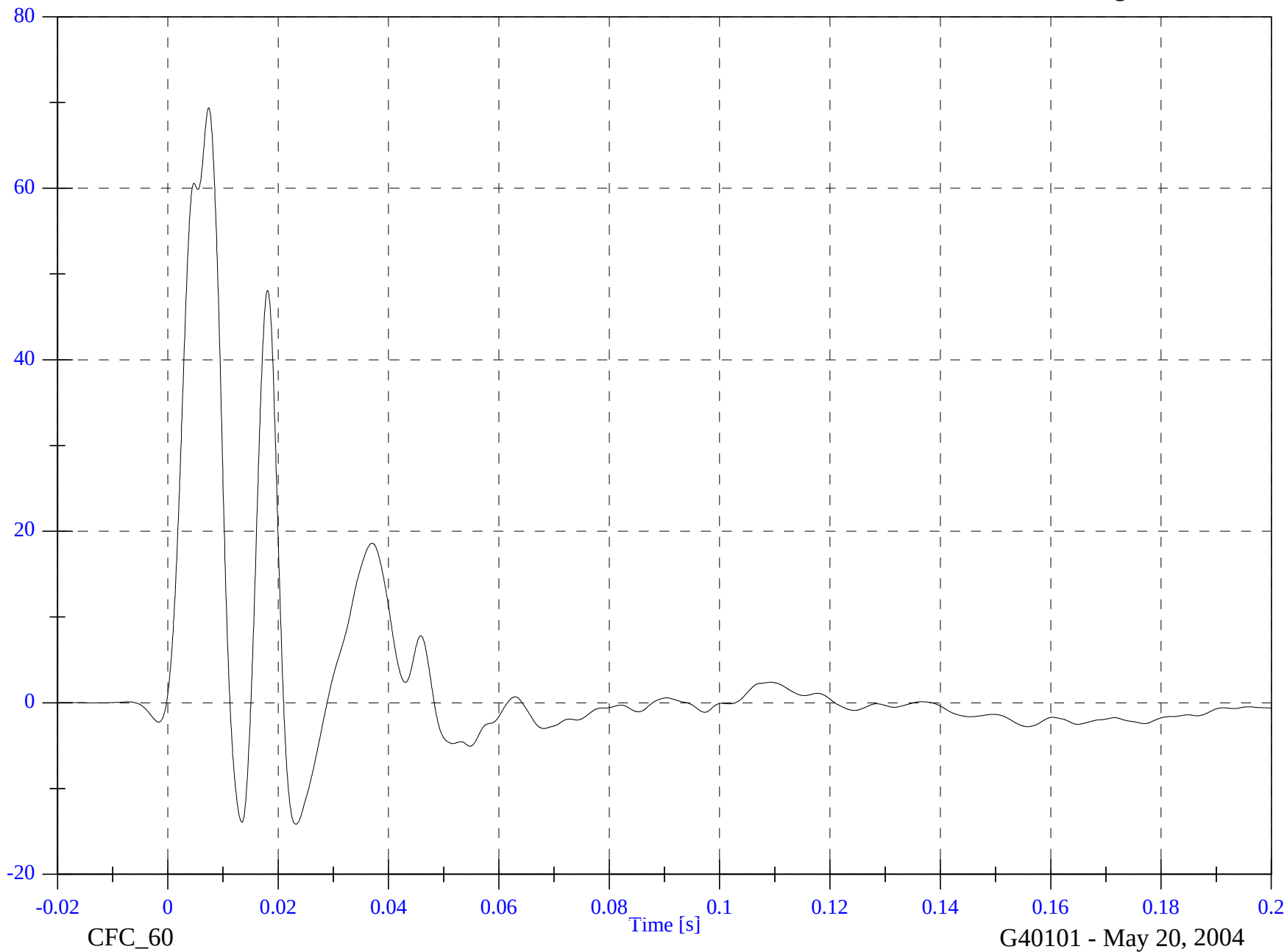


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A4 Left Rear Sill Y

Max: 69.4 [g] at 0.007 [s]

Min: -14.2 [g] at 0.023 [s]



B-81

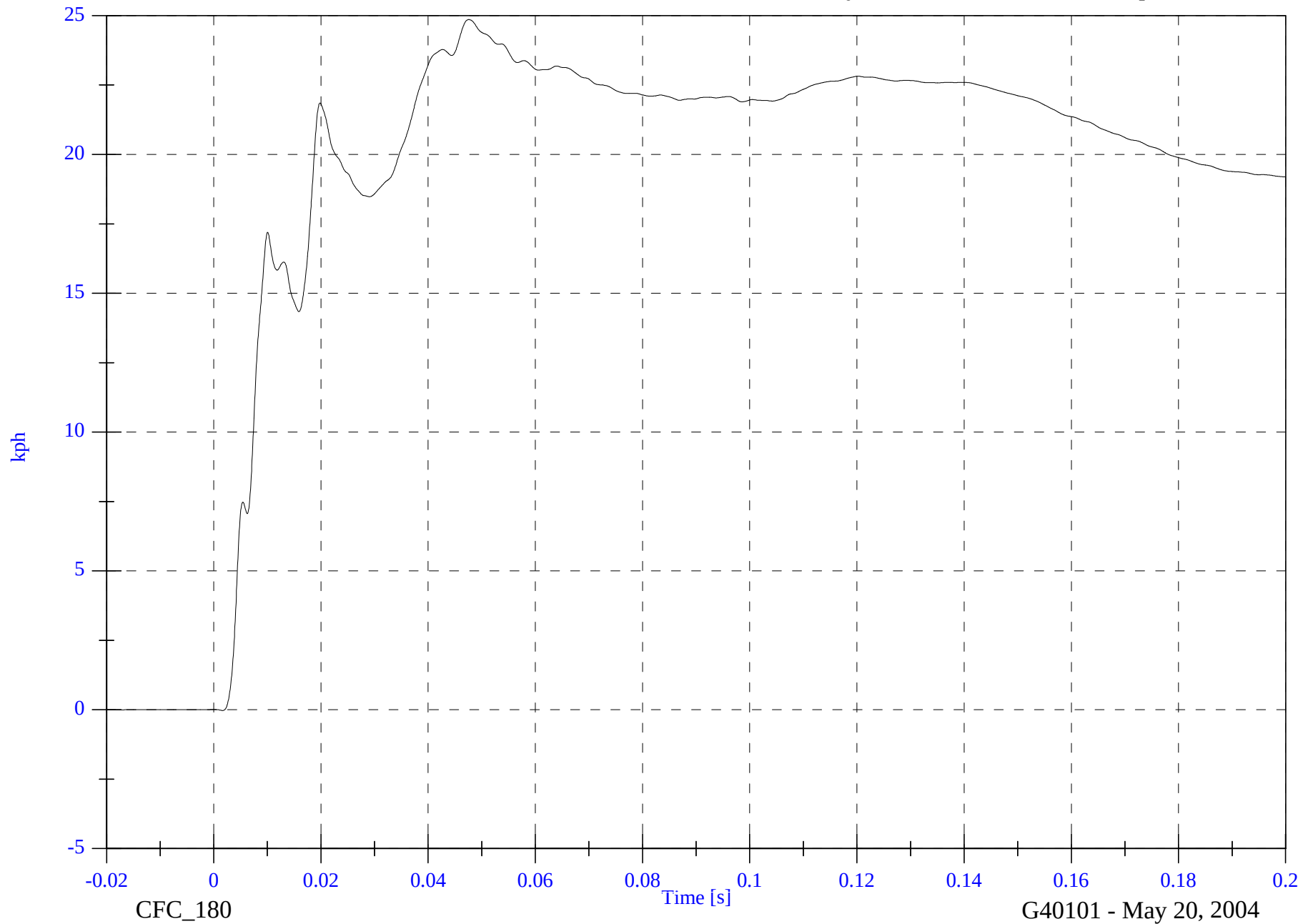
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A4 Left Rear Sill Y Velocity

Max: 24.9 [kph] at 0.048 [s]

Min: -0.0 [kph] at 0.002 [s]



B-82

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

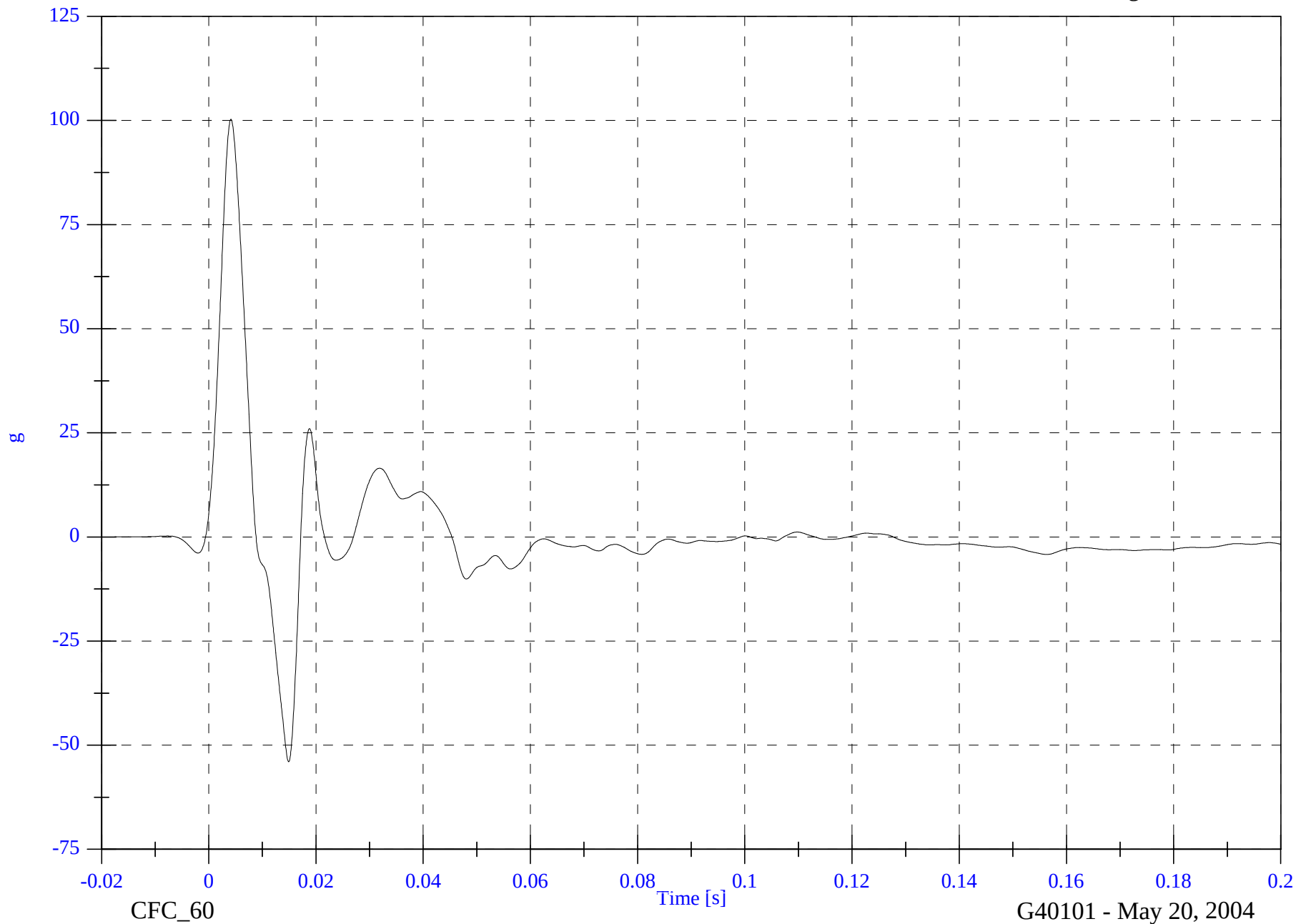
V2 A5 Left Front Sill Y

Max: 100.3 [g] at 0.004 [s]

Min: -54.0 [g] at 0.015 [s]

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8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

V2 A5 Left Front Sill Y Velocity

Max: 17.6 [kph] at 0.008 [s]

Min: -0.0 [kph] at 0.001 [s]



B-84

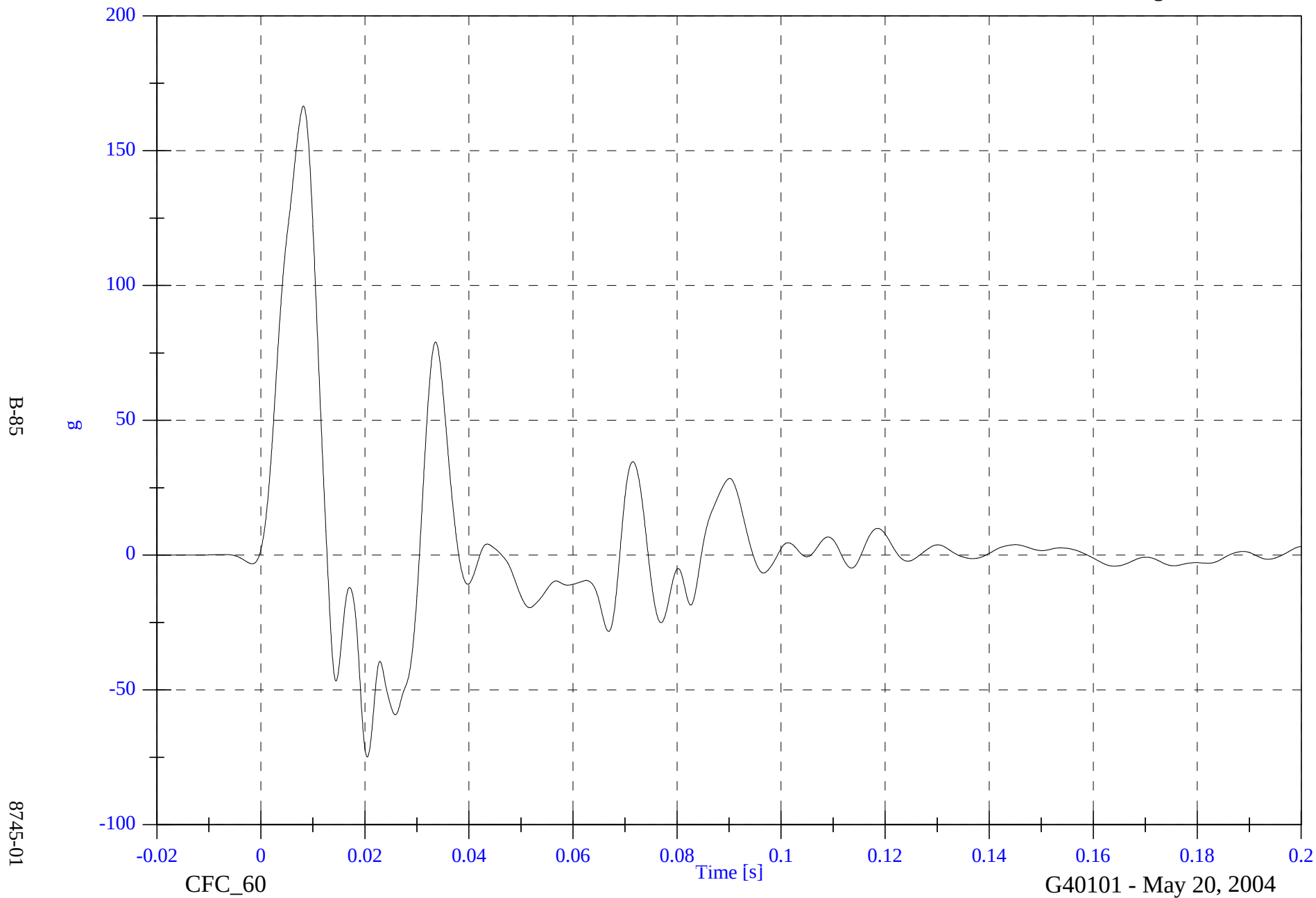
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A6 Left Front Door C/L Y

Max: 166.6 [g] at 0.008 [s]

Min: -74.8 [g] at 0.020 [s]

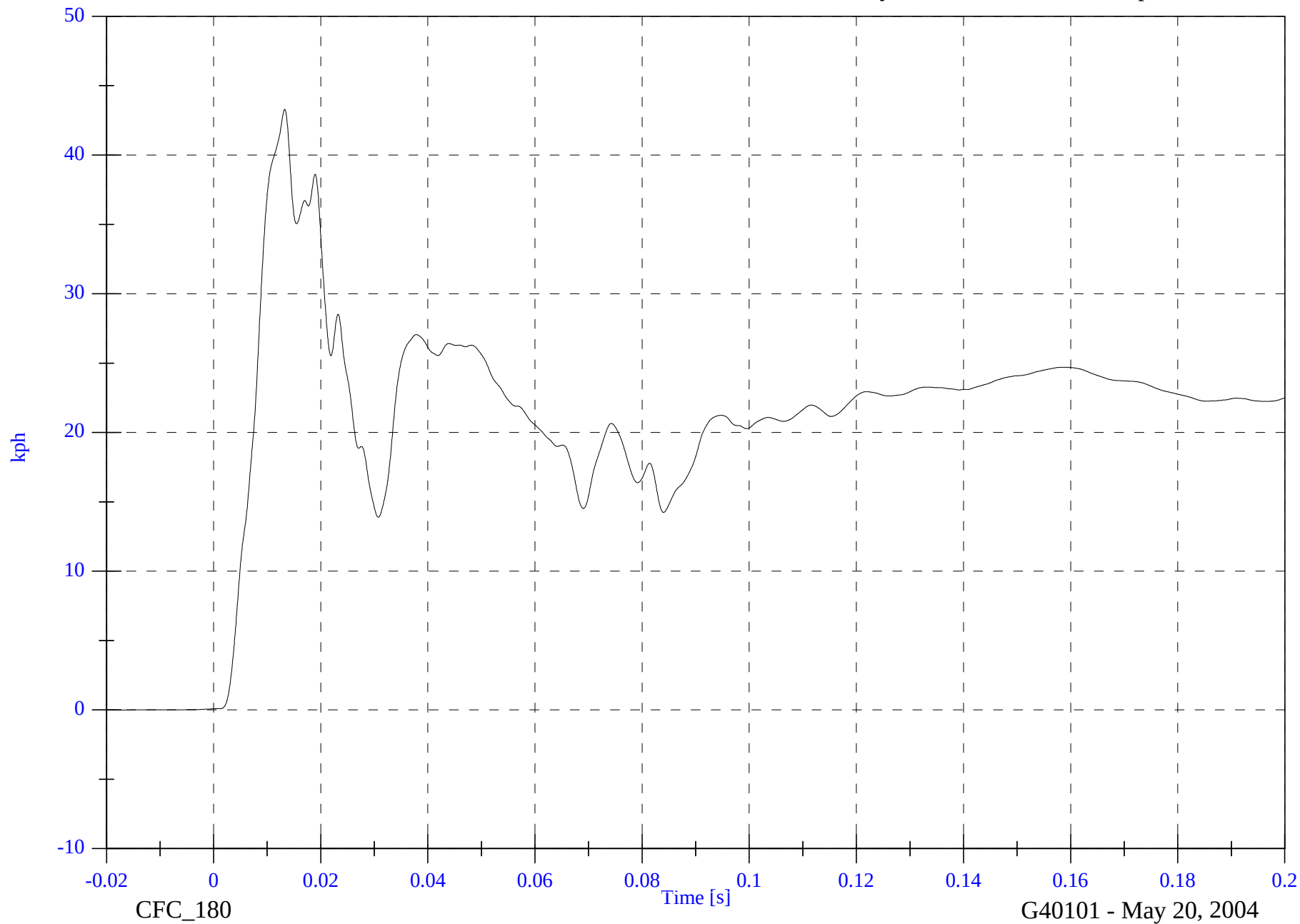


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A6 Left Front Door C/L Y Velocity

Max: 43.3 [kph] at 0.013 [s]

Min: -0.0 [kph] at -0.020 [s]



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8745-01

CFC\_180

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A7 Right Rear Compartment Y

Max: 24.0 [g] at 0.020 [s]

Min: -2.0 [g] at 0.157 [s]



B-87

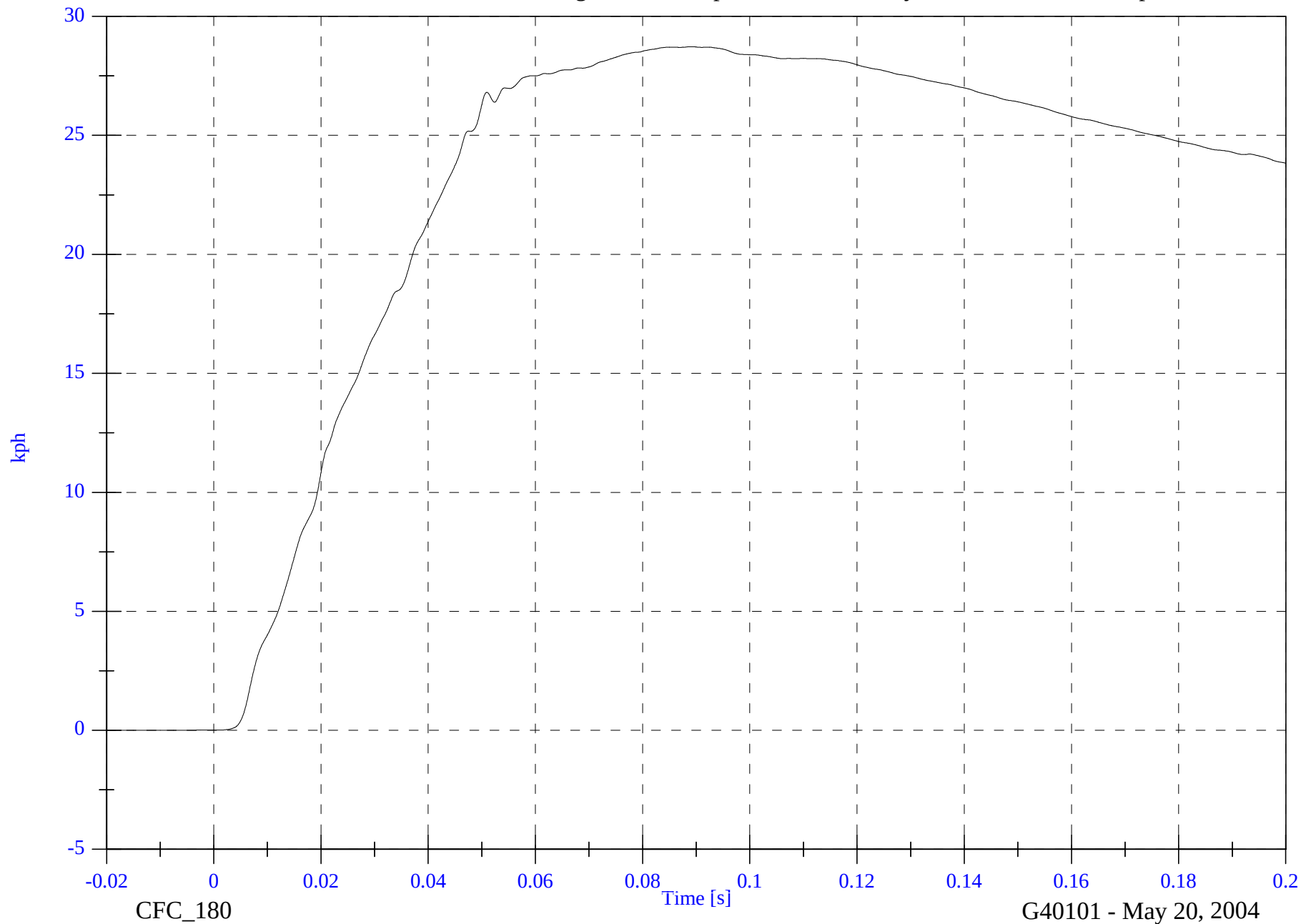
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A7 Right Rear Compartment Y Velocity

Max: 28.7 [kph] at 0.089 [s]

Min: -0.0 [kph] at -0.012 [s]



B-88

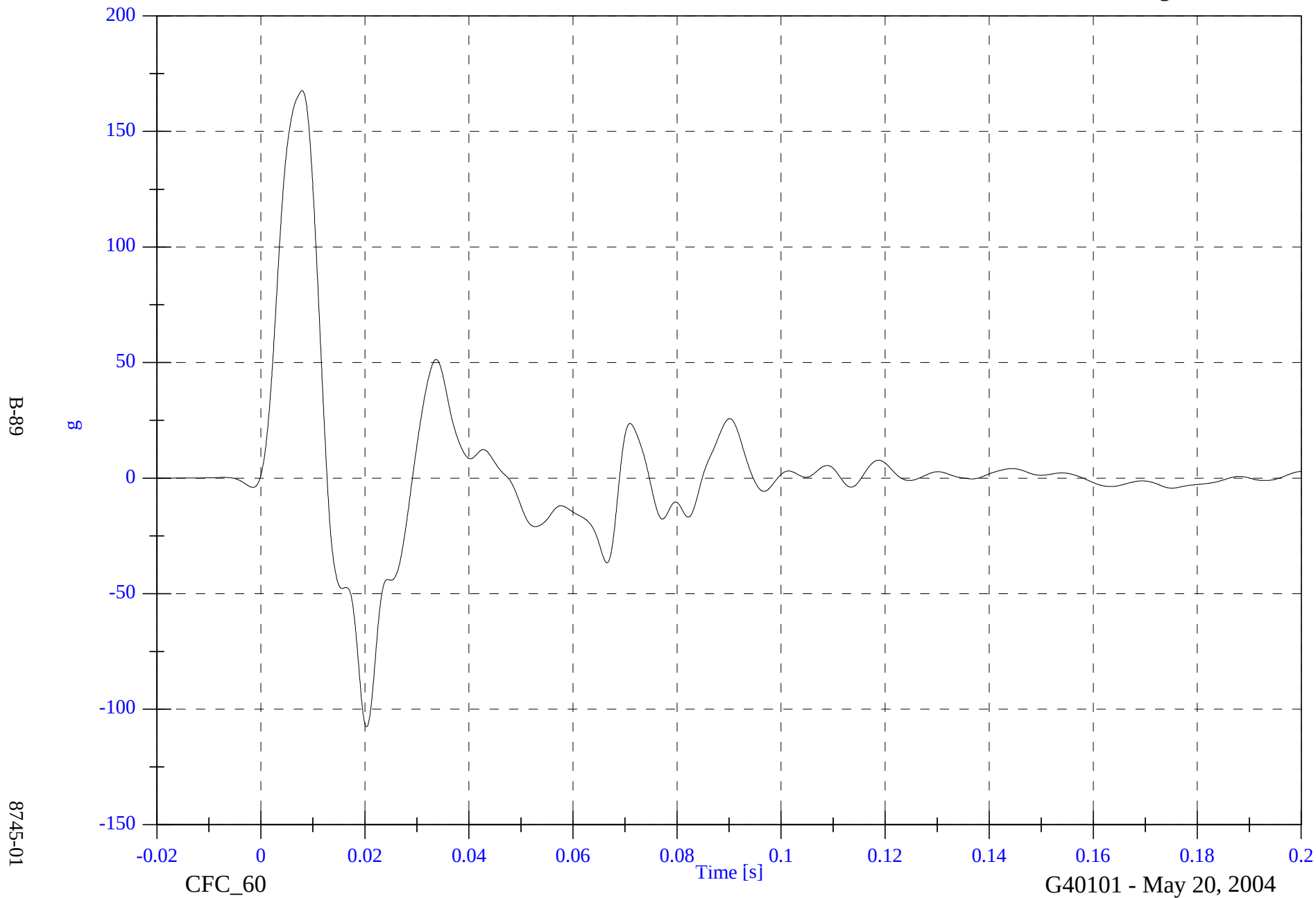
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A8 Left Front Door Midrear Y

Max: 167.6 [g] at 0.008 [s]

Min: -107.6 [g] at 0.020 [s]

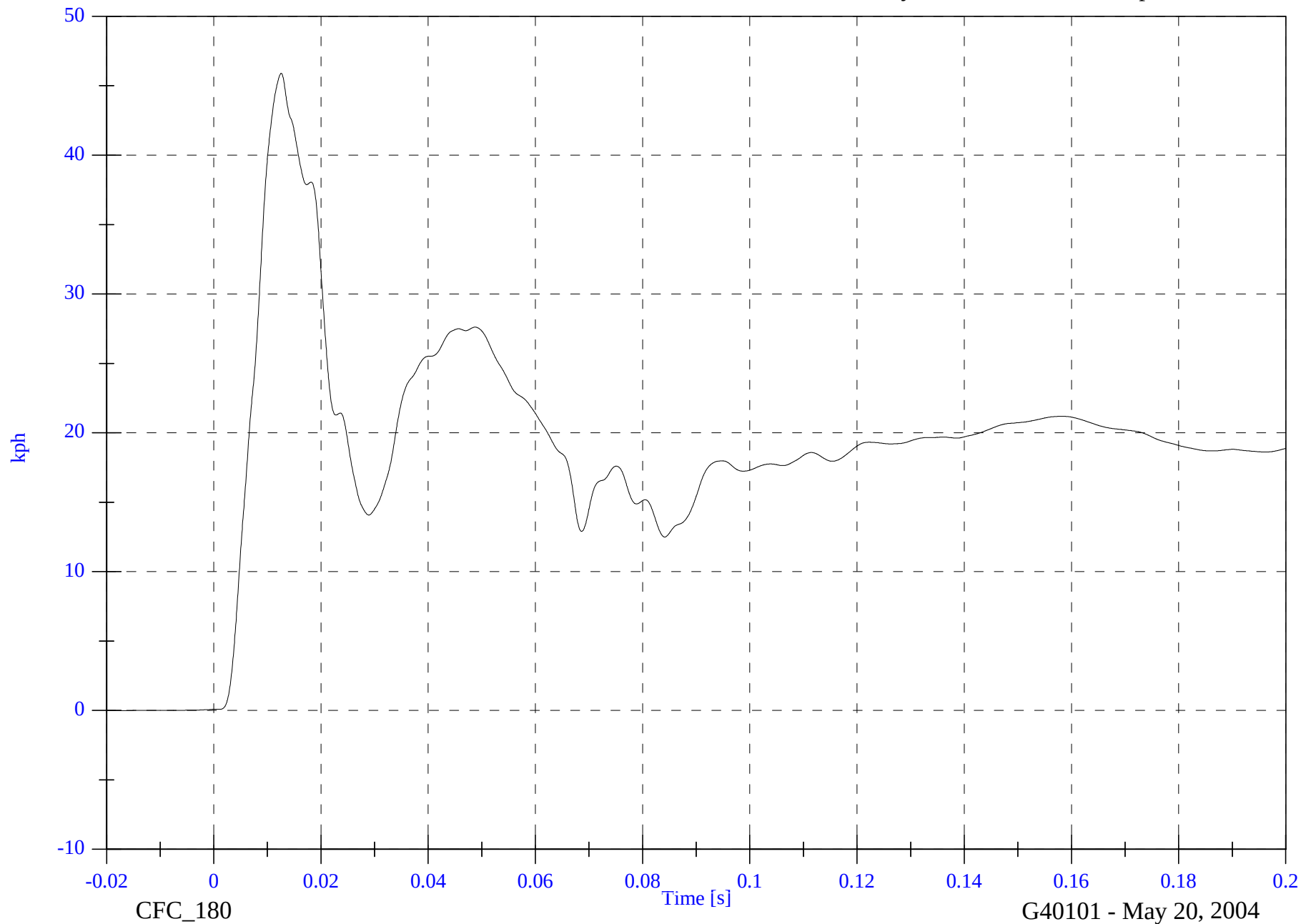


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A8 Left Front Door Midrear Y Velocity

Max: 45.9 [kph] at 0.013 [s]

Min: -0.0 [kph] at -0.018 [s]



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8745-01

CFC\_180

Time [s]

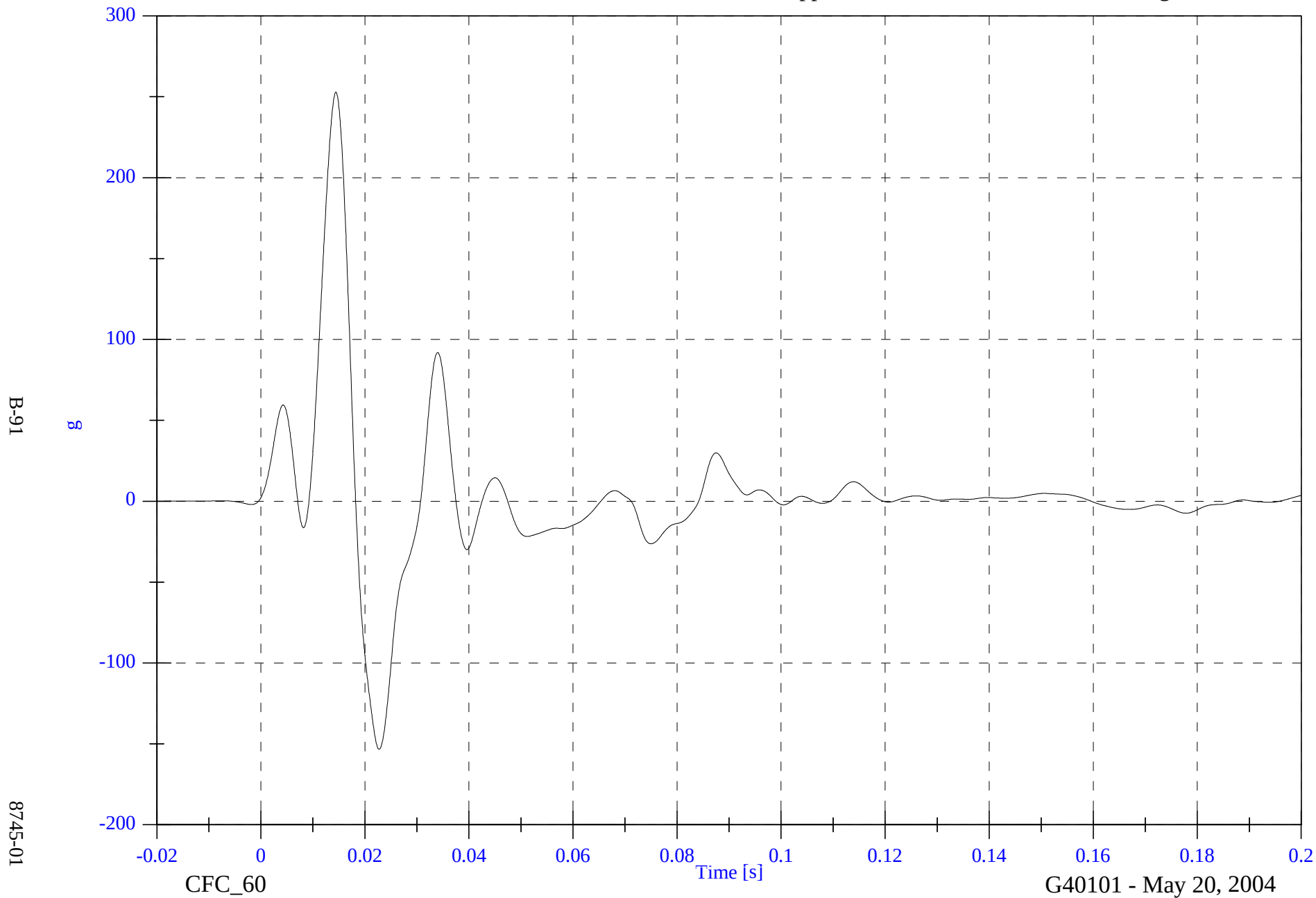
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A9 Left Front Door Upper C/L Y

Max: 252.9 [g] at 0.014 [s]

Min: -153.4 [g] at 0.023 [s]

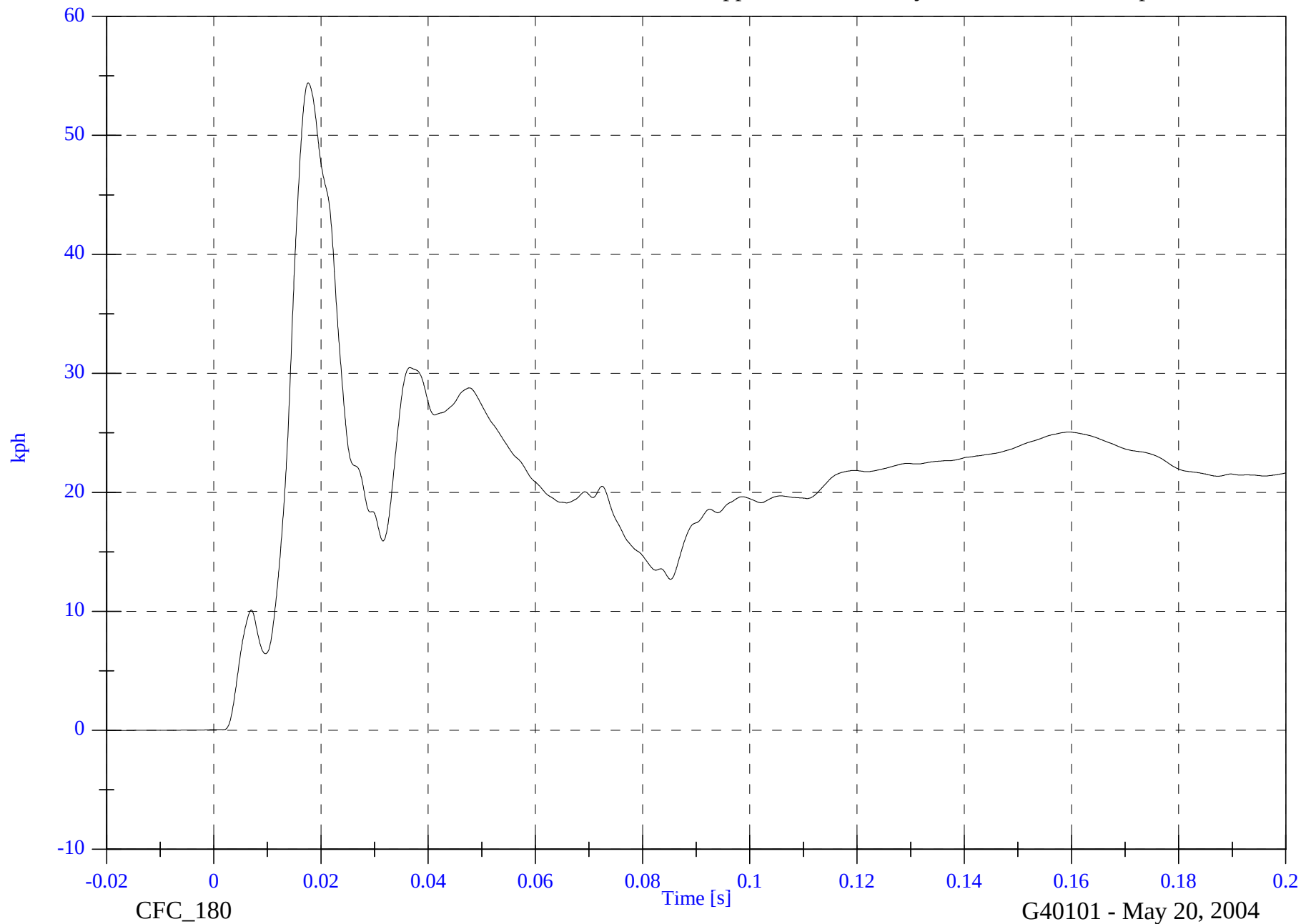


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A9 Left Front Door Upper C/L Y Velocity

Max: 54.4 [kph] at 0.018 [s]

Min: -0.0 [kph] at -0.018 [s]



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8745-01

CFC\_180

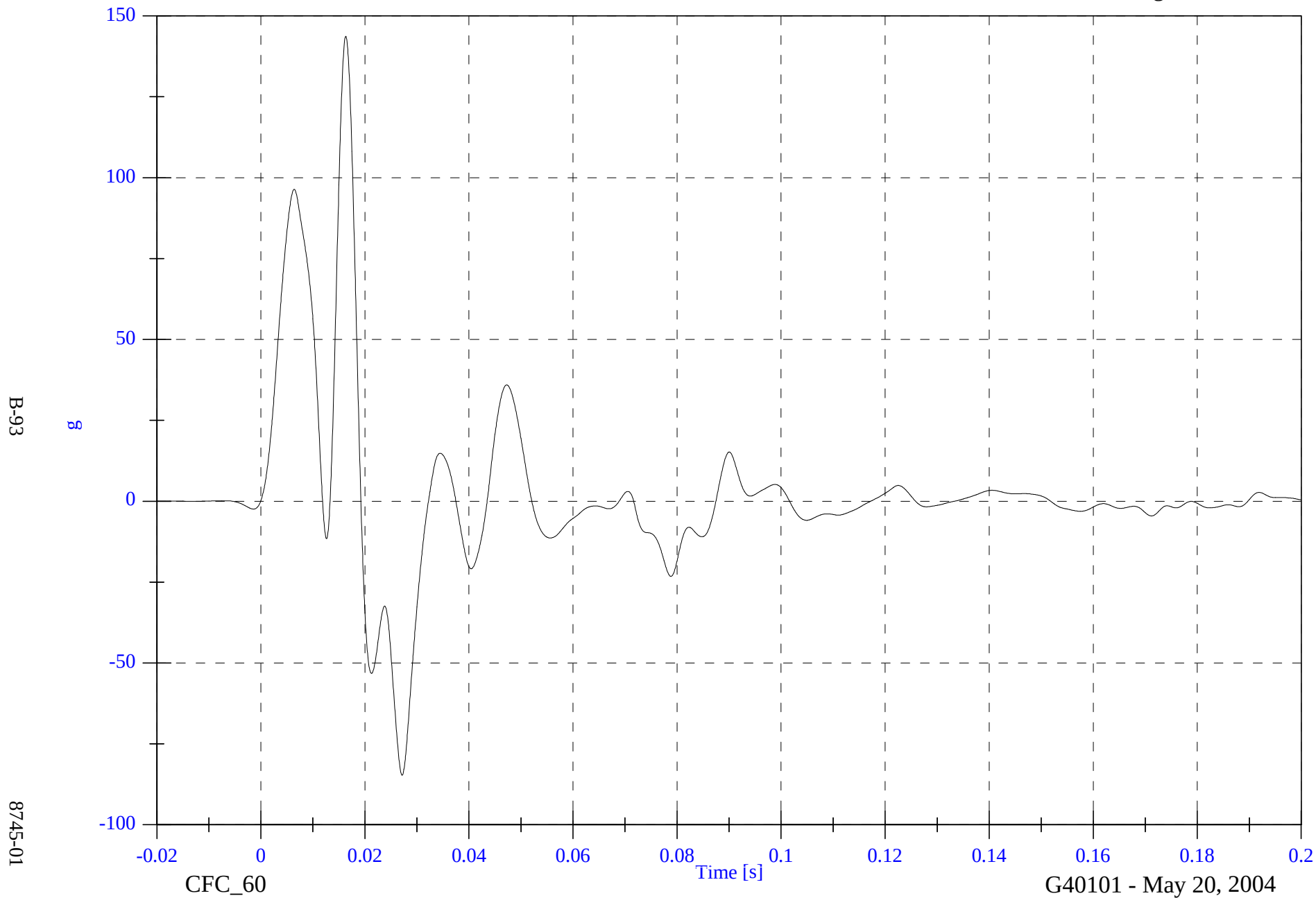
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A10 Left Rear Door Midrear Y

Max: 143.7 [g] at 0.016 [s]

Min: -84.7 [g] at 0.027 [s]

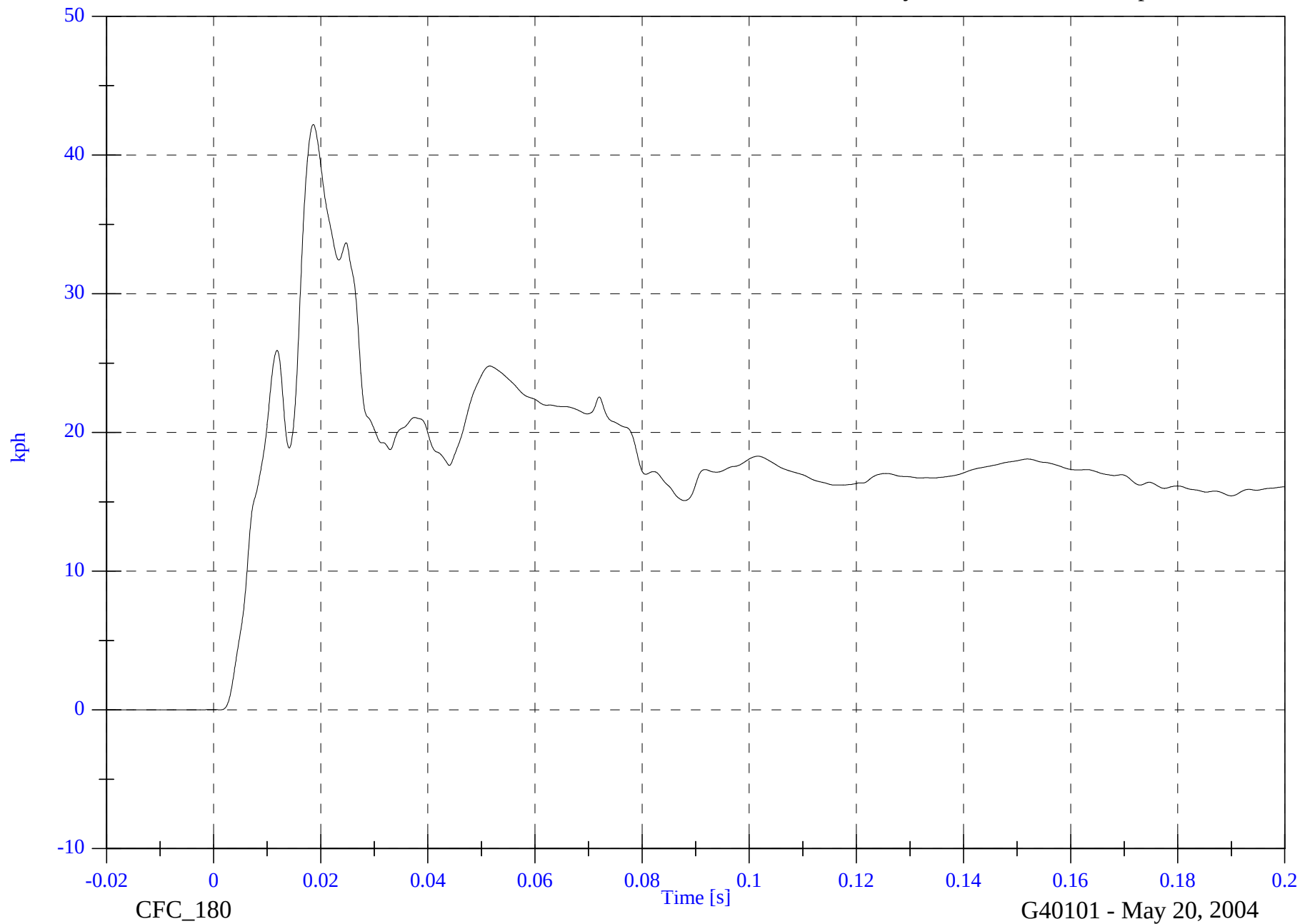


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A10 Left Rear Door Midrear Y Velocity

Max: 42.2 [kph] at 0.019 [s]

Min: -0.0 [kph] at -0.020 [s]



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8745-01

CFC\_180

Time [s]

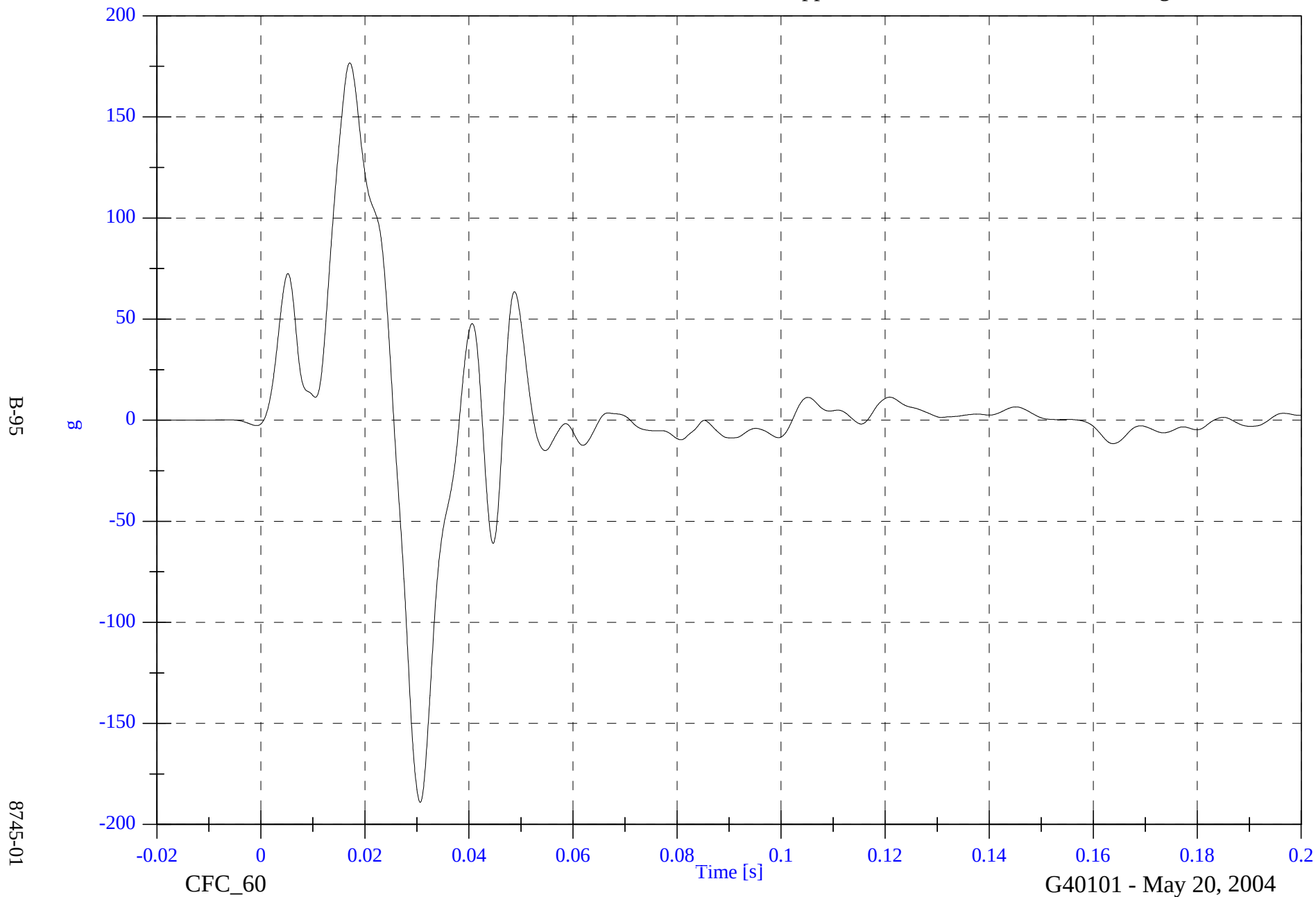
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A11 Left Rear Door Upper C/L Y

Max: 176.7 [g] at 0.017 [s]

Min: -189.1 [g] at 0.031 [s]

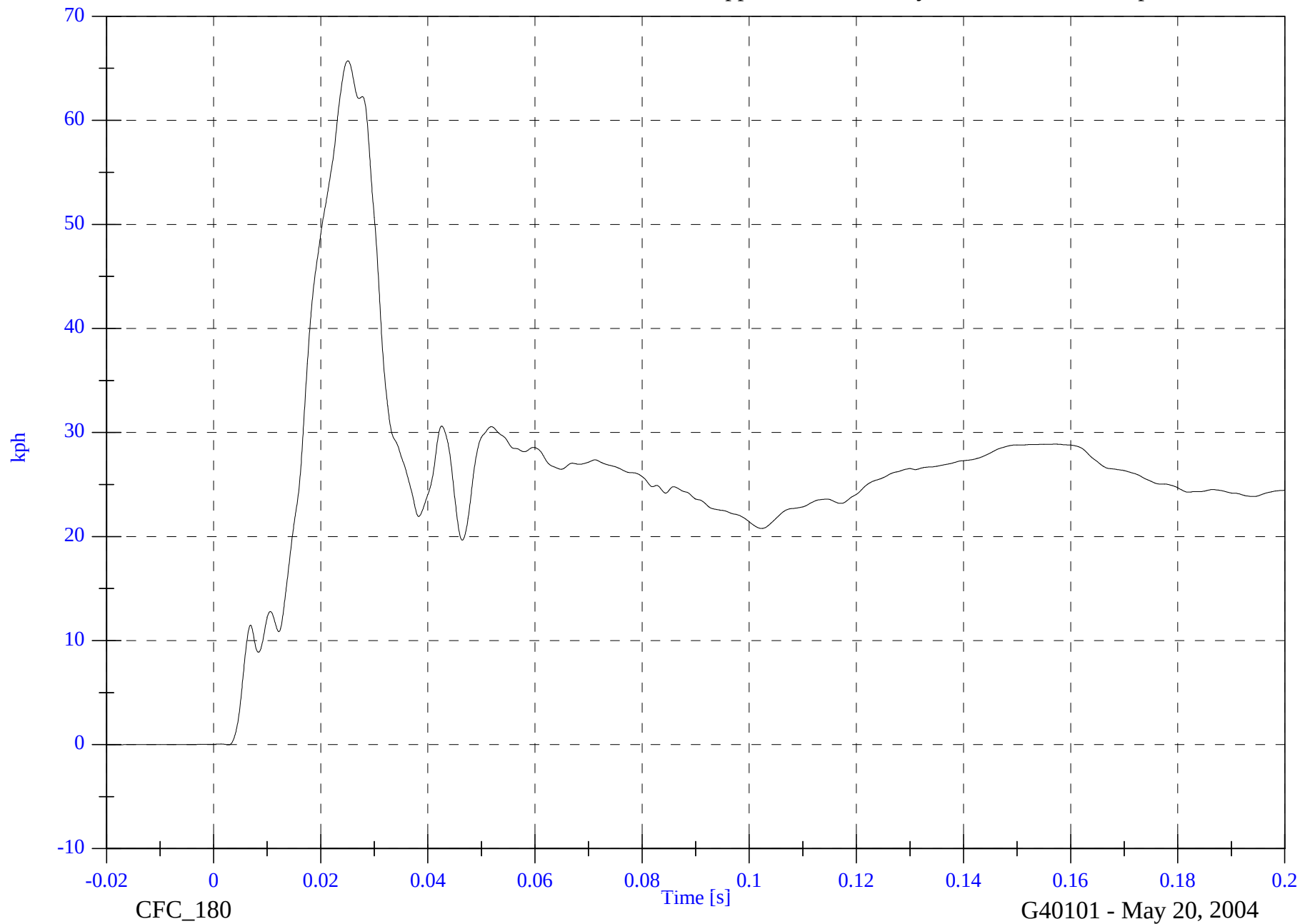


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A11 Left Rear Door Upper C/L Y Velocity

Max: 65.7 [kph] at 0.025 [s]

Min: -0.0 [kph] at 0.003 [s]



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8745-01

CFC\_180

Time [s]

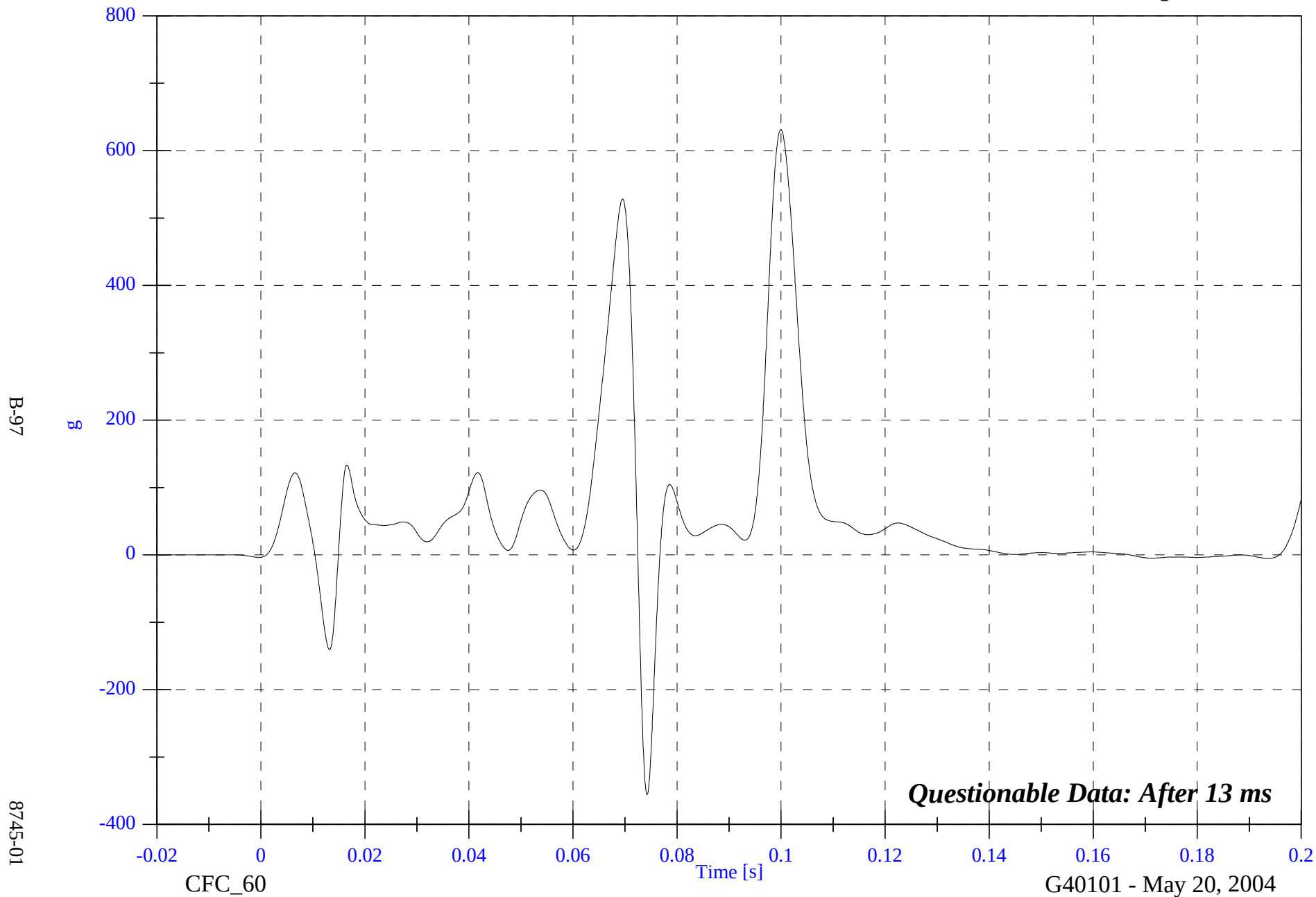
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A12 Left Lower B Post Y

Max: 631.5 [g] at 0.100 [s]

Min: -355.7 [g] at 0.074 [s]

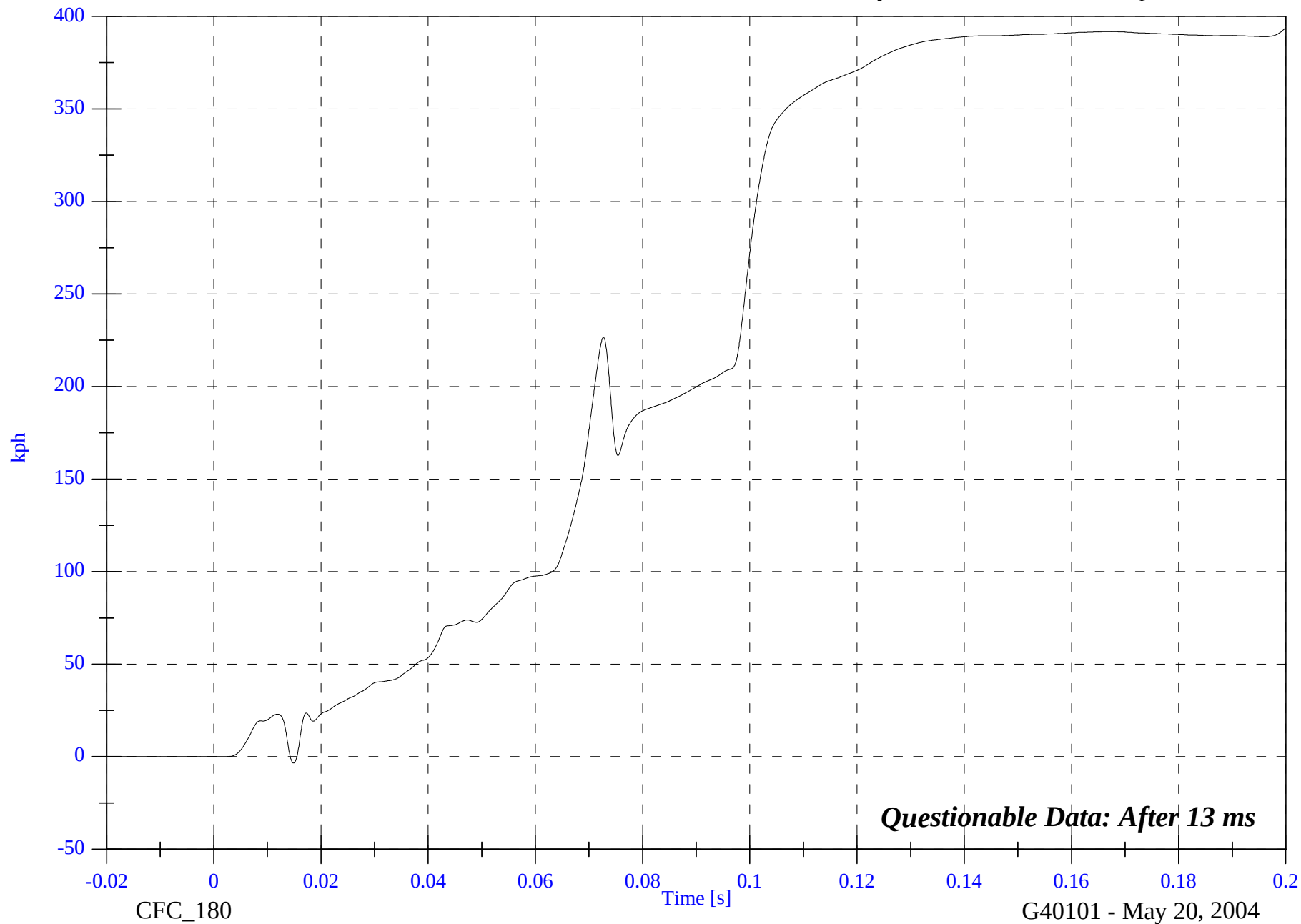


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A12 Left Lower B Post Y Velocity

Max: 393.9 [kph] at 0.200 [s]

Min: -3.4 [kph] at 0.015 [s]



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8745-01

**Questionable Data: After 13 ms**

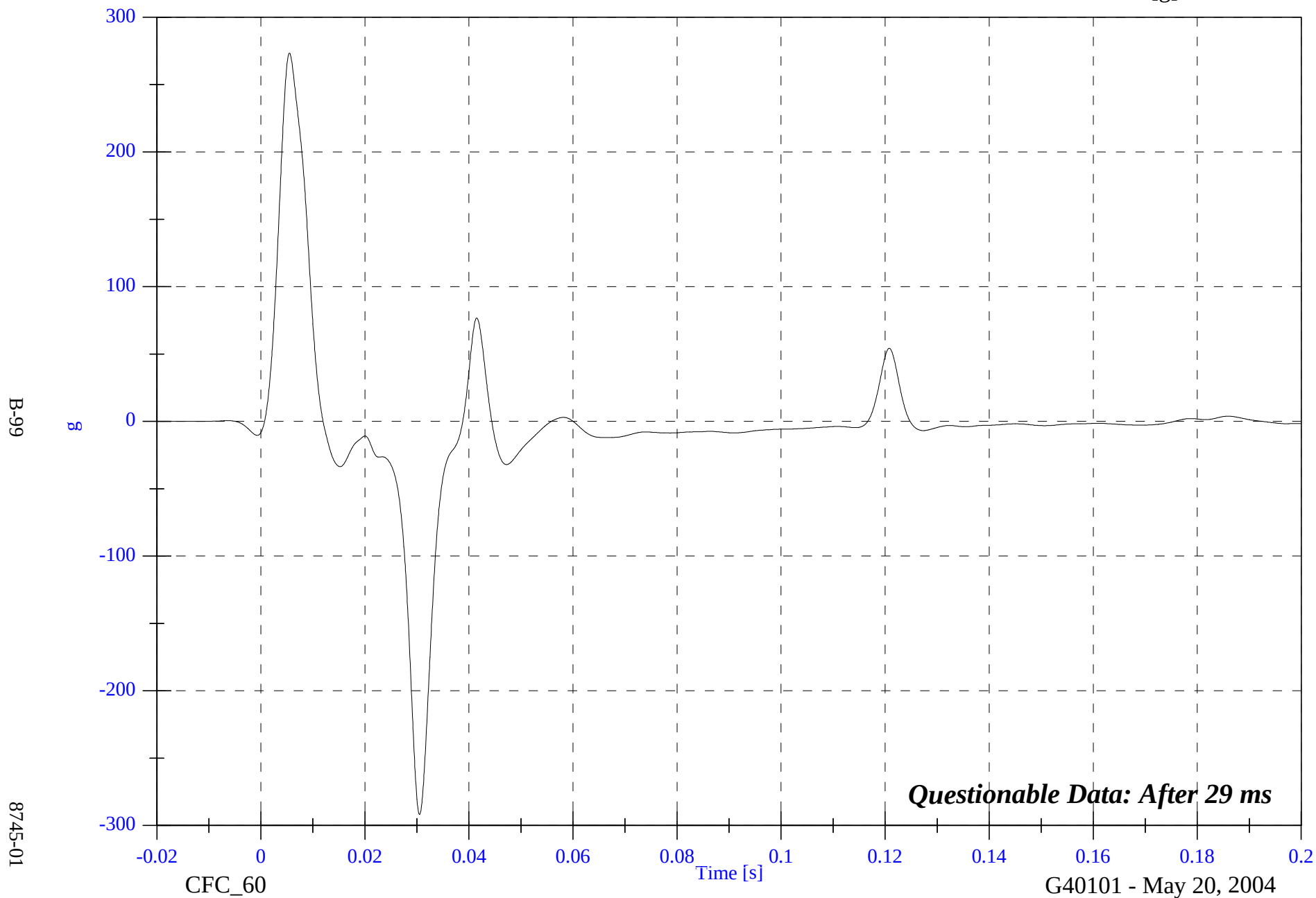
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A13 Left Mid B Post Y

Max: 273.3 [g] at 0.005 [s]

Min: -291.8 [g] at 0.030 [s]

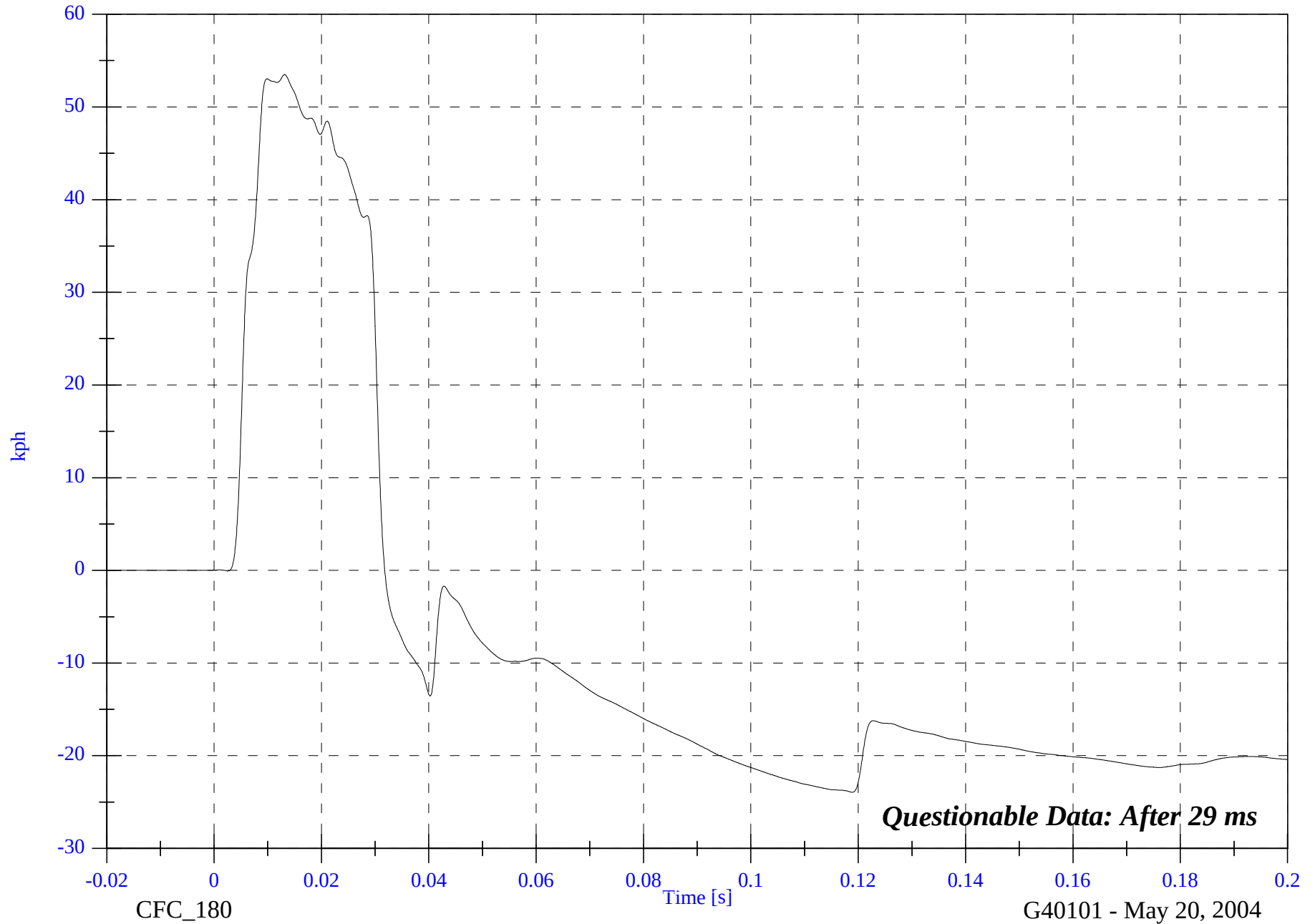


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A13 Left Mid B Post Y Velocity

Max: 53.5 [kph] at 0.013 [s]

Min: -23.9 [kph] at 0.119 [s]



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CFC\_180

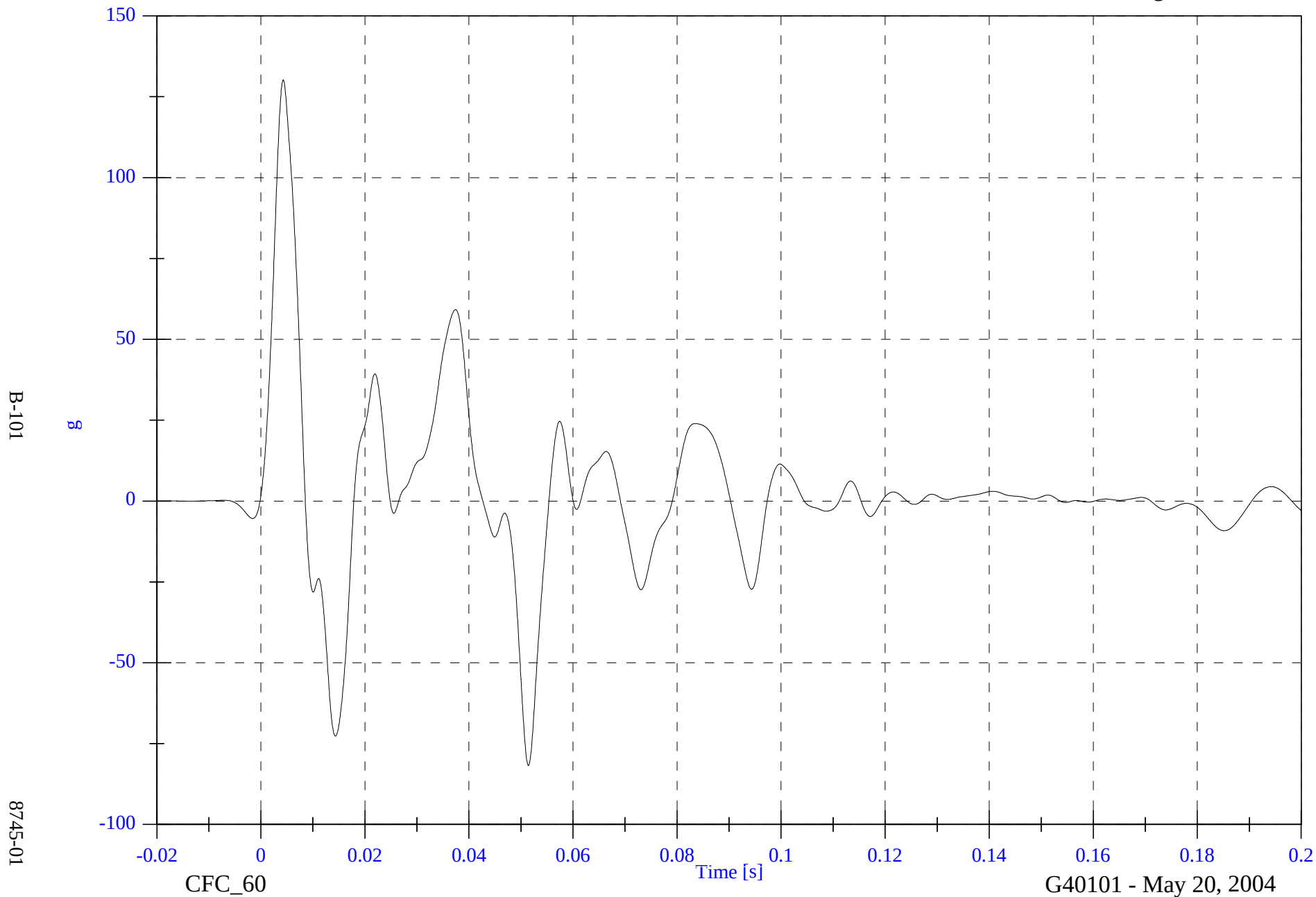
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A14 Left Lower A Post Y

Max: 130.2 [g] at 0.004 [s]

Min: -81.8 [g] at 0.051 [s]

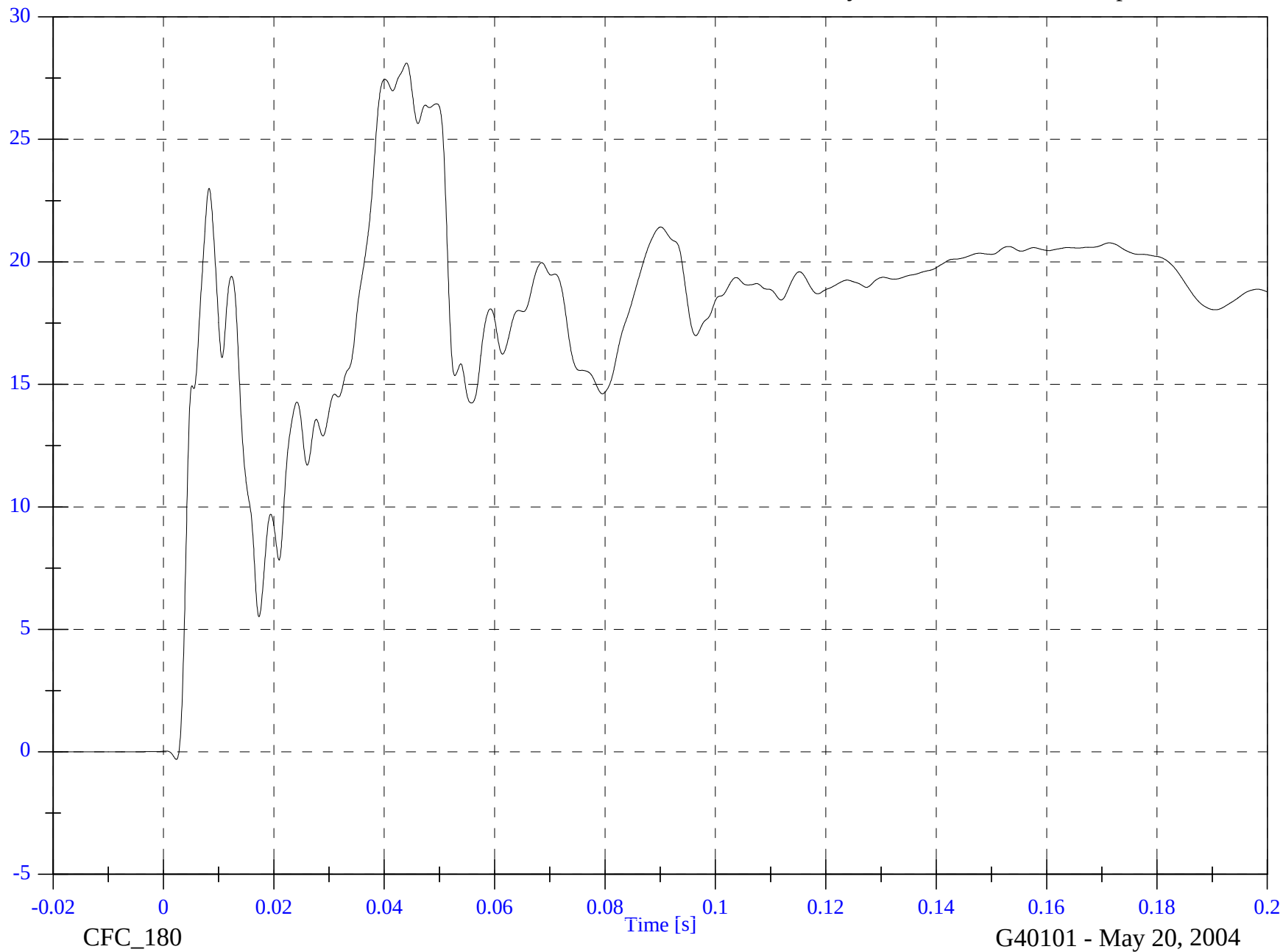


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A14 Left Lower A Post Y Velocity

Max: 28.1 [kph] at 0.044 [s]

Min: -0.3 [kph] at 0.002 [s]



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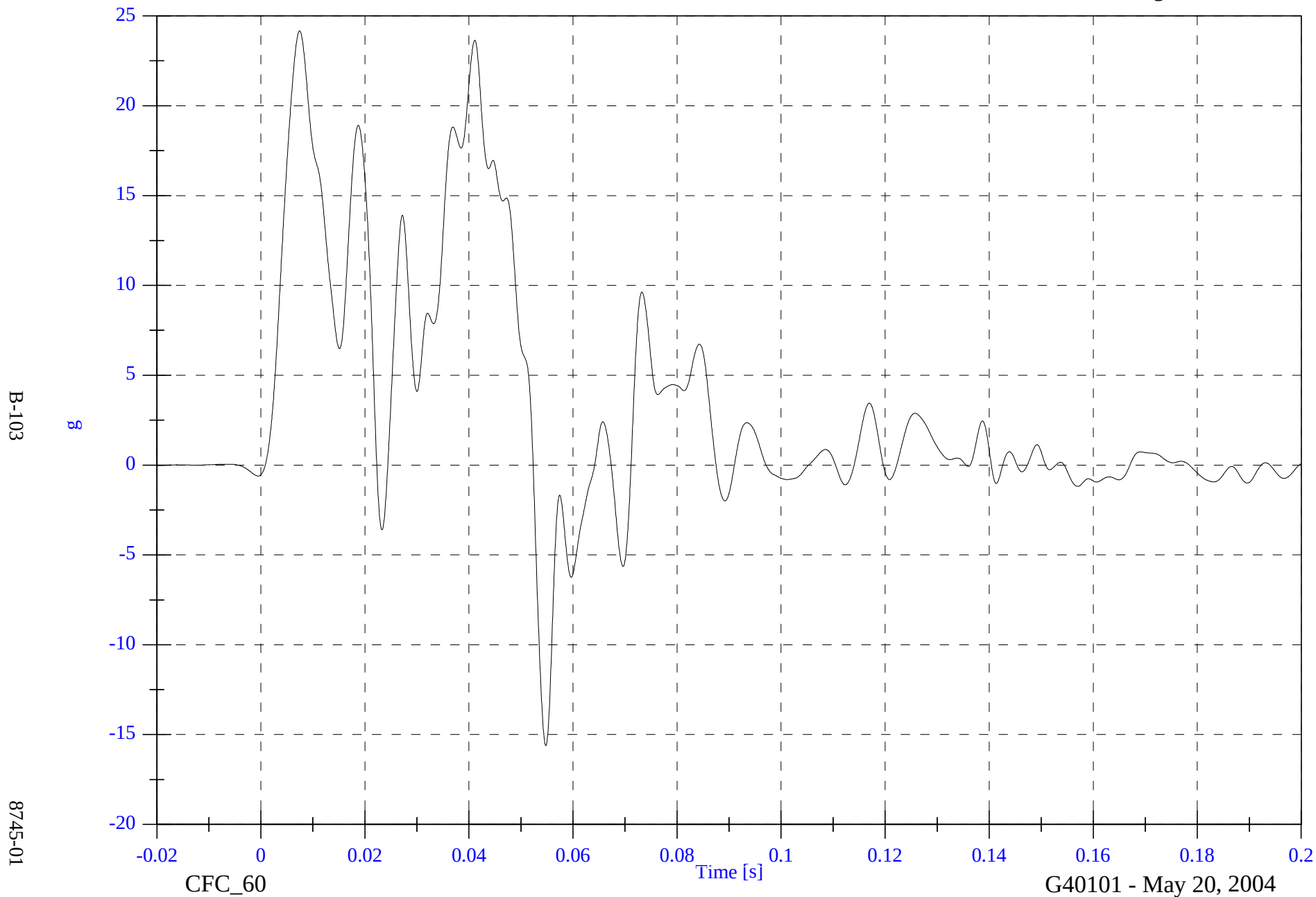
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A15 Left Mid A Post Y

Max: 24.2 [g] at 0.007 [s]

Min: -15.6 [g] at 0.055 [s]

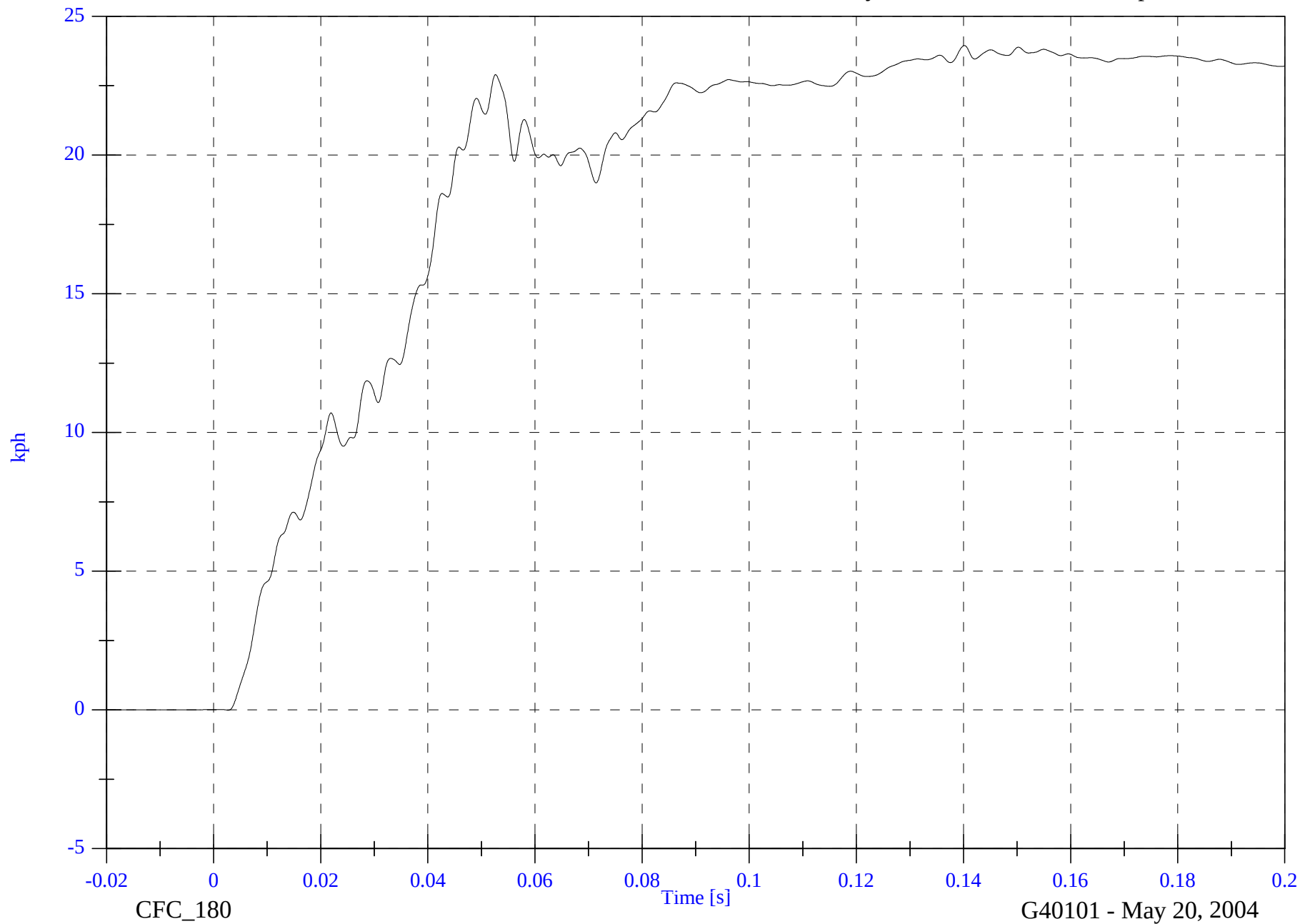


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A15 Left Mid A Post Y Velocity

Max: 23.9 [kph] at 0.140 [s]

Min: -0.0 [kph] at 0.003 [s]



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8745-01

CFC\_180

Time [s]

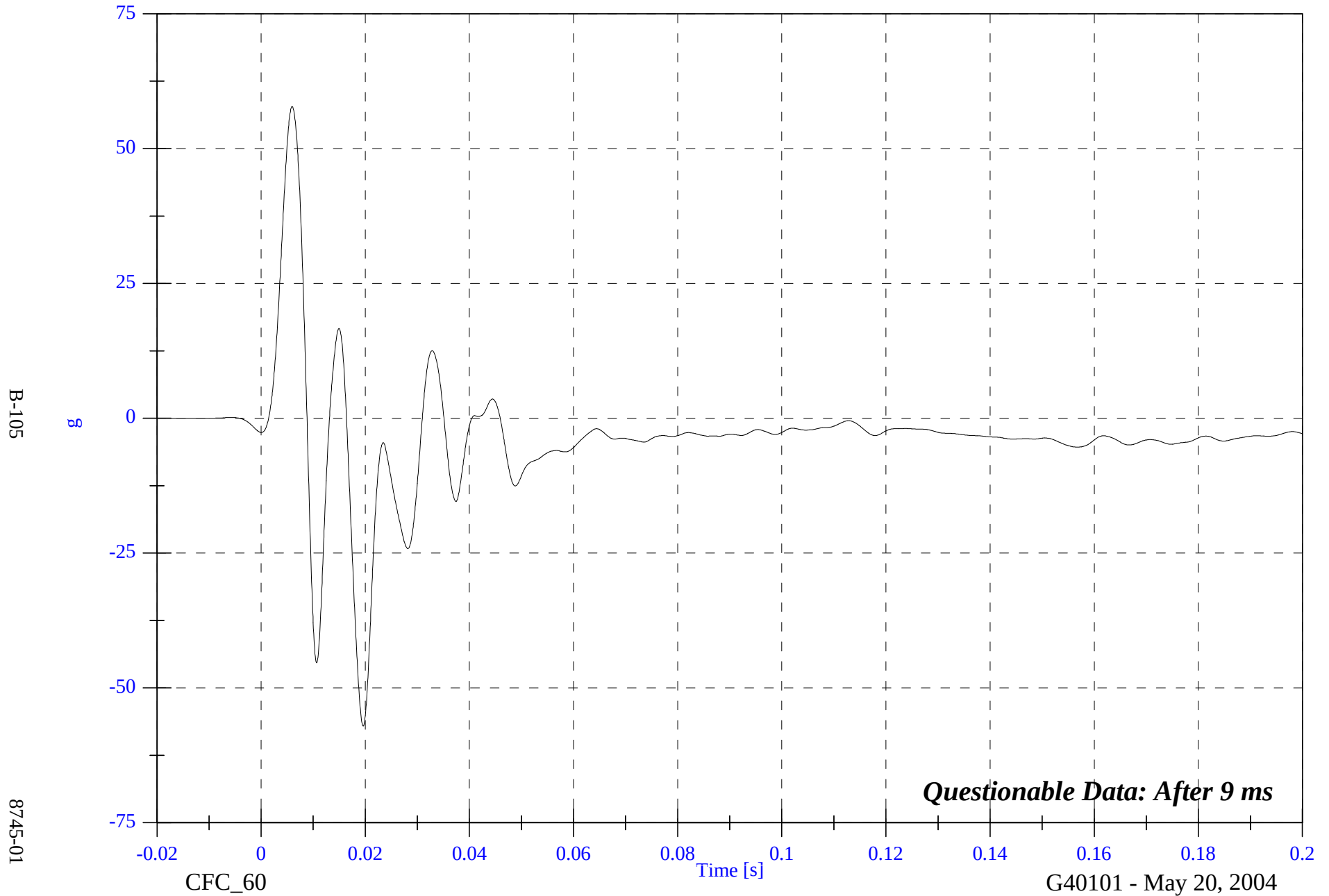
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A16 Front Seat Track Y

Max: 57.8 [g] at 0.006 [s]

Min: -57.1 [g] at 0.020 [s]

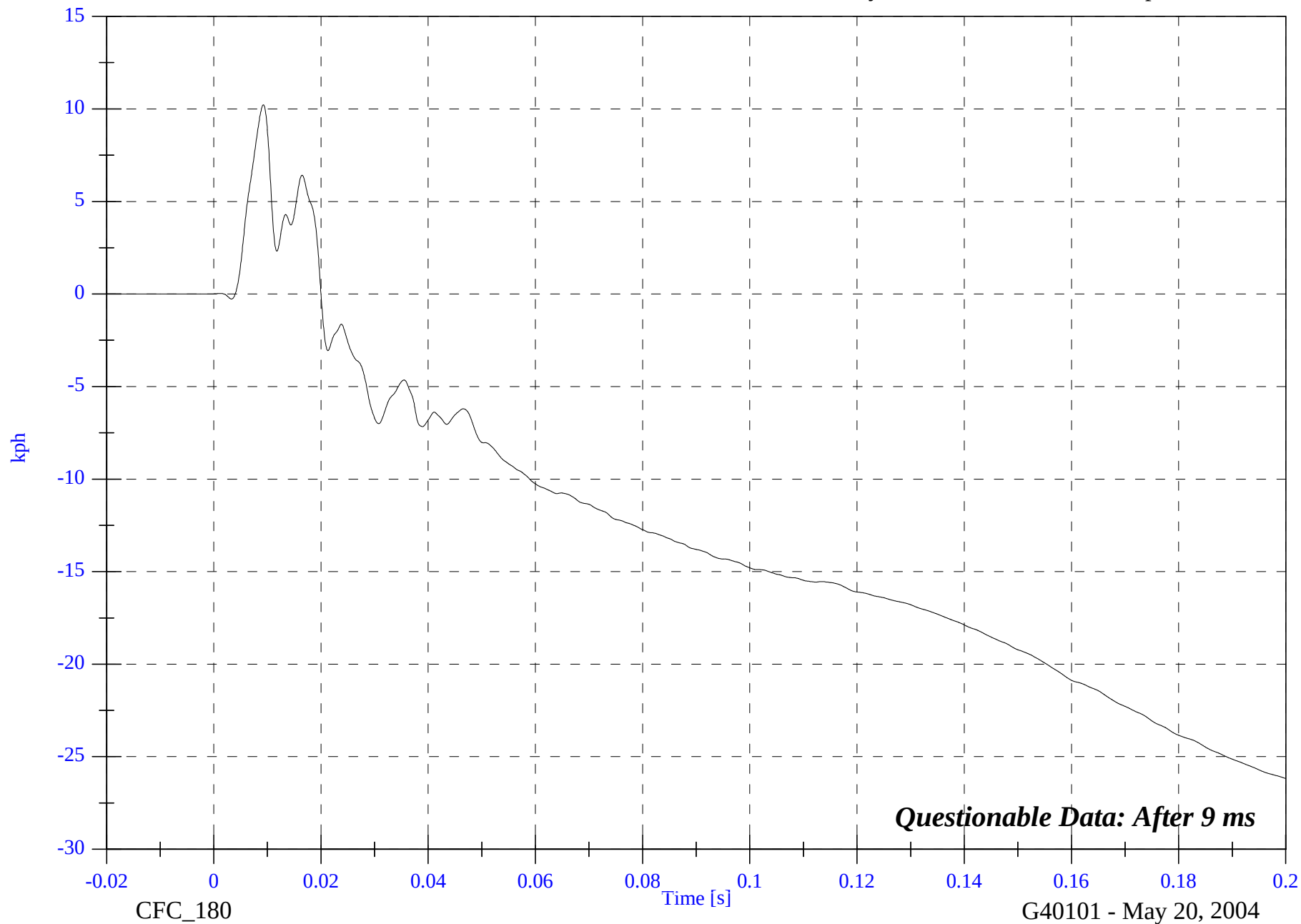


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A16 Front Seat Track Y Velocity

Max: 10.2 [kph] at 0.009 [s]

Min: -26.2 [kph] at 0.200 [s]



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CFC\_180

Time [s]

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A17 Rear Seat Track Y

Max: 25.0 [g] at 0.020 [s]

Min: -3.6 [g] at 0.121 [s]

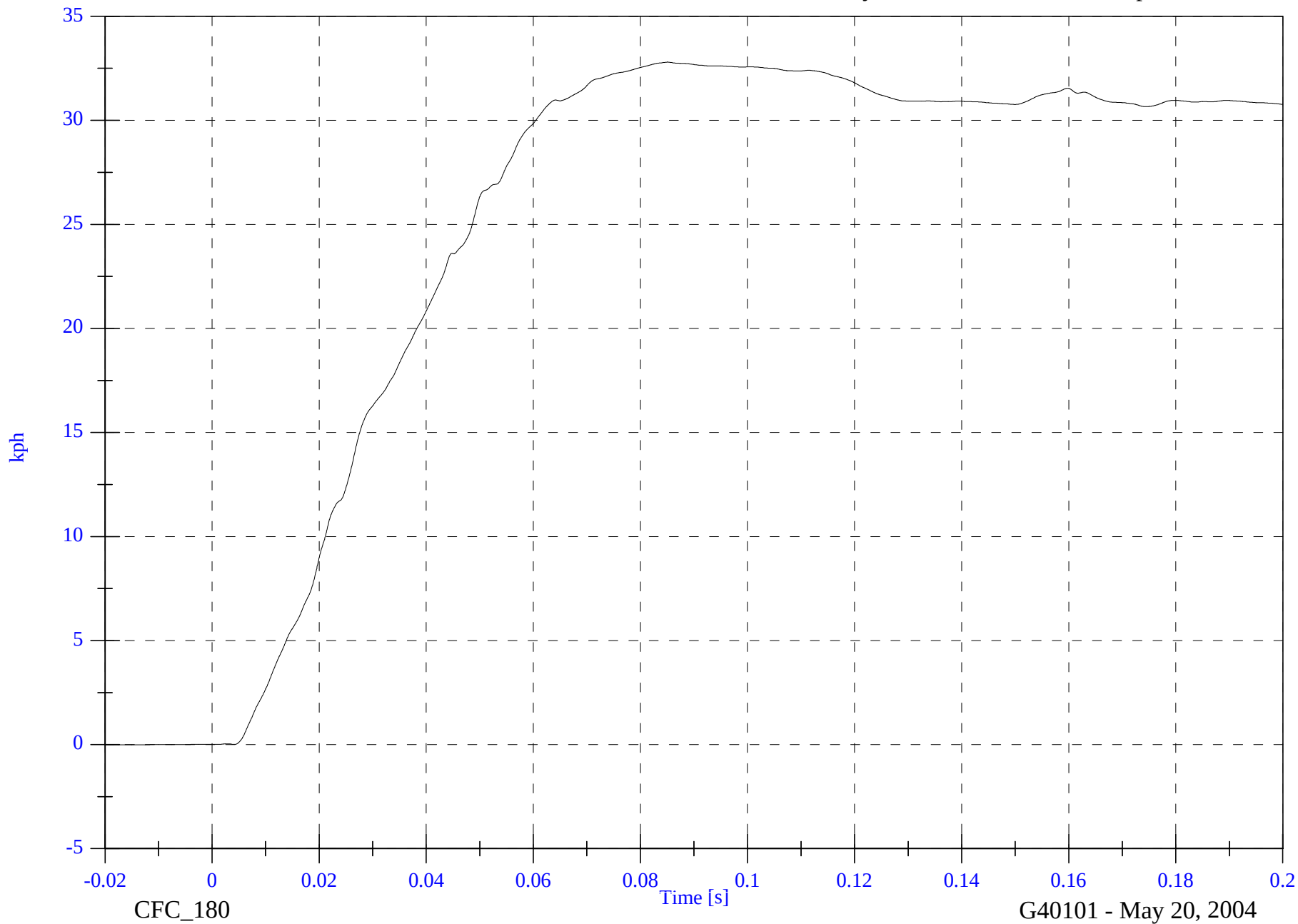


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A17 Rear Seat Track Y Velocity

Max: 32.8 [kph] at 0.085 [s]

Min: -0.0 [kph] at -0.019 [s]



B-108

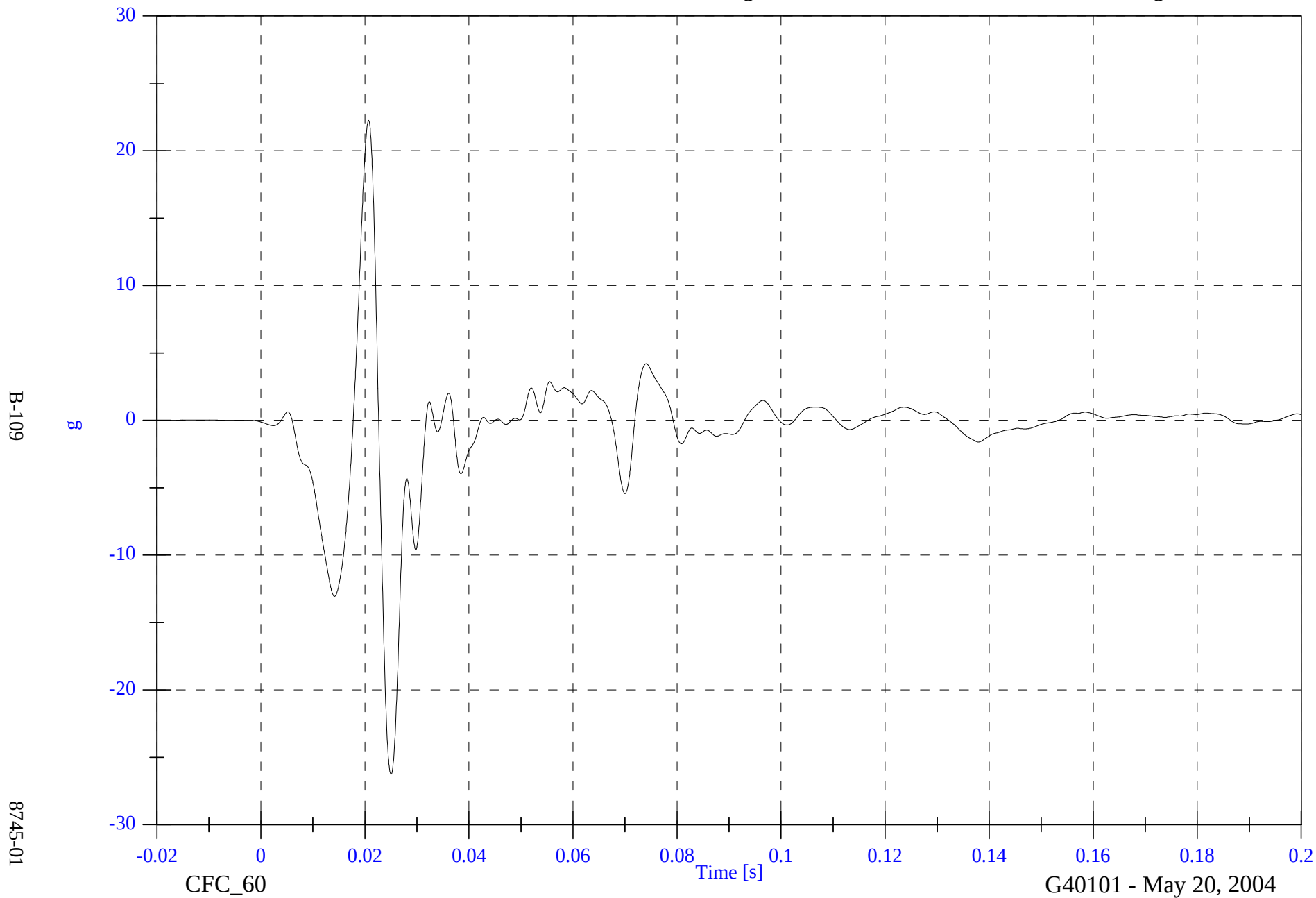
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A18 Target CG X

Max: 22.3 [g] at 0.021 [s]

Min: -26.3 [g] at 0.025 [s]

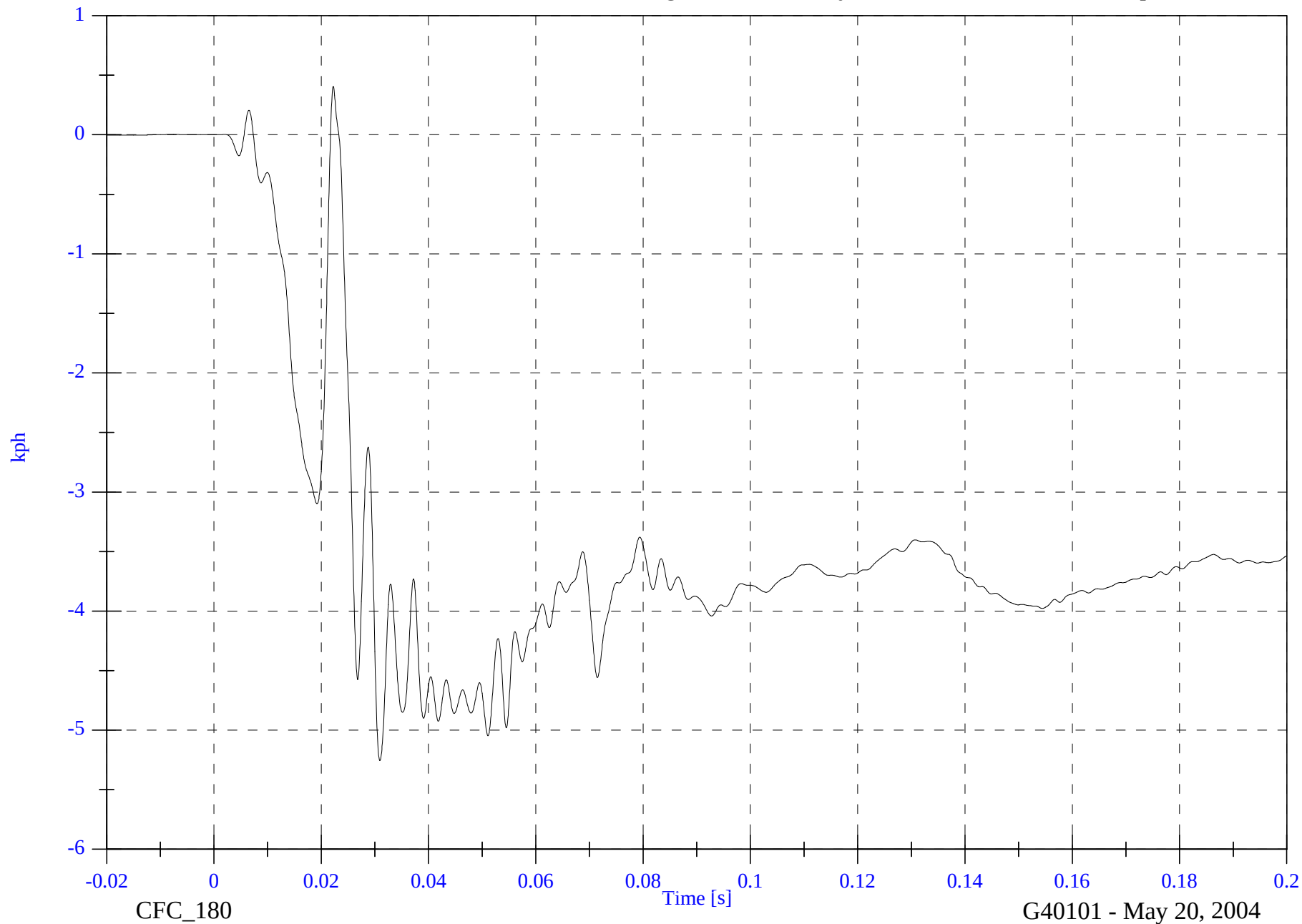


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A18 Target CG X Velocity

Max: 0.4 [kph] at 0.022 [s]

Min: -5.3 [kph] at 0.031 [s]



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8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

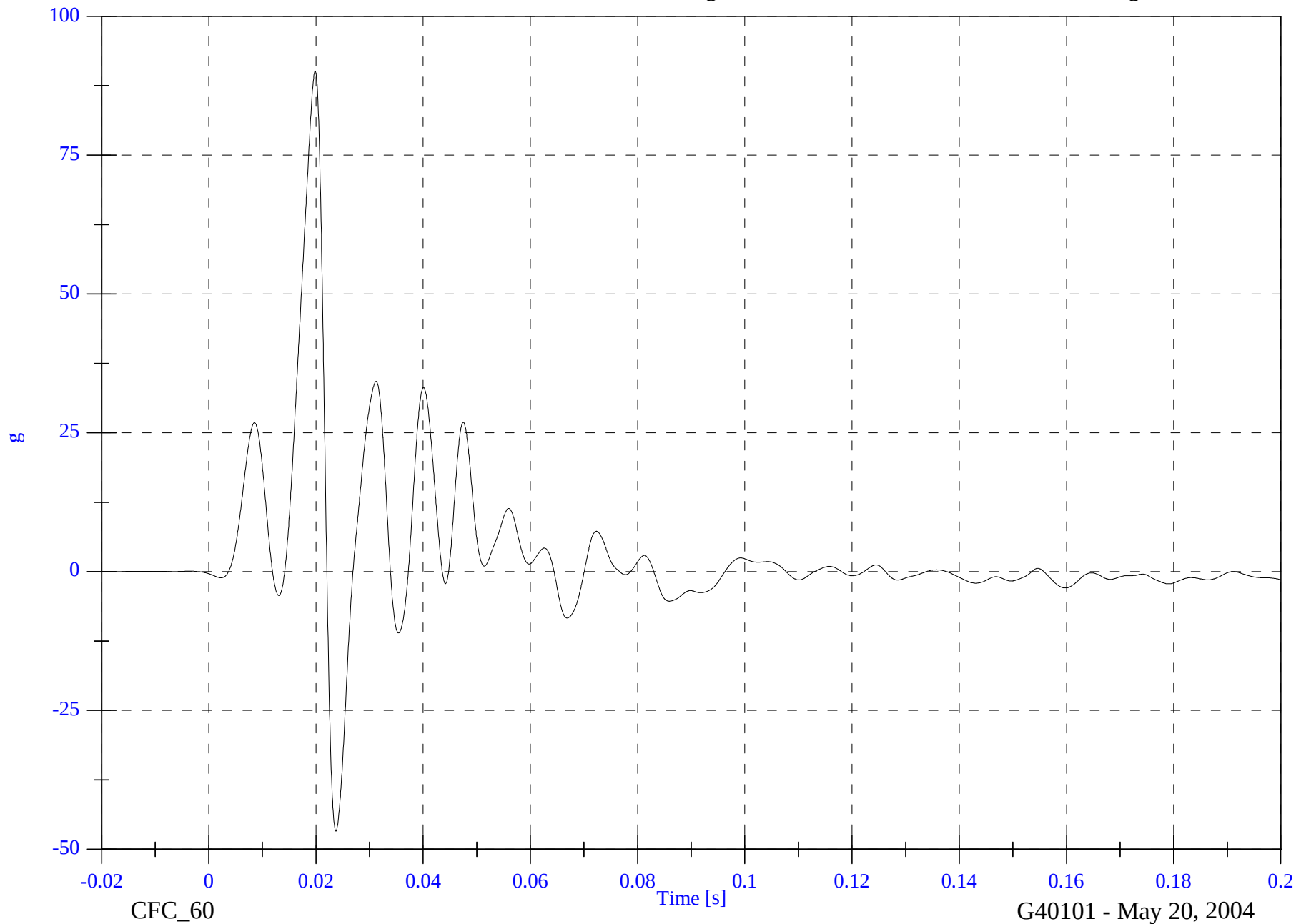
V2 A18 Target CG Y

Max: 90.2 [g] at 0.020 [s]

Min: -46.7 [g] at 0.024 [s]

B-111

8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

V2 A18 Target CG Y Velocity

Max: 26.7 [kph] at 0.065 [s]

Min: -0.0 [kph] at 0.005 [s]



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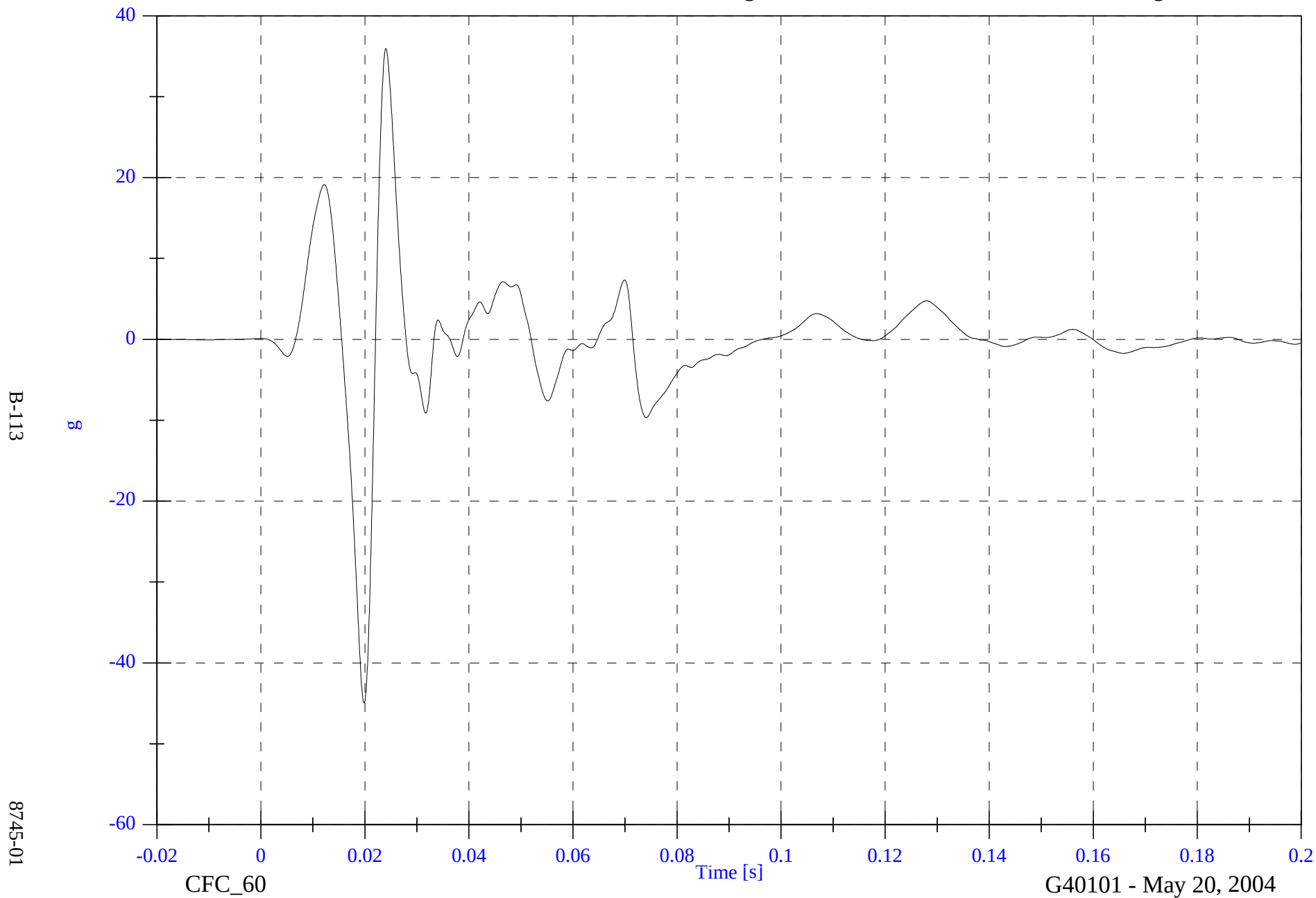
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2 A18 Target CG Z

Max: 36.0 [g] at 0.024 [s]

Min: -44.9 [g] at 0.020 [s]

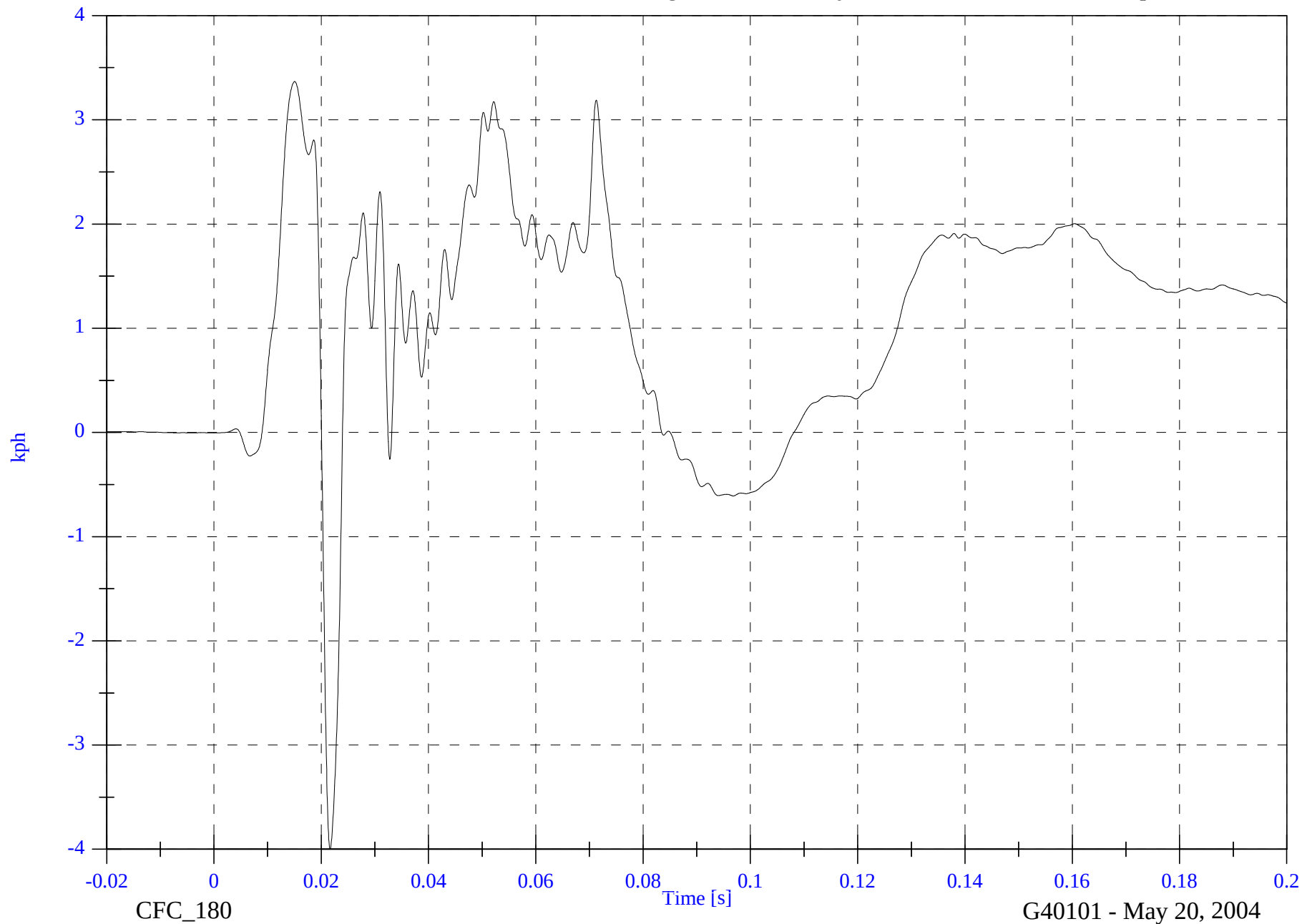


2004 Side NCAP - 2004 Chevrolet Malibu

V2 A18 Target CG Z Velocity

Max: 3.4 [kph] at 0.015 [s]

Min: -4.0 [kph] at 0.022 [s]



B-114

8745-01

CFC\_180

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

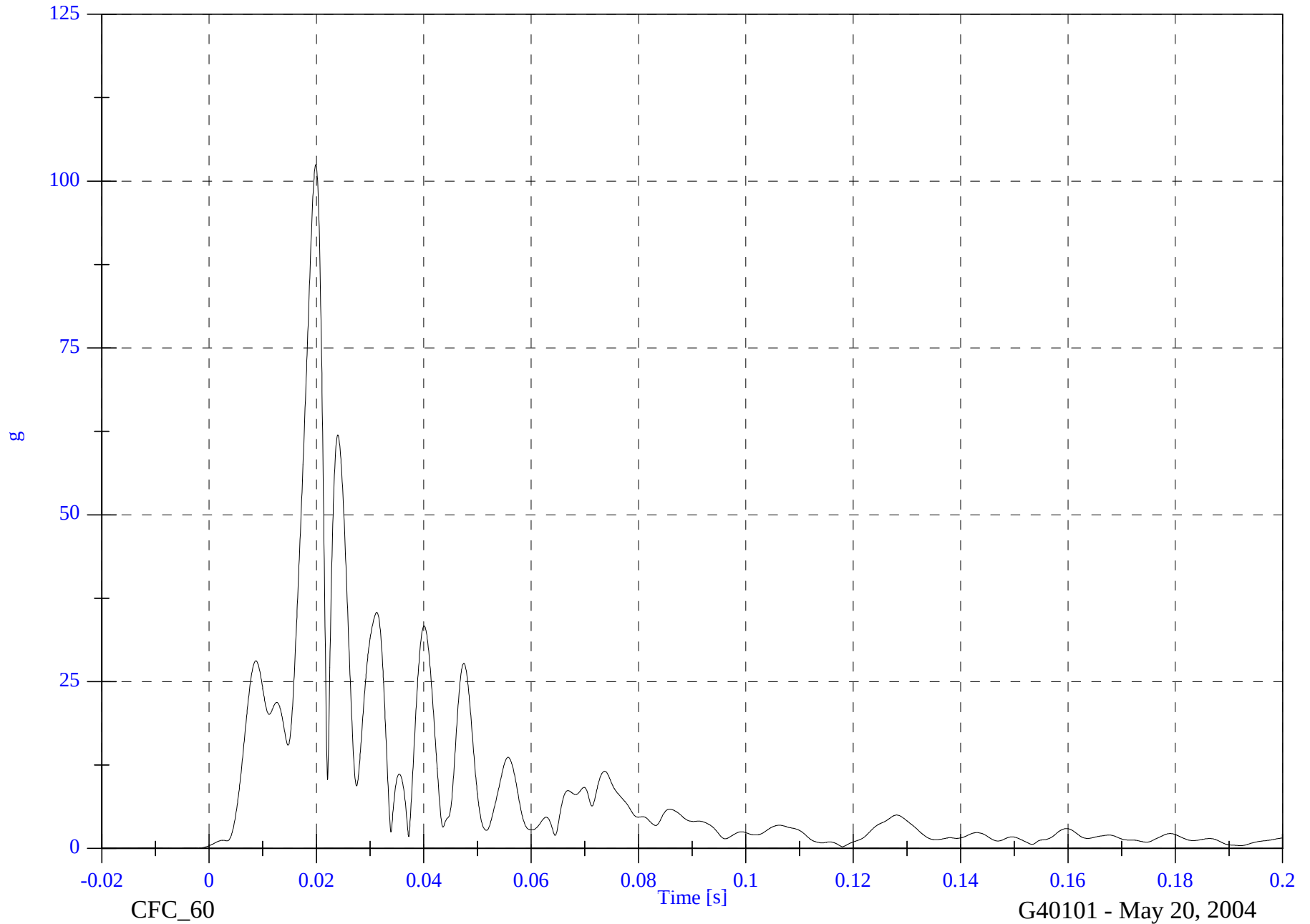
V2 A18 Target CG Resultant

Max: 102.5 [g] at 0.020 [s]

Min: 0.0 [g] at -0.020 [s]

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8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

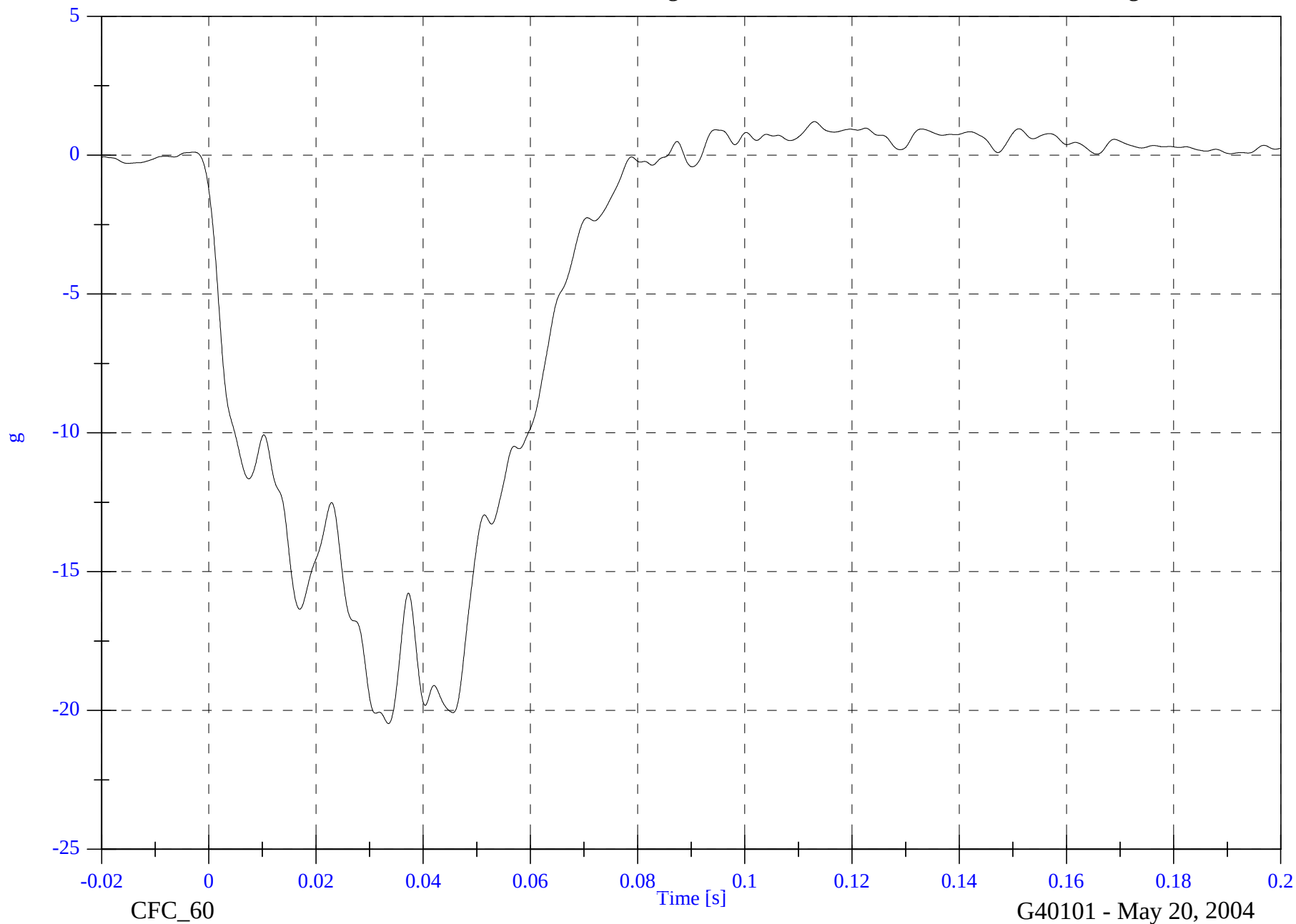
V1 Moving Barrier CG X

Max: 1.2 [g] at 0.113 [s]

Min: -20.5 [g] at 0.034 [s]

B-116

8745-01

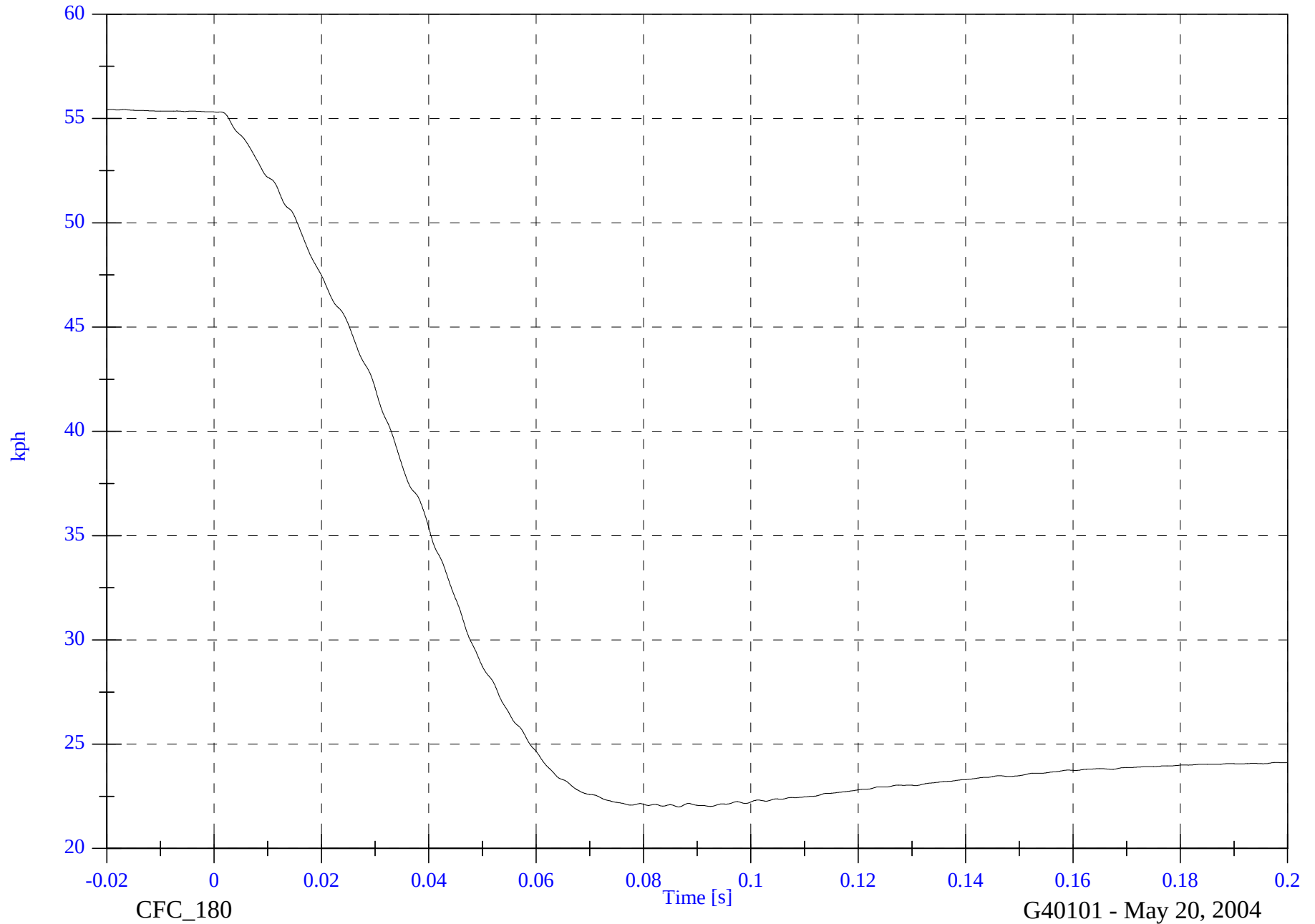


2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier CG X Velocity

Max: 55.4 [kph] at -0.019 [s]

Min: 22.0 [kph] at 0.087 [s]



B-117

8745-01

CFC\_180

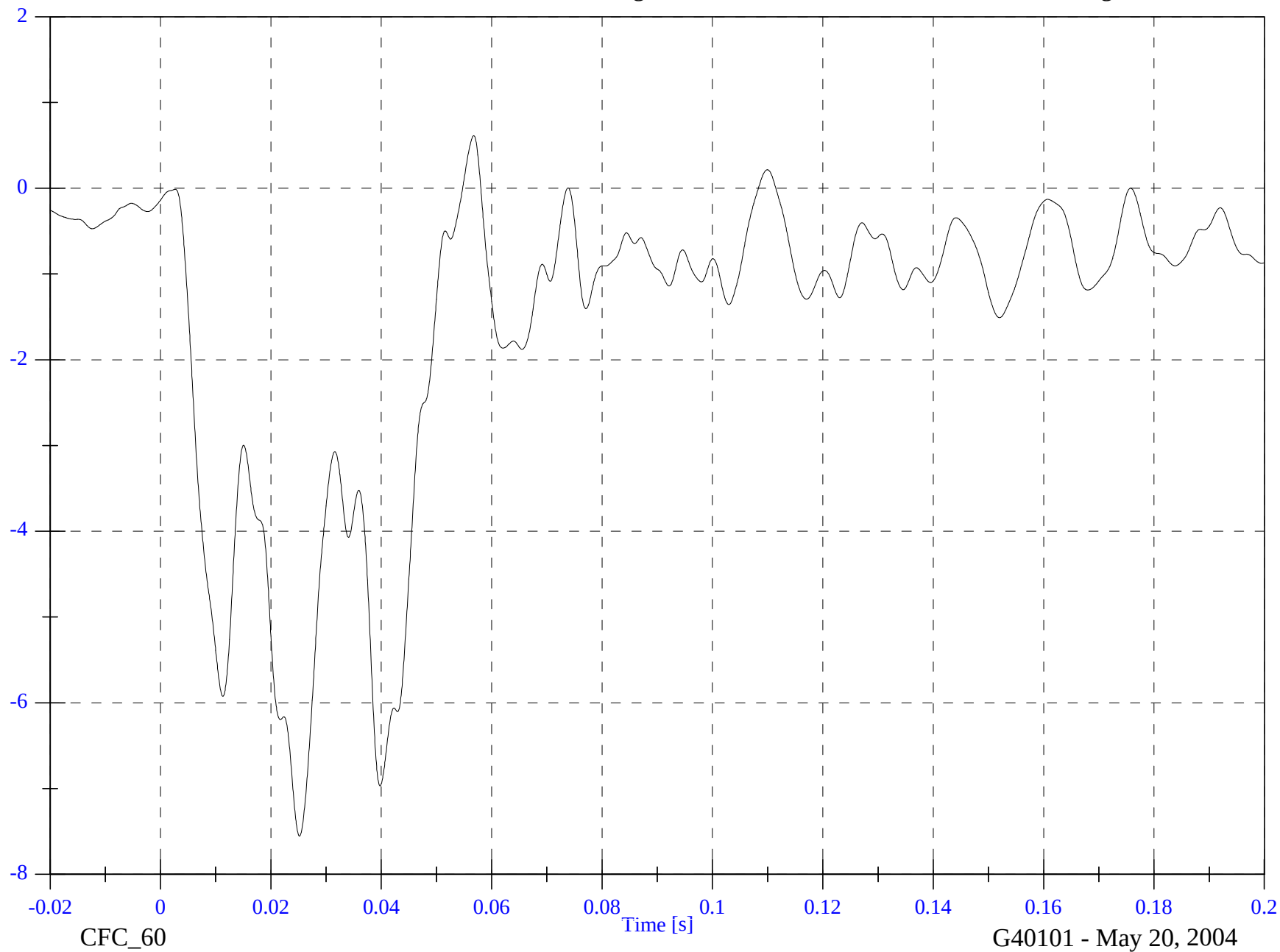
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier CG Y

Max: 0.6 [g] at 0.057 [s]

Min: -7.6 [g] at 0.025 [s]



B-118

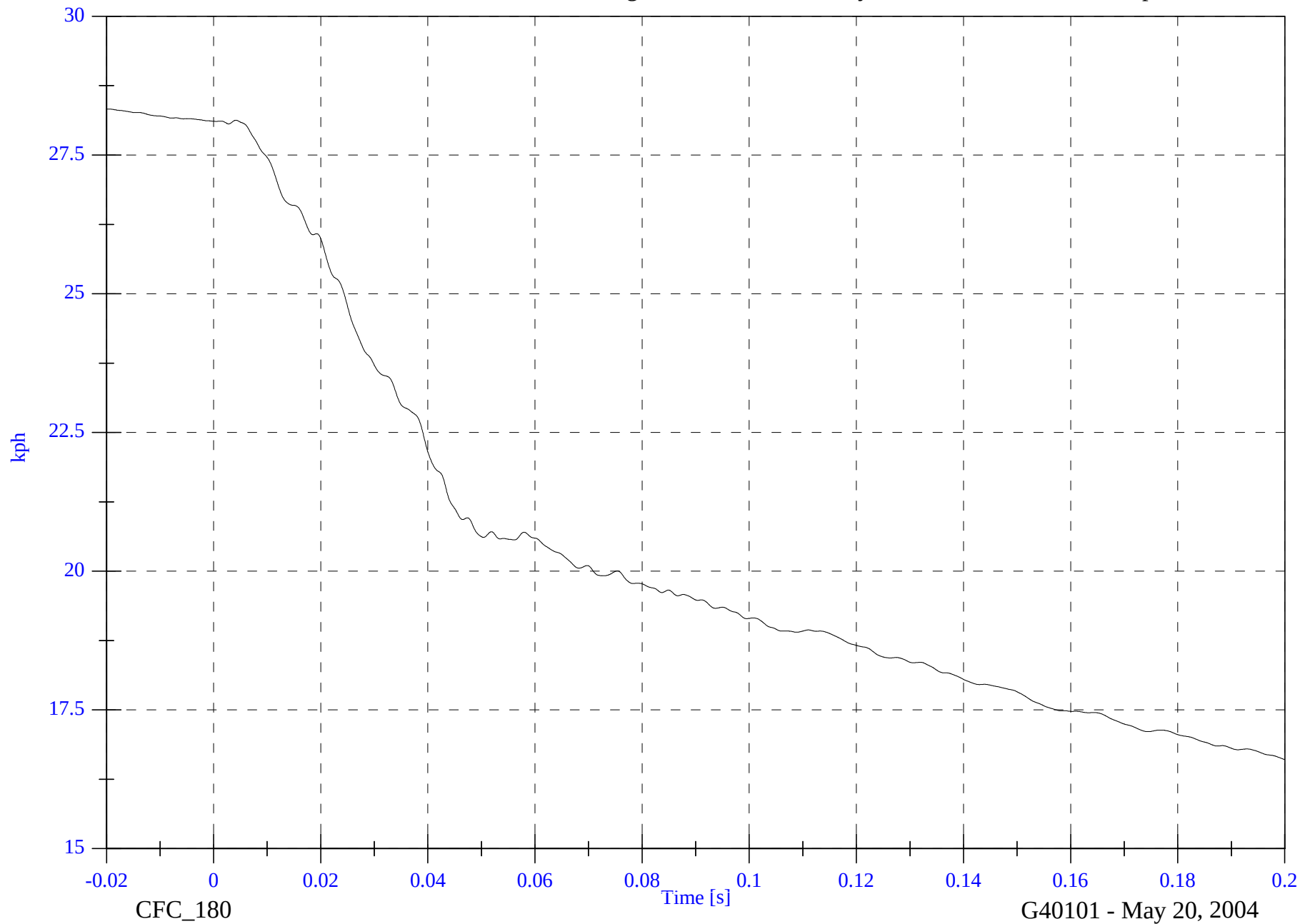
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier CG Y Velocity

Max: 28.3 [kph] at -0.020 [s]

Min: 16.6 [kph] at 0.200 [s]



B-119

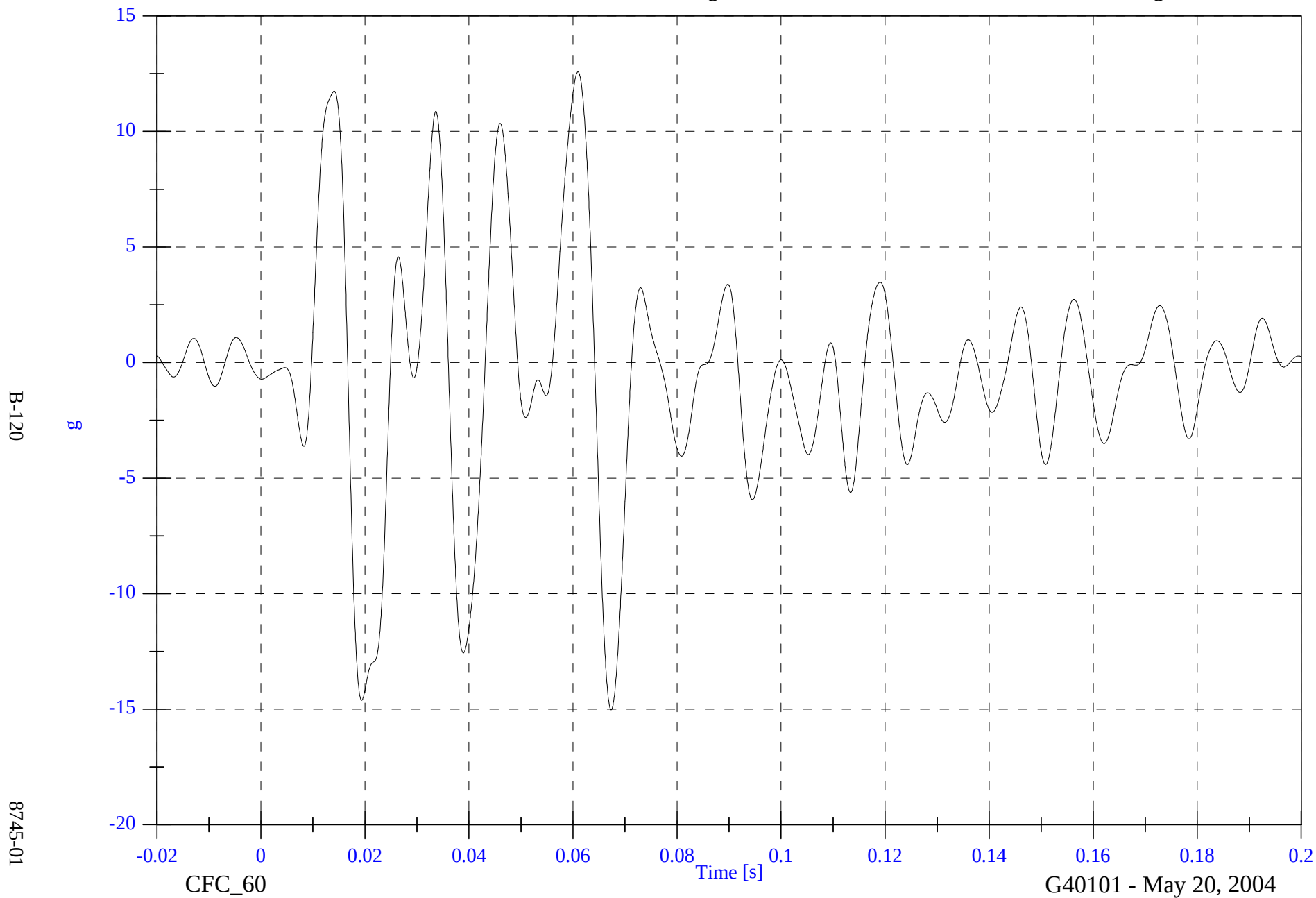
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier CG Z

Max: 12.6 [g] at 0.061 [s]

Min: -15.0 [g] at 0.067 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier CG Z Velocity

Max: 2.1 [kph] at 0.017 [s]

Min: -4.4 [kph] at 0.190 [s]



B-121

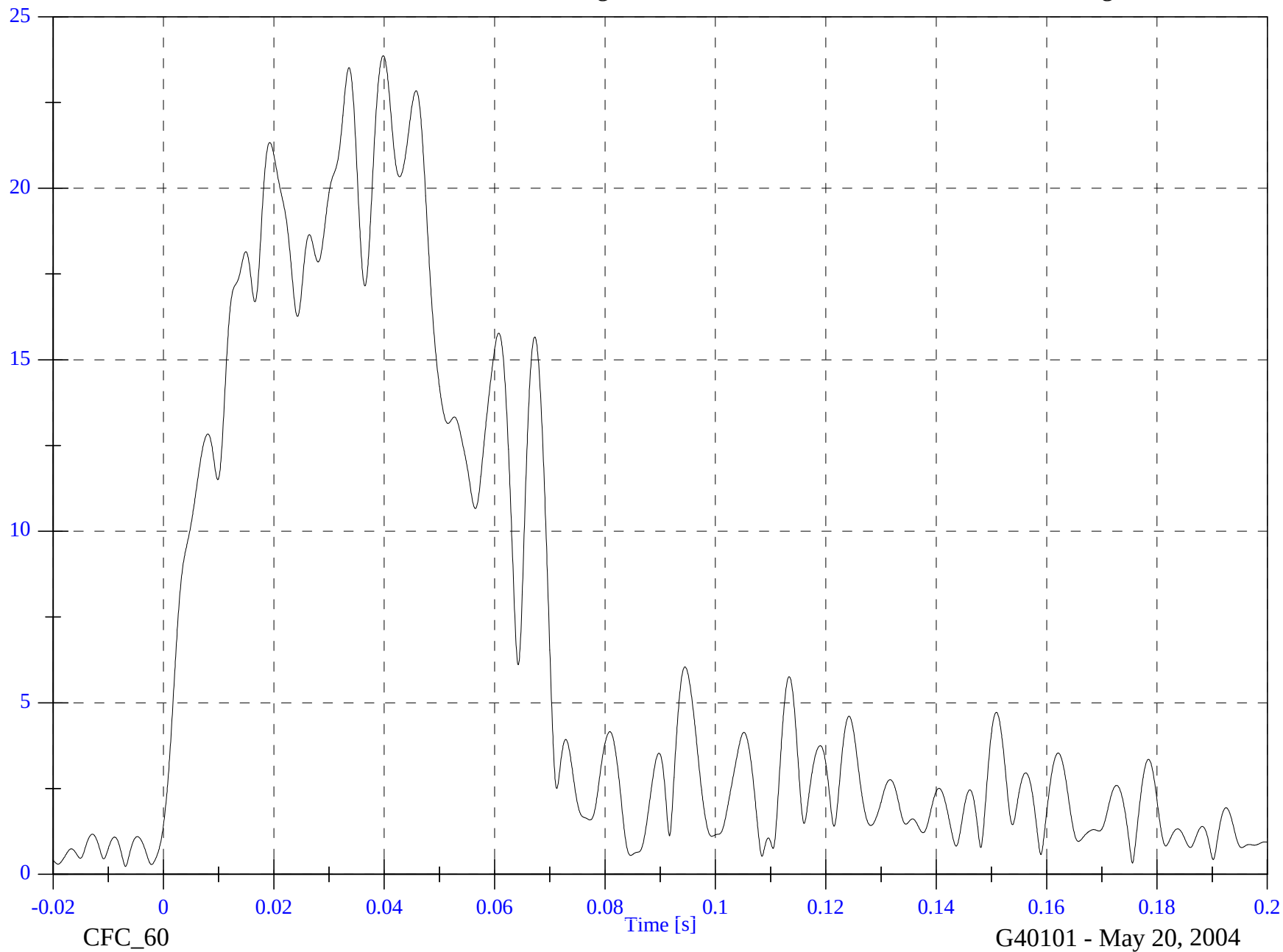
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier CG Resultant

Max: 23.9 [g] at 0.040 [s]

Min: 0.2 [g] at -0.007 [s]



B-122

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

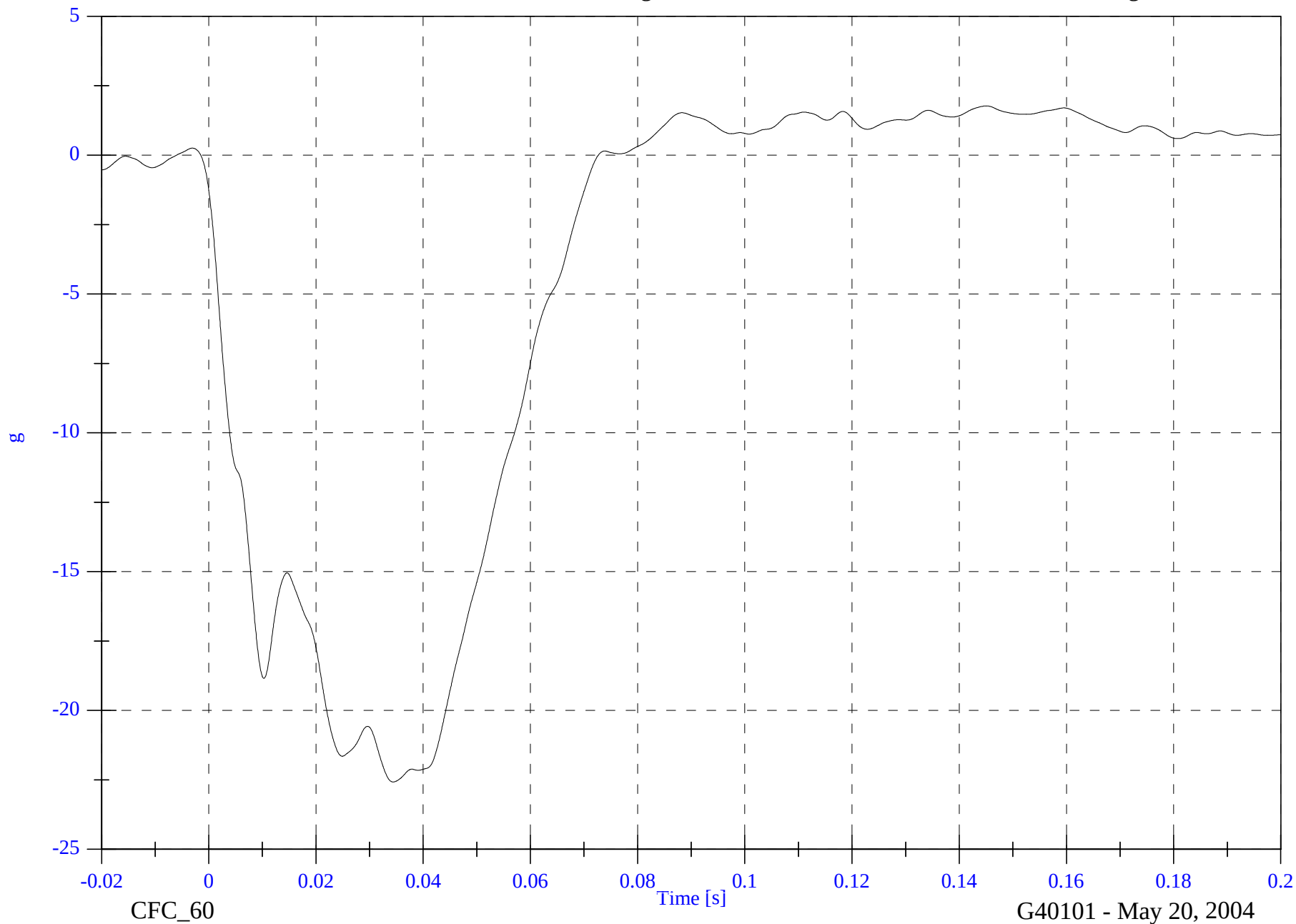
V1 Moving Barrier Left Rail X

Max: 1.8 [g] at 0.145 [s]

Min: -22.6 [g] at 0.034 [s]

B-123

8745-01

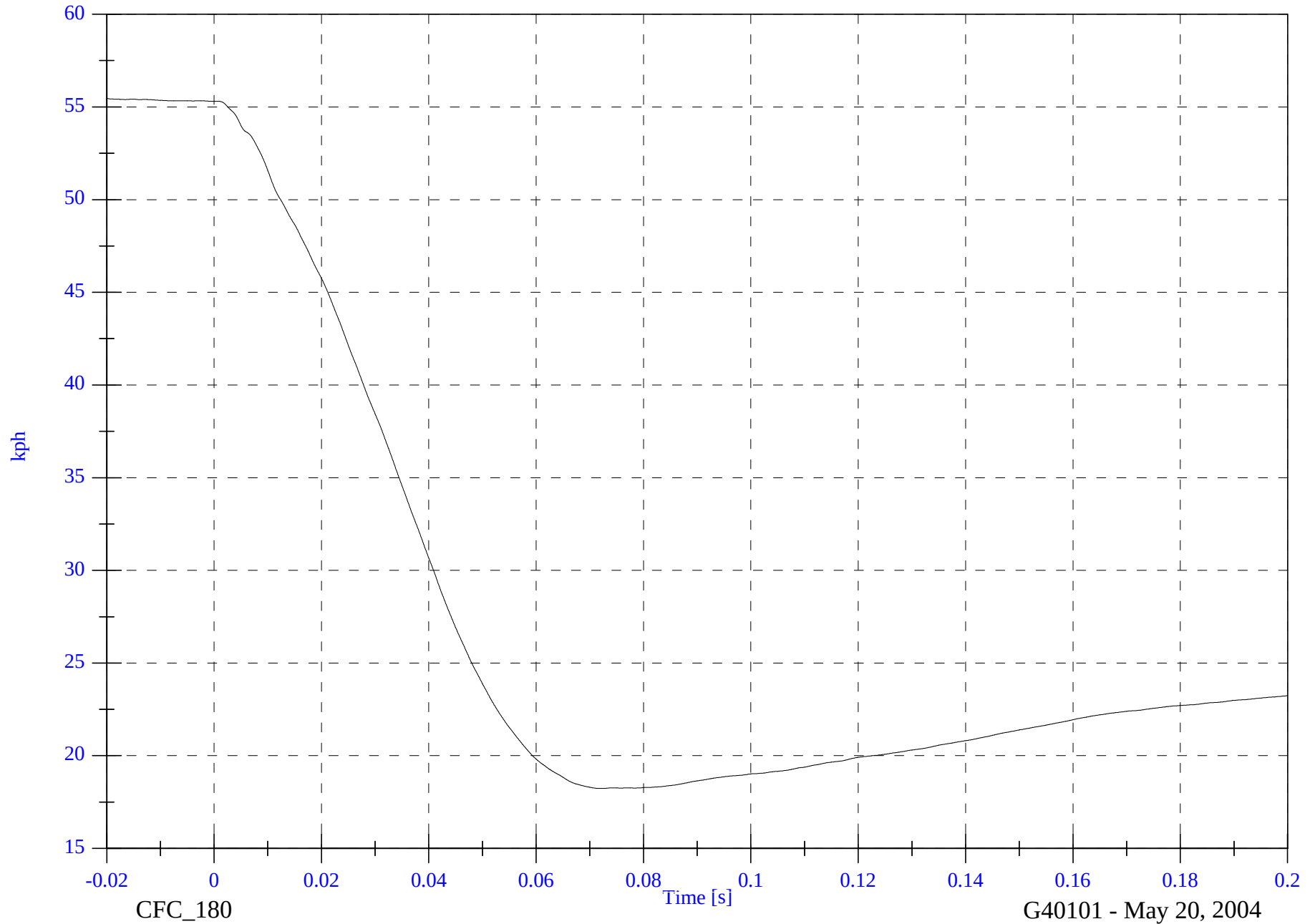


2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier Left Rail X Velocity

Max: 55.5 [kph] at -0.020 [s]

Min: 18.2 [kph] at 0.072 [s]



B-124

8745-01

CFC\_180

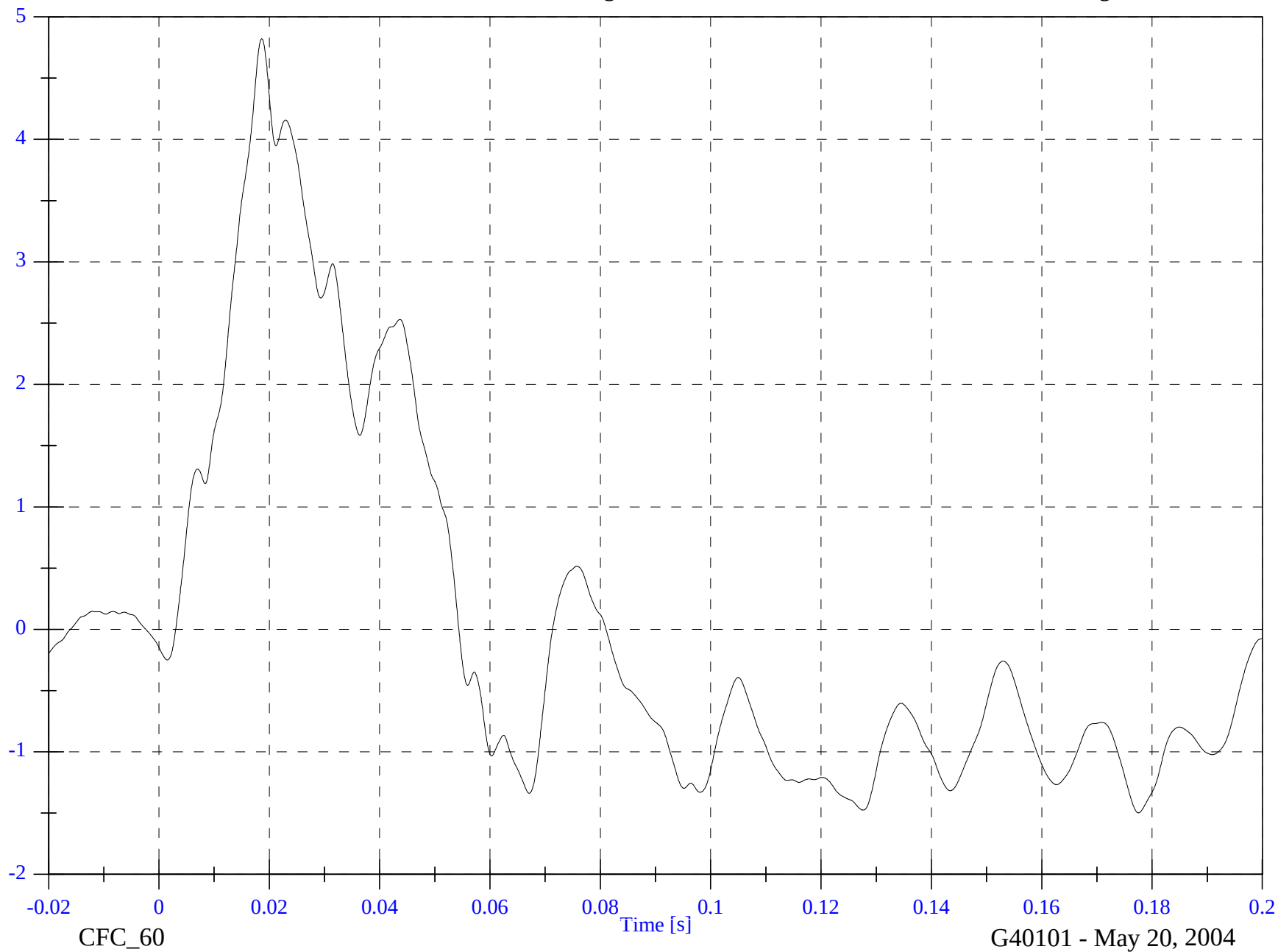
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier Left Rail Y

Max: 4.8 [g] at 0.019 [s]

Min: -1.5 [g] at 0.178 [s]



B-125

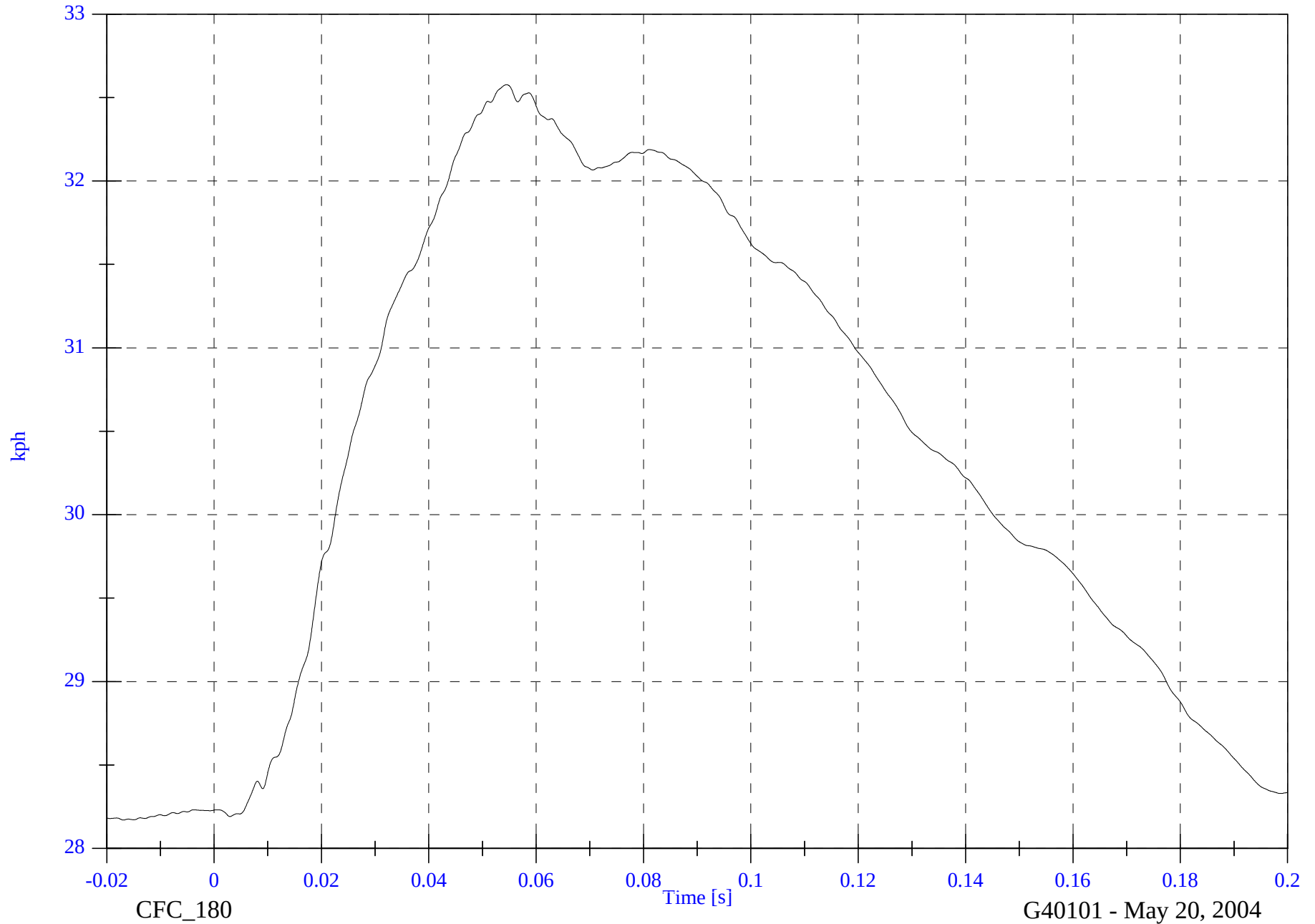
8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V1 Moving Barrier Left Rail Y Velocity

Max: 32.6 [kph] at 0.054 [s]

Min: 28.2 [kph] at -0.017 [s]



B-126

8745-01

CFC\_180

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

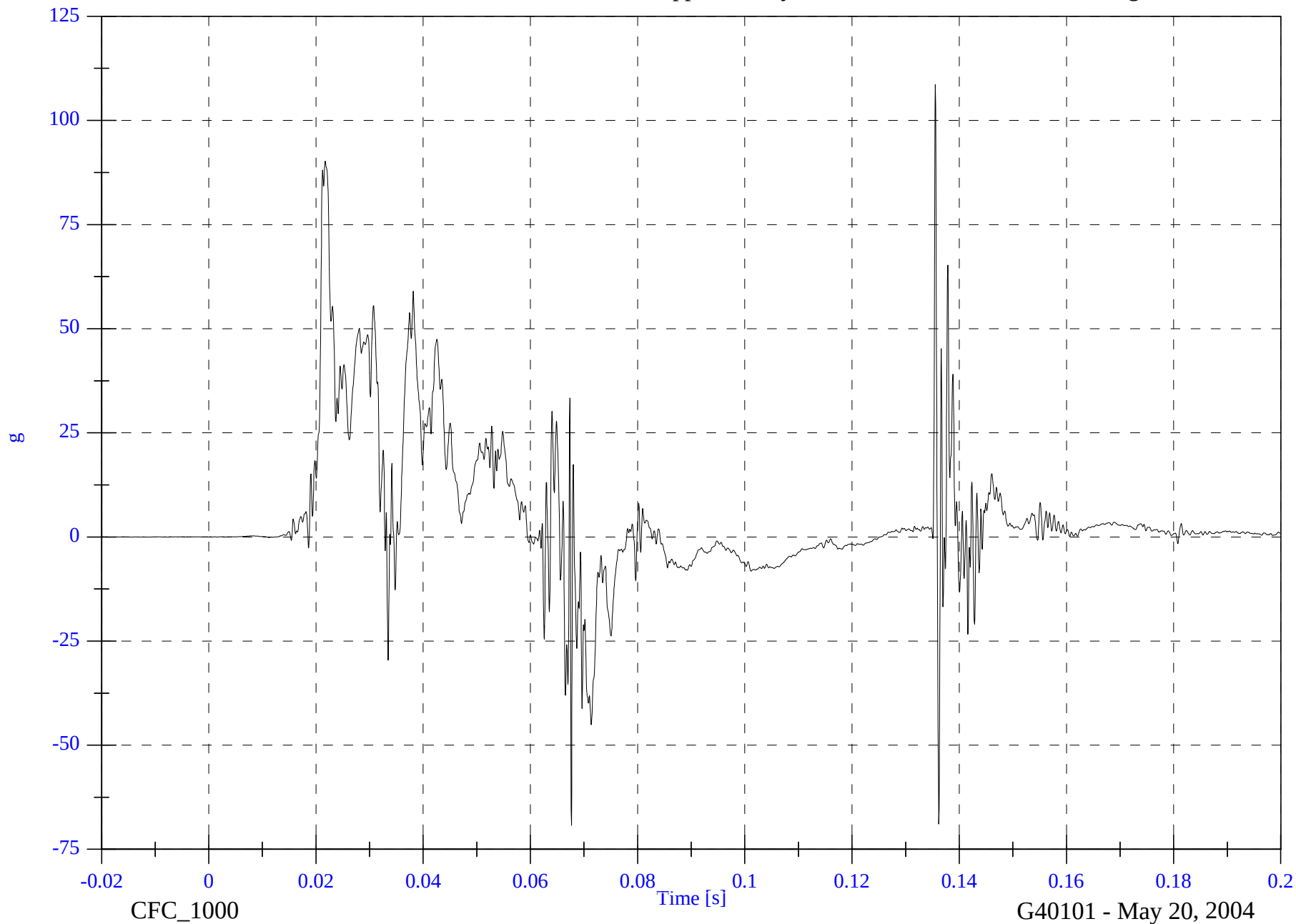
V2P1 Upper Rib Ry

Max: 108.6 [g] at 0.136 [s]

Min: -69.3 [g] at 0.068 [s]

B-127

8745-01

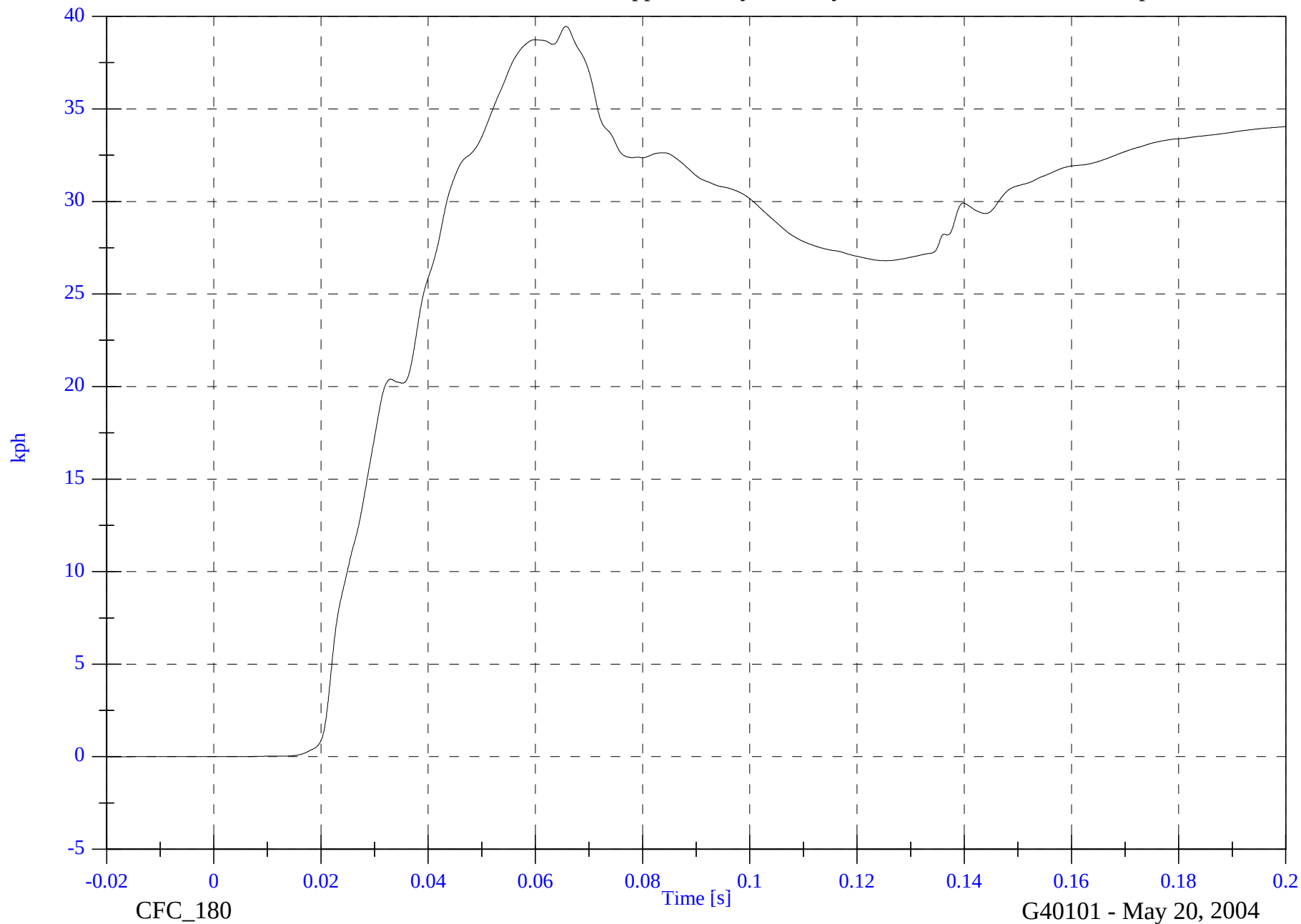


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Rib Ry Velocity

Max: 39.5 [kph] at 0.066 [s]

Min: -0.0 [kph] at -0.020 [s]



B-128

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

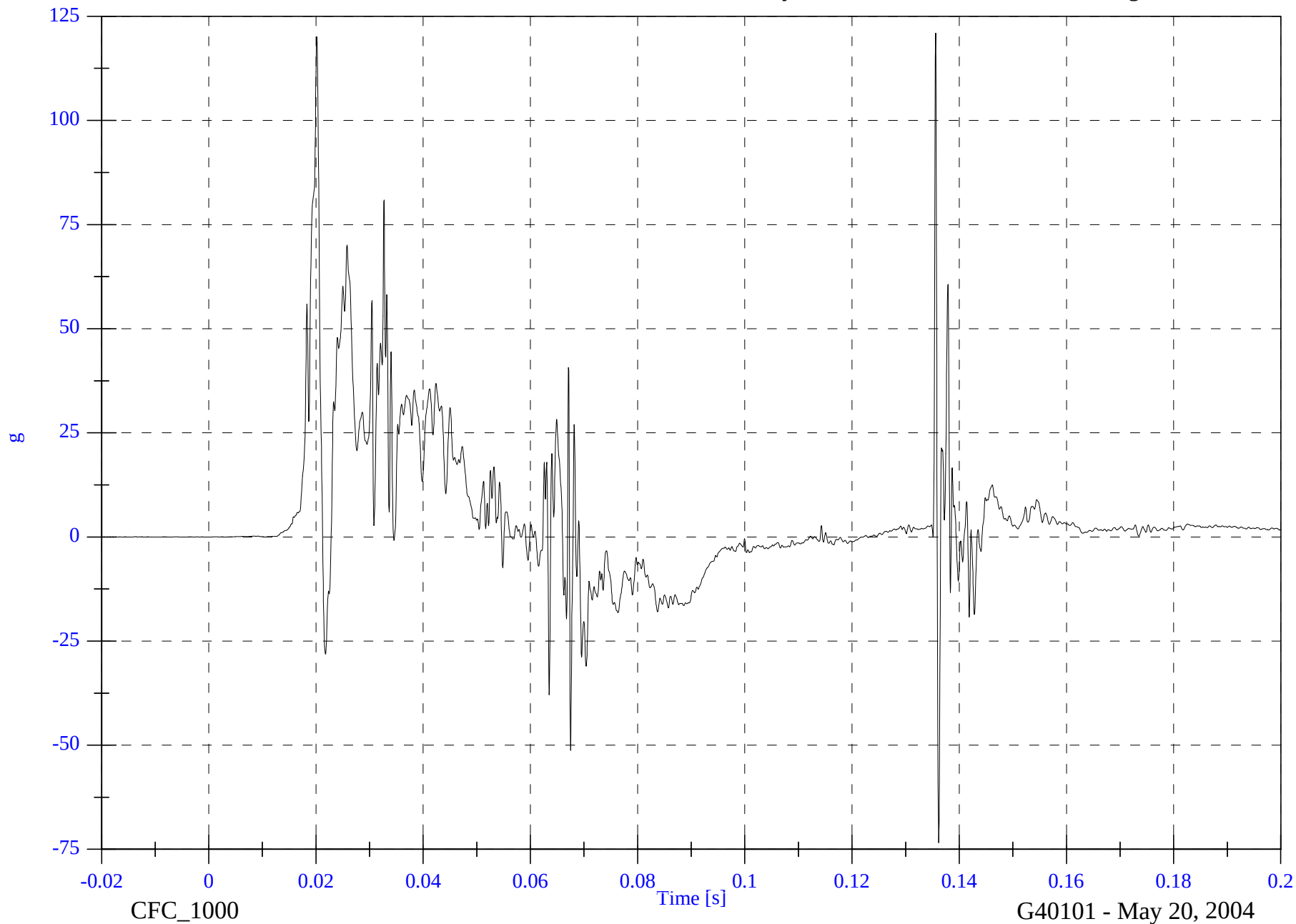
V2P1 Lower Rib Ry

Max: 121.0 [g] at 0.136 [s]

Min: -73.5 [g] at 0.136 [s]

B-129

8745-01

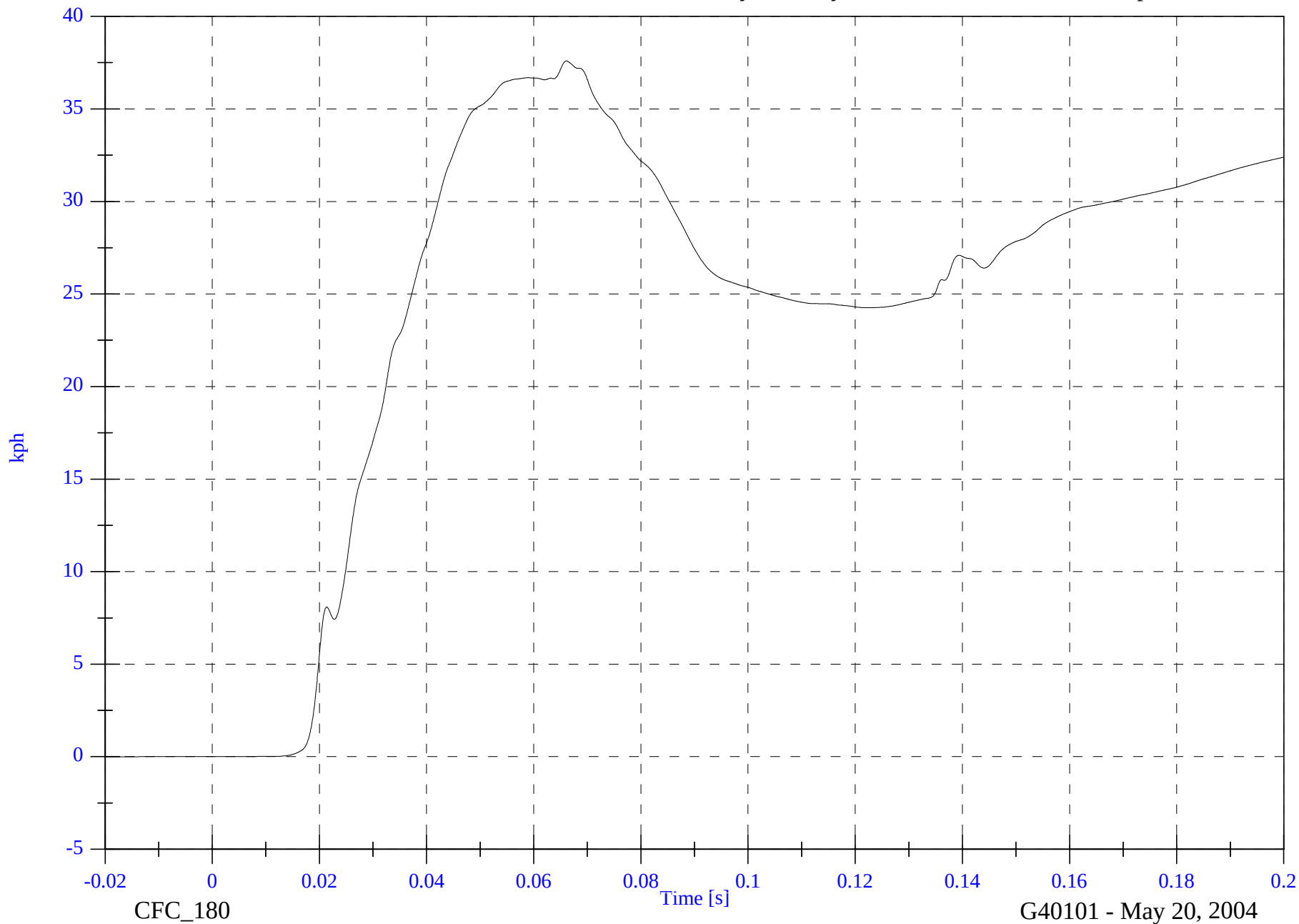


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Lower Rib Ry Velocity

Max: 37.6 [kph] at 0.066 [s]

Min: -0.0 [kph] at -0.020 [s]



B-130

8745-01

CFC\_180

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Lower Spine Ry

Max: 79.9 [g] at 0.027 [s]

Min: -34.0 [g] at 0.063 [s]

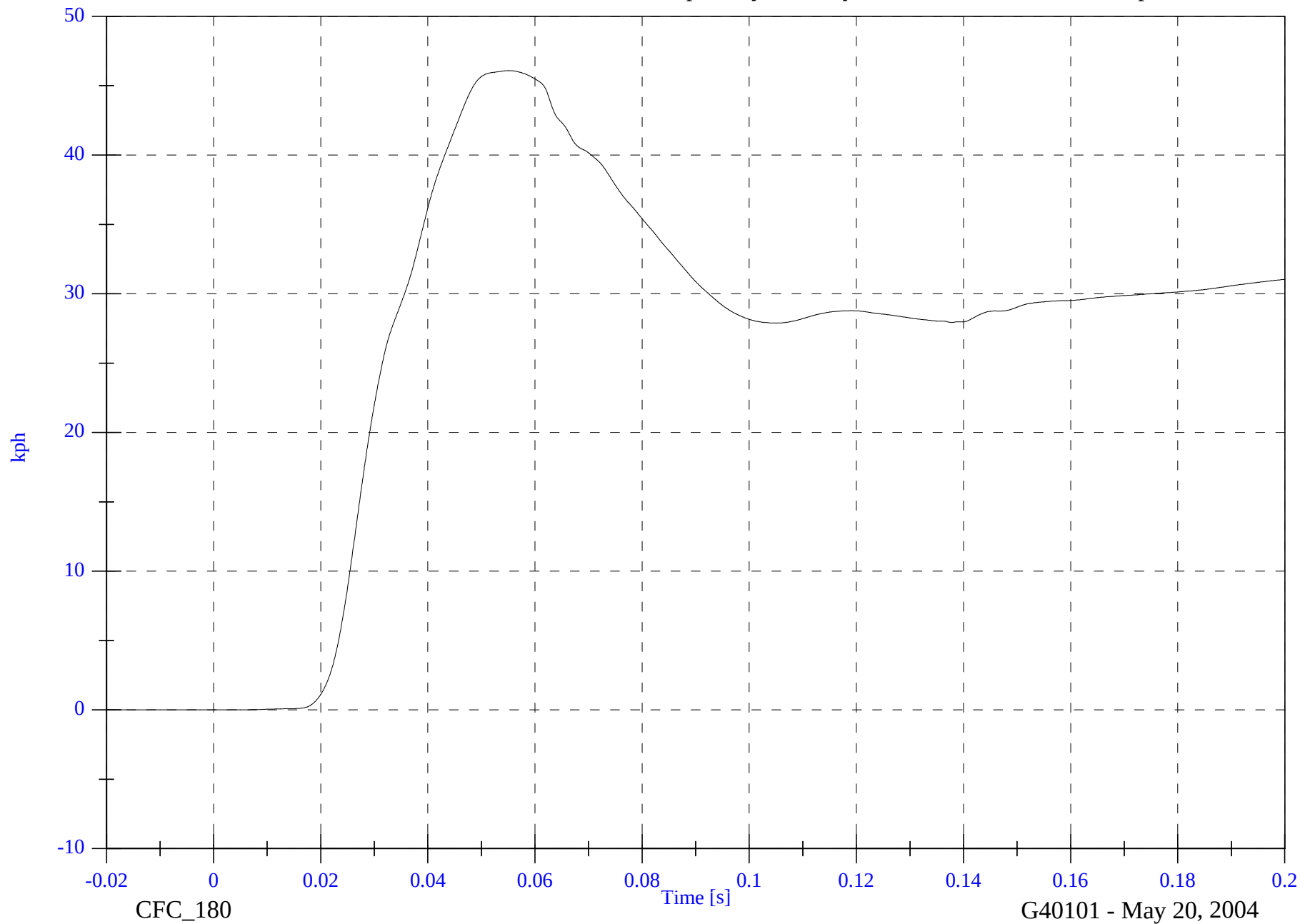


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Lower Spine Ry Velocity

Max: 46.1 [kph] at 0.055 [s]

Min: -0.0 [kph] at -0.019 [s]



B-132

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Pelvic Ry

Max: 93.0 [g] at 0.026 [s]

Min: -22.6 [g] at 0.049 [s]

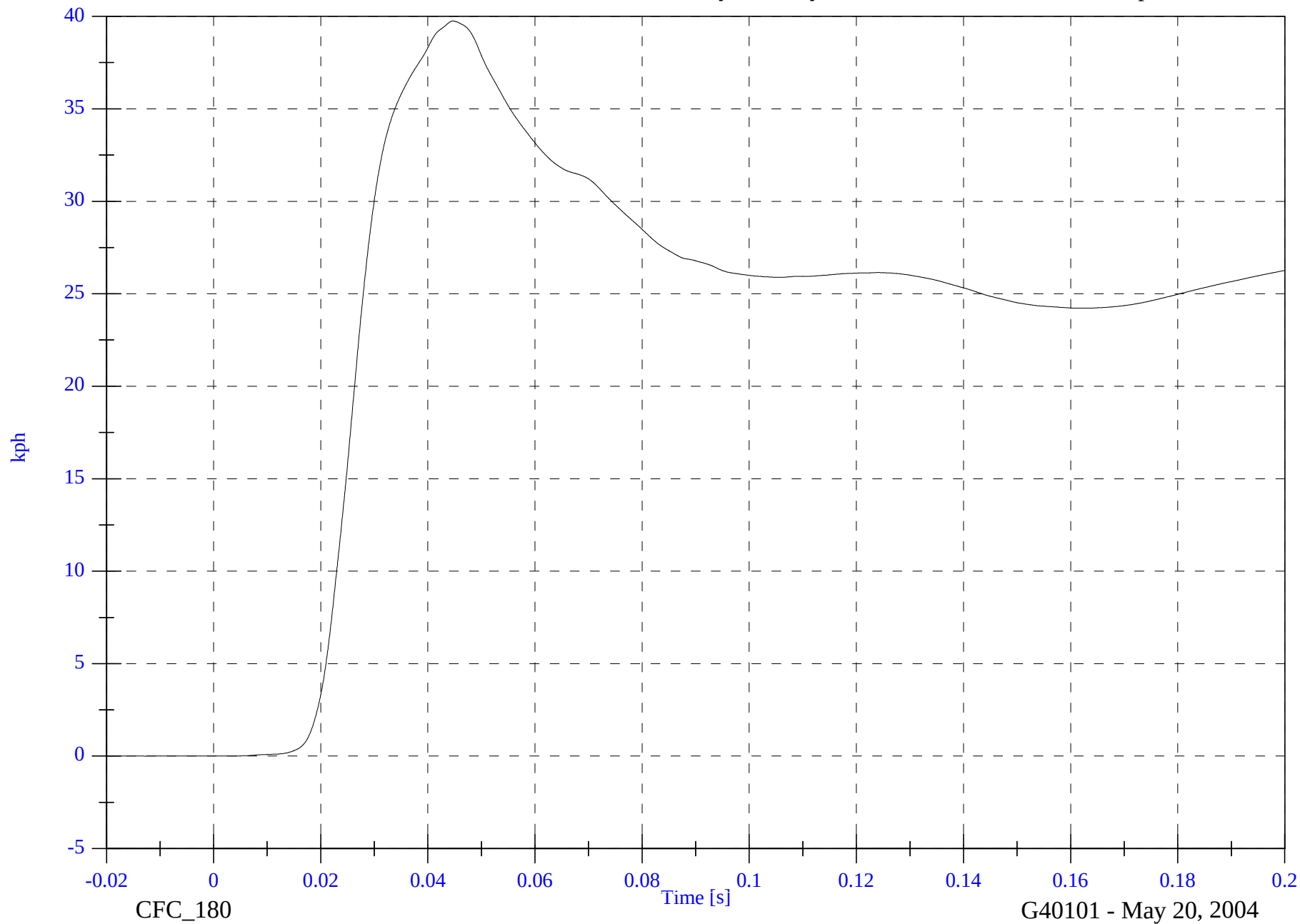


2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Pelvic Ry Velocity

Max: 39.7 [kph] at 0.045 [s]

Min: -0.0 [kph] at -0.013 [s]



B-134

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

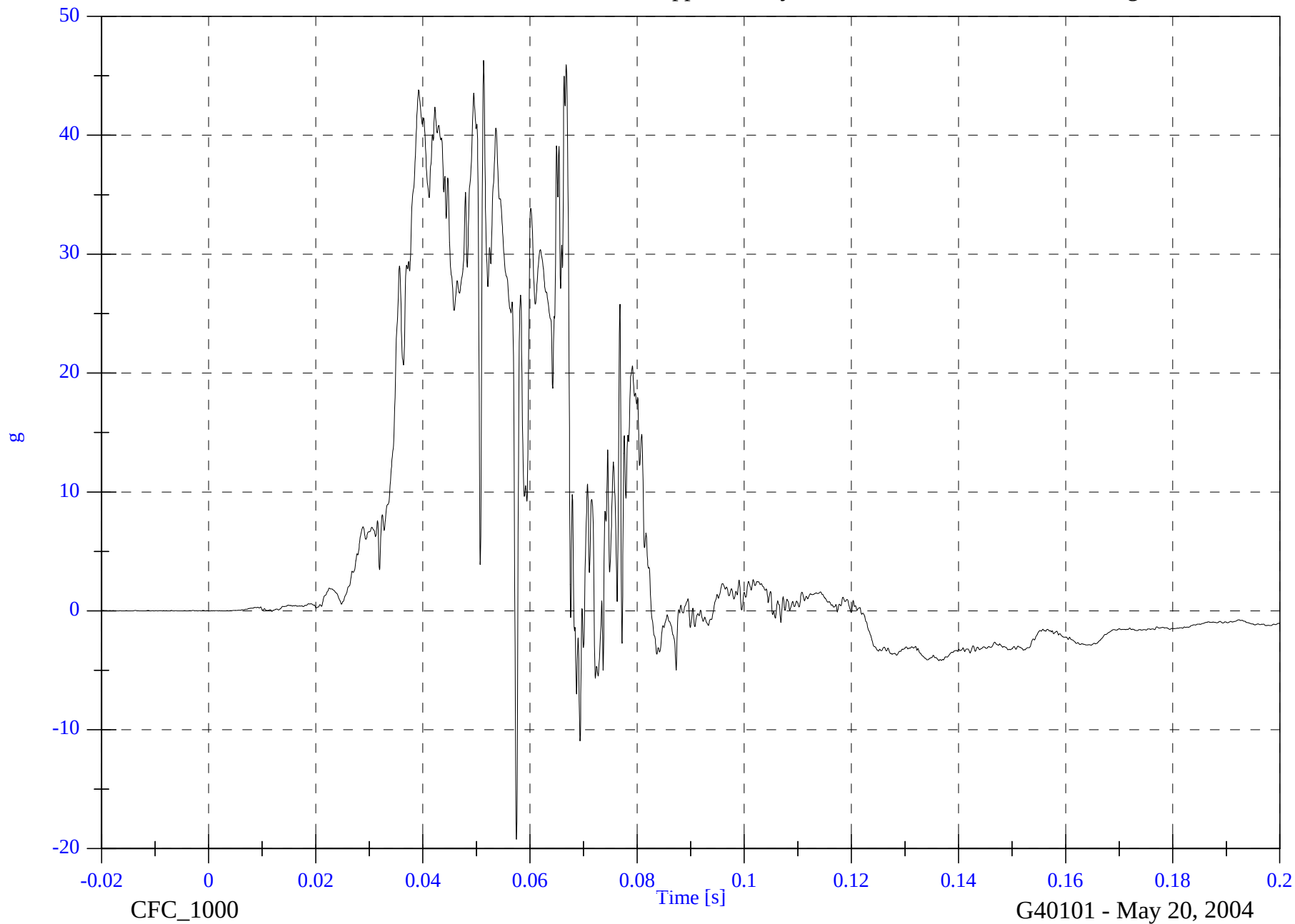
V2P4 Upper Rib Ry

Max: 46.3 [g] at 0.051 [s]

Min: -19.2 [g] at 0.057 [s]

B-135

8745-01

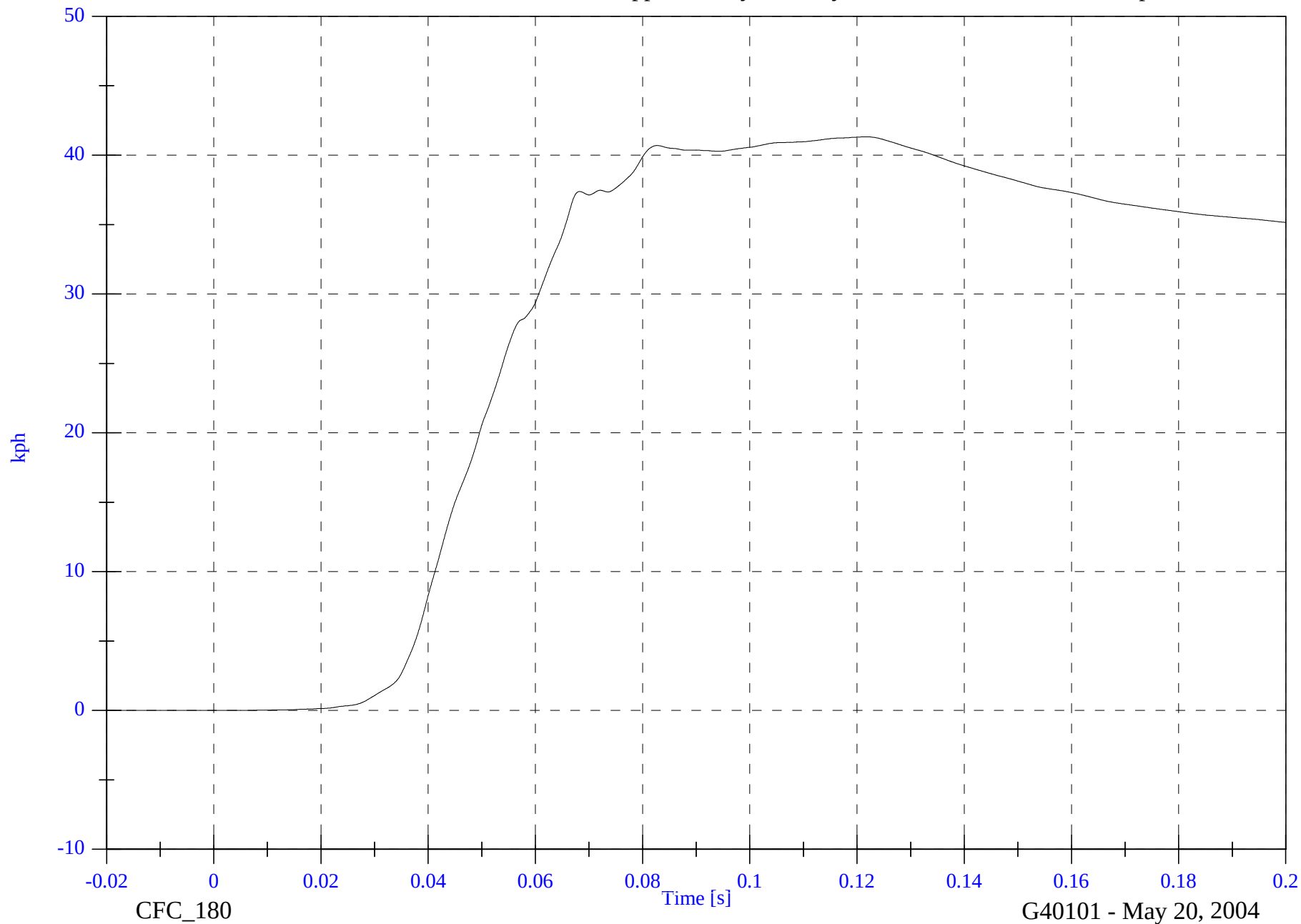


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Upper Rib Ry Velocity

Max: 41.3 [kph] at 0.122 [s]

Min: -0.0 [kph] at -0.020 [s]



B-136

8745-01

CFC\_180

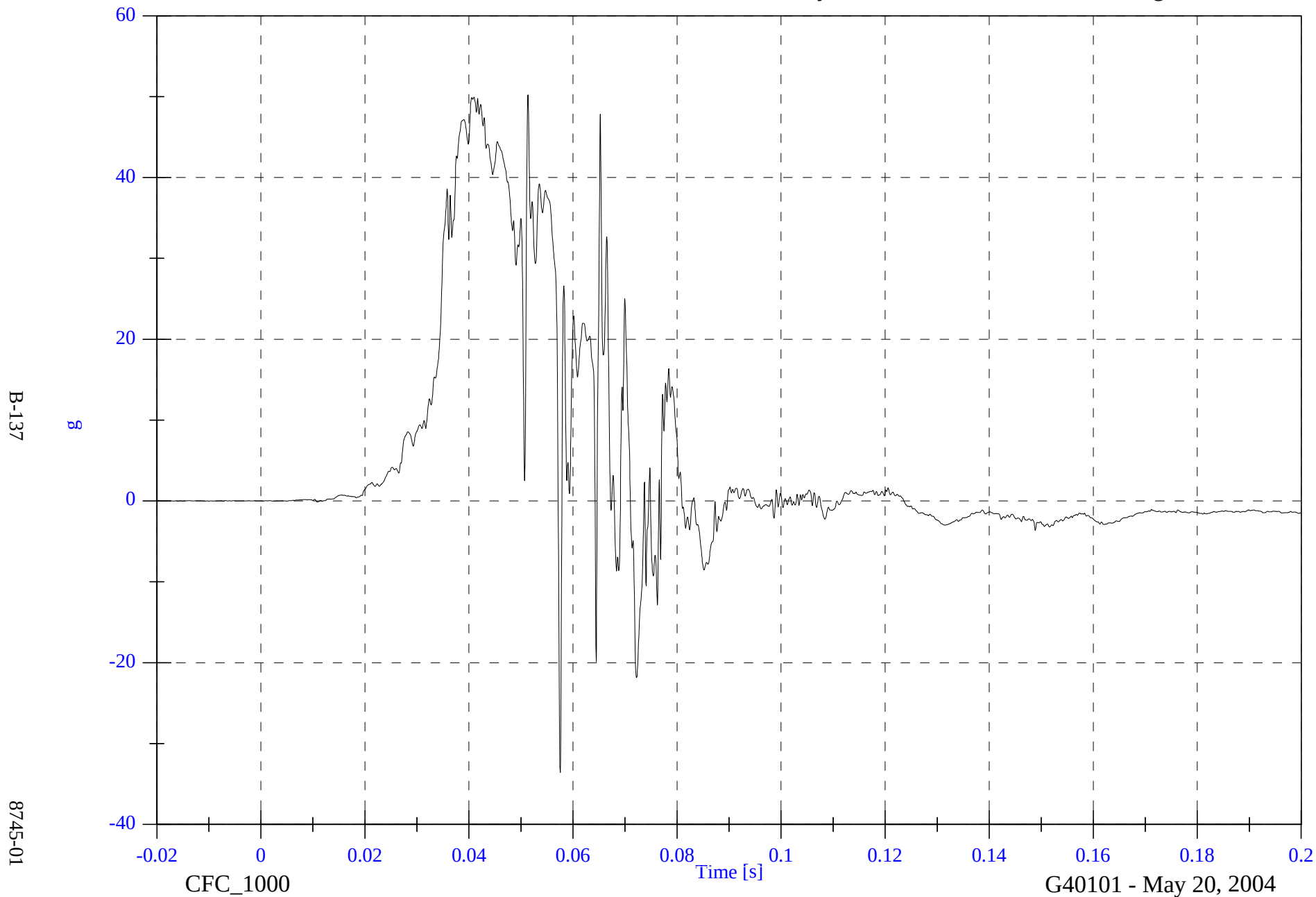
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Lower Rib Ry

Max: 50.2 [g] at 0.051 [s]

Min: -33.6 [g] at 0.058 [s]

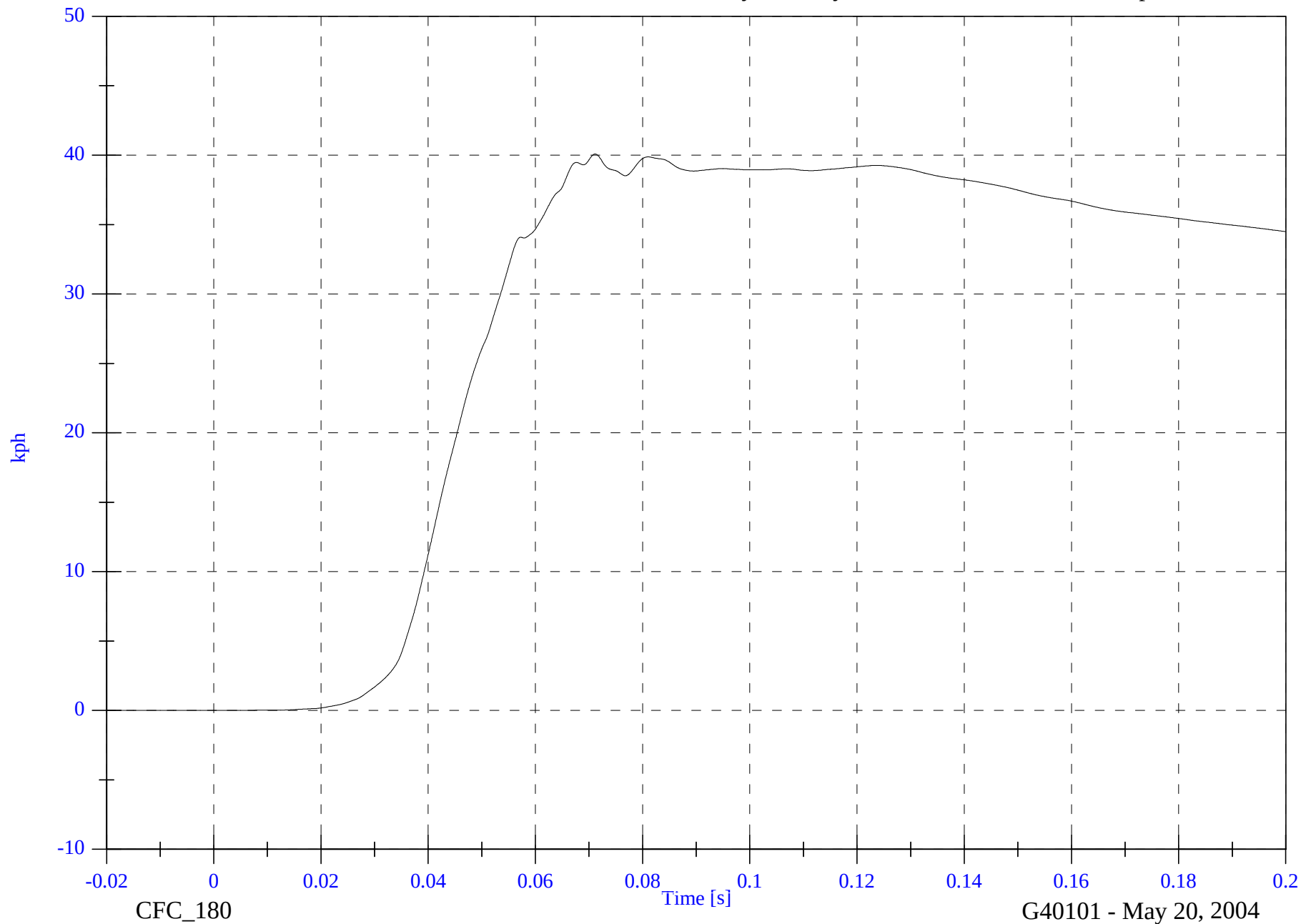


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Lower Rib Ry Velocity

Max: 40.1 [kph] at 0.071 [s]

Min: -0.0 [kph] at -0.020 [s]



B-138

8745-01

CFC\_180

Time [s]

G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

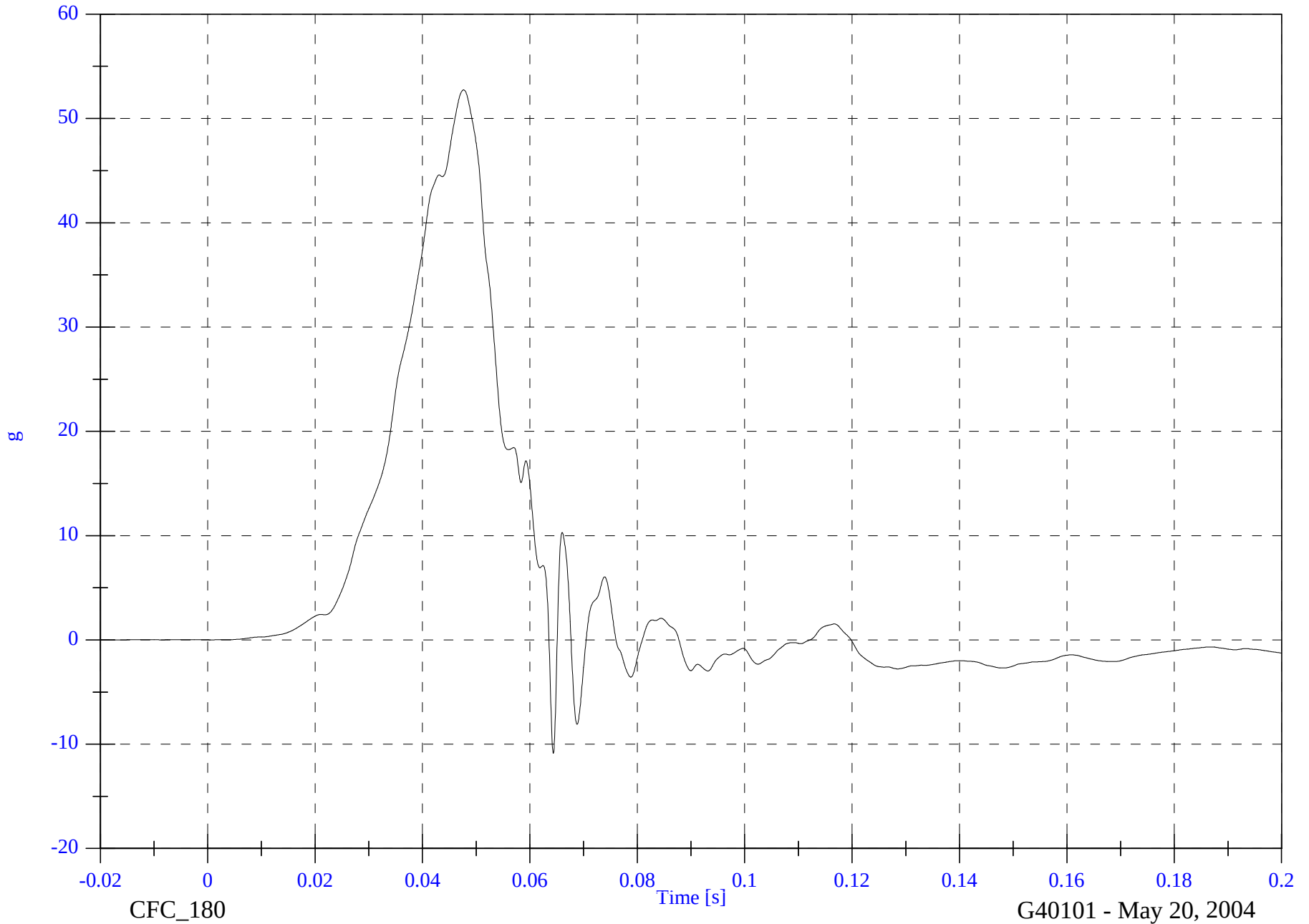
V2P4 Lower Spine Ry

Max: 52.7 [g] at 0.048 [s]

Min: -10.9 [g] at 0.064 [s]

B-139

8745-01

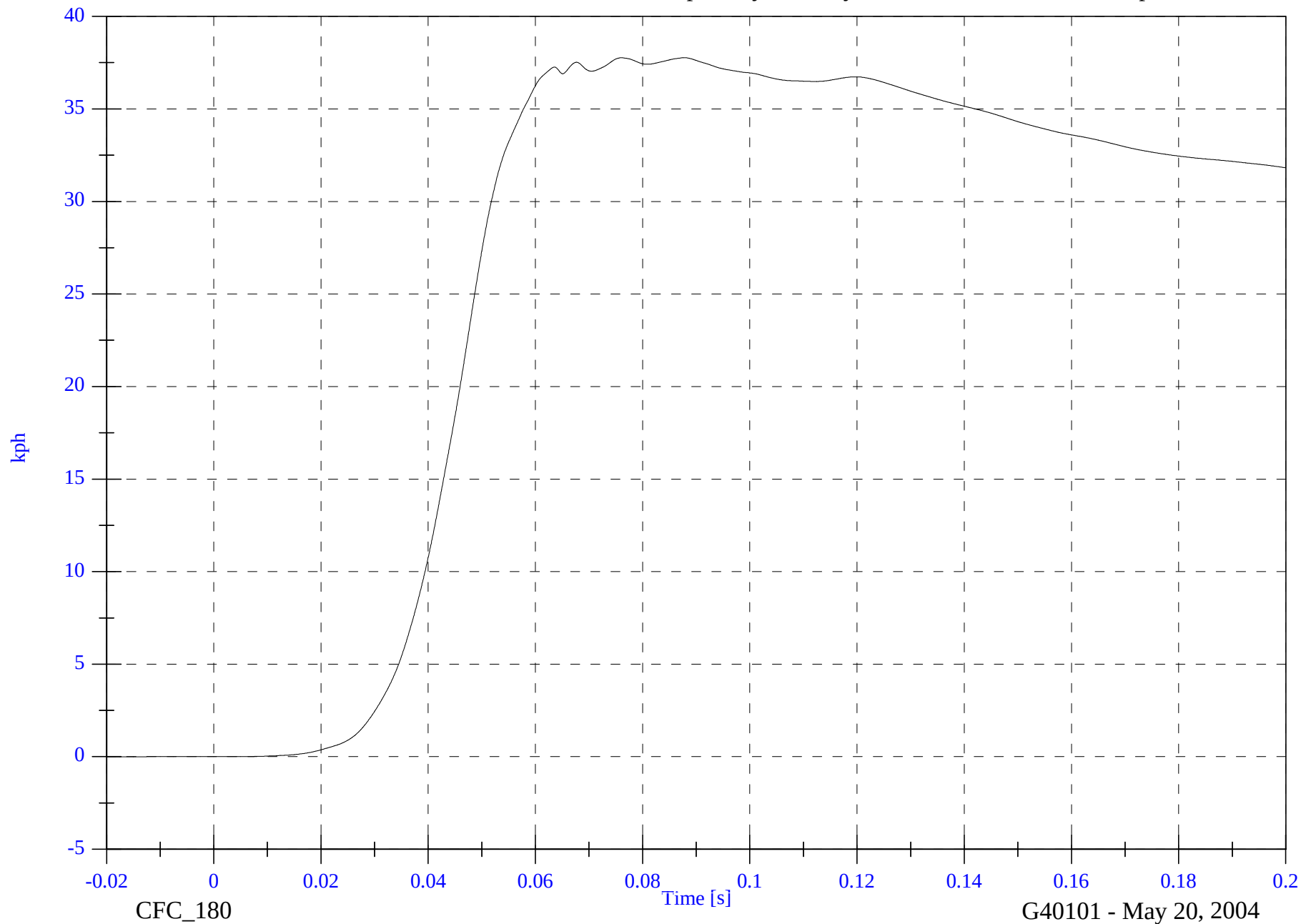


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Lower Spine Ry Velocity

Max: 37.8 [kph] at 0.088 [s]

Min: -0.0 [kph] at -0.020 [s]



B-140

8745-01

2004 Side NCAP - 2004 Chevrolet Malibu

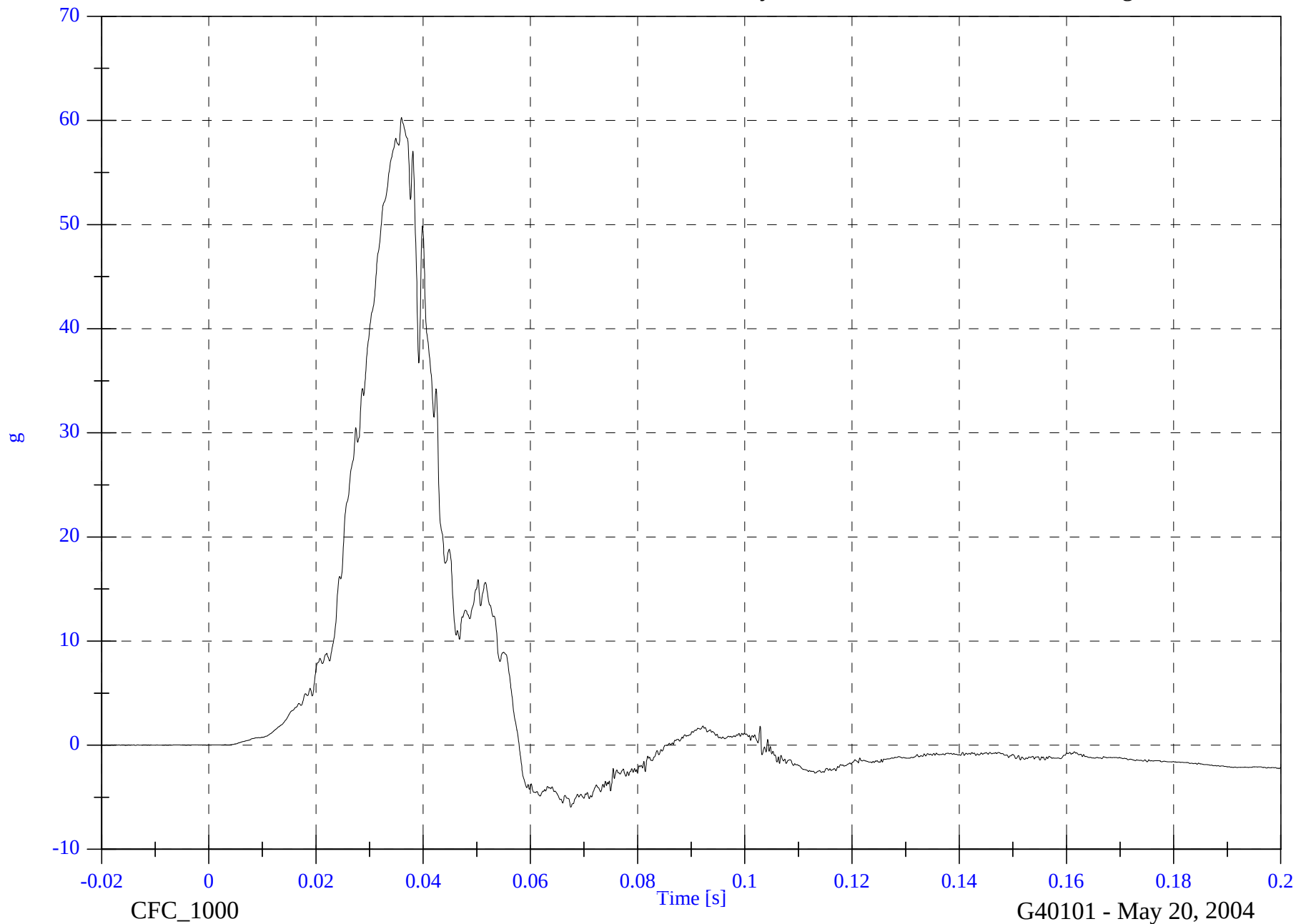
V2P4 Pelvic Ry

Max: 60.3 [g] at 0.036 [s]

Min: -5.9 [g] at 0.068 [s]

B-141

8745-01

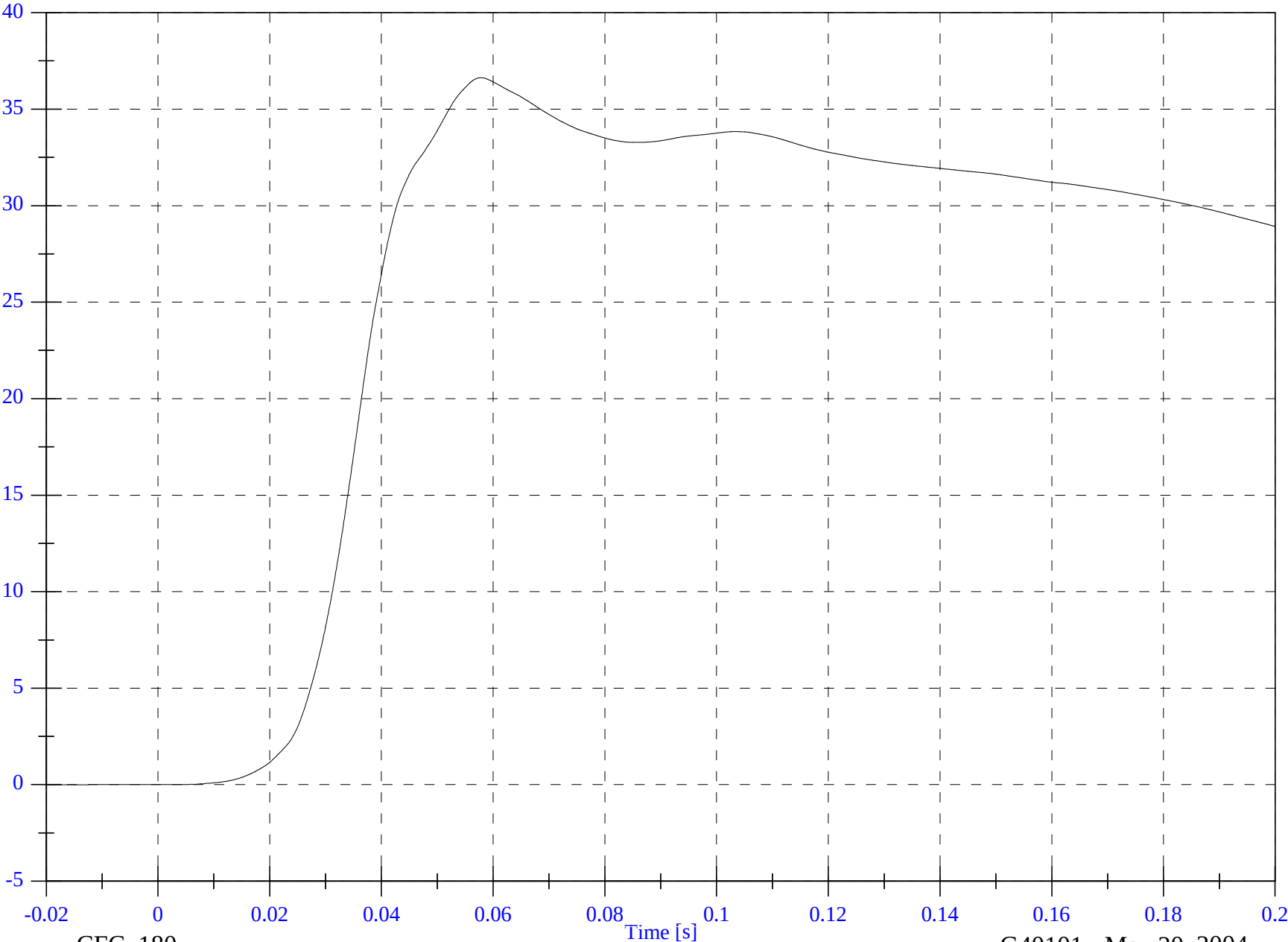


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Pelvic Ry Velocity

Max: 36.6 [kph] at 0.058 [s]

Min: -0.0 [kph] at -0.020 [s]



B-142

8745-01

CFC\_180

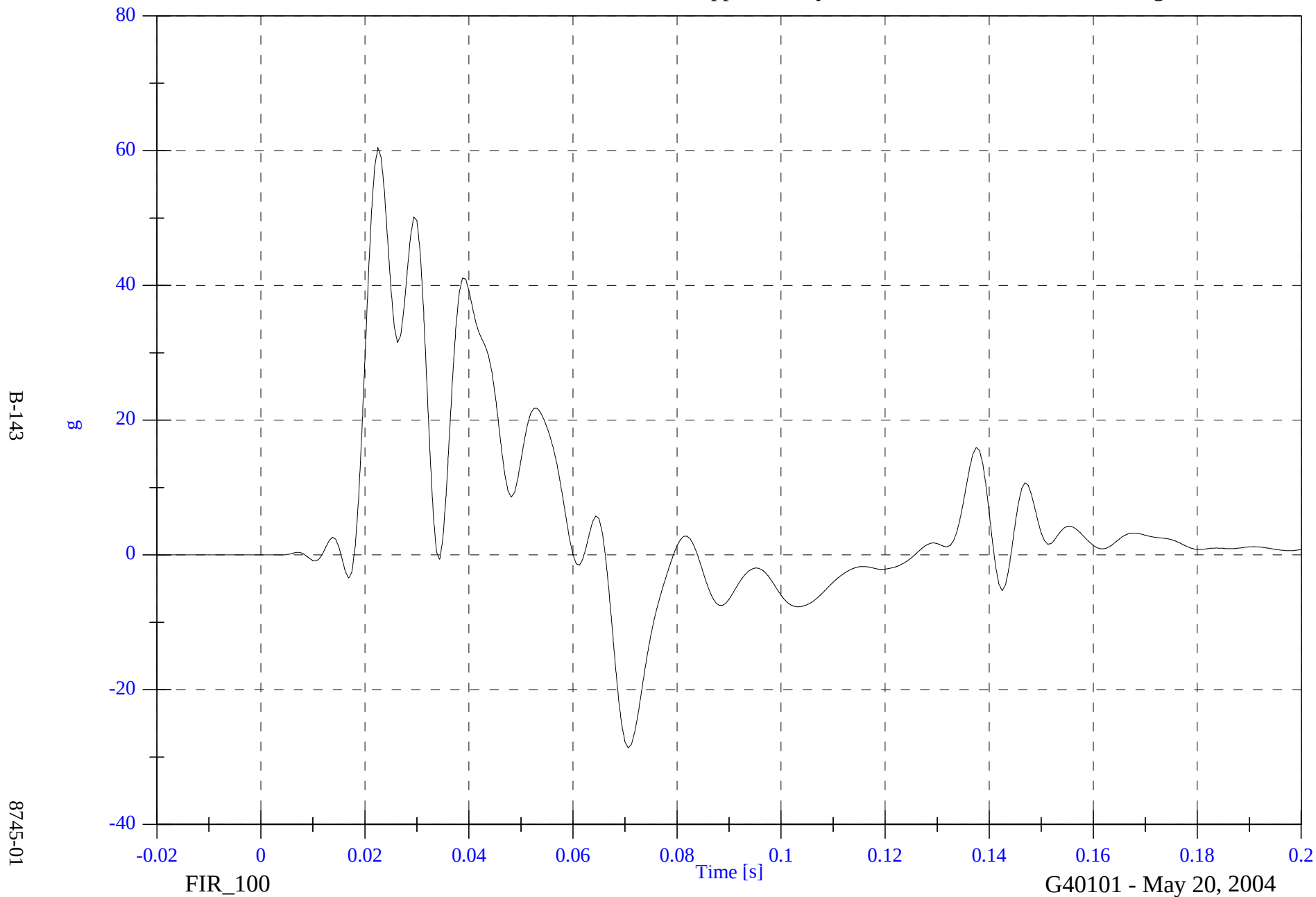
G40101 - May 20, 2004

2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Upper Rib Ry

Max: 60.5 [g] at 0.022 [s]

Min: -28.6 [g] at 0.071 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

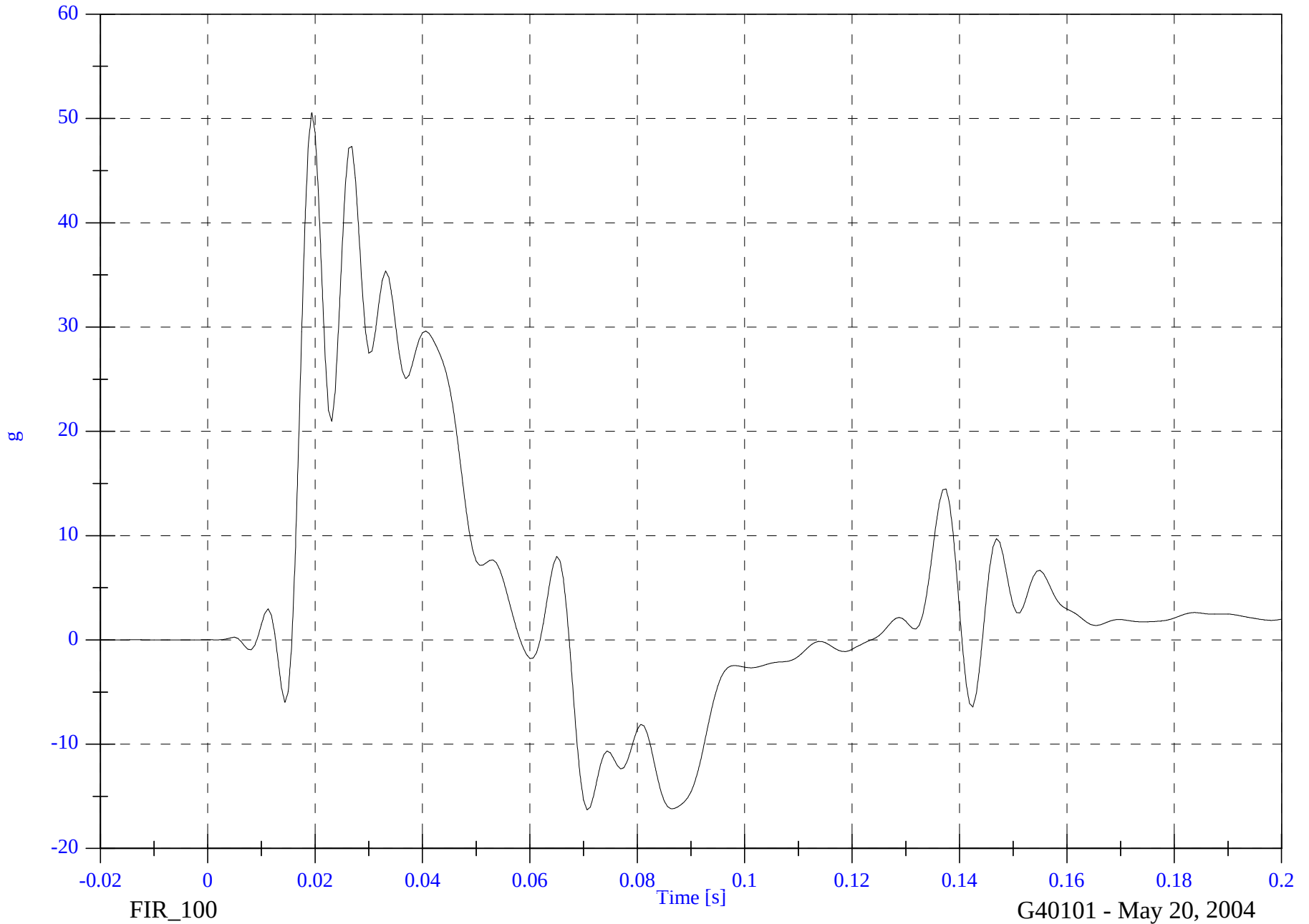
V2P1 Lower Rib Ry

Max: 50.5 [g] at 0.019 [s]

Min: -16.3 [g] at 0.071 [s]

B-144

8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Lower Spine Ry

Max: 79.7 [g] at 0.027 [s]

Min: -22.2 [g] at 0.064 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

V2P1 Pelvic Ry

Max: 89.9 [g] at 0.026 [s]

Min: -17.8 [g] at 0.051 [s]



2004 Side NCAP - 2004 Chevrolet Malibu

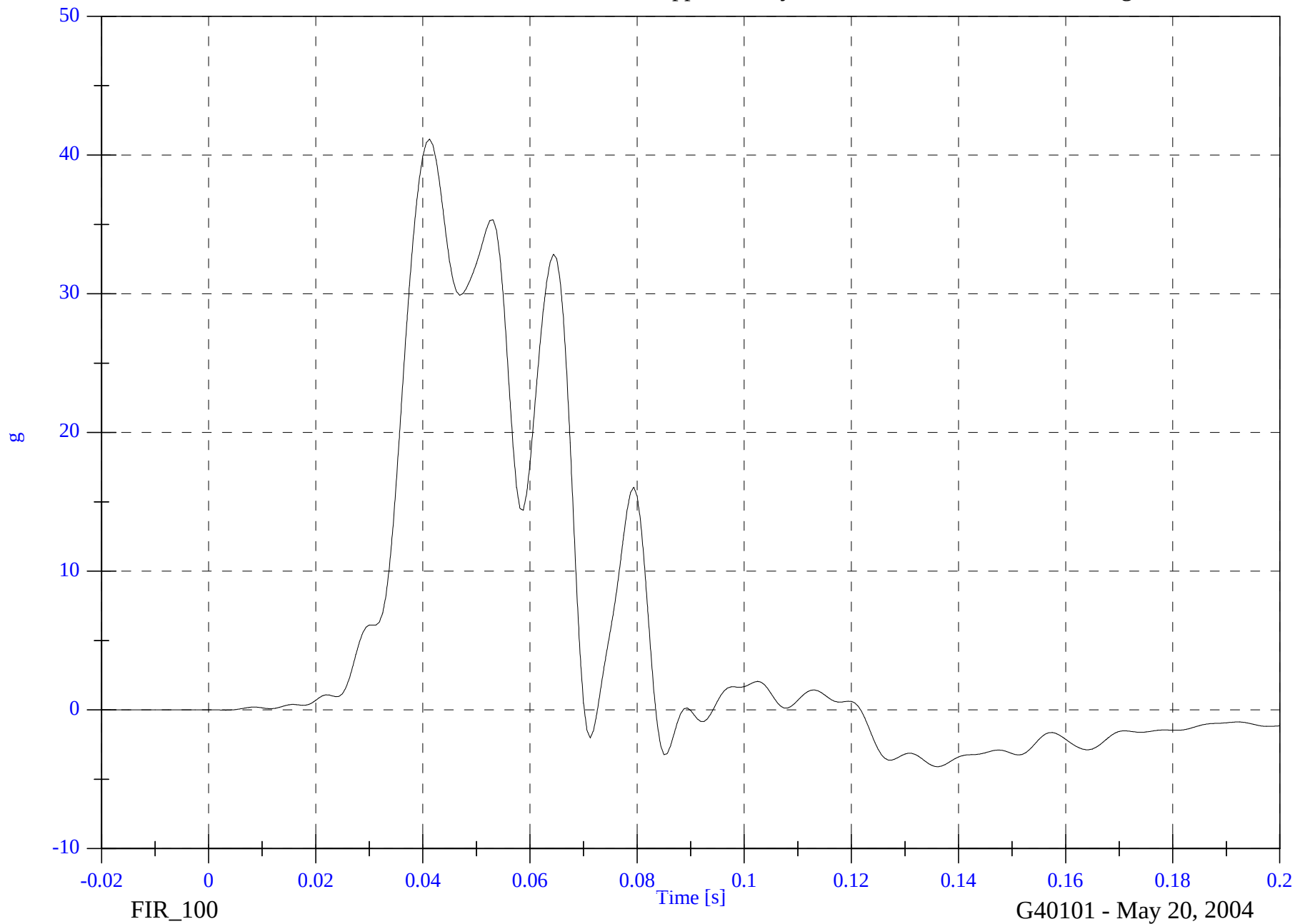
V2P4 Upper Rib Ry

Max: 41.2 [g] at 0.041 [s]

Min: -4.1 [g] at 0.136 [s]

B-147

8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

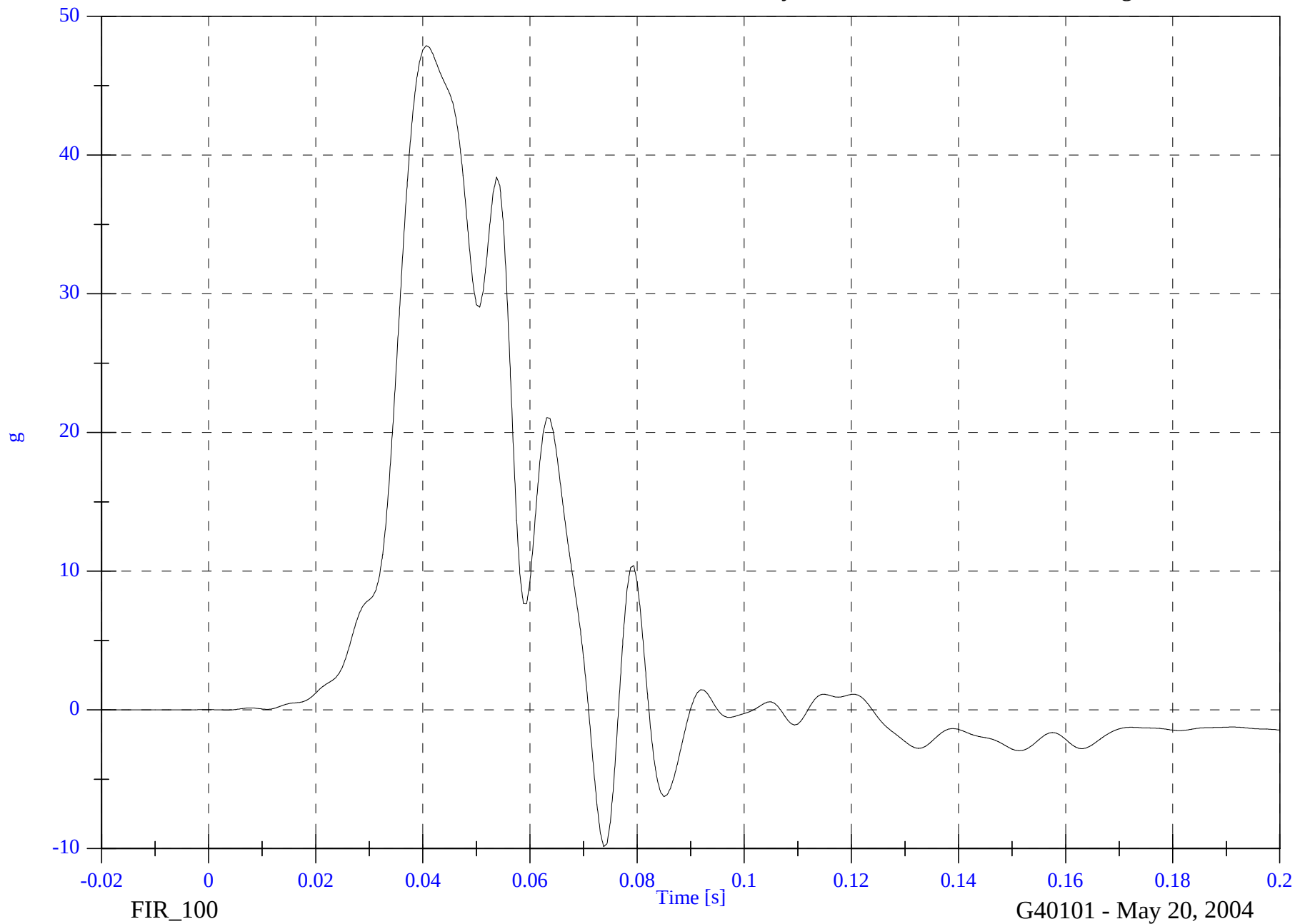
V2P4 Lower Rib Ry

Max: 47.9 [g] at 0.041 [s]

Min: -9.9 [g] at 0.074 [s]

B-148

8745-01



2004 Side NCAP - 2004 Chevrolet Malibu

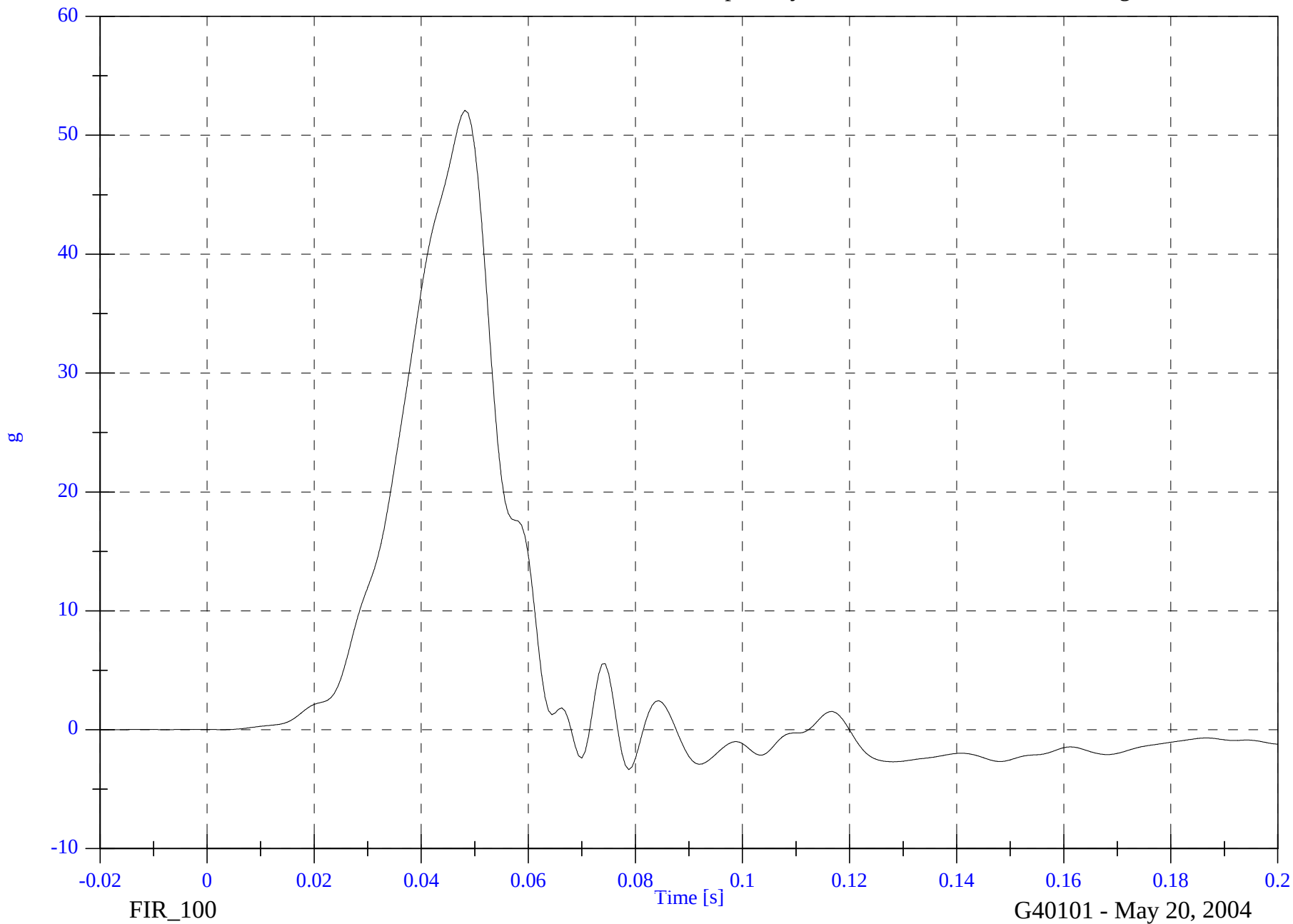
V2P4 Lower Spine Ry

Max: 52.1 [g] at 0.048 [s]

Min: -3.4 [g] at 0.079 [s]

B-149

8745-01

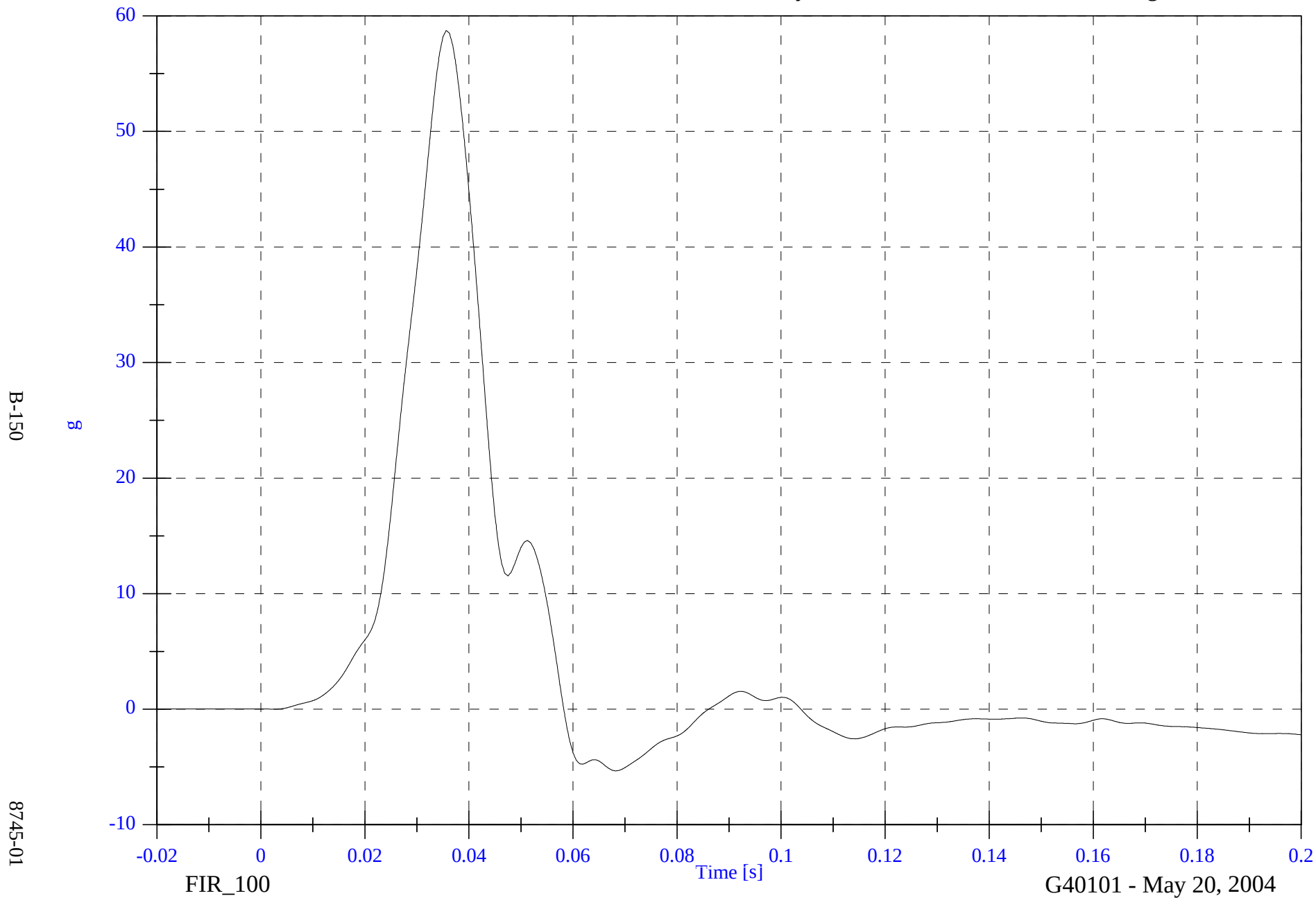


2004 Side NCAP - 2004 Chevrolet Malibu

V2P4 Pelvic Ry

Max: 58.7 [g] at 0.036 [s]

Min: -5.3 [g] at 0.068 [s]



## **APPENDIX C**

### **SID HYBRID III CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

**SUMMARY**  
**SID H3 PRE & POST TEST CALIBRATION**  
**CONFIGURED FOR LEFT SIDE IMPACT**

Date: May 19, 2004 Sequential Test Number: 3; 4  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER                     | SPECIFICATION | SID H3 269<br>NO.: |              | SID H3 270<br>NO.: |              |
|------------------------------------|---------------|--------------------|--------------|--------------------|--------------|
|                                    |               | PRE<br>TEST        | POST<br>TEST | PRE<br>TEST        | POST<br>TEST |
| SH- Seated Height (mm)             | 889 - 909     | 904                | 904          | 902                | 904          |
| RH- Rib Height (mm)                | 501 - 521     | 503                | 503          | 505                | 505          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99                 | 99           | 99                 | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 234                | 234          | 234                | 234          |
| KV- Knee Pivot from Back Line (mm) | 511 - 526     | 518                | 518          | 516                | 516          |
| SW- Knee Pivot to Floor (mm)       | 490 - 505     | 495                | 495          | 495                | 495          |
| HW- Hip Width (mm)                 | 356 - 391     | 371                | 376          | 376                | 378          |
| <b>THORAX IMPACTS</b>              |               |                    |              |                    |              |
| TEMPERATURE (°C)                   | 18.9 - 25.5   | 21.1               | 21.1         | 21.1               | 21.1         |
| RELATIVE HUMIDITY (%)              | 10 -70        | 31.00              | 31.0         | 31.00              | 31.0         |
| PROBE SPEED (m/s)                  | 4.27 - 4.33   | 4.31               | 4.29         | 4.31               | 4.30         |
| UPPER RIB (g's)                    | 37 - 46       | 37.93              | 38.51        | 38.05              | 37.23        |
| LOWER RIB (g's)                    | 37 - 46       | 38.31              | 38.44        | 38.88              | 37.40        |
| LOWER SPINE (g's)                  | 15 -22        | 19.62              | 18.51        | 18.60              | 18.70        |
| <b>PELVIS IMPACT</b>               |               |                    |              |                    |              |
| TEMPERATURE (°C)                   | 18.9 - 25.5   | 21.1               | 21.1         | 21.1               | 21.1         |
| RELATIVE HUMIDITY (%)              | 10 - 70       | 31.00              | 31.0         | 31.00              | 28.0         |
| PROBE SPEED (m/s)                  | 4.27 - 4.33   | 4.32               | 4.30         | 4.31               | 4.31         |
| PELVIS (g's)                       | 40 -60        | 47.35              | 52.86        | 56.57              | 50.00        |

**REMARKS:** None

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**SID H3 NO.:** 269

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 269 Sequential Test Number: 3  
Date: May 19, 2004 Laboratory Technician: B. Swiecicki

| TEST                         | COMMENTS                 |
|------------------------------|--------------------------|
| EXTERNAL DIMENSIONS          | Passed all requirements. |
| THORACIC SHOCK ABSORBER TEST | Passed all requirements. |
| LATERAL THORAX IMPACT TEST   | Passed all requirements. |
| LATERAL PELVIS IMPACT TEST   | Passed all requirements. |
| HEAD DROP TEST*              | Passed all requirements. |
| LATERAL NECK BEND TEST*      | Passed all requirements. |
| ABDOMINAL COMPRESSION TEST*  | Passed all requirements. |
| LUMBAR FLEXION TEST*         | Passed all requirements. |

\* Test not required for SID certification.

**REMARKS:** None

**EXTERNAL DIMENSIONS  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 269 Sequential Test Number: 3  
Date: May 19, 2004 Laboratory Technician: B. Swiecicki

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 – 909     | 904          |
| RH- Rib Height (mm)                | 502 – 520     | 503          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 – 241     | 234          |
| KH- Knee Pivot from Back Line (mm) | 511 – 526     | 518          |
| KV- Knee Pivot to Floor (mm)       | 490 – 505     | 495          |
| HW- Hip Width (mm)                 | 356 - 391     | 371          |

**REMARKS:** None

# Shock Impact - Low ( 3.05 m/s )

## PRE TEST

### CONFIGURED FOR LEFT SIDE IMPACT

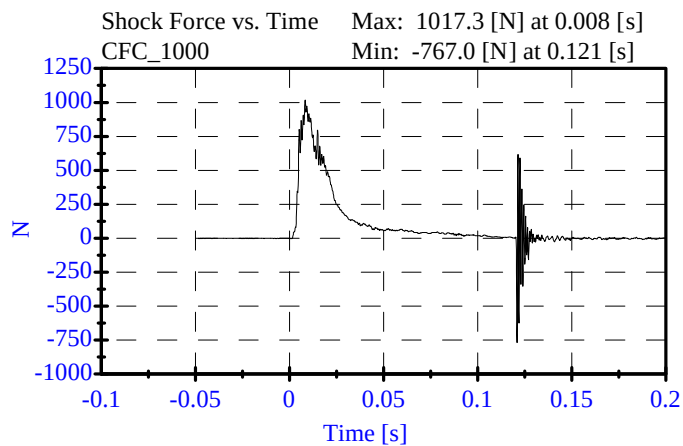
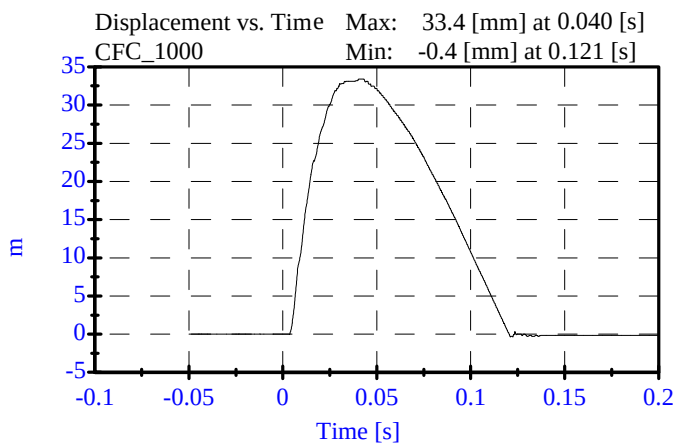
ATD Serial No: 269

Date: April 22, 2004

Sequential Test Number: 1 File: 269SL 04-22-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION    | TEST RESULTS | STATUS |
|------------------------|------------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C      | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %          | 37.00 %      | Passed |
| Displacement:          | 30.00-35.00 mm   | 33.40 mm     | Passed |
| Maximum Force:         | 836.00-1125.00 N | 1017.34 N    | Passed |
| Impact Test Velocity:  | 3.05 m/s         |              |        |
| Damper Identification: | 269              |              |        |
| Damper Setting:        | 5                |              |        |



# Shock Impact - Med ( 4.27 m/s )

## PRE TEST

### CONFIGURED FOR LEFT SIDE IMPACT

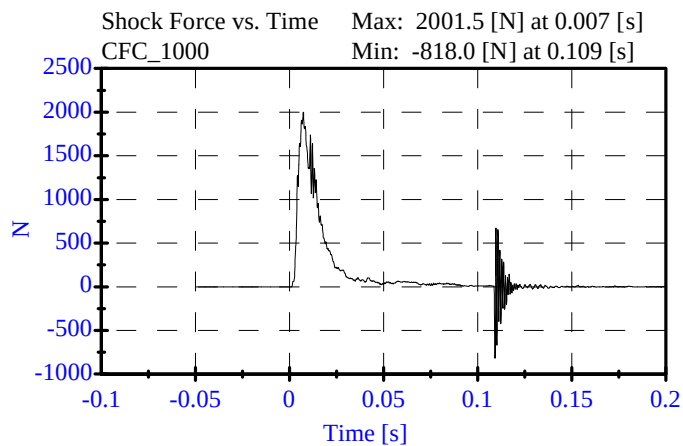
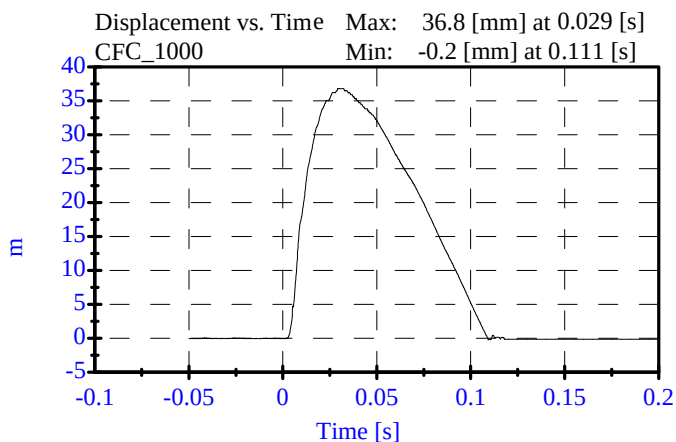
ATD Serial No: 269

Date: April 22, 2004

Sequential Test Number: 1 File: 269SM 04-22-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS | STATUS |
|------------------------|-------------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C       | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %           | 37.00 %      | Passed |
| Displacement:          | 32.00-37.00 mm    | 36.83 mm     | Passed |
| Maximum Force:         | 1730.00-2099.00 N | 2001.46 N    | Passed |
| Impact Test Velocity:  | 4.27 m/s          |              |        |
| Damper Identification: | 269               |              |        |
| Damper Setting:        | 5                 |              |        |



# Shock Impact - High ( 6.10 m/s )

## PRE TEST

### CONFIGURED FOR LEFT SIDE IMPACT

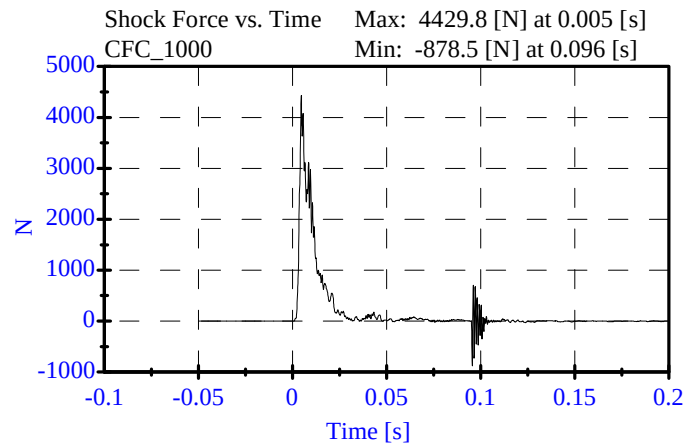
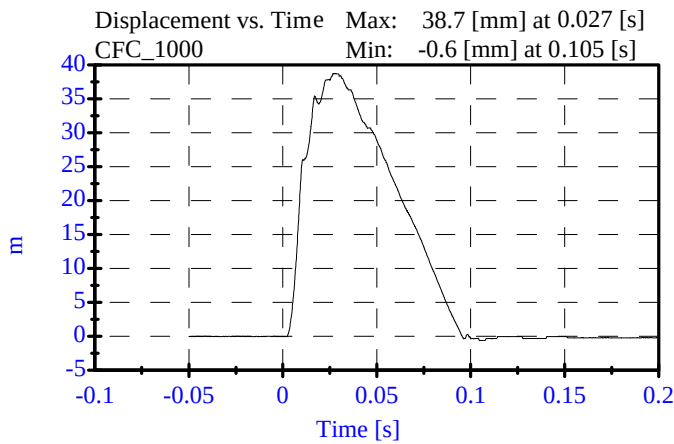
ATD Serial No: 269

Date: April 22, 2004

Sequential Test Number: 1 File: 269SH1 04-22-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS | STATUS |
|------------------------|-------------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C       | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %           | 37.00 %      | Passed |
| Displacement:          | 33.00-40.00 mm    | 38.73 mm     | Passed |
| Maximum Force:         | 3741.00-4448.00 N | 4429.82 N    | Passed |
| Impact Test Velocity:  | 6.10 m/s          |              |        |
| Damper Identification: | 269               |              |        |
| Damper Setting:        | 5                 |              |        |



# Thorax Impact

## Pre-Test

### CONFIGURED FOR LEFT SIDE IMPACT

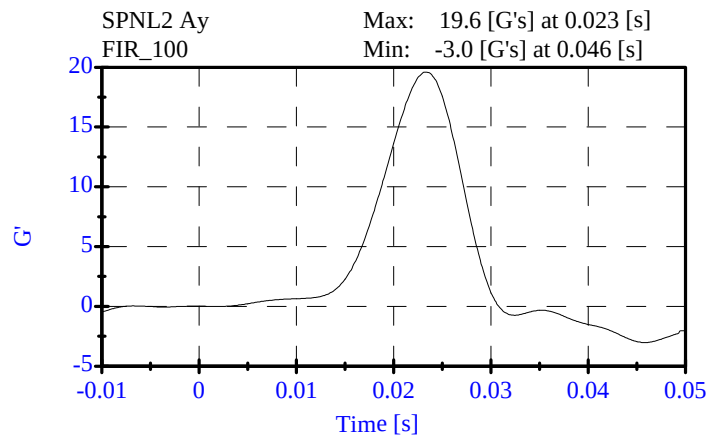
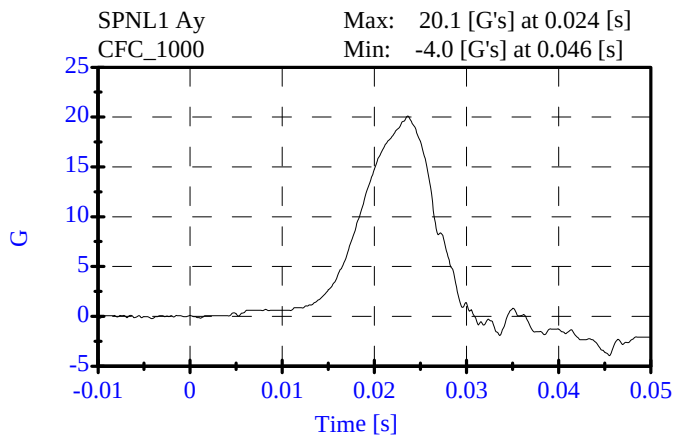
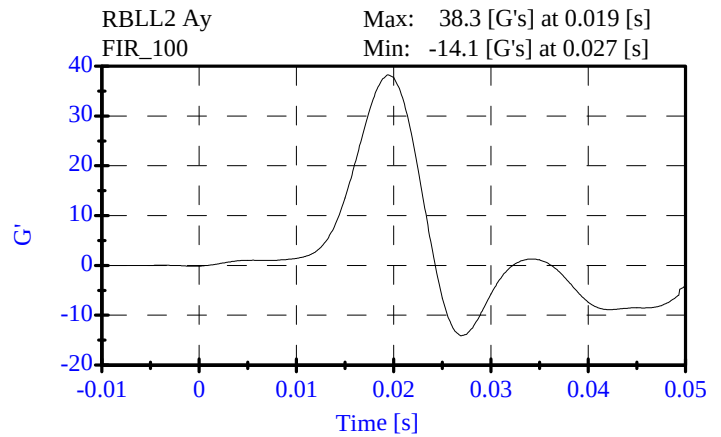
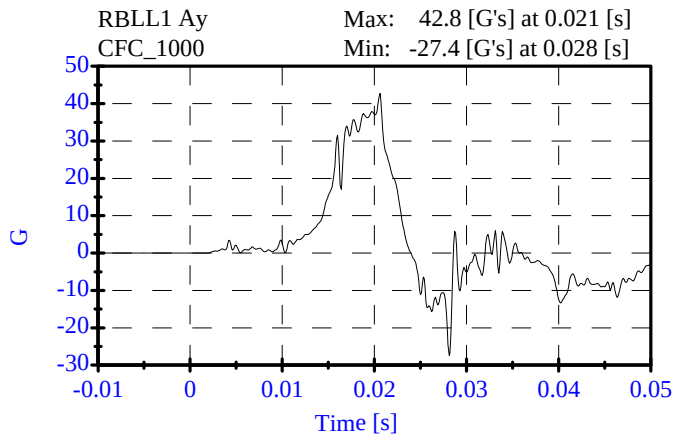
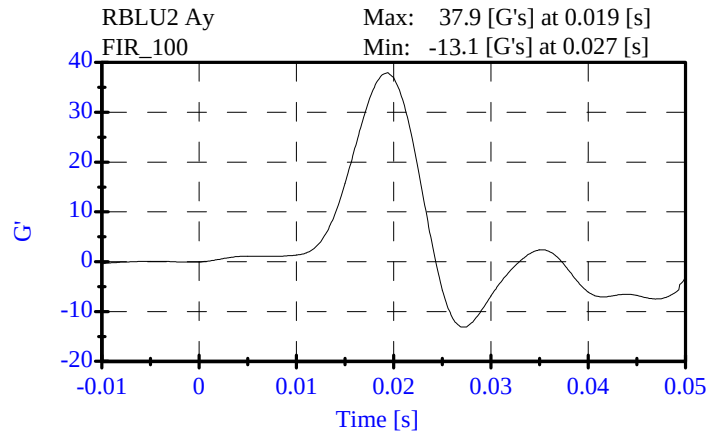
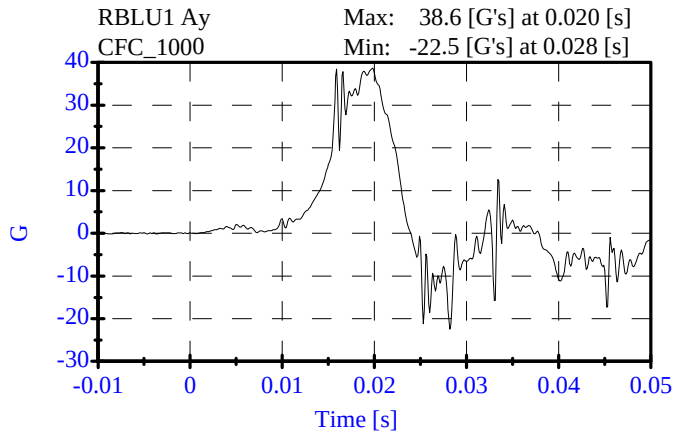
ATD Serial No: 269

Date: May 18, 2004

Sequential Test Number: 1 File: 269T 05-18-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER            | SPECIFICATION   | TEST RESULTS | STATUS |
|---------------------------|-----------------|--------------|--------|
| Lab Temperature:          | 18.9-25.5 C     | 21.1 C       | Passed |
| Lab Humidity:             | 10-70 %         | 31.00 %      | Passed |
| Probe Velocity:           | 4.27- 4.33 m/s  | 4.31 m/s     | Passed |
| Upper Rib Acceleration:   | 37.00-46.00 G's | 37.93 G's    | Passed |
| Lower Rib Acceleration:   | 37.00-46.00 G's | 38.31 G's    | Passed |
| Lower Spine Acceleration: | 15.00-22.00 G's | 19.62 G's    | Passed |



## Pelvic Impact

### Pre-Test

#### CONFIGURED FOR LEFT SIDE IMPACT

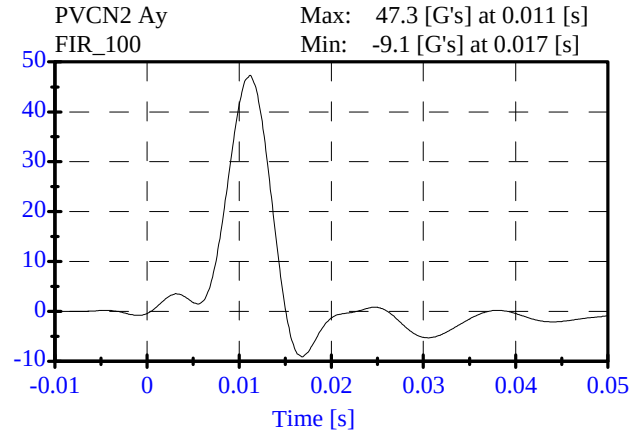
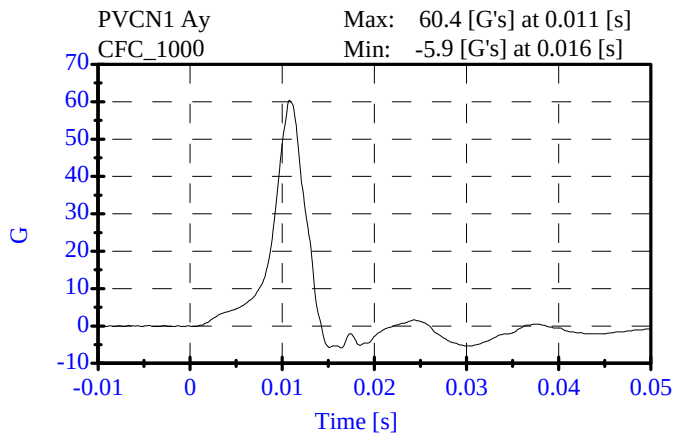
ATD Serial No: 269

Date: May 18, 2004

Sequential Test Number: 1 File: 269P 05-18-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION   | TEST RESULTS | STATUS |
|------------------------|-----------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C     | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %         | 31.00 %      | Passed |
| Probe Velocity:        | 4.27- 4.33 m/s  | 4.32 m/s     | Passed |
| Pelvis Y Acceleration: | 40.00-60.00 G's | 47.35 G's    | Passed |
| Time Above 20 Gs       | 3.0-7.0 ms      | 5.3 ms       | Passed |



## Head Drop

### Pre-Test

#### CONFIGURED FOR LEFT SIDE IMPACT

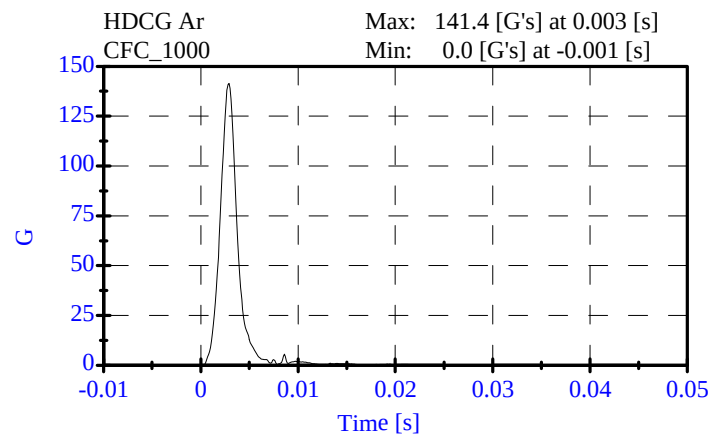
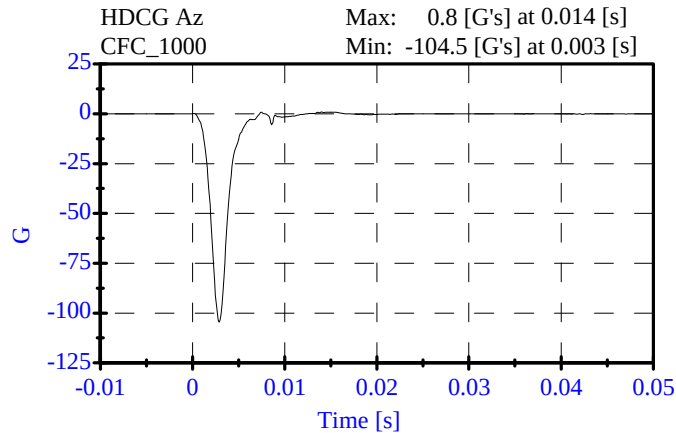
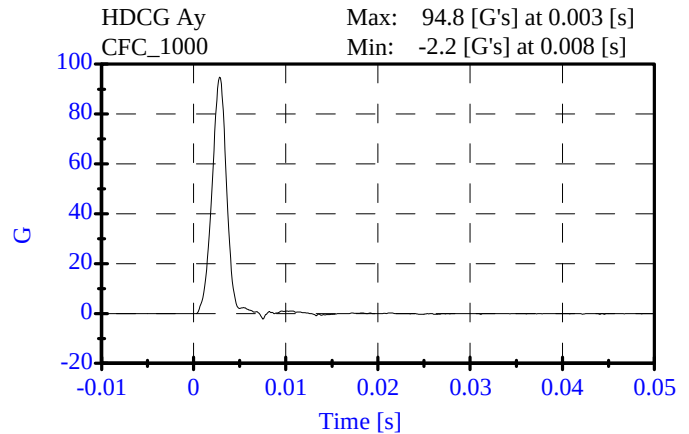
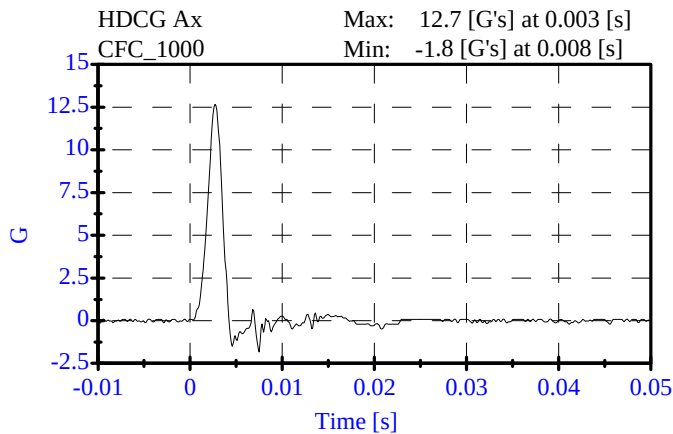
ATD Serial No: 269

Date: May 18, 2004

Sequential Test Number: 1 File: 269H 05-18-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER          | SPECIFICATION | TEST RESULTS | STATUS |
|-------------------------|---------------|--------------|--------|
| Lab Temperature:        | 18.9-25.6 C   | 21.1 C       | Passed |
| Lab Humidity:           | 10-70 %       | 31.00 %      | Passed |
| Peak Resultant Accel.:  | 120-150 Gs    | 141.42 Gs    | Passed |
| Peak Lateral Accel.:    | 15 Gs Max     | 12.66 Gs     | Passed |
| Curve PerCent NonModal: | < 15%         | 3.91 %       | Passed |



**Neck Test****Pre-Test****CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 269

Date: May 18, 2004

Sequential Test Number: 1 File: 269N 05-18-04

Laboratory Technician: B. Swiecicki

| <u>TEST PARAMETER</u>                                           | <u>SPECIFICATION</u> | <u>TEST RESULTS</u> | <u>STATUS</u> |
|-----------------------------------------------------------------|----------------------|---------------------|---------------|
| Lab Temperature:                                                | 20.6-22.2 C          | 21.1 C              | Passed        |
| Lab Humidity:                                                   | 10-70 %              | 31.00 %             | Passed        |
| Impact Velocity:                                                | 6.89- 7.13 m/s       | 7.01 m/s            | Passed        |
| PENDULUM DELTA V                                                |                      |                     |               |
| Delta V at 10 ms:                                               | 1.96- 2.55 m/s       | 2.04 m/s            | Passed        |
| Delta V at 20 ms:                                               | 4.12- 5.10 m/s       | 4.30 m/s            | Passed        |
| Delta V at 30 ms:                                               | 5.73- 7.01 m/s       | 6.22 m/s            | Passed        |
| Delta V between 40-70 ms:                                       | 6.27- 7.64 m/s       | 7.09 m/s            | Passed        |
| D PLANE ROTATION                                                |                      |                     |               |
| Maximum Rotation:                                               | 66.0-82.0 Deg        | 73.79 Deg           | Passed        |
| Rotation Angle Decay:                                           | 58.0-67.0 ms         | 59.60 ms            | Passed        |
| MOMENT ABOUT THE OCCIPITAL CONDYLE                              |                      |                     |               |
| Max Occipital Moment:                                           | 73.00- 88.00 N-m     | 87.59 N-m           | Passed        |
| Occipital Moment Decay:                                         | 49.0-64.0 ms         | 54.50 ms            | Passed        |
| HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT |                      |                     |               |
| Moment to Rotation Peak:                                        | 2.0-16.0 ms          | 10.40 ms            | Passed        |

## Neck Test

### Pre-Test

#### CONFIGURED FOR LEFT SIDE IMPACT

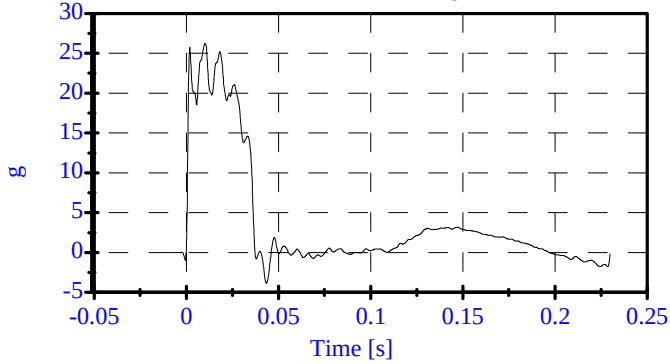
ATD Serial No: 269

Date: May 18, 2004

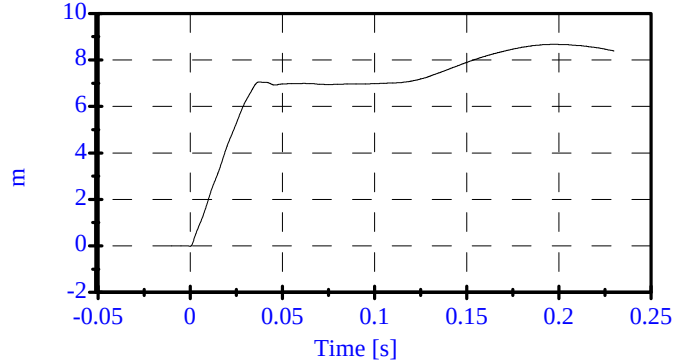
Sequential Test Number: 1 File: 269N 05-18-04

Laboratory Technician: B. Swiecicki

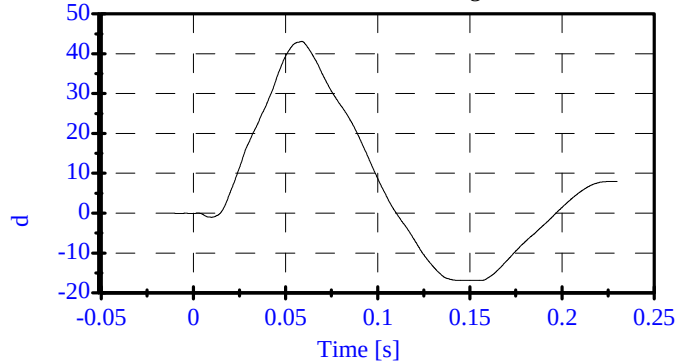
Pend Ax  
CFC\_180  
Max: 26.2 [g's] at 0.010 [s]  
Min: -3.9 [g's] at 0.044 [s]



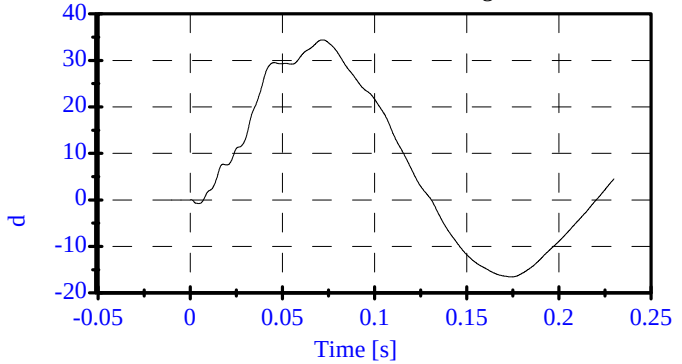
Pend Vx  
CFC\_180  
Max: 8.7 [m/s] at 0.197 [s]  
Min: -0.0 [m/s] at -0.000 [s]



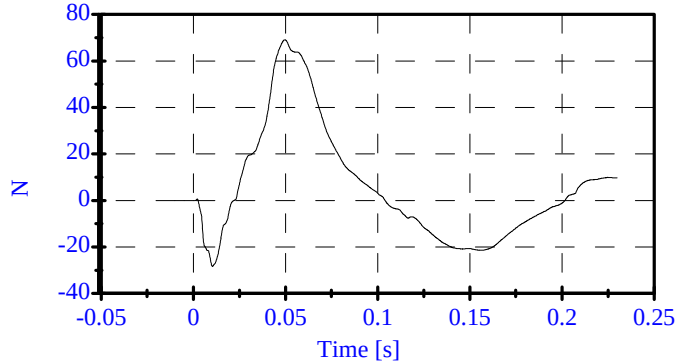
Head Rot  
CFC\_180  
Max: 43.1 [degrees] at 0.059 [s]  
Min: -16.9 [degrees] at 0.156 [s]



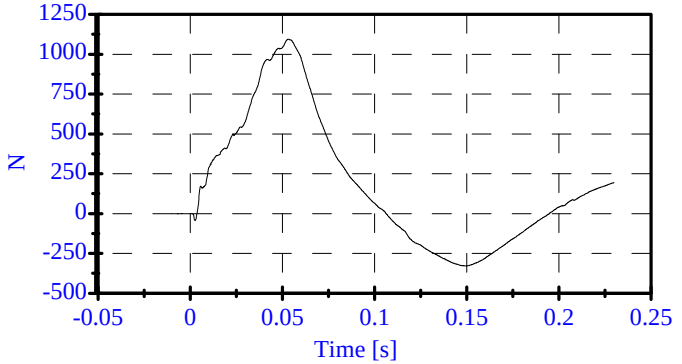
Arm Rot  
CFC\_180  
Max: 34.4 [degrees] at 0.072 [s]  
Min: -16.5 [degrees] at 0.174 [s]



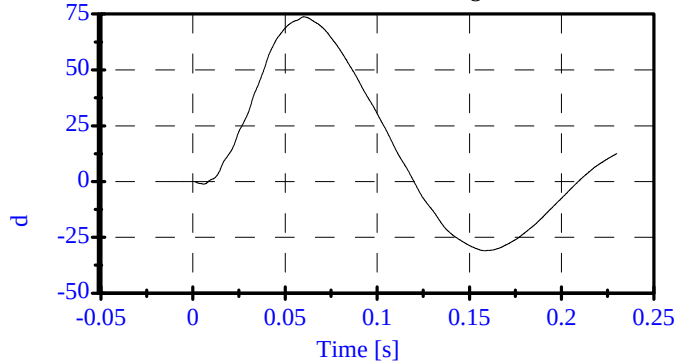
Neck Mx  
CFC\_600  
Max: 69.1 [N-m] at 0.050 [s]  
Min: -28.4 [N-m] at 0.010 [s]



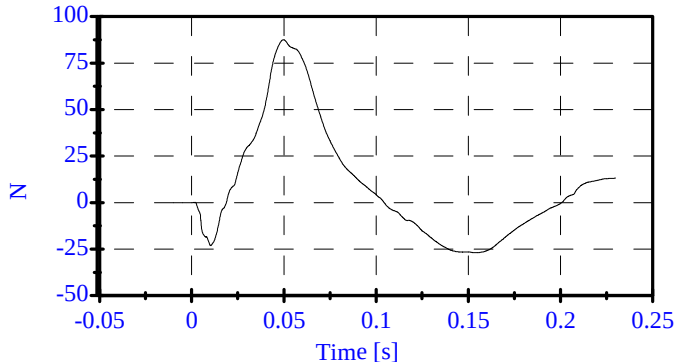
Neck Fy  
CFC\_1000  
Max: 1094.3 [N] at 0.053 [s]  
Min: -328.4 [N] at 0.150 [s]



Tot Rot  
CFC\_180  
Max: 73.8 [degrees] at 0.060 [s]  
Min: -31.0 [degrees] at 0.158 [s]



MOCX  
Max: 87.6 [N-m] at 0.050 [s]  
Min: -26.9 [N-m] at 0.153 [s]



**ABDOMINAL COMPRESSION TEST  
PRE-TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 269

Date: May 19, 2004

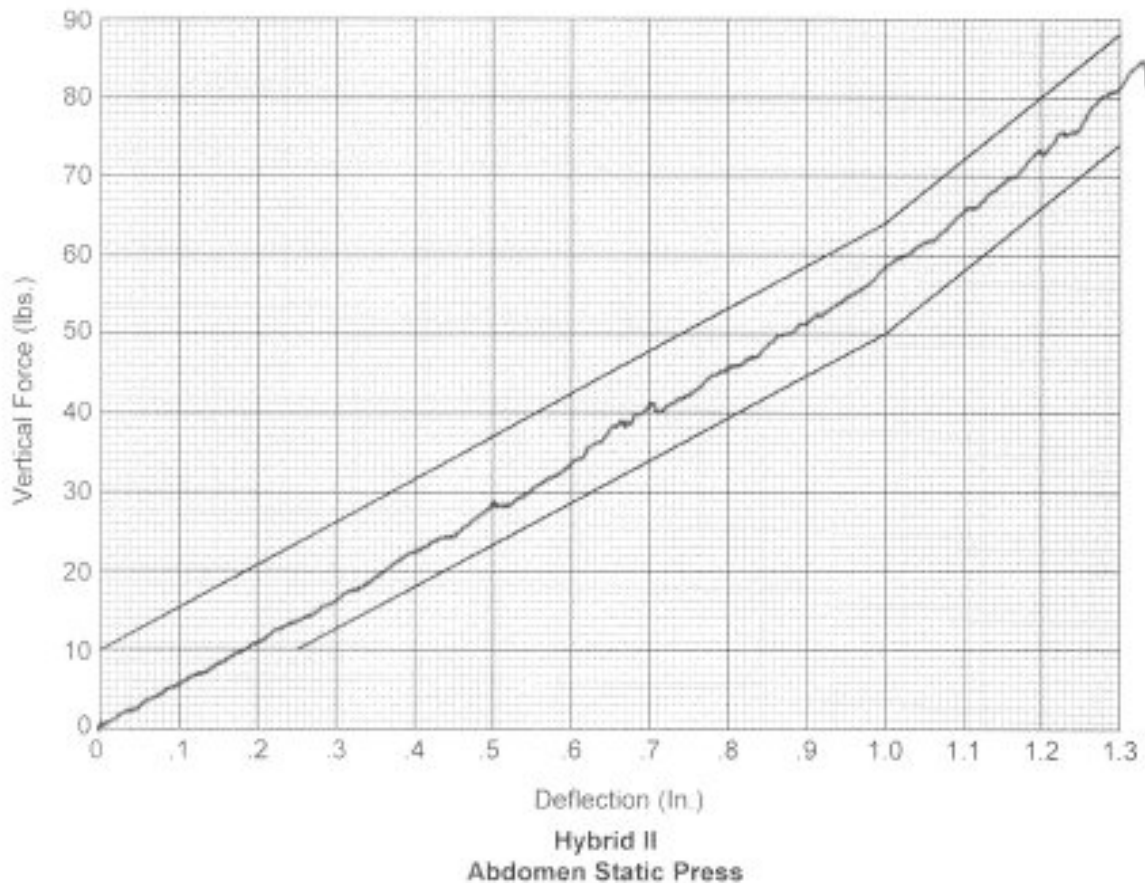
Sequential Test Number:

Laboratory Technician:

3

B. Swiecicki

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 35.00        |
| FORCE @ 13 mm (N)     | 104 - 162     | 112.32       |
| FORCE @ 19 mm (N)     | 163 - 221     | 187.94       |
| FORCE @ 25 mm (N)     | 222 - 280     | 260.22       |
| FORCE @ 33 mm (N)     | 325 - 391     | 362.09       |



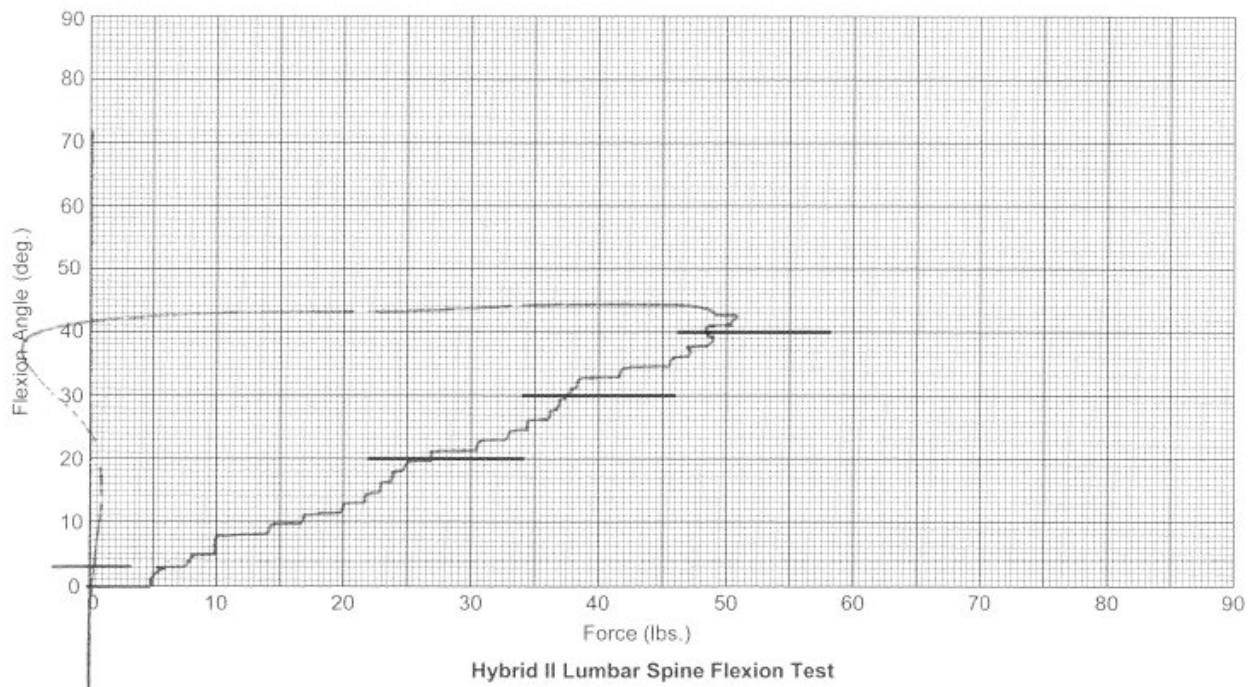
**REMARKS:** None

**LUMBAR FLEXION TEST**  
**PRE-TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

|                        |                                     |
|------------------------|-------------------------------------|
| SID H3 Serial No.: 269 | Sequential Test Number: 3           |
| Date: May 19, 2004     | Laboratory Technician: B. Swiecicki |

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 35.00        |
| FORCE @ 0° (N)        | 0 - 26.7      | 0.00         |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 120.10       |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 166.81       |
| FORCE @ 40° (N)       | 204.6 - 258   | 213.51       |
| RETURN ANGLE          | 12° max.      | 3.2°         |



**REMARKS:** None

**PRE-TEST DUMMY INSPECTION LIST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 269 Sequential Test Number: 3  
Date: May 19, 2004 Laboratory Technician: B. Swiecicki

| PART         | ITEMS CHECKED                                     | COMMENTS |
|--------------|---------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                                 | OK       |
| HEAD         | VISUAL, BALLAST,<br>ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                              | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT,<br>ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                       | OK       |
| STERNUM      | VISUAL                                            | OK       |
| LUMBAR SPINE | VISUAL                                            | OK       |
| ABDOMEN      | VISUAL                                            | OK       |
| PELVIS       | VISUAL, PALPATE,<br>ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                            | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                            | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                           | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                           | OK       |
| FEET         | VISUAL, RANGE OF MOTION                           | OK       |
| JOINTS       | 1 TO 2 g RANGE                                    | OK       |
| OTHER        | NONE                                              | -        |

**REMARKS:** None

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**SID H3 NO.:** 270

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 5  
Date: May 19, 2004 Laboratory Technician: B. Swiecicki

| TEST                         | COMMENTS                 |
|------------------------------|--------------------------|
| EXTERNAL DIMENSIONS          | Passed all requirements. |
| THORACIC SHOCK ABSORBER TEST | Passed all requirements. |
| LATERAL THORAX IMPACT TEST   | Passed all requirements. |
| LATERAL PELVIS IMPACT TEST   | Passed all requirements. |
| HEAD DROP TEST*              | Passed all requirements. |
| LATERAL NECK BEND TEST*      | Passed all requirements. |
| ABDOMINAL COMPRESSION TEST*  | Passed all requirements. |
| LUMBAR FLEXION TEST*         | Passed all requirements. |

\* Test not required for SID certification.

**REMARKS:** None

**EXTERNAL DIMENSIONS  
PRE-TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 5  
Date: May 19, 2004 Laboratory Technician: B. Swiecicki

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 - 909     | 902          |
| RH- Rib Height (mm)                | 502 - 520     | 505          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 234          |
| KH- Knee Pivot from Back Line (mm) | 511 - 526     | 516          |
| KV- Knee Pivot to Floor (mm)       | 490 - 505     | 495          |
| HW- Hip Width (mm)                 | 356 - 391     | 376          |

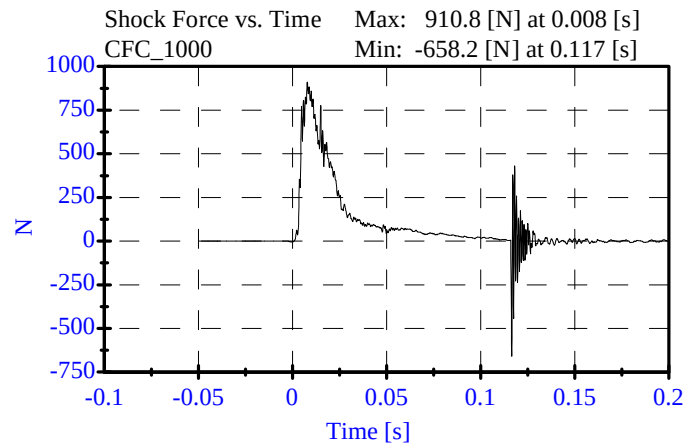
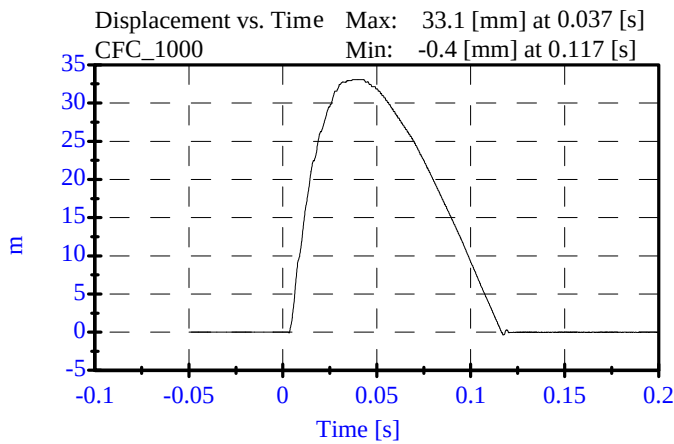
**REMARKS:** None

**Shock Impact ( 3.05 m/s )**  
**PRE TEST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: March 18, 2004

Sequential Test Number: 1    File: 270SL 03-18-04  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION    | TEST RESULTS | STATUS |
|------------------------|------------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C      | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %          | 35.00 %      | Passed |
| Displacement:          | 30.00-35.00 mm   | 33.07 mm     | Passed |
| Maximum Force:         | 836.00-1125.00 N | 910.80 N     | Passed |
| Impact Test Velocity:  | 3.05 m/s         |              |        |
| Damper Identification: | 270              |              |        |
| Damper Setting:        | 5                |              |        |

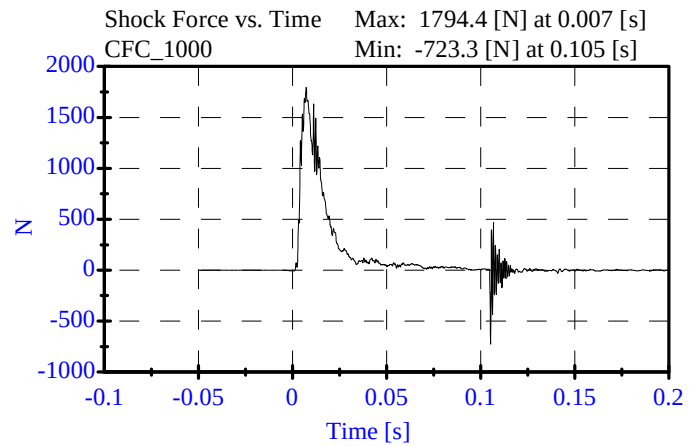
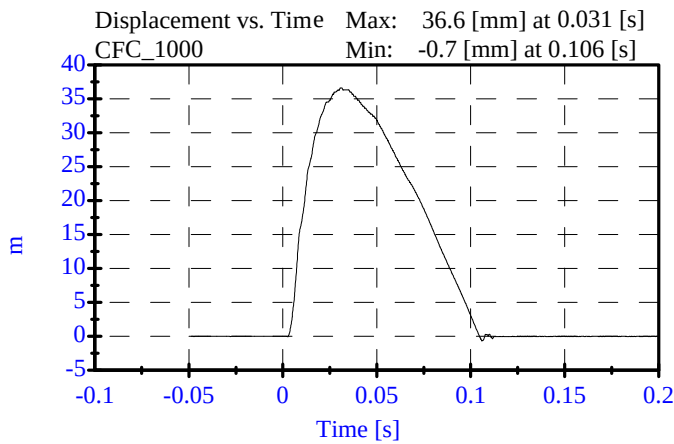


**Shock Impact ( 4.27 m/s )**  
**PRE TEST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: March 18, 2004

Sequential Test Number: 1    File: 270SM 03-18-04  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS | STATUS |
|------------------------|-------------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C       | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %           | 35.00 %      | Passed |
| Displacement:          | 32.00-37.00 mm    | 36.64 mm     | Passed |
| Maximum Force:         | 1730.00-2099.00 N | 1794.45 N    | Passed |
| Impact Test Velocity:  | 4.27 m/s          |              |        |
| Damper Identification: | 270               |              |        |
| Damper Setting:        | 5                 |              |        |

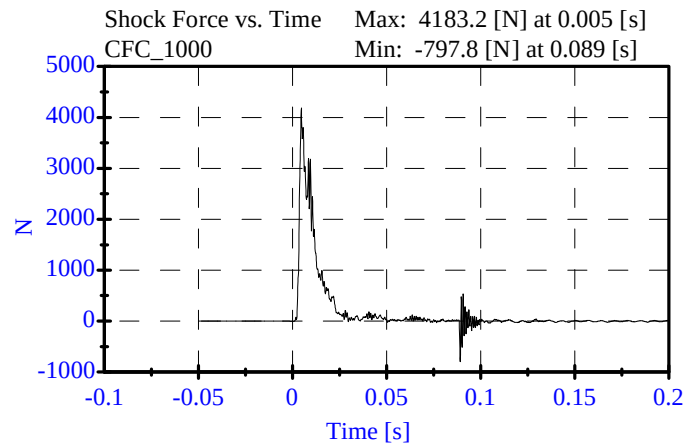
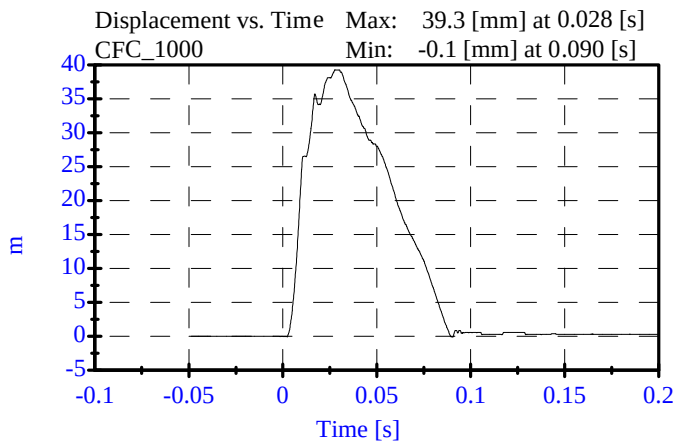


**Shock Impact ( 6.10 m/s )**  
**PRE TEST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: March 18, 2004

Sequential Test Number: 1    File: 270SH 03-18-04  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION     | TEST RESULTS | STATUS |
|------------------------|-------------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C       | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %           | 35.00 %      | Passed |
| Displacement:          | 33.00-40.00 mm    | 39.29 mm     | Passed |
| Maximum Force:         | 3741.00-4448.00 N | 4183.25 N    | Passed |
| Impact Test Velocity:  | 6.10 m/s          |              |        |
| Damper Identification: | 270               |              |        |
| Damper Setting:        | 5                 |              |        |

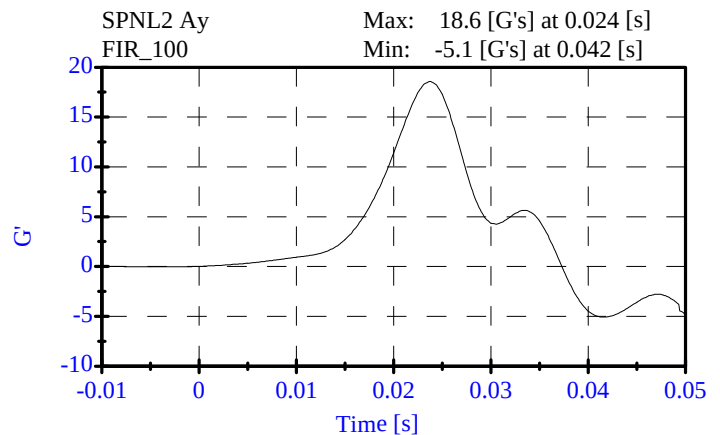
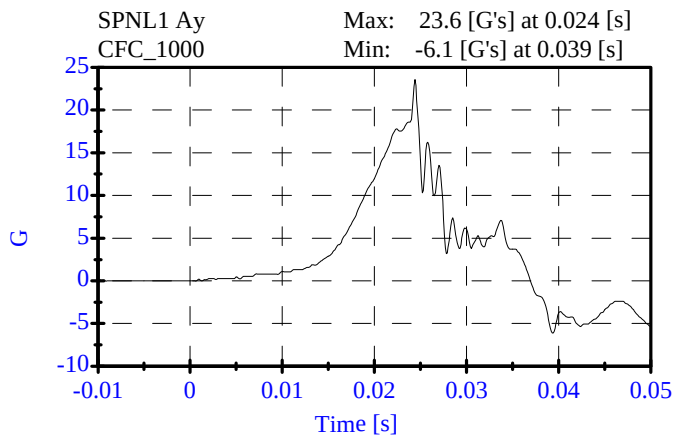
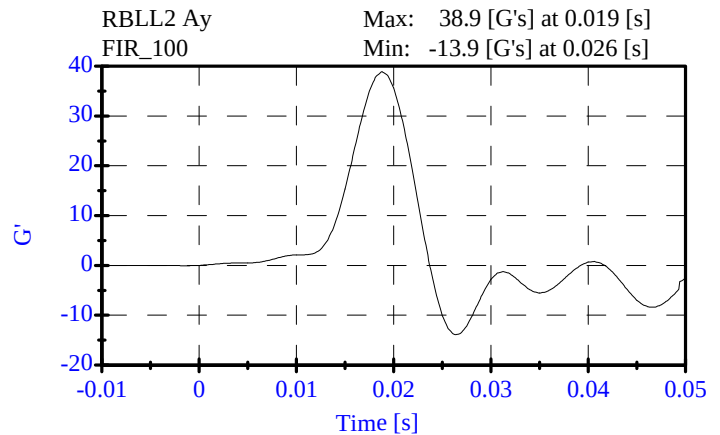
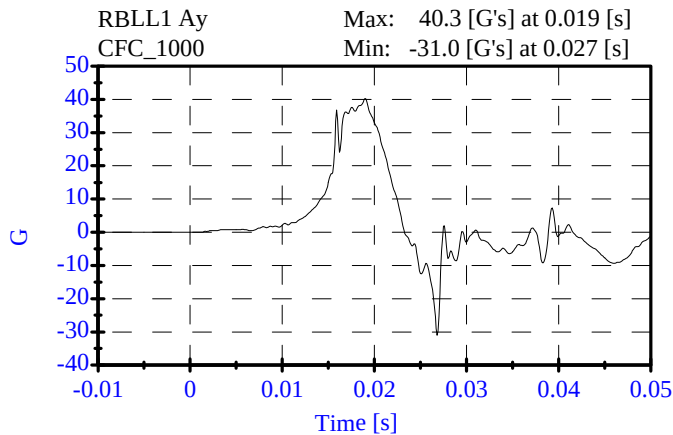
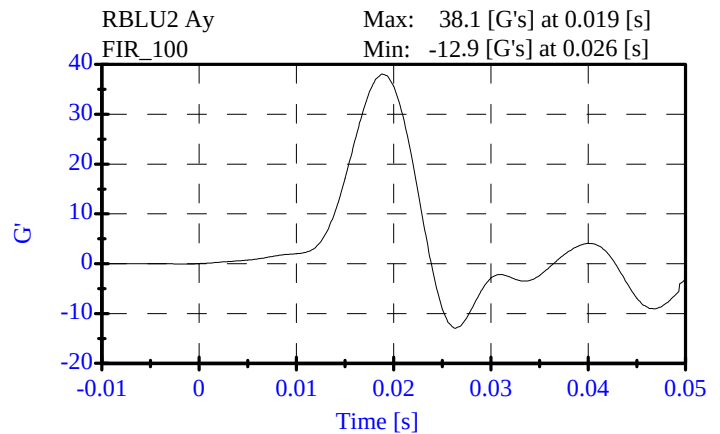
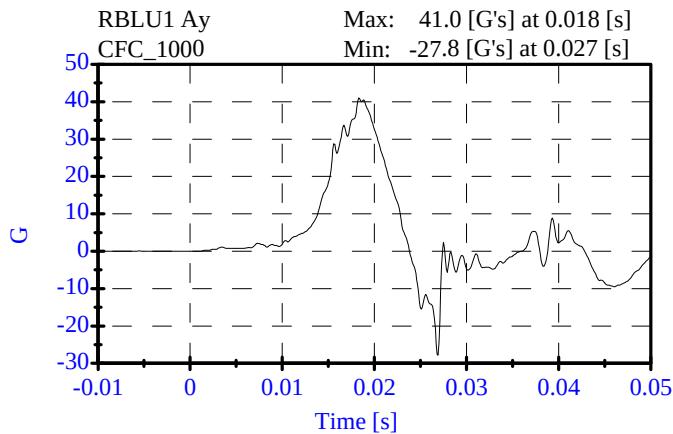


**Thorax Impact**  
**Pre-Test**  
**CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: May 18, 2004

Sequential Test Number: 1 File: 270T 05-18-04  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER            | SPECIFICATION   | TEST RESULTS | STATUS |
|---------------------------|-----------------|--------------|--------|
| Lab Temperature:          | 18.9-25.5 C     | 21.1 C       | Passed |
| Lab Humidity:             | 10-70 %         | 31.00 %      | Passed |
| Probe Velocity:           | 4.27- 4.33 m/s  | 4.31 m/s     | Passed |
| Upper Rib Acceleration:   | 37.00-46.00 G's | 38.05 G's    | Passed |
| Lower Rib Acceleration:   | 37.00-46.00 G's | 38.88 G's    | Passed |
| Lower Spine Acceleration: | 15.00-22.00 G's | 18.60 G's    | Passed |



## Pelvic Impact

### Pre-Test

#### CONFIGURED FOR LEFT SIDE IMPACT

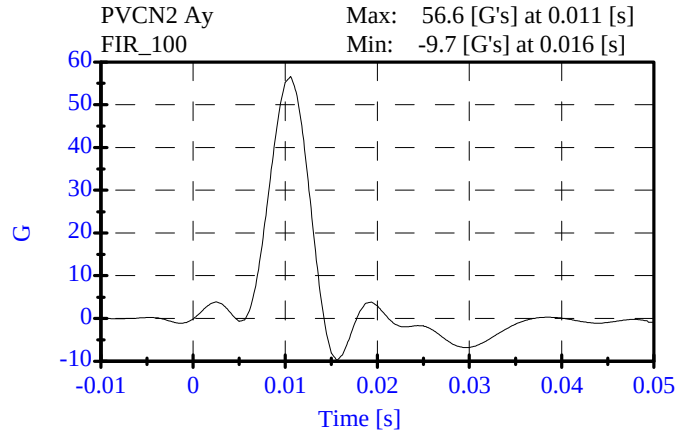
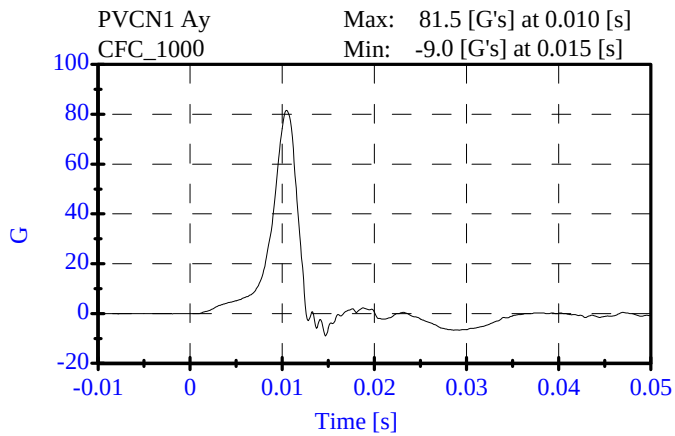
ATD Serial No: 270

Date: May 18, 2004

Sequential Test Number: 1 File: 270P 05-18-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER         | SPECIFICATION   | TEST RESULTS | STATUS |
|------------------------|-----------------|--------------|--------|
| Lab Temperature:       | 18.9-25.5 C     | 21.1 C       | Passed |
| Lab Humidity:          | 10-70 %         | 31.00 %      | Passed |
| Probe Velocity:        | 4.27- 4.33 m/s  | 4.31 m/s     | Passed |
| Pelvis Y Acceleration: | 40.00-60.00 G's | 56.57 G's    | Passed |
| Time Above 20 Gs       | 3.0-7.0 ms      | 5.4 ms       | Passed |



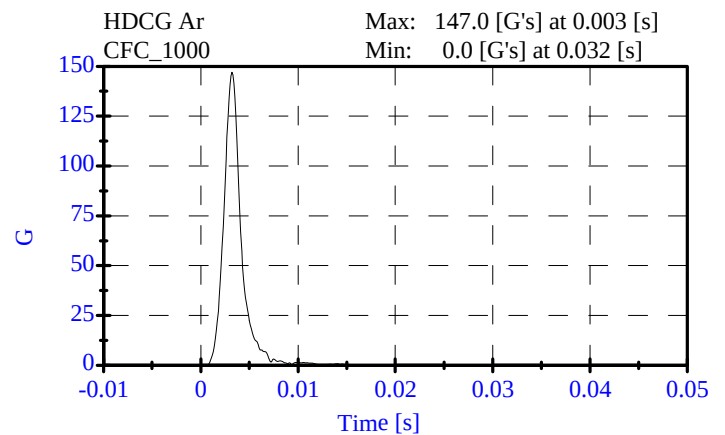
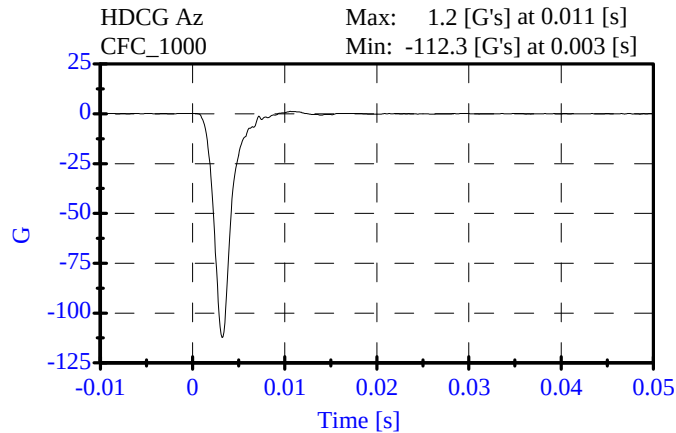
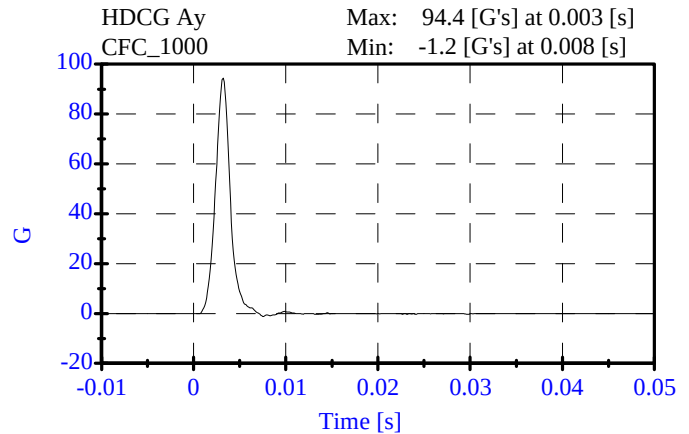
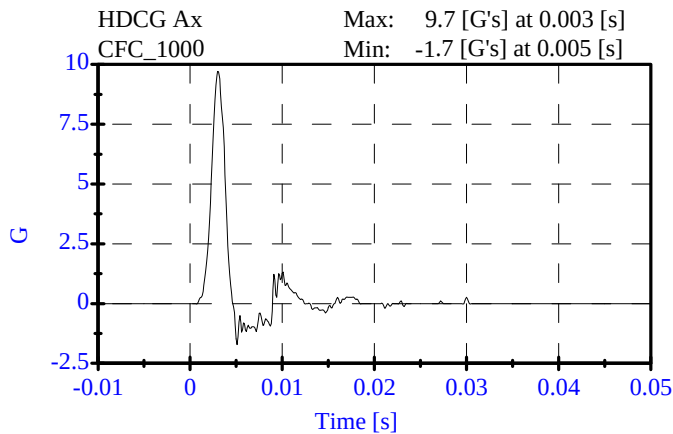
# **Head Drop** **Pre-Test**

## **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: May 18, 2004

Sequential Test Number: 1 File: 270H 05-18-04  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER          | SPECIFICATION | TEST RESULTS | STATUS |
|-------------------------|---------------|--------------|--------|
| Lab Temperature:        | 18.9-25.6 C   | 21.1 C       | Passed |
| Lab Humidity:           | 10-70 %       | 31.00 %      | Passed |
| Peak Resultant Accel.:  | 120-150 Gs    | 147.01 Gs    | Passed |
| Peak Lateral Accel.:    | 15 Gs Max     | 9.70 Gs      | Passed |
| Curve PerCent NonModal: | < 15%         | 5.23 %       | Passed |



**Neck Test****Pre-Test****CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270

Date: May 18, 2004

Sequential Test Number: 1 File: 270N 05-18-04

Laboratory Technician: B. Swiecicki

| <u>TEST PARAMETER</u>                                           | <u>SPECIFICATION</u> | <u>TEST RESULTS</u> | <u>STATUS</u> |
|-----------------------------------------------------------------|----------------------|---------------------|---------------|
| Lab Temperature:                                                | 20.6-22.2 C          | 21.1 C              | Passed        |
| Lab Humidity:                                                   | 10-70 %              | 31.00 %             | Passed        |
| Impact Velocity:                                                | 6.89- 7.13 m/s       | 7.02 m/s            | Passed        |
| PENDULUM DELTA V                                                |                      |                     |               |
| Delta V at 10 ms:                                               | 1.96- 2.55 m/s       | 2.04 m/s            | Passed        |
| Delta V at 20 ms:                                               | 4.12- 5.10 m/s       | 4.28 m/s            | Passed        |
| Delta V at 30 ms:                                               | 5.73- 7.01 m/s       | 6.10 m/s            | Passed        |
| Delta V between 40-70 ms:                                       | 6.27- 7.64 m/s       | 7.02 m/s            | Passed        |
| D PLANE ROTATION                                                |                      |                     |               |
| Maximum Rotation:                                               | 66.0-82.0 Deg        | 74.92 Deg           | Passed        |
| Rotation Angle Decay:                                           | 58.0-67.0 ms         | 59.00 ms            | Passed        |
| MOMENT ABOUT THE OCCIPITAL CONDYLE                              |                      |                     |               |
| Max Occipital Moment:                                           | 73.00- 88.00 N-m     | 87.52 N-m           | Passed        |
| Occipital Moment Decay:                                         | 49.0-64.0 ms         | 55.40 ms            | Passed        |
| HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT |                      |                     |               |
| Moment to Rotation Peak:                                        | 2.0-16.0 ms          | 12.30 ms            | Passed        |

# Neck Test

## Pre-Test

### CONFIGURED FOR LEFT SIDE IMPACT

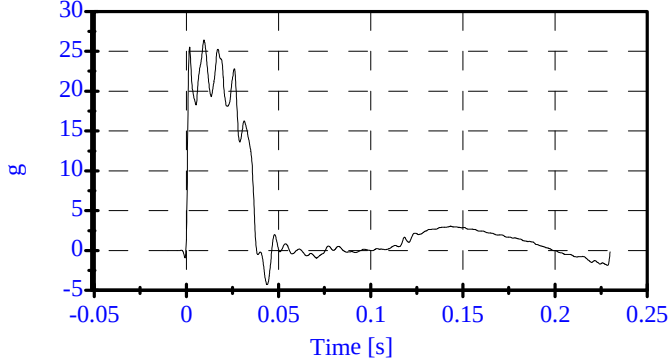
ATD Serial No: 270

Date: May 18, 2004

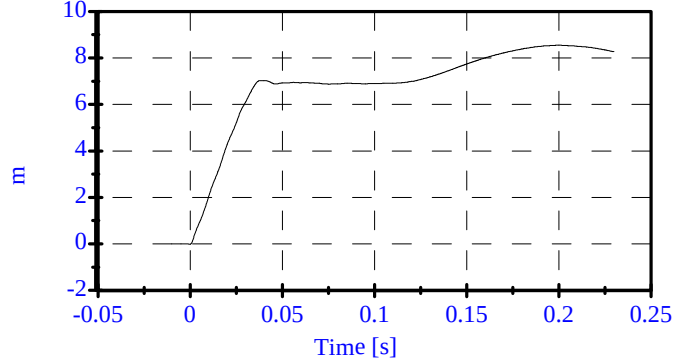
Sequential Test Number: 1 File: 270N 05-18-04

Laboratory Technician: B. Swiecicki

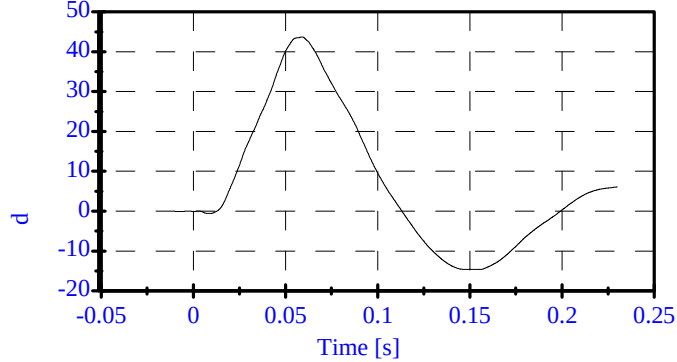
Pend Ax  
CFC\_180  
Max: 26.4 [g's] at 0.010 [s]  
Min: -4.3 [g's] at 0.044 [s]



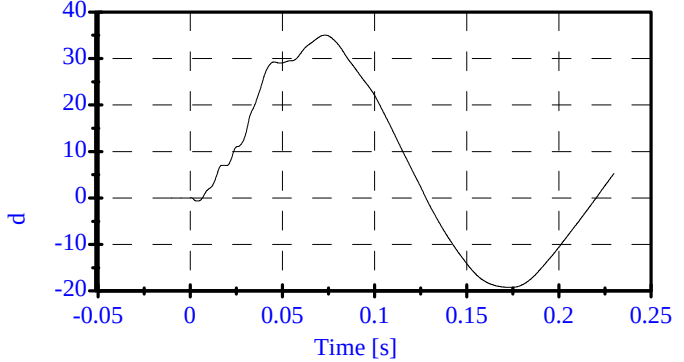
Pend Vx  
CFC\_180  
Max: 8.5 [m/s] at 0.200 [s]  
Min: -0.0 [m/s] at -0.000 [s]



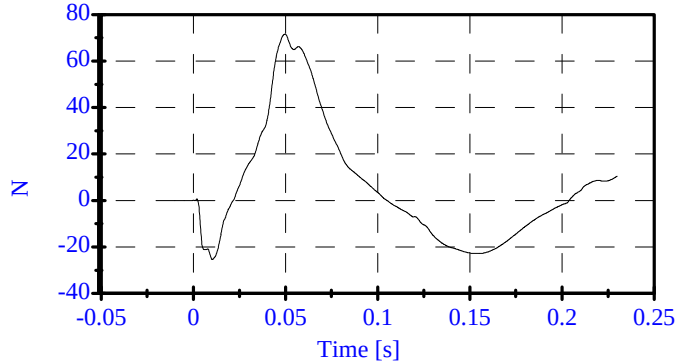
Head Rot  
CFC\_180  
Max: 43.7 [degrees] at 0.059 [s]  
Min: -14.6 [degrees] at 0.149 [s]



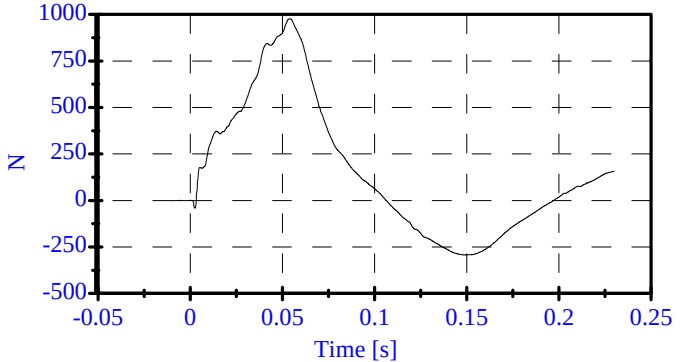
Arm Rot  
CFC\_180  
Max: 35.0 [degrees] at 0.073 [s]  
Min: -19.2 [degrees] at 0.173 [s]



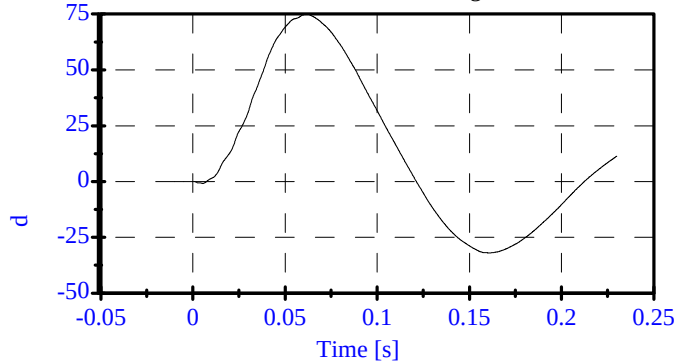
Neck Mx  
CFC\_600  
Max: 71.5 [N-m] at 0.050 [s]  
Min: -25.4 [N-m] at 0.010 [s]



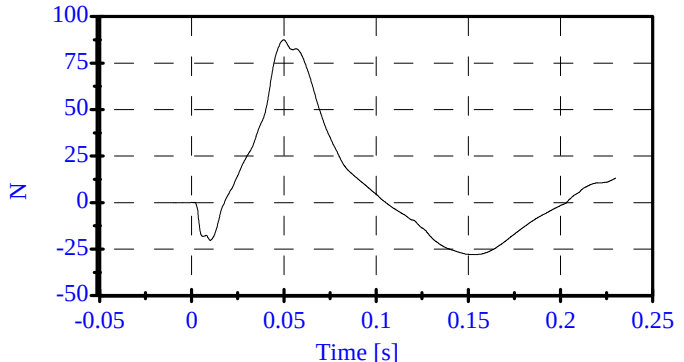
Neck Fy  
CFC\_1000  
Max: 977.4 [N] at 0.054 [s]  
Min: -294.8 [N] at 0.150 [s]



Tot Rot  
CFC\_180  
Max: 74.9 [degrees] at 0.062 [s]  
Min: -31.9 [degrees] at 0.161 [s]



MOCX  
Max: 87.5 [N-m] at 0.050 [s]  
Min: -28.0 [N-m] at 0.151 [s]



**ABDOMINAL COMPRESSION TEST  
PRE-TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270

Date: May 19, 2004

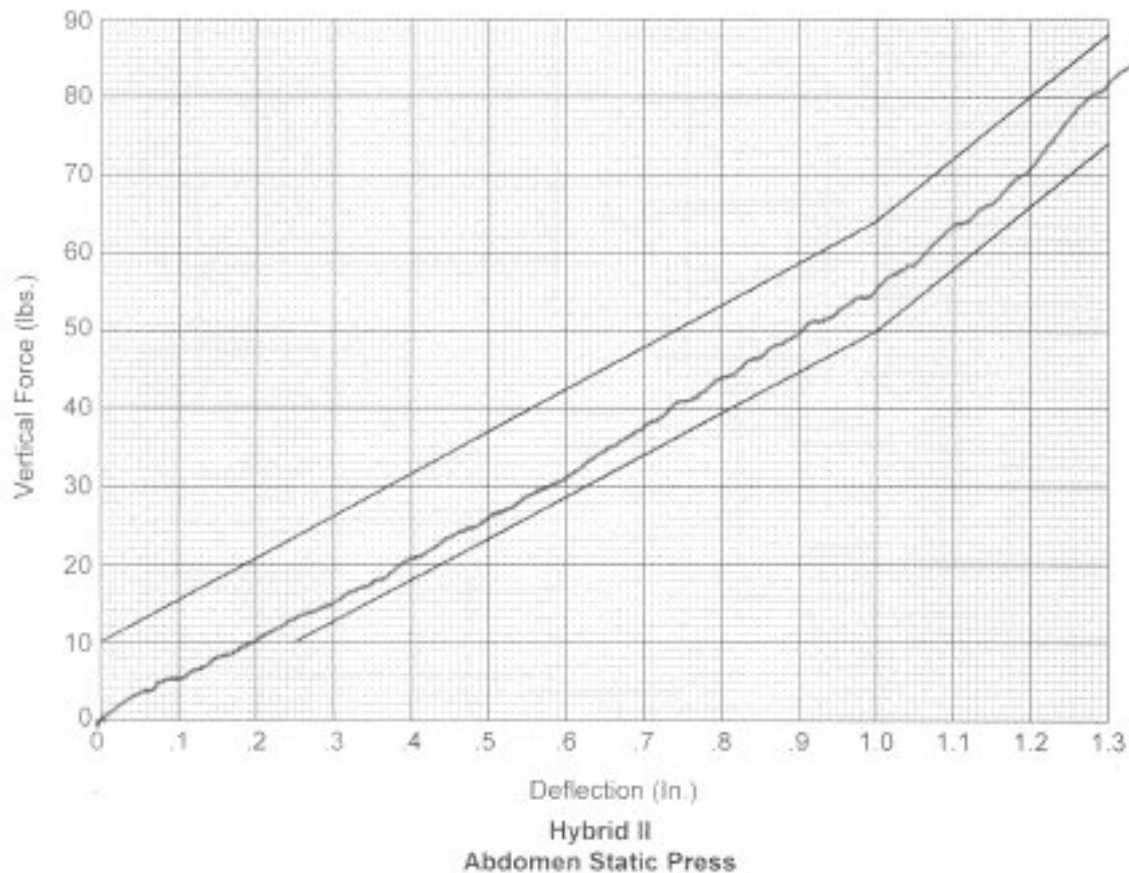
Sequential Test Number:

Laboratory Technician:

5

B. Swiecicki

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 35.00        |
| FORCE @ 13 mm (N)     | 104 - 162     | 118.99       |
| FORCE @ 19 mm (N)     | 163 - 221     | 182.38       |
| FORCE @ 25 mm (N)     | 222 - 280     | 249.10       |
| FORCE @ 33 mm (N)     | 325 - 391     | 364.75       |



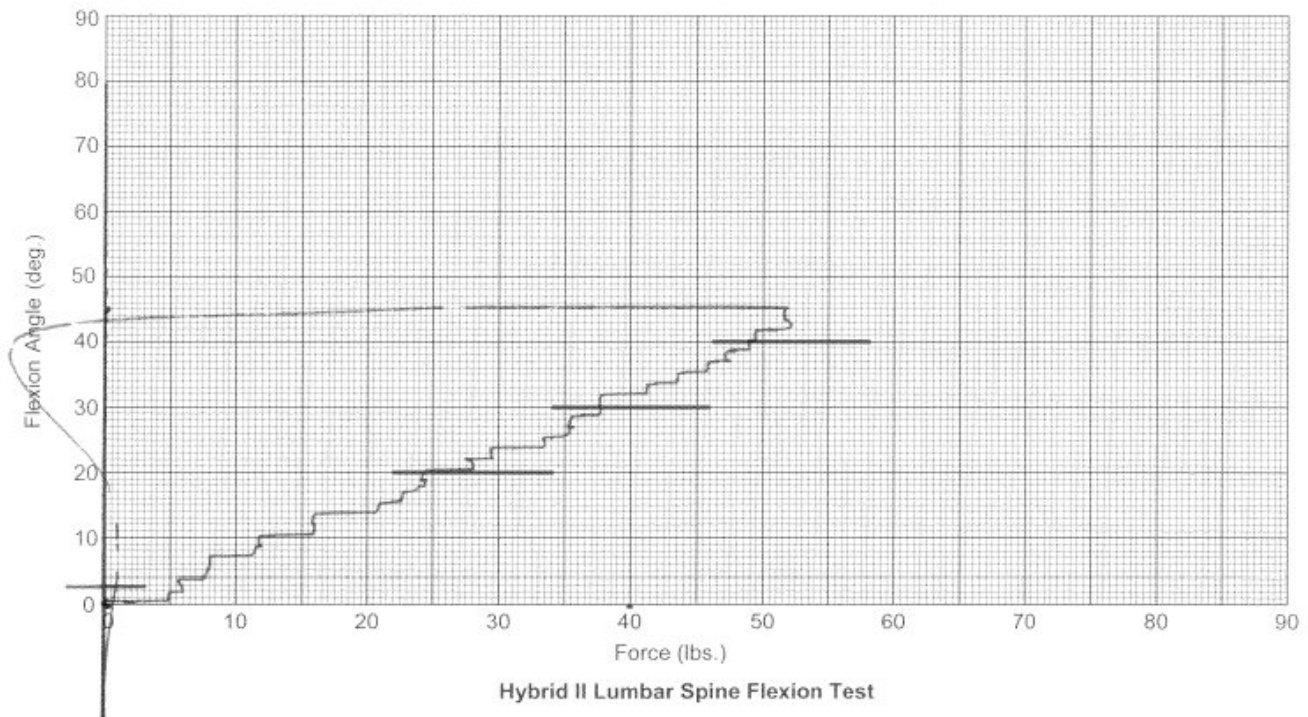
**REMARKS:** None

**LUMBAR FLEXION TEST**  
**PRE-TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

|                        |                                     |  |
|------------------------|-------------------------------------|--|
| SID H3 Serial No.: 270 | Sequential Test Number: 5           |  |
| Date: May 19, 2004     | Laboratory Technician: B. Swiecicki |  |

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 35.00        |
| FORCE @ 0° (N)        | 0 - 26.7      | 0.00         |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 122.33       |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 169.03       |
| FORCE @ 40° (N)       | 204.6 - 258   | 217.96       |
| RETURN ANGLE          | 12° max.      | 3.0°         |



**REMARKS:** None

**PRE-TEST DUMMY INSPECTION LIST**

**CONFIGURED FOR LEFT SIDE IMPACT**

|                        |                                     |  |
|------------------------|-------------------------------------|--|
| SID H3 Serial No.: 270 | Sequential Test Number: 5           |  |
| Date: May 19, 2004     | Laboratory Technician: B. Swiecicki |  |

| PART         | ITEMS CHECKED                                     | COMMENTS |
|--------------|---------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                                 | OK       |
| HEAD         | VISUAL, BALLAST,<br>ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                              | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT,<br>ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                       | OK       |
| STERNUM      | VISUAL                                            | OK       |
| LUMBAR SPINE | VISUAL                                            | OK       |
| ABDOMEN      | VISUAL                                            | OK       |
| PELVIS       | VISUAL, PALPATE,<br>ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                            | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                            | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                           | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                           | OK       |
| FEET         | VISUAL, RANGE OF MOTION                           | OK       |
| JOINTS       | 1 TO 2 g RANGE                                    | OK       |
| OTHER        | NONE                                              | -        |

**REMARKS:** None

**CALIBRATION TEST RESULTS**

**POST TEST**

**SID H3 NO.:** 269

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 269 Sequential Test Number: 4  
Date: 6/2/2004 Laboratory Technician: B. Swiecicki

| TEST                        | COMMENTS                                                               |
|-----------------------------|------------------------------------------------------------------------|
| EXTERNAL DIMENSIONS         | Passed all requirements.                                               |
| LATERAL THORAX IMPACT TEST  | Passed all requirements.                                               |
| LATERAL PELVIS IMPACT TEST  | Passed all requirements.                                               |
| HEAD DROP TEST*             | Passed all requirements.                                               |
| LATERAL NECK BEND TEST*     | Failed Rotation Angle Decay and Maximum Occipital Moment requirements. |
| ABDOMINAL COMPRESSION TEST* | Passed all requirements.                                               |
| LUMBAR FLEXION TEST*        | Passed all requirements.                                               |

\* Test not required for SID certification.

**REMARKS:** None

**EXTERNAL DIMENSIONS  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 269 Sequential Test Number: 4  
Date: 6/3/2004 Laboratory Technician: B. Swiecicki

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 - 909     | 904          |
| RH- Rib Height (mm)                | 502 - 520     | 503          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 234          |
| KH- Knee Pivot from Back Line (mm) | 511 - 526     | 518          |
| KV- Knee Pivot to Floor (mm)       | 490 - 505     | 495          |
| HW- Hip Width (mm)                 | 356 - 391     | 376          |

**REMARKS:** None

# Thorax Impact POST TEST

## CONFIGURED FOR LEFT SIDE IMPACT

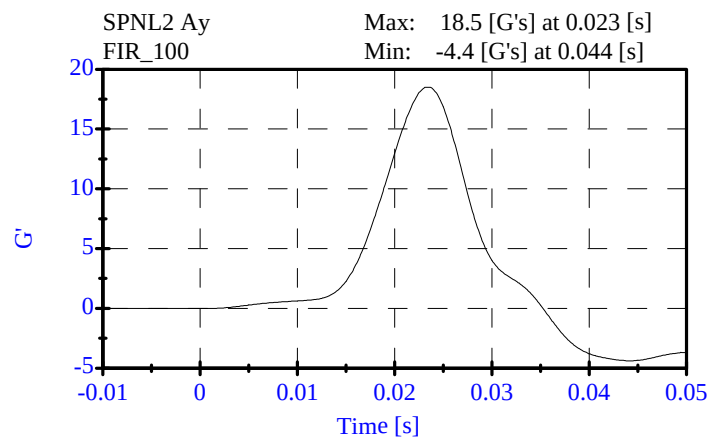
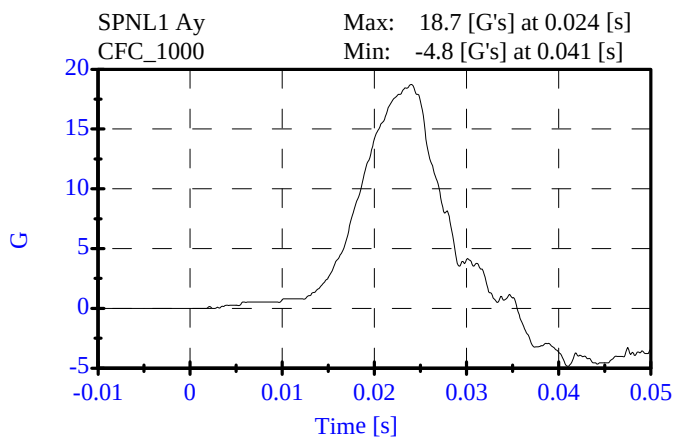
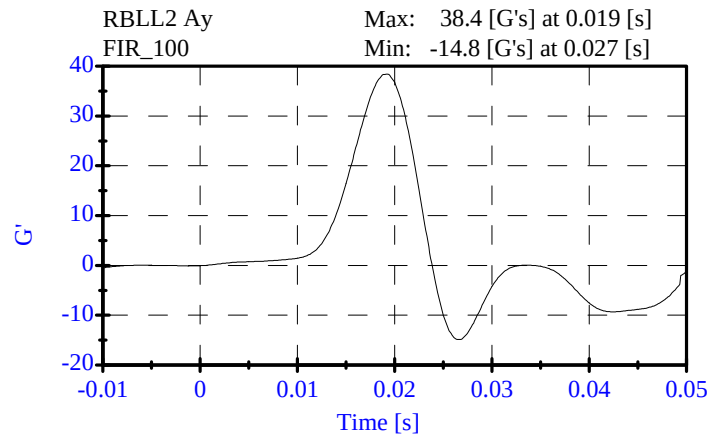
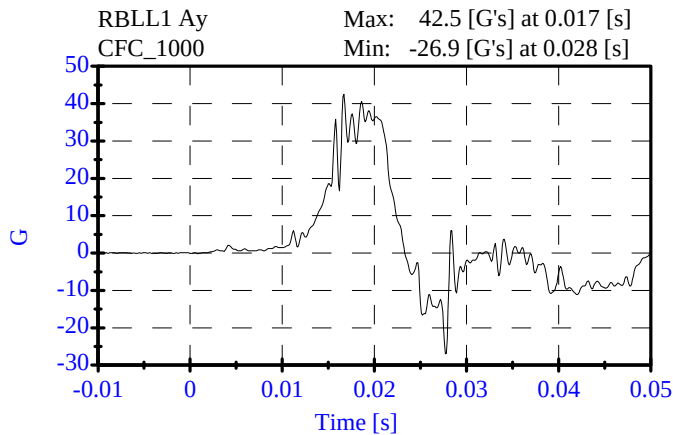
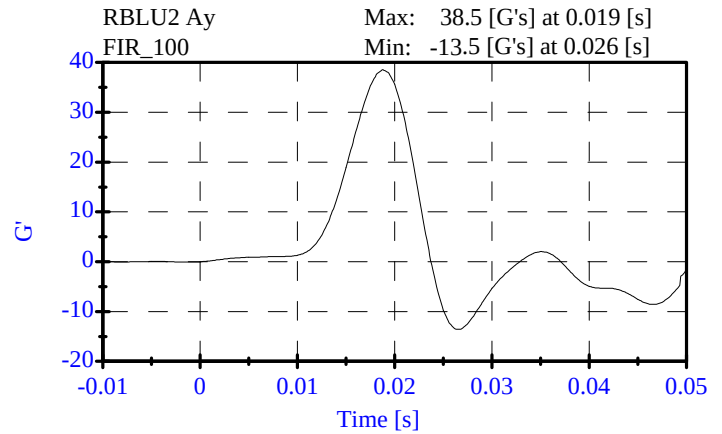
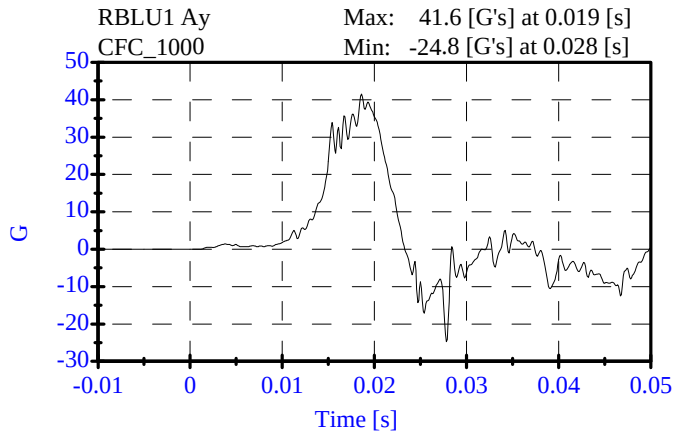
ATD Serial No: 269

Date: 06-02-04

Sequential Test Number: 1 File: 269T 06-02-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER            | SPECIFICATION   | TEST RESULTS | STATUS |
|---------------------------|-----------------|--------------|--------|
| Lab Temperature:          | 18.9-25.5 C     | 21.1 C       | Passed |
| Lab Humidity:             | 10-70 %         | 31.00 %      | Passed |
| Probe Velocity:           | 4.27- 4.33 m/s  | 4.29 m/s     | Passed |
| Upper Rib Acceleration:   | 37.00-46.00 G's | 38.51 G's    | Passed |
| Lower Rib Acceleration:   | 37.00-46.00 G's | 38.44 G's    | Passed |
| Lower Spine Acceleration: | 15.00-22.00 G's | 18.51 G's    | Passed |



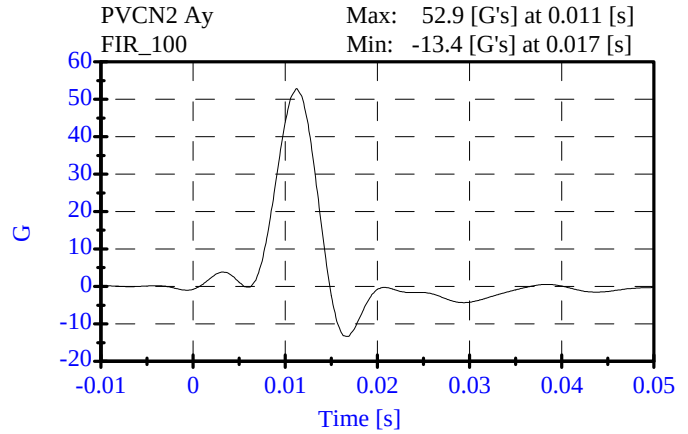
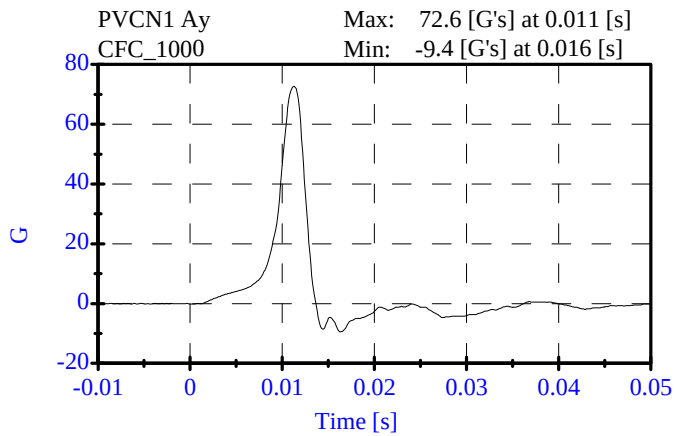
# **Pelvic Impact POST TEST**

## **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 269  
Date: 06-02-04

Sequential Test Number: 1 File: 269P 06-02-04  
Laboratory Technician: B. Swiecicki

| <u>TEST PARAMETER</u>  | <u>SPECIFICATION</u> | <u>TEST RESULTS</u> | <u>STATUS</u> |
|------------------------|----------------------|---------------------|---------------|
| Lab Temperature:       | 18.9-25.5 C          | 21.1 C              | Passed        |
| Lab Humidity:          | 10-70 %              | 31.00 %             | Passed        |
| Probe Velocity:        | 4.27- 4.33 m/s       | 4.30 m/s            | Passed        |
| Pelvis Y Acceleration: | 40.00-60.00 G's      | 52.86 G's           | Passed        |
| Time Above 20 Gs       | 3.0-7.0 ms           | 5.3 ms              | Passed        |



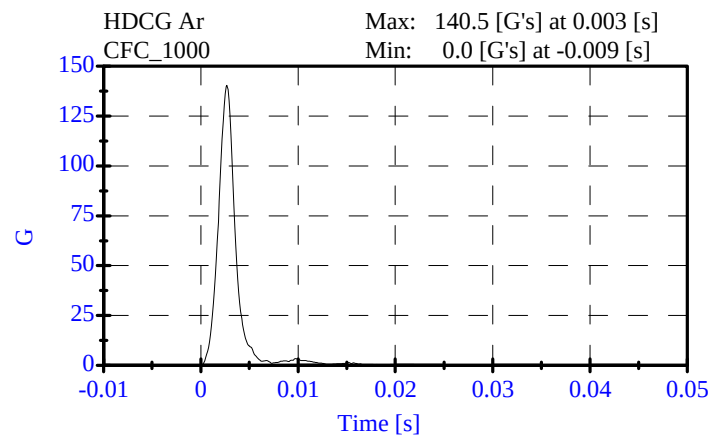
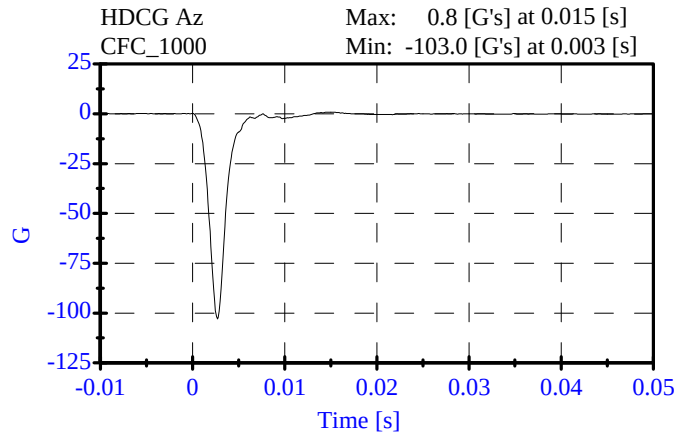
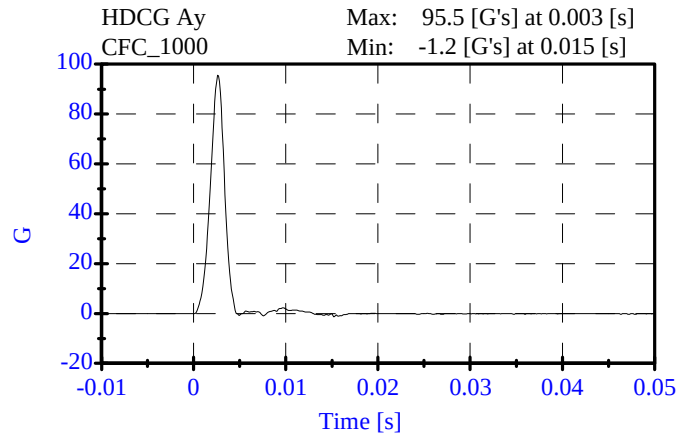
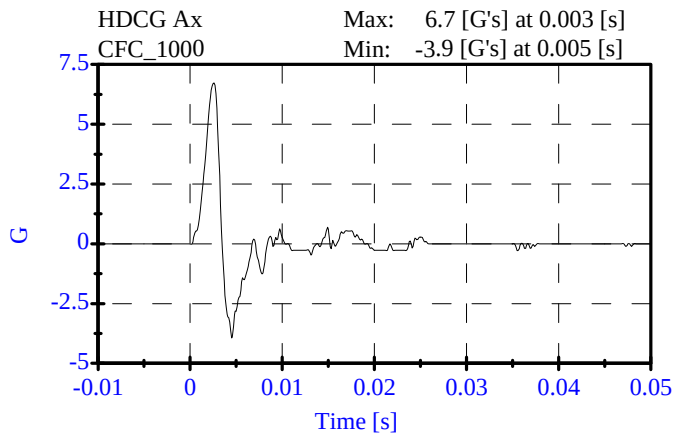
# Head Drop POST TEST

## CONFIGURED FOR LEFT SIDE IMPACT

ATD Serial No: 269  
Date: 06-01-04

Sequential Test Number: 1 File: 269H 06-01-04  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER          | SPECIFICATION | TEST RESULTS | STATUS |
|-------------------------|---------------|--------------|--------|
| Lab Temperature:        | 20.6-22.2 C   | 21.1 C       | Passed |
| Lab Humidity:           | 10-70 %       | 29.00 %      | Passed |
| Peak Resultant Accel.:  | 120-150 Gs    | 140.50 Gs    | Passed |
| Peak Lateral Accel.:    | 15 Gs Max     | 6.72 Gs      | Passed |
| Curve PerCent NonModal: | < 15%         | 2.47 %       | Passed |



**Neck Test  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 269  
Date: 06-02-04

Sequential Test Number: 1 File: 269N2 06-02-04  
Laboratory Technician: B. Swiecicki

| <u>TEST PARAMETER</u>                                                  | <u>SPECIFICATION</u> | <u>TEST RESULTS</u> | <u>STATUS</u> |
|------------------------------------------------------------------------|----------------------|---------------------|---------------|
| Lab Temperature:                                                       | 20.6-22.2 C          | 21.1 C              | Passed        |
| Lab Humidity:                                                          | 10-70 %              | 31.00 %             | Passed        |
| Impact Velocity:                                                       | 6.89- 7.13 m/s       | 7.01 m/s            | Passed        |
| <b>PENDULUM DELTA V</b>                                                |                      |                     |               |
| Delta V at 10 ms:                                                      | 1.96- 2.55 m/s       | 2.04 m/s            | Passed        |
| Delta V at 20 ms:                                                      | 4.12- 5.10 m/s       | 4.28 m/s            | Passed        |
| Delta V at 30 ms:                                                      | 5.73- 7.01 m/s       | 6.21 m/s            | Passed        |
| Delta V between 40-70 ms:                                              | 6.27- 7.64 m/s       | 7.21 m/s            | Passed        |
| <b>D PLANE ROTATION</b>                                                |                      |                     |               |
| Maximum Rotation:                                                      | 66.0-82.0 Deg        | 71.40 Deg           | Passed        |
| Rotation Angle Decay:                                                  | 58.0-67.0 ms         | 55.20 ms            | Failed        |
| <b>MOMENT ABOUT THE OCCIPITAL CONDYLE</b>                              |                      |                     |               |
| Max Occipital Moment:                                                  | 73.00- 88.00 N-m     | 92.33 N-m           | Failed        |
| Occipital Moment Decay:                                                | 49.0-64.0 ms         | 51.30 ms            | Passed        |
| <b>HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT</b> |                      |                     |               |
| Moment to Rotation Peak:                                               | 2.0-16.0 ms          | 11.10 ms            | Passed        |

Neck Test  
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

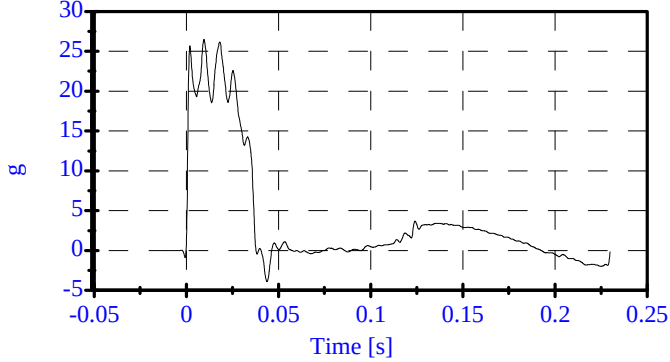
ATD Serial No: 269

Date: 06-02-04

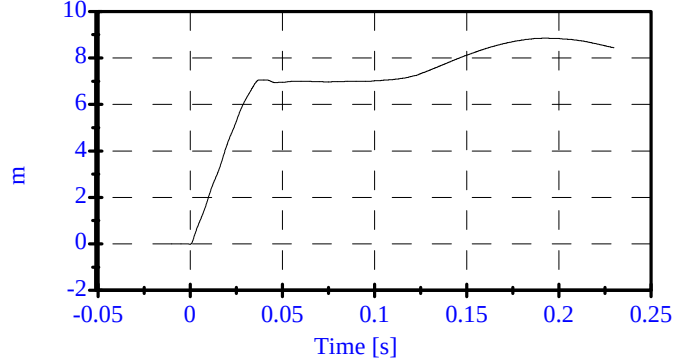
Sequential Test Number: 1 File: 269N2 06-02-04

Laboratory Technician: B. Swiecicki

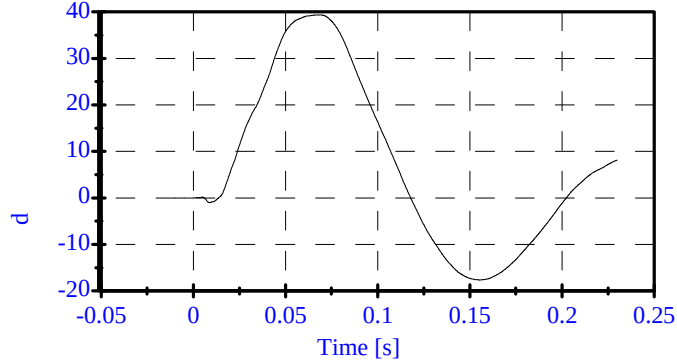
Pend Ax  
CFC\_180  
Max: 26.5 [g's] at 0.010 [s]  
Min: -3.9 [g's] at 0.044 [s]



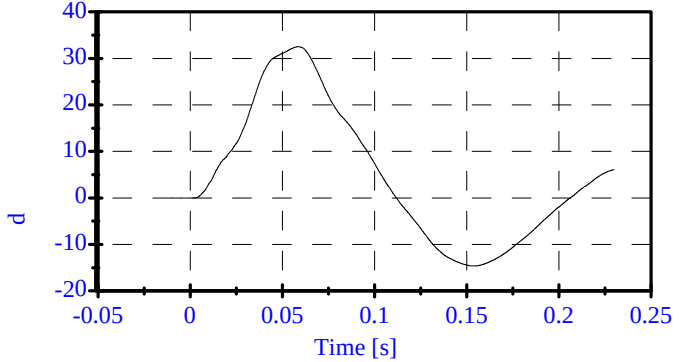
Pend Vx  
CFC\_180  
Max: 8.9 [m/s] at 0.193 [s]  
Min: -0.0 [m/s] at -0.000 [s]



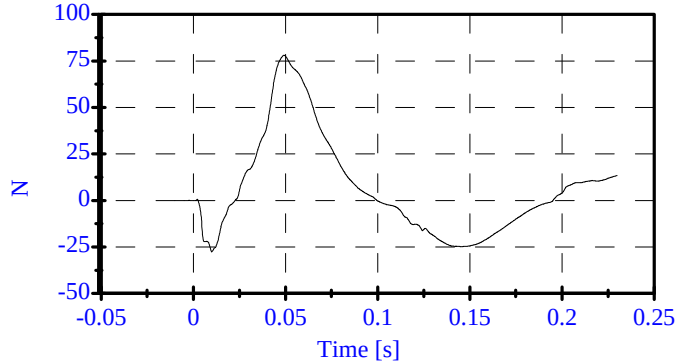
Head Rot  
CFC\_180  
Max: 39.4 [degrees] at 0.069 [s]  
Min: -17.6 [degrees] at 0.156 [s]



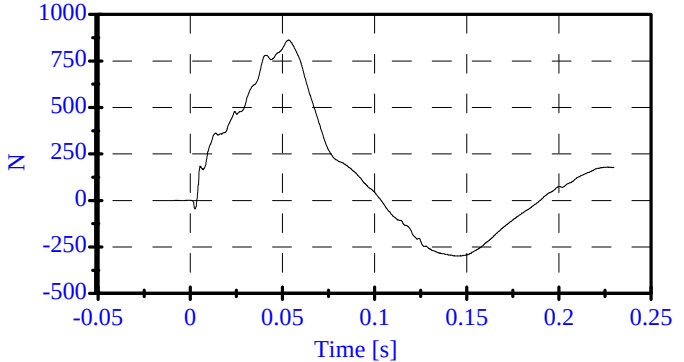
Arm Rot  
CFC\_180  
Max: 32.5 [degrees] at 0.059 [s]  
Min: -14.6 [degrees] at 0.154 [s]



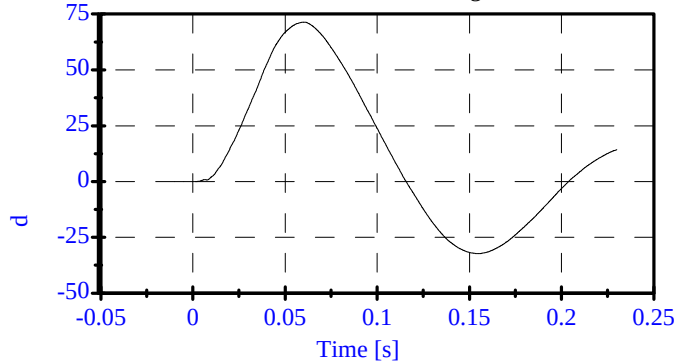
Neck Mx  
CFC\_600  
Max: 78.0 [N-m] at 0.049 [s]  
Min: -27.5 [N-m] at 0.010 [s]



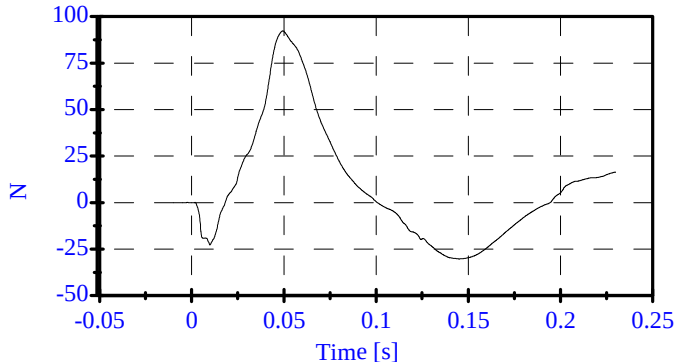
Neck Fy  
CFC\_1000  
Max: 862.5 [N] at 0.053 [s]  
Min: -299.5 [N] at 0.144 [s]



Tot Rot  
CFC\_180  
Max: 71.4 [degrees] at 0.061 [s]  
Min: -32.2 [degrees] at 0.155 [s]



Mocx  
Max: 92.3 [N-m] at 0.049 [s]  
Min: -30.2 [N-m] at 0.145 [s]



**ABDOMINAL COMPRESSION TEST  
POST TEST**

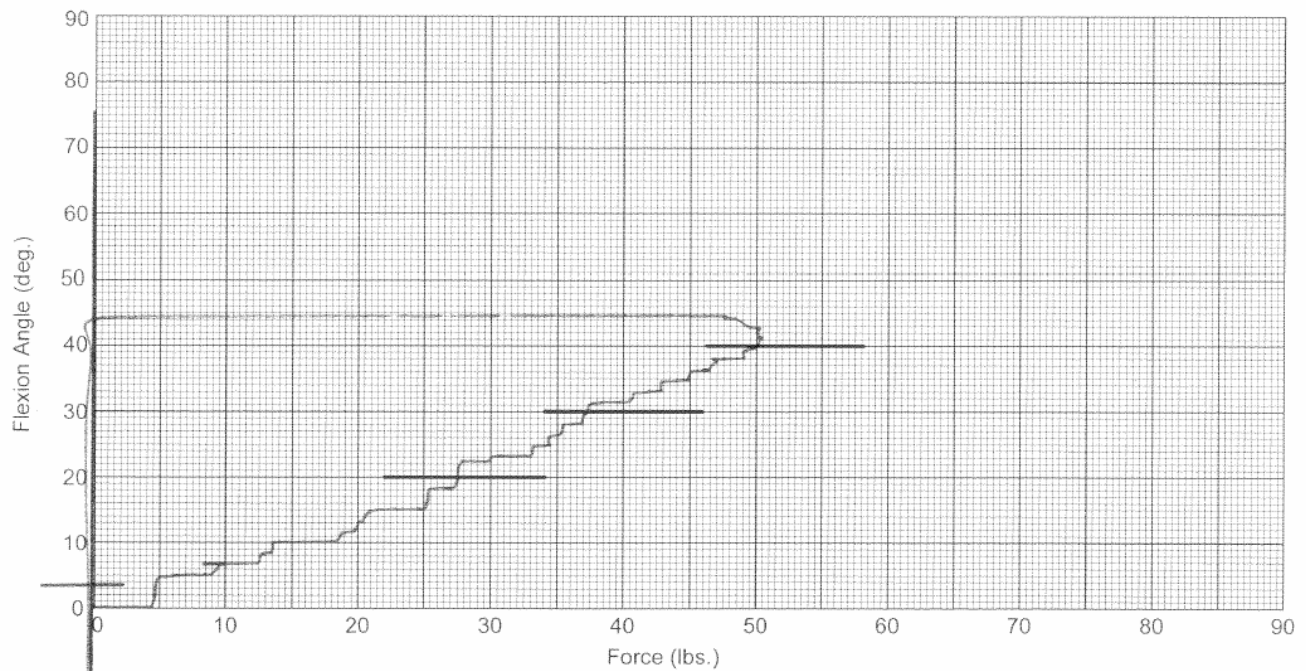
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

|                               |                                            |  |
|-------------------------------|--------------------------------------------|--|
| SID H3 Serial No.: <u>269</u> | Sequential Test Number: <u>4</u>           |  |
| Date: <u>6/3/2004</u>         | Laboratory Technician: <u>B. Swiecicki</u> |  |

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 28           |
| FORCE @ 13 mm (N)     | 104 - 162     | 129          |
| FORCE @ 19 mm (N)     | 163 - 221     | 188          |
| FORCE @ 25 mm (N)     | 222 - 280     | 262          |
| FORCE @ 33 mm (N)     | 325 - 391     | 362          |

**REMARKS:** None



**Hybrid II Lumbar Spine Flexion Test**

FM-052-CECT-005-R00

PC32/D52 ISO Forms

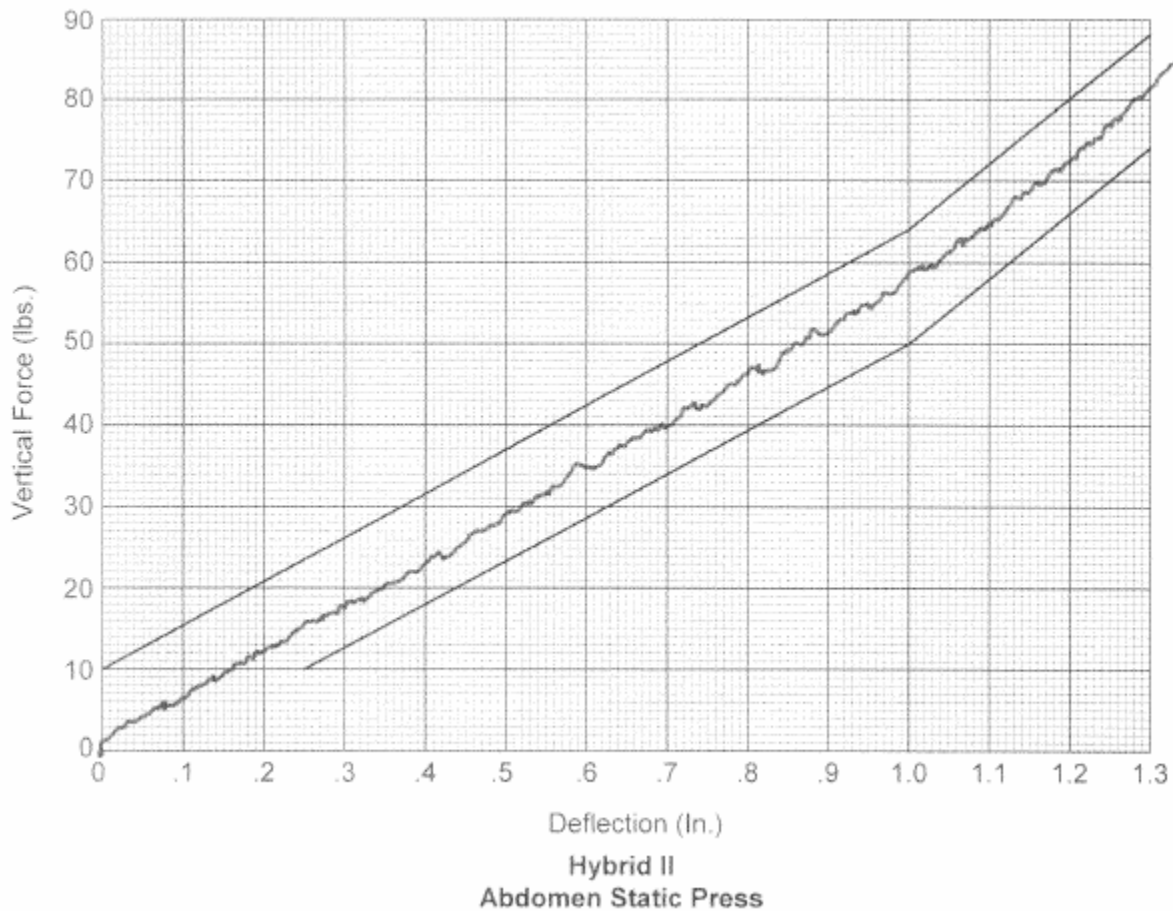
**LUMBAR FLEXION TEST**  
**POST TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

|                        |                                     |
|------------------------|-------------------------------------|
| SID H3 Serial No.: 269 | Sequential Test Number: 4           |
| Date: 6/3/2004         | Laboratory Technician: B. Swiecicki |

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 28           |
| FORCE @ 0° (N)        | 0 - 26.7      | 0.0          |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 122          |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 166          |
| FORCE @ 40° (N)       | 204.6 - 258   | 222          |
| RETURN ANGLE          | 12° max.      | 3.4°         |

**REMARKS:** None



**POST TEST DUMMY INSPECTION LIST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

|                        |                                     |  |
|------------------------|-------------------------------------|--|
| SID H3 Serial No.: 269 | Sequential Test Number: 4           |  |
| Date: 6/3/2004         | Laboratory Technician: B. Swiecicki |  |

| PART         | ITEMS CHECKED                                     | COMMENTS |
|--------------|---------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                                 | OK       |
| HEAD         | VISUAL, BALLAST,<br>ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                              | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT,<br>ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                       | OK       |
| STERNUM      | VISUAL                                            | OK       |
| LUMBAR SPINE | VISUAL                                            | OK       |
| ABDOMEN      | VISUAL                                            | OK       |
| PELVIS       | VISUAL, PALPATE,<br>ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                            | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                            | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                           | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                           | OK       |
| FEET         | VISUAL, RANGE OF MOTION                           | OK       |
| JOINTS       | 1 TO 2 g RANGE                                    | OK       |
| OTHER        | NONE                                              | -        |

**REMARKS:** None

**CALIBRATION TEST RESULTS**

**POST TEST**

**SID H3 NO.:** 270

**CONFIGURED FOR LEFT SIDE IMPACT**

**CALIBRATION TEST RESULTS SUMMARY  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: 6/3/2004 Laboratory Technician: B. Swiecicki

| TEST                        | COMMENTS                                     |
|-----------------------------|----------------------------------------------|
| EXTERNAL DIMENSIONS         | Passed all requirements.                     |
| LATERAL THORAX IMPACT TEST  | Passed all requirements.                     |
| LATERAL PELVIS IMPACT TEST  | Passed all requirements.                     |
| HEAD DROP TEST*             | Passed all requirements.                     |
| LATERAL NECK BEND TEST*     | Failed Maximum Occipital Moment requirements |
| ABDOMINAL COMPRESSION TEST* | Passed all requirements.                     |
| LUMBAR FLEXION TEST*        | Passed all requirements.                     |

\* Test not required for SID certification.

**REMARKS:** None

**EXTERNAL DIMENSIONS  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: 6/3/2004 Laboratory Technician: B. Swiecicki

| TEST PARAMETER                     | SPECIFICATION | TEST RESULTS |
|------------------------------------|---------------|--------------|
| SH- Seated Height (mm)             | 889 - 909     | 904          |
| RH- Rib Height (mm)                | 502 - 520     | 505          |
| HP- Hip Pivot Height (mm)          | 99 ref.       | 99           |
| RD- Rib from Back Line (mm)        | 229 - 241     | 234          |
| KH- Knee Pivot from Back Line (mm) | 511 - 526     | 516          |
| KV- Knee Pivot to Floor (mm)       | 490 - 505     | 495          |
| HW- Hip Width (mm)                 | 356 - 391     | 378          |

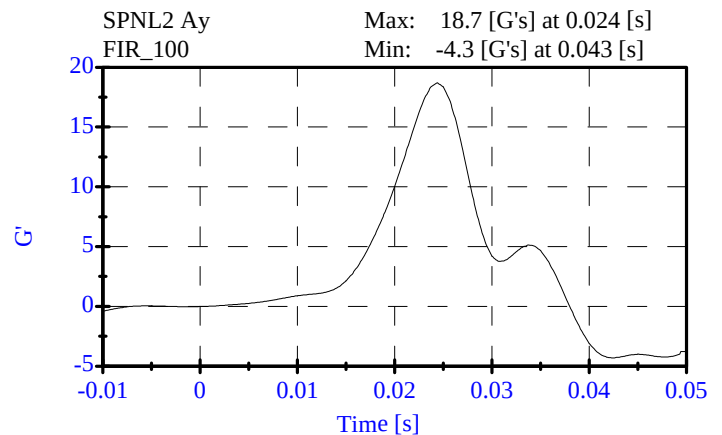
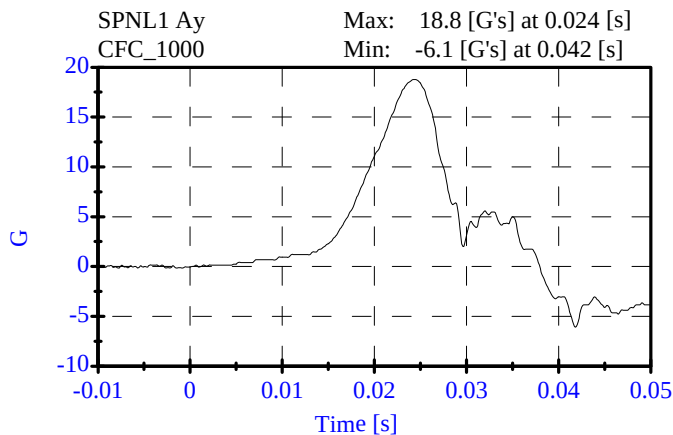
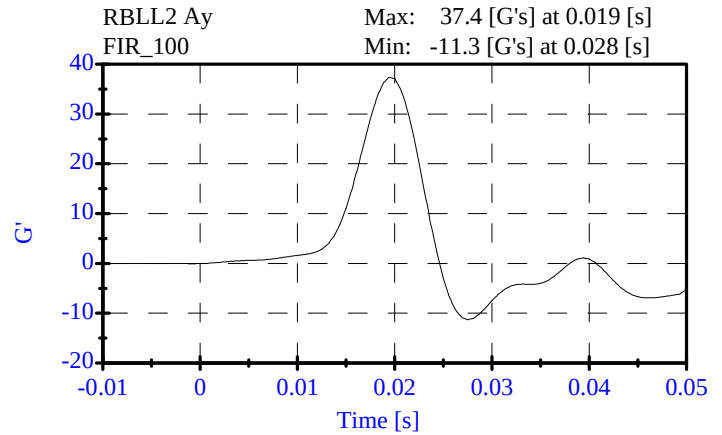
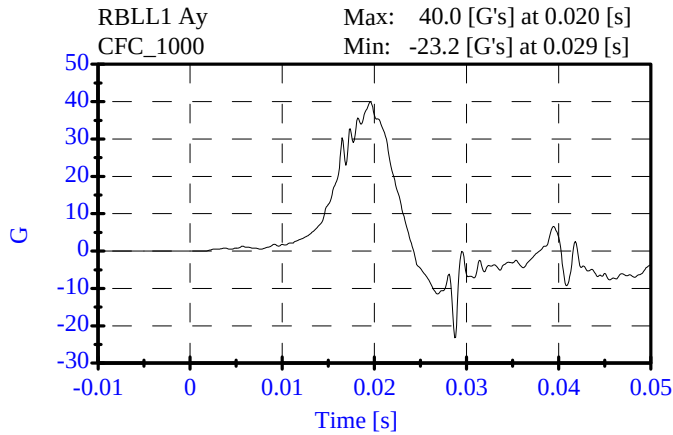
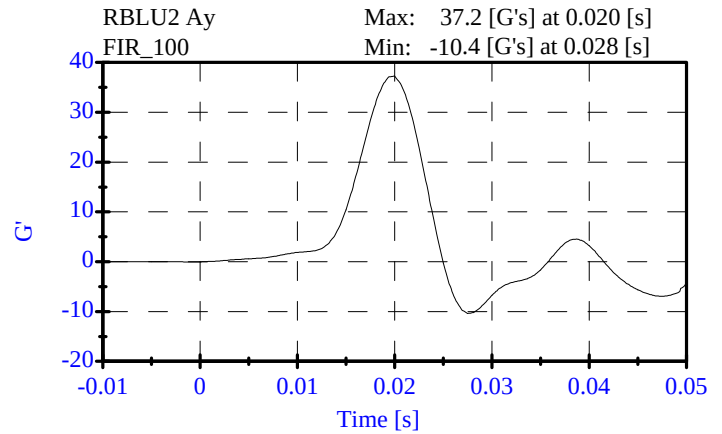
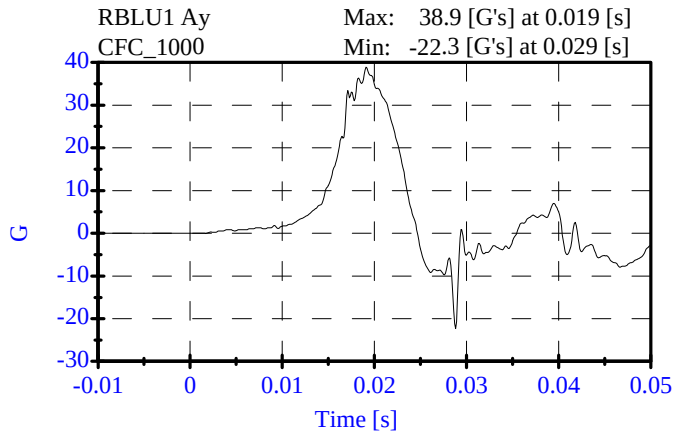
**REMARKS:** None

**Thorax Impact**  
**POST TEST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: 06-02-04

Sequential Test Number: 1 File: 270T 06-02-04  
Laboratory Technician: B. Swiecicki

| TEST PARAMETER            | SPECIFICATION   | TEST RESULTS | STATUS |
|---------------------------|-----------------|--------------|--------|
| Lab Temperature:          | 18.9-25.5 C     | 21.1 C       | Passed |
| Lab Humidity:             | 10-70 %         | 31.00 %      | Passed |
| Probe Velocity:           | 4.27- 4.33 m/s  | 4.30 m/s     | Passed |
| Upper Rib Acceleration:   | 37.00-46.00 G's | 37.23 G's    | Passed |
| Lower Rib Acceleration:   | 37.00-46.00 G's | 37.40 G's    | Passed |
| Lower Spine Acceleration: | 15.00-22.00 G's | 18.70 G's    | Passed |



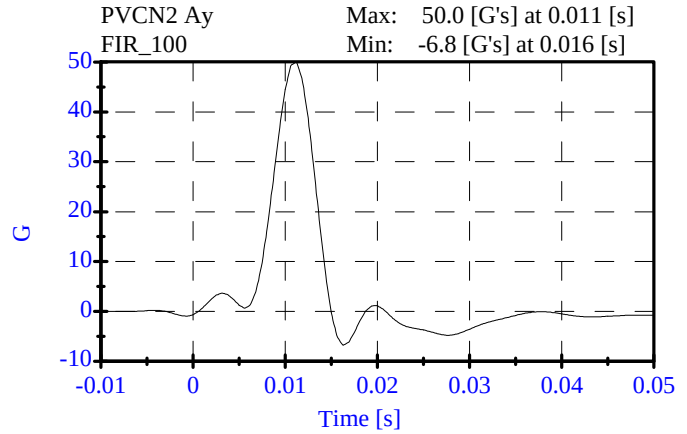
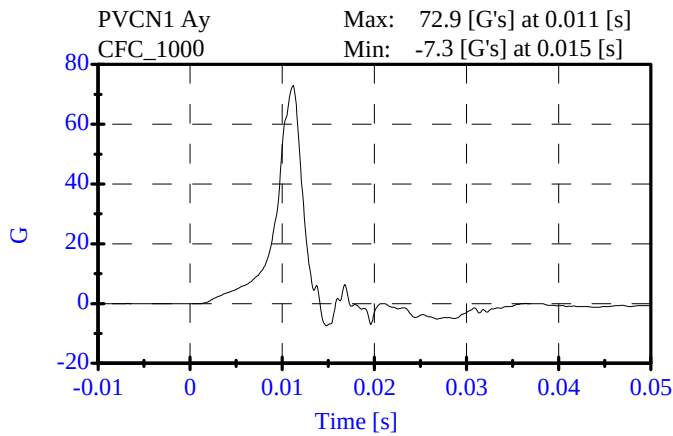
# **Pelvic Impact POST TEST**

## **CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: 06-03-04

Sequential Test Number: 1 File: 270P 06-03-04  
Laboratory Technician: B. Swiecicki

| <u>TEST PARAMETER</u>  | <u>SPECIFICATION</u> | <u>TEST RESULTS</u> | <u>STATUS</u> |
|------------------------|----------------------|---------------------|---------------|
| Lab Temperature:       | 18.9-25.5 C          | 21.1 C              | Passed        |
| Lab Humidity:          | 10-70 %              | 28.00 %             | Passed        |
| Probe Velocity:        | 4.27- 4.33 m/s       | 4.31 m/s            | Passed        |
| Pelvis Y Acceleration: | 40.00-60.00 G's      | 50.00 G's           | Passed        |
| Time Above 20 Gs       | 3.0-7.0 ms           | 5.3 ms              | Passed        |



# Head Drop POST TEST

## CONFIGURED FOR LEFT SIDE IMPACT

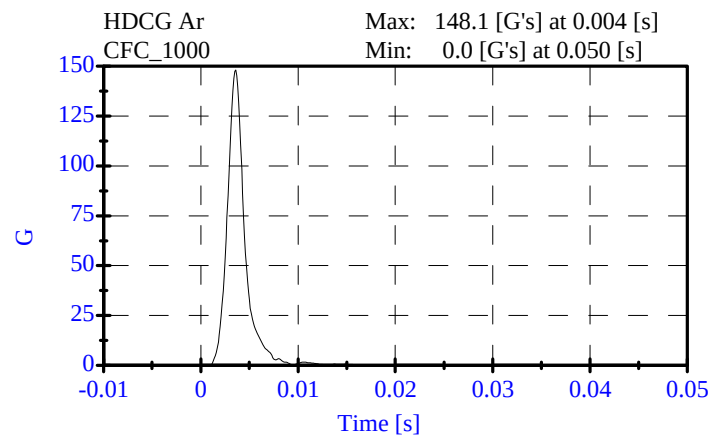
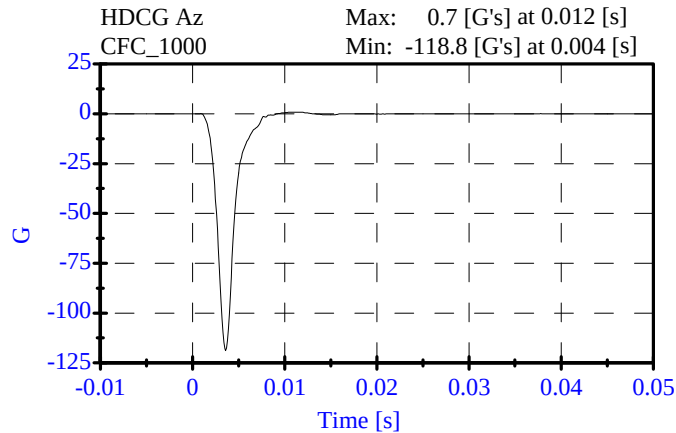
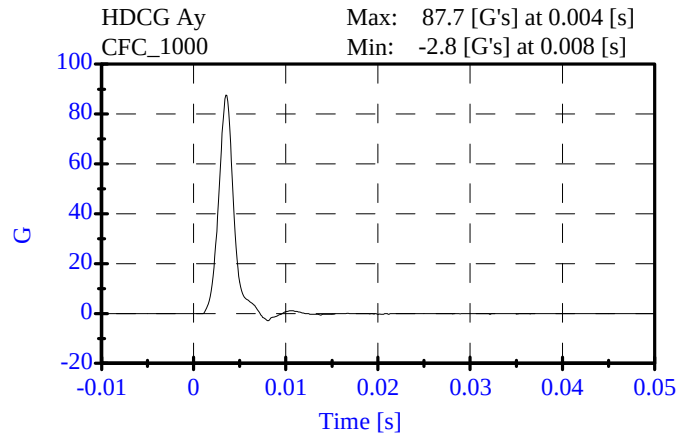
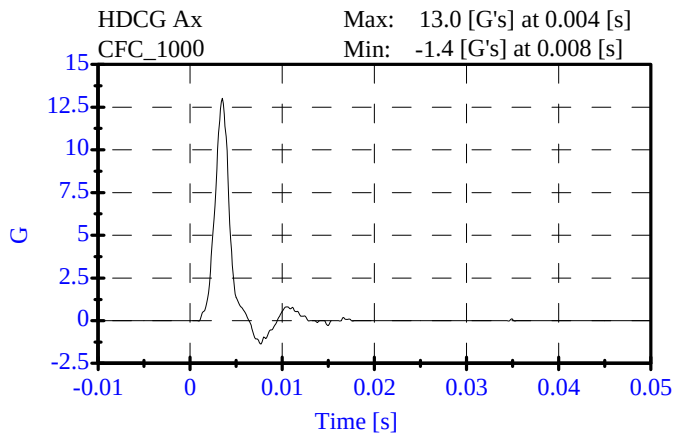
ATD Serial No: 270

Date: 06-01-04

Sequential Test Number: 1 File: 270H 06-01-04

Laboratory Technician: B. Swiecicki

| TEST PARAMETER          | SPECIFICATION | TEST RESULTS | STATUS |
|-------------------------|---------------|--------------|--------|
| Lab Temperature:        | 20.6-22.2 C   | 21.1 C       | Passed |
| Lab Humidity:           | 10-70 %       | 29.00 %      | Passed |
| Peak Resultant Accel.:  | 120-150 Gs    | 148.08 Gs    | Passed |
| Peak Lateral Accel.:    | 15 Gs Max     | 13.01 Gs     | Passed |
| Curve PerCent NonModal: | < 15%         | 2.27 %       | Passed |



**Neck Test  
POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

ATD Serial No: 270  
Date: 06-02-04

Sequential Test Number: 1 File: 270N 06-02-04  
Laboratory Technician: B. Swiecicki

| <u>TEST PARAMETER</u>                                                  | <u>SPECIFICATION</u> | <u>TEST RESULTS</u> | <u>STATUS</u> |
|------------------------------------------------------------------------|----------------------|---------------------|---------------|
| Lab Temperature:                                                       | 20.6-22.2 C          | 21.1 C              | Passed        |
| Lab Humidity:                                                          | 10-70 %              | 31.00 %             | Passed        |
| Impact Velocity:                                                       | 6.89- 7.13 m/s       | 7.01 m/s            | Passed        |
| <b>PENDULUM DELTA V</b>                                                |                      |                     |               |
| Delta V at 10 ms:                                                      | 1.96- 2.55 m/s       | 2.00 m/s            | Passed        |
| Delta V at 20 ms:                                                      | 4.12- 5.10 m/s       | 4.16 m/s            | Passed        |
| Delta V at 30 ms:                                                      | 5.73- 7.01 m/s       | 6.08 m/s            | Passed        |
| Delta V between 40-70 ms:                                              | 6.27- 7.64 m/s       | 7.10 m/s            | Passed        |
| <b>D PLANE ROTATION</b>                                                |                      |                     |               |
| Maximum Rotation:                                                      | 66.0-82.0 Deg        | 73.91 Deg           | Passed        |
| Rotation Angle Decay:                                                  | 58.0-67.0 ms         | 61.60 ms            | Passed        |
| <b>MOMENT ABOUT THE OCCIPITAL CONDYLE</b>                              |                      |                     |               |
| Max Occipital Moment:                                                  | 73.00- 88.00 N-m     | 89.55 N-m           | Failed        |
| Occipital Moment Decay:                                                | 49.0-64.0 ms         | 55.70 ms            | Passed        |
| <b>HEAD ROTATION TIME WITH RESPECT TO THE OCCIPITAL CONDYLE MOMENT</b> |                      |                     |               |
| Moment to Rotation Peak:                                               | 2.0-16.0 ms          | 9.90 ms             | Passed        |

Neck Test  
POST TEST

CONFIGURED FOR LEFT SIDE IMPACT

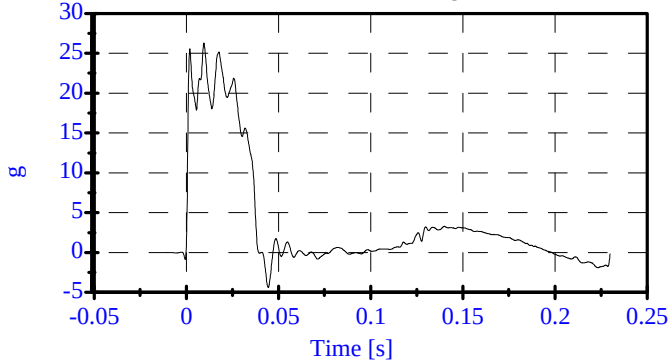
ATD Serial No: 270

Date: 06-02-04

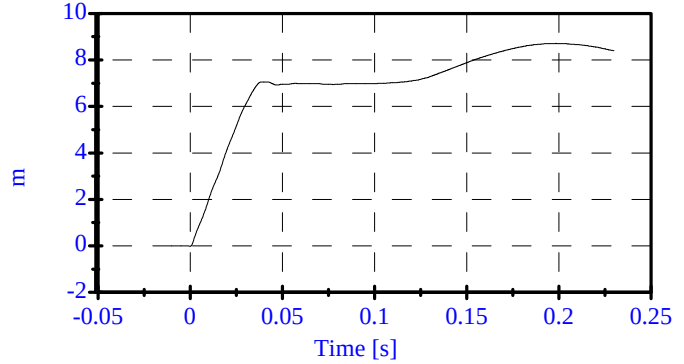
Sequential Test Number: 1 File: 270N 06-02-04

Laboratory Technician: B. Swiecicki

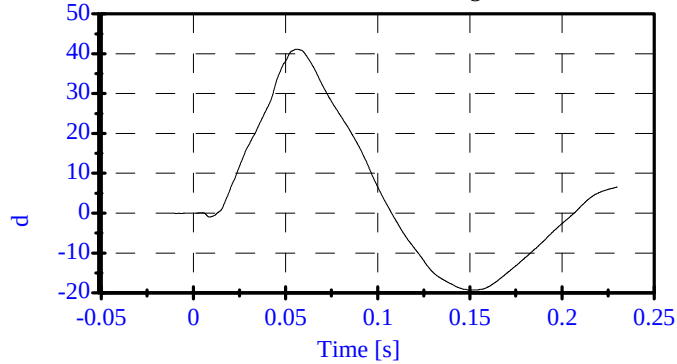
Pend Ax  
CFC\_180  
Max: 26.3 [g's] at 0.010 [s]  
Min: -4.4 [g's] at 0.044 [s]



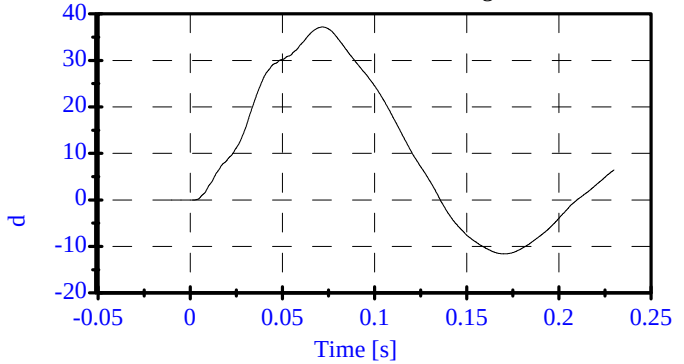
Pend Vx  
CFC\_180  
Max: 8.7 [m/s] at 0.199 [s]  
Min: -0.0 [m/s] at -0.000 [s]



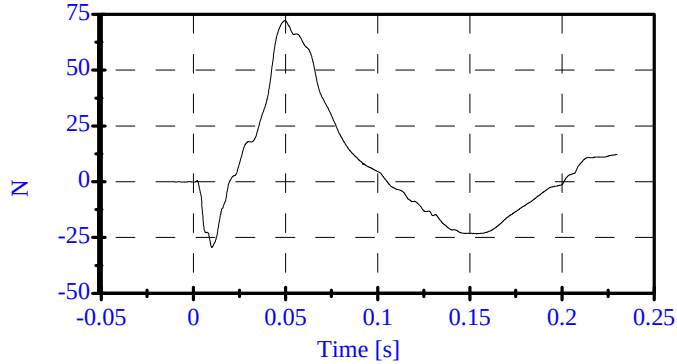
Head Rot  
CFC\_180  
Max: 41.2 [degrees] at 0.056 [s]  
Min: -19.3 [degrees] at 0.150 [s]



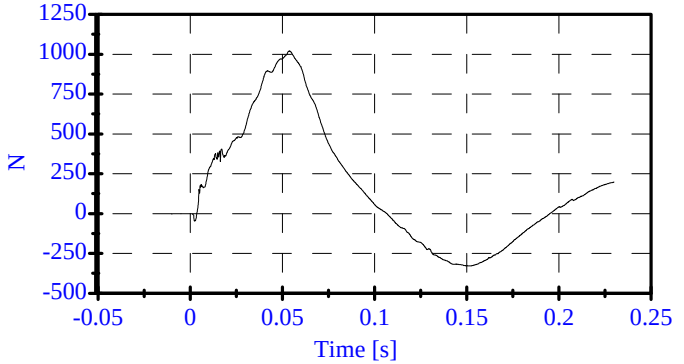
Arm Rot  
CFC\_180  
Max: 37.2 [degrees] at 0.072 [s]  
Min: -11.6 [degrees] at 0.171 [s]



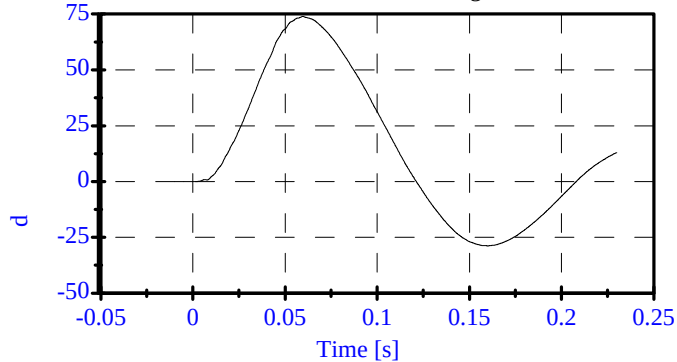
Neck Mx  
CFC\_600  
Max: 72.3 [N-m] at 0.050 [s]  
Min: -29.3 [N-m] at 0.010 [s]



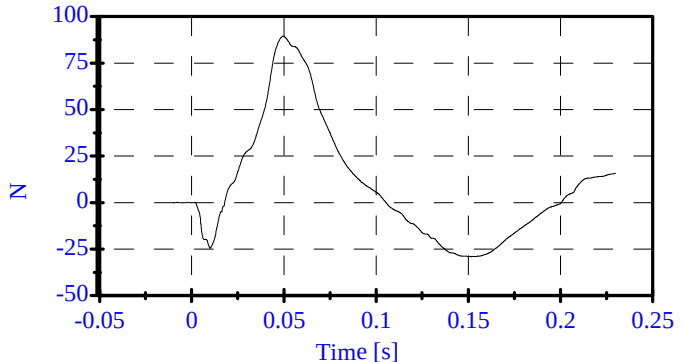
Neck Fy  
CFC\_1000  
Max: 1021.5 [N] at 0.054 [s]  
Min: -328.5 [N] at 0.152 [s]



Tot Rot  
CFC\_180  
Max: 73.9 [degrees] at 0.060 [s]  
Min: -28.8 [degrees] at 0.160 [s]



Mocx  
Max: 89.6 [N-m] at 0.050 [s]  
Min: -29.0 [N-m] at 0.152 [s]



**ABDOMINAL COMPRESSION TEST  
POST TEST**

(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270

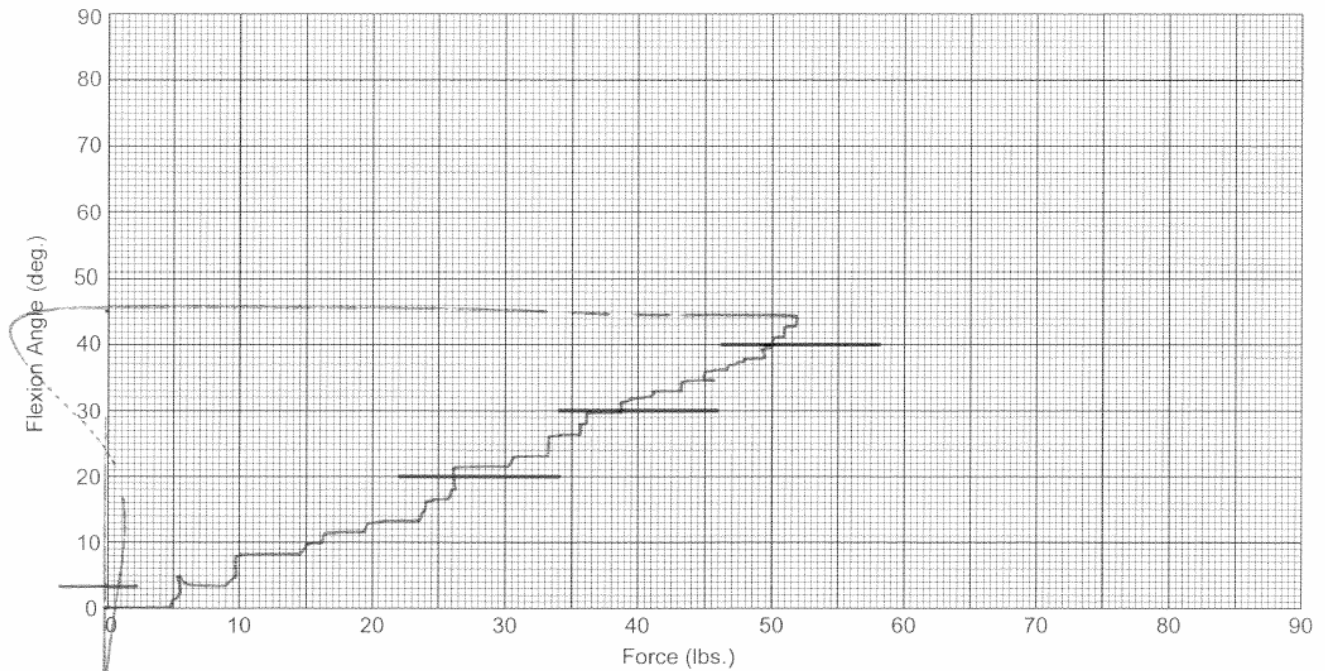
Date: 6/3/2004

Sequential Test Number: 1

Laboratory Technician: B. Swiecicki

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 28           |
| FORCE @ 13 mm (N)     | 104 - 162     | 124          |
| FORCE @ 19 mm (N)     | 163 - 221     | 187          |
| FORCE @ 25 mm (N)     | 222 - 280     | 226          |
| FORCE @ 33 mm (N)     | 325 - 391     | 365          |

**REMARKS:** None



FM-052-CERT-005-R00

PC32/D52 ISO Forms

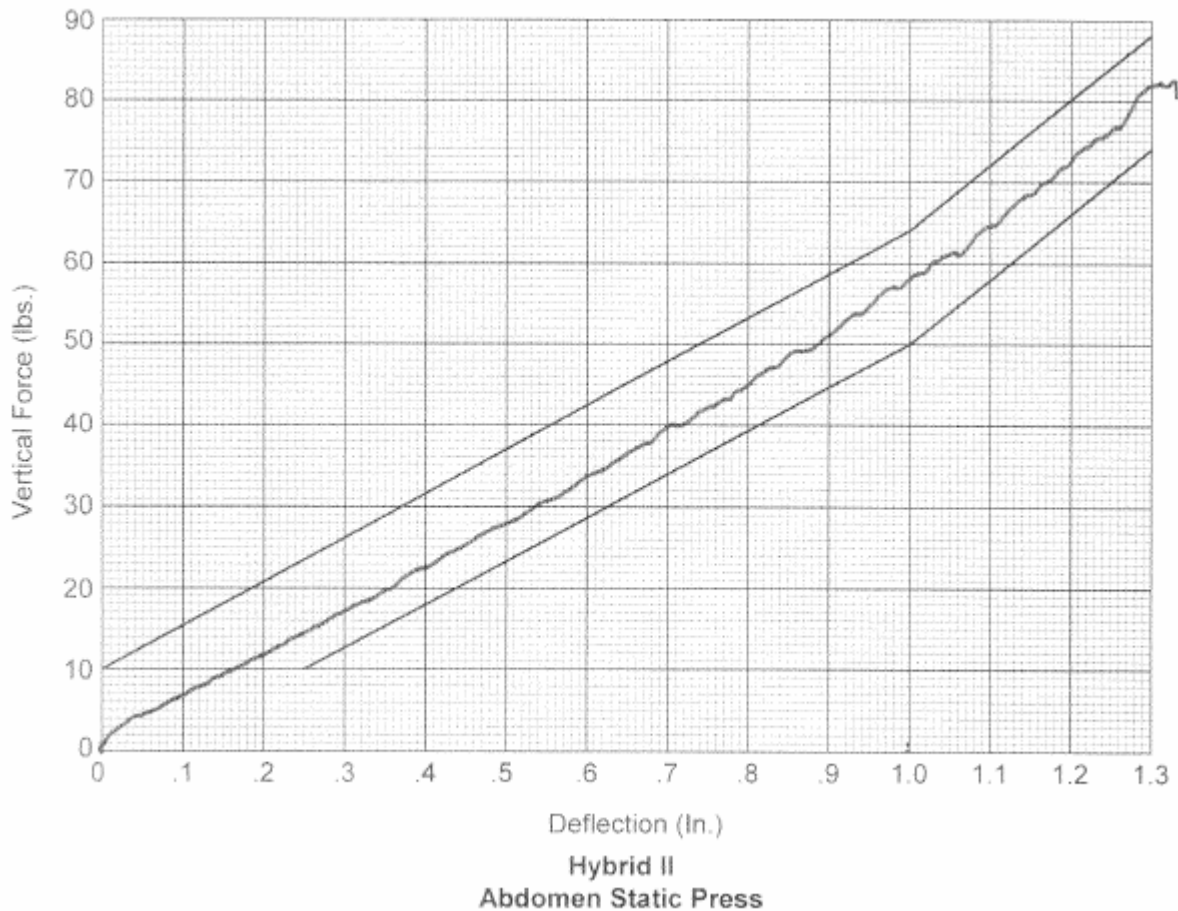
**LUMBAR FLEXION TEST**  
**POST TEST**  
(Test not required for SID certification)

**CONFIGURED FOR LEFT SIDE IMPACT**

|                               |                                            |  |
|-------------------------------|--------------------------------------------|--|
| SID H3 Serial No.: <u>270</u> | Sequential Test Number: <u>1</u>           |  |
| Date: <u>6/3/2004</u>         | Laboratory Technician: <u>B. Swiecicki</u> |  |

| TEST PARAMETER        | SPECIFICATION | TEST RESULTS |
|-----------------------|---------------|--------------|
| TEMPERATURE (°C)      | 18.9 - 25.5   | 21.1         |
| RELATIVE HUMIDITY (%) | 10 - 70       | 28           |
| FORCE @ 0° (N)        | 0 - 26.7      | 0.0          |
| FORCE @ 20° (N)       | 97.8 - 151.2  | 116          |
| FORCE @ 30° (N)       | 151.2 - 204.6 | 167          |
| FORCE @ 40° (N)       | 204.6 - 258   | 222          |
| RETURN ANGLE          | 12° max.      | 3.2°         |

**REMARKS:** None



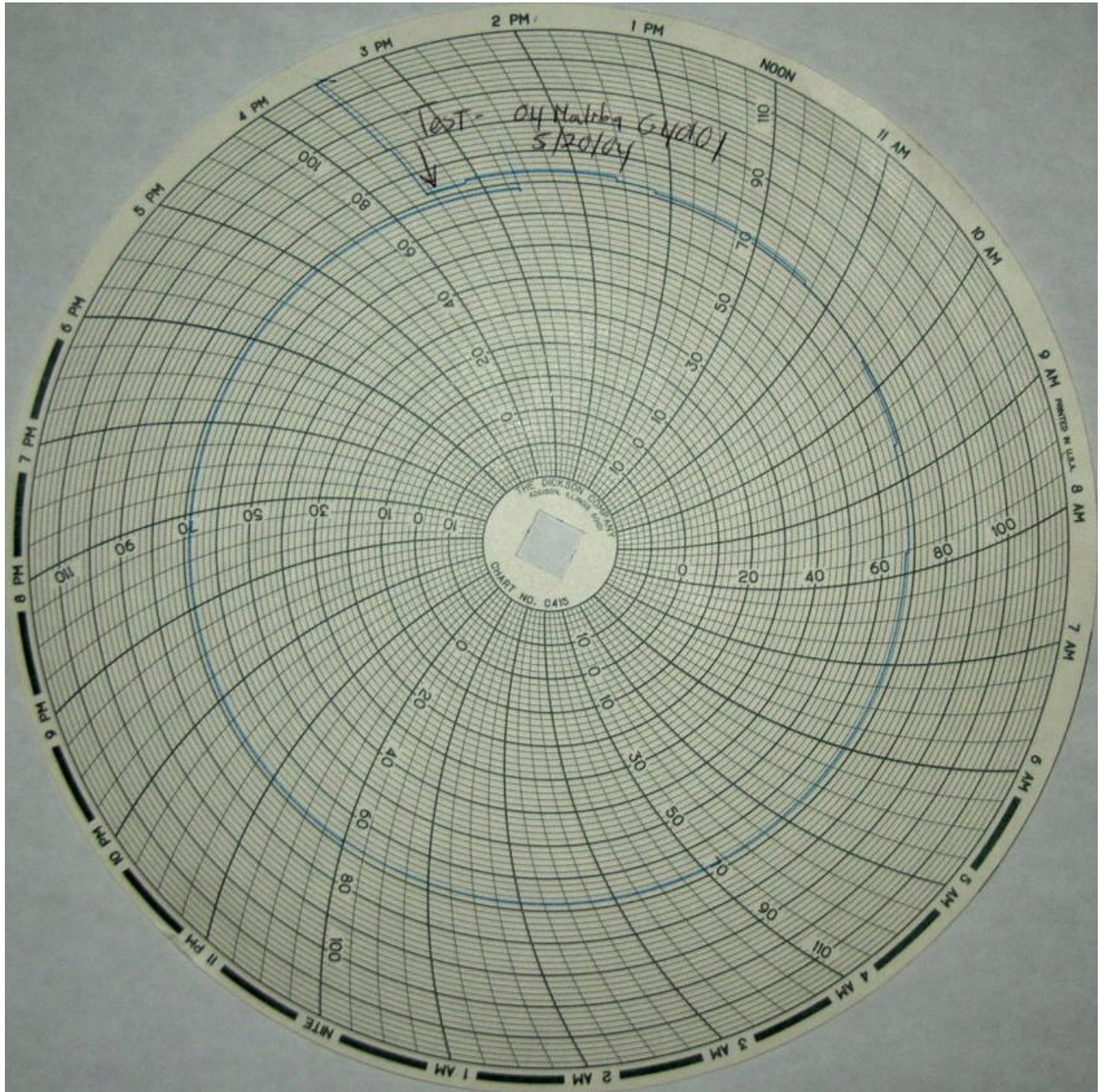
**POST TEST DUMMY INSPECTION LIST**  
**CONFIGURED FOR LEFT SIDE IMPACT**

SID H3 Serial No.: 270 Sequential Test Number: 1  
Date: 6/3/2004 Laboratory Technician: B. Swiecicki

| PART         | ITEMS CHECKED                                     | COMMENTS |
|--------------|---------------------------------------------------|----------|
| SKIN         | VISUAL INSPECTION                                 | OK       |
| HEAD         | VISUAL, BALLAST,<br>ACCELEROMETER MOUNT           | OK       |
| NECK         | VISUAL, CABLE TORQUE                              | OK       |
| SPINE BOX    | VISUAL, BALLAST, WELDMENT,<br>ACCELEROMETER MOUNT | OK       |
| RIB CAGE     | VISUAL, MEASURE, STIFFENERS                       | OK       |
| STERNUM      | VISUAL                                            | OK       |
| LUMBAR SPINE | VISUAL                                            | OK       |
| ABDOMEN      | VISUAL                                            | OK       |
| PELVIS       | VISUAL, PALPATE,<br>ACCELEROMETER MOUNT           | OK       |
| UPPER LEGS   | VISUAL                                            | OK       |
| KNEES        | VISUAL, STOPS, INSERTS                            | OK       |
| LOWER LEGS   | VISUAL, RANGE OF MOTION                           | OK       |
| ANKLES       | VISUAL, RANGE OF MOTION                           | OK       |
| FEET         | VISUAL, RANGE OF MOTION                           | OK       |
| JOINTS       | 1 TO 2 g RANGE                                    | OK       |
| OTHER        | NONE                                              | -        |

**REMARKS:** None

# TEMPERATURE TRACE



## **APPENDIX D**

### **TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

# TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

## SID INSTRUMENTATION

|                       | FRONT SID NO.: 269 |              |                  |
|-----------------------|--------------------|--------------|------------------|
|                       | SERIAL NUMBER      | MANUFACTURER | CALIBRATION DATE |
| HEAD AX               | AC-P23161          | ENDEVCO      | 3/30/2004        |
| HEAD AY               | AC-P24011          | ENDEVCO      | 3/30/2004        |
| HEAD AZ               | AC-P19111          | ENDEVCO      | 3/30/2004        |
| UPPER NECK FX         | LC-440FX           | DENTON       | 6/18/2003        |
| UPPER NECK FY         | LC-440FY           | DENTON       | 6/18/2003        |
| UPPER NECK FZ         | LC-440FZ           | DENTON       | 6/18/2003        |
| UPPER NECK MX         | LC-440MX           | DENTON       | 6/18/2003        |
| UPPER NECK MY         | LC-440MY           | DENTON       | 6/18/2003        |
| UPPER NECK MZ         | LC-440MZ           | DENTON       | 6/18/2003        |
| UPPER RIB             | AC-P16862          | ENDEVCO      | 3/30/2004        |
| LOWER RIB             | AC-P16656          | ENDEVCO      | 3/30/2004        |
| LOWER SPINE           | AC-P16866          | ENDEVCO      | 3/30/2004        |
| PELVIS                | AC-P16676          | ENDEVCO      | 3/30/2004        |
| UPPER RIB REDUNDANT   | AC-P23156          | ENDEVCO      | 3/30/2004        |
| LOWER RIB REDUNDANT   | AC-P16645          | ENDEVCO      | 3/30/2004        |
| LOWER SPINE REDUNDANT | AC-P19343          | ENDEVCO      | 3/30/2004        |
| PELVIS REDUNDANT      | AC-P16843          | ENDEVCO      | 3/30/2004        |

|                       | REAR SID NO.: 270 |              |                  |
|-----------------------|-------------------|--------------|------------------|
|                       | SERIAL NUMBER     | MANUFACTURER | CALIBRATION DATE |
| HEAD AX               | AC-P23139         | ENDEVCO      | 3/30/2004        |
| HEAD AY               | AC-P13323         | ENDEVCO      | 3/30/2004        |
| HEAD AZ               | AC-P22943         | ENDEVCO      | 3/25/2004        |
| UPPER NECK FX         | LC-205FX          | DENTON       | 6/18/2003        |
| UPPER NECK FY         | LC-205FY          | DENTON       | 6/18/2003        |
| UPPER NECK FZ         | LC-205FZ          | DENTON       | 6/18/2003        |
| UPPER NECK MX         | LC-205MX          | DENTON       | 6/18/2003        |
| UPPER NECK MY         | LC-205MY          | DENTON       | 6/18/2003        |
| UPPER NECK MZ         | LC-205MZ          | DENTON       | 6/18/2003        |
| UPPER RIB             | AC-P18524         | ENDEVCO      | 3/25/2004        |
| LOWER RIB             | AC-P18533         | ENDEVCO      | 3/25/2004        |
| LOWER SPINE           | AC-P18514         | ENDEVCO      | 3/25/2004        |
| PELVIS                | AC-P18519         | ENDEVCO      | 3/30/2004        |
| UPPER RIB REDUNDANT   | AC-P18528         | ENDEVCO      | 3/25/2004        |
| LOWER RIB REDUNDANT   | AC-P18518         | ENDEVCO      | 3/25/2004        |
| LOWER SPINE REDUNDANT | AC-P18688         | ENDEVCO      | 3/25/2004        |
| PELVIS REDUNDANT      | AC-P18531         | ENDEVCO      | 3/30/2004        |

**REMARKS:** None

# TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

## VEHICLE AND MDB INSTRUMENTATION

|                                    | VEHICLE AND MDB INSTRUMENTS |              |                  |
|------------------------------------|-----------------------------|--------------|------------------|
|                                    | SERIAL NUMBER               | MANUFACTURER | CALIBRATION DATE |
| RIGHT FRONT SILL (X)               | AC-P16575                   | ENDEVCO      | 3/17/2004        |
| RIGHT FRONT SILL (Y)               | AC-P14388                   | ENDEVCO      | 3/18/2004        |
| RIGHT FRONT SILL (Z)               | AC-P21135                   | ENDEVCO      | 3/18/2004        |
| RIGHT REAR SILL (X)                | AC-P23993                   | ENDEVCO      | 3/22/2004        |
| RIGHT REAR SILL (Y)                | AC-P23999                   | ENDEVCO      | 3/22/2004        |
| RIGHT REAR SILL (Z)                | AC-P23939                   | ENDEVCO      | 3/22/2004        |
| REAR FLOORPAN ABOVE AXLE (X)       | AC-J37980                   | ENDEVCO      | 3/22/2004        |
| REAR FLOORPAN ABOVE AXLE (Y)       | AC-J37854                   | ENDEVCO      | 3/22/2004        |
| REAR FLOORPAN ABOVE AXLE (Z)       | AC-J38127                   | ENDEVCO      | 3/22/2004        |
| LEFT REAR SILL (Y)                 | AC-J30041                   | ENDEVCO      | 4/29/2004        |
| LEFT FRONT SILL (Y)                | AC-B11408                   | ENDEVCO      | 3/31/2004        |
| LEFT FRONT DOOR CENTERLINE (Y)     | AC-J33071                   | ENDEVCO      | 4/29/2004        |
| RIGHT REAR SEAT OCCUPANT COMP. (Y) | AC-F53                      | ICS          | 12/1/2003        |
| MID REAR OF LEFT FRONT DOOR (Y)    | AC-J33843                   | ENDEVCO      | 3/22/2004        |
| LEFT FRONT DOOR UPPER C/L (Y)      | AC-J32787                   | ENDEVCO      | 4/29/2004        |
| MID REAR OF LEFT REAR DOOR (Y)     | AC-9440-034                 | GS SENSORS   | 12/3/2003        |
| LEFT REAR DOOR UPPER C/L (Y)       | AC-9440-006                 | GS SENSORS   | 12/16/2003       |
| LOWER LEFT B- PILLAR (Y)           | AC-9440-024                 | GS SENSORS   | 12/2/2003        |
| MIDDLE LEFT B-PILLAR (Y)           | AC-9440-017                 | GS SENSORS   | 12/1/2003        |
| LOWER LEFT A-PILLAR (Y)            | AC-A13513                   | ENDEVCO      | 3/31/2004        |
| UPPER LEFT A-PILLAR (Y)            | AC-J33198                   | ENDEVCO      | 3/22/2004        |
| FRONT SEAT TRACK (Y)               | AC-P32269                   | ENDEVCO      | 2/17/2004        |
| REAR SEAT TRACK (Y)                | AC-9440-032                 | GS SENSORS   | 1/19/2004        |
| VEHICLE CG (X)                     | AC-P23873                   | ENDEVCO      | 1/16/2004        |
| VEHICLE CG (Y)                     | AC-P19246                   | ENDEVCO      | 1/16/2004        |
| VEHICLE CG (Z)                     | AC-J31034                   | ENDEVCO      | 1/22/2004        |
| MDB CG (X)                         | AC-C16433                   | ENDEVCO      | 2/12/2004        |
| MDB CG (Y)                         | AC-C16416                   | ENDEVCO      | 2/12/2004        |
| MDB CG (Z)                         | AC-C16499                   | ENDEVCO      | 2/12/2004        |
| MDB REAR FRAME MEMBER (X)          | AC-C14948                   | ENDEVCO      | 2/12/2004        |
| MDB REAR FRAME MEMBER (Y)          | AC-C16680                   | ENDEVCO      | 2/12/2004        |

REMARKS: None