

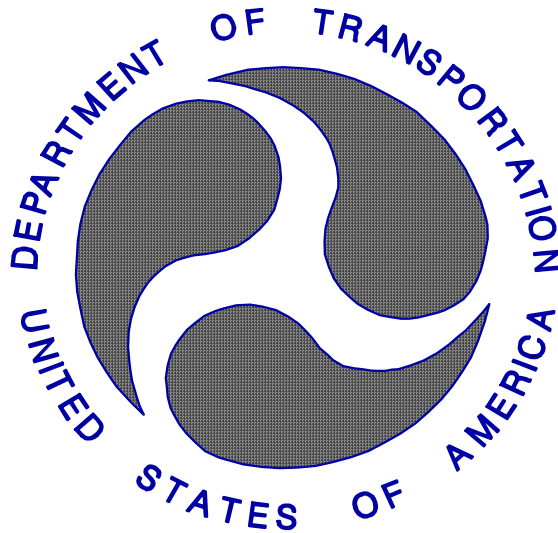
REPORT NO. MCW-DOT-03SN05

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING**

DAIMLER CHRYSLER
2003 MERCEDES-BENZ E-CLASS E320W 4 DOOR SEDAN

NHTSA NUMBER: M3 0510

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



05 FEBRUARY 2003

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

This Final Report was prepared for the U.S. Department of Transportation, National Highway Traffic Safety Administration, under Contract No. DTNH22-01-D-02003. This document is disseminated under the sponsorship of the U. S. Department of Transportation in the interest of information exchange. The United States Government assumes no liability for its content or use thereof.

Prepared By:

Michael B. Schlick, Project Engineer

Approved By:

Frank A. Pintar, Facility Director

Approval Date:

FINAL REPORT ACCEPTANCE BY:

Accepted By:

Acceptance Date:

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16. Abstract A 55/28 km/h 90° Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2003 Mercedes-Benz E-class E320W 4 Door Sedan 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 05 February 2003. The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 (38.5 mph) km/h, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 21° C. The target vehicle post-test maximum crush was 270 mm at Level 2. The test vehicle's performance follows: <table border="1"> <thead> <tr> <th></th><th><u>DRIVER</u></th><th><u>PASSENGER</u></th></tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration G</td><td align="center">39.9</td><td align="center">49.4</td></tr> <tr> <td>Left Lower Rib Acceleration G</td><td align="center">32.5</td><td align="center">47.7</td></tr> <tr> <td>Lower Spine Acceleration G</td><td align="center">37.3</td><td align="center">47.1</td></tr> <tr> <td>Thoracic Trauma Index TTI</td><td align="center">39</td><td align="center">48</td></tr> <tr> <td>Pelvis Acceleration G</td><td align="center">47</td><td align="center">50</td></tr> </tbody> </table> The doors 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. The door skin of the left rear door was bent but the door was still latched. The distance between the door skin the exterior of the car was 44 mm at the latch..					<u>DRIVER</u>	<u>PASSENGER</u>	Left Upper Rib Acceleration G	39.9	49.4	Left Lower Rib Acceleration G	32.5	47.7	Lower Spine Acceleration G	37.3	47.1	Thoracic Trauma Index TTI	39	48	Pelvis Acceleration G	47	50
	<u>DRIVER</u>	<u>PASSENGER</u>																			
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17. Key Words New Car Assessment Program (NCAP) Side Impact MDB Side Impact Dummy (SID H3) NHTSA No. M3 0510		18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Office of Crashworthiness Standards Room 5307, NVS-111 400 Seventh Street, SW Washington, DC 20590																			
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SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test was part of the FY03 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-01-D-02003. The purpose of this test was to evaluate side impact protection of a 2003 Mercedes-Benz E-class E320W 4 Door Sedan. This side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated May 1999.

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 2003 Mercedes-Benz E-class E320W 4 Door Sedan 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 (38.5 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 05 February 2003.

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 May 1999. The side impact event was documented by four high-speed cine cameras, five high speed video cameras, 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) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (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 SID H3s are included in Appendix A. Appendix B contains the vehicle, MDB, and dummy response data traces. A summary of the SID H3 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.

Injury Criteria

Injury Criteria	Front SID H3	Rear SID H3
TTI (G)	39	48
PELVIS (G)	47	50
HIC36	94	84

Air bag information

	Frontal	Side-Torso	Side-Torso/Head	Side-Head
Driver	Yes- Steering Wheel	Yes- Seat	None	Yes- Curtain
Front Passenger	Yes- Dashboard	Yes- Seat	None	Yes- Curtain
Left Rear Passenger	None	Yes- Door	None	Yes- Curtain

Additional Test Observations

The door skin of the left rear door was bent but the door was still latched to the striker. The distance between the door skin the exterior of the car was 44 mm (measured at the latch).

SECTION 3
SUMMARY OF TEST RESULTS

DATA SHEET NO. 1

GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION

Year/ Make/ Model/ Body Style				2003 Mercedes-Benz E-class E320W 4 Door Sedan			
Vehicle NHTSA NO.				M3 0510	VIN	WDBUF65J93A165479	
Vehicle Body Color				Black	Build Date	October 2002	
Engine Data	<u>6</u>	Cylinders	CID	<u>3.2</u>	Liter	<u>cc</u>	
Placement	<u>X</u>	Longitudinal	Lateral				
Transmission	<u>5</u>	Speed	Manual	<u>X</u>	Automatic	<u>X</u>	Overdrive
Final Drive	<u>X</u>	Rear Wheel Drive	Front Wheel Drive	Four Wheel Drive			
Odometer Reading	<u>93.4 miles</u>	Date	<u>23 January 2003</u>				
Options	<u>X</u>	A/C	<u>X</u>	Power Steering	<u>X</u>	Power Brakes	<u>X</u>
	<u>X</u>	Cruise Control	<u>X</u>	Tilt Wheel	<u>X</u>	Power Locks	

DATA FROM TIRE PLACARD:

Tire Pressure (at Capacity)	<u>26</u>	PSI Front
	<u>32</u>	PSI Rear
Recommended Tire Size	<u>225-55R16 95H</u>	
Tires on Test Vehicle	<u>225-55R16 95H</u>	Manufacturer <u>Continental</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	Yes- Seat	None	Yes- Curtain
Front Passenger	Yes- Dashboard	Yes- Seat	None	Yes- Curtain
Left Rear Passenger	None	Yes- Door	None	Yes- Curtain

VEHICLE CAPACITY DATA:

Number of Occupants:	<u>2</u>	Front	<u>3</u>	Rear	<u>3rd</u>	Seat	<u>5</u>	Total
Type of Front Seats	<u>X</u>	Bucket		Bench		Split Bench		
Type of Front Seat Back		Fixed	<u>X</u>	Adjustable w/		Lever	<u>X</u>	Knob
Vehicle Max Capacity Loading			<u>437.7</u>	kg	(A)			
No. of Occupants X 68.04 kg			<u>340.2</u>	kg	(B)			
Cargo Capacity (A) – (B)			<u>97.5</u>	kg				

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front	=	<u>417.8</u>	kg	Left Rear	=	<u>402.8</u>	kg
Right Front	=	<u>422.7</u>	kg	Right Rear	=	<u>406.9</u>	kg
TOTAL FRONT	=	<u>840.5</u>	kg	TOTAL REAR	=	<u>809.7</u>	kg
% Total Weight	=	<u>50.9</u>	%	%Total Weight	=	<u>49.1</u>	%
TOTAL WEIGHT	=	<u>1650.2</u>	kg				

DATA SHEET 1 (continued)

GENERAL VEHICLE TEST PARAMETER DATA

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Max Fluids	=	<u>1650.2</u>	kg	(A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>97.5</u>	kg	(B)
Weight of (2) instrumented Side Impact Dummies	=	<u>161.5</u>	kg	(C)
TEST VEHICLE TARGET WEIGHT	=	<u>1909.2</u>	kg	(A+B+C)

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

Left Front	=	<u>477.6</u>	kg	Left Rear	=	<u>498.1</u>	kg
Right Front	=	<u>447.2</u>	kg	Right Rear	=	<u>486.3</u>	kg
TOTAL FRONT	=	<u>924.8</u>	kg	TOTAL REAR	=	<u>984.4</u>	kg
% Total Weight	=	<u>48.4</u>	%	%Total Weight	=	<u>51.6</u>	%
TOTAL WEIGHT	=	<u>1909.2</u>	kg				

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

Left Front	=	<u>473.6</u>	kg	Left Rear	=	<u>495.3</u>	kg
Right Front	=	<u>445.9</u>	kg	Right Rear	=	<u>485.8</u>	kg
TOTAL FRONT	=	<u>919.5</u>	kg	TOTAL REAR	=	<u>981.1</u>	kg
% Total Weight	=	<u>48.4</u>	%	%Total Weight	=	<u>51.6</u>	%
TOTAL WEIGHT	=	<u>1900.6</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED

Left Front	<u>722</u>	Right Front	<u>725</u>	Left Rear	<u>712</u>	Right Rear	<u>716</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

FULLY LOADED

Left Front	<u>697</u>	Right Front	<u>703</u>	Left Rear	<u>676</u>	Right Rear	<u>689</u>
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AS TESTED

Left Front	<u>698</u>	Right Front	<u>705</u>	Left Rear	<u>679</u>	Right Rear	<u>691</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

Test Vehicle Wheelbase 2855 mm

As Tested CG = 1473 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side	=	<u>4556</u>	mm
Left Side	=	<u>4556</u>	mm
Centerline	=	<u>4839</u>	mm

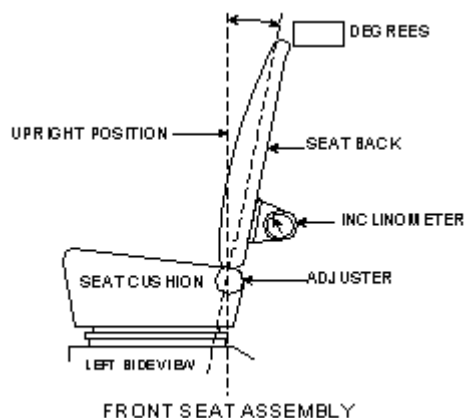
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510

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



FRONT SEAT CUSHION PLACEMENT:

Total Length of Adjustment Travel			317 mm
Total Number of Detents	N/A	Test Position	Mid Position

FRONT SEAT BACK ADJUSTMENT:

Seat Back Angle	16.7° measured at back rest
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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	<u>Up</u>	Right Front	<u>Down</u>
Left Rear	<u>Up</u>	Right Rear	<u>Down</u>

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel System usable Capacity	80.0 L.	
Test Volume	74.4 L.	93 % usable capacity

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

Wheelbase	2855 mm	
Impact Point is	488 mm rearward	of front axle centerline
Actual Impact Point is	482 mm rearward	of front axle centerline

DATA SHEET 2
TEST VEHICLE SUMMARY

VEHICLE IDENTIFICATION:

Year/Make/Model/Body Style	2003 Mercedes-Benz E-class E320W 4 Door Sedan		
Body Color	Black	VIN	WDBUF65J93A165479
NHTSA No.	M3 0510	Test Date	05 February 2003
Overall Length	4839 mm	Overall Width	1802 mm

VEHICLE TEST WEIGHT (Pre-Test):

Left Front	=	473.6	kg	Left Rear	=	495.3	kg
Right Front	=	445.9	kg	Right Rear	=	485.8	kg
TOTAL FRONT	=	919.5	kg	TOTAL REAR	=	981.1	kg
% Total Weight	=	48.4	%	%Total Weight	=	51.6	%
TOTAL WEIGHT	=	1900.6	kg				
Wheelbase				=		2855 mm	
Longitudinal CG from Center of Front Axle				=		1473 mm	
Impact Angle with Respect to Impactor				=		90°	

ACTUAL IMPACT POINT

Actual Impact Point is 6 mm Forward of nominal impact reference line

Actual Impact Point is 2 mm Below nominal impact line

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1	(261 mm above ground)	=	82	mm
2. LEVEL 2	(483 mm above ground)	=	270	mm
3. LEVEL 3	(581 mm above ground)	=	255	mm
4. LEVEL 4	(898 mm above ground)	=	169	mm
5. LEVEL 5	(1286 mm above ground)	=	26	mm

Maximum Post-Test intrusion at Level 2 is 270 mm

OCCUPANTS

	<u>Left Front Passenger</u>	<u>Left Rear Passenger</u>
Dummy Identification	SID H3/058	SID H3/056
Restraints Used	3 point belt, Side AB	3 point belt, side AB
	Torso, Side AB	Torso, Side AB
	Head, Curtain AB	Head, Curtain AB

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

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore Serial Number 088C1C92E-1 143A0802

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>1109.3 mm</u>
C.G. Location From Center Line	=	<u>-1.9 mm</u>
C.G. Location Above Ground Level	=	<u>477.2 mm</u>

MDB WEIGHT:

Left Front	=	<u>495.2</u>	kg	Left Rear	=	<u>184.8</u>	kg
Right Front	=	<u>278</u>	kg	Right Rear	=	<u>399.2</u>	kg
TOTAL FRONT	=	<u>773.2</u>	kg	TOTAL REAR	=	<u>584</u>	kg
% Total Weight	=	<u>57.0</u>	%	%Total Weight	=	<u>43.0</u>	%
TOTAL WEIGHT	=	<u>1357.2</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>38.5 mph</u>
	Secondary	<u>62.0 km/h</u>	<u>38.5 mph</u>
	On-Board	<u>62.0 km/h</u>	<u>38.5 mph</u>

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A Center of Bumper	=	<u>209</u>	mm
2. Row B Top of Bumper	=	<u>170</u>	mm
3. Row C Mid-Level	=	<u>203</u>	mm
4. Row D Top of Stack	=	<u>207</u>	mm

INSTRUMENTATION:

Number of MDB Data Channels	=	<u>5</u>
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DATA SHEET NO. 4**POST-TEST OBSERVATIONS**Vehicle: 2003 Mercedes-Benz E-Class E320WNHTSA No.: M3 0510**VISIBLE DUMMY CONTACT POINTS:**

	<u>LEFT FRONT SID H3</u>	<u>LEFT REAR SID H3</u>
Head	TO SIDE CURTAIN AIRBAG	TOP OF HEAD TO SIDE HEADER, SIDE OF HEAD TO CURTAIN SAB
Upper Torso	TO SEAT MOUNTED SAB	TO DOOR MOUNTED SAB
Lower Torso	TO SEAT MOUNTED SAB	TO DOOR MOUNTED SAB
Left Knee	TO LEFT FRONT DOOR PANEL AT ARM REST	TO LEFT REAR DOOR PANEL 90 mm ABOVE ARM REST
Left Leg	TO LEFT FRONT DOOR PANEL AT ARM REST	TO LEFT REAR DOOR PANEL AT ARM REST

DOOR OPENING:

	<u>LEFT DOOR</u>	<u>RIGHT DOOR</u>
Front	closed/inoperable/latched	closed/operable/latched
Rear	closed/inoperable/latched	closed/operable/latched

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal	<u>6 mm forward</u>	Vertical	<u>2 mm below</u>
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ARM REST LOCATIONS:

Front	<u>245 mm below window sill</u>
Rear	<u>260 mm below window sill</u>

SEAT MOVEMENT:

Front	<u>Seat Crush: ~ 35 mm; Seat Back Crush: ~ 50 mm</u>
Rear	<u>Seat Crush: ~ 20 mm; Seat Back Crush: ~ 15 mm</u>

GLAZING DAMAGE

Windshield	<u>None</u>
Window	<u>Front and rear struck side window shattered on impact</u>

PILLAR PERFORMANCE:

<u>None noted</u>

SILL SEPARATION

<u>None noted</u>

AIRBAG DEPLOYMENT STATUS:

	DRIVER	FRONT PASSENGER	REAR PASSENGER
FRONT	did not deploy	did not deploy	N/A
SIDE	deployed	did not deploy	deployed

OTHER NOTABLE IMPACT EFFECTS:

<u>None noted</u>

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5

SID H3 INSTRUMENTATION DATA

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510

	Front Dummy ID SID H3/058				Rear Dummy ID SID H3/056			
	Max		Min		Max		Min	
	G's	msec	G's	msec	G's	msec	G's	msec
HEAD ACCELERATIONS								
Longitudinal (X)	10.6	26.2	-8.1	165.0	6.8	17.8	-9.0	59.7
Lateral (Y)	27.8	44.8	-4.0	177.4	29.3	49.6	-4.6	199.9
Vertical (Z)	6.5	27.4	-8.7	32.5	6.9	18.7	-13.1	63.8
Resultant (R)	28.0	52.2			29.6	49.6		
HIC36	94.4				83.5			
RIB ACCELERATIONS								
Upper Rib Lateral (Y)	39.9	30.6	-15.5	35.0	49.4	46.9	-5.9	118.1
Upper Rib Lateral (Y _R)	39.9	30.0	-15.8	35.0	49.9	46.9	-6.1	117.5
Lower Rib Lateral (Y)	32.5	21.2	-4.0	56.9	47.7	46.2	-8.7	100.0
Lower Rib Lateral (Y _R)	34.2	21.2	-4.2	56.9	47.3	46.2	-9.2	100.6
SPINE ACCELERATIONS								
Lower Lateral (Y)	37.3	35.6	-7.1	76.9	47.1	50.6	-4.1	113.1
Lower Lateral (Y _R)	36.9	35.6	-7.1	77.5	46.6	50.6	-4.3	85.0
PELVIS ACCELERATIONS								
Lateral (Y)	47.0	31.2	-13.2	76.2	50.2	45.0	-5.8	100.6
Lateral (Y _R)	45.3	32.5	-13.2	75.6	49.4	45.0	-5.4	100.6

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_R denotes redundant Y-direction accelerometer

DATA SHEET 5 (continued)

SID H3 INSTRUMENTATION DATA

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

	Front Dummy ID SID H3/058				Rear Dummy ID SID H3/056			
	Max		Min		Max		Min	
	N	msec	N	msec	N	msec	N	msec
NECK FORCES								
Longitudinal (X)	623.4	65.0	-357.1	155.8	405.6	69.4	-140.5	26.2
Lateral (Y)	147.8	26.2	-253.2	49.8	88.3	135.4	-613.9	49.9
Vertical (Z)	304.4	113.8	-846.9	53.5	255	199.9	-751.5	59.0
NECK MOMENTS								
	Nm	msec	Nm	msec	Nm	msec	Nm	msec
Lateral Bending (X)	12.1	133.5	-54.3	53.7	20.5	99.9	-22.4	63.9
Flexion/Extension (Y)	22.1	156.8	-34.5	79.3	†	†	†	†
Rotation (Z)	24.6	82.4	-15.4	140.8	20.2	96.6	-5.0	49.6

† SID H3 056 Upper Neck Moment (Y) wire was pinched approximately 49 milliseconds after impact

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

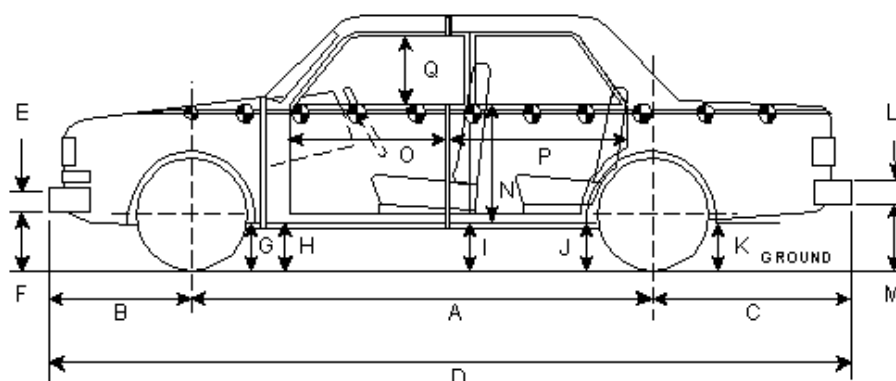
Neck moments have been filtered at SAE Class 600

DATA SHEET 6

VEHICLE PRE- AND POST- MEASUREMENTS

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510



LEFT SIDE VIEW

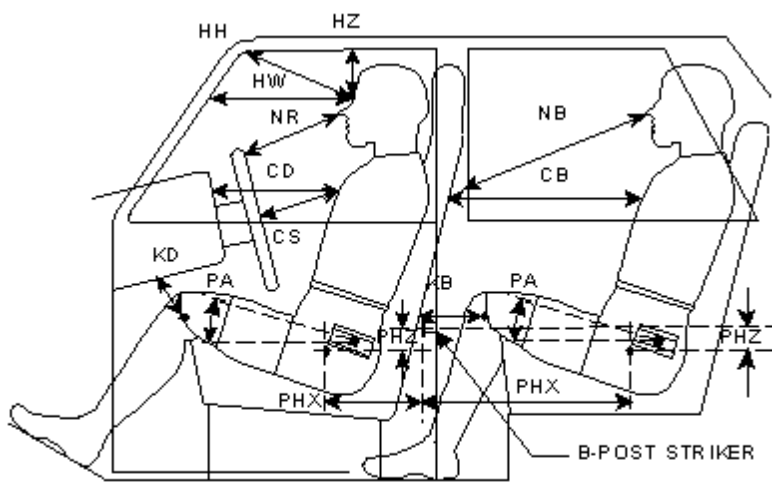
	PRE-TEST As delivered (mm)	PRE-TEST As Tested (mm)	POST-TEST (mm)	Δ CHANGE (mm)
A	2855	-	2824	-31
B	665	-	668	3
C	1036	-	1040	4
D	4839	-	4828	-11
E	238	-	238	0
F	269	252	265	13
G	255	225	214	-11
H	258	227	265	38
I	276	245	274	29
J1	188	155	145	-10
J2	284	250	247	-3
K	238	202	201	-1
L	222	-	222	0
M	373	335	340	5
N	700	-	675	-25
O	1092	-	1086	-6
P	827	-	788	-39
Q	438	-	430	-8
R	4556	-	4554	-2
S	4556	-	4532	-24
T	1802	-	1582	-220

DATA SHEET 7

SID H3 LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510



LEFT SIDE VIEW

NOTE: All dimensions are in millimeters with tolerance of ± 3 mm

	DRIVER SID H3/058	LEFT REAR PASSENGER SID H3/056
HH	354	-
HW	562	-
HZ	189	155
NR/NB	439	634
CD/CB	519	569
CS	353	-
KDL(KDA°)/KBL(KDA°)	173/24	215/35
KDR(KDA°)/KBR(KDA°)	158/25	218/35
PA°	23.2	24.5
PHX	2542	1612
PHZ	63	34

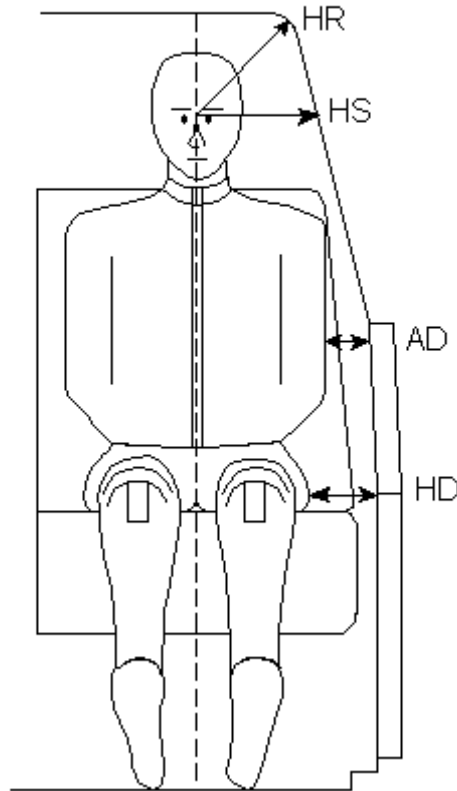
PHX and PHZ referenced from middle of test vehicle's rear bumper

DATASHEET 8

SID H3 LATERAL CLEARANCE DIMENSIONS

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510



NOTE: All dimensions are in millimeters with tolerance of ± 3 mm

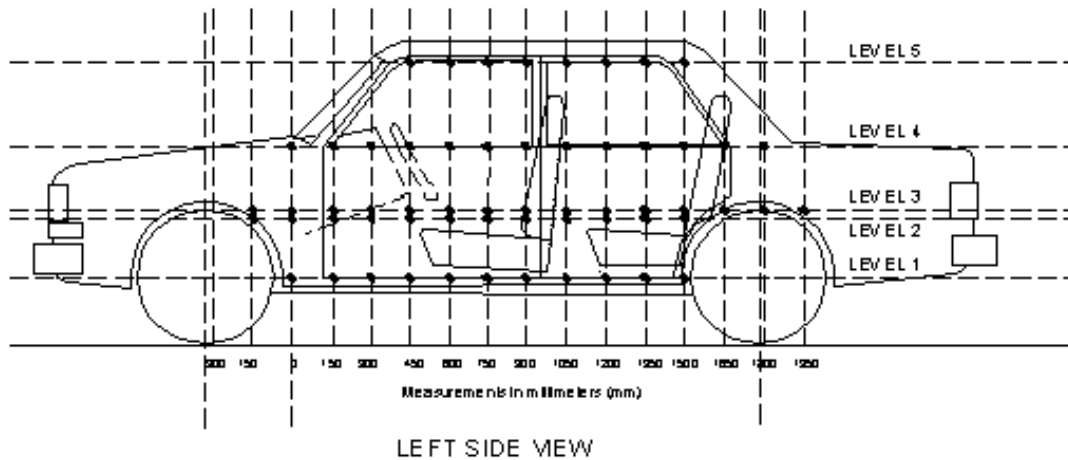
	DRIVER ID SID H3/058	LEFT REAR PASSENGER ID SID H3/056
HR	210	187
HS	304	302
AD	Upper 99 Lower 107	Upper 122 Lower 82
HD	124	154

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510



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	1286 mm
Level 4 @ Window Sill	898 mm
Level 3 @ Mid-Door	581 mm
Level 2 @ Occupant H-Point	483 mm
Level 1 @ Axle Centerline or Sill Top Height	261 mm

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES – ALL LEVELS

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

Note: All Dimensions are in millimeters with a tolerance of ± 3 mm

			DISTANCE IN MILLIMETERS (mm) FROM IMPACT POINT																											
HEIGHT			-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	2850	3000	
LEVEL 1	261	PRE							203	207	208	210	211	211	210	210	208	207	204	201	196	188								
		POST							205	212	267	275	279	284	288	292	288	280	266	248	225	197								
		CRUSH							2	5	59	65	68	73	78	82	80	73	62	47	29	9								
LEVEL 2	483	PRE	191						179	172	170	168	166	164	162	161	160	160	161	162	162	167						163	190	207
		POST	192						255	306	342	384	403	414	422	431	413	406	416	393	321	215						169	194	212
		CRUSH	1						76	134	172	216	237	250	260	270	253	246	255	231	159	48						6	4	5
LEVEL 3	581	PRE	197					162	182	183	181	180	177	176	175	175	174	175	176	176	175	174	165	159		155	195	215	234	
		POST	196					185	227	271	311	335	354	366	378	386	395	430	406	405	357	269	190	173		166	201	220	238	
		CRUSH	-1					23	45	88	130	155	177	190	203	211	221	255	230	229	182	95	25	14		11	6	5	4	
LEVEL 4	898	PRE	281	266	254	249	245	244	241	243	240	250	247	245	246	245	245	244	246	250	255	258	264	268	277	287	302	319	340	
		POST	272	259	253	250	248	247	252	260	301	302	311	330	346	359	375	413	403	390	378	340	309	285	293	300	309	325	343	
		CRUSH	-9	-7	-1	1	3	3	11	17	61	52	64	85	100	114	130	169	157	140	123	82	45	17	16	13	7	6	3	
LEVEL 5	1286	PRE												425	459	479	491	497	500	500	500	496	480	459						
		POST												436	470	494	510	520	526	519	514	507	4900	468						
		CRUSH												11	11	15	19	23	26	19	14	11	10	9						

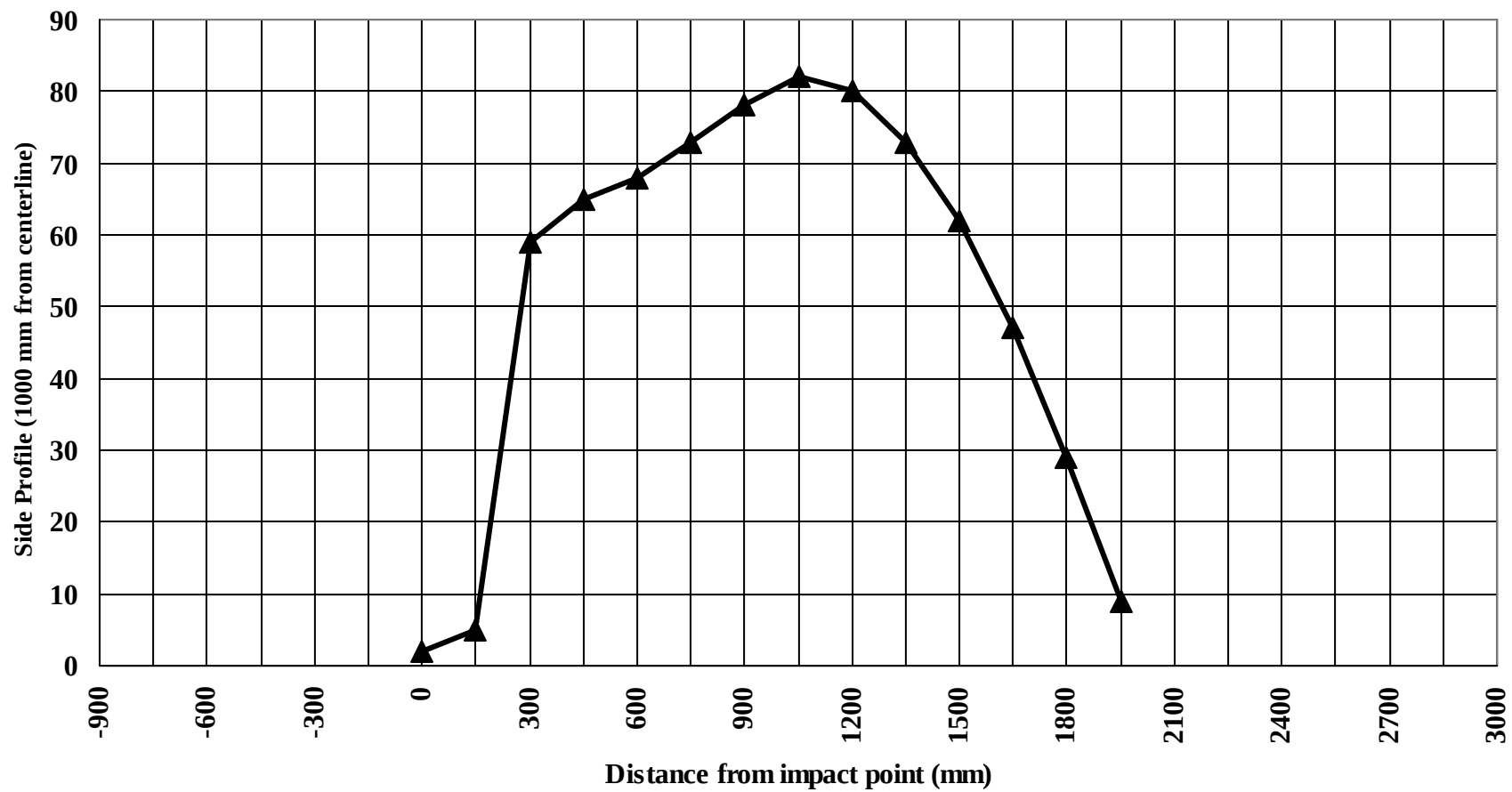
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510

SIDE PROFILE LEVEL 1 -261 mm above ground



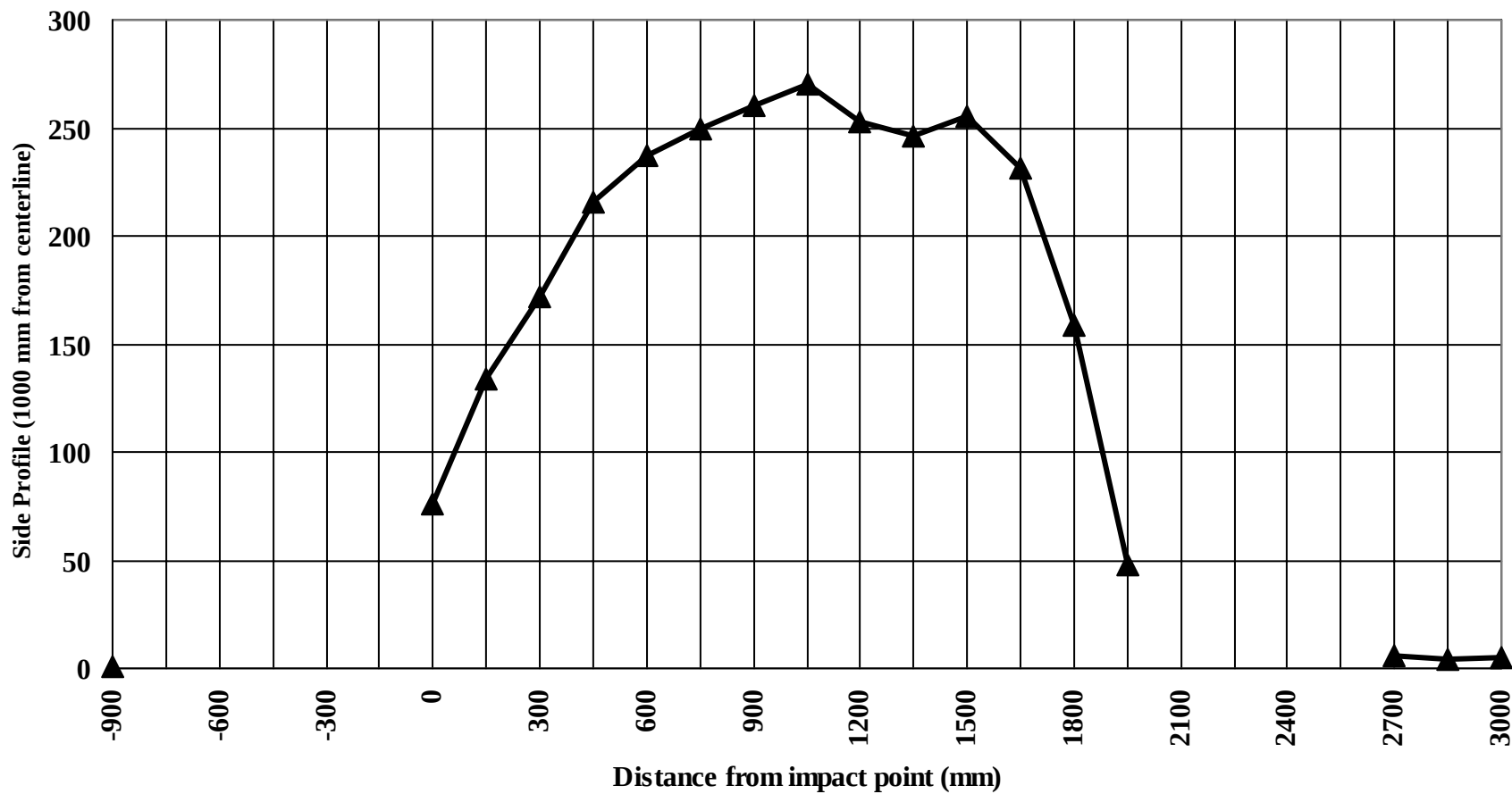
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510

SIDE PROFILE LEVEL 2 - 483 mm above ground



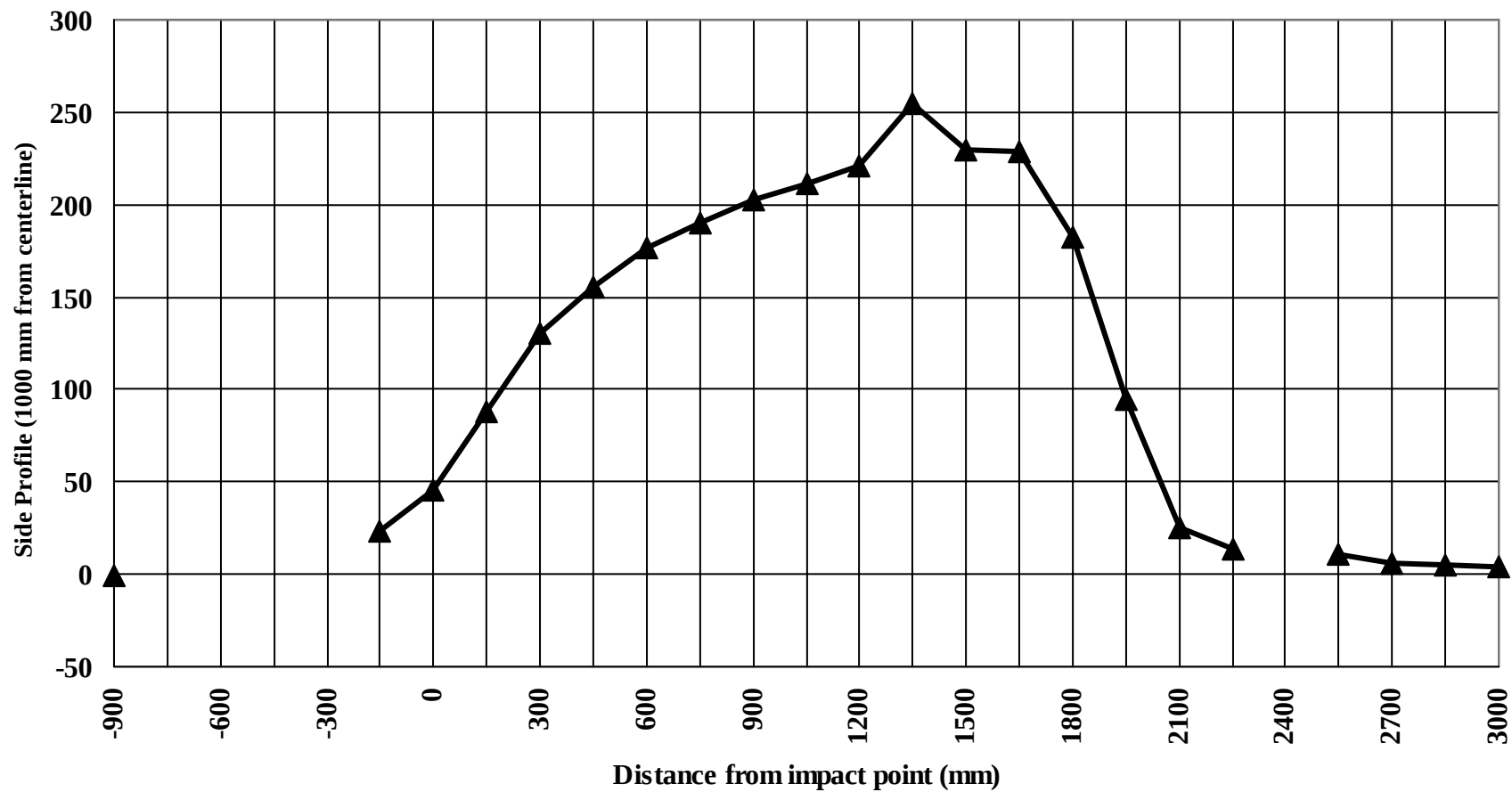
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510

SIDE PROFILE LEVEL 3 - 581 mm above ground



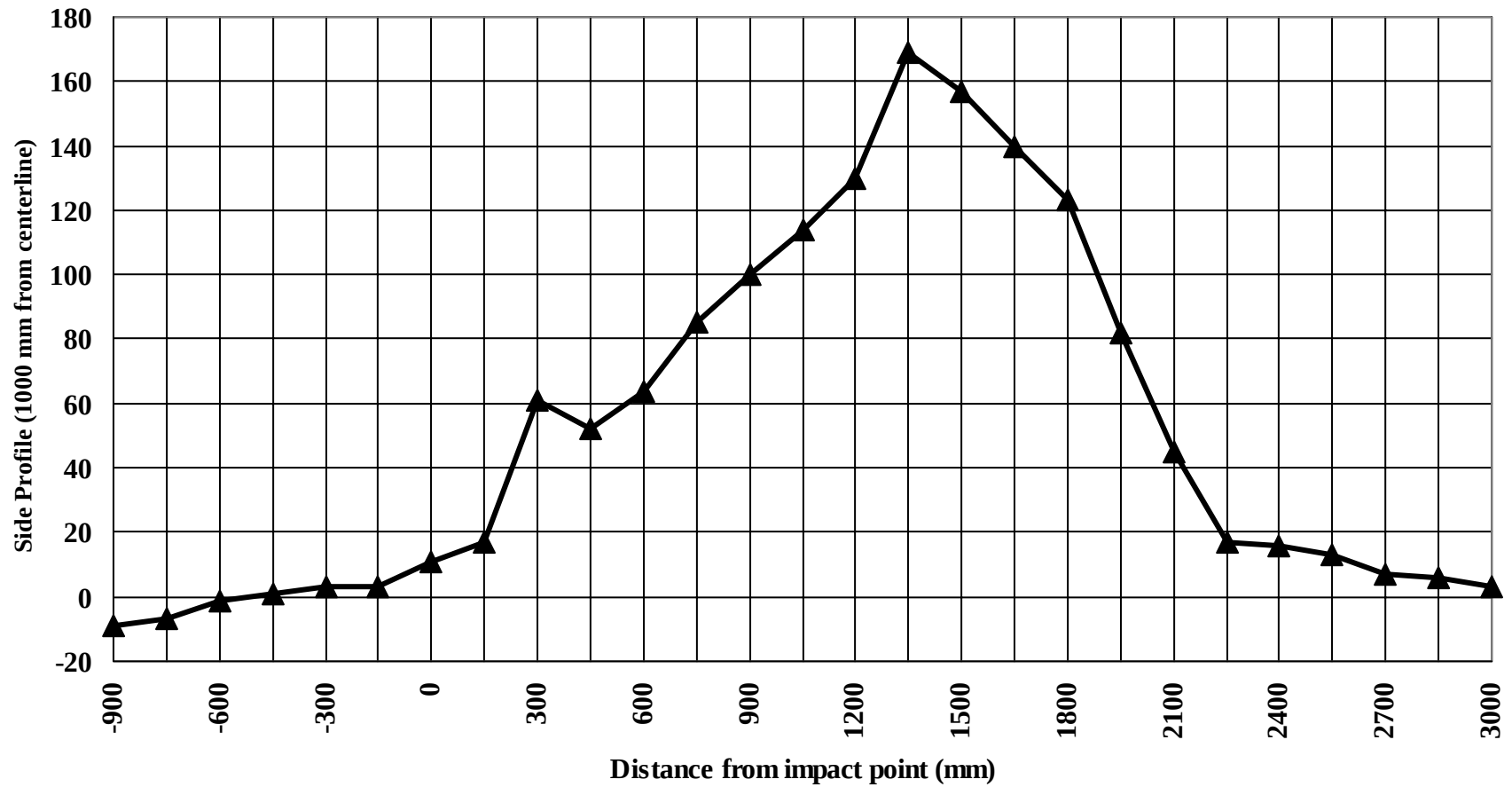
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

SIDE PROFILE LEVEL 4 - 930 mm above ground



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

SIDE PROFILE LEVEL 5 - 1933 mm above ground

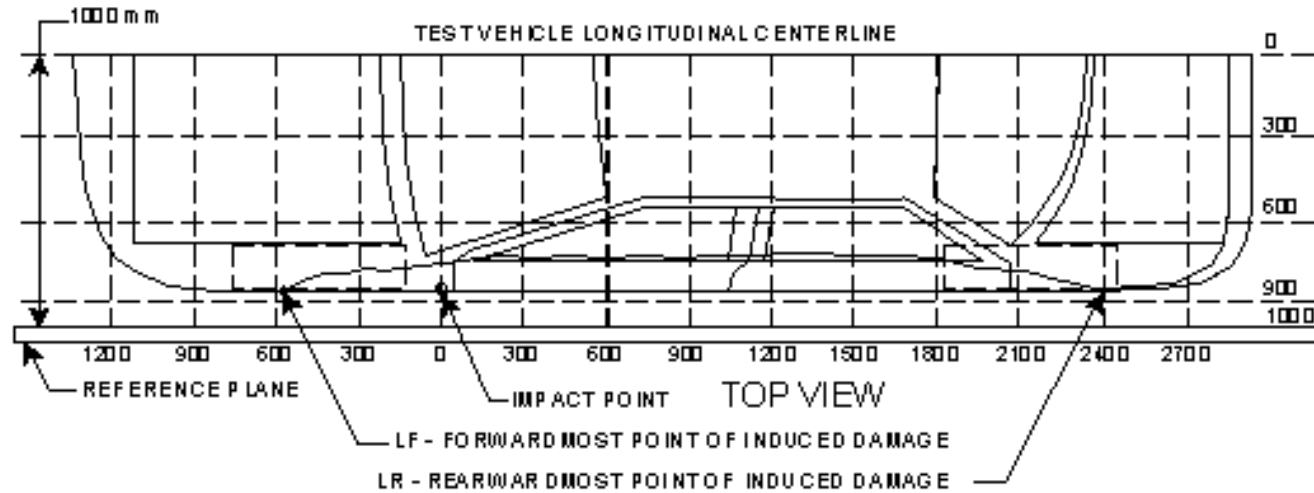


DATA SHEET 11

VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510



DPD MEASUREMENTS (mm)		POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1	-300	168	168	0
2	240	328	167	161
3	780	418	166	252
4	1320	397	165	232
5	1860	312	164	148
6	2400	163	163	0

DATA SHEET 12

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

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

Note: All Dimensions are in millimeters with a tolerance of ± 3 mm

LEVEL	HEIGHT AT CL (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 TOP STACK	810	PRE-	528	529	529	529	530	530	530	531	531	532	532	532	533	533	534	534	535
		POST-	577	560	553	565	607	621	604	585	576	585	592	604	611	623	656	709	742
		CRUSH	49	31	24	36	77	91	74	54	45	53	60	72	78	90	122	175	207
LEVEL 3 MID- LEVEL	685	PRE-	527	527	527	527	528	529	529	529	529	529	530	530	530	531	531	532	532
		POST-	588	564	557	558	579	591	576	562	558	559	563	572	586	608	642	694	735
		CRUSH	61	37	30	31	51	62	47	33	29	30	33	42	56	77	111	162	203
LEVEL 2 TOP BUMPER	560	PRE-	525	525	525	525	526	526	527	527	527	527	528	528	529	529	530	530	530
		POST-	637	636	636	630	630	609	594	594	602	615	620	626	632	640	657	675	700
		CRUSH	112	111	111	105	104	83	67	67	75	88	92	98	103	111	127	145	170
LEVEL 1 MID- BUMPER	432	PRE-	434	422	422	422	422	423	423	423	424	424	424	424	425	425	426	426	428
		POST-	633	601	583	585	593	583	573	563	559	561	563	568	573	585	609	635	636
		CRUSH	199	179	161	163	171	160	150	140	135	137	139	144	148	160	183	209	208

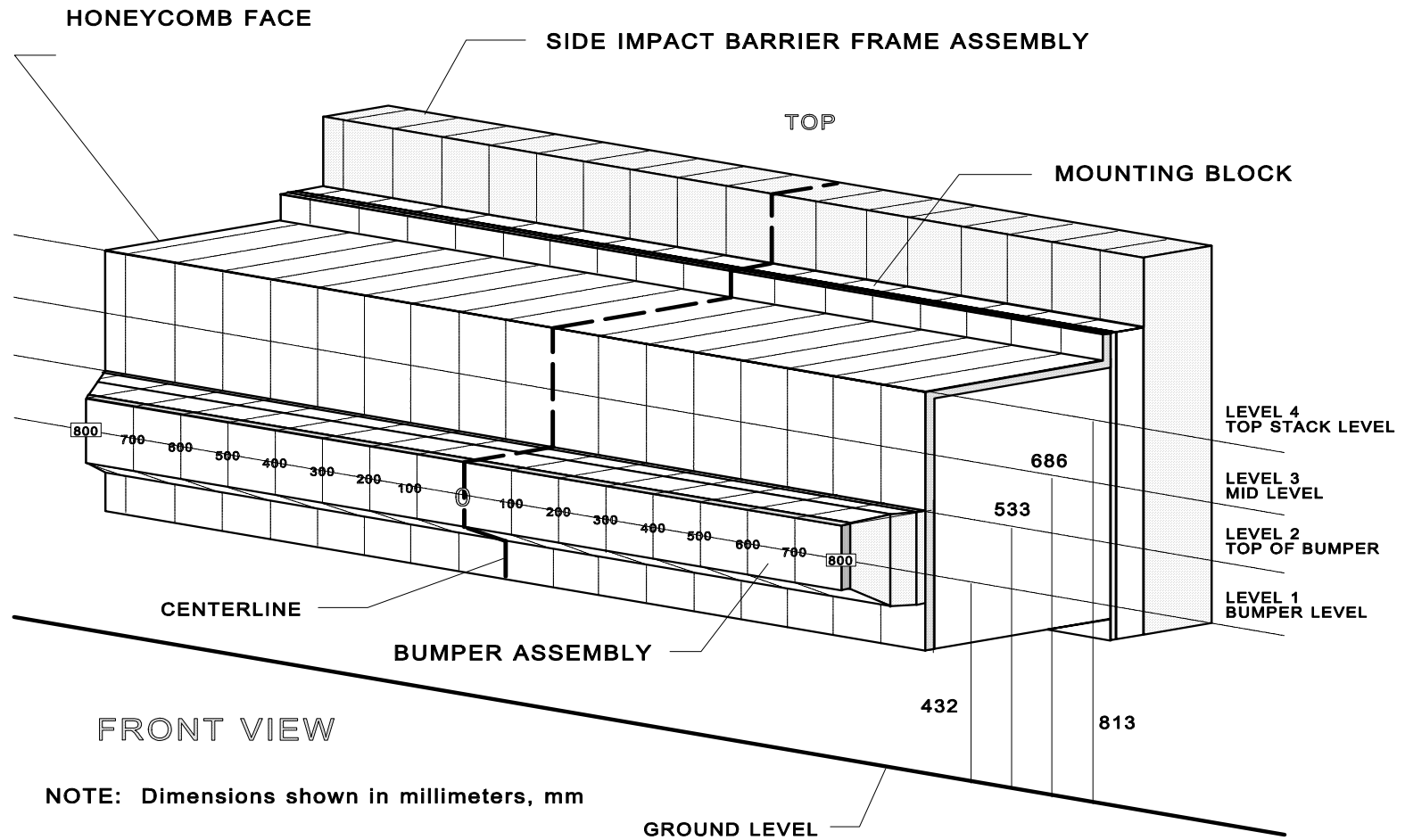
DATA SHEET 12 (continued)

STATIC CRUSH OF IMPACTOR FACE

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

4-16

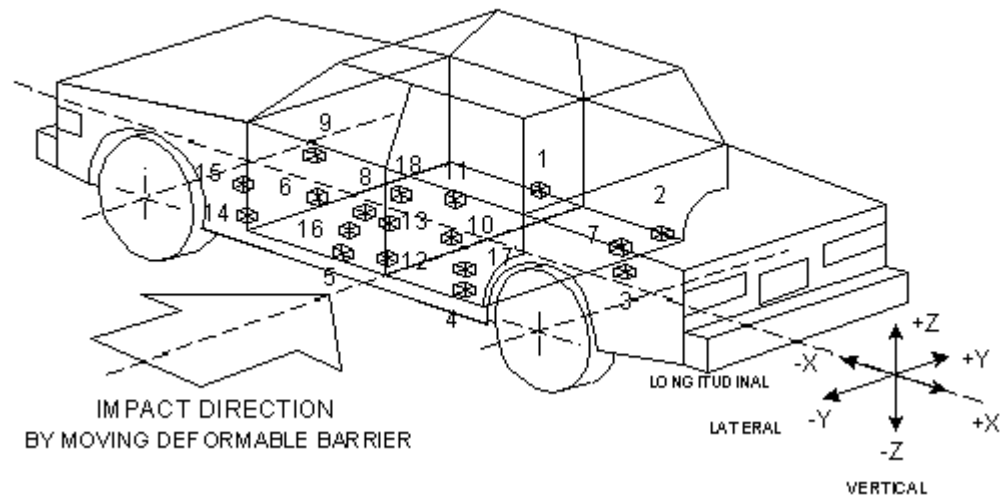


DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510



- | | |
|--|--|
| <ul style="list-style-type: none"> 1. Right Side Sill at Front Seat 2. Right Side Sill at Rear Seat 3. Rear Floorpan Above Axle 4. Left Side Sill at Rear Seat 5. Left Side Sill at Front Seat 6. Left Front Door on Centerline 7. Right Rear Occupant Compartment 8. Mid-rear of Left Front Door 9. Left Front Door Upper Centerline | <ul style="list-style-type: none"> 10. Mid-rear of Left Rear Door 11. Left Rear Door Upper Centerline 12. Left Lower B-Pillar 13. Left Middle B-Pillar 14. Left Lower A-Pillar 15. Left Middle A-Pillar 16. Front Seat Track 17. Rear Seat Track 18. Vehicle CG |
|--|--|

DATASHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X mm	Y mm	Z 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	3100	668	360	1.7	61.1	-7.2	32.7	18.3	6.5	-2.4	88.3	6.2	37.1	-3.0	9.9	18.8	6.6
2	Right Side Sill at Rear Seat	2044	674	384	3.0	59.3	-25.9	53.1	18.4	5.4	-14.9	9.8	15.1	26.6	-14.4	21.9	28.5	53.0
3	Rear Floorpan Above Axle	949	10.0	89	2.5	61.0	-9.4	18.8	21.0	21.0	-1.6	92.8	21.4	17.9	-6.5	10.6	26.2	18.2
4	Left Side Sill at Rear Seat	2179	-703	372					28.6	23.1	-19.6	51.8						
5	Left Side Sill at Front Seat	2959	-703	354					27.5	4.4	-8.6	51.8						
6	Left Front Door on Centerline	2752	-790	8					285.2	5.8	-121.8	11.9						
7	Right Rear Occupant Compartment	1980	331	245					19.5	6.1	-16.7	45.9						
8	Midrear of Left Front Door	2534	-801	10					340.2	6.5	-194.4	12.7						
9	Left Front Door Upper Centerline	2748	-805	80					100.7	8.5	-78.1	25.7						
10	Midrear of Left Rear Door	1641	-795	1					85.2	3.6	-19.7	8.0						

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)

VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

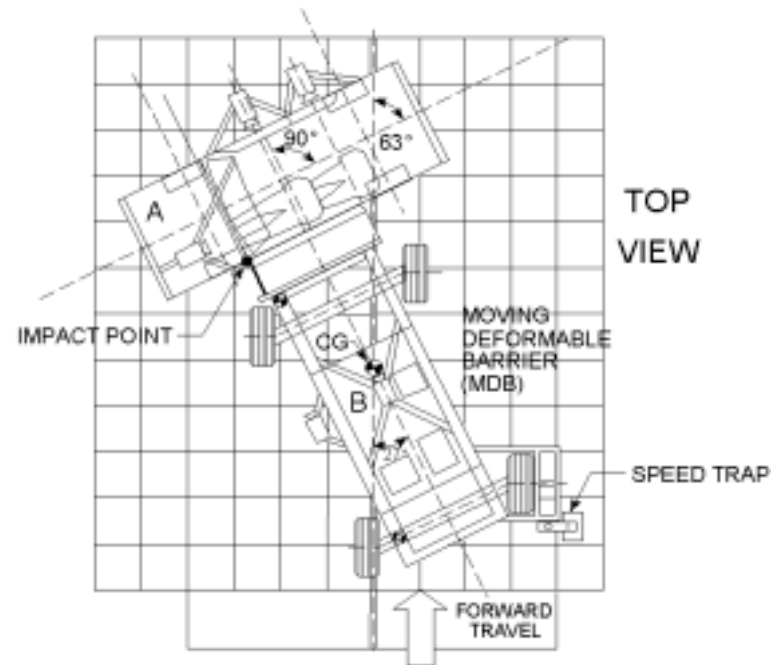
NHTSA No. M3 0510

Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X mm	Y mm	Z 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 Upper Centerline	1856	-803	75					81.7	3.1	-30.7	14.6						
12	Left Lower B-Pillar	2290	-710	-27					103.9	3.4	-34.3	20.9						
13	Left Middle B-Pillar	2300	-703	-229					90.4†	3.9†	-32.1†	17.5†						
14	Left Lower A-Pillar	3234	-710	-101					51.7	3.4	-5.8	48.8						
15	Left Middle A-Pillar	3232	-709	-243					32.6‡	4.7‡	-12.5‡	21.0‡						
16	Front Seat Track	2347	-607	302					16.9	52.2	-35.2	7.5						
17	Rear Seat Track	1975	-381	238					22.4	6.3	-26.6	27.8						
18	Vehicle CG	2576	-2	60	2.6	77.6	-8.2	13.0	33.3	25.8	-5.2	54.8	16.6	22.4	-14.1	26.6	36.0	26.1

† Left Middle B-Pillar accelerometer wire broke approximately 19 milliseconds after impact
‡ Left Middle A-Pillar accelerometer wire broke approximately 34 milliseconds after impact

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY



Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X mm	Y mm	Z 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	1.3	87.2	-34.9	17.2	1.8	74.7	-7.6	37.0	8.2	14.9	-5.8	45.1	35.2	17.2
2	MDB Rear Frame Member	2812	-614	585	2.6	90.9	-26.3	38.8	5.2	21.3	-3.1	59.5						

Axis Origin

X – Rear Bumper
Y – Vehicle Centerline
Z – Middle of rear bumper

Axis Orientation

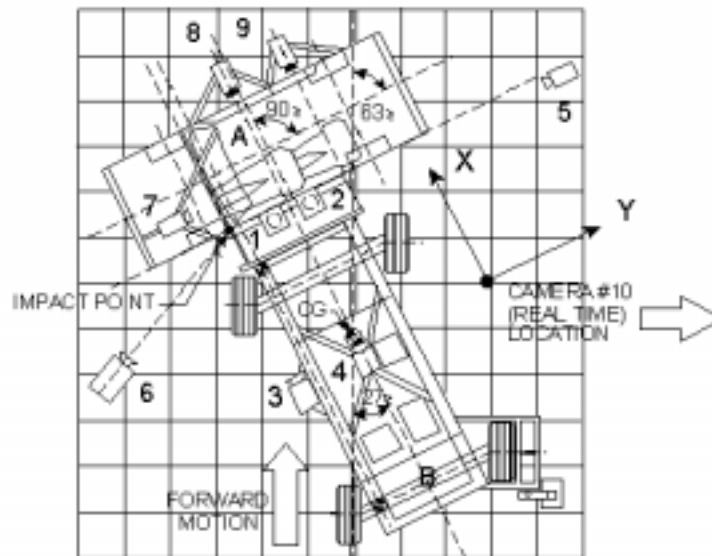
+(X) Forward
+(Y) Right
+(Z) Down

DATA SHEET 15

HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510



Camera No.	View	Coordinates (mm)*			Angle wrt Horiz.	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead view of test vehicle	2154	-677	-3758	-90	12.5	1000
2	Overhead close-up view of impact plane	2839	-757	-3761	-90	25	1000
3	MDB onboard close-up view of impact point	3218	-3393	-212	0	35	1000
4	MDB onboard view of driver dummy	2305	-3348	-676	-5	13	1000
5	Right side ground level overall view	-9956	-1007	-175	0	50	1000
6	Left side ground level overall view	7104	-127	-70	0	12.5	500
7	Test vehicle onboard driver front view	3515	-378	-781	-15	10	1000
8	Test vehicle onboard driver side view	2555	825	-489	0	7.5	1000
9	Test vehicle onboard passenger side view	1740	803	-533	-5	7.5	1000
10	Real-time film coverage of test	-	-	-	-	-	24

* Reference: Middle of rear bumper on test vehicle (Point L)

+ (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

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510

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

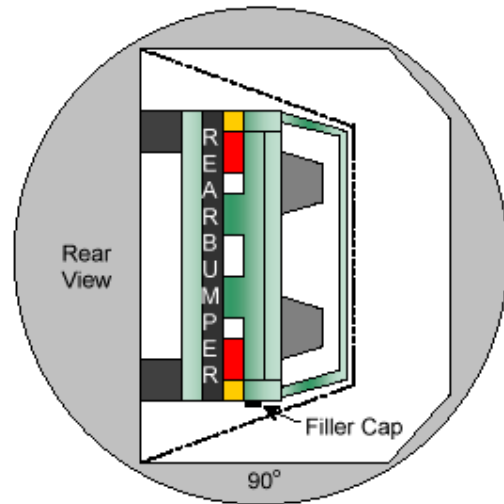
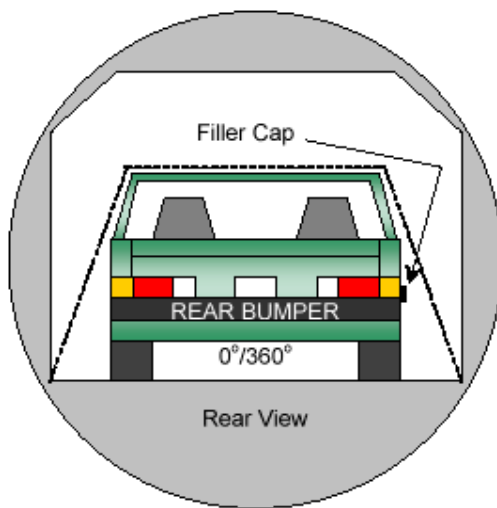
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17

ROLLOVER DATA

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510



0° TO 90°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

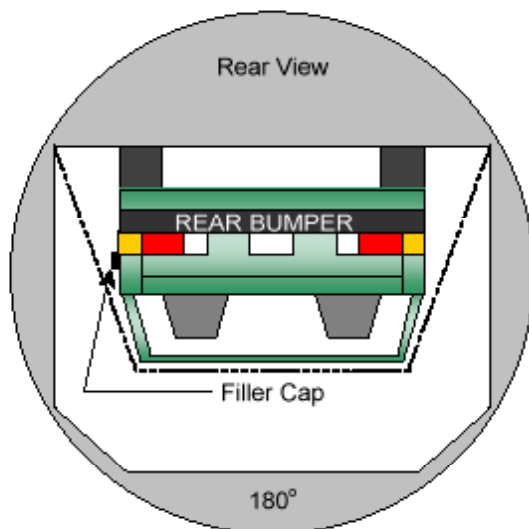
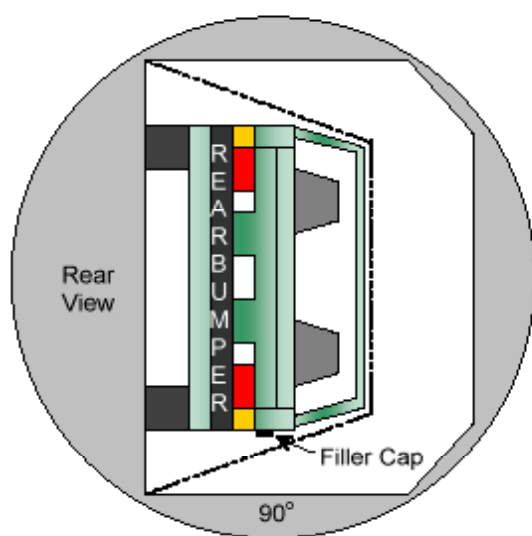
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510



90° TO 180°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>8</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>8</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.

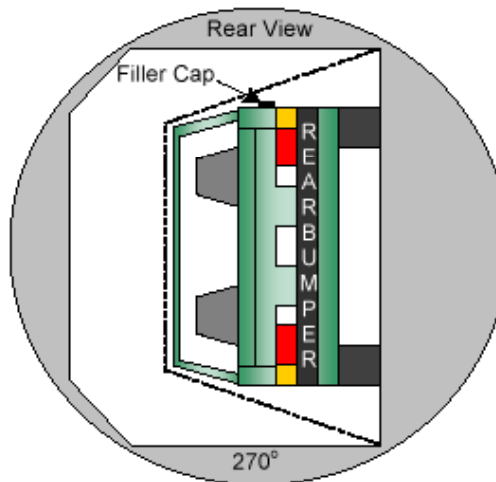
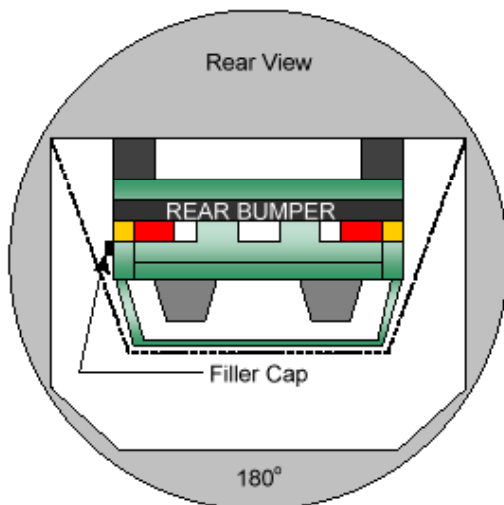
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No. M3 0510



180° TO 270°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>6</u> seconds
(Spec Range =1 to 3 minutes)		
FMVSS 301 Position Hold Time	<u>5</u> minutes	<u>10</u> seconds
TOTAL	<u>6</u> minutes	<u>16</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.

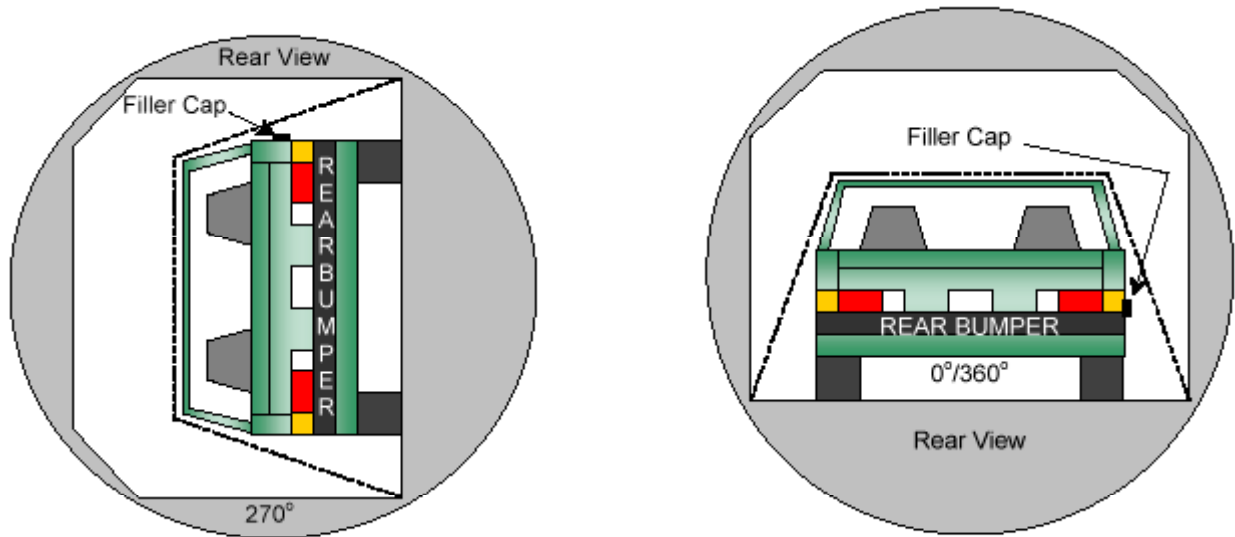
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2003 Mercedes-Benz E-Class E320W

NHTSA No.: M3 0510



270° TO 360°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>8</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>8</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

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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



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



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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: PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-18: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



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



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



Figure A-21: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID



Figure A-22: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID



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



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



Figure A-25: PRE-TEST INTERIOR OF FRONT DOOR



Figure A-26: POST-TEST INTERIOR OF FRONT DOOR SHOWING SID IMPACT LOCATIONS



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



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



Figure A-29: PRE-TEST LEFT SIDE VIEW OF MDB IN IMPACT POSITION



Figure A-30: POST-TEST LEFT SIDE VIEW OF MDB



Figure A-31: PRE-TEST RIGHT SIDE VIEW OF MDB IN IMPACT POSITION



Figure A-32: POST-TEST FRONT RIGHT VIEW OF MDB

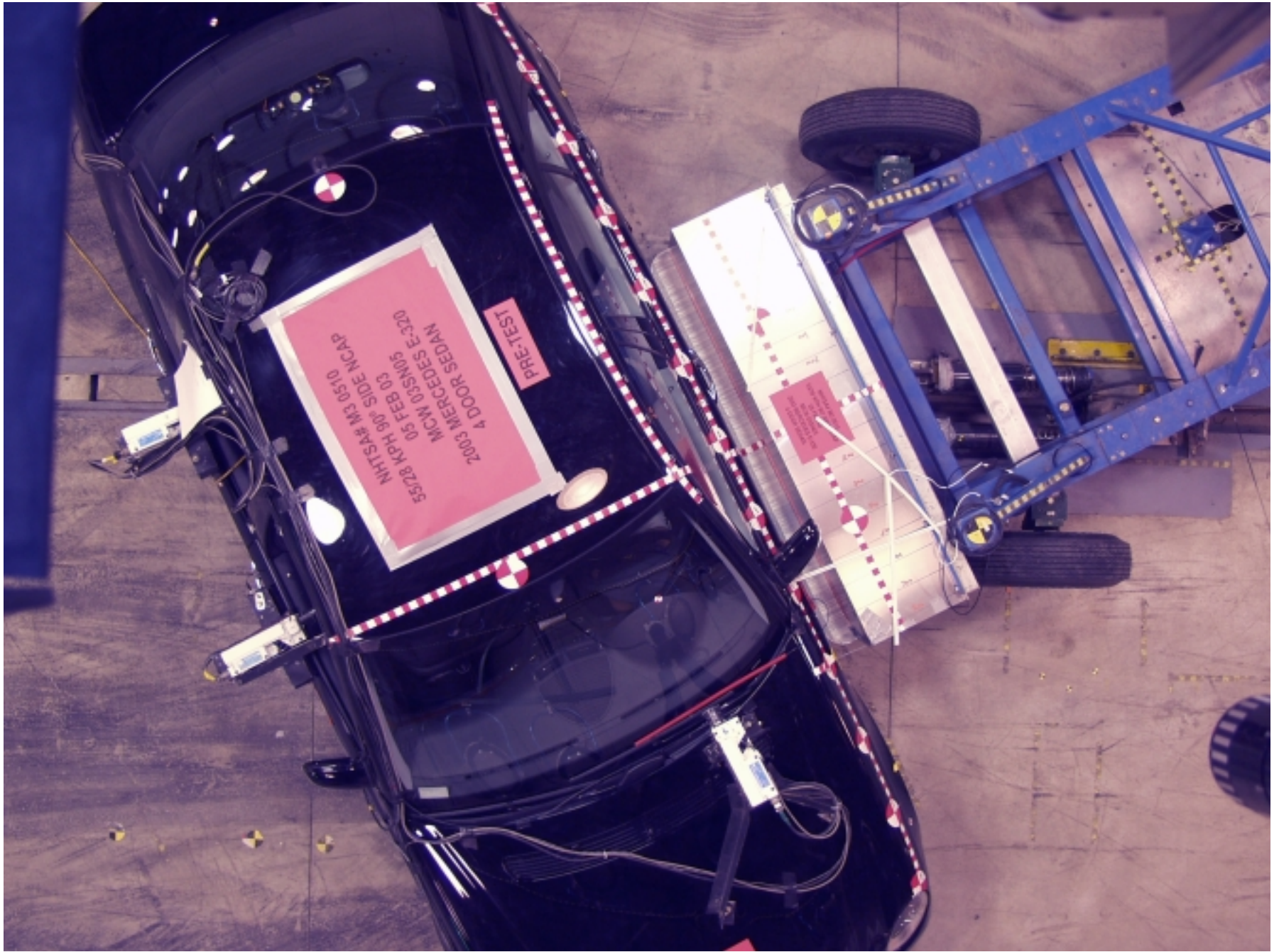


Figure A-33: PRE-TEST OVERHEAD VIEW OF MDB IN IMPACT POSITION



Figure A-34: POST-TEST OVERHEAD VIEW OF MDB



Figure A-35: PRE-TEST CLOSE-UP OF IMPACT POINT TARGET SHOWING WELDING ROD

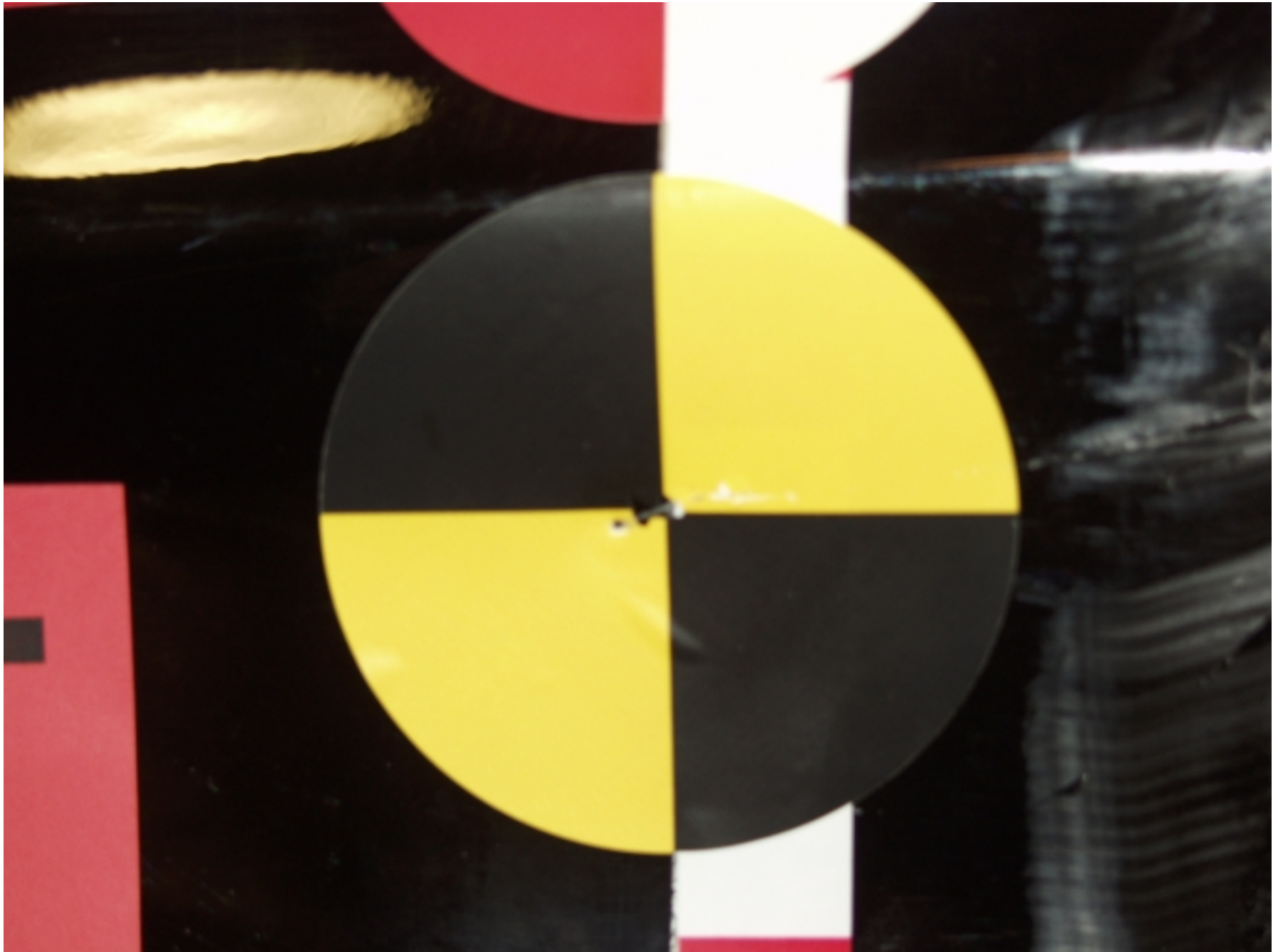


Figure A-36: POST-TEST CLOSE-UP OF IMPACT POINT TARGET

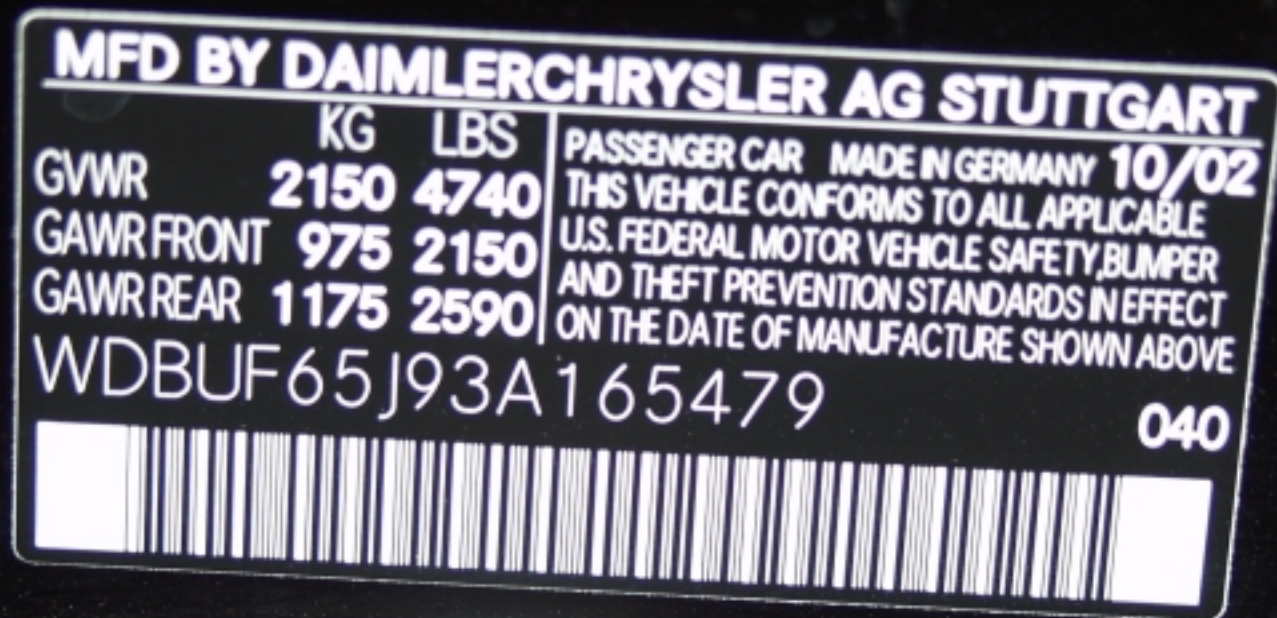


Figure A-37: VEHICLE CERTIFICATION LABEL



Figure A-38: VEHICLE TIRE PLACARD



Figure A-39: IMPACT



Figure A-40: ROLLOVER 0 DEGREES

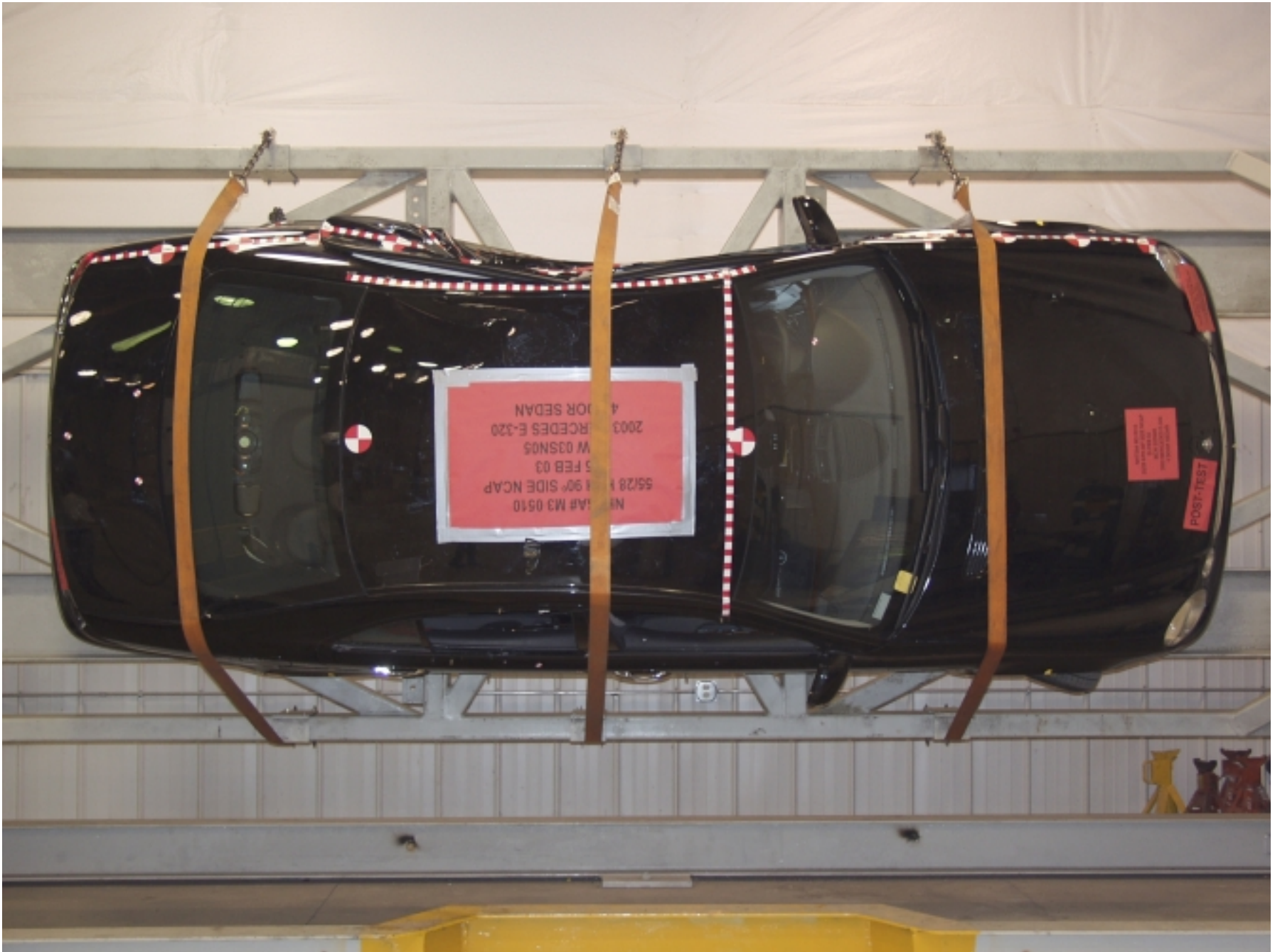


Figure A-41: ROLLOVER 90 DEGREES

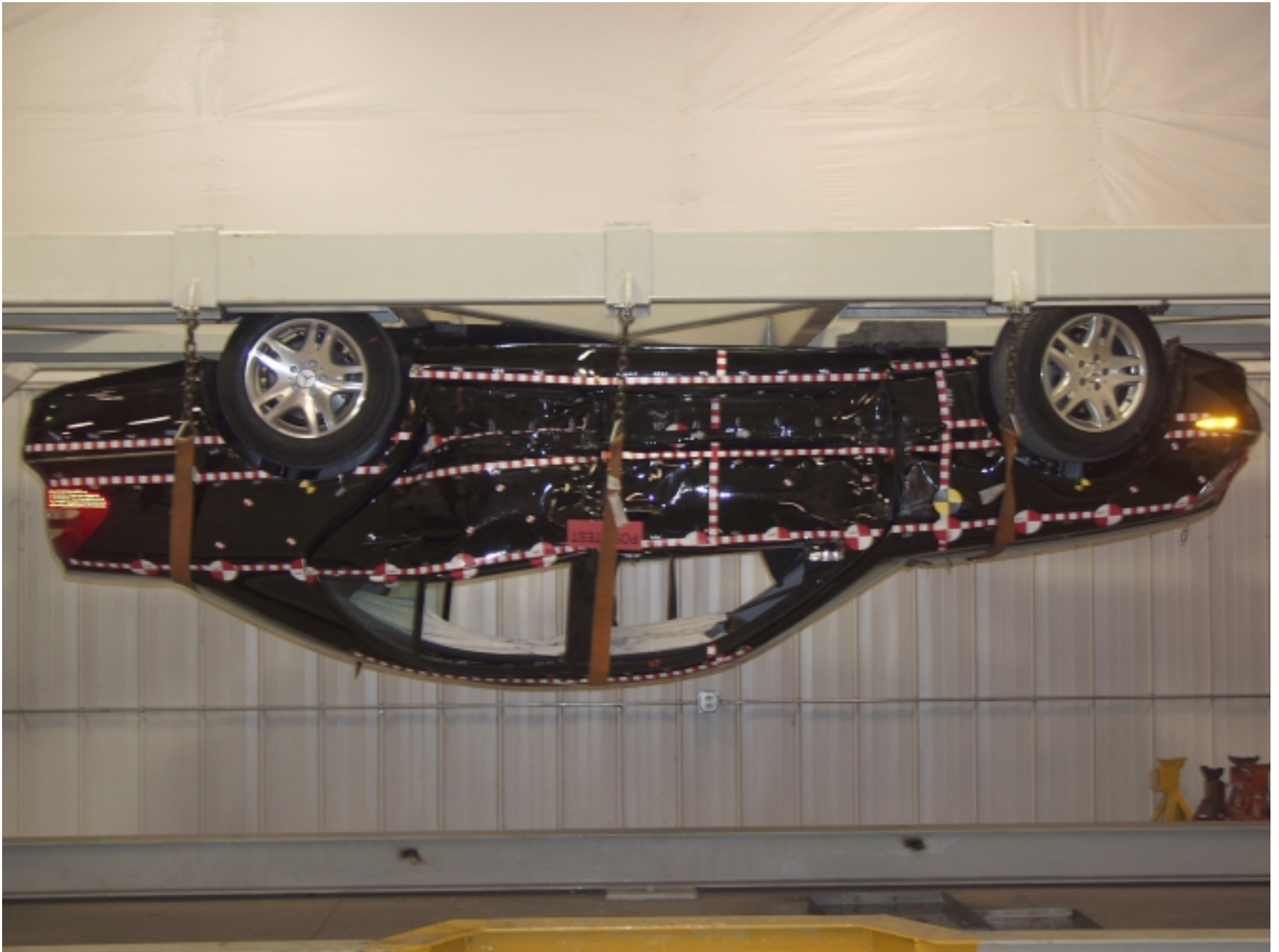


Figure A-42: ROLLOVER 180 DEGREES

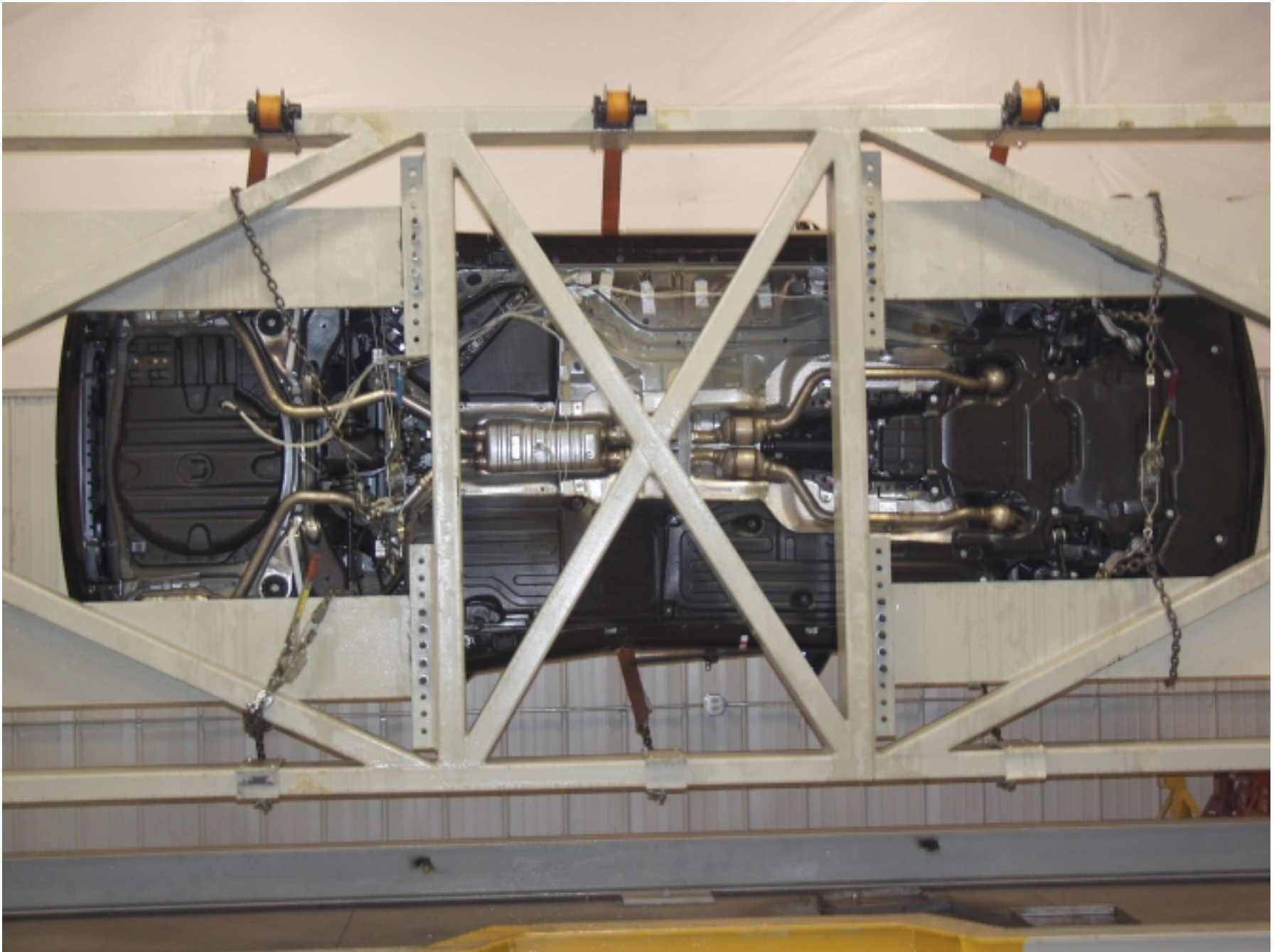


Figure A-43: ROLLOVER 270 DEGREES



Figure A-44: ROLLOVER 360 DEGREES



Figure A-45: PRE-TEST ALUMINUM BARRIER FRONT



Figure A-46: POST-TEST ALUMINUM BARRIER FRONT



Figure A-47: PRE-TEST ALUMINUM BARRIER LEFT SIDE



Figure A-48: POST-TEST ALUMINUM BARRIER LEFT SIDE



Figure A-49: PRE-TEST ALUMINUM BARRIER RIGHT SIDE



Figure A-50: POST-TEST ALUMINUM BARRIER RIGHT SIDE

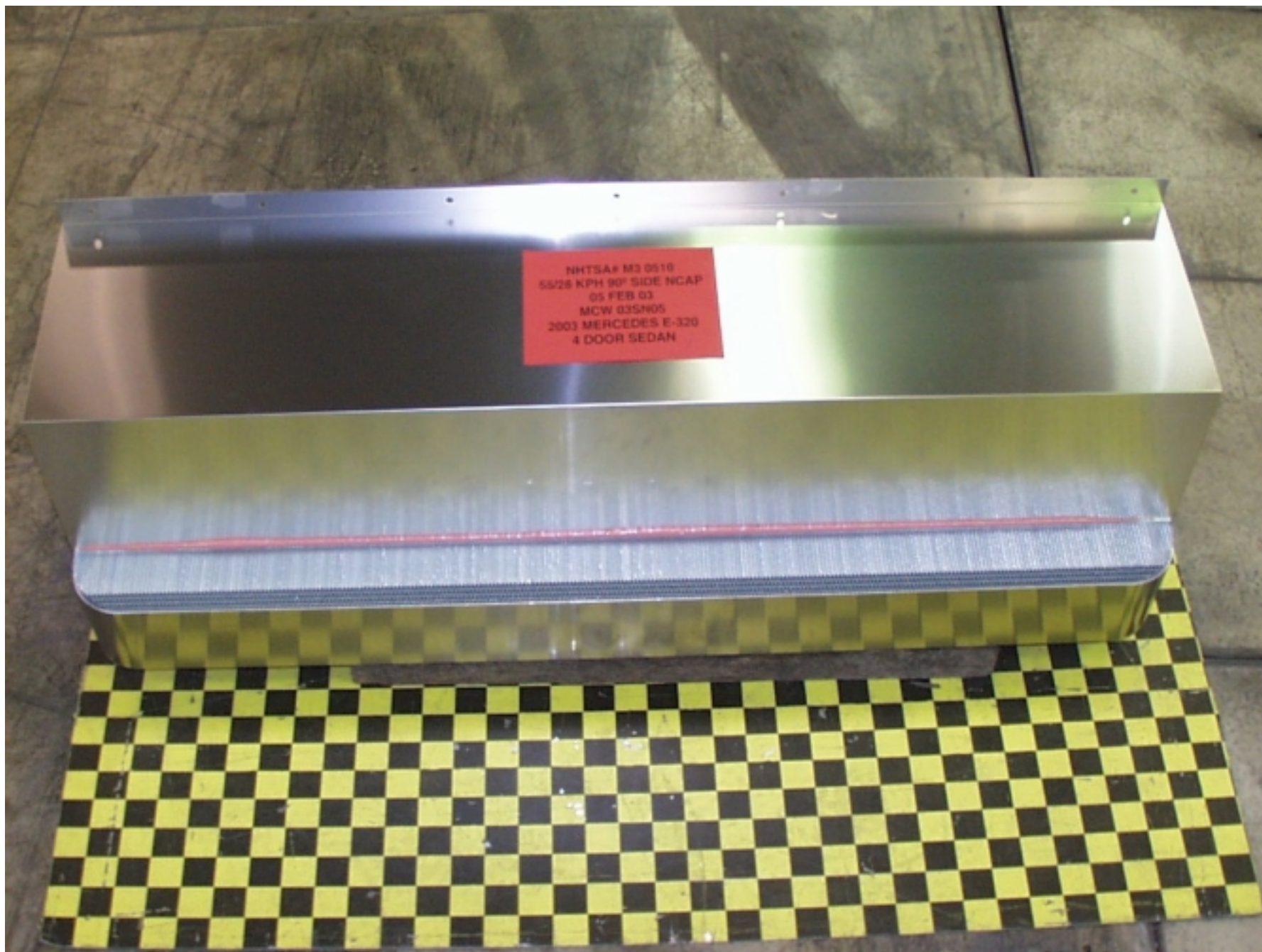


Figure A-51: PRE-TEST ALUMINUM BARRIER OVERHEAD



Figure A-52: POST-TEST ALUMINUM BARRIER OVERHEAD

APPENDIX B

VEHICLE, MDB, AND SID RESPONSE DATA

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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

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INTEGRATION DATA – FILTER CLASS 180

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MDB INSTRUMENTATION PLOTS
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DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)
ACCELERATION DATA – FILTER CLASS 1000, LOWER SPINE FILTER CLASS 180
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130	PASSENGER LOWER SPINE (Y) ACCELERATION-REDUNDANT	B-135
131	PASSENGER LOWER SPINE (Y) VELOCITY-REDUNDANT	B-136
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DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOT (REDUNDANT)
ACCELERATION DATA – FIR FILTERED

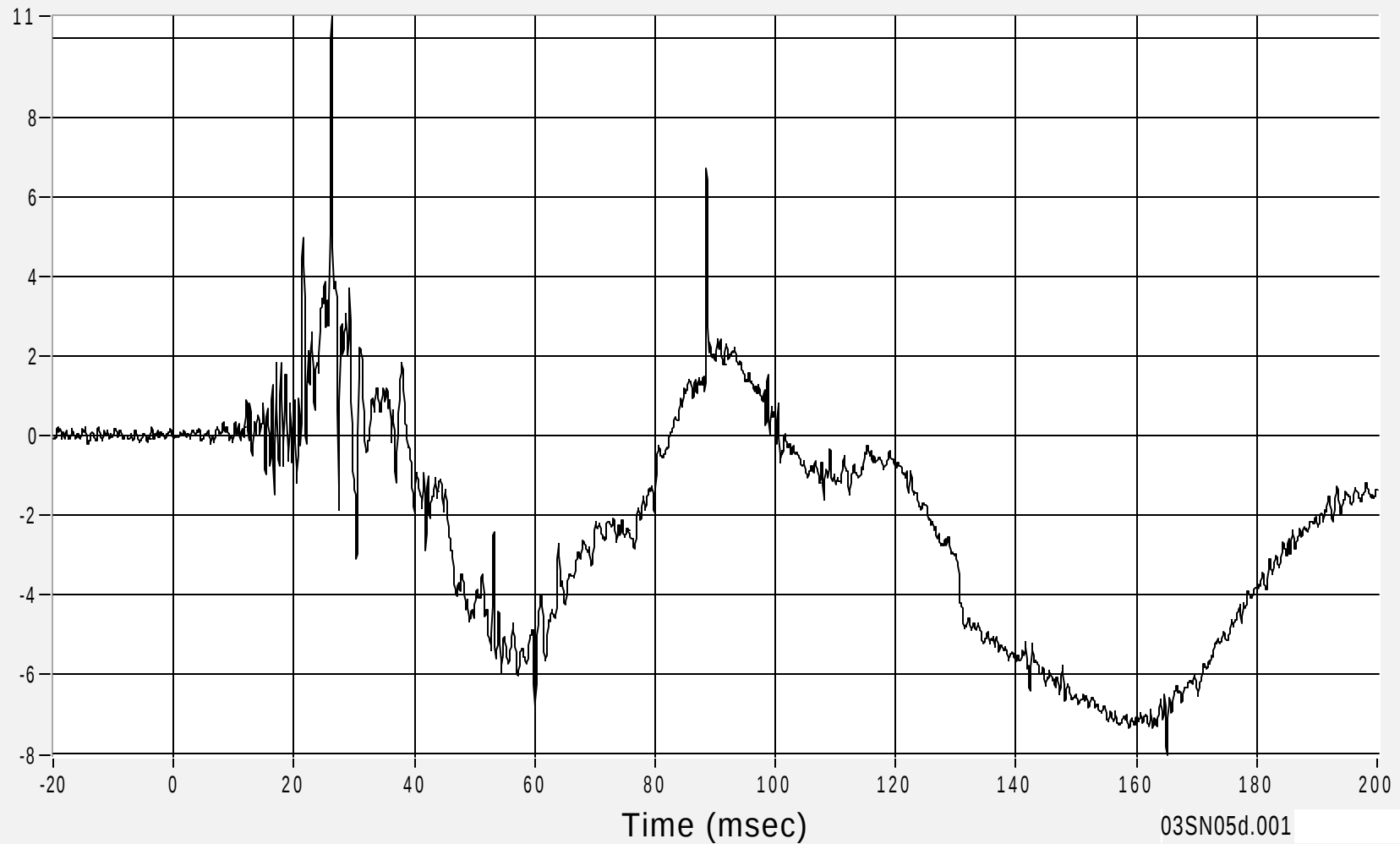
<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
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140	PASSENGER LOWER SPINE (Y) ACCELERATION-REDUNDANT	B-145
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Driver Head CG (X) Acceleration

Acceleration (G's) CFC1000

Max 10.6 G's at 26.2 msec
Min -8.1 G's at 165.0 msec

B-6



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

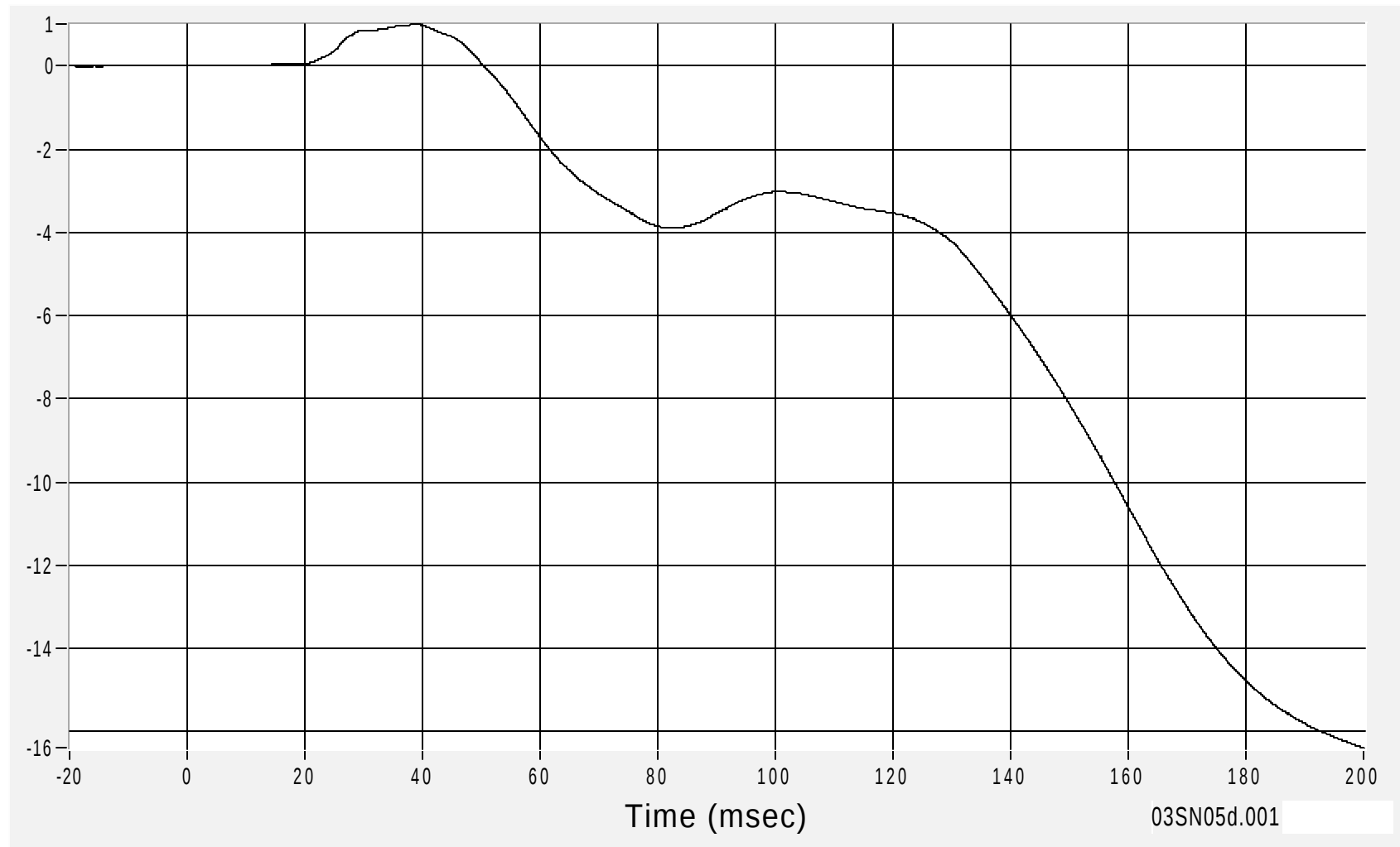
Driver Head CG (X) Velocity

Velocity (km/h) CFC180

Max 1.0 km/h at 38.8 msec

Min -16.4 km/h at 199.9 msec

B-7



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

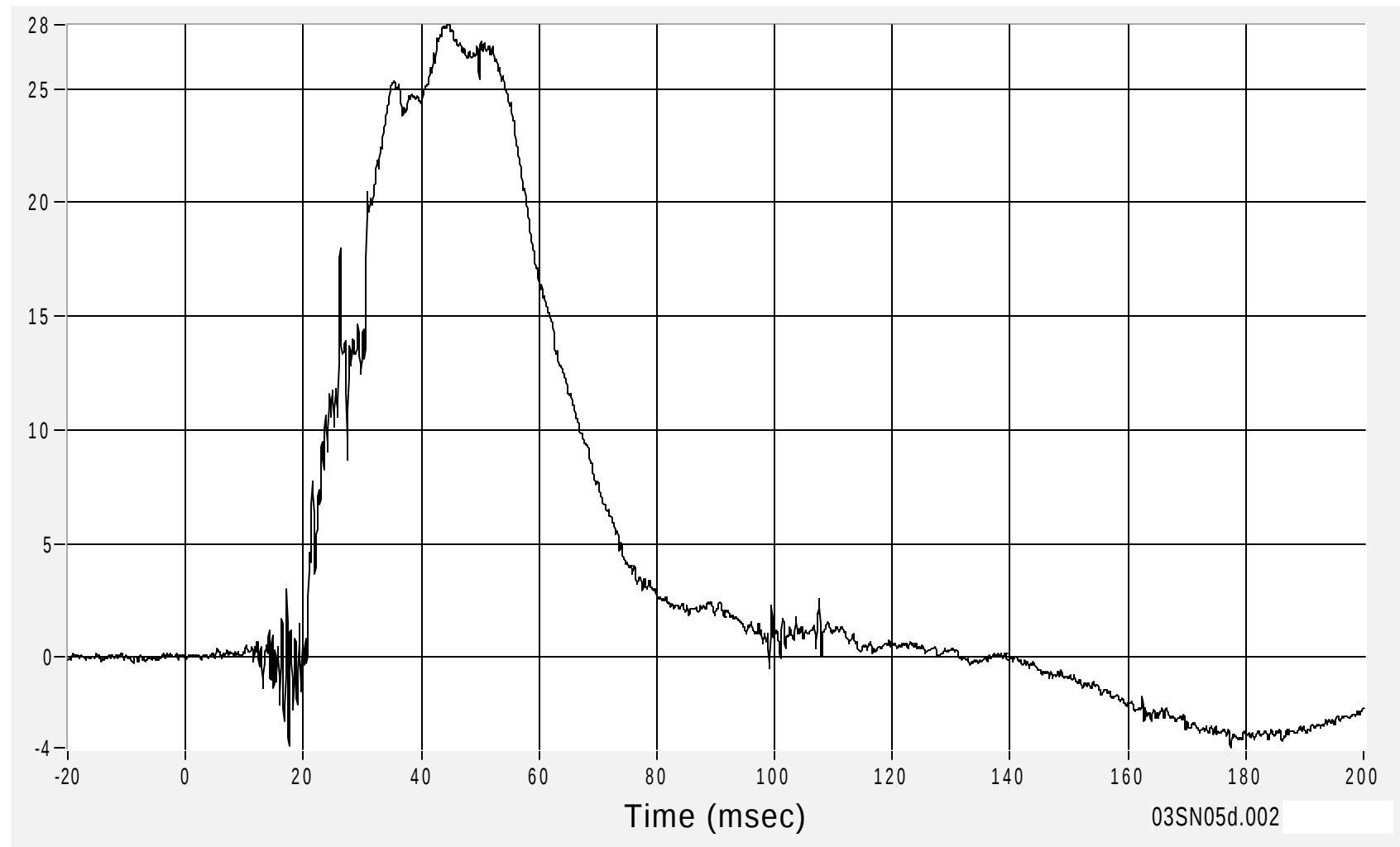
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (Y) Acceleration

Acceleration (G's) CFC1000

Max 27.8 G's at 44.8 msec
Min -4.0 G's at 177.4 msec

B-8



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

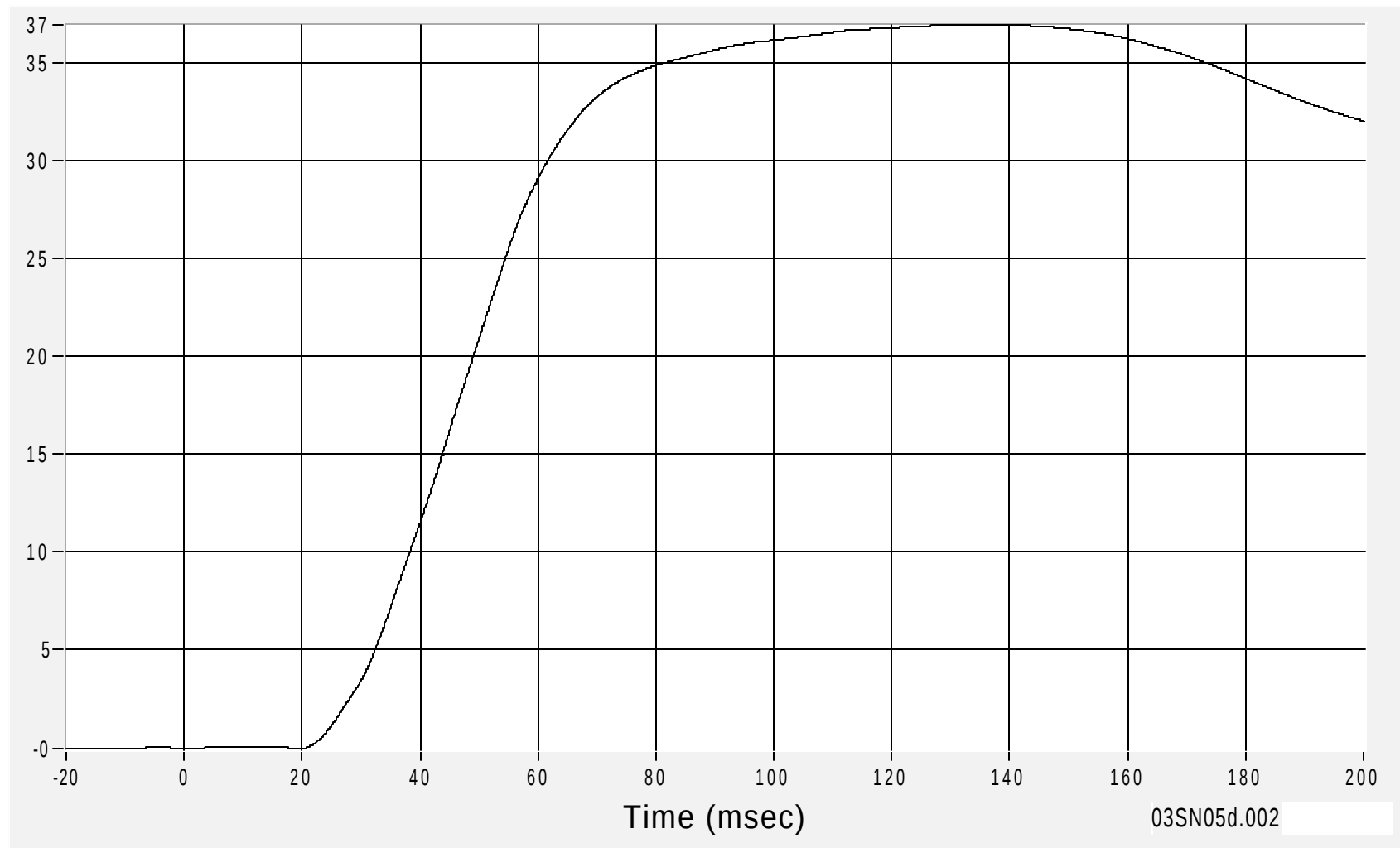
Driver Head CG (Y) Velocity

Velocity (km/h) CFC180

Max 37.0 km/h at 131.6 msec

Min 0.0 km/h at 19.8 msec

B-9



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

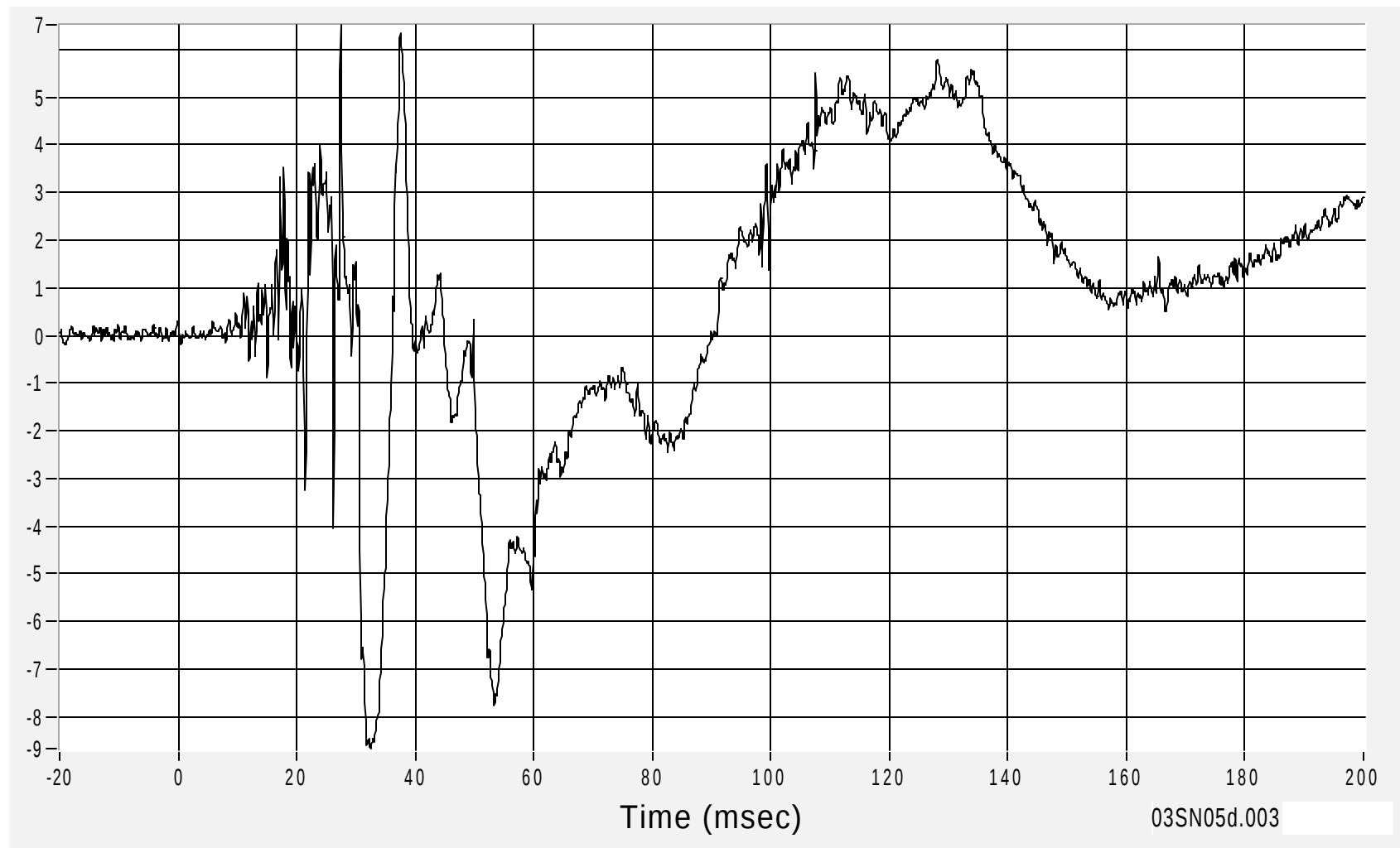
Driver Head CG (Z) Acceleration

Acceleration (G's) CFC1000

Max 6.5 G's at 27.4 msec

Min -8.7 G's at 32.5 msec

B-10



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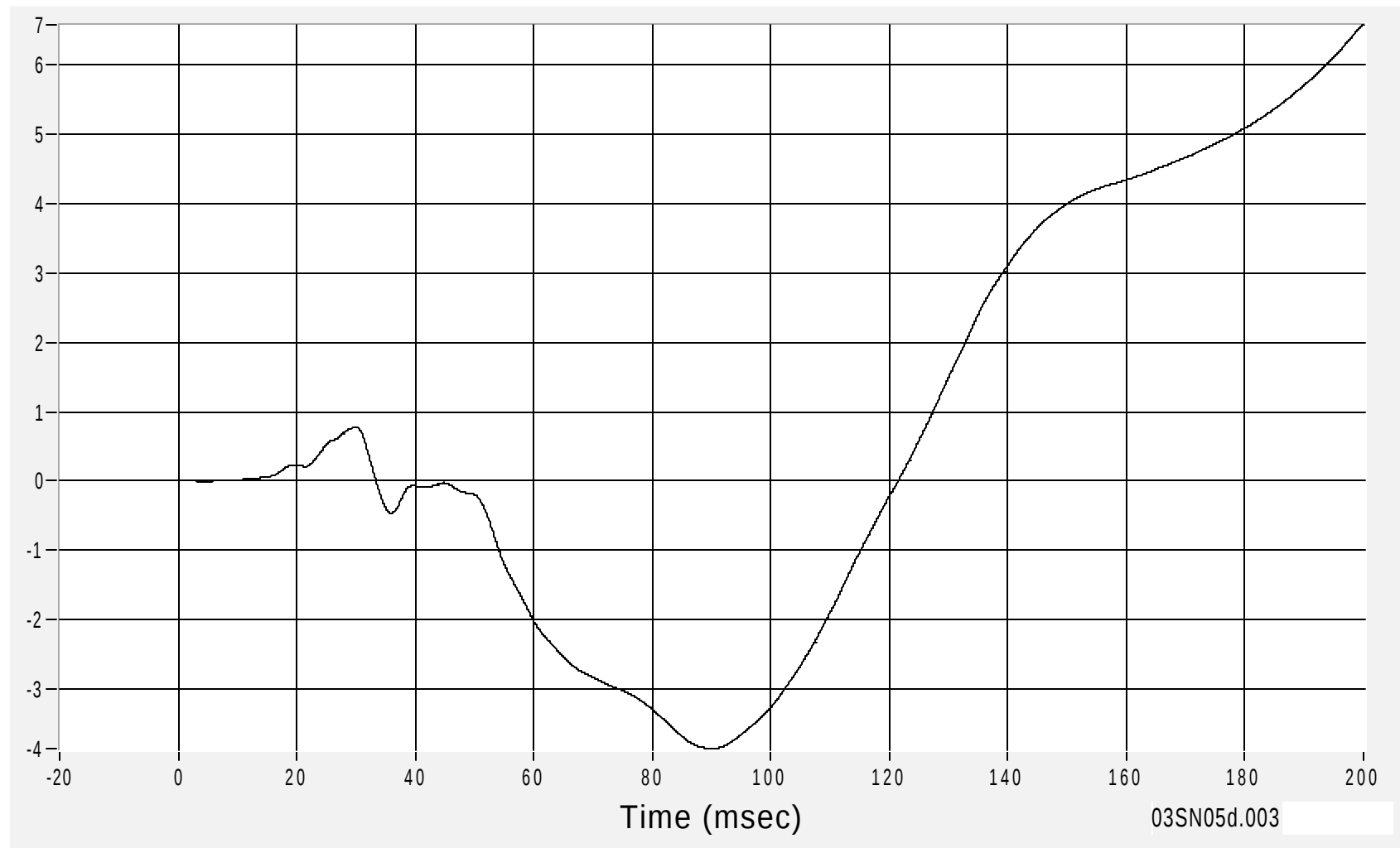
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (Z) Velocity

Velocity (km/h) CFC180

Max 6.6 km/h at 199.9 msec
Min -3.9 km/h at 90.2 msec

B-11



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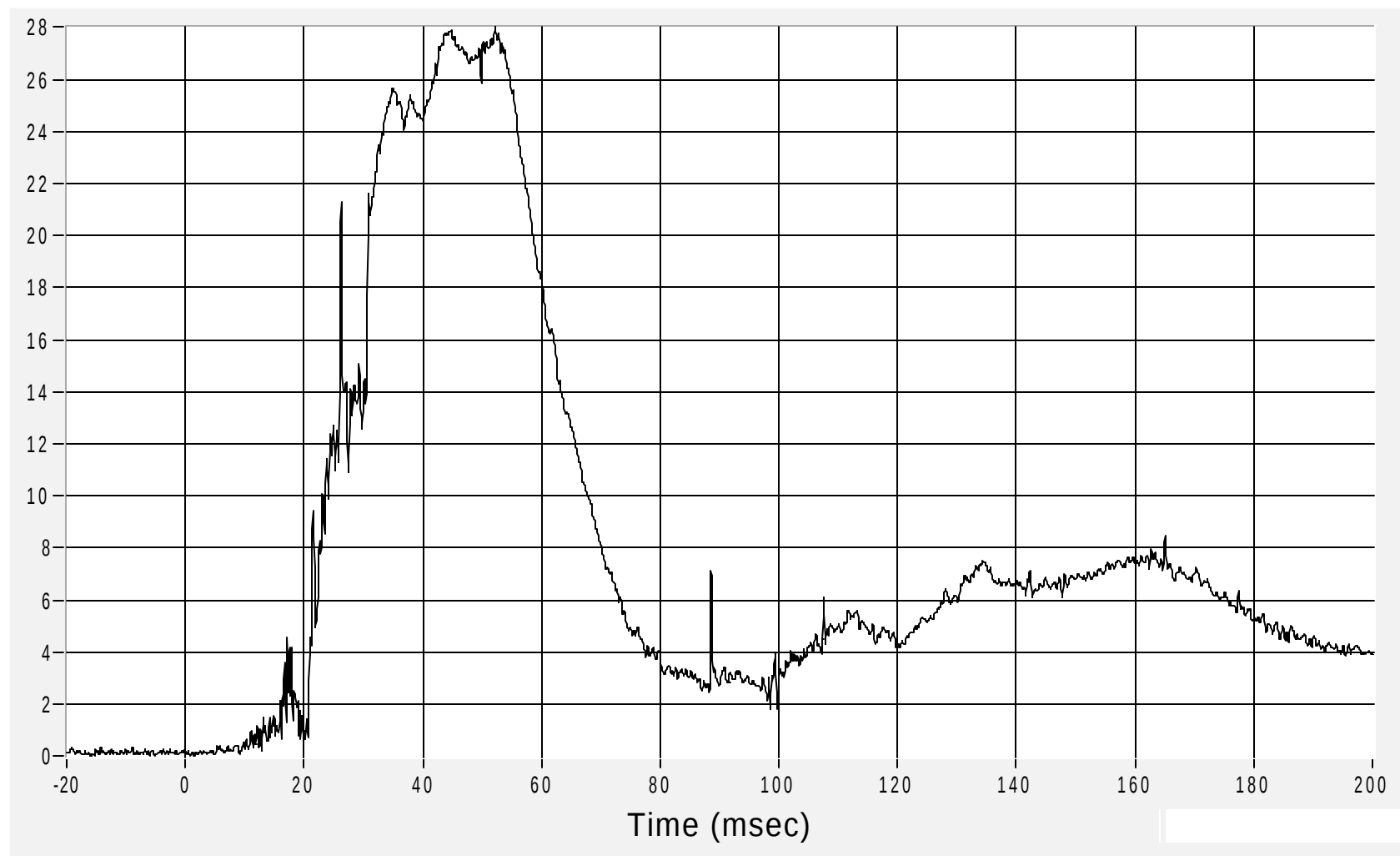
Driver Head Resultant Acceleration

Acceleration (G's) CFC1000

Max 28.0 G's at 52.2 msec

Min 0.0 G's at 1.5 msec

B-12



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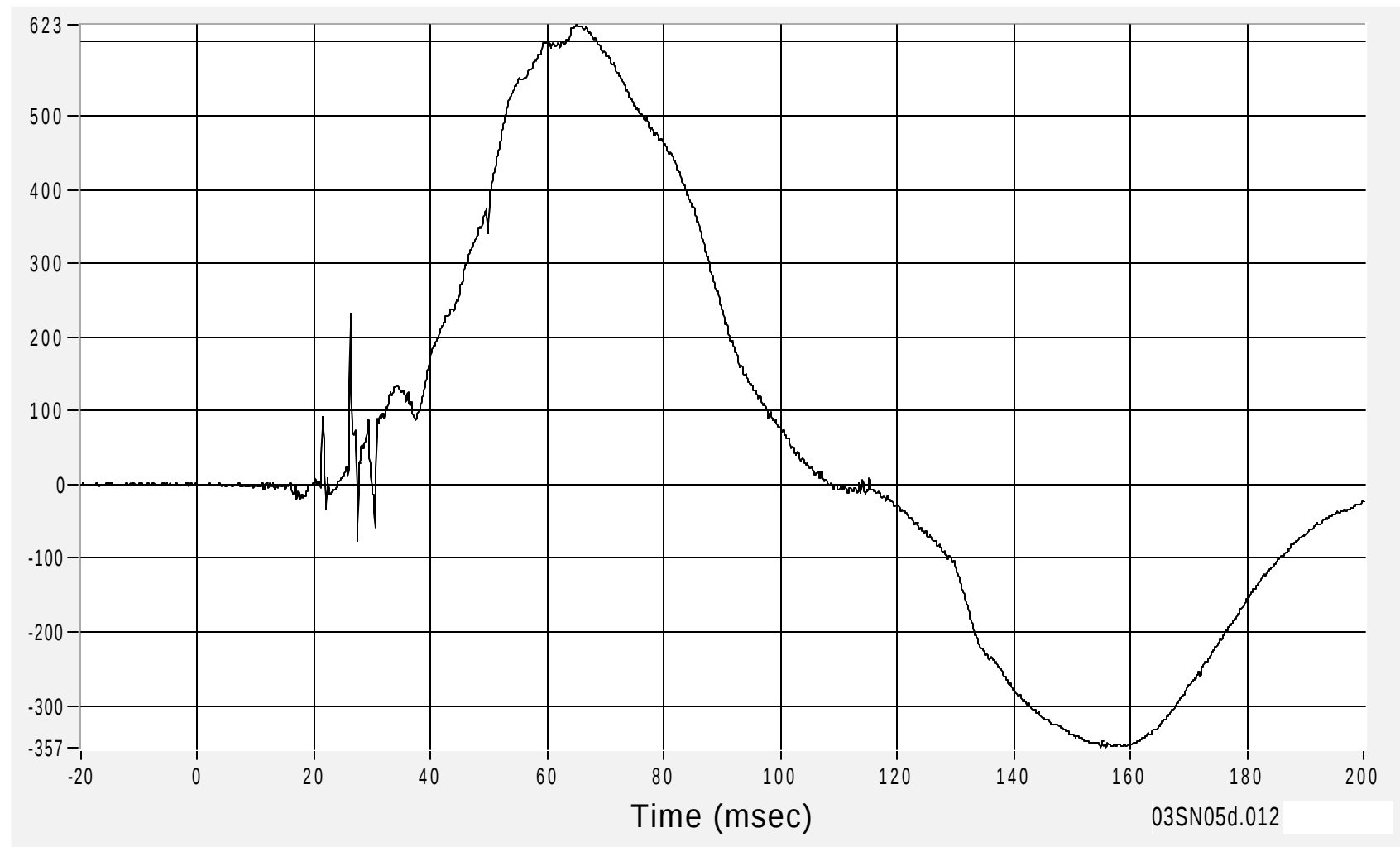
Driver Upper Neck (X) Force

Force (N) CFC1000

Max 623.4 N at 65.0 msec

Min -357.1 N at 155.8 msec

B-13



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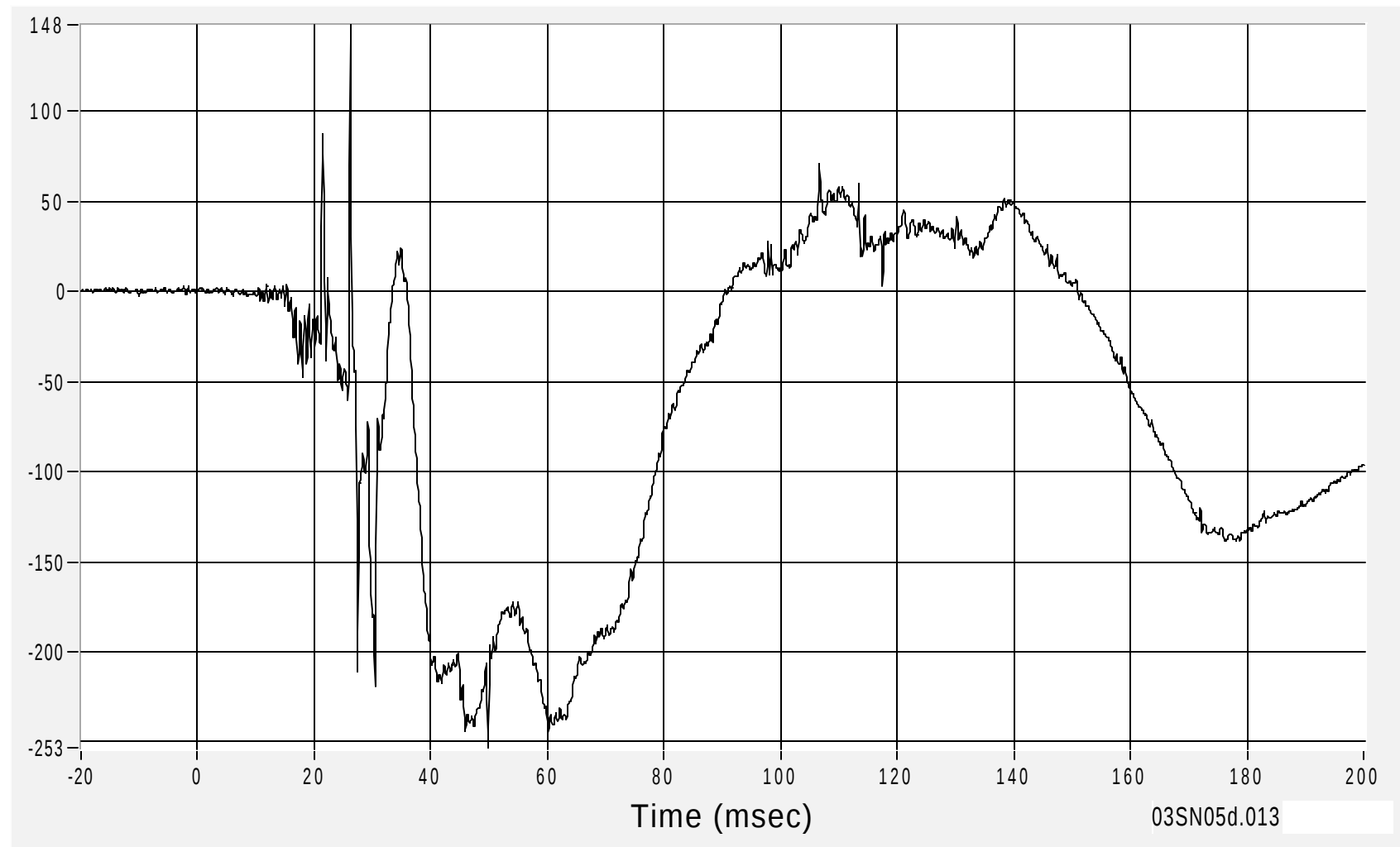
Driver Upper Neck (Y) Force

Force (N) CFC1000

Max 147.8 N at 26.2 msec

Min -253.2 N at 49.8 msec

B-14



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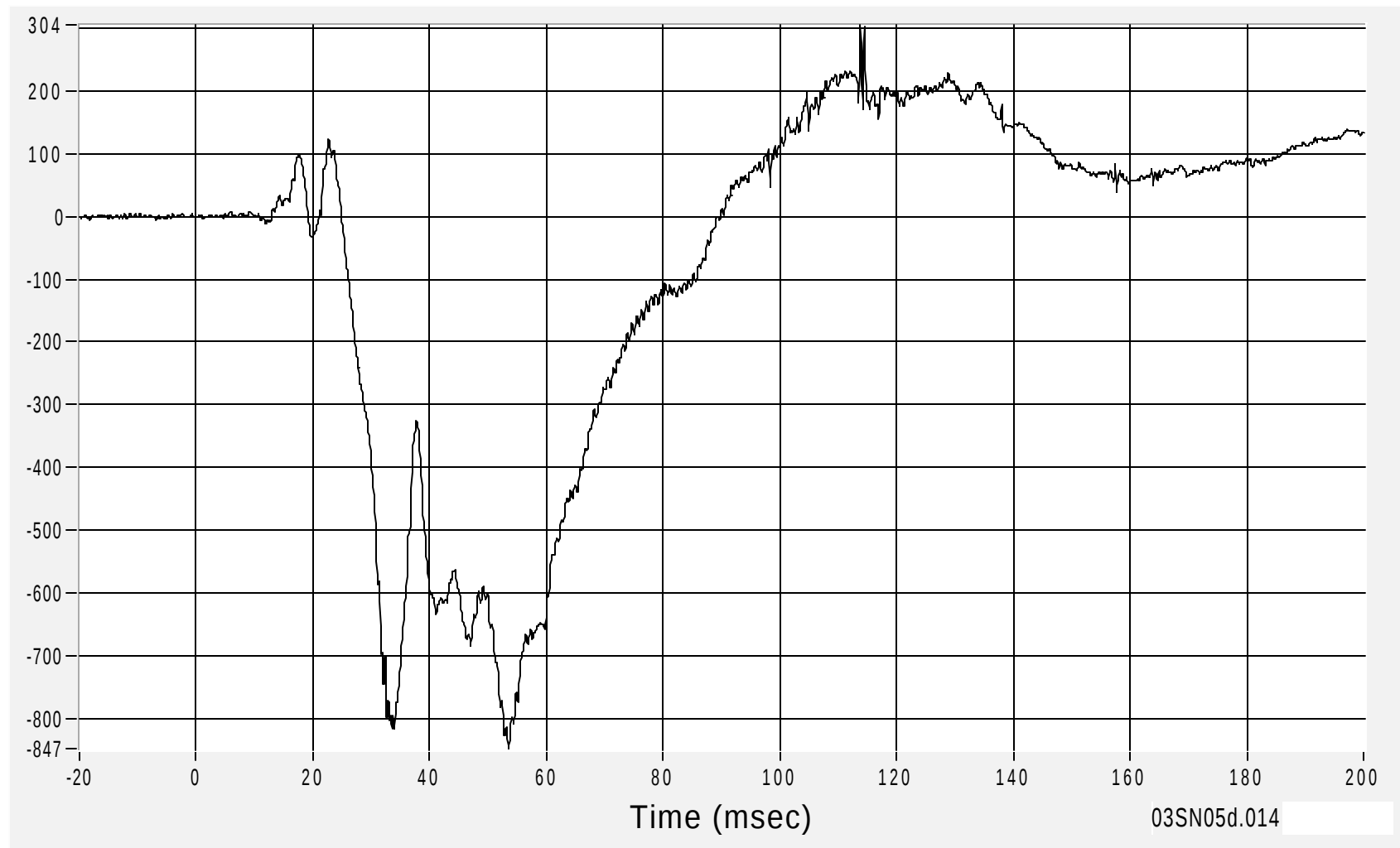
Driver Upper Neck (Z) Force

Force (N) CFC1000

Max 304.4 N at 113.8 msec

Min -846.9 N at 53.5 msec

B-15



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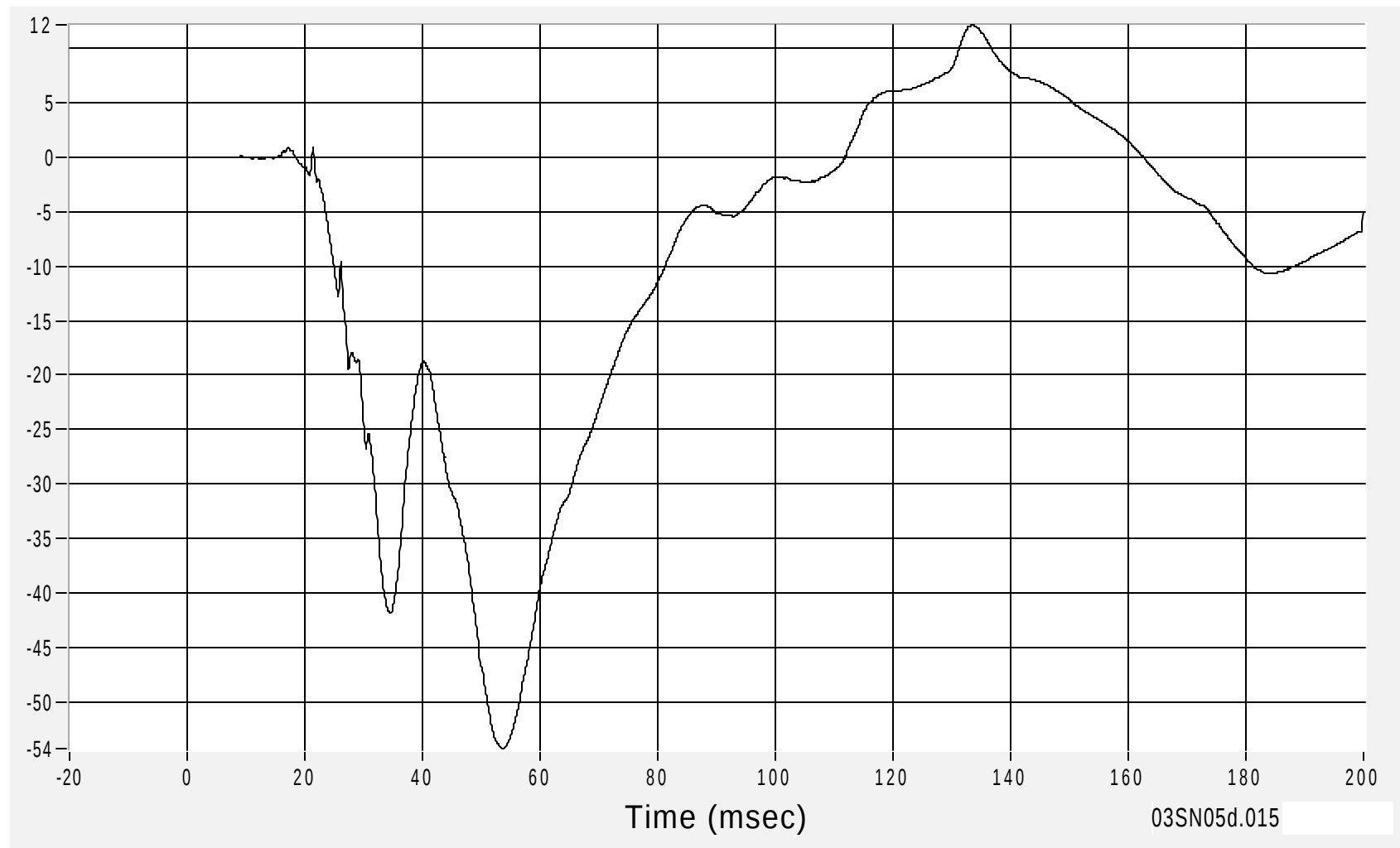
Driver Upper Neck (X) Moment

Moment (Nm) CFC600

Max 12.1 Nm at 133.5 msec

Min -54.3 Nm at 53.7 msec

B-16



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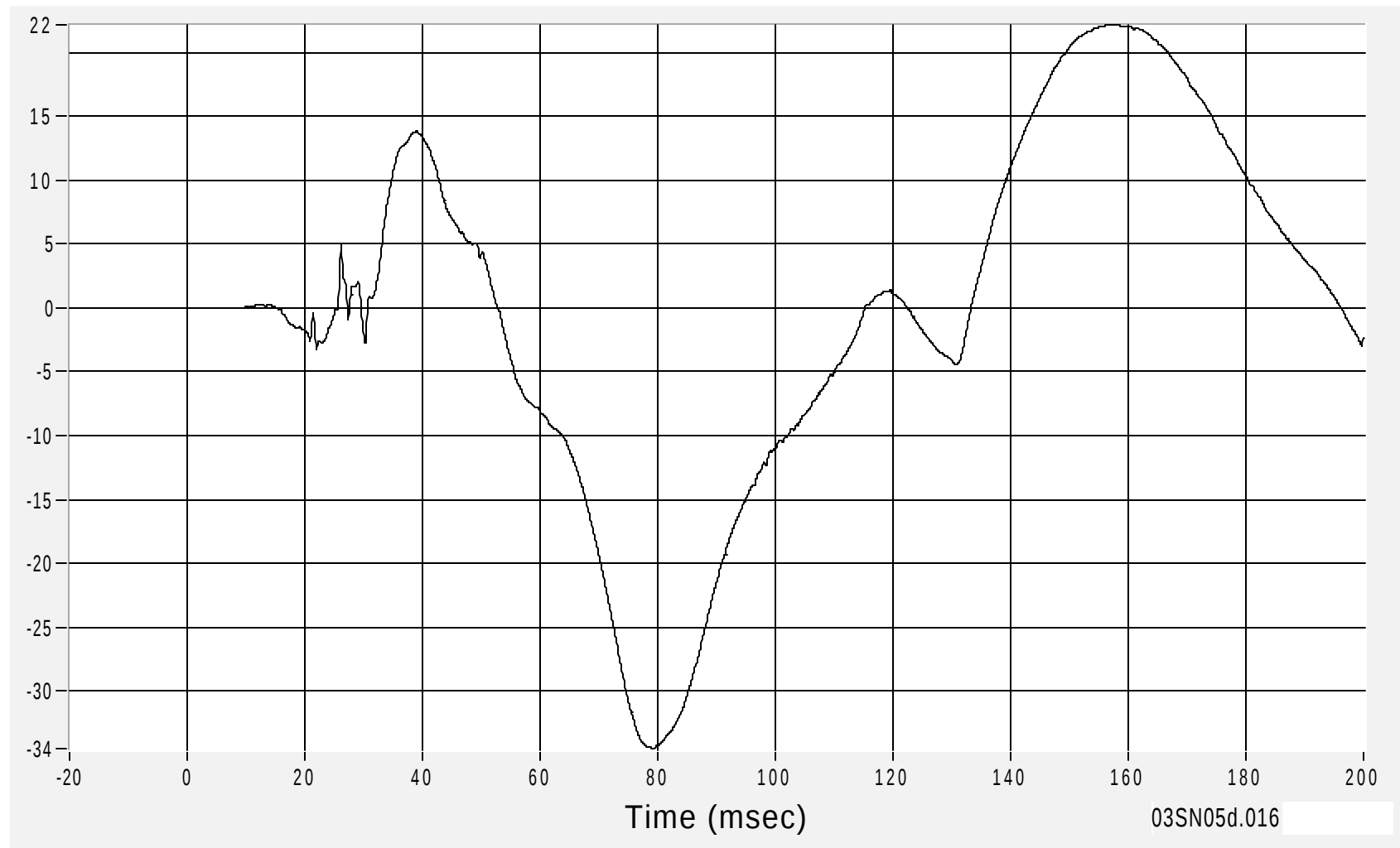
Driver Upper Neck (Y) Moment

Moment (Nm) CFC600

Max 22.1 Nm at 156.8 msec

Min -34.5 Nm at 79.3 msec

B-17



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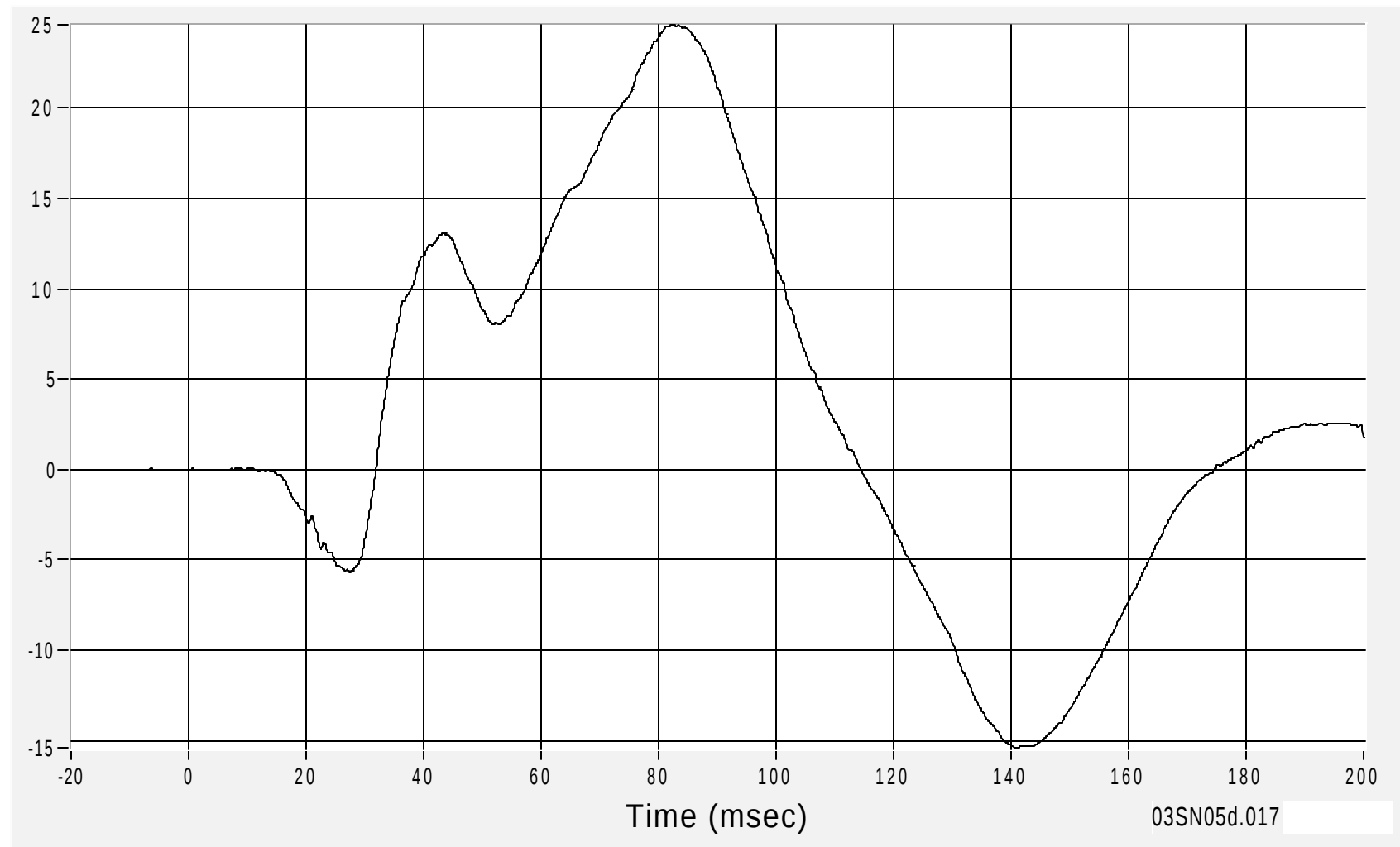
Driver Upper Neck (Z) Moment

Moment (Nm) CFC600

Max 24.6 Nm at 82.4 msec

Min -15.4 Nm at 140.8 msec

B-18



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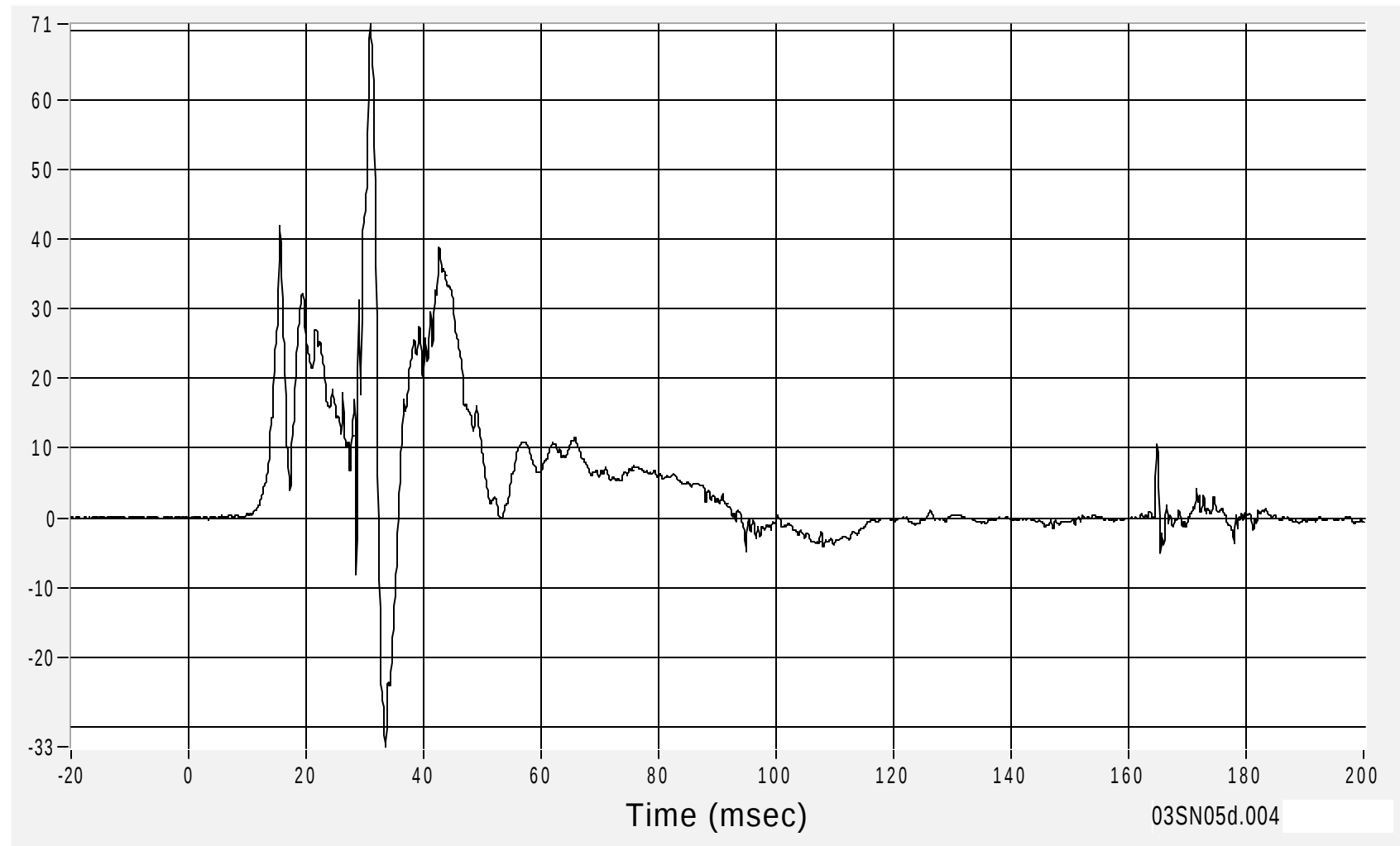
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 71.0 G's at 31.0 msec
Min -33.0 G's at 33.5 msec

B-19



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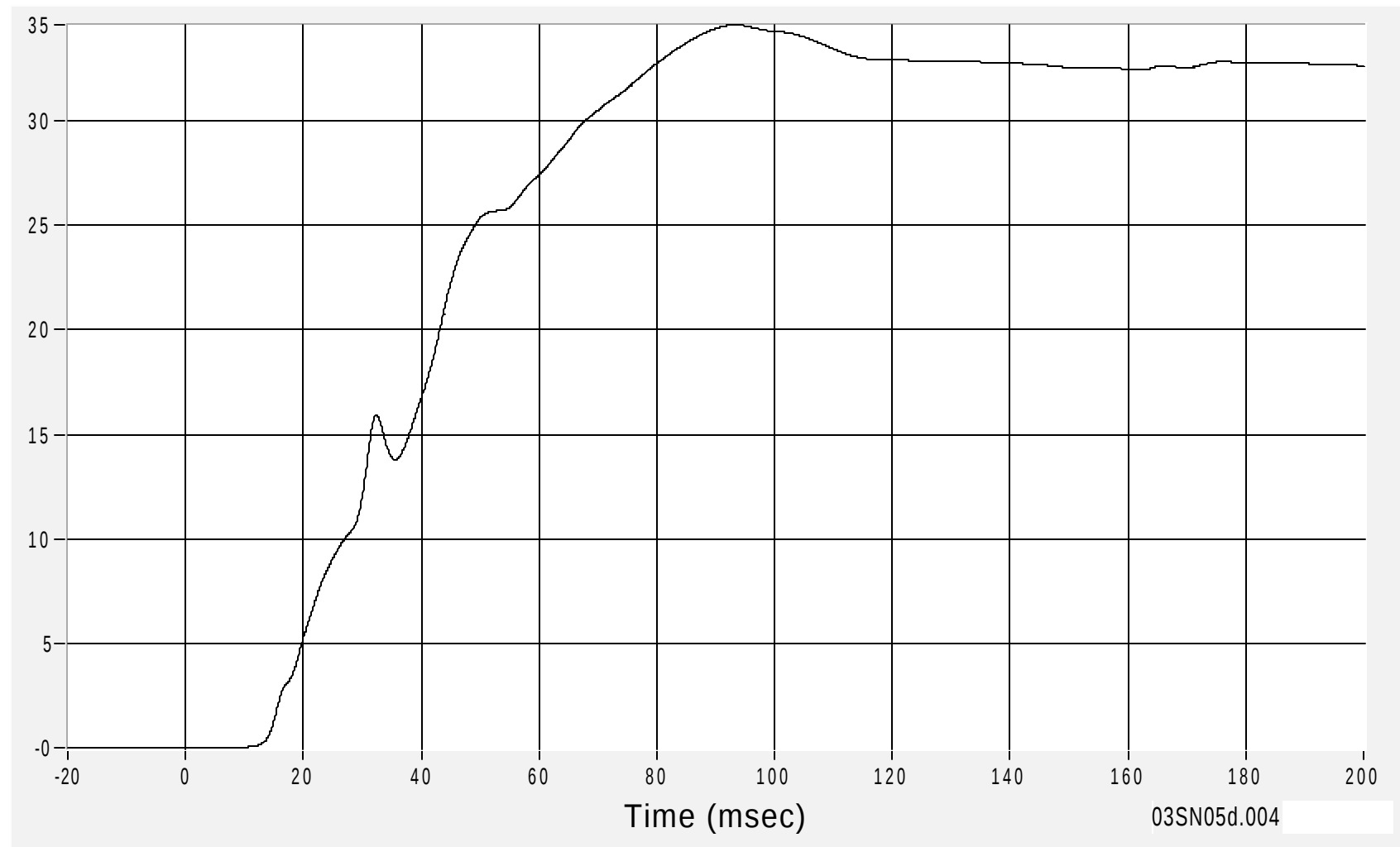
Driver Upper Rib (Y) Velocity

Velocity (km/h) CFC180

Max 34.6 km/h at 93.7 msec

Min 0.0 km/h at 3.7 msec

B-20



03SN05 - 2003 MERCEDES E-CLASS E320W

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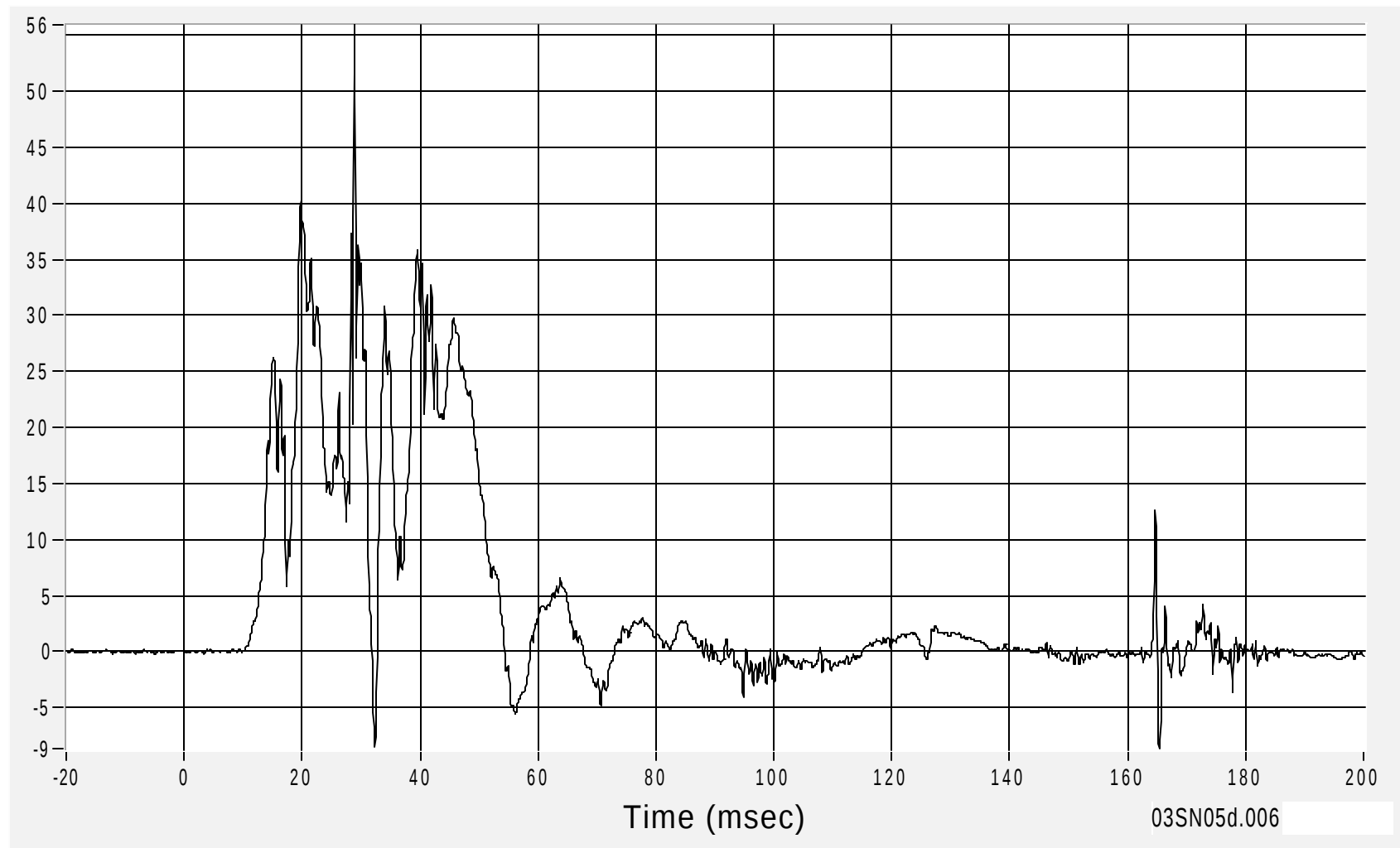
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 55.9 G's at 28.9 msec
Min -8.6 G's at 165.4 msec

B-21



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5 February 2003

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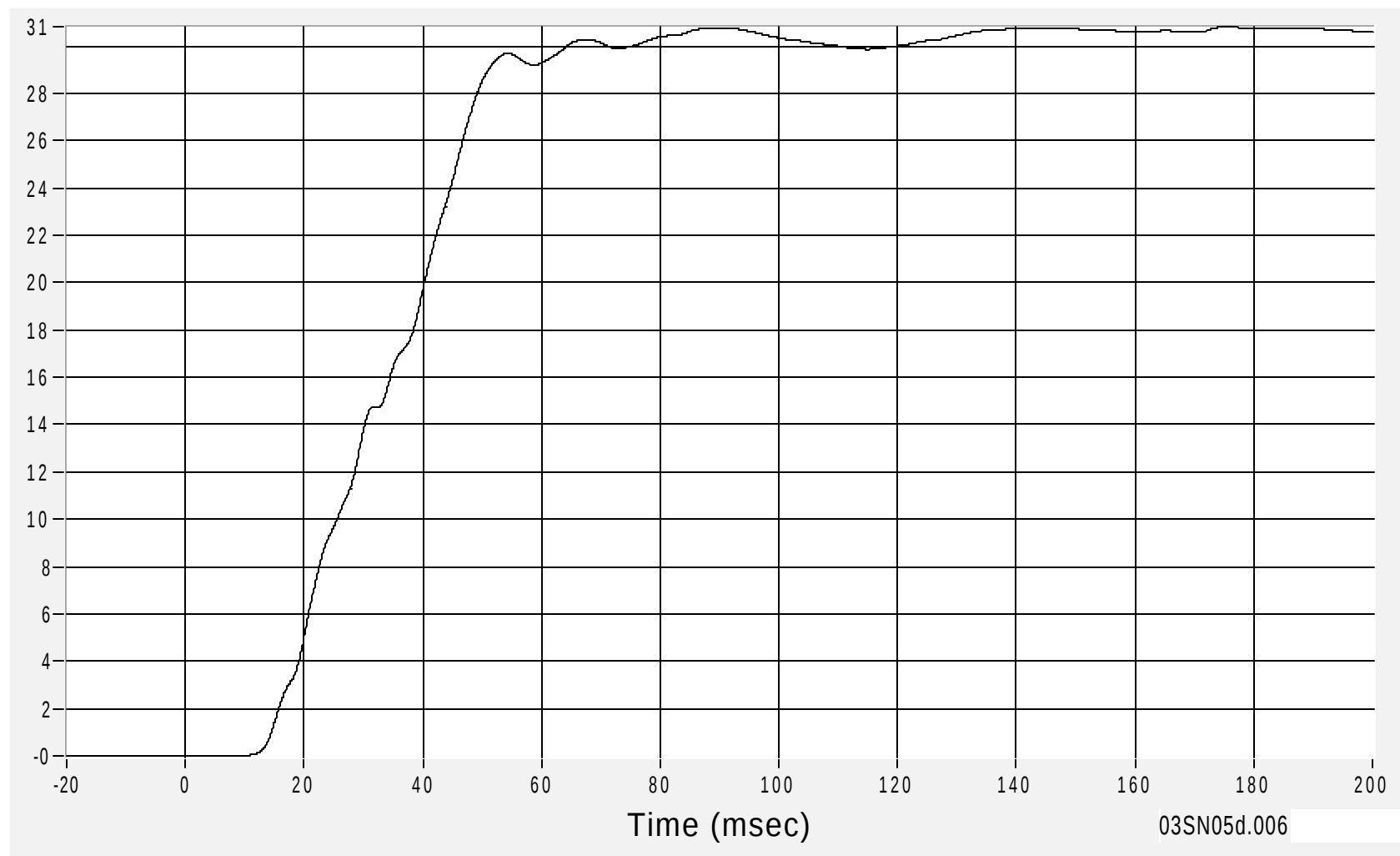
Driver Lower Rib (Y) Velocity

Velocity (km/h) CFC180

Max 30.8 km/h at 175.8 msec

Min 0.0 km/h at 0.0 msec

B-22



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

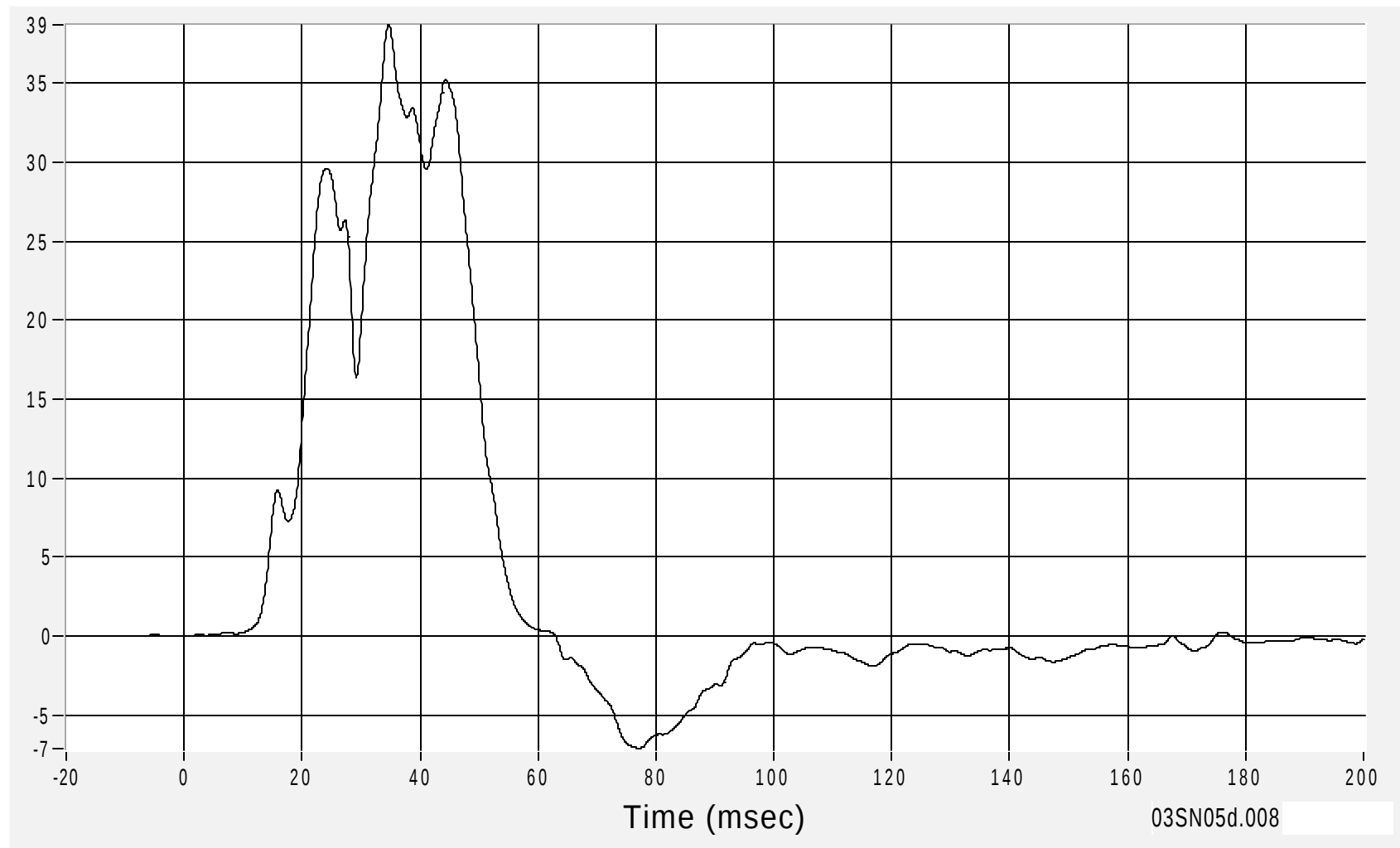
Medical College of Wisconsin
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Driver Lower Spine (Y) Acceleration

Acceleration (G's) CFC180

Max 38.7 G's at 34.6 msec
Min -7.1 G's at 77.1 msec

B-23



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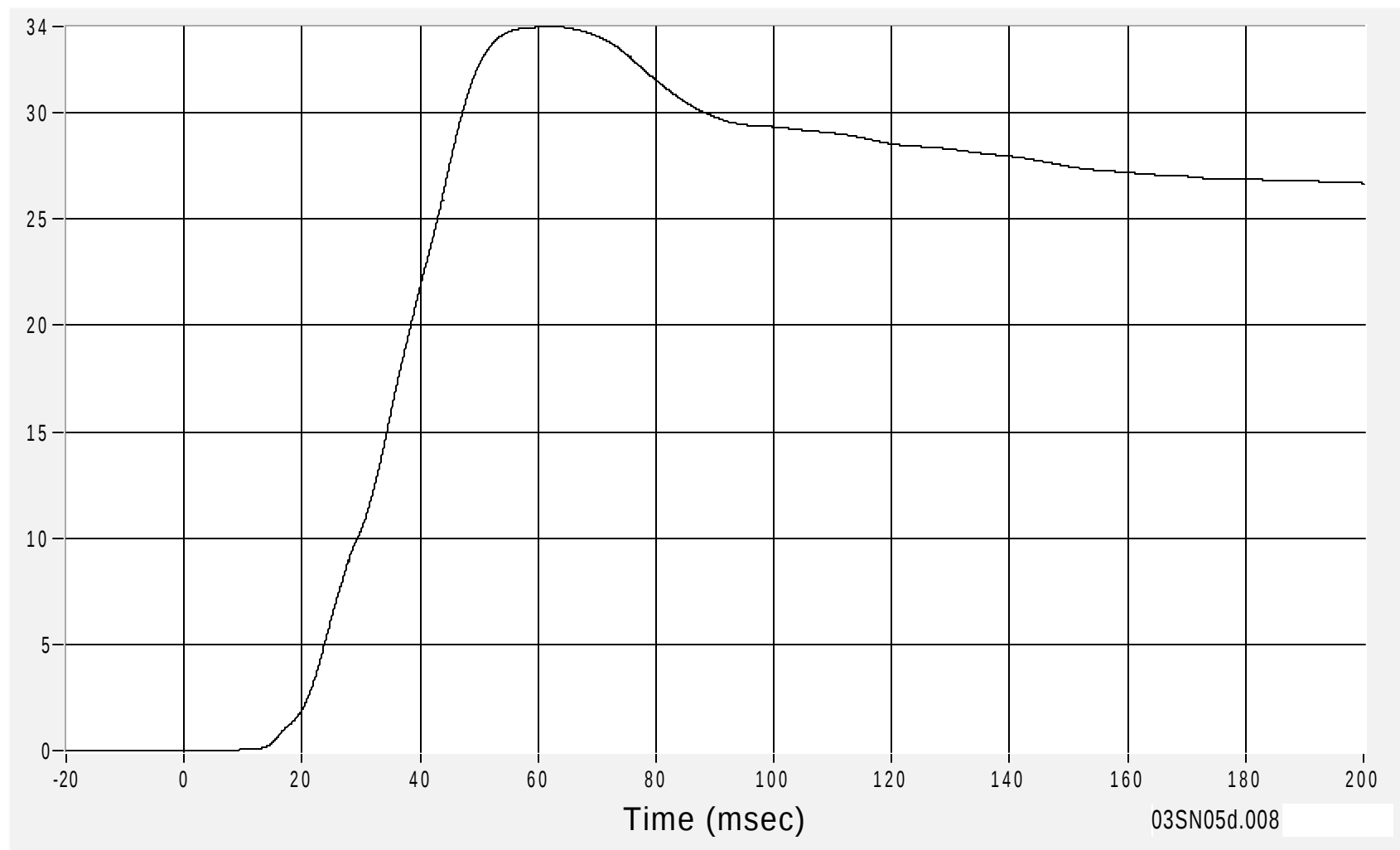
Driver Lower Spine (Y) Velocity

Velocity (km/h) CFC180

Max 34.1 km/h at 63.0 msec

Min 0.0 km/h at 0.0 msec

B-24



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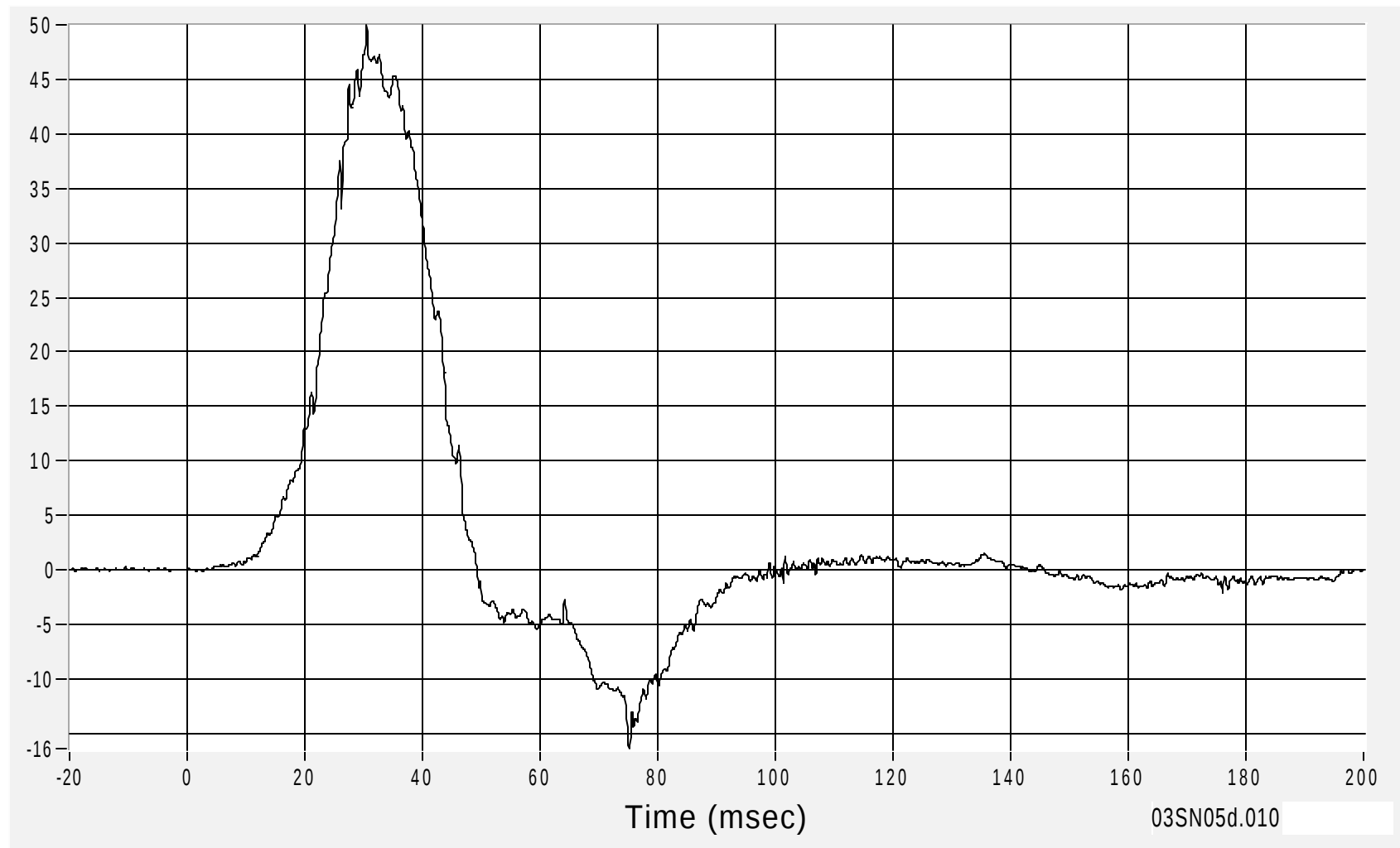
Driver Pelvic (Y) Acceleration

Acceleration (G's) CFC1000

Max 50.0 G's at 30.6 msec

Min -16.4 G's at 75.2 msec

B-25



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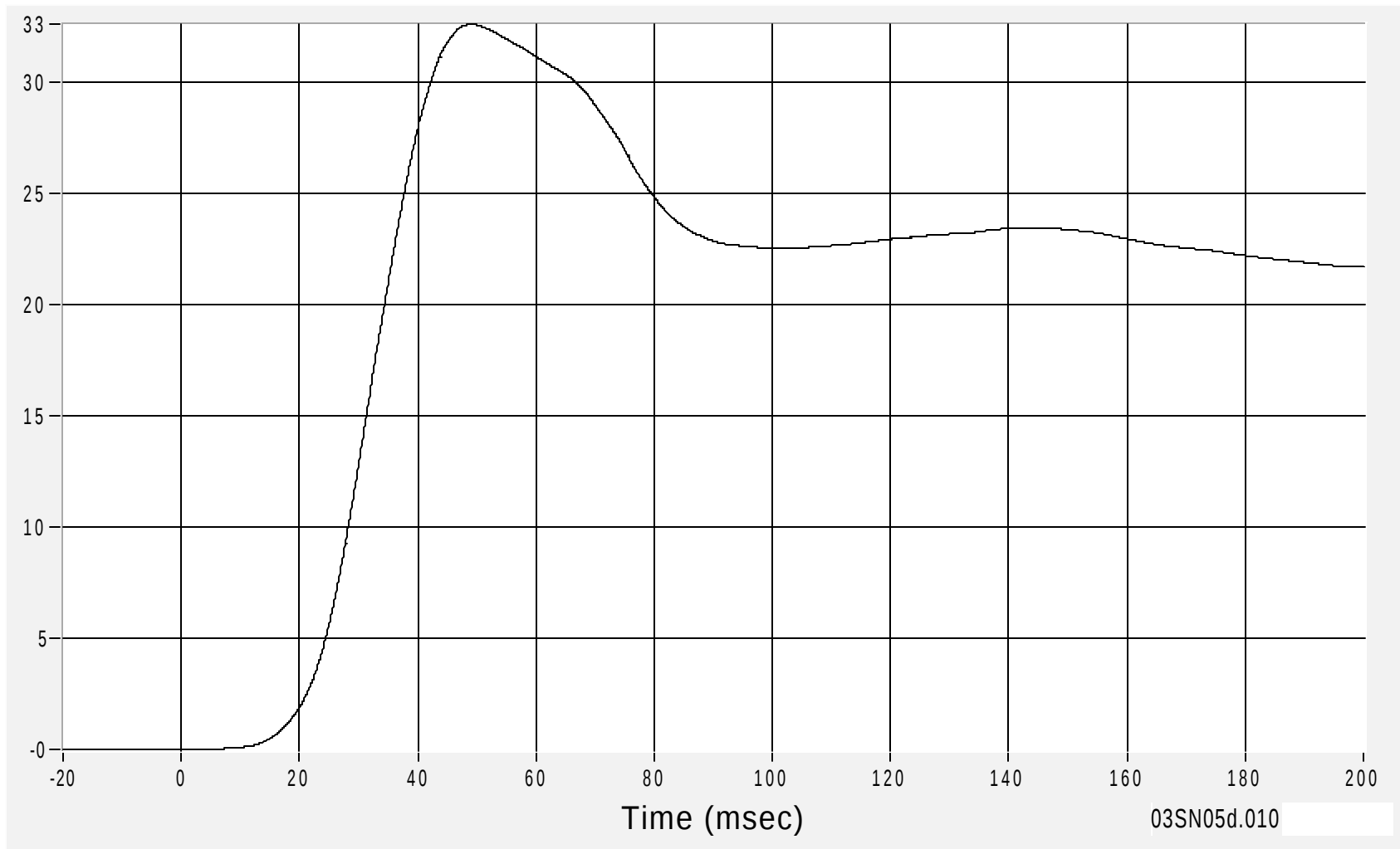
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Velocity

Velocity (km/h) CFC180

Max 32.6 km/h at 49.1 msec
Min 0.0 km/h at 3.4 msec

B-26



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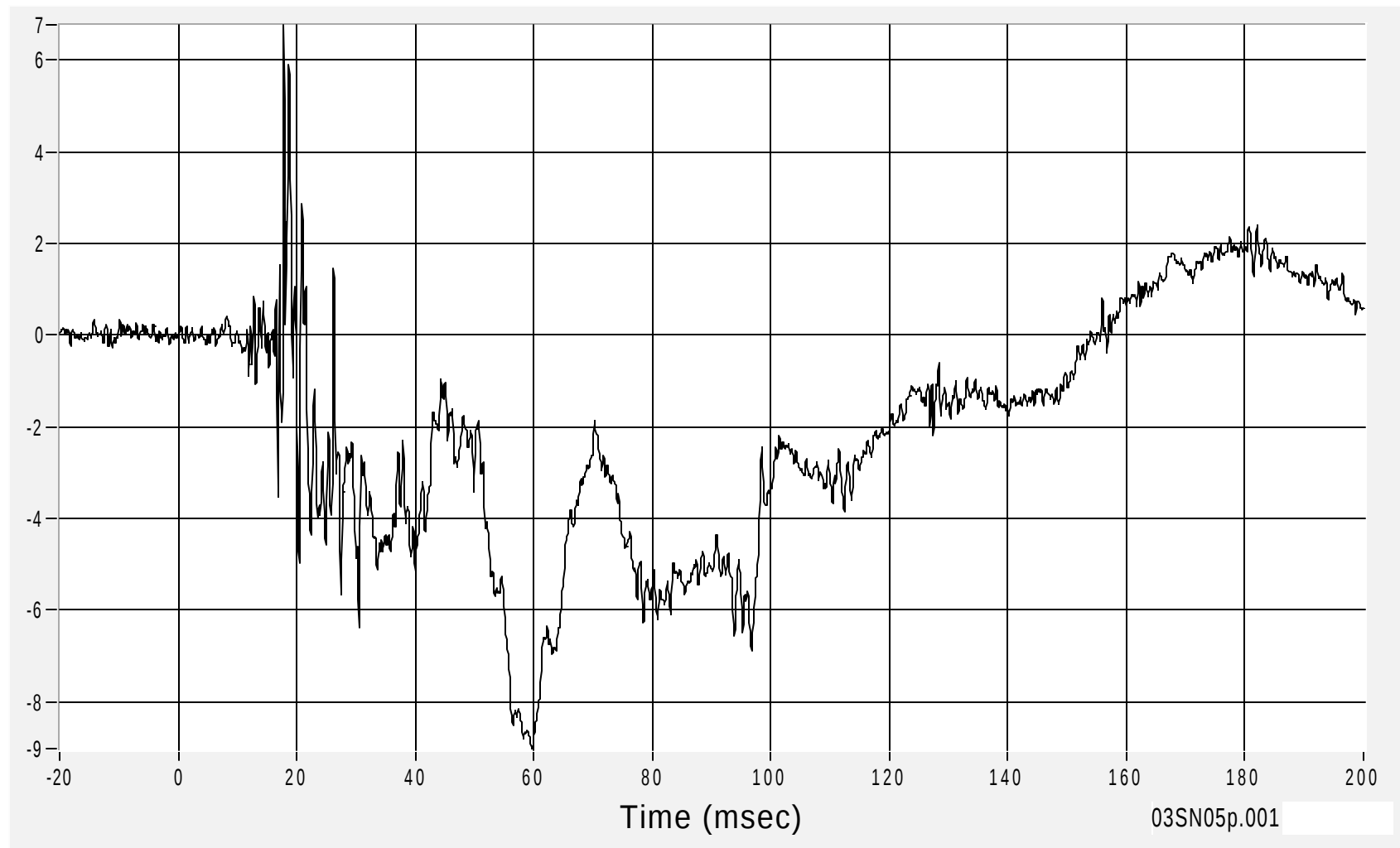
Passenger Head CG (X) Acceleration

Acceleration (G's) CFC1000

Max 6.8 G's at 17.8 msec

Min -9.0 G's at 59.7 msec

B-27



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Vehicle Crashworthiness Lab

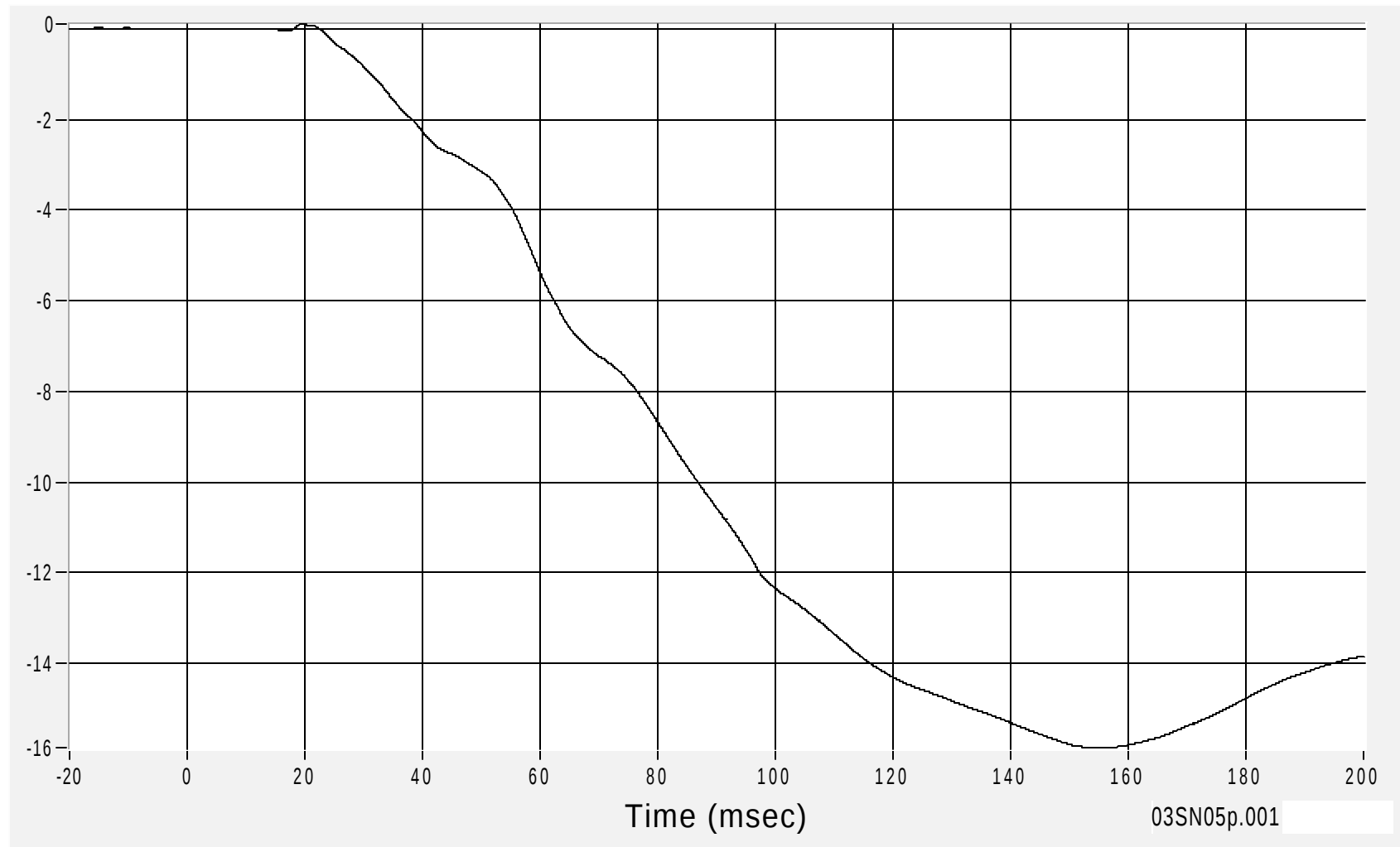
Passenger Head CG (X) Velocity

Velocity (km/h) CFC180

Max 0.1 km/h at 19.5 msec

Min -15.9 km/h at 155.0 msec

B-28



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5 February 2003

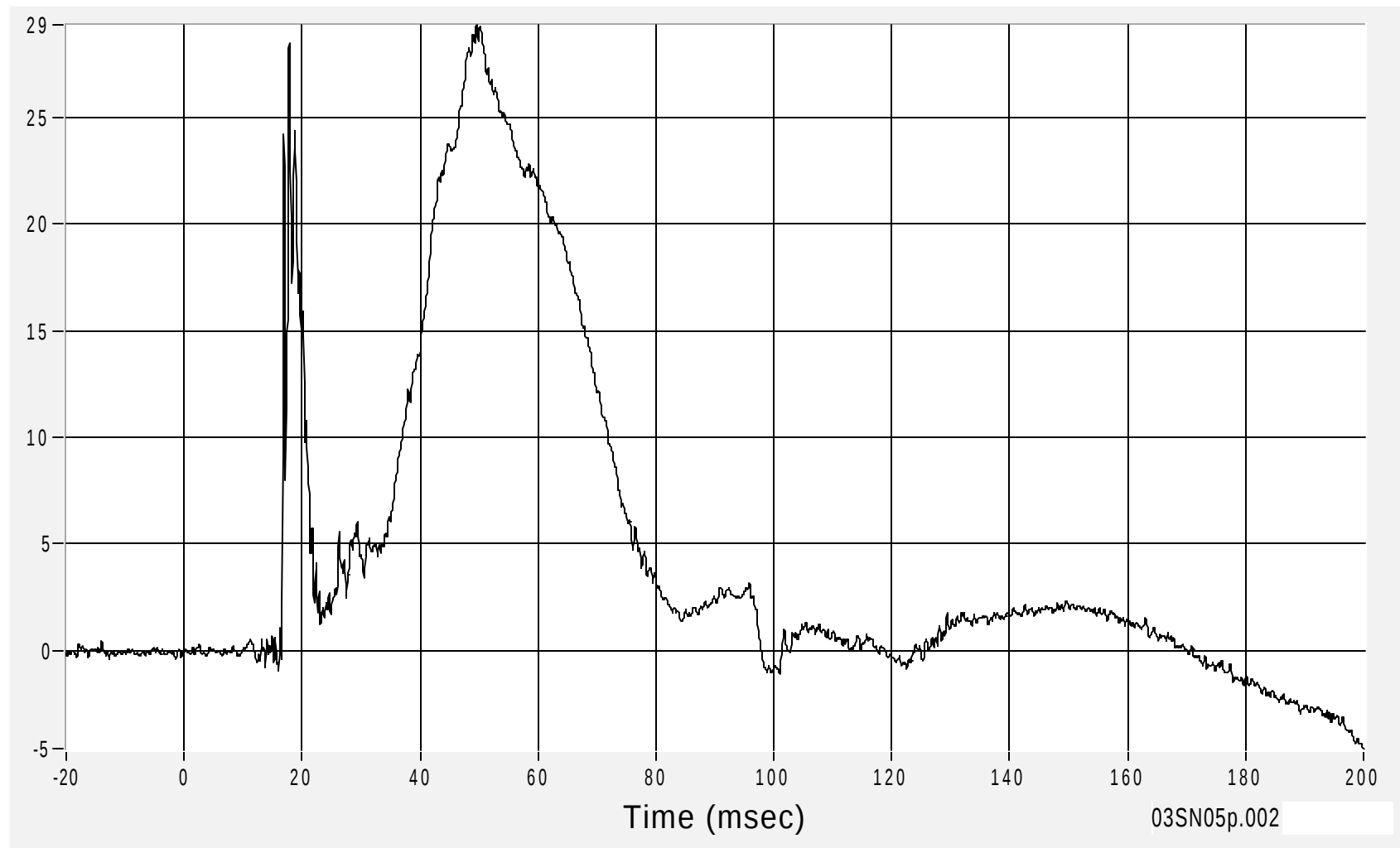
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (Y) Acceleration

Acceleration (G's) CFC1000

Max 29.3 G's at 49.6 msec
Min -4.6 G's at 199.9 msec

B-29



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Vehicle Crashworthiness Lab

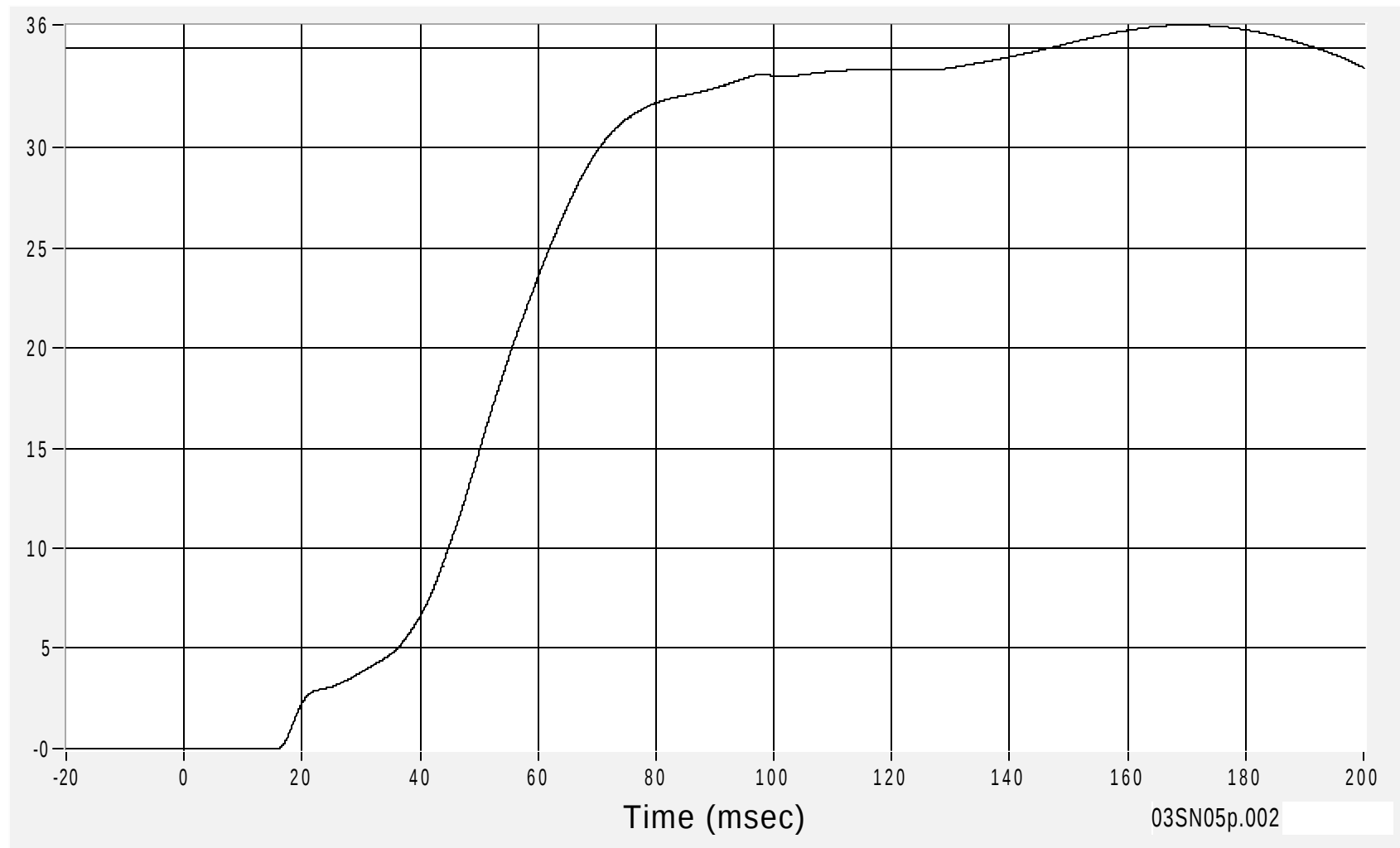
Passenger Head CG (Y) Velocity

Velocity (km/h) CFC180

Max 36.2 km/h at 170.8 msec

Min 0.0 km/h at 15.8 msec

B-30



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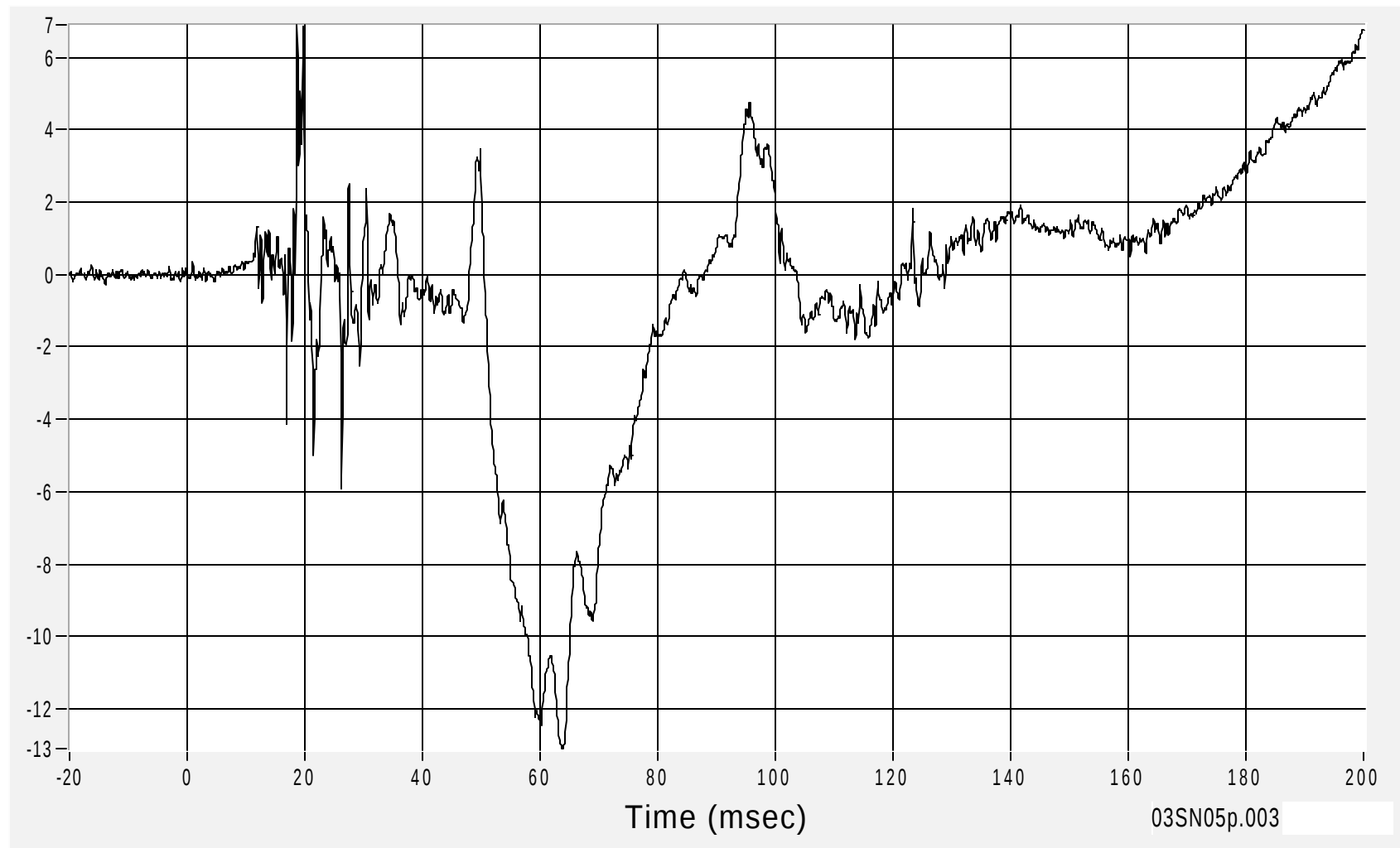
Passenger Head CG (Z) Acceleration

Acceleration (G's) CFC1000

Max 6.9 G's at 18.7 msec

Min -13.1 G's at 63.8 msec

B-31



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5 February 2003

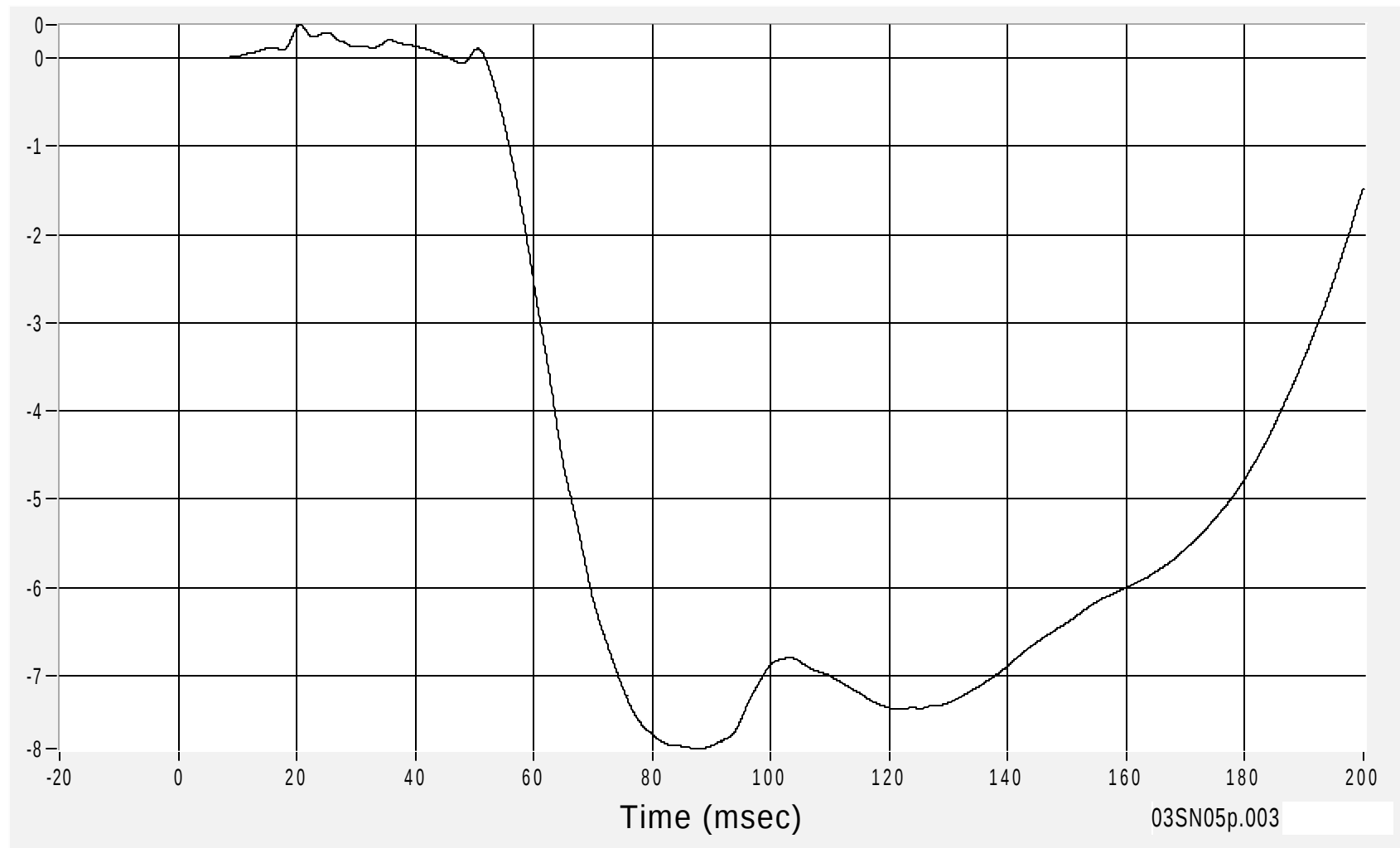
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (Z) Velocity

Velocity (km/h) CFC180

Max 0.4 km/h at 20.6 msec
Min -7.8 km/h at 87.8 msec

B-32



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5 February 2003

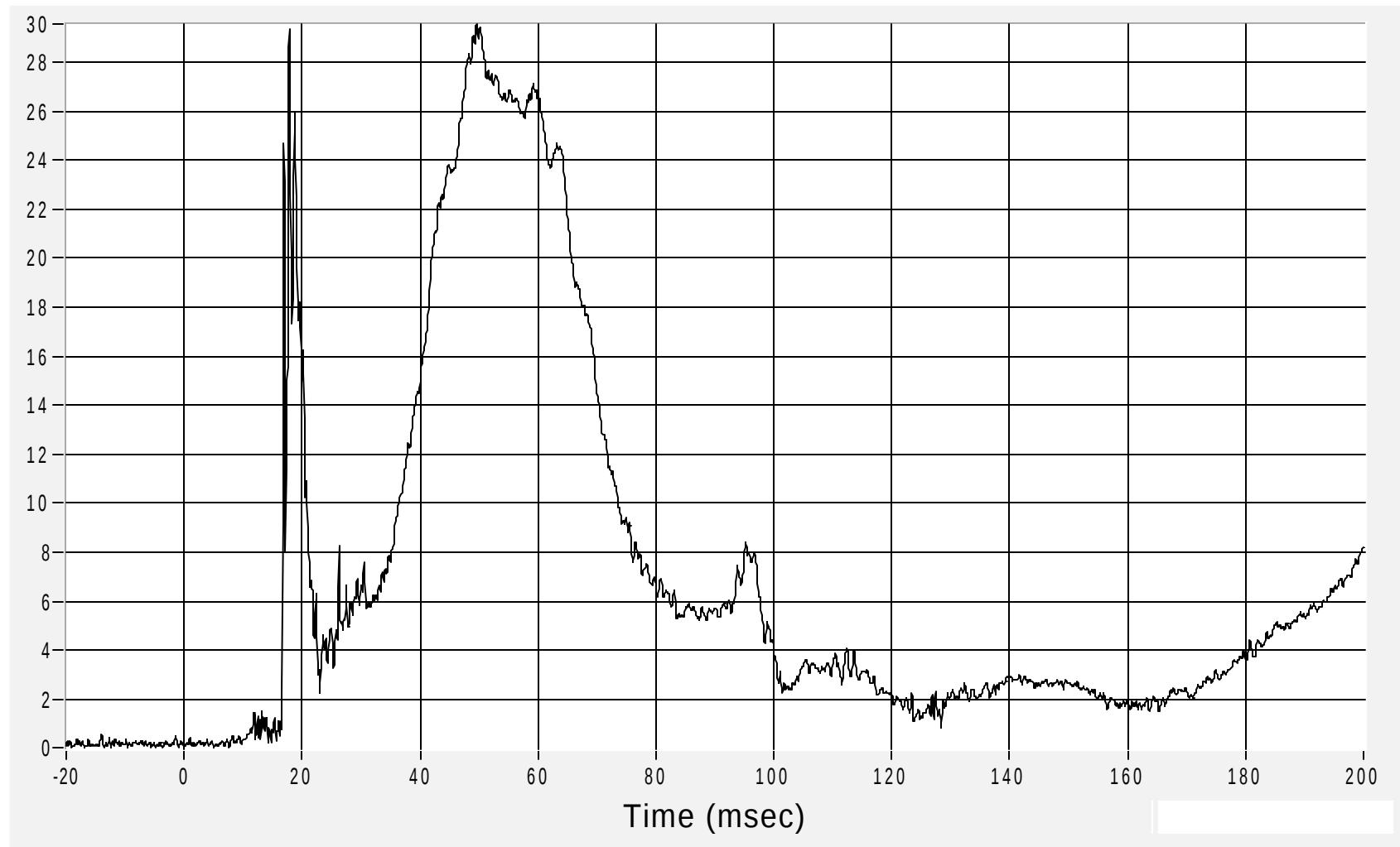
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head Resultant Acceleration

Acceleration (G's) CFC1000

Max 29.6 G's at 49.6 msec
Min 0.1 G's at 5.0 msec

B-33



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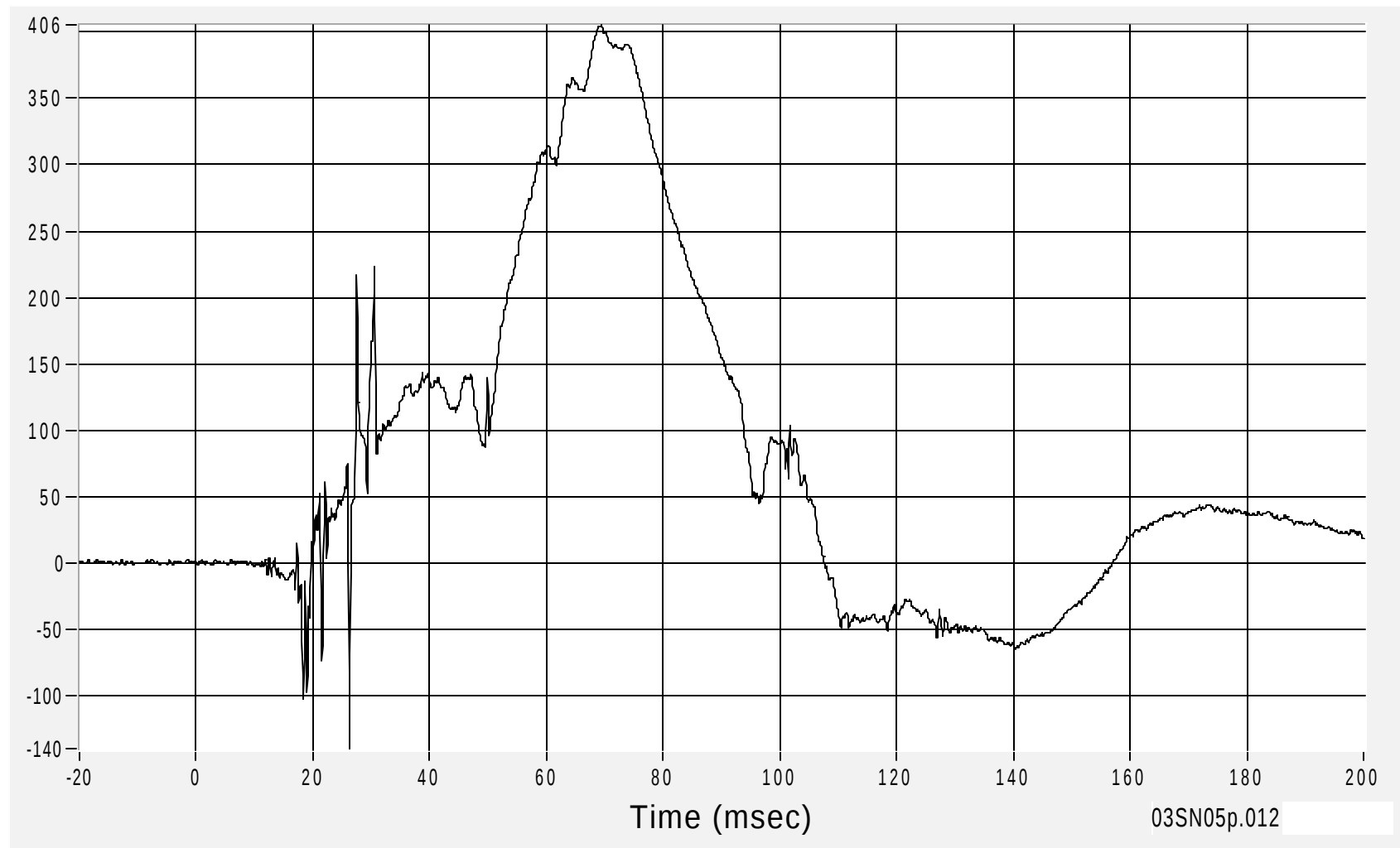
Passenger Upper Neck (X) Force

Force (N) CFC1000

Max 405.6 N at 69.4 msec

Min -140.5 N at 26.2 msec

B-34



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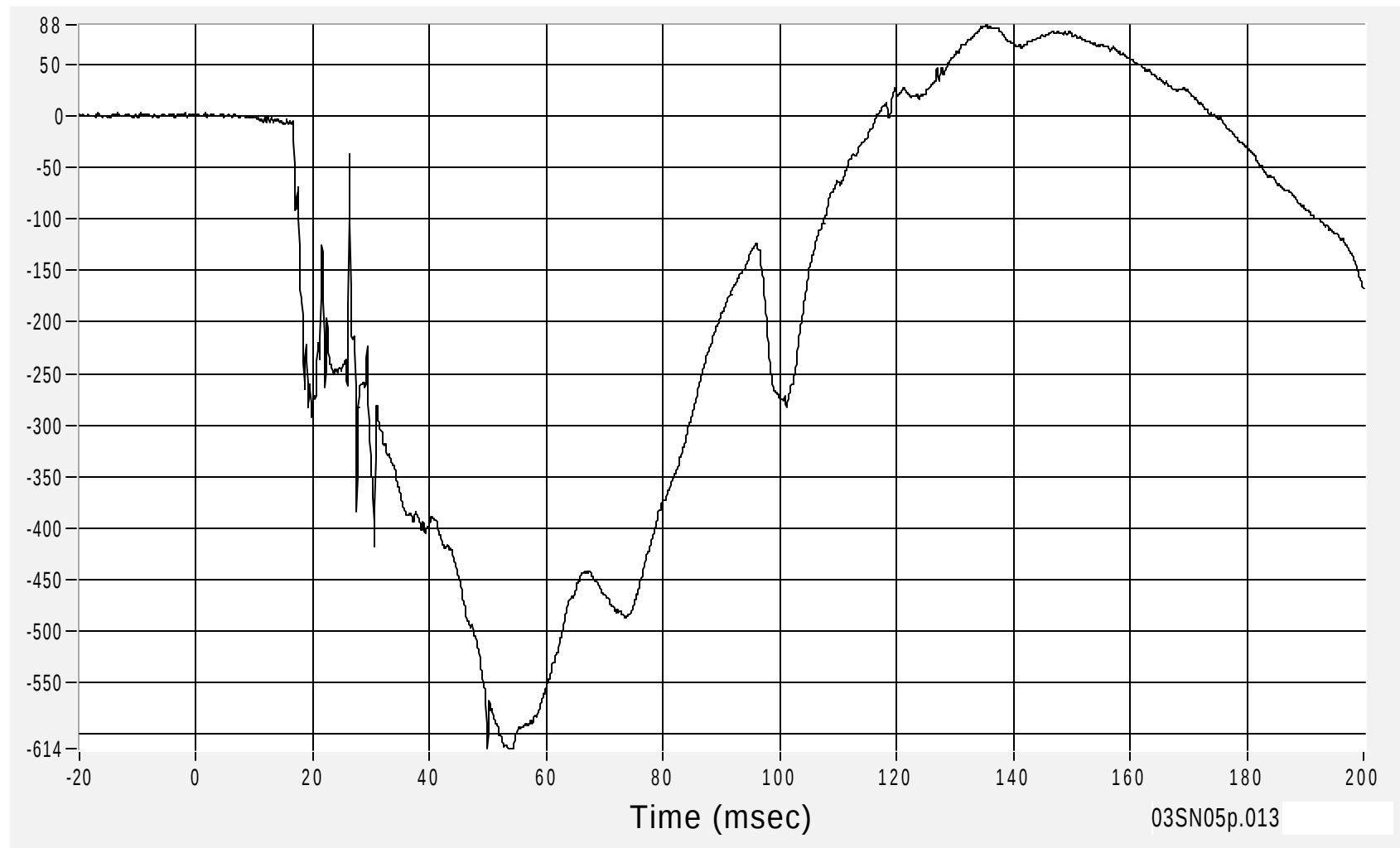
Passenger Upper Neck (Y) Force

Force (N) CFC1000

Max 88.3 N at 135.4 msec

Min -613.9 N at 49.9 msec

B-35



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Vehicle Crashworthiness Lab

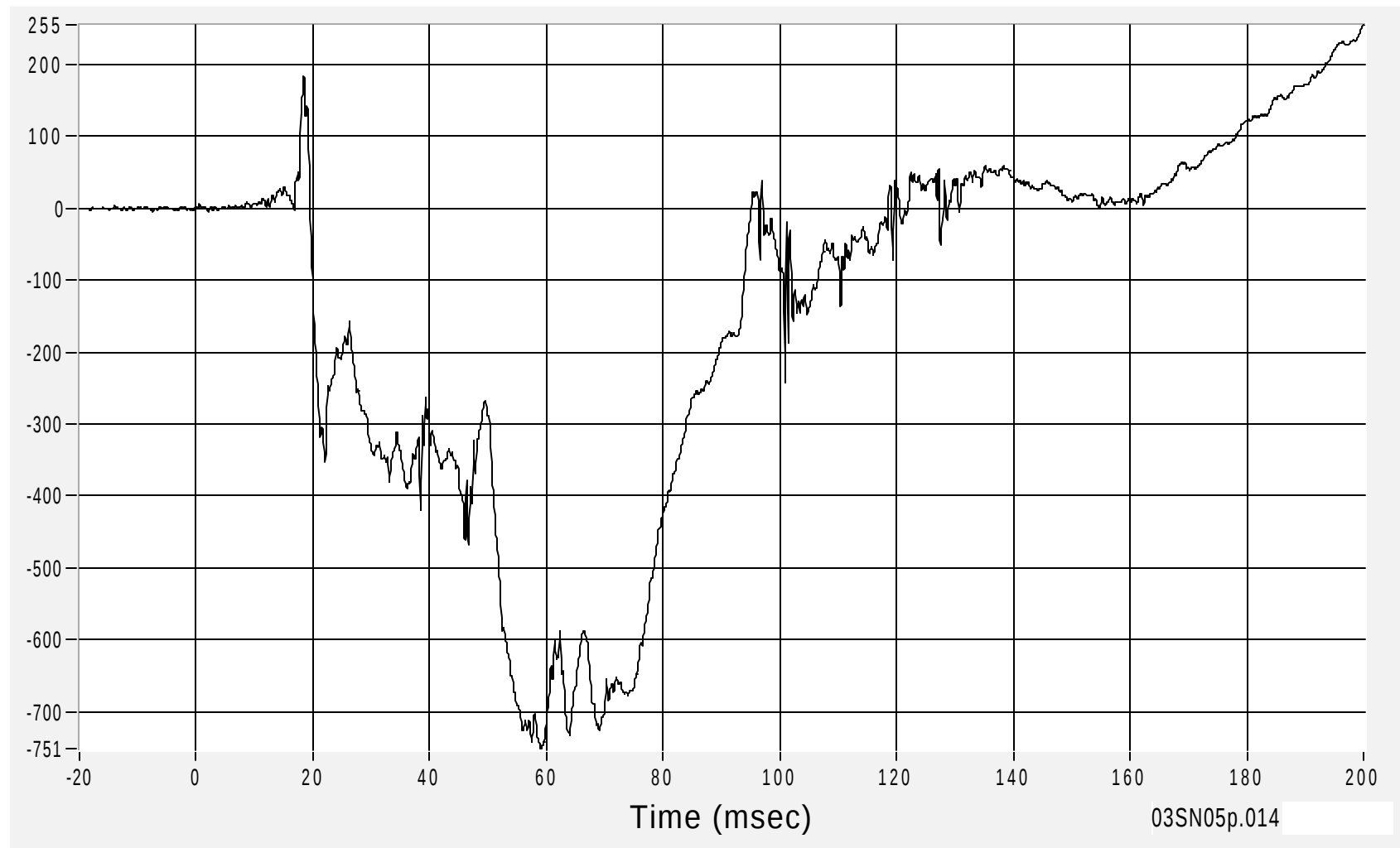
Passenger Upper Neck (Z) Force

Force (N) CFC1000

Max 255.0 N at 199.9 msec

Min -751.5 N at 59.0 msec

B-36



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Vehicle Crashworthiness Lab

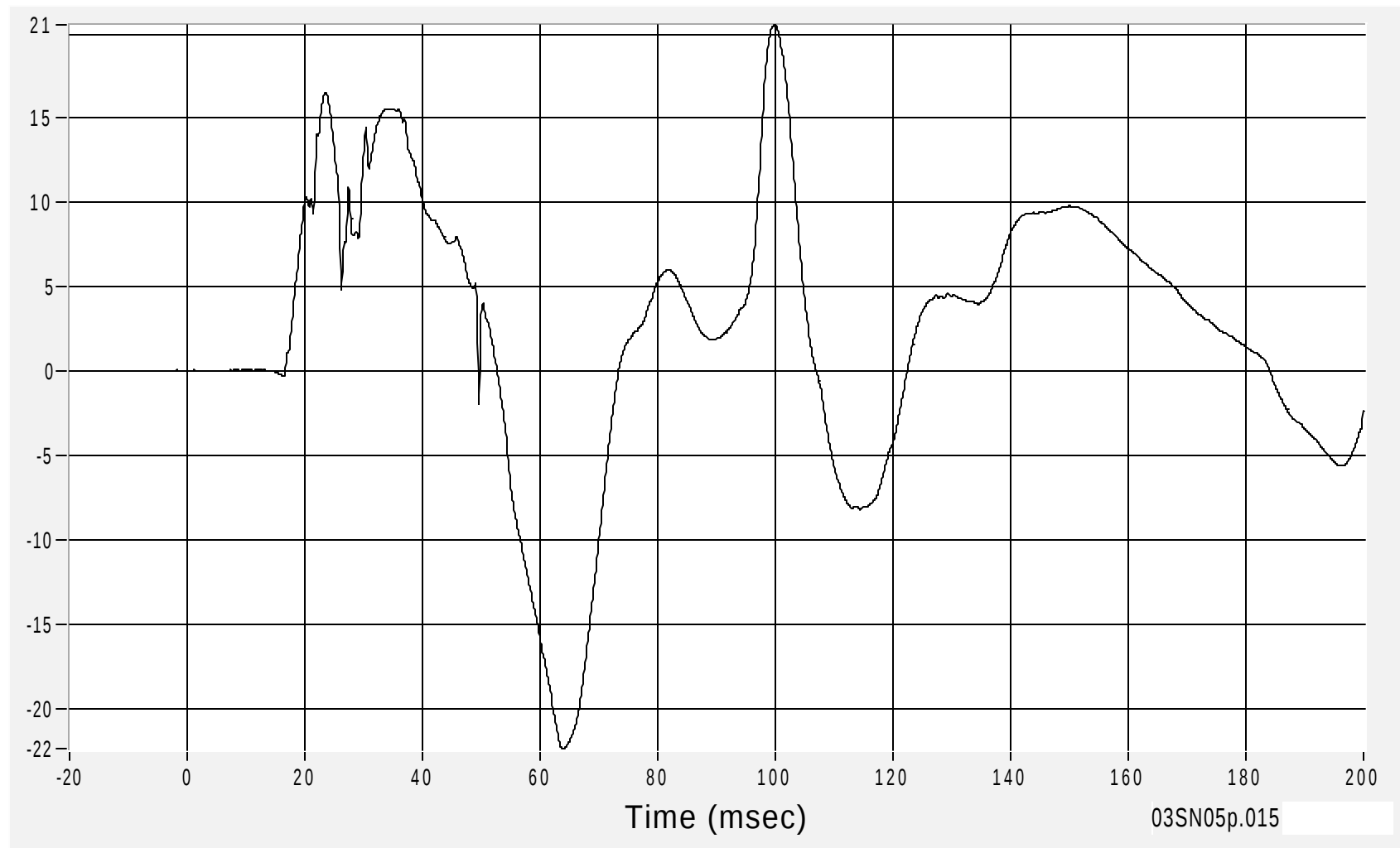
Passenger Upper Neck (X) Moment

Moment (Nm) CFC600

Max 20.5 Nm at 99.9 msec

Min -22.4 Nm at 63.9 msec

B-37



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Passenger Upper Neck (Y) Moment

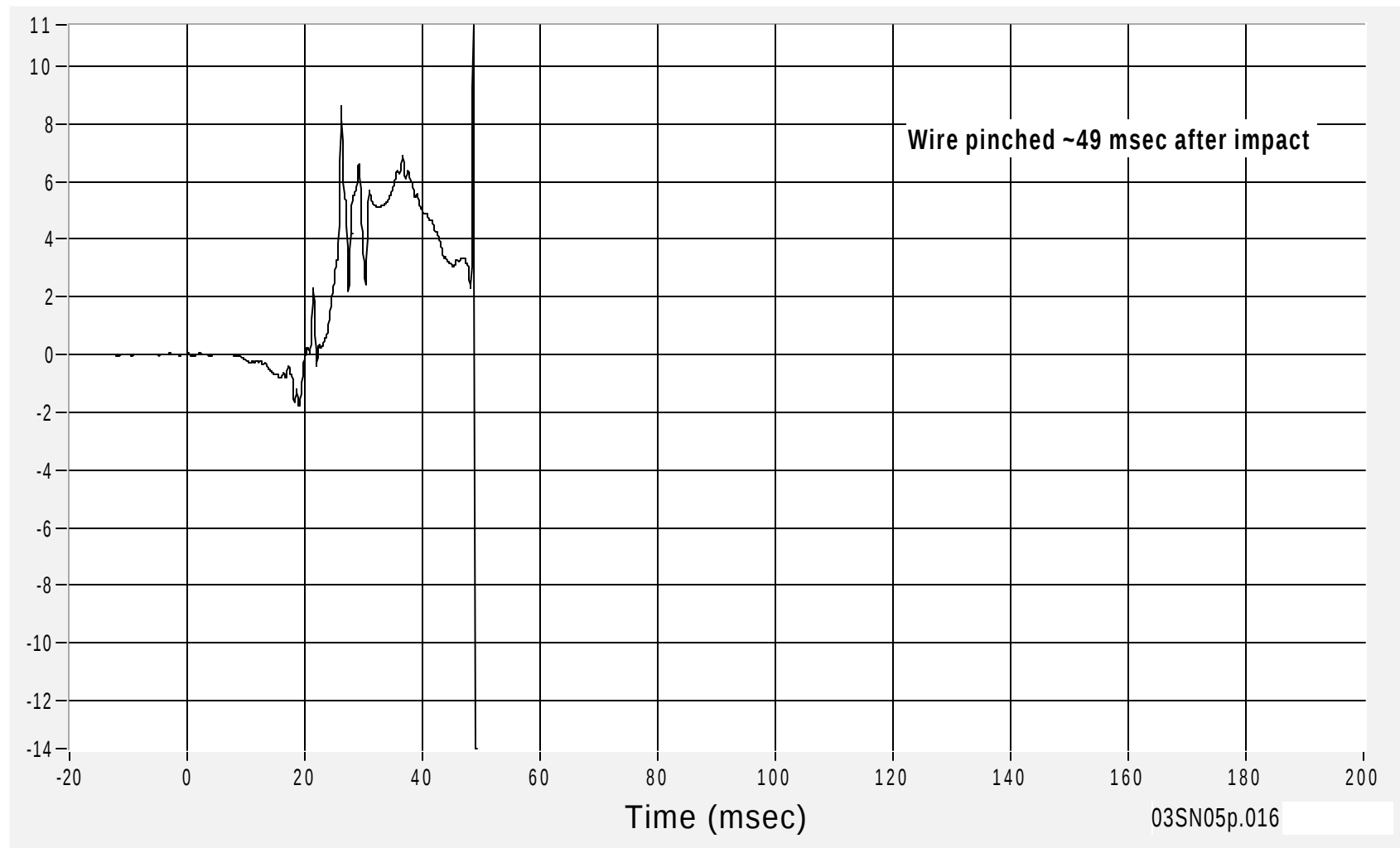
Moment (Nm)

CFC600

Max 11.4 Nm at 48.6 msec

Min -13.7 Nm at 48.9 msec

B-38



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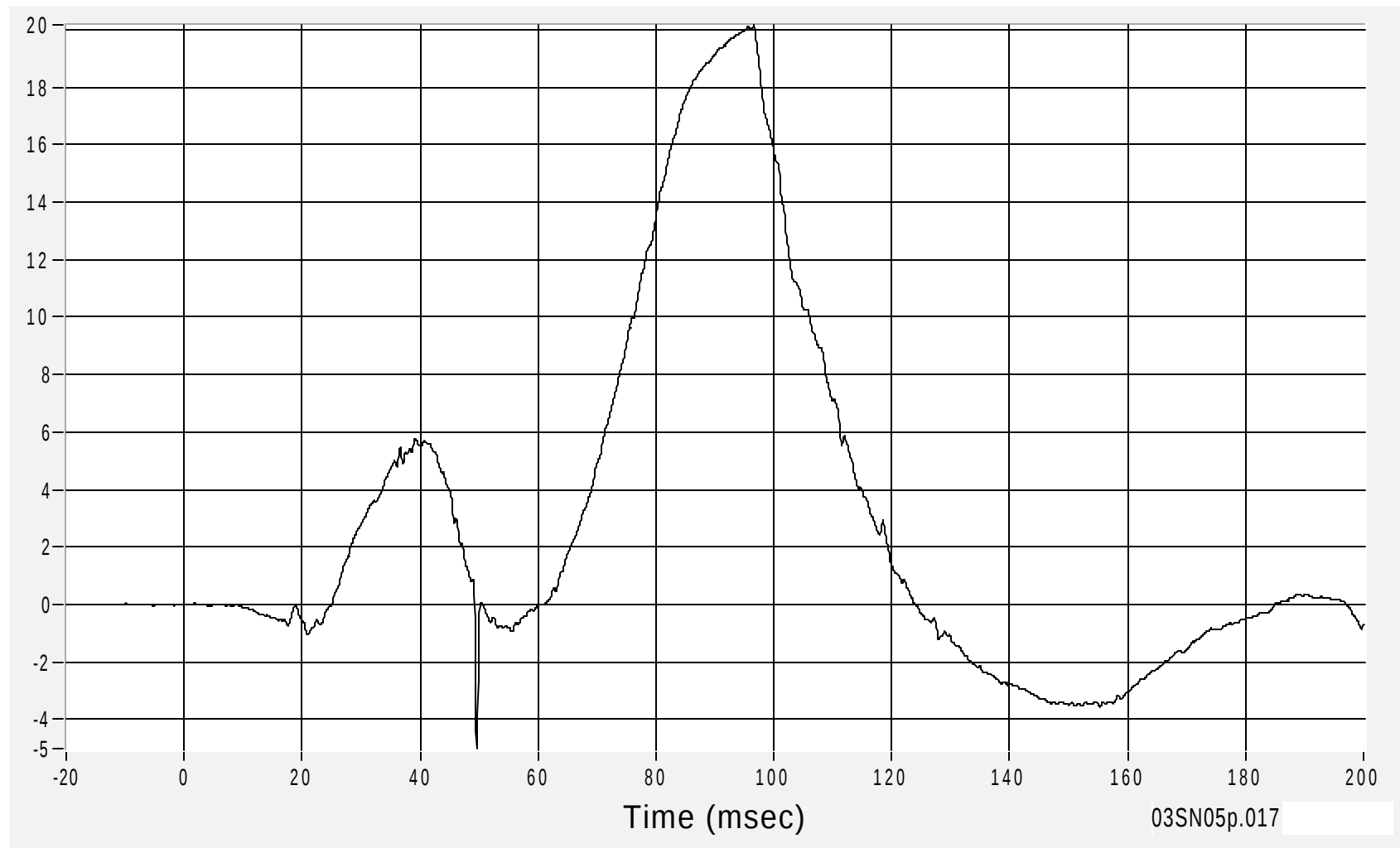
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Neck (Z) Moment

Moment (Nm) CFC600

Max 20.2 Nm at 96.6 msec
Min -5.0 Nm at 49.6 msec

B-39



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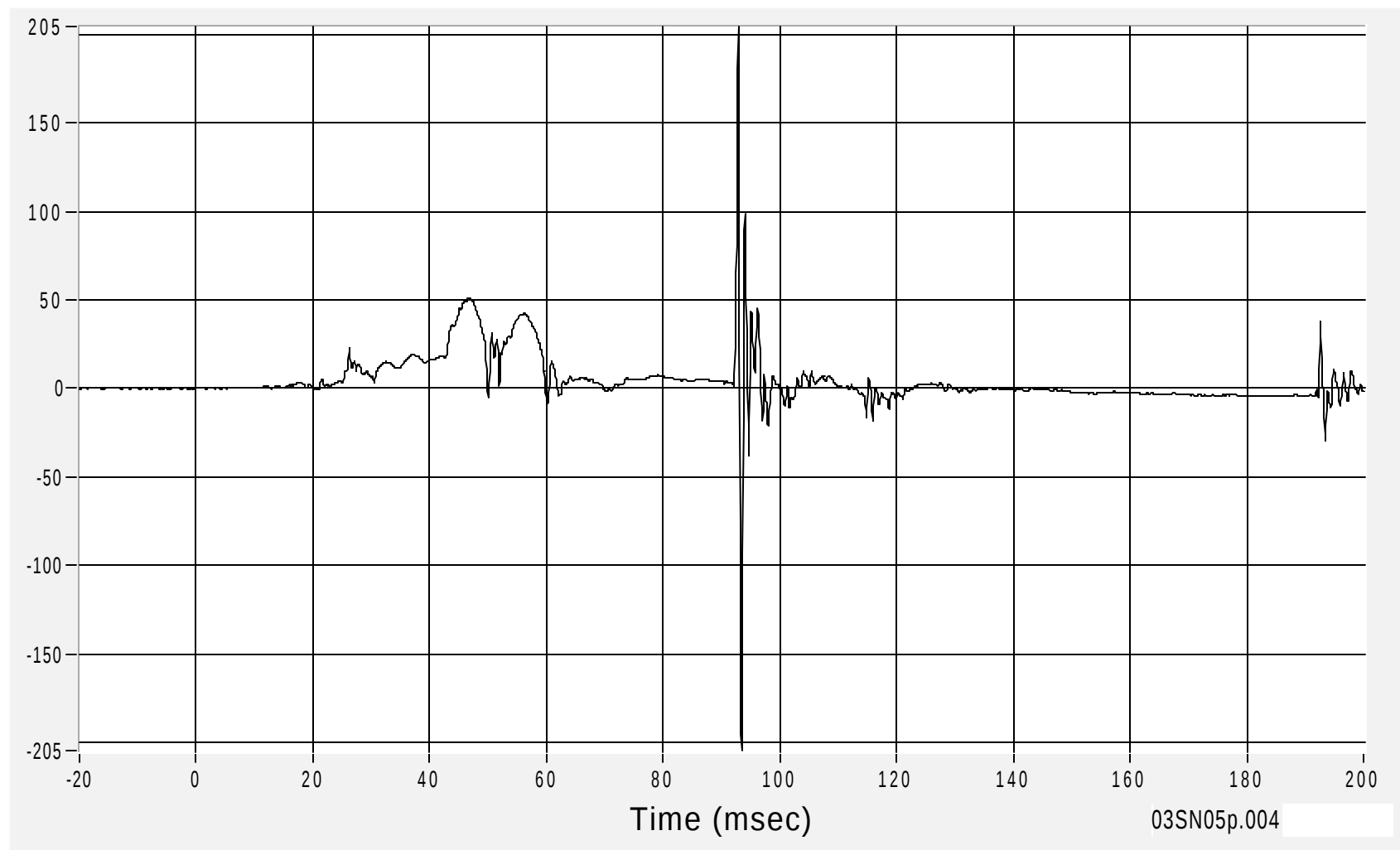
Passenger Upper Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 204.6 G's at 92.9 msec

Min -204.8 G's at 93.4 msec

B-40



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5 February 2003

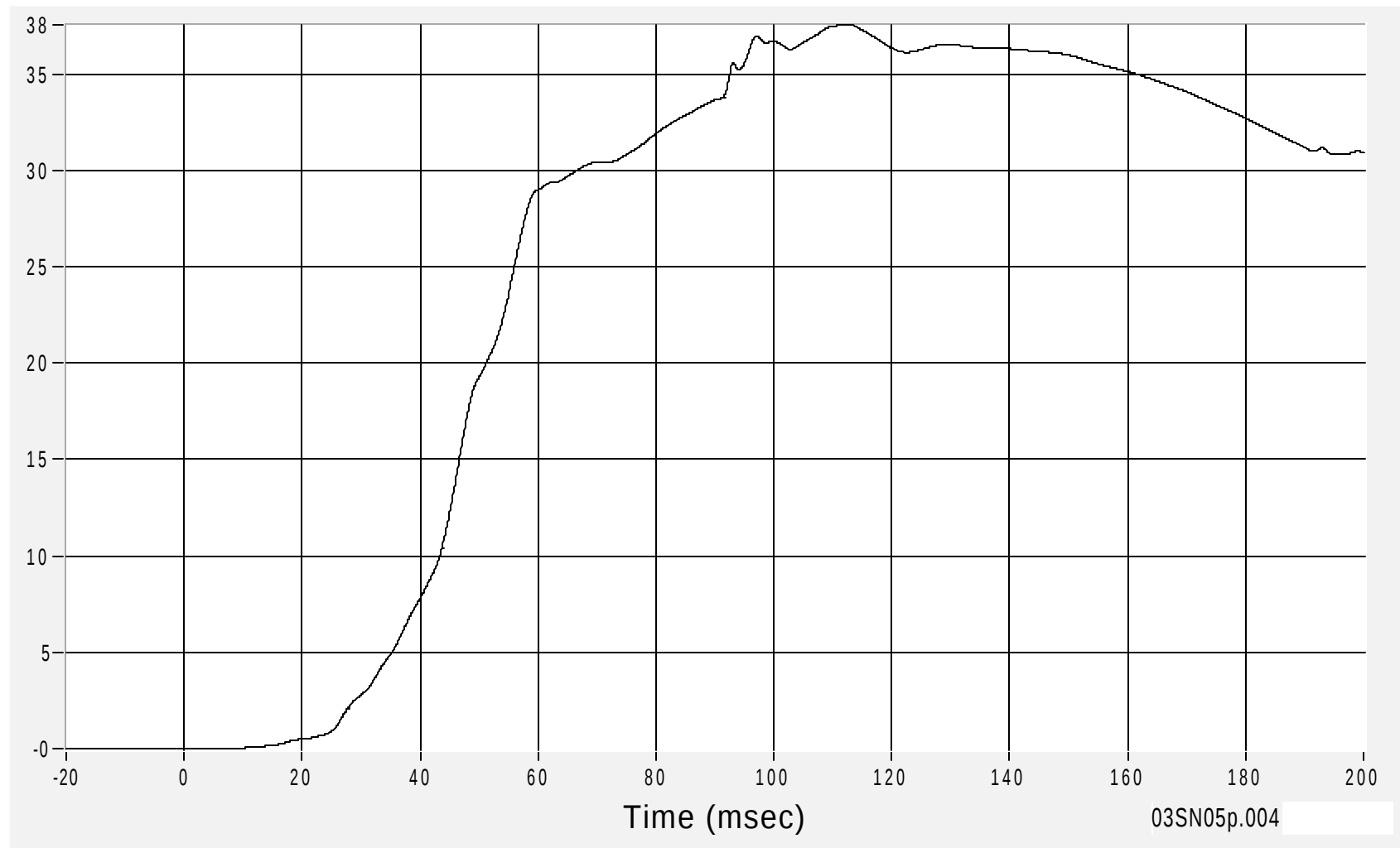
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Velocity

Velocity (km/h) CFC180

Max 37.5 km/h at 112.6 msec
Min 0.0 km/h at 0.0 msec

B-41



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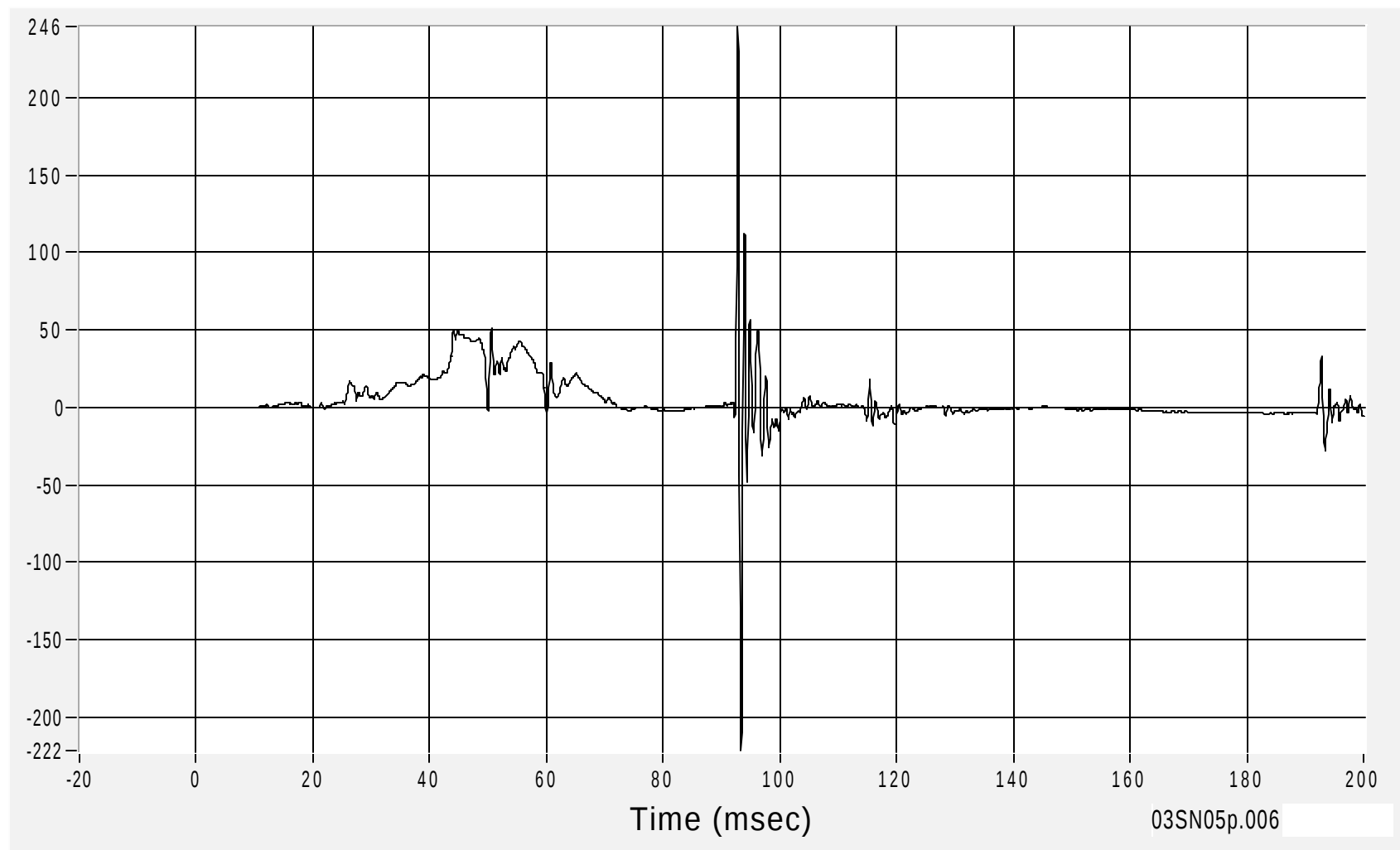
Passenger Lower Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 246.1 G's at 92.8 msec

Min -221.7 G's at 93.4 msec

B-42



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5 February 2003

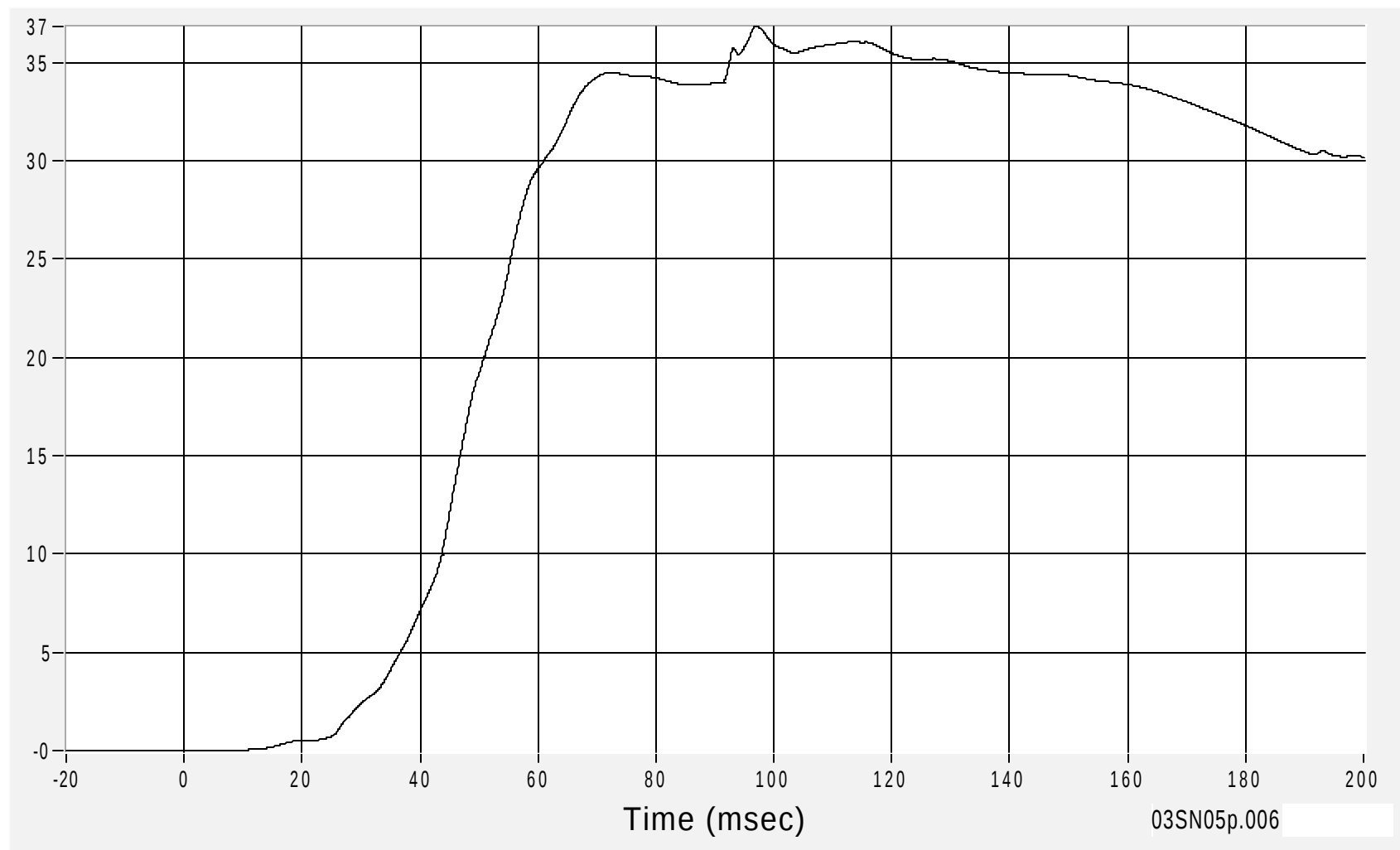
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Velocity

Velocity (km/h) CFC180

Max 36.8 km/h at 97.0 msec
Min 0.0 km/h at 0.0 msec

B-43



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5 February 2003

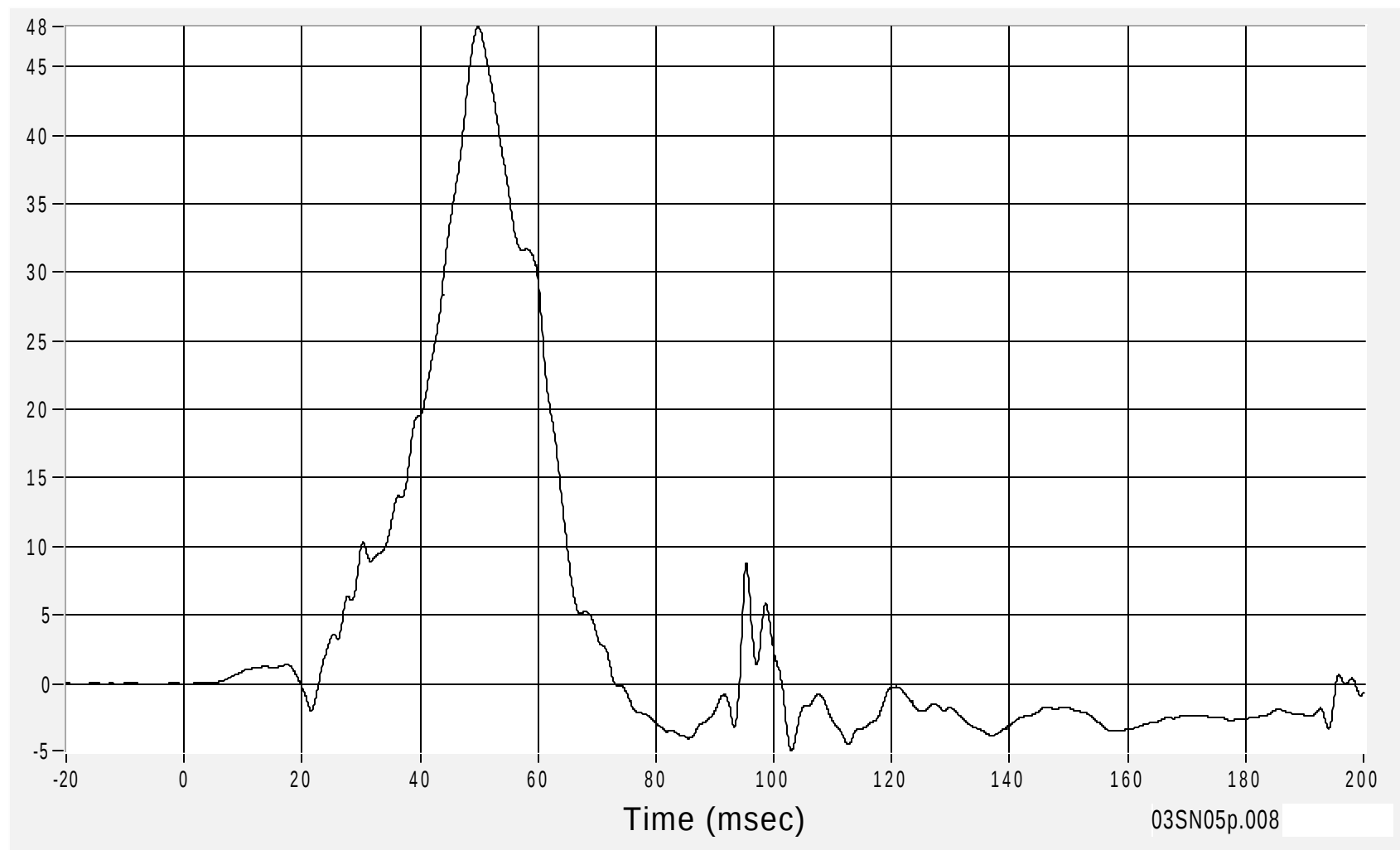
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Acceleration

Acceleration (G's) CFC180

Max 47.9 G's at 49.8 msec
Min -4.9 G's at 103.0 msec

B-44



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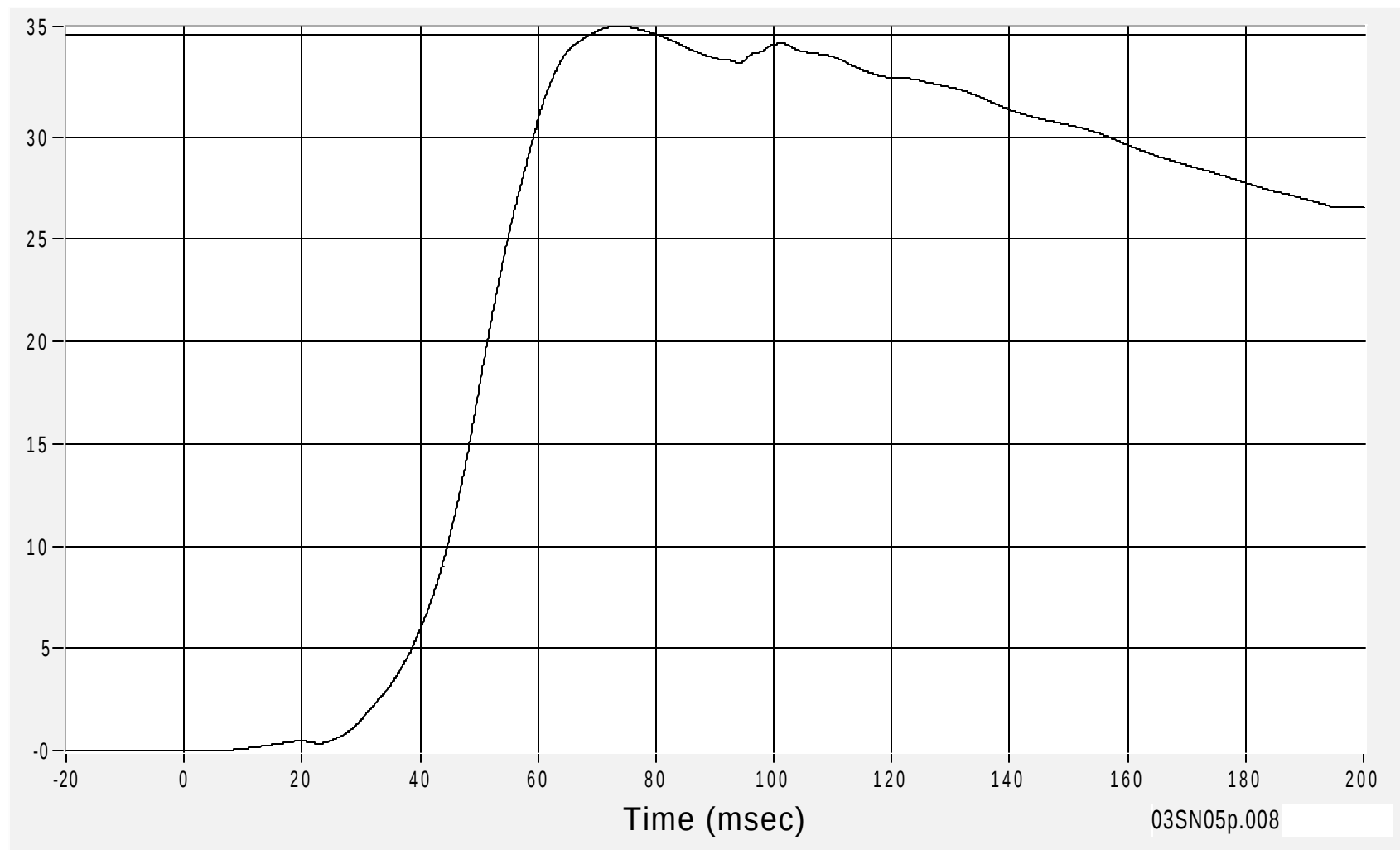
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Velocity

Velocity (km/h) CFC180

Max 35.4 km/h at 73.0 msec
Min 0.0 km/h at 1.4 msec

B-45



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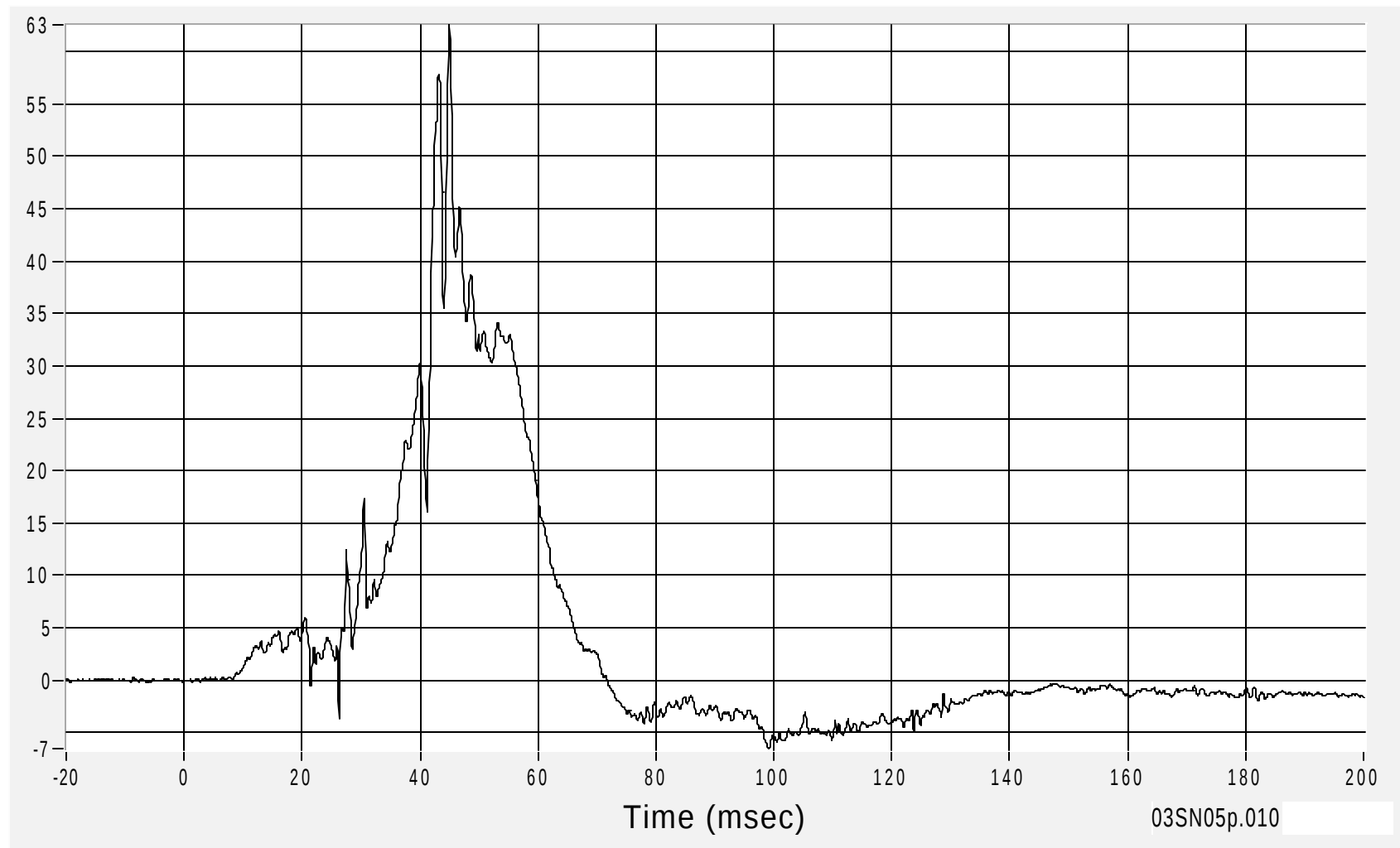
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Acceleration

Acceleration (G's) CFC1000

Max 62.5 G's at 45.0 msec
Min -6.5 G's at 99.1 msec

B-46



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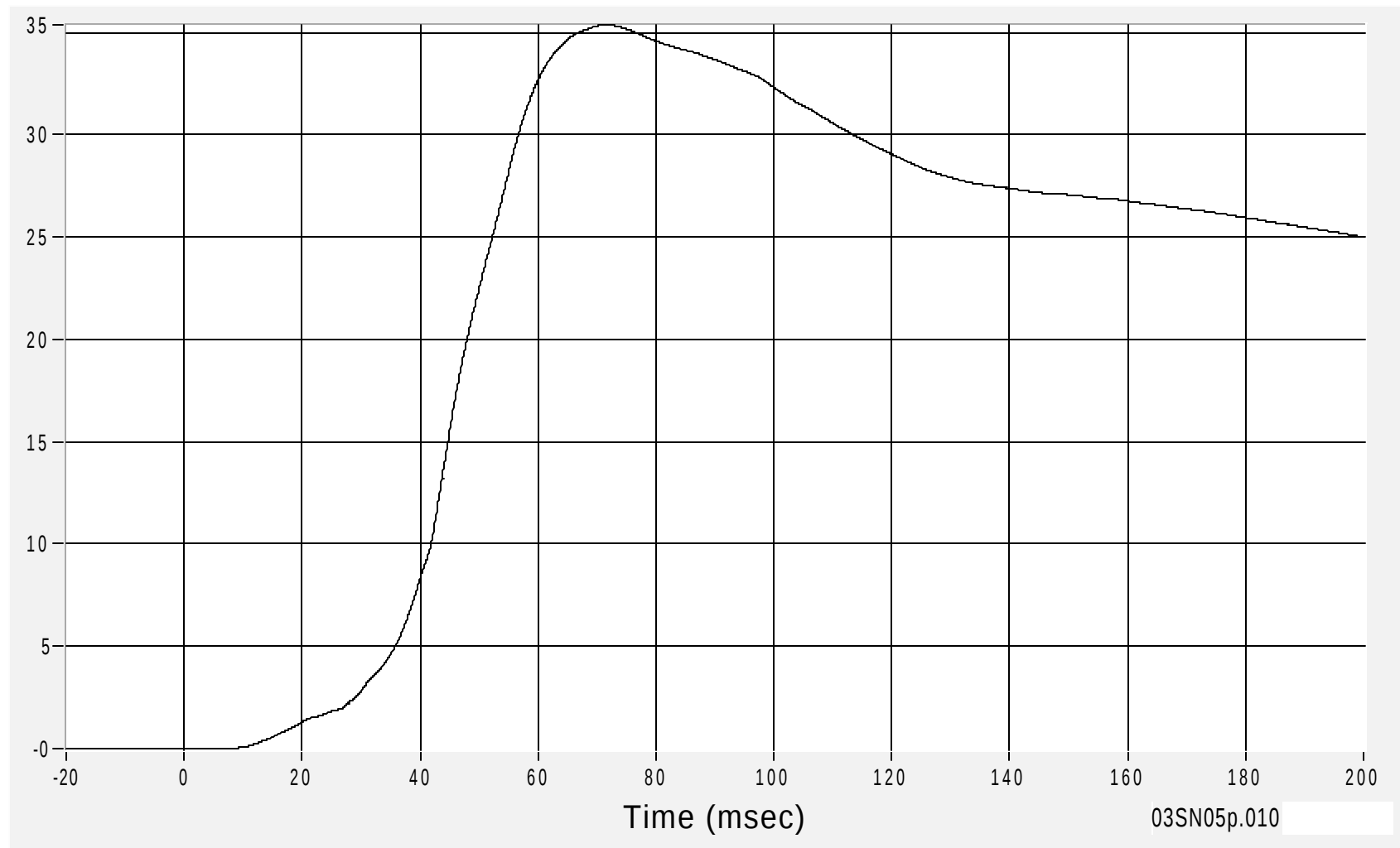
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Velocity

Velocity (km/h) CFC180

Max 35.4 km/h at 71.5 msec
Min 0.0 km/h at 1.8 msec

B-47



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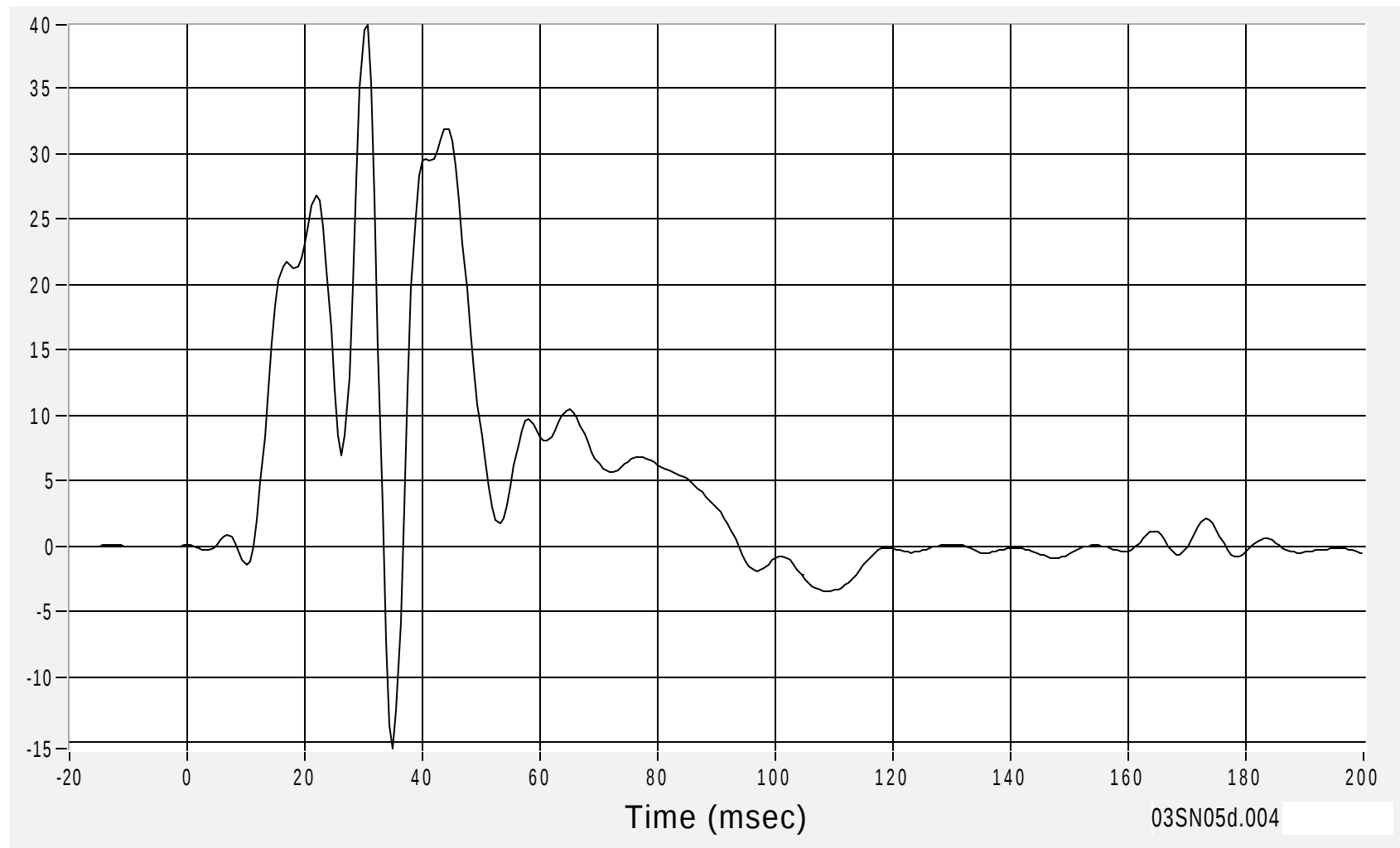
Driver Upper Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 39.9 G's at 30.6 msec

Min -15.5 G's at 35.0 msec

B-48



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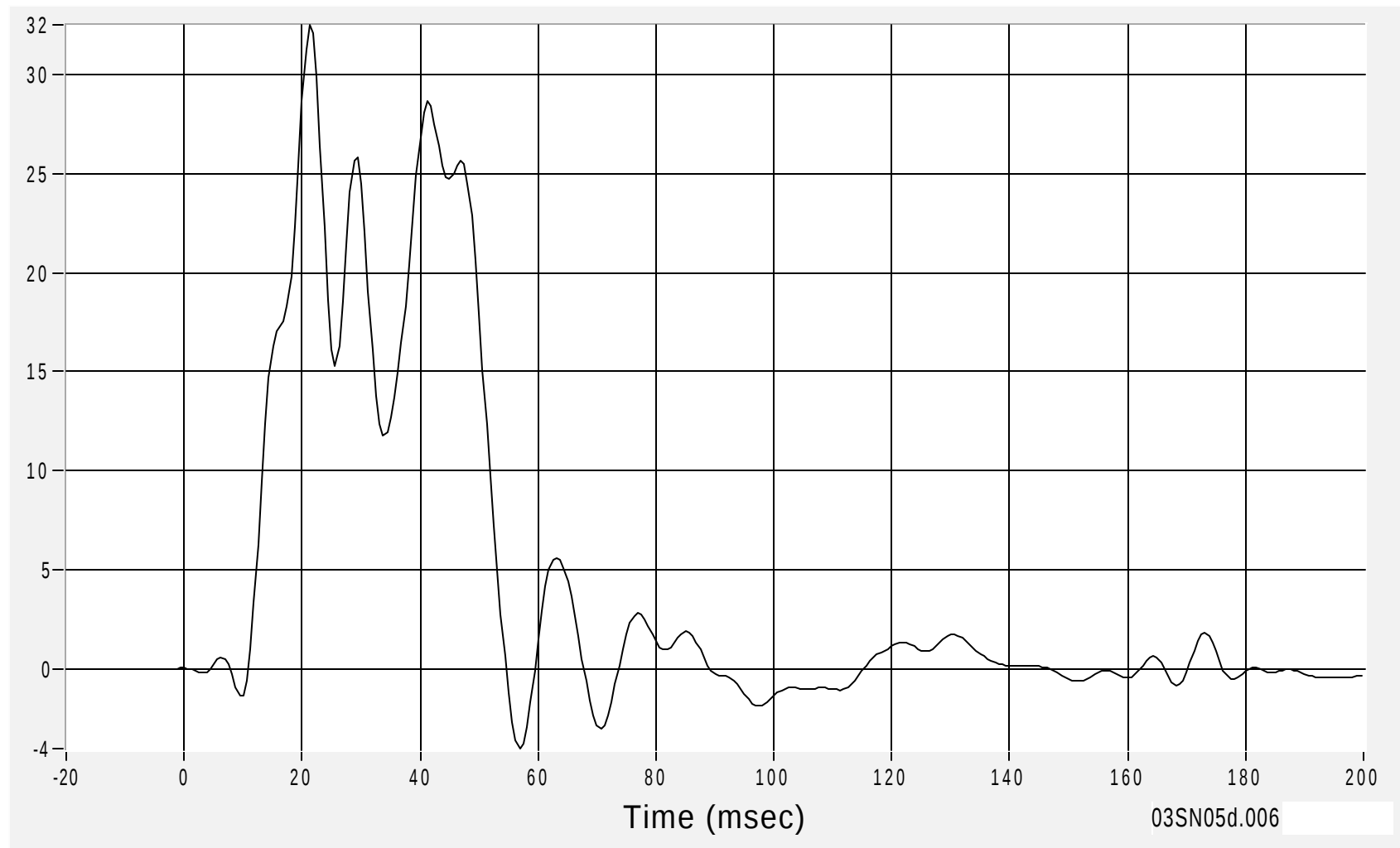
Medical College of Wisconsin
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Driver Lower Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 32.5 G's at 21.2 msec
Min -4.0 G's at 56.9 msec

B-49



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Vehicle Crashworthiness Lab

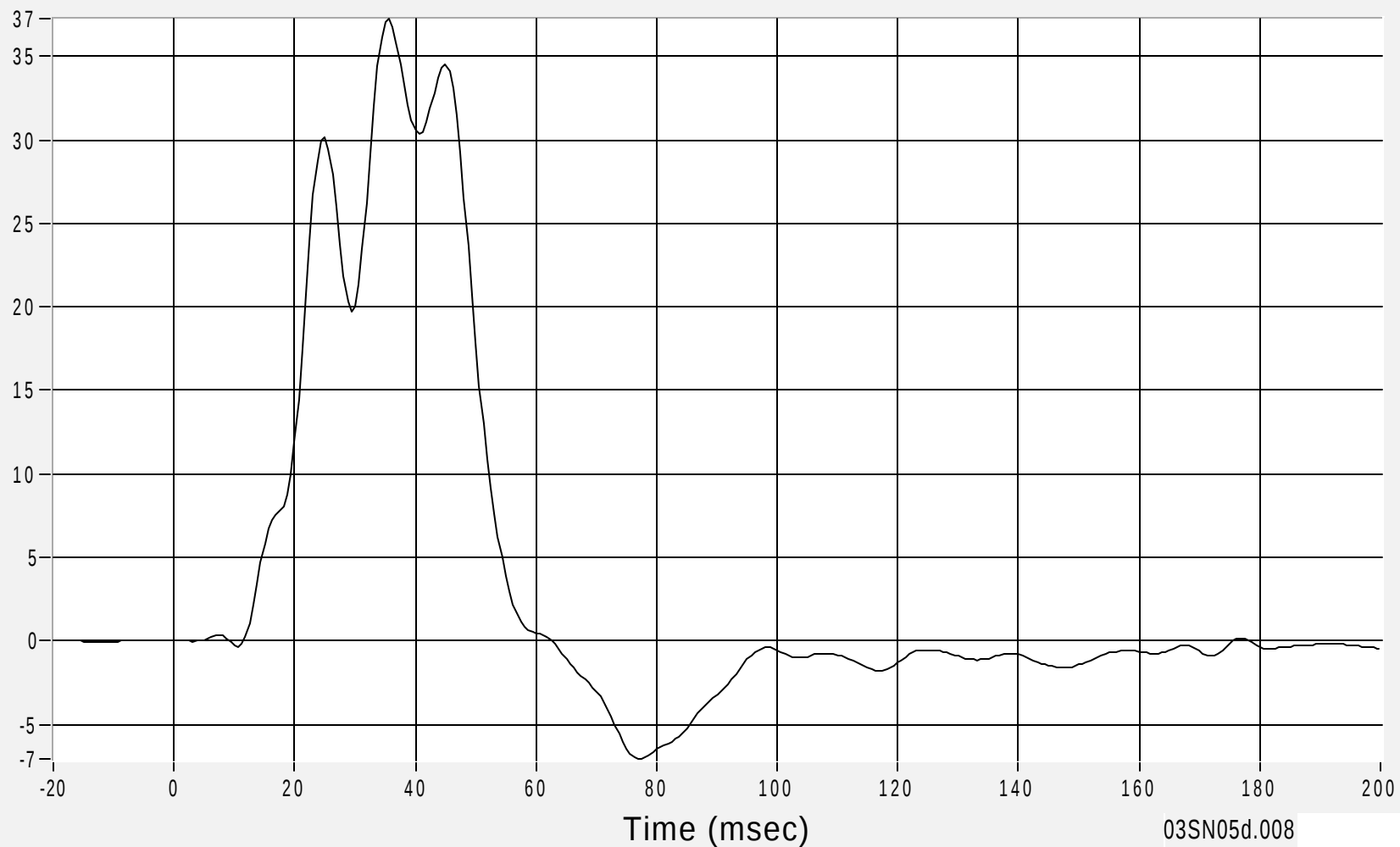
Driver Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 37.3 G's at 35.6 msec

Min -7.1 G's at 76.9 msec

B-50



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Medical College of Wisconsin
Vehicle Crashworthiness Lab

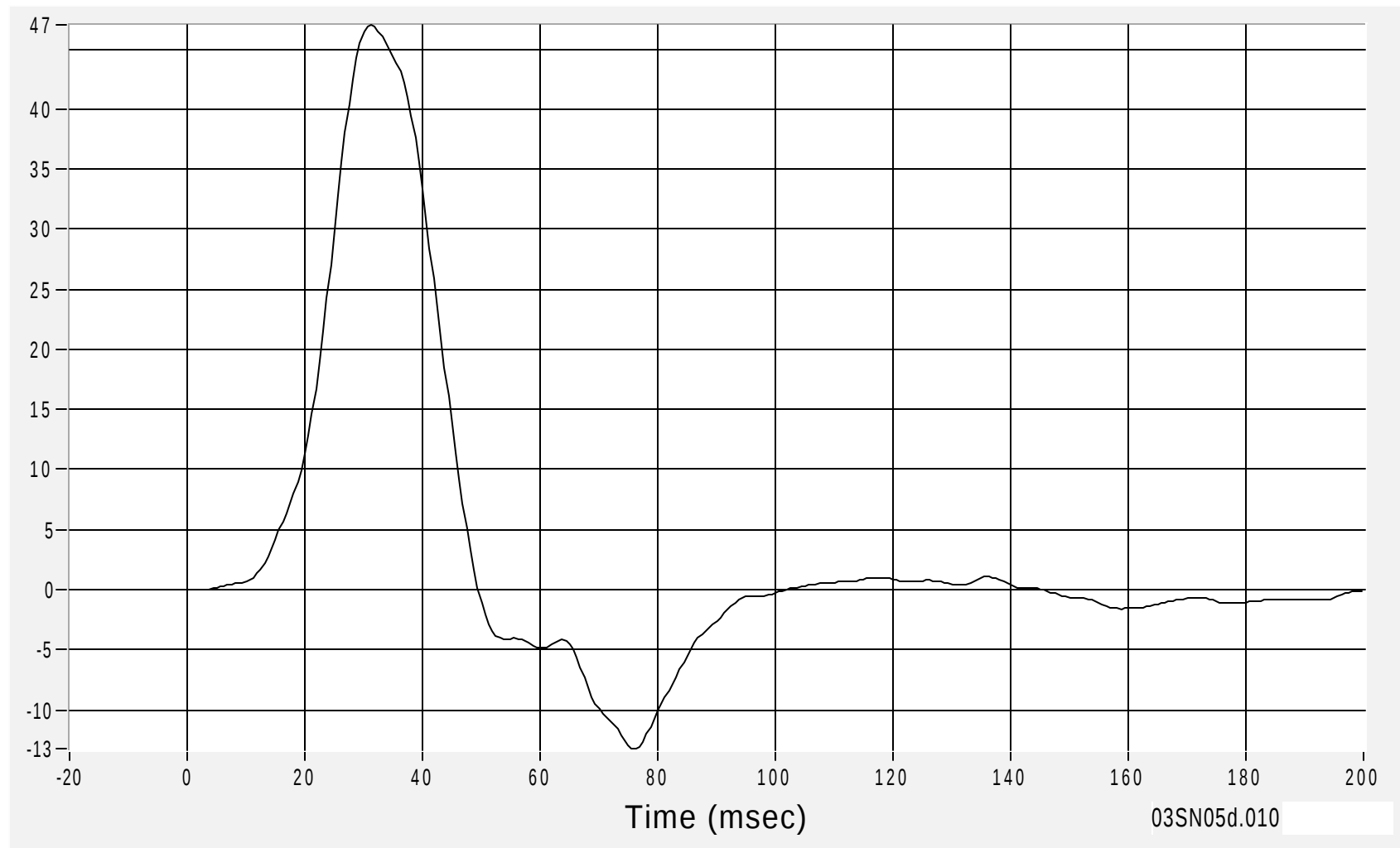
Driver Pelvic (Y) Acceleration

Acceleration (G's) FIR100

Max 47.0 G's at 31.2 msec

Min -13.2 G's at 76.2 msec

B-51



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5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

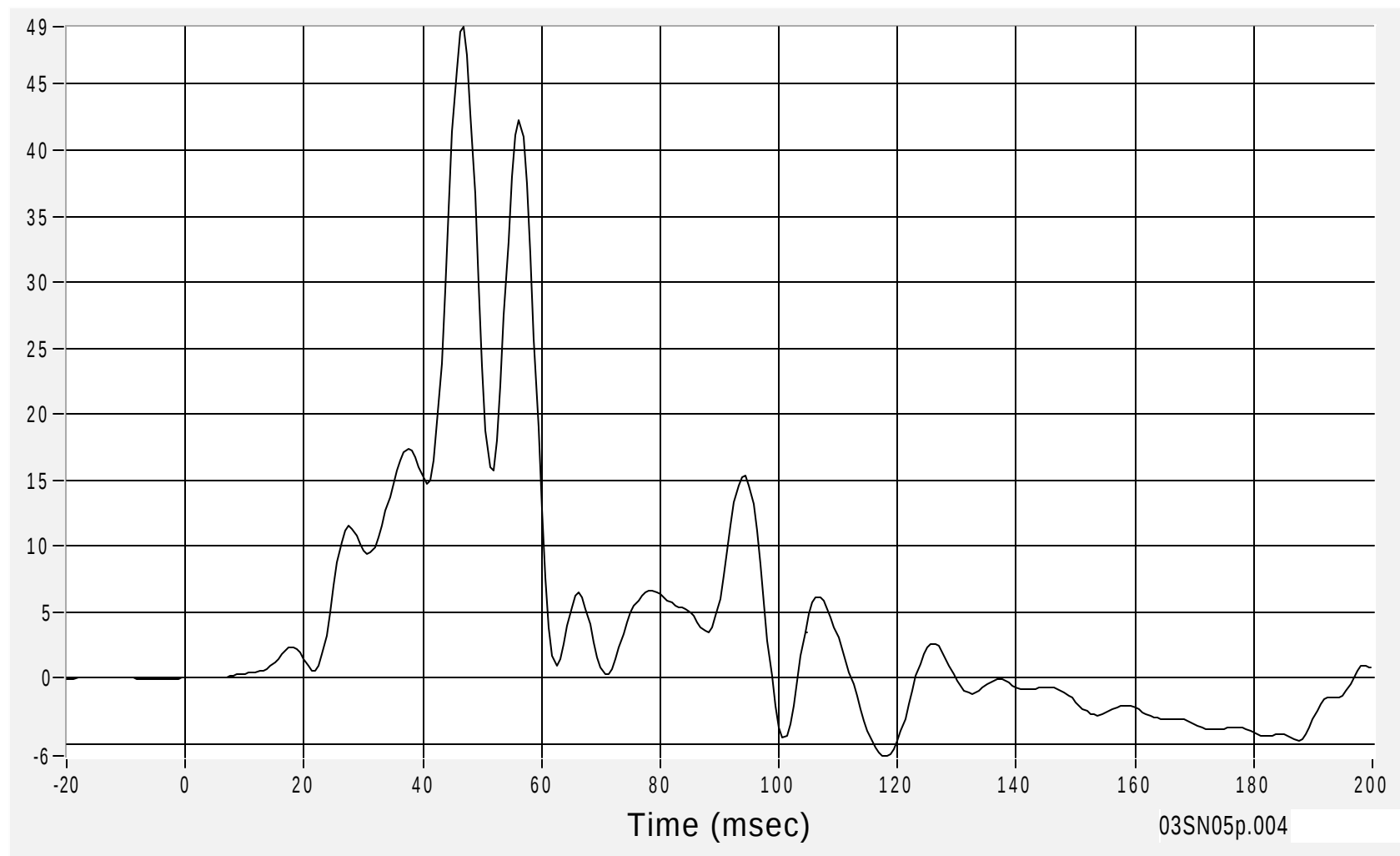
Passenger Upper Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 49.4 G's at 46.9 msec

Min -5.9 G's at 118.1 msec

B-52



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5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

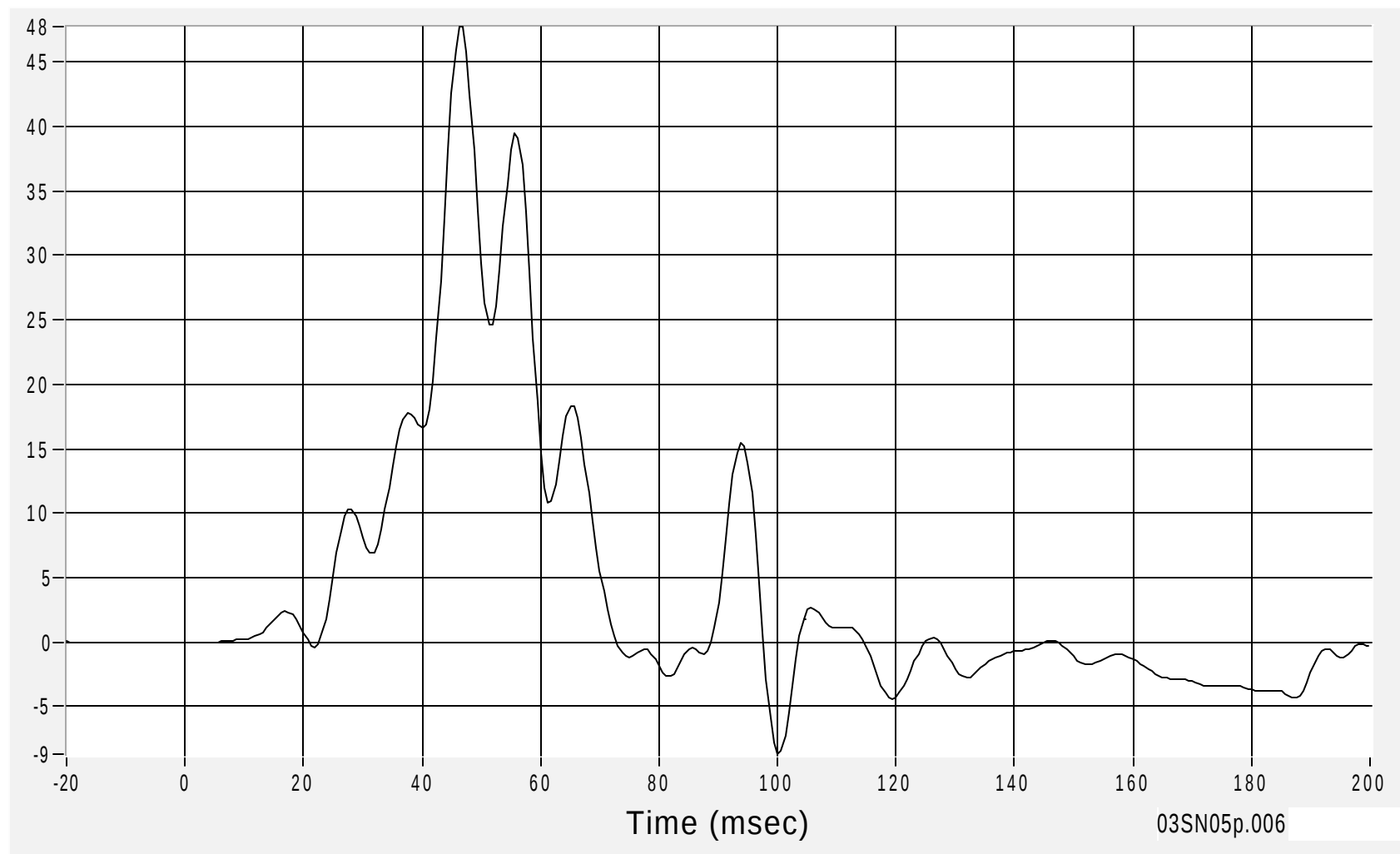
Passenger Lower Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 47.7 G's at 46.2 msec

Min -8.7 G's at 100.0 msec

B-53



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Vehicle Crashworthiness Lab

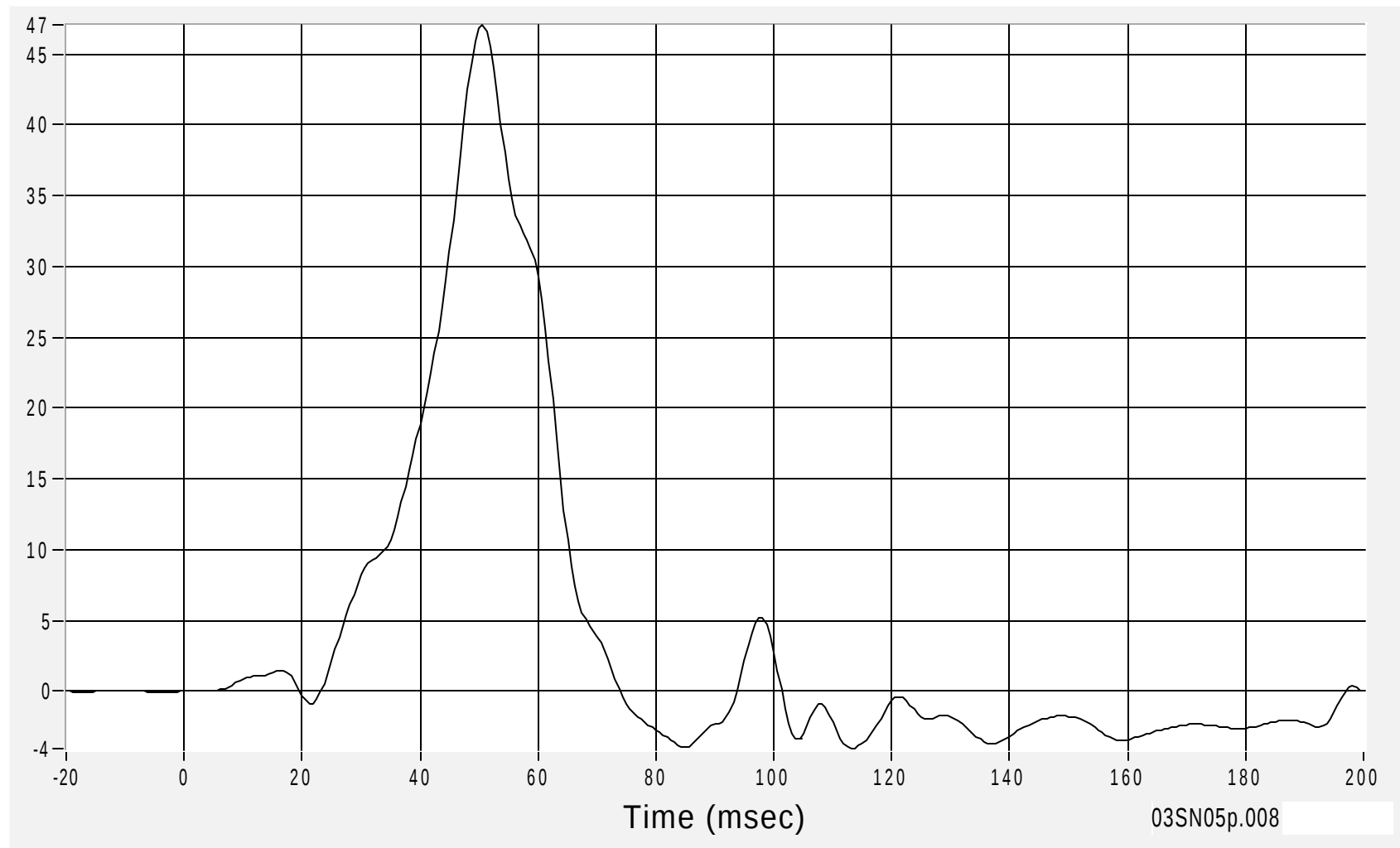
Passenger Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 47.1 G's at 50.6 msec

Min -4.1 G's at 113.1 msec

B-54



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Vehicle Crashworthiness Lab

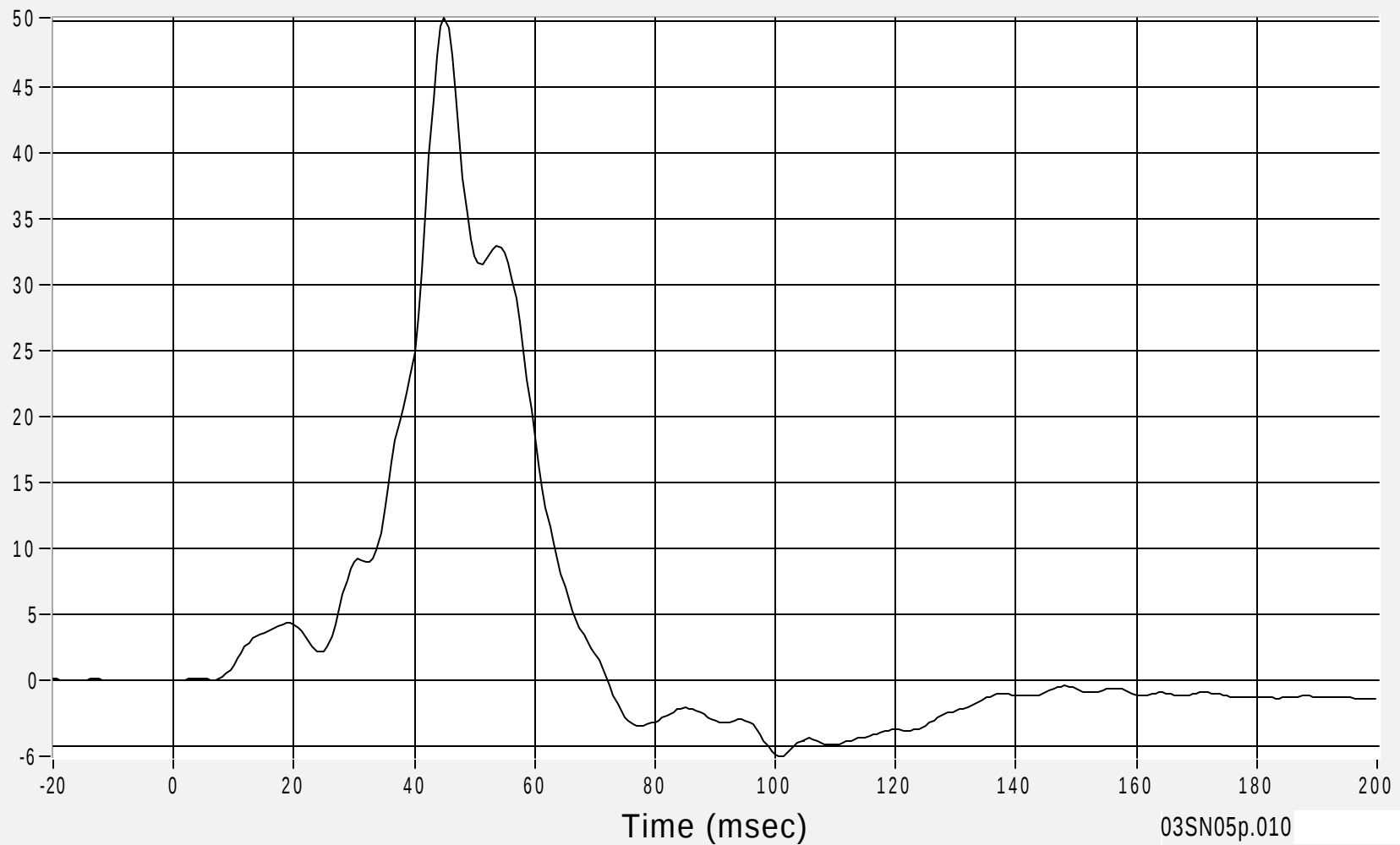
Passenger Pelvic (Y) Acceleration

Acceleration (G's) FIR100

Max 50.2 G's at 45.0 msec

Min -5.8 G's at 100.6 msec

B-55



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5 February 2003

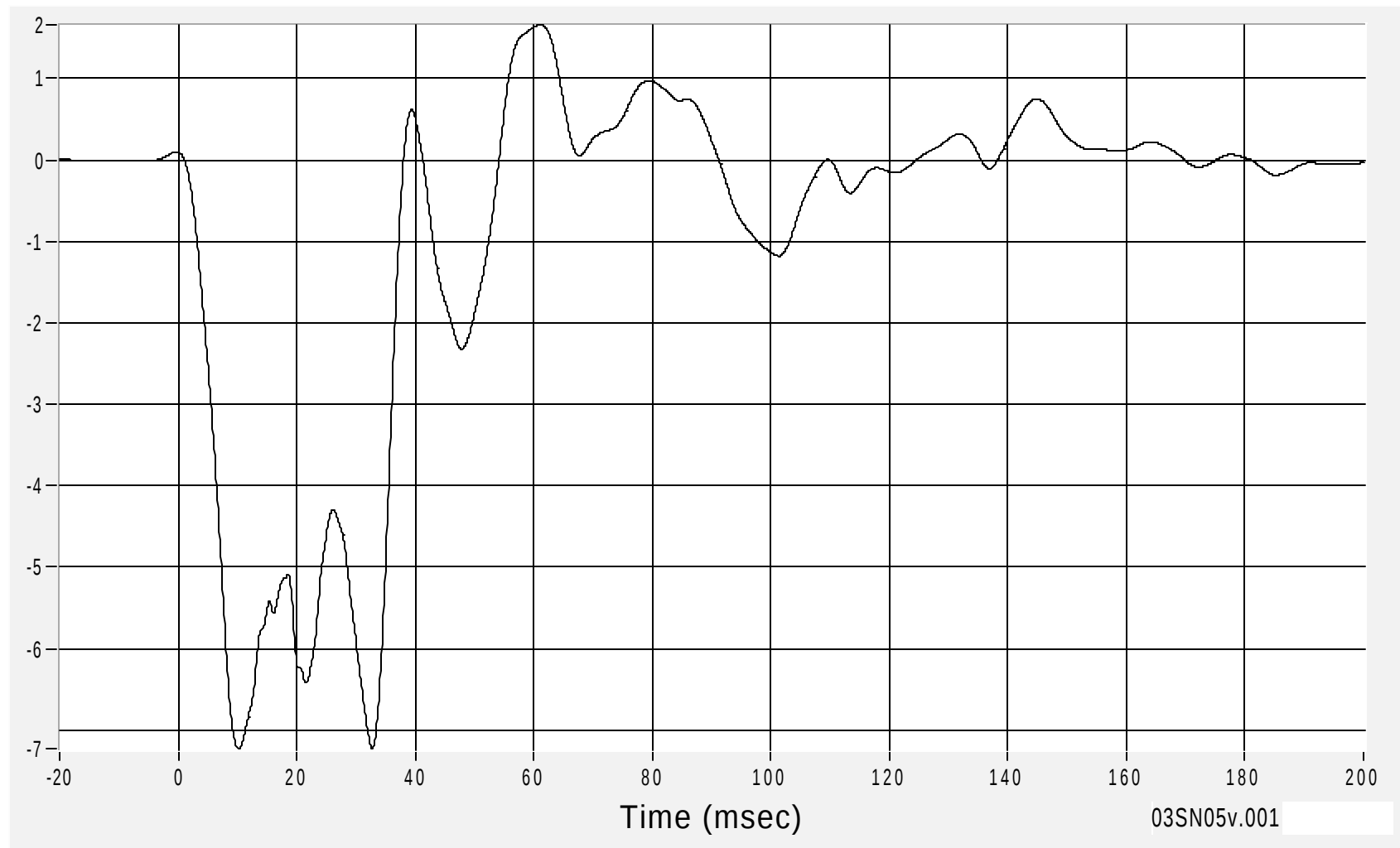
Medical College of Wisconsin
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Right Side Sill at Front Seat (X) Acceleration

Acceleration (G's) CFC60

Max 1.7 G's at 61.1 msec
Min -7.2 G's at 32.7 msec

B-56



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5 February 2003

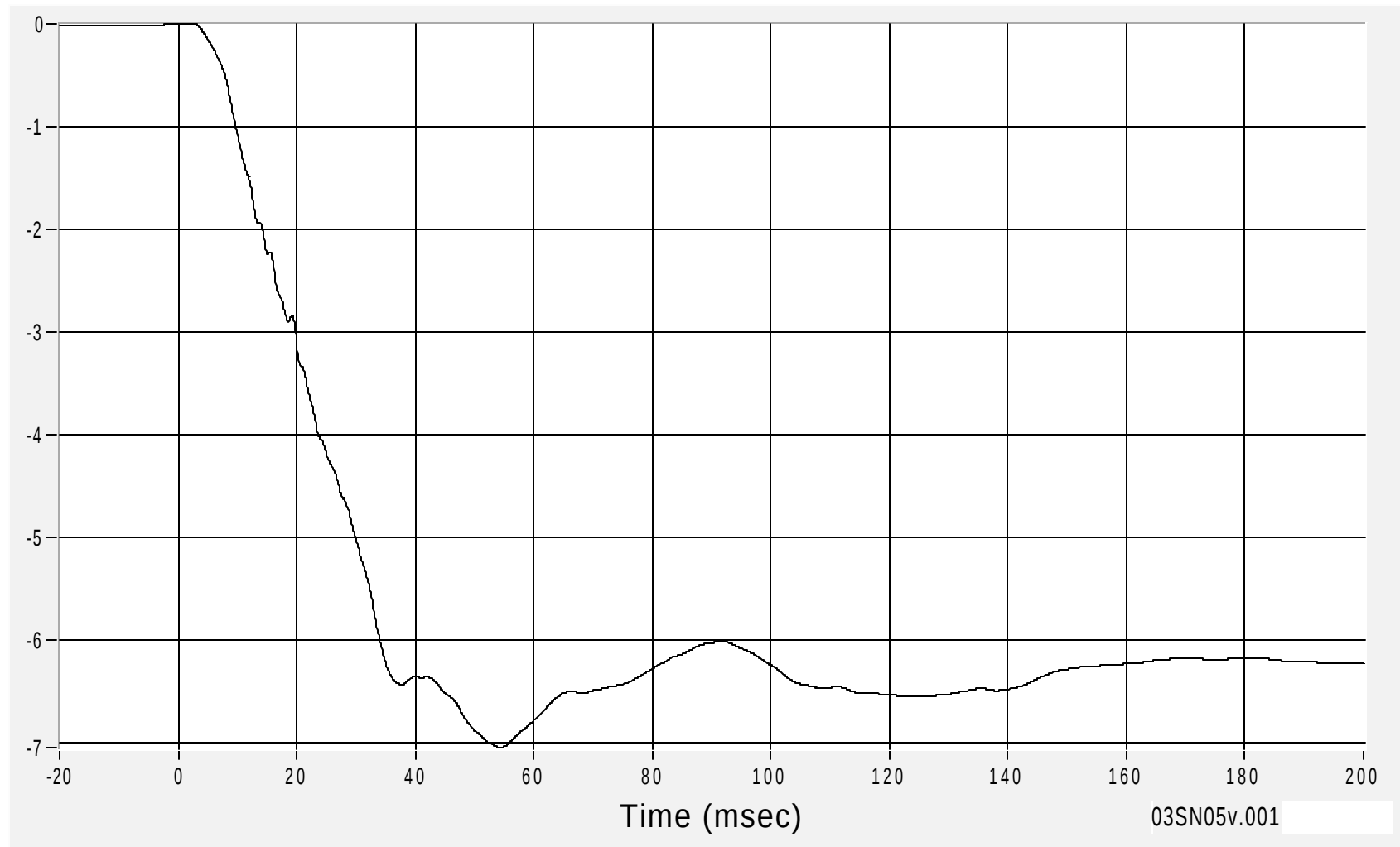
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 2.7 msec
Min -7.0 km/h at 54.5 msec

B-57



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

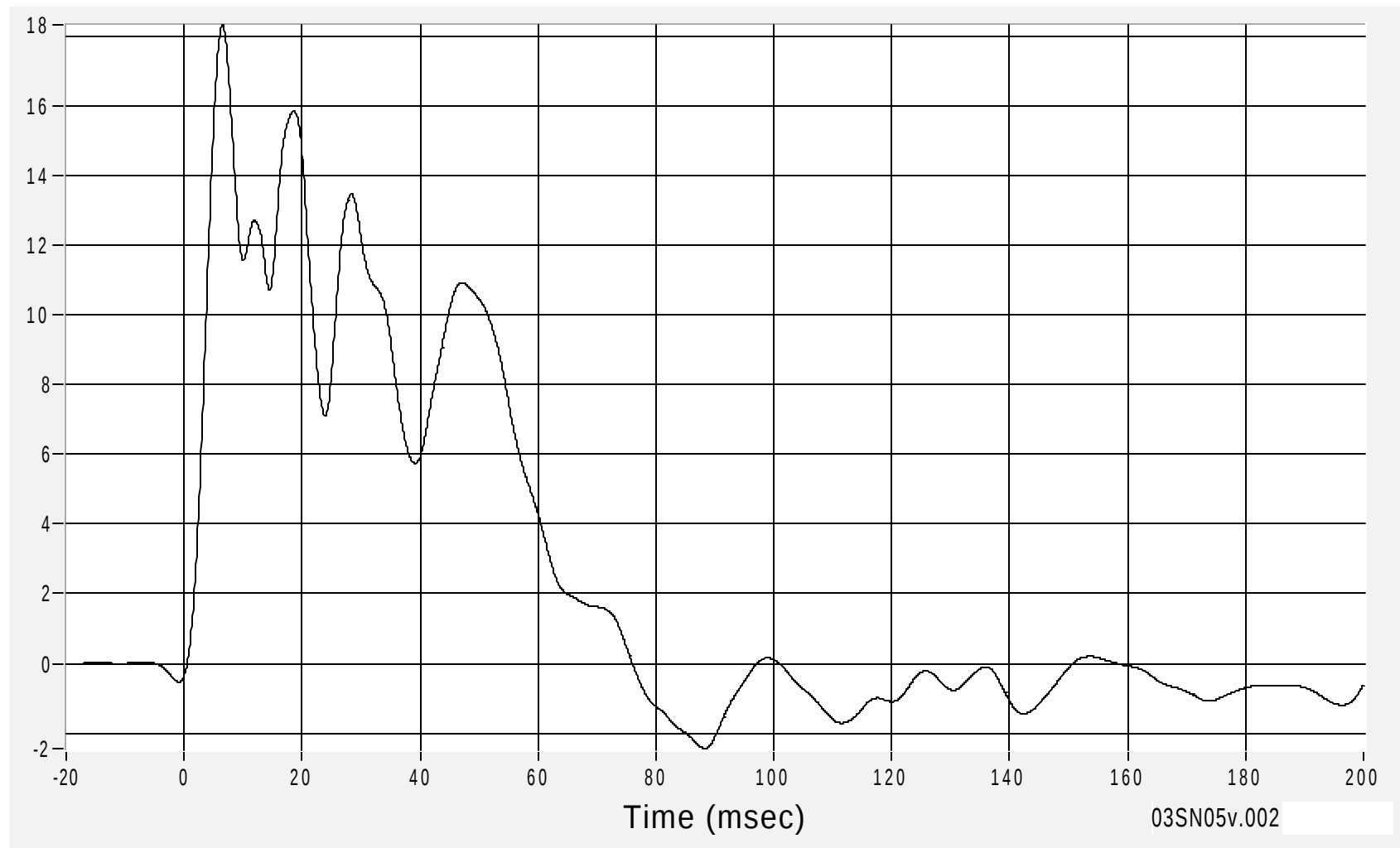
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 18.3 G's at 6.5 msec
Min -2.4 G's at 88.3 msec

B-58



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5 February 2003

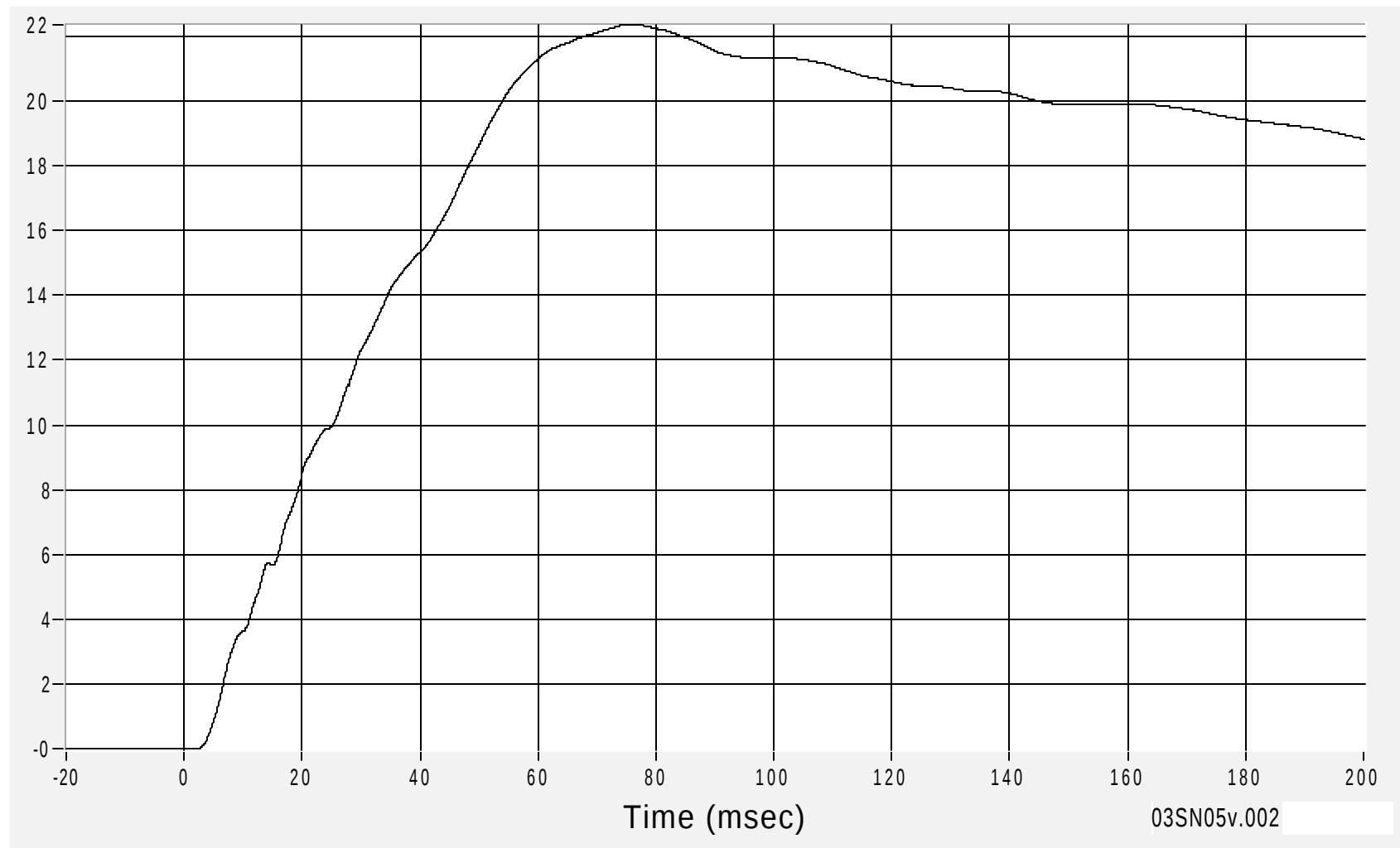
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Y) Velocity

Velocity (km/h) CFC180

Max 22.4 km/h at 75.4 msec
Min 0.0 km/h at 1.8 msec

B-59



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5 February 2003

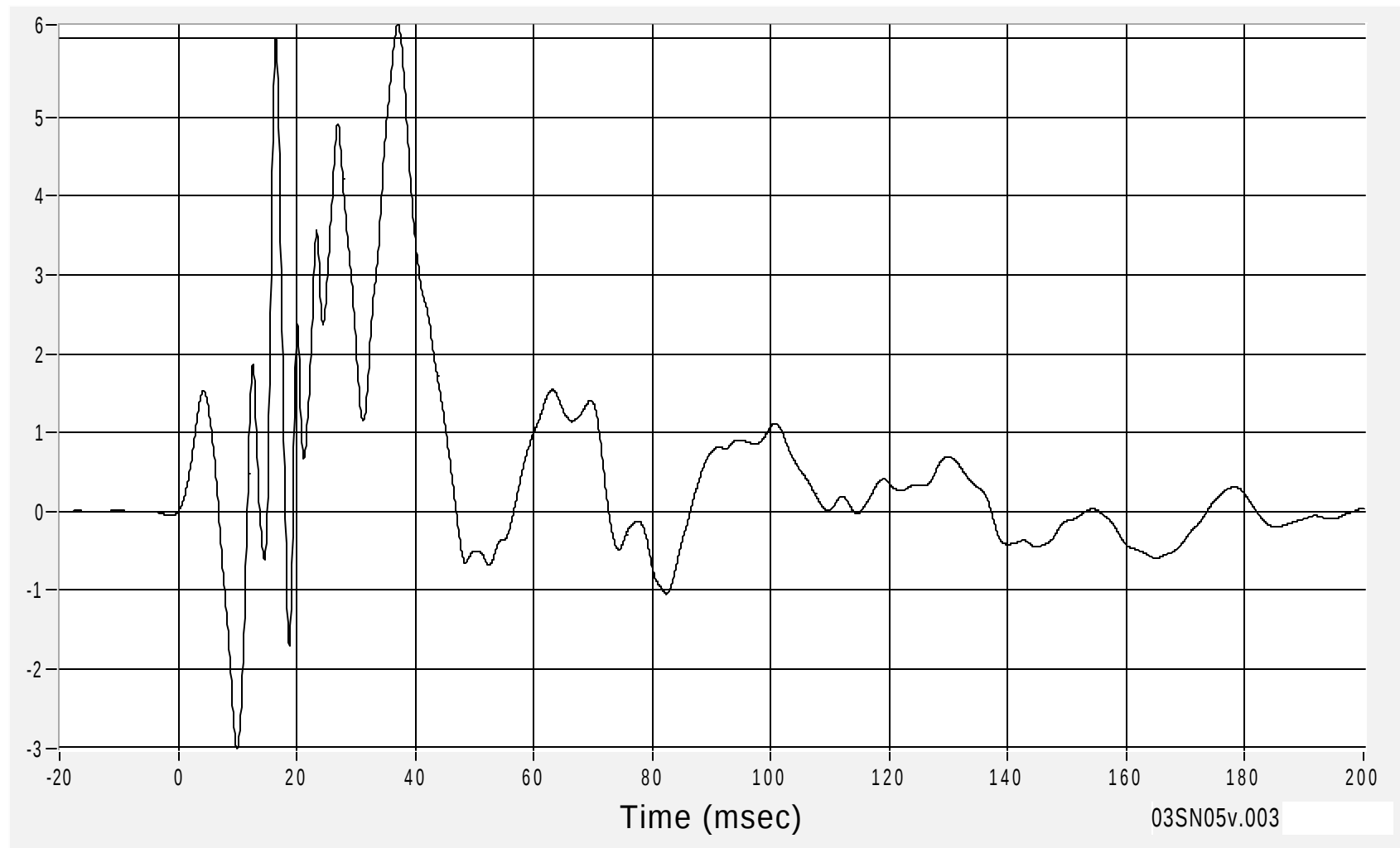
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Z) Acceleration

Acceleration (G's) CFC60

Max 6.2 G's at 37.1 msec
Min -3.0 G's at 9.9 msec

B-60



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5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

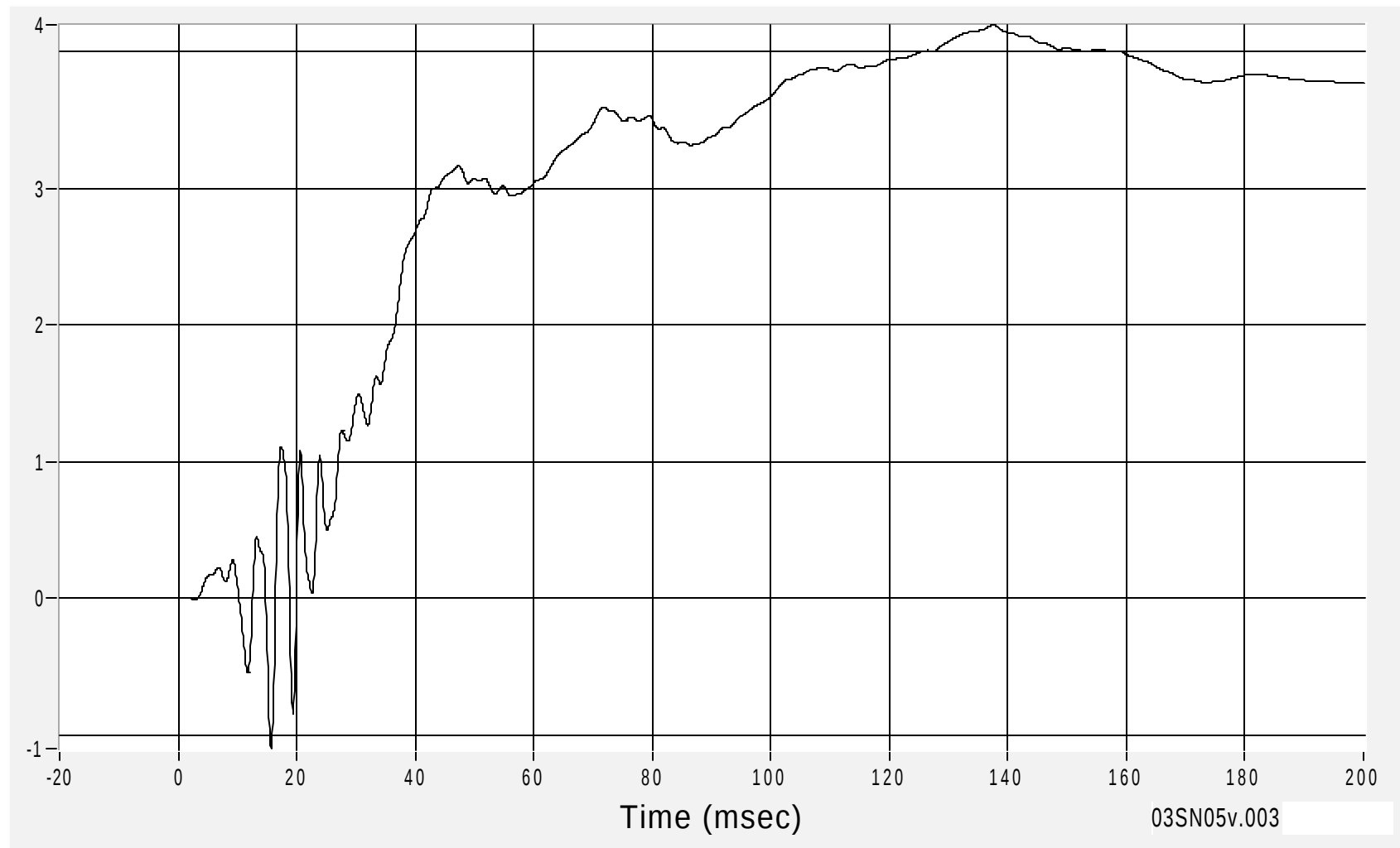
Right Side Sill at Front Seat (Z) Velocity

Velocity (km/h) CFC180

Max 4.2 km/h at 137.6 msec

Min -1.1 km/h at 15.7 msec

B-61



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5 February 2003

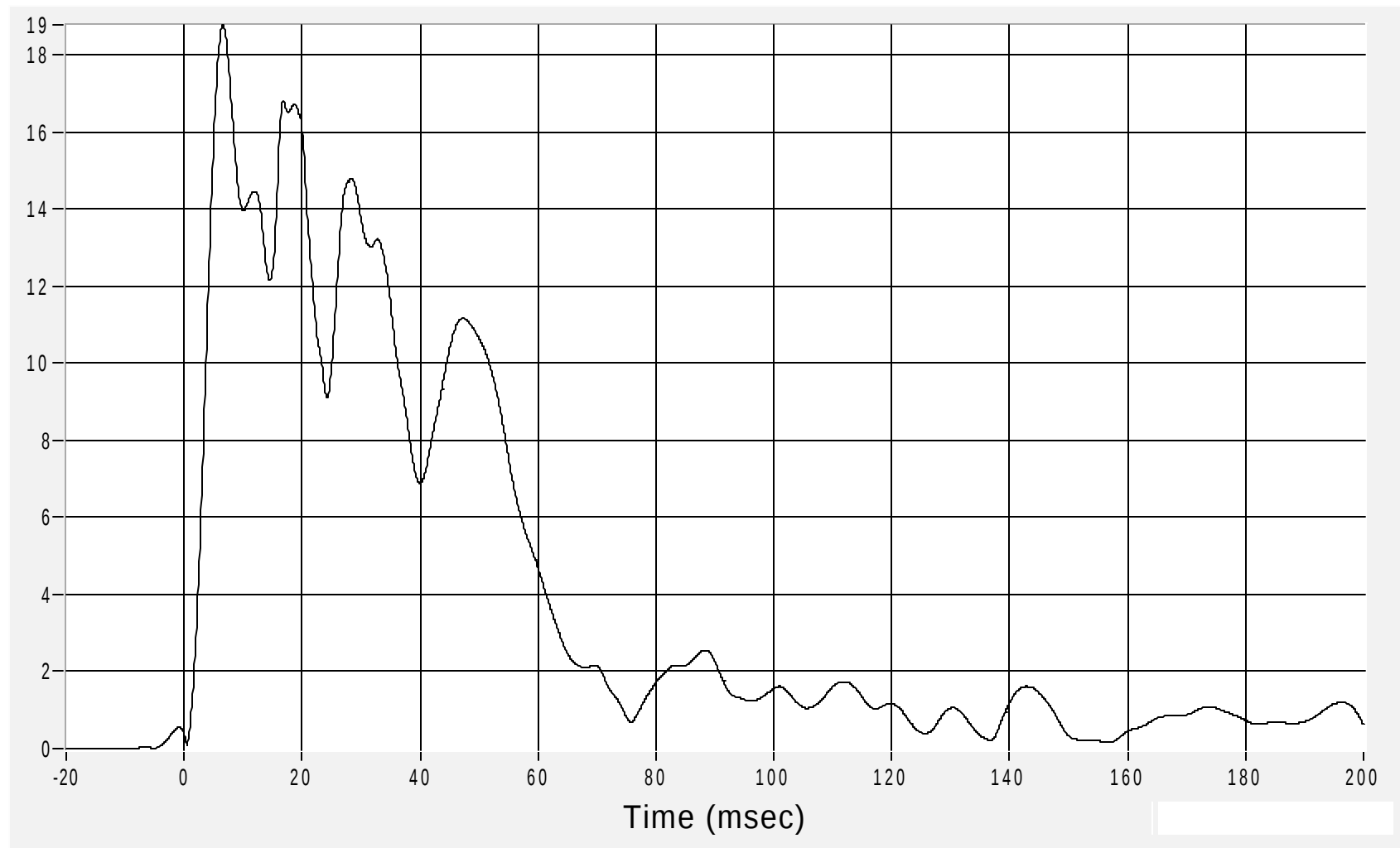
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat Resultant Acceleration

Acceleration (G's) CFC60

Max 18.8 G's at 6.6 msec
Min 0.1 G's at 0.5 msec

B-62



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5 February 2003

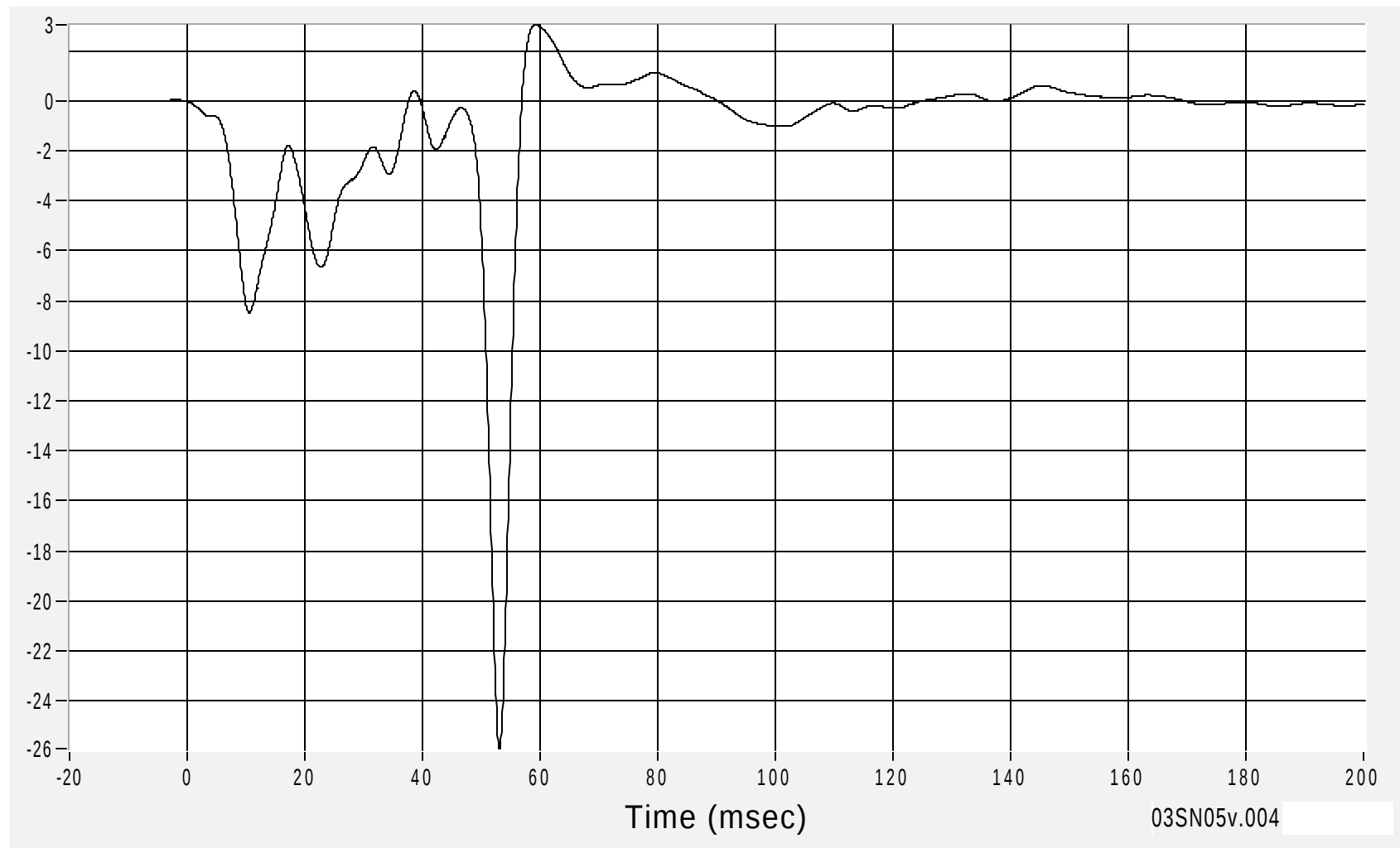
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (X) Acceleration

Acceleration (G's) CFC60

Max 3.0 G's at 59.3 msec
Min -25.9 G's at 53.1 msec

B-63



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5 February 2003

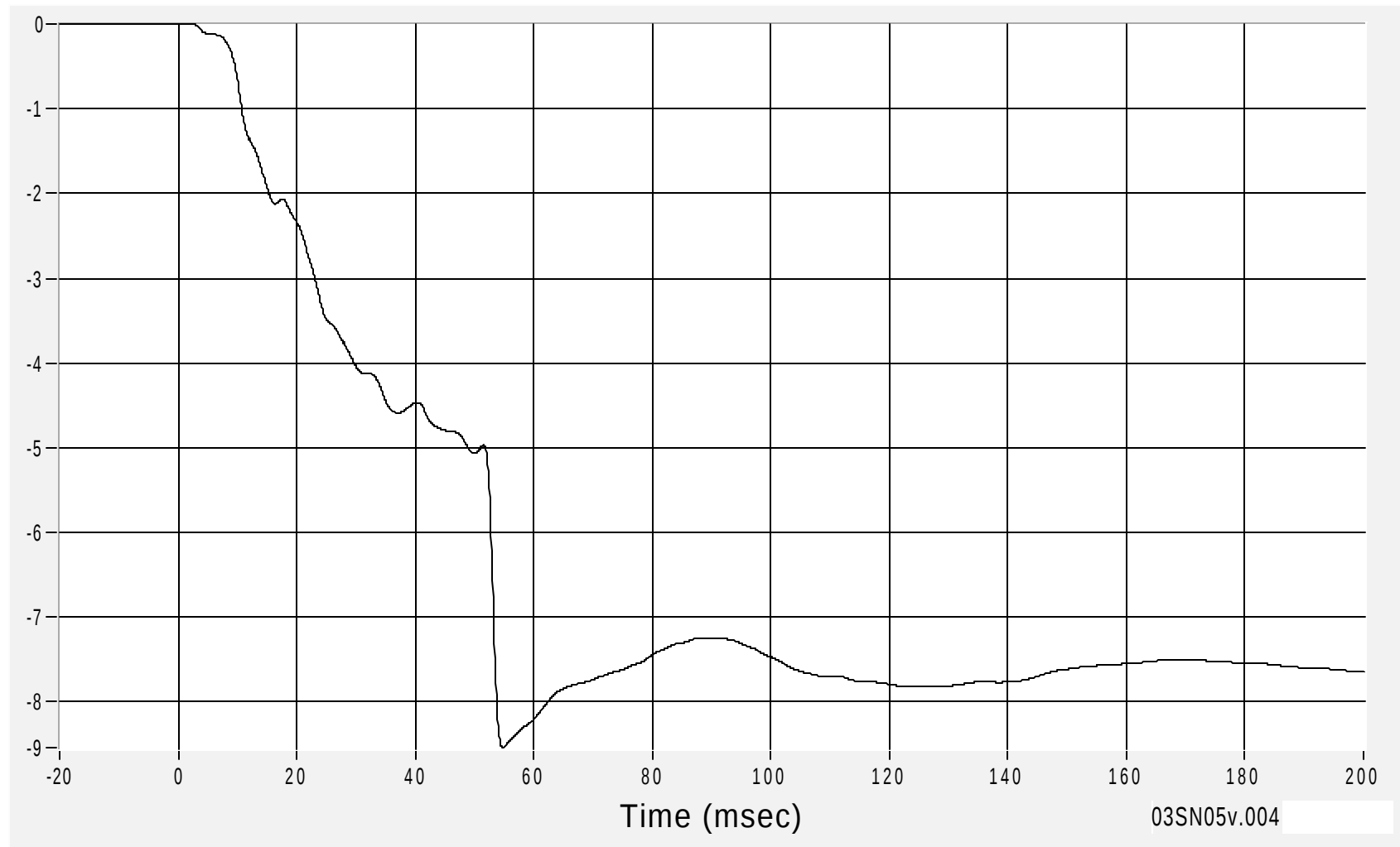
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 2.0 msec
Min -8.5 km/h at 54.8 msec

B-64



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5 February 2003

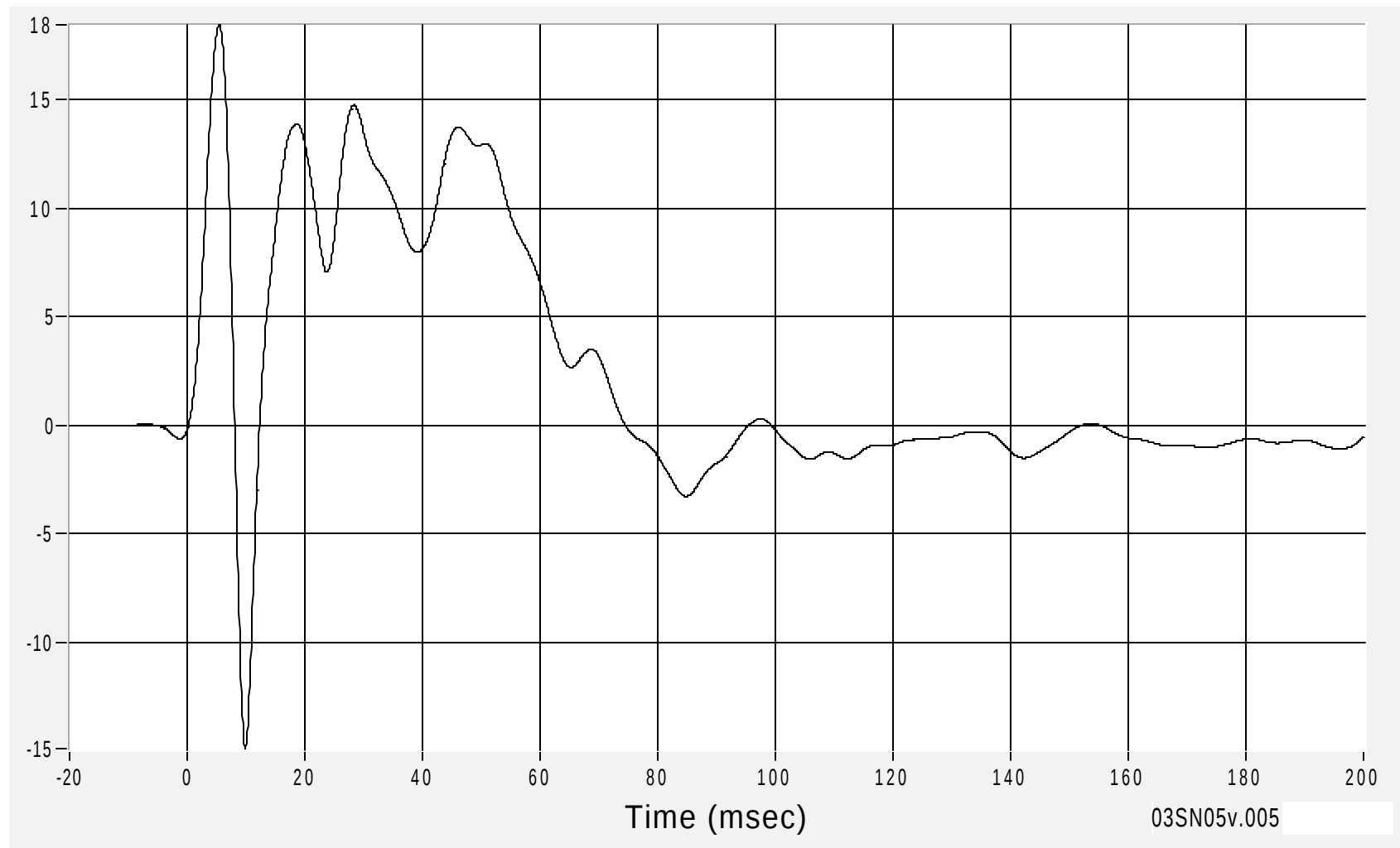
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 18.4 G's at 5.4 msec
Min -14.9 G's at 9.8 msec

B-65



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5 February 2003

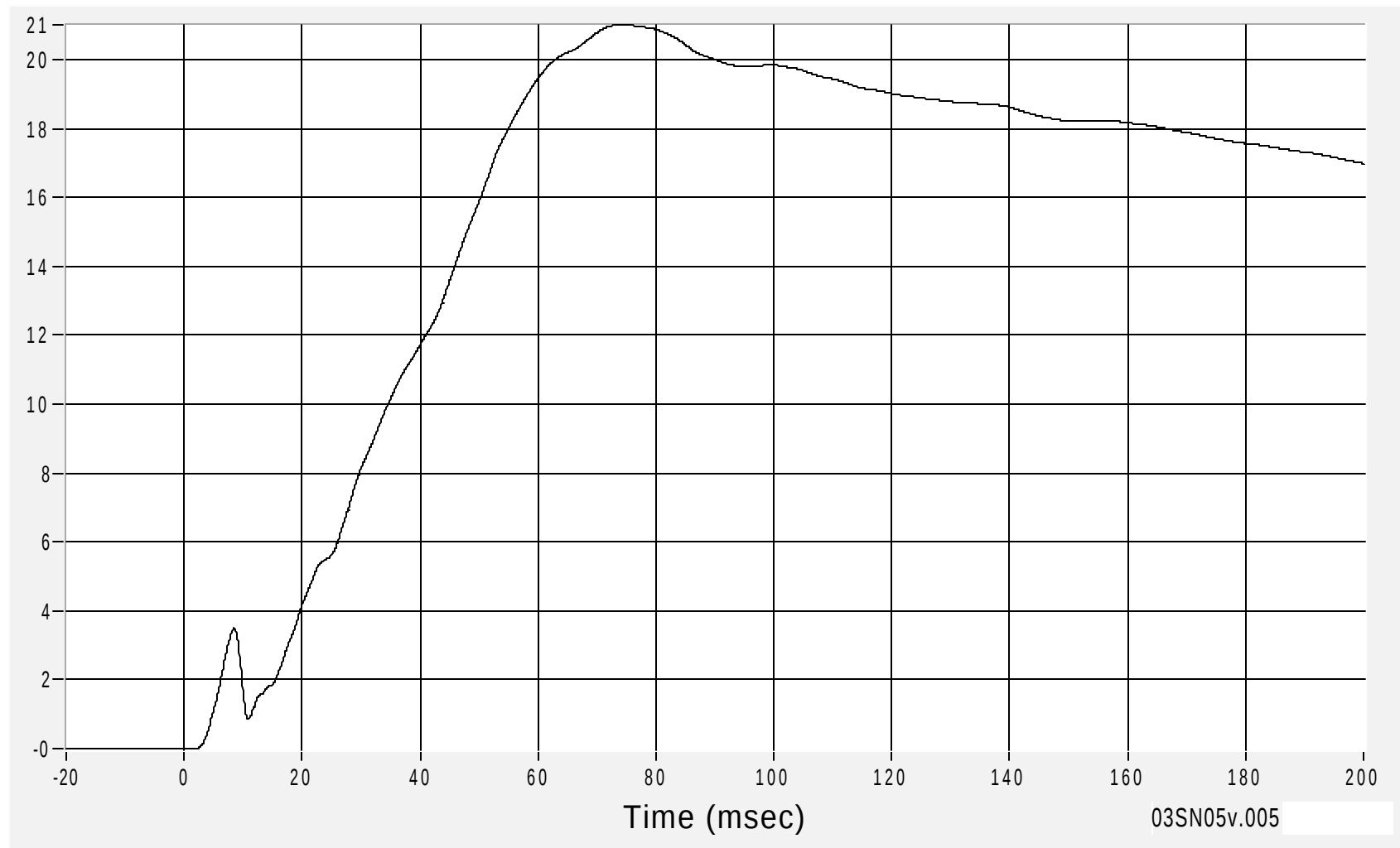
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Y) Velocity

Velocity (km/h) CFC180

Max 21.0 km/h at 74.2 msec
Min 0.0 km/h at 1.7 msec

B-66



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5 February 2003

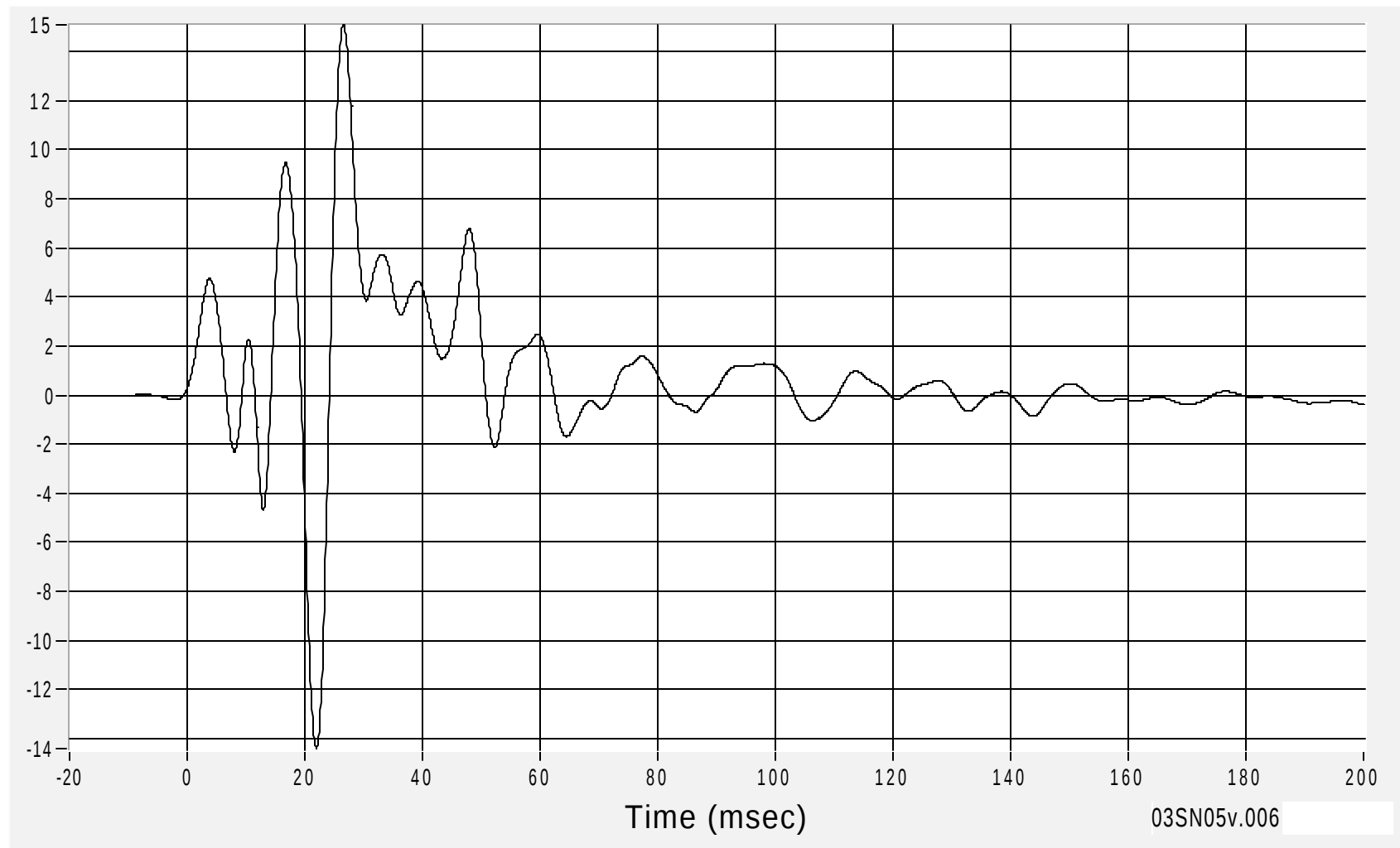
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Z) Acceleration

Acceleration (G's) CFC60

Max 15.1 G's at 26.6 msec
Min -14.4 G's at 21.9 msec

B-67



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5 February 2003

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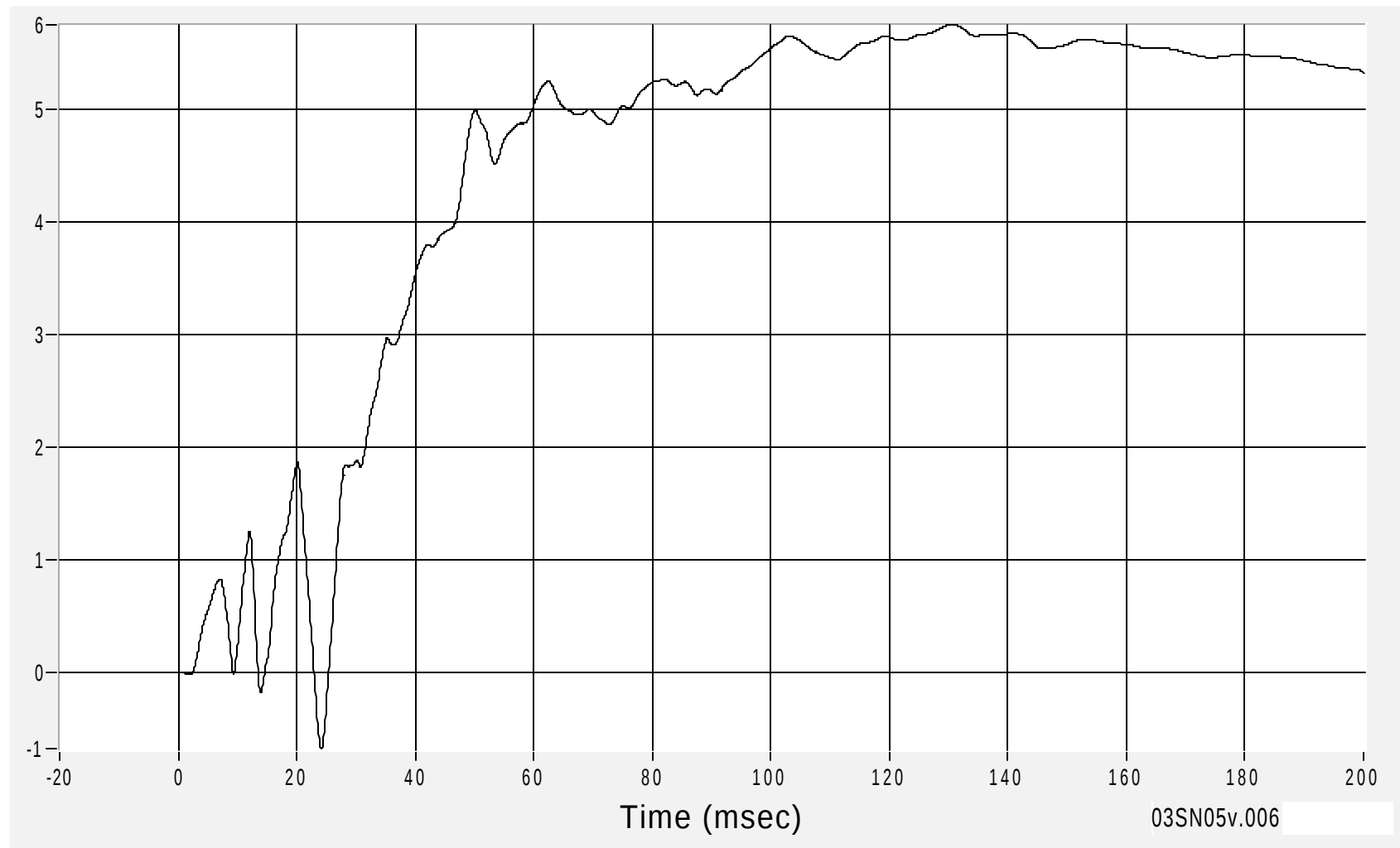
Right Side Sill at Rear Seat (Z) Velocity

Velocity (km/h) CFC180

Max 5.7 km/h at 130.9 msec

Min -0.7 km/h at 24.2 msec

B-68



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5 February 2003

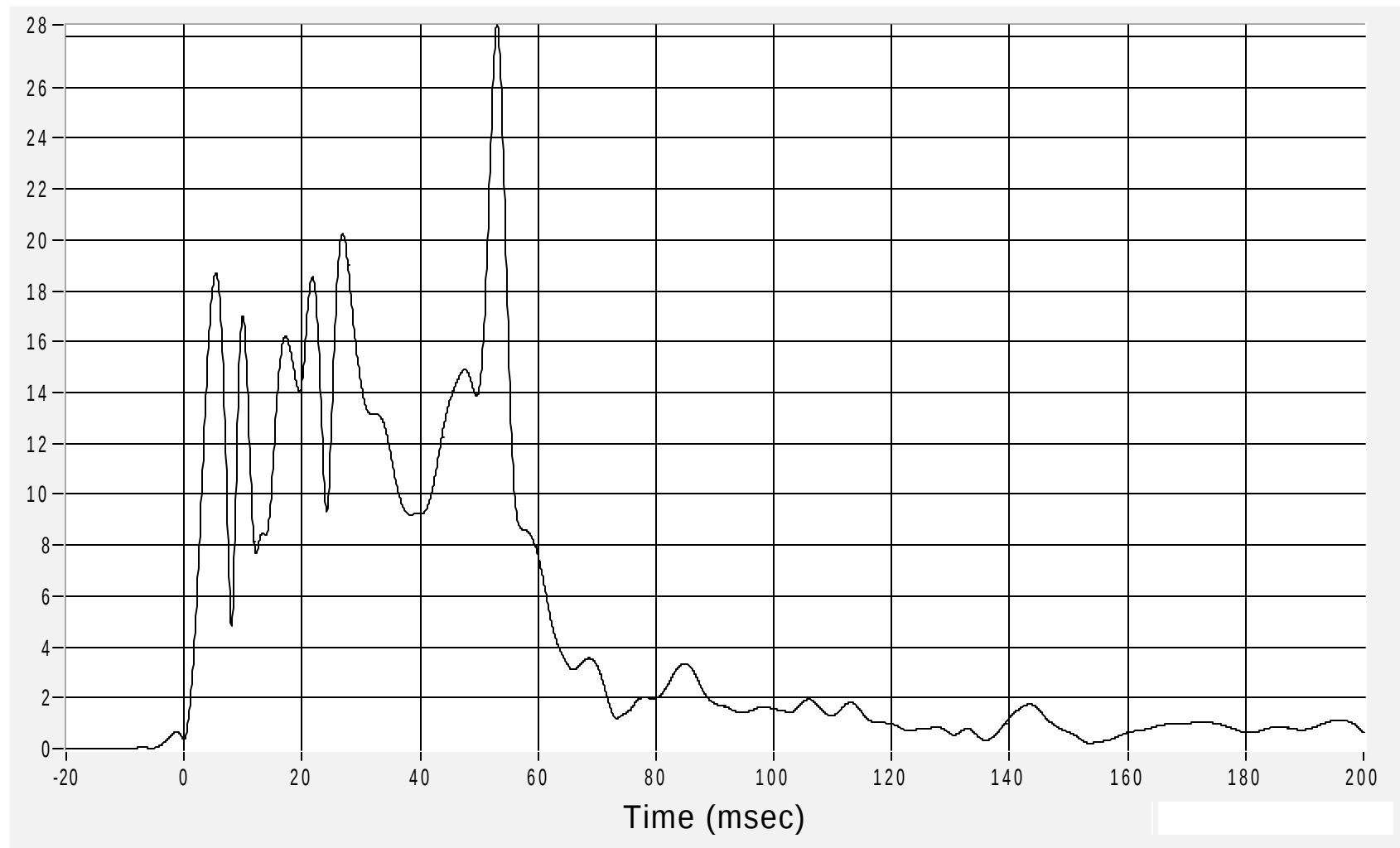
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat Resultant Acceleration

Acceleration (G's) CFC60

Max 28.5 G's at 53.0 msec
Min 0.2 G's at 153.6 msec

B-69



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5 February 2003

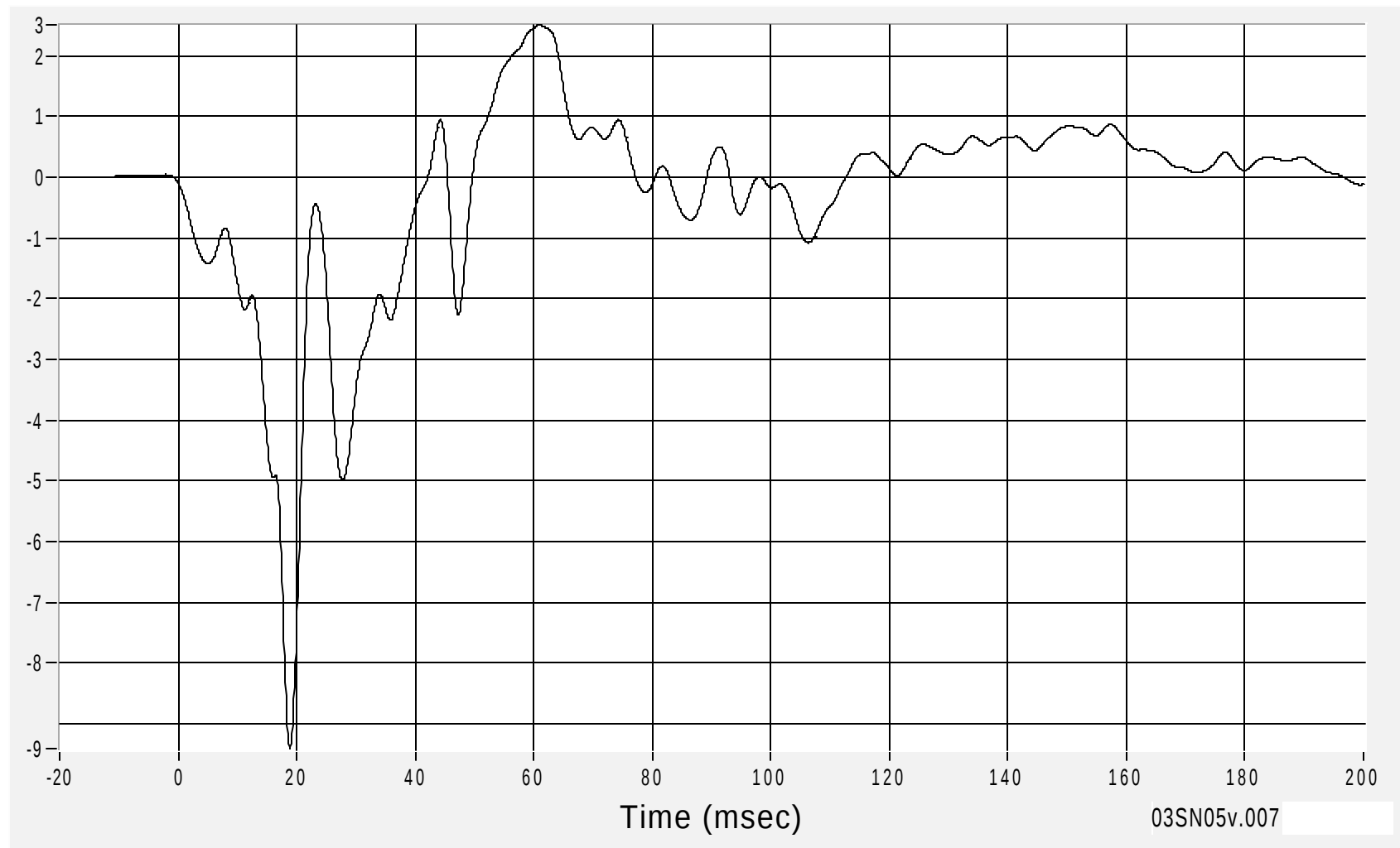
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (X) Acceleration

Acceleration (G's) CFC60

Max 2.5 G's at 61.0 msec
Min -9.4 G's at 18.8 msec

B-70



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5 February 2003

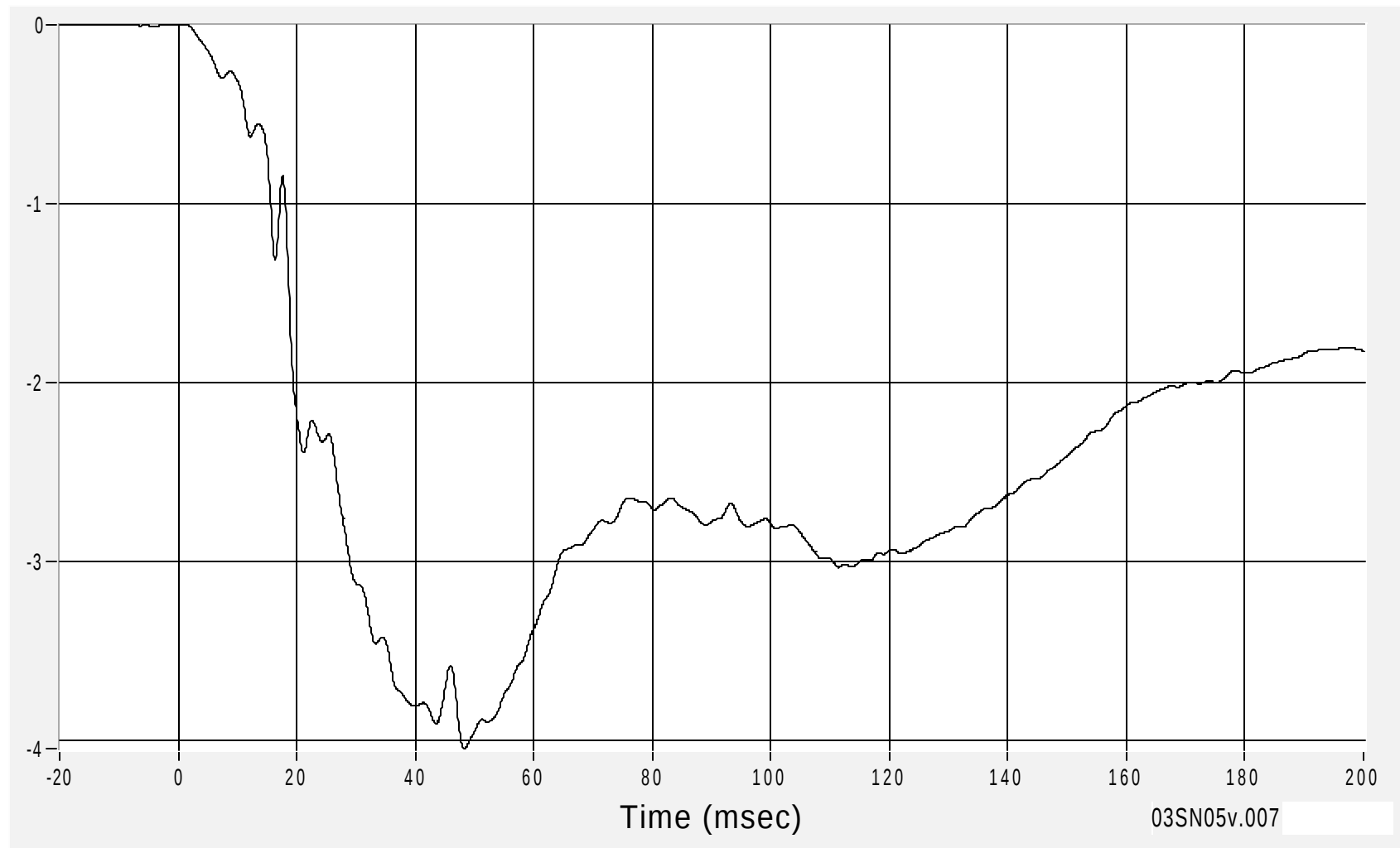
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 1.2 msec
Min -4.1 km/h at 48.3 msec

B-71



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5 February 2003

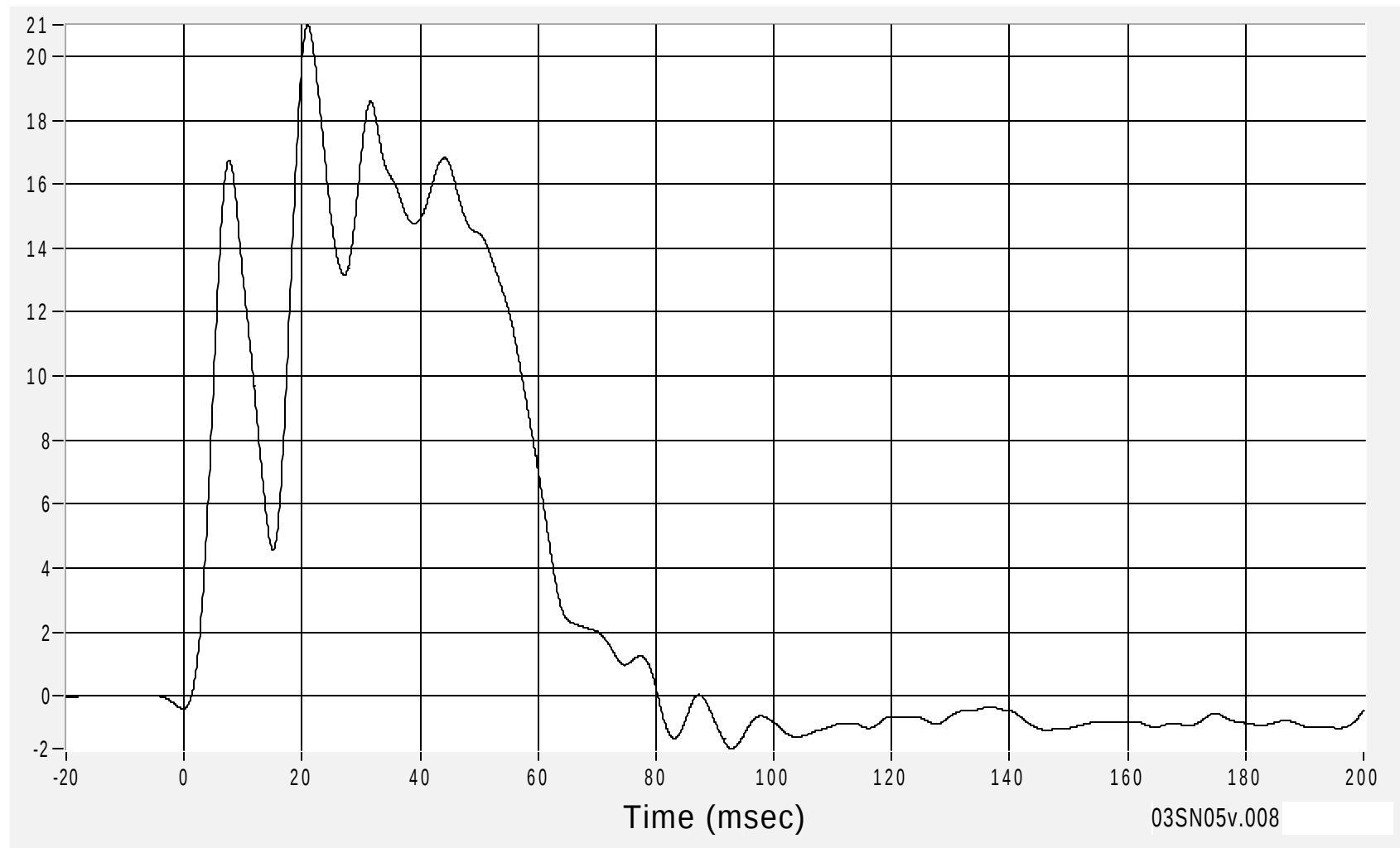
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (Y) Acceleration

Acceleration (G's) CFC60

Max 21.0 G's at 21.0 msec
Min -1.6 G's at 92.8 msec

B-72



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5 February 2003

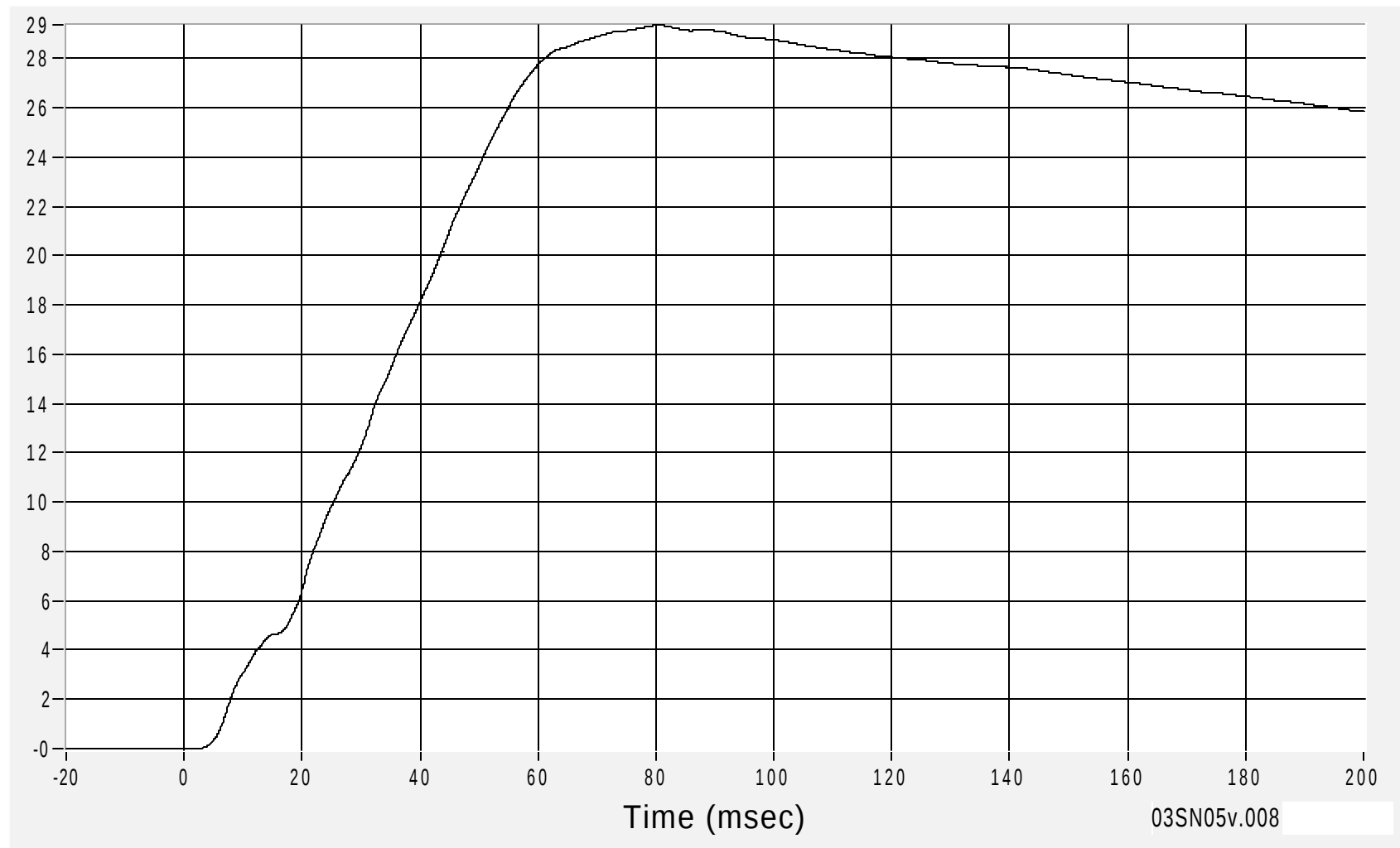
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (Y) Velocity

Velocity (km/h) CFC180

Max 29.4 km/h at 80.4 msec
Min 0.0 km/h at 1.8 msec

B-73



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5 February 2003

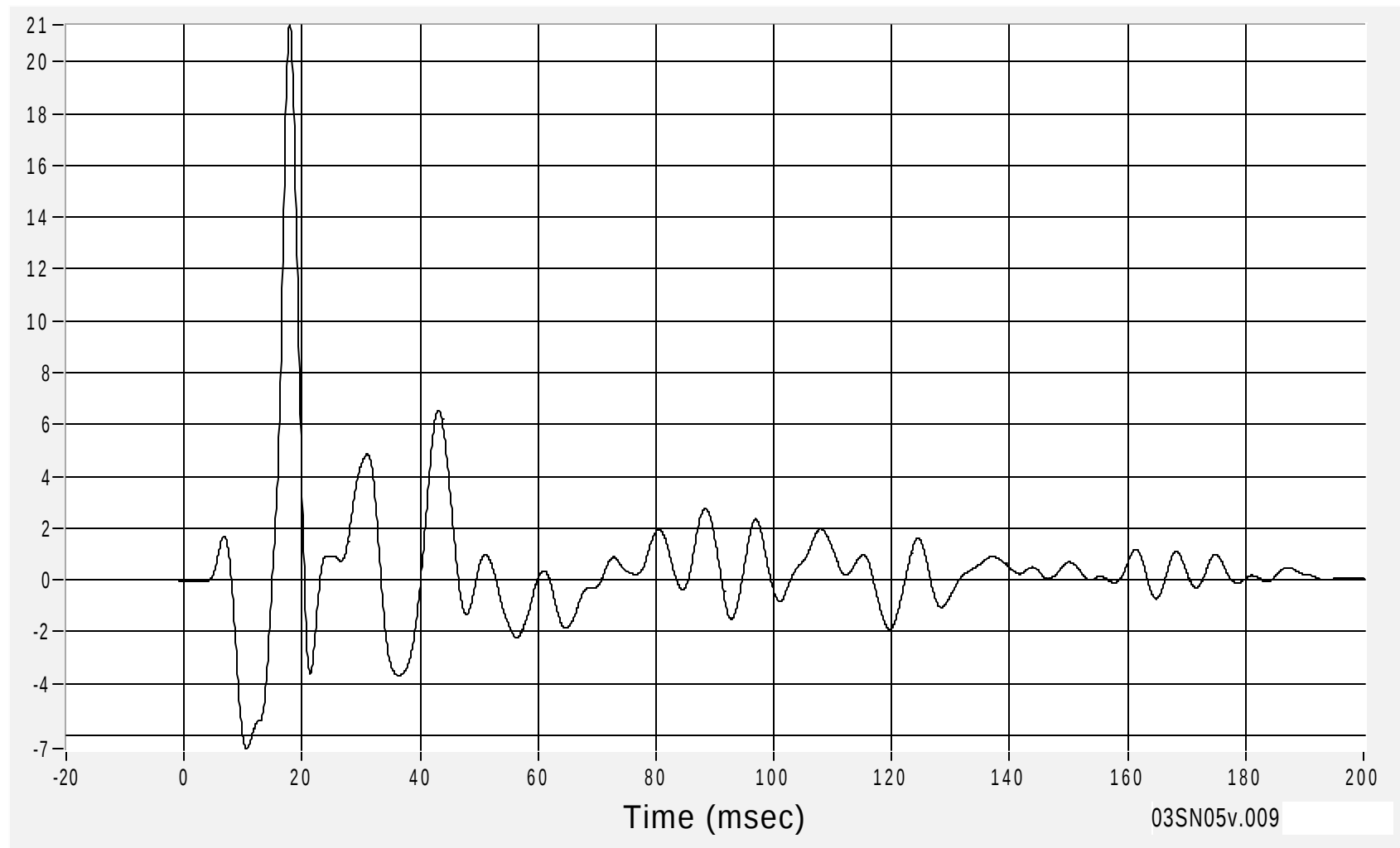
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (Z) Acceleration

Acceleration (G's) CFC60

Max 21.4 G's at 17.9 msec
Min -6.5 G's at 10.6 msec

B-74



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5 February 2003

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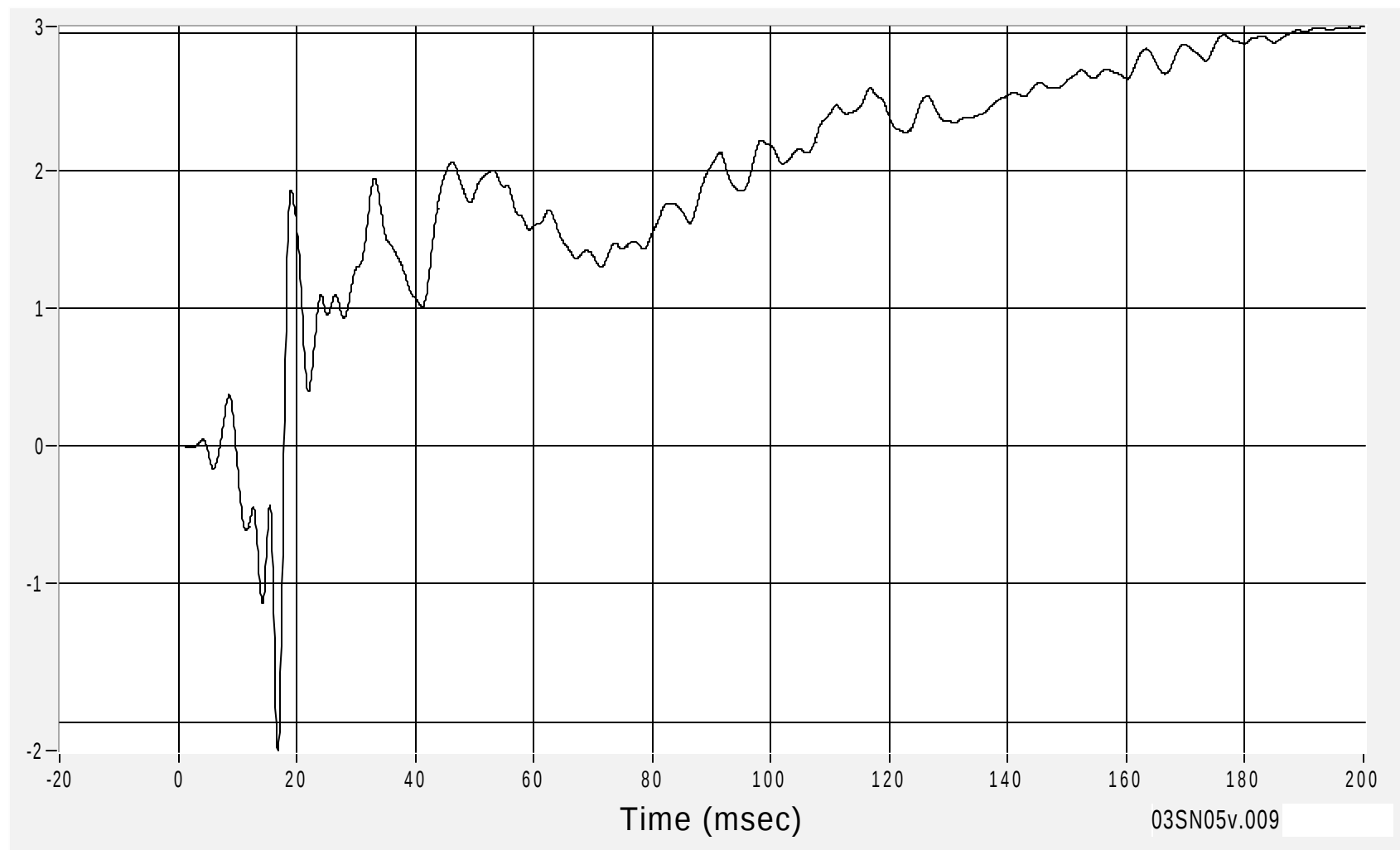
Rear Floorpan Above Axle (Z) Velocity

Velocity (km/h) CFC180

Max 3.0 km/h at 199.9 msec

Min -2.2 km/h at 16.8 msec

B-75



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5 February 2003

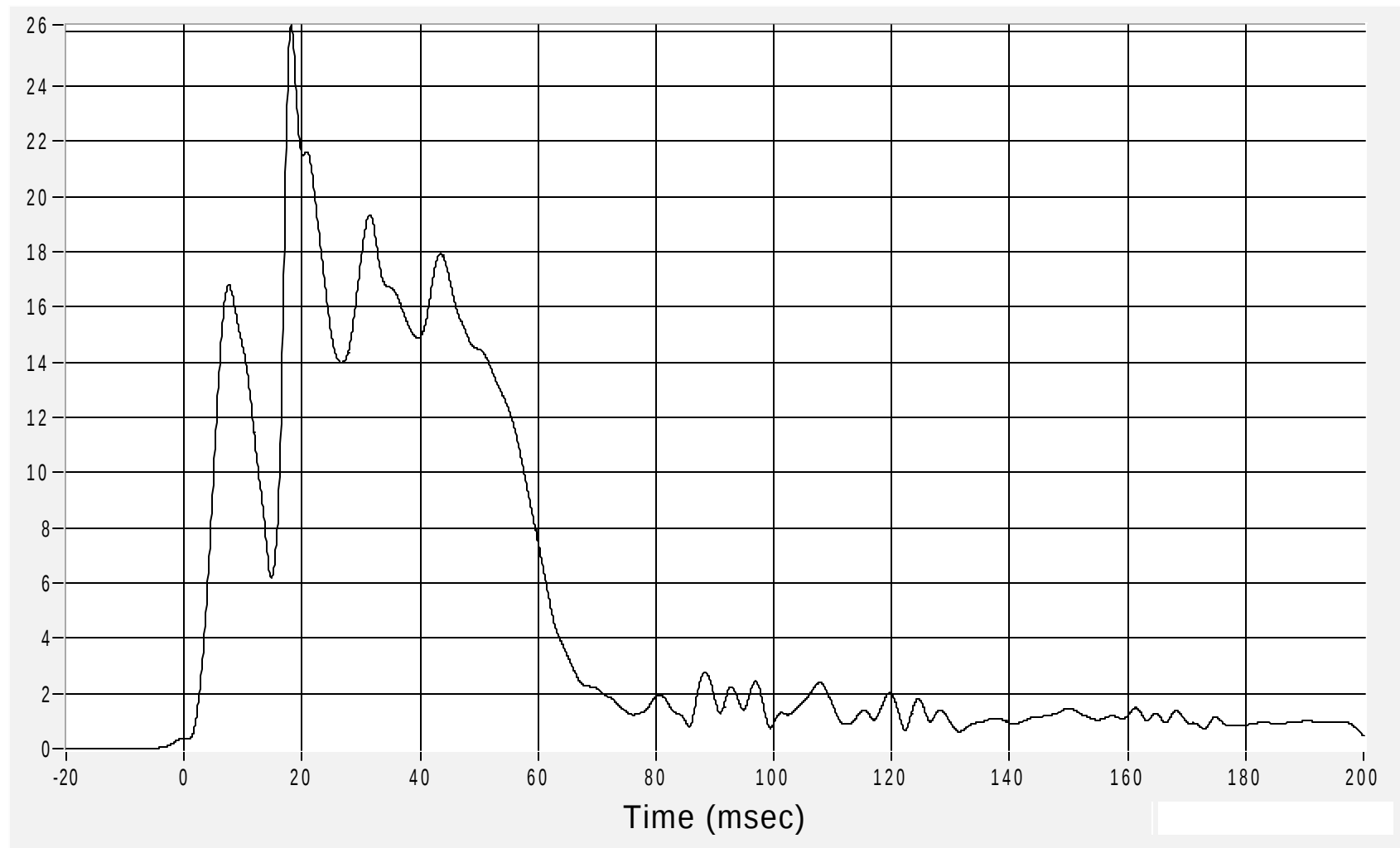
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle Resultant Acceleration

Acceleration (G's) CFC60

Max 26.2 G's at 18.2 msec
Min 0.4 G's at 0.8 msec

B-76



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5 February 2003

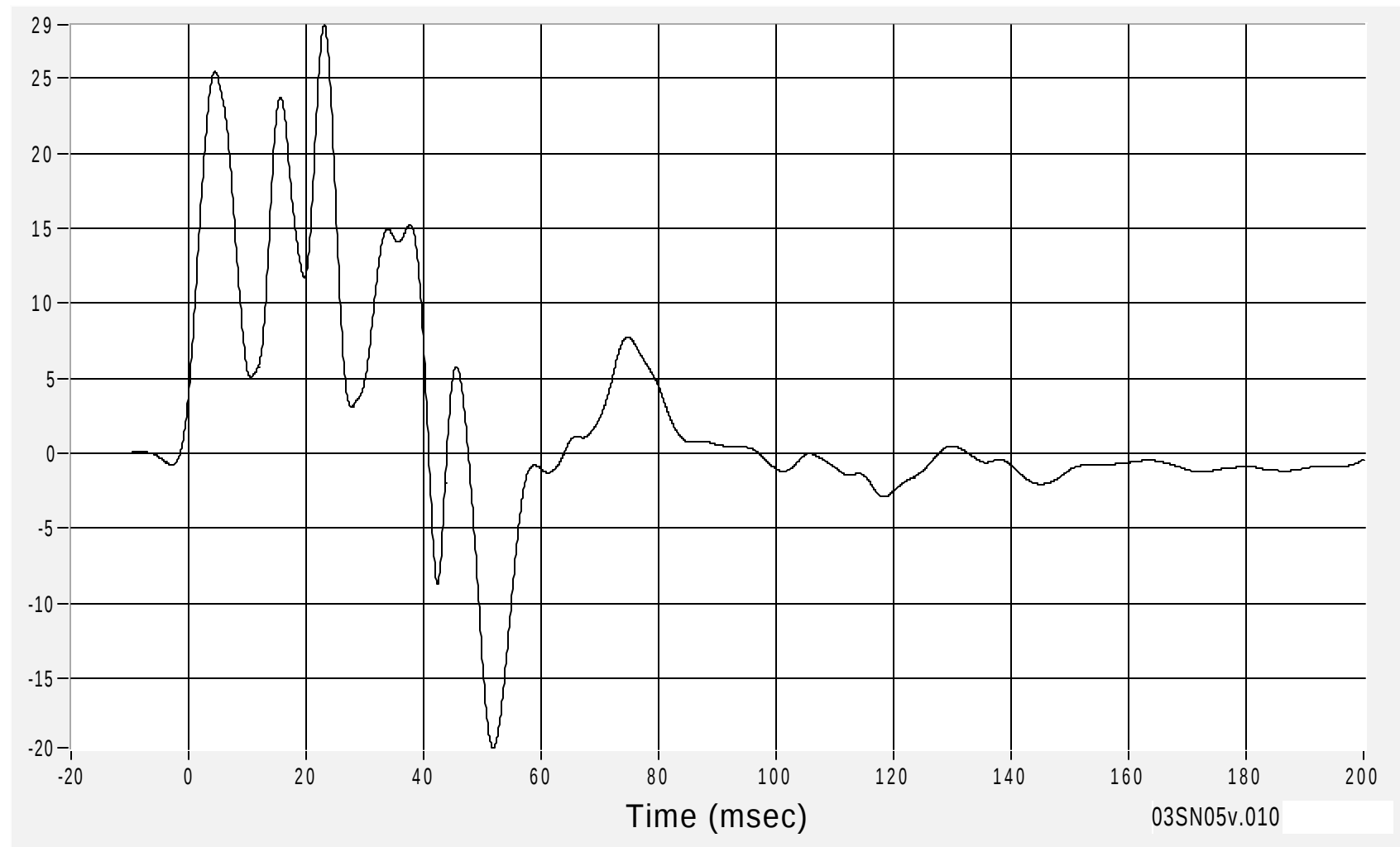
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Side Sill at Rear Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 28.6 G's at 23.1 msec
Min -19.6 G's at 51.8 msec

B-77



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5 February 2003

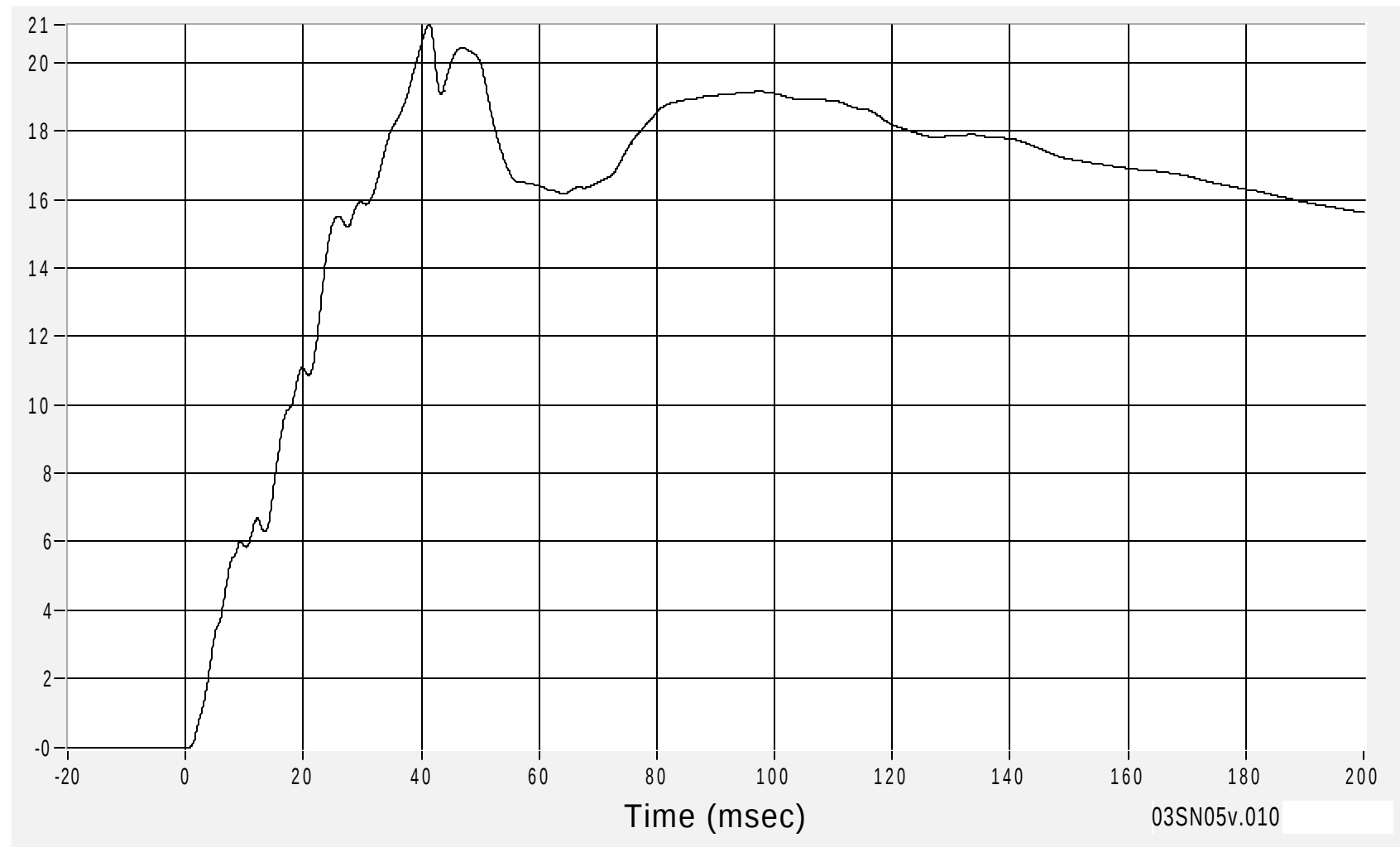
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Side Sill at Rear Seat (Y) Velocity

Velocity (km/h) CFC180

Max 21.1 km/h at 41.3 msec
Min 0.0 km/h at 0.5 msec

B-78



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5 February 2003

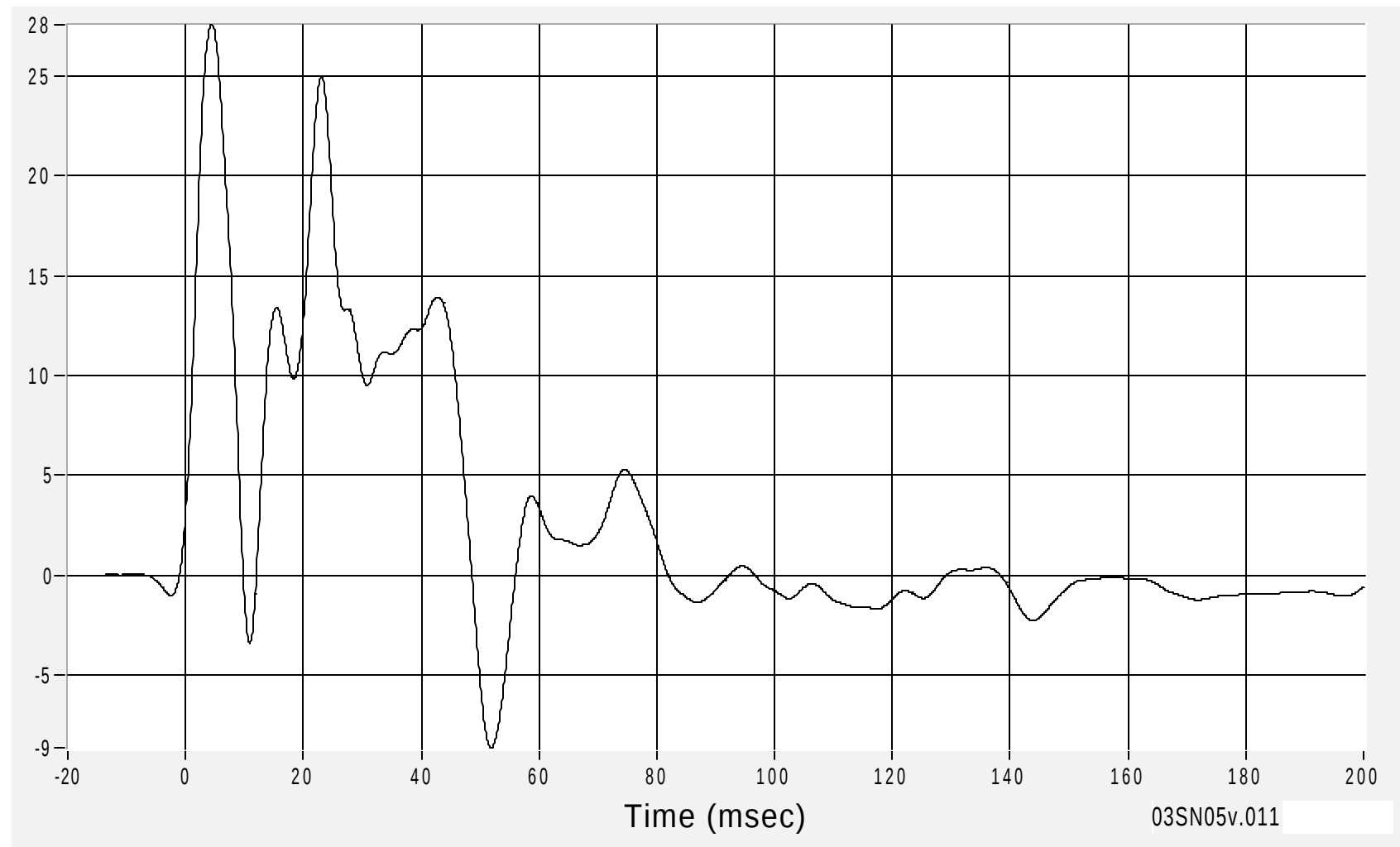
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Side Sill at Front Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 27.5 G's at 4.4 msec
Min -8.6 G's at 51.8 msec

B-79



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5 February 2003

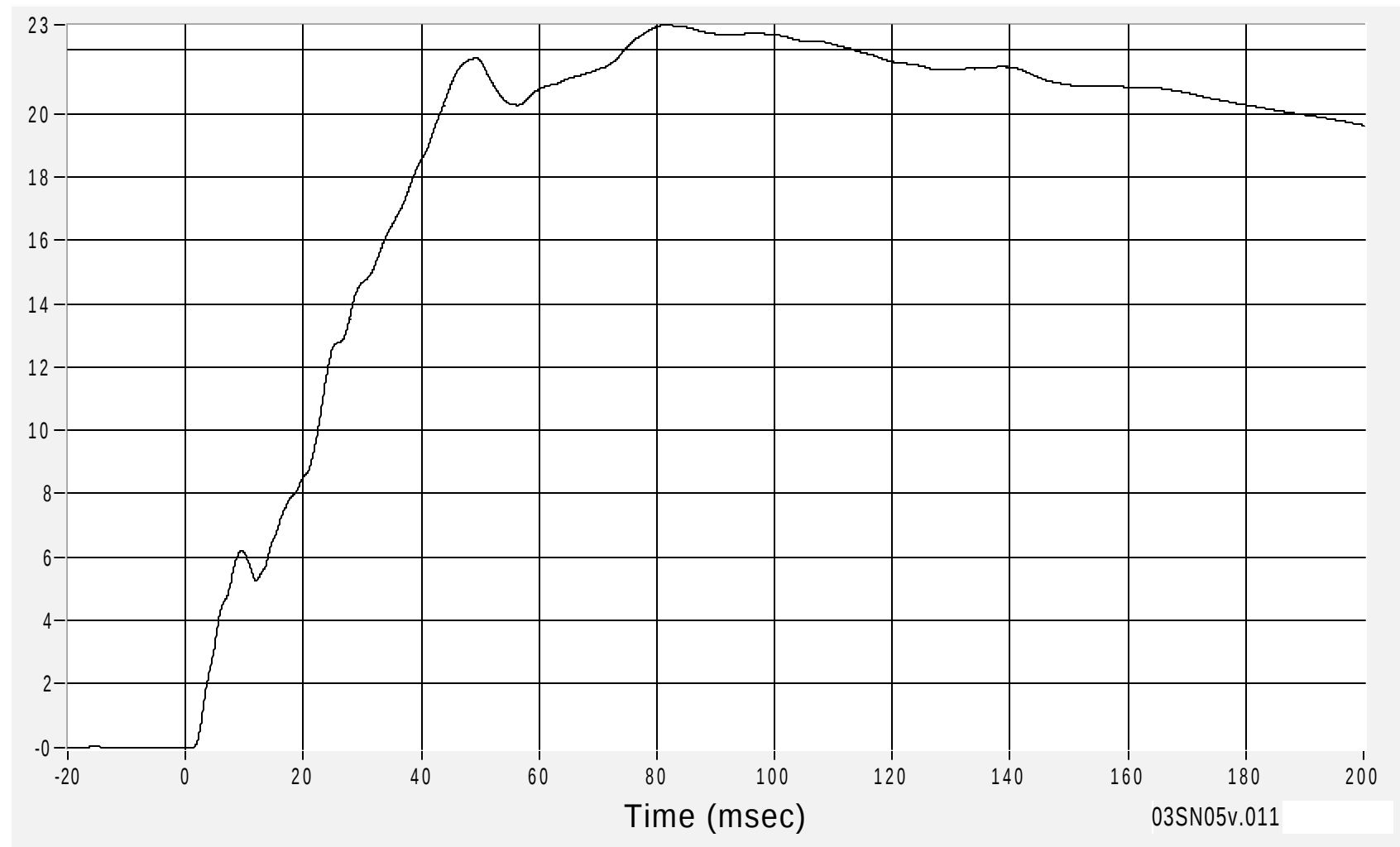
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Side Sill at Front Seat (Y) Velocity

Velocity (km/h) CFC180

Max 22.8 km/h at 81.5 msec
Min 0.0 km/h at 1.0 msec

B-80



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5 February 2003

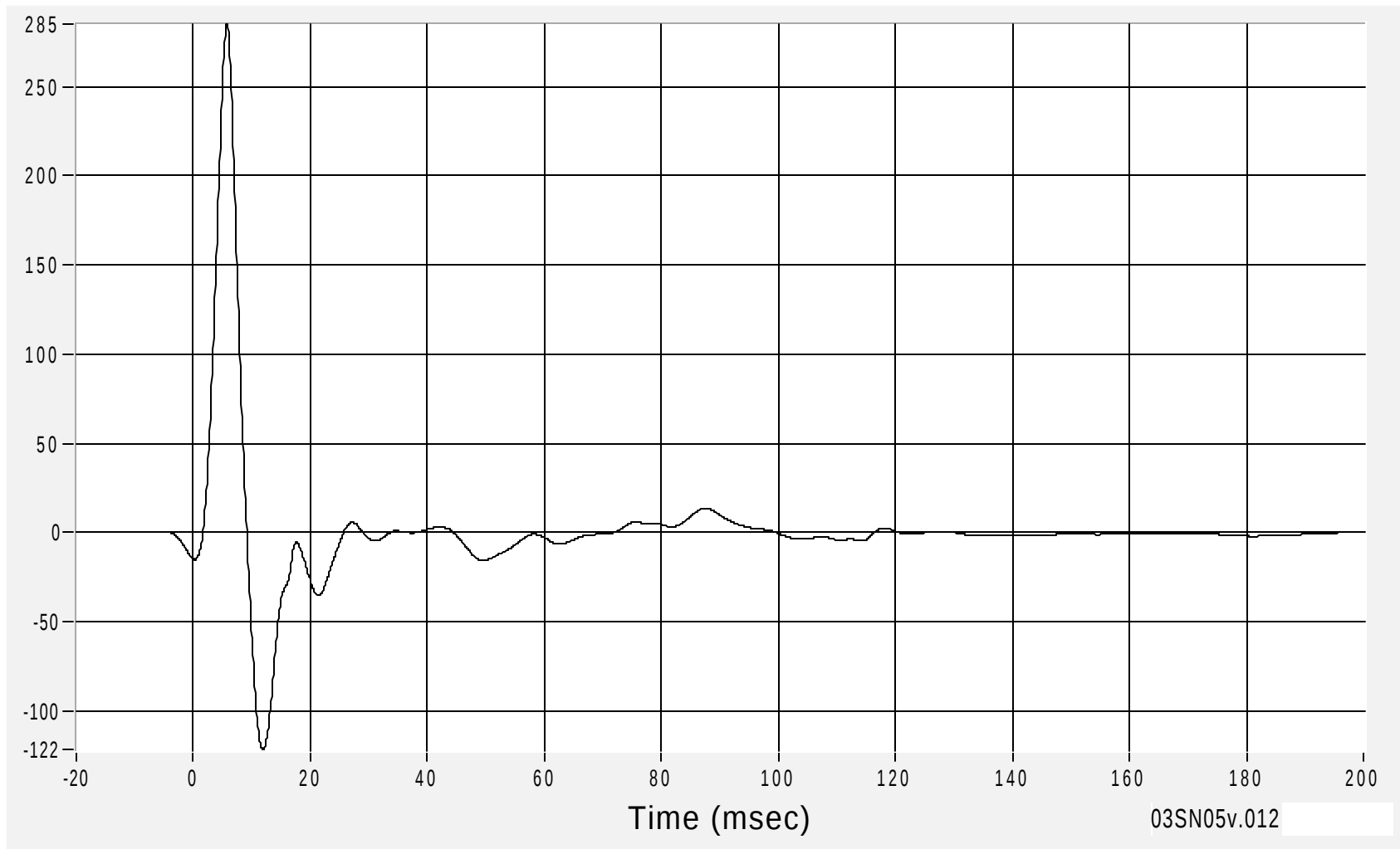
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Front Door on Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 285.2 G's at 5.8 msec
Min -121.8 G's at 11.9 msec

B-81



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5 February 2003

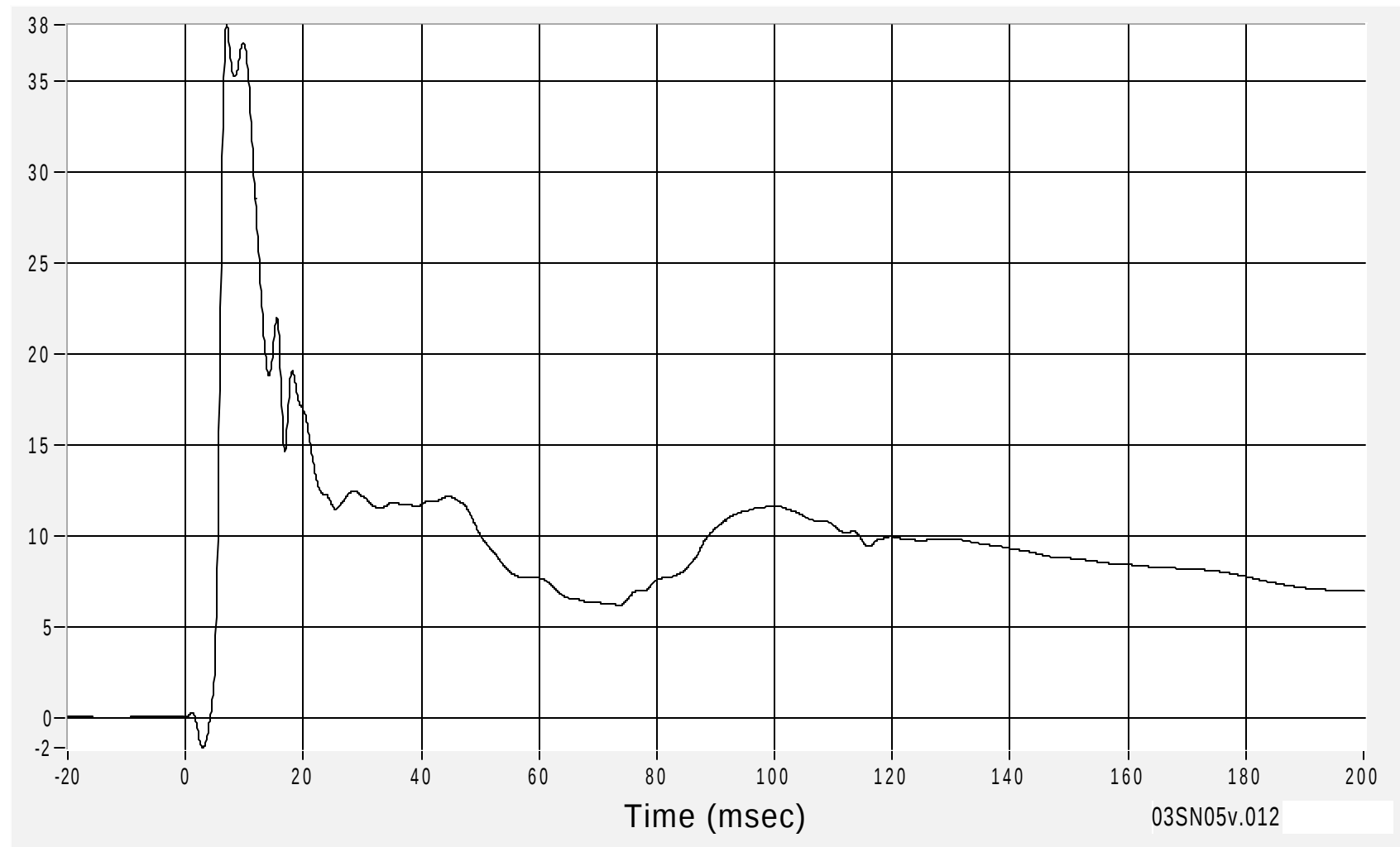
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Front Door on Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 38.1 km/h at 7.0 msec
Min -1.7 km/h at 2.9 msec

B-82



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5 February 2003

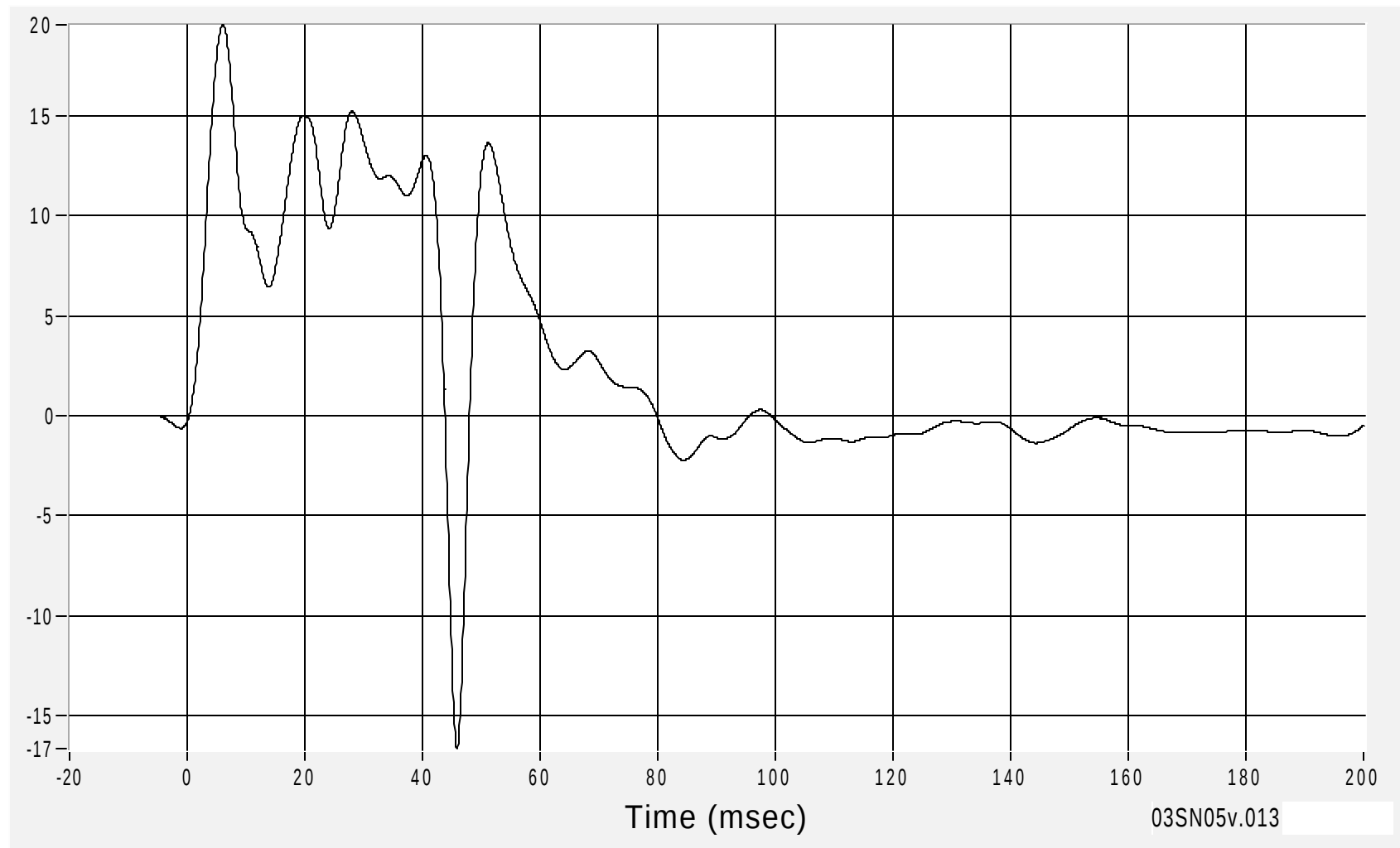
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Rear Occupant Compartment (Y) Acceleration

Acceleration (G's) CFC60

Max 19.5 G's at 6.1 msec
Min -16.7 G's at 45.9 msec

B-83



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5 February 2003

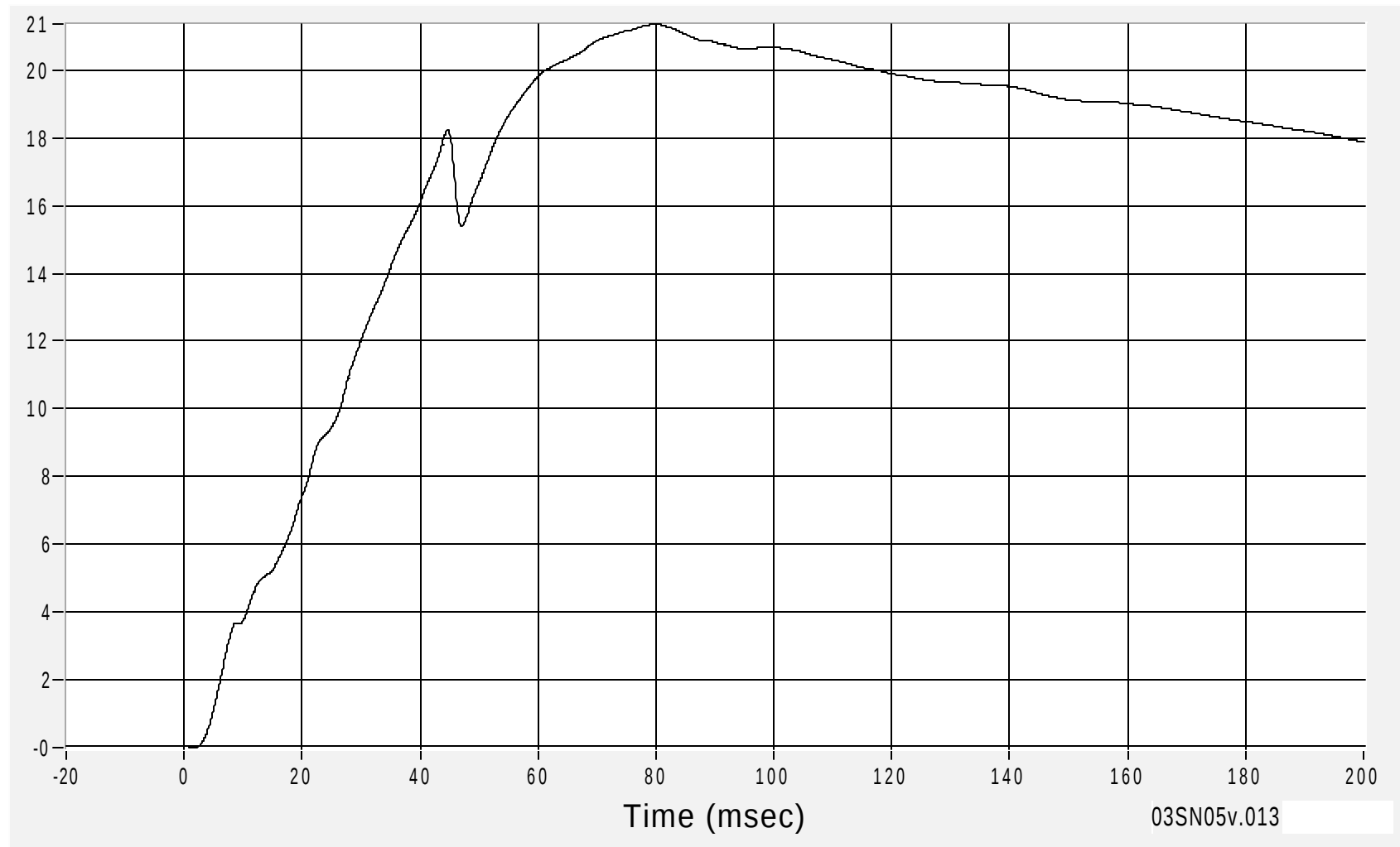
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Rear Occupant Compartment (Y) Velocity

Velocity (km/h) CFC180

Max 21.4 km/h at 80.0 msec
Min 0.0 km/h at 1.8 msec

B-84



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5 February 2003

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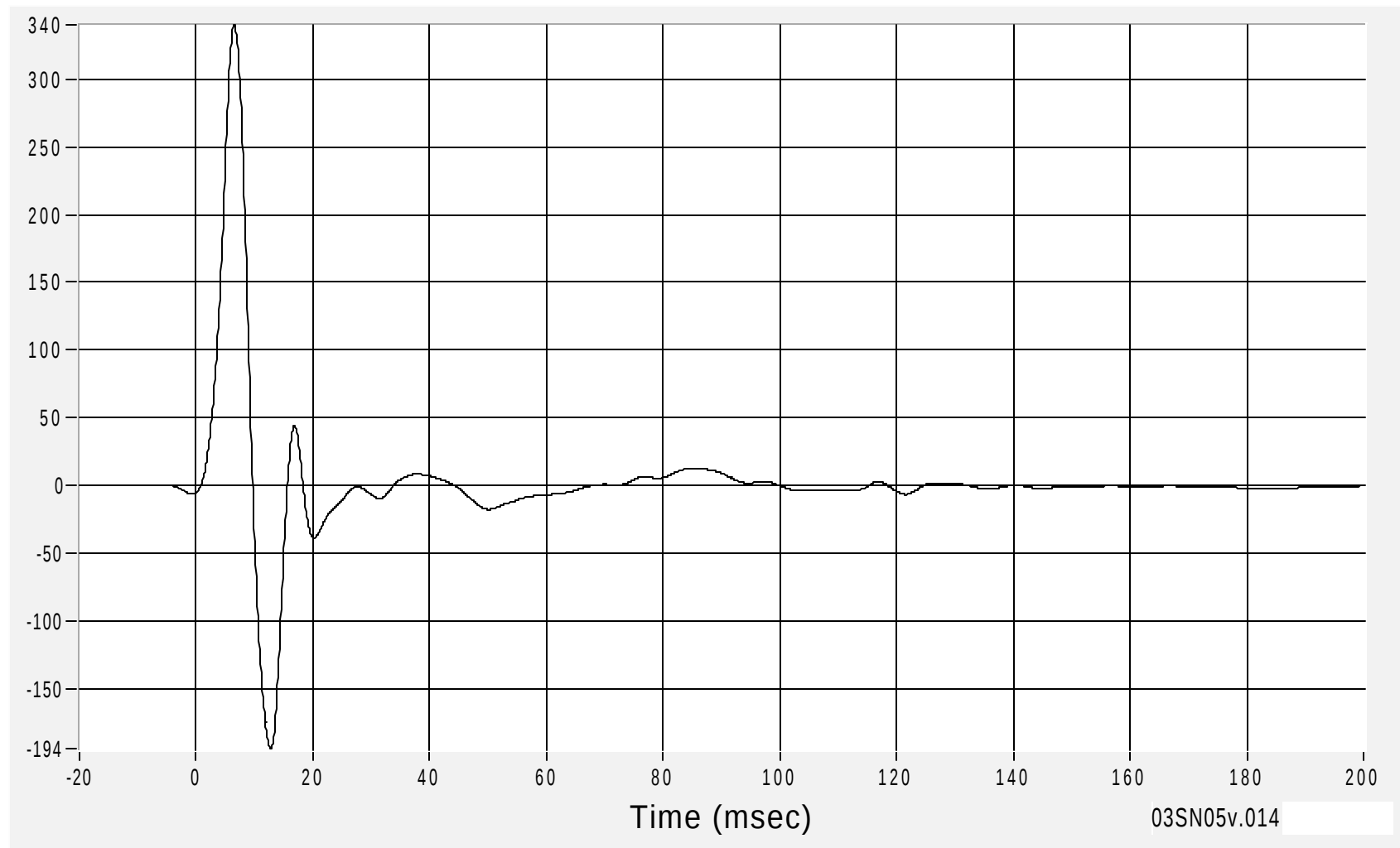
Mid-Rear of Left Front Door (Y) Acceleration

Acceleration (G's) CFC60

Max 340.2 G's at 6.5 msec

Min -194.4 G's at 12.7 msec

B-85



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5 February 2003

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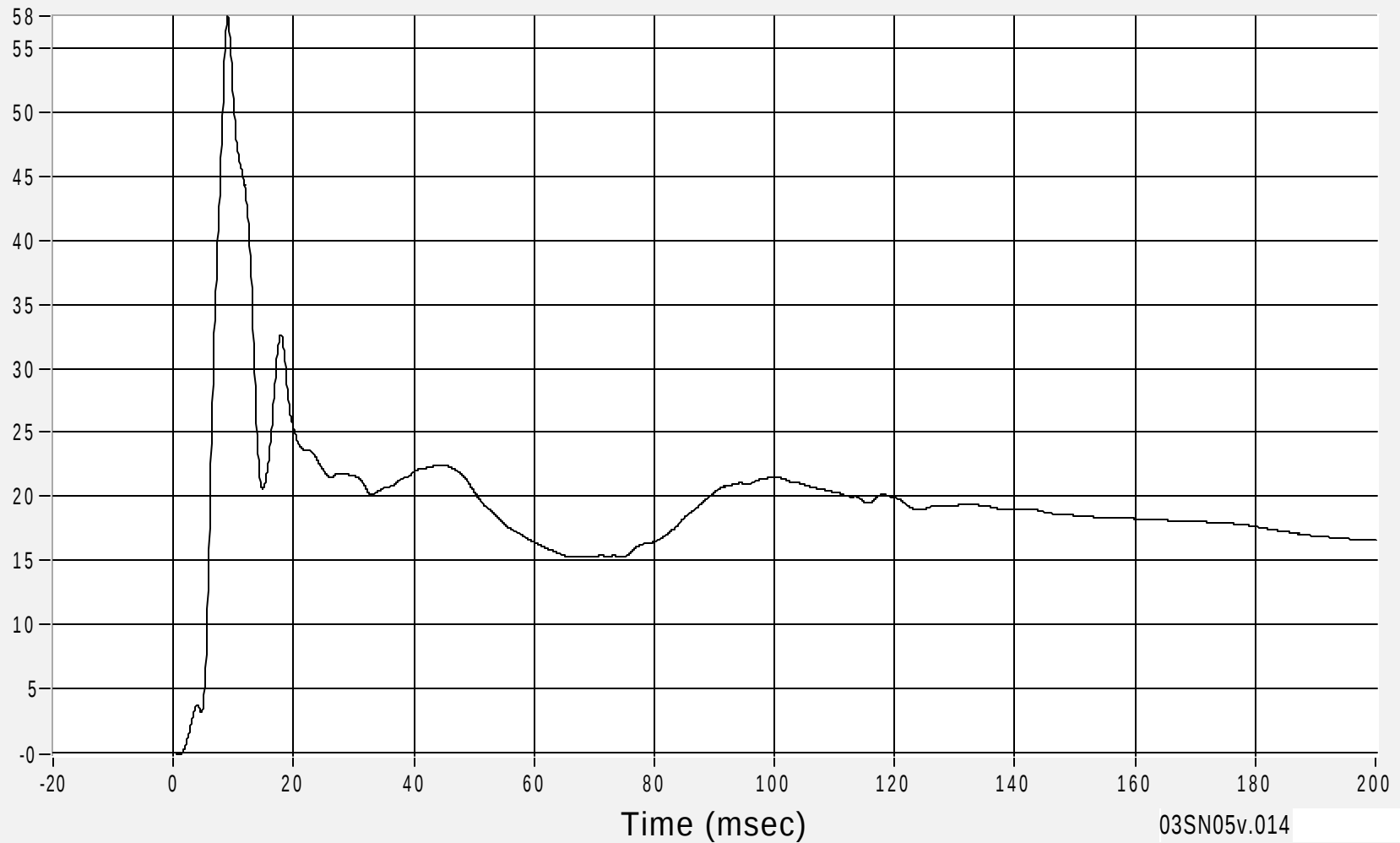
Mid-Rear of Left Front Door (Y) Velocity

Velocity (km/h) CFC180

Max 57.5 km/h at 9.0 msec

Min -0.1 km/h at 1.0 msec

B-86



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5 February 2003

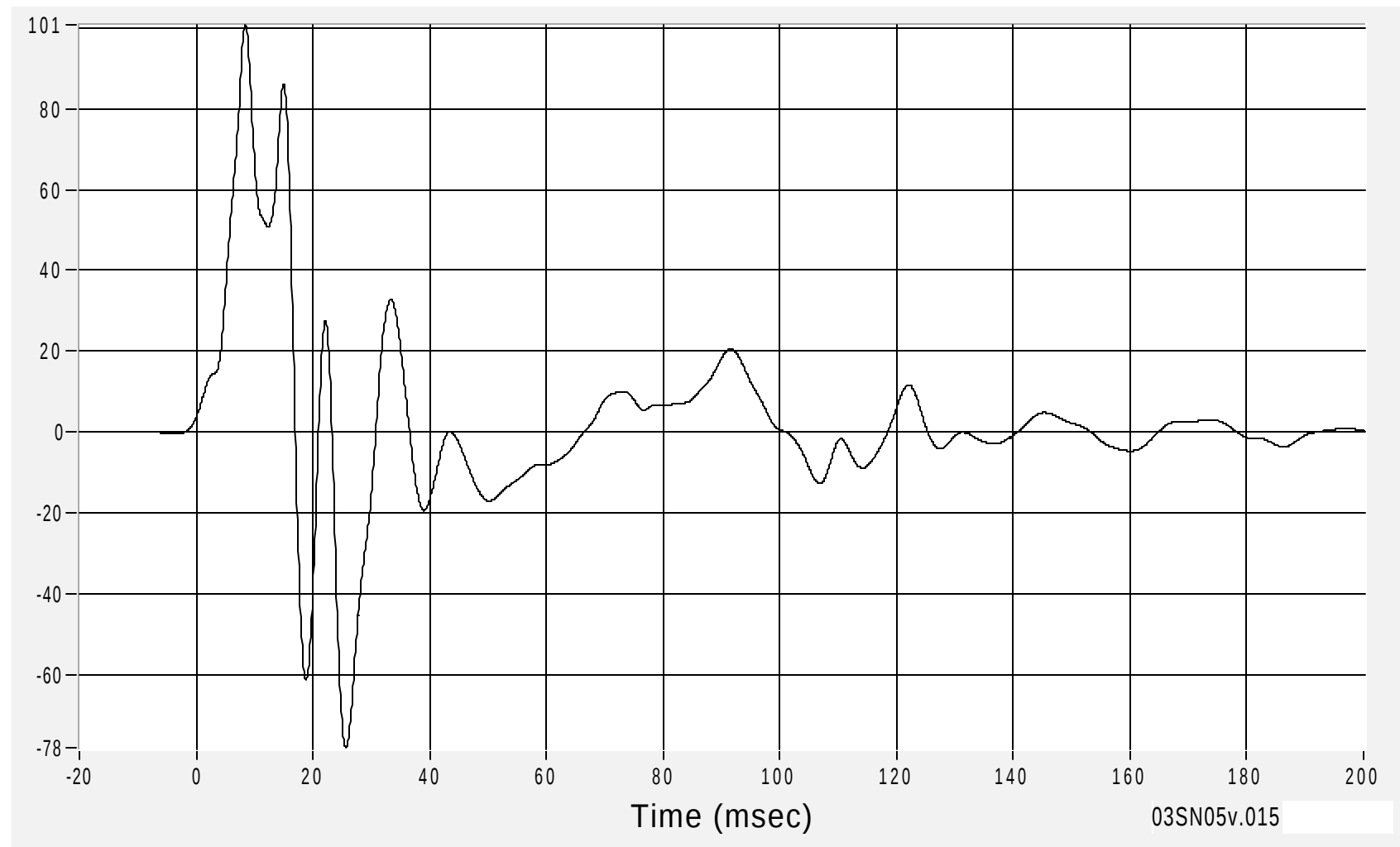
Medical College of Wisconsin
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Left Front Door Upper Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 100.7 G's at 8.5 msec
Min -78.1 G's at 25.7 msec

B-87



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5 February 2003

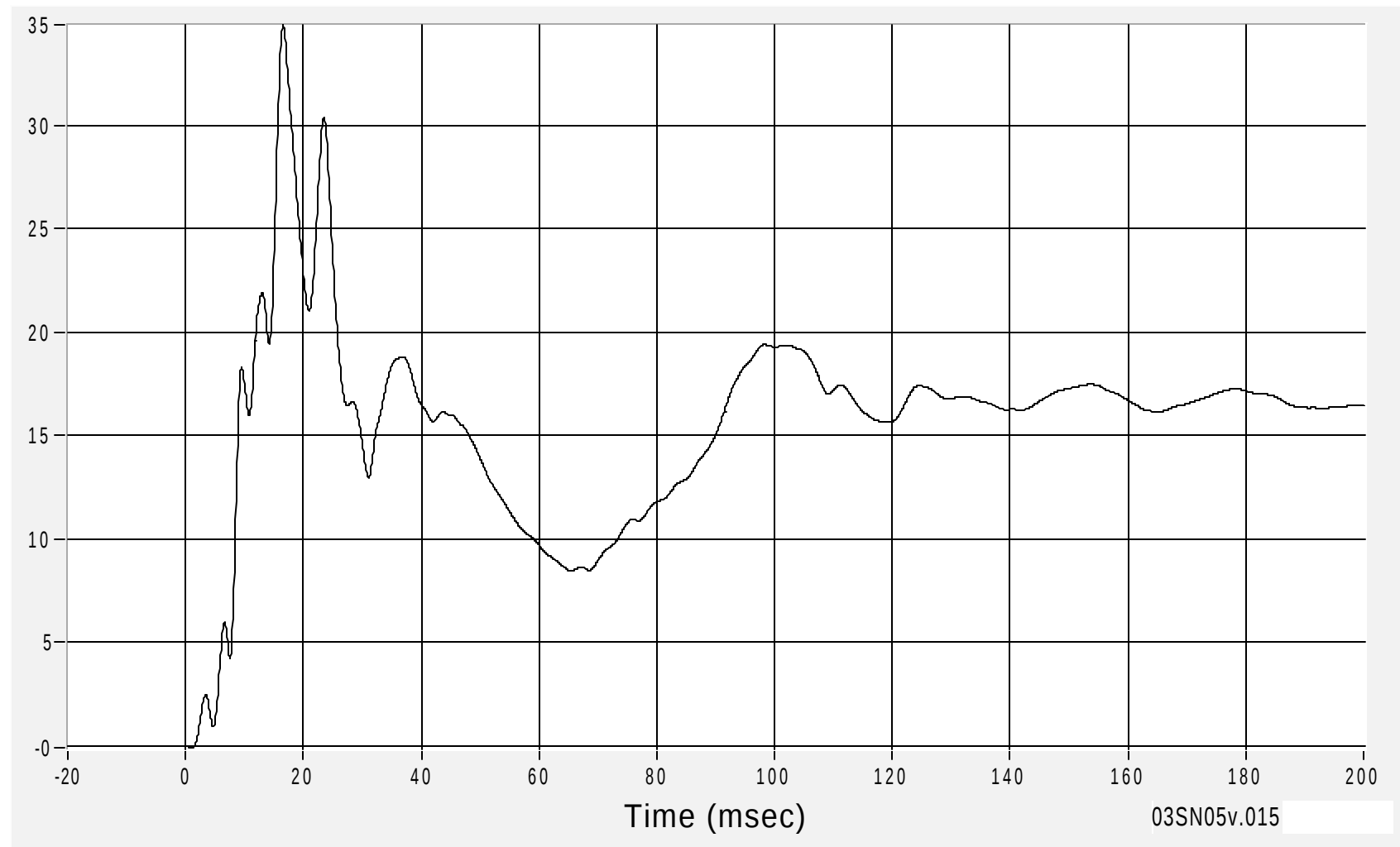
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Front Door Upper Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 34.9 km/h at 16.6 msec
Min 0.0 km/h at 1.0 msec

B-88



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5 February 2003

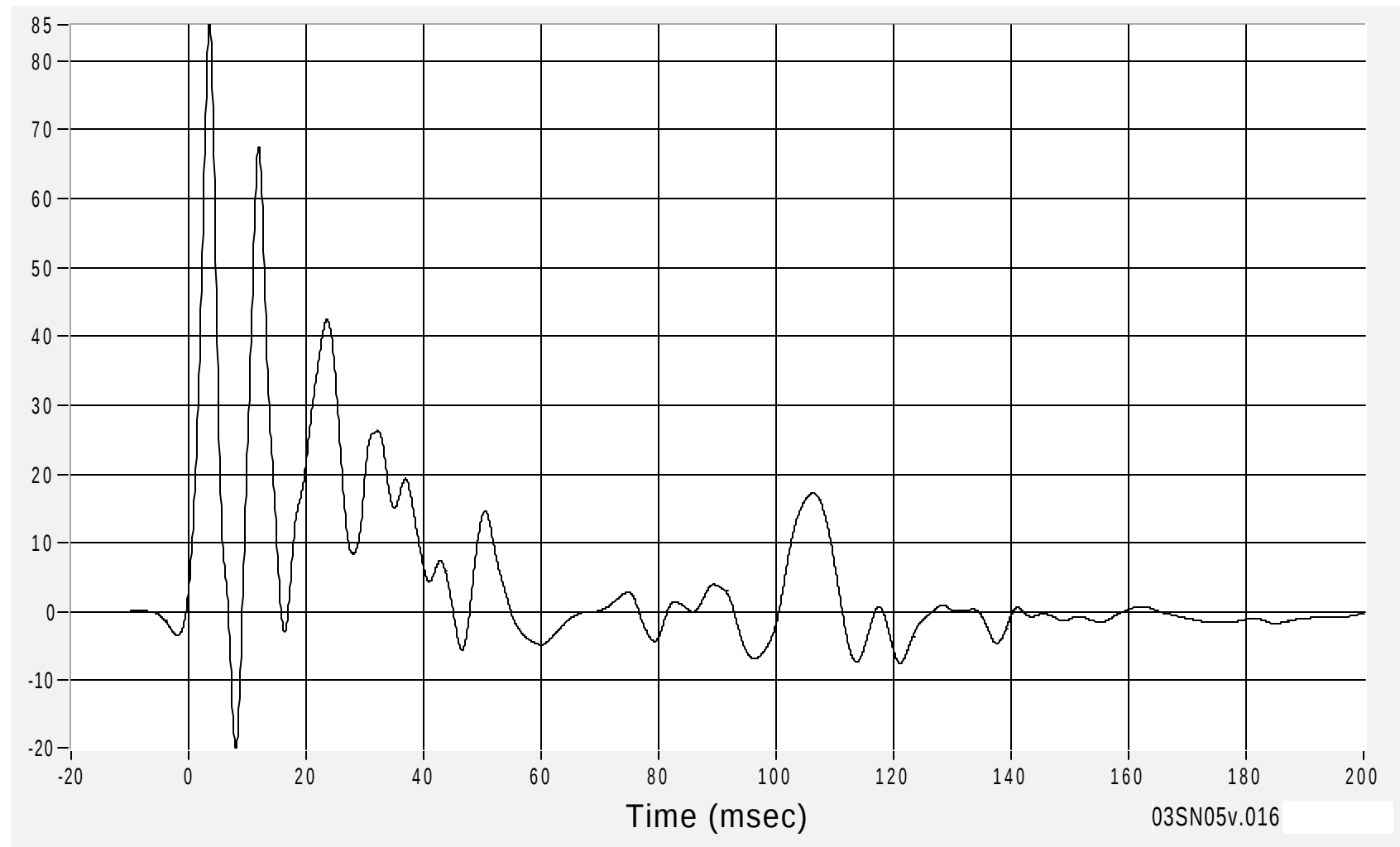
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Mid-Rear of Left Rear Door (Y) Acceleration

Acceleration (G's) CFC60

Max 85.2 G's at 3.6 msec
Min -19.7 G's at 8.0 msec

B-89



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5 February 2003

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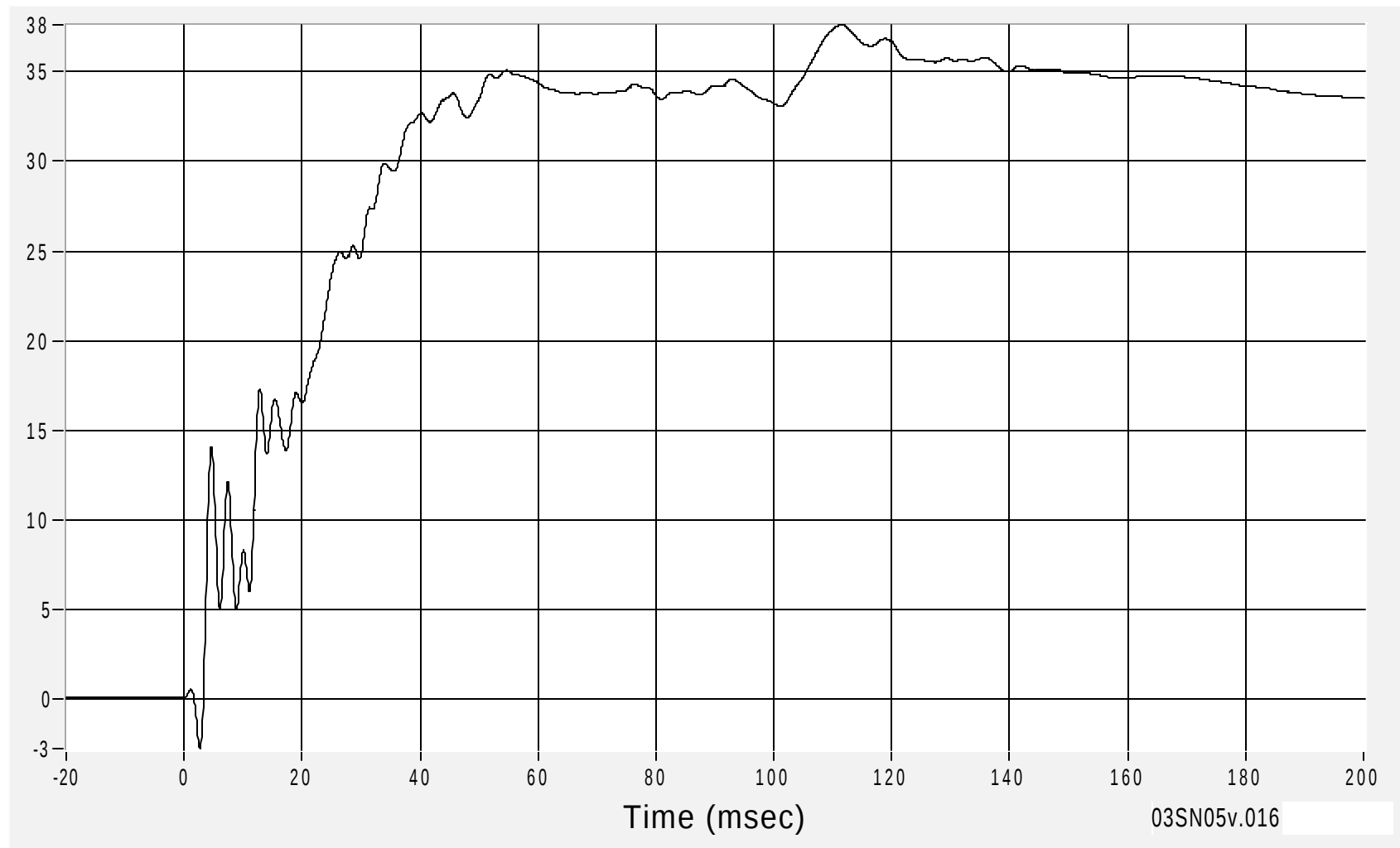
Mid-Rear of Left Rear Door (Y) Velocity

Velocity (km/h) CFC180

Max 37.6 km/h at 111.5 msec

Min -2.8 km/h at 2.7 msec

B-90



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5 February 2003

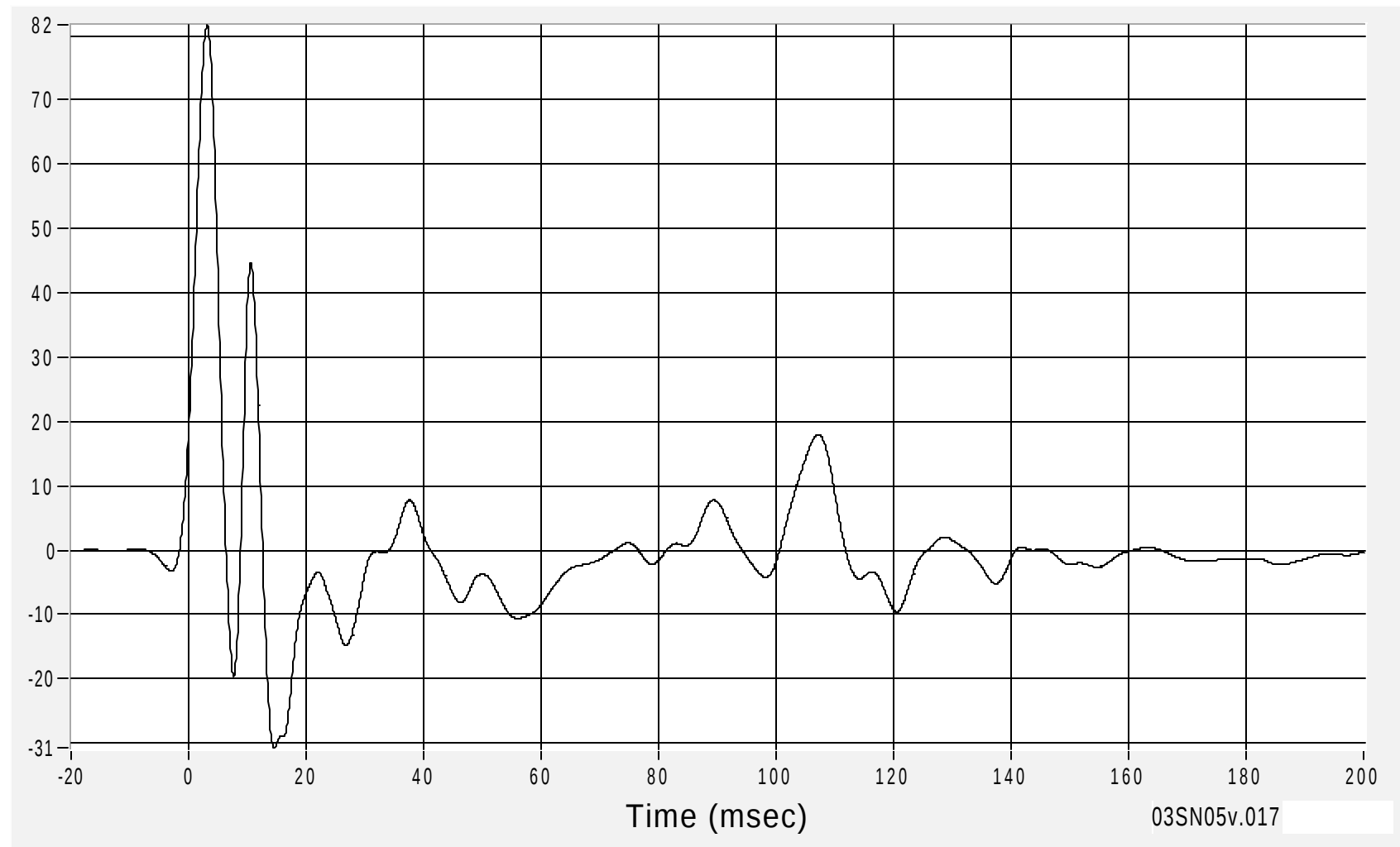
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Rear Door Upper Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 81.7 G's at 3.1 msec
Min -30.7 G's at 14.6 msec

B-91



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5 February 2003

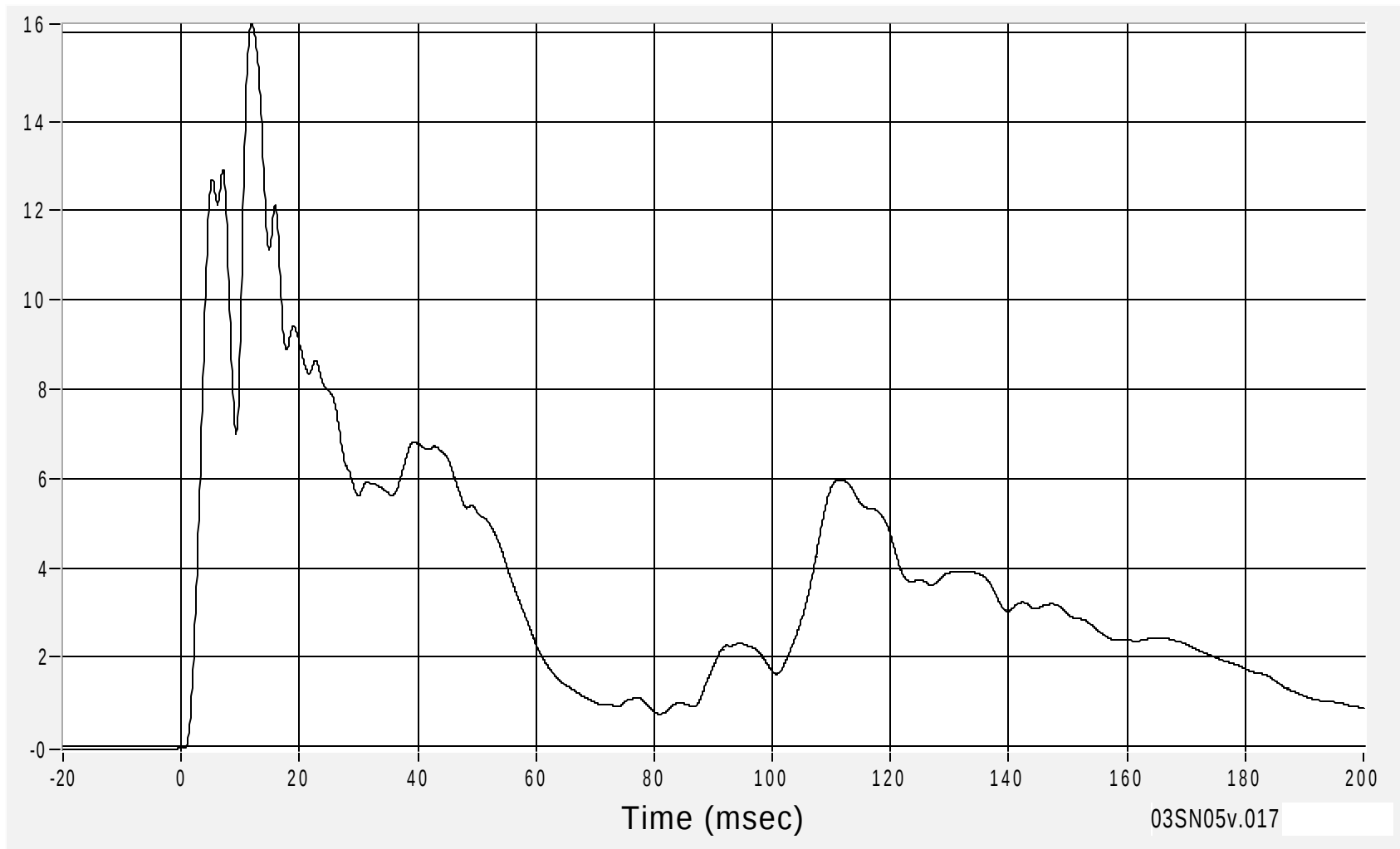
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Rear Door Upper Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 16.2 km/h at 11.9 msec
Min 0.0 km/h at 0.6 msec

B-92



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5 February 2003

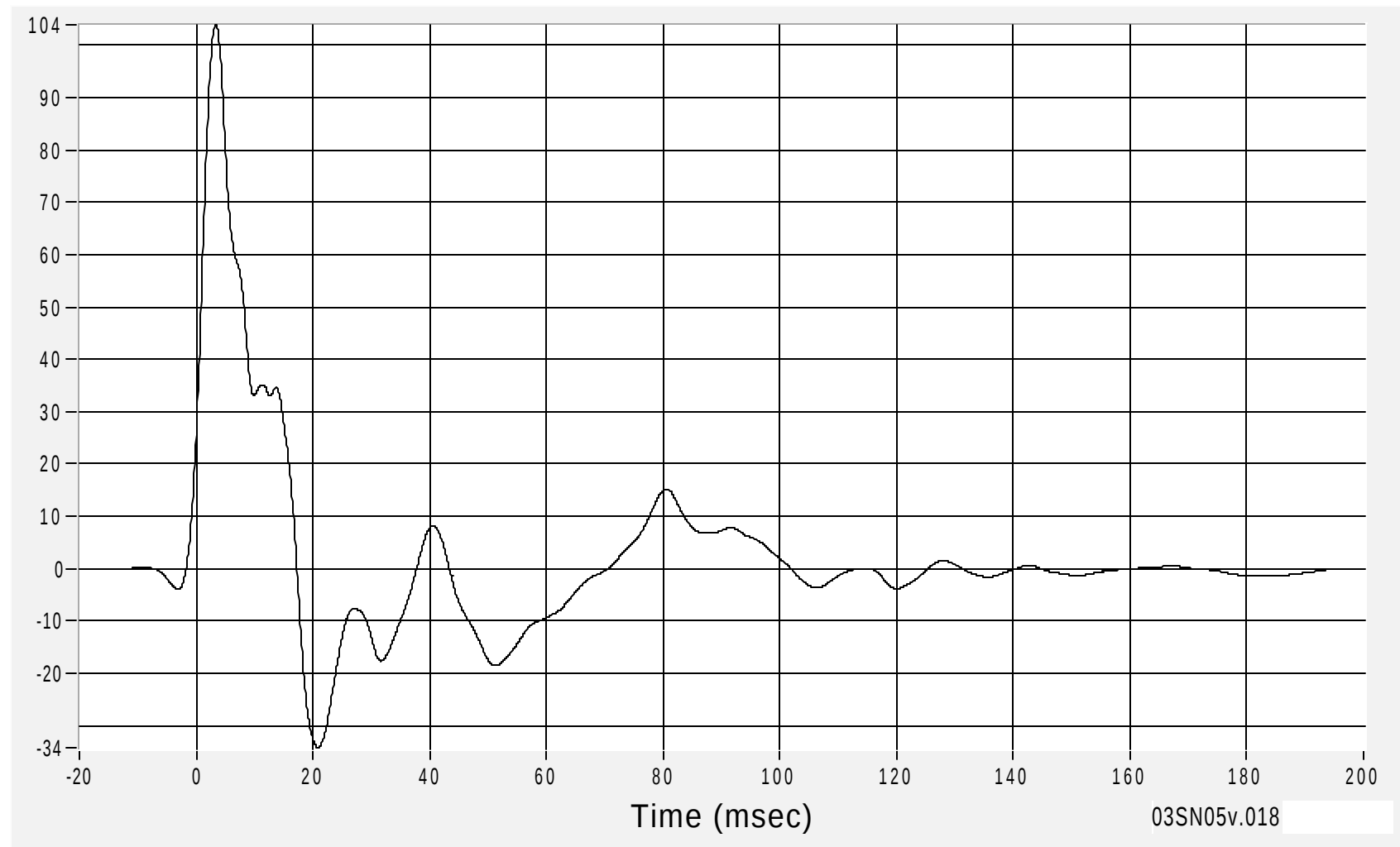
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Lower B-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 103.9 G's at 3.4 msec
Min -34.3 G's at 20.9 msec

B-93



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5 February 2003

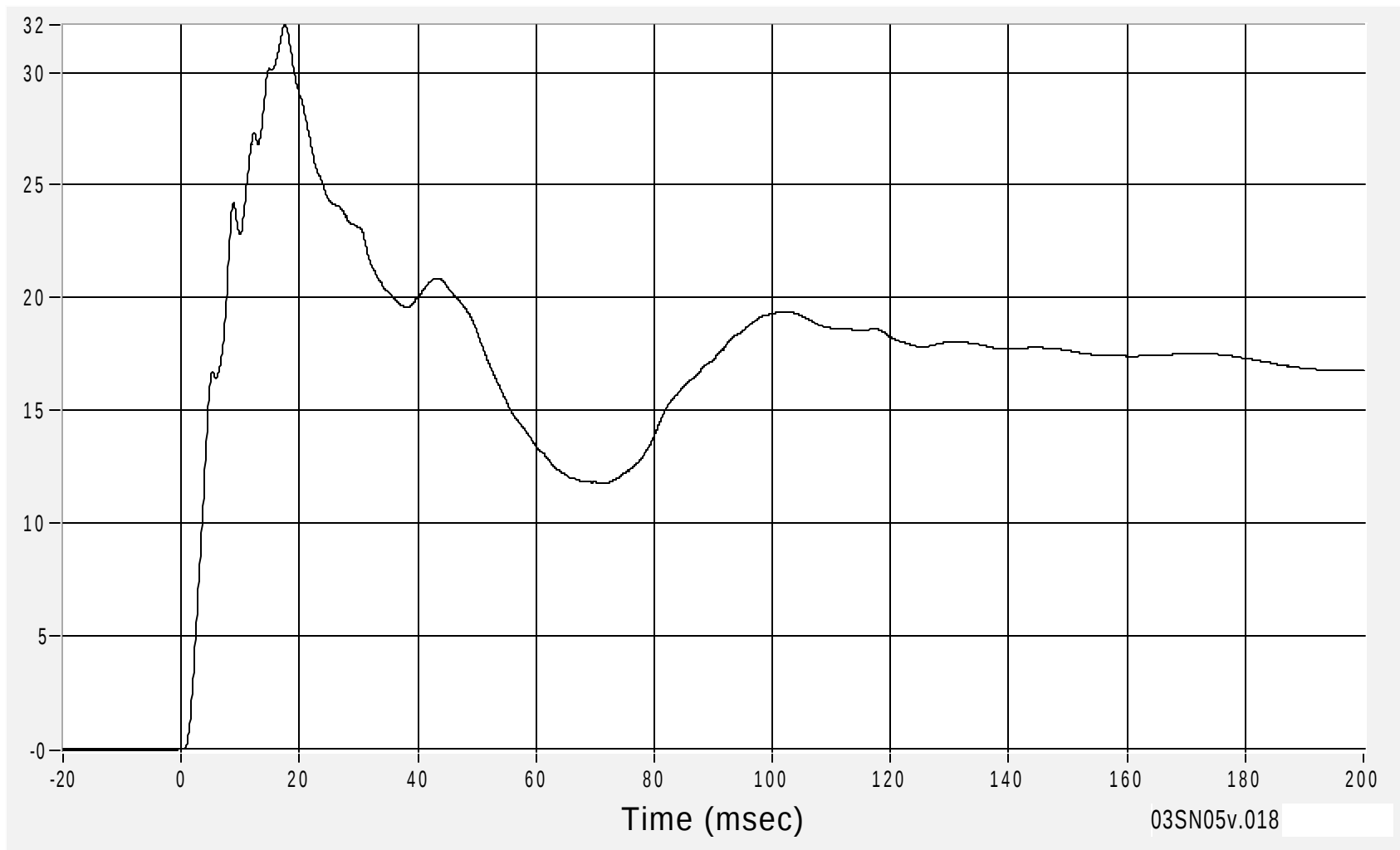
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Lower B-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 32.1 km/h at 17.5 msec
Min 0.0 km/h at 0.4 msec

B-94



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5 February 2003

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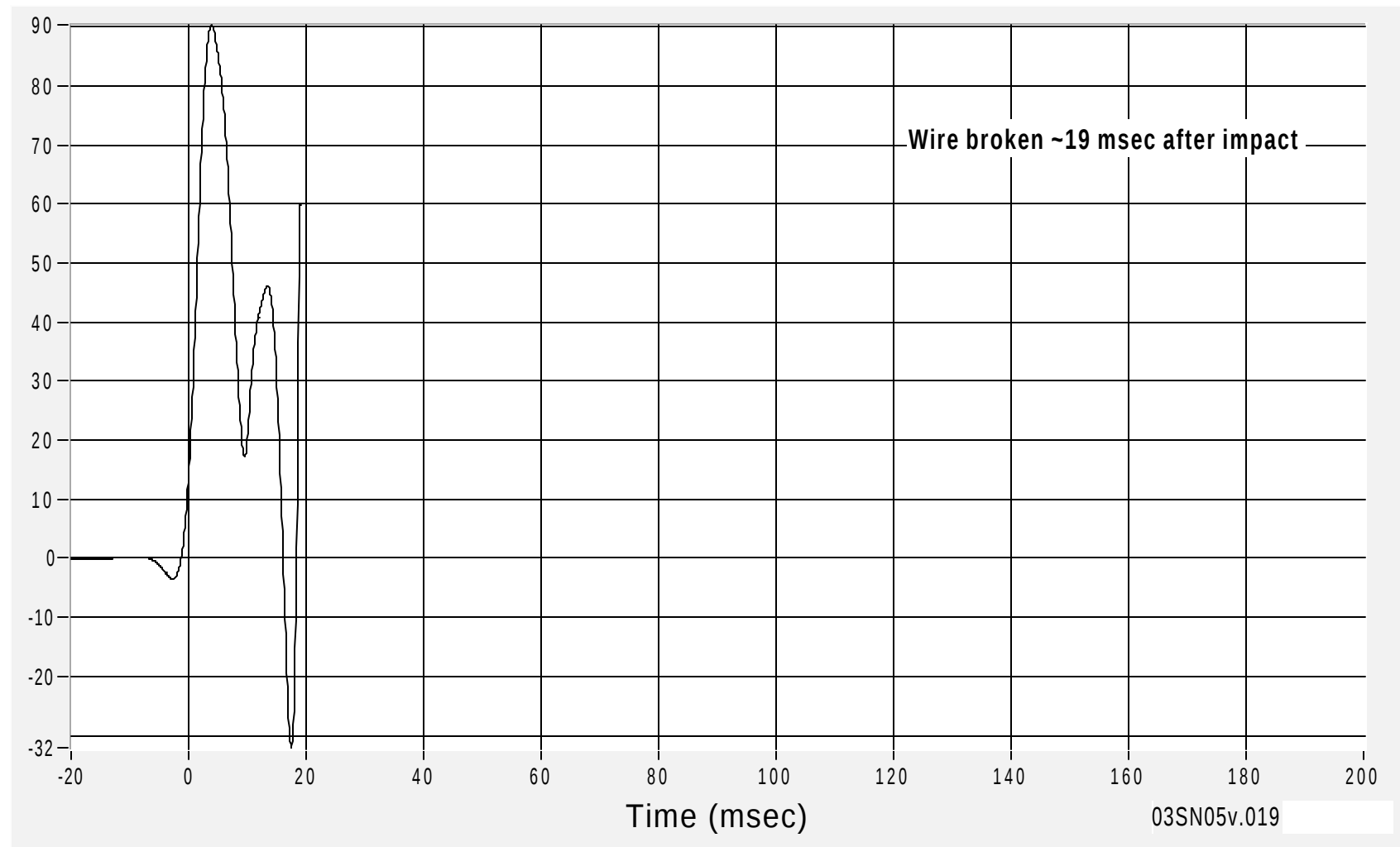
Left Middle B-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 90.4 G's at 3.9 msec

Min -32.1 G's at 17.5 msec

B-95



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5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

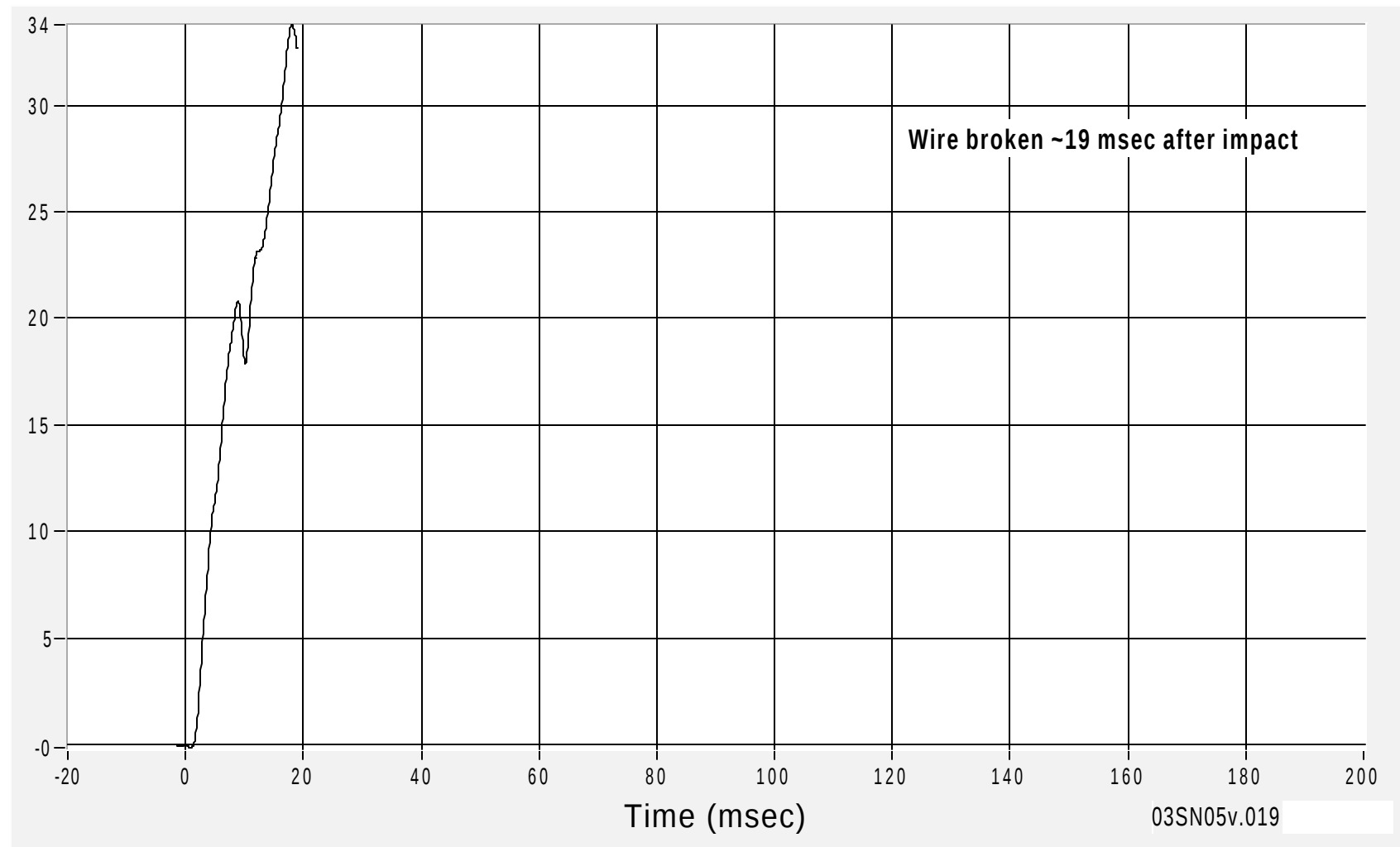
Left Middle B-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 33.8 km/h at 18.0 msec

Min -0.1 km/h at 1.0 msec

B-96



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5 February 2003

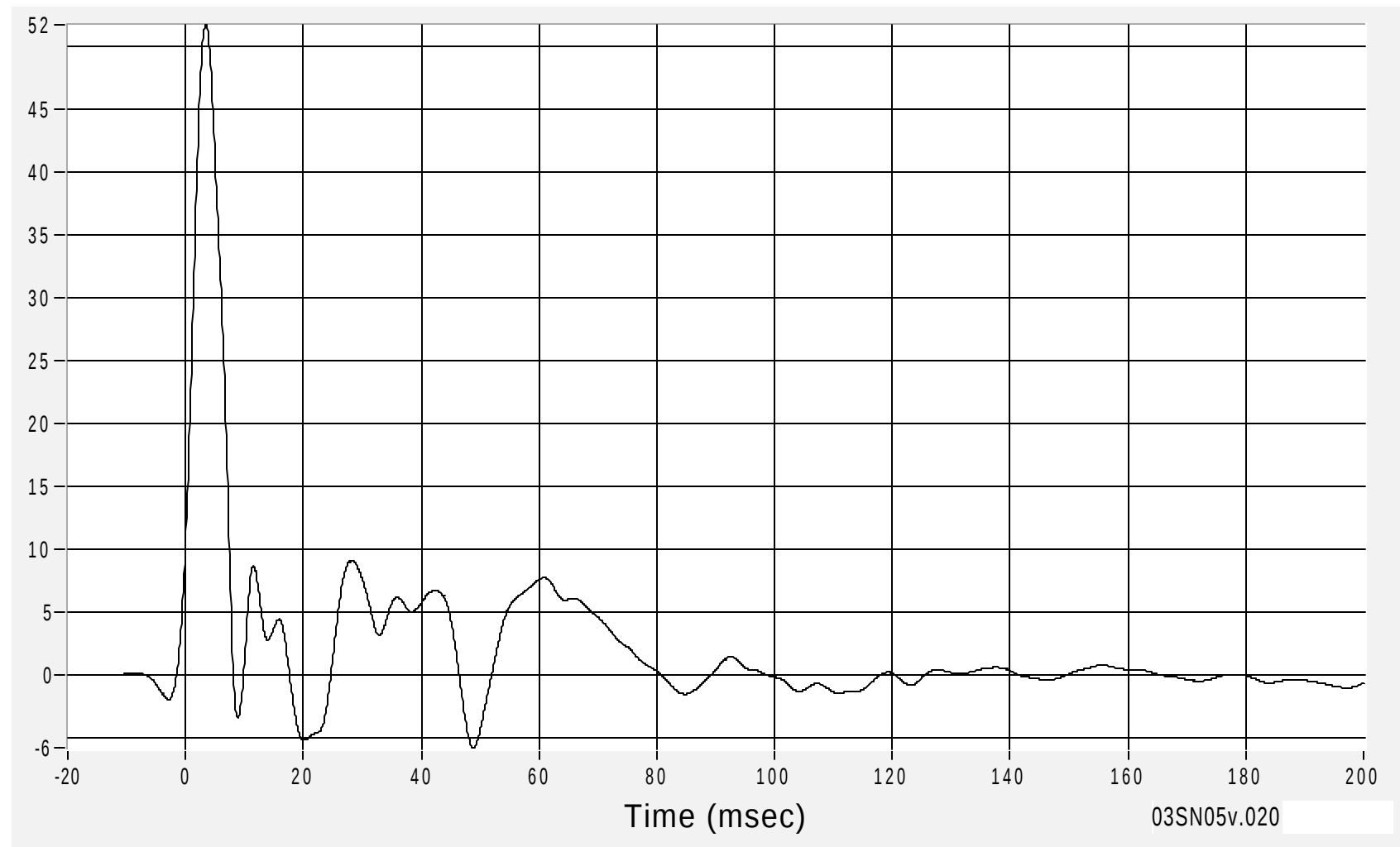
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Lower A-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 51.7 G's at 3.4 msec
Min -5.8 G's at 48.8 msec

B-97



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5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

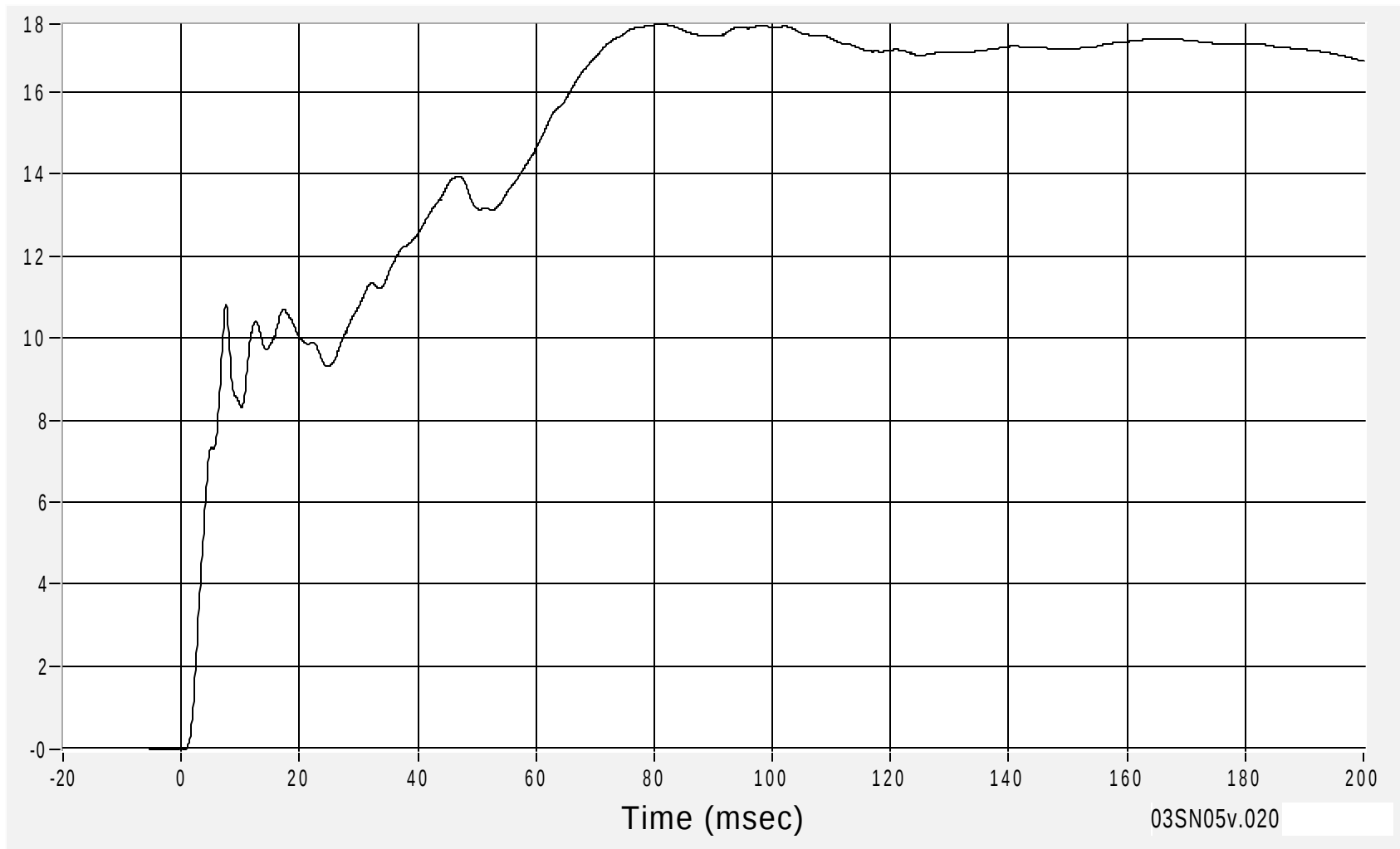
Left Lower A-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 17.6 km/h at 81.0 msec

Min 0.0 km/h at 0.6 msec

B-98



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5 February 2003

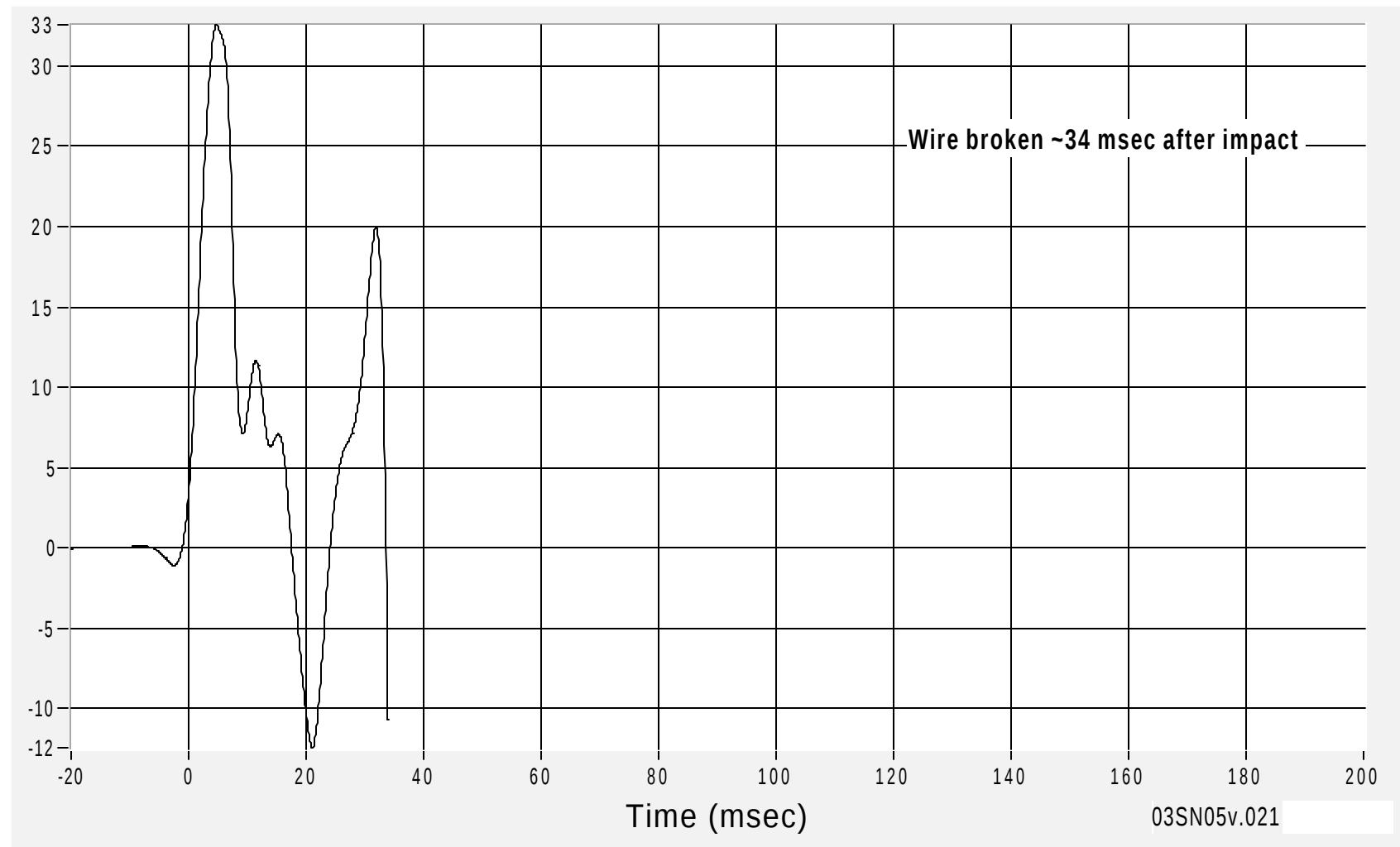
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Middle A-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 32.6 G's at 4.7 msec
Min -12.5 G's at 21.0 msec

B-99



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5 February 2003

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Vehicle Crashworthiness Lab

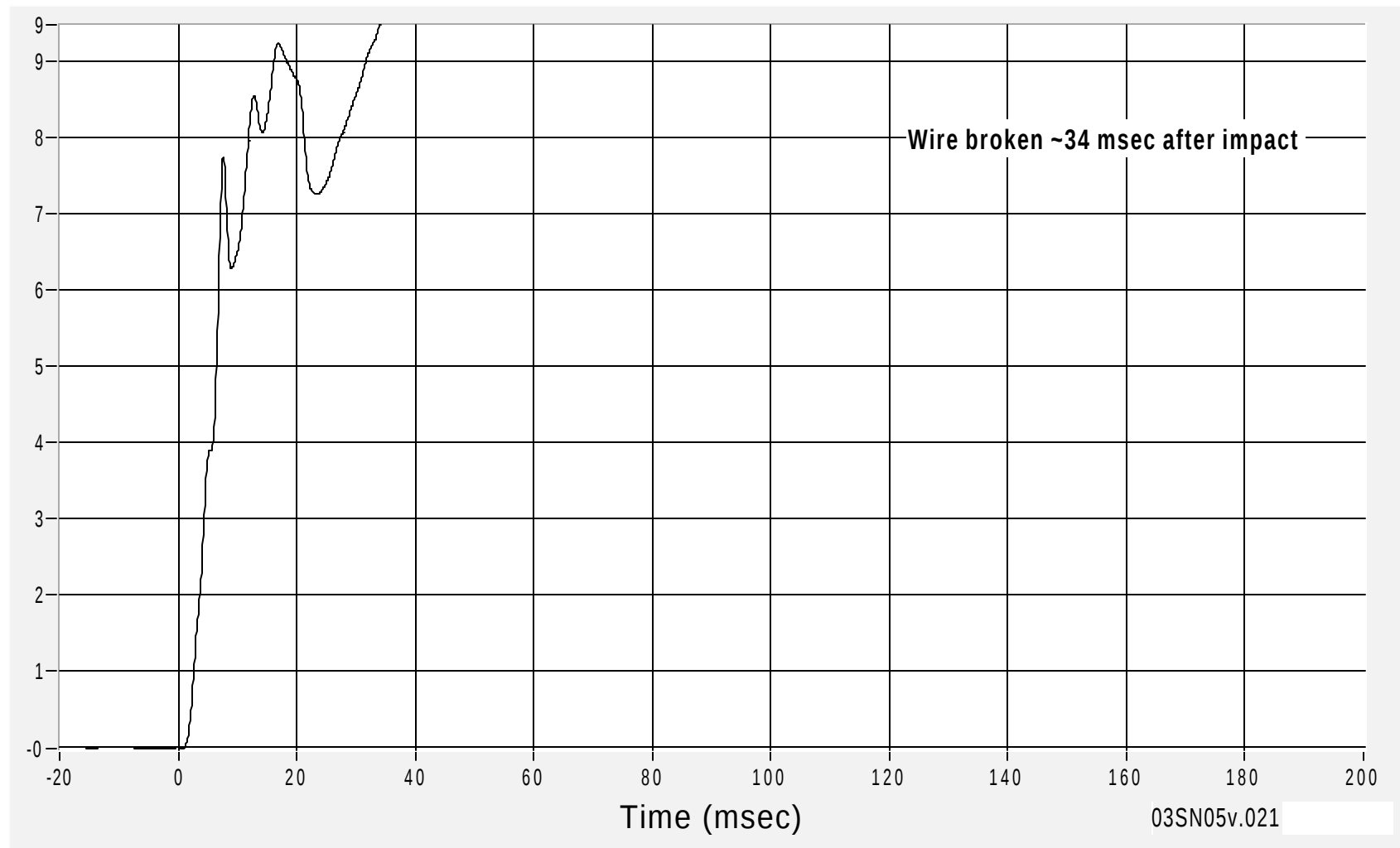
Left Middle A-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 9.5 km/h at 33.9 msec

Min 0.0 km/h at 0.7 msec

B-100



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Medical College of Wisconsin
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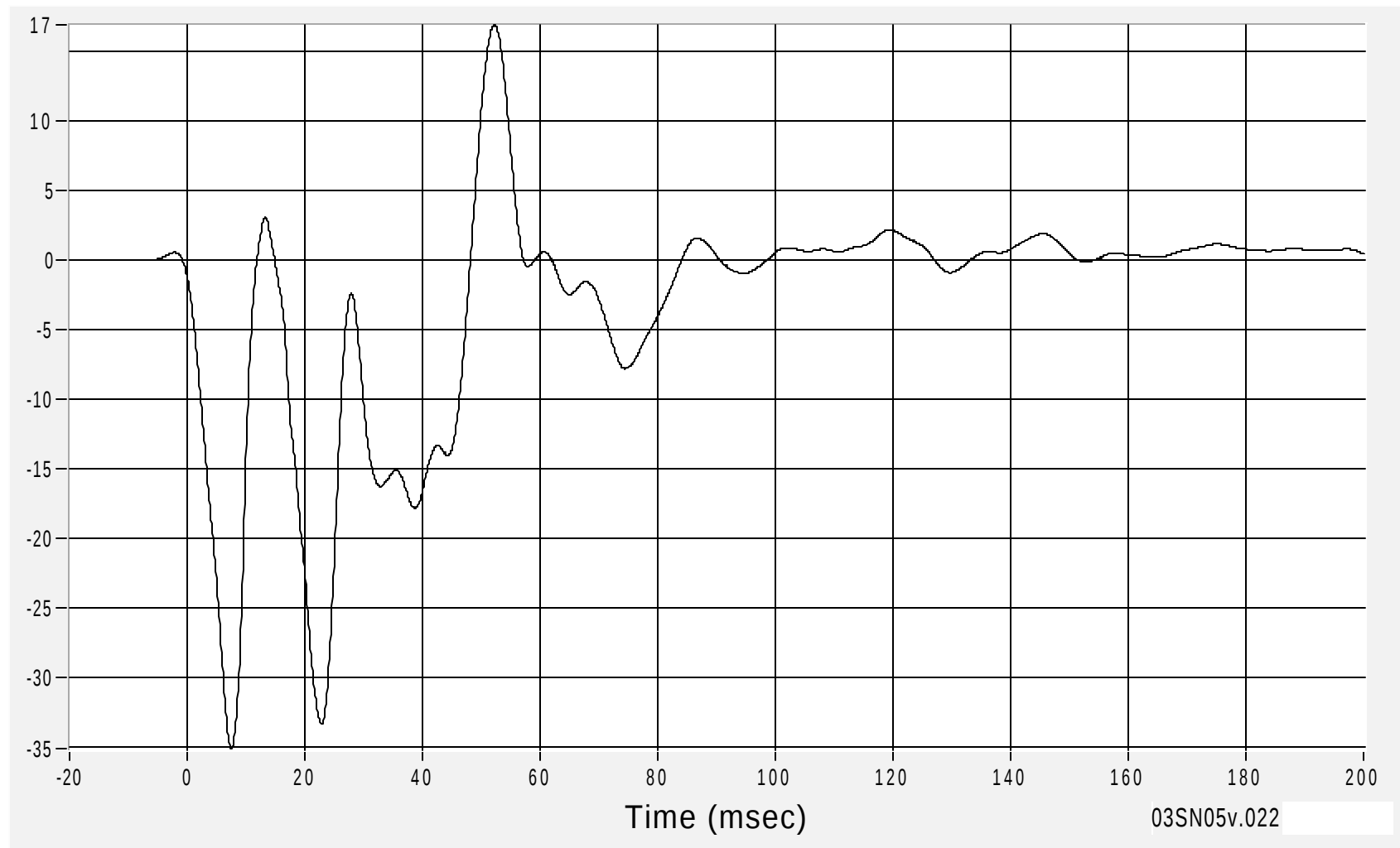
Front Seat Track (Y) Acceleration

Acceleration (G's) CFC60

Max 16.9 G's at 52.2 msec

Min -35.2 G's at 7.5 msec

B-101



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Vehicle Crashworthiness Lab

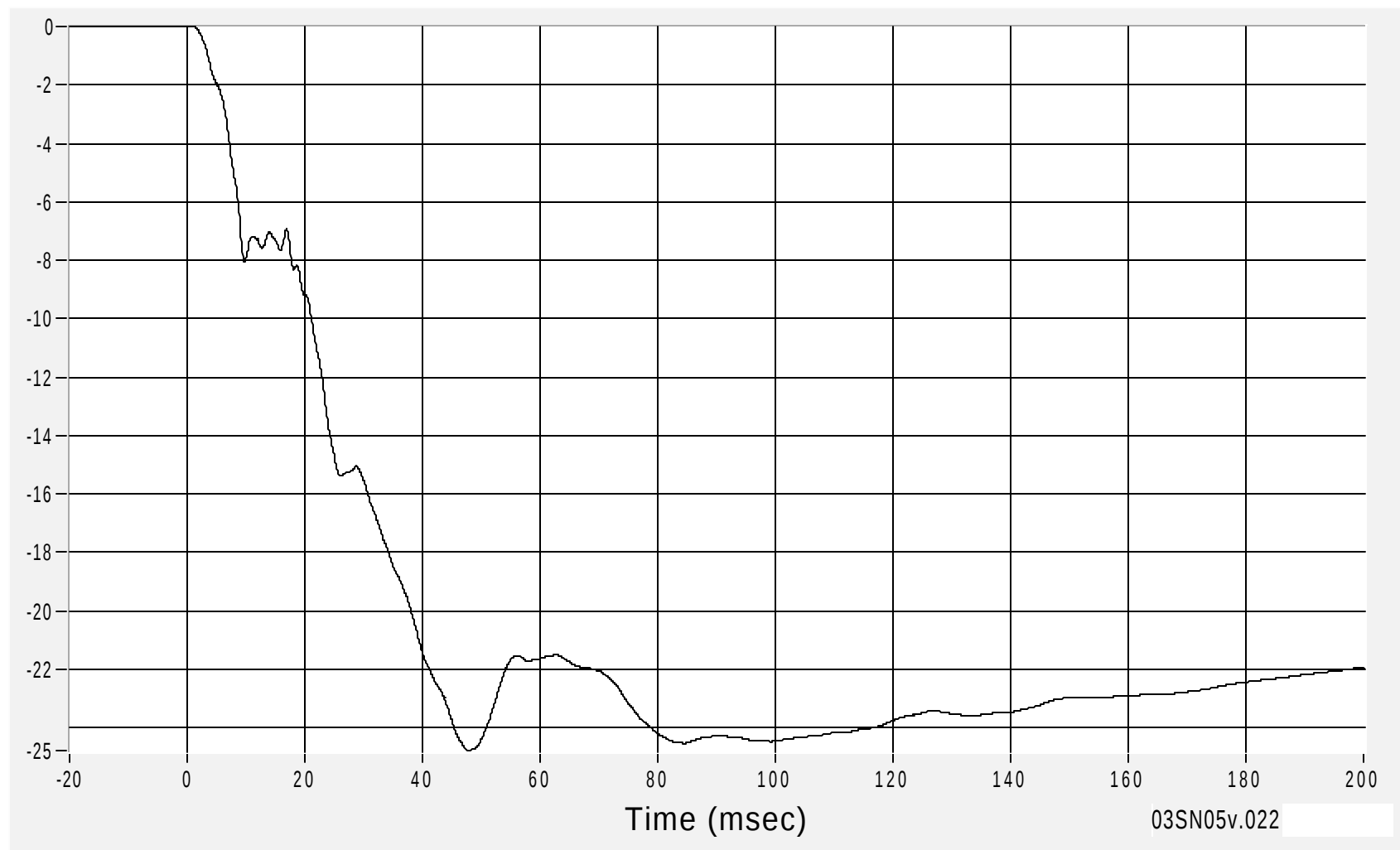
Front Seat Track (Y) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 0.7 msec

Min -24.8 km/h at 47.8 msec

B-102



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Medical College of Wisconsin
Vehicle Crashworthiness Lab

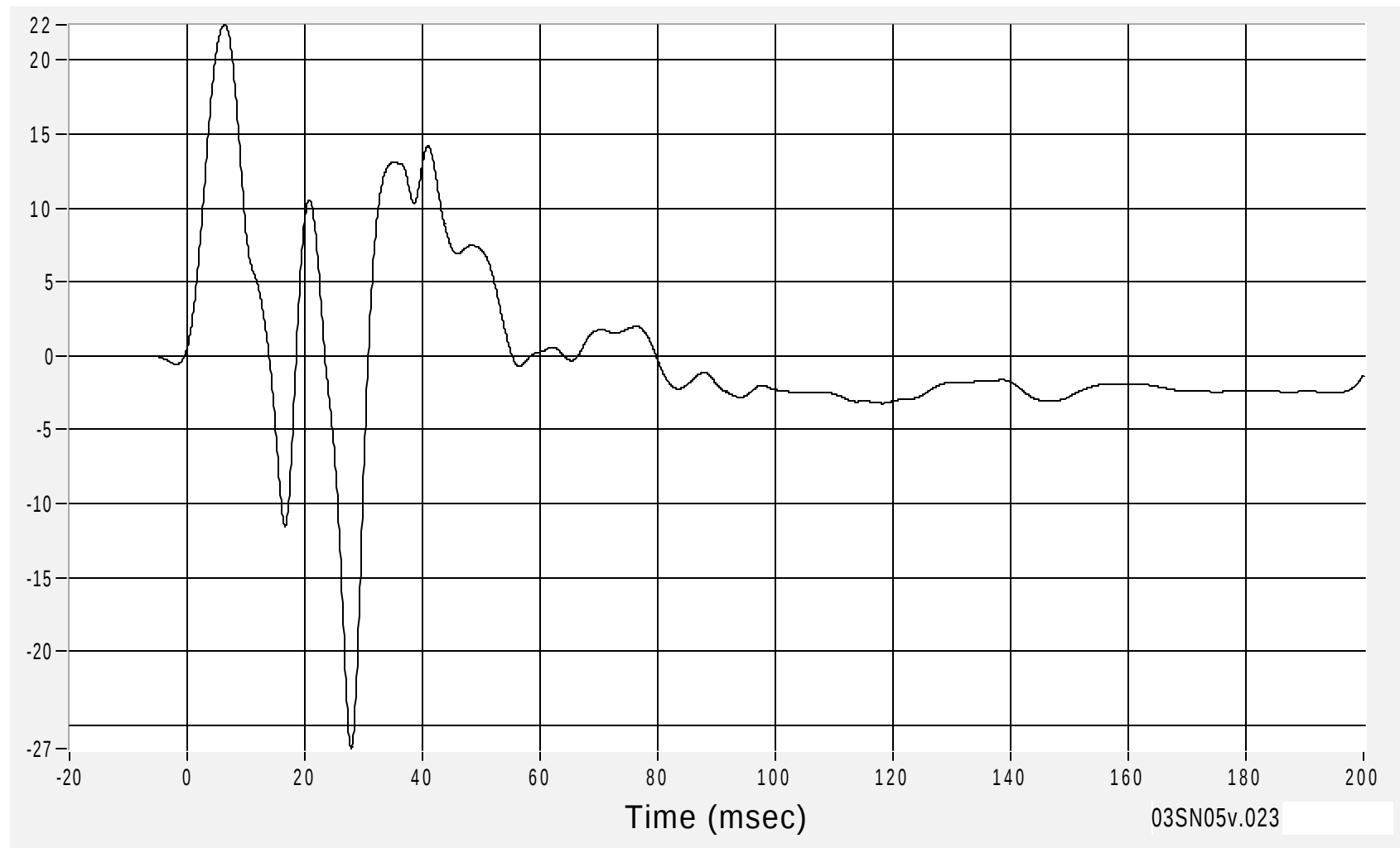
Rear Seat Track (Y) Acceleration

Acceleration (G's) CFC60

Max 22.4 G's at 6.3 msec

Min -26.6 G's at 27.8 msec

B-103



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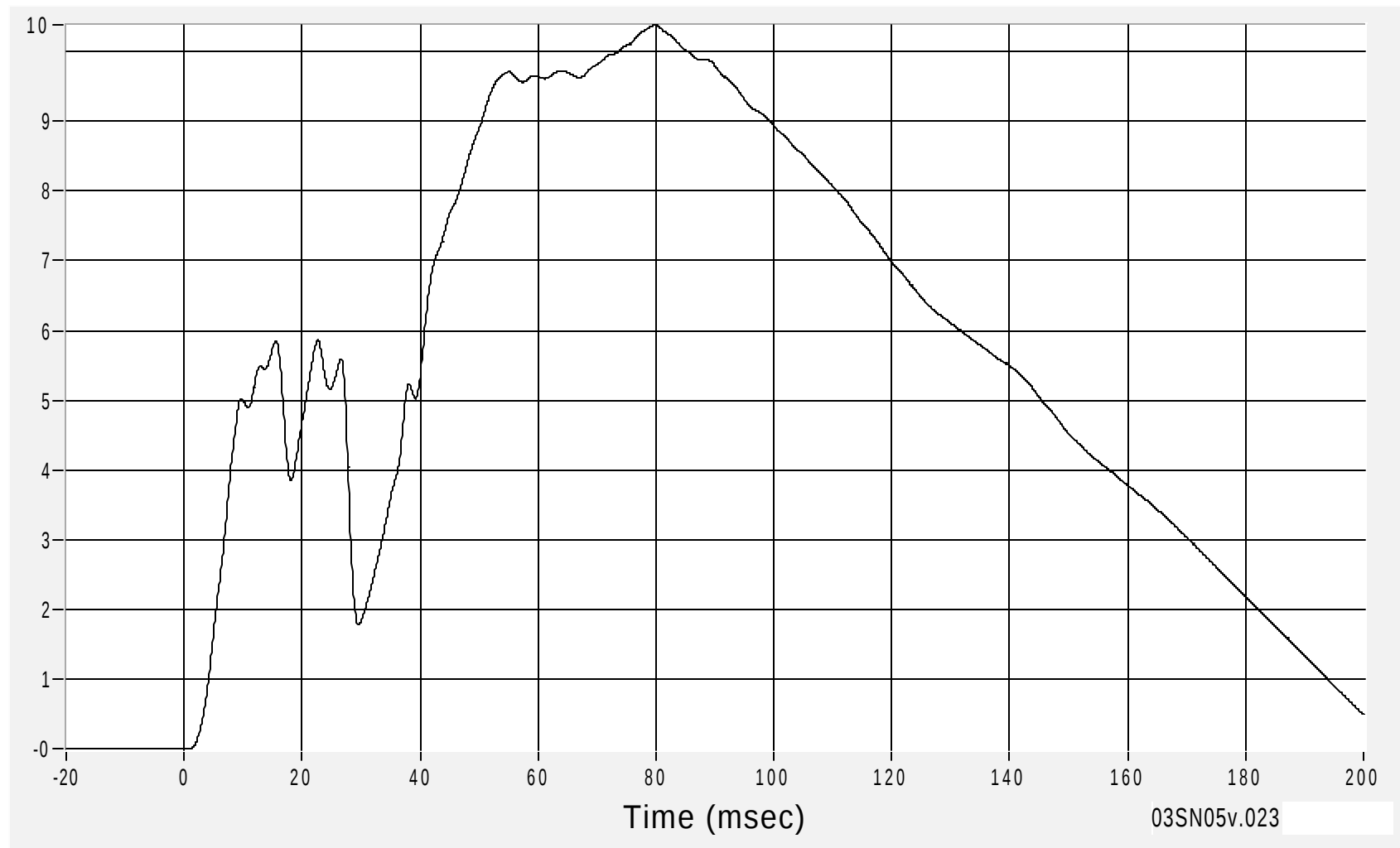
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Seat Track (Y) Velocity

Velocity (km/h) CFC180

Max 10.4 km/h at 79.8 msec
Min 0.0 km/h at 0.9 msec

B-104



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5 February 2003

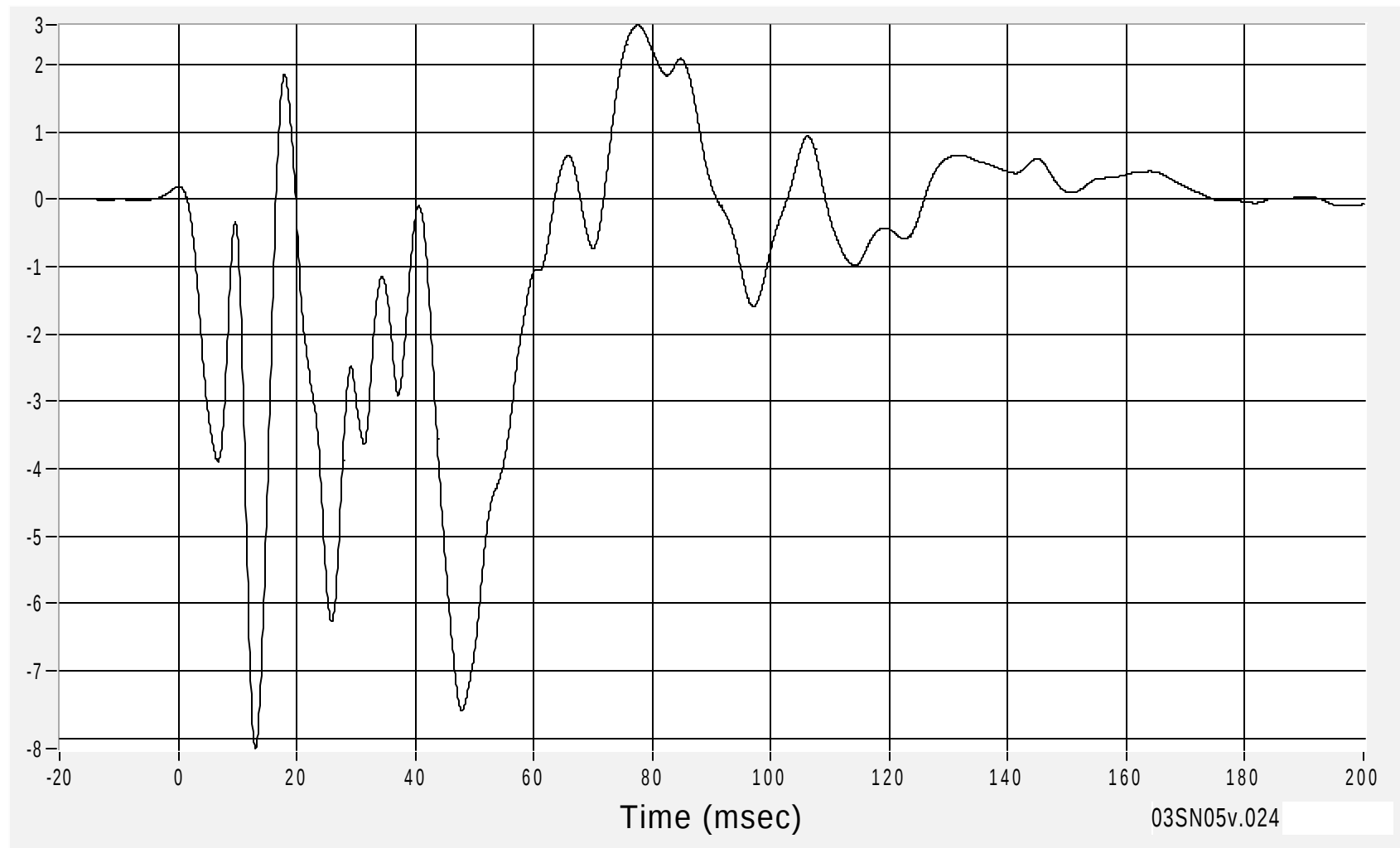
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (X) Acceleration

Acceleration (G's) CFC60

Max 2.6 G's at 77.6 msec
Min -8.2 G's at 13.0 msec

B-105



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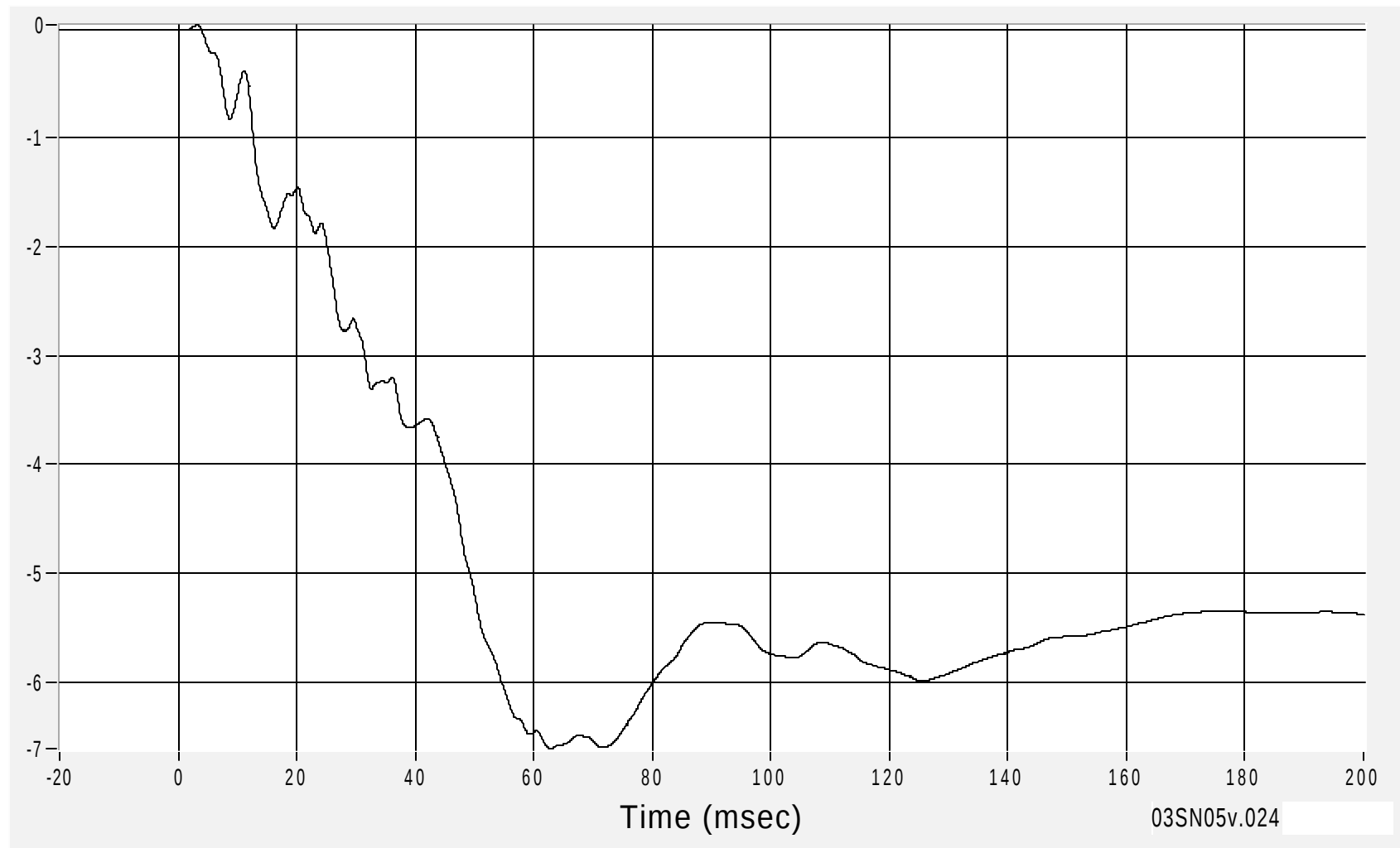
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 3.3 msec
Min -6.6 km/h at 63.0 msec

B-106



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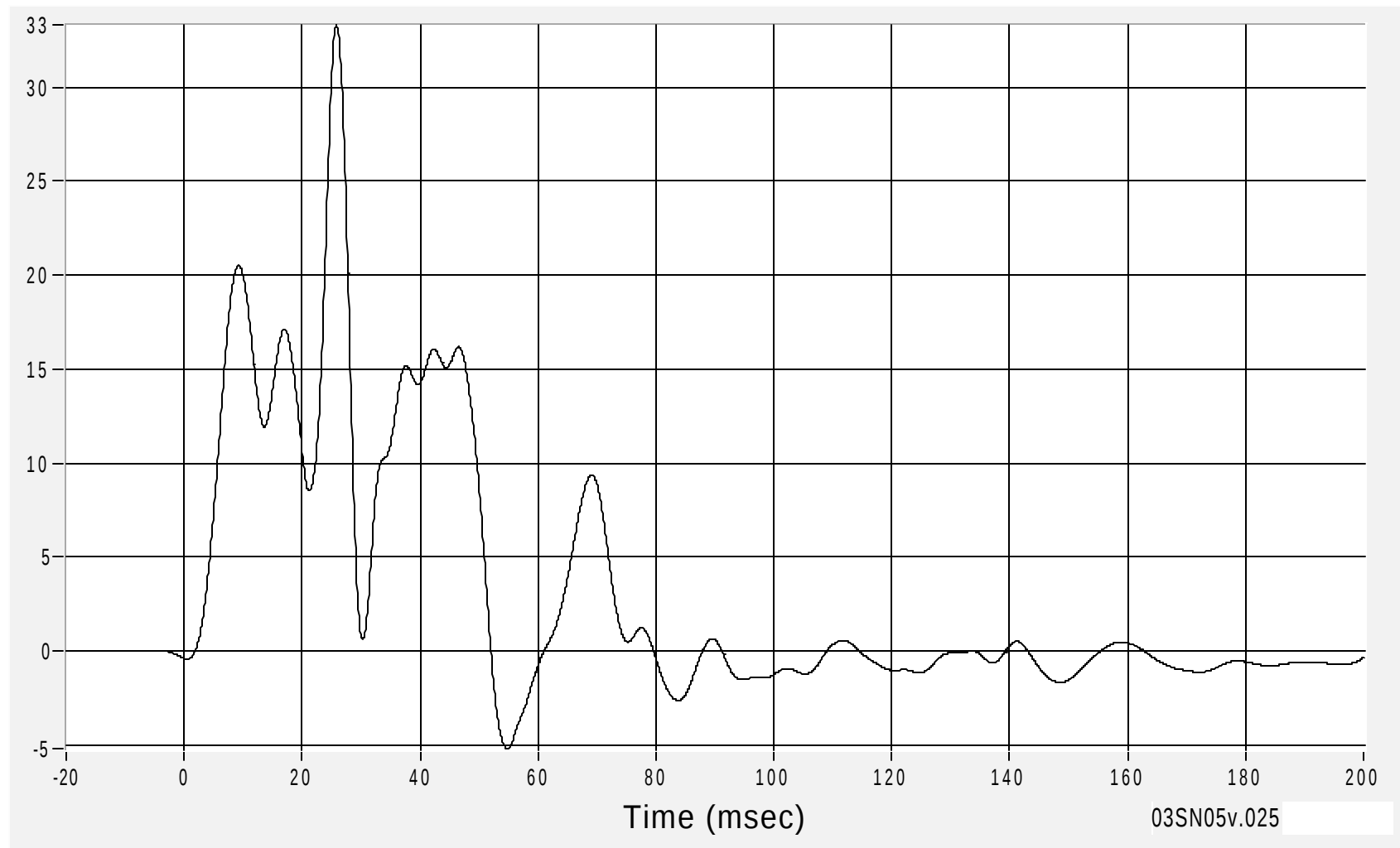
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (Y) Acceleration

Acceleration (G's) CFC60

Max 33.3 G's at 25.8 msec
Min -5.2 G's at 54.8 msec

B-107



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5 February 2003

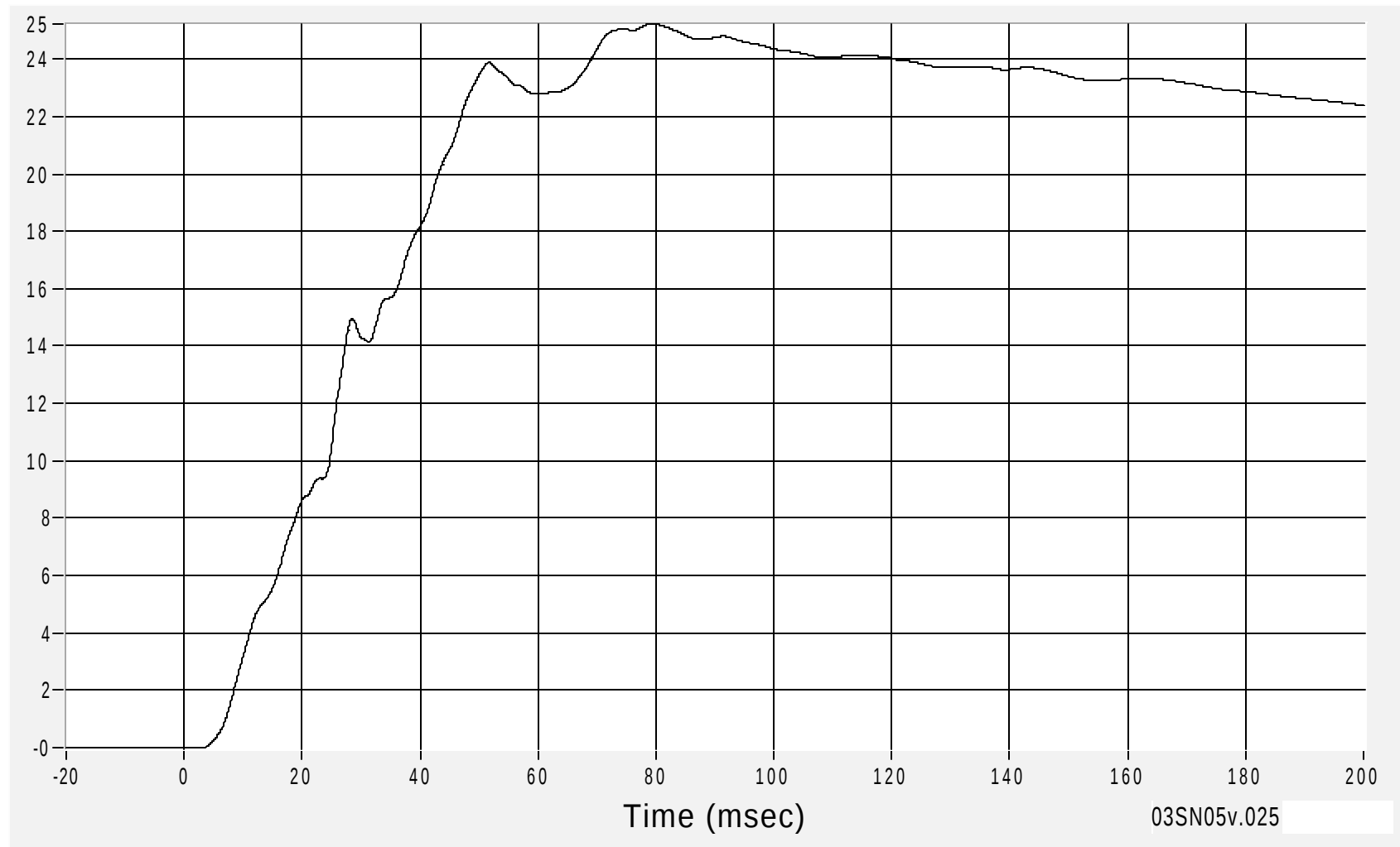
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (Y) Velocity

Velocity (km/h) CFC180

Max 25.2 km/h at 79.4 msec
Min 0.0 km/h at 3.0 msec

B-108



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5 February 2003

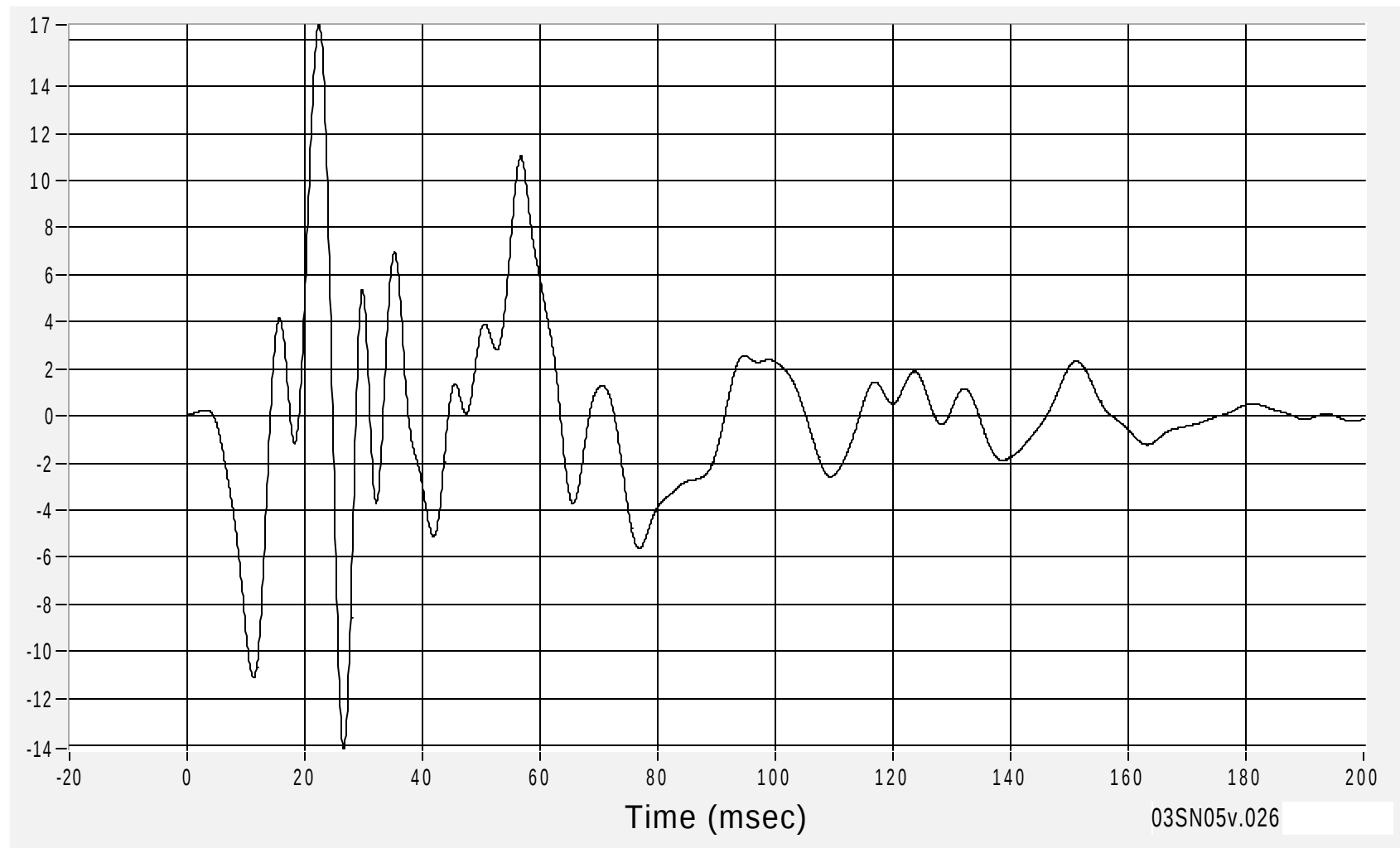
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (Z) Acceleration

Acceleration (G's) CFC60

Max 16.6 G's at 22.4 msec
Min -14.1 G's at 26.6 msec

B-109



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5 February 2003

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Vehicle Crashworthiness Lab

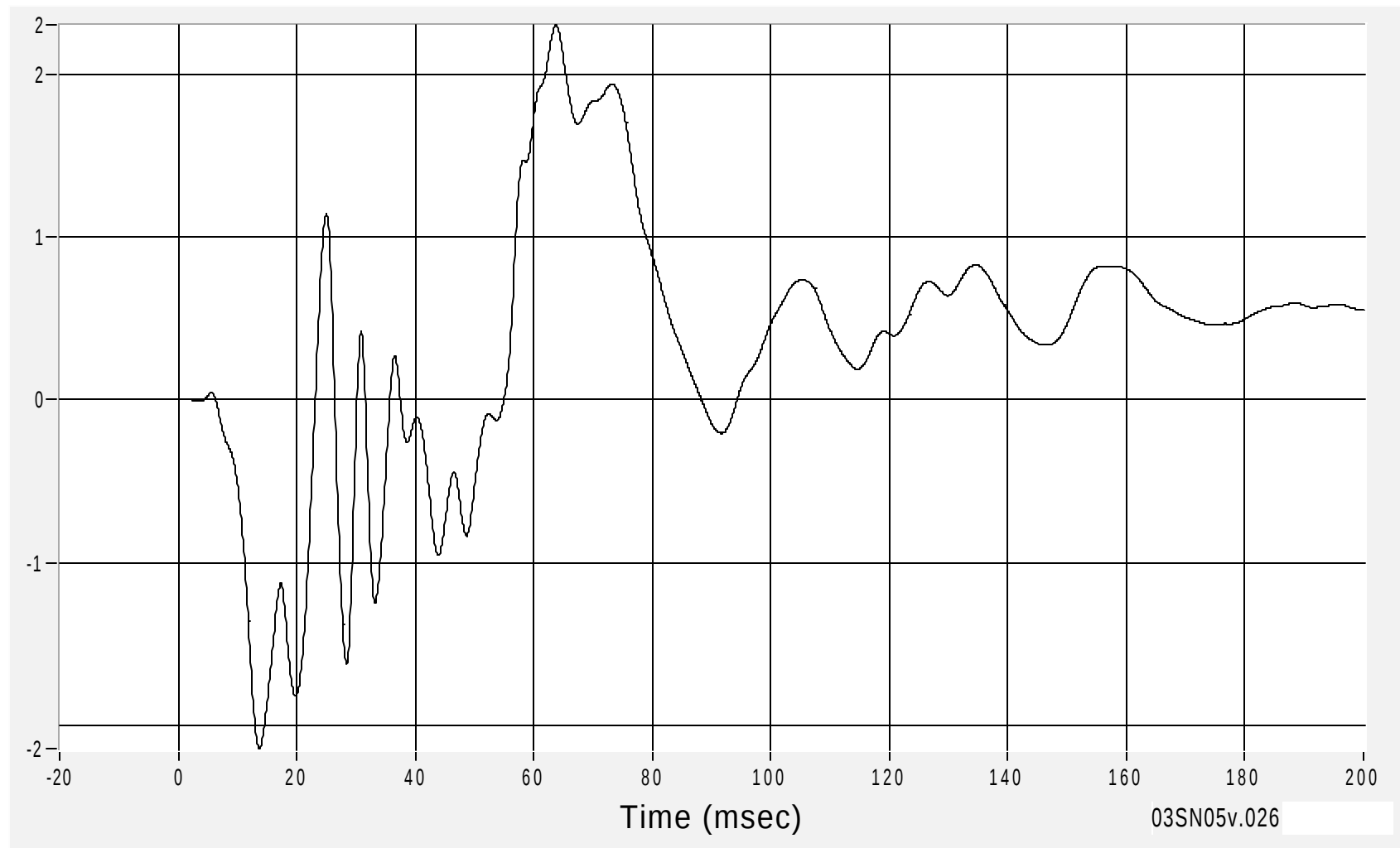
Vehicle Center of Gravity (Z) Velocity

Velocity (km/h) CFC180

Max 2.3 km/h at 63.8 msec

Min -2.1 km/h at 13.8 msec

B-110



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Vehicle Crashworthiness Lab

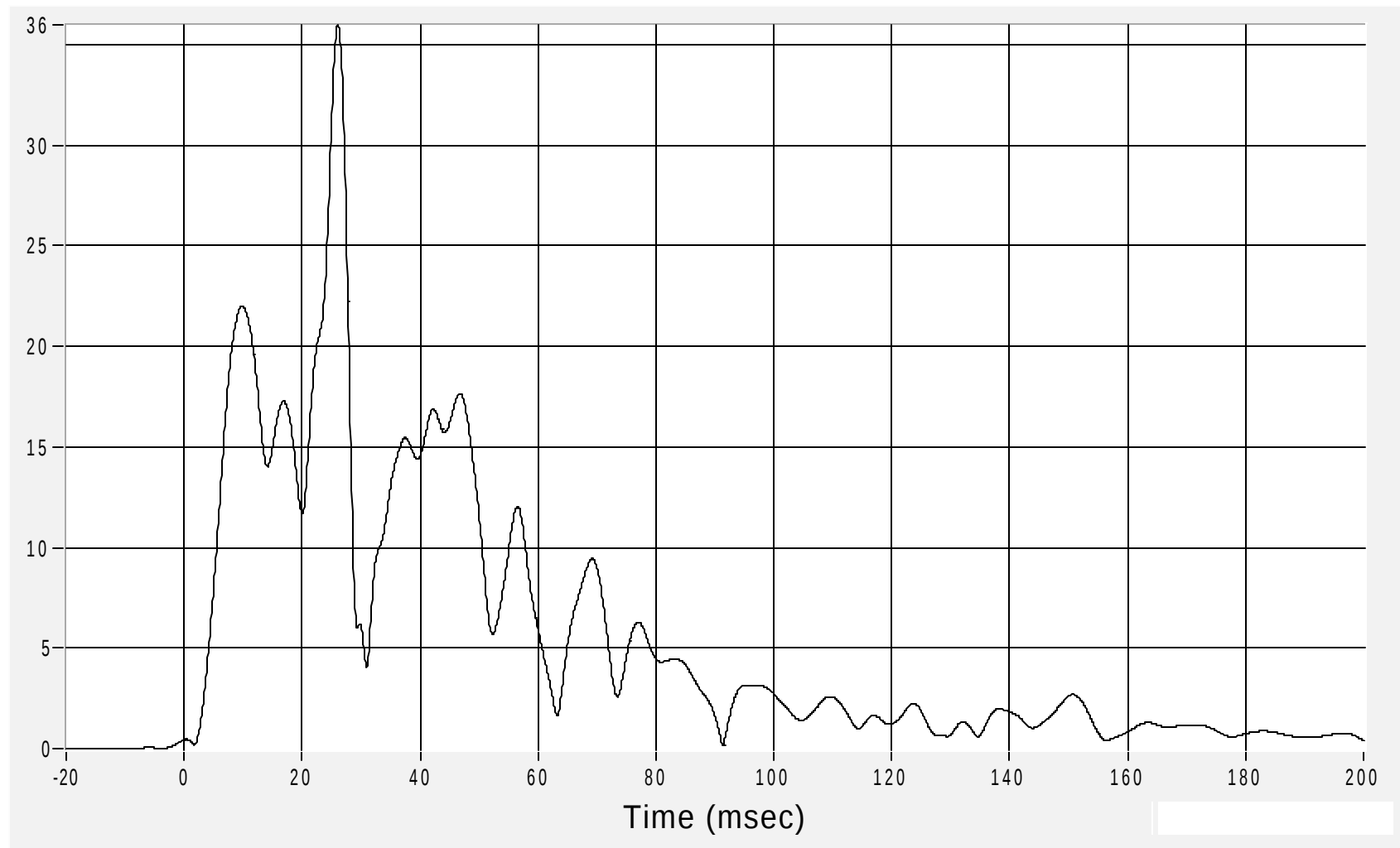
Vehicle Center of Gravity Resultant Acceleration

Acceleration (G's) CFC60

Max 36.0 G's at 26.1 msec

Min 0.1 G's at 91.4 msec

B-111



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Vehicle Crashworthiness Lab

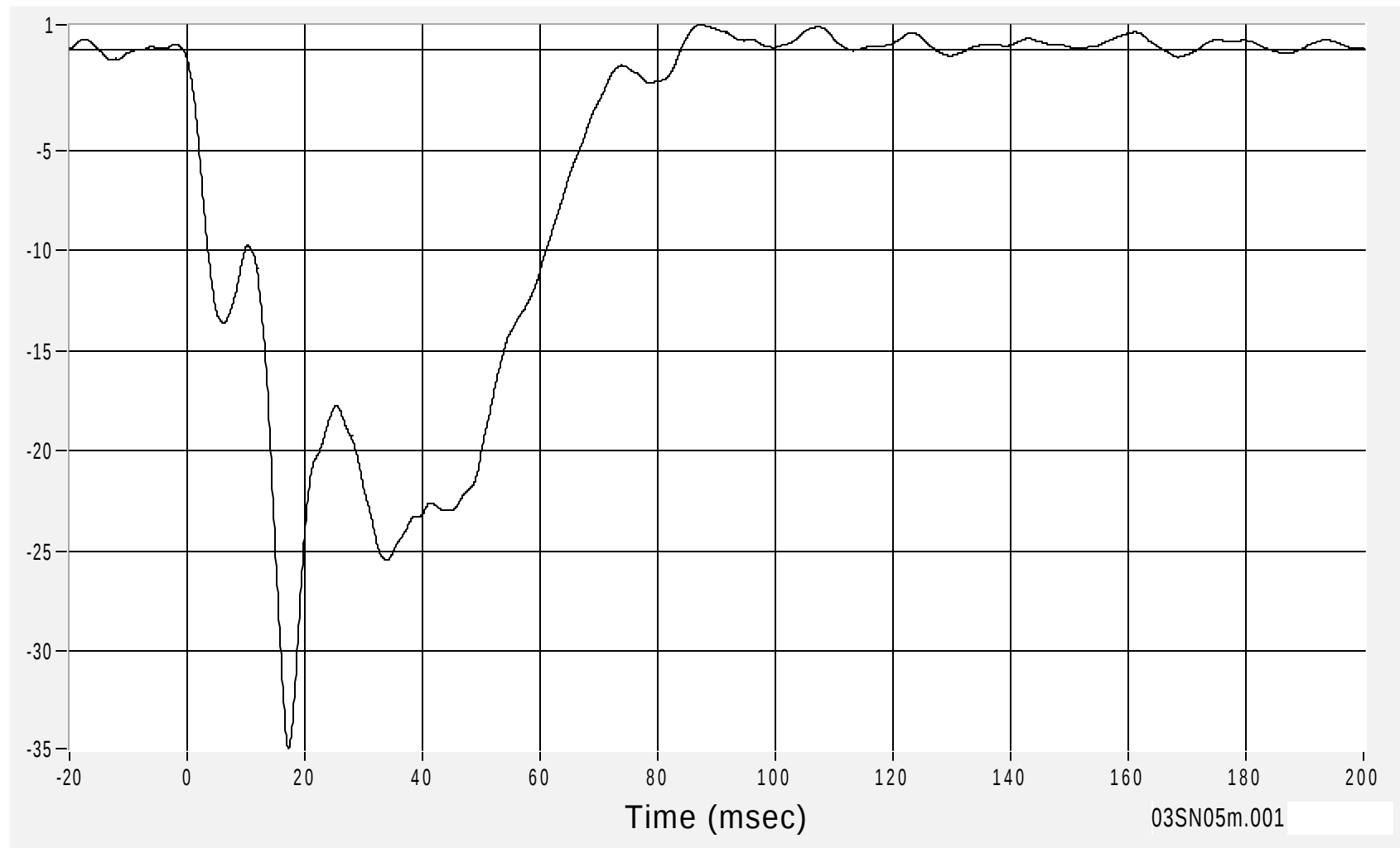
MDB Center of Gravity (X) Acceleration

Acceleration (G's) CFC60

Max 1.3 G's at 87.2 msec

Min -34.9 G's at 17.2 msec

B-112



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5 February 2003

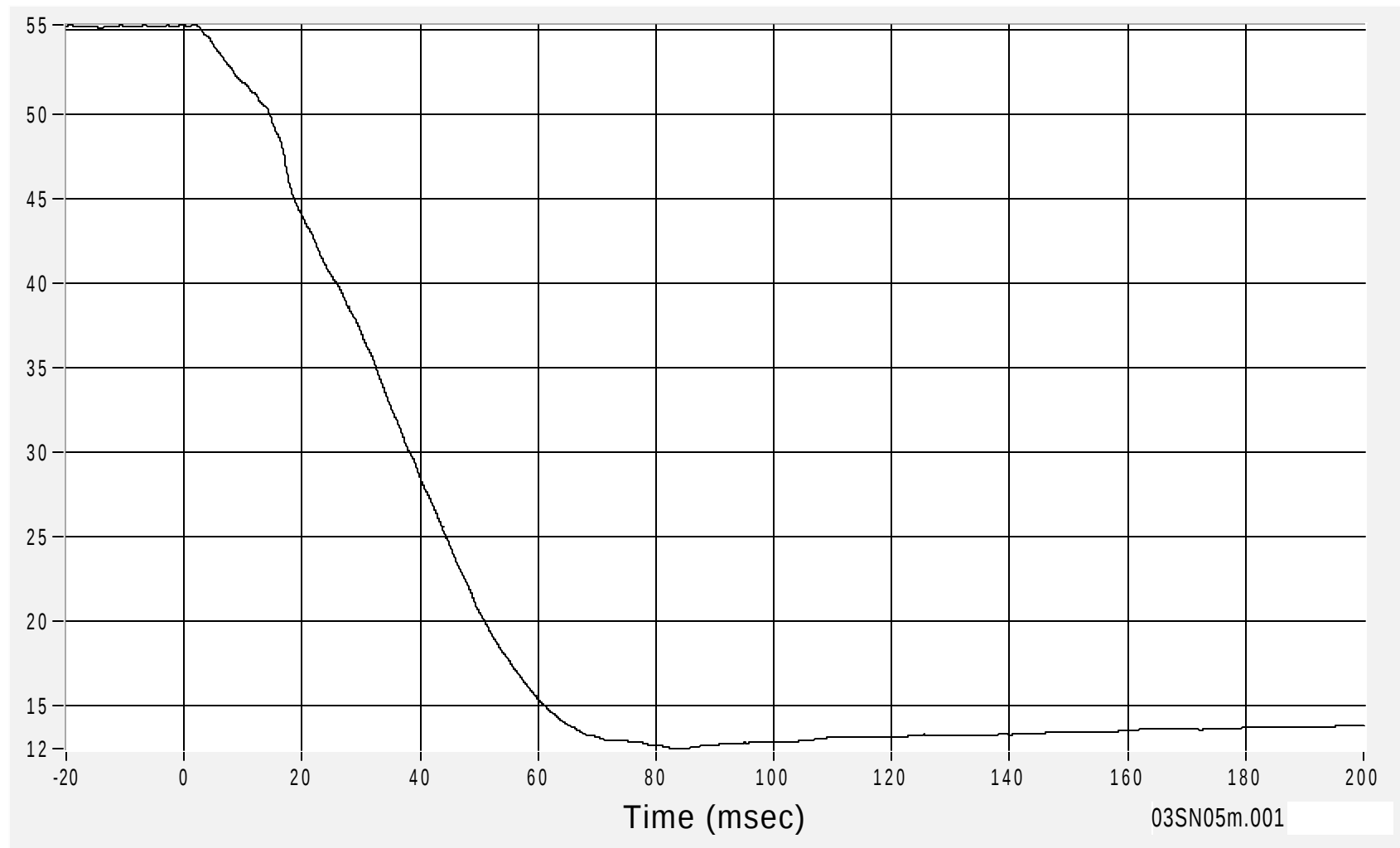
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (X) Velocity

Velocity (km/h) CFC180

Max 55.3 km/h at 1.9 msec
Min 12.4 km/h at 83.5 msec

B-113



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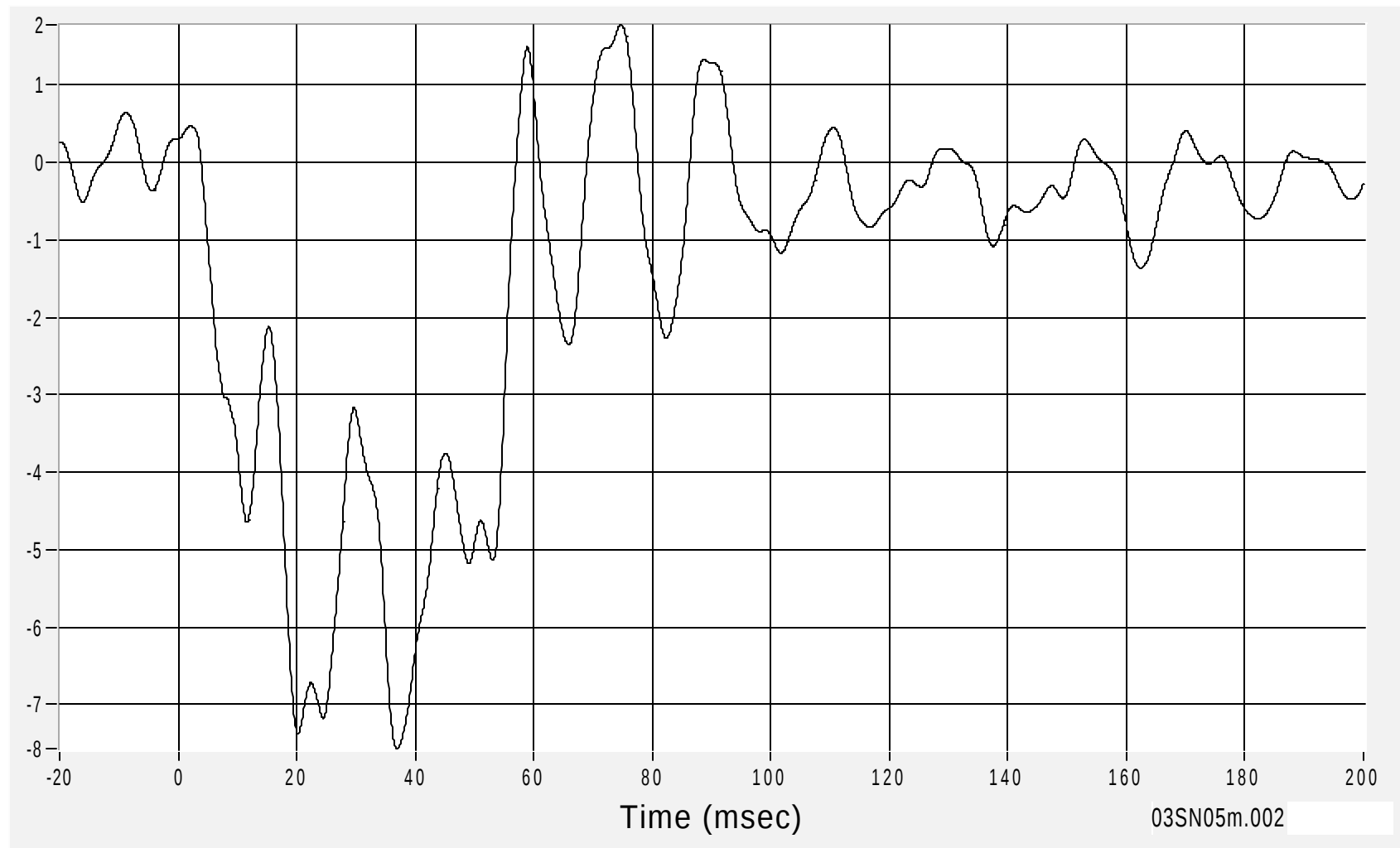
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Y) Acceleration

Acceleration (G's) CFC60

Max 1.8 G's at 74.7 msec
Min -7.6 G's at 37.0 msec

B-114



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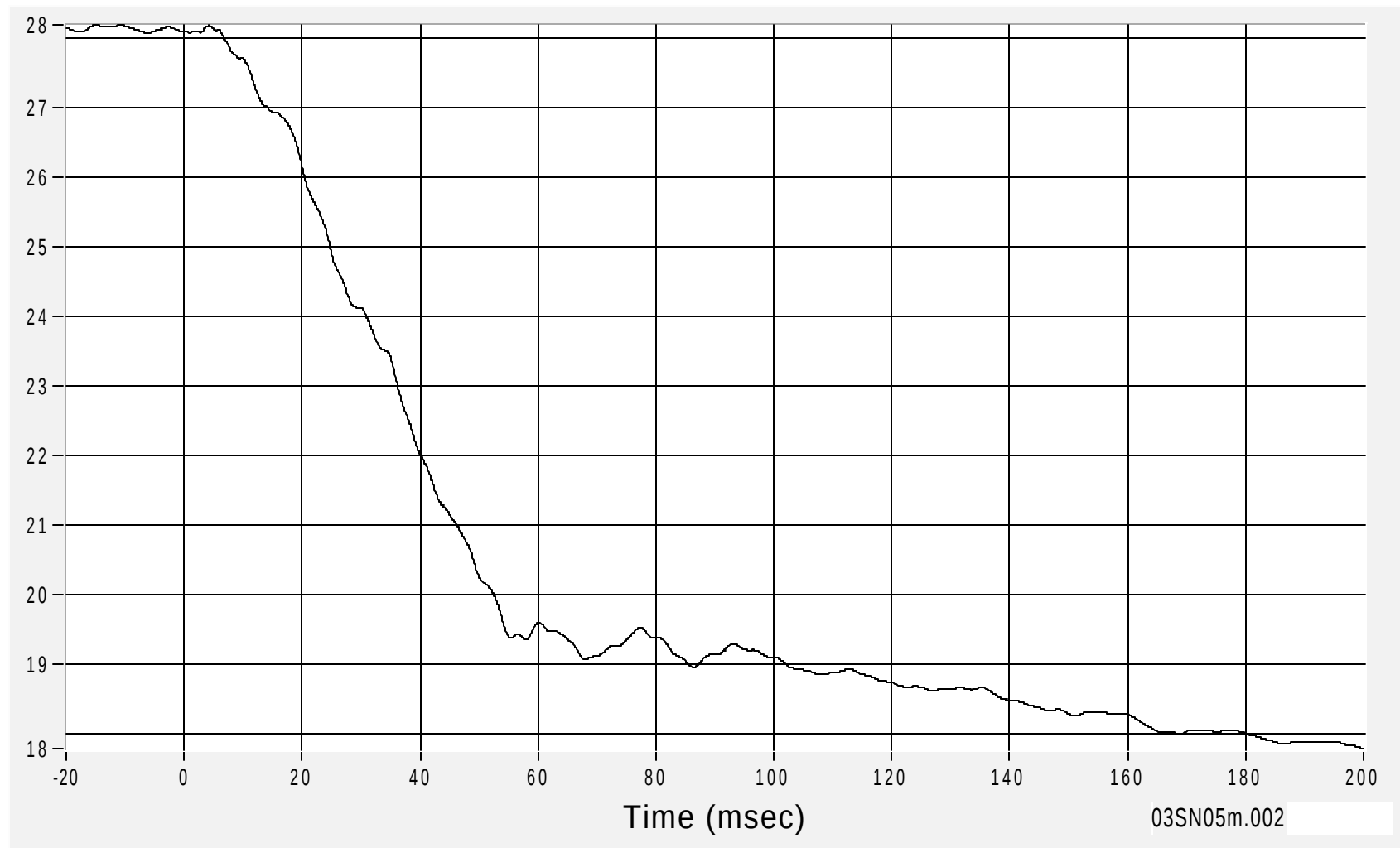
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Y) Velocity

Velocity (km/h) CFC180

Max 28.2 km/h at 4.2 msec
Min 17.8 km/h at 199.9 msec

B-115



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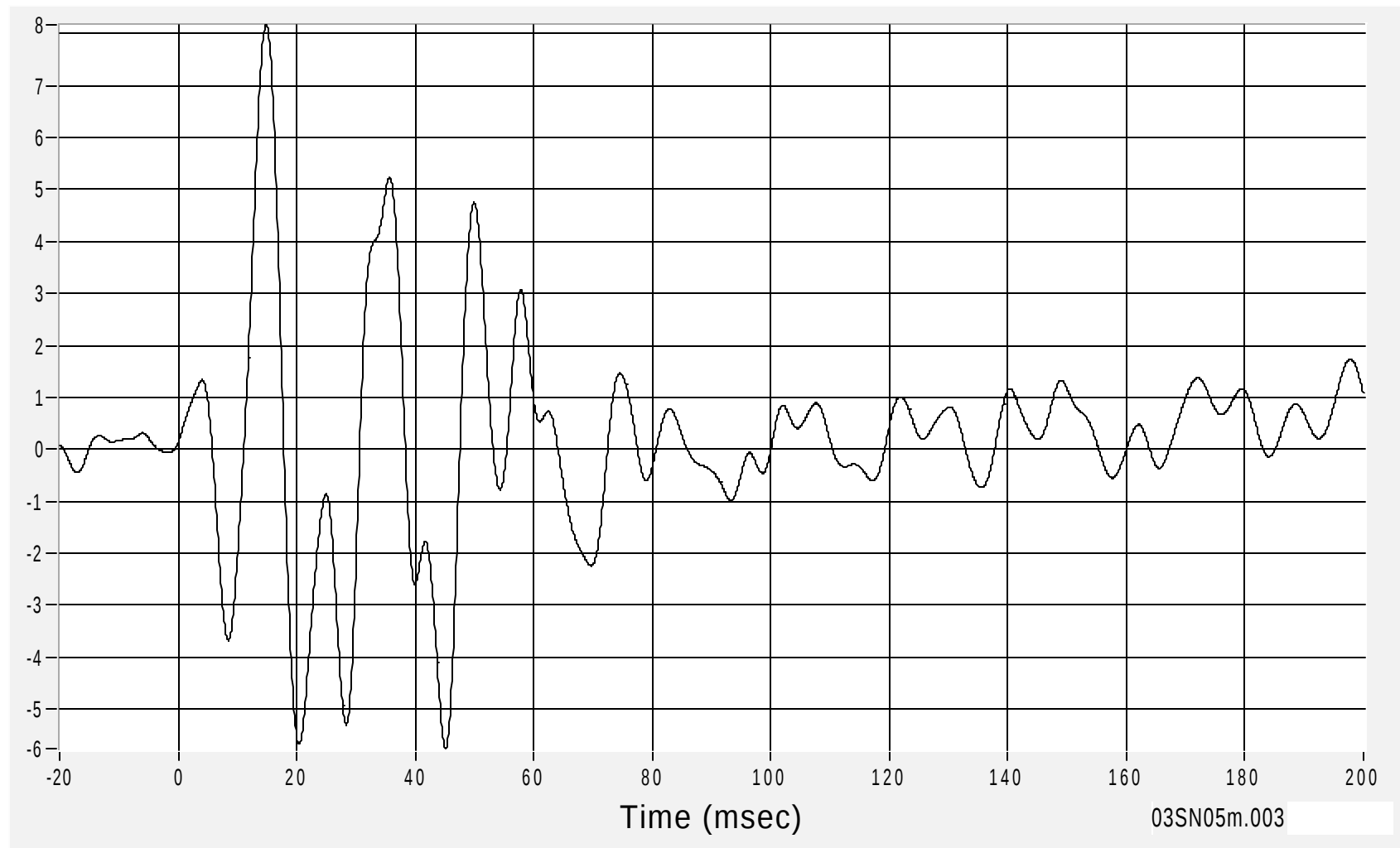
MDB Center of Gravity (Z) Acceleration

Acceleration (G's) CFC60

Max 8.2 G's at 14.9 msec

Min -5.8 G's at 45.1 msec

B-116



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5 February 2003

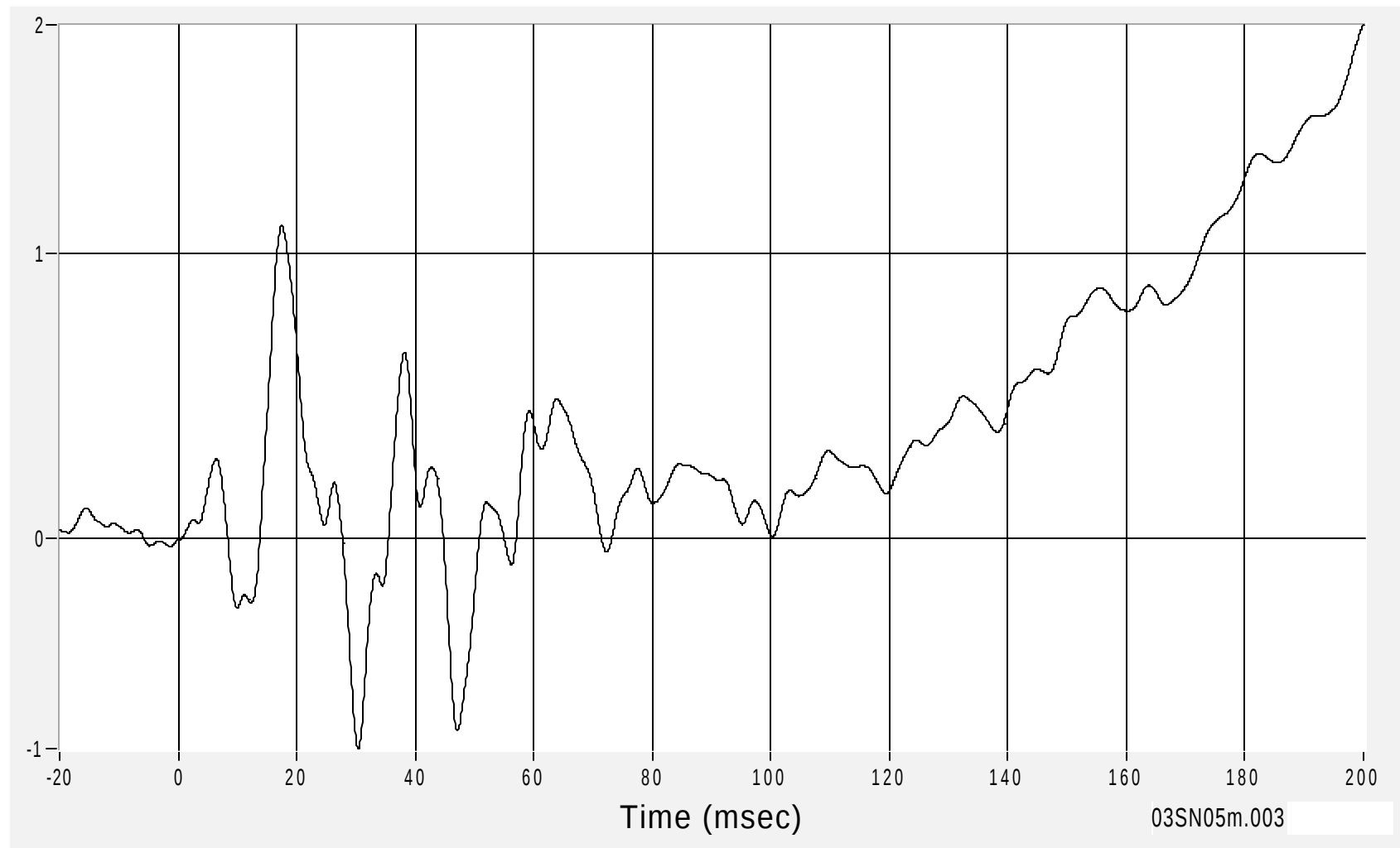
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Z) Velocity

Velocity (km/h) CFC180

Max 1.8 km/h at 199.9 msec
Min -0.7 km/h at 30.4 msec

B-117



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5 February 2003

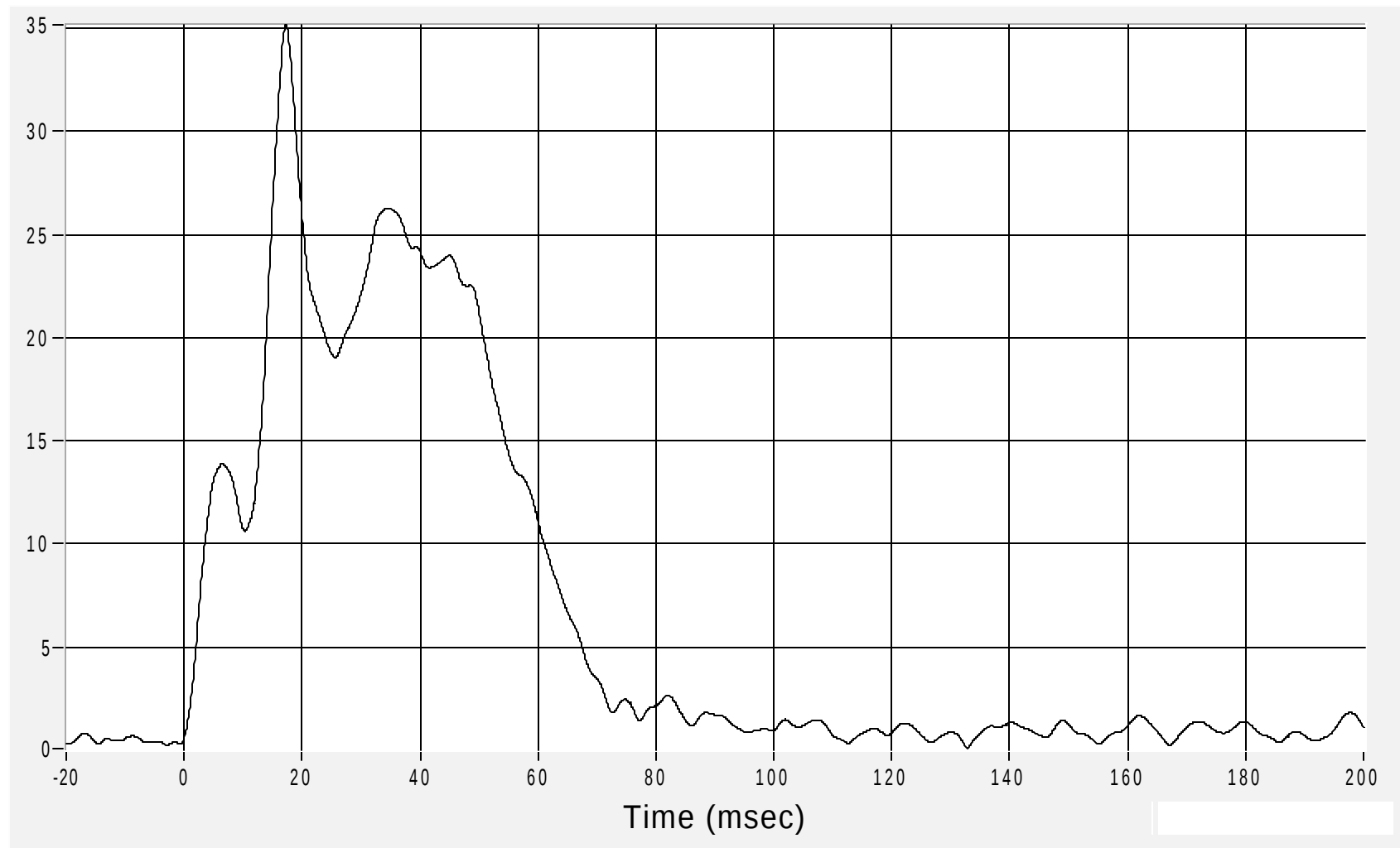
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity Resultant Acceleration

Acceleration (G's) CFC60

Max 35.2 G's at 17.2 msec
Min 0.1 G's at 132.8 msec

B-118



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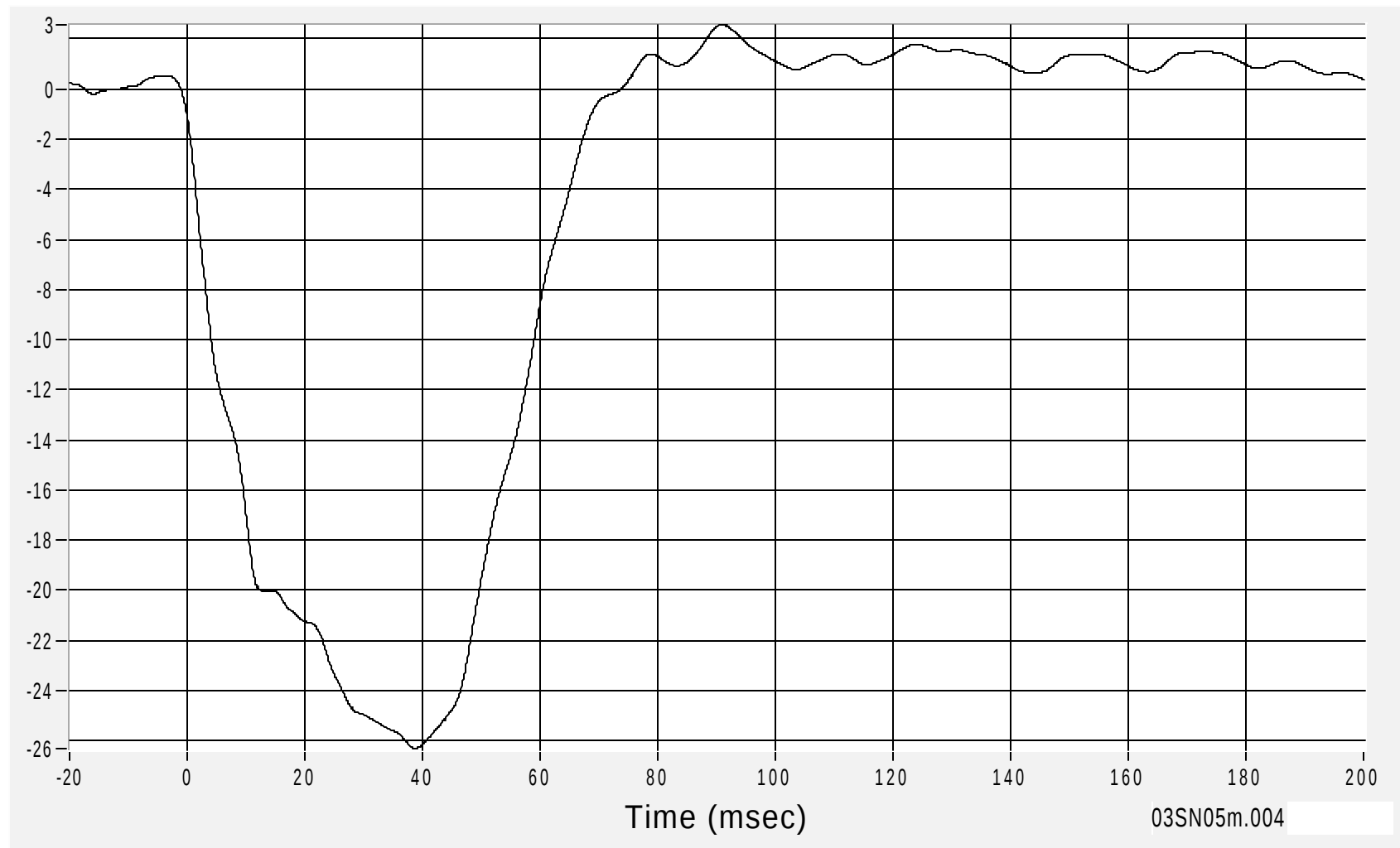
MDB Rear (X) Acceleration

Acceleration (G's) CFC60

Max 2.6 G's at 90.9 msec

Min -26.3 G's at 38.8 msec

B-119



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5 February 2003

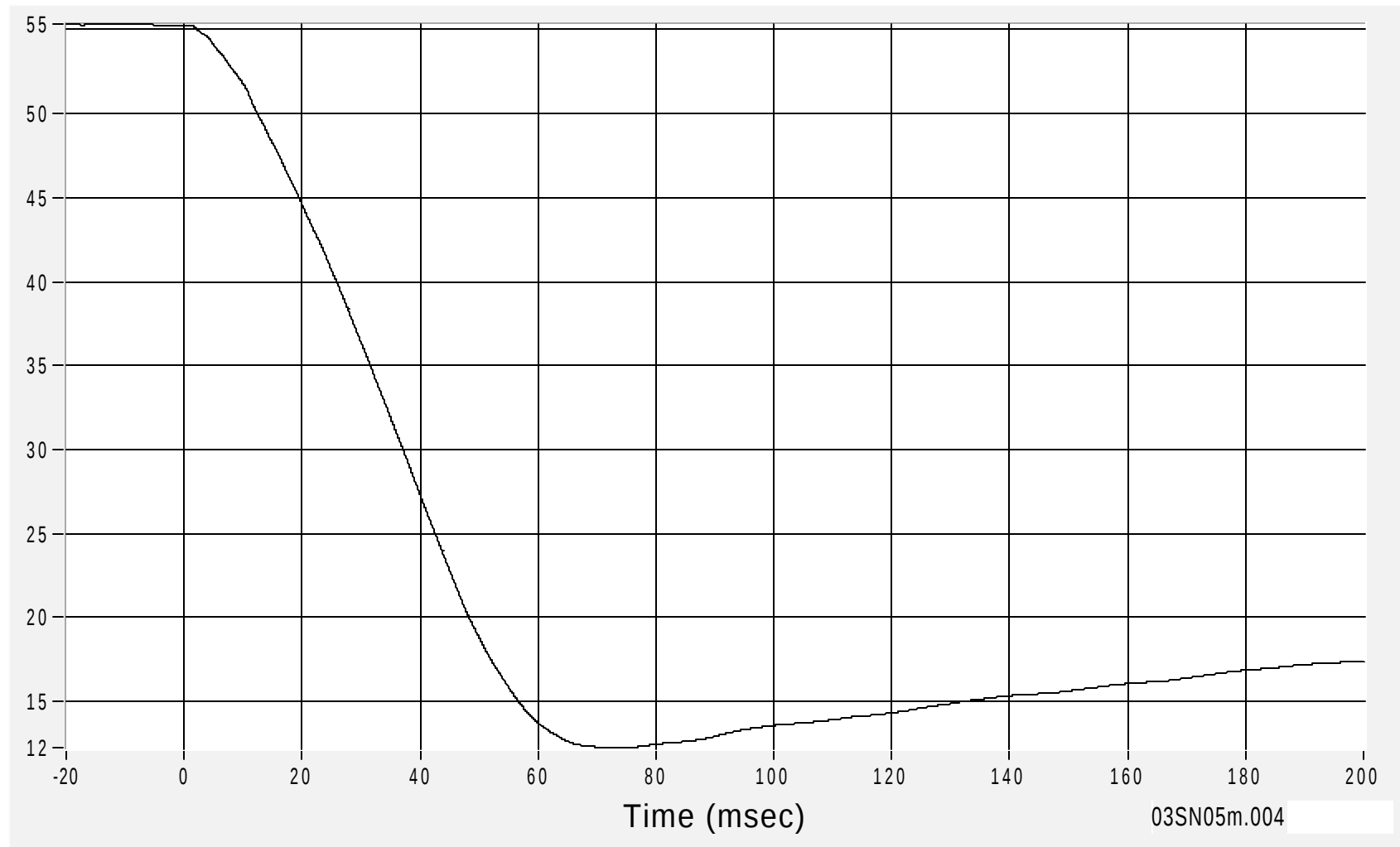
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Rear (X) Velocity

Velocity (km/h) CFC180

Max 55.3 km/h at 0.7 msec
Min 12.2 km/h at 74.6 msec

B-120



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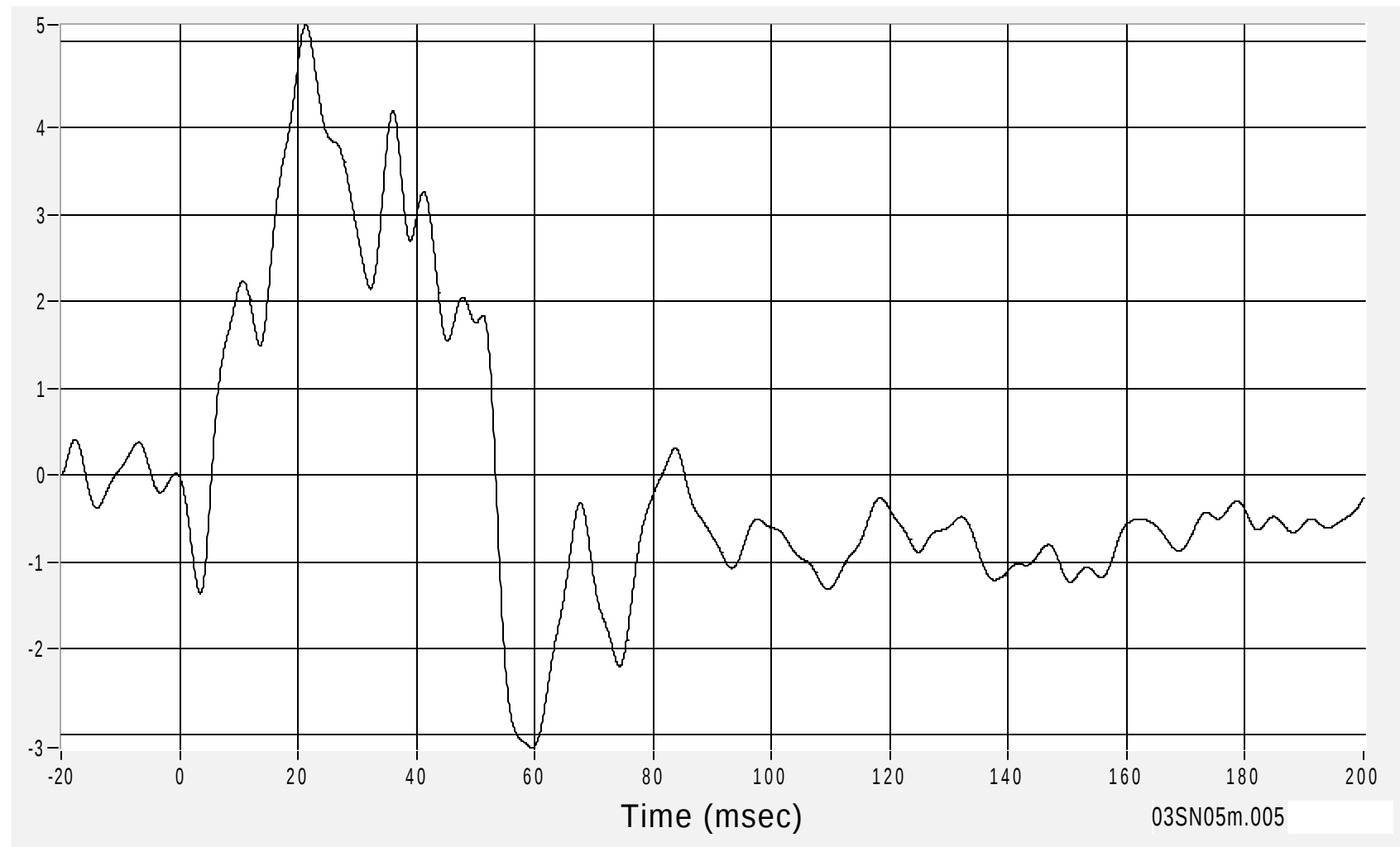
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Rear (Y) Acceleration

Acceleration (G's) CFC60

Max 5.2 G's at 21.3 msec
Min -3.1 G's at 59.5 msec

B-121



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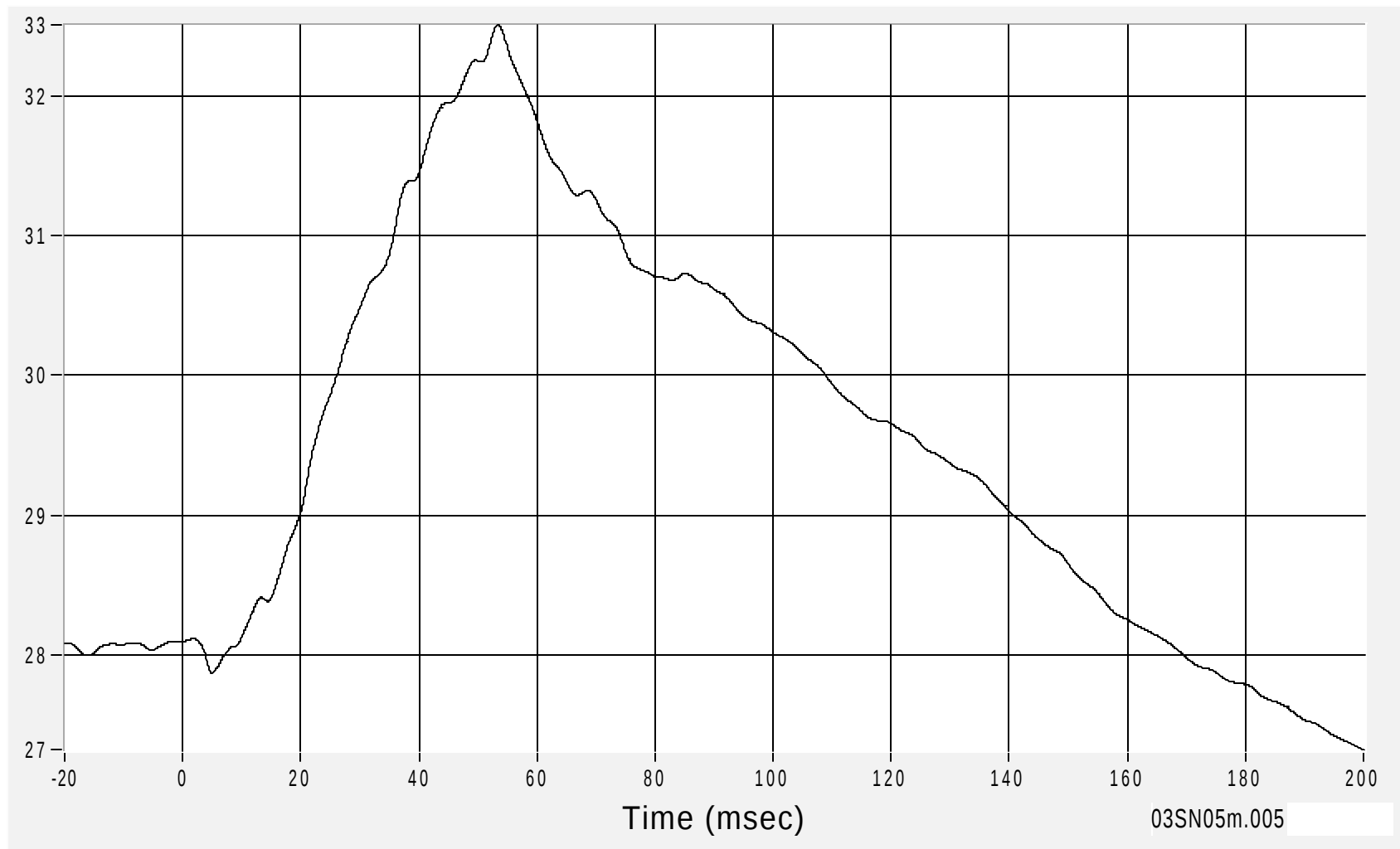
MDB Rear (Y) Velocity

Velocity (km/h) CFC180

Max 32.5 km/h at 53.4 msec

Min 27.3 km/h at 199.9 msec

B-122



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5 February 2003

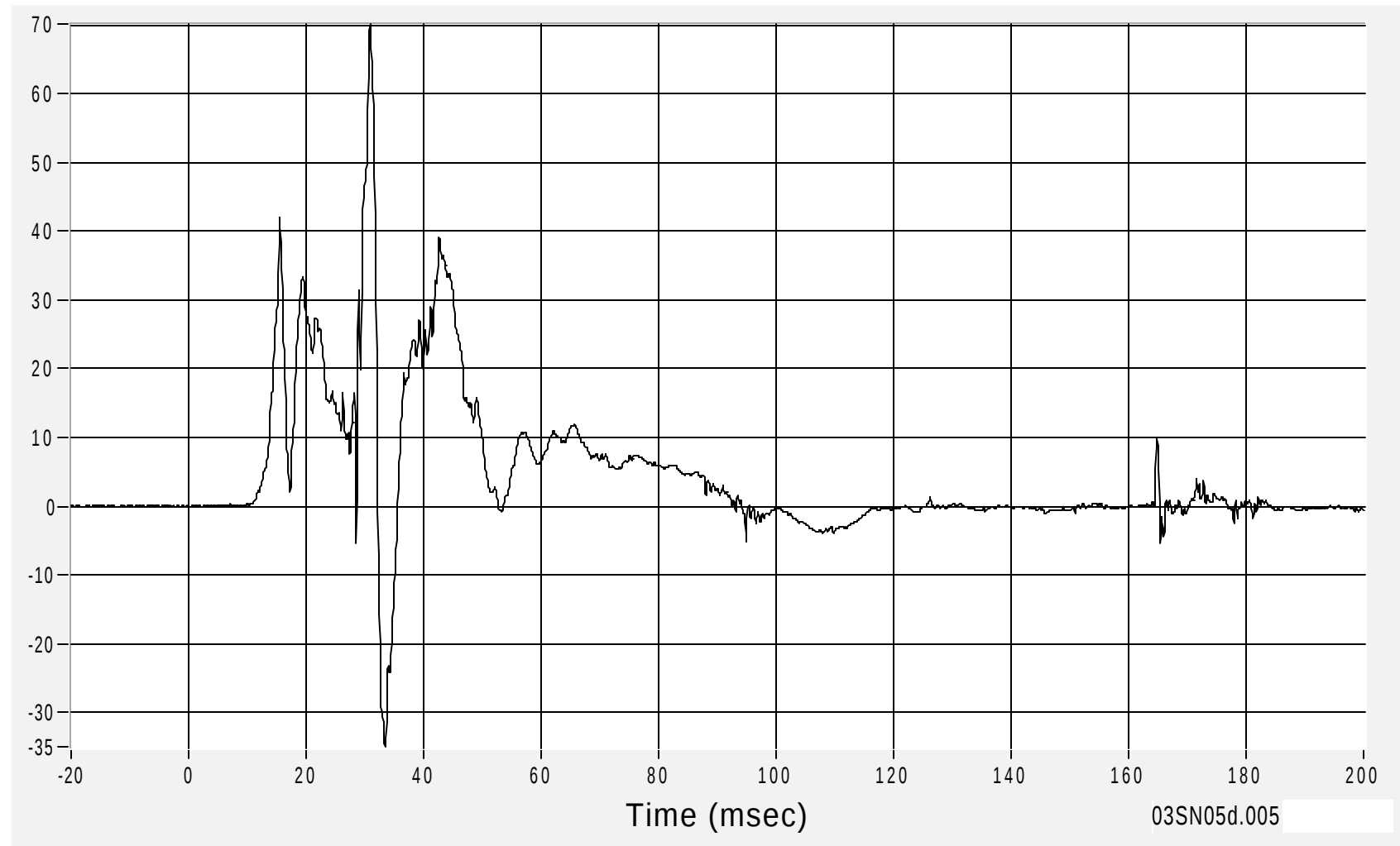
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 70.1 G's at 30.9 msec
Min -35.0 G's at 33.4 msec

B-123



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5 February 2003

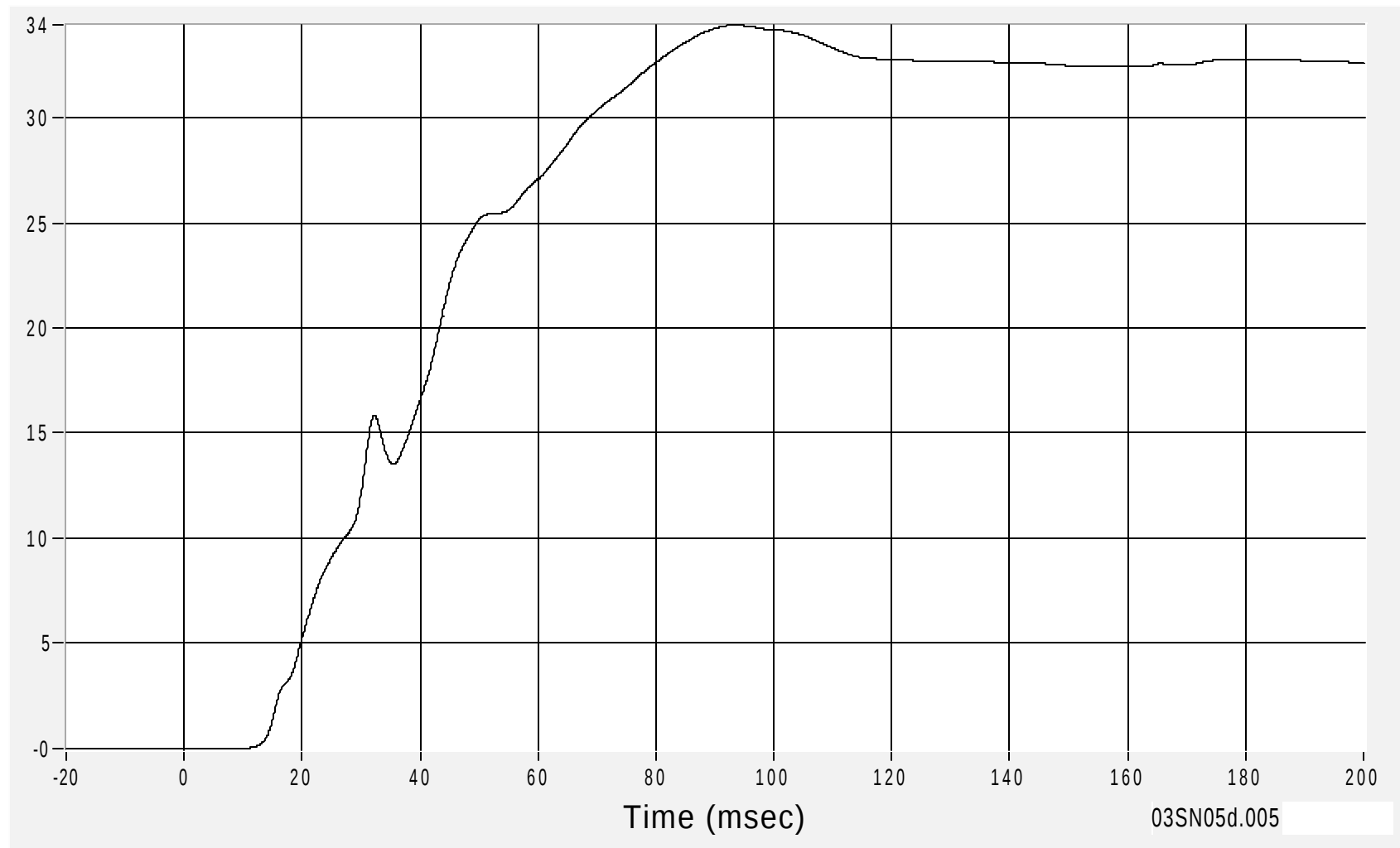
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 34.4 km/h at 93.8 msec
Min 0.0 km/h at 4.1 msec

B-124



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5 February 2003

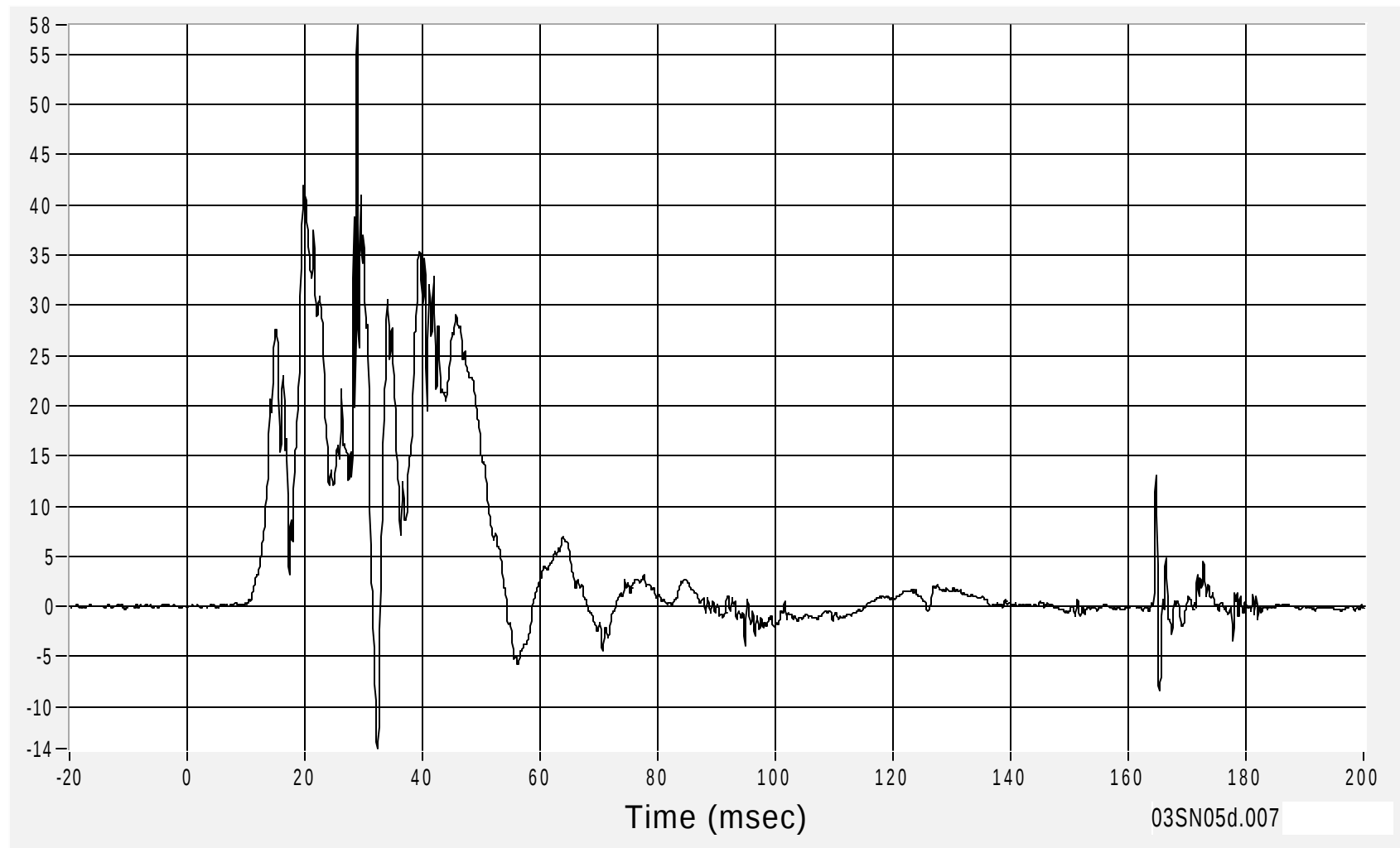
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 57.9 G's at 28.9 msec
Min -14.2 G's at 32.4 msec

B-125



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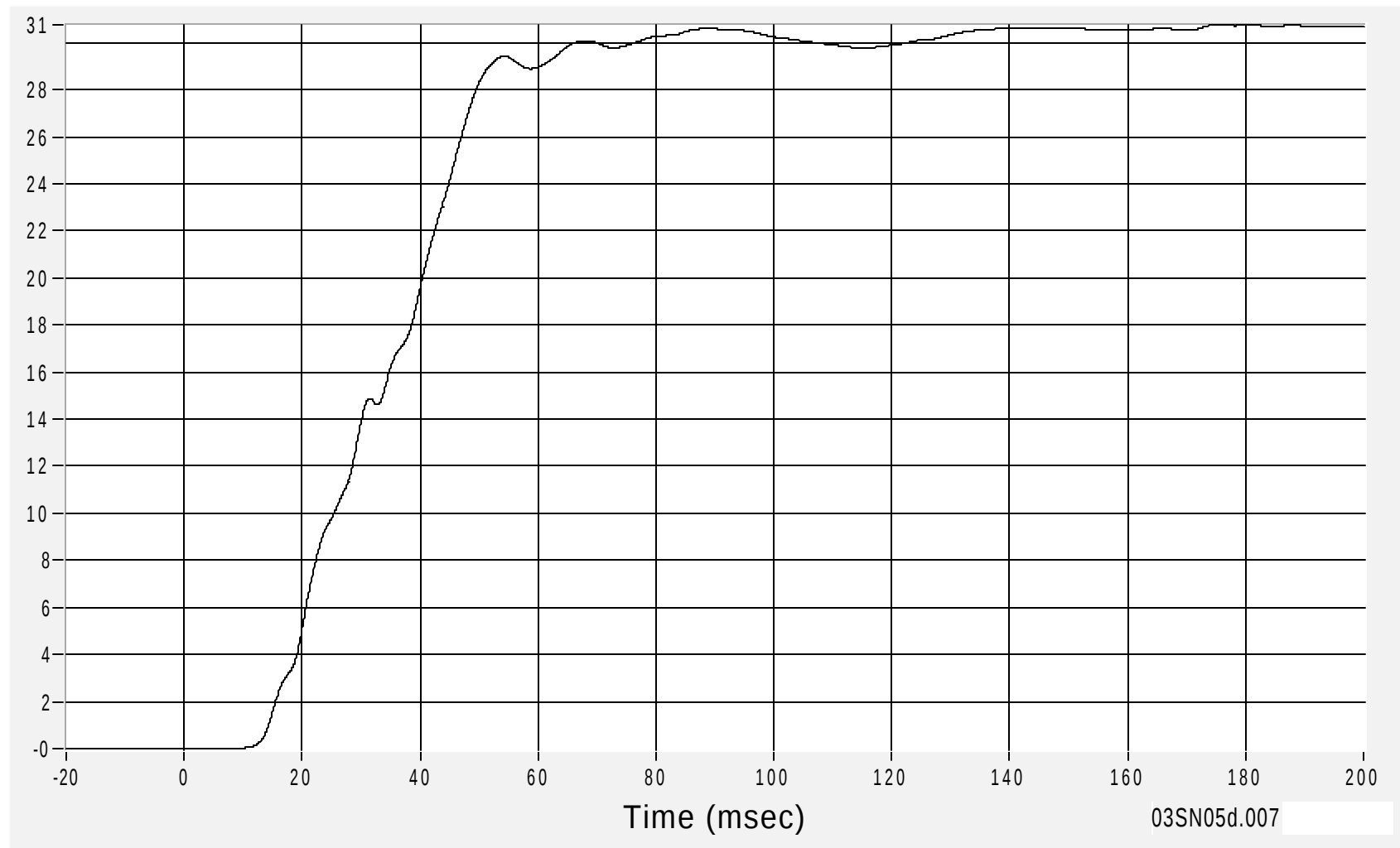
Driver Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 30.8 km/h at 175.6 msec

Min 0.0 km/h at 0.1 msec

B-126



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5 February 2003

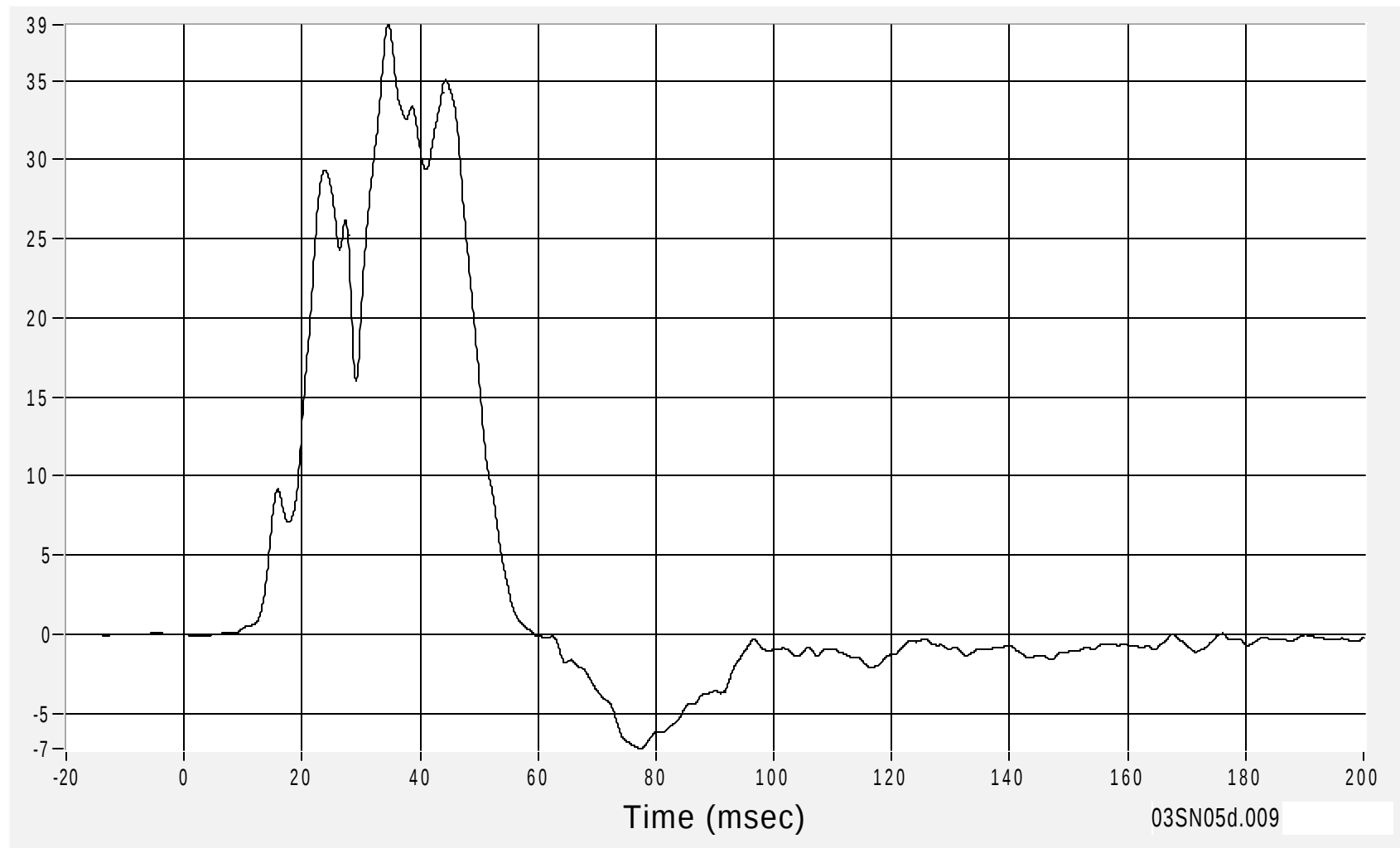
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) CFC180

Max 38.5 G's at 34.6 msec
Min -7.2 G's at 77.3 msec

B-127



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5 February 2003

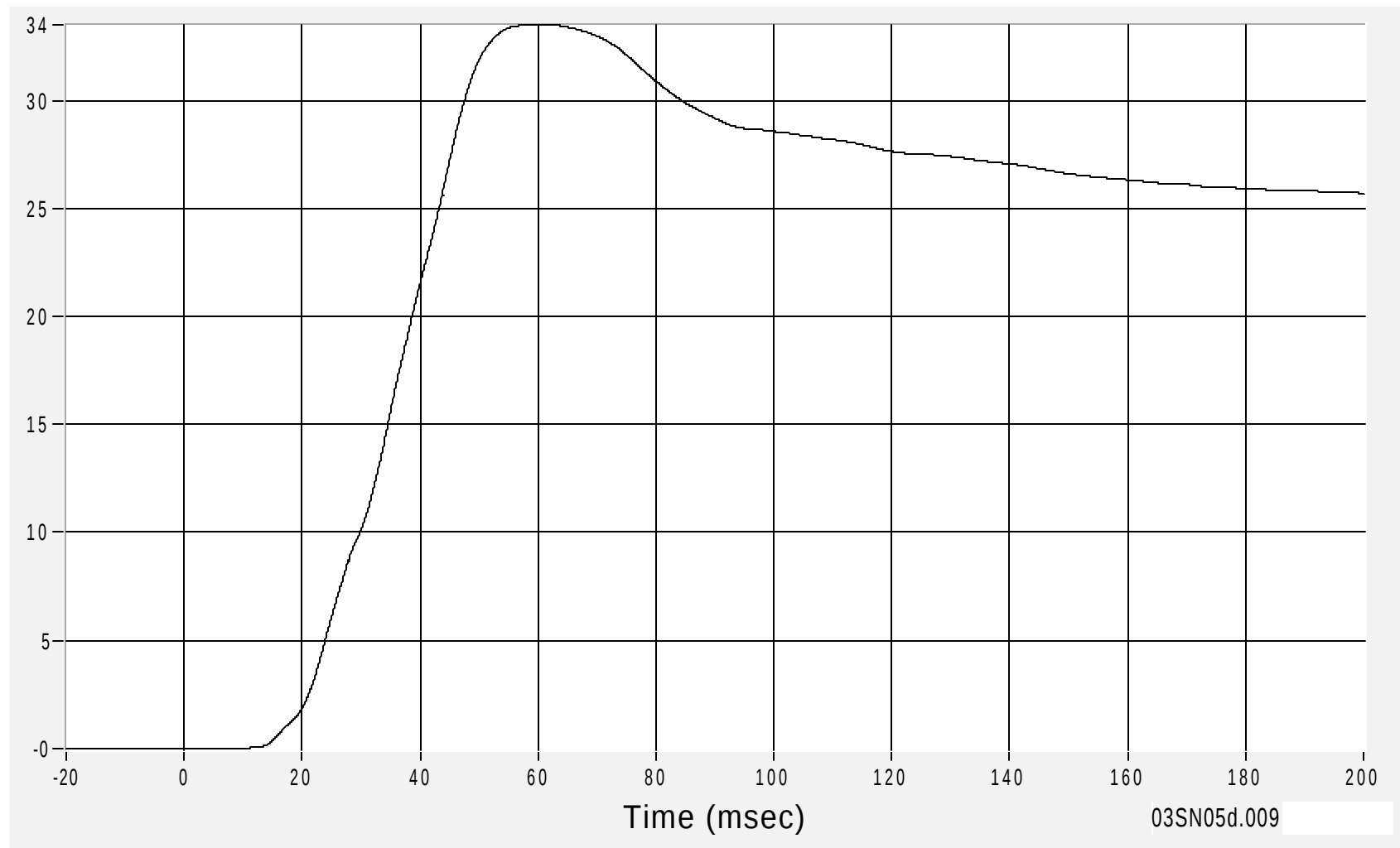
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 33.5 km/h at 59.4 msec
Min 0.0 km/h at 5.5 msec

B-128



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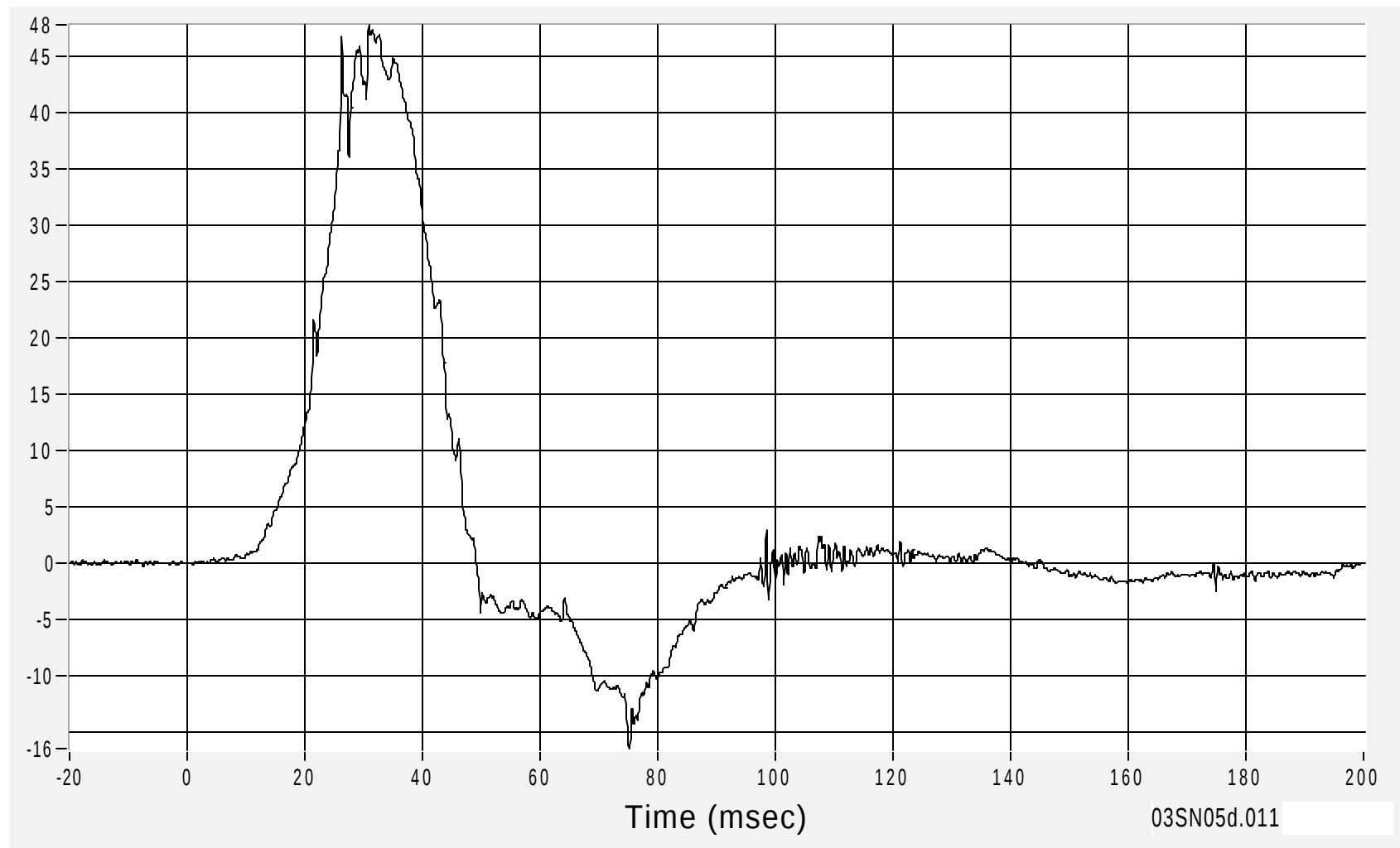
Driver Pelvic (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 47.7 G's at 30.9 msec

Min -16.4 G's at 75.2 msec

B-129



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5 February 2003

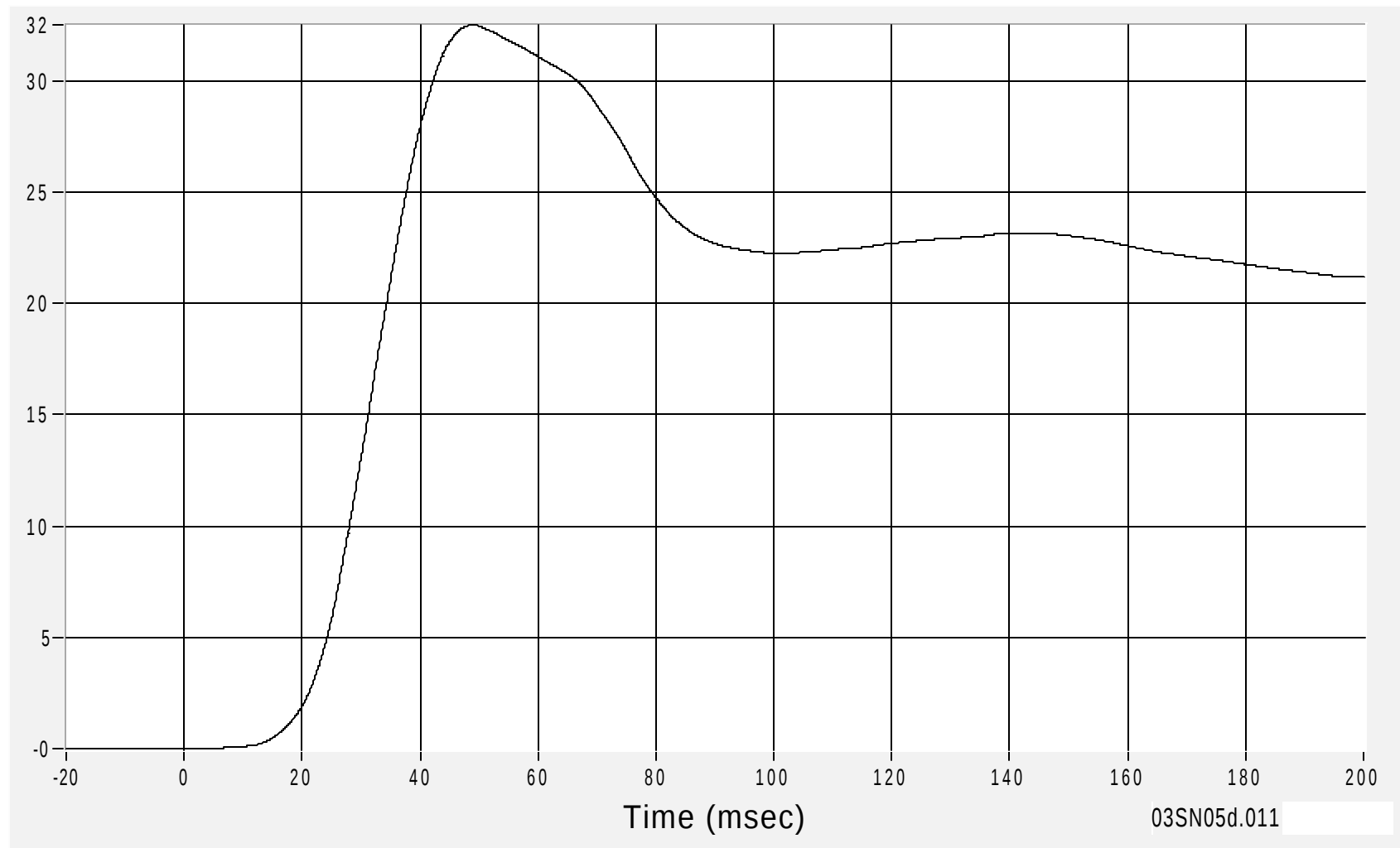
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 32.5 km/h at 49.0 msec
Min 0.0 km/h at 1.1 msec

B-130



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5 February 2003

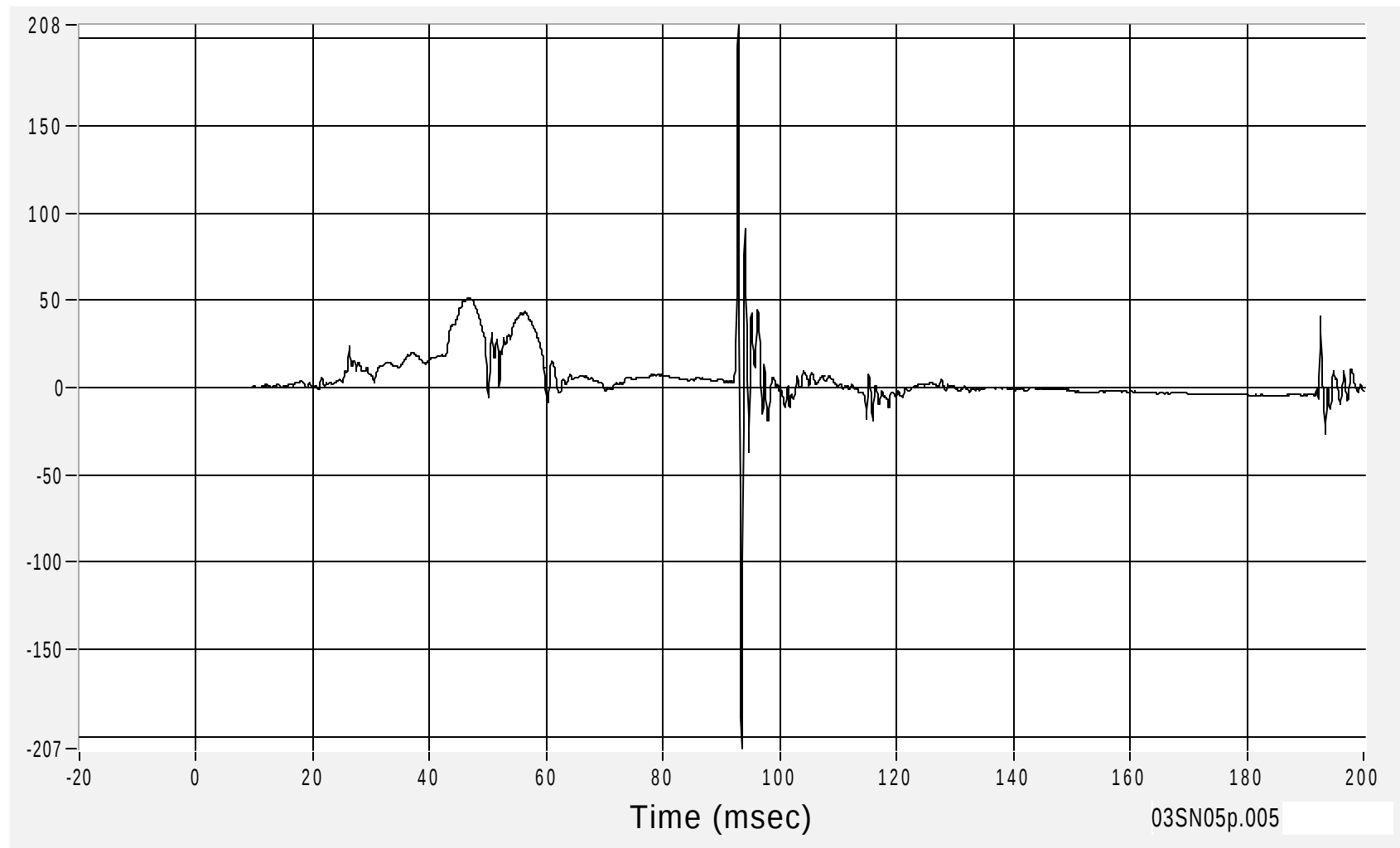
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 207.8 G's at 92.9 msec
Min -207.0 G's at 93.4 msec

B-131



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5 February 2003

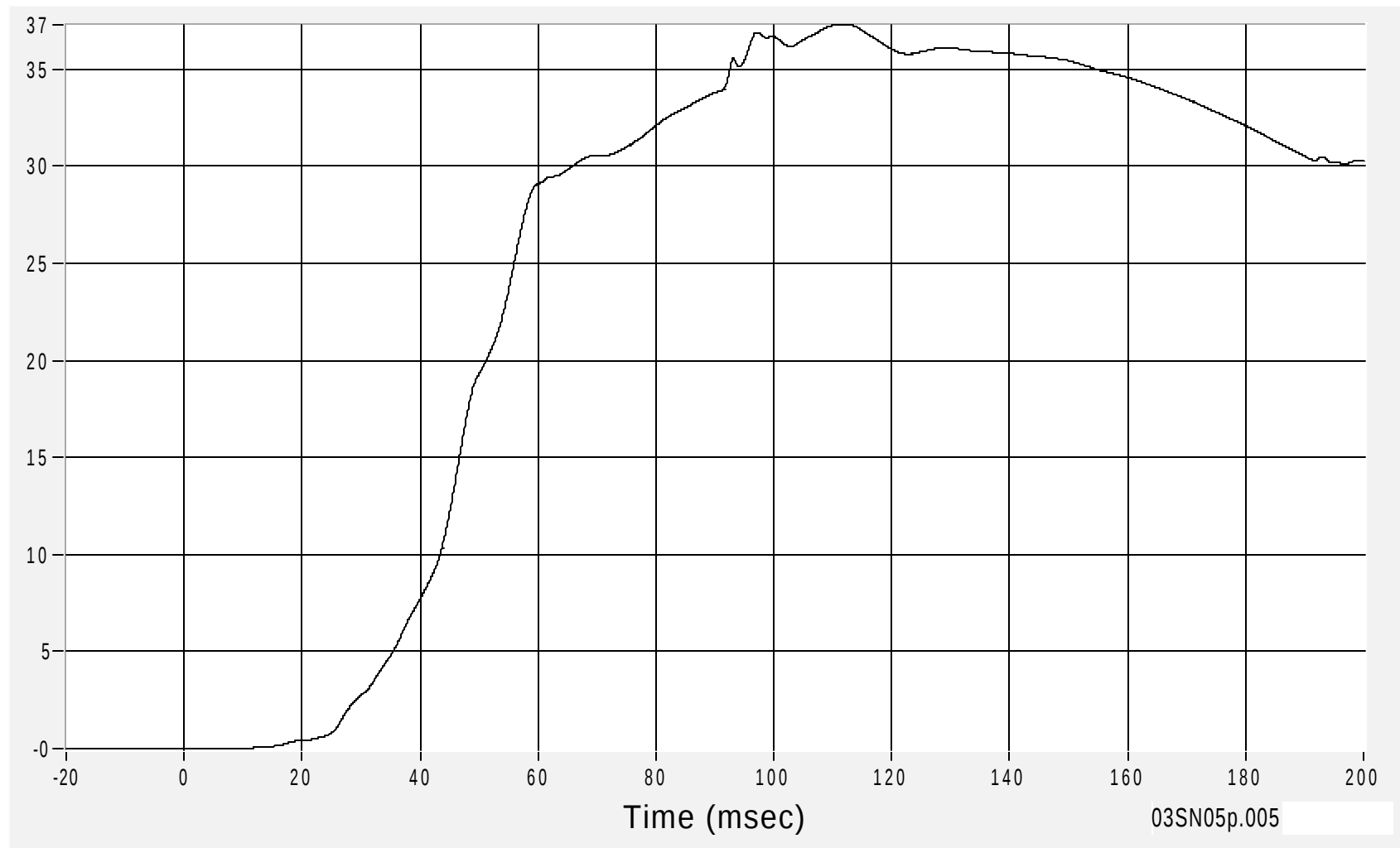
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 37.3 km/h at 112.6 msec
Min 0.0 km/h at 4.4 msec

B-132



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Vehicle Crashworthiness Lab

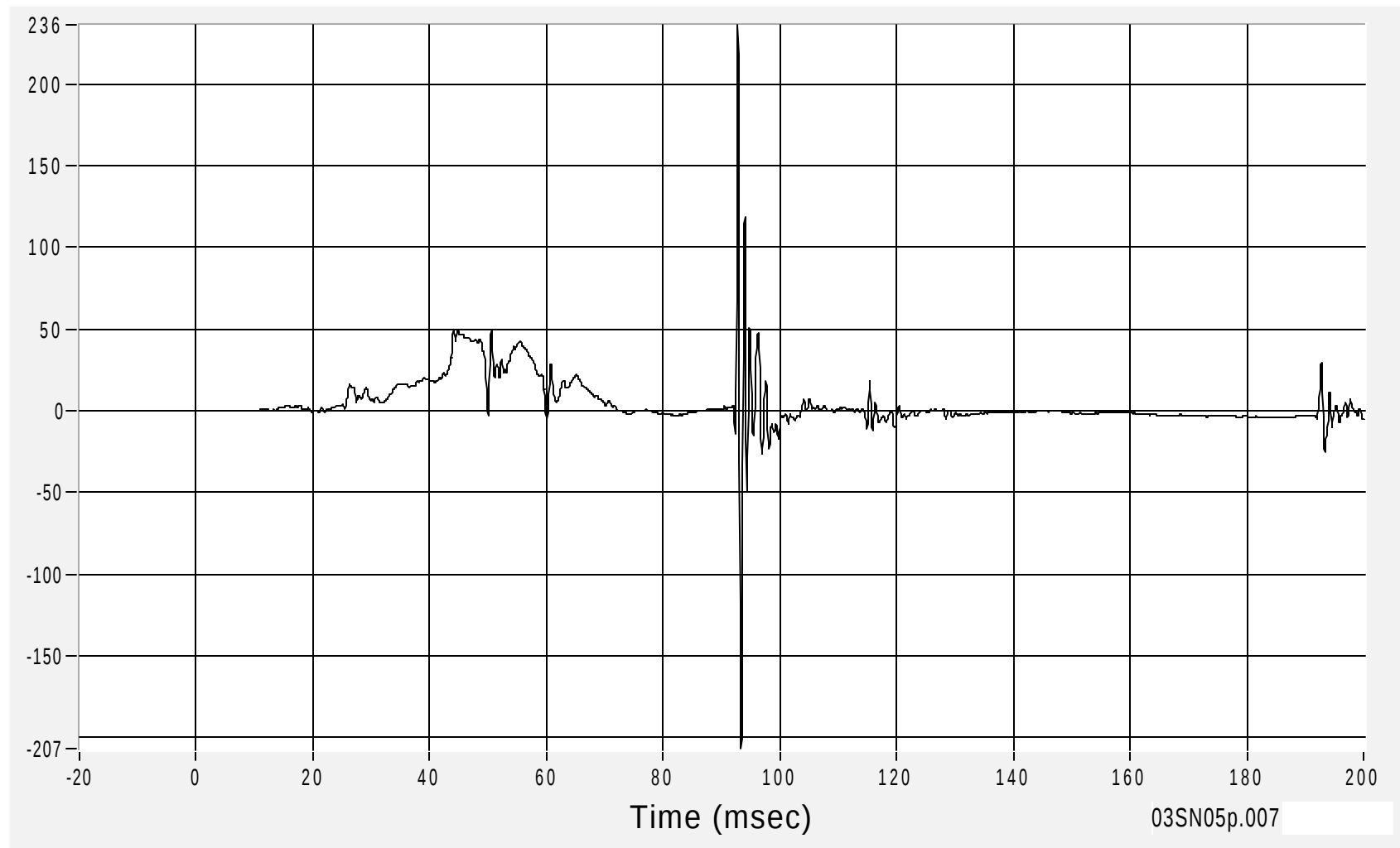
Passenger Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 236.4 G's at 92.8 msec

Min -206.8 G's at 93.4 msec

B-133



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5 February 2003

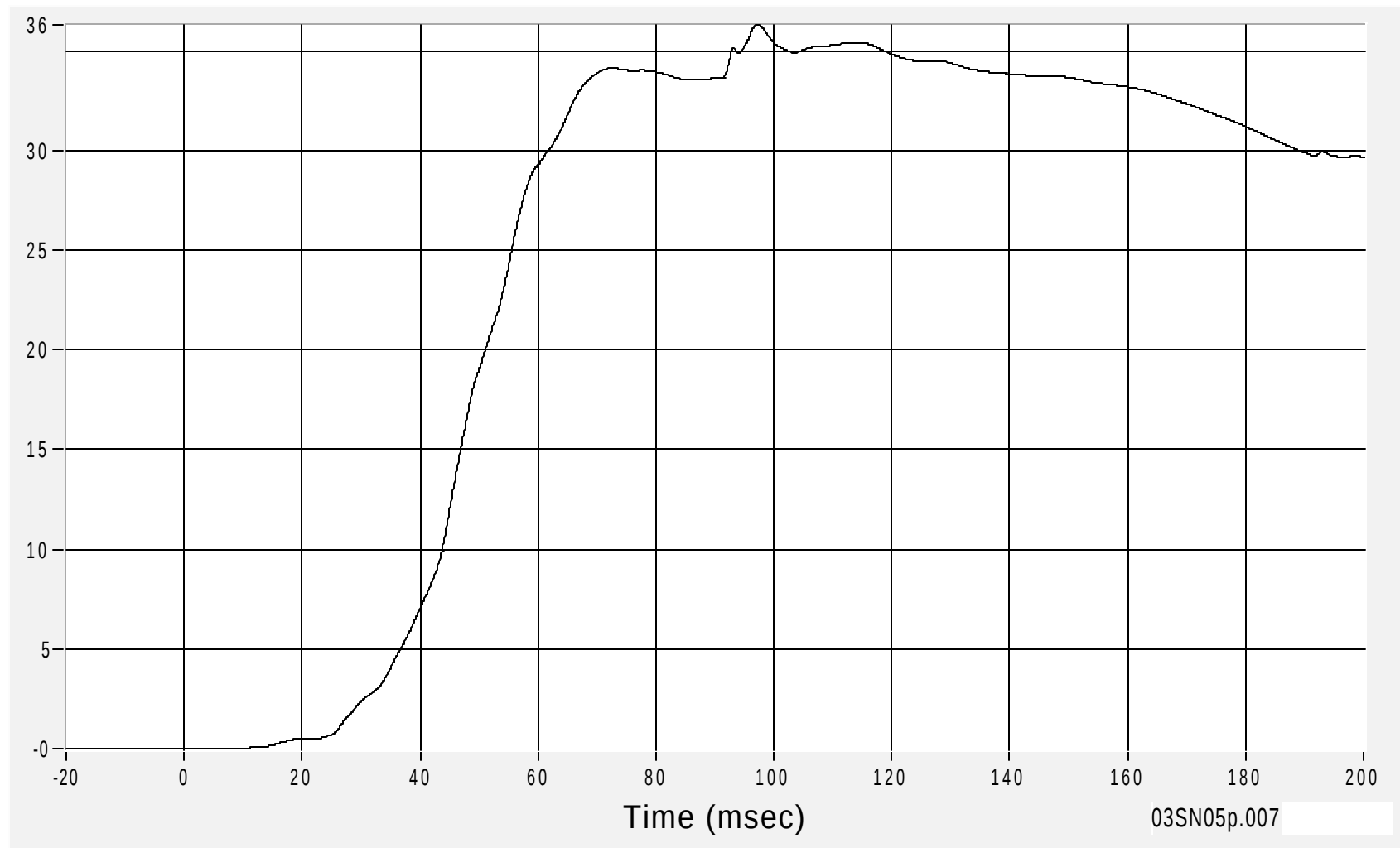
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 36.3 km/h at 97.2 msec
Min 0.0 km/h at 2.1 msec

B-134



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5 February 2003

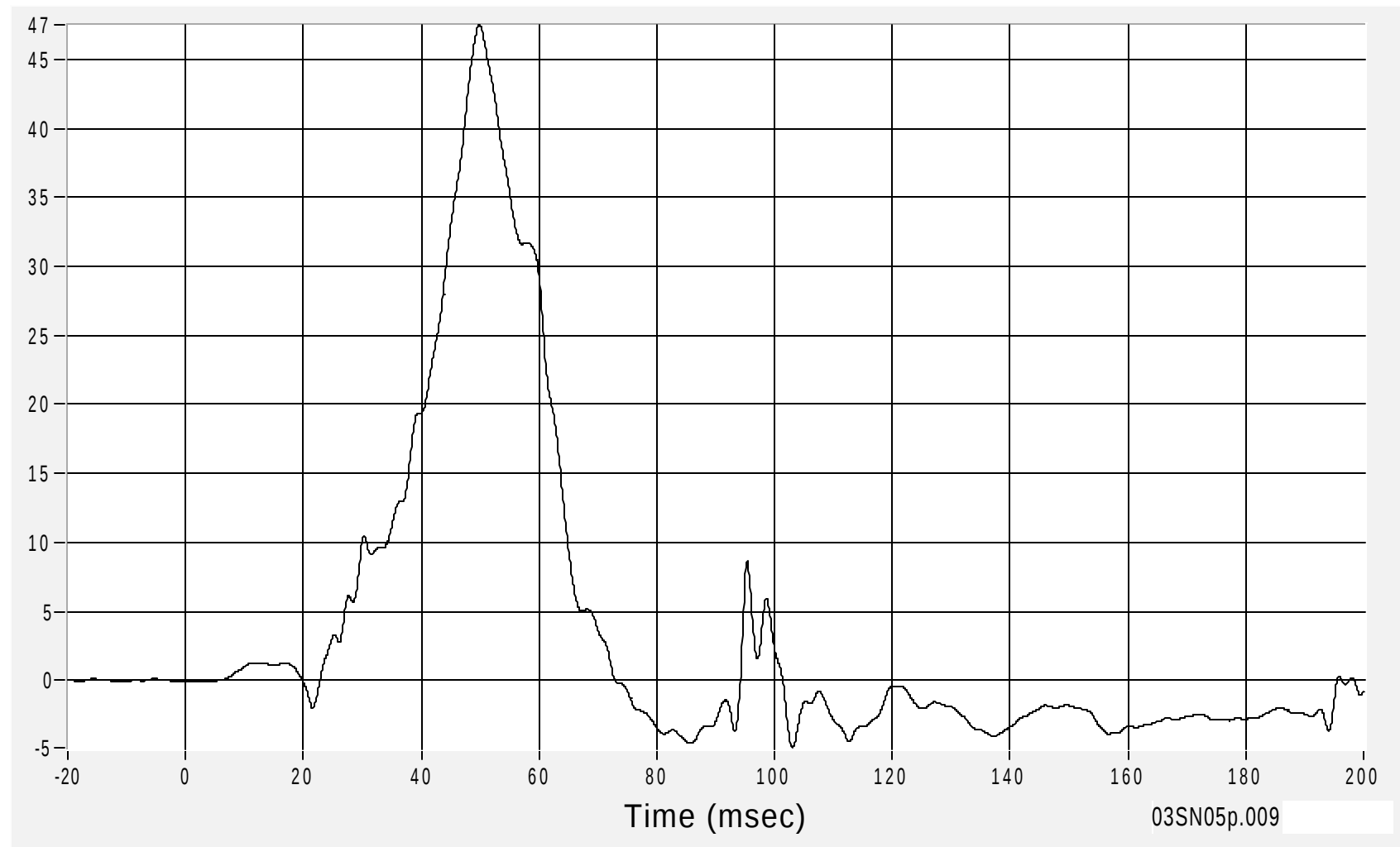
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) CFC180

Max 47.5 G's at 49.8 msec
Min -4.9 G's at 103.0 msec

B-135



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5 February 2003

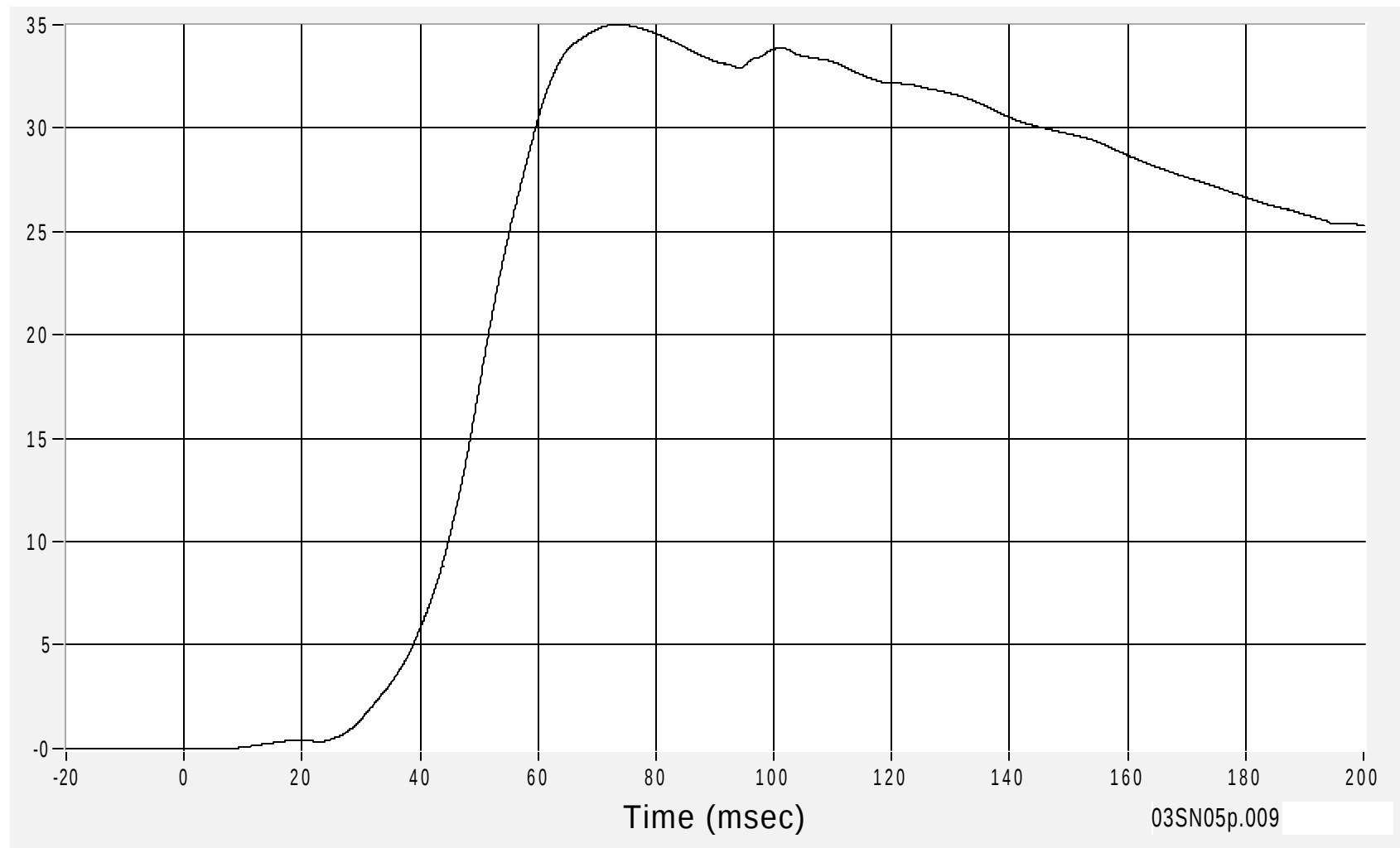
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 35.0 km/h at 73.0 msec
Min 0.0 km/h at 5.4 msec

B-136



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5 February 2003

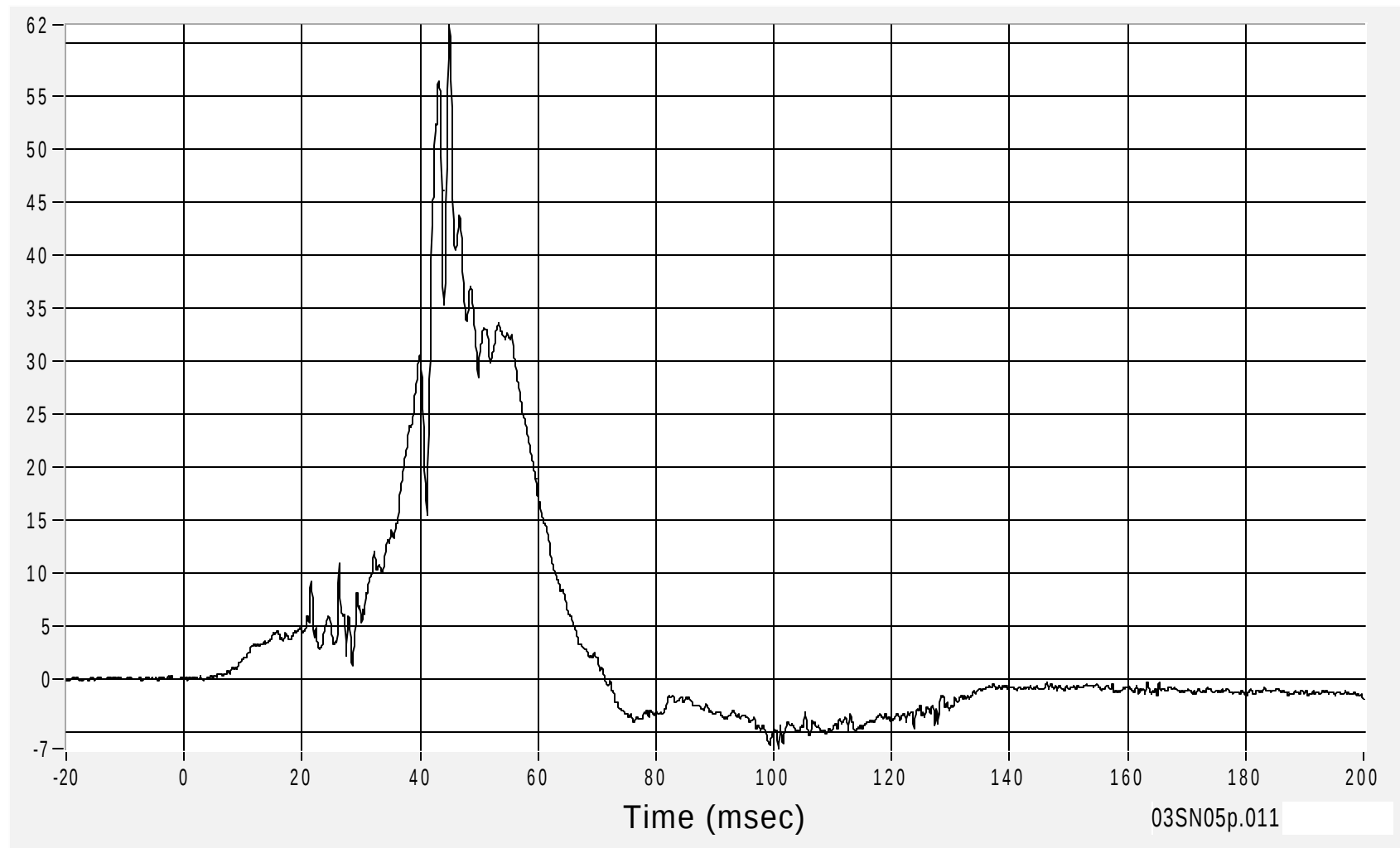
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 61.7 G's at 45.0 msec
Min -6.6 G's at 100.8 msec

B-137



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5 February 2003

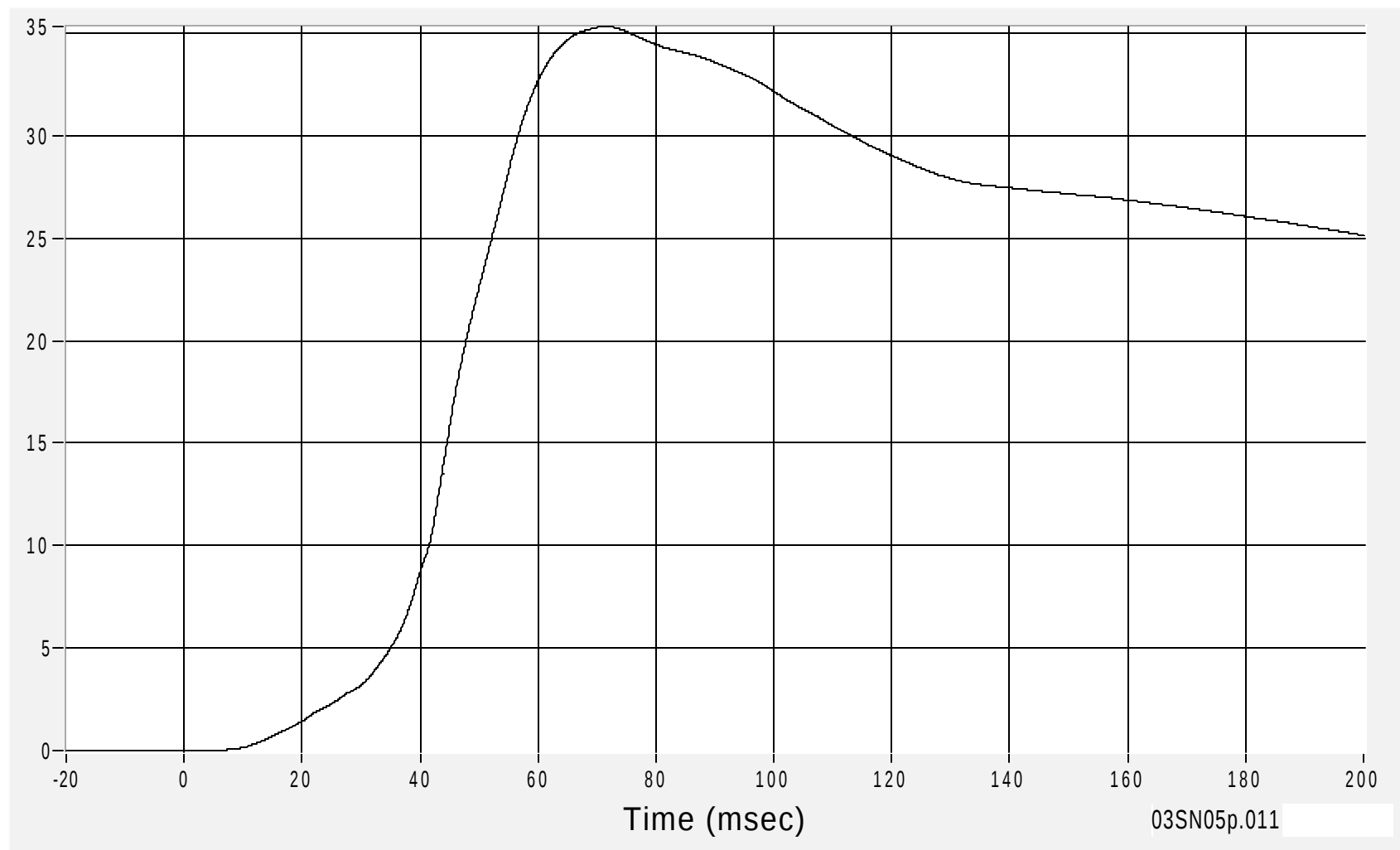
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 35.3 km/h at 71.4 msec
Min 0.0 km/h at 0.0 msec

B-138



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

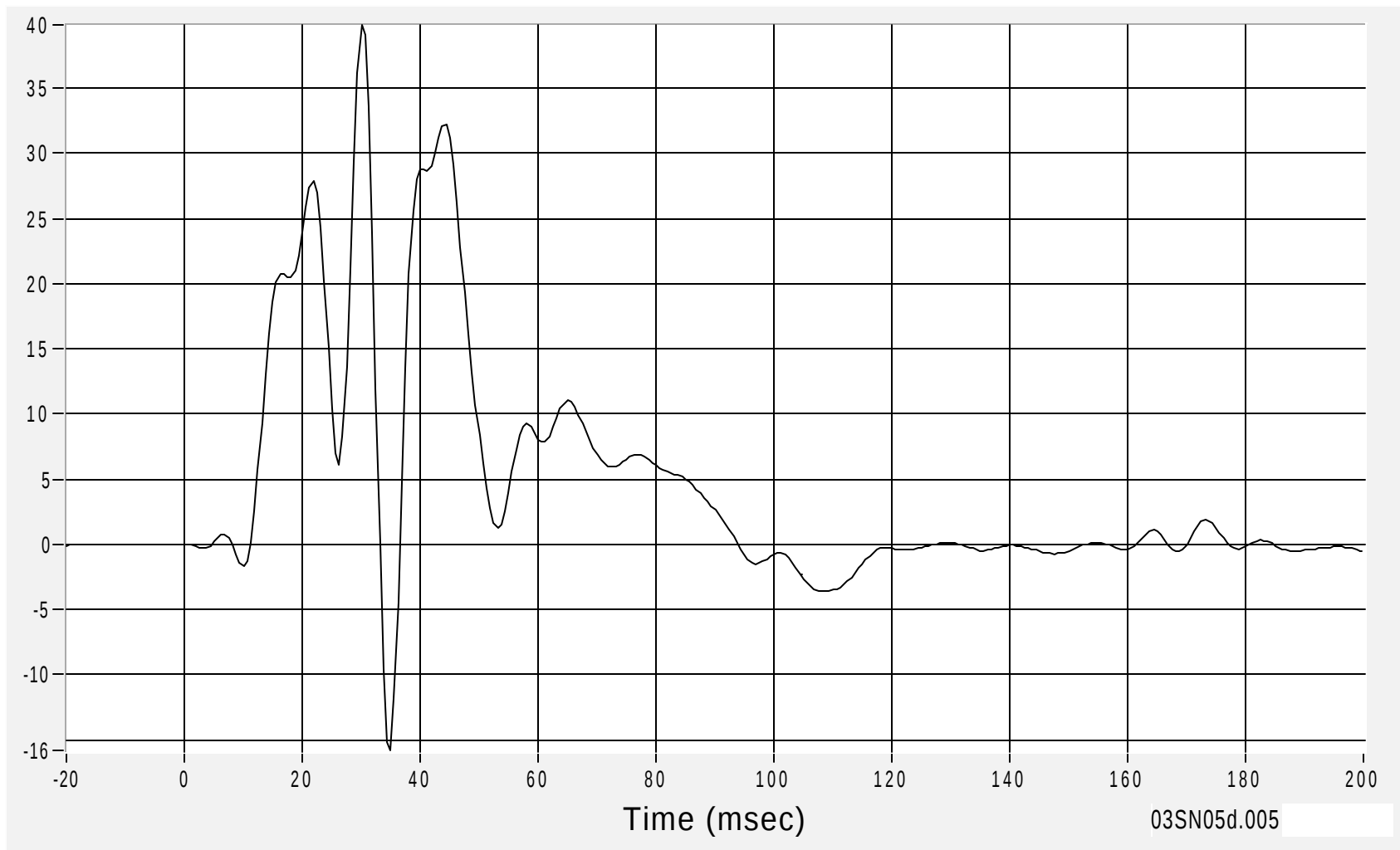
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 39.9 G's at 30.0 msec
Min -15.8 G's at 35.0 msec

B-139



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5 February 2003

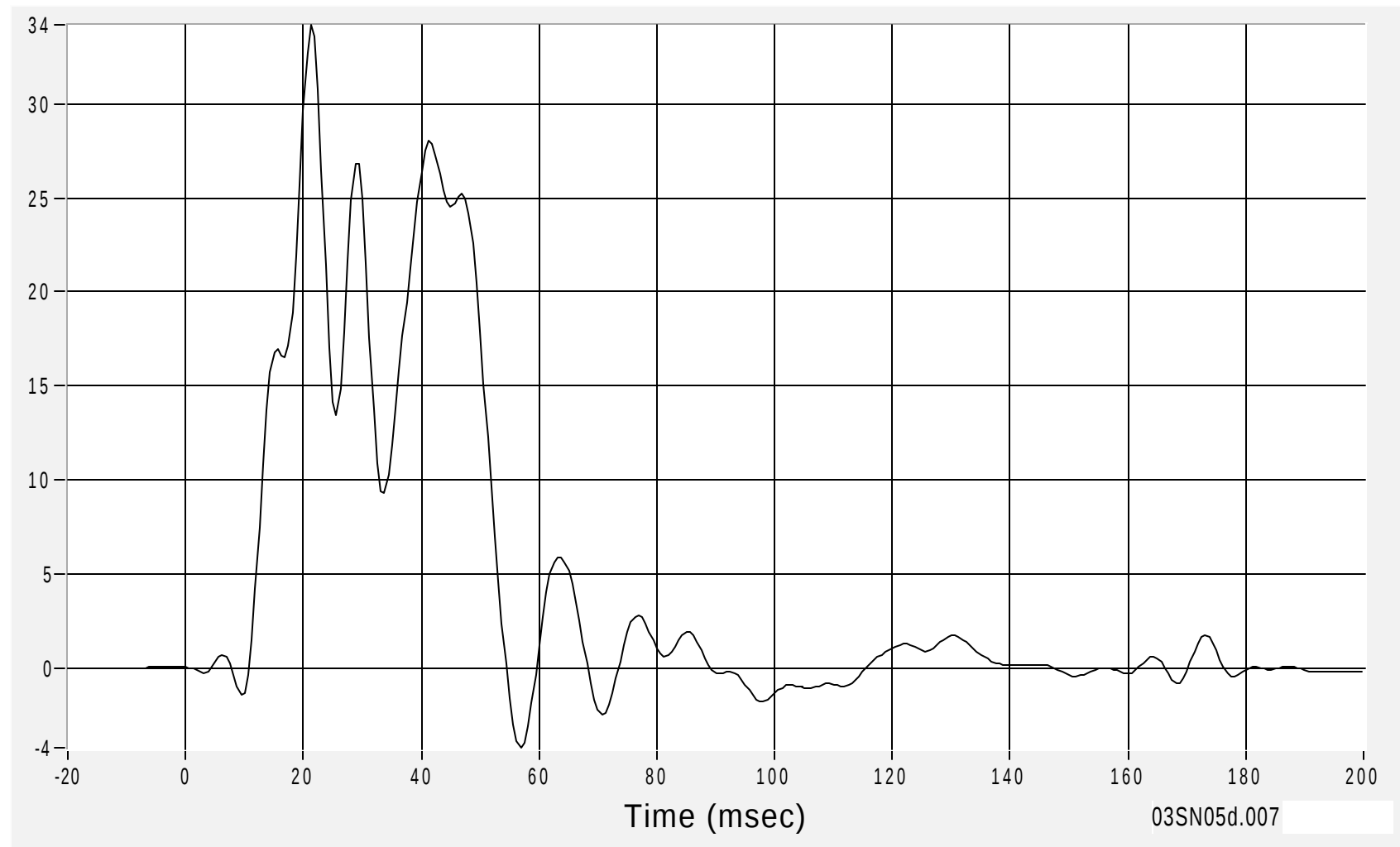
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max	34.2	G's	at	21.2	msec
Min	-4.2	G's	at	56.9	msec

B-140



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5 February 2003

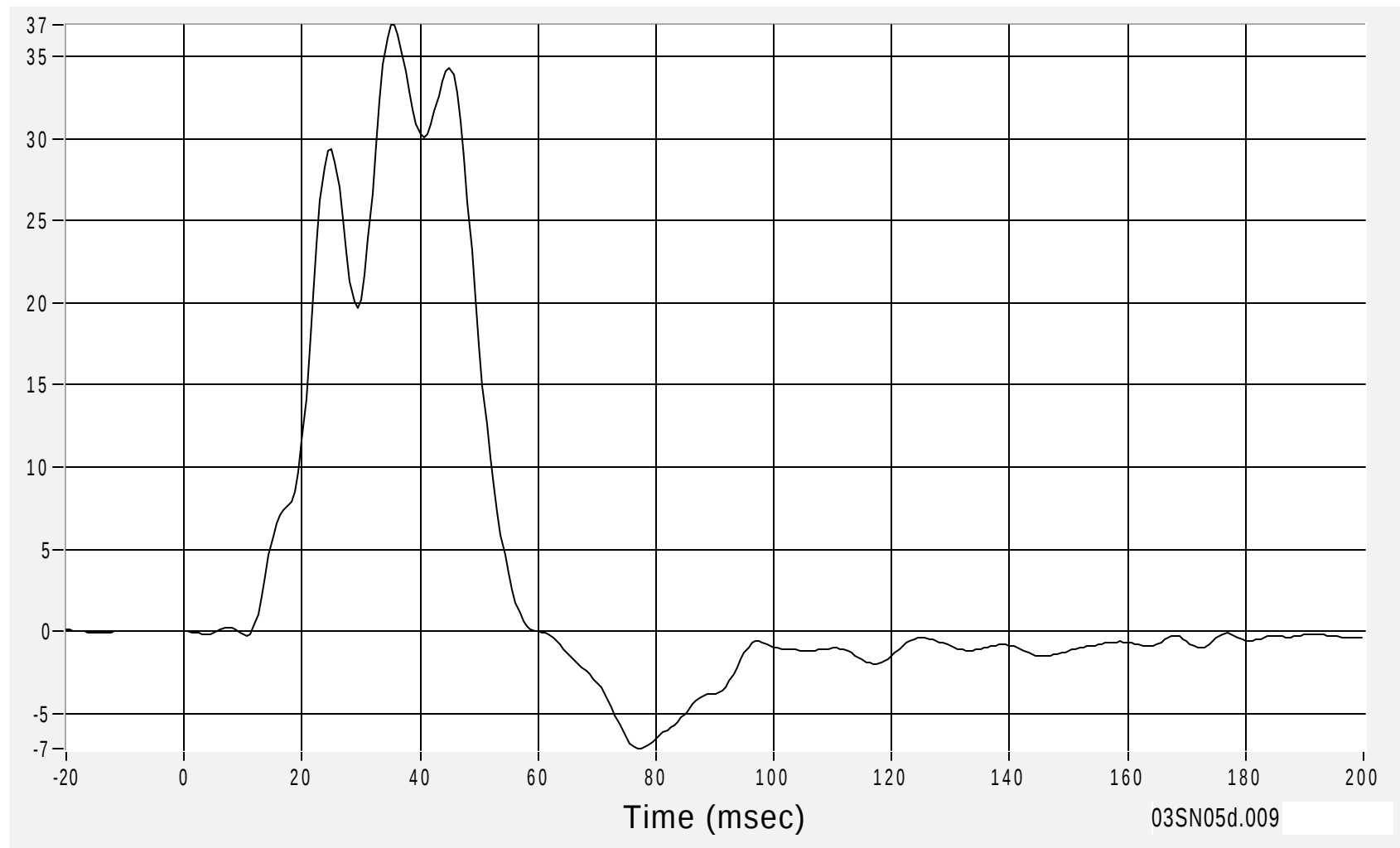
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 36.9 G's at 35.6 msec
Min -7.1 G's at 77.5 msec

B-141



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Medical College of Wisconsin
Vehicle Crashworthiness Lab

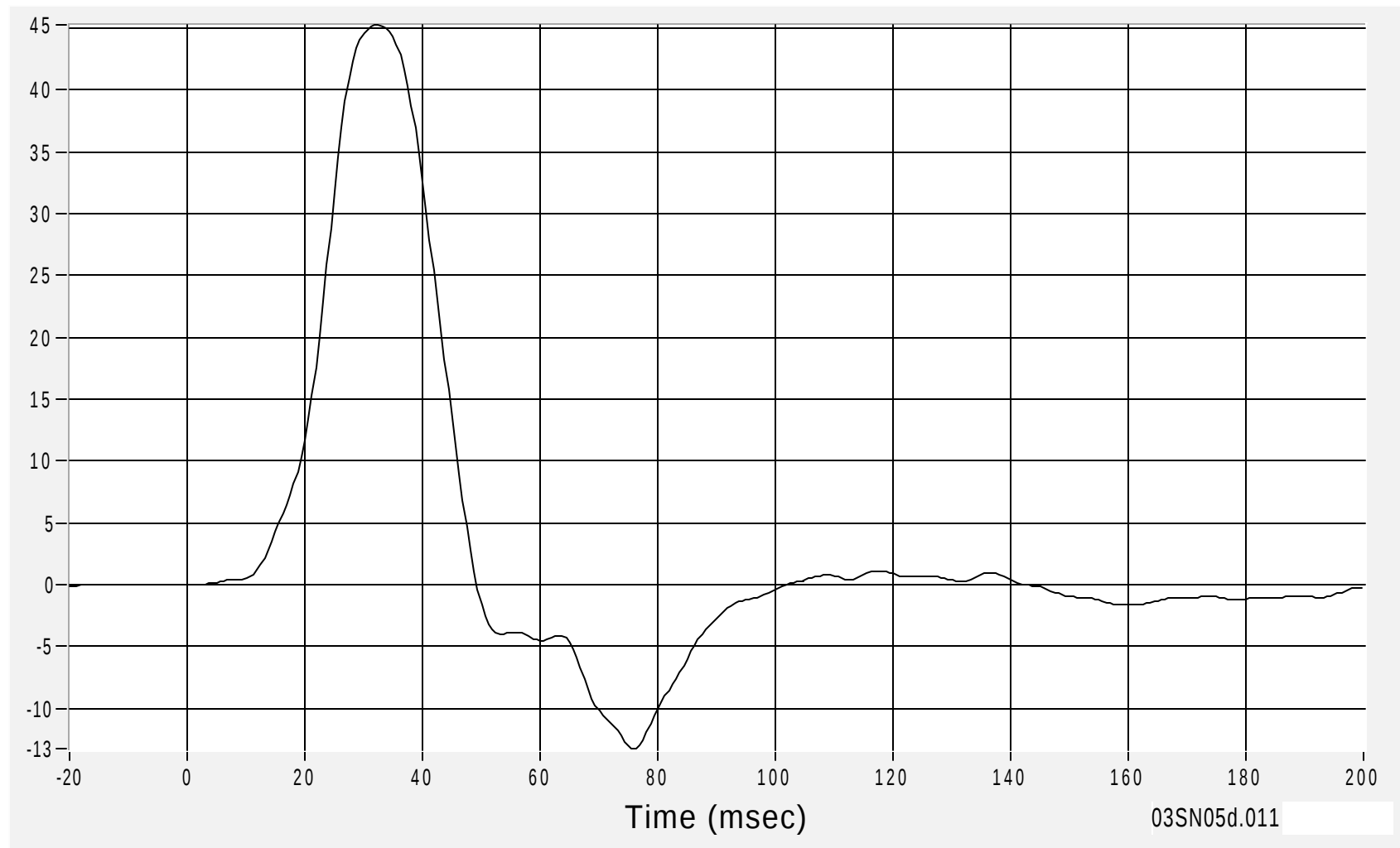
Driver Pelvic (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 45.3 G's at 32.5 msec

Min -13.2 G's at 75.6 msec

B-142



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

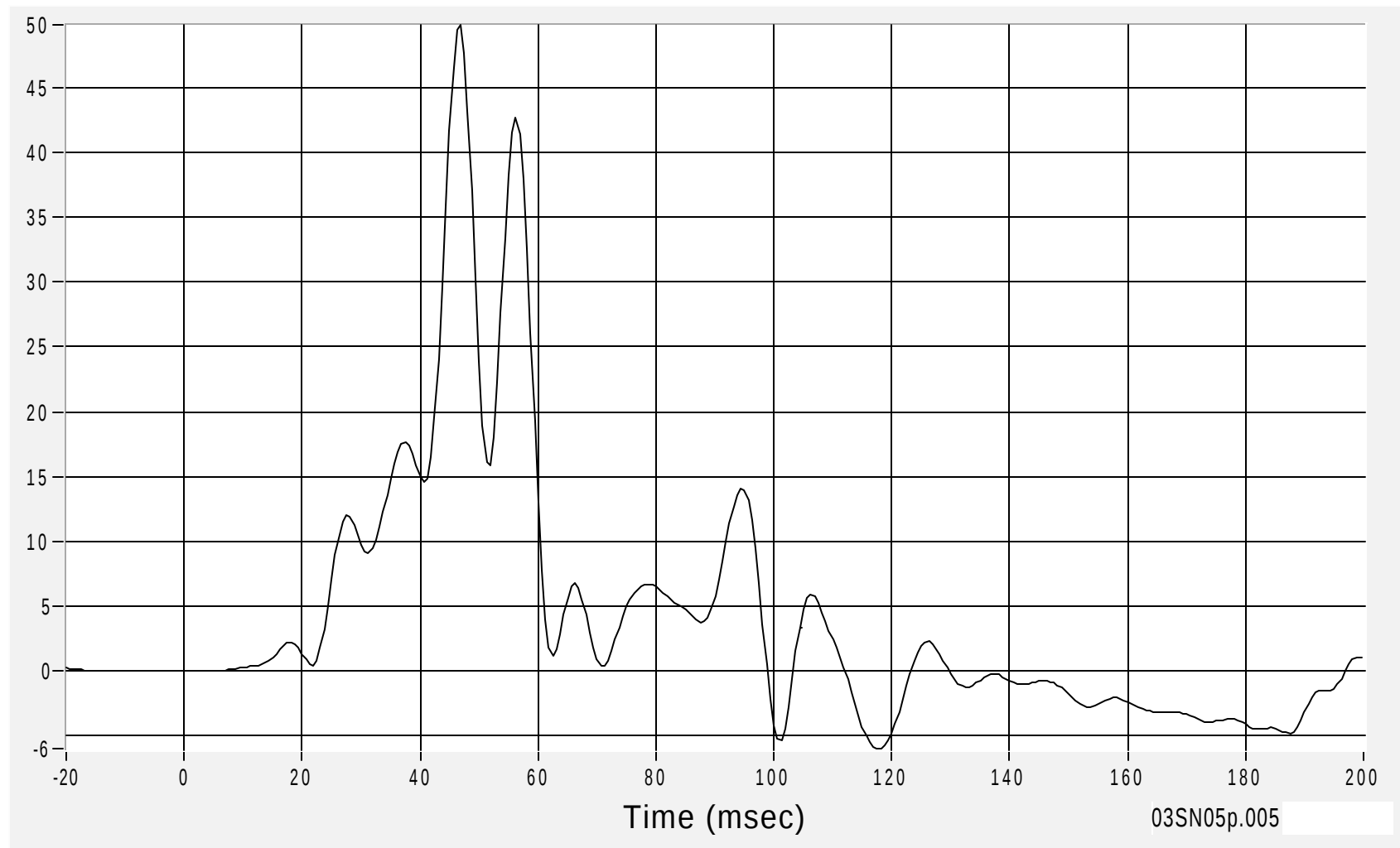
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 49.9 G's at 46.9 msec
Min -6.1 G's at 117.5 msec

B-143



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

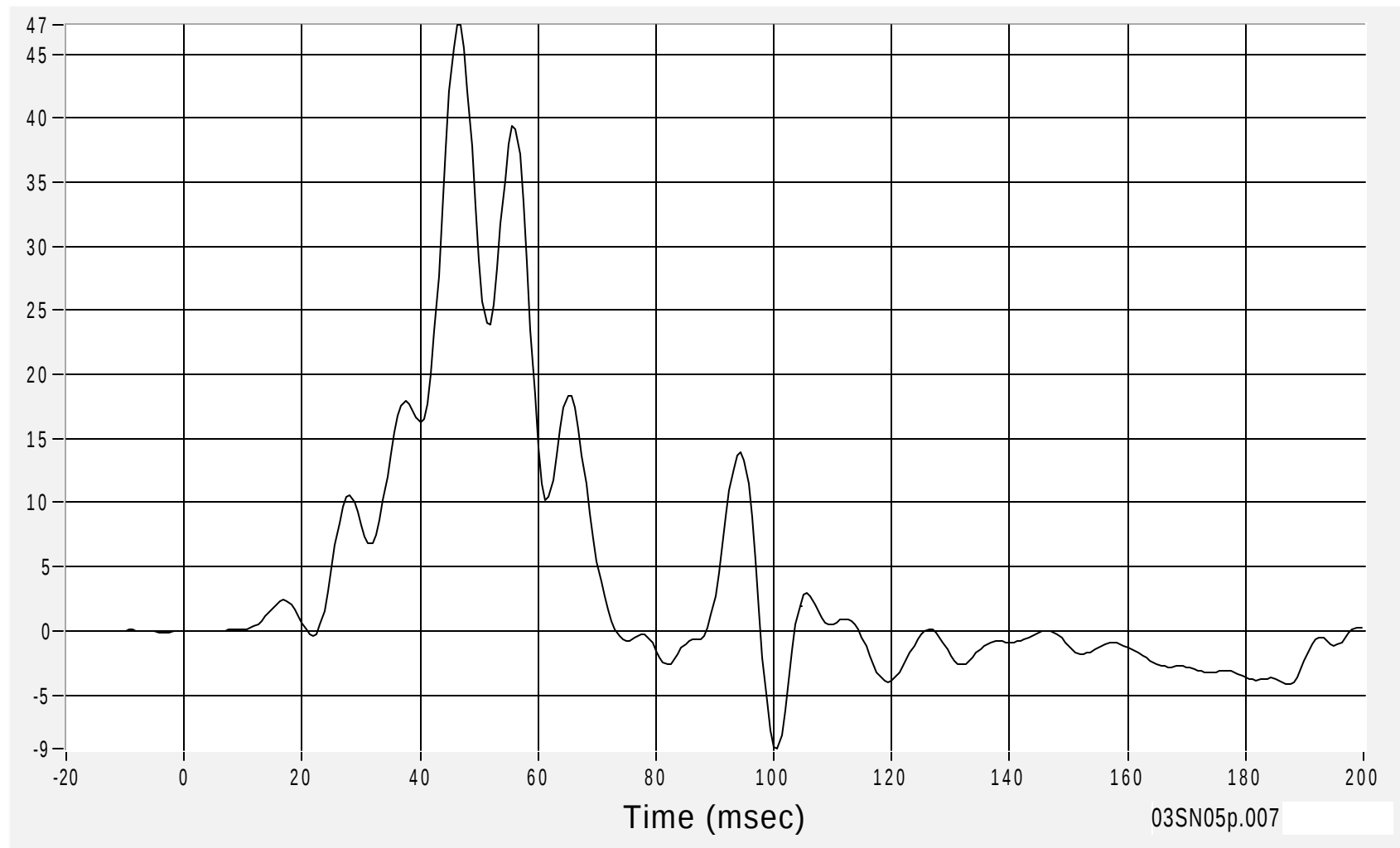
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 47.3 G's at 46.2 msec
Min -9.2 G's at 100.6 msec

B-144



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5 February 2003

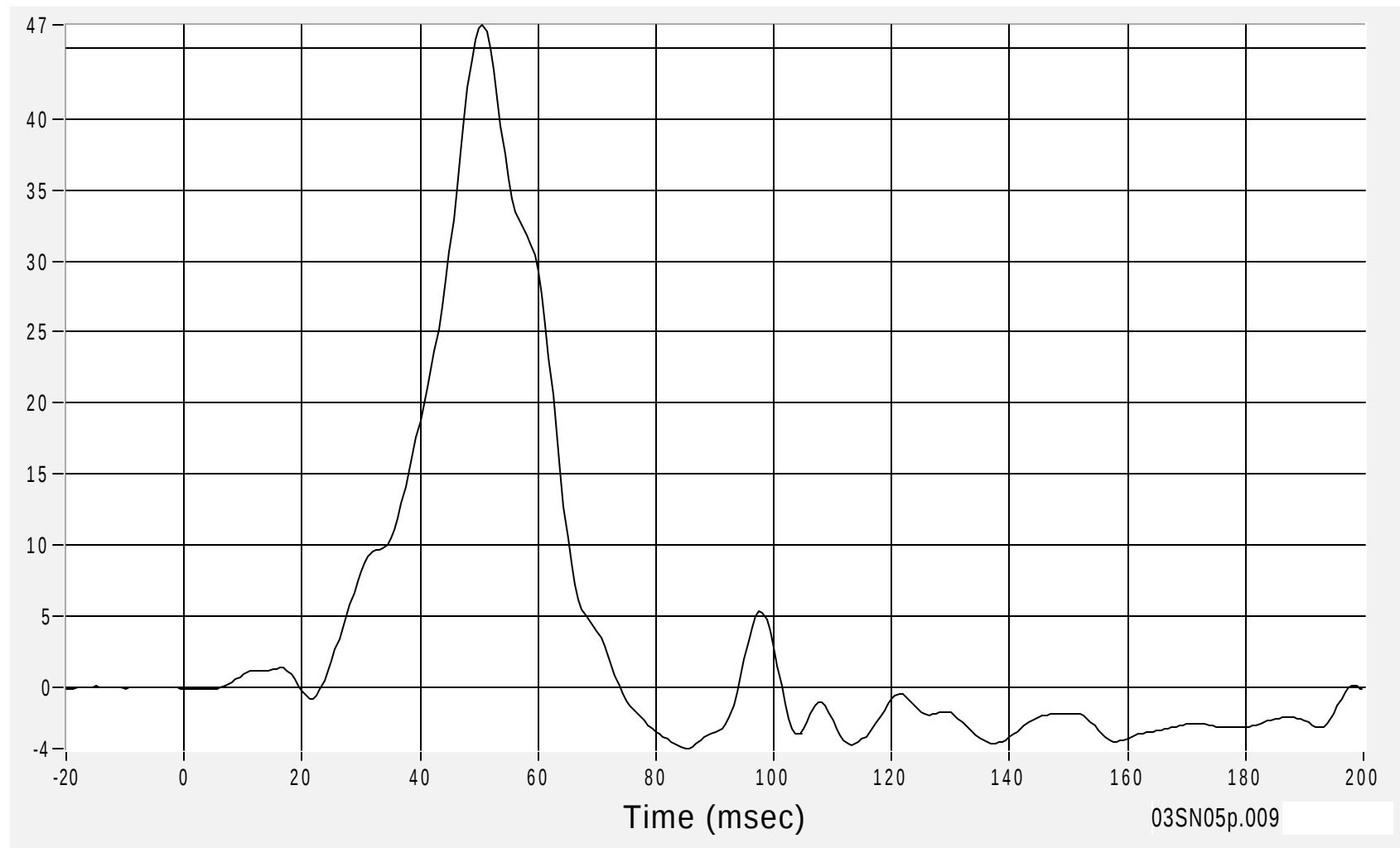
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 46.6 G's at 50.6 msec
Min -4.3 G's at 85.0 msec

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03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

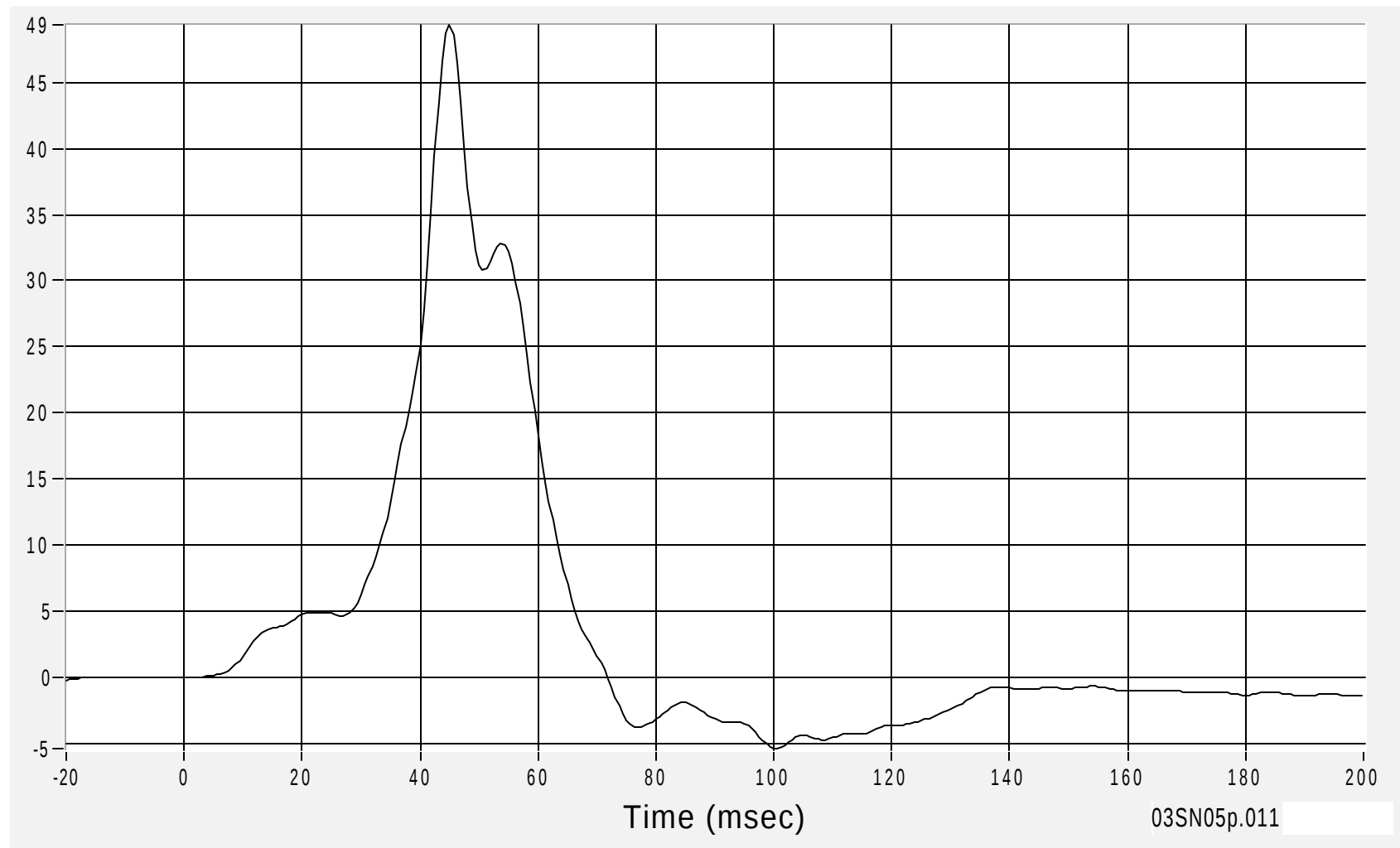
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 49.4 G's at 45.0 msec
Min -5.4 G's at 100.6 msec

B-146



03SN05 - 2003 MERCEDES E-CLASS E320W

5 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

APPENDIX C

SID 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 04 and 05

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	John Humm	Pass all requirements	John Humm
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	John Humm	Pass all requirements	John Humm
LUMBAR FLEXION	Pass all requirements	John Humm	Pass all requirements	John Humm
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	John Humm	Pass all requirements	John Humm
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	John Humm	Pass all requirements	John Humm
LUMBAR FLEXION	Pass all requirements	John Humm	Pass all requirements	John Humm
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 PRE AND POST VERIFICATION

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number	SID H3 056 SID H3 058	Test Sequences	04 and 05 (056) 05 and 06 (058)
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TEST PARAMETER	SPECIFICATION	SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
MEASUREMENTS					
Date	-	31 Jan 03	18 Feb 03	03 Feb 03	18 Feb 03
Sequential Test Number	-	04	05	05	06
Temperature (°C)	18.9-25.5	21.2	23.5	22.0	23.0
Relative Humidity (%)	10-70	15.6	16.4	19.8	16.6
SH – Seated Height (mm)	889-909	903	903	904	909
RH – Rib Height (mm)	501-521	505	507	506	513
HP – Hip Pivot Height (mm)	99	99/99	99/99	99/99	99/99
RD – Rib From Back Line (mm)	229-241	229	229	233	233
KH – Knee Pivot from Back Line (mm)	511-526	525/522	525/518	524/526	524/520
KV – Knee Pivot to Floor (mm)	490-505	504/495	504/493	502/495	503/500
HW – Hip Width (mm)	356-391	366	366	356	356
THORAX IMPACTS					
Date	-	31 Jan 03	18 Feb 03	03 Feb 03	18 Feb 03
Sequential Test Number	-	04	05	05	06
Temperature (°C)	18.9-25.5	19.7	23.4	20.1	22.8
Relative Humidity (%)	10-70	19.0	16.4	18.6	16.5
Probe Speed (m/s)	4.21-4.33	4.26	4.23	4.30	4.31
Upper Rib Acceleration (G)	37-46	42.8	40.9	43.2	43.8
Lower Rib Acceleration (G)	37-46	42.7	40.7	41.2	43.1
Lower Spine Acceleration (G)	15-22	20.5	19.4	20.2	20.6
PELVIS IMPACTS					
Date	-	03 Feb 03	18 Feb 03	03 Feb 03	18 Feb 03
Sequential Test Number	-	04	05	05	06
Temperature (°C)	18.9-25.5	18.9	23.3	20.2	22.8
Relative Humidity (%)	10-70	20.0	16.3	18.6	16.6
Probe Speed (m/s)	4.21-4.33	4.30	4.22	4.32	4.23
Pelvis Acceleration (G)	40-60	58.9	50.1	47.5	42.2
THORACIC SHOCK ABSORBER					
Shock Absorber ID Number	-	-	406	-	03130164
Damper Setting	1-10	-	6.2	-	5
Date	-	-	14 Feb 03	-	14 Feb 03
Sequential Test Number	-	-	02	-	02
Temperature	18.9-25.5	-	19.2	-	21.0
Relative Humidity	10-70	-	16.5	-	17.7
Probe Speed (m/s) Low	3.05	-	3.05	-	3.02
Force (N)	836 – 1125	-	1016.4	-	888.9
Displacement (mm)	30 – 35	-	32.1	-	30.0
Probe Speed (m/s) Middle	4.27	-	4.27	-	4.27
Force (N)	1730 – 2099	-	1754.4	-	1788.3
Displacement (mm)	32 – 37	-	36.0	-	34.0
Probe Speed (m/s) High	6.10	-	6.10	-	6.13
Force (N)	3741 – 4448	-	3869.7	-	4132.0
Displacement (mm)	33 – 40	-	38.8	-	36.5

TEST PARAMETER	SPECIFICATION	SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
ABDOMINAL COMPRESSION					
Date	-	-	17 Feb 03	-	17 Feb 03
Sequential Test Number	-	-	2	-	2
Temperature (°C)	18.9-25.5	-	23.7	-	22.4
Relative Humidity (%)	10-70	-	16.7	-	16.6
Force at 13 mm (N)	104-162	-	121.6	-	130.7
Force at 19 mm (N)	163-221	-	178.1	-	195.0
Force at 25 mm (N)	222-280	-	257.9	-	269.5
Force at 33 mm (N)	325-391	-	389.8	-	374.6
LUMBAR FLEXION					
Date	-	-	17 Feb 03	-	17 Feb 03
Sequential Test Number	-	-	2	-	2
Temperature (°C)	18.9-25.5	-	20.7	-	21.3
Relative Humidity (%)	10-70	-	17.9	-	18.2
Force at 0° (N)	0-26.7	-	0	-	22.5
Force at 0° (N)	97.8-151.2	-	108.7	-	134.2
Force at 0° (N)	151.2-204.6	-	158.5	-	166.6
Force at 0° (N)	204.6-258	-	212.7	-	207.9
Return Angle	12° Maximum	-	2.5	-	4.3
HYBRID III LATERAL NECK					
Date	-	30 Jan 03	11 Feb 03	30 Jan 03	11 Feb 03
Sequential Test Number	-	04	05	05	06
Temperature (°C)	18.9-25.5	20.7	20.1	20.1	20.3
Relative Humidity (%)	10-70	32.5	18.0	20.2	16.7
Pendulum Speed (m/s)	6.89-7.13	7.11	7.08	7.03	6.94
Pendulum Pulse 10ms (m/s)	1.96-2.55	2.44	1.98	2.31	2.18
Pendulum Pulse 20ms (m/s)	4.12-5.10	4.93	4.23	4.83	4.86
Pendulum Pulse 30ms (m/s)	5.73-7.01	6.77	6.25	6.61	6.95
Pendulum Pulse 40 –70 ms (m/s)	6.27-7.64	6.72	6.75	6.53	6.90
Max Head rotation (deg)	64-78	72.6	75.8	71.6	77.1
Head angle crosses zero (ms)	50-70	55.0	60.3	50.6	51.9
Peak Moment (Nm)	88-108	88.3	93.4	92.0	91.1
Moment crosses zero (ms)	40-60	50.0	51.2	44.9	48.6
Max rotation wrt peak moment (ms)	0-20	10.7	6.2	7.0	7.36
HYBRID III LATERAL HEAD DROP					
Date	-	28 Jan 03	10 Feb 03	27 Jan 03	7 Feb 03
Sequential Test Number	-	04	05	05	06
Temperature (°C)	18.9-25.5	19.0	19.9	19.7	19.4
Relative Humidity (%)	10-70	18.1	18.9	18.5	19.1
Resultant Max (G)	120-150	128.4	125.4	131.7	121.8
Longitudinal Max (G)	<15	12.4	5.3	10.1	8.4

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

SID Serial Number

SID H3 056

Test Sequences

05 and 06 (056)

SID H3 058

06 and 07 (058)

		SID H3 058		SID H3 056	
		PRE	POST	PRE	POST
	Date	04 Feb 03	18 Feb 03	04 Feb 03	18 Feb 03
	Performed By	Mark Meyer	Mark Meyer	Mark Meyer	Mark Meyer
PART	INSPECTION	Pass	Pass	Pass	Pass
Skin	Visual	Pass	Pass	Pass	Pass
Head	Visual, Ballast, Accelerometer Mount	Pass	Pass	Pass	Pass
Neck	Visual and Palpated, Cable Torque	Pass	Pass	Pass	Pass
Spine Box	Visual, Ballast, Weldment, Accelerometer Mount	Pass	Pass	Pass	Pass
Rib Cage	Visual, Palpated, Measured, Stiffness	Pass	Pass	Pass	Pass
Sternum	Visual	Pass	Pass	Pass	Pass
Lumbar Spine	Visual	Pass	Pass	Pass	Pass
Abdomen	Visual	Pass	Pass	Pass	Pass
Pelvis	Visual, Palpated, Accelerometer Mount	Pass	Pass	Pass	Pass
Upper Legs	Visual	Pass	Pass	Pass	Pass
Knees	Visual, Stops, Inserts	Pass	Pass	Pass	Pass
Lower 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		None	None	None	None

APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

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SID INSTRUMENTATION**FRONT SID H3 NO. 058**

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X ACCELERATION	J35641	ENDEVCO	01Nov02
HEAD Y ACCELERATION	J19089	ENDEVCO	05Nov02
HEAD Z ACCELERATION	J34364	ENDEVCO	05Nov02
SIX AXIS UPPER NECK LOAD CELL (FX, FY, FZ, MX, MY, MZ)	0452	DENTON ATD	18Nov02
UPPER RIB ACCELERATION	J36031	ENDEVCO	04Nov02
LOWER RIB ACCELERATION	J35932	ENDEVCO	06Nov02
LOWER SPINE ACCELERATION	J21552	ENDEVCO	05Nov02
PELVIS ACCELERATION	J35937	ENDEVCO	04Nov02
UPPER RIB REDUNDANT ACCELERATION	J18553	ENDEVCO	01Nov02
LOWER RIB REDUNDANT ACCELERATION	J36616	ENDEVCO	05Nov02
LOWER SPINE REDUNDANT ACCELERATION	J35839	ENDEVCO	04Nov02
PELVIS REDUNDANT ACCELERATION	J32565	ENDEVCO	15Nov02

REAR SID H3 NO. 056

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X ACCELERATION	P16867	ENDEVCO	13Dec02
HEAD Y ACCELERATION	P13819	ENDEVCO	14Nov02
HEAD Z ACCELERATION	J35768	ENDEVCO	14Nov02
SIX AXIS UPPER NECK LOAD CELL (FX, FY, FZ, MX, MY, MZ)	274	FTSS	12Nov02
UPPER RIB ACCELERATION	J21551	ENDEVCO	05Nov02
LOWER RIB ACCELERATION	J36614	ENDEVCO	05Nov02
LOWER SPINE ACCELERATION	J36603	ENDEVCO	01Nov02
PELVIS ACCELERATION	J36617	ENDEVCO	04Nov02
UPPER RIB REDUNDANT ACCELERATION	J32665	ENDEVCO	01Nov02
LOWER RIB REDUNDANT ACCELERATION	J22318	ENDEVCO	15Nov02
LOWER SPINE REDUNDANT ACCELERATION	J32662	ENDEVCO	04Nov02
PELVIS REDUNDANT ACCELERATION	J22189	ENDEVCO	14Nov02

VEHICLE INSTRUMENTATION

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL X	P22239	ENDEVCO	14Nov02
RIGHT FRONT SILL Y	P12825	ENDEVCO	15Nov02
RIGHT FRONT SILL Z	P21820	ENDEVCO	06Nov02
RIGHT REAR SILL X	P13846	ENDEVCO	15Nov02
RIGHT REAR SILL Y	P22230	ENDEVCO	14Nov02
RIGHT REAR SILL Z	P13725	ENDEVCO	14Nov02
REAR FLOORPAN ABOVE AXLE X	98G98D22-Z04	ENTRAN	15Nov02
REAR FLOORPAN ABOVE AXLE Y	98B98A26-D05	ENTRAN	15Nov02
REAR FLOORPAN ABOVE AXLE Z	98G98E11-K02	ENTRAN	15Nov02
LEFT REAR SILL Y	P22993	ENDEVCO	14Nov02
LEFT FRONT SILL Y	P13837	ENDEVCO	14Nov02
LEFT FRONT DOOR CENTERLINE Y	P22314	ENTRAN	15Nov02
RIGHT REAR OCCUPANT COMP Y	P22312	ENDEVCO	15Nov02
MID-REAR OF LEFT FRONT DOOR Y	P22318	ENDEVCO	13Dec02
LEFT FRONT DOOR UPPER C/L Y	P22339	ENDEVCO	15Nov02
MID-REAR OF LEFT REAR DOOR Y	P12931	ENDEVCO	14Nov02
LEFT REAR DOOR UPPER C/L Y	P19568	ENDEVCO	13Dec02
LEFT LOWER B-PILLAR Y	P21137	ENDEVCO	06Nov02
LEFT MIDDLE B-PILLAR Y	P22578	ENDEVCO	13Dec02
LEFT LOWER A-PILLAR Y	P23582	ENDEVCO	16Aug02
LEFT UPPER A-PILLAR	P22313	ENDEVCO	15Nov02
FRONT SEAT TRACK Y	P19211	ENDEVCO	13Dec02
REAR SEAT TRACK Y	P23595	ENDEVCO	13Dec02
VEHICLE CG X	P13598	ENDEVCO	14Nov02
VEHICLE CG Y	P13868	ENDEVCO	15Nov02
VEHICLE CG Z	P13869	ENDEVCO	14Nov02

MDB INSTRUMENTATION

MDB CG X	P22322	ENDEVCO	14Nov02
MDB CG Y	P21151	ENDEVCO	27Nov02
MDB CG Z	98B98A26-D10	ENTRAN	14Nov02
MDB REAR FRAME MEMBER X	P22350	ENDEVCO	27Nov02
MDB REAR FRAME MEMBER Y	P22978	ENDEVCO	27Nov02