

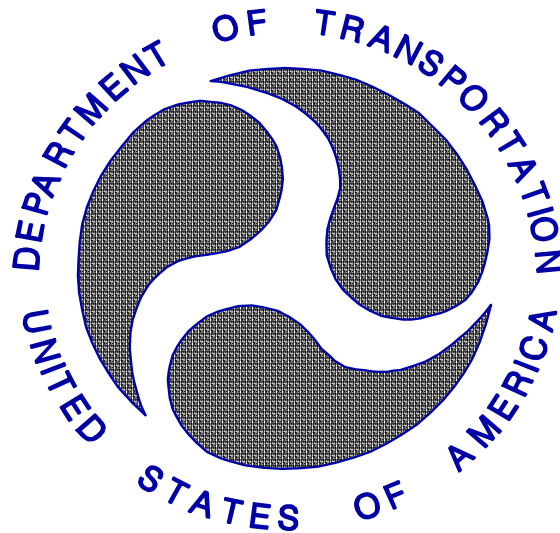
REPORT NO. MCW-DOT-05SN05

**NEW CAR ASSESSMENT PROGRAM  
SIDE IMPACT TESTING**

DAIMLER-CHRYSLER  
2005 JEEP GRAND CHEROKEE LAREDO MPV

NHTSA NUMBER: M5 0308

MEDICAL COLLEGE OF WISCONSIN  
5000 WEST NATIONAL AVENUE  
MILWAUKEE, WI 53295



21-Jan-2005

FINAL REPORT

U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
RULEMAKING  
OFFICE OF CRASHWORTHINESS STANDARDS  
ROOM 5307, NVS-111  
400 SEVENTH STREET, SW  
WASHINGTON, DC 20590

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# **TECHNICAL REPORT STANDARD TITLE PAGE**

| <b>1. Report No.</b><br>Final Copy                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>2. Government Accession No.</b>                         | <b>3. Recipient's Catalog No.</b><br>05SN05                                                                                                                                                                                                                          |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
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| <b>4. Title and Subtitle</b><br>Final Report of New Car Assessment Program Side Impact Test of a 2005 Jeep Grand Cherokee Laredo MPV<br>NHTSA No. M5 0308                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                            | <b>5. Report Date</b><br>21-Jan-2005                                                                                                                                                                                                                                 |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
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| <b>7. Author(s)</b><br>John Humm                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                            | <b>8. Performing Organization Report No.</b><br>05SN05                                                                                                                                                                                                               |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>9. Performing Organization Name and Address</b><br>Medical College of Wisconsin<br>5000 W. National Avenue<br>Milwaukee, WI 53295                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                            | <b>10. Work Unit No.</b>                                                                                                                                                                                                                                             |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
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| <b>12. Sponsoring Agency Name and Address</b><br>U.S. Department of Transportation<br>National Highway Traffic Safety Administration<br>Rulemaking<br>Office of Crashworthiness Standards<br>Room 5307, NVS-111<br>400 Seventh Street, SW<br>Washington, DC 20590                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                            | <b>13. Type of Report and Period Covered</b>                                                                                                                                                                                                                         |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
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| <b>15. Supplementary Notes</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                            |                                                                                                                                                                                                                                                                      |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>16. Abstract</b><br><p>A 55/28 km/h 90° Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2005 Jeep Grand Cherokee Laredo in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for generation of consumer information on vehicle side crash protection. This test was conducted at the Medical College of Wisconsin Vehicle Crashworthiness Lab in Milwaukee, Wisconsin, on 21-Jan-2005.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 km/h, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 20° C. The target vehicle post-test maximum crush was 309 mm at Level 3. The test vehicle's performance follows:</p> <table border="0"> <thead> <tr> <th></th><th align="center"><u><b>DRIVER</b></u></th><th align="center"><u><b>PASSENGER</b></u></th></tr> </thead> <tbody> <tr> <td><b>Left Upper Rib Acceleration G</b></td><td align="center">33.1</td><td align="center">26.1</td></tr> <tr> <td><b>Left Lower Rib Acceleration G</b></td><td align="center">27.8</td><td align="center">29.7</td></tr> <tr> <td><b>Lower Spine Acceleration G</b></td><td align="center">43.0</td><td align="center">27.7</td></tr> <tr> <td><b>Thoracic Trauma Index TTI</b></td><td align="center">38</td><td align="center">29</td></tr> <tr> <td><b>Pelvis Acceleration G</b></td><td align="center">47</td><td align="center">49</td></tr> </tbody> </table> <p>The driver side door latch separated ~4-1/2" from the striker during impact. The passenger side door on the struck side of the vehicle did not separate from the body at the hinges or latches, and the opposite doors did not open during the side impact event.</p> |                                                            |                                                                                                                                                                                                                                                                      |                  |  | <u><b>DRIVER</b></u> | <u><b>PASSENGER</b></u> | <b>Left Upper Rib Acceleration G</b> | 33.1 | 26.1 | <b>Left Lower Rib Acceleration G</b> | 27.8 | 29.7 | <b>Lower Spine Acceleration G</b> | 43.0 | 27.7 | <b>Thoracic Trauma Index TTI</b> | 38 | 29 | <b>Pelvis Acceleration G</b> | 47 | 49 |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | <u><b>DRIVER</b></u>                                       | <u><b>PASSENGER</b></u>                                                                                                                                                                                                                                              |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>Left Upper Rib Acceleration G</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 33.1                                                       | 26.1                                                                                                                                                                                                                                                                 |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>Left Lower Rib Acceleration G</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | 27.8                                                       | 29.7                                                                                                                                                                                                                                                                 |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>Lower Spine Acceleration G</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 43.0                                                       | 27.7                                                                                                                                                                                                                                                                 |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>Thoracic Trauma Index TTI</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 38                                                         | 29                                                                                                                                                                                                                                                                   |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>Pelvis Acceleration G</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 47                                                         | 49                                                                                                                                                                                                                                                                   |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>17. Key Words</b><br>New Car Assessment Program (NCAP)<br>Side Impact<br>MDB<br>Side Impact Dummy (SID H3)<br>NHTSA No. M5 0308                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                            | <b>18. Distribution Statement</b><br><u>Copies of this report are available from:</u><br>National Highway Traffic Safety Administration<br>Rulemaking<br>Office of Crashworthiness Standards<br>Room 5307, NVS-111<br>400 Seventh Street, SW<br>Washington, DC 20590 |                  |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |
| <b>19. Security Classif.(of this report)</b><br>Unclassified                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>20. Security Classif.(of this page)</b><br>Unclassified | <b>21. No. of Pages</b><br>250                                                                                                                                                                                                                                       | <b>22. Price</b> |  |                      |                         |                                      |      |      |                                      |      |      |                                   |      |      |                                  |    |    |                              |    |    |

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**SECTION 1****PURPOSE AND TEST PROCEDURE**

This side impact test was part of the FY05 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-03-D-42005. The purpose of this test was to evaluate side impact protection of a 2005 Jeep Grand Cherokee Laredo MPV. This side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated November 2002.

The Medical College of Wisconsin does not endorse or certify products. The manufacturer's name appears solely for identification purposes only.

## SECTION 2

### SUMMARY OF SIDE IMPACT TEST

A 2005 Jeep Grand Cherokee Laredo MPV was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) that was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.0 km/h (38.52 mph). The target vehicle was stationary and positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Medical College of Wisconsin in Milwaukee, Wisconsin, on 21-Jan-2005.

Two restrained Side Impact Hybrid III Dummies (SID H3's) were placed in the driver and left rear designated seating positions, according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated November 2002. The side impact event was documented by nine high-speed video cameras and one real-time camera. Camera locations and other pertinent camera information can be found in this report.

The SID H3s were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) Primary and Redundant uniaxial accelerometers (Y-direction)
2. Left Lower Rib (LLR) Primary and Redundant uniaxial accelerometers (Y-direction)
3. Lower Thoracic Spine (T<sub>12</sub>) Primary and Redundant uniaxial accelerometers (Y-direction)
4. Pelvic (PEV) section Primary and Redundant uniaxial accelerometers (Y-direction)
5. Head Center of Gravity triaxial accelerometers (X-, Y-, and Z-direction)
6. Upper Neck (NKU) six axis load cell (Fx, Fy, Fz, Mx, My, and Mz)

Pre- and post-test photographs of the test vehicle, the MDB, and the side impact dummies (SID H3s) are included in Appendix A. Appendix B contains the vehicle, MDB, and dummy response data traces. A summary of the side impact dummy configuration and performance verification test data is shown in Appendix C. Dummy and vehicle calibration data can be found in Appendix D of this report.

The following table summarizes the results of this test.

| Injury Criteria | Front SID H3 | Rear SID H3 |
|-----------------|--------------|-------------|
| TTI (G)         | 38           | 29          |
| PELVIS (G)      | 47           | 49          |
| HIC36           | 76.5         | 176.5       |

The vehicle's airbag information is summarized in the following table

|                     | Frontal            | Side-Torso | Side-Torso/Head | Side-Head |
|---------------------|--------------------|------------|-----------------|-----------|
| Driver              | Yes-Steering wheel | None       | None            | None      |
| Front Passenger     | Yes- Dashboard     | None       | None            | None      |
| Left Rear Passenger | None               | None       | None            | None      |

**SECTION 3**  
**SUMMARY OF TEST RESULTS**

**DATA SHEET NO. 1****GENERAL VEHICLE TEST PARAMETER DATA**TEST VEHICLE INFORMATION

|                               |                            |                                     |                           |                        |  |
|-------------------------------|----------------------------|-------------------------------------|---------------------------|------------------------|--|
| Year/ Make/ Model/ Body Style |                            | 2005 Jeep Grand Cherokee Laredo MPV |                           |                        |  |
| Vehicle NHTSA NO.             |                            | M5 0308                             | VIN                       | 1J4GR48K45C556619      |  |
| Vehicle Body Color            |                            | Silver                              | Build Date                | December-04            |  |
| Engine Data                   | <u>6</u> Cylinders         | <u>CID</u>                          | <u>3.7</u> Liter          | <u>cc</u>              |  |
| Placement                     | <u>X</u> Longitudinal      | <u>  </u> Lateral                   |                           |                        |  |
| Transmission                  | <u>  </u> Speed            | <u>  </u> Manual                    | <u>X</u> Automatic        | <u>X</u> Overdrive     |  |
| Final Drive                   | <u>  </u> Rear Wheel Drive | <u>  </u> Front Wheel Drive         | <u>X</u> Four Wheel Drive |                        |  |
| Odometer Reading              | <u>34 Miles</u>            | Date                                | <u>17-Dec-04</u>          |                        |  |
| Options                       | <u>X</u> A/C               | <u>X</u> Power Steering             | <u>X</u> Power Brakes     | <u>X</u> Power Windows |  |
|                               | <u>X</u> Cruise Control    | <u>X</u> Tilt Wheel                 | <u>X</u> Power Locks      | <u>  </u> ADL's        |  |

DATA FROM TIRE PLACARD:

|                             |                                                          |
|-----------------------------|----------------------------------------------------------|
| Tire Pressure (at Capacity) | <u>33</u> PSI Front                                      |
|                             | <u>33</u> PSI Rear                                       |
| Recommended Tire Size       | <u>P245 65 R17</u>                                       |
| Tires on Test Vehicle       | <u>P245 65 R17</u> Manufacturer <u>Goodyear Wrangler</u> |

TEST VEHICLE AIRBAG INFORMATION:

|                     | <u>Frontal</u>     | <u>Side-Torso</u> | <u>Side-Torso/Head</u> | <u>Side-Head</u> |
|---------------------|--------------------|-------------------|------------------------|------------------|
| Driver              | Yes-Steering wheel | None              | None                   | None             |
| Front Passenger     | Yes- Dashboard     | None              | None                   | None             |
| Left Rear Passenger | None               | None              | None                   | None             |

VEHICLE CAPACITY DATA:

|                              |                 |                        |                                |                |
|------------------------------|-----------------|------------------------|--------------------------------|----------------|
| Number of Occupants:         | <u>2</u> Front  | <u>3</u> Rear          | <u>  </u> 3 <sup>rd</sup> Seat | <u>5</u> Total |
| Type of Front Seats          | <u>X</u> Bucket | <u>  </u> Bench        | <u>  </u> Split Bench          |                |
| Type of Front Seat Back      | <u>  </u> Fixed | <u>X</u> Adjustable w/ | <u>X</u> Lever                 | <u>  </u> Knob |
| Vehicle Max Capacity Loading | <u>498.0</u>    |                        | kg                             | (A)            |
| No. of Occupants X 68.04 kg  | <u>340.2</u>    |                        | kg                             | (B)            |
| Cargo Capacity (A) – (B)     | <u>157.8</u>    |                        | kg                             |                |

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

|                |   |               |    |               |   |              |    |
|----------------|---|---------------|----|---------------|---|--------------|----|
| Left Front     | = | <u>563.8</u>  | kg | Left Rear     | = | <u>484.0</u> | kg |
| Right Front    | = | <u>508.0</u>  | kg | Right Rear    | = | <u>476.3</u> | kg |
| TOTAL FRONT    | = | <u>1071.8</u> | kg | TOTAL REAR    | = | <u>960.3</u> | kg |
| % Total Weight | = | <u>52.7</u>   | %  | %Total Weight | = | <u>47.3</u>  | %  |
| TOTAL WEIGHT   | = | <u>2032.1</u> | kg |               |   |              |    |

**DATA SHEET 1 (continued)****GENERAL VEHICLE TEST PARAMETER DATA**CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

|                                                     |   |               |    |         |
|-----------------------------------------------------|---|---------------|----|---------|
| Total Test Vehicle Delivered Weight with Max Fluids | = | <u>2032.1</u> | kg | (A)     |
| Maximum Cargo Carrying Capacity of Test Vehicle     | = | <u>136.1</u>  | kg | (B)     |
| Weight of (2) instrumented Side Impact Dummies      | = | <u>161.0</u>  | kg | (C)     |
| TEST VEHICLE TARGET WEIGHT                          | = | <u>2329.2</u> | kg | (A+B+C) |

FULLY LOADED TEST VEHICLE (UDVW + 1 OR 2 SID H3(s) + CARGO)

|                |   |               |    |               |   |               |    |
|----------------|---|---------------|----|---------------|---|---------------|----|
| Left Front     | = | <u>603.3</u>  | kg | Left Rear     | = | <u>622.8</u>  | kg |
| Right Front    | = | <u>517.5</u>  | kg | Right Rear    | = | <u>585.5</u>  | kg |
| TOTAL FRONT    | = | <u>1120.8</u> | kg | TOTAL REAR    | = | <u>1208.3</u> | kg |
| % Total Weight | = | <u>48.1</u>   | %  | %Total Weight | = | <u>51.9</u>   | %  |
| TOTAL WEIGHT   | = | <u>2329.1</u> | kg |               |   |               |    |

AS TESTED WEIGHT OF TEST VEHICLE (UDVW+ SID H3(s)+CARGO+EQUIPMENT & INSTRUMENTATION)

|                |   |               |    |               |   |               |    |
|----------------|---|---------------|----|---------------|---|---------------|----|
| Left Front     | = | <u>600.6</u>  | kg | Left Rear     | = | <u>620.1</u>  | kg |
| Right Front    | = | <u>517.1</u>  | kg | Right Rear    | = | <u>584.7</u>  | kg |
| TOTAL FRONT    | = | <u>1117.7</u> | kg | TOTAL REAR    | = | <u>1204.8</u> | kg |
| % Total Weight | = | <u>48.1</u>   | %  | %Total Weight | = | <u>51.9</u>   | %  |
| TOTAL WEIGHT   | = | <u>2322.5</u> | kg |               |   |               |    |

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

## AS DELIVERED

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>855</u> | Right Front | <u>863</u> | Left Rear | <u>871</u> | Right Rear | <u>880</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

## FULLY LOADED

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>841</u> | Right Front | <u>851</u> | Left Rear | <u>825</u> | Right Rear | <u>845</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

## AS TESTED

|            |            |             |            |           |            |            |            |
|------------|------------|-------------|------------|-----------|------------|------------|------------|
| Left Front | <u>845</u> | Right Front | <u>856</u> | Left Rear | <u>830</u> | Right Rear | <u>847</u> |
|------------|------------|-------------|------------|-----------|------------|------------|------------|

Test Vehicle Wheelbase 2780 mm

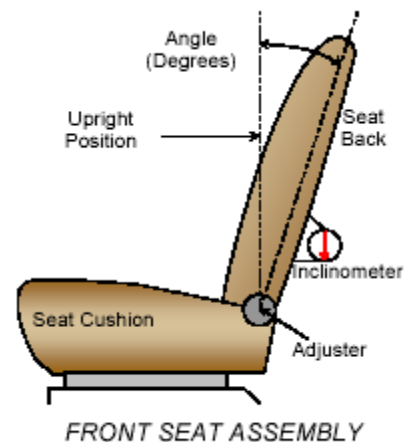
As Tested CG = 1443 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

|            |   |             |    |
|------------|---|-------------|----|
| Right Side | = | <u>4380</u> | mm |
| Left Side  | = | <u>4380</u> | mm |
| Centerline | = | <u>4761</u> | mm |

**DATA SHEET 1 (continued)****GENERAL TEST VEHICLE PARAMETER DATA**Nominal Design Riding Position

Seat travel was determined by measuring the difference between the full rear-down position and the full up-forward position. Seat travel was 294 mm. The mid position was obtained by placing the seat 147 mm forward of full rear-down position.

FRONT SEAT CUSHION PLACEMENT:

|                                   |     |               |                                               |
|-----------------------------------|-----|---------------|-----------------------------------------------|
| Total Length of Adjustment Travel |     |               | 294 mm                                        |
| Total Number of Detents           | N/A | Test Position | 147 mm forward of full rear and down position |

FRONT SEAT BACK ADJUSTMENT:

|                 |                                                          |
|-----------------|----------------------------------------------------------|
| Seat Back Angle | 14 degrees relative to upright position @ head rest post |
|-----------------|----------------------------------------------------------|

REAR SEAT POSITION:

|                                  |     |
|----------------------------------|-----|
| Total Length Fore/Aft Adjustment | N/A |
| Seat Back Adjustment Position    | N/A |

ADJUSTABLE STEERING COLUMN POSITION:

|              |
|--------------|
| Mid-Position |
|--------------|

WINDOW POSITIONS:

|            |    |             |      |
|------------|----|-------------|------|
| Left Front | Up | Right Front | Down |
| Left Rear  | Up | Right Rear  | Down |

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

|                             |        |                     |
|-----------------------------|--------|---------------------|
| Fuel System usable Capacity | 77.6 L |                     |
| Test Volume                 | 72.2 L | 93% usable capacity |

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

|                        |                 |                          |
|------------------------|-----------------|--------------------------|
| Wheelbase              | 2780 mm         |                          |
| Impact Point is        | 450 mm rearward | of front axle centerline |
| Actual Impact Point is | 479 mm rearward | of front axle centerline |

## DATA SHEET 2

### TEST VEHICLE SUMMARY

VEHICLE IDENTIFICATION:

|                            |                                     |               |                   |
|----------------------------|-------------------------------------|---------------|-------------------|
| Year/Make/Model/Body Style | 2005 Jeep Grand Cherokee Laredo MPV |               |                   |
| Body Color                 | Silver                              | VIN           | 1J4GR48K45C556619 |
| NHTSA No.                  | M5 0308                             | Test Date     | 21-Jan-2005       |
| Overall Length             | 4761 mm                             | Overall Width | 1841 mm           |

VEHICLE TEST WEIGHT (Pre-Test):

|                                           |   |        |    |               |   |        |    |
|-------------------------------------------|---|--------|----|---------------|---|--------|----|
| Left Front                                | = | 600.6  | kg | Left Rear     | = | 620.1  | kg |
| Right Front                               | = | 517.1  | kg | Right Rear    | = | 584.7  | kg |
| TOTAL FRONT                               | = | 1117.7 | kg | TOTAL REAR    | = | 1204.8 | kg |
| % Total Weight                            | = | 48.1   | %  | %Total Weight | = | 51.9   | %  |
| TOTAL WEIGHT                              | = | 2322.5 | kg |               |   |        |    |
| Wheelbase                                 |   |        |    | =             |   | 2780   | mm |
| Longitudinal CG from Center of Front Axle |   |        |    | =             |   | 1443   | mm |
| Impact Angle with Respect to Impactor     |   |        |    | =             |   | 90     |    |

ACTUAL IMPACT POINT

Actual impact was 29 mm rearward and 7 mm above nominal impact point

MAXIMUM EXTERIOR STATIC CRUSH:

|            |                        |   |     |    |
|------------|------------------------|---|-----|----|
| 1. LEVEL 1 | (346 mm above ground)  | = | 203 | mm |
| 2. LEVEL 2 | (726 mm above ground)  | = | 306 | mm |
| 3. LEVEL 3 | (749 mm above ground)  | = | 309 | mm |
| 4. LEVEL 4 | (1102 mm above ground) | = | 159 | mm |
| 5. LEVEL 5 | (1552 mm above ground) | = | 29  | mm |

Maximum Post-Test intrusion at Level 3 is 309 mm

OCCUPANTS

|                      |                             |                            |
|----------------------|-----------------------------|----------------------------|
|                      | <u>Left Front Passenger</u> | <u>Left Rear Passenger</u> |
| Dummy Identification | SID H3/056                  | SID H3/058                 |
| Restraints Used      | 3-Point Belt                | 3-Point Belt               |

INSTRUMENTATION:

|                                 |           |    |
|---------------------------------|-----------|----|
| Number of Vehicle Data Channels |           | 26 |
| Number of Cameras               | Onboard   | 3  |
|                                 | Off board | 4  |
|                                 | MDB       | 2  |
|                                 | Real Time | 1  |
|                                 | TOTAL     | 10 |

**DATA SHEET NO. 3****MOVING DEFORMABLE BARRIER (MDB) SUMMARY****MDB FACE MANUFACTURER AND SERIAL NUMBER:**Plascore Serial Number 039A0304 071A0404

---

**POSITION OF IMPACT (MDB) ON TOW SYSTEM**Crabbed 27° to the left

---

**MDB DETAILS:**

|                                                     |   |                |
|-----------------------------------------------------|---|----------------|
| Overall Width of Framework Carriage                 | = | <u>1250 mm</u> |
| Overall Length of MDB (incl. honeycomb impact face) | = | <u>4116 mm</u> |
| Wheelbase of Framework Carriage                     | = | <u>2578 mm</u> |
| Tread of Framework Carriage (Front & Rear)          | = | <u>1880 mm</u> |
| C.G. Location Rearward of Front Axle                | = | <u>1135 mm</u> |
| C.G. Location From Center Line                      | = | <u>-10 mm</u>  |
| C.G. Location Above Ground Level                    | = | <u>480 mm</u>  |

**MDB WEIGHT:**

|                |   |               |    |               |   |              |    |
|----------------|---|---------------|----|---------------|---|--------------|----|
| Left Front     | = | <u>458.0</u>  | kg | Left Rear     | = | <u>228.9</u> | kg |
| Right Front    | = | <u>307.2</u>  | kg | Right Rear    | = | <u>365.6</u> | kg |
| TOTAL FRONT    | = | <u>765.2</u>  | kg | TOTAL REAR    | = | <u>594.5</u> | kg |
| % Total Weight | = | <u>56.3</u>   | %  | %Total Weight | = | <u>43.7</u>  | %  |
| TOTAL WEIGHT   | = | <u>1359.7</u> | kg |               |   |              |    |

**MDB IMPACT:**

|                                          |           |                  |                  |
|------------------------------------------|-----------|------------------|------------------|
| Impact Angle (MDB C/L to Target Vehicle) |           | <u>270°</u>      |                  |
| Impact Speed                             | Primary   | <u>62.0 km/h</u> | <u>38.52 mph</u> |
|                                          | Secondary | <u>61.8 km/h</u> | <u>38.38 mph</u> |

**MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:**

|                           |   |            |    |
|---------------------------|---|------------|----|
| 1. Row A Center of Bumper | = | <u>195</u> | mm |
| 2. Row B Top of Bumper    | = | <u>130</u> | mm |
| 3. Row C Mid-Level        | = | <u>102</u> | mm |
| 4. Row D Top of Stack     | = | <u>176</u> | mm |

**INSTRUMENTATION:**

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



**DATA SHEET NO. 4****POST-TEST OBSERVATIONS**VISIBLE DUMMY CONTACT POINTS:

|             | <u>LEFT FRONT SID H3</u>                         | <u>LEFT REAR SID H3</u>                          |
|-------------|--------------------------------------------------|--------------------------------------------------|
| Head        | Top of head to side header                       | Side of head to C-Pillar near roof               |
| Upper Torso | To left front door panel 70 mm below window sill | To left rear door panel 50 mm below window sill  |
| Lower Torso | To left front door panel at arm rest             | To left rear door panel 240 mm below window sill |
| Left Knee   | To left front door panel 170 mm below arm rest   | To left rear door panel 75 mm below arm rest     |
| Left Leg    | To left front door panel 200 mm below arm rest   | To left rear door panel 90 mm below arm rest     |

DOOR OPENING:

|       | <u>LEFT DOOR</u>            | <u>RIGHT DOOR</u>       |
|-------|-----------------------------|-------------------------|
| Front | Closed/Unlatched/Inoperable | Closed/Latched/Operable |
| Rear  | Closed/Latched/Inoperable   | Closed/Latched/Operable |

MDB DISTANCE FROM TARGET IMPACT POINT:

|            |            |          |                |
|------------|------------|----------|----------------|
| Horizontal | 7 mm above | Vertical | 29 mm rearward |
|------------|------------|----------|----------------|

ARM REST LOCATIONS:

|       |                          |
|-------|--------------------------|
| Front | 240 mm below window sill |
| Rear  | 245 mm below window sill |

SEAT MOVEMENT:

|       |                                                 |
|-------|-------------------------------------------------|
| Front | 60 mm seat crush; 40 mm seat back crush         |
| Rear  | 90 mm seat crush; No measurable seat back crush |

GLAZING DAMAGE

|            |                                               |
|------------|-----------------------------------------------|
| Windshield | None                                          |
| Window     | Left front door window cracked at window sill |

PILLAR PERFORMANCE:

|            |
|------------|
| None noted |
|------------|

SILL SEPARATION

|            |
|------------|
| None noted |
|------------|

DOOR LOCK INFORMATION

Test vehicle was not equipped with Automatic Door Locks as standard equipment

|                 |          |                  |          |
|-----------------|----------|------------------|----------|
| LEFT FRONT DOOR | Unlocked | RIGHT FRONT DOOR | Unlocked |
| LEFT REAR DOOR  | Unlocked | RIGHT REAR DOOR  | Unlocked |

AIRBAG DEPLOYMENT STATUS:

|       | <u>DRIVER</u>  | <u>FRONT PASSENGER</u> | <u>REAR PASSENGER</u> |
|-------|----------------|------------------------|-----------------------|
| FRONT | Did not deploy | Did not deploy         | N/A                   |
| SIDE  | N/A            | N/A                    | N/A                   |

OTHER NOTABLE IMPACT EFFECTS:

Left front door latch separated from striker during impact. The latch separated 4-1/2" from the striker.

**SECTION 4**  
**OCCUPANT AND VEHICLE INFORMATION**

**DATA SHEET 5****SID H3 INSTRUMENTATION DATA**

|                                     | Front Dummy ID<br>SID H3/056 |      |       |       | Rear Dummy ID<br>SID H3/058 |      |       |       |
|-------------------------------------|------------------------------|------|-------|-------|-----------------------------|------|-------|-------|
|                                     | Max                          |      | Min   |       | Max                         |      | Min   |       |
|                                     | G's                          | msec | G's   | msec  | G's                         | msec | G's   | msec  |
| HEAD ACCELERATIONS                  |                              |      |       |       |                             |      |       |       |
| Longitudinal (X)                    | 3.4                          | 33.4 | -13.8 | 68.1  | 2.8                         | 51.0 | -18.0 | 94.3  |
| Lateral (Y)                         | 37.7                         | 66.6 | -5.1  | 39.5  | 64.6                        | 63.2 | -8.3  | 86.5  |
| Vertical (Z)                        | 17.4                         | 64.6 | -1.6  | 151.3 | 7.0                         | 55.5 | -12.0 | 82.8  |
| Resultant (R)                       | 41.9                         | 66.6 |       |       | 65.2                        | 63.2 |       |       |
| HIC36                               | 76.5                         |      |       |       | 176.5                       |      |       |       |
| RIB ACCELERATIONS                   |                              |      |       |       |                             |      |       |       |
| Upper Rib Lateral (Y)               | 33.1                         | 52.5 | -5.8  | 80.0  | 26.1                        | 63.1 | -0.9  | 188.1 |
| Upper Rib Lateral (Y <sub>R</sub> ) | 33.1                         | 51.9 | -5.8  | 80.0  | 25.4                        | 63.1 | -1.0  | 188.8 |
| Lower Rib Lateral (Y)               | 27.8                         | 51.2 | -6.8  | 80.0  | 29.7                        | 56.9 | -0.7  | 189.4 |
| Lower Rib Lateral (Y <sub>R</sub> ) | 28.3                         | 49.4 | -6.7  | 79.4  | 29.1                        | 56.9 | -0.8  | 113.1 |
| TTI                                 | 38                           |      |       |       | 29                          |      |       |       |
| SPINE ACCELERATIONS                 |                              |      |       |       |                             |      |       |       |
| Lower Lateral (Y)                   | 43.0                         | 35.0 | -6.1  | 79.4  | 27.7                        | 53.1 | -0.8  | 6.9   |
| Lower Lateral (Y <sub>R</sub> )     | 42.9                         | 35.0 | -6.4  | 79.4  | 26.9                        | 53.8 | -1.1  | 74.4  |
| PELVIS ACCELERATIONS                |                              |      |       |       |                             |      |       |       |
| Lateral (Y)                         | 46.7                         | 33.8 | -8.6  | 60.0  | 48.6                        | 43.8 | -11.2 | 78.8  |
| Lateral (Y <sub>R</sub> )           | 47.3                         | 33.8 | -8.9  | 60.0  | 48.0                        | 43.8 | -11.1 | 79.4  |

REFERENCE:

|                      |                    |                  |
|----------------------|--------------------|------------------|
| Positive Direction - | Anterior/Posterior | +(X) = anterior  |
|                      | Lateral            | +(Y)= right      |
|                      | Superior/Inferior  | +(Z)= inferior   |
| Negative Direction   | Anterior/Posterior | -(X) = posterior |
|                      | Lateral            | -(Y)= left       |
|                      | Superior/Inferior  | -(Z)= superior   |

All the above data (except head accelerations) has been filtered using FIR (Version 1.0; July 16, 1990)

Head Accelerations have been filtered at SAE Class 1000

Y<sub>R</sub> denotes redundant Y-direction accelerometer

**DATA SHEET 5 (continued)****SID H3 INSTRUMENTATION DATA**

|                       | Front Dummy ID<br>SID H3/056 |       |        |       | Rear Dummy ID<br>SID H3/058 |       |        |       |
|-----------------------|------------------------------|-------|--------|-------|-----------------------------|-------|--------|-------|
|                       | Max                          |       | Min    |       | Max                         |       | Min    |       |
| NECK FORCES           |                              |       |        |       |                             |       |        |       |
|                       | N                            | msec  | N      | msec  | N                           | msec  | N      | msec  |
| Longitudinal (X)      | 7.2                          | 11.1  | -223.2 | 115.4 | 331.9                       | 72.5  | -127.1 | 99.3  |
| Lateral (Y)           | 517.4                        | 69.9  | -307.2 | 39.2  | 9.7                         | 198.9 | -784.3 | 69.2  |
| Vertical (Z)          | 502.5                        | 88.2  | -303.7 | 72.2  | 291.9                       | 55.4  | -916.6 | 71.9  |
| NECK MOMENTS          |                              |       |        |       |                             |       |        |       |
|                       | Nm                           | msec  | Nm     | msec  | Nm                          | msec  | Nm     | msec  |
| Lateral Bending (X)   | 29.2                         | 91.4  | -60.2  | 69.6  | 3.9                         | 198.2 | -52.9  | 67.5  |
| Flexion/Extension (Y) | 14.8                         | 129.0 | -31.1  | 72.6  | 17.7                        | 187.1 | -81.2  | 81.7  |
| Rotation (Z)          | 10.5                         | 99.2  | -5.5   | 68.7  | 40.0                        | 91.6  | -8.7   | 190.2 |

**REFERENCE:**

*Upper neck load cell polarity follows the dummy manipulation table A-1 in the NHTSA Test Reference Guide version 5*

## Force

- Fx positive response: Head rearward, chest forward
- Fy positive response: Head leftward, chest rightward
- Fz positive response: Head upward, chest downward

## Moment

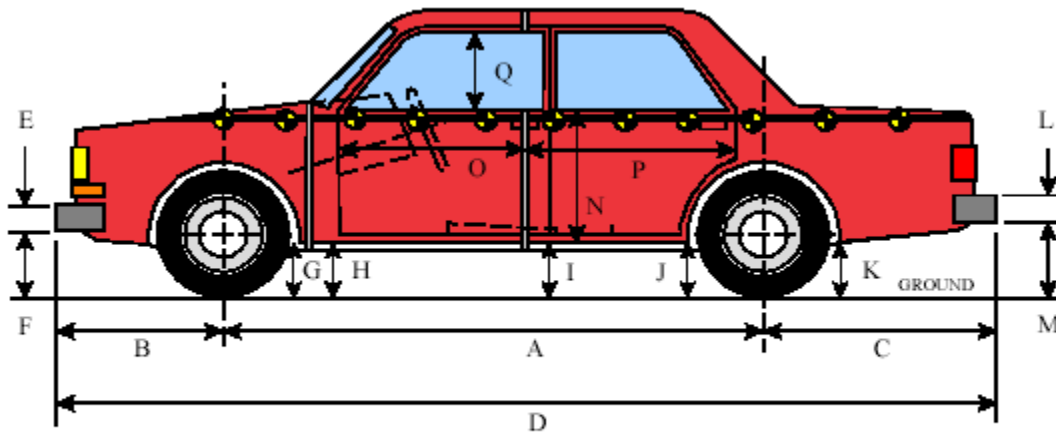
- Mx positive response: Left ear to left shoulder
- My positive response: Chin to sternum
- Mz positive response: Chin to left shoulder

Neck forces have been filtered at SAE Class 1000

Neck moments have been filtered at SAE Class 600

## DATA SHEET 6

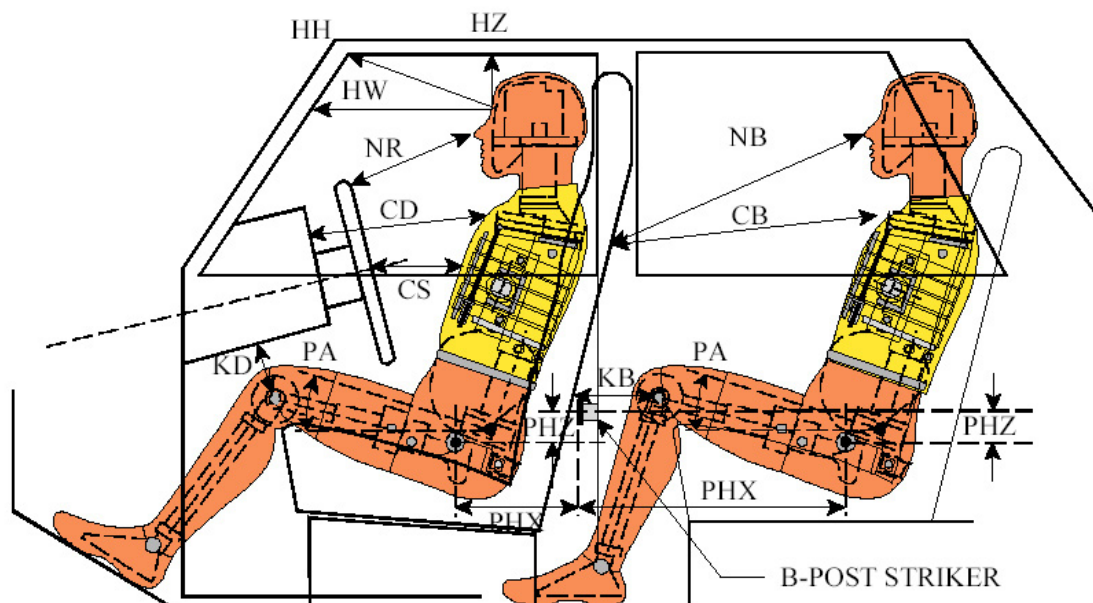
## VEHICLE PRE- AND POST- MEASUREMENTS



|    | PRE-TEST<br>As delivered (mm) | PRE-TEST<br>As Tested (mm) | POST-TEST<br>(mm) | Δ CHANGE<br>(mm) |
|----|-------------------------------|----------------------------|-------------------|------------------|
| A  | 2780                          | -                          | 2775              | -5               |
| B  | 656                           | -                          | 653               | -3               |
| C  | 944                           | -                          | 929               | -15              |
| D  | 4761                          | -                          | 4751              | -10              |
| E  | 148                           | -                          | 148               | 0                |
| F  | 521                           | 524                        | 551               | 27               |
| G  | 310                           | 295                        | 295               | 0                |
| H  | 312                           | 297                        | 295               | -2               |
| I  | 333                           | 310                        | 305               | -5               |
| J1 | 335                           | 301                        | 324               | 23               |
| J2 | 342                           | 309                        | 289               | -20              |
| K  | 440                           | 391                        | 358               | -33              |
| L  | 109                           | -                          | 109               | 0                |
| M  | 619                           | 565                        | 495               | -70              |
| N  | 741                           | -                          | 671               | -70              |
| O  | 1110                          | -                          | 1108              | -2               |
| P  | 950                           | -                          | 901               | -49              |
| Q  | 455                           | -                          | 450               | -5               |
| R  | 4380                          | -                          | 4384              | 4                |
| S  | 4380                          | -                          | 4357              | -23              |
| T  | 1841                          | -                          | 1617              | -224             |

## DATA SHEET 7

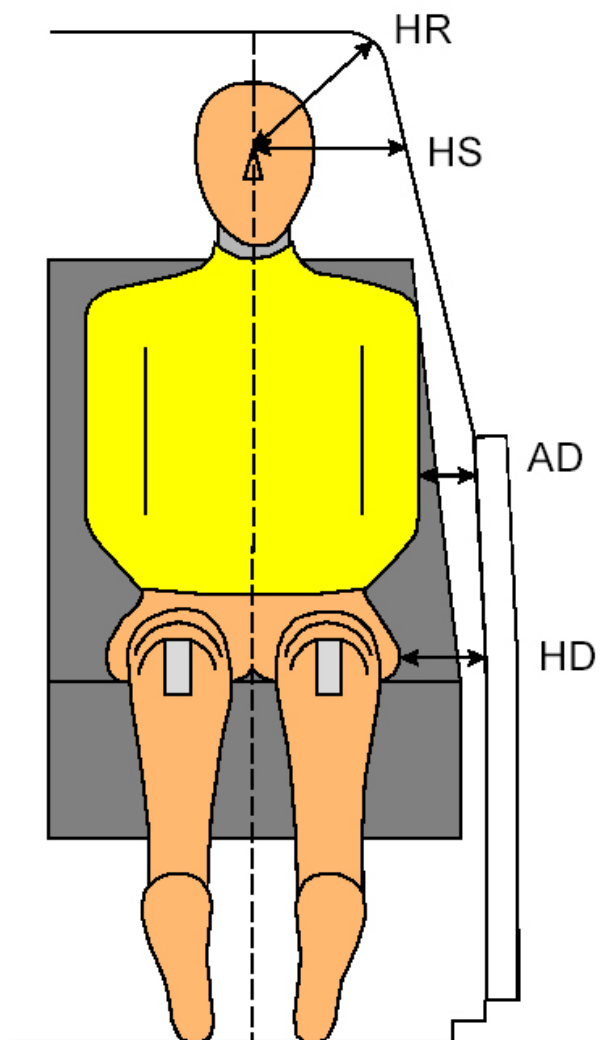
## SID H3 LONGITUDINAL CLEARANCE DIMENSIONS



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

|                     | DRIVER ID<br>SID H3/056 | LEFT REAR PASSENGER ID<br>SID H3/058 |
|---------------------|-------------------------|--------------------------------------|
| HH                  | 374                     | N/A                                  |
| HW                  | 575                     | N/A                                  |
| HZ                  | 150                     | 214                                  |
| NR/NB               | 356                     | 635                                  |
| CD/CB               | 542                     | 579                                  |
| CS                  | 311                     | N/A                                  |
| KDL(KDA°)/KBL(KDA°) | 162/20.2                | 254/10.1                             |
| KDR(KDA°)/KBR(KDA°) | 161/24.2                | 236/7.6                              |
| PA°                 | 24.1                    | 23.6                                 |
| PHX                 | 163                     | 212                                  |
| PHZ                 | 64                      | 241                                  |

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

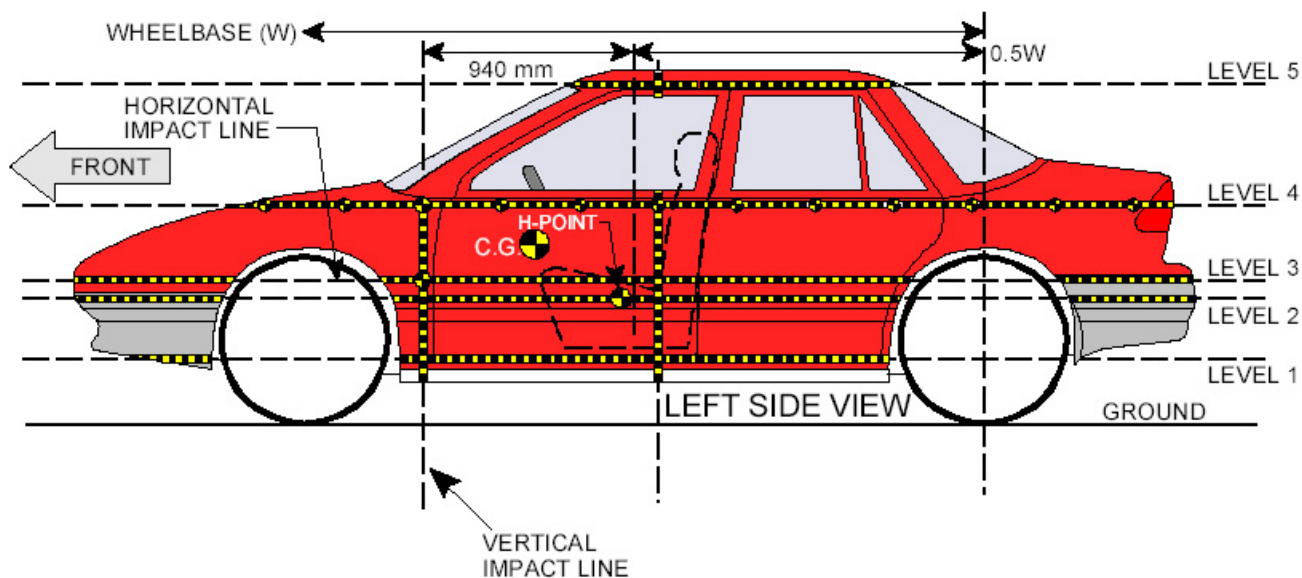
**DATASHEET 8****SID H3 LATERAL CLEARANCE DIMENSIONS**

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

|    | DRIVER ID<br>SID H3/056 |           | LEFT REAR PASSENGER ID<br>SID H3/058 |          |
|----|-------------------------|-----------|--------------------------------------|----------|
| HR | 181                     |           | 183                                  |          |
| HS | 351                     |           | 325                                  |          |
| AD | Upper 115               | Lower 120 | Upper 114                            | Lower 99 |
| HD | 135                     |           | 158                                  |          |

## DATA SHEET 9

## VEHICLE SIDE MEASUREMENTS



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 as shown

Level 5 @ Window Top  
 Level 4 @ Window Sill  
 Level 3 @ Mid-Door  
 Level 2 @ Occupant H-Point  
 Level 1 @ Axle Centerline or Sill Top Height

|         |
|---------|
| 1552 mm |
| 1102 mm |
| 749 mm  |
| 726 mm  |
| 346 mm  |



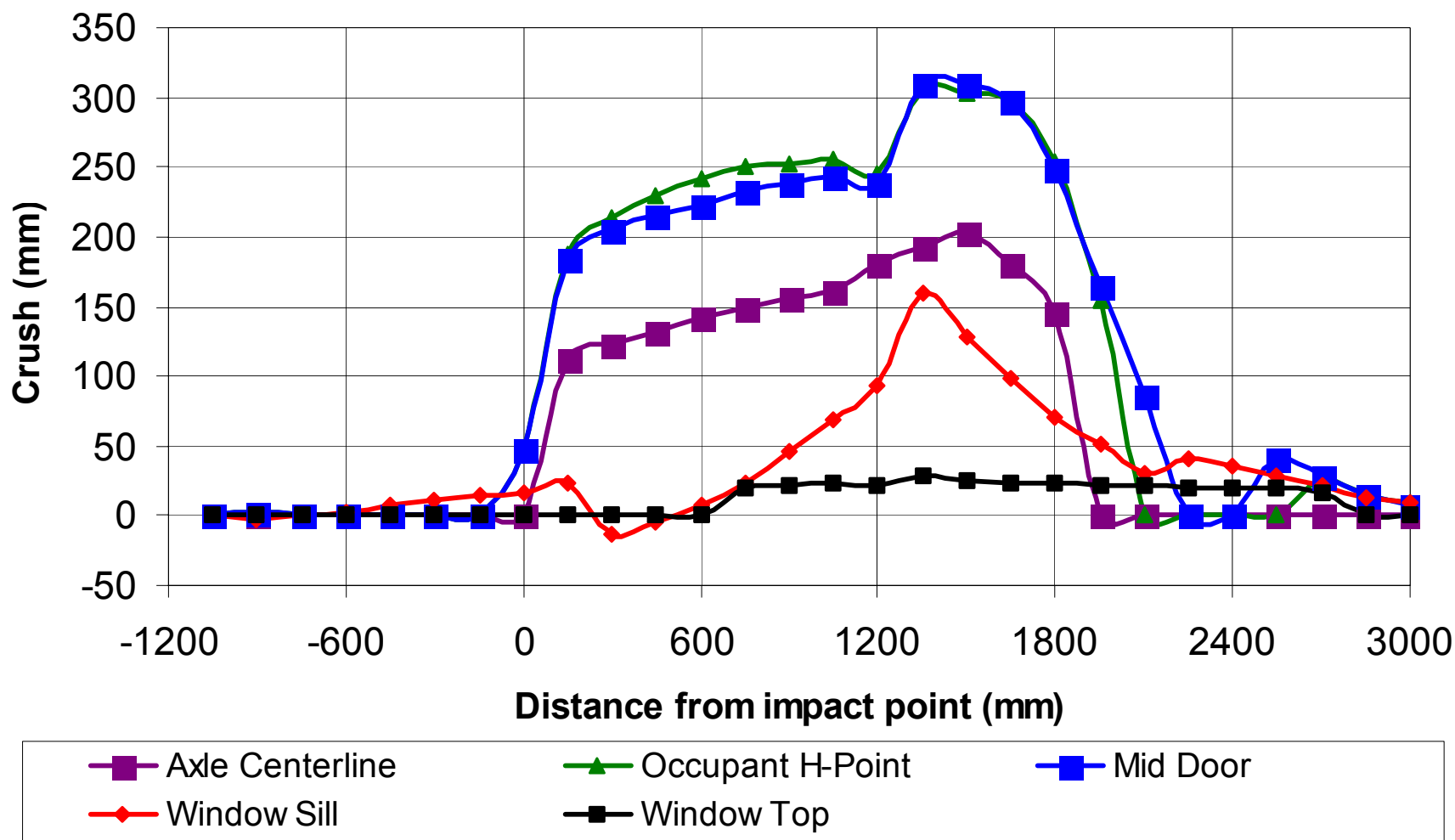
## DATA SHEET 10

## VEHICLE EXTERIOR CRUSH PROFILES – ALL LEVELS

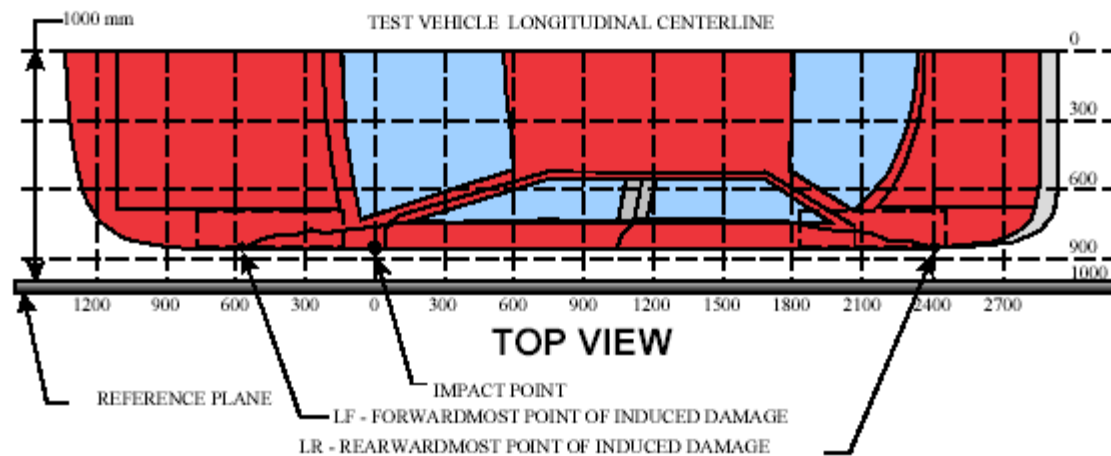
Note: All Dimensions are in millimeters with a tolerance of  $\pm 3$  mm

| Level                                          |      | 1   |      |       | 2   |      |       | 3   |      |       | 4    |      |       | 5    |      |       |
|------------------------------------------------|------|-----|------|-------|-----|------|-------|-----|------|-------|------|------|-------|------|------|-------|
| Height (mm)                                    |      | 346 |      |       | 726 |      |       | 749 |      |       | 1102 |      |       | 1552 |      |       |
|                                                |      | Pre | Post | Crush | Pre | Post | Crush | Pre | Post | Crush | Pre  | Post | Crush | Pre  | Post | Crush |
| DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT | -    |     |      |       |     |      |       |     |      |       |      |      |       |      |      |       |
|                                                | 1050 |     |      |       |     |      |       |     |      |       |      |      |       |      |      |       |
|                                                | -900 |     |      |       | 165 | 168  | 3     | 164 | 167  | 3     | 273  | 270  | -3    |      |      |       |
|                                                | -750 |     |      |       |     |      |       |     |      |       | 258  | 258  | 0     |      |      |       |
|                                                | -600 |     |      |       |     |      |       |     |      |       | 245  | 247  | 2     |      |      |       |
|                                                | -450 |     |      |       |     |      |       |     |      |       | 235  | 243  | 8     |      |      |       |
|                                                | -300 |     |      |       |     |      |       |     |      |       | 226  | 237  | 11    |      |      |       |
|                                                | -150 |     |      |       |     |      |       |     |      |       | 220  | 234  | 14    |      |      |       |
|                                                | 0    |     |      |       | 142 | 189  | 47    | 143 | 190  | 47    | 215  | 232  | 17    |      |      |       |
|                                                | 150  | 180 | 292  | 112   | 165 | 352  | 187   | 164 | 348  | 184   | 211  | 235  | 24    |      |      |       |
|                                                | 300  | 190 | 313  | 123   | 162 | 375  | 213   | 162 | 367  | 205   | 207  | 193  | -14   |      |      |       |
|                                                | 450  | 189 | 320  | 131   | 159 | 388  | 229   | 159 | 374  | 215   | 206  | 202  | -4    |      |      |       |
|                                                | 600  | 187 | 329  | 142   | 157 | 398  | 241   | 156 | 379  | 223   | 202  | 209  | 7     |      |      |       |
|                                                | 750  | 185 | 334  | 149   | 154 | 405  | 251   | 154 | 387  | 233   | 200  | 223  | 23    | 396  | 416  | 20    |
|                                                | 900  | 184 | 340  | 156   | 153 | 406  | 253   | 153 | 392  | 239   | 199  | 245  | 46    | 414  | 435  | 21    |
|                                                | 1050 | 183 | 345  | 162   | 151 | 407  | 256   | 151 | 394  | 243   | 197  | 265  | 68    | 422  | 445  | 23    |
|                                                | 1200 | 184 | 365  | 181   | 149 | 395  | 246   | 149 | 387  | 238   | 195  | 289  | 94    | 425  | 447  | 22    |
|                                                | 1350 | 185 | 378  | 193   | 150 | 456  | 306   | 150 | 459  | 309   | 196  | 355  | 159   | 427  | 456  | 29    |
|                                                | 1500 | 186 | 389  | 203   | 151 | 454  | 303   | 150 | 459  | 309   | 196  | 324  | 128   | 430  | 455  | 25    |
|                                                | 1650 | 186 | 367  | 181   | 152 | 449  | 297   | 151 | 448  | 297   | 197  | 296  | 99    | 432  | 455  | 23    |
|                                                | 1800 | 170 | 316  | 146   | 150 | 404  | 254   | 151 | 399  | 248   | 200  | 270  | 70    | 433  | 457  | 24    |
|                                                | 1950 |     |      |       | 126 | 281  | 155   | 128 | 292  | 164   | 202  | 253  | 51    | 434  | 455  | 21    |
|                                                | 2100 |     |      |       |     |      |       | 126 | 212  | 86    | 205  | 236  | 31    | 436  | 457  | 21    |
|                                                | 2250 |     |      |       |     |      |       |     |      |       | 208  | 249  | 41    | 438  | 457  | 19    |
|                                                | 2400 |     |      |       |     |      |       |     |      |       | 212  | 247  | 35    | 440  | 460  | 20    |
|                                                | 2550 |     |      |       |     |      |       | 132 | 172  | 40    | 218  | 246  | 28    | 442  | 462  | 20    |
|                                                | 2700 |     |      |       | 140 | 165  | 25    | 142 | 170  | 28    | 224  | 245  | 21    | 449  | 465  | 16    |
|                                                | 2850 |     |      |       | 190 | 205  | 15    | 196 | 211  | 15    | 231  | 244  | 13    |      |      |       |
|                                                | 3000 |     |      |       | 216 | 225  | 9     | 214 | 222  | 8     | 240  | 250  | 10    |      |      |       |

DATA SHEET 10 (continued)  
VEHICLE EXTERIOR CRUSH PROFILES ALL LEVELS



# DATA SHEET 11 VEHICLE DAMAGE PROFILE DISTANCES



| DPD MEASUREMENTS (mm) |      | POST-TEST (mm) | PRE-TEST (mm) | STATIC CRUSH (mm) |
|-----------------------|------|----------------|---------------|-------------------|
| 1                     | -150 | 155            | 155           | 0                 |
| 2                     | 390  | 367            | 158           | 209               |
| 3                     | 930  | 395            | 162           | 233               |
| 4                     | 1470 | 459            | 164           | 295               |
| 5                     | 2010 | 225            | 161           | 64                |
| 6                     | 2550 | 169            | 169           | 0                 |

## DATA SHEET 12

**STATIC CRUSH OF IMPACTOR FACE**  
**(Grid as looking at MDB from front)**

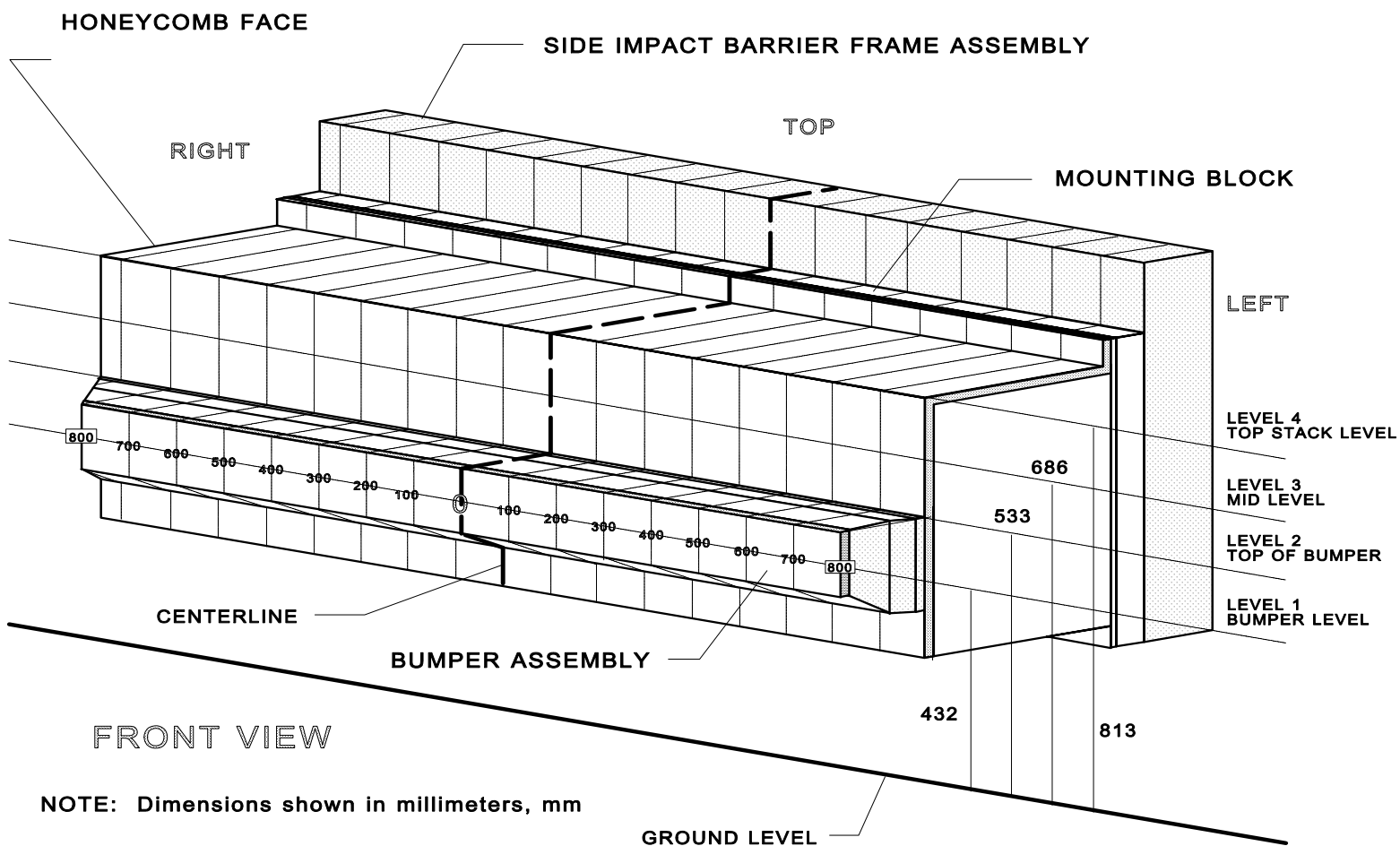
Note: All Dimensions are in millimeters with a tolerance of  $\pm 3$  mm

| LEVEL                     | HEIGHT<br>AT CL<br>(mm) |       | DISTANCE LEFT OF CENTER |     |     |     |     |     |     |     | 0   | DISTANCE RIGHT OF CENTER |     |     |     |     |     |     |     |
|---------------------------|-------------------------|-------|-------------------------|-----|-----|-----|-----|-----|-----|-----|-----|--------------------------|-----|-----|-----|-----|-----|-----|-----|
|                           |                         |       | 800                     | 700 | 600 | 500 | 400 | 300 | 200 | 100 |     | 100                      | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| LEVEL 4<br>TOP<br>STACK   | 810                     | PRE-  | 525                     | 525 | 526 | 526 | 527 | 527 | 528 | 528 | 528 | 528                      | 528 | 528 | 528 | 528 | 528 | 528 | 529 |
|                           |                         | POST- | 620                     | 597 | 571 | 554 | 553 | 568 | 586 | 594 | 600 | 608                      | 618 | 625 | 632 | 643 | 658 | 681 | 705 |
|                           |                         | CRUSH | 95                      | 72  | 45  | 28  | 26  | 41  | 58  | 66  | 72  | 80                       | 90  | 97  | 104 | 115 | 130 | 153 | 176 |
| LEVEL 3<br>MID-<br>LEVEL  | 685                     | PRE-  | 526                     | 526 | 526 | 525 | 526 | 526 | 527 | 526 | 526 | 527                      | 527 | 527 | 527 | 528 | 528 | 528 | 529 |
|                           |                         | POST- | 622                     | 582 | 565 | 565 | 577 | 582 | 571 | 563 | 558 | 558                      | 560 | 564 | 570 | 580 | 594 | 613 | 631 |
|                           |                         | CRUSH | 96                      | 56  | 39  | 40  | 51  | 56  | 44  | 37  | 32  | 31                       | 33  | 37  | 43  | 52  | 66  | 85  | 102 |
| LEVEL 2<br>TOP<br>BUMPER  | 560                     | PRE-  | 523                     | 523 | 523 | 524 | 524 | 524 | 524 | 524 | 524 | 525                      | 525 | 525 | 525 | 525 | 526 | 526 | 526 |
|                           |                         | POST- | 636                     | 634 | 627 | 628 | 626 | 631 | 626 | 627 | 622 | 623                      | 628 | 628 | 629 | 628 | 635 | 638 | 656 |
|                           |                         | CRUSH | 113                     | 111 | 104 | 104 | 102 | 107 | 102 | 103 | 98  | 98                       | 103 | 103 | 104 | 103 | 109 | 112 | 130 |
| LEVEL 1<br>MID-<br>BUMPER | 432                     | PRE-  | 432                     | 420 | 420 | 421 | 421 | 421 | 421 | 422 | 421 | 422                      | 422 | 423 | 423 | 423 | 423 | 424 | 433 |
|                           |                         | POST- | 627                     | 608 | 598 | 592 | 595 | 595 | 595 | 596 | 595 | 598                      | 598 | 599 | 598 | 601 | 606 | 614 | 627 |
|                           |                         | CRUSH | 195                     | 188 | 178 | 171 | 174 | 174 | 174 | 174 | 174 | 176                      | 176 | 176 | 175 | 178 | 183 | 190 | 194 |

**Note: Top of Bumper static crush measurements made 560 mm above ground to avoid glue at bumper/barrier interface**

## DATA SHEET 12 (continued)

## STATIC CRUSH OF IMPACTOR FACE

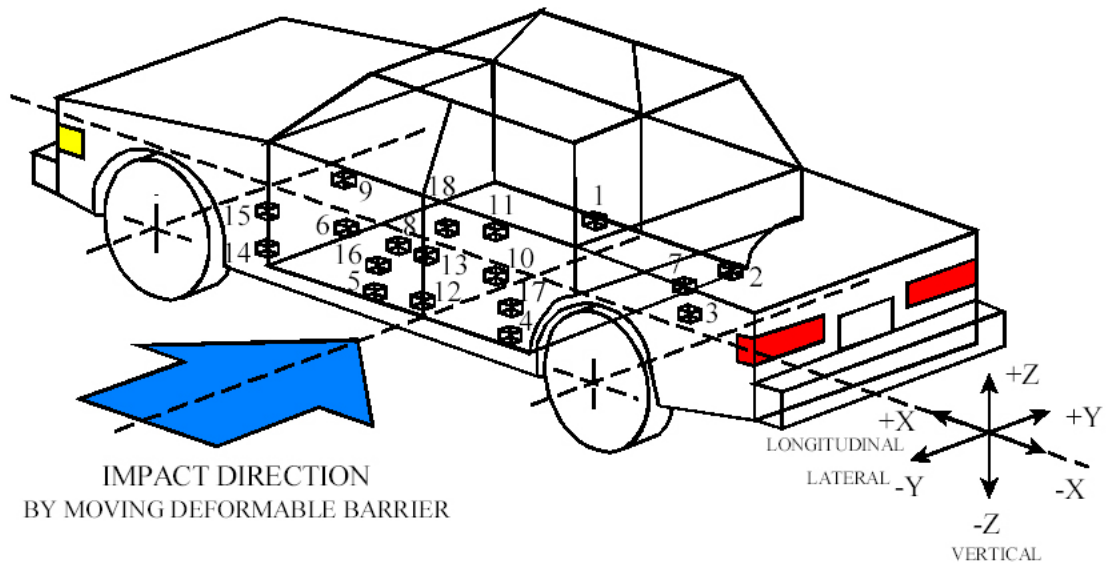


NOTE: Dimensions shown in millimeters, mm

Note: Top of Bumper static crush measurements made 560 mm above ground to avoid glue at bumper/barrier interface

## DATA SHEET 13

## TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY



|                                     |                                     |
|-------------------------------------|-------------------------------------|
| 1. Right Side Sill at Front Seat    | 10. Mid-rear of Left Rear Door      |
| 2. Right Side Sill at Rear Seat     | 11. Left Rear Door Upper Centerline |
| 3. Rear Floorpan Above Axle         | 12. Left Lower B-Pillar             |
| 4. Left Side Sill at Rear Seat      | 13. Left Middle B-Pillar            |
| 5. Left Side Sill at 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. Mid-rear of Left Front Door      | 17. Rear Seat Track                 |
| 9. Left Front Door Upper Centerline | 18. Vehicle CG                      |

## DATASHEET 13 (continued)

## VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

| Location |                                  | Coordinates |         |         | Longitudinal (X) |        |          |        | Lateral (Y) |      |        |       | Vertical (Z) |      |       |      | Resultant |        |
|----------|----------------------------------|-------------|---------|---------|------------------|--------|----------|--------|-------------|------|--------|-------|--------------|------|-------|------|-----------|--------|
|          |                                  | X<br>mm     | Y<br>mm | Z<br>mm | Max              |        | Min      |        | Max         |      | Min    |       | Max          |      | Min   |      | Max       |        |
|          |                                  |             |         |         | G's              | msec   | G's      | msec   | G's         | msec | G's    | msec  | G's          | msec | G's   | msec | G's       | msec   |
| 1        | Right Side Sill at Front Seat    | 2566        | 652     | 296     | 2.4 †            | 60.3 † | -119.7 † | 29.0 † | 23.5        | 12.0 | -1.8   | 137.0 | 3.6          | 95.8 | -21.0 | 27.0 | 120.7 ‡   | 28.9 ‡ |
| 2        | Right Side Sill at Rear Seat     | 1900        | 644     | 300     | 2.8              | 59.3   | -3.0     | 11.2   | 20.2        | 8.2  | -27.9  | 17.3  | 3.7          | 82.1 | -12.5 | 18.4 | 30.4      | 17.4   |
| 3        | Rear Floorpan Above Axle         | 1077        | 75      | -31     | 1.2              | 59.4   | -4.7     | 16.5   | 21.6        | 34.4 | -1.5   | 111.1 | 7.4          | 45.8 | -6.5  | 20.3 | 21.7      | 34.4   |
| 4        | Left Side Sill at Rear Seat      | 1817        | -755    | 360     |                  |        |          |        | 177.3       | 10.7 | -22.4  | 16.8  |              |      |       |      |           |        |
| 5        | Left Side Sill at Front Seat     | 2634        | -760    | 357     |                  |        |          |        | 60.5        | 10.9 | -49.0  | 15.7  |              |      |       |      |           |        |
| 6        | Left Front Door on Centerline    | 2779        | -753    | -23     |                  |        |          |        | 328.8       | 11.4 | -248.6 | 19.0  |              |      |       |      |           |        |
| 7        | Right Rear Occupant Compartment  | 1752        | 567     | 125     |                  |        |          |        | 29.8        | 12.6 | -19.9  | 26.6  |              |      |       |      |           |        |
| 8        | Midrear of Left Front Door       | 2519        | -785    | -97     |                  |        |          |        | 265.3       | 13.2 | -92.7  | 22.0  |              |      |       |      |           |        |
| 9        | Left Front Door Upper Centerline | 2717        | -798    | -227    |                  |        |          |        | 100.8       | 15.7 | -51.3  | 29.4  |              |      |       |      |           |        |
| 10       | Midrear of Left Rear Door        | 1478        | -785    | -223    |                  |        |          |        | 76.0        | 16.1 | -37.6  | 36.2  |              |      |       |      |           |        |

Axis Origin      X – Point L      Axis Orientation      +(X) Forward where x axis is the vector from middle of rear bumper to mid front bumper  
                          Y – Point L      +(Y) Right where y axis is parallel to ground reference plane  
                          Z – Point L      +(Z) Down where z axis is cross product of +(X) and +(Y)

† Right Side Sill at Front Seat (X) Accelerometer wire may have been pinched 29 msec after impact

‡ Right Side Sill at Front Seat (X) Accelerometer not used to calculate resultant

## DATASHEET 13 (continued)

## VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

| Location |                                    | Coordinates |         |         | Longitudinal (X) |      |      |      | Lateral (Y) |      |       |       | Vertical (Z) |      |      |      | Resultant |      |
|----------|------------------------------------|-------------|---------|---------|------------------|------|------|------|-------------|------|-------|-------|--------------|------|------|------|-----------|------|
|          |                                    | X<br>mm     | Y<br>mm | Z<br>mm | Max              |      | Min  |      | Max         |      | Min   |       | Max          |      | Min  |      | Max       |      |
|          |                                    |             |         |         | G's              | msec | G's  | msec | G's         | msec | G's   | msec  | G's          | msec | G's  | msec | G's       | msec |
| 11       | Left Rear Door<br>Upper Centerline | 1725        | -777    | -131    |                  |      |      |      | 131.5       | 15.1 | -83.6 | 36.2  |              |      |      |      |           |      |
| 12       | Left Lower B-<br>Pillar            | 2135        | -743    | -20     |                  |      |      |      | 167.1       | 4.3  | -86.1 | 25.0  |              |      |      |      |           |      |
| 13       | Left Middle B-<br>Pillar           | 2224        | -743    | -310    |                  |      |      |      | 79.4        | 5.2  | -40.9 | 24.7  |              |      |      |      |           |      |
| 14       | Left Lower A-<br>Pillar            | 3245        | -733    | 112     |                  |      |      |      | 220.1       | 3.6  | -80.7 | 11.8  |              |      |      |      |           |      |
| 15       | Left Middle A-<br>Pillar           | 3222        | -744    | -209    |                  |      |      |      | 42.7        | 4.2  | -6.4  | 8.6   |              |      |      |      |           |      |
| 16       | Front Seat Track                   | 2495        | -659    | 157     |                  |      |      |      | 104.5       | 12.9 | -65.3 | 21.0  |              |      |      |      |           |      |
| 17       | Rear Seat Track                    | 1709        | -566    | 154     |                  |      |      |      | 39.9        | 34.3 | -44.1 | 26.2  |              |      |      |      |           |      |
| 18       | Vehicle CG                         | 2659        | 11      | 21      | 7.9              | 12.7 | -8.9 | 28.6 | 33.2        | 18.6 | -1.7  | 124.1 | 9.3          | 26.7 | -9.9 | 8.2  | 33.7      | 18.6 |

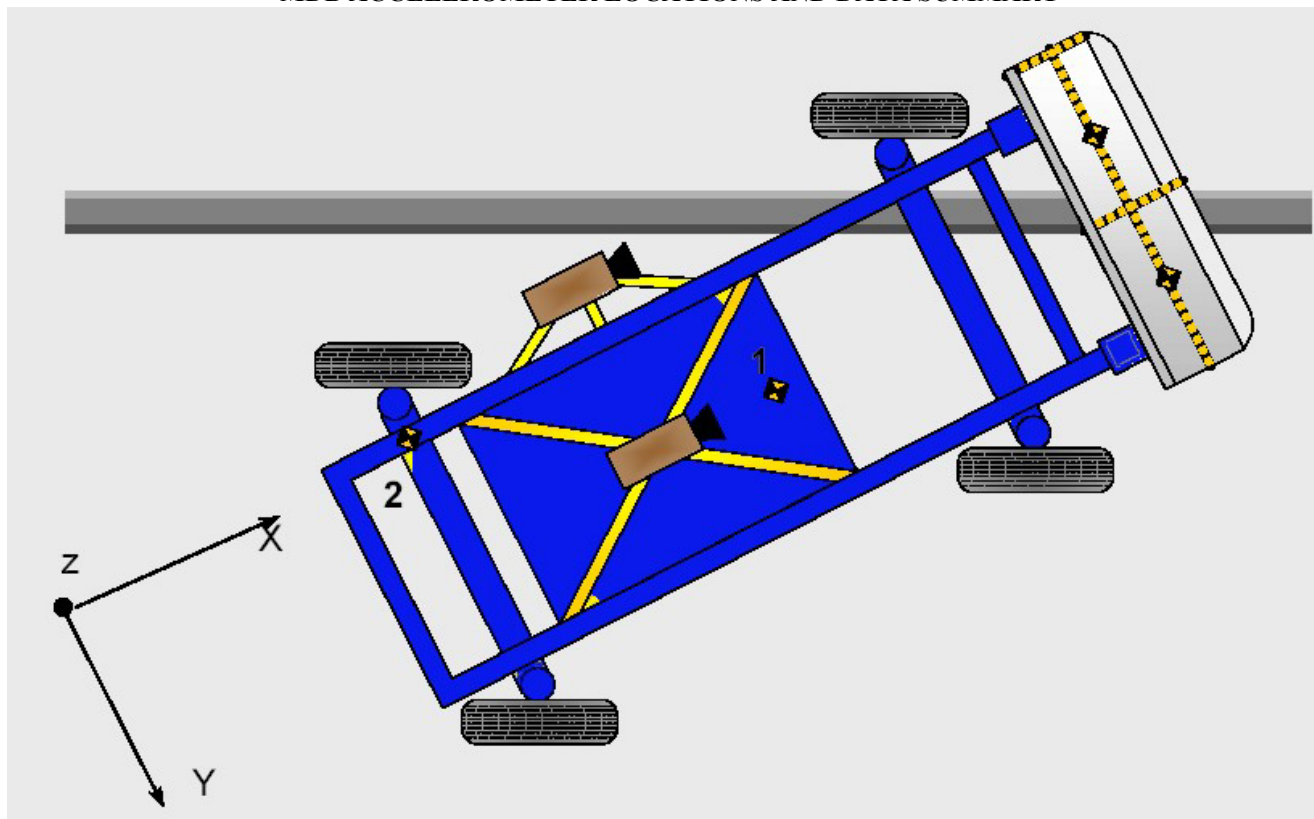
Axis Origin      X – Point L  
                      Y – Point L  
                      Z – Point L

Axis Orientation      +(X) Forward where x axis is the vector from middle of rear bumper to mid front bumper  
                                  +(Y) Right where y axis is parallel to ground reference plane  
                                  +(Z) Down where z axis is cross product of +(X) and +(Y)



# DATA SHEET 14

## MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY



| Location |                       | Coordinates |         |         | Longitudinal (X) |       |       |      | Lateral (Y) |      |      |      | Vertical (Z) |      |      |      | Resultant |      |
|----------|-----------------------|-------------|---------|---------|------------------|-------|-------|------|-------------|------|------|------|--------------|------|------|------|-----------|------|
|          |                       | X<br>mm     | Y<br>mm | Z<br>mm | Max              |       | Min   |      | Max         |      | Min  |      | Max          |      | Min  |      | Max       |      |
|          |                       |             |         |         | G's              | msec  | G's   | msec | G's         | msec | G's  | msec | G's          | msec | G's  | msec | G's       | msec |
| 1        | MDB Center of Gravity | 1113        | -1      | 311     | 1.1              | 137.9 | -23.6 | 39.8 | 2.2         | 63.8 | -7.6 | 27.8 | 6.9          | 53.8 | -5.4 | 21.0 | 24.4      | 39.7 |
| 2        | MDB Rear Frame Member | 2812        | -614    | 585     | 2.9              | 102.9 | -25.5 | 37.7 | 4.7         | 27.4 | -2.4 | 61.4 |              |      |      |      |           |      |

Axis Origin

X – Rear Bumper

Y – Vehicle Centerline

Z – Middle of rear bumper

Axis Orientation

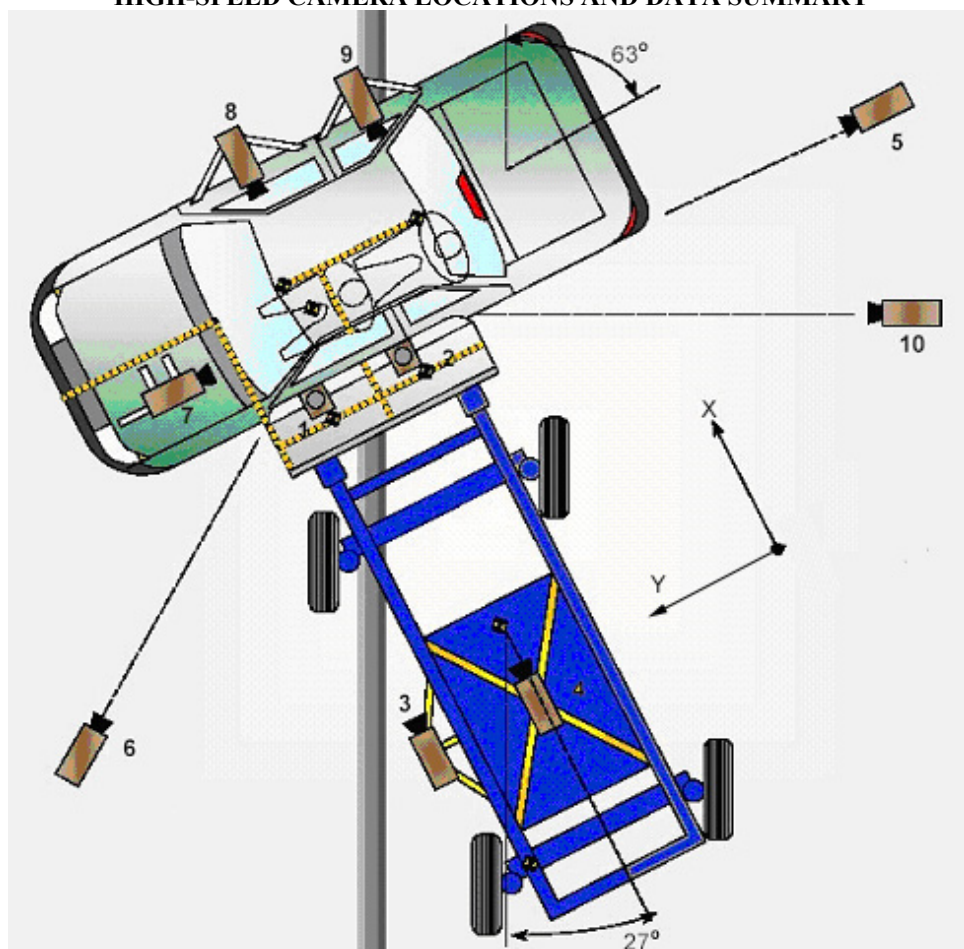
+(X) Forward

+(Y) Right

+(Z) Down

## DATA SHEET 15

## HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY



| Camera No. | View                                      | Coordinates (mm)* |        |      | Angle wrt Horiz. | Lens (mm) | Video Speed (fps) |
|------------|-------------------------------------------|-------------------|--------|------|------------------|-----------|-------------------|
|            |                                           | X                 | Y      | Z    |                  |           |                   |
| 1          | Overhead view of test vehicle             | 526               | -673   | 4843 | 90               | 8         | 1000              |
| 2          | Overhead close-up view of impact plane    | 225               | -158   | 4371 | 90               | 16        | 1000              |
| 3          | MDB onboard close-up view of impact point | -1542             | -1026  | 25   | 0                | 25        | 1000              |
| 4          | MDB onboard view of driver dummy          | -1415             | -1891  | 780  | 5                | 13        | 1000              |
| 5          | Right side ground level overall view      | -1536             | 4542   | 879  | 7                | 25        | 1000              |
| 6          | Left side ground level overall view       | 107               | -11875 | 928  | 10               | 35        | 1000              |
| 7          | Test vehicle onboard driver front view    | 517               | 225    | 707  | 15               | 25        | 1000              |
| 8          | Test vehicle onboard driver side view     | 1753              | -991   | 520  | 10               | 12.5      | 1000              |
| 9          | Test vehicle onboard passenger side view  | 1774              | -1802  | 519  | 10               | 12.5      | 1000              |
| 10         | Real-time film coverage of test           | -                 | -      | -    | -                | -         | -                 |

\* Reference: Middle of rear bumper on test vehicle

+ (X) Forward where x-axis is the vector from middle of rear bumper to mid front bumper

+ (Y) Right where y axis is parallel to ground reference plane

+ (Z) Down where z axis is cross product of + (X) and + (Y)

**SECTION 5**  
**FUEL SYSTEM INTEGRITY**

**DATA SHEET 16****FUEL SYSTEM INTEGRITY DATA****TEST REQUIREMENTS:**

Drain the test vehicle's fuel system and operate the engine until the fuel system is dry. Add Stoddard solvent, which has been dyed purple, until 92-94% of the stated usable capacity is reached. Operate the engine to assure the Stoddard solvent is present throughout the entire fuel system.

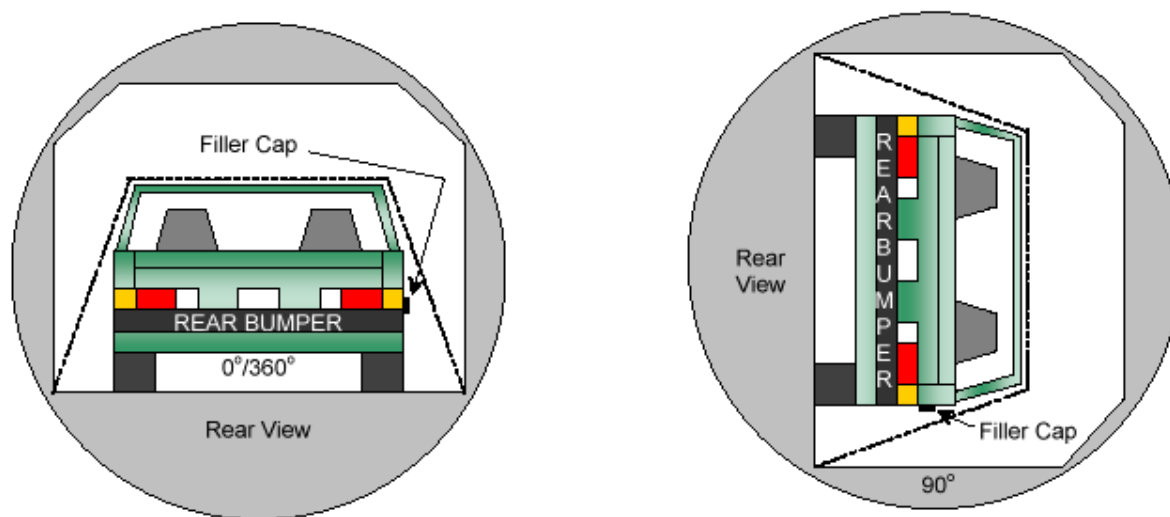
**TEST VEHICLE IMPACT TYPE:** Side impacting Moving Deformable Barrier contacting the driver side.

**FUEL SPILLAGE MEASUREMENT:**

| POST IMPACT TEST                                   | TEST RESULTS | MAXIMUM ALLOWABLE |
|----------------------------------------------------|--------------|-------------------|
| 1. From impact until vehicle motion ceases         | 0            | 1 oz.             |
| 2. For 5 minute period after vehicle motion ceases | 0            | 5 oz.             |
| 3. For next 25 minutes                             | 0            | 1 oz./minute      |

**FUEL SPILLAGE LOCATION(S):** None

**DATA SHEET 17**  
**ROLLOVER DATA**



**0° TO 90°**

**DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:**

|                                    |                  |                  |
|------------------------------------|------------------|------------------|
| Rollover Fixture 90° Rotation Time | <u>1</u> minutes | <u>3</u> seconds |
| (Spec Range =1 to 3 minutes)       |                  |                  |
| FMVSS 301 Position Hold Time       | <u>5</u> minutes | <u>5</u> seconds |
| TOTAL                              | <u>6</u> minutes | <u>8</u> seconds |
| Next whole minute interval         | <u>7</u> minutes |                  |

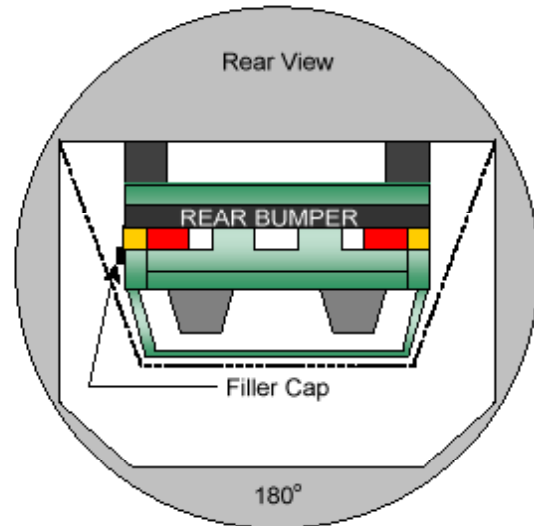
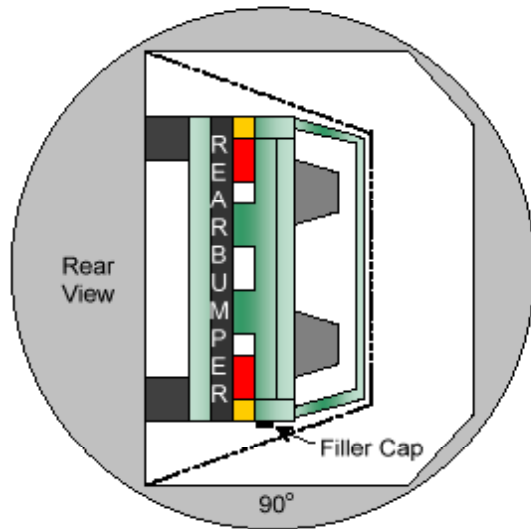
**FUEL SPILLAGE MEASUREMENT:**

| 0° TO 90° ROTATION                        | TEST RESULTS | MAXIMUM ALLOWABLE |
|-------------------------------------------|--------------|-------------------|
| 1. First 5 Minutes From Onset of Rotation | 0            | 5 oz.             |
| 2. Sixth Minute From Onset of Rotation    | 0            | 1 oz.             |
| 3. Seventh Minute From Onset of Rotation  | 0            | 1 oz.             |
| 4. Eighth Minute if Required              | -            | 1 oz.             |

**FUEL SPILLAGE LOCATION(S):** None

## DATA SHEET 17 (continued)

## ROLLOVER VEHICLE



## 90° TO 180°

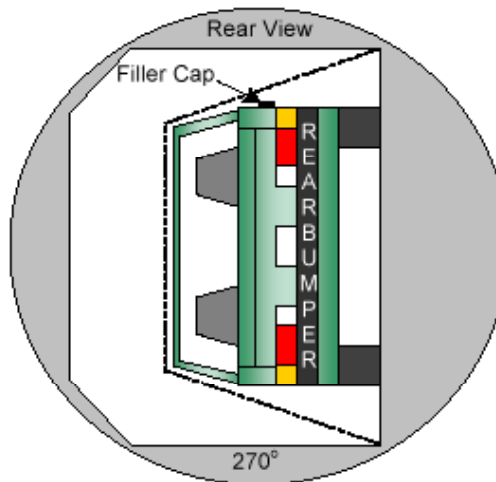
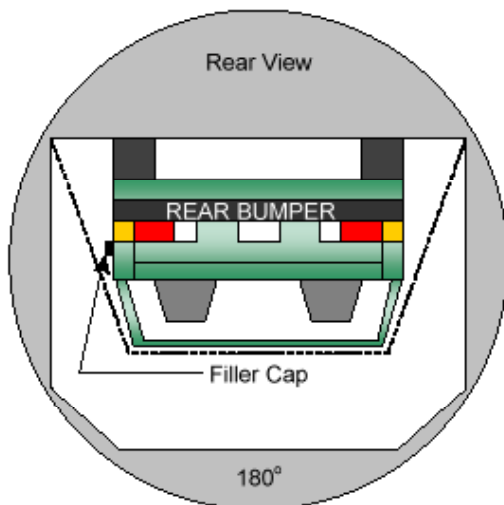
DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FUEL SPILLAGE MEASUREMENT:

| 90° TO 180° ROTATION                      | TEST RESULTS | MAXIMUM ALLOWABLE |
|-------------------------------------------|--------------|-------------------|
| 1. First 5 Minutes From Onset of Rotation | 0            | 5 oz.             |
| 2. Sixth Minute From Onset of Rotation    | 0            | 1 oz.             |
| 3. Seventh Minute From Onset of Rotation  | 0            | 1 oz.             |
| 4. Eighth Minute if Required              | -            | 1 oz.             |

FUEL SPILLAGE LOCATION(S): None

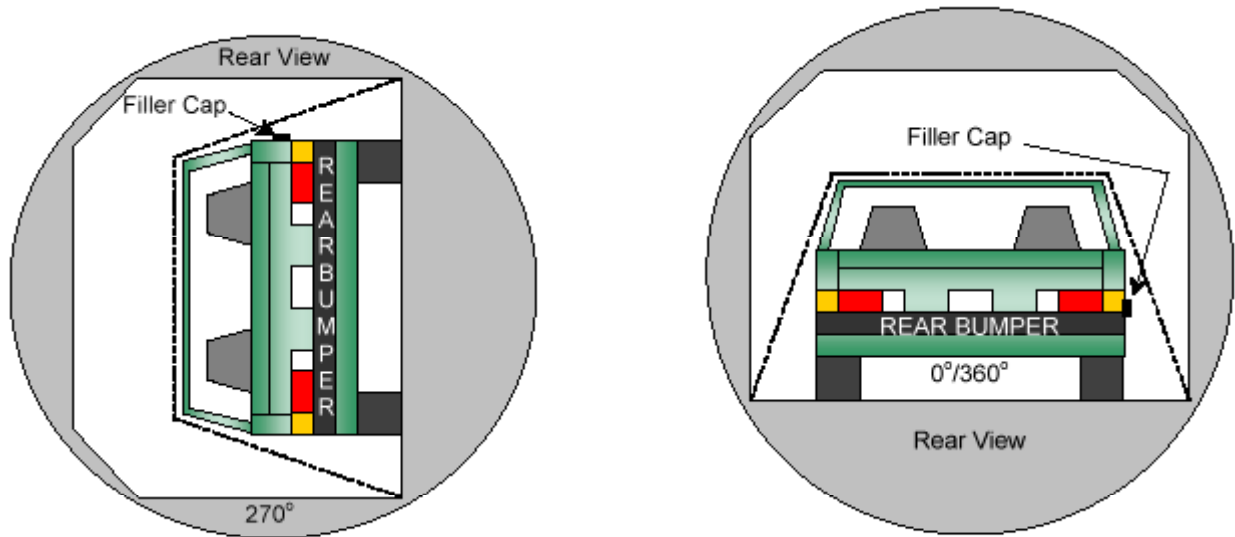
**DATA SHEET 17 (continued)****ROLLOVER VEHICLE****180° TO 270°**DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FUEL SPILLAGE MEASUREMENT:

| 180° TO 270° ROTATION                     | TEST RESULTS | MAXIMUM ALLOWABLE |
|-------------------------------------------|--------------|-------------------|
| 1. First 5 Minutes From Onset of Rotation | 0            | 5 oz.             |
| 2. Sixth Minute From Onset of Rotation    | 0            | 1 oz.             |
| 3. Seventh Minute From Onset of Rotation  | 0            | 1 oz.             |
| 4. Eighth Minute From Onset of Rotation   | -            | 1 oz.             |

FUEL SPILLAGE LOCATION(S): None

**DATA SHEET 17 (continued)****ROLLOVER VEHICLE****270° TO 360°****DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:**

|                                    |                  |                  |
|------------------------------------|------------------|------------------|
| Rollover Fixture 90° Rotation Time | <u>1</u> minutes | <u>4</u> seconds |
| (Spec Range =1 to 3 minutes)       |                  |                  |
| FMVSS 301 Position Hold Time       | <u>5</u> minutes | <u>0</u> seconds |
| TOTAL                              | <u>6</u> minutes | <u>4</u> seconds |
| Next whole minute interval         | <u>7</u> minutes |                  |

**FUEL SPILLAGE MEASUREMENT:**

| 270° TO 360° ROTATION                     | TEST RESULTS | MAXIMUM ALLOWABLE |
|-------------------------------------------|--------------|-------------------|
| 1. First 5 Minutes From Onset of Rotation | 0            | 5 oz.             |
| 2. Sixth Minute From Onset of Rotation    | 0            | 1 oz.             |
| 3. Seventh Minute From Onset of Rotation  | 0            | 1 oz.             |
| 4. Eighth Minute if Required              | -            | 1 oz.             |

**FUEL SPILLAGE LOCATION(S):** None



**APPENDIX A**  
**PHOTOGRAPHS**

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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 LEFT FRONT VIEW OF TEST VEHICLE





Figure A-4: POST-TEST LEFT FRONT VIEW OF TEST VEHICLE





Figure A-5: PRE-TEST LEFT SIDE VIEW OF TEST VEHICLE





Figure A-6: POST-TEST LEFT SIDE VIEW OF TEST VEHICLE





Figure A-7: PRE-TEST LEFT REAR VIEW OF TEST VEHICLE



Figure A-8: POST-TEST LEFT REAR VIEW OF TEST VEHICLE





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



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





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





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





Figure A-13: PRE-TEST RIGHT SIDE VIEW OF TEST VEHICLE



Figure A-14: POST-TEST RIGHT SIDE VIEW OF TEST VEHICLE





Figure A-15: PRE-TEST FRONT RIGHT VIEW OF TEST VEHICLE





Figure A-16: POST-TEST FRONT RIGHT VIEW OF TEST VEHICLE



Figure A-17: POST-TEST UNLATCHED DRIVER DOOR





Figure A-18: POST-TEST UNLATCHED DRIVER DOOR 2



Figure A-19: PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3





Figure A-20: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-21: PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3





Figure A-22: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-23: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3





Figure A-24: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-25: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3





Figure A-26: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3



Figure A-27: PRE-TEST INTERIOR OF FRONT DOOR





Figure A-28: POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS



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Figure A-30: PRE-TEST INTERIOR OF REAR PASSENGER COMPARTMENT



Figure A-31: POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS





Figure A-32: POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS 2





Figure A-33: PRE TEST LEFT SIDE VIEW OF MDB IN IMPACT POSITION





Figure A-34: POST TEST LEFT SIDE VIEW OF MDB





Figure A-35: PRE TEST RIGHT SIDE VIEW OF MDB IN IMPACT POSITION





Figure A-36: POST TEST RIGHT SIDE VIEW OF MDB





Figure A-37: PRE TEST OVERHEAD VIEW OF MDB IN IMPACT POSITION



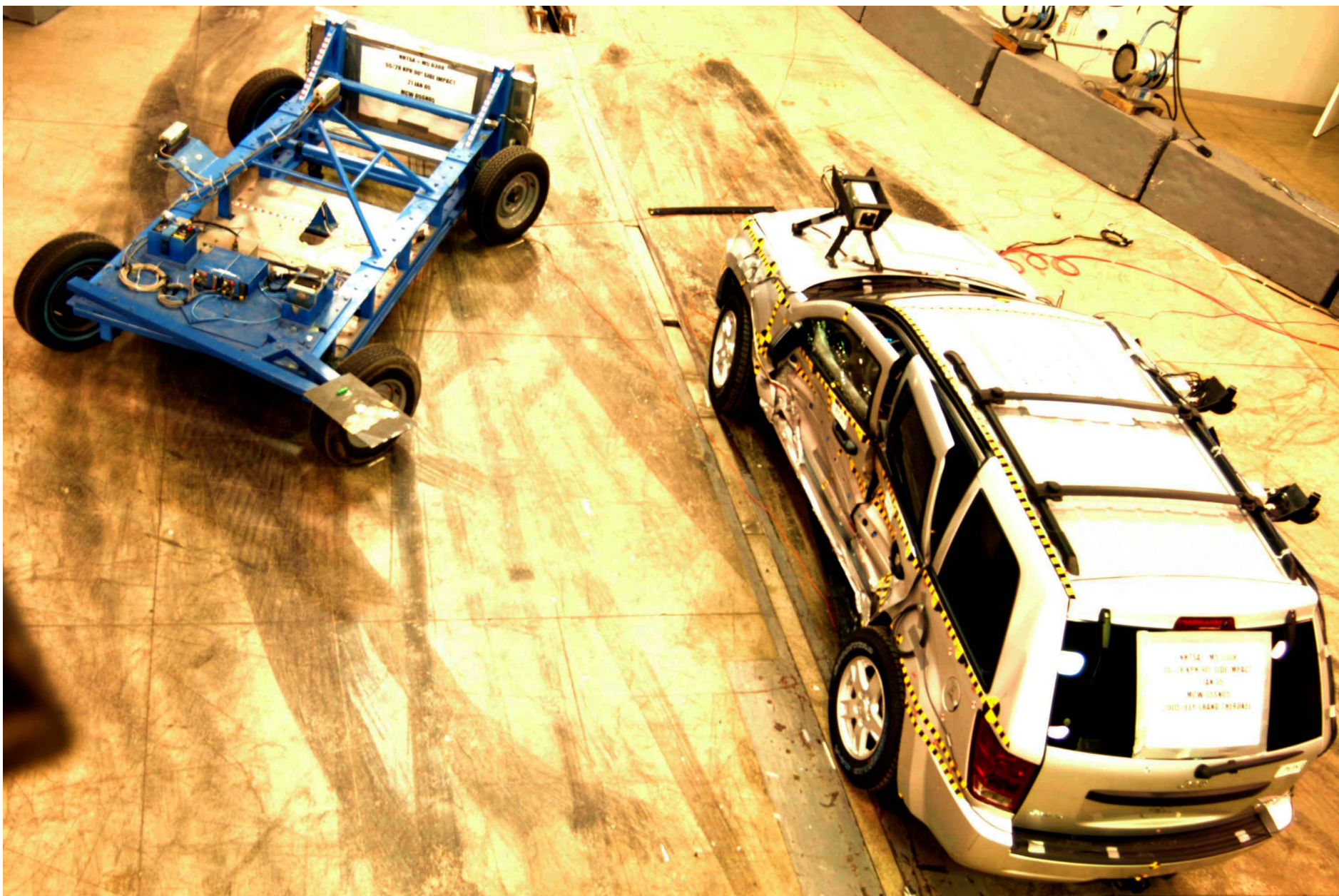


Figure A-38: POST TEST OVERHEAD VIEW OF MDB





Figure A-39: PRE TEST CLOSE-UP OF IMPACT POINT TARGET SHOWING WELDING ROD





Figure A-40: POST TEST CLOSE-UP OF IMPACT POINT TARGET



Figure A-41: VEHICLE TIRE PLACARD





Figure A-42: VEHICLE CERTIFICATION LABEL



Figure A-43: IMPACT





Figure A-44: ROLLOVER 0 DEGREES



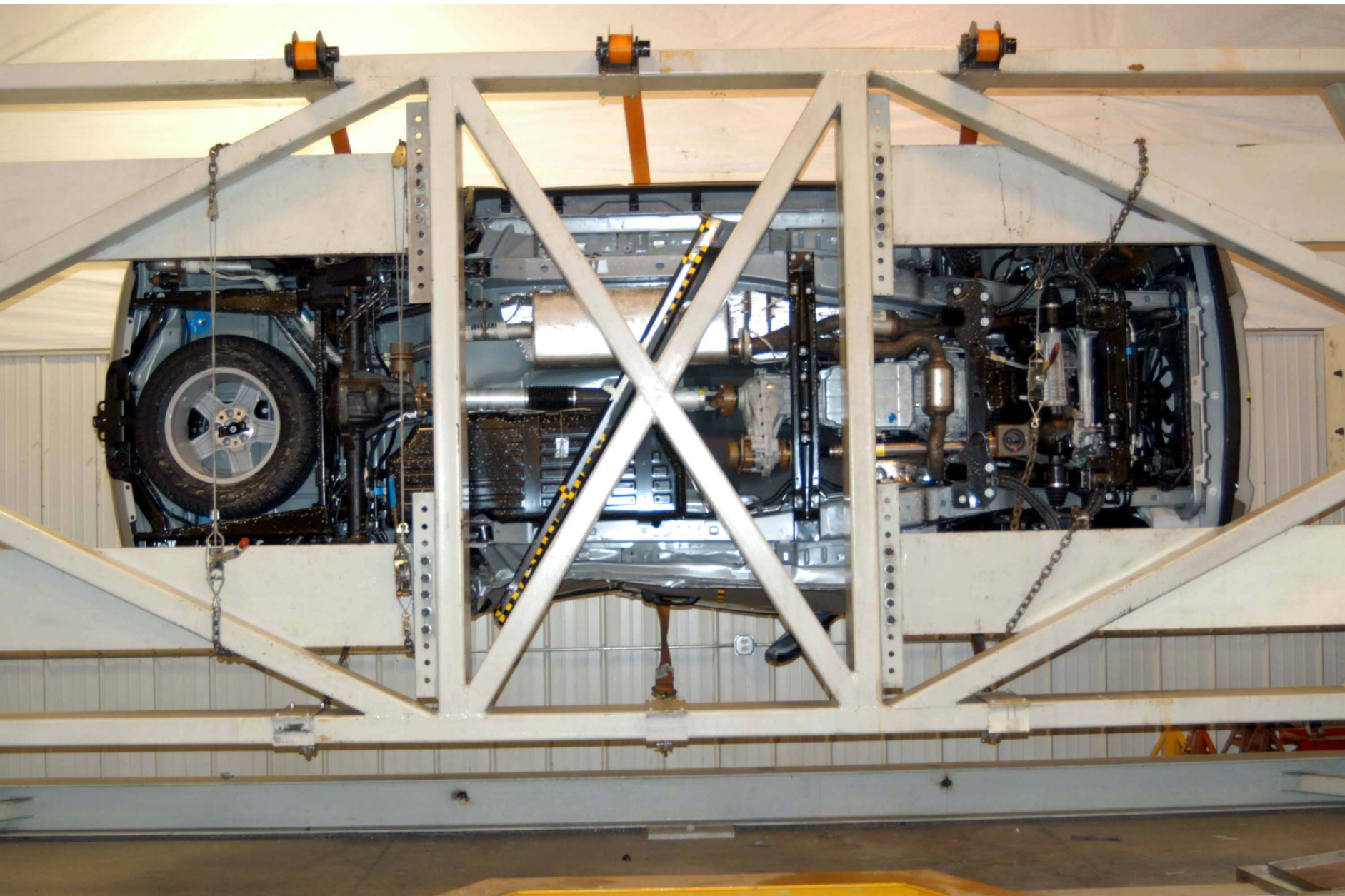


Figure A-45: ROLLOVER 90 DEGREES

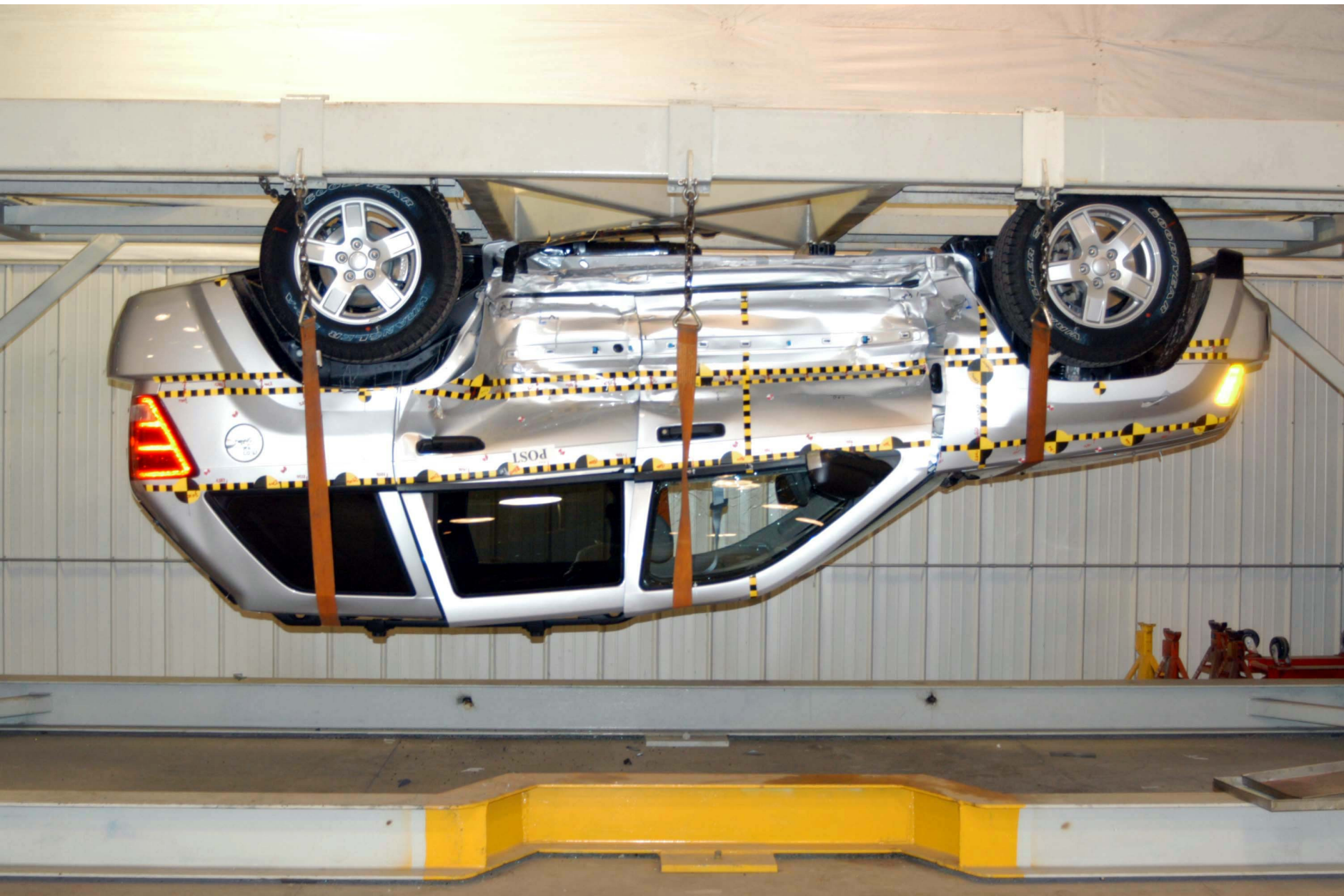


Figure A-46: ROLLOVER 180 DEGREES



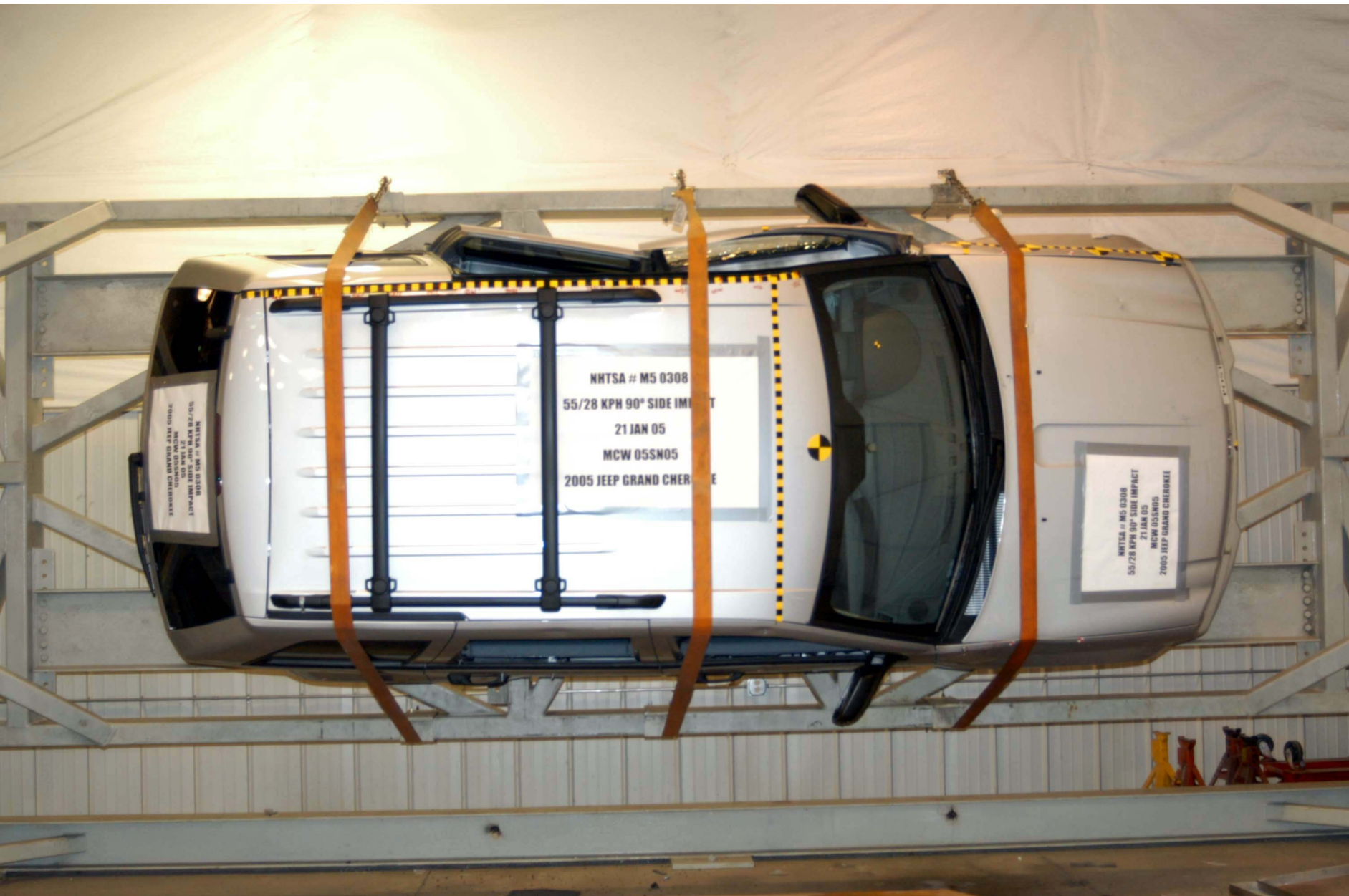


Figure A-47: ROLLOVER 270 DEGREES





Figure A-48: ROLLOVER 360 DEGREES



Figure A-49: PRE-TEST ALUMINUM BARRIER FRONT



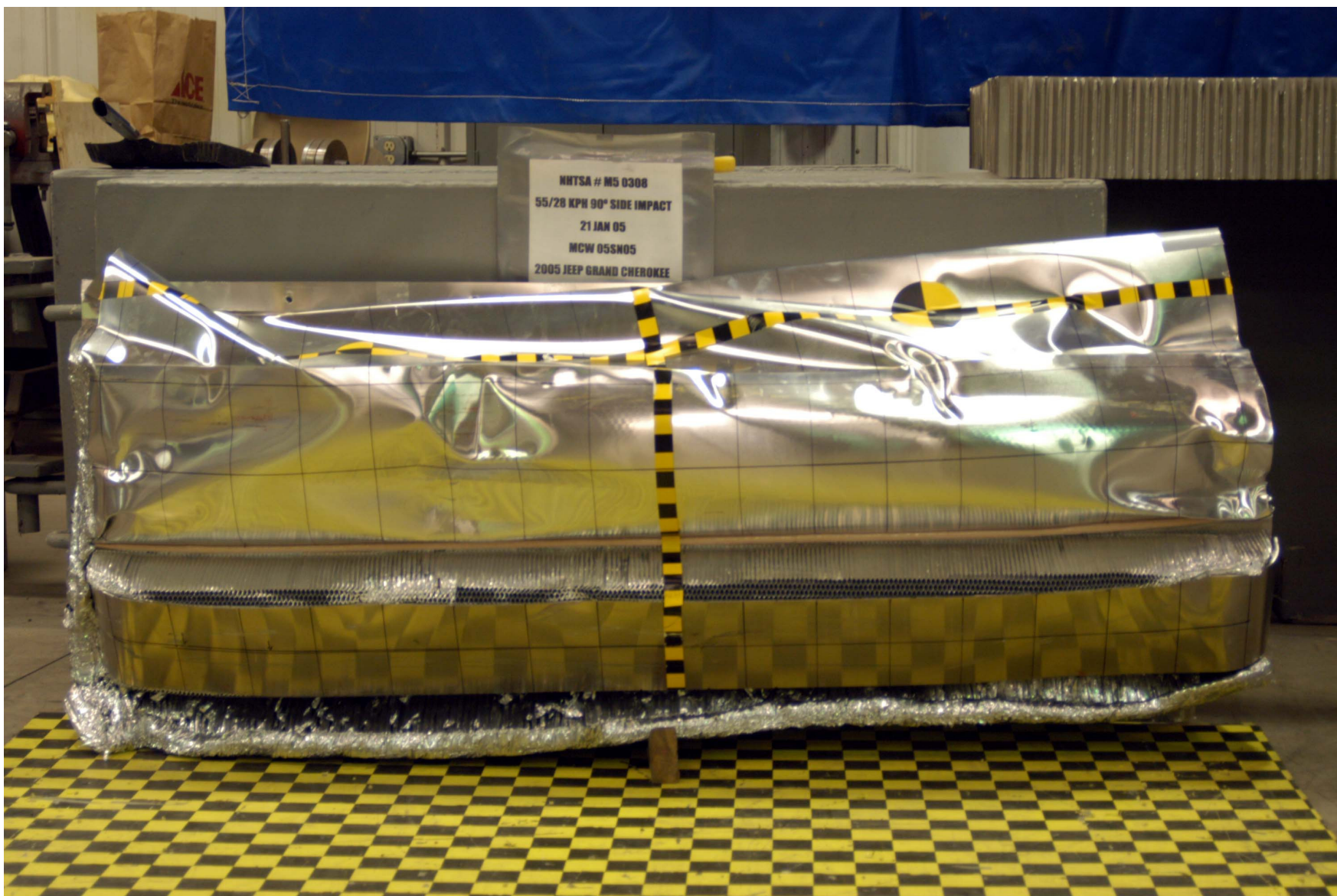


Figure A-50: POST-TEST ALUMINUM BARRIER FRONT





Figure A-51: PRE-TEST ALUMINUM BARRIER LEFT SIDE





Figure A-52: POST-TEST ALUMINUM BARRIER LEFT SIDE





Figure A-53: PRE-TEST ALUMINUM BARRIER RIGHT SIDE





Figure A-54: POST-TEST ALUMINUM BARRIER RIGHT SIDE



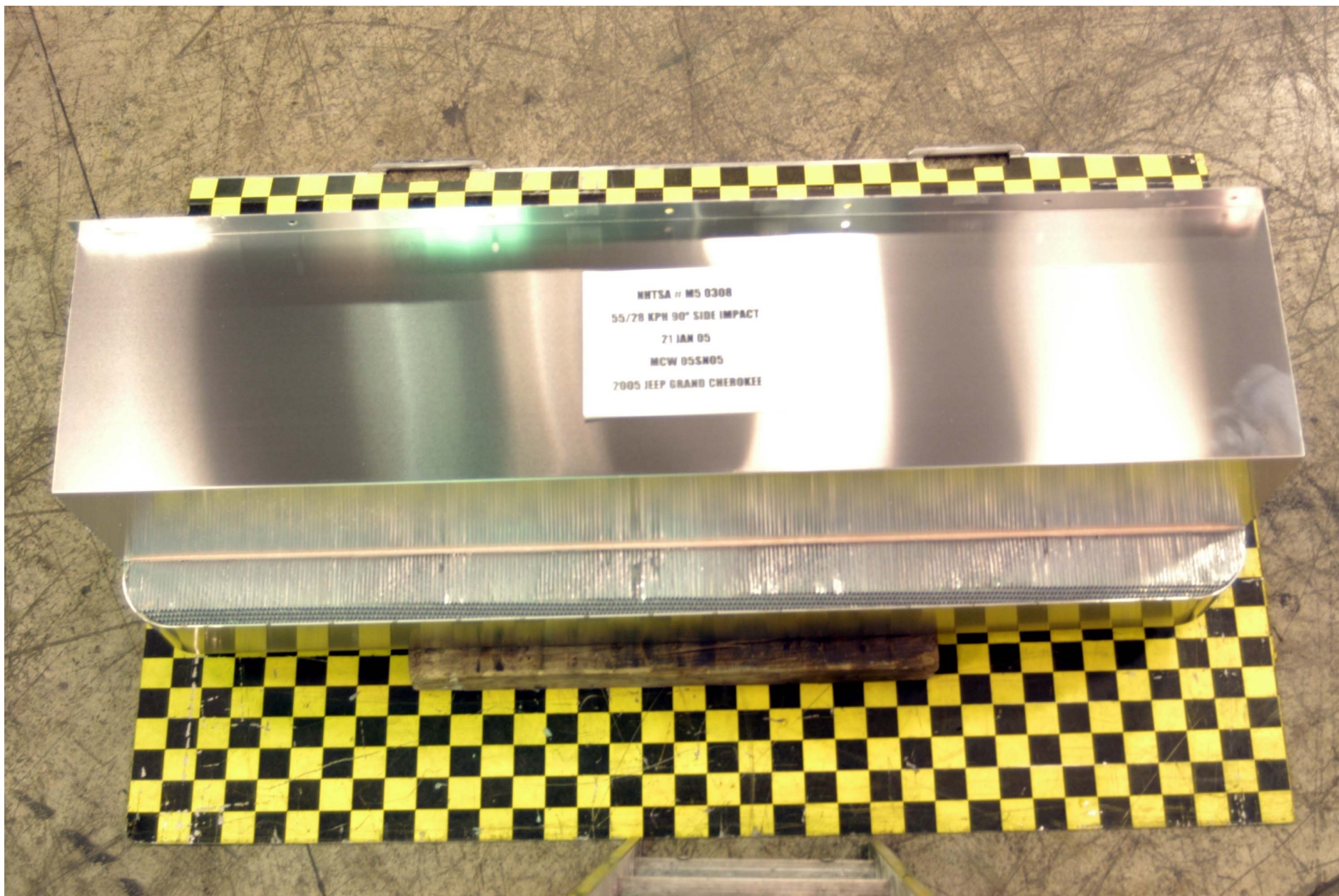


Figure A-55: PRE-TEST ALUMINUM BARRIER TOP





Figure A-56: POST-TEST ALUMINUM BARRIER TOP



## **APPENDIX B**

### **VEHICLE, MDB, AND SID H3 RESPONSE DATA**

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ACCELERATION DATA – FILTER CLASS 1000, LOWER SPINE FILTER CLASS 180  
 UPPER NECK FORCES – FILTER CLASS 1000; UPPER NECK MOMENTS FILTER CLASS 600  
 INTEGRATION DATA FILTER CLASS 180

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**DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS**

ACCELERATION DATA – FIR FILTERED

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**TEST VEHICLE INSTRUMENTATION PLOTS**  
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**INTEGRATION DATA – FILTER CLASS 180**

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**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> |
|-----------------|----------------------------------------------|-------------|
| 107             | MDB CENTER OF GRAVITY (X) ACCELERATION       | B-112       |
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| 110             | MDB CENTER OF GRAVITY (Y) VELOCITY           | B-115       |
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**DRIVER AND 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> |
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| 120             | DRIVER LOWER RIB (Y) ACCELERATION-REDUNDANT      | B-125       |
| 121             | DRIVER LOWER RIB (Y) VELOCITY-REDUNDANT          | B-126       |
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| 130             | PASSENGER LOWER SPINE (Y) ACCELERATION-REDUNDANT | B-135       |
| 131             | PASSENGER LOWER SPINE (Y) VELOCITY-REDUNDANT     | B-136       |
| 132             | PASSENGER PELVIC (Y) ACCELERATION-REDUNDANT      | B-137       |
| 133             | PASSENGER PELVIC (Y) VELOCITY-REDUNDANT          | B-138       |

**DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOT (REDUNDANT)**  
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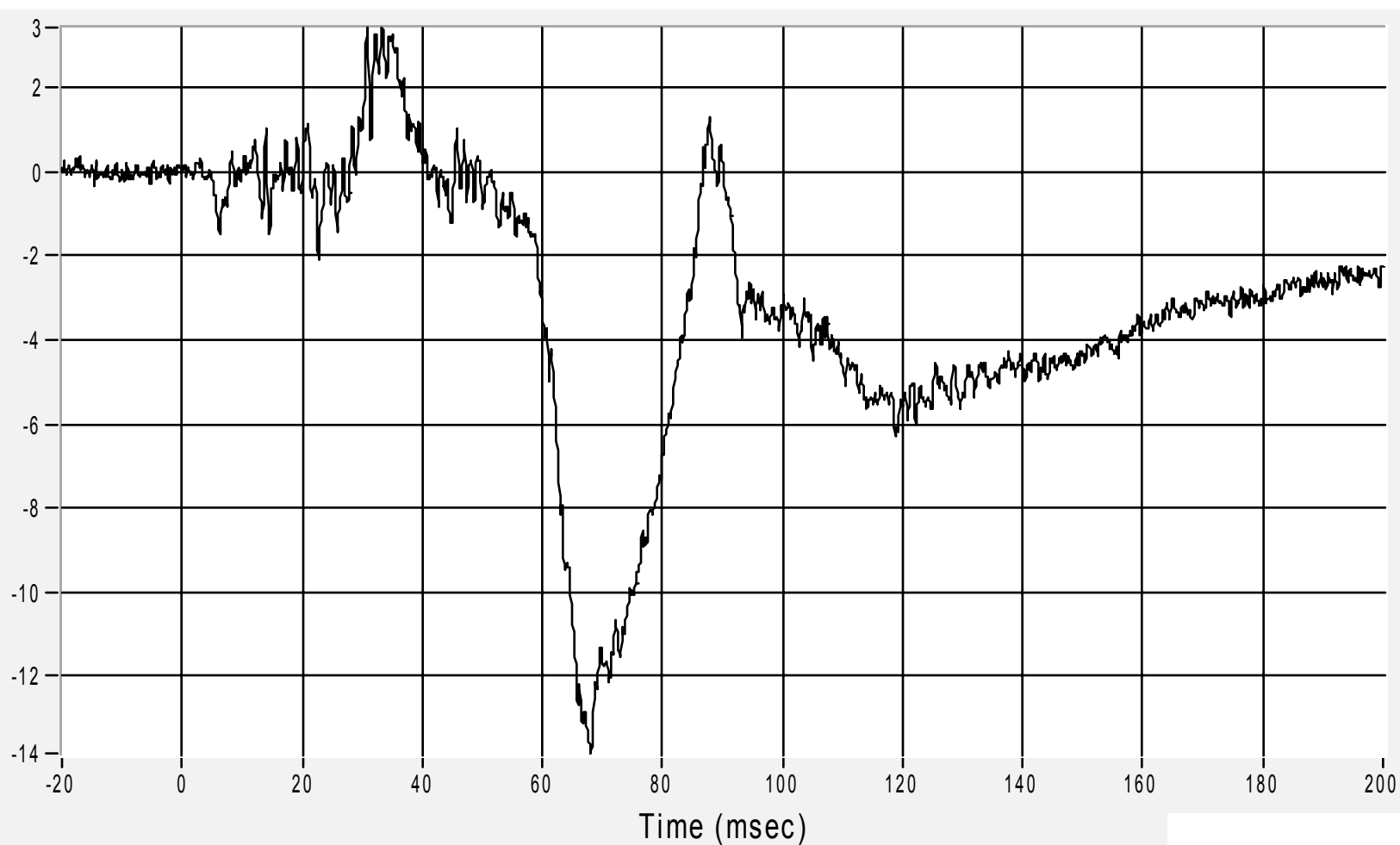
| <u>Plot No.</u> | <u>Data Plot Title</u>                           | <u>Page</u> |
|-----------------|--------------------------------------------------|-------------|
| 134             | DRIVER UPPER RIB (Y) ACCELERATION-REDUNDANT      | B-139       |
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| 136             | DRIVER LOWER SPINE (Y) ACCELERATION-REDUNDANT    | B-141       |
| 137             | DRIVER PELVIC (Y) ACCELERATION-REDUNDANT         | B-142       |
| 138             | PASSENGER UPPER RIB (Y) ACCELERATION-REDUNDANT   | B-143       |
| 139             | PASSENGER LOWER RIB (Y) ACCELERATION-REDUNDANT   | B-144       |
| 140             | PASSENGER LOWER SPINE (Y) ACCELERATION-REDUNDANT | B-145       |
| 141             | PASSENGER PELVIC (Y) ACCELERATION-REDUNDANT      | B-146       |

**Driver Head CG (X) Acceleration**

Acceleration (G's) CFC1000

Max 3.4 G at 33.4 msec

Min -13.8 G at 68.1 msec



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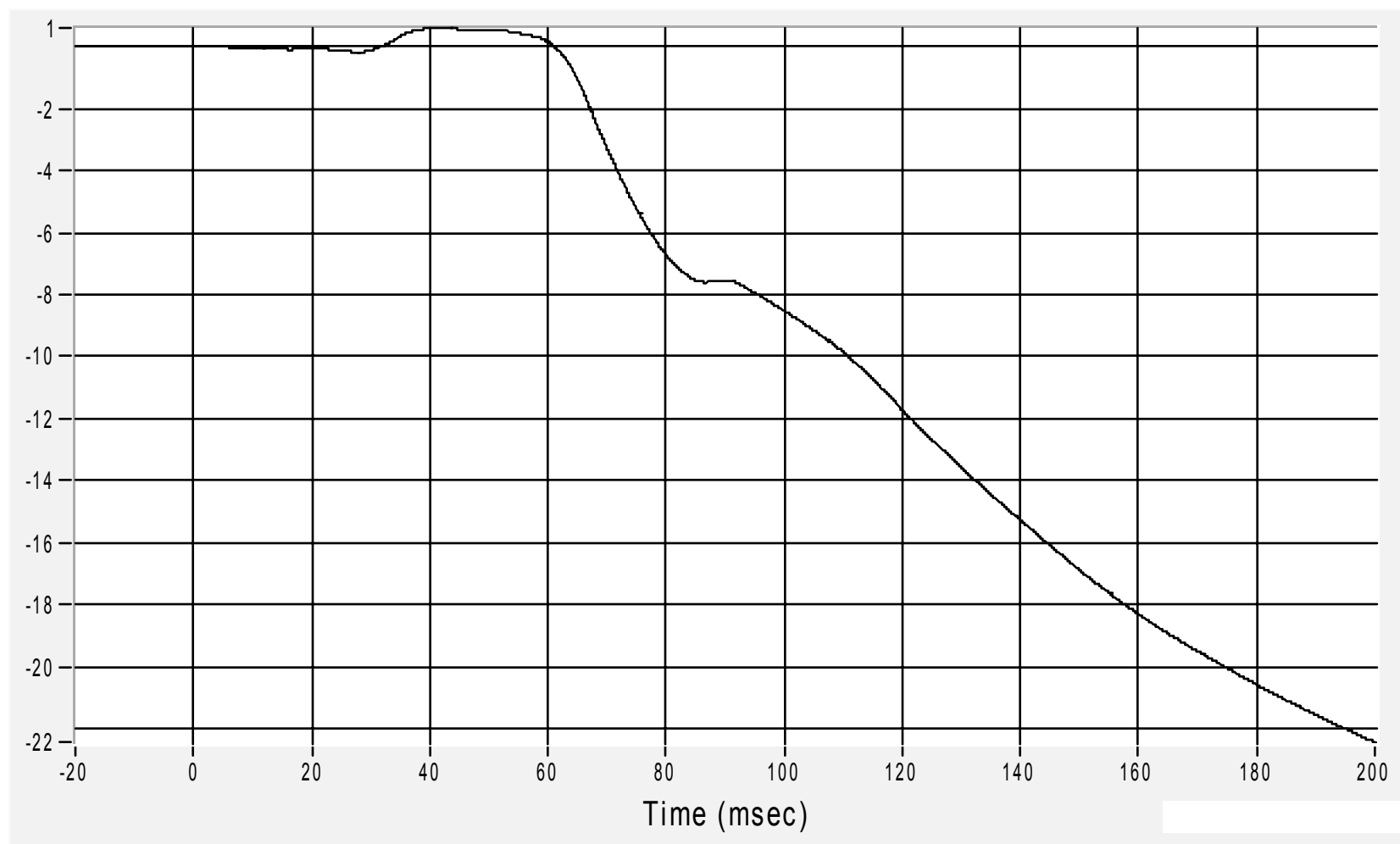


**Driver Head CG (X) Velocity**

Velocity (km/h) CFC180

Max 0.6 km/h at 41.1 msec

Min -22.4 km/h at 199.9 msec



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21 January 2005

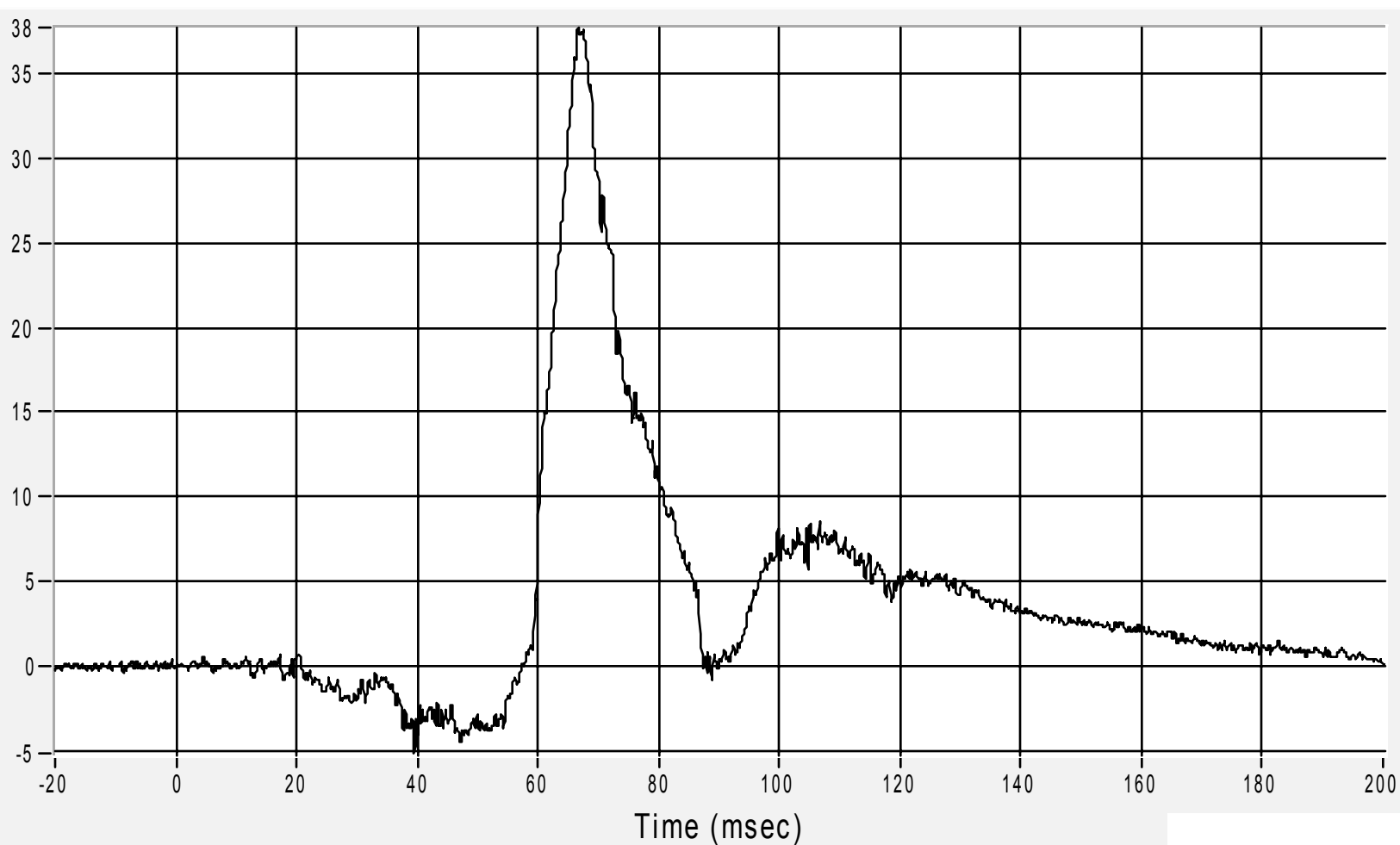
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**Driver Head CG (Y) Acceleration**

Acceleration (G's) CFC1000

Max 37.7 G at 66.6 msec

Min -5.1 G at 39.5 msec



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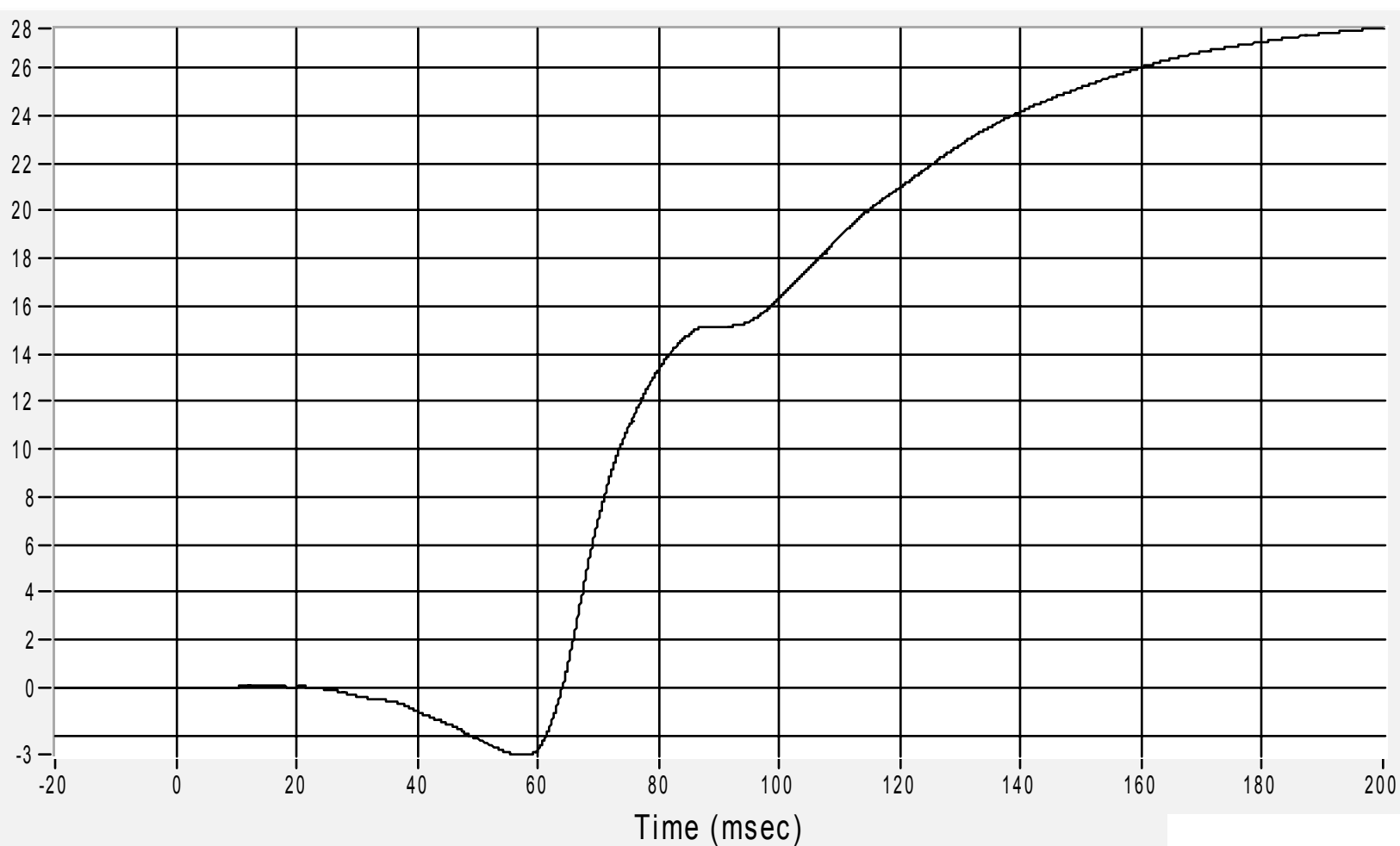
B-8

**Driver Head CG (Y) Velocity**

Velocity (km/h) CFC180

Max 27.6 km/h at 199.9 msec

Min -2.8 km/h at 57.4 msec



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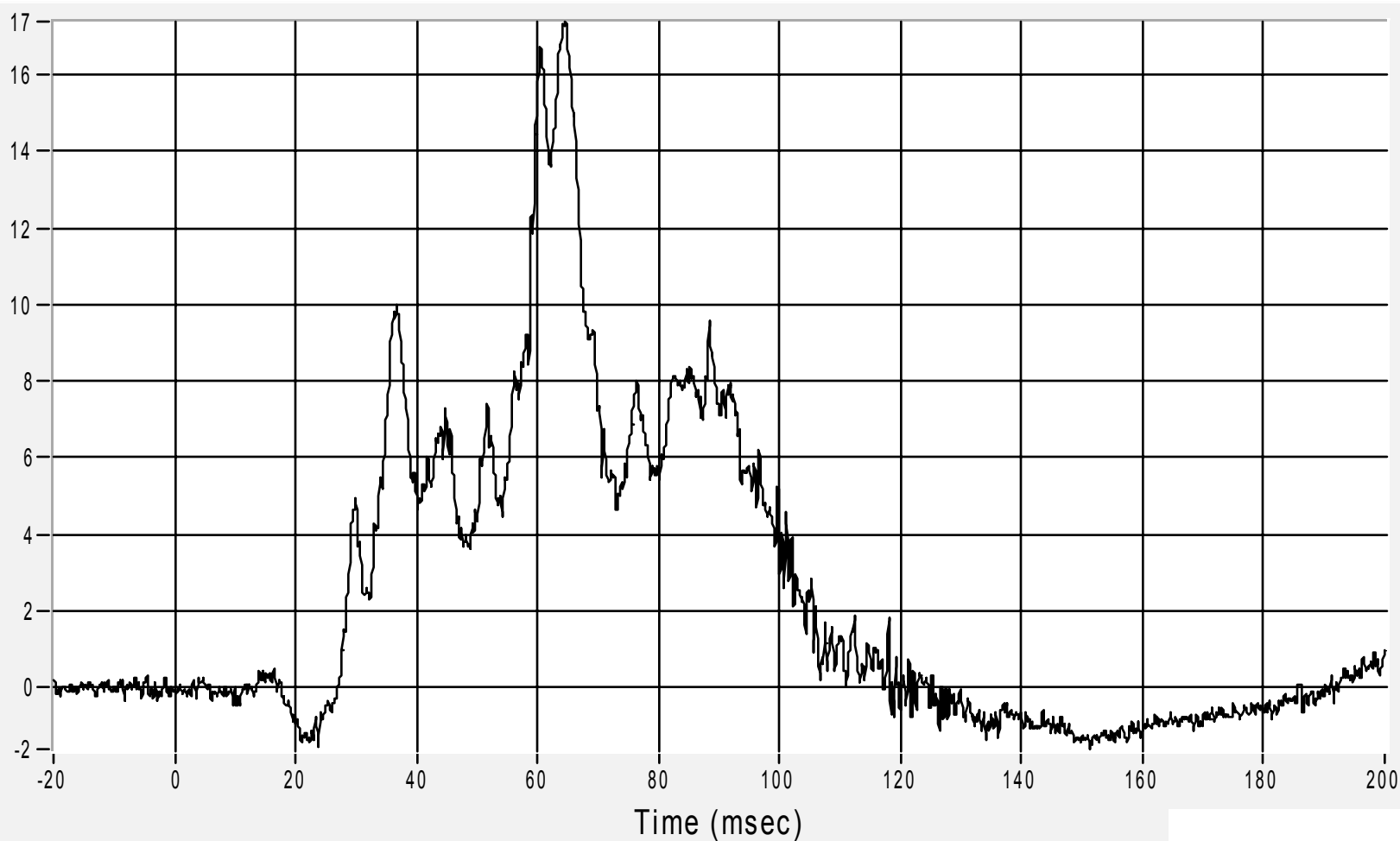


**Driver Head CG (Z) Acceleration**

Acceleration (G's) CFC1000

Max 17.4 G at 64.6 msec

Min -1.6 G at 151.3 msec



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21 January 2005

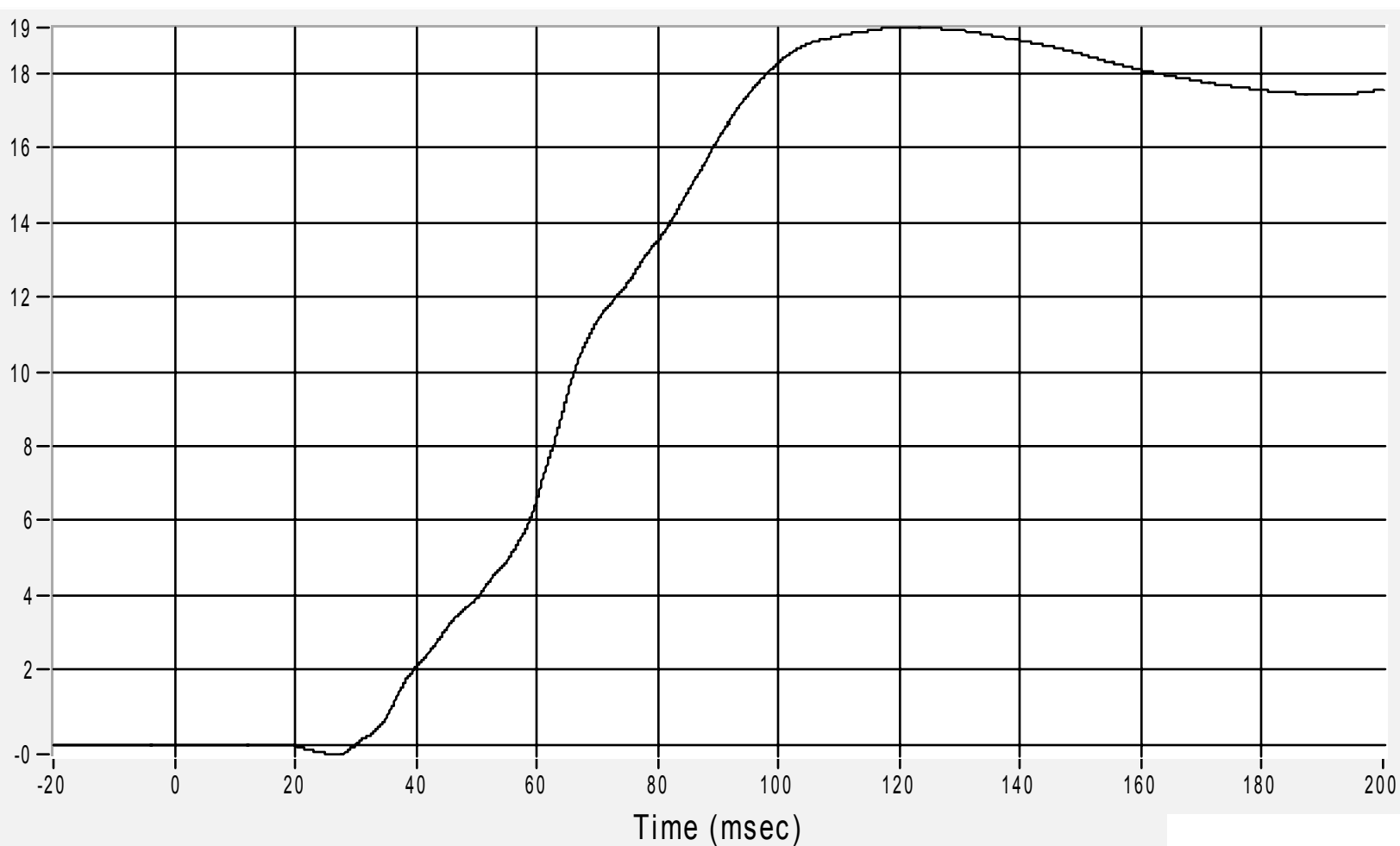
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**Driver Head CG (Z) Velocity**

Velocity (km/h) CFC180

Max 19.2 km/h at 124.4 msec

Min -0.3 km/h at 27.0 msec



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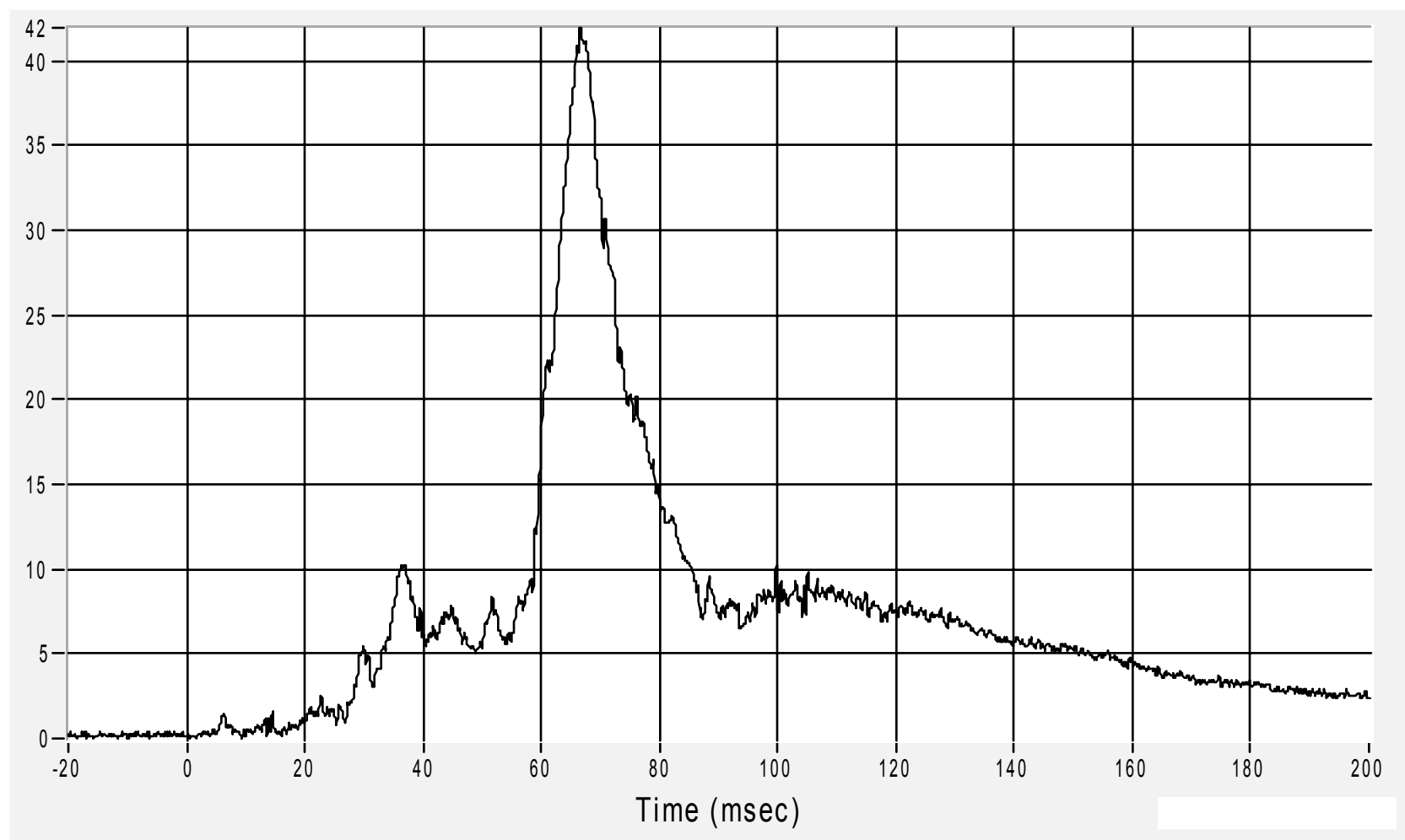
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Driver Head Resultant Acceleration**

Acceleration (G's) CFC1000

Max 41.9 G's at 66.6 msec

Min 0.1 G's at 1.5 msec



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21 January 2005

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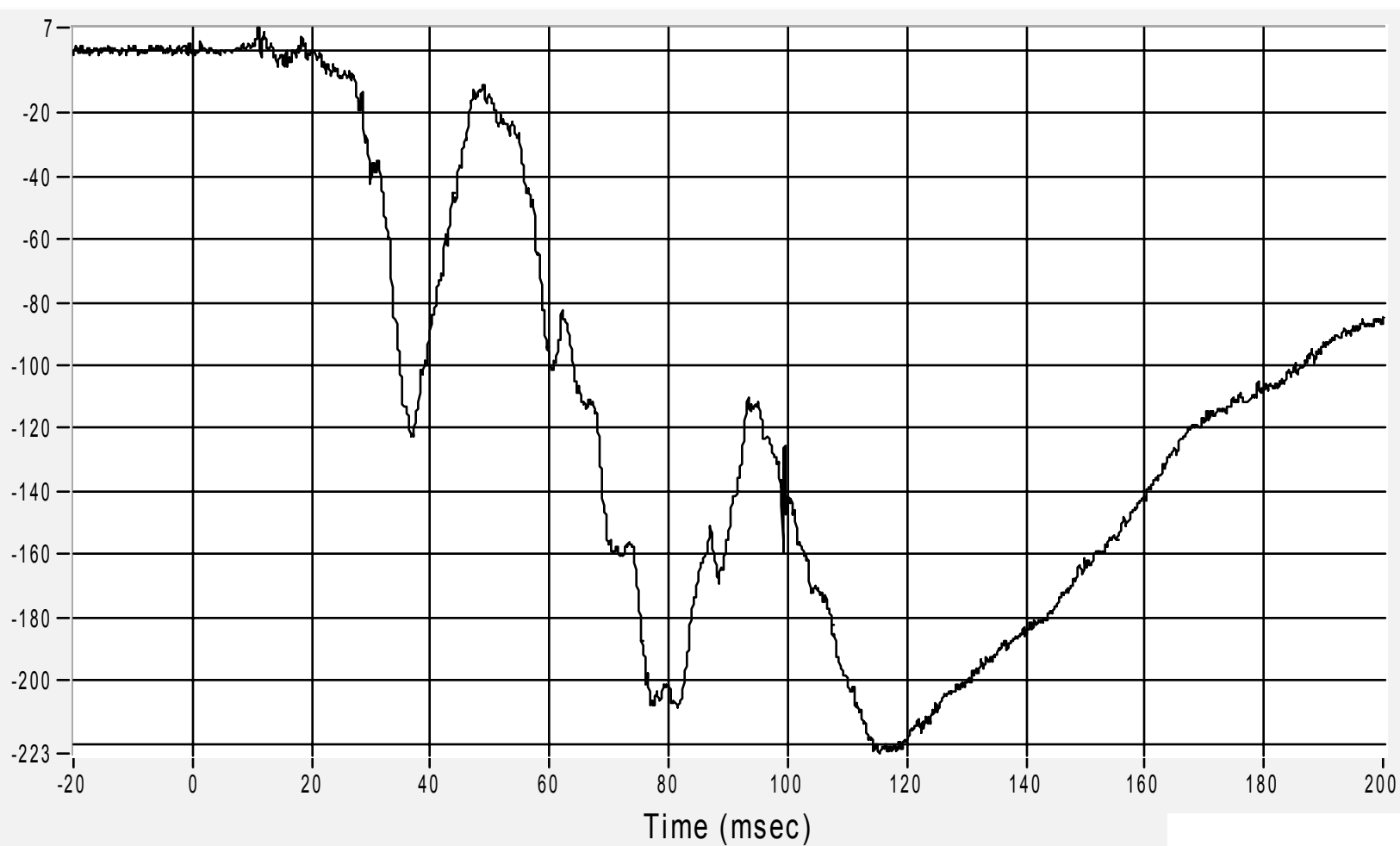
**Driver Upper Neck (X) Force**

Force (N)

CFC1000

Max 7.2 N at 11.1 msec

Min -223.2 N at 115.4 msec



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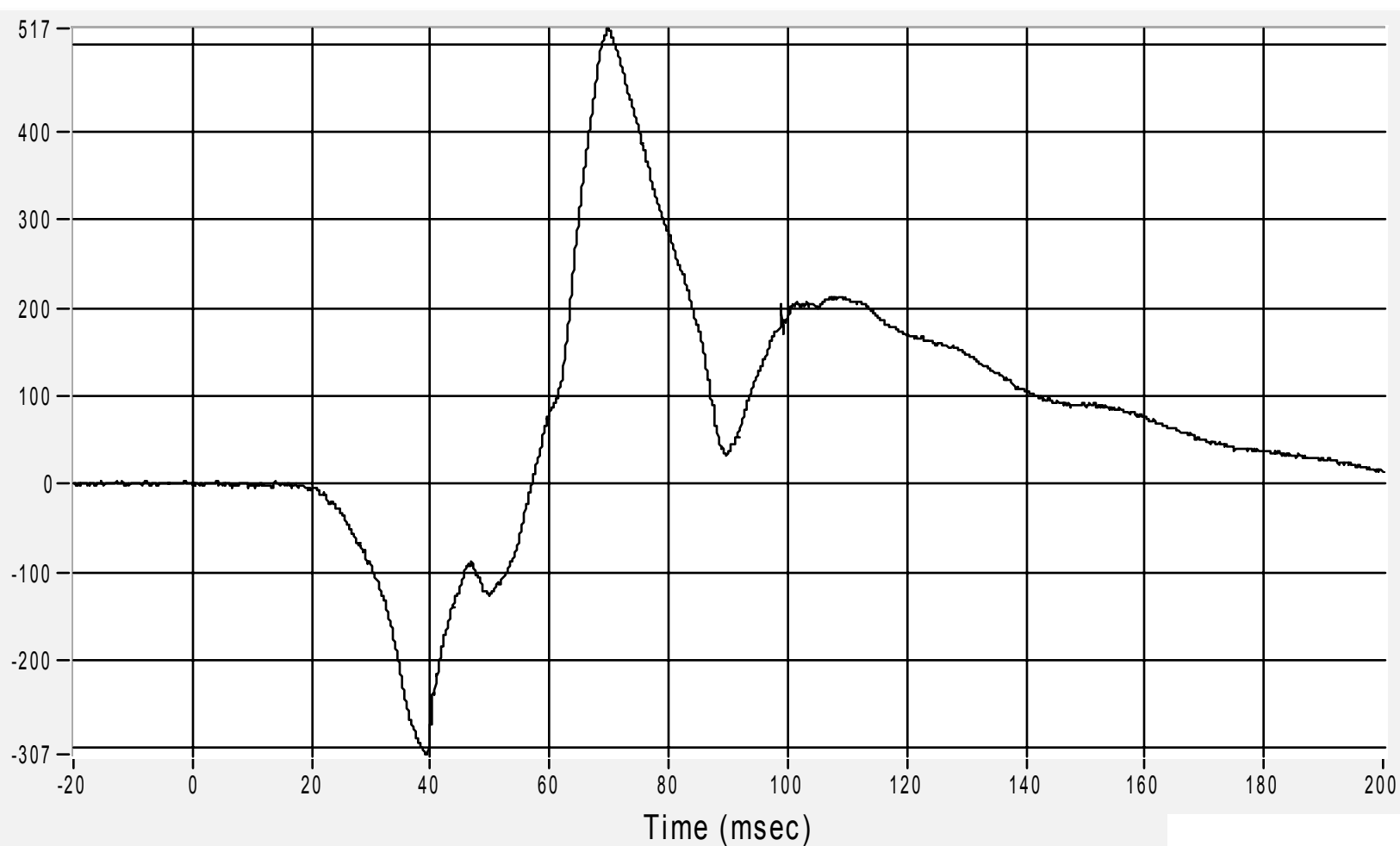
21 January 2005

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**Driver Upper Neck (Y) Force**

Force (N)

CFC1000

**Max 517.4 N at 69.9 msec****Min -307.2 N at 39.2 msec**

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21 January 2005

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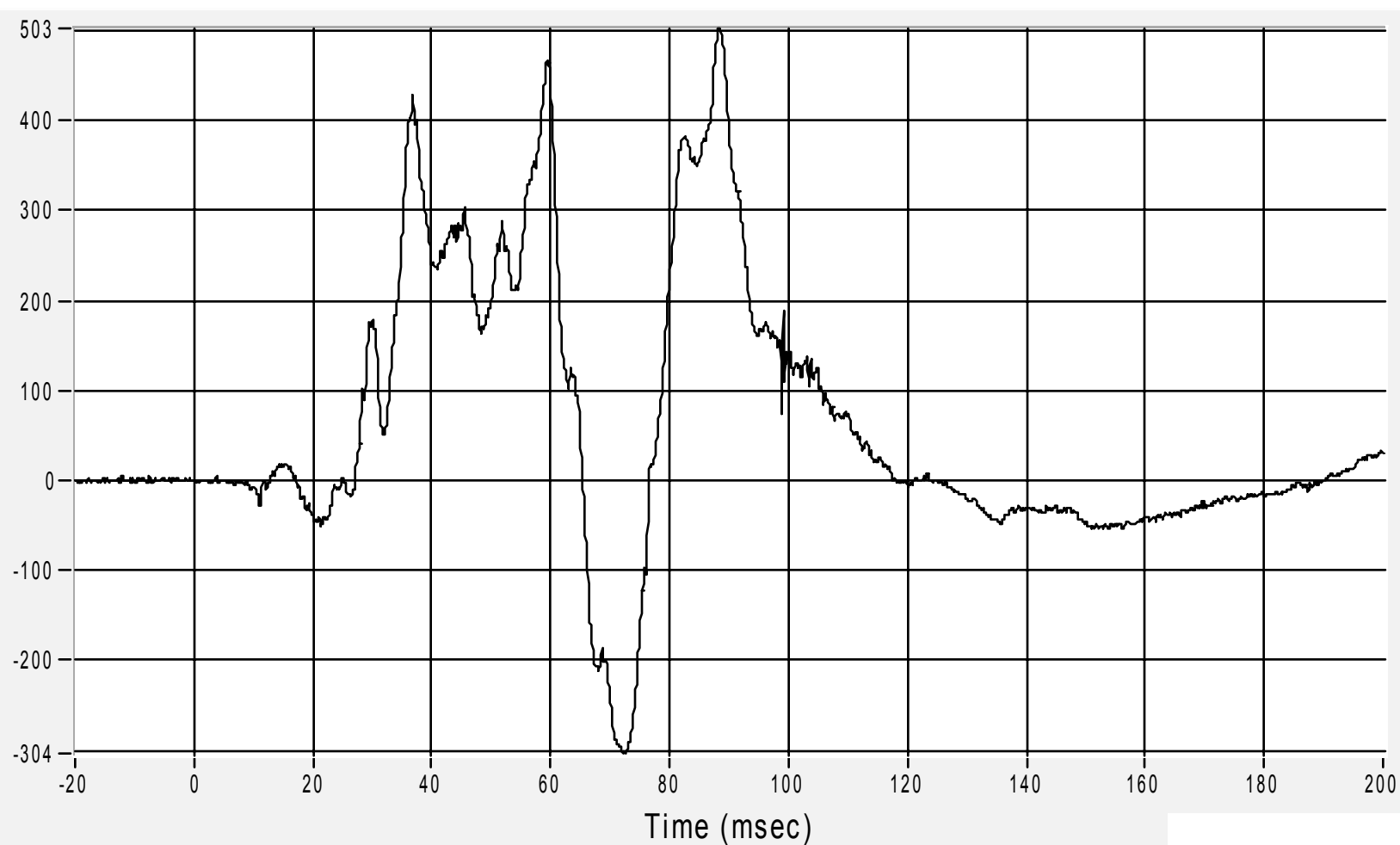
**Driver Upper Neck (Z) Force**

Force (N)

CFC1000

Max 502.5 N at 88.2 msec

Min -303.7 N at 72.2 msec



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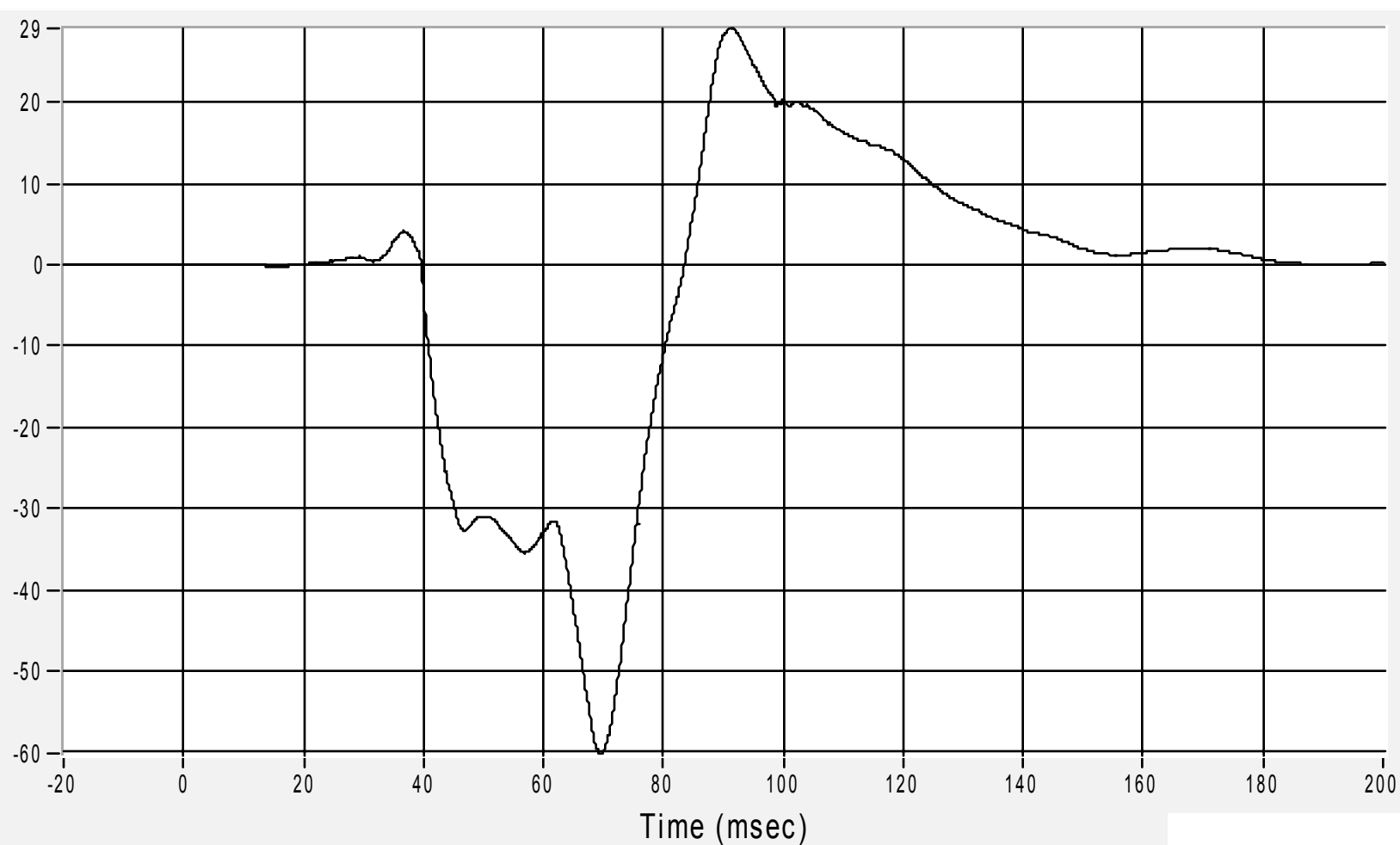


**Driver Upper Neck (X) Moment**

Moment (Nm) CFC600

Max 29.2 Nm at 91.4 msec

Min -60.2 Nm at 69.6 msec



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21 January 2005

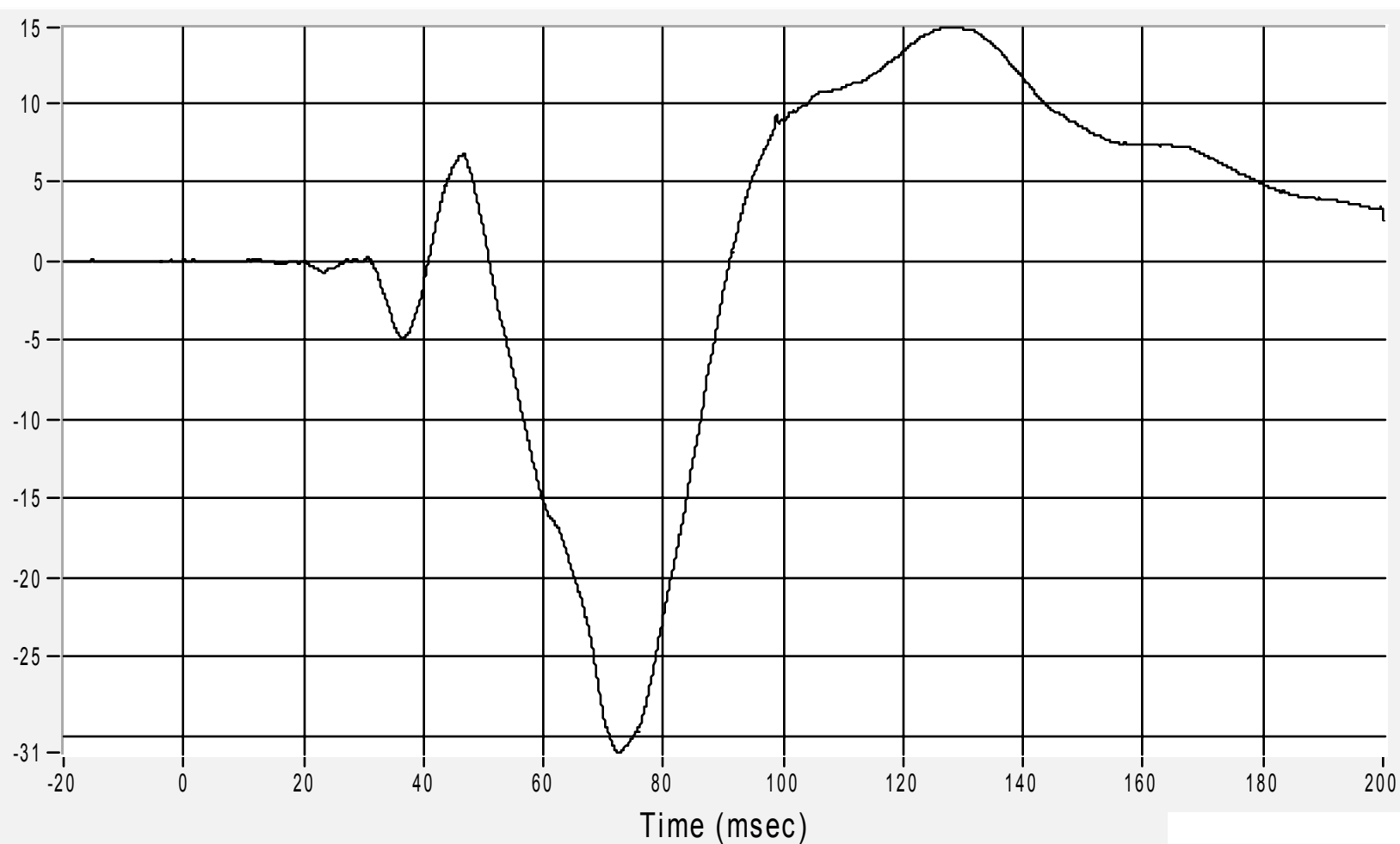
Medical College of Wisconsin  
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**Driver Upper Neck (Y) Moment**

Moment (Nm) CFC600

Max 14.8 Nm at 129.0 msec

Min -31.1 Nm at 72.6 msec



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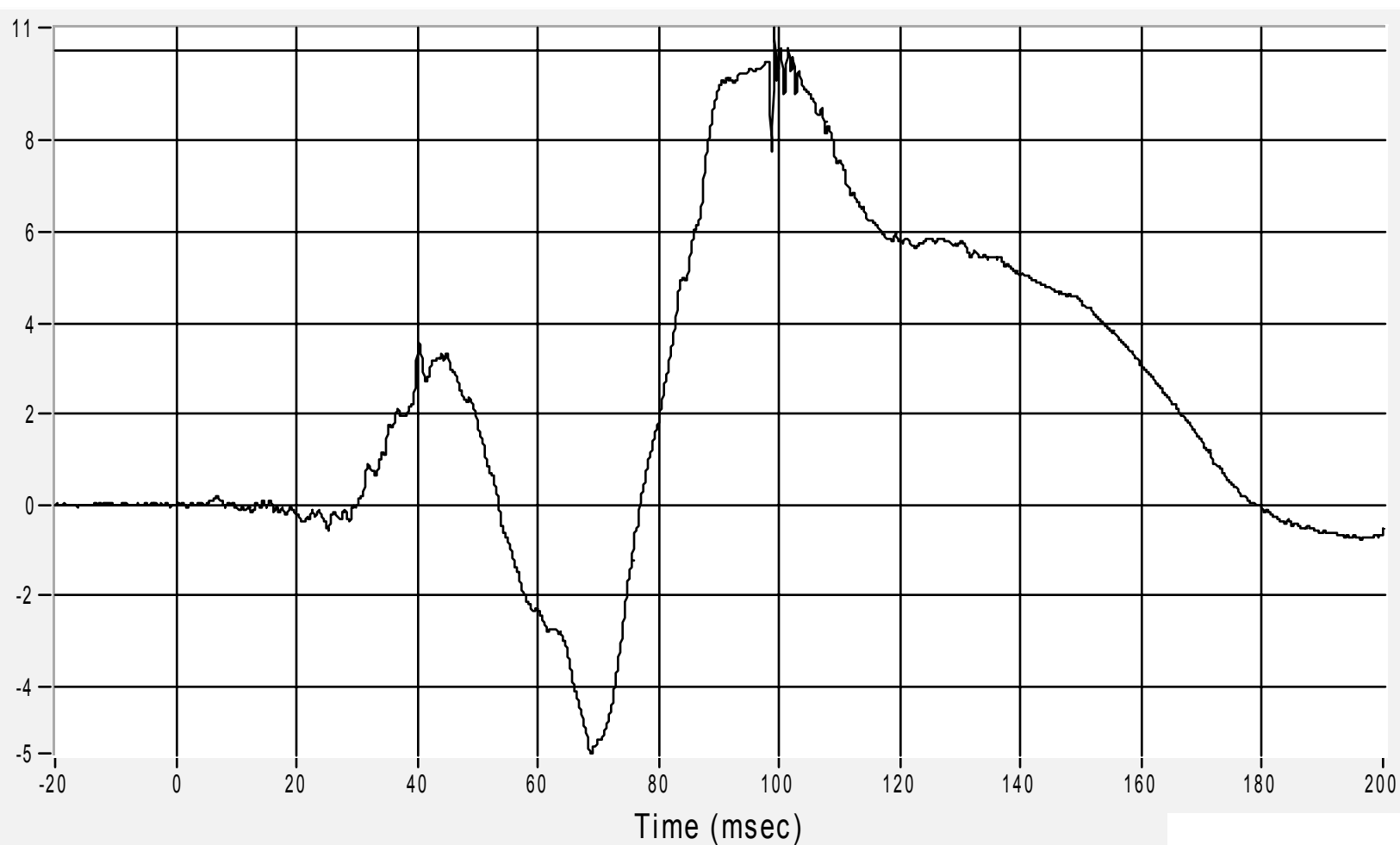
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**Driver Upper Neck (Z) Moment**

Moment (Nm) CFC600

Max 10.5 Nm at 99.2 msec

Min -5.5 Nm at 68.7 msec



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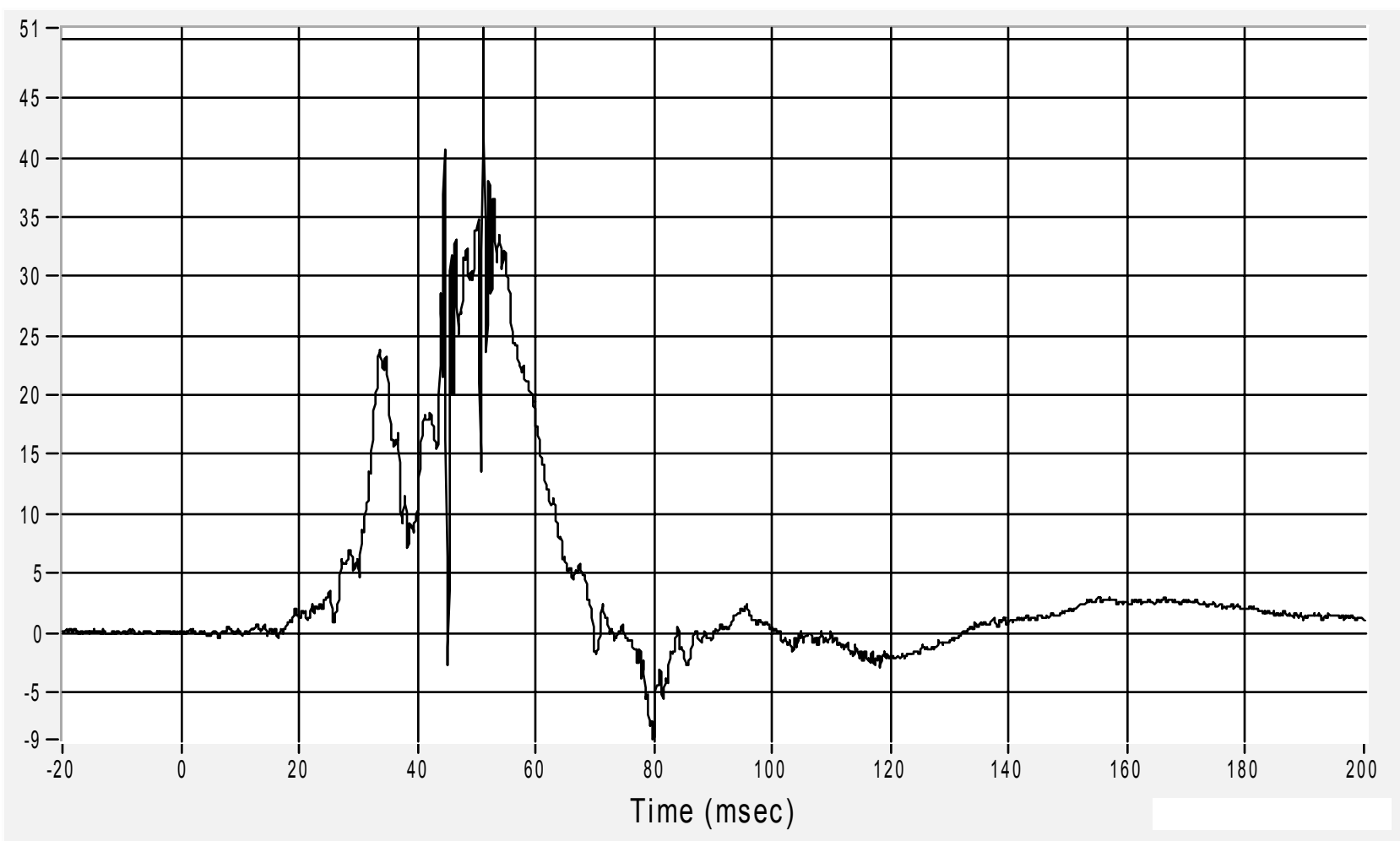


**Driver Upper Rib (Y) Acceleration**

Acceleration (G's) CFC1000

Max 50.9 G at 51.2 msec

Min -9.0 G at 79.8 msec



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21 January 2005

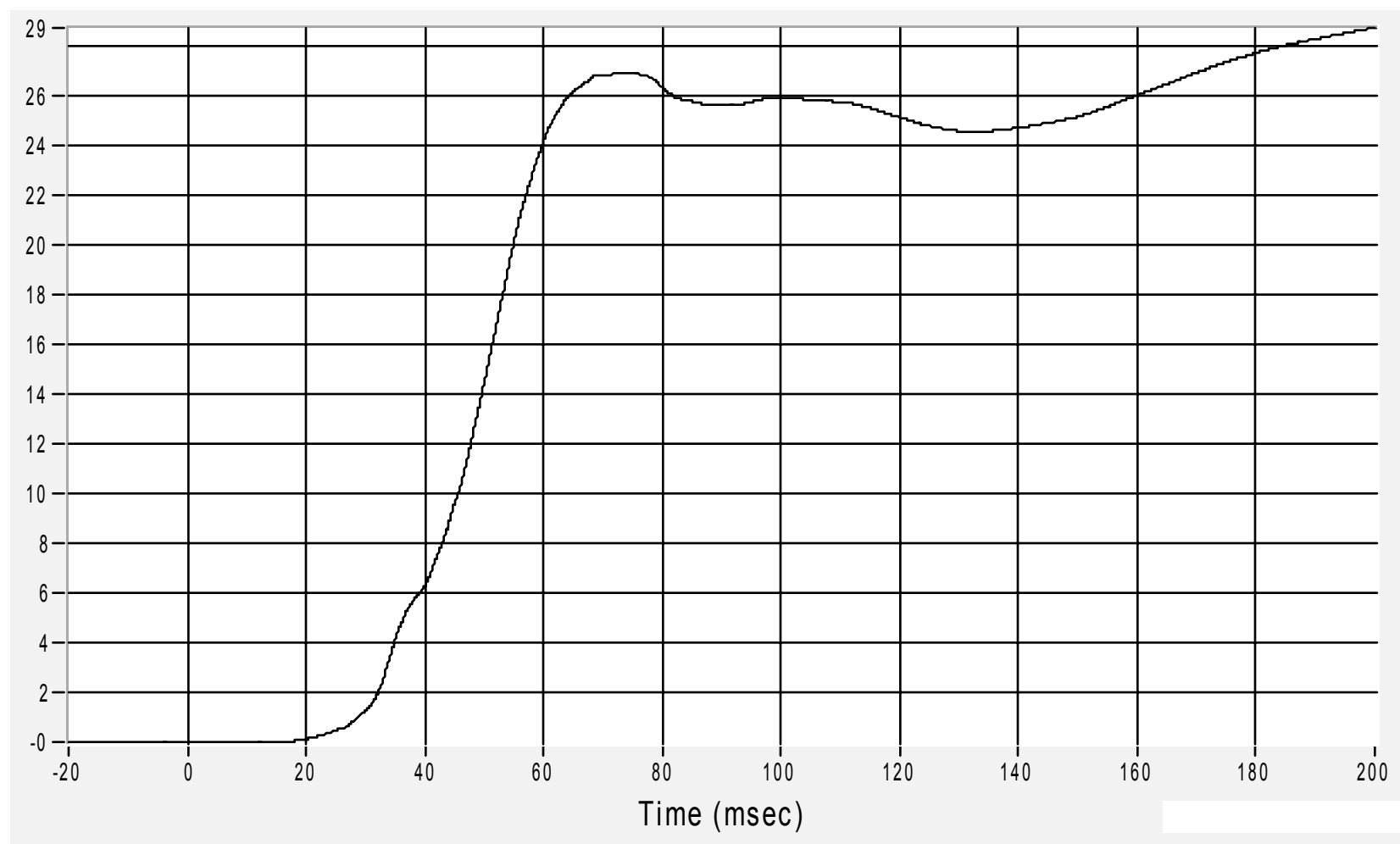
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**Driver Upper Rib (Y) Velocity**

Velocity (km/h) CFC180

Max 28.7 km/h at 199.9 msec

Min 0.0 km/h at 7.1 msec



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21 January 2005

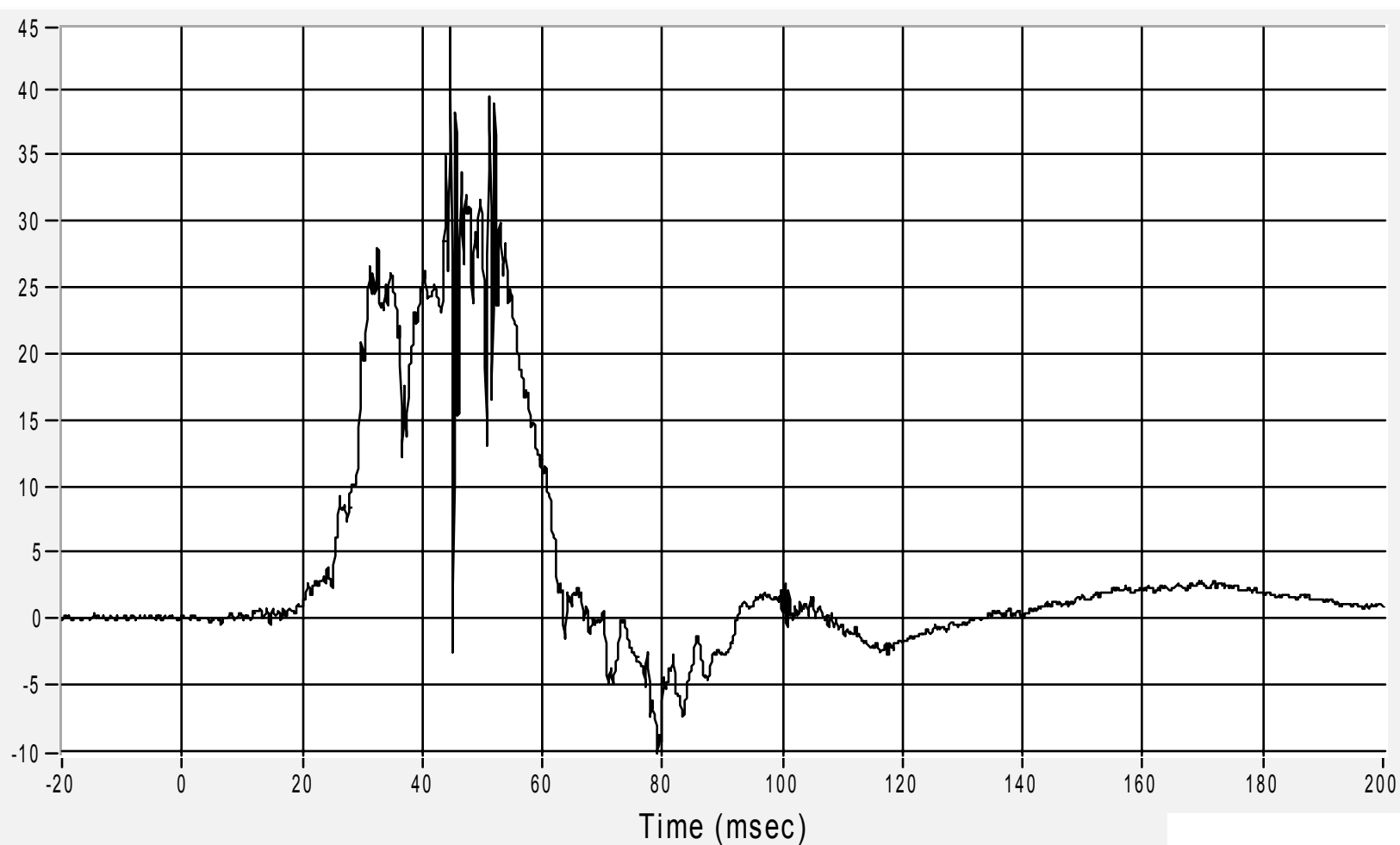
Medical College of Wisconsin  
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**Driver Lower Rib (Y) Acceleration**

Acceleration (G's) CFC1000

Max 44.6 G at 44.7 msec

Min -10.2 G at 79.2 msec



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21 January 2005

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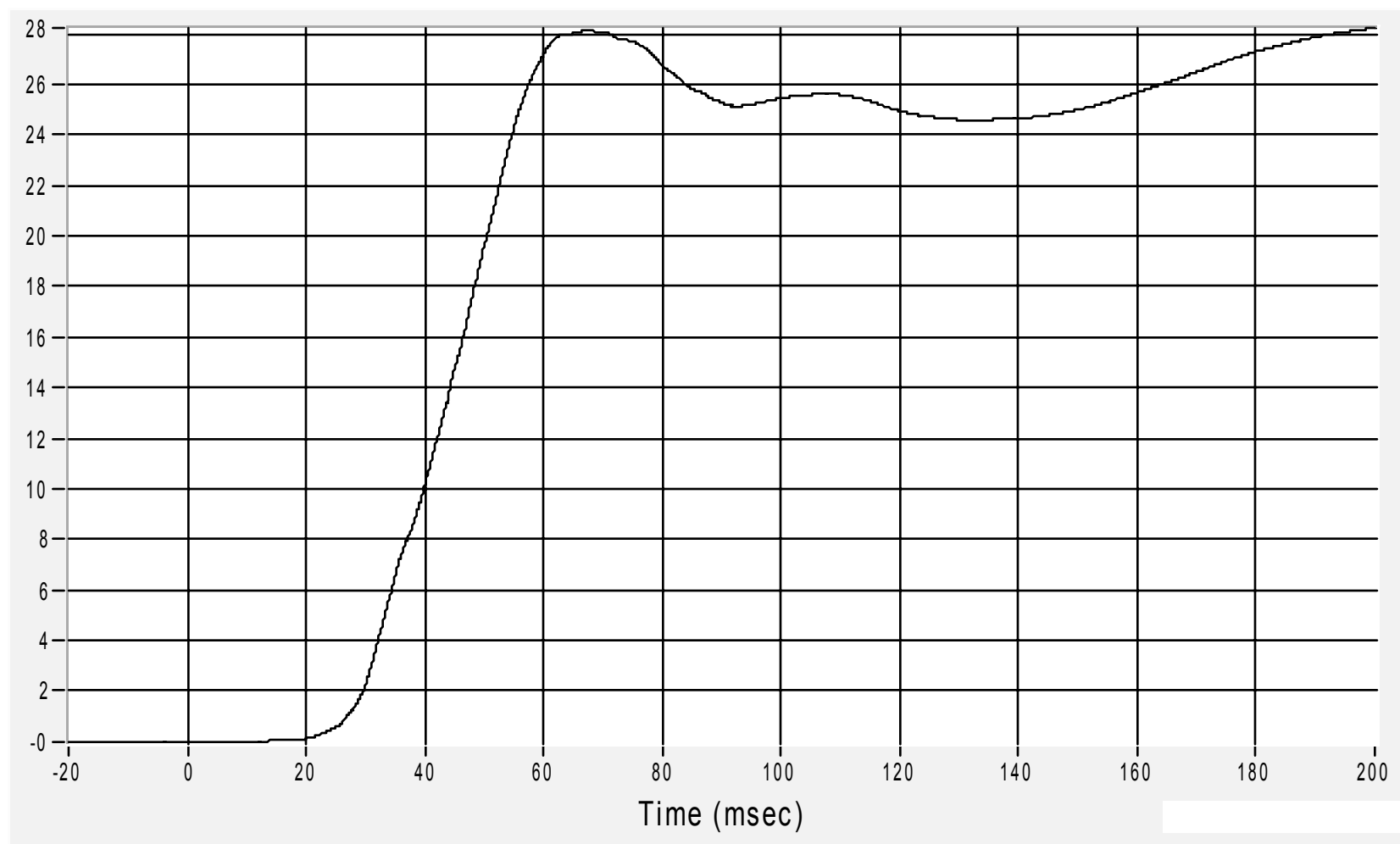


**Driver Lower Rib (Y) Velocity**

Velocity (km/h) CFC180

Max 28.2 km/h at 199.9 msec

Min 0.0 km/h at 7.3 msec



05SN05 - 2005 JEEP GRAND CHEROKEE LAREDO 4WD MPV

21 January 2005

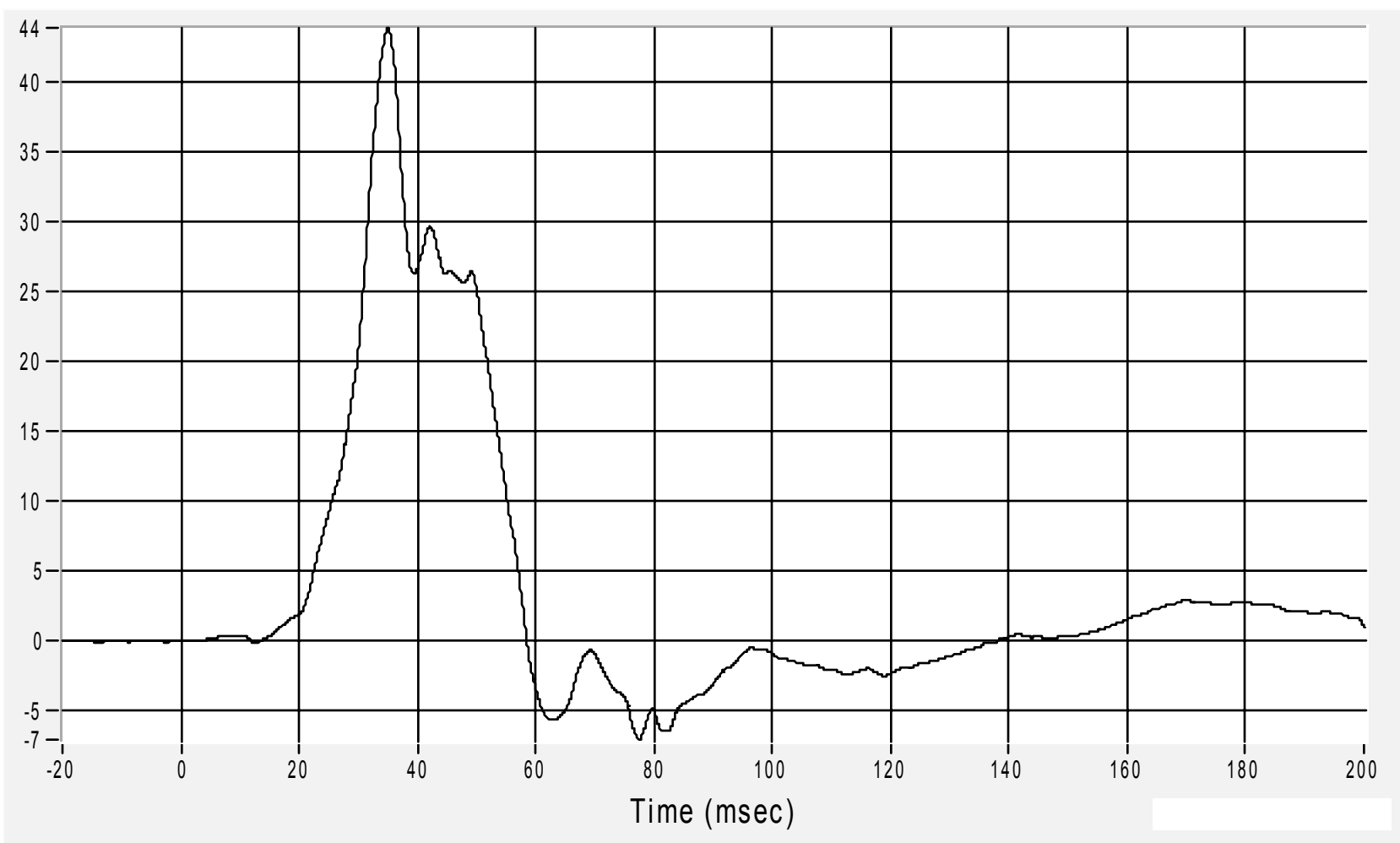
Medical College of Wisconsin  
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**Driver Lower Spine (Y) Acceleration**

Acceleration (G's) CFC180

Max 43.9 G at 35.0 msec

Min -7.1 G at 77.4 msec



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21 January 2005

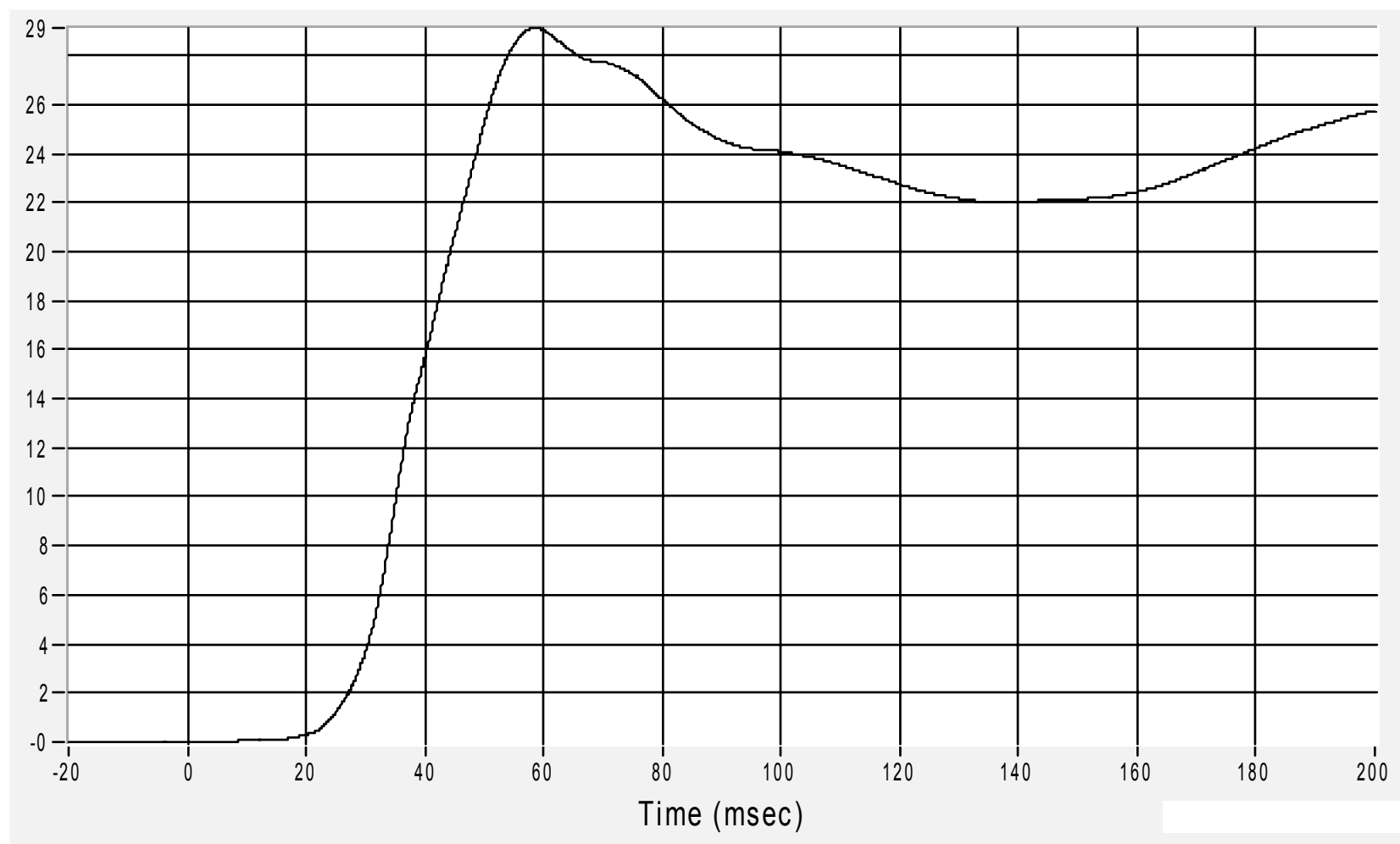
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**Driver Lower Spine (Y) Velocity**

Velocity (km/h) CFC180

Max 29.1 km/h at 58.5 msec

Min 0.0 km/h at 2.2 msec



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21 January 2005

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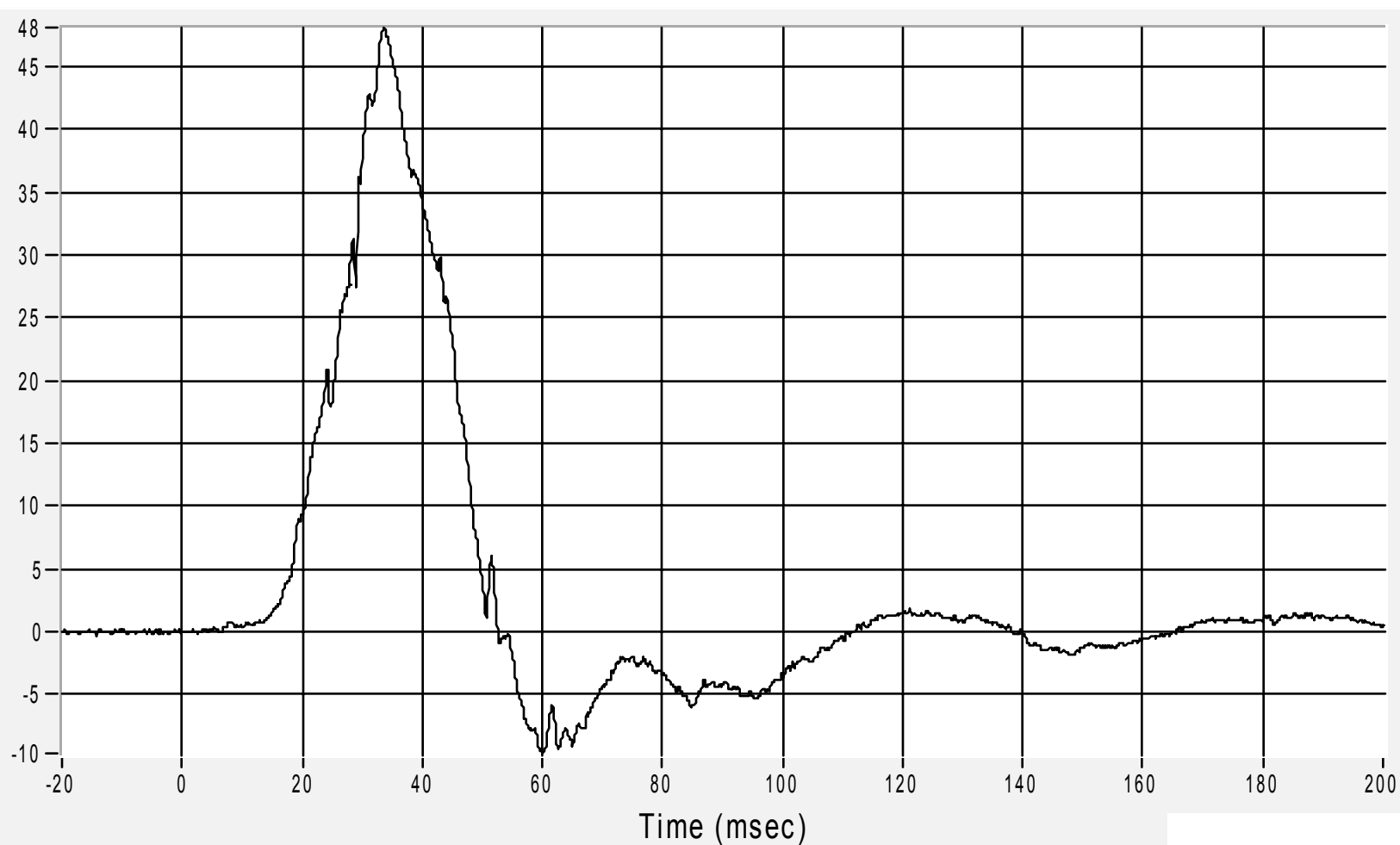


**Driver Pelvic (Y) Acceleration**

Acceleration (G's) CFC1000

Max 48.1 G at 33.6 msec

Min -9.7 G at 60.0 msec



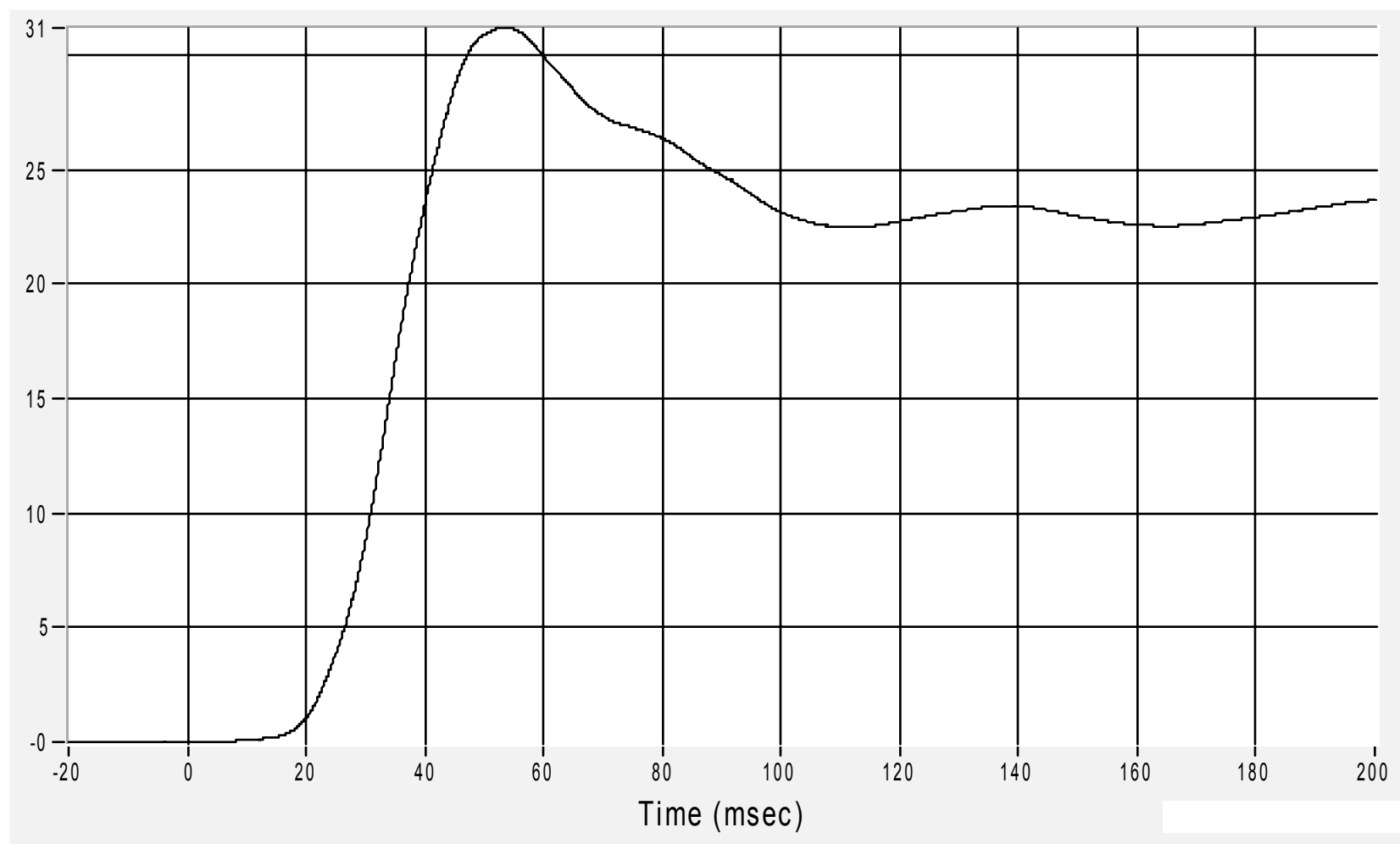
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**Driver Pelvic (Y) Velocity**

Velocity (km/h) CFC180

**Max 31.2 km/h at 52.9 msec****Min 0.0 km/h at 0.3 msec**

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21 January 2005

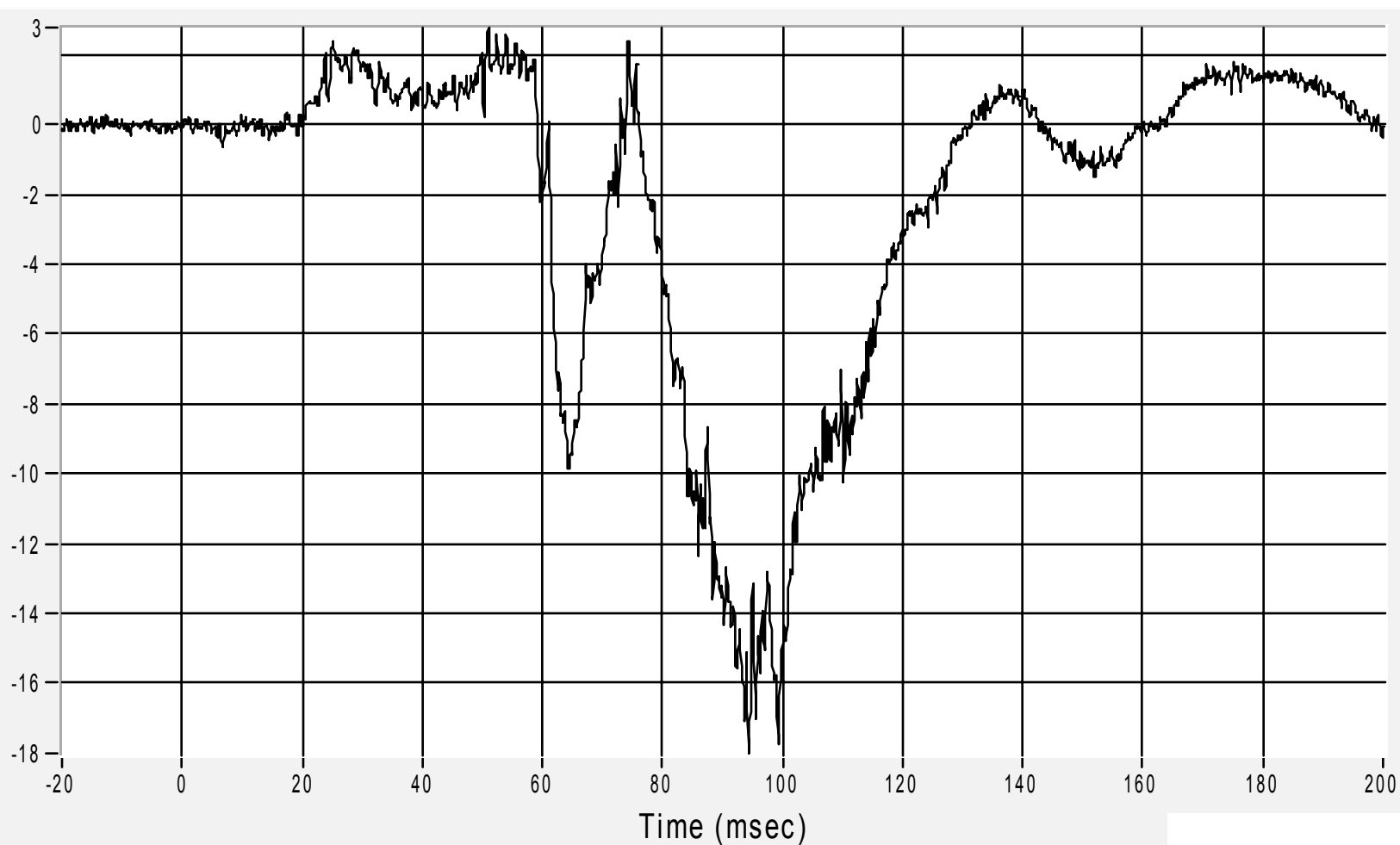
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**Passenger Head CG (X) Acceleration**

Acceleration (G's) CFC1000

Max 2.8 G at 51.0 msec

Min -18.0 G at 94.3 msec



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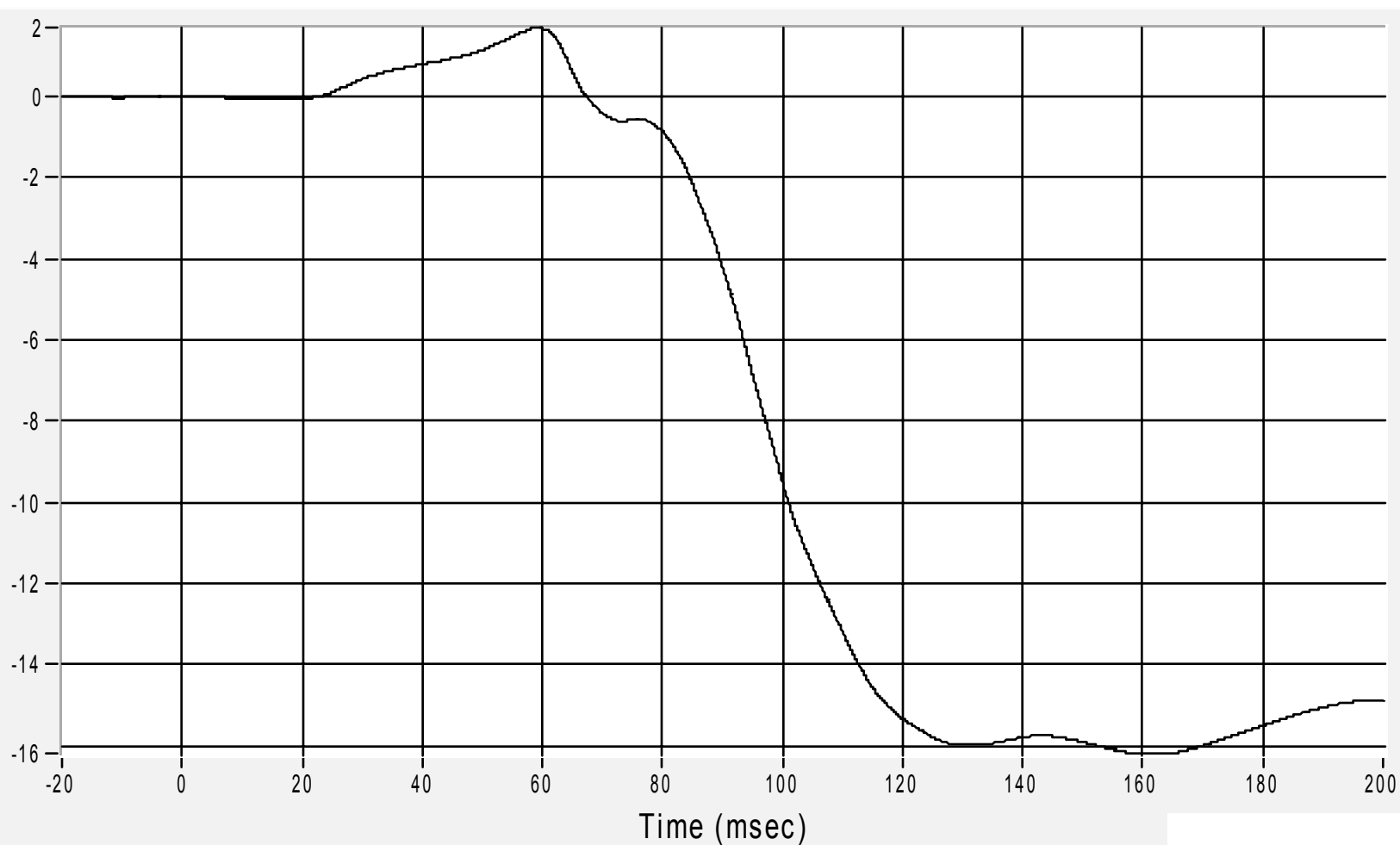


**Passenger Head CG (X) Velocity**

Velocity (km/h) CFC180

Max 1.7 km/h at 59.0 msec

Min -16.2 km/h at 162.6 msec



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21 January 2005

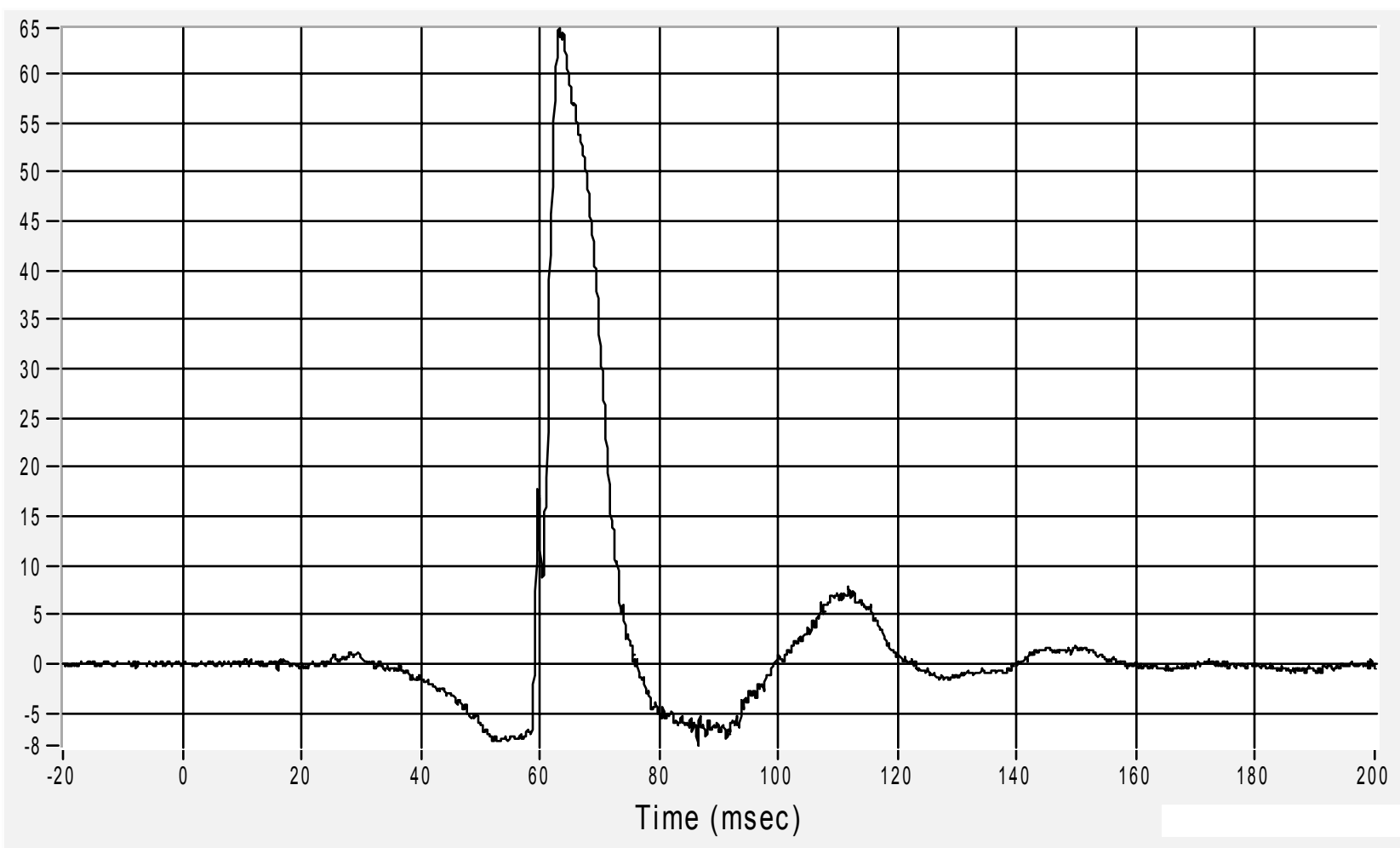
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**Passenger Head CG (Y) Acceleration**

Acceleration (G's) CFC1000

Max 64.6 G at 63.2 msec

Min -8.3 G at 86.5 msec



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21 January 2005

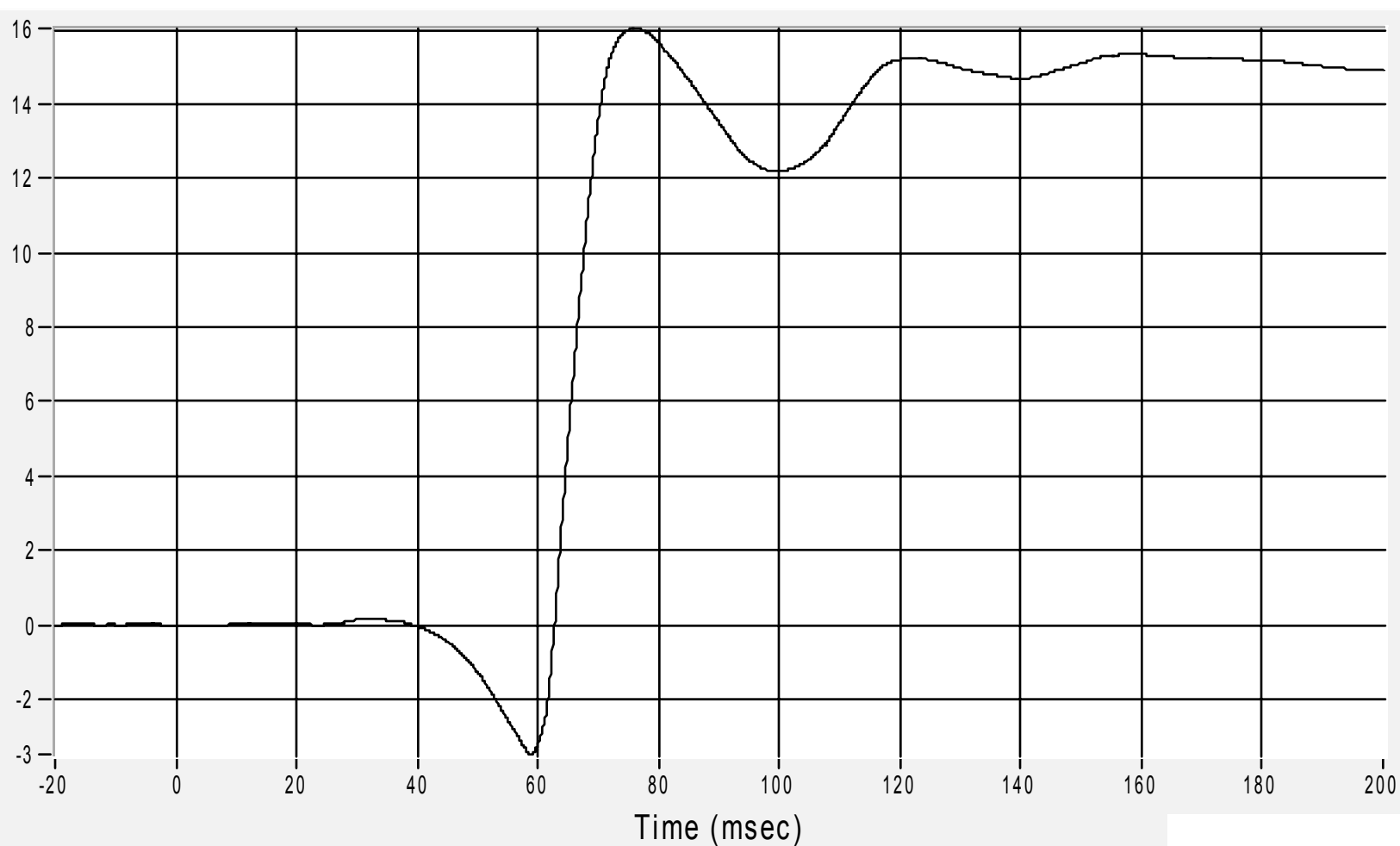
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**Passenger Head CG (Y) Velocity**

Velocity (km/h) CFC180

Max 16.0 km/h at 76.0 msec

Min -3.5 km/h at 58.8 msec



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21 January 2005

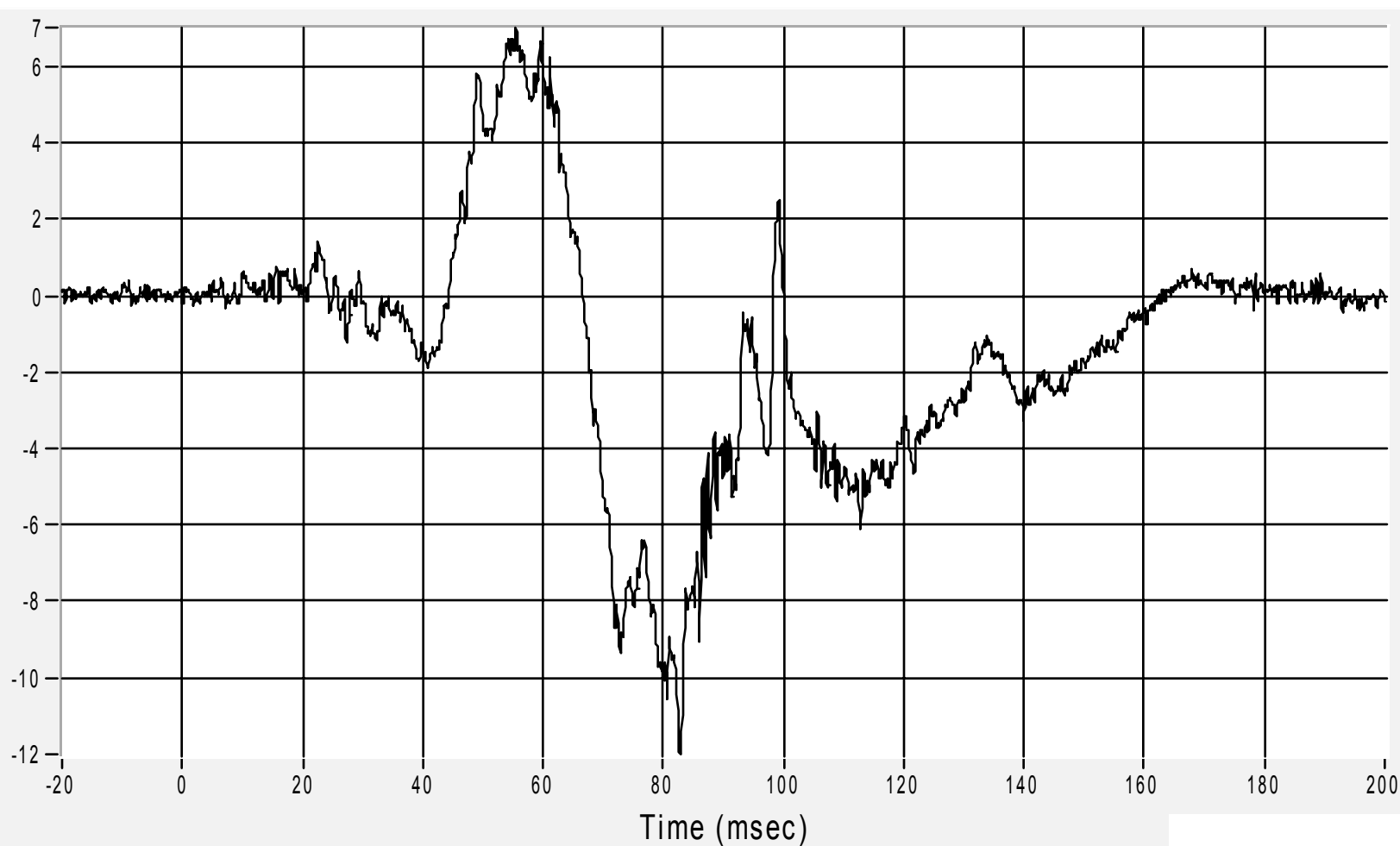
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**Passenger Head CG (Z) Acceleration**

Acceleration (G's) CFC1000

Max 7.0 G at 55.5 msec

Min -12.0 G at 82.8 msec



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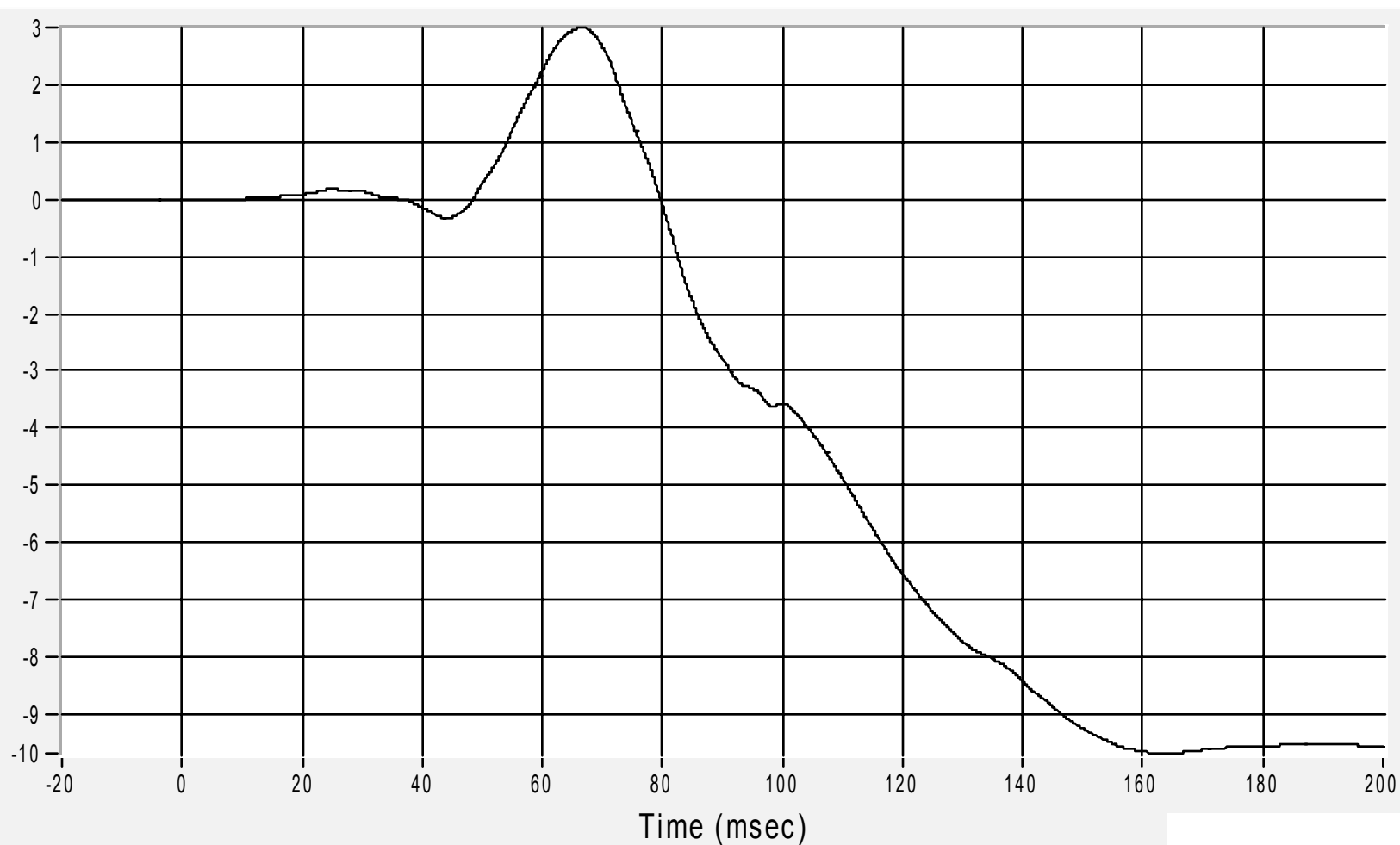


**Passenger Head CG (Z) Velocity**

Velocity (km/h) CFC180

Max 3.0 km/h at 66.6 msec

Min -9.7 km/h at 163.7 msec



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21 January 2005

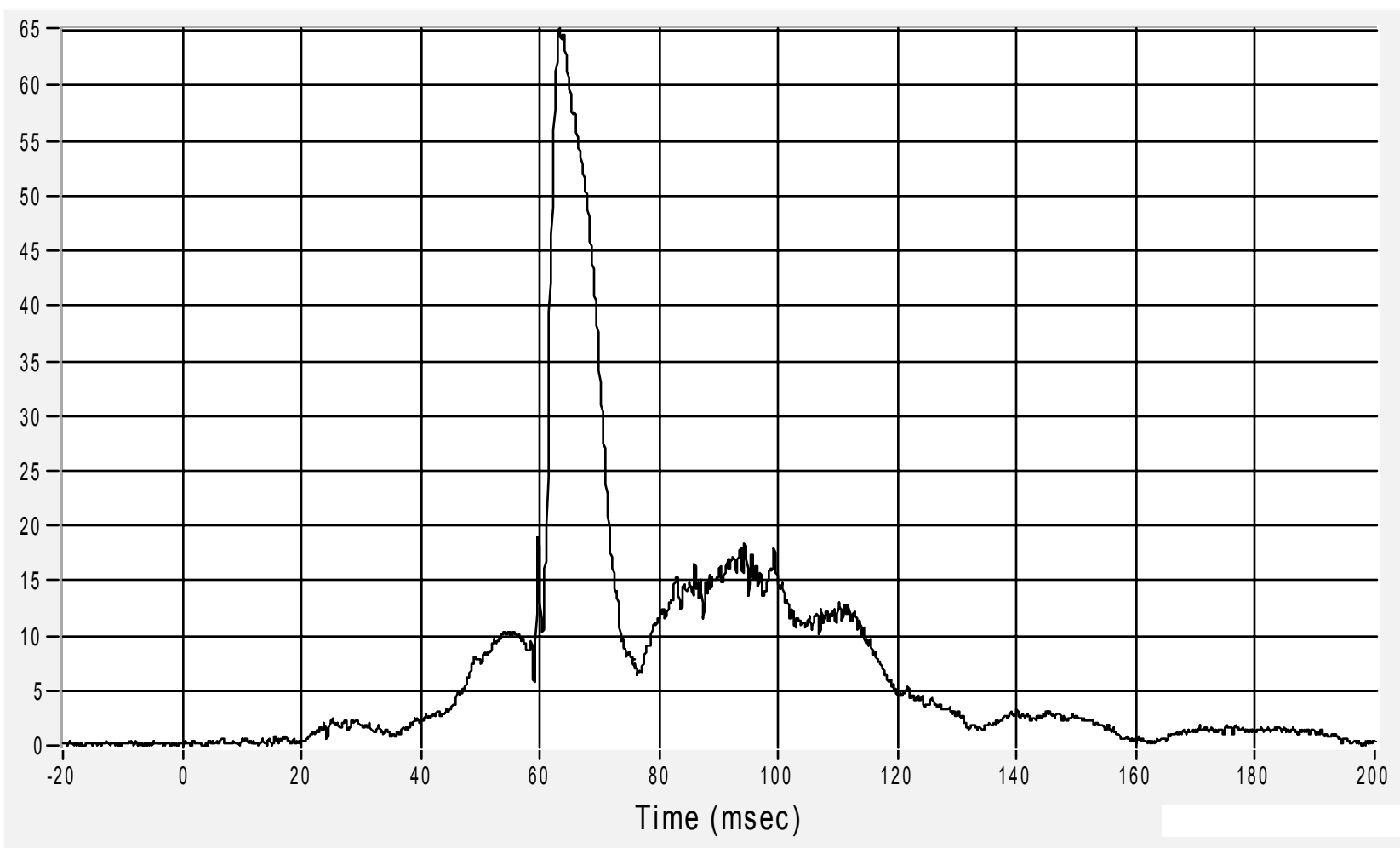
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Vehicle Crashworthiness Lab

**Passenger Head Resultant Acceleration**

Acceleration (G's) CFC1000

Max 65.2 G's at 63.2 msec

Min 0.0 G's at 198.3 msec



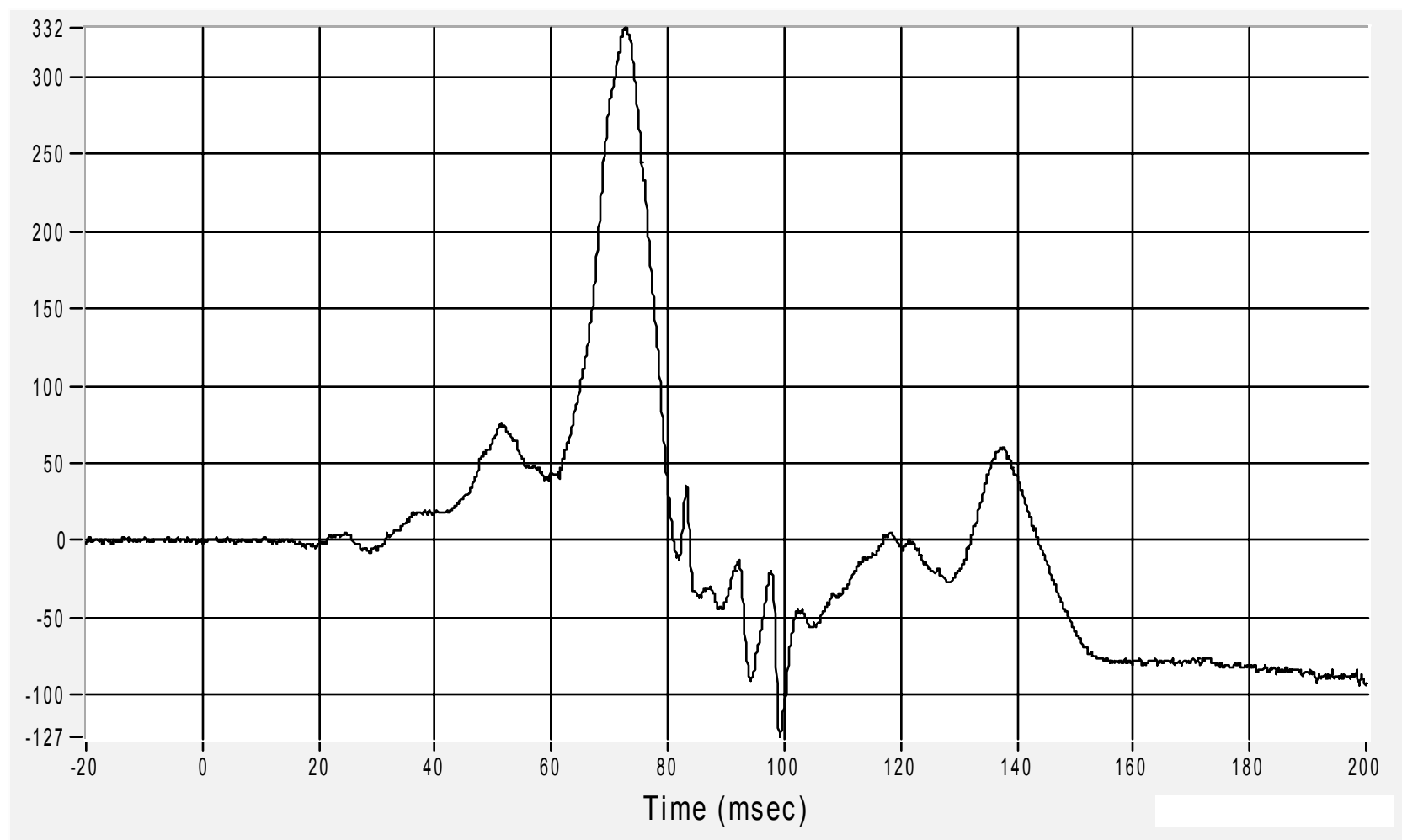
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**Passenger Upper Neck (X) Force**  
Force (N) CFC1000

Max 331.9 N at 72.5 msec  
Min -127.1 N at 99.3 msec

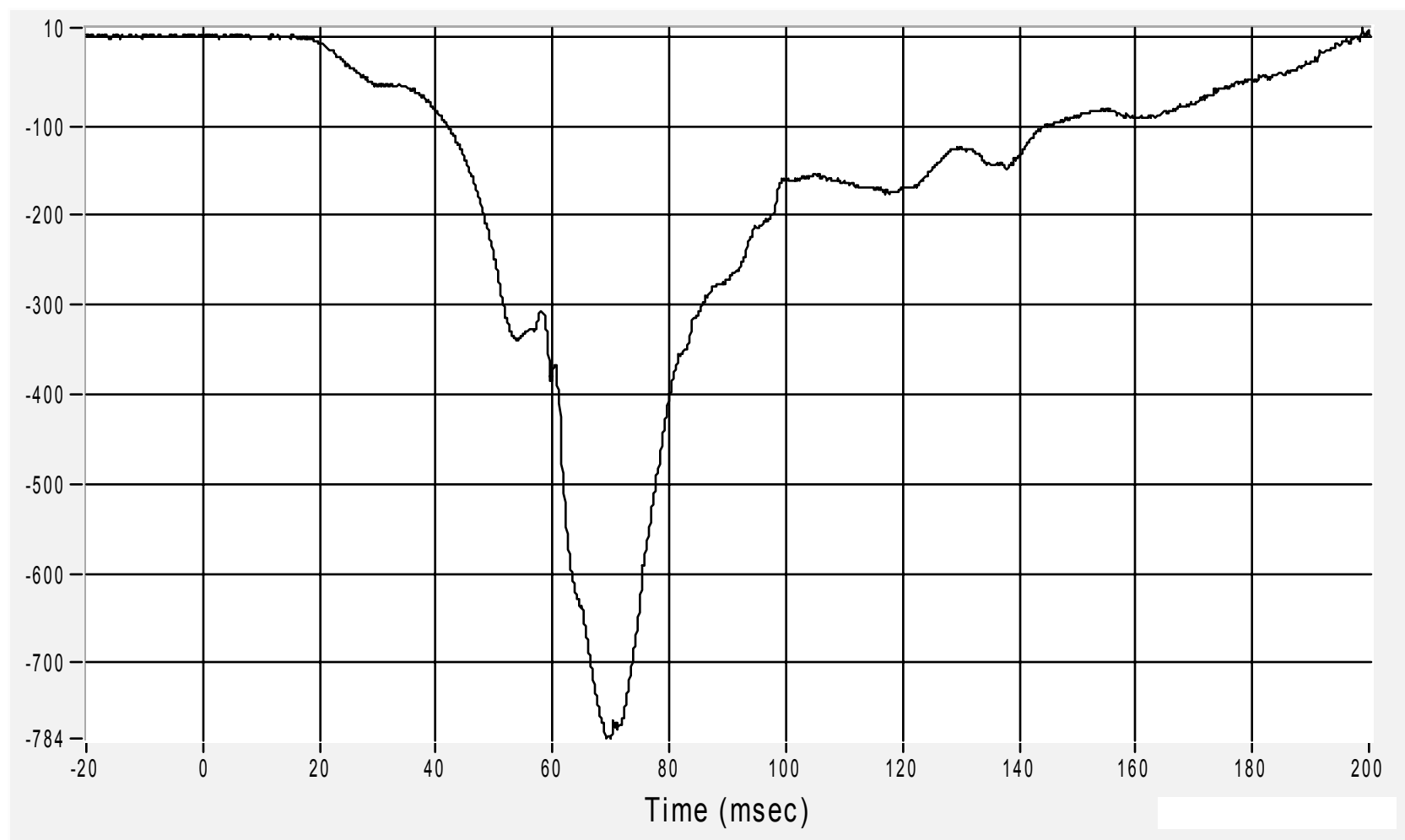


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**Passenger Upper Neck (Y) Force**  
Force (N) CFC1000

Max 9.7 N at 198.9 msec  
Min -784.3 N at 69.2 msec



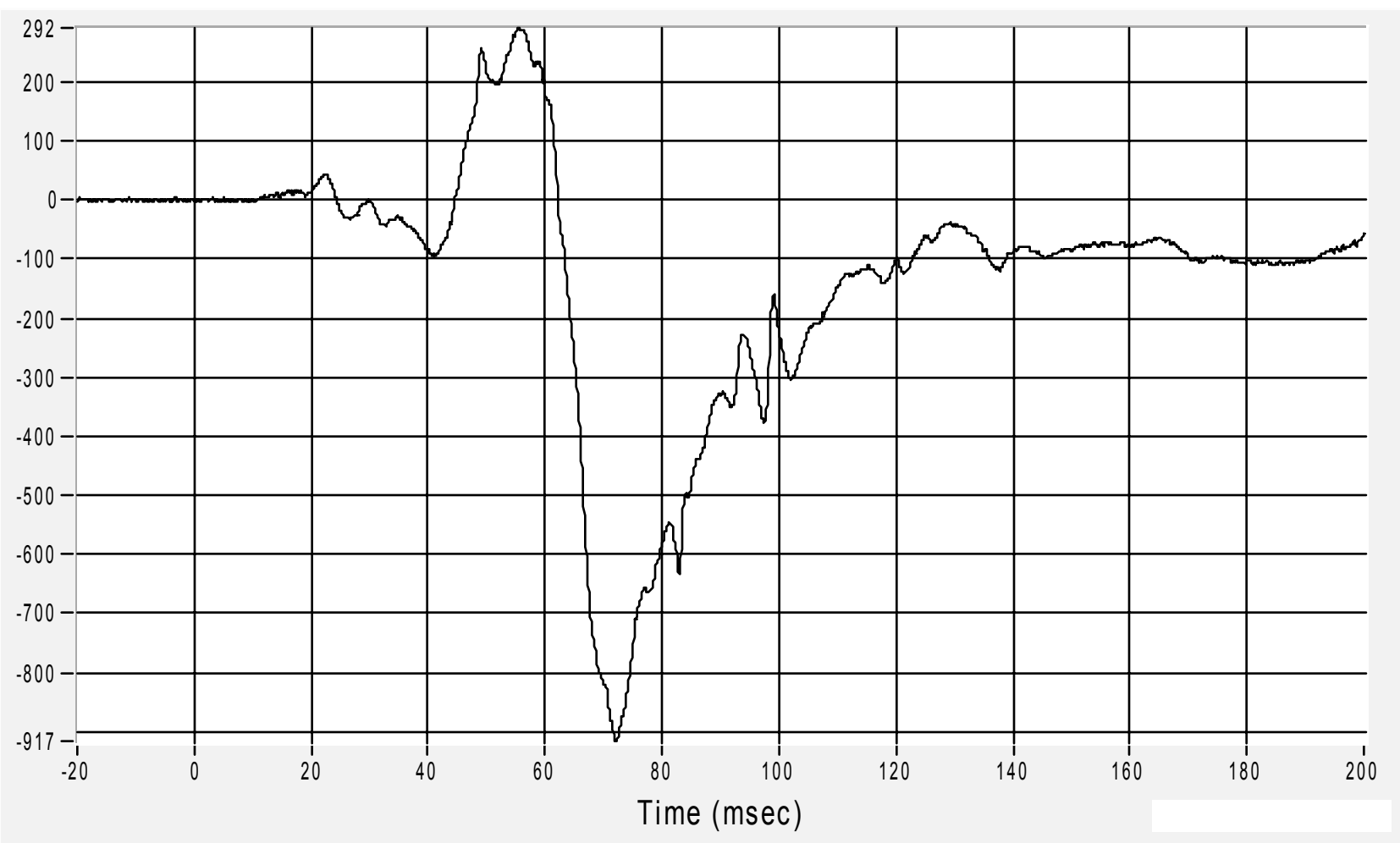
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**Passenger Upper Neck (Z) Force**  
Force (N) CFC1000

Max 291.9 N at 55.4 msec  
Min -916.6 N at 71.9 msec



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21 January 2005

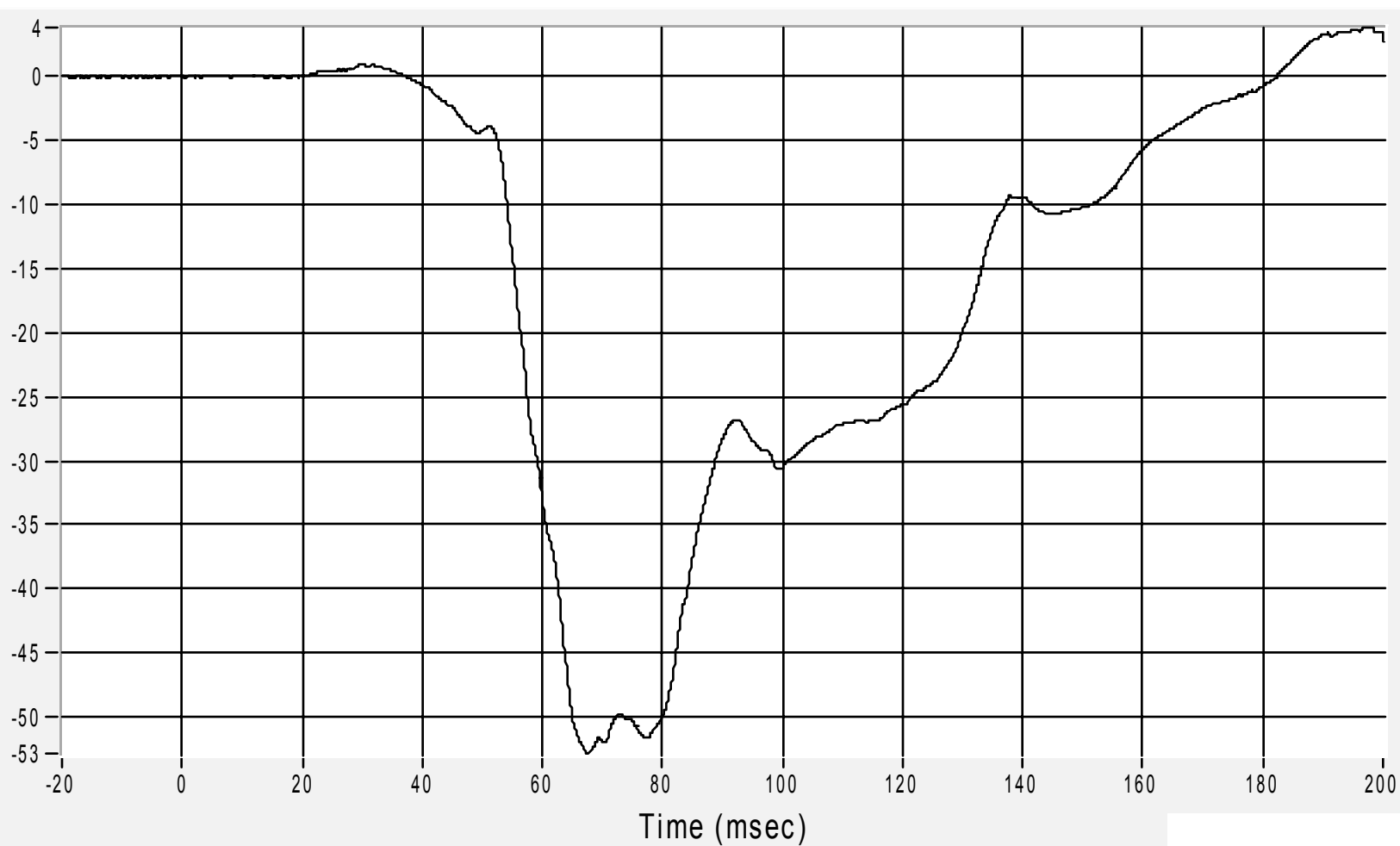
Medical College of Wisconsin  
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**Passenger Upper Neck (X) Moment**

Moment (Nm) CFC600

Max 3.9 Nm at 198.2 msec

Min -52.9 Nm at 67.5 msec



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21 January 2005

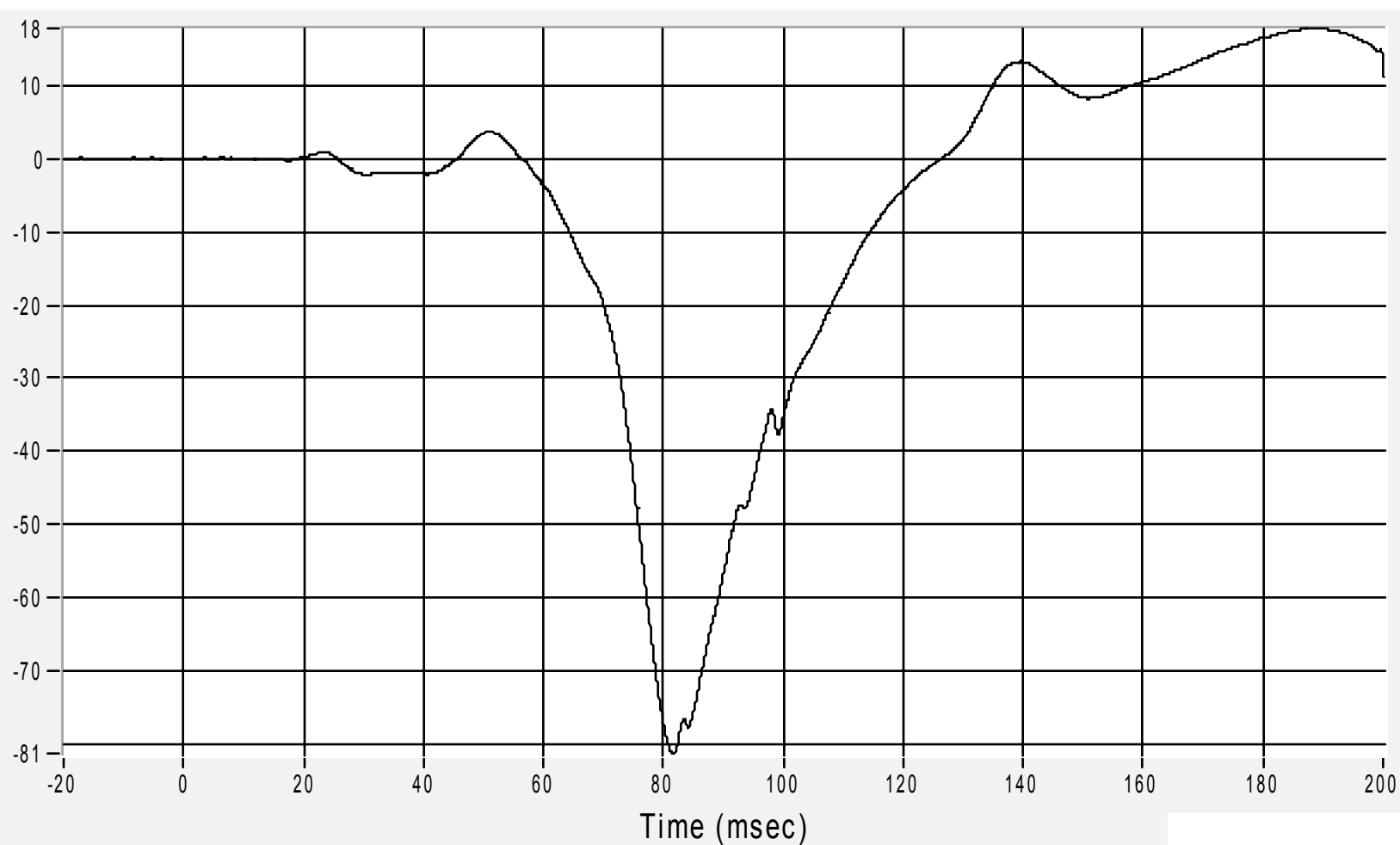
Medical College of Wisconsin  
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**Passenger Upper Neck (Y) Moment**

Moment (Nm) CFC600

Max 17.7 Nm at 187.1 msec

Min -81.2 Nm at 81.7 msec



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21 January 2005

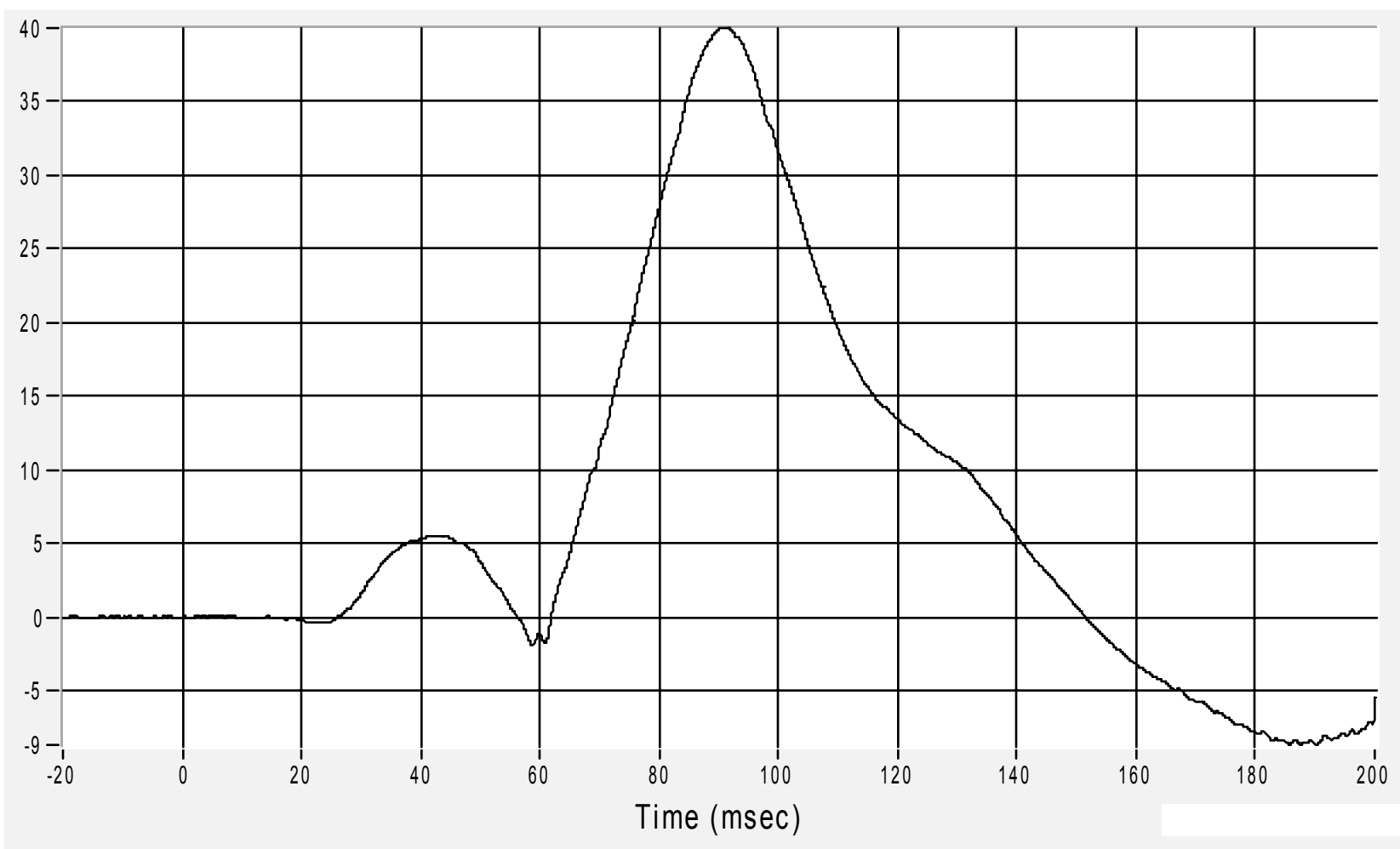
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**Passenger Upper Neck (Z) Moment**

Moment (Nm) CFC600

Max 40.0 Nm at 91.6 msec

Min -8.7 Nm at 190.2 msec



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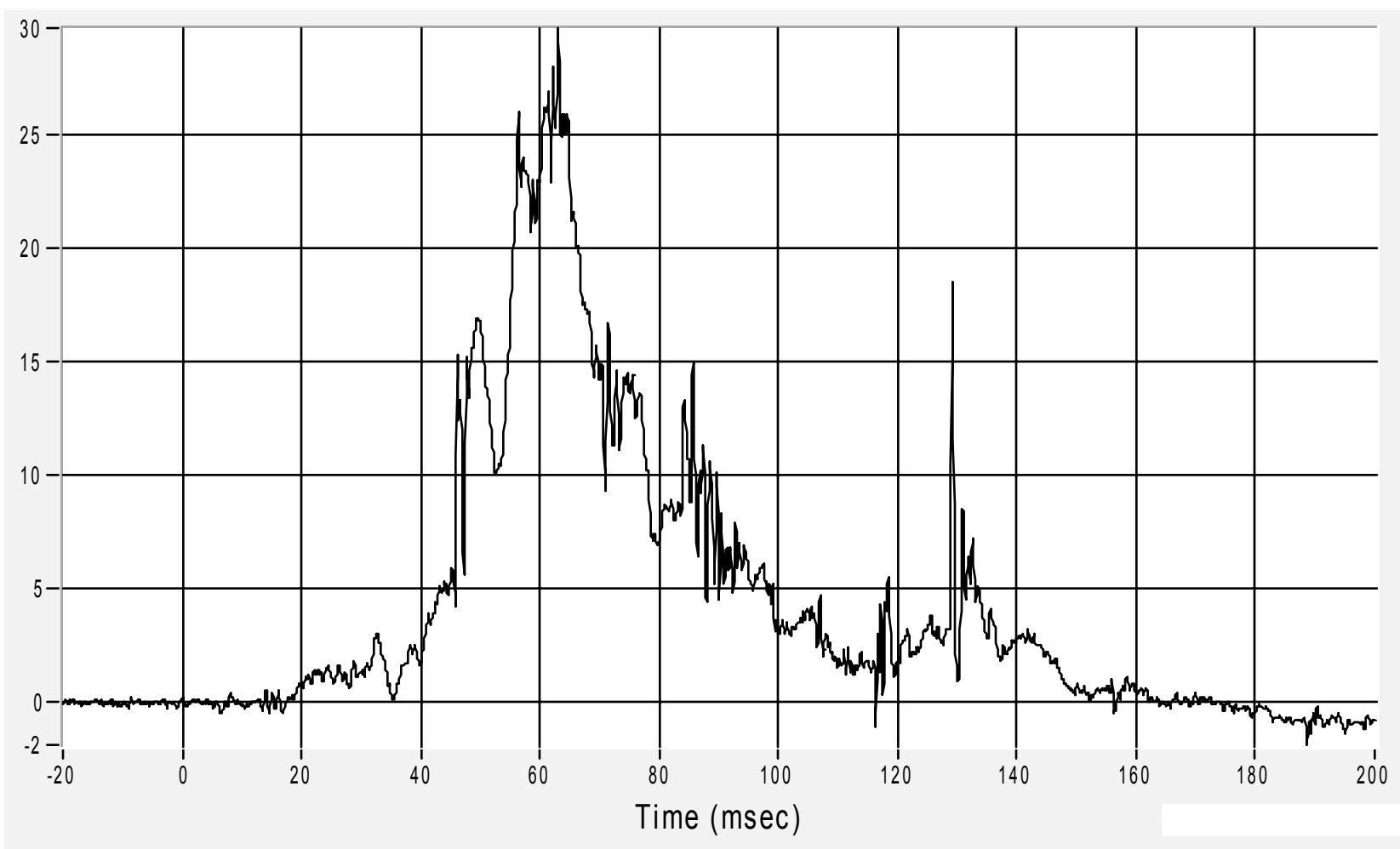


**Passenger Upper Rib (Y) Acceleration**

Acceleration (G's) CFC1000

Max 29.7 G at 63.0 msec

Min -1.9 G at 188.6 msec



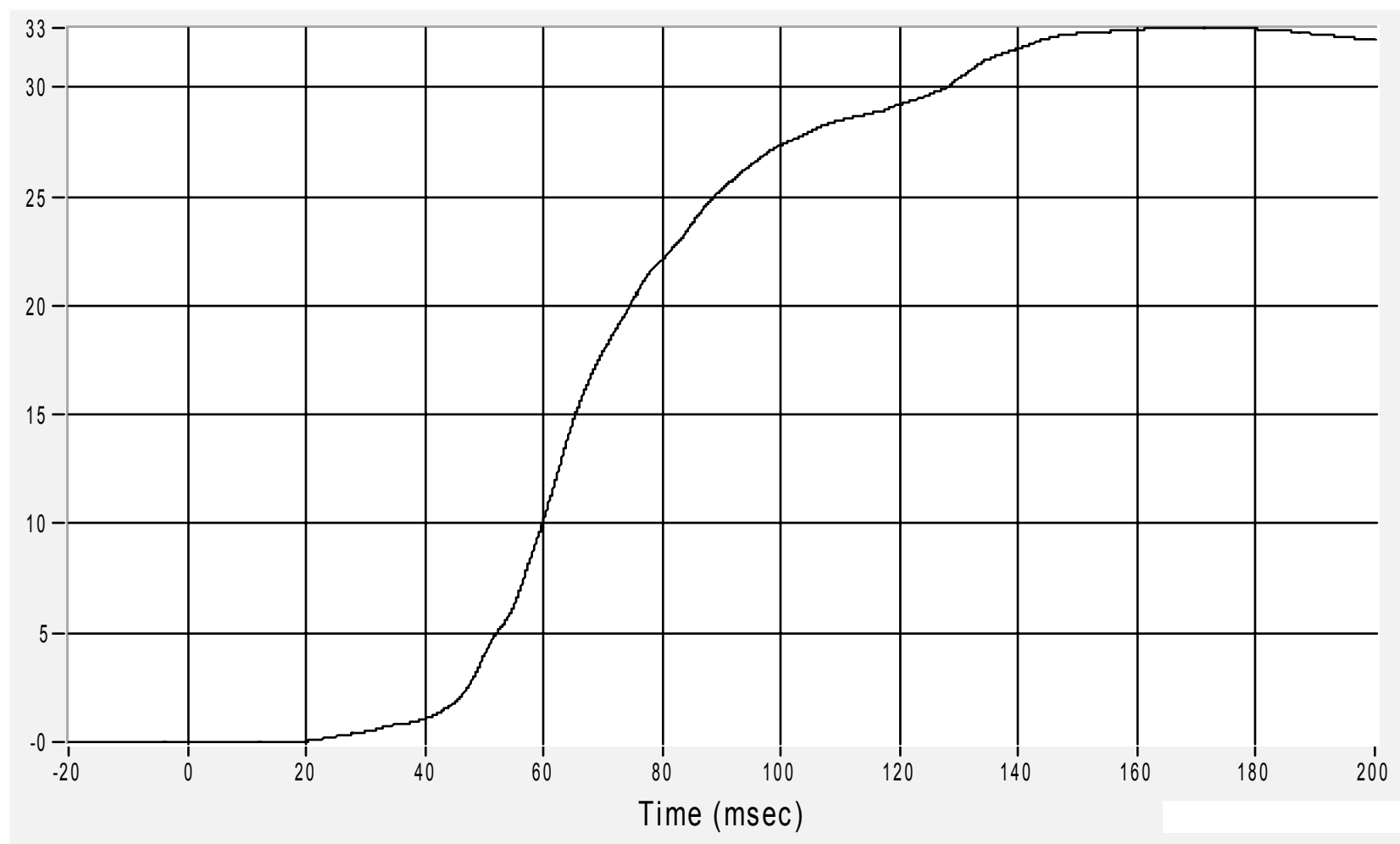
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**Passenger Upper Rib (Y) Velocity**

Velocity (km/h) CFC180

**Max 32.7 km/h at 173.3 msec****Min 0.0 km/h at 7.4 msec**

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21 January 2005

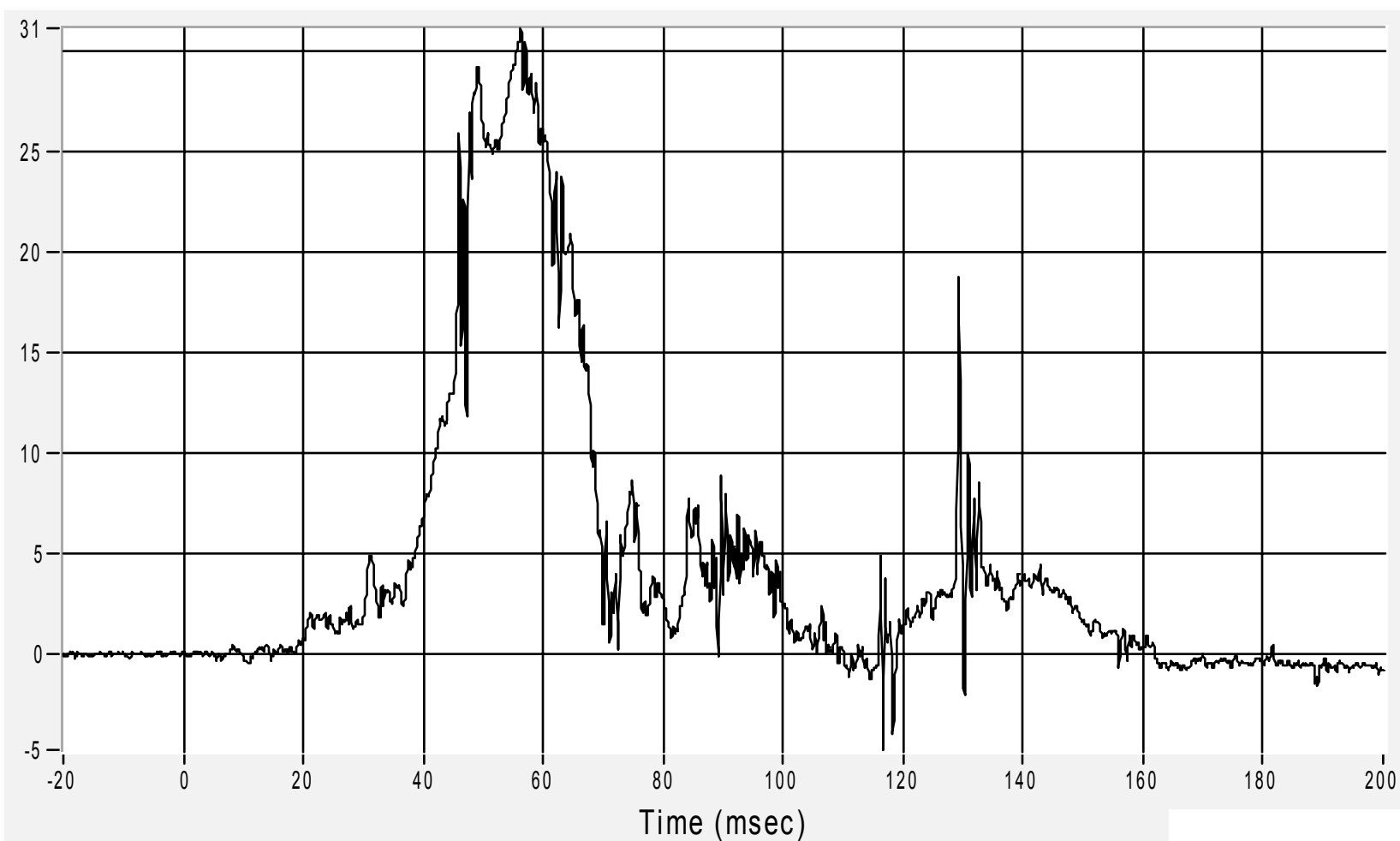
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**Passenger Lower Rib (Y) Acceleration**

Acceleration (G's) CFC1000

Max 31.1 G at 56.2 msec

Min -4.7 G at 116.6 msec



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21 January 2005

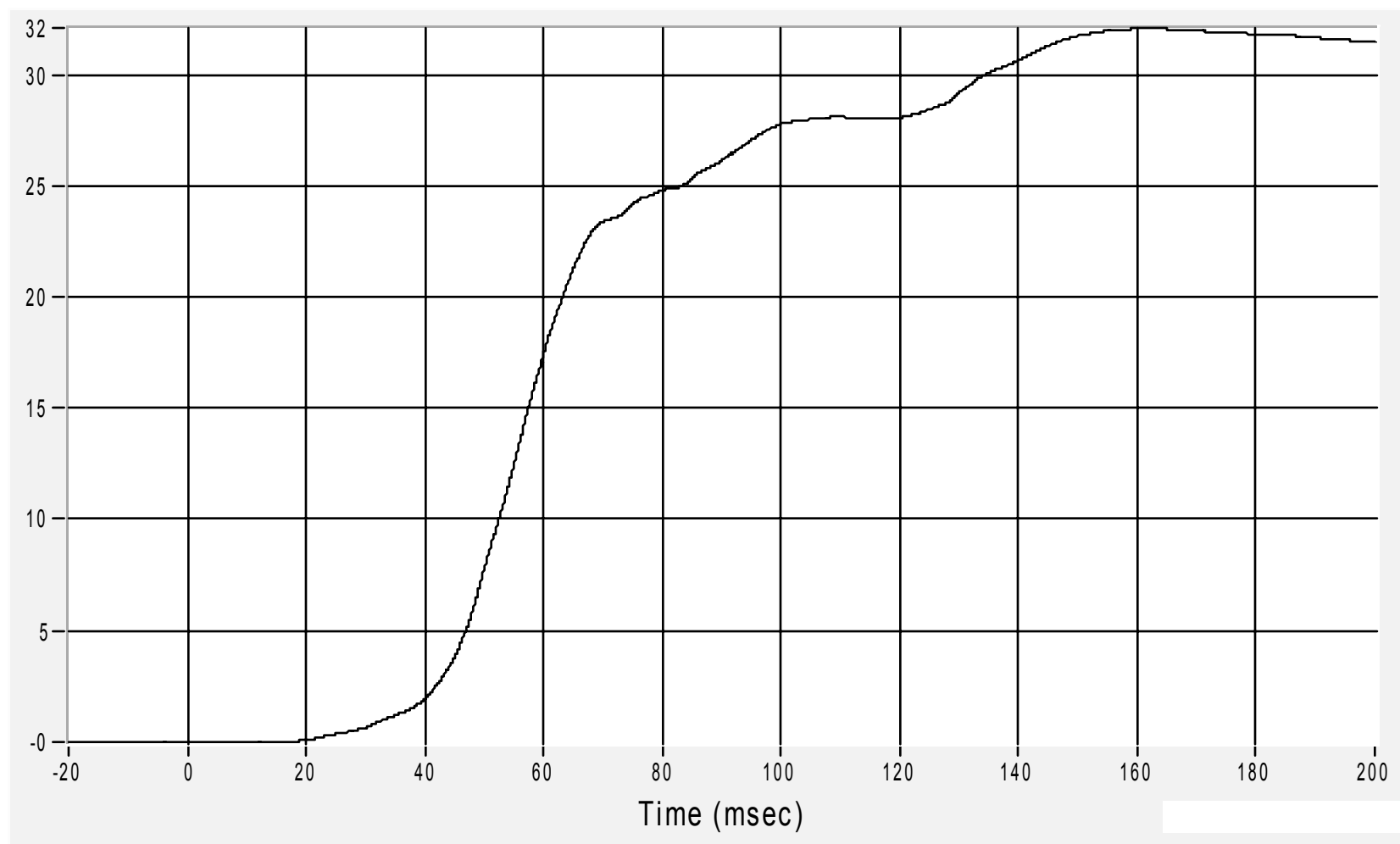
*Medical College of Wisconsin  
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**Passenger Lower Rib (Y) Velocity**

Velocity (km/h) CFC180

Max 32.1 km/h at 161.9 msec

Min 0.0 km/h at 7.2 msec



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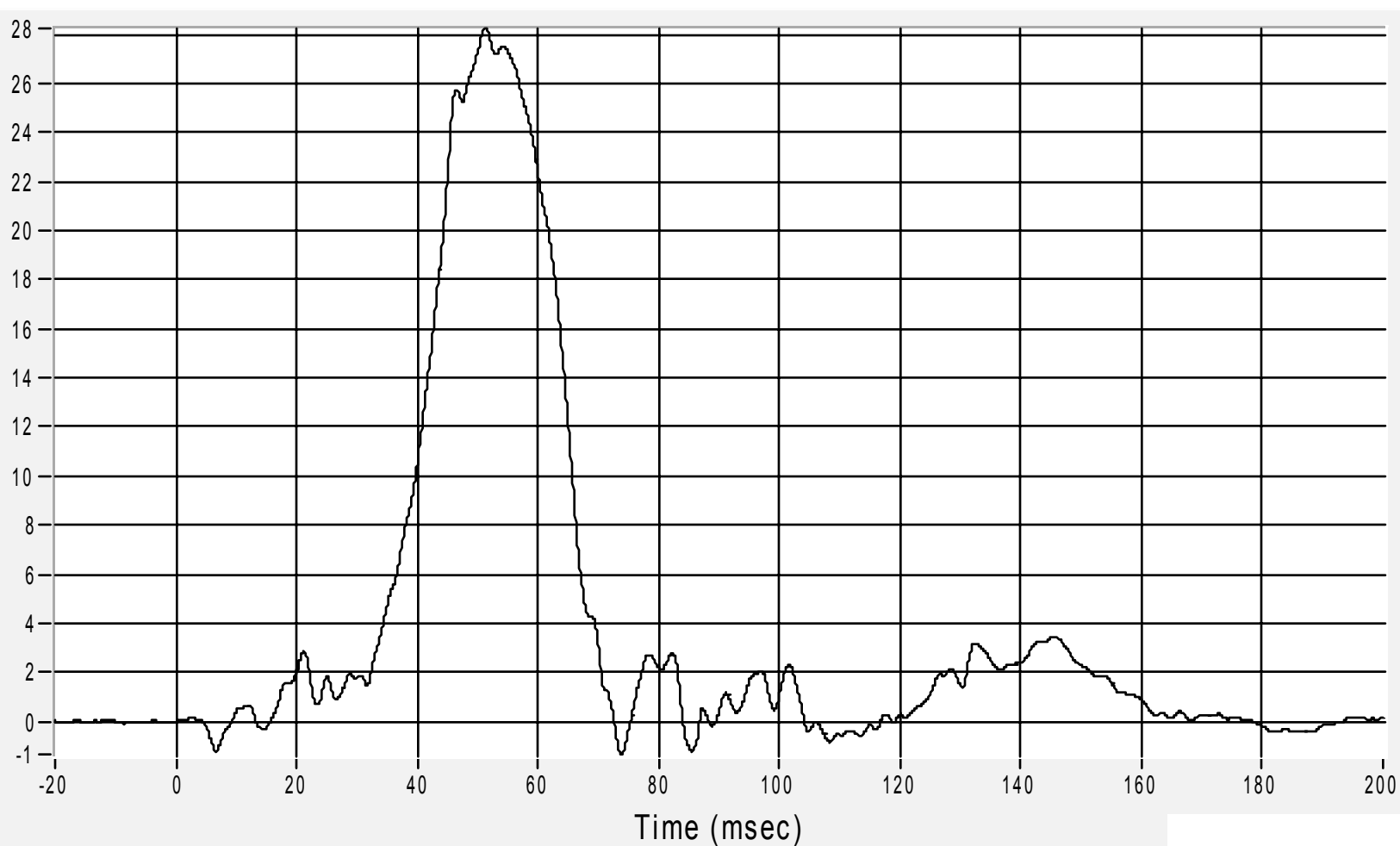


**Passenger Lower Spine (Y) Acceleration**

Acceleration (G's) CFC180

Max 28.2 G at 51.3 msec

Min -1.4 G at 73.8 msec



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21 January 2005

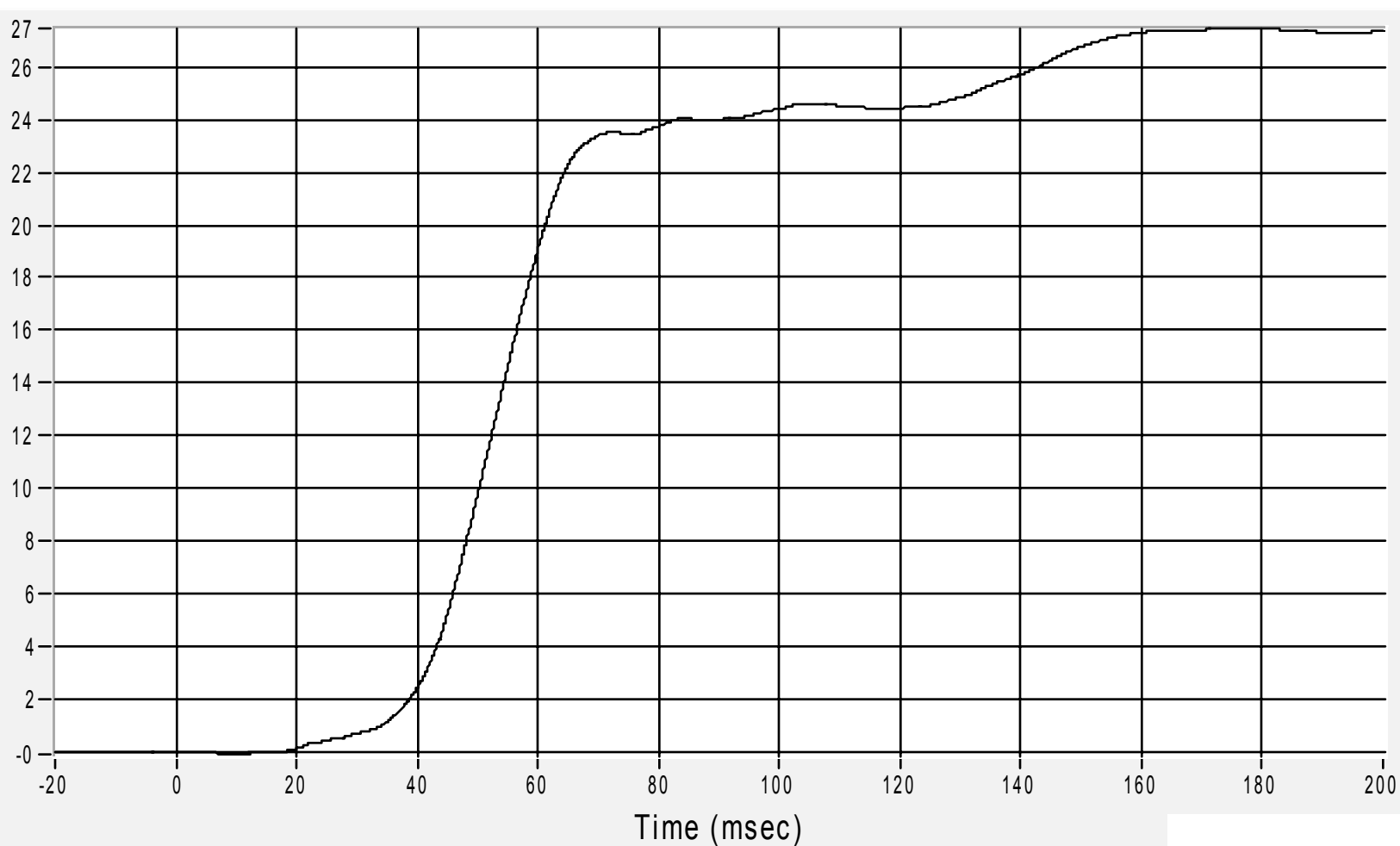
Medical College of Wisconsin  
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**Passenger Lower Spine (Y) Velocity**

Velocity (km/h) CFC180

Max 27.5 km/h at 178.5 msec

Min 0.0 km/h at 9.3 msec



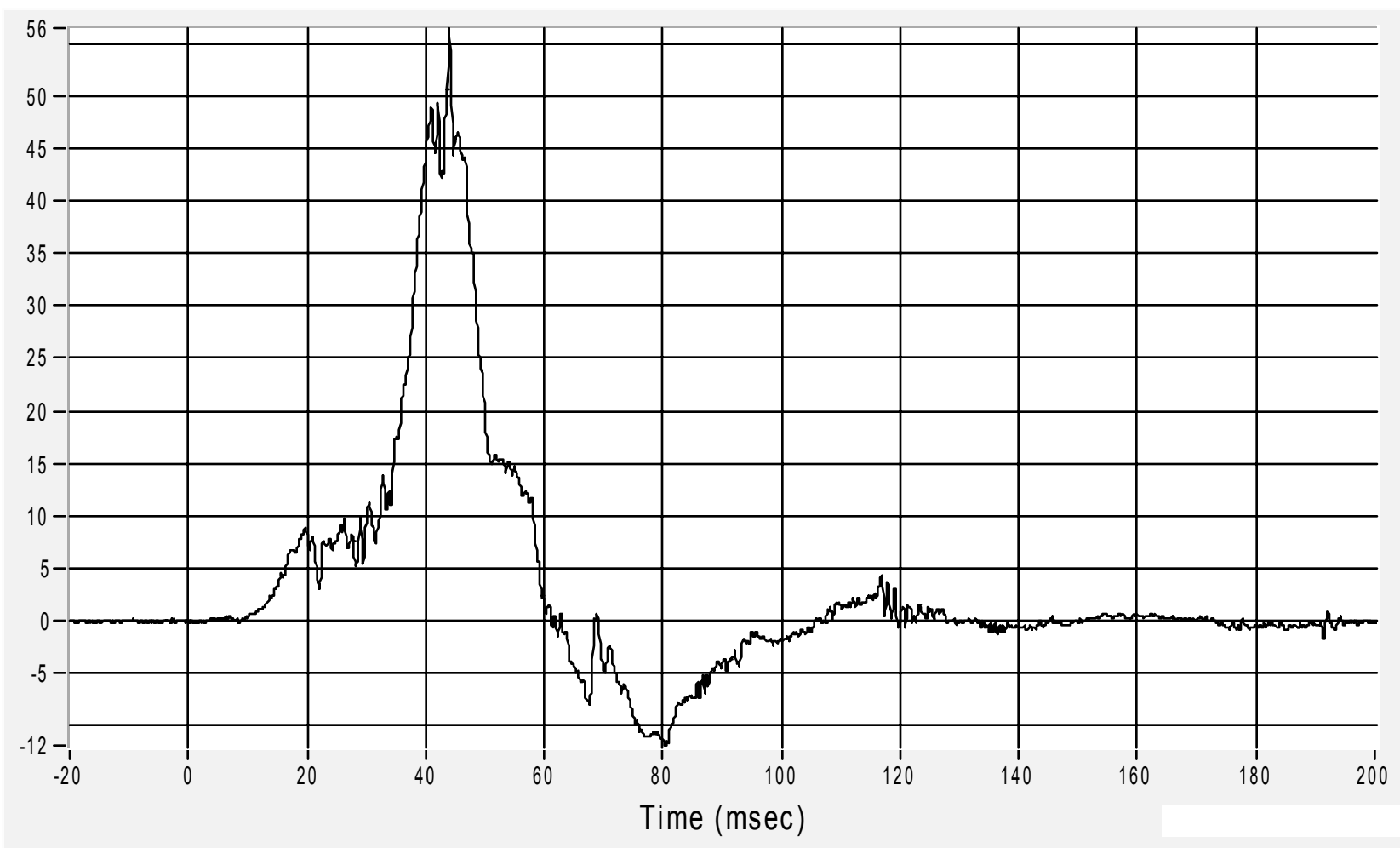
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**Passenger Pelvic (Y) Acceleration**  
Acceleration (G's) CFC1000

Max 56.4 G at 44.0 msec  
Min -11.9 G at 80.4 msec



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21 January 2005

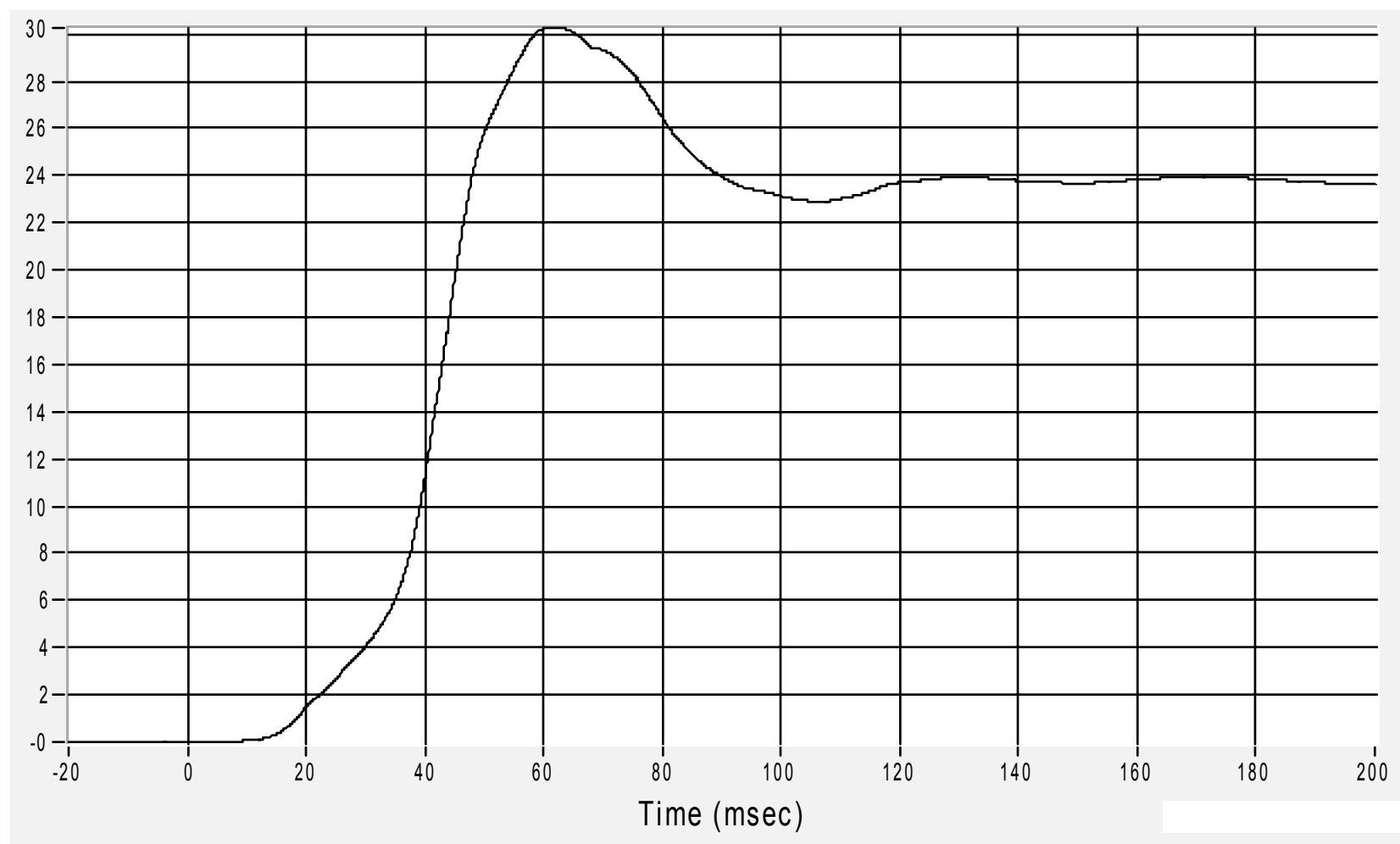
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Passenger Pelvic (Y) Velocity**

Velocity (km/h) CFC180

Max 30.3 km/h at 61.5 msec

Min 0.0 km/h at 2.9 msec



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21 January 2005

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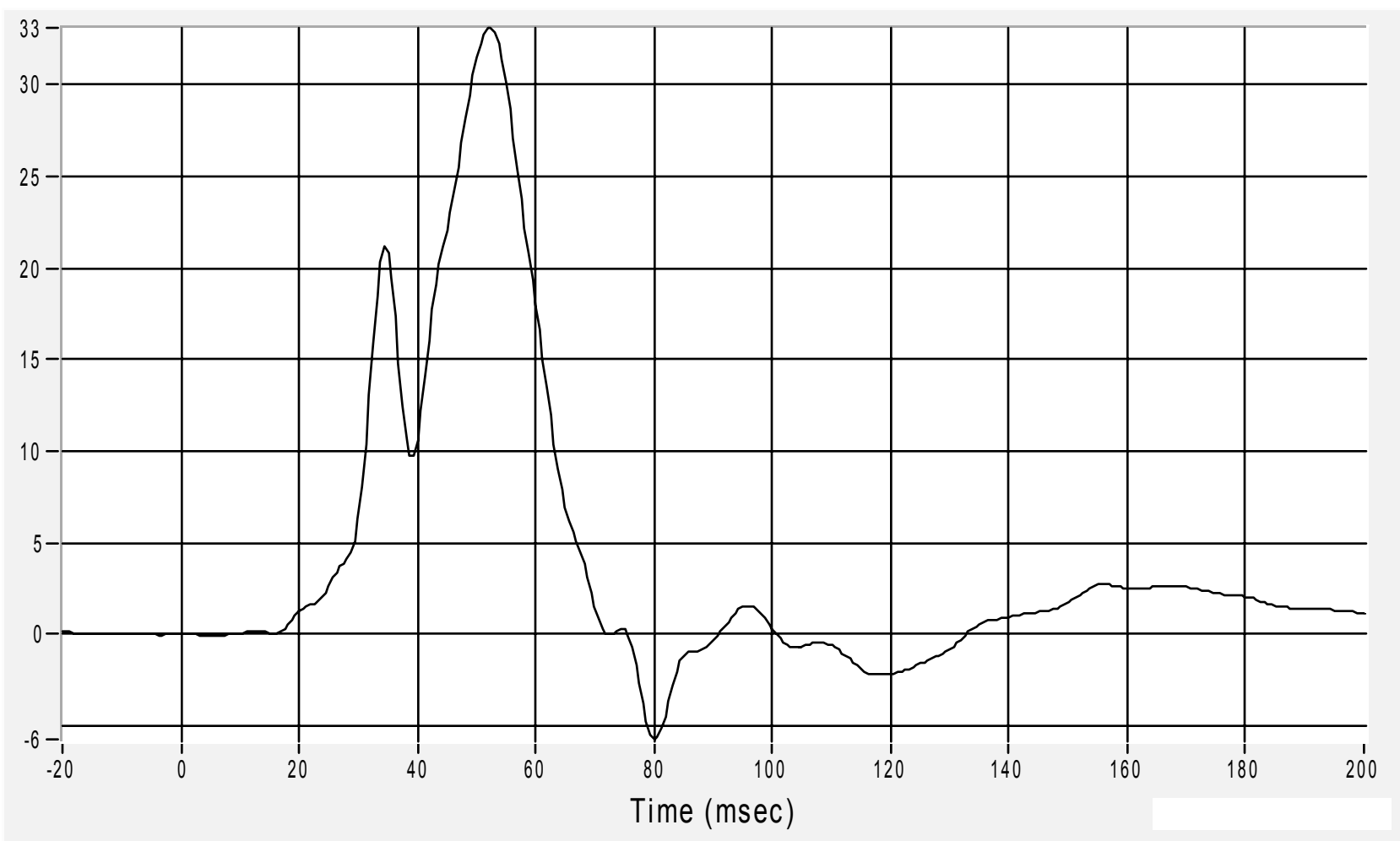


**Driver Upper Rib (Y) Acceleration**

Acceleration (G's)      FIR100

Max    33.1    G    at    52.5    msec

Min    -5.8    G    at    80.0    msec



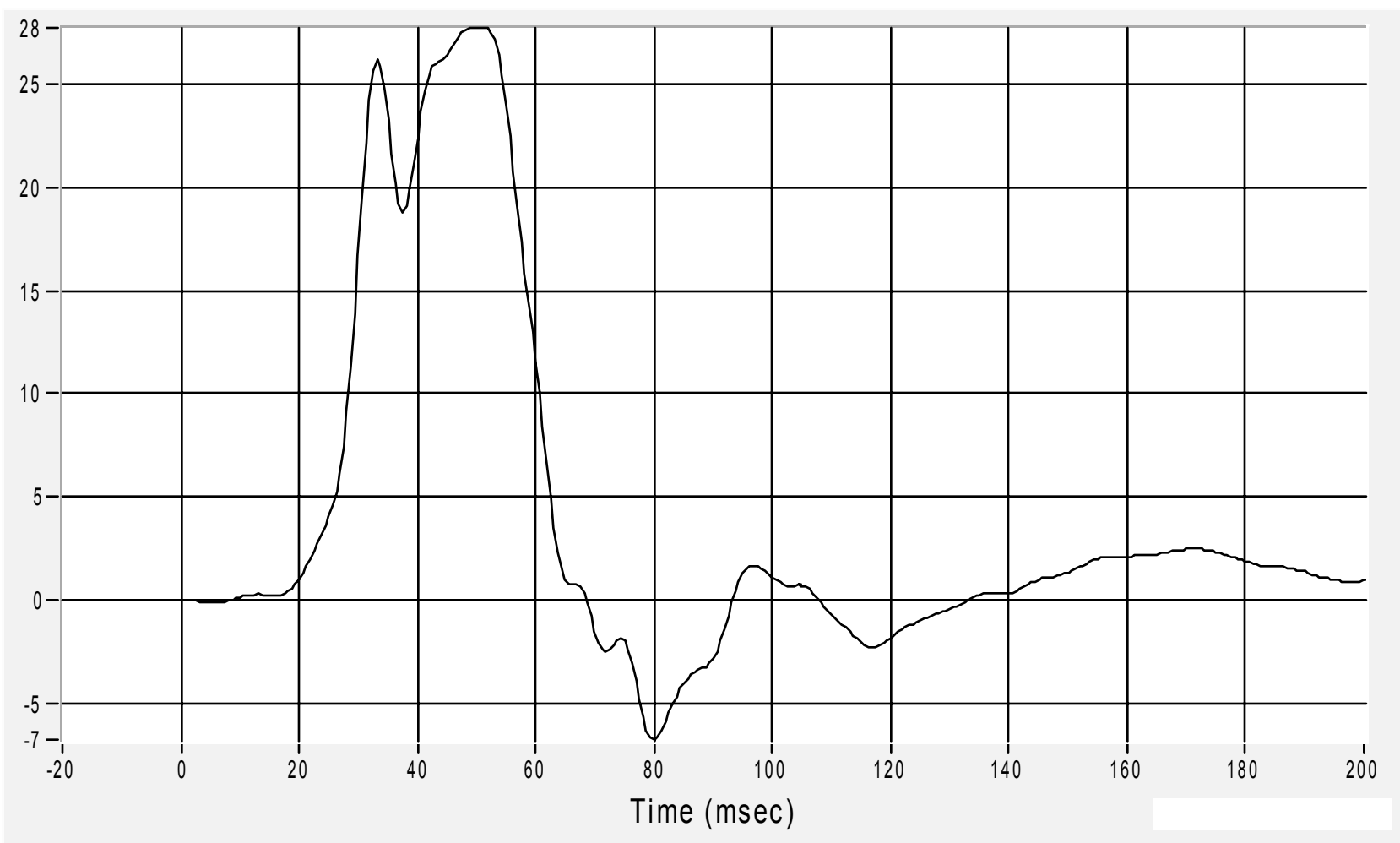
05SN05 - 2005 JEEP GRAND CHEROKEE LAREDO 4WD MPV

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**Driver Lower Rib (Y) Acceleration**

Acceleration (G's)      FIR100

**Max    27.8    G    at    51.2    msec****Min    -6.8    G    at    80.0    msec**

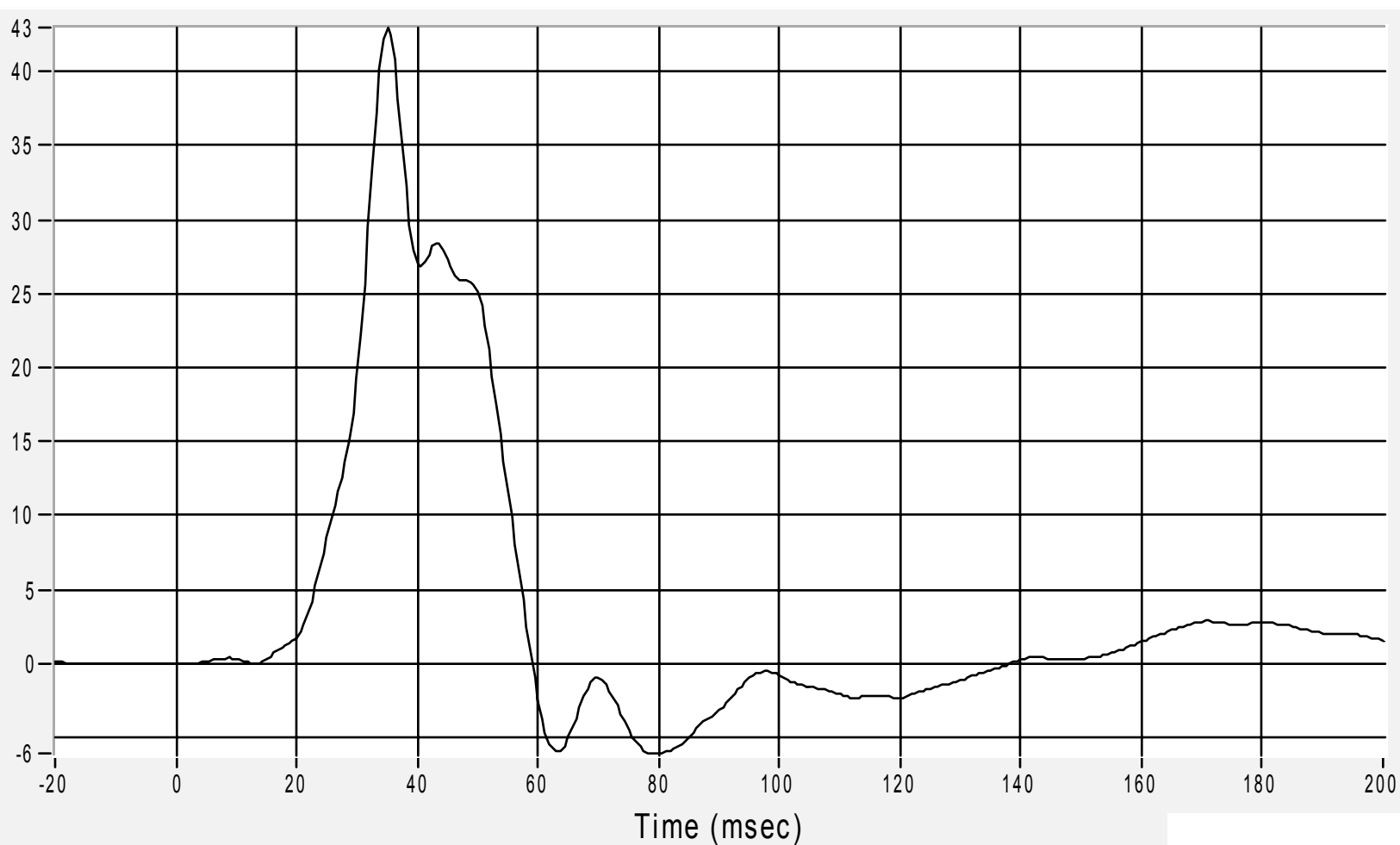
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21 January 2005

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**Driver Lower Spine (Y) Acceleration**

Acceleration (G's)      FIR100

**Max    43.0    G    at    35.0    msec****Min    -6.1    G    at    79.4    msec**

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21 January 2005

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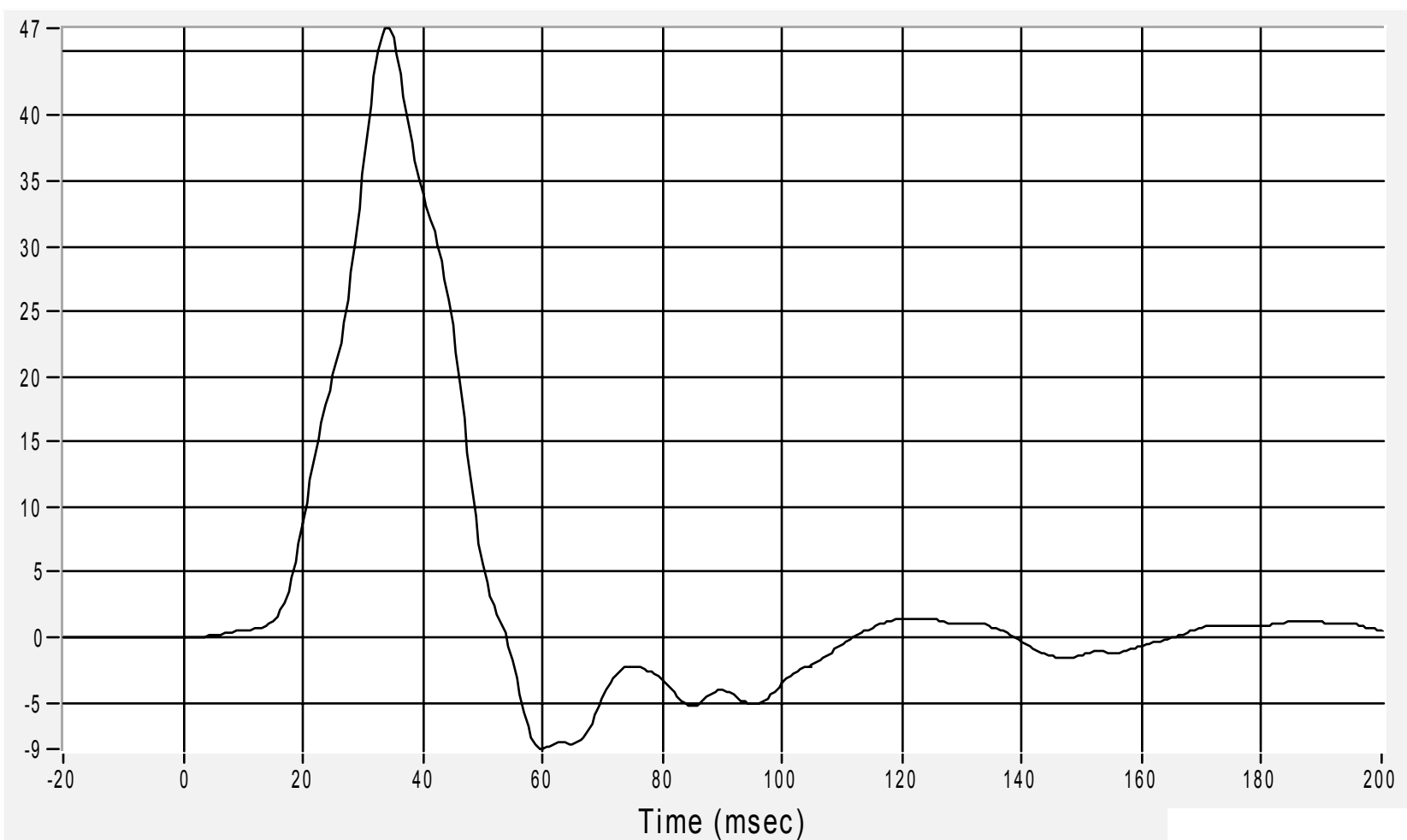
B-50

**Driver Pelvic (Y) Acceleration**

Acceleration (G's)      FIR100

Max    46.7    G    at    33.8    msec

Min    -8.6    G    at    60.0    msec



05SN05 - 2005 JEEP GRAND CHEROKEE LAREDO 4WD MPV

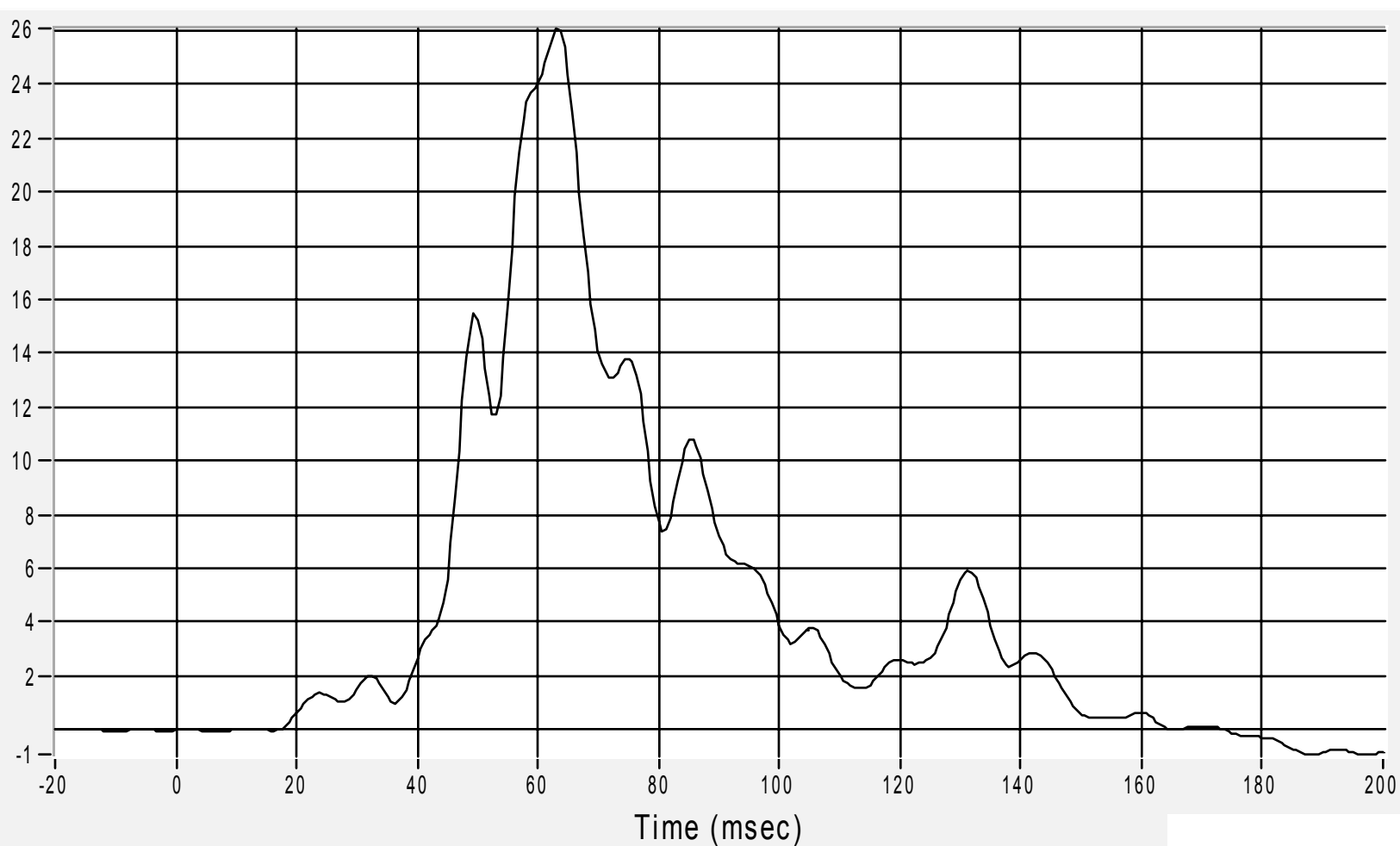
21 January 2005

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**Passenger Upper Rib (Y) Acceleration**

Acceleration (G's)      FIR100

**Max    26.1    G    at    63.1    msec****Min    -0.9    G    at    188.1    msec**

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21 January 2005

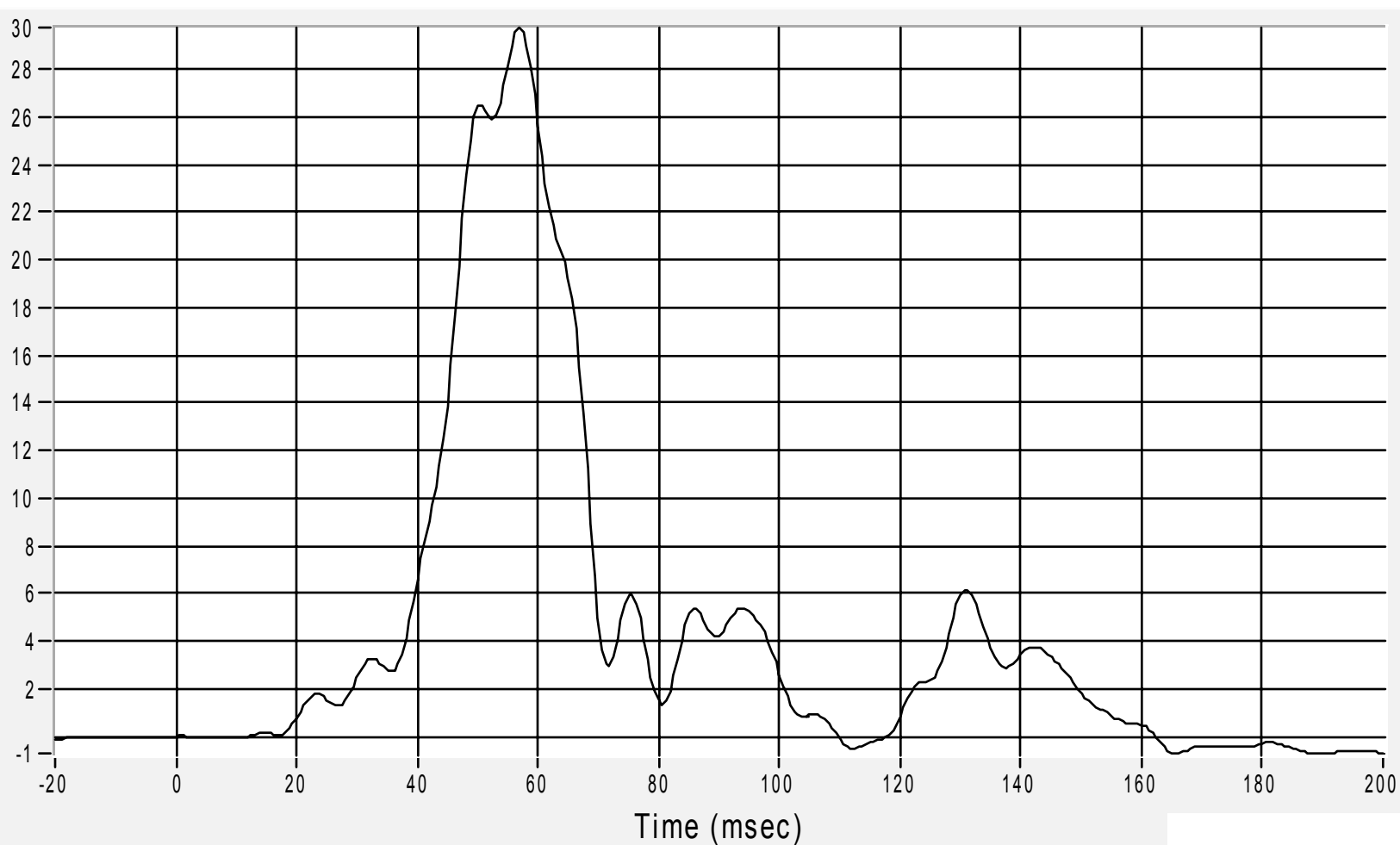
*Medical College of Wisconsin  
Vehicle Crashworthiness Lab*

**Passenger Lower Rib (Y) Acceleration**

Acceleration (G's)      FIR100

Max    29.7    G    at    56.9    msec

Min    -0.7    G    at    189.4    msec



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21 January 2005

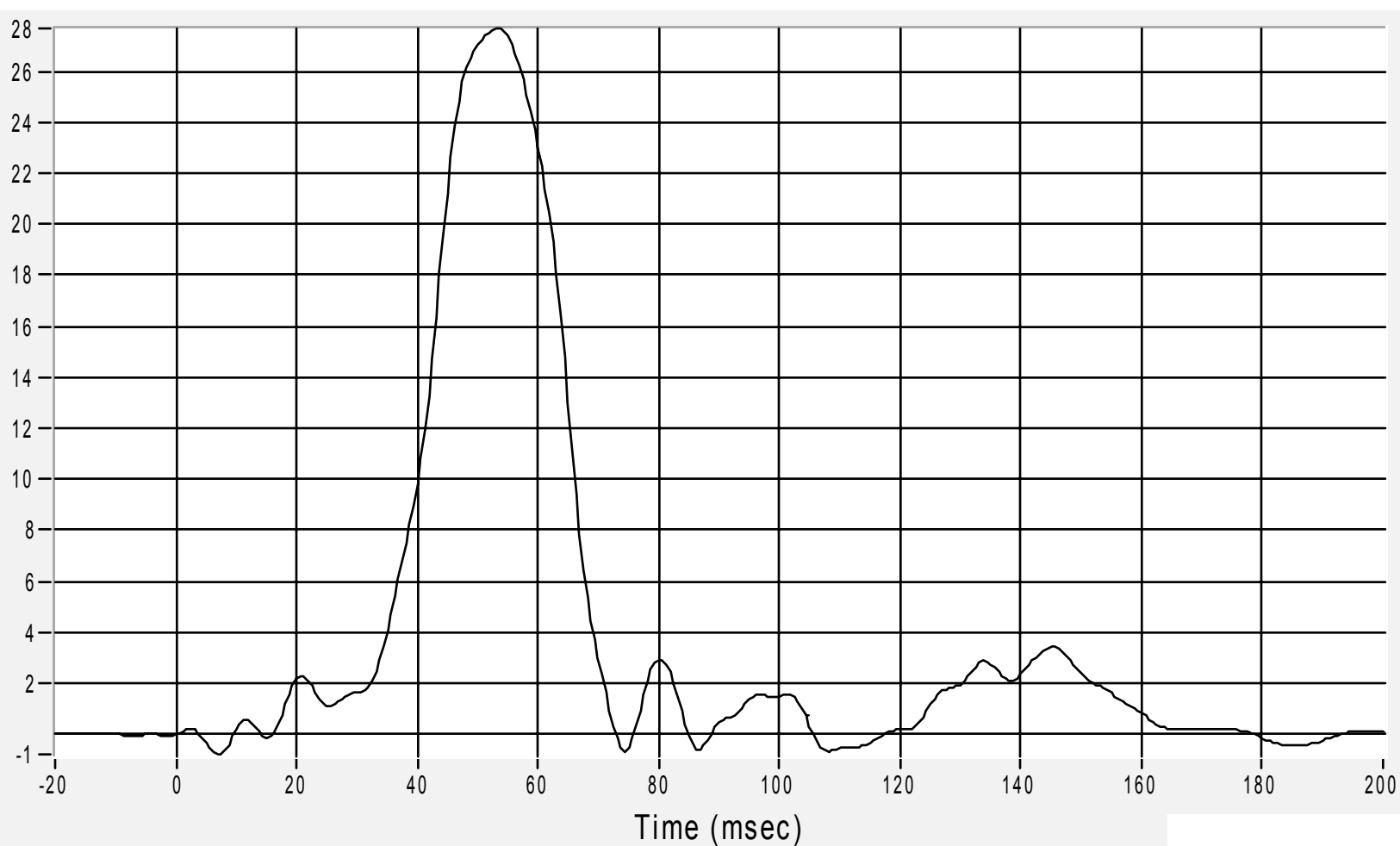
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Passenger Lower Spine (Y) Acceleration**

Acceleration (G's)      FIR100

Max    27.7    G    at    53.1    msec

Min    -0.8    G    at    6.9    msec



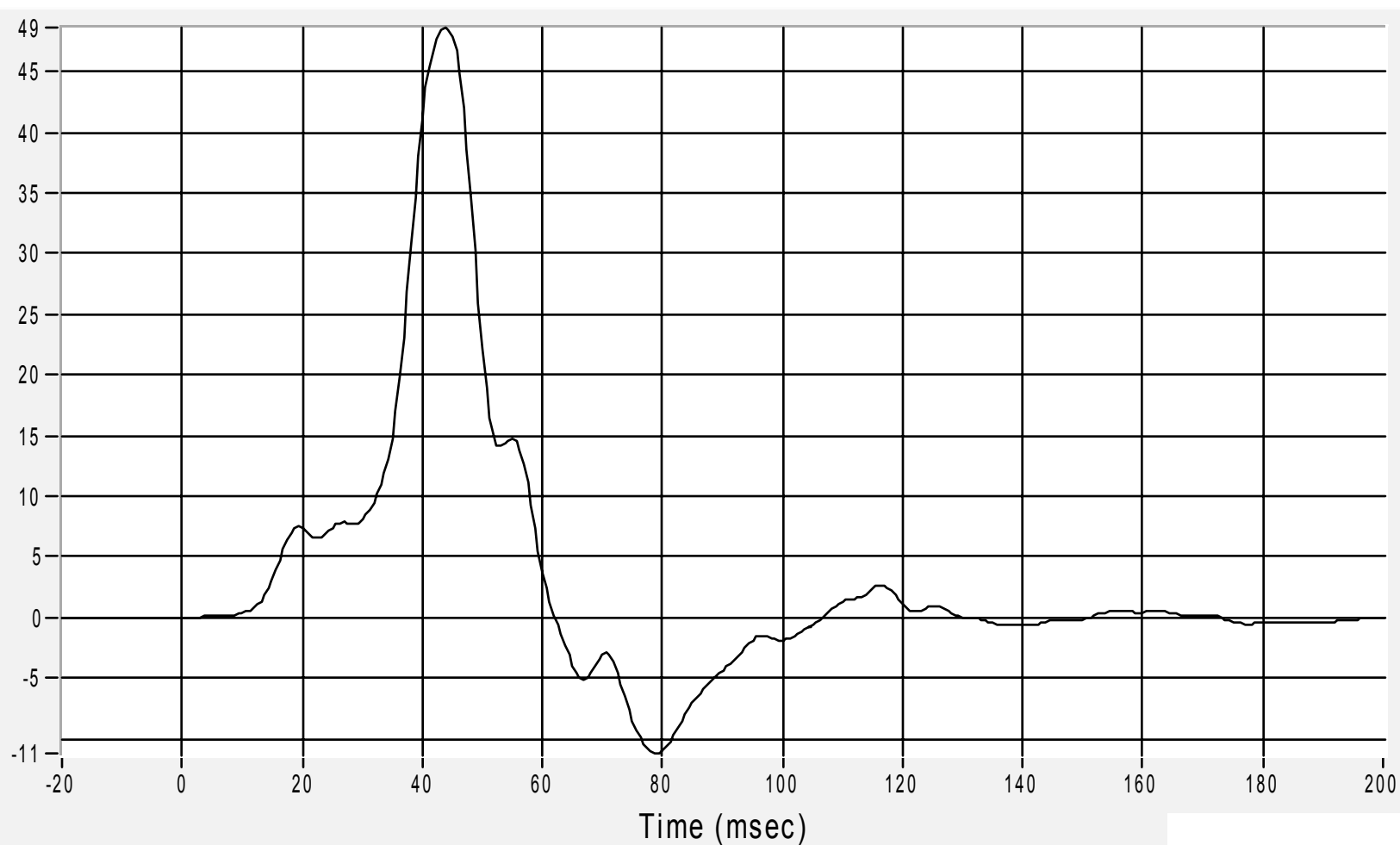
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**Passenger Pelvic (Y) Acceleration**

Acceleration (G's)      FIR100

**Max    48.6    G    at    43.8    msec****Min    -11.2    G    at    78.8    msec**

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21 January 2005

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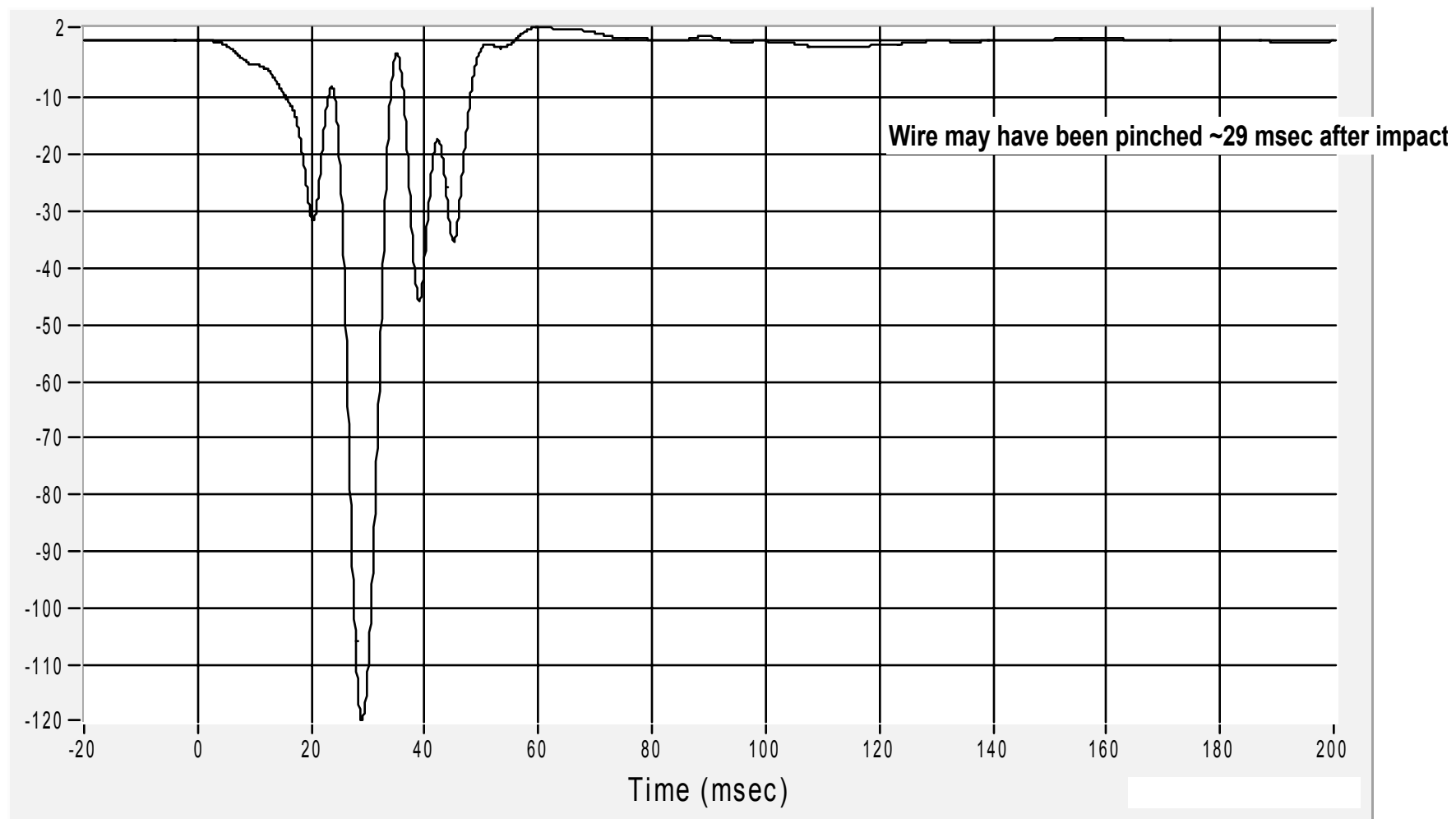


**Right Side Sill at Front Seat (X) Acceleration**

Acceleration (G's) CFC60

Max 2.4 G at 60.3 msec

Min -119.7 G at 29.0 msec



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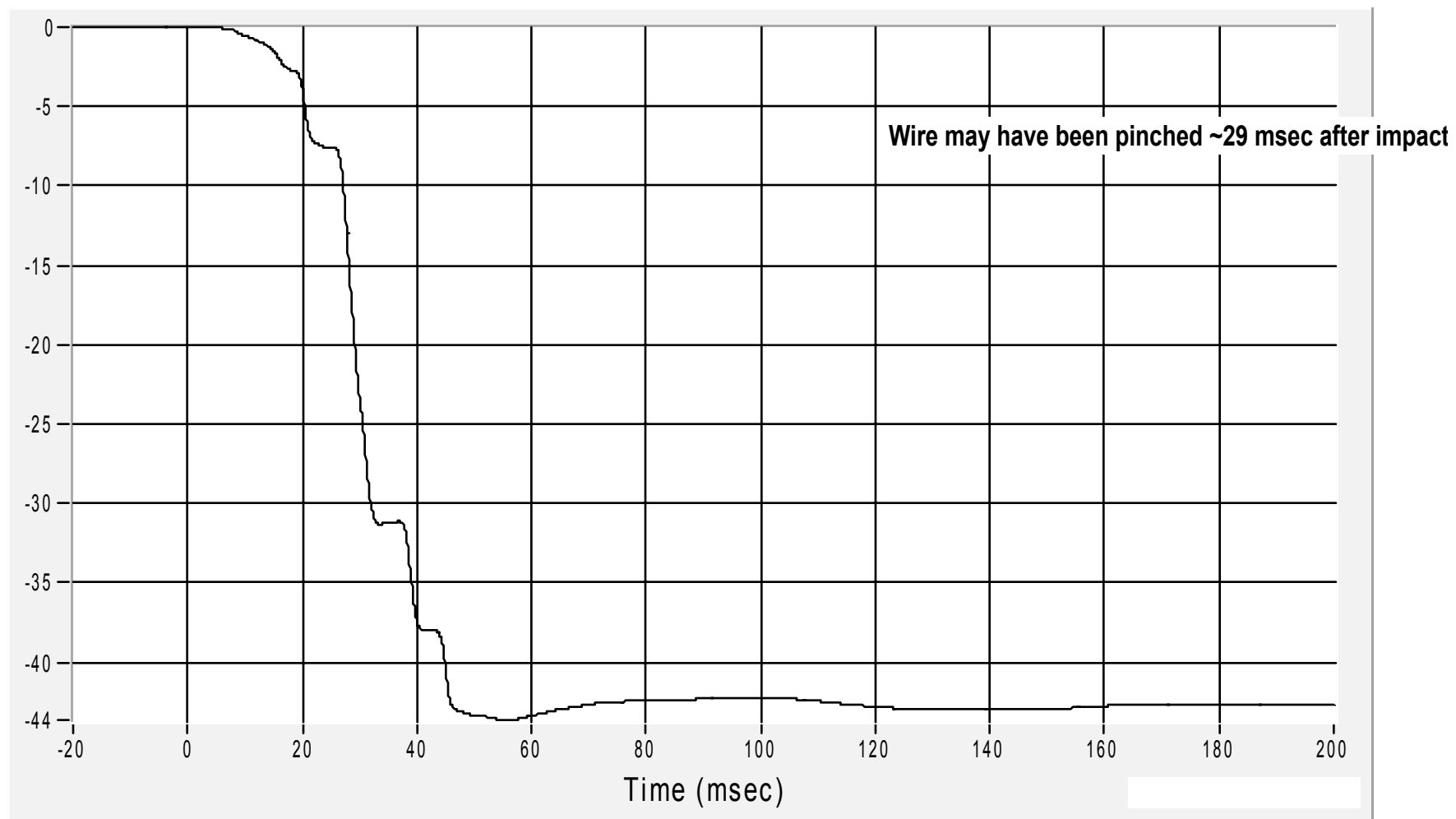
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Right Side Sill at Front Seat (X) Velocity**

Velocity (km/h) CFC180

Max 0.0 km/h at 1.2 msec

Min -43.6 km/h at 55.5 msec



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21 January 2005

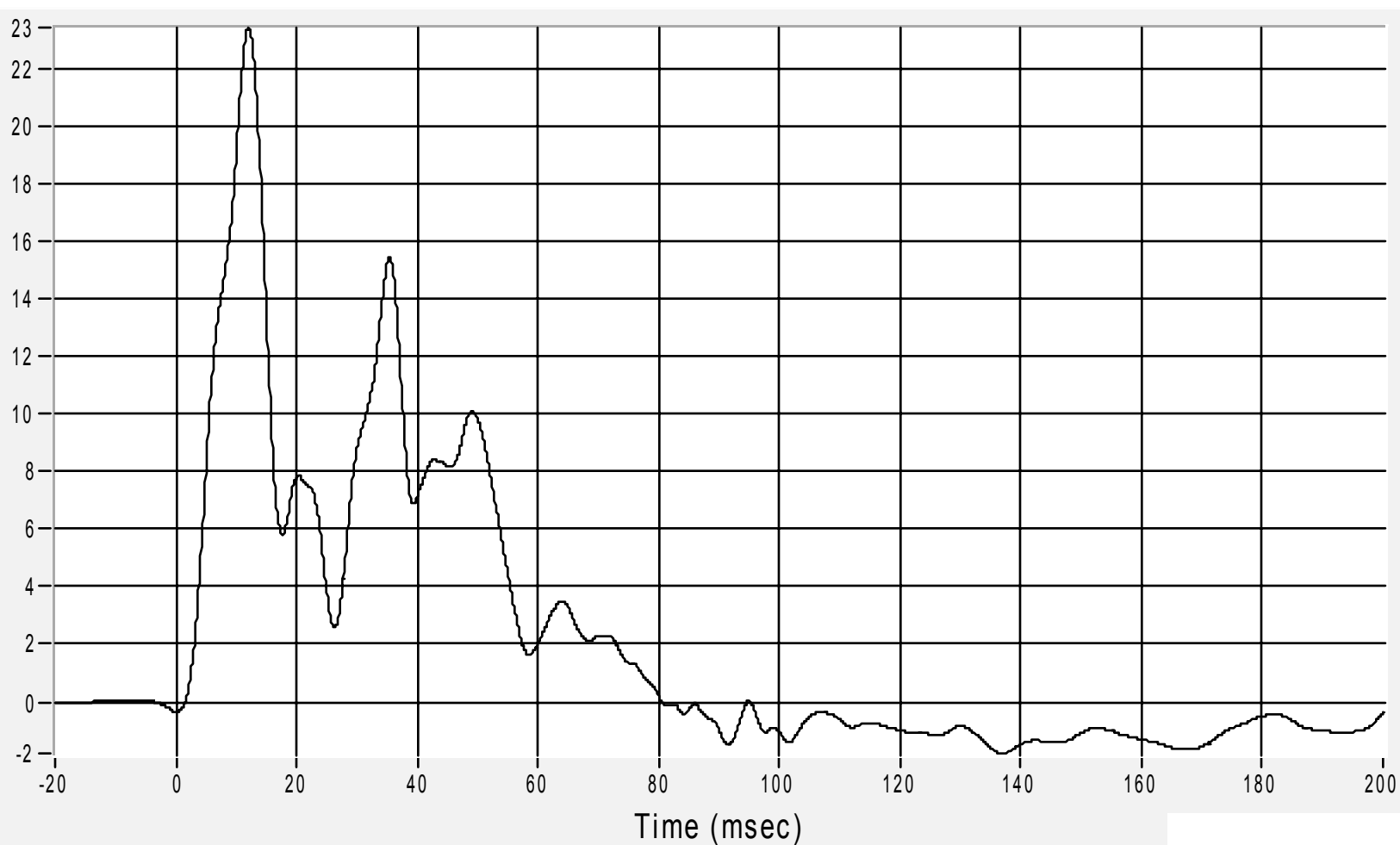
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Right Side Sill at Front Seat (Y) Acceleration**

Acceleration (G's) CFC60

Max 23.5 G at 12.0 msec

Min -1.8 G at 137.0 msec



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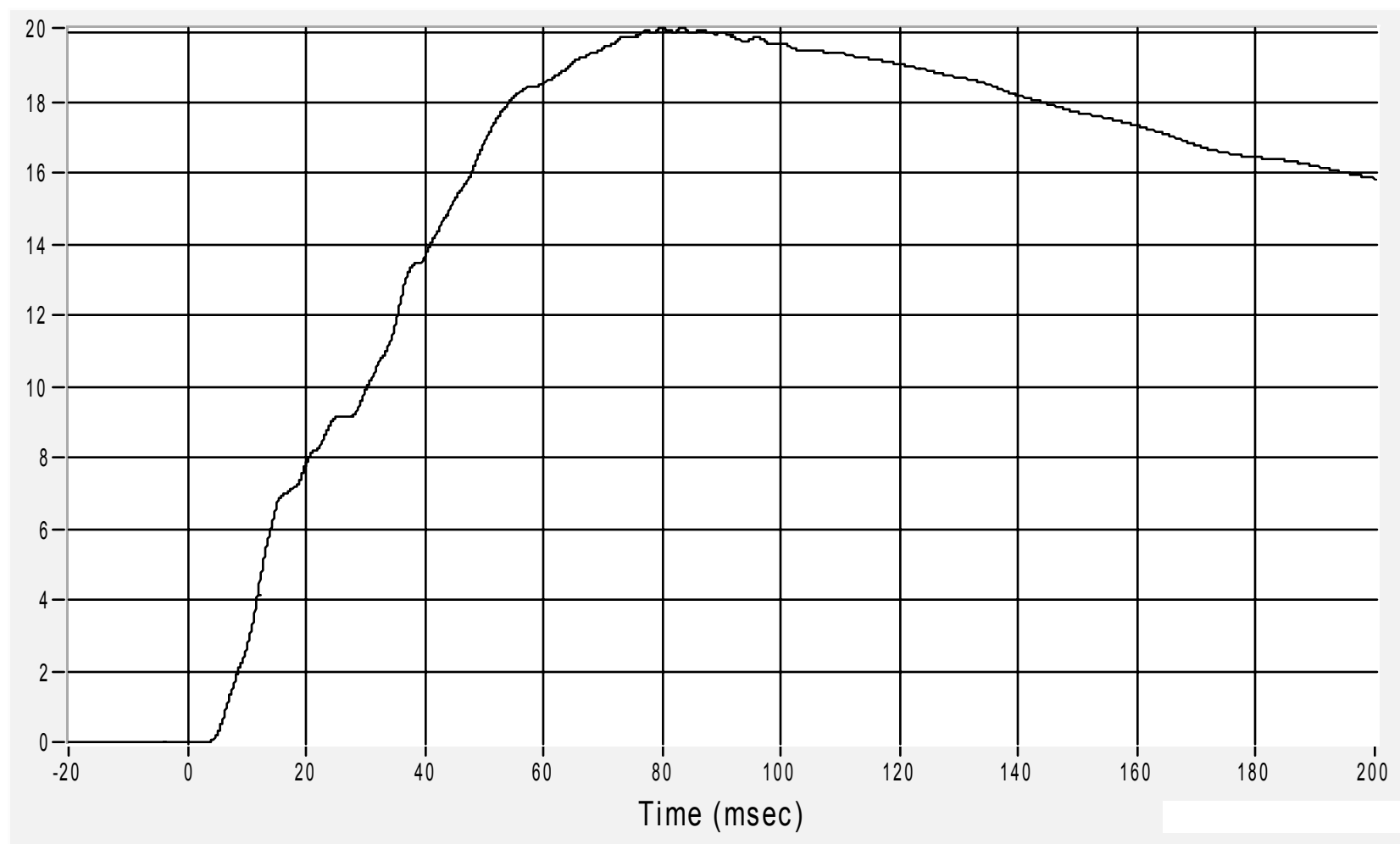
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Right Side Sill at Front Seat (Y) Velocity**

Velocity (km/h) CFC180

Max 20.1 km/h at 83.4 msec

Min 0.0 km/h at 0.0 msec



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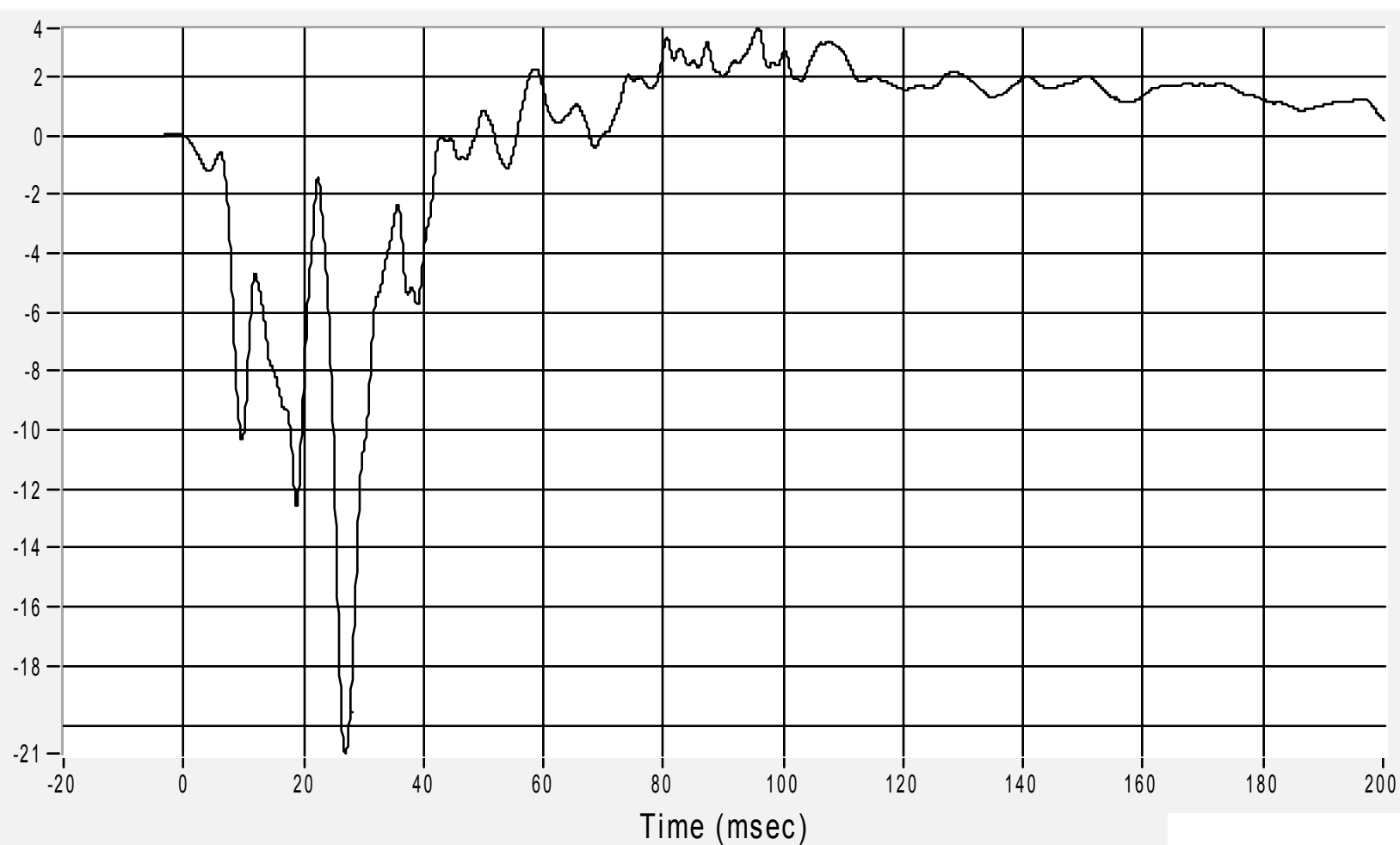


**Right Side Sill at Front Seat (Z) Acceleration**

Acceleration (G's) CFC60

Max 3.6 G at 95.8 msec

Min -21.0 G at 27.0 msec



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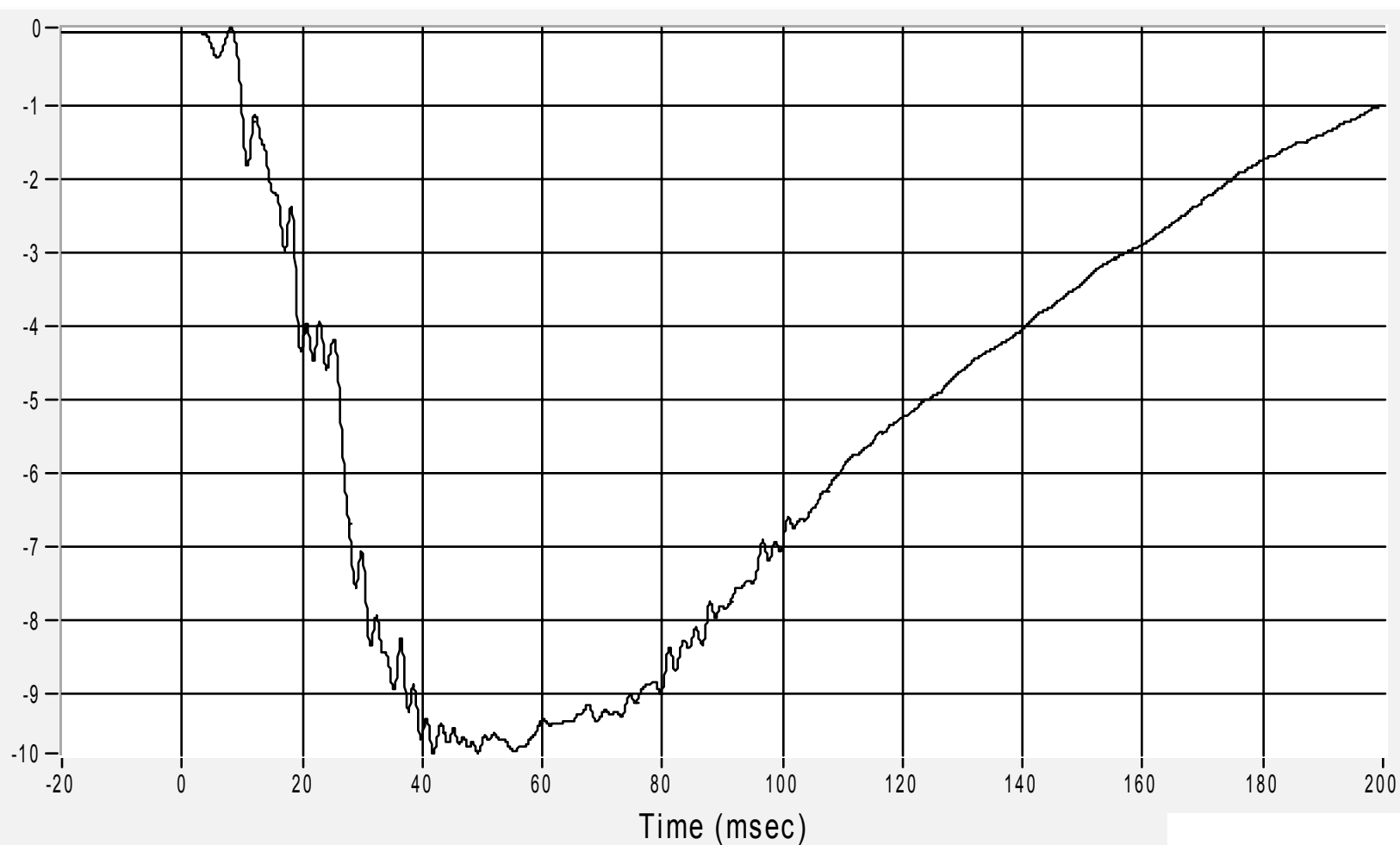
B-60

**Right Side Sill at Front Seat (Z) Velocity**

Velocity (km/h) CFC180

Max 0.1 km/h at 8.2 msec

Min -9.8 km/h at 41.8 msec



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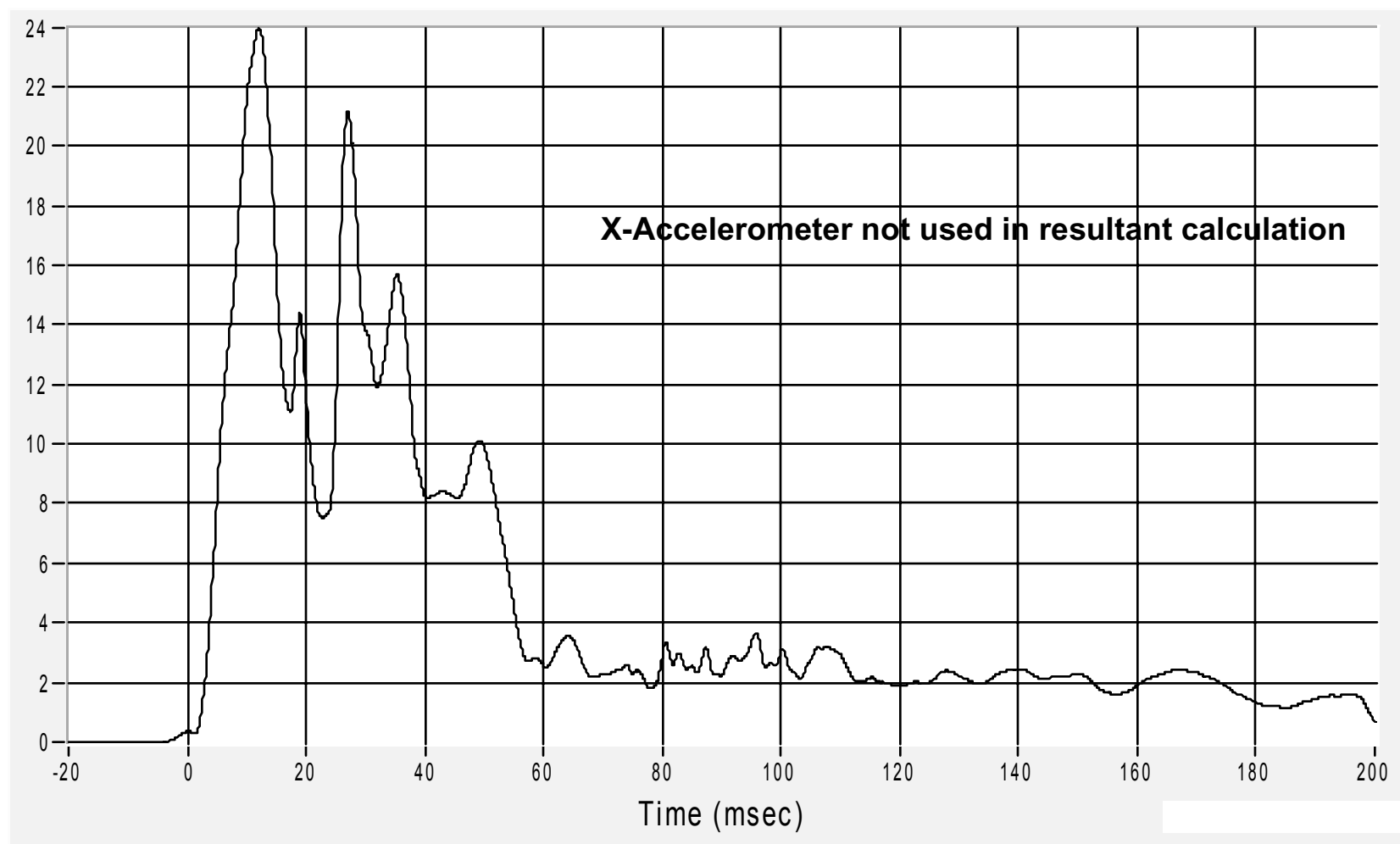
Medical College of Wisconsin  
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**Right Side Sill at Front Seat Resultant Acceleration**

Acceleration (G's) CFC60

Max 24.0 G's at 12.1 msec

Min 0.3 G's at 1.3 msec



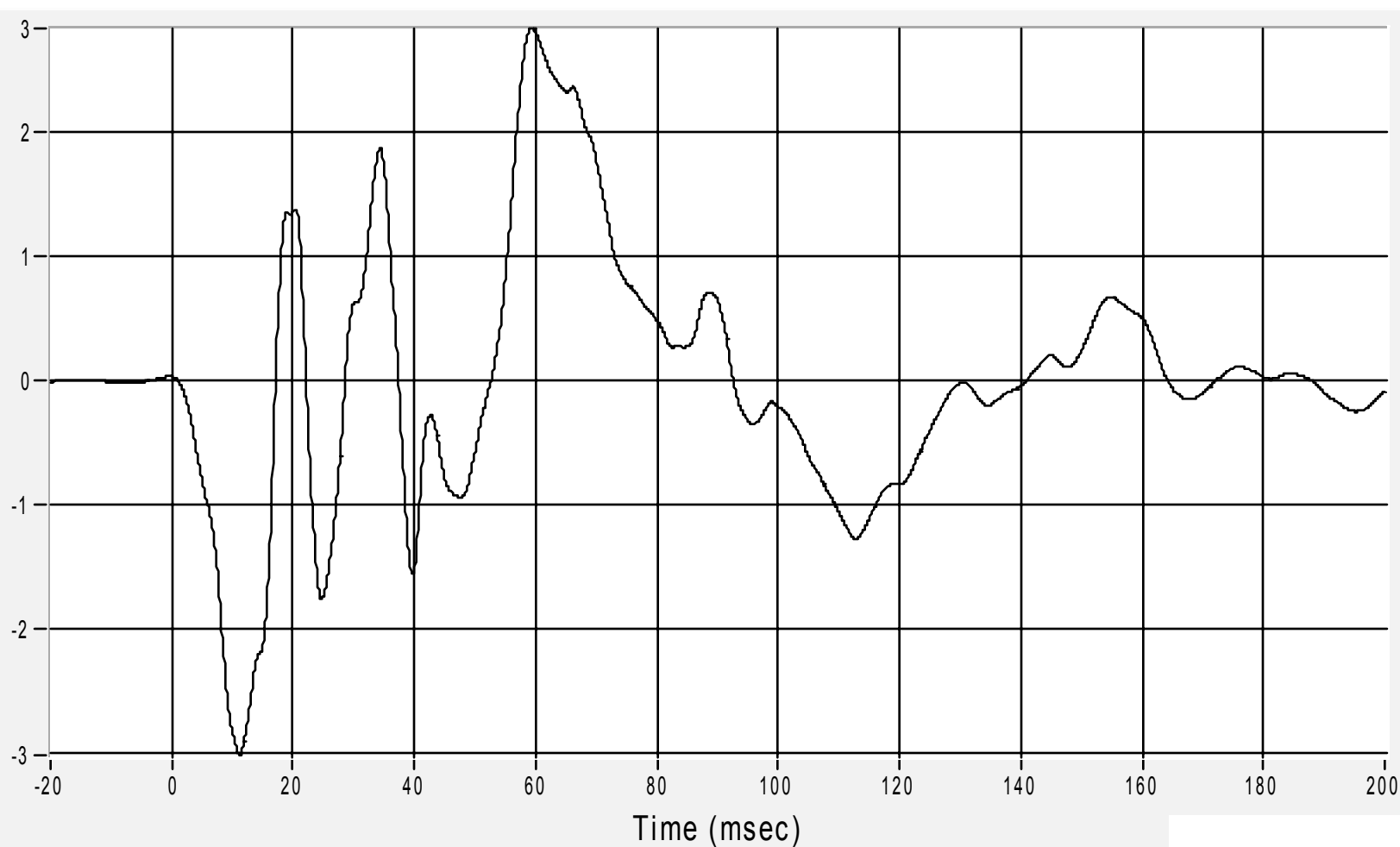
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**Right Side Sill at Rear Seat (X) Acceleration**

Acceleration (G's) CFC60

**Max 2.8 G at 59.3 msec****Min -3.0 G at 11.2 msec**

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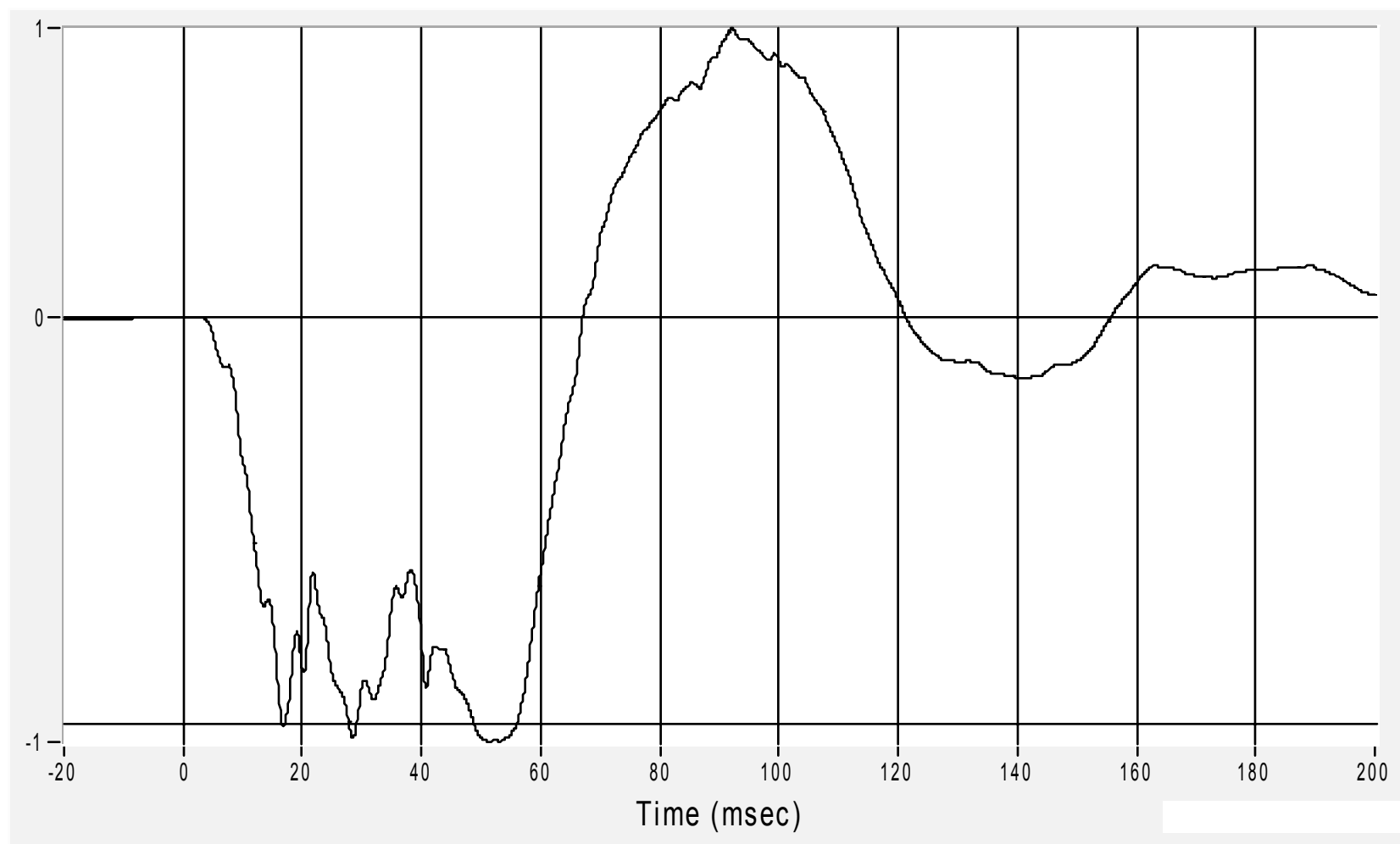


**Right Side Sill at Rear Seat (X) Velocity**

Velocity (km/h) CFC180

Max 0.7 km/h at 92.1 msec

Min -1.0 km/h at 51.5 msec



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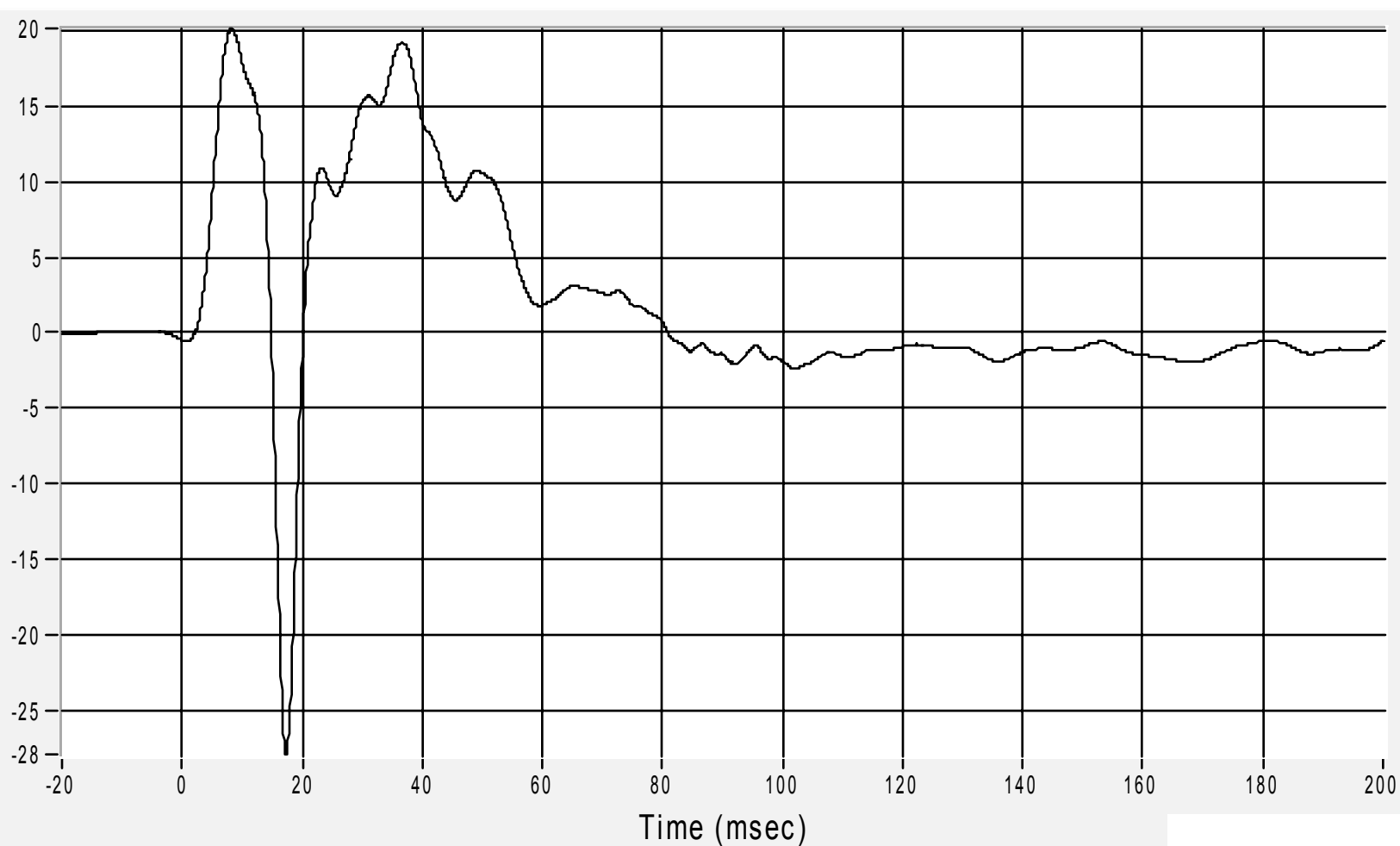
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**Right Side Sill at Rear Seat (Y) Acceleration**

Acceleration (G's) CFC60

Max 20.2 G at 8.2 msec

Min -27.9 G at 17.3 msec



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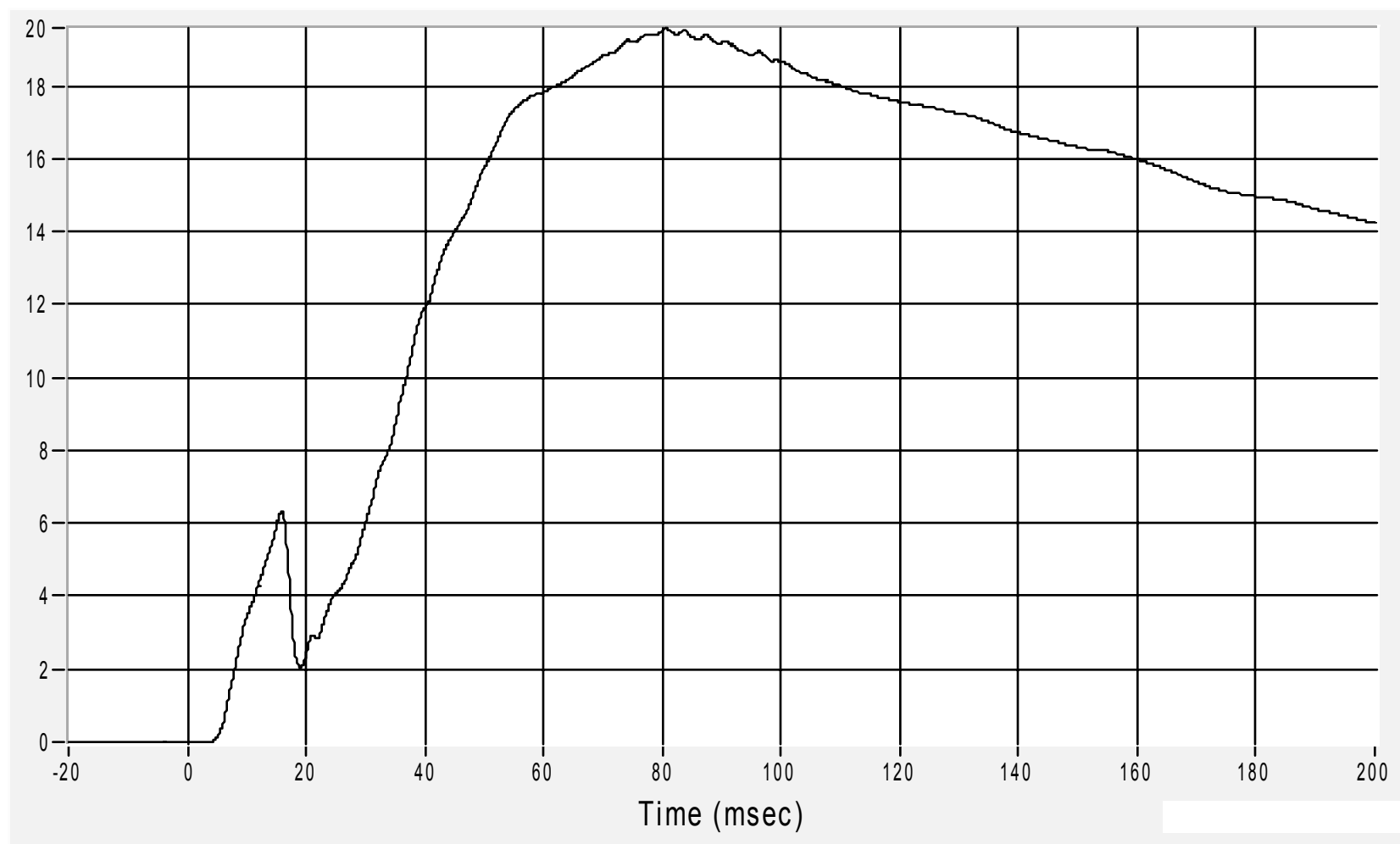
Medical College of Wisconsin  
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**Right Side Sill at Rear Seat (Y) Velocity**

Velocity (km/h) CFC180

Max 19.6 km/h at 80.6 msec

Min 0.0 km/h at 0.0 msec



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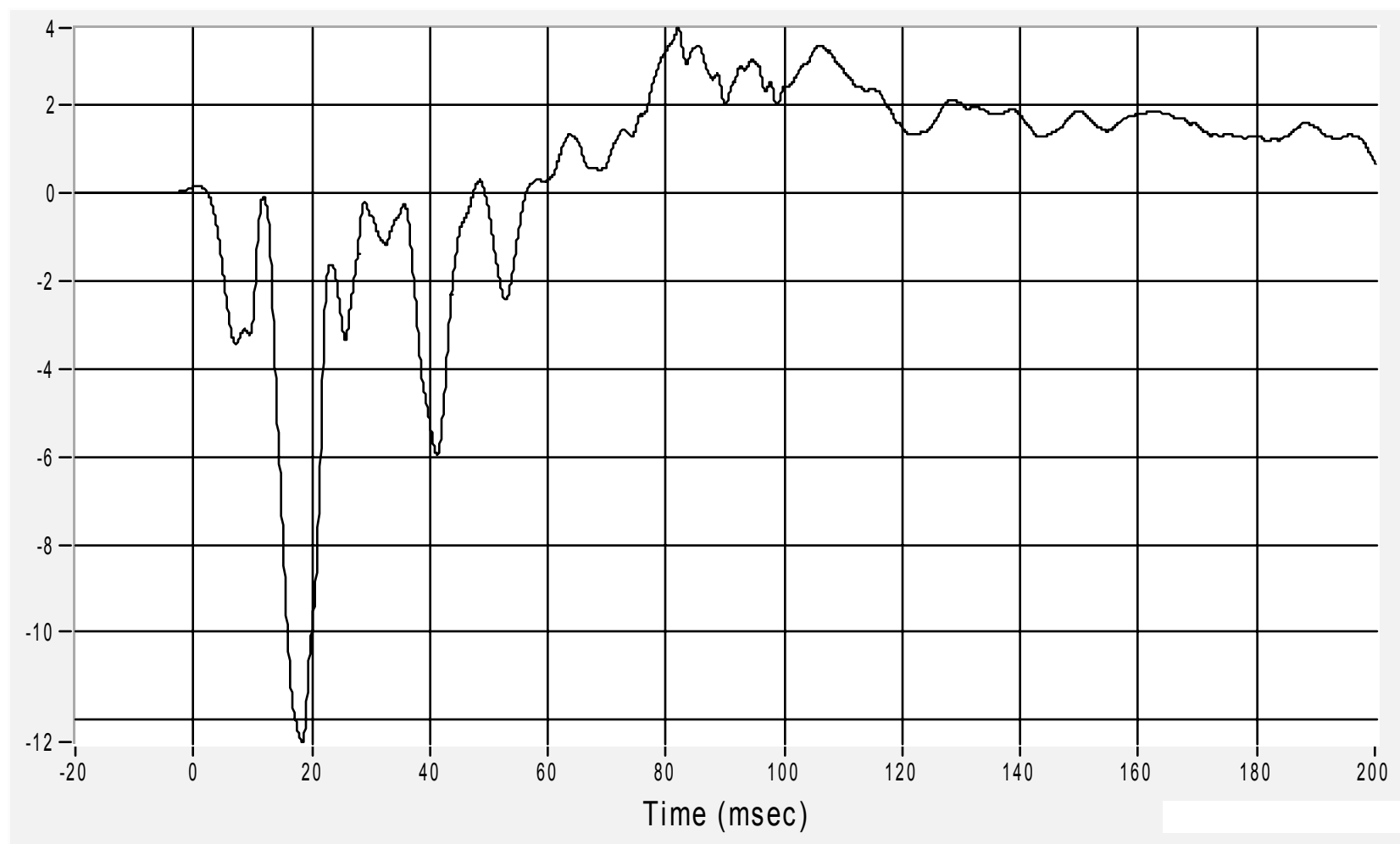
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**Right Side Sill at Rear Seat (Z) Acceleration**

Acceleration (G's) CFC60

Max 3.7 G at 82.1 msec

Min -12.5 G at 18.4 msec



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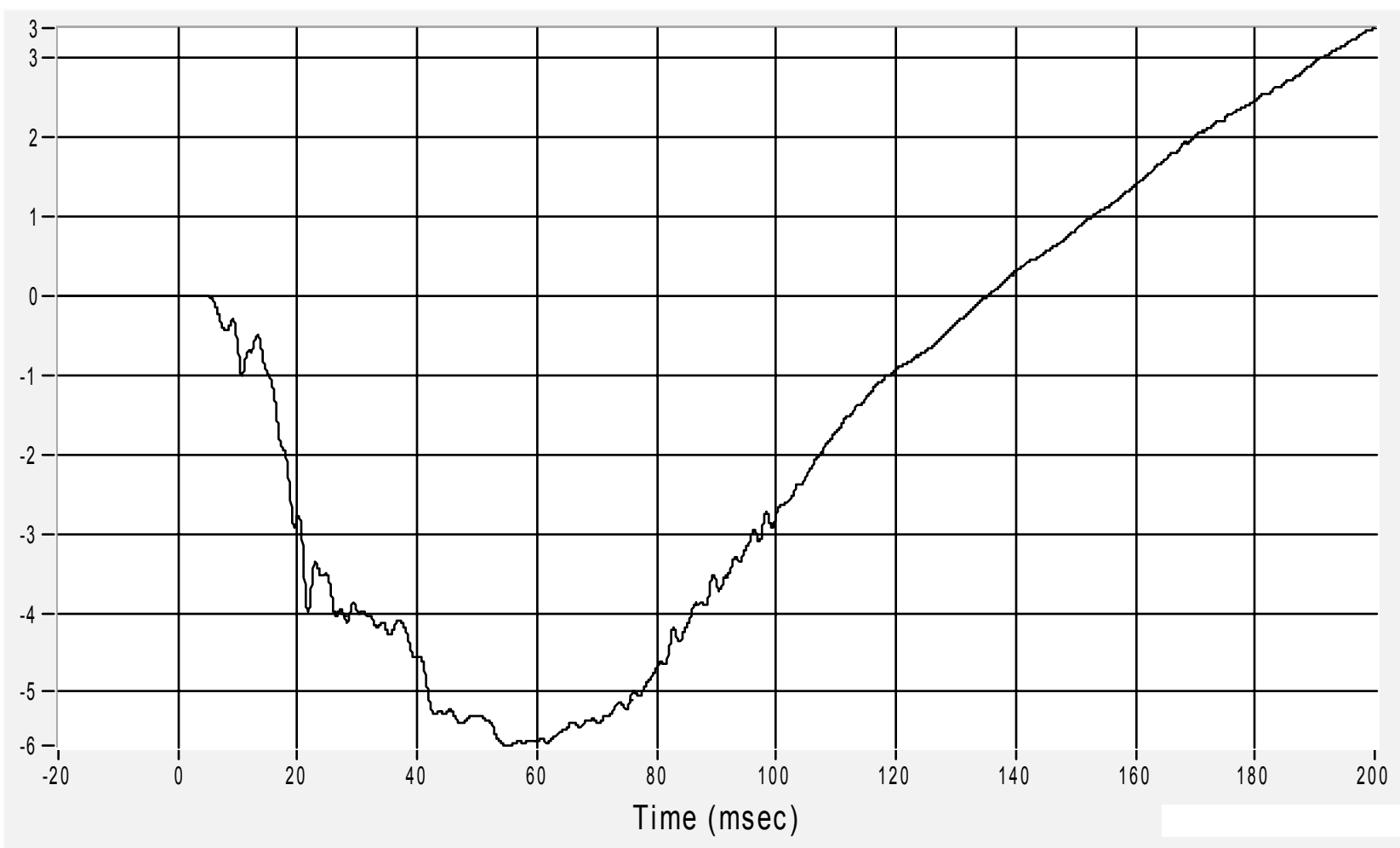
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**Right Side Sill at Rear Seat (Z) Velocity**

Velocity (km/h) CFC180

Max 3.4 km/h at 199.9 msec

Min -5.7 km/h at 55.0 msec



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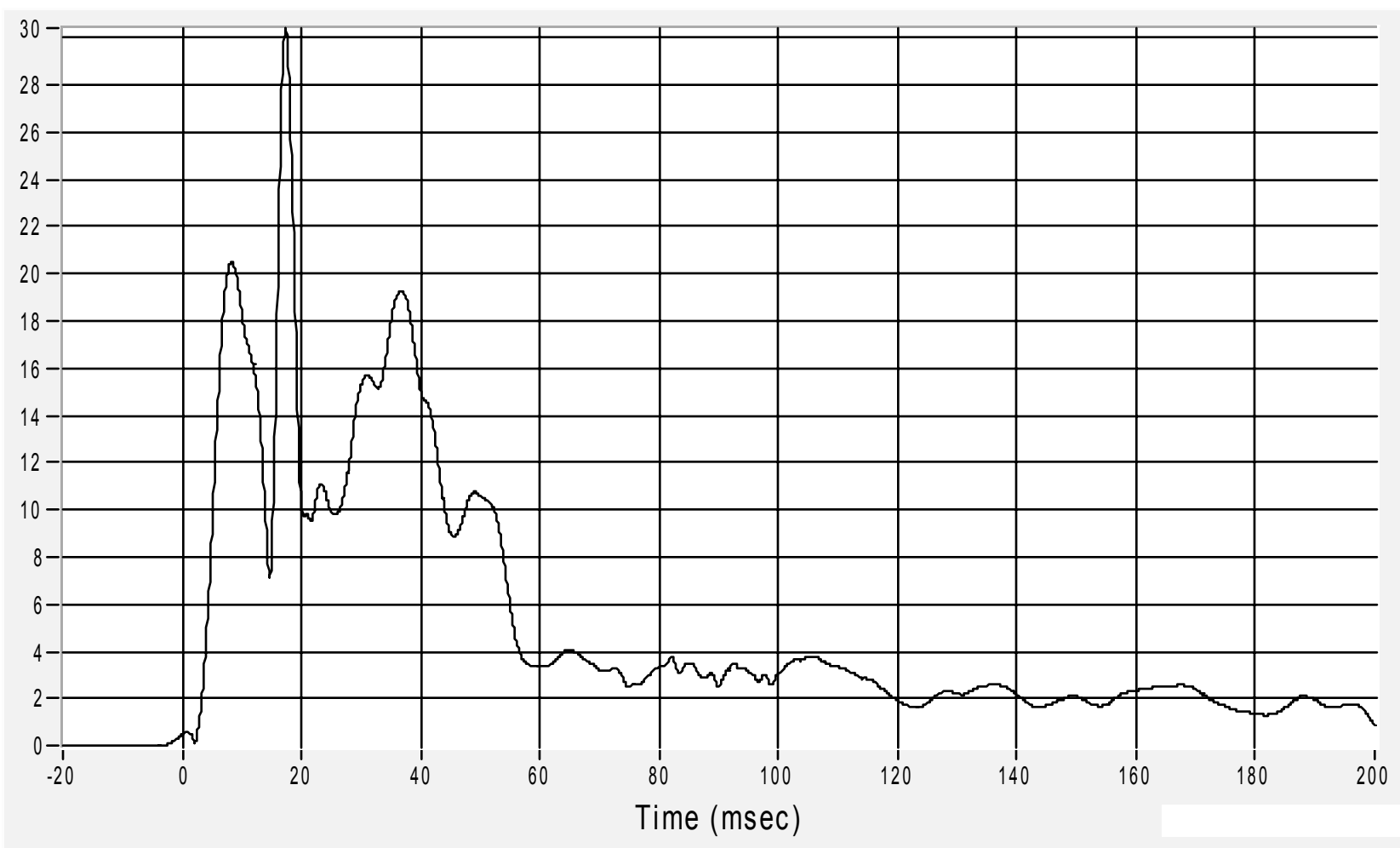


**Right Side Sill at Rear Seat Resultant Acceleration**

Acceleration (G's) CFC60

Max 30.4 G's at 17.4 msec

Min 0.1 G's at 2.2 msec



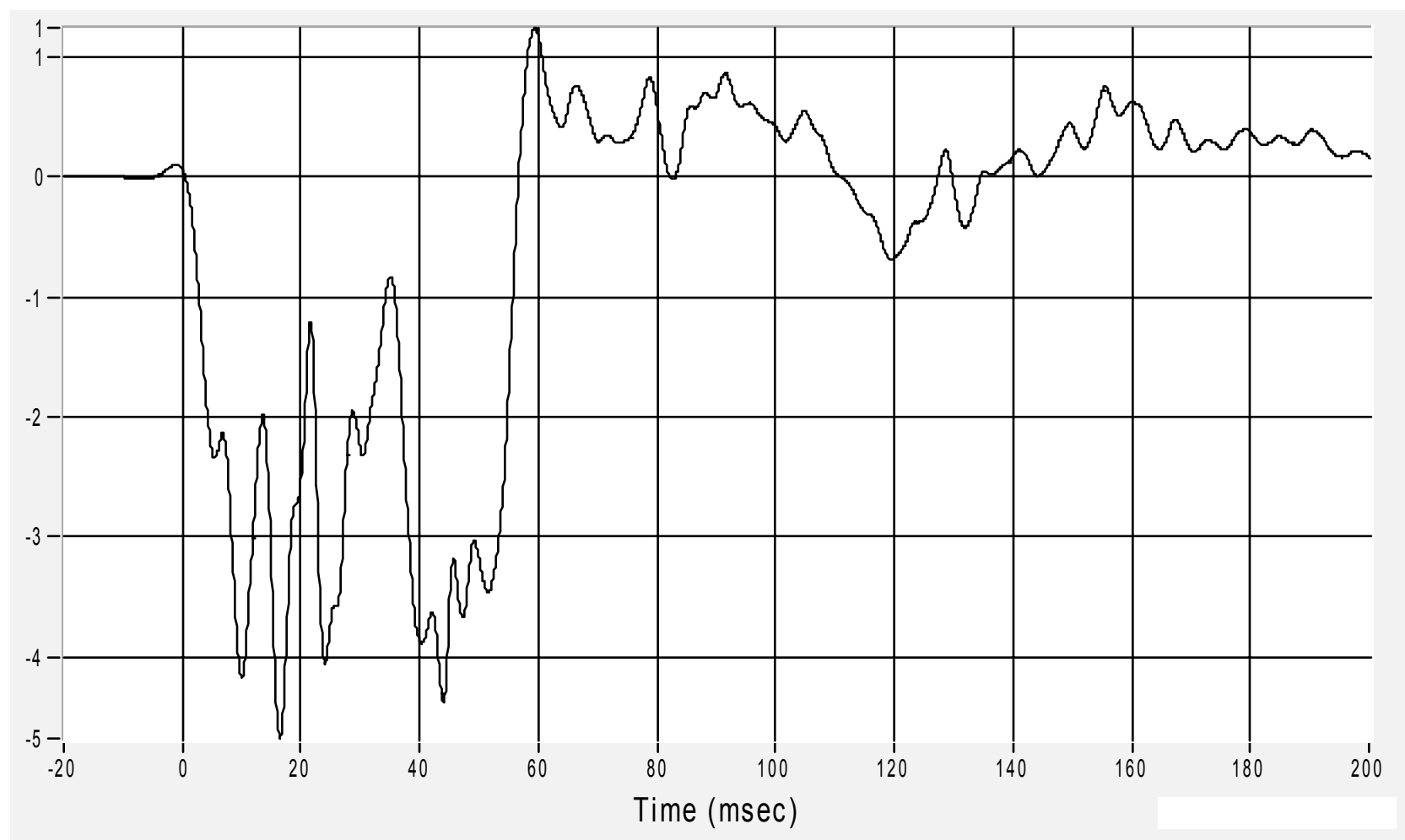
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**Rear Floorpan Above Axle (X) Acceleration**

Acceleration (G's) CFC60

**Max 1.2 G at 59.4 msec****Min -4.7 G at 16.5 msec**

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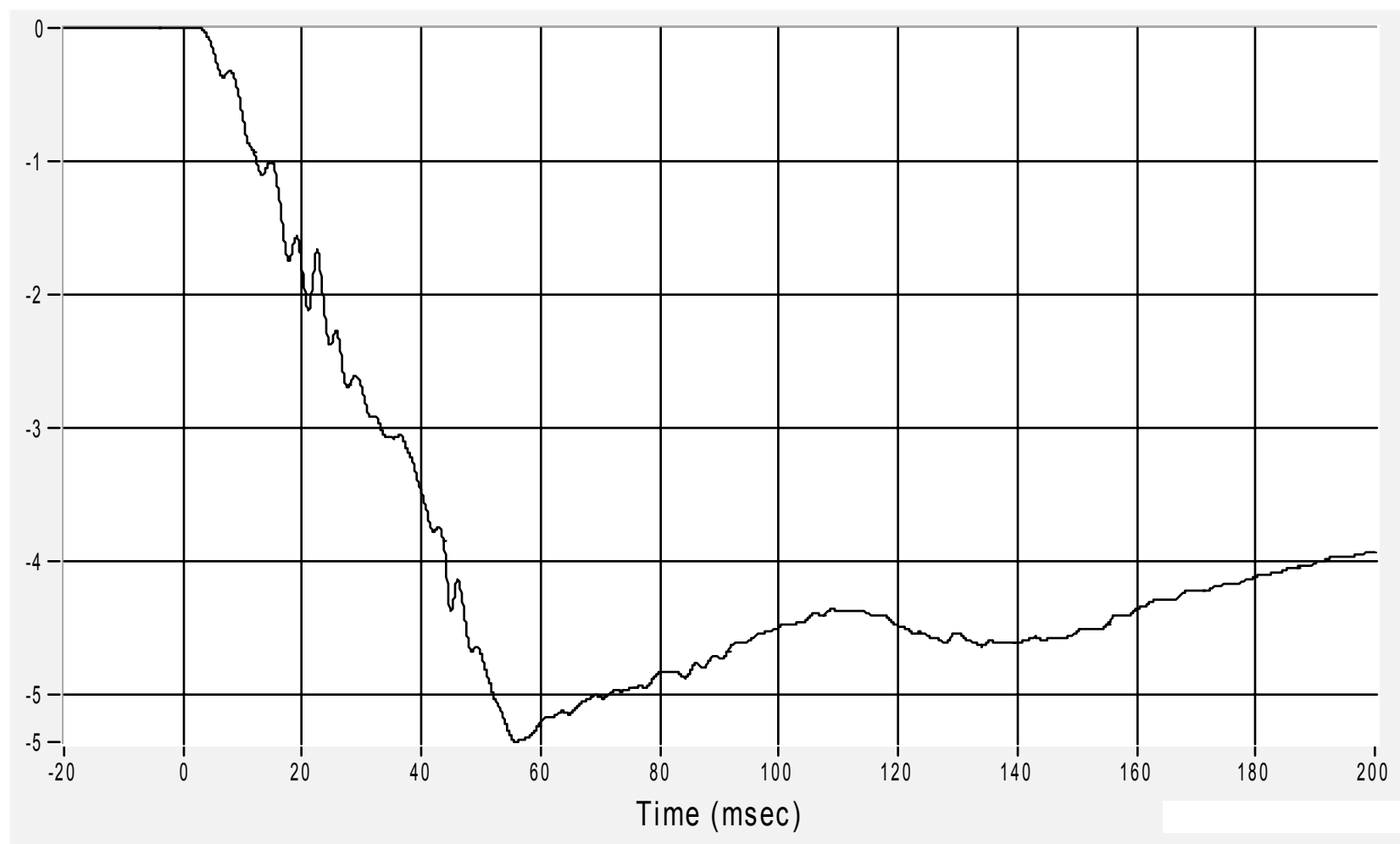
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**Rear Floorpan Above Axle (X) Velocity**

Velocity (km/h) CFC180

Max 0.0 km/h at 2.2 msec

Min -5.4 km/h at 55.8 msec



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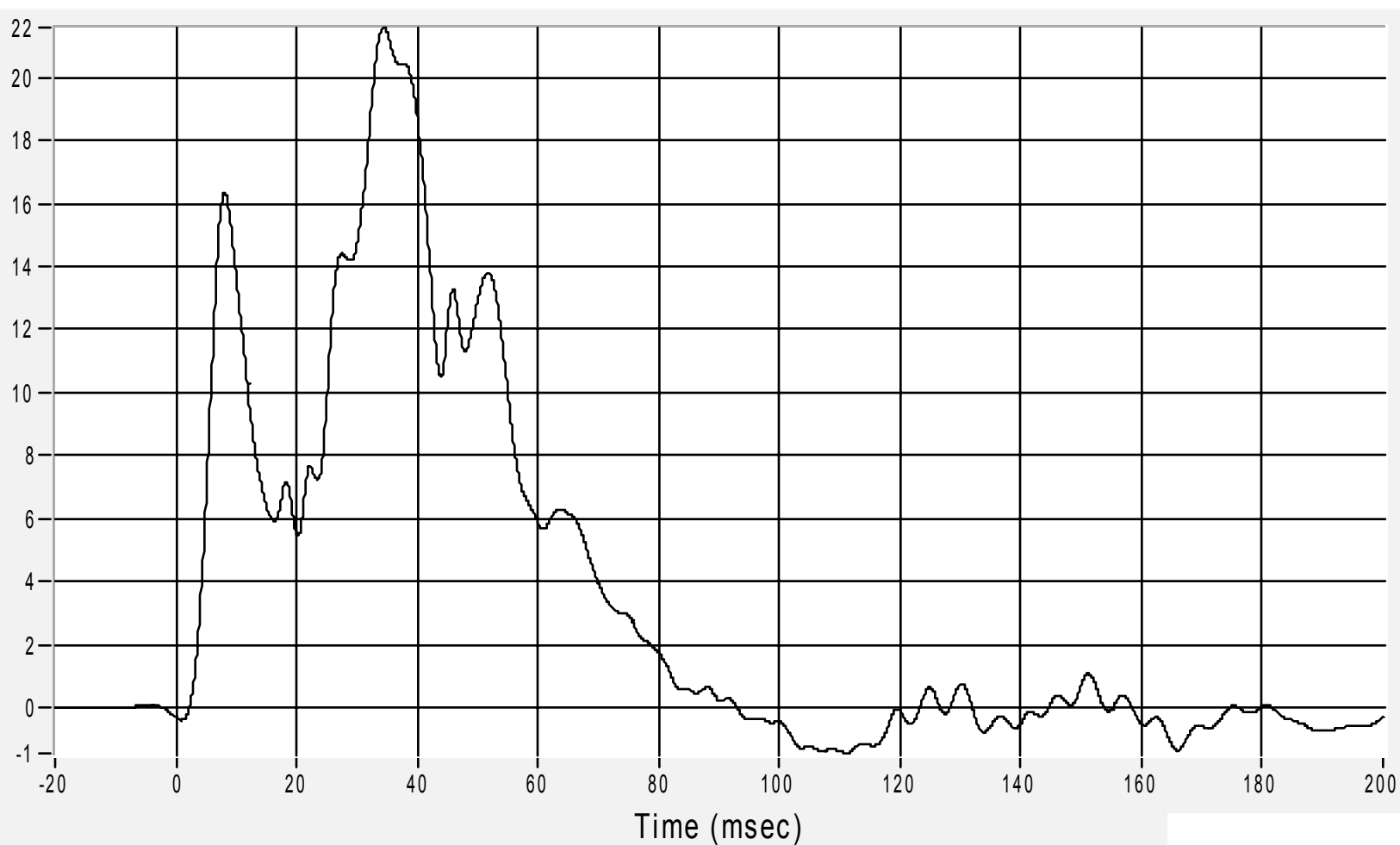
Medical College of Wisconsin  
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**Rear Floorpan Above Axle (Y) Acceleration**

Acceleration (G's) CFC60

Max 21.6 G at 34.4 msec

Min -1.5 G at 111.1 msec



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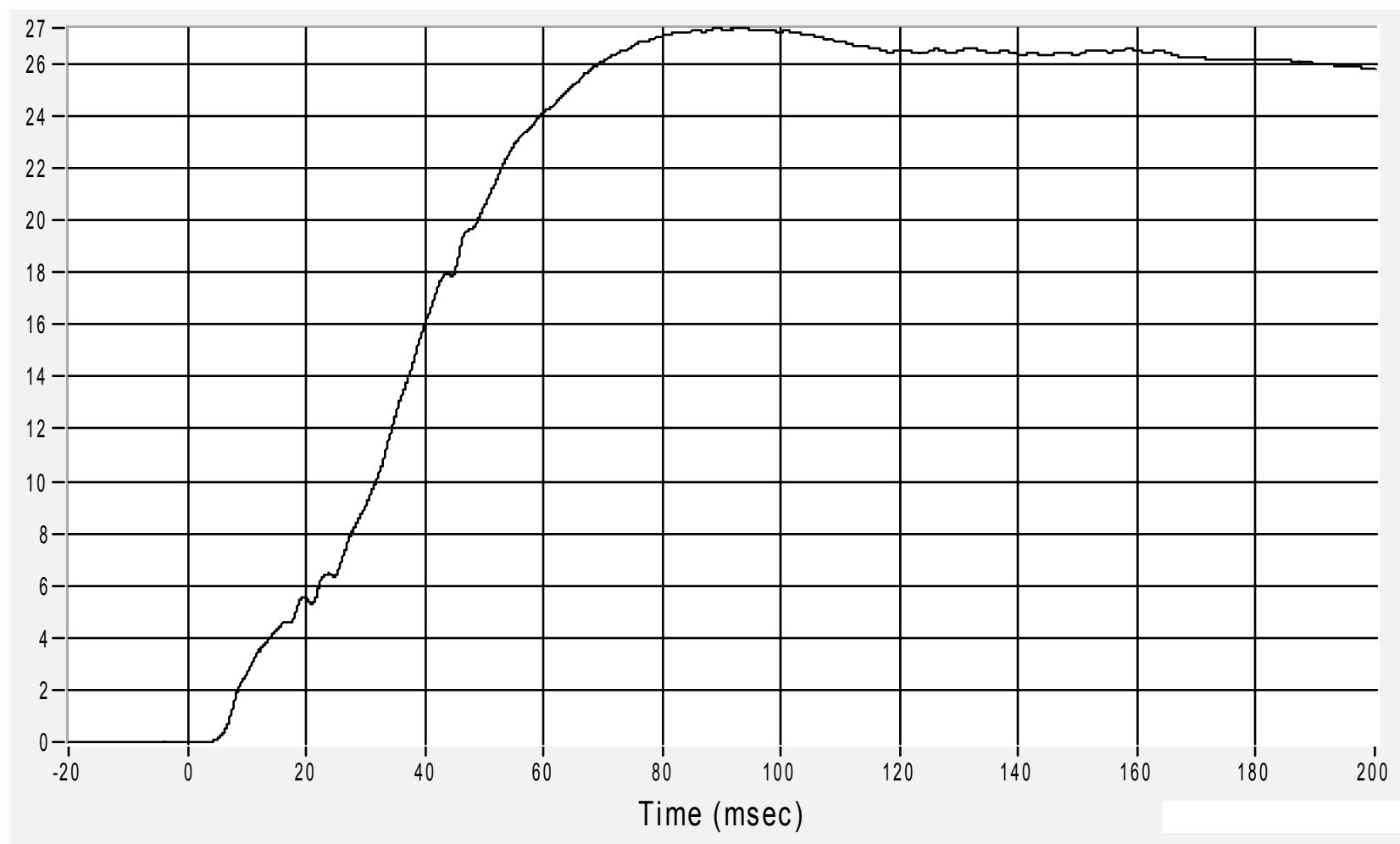
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**Rear Floorpan Above Axle (Y) Velocity**

Velocity (km/h) CFC180

Max 27.4 km/h at 93.1 msec

Min 0.0 km/h at 0.0 msec



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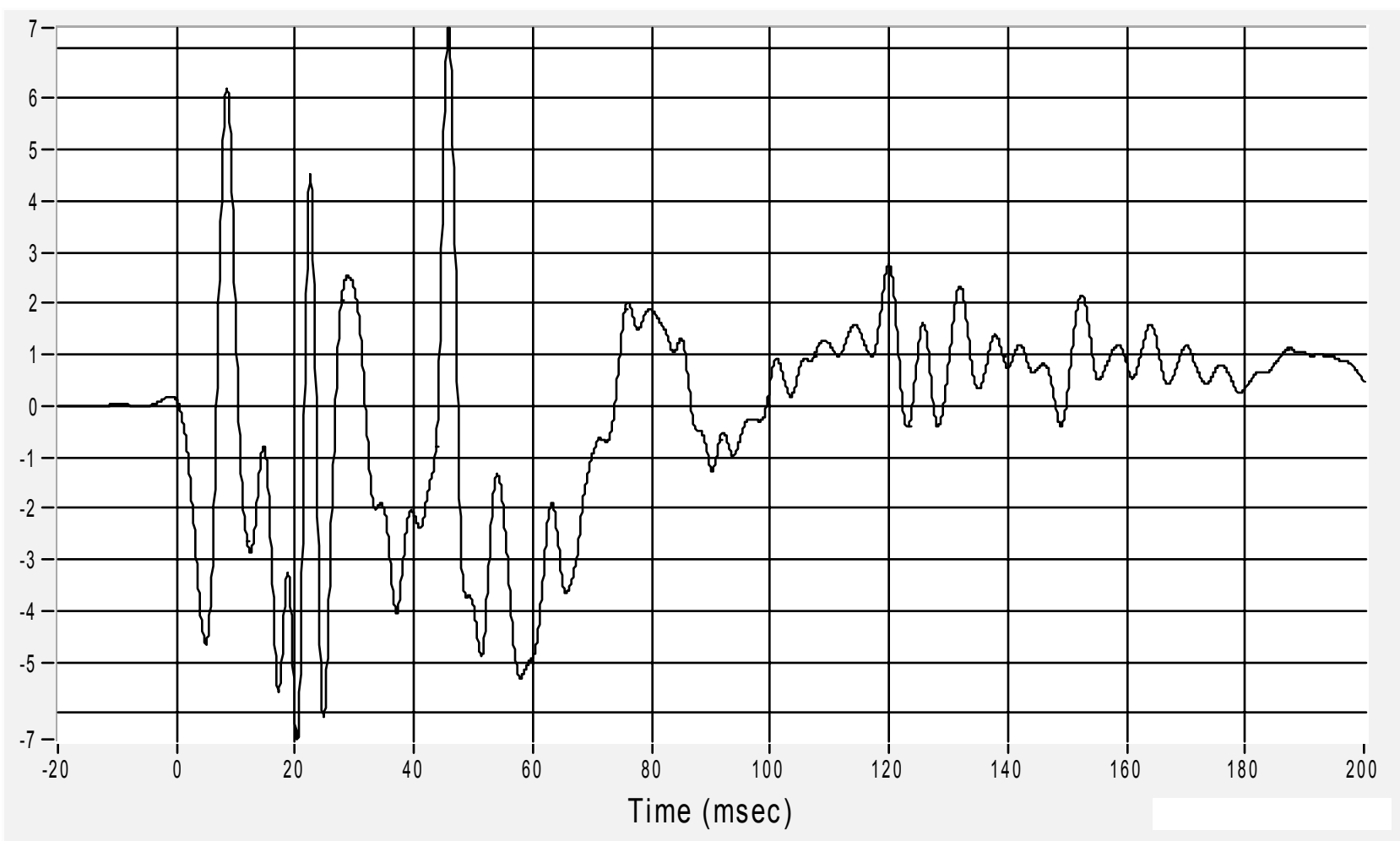


**Rear Floorpan Above Axle (Z) Acceleration**

Acceleration (G's) CFC60

Max 7.4 G at 45.8 msec

Min -6.5 G at 20.3 msec



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21 January 2005

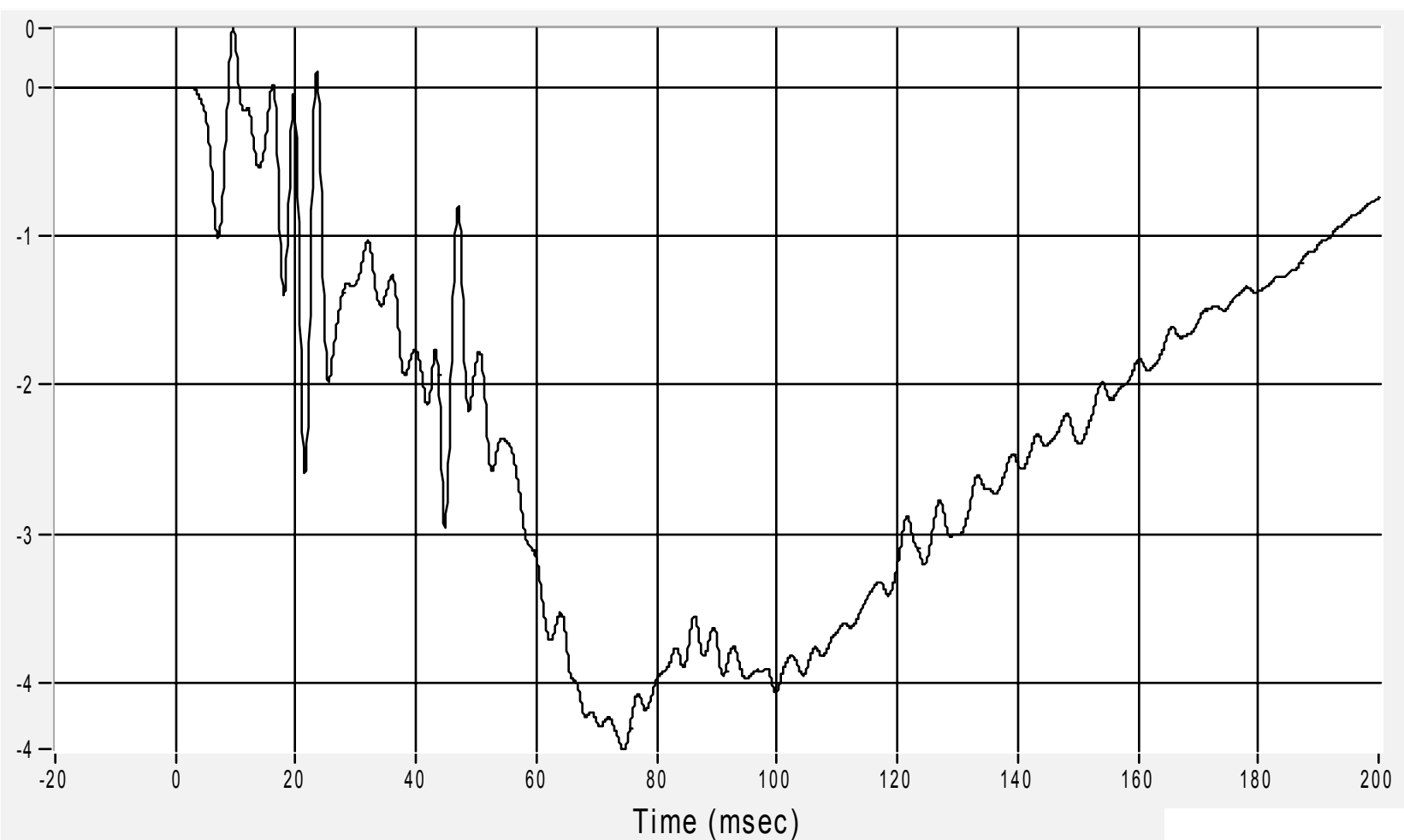
Medical College of Wisconsin  
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**Rear Floorpan Above Axle (Z) Velocity**

Velocity (km/h) CFC180

Max 0.4 km/h at 9.6 msec

Min -4.4 km/h at 74.4 msec



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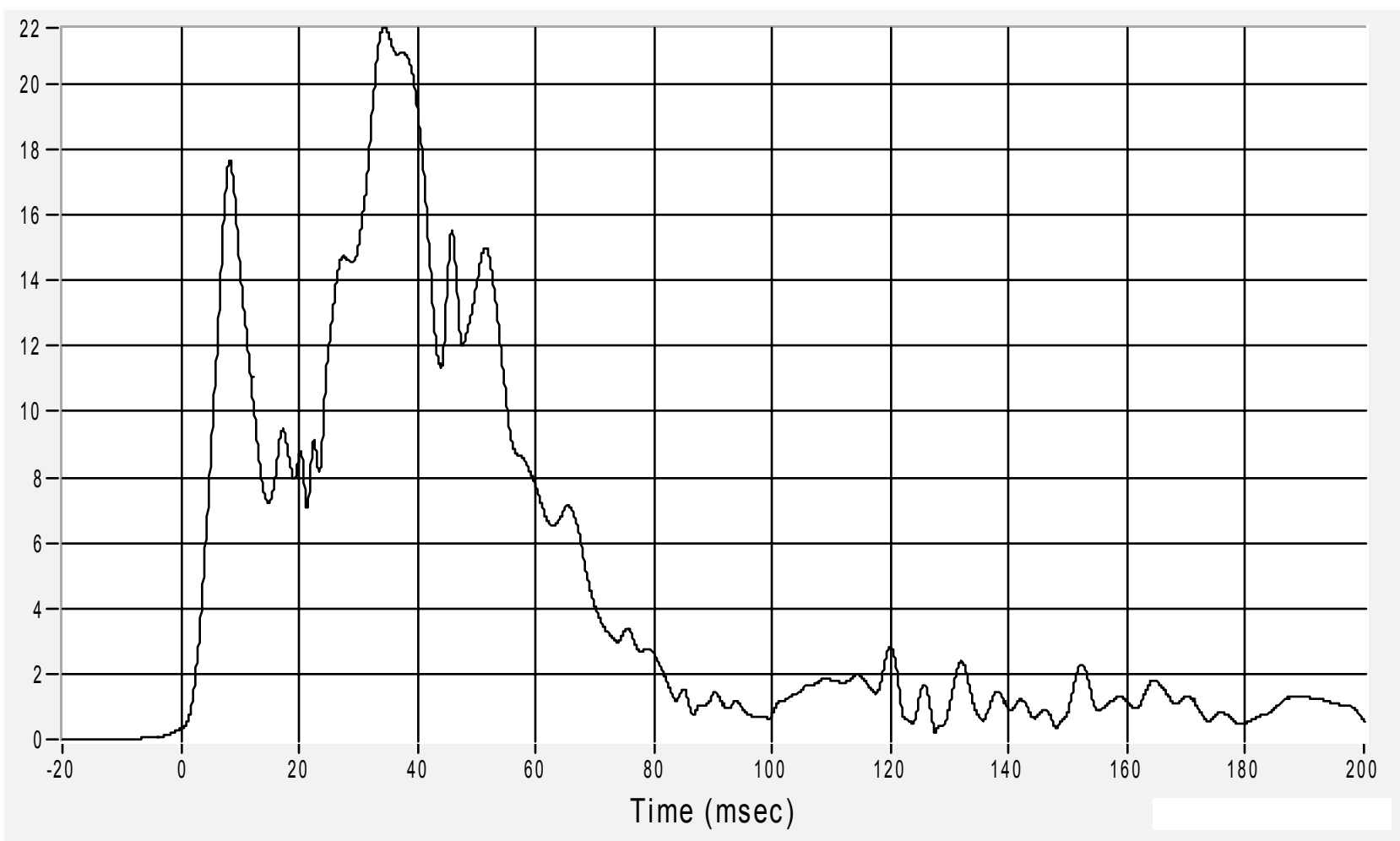
Medical College of Wisconsin  
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**Rear Floorpan Above Axle Resultant Acceleration**

Acceleration (G's) CFC60

Max 21.7 G's at 34.4 msec

Min 0.2 G's at 127.5 msec



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21 January 2005

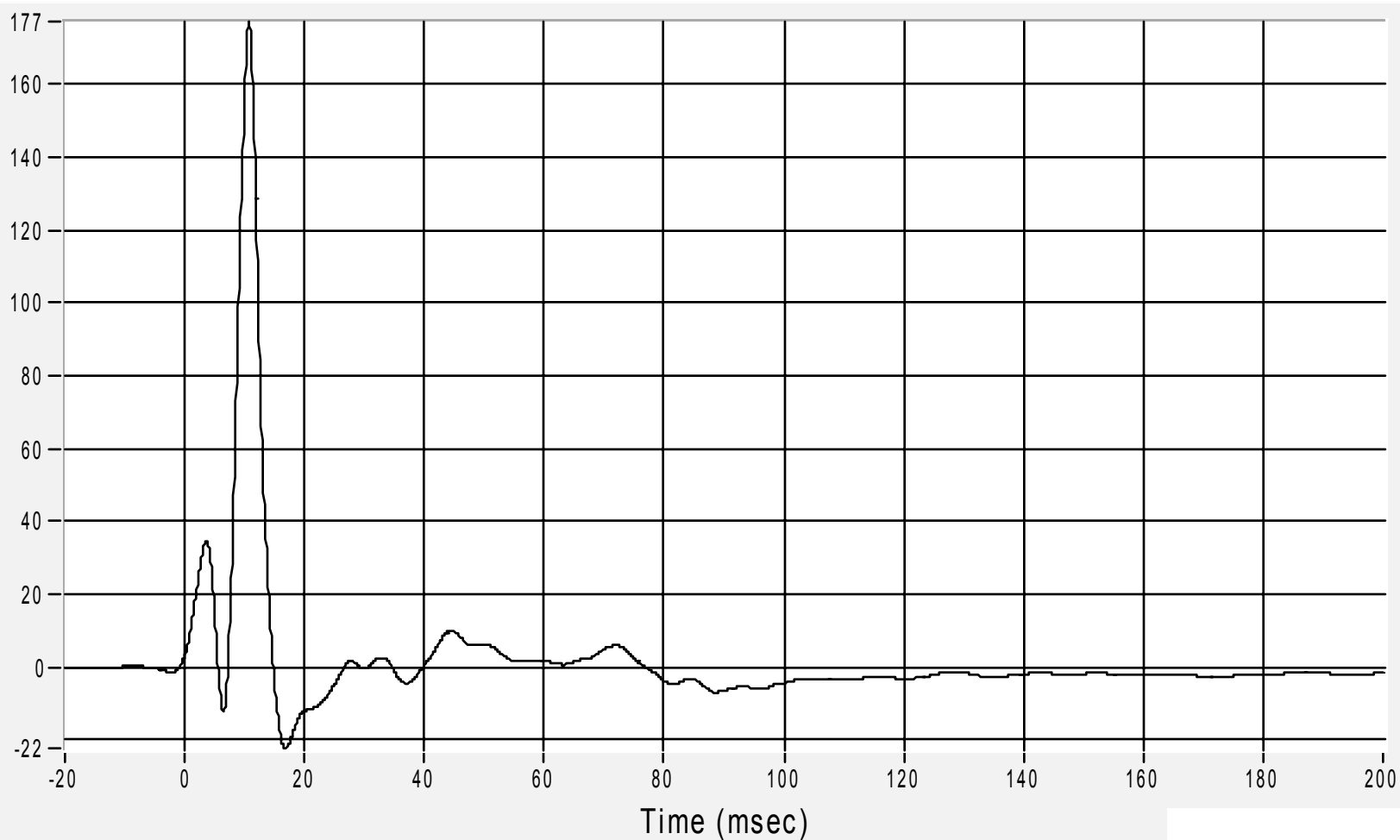
Medical College of Wisconsin  
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**Left Side Sill at Rear Seat (Y) Acceleration**

Acceleration (G's) CFC60

Max 177.3 G at 10.7 msec

Min -22.4 G at 16.8 msec



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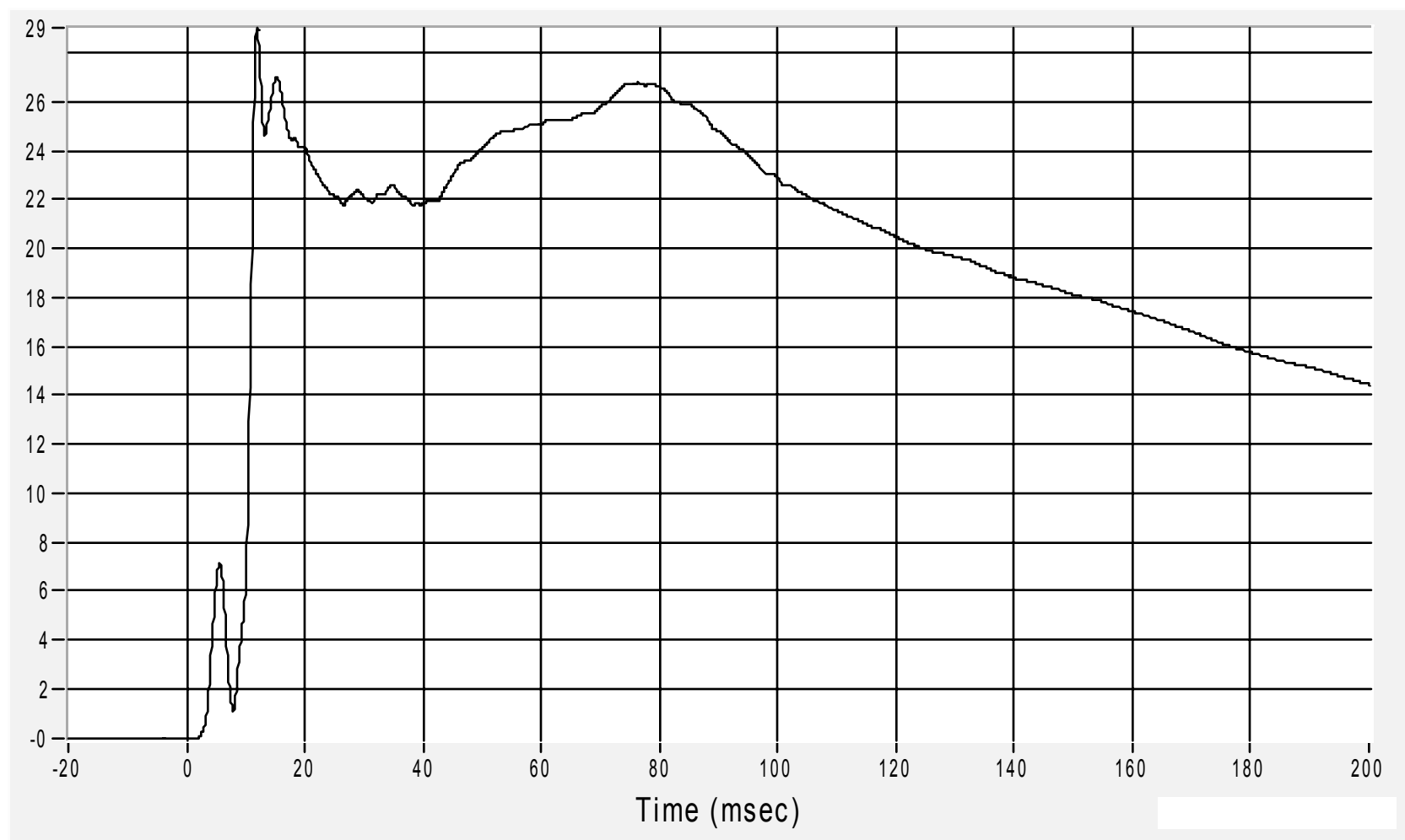
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**Left Side Sill at Rear Seat (Y) Velocity**

Velocity (km/h) CFC180

Max 29.0 km/h at 11.9 msec

Min 0.0 km/h at 1.3 msec



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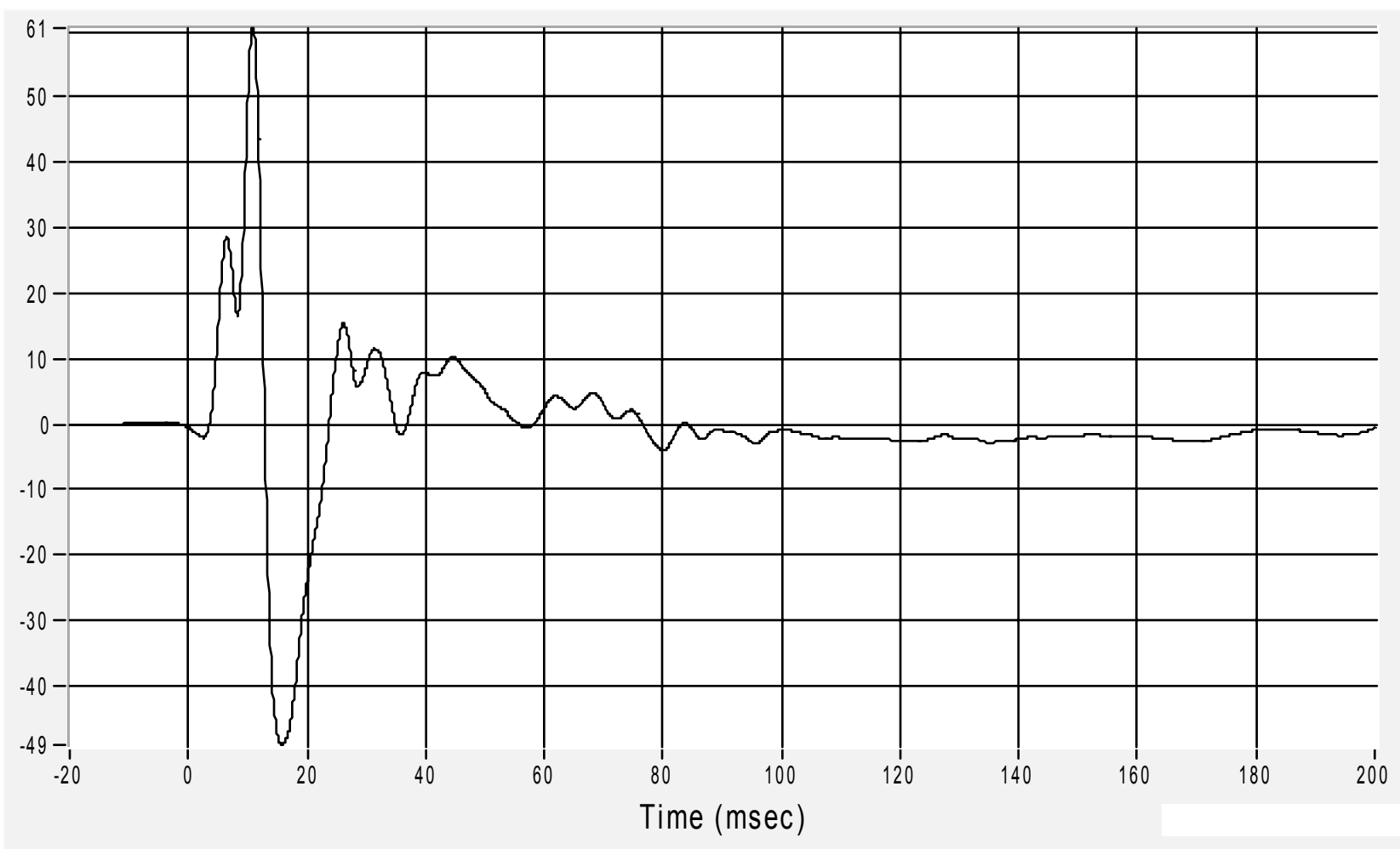


**Left Side Sill at Front Seat (Y) Acceleration**

Acceleration (G's) CFC60

Max 60.5 G at 10.9 msec

Min -49.0 G at 15.7 msec



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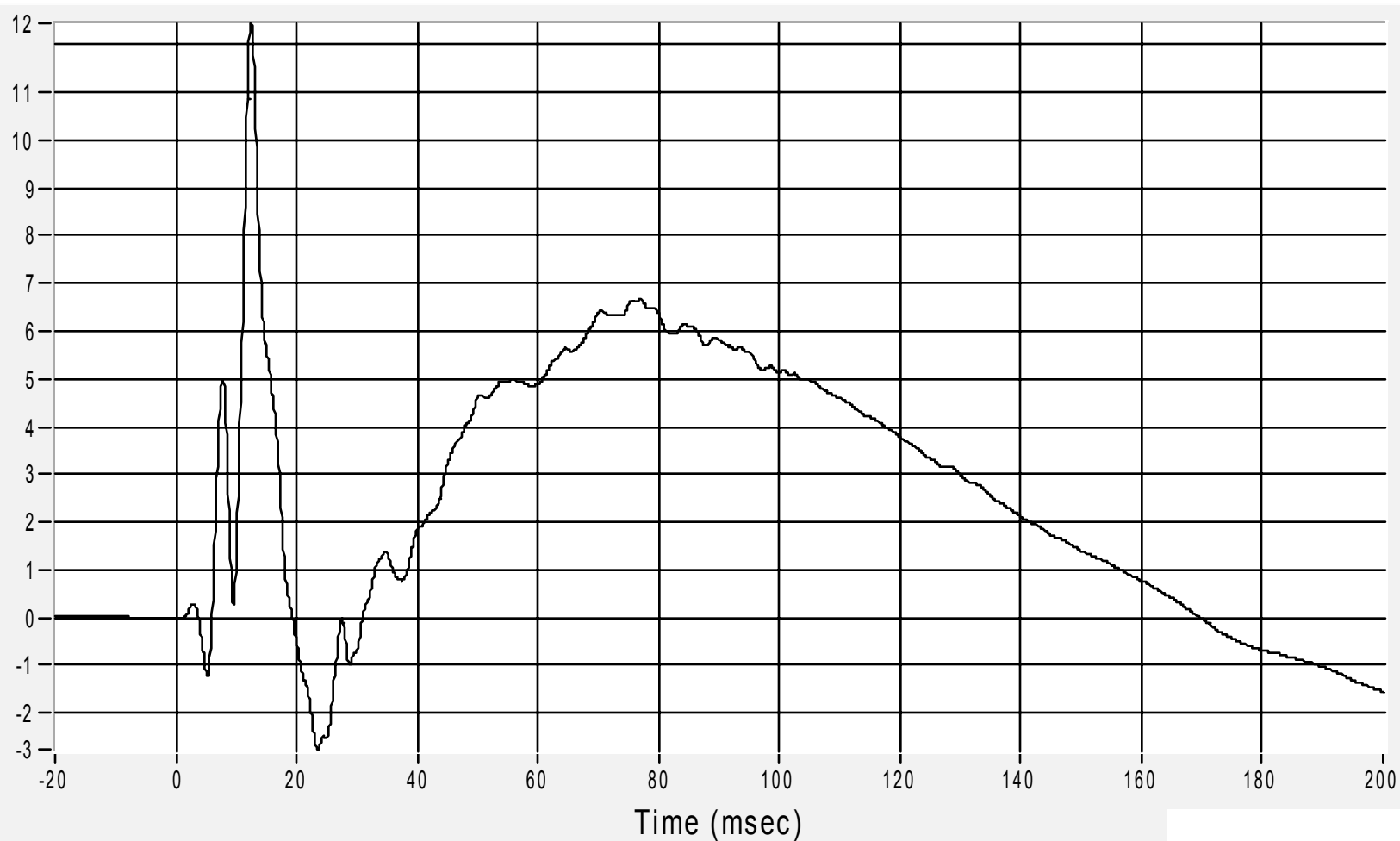
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Left Side Sill at Front Seat (Y) Velocity**

Velocity (km/h) CFC180

Max 12.4 km/h at 12.5 msec

Min -2.8 km/h at 23.5 msec



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21 January 2005

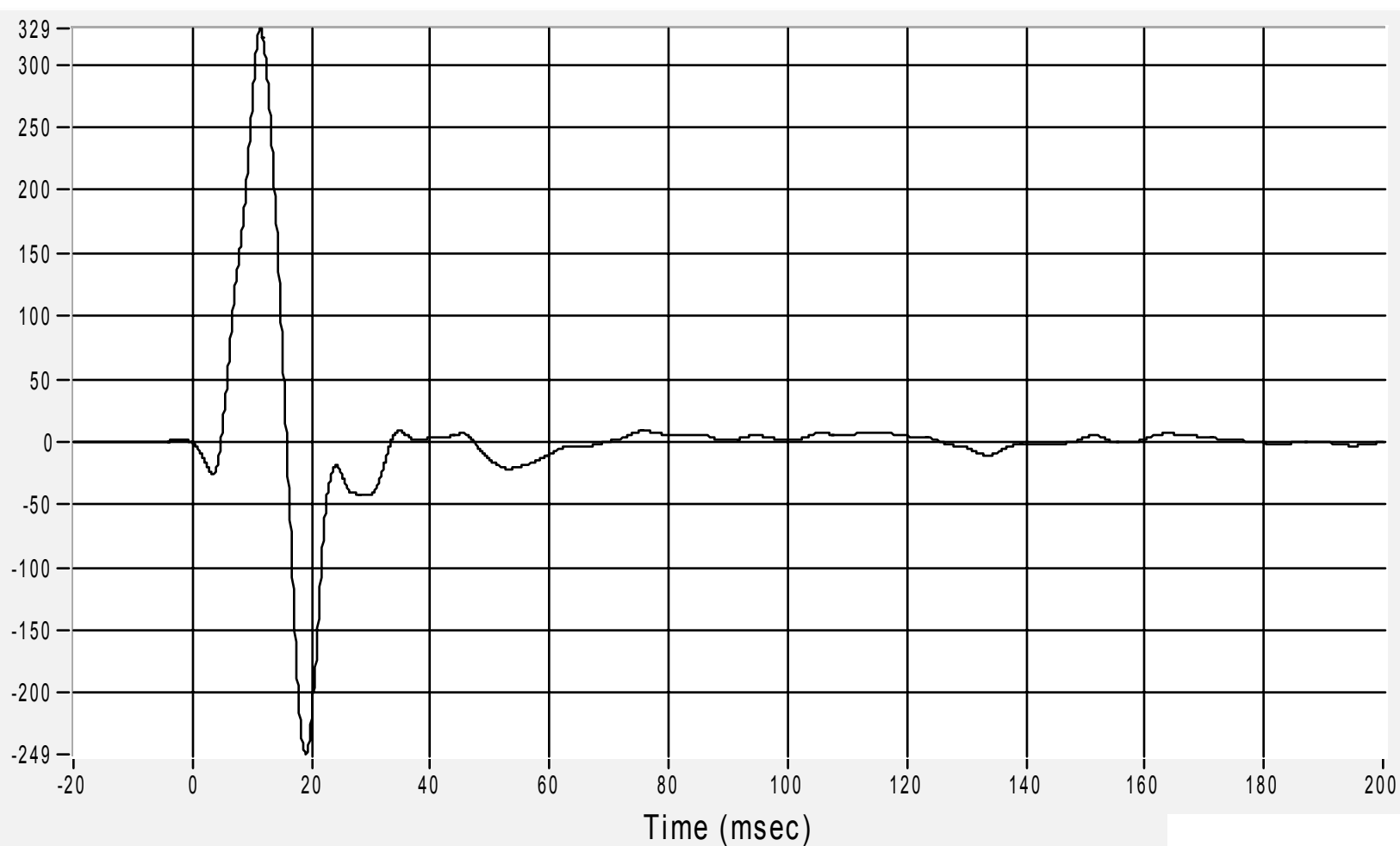
Medical College of Wisconsin  
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**Left Front Door on Centerline (Y) Acceleration**

Acceleration (G's) CFC60

Max 328.8 G at 11.4 msec

Min -248.6 G at 19.0 msec



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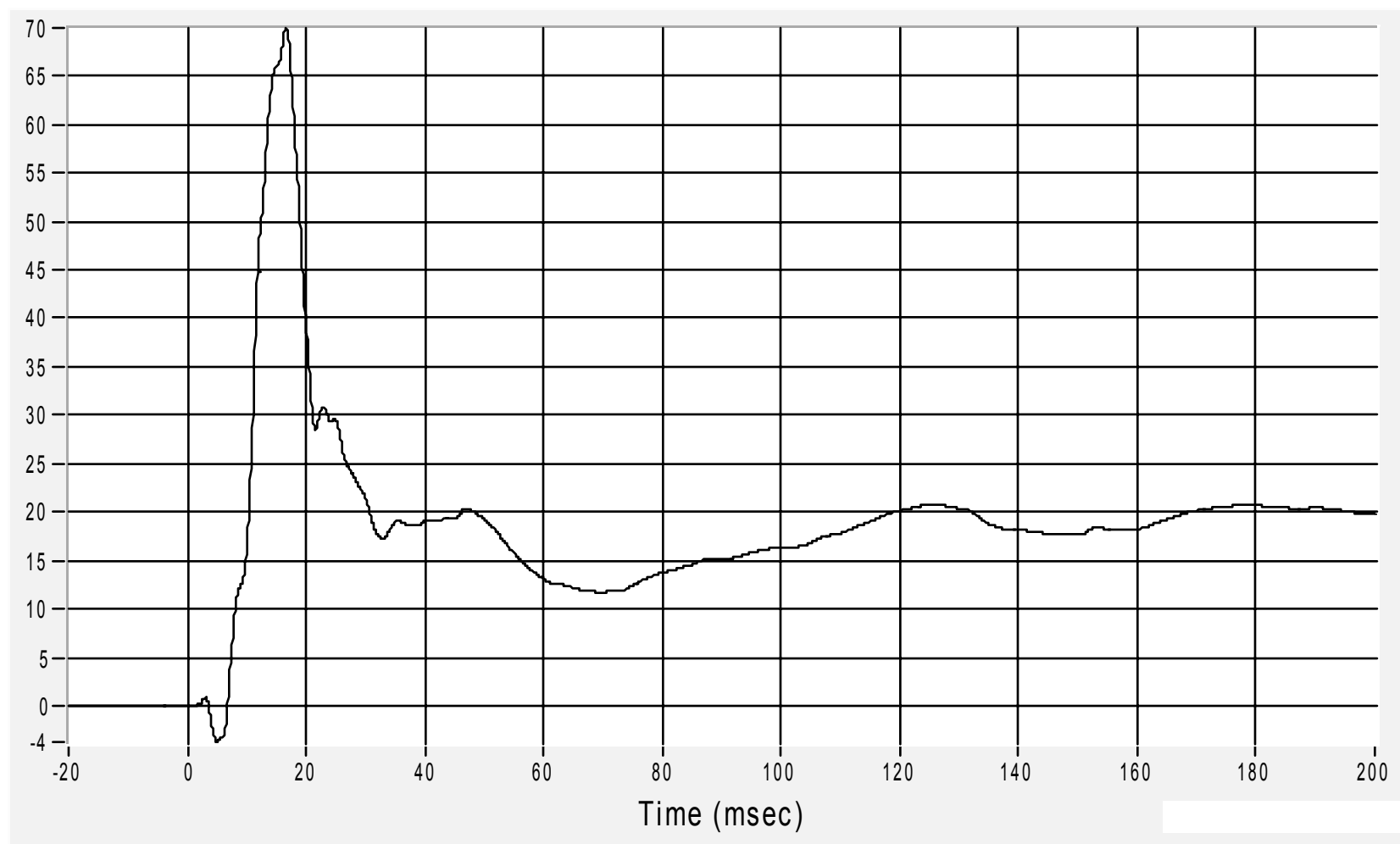
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Vehicle Crashworthiness Lab

**Left Front Door on Centerline (Y) Velocity**

Velocity (km/h) CFC180

Max 70.0 km/h at 16.6 msec

Min -3.7 km/h at 5.0 msec



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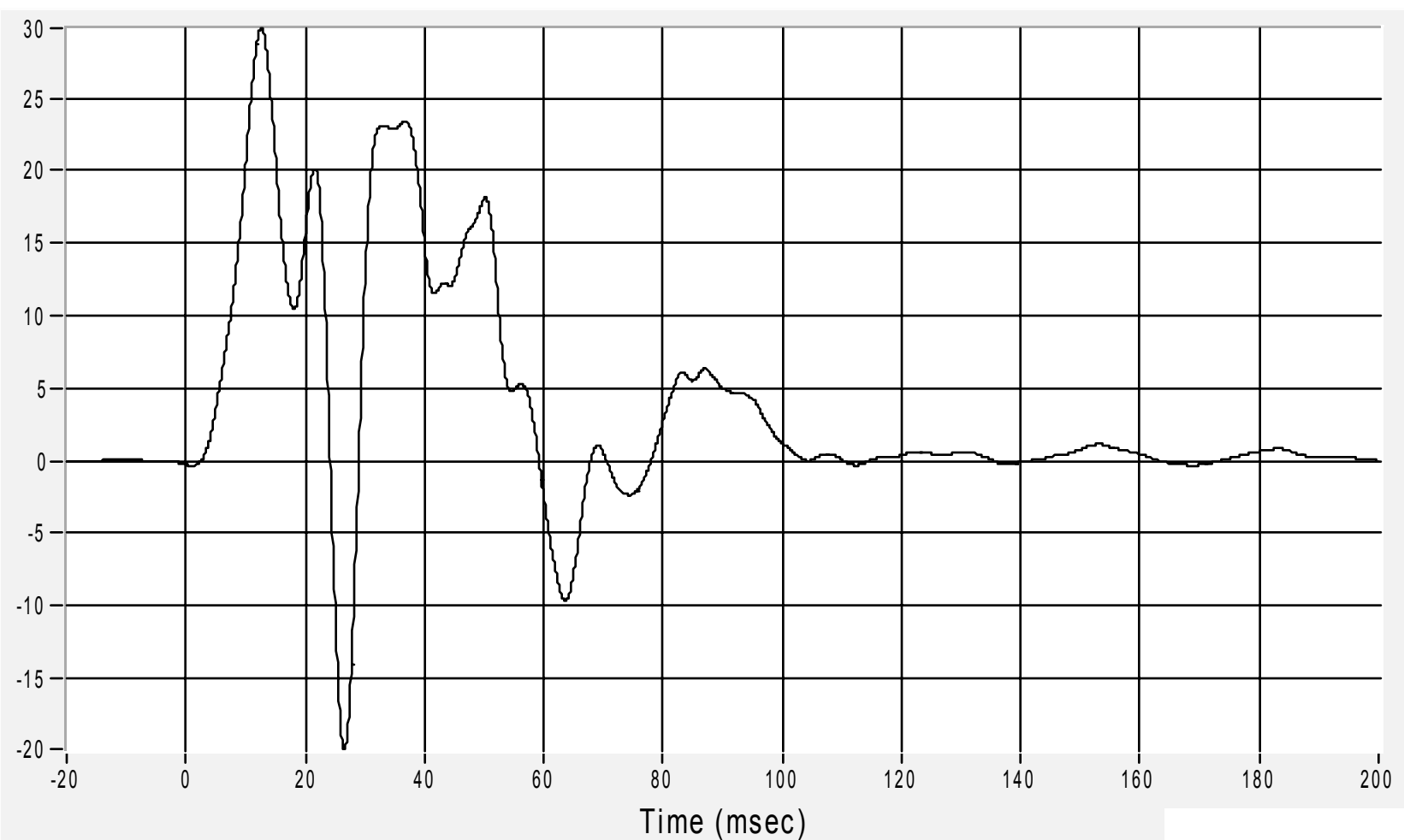
Medical College of Wisconsin  
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**Right Rear Occupant Compartment (Y) Acceleration**

Acceleration (G's) CFC60

Max 29.8 G at 12.6 msec

Min -19.9 G at 26.6 msec



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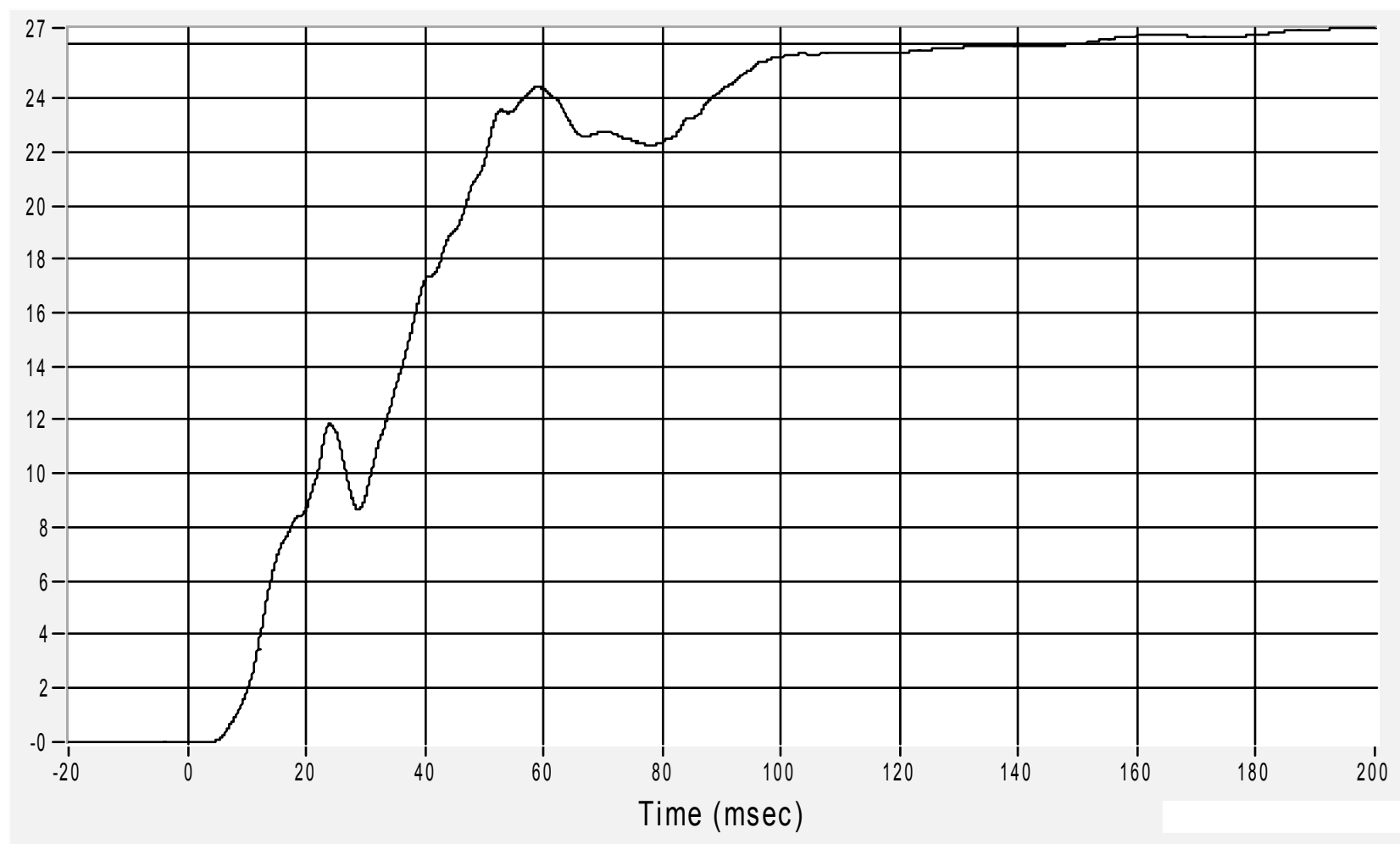


**Right Rear Occupant Compartment (Y) Velocity**

Velocity (km/h) CFC180

Max 26.6 km/h at 199.2 msec

Min 0.0 km/h at 3.6 msec



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21 January 2005

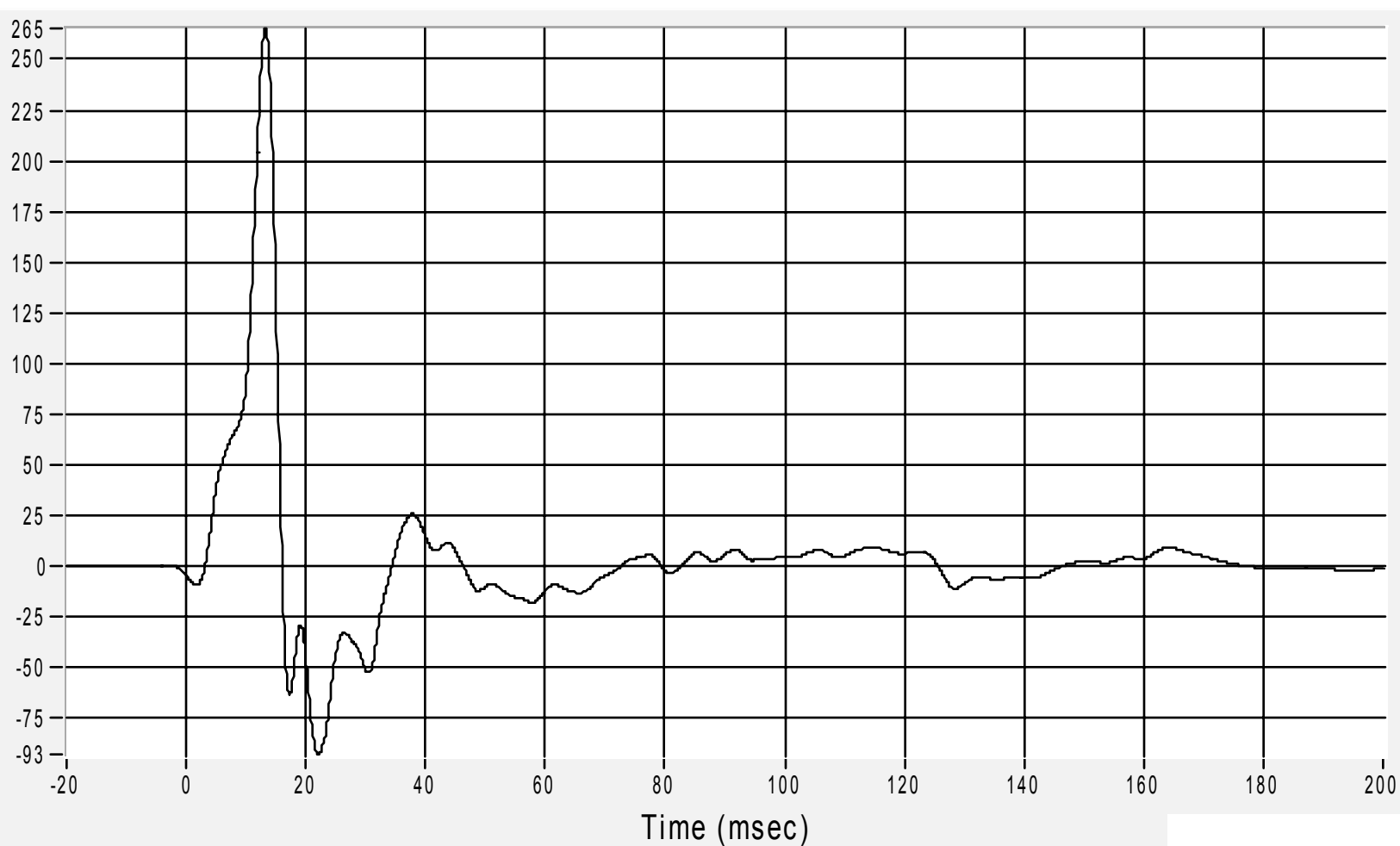
Medical College of Wisconsin  
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**Mid-Rear of Left Front Door (Y) Acceleration**

Acceleration (G's) CFC60

Max 265.3 G at 13.2 msec

Min -92.7 G at 22.0 msec



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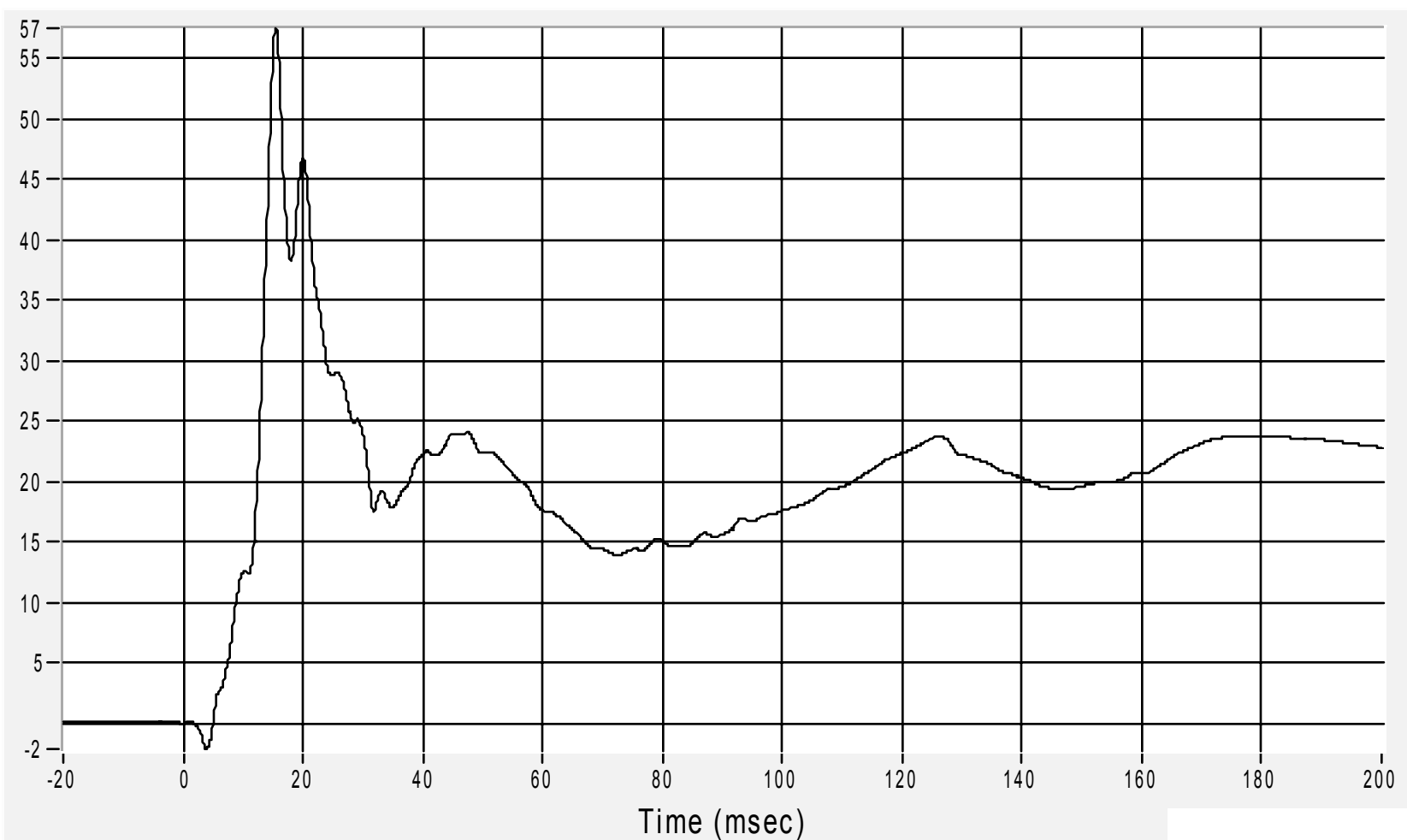
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**Mid-Rear of Left Front Door (Y) Velocity**

Velocity (km/h) CFC180

Max 57.5 km/h at 15.4 msec

Min -2.1 km/h at 3.9 msec



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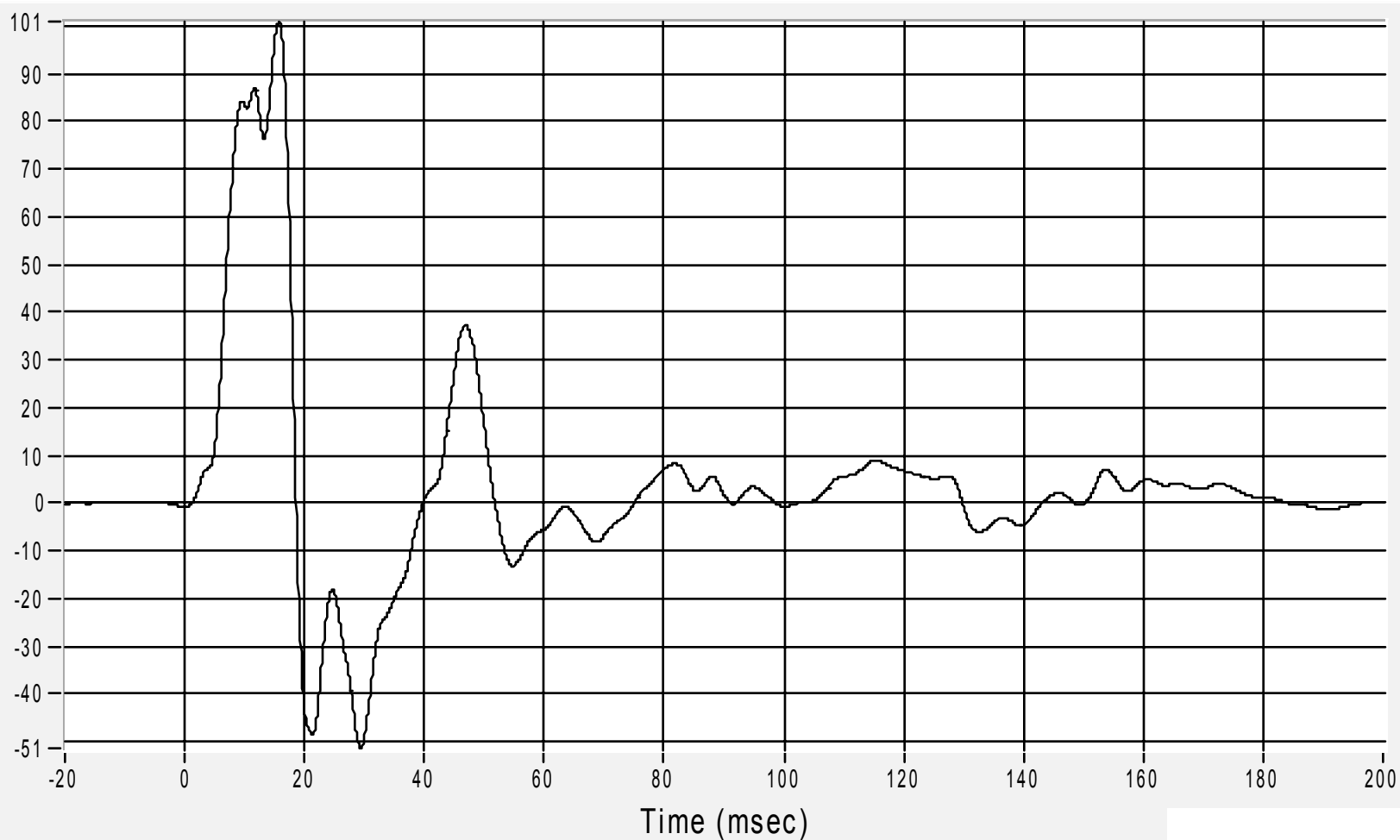
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**Left Front Door Upper Centerline (Y) Acceleration**

Acceleration (G's) CFC60

Max 100.8 G at 15.7 msec

Min -51.3 G at 29.4 msec



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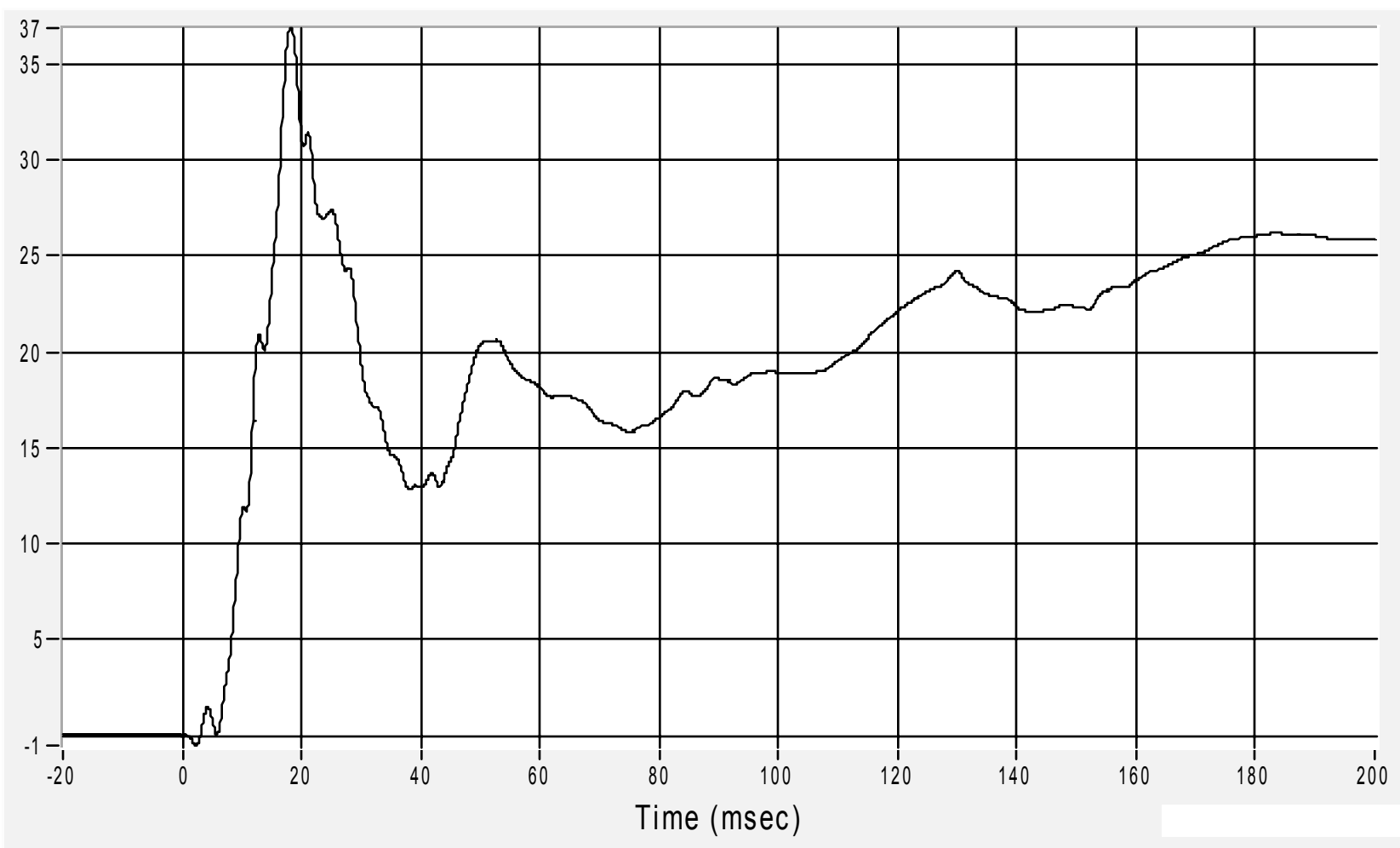
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**Left Front Door Upper Centerline (Y) Velocity**

Velocity (km/h) CFC180

Max 36.9 km/h at 18.2 msec

Min -0.5 km/h at 2.3 msec



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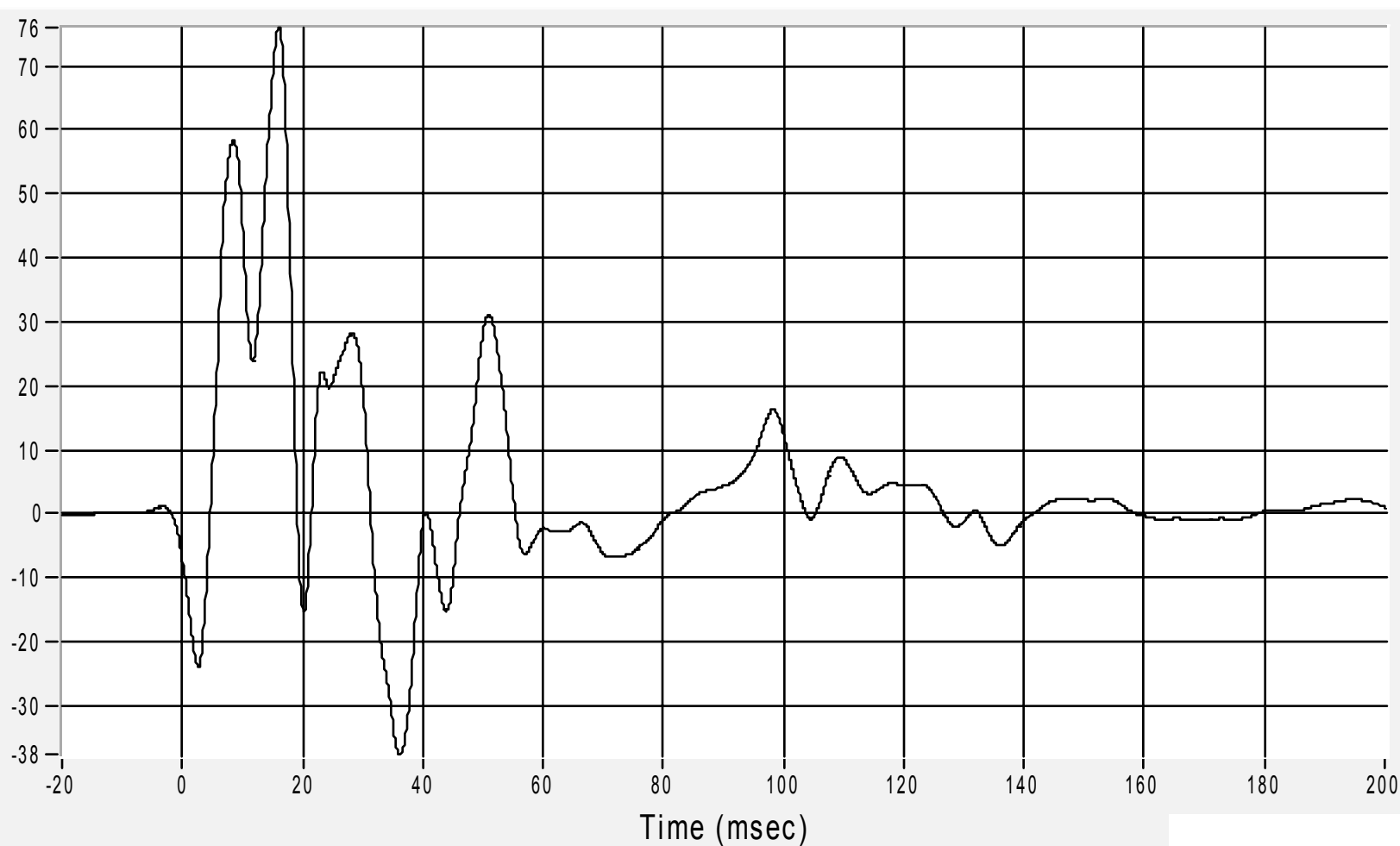


**Mid-Rear of Left Rear Door (Y) Acceleration**

Acceleration (G's) CFC60

Max 76.0 G at 16.1 msec

Min -37.6 G at 36.2 msec



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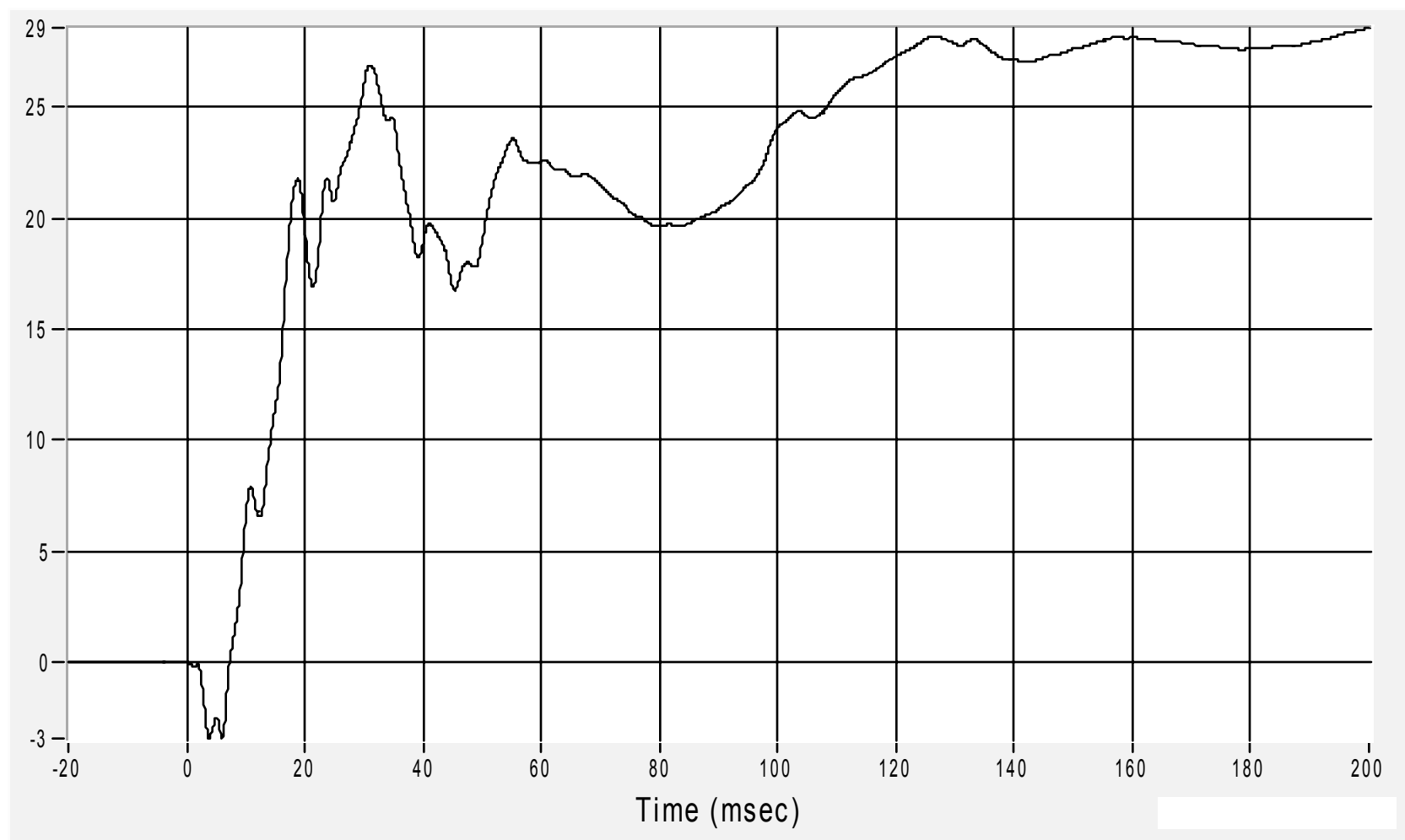
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**Mid-Rear of Left Rear Door (Y) Velocity**

Velocity (km/h) CFC180

Max 28.5 km/h at 199.9 msec

Min -3.4 km/h at 3.8 msec



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21 January 2005

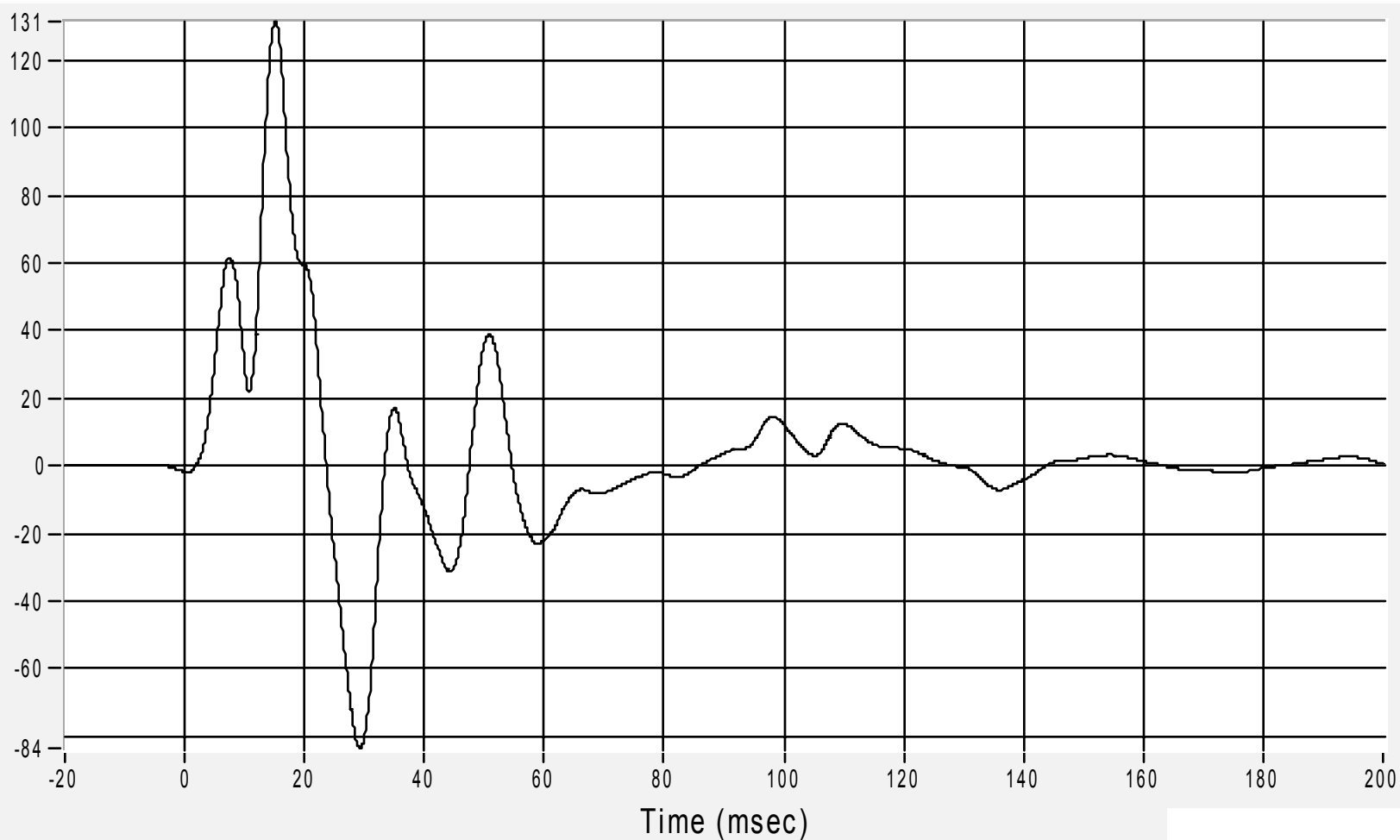
Medical College of Wisconsin  
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**Left Rear Door Upper Centerline (Y) Acceleration**

Acceleration (G's) CFC60

Max 131.5 G at 15.1 msec

Min -83.6 G at 29.3 msec



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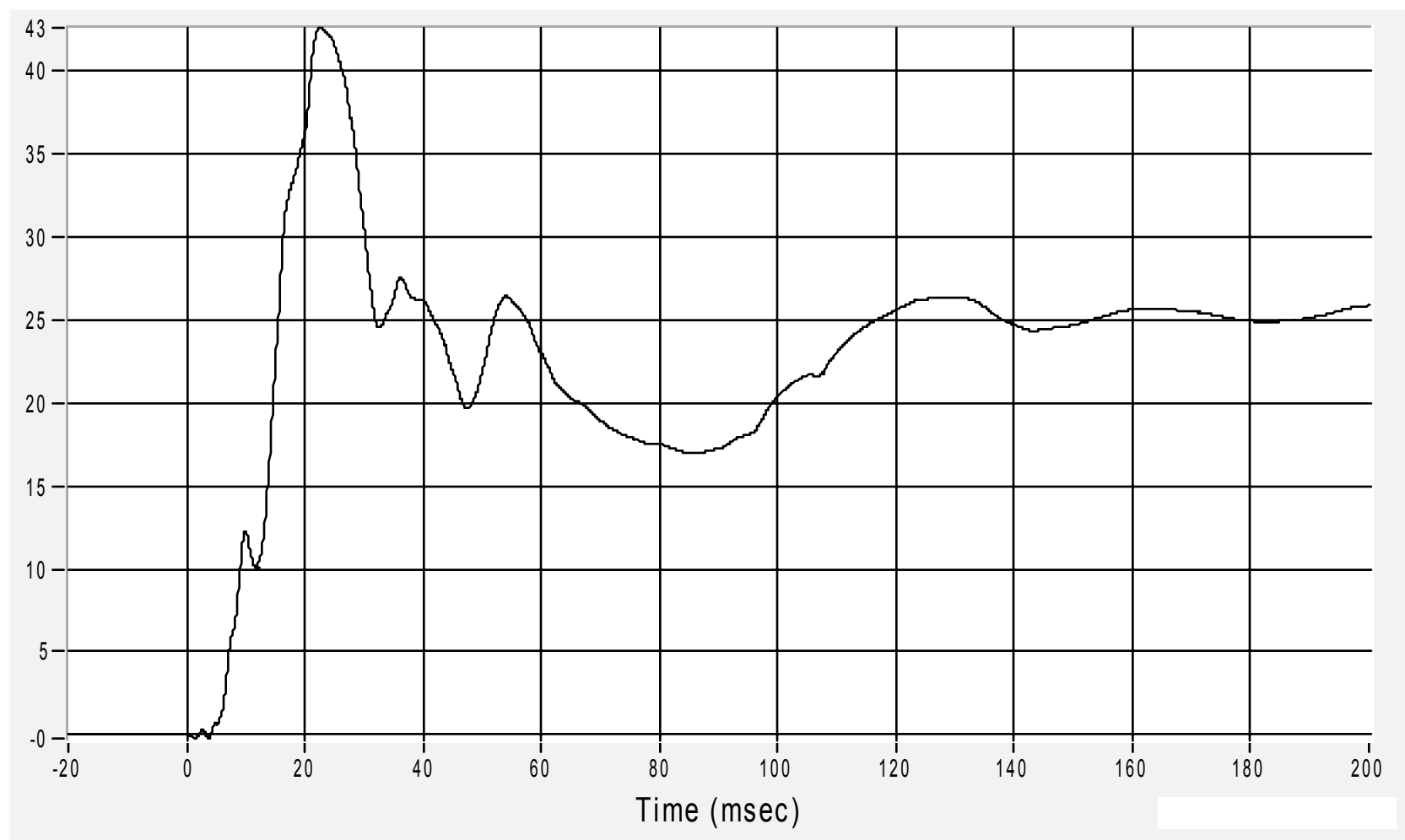
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**Left Rear Door Upper Centerline (Y) Velocity**

Velocity (km/h) CFC180

Max 42.6 km/h at 22.6 msec

Min -0.2 km/h at 3.8 msec



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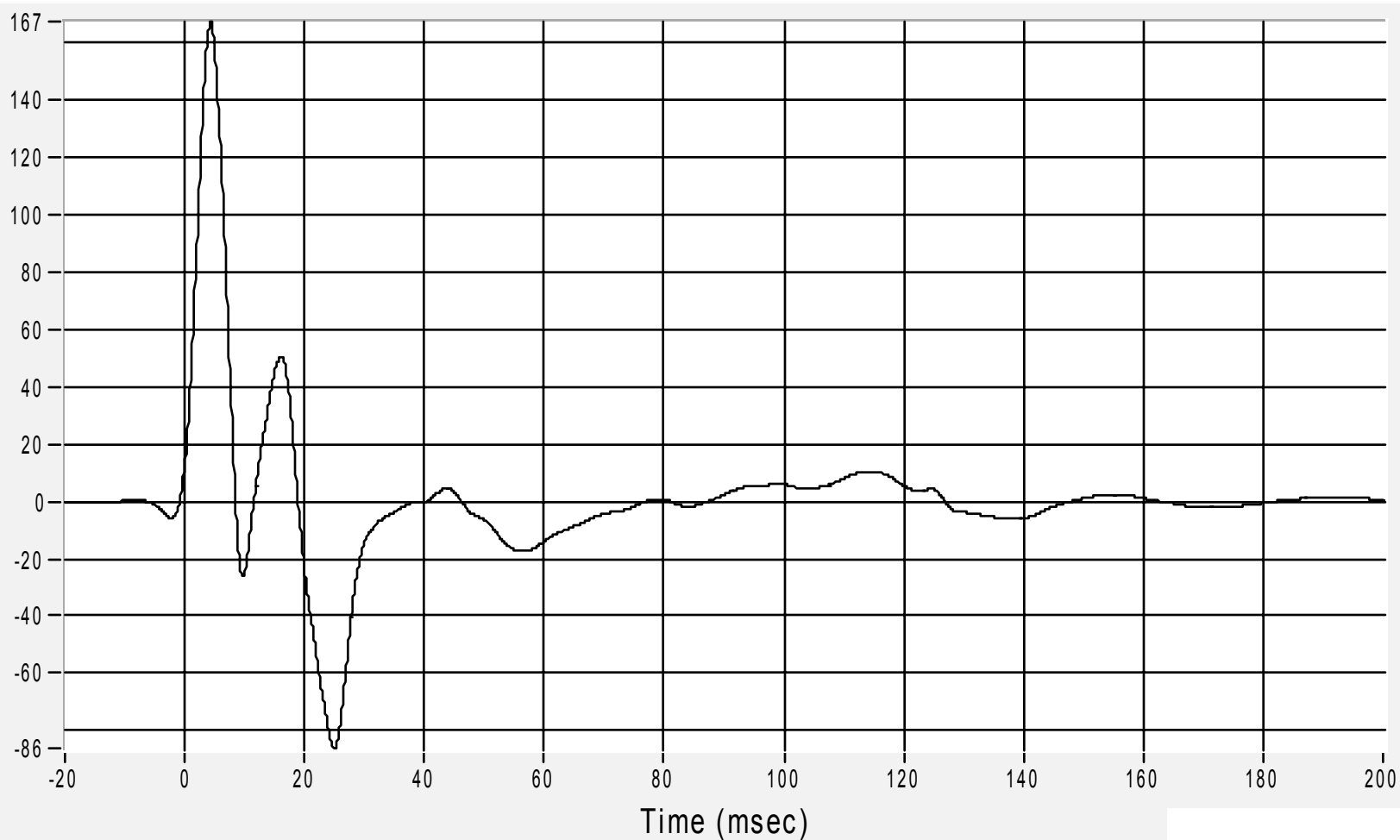
Medical College of Wisconsin  
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**Left Lower B-Pillar (Y) Acceleration**

Acceleration (G's) CFC60

Max 167.1 G at 4.3 msec

Min -86.1 G at 25.0 msec



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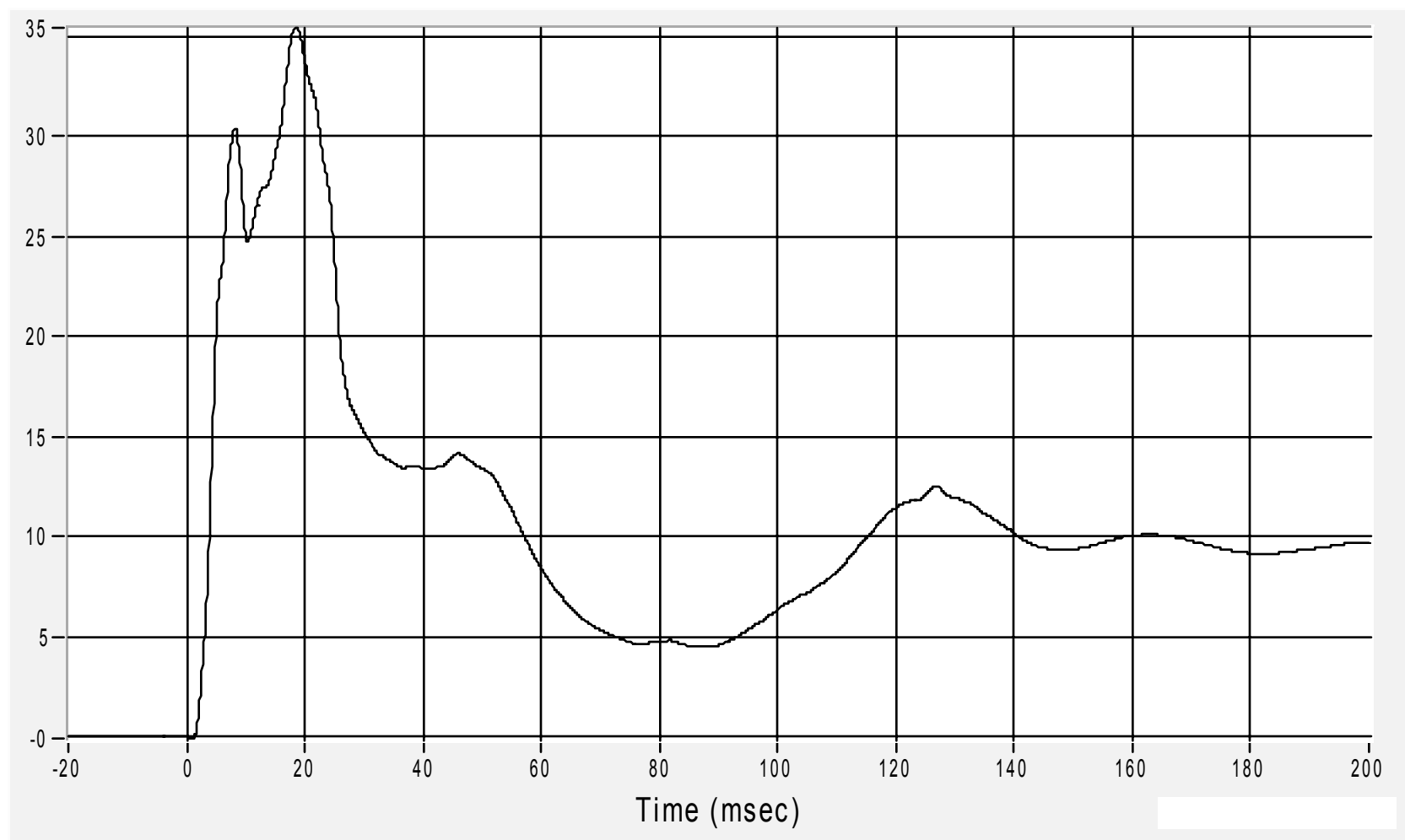
21 January 2005

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**Left Lower B-Pillar (Y) Velocity**

Velocity (km/h) CFC180

**Max 35.4 km/h at 18.6 msec****Min 0.0 km/h at 0.9 msec**

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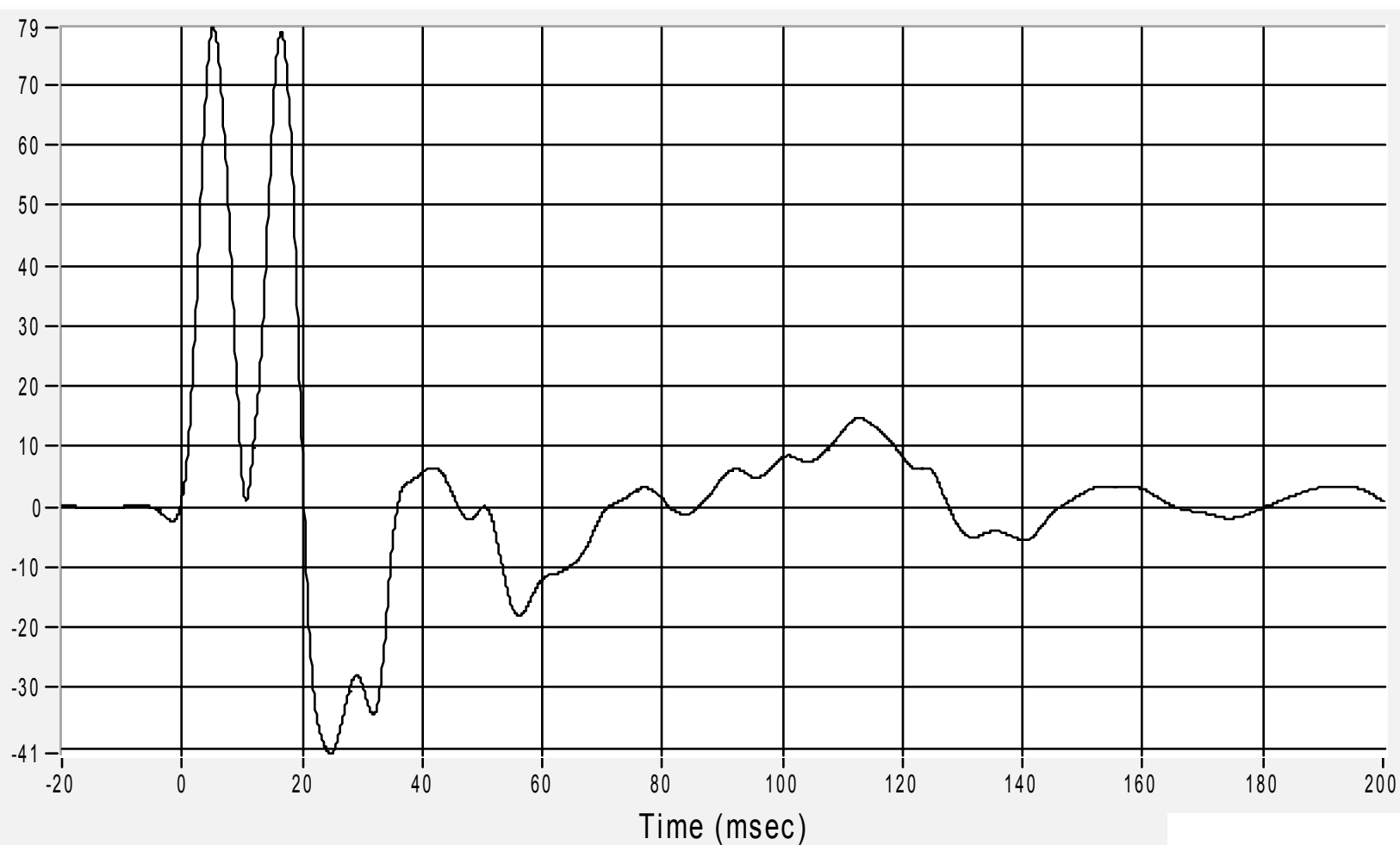
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**Left Middle B-Pillar (Y) Acceleration**

Acceleration (G's) CFC60

Max 79.4 G at 5.2 msec

Min -40.9 G at 24.7 msec



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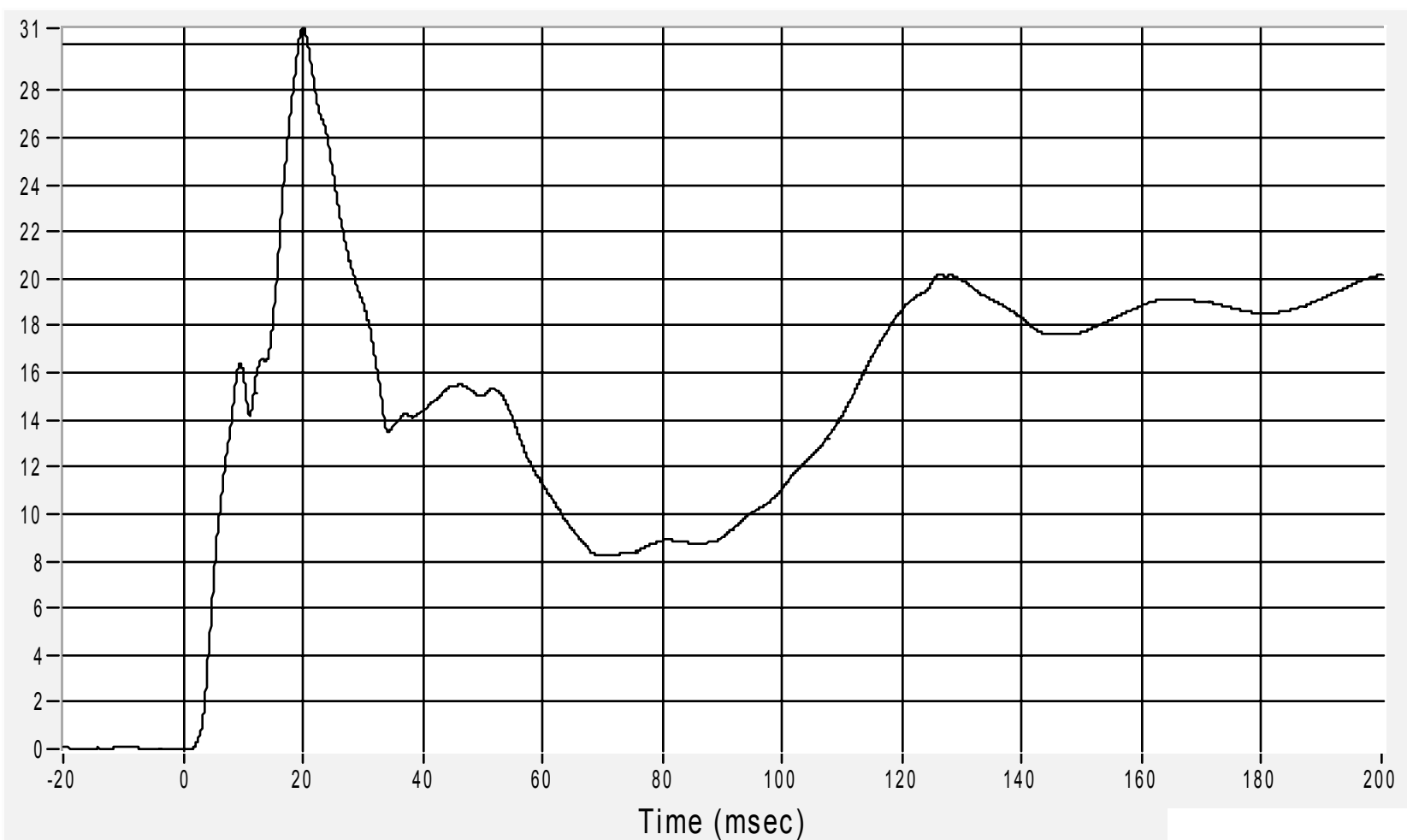
B-95

**Left Middle B-Pillar (Y) Velocity**

Velocity (km/h) CFC180

Max 30.7 km/h at 20.0 msec

Min 0.0 km/h at 0.0 msec



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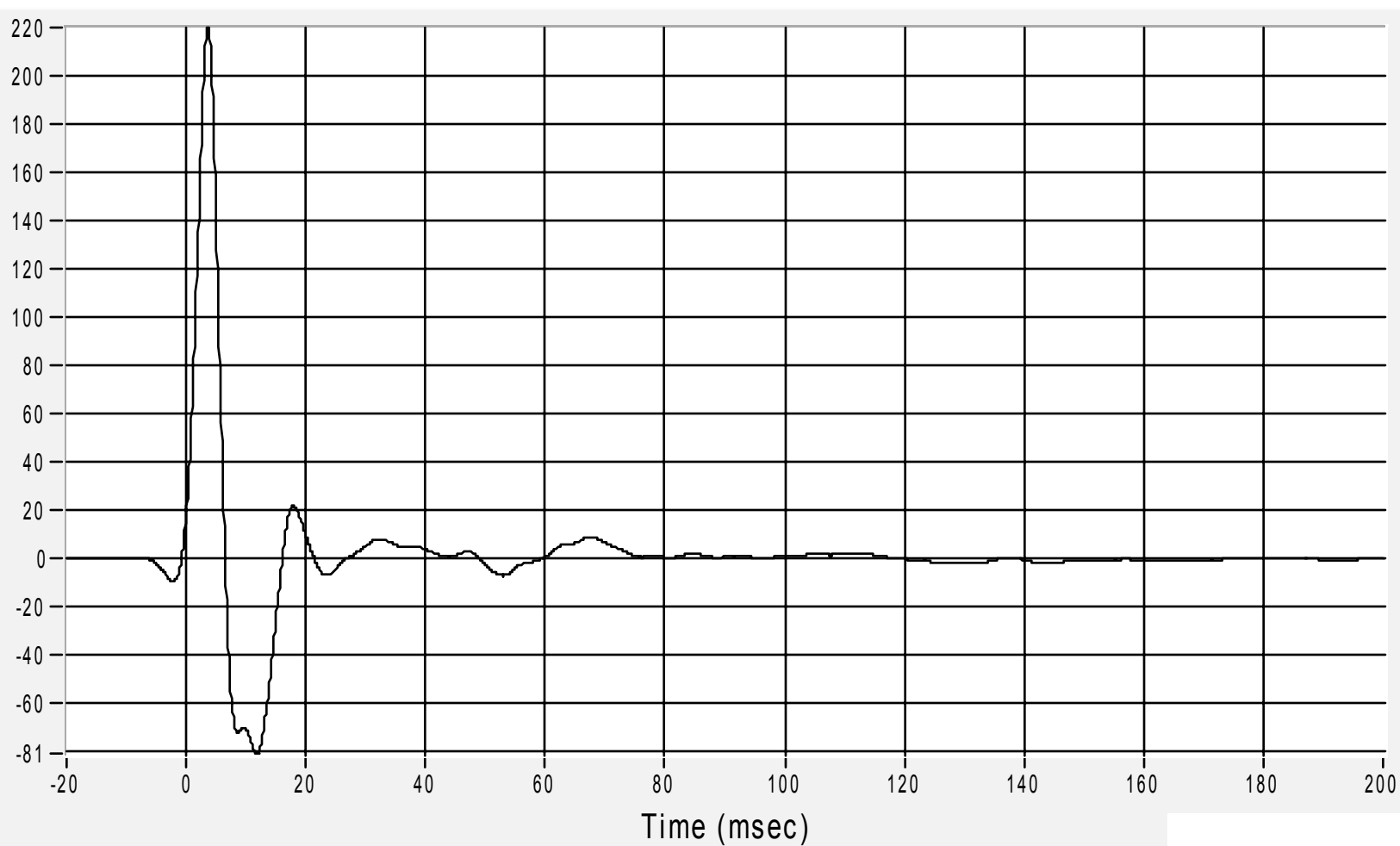
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**Left Lower A-Pillar (Y) Acceleration**

Acceleration (G's) CFC60

Max 220.1 G at 3.6 msec

Min -80.7 G at 11.8 msec



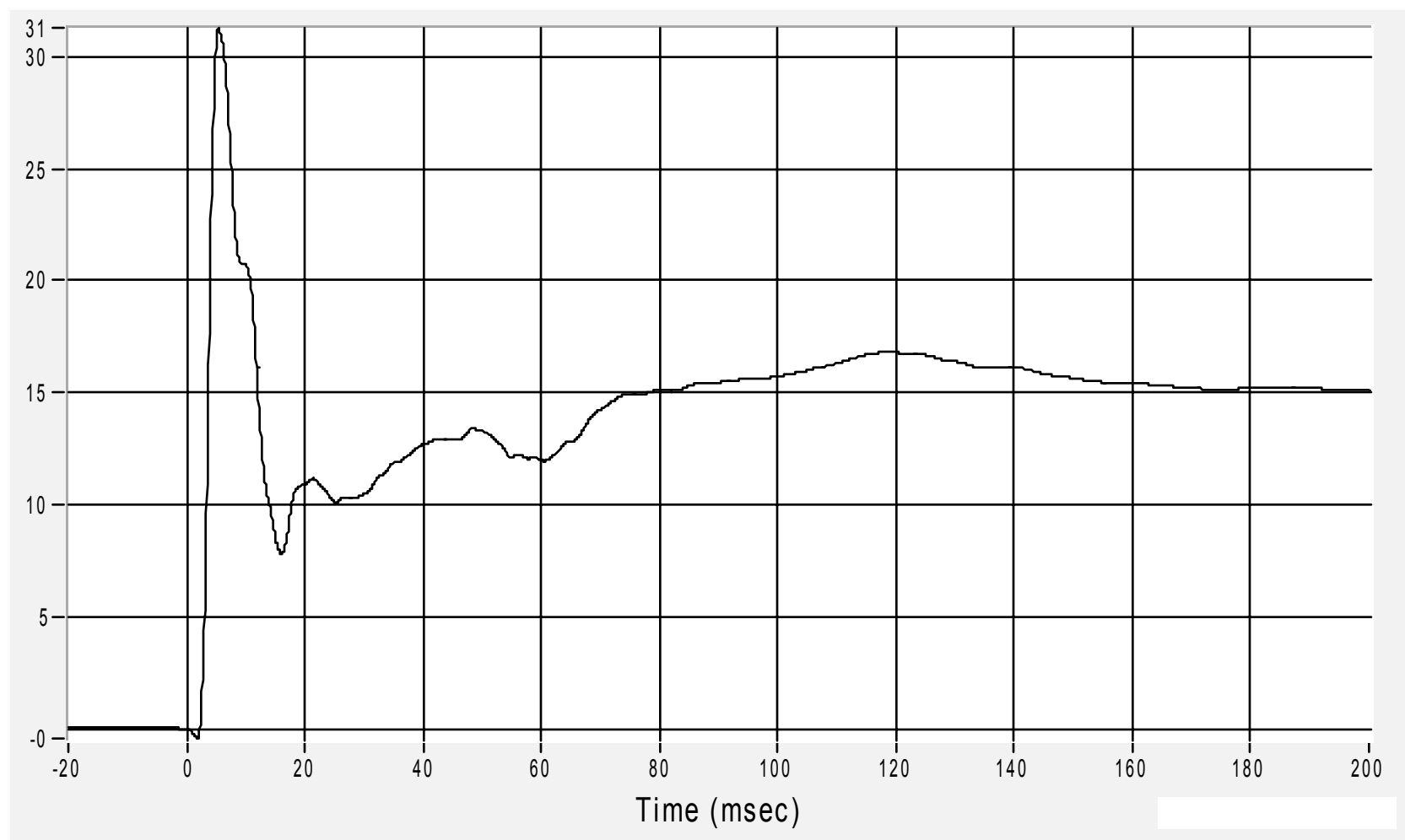
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**Left Lower A-Pillar (Y) Velocity**

Velocity (km/h) CFC180

**Max 31.3 km/h at 5.4 msec****Min -0.4 km/h at 1.8 msec**

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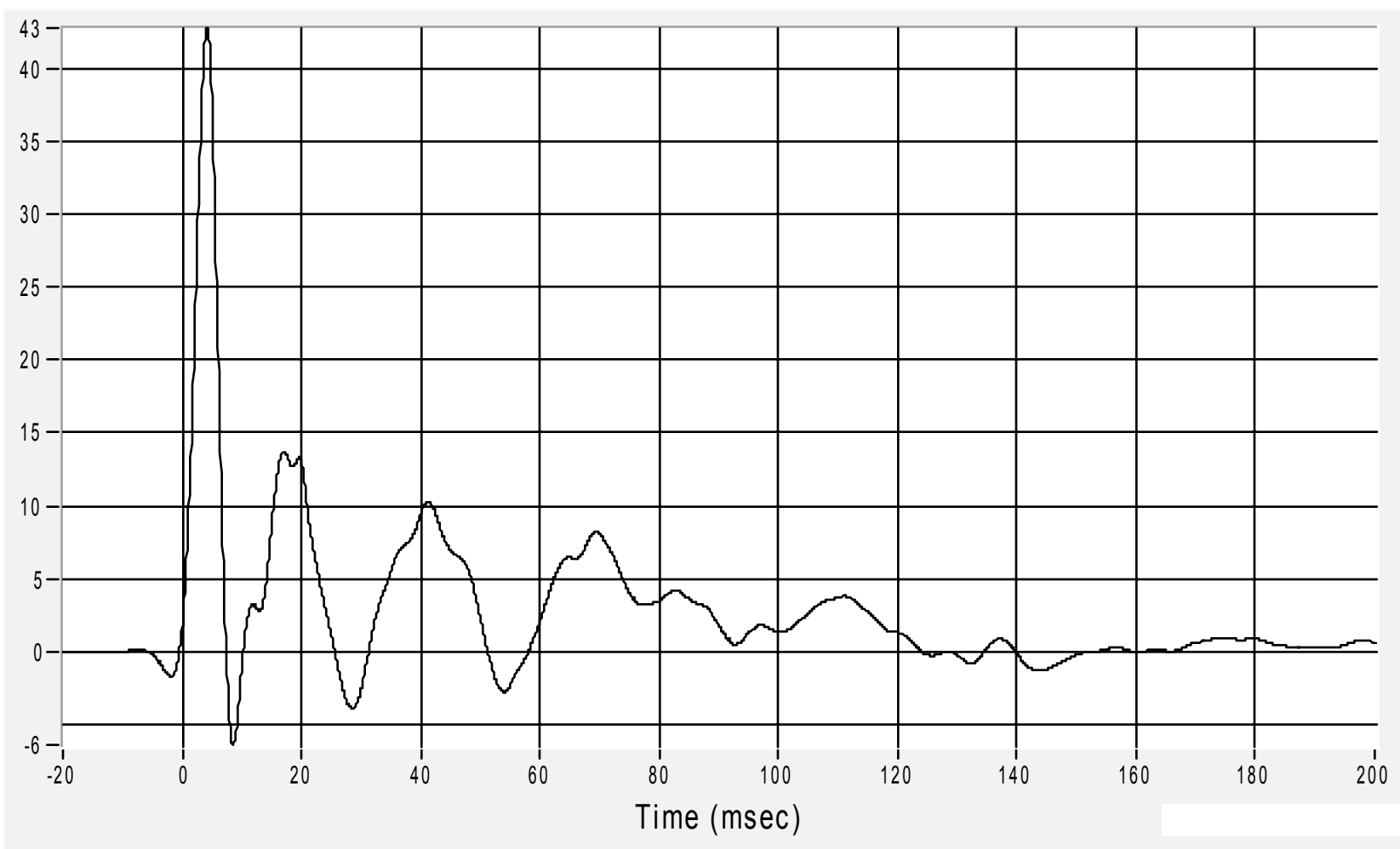


**Left Middle A-Pillar (Y) Acceleration**

Acceleration (G's) CFC60

Max 42.7 G at 4.2 msec

Min -6.4 G at 8.6 msec



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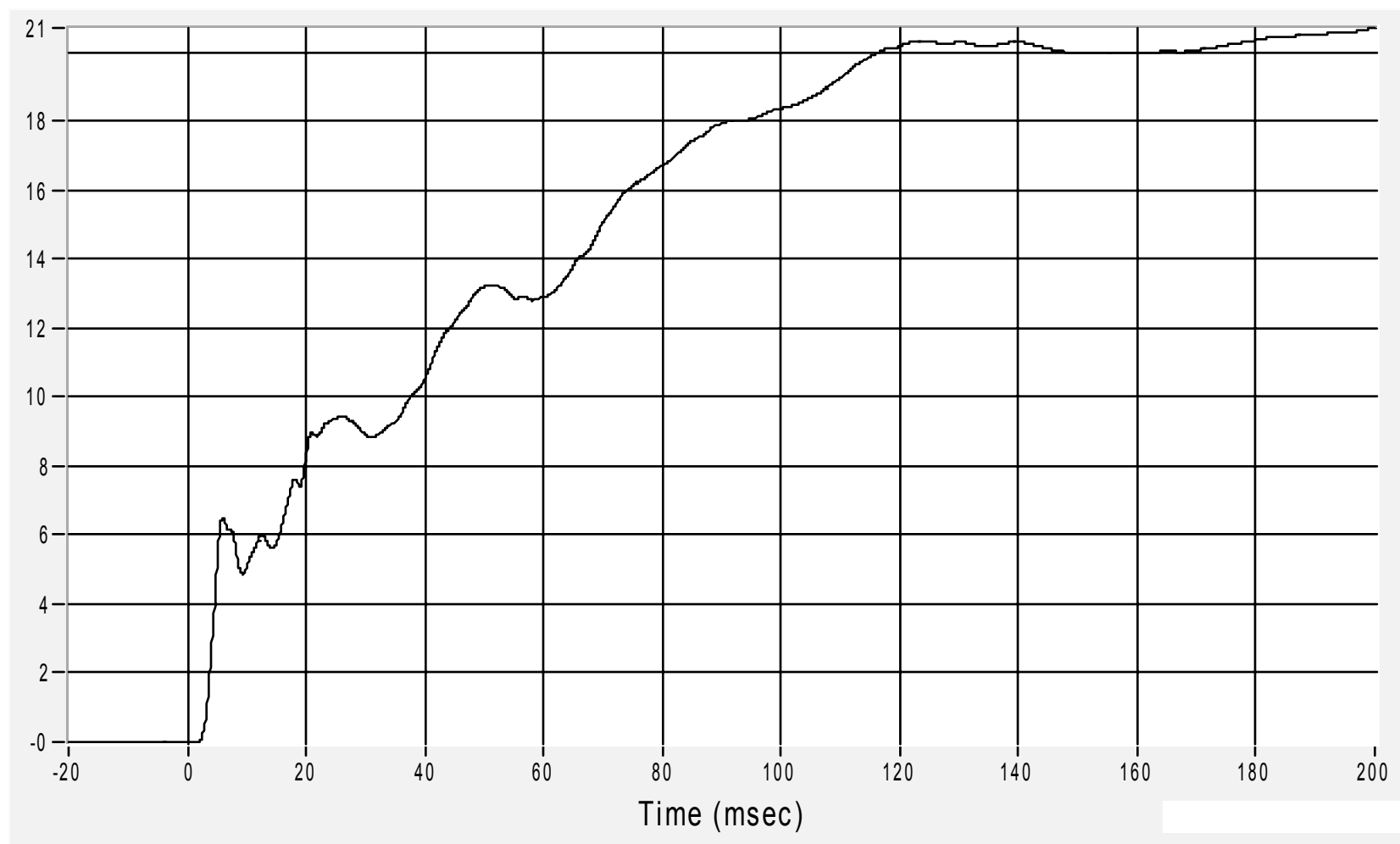
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Vehicle Crashworthiness Lab

**Left Middle A-Pillar (Y) Velocity**

Velocity (km/h) CFC180

Max 20.7 km/h at 199.9 msec

Min 0.0 km/h at 1.7 msec



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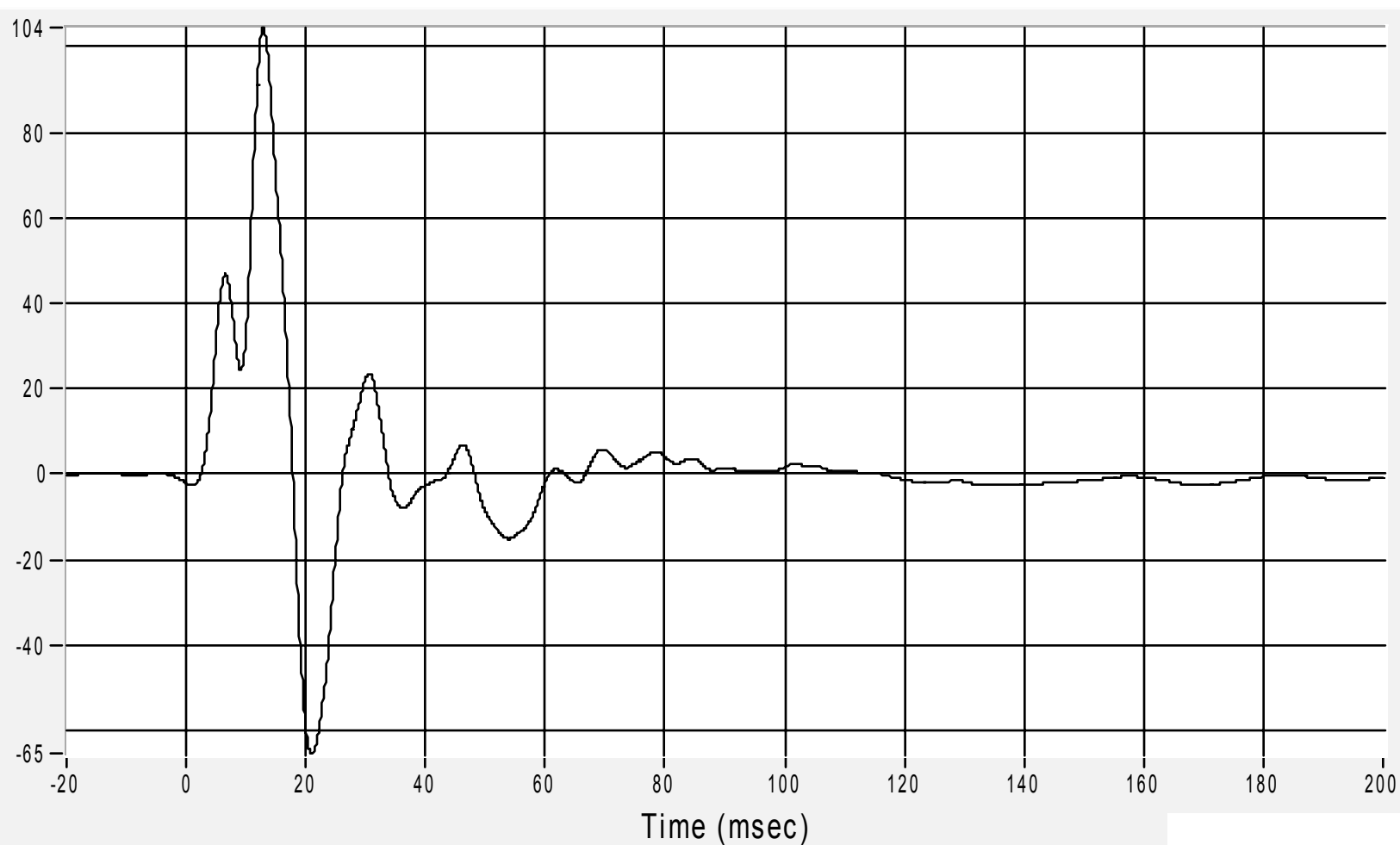
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**Front Seat Track (Y) Acceleration**

Acceleration (G's) CFC60

Max 104.5 G at 12.9 msec

Min -65.3 G at 21.0 msec



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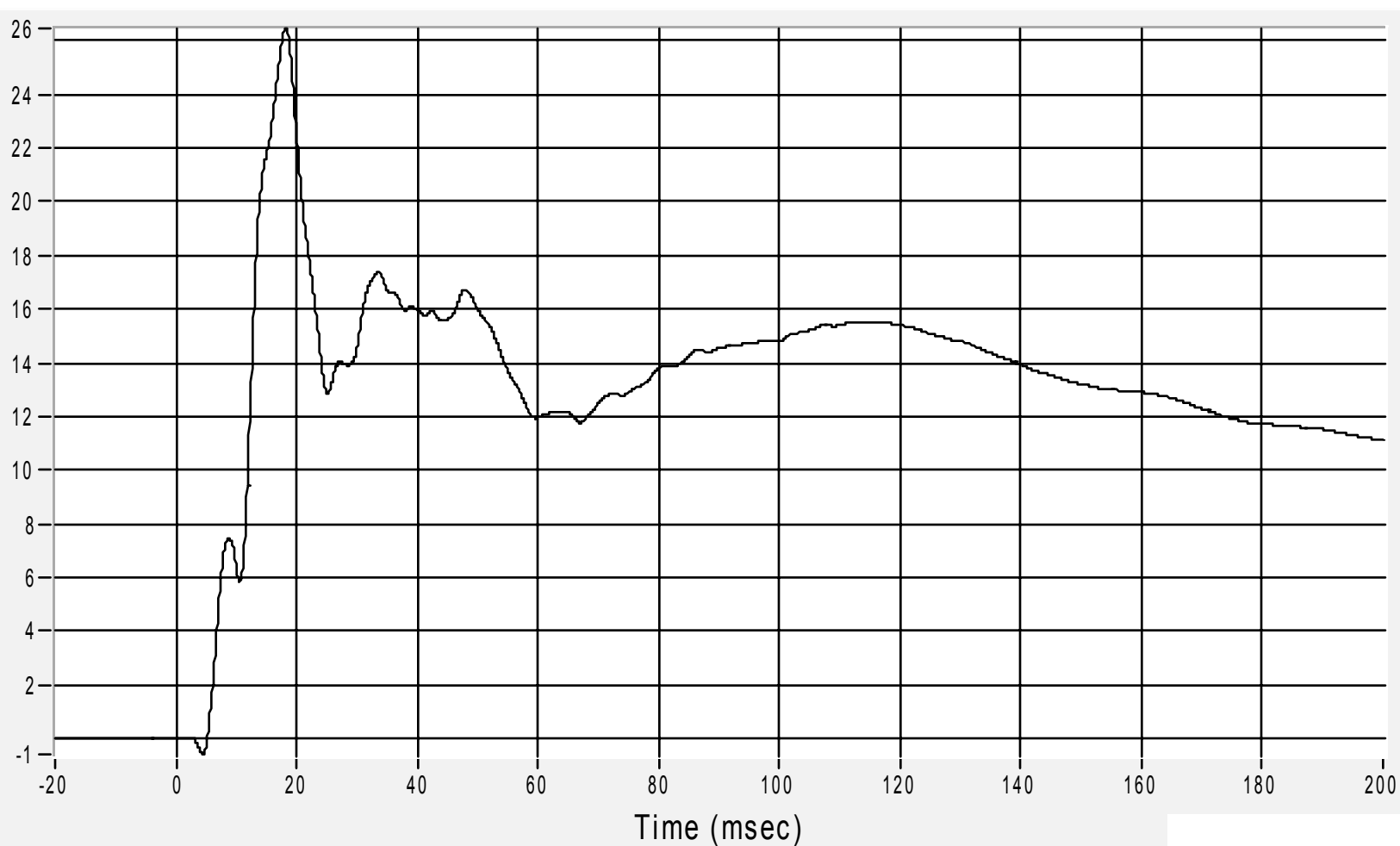
Medical College of Wisconsin  
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**Front Seat Track (Y) Velocity**

Velocity (km/h) CFC180

Max 26.4 km/h at 18.2 msec

Min -0.6 km/h at 4.5 msec



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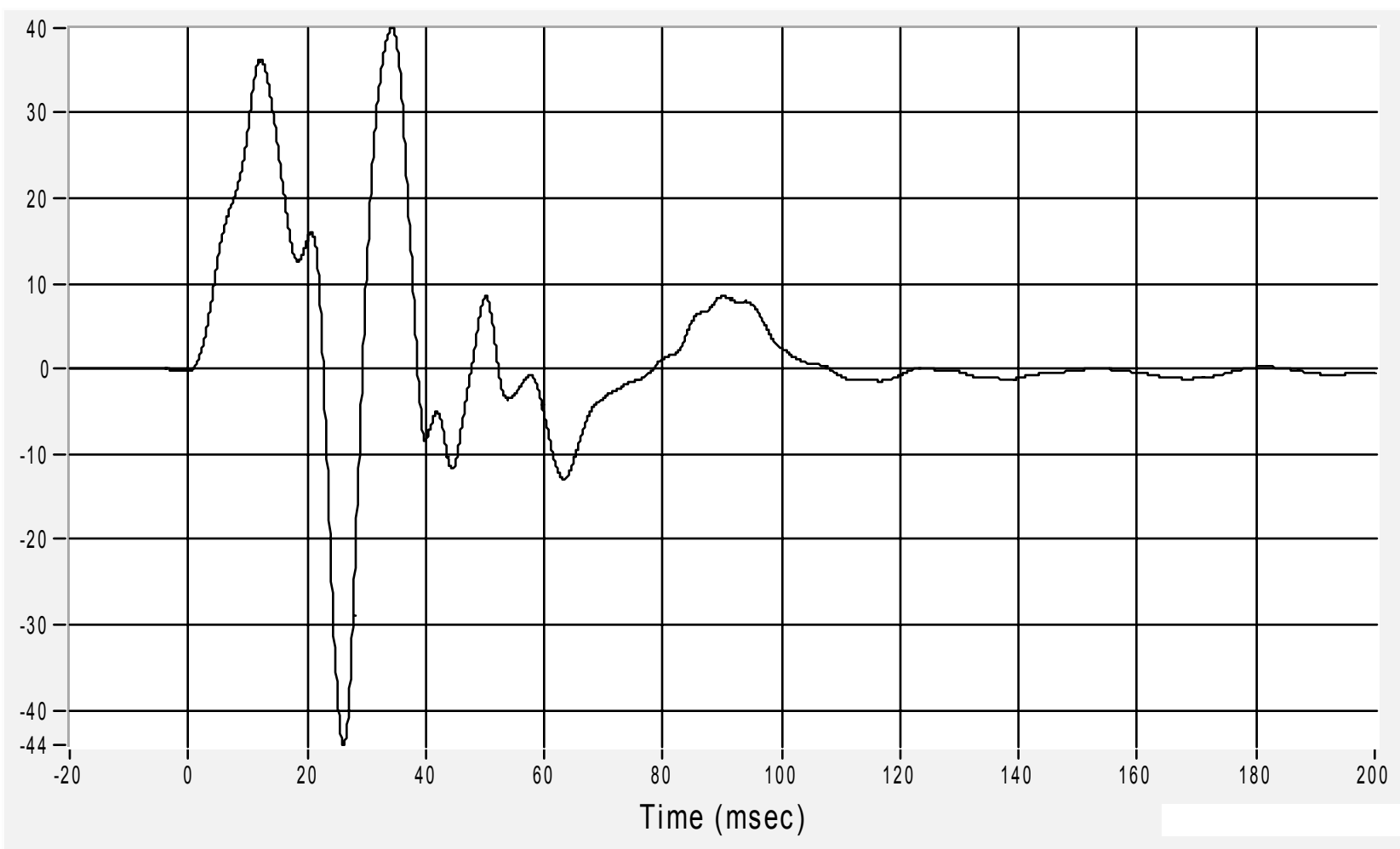
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**Rear Seat Track (Y) Acceleration**

Acceleration (G's) CFC60

Max 39.9 G at 34.3 msec

Min -44.1 G at 26.2 msec



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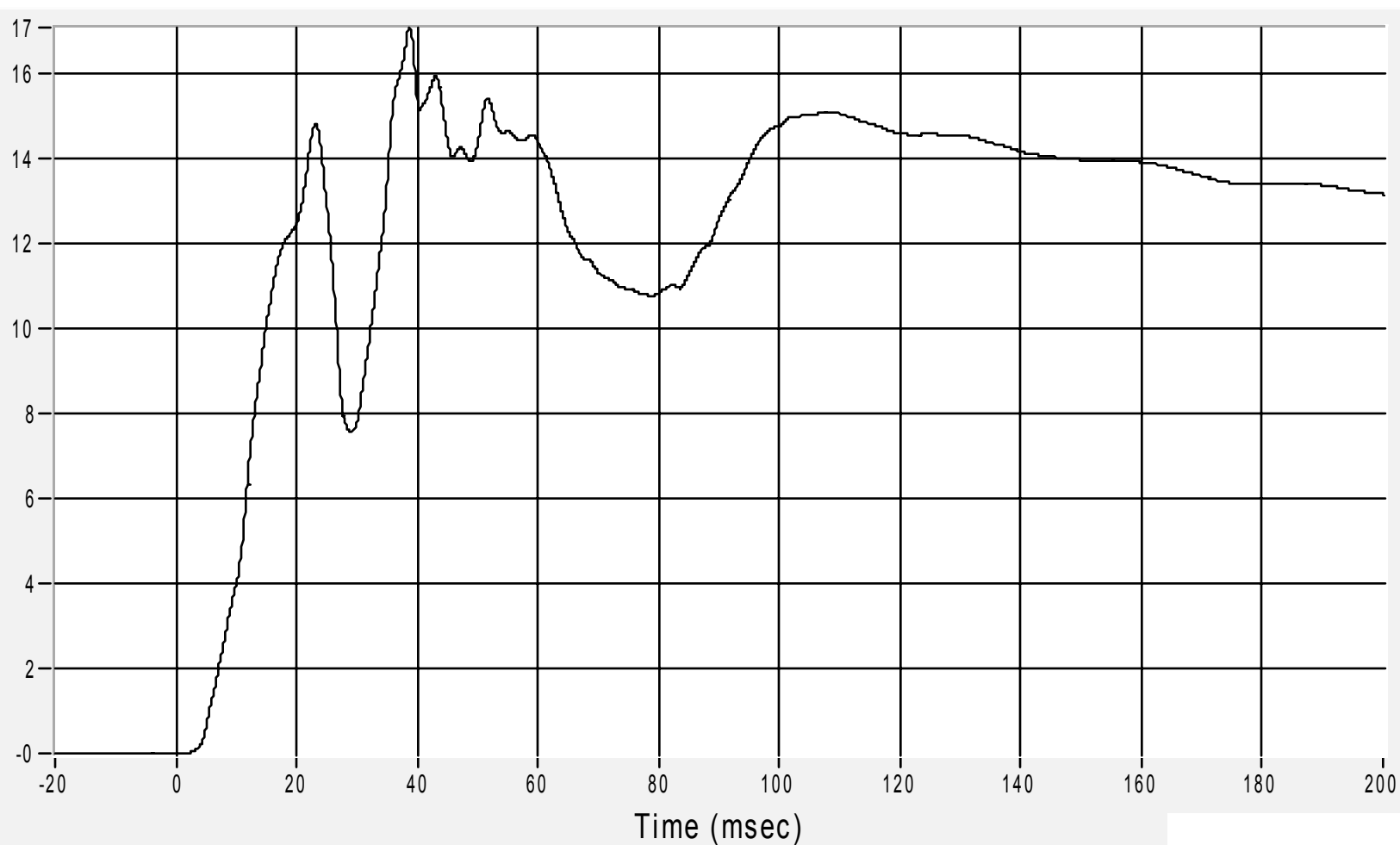
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**Rear Seat Track (Y) Velocity**

Velocity (km/h) CFC180

Max 17.1 km/h at 38.7 msec

Min 0.0 km/h at 0.0 msec



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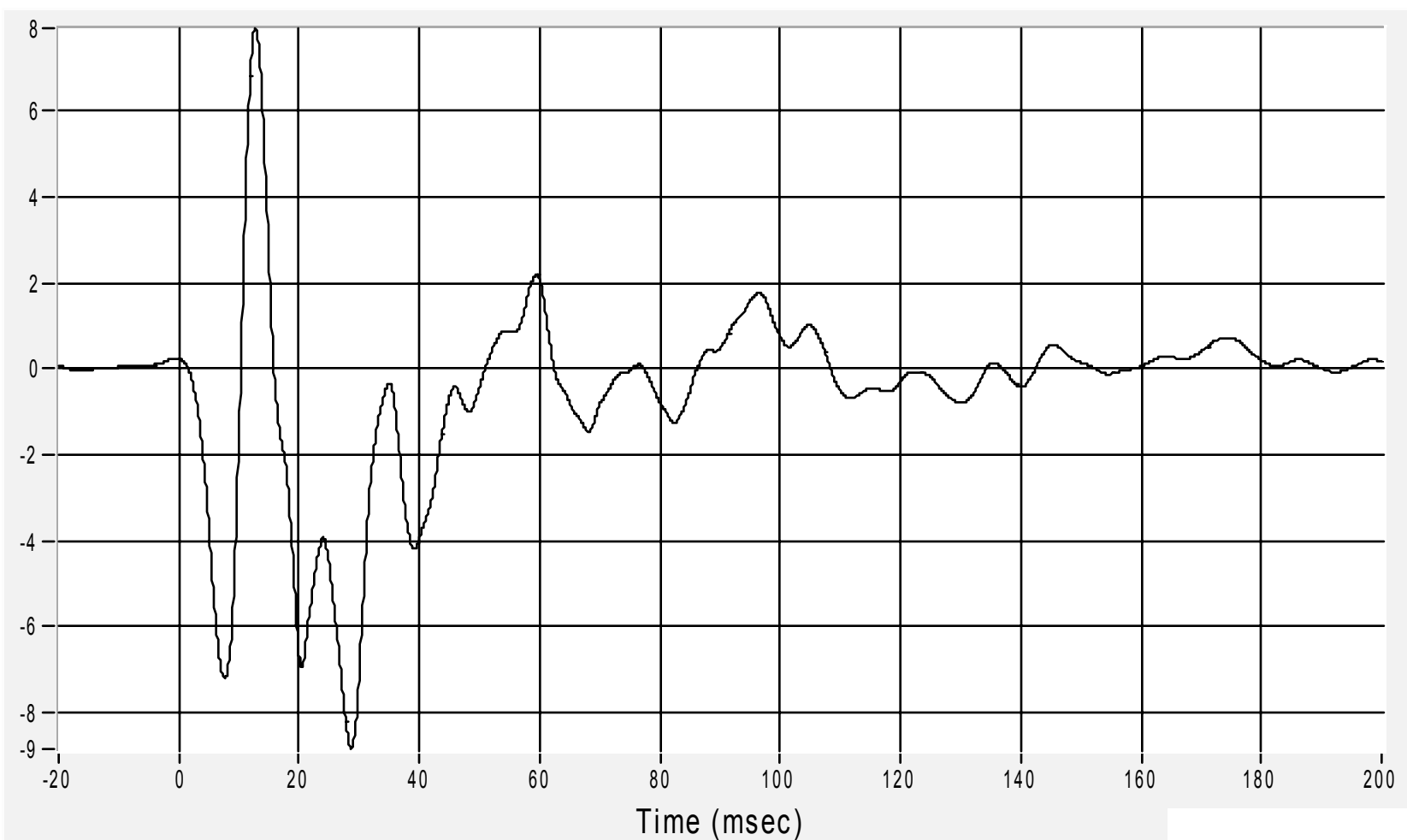


**Vehicle Center of Gravity (X) Acceleration**

Acceleration (G's) CFC60

Max 7.9 G at 12.7 msec

Min -8.9 G at 28.6 msec



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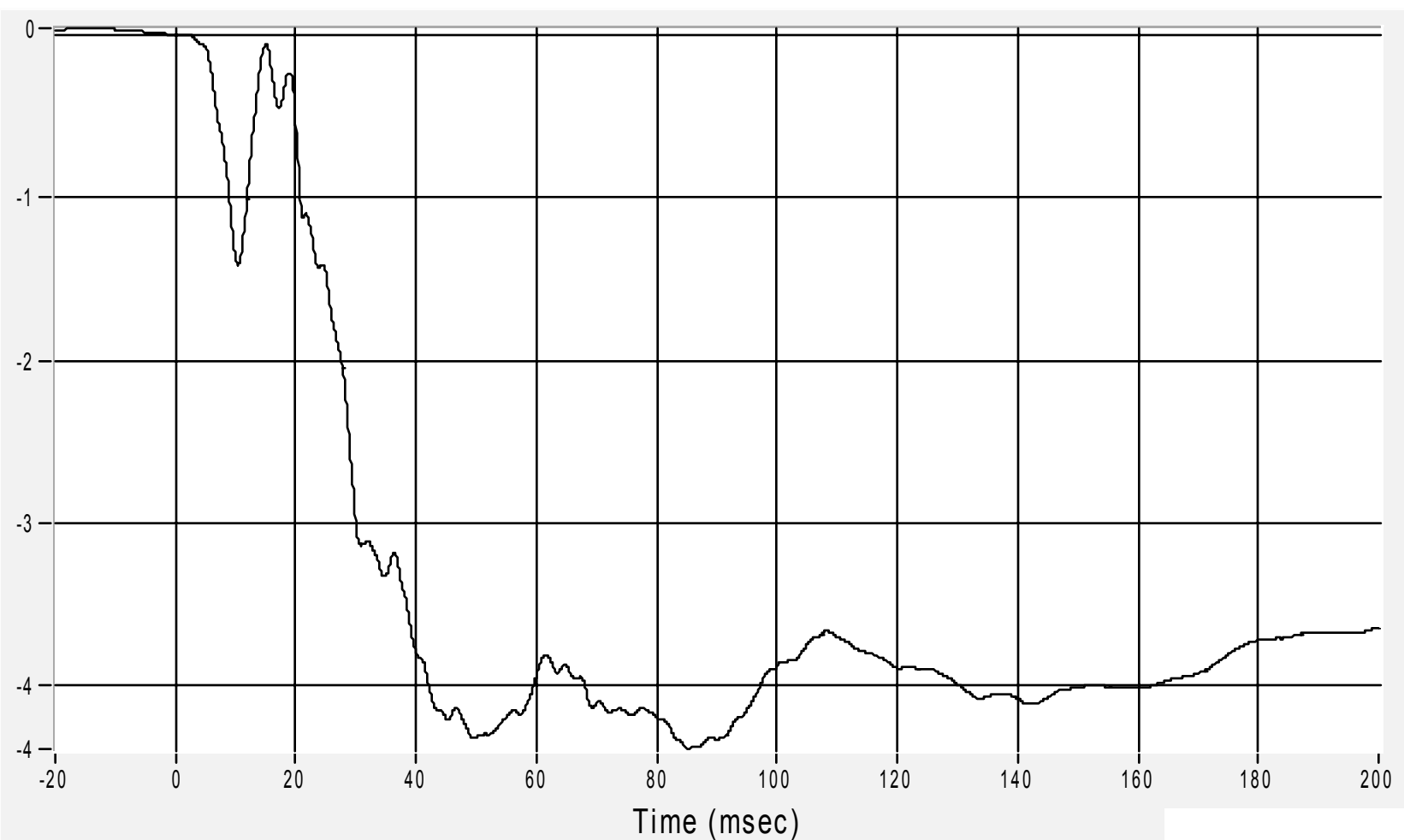
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**Vehicle Center of Gravity (X) Velocity**

Velocity (km/h) CFC180

Max 0.0 km/h at 1.4 msec

Min -4.4 km/h at 85.2 msec



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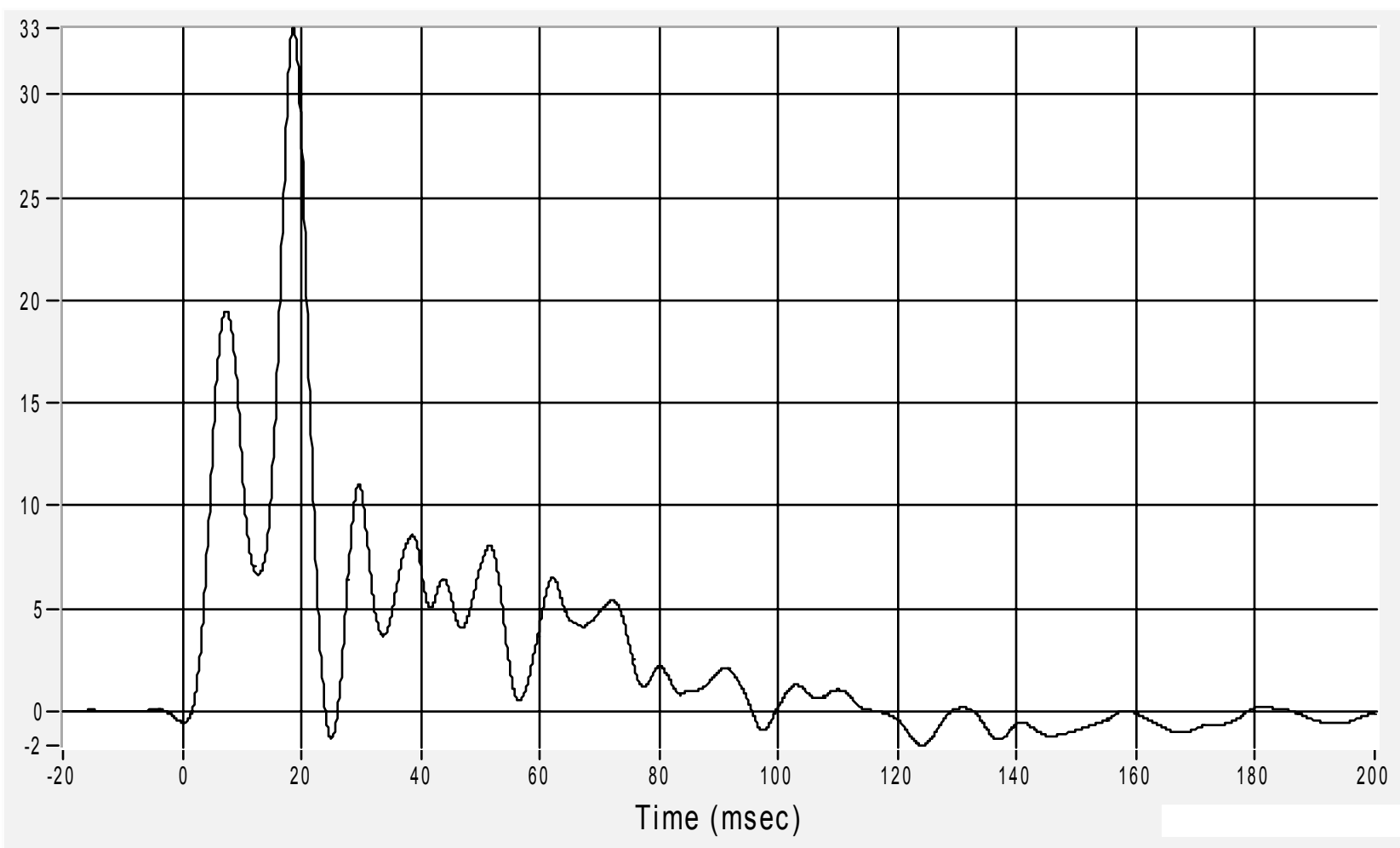
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**Vehicle Center of Gravity (Y) Acceleration**

Acceleration (G's) CFC60

Max 33.2 G at 18.6 msec

Min -1.7 G at 124.1 msec



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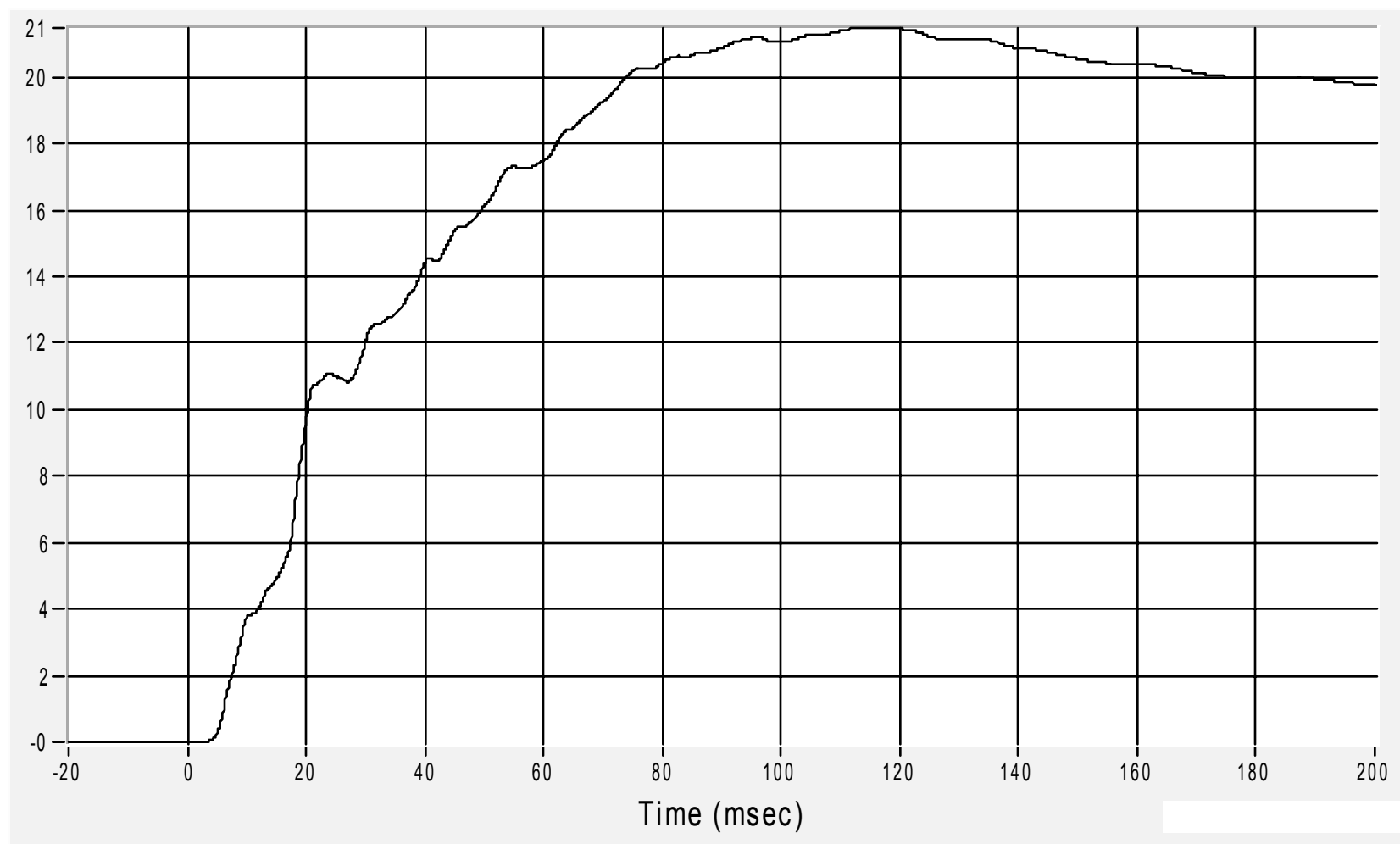
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**Vehicle Center of Gravity (Y) Velocity**

Velocity (km/h) CFC180

Max 21.5 km/h at 112.7 msec

Min 0.0 km/h at 2.5 msec



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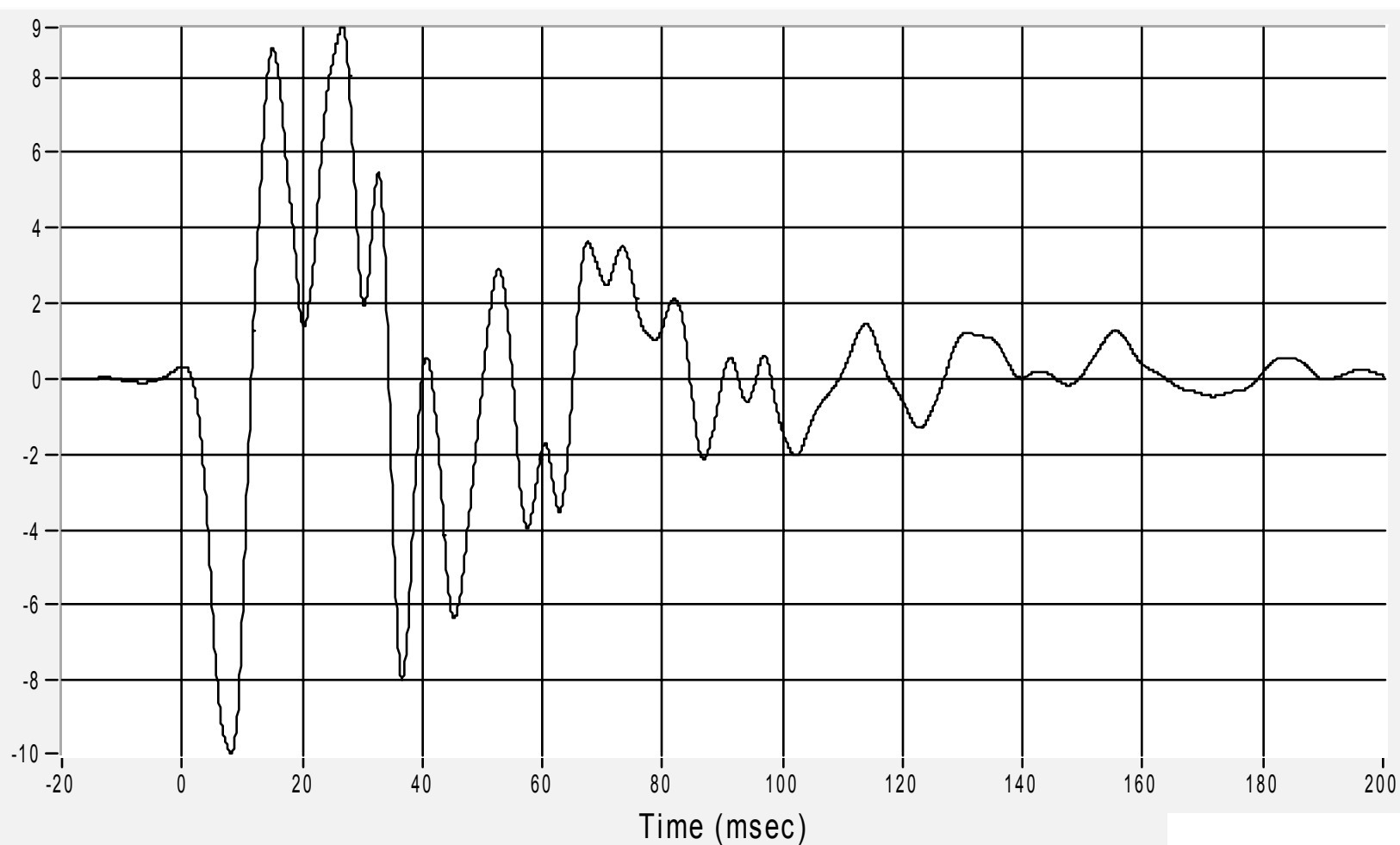
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**Vehicle Center of Gravity (Z) Acceleration**

Acceleration (G's) CFC60

Max 9.3 G at 26.7 msec

Min -9.9 G at 8.2 msec



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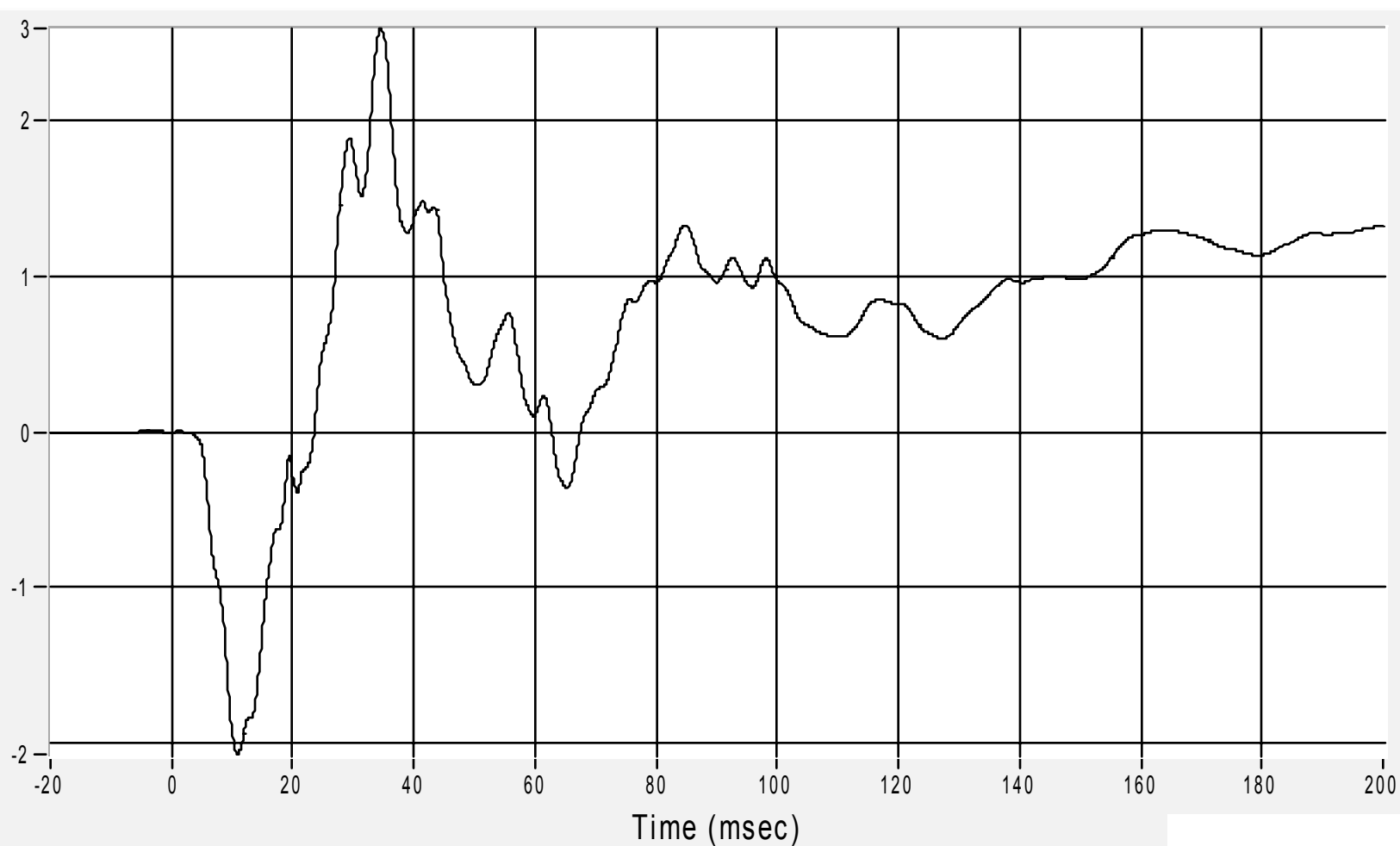
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**Vehicle Center of Gravity (Z) Velocity**

Velocity (km/h) CFC180

Max 2.6 km/h at 34.6 msec

Min -2.1 km/h at 10.9 msec



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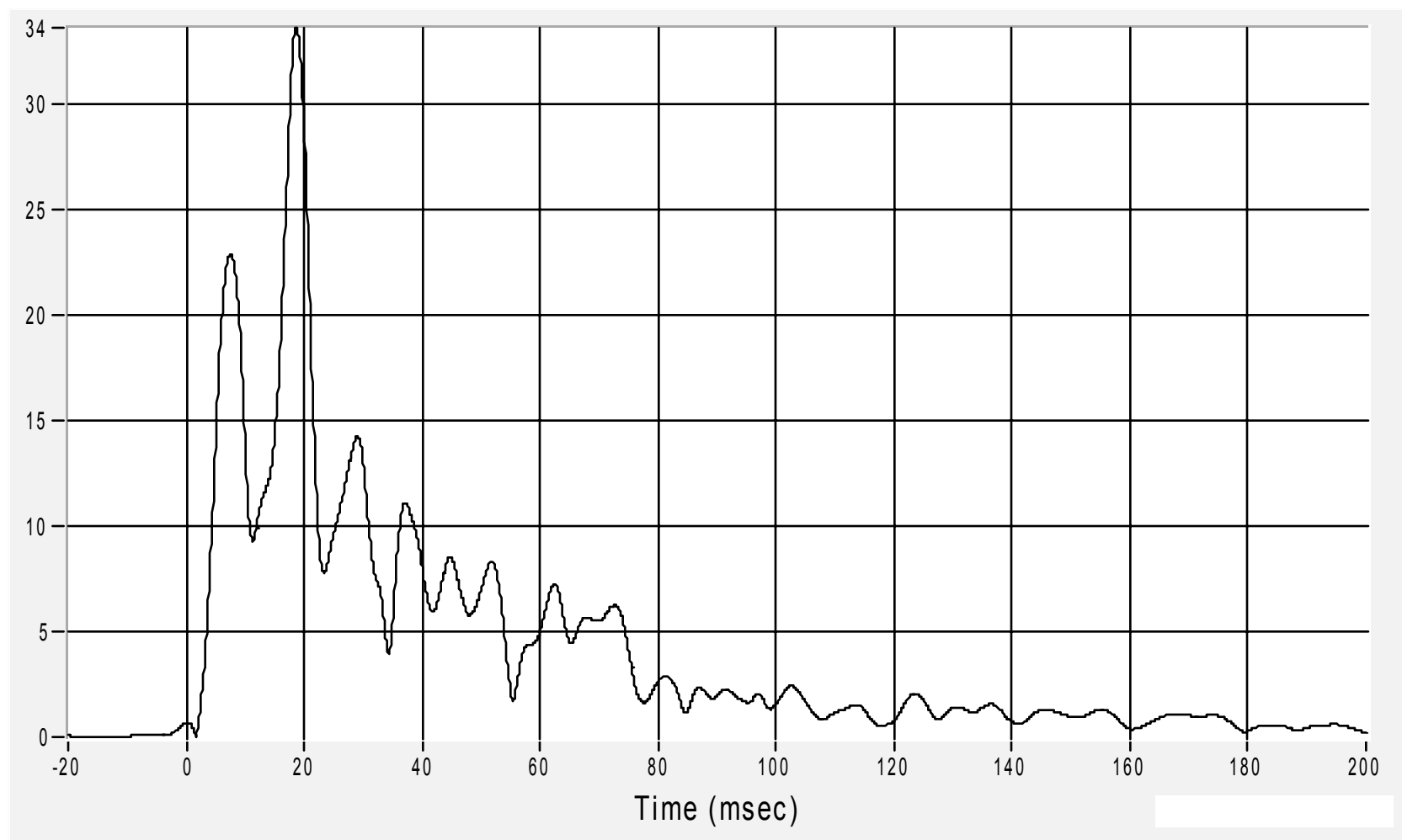


**Vehicle Center of Gravity Resultant Acceleration**

Acceleration (G's) CFC60

Max 33.7 G's at 18.6 msec

Min 0.1 G's at 1.7 msec



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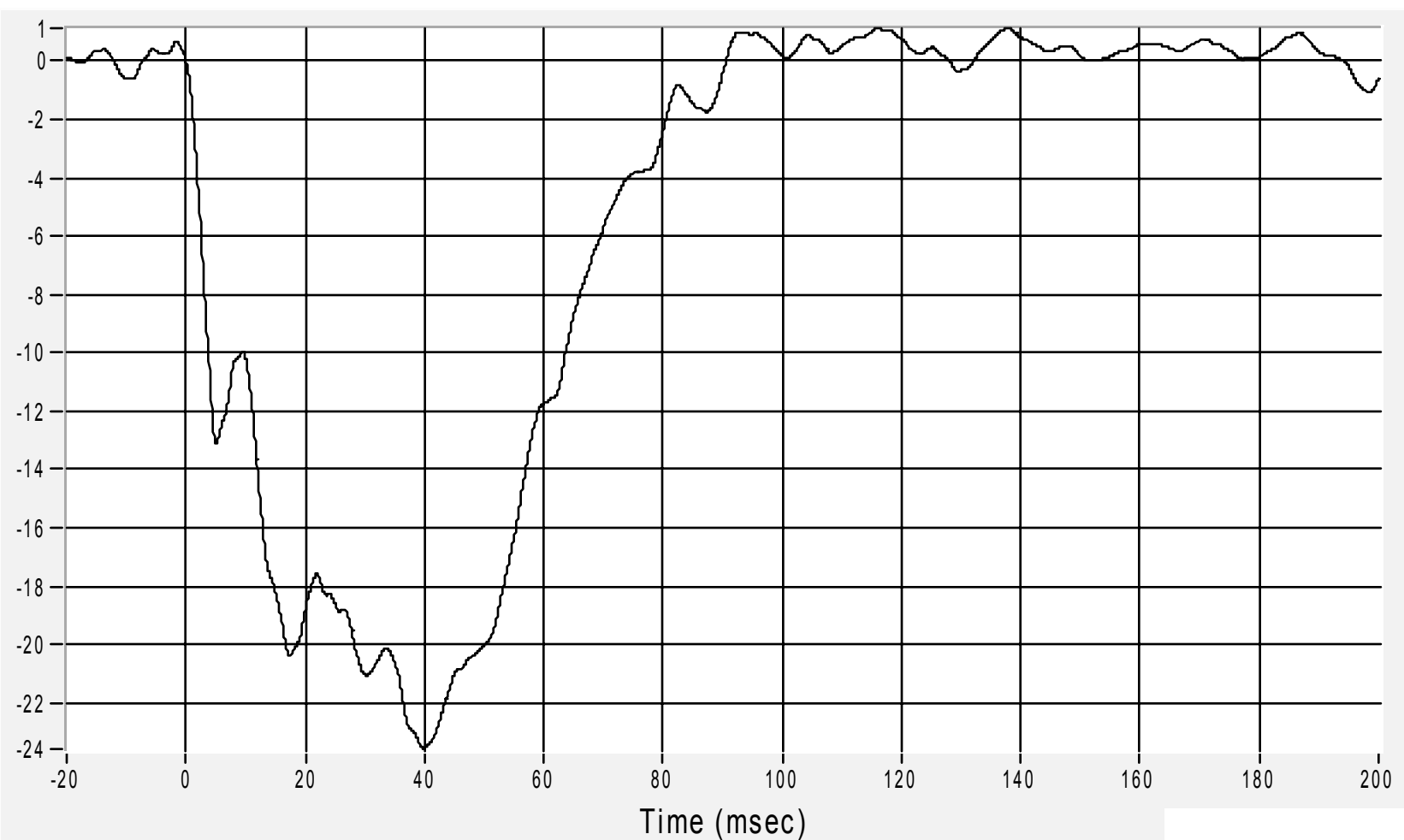
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**MDB Center of Gravity (X) Acceleration**

Acceleration (G's) CFC60

Max 1.1 G at 137.9 msec

Min -23.6 G at 39.8 msec



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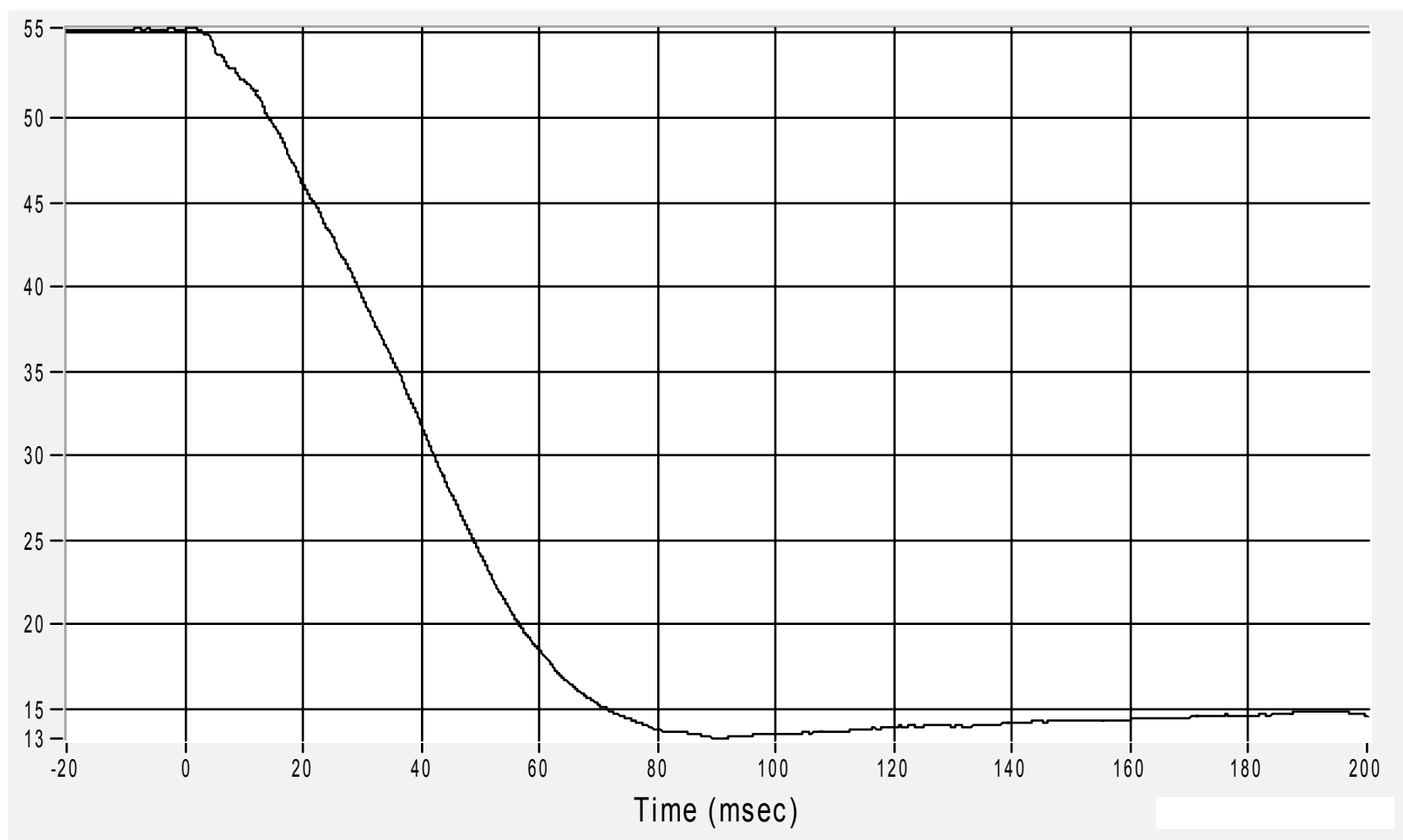
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**MDB Center of Gravity (X) Velocity**

Velocity (km/h) CFC180

Max 55.3 km/h at 1.0 msec

Min 13.3 km/h at 90.6 msec



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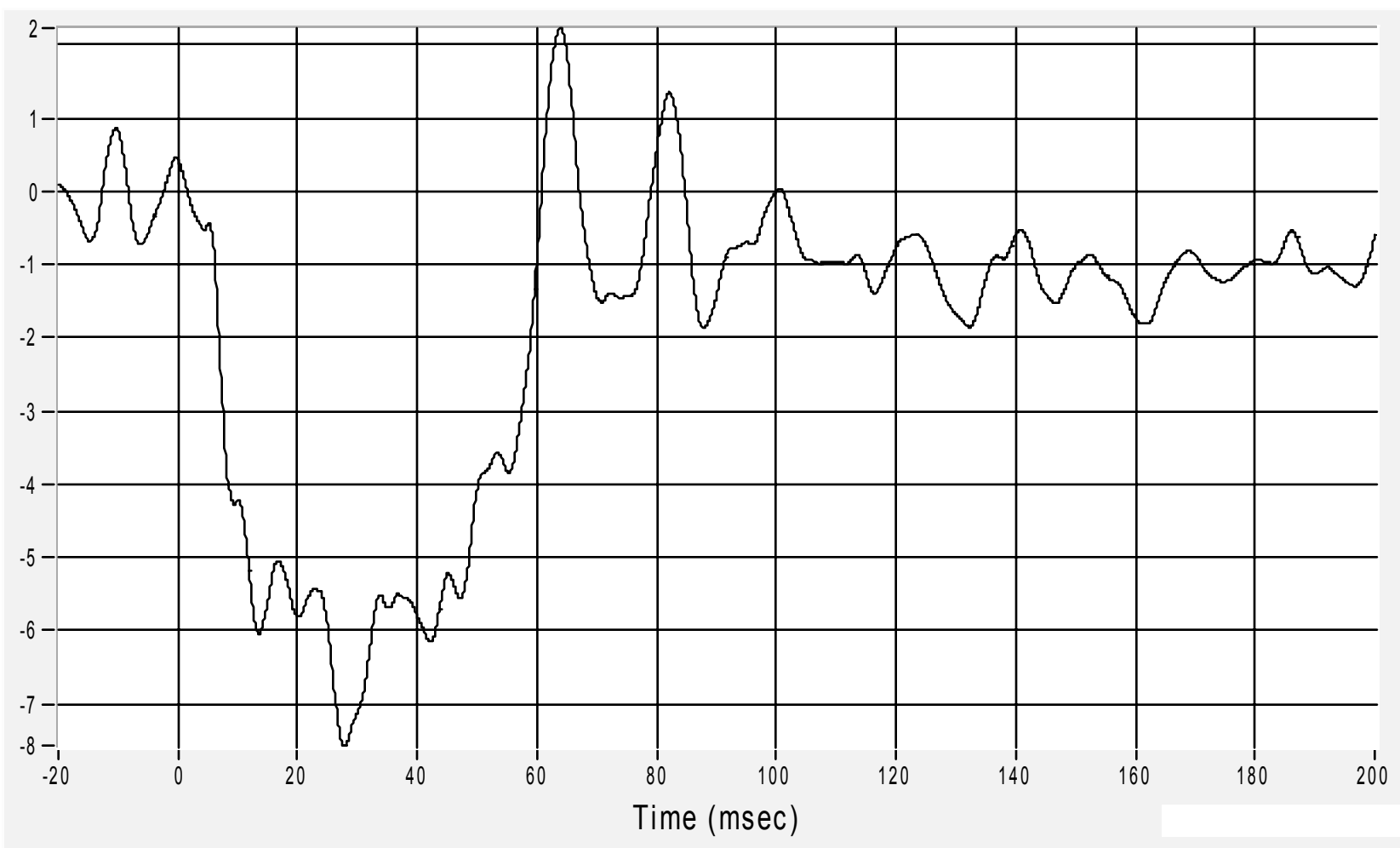
Medical College of Wisconsin  
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**MDB Center of Gravity (Y) Acceleration**

Acceleration (G's) CFC60

Max 2.2 G at 63.8 msec

Min -7.6 G at 27.8 msec



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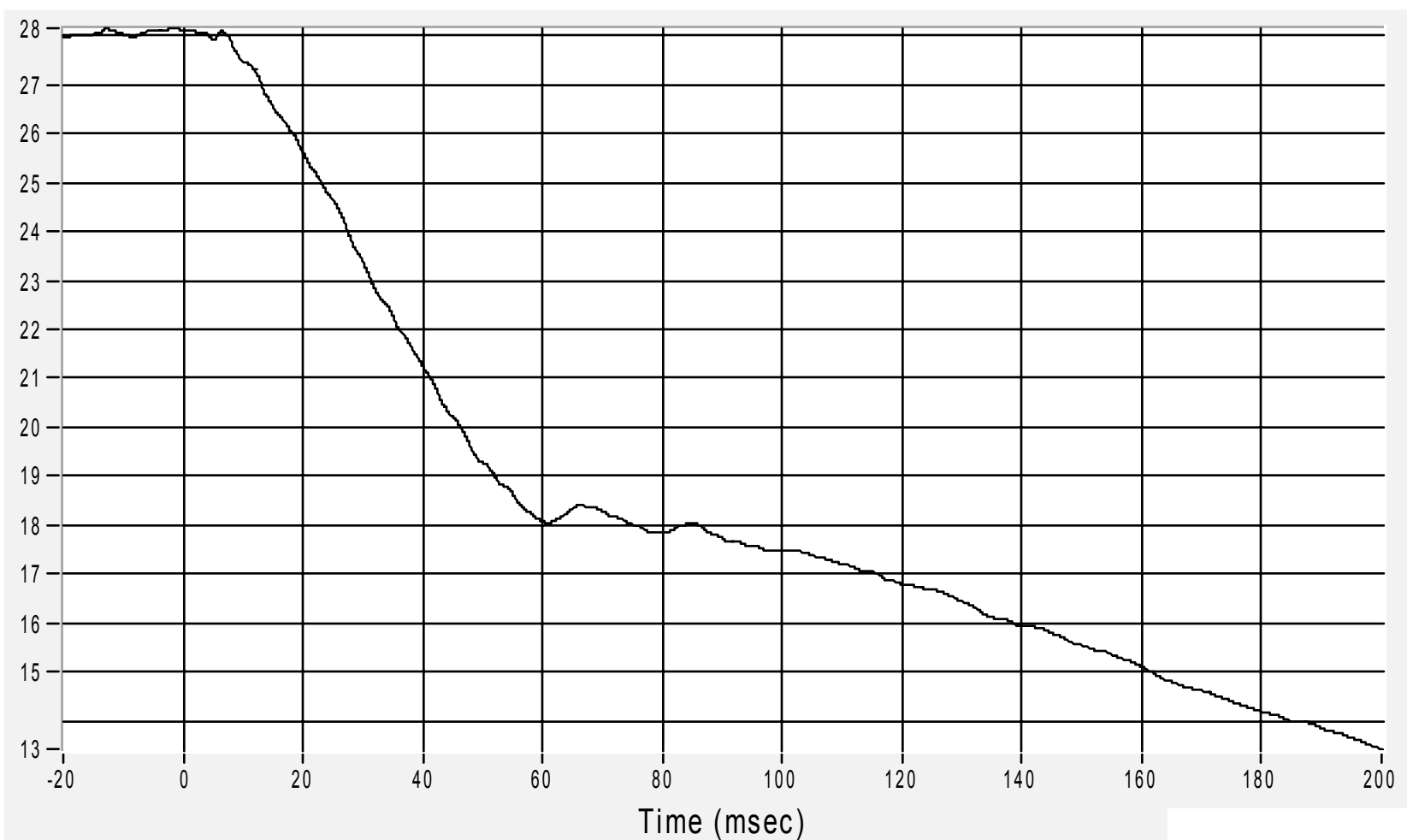
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**MDB Center of Gravity (Y) Velocity**

Velocity (km/h) CFC180

Max 28.1 km/h at 0.4 msec

Min 13.4 km/h at 199.9 msec



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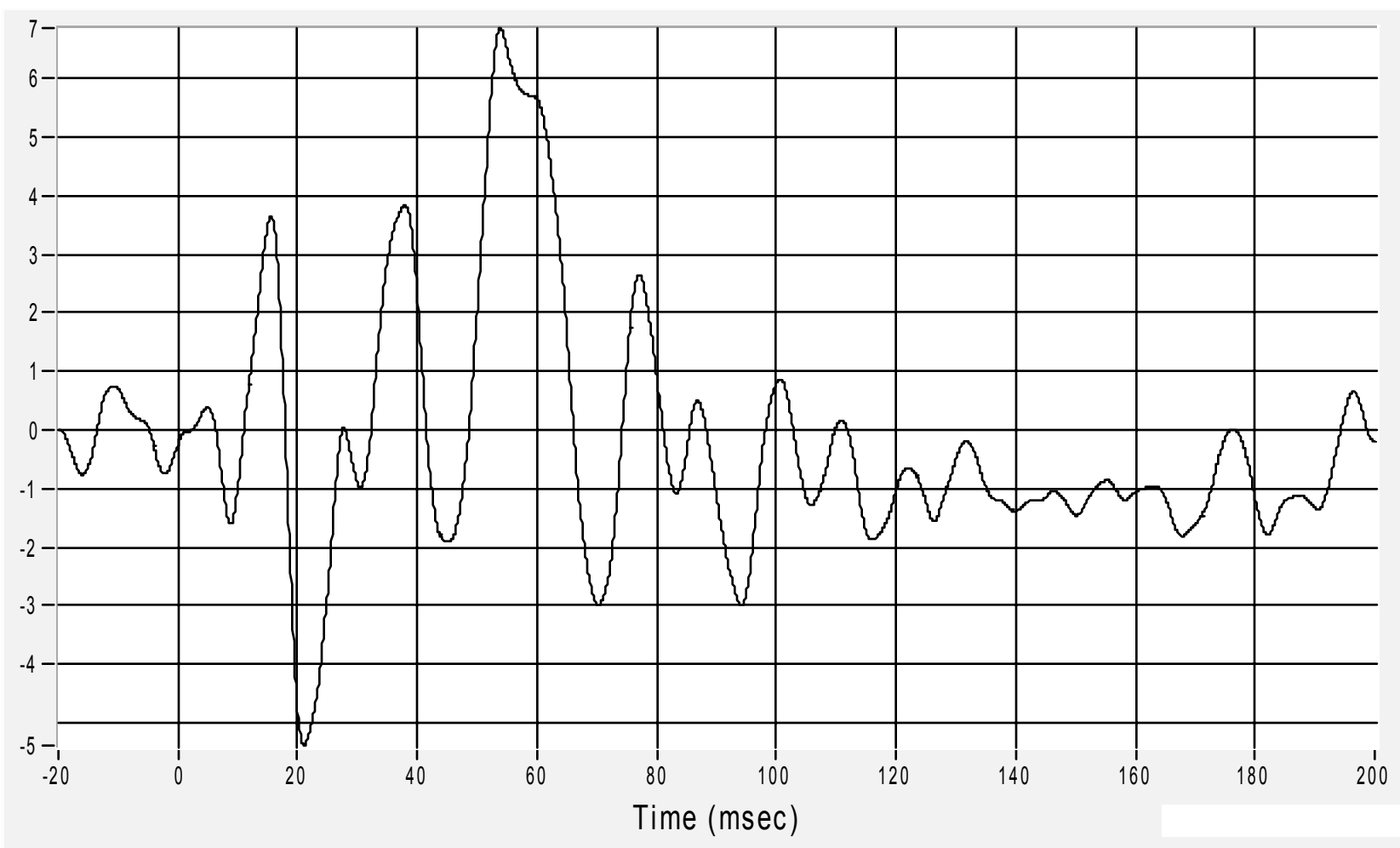
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**MDB Center of Gravity (Z) Acceleration**

Acceleration (G's) CFC60

Max 6.9 G at 53.8 msec

Min -5.4 G at 21.0 msec



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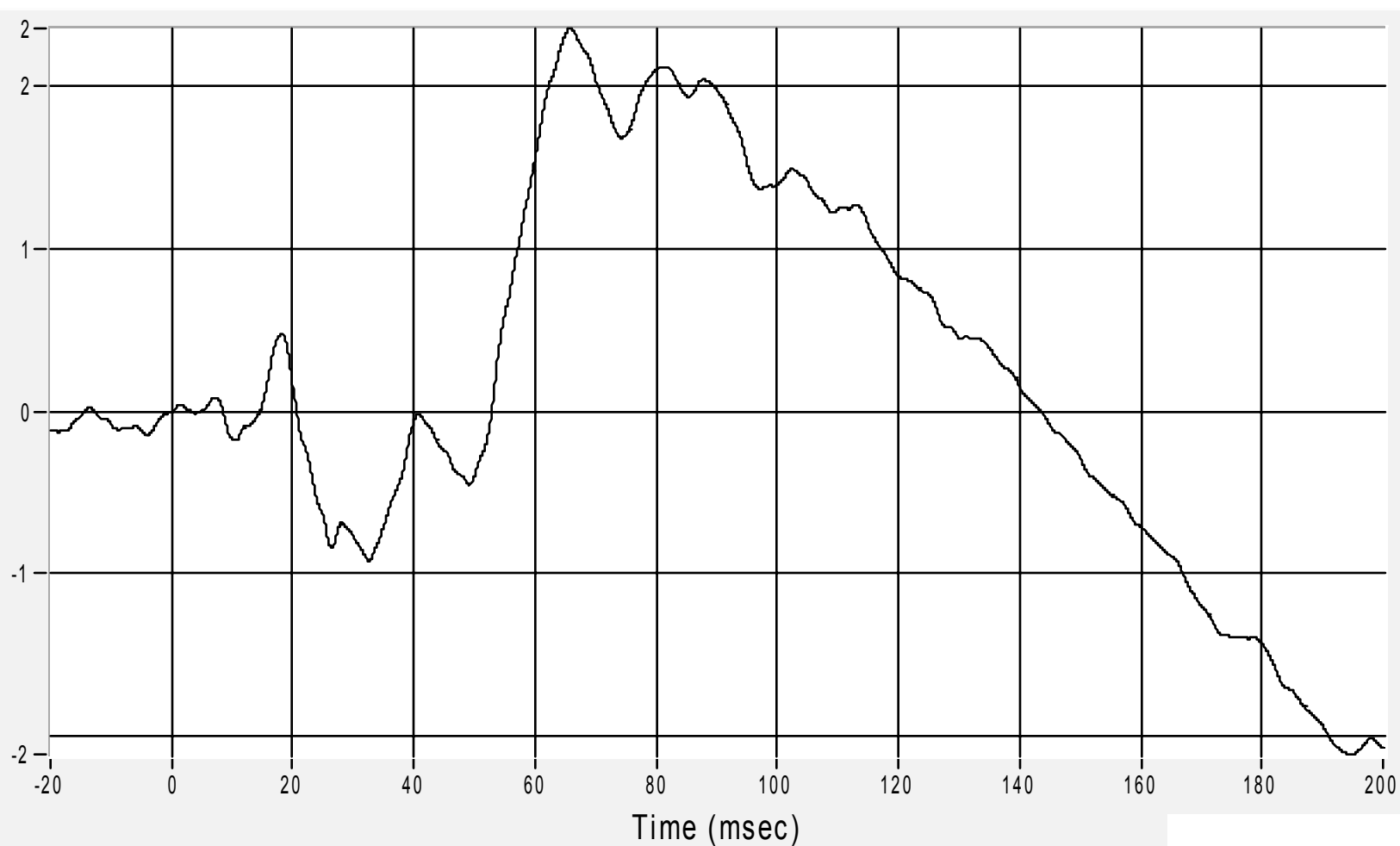


**MDB Center of Gravity (Z) Velocity**

Velocity (km/h) CFC180

Max 2.4 km/h at 65.8 msec

Min -2.1 km/h at 194.6 msec



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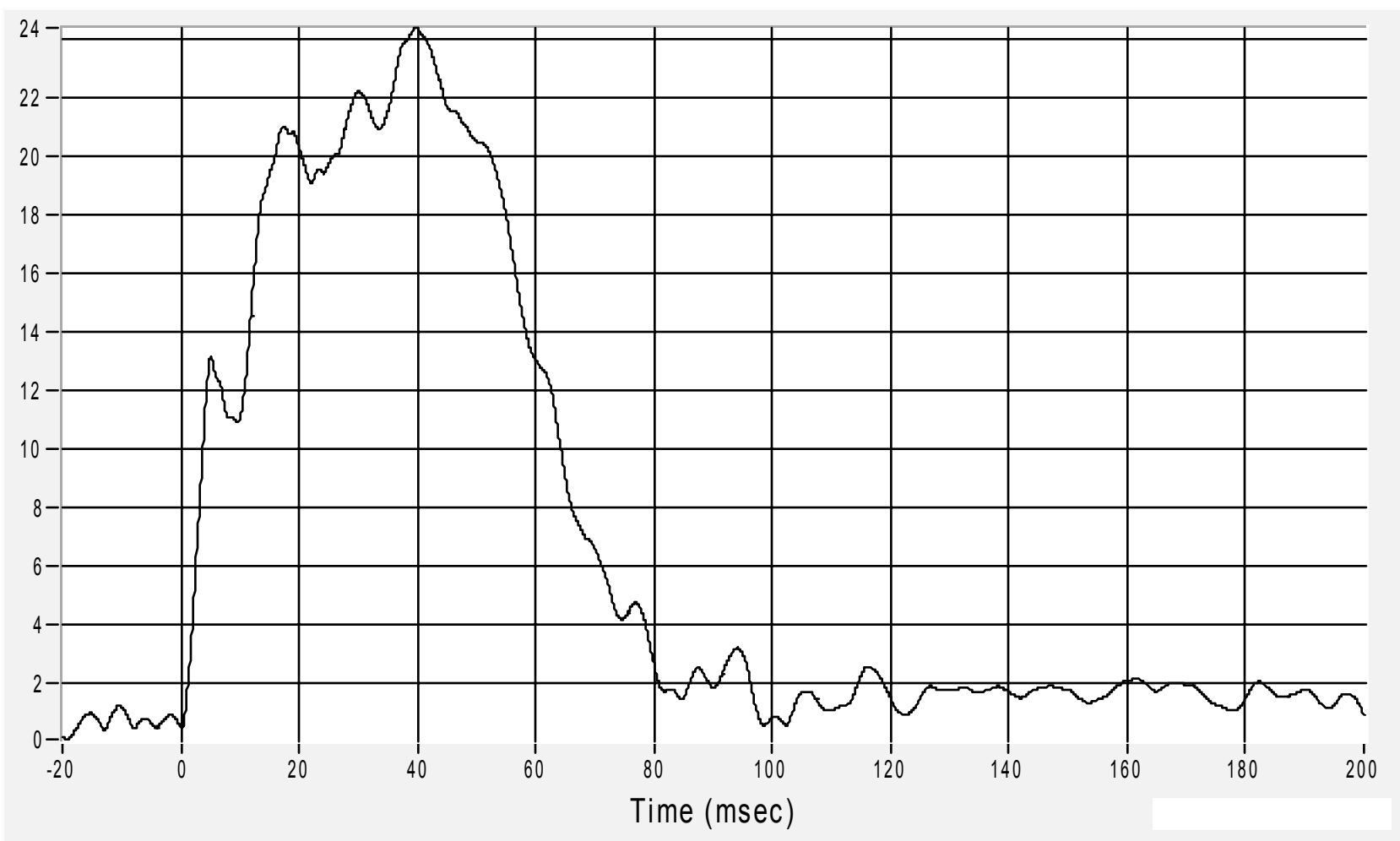
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**MDB Center of Gravity Resultant Acceleration**

Acceleration (G's) CFC60

Max 24.4 G's at 39.7 msec

Min 0.5 G's at 0.2 msec



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21 January 2005

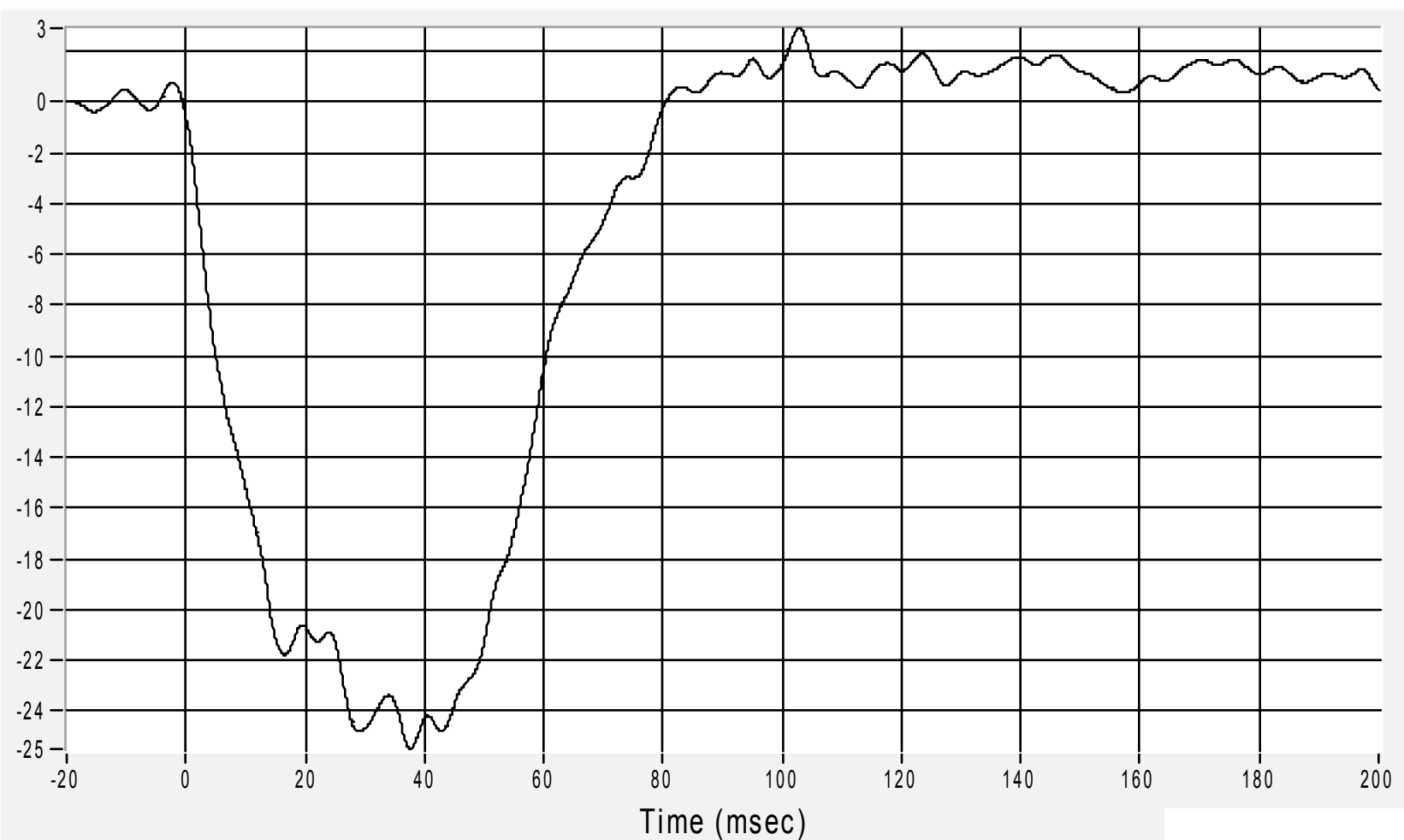
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**MDB Rear (X) Acceleration**

Acceleration (G's) CFC60

Max 2.9 G at 102.9 msec

Min -25.5 G at 37.7 msec



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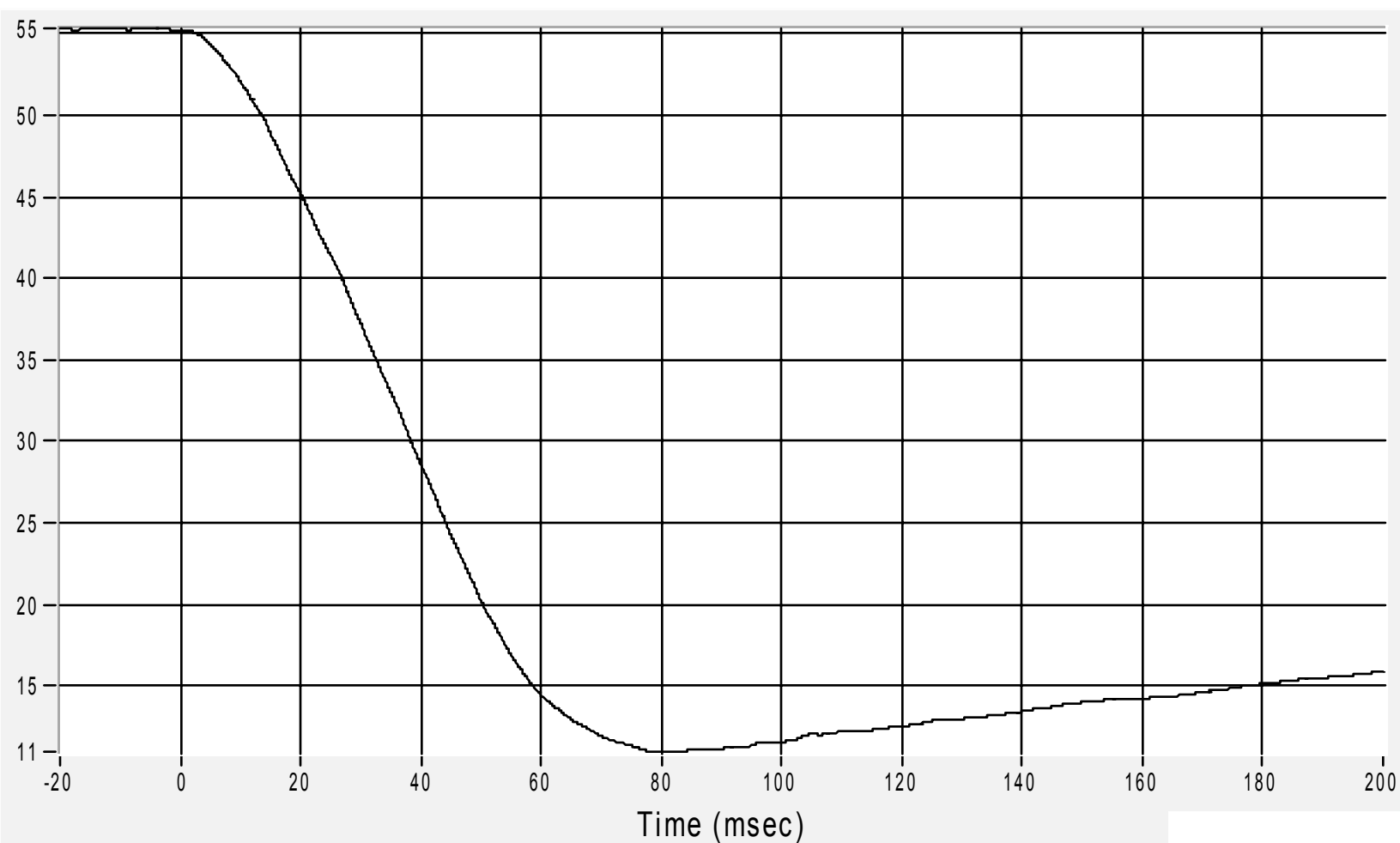
**MDB Rear (X) Velocity**

Velocity (km/h)

CFC180

Max 55.2 km/h at 0.0 msec

Min 11.0 km/h at 81.0 msec



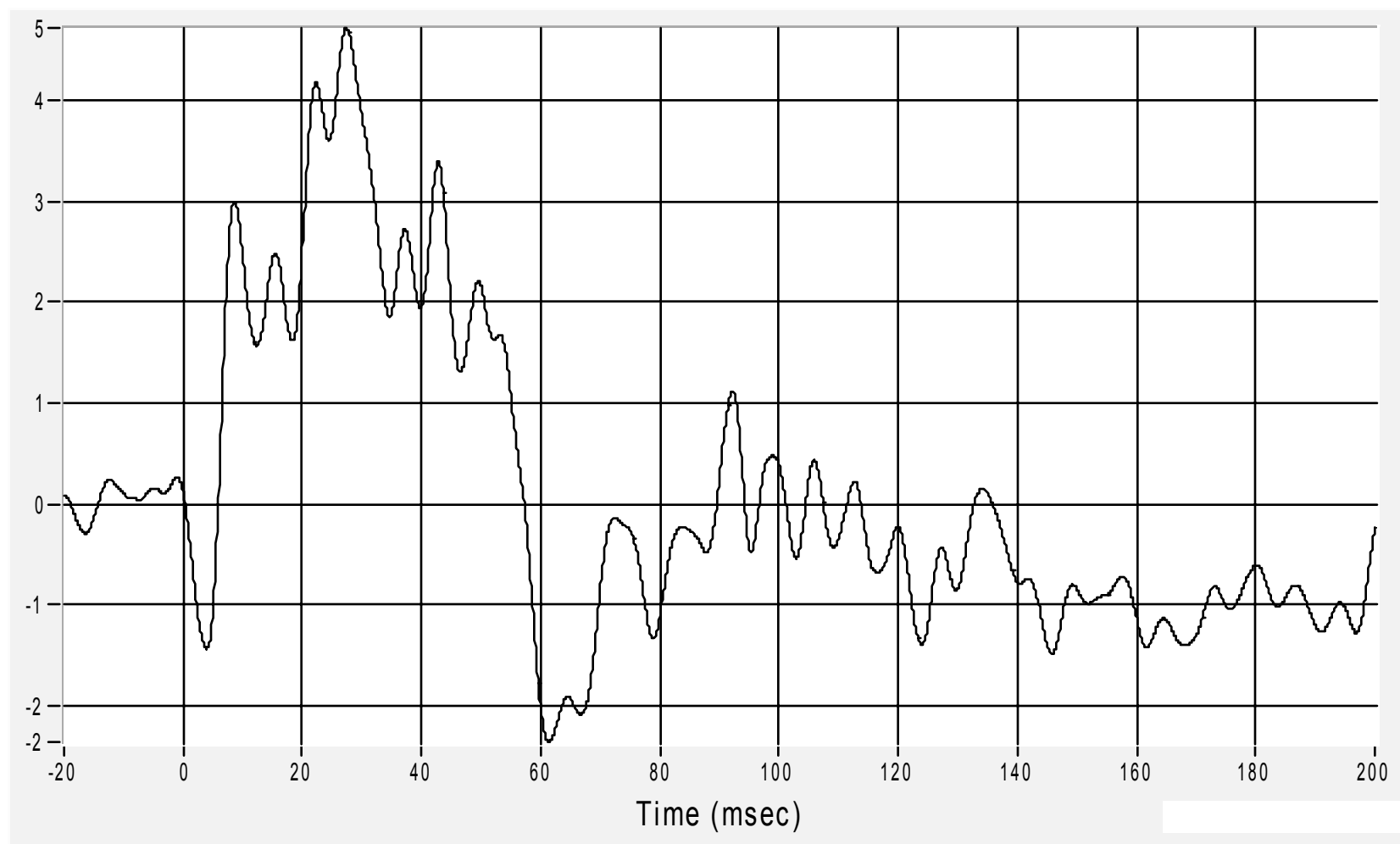
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**MDB Rear (Y) Acceleration**

Acceleration (G's) CFC60

**Max 4.7 G at 27.4 msec****Min -2.4 G at 61.4 msec**

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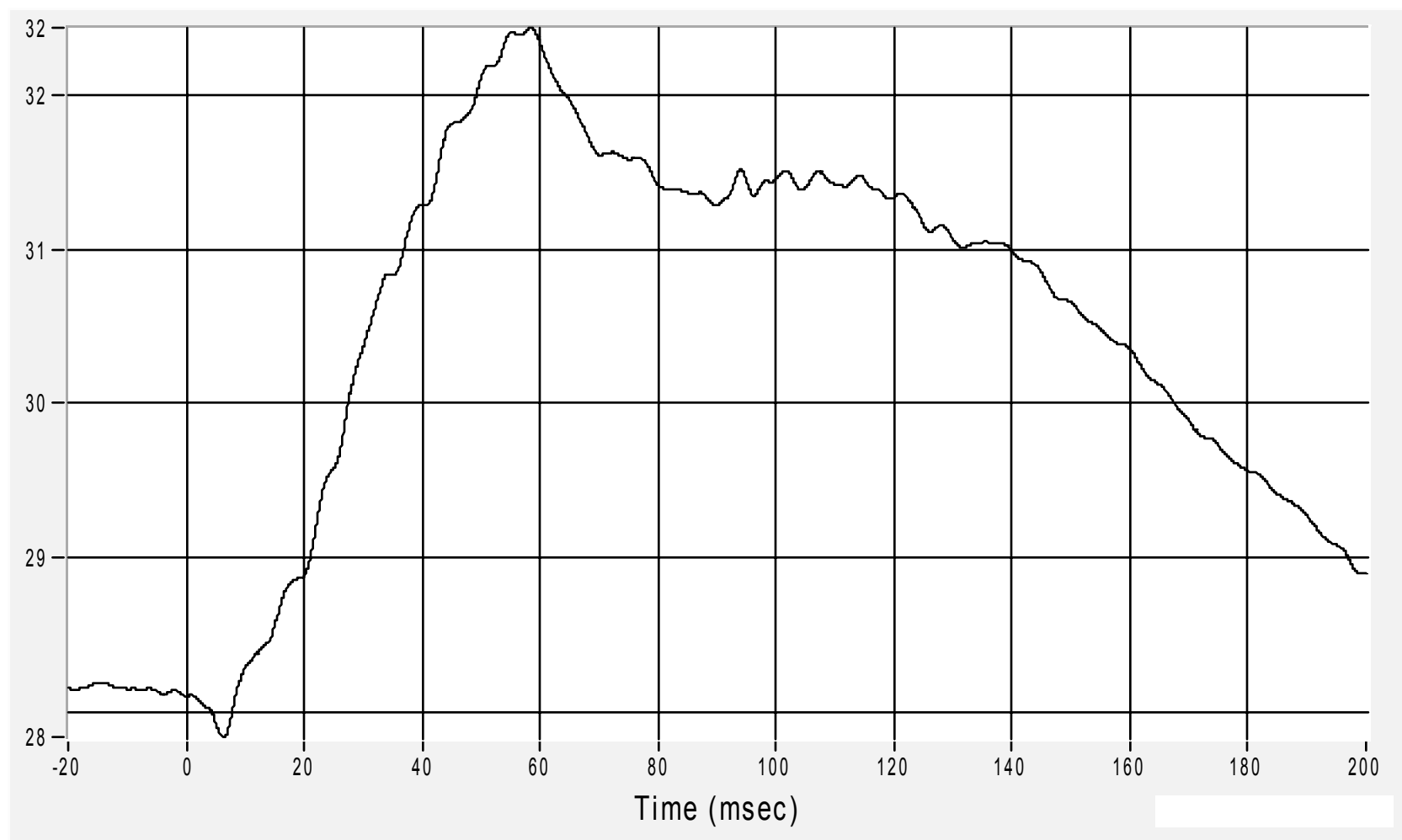
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**MDB Rear (Y) Velocity**

Velocity (km/h) CFC180

Max 32.4 km/h at 58.4 msec

Min 27.8 km/h at 6.3 msec



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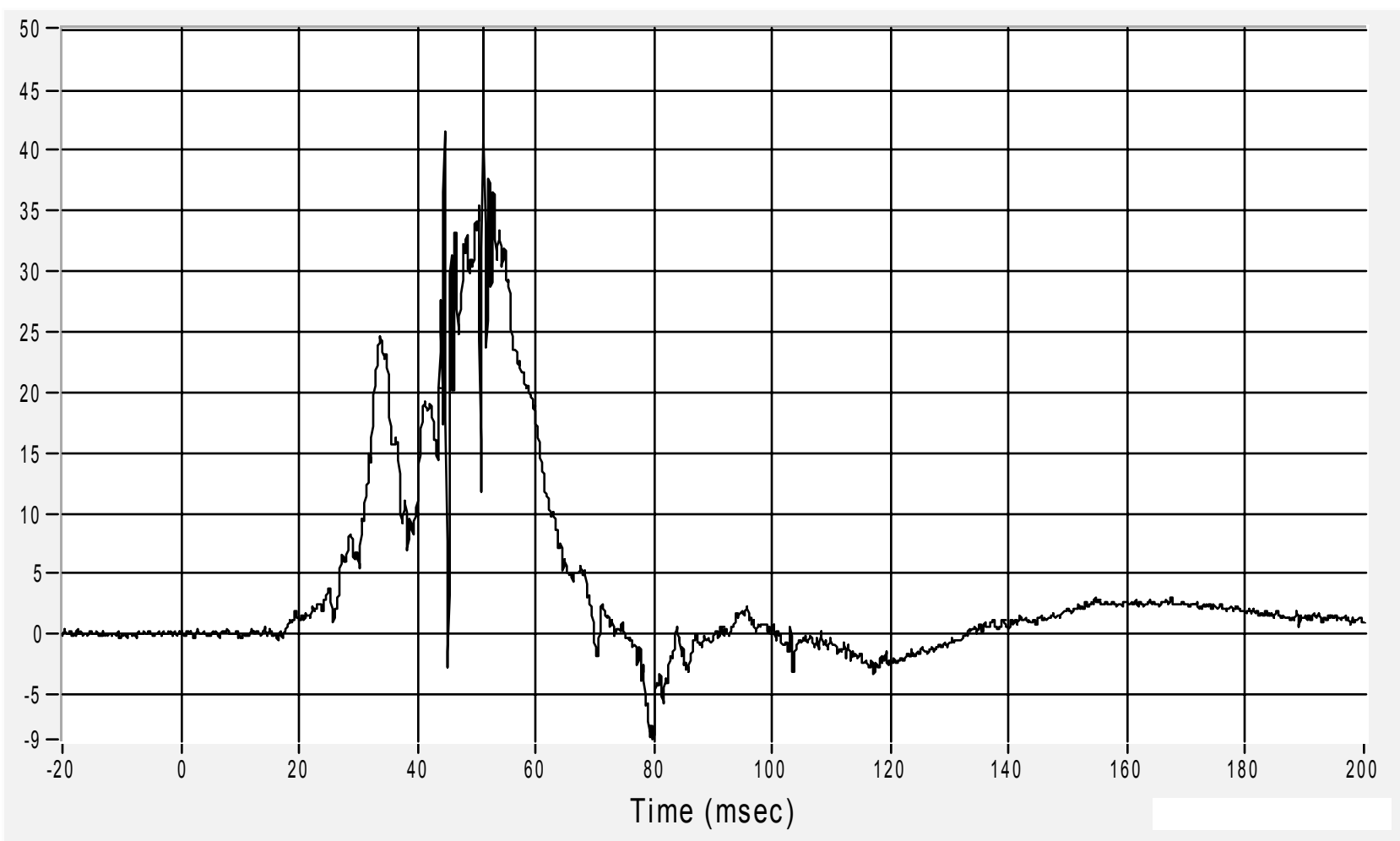


**Driver Upper Rib (Y) - Redundant Acceleration**

Acceleration (G's) CFC1000

Max 50.2 G at 51.2 msec

Min -8.7 G at 79.8 msec



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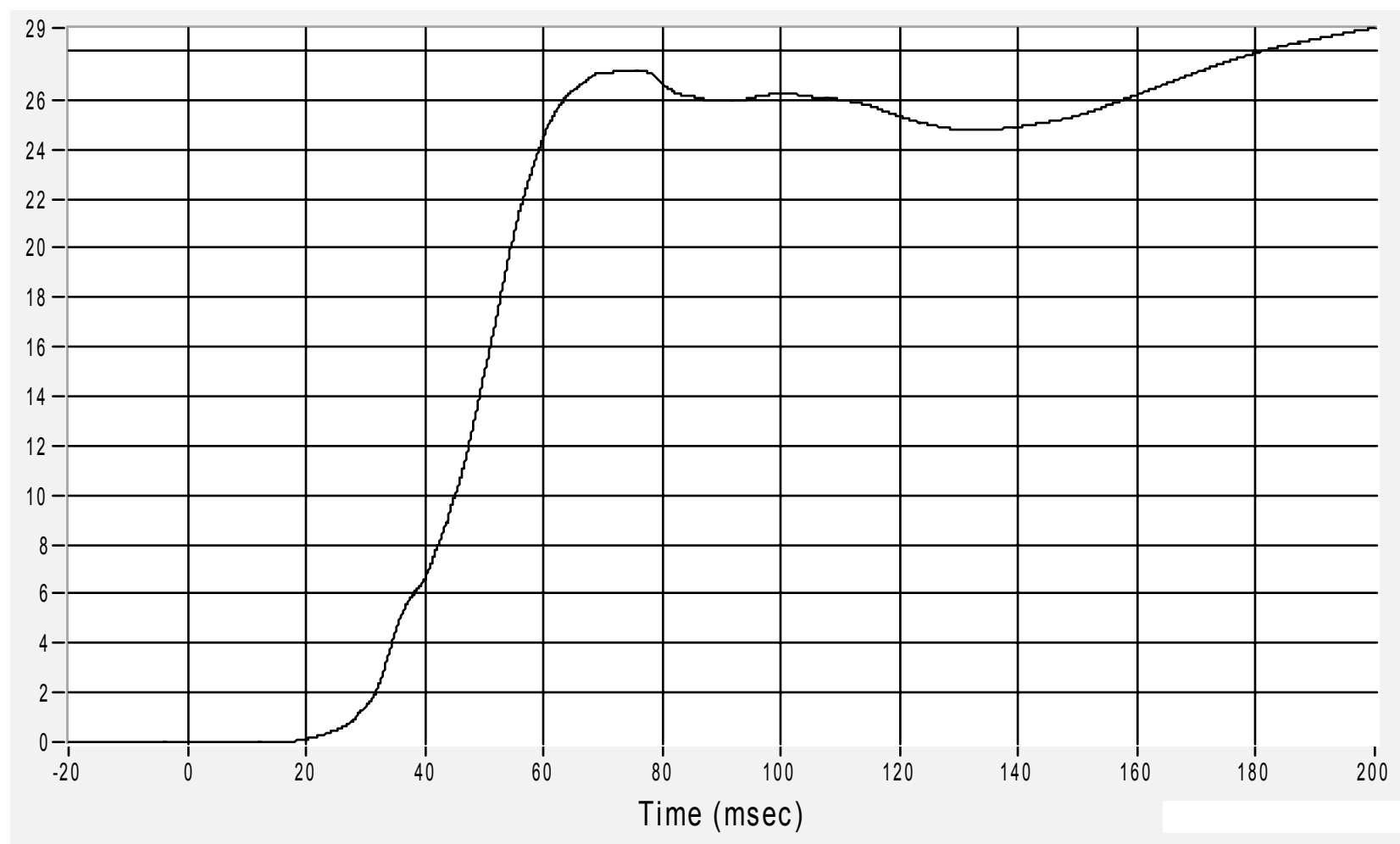
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**Driver Upper Rib (Y) Velocity - Redundant**

Velocity (km/h) CFC180

Max 28.9 km/h at 199.9 msec

Min 0.0 km/h at 0.0 msec



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21 January 2005

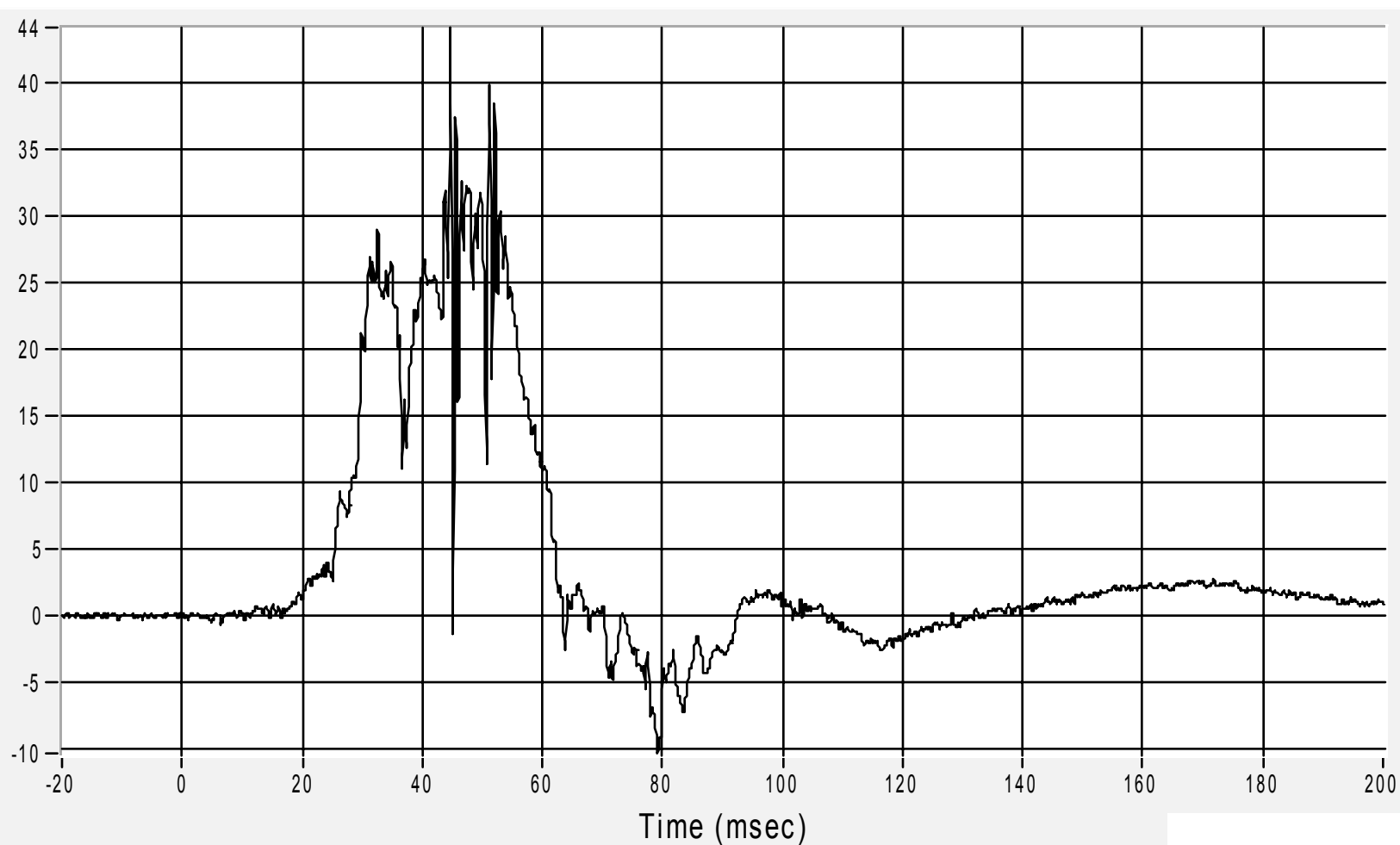
Medical College of Wisconsin  
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**Driver Lower Rib (Y) - Redundant Acceleration**

Acceleration (G's) CFC1000

Max 44.1 G at 44.6 msec

Min -10.3 G at 79.2 msec



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21 January 2005

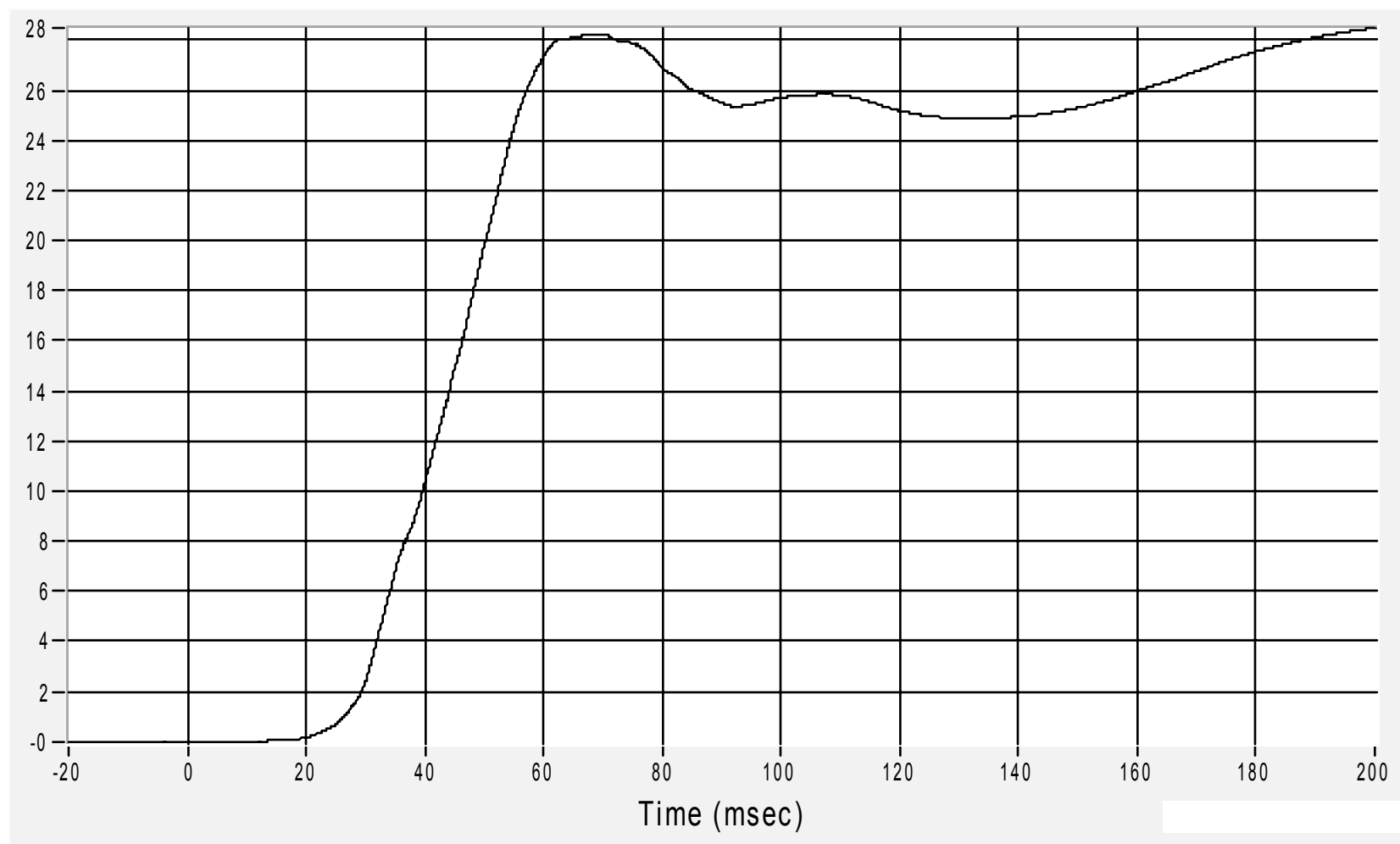
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**Driver Lower Rib (Y) Velocity - Redundant**

Velocity (km/h) CFC180

Max 28.5 km/h at 199.9 msec

Min 0.0 km/h at 7.3 msec



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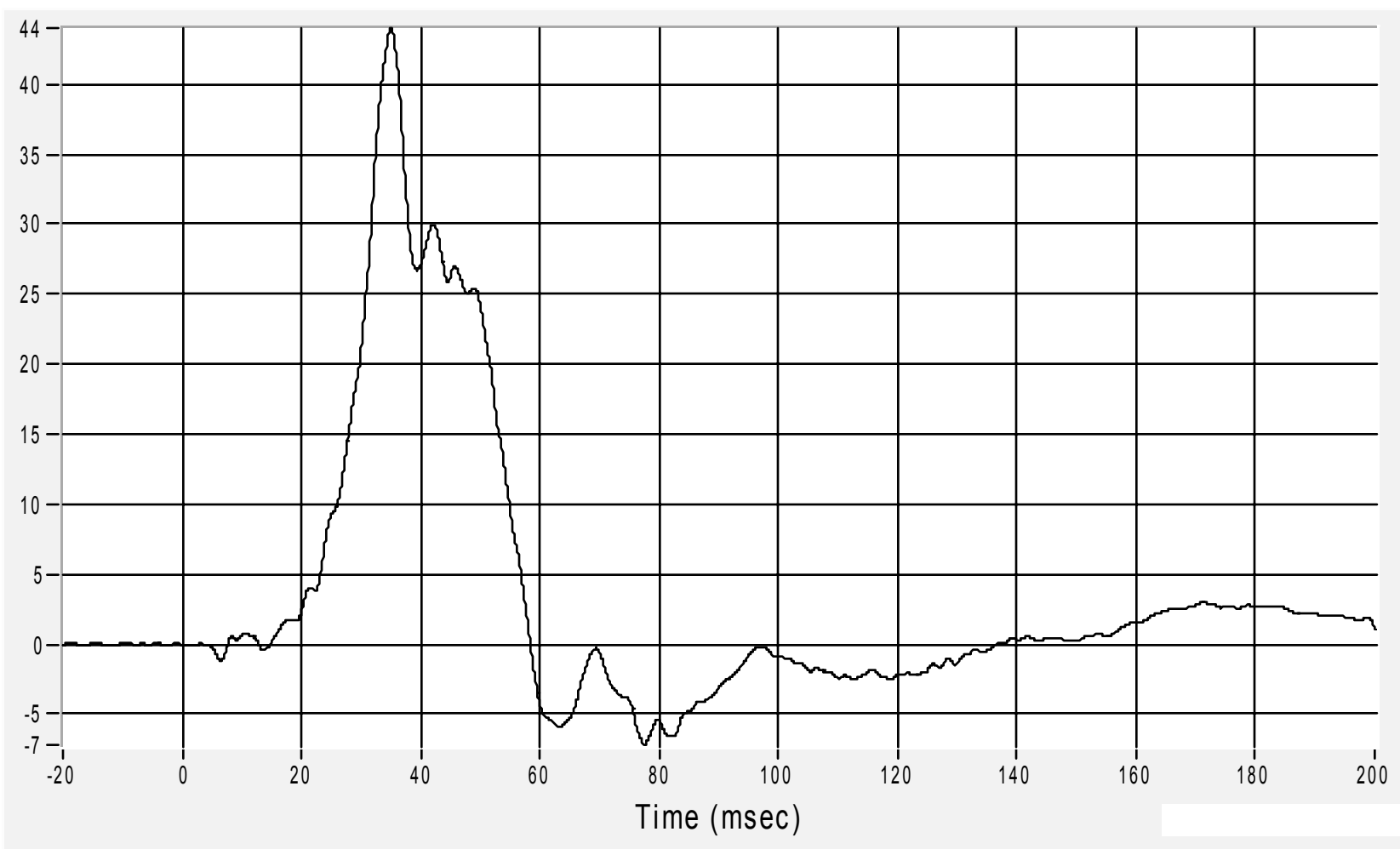
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**Driver Lower Spine (Y) - Redundant Acceleration**

Acceleration (G's) CFC180

Max 44.0 G at 35.0 msec

Min -7.2 G at 77.5 msec



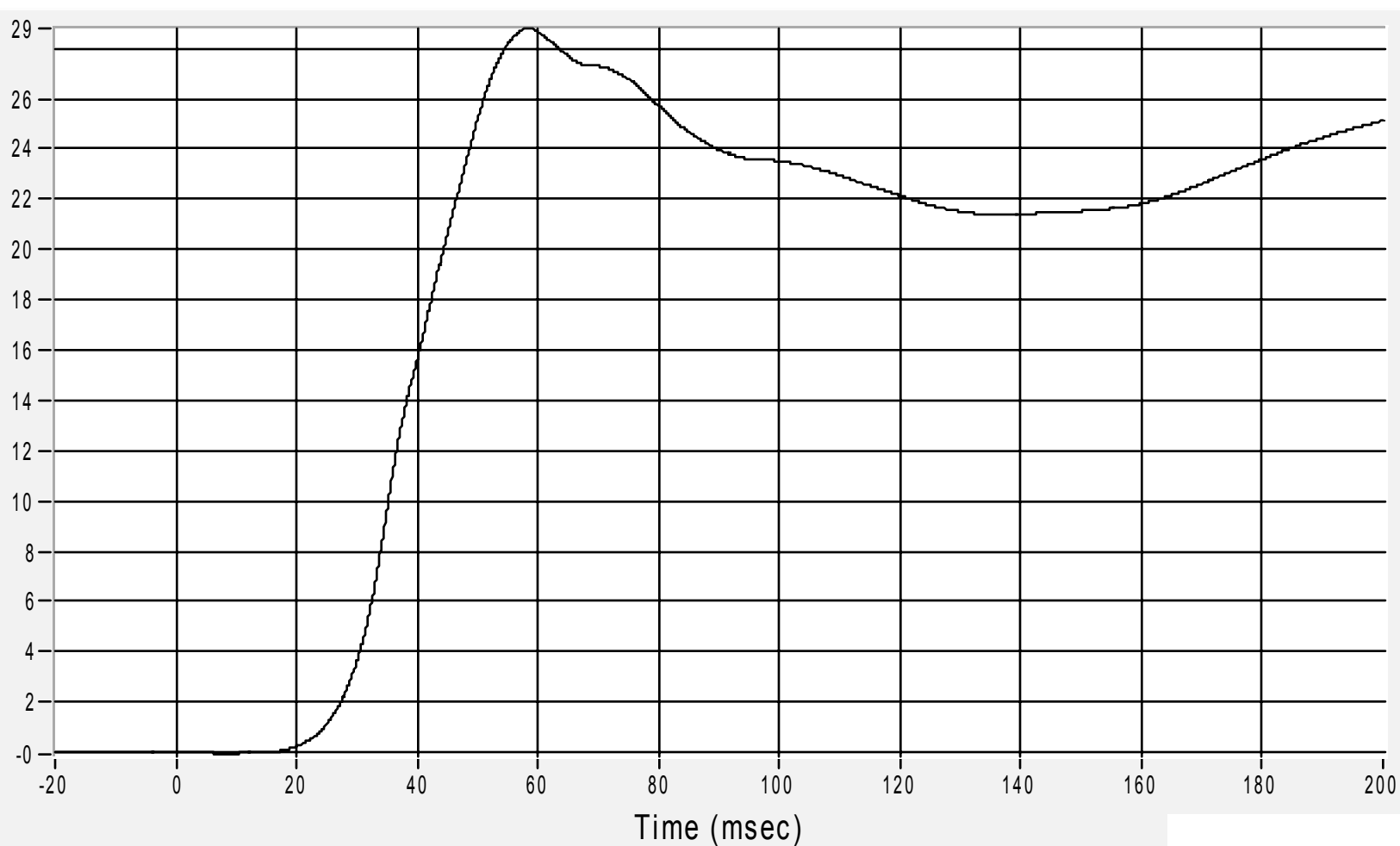
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**Driver Lower Spine (Y) Velocity - Redundant**

Velocity (km/h) CFC180

**Max 28.8 km/h at 58.4 msec****Min 0.0 km/h at 7.6 msec**

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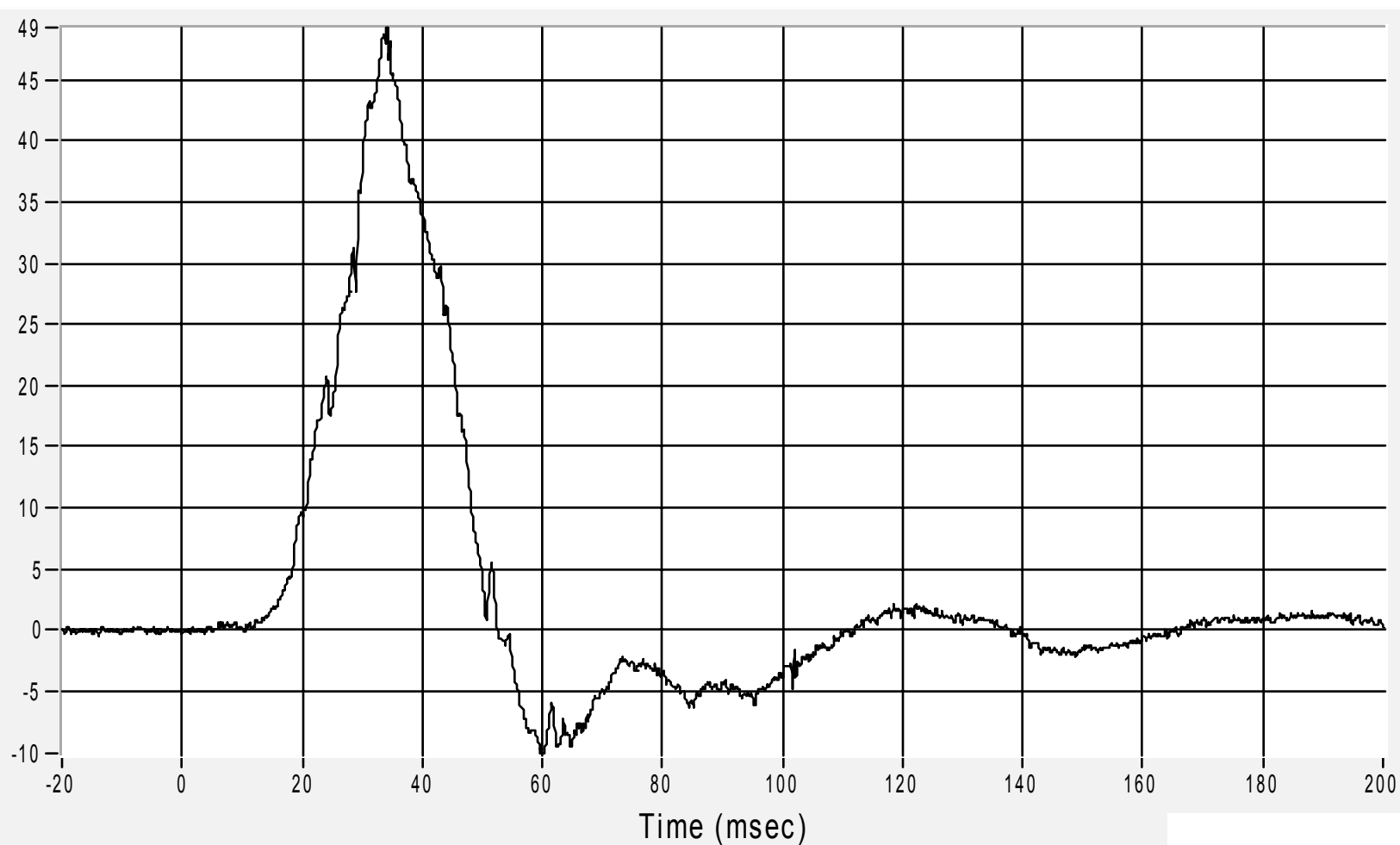


**Driver Pelvic (Y) - Redundant Acceleration**

Acceleration (G's) CFC1000

Max 49.3 G at 34.1 msec

Min -10.1 G at 59.8 msec



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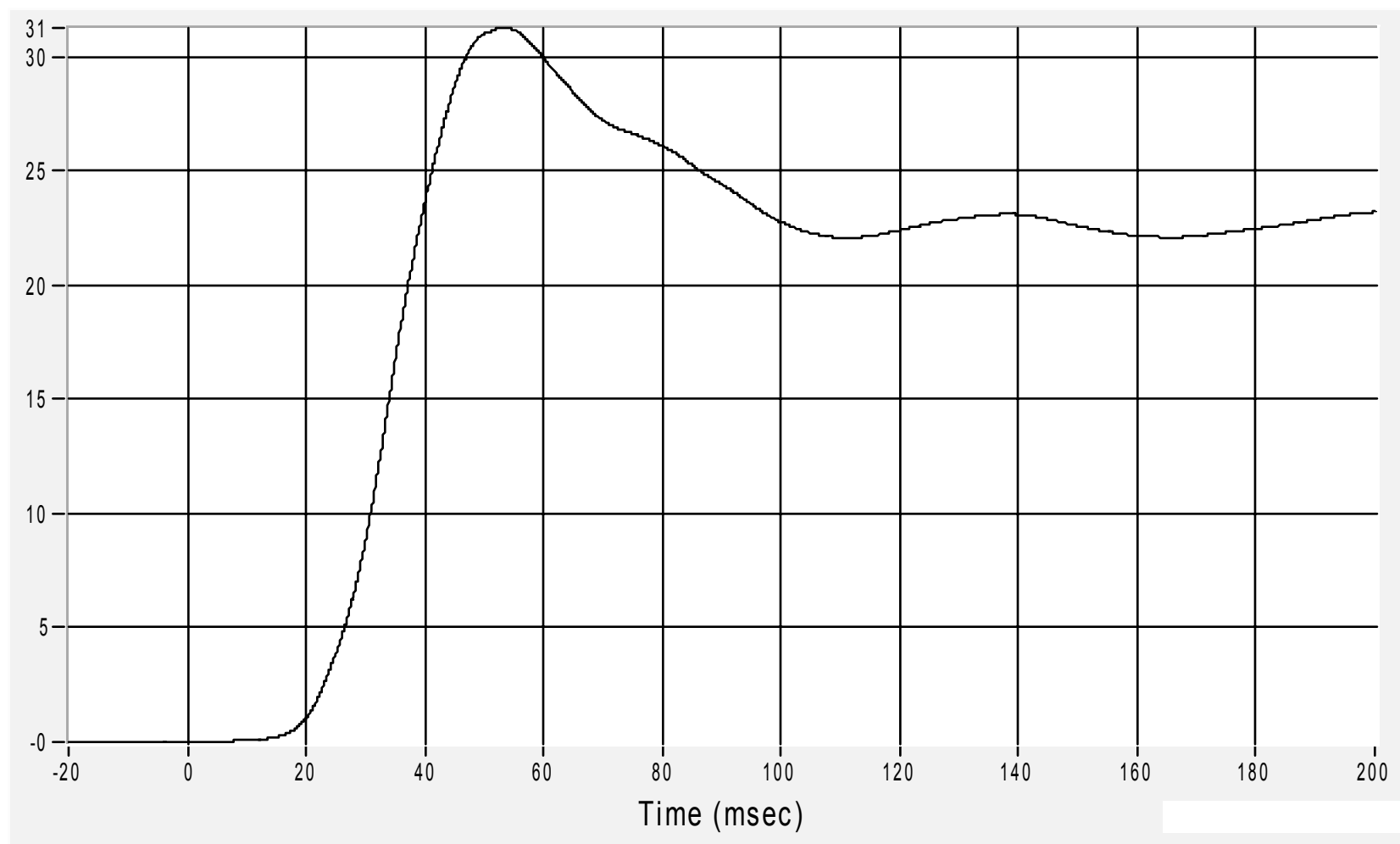
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**Driver Pelvic (Y) Velocity - Redundant**

Velocity (km/h) CFC180

Max 31.3 km/h at 52.8 msec

Min 0.0 km/h at 1.4 msec



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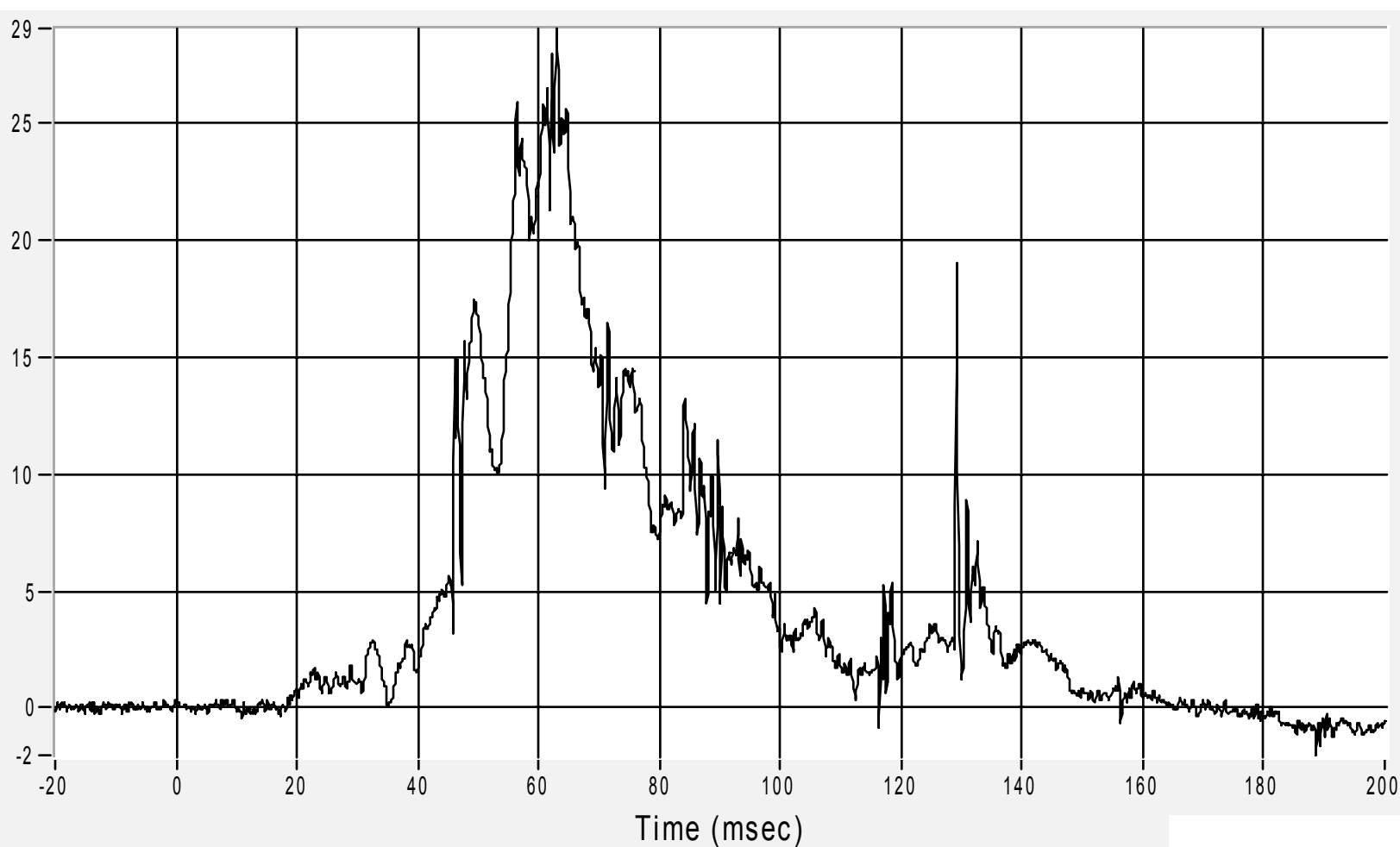
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**Passenger Upper Rib (Y) - Redundant Acceleration**

Acceleration (G's) CFC1000

Max 29.1 G at 63.0 msec

Min -2.0 G at 188.6 msec



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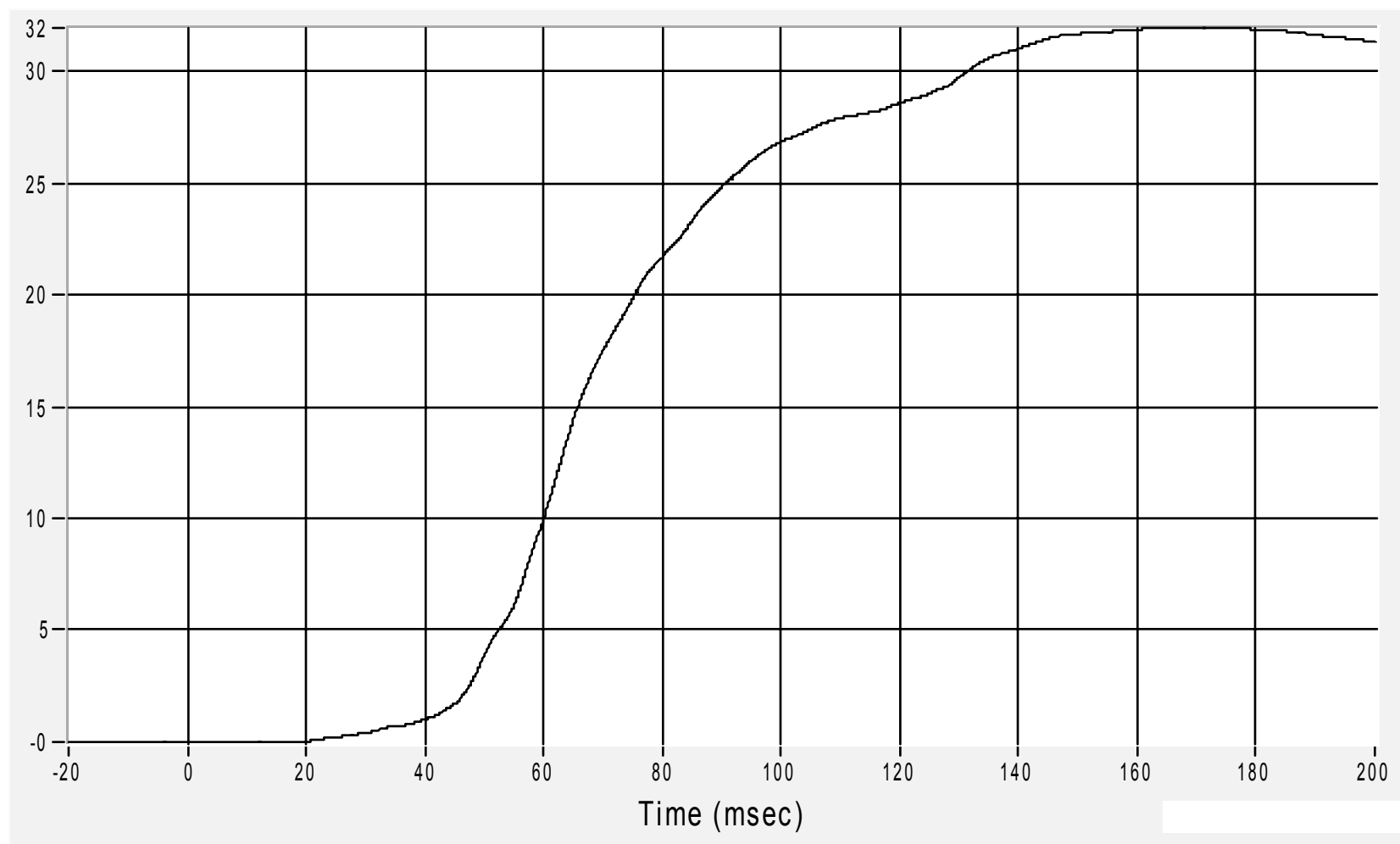
Medical College of Wisconsin  
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**Passenger Upper Rib (Y) Velocity - Redundant**

Velocity (km/h) CFC180

Max 31.9 km/h at 168.2 msec

Min 0.0 km/h at 13.6 msec



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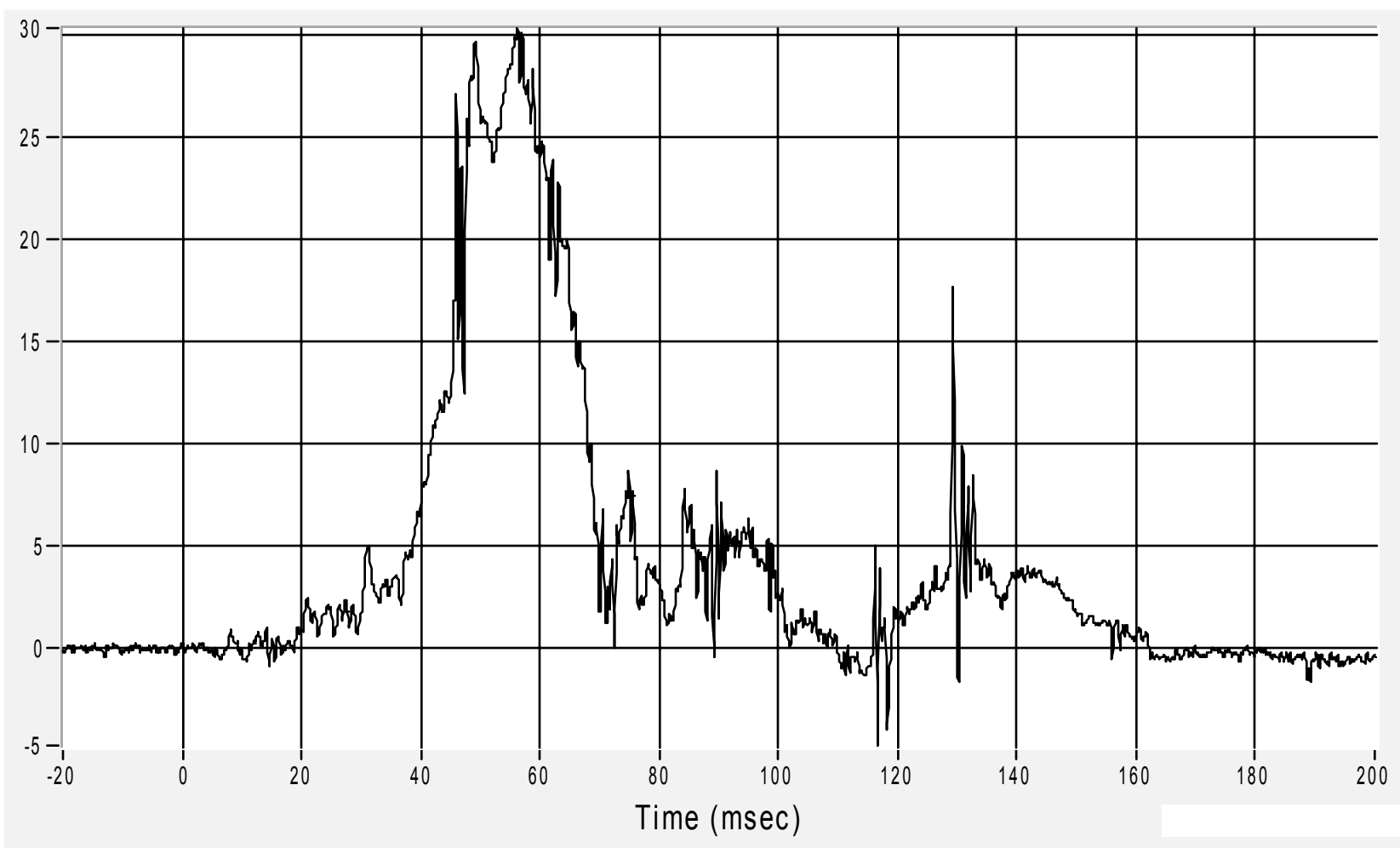
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**Passenger Lower Rib (Y) - Redundant Acceleration**

Acceleration (G's) CFC1000

Max 30.4 G at 56.2 msec

Min -4.8 G at 116.6 msec



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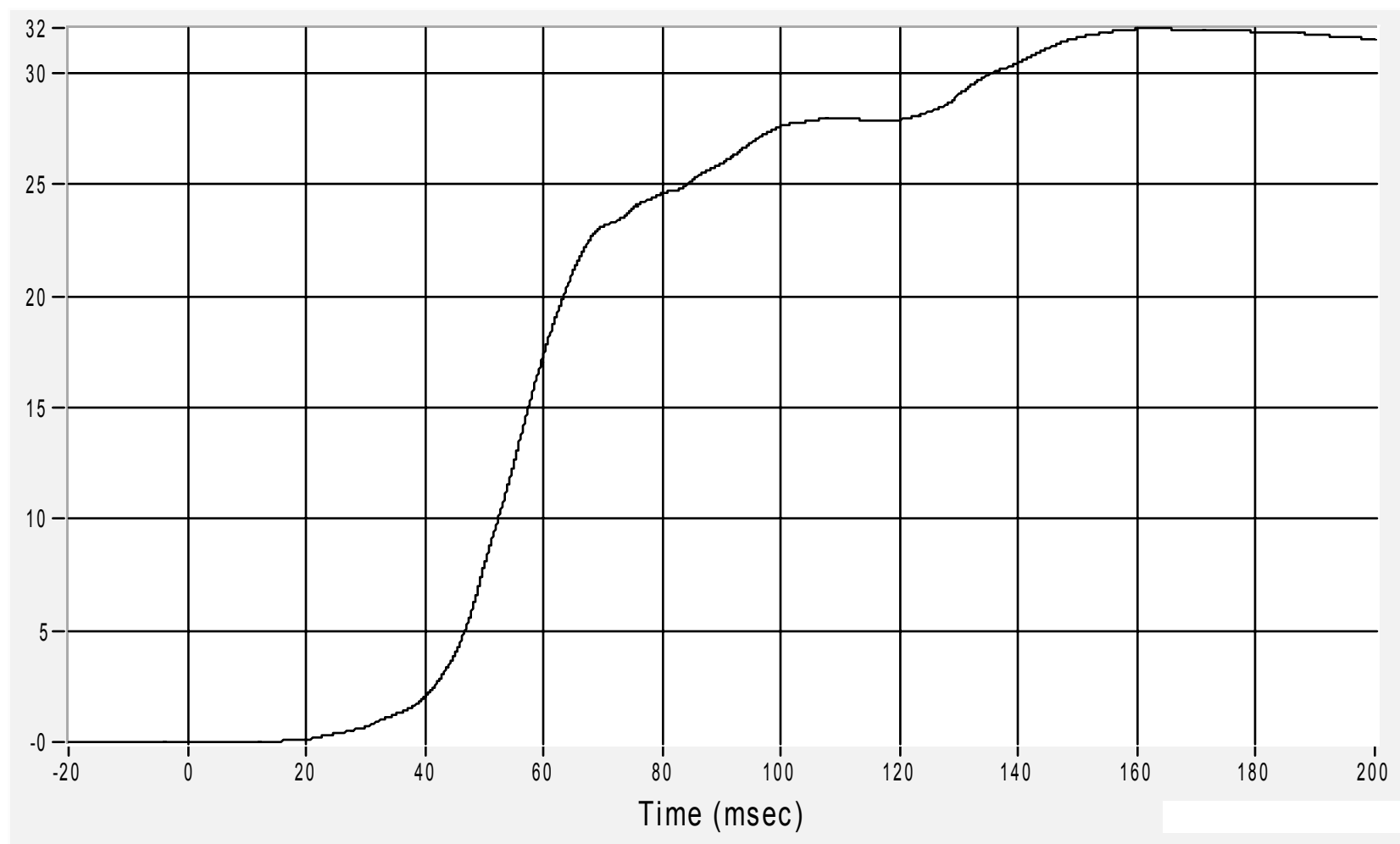
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**Passenger Lower Rib (Y) Velocity - Redundant**

Velocity (km/h) CFC180

Max 32.0 km/h at 162.2 msec

Min 0.0 km/h at 7.1 msec



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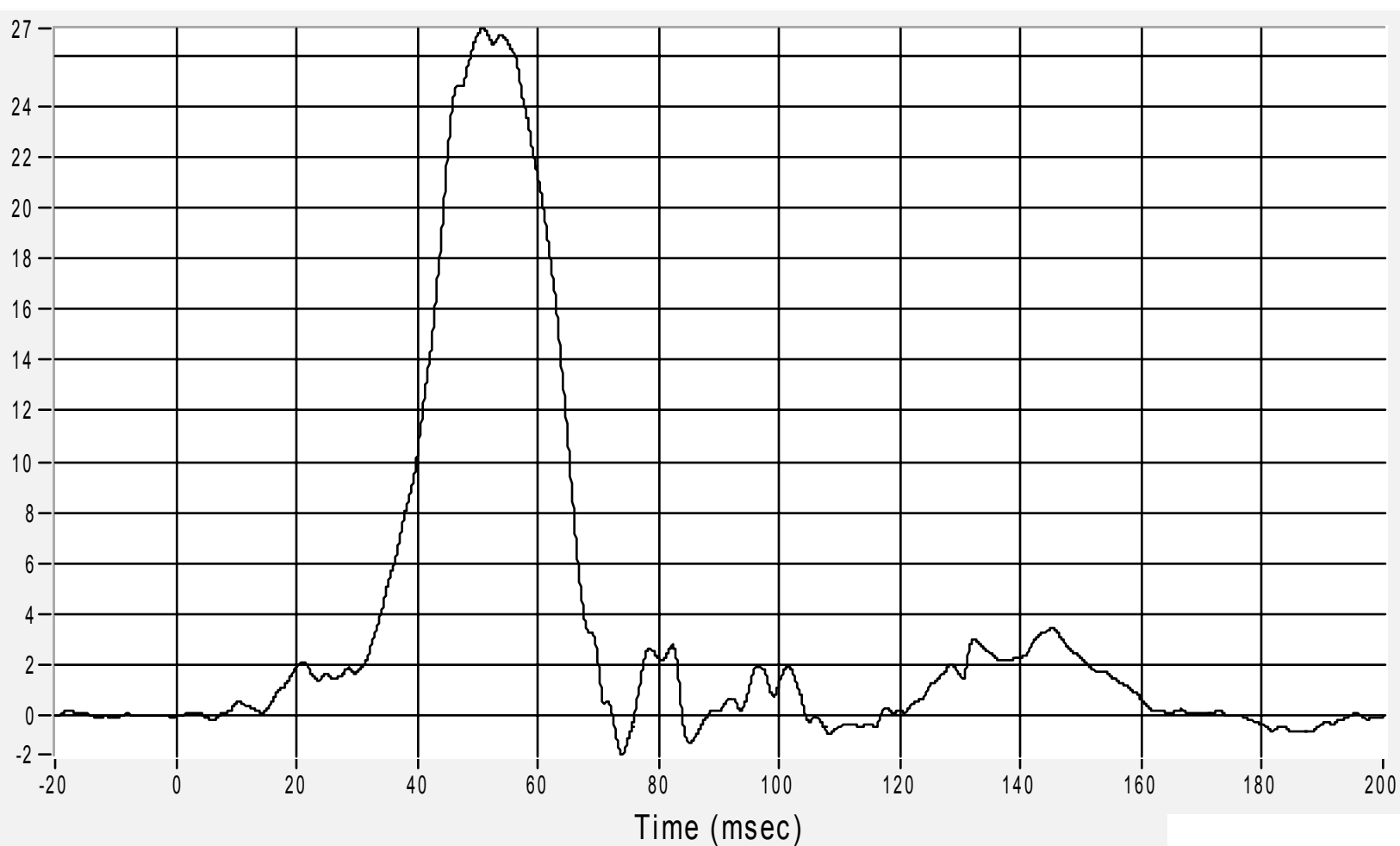


**Passenger Lower Spine (Y) - Redundant Acceleration**

Acceleration (G's) CFC180

Max 27.1 G at 50.9 msec

Min -1.6 G at 74.0 msec



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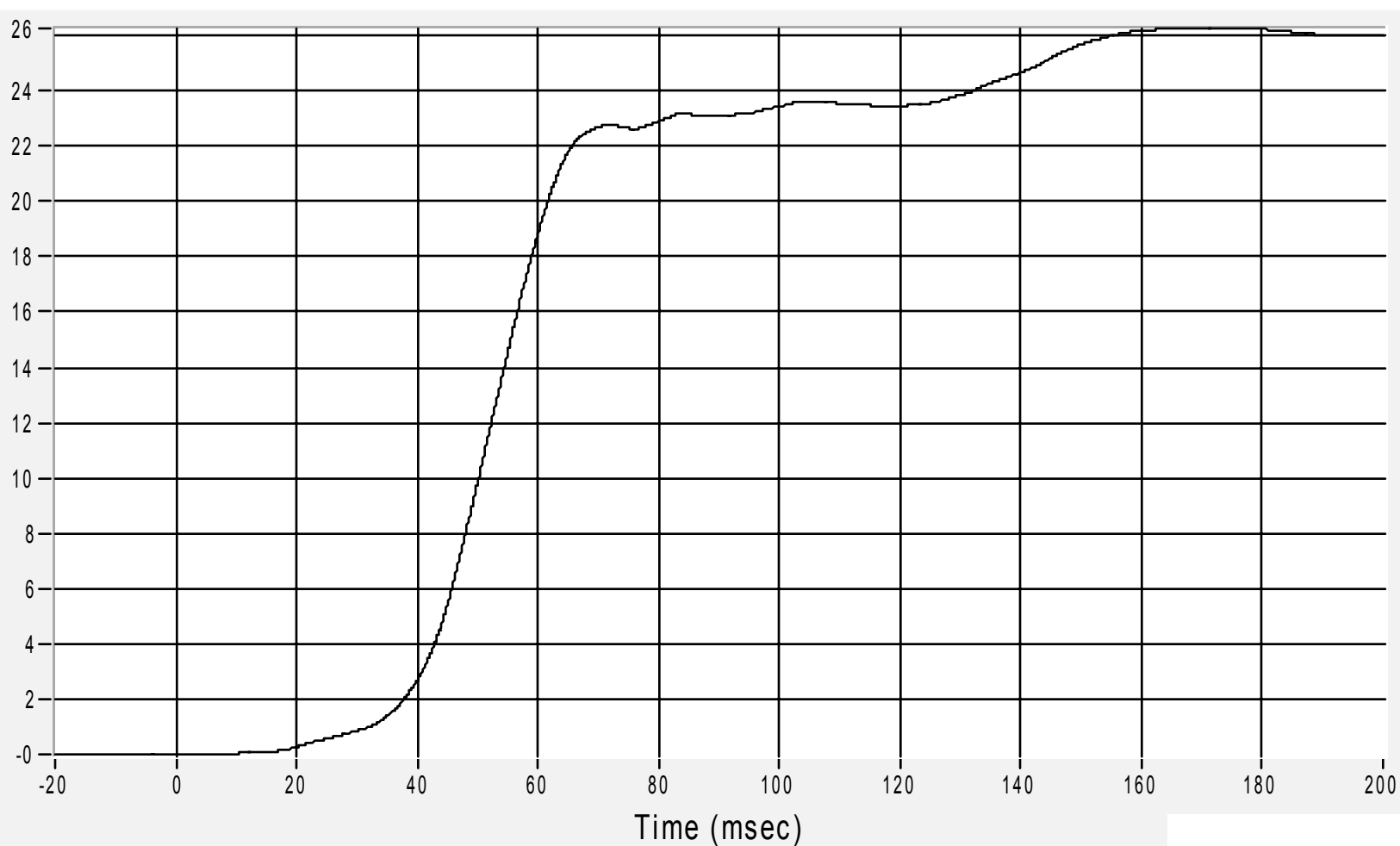
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**Passenger Lower Spine (Y) Velocity - Redundant**

Velocity (km/h) CFC180

Max 26.3 km/h at 174.0 msec

Min 0.0 km/h at 7.4 msec



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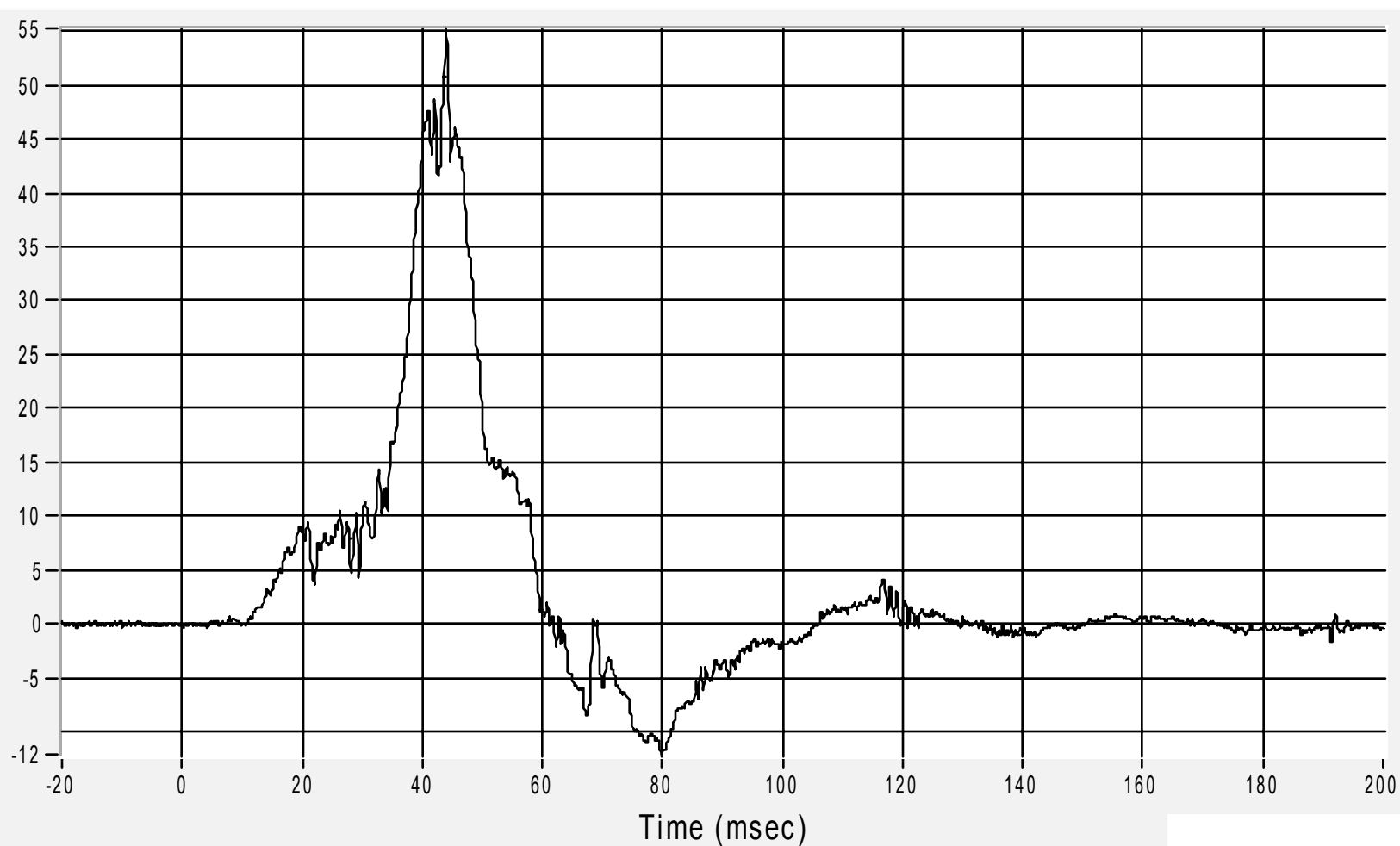
Medical College of Wisconsin  
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**Passenger Pelvic (Y) - Redundant Acceleration**

Acceleration (G's) CFC1000

Max 55.2 G at 44.0 msec

Min -12.1 G at 79.8 msec



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21 January 2005

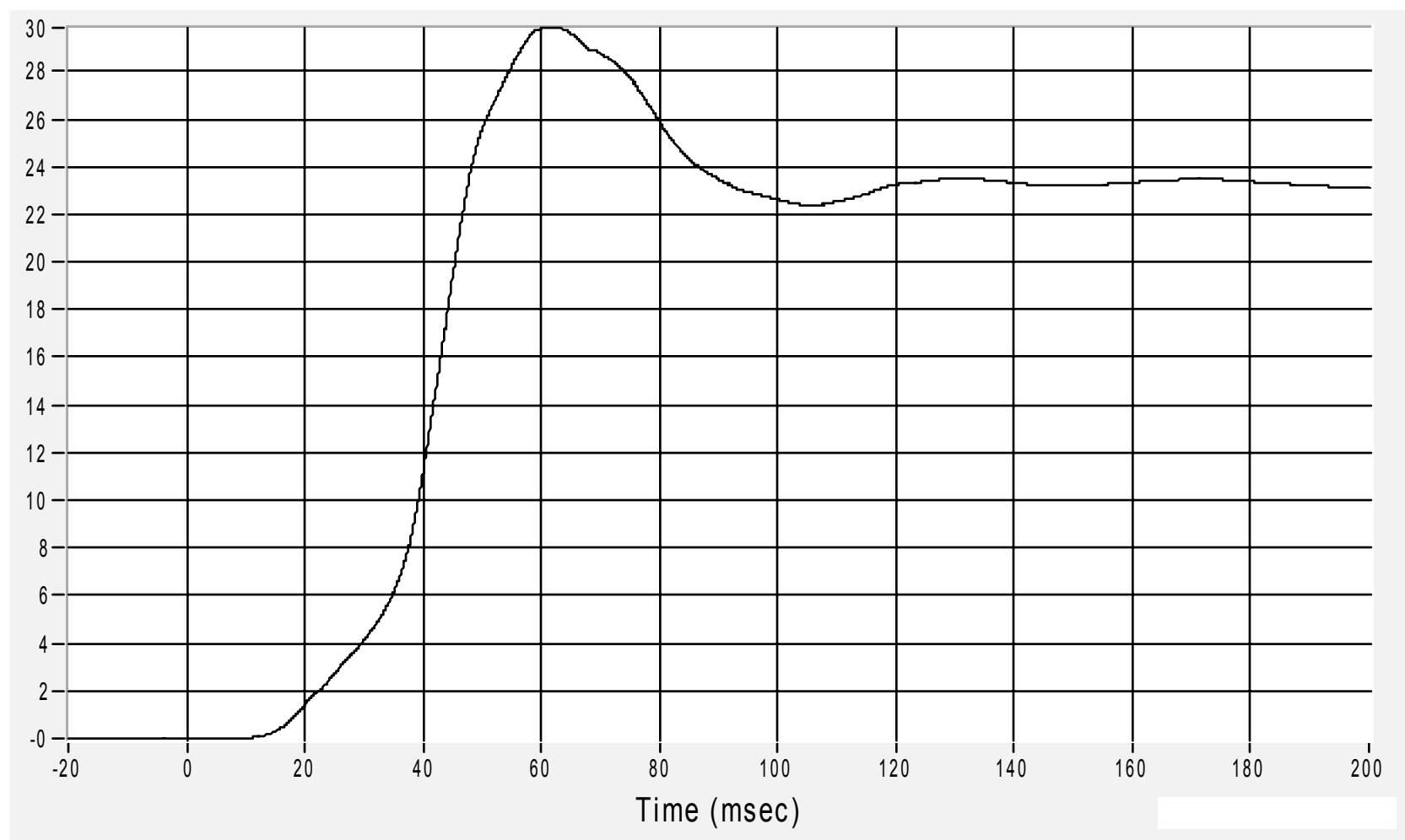
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Vehicle Crashworthiness Lab

**Passenger Pelvic (Y) Velocity - Redundant**

Velocity (km/h) CFC180

Max 29.8 km/h at 61.6 msec

Min 0.0 km/h at 4.6 msec



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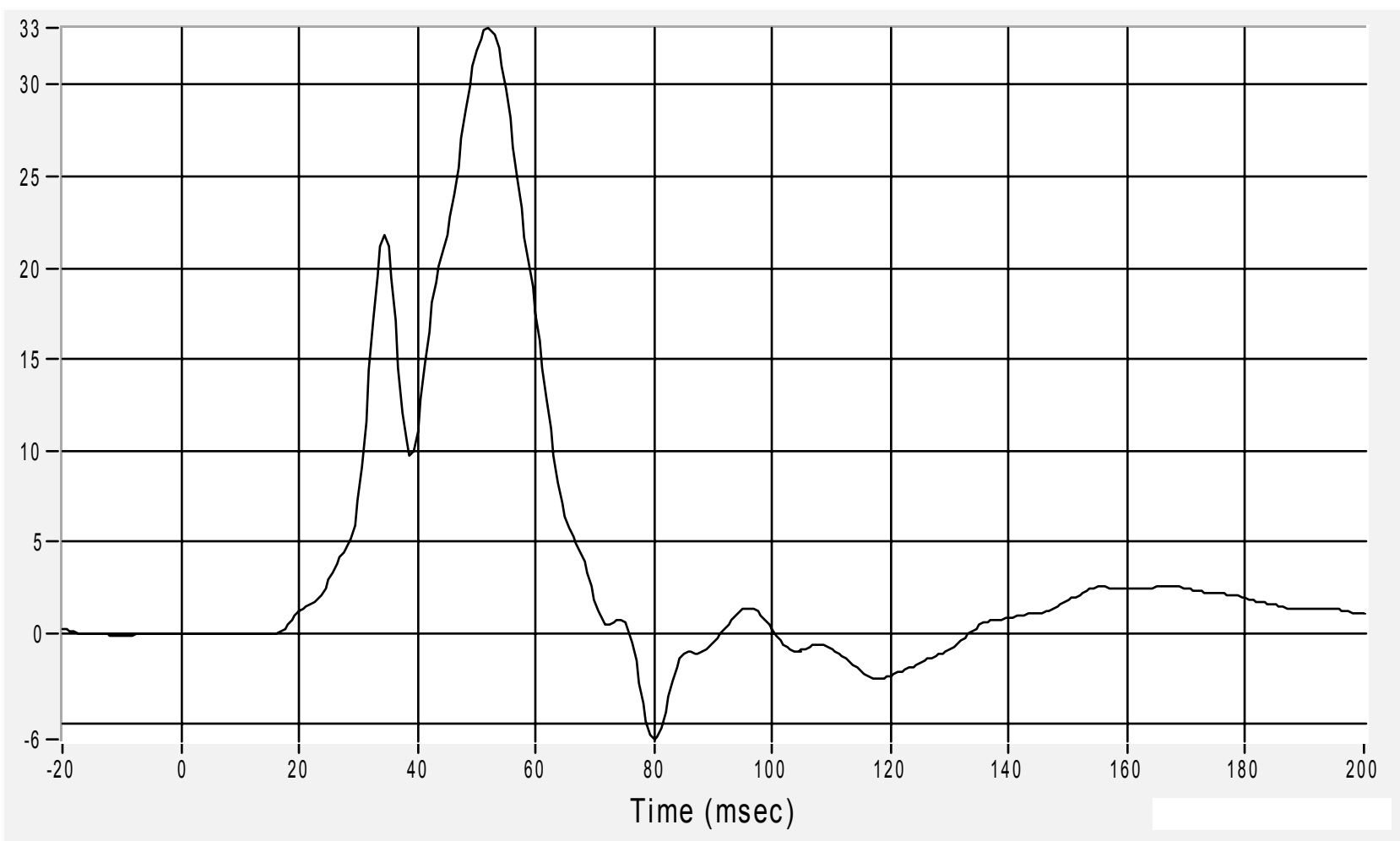
Medical College of Wisconsin  
Vehicle Crashworthiness Lab

**Driver Upper Rib (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

Max    33.1    G    at    51.9    msec

Min    -5.8    G    at    80.0    msec



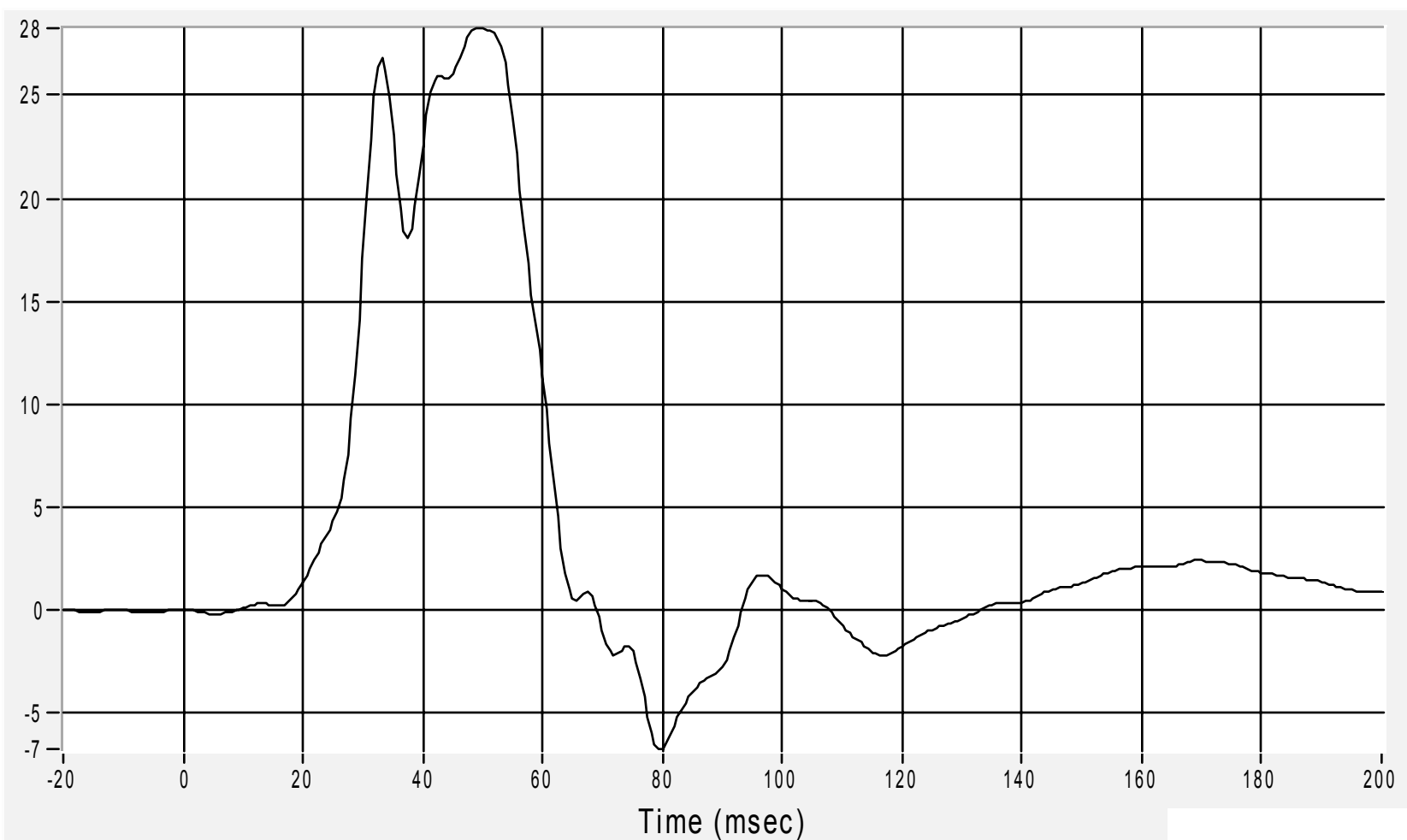
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**Driver Lower Rib (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

**Max    28.3    G    at    49.4    msec****Min    -6.7    G    at    79.4    msec**

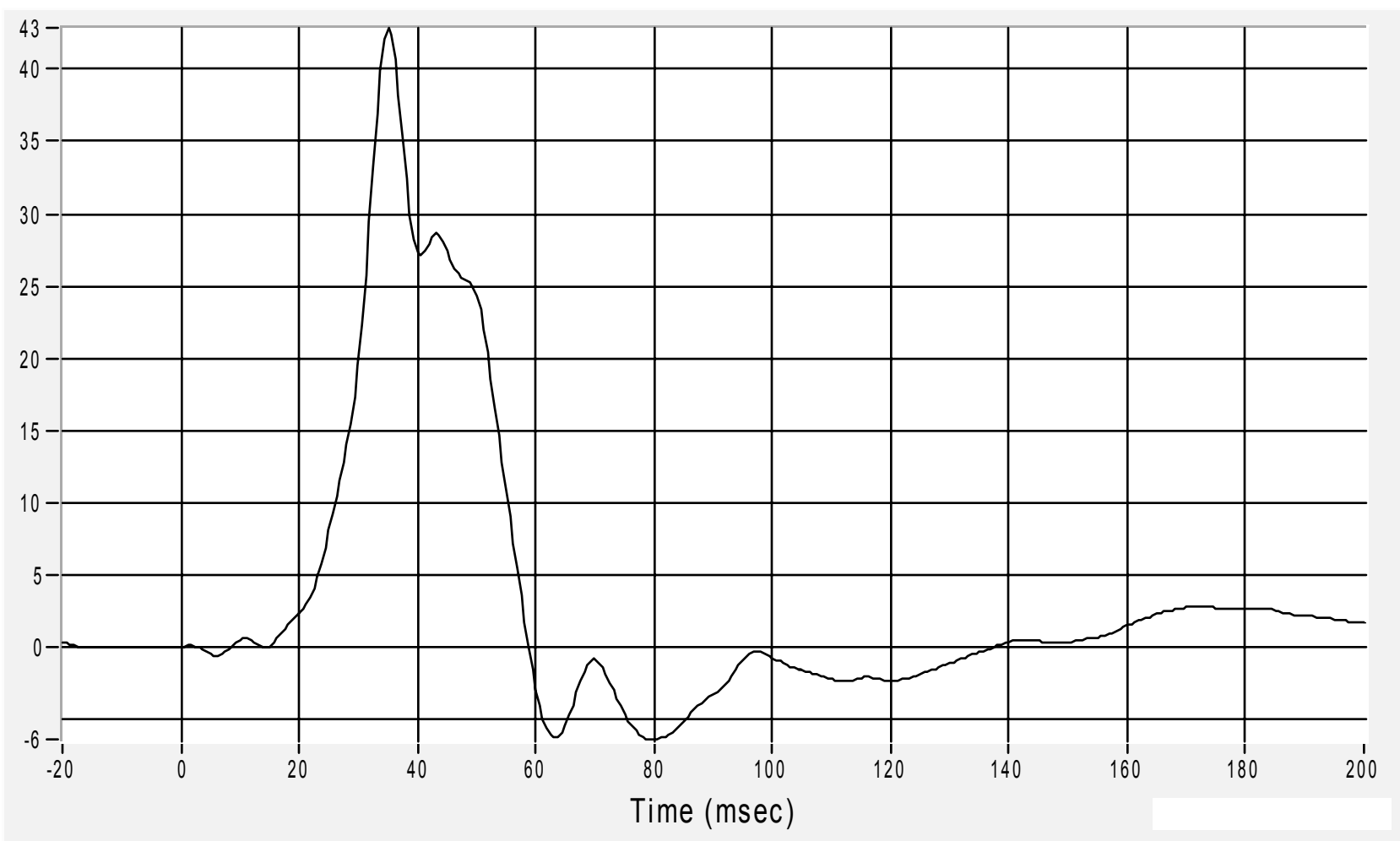
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21 January 2005

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**Driver Lower Spine (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

**Max    42.9    G    at    35.0    msec****Min    -6.4    G    at    79.4    msec**

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21 January 2005

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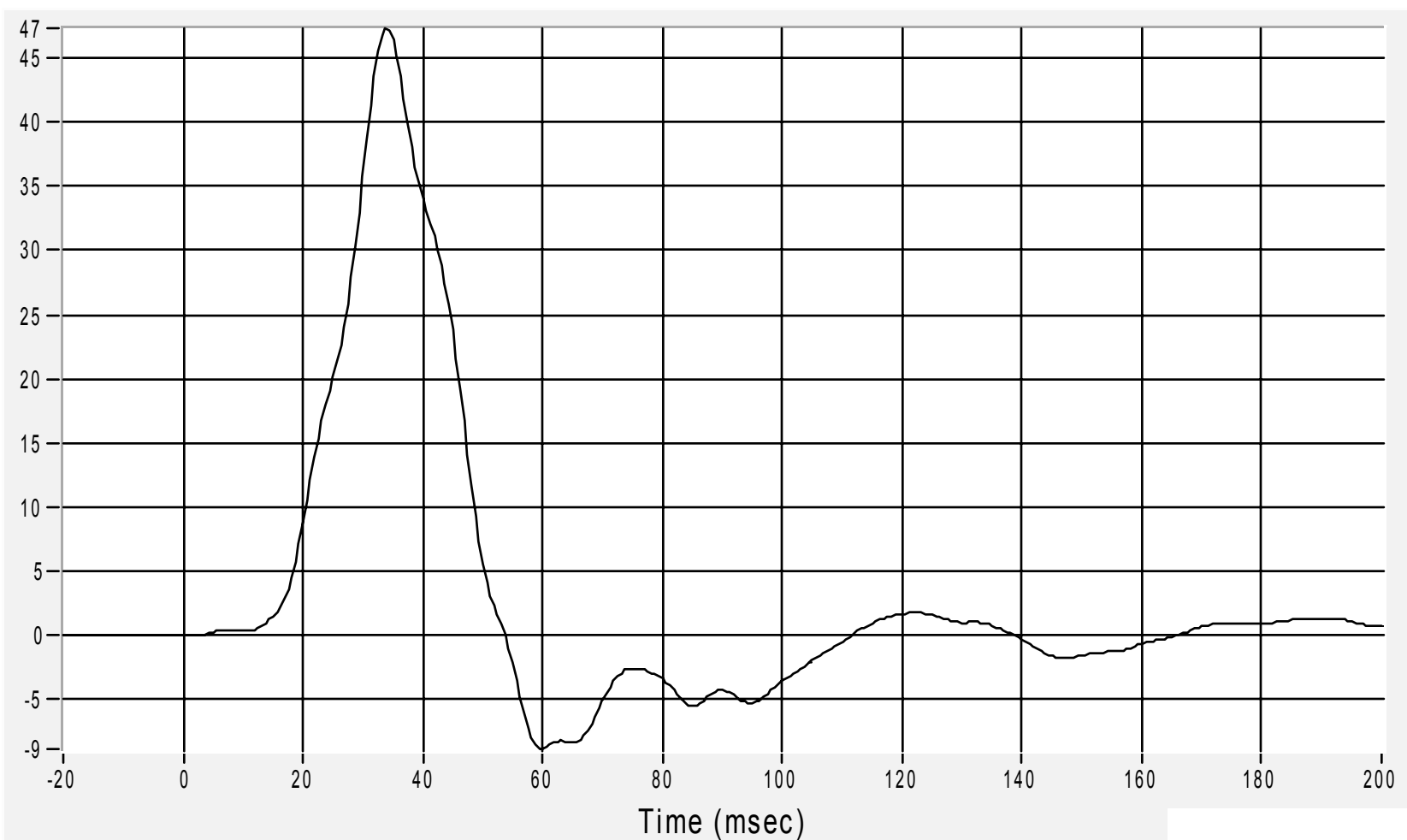


**Driver Pelvic (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

Max    47.3    G    at    33.8    msec

Min    -8.9    G    at    60.0    msec



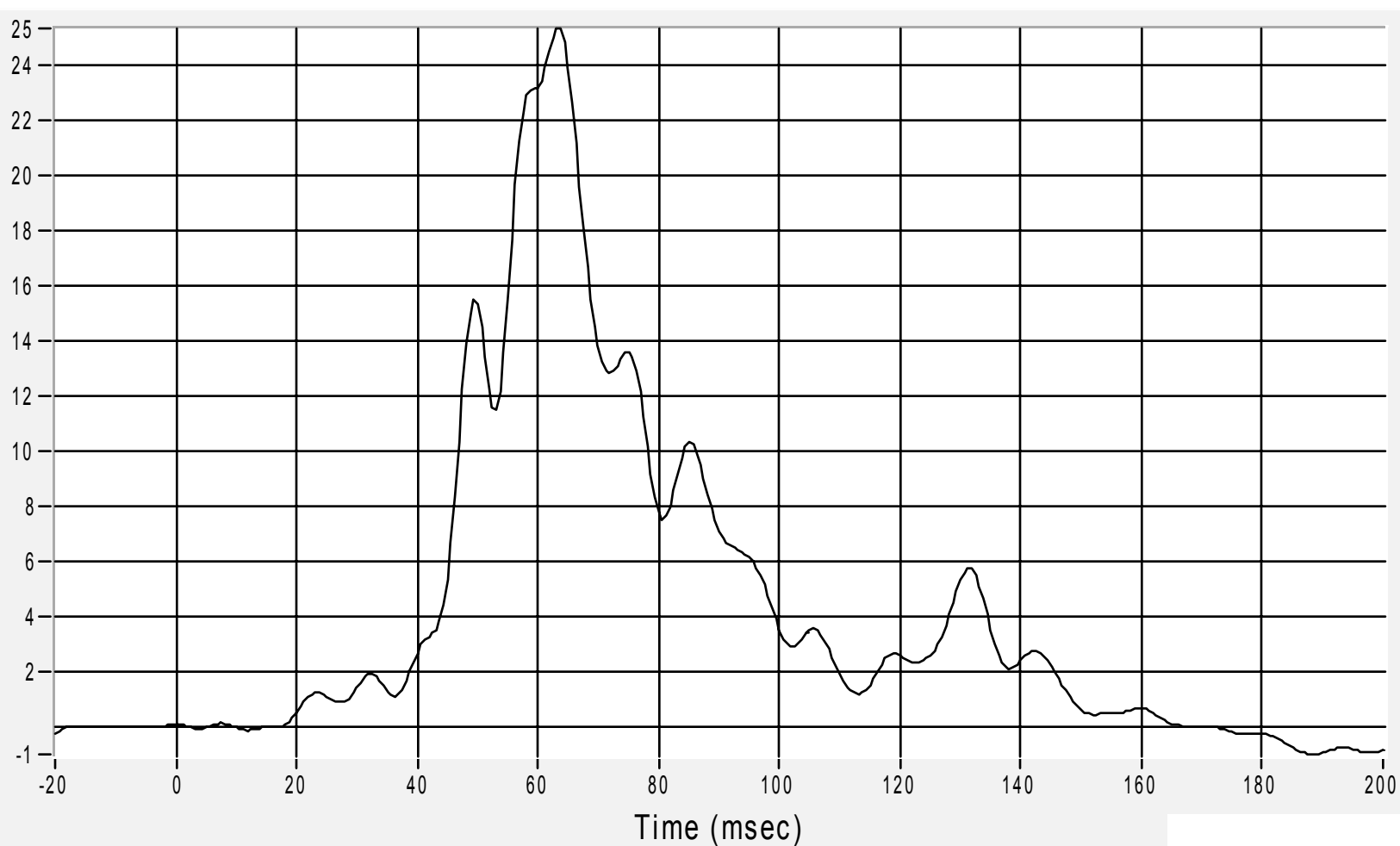
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**Passenger Upper Rib (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

**Max    25.4    G    at   63.1    msec****Min    -1.0    G    at   188.8    msec**

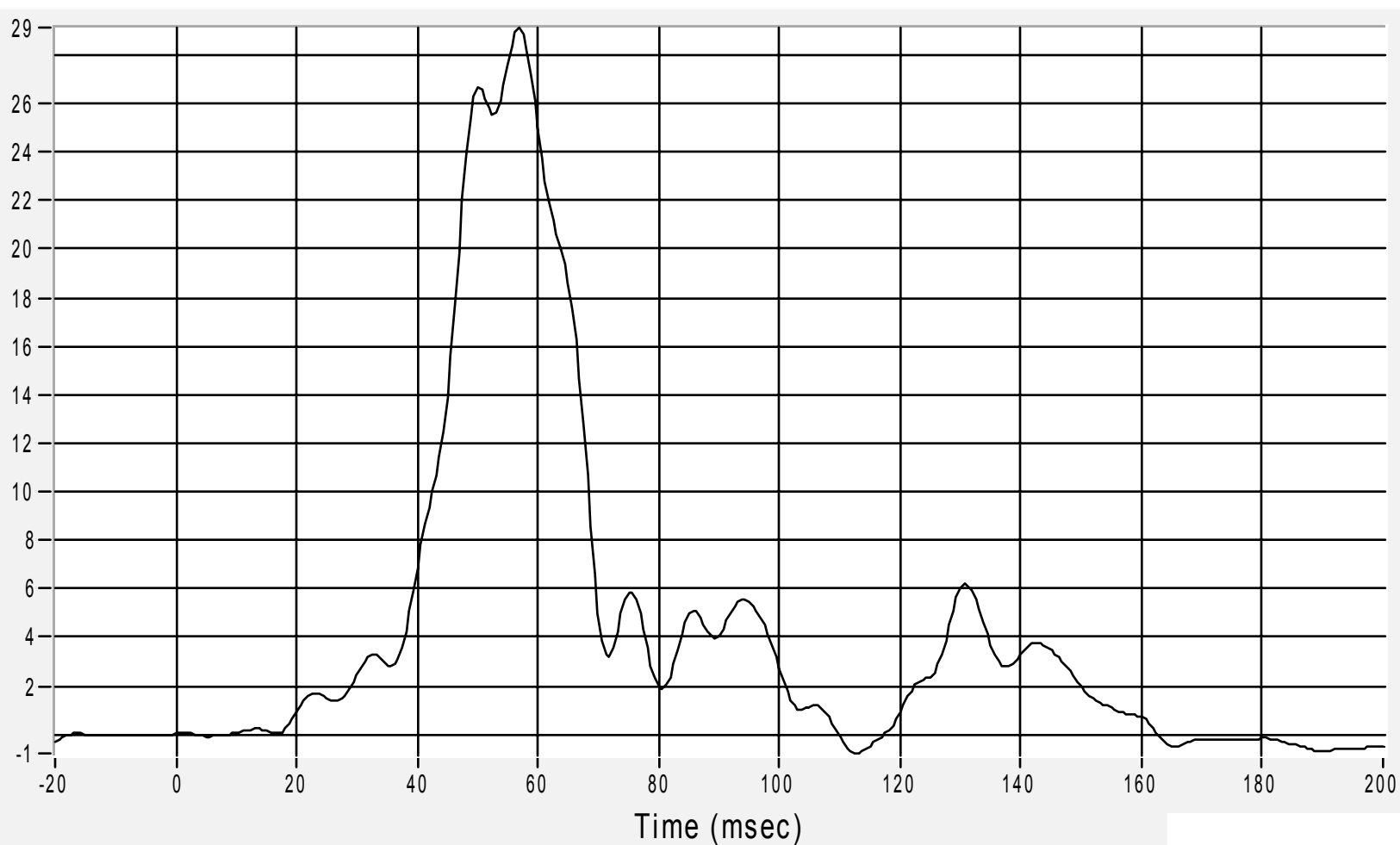
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**Passenger Lower Rib (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

**Max    29.1    G    at    56.9    msec****Min    -0.8    G    at    113.1    msec**

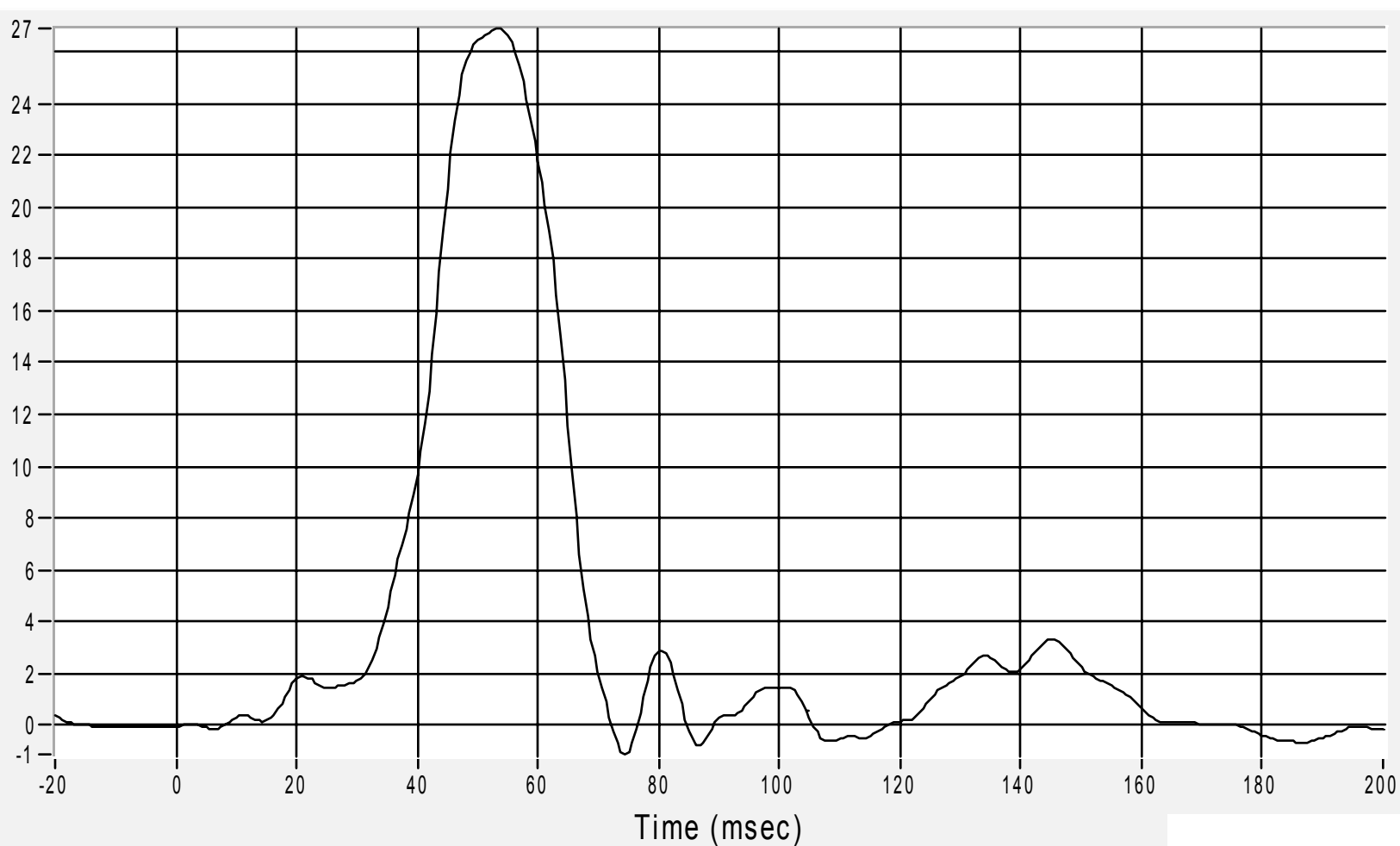
05SN05 - 2005 JEEP GRAND CHEROKEE LAREDO 4WD MPV

21 January 2005

*Medical College of Wisconsin  
Vehicle Crashworthiness Lab*

**Passenger Lower Spine (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

**Max    26.9    G    at    53.8    msec****Min    -1.1    G    at    74.4    msec**

05SN05 - 2005 JEEP GRAND CHEROKEE LAREDO 4WD MPV

21 January 2005

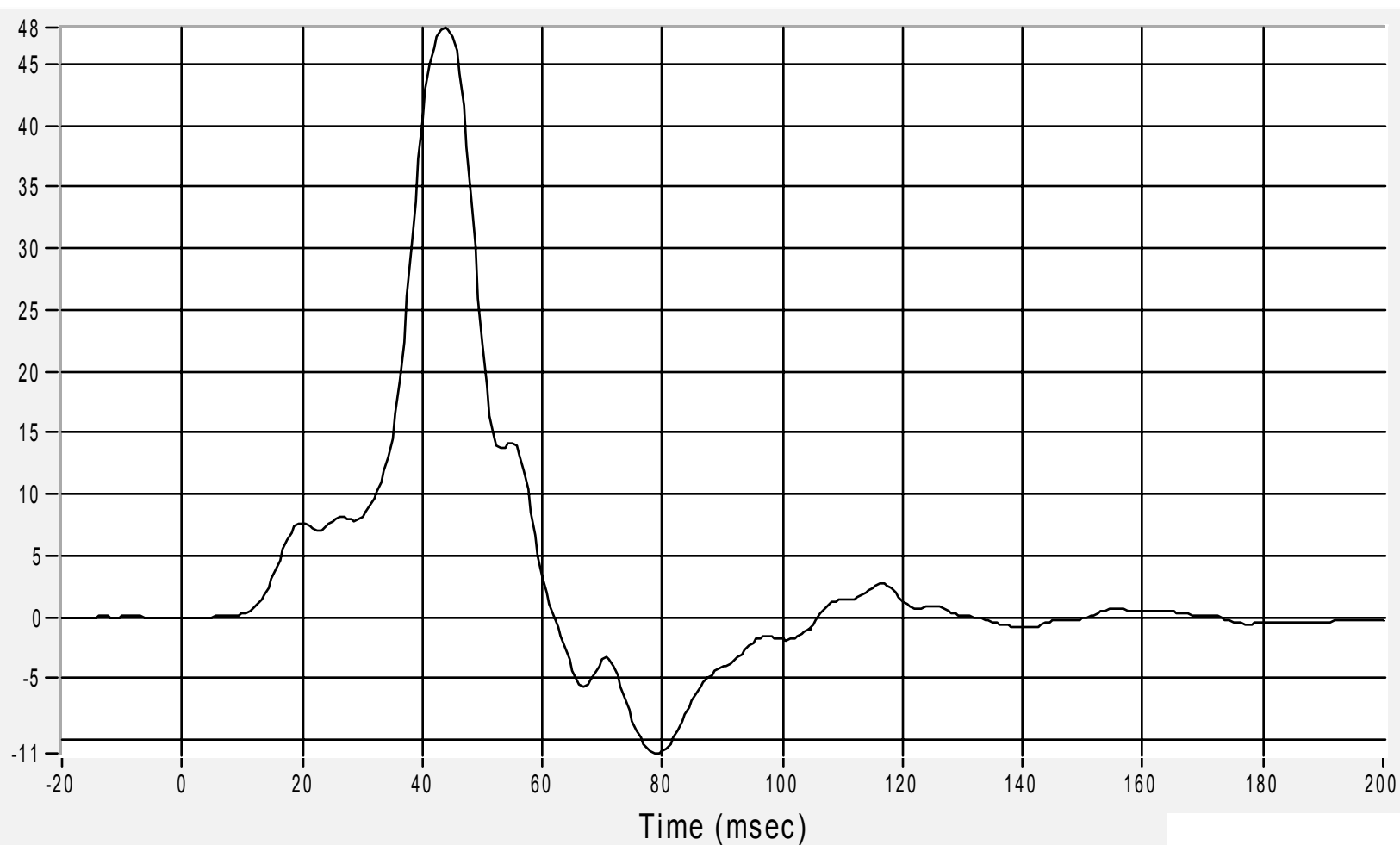
*Medical College of Wisconsin  
Vehicle Crashworthiness Lab*

**Passenger Pelvic (Y) - Redundant Acceleration**

Acceleration (G's)      FIR100

Max    48.0    G    at    43.8    msec

Min    -11.1    G    at    79.4    msec



05SN05 - 2005 JEEP GRAND CHEROKEE LAREDO 4WD MPV

21 January 2005

*Medical College of Wisconsin  
Vehicle Crashworthiness Lab*

## **APPENDIX C**

### **SID H3 CONFIGURATION AND VERIFICATION RESULTS**

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**VERIFICATION TEST RESULTS SUMMARY  
PRE AND POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial Number SID H3 056 Test Sequences 05 and 06

| TEST                         | PRE                   |            | POST                  |            |
|------------------------------|-----------------------|------------|-----------------------|------------|
|                              | COMMENTS              | BY         | COMMENTS              | BY         |
| EXTERNAL DIMENSIONS          | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| THORACIC SHOCK ABSORBER TEST | Pass all requirements | Mark Meyer | N/A                   | N/A        |
| LATERAL THORAX IMPACT TEST   | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LATERAL PELVIS IMPACT TEST   | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| ABDOMINAL COMPRESSION        | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LUMBAR FLEXION               | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL NECK TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL HEAD DROP | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |

SID Serial Number SID H3 058 Test Sequences 05 and 06

| TEST                         | PRE                   |            | POST                  |            |
|------------------------------|-----------------------|------------|-----------------------|------------|
|                              | COMMENTS              | BY         | COMMENTS              | BY         |
| EXTERNAL DIMENSIONS          | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| THORACIC SHOCK ABSORBER TEST | Pass all requirements | Mark Meyer | N/A                   | N/A        |
| LATERAL THORAX IMPACT TEST   | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LATERAL PELVIS IMPACT TEST   | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| ABDOMINAL COMPRESSION        | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| LUMBAR FLEXION               | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL NECK TEST | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |
| HYBRID III LATERAL HEAD DROP | Pass all requirements | Mark Meyer | Pass all requirements | Mark Meyer |

**SUMMARY**  
**SID H3 PRE AND POST VERIFICATION**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial Number      SID H3 056  
                                      SID H3 058

Test Sequences

05 and 06 (SID H3 056)  
05 and 06 (SID H3 058)

| TEST PARAMETER                      | SPECIFICATION | SID H3 056 |         | SID H3 058 |         |
|-------------------------------------|---------------|------------|---------|------------|---------|
|                                     |               | PRE        | POST    | PRE        | POST    |
| MEASUREMENTS                        |               |            |         |            |         |
| Date                                | -             | 17Jan05    | 27Jan05 | 17Jan05    | 26Jan05 |
| Sequential Test Number              | -             | 5          | 6       | 5          | 6       |
| Temperature (°C)                    | 18.9-25.5     | 19.7       | 21.3    | 20.0       | 22.2    |
| Relative Humidity (%)               | 10-70         | 17.5       | 21.0    | 18.1       | 24.2    |
| SH – Seated Height (mm)             | 889-909       | 907        | 908     | 908        | 908     |
| RH – Rib Height (mm)                | 501-521       | 503        | 506     | 509        | 511     |
| HP – Hip Pivot Height (mm)          | 99            | 99/99      | 99/99   | 99/99      | 99/99   |
| RD – Rib From Back Line (mm)        | 229-241       | 229        | 229     | 229        | 229     |
| KH – Knee Pivot from Back Line (mm) | 511-526       | 524/519    | 521/519 | 519/522    | 519/519 |
| KV – Knee Pivot to Floor (mm)       | 490-505       | 499/496    | 500/501 | 502/495    | 499/500 |
| HW – Hip Width (mm)                 | 356-391       | 364        | 364     | 363        | 365     |
| THORAX IMPACTS                      |               |            |         |            |         |
| Date                                | -             | 17Jan05    | 27Jan05 | 17Jan05    | 26Jan05 |
| Sequential Test Number              | -             | 5          | 6       | 5          | 6       |
| Temperature (°C)                    | 18.9-25.5     | 20.5       | 20.4    | 20.7       | 22.6    |
| Relative Humidity (%)               | 10-70         | 20.8       | 21.9    | 21.0       | 23.7    |
| Probe Speed (m/s)                   | 4.21-4.33     | 4.27       | 4.30    | 4.27       | 4.24    |
| Upper Rib Acceleration (G)          | 37-46         | 41.4       | 41.9    | 44.4       | 44.4    |
| Lower Rib Acceleration (G)          | 37-46         | 41.4       | 41.5    | 44.0       | 43.3    |
| Lower Spine Acceleration (G)        | 15-22         | 18.5       | 20.7    | 21.1       | 20.6    |
| PELVIS IMPACTS                      |               |            |         |            |         |
| Date                                | -             | 17Jan05    | 27Jan05 | 17Jan05    | 26Jan05 |
| Sequential Test Number              | -             | 5          | 6       | 5          | 6       |
| Temperature (°C)                    | 18.9-25.5     | 20.5       | 22.0    | 20.7       | 22.6    |
| Relative Humidity (%)               | 10-70         | 20.8       | 20.1    | 20.7       | 23.9    |
| Probe Speed (m/s)                   | 4.21-4.33     | 4.27       | 4.30    | 4.27       | 4.25    |
| Pelvis Acceleration (G)             | 40-60         | 48.8       | 54.7    | 50.9       | 46.5    |
| THORACIC SHOCK ABSORBER             |               |            |         |            |         |
| Shock Absorber ID Number            | -             | 1746       | N/A     | 3130164    | N/A     |
| Damper Setting                      | 1-10          | 6.25       |         | 5          |         |
| Date                                | -             | 18Dec04    |         | 17Dec04    |         |
| Sequential Test Number              | -             | 2          |         | 2          |         |
| Temperature                         | 18.9-25.5     | 19.7       |         | 22.0       |         |
| Relative Humidity                   | 10-70         | 24.0       |         | 21.1       |         |
| Probe Speed (m/s) Low               | 3.05          | 3.05       |         | 3.05       |         |
| Force (N)                           | 836 – 1125    | 983.2      |         | 1045.4     |         |
| Displacement (mm)                   | 30 – 35       | 32.7       |         | 30.0       |         |
| Probe Speed (m/s) Middle            | 4.27          | 4.27       |         | 4.27       |         |
| Force (N)                           | 1730 – 2099   | 1759.6     |         | 1873.7     |         |
| Displacement (mm)                   | 32 – 37       | 35.4       |         | 33.5       |         |
| Probe Speed (m/s) High              | 6.10          | 6.10       |         | 6.10       |         |
| Force (N)                           | 3741 – 4448   | 3903.9     |         | 4100.7     |         |
| Displacement (mm)                   | 33 - 40       | 37.0       |         | 35.1       |         |

| TEST PARAMETER                    | SPECIFICATION | SID H3 056 |         | SID H3 058 |         |
|-----------------------------------|---------------|------------|---------|------------|---------|
|                                   |               | PRE        | POST    | PRE        | POST    |
| ABDOMINAL COMPRESSION             |               |            |         |            |         |
| Date                              | -             | 12Jan05    | 24Jan05 | 12Jan05    | 25Jan05 |
| Sequential Test Number            | -             | 5          | 6       | 5          | 6       |
| Temperature (°C)                  | 18.9-25.5     | 24.5       | 20.6    | 24.4       | 22.6    |
| Relative Humidity (%)             | 10-70         | 28.5       | 26.0    | 28.5       | 23.3    |
| Force at 13 mm (N)                | 104-162       | 138.8      | 138.6   | 140.6      | 139.6   |
| Force at 19 mm (N)                | 163-221       | 201.9      | 190.0   | 191.0      | 189.1   |
| Force at 25 mm (N)                | 222-280       | 255.1      | 251.9   | 245.9      | 246.3   |
| Force at 33 mm (N)                | 325-391       | 360.4      | 247.0   | 338.3      | 338.0   |
| LUMBAR FLEXION                    |               |            |         |            |         |
| Date                              | -             | 12Jan05    | 25Jan05 | 12Jan05    | 25Jan05 |
| Sequential Test Number            | -             | 5          | 6       | 5          | 6       |
| Temperature (°C)                  | 18.9-25.5     | 24.1       | 22.9    | 23.5       | 23.1    |
| Relative Humidity (%)             | 10-70         | 28.0       | 23.9    | 29.0       | 23.2    |
| Force at 0° (N)                   | 0-26.7        | 0          | 0       | 0          | 0       |
| Force at 0° (N)                   | 97.8-151.2    | 119.8      | 126.1   | 103.1      | 120.6   |
| Force at 0° (N)                   | 151.2-204.6   | 160.1      | 159.3   | 161.2      | 170.3   |
| Force at 0° (N)                   | 204.6-258     | 207.9      | 220.4   | 210.5      | 209.0   |
| Return Angle                      | 12° Maximum   | 8.6        | 5.2     | 6.3        | 3.6     |
| HYBRID III LATERAL NECK           |               |            |         |            |         |
| Date                              | -             | 14Jan05    | 25Jan05 | 13Jan05    | 26Jan05 |
| Sequential Test Number            | -             | 5          | 6       | 5          | 6       |
| Temperature (°C)                  | 18.9-25.5     | 20.7       | 20.0    | 20.0       | 20.0    |
| Relative Humidity (%)             | 10-70         | 21.7       | 30.3    | 31.6       | 25.9    |
| Pendulum Speed (m/s)              | 6.89-7.13     | 7.08       | 7.10    | 7.08       | 7.08    |
| Pendulum Pulse 10ms (m/s)         | 1.96-2.55     | 2.15       | 2.02    | 2.07       | 2.17    |
| Pendulum Pulse 20ms (m/s)         | 4.12-5.10     | 4.40       | 4.18    | 4.17       | 4.46    |
| Pendulum Pulse 30ms (m/s)         | 5.73-7.01     | 6.25       | 5.94    | 6.28       | 6.49    |
| Pendulum Pulse 40 –70 ms (m/s)    | 6.27-7.64     | 7.14       | 7.55    | 7.43       | 7.20    |
| Max Head rotation (deg)           | 66-82         | 74.0       | 69.7    | 66.2       | 72.5    |
| Head angle crosses zero (ms)      | 58-67         | 64.2       | 61.5    | 59.8       | 59.0    |
| Peak Moment (Nm)                  | 73-88         | 78.1       | 74.5    | 73.7       | 74.0    |
| Moment crosses zero (ms)          | 49-64         | 53.0       | 51.8    | 52.2       | 53.8    |
| Max rotation wrt peak moment (ms) | 2-15          | 9.0        | 5.5     | 9.2        | 11.1    |
| HYBRID III LATERAL HEAD DROP      |               |            |         |            |         |
| Date                              | -             | 12Jan05    | 24Jan05 | 12Jan05    | 24Jan05 |
| Sequential Test Number            | -             | 5          | 6       | 5          | 6       |
| Temperature (°C)                  | 18.9-25.5     | 22.7       | 21.0    | 23.0       | 21.3    |
| Relative Humidity (%)             | 10-70         | 29.2       | 25.9    | 29.2       | 25.4    |
| Resultant Max (G)                 | 120-150       | 130.4      | 121.3   | 133.1      | 139.6   |
| Longitudinal Max (G)              | <15           | 6.2        | 1.3     | 1.3        | 9.3     |

**DUMMY INSPECTION LIST  
PRE AND POST TEST**

**CONFIGURED FOR LEFT SIDE IMPACT**

SID Serial Number

SID H3 056

Test Sequences

05 and 06 (SID H3 056)

SID H3 058

05 and 06 (SID H3 058)

|                 |                                                      | SID H3 056 |            | SID H3 058 |            |
|-----------------|------------------------------------------------------|------------|------------|------------|------------|
|                 |                                                      | PRE        | POST       | PRE        | POST       |
|                 | Date                                                 | 20Jan05    | 24Jan05    | 20Jan05    | 24Jan05    |
|                 | Performed By                                         | Mark Meyer | Mark Meyer | Mark Meyer | Mark Meyer |
| PART            | INSPECTION                                           |            |            |            |            |
| Skin            | Visual                                               | Pass       | Pass       | Pass       | Pass       |
| Head            | Visual, Ballast,<br>Accelerometer Mount              | Pass       | Pass       | Pass       | Pass       |
| Neck            | Visual and Palpated,<br>Cable Torque                 | Pass       | Pass       | Pass       | Pass       |
| Spine Box       | Visual, Ballast,<br>Weldment,<br>Accelerometer Mount | Pass       | Pass       | Pass       | Pass       |
| Rib Cage        | Visual, Palpated,<br>Measured, Stiffness             | Pass       | Pass       | Pass       | Pass       |
| Sternum         | Visual                                               | Pass       | Pass       | Pass       | Pass       |
| Lumbar<br>Spine | Visual                                               | Pass       | Pass       | Pass       | Pass       |
| Abdomen         | Visual                                               | Pass       | Pass       | Pass       | Pass       |
| Pelvis          | Visual, Palpated,<br>Accelerometer Mount             | Pass       | Pass       | Pass       | Pass       |
| Upper<br>Legs   | Visual                                               | Pass       | Pass       | Pass       | Pass       |
| Knees           | Visual, Stops, Inserts                               | Pass       | Pass       | Pass       | Pass       |
| Lower<br>Legs   | Visual, Range of Motion                              | Pass       | Pass       | Pass       | Pass       |
| Ankles          | Visual, Range of Motion                              | Pass       | Pass       | Pass       | Pass       |
| Feet            | Visual, Range of Motion                              | Pass       | Pass       | Pass       | Pass       |
| Joints          | 1 to 2 G Range                                       | Pass       | Pass       | Pass       | Pass       |
| Other           |                                                      | N/A        | N/A        | N/A        | N/A        |

**APPENDIX D**

**TEST EQUIPMENT LIST AND CALIBRATION INFORMATION**

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**SID INSTRUMENTATION****FRONT SID H3 NO. 056**

|                                                              | SERIAL NUMBER | MANUFACTURER | CALIBRATION DATE |
|--------------------------------------------------------------|---------------|--------------|------------------|
| HEAD X ACCELERATION                                          | J43443        | ENDEVCO      | 01Sep04          |
| HEAD Y ACCELERATION                                          | J22318        | ENDEVCO      | 01Sep04          |
| HEAD Z ACCELERATION                                          | J36659        | ENDEVCO      | 27Aug04          |
| SIX AXIS UPPER NECK<br>LOAD CELL (FX, FY, FZ, MX,<br>MY, MZ) | 1591          | DENTON ATD   | 10Aug04          |
| UPPER RIB ACCELERATION                                       | J43512        | ENDEVCO      | 27Aug04          |
| LOWER RIB<br>ACCELERATION                                    | J43445        | ENDEVCO      | 27Aug04          |
| LOWER SPINE<br>ACCELERATION                                  | J44021        | ENDEVCO      | 27Aug04          |
| PELVIS ACCELERATION                                          | J43810        | ENDEVCO      | 27Aug04          |
| UPPER RIB REDUNDANT<br>ACCELERATION                          | J43798        | ENDEVCO      | 27Aug04          |
| LOWER RIB REDUNDANT<br>ACCELERATION                          | J43434        | ENDEVCO      | 26Aug04          |
| LOWER SPINE REDUNDANT<br>ACCELERATION                        | J43485        | ENDEVCO      | 31Aug04          |
| PELVIS REDUNDANT<br>ACCELERATION                             | J43739        | ENDEVCO      | 27Aug04          |

**REAR SID H3 NO. 058**

|                                                              | SERIAL NUMBER | MANUFACTURER | CALIBRATION DATE |
|--------------------------------------------------------------|---------------|--------------|------------------|
| HEAD X ACCELERATION                                          | J35932        | ENDEVCO      | 26Aug04          |
| HEAD Y ACCELERATION                                          | J43481        | ENDEVCO      | 27Aug04          |
| HEAD Z ACCELERATION                                          | J43442        | ENDEVCO      | 27Aug04          |
| SIX AXIS UPPER NECK<br>LOAD CELL (FX, FY, FZ, MX,<br>MY, MZ) | 0452          | DENTON       | 10Aug04          |
| UPPER RIB ACCELERATION                                       | J43444        | ENDEVCO      | 27Aug04          |
| LOWER RIB<br>ACCELERATION                                    | J44018        | ENDEVCO      | 27Aug04          |
| LOWER SPINE<br>ACCELERATION                                  | J44022        | ENDEVCO      | 27Aug04          |
| PELVIS ACCELERATION                                          | J43708        | ENDEVCO      | 27Aug04          |
| UPPER RIB REDUNDANT<br>ACCELERATION                          | J43809        | ENDEVCO      | 27Aug04          |
| LOWER RIB REDUNDANT<br>ACCELERATION                          | J43480        | ENDEVCO      | 31Aug04          |
| LOWER SPINE REDUNDANT<br>ACCELERATION                        | J43468        | ENDEVCO      | 27Aug04          |
| PELVIS REDUNDANT<br>ACCELERATION                             | J43441        | ENDEVCO      | 27Aug04          |



**VEHICLE INSTRUMENTATION**

|                               | SERIAL NUMBER | MANUFACTURER | CALIBRATION DATE |
|-------------------------------|---------------|--------------|------------------|
| RIGHT FRONT SILL X            | P22993        | ENDEVCO      | 27Aug04          |
| RIGHT FRONT SILL Y            | P21738        | ENDEVCO      | 27Aug04          |
| RIGHT FRONT SILL Z            | P22312        | ENDEVCO      | 26Aug04          |
| RIGHT REAR SILL X             | P12746        | ENDEVCO      | 26Aug04          |
| RIGHT REAR SILL Y             | P14135        | ENDEVCO      | 31Aug04          |
| RIGHT REAR SILL Z             | P22322        | ENDEVCO      | 31Aug04          |
| REAR FLOORPAN ABOVE AXLE X    | 98L98H31-Z05  | ENTRAN       | 31Aug04          |
| REAR FLOORPAN ABOVE AXLE Y    | 98L98L11-N01  | ENTRAN       | 01Sep04          |
| REAR FLOORPAN ABOVE AXLE Z    | 98G98D22-Z15  | ENTRAN       | 31Aug04          |
| LEFT REAR SILL Y              | J35839        | ENDEVCO      | 01Sep04          |
| LEFT FRONT SILL Y             | P22978        | ENDEVCO      | 26Aug04          |
| LEFT FRONT DOOR CENTERLINE Y  | P25033        | ENDEVCO      | 30Aug03          |
| RIGHT REAR OCCUPANT COMP Y    | 98F98E11-K11  | ENTRAN       | 25Aug04          |
| MID-REAR OF LEFT FRONT DOOR Y | 04A04A12-Z10  | ENTRAN       | 26Aug04          |
| LEFT FRONT DOOR UPPER C/L Y   | 04A04A05-A06  | ENTRAN       | 27Aug04          |
| MID-REAR OF LEFT REAR DOOR Y  | P21580        | ENDEVCO      | 30Aug04          |
| LEFT REAR DOOR UPPER C/L Y    | P22041        | ENDEVCO      | 27Aug04          |
| LEFT LOWER B-PILLAR Y         | P24302        | ENDEVCO      | 26Aug04          |
| LEFT MIDDLE B-PILLAR Y        | P21586        | ENDEVCO      | 26Aug04          |
| LEFT LOWER A-PILLAR Y         | P21732        | ENDEVCO      | 31Aug04          |
| LEFT UPPER A-PILLAR           | P22951        | ENDEVCO      | 27Aug04          |
| FRONT SEAT TRACK Y            | P21580        | ENDEVCO      | 27Aug04          |
| REAR SEAT TRACK Y             | P13598        | ENDEVCO      | 26Aug04          |
| VEHICLE CG X                  | P19287        | ENDEVCO      | 27Aug04          |
| VEHICLE CG Y                  | P19385        | ENDEVCO      | 27Aug04          |
| VEHICLE CG Z                  | P22522        | ENDEVCO      | 27Aug04          |

**MDB INSTRUMENTATION**

|                         |        |         |         |
|-------------------------|--------|---------|---------|
| MDB CG X                | P25041 | ENDEVCO | 07Sep04 |
| MDB CG Y                | P23595 | ENDEVCO | 07Sep04 |
| MDB CG Z                | P24733 | ENDEVCO | 03Sep04 |
| MDB REAR FRAME MEMBER X | P21608 | ENDEVCO | 07Sep04 |
| MDB REAR FRAME MEMBER Y | P24089 | ENDEVCO | 07Sep04 |