

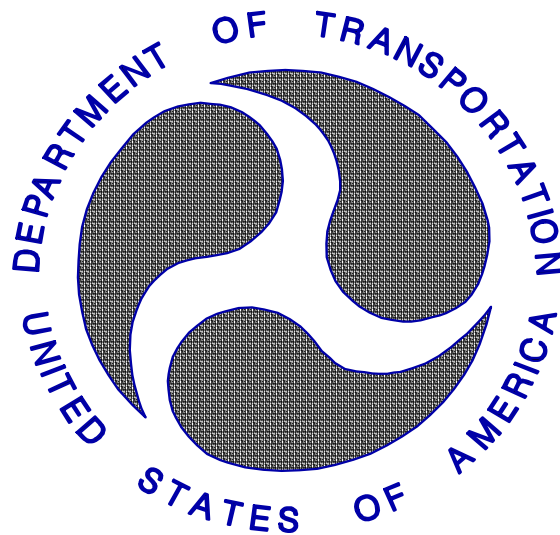
REPORT NO. MCW-DOT-04SN05

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING**

GENERAL MOTORS CORPORATION
2004 CHEVROLET COLORADO 4 DOOR PICKUP

NHTSA NUMBER: M40109

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



22 JANUARY 2004

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.

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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 2004 Chevrolet Colorado 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 22 January 2004. The impact velocity of the Moving Deformable Barrier (MDB) was 62.07 km/h, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 19.5° C. The target vehicle post-test maximum crush was 357 mm at Level 3. 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>44.8</td><td>44.3</td></tr> <tr> <td>Left Lower Rib Acceleration G</td><td>42.8</td><td>58.6</td></tr> <tr> <td>Lower Spine Acceleration G</td><td>80.0</td><td>43.7</td></tr> <tr> <td>Thoracic Trauma Index TTI</td><td>62</td><td>51</td></tr> <tr> <td>Pelvis Acceleration G</td><td>115</td><td>69</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.					<u>DRIVER</u>	<u>PASSENGER</u>	Left Upper Rib Acceleration G	44.8	44.3	Left Lower Rib Acceleration G	42.8	58.6	Lower Spine Acceleration G	80.0	43.7	Thoracic Trauma Index TTI	62	51	Pelvis Acceleration G	115	69
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17. Key Words New Car Assessment Program (NCAP) Side Impact MDB Side Impact Dummy (SID H3) NHTSA No. M40109		18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Rulemaking Office of Crashworthiness Standards Room 5307, NVS-111 400 Seventh Street, SW Washington, DC 20590																			
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SECTION 1**PURPOSE AND TEST PROCEDURE**

This side impact test was part of the FY04 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 2004 Chevrolet Colorado 4 Door Pickup. This side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated November 2002.

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 2004 Chevrolet Colorado 4 Door Pickup 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 62.07 km/h (38.57 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 22 January 2004.

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

The SID H3s were instrumented with the following accelerometers.

1. Left Upper Rib (LUR) Primary and Redundant uniaxial accelerometers (Y-direction)
2. Left Lower Rib (LLR) Primary and Redundant uniaxial accelerometers (Y-direction)
3. Lower Thoracic Spine (T₁₂) Primary and Redundant uniaxial accelerometers (Y-direction)
4. Pelvic (PEV) section Primary and Redundant uniaxial accelerometers (Y-direction)
5. Head Center of Gravity triaxial accelerometers (X-, Y-, and Z-direction)
6. Upper Neck (NKU) six axis load cell (Fx, Fy, Fz, Mx, My, and Mz)

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

The following table summarizes the results of this test.

Injury Criteria	Front SID H3	Rear SID H3
TTI (G)	62	51
PELVIS (G)	115.0	69.2
HIC36	420.2	145.6

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

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

SECTION 3
SUMMARY OF TEST RESULTS

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

Year/ Make/ Model/ Body Style				2004 Chevrolet Colorado 4 Door Pickup			
Vehicle NHTSA NO.		M40109		VIN		1GCCS136448107024	
Vehicle Body Color		Black		Build Date		November 2003	
Engine Data	<u>6</u>	Cylinders	<u>CID</u>	<u>3.5</u>	Liter	<u>cc</u>	
Placement	<u>X</u>	Longitudinal	<u>Lateral</u>				
Transmission	<u>4</u>	Speed	<u>Manual</u>	<u>X</u>	Automatic	<u>X</u>	Overdrive
Final Drive	<u>X</u>	Rear Wheel Drive	<u>Front Wheel Drive</u>		Four Wheel Drive		
Odometer Reading	<u>99 miles</u>	Date	<u>30 November 2003</u>				
Options	<u>X</u>	A/C	<u>X</u>	Power Steering	<u>X</u>	Power Brakes	<u>X</u> Power Windows
	<u>X</u>	Cruise Control	<u>X</u>	Tilt Wheel	<u>X</u>	Power Locks	<u>ADLS</u>

DATA FROM TIRE PLACARD:

Tire Pressure (at Capacity)	<u>33</u>	PSI Front
	<u>33</u>	PSI Rear
Recommended Tire Size	<u>P225 75R15</u>	
Tires on Test Vehicle	<u>P225 75R15</u>	Manufacturer <u>General</u>

TEST VEHICLE AIRBAG INFORMATION:

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

VEHICLE CAPACITY DATA:

Number of Occupants:	<u>3</u>	Front	<u>3</u>	Rear	<u>3rd Seat</u>	<u>6</u>	Total
Type of Front Seats	<u>X</u>	Bucket		Bench	<u>Split Bench</u>		
Type of Front Seat Back		Fixed	<u>X</u>	Adjustable w/	<u>X</u>	Lever	<u>X</u> Knob
Vehicle Max Capacity Loading				<u>519.4</u>	kg	(A)	
No. of Occupants X 68.04 kg				<u>408.2</u>	kg	(B)	
Cargo Capacity (A) – (B)				<u>111.2</u>	kg		

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front	=	<u>489.0</u>	kg	Left Rear	=	<u>380.6</u>	kg
Right Front	=	<u>465.4</u>	kg	Right Rear	=	<u>369.2</u>	kg
TOTAL FRONT	=	<u>954.4</u>	kg	TOTAL REAR	=	<u>749.8</u>	kg
% Total Weight	=	<u>56.0</u>	%	%Total Weight	=	<u>44.0</u>	%
TOTAL WEIGHT	=	<u>1704.2</u>	kg				

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

Total Test Vehicle Delivered Weight with Max Fluids	=	<u>1704.2</u>	kg	(A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>111.2</u>	kg	(B)
Weight of (2) instrumented Side Impact Dummies	=	<u>161.0</u>	kg	(C)
TEST VEHICLE TARGET WEIGHT	=	<u>1976.4</u>	kg	(A+B+C)

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

Left Front	=	<u>555.7</u>	kg	Left Rear	=	<u>491.7</u>	kg
Right Front	=	<u>463.2</u>	kg	Right Rear	=	<u>465.8</u>	kg
TOTAL FRONT	=	<u>1018.9</u>	kg	TOTAL REAR	=	<u>957.5</u>	kg
% Total Weight	=	<u>51.6</u>	%	%Total Weight	=	<u>48.4</u>	%
TOTAL WEIGHT	=	<u>1976.4</u>	kg				

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

Left Front	=	<u>552.0</u>	kg	Left Rear	=	<u>489.0</u>	kg
Right Front	=	<u>463.6</u>	kg	Right Rear	=	<u>464.5</u>	kg
TOTAL FRONT	=	<u>1015.6</u>	kg	TOTAL REAR	=	<u>953.5</u>	kg
% Total Weight	=	<u>51.6</u>	%	%Total Weight	=	<u>48.4</u>	%
TOTAL WEIGHT	=	<u>1969.1</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED

Left Front	<u>865</u>	Right Front	<u>873</u>	Left Rear	<u>885</u>	Right Rear	<u>888</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

FULLY LOADED

Left Front	<u>844</u>	Right Front	<u>863</u>	Left Rear	<u>838</u>	Right Rear	<u>857</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

AS TESTED

Left Front	<u>845</u>	Right Front	<u>866</u>	Left Rear	<u>839</u>	Right Rear	<u>859</u>
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Test Vehicle Wheelbase 3210 mm

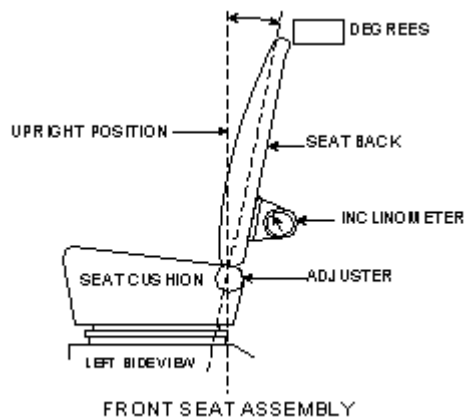
As Tested CG = 1554 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side	=	<u>4897</u>	mm
Left Side	=	<u>4897</u>	mm
Centerline	=	<u>5260</u>	mm

DATA SHEET 1 (continued)**GENERAL TEST VEHICLE PARAMETER DATA**

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		243 mm
Total Number of Detents	25	Test Position 13th Detent (Mid-Position)

FRONT SEAT BACK ADJUSTMENT:

Seat Back Angle	22.5 degrees from vertical at upper outboard seat frame
-----------------	---

REAR SEAT POSITION:

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

ADJUSTABLE STEERING COLUMN POSITION:

Mid-Position

WINDOW POSITIONS:

Left Front	Up	Right Front	Down
Left Rear	Up	Right Rear	Down

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel System usable Capacity	73.8 L
Test Volume	68.6 L
	93% Usable capacity

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

Wheelbase	3210 mm	
Impact Point is	508 mm rearward	of front axle centerline
Actual Impact Point is	513 mm rearward	of front axle centerline

DATA SHEET 2

TEST VEHICLE SUMMARY

VEHICLE IDENTIFICATION:

Year/Make/Model/Body Style	2004 Chevrolet Colorado 4 Door Pickup		
Body Color	Black	VIN	1GCCS136448107024
NHTSA No.	M40109	Test Date	22 January 2004
Overall Length	5260 mm	Overall Width	1706 mm

VEHICLE TEST WEIGHT (Pre-Test):

Left Front	=	552.0	kg	Left Rear	=	489.0	kg
Right Front	=	463.6	kg	Right Rear	=	464.5	kg
TOTAL FRONT	=	1015.6	kg	TOTAL REAR	=	953.5	kg
% Total Weight	=	51.6	%	%Total Weight	=	48.4	%
TOTAL WEIGHT	=	1969.1	kg				
Wheelbase				=		3210	mm
Longitudinal CG from Center of Front Axle				=		1554	mm
Impact Angle with Respect to Impactor				=		90°	

ACTUAL IMPACT POINT

Actual Impact Point is 5 mm rearward and 8 mm below nominal impact point

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1	(390 mm above ground)	=	261	mm
2. LEVEL 2	(700 mm above ground)	=	355	mm
3. LEVEL 3	(732 mm above ground)	=	357	mm
4. LEVEL 4	(1065 mm above ground)	=	223	mm
5. LEVEL 5	(1578 mm above ground)	=	104	mm

Maximum Post-Test intrusion at Level 3 is 357 mm

OCCUPANTS

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

INSTRUMENTATION:

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

DATA SHEET NO. 3**MOVING DEFORMABLE BARRIER (MDB) SUMMARY**MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore Serial Number Plascore Serial Number 033A0703-3 024B0703

POSITION OF IMPACT (MDB) ON TOW SYSTEM

Crabbed 27° to the left

MDB DETAILS:

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

MDB WEIGHT:

Left Front	=	458.0	kg	Left Rear	=	228.9	kg
Right Front	=	307.2	kg	Right Rear	=	365.6	kg
TOTAL FRONT	=	765.2	kg	TOTAL REAR	=	594.5	kg
% Total Weight	=	56.3	%	%Total Weight	=	43.7	%
TOTAL WEIGHT	=	1359.7	kg				

MDB IMPACT:

Impact Angle (MDB C/L to Target Vehicle)		270°	
Impact Speed	Primary	62.071 km/h	38.57 mph
	Secondary	61.89 km/h	38.46 mph
	Redundant	62.07 km/h	38.57 mph

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A Center of Bumper	=	181	mm
2. Row B Top of Bumper	=	88	mm
3. Row C Mid-Level	=	112	mm
4. Row D Top of Stack	=	151	mm

INSTRUMENTATION:

Number of MDB Data Channels	=	5
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DATA SHEET NO. 4**POST-TEST OBSERVATIONS**VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID H3</u>	<u>LEFT REAR SID H3</u>
Head	Side of head to side glass ~280 mm above window sill	Top of head to header ~100 mm in from of C-Pillar
Upper Torso	To side glass ~80 mm above window sill	To side glass ~90 mm above window sill
Lower Torso	To left front door panel at arm rest	To left rear door panel at arm rest
Left Knee	To left front door panel ~140 mm below arm rest	To left rear door panel ~ 75 mm below arm rest
Left Leg	To left front door panel ~100 mm below power window switches	To B-Pillar

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal	<u>5 mm rearward</u>	Vertical	<u>8 mm below</u>
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ARM REST LOCATIONS:

Front	<u>220 mm below window sill</u>
Rear	<u>205 mm below window sill</u>

SEAT MOVEMENT:

Front	<u>Seat crush ~30 mm; seat back crush ~50 mm</u>
Rear	<u>Seat crush ~95 mm;no measureable seat back crush</u>

GLAZING DAMAGE

Windshield	<u>None</u>
Window	<u>None</u>

PILLAR PERFORMANCE:

None noted

SILL SEPARATION

None noted

DOOR LOCK INFORMATION

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

LEFT FRONT DOOR	Unlocked		RIGHT FRONT DOOR	Unlocked
LEFT REAR DOOR	Unlocked		RIGHT REAR DOOR	Unlocked

AIRBAG DEPLOYMENT STATUS:

	DRIVER	FRONT PASSENGER	REAR PASSENGER
FRONT	Did not deploy	Did not deploy	N/A
SIDE	N/A	N/A	N/A

OTHER NOTABLE IMPACT EFFECTS:

None

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5**SID H3 INSTRUMENTATION DATA**

	Front Dummy Accelerations SID H3/056				Rear Dummy Accelerations SID H3/058			
	Max		Min		Max		Min	
	G's	msec	G's	msec	G's	msec	G's	msec
HEAD ACCELERATIONS								
Longitudinal (X)	3.1	26.6	-13.1	67.4	9.0	59.3	-12.5	44.0
Lateral (Y)	105.0	69.9	-11.4	44.1	74.4	42.6	-10.2	67.5
Vertical (Z)	60.5	69.0	-2.7	18.1	7.8	18.6	-9.8	19.2
Resultant (R)	115.4	69.9			74.9	42.6		
HIC36	420.2				145.6			
RIB ACCELERATIONS								
Upper Rib Lateral (Y)	44.8	51.9	-9.2	40.0	44.3	47.5	-1.8	97.5
Upper Rib Lateral (Y _R)	44.6	51.9	-9.1	40.0	44.1	47.5	-1.7	97.5
Lower Rib Lateral (Y)	42.8	34.4	-3.9	97.5	58.6	46.9	-6.1	66.3
Lower Rib Lateral (Y _R)	43.8	34.4	-3.8	96.9	58.0	46.9	-5.9	66.3
SPINE ACCELERATIONS								
Lower Lateral (Y)	80.0	37.5	-11.5	62.5	43.7	46.3	-7.6	97.5
Lower Lateral (Y _R)	79.0	37.5	-11.9	62.5	42.7	46.3	-7.6	97.5
PELVIS ACCELERATIONS								
Lateral (Y)	115.0	35.6	-13.5	50.0	69.2	36.3	-12.3	81.3
Lateral (Y _R)	114.6	35.6	-14.6	50.0	69.6	36.3	-12.2	84.4

REFERENCE:

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

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

Head Accelerations have been filtered at SAE Class 1000

Y_R denotes redundant Y-direction accelerometer

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

	Front Dummy Accelerations SID H3/056				Rear Dummy Accelerations SID H3/058			
	Max		Min		Max		Min	
	N	msec	N	msec	N	msec	N	msec
NECK FORCES								
Longitudinal (X)	28.3	26.6	-505.2	68.6	1104.9	83.4	-91.1	199.9
Lateral (Y)	374.6	60.6	-378.6	41.7	31.2	141.4	-1212.9	49.8
Vertical (Z)	1805.3	67.9	-361.5	72.9	94.8	146.6	-2065.1	46.7
NECK MOMENTS								
	Nm	msec	Nm	msec	Nm	msec	Nm	msec
Lateral Bending (X)	18.3	69.4	-67.2	55.4	1.0	156.8	-125.3	62.9
Flexion/Extension (Y)	24.1	103.8	-26.4	50.8	7.5	199.7	-56.8	69.7
Rotation (Z)	27.7	89.0	-18.5	54.0	8.2	48.5	-21.8	74.6

REFERENCE:

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

Force

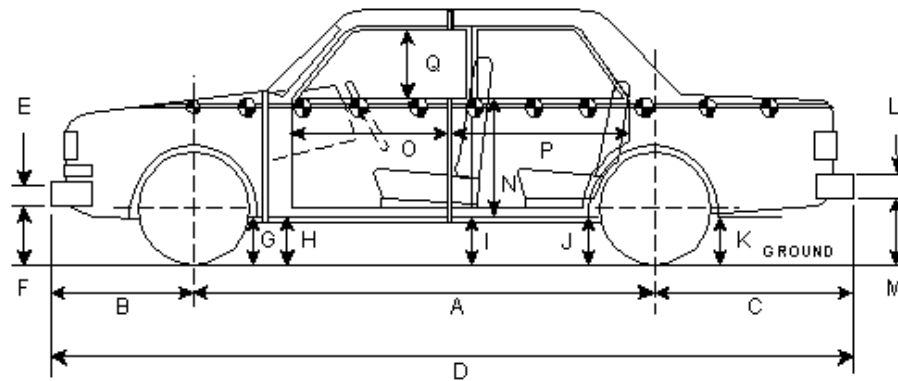
Fx positive response: Head rearward, chest forward
 Fy positive response: Head leftward, chest rightward
 Fz positive response: Head upward, chest downward

Moment

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

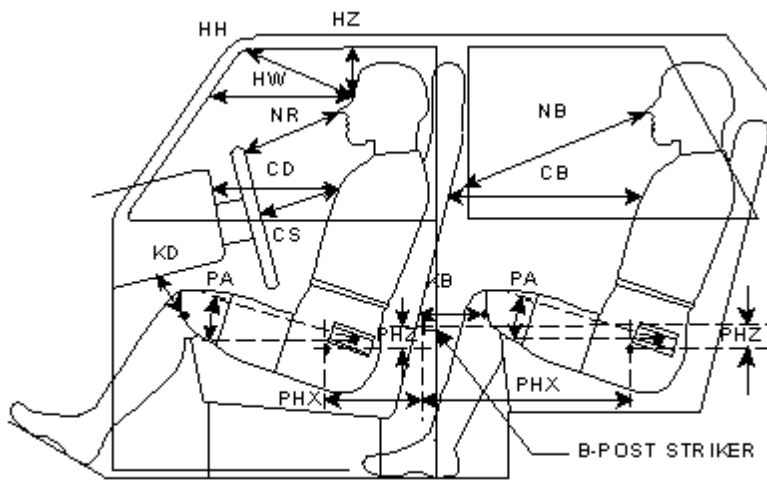
Neck forces have been filtered at SAE Class 1000

Neck moments have been filtered at SAE Class 600

DATA SHEET 6**VEHICLE PRE- AND POST- MEASUREMENTS**

LEFT SIDE VIEW

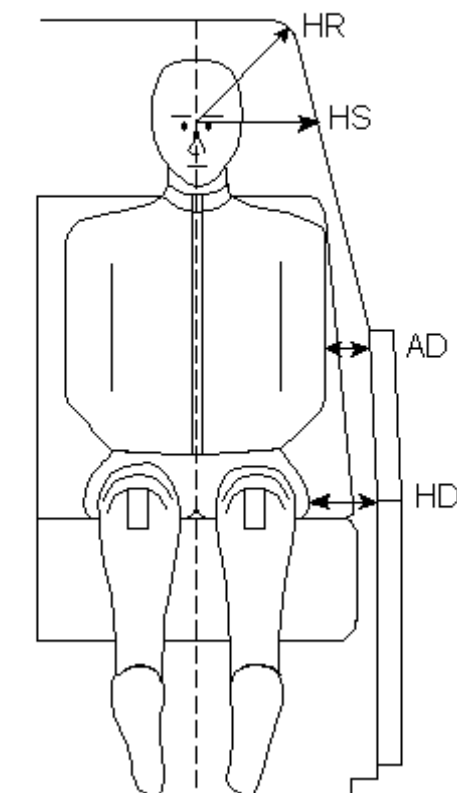
	PRE-TEST As delivered (mm)	PRE-TEST As Tested (mm)	POST-TEST (mm)	Δ CHANGE (mm)
A	3210	-	3198	-12
B	653	-	662	9
C	1034	-	991	-43
D	5260	-	5249	-11
E	90	-	90	0
F	475	467	468	1
G	387	360	343	-17
H	390	361	375	14
I	406	371	370	-1
J1	338	297	306	9
J2	415	373	395	22
K	458	407	430	23
L	187	-	187	0
M	422	373	392	19
N	701	-	668	-33
O	1180	-	1161	-19
P	810	-	771	-39
Q	501	-	498	-3
R	4897	-	4909	12
S	4897	-	4851	-46
T	1706	-	1443	-263

DATA SHEET 7**SID H3 LONGITUDINAL CLEARANCE DIMENSIONS****LEFT SIDE VIEW**

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

	DRIVER ID SID H3/056	LEFT REAR PASSENGER SID H3/058
HH	468	N/A
HW	659	N/A
HZ	185	187
NR/NB	500	544
CD/CB	599	505
CS	403	N/A
KDL(KDA°)/KBL(KDA°)	174/18.6	175/14.7
KDR(KDA°)/KBR(KDA°)	165/20.1	168/12.5
PA°	23.8	23.0
PHX	243	190
PHZ	81	69

PHX and PHZ measurements use the front door striker as reference for the front occupant and the rear door striker for the rear occupant

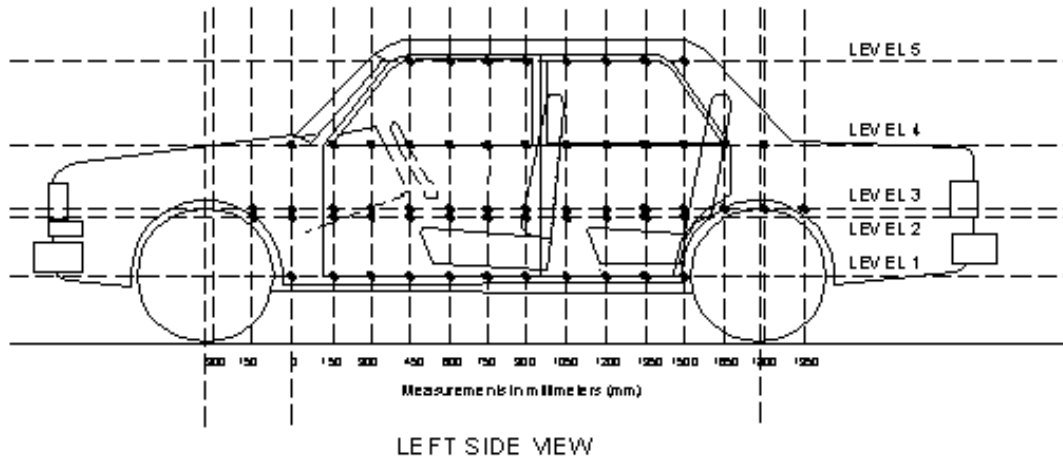
DATASHEET 8**SID H3 LATERAL CLEARANCE DIMENSIONS**

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

	DRIVER ID SID H3/056		LEFT REAR PASSENGER ID SID H3/058	
HR	210		216	
HS	312		312	
AD	Upper 134	Lower 151	Upper 96	Lower 113
HD	160		147	

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS



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

MEASUREMENTS ARE TAKEN WHEN THE VEHICLE IS IN THE “AS TESTED” CONFIGURATION
 Measurements along the Vertical 750 mm line as shown

Level 5 @ Window Top	1578 mm
Level 4 @ Window Sill	1065 mm
Level 3 @ Mid-Door	732 mm
Level 2 @ Occupant H-Point	700 mm
Level 1 @ Axle Centerline or Sill Top Height	390 mm

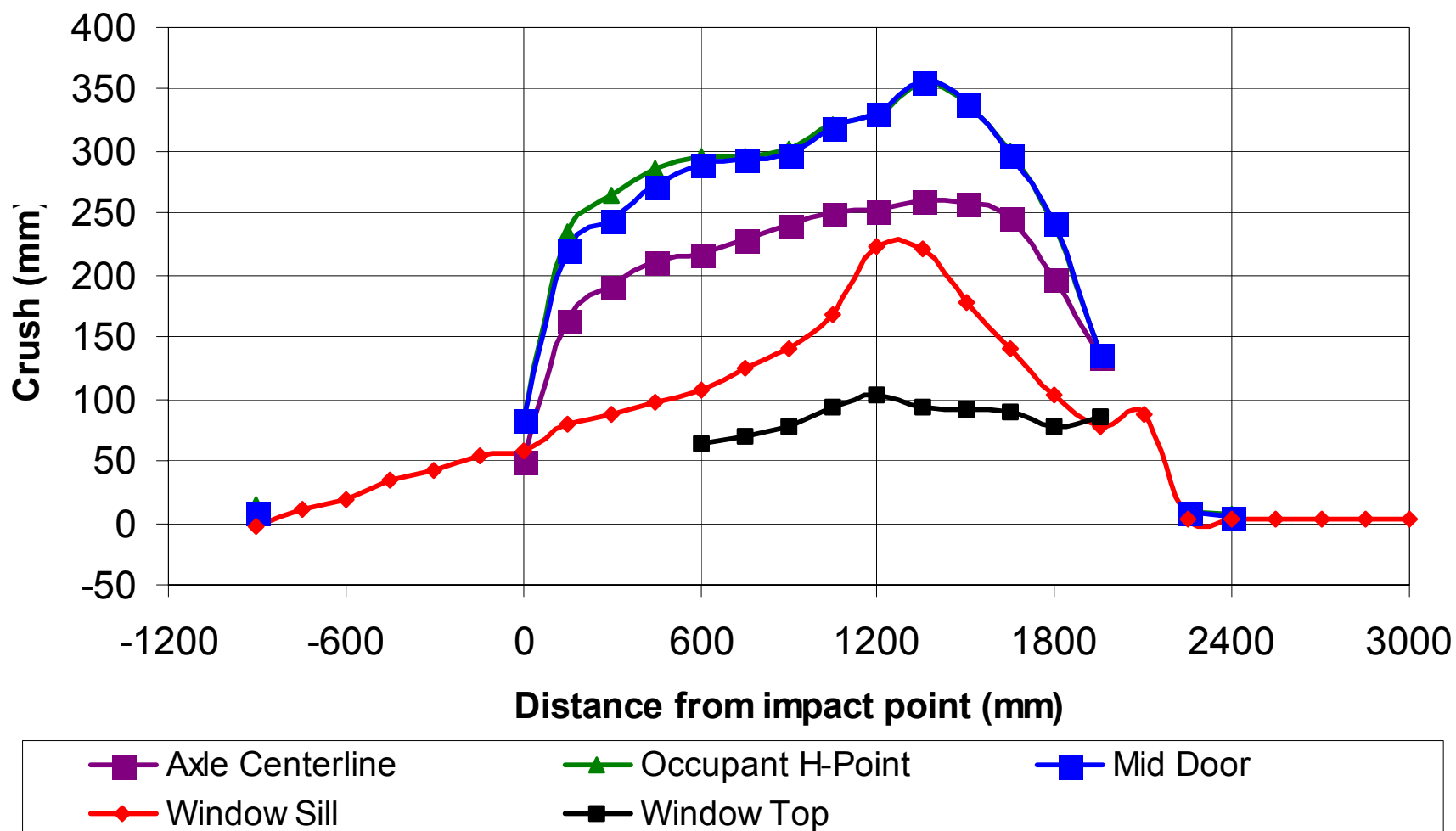
DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES – ALL LEVELS

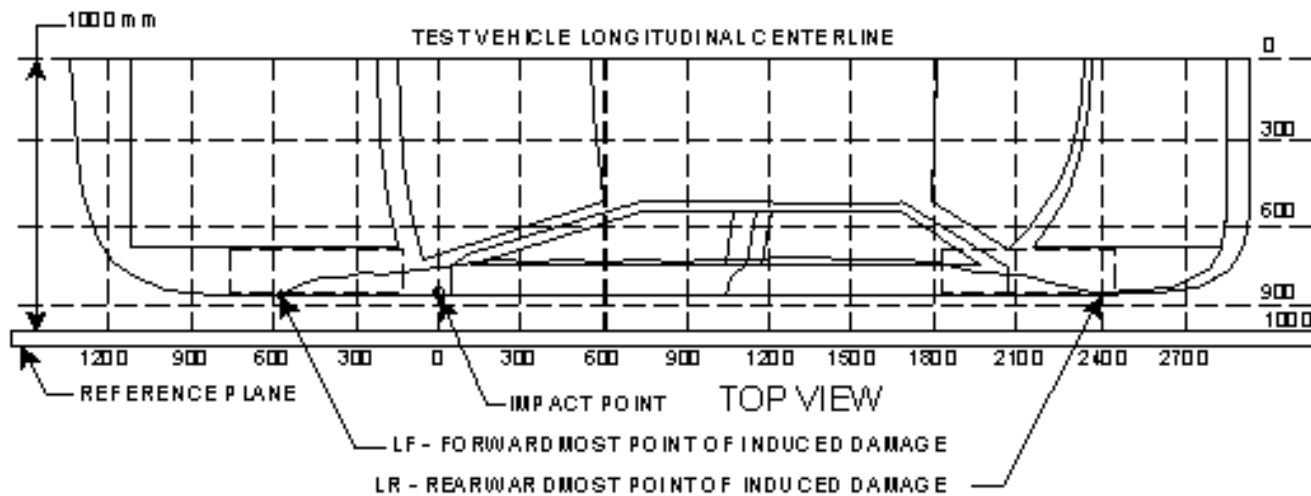
Note: All Dimensions are in millimeters with a tolerance of ± 3 mm

			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	390	PRE							245	266	266	265	265	265	265	265	265	265	266	267	269	269								
		POST							295	430	457	476	483	495	506	516	517	526	525	514	466	403								
		CRUSH							50	164	191	211	218	230	241	251	252	261	259	247	197	134								
LEVEL 2	700	PRE	221						229	230	227	225	223	222	222	222	222	222	223	223	224	224		220	210					
		POST	236						312	465	492	512	518	518	523	544	551	577	562	522	465	360		228	217					
		CRUSH	15						83	235	265	287	295	296	301	322	329	355	339	299	241	136		8	7					
LEVEL 3	732	PRE	226						227	227	225	223	222	222	222	222	222	222	222	224	224	224		221	211					
		POST	234						310	449	470	496	511	516	520	541	554	579	561	522	466	360		229	217					
		CRUSH	8						83	222	245	273	289	294	298	319	332	357	339	298	242	136		8	6					
LEVEL 4	1065	PRE	310	297	290	283	279	276	275	275	278	280	282	279	279	279	272	276	278	278	278	276	282	289	291	291	292	292	291	
		POST	308	307	309	318	322	331	333	354	366	377	390	404	420	448	495	497	455	419	382	354	370	292	294	295	295	296	295	
		CRUSH	-2	10	19	35	43	55	58	79	88	97	108	125	141	169	223	221	177	141	104	78	88	3	3	4	3	4	4	
LEVEL 5	1578	PRE											488	501	507	511	504	516	519	524	525	521								
		POST											552	570	585	604	608	610	610	614	603	607								
		CRUSH											64	69	78	93	104	94	91	90	78	86								

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



DATA SHEET 11 VEHICLE DAMAGE PROFILE DISTANCES



DPD MEASUREMENTS (mm)		POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1	1	230	230	0
2	2	228	310	82
3	3	226	508	282
4	4	222	549	327
5	5	219	481	262
6	6	216	216	0

DATA SHEET 12

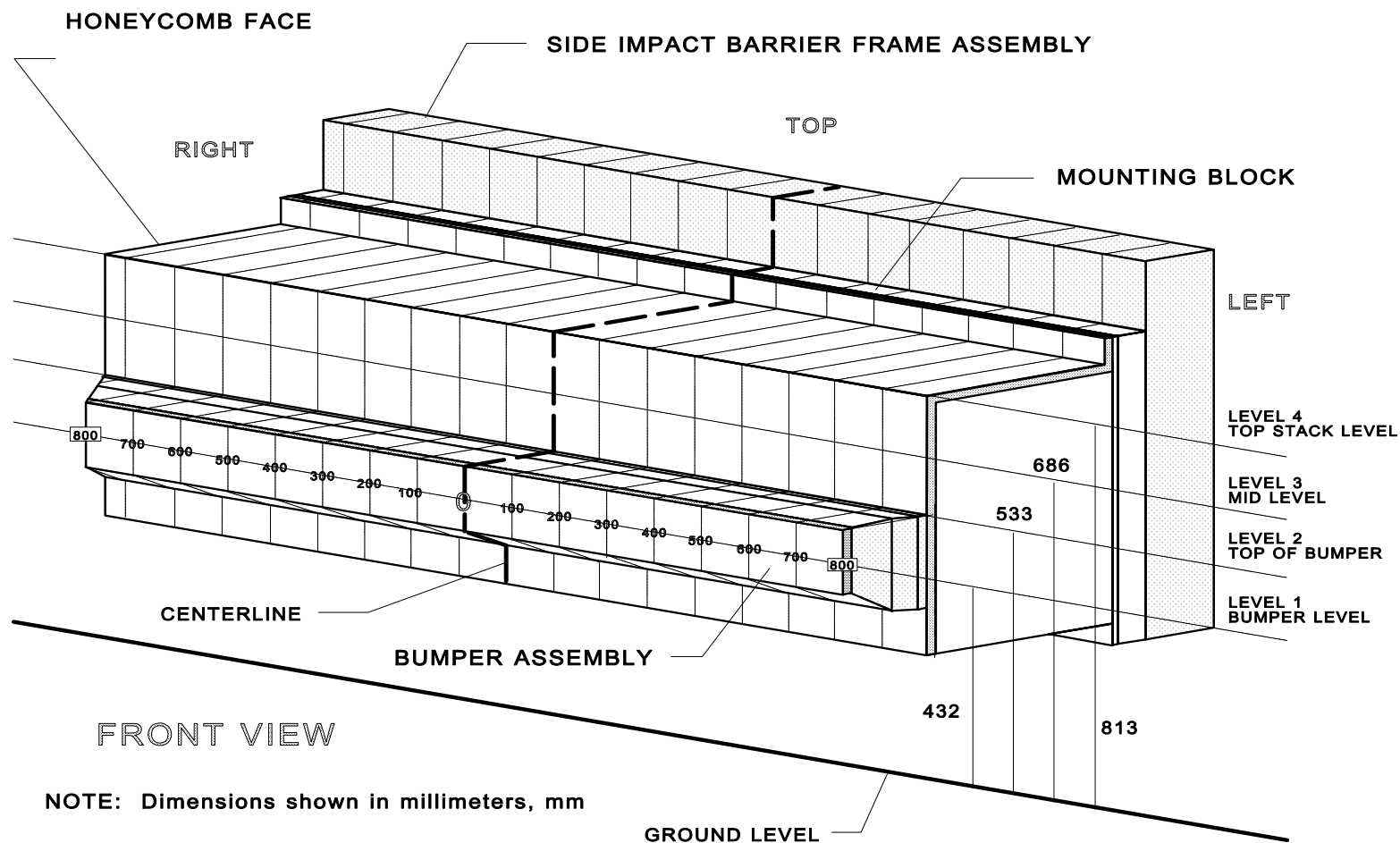
STATIC CRUSH OF IMPACTOR FACE
(Grid as looking at MDB from front)

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

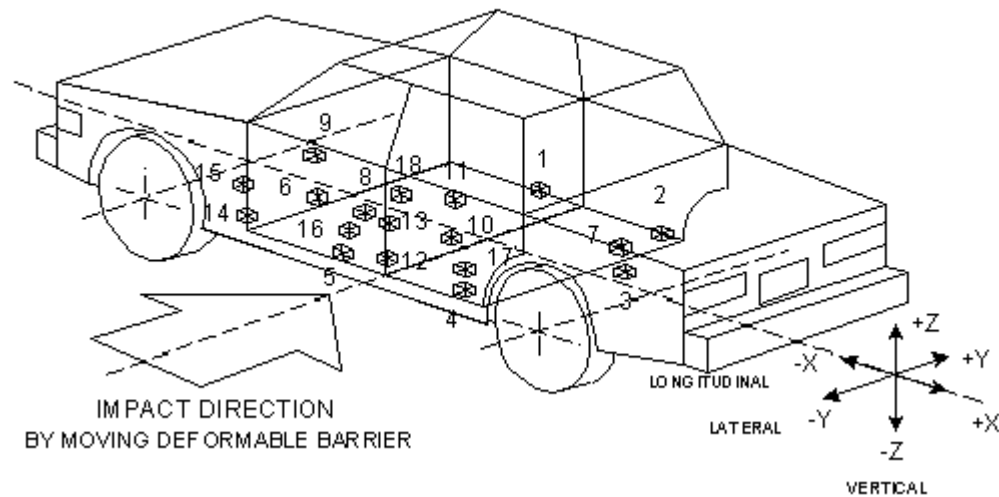
LEVEL	HEIGHT AT CL (mm)		DISTANCE LEFT OF CENTER								0	DISTANCE RIGHT OF CENTER							
			800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
LEVEL 4 TOP STACK	810	PRE-	527	528	528	529	529	529	530	530	530	530	531	532	533	534	534	535	535
		POST-	678	640	609	577	558	557	550	554	556	559	562	570	578	592	614	634	660
		CRUSH	151	112	81	48	29	28	20	24	26	29	31	38	45	58	80	99	125
LEVEL 3 MID- LEVEL	685	PRE-	525	525	526	526	527	528	528	528	529	529	530	530	531	532	532	533	533
		POST-	637	605	567	549	541	549	549	541	541	542	542	544	545	552	562	584	612
		CRUSH	112	80	41	23	14	21	21	13	12	13	12	14	14	20	30	51	79
LEVEL 2 TOP BUMPER	560	PRE-	524	524	524	525	525	525	525	526	527	527	528	528	528	529	529	530	530
		POST-	612	594	571	566	565	568	564	561	561	558	559	556	553	556	558	566	580
		CRUSH	88	70	47	41	40	43	39	35	34	31	31	28	25	27	29	36	50
LEVEL 1 MID- BUMPER	432	PRE-	430	421	422	422	422	423	423	423	424	424	425	425	425	426	426	427	436
		POST-	611	578	557	552	551	549	547	540	542	537	540	540	538	541	544	552	571
		CRUSH	181	157	135	130	129	126	124	117	118	113	115	115	113	115	118	125	135

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

DATA SHEET 12 (continued)
STATIC CRUSH OF IMPACTOR FACE



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

DATA SHEET 13**TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY**

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

DATASHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X 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	2189	650	202	7.7	22.6	-52.2	46.6	73.8	12.3	-104.5	50.0	12.6	33.0	-24.2	18.7	105.2	49.9
2	Right Side Sill at Rear Seat	1970	653	204	5.9	22.8	-99.6	47.8	97.2	11.8	-34.0	46.8	11.4	118.2	-19.0	17.3	104.2	47.6
3	Rear Floorpan Above Axle	1159	5	-78	2.2	80.6	-7.6	39.0	35.0	17.5	-2.6	124.1	15.3	66.3	-14.1	55.0	35.4	17.5
4	Left Side Sill at Rear Seat	2176	-702	210					93.5	11.1	-12.2	17.6						
5	Left Side Sill at Front Seat	1954	-713	216					70.3	10.2	-16.8	19.5						
6	Left Front Door on Centerline	3181	-729	8					273.2	5.4	-100.3	16.2						
7	Right Rear Occupant Compartment	2181	214	126					36.3	6.6	-8.8	62.0						
8	Midrear of Left Front Door	2924	-737	62					342.8	4.2	-166.7	10.5						
9	Left Front Door Upper Centerline	2209	-735	-219					314.8	9.4	-96.6	15.1						
10	Midrear of Left Rear Door	1982	-722	-19					143.1	14.6	-61.3	26.5						

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

Axis Orientation

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

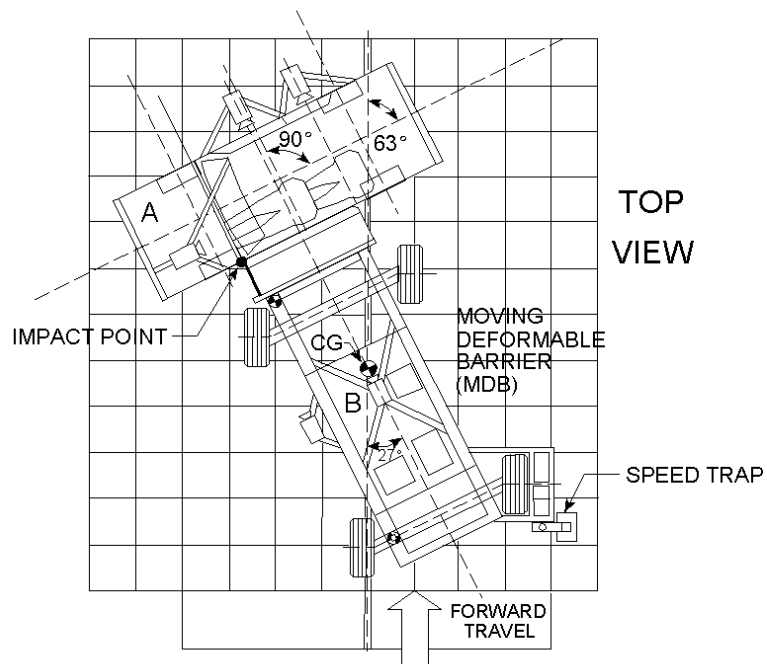
VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

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)

† Wire broken ~25 msec after impact

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY



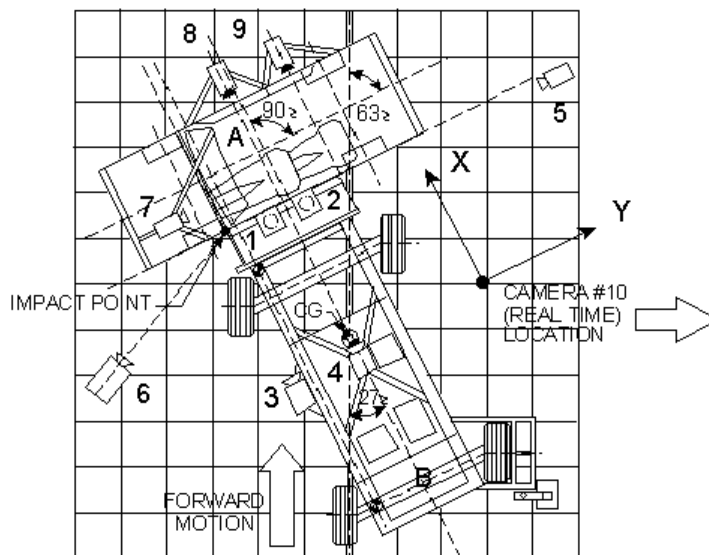
Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X mm	Y mm	Z mm	Max		Min		Max		Min		Max		Min		Max	
					G's	msec	G's	msec	G's	msec	G's	msec	G's	msec	G's	msec	G's	msec
1	MDB Center of Gravity	1113	-1	311	1.5	136.4	-22.7	38.6	2.5	57.5	-9.1	25.0	14.8	30.8	-7.7	19.7	26.5	30.2
2	MDB Rear Frame Member	2812	-614	585	2.0	118.4	-21.0	32.9	5.0	21.0	-2.8	57.7						

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

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

DATA SHEET 15

HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY



Camera No.	View	Coordinates (mm)*			Angle wrt Horiz.	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead view of test vehicle	150	992	4663	-90	10	1000
2	Overhead close-up view of impact plane	30	305	4669	-90	13	1000
3	MDB onboard close-up view of impact point	-2333	-60	-38	0	35	1000
4	MDB onboard view of driver dummy	-2262	840	740	-5	13	1000
5	Right side ground level overall view	10195	670	542	-5	62	1000
6	Left side ground level overall view	7994	-870	682	-10	25	1000
7	Test vehicle onboard driver front view	4077	-371	-659	-15	10	1000
8	Test vehicle onboard driver side view	2879	824	-638	-5	7.5	1000
9	Test vehicle onboard passenger side view	2052	826	-632	-5	7.5	1000
10	Real-time film coverage of test	-	-	-	-	-	-

* 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**TEST REQUIREMENTS:

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

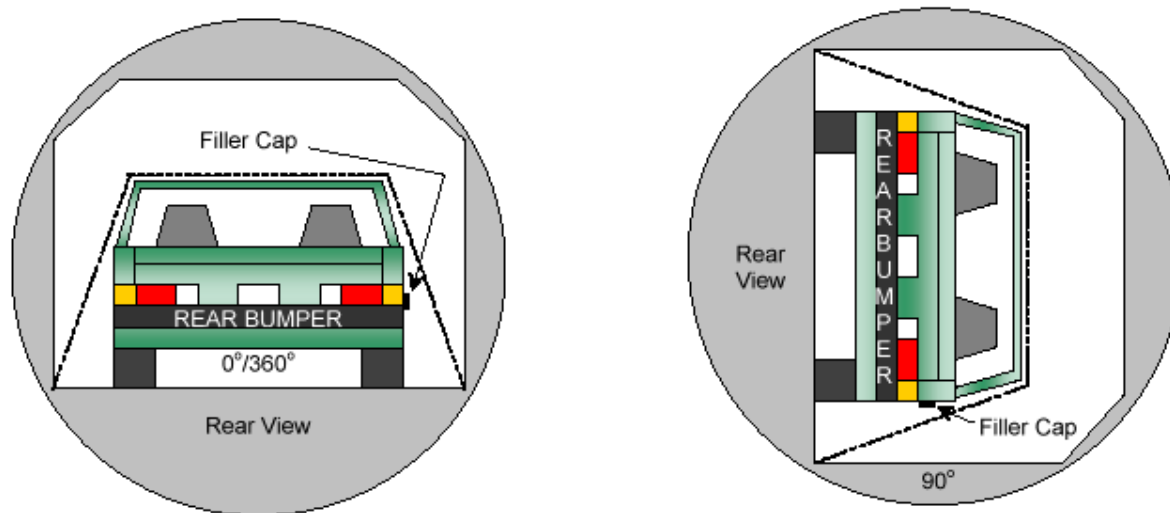
TEST VEHICLE IMPACT TYPE: Side impacting Moving Deformable Barrier contacting the driver side.

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17
ROLLOVER DATA



0° TO 90°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

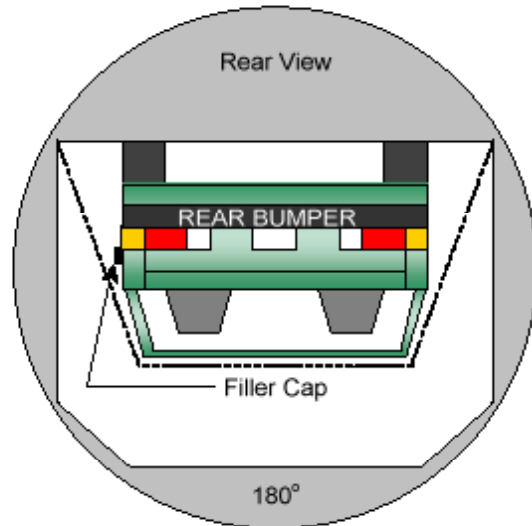
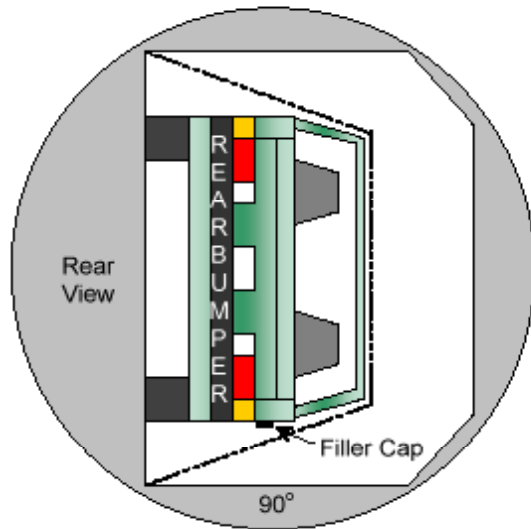
FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE



90° TO 180°

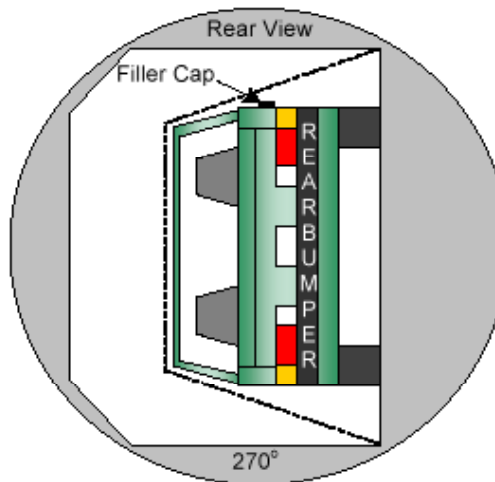
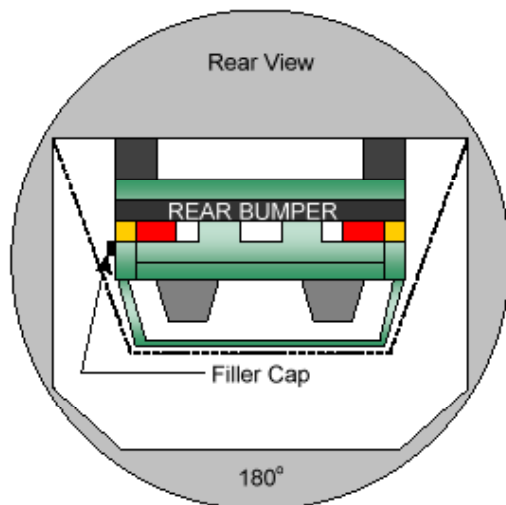
DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>3</u>	seconds
(Spec Range =1 to 3 minutes)				
FMVSS 301 Position Hold Time	<u>5</u>	minutes	<u>2</u>	seconds
TOTAL	<u>6</u>	minutes	<u>5</u>	seconds
Next whole minute interval	<u>7</u>	minutes		

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATION(S): None

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

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>5</u> seconds
(Spec Range =1 to 3 minutes)		
FMVSS 301 Position Hold Time	<u>5</u> minutes	<u>4</u> seconds
TOTAL	<u>6</u> minutes	<u>9</u> seconds
Next whole minute interval	<u>7</u> minutes	

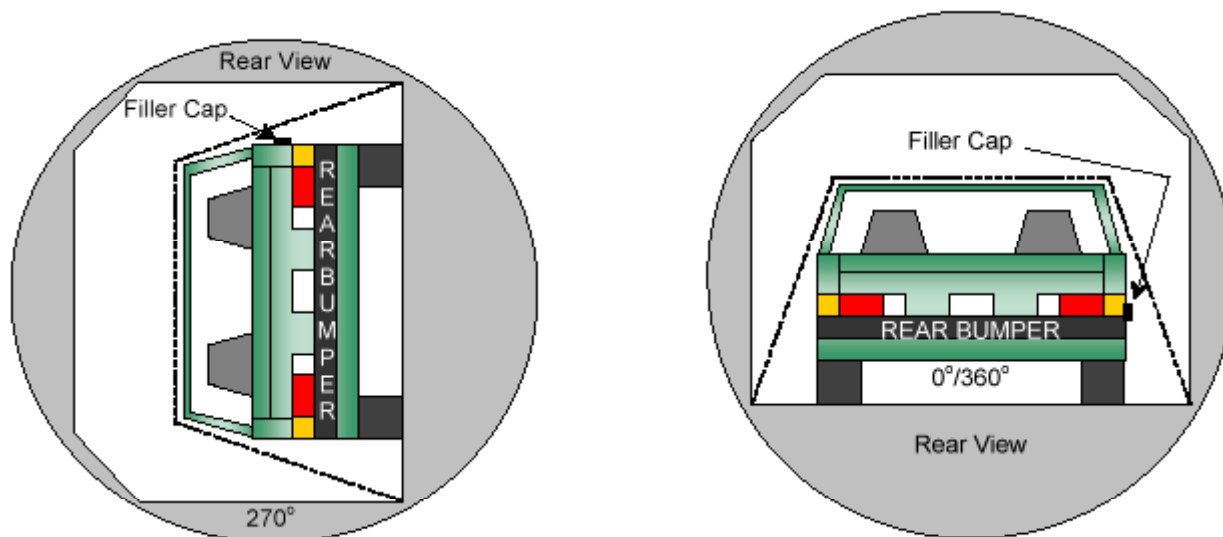
FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE



270° TO 360°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>5</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>5</u> seconds
Next whole minute interval	<u>7</u> minutes	

FUEL SPILLAGE MEASUREMENT:

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

FUEL SPILLAGE LOCATION(S): None

APPENDIX A
PHOTOGRAPHS

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



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



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Figure A-18: POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



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



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



Figure A-21: PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



Figure A-22: POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3



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



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



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



Figure A-26: POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS



Figure A-27: POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS 2

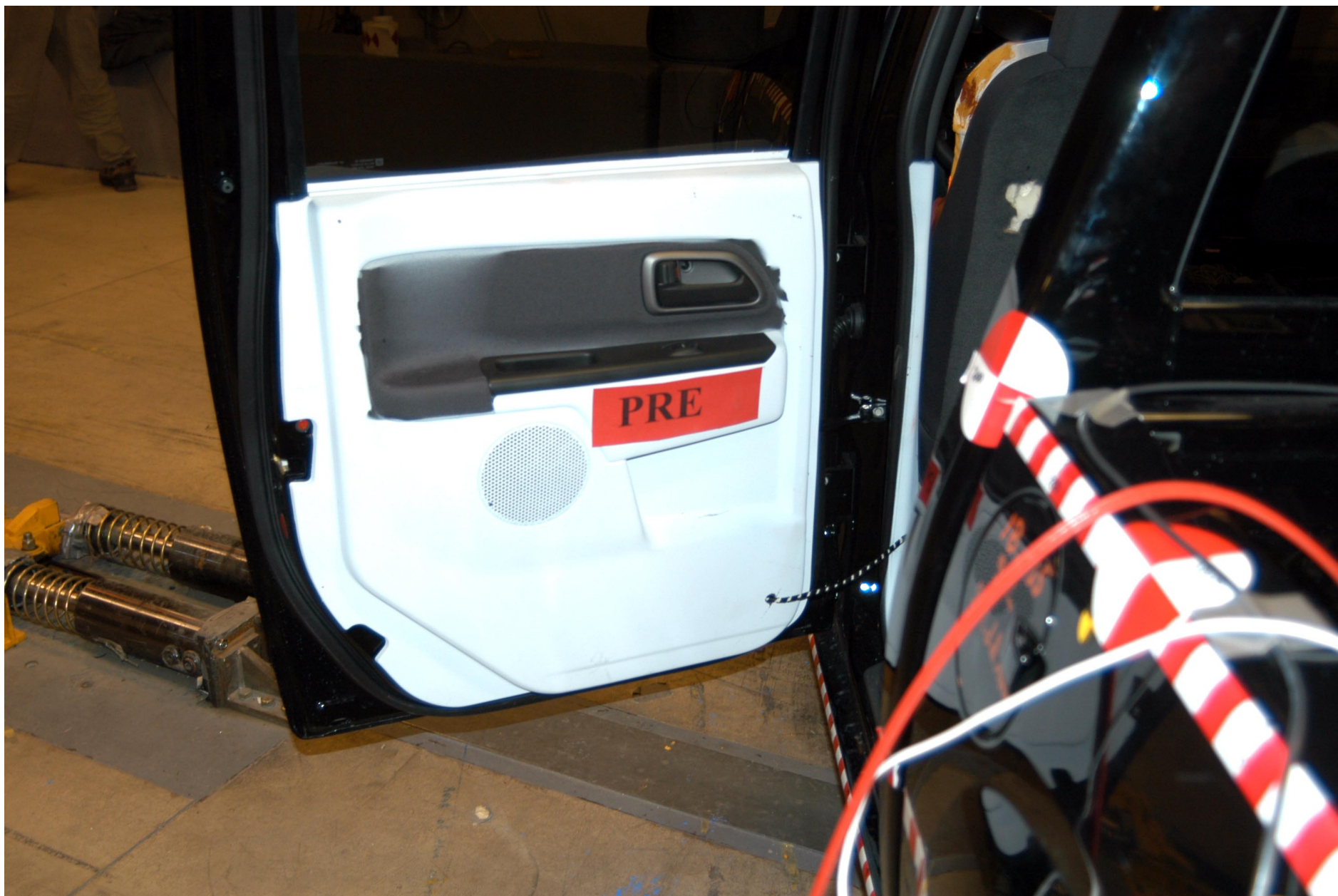


Figure A-28: PRE-TEST INTERIOR OF REAR PASSENGER COMPARTMENT



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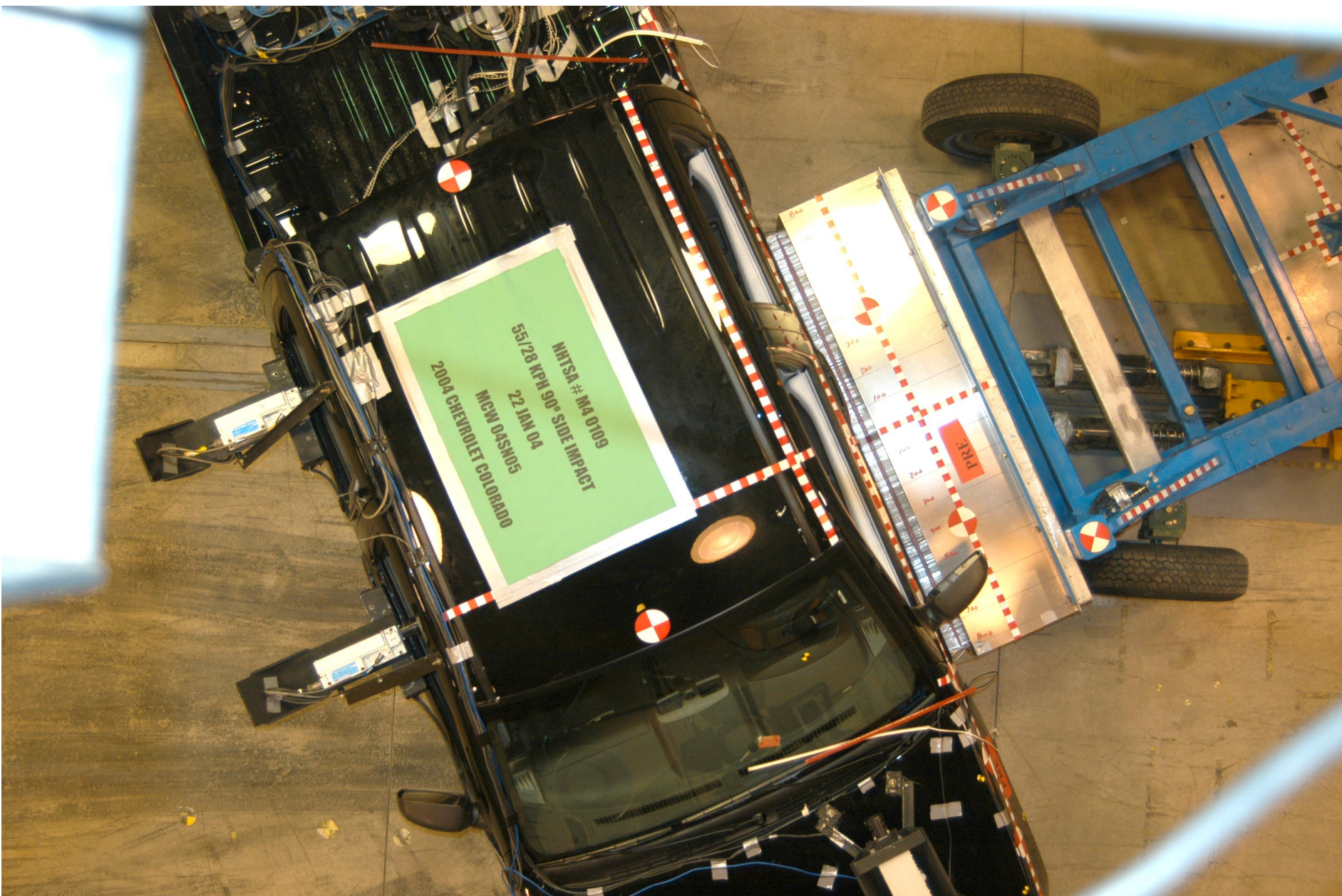


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Figure A-36: POST-TEST OVERHEAD VIEW OF MDB



Figure A-37: PRE-TEST CLOSE-UP OF IMPACT POINT TARGET SHOWING WELDING ROD



Figure A-38: POST-TEST CLOSE-UP OF IMPACT POINT TARGET

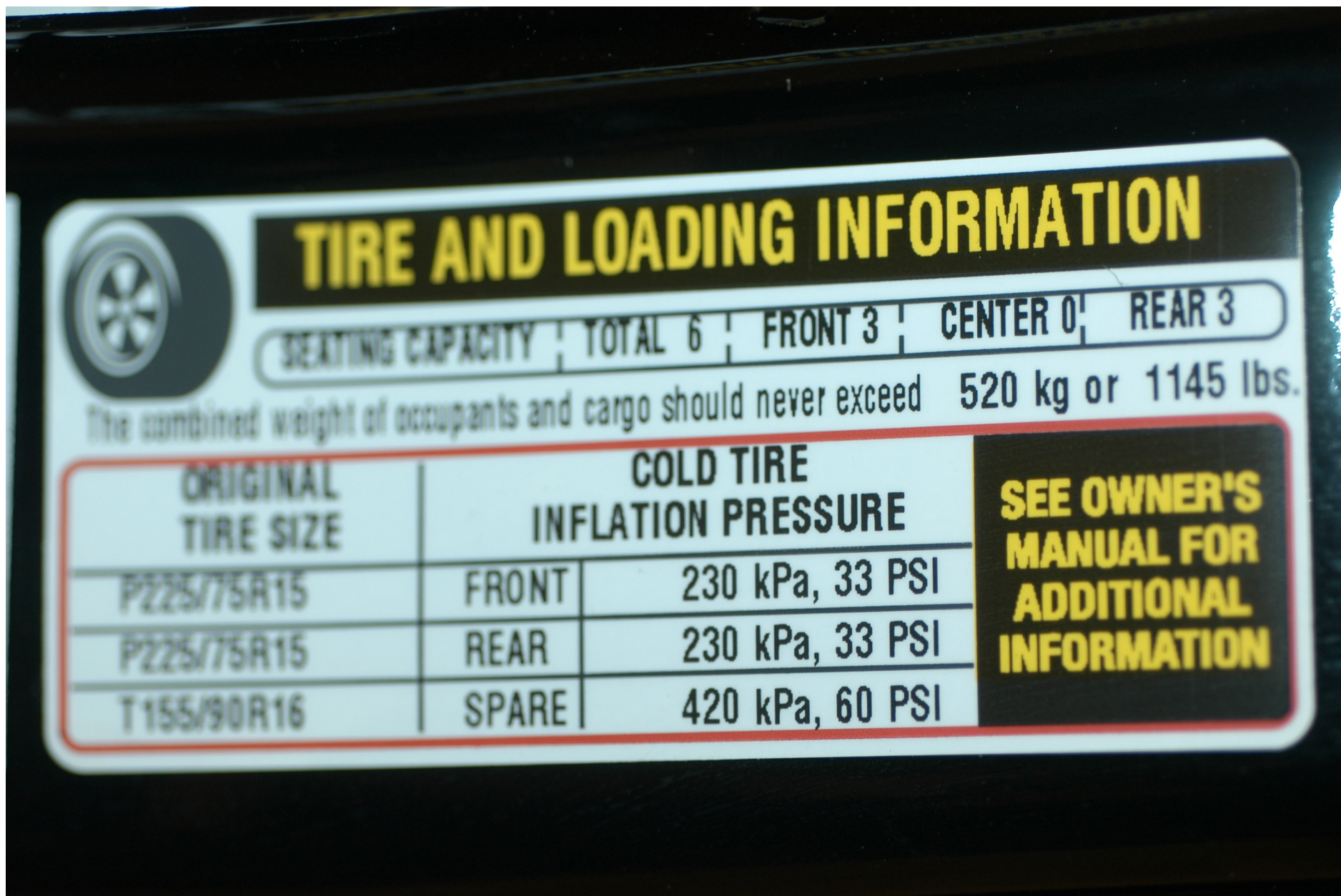


Figure A-39: VEHICLE TIRE PLACARD



Figure A-40: VEHICLE CERTIFICATION LABEL



Figure A-41: IMPACT



Figure A-42: ROLLOVER 0 DEGREES

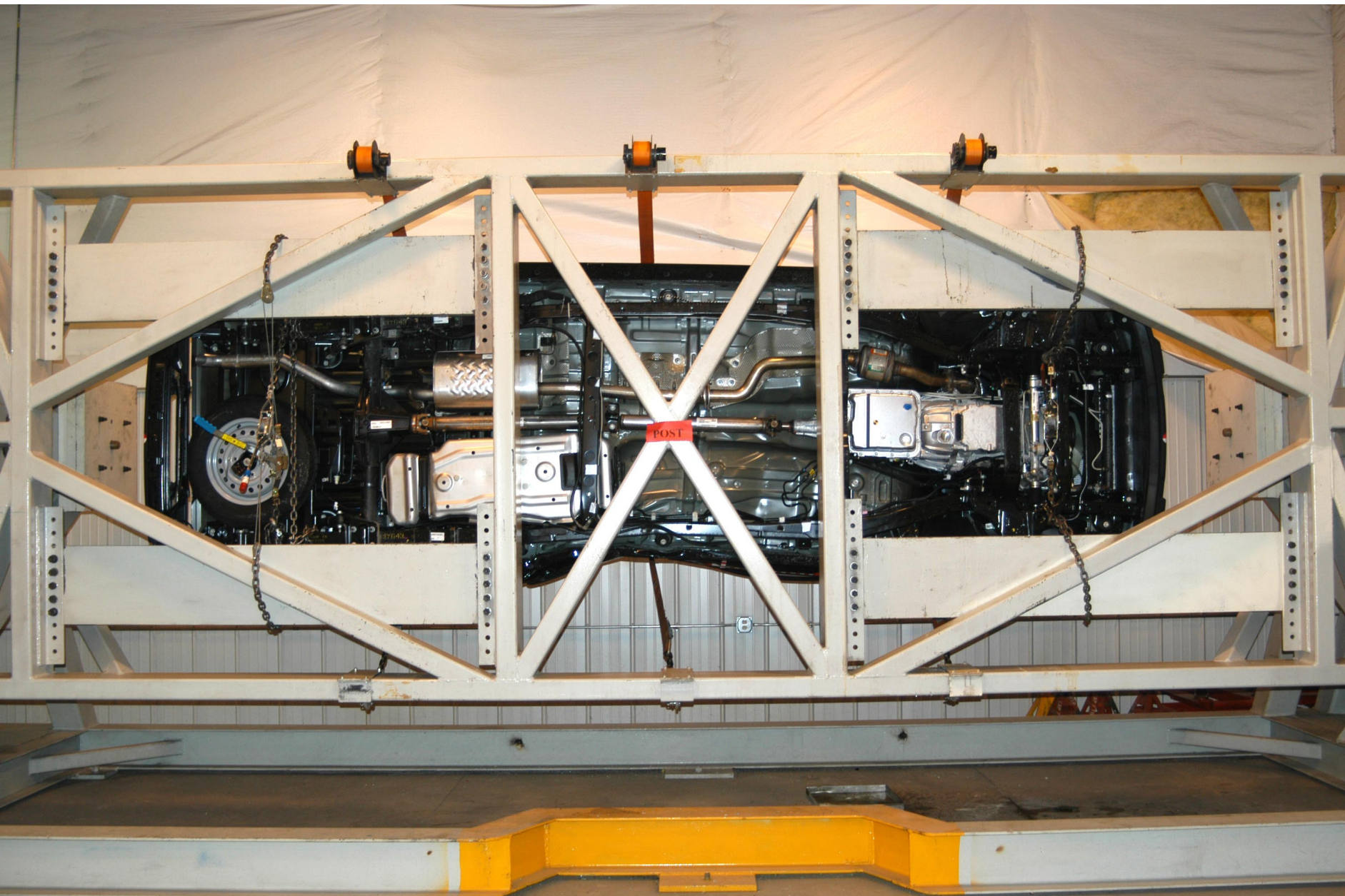


Figure A-43: ROLLOVER 90 DEGREES



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Figure A-45: ROLLOVER 270 DEGREES



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Figure A-48: POST-TEST ALUMINUM BARRIER FRONT



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



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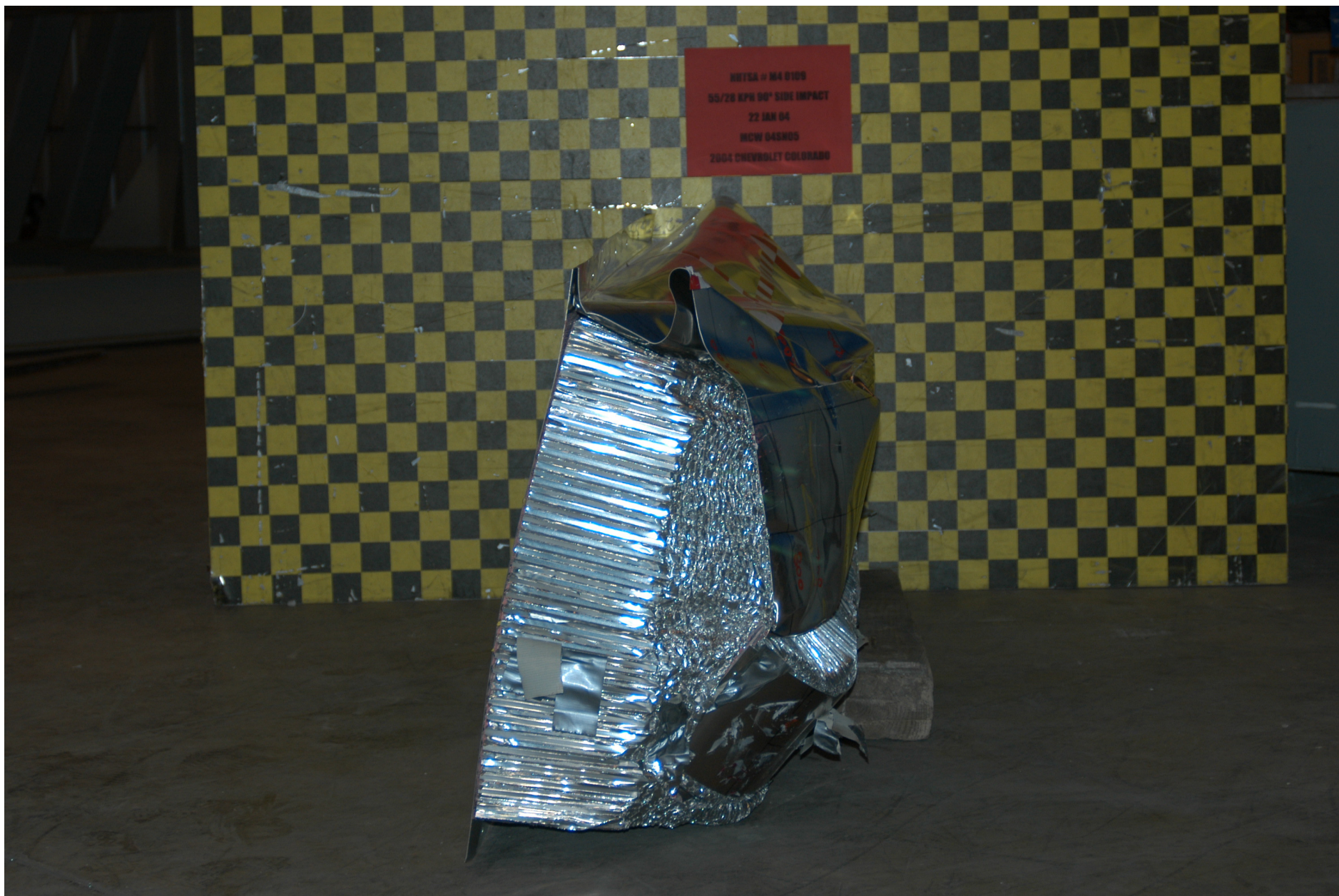


Figure A-52: POST-TEST ALUMINUM BARRIER RIGHT SIDE



Figure A-53: PRE-TEST ALUMINUM BARRIER TOP



Figure A-54: POST-TEST ALUMINUM BARRIER TOP

APPENDIX B

VEHICLE, MDB, AND SID RESPONSE DATA

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DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS

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MDB INSTRUMENTATION PLOTS
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DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)

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DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOT (REDUNDANT)

ACCELERATION DATA – FIR FILTERED

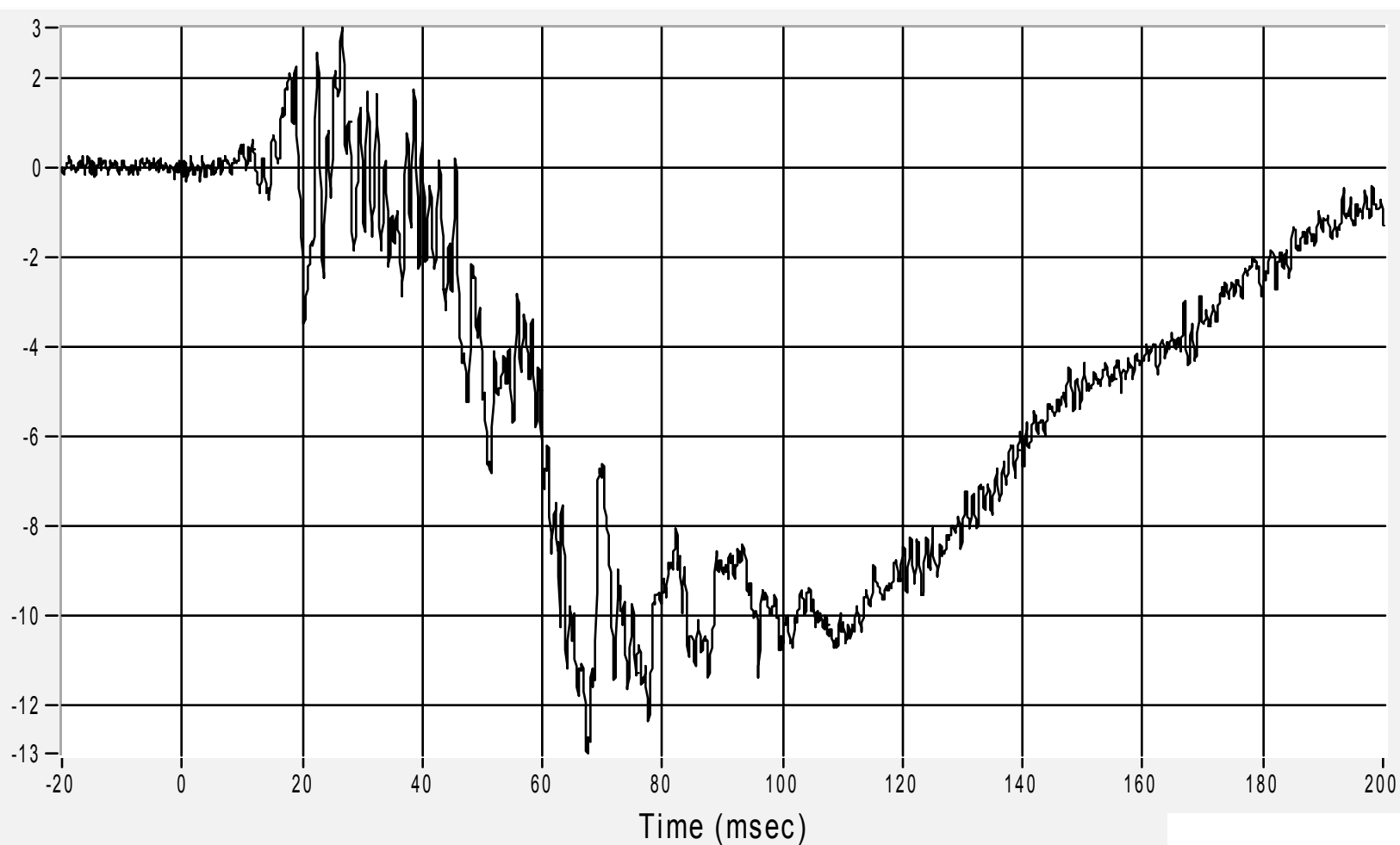
<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
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Driver Head CG (X) Acceleration

Acceleration (G's) CFC1000

Max 3.1 G at 26.6 msec

Min -13.1 G at 67.4 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

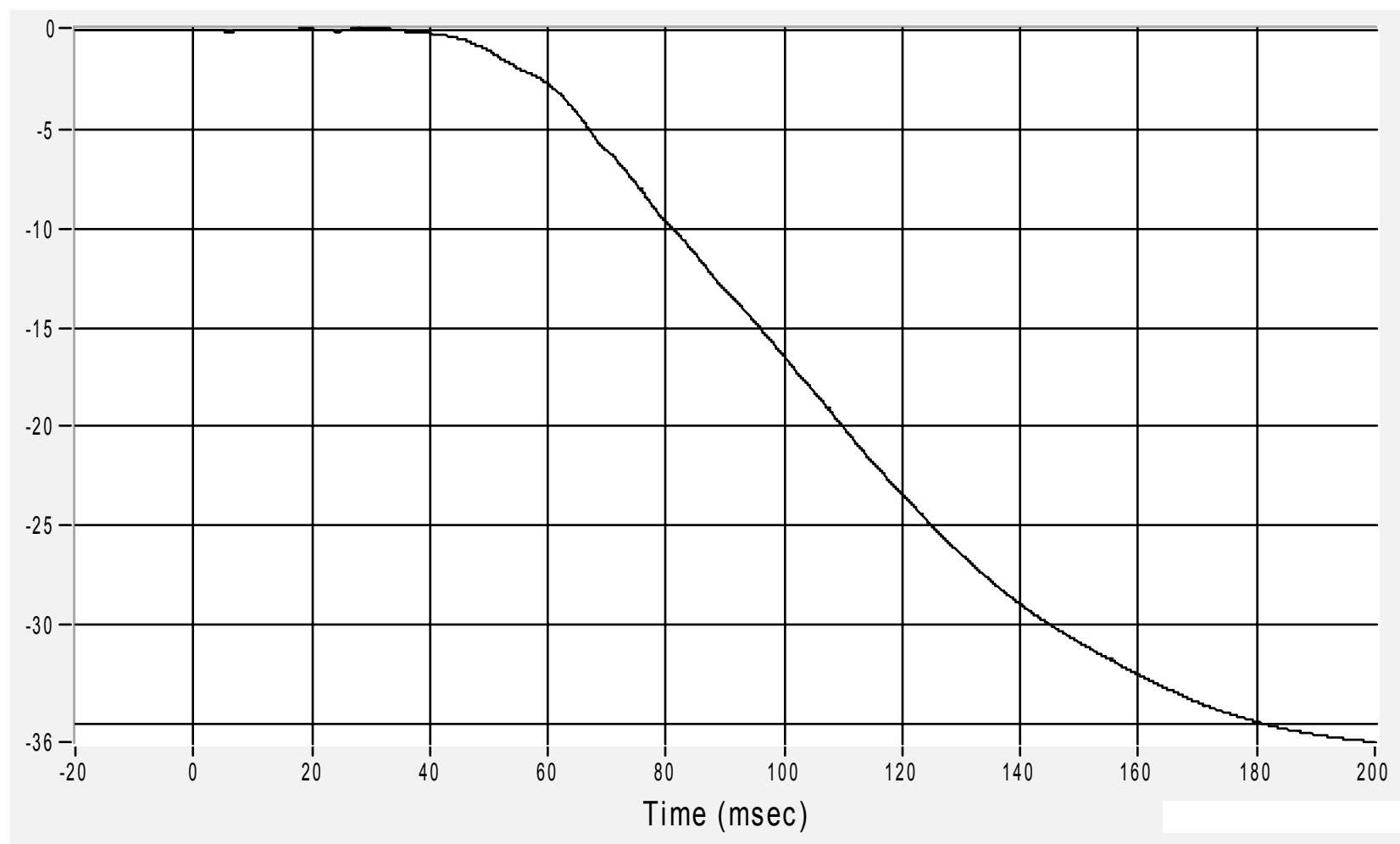
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (X) Velocity

Velocity (km/h) CFC180

Max 0.2 km/h at 19.3 msec

Min -36.0 km/h at 199.9 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

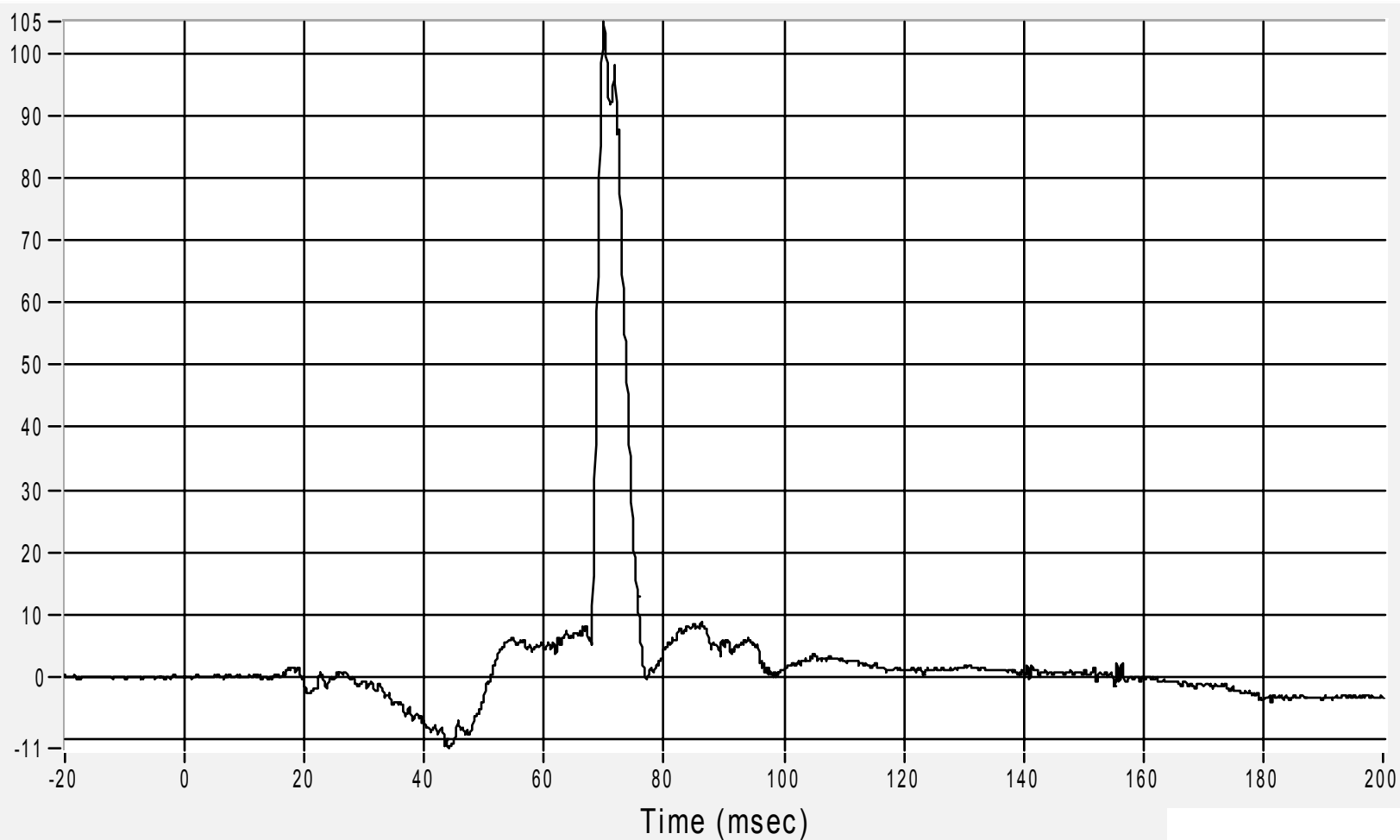
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Driver Head CG (Y) Acceleration

Acceleration (G's) CFC1000

Max 105.0 G at 69.9 msec

Min -11.4 G at 44.1 msec



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22 January 2004

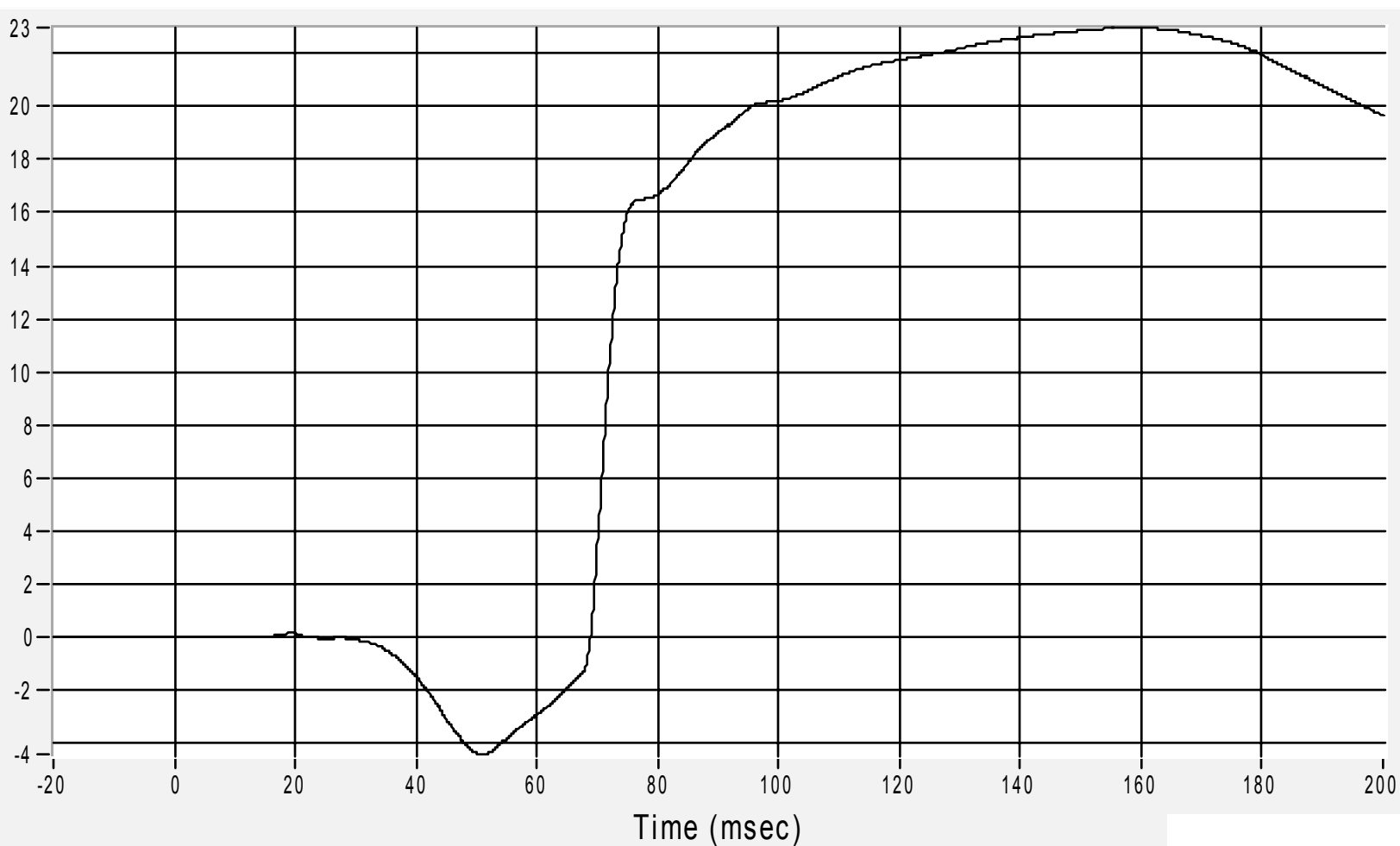
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (Y) Velocity

Velocity (km/h) CFC180

Max 23.0 km/h at 157.0 msec

Min -4.4 km/h at 51.0 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

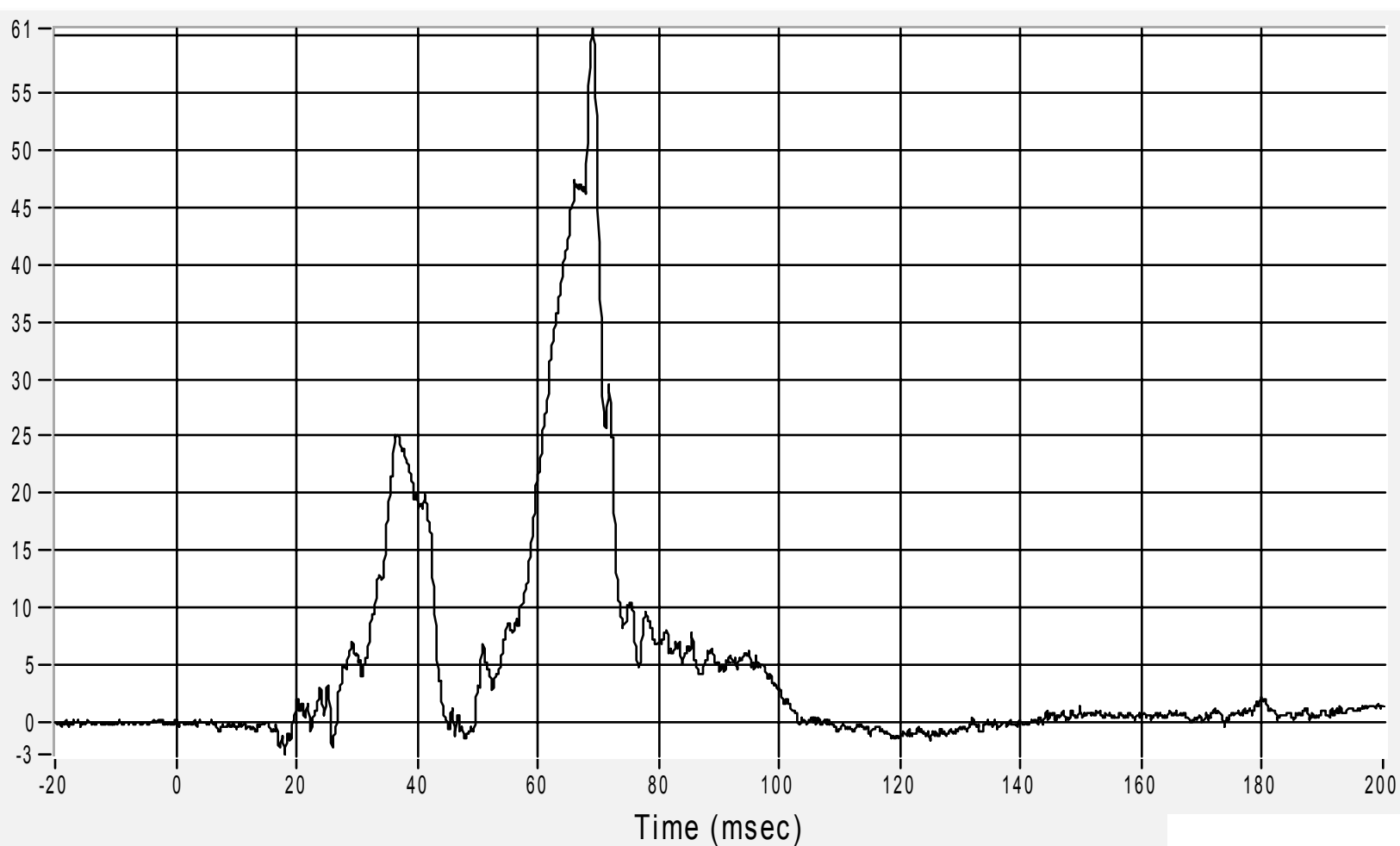
*Medical College of Wisconsin
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Driver Head CG (Z) Acceleration

Acceleration (G's) CFC1000

Max 60.5 G at 69.0 msec

Min -2.7 G at 18.1 msec



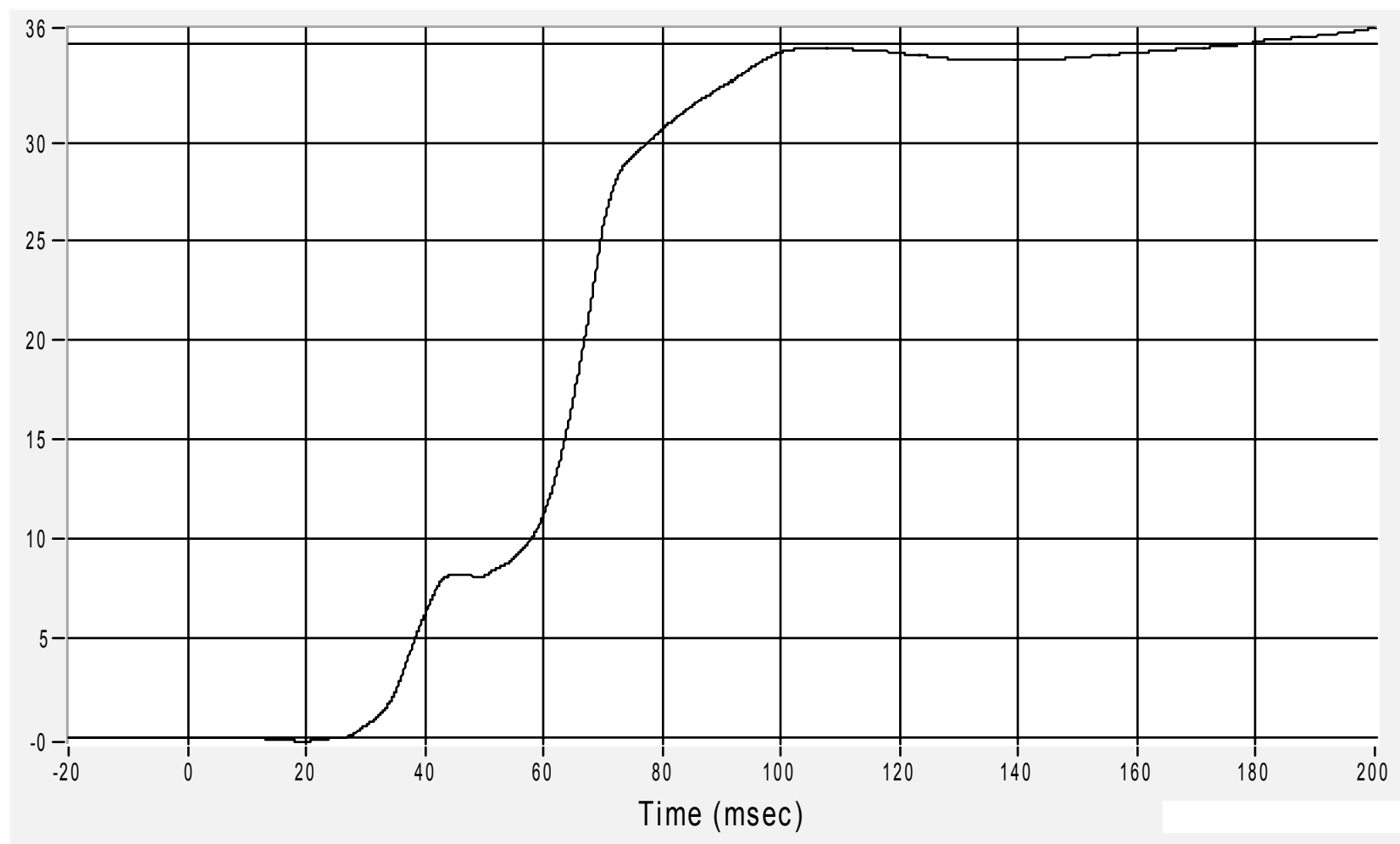
04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

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Driver Head CG (Z) Velocity

Velocity (km/h) CFC180

Max 35.8 km/h at 199.9 msec**Min -0.3 km/h at 19.4 msec**

04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

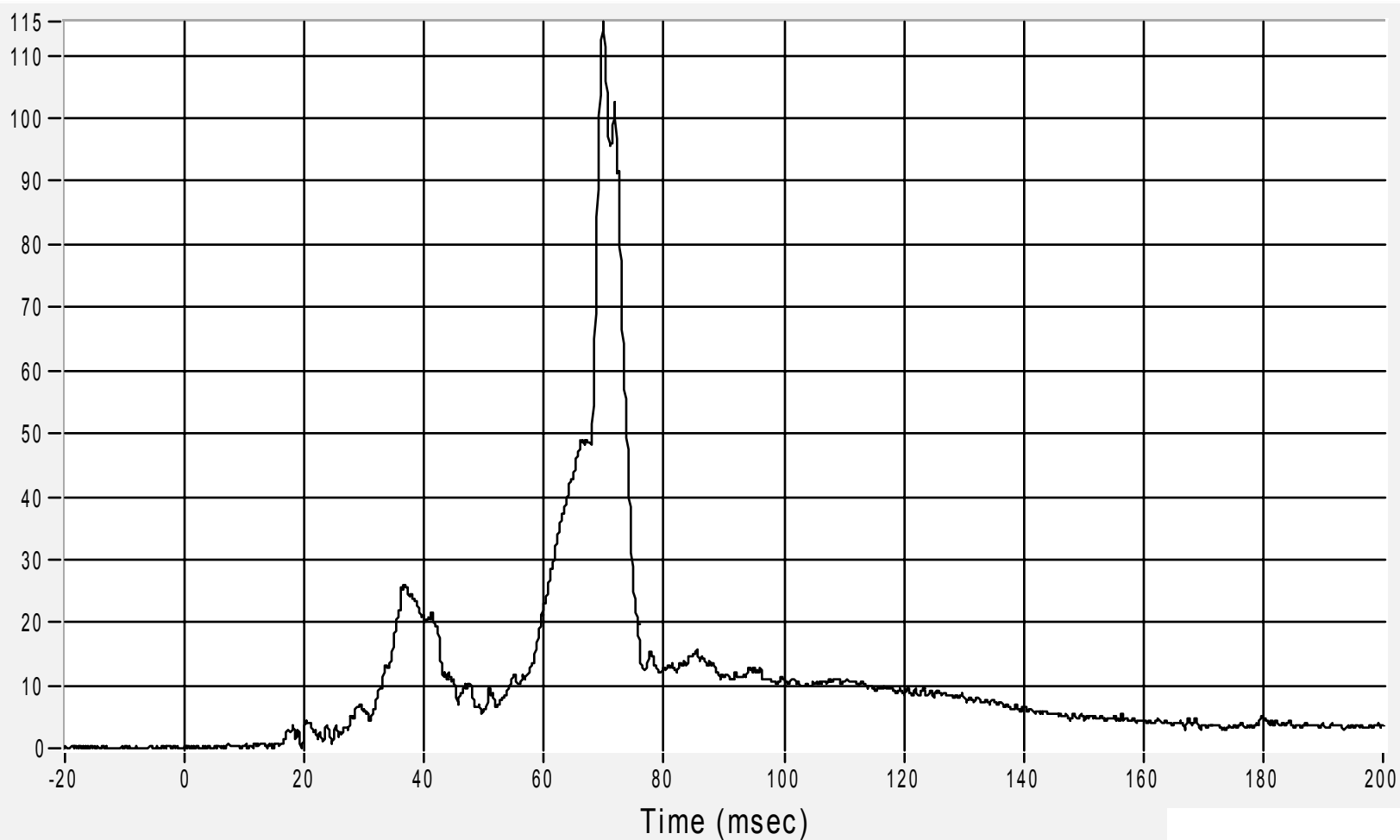
*Medical College of Wisconsin
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Driver Head Resultant Acceleration

Acceleration (G's) CFC1000

Max 115.4 G's at 69.9 msec

Min 0.1 G's at 2.6 msec



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22 January 2004

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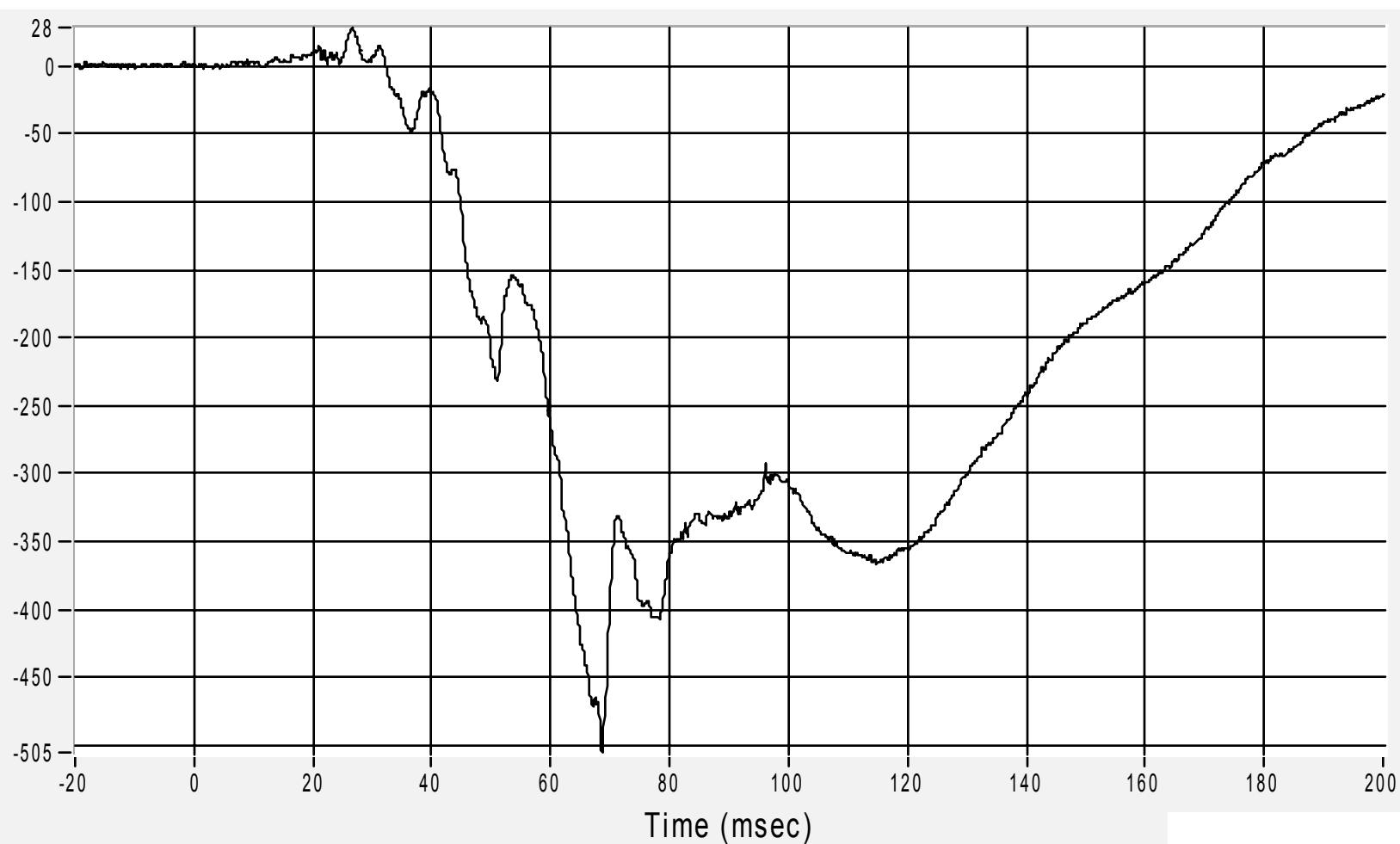
Driver Upper Neck (X) Force

Force (N)

CFC1000

Max 28.3 N at 26.6 msec

Min -505.2 N at 68.6 msec



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22 January 2004

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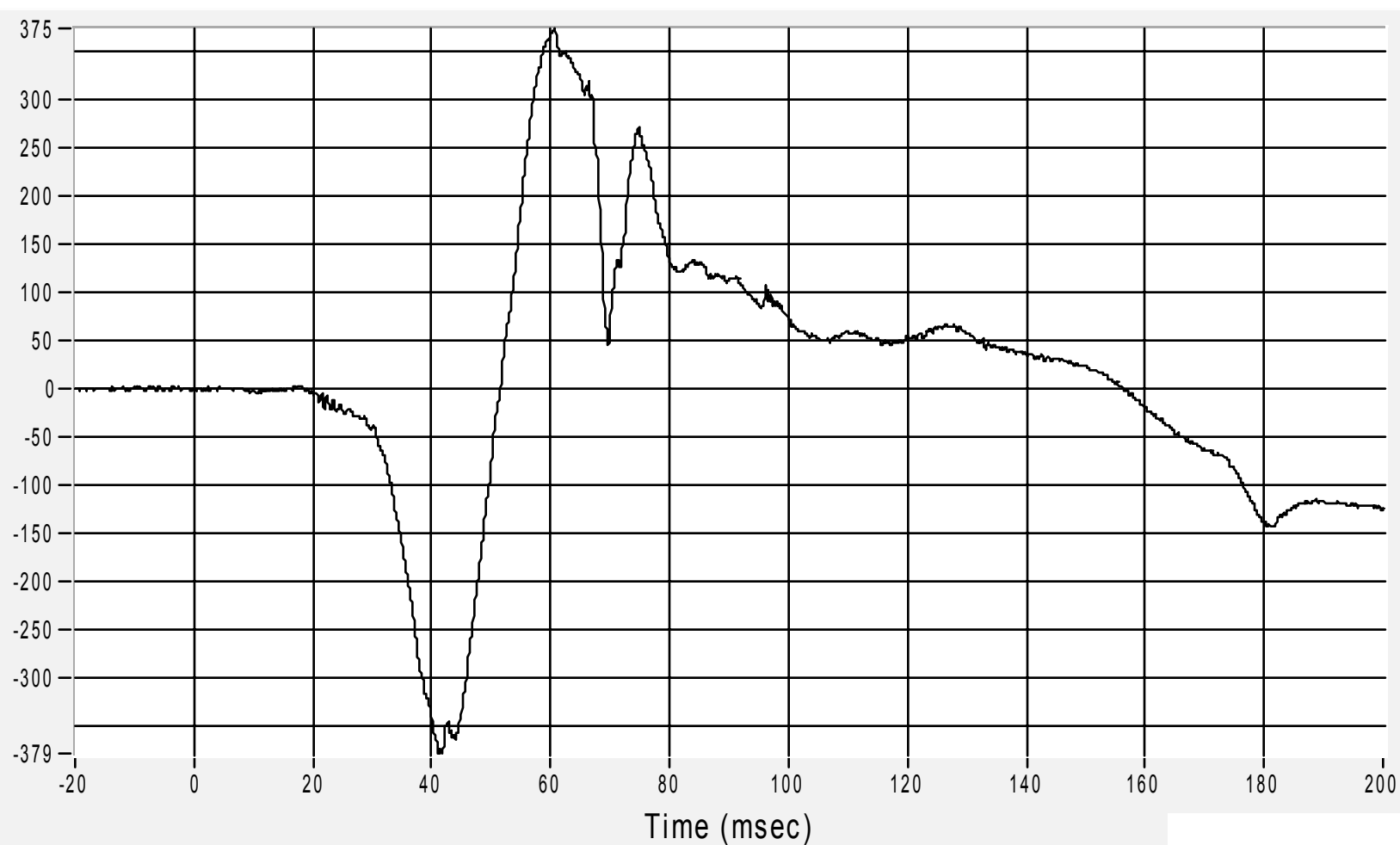
Driver Upper Neck (Y) Force

Force (N)

CFC1000

Max 374.6 N at 60.6 msec

Min -378.6 N at 41.7 msec



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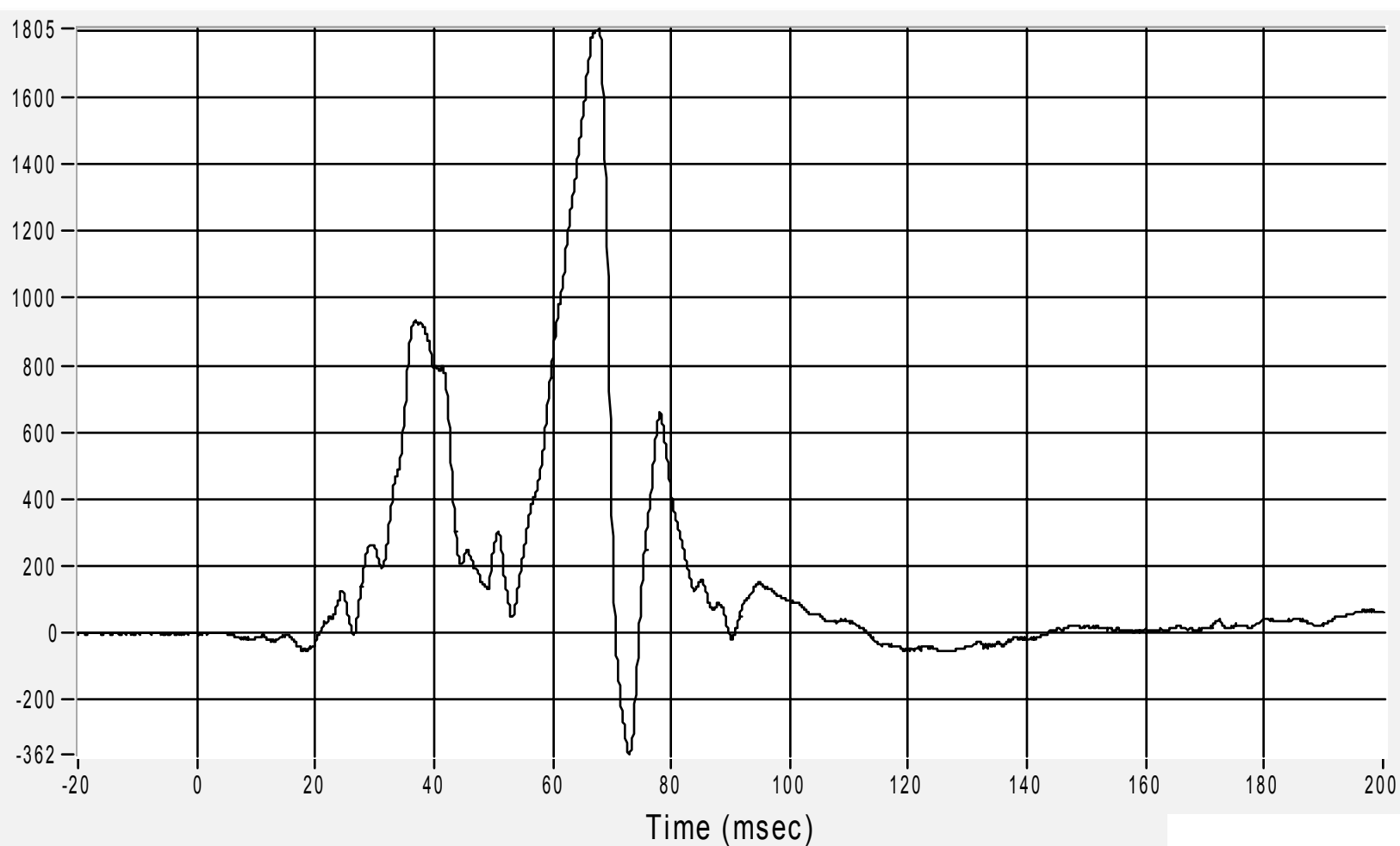
22 January 2004

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Driver Upper Neck (Z) Force

Force (N)

CFC1000

Max 1805.3 N at 67.9 msec**Min -361.5 N at 72.9 msec**

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22 January 2004

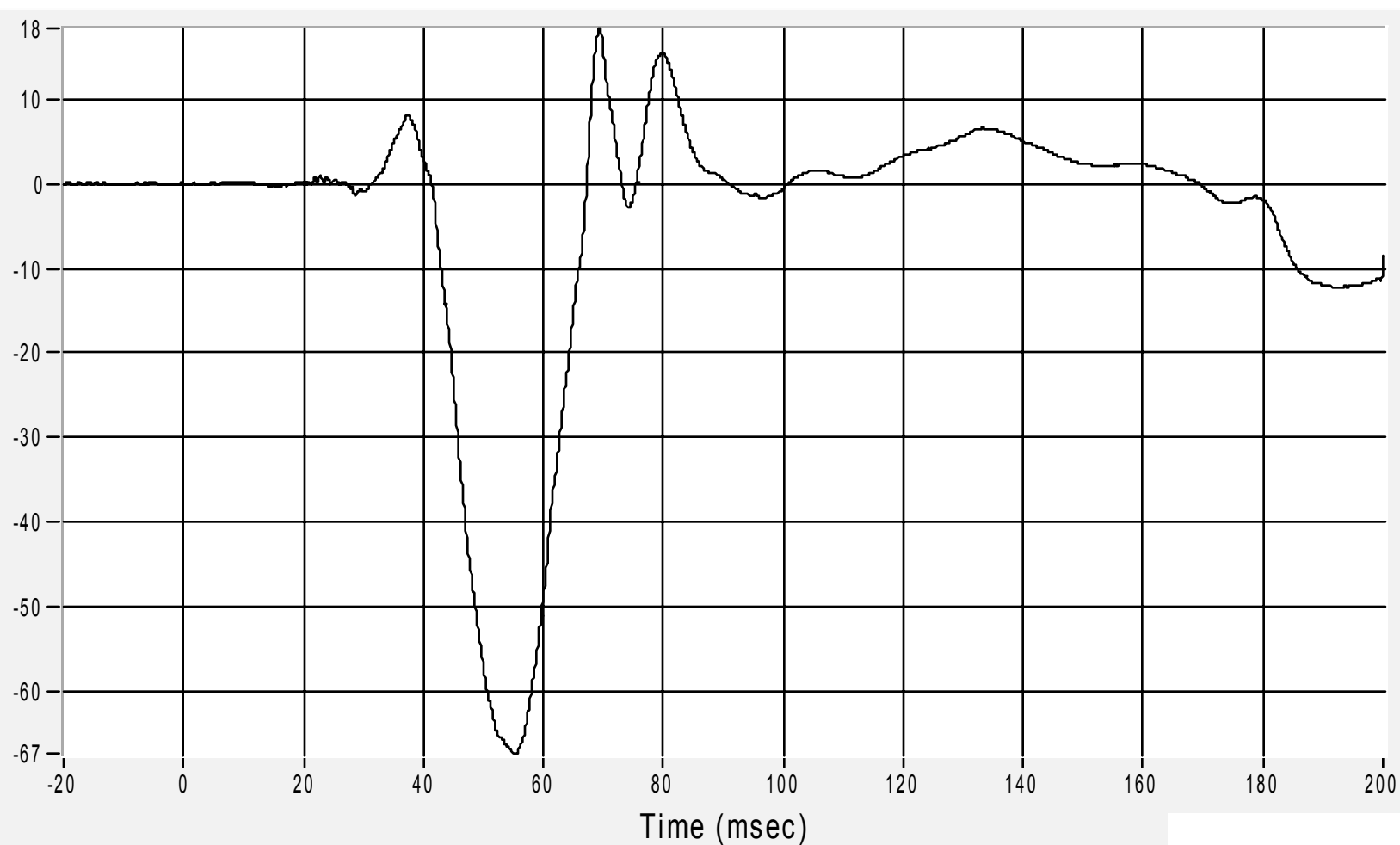
*Medical College of Wisconsin
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Driver Upper Neck (X) Moment

Moment (Nm) CFC600

Max 18.3 Nm at 69.4 msec

Min -67.2 Nm at 55.4 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

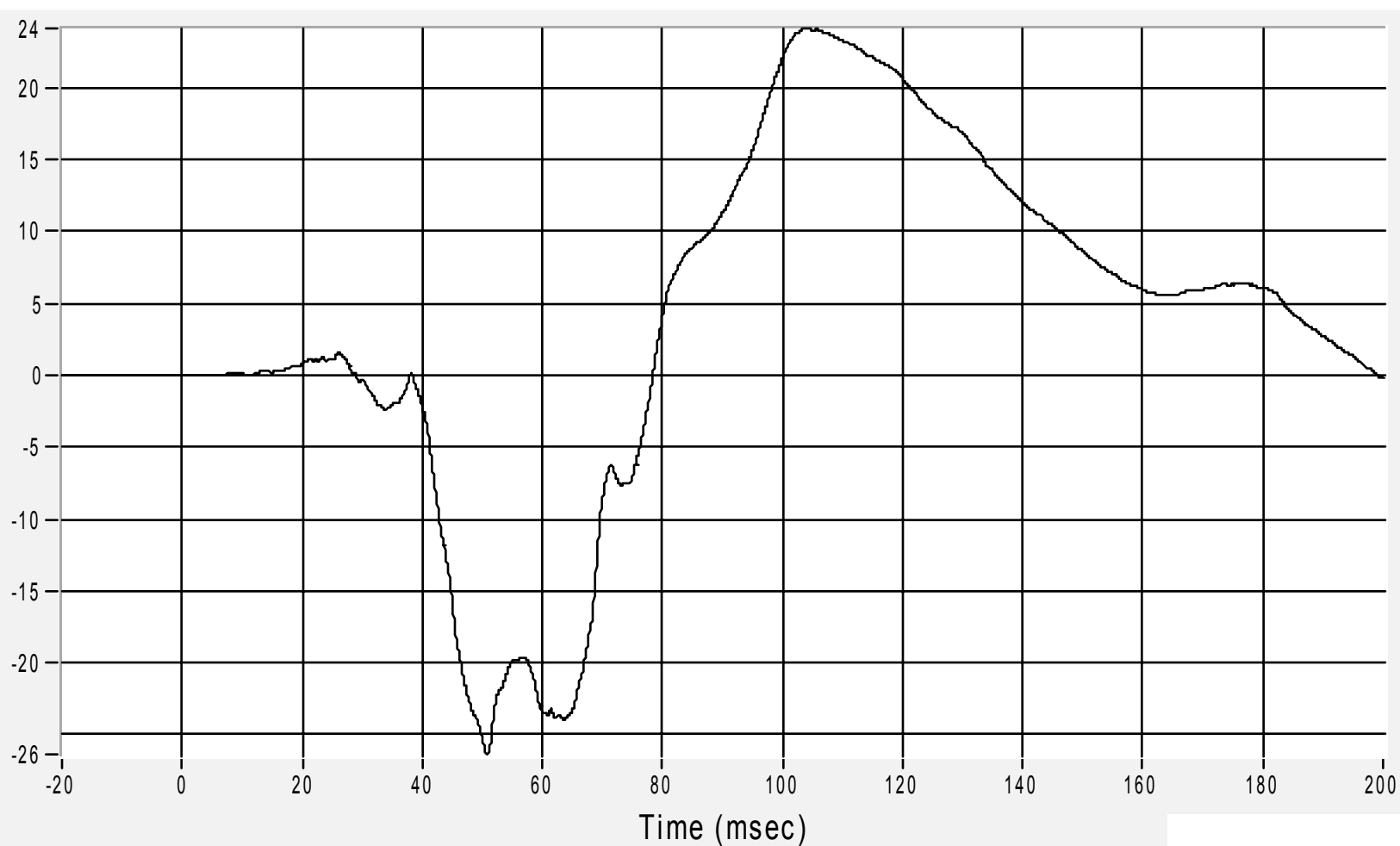
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (Y) Moment

Moment (Nm) CFC600

Max 24.1 Nm at 103.8 msec

Min -26.4 Nm at 50.8 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

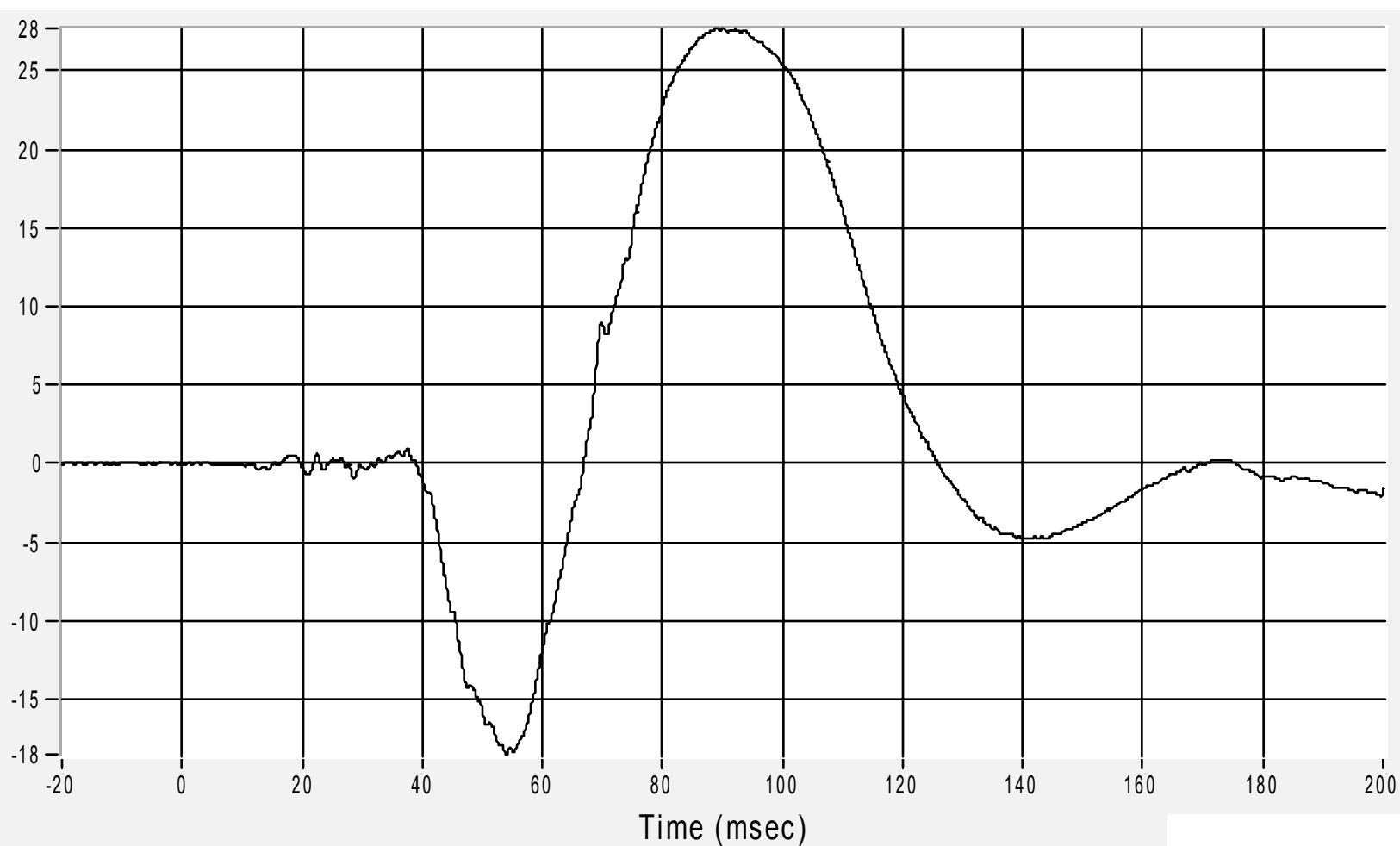
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (Z) Moment

Moment (Nm) CFC600

Max 27.7 Nm at 89.0 msec

Min -18.5 Nm at 54.0 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

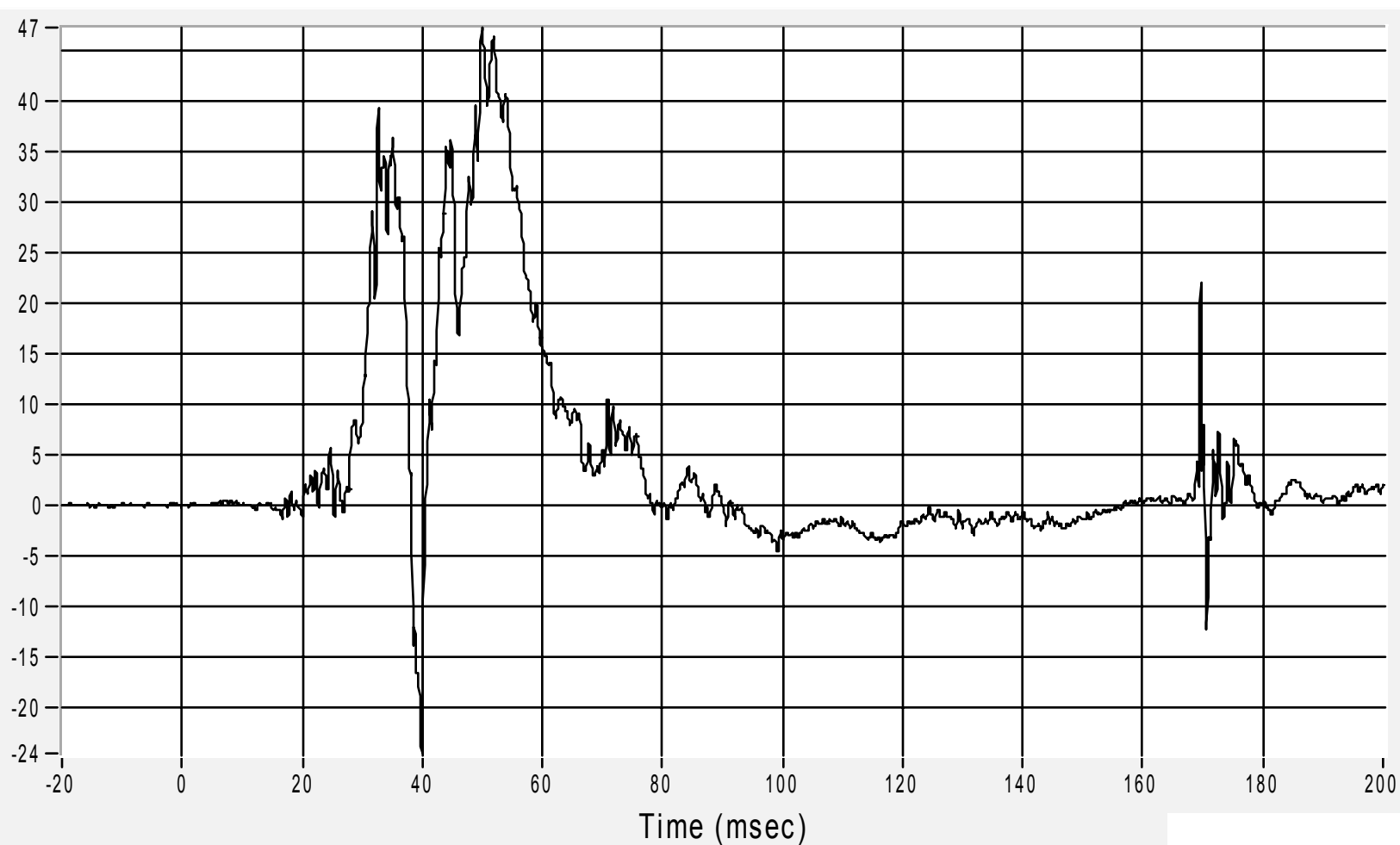
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 47.2 G at 49.9 msec

Min -24.5 G at 39.9 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

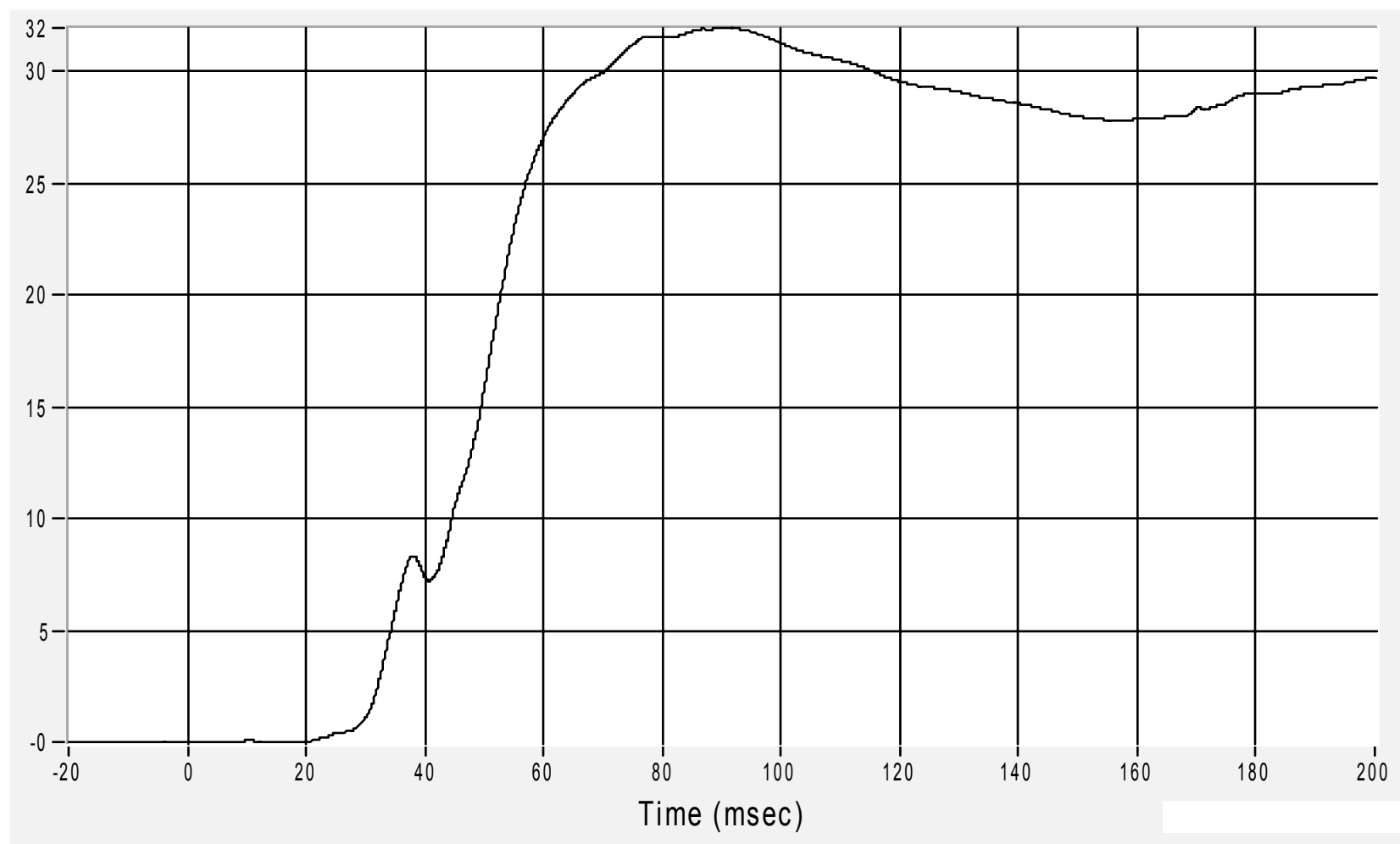
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Velocity

Velocity (km/h) CFC180

Max 31.9 km/h at 90.0 msec

Min 0.0 km/h at 0.8 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

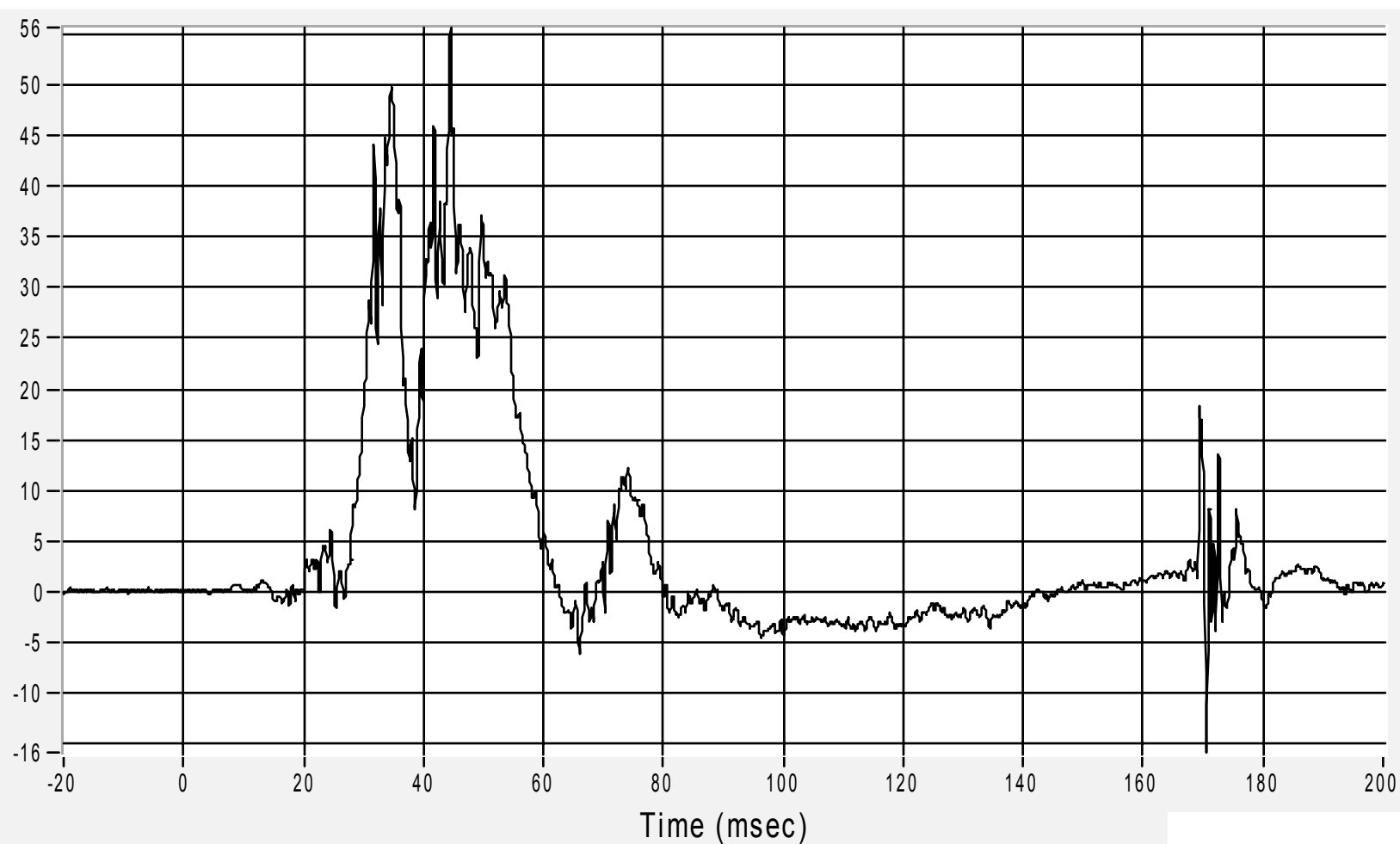
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 55.7 G at 44.5 msec

Min -16.0 G at 170.6 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

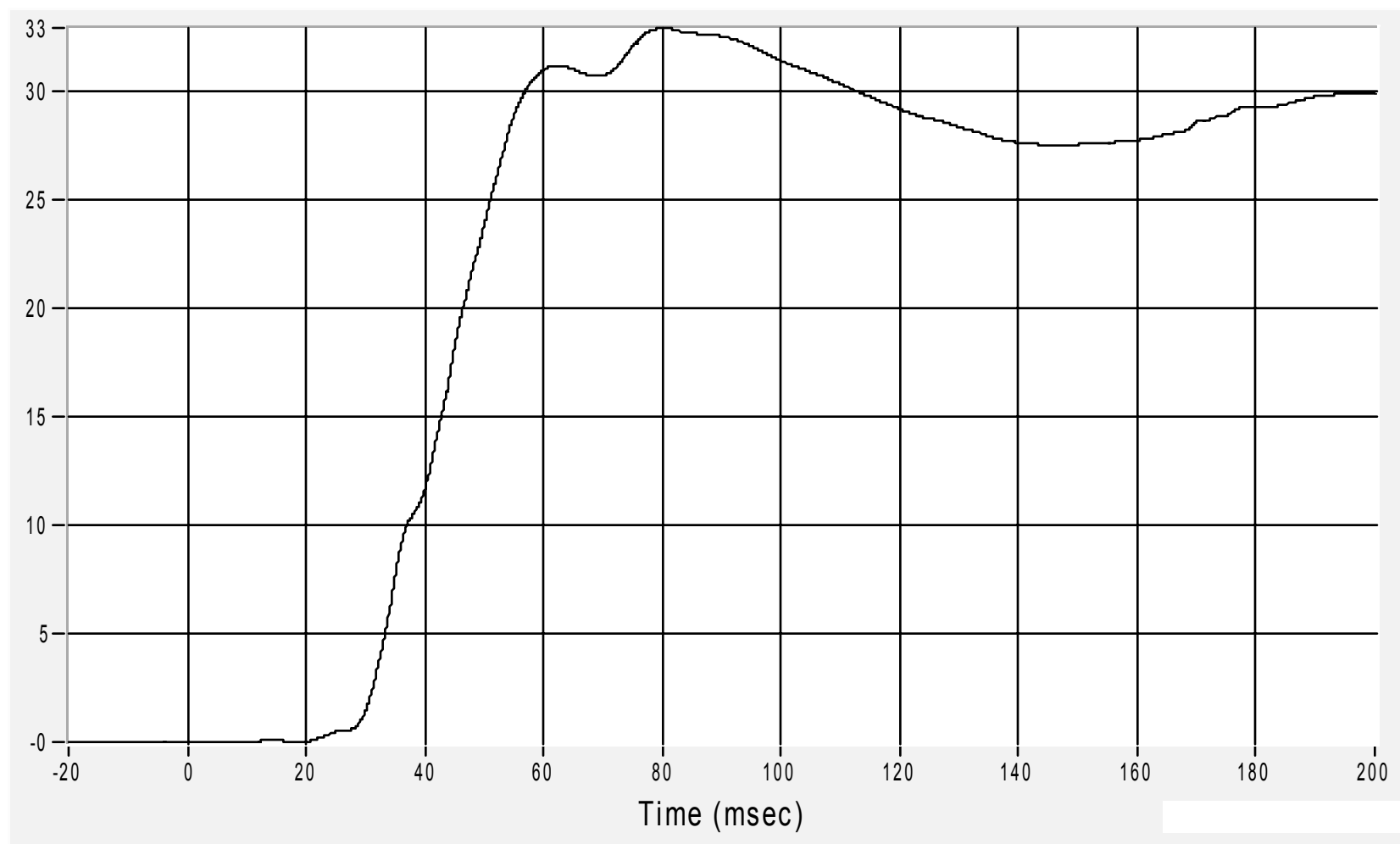
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Velocity

Velocity (km/h) CFC180

Max 32.9 km/h at 80.1 msec

Min 0.0 km/h at 19.4 msec



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22 January 2004

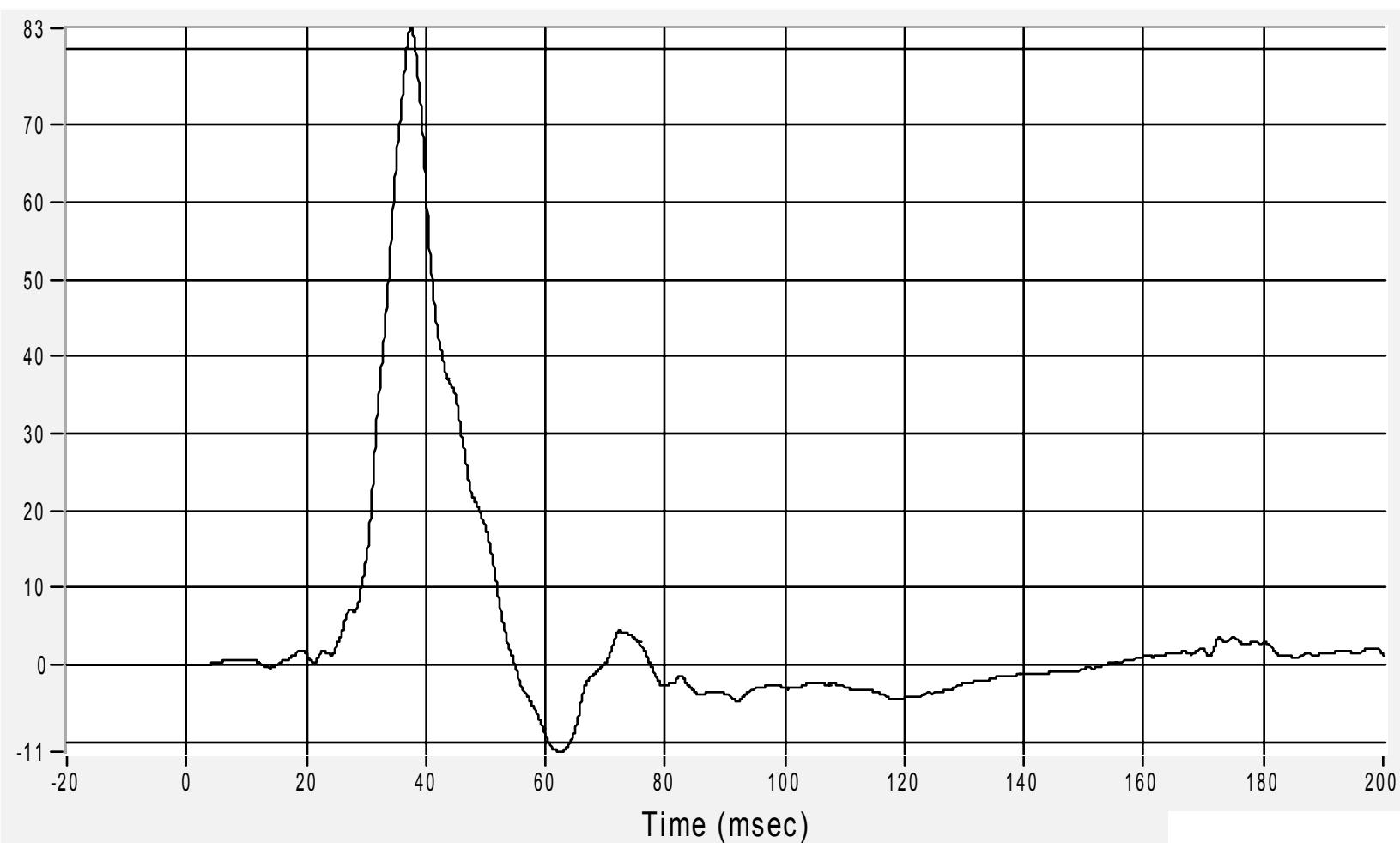
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Driver Lower Spine (Y) Acceleration

Acceleration (G's) CFC180

Max 82.6 G at 37.5 msec

Min -11.3 G at 62.6 msec



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22 January 2004

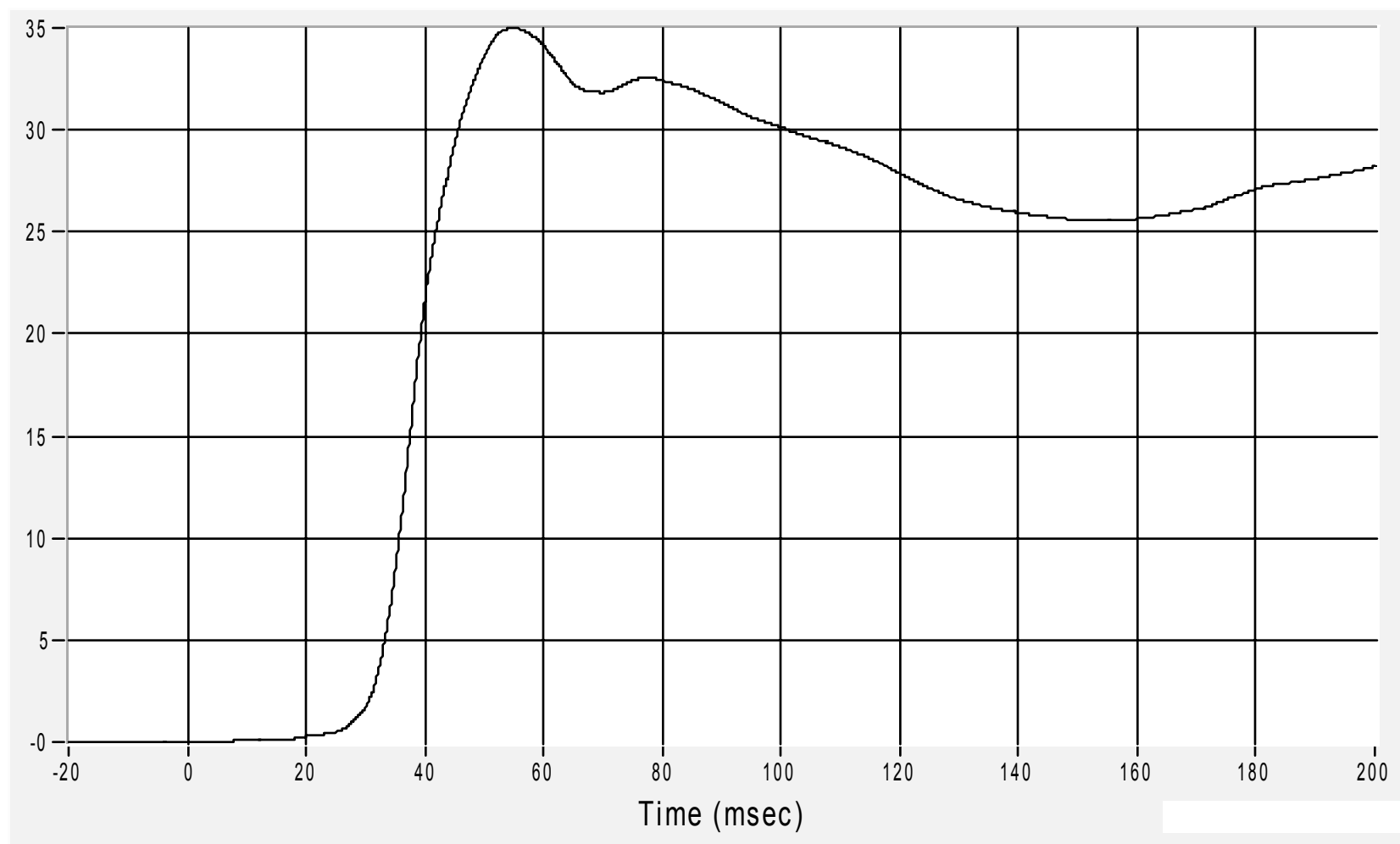
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Velocity

Velocity (km/h) CFC180

Max 35.0 km/h at 54.9 msec

Min 0.0 km/h at 3.3 msec



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22 January 2004

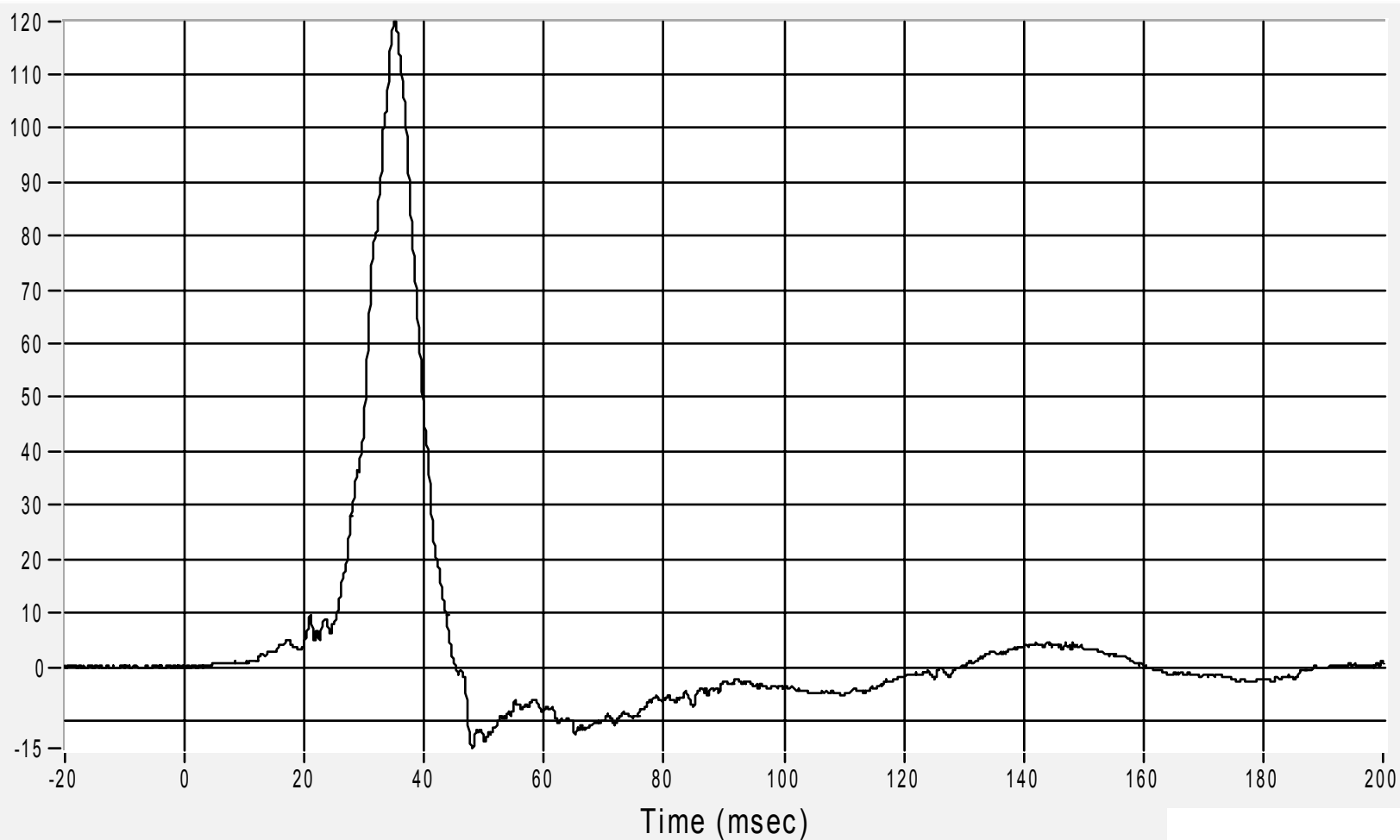
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Acceleration

Acceleration (G's) CFC1000

Max 119.8 G at 35.0 msec

Min -15.1 G at 48.0 msec



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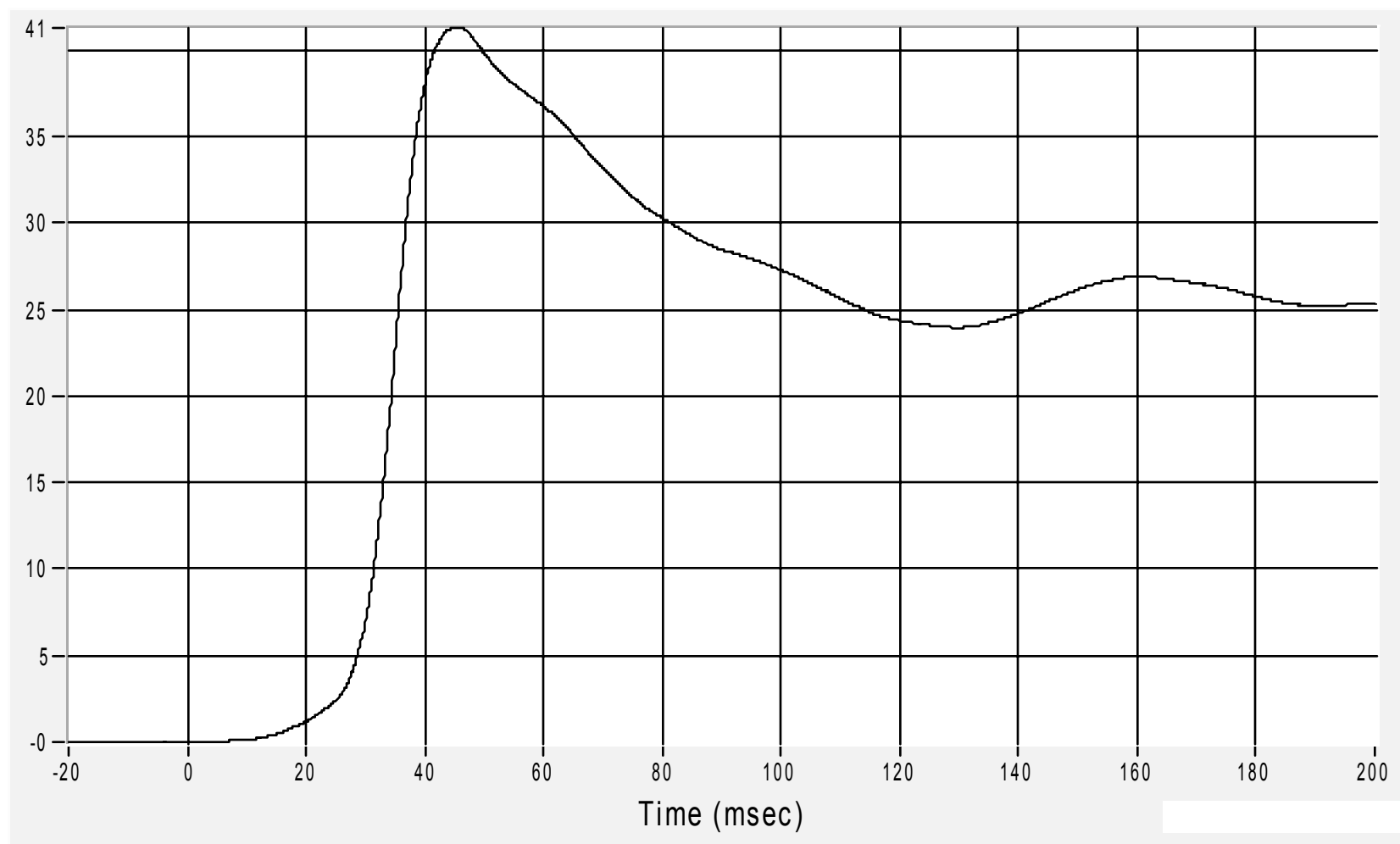
Medical College of Wisconsin
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Driver Pelvic (Y) Velocity

Velocity (km/h) CFC180

Max 41.3 km/h at 45.3 msec

Min 0.0 km/h at 0.3 msec



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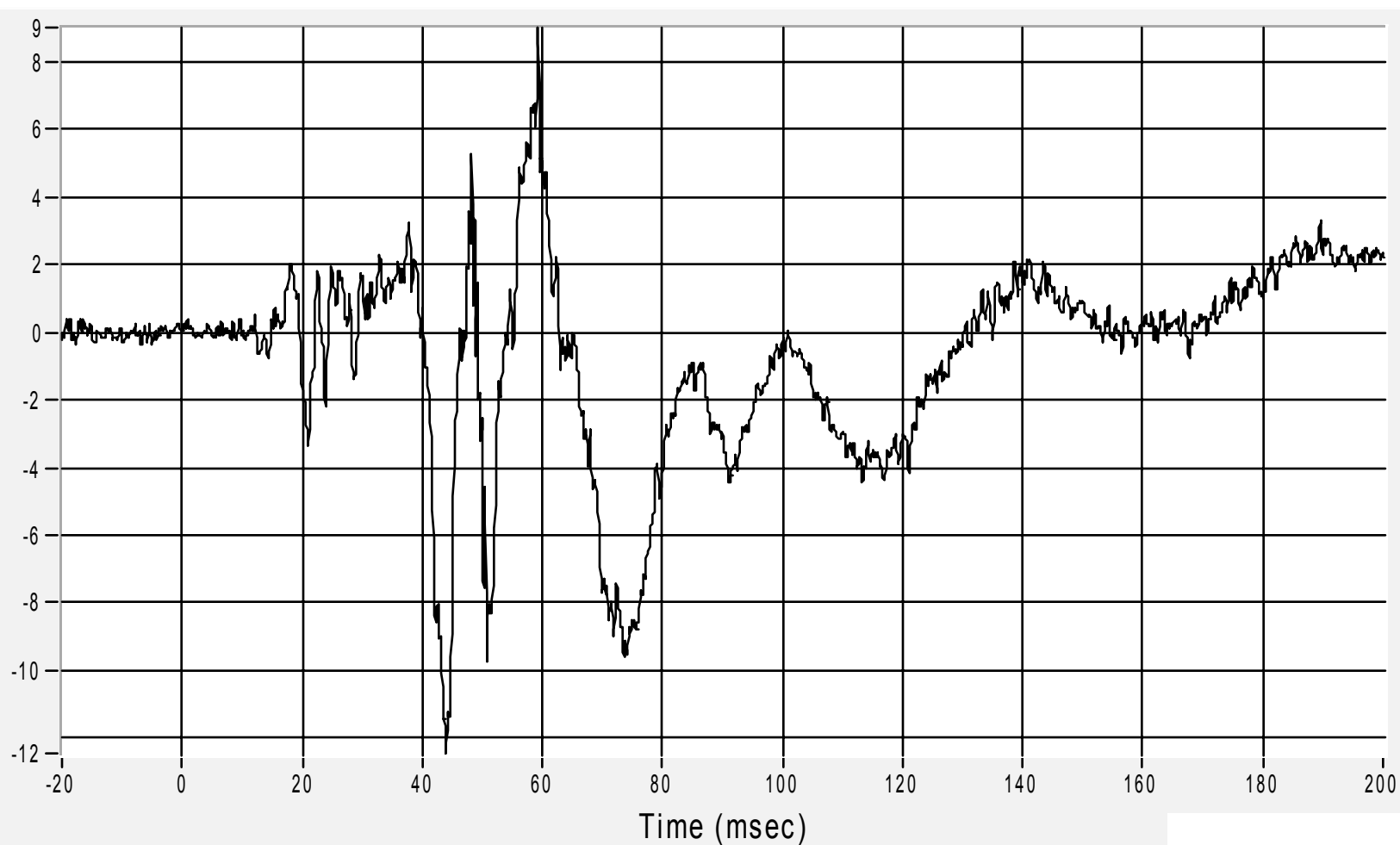
Medical College of Wisconsin
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Passenger Head CG (X) Acceleration

Acceleration (G's) CFC1000

Max 9.0 G at 59.3 msec

Min -12.5 G at 44.0 msec



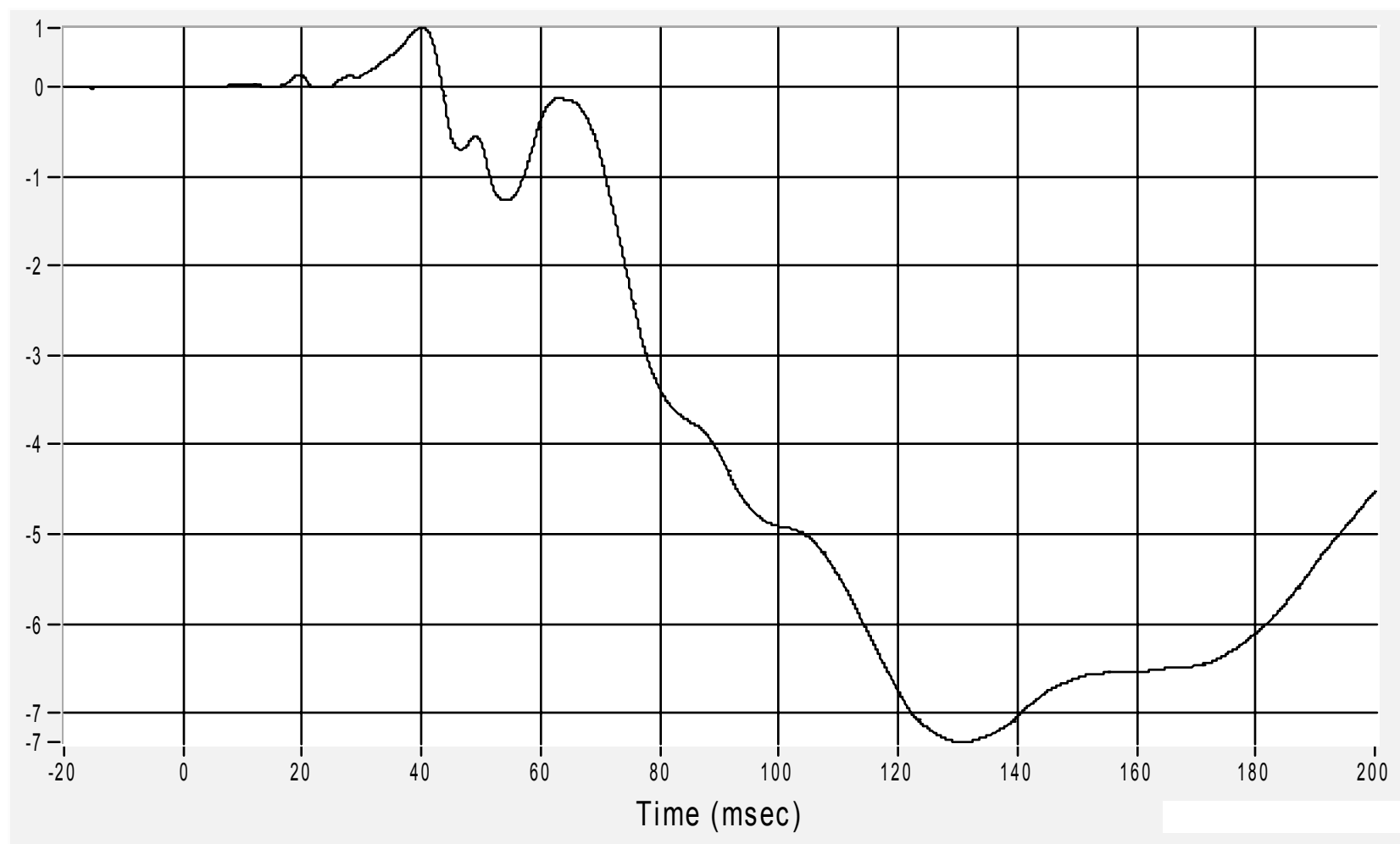
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Passenger Head CG (X) Velocity

Velocity (km/h) CFC180

Max 0.7 km/h at 40.1 msec**Min -7.3 km/h at 131.3 msec**

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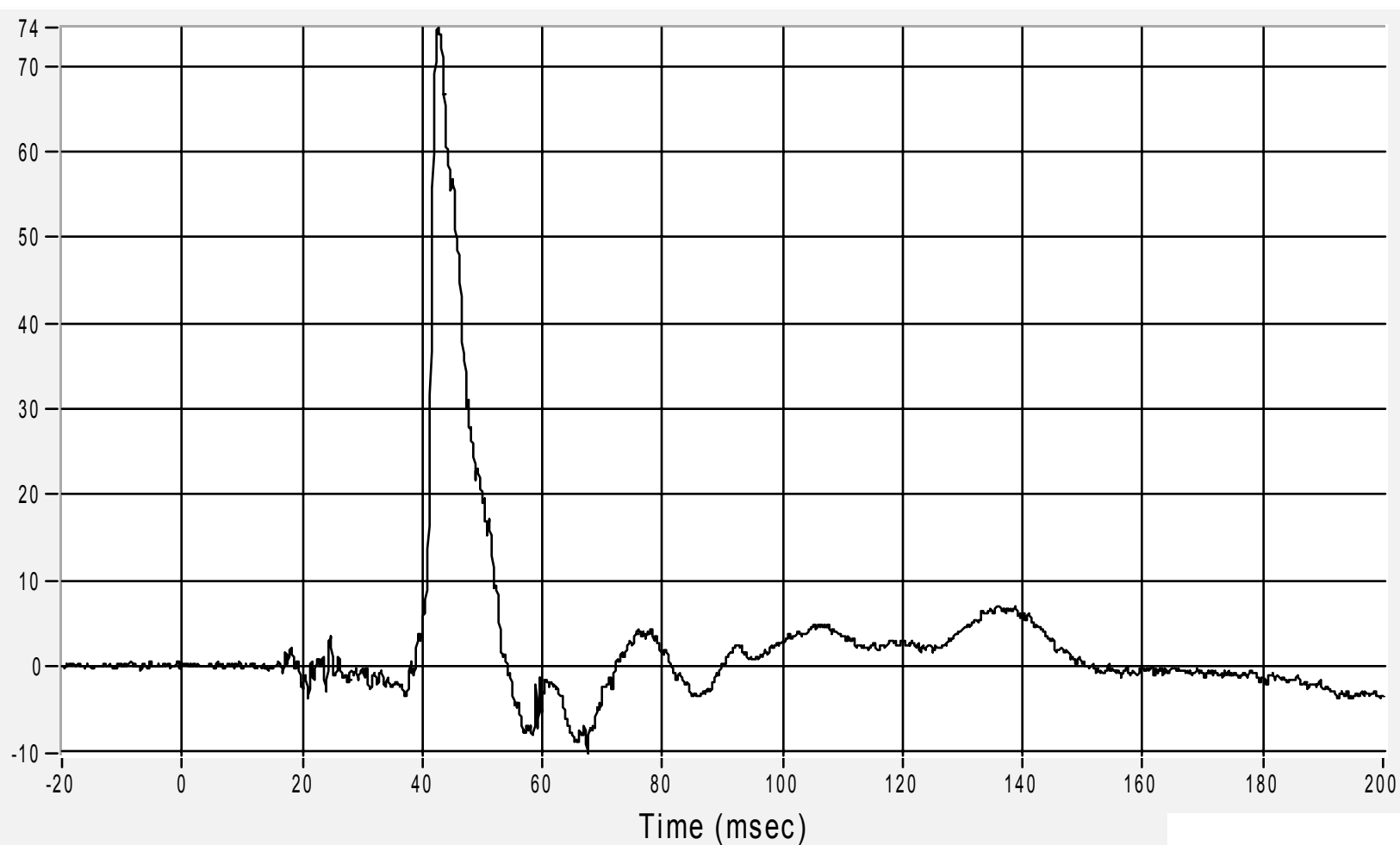
*Medical College of Wisconsin
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Passenger Head CG (Y) Acceleration

Acceleration (G's) CFC1000

Max 74.4 G at 42.6 msec

Min -10.2 G at 67.5 msec



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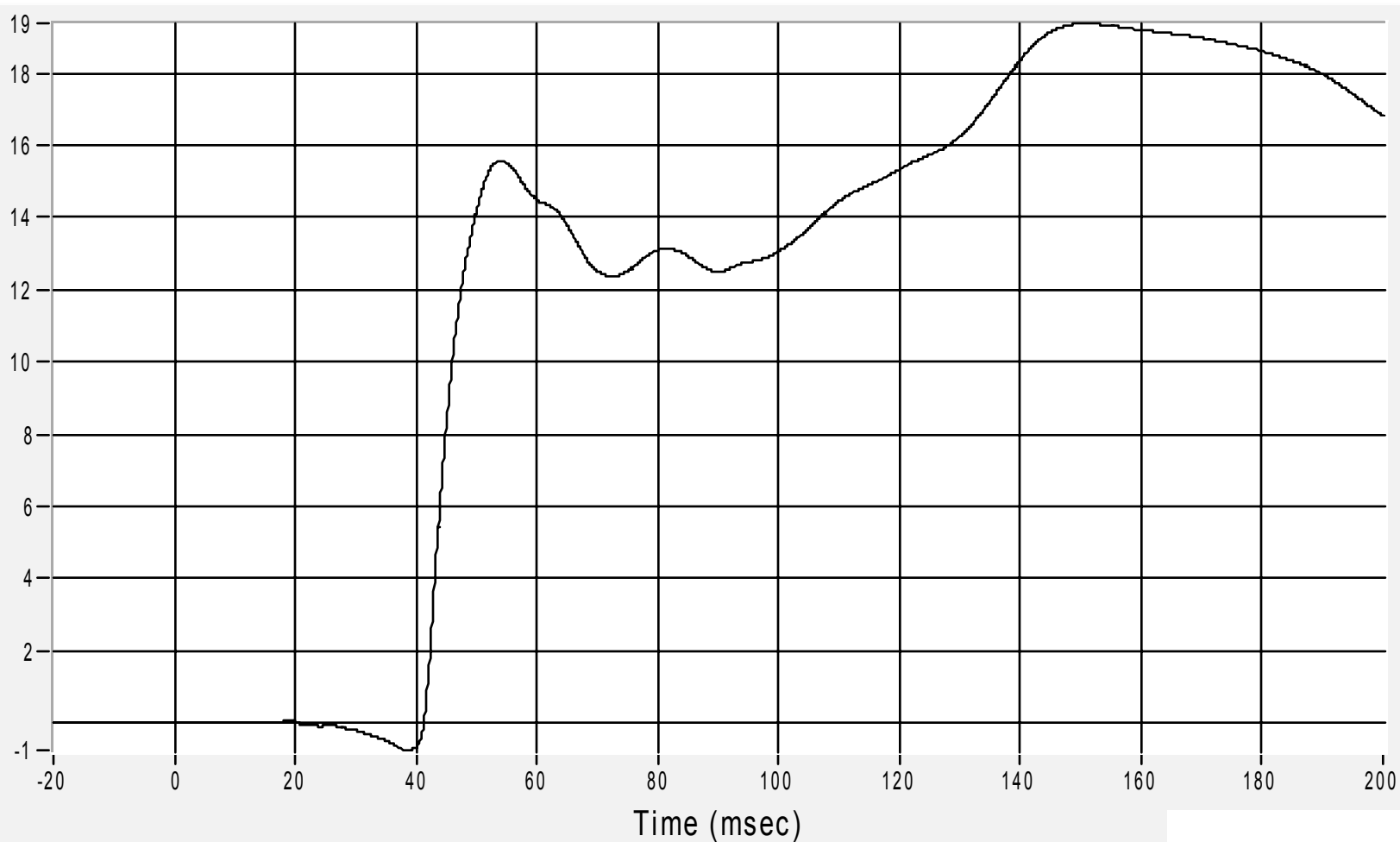
Medical College of Wisconsin
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Passenger Head CG (Y) Velocity

Velocity (km/h) CFC180

Max 19.4 km/h at 150.8 msec

Min -0.8 km/h at 38.6 msec



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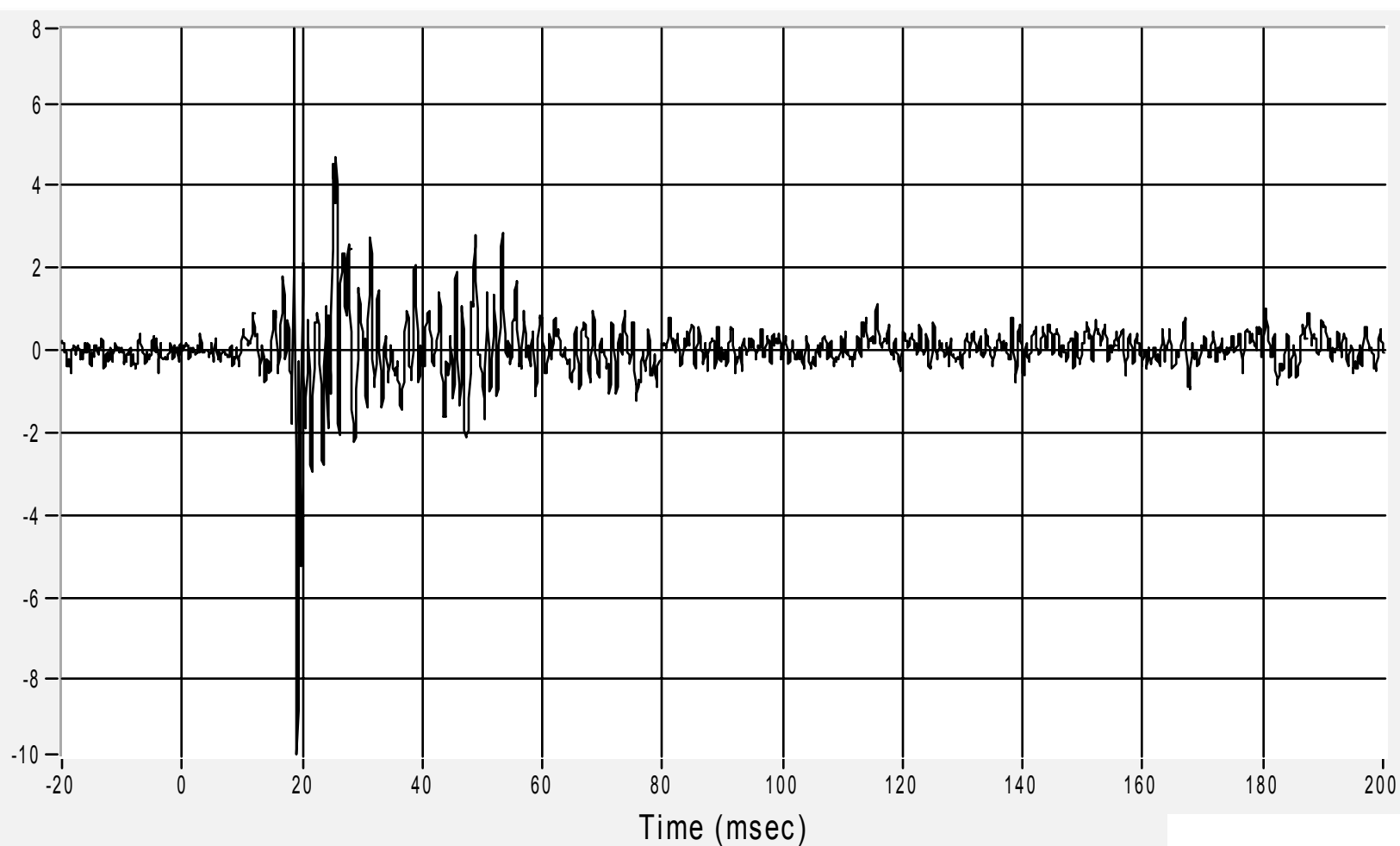
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (Z) Acceleration

Acceleration (G's) CFC1000

Max 7.8 G at 18.6 msec

Min -9.8 G at 19.2 msec



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22 January 2004

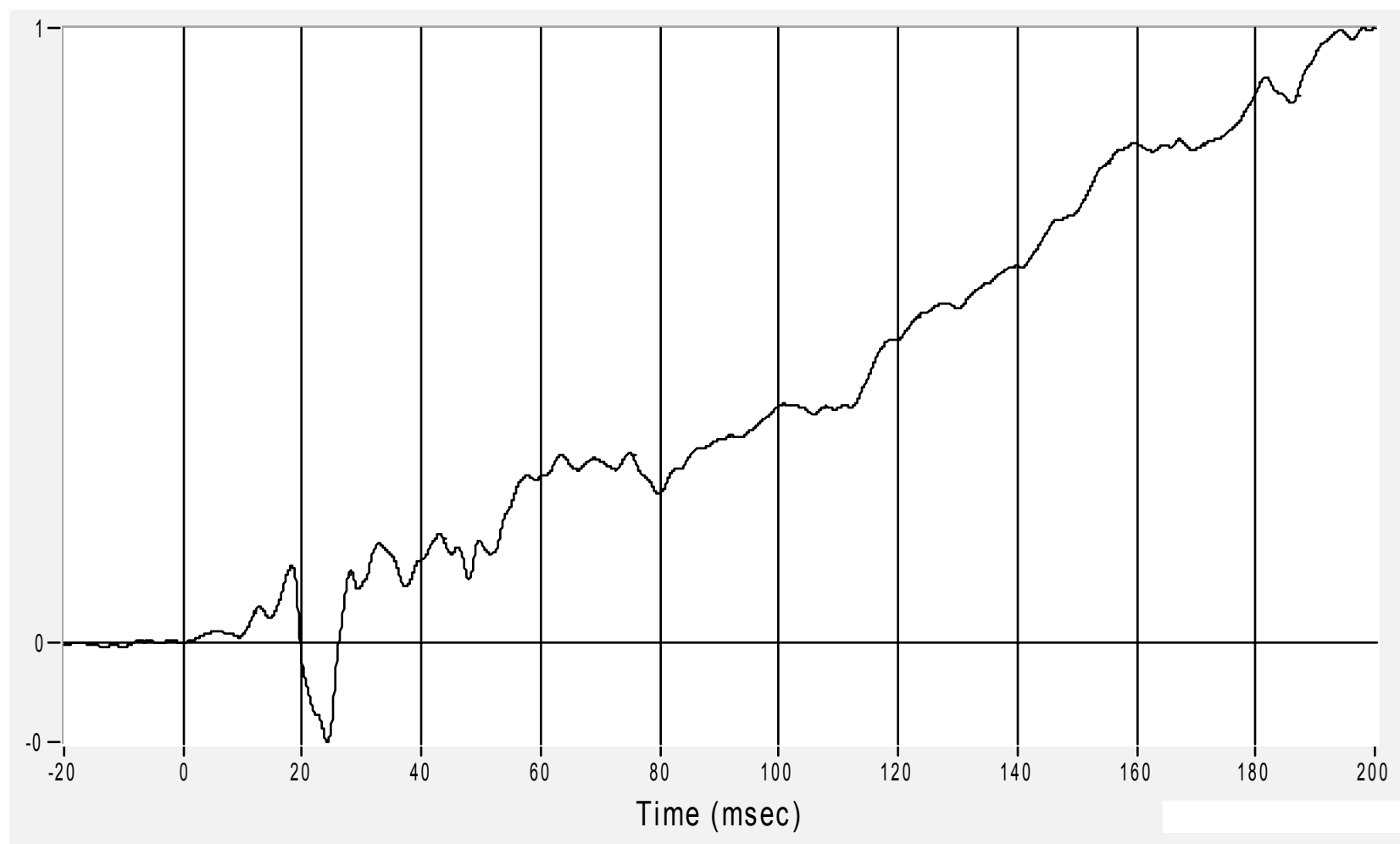
*Medical College of Wisconsin
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Passenger Head CG (Z) Velocity

Velocity (km/h) CFC180

Max 0.7 km/h at 199.9 msec

Min -0.1 km/h at 24.2 msec



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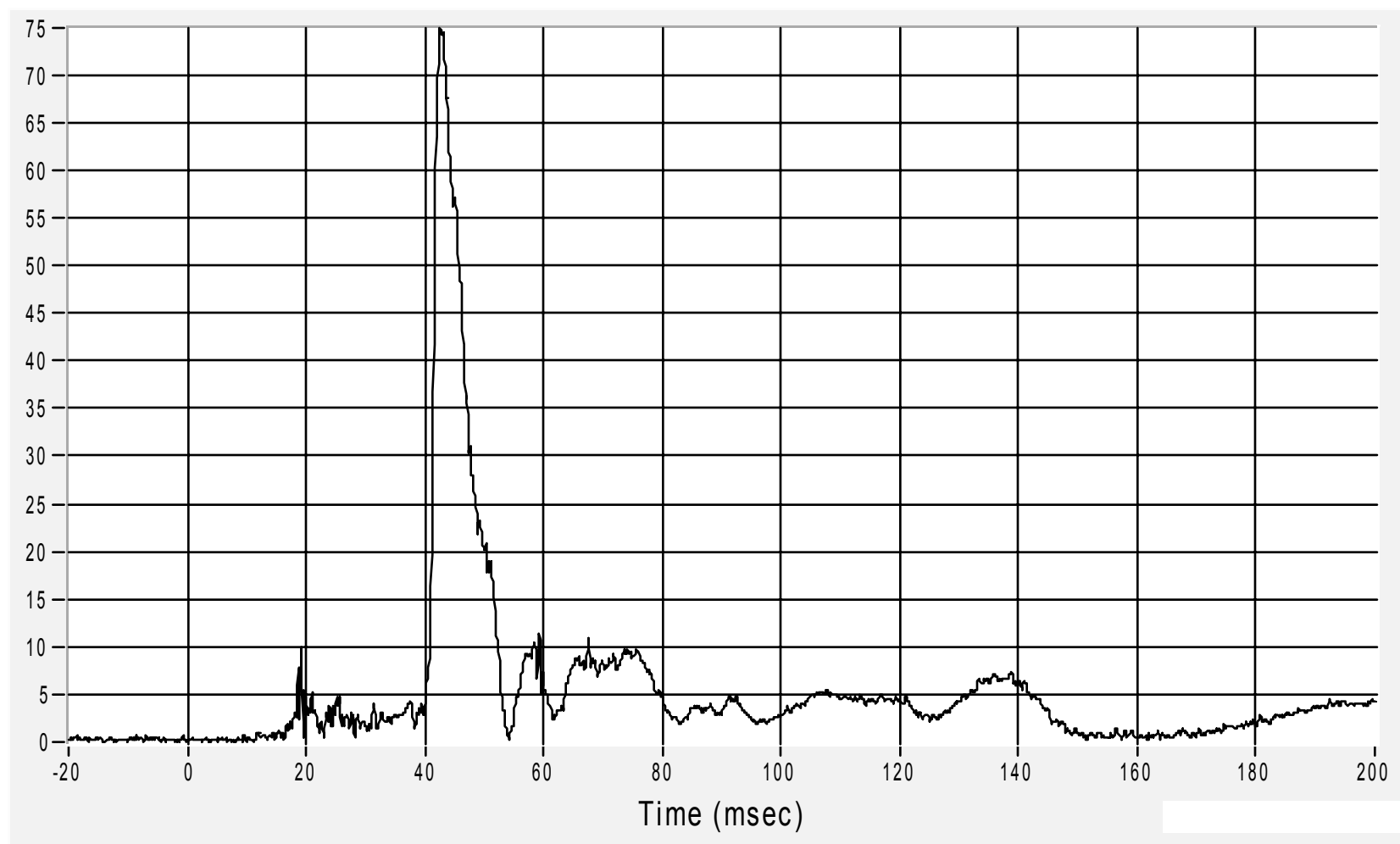
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Passenger Head Resultant Acceleration

Acceleration (G's) CFC1000

Max 74.9 G's at 42.6 msec

Min 0.1 G's at 6.8 msec



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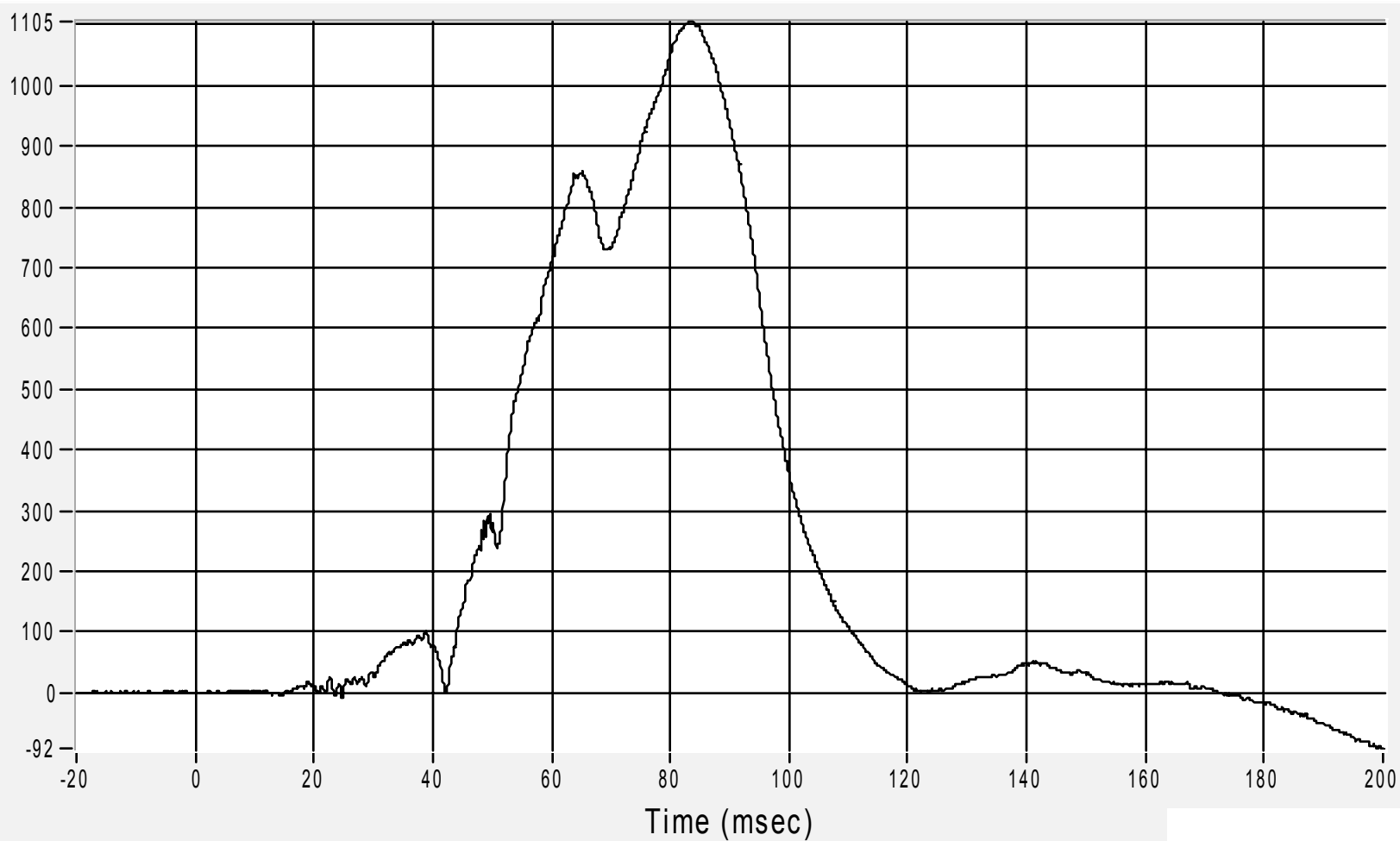
Passenger Upper Neck (X) Force

Force (N)

CFC1000

Max 1104.9 N at 83.4 msec

Min -91.1 N at 199.9 msec



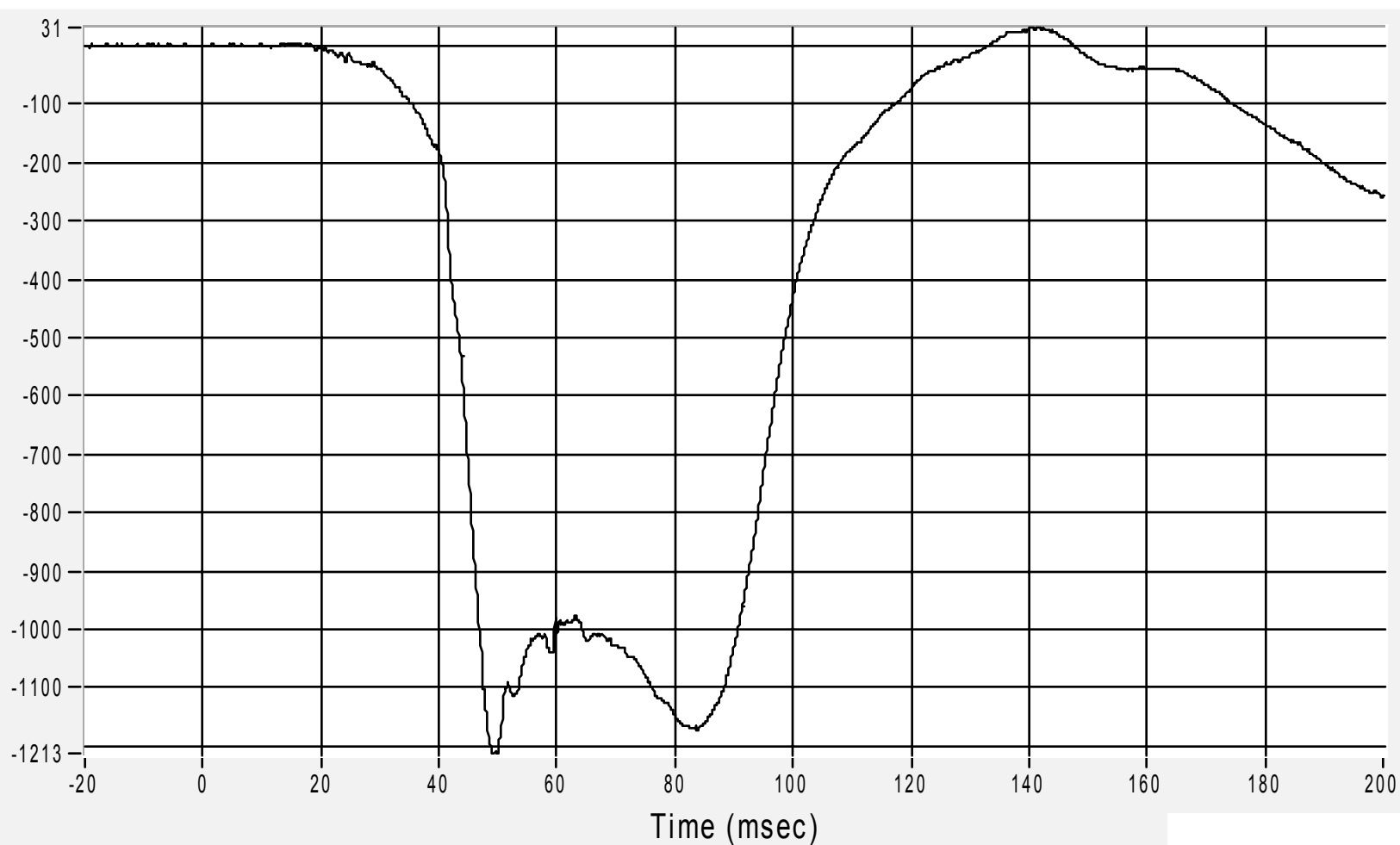
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Passenger Upper Neck (Y) Force
Force (N) CFC1000

Max 31.2 N at 141.4 msec
Min -1212.9 N at 49.8 msec

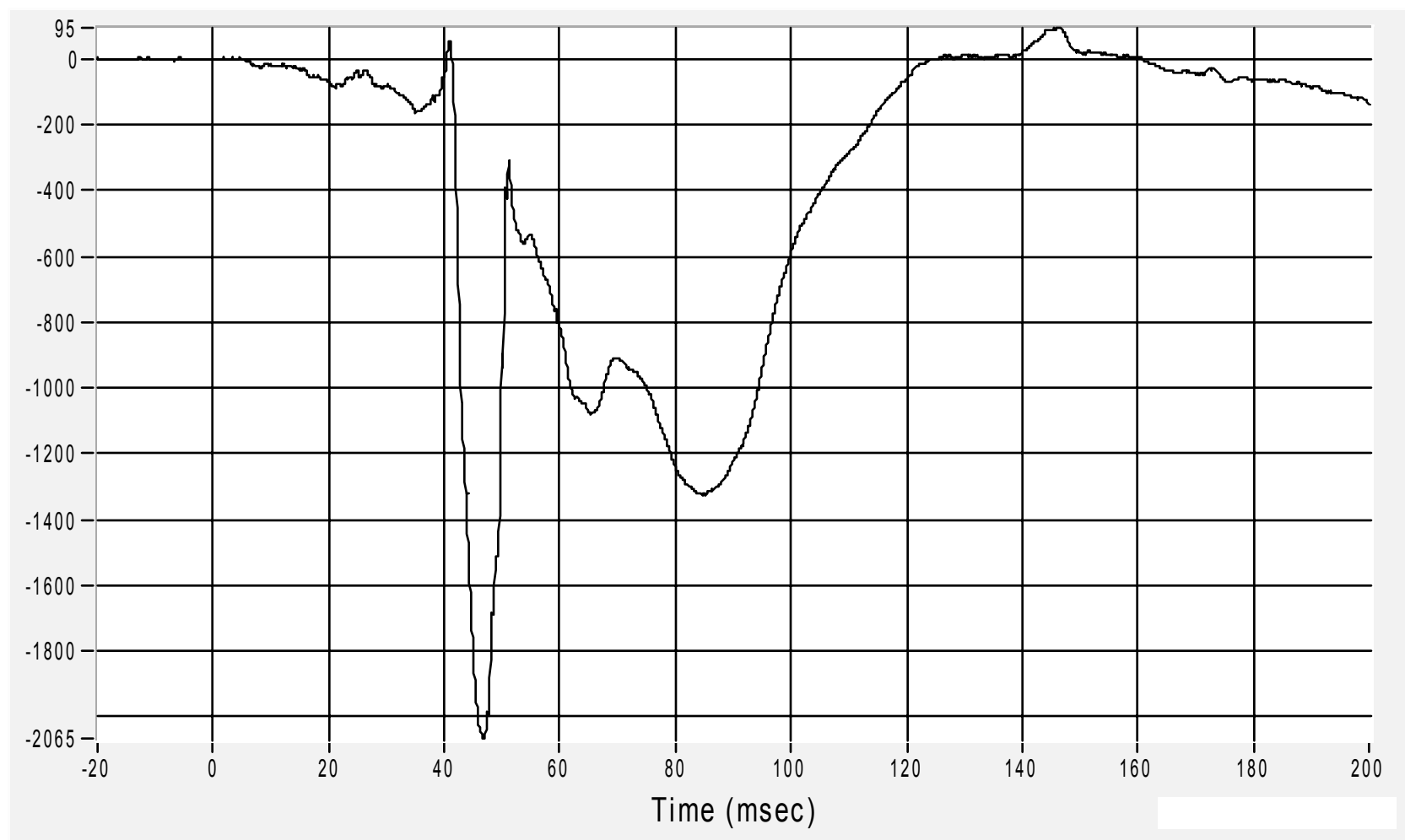


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Passenger Upper Neck (Z) Force
Force (N) CFC1000

Max 94.8 N at 146.6 msec
Min -2065.1 N at 46.7 msec



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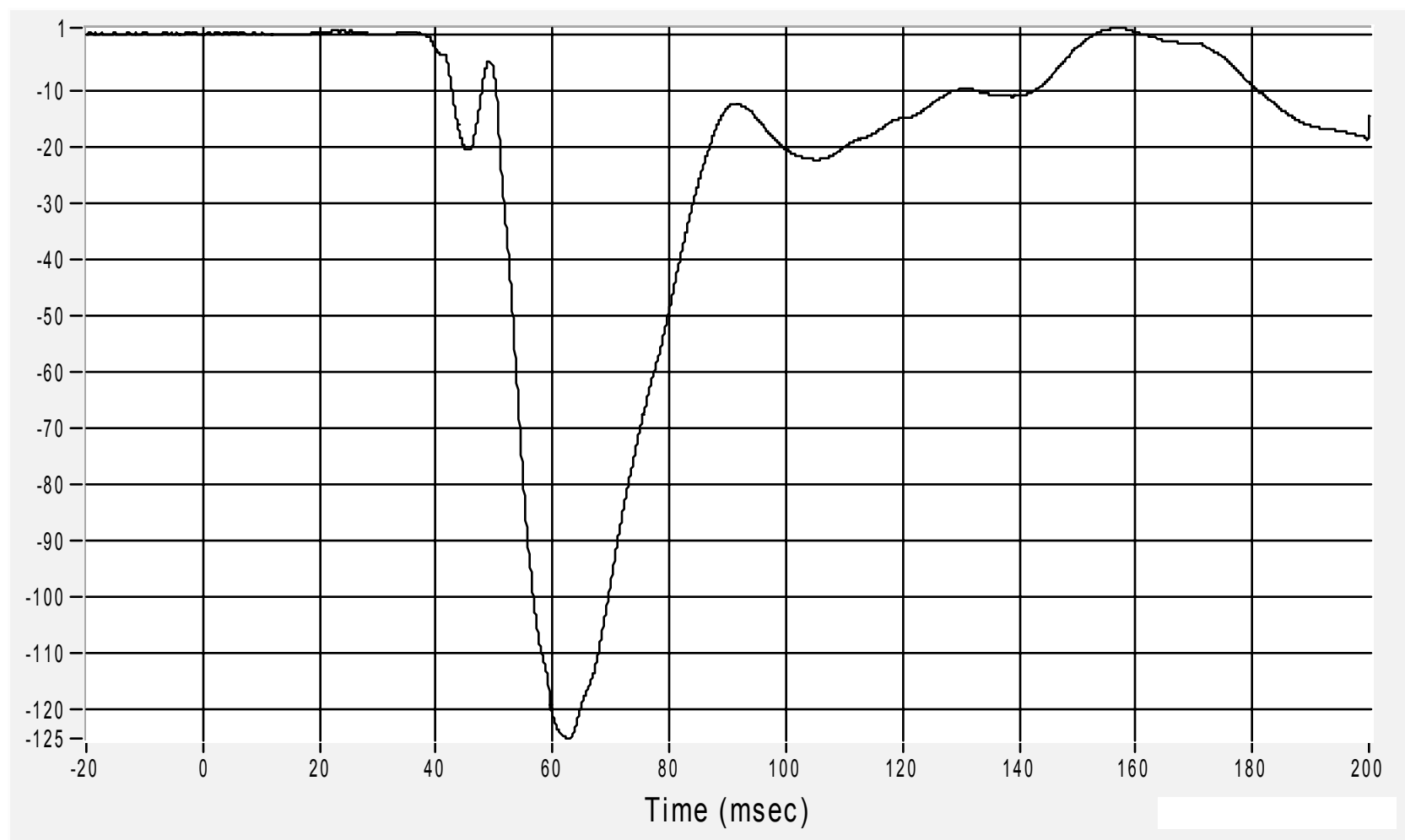
Medical College of Wisconsin
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Passenger Upper Neck (X) Moment

Moment (Nm) CFC600

Max 1.0 Nm at 156.8 msec

Min -125.3 Nm at 62.9 msec



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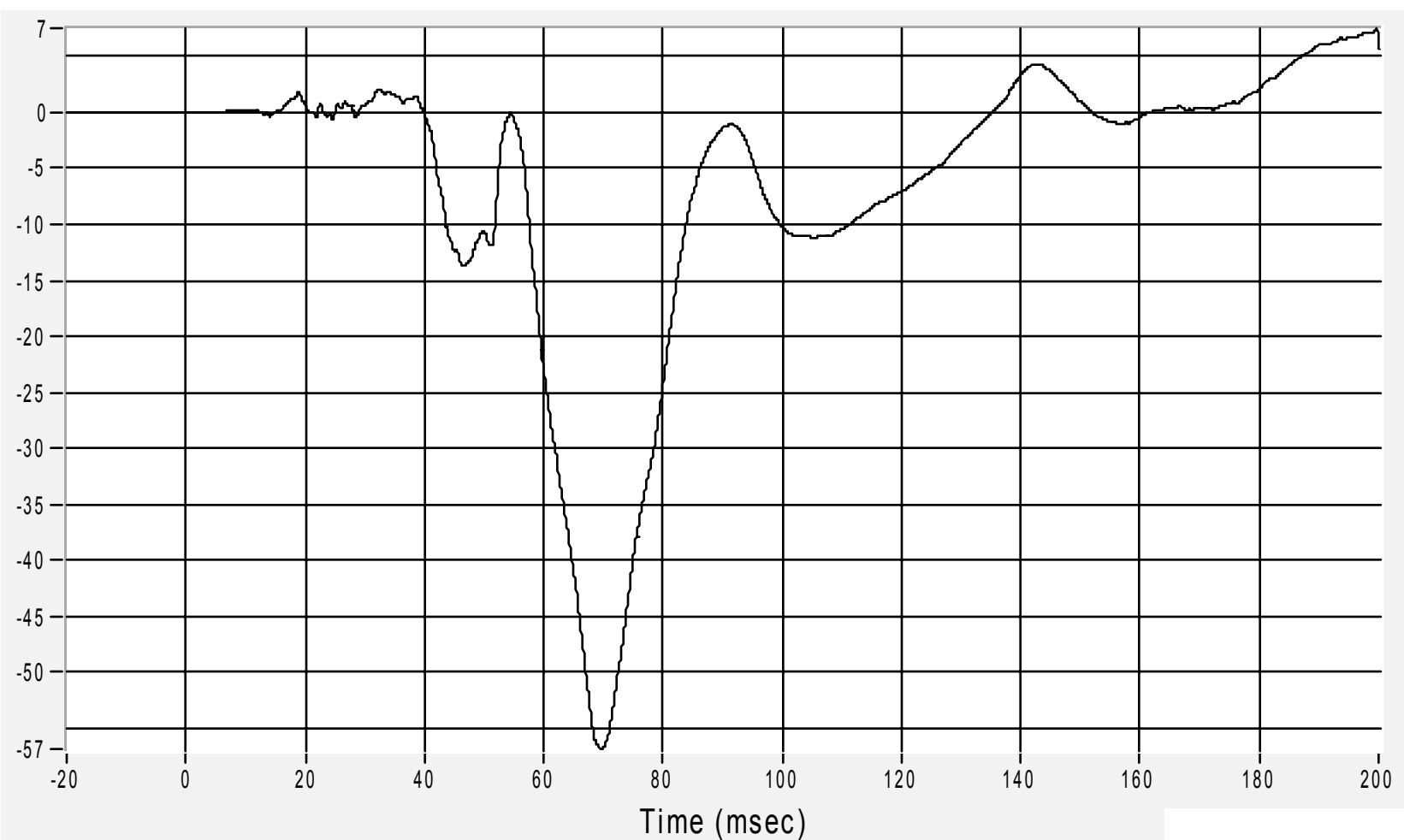
Passenger Upper Neck (Y) Moment

Moment (Nm)

CFC600

Max 7.5 Nm at 199.7 msec

Min -56.8 Nm at 69.7 msec



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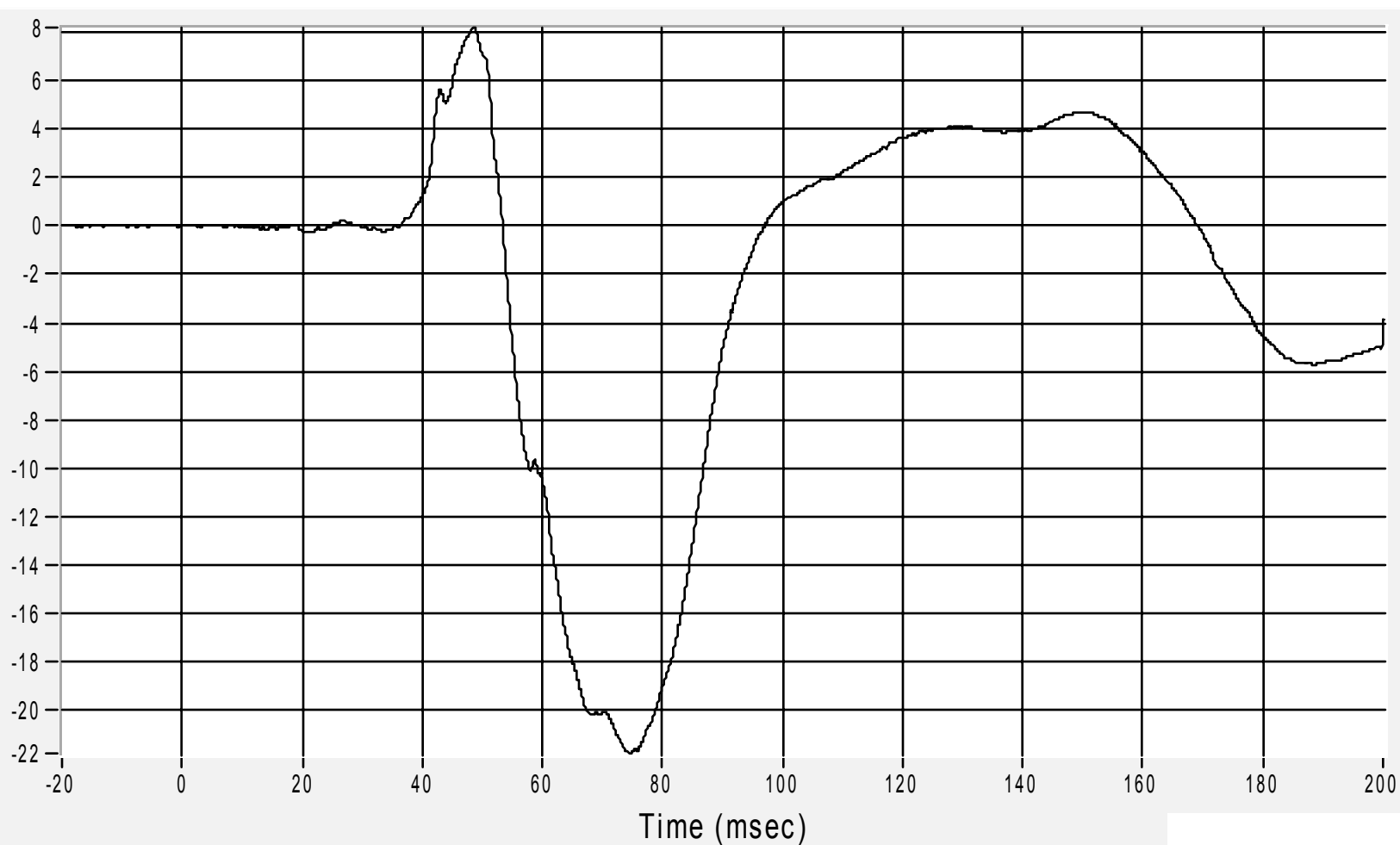
Passenger Upper Neck (Z) Moment

Moment (Nm)

CFC600

Max 8.2 Nm at 48.5 msec

Min -21.8 Nm at 74.6 msec



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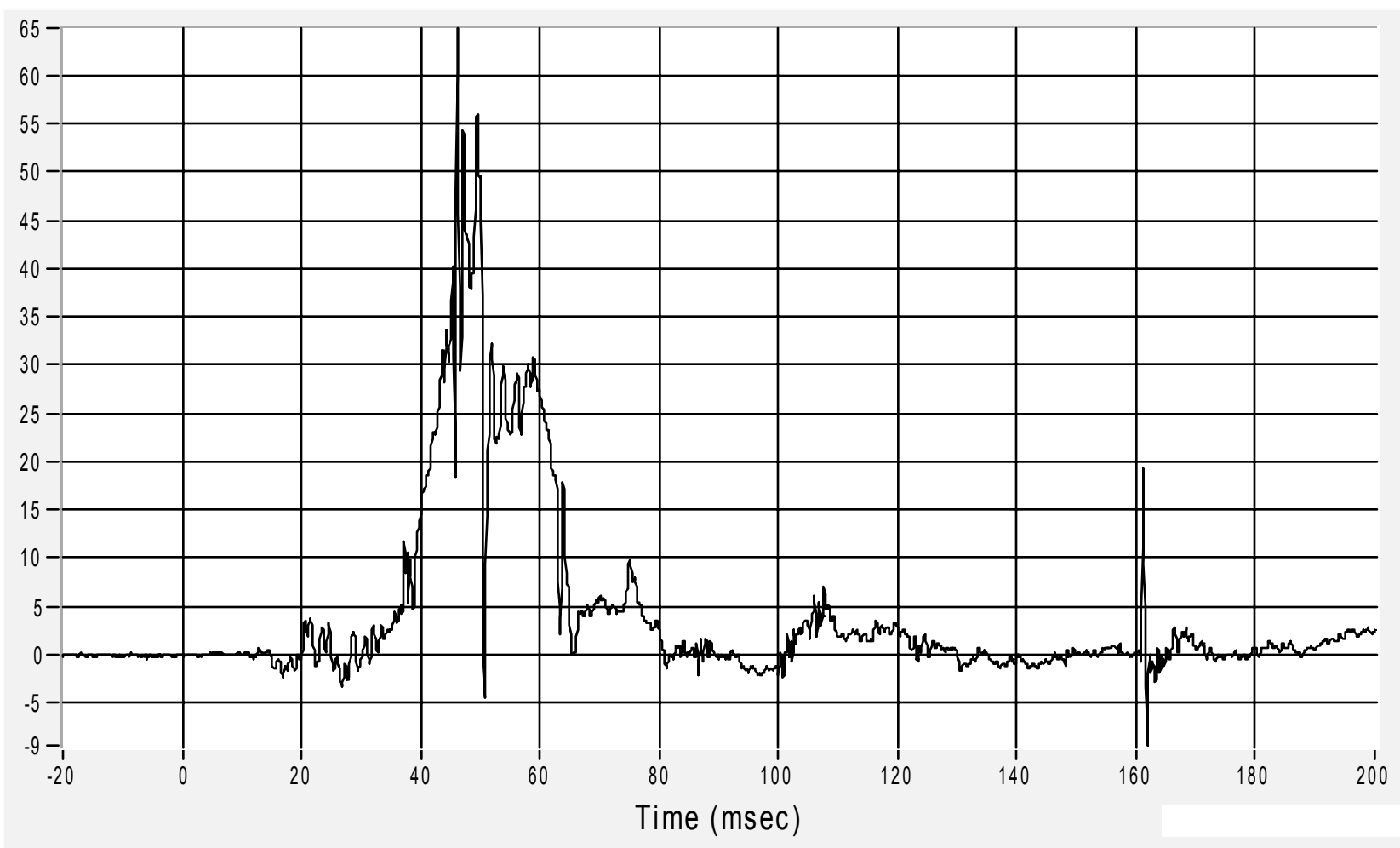
Medical College of Wisconsin
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Passenger Upper Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 64.9 G at 46.2 msec

Min -9.4 G at 161.8 msec



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22 January 2004

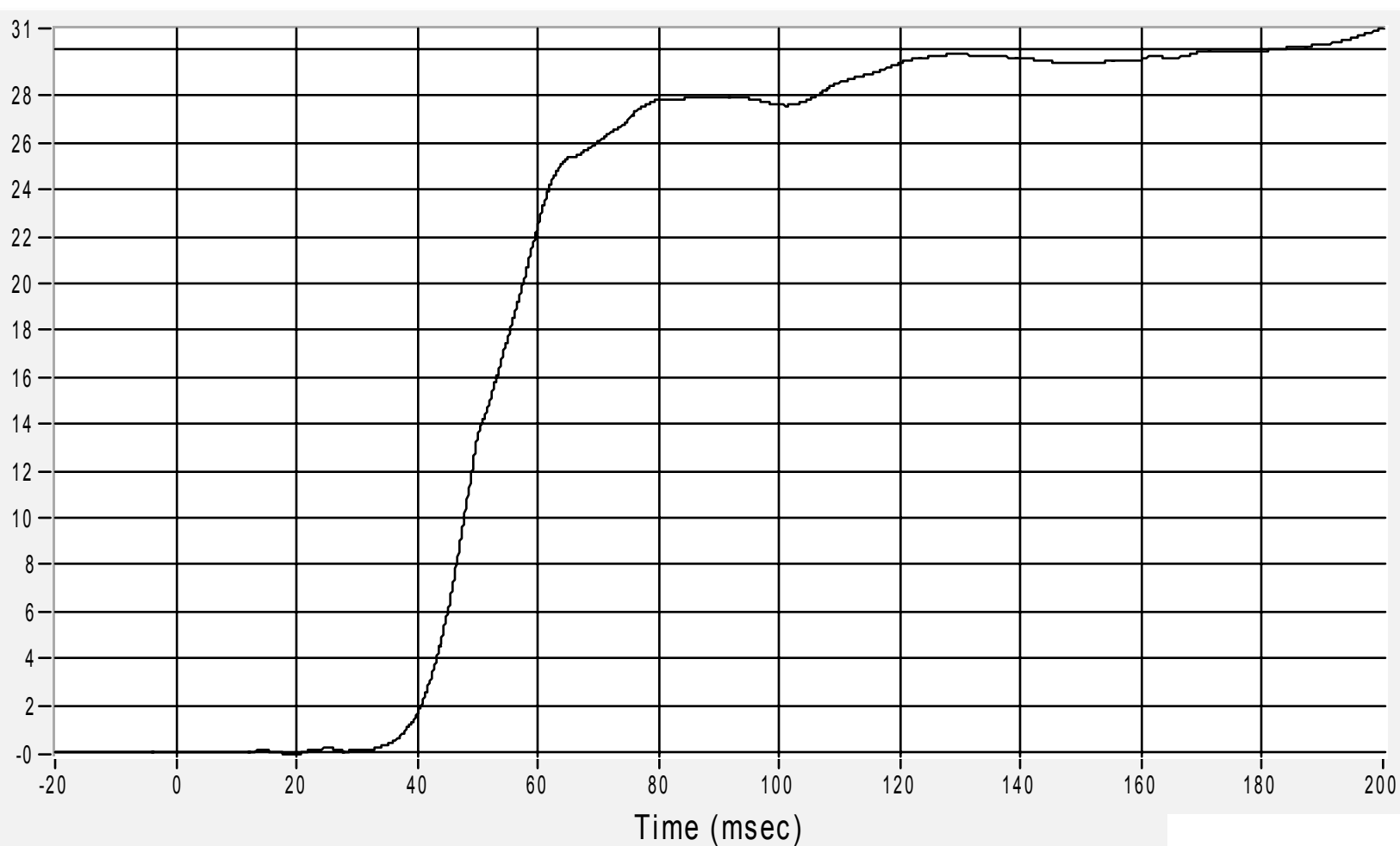
Medical College of Wisconsin
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Passenger Upper Rib (Y) Velocity

Velocity (km/h) CFC180

Max 30.9 km/h at 199.9 msec

Min -0.1 km/h at 19.6 msec



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22 January 2004

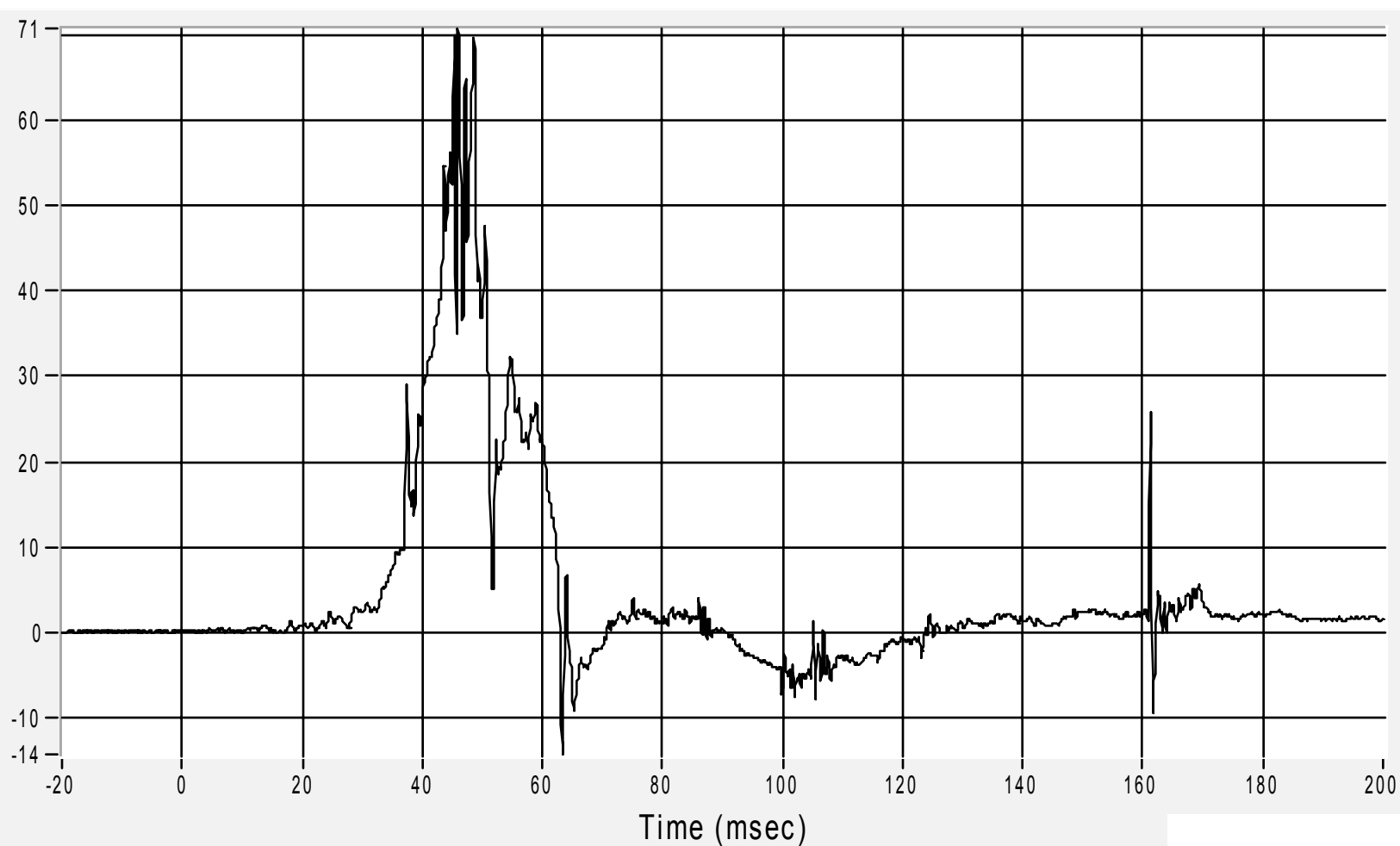
*Medical College of Wisconsin
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Passenger Lower Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 70.9 G at 46.0 msec

Min -14.4 G at 63.4 msec



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22 January 2004

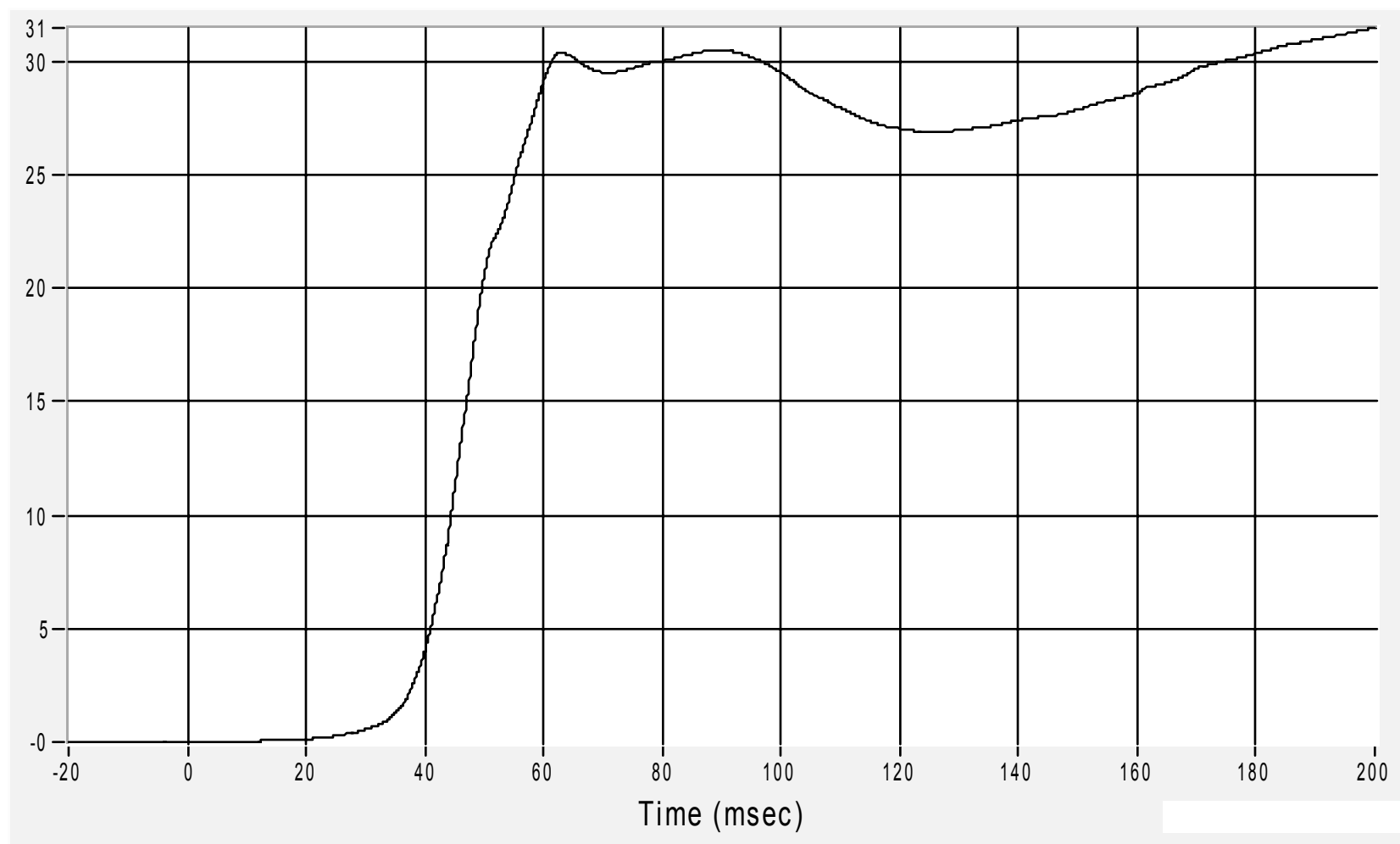
Medical College of Wisconsin
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Passenger Lower Rib (Y) Velocity

Velocity (km/h) CFC180

Max 31.5 km/h at 199.9 msec

Min 0.0 km/h at 0.0 msec



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22 January 2004

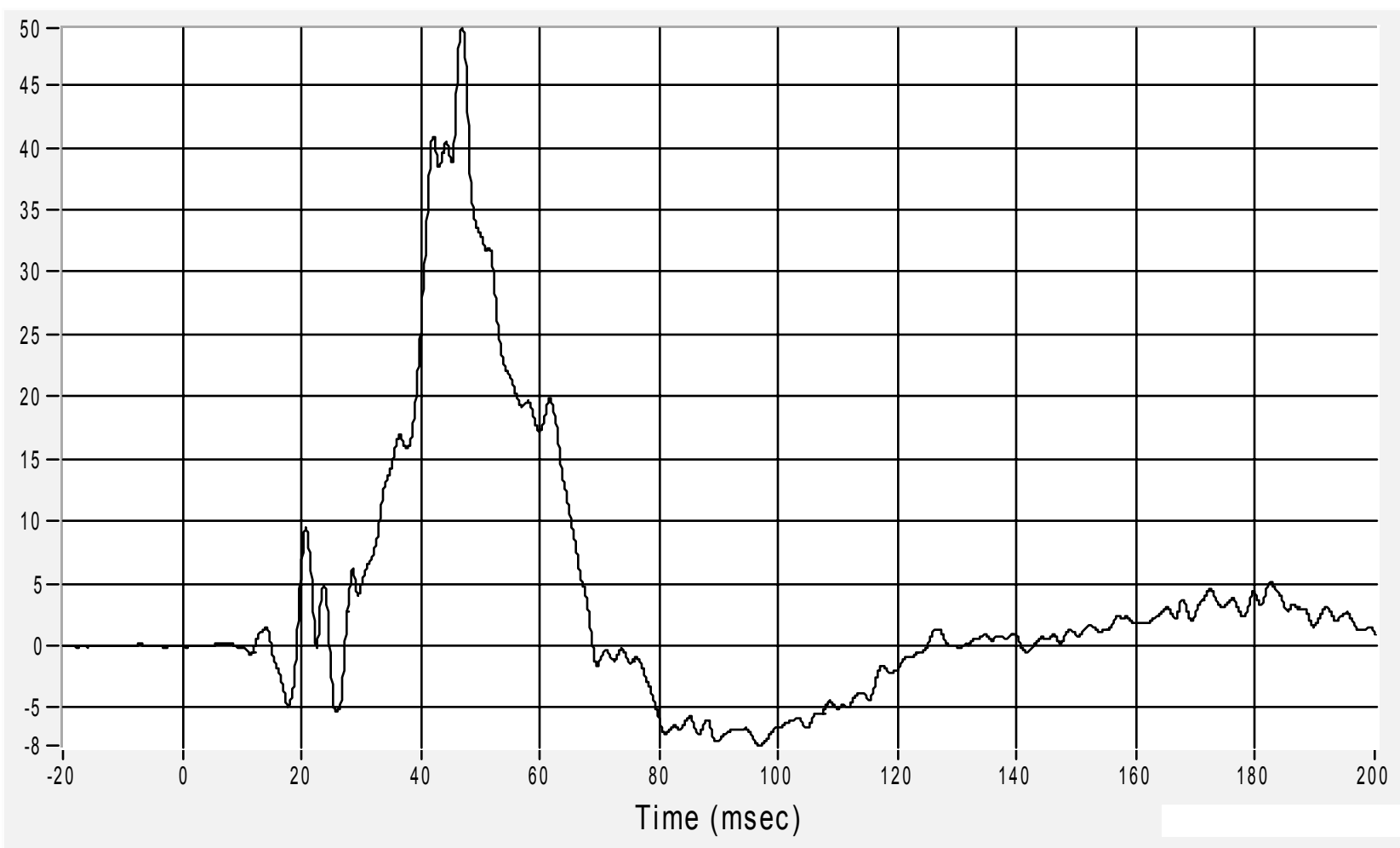
Medical College of Wisconsin
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Passenger Lower Spine (Y) Acceleration

Acceleration (G's) CFC180

Max 49.6 G at 46.9 msec

Min -8.0 G at 96.9 msec



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22 January 2004

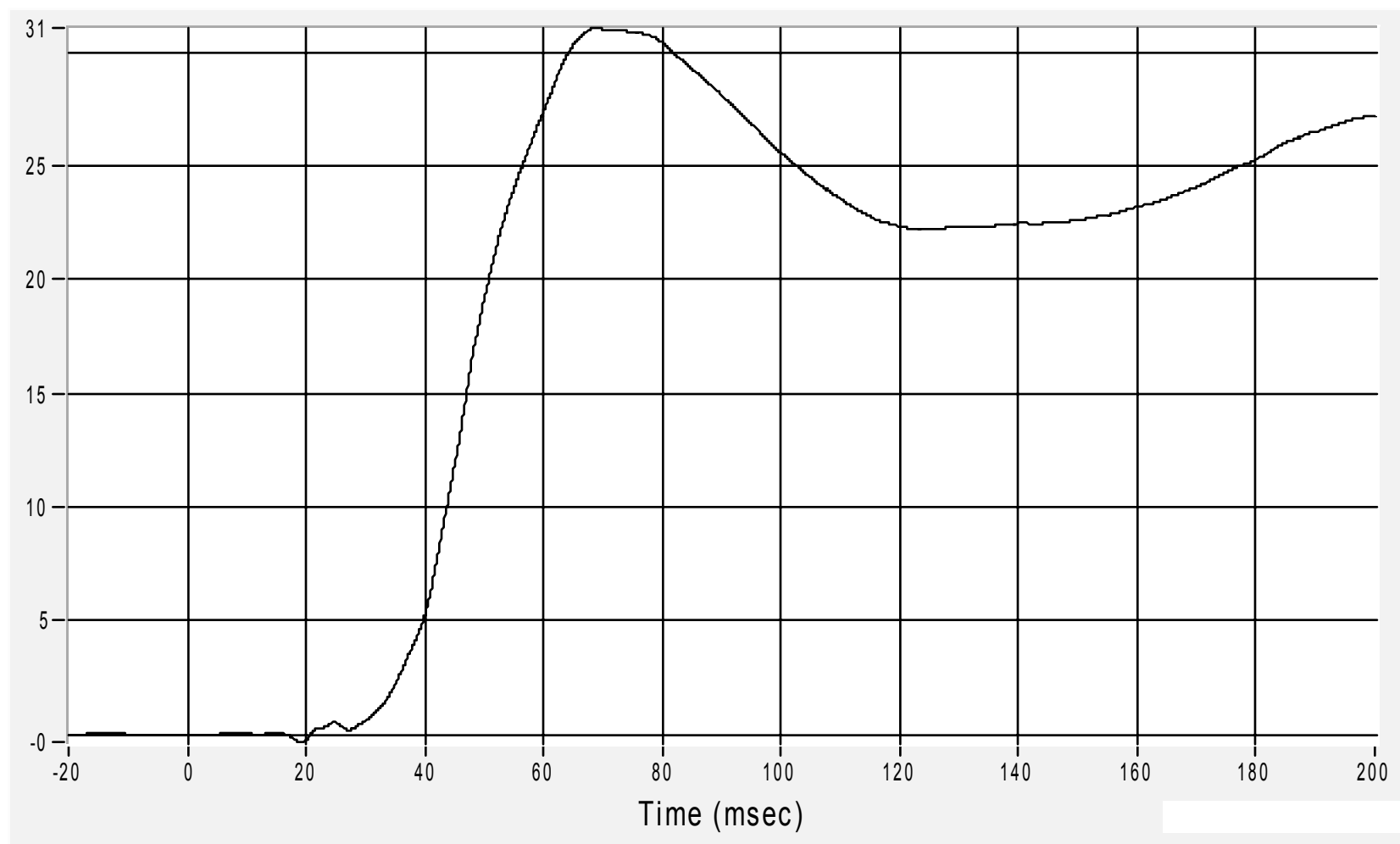
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Velocity

Velocity (km/h) CFC180

Max 31.1 km/h at 68.8 msec

Min -0.3 km/h at 19.2 msec



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22 January 2004

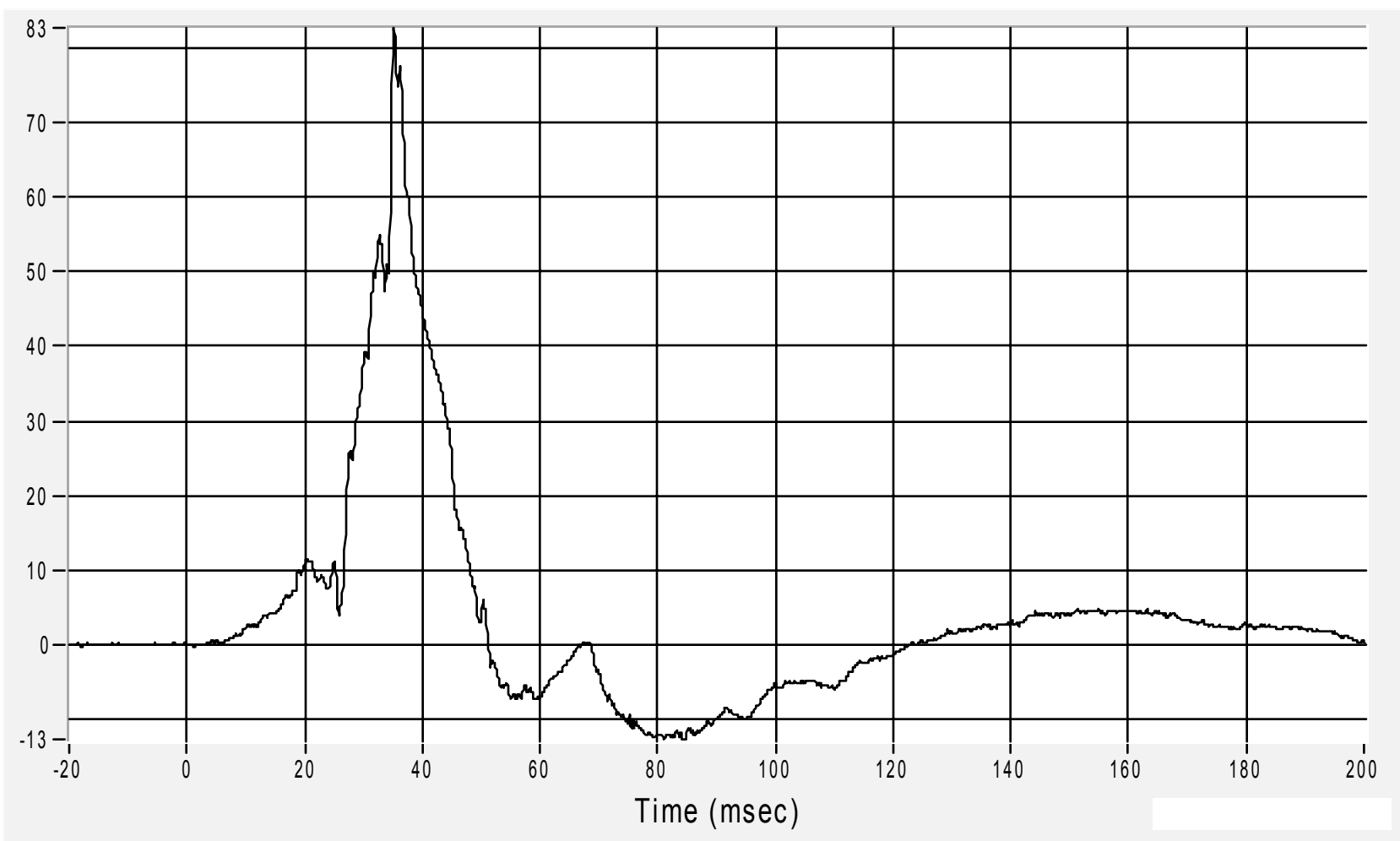
*Medical College of Wisconsin
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Passenger Pelvic (Y) Acceleration

Acceleration (G's) CFC1000

Max 82.7 G at 35.2 msec

Min -12.7 G at 84.6 msec



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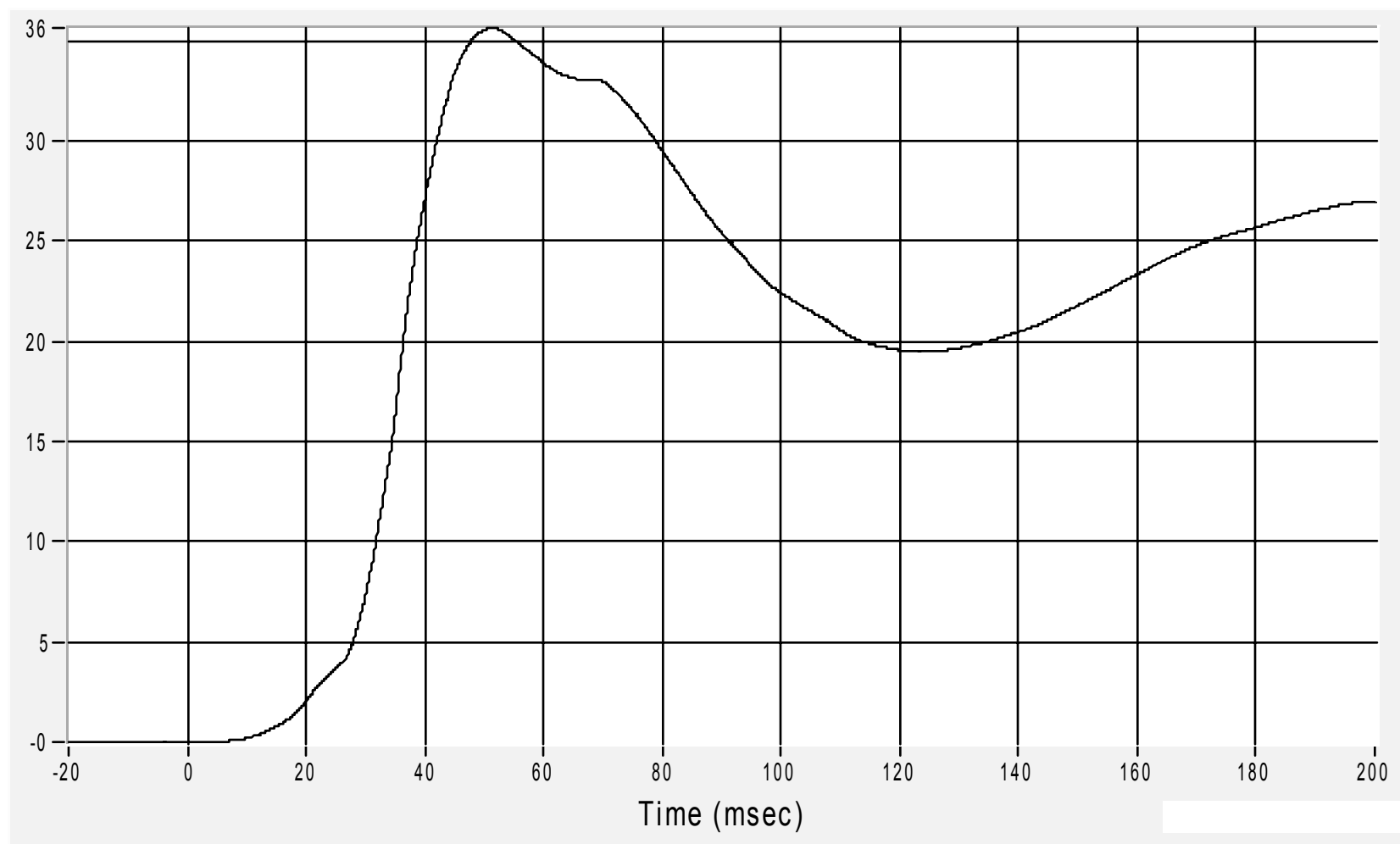
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Velocity

Velocity (km/h) CFC180

Max 35.7 km/h at 51.3 msec

Min 0.0 km/h at 2.5 msec



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22 January 2004

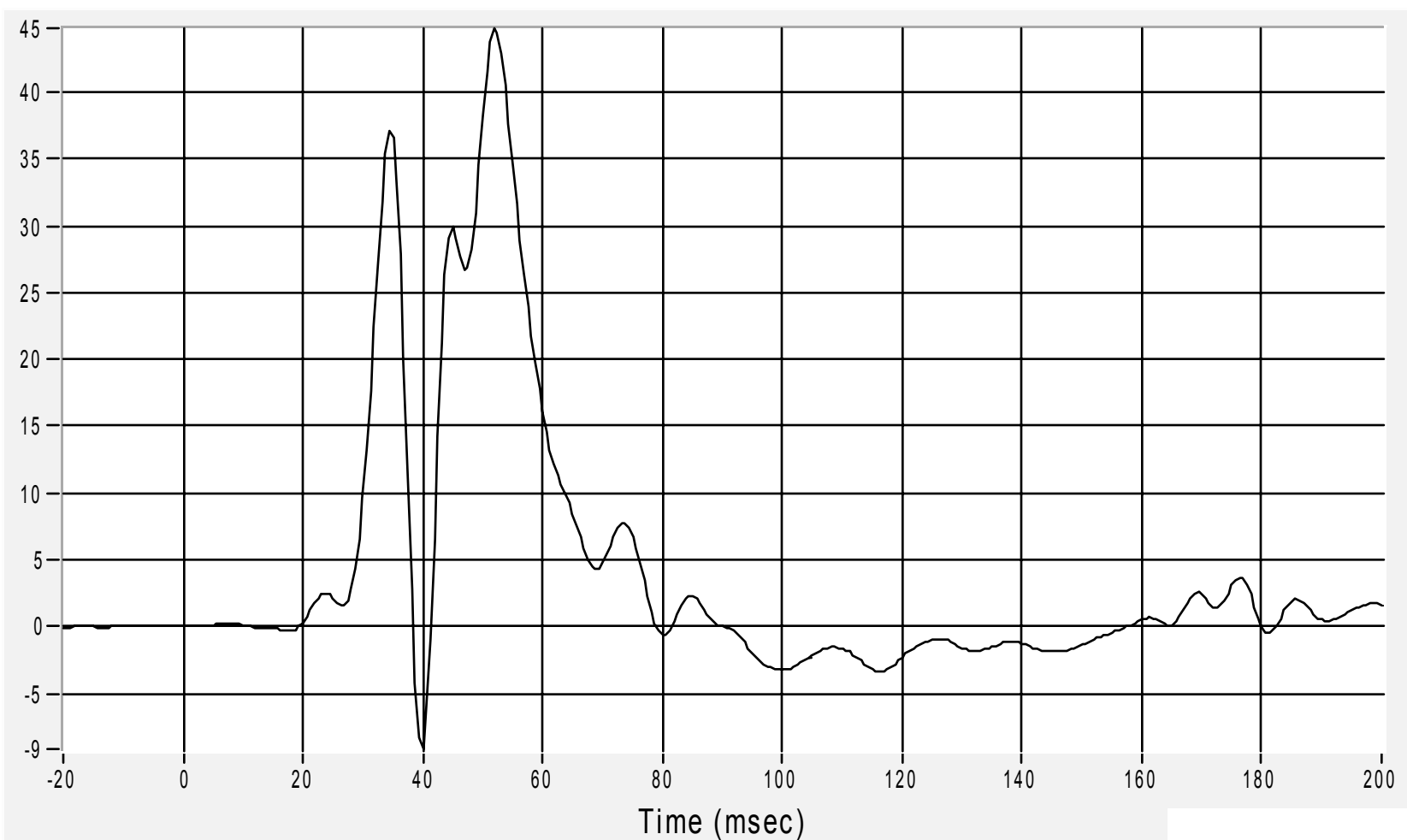
Medical College of Wisconsin
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Driver Upper Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 44.8 G at 51.9 msec

Min -9.2 G at 40.0 msec



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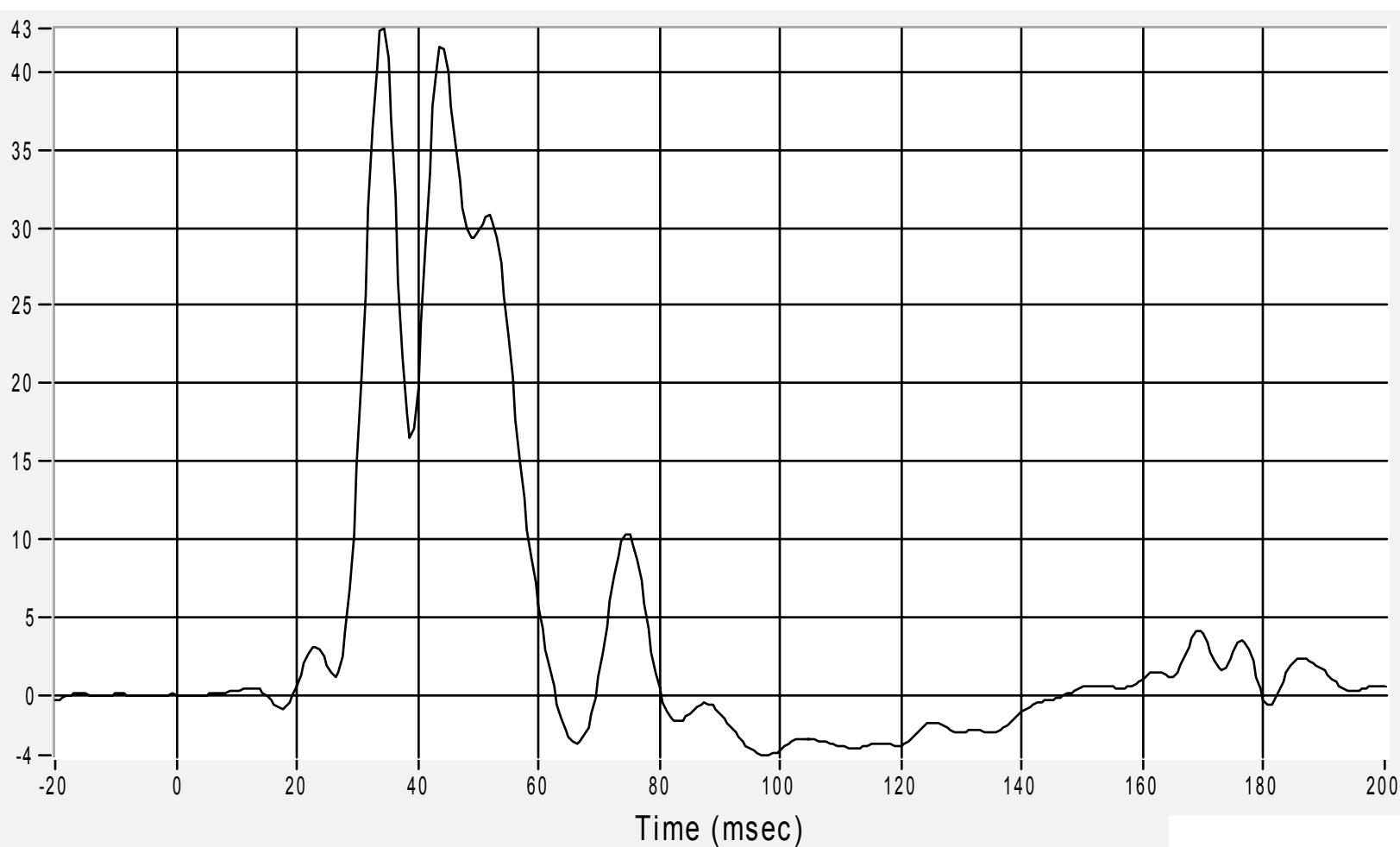
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Driver Lower Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 42.8 G at 34.4 msec

Min -3.9 G at 97.5 msec



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Vehicle Crashworthiness Lab

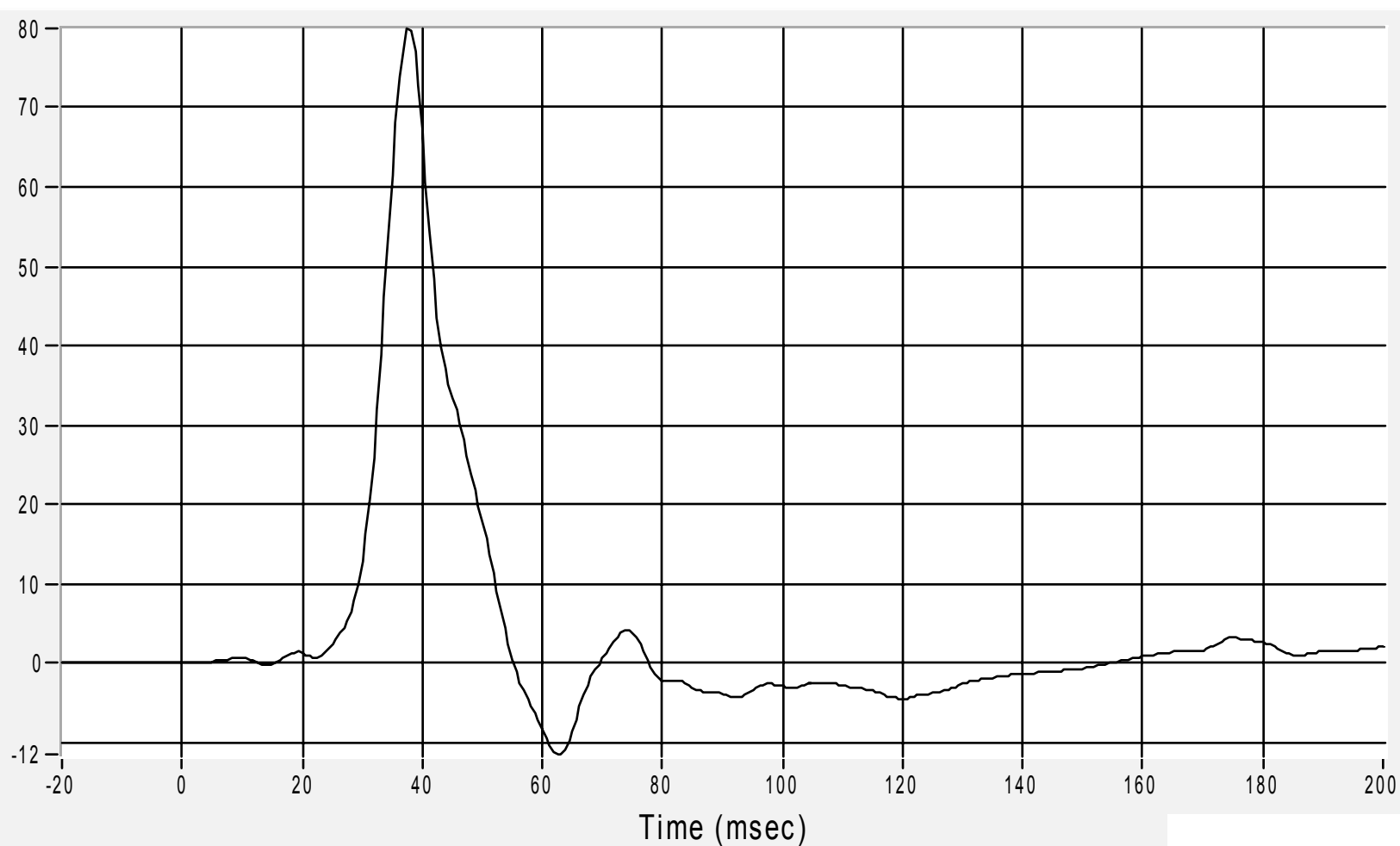
B-49

Driver Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 80.0 G at 37.5 msec

Min -11.5 G at 62.5 msec



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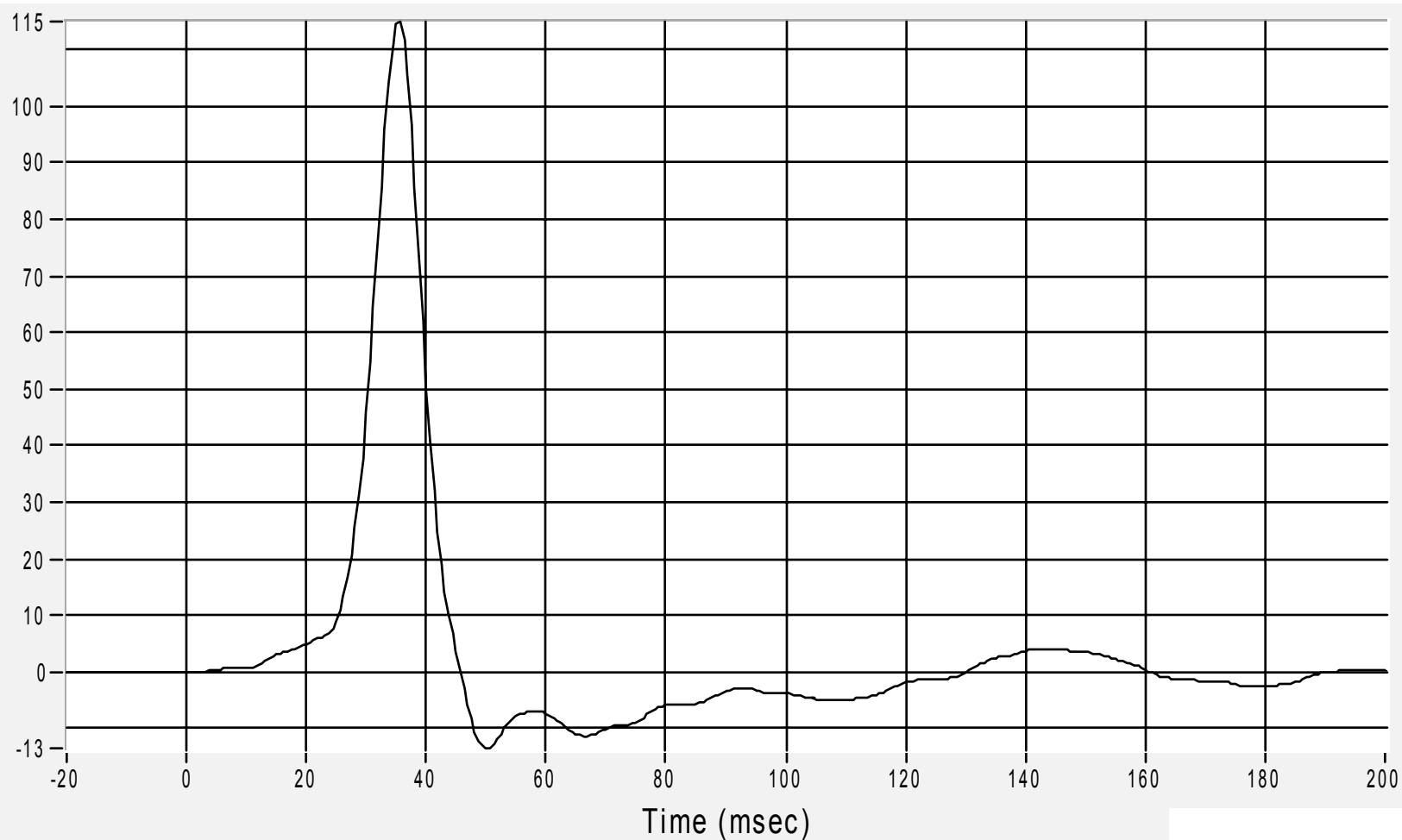
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Acceleration

Acceleration (G's) FIR100

Max 115.0 G at 35.6 msec

Min -13.5 G at 50.0 msec



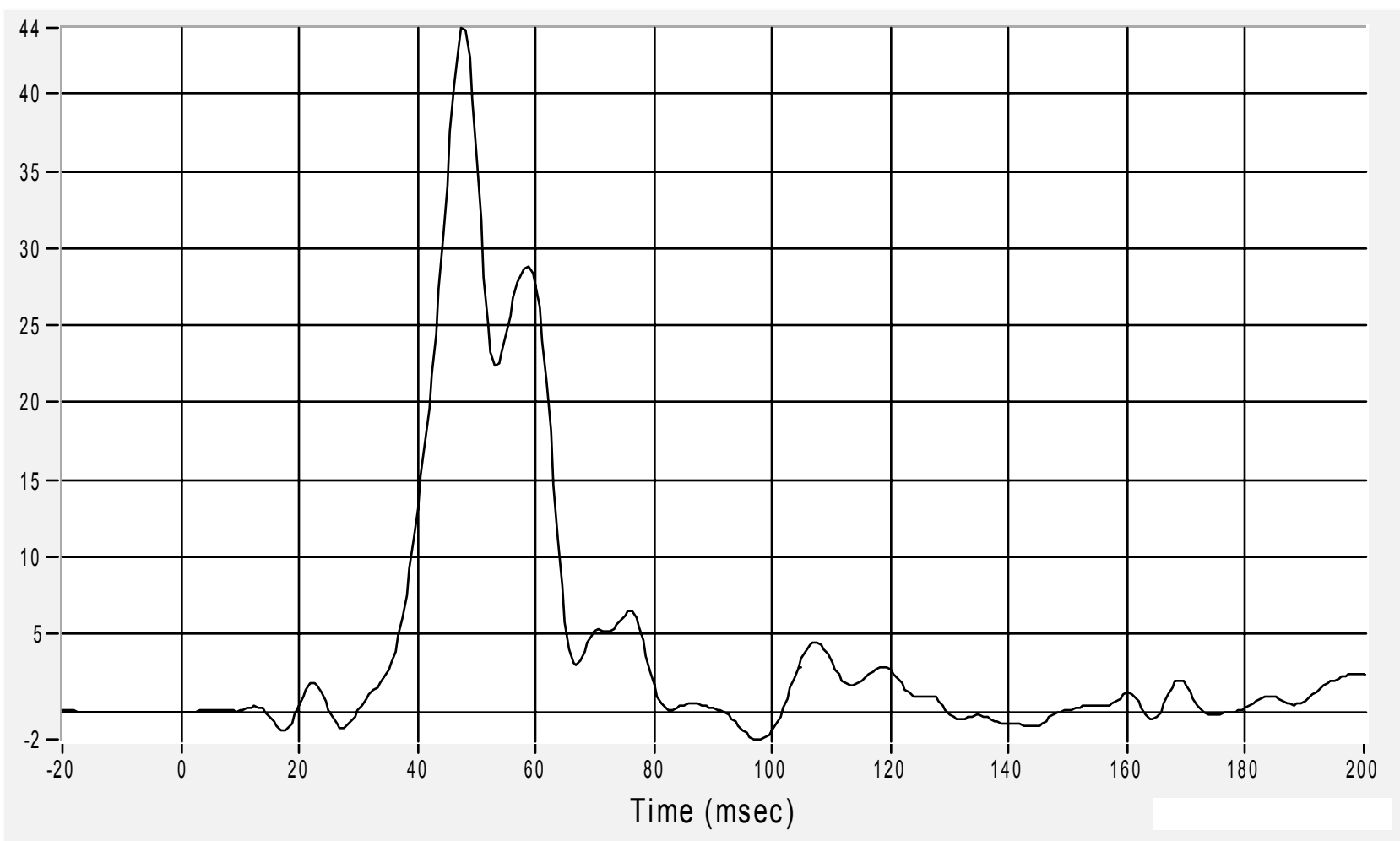
04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

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Passenger Upper Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 44.3 G at 47.5 msec**Min -1.8 G at 97.5 msec**

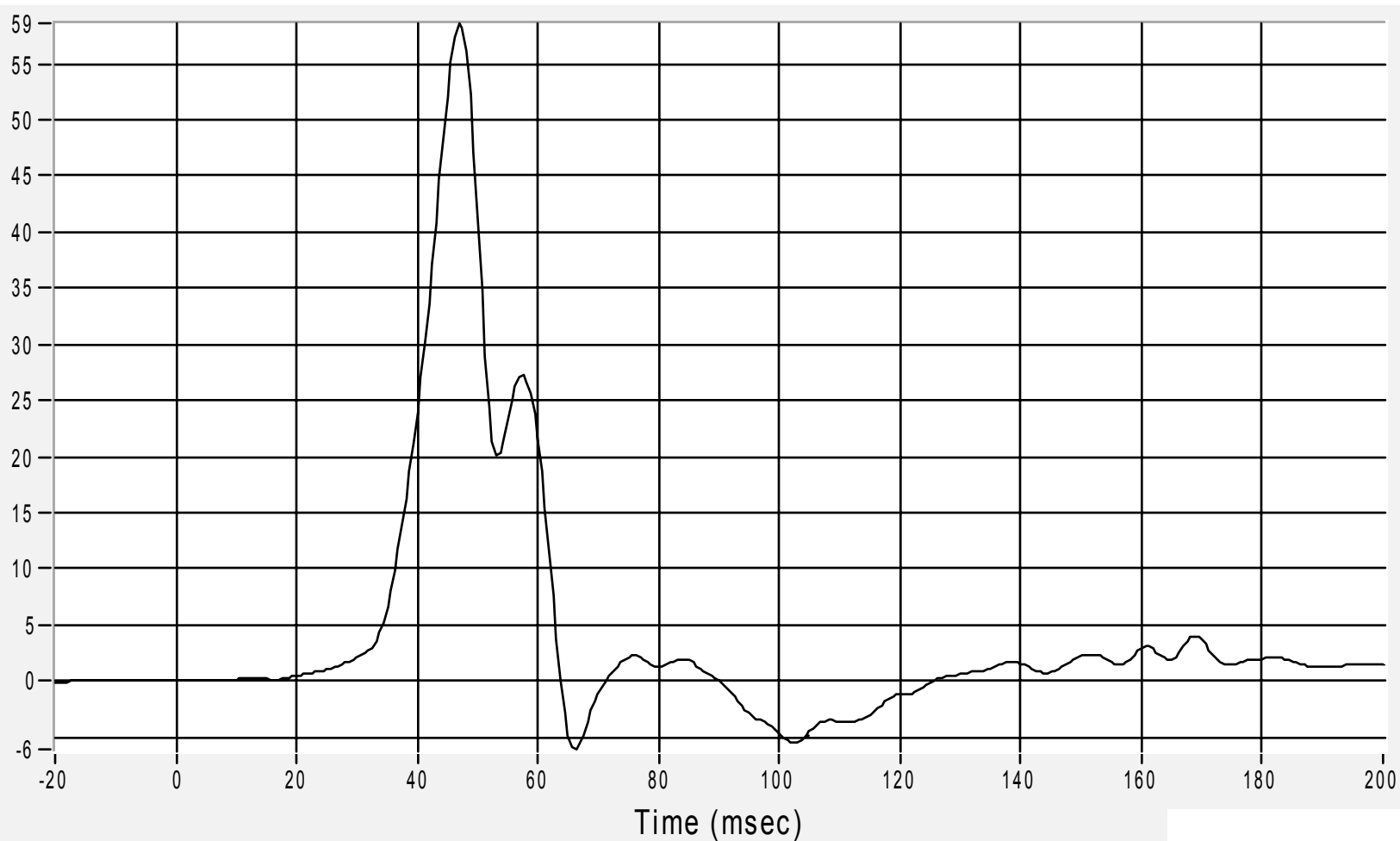
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Passenger Lower Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 58.6 G at 46.9 msec**Min -6.1 G at 66.2 msec**

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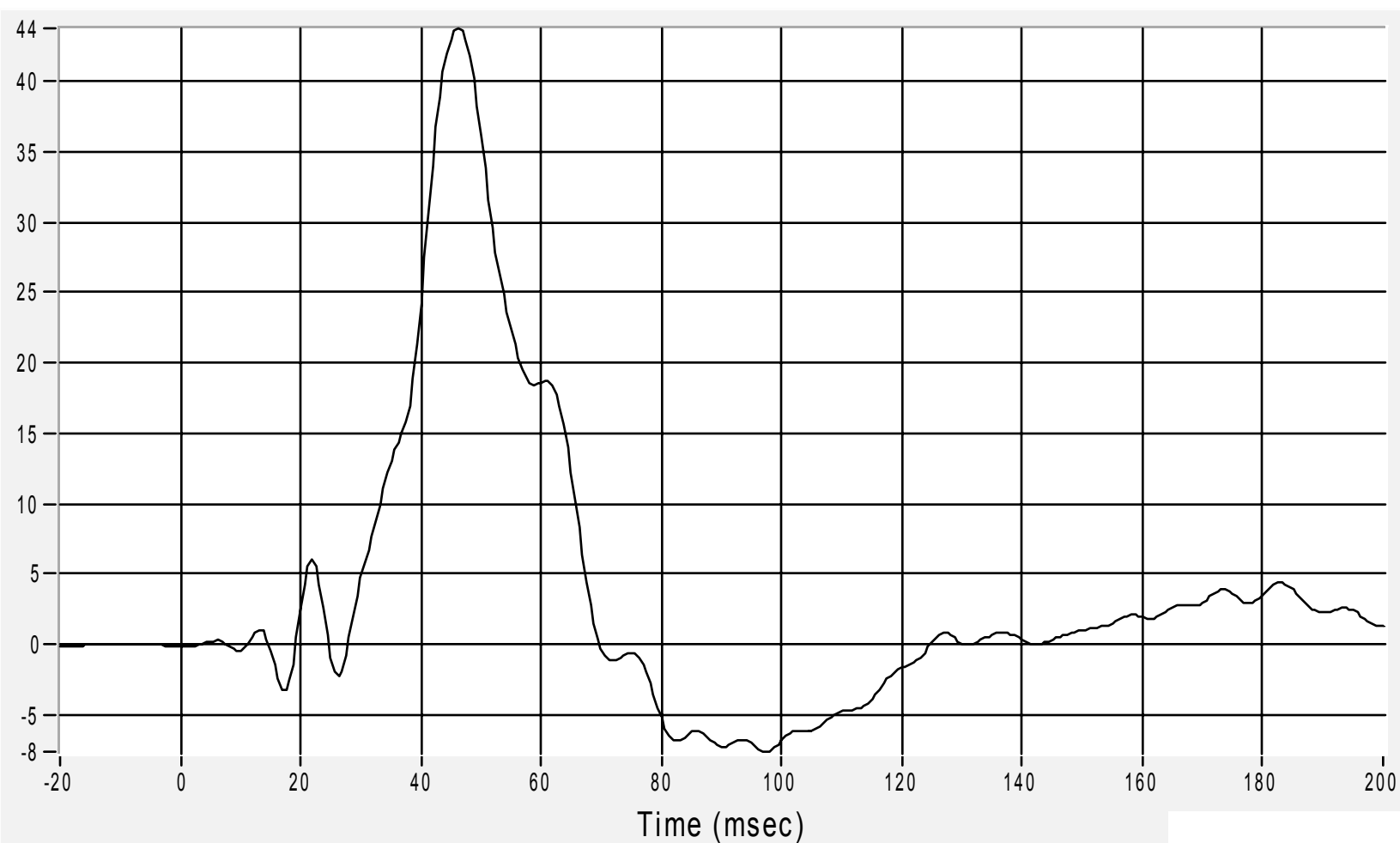
*Medical College of Wisconsin
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Passenger Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 43.7 G at 46.2 msec

Min -7.6 G at 97.5 msec



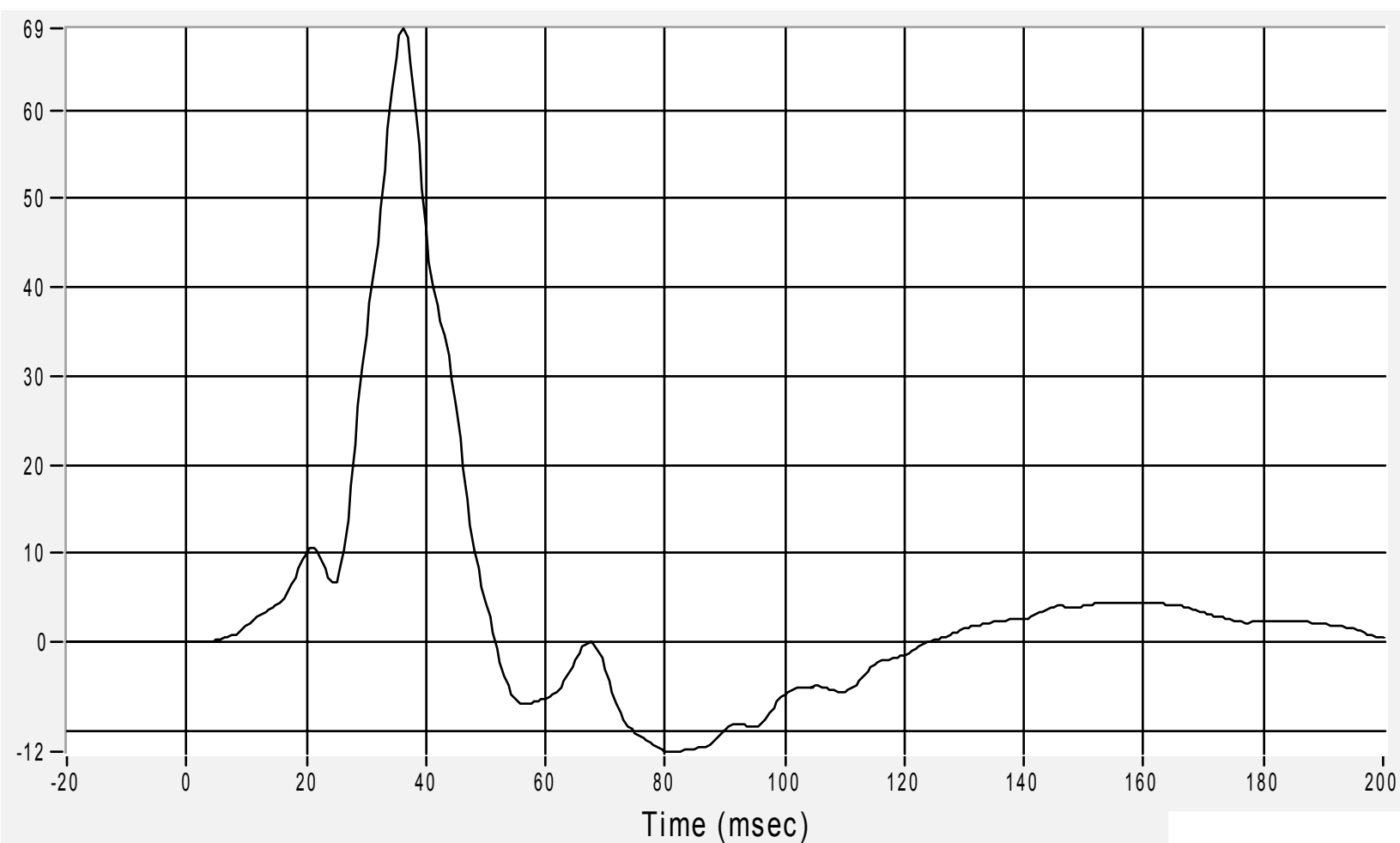
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Passenger Pelvic (Y) Acceleration

Acceleration (G's) FIR100

Max 69.2 G at 36.2 msec**Min -12.3 G at 81.2 msec**

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22 January 2004

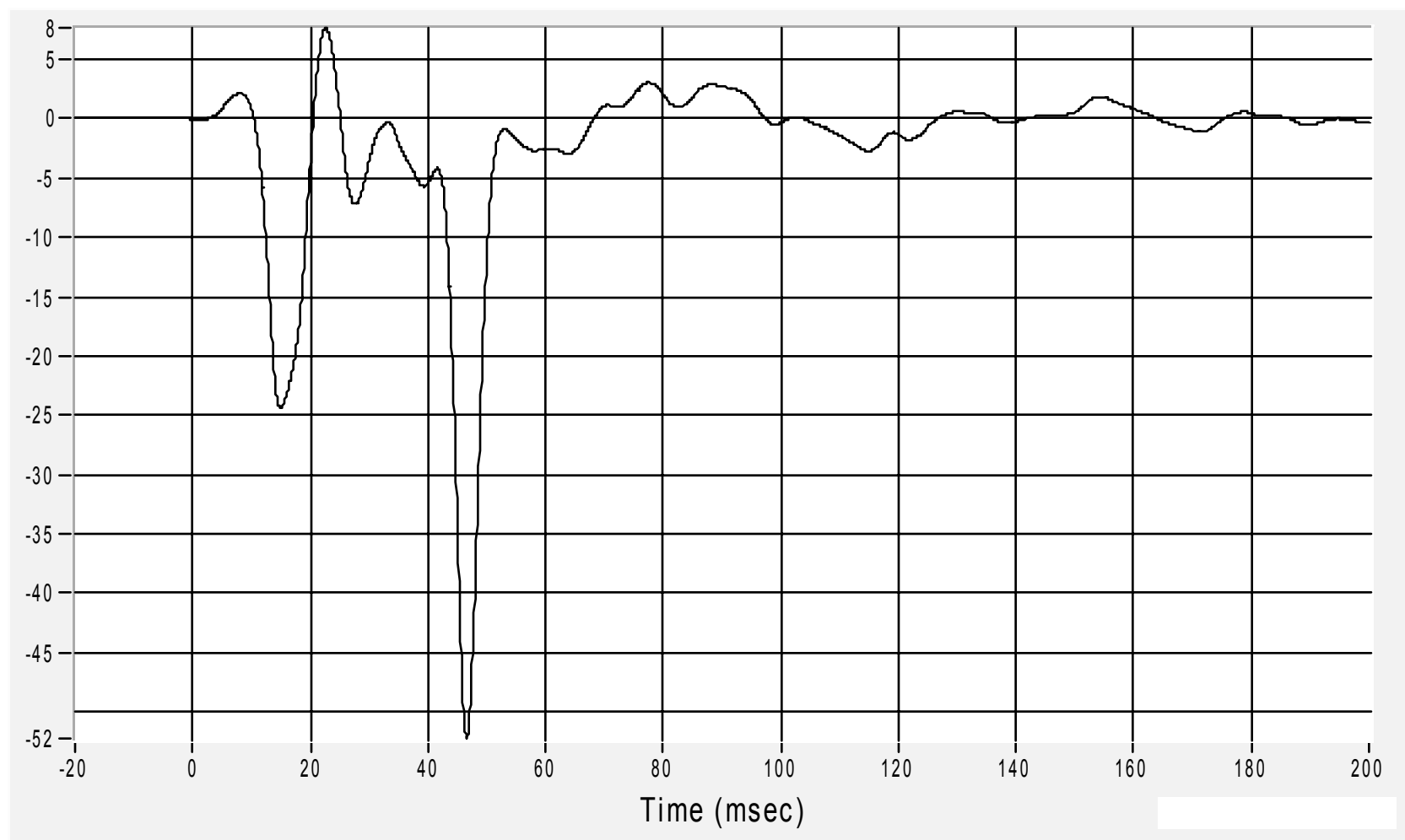
*Medical College of Wisconsin
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Right Side Sill at Front Seat (X) Acceleration

Acceleration (G's) CFC60

Max 7.7 G at 22.6 msec

Min -52.2 G at 46.6 msec



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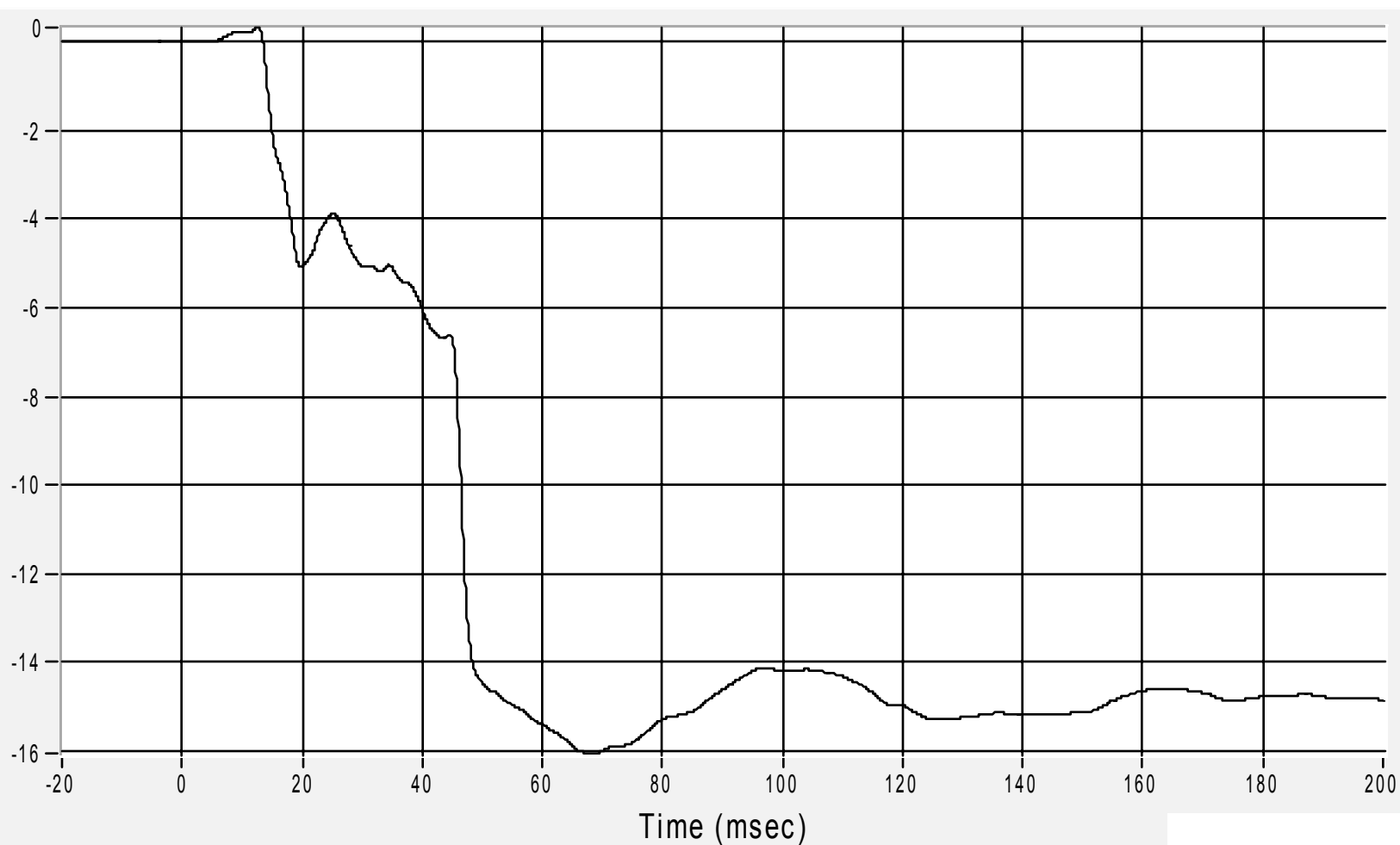
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (X) Velocity

Velocity (km/h) CFC180

Max 0.3 km/h at 12.7 msec

Min -16.1 km/h at 68.6 msec



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22 January 2004

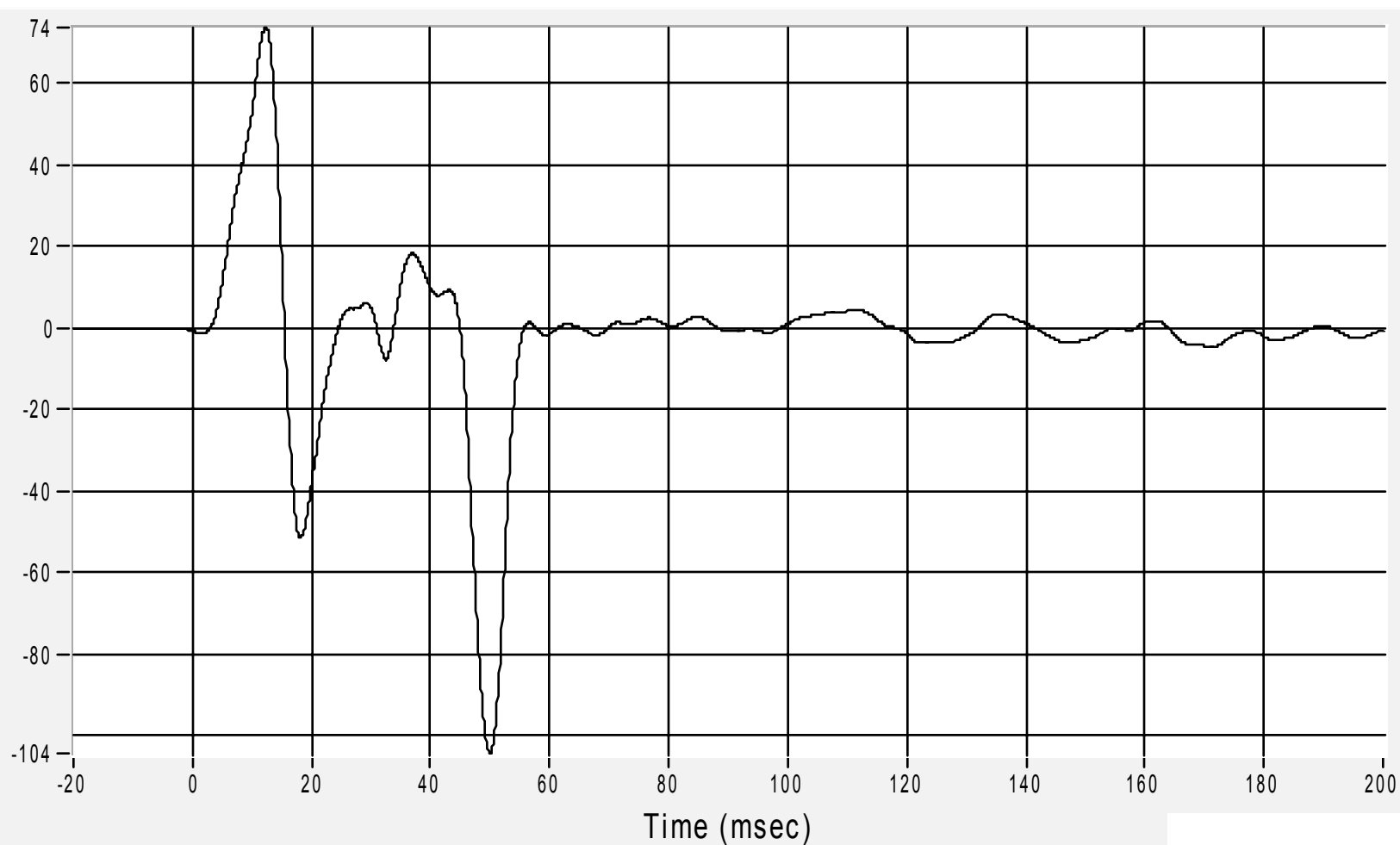
Medical College of Wisconsin
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Right Side Sill at Front Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 73.8 G at 12.3 msec

Min -104.5 G at 50.0 msec



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22 January 2004

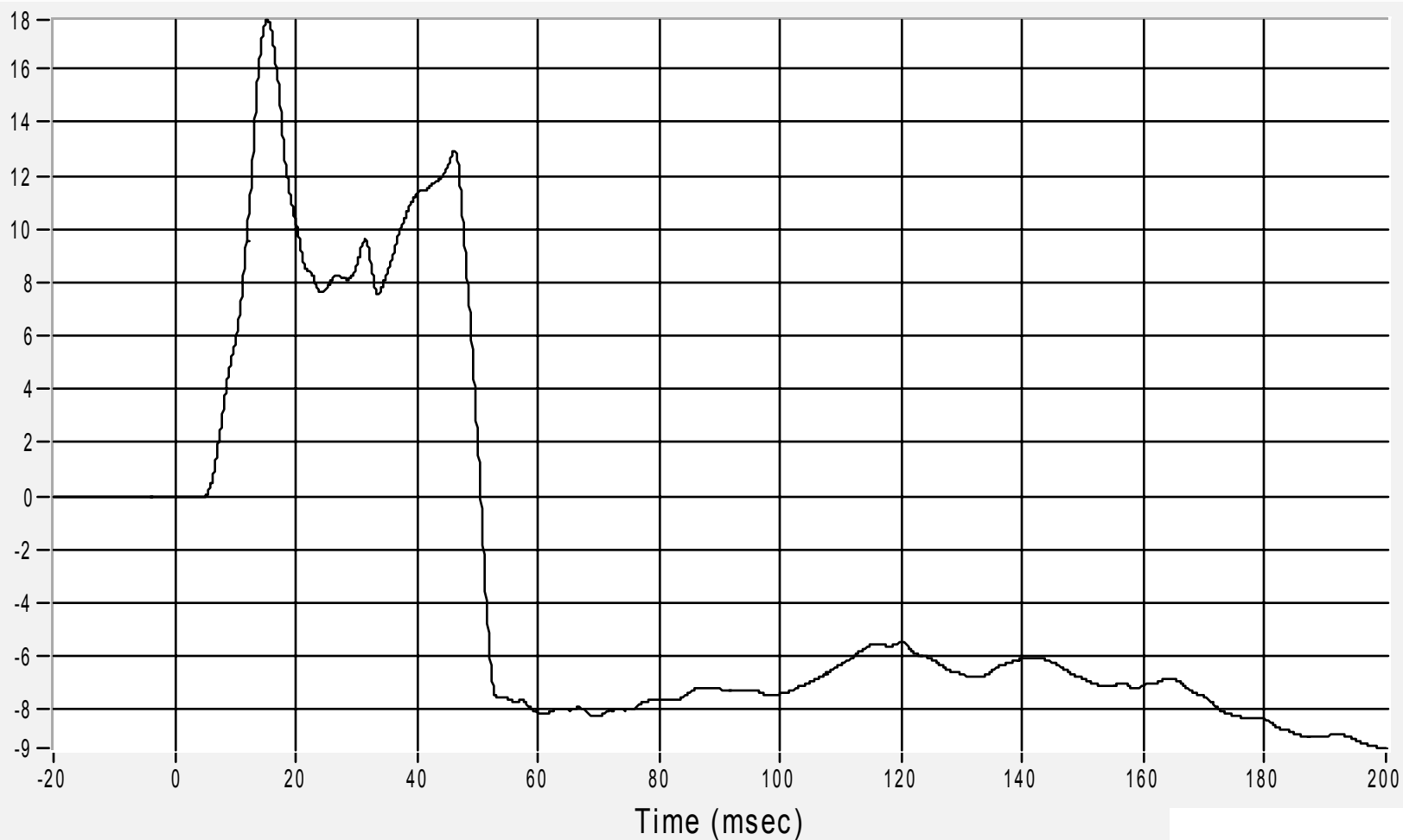
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Y) Velocity

Velocity (km/h) CFC180

Max 17.8 km/h at 15.3 msec

Min -9.4 km/h at 199.9 msec



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22 January 2004

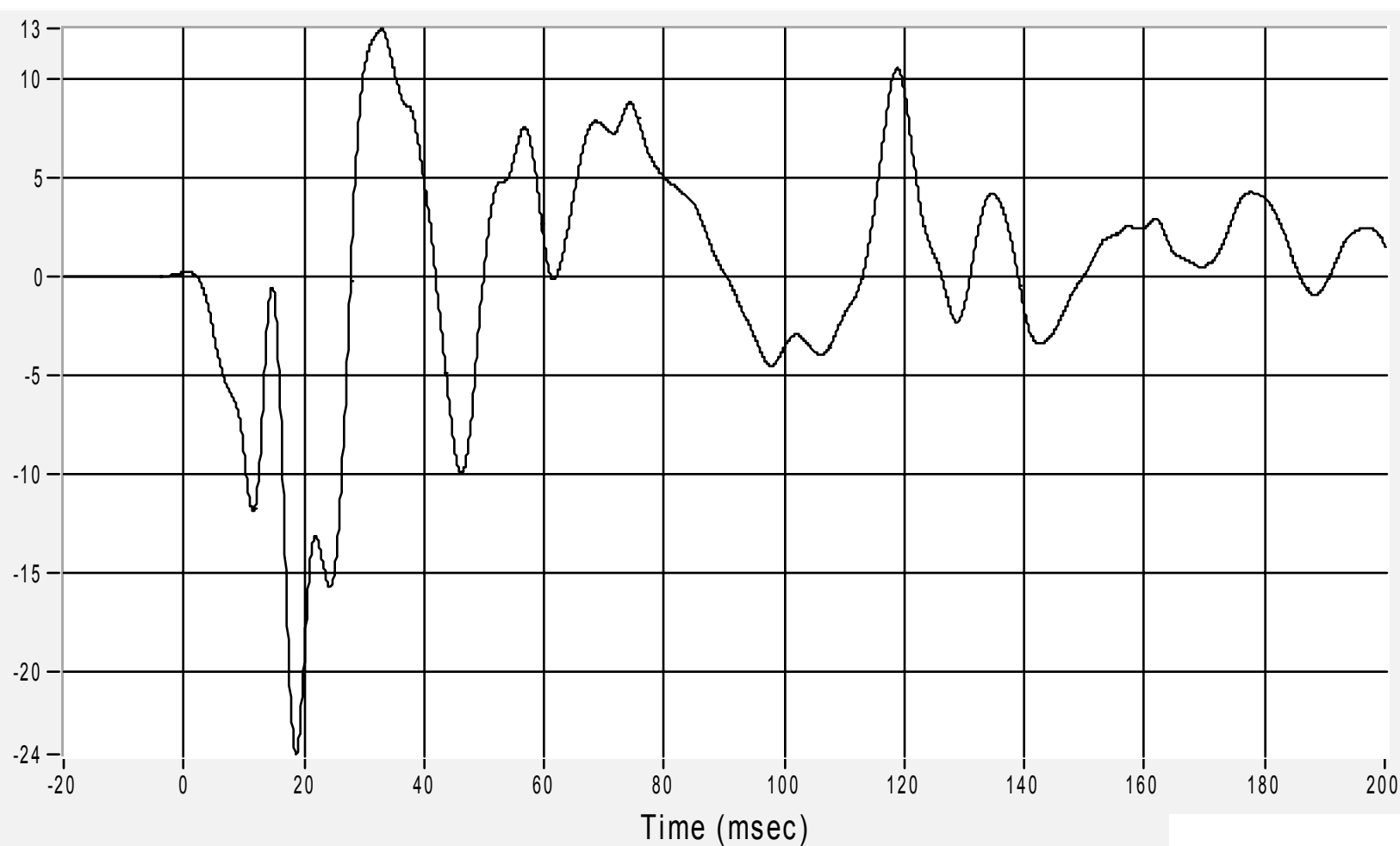
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Z) Acceleration

Acceleration (G's) CFC60

Max 12.6 G at 33.0 msec

Min -24.2 G at 18.7 msec



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Medical College of Wisconsin
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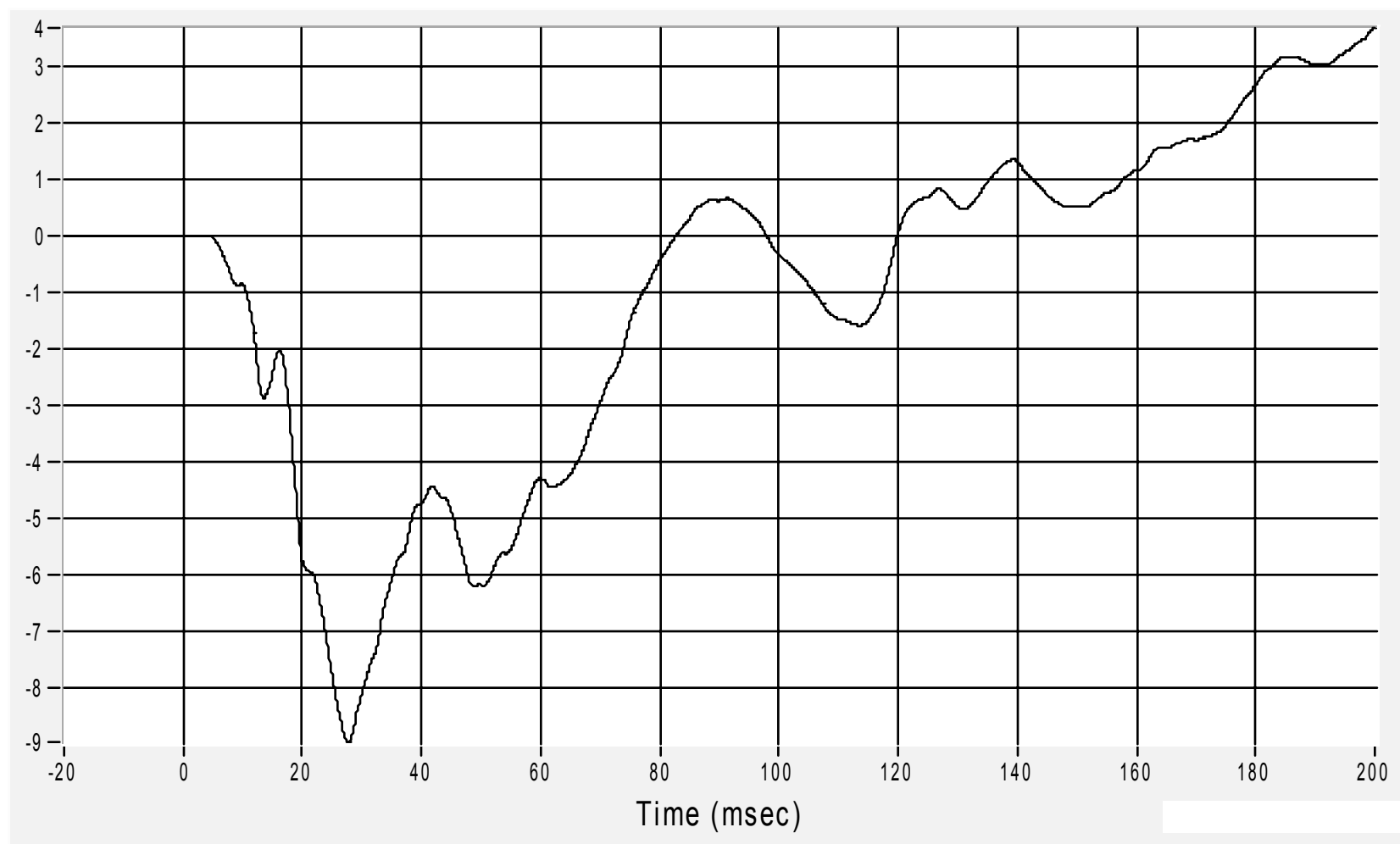
B-60

Right Side Sill at Front Seat (Z) Velocity

Velocity (km/h) CFC180

Max 3.7 km/h at 199.9 msec

Min -9.0 km/h at 27.7 msec



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22 January 2004

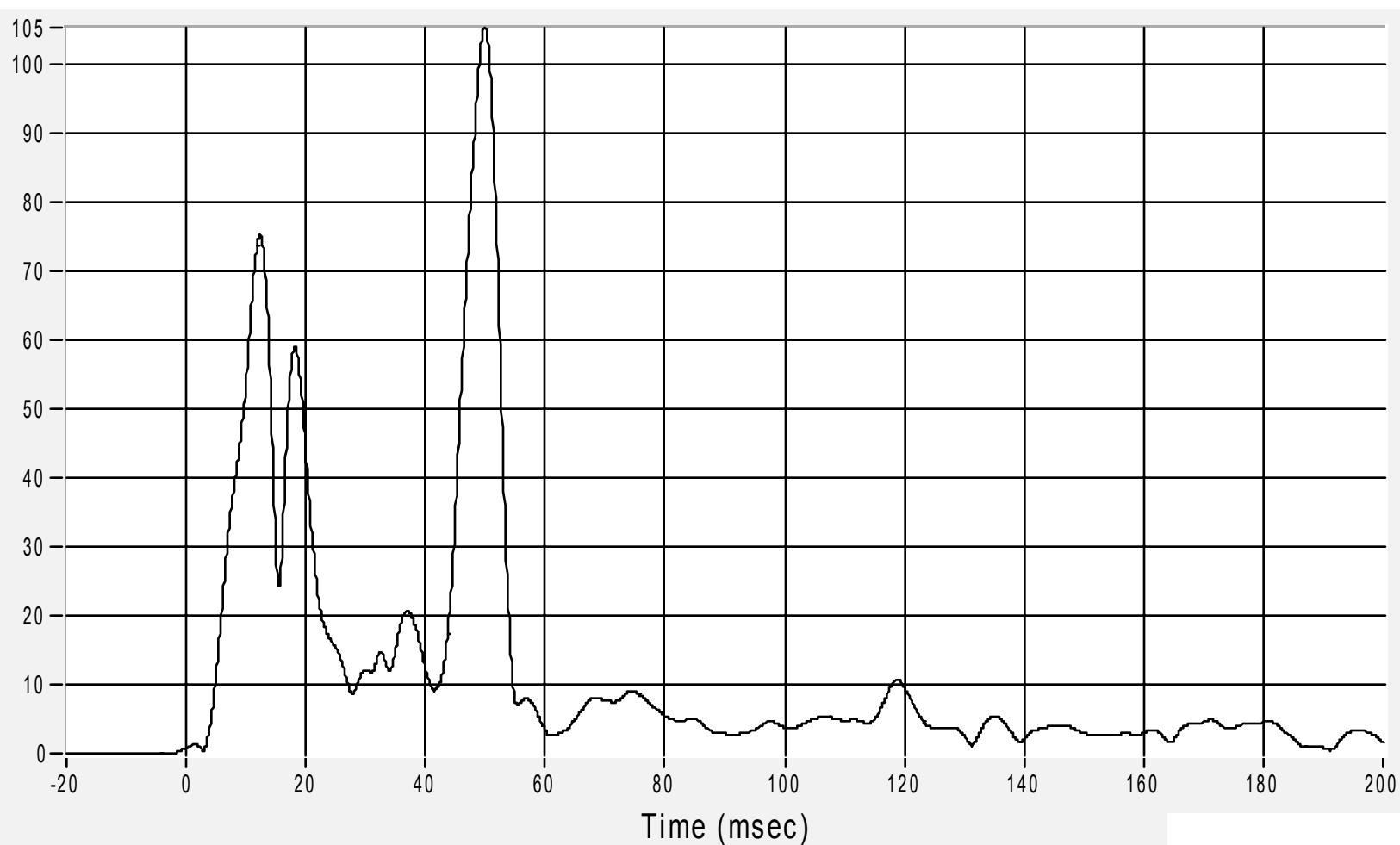
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat Resultant Acceleration

Acceleration (G's) CFC60

Max 105.2 G's at 49.9 msec

Min 0.4 G's at 2.9 msec



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22 January 2004

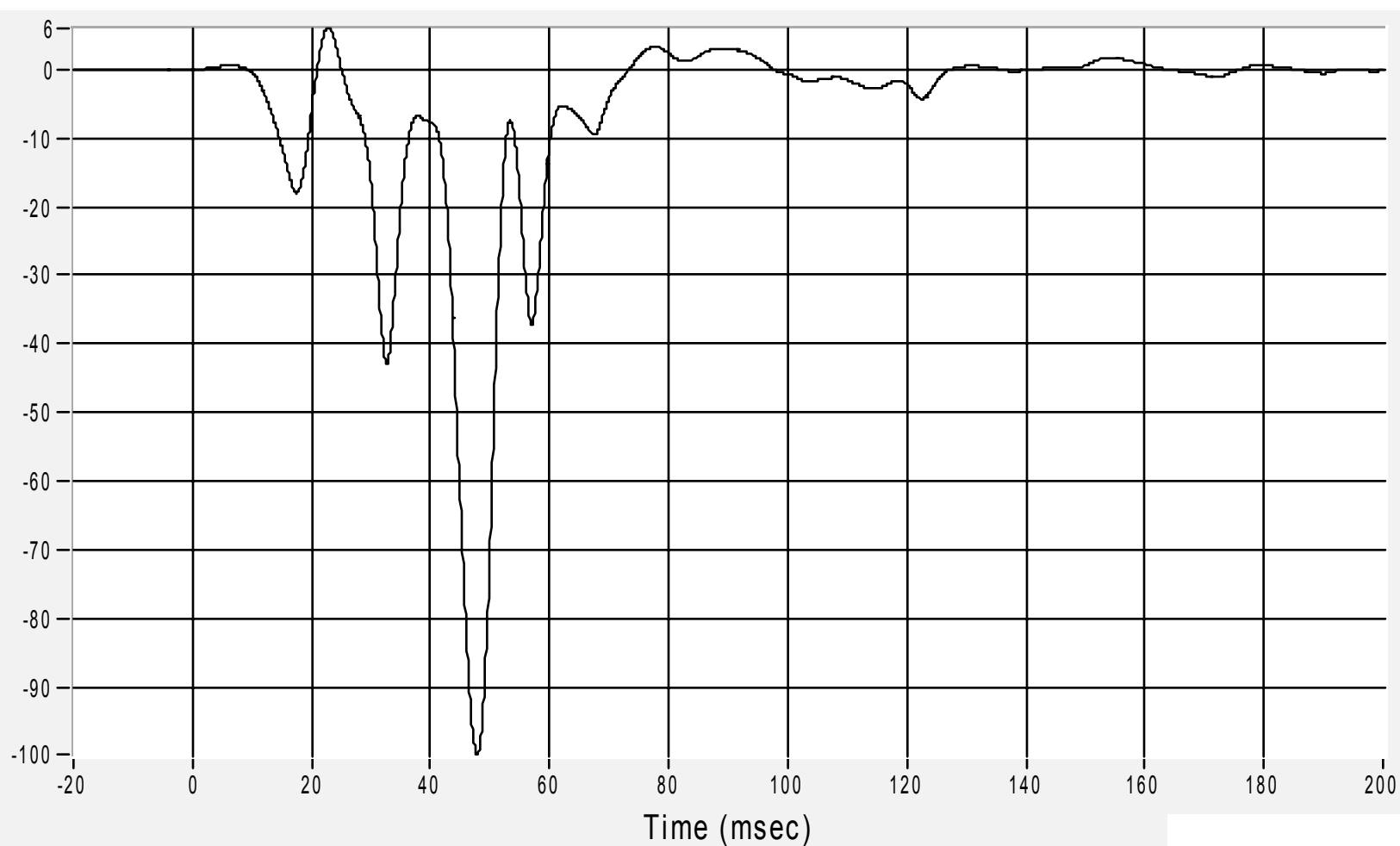
Medical College of Wisconsin
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Right Side Sill at Rear Seat (X) Acceleration

Acceleration (G's) CFC60

Max 5.9 G at 22.8 msec

Min -99.6 G at 47.8 msec



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22 January 2004

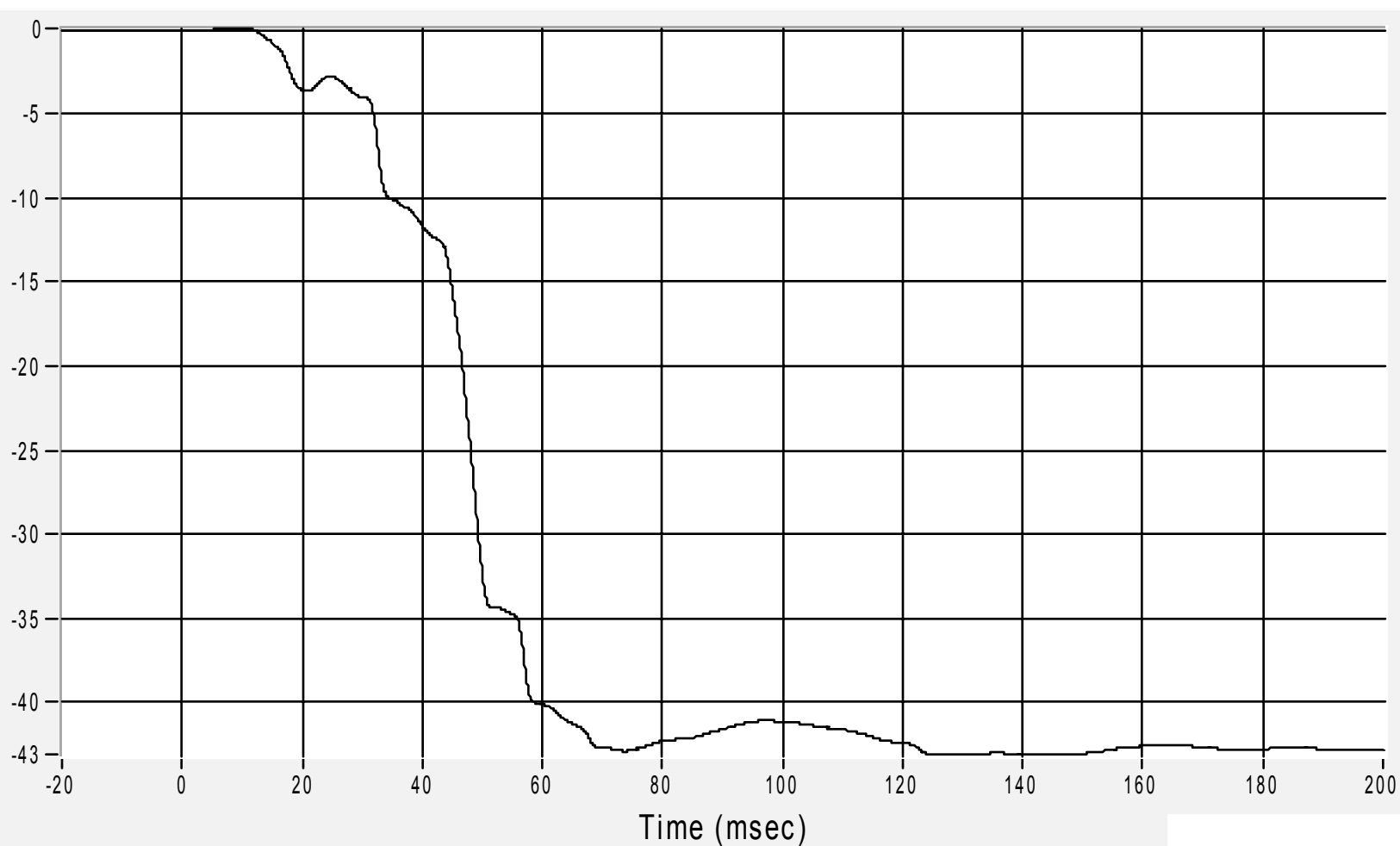
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (X) Velocity

Velocity (km/h) CFC180

Max 0.1 km/h at 7.6 msec

Min -43.1 km/h at 129.2 msec



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22 January 2004

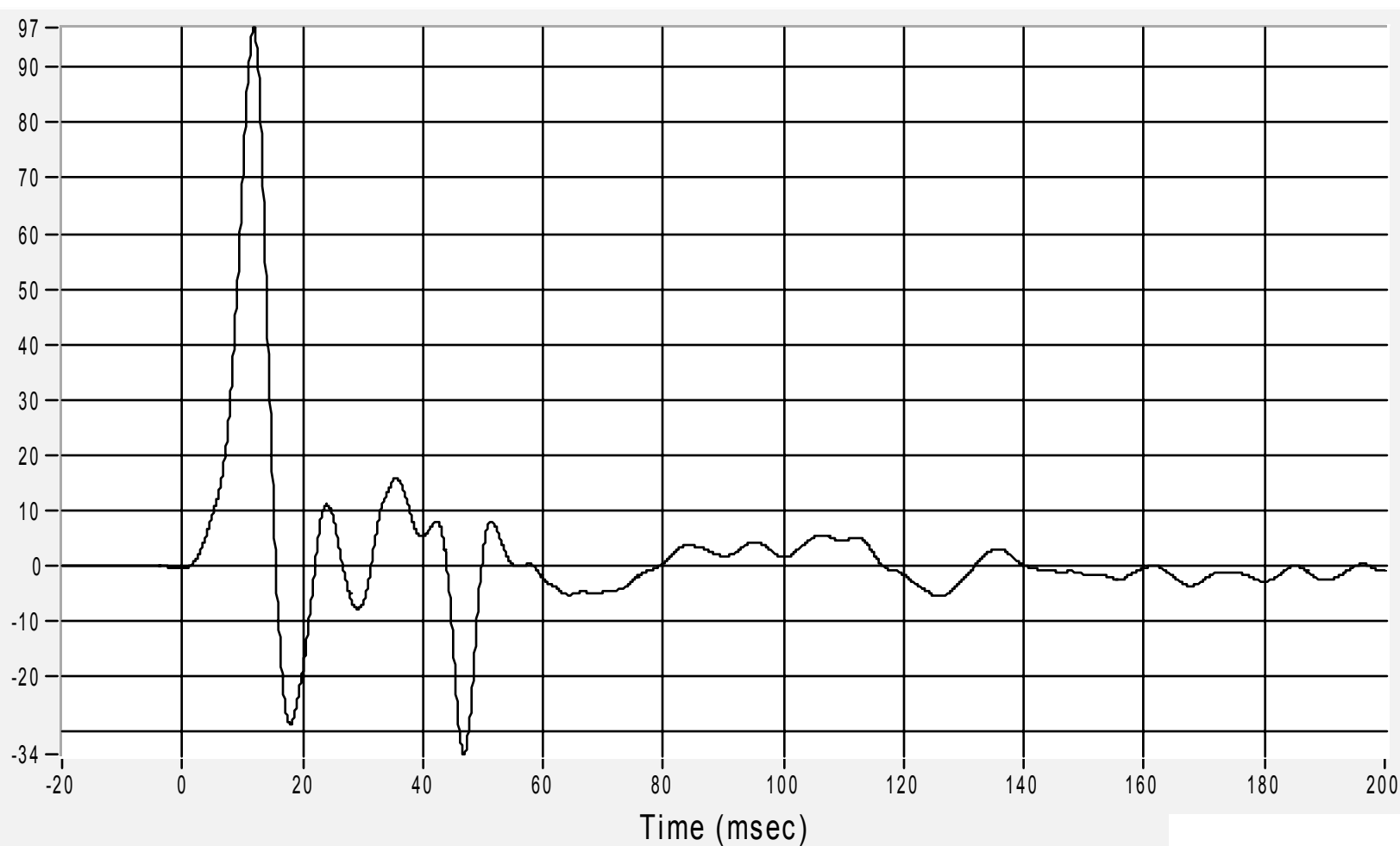
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 97.2 G at 11.8 msec

Min -34.0 G at 46.8 msec



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22 January 2004

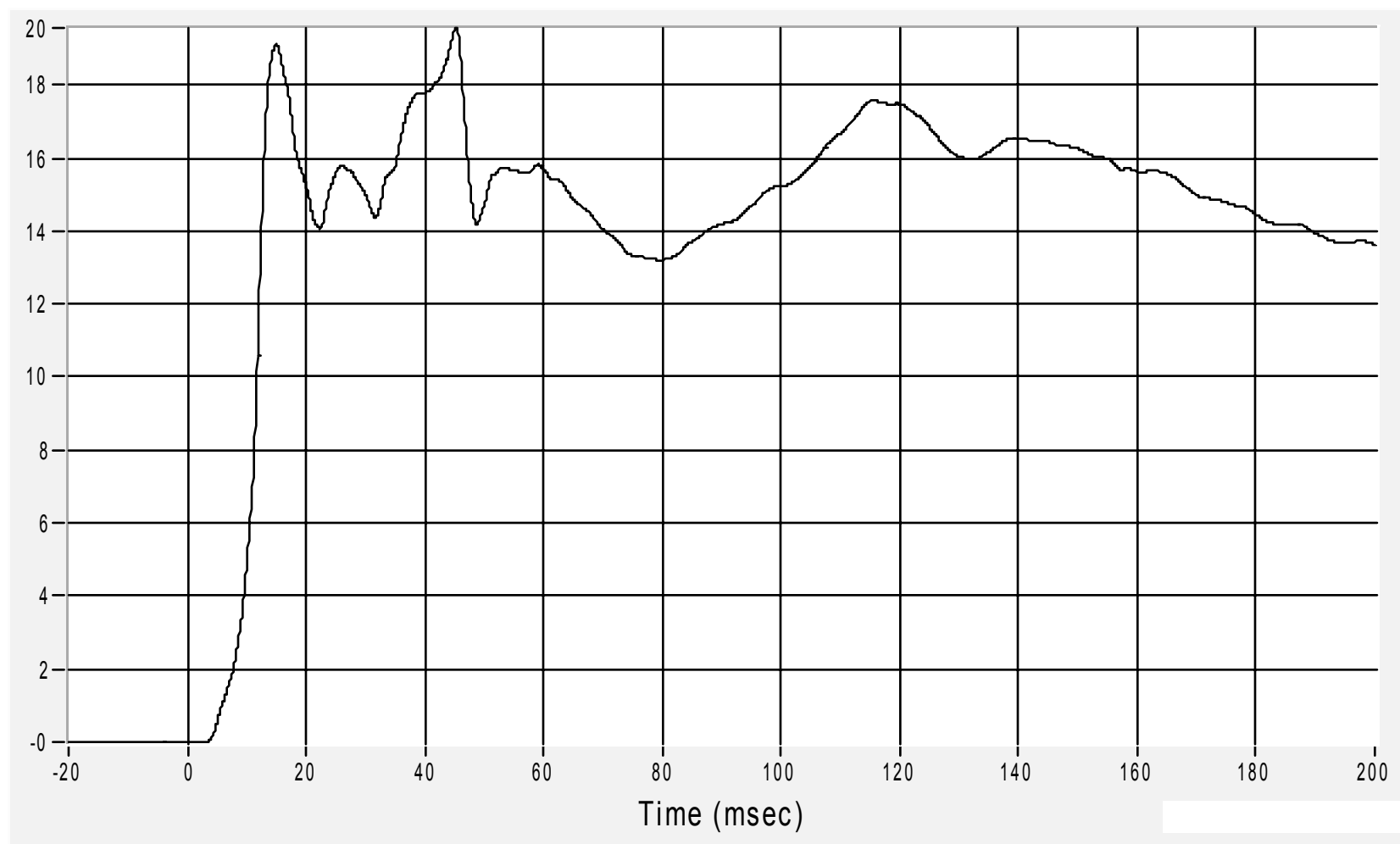
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Y) Velocity

Velocity (km/h) CFC180

Max 19.6 km/h at 45.3 msec

Min 0.0 km/h at 3.0 msec



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22 January 2004

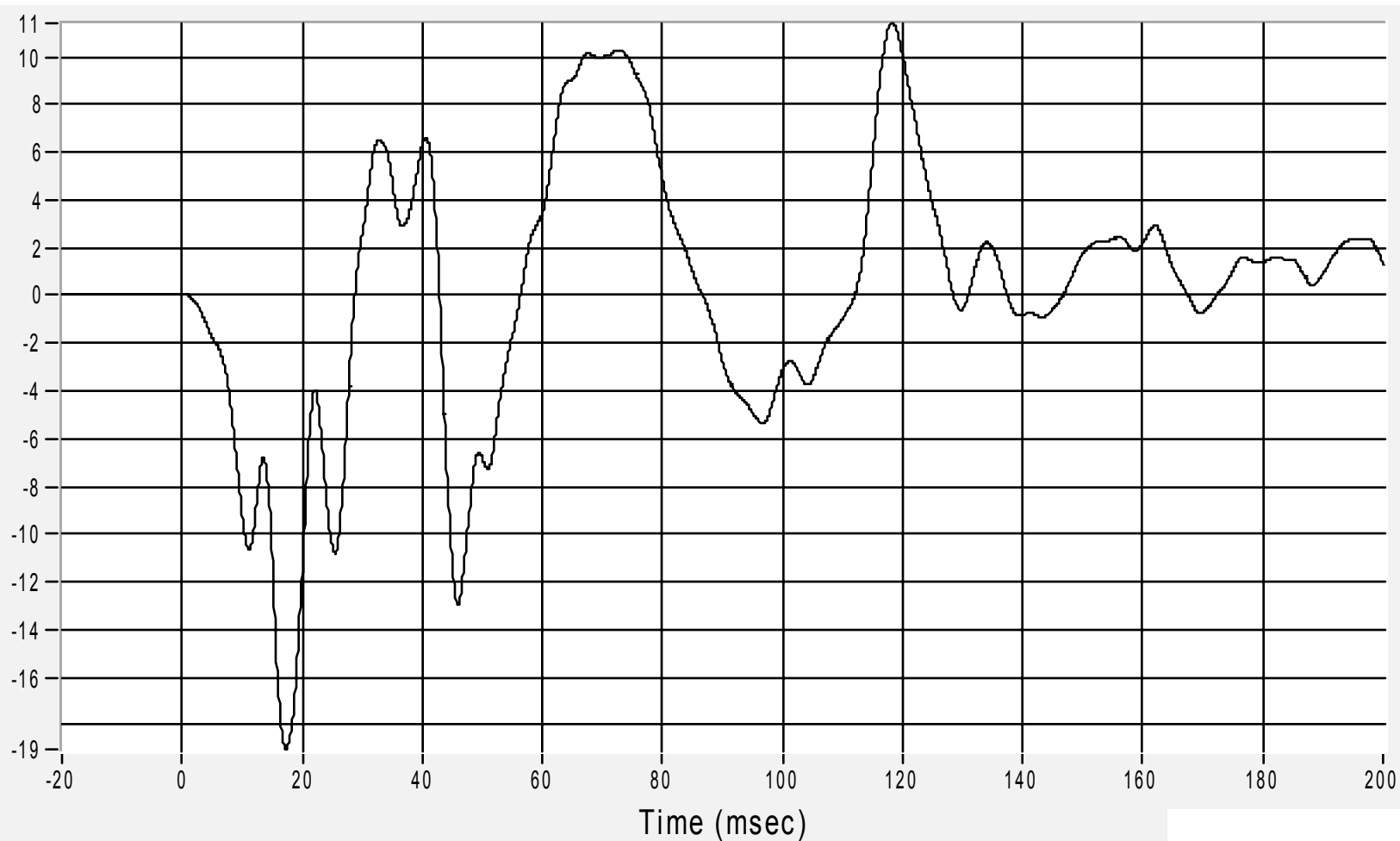
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Z) Acceleration

Acceleration (G's) CFC60

Max 11.4 G at 118.2 msec

Min -19.0 G at 17.3 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

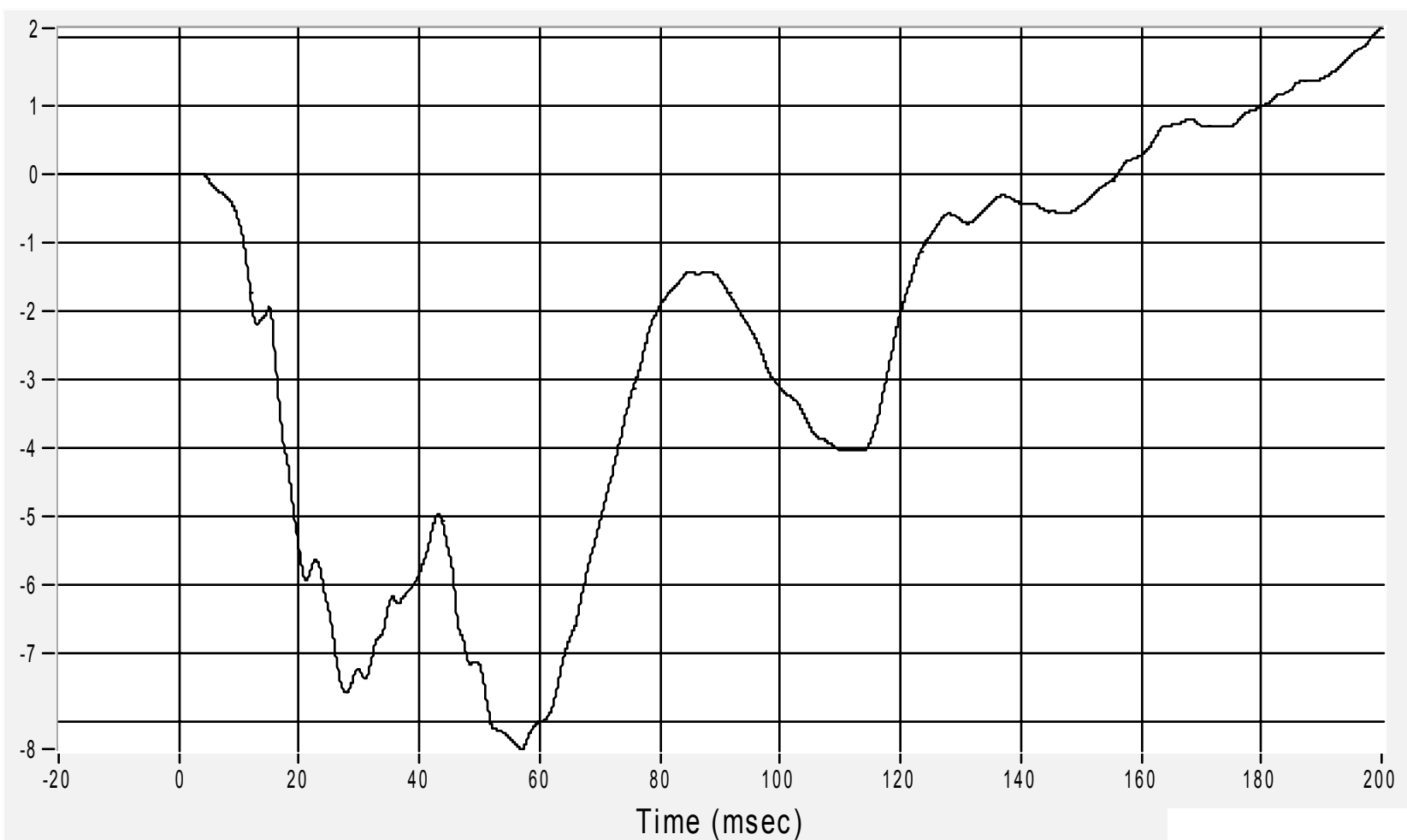
Medical College of Wisconsin
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Right Side Sill at Rear Seat (Z) Velocity

Velocity (km/h) CFC180

Max 2.1 km/h at 199.9 msec

Min -8.4 km/h at 57.0 msec



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22 January 2004

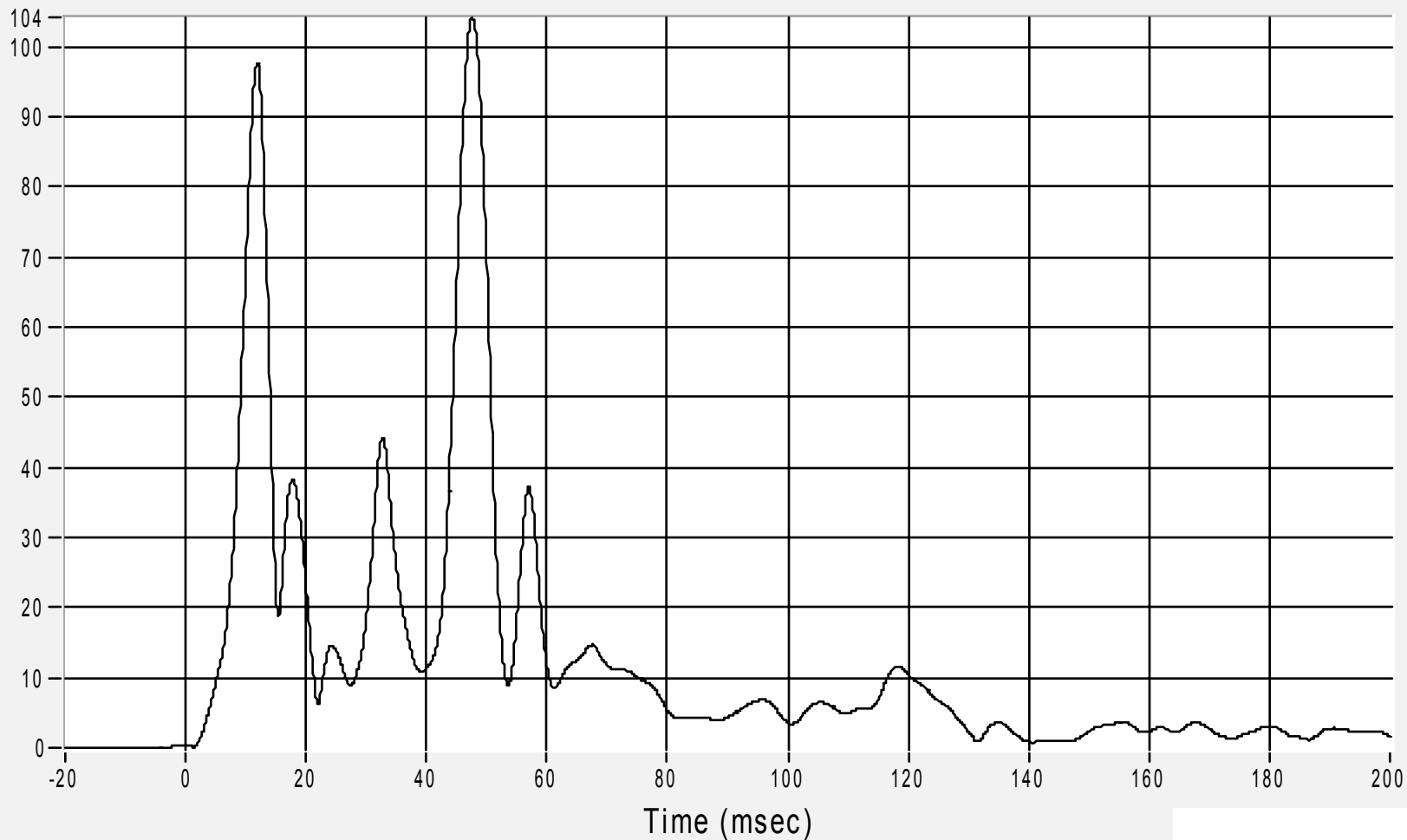
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat Resultant Acceleration

Acceleration (G's) CFC60

Max 104.2 G's at 47.6 msec

Min 0.1 G's at 1.3 msec



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22 January 2004

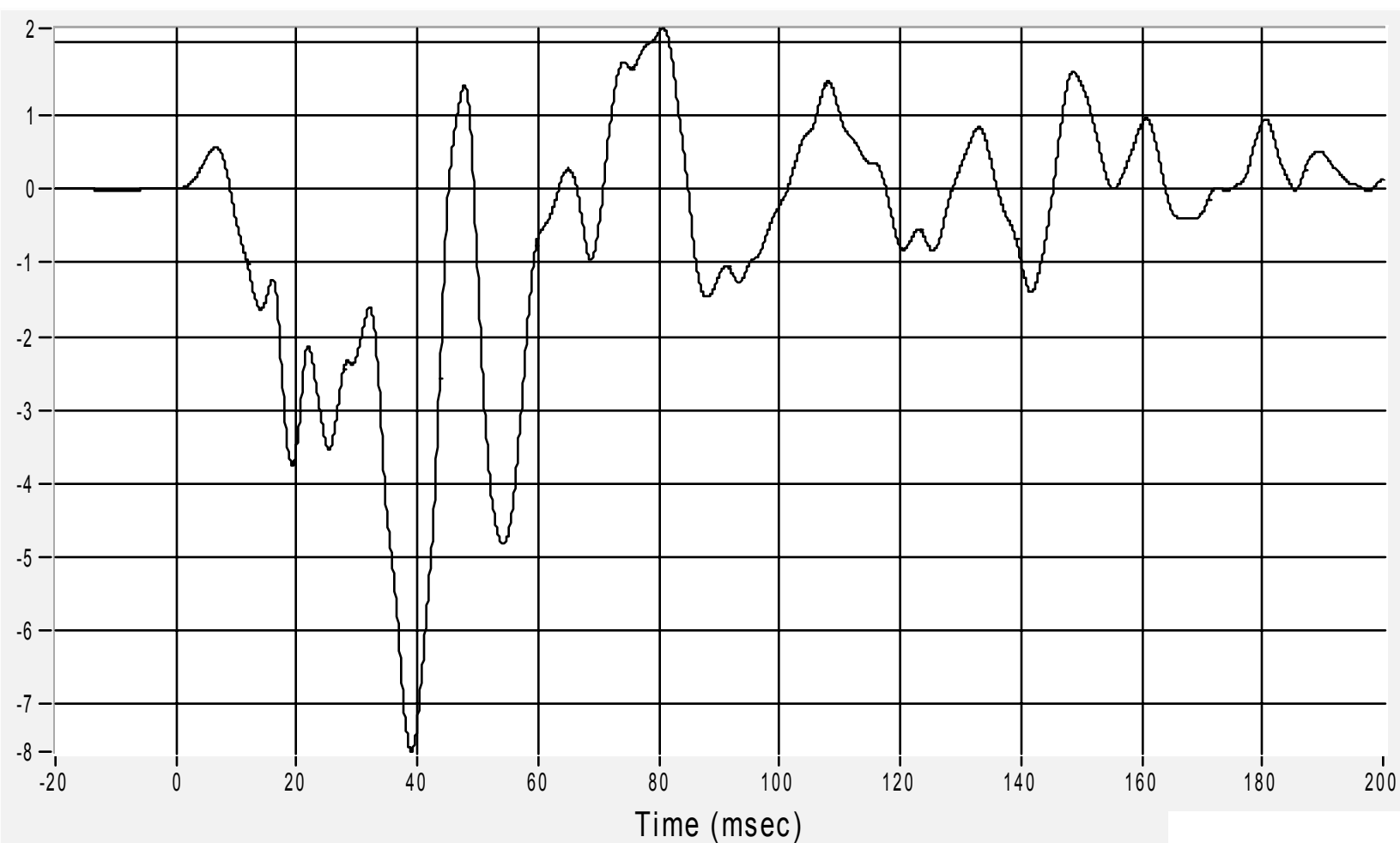
Medical College of Wisconsin
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Rear Floorpan Above Axle (X) Acceleration

Acceleration (G's) CFC60

Max 2.2 G at 80.6 msec

Min -7.6 G at 39.0 msec



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22 January 2004

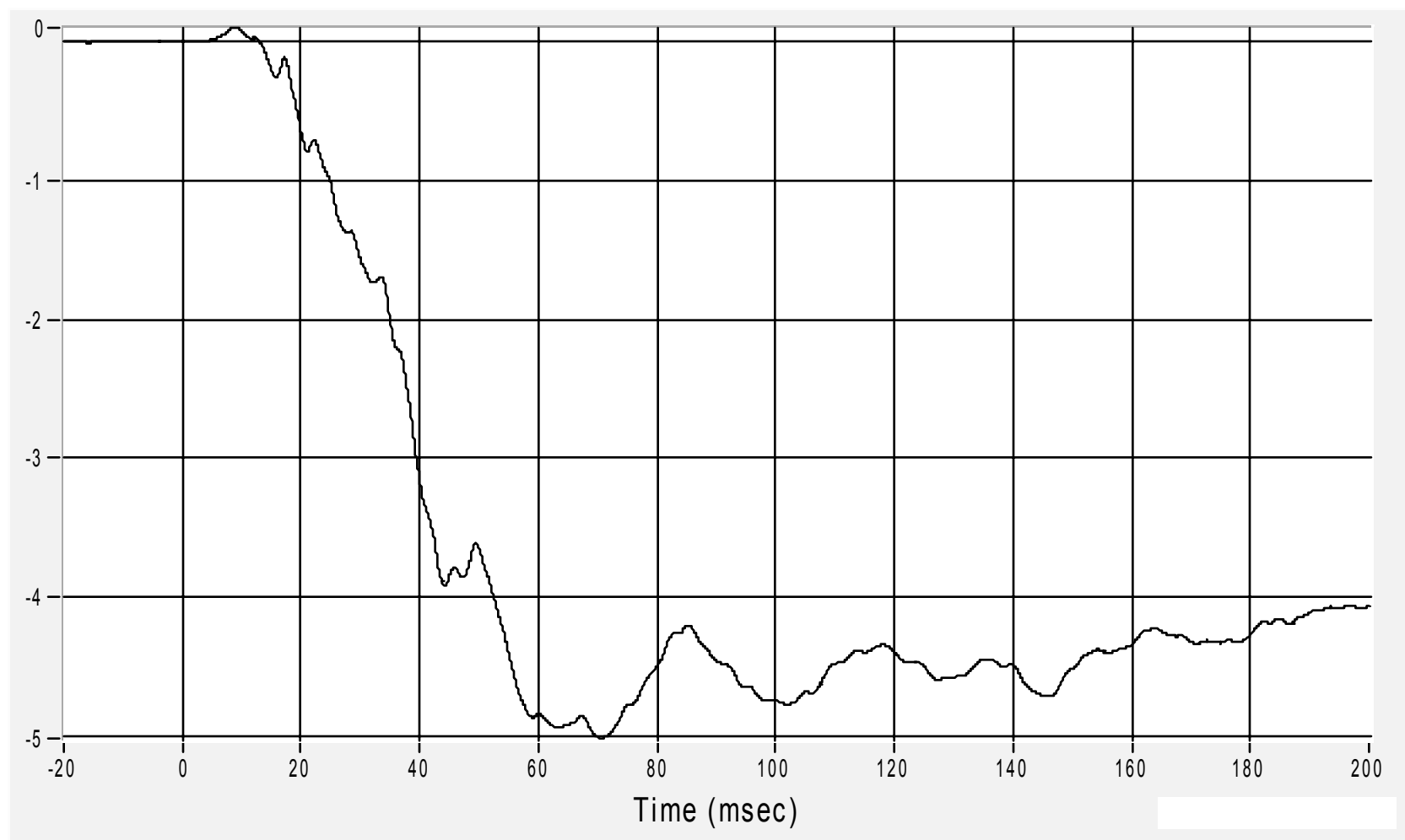
Medical College of Wisconsin
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Rear Floorpan Above Axle (X) Velocity

Velocity (km/h) CFC180

Max 0.1 km/h at 8.8 msec

Min -5.0 km/h at 70.6 msec



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22 January 2004

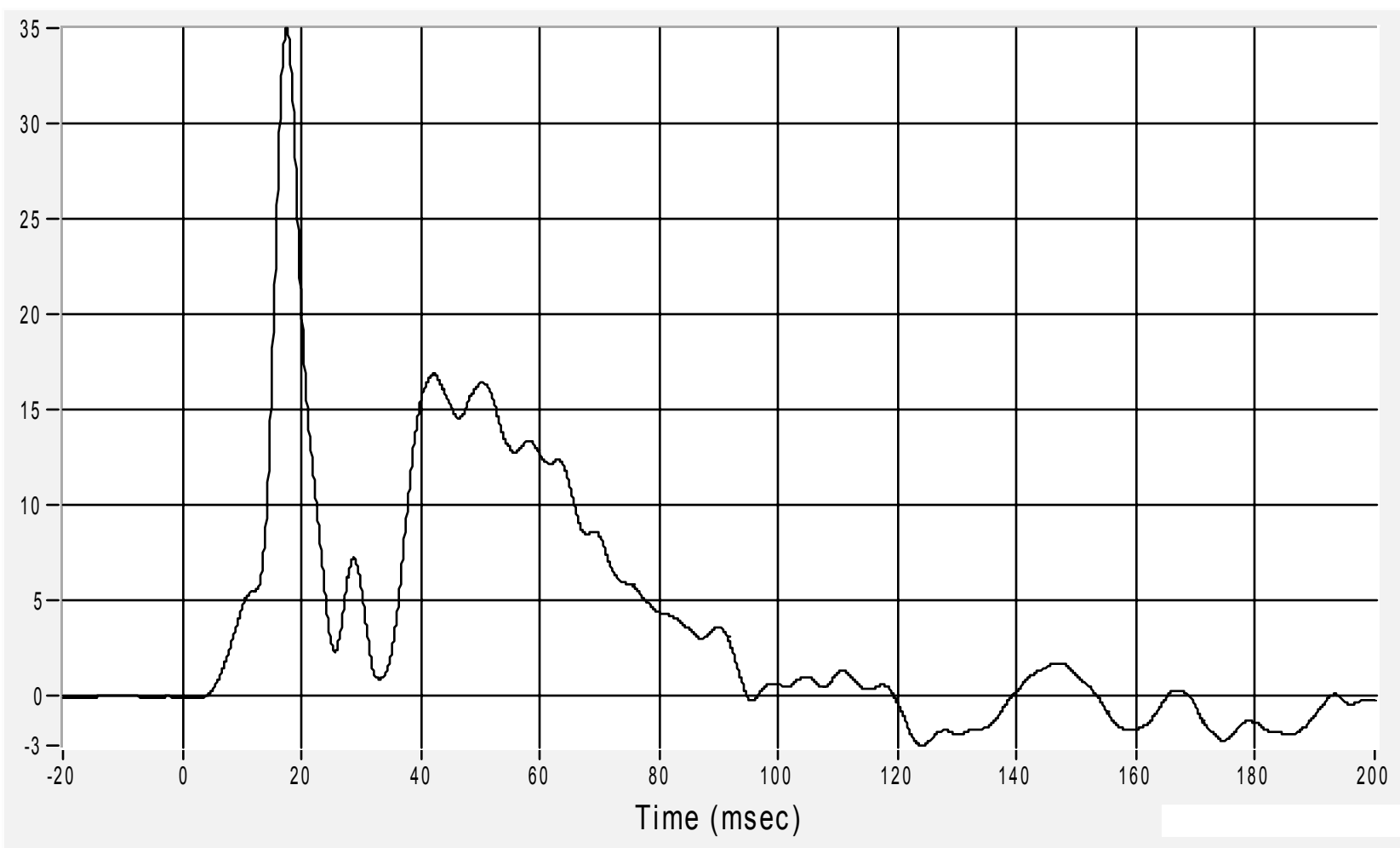
Medical College of Wisconsin
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Rear Floorpan Above Axle (Y) Acceleration

Acceleration (G's) CFC60

Max 35.0 G at 17.5 msec

Min -2.6 G at 124.1 msec



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22 January 2004

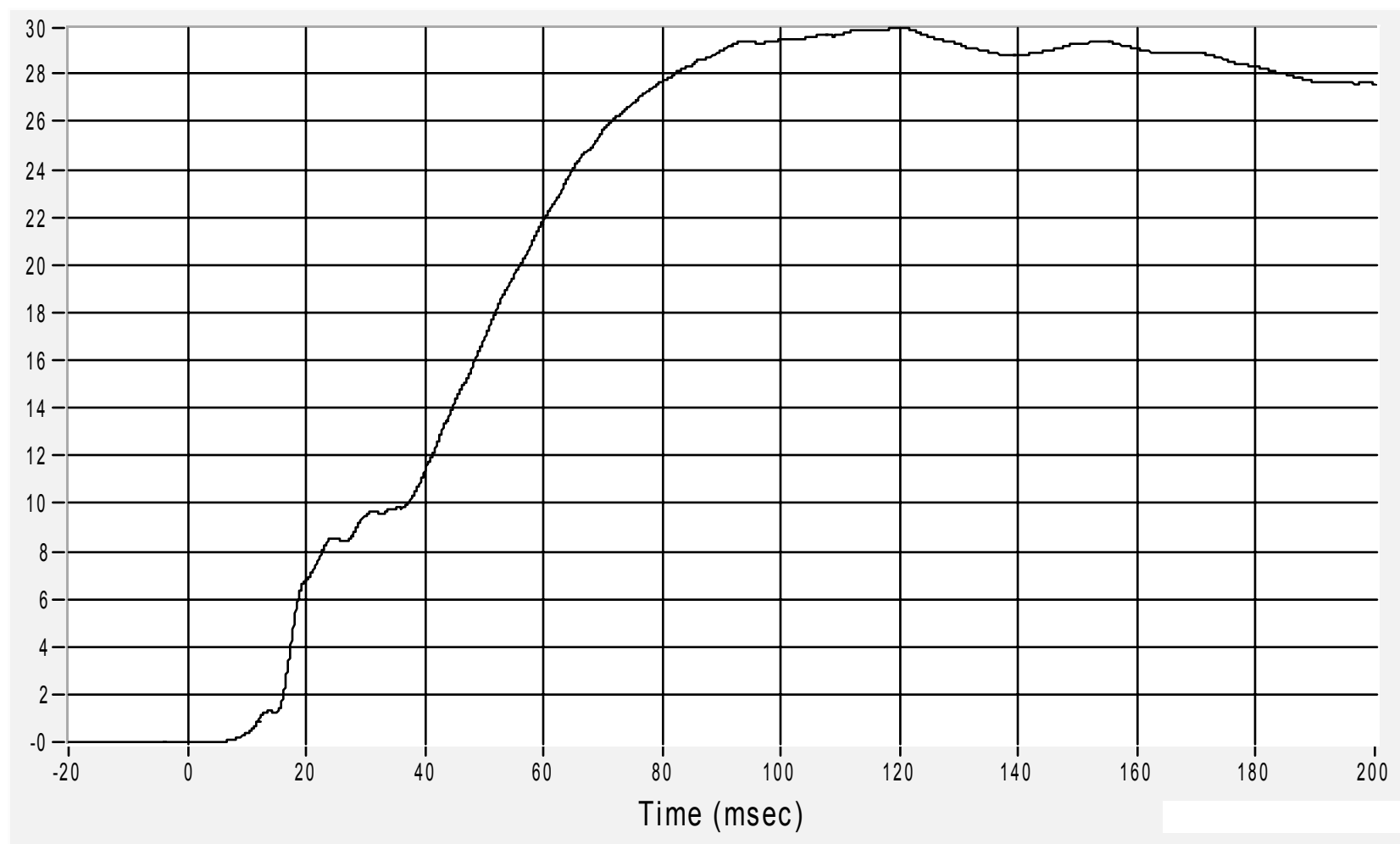
Medical College of Wisconsin
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Rear Floorpan Above Axle (Y) Velocity

Velocity (km/h) CFC180

Max 29.9 km/h at 119.0 msec

Min 0.0 km/h at 4.9 msec



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22 January 2004

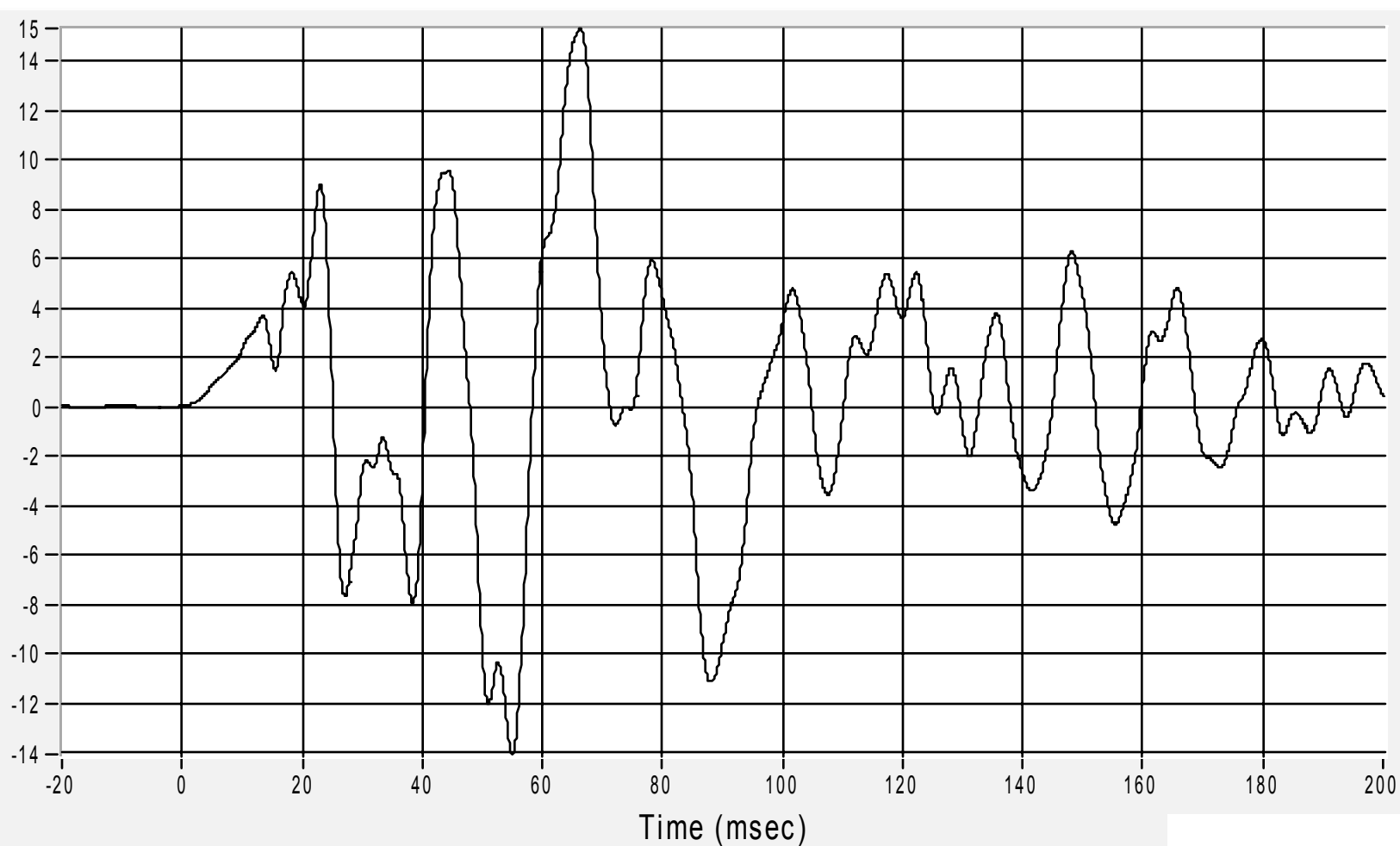
Medical College of Wisconsin
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Rear Floorpan Above Axle (Z) Acceleration

Acceleration (G's) CFC60

Max 15.3 G at 66.3 msec

Min -14.1 G at 55.0 msec



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22 January 2004

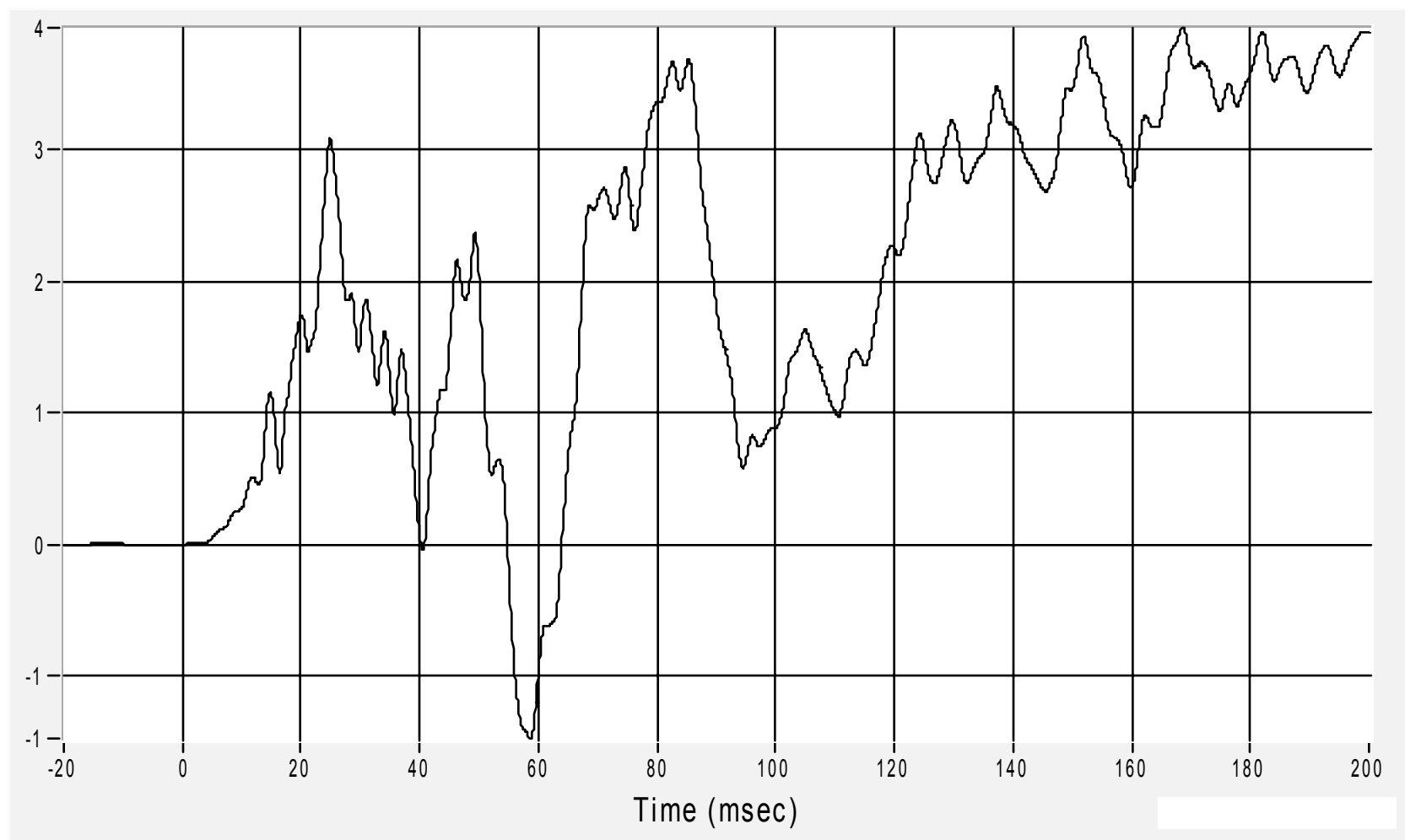
Medical College of Wisconsin
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Rear Floorpan Above Axle (Z) Velocity

Velocity (km/h) CFC180

Max 3.9 km/h at 168.6 msec

Min -1.5 km/h at 58.6 msec



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22 January 2004

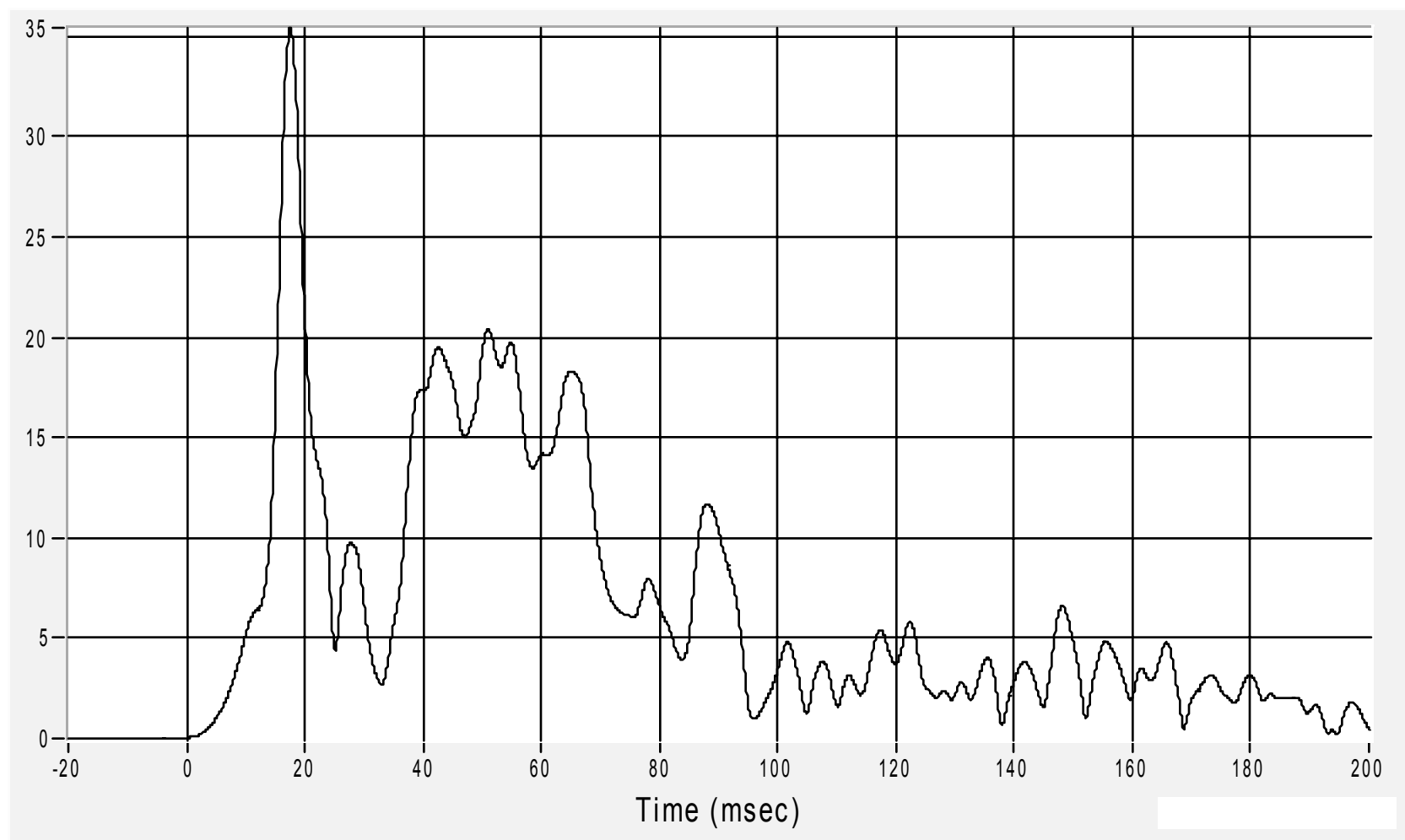
*Medical College of Wisconsin
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Rear Floorpan Above Axle Resultant Acceleration

Acceleration (G's) CFC60

Max 35.4 G's at 17.5 msec

Min 0.0 G's at 0.0 msec



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22 January 2004

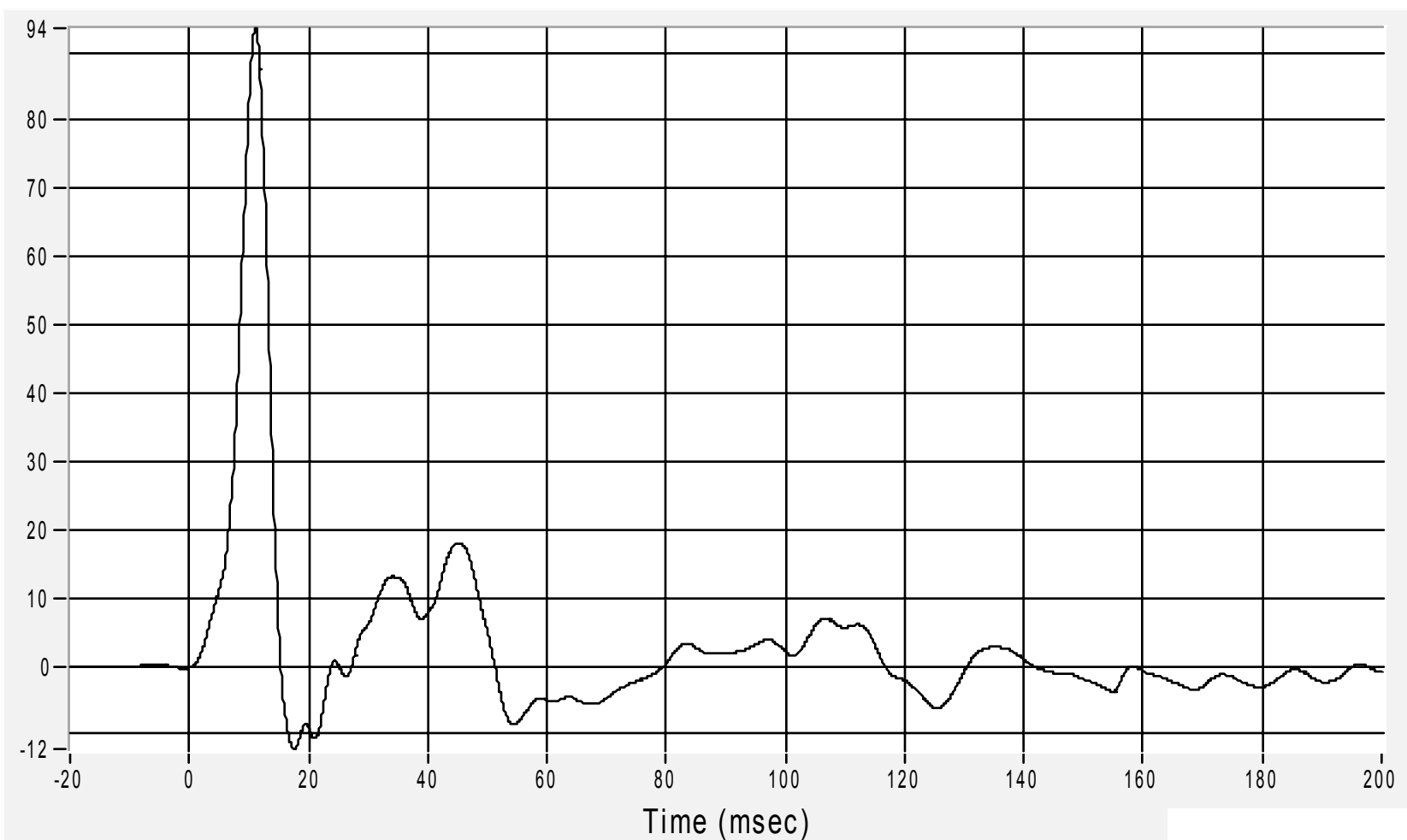
*Medical College of Wisconsin
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Left Side Sill at Rear Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 93.5 G at 11.1 msec

Min -12.2 G at 17.6 msec



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22 January 2004

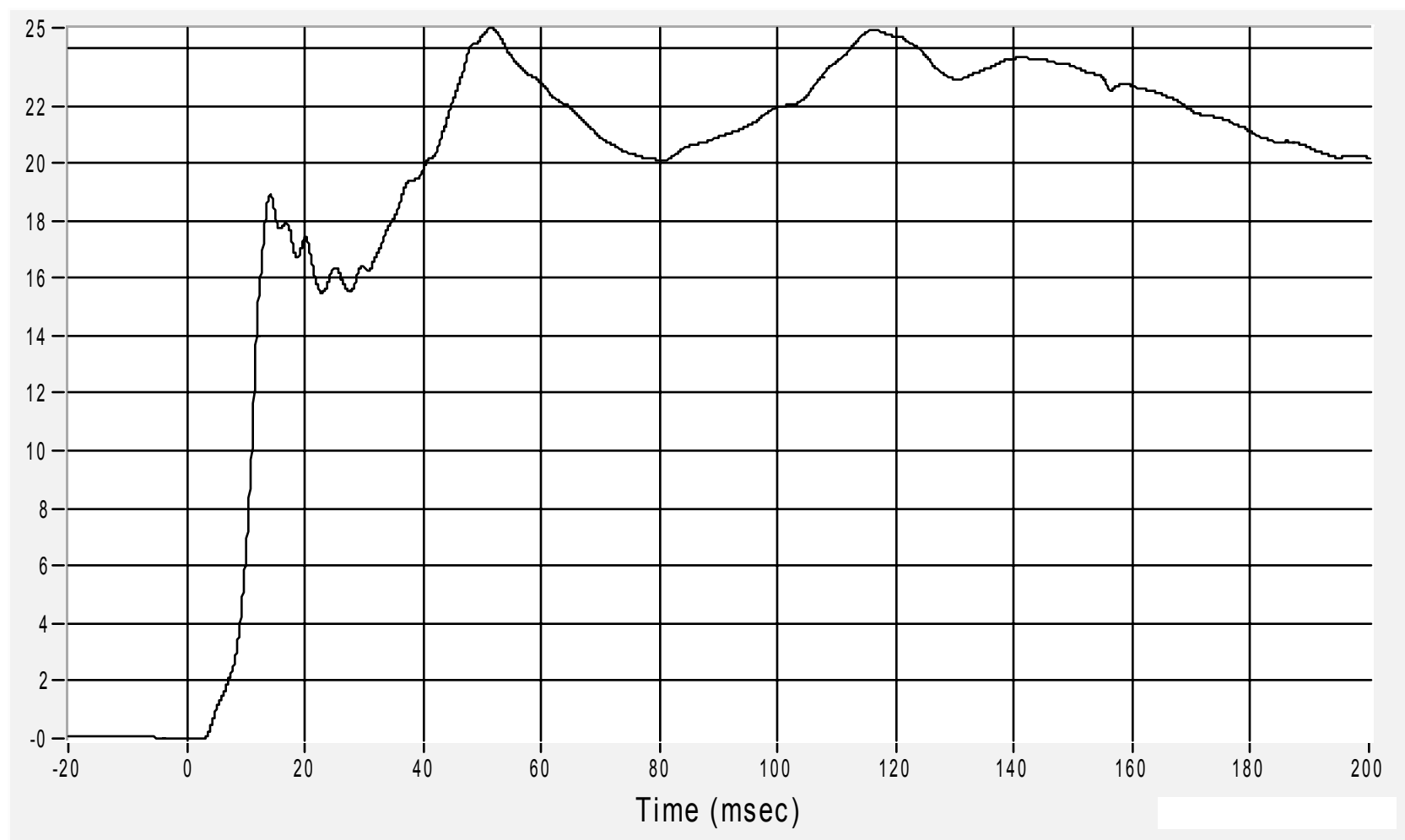
Medical College of Wisconsin
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Left Side Sill at Rear Seat (Y) Velocity

Velocity (km/h) CFC180

Max 24.7 km/h at 51.4 msec

Min 0.0 km/h at 2.6 msec



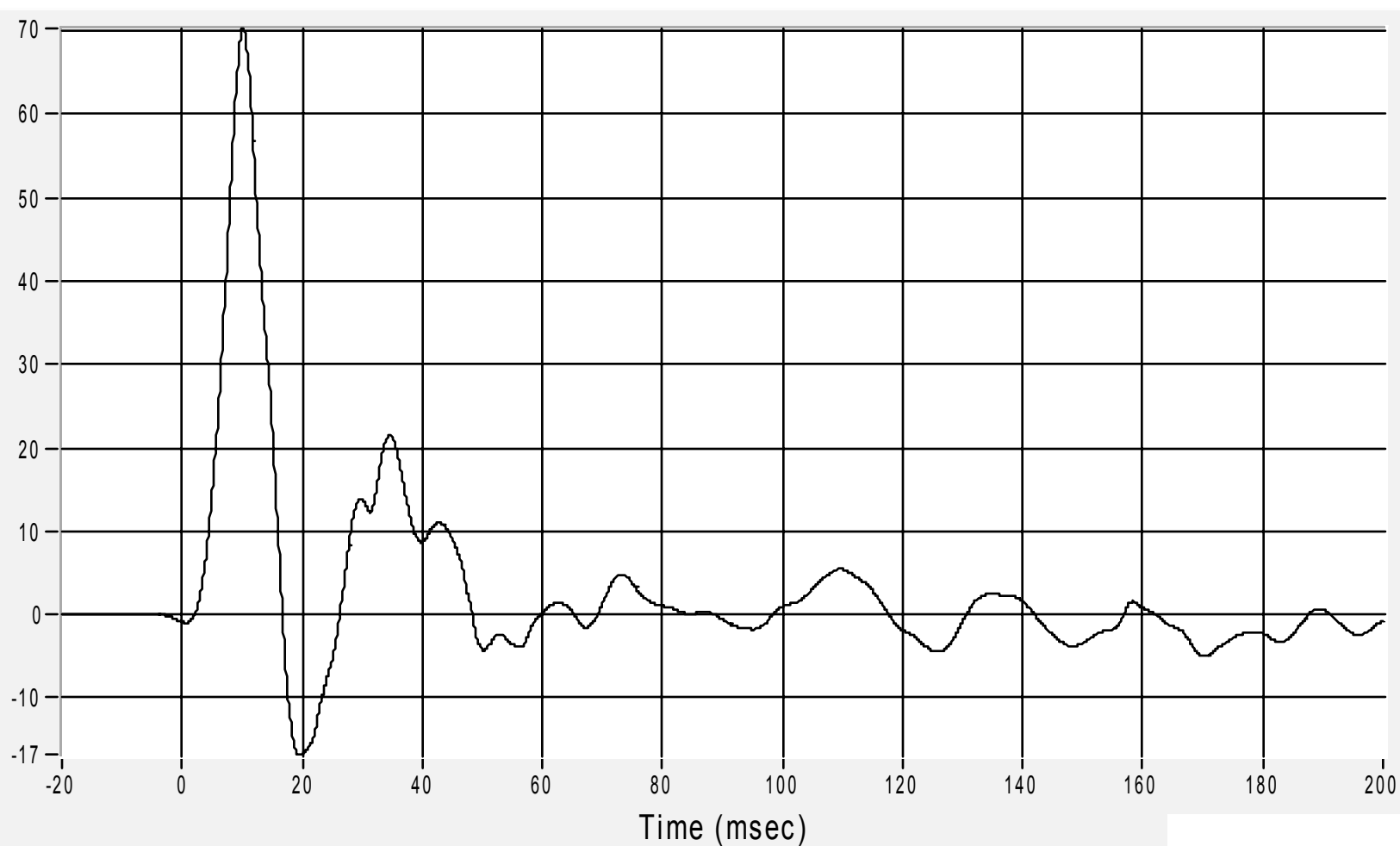
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Left Side Sill at Front Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 70.3 G at 10.2 msec**Min -16.8 G at 19.5 msec**

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22 January 2004

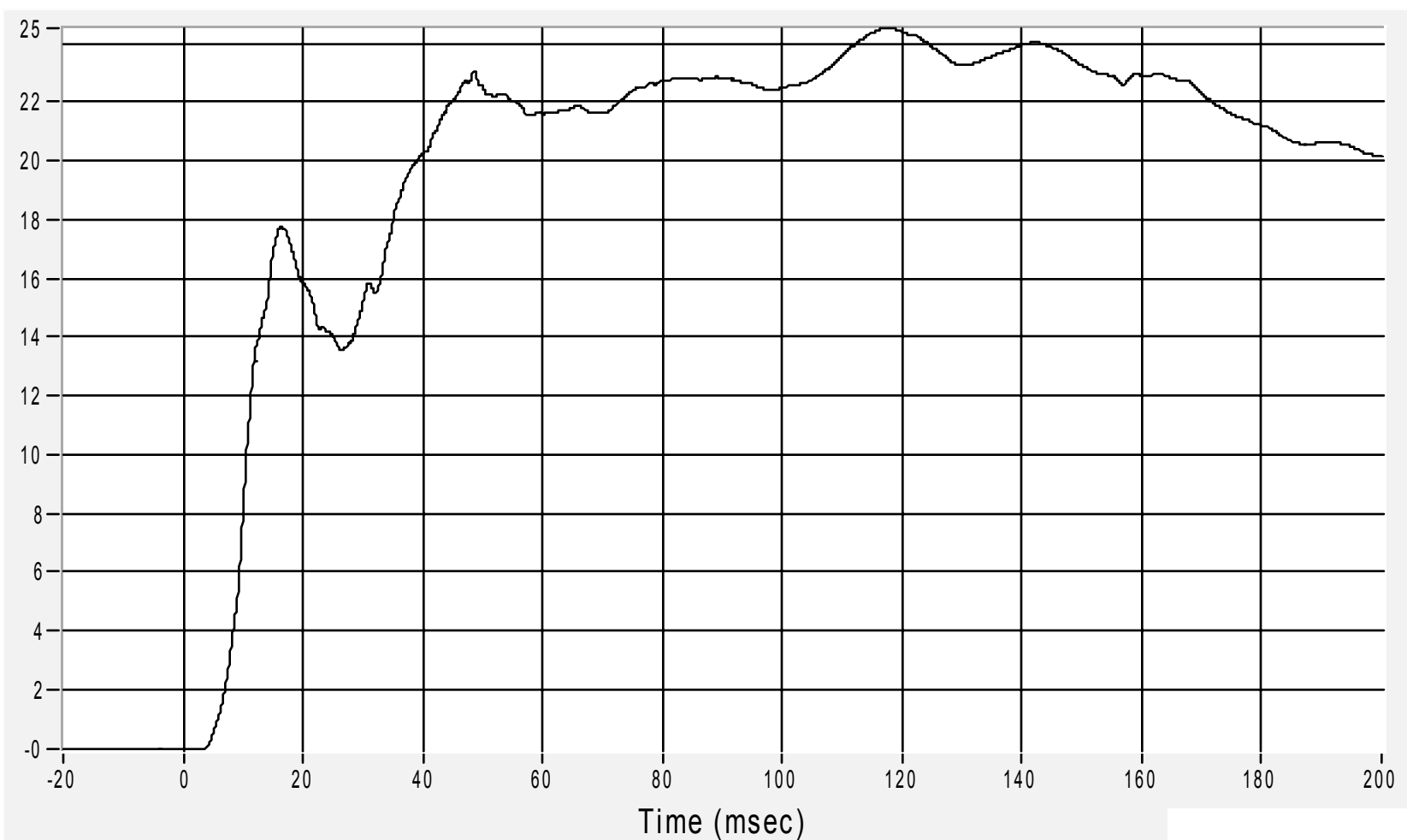
*Medical College of Wisconsin
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Left Side Sill at Front Seat (Y) Velocity

Velocity (km/h) CFC180

Max 24.5 km/h at 117.0 msec

Min 0.0 km/h at 3.1 msec



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22 January 2004

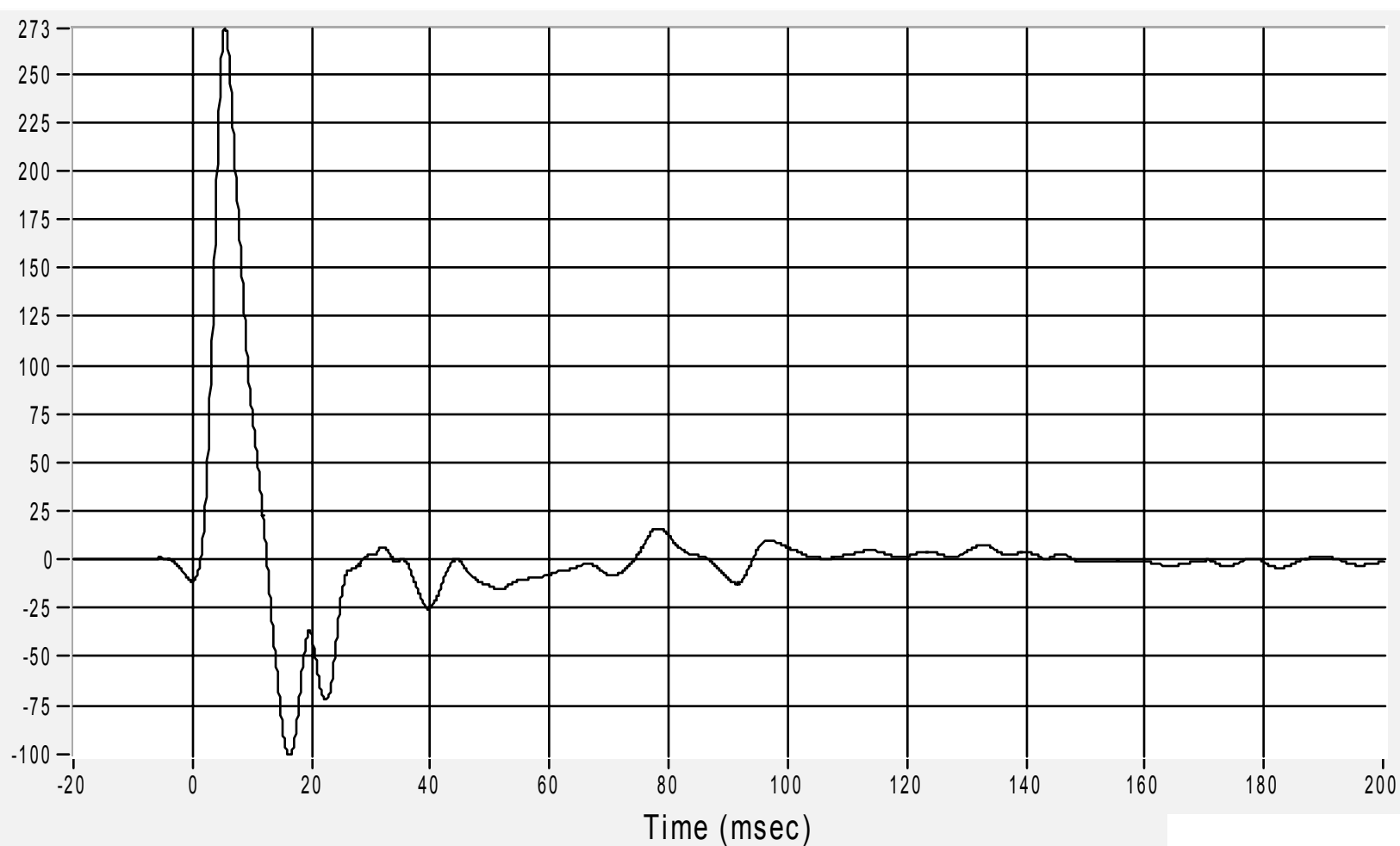
Medical College of Wisconsin
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Left Front Door on Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 273.2 G at 5.4 msec

Min -100.3 G at 16.2 msec



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22 January 2004

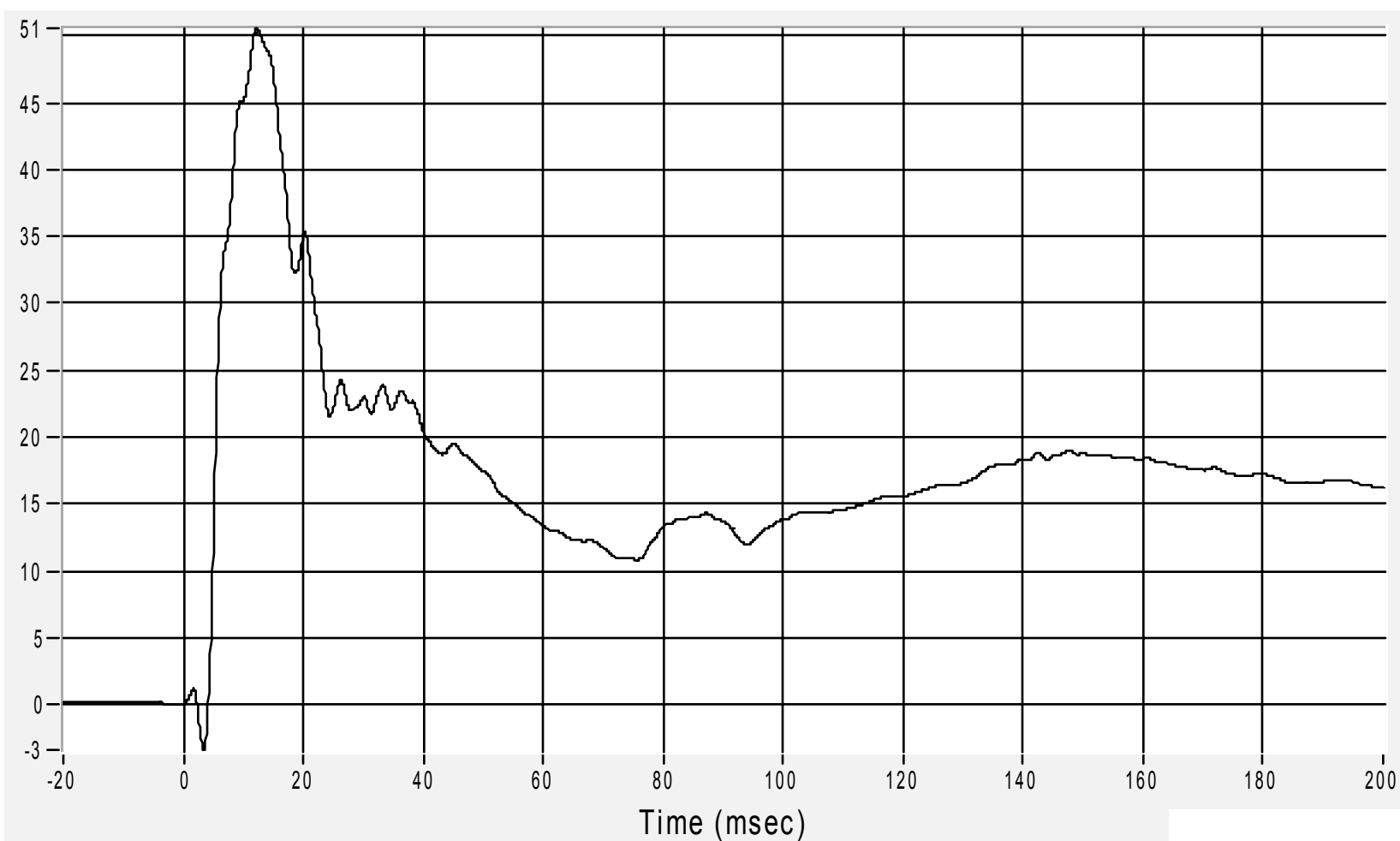
Medical College of Wisconsin
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Left Front Door on Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 50.6 km/h at 12.2 msec

Min -3.4 km/h at 3.4 msec



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22 January 2004

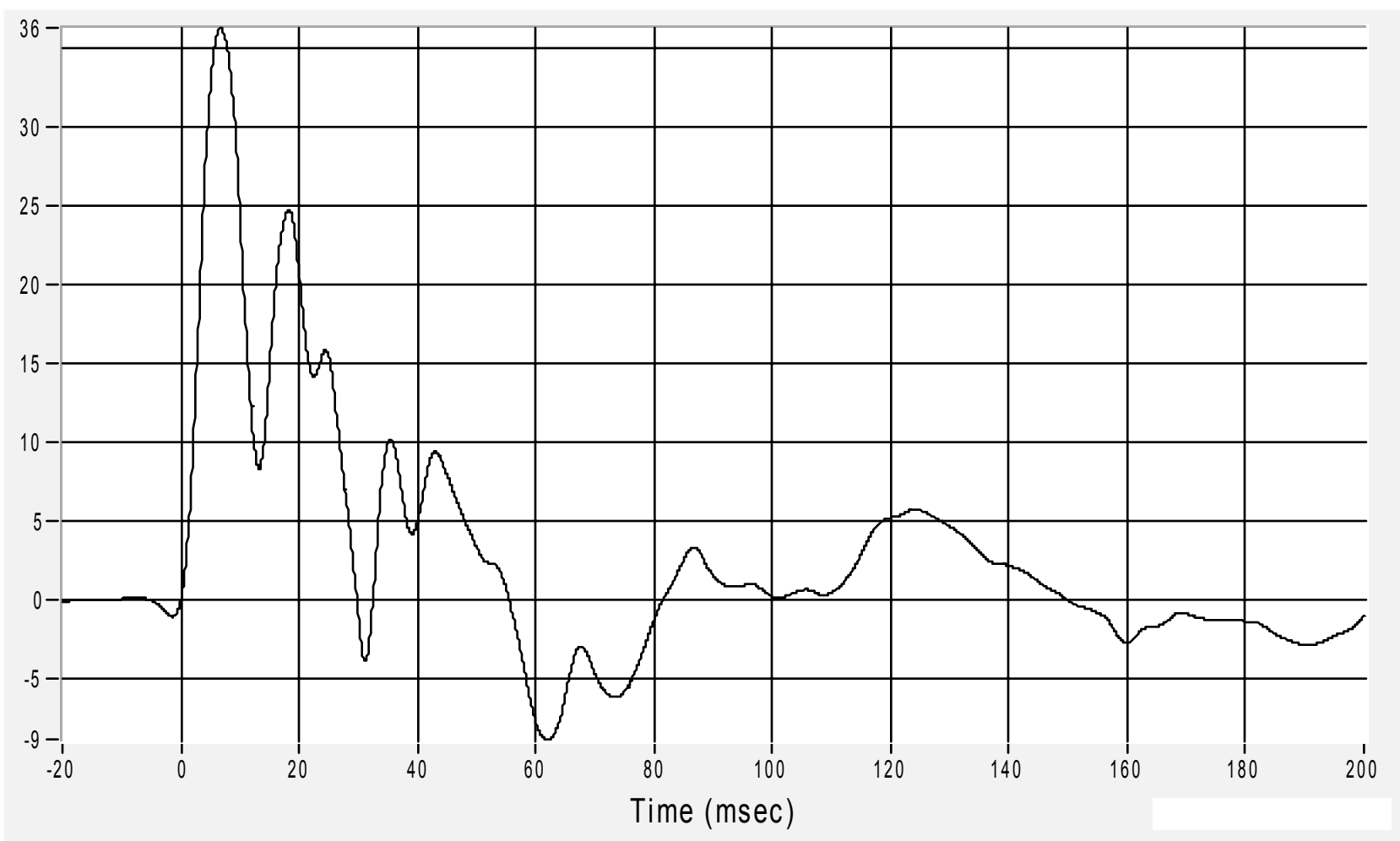
Medical College of Wisconsin
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Right Rear Occupant Compartment (Y) Acceleration

Acceleration (G's) CFC60

Max 36.3 G at 6.6 msec

Min -8.8 G at 62.0 msec



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22 January 2004

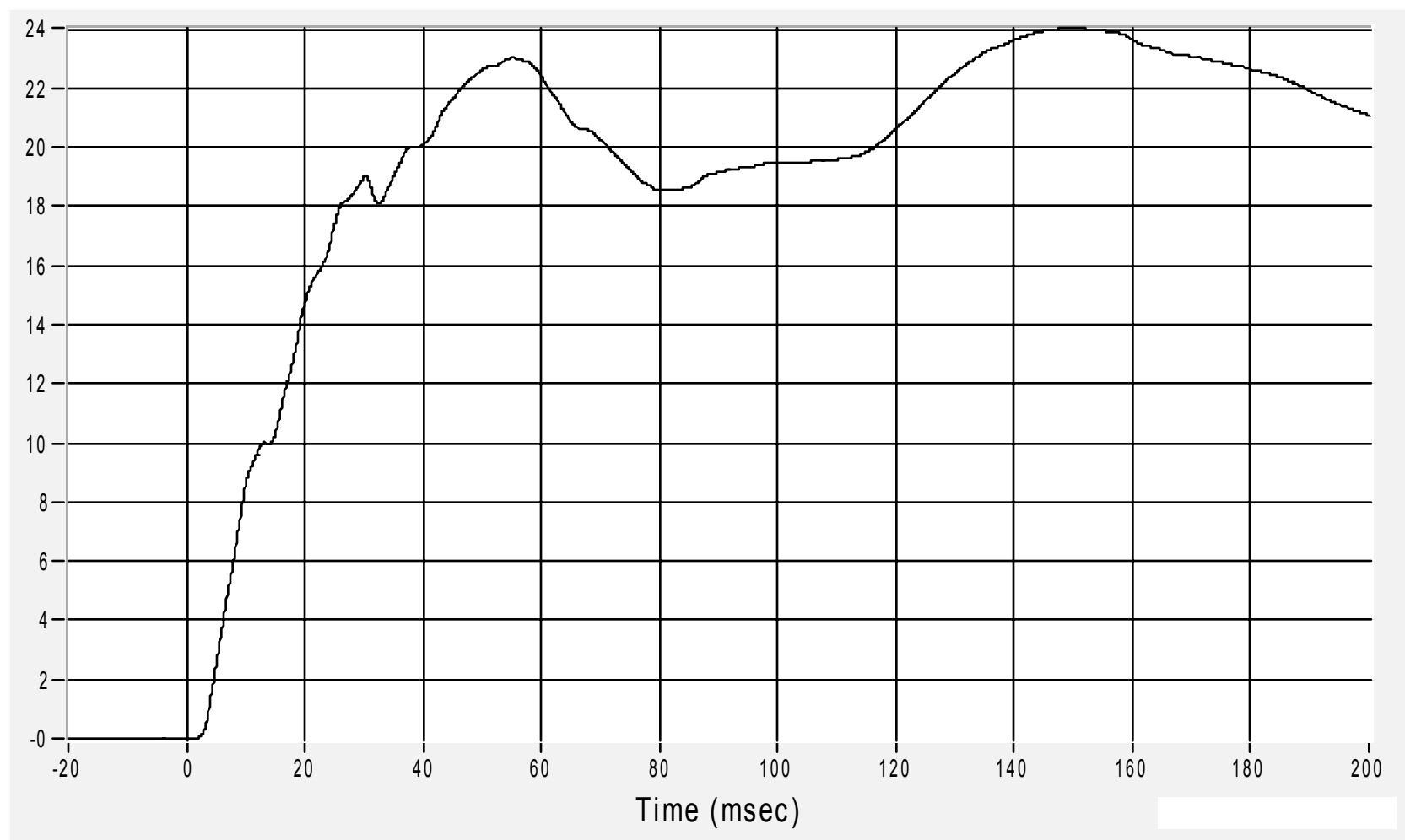
Medical College of Wisconsin
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Right Rear Occupant Compartment (Y) Velocity

Velocity (km/h) CFC180

Max 24.0 km/h at 149.8 msec

Min 0.0 km/h at 1.4 msec



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22 January 2004

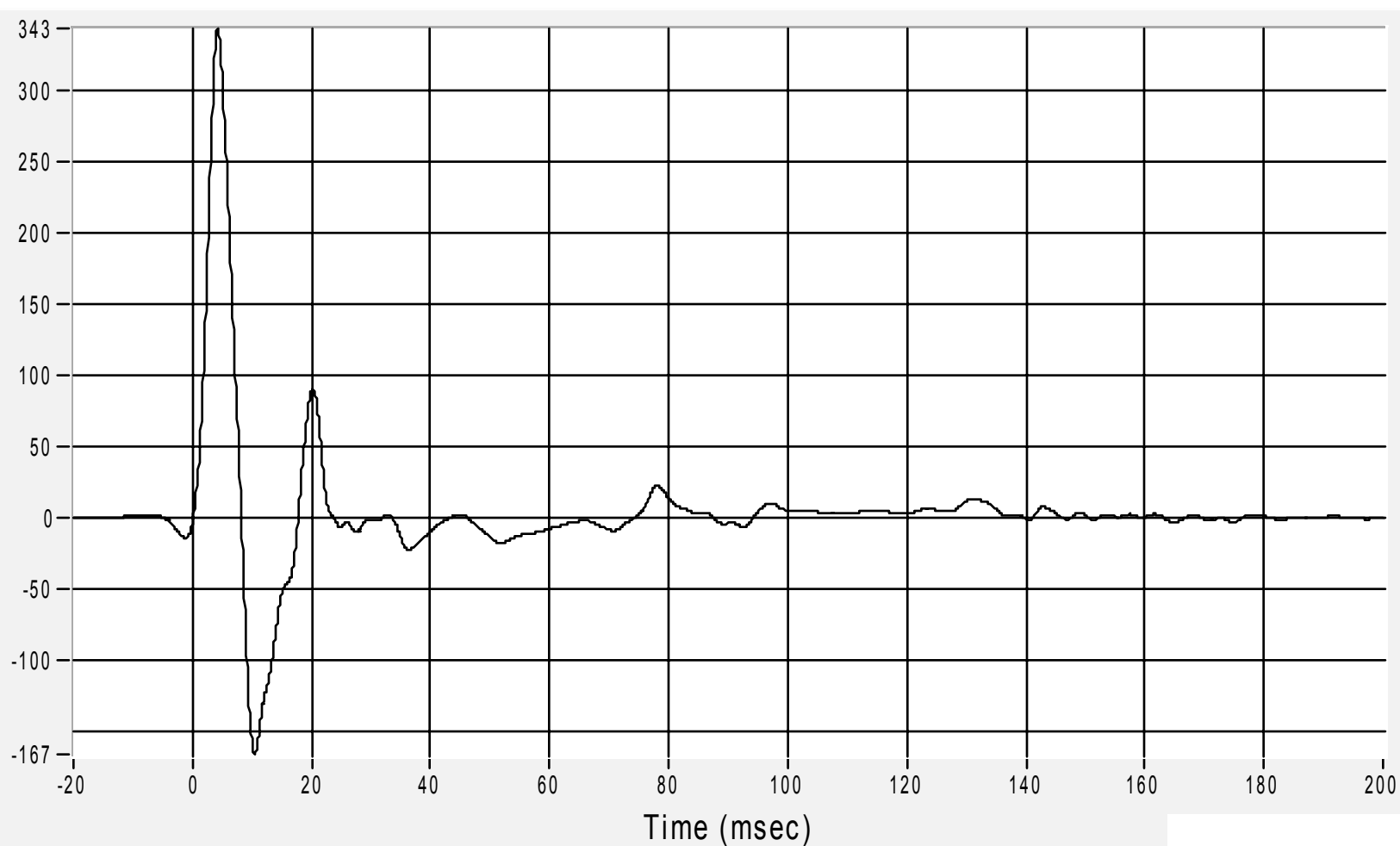
Medical College of Wisconsin
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Mid-Rear of Left Front Door (Y) Acceleration

Acceleration (G's) CFC60

Max 342.8 G at 4.2 msec

Min -166.7 G at 10.5 msec



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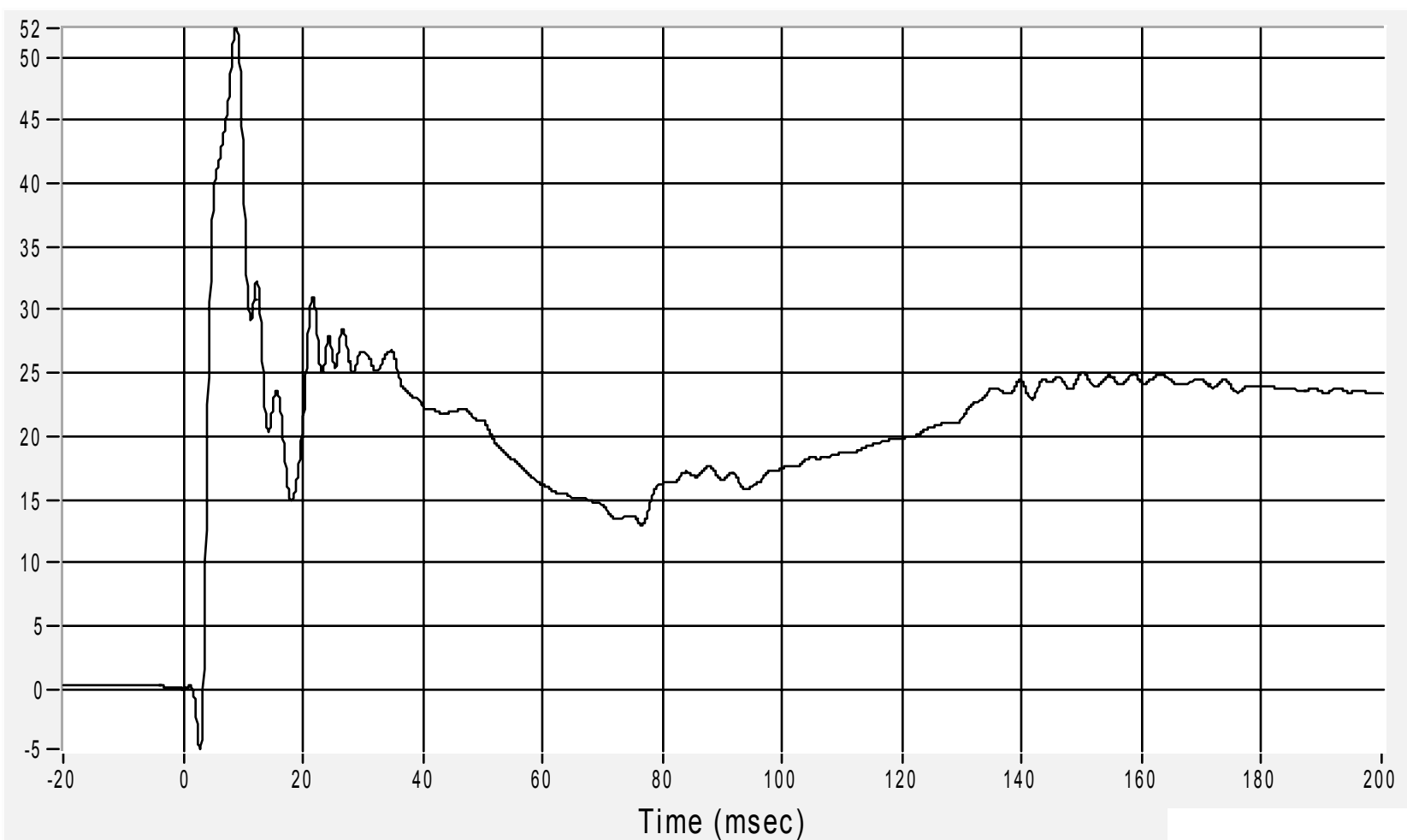
B-85

Mid-Rear of Left Front Door (Y) Velocity

Velocity (km/h) CFC180

Max 52.3 km/h at 8.9 msec

Min -4.7 km/h at 2.8 msec



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22 January 2004

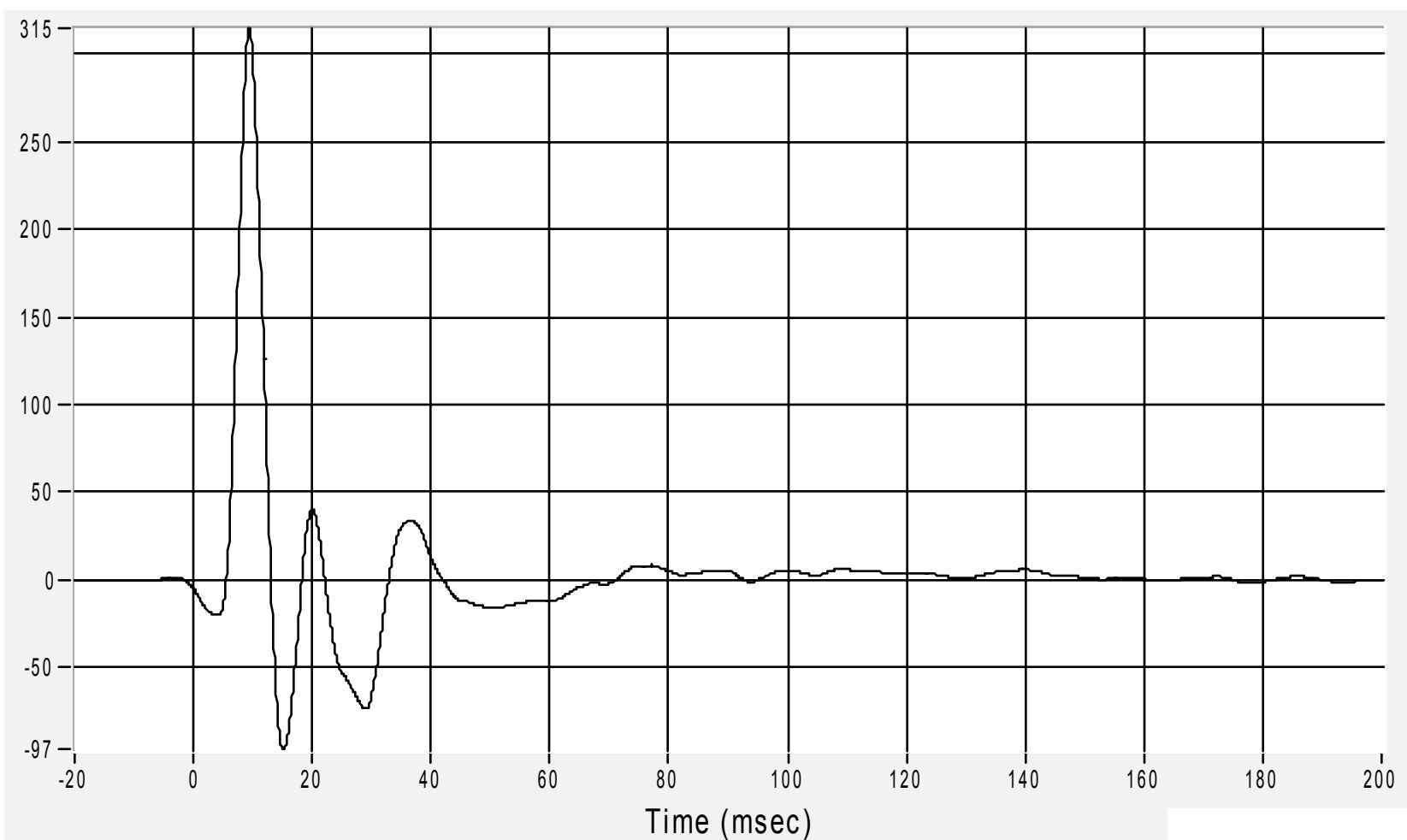
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Left Front Door Upper Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 314.8 G at 9.4 msec

Min -96.6 G at 15.1 msec



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22 January 2004

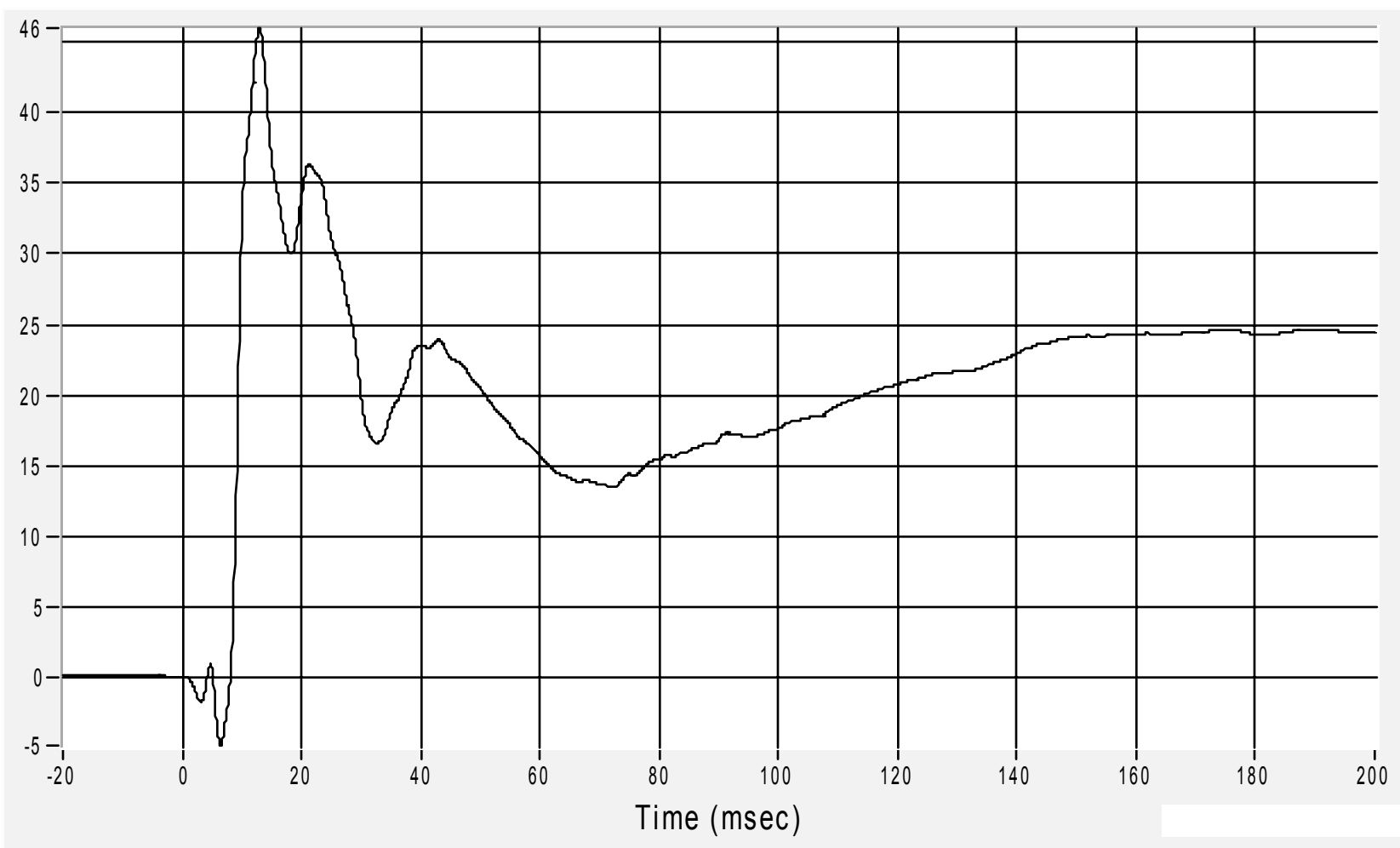
Medical College of Wisconsin
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Left Front Door Upper Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 46.0 km/h at 13.0 msec

Min -4.8 km/h at 6.4 msec



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22 January 2004

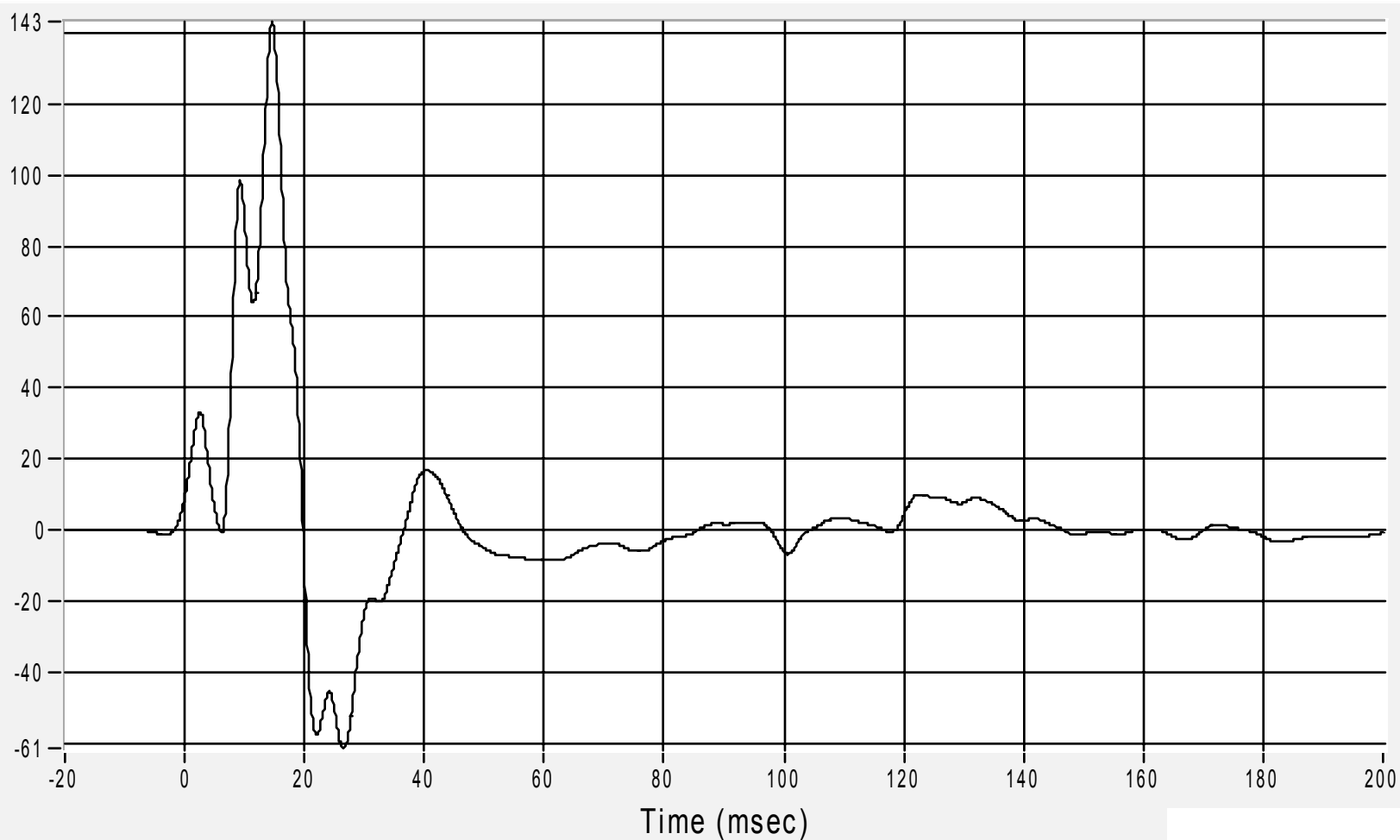
Medical College of Wisconsin
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Mid-Rear of Left Rear Door (Y) Acceleration

Acceleration (G's) CFC60

Max 143.1 G at 14.6 msec

Min -61.3 G at 26.5 msec



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22 January 2004

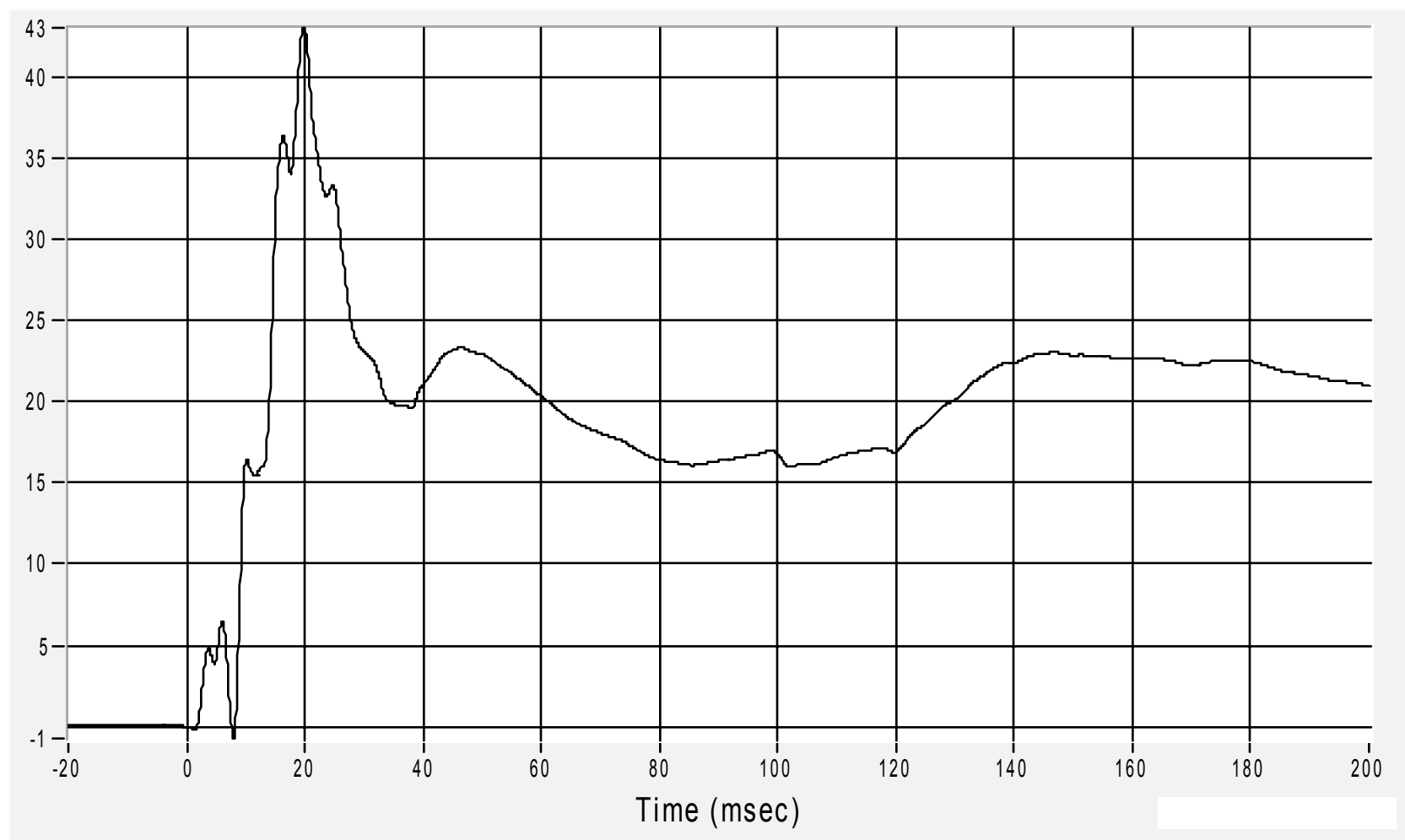
Medical College of Wisconsin
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Mid-Rear of Left Rear Door (Y) Velocity

Velocity (km/h) CFC180

Max 43.1 km/h at 19.8 msec

Min -0.8 km/h at 7.9 msec



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22 January 2004

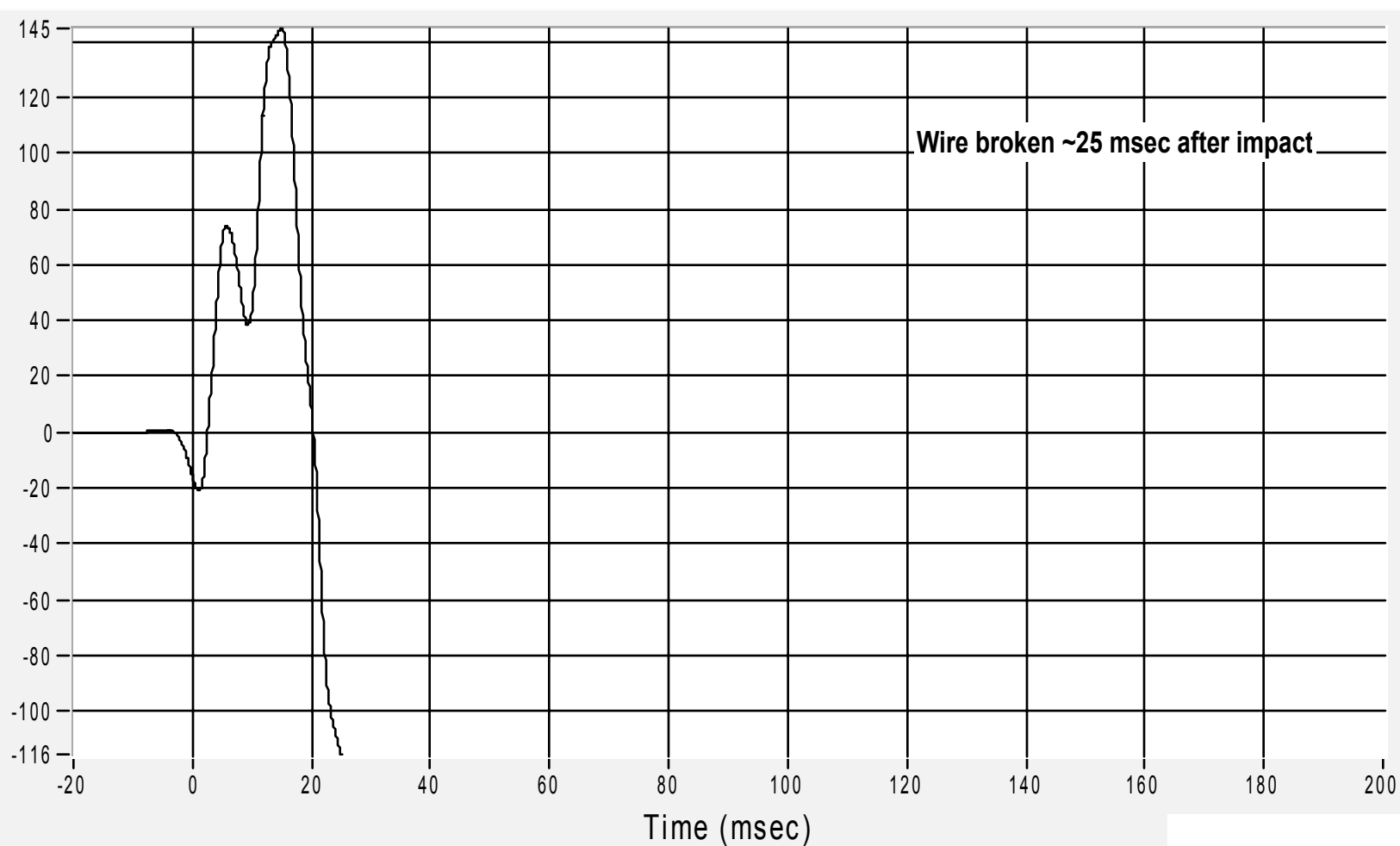
Medical College of Wisconsin
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Left Rear Door Upper Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 144.7 G at 15.0 msec

Min -115.2 G at 24.9 msec



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22 January 2004

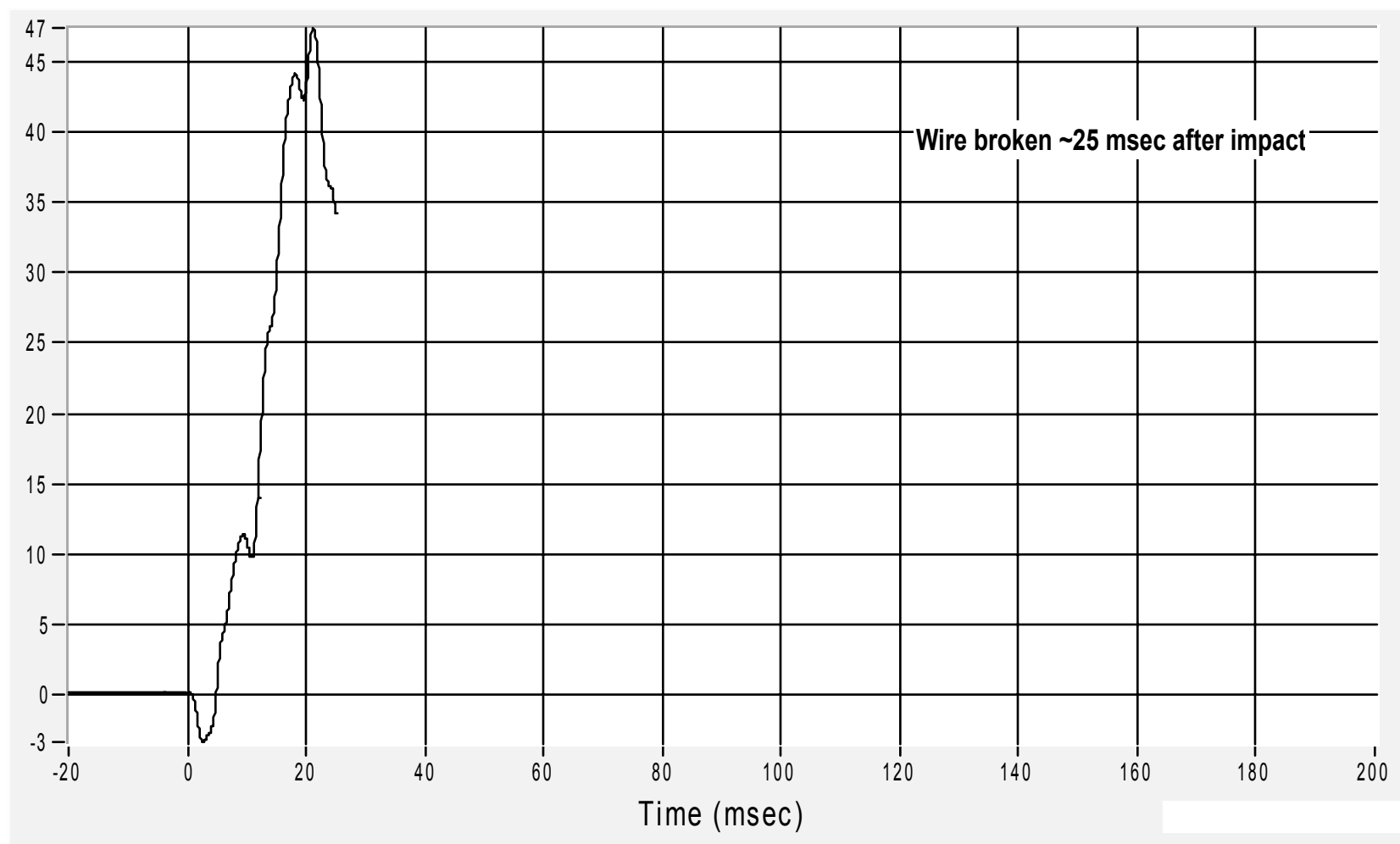
Medical College of Wisconsin
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Left Rear Door Upper Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 47.5 km/h at 21.2 msec

Min -3.4 km/h at 2.6 msec



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22 January 2004

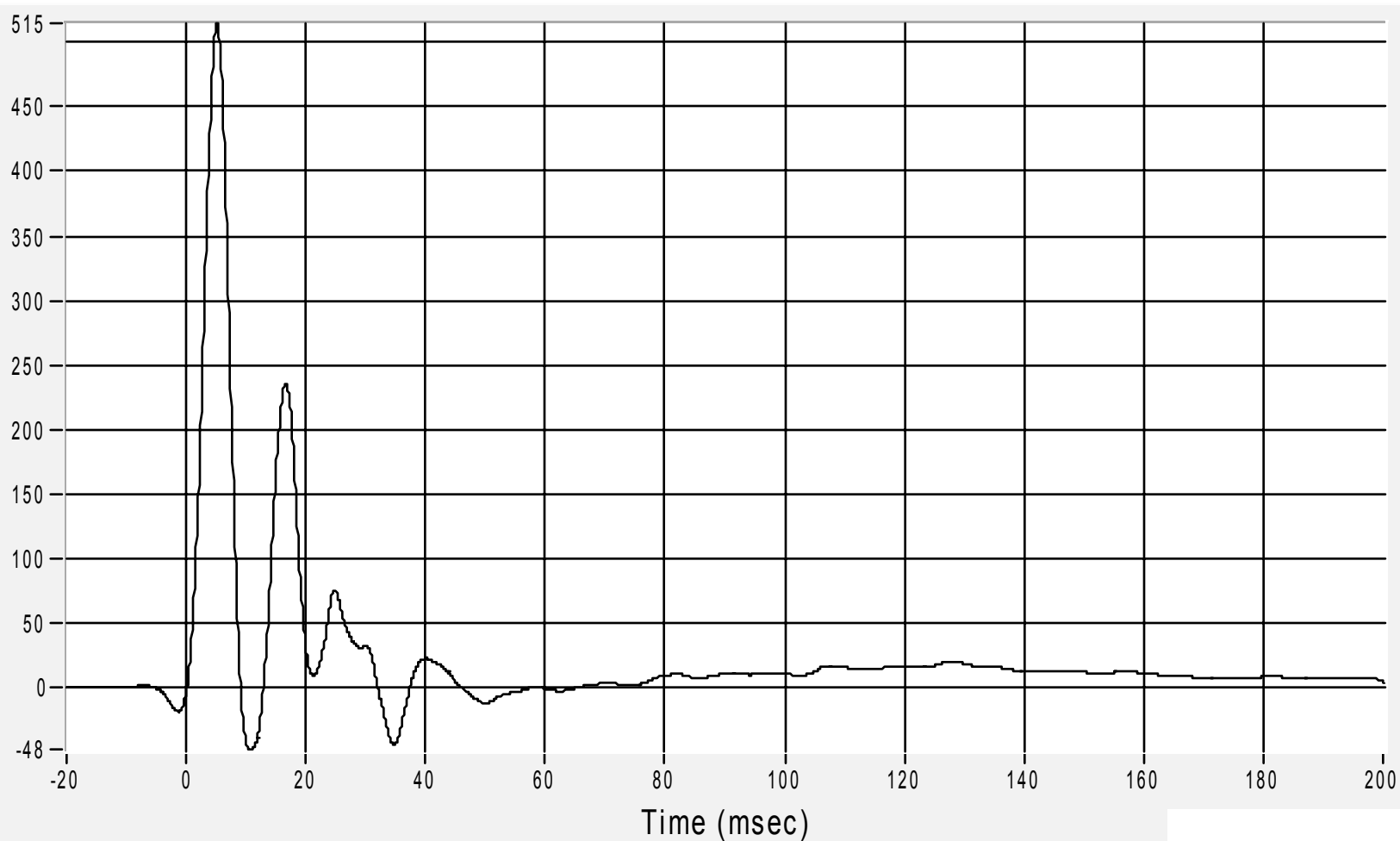
Medical College of Wisconsin
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Left Lower B-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 515.0 G at 5.1 msec

Min -48.5 G at 10.7 msec



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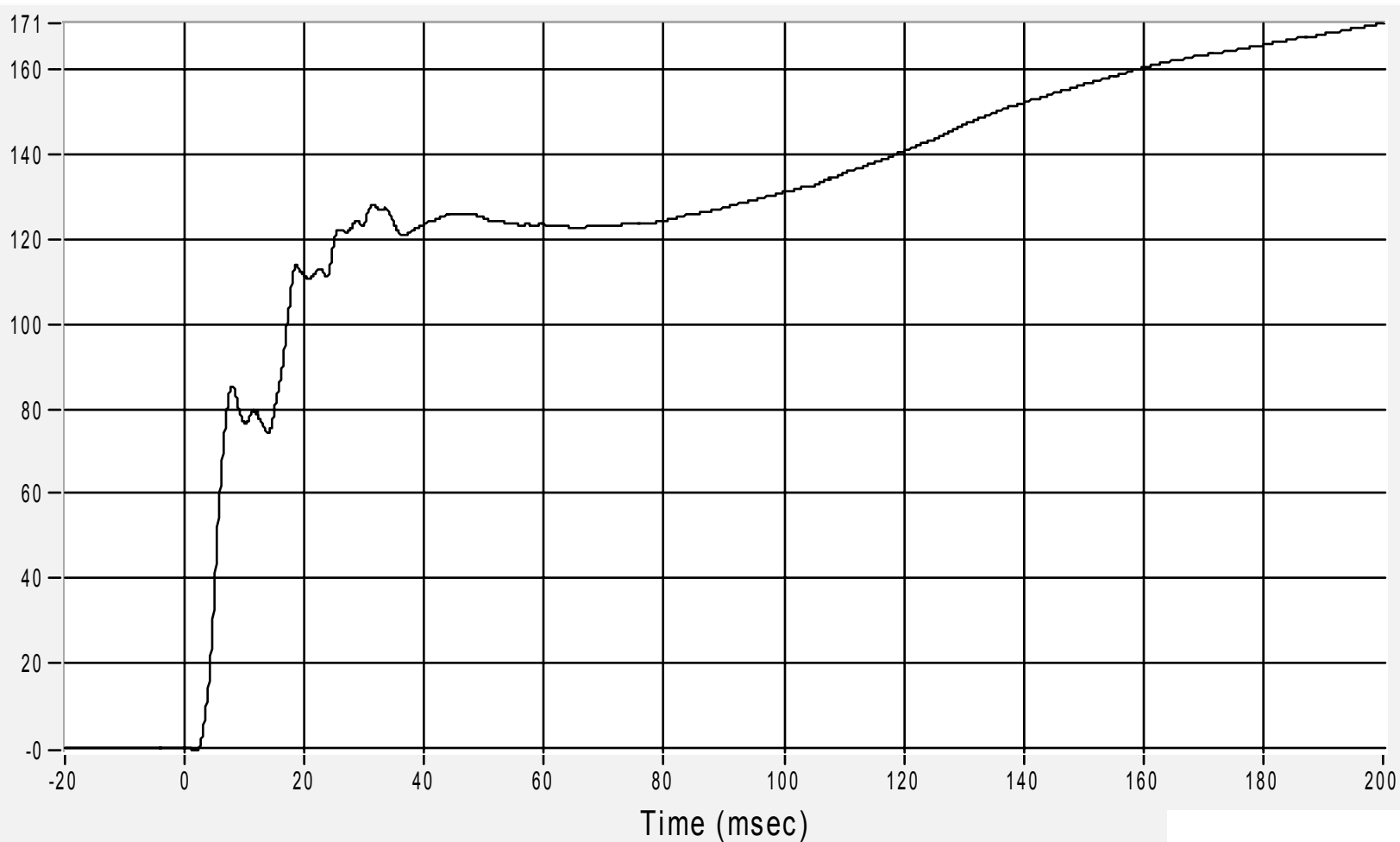
B-93

Left Lower B-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 170.8 km/h at 199.9 msec

Min -0.5 km/h at 1.9 msec



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22 January 2004

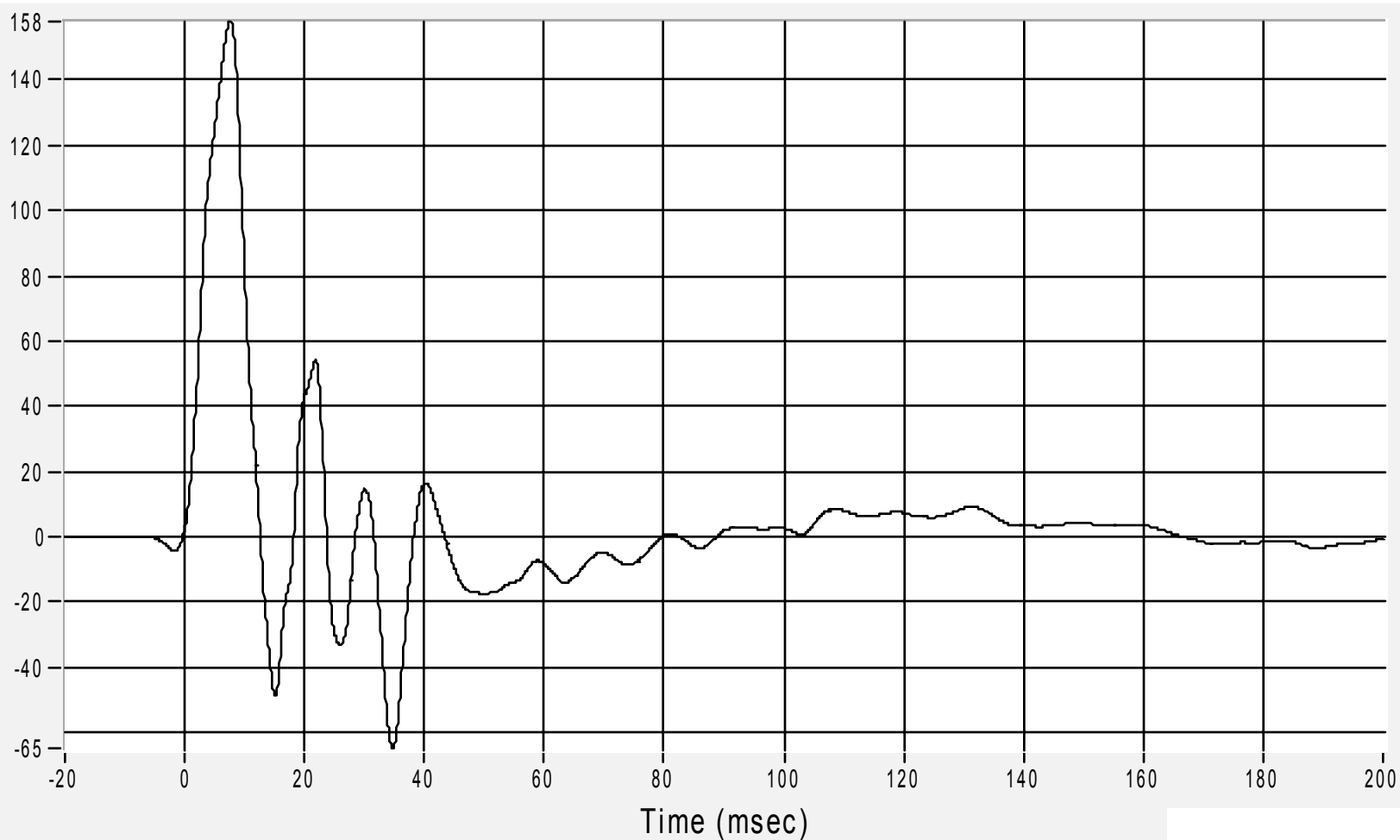
Medical College of Wisconsin
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Left Middle B-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 157.9 G at 7.6 msec

Min -64.8 G at 34.7 msec



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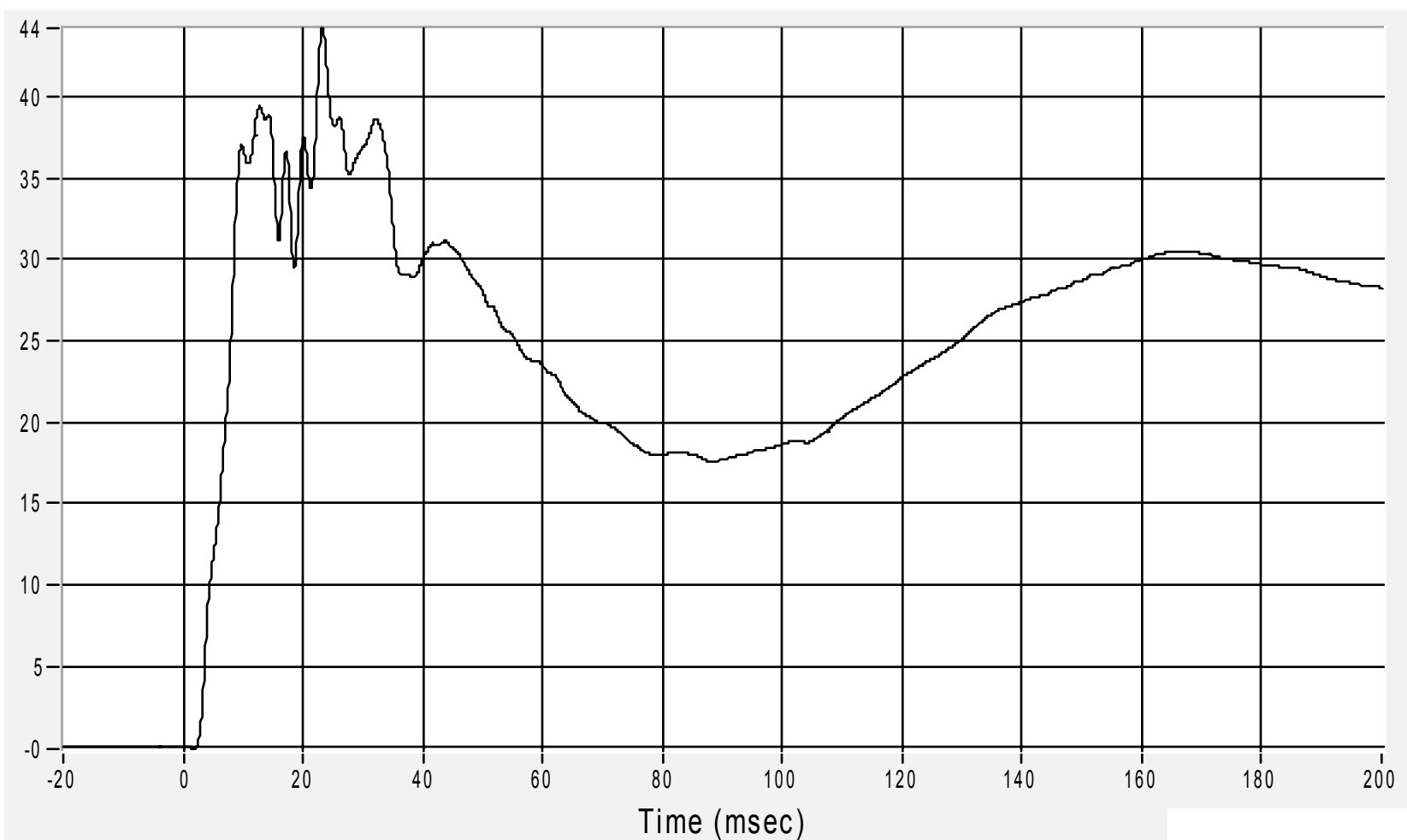
B-95

Left Middle B-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 44.2 km/h at 23.2 msec

Min -0.1 km/h at 1.9 msec



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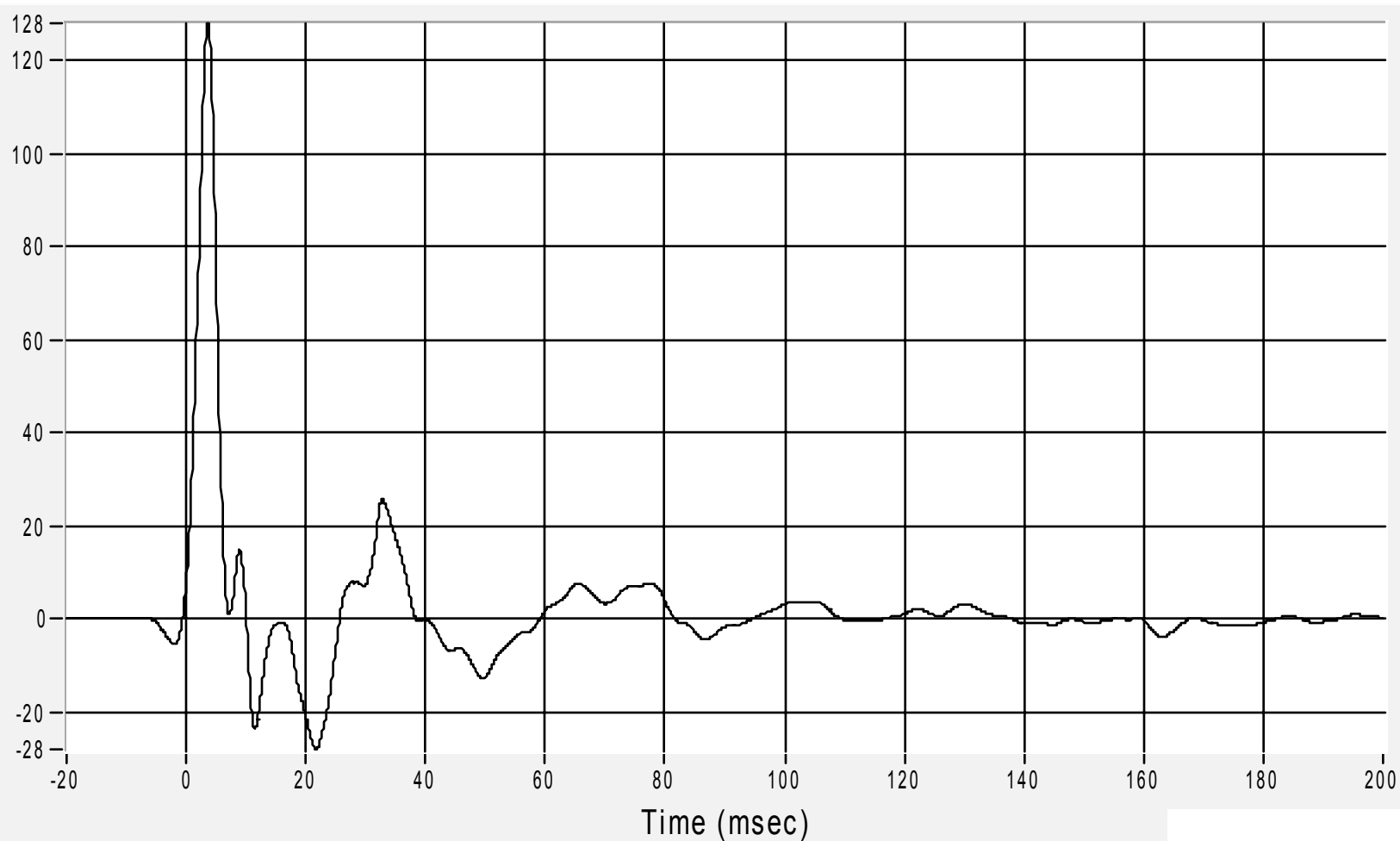
Medical College of Wisconsin
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Left Lower A-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 128.1 G at 3.6 msec

Min -28.1 G at 21.7 msec



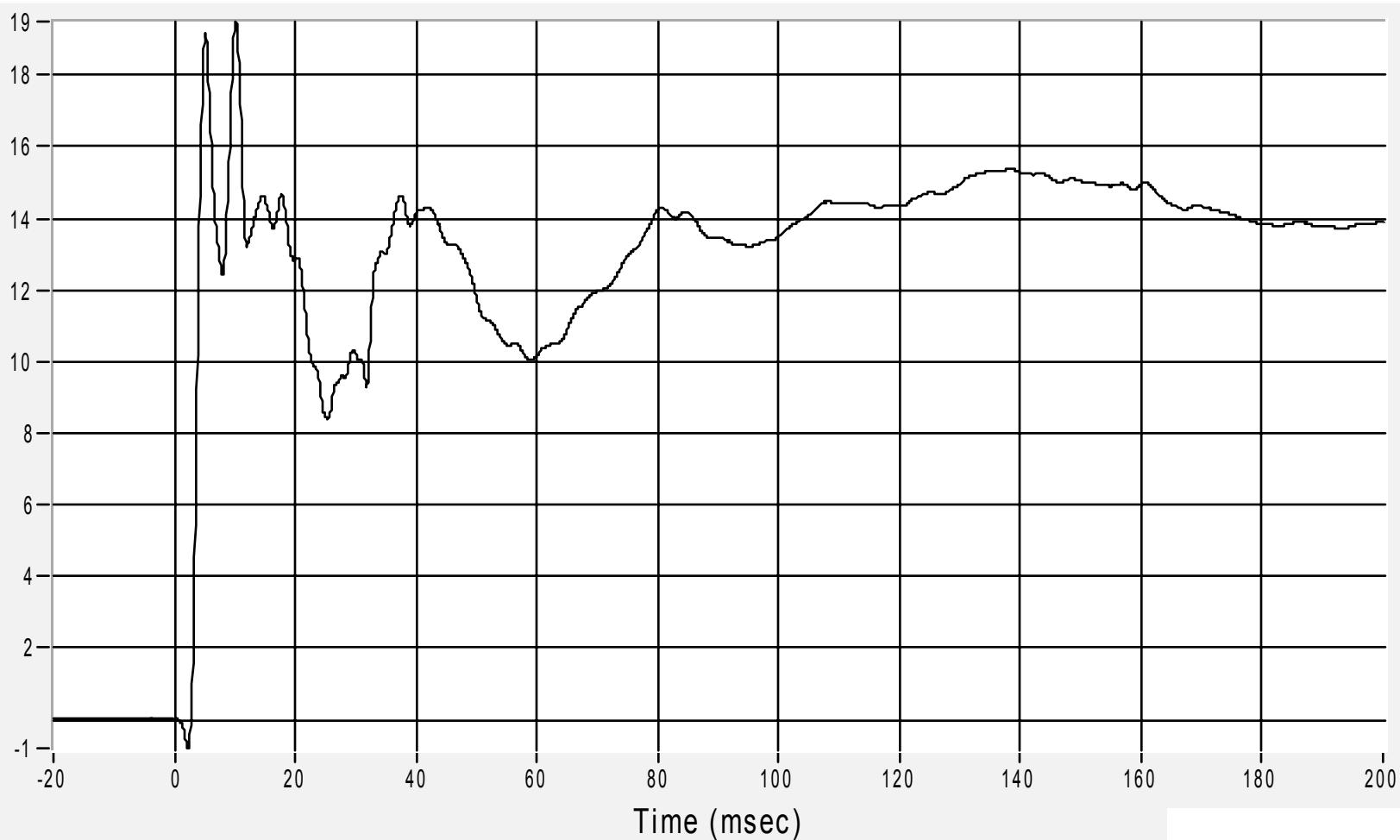
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Left Lower A-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 19.5 km/h at 10.2 msec**Min -0.8 km/h at 2.3 msec**

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22 January 2004

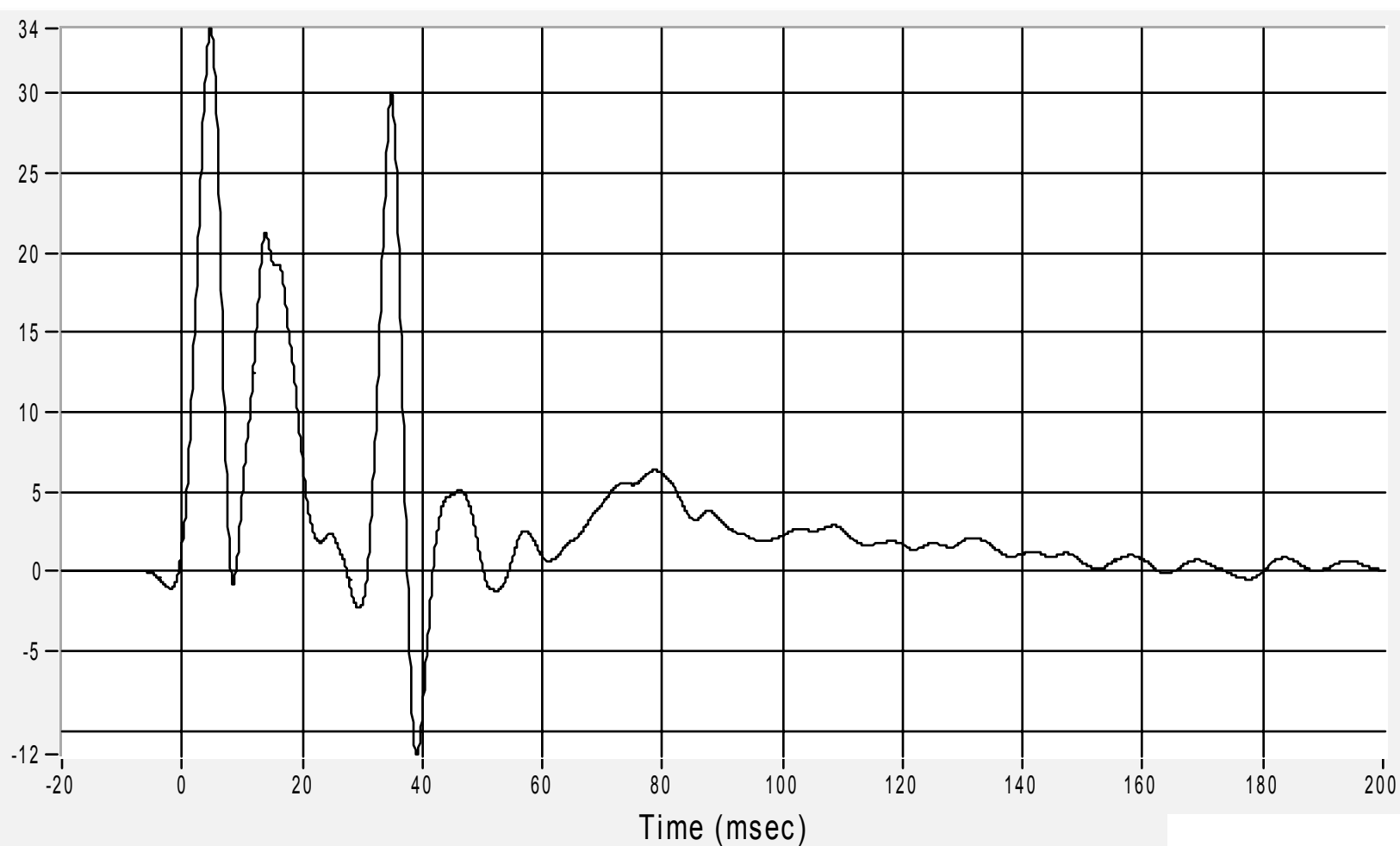
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Left Middle A-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 34.1 G at 4.7 msec

Min -11.5 G at 39.0 msec



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22 January 2004

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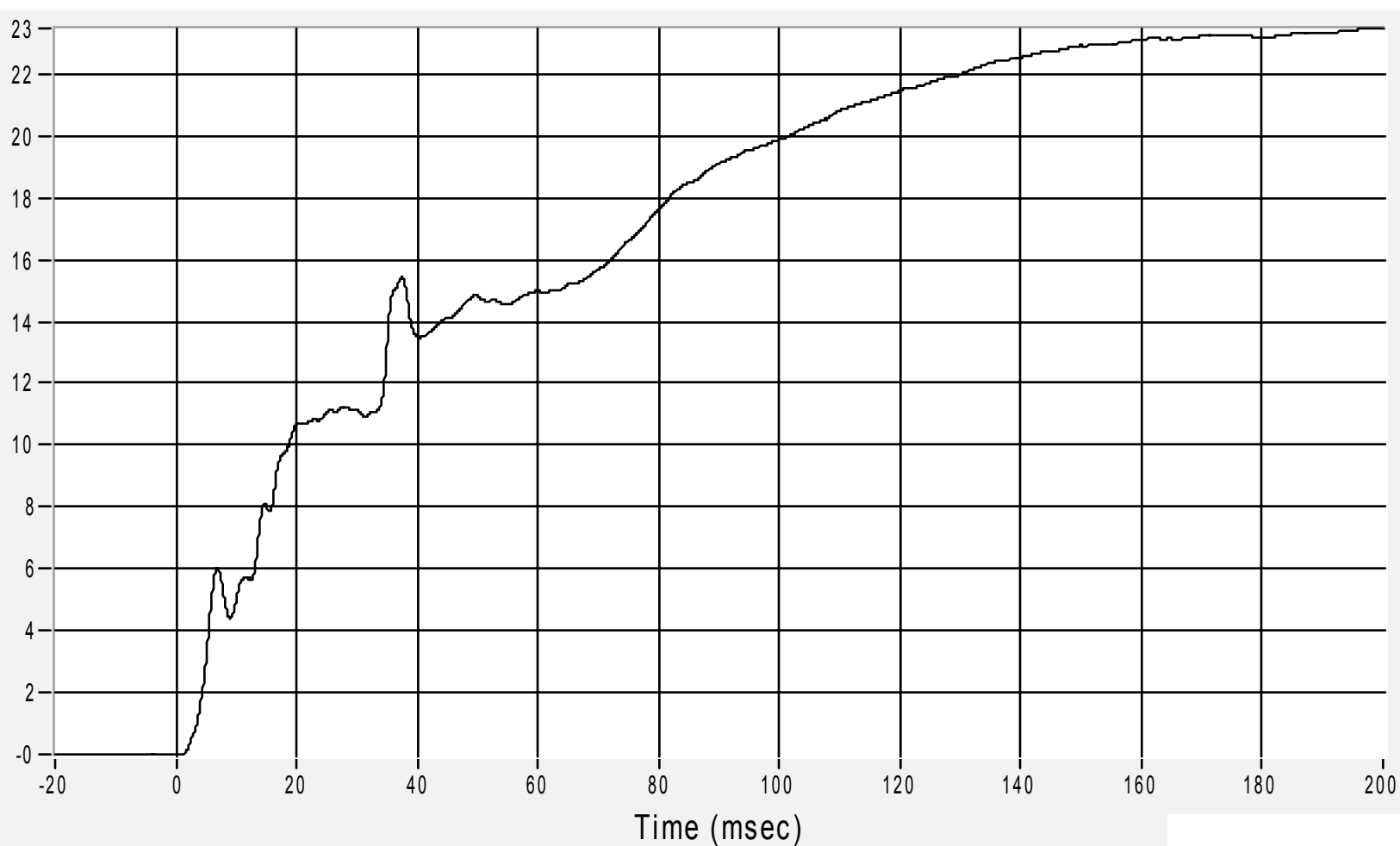
B-99

Left Middle A-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 23.5 km/h at 199.5 msec

Min 0.0 km/h at 0.8 msec



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22 January 2004

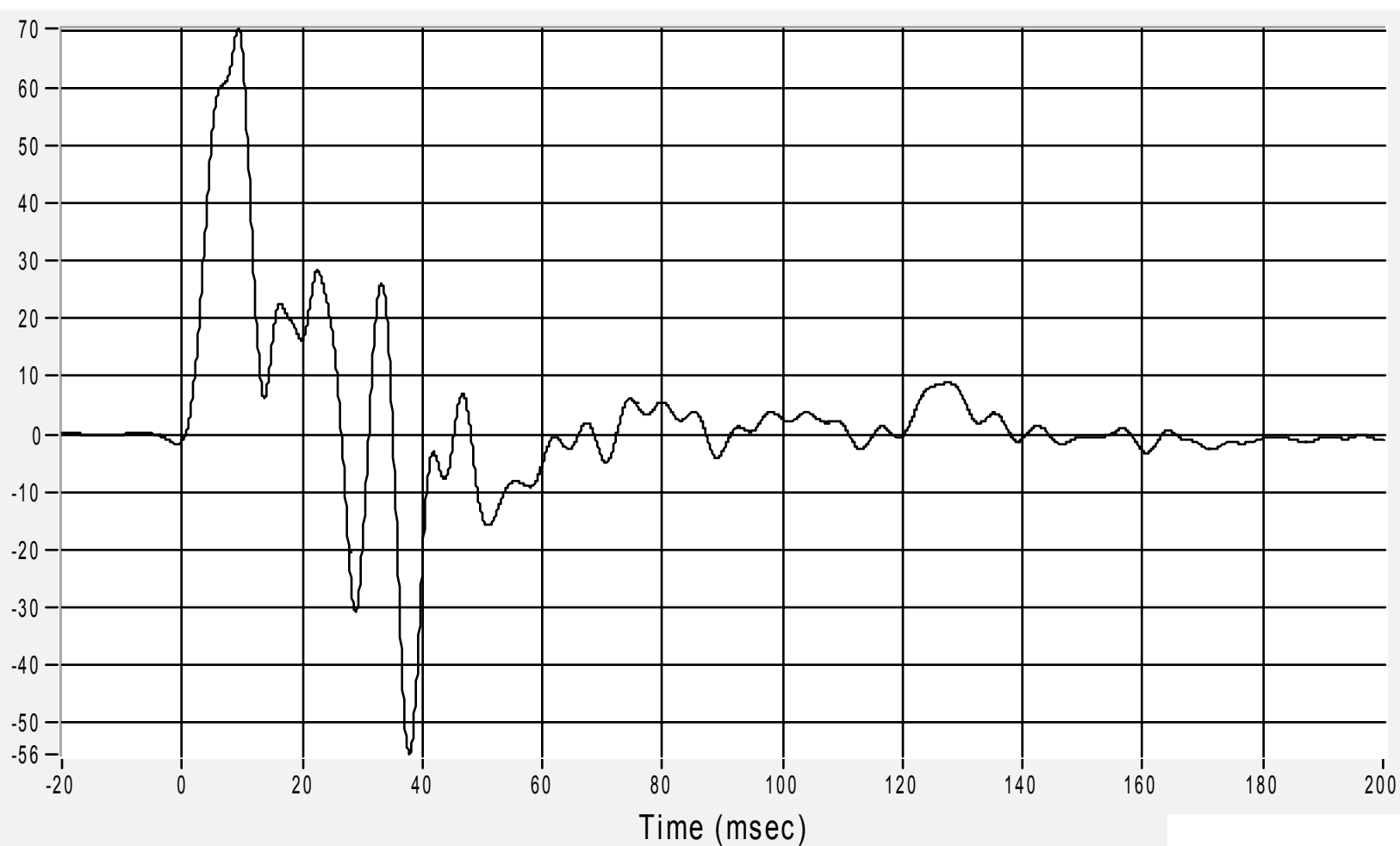
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Front Seat Track (Y) Acceleration

Acceleration (G's) CFC60

Max 70.5 G at 9.4 msec

Min -55.7 G at 37.8 msec



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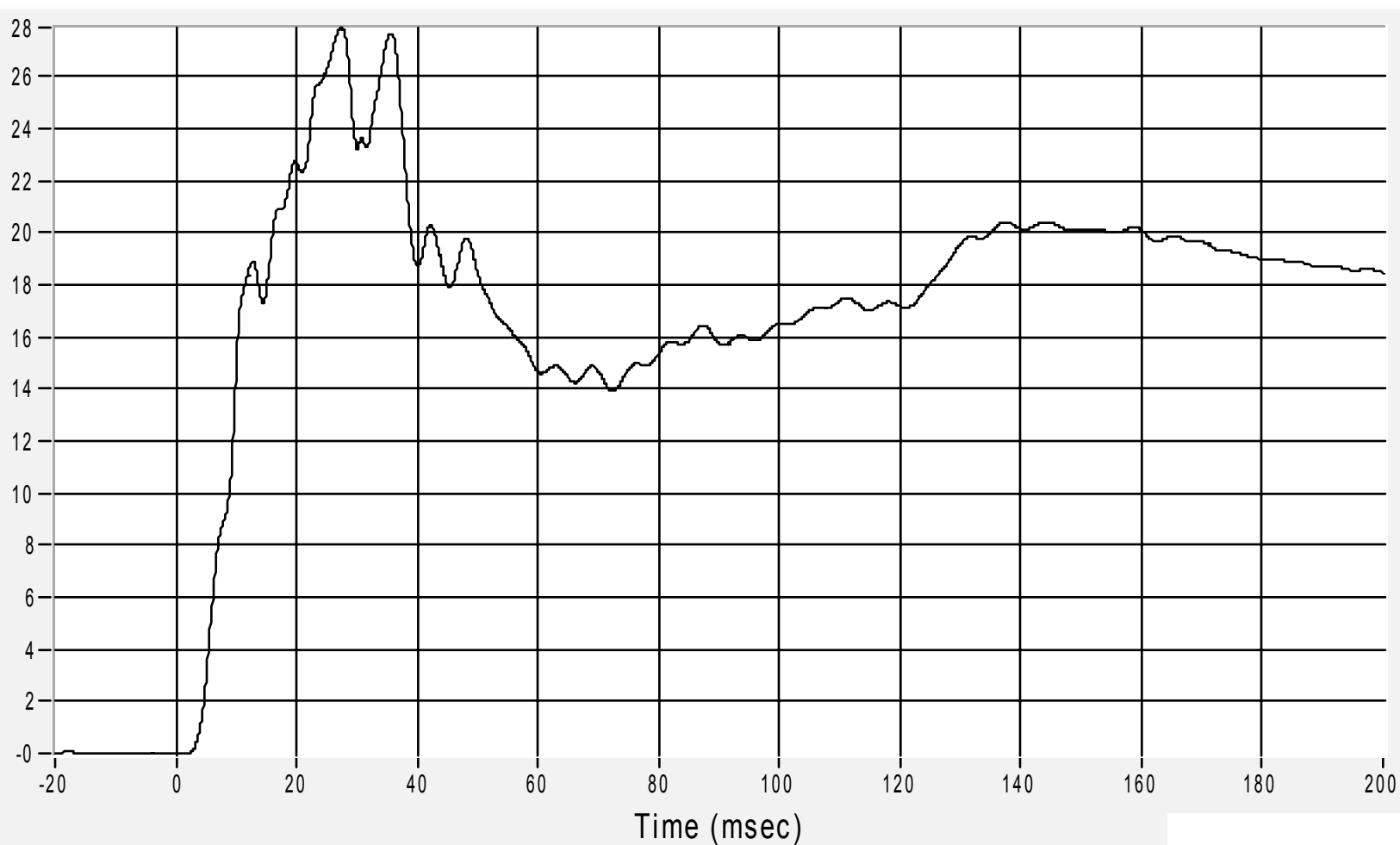
B-101

Front Seat Track (Y) Velocity

Velocity (km/h) CFC180

Max 27.9 km/h at 27.4 msec

Min 0.0 km/h at 1.8 msec



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22 January 2004

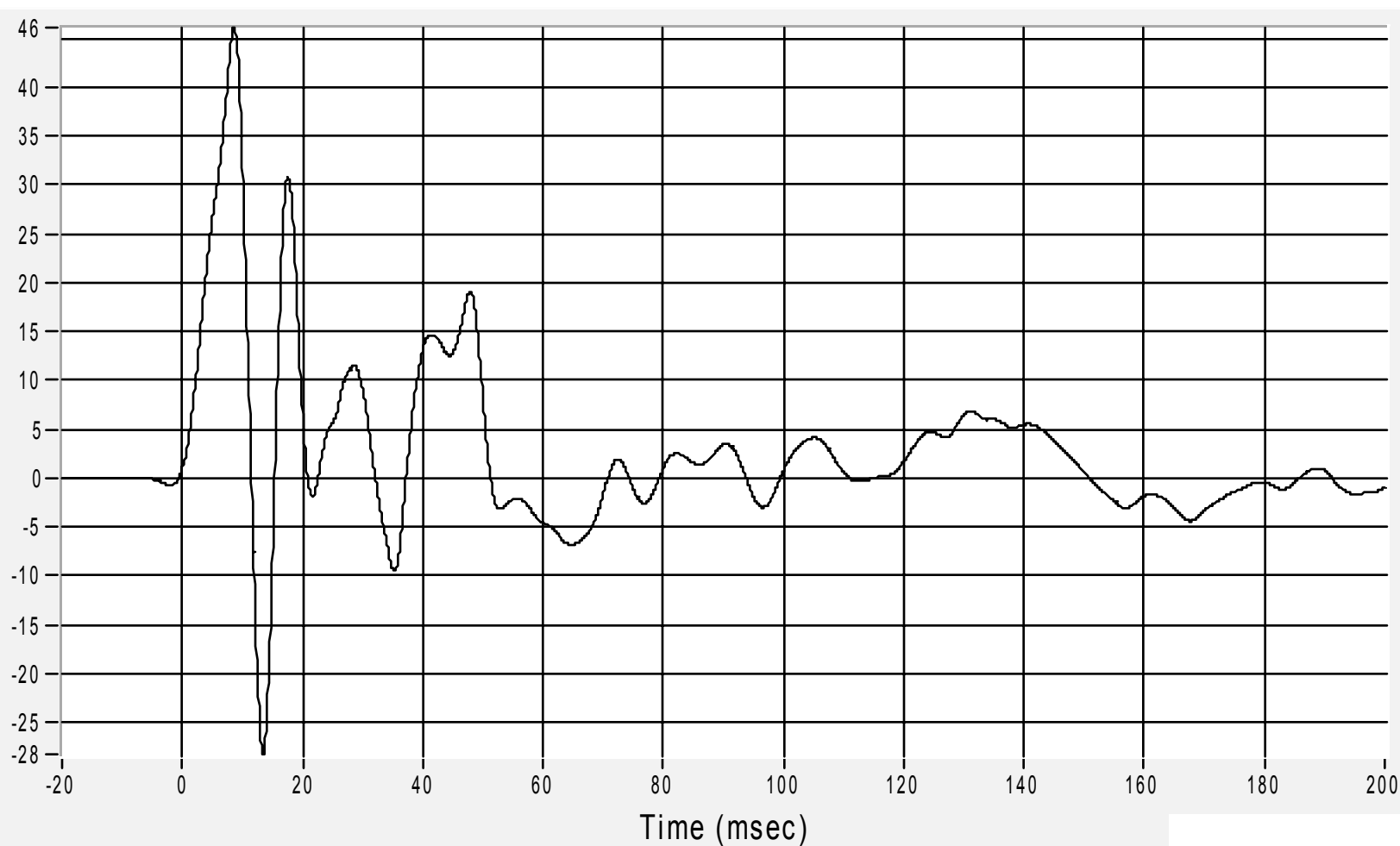
Medical College of Wisconsin
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Rear Seat Track (Y) Acceleration

Acceleration (G's) CFC60

Max 46.1 G at 8.6 msec

Min -28.2 G at 13.4 msec



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22 January 2004

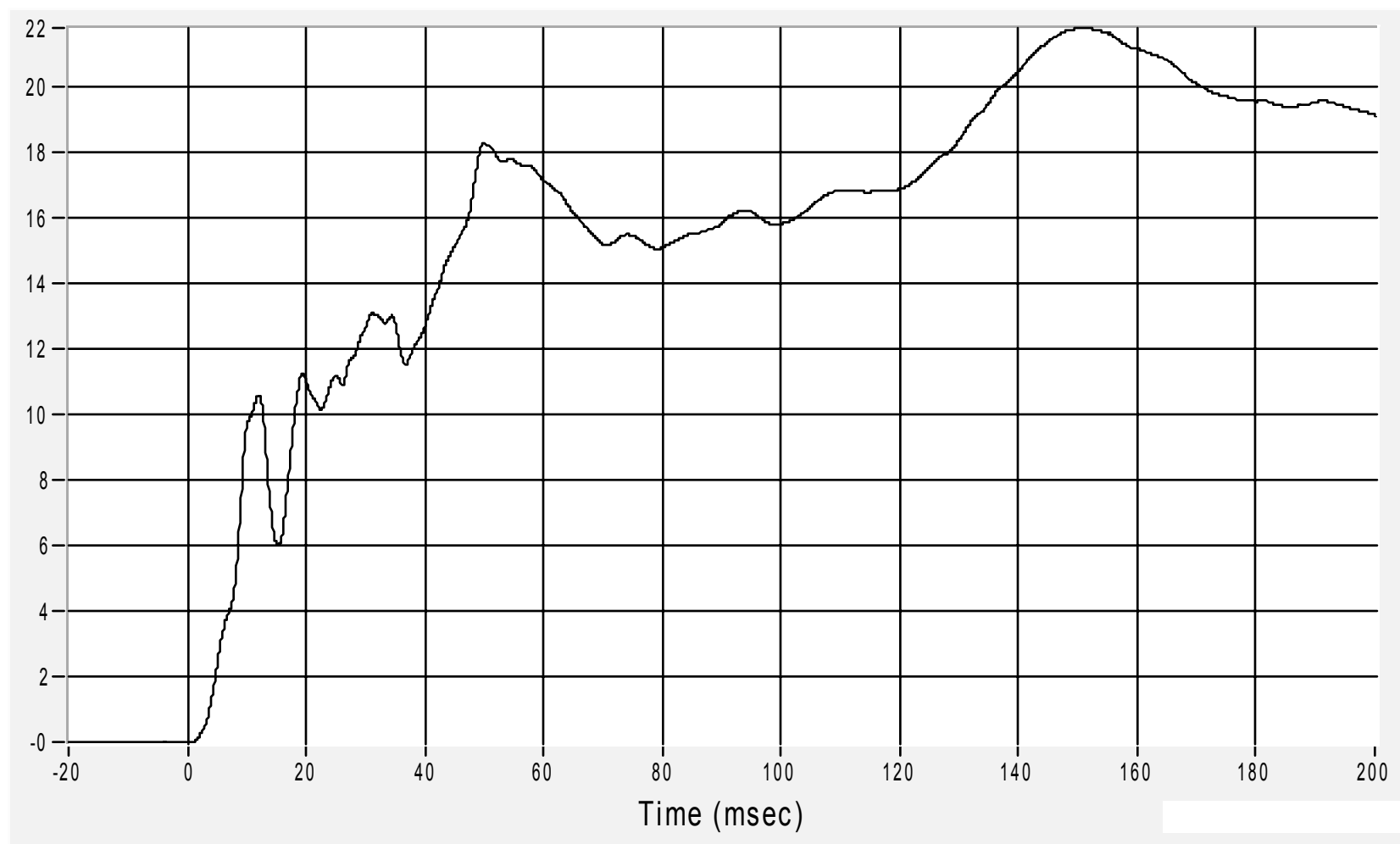
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Rear Seat Track (Y) Velocity

Velocity (km/h) CFC180

Max 21.8 km/h at 151.1 msec

Min 0.0 km/h at 0.4 msec



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22 January 2004

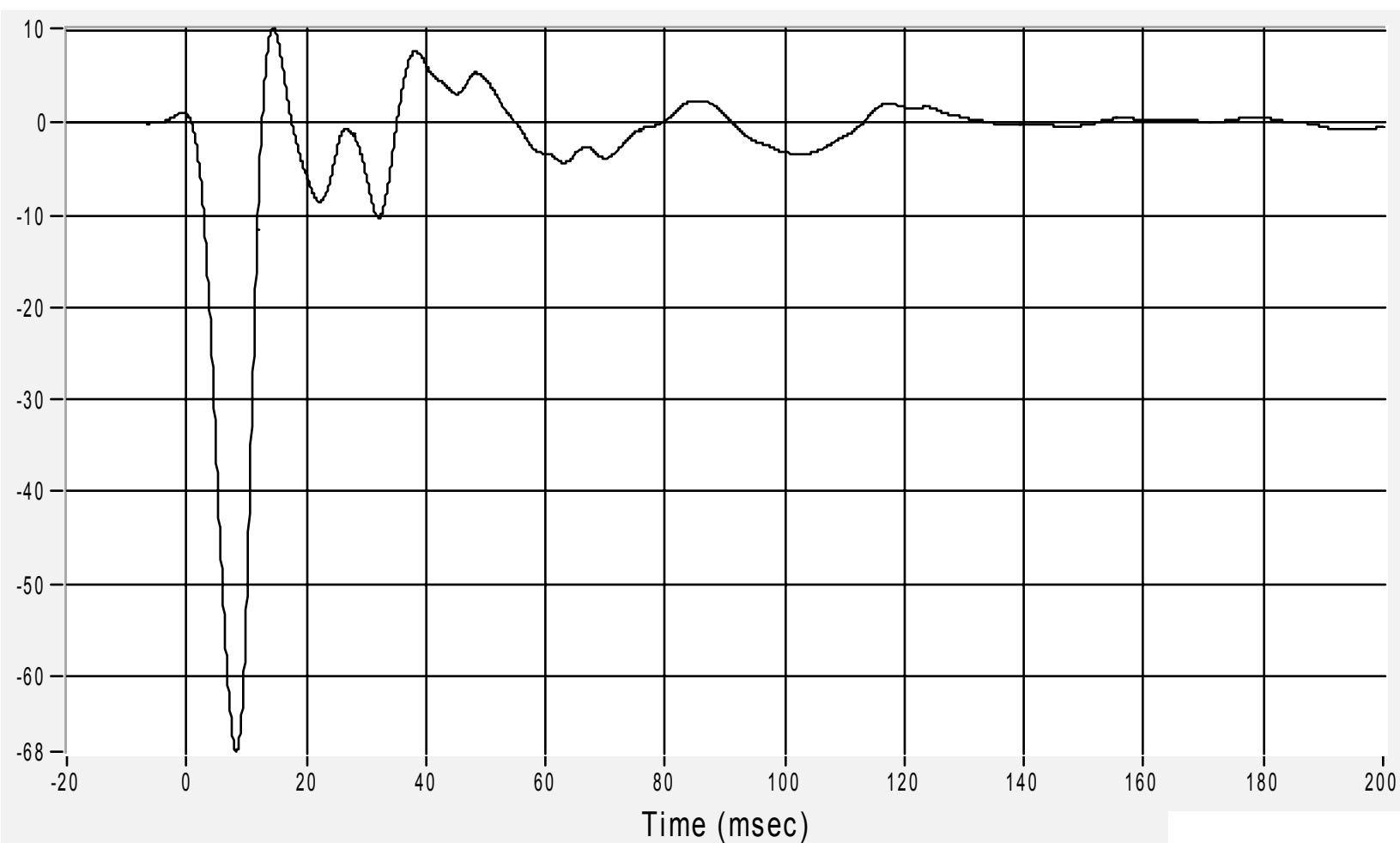
Medical College of Wisconsin
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Vehicle Center of Gravity (X) Acceleration

Acceleration (G's) CFC60

Max 10.3 G at 14.5 msec

Min -68.3 G at 8.3 msec



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22 January 2004

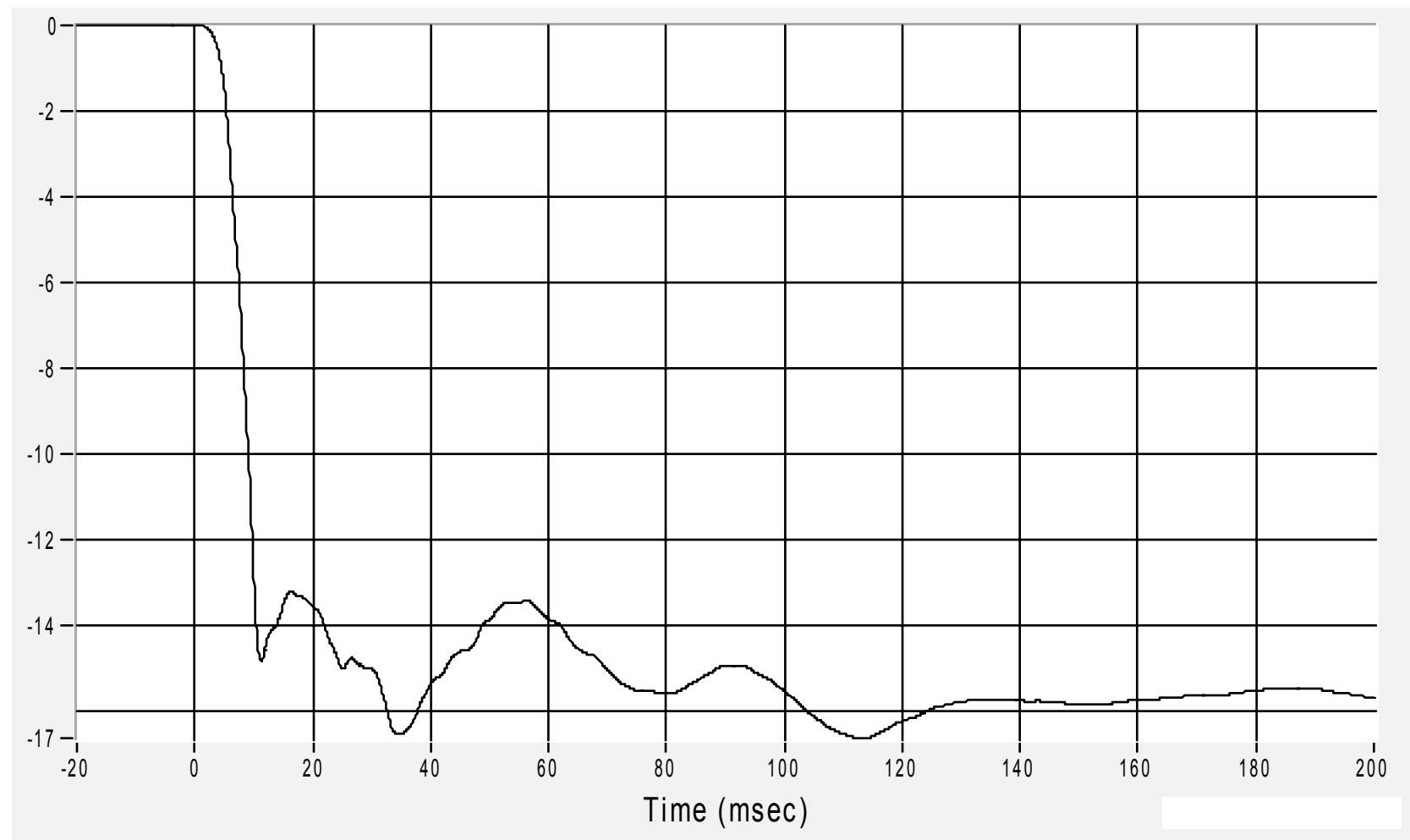
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 0.6 msec

Min -16.6 km/h at 113.5 msec



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22 January 2004

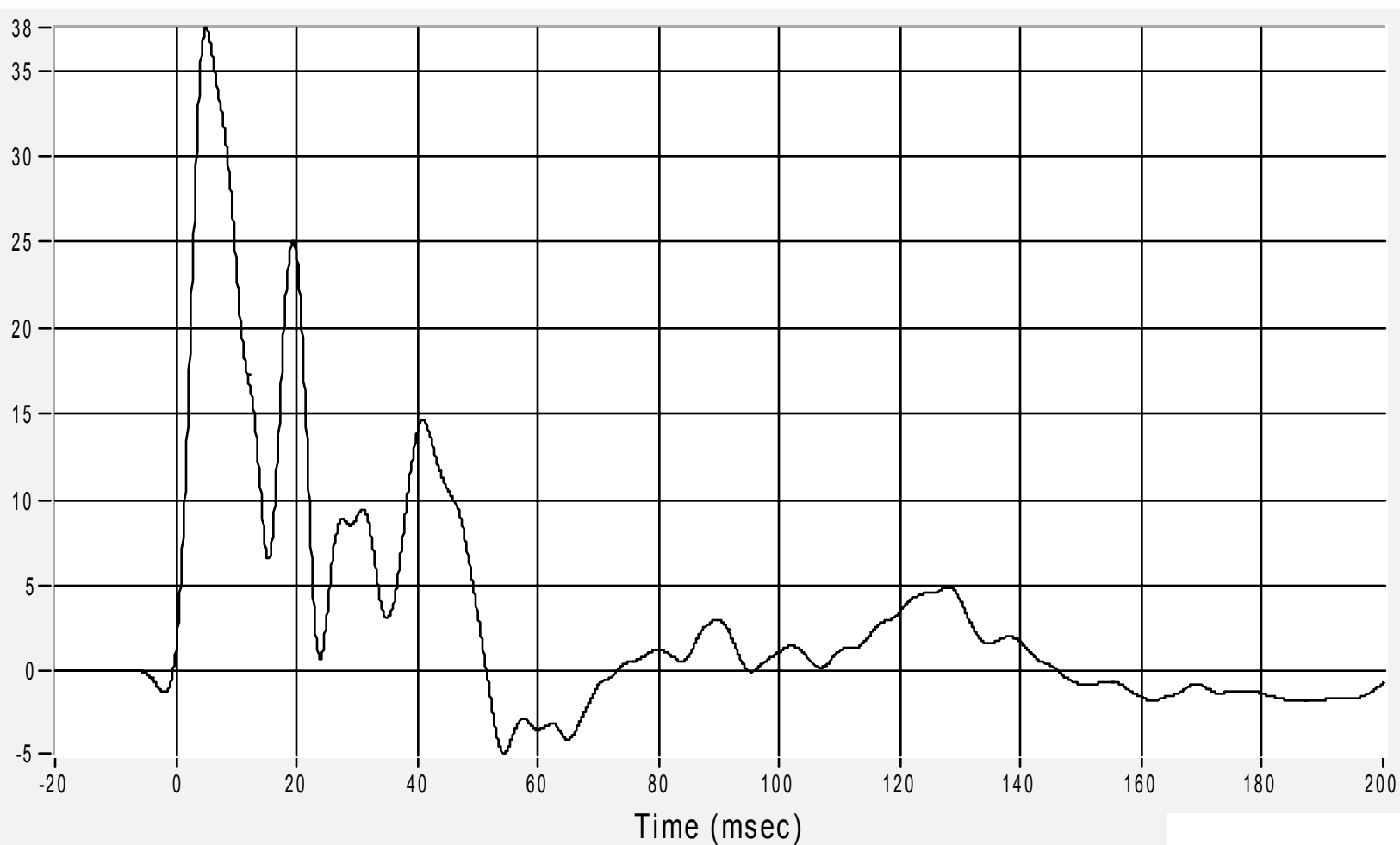
Medical College of Wisconsin
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Vehicle Center of Gravity (Y) Acceleration

Acceleration (G's) CFC60

Max 37.5 G at 5.0 msec

Min -4.8 G at 54.3 msec



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22 January 2004

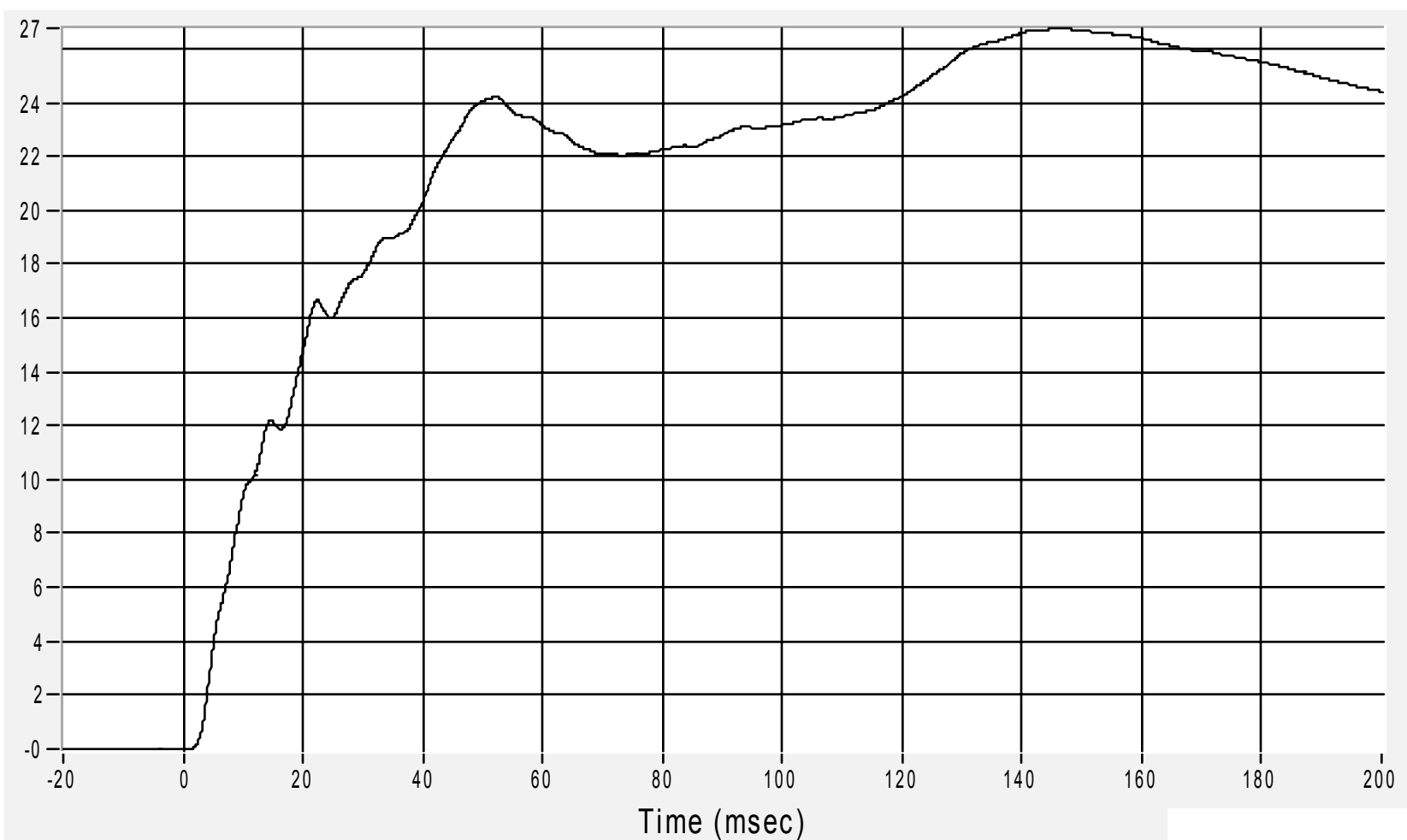
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (Y) Velocity

Velocity (km/h) CFC180

Max 26.8 km/h at 146.3 msec

Min 0.0 km/h at 1.0 msec



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22 January 2004

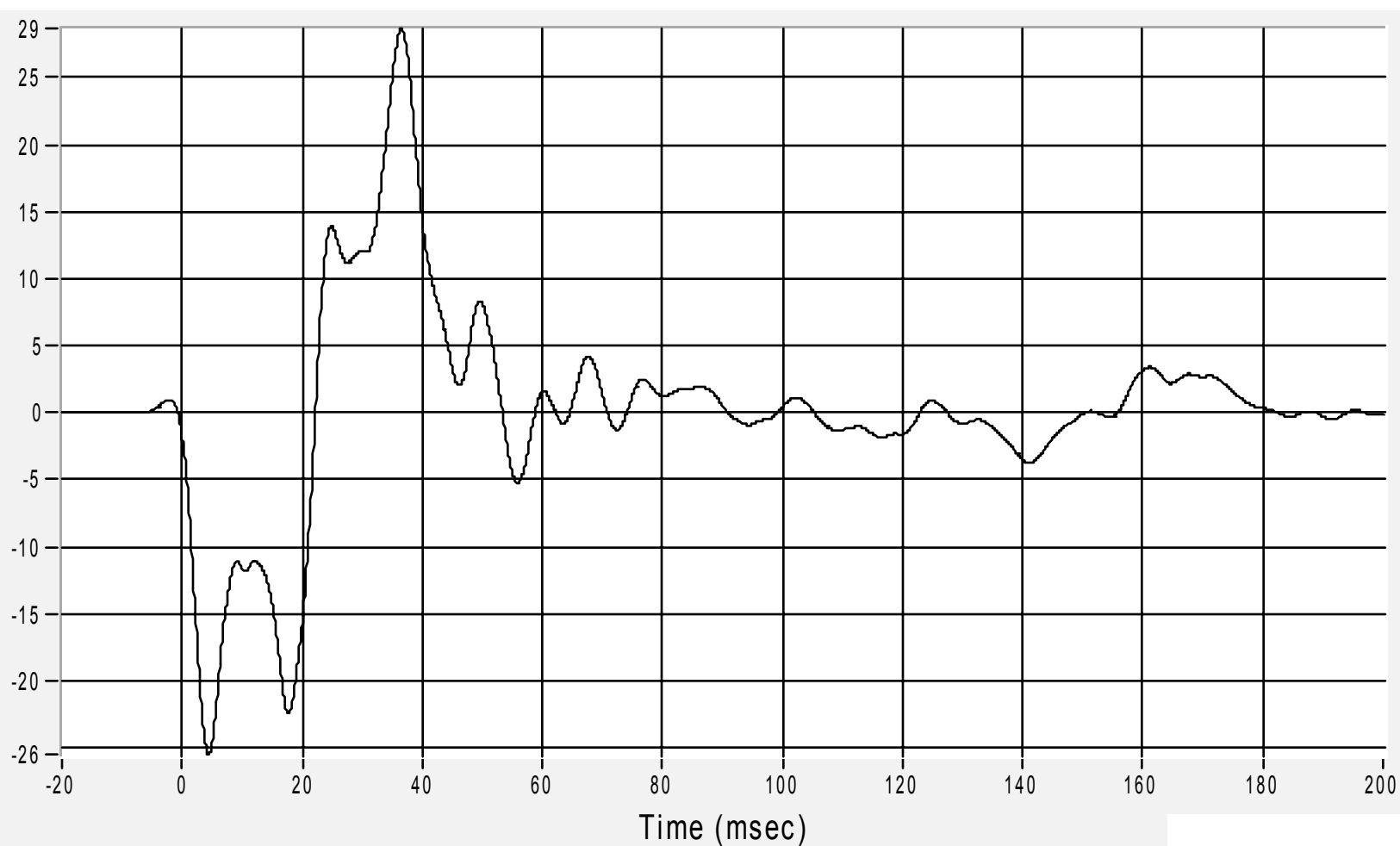
Medical College of Wisconsin
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Vehicle Center of Gravity (Z) Acceleration

Acceleration (G's) CFC60

Max 28.7 G at 36.5 msec

Min -25.5 G at 4.4 msec



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22 January 2004

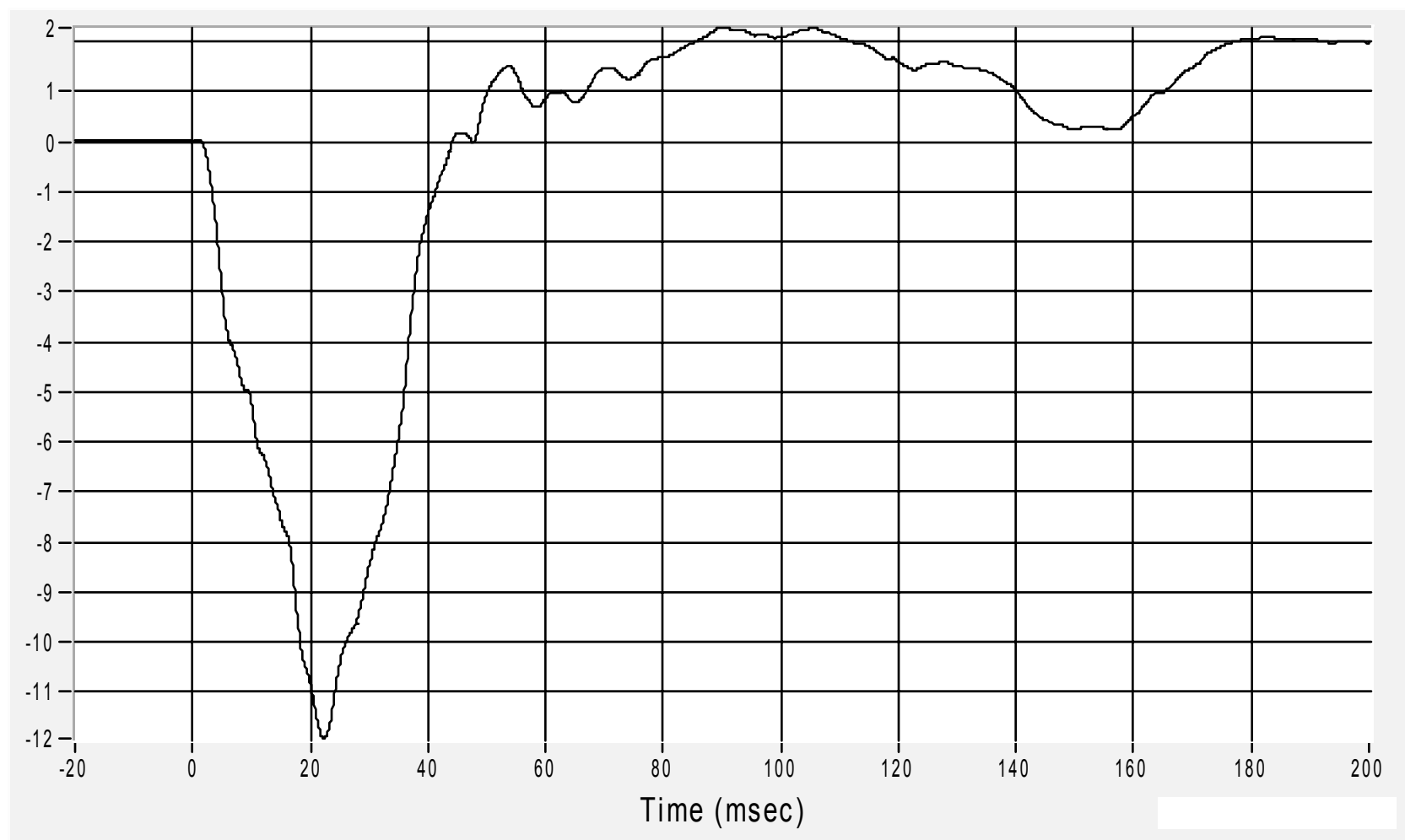
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Vehicle Center of Gravity (Z) Velocity

Velocity (km/h) CFC180

Max 2.3 km/h at 105.6 msec

Min -11.9 km/h at 22.2 msec



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22 January 2004

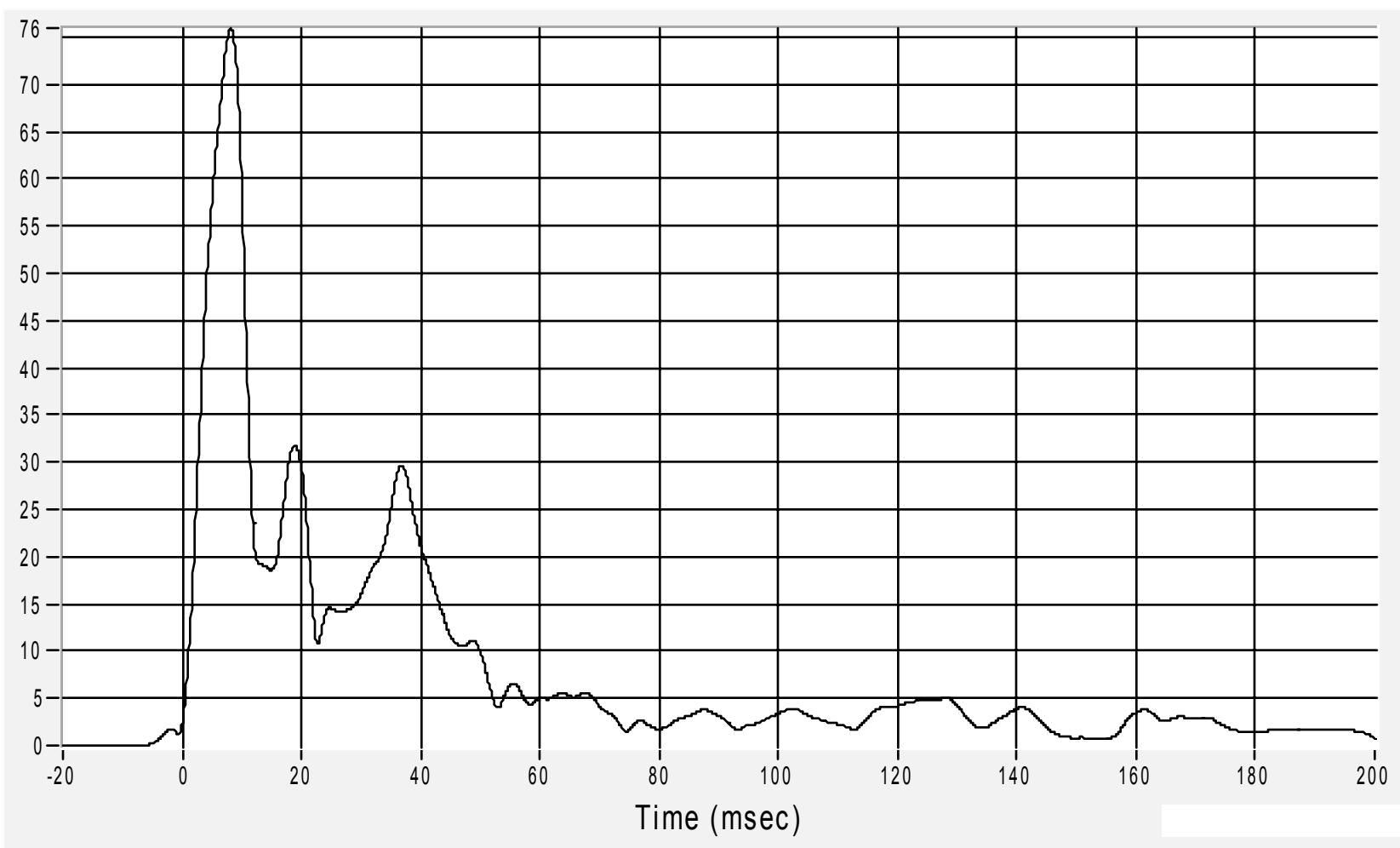
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity Resultant Acceleration

Acceleration (G's) CFC60

Max 75.9 G's at 8.2 msec

Min 0.7 G's at 153.0 msec



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22 January 2004

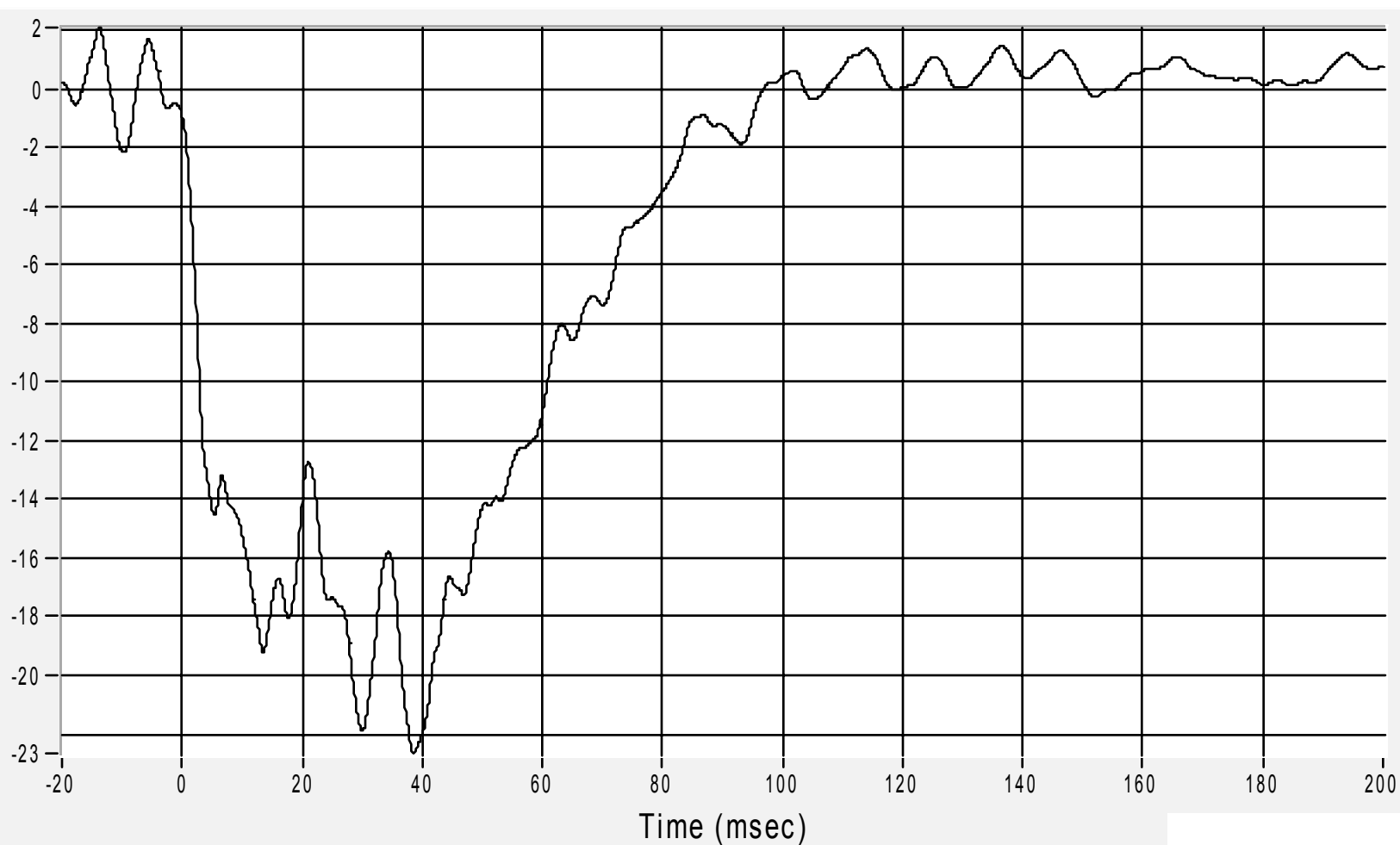
*Medical College of Wisconsin
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MDB Center of Gravity (X) Acceleration

Acceleration (G's) CFC60

Max 1.5 G at 136.4 msec

Min -22.7 G at 38.6 msec



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22 January 2004

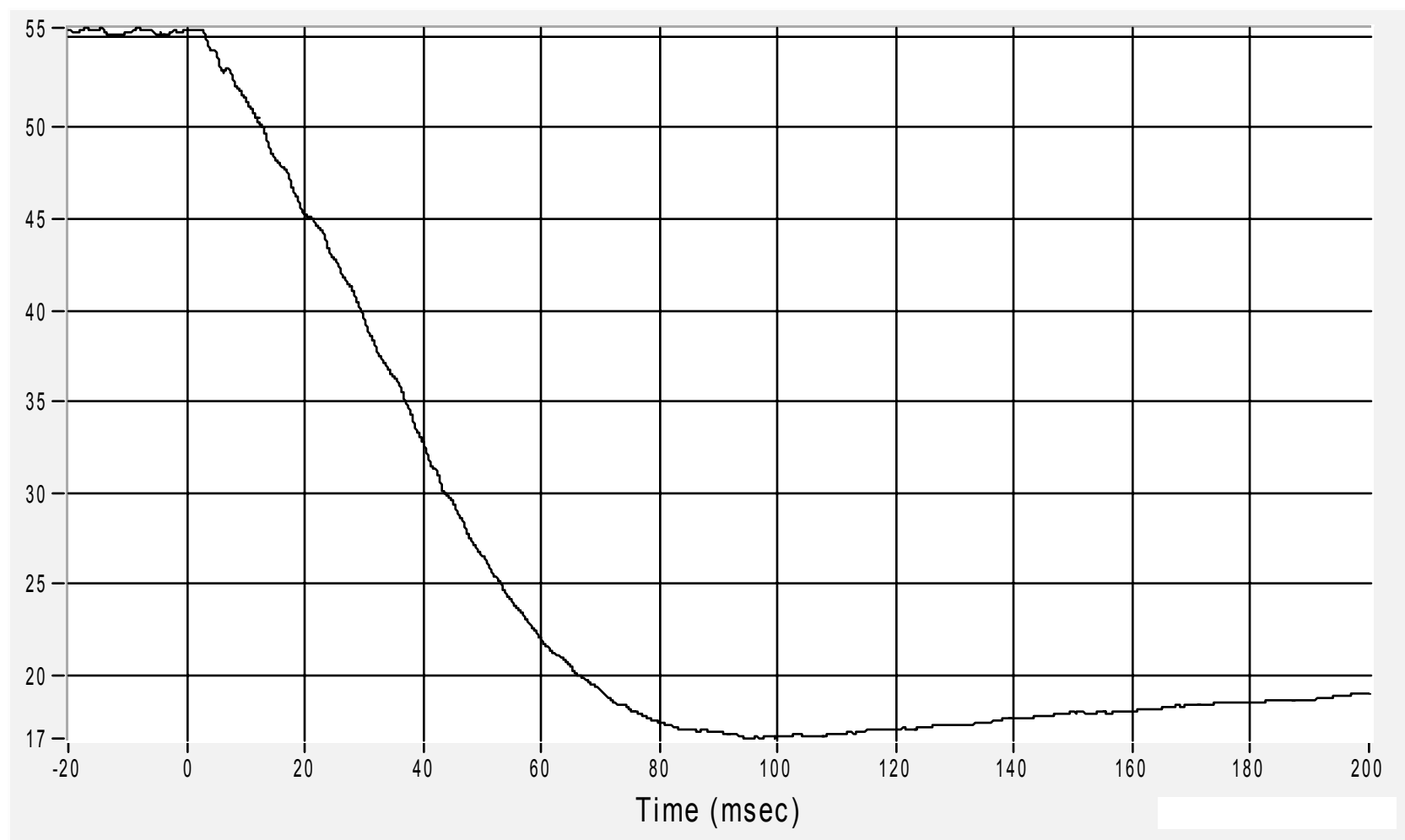
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (X) Velocity

Velocity (km/h) CFC180

Max 55.4 km/h at 2.4 msec

Min 16.5 km/h at 95.0 msec



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22 January 2004

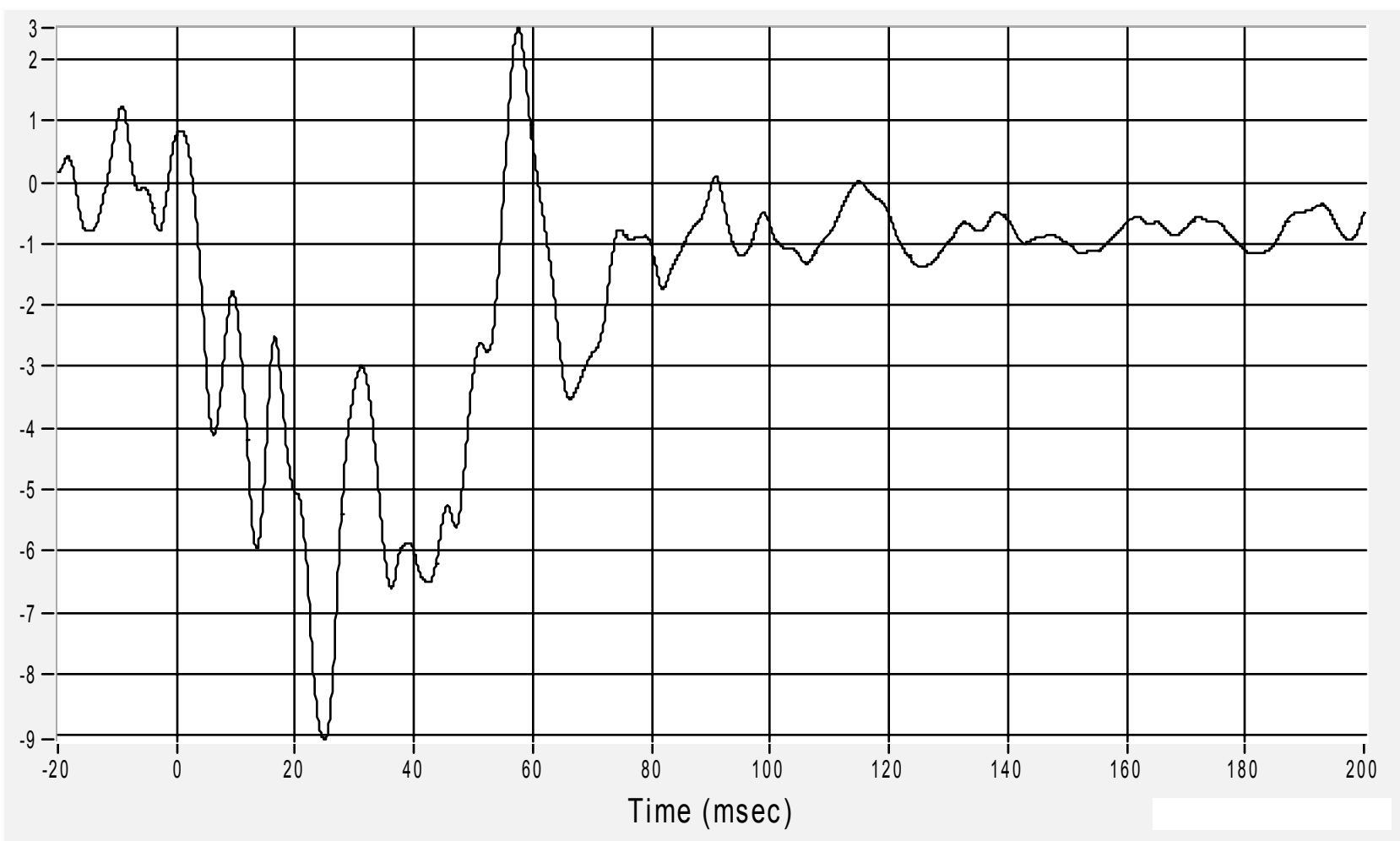
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Y) Acceleration

Acceleration (G's) CFC60

Max 2.5 G at 57.5 msec

Min -9.1 G at 25.0 msec



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22 January 2004

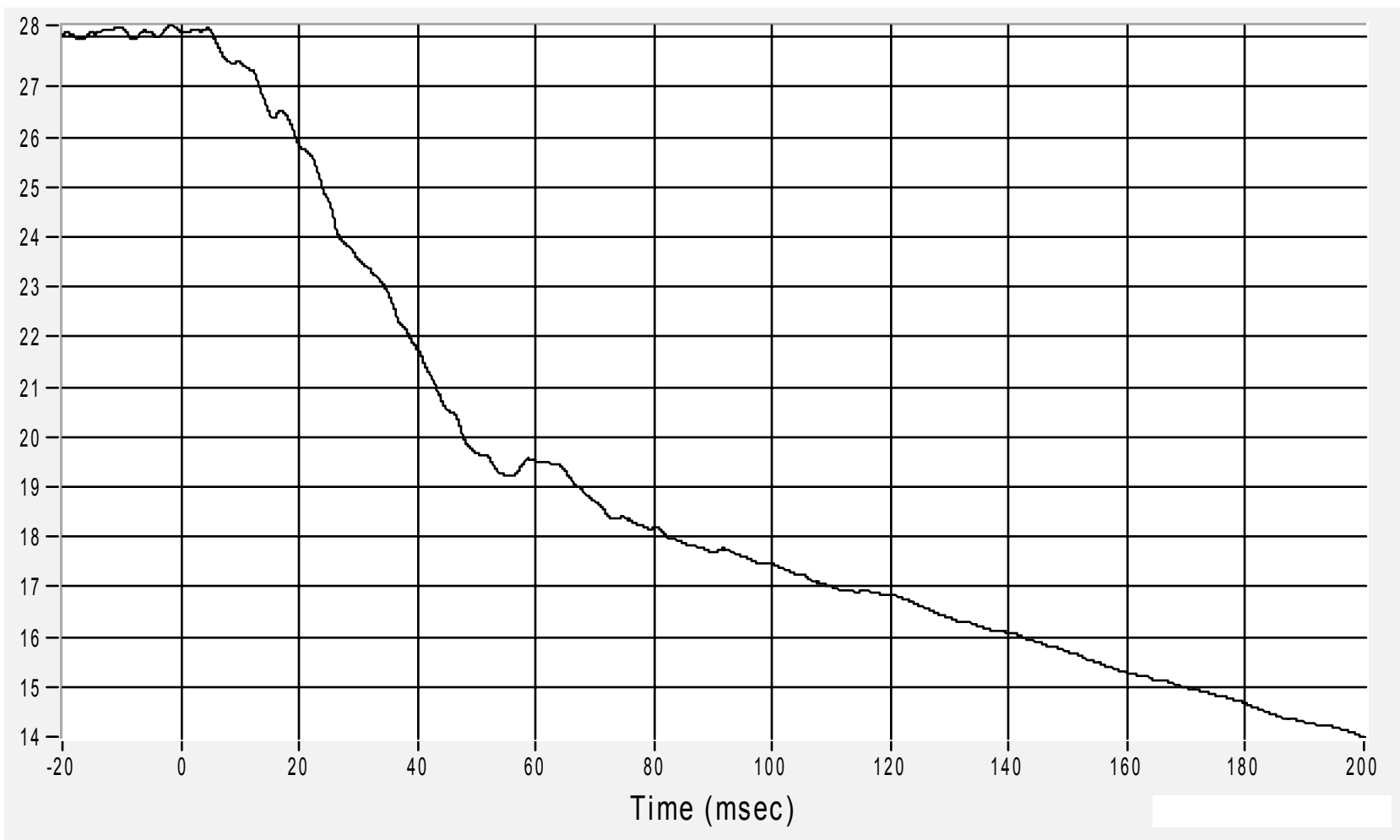
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Y) Velocity

Velocity (km/h) CFC180

Max 28.2 km/h at 4.6 msec

Min 14.0 km/h at 199.9 msec



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22 January 2004

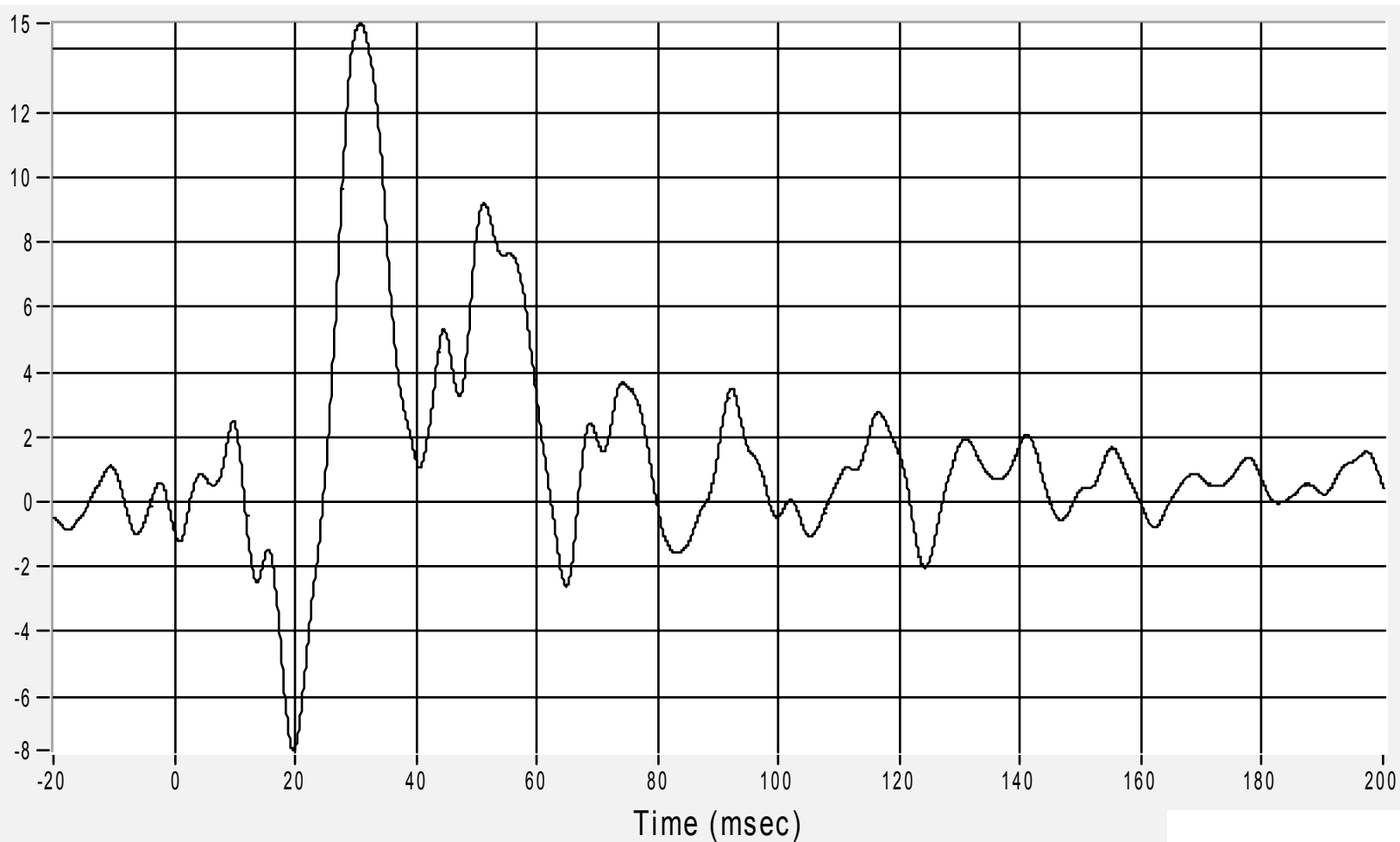
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Z) Acceleration

Acceleration (G's) CFC60

Max 14.8 G at 30.8 msec

Min -7.7 G at 19.7 msec



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22 January 2004

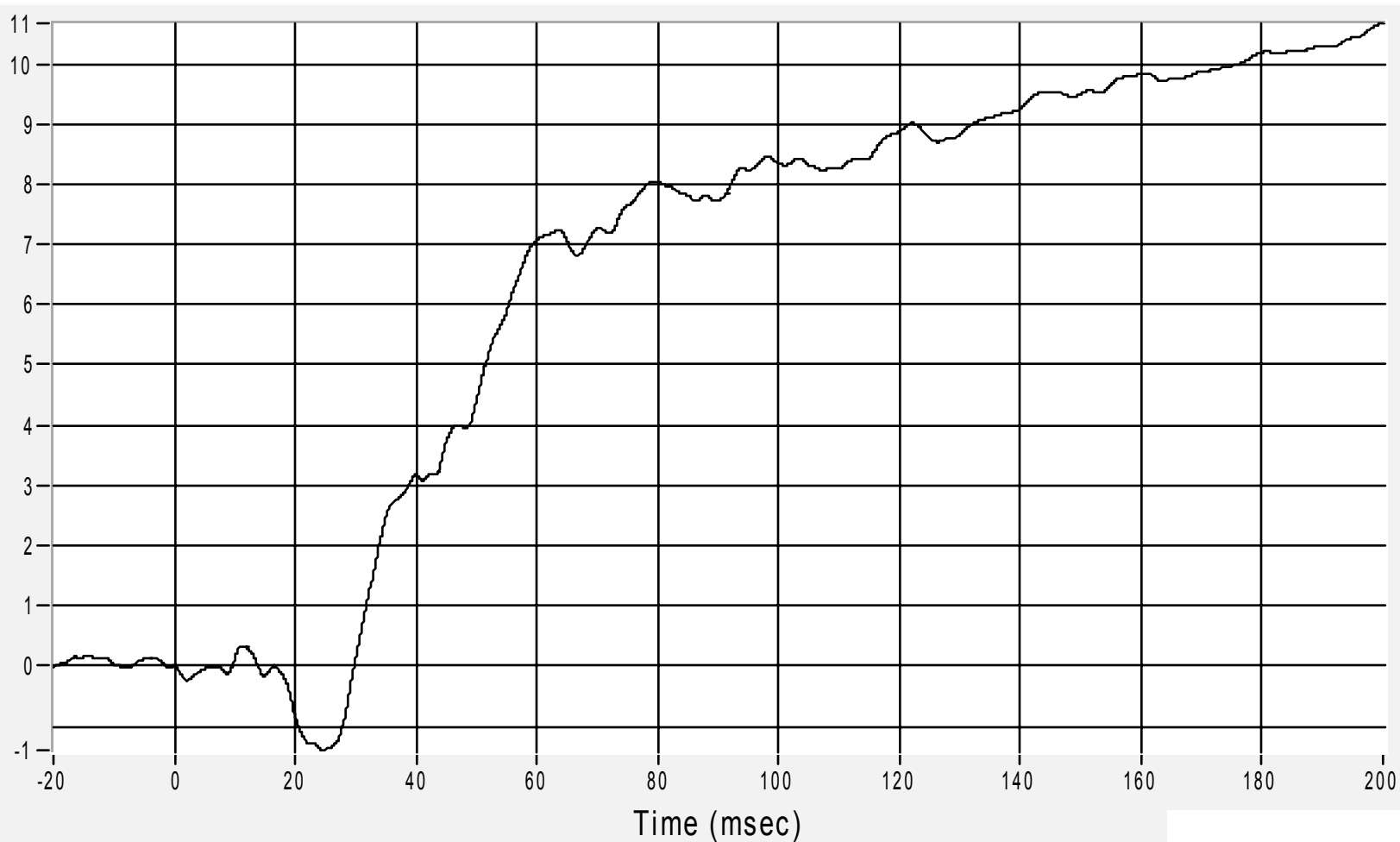
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Z) Velocity

Velocity (km/h) CFC180

Max 10.7 km/h at 199.9 msec

Min -1.4 km/h at 24.6 msec



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22 January 2004

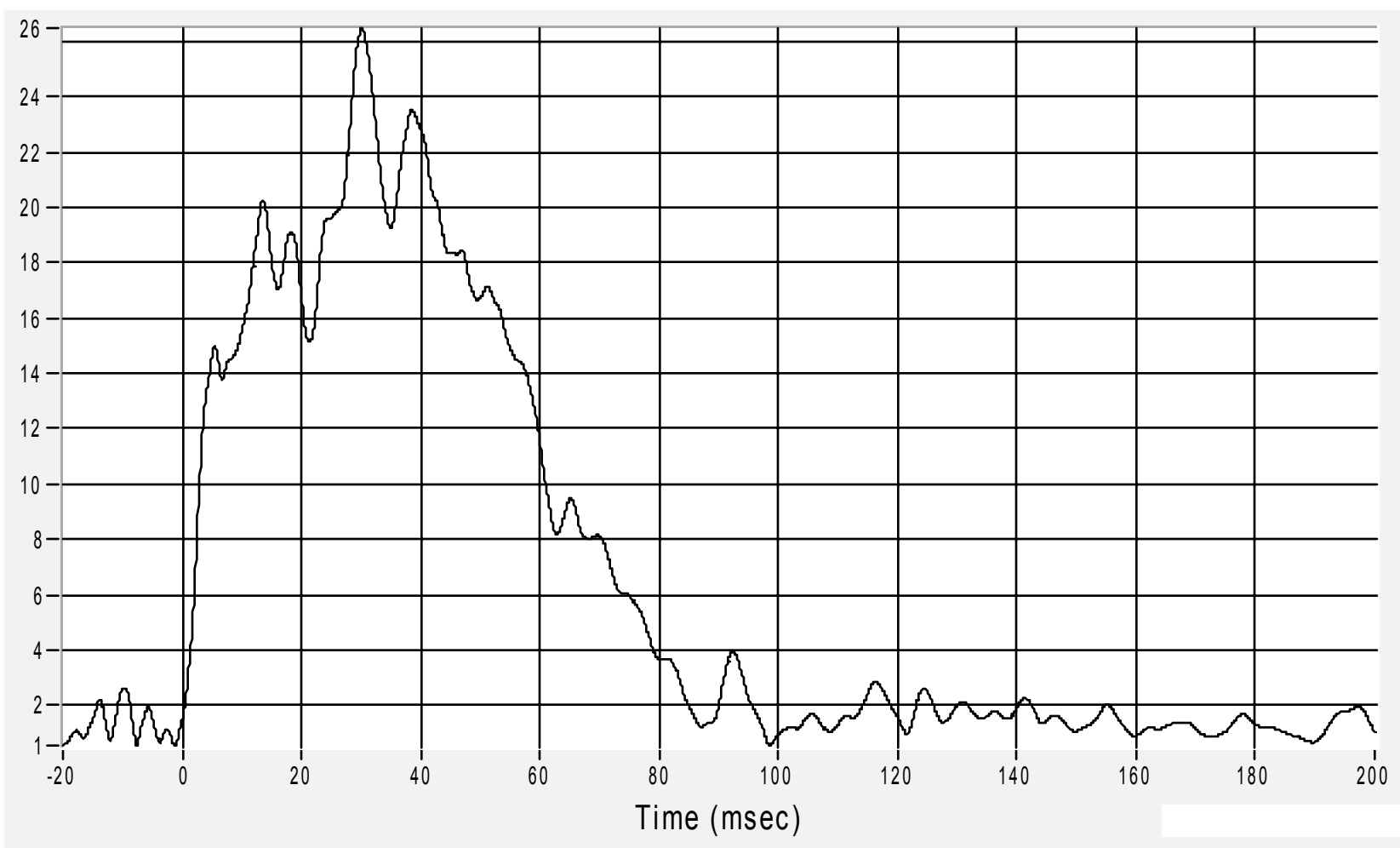
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity Resultant Acceleration

Acceleration (G's) CFC60

Max 26.5 G's at 30.2 msec

Min 0.6 G's at 98.6 msec



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22 January 2004

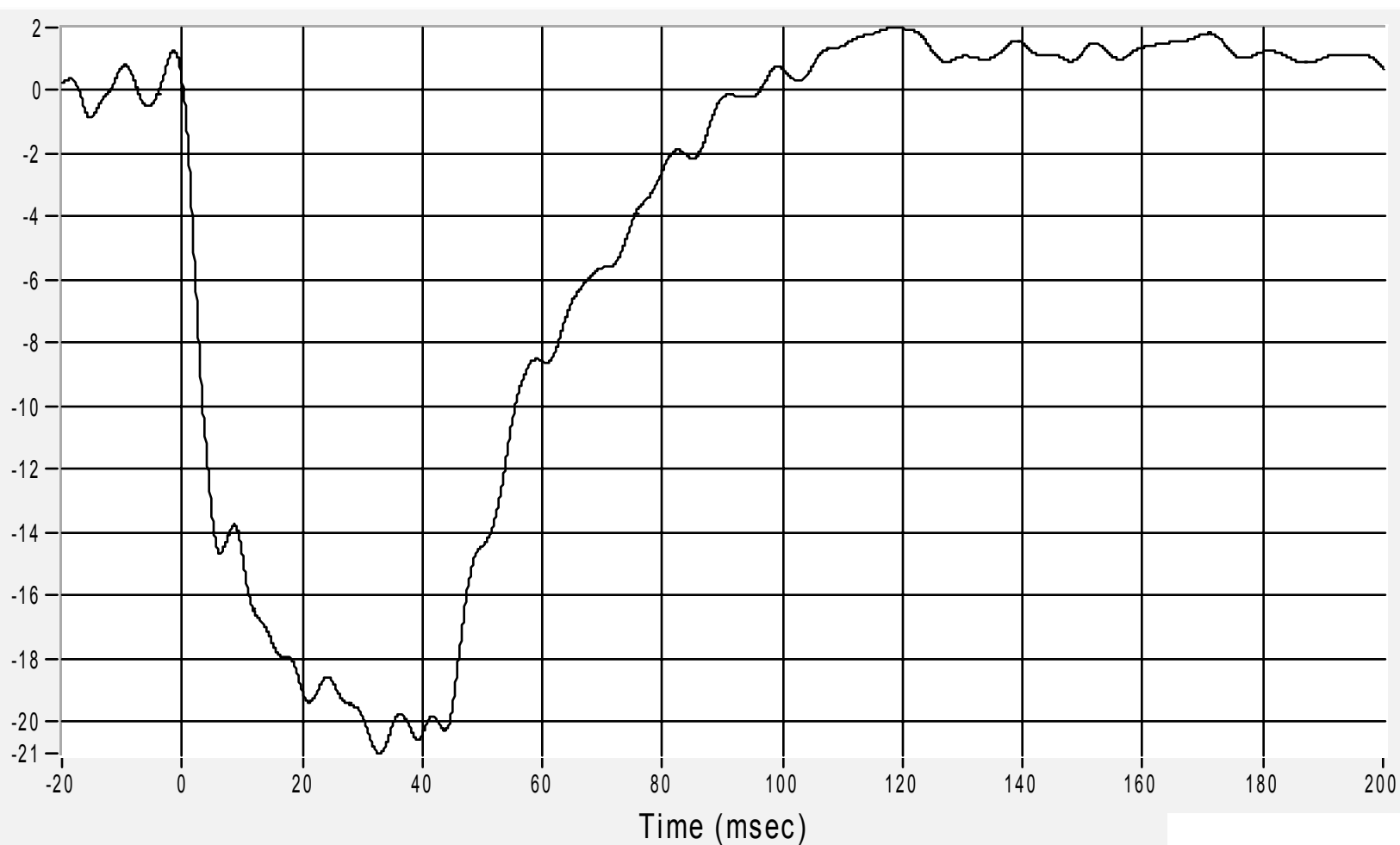
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Rear (X) Acceleration

Acceleration (G's) CFC60

Max 2.0 G at 118.4 msec

Min -21.0 G at 32.9 msec



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22 January 2004

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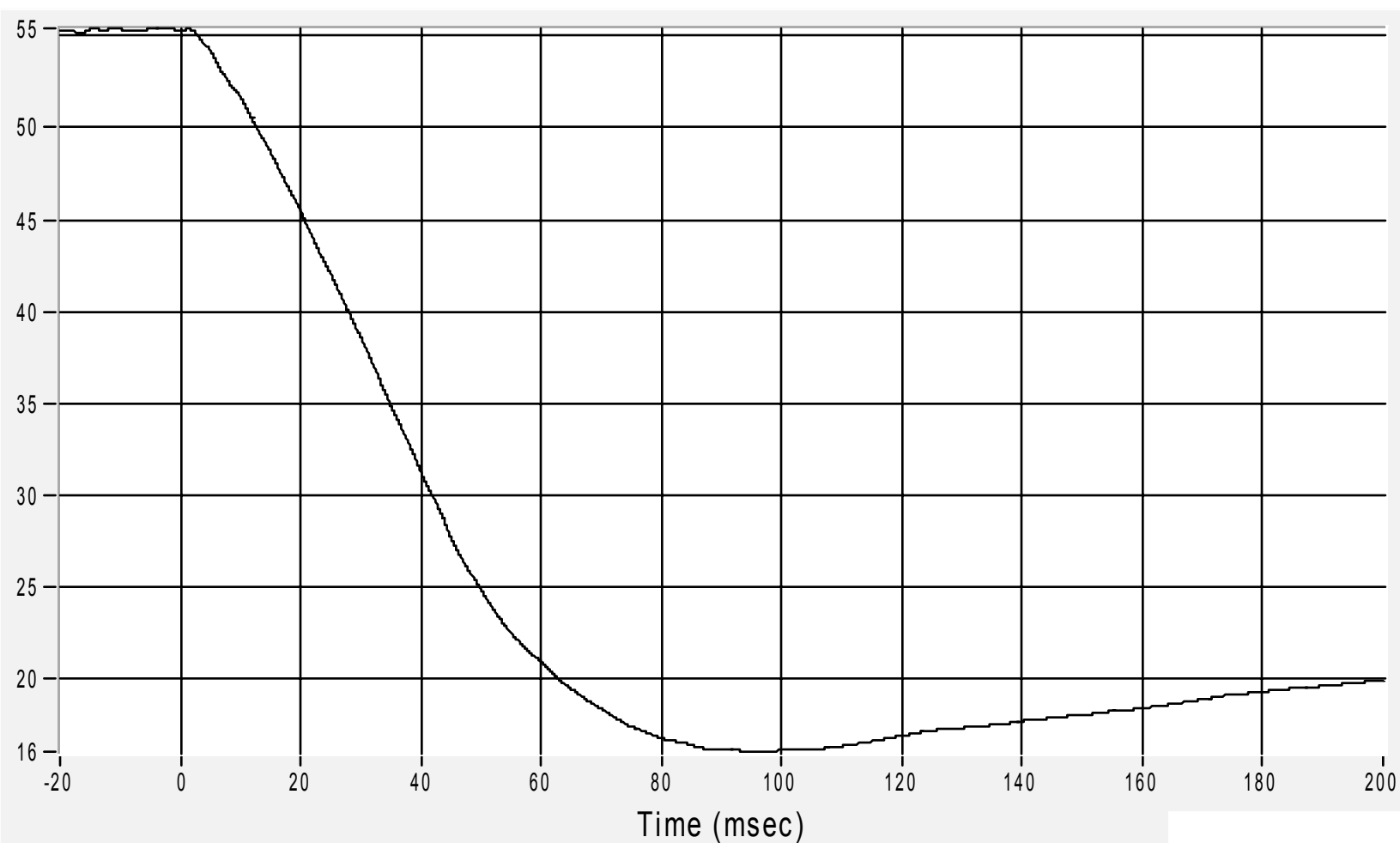
MDB Rear (X) Velocity

Velocity (km/h)

CFC180

Max 55.4 km/h at 1.4 msec

Min 16.1 km/h at 97.2 msec



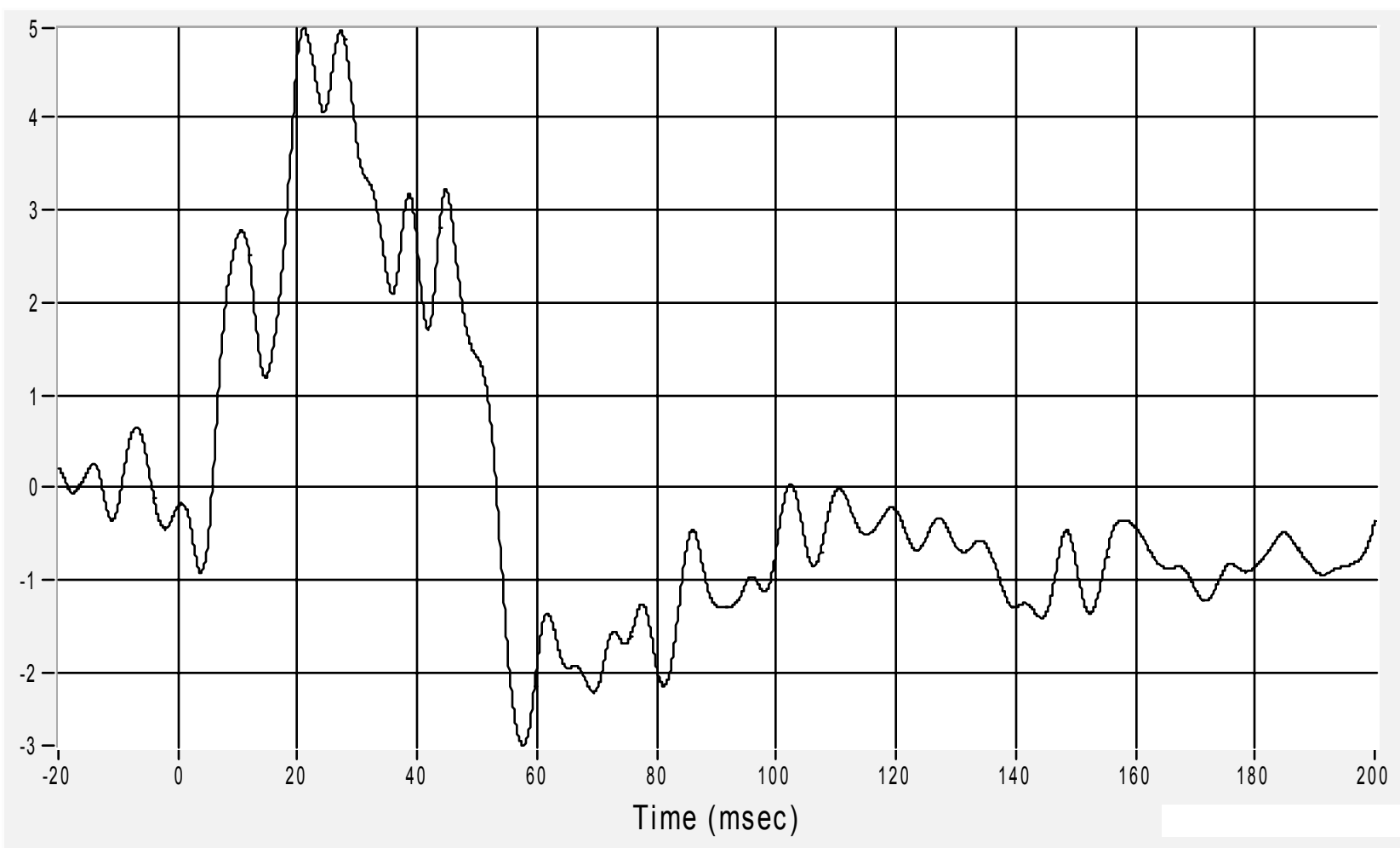
04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

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MDB Rear (Y) Acceleration

Acceleration (G's) CFC60

Max 5.0 G at 21.0 msec**Min -2.8 G at 57.7 msec**

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22 January 2004

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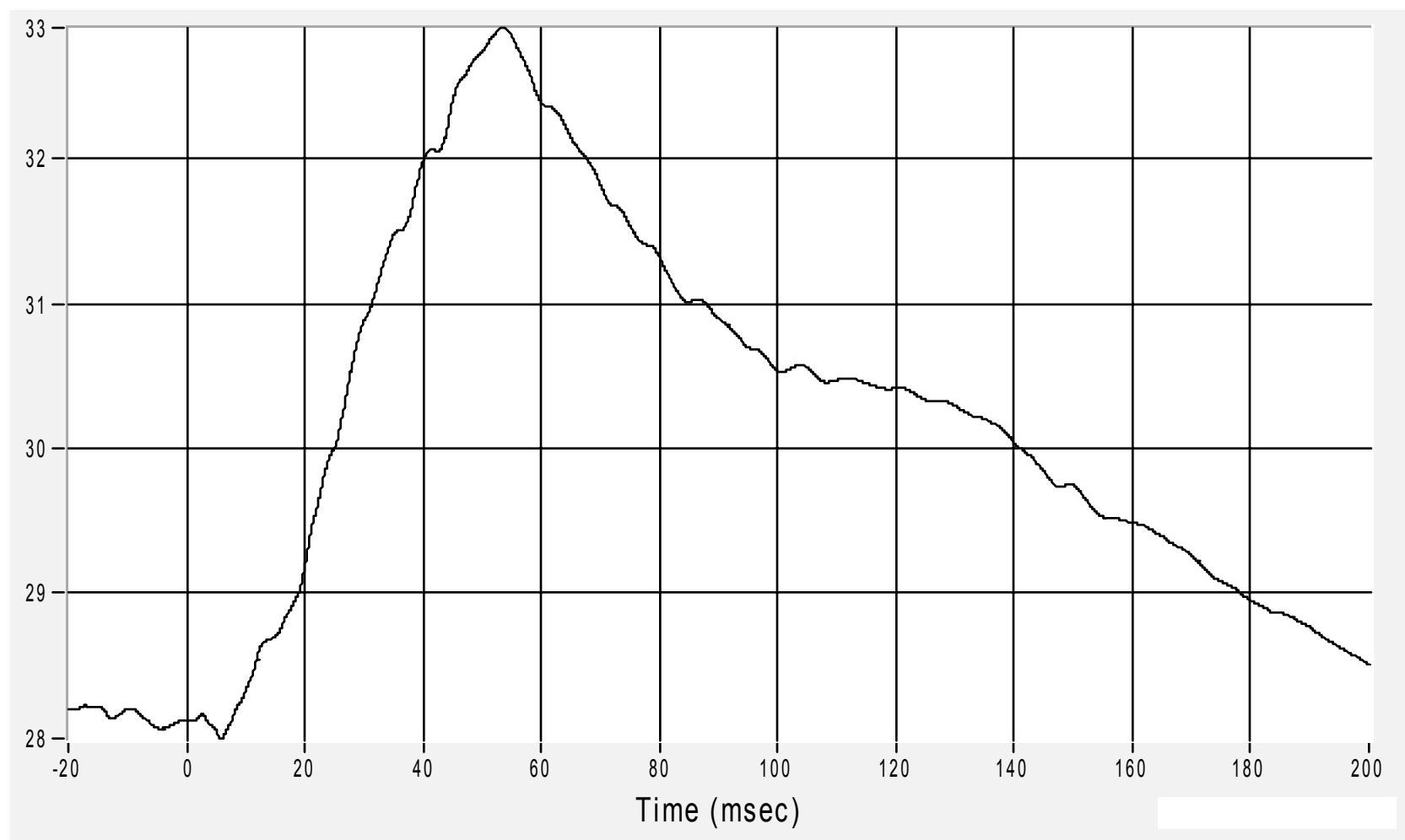
MDB Rear (Y) Velocity

Velocity (km/h)

CFC180

Max 32.9 km/h at 53.4 msec

Min 28.0 km/h at 5.8 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

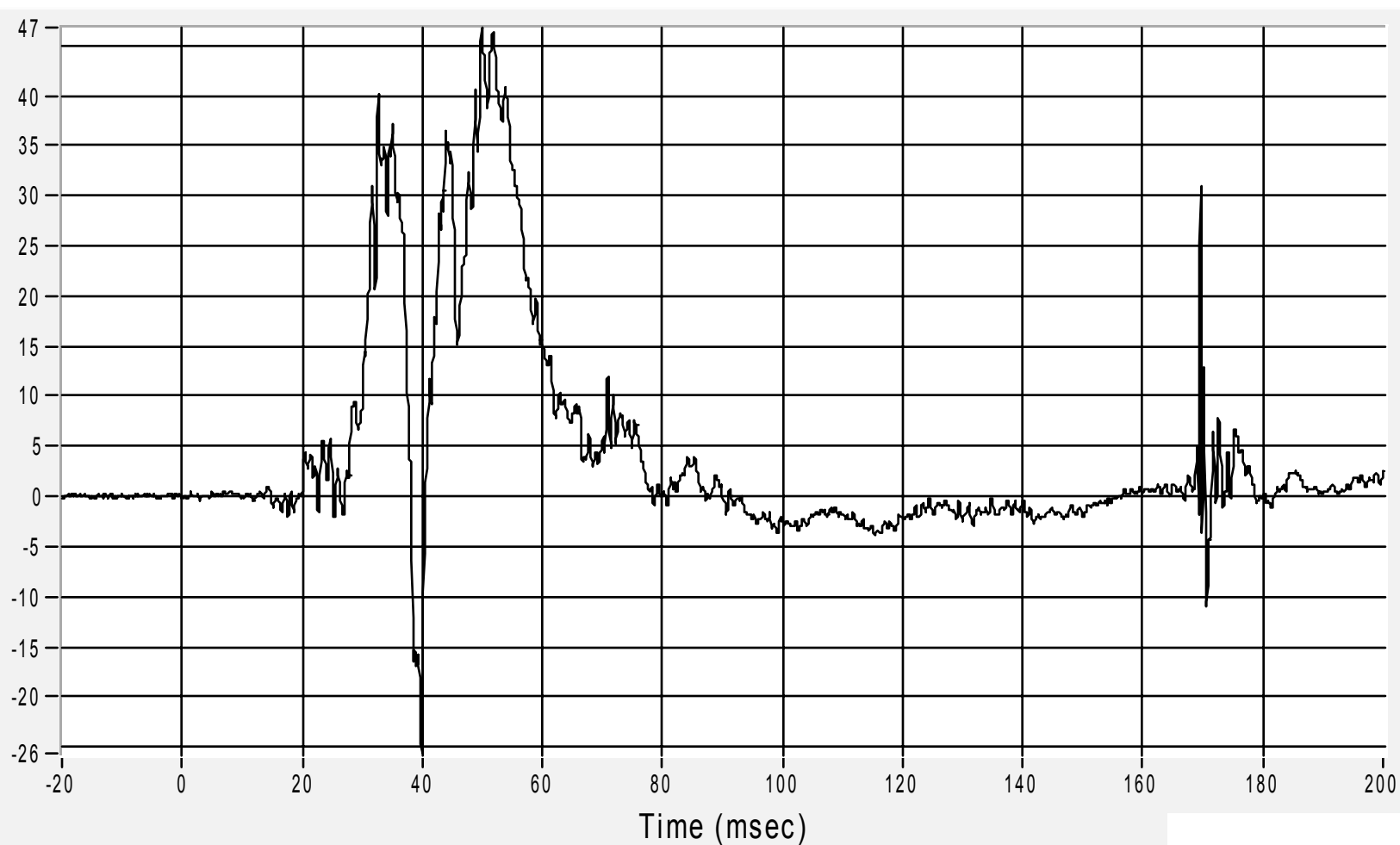
Medical College of Wisconsin
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Driver Upper Rib (Y) - Redundant Acceleration

Acceleration (G's) CFC1000

Max 46.8 G at 49.8 msec

Min -25.7 G at 39.9 msec



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22 January 2004

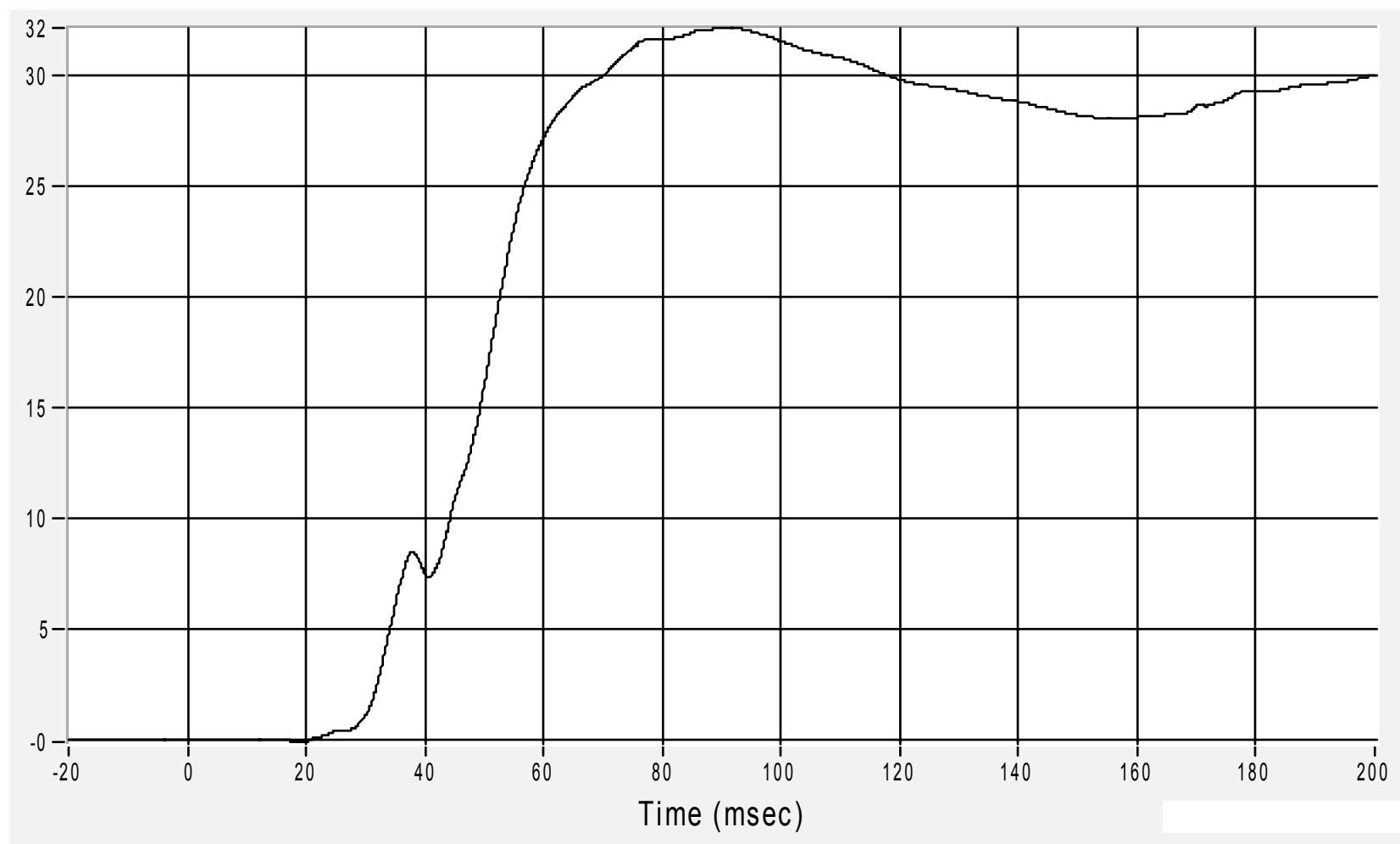
*Medical College of Wisconsin
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Driver Upper Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 32.1 km/h at 90.0 msec

Min 0.0 km/h at 19.3 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

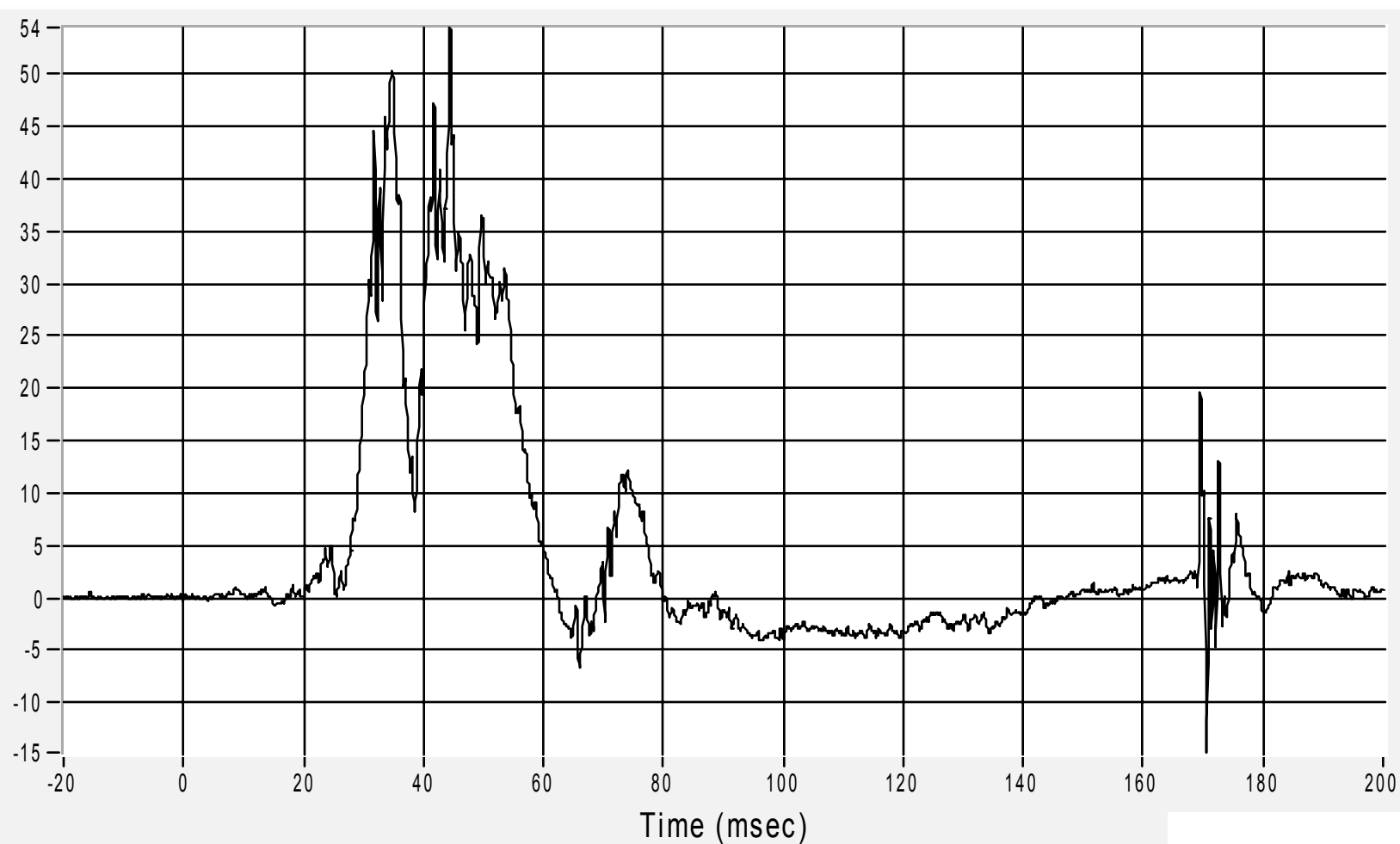
*Medical College of Wisconsin
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Driver Lower Rib (Y) - Redundant Acceleration

Acceleration (G's) CFC1000

Max 54.4 G at 44.4 msec

Min -14.8 G at 170.6 msec



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22 January 2004

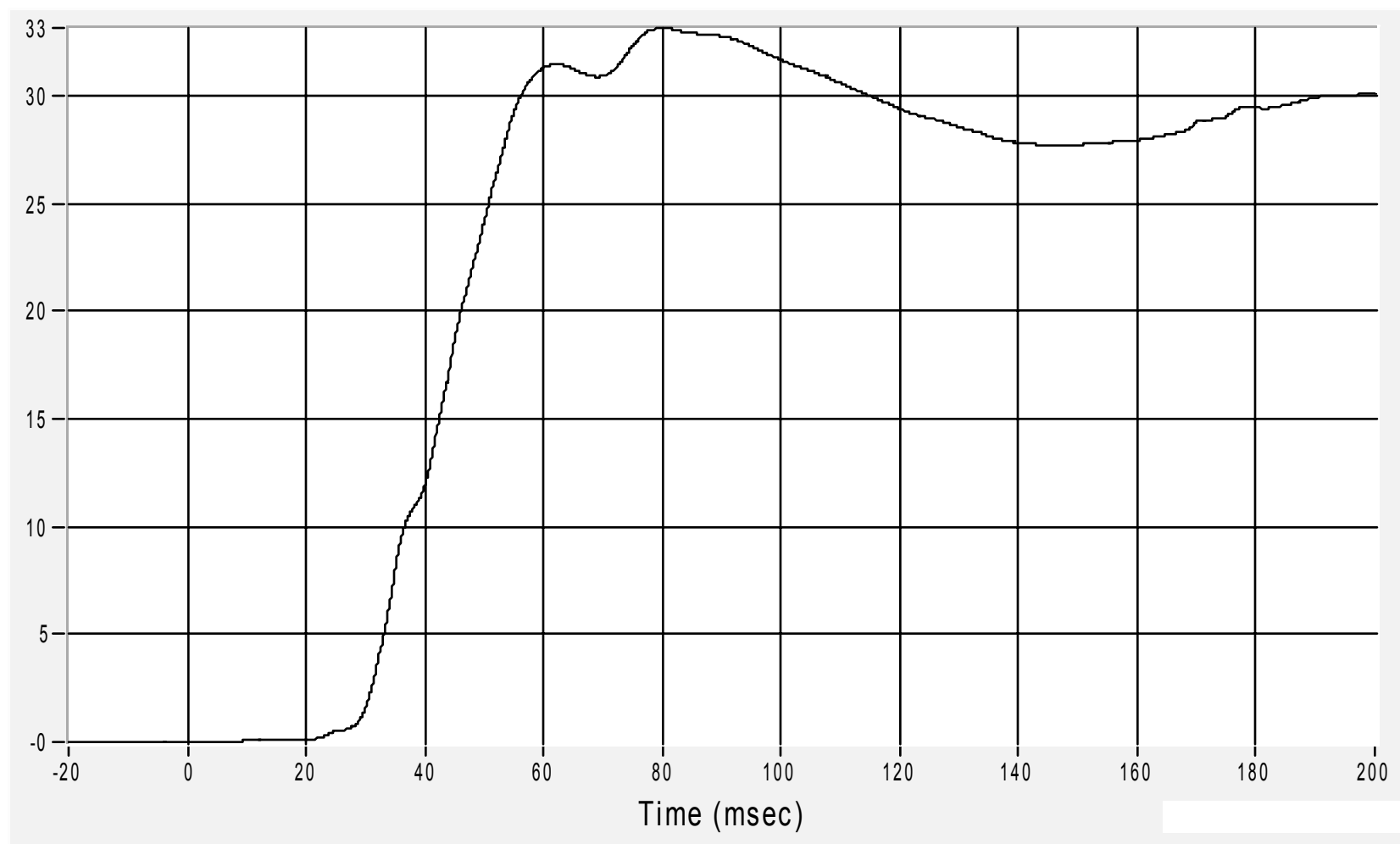
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 33.2 km/h at 80.1 msec

Min 0.0 km/h at 4.6 msec



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22 January 2004

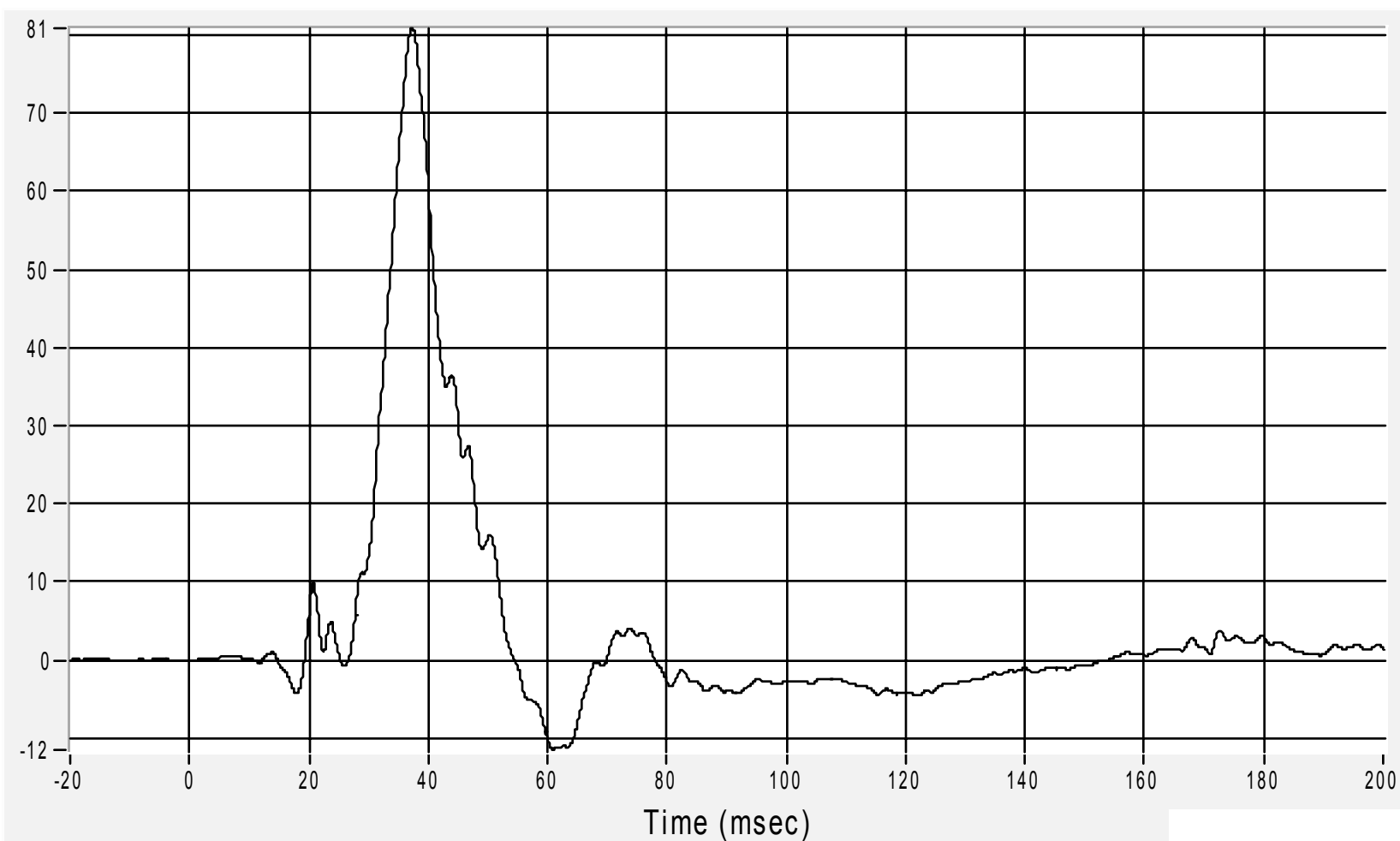
*Medical College of Wisconsin
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Driver Lower Spine (Y) - Redundant Acceleration

Acceleration (G's) CFC180

Max 80.9 G at 37.4 msec

Min -11.5 G at 60.9 msec



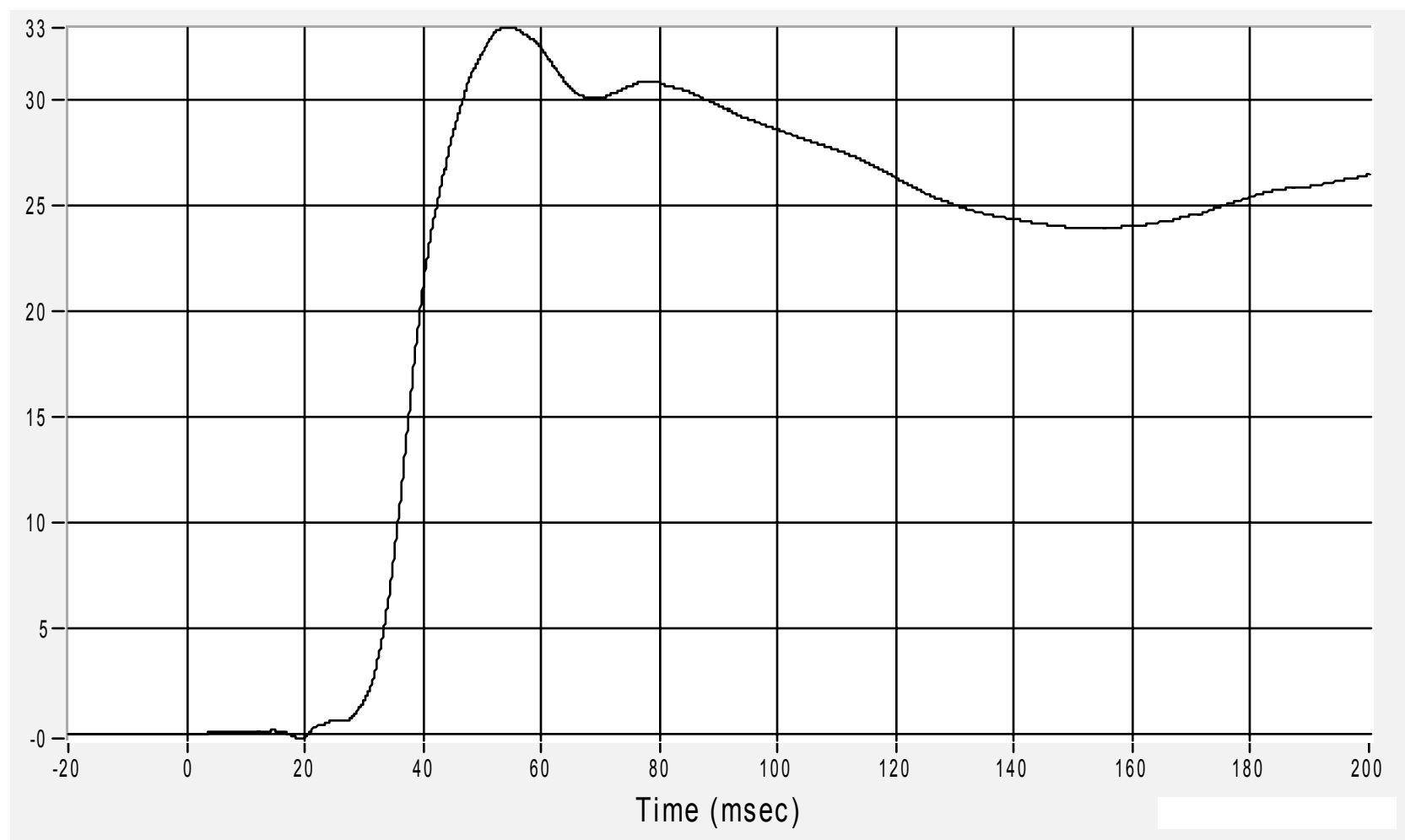
04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 33.5 km/h at 54.4 msec**Min -0.3 km/h at 19.3 msec**

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22 January 2004

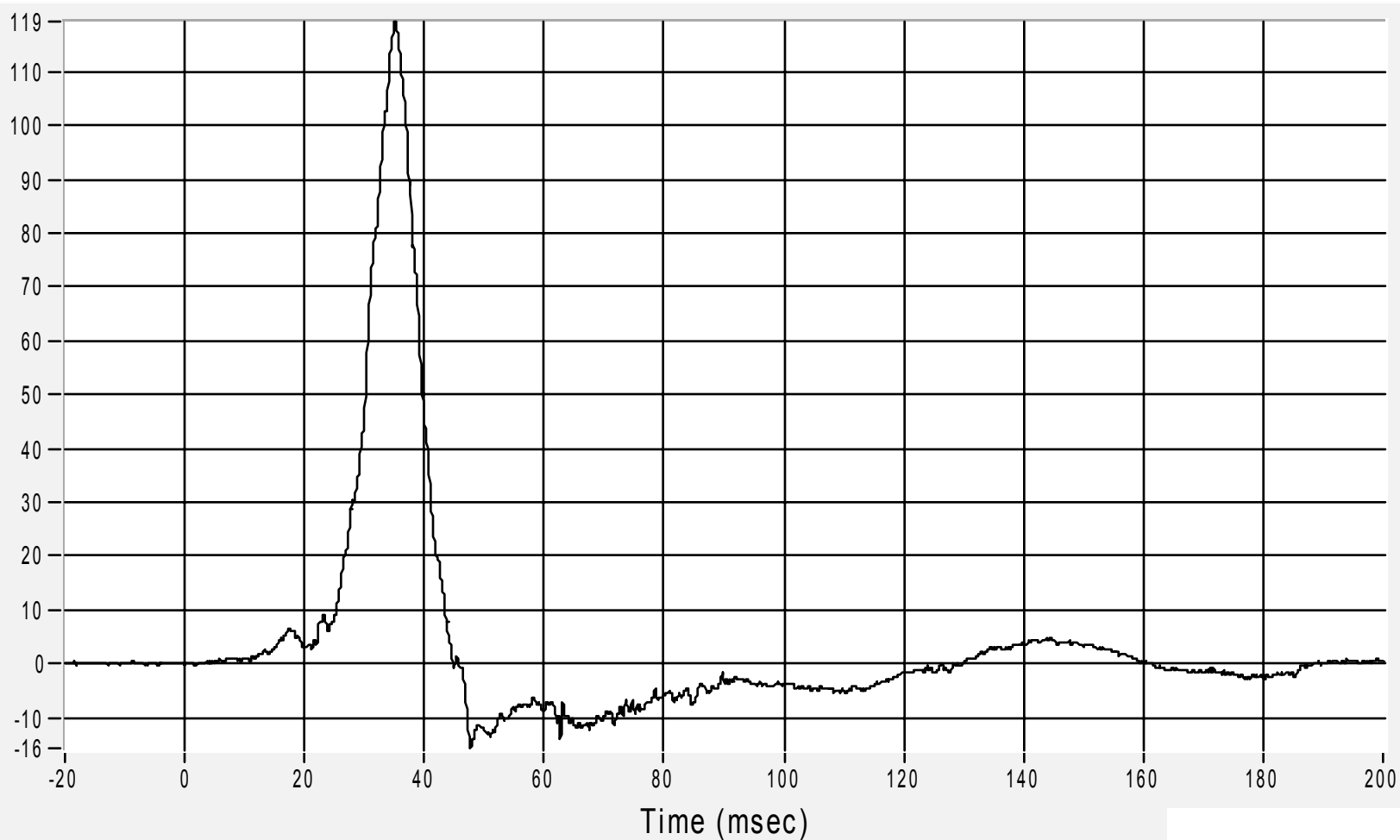
*Medical College of Wisconsin
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Driver Pelvic (Y) - Redundant Acceleration

Acceleration (G's) CFC1000

Max 119.3 G at 35.1 msec

Min -15.8 G at 47.7 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

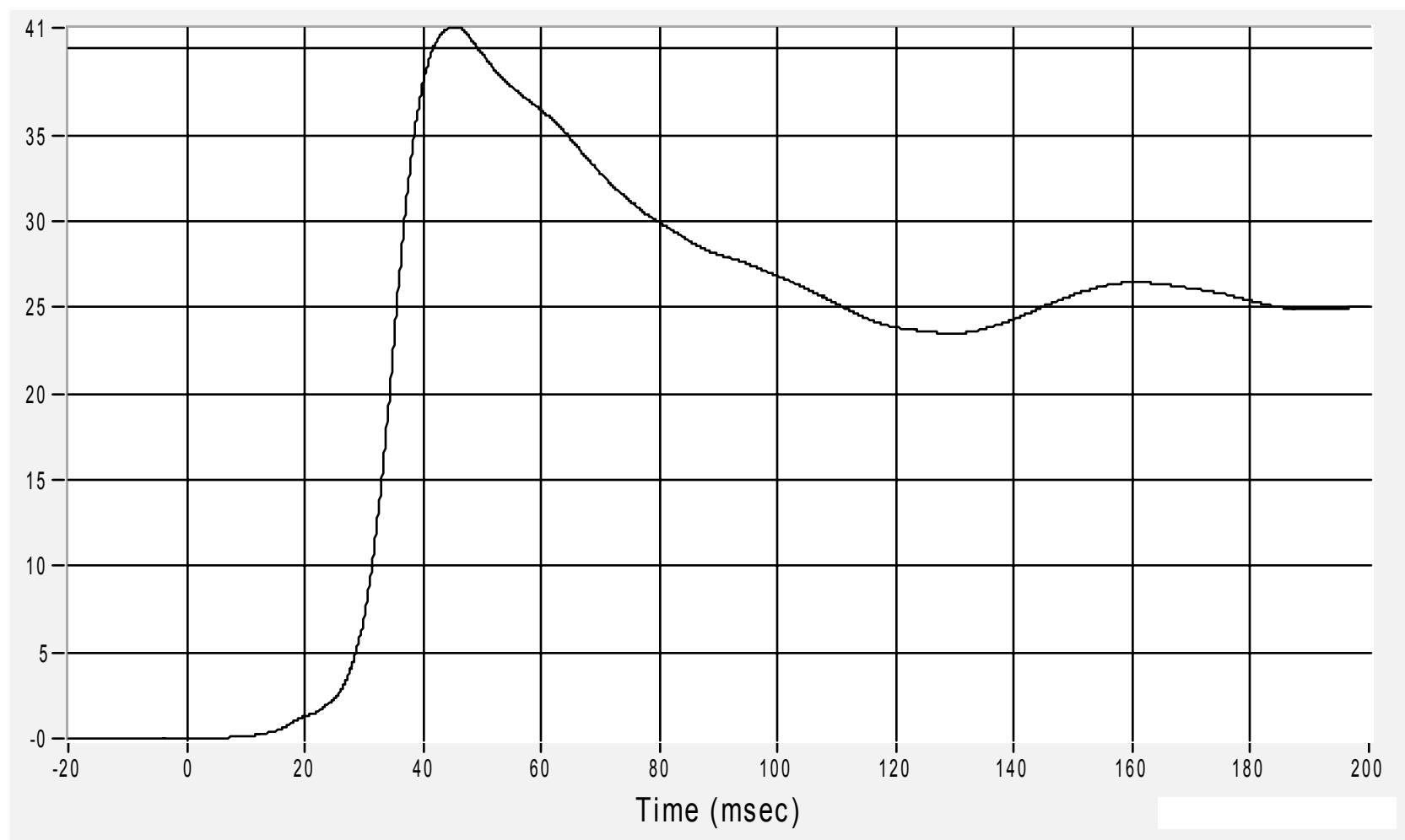
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 41.2 km/h at 45.5 msec

Min 0.0 km/h at 2.4 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

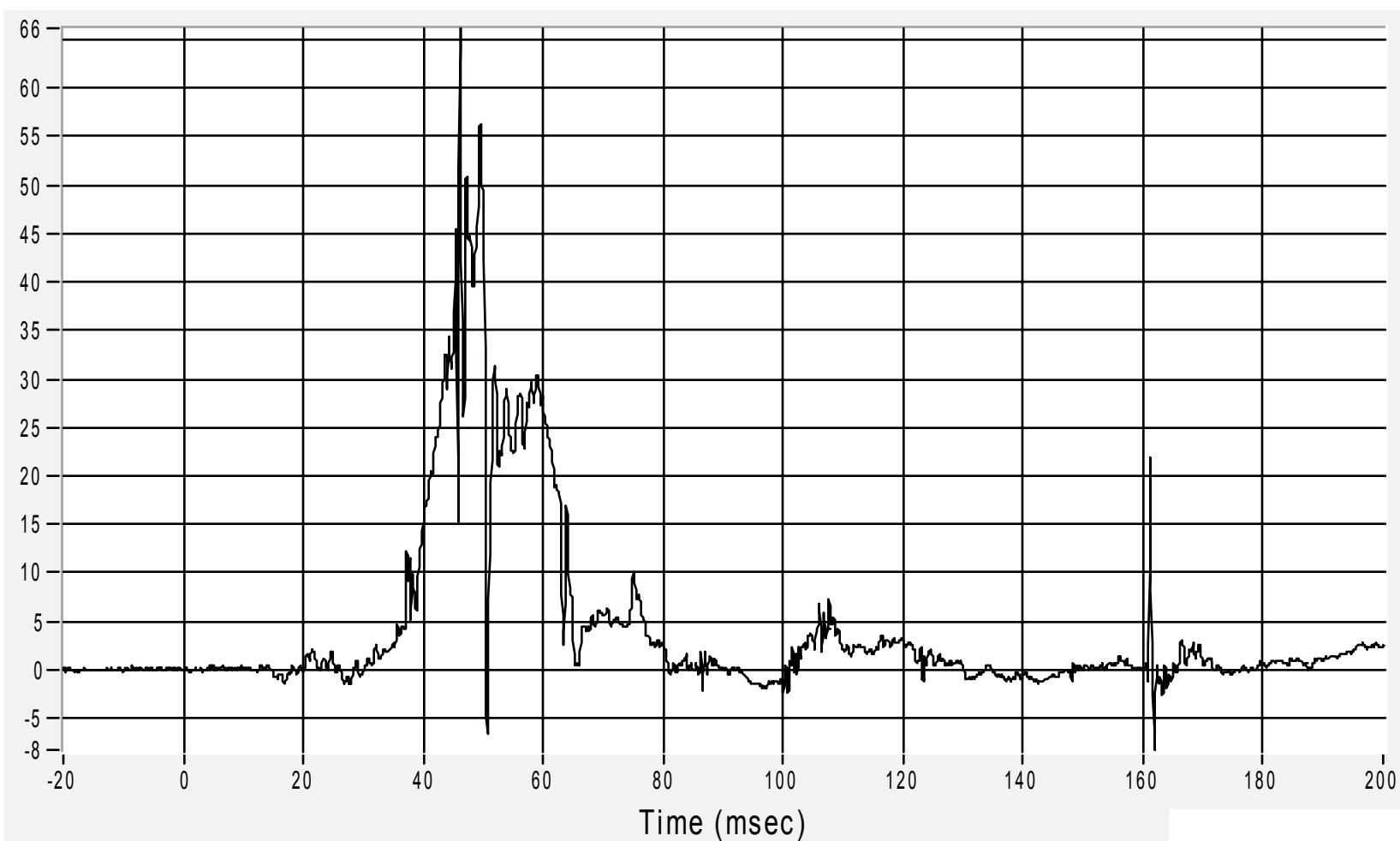
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) - Redundant Acceleration

Acceleration (G's) CFC1000

Max 66.2 G at 46.2 msec

Min -8.3 G at 161.8 msec



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22 January 2004

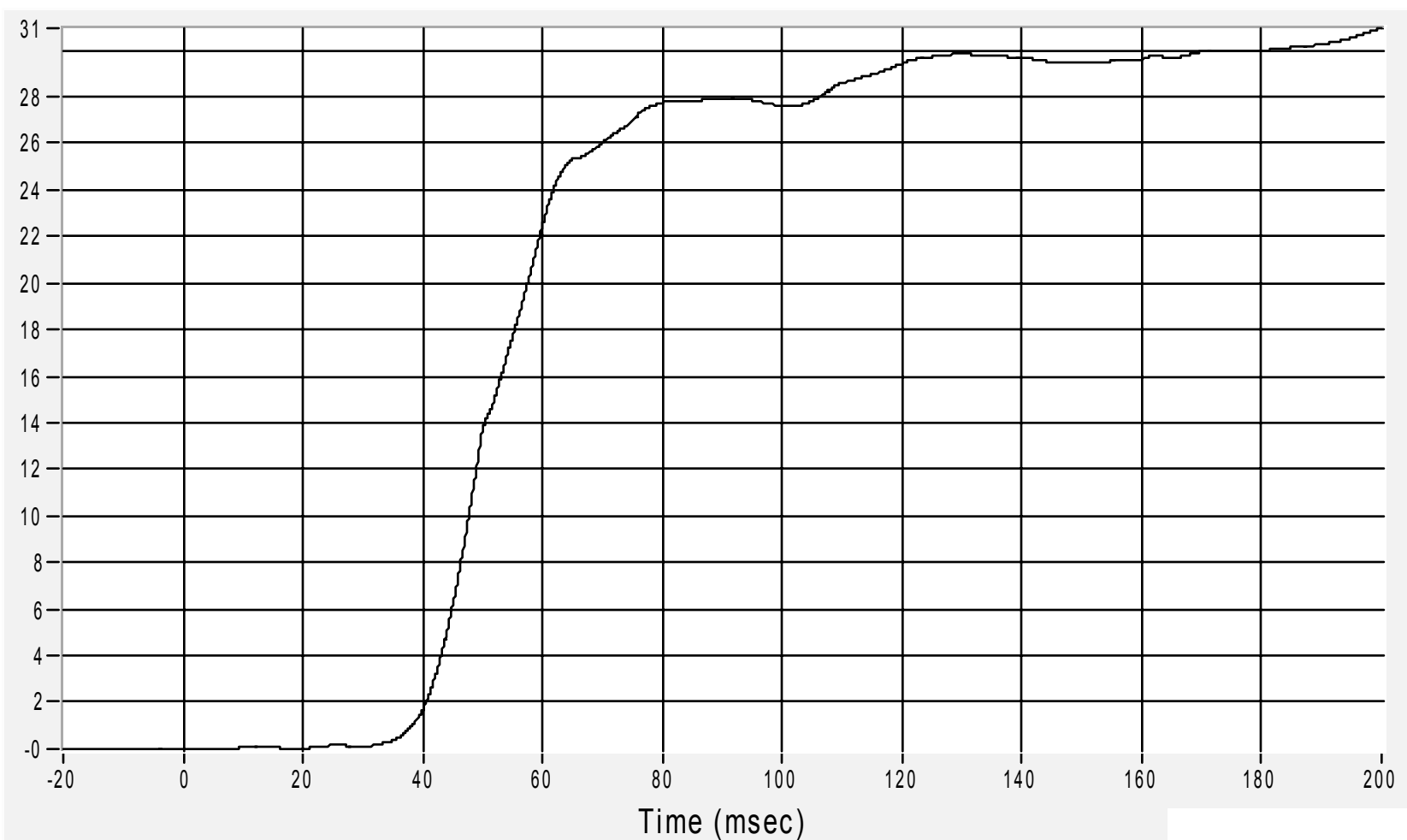
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 30.9 km/h at 199.9 msec

Min 0.0 km/h at 19.0 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

22 January 2004

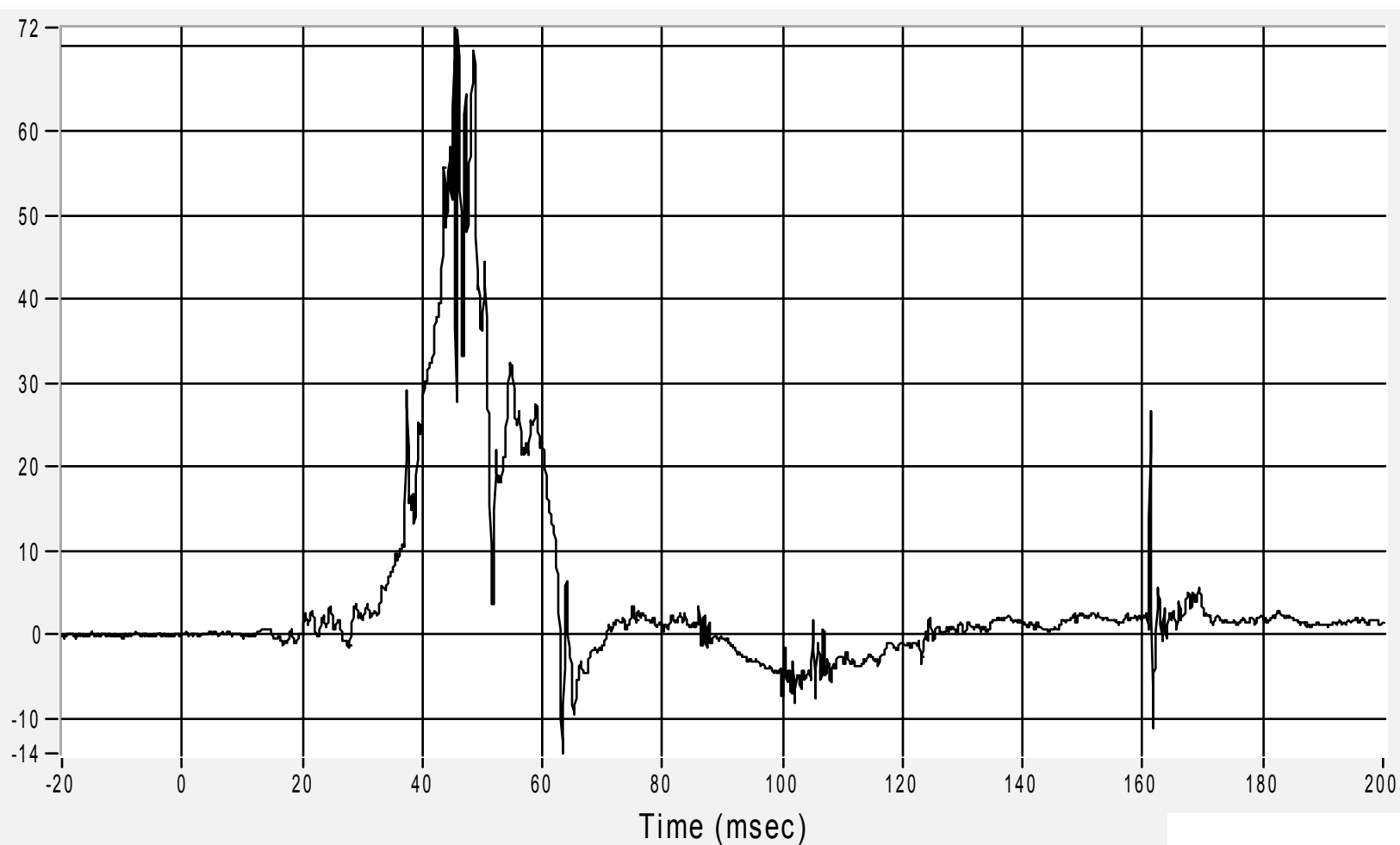
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) - Redundant Acceleration

Acceleration (G's) CFC1000

Max 72.3 G at 45.4 msec

Min -14.1 G at 63.4 msec



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22 January 2004

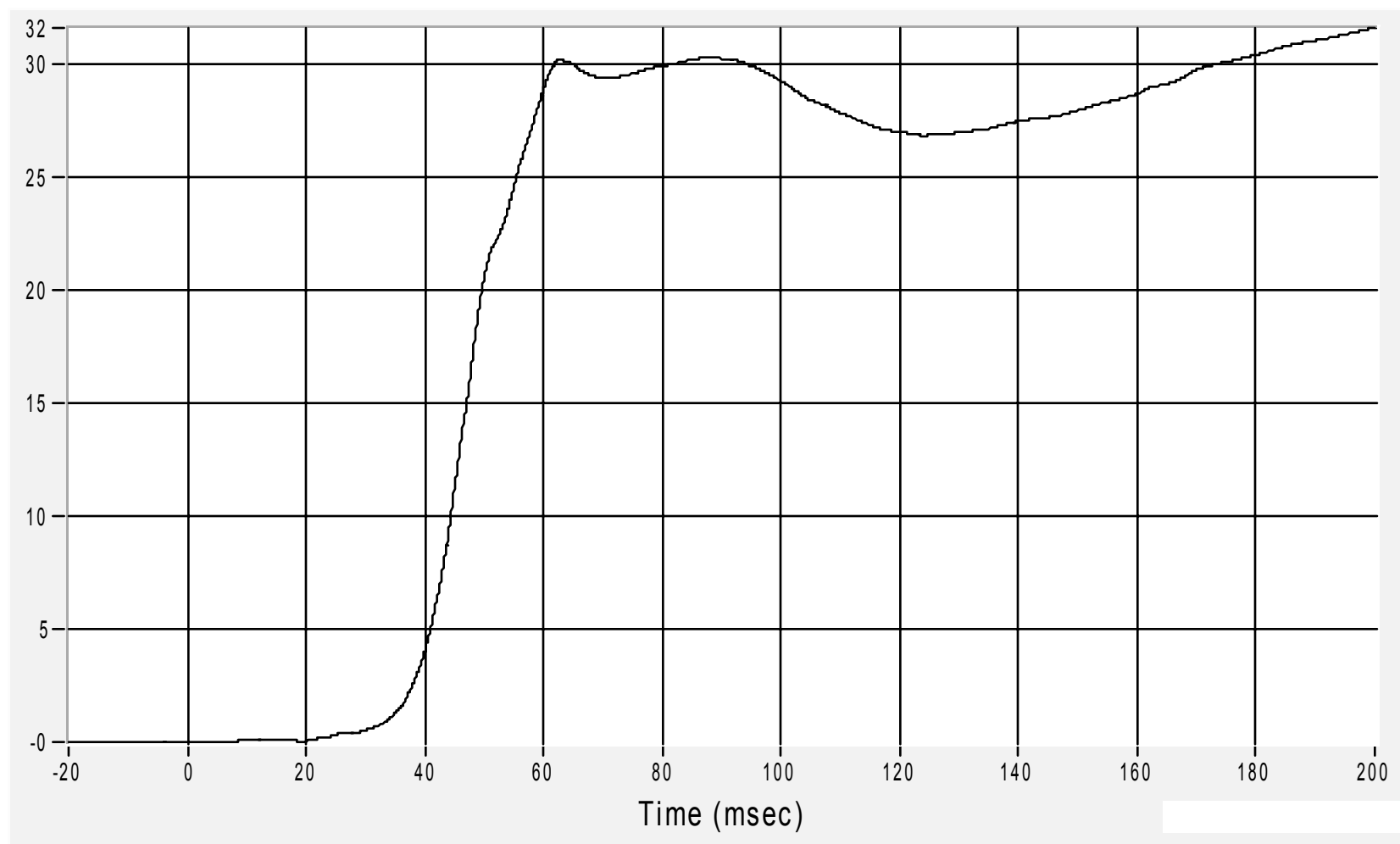
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 31.6 km/h at 199.9 msec

Min 0.0 km/h at 0.0 msec



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22 January 2004

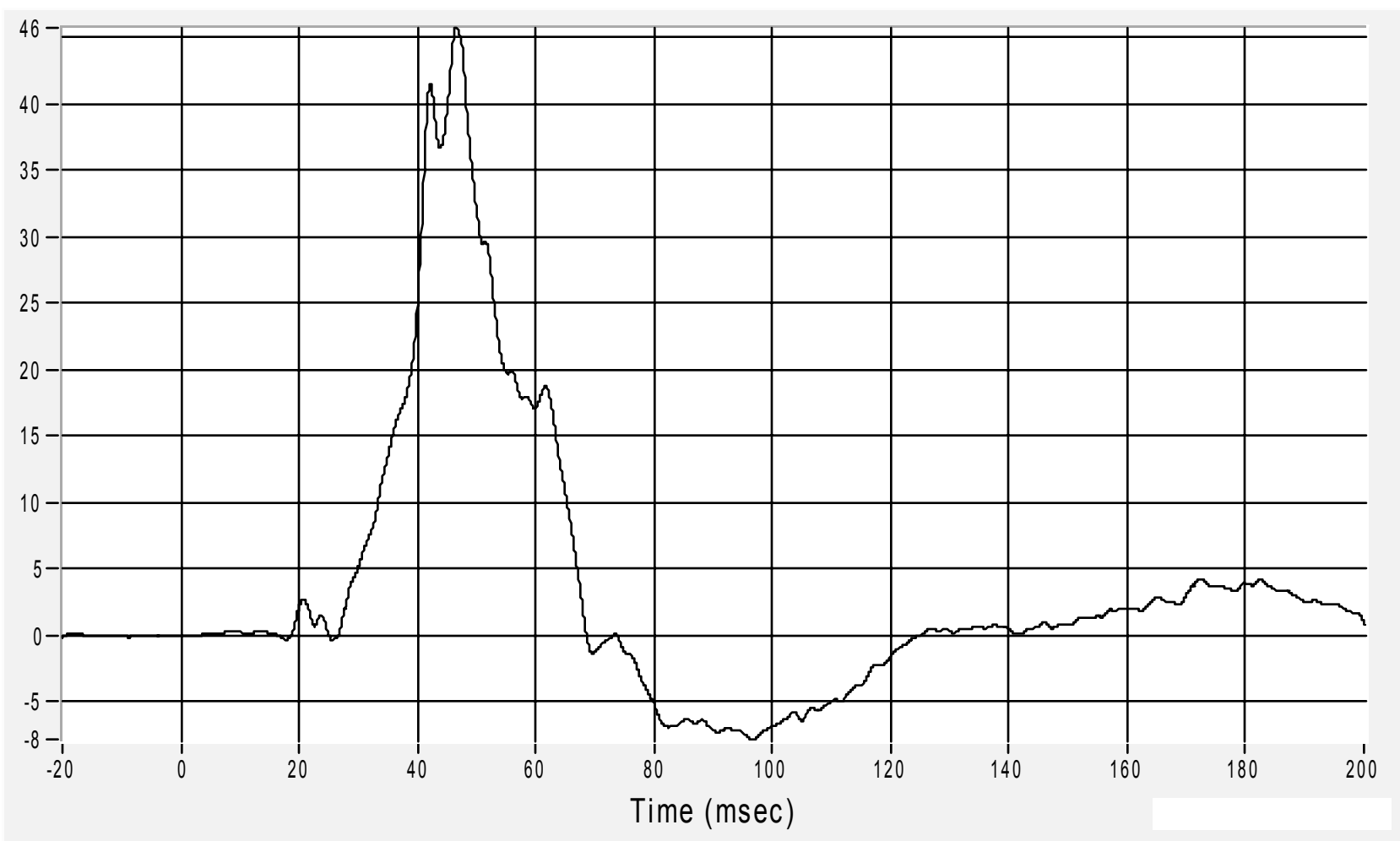
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) - Redundant Acceleration

Acceleration (G's) CFC180

Max 45.7 G at 46.6 msec

Min -7.8 G at 96.9 msec



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22 January 2004

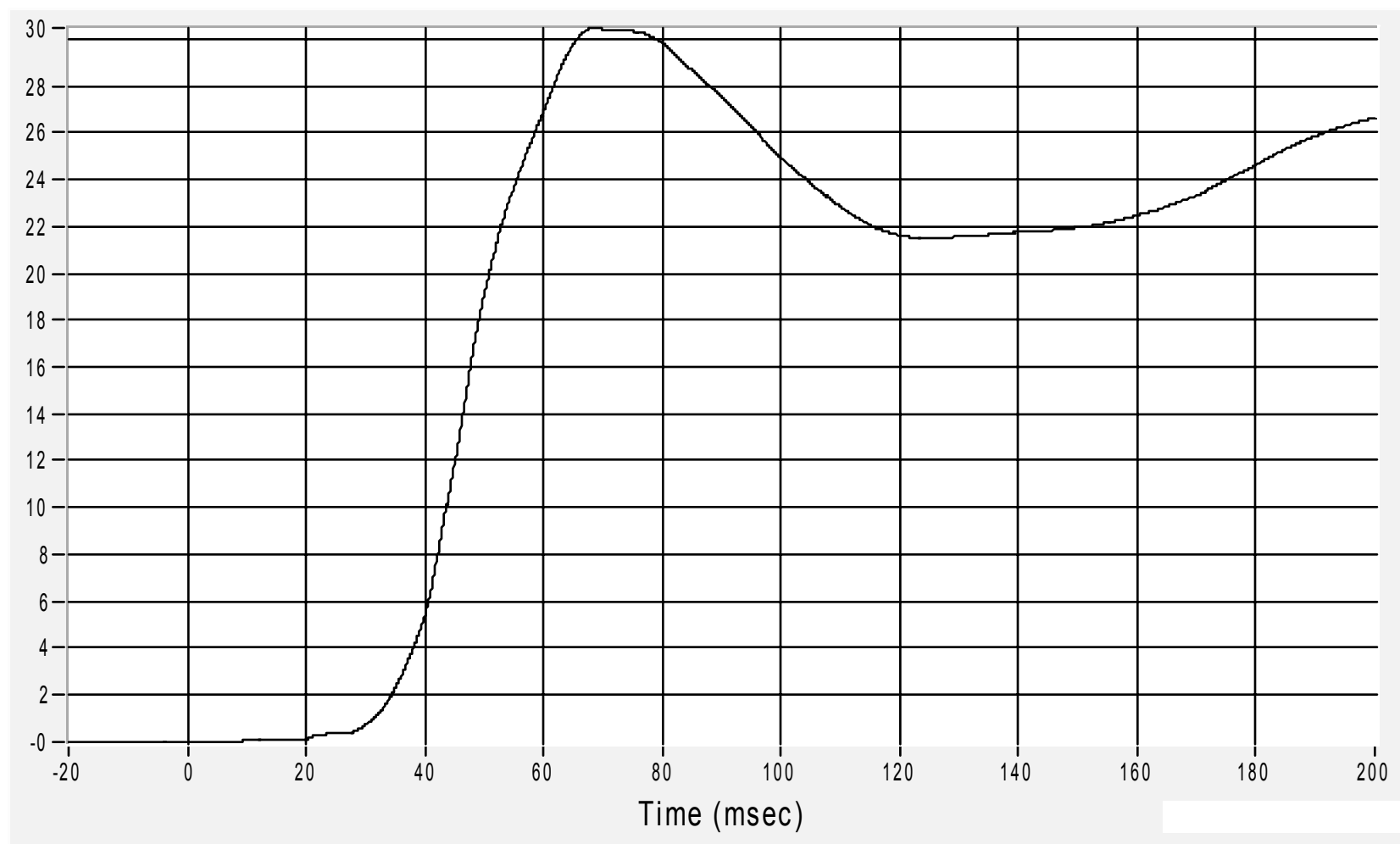
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 30.5 km/h at 68.6 msec

Min 0.0 km/h at 3.2 msec



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22 January 2004

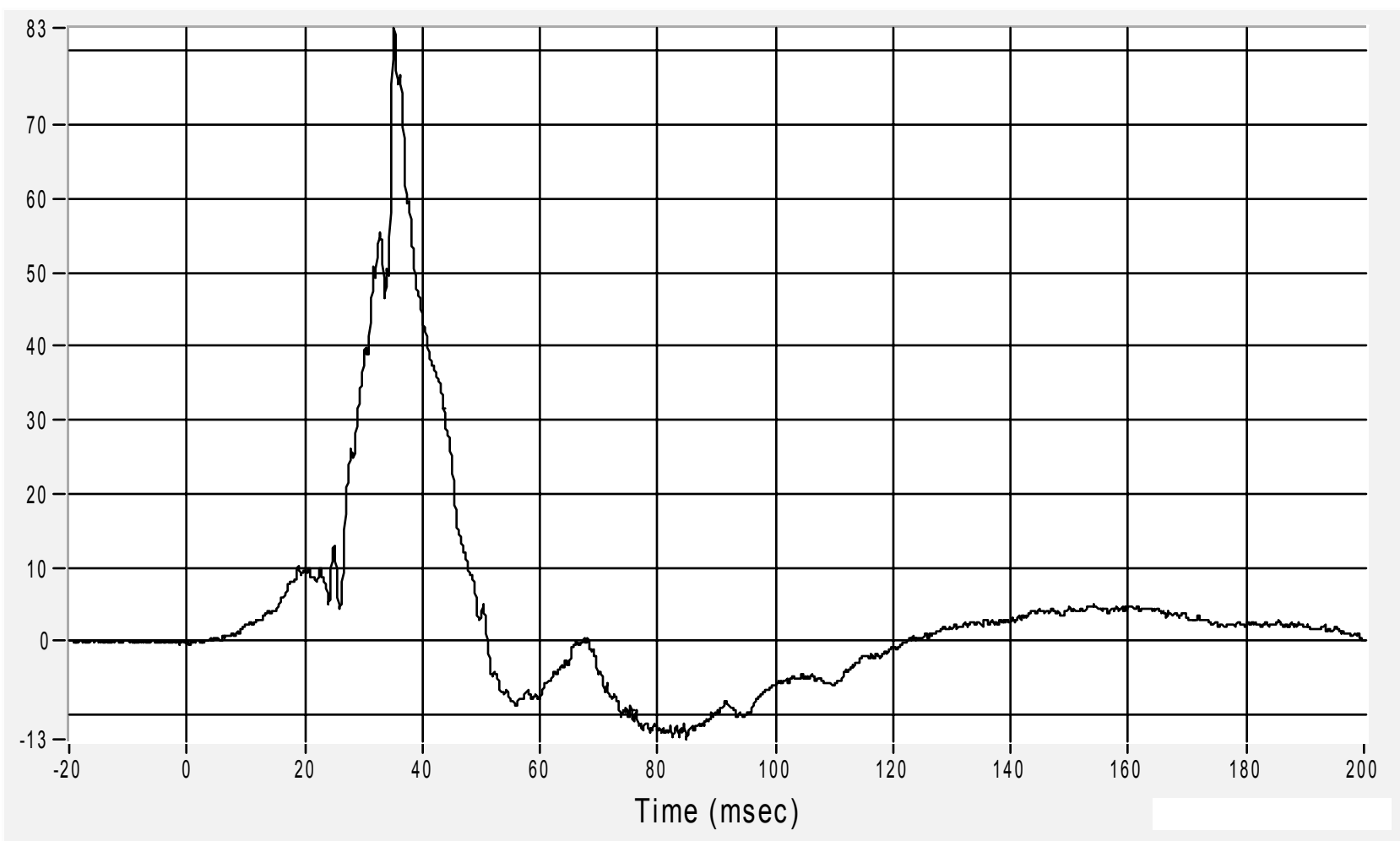
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) - Redundant Acceleration

Acceleration (G's) CFC1000

Max 83.2 G at 35.2 msec

Min -13.3 G at 84.9 msec



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22 January 2004

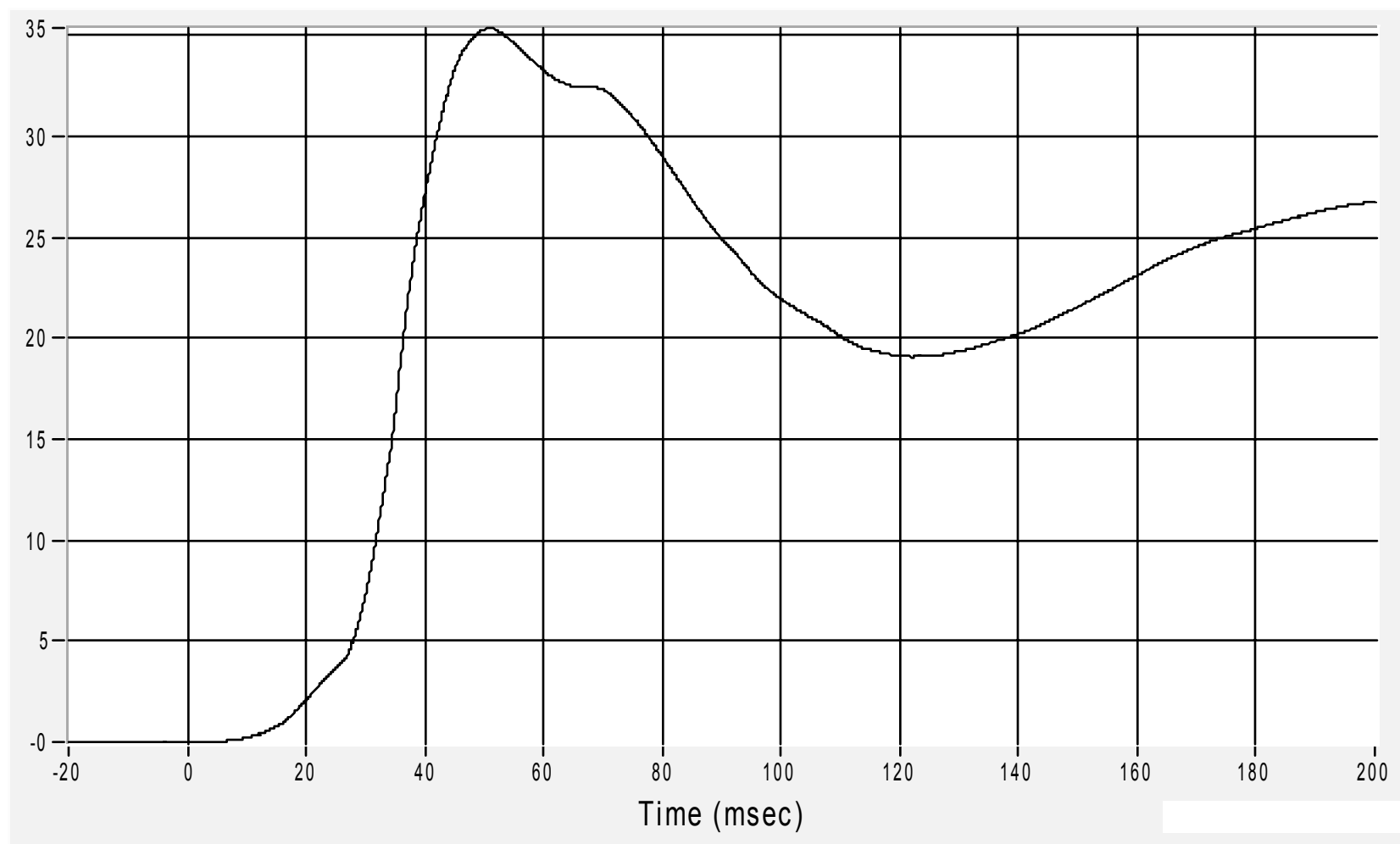
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 35.4 km/h at 51.0 msec

Min 0.0 km/h at 1.0 msec



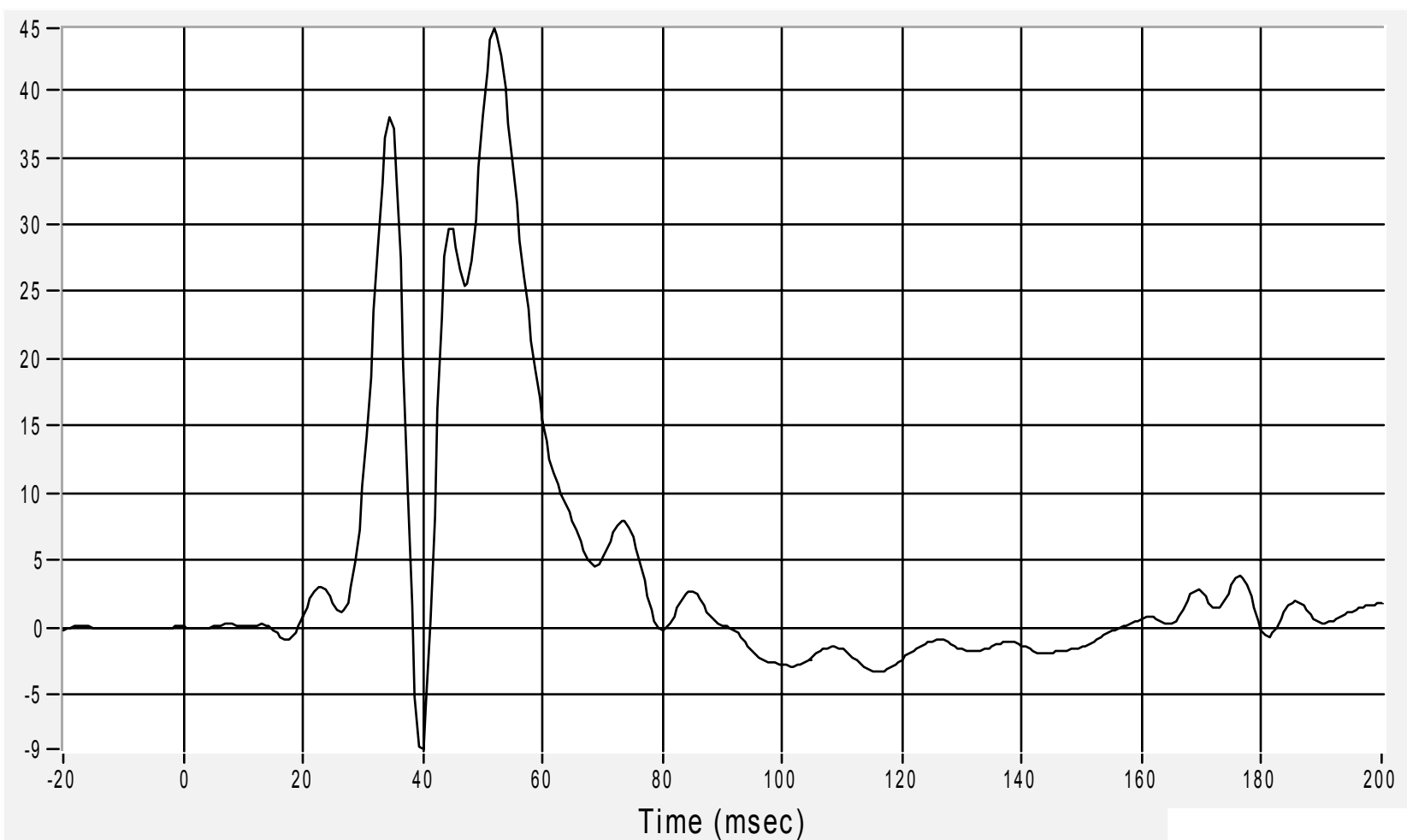
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Driver Upper Rib (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 44.6 G at 51.9 msec**Min -9.1 G at 40.0 msec**

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22 January 2004

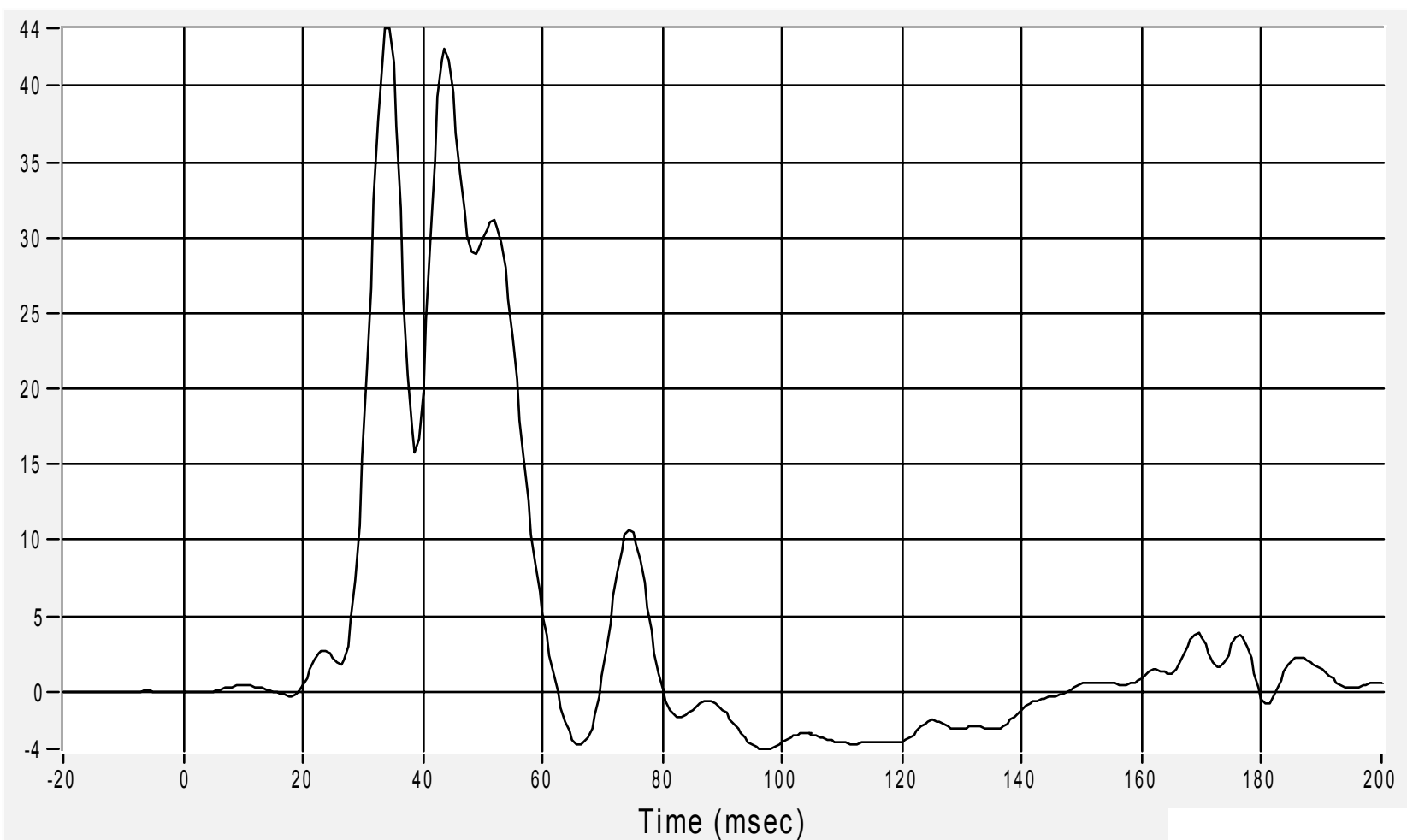
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Driver Lower Rib (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 43.8 G at 34.4 msec

Min -3.8 G at 96.9 msec



04SN05 - 2004 CHEVROLET COLORADO 4-DOOR PICKUP

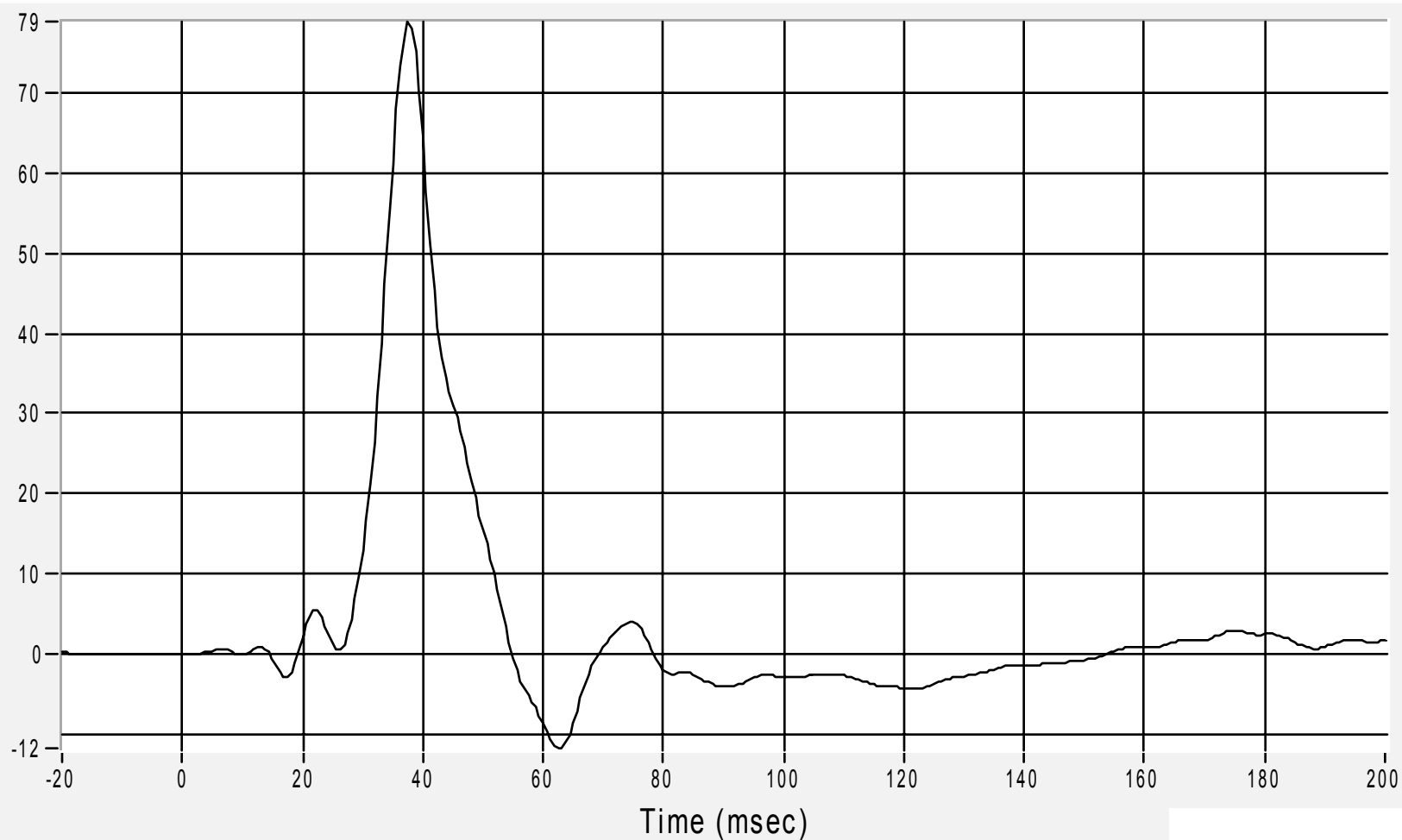
22 January 2004

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Vehicle Crashworthiness Lab*

B-140

Driver Lower Spine (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 79.0 G at 37.5 msec**Min -11.9 G at 62.5 msec**

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22 January 2004

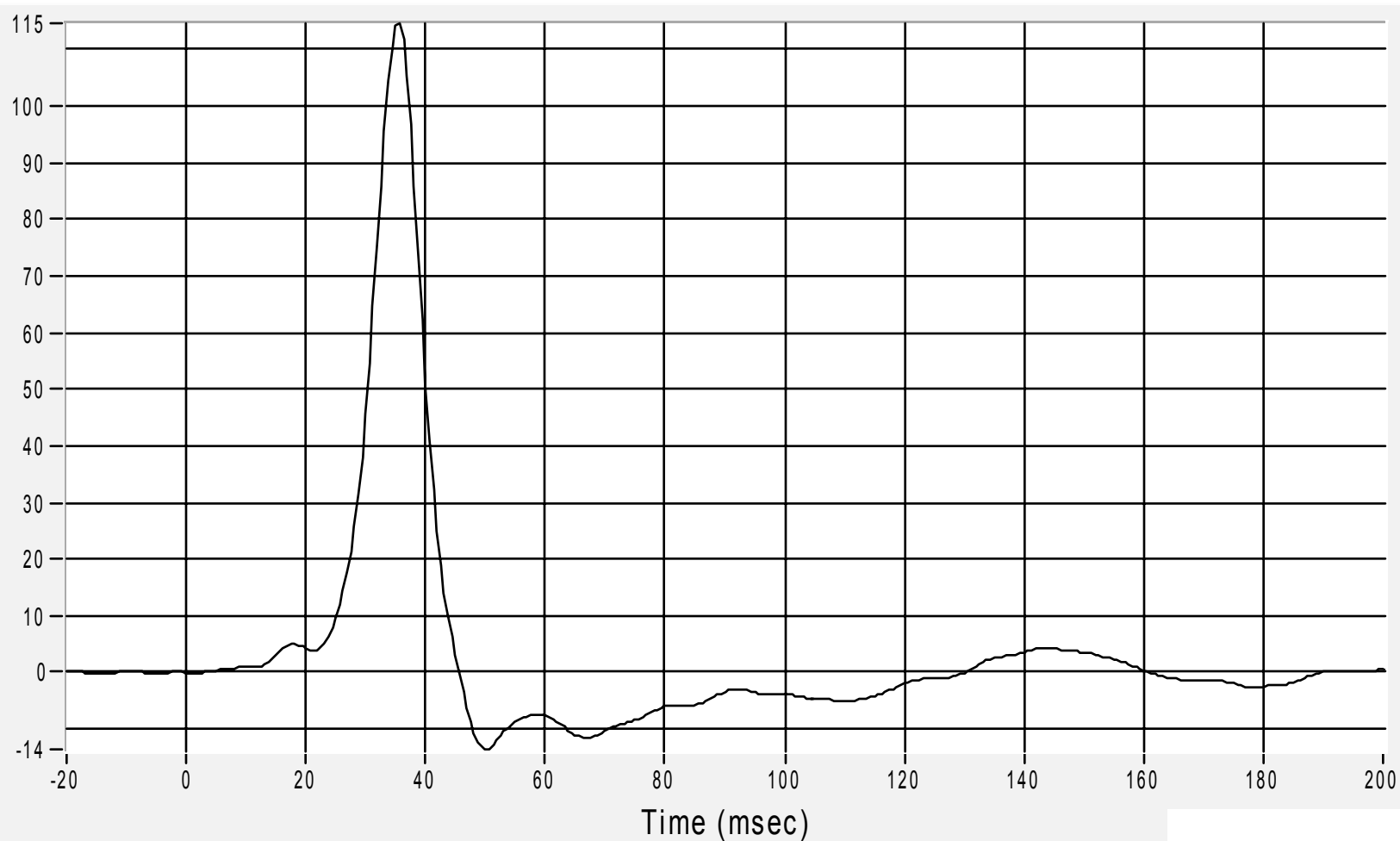
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Driver Pelvic (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 114.6 G at 35.6 msec

Min -13.6 G at 50.0 msec



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22 January 2004

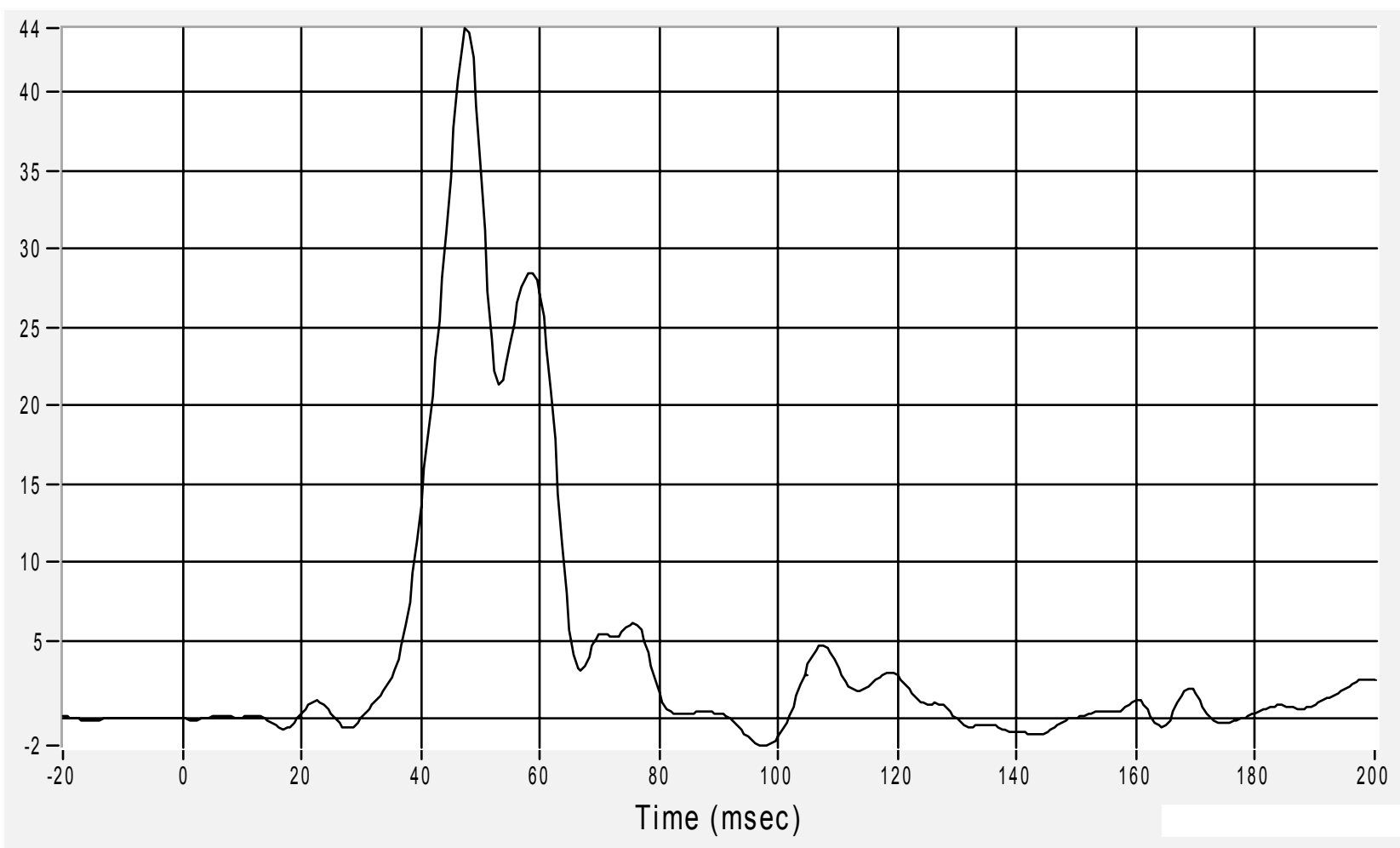
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Passenger Upper Rib (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 44.1 G at 47.5 msec

Min -1.7 G at 97.5 msec



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22 January 2004

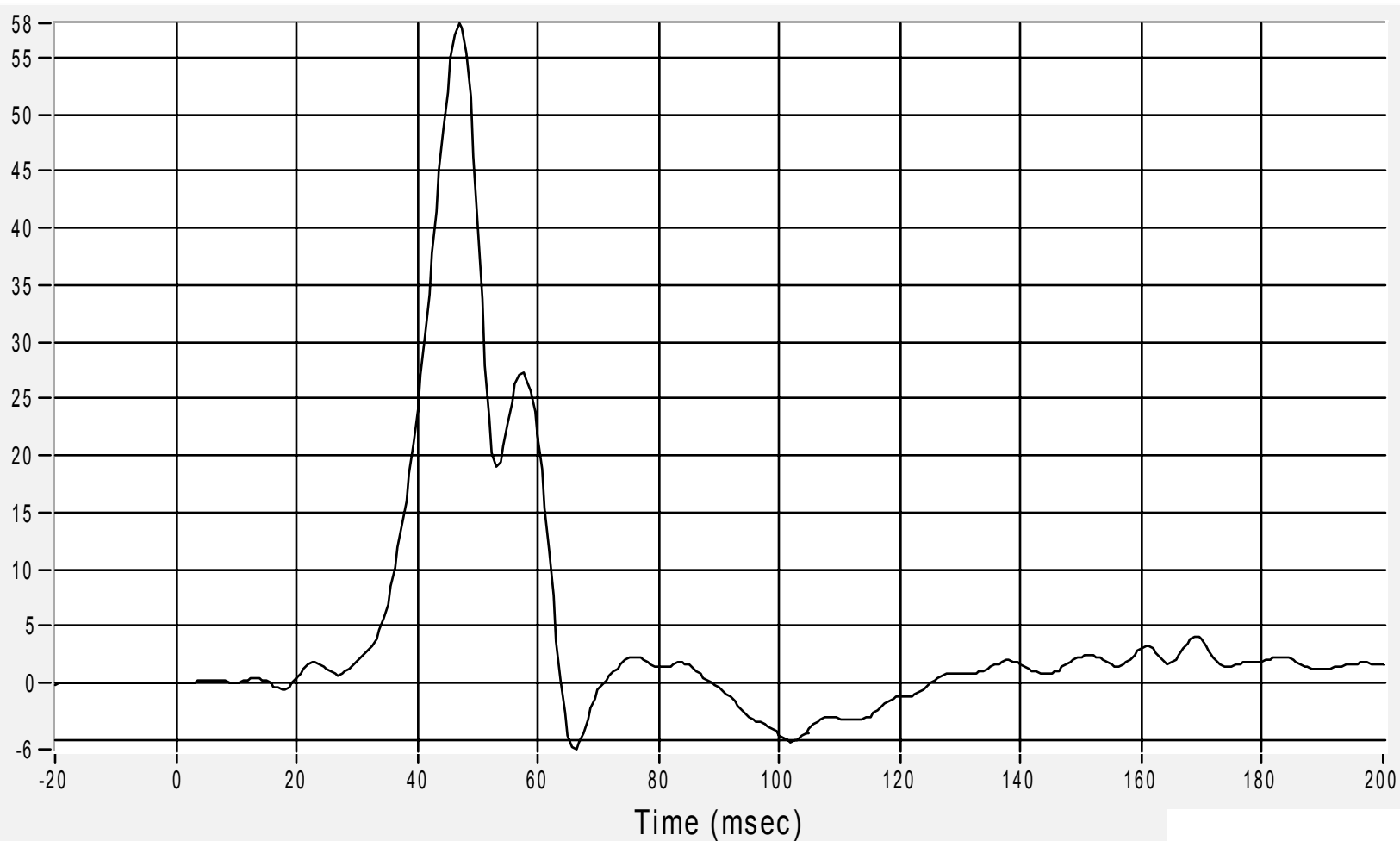
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 58.0 G at 46.9 msec

Min -5.9 G at 66.2 msec



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22 January 2004

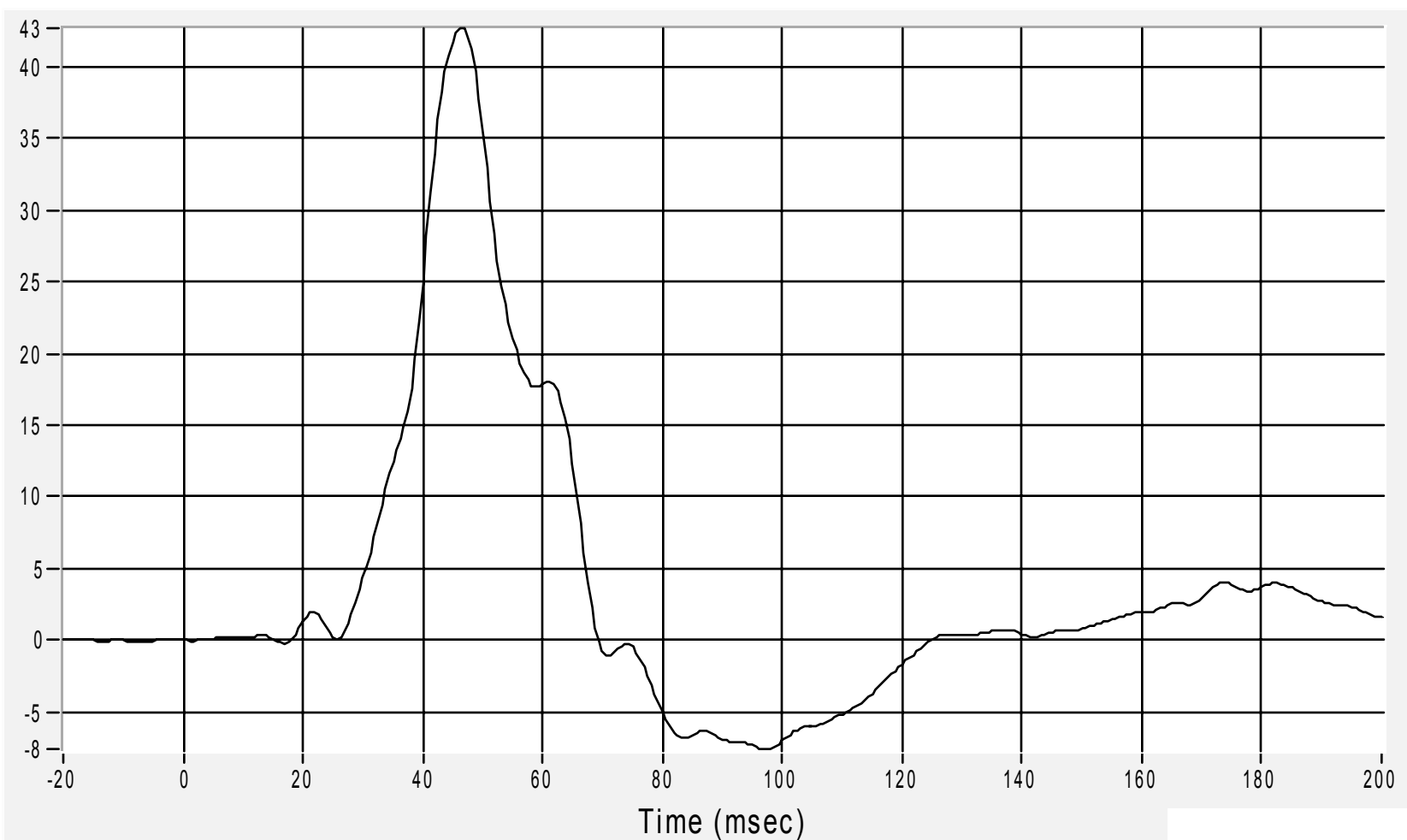
*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Passenger Lower Spine (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 42.7 G at 46.2 msec

Min -7.6 G at 97.5 msec



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22 January 2004

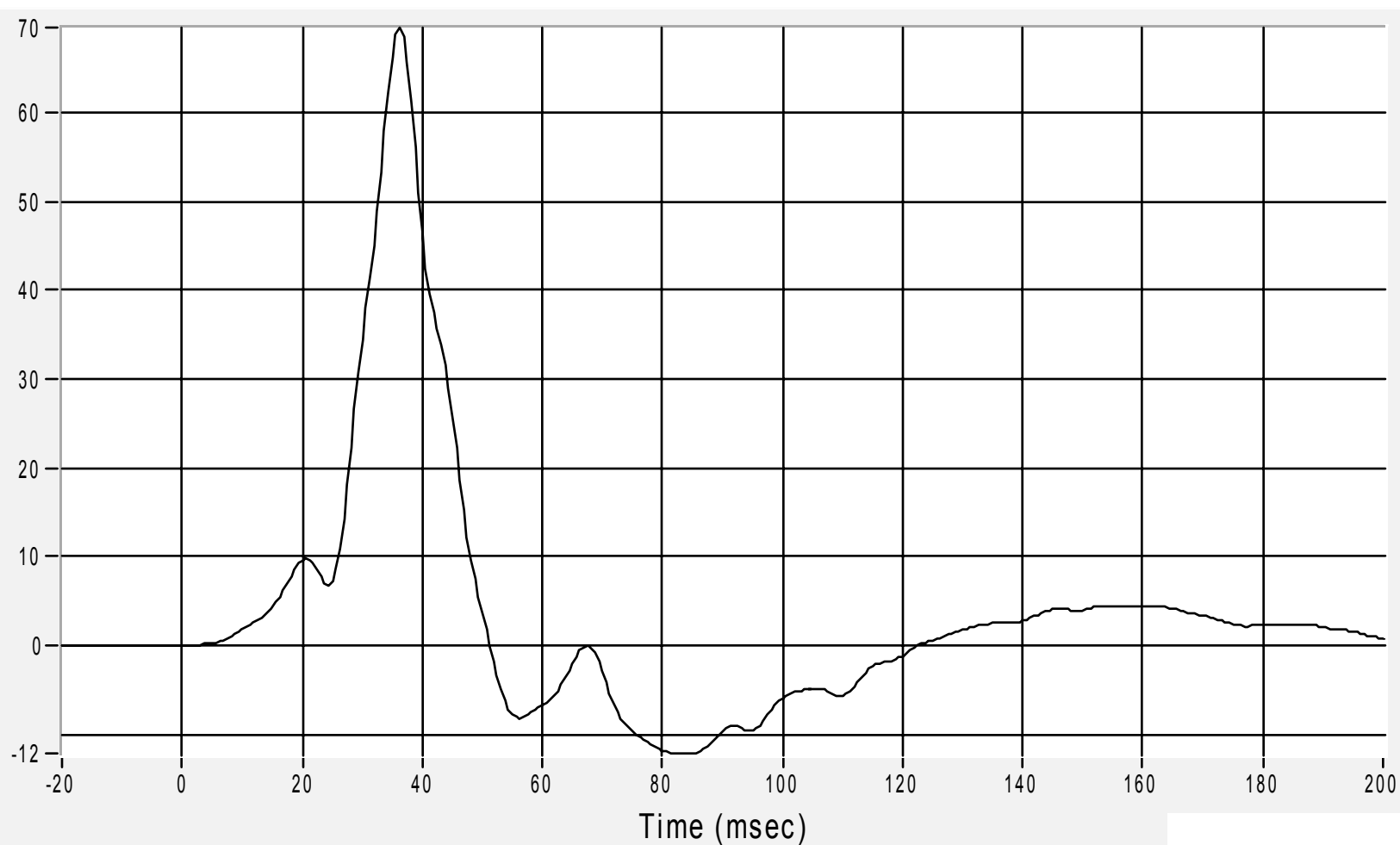
*Medical College of Wisconsin
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Passenger Pelvic (Y) - Redundant Acceleration

Acceleration (G's) FIR100

Max 69.6 G at 36.2 msec

Min -12.2 G at 84.4 msec



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22 January 2004

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	Page No.
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DUMMY INSPECTION LIST PRE AND POST TEST	C-4
	C-6

**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	Mark Meyer	N/A	N/A
LATERAL THORAX IMPACT TEST	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer
LATERAL PELVIS IMPACT TEST	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer
ABDOMINAL COMPRESSION	Pass all requirements	Mark Meyer	N/A	N/A
LUMBAR FLEXION	Pass all requirements	Mark Meyer	N/A	N/A
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 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	Mark Meyer	N/A	N/A
LATERAL THORAX IMPACT TEST	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer
LATERAL PELVIS IMPACT TEST	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer
ABDOMINAL COMPRESSION	Pass all requirements	Mark Meyer	N/A	N/A
LUMBAR FLEXION	Pass all requirements	Mark Meyer	N/A	N/A
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

Test Sequences

04 and 05

SID H3 058

TEST PARAMETER	SPECIFICATION	SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
MEASUREMENTS					
Date	-	19Jan04	28Jan04	19Jan04	28Jan04
Sequential Test Number	-	04	05	04	05
Temperature (°C)	18.9-25.5	20.4	19.6	20.6	19.8
Relative Humidity (%)	10-70	14.4	23.2	14.0	23.3
SH – Seated Height (mm)	889-909	908	908	908	908
RH – Rib Height (mm)	501-521	511	507	507	505
HP – Hip Pivot Height (mm)	99	99/99	99/99	99/99	99/99
RD – Rib From Back Line (mm)	229-241	229	229	229	229
KH – Knee Pivot from Back Line (mm)	511-526	519/517	520/526	521/520	521/525
KV – Knee Pivot to Floor (mm)	490-505	503/503	505/498	497/497	503/495
HW – Hip Width (mm)	356-391	365	366	357	357
THORAX IMPACTS					
Date	-	19Jan04	29Jan04	19Jan04	28Jan04
Sequential Test Number	-	04	05	04	05
Temperature (°C)	18.9-25.5	20.6	19.7	21.1	20.2
Relative Humidity (%)	10-70	13.5	24.2	13.9	23.7
Probe Speed (m/s)	4.21-4.33	4.29	4.27	4.27	4.27
Upper Rib Acceleration (G)	37-46	44.9	40.0	41.9	44.9
Lower Rib Acceleration (G)	37-46	44.7	39.2	40.9	44.6
Lower Spine Acceleration (G)	15-22	17.4	18.4	16.3	20.1
PELVIS IMPACTS					
Date	-	19Jan04	29Jan04	19Jan04	28Jan04
Sequential Test Number	-	04	05	04	05
Temperature (°C)	18.9-25.5	20.7	20.0	21.2	20.2
Relative Humidity (%)	10-70	13.6	24.8	14.0	24.0
Probe Speed (m/s)	4.21-4.33	4.27	4.29	4.27	4.27
Pelvis Acceleration (G)	40-60	56.9	45.6	51.2	49.2
THORACIC SHOCK ABSORBER					
Shock Absorber ID Number	-	1764	-	03130164	-
Damper Setting	1-10	6-1/4	-	5	-
Date	-	17Oct03	-	17Oct03	-
Sequential Test Number	-	01	-	01	-
Temperature	18.9-25.5	23.5	-	23.0	-
Relative Humidity	10-70	34.0	-	35.2	-
Probe Speed (m/s) Low	3.05	3.05	-	3.05	-
Force (N)	836 – 1125	896.7	-	1025.7	-
Displacement (mm)	30 – 35	31.2	-	30.1	-
Probe Speed (m/s) Middle	4.27	4.27	-	4.27	-
Force (N)	1730 – 2099	1815.9	-	2803.5	-
Displacement (mm)	32 – 37	34.8	-	33.2	-
Probe Speed (m/s) High	6.10	6.10	-	6.10	-
Force (N)	3741 – 4448	4116.2	-	4357.4	-
Displacement (mm)	33 - 40	37.2	-	36.2	-

TEST PARAMETER	SPECIFICATION	SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
ABDOMINAL COMPRESSION					
Date	-	12Oct03	-	12Oct03	-
Sequential Test Number	-	01	-	01	-
Temperature (°C)	18.9-25.5	23.0	-	22.2	-
Relative Humidity (%)	10-70	38.0	-	38.4	-
Force at 13 mm (N)	104-162	116.8	-	114.6	-
Force at 19 mm (N)	163-221	163.8	-	163.1	-
Force at 25 mm (N)	222-280	224.8	-	233.8	-
Force at 33 mm (N)	325-391	335.1	-	362.3	-
LUMBAR FLEXION					
Date	-	15Oct03	-	15Oct03	-
Sequential Test Number	-	01	-	01	-
Temperature (°C)	18.9-25.5	23.1	-	23.4	-
Relative Humidity (%)	10-70	35.4	-	35.4	-
Force at 0° (N)	0-26.7	0	-	0	-
Force at 0° (N)	97.8-151.2	113	-	116	-
Force at 0° (N)	151.2-204.6	152	-	174	-
Force at 0° (N)	204.6-258	217	-	211	-
Return Angle	12° Maximum	5	-	5	-
HYBRID III LATERAL NECK					
Date	-	16Jan04	27Jan04	17Jan04	27Jan04
Sequential Test Number	-	04	05	04	05
Temperature (°C)	18.9-25.5	20.8	20.2	20.8	20.5
Relative Humidity (%)	10-70	18.0	21.0	20.7	25.6
Pendulum Speed (m/s)	6.89-7.13	7.08	7.08	7.10	7.13
Pendulum Pulse 10ms (m/s)	1.96-2.55	2.29	2.45	2.29	2.13
Pendulum Pulse 20ms (m/s)	4.12-5.10	5.05	5.00	4.53	4.35
Pendulum Pulse 30ms (m/s)	5.73-7.01	6.93	7.01	6.69	6.42
Pendulum Pulse 40 –70 ms (m/s)	6.27-7.64	6.82	6.96	7.04	7.02
Max Head rotation (deg)	66-82	73.4	71.3	71.5	75.4
Head angle crosses zero (ms)	58-67	61.8	58.6	58.2	62.0
Peak Moment (Nm)	73-88	76.9	74.7	83.3	77.6
Moment crosses zero (ms)	49-64	49.4	50.8	49.4	50.7
Max rotation wrt peak moment (ms)	2-15	6.6	7.9	4.5	7.5
HYBRID III LATERAL HEAD DROP					
Date	-	15Jan04	26Jan04	15Jan04	26Jan04
Sequential Test Number	-	04	05	04	05
Temperature (°C)	18.9-25.5	20.2	20.1	20.5	20.0
Relative Humidity (%)	10-70	14.3	24.5	15.6	24.2
Resultant Max (G)	120-150	130.4	128.0	136.5	139.0
Longitudinal Max (G)	<15	11.6	5.6	14.0	5.1

**DUMMY INSPECTION LIST
PRE AND POST TEST**

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number

SID H3 056

Test Sequences

04 and 05

 SID H3 058

		SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
	Date	19Jan04	30Jan04	19Jan04	30Jan04
	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. 056**

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X ACCELERATION	J21551	ENDEVCO	20Aug03
HEAD Y ACCELERATION	J36659	ENDEVCO	29May03
HEAD Z ACCELERATION	J21466	ENDEVCO	29May03
SIX AXIS UPPER NECK LOAD CELL (FX, FY, FZ, MX, MY, MZ)	1591	DENTON ATD	7Apr03
UPPER RIB ACCELERATION	J43512	ENDEVCO	22Aug03
LOWER RIB ACCELERATION	J43444	ENDEVCO	22Aug03
LOWER SPINE ACCELERATION	J36603	ENDEVCO	07Aug03
PELVIS ACCELERATION	J43429	ENDEVCO	22Aug03
UPPER RIB REDUNDANT ACCELERATION	J43480	ENDEVCO	22Aug03
LOWER RIB REDUNDANT ACCELERATION	J43445	ENDEVCO	22Aug03
LOWER SPINE REDUNDANT ACCELERATION	J32665	ENDEVCO	07Aug03
PELVIS REDUNDANT ACCELERATION	J36617	ENDEVCO	07Aug03

REAR SID H3 NO. 058

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X ACCELERATION	P24628	ENDEVCO	08Sep03
HEAD Y ACCELERATION	P21689	ENDEVCO	20Aug03
HEAD Z ACCELERATION	P21704	ENDEVCO	05Sep03
SIX AXIS UPPER NECK LOAD CELL (FX, FY, FZ, MX, MY, MZ)	0452	DENTON	02Sep03
UPPER RIB ACCELERATION	J43513	ENDEVCO	22Aug03
LOWER RIB ACCELERATION	J43481	ENDEVCO	22Aug03
LOWER SPINE ACCELERATION	J43473	ENDEVCO	22Aug03
PELVIS ACCELERATION	J43434	ENDEVCO	22Aug03
UPPER RIB REDUNDANT ACCELERATION	J43479	ENDEVCO	22Aug03
LOWER RIB REDUNDANT ACCELERATION	J43475	ENDEVCO	22Aug03
LOWER SPINE REDUNDANT ACCELERATION	J343491	ENDEVCO	22Aug03
PELVIS REDUNDANT ACCELERATION	J43433	ENDEVCO	22Aug03

VEHICLE INSTRUMENTATION

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL X	P19287	ENDEVCO	22Apr03
RIGHT FRONT SILL Y	P19385	ENDEVCO	05Sep03
RIGHT FRONT SILL Z	P22522	ENDEVCO	21Aug03
RIGHT REAR SILL X	P18288	ENDEVCO	05Sep03
RIGHT REAR SILL Y	P25033	ENDEVCO	05Sep03
RIGHT REAR SILL Z	P21580	ENDEVCO	05Sep03
REAR FLOORPAN ABOVE AXLE X	98G98E11-K02	ENTRAN	08Sep03
REAR FLOORPAN ABOVE AXLE Y	98B98A26-D05	ENTRAN	29May03
REAR FLOORPAN ABOVE AXLE Z	98G98D22-Z04	ENTRAN	23May03
LEFT REAR SILL Y	P24165	ENDEVCO	22Aug03
LEFT FRONT SILL Y	P22230	ENDEVCO	08Sep03
LEFT FRONT DOOR CENTERLINE Y	P13837	ENDEVCO	05Sep03
RIGHT REAR OCCUPANT COMP Y	P22041	ENDEVCO	05Sep03
MID-REAR OF LEFT FRONT DOOR Y	98H98H-F53	ENTRAN	21Aug03
LEFT FRONT DOOR UPPER C/L Y	P22794	ENDEVCO	22Aug03
MID-REAR OF LEFT REAR DOOR Y	P25036	ENDEVCO	22Aug03
LEFT REAR DOOR UPPER C/L Y	P21732	ENDEVCO	20Aug03
LEFT LOWER B-PILLAR Y	P24556	ENDEVCO	08Sep03
LEFT MIDDLE B-PILLAR Y	P21661	ENDEVCO	20Aug03
LEFT LOWER A-PILLAR Y	P22993	ENDEVCO	05Sep03
LEFT UPPER A-PILLAR	P13835	ENDEVCO	05Sep03
FRONT SEAT TRACK Y	P14233	ENDEVCO	03Feb03
REAR SEAT TRACK Y	P18295	ENDEVCO	05Sep03
VEHICLE CG X	P22978	ENDEVCO	19Apr03
VEHICLE CG Y	P22350	ENDEVCO	07Aug03
VEHICLE CG Z	P22312	ENDEVCO	27May03

MDB INSTRUMENTATION

MDB CG X	P24089	ENDEVCO	05Sep03
MDB CG Y	P24733	ENDEVCO	03Sep03
MDB CG Z	P23595	ENDEVCO	29May03
MDB REAR FRAME MEMBER X	P13842	ENDEVCO	19Mar03
MDB REAR FRAME MEMBER Y	J43479	ENDEVCO	22Aug03