

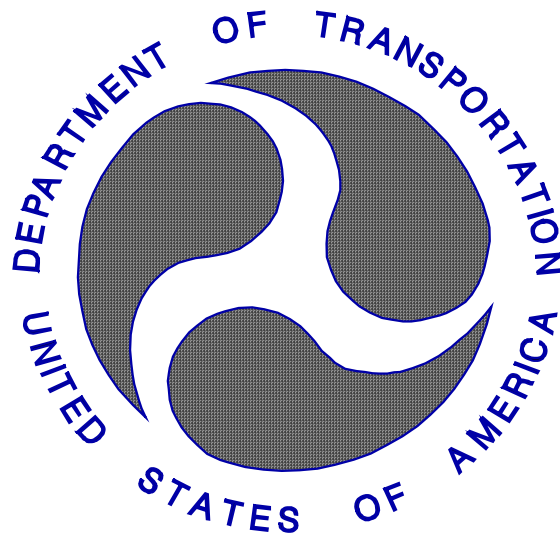
REPORT NO. MCW-DOT-03SN07

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING**

TOYOTA MOTOR CORPORATION
2003 TOYOTA HIGHLANDER MPV

NHTSA NUMBER: TO 5101

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



28 FEBRUARY 2003

FINAL REPORT

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

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

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16. Abstract A 55/28 km/h 90° Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2003 Toyota Highlander 4 Door MPV 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 28 February 2003. The impact velocity of the Moving Deformable Barrier (MDB) was 62.1 km/h, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 23° C. The target vehicle post-test maximum crush was 332 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 align="center">33.0</td><td align="center">41.7</td></tr> <tr> <td>Left Lower Rib Acceleration G</td><td align="center">30.1</td><td align="center">47.6</td></tr> <tr> <td>Lower Spine Acceleration G</td><td align="center">37.9</td><td align="center">49.5</td></tr> <tr> <td>Thoracic Trauma Index TTI</td><td align="center">35</td><td align="center">49</td></tr> <tr> <td>Pelvis Acceleration G</td><td align="center">52</td><td align="center">103</td></tr> </tbody> </table> The left rear door latch on the struck side of the vehicle separated from the striker post during the impact event. The left front door and opposite side doors did not separate from the body at the hinges or latches. The door was jammed shut and the door opening at the latch lever was 4 7/8 inches wide.					<u>DRIVER</u>	<u>PASSENGER</u>	Left Upper Rib Acceleration G	33.0	41.7	Left Lower Rib Acceleration G	30.1	47.6	Lower Spine Acceleration G	37.9	49.5	Thoracic Trauma Index TTI	35	49	Pelvis Acceleration G	52	103
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17. Key Words New Car Assessment Program (NCAP) Side Impact MDB Side Impact Dummy (SID H3) NHTSA No. TO 5101		18. Distribution Statement Copies of this report are available from: 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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TABLE OF CONTENTS

Section		Page No.
1	PURPOSE AND TEST PROCEDURE	1-1
2	SUMMARY OF SIDE IMPACT TEST	2-1
3	SUMMARY OF TEST RESULTS	3-1
	Data Sheet 1 – General Vehicle Test Parameter Data	3-2
	Data Sheet 2 – Test Vehicle Summary	3-5
	Data Sheet 3 – Moving Deformable Barrier (MDB) Summary	3-6
	Data Sheet 4 – Post-Test Observations	3-7
4	OCCUPANT AND VEHICLE INFORMATION	4-1
	Data Sheet 5 – SID H3 Instrumentation Data	4-2
	Data Sheet 6 – Vehicle Pre- and Post-Measurements	4-4
	Data Sheet 7 – SID H3 Longitudinal Clearance Dimensions	4-5
	Data Sheet 8 – SID H3 Lateral Clearance Dimensions	4-6
	Data Sheet 9 – Vehicle Side Measurements	4-7
	Data Sheet 10 – Vehicle Exterior Crush Profiles – All Levels	4-8
	Data Sheet 11 – Vehicle Damage Profile Distances	4-14
	Data Sheet 12 – Static Crush of Impactor Face	4-15
	Data Sheet 13 – Test Vehicle Accelerometer and Data Summary	4-17
	Data Sheet 14 – MDB Accelerometer Locations and Data Summary	4-20
	Data Sheet 15 – High-Speed Camera Locations and Data	4-21
5	VEHICLE FUEL SYSTEM INTEGRITY	5-1
	Data Sheet 16 – FMVSS 301 Fuel System Integrity Data	5-2
	Data Sheet 17 – FMVSS 301 Rollover Data	5-3
	APPENDIX A PHOTOGRAPHS	A-1
	APPENDIX B VEHICLE, MDB, AND SID H3 RESPONSE DATA	B-1
	APPENDIX C SID H3 CONFIGURATION AND VERIFICATION RESULTS	C-1
	APPENDIX D TEST EQUIPMENT LIST AND CALIBRATION INFORMATION	D-1

SECTION 1

PURPOSE AND TEST PROCEDURE

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

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

SECTION 2

SUMMARY OF SIDE IMPACT TEST

A 2003 Toyota Highlander 4 Door MPV was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) that was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.1 km/h (38.6 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 28 February 2003.

Two restrained Side Impact Hybrid III Dummies (SID H3's) were placed in the driver and left rear designated seating positions, according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated May 1999. The side impact event was documented by five high-speed video cameras, four high-speed cine 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) uniaxial accelerometer (Y-direction)
2. Left Lower Rib (LLR) uniaxial accelerometer (Y-direction)
3. Lower Thoracic Spine (T₁₂) uniaxial accelerometer (Y-direction)
4. Pelvic (PEV) section uniaxial accelerometer (Y-direction)
5. Head Center of Gravity triaxial accelerometers (X-, Y-, and Z-direction)
6. Upper Neck (NKU) six axis load cell (Fx, Fy, Fz, Mx, My, and Mz)

Pre- and post-test photographs of the test vehicle, the MDB, and the 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)	35	49
PELVIS (G)	52	103
HIC36	149.3	442.3

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				2003 Toyota Highlander 4 Door MPV			
Vehicle NHTSA NO.		TO 5101		VIN		JTEHF21A630124567	
Vehicle Body Color		White		Build Date		December 2002	
Engine Data	<u>6</u>	Cylinders	<u> </u> CID	<u>3.0</u>	Liter	<u> </u>	cc
Placement	<u> </u>	Longitudinal	<u>X</u> Lateral				
Transmission	<u>4</u>	Speed	<u> </u> Manual	<u>X</u>	Automatic	<u>X</u>	Overdrive
Final Drive	<u> </u>	Rear Wheel Drive	Front Wheel Drive	<u>X</u>	Four Wheel Drive		
Odometer Reading	<u>23 miles</u>	Date	<u>05 February 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	

DATA FROM TIRE PLACARD:

Tire Pressure (at Capacity)	<u>30</u>	PSI Front
	<u>30</u>	PSI Rear
Recommended Tire Size	<u>P225 70 R16</u>	
Tires on Test Vehicle	<u>P225 70 R16</u>	Manufacturer <u>Bridgestone</u>

TEST VEHICLE AIRBAG INFORMATION:

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

VEHICLE CAPACITY DATA:

Number of Occupants:	<u>2</u>	Front	<u>3</u>	Rear	<u> </u>	3 rd Seat	<u>5</u>	Total
Type of Front Seats	<u>X</u>	Bucket	<u> </u>	Bench	<u> </u>	Split Bench		
Type of Front Seat Back	<u> </u>	Fixed	<u>X</u>	Adjustable w/	<u>X</u>	Lever	<u> </u>	Knob
Vehicle Max Capacity Loading	<u>419.6</u>				kg	(A)		
No. of Occupants X 68.04 kg	<u>340.2</u>				kg	(B)		
Cargo Capacity (A) – (B)	<u>79.4</u>				kg			

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front	=	<u>514.8</u>	kg	Left Rear	=	<u>379.7</u>	kg
Right Front	=	<u>511.2</u>	kg	Right Rear	=	<u>365.1</u>	kg
TOTAL FRONT	=	<u>1026</u>	kg	TOTAL REAR	=	<u>744.8</u>	kg
% Total Weight	=	<u>57.9</u>	%	%Total Weight	=	<u>42.1</u>	%
TOTAL WEIGHT	=	<u>1770.8</u>	kg				

DATA SHEET 1 (continued)**GENERAL VEHICLE TEST PARAMETER DATA**Vehicle: 2003 Toyota Highlander 4 Door MPVNHTSA No. TO 5101CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Max Fluids	=	<u>1770.8</u>	kg	(A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>79.4</u>	kg	(B)
Weight of (2) instrumented Side Impact Dummies	=	<u>161.5</u>	kg	(C)
TEST VEHICLE TARGET WEIGHT	=	<u>2011.7</u>	kg	(A+B+C)

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

Left Front	=	<u>561.5</u>	kg	Left Rear	=	<u>491.2</u>	kg
Right Front	=	<u>509.8</u>	kg	Right Rear	=	<u>449.2</u>	kg
TOTAL FRONT	=	<u>1071.3</u>	kg	TOTAL REAR	=	<u>940.4</u>	kg
% Total Weight	=	<u>53.3</u>	%	%Total Weight	=	<u>46.7</u>	%
TOTAL WEIGHT	=	<u>2011.7</u>	kg				

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

Left Front	=	<u>558.4</u>	kg	Left Rear	=	<u>489.9</u>	kg
Right Front	=	<u>508</u>	kg	Right Rear	=	<u>448.6</u>	kg
TOTAL FRONT	=	<u>1066.4</u>	kg	TOTAL REAR	=	<u>938.5</u>	kg
% Total Weight	=	<u>53.1</u>	%	%Total Weight	=	<u>46.9</u>	%
TOTAL WEIGHT	=	<u>2004.9</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED

Left Front	<u>840</u>	Right Front	<u>836</u>	Left Rear	<u>834</u>	Right Rear	<u>837</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

FULLY LOADED

Left Front	<u>826</u>	Right Front	<u>830</u>	Left Rear	<u>799</u>	Right Rear	<u>805</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

AS TESTED

Left Front	<u>831</u>	Right Front	<u>835</u>	Left Rear	<u>801</u>	Right Rear	<u>808</u>
------------	------------	-------------	------------	-----------	------------	------------	------------

Test Vehicle Wheelbase 2715 mmAs Tested CG = 1273 mm rearward of front wheel centerlineTOTAL VEHICLE LENGTH:

Right Side	=	<u>4352</u>	mm
Left Side	=	<u>4352</u>	mm
Centerline	=	<u>4663</u>	mm

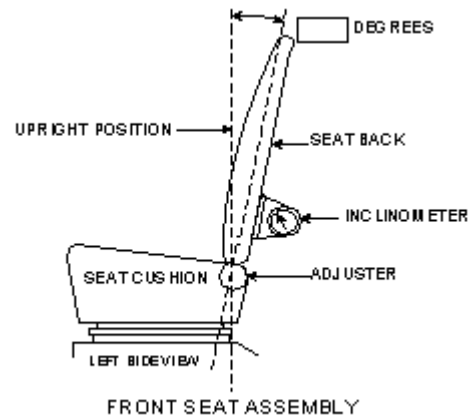
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

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			<u>241 mm</u>
Total Number of Detents	<u>N/A</u>	Test Position	<u>Mid-position</u>

FRONT SEAT BACK ADJUSTMENT:

Seat Back Angle	<u>5.3 degrees measured at headrest</u>
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REAR SEAT POSITION:

Total Length Fore/Aft Adjustment	<u>N/A</u>
Seat Back Adjustment Position	<u>N/A</u>

ADJUSTABLE STEERING COLUMN POSITION:

<u>Mid-position</u>

WINDOW POSITIONS:

Left Front	<u>Up</u>	Right Front	<u>Down</u>
Left Rear	<u>Up</u>	Right Rear	<u>Down</u>

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel System usable Capacity	<u>75.0 L.</u>	
Test Volume	<u>69.7 L</u>	<u>92.9% usable capacity</u>

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

Wheelbase	<u>2715 mm</u>	
Impact Point is	<u>418 mm rearward</u>	of front axle centerline
Actual Impact Point is	<u>407 mm rearward</u>	of front axle centerline

DATA SHEET 2
TEST VEHICLE SUMMARY

VEHICLE IDENTIFICATION:

Year/Make/Model/Body Style	2003 Toyota Highlander MPV		
Body Color	White	VIN	JTEHF21A630124567
NHTSA No.	TO 5101	Test Date	28 February 2003
Overall Length	4663 mm	Overall Width	1821 mm

VEHICLE TEST WEIGHT:

Left Front	=	558.4	kg	Left Rear	=	489.9	kg
Right Front	=	508.0	kg	Right Rear	=	448.6	kg
TOTAL FRONT	=	1066.4	kg	TOTAL REAR	=	938.5	kg
% Total Weight	=	53.1	%	%Total Weight	=	46.9	%
TOTAL WEIGHT	=	2004.9	kg				
Wheelbase				=		2715 mm	
Longitudinal CG from Center of Front Axle				=		1273 mm	
Impact Angle with Respect to Impactor				=		90°	

ACTUAL IMPACT POINT

Impact is 11 mm forward and 6 mm below impact point

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1	(381 mm above ground)	=	180	mm
2. LEVEL 2	(693 mm above ground)	=	330	mm
3. LEVEL 3	(754 mm above ground)	=	332	mm
4. LEVEL 4	(1108 mm above ground)	=	205	mm
5. LEVEL 5	(1564 mm above ground)	=	30	mm

Maximum Post-Test intrusion at Level 3 is 332 mm

OCCUPANTS

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

INSTRUMENTATION:

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

DATA SHEET NO. 3

MOVING DEFORMABLE BARRIER (MDB) SUMMARY

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

MDB FACE MANUFACTURER AND SERIAL NUMBER:

Plascore Serial Number 087C1002 143A0802

POSITION OF IMPACT (MDB) ON TOW SYSTEM

Crabbed 27° to the left

MDB DETAILS:

Overall Width of Framework Carriage	=	<u>1250 mm</u>
Overall Length of MDB (incl. honeycomb impact face)	=	<u>4116 mm</u>
Wheelbase of Framework Carriage	=	<u>2578 mm</u>
Tread of Framework Carriage (Front & Rear)	=	<u>1880 mm</u>
C.G. Location Rearward of Front Axle	=	<u>1109.3 mm</u>
C.G. Location From Center Line	=	<u>-1.9 mm</u>
C.G. Location Above Ground Level	=	<u>477.2 mm</u>

MDB WEIGHT:

Left Front	=	<u>495.2</u>	kg	Left Rear	=	<u>184.8</u>	kg
Right Front	=	<u>278</u>	kg	Right Rear	=	<u>399.2</u>	kg
TOTAL FRONT	=	<u>773.2</u>	kg	TOTAL REAR	=	<u>584</u>	kg
% Total Weight	=	<u>57.0</u>	%	%Total Weight	=	<u>43.0</u>	%
TOTAL WEIGHT	=	<u>1357.2</u>	kg				

MDB IMPACT:

Impact Angle (MDB C/L to Target Vehicle)		<u>270°</u>	
Impact Speed	Primary	<u>62.1 km/h</u>	<u>38.6 mph</u>
	Secondary	<u>61.9 km/h</u>	<u>38.5 mph</u>
	On-Board	<u>61.9 km/h</u>	<u>38.5 mph</u>

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A Center of Bumper	=	<u>211</u>	mm
2. Row B Top of Bumper	=	<u>125</u>	mm
3. Row C Mid-Level	=	<u>110</u>	mm
4. Row D Top of Stack	=	<u>145</u>	mm

INSTRUMENTATION:

Number of MDB Data Channels = 5

DATA SHEET NO. 4**POST-TEST OBSERVATIONS**Vehicle: 2003 Toyota Highlander 4 Door MPVNHTSA No. TO 5101VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID H3</u>	<u>LEFT REAR SID H3</u>
Head	<u>Back of head strike at D-ring</u>	<u>200 mm from upper C-pillar at window frame</u>
Upper Torso	<u>740 mm from upper A-pillar at top of door</u>	<u>20 mm from top of door, 100 mm from upper C-pillar</u>
Lower Torso	<u>680 mm from upper A-pillar at top of armrest</u>	<u>Corner of armrest, 140 mm from upper C-pillar</u>
Left Knee	<u>220 mm from upper A-pillar, 280 mm from top of door</u>	<u>168 mm from upper C-pillar</u>
Left Leg	<u>240 mm from upper A-pillar, 290 mm from top of door</u>	<u>270 mm from upper C-pillar</u>

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal	<u>11 mm below</u>	Vertical	<u>6 mm forward</u>
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ARM REST LOCATIONS:

Front	<u>210 mm below window sill</u>
Rear	<u>250 mm below window sill</u>

SEAT MOVEMENT:

Front	<u>Seat cushion crush: ~21 mm; Seatback: ~10 mm</u>
Rear	<u>Seat cushion crush: ~70 mm; Seatback: ~45 mm</u>

GLAZING DAMAGE

Windshield	<u>None</u>
Window	<u>Left rear window shattered at impact</u>

PILLAR PERFORMANCE:

<u>None noted</u>

SILL SEPARATION

<u>None noted</u>

AIRBAG DEPLOYMENT STATUS:

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

OTHER NOTABLE IMPACT EFFECTS:

<u>Left rear door separated from latch during impact event. Gap at top of window was 305 mm measured post-test.</u>

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5

SID H3 INSTRUMENTATION DATA

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

	Front Dummy ID SID H3/058				Rear Dummy ID SID H3/056			
	Max		Min		Max		Min	
	G's	msec	G's	msec	G's	msec	G's	msec
HEAD ACCELERATIONS								
Longitudinal (X)	6.4	142.2	-15.5	81.0	38.4	184.6	-15.8	103.7
Lateral (Y)	21.9	77.1	-5.8	38.6	44.5	102.3	-34.0	184.5
Vertical (Z)	37.2	60.2	-1.5	22.2	51.7	81.2	-8.2	63.4
Resultant (R)	41.2	60.0			53.9	81.3		
HIC36	149.3				442.3			
RIB ACCELERATIONS								
Upper Rib Lateral (Y)	33.0	50.0	-9.4	87.5	41.7	60.6	-3.1	98.1
Upper Rib Lateral (Y _R)	32.5	50.0	-9.4	87.5	41.5	60.6	-3.0	98.1
Lower Rib Lateral (Y)	30.1	41.2	-7.8	89.4	47.6	51.2	-5.4	113.8
Lower Rib Lateral (Y _R)	29.9	41.2	-7.6	88.8	46.9	51.2	-5.1	113.8
SPINE ACCELERATIONS								
Lower Lateral (Y)	37.9	44.4	-8.2	58.1	49.5	47.5	-6.6	103.1
Lower Lateral (Y _R)	37.5	32.5	-8.4	58.1	49.3	47.5	-6.6	103.1
PELVIS ACCELERATIONS								
Lateral (Y)	51.7	35.0	-11.2	61.9	102.9	43.1	-11.8	72.5
Lateral (Y _R)	51.1	35.0	-11.0	62.5	101.5	43.1	-13.0	71.2

REFERENCE:

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

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

Head Accelerations have been filtered at SAE Class 1000

Y_R denotes redundant Y-direction accelerometer

DATA SHEET 5 (continued)

SID H3 INSTRUMENTATION DATA

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

	Front Dummy ID SID H3/058				Rear Dummy ID SID H3/056			
	Max		Min		Max		Min	
	N	msec	N	msec	N	msec	N	msec
NECK FORCES								
Longitudinal (X)	58.7	47.6	-578.7	82.6	83.3	63.8	-594.7	81.4
Lateral (Y)	792.8	76.2	-212.9	38.5	861.5	105.4	-423.2	54.3
Vertical (Z)	1606.1	60.2	-55.8	22.6	2212.8	81.4	-277.0	111.2
NECK MOMENTS								
	Nm	msec	Nm	msec	Nm	msec	Nm	msec
Lateral Bending (X)	65.7	70.2	-45.8	45.2	41.8	87.0	-69.0	64.0
Flexion/Extension (Y)	33.5	91.3	-21.3	59.8	16.3	116.6	-30.4	79.2
Rotation (Z)	15.7	77.1	-8.2	39.8	19.3	117.3	-8.9	69.2

REFERENCE:

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

Force

Fx positive response: Head rearward, chest forward

Fy positive response: Head leftward, chest rightward

Fz positive response: Head upward, chest downward

Moment

Mx positive response: Left ear to left shoulder

My positive response: Chin to sternum

Mz positive response: Chin to left shoulder

Neck forces have been filtered at SAE Class 1000

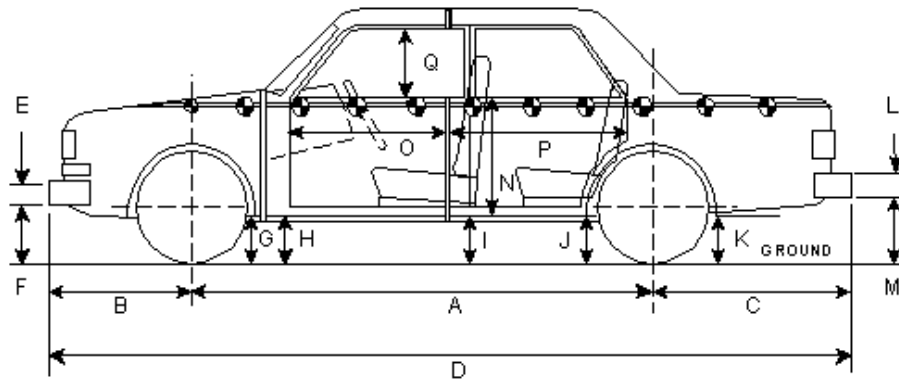
Neck moments have been filtered at SAE Class 600

DATA SHEET 6

VEHICLE PRE- AND POST- MEASUREMENTS

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



LEFT SIDE VIEW

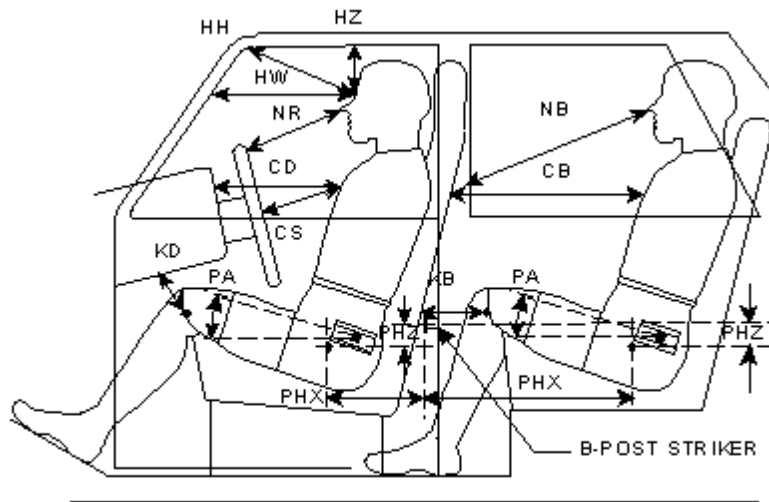
	PRE-TEST As delivered (mm)	PRE-TEST As Tested (mm)	POST-TEST (mm)	Δ CHANGE (mm)
A	2715	-	2692	-23
B	744	-	747	3
C	893	-	873	-20
D	4663	-	4685	22
E	211	-	212	1
F	470	473	482	9
G	328	316	330	14
H	330	318	348	30
I	351	337	370	33
J1	266	240	270	30
J2	328	304	355	51
K	378	343	333	-10
L	228	-	228	0
M	444	398	406	8
N	800	-	694	-106
O	1045	-	1006	-39
P	896	-	793	-103
Q	491	-	482	-9
R	4352	-	4354	2
S	4352	-	4312	-40
T	1821	-	1567	-254

DATA SHEET 7

SID H3 LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



LEFT SIDE VIEW

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

	DRIVER ID SID H3/ 058	LEFT REAR PASSENGER ID SID H3/ 056
HH	463	-
HW	789	-
HZ	228	241
NR/NB	513	625
CD/CB	585	553
CS	388	-
KDL(KDA°)/KBL(KDA°)	156/20	238/14
KDR(KDA°)/KBR(KDA°)	165/20	241/11
PA°	23.2°	23.2°
PHX	2484	1544
PHZ	10	-44

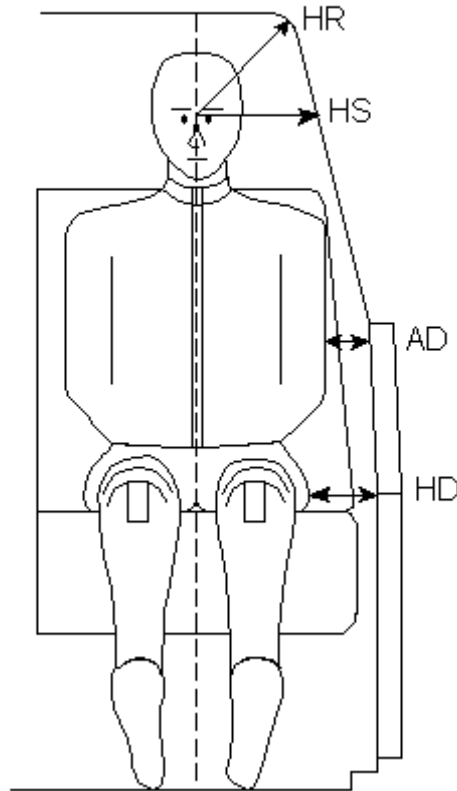
PHX and PHZ referenced from middle of test vehicle's rear bumper

DATASHEET 8

SID H3 LATERAL CLEARANCE DIMENSIONS

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



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

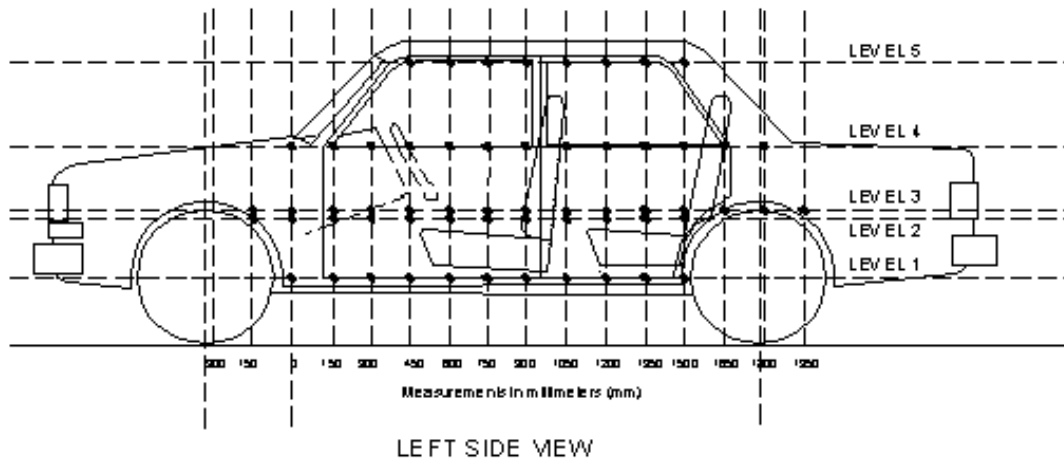
	DRIVER ID SID H3/ 058		LEFT REAR PASSENGER ID SID H3/ 056	
HR	251		265	
HS	339		363	
AD	Upper 112	Lower 56	Upper 145	Lower 134
HD	205		202	

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



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	1564 mm
Level 4 @ Window Sill	1108 mm
Level 3 @ Mid-Door	754 mm
Level 2 @ Occupant H-Point	693 mm
Level 1 @ Axle Centerline or Sill Top Height	381 mm

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES – ALL LEVELS

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

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	381	PRE								231	244	245	245	245	245	245	246	246	247	242	231									
		POST								354	407	419	421	424	425	425	425	425	412	403	364									
		CRUSH								123	163	174	176	179	180	180	179	179	165	161	133									
LEVEL 2	693	PRE	175						158	161	160	160	160	161	161	164	168	171	173	171	167	161								
		POST	183						258	350	408	424	437	452	468	479	478	501	492	468	397	274								
		CRUSH	8						100	189	248	264	277	291	307	315	310	330	319	297	230	113								
LEVEL 3	754	PRE	181	162					162	165	168	169	168	167	166	166	167	169	171	169	165	162	157				158	173	186	
		POST	192	176					266	357	418	440	456	470	479	470	479	501	491	467	396	288	255				215	209	212	
		CRUSH	11	14					104	192	250	271	288	303	313	304	312	332	320	298	231	126	98				57	36	26	
LEVEL 4	1108	PRE	308	289	275	265	255	246	240	241	240	231	229	227	226	227	228	229	231	234	237	240	243	249	256	261	273	288		
		POST	305	291	286	283	278	270	262	268	276	281	293	306	327	351	405	434	358	289	242	185	143	291	283	277	278	290		
		CRUSH	-3	2	11	18	23	24	22	27	36	50	64	79	101	124	177	205	127	55	5	-55	-100	42	27	16	5	2		
LEVEL 5	1564	PRE											434	441	449	452	453	455	456	457	458	459	459	459	458	455	453			
		POST											453	463	469	475	483	482	477	474	473	470	4680	466	465	459	456			
		CRUSH											19	22	20	23	30	27	21	17	15	11	9	7	7	4	3			

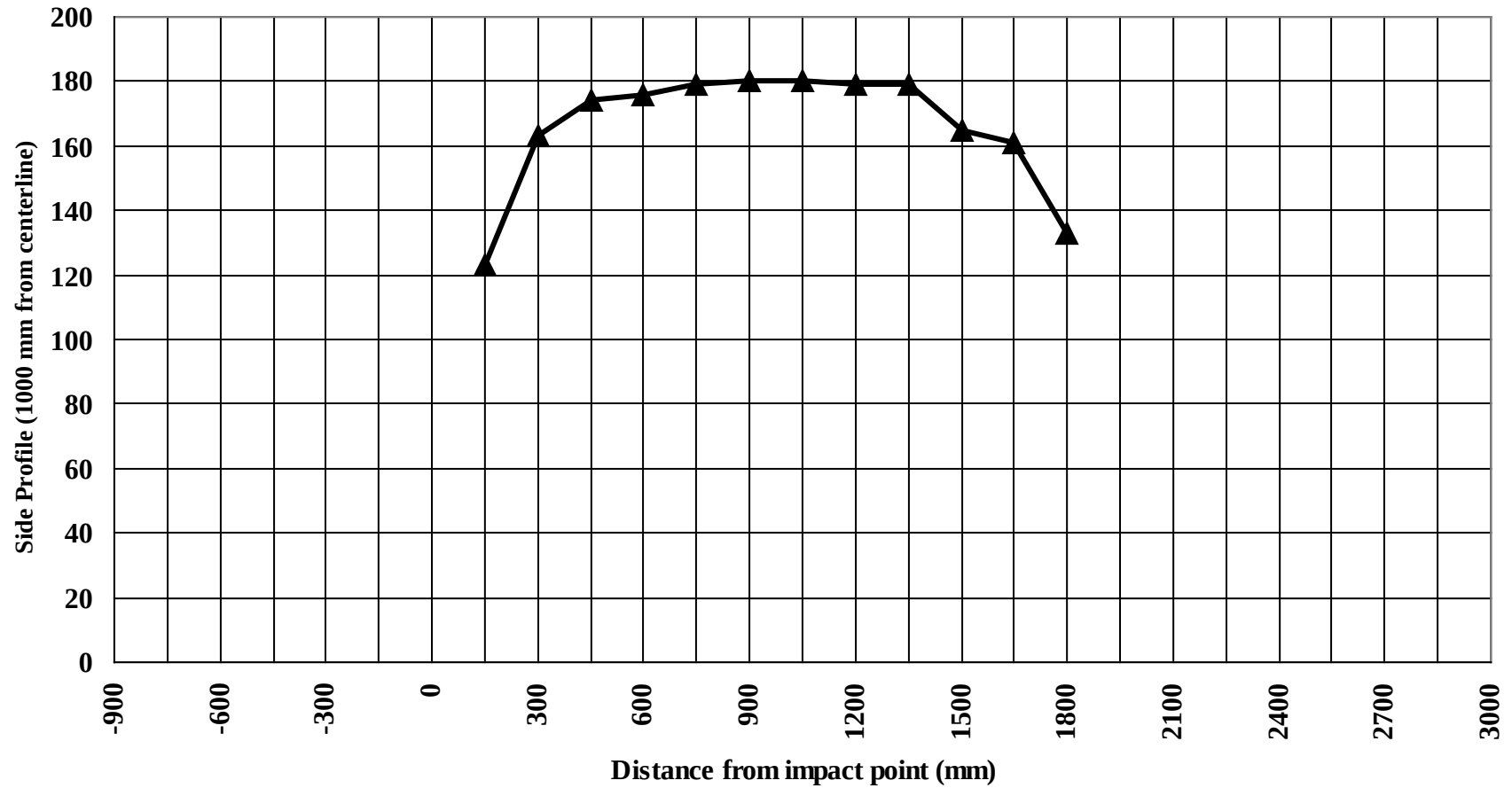
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

SIDE PROFILE LEVEL 1 -381 mm above ground



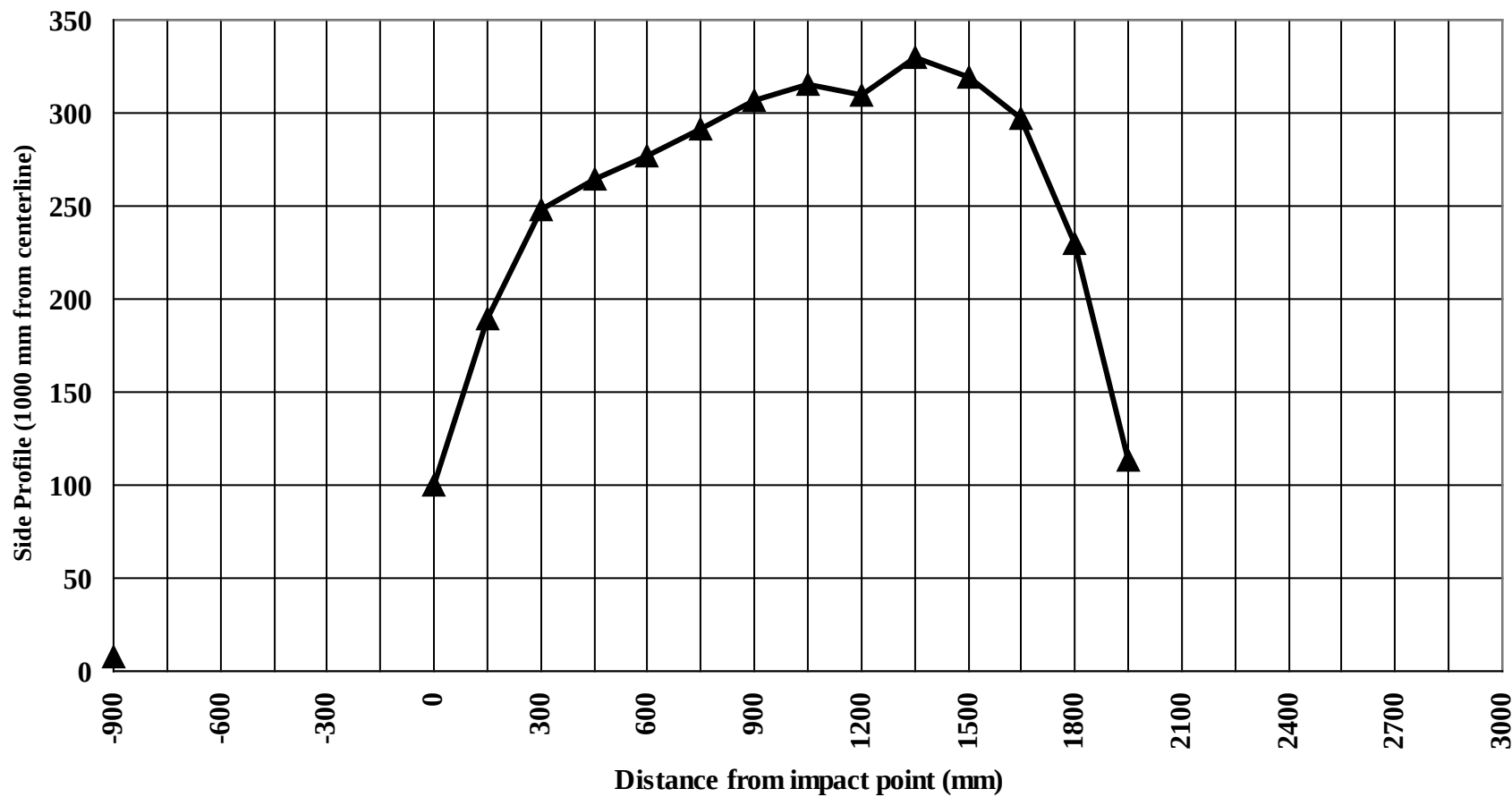
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

SIDE PROFILE LEVEL 2 - 693 mm above ground



DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

SIDE PROFILE LEVEL 3 - 754 mm above ground



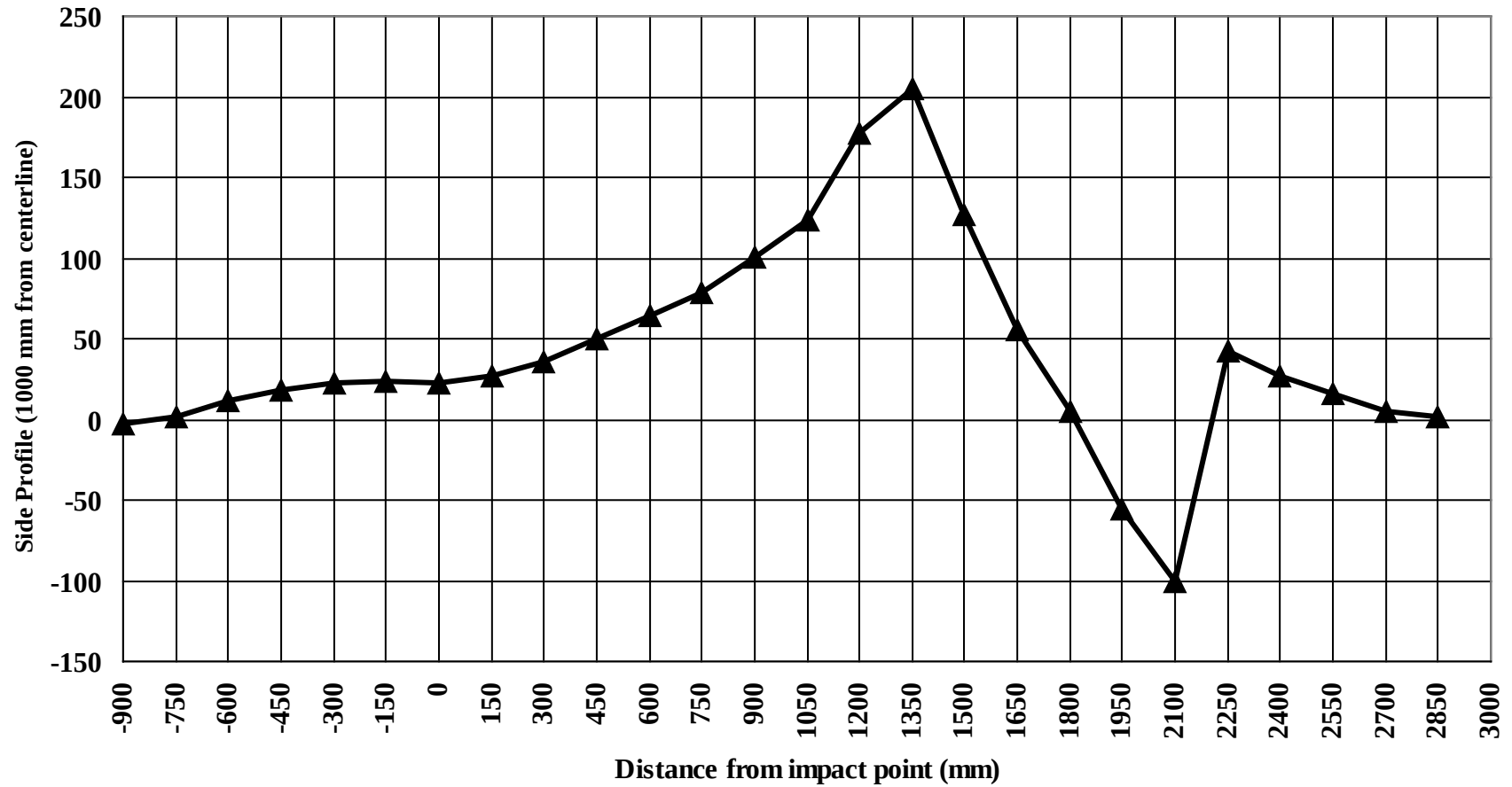
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

SIDE PROFILE LEVEL 4 - 930 mm above ground



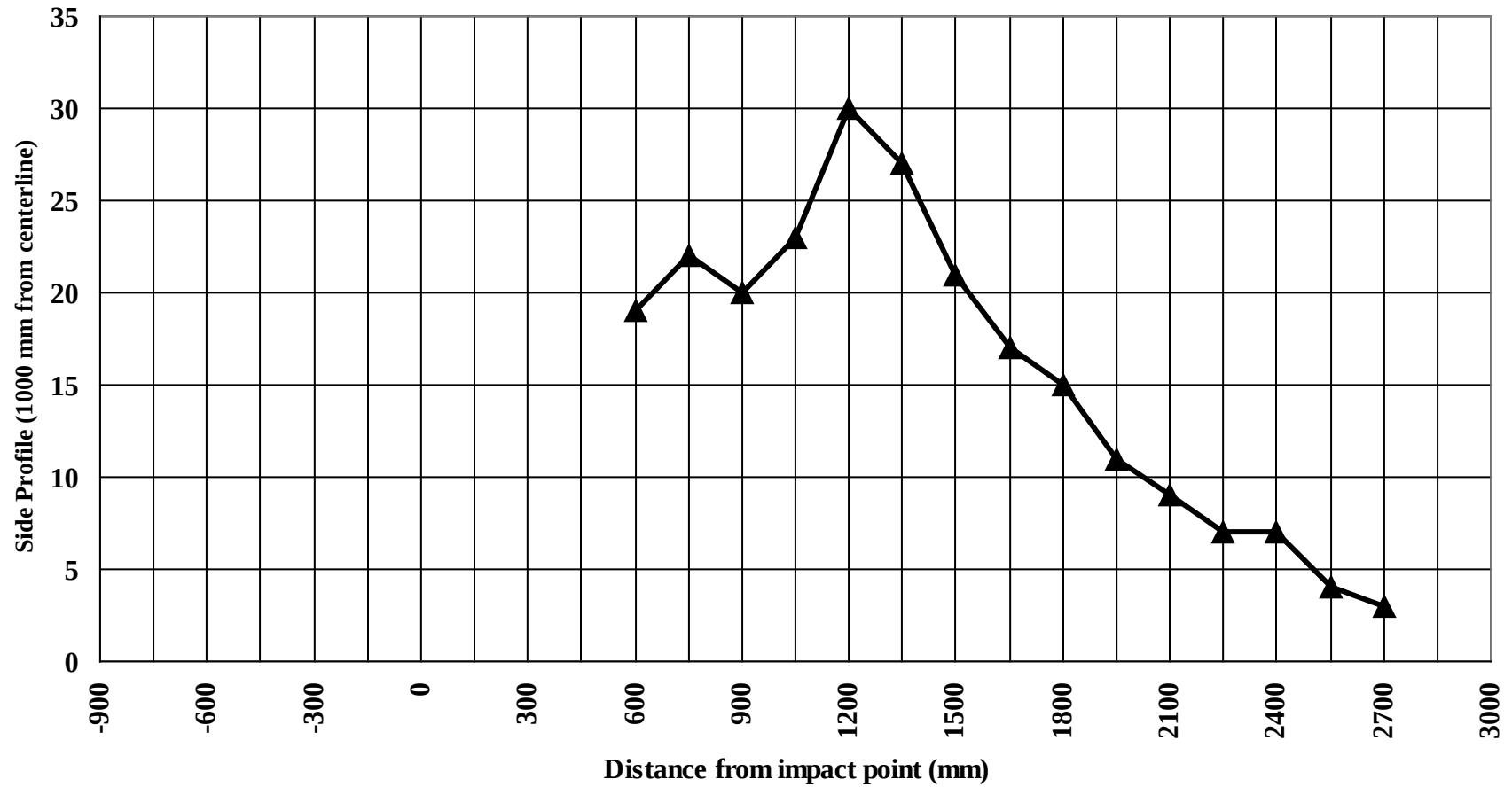
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

SIDE PROFILE LEVEL 5 - 1933 mm above ground

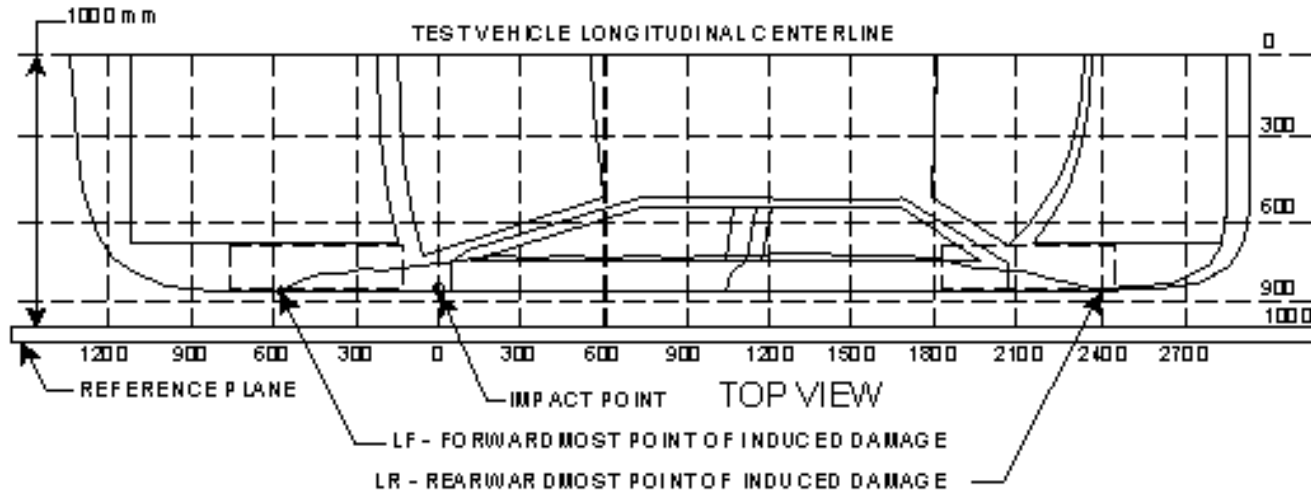


DATA SHEET 11

VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



DPD MEASUREMENTS (mm)		POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1	-450	175	175	0
2	180	362	181	181
3	810	453	186	267
4	1440	498	194	304
5	2070	260	201	59
6	2700	210	210	0

DATA SHEET 12

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

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

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

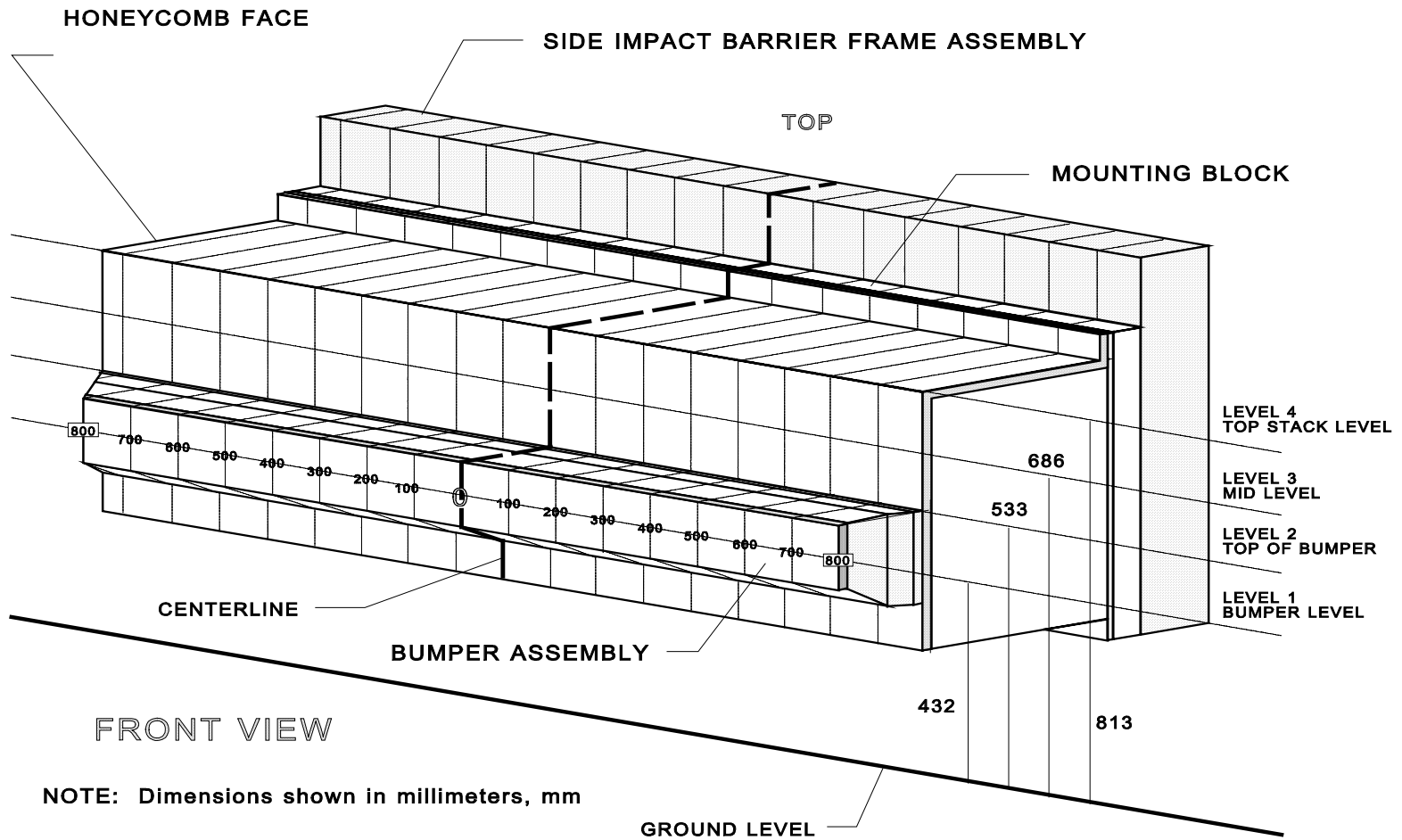
LEVEL	HEIGHT AT CL (mm)		DISTANCE LEFT OF CENTER								0	DISTANCE RIGHT OF CENTER							
			800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
LEVEL 4 TOP STACK	810	PRE-	526	526	527	527	528	529	529	529	530	530	531	533	534	534	534	535	535
		POST-	585	560	535	533	546	597	597	580	568	565	570	574	594	594	606	638	680
		CRUSH	59	34	8	6	18	68	68	51	38	35	39	41	60	60	72	103	145
LEVEL 3 MID- LEVEL	685	PRE-	524	524	525	525	526	527	527	527	528	529	529	530	531	531	532	532	533
		POST-	595	569	552	550	554	580	580	569	563	567	562	562	575	575	587	610	643
		CRUSH	71	45	27	25	28	53	53	42	35	38	33	32	44	44	55	78	110
LEVEL 2 TOP BUMPER	560	PRE-	522	522	522	522	523	524	524	524	525	526	527	527	529	529	529	530	530
		POST-	647	638	638	630	623	605	605	603	606	612	611	600	600	600	601	606	653
		CRUSH	125	116	116	108	100	81	81	79	81	86	84	73	71	71	72	76	123
LEVEL 1 MID- BUMPER	432	PRE-	432	420	420	420	421	422	422	422	423	424	424	425	426	426	426	427	437
		POST-	643	626	612	601	592	583	583	582	577	575	573	570	566	566	568	516	598
		CRUSH	211	206	192	181	171	161	161	160	154	151	149	145	140	140	142	89	161

DATA SHEET 12 (continued)

STATIC CRUSH OF IMPACTOR FACE

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

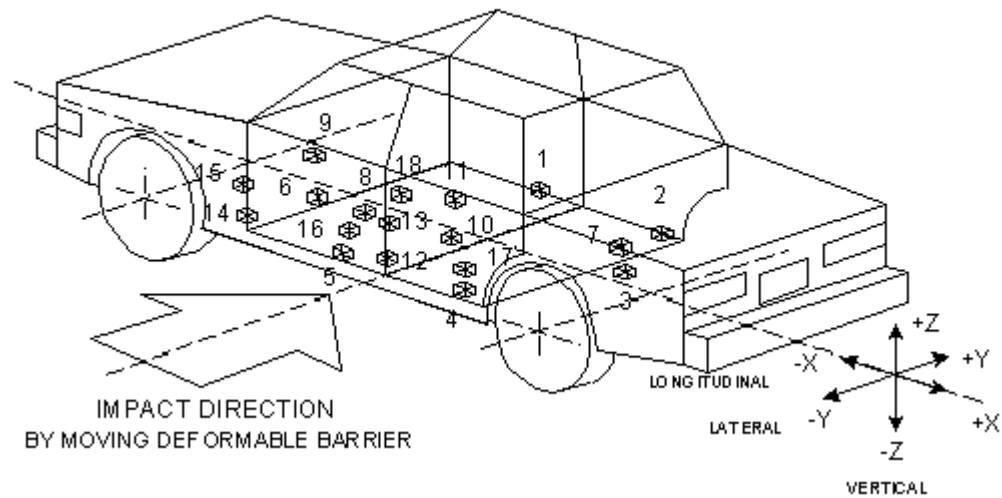


DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



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

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

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	2755	709	413	2.8	59.4	-11.8	13.4	27.7	16.6	-6.9	21.5	0.1	40.5	-0.1	19.6	28.2	16.6
2	Right Side Sill at Rear Seat	1799	670	389	3.0	59.2	-21.2	9.9	26.6	7.2	-3.1	89.5	6.4	93.1	-10.5	19.0	28.4	7.5
3	Rear Floorpan Above Axle	1064	18	-24	6.3	16.8	-8.1	23.8	21.8	37.3	-2.8	177.6	7.7	16.0	-9.0	22.1	22.1	37.2
4	Left Side Sill at Rear Seat	1710	-699	419					42.7	7.4	-52.1	11.7						
5	Left Side Sill at Front Seat	2670	-703	427					84.6	7.7	-91.2	18.1						
6	Left Front Door on Centerline	2756	-775	53					164.6	9.0	-47.6	27.5						
7	Right Rear Occupant Compartment	1845	327	183					29.7	7.0	-3.3	83.2						
8	Midrear of Left Front Door	2520	-765	-83					163.5	11.0	-57.4	28.2						
9	Left Front Door Upper Centerline	2742	-763	-174					86.2	10.2	-97.4	28.1						
10	Midrear of Left Rear Door	1535	-760	-136					268.2	18.6	-76.2	24.5						

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)

DATASHEET 13 (continued)

VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X mm	Y mm	Z mm	Max		Min		Max		Min		Max		Min		Max	
					G's	msec	G's	msec	G's	msec	G's	msec	G's	msec	G's	msec	G's	msec
11	Left Rear Door Upper Centerline	1744	-757	-178					102.6	15.6	-85.6	27.9						
12	Left Lower B- Pillar	2256	-734	-4					195.3	6.8	-59.7	17.8						
13	Left Middle B- Pillar	2209	-735	-315					151.2	12.1	65.4	18.9						
14	Left Lower A- Pillar	3196	-715	100					91.7	4.3	-140.0	9.9						
15	Left Middle A- Pillar	3189	-715	-183					61.8	10.4	-50.7	16.6						
16	Front Seat Track	2483	-534	226					70.7	16.8	-63.6	21.2						
17	Rear Seat Track	1719	-509	191					37.9	17.7	-14.1	53.3						
18	Vehicle CG	2905	17	297	4.9	51.2	-11.0	14.3	25.2	6.9	-15.7	21.1	34.2	20.0	-7.8	55.4	36.2	20.2

Axis Origin

X – Point L

Y – Point L

Z – Point L

Axis Orientation

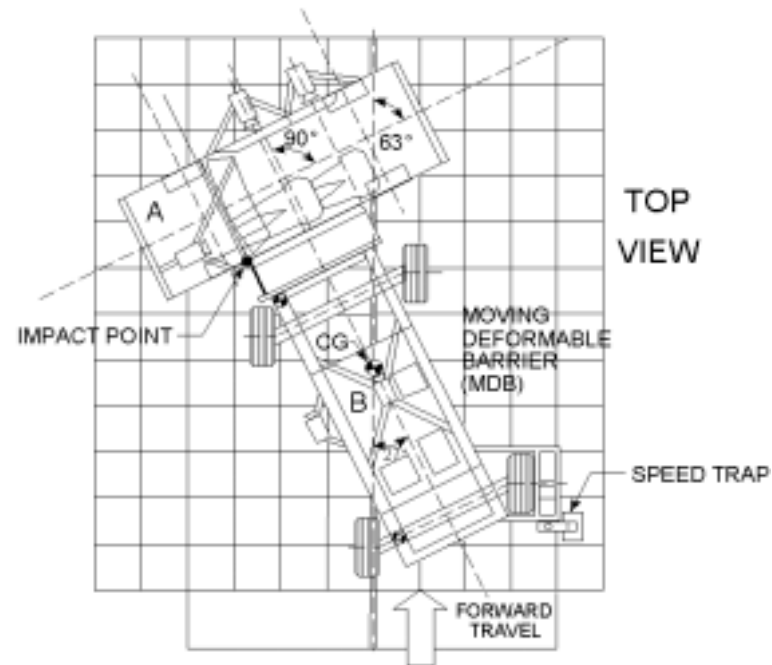
+(X) Forward where x axis is the vector from middle of rear bumper to mid front bumper

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

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

DATA SHEET 14

MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY



Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X 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	2.2	63.4	-7.1	28.2	3.1	62.0	-10.7	28.7	7.0	57.3	-6.6	26.1	12.8	29.0
2	MDB Rear Frame Member	2812	-614	585	2.0	136.3	-26.9	37.6	17.0	33.4	-1.0	132.0						

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

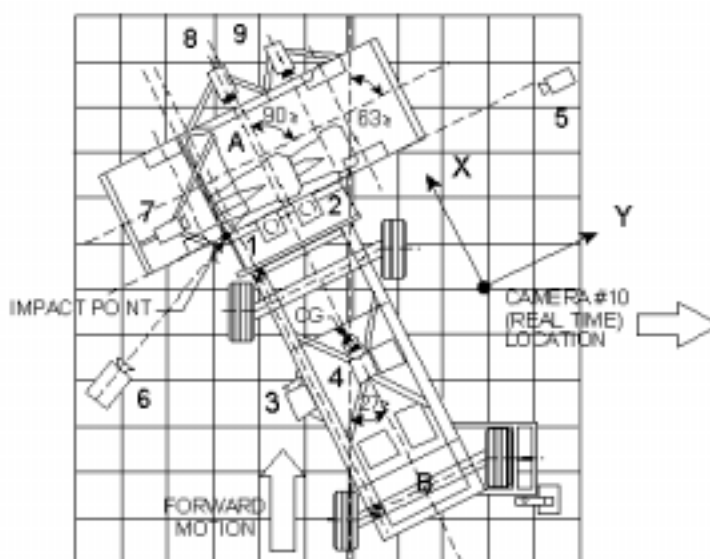
Axis Orientation +(X) Forward
 +(Y) Right
 +(Z) Down

DATA SHEET 15

HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



Camera No.	View	Coordinates (mm)*			Angle wrt Horiz.	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead view of test vehicle	2154	-677	-3758	-90	12.5	1000
2	Overhead close-up view of impact plane	2839	-757	-3761	-90	25	1000
3	MDB onboard close-up view of impact point	3218	-3393	-212	0	35	1000
4	MDB onboard view of driver dummy	2305	-3348	-676	-5	13	1000
5	Right side ground level overall view	-9956	-1007	-175	0	50	1000
6	Left side ground level overall view	7104	-127	-70	0	12.5	500
7	Test vehicle onboard driver front view	3533	-339	-759	-15	10	1000
8	Test vehicle onboard driver side view	2539	845	-549	-5	7.5	1000
9	Test vehicle onboard passenger side view	1686	826	-616	-8	7.5	1000
10	Real-time film coverage of test	-	-	-	-	-	24

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

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

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

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

SECTION 5
FUEL SYSTEM INTEGRITY

DATA SHEET 16

FUEL SYSTEM INTEGRITY DATA

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101

TEST REQUIREMENTS:

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

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

FUEL SPILLAGE MEASUREMENT:

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

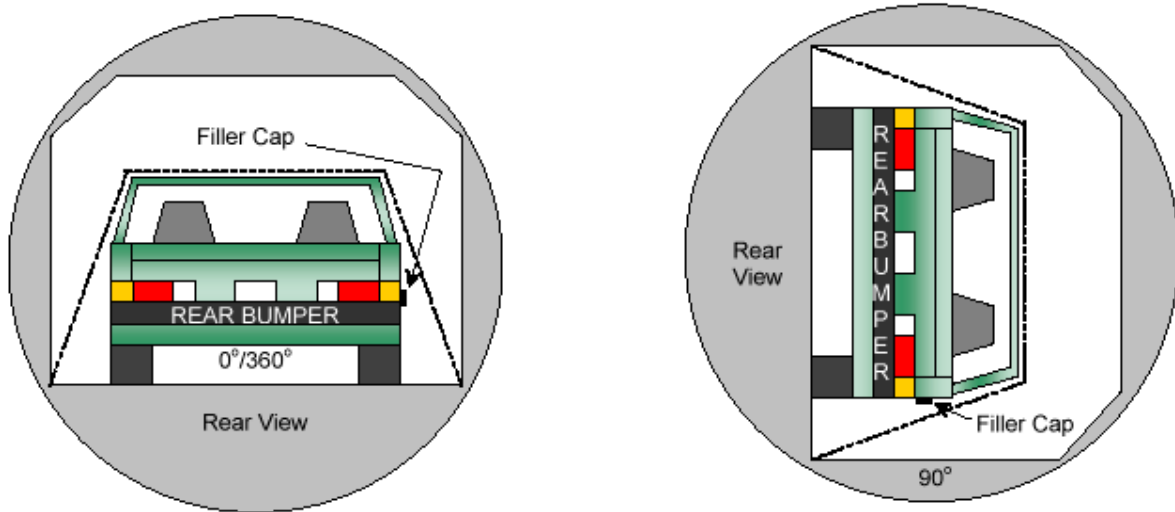
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17

ROLLOVER DATA

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



0° TO 90°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	1	minutes	03	seconds
(Spec Range =1 to 3 minutes)				
FMVSS 301 Position Hold Time	5	minutes	0	seconds
TOTAL	6	minutes	03	seconds
Next whole minute interval	7	minutes		

FUEL SPILLAGE MEASUREMENT:

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

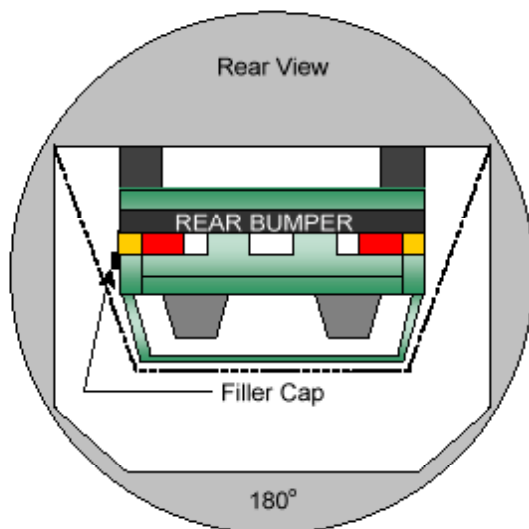
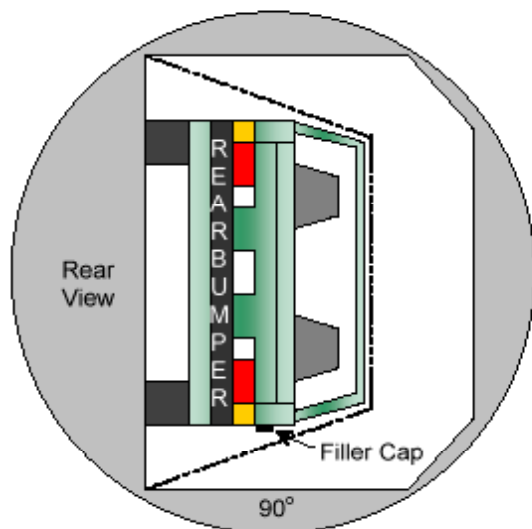
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



90° TO 180°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u>	minutes	<u>05</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>05</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	0	1 oz.

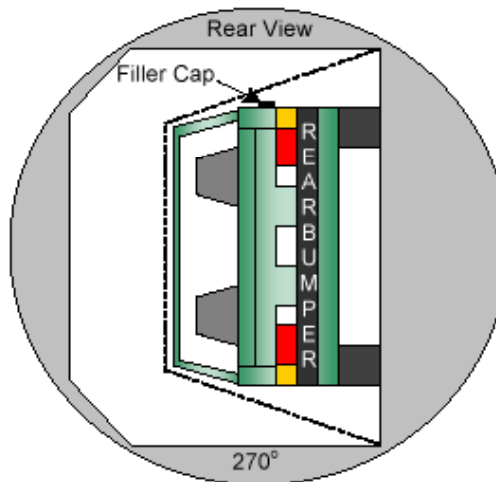
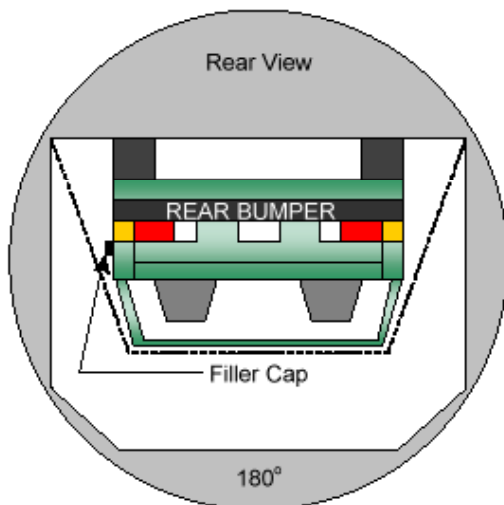
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



180° TO 270°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>10</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>10</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	0	1 oz.

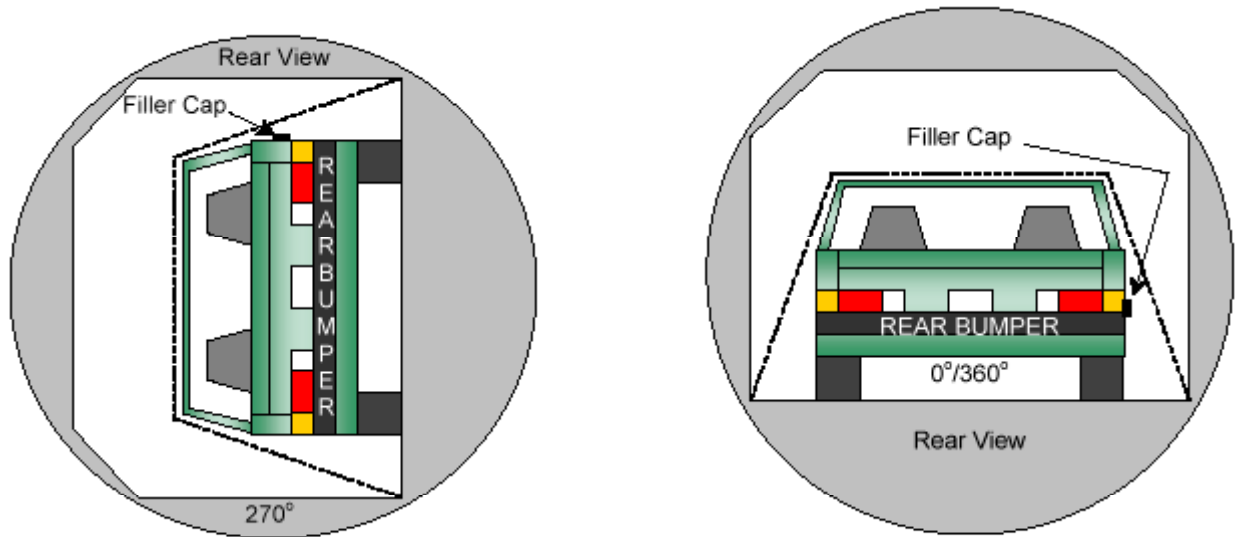
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2003 Toyota Highlander 4 Door MPV

NHTSA No. TO 5101



270° TO 360°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>14</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>14</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	0	1 oz.

FUEL SPILLAGE LOCATION(S): None

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

<u>Figure</u>	<u>Photograph Title</u>	<u>Page</u>
A-1	PRE-TEST FRONTAL VIEW OF TEST VEHICLE	A-4
A-2	POST-TEST FRONTAL VIEW OF TEST VEHICLE	A-5
A-3	PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE	A-6
A-4	POST-TEST LEFT FRONT VIEW OF TEST VEHICLE	A-7
A-5	PRE-TEST LEFT (IMPACTED) SIDE VIEW OF TEST VEHICLE	A-8
A-6	POST-TEST LEFT (IMPACTED) SIDE VIEW OF TEST VEHICLE	A-9
A-7	PRE-TEST LEFT REAR VIEW OF TEST VEHICLE	A-10
A-8	POST-TEST LEFT REAR VIEW OF TEST VEHICLE	A-11
A-9	PRE-TEST REAR VIEW OF TEST VEHICLE	A-12
A-10	POST-TEST REAR VIEW OF TEST VEHICLE	A-13
A-11	PRE-TEST RIGHT REAR OF TEST VEHICLE	A-14
A-12	POST-TEST RIGHT REAR OF TEST VEHICLE	A-15
A-13	PRE-TEST RIGHT SIDE VIEW OF TEST VEHICLE	A-16
A-14	POST-TEST RIGHT SIDE VIEW OF TEST VEHICLE	A-17
A-15	PRE-TEST RIGHT FRONT VIEW OF TEST VEHICLE	A-18
A-16	POST-TEST RIGHT FRONT VIEW OF TEST VEHICLE	A-19
A-17	PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A-20
A-18	POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A-21
A-19	PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A-22
A-20	POST-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A-23
A-21	PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A-24
A-22	POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF FRONT SID H3	A-25
A-23	PRE-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A-26
A-24	POST-TEST LEFT OCCUPANT COMPARTMENT VIEW OF REAR SID H3	A-27
A-25	PRE-TEST INTERIOR OF FRONT DOOR	A-28
A-26	POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS	A-29
A-27	POST-TEST INTERIOR OF FRONT DOOR SHOWING SID H3 IMPACT LOCATIONS 2	A-30
A-28	PRE-TEST INTERIOR OF REAR DOOR	A-31
A-29	POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS	A-32
A-30	POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS 2	A-33
A-31	PRE-TEST LEFT SIDE VIEW OF MDB IN IMPACT POSITION	A-34
A-32	POST-TEST LEFT SIDE VIEW OF MDB	A-35
A-33	PRE-TEST RIGHT SIDE VIEW OF MDB IN IMPACT POSITION	A-36
A-34	POST-TEST RIGHT SIDE VIEW OF MDB	A-37
A-35	PRE-TEST OVERHEAD VIEW OF MDB IN IMPACT POSITION	A-38
A-36	POST-TEST OVERHEAD VIEW OF MDB	A-39
A-37	PRE-TEST CLOSE UP OF IMPACT POINT TARGET SHOWING WELDING ROD	A-40
A-38	POST-TEST CLOSE-UP OF IMPACT POINT TARGET	A-41
A-39	CLOSE-UP OF VEHICLE'S CERTIFICATION LABELS	A-42
A-40	VEHICLE TIRE PLACARD	A-43
A-41	IMPACT	A-44
A-42	UNLATCHED DOOR 1	A-45
A-43	UNLATCHED DOOR 2	A-46
A-44	ROLLOVER 0 DEGREES	A-47
A-45	ROLLOVER 90 DEGREES	A-48
A-46	ROLLOVER 180 DEGREES	A-49
A-47	ROLLOVER 270 DEGREES	A-50
A-48	ROLLOVER 360 DEGREES	A-51
A-49	PRE-TEST ALUMINUM BARRIER FRONT	A-52
A-50	POST-TEST ALUMINUM BARRIER FRONT	A-53
A-51	PRE-TEST ALUMINUM BARRIER LEFT SIDE	A-54
A-52	POST-TEST ALUMINUM BARRIER LEFT SIDE	A-55

A-53 PRE-TEST ALUMINUM BARRIER RIGHT SIDE
A-54 POST-TEST ALUMINUM BARRIER RIGHT SIDE
A-55 PRE-TEST ALUMINUM BARRIER OVERHEAD
A-56 POST-TEST ALUMINUM BARRIER OVERHEAD

A-56
A-57
A-58
A-59



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



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



Figure A-3: PRE-TEST LEFT FRONT VIEW OF TEST VEHICLE



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



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



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



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



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



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



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



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



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



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



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



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



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



Figure A-17: PRE-TEST RIGHT OCCUPANT COMPARTMENT VIEW OF FRONT SID



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



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



Figure A-29: POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS



Figure A-30: POST-TEST INTERIOR OF REAR DOOR SHOWING SID H3 IMPACT LOCATIONS 2



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



Figure A-32: POST-TEST LEFT SIDE VIEW OF MDB



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



Figure A-34: POST-TEST FRONT RIGHT VIEW OF MDB

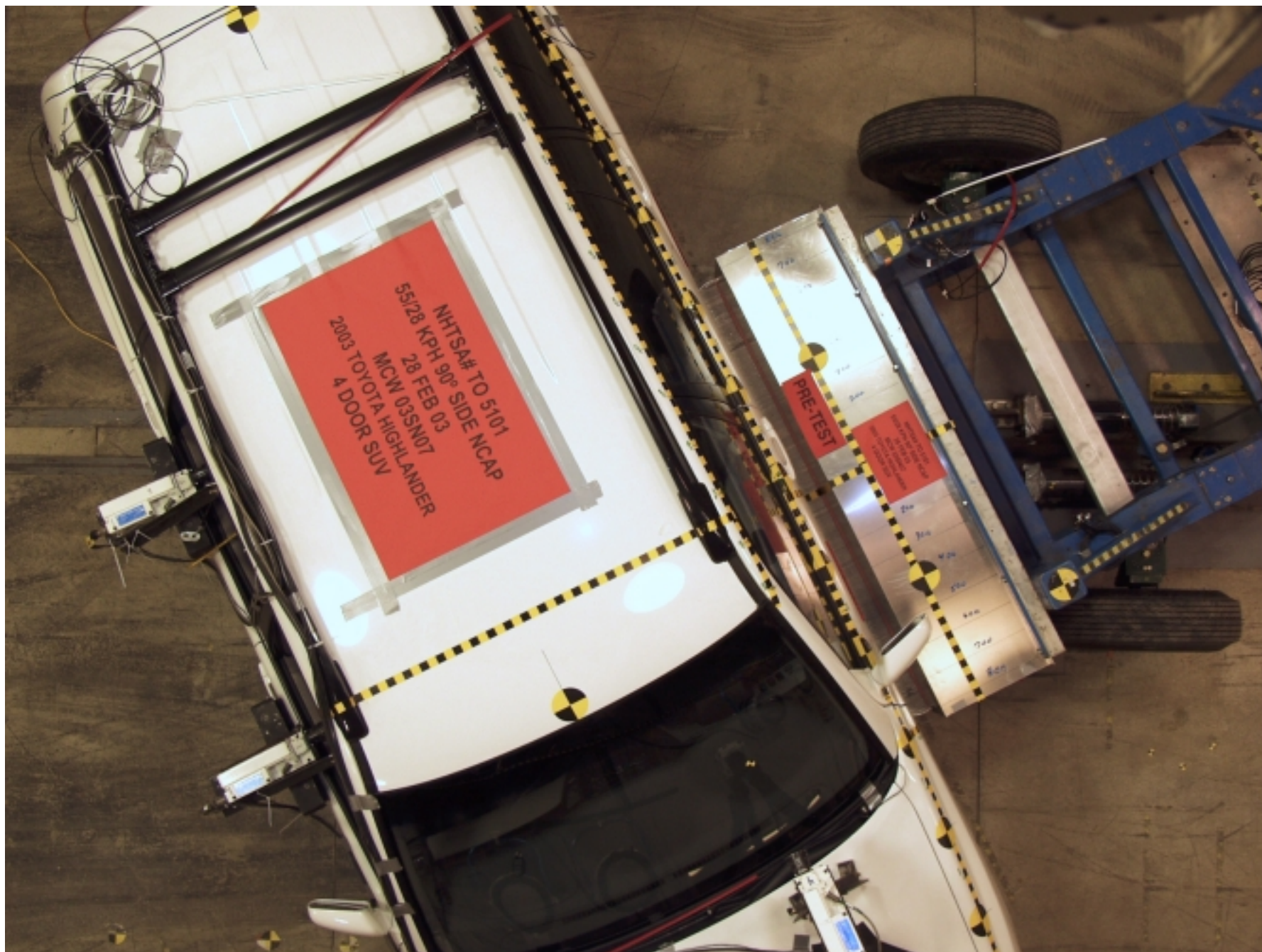


Figure A-35: PRE-TEST OVERHEAD VIEW OF MDB IN IMPACT POSITION



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 CERTIFICATION LABEL



Figure A-40: VEHICLE TIRE PLACARD



Figure A-41: IMPACT



Figure A-42: Unlatched Door 1



Figure A-43: Unlatched Door 2



Figure A-44: ROLLOVER 0 DEGREES

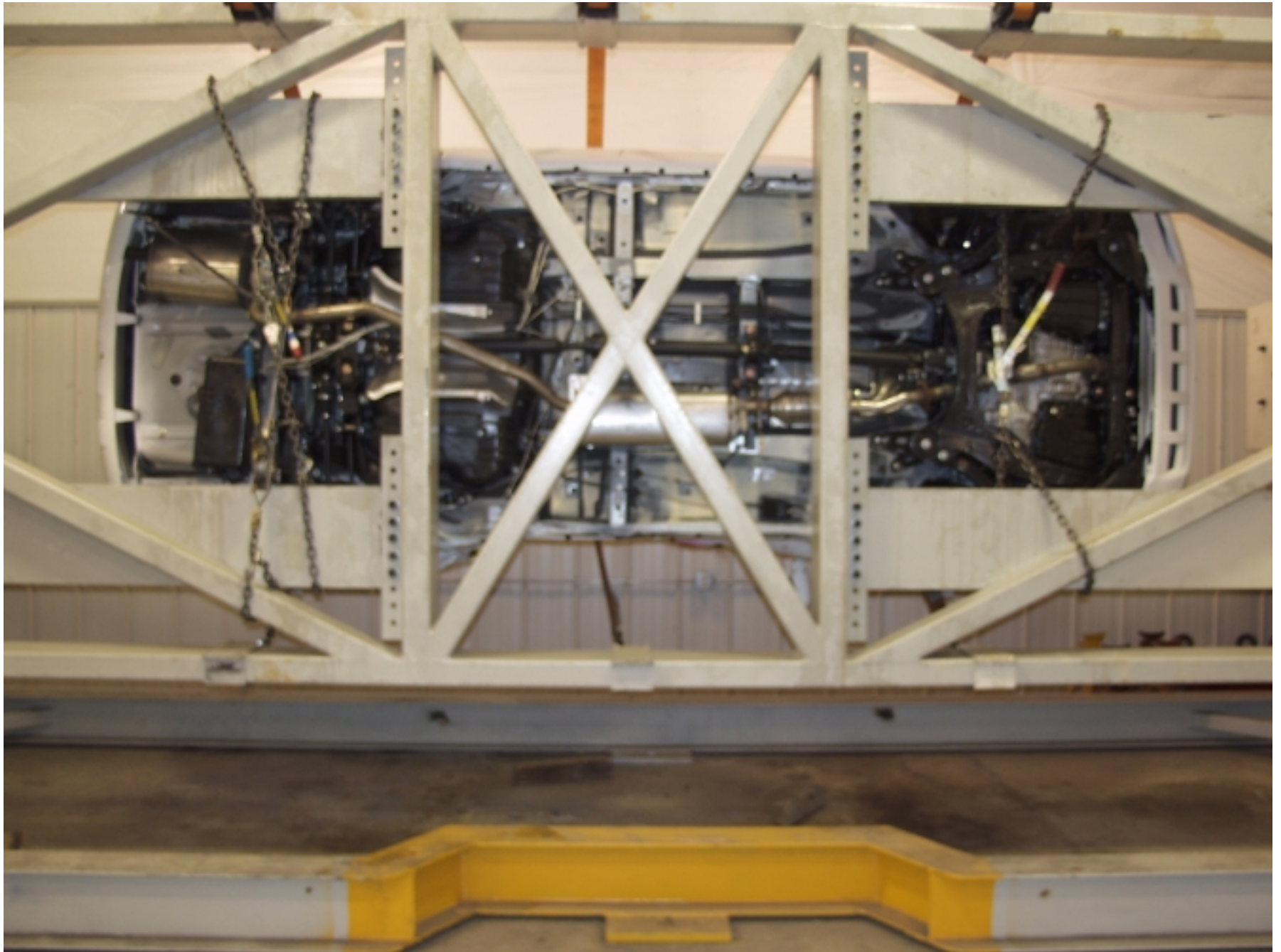


Figure A-45: ROLLOVER 90 DEGREES

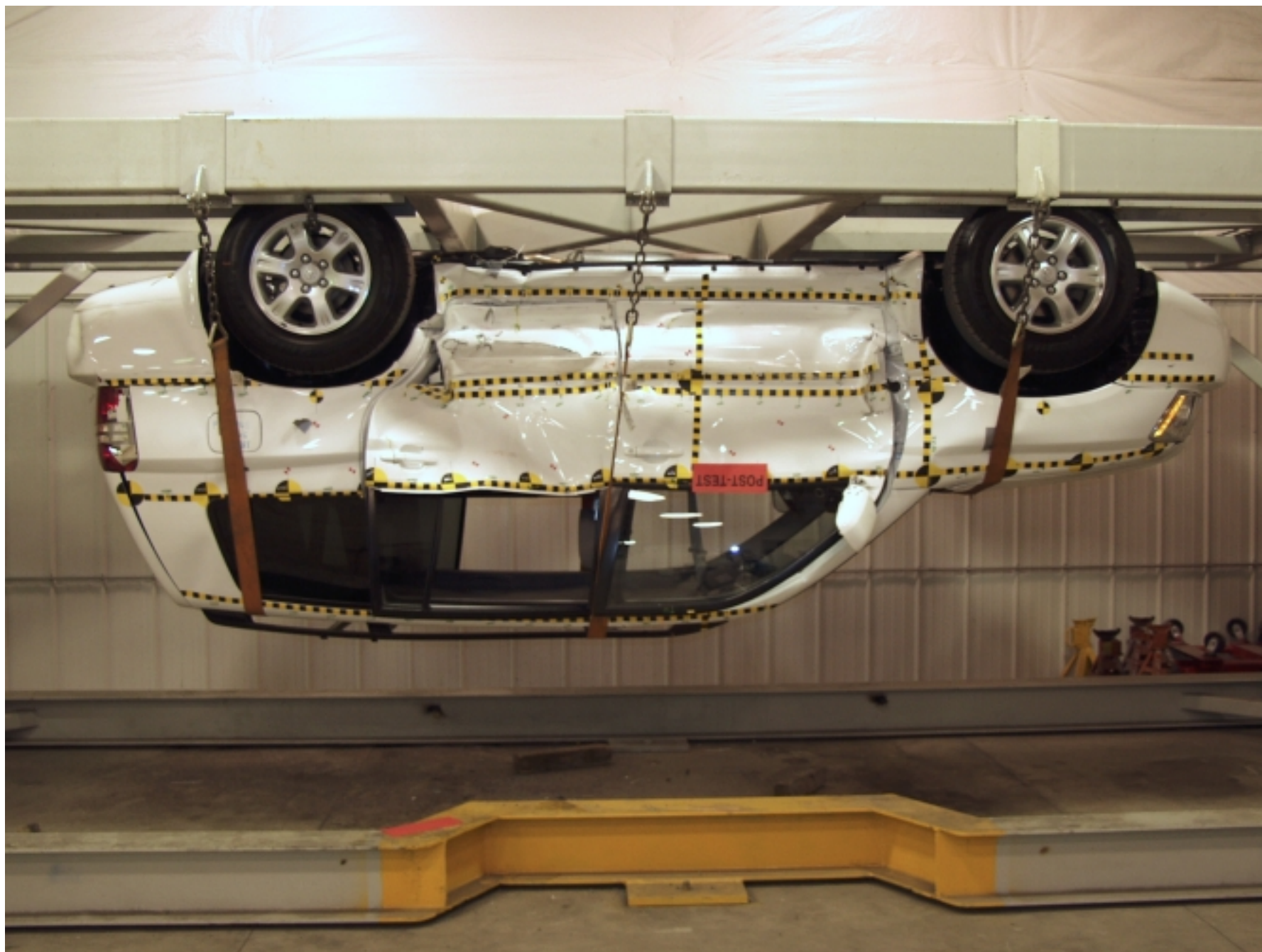


Figure A-46: ROLLOVER 180 DEGREES



Figure A-47: ROLLOVER 270 DEGREES



Figure A-48: ROLLOVER 360 DEGREES



Figure A-49: PRE-TEST ALUMINUM BARRIER FRONT



Figure A-50: POST-TEST ALUMINUM BARRIER FRONT



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



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



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



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



Figure A-55: PRE-TEST ALUMINUM BARRIER OVERHEAD

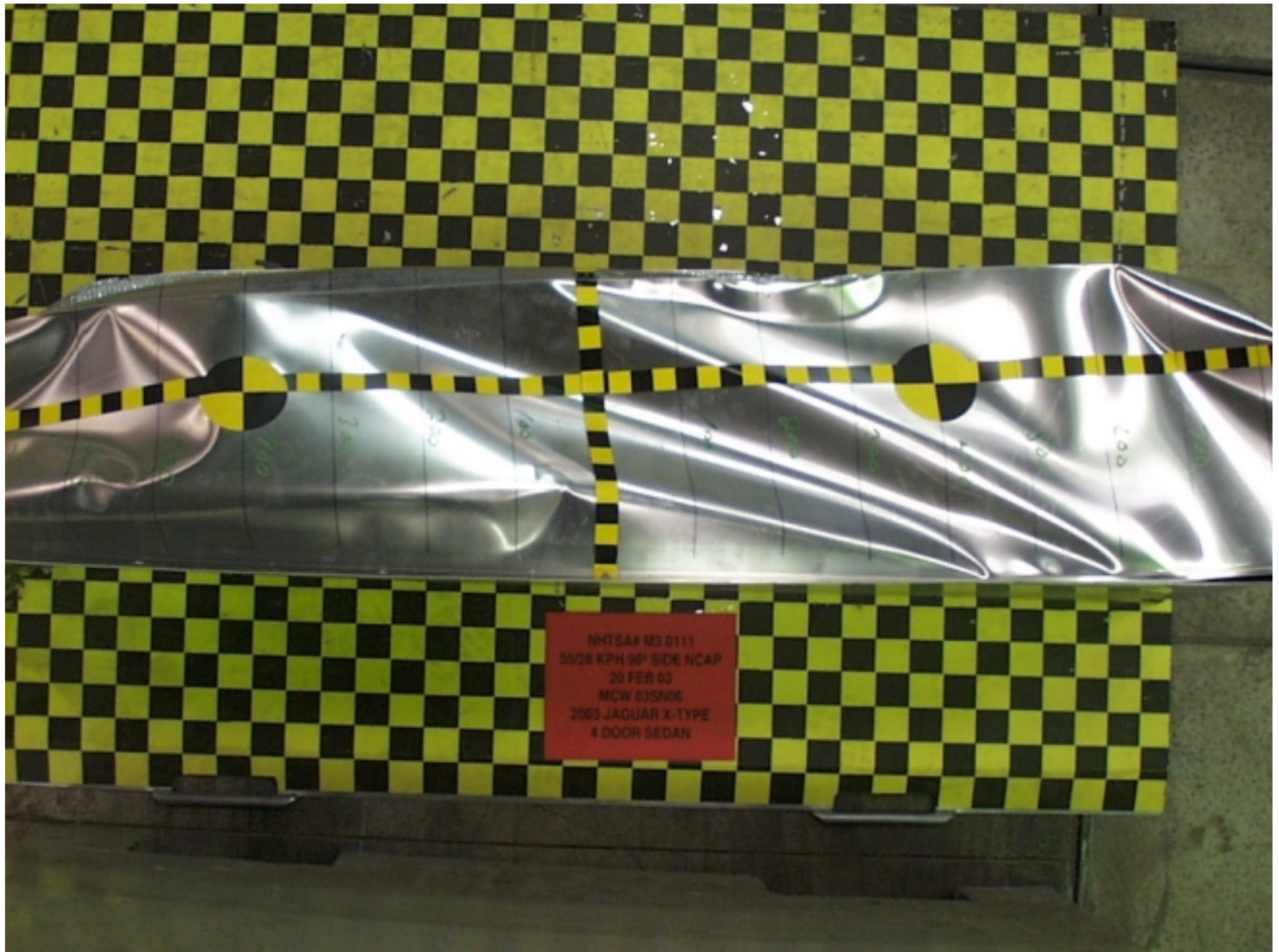


Figure A-56: POST-TEST ALUMINUM BARRIER OVERHEAD

APPENDIX B

VEHICLE, MDB, AND SID RESPONSE DATA

TABLE OF CONTENTS

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS

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

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

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS

ACCELERATION DATA – FIR FILTERED

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
43	DRIVER UPPER RIB (Y) ACCELERATION	B-48
44	DRIVER LOWER RIB (Y) ACCELERATION	B-49
45	DRIVER LOWER SPINE (Y) ACCELERATION	B-50
46	DRIVER PELVIS (Y) ACCELERATION	B-51
47	PASSENGER UPPER RIB (Y) ACCELERATION	B-52
48	PASSENGER LOWER RIB (Y) ACCELERATION	B-53
49	PASSENGER LOWER SPINE (Y) ACCELERATION	B-54
50	PASSENGER PELVIS (Y) ACCELERATION	B-55

TEST VEHICLE INSTRUMENTATION PLOTS
ACCELERATION DATA – FILTER CLASS 60
INTEGRATION DATA – FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
51	RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION	B-56
52	RIGHT SIDE SILL AT FRONT SEAT (X) VELOCITY	B-57
53	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION	B-58
54	RIGHT SIDE SILL AT FRONT SEAT (Y) VELOCITY	B-59
55	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION	B-60
56	RIGHT SIDE SILL AT FRONT SEAT (Z) VELOCITY	B-61
57	RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION	B-62
58	RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION	B-63
59	RIGHT SIDE SILL AT REAR SEAT (X) VELOCITY	B-64
60	RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION	B-65
61	RIGHT SIDE SILL AT REAR SEAT (Y) VELOCITY	B-66
62	RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION	B-67
63	RIGHT SIDE SILL AT REAR SEAT (Z) VELOCITY	B-68
64	RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION	B-69
65	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION	B-70
66	REAR FLOORPAN ABOVE AXLE (X) VELOCITY	B-71
67	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION	B-72
68	REAR FLOORPAN ABOVE AXLE (Y) VELOCITY	B-73
69	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION	B-74
70	REAR FLOORPAN ABOVE AXLE (Z) VELOCITY	B-75
71	REAR FLOORPAN ABOVE AXLE (Z) RESULTANT ACCELERATION	B-76
72	LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION	B-77
73	LEFT SIDE SILL AT REAR SEAT (Y) VELOCITY	B-78
74	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION	B-79
75	LEFT SIDE SILL AT FRONT SEAT (Y) VELOCITY	B-80
76	LEFT FRONT DOOR ON CENTERLINE (Y) ACCELERATION	B-81
77	LEFT FRONT DOOR ON CENTERLINE (Y) VELOCITY	B-82
78	RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION	B-83
79	RIGHT REAR OCCUPANT COMPARTMENT (Y) VELOCITY	B-84
80	MID-REAR OF LEFT FRONT DOOR (Y) ACCELERATION	B-85
81	MID-REAR OF LEFT FRONT DOOR (Y) VELOCITY	B-86
82	LEFT FRONT DOOR UPPER CENTERLINE (Y) ACCELERATION	B-87
83	LEFT FRONT DOOR UPPER CENTERLINE (Y) VELOCITY	B-88
84	MID-REAR OF LEFT REAR DOOR (Y) ACCELERATION	B-89
85	MID-REAR OF LEFT REAR DOOR (Y) VELOCITY	B-90
86	LEFT REAR DOOR UPPER CENTERLINE (Y) ACCELERATION	B-91
87	LEFT REAR DOOR UPPER CENTERLINE (Y) VELOCITY	B-92
88	LOWER B-PILLAR (Y) ACCELERATION	B-93
89	LOWER B-PILLAR (Y) VELOCITY	B-94
90	MIDDLE B-PILLAR (Y) ACCELERATION	B-95
91	MIDDLE B-PILLAR (Y) VELOCITY	B-96
92	LOWER A-PILLAR (Y) ACCELERATION	B-97
93	LOWER A-PILLAR (Y) VELOCITY	B-98
94	MIDDLE A-PILLAR (Y) ACCELERATION	B-99
95	MIDDLE A-PILLAR (Y) VELOCITY	B-100
96	FRONT SEAT TRACK (Y) ACCELERATION	B-101
97	FRONT SEAT TRACK (Y) VELOCITY	B-102
98	REAR SEAT TRACK (Y) ACCELERATION	B-103
99	REAR SEAT TRACK (Y) VELOCITY	B-104
100	VEHICLE CENTER OF GRAVITY (X) ACCELERATION	B-105
101	VEHICLE CENTER OF GRAVITY (X) VELOCITY	B-106
102	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION	B-107
103	VEHICLE CENTER OF GRAVITY (Y) VELOCITY	B-108
104	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION	B-109
105	VEHICLE CENTER OF GRAVITY (Z) VELOCITY	B-110
106	VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION	B-111

MDB INSTRUMENTATION PLOTS
ACCELERATION DATA – FILTER CLASS 60
INTEGRATION DATA – FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
107	MDB CENTER OF GRAVITY (X) ACCELERATION	B-112
108	MDB CENTER OF GRAVITY (X) VELOCITY	B-113
109	MDB CENTER OF GRAVITY (Y) ACCELERATION	B-114
110	MDB CENTER OF GRAVITY (Y) VELOCITY	B-115
111	MDB CENTER OF GRAVITY (Z) ACCELERATION	B-116
112	MDB CENTER OF GRAVITY (Z) VELOCITY	B-117
113	MDB CENTER OF GRAVITY RESULTANT ACCELERATION	B-118
114	MDB REAR (X) ACCELERATION	B-119
115	MDB REAR (X) VELOCITY	B-120
116	MDB REAR (X) ACCELERATION	B-121
117	MDB REAR (X) VELOCITY	B-122

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOTS (REDUNDANT)
ACCELERATION DATA – FILTER CLASS 1000, LOWER SPINE FILTER CLASS 180
INTEGRATION DATA FILTER CLASS 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
118	DRIVER UPPER RIB (Y) ACCELERATION-REDUNDANT	B-123
119	DRIVER UPPER RIB (Y) VELOCITY-REDUNDANT	B-124
120	DRIVER LOWER RIB (Y) ACCELERATION-REDUNDANT	B-125
121	DRIVER LOWER RIB (Y) VELOCITY-REDUNDANT	B-126
122	DRIVER LOWER SPINE (Y) ACCELERATION-REDUNDANT	B-127
123	DRIVER LOWER SPINE (Y) VELOCITY-REDUNDANT	B-128
124	DRIVER PELVIS (Y) ACCELERATION-REDUNDANT	B-129
125	DRIVER PELVIS (Y) VELOCITY-REDUNDANT	B-130
126	PASSENGER UPPER RIB (Y) ACCELERATION-REDUNDANT	B-131
127	PASSENGER UPPER RIB (Y) VELOCITY-REDUNDANT	B-132
128	PASSENGER LOWER RIB (Y) ACCELERATION-REDUNDANT	B-133
129	PASSENGER LOWER RIB (Y) VELOCITY-REDUNDANT	B-134
130	PASSENGER LOWER SPINE (Y) ACCELERATION-REDUNDANT	B-135
131	PASSENGER LOWER SPINE (Y) VELOCITY-REDUNDANT	B-136
132	PASSENGER PELVIS (Y) ACCELERATION-REDUNDANT	B-137
133	PASSENGER PELVIS (Y) VELOCITY-REDUNDANT	B-138

DRIVER AND PASSENGER DUMMY INSTRUMENTATION PLOT (REDUNDANT)
ACCELERATION DATA – FIR FILTERED

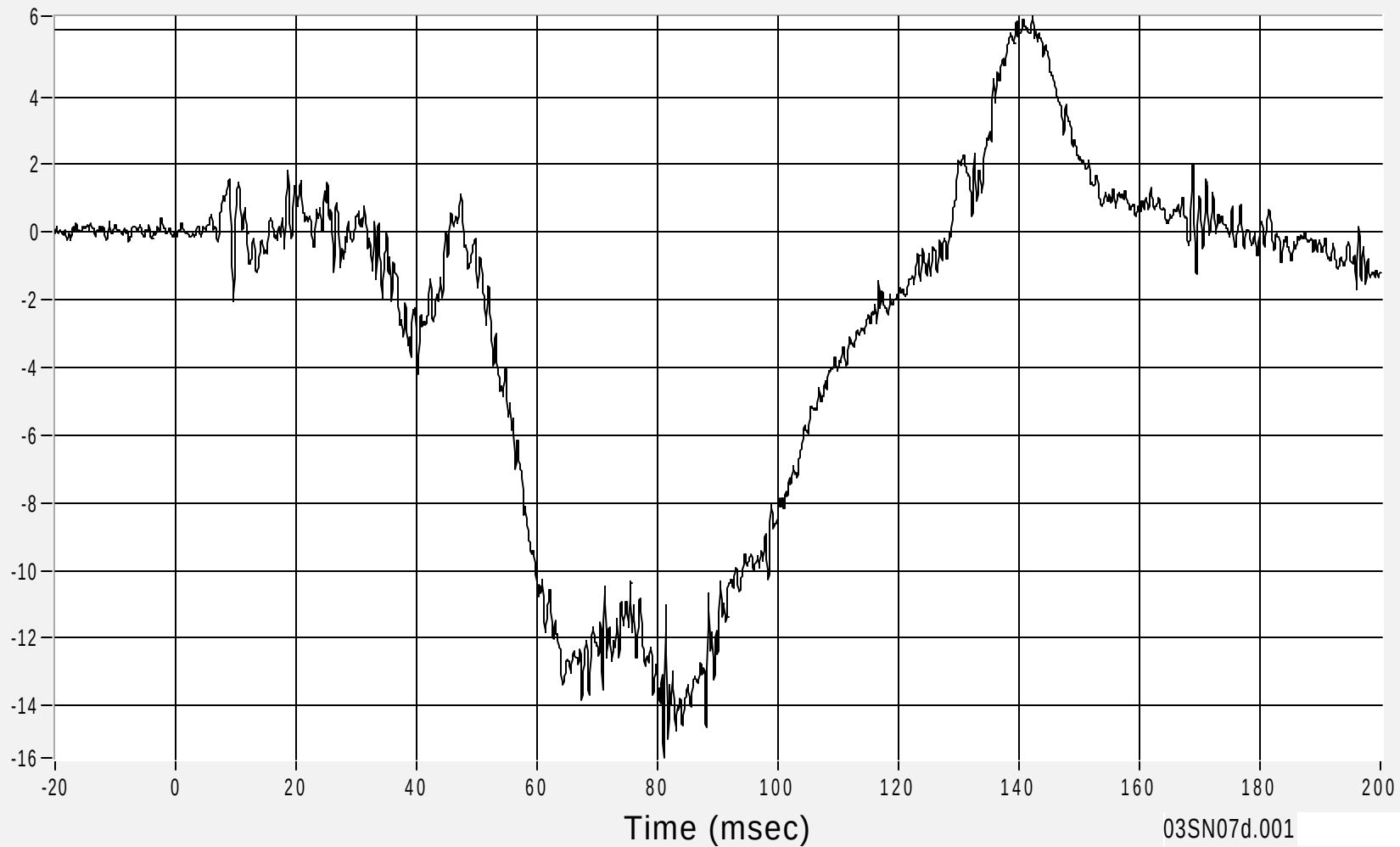
<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
134	DRIVER UPPER RIB (Y) ACCELERATION-REDUNDANT	B-139
135	DRIVER LOWER RIB (Y) ACCELERATION-REDUNDANT	B-140
136	DRIVER LOWER SPINE (Y) ACCELERATION-REDUNDANT	B-141
137	DRIVER PELVIS (Y) ACCELERATION-REDUNDANT	B-142
138	PASSENGER UPPER RIB (Y) ACCELERATION-REDUNDANT	B-143
139	PASSENGER LOWER RIB (Y) ACCELERATION-REDUNDANT	B-144
140	PASSENGER LOWER SPINE (Y) ACCELERATION-REDUNDANT	B-145
141	PASSENGER PELVIS (Y) ACCELERATION-REDUNDANT	B-146

Driver Head CG (X) Acceleration

Acceleration (G's) CFC1000

Max 6.4 G's at 142.2 msec

Min -15.5 G's at 81.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

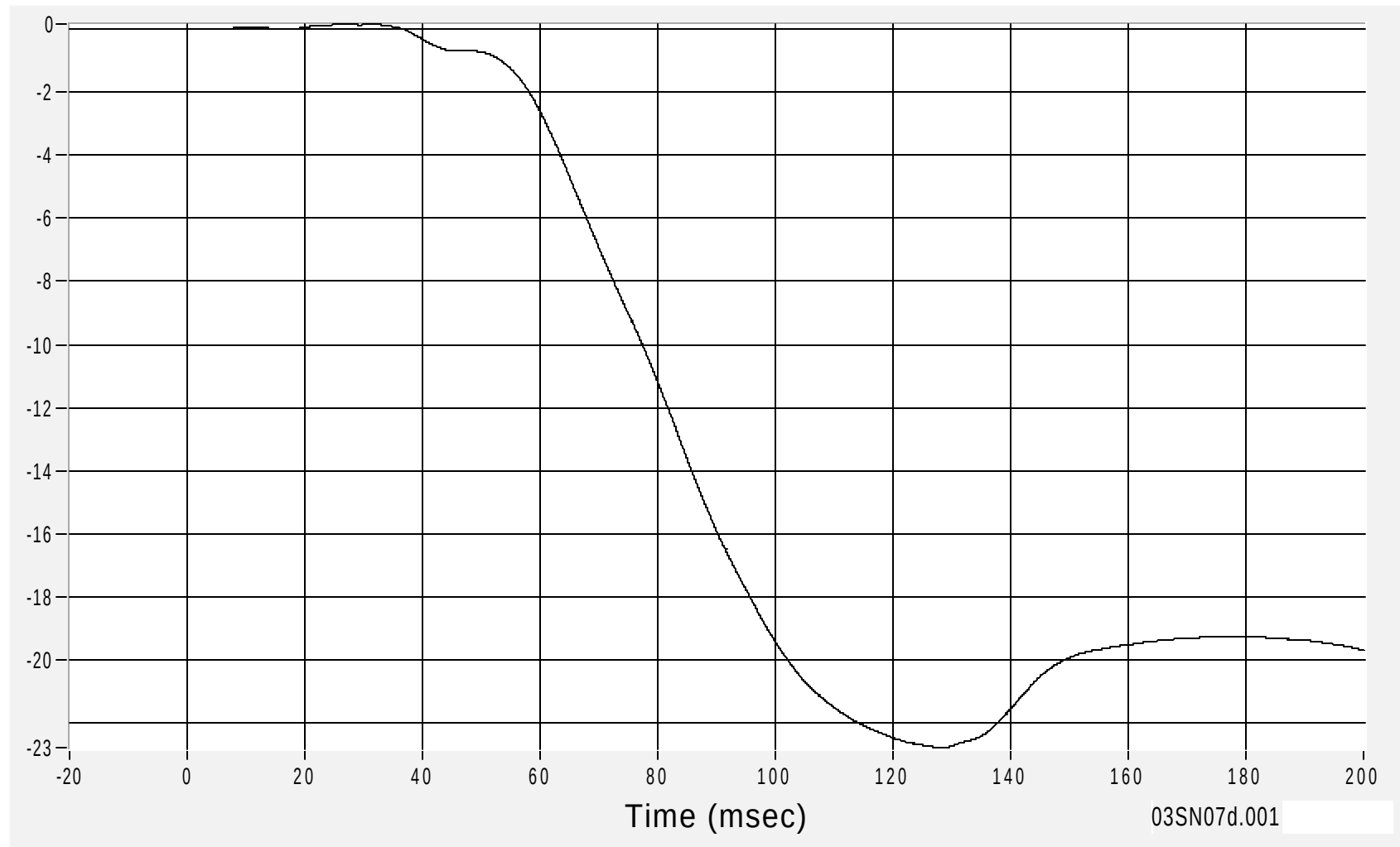
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (X) Velocity

Velocity (km/h) CFC180

Max 0.2 km/h at 26.3 msec

Min -22.8 km/h at 128.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

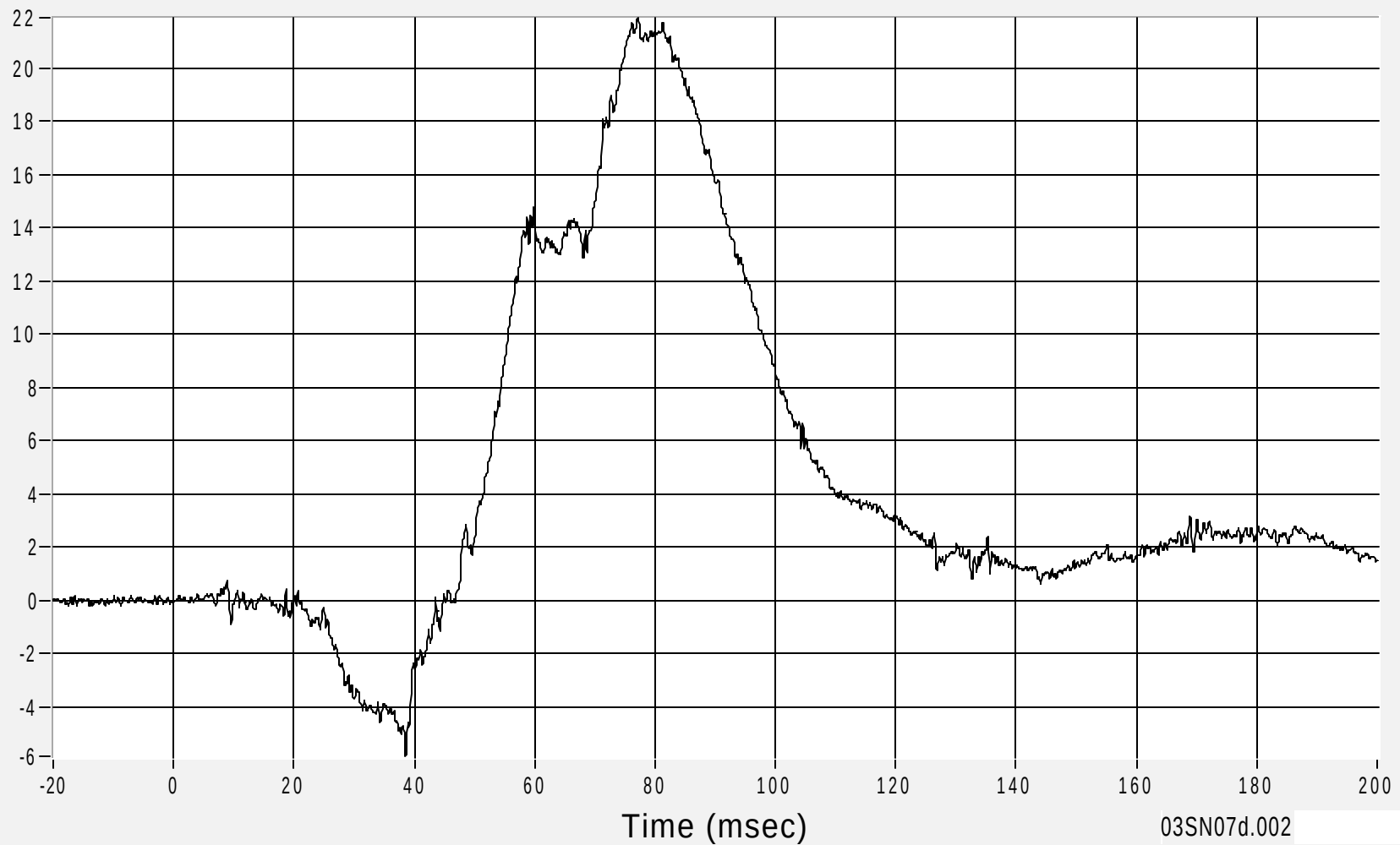
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (Y) Acceleration

Acceleration (G's) CFC1000

Max 21.9 G's at 77.1 msec
Min -5.8 G's at 38.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

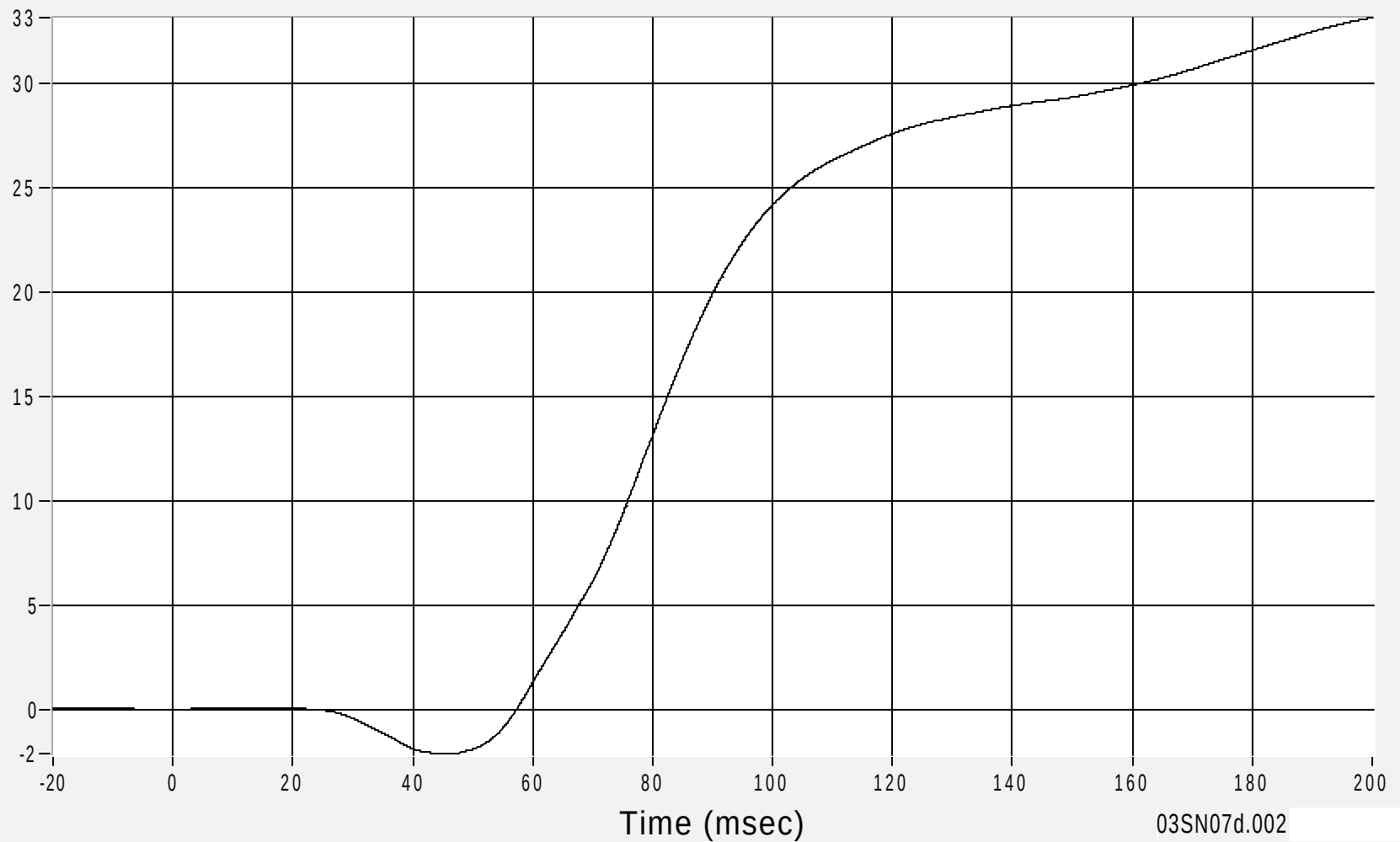
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (Y) Velocity

Velocity (km/h) CFC180

Max 33.1 km/h at 199.9 msec

Min -2.1 km/h at 45.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

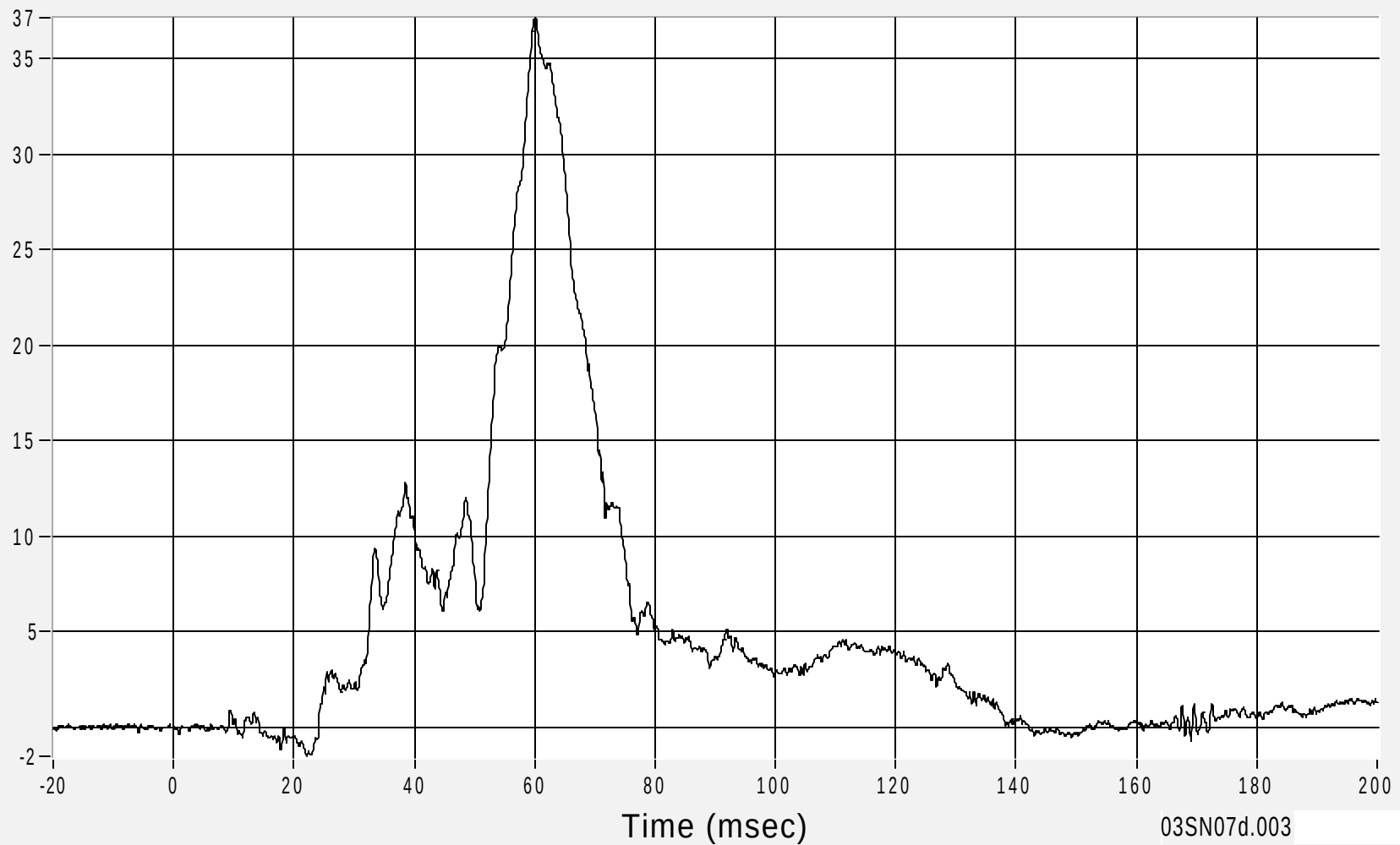
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (Z) Acceleration

Acceleration (G's) CFC1000

Max 37.2 G's at 60.2 msec
Min -1.5 G's at 22.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

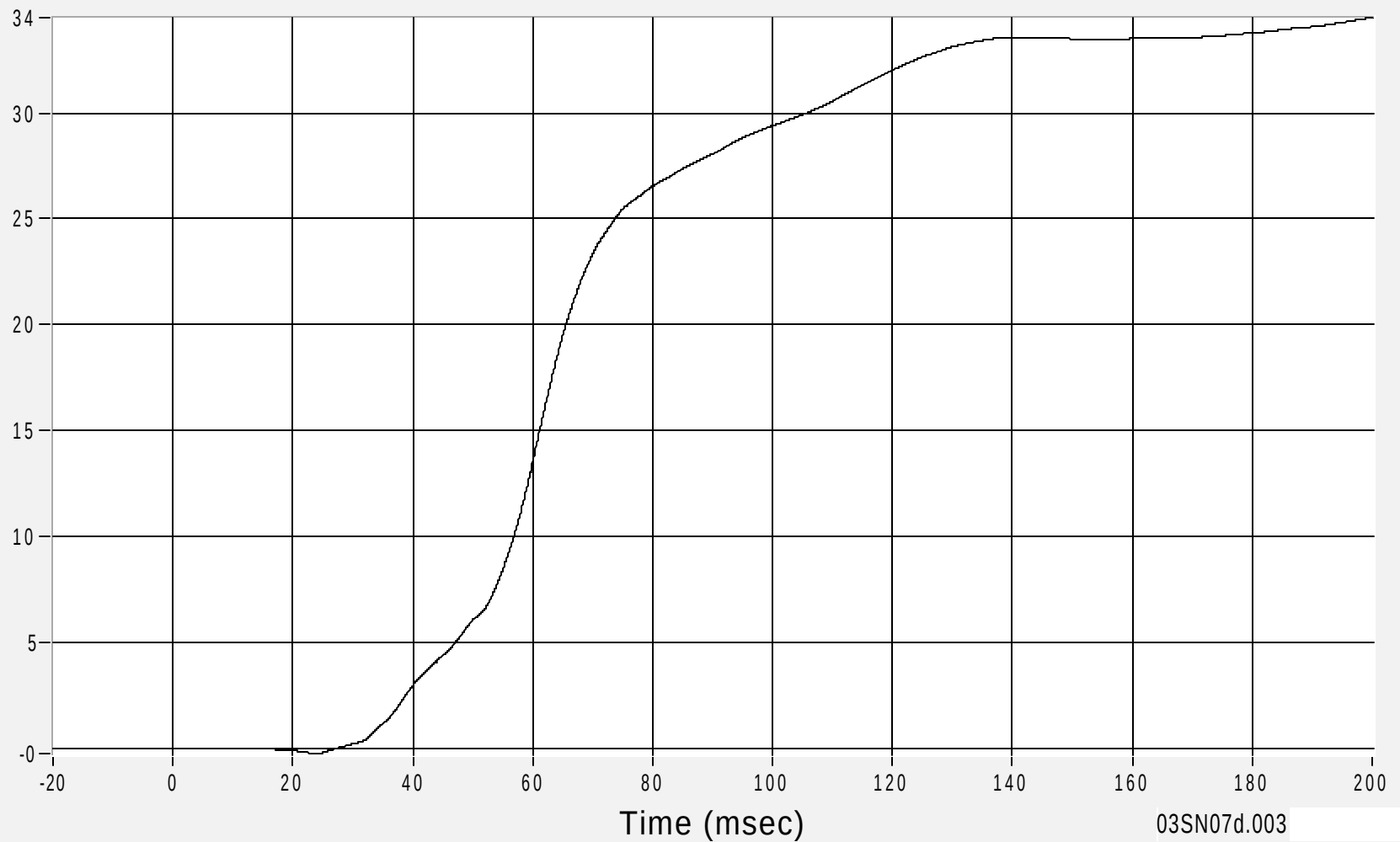
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head CG (Z) Velocity

Velocity (km/h) CFC180

Max 34.5 km/h at 199.9 msec

Min -0.2 km/h at 23.9 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

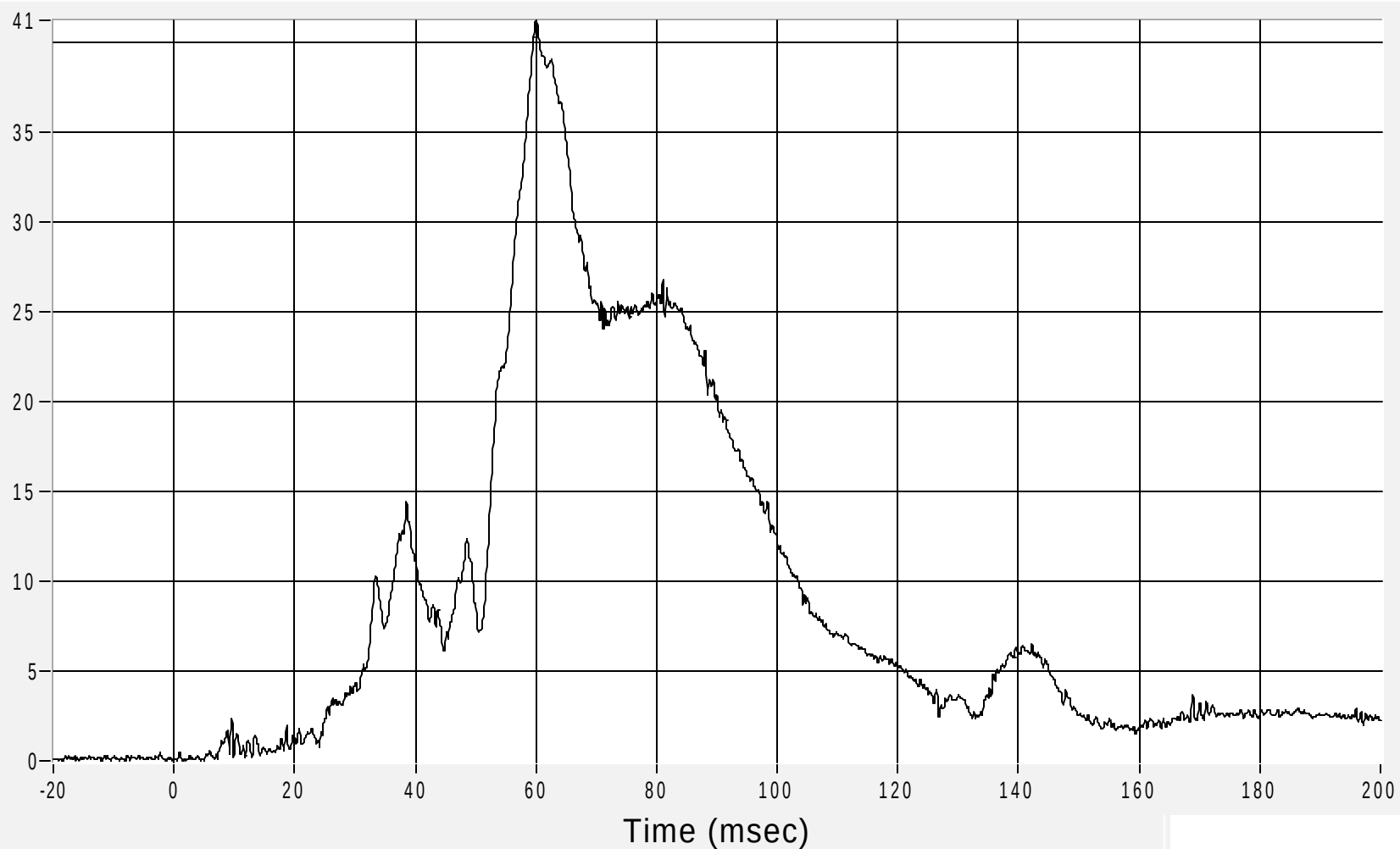
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Head Resultant Acceleration

Acceleration (G's) CFC1000

Max 41.2 G's at 60.0 msec
Min 0.0 G's at 1.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

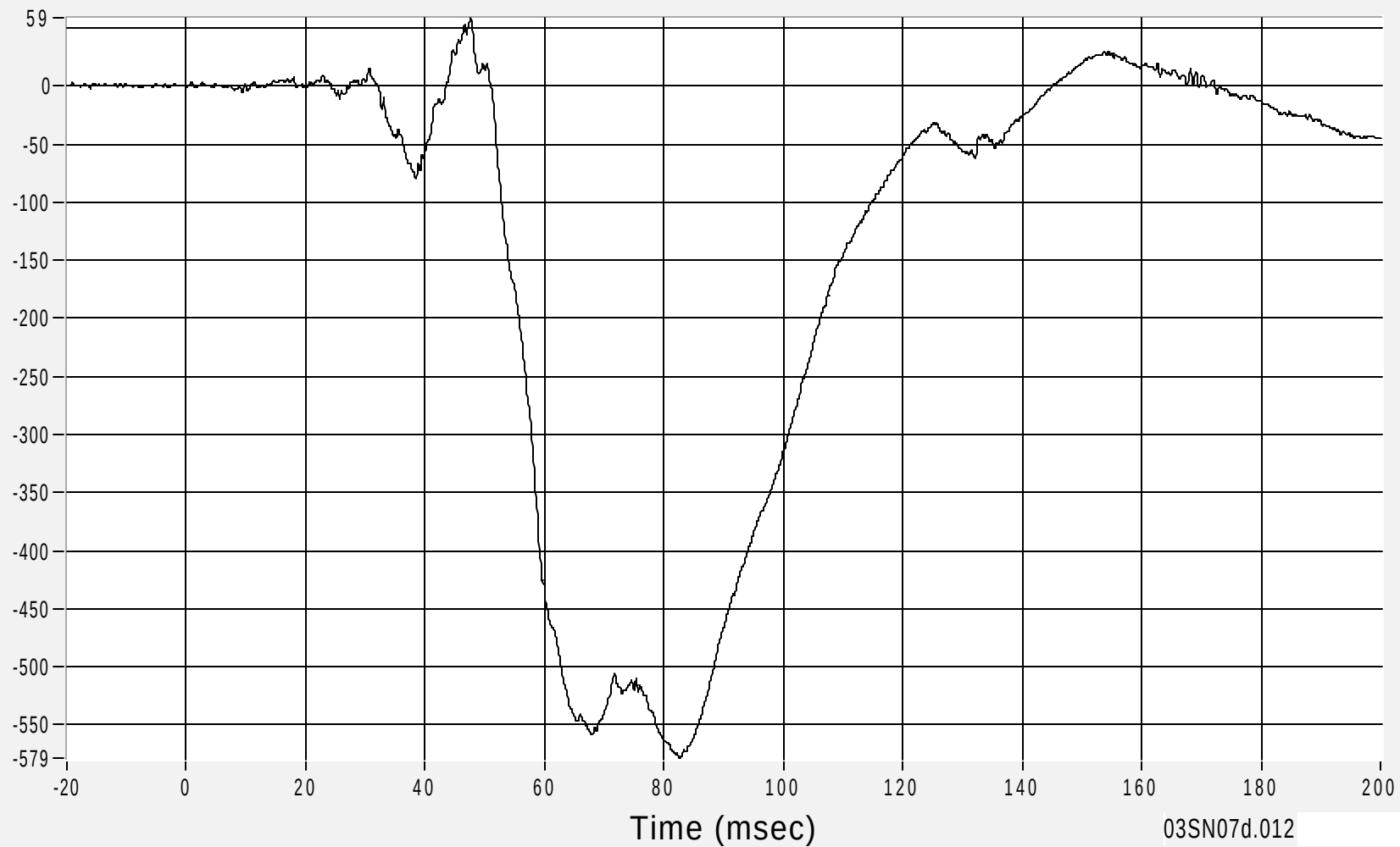
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (X) Force

Force (N) CFC1000

Max 58.7 N at 47.6 msec

Min -578.7 N at 82.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

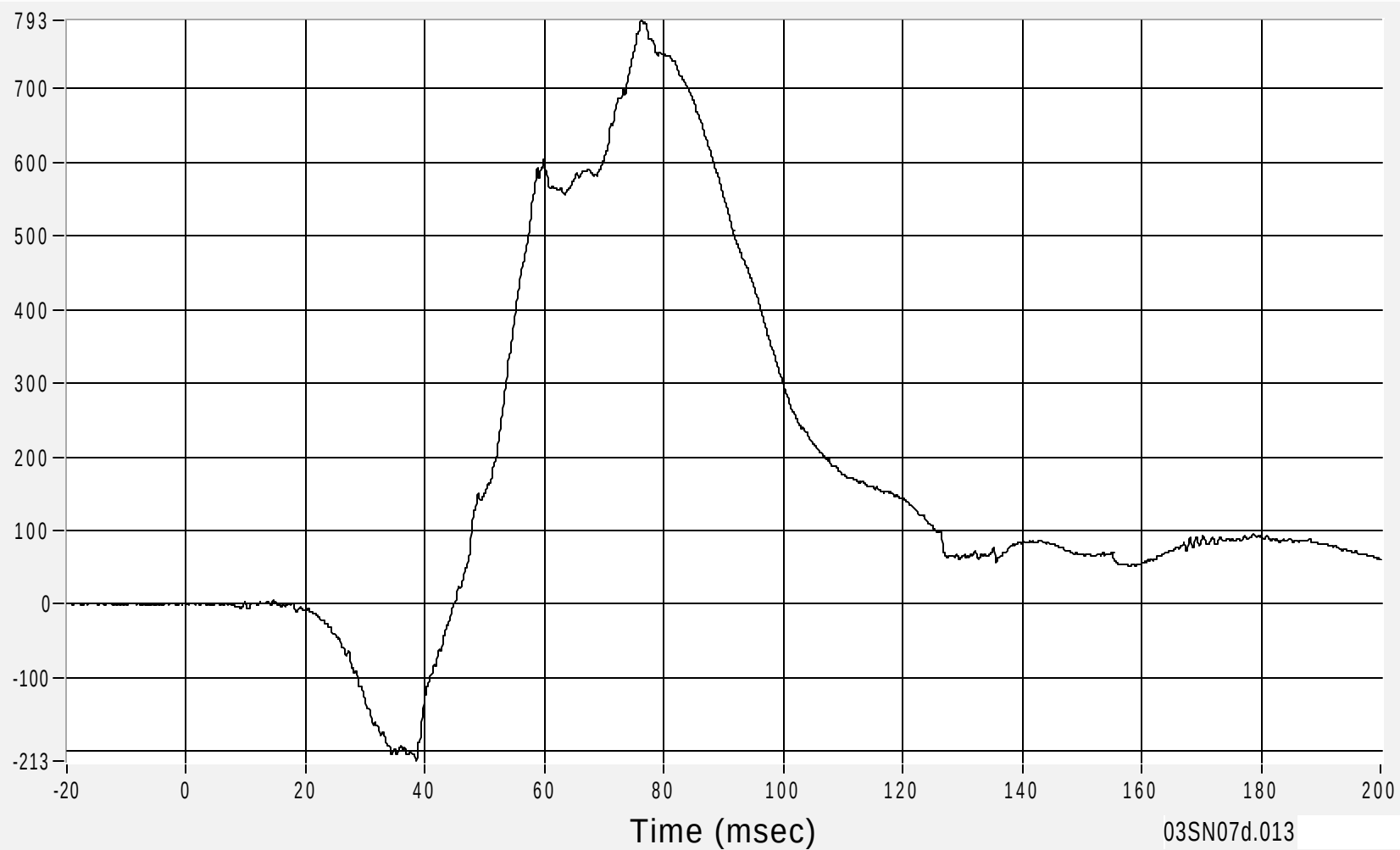
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (Y) Force

Force (N) CFC1000

Max 792.8 N at 76.2 msec

Min -212.9 N at 38.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

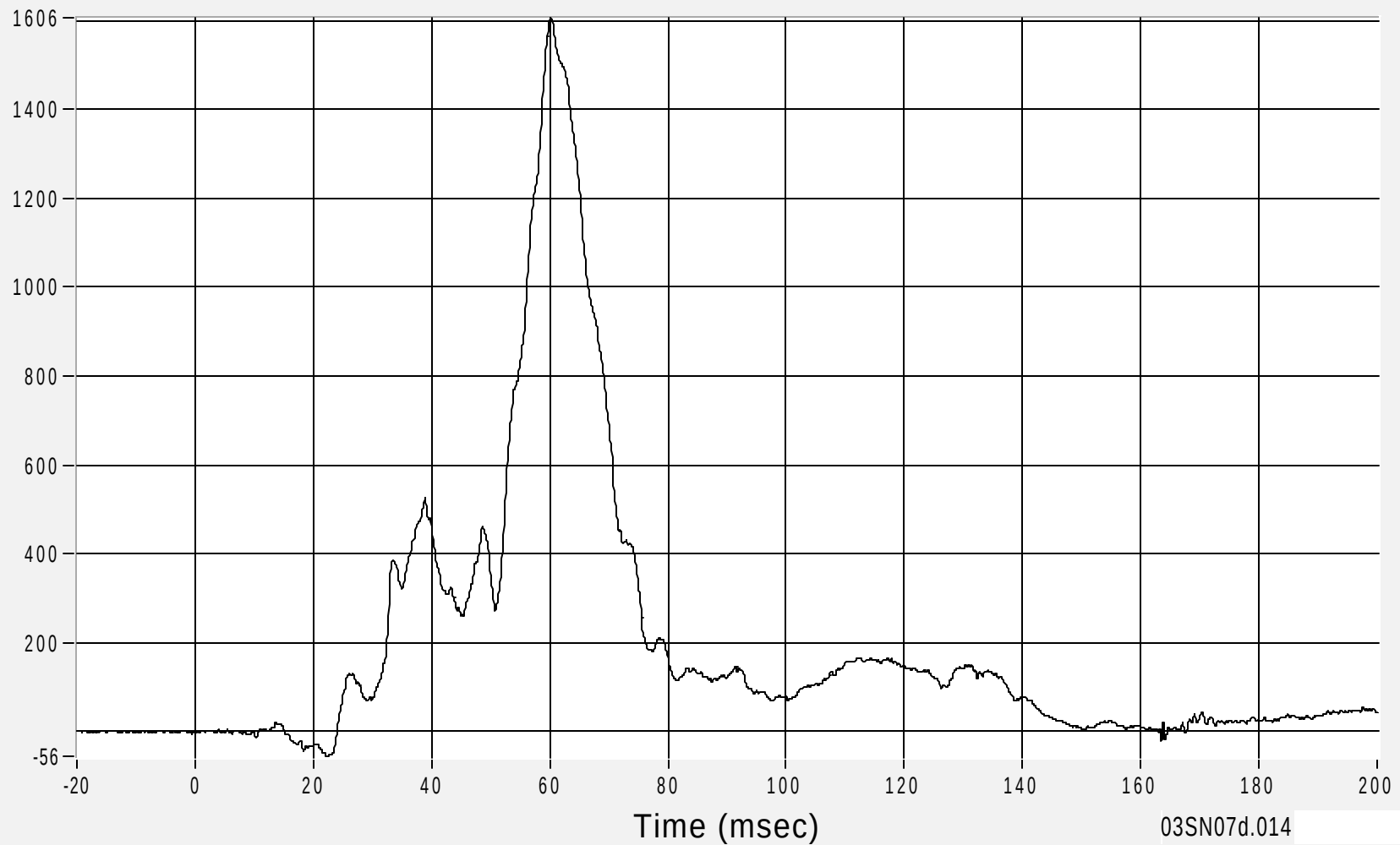
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (Z) Force

Force (N) CFC1000

Max 1606.1 N at 60.2 msec

Min -55.8 N at 22.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

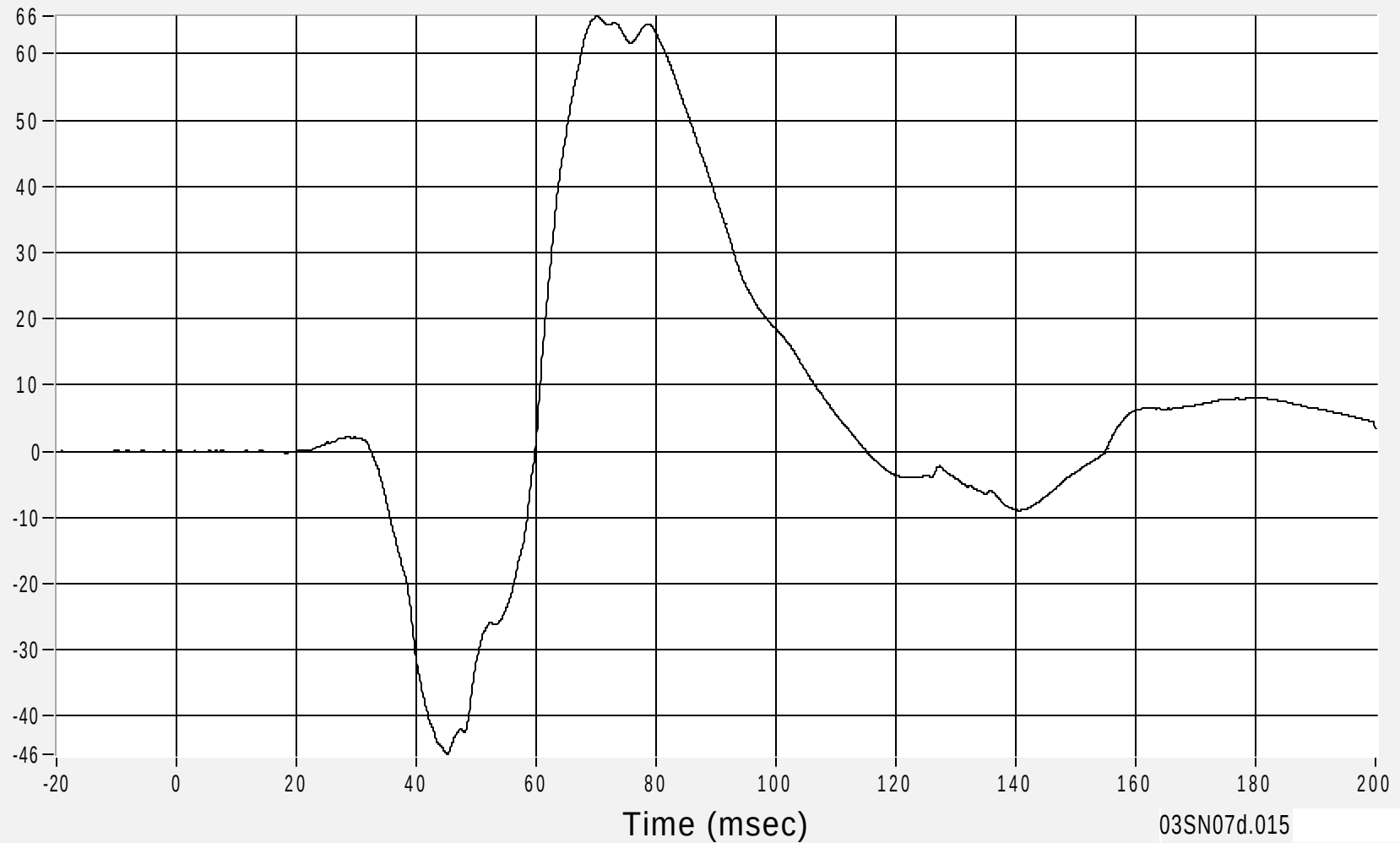
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (X) Moment

Moment (Nm) CFC600

Max 65.7 Nm at 70.2 msec
Min -45.8 Nm at 45.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

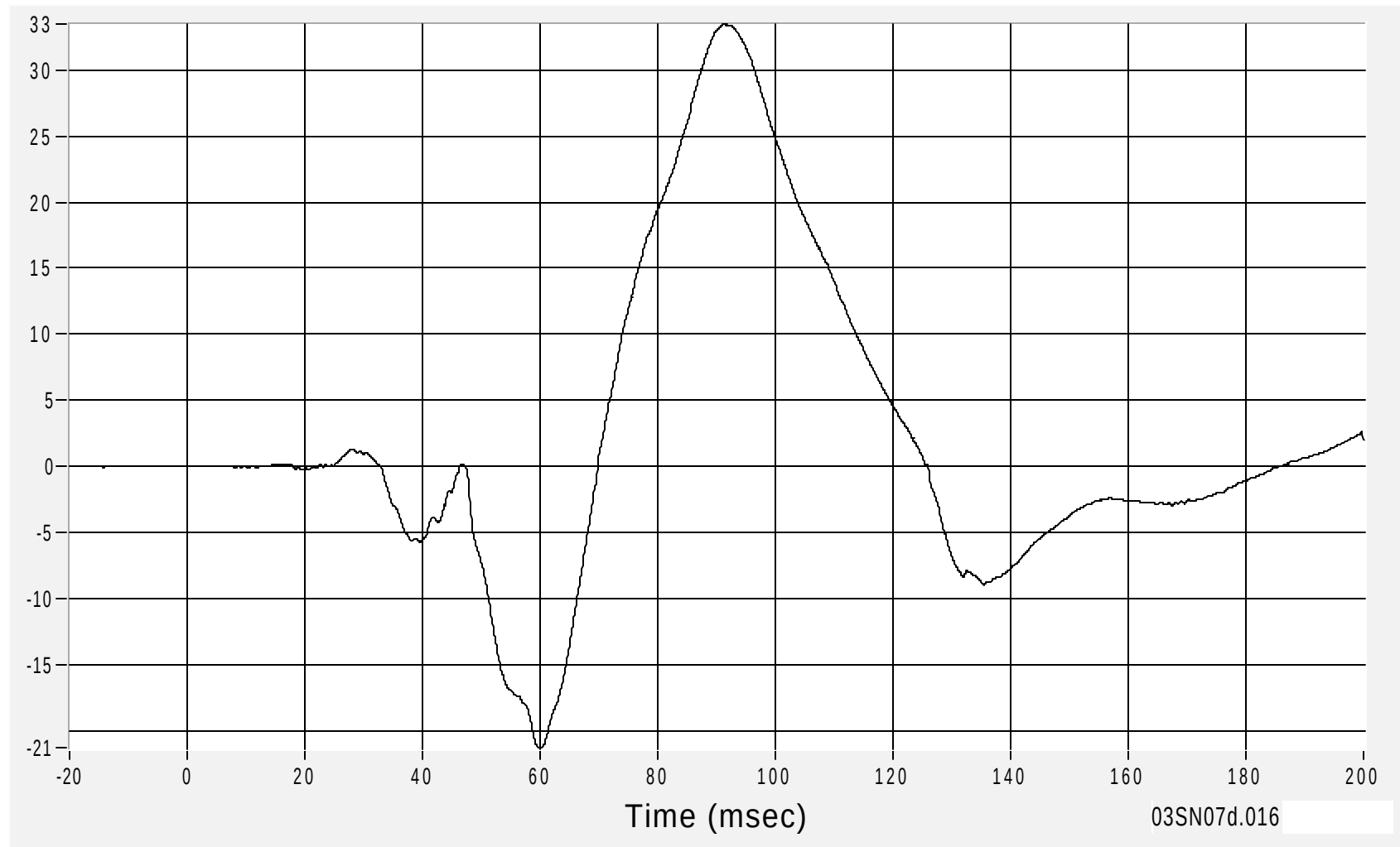
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (Y) Moment

Moment (Nm) CFC600

Max 33.5 Nm at 91.3 msec
Min -21.3 Nm at 59.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

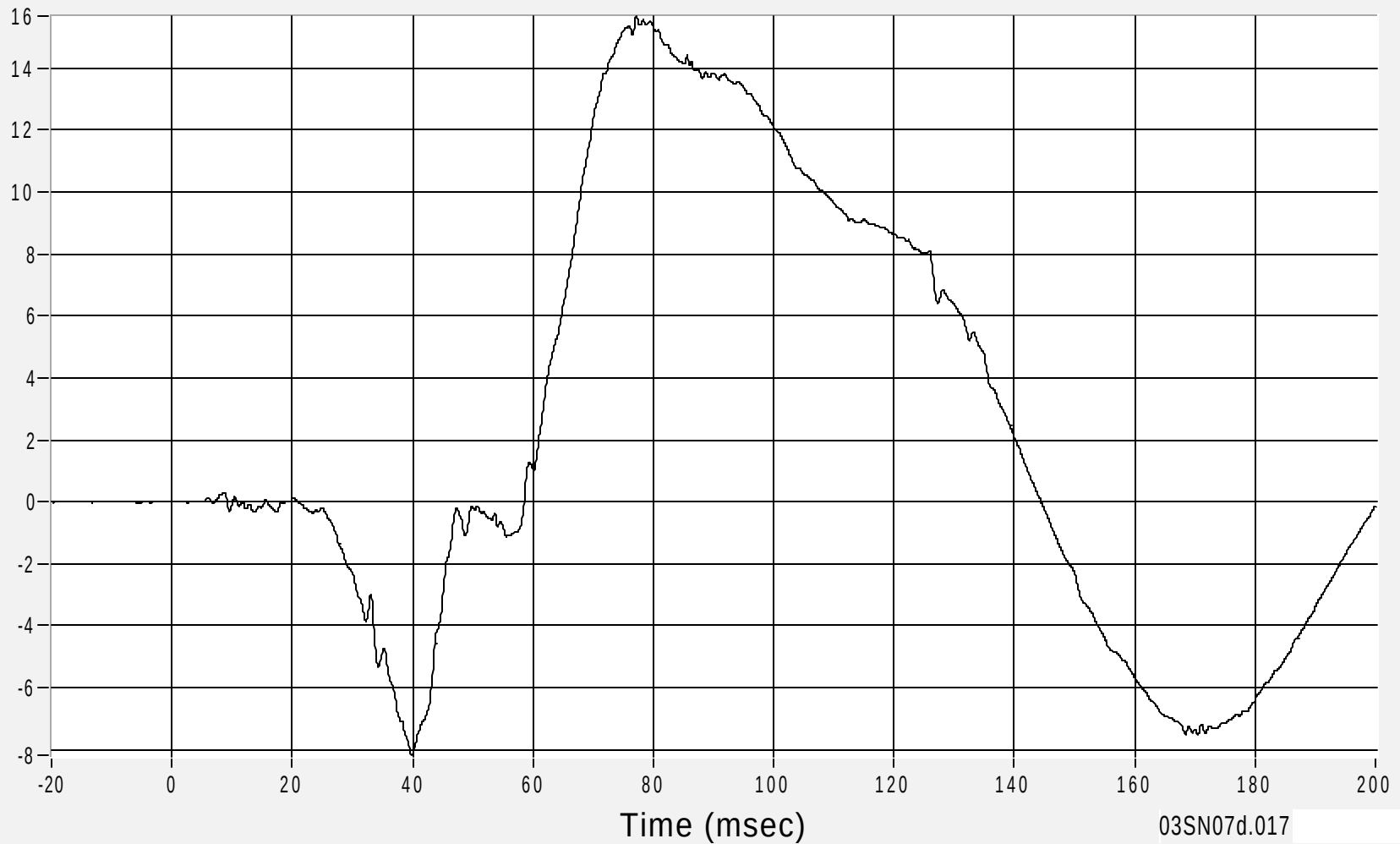
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Neck (Z) Moment

Moment (Nm) CFC600

Max 15.7 Nm at 77.1 msec
Min -8.2 Nm at 39.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

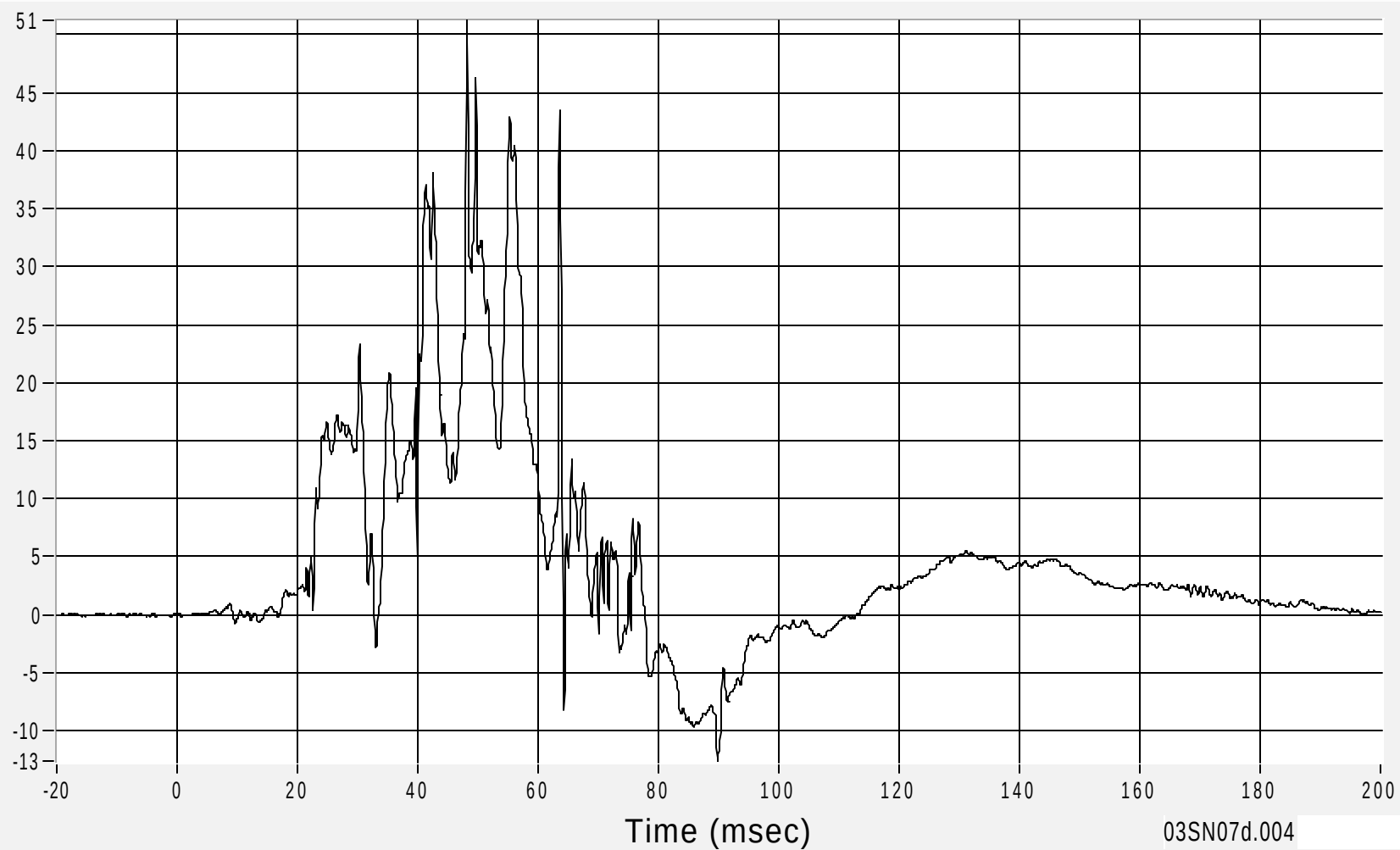
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 51.2 G's at 48.2 msec
Min -12.6 G's at 89.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

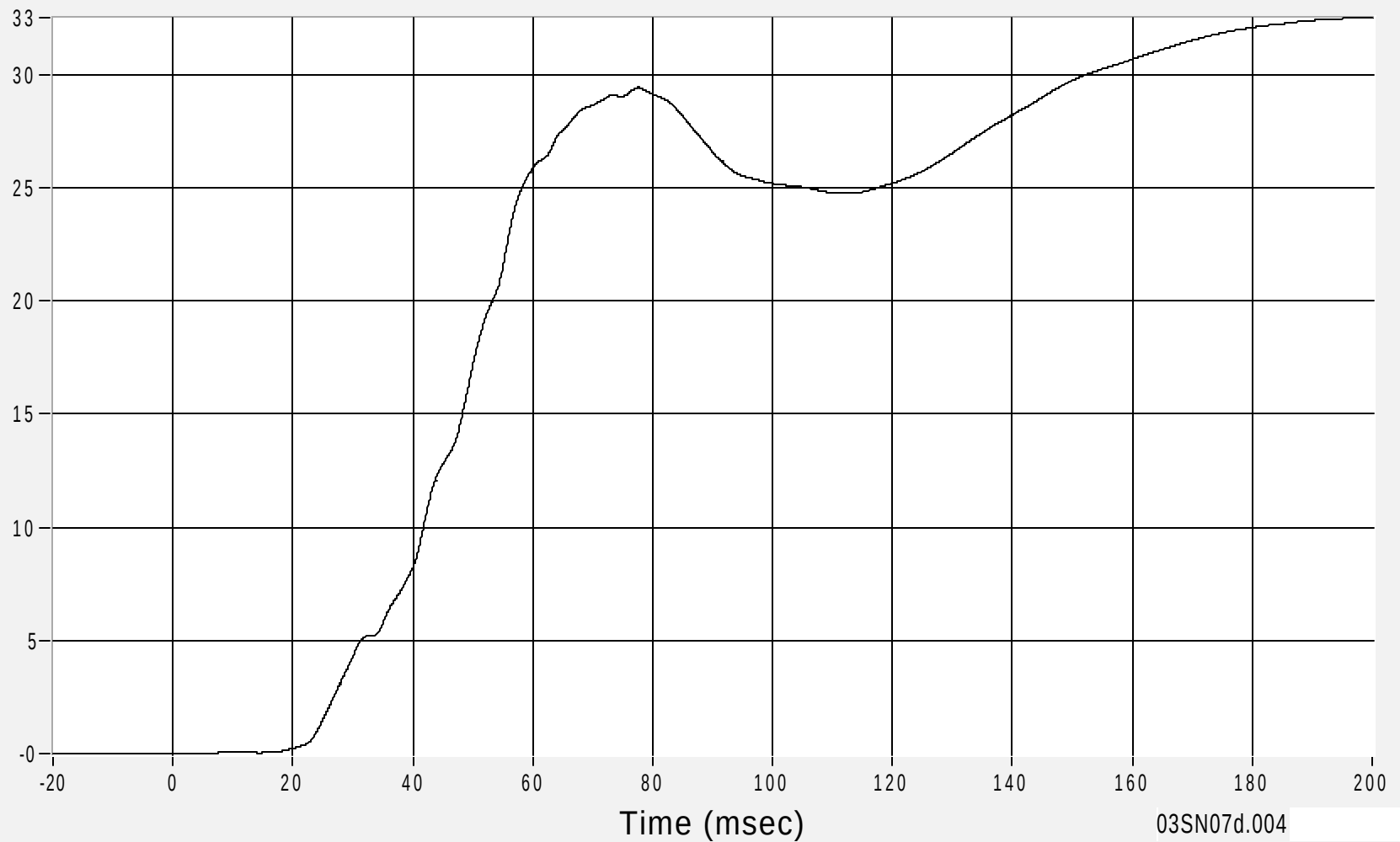
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Velocity

Velocity (km/h) CFC180

Max 32.5 km/h at 199.9 msec

Min 0.0 km/h at 2.0 msec



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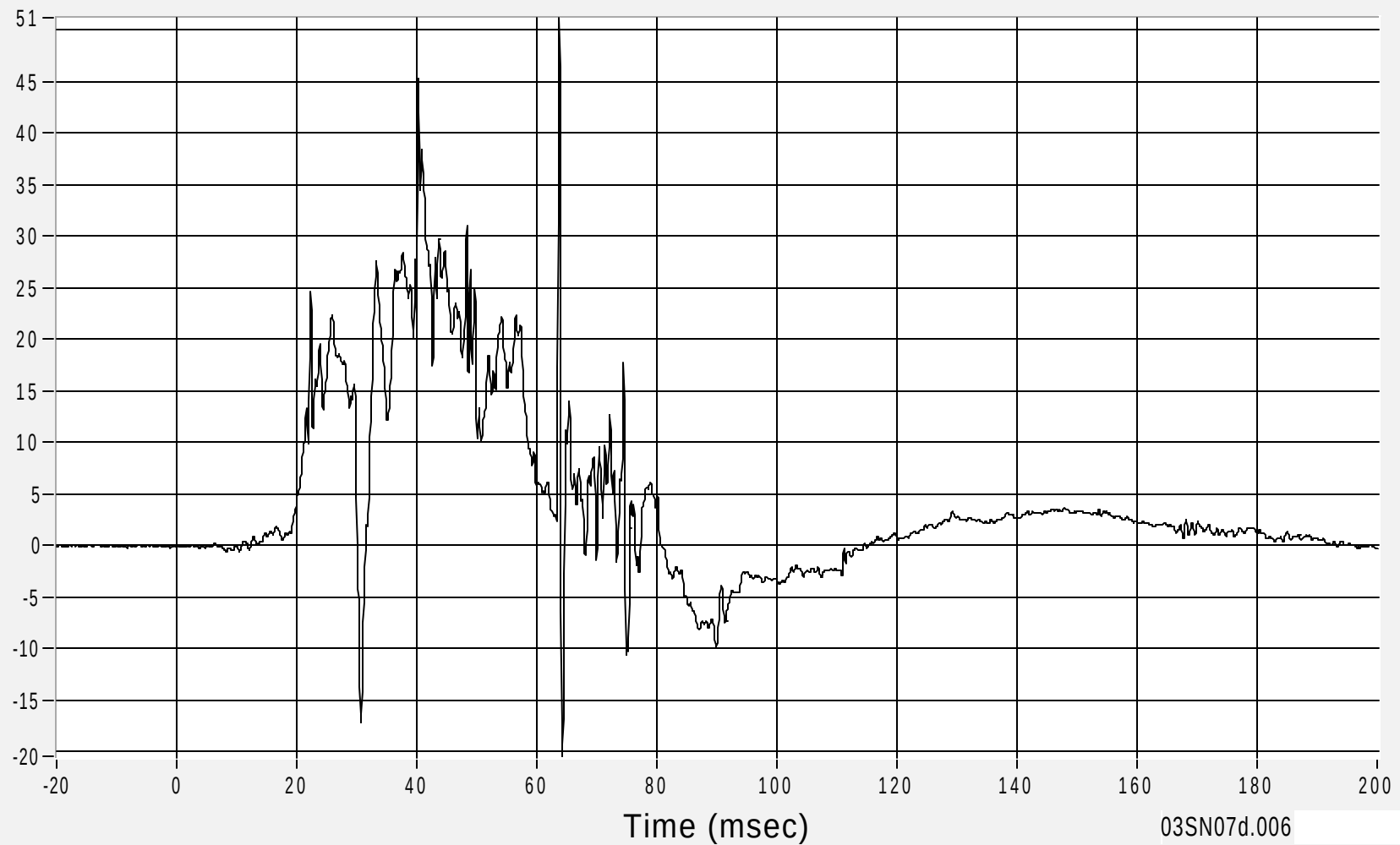
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 51.2 G's at 63.8 msec
Min -20.5 G's at 64.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

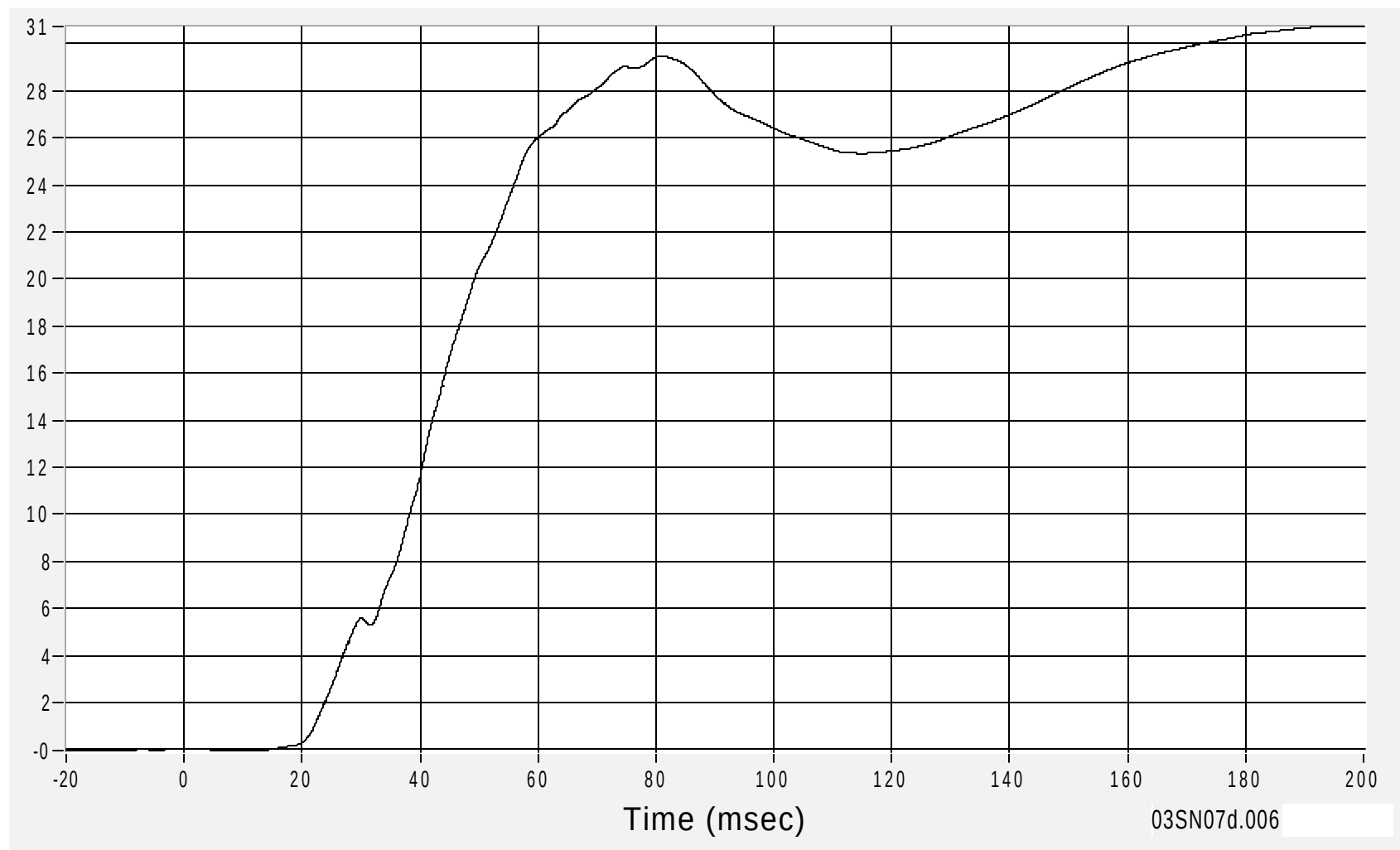
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Velocity

Velocity (km/h) CFC180

Max 30.7 km/h at 196.1 msec

Min 0.0 km/h at 10.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

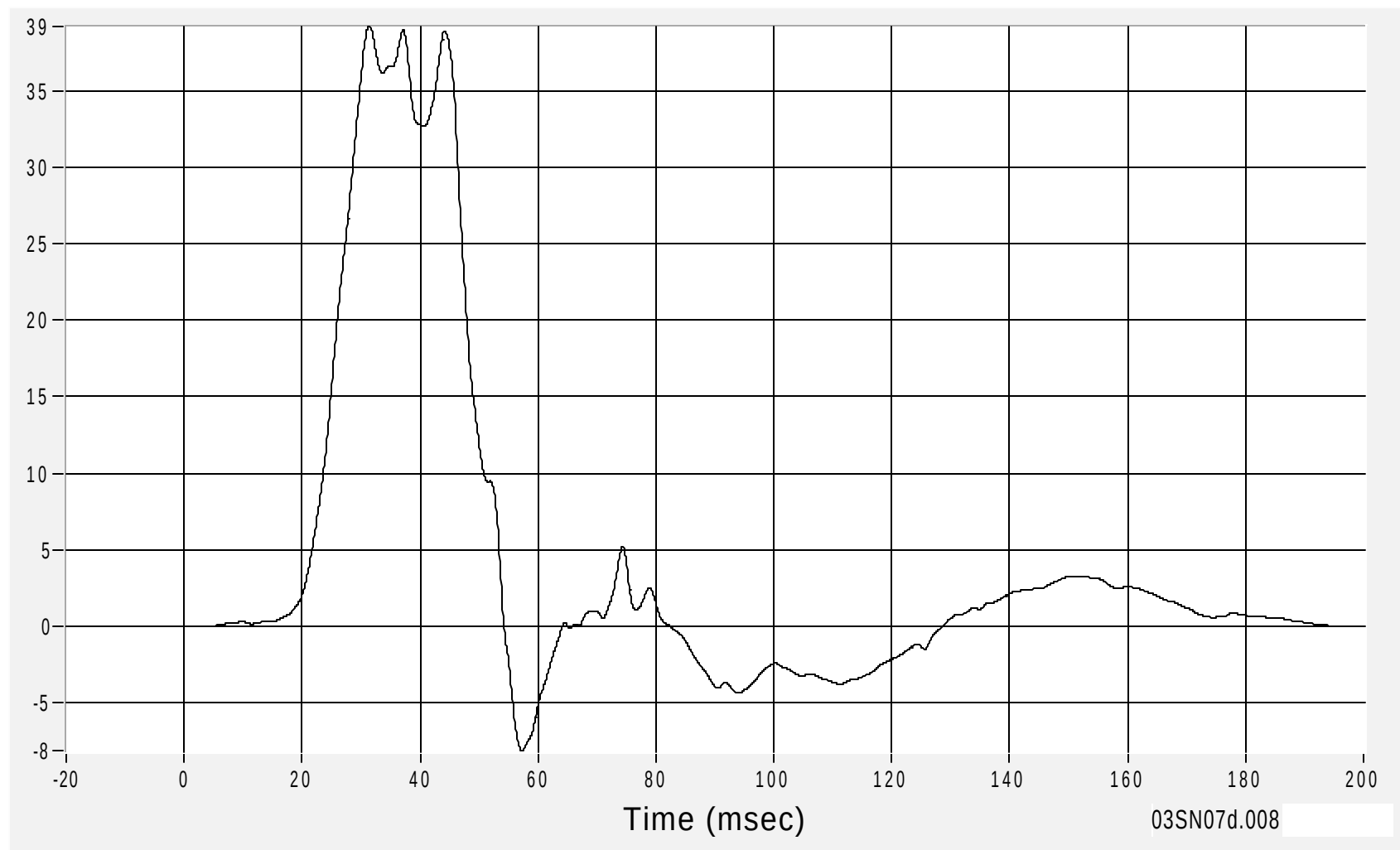
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Acceleration

Acceleration (G's) CFC180

Max 39.2 G's at 31.4 msec
Min -8.1 G's at 57.4 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

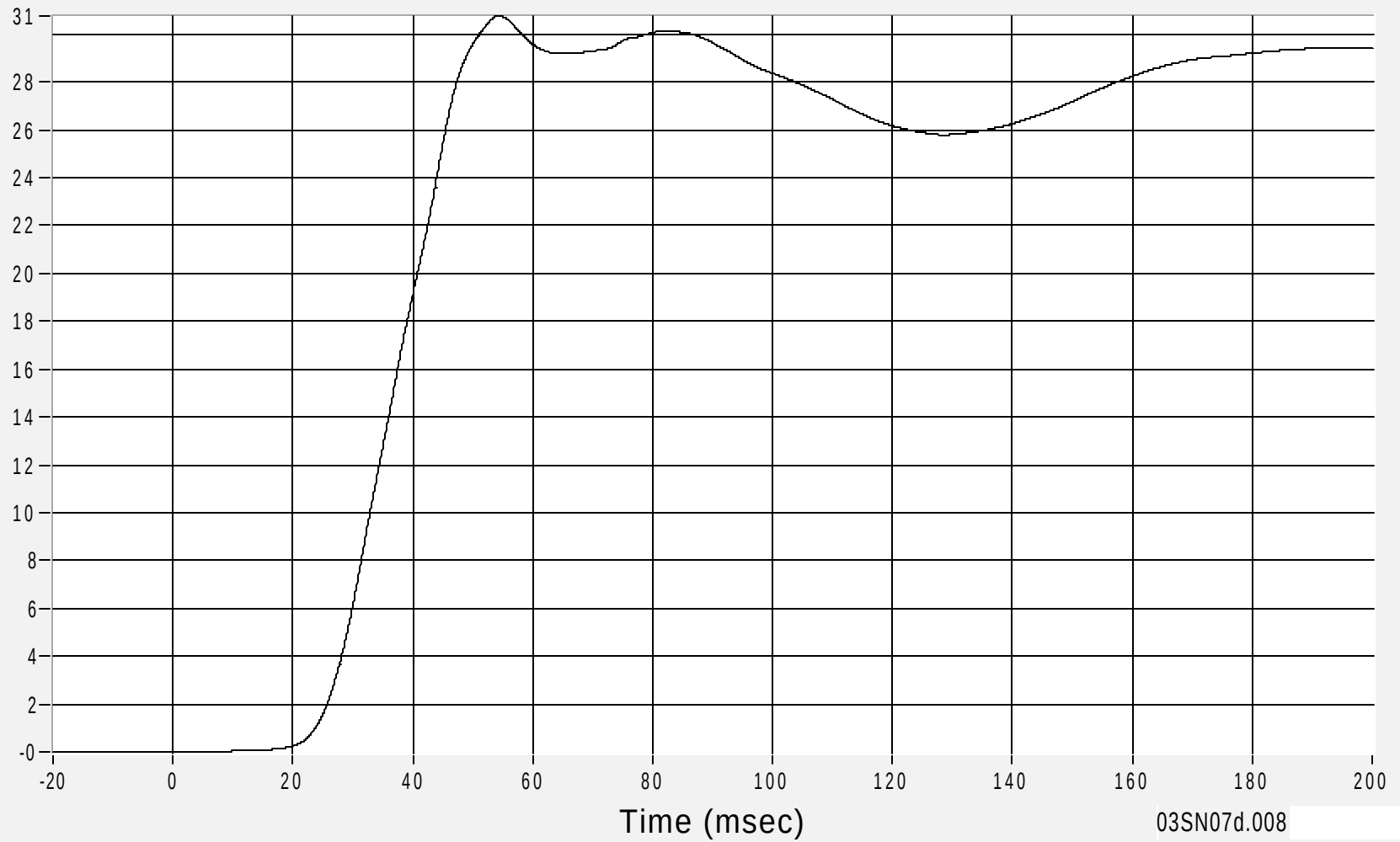
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Velocity

Velocity (km/h) CFC180

Max 30.8 km/h at 54.2 msec
Min 0.0 km/h at 0.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

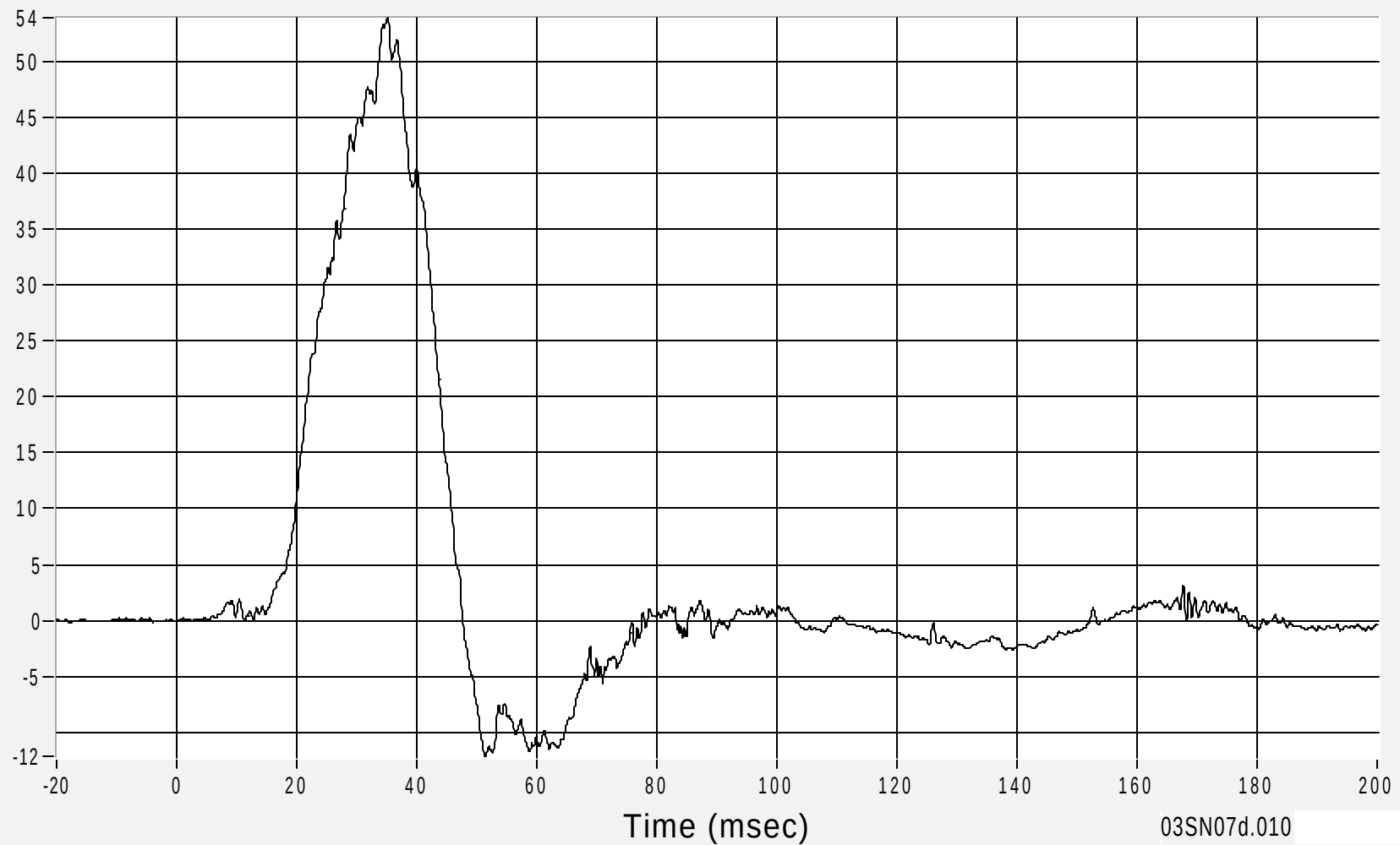
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Acceleration

Acceleration (G's) CFC1000

Max 53.9 G's at 35.1 msec
Min -12.2 G's at 51.4 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

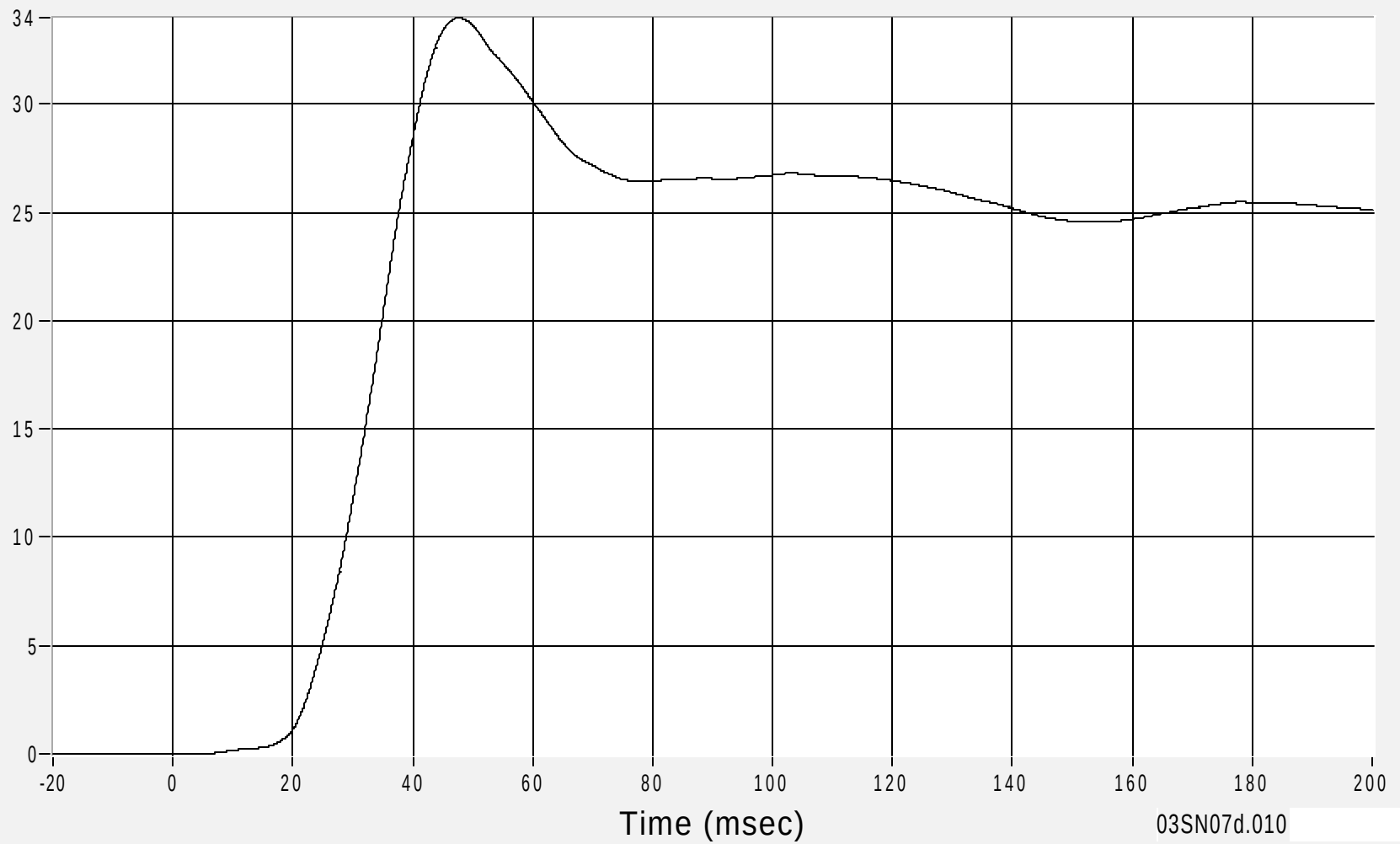
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Velocity

Velocity (km/h) CFC180

Max 34.0 km/h at 47.7 msec
Min 0.0 km/h at 0.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

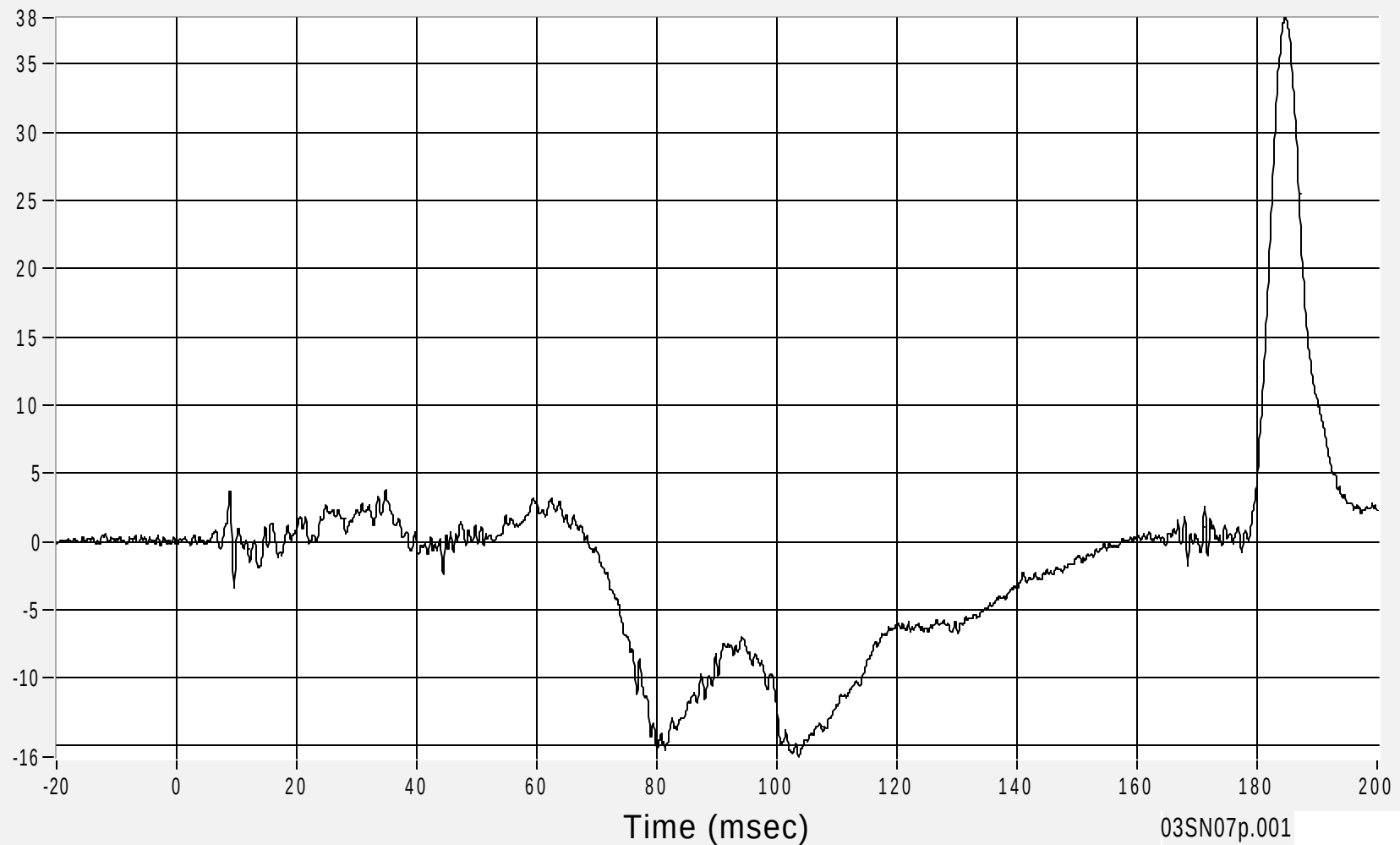
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (X) Acceleration

Acceleration (G's) CFC1000

Max 38.4 G's at 184.6 msec

Min -15.8 G's at 103.7 msec



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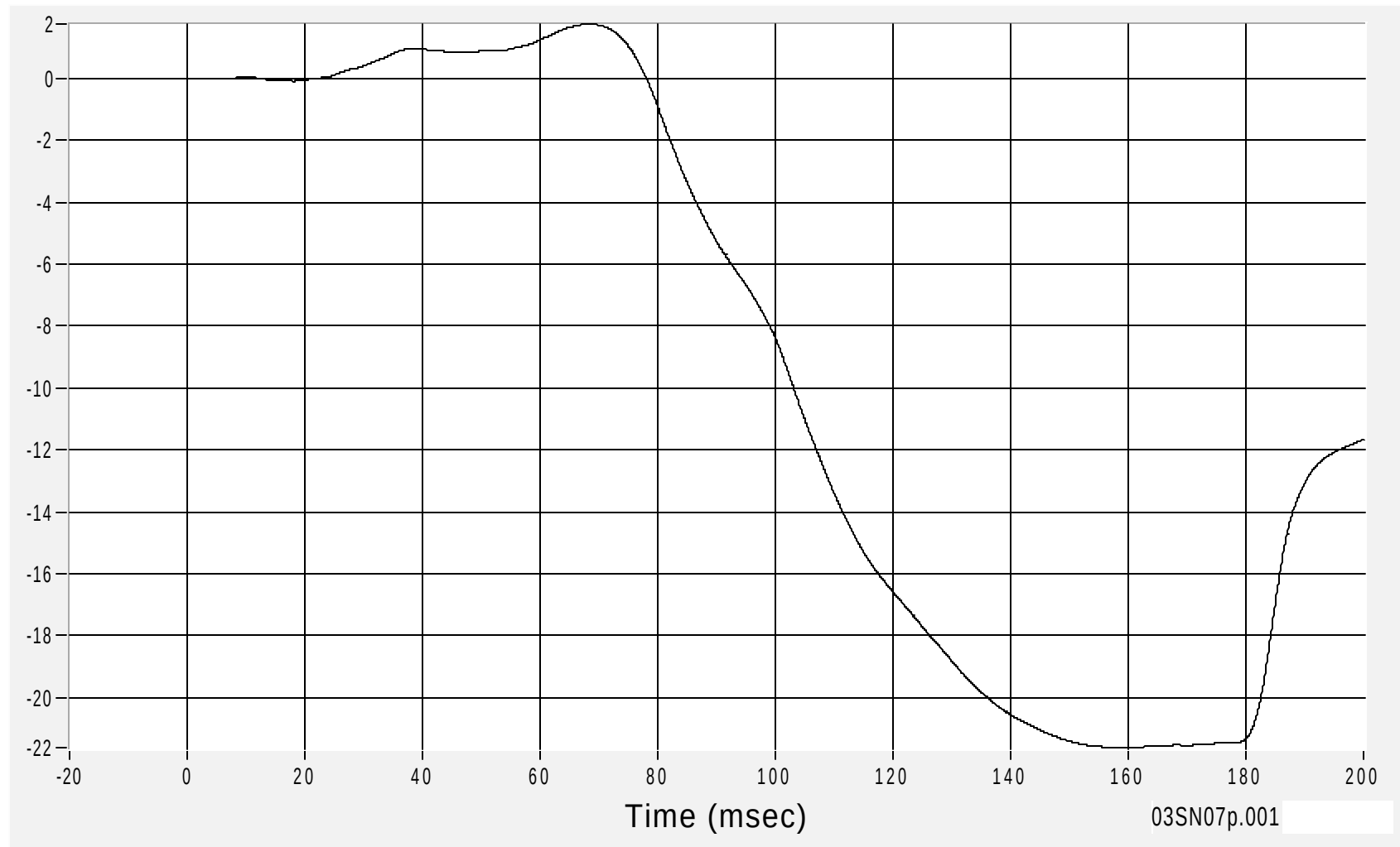
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (X) Velocity

Velocity (km/h) CFC180

Max 1.8 km/h at 68.2 msec
Min -21.6 km/h at 158.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

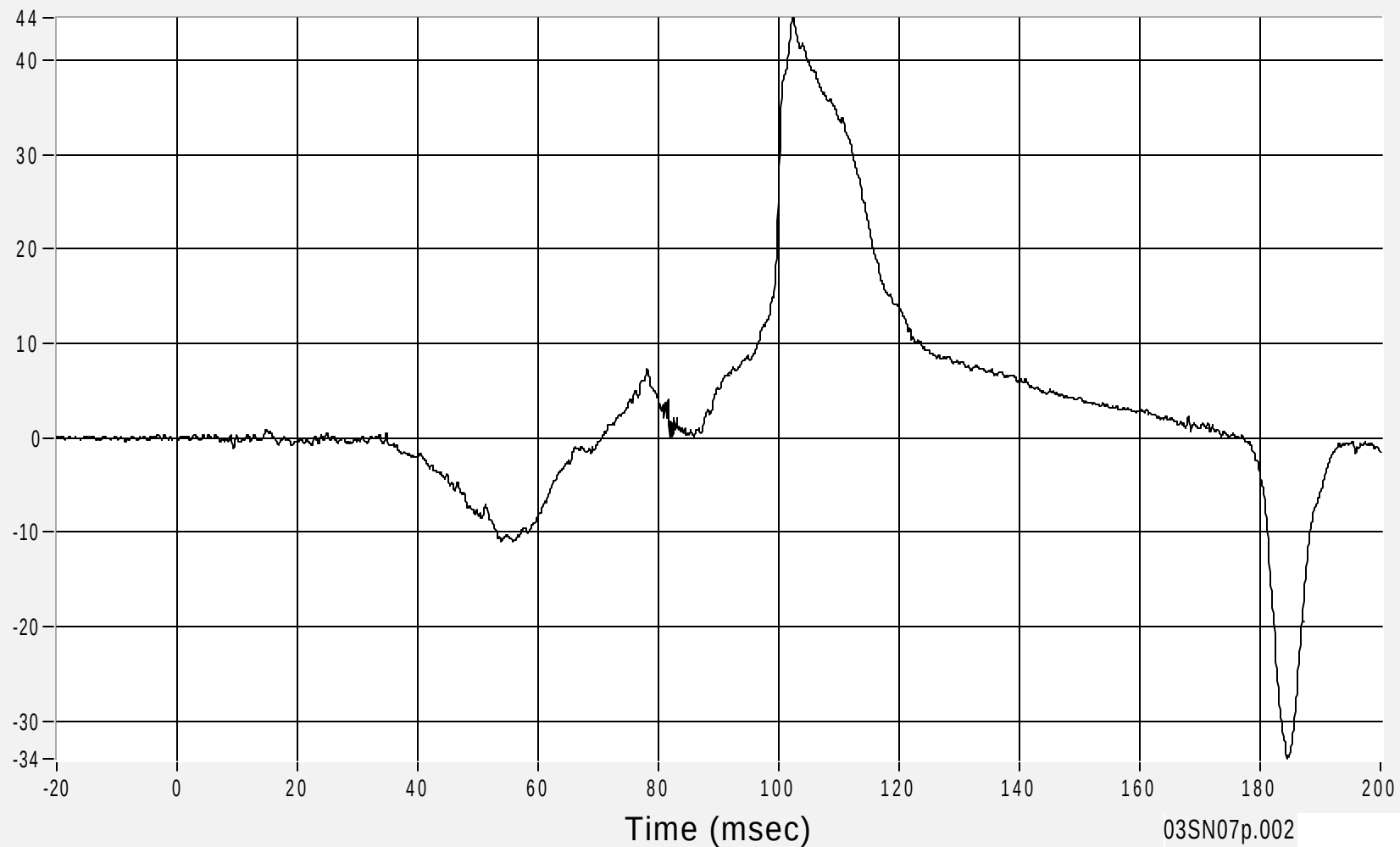
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (Y) Acceleration

Acceleration (G's) CFC1000

Max 44.5 G's at 102.3 msec

Min -34.0 G's at 184.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

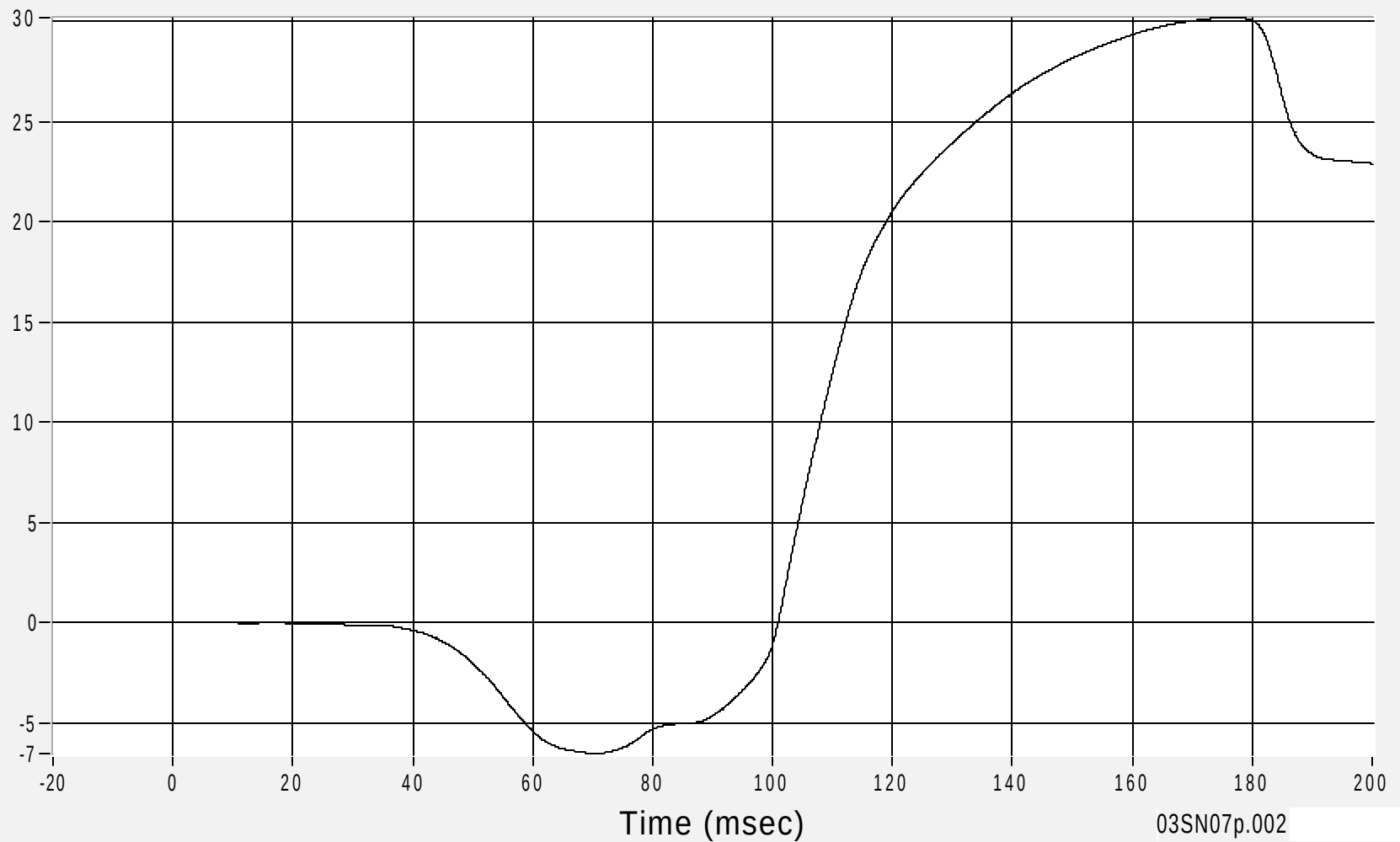
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (Y) Velocity

Velocity (km/h) CFC180

Max 30.2 km/h at 177.0 msec

Min -6.5 km/h at 70.5 msec



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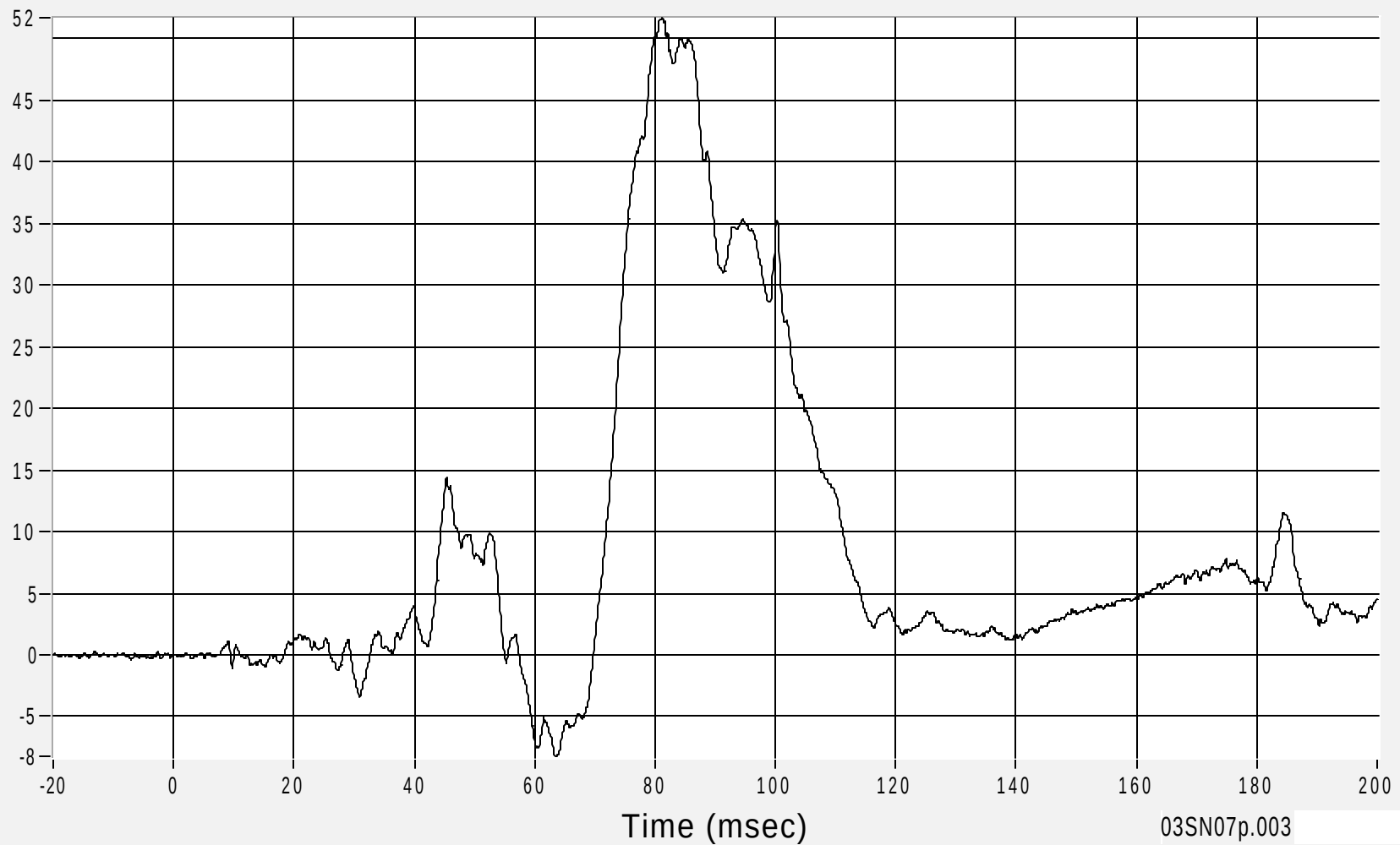
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (Z) Acceleration

Acceleration (G's) CFC1000

Max 51.7 G's at 81.2 msec
Min -8.2 G's at 63.4 msec



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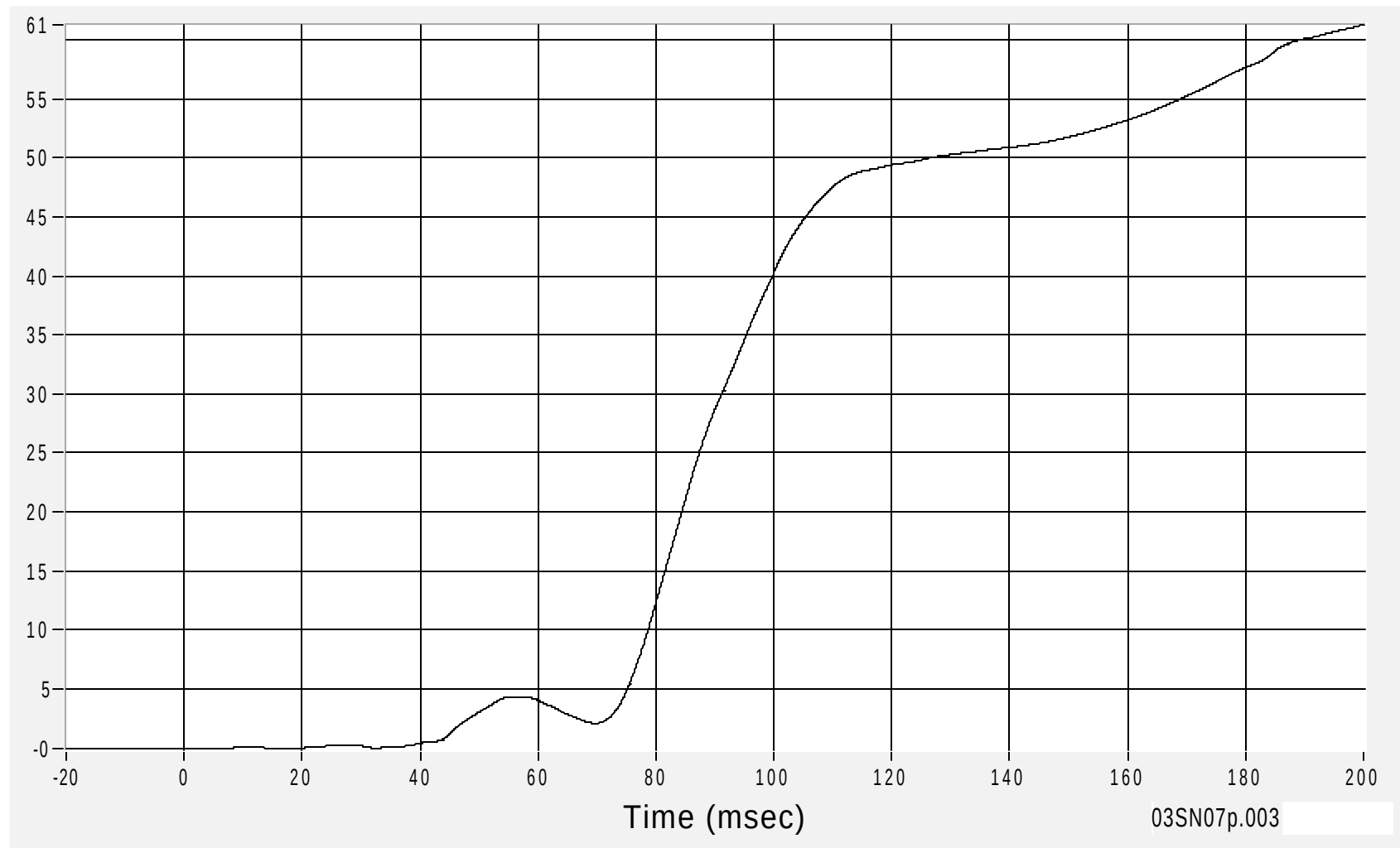
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head CG (Z) Velocity

Velocity (km/h) CFC180

Max 61.3 km/h at 199.9 msec
Min 0.0 km/h at 18.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

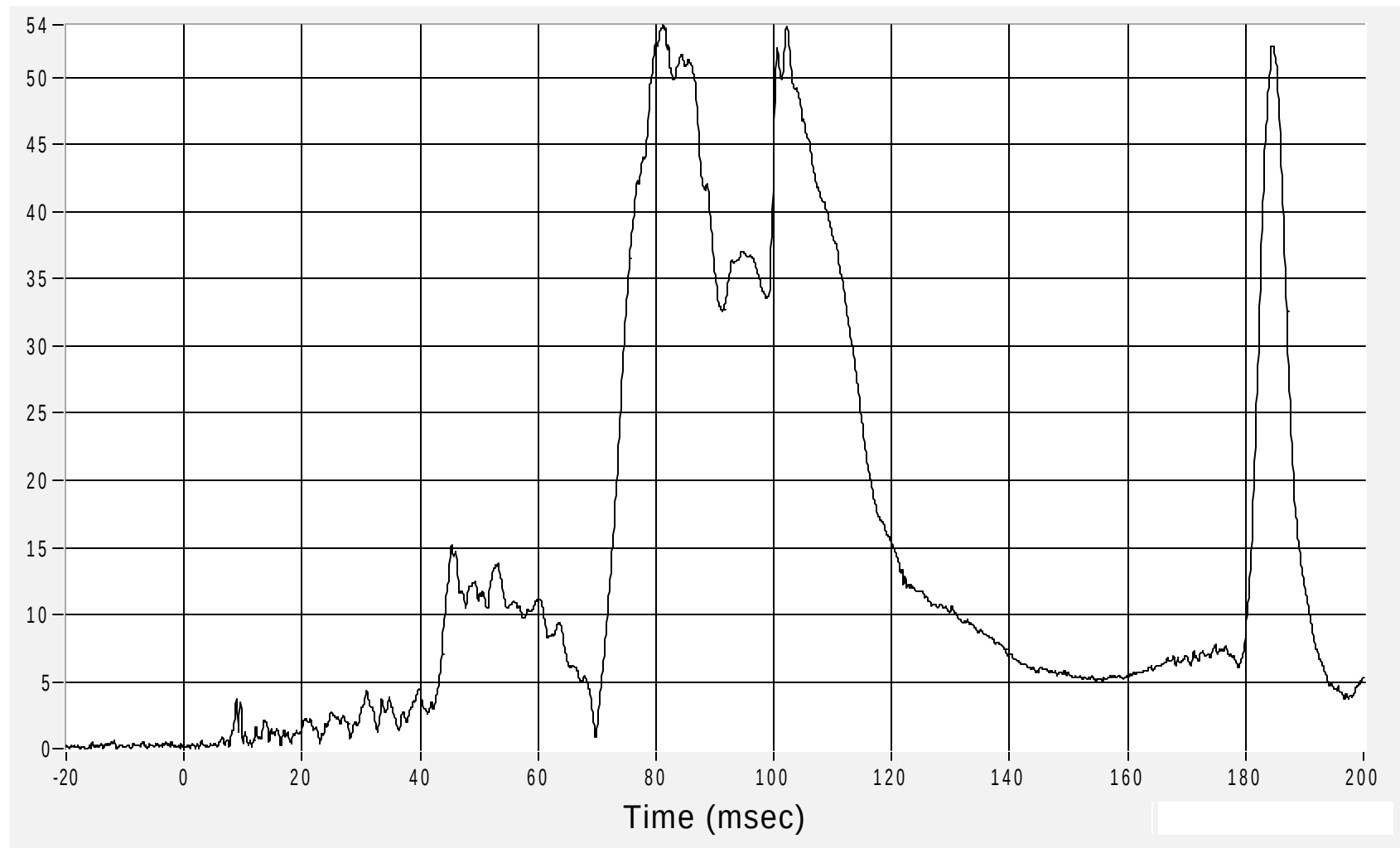
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Head Resultant Acceleration

Acceleration (G's) CFC1000

Max 53.9 G's at 81.3 msec
Min 0.1 G's at 2.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

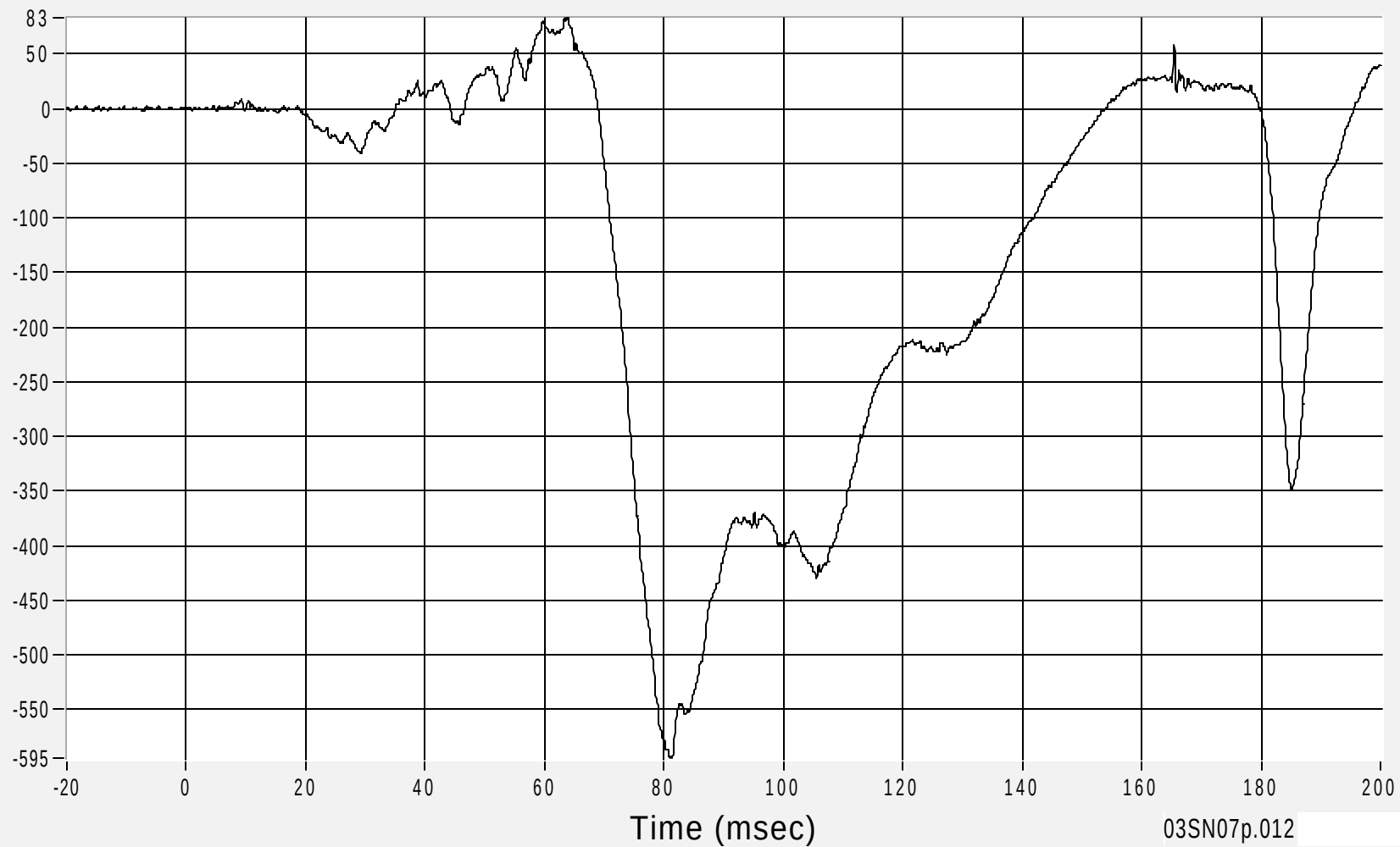
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Neck (X) Force

Force (N) CFC1000

Max 83.3 N at 63.8 msec

Min -594.7 N at 81.4 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

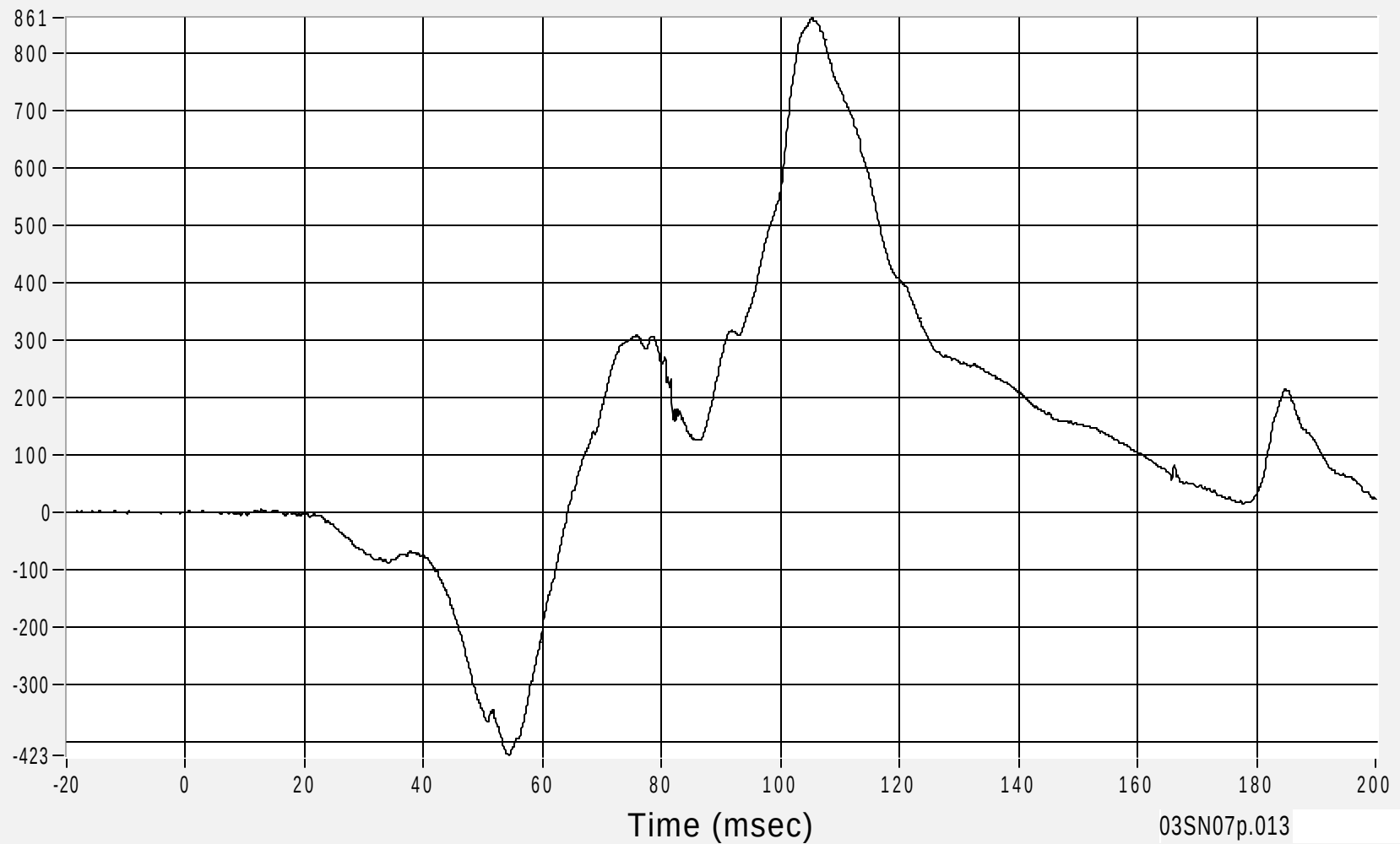
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Neck (Y) Force

Force (N) CFC1000

Max 861.5 N at 105.4 msec

Min -423.2 N at 54.3 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

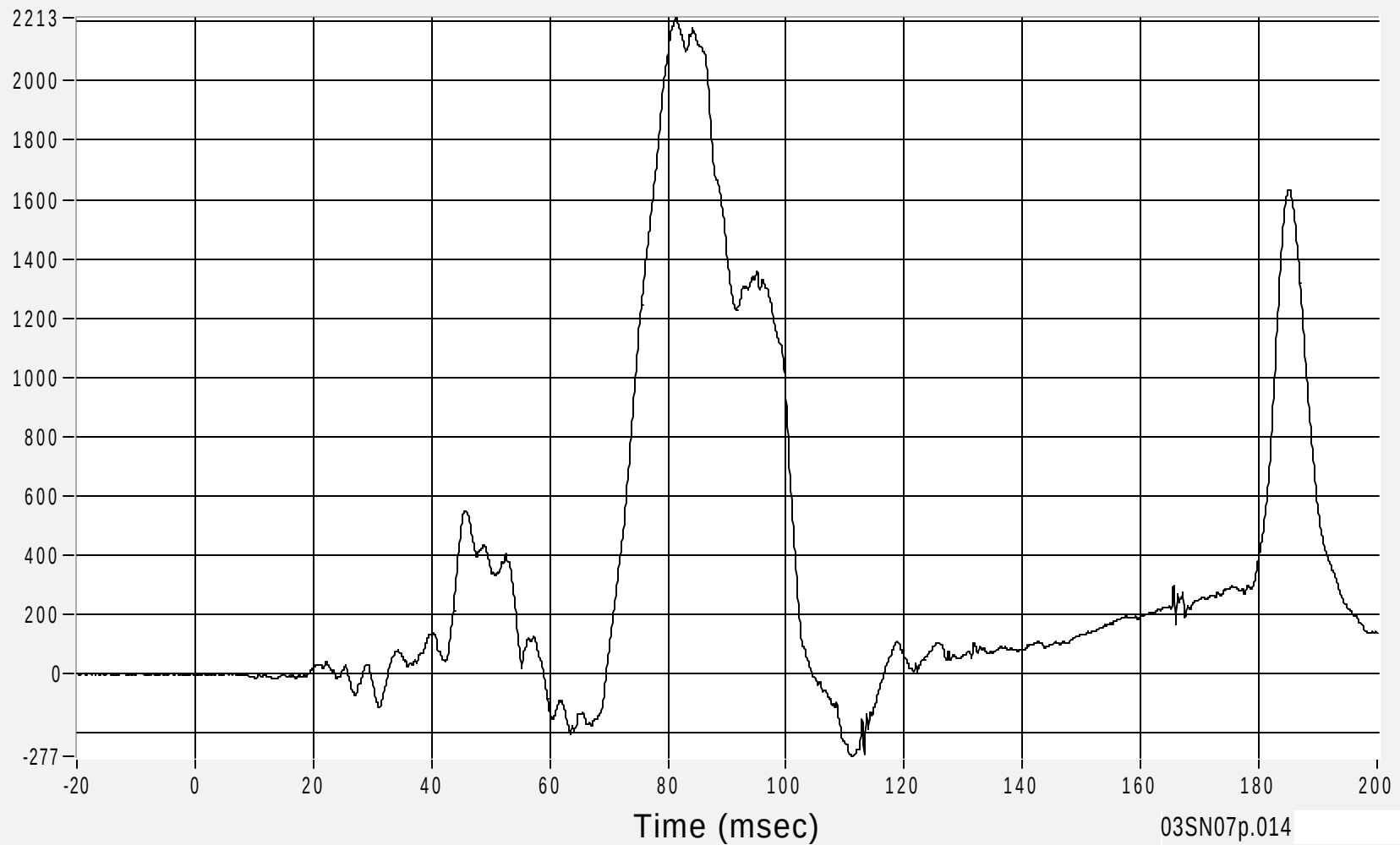
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Neck (Z) Force

Force (N) CFC1000

Max 2212.8 N at 81.4 msec

Min -277.0 N at 111.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

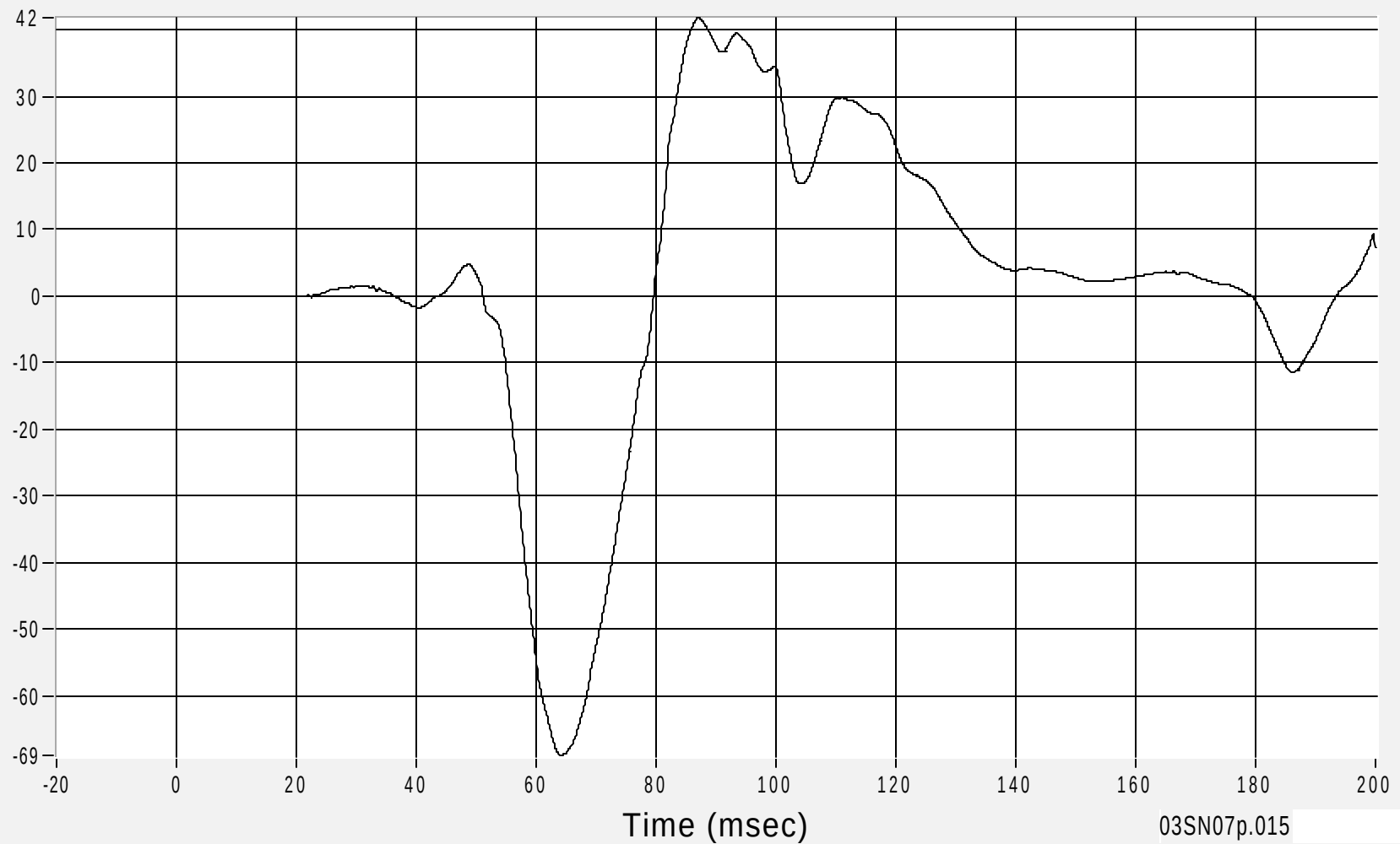
Passenger Upper Neck (X) Moment

Moment (Nm)

CFC600

Max 41.8 Nm at 87.0 msec

Min -69.0 Nm at 64.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

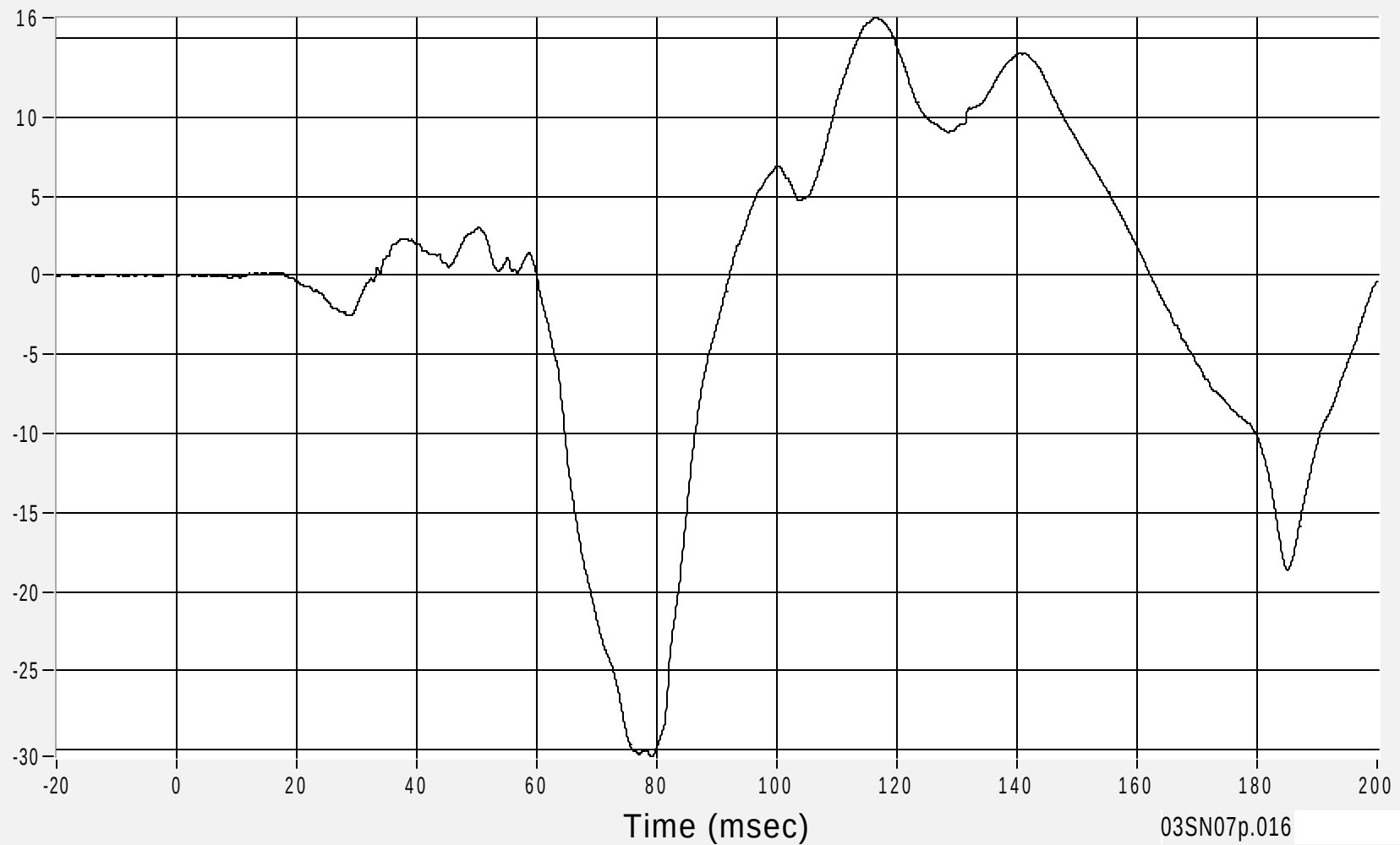
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Neck (Y) Moment

Moment (Nm) CFC600

Max 16.3 Nm at 116.6 msec

Min -30.4 Nm at 79.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

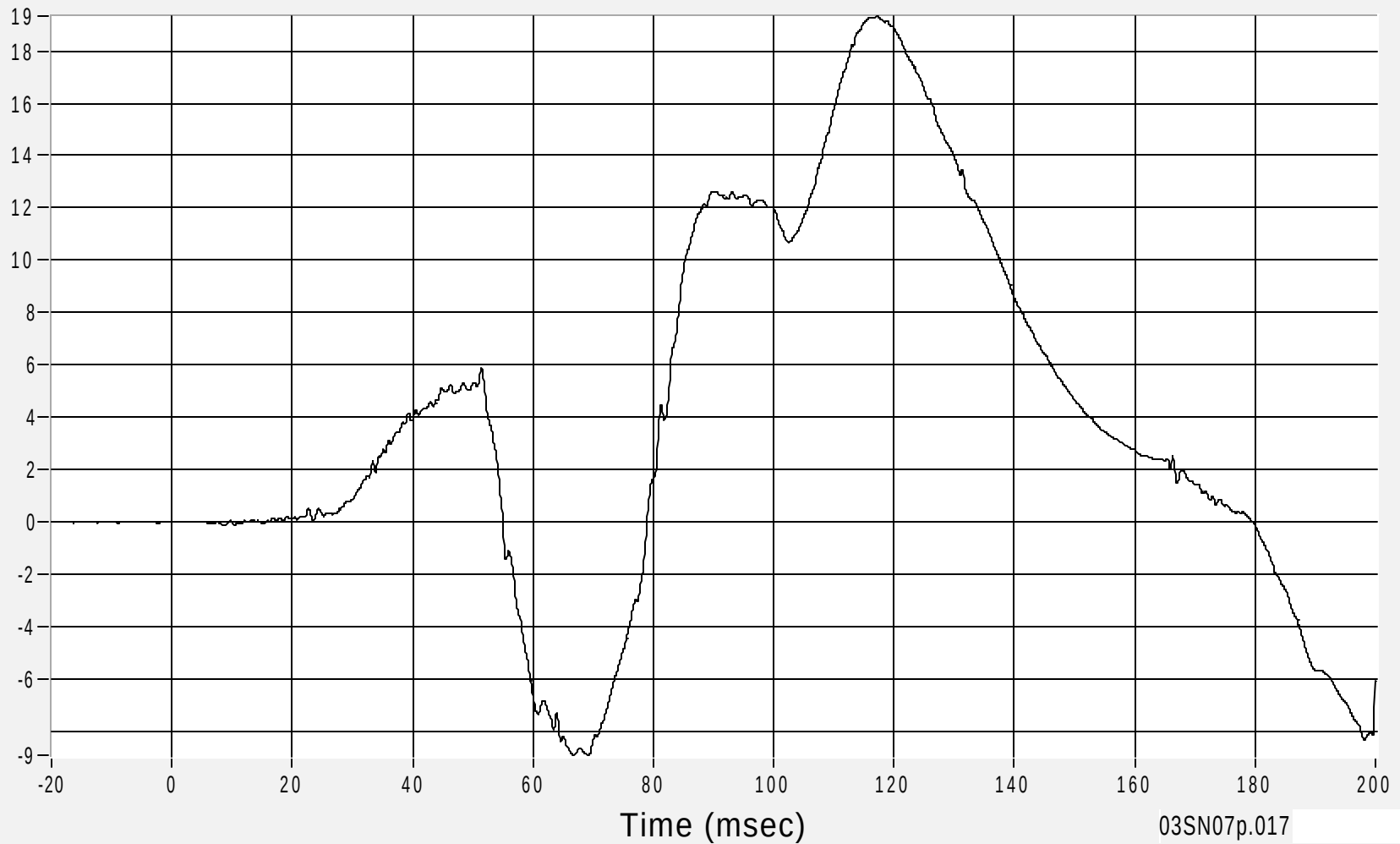
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Neck (Z) Moment

Moment (Nm) CFC600

Max 19.3 Nm at 117.3 msec
Min -8.9 Nm at 69.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

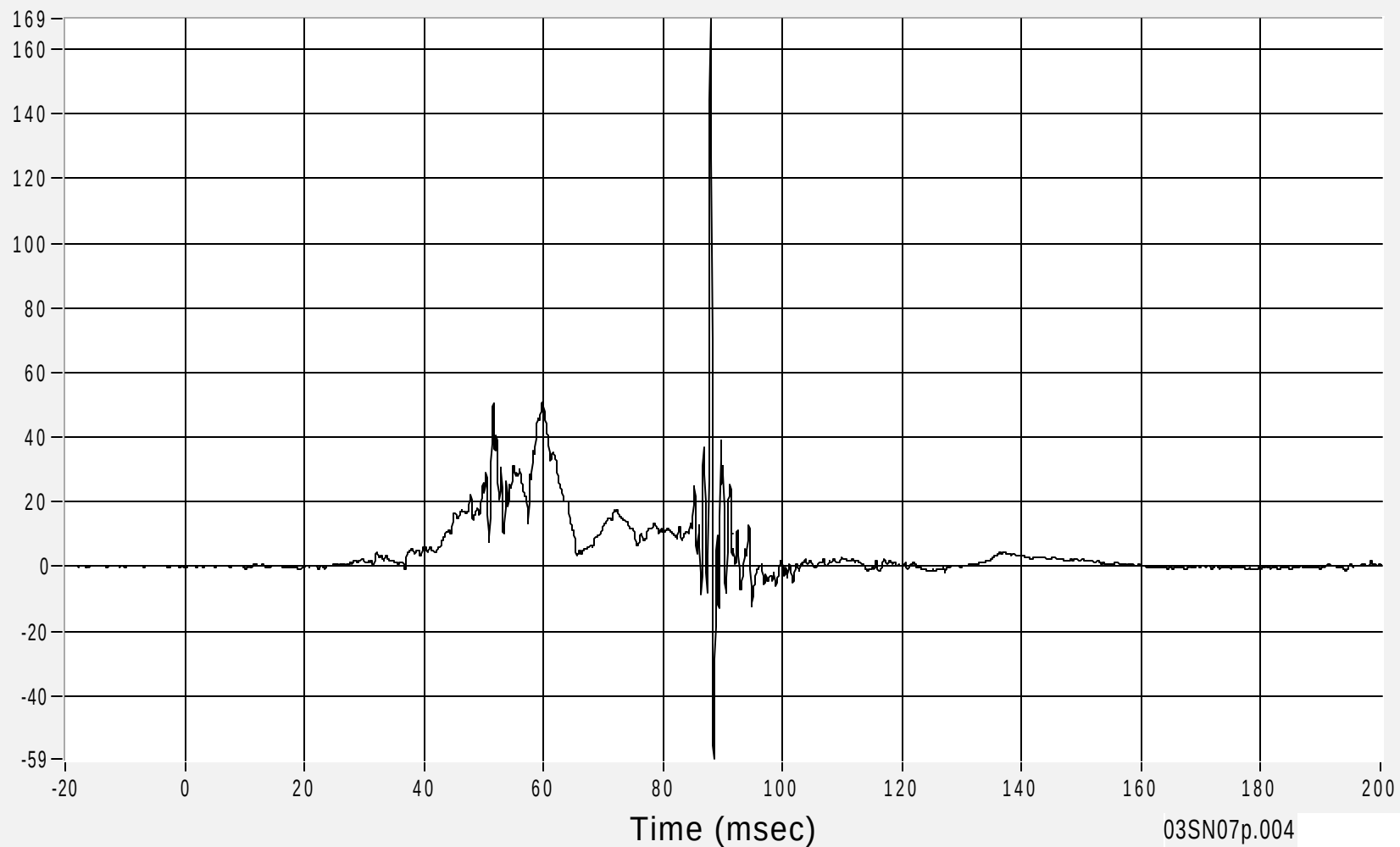
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 169.5 G's at 87.9 msec

Min -59.5 G's at 88.5 msec



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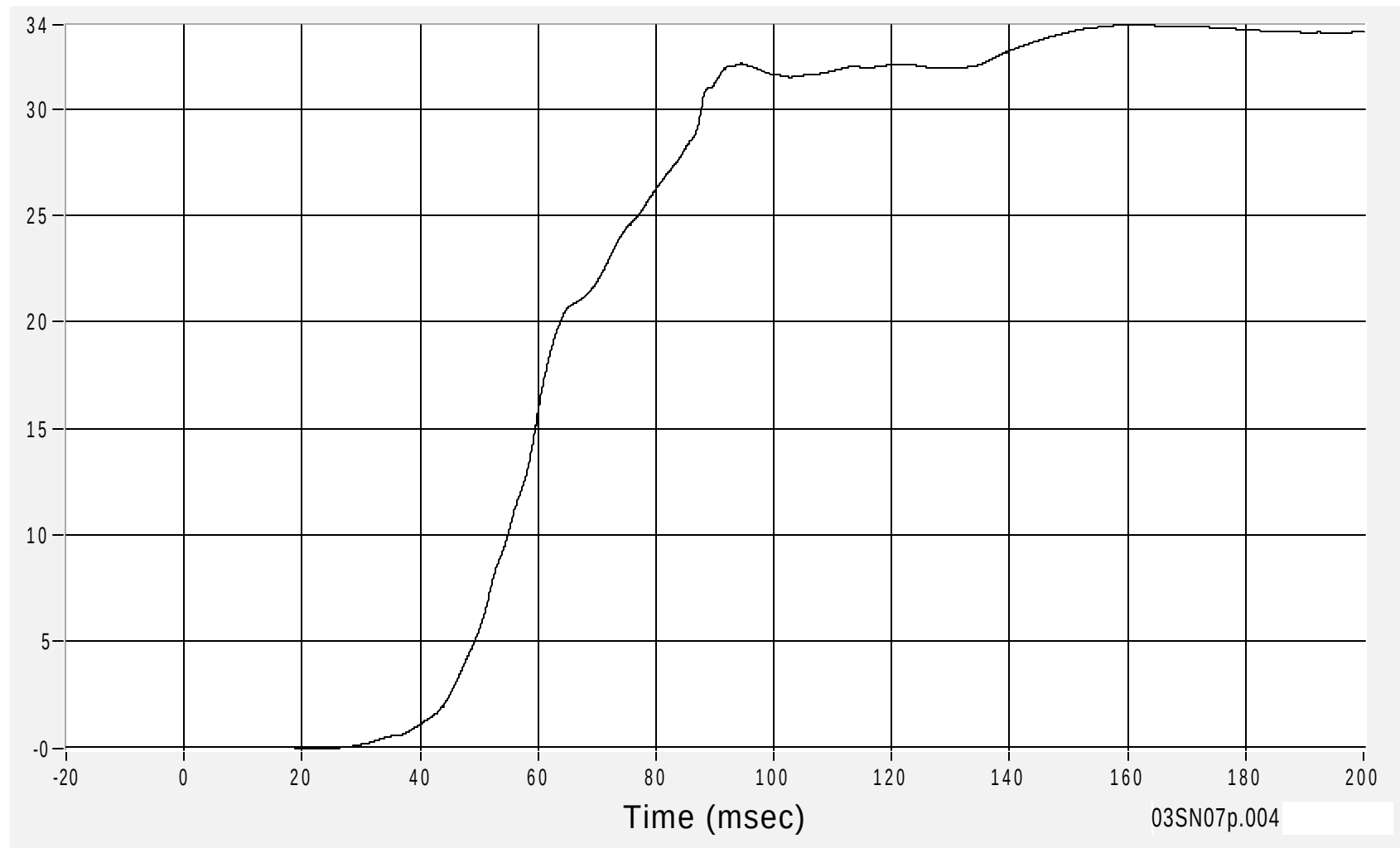
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Velocity

Velocity (km/h) CFC180

Max 34.0 km/h at 160.6 msec
Min 0.0 km/h at 23.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

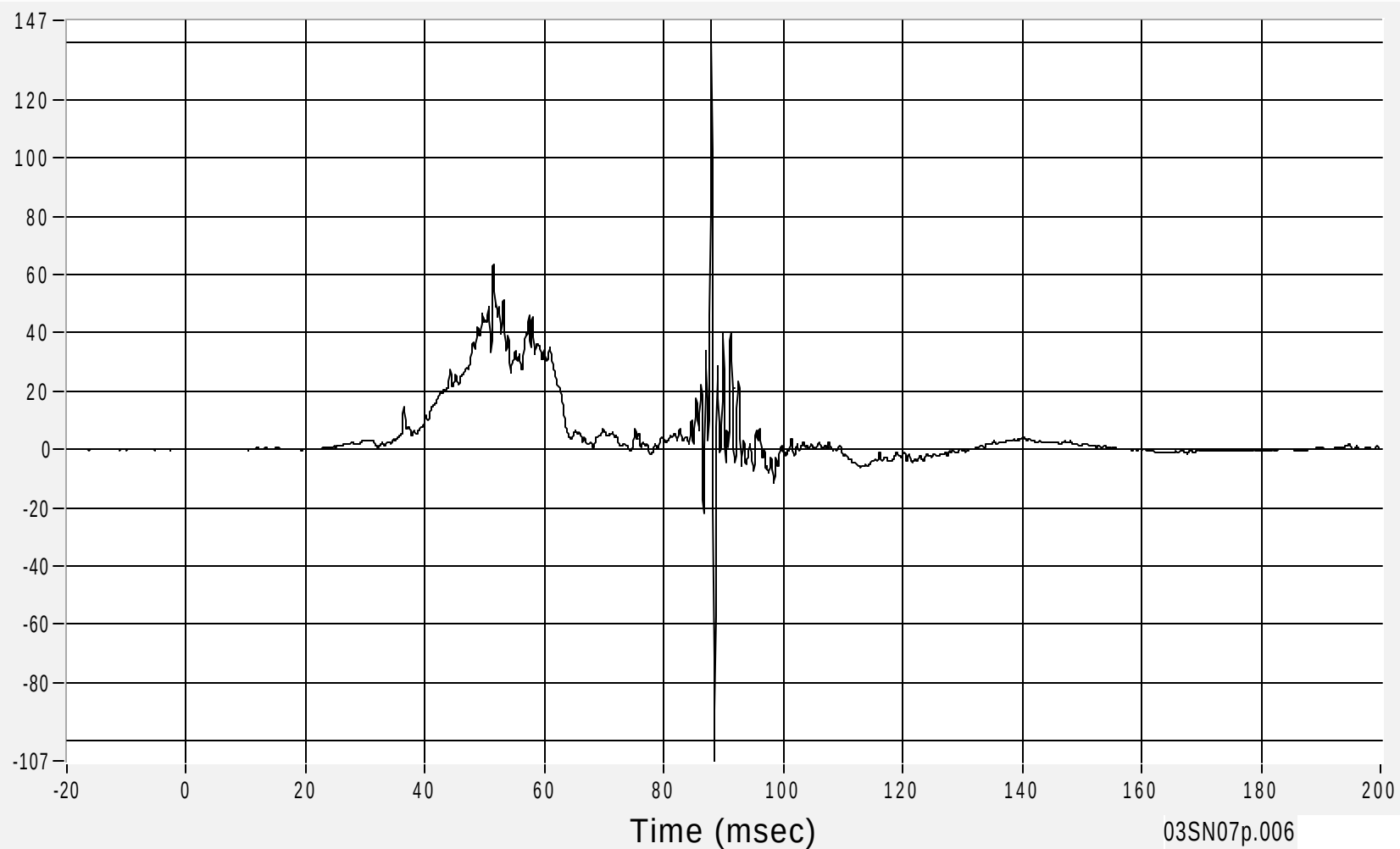
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Acceleration

Acceleration (G's) CFC1000

Max 147.3 G's at 87.9 msec

Min -106.9 G's at 88.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

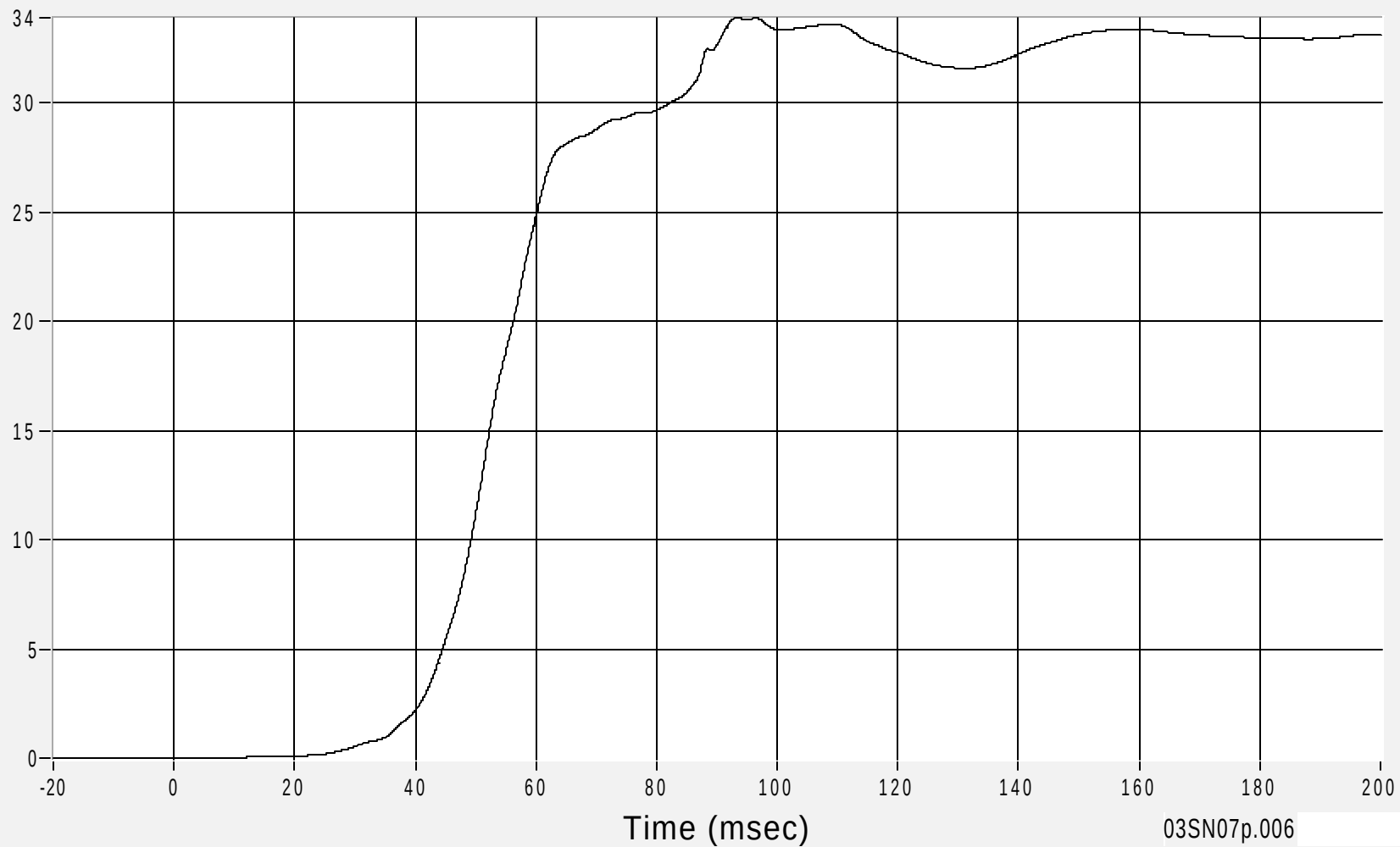
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Velocity

Velocity (km/h) CFC180

Max 33.9 km/h at 93.4 msec

Min 0.0 km/h at 0.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

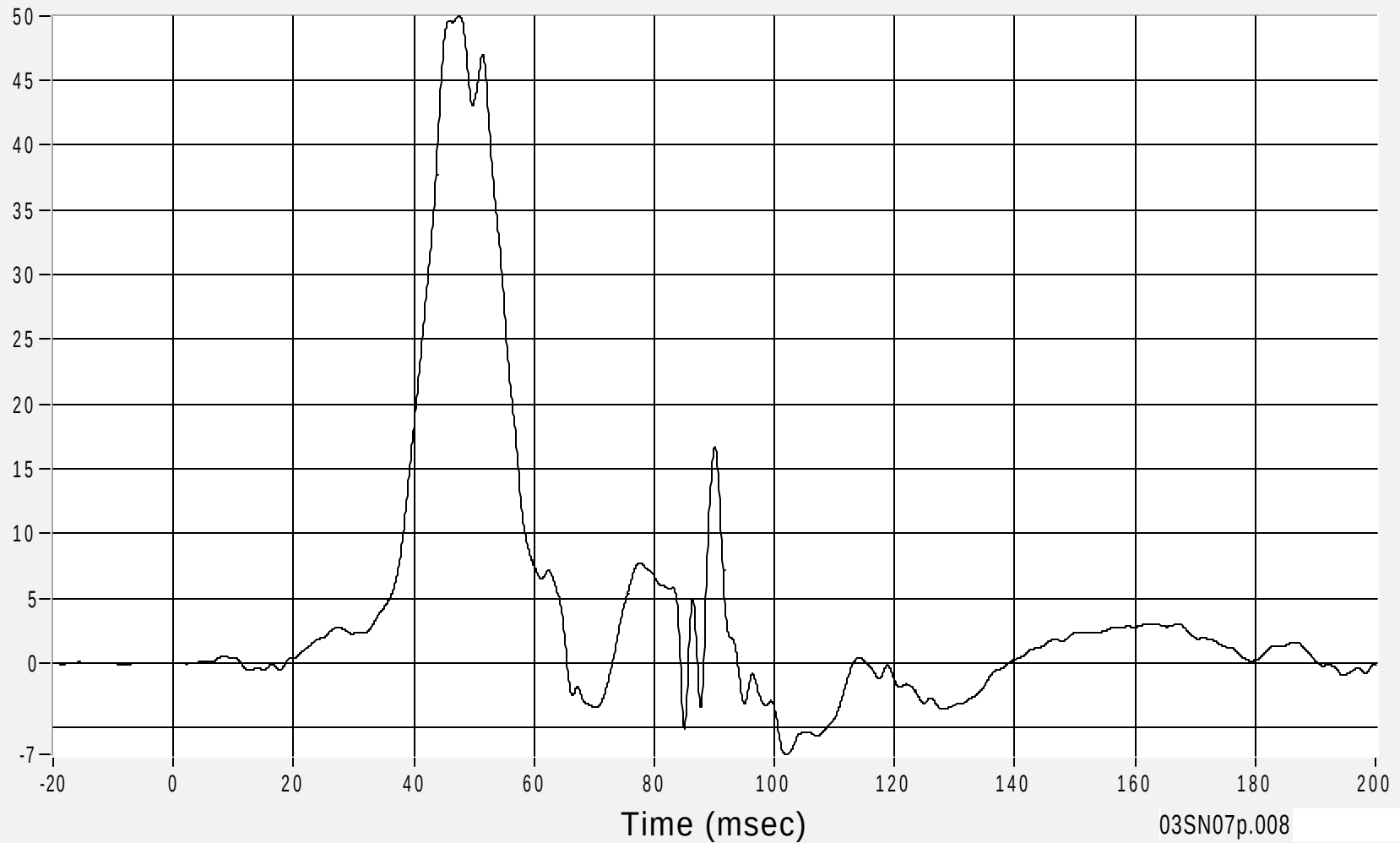
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Acceleration

Acceleration (G's) CFC180

Max 49.9 G's at 47.6 msec
Min -7.0 G's at 101.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

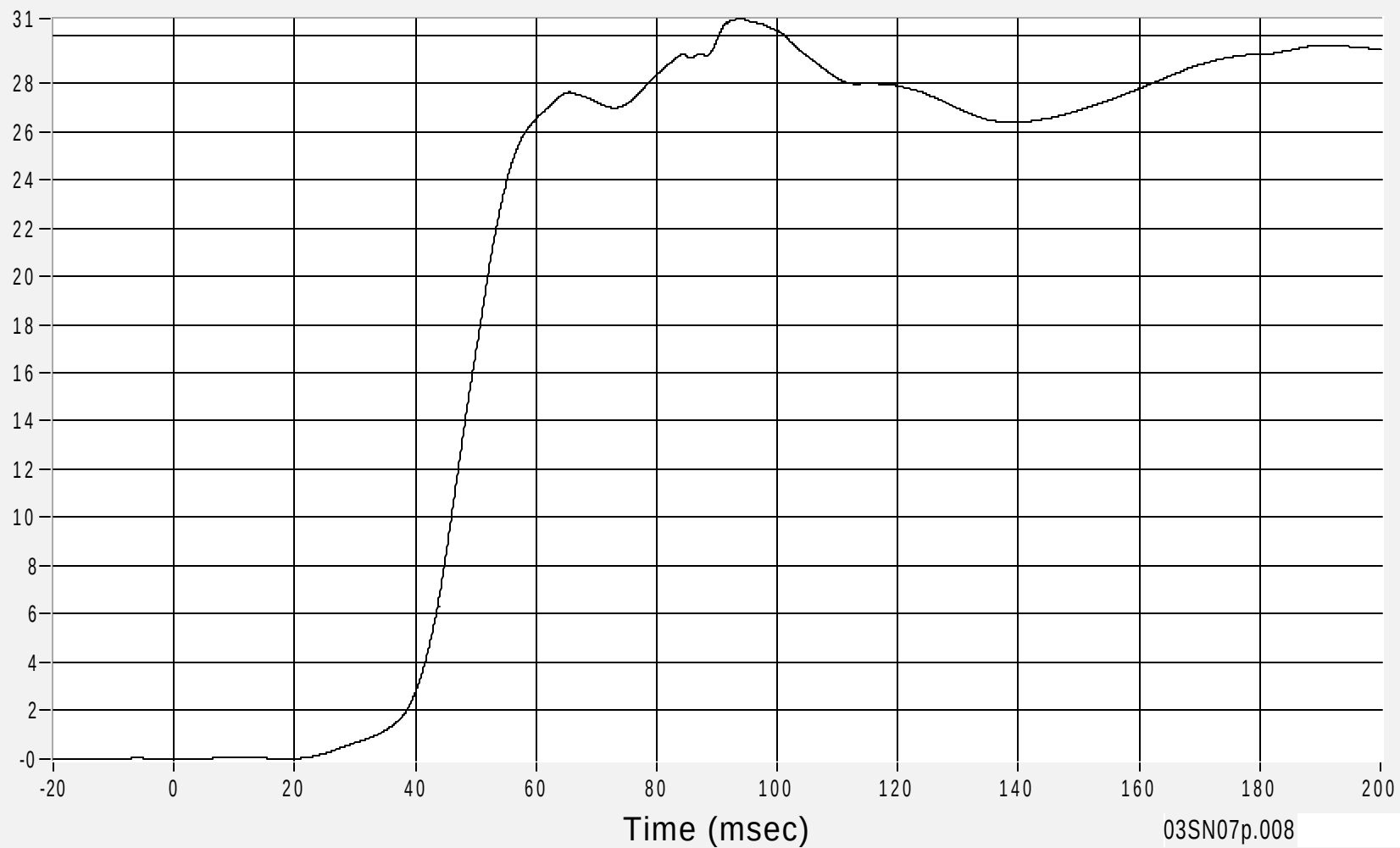
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Velocity

Velocity (km/h) CFC180

Max 30.7 km/h at 93.9 msec

Min 0.0 km/h at 18.7 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

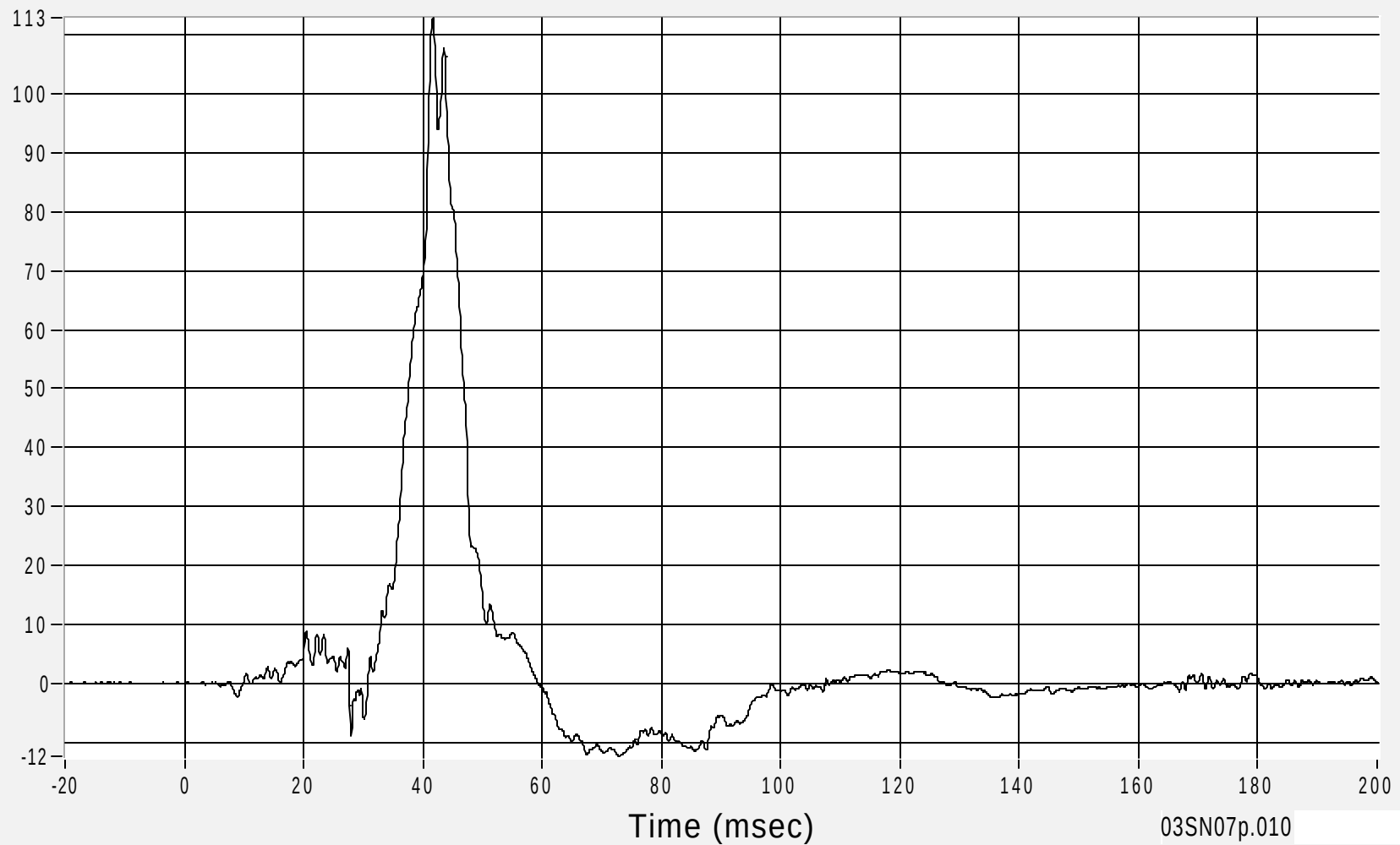
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Acceleration

Acceleration (G's) CFC1000

Max 112.9 G's at 41.7 msec

Min -12.4 G's at 73.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

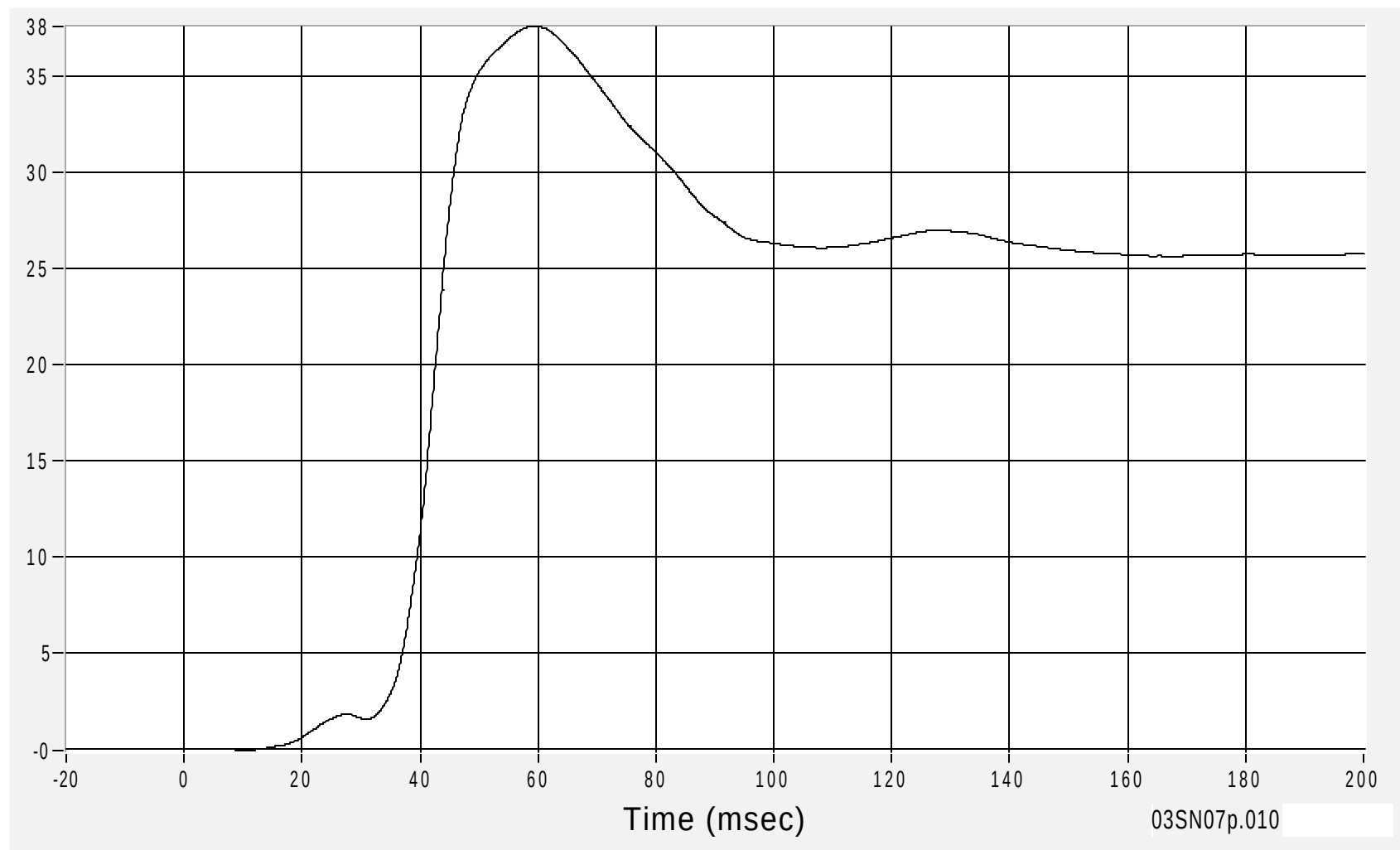
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Velocity

Velocity (km/h) CFC180

Max 37.6 km/h at 59.3 msec

Min -0.1 km/h at 9.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

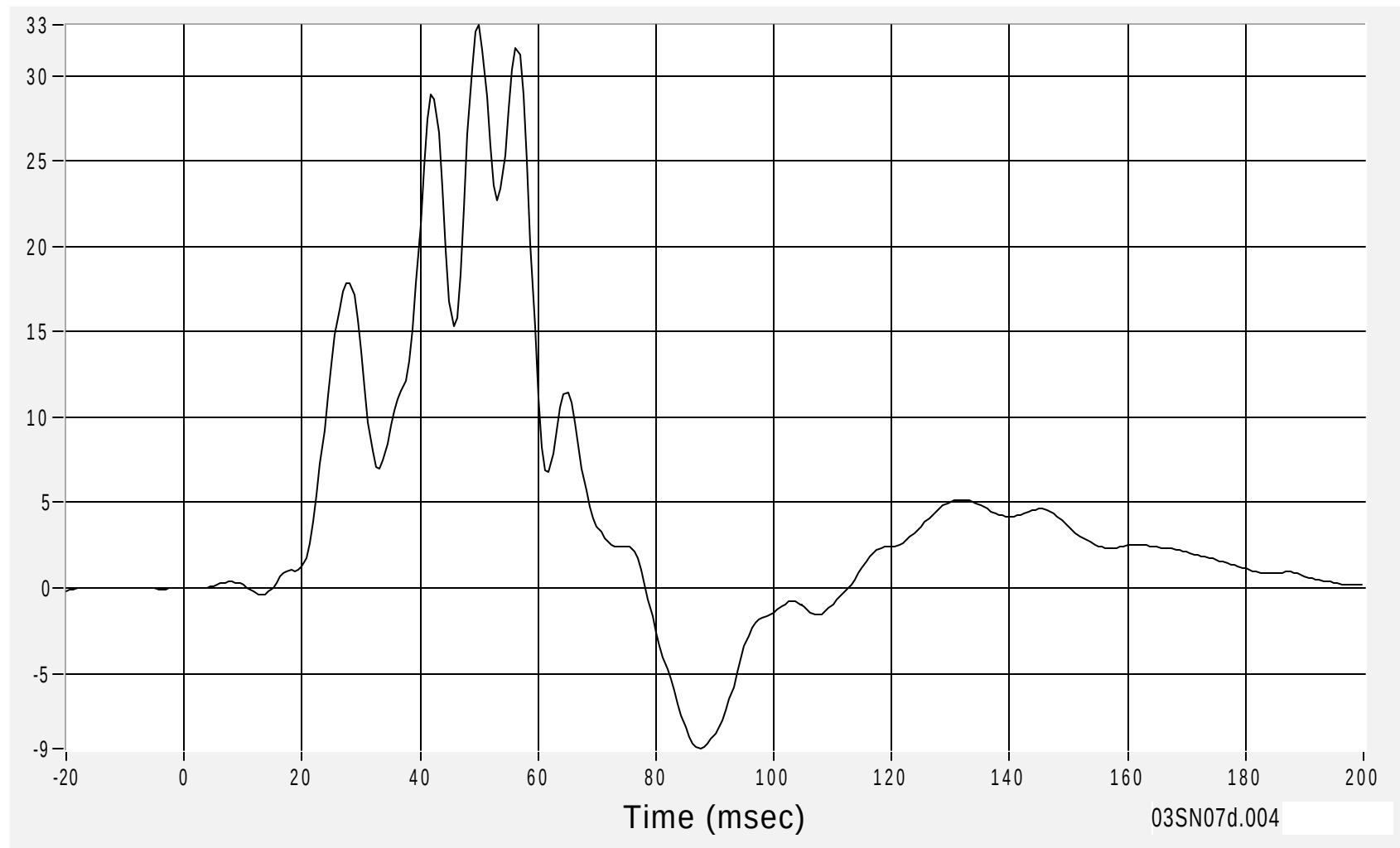
Driver Upper Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 33.0 G's at 50.0 msec

Min -9.4 G's at 87.5 msec

B-48



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

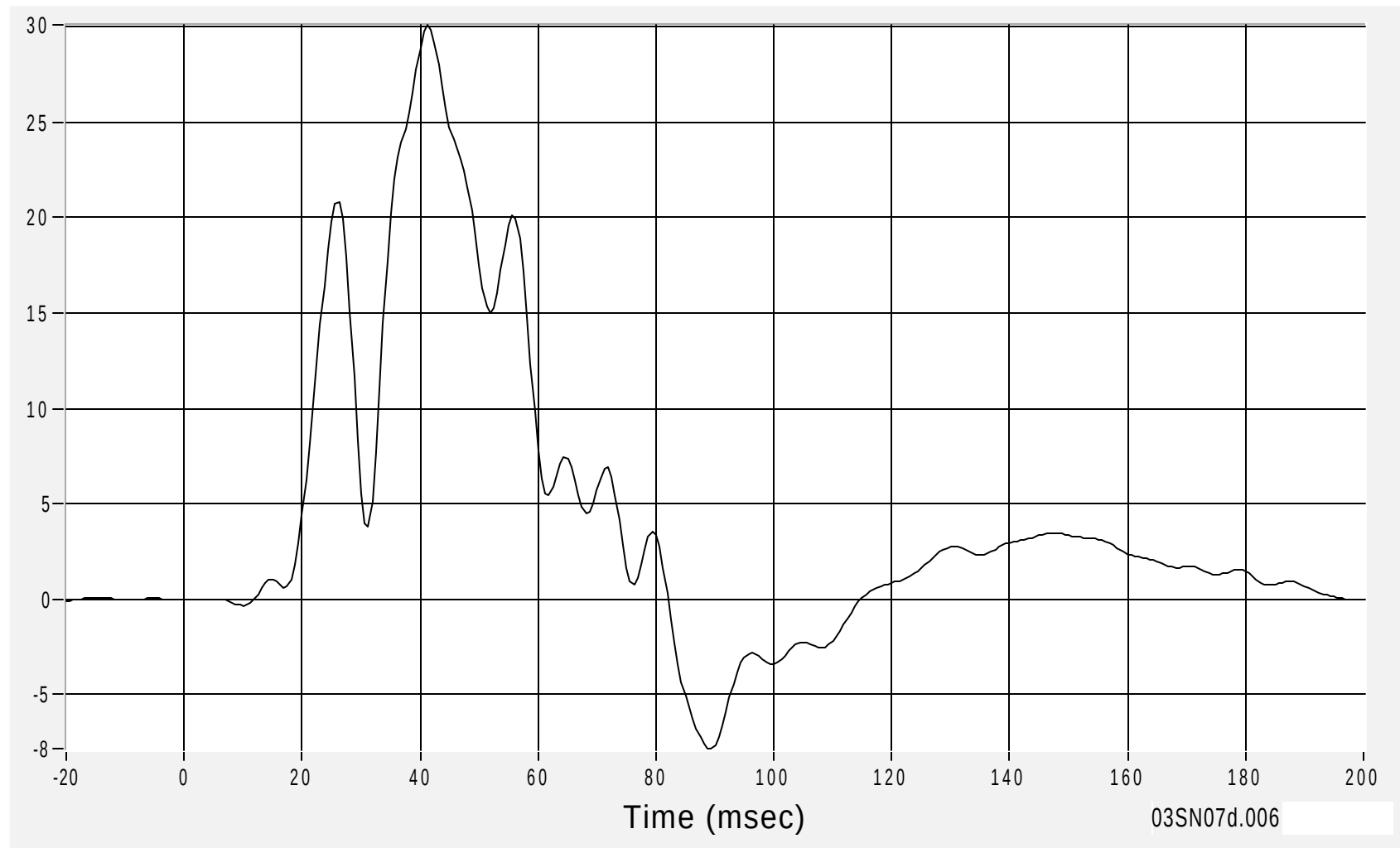
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 30.1 G's at 41.2 msec
Min -7.8 G's at 89.4 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

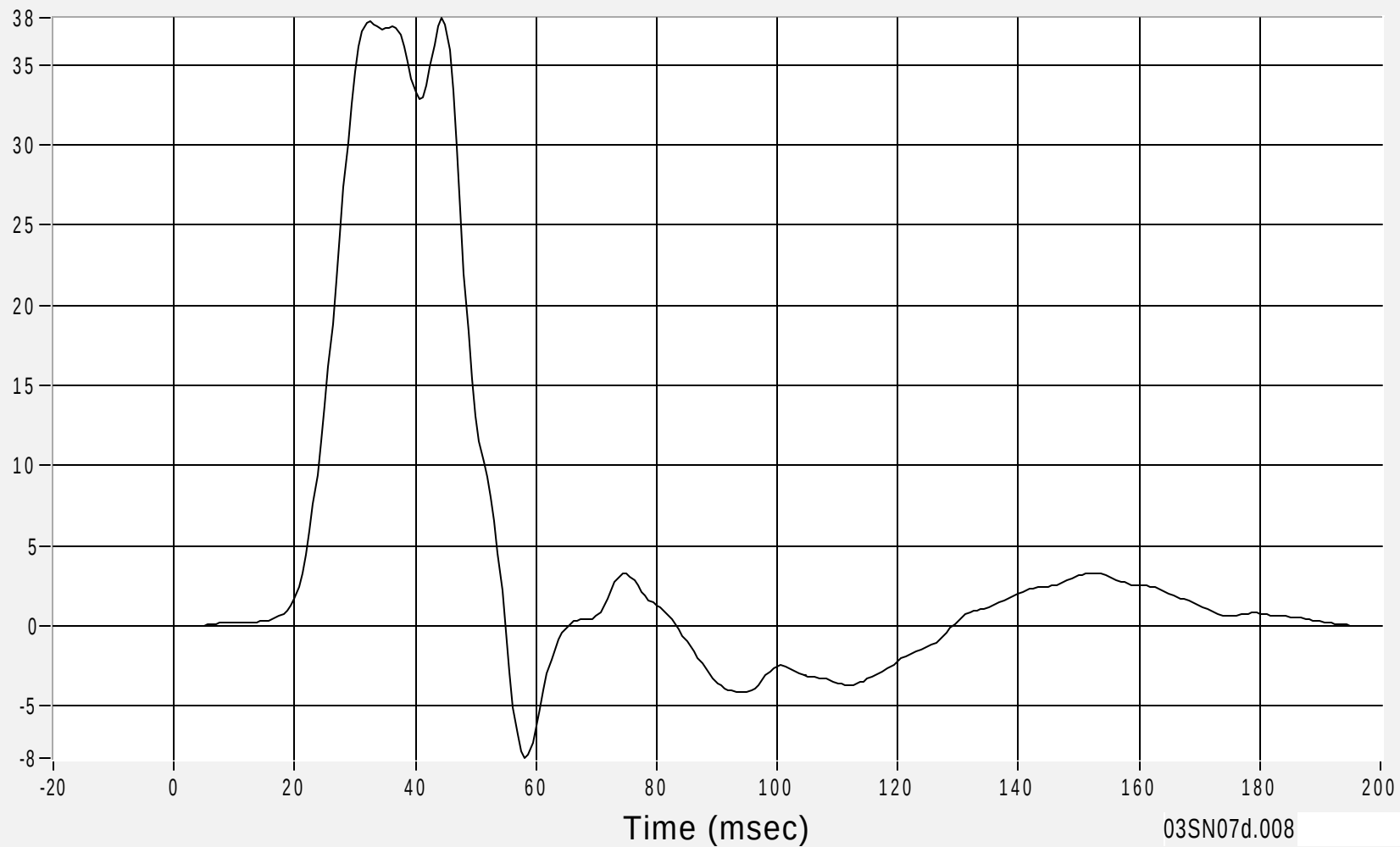
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 37.9 G's at 44.4 msec

Min -8.2 G's at 58.1 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

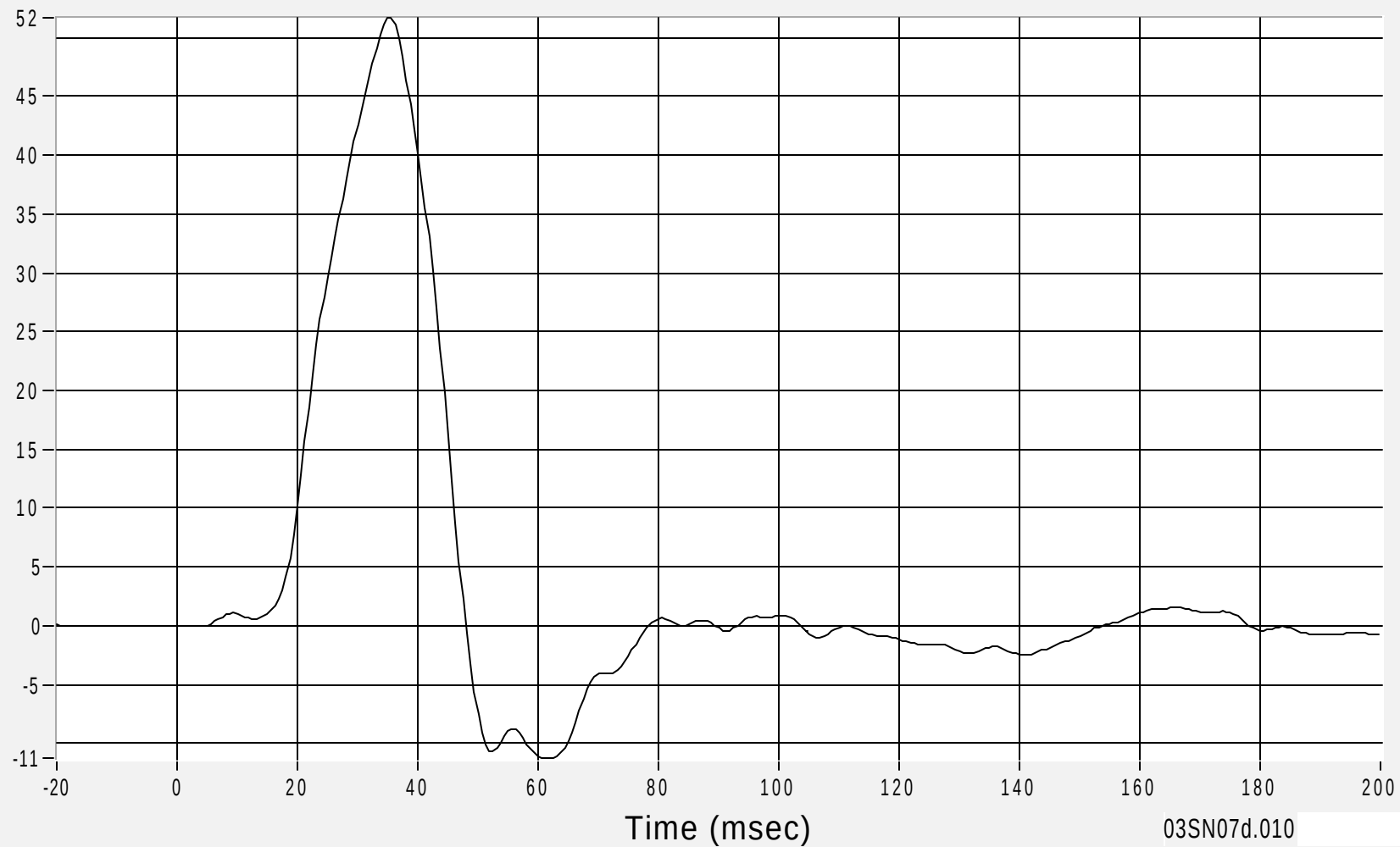
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Acceleration

Acceleration (G's) FIR100

Max 51.7 G's at 35.0 msec

Min -11.2 G's at 61.9 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

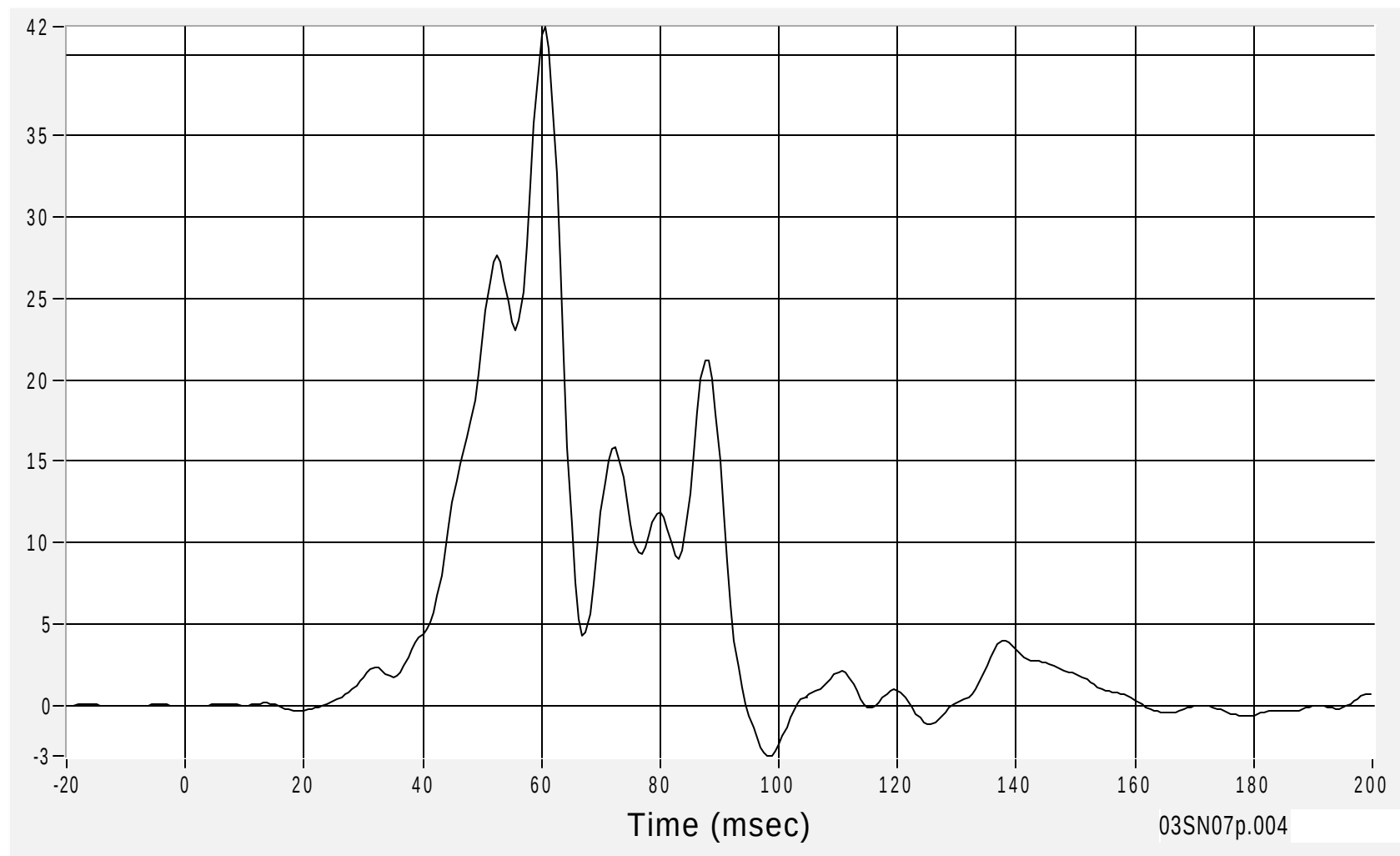
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 41.7 G's at 60.6 msec

Min -3.1 G's at 98.1 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

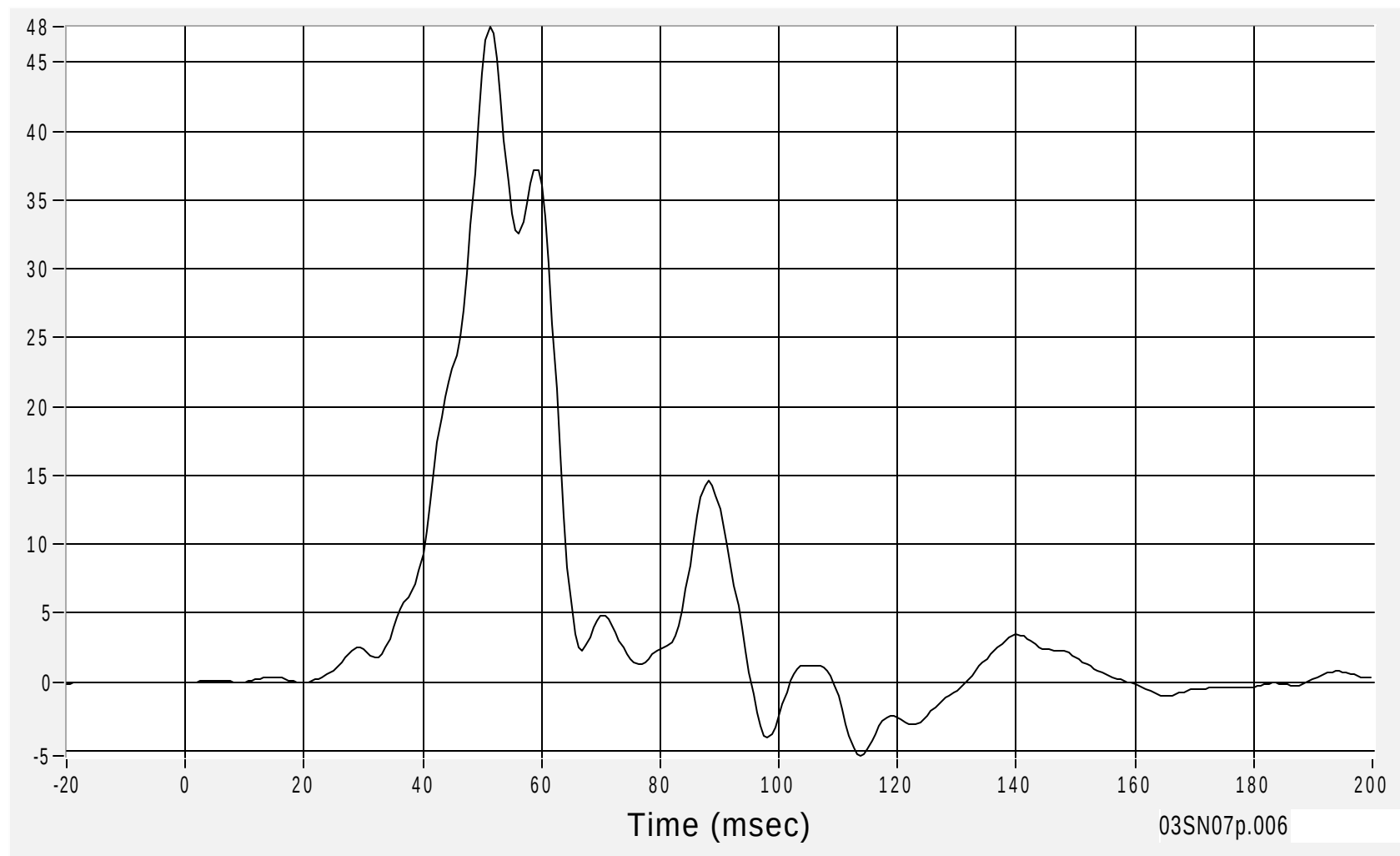
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 47.6 G's at 51.2 msec

Min -5.4 G's at 113.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

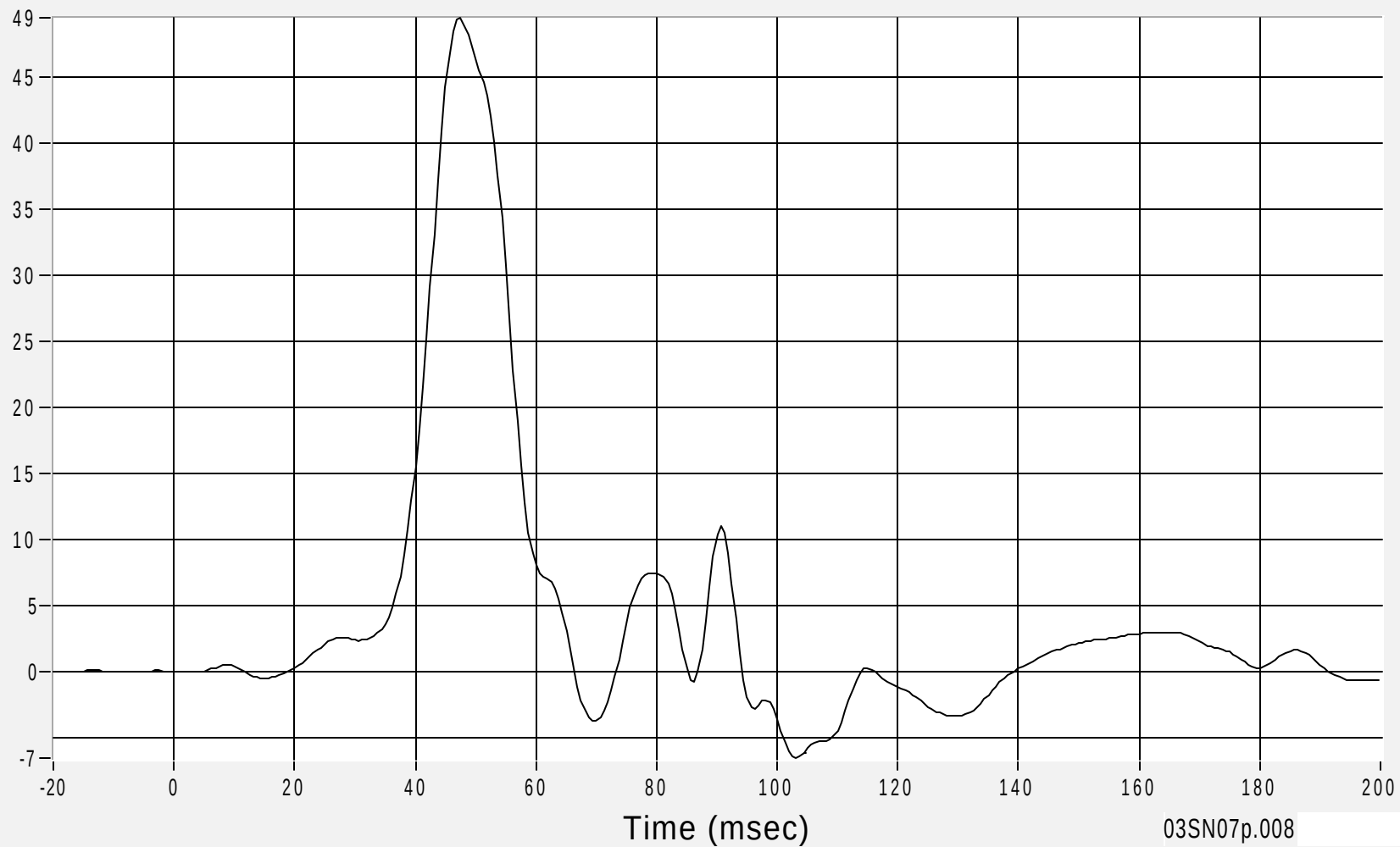
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 49.5 G's at 47.5 msec
Min -6.6 G's at 103.1 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

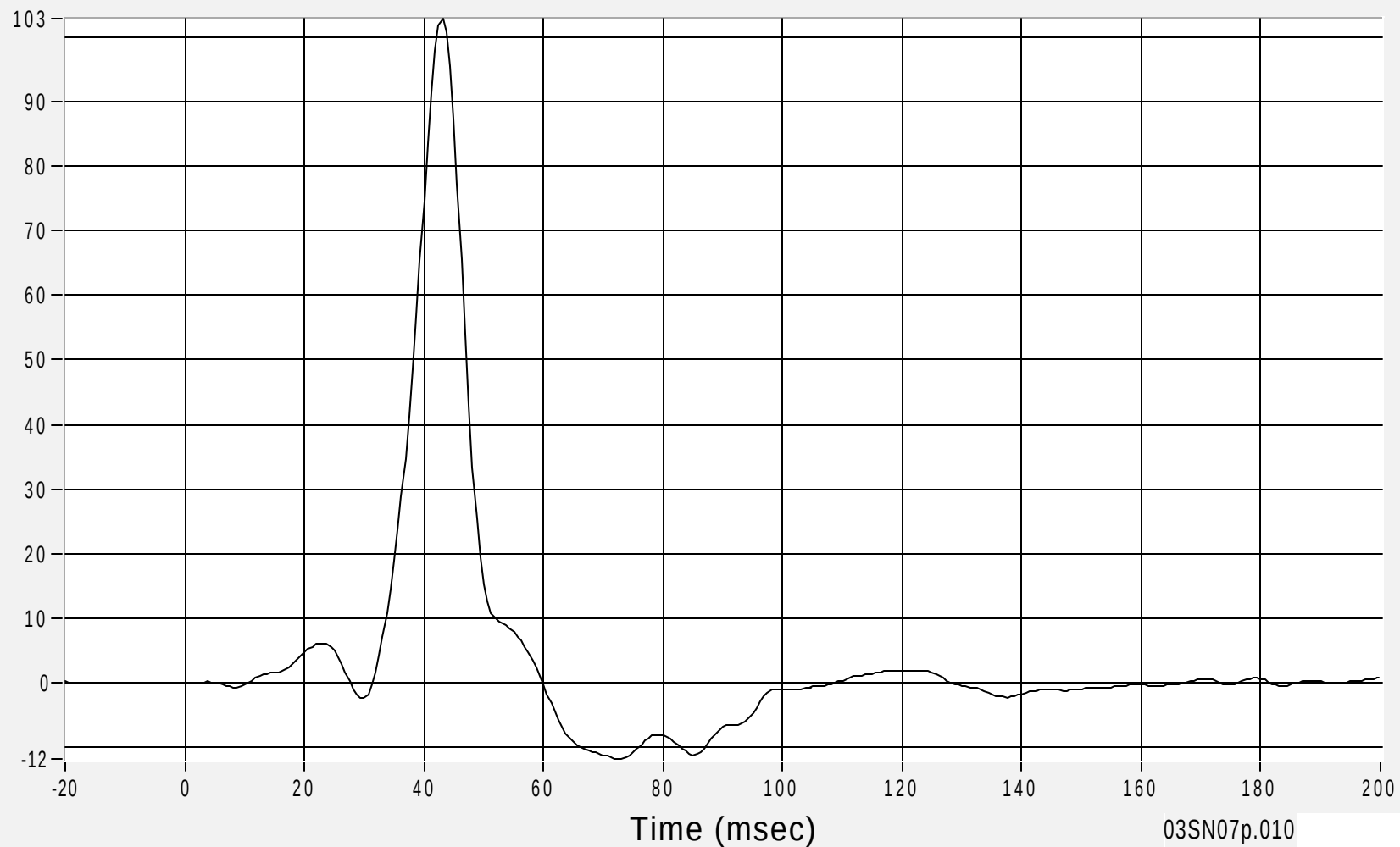
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Acceleration

Acceleration (G's) FIR100

Max 102.9 G's at 43.1 msec

Min -11.8 G's at 72.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

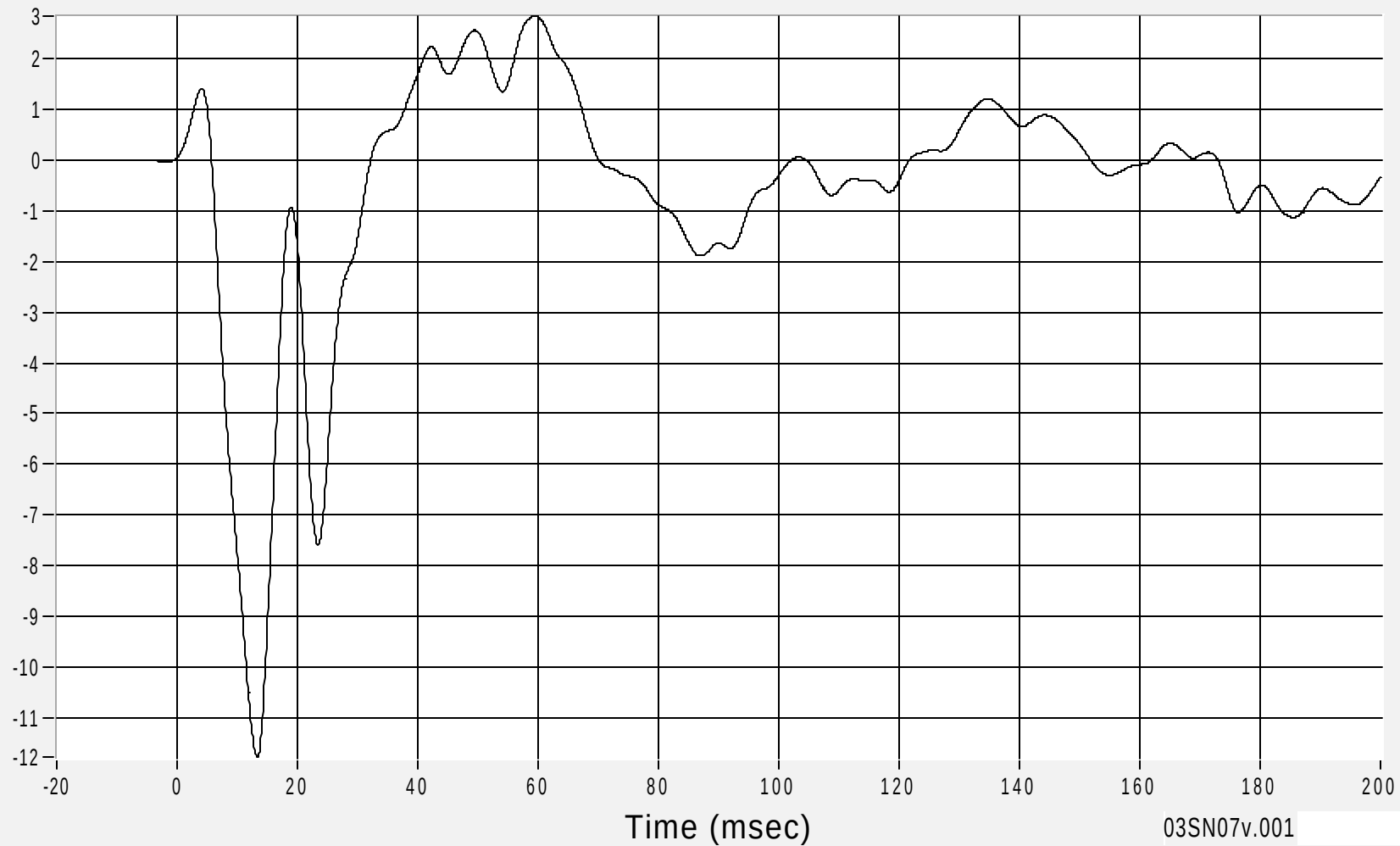
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (X) Acceleration

Acceleration (G's) CFC60

Max 2.8 G's at 59.4 msec

Min -11.8 G's at 13.4 msec



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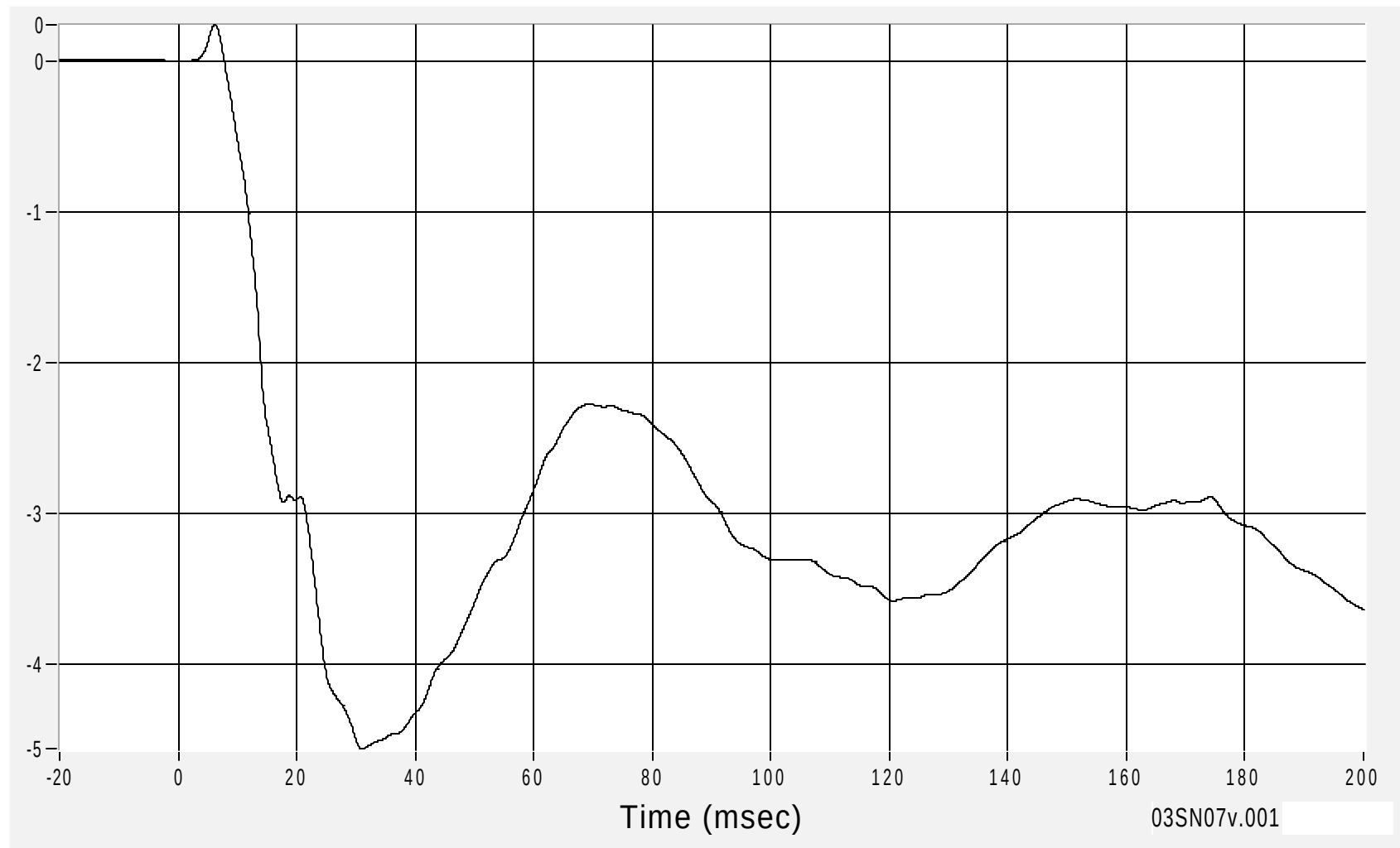
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (X) Velocity

Velocity (km/h) CFC180

Max 0.2 km/h at 6.2 msec
Min -4.6 km/h at 31.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

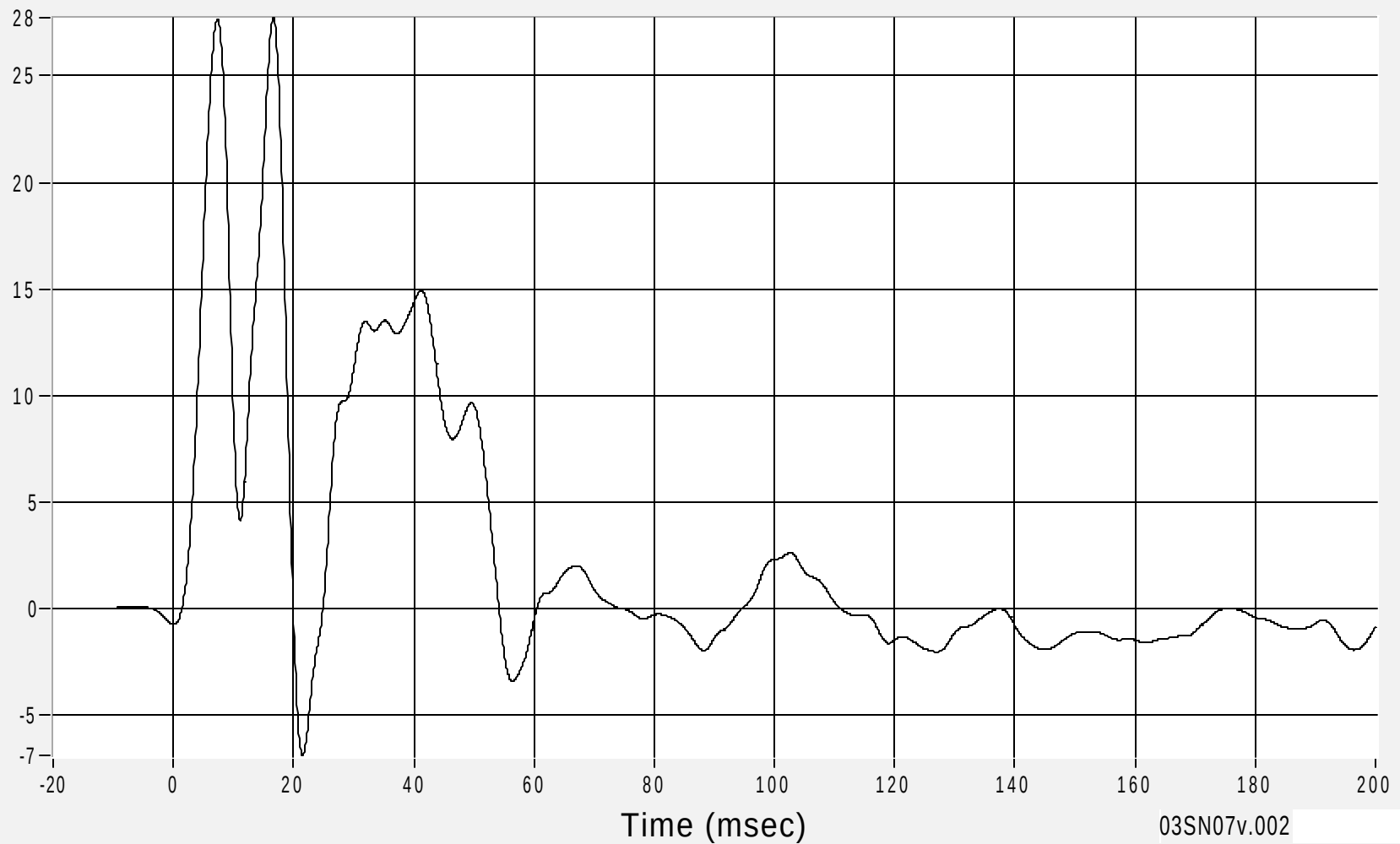
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 27.7 G's at 16.6 msec
Min -6.9 G's at 21.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

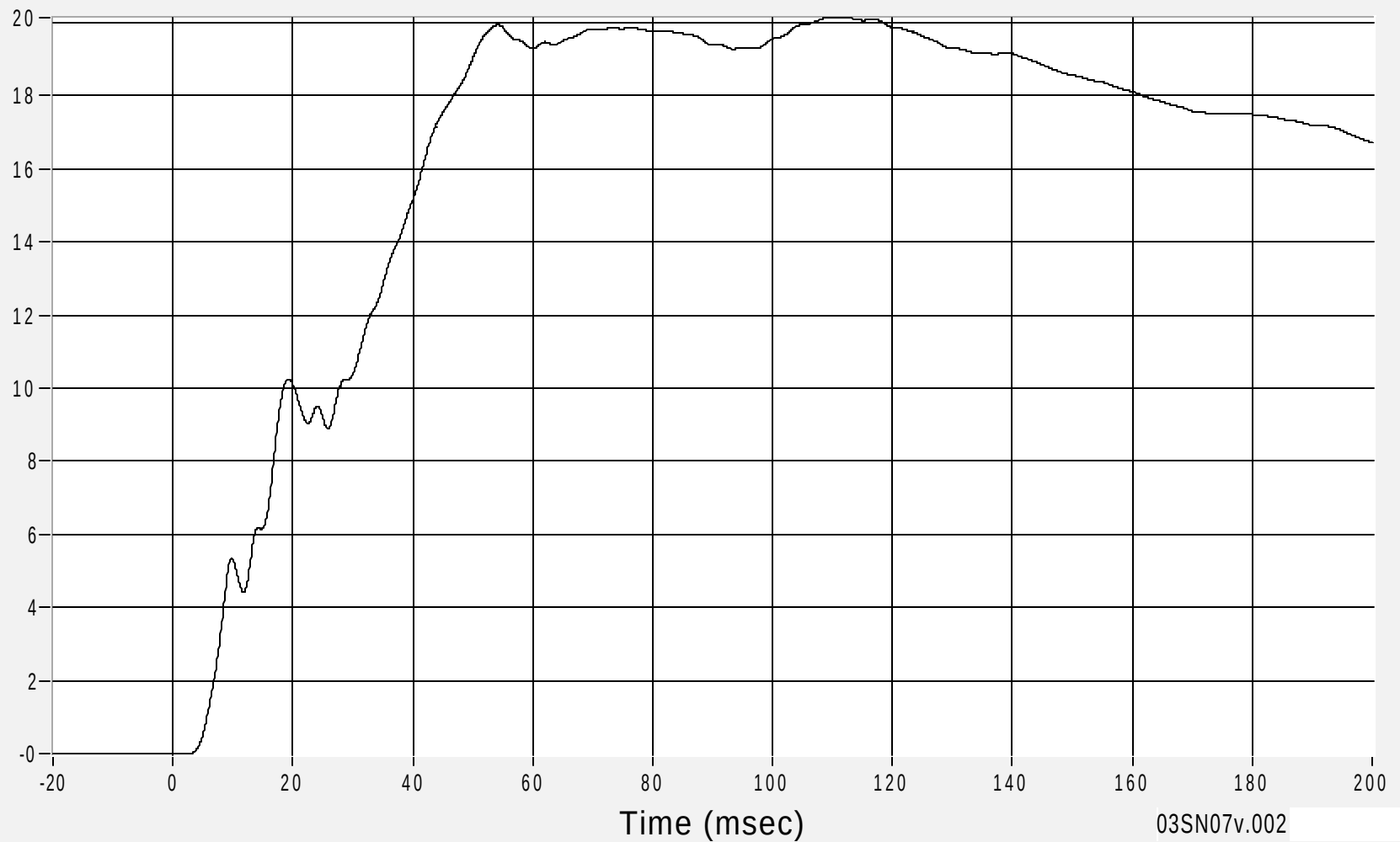
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Y) Velocity

Velocity (km/h) CFC180

Max 20.1 km/h at 109.4 msec
Min 0.0 km/h at 2.2 msec



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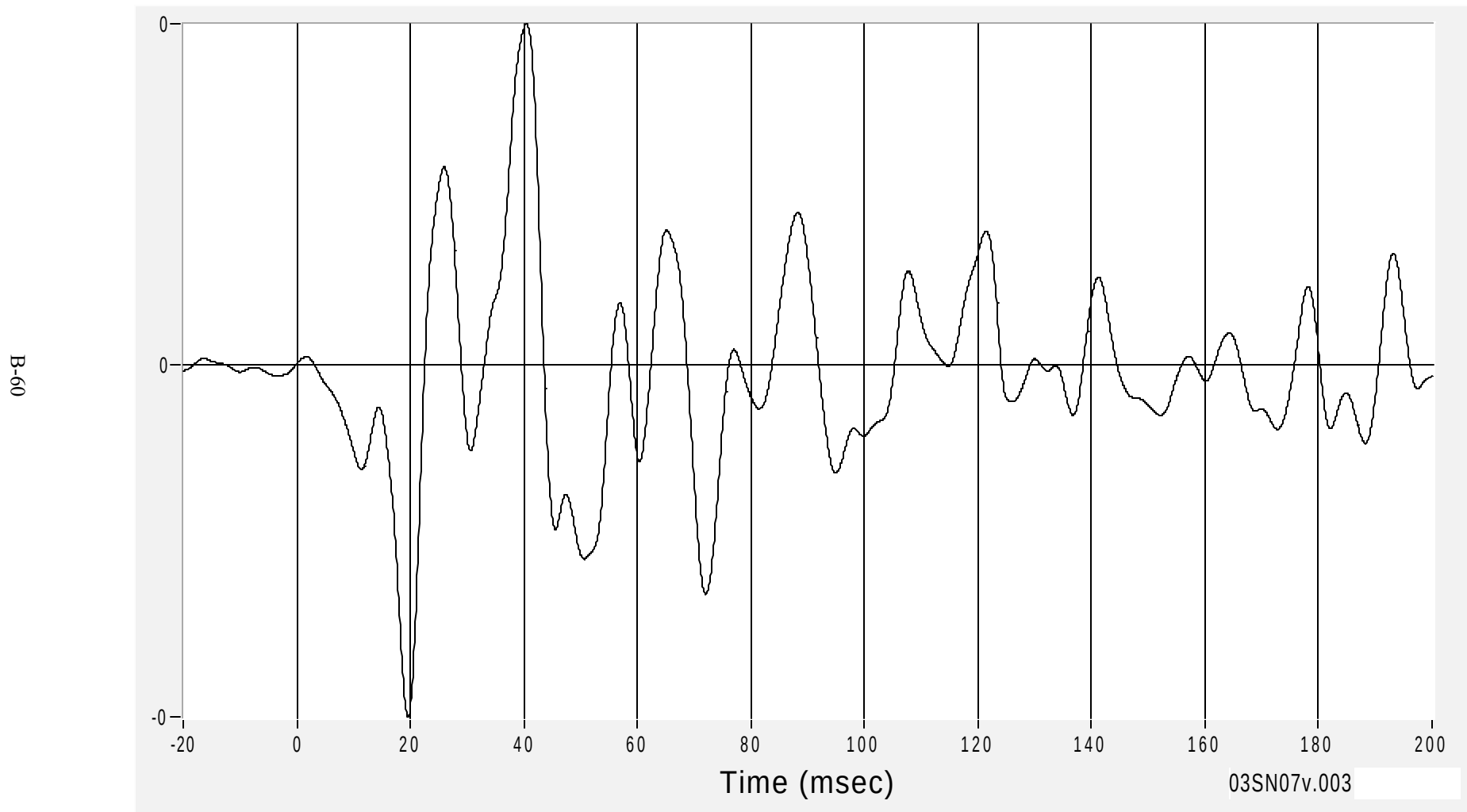
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Z) Acceleration

Acceleration (G's) CFC60

Max 0.1 G's at 40.5 msec
Min -0.1 G's at 19.6 msec



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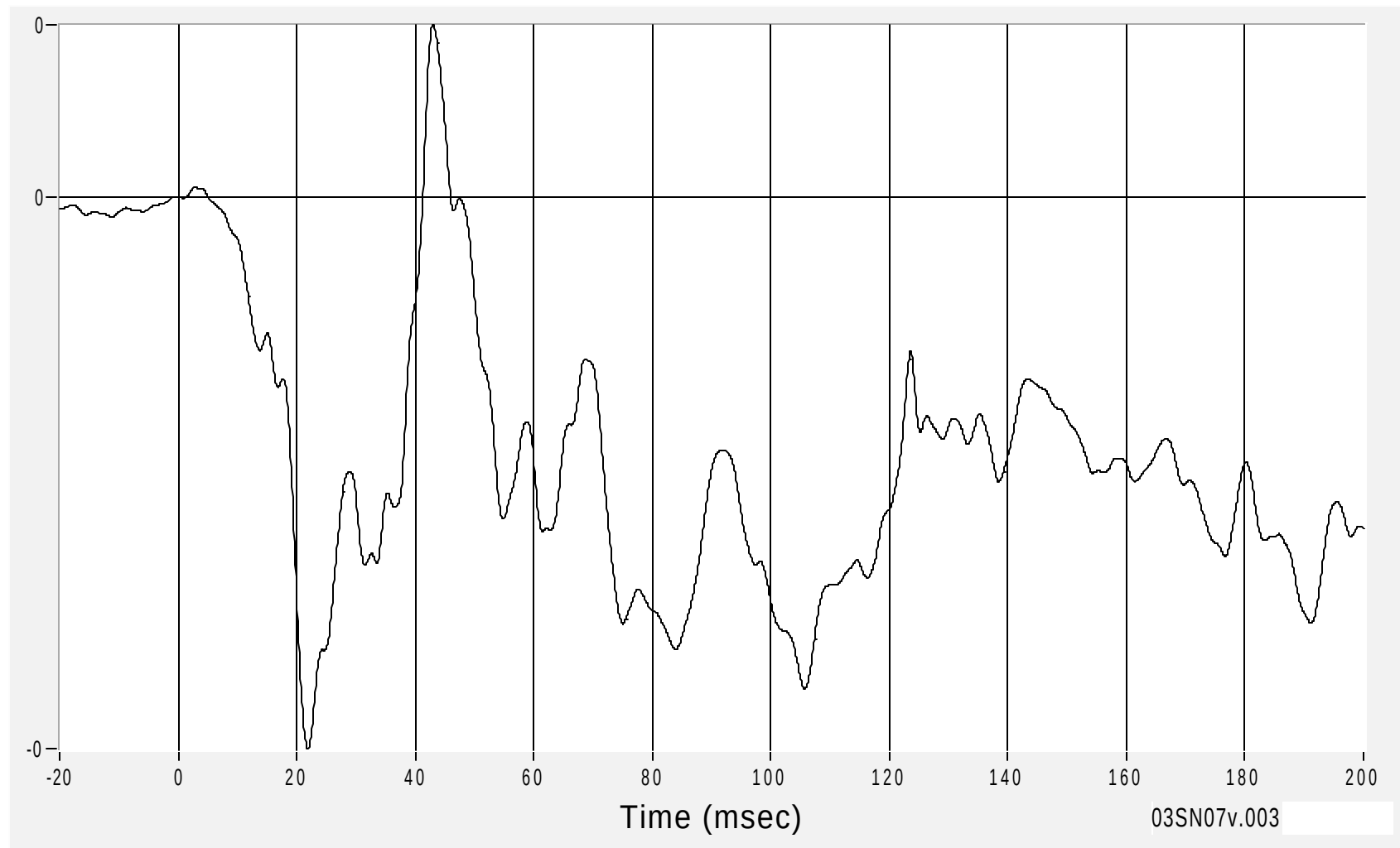
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Front Seat (Z) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 43.0 msec
Min 0.0 km/h at 21.8 msec



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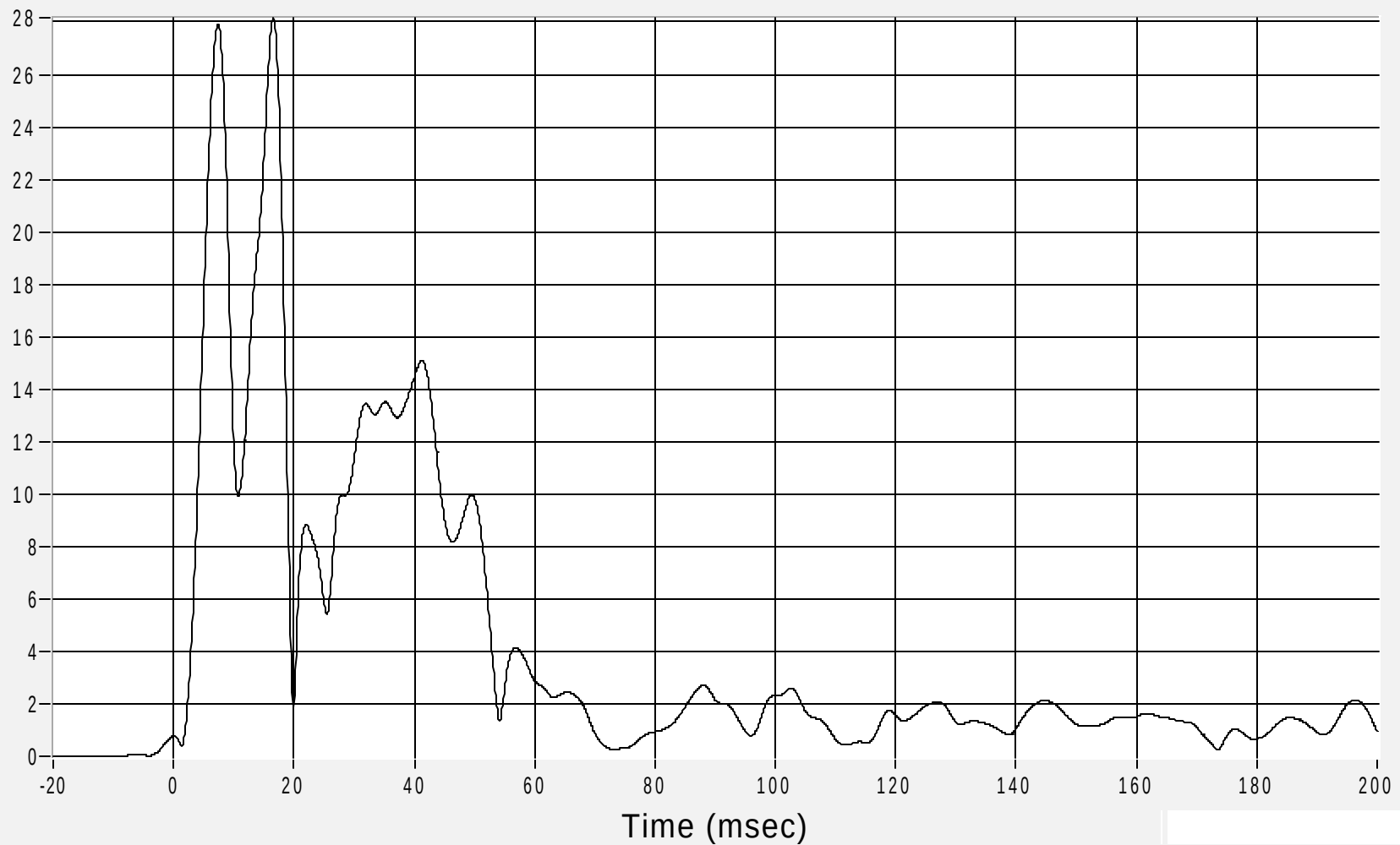
28 February 2003

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

Acceleration (G's) CFC60

Max 28.2 G's at 16.6 msec
Min 0.2 G's at 173.5 msec



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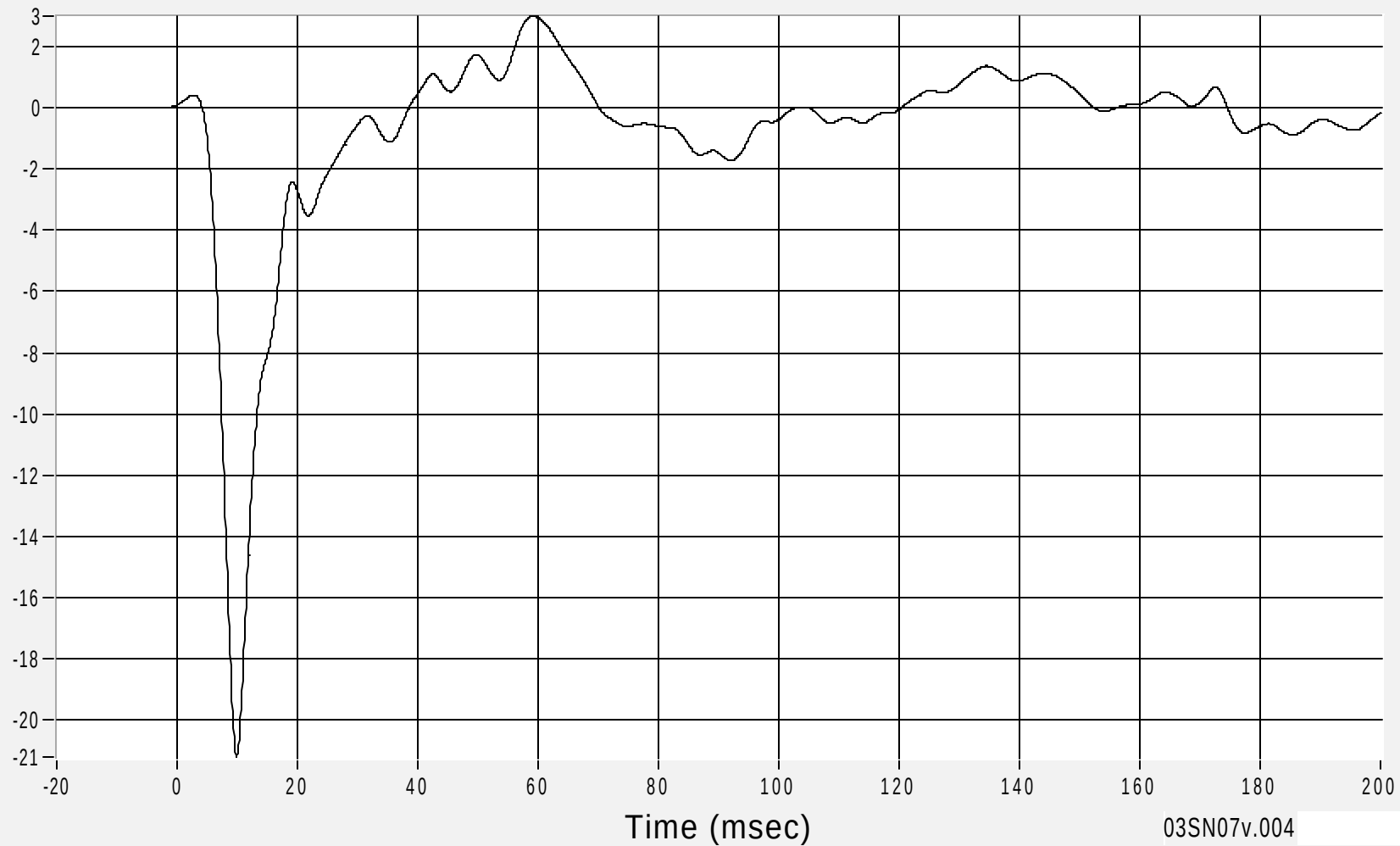
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (X) Acceleration

Acceleration (G's) CFC60

Max 3.0 G's at 59.2 msec
Min -21.2 G's at 9.9 msec



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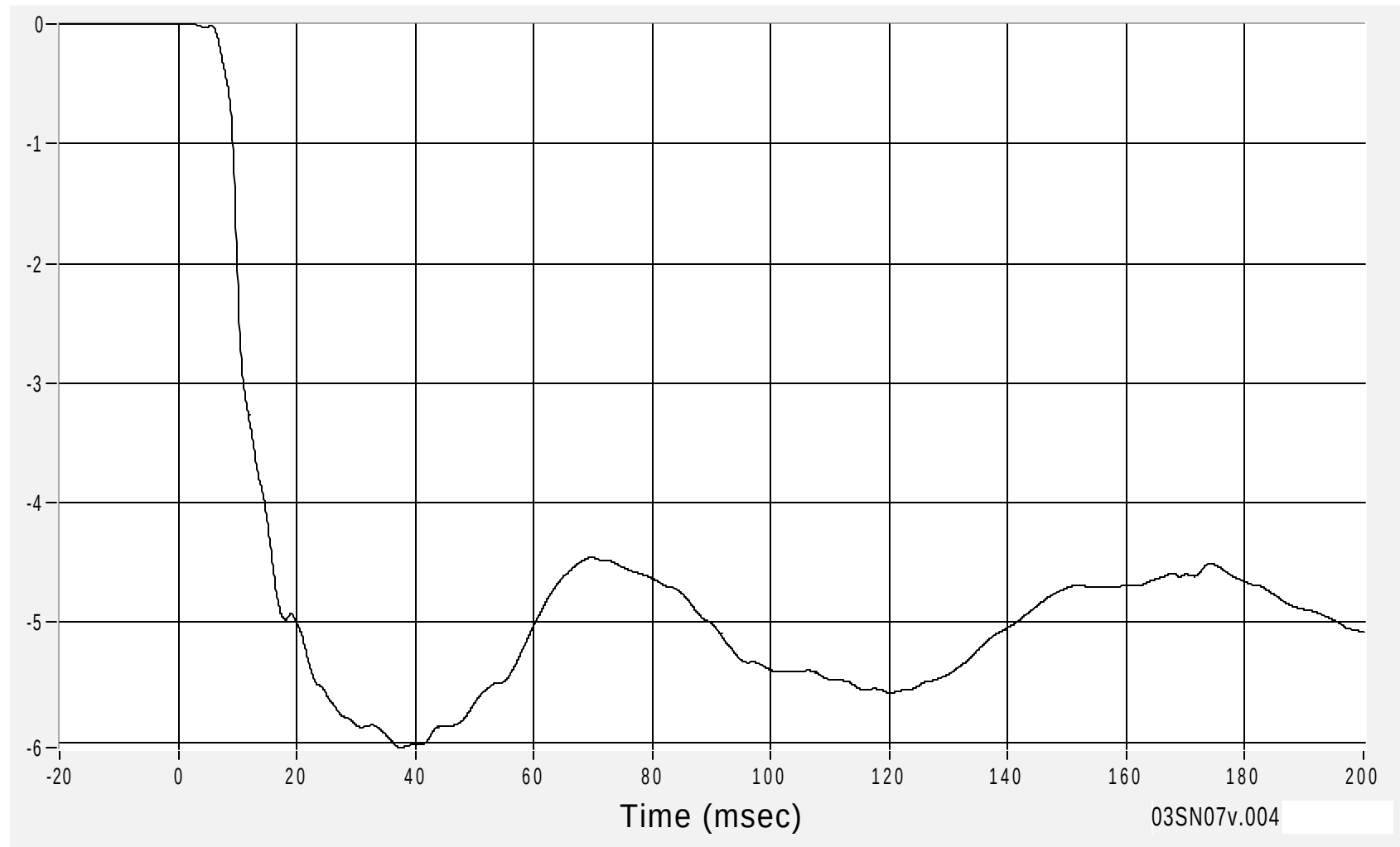
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 1.7 msec
Min -6.0 km/h at 37.5 msec



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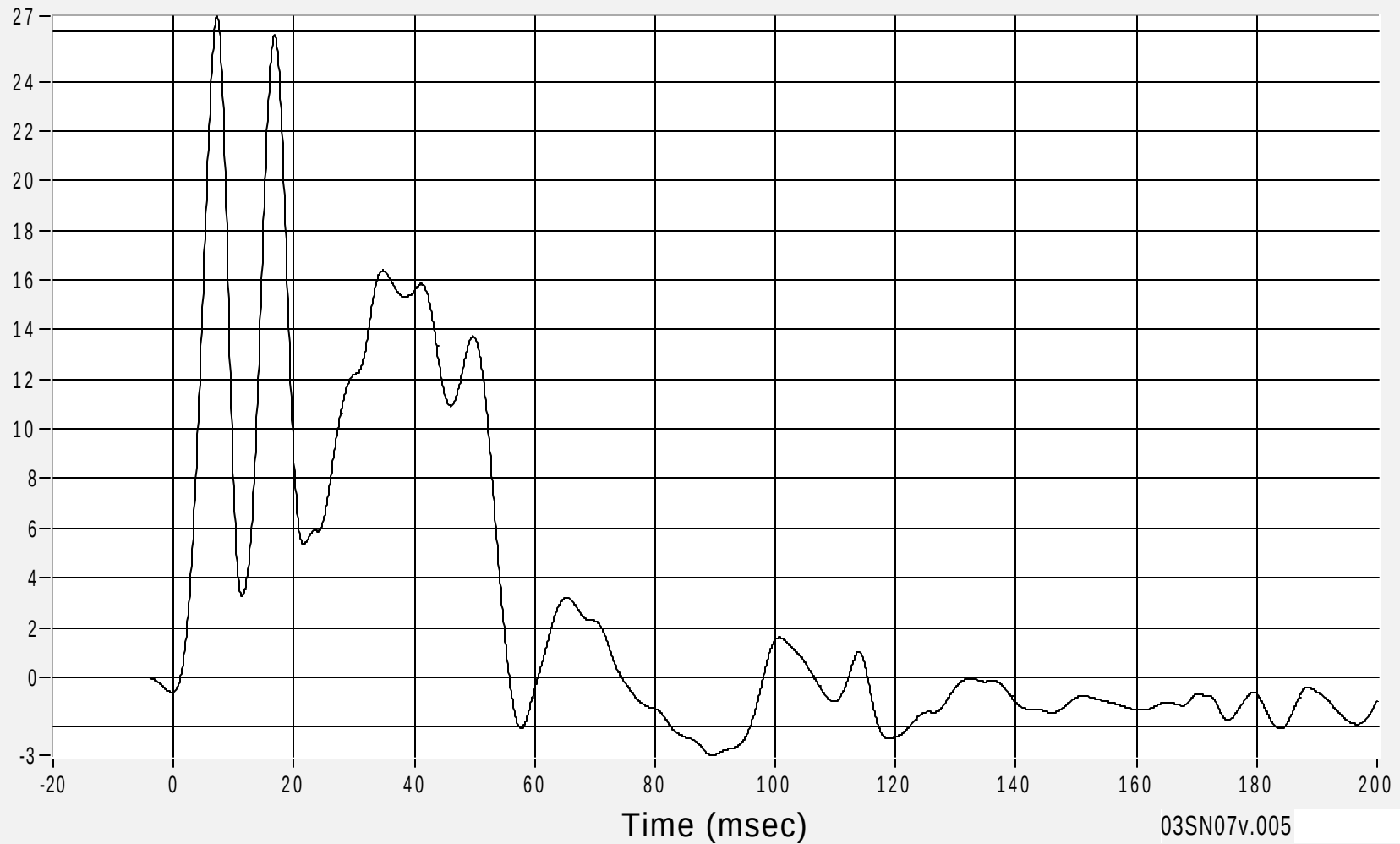
28 February 2003

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Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Y) Acceleration

Acceleration (G's) CFC60

Max	26.6	G's	at	7.2	msec
Min	-3.1	G's	at	89.5	msec



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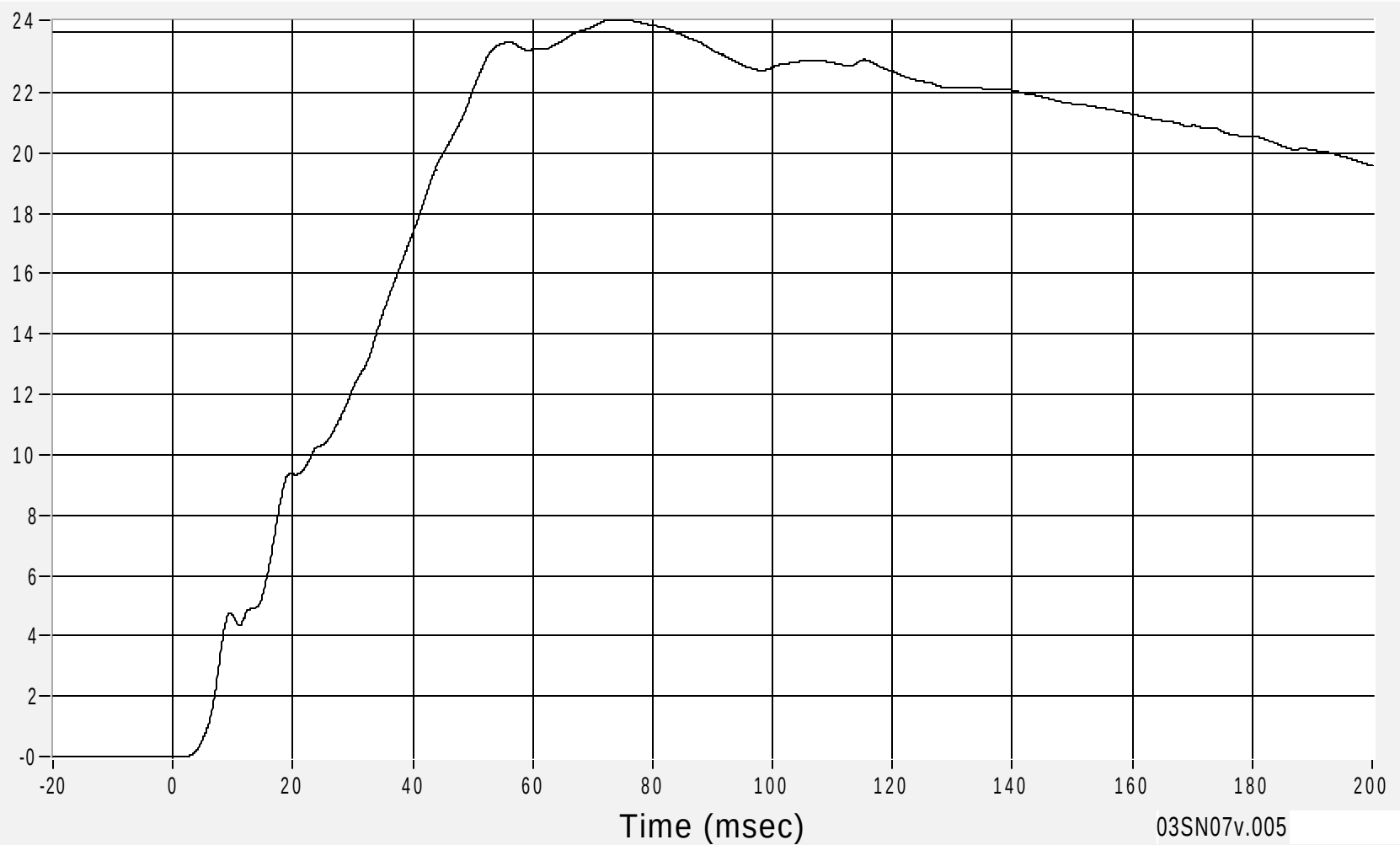
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Y) Velocity

Velocity (km/h) CFC180

Max 24.4 km/h at 72.9 msec
Min 0.0 km/h at 1.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

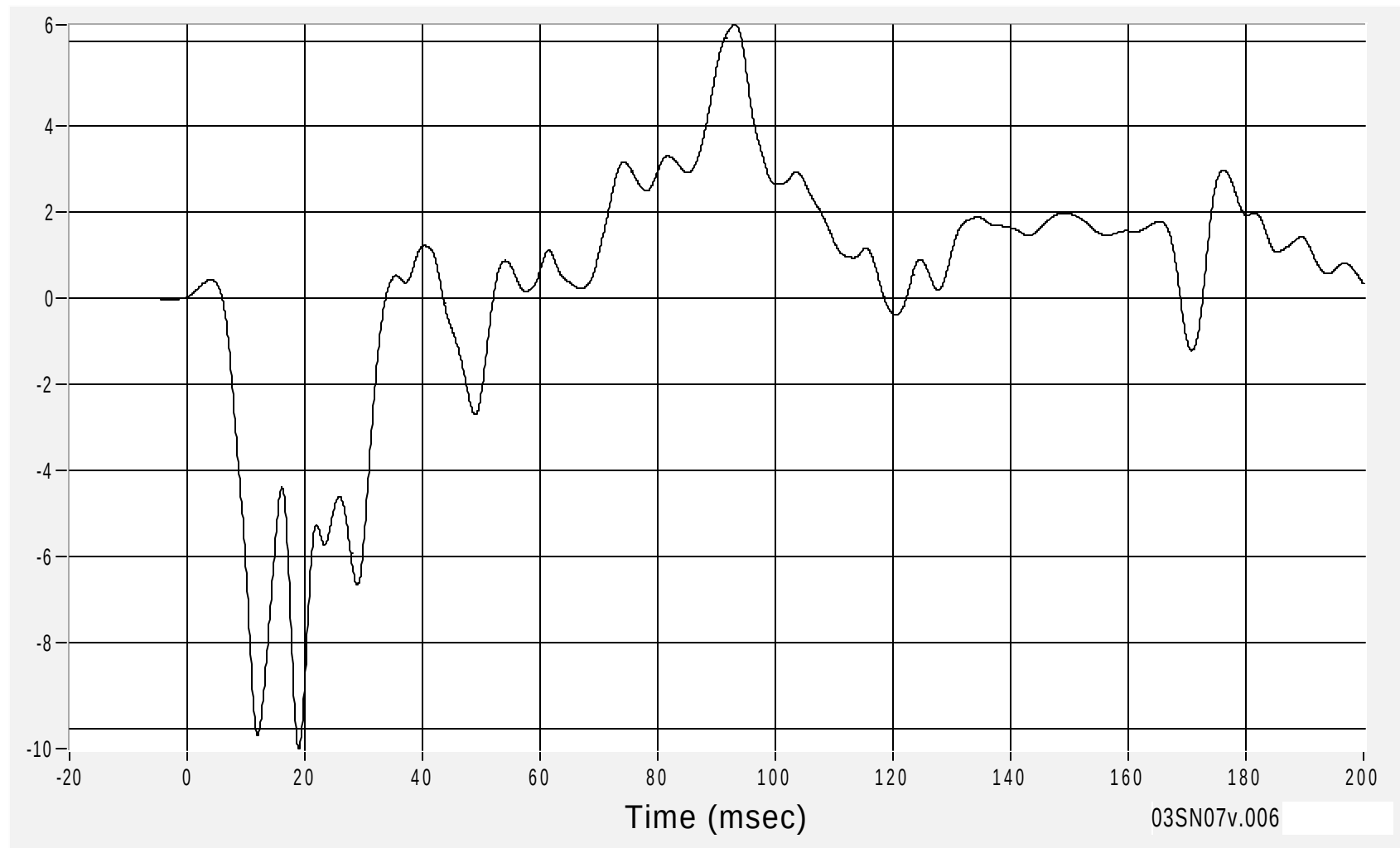
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Z) Acceleration

Acceleration (G's) CFC60

Max 6.4 G's at 93.1 msec
Min -10.5 G's at 19.0 msec



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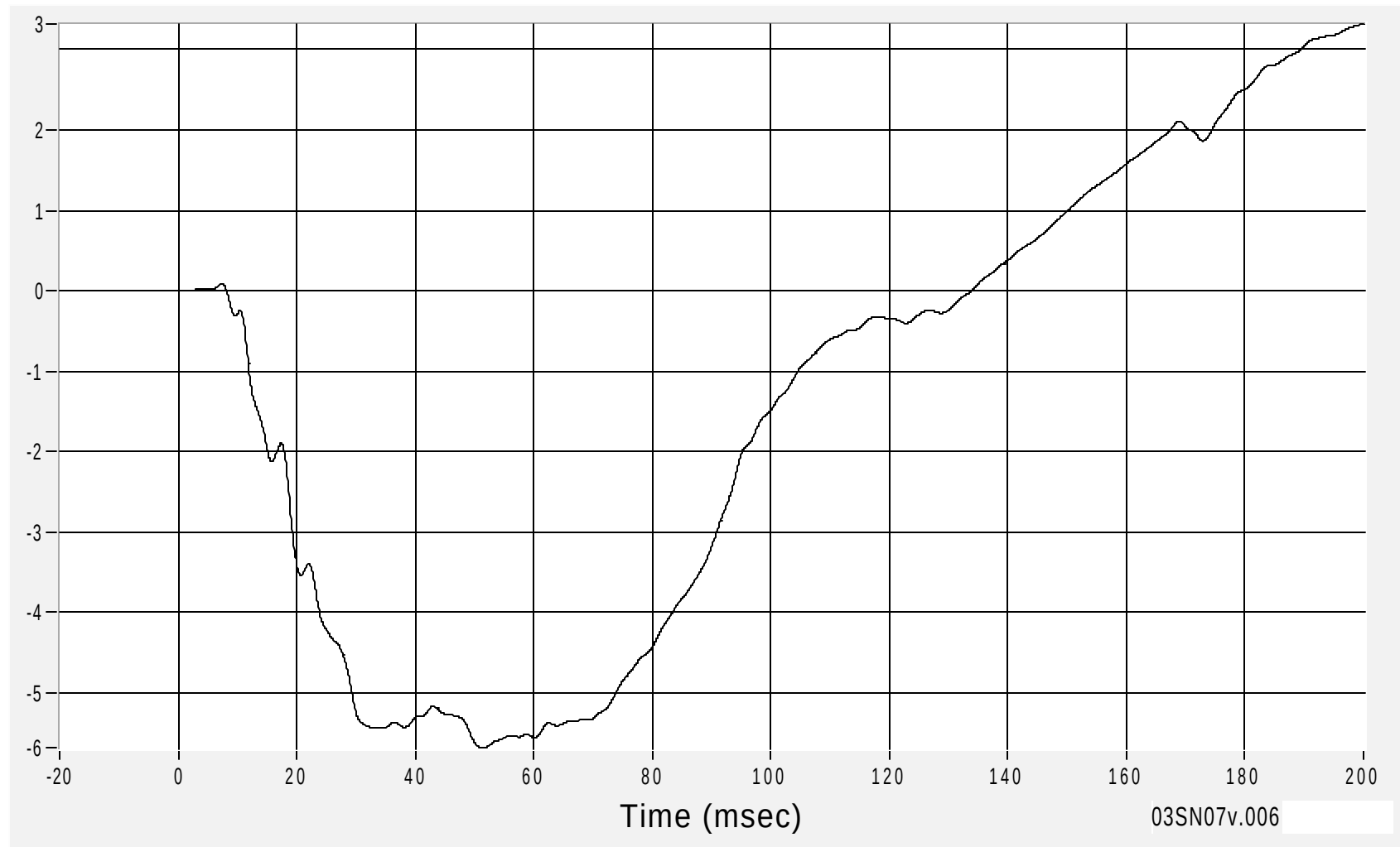
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat (Z) Velocity

Velocity (km/h) CFC180

Max 3.3 km/h at 199.9 msec
Min -5.7 km/h at 51.4 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

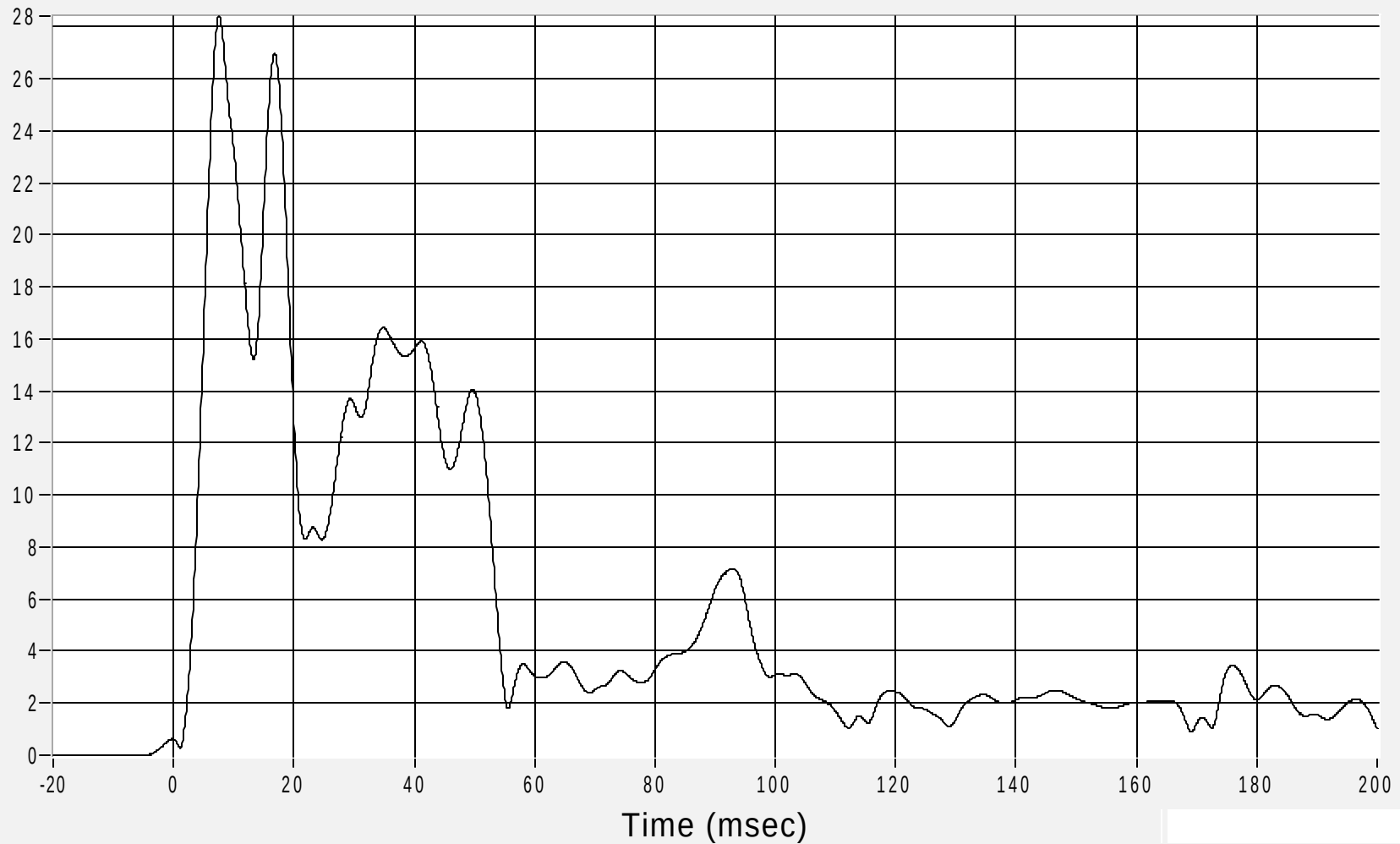
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Right Side Sill at Rear Seat Resultant Acceleration

Acceleration (G's) CFC60

Max	28.4	G's	at	7.5	msec
Min	0.3	G's	at	1.1	msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

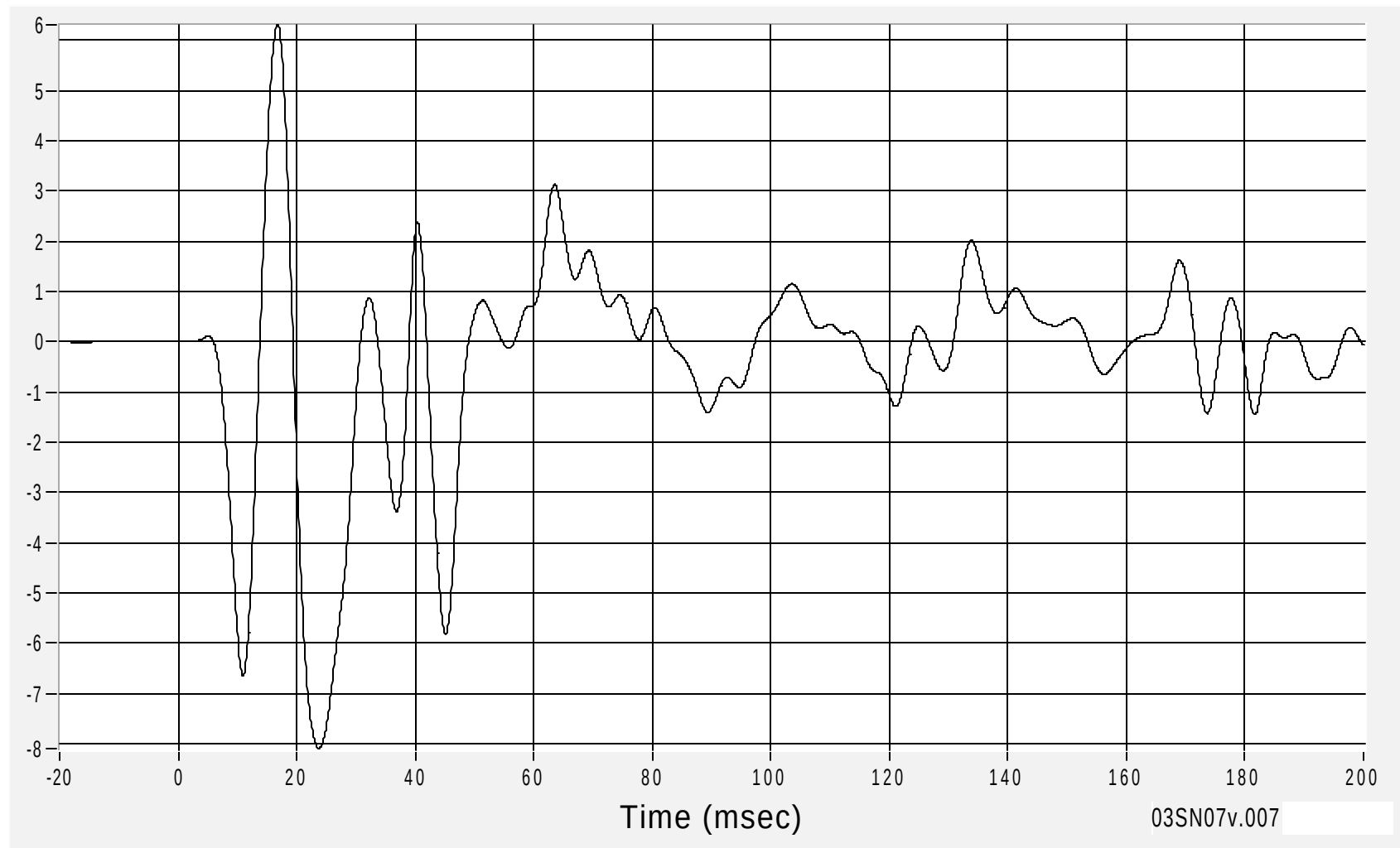
Medical College of Wisconsin
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Rear Floorpan Above Axle (X) Acceleration

Acceleration (G's) CFC60

Max 6.3 G's at 16.8 msec

Min -8.1 G's at 23.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

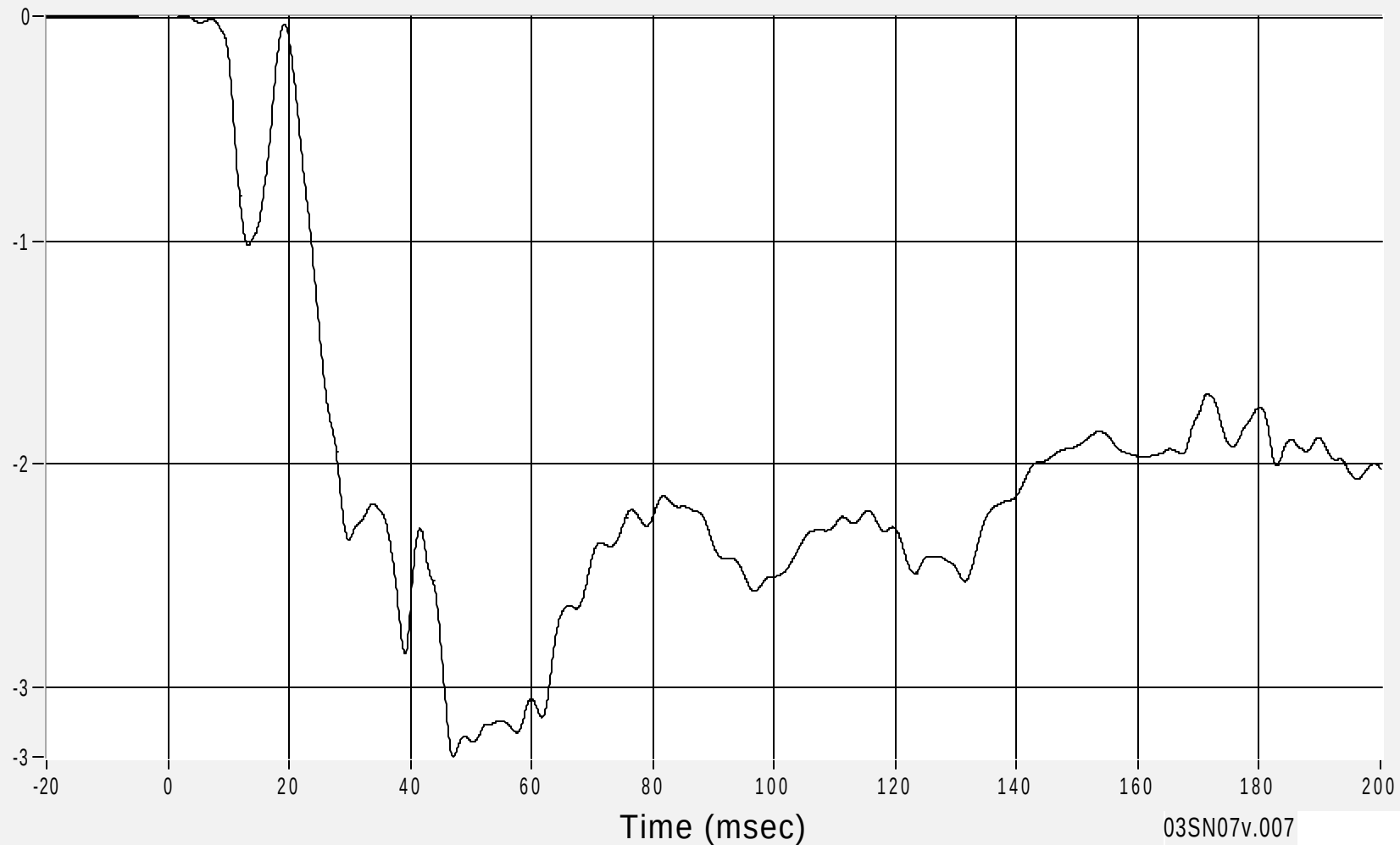
Medical College of Wisconsin
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Rear Floorpan Above Axle (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 2.9 msec

Min -3.3 km/h at 47.0 msec



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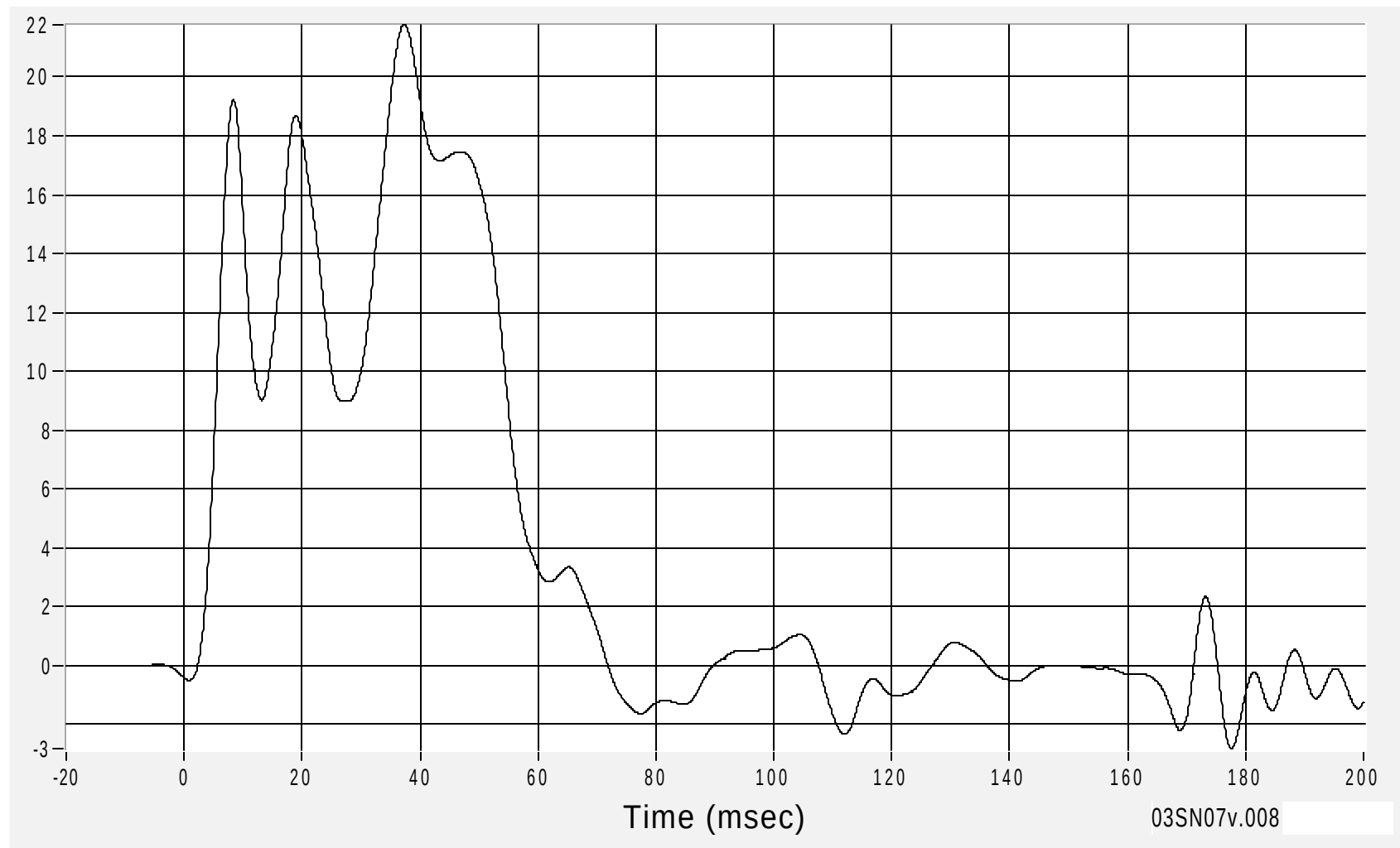
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (Y) Acceleration

Acceleration (G's) CFC60

Max 21.8 G's at 37.3 msec
Min -2.8 G's at 177.6 msec



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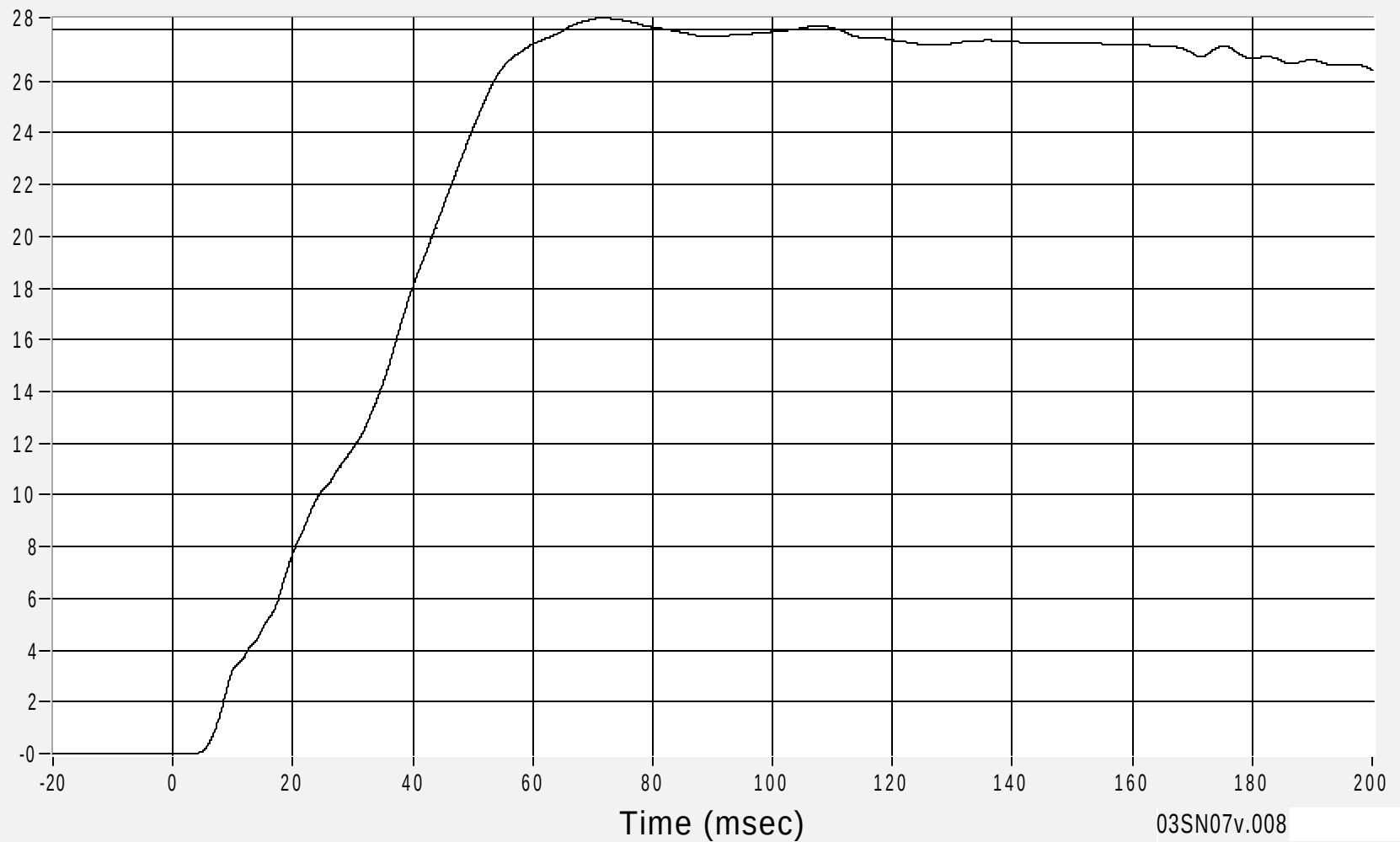
28 February 2003

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Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (Y) Velocity

Velocity (km/h) CFC180

Max 28.5 km/h at 71.8 msec
Min 0.0 km/h at 2.0 msec



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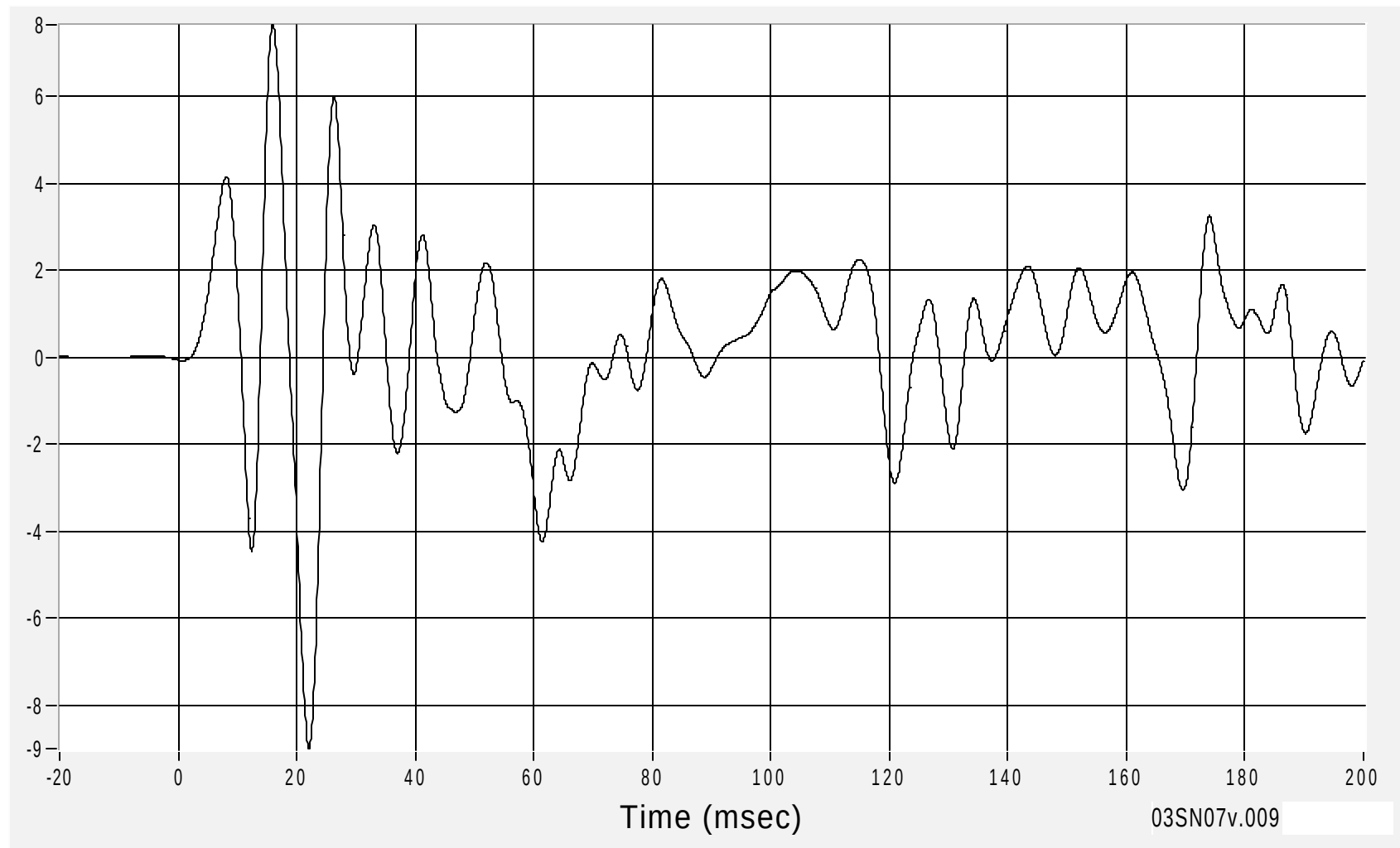
28 February 2003

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Rear Floorpan Above Axle (Z) Acceleration

Acceleration (G's) CFC60

Max 7.7 G's at 16.0 msec
Min -9.0 G's at 22.1 msec



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28 February 2003

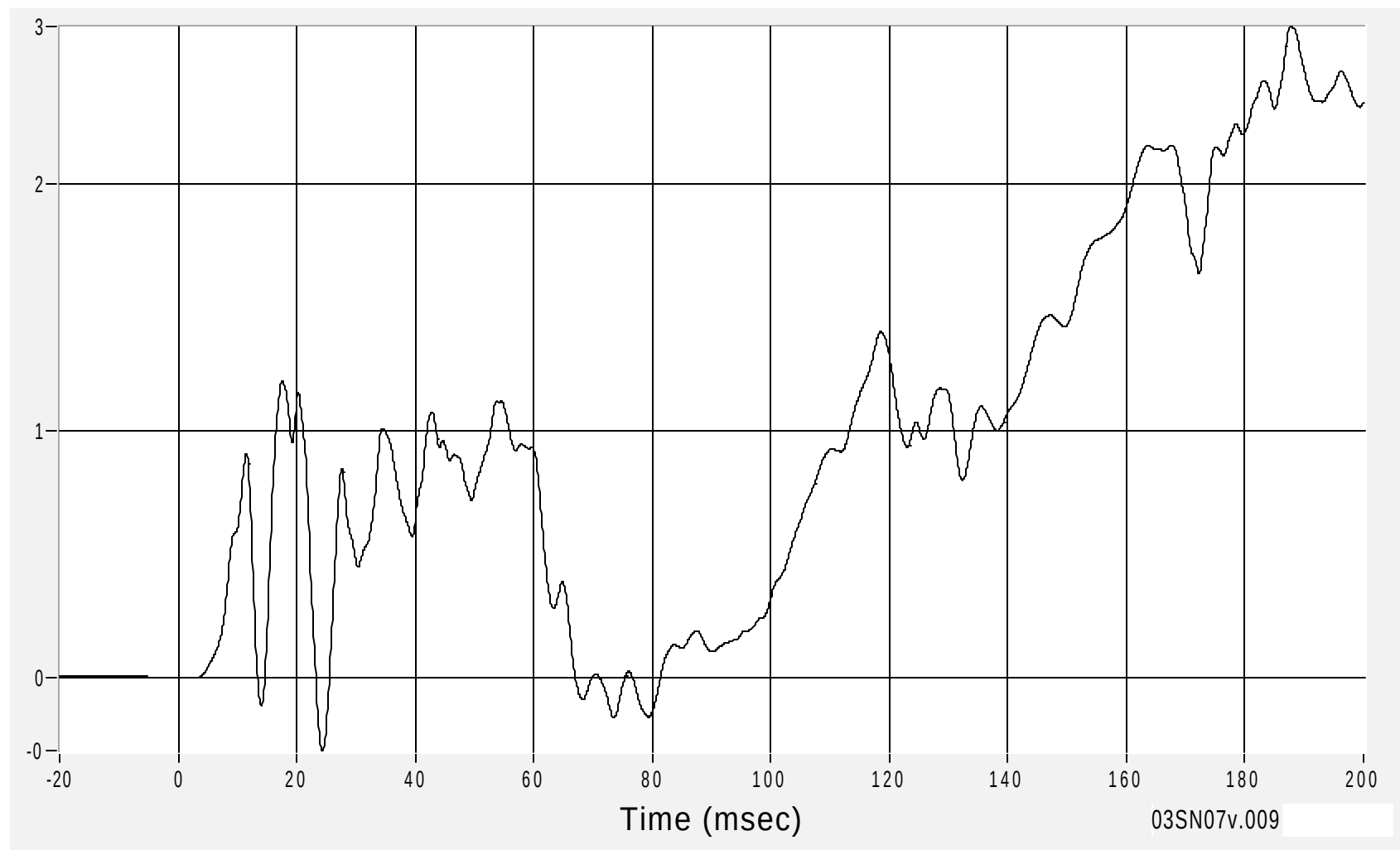
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle (Z) Velocity

Velocity (km/h) CFC180

Max 2.6 km/h at 187.8 msec

Min -0.3 km/h at 24.3 msec



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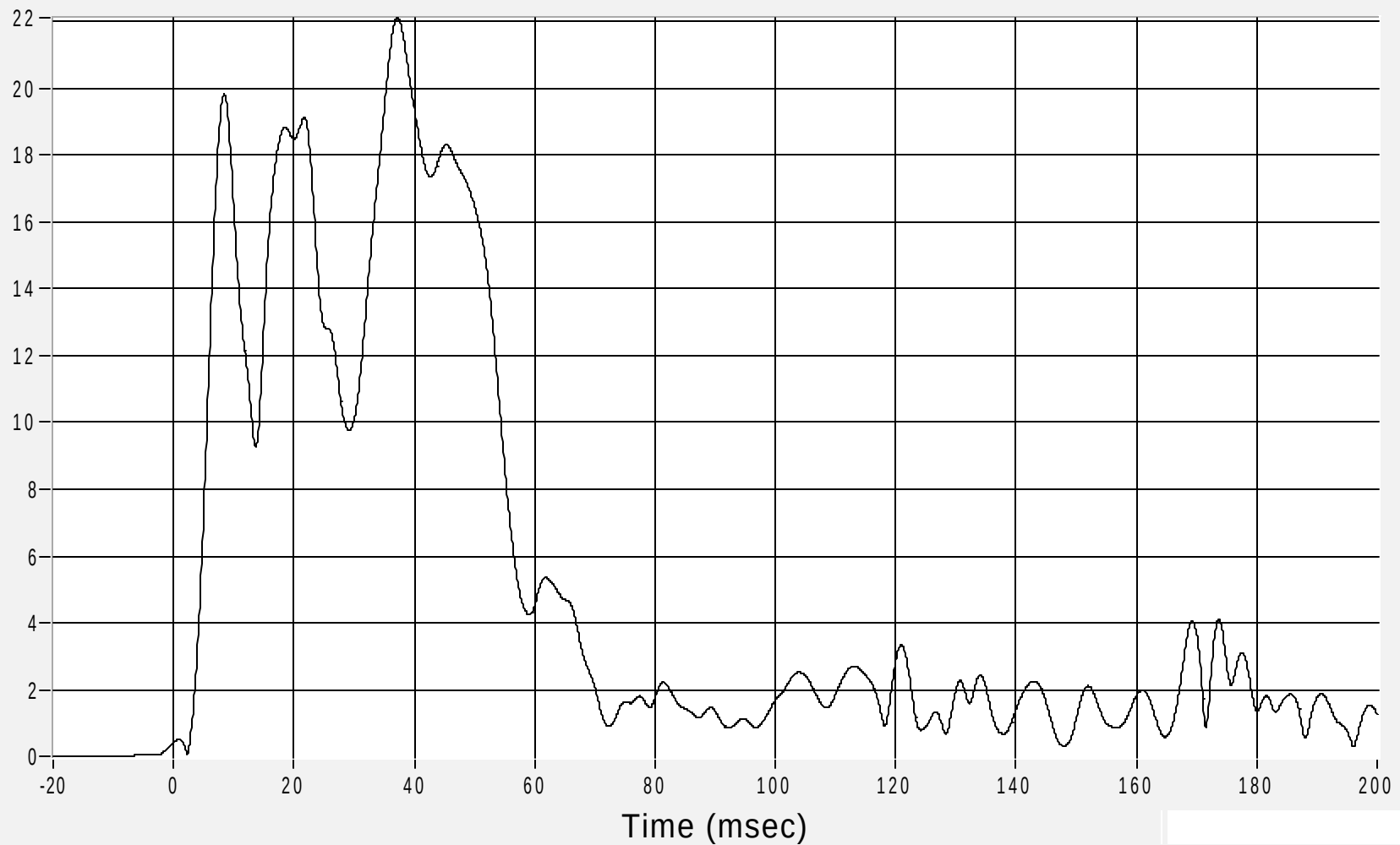
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Floorpan Above Axle Resultant Acceleration

Acceleration (G's) CFC60

Max 22.1 G's at 37.2 msec
Min 0.0 G's at 2.3 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

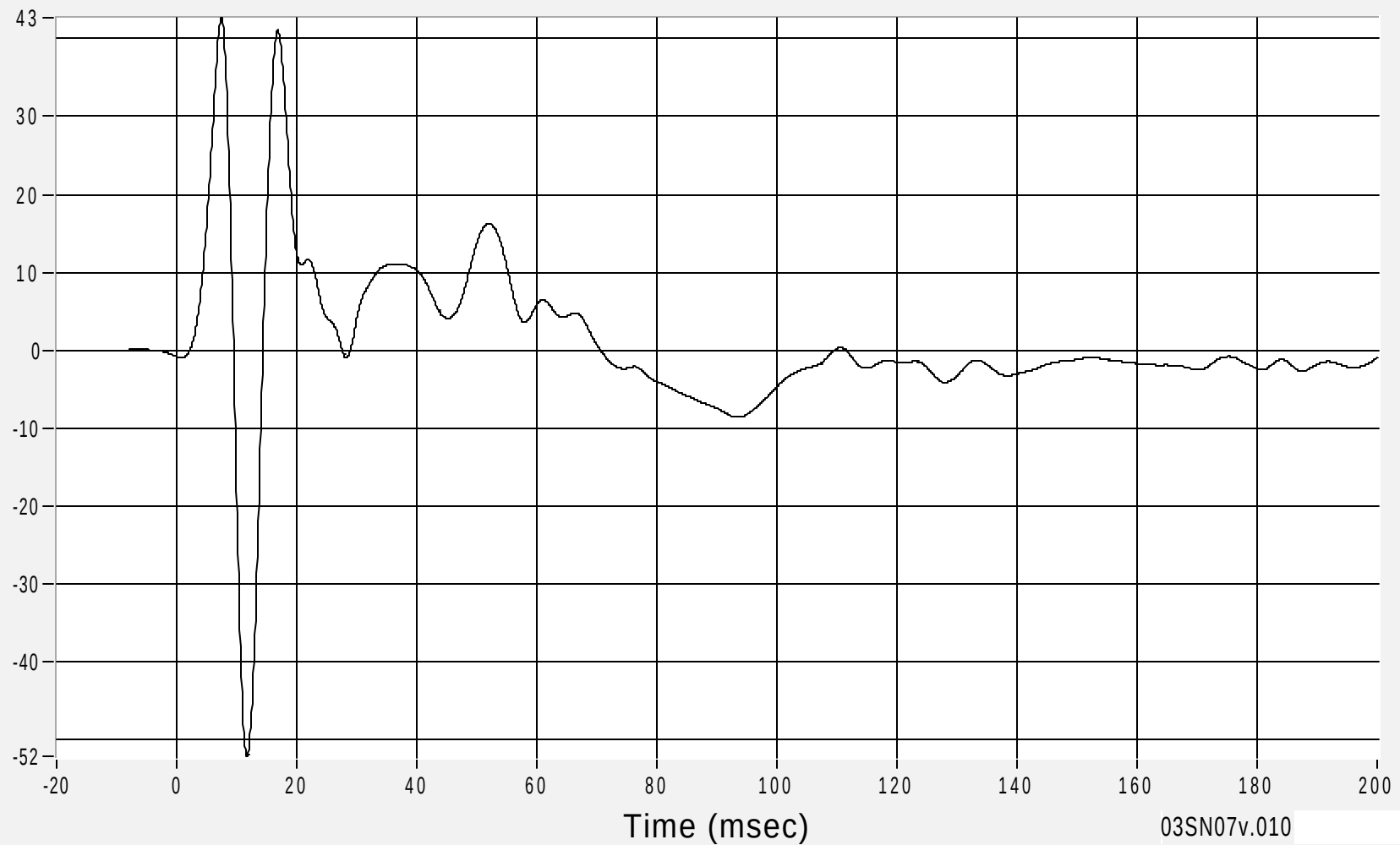
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Side Sill at Rear Seat (Y) Acceleration

Acceleration (G's) CFC60

Max 42.7 G's at 7.4 msec

Min -52.1 G's at 11.7 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

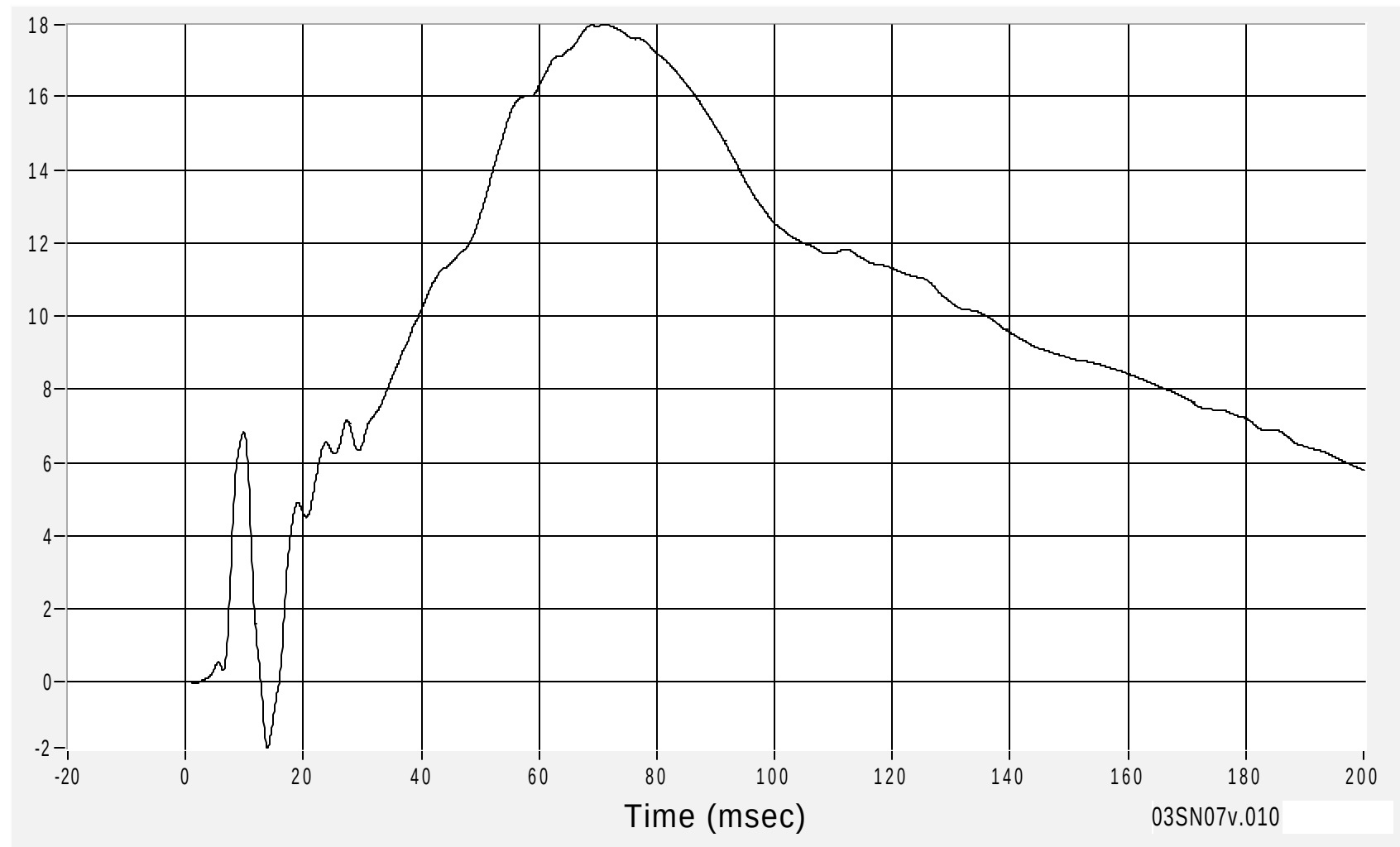
28 February 2003

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Vehicle Crashworthiness Lab

Left Side Sill at Rear Seat (Y) Velocity

Velocity (km/h) CFC180

Max 18.0 km/h at 71.0 msec
Min -1.8 km/h at 13.9 msec



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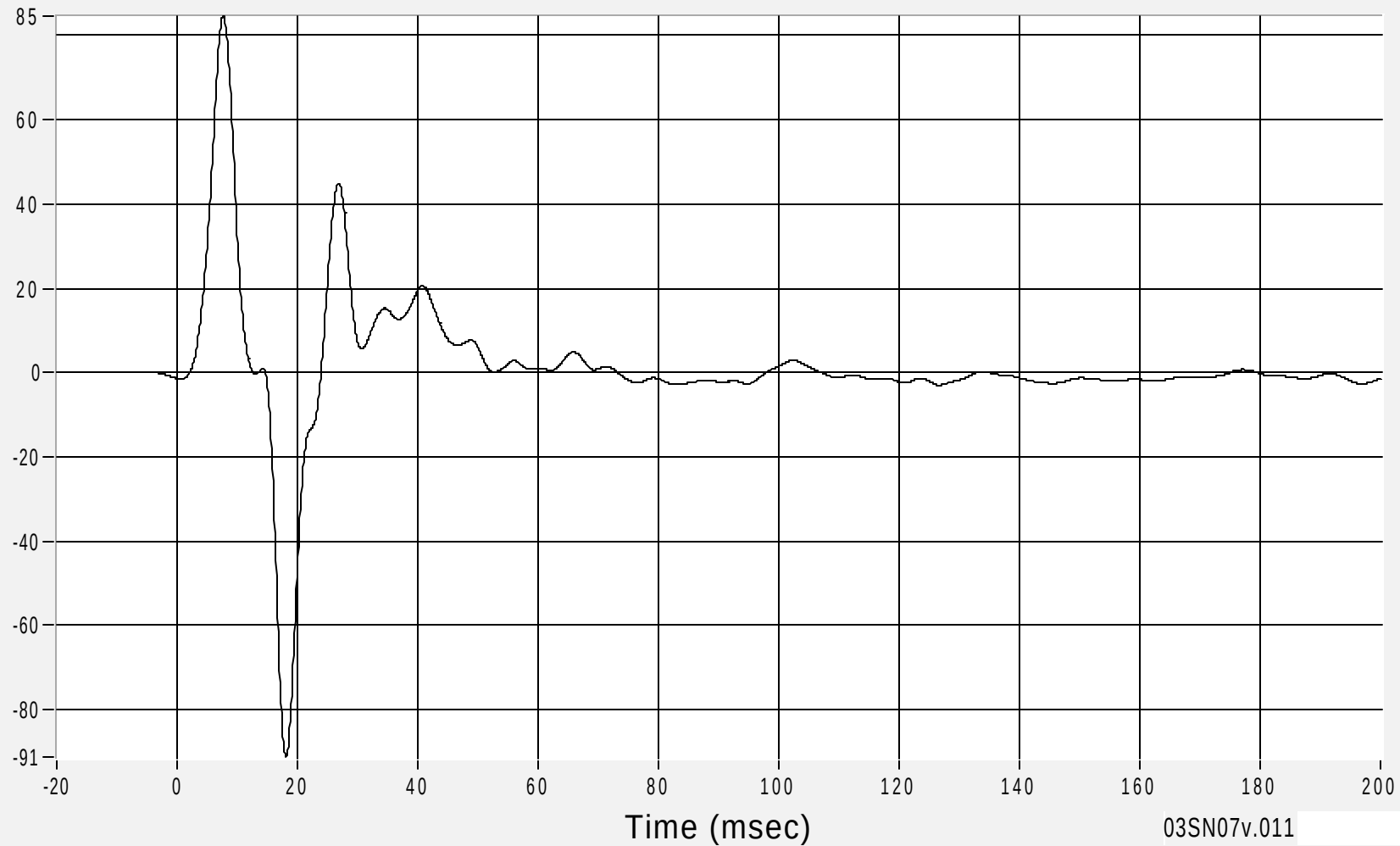
28 February 2003

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

Acceleration (G's) CFC60

Max 84.6 G's at 7.7 msec
Min -91.2 G's at 18.1 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

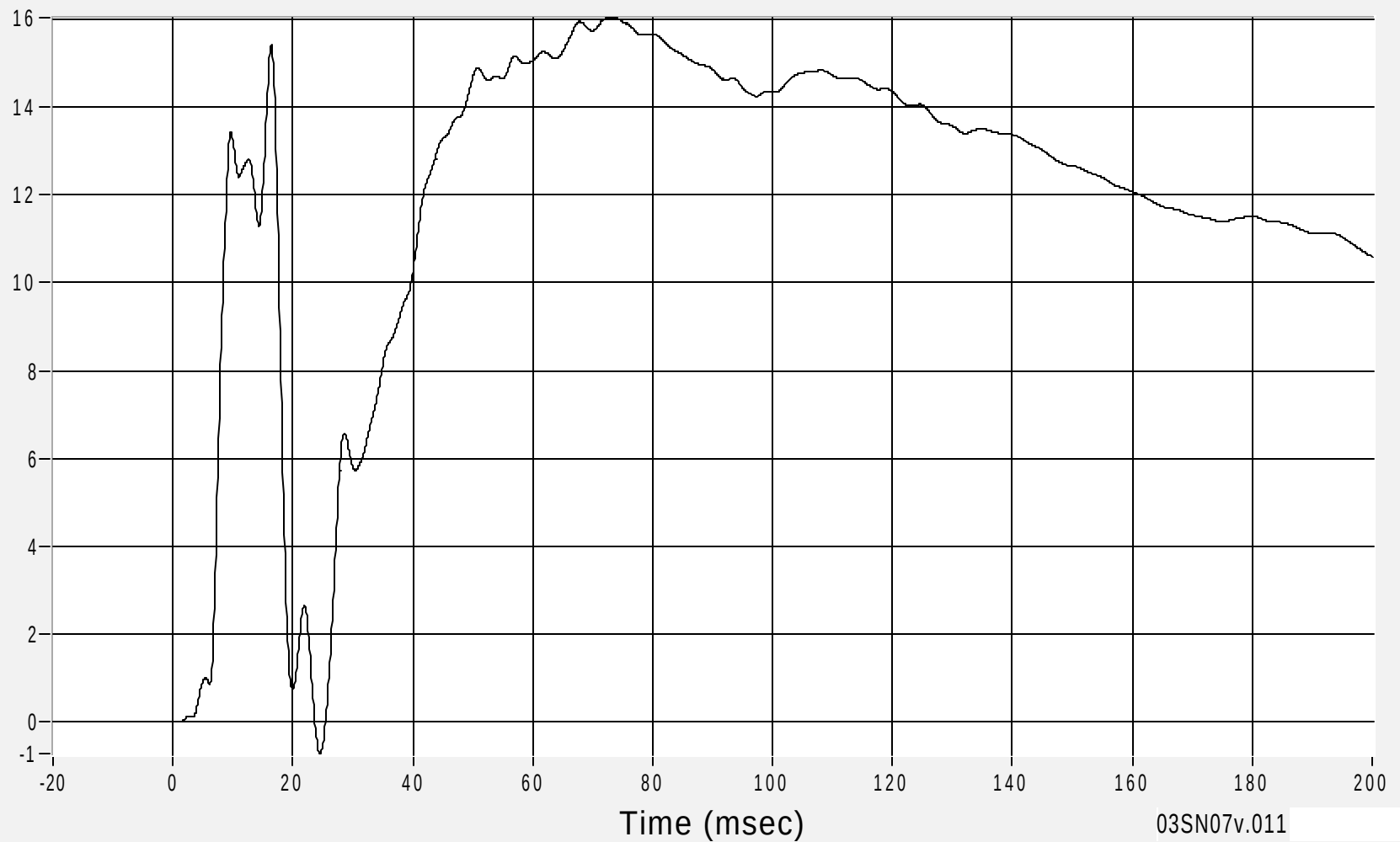
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Side Sill at Front Seat (Y) Velocity

Velocity (km/h) CFC180

Max 16.0 km/h at 73.4 msec

Min -0.7 km/h at 24.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

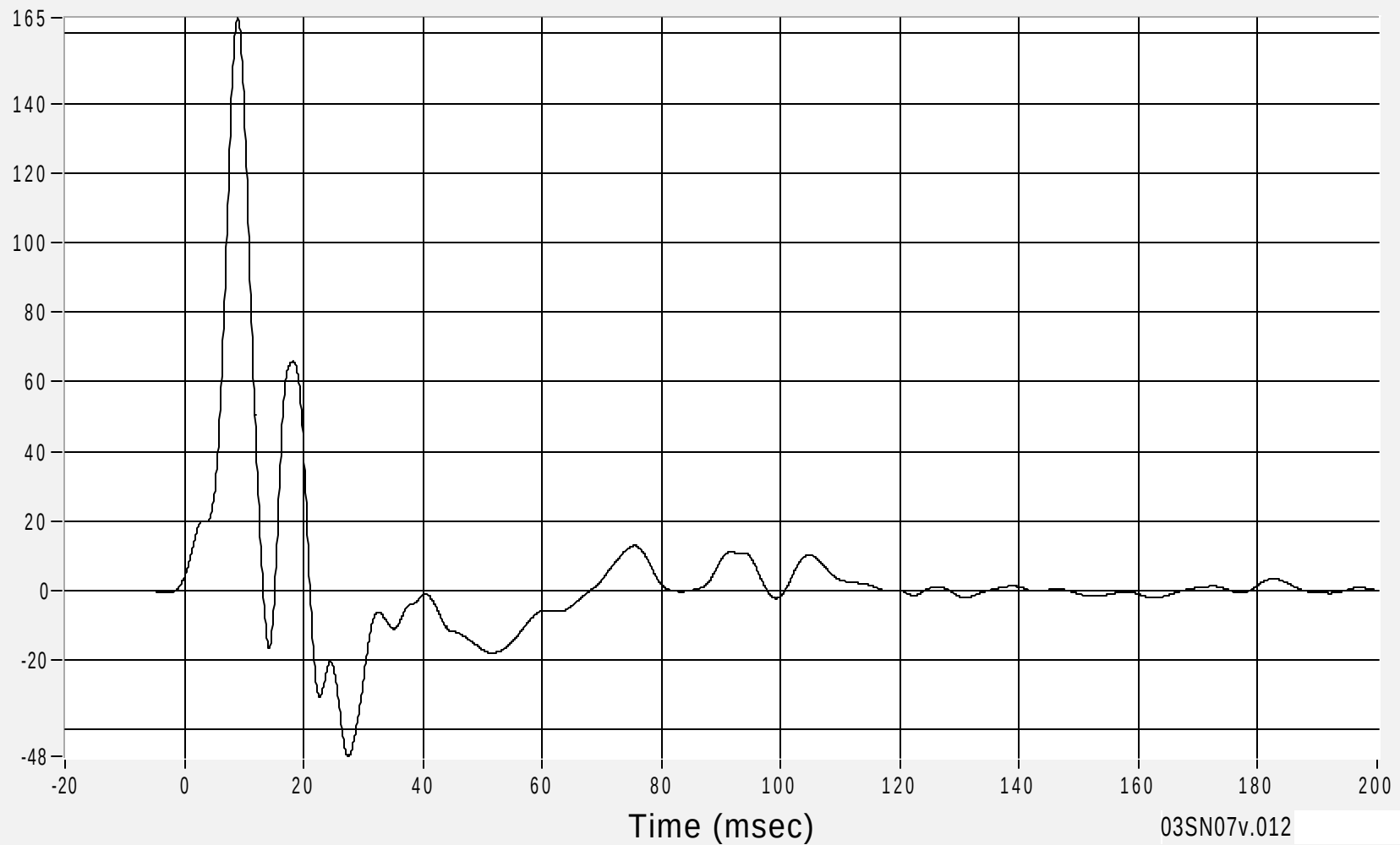
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Left Front Door on Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 164.6 G's at 9.0 msec

Min -47.6 G's at 27.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

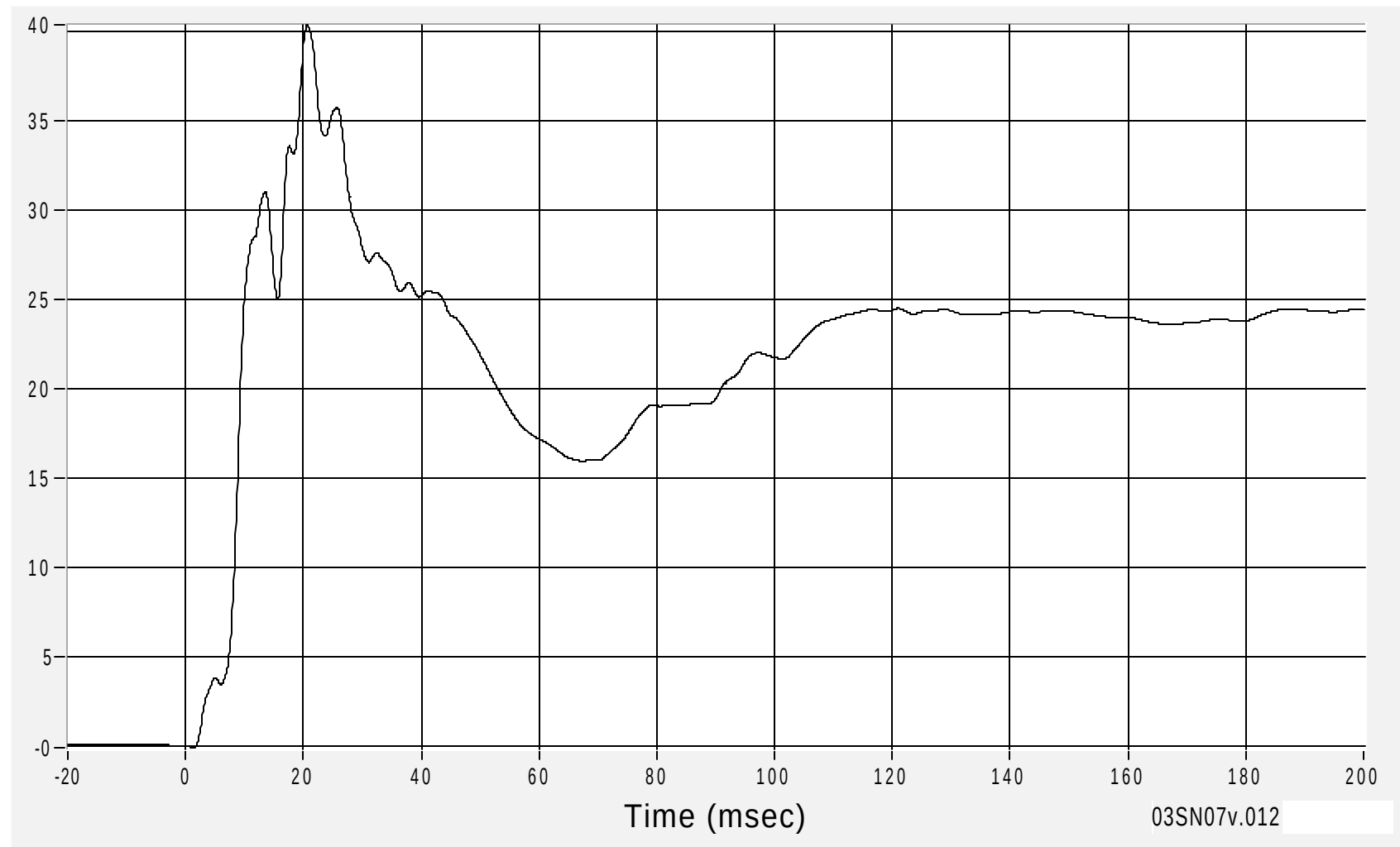
28 February 2003

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Vehicle Crashworthiness Lab

Left Front Door on Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 40.4 km/h at 20.6 msec
Min -0.1 km/h at 1.4 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

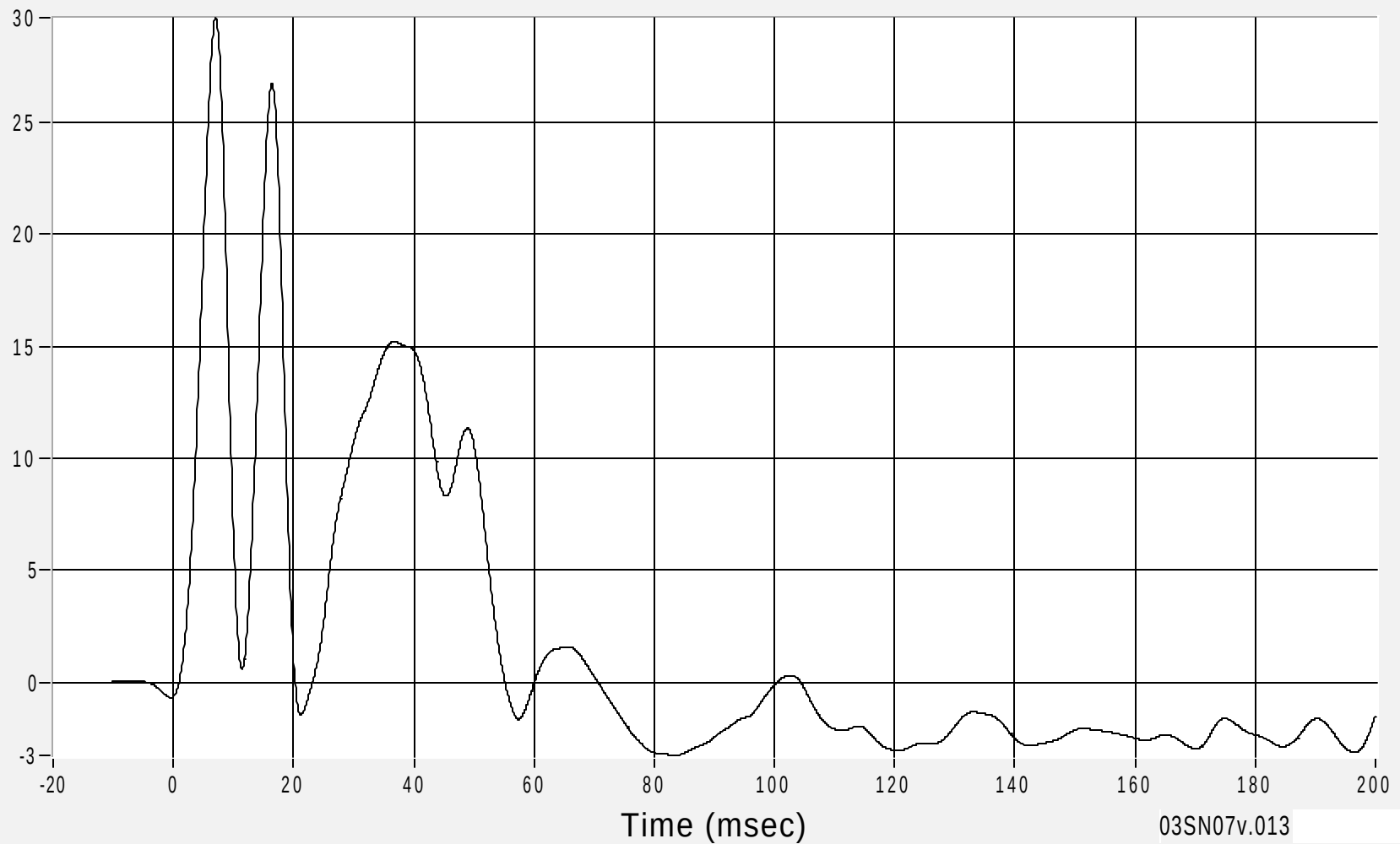
28 February 2003

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Right Rear Occupant Compartment (Y) Acceleration

Acceleration (G's) CFC60

Max 29.7 G's at 7.0 msec
Min -3.3 G's at 83.2 msec



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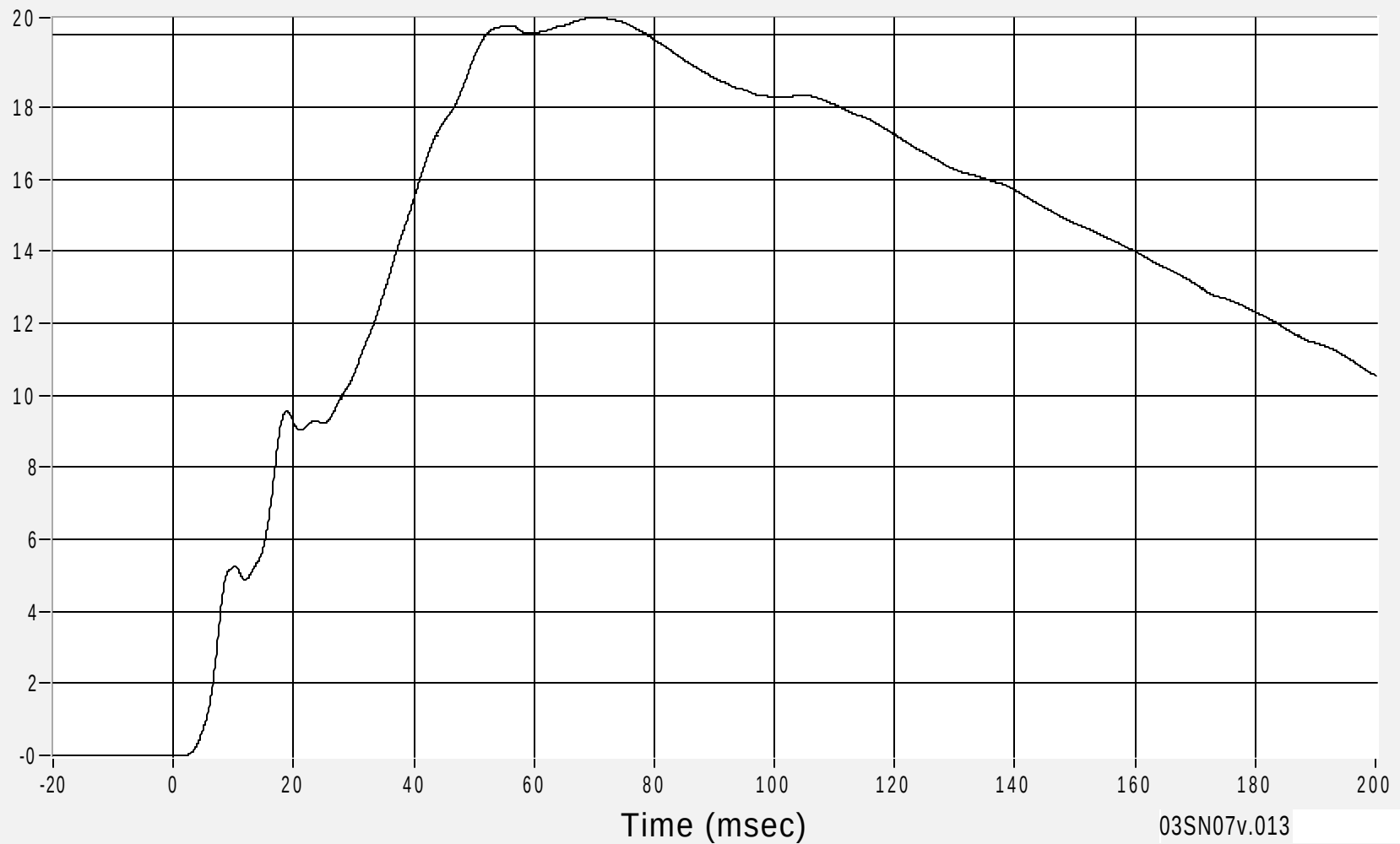
28 February 2003

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Vehicle Crashworthiness Lab

Right Rear Occupant Compartment (Y) Velocity

Velocity (km/h) CFC180

Max 20.5 km/h at 71.2 msec
Min 0.0 km/h at 1.4 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

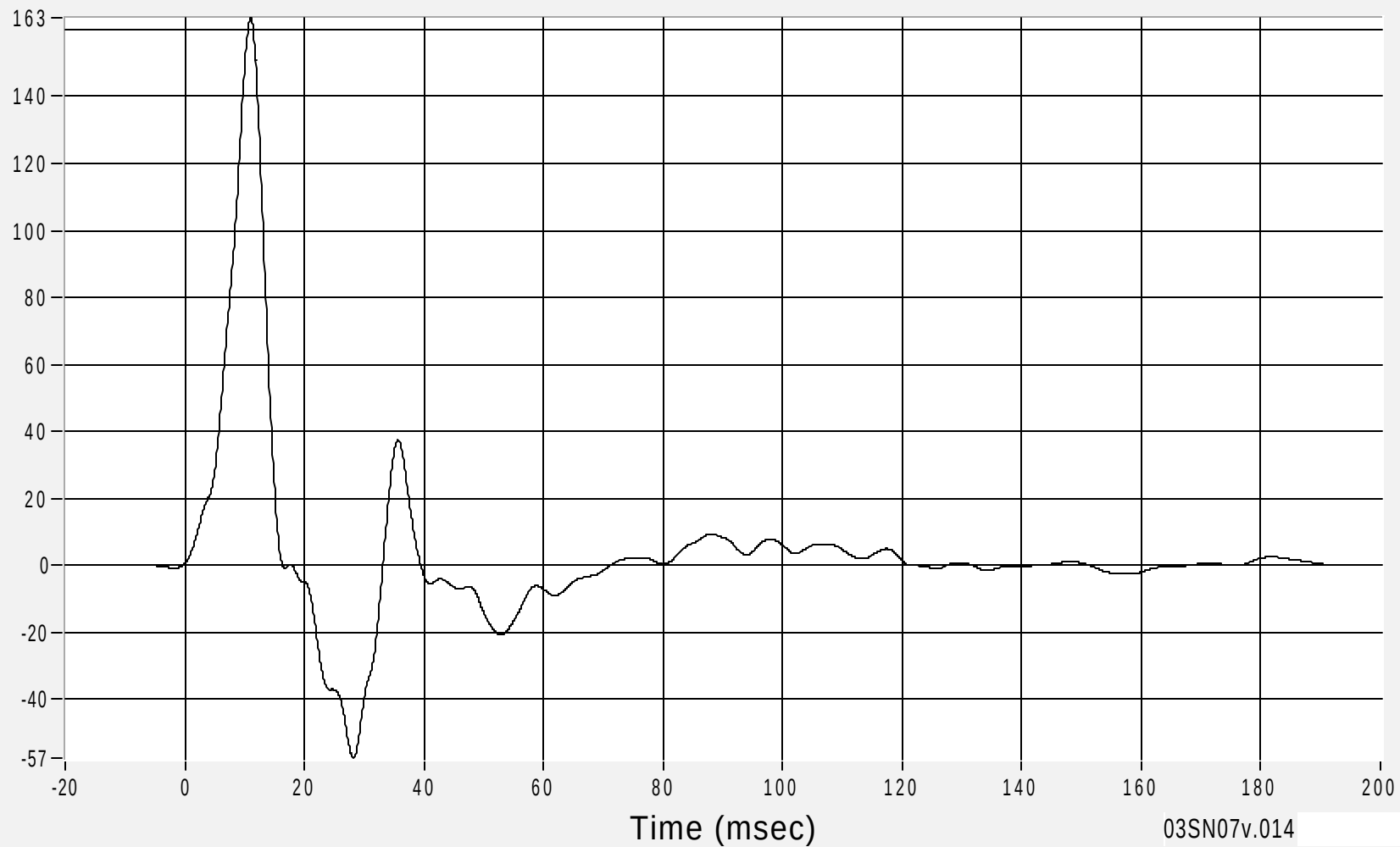
Medical College of Wisconsin
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Mid-Rear of Left Front Door (Y) Acceleration

Acceleration (G's) CFC60

Max 163.5 G's at 11.0 msec

Min -57.4 G's at 28.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

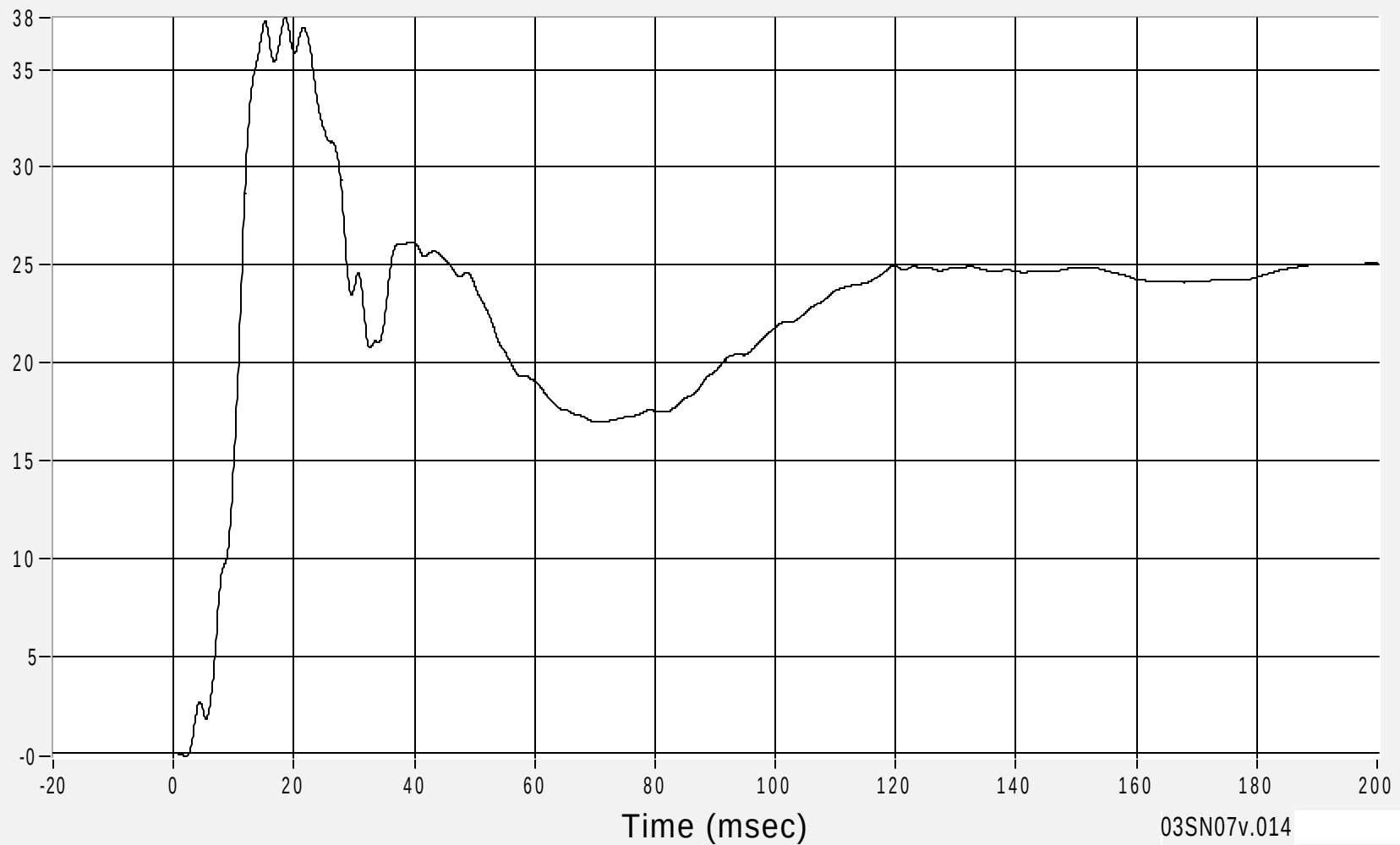
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Mid-Rear of Left Front Door (Y) Velocity

Velocity (km/h) CFC180

Max 37.6 km/h at 18.6 msec

Min -0.1 km/h at 2.1 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

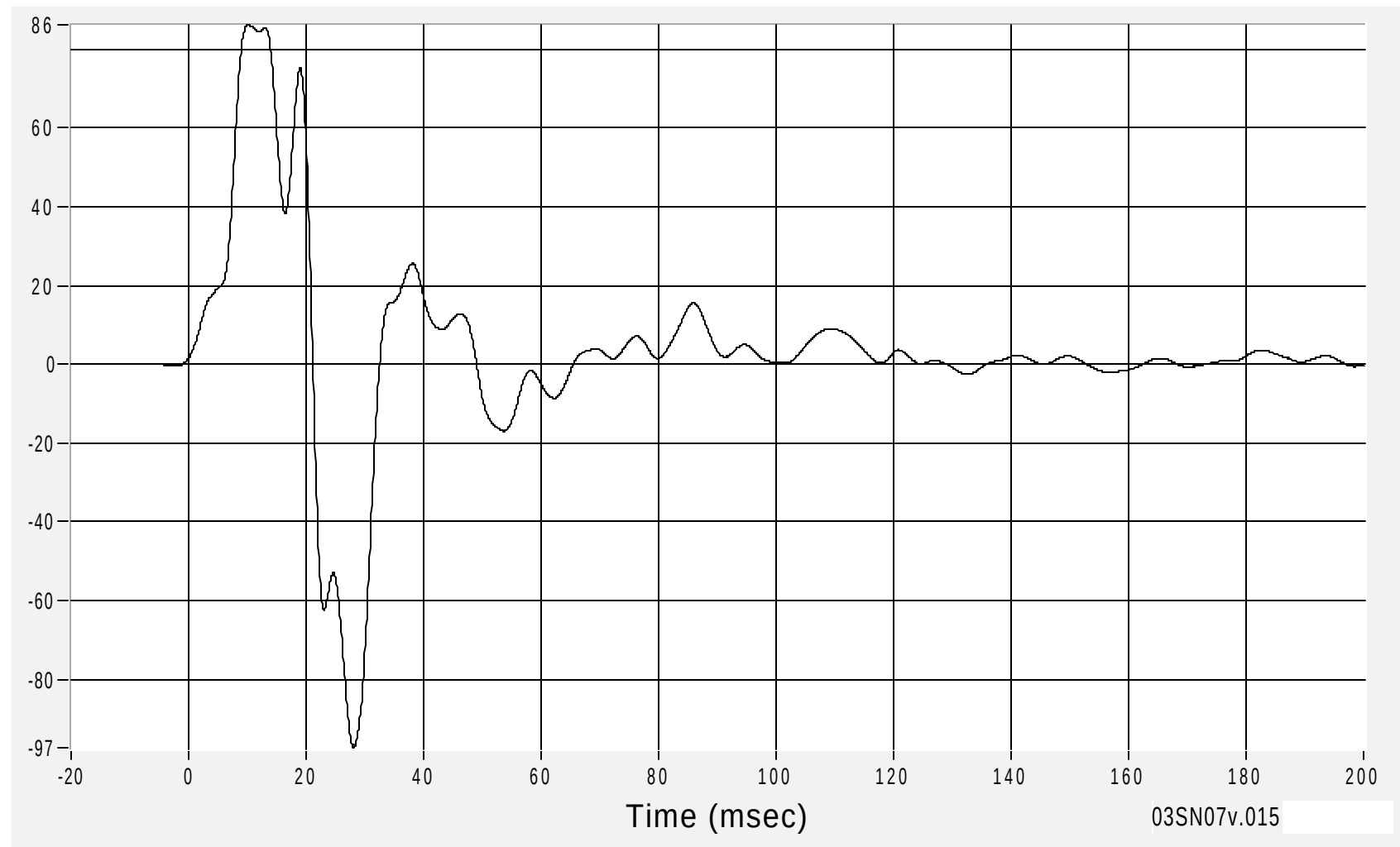
28 February 2003

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Left Front Door Upper Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 86.2 G's at 10.2 msec
Min -97.4 G's at 28.1 msec



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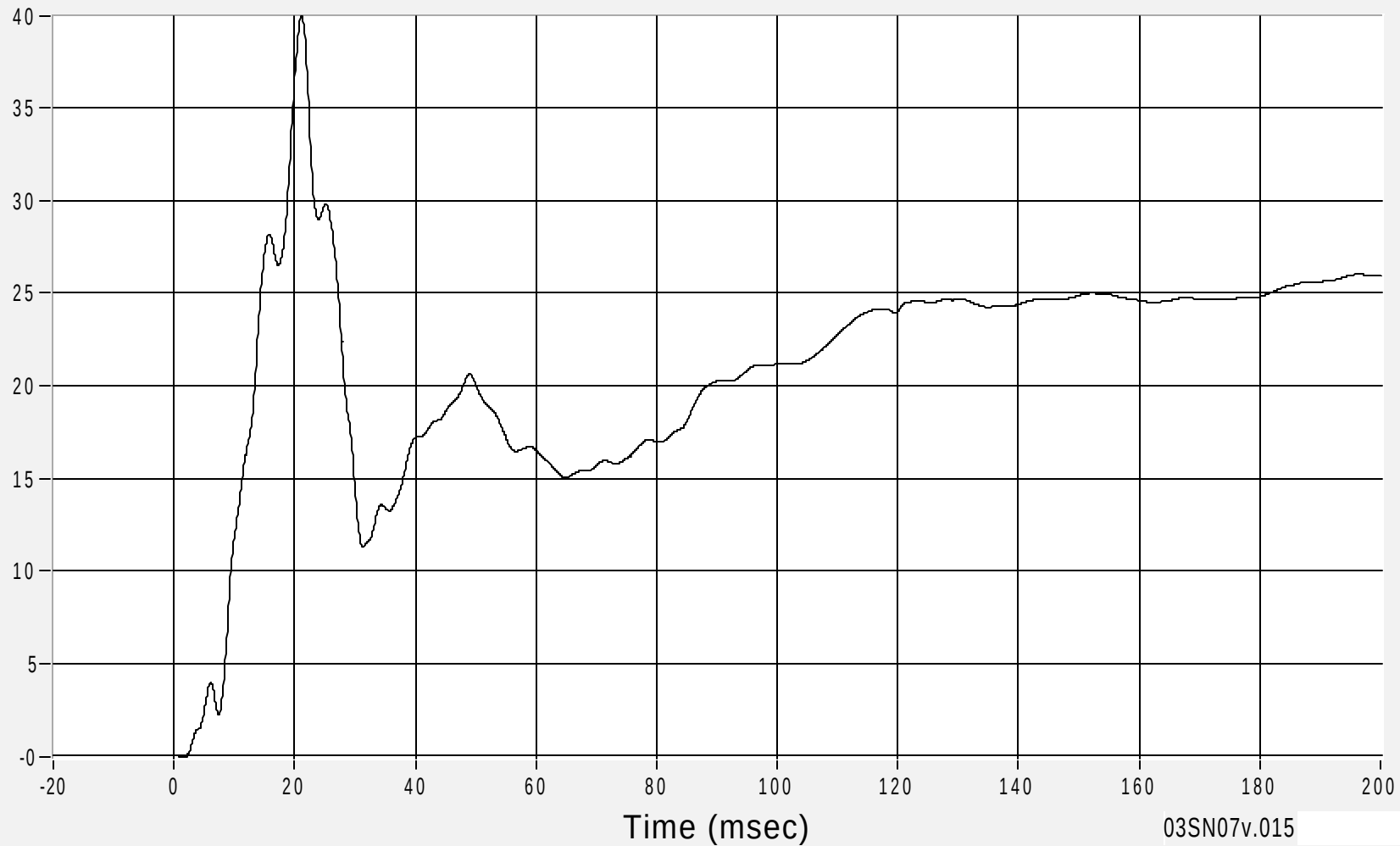
28 February 2003

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Vehicle Crashworthiness Lab

Left Front Door Upper Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 40.0 km/h at 21.2 msec
Min 0.0 km/h at 1.7 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

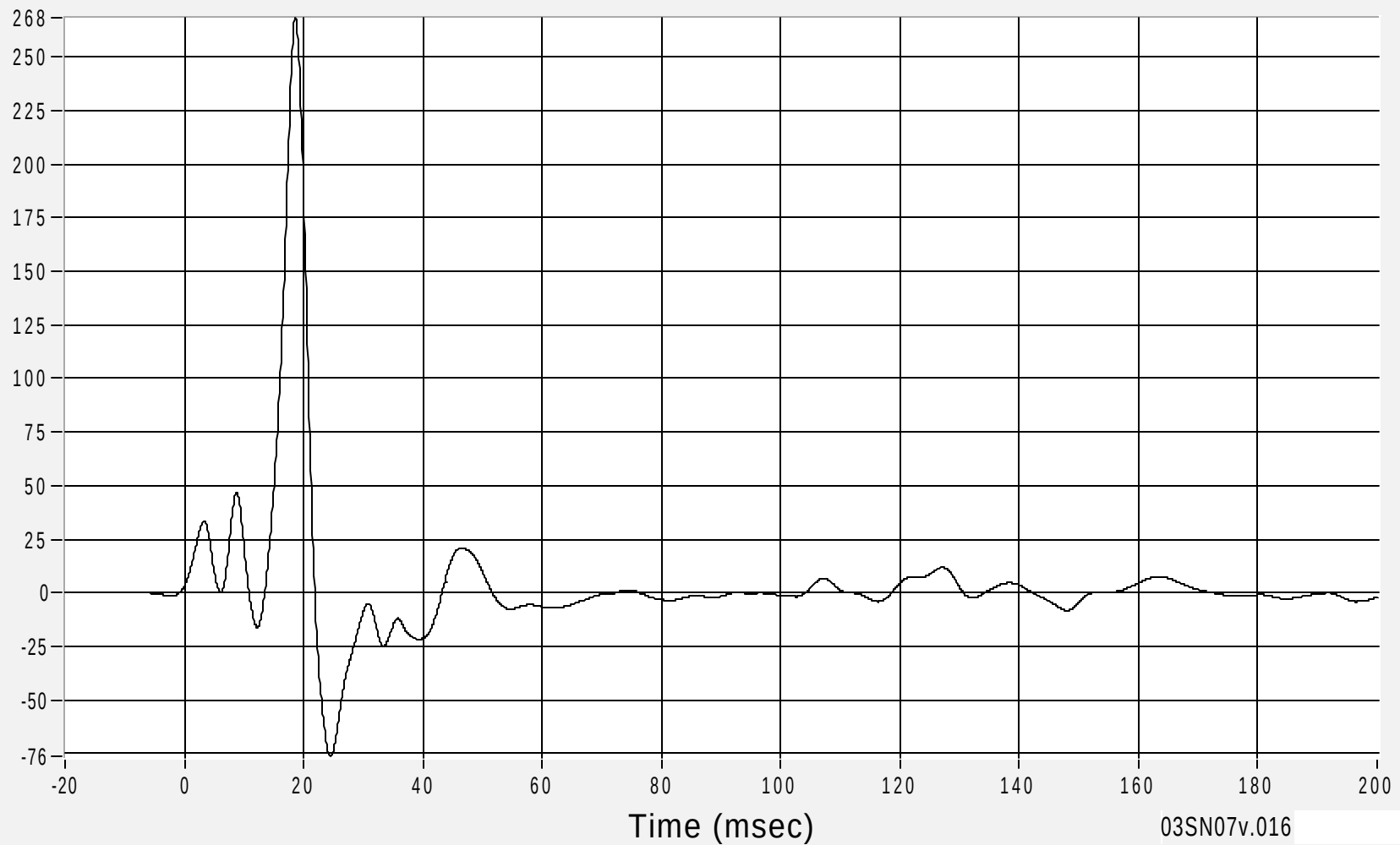
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Mid-Rear of Left Rear Door (Y) Acceleration

Acceleration (G's) CFC60

Max 268.2 G's at 18.6 msec

Min -76.2 G's at 24.5 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

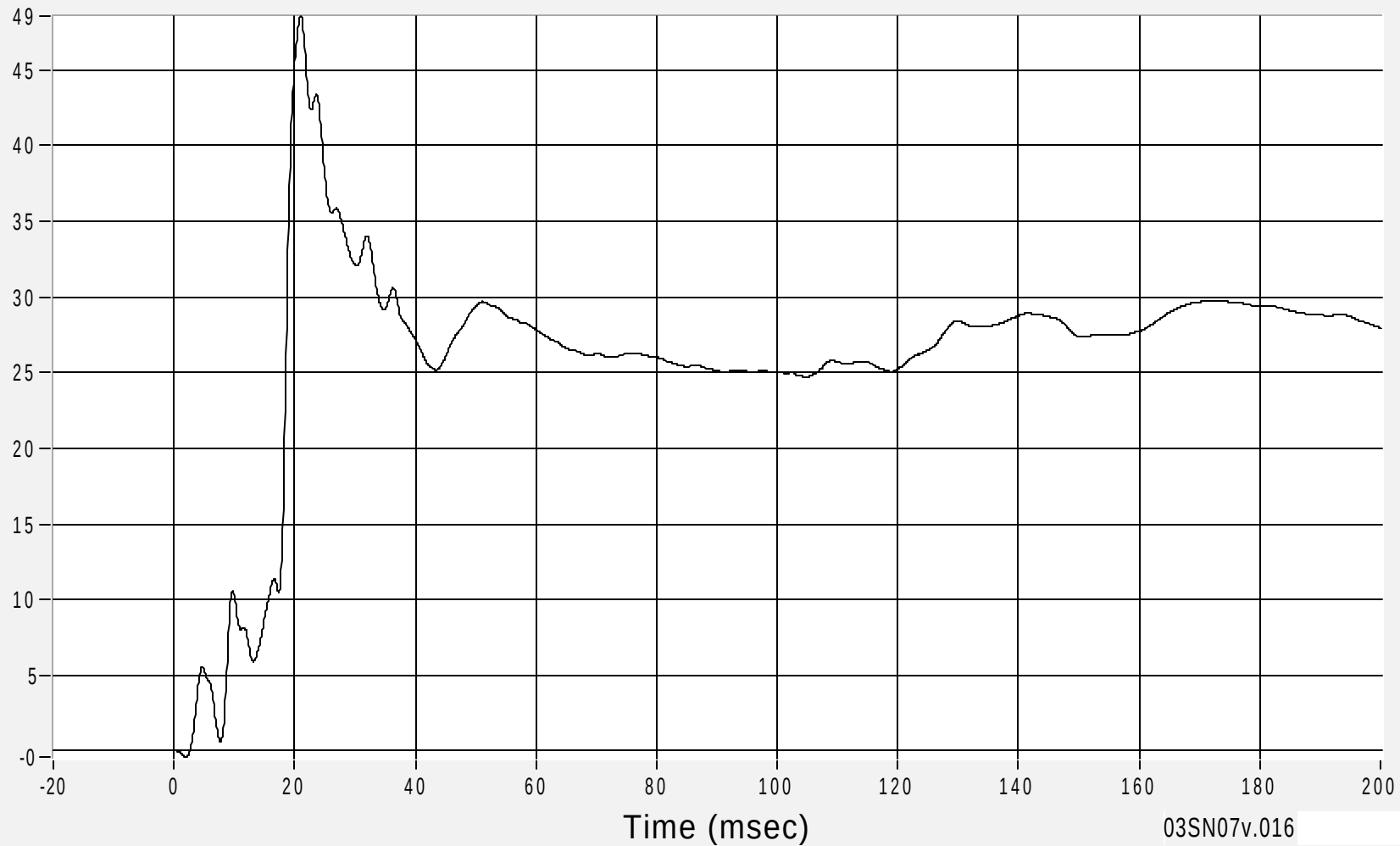
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Mid-Rear of Left Rear Door (Y) Velocity

Velocity (km/h) CFC180

Max 48.5 km/h at 21.0 msec

Min -0.4 km/h at 2.0 msec



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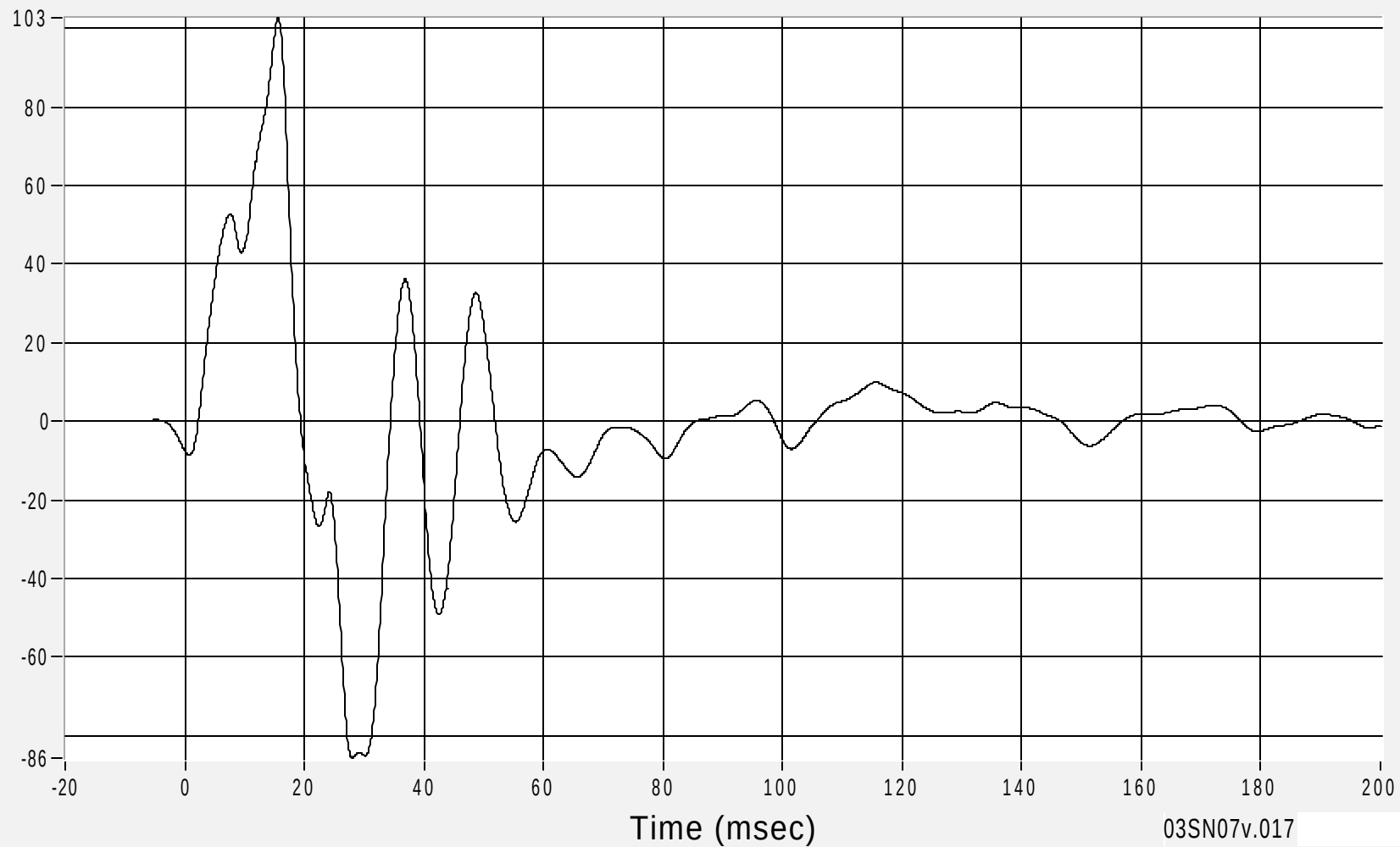
28 February 2003

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Left Rear Door Upper Centerline (Y) Acceleration

Acceleration (G's) CFC60

Max 102.6 G's at 15.6 msec
Min -85.6 G's at 27.9 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

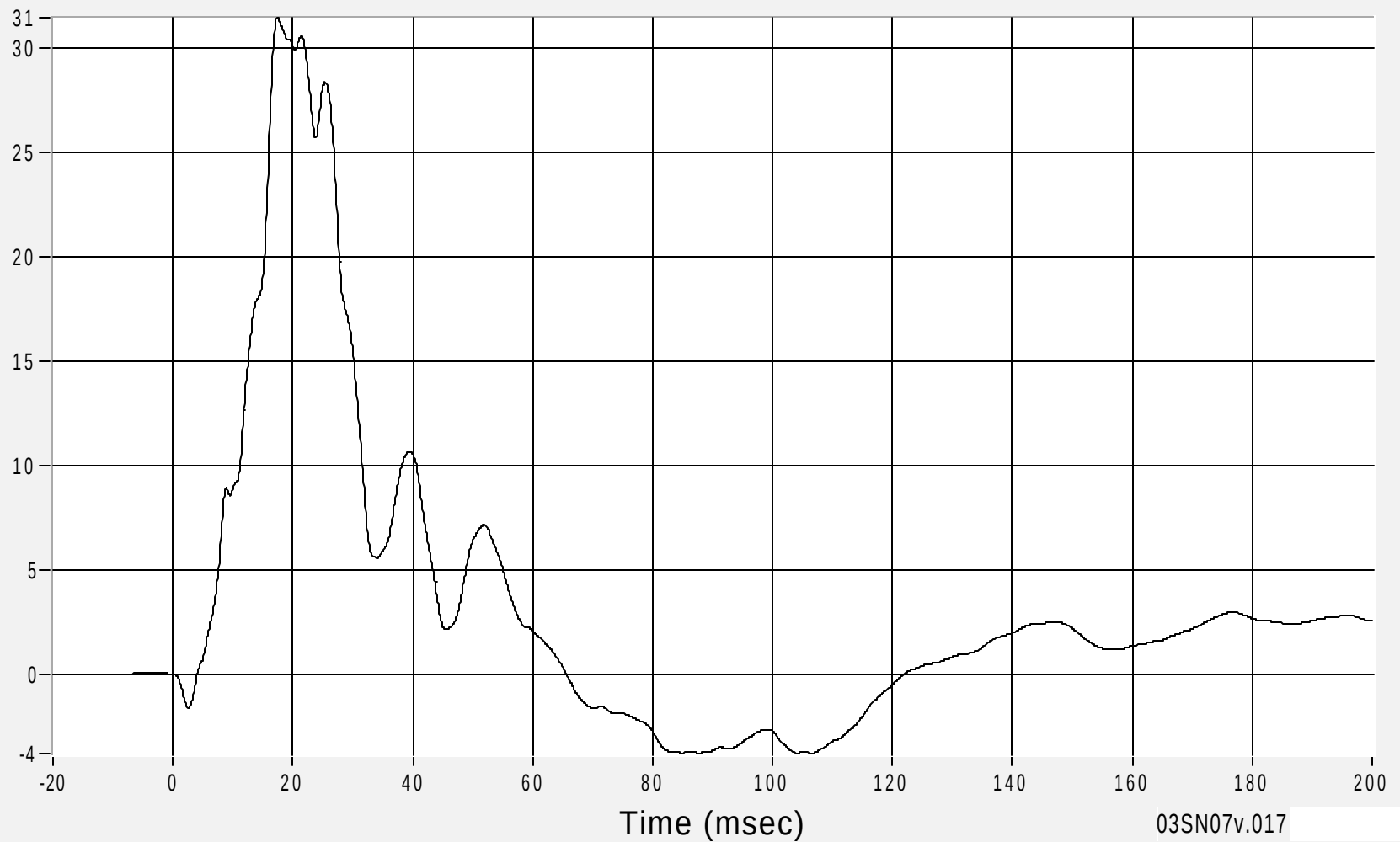
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Rear Door Upper Centerline (Y) Velocity

Velocity (km/h) CFC180

Max 31.5 km/h at 17.4 msec
Min -3.8 km/h at 106.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

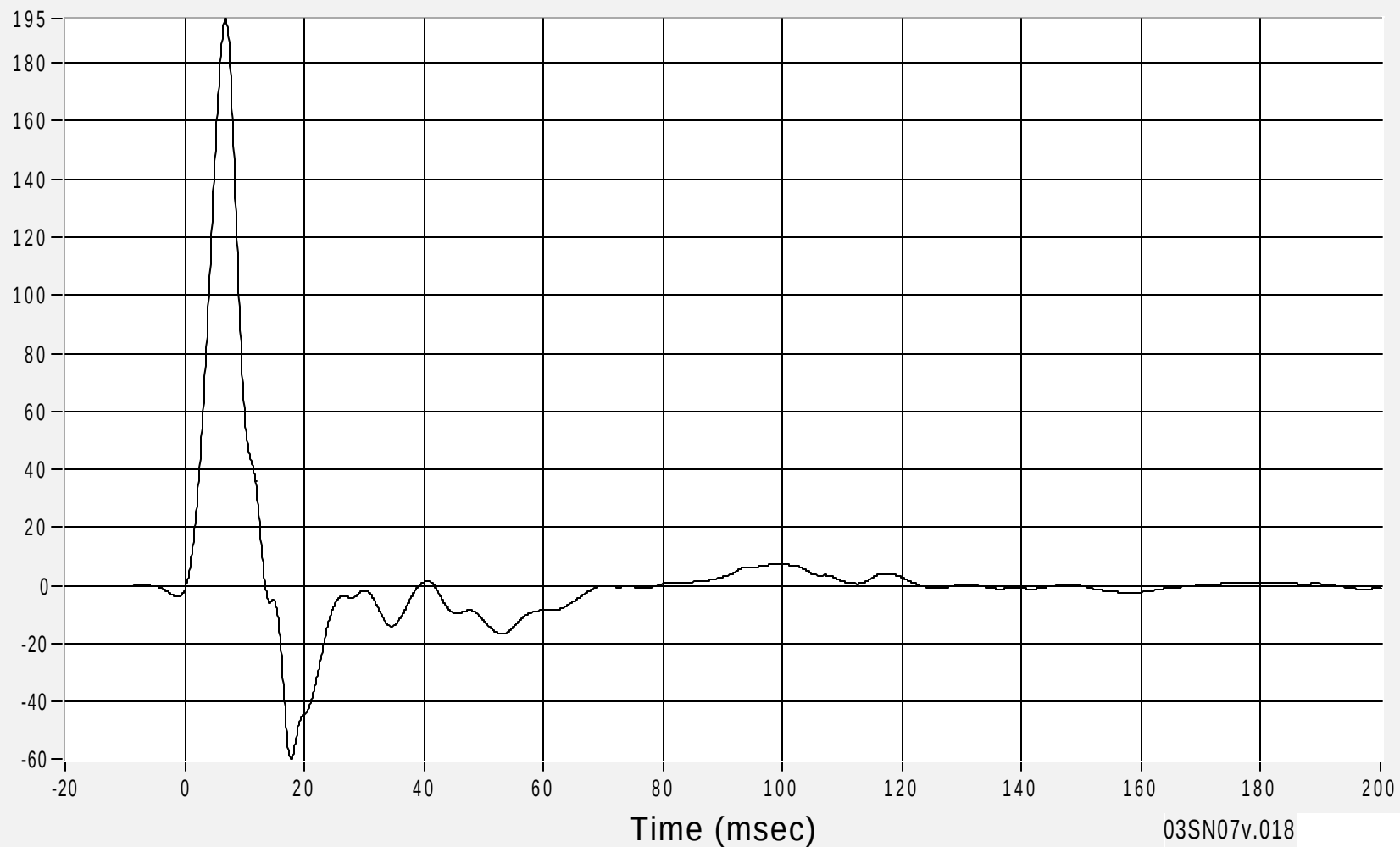
Medical College of Wisconsin
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Left Lower B-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 195.3 G's at 6.8 msec

Min -59.7 G's at 17.8 msec



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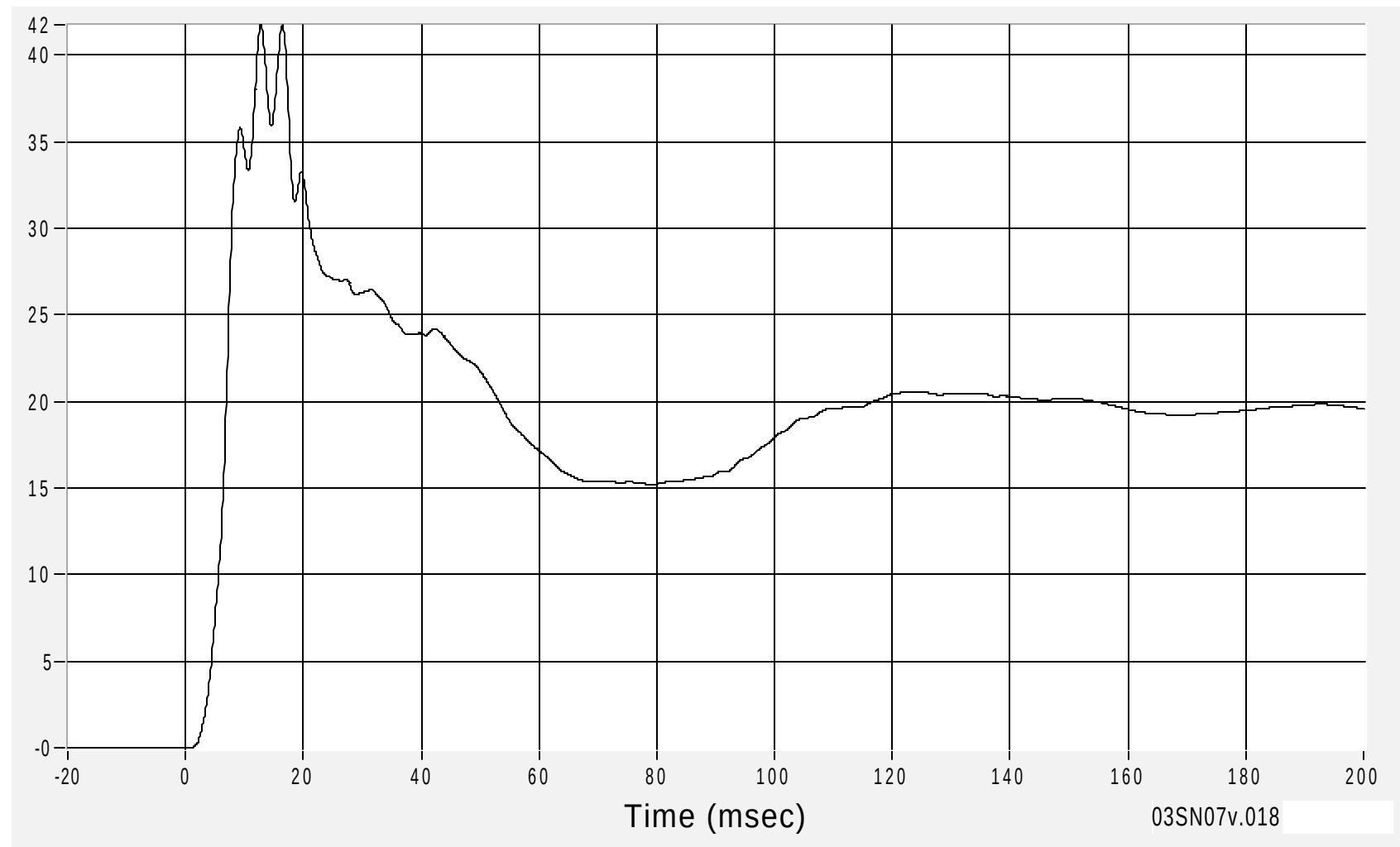
28 February 2003

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Left Lower B-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 41.8 km/h at 16.4 msec
Min 0.0 km/h at 0.9 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

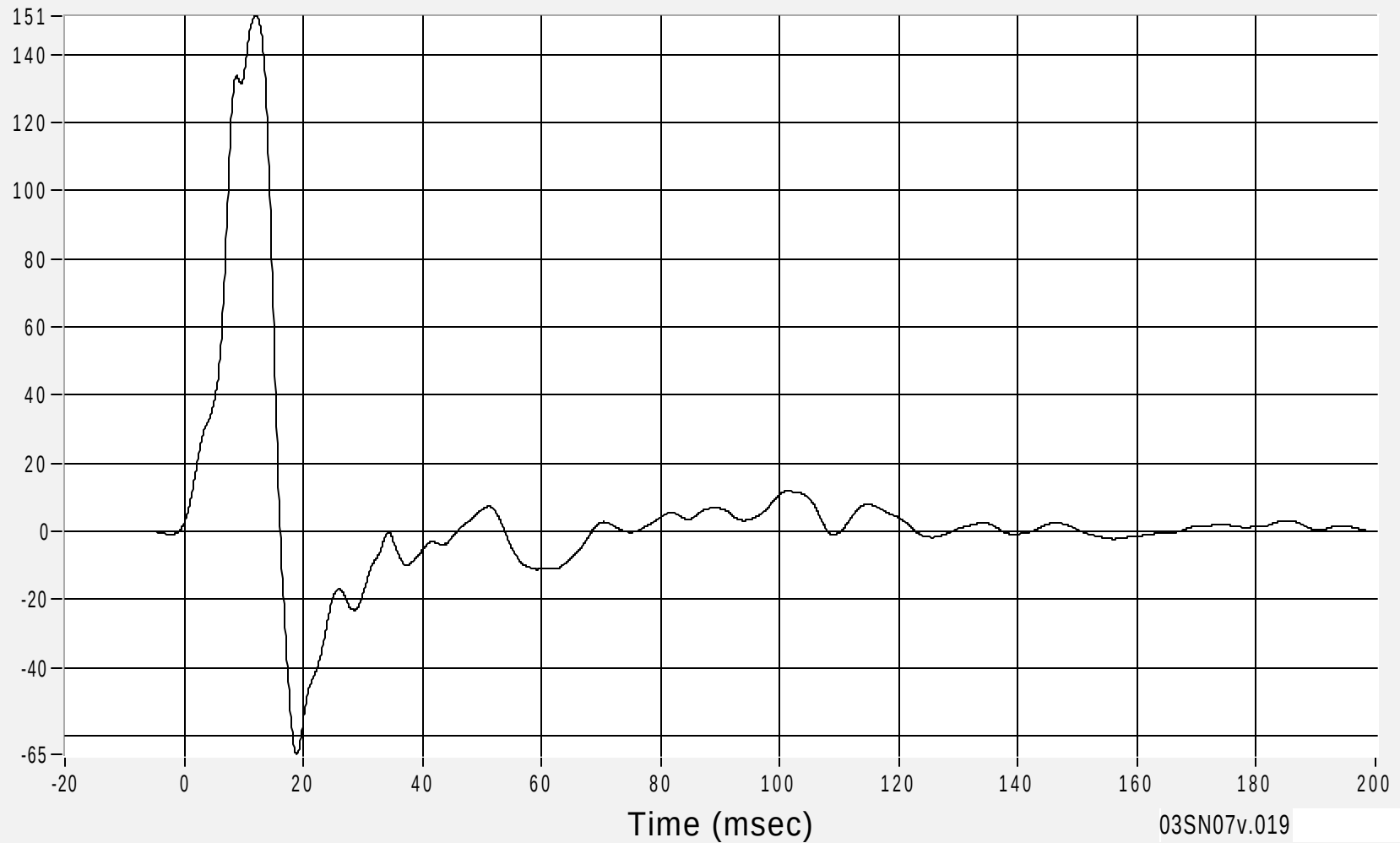
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Left Middle B-Pillar (Y) Acceleration

Acceleration (G's) CFC60

Max 151.2 G's at 12.1 msec

Min -65.4 G's at 18.9 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

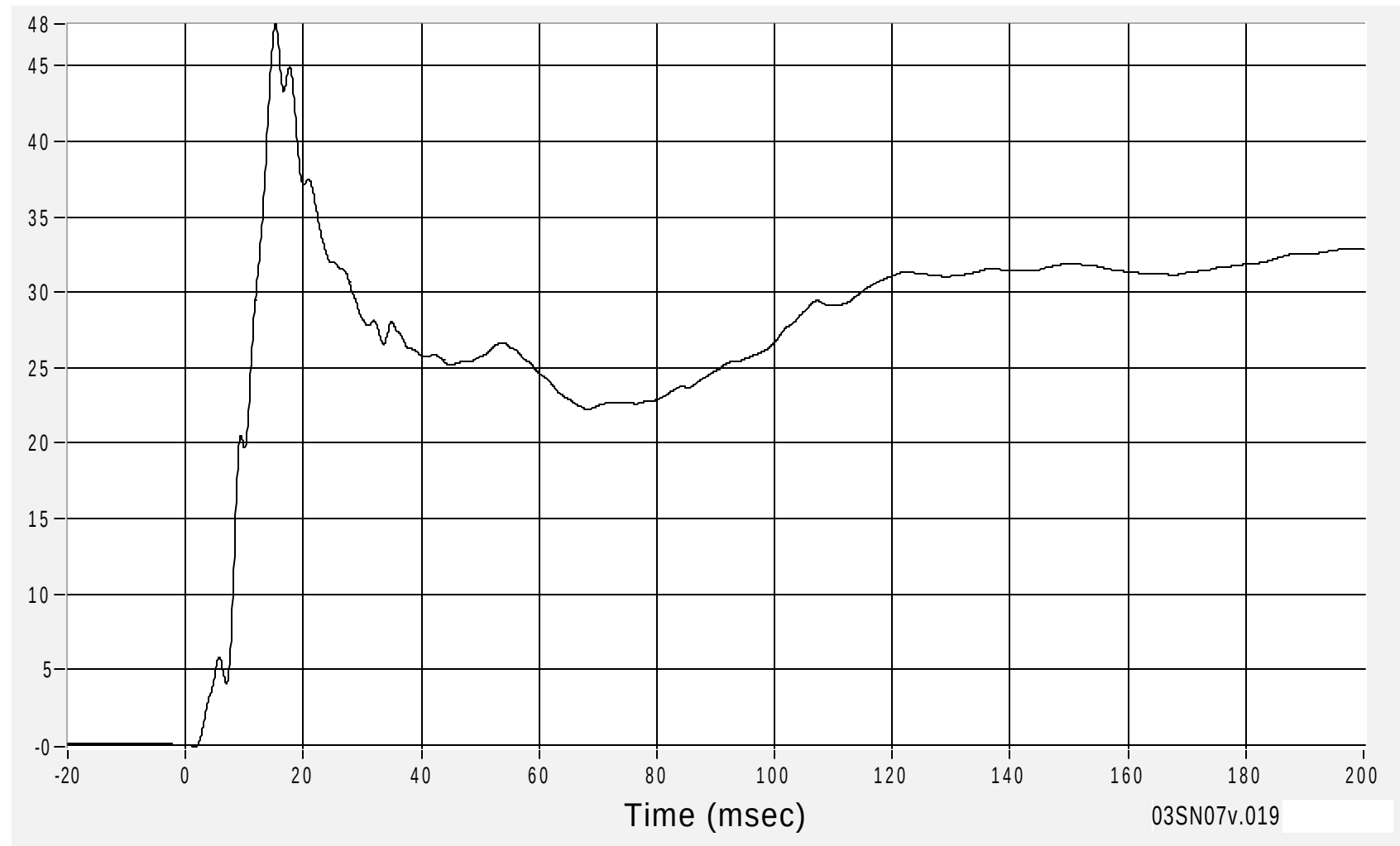
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Middle B-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 47.8 km/h at 15.3 msec

Min -0.1 km/h at 1.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

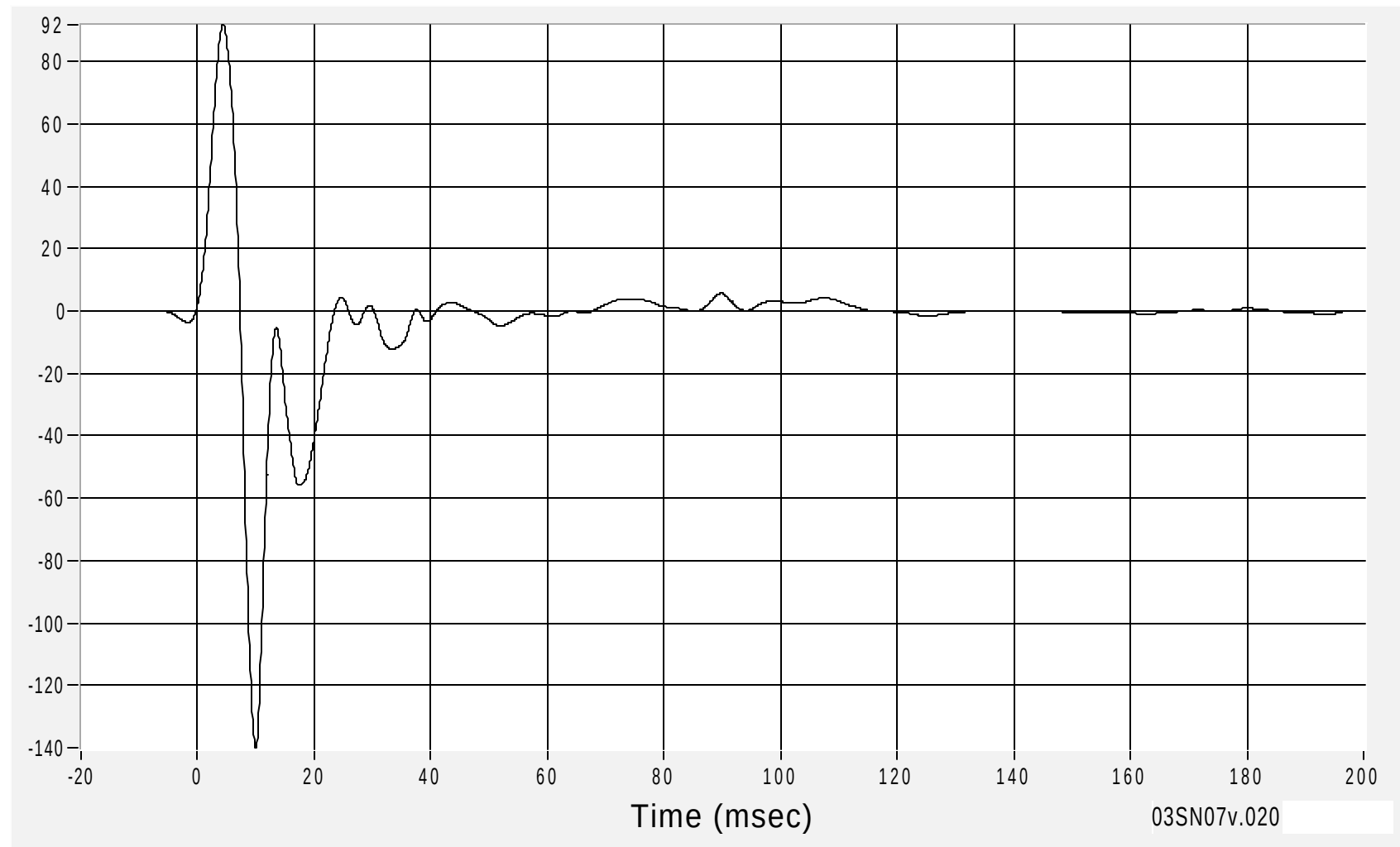
28 February 2003

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

Acceleration (G's) CFC60

Max 91.7 G's at 4.3 msec
Min -140.0 G's at 9.9 msec



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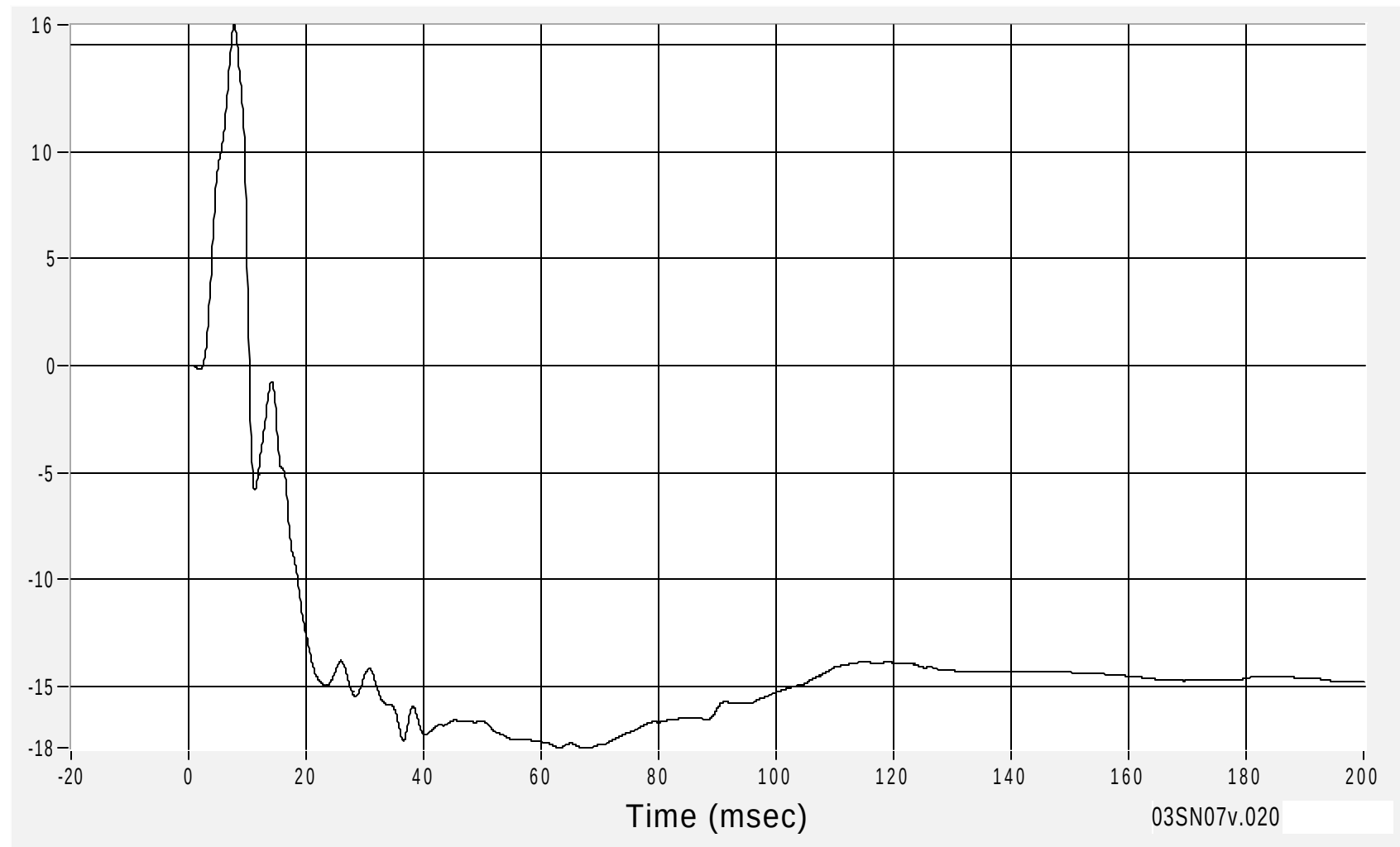
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Lower A-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max 15.9 km/h at 7.8 msec
Min -17.9 km/h at 63.0 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

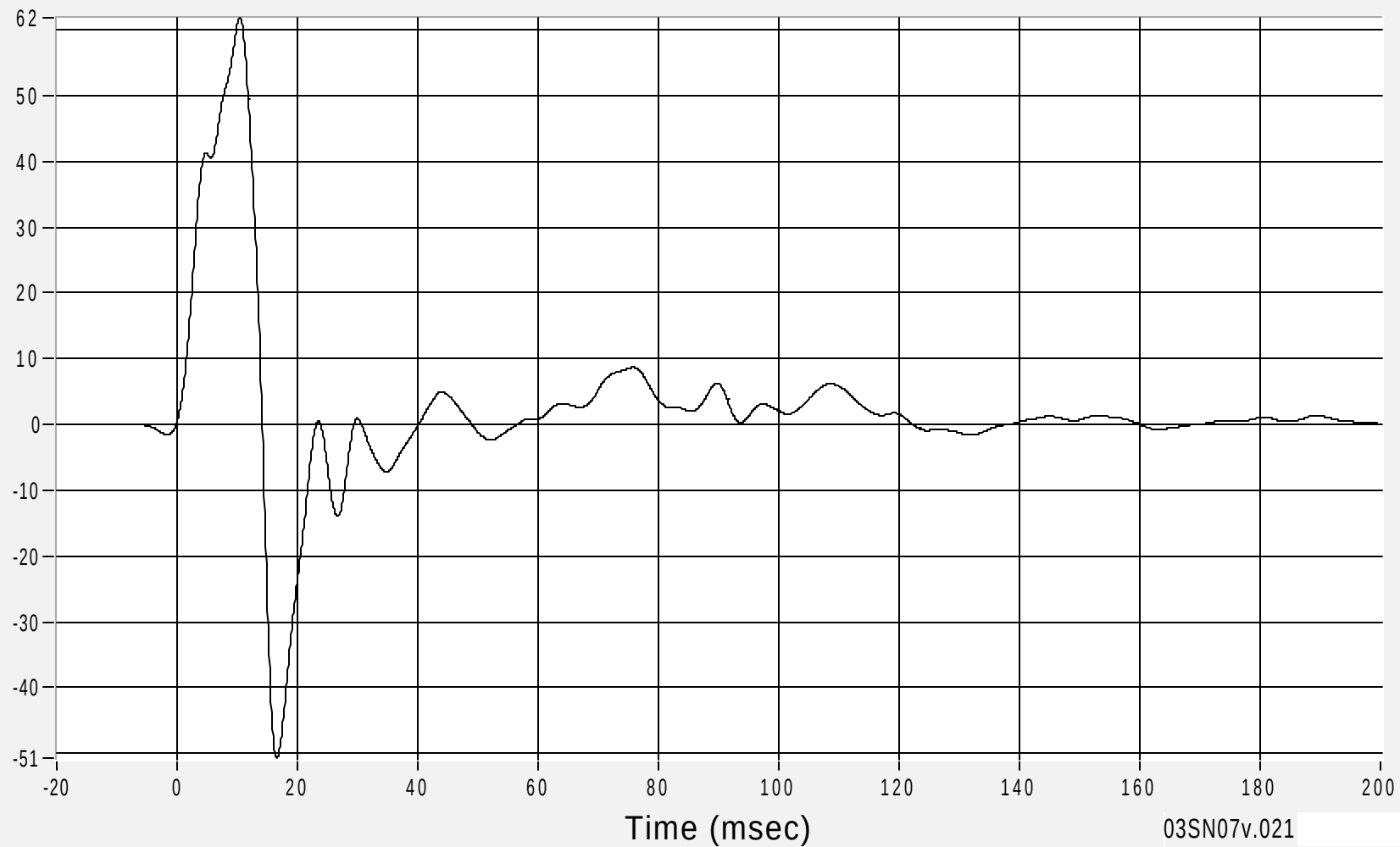
28 February 2003

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

Acceleration (G's) CFC60

Max 61.8 G's at 10.4 msec
Min -50.7 G's at 16.6 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

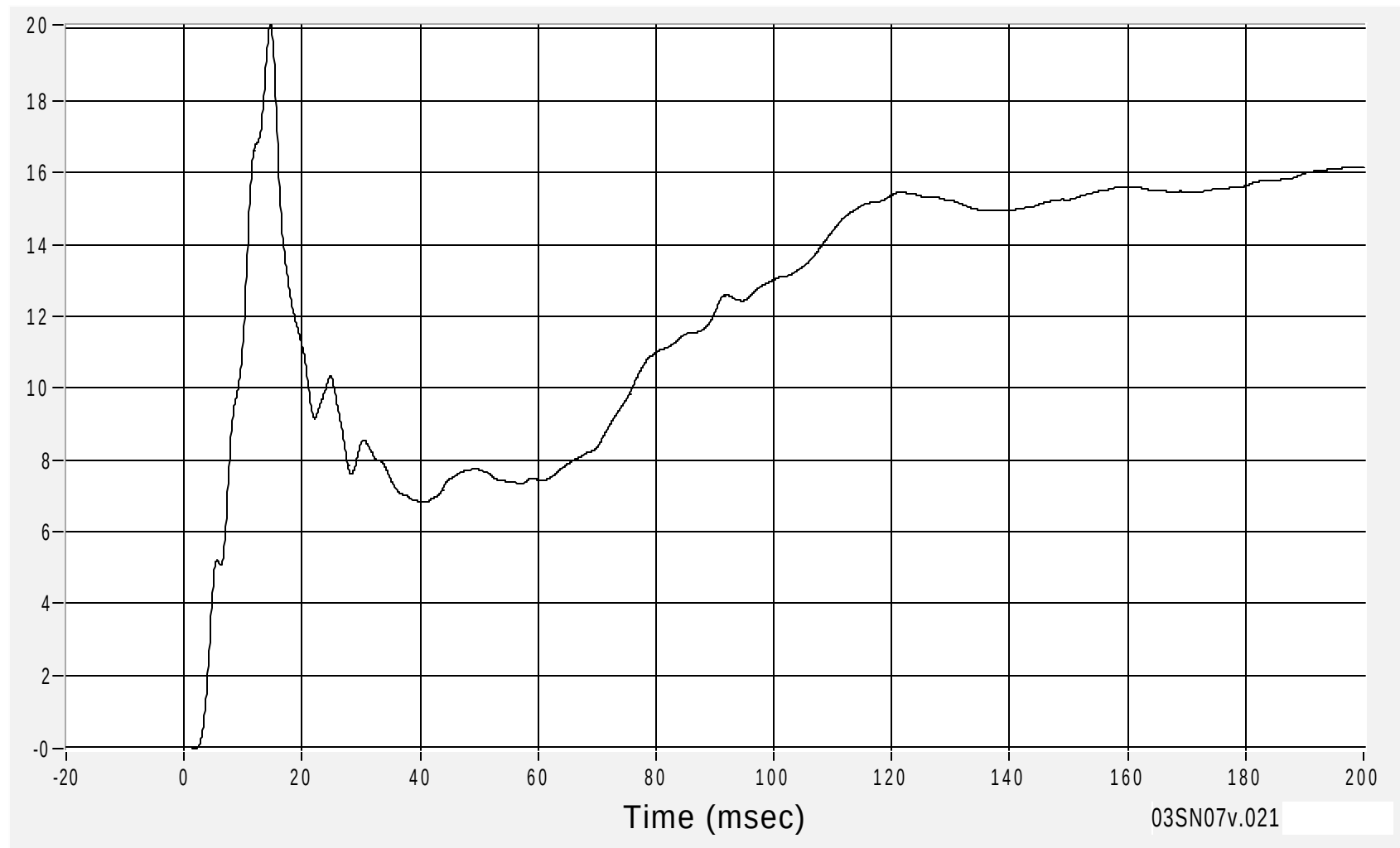
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Left Middle A-Pillar (Y) Velocity

Velocity (km/h) CFC180

Max	20.1	km/h	at	14.6	msec
Min	0.0	km/h	at	2.0	msec

B-100



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

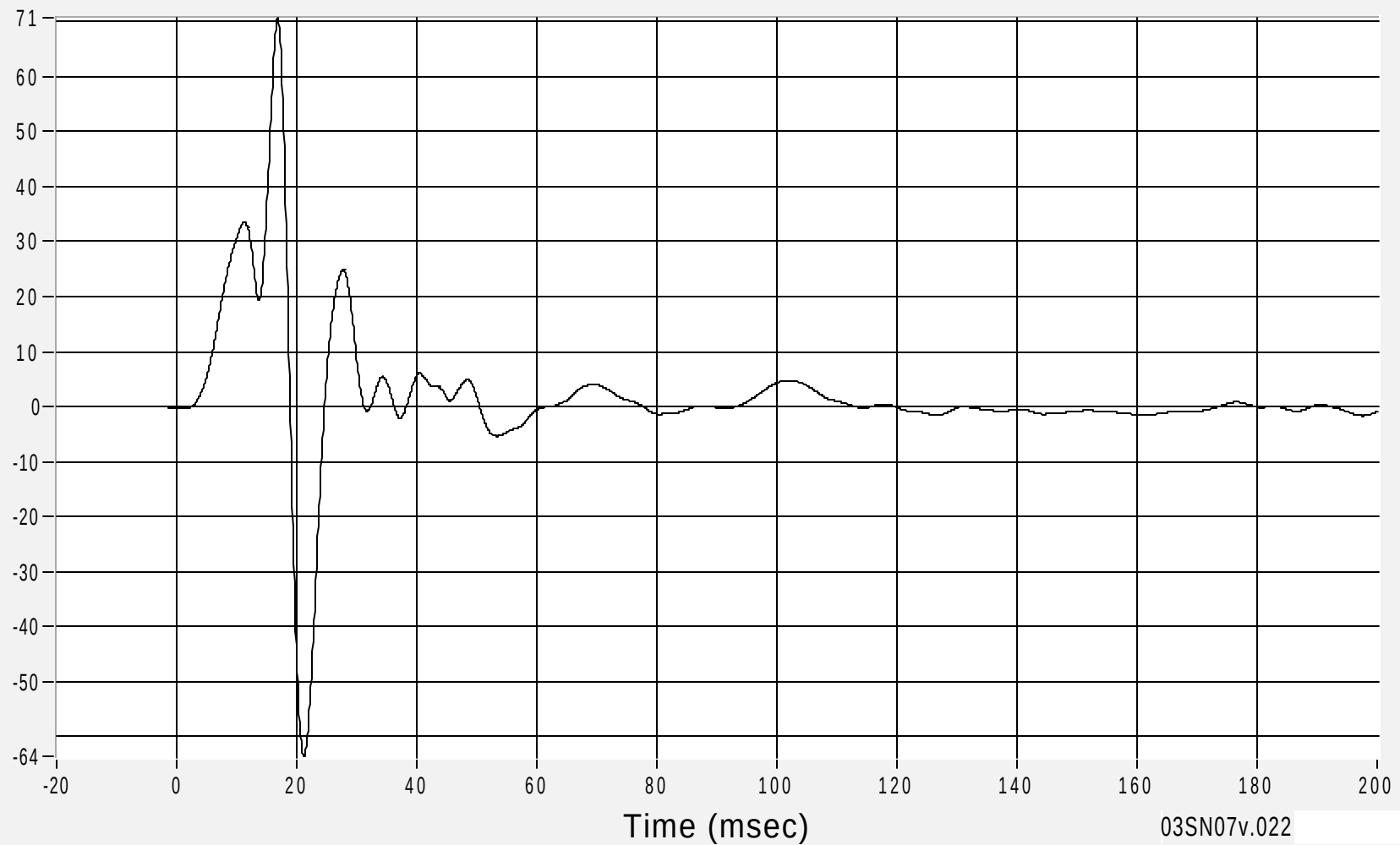
Medical College of Wisconsin
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Front Seat Track (Y) Acceleration

Acceleration (G's) CFC60

Max 70.7 G's at 16.8 msec

Min -63.6 G's at 21.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

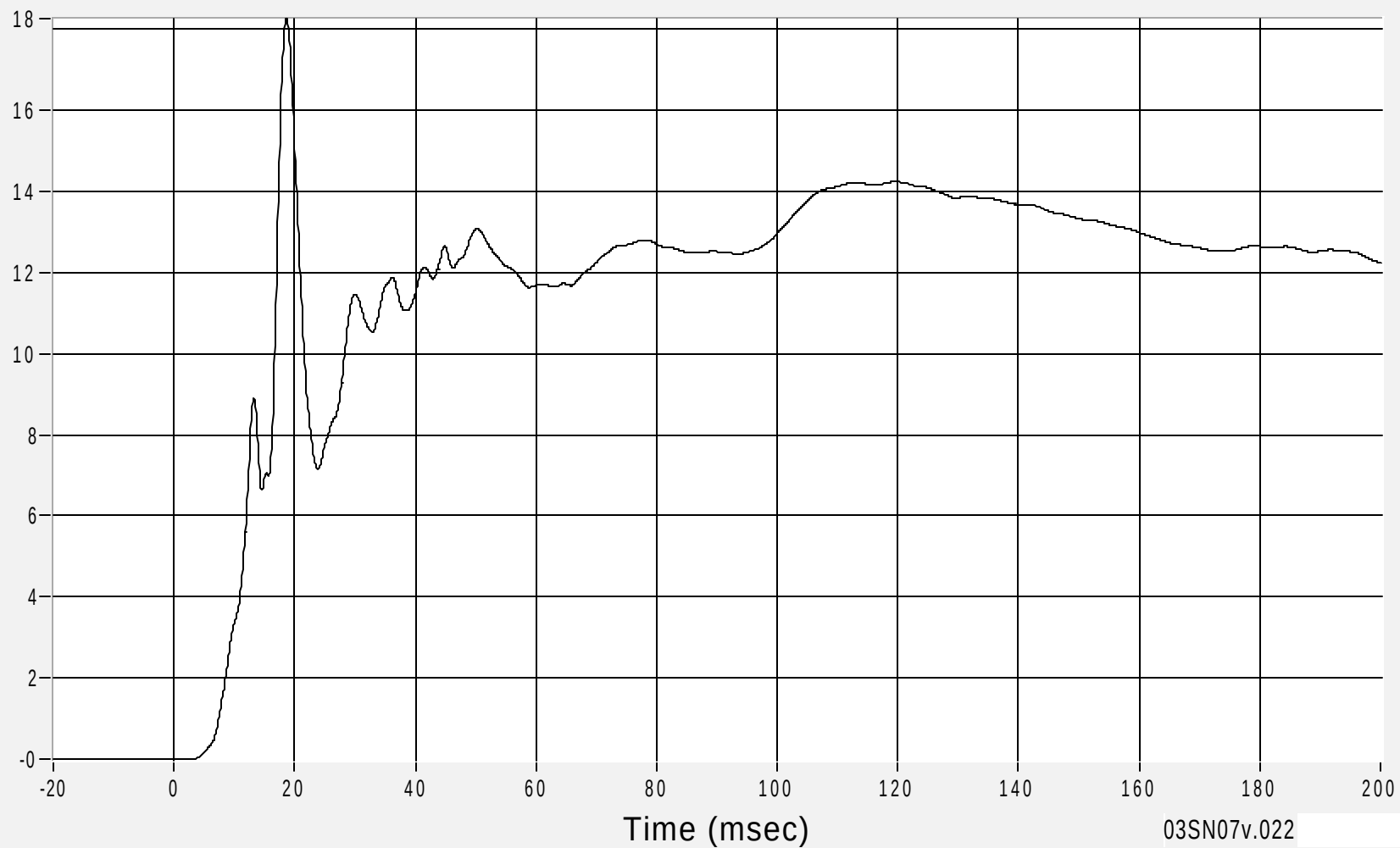
Medical College of Wisconsin
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Front Seat Track (Y) Velocity

Velocity (km/h) CFC180

Max 18.3 km/h at 18.6 msec

Min 0.0 km/h at 2.7 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

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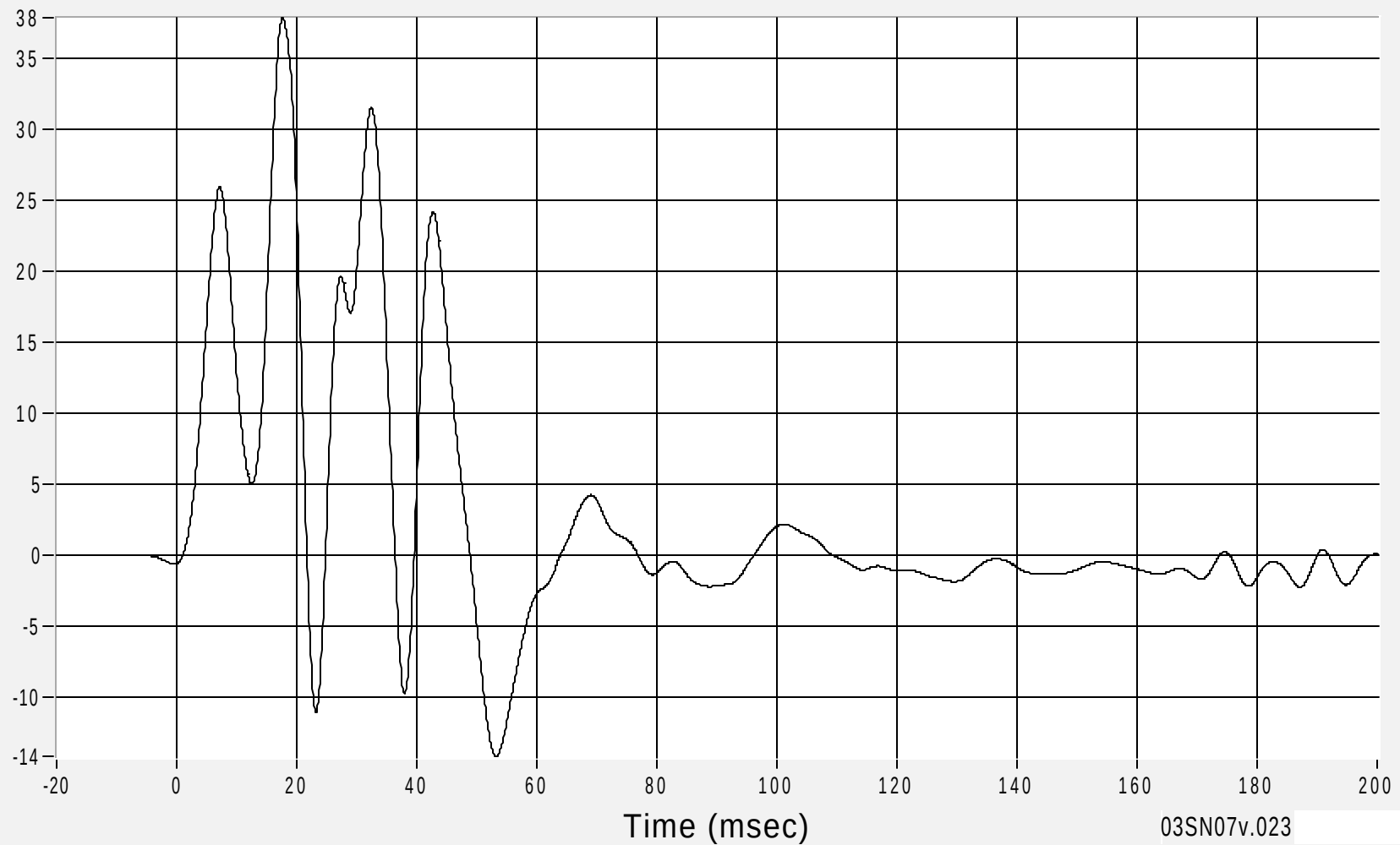
B-102

Rear Seat Track (Y) Acceleration

Acceleration (G's) CFC60

Max 37.9 G's at 17.7 msec

Min -14.1 G's at 53.3 msec



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28 February 2003

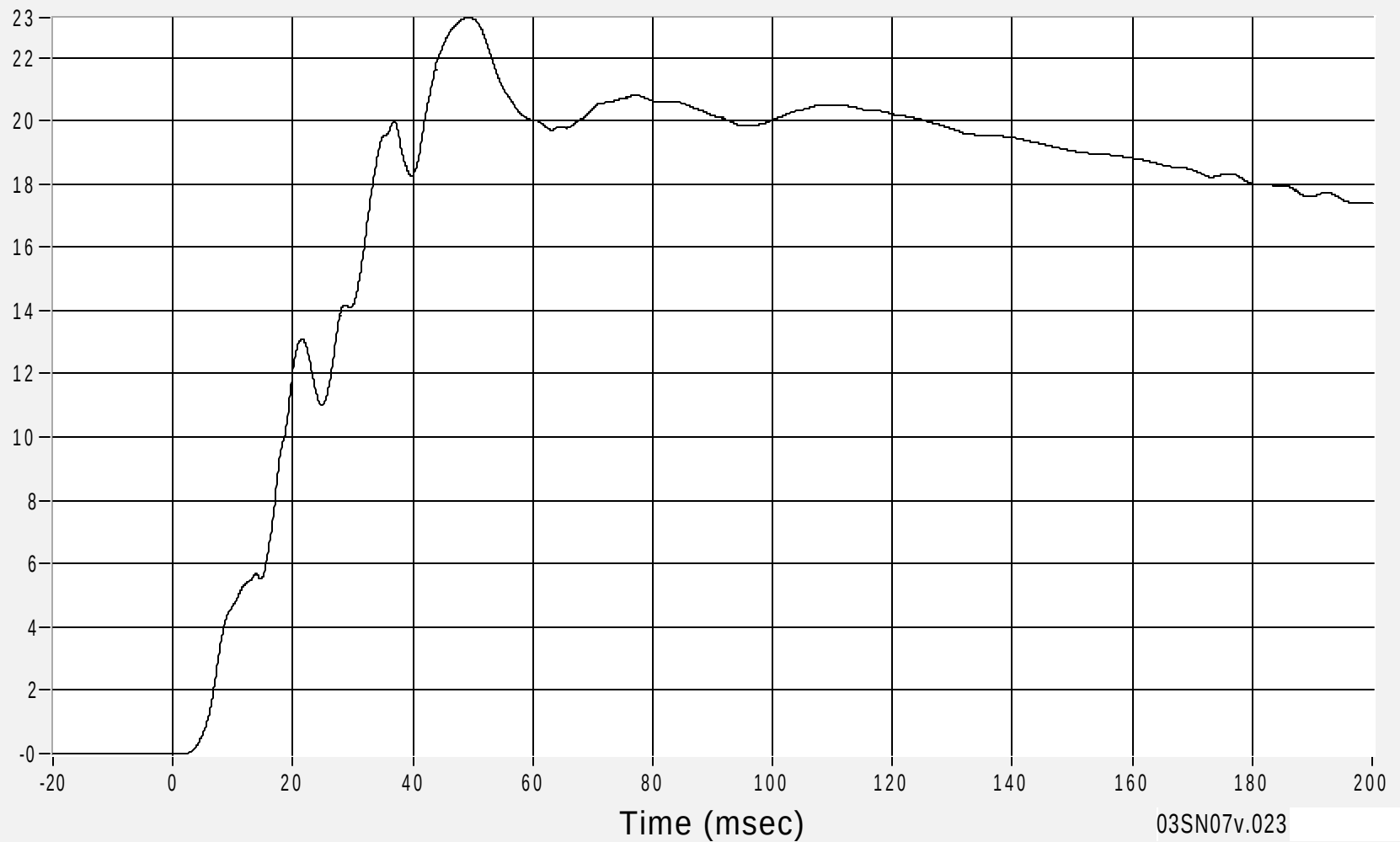
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Rear Seat Track (Y) Velocity

Velocity (km/h) CFC180

Max 23.3 km/h at 49.4 msec

Min 0.0 km/h at 1.4 msec



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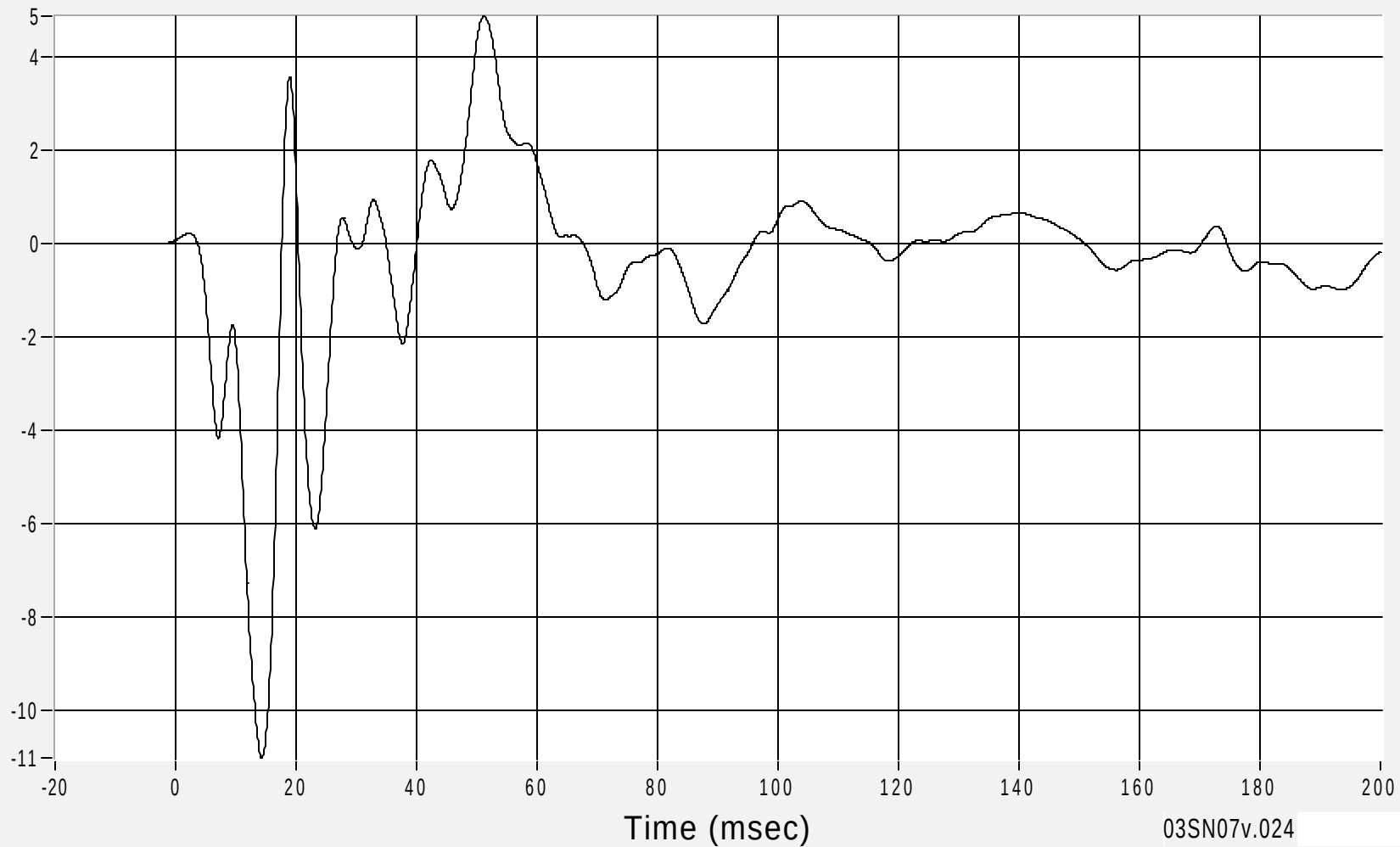
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (X) Acceleration

Acceleration (G's) CFC60

Max 4.9 G's at 51.2 msec
Min -11.0 G's at 14.3 msec



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28 February 2003

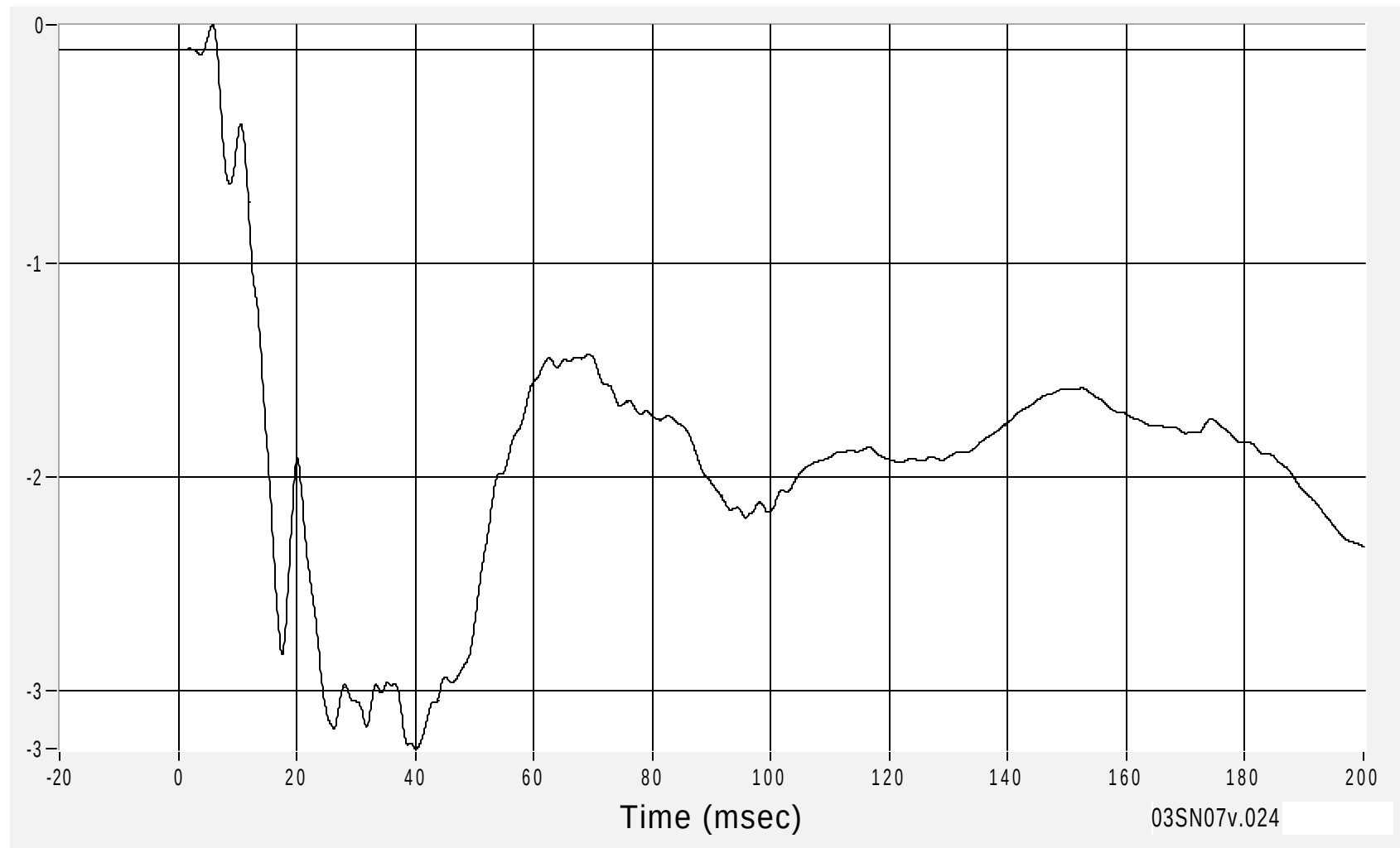
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (X) Velocity

Velocity (km/h) CFC180

Max 0.1 km/h at 5.8 msec

Min -3.3 km/h at 40.2 msec



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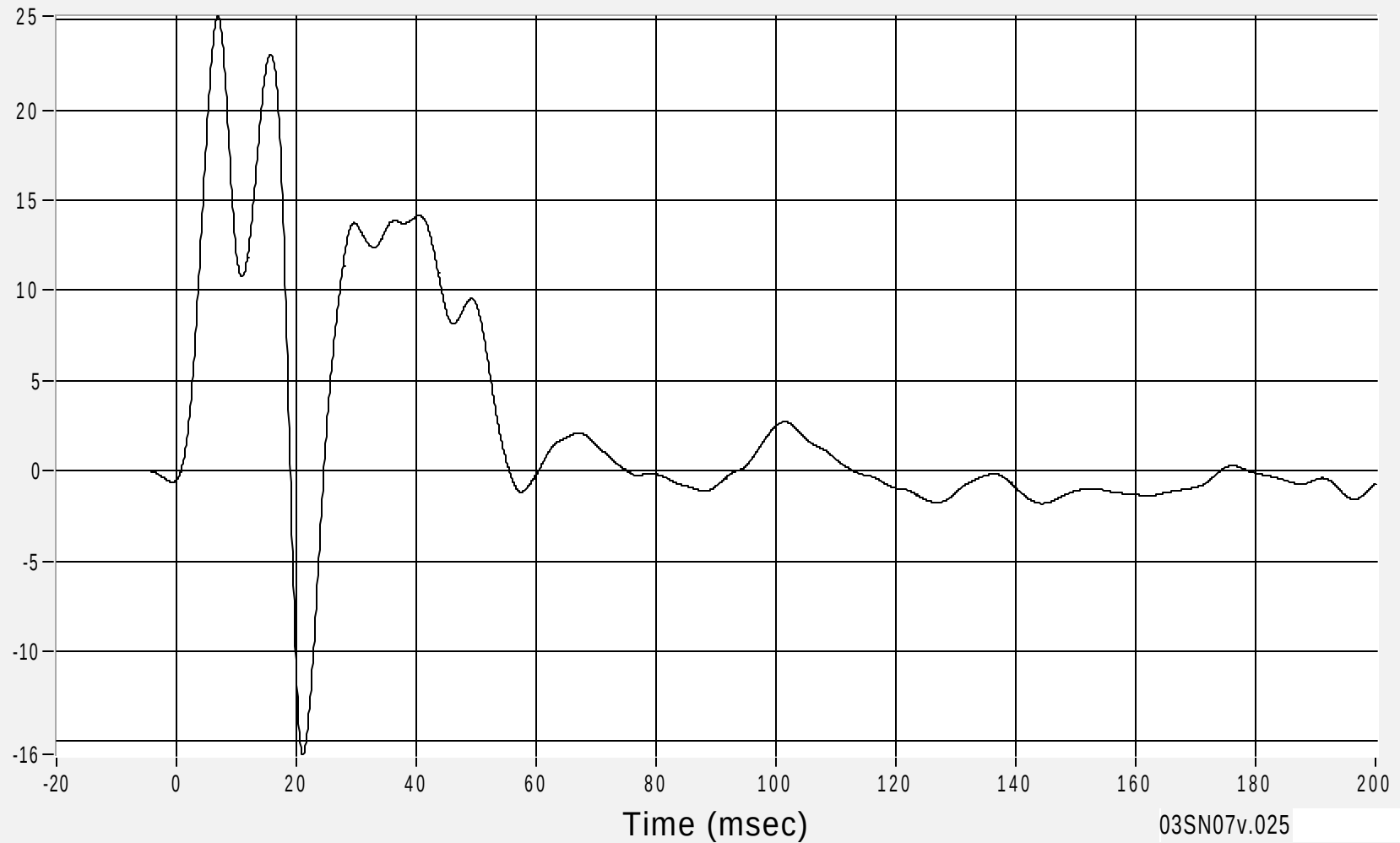
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (Y) Acceleration

Acceleration (G's) CFC60

Max 25.2 G's at 6.9 msec
Min -15.7 G's at 21.1 msec



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28 February 2003

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Vehicle Crashworthiness Lab

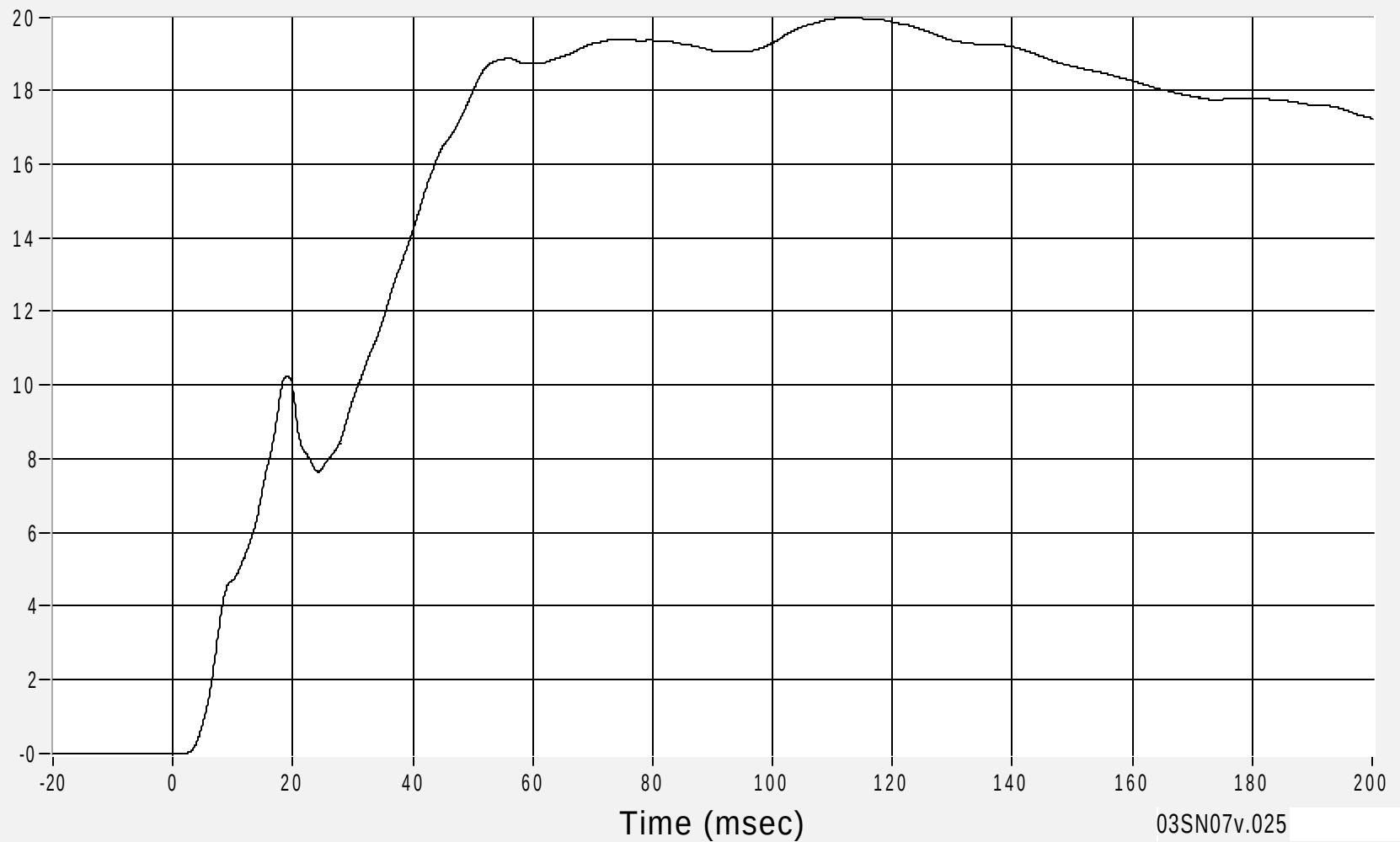
B-107

Vehicle Center of Gravity (Y) Velocity

Velocity (km/h) CFC180

Max 20.0 km/h at 113.0 msec

Min 0.0 km/h at 1.4 msec



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28 February 2003

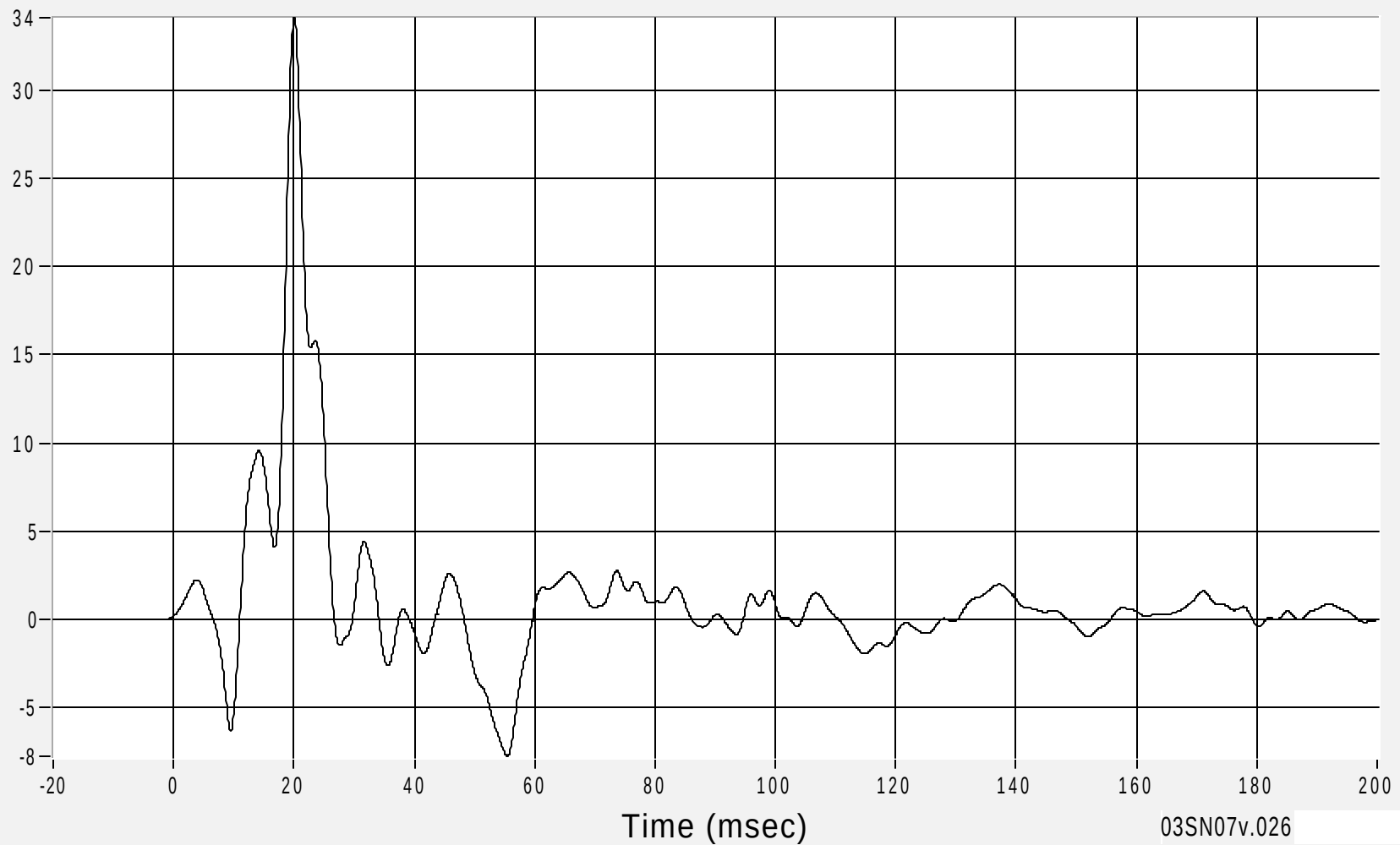
Medical College of Wisconsin
Vehicle Crashworthiness Lab

B-108

Vehicle Center of Gravity (Z) Acceleration

Acceleration (G's) CFC60

Max 34.2 G's at 20.0 msec
Min -7.8 G's at 55.4 msec



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28 February 2003

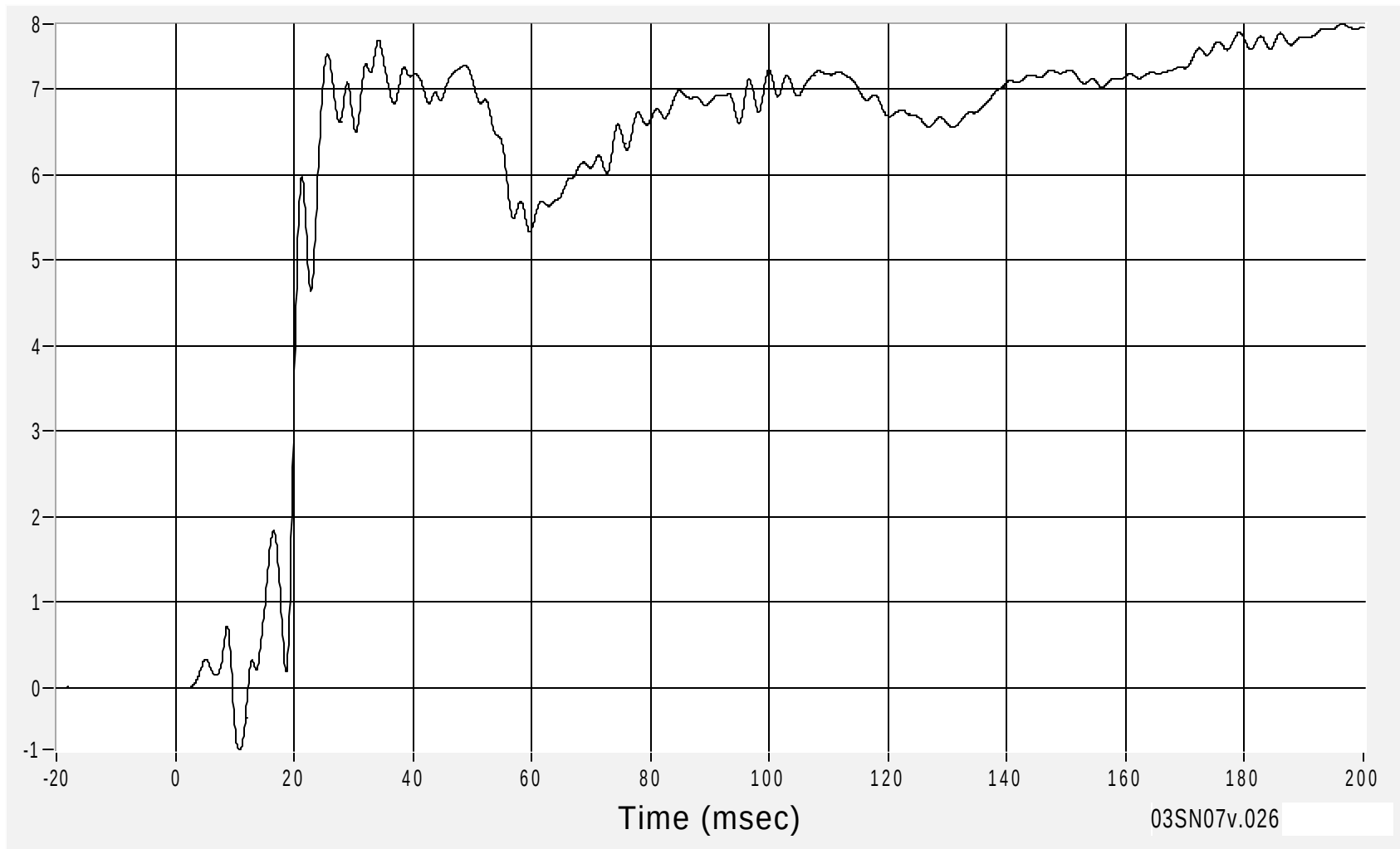
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity (Z) Velocity

Velocity (km/h) CFC180

Max 7.8 km/h at 196.4 msec

Min -0.7 km/h at 10.8 msec



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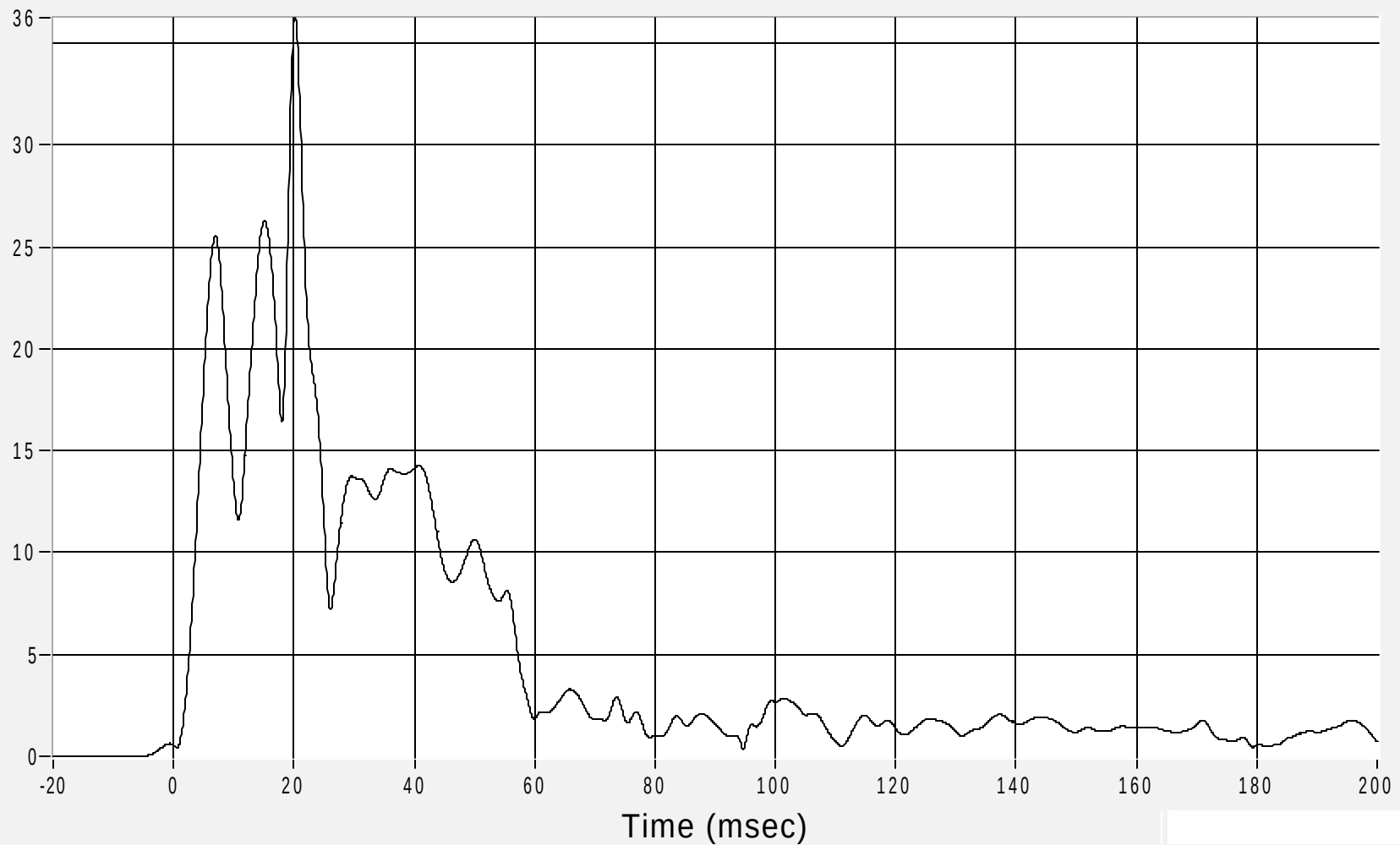
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Vehicle Center of Gravity Resultant Acceleration

Acceleration (G's) CFC60

Max 36.2 G's at 20.2 msec
Min 0.3 G's at 94.6 msec



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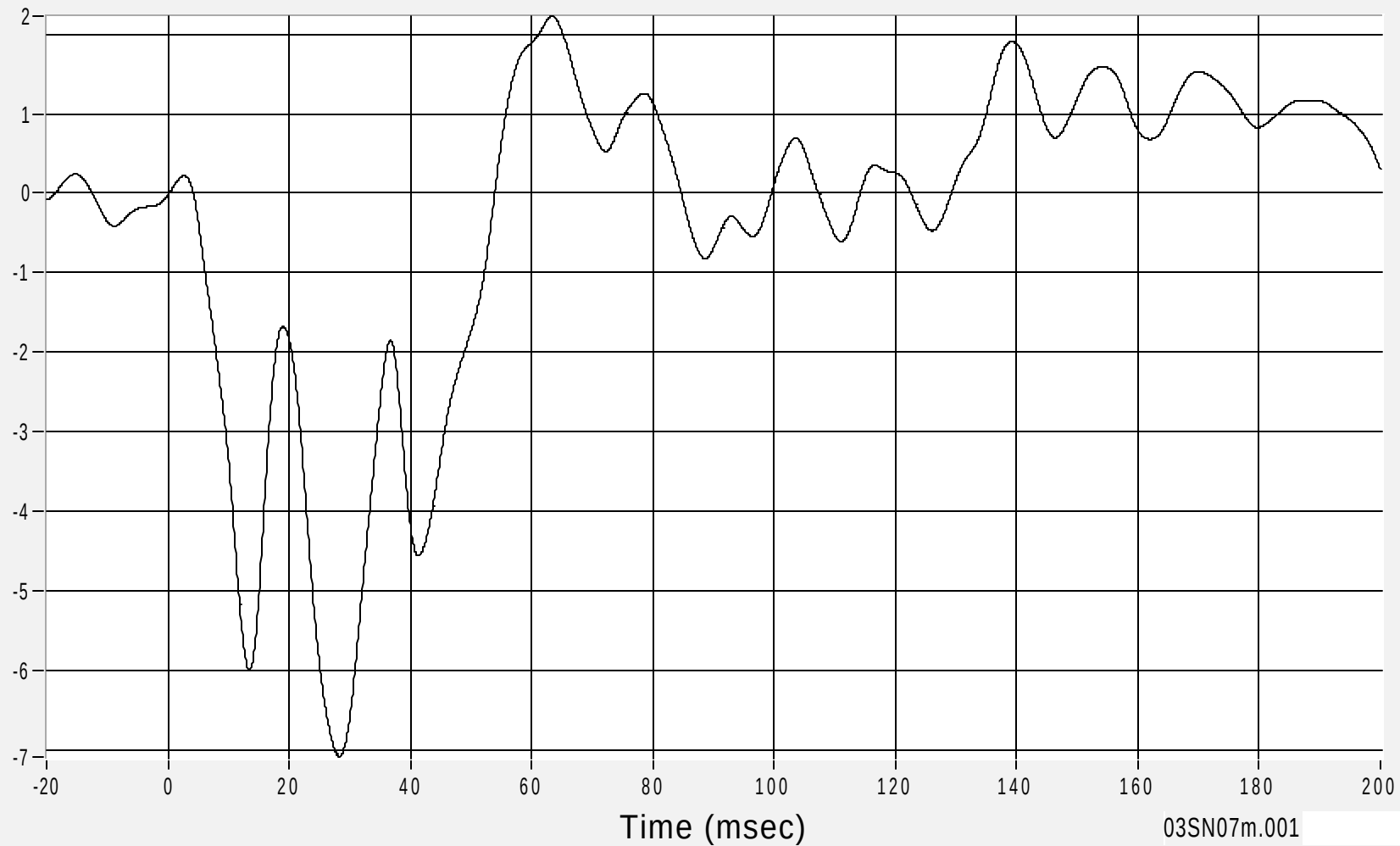
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (X) Acceleration

Acceleration (G's) CFC60

Max 2.2 G's at 63.4 msec
Min -7.1 G's at 28.2 msec



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28 February 2003

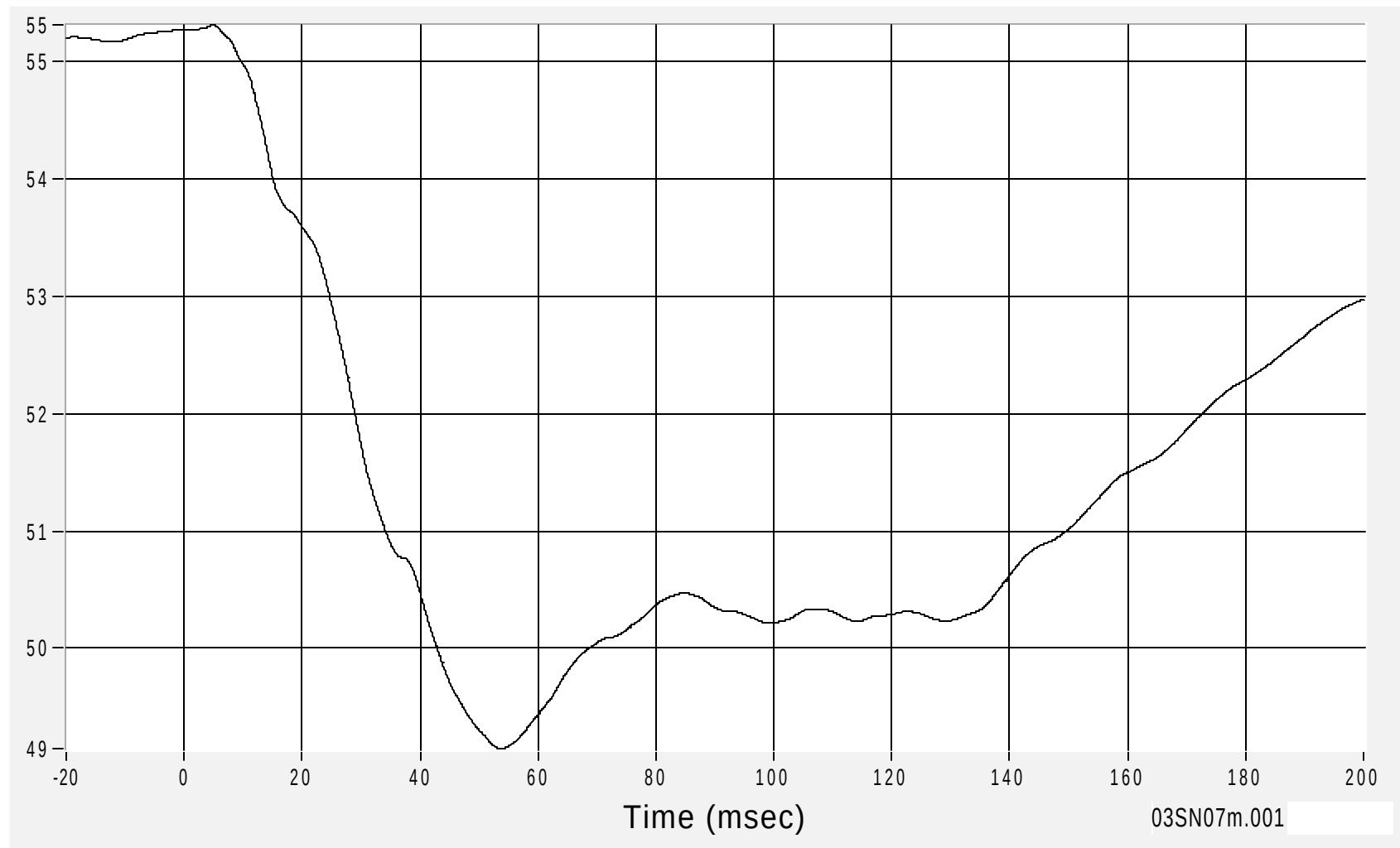
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (X) Velocity

Velocity (km/h) CFC180

Max 55.3 km/h at 4.9 msec

Min 49.1 km/h at 53.7 msec



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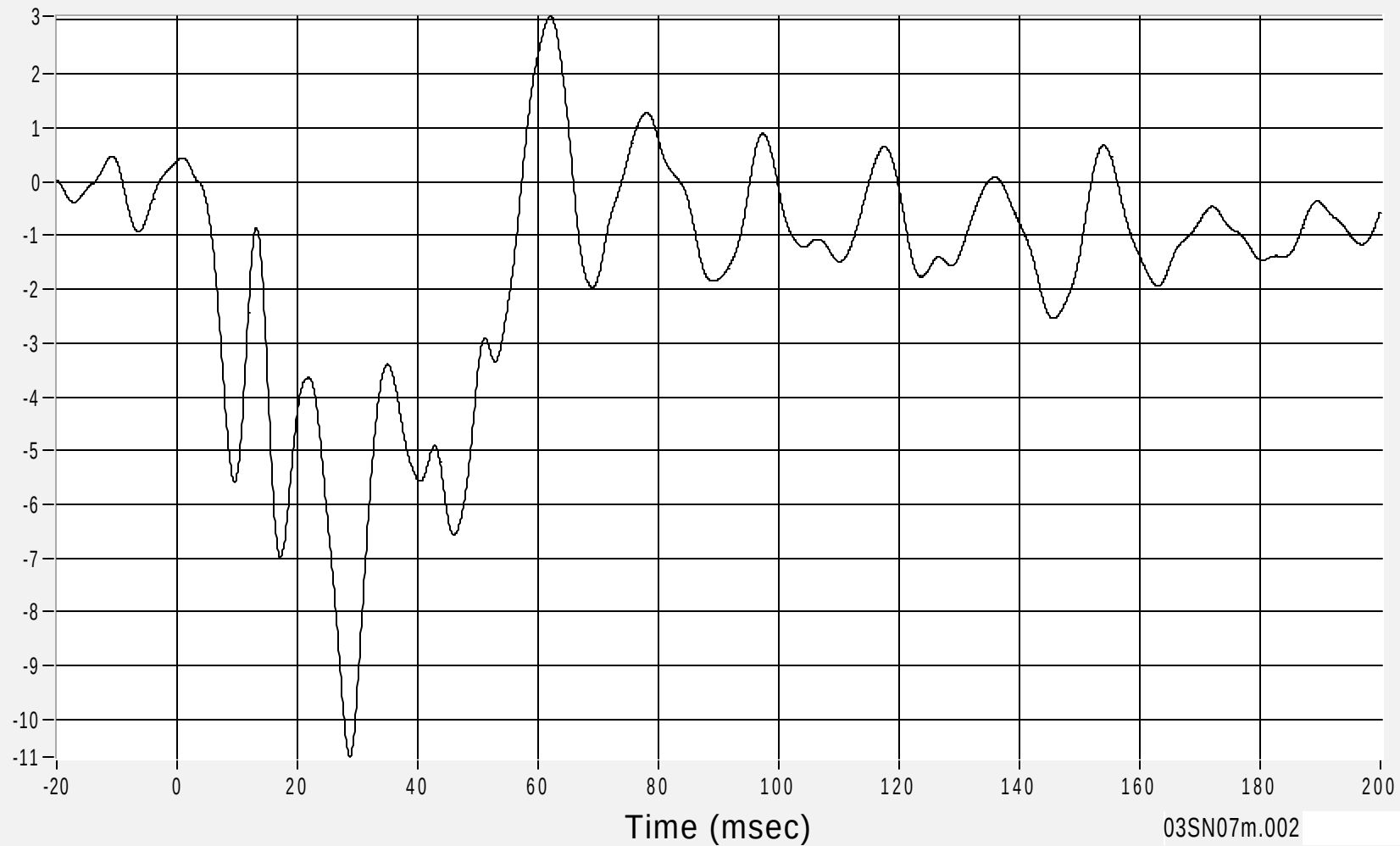
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Y) Acceleration

Acceleration (G's) CFC60

Max 3.1 G's at 62.0 msec
Min -10.7 G's at 28.7 msec



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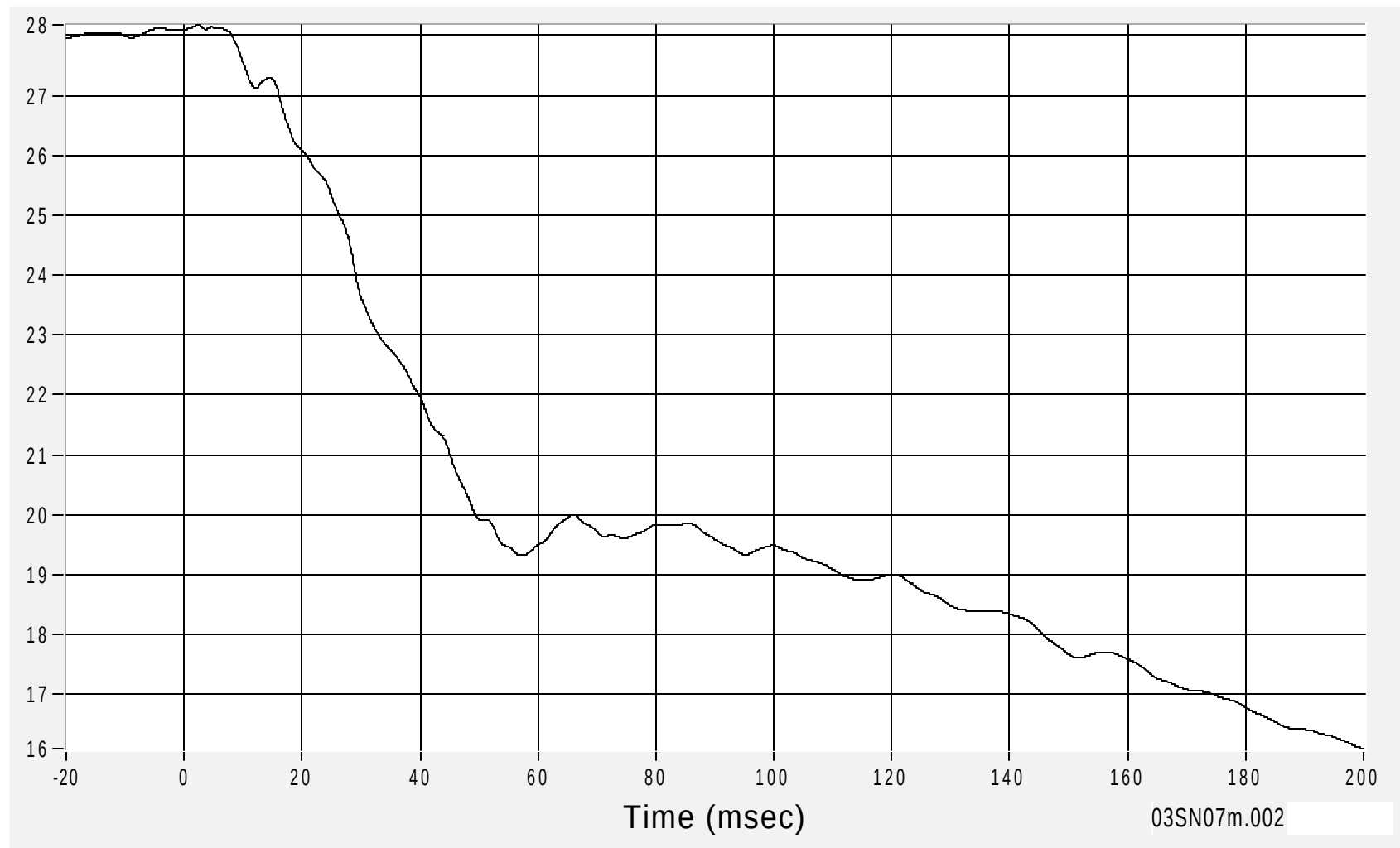
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Y) Velocity

Velocity (km/h) CFC180

Max 28.2 km/h at 2.4 msec
Min 16.1 km/h at 199.9 msec



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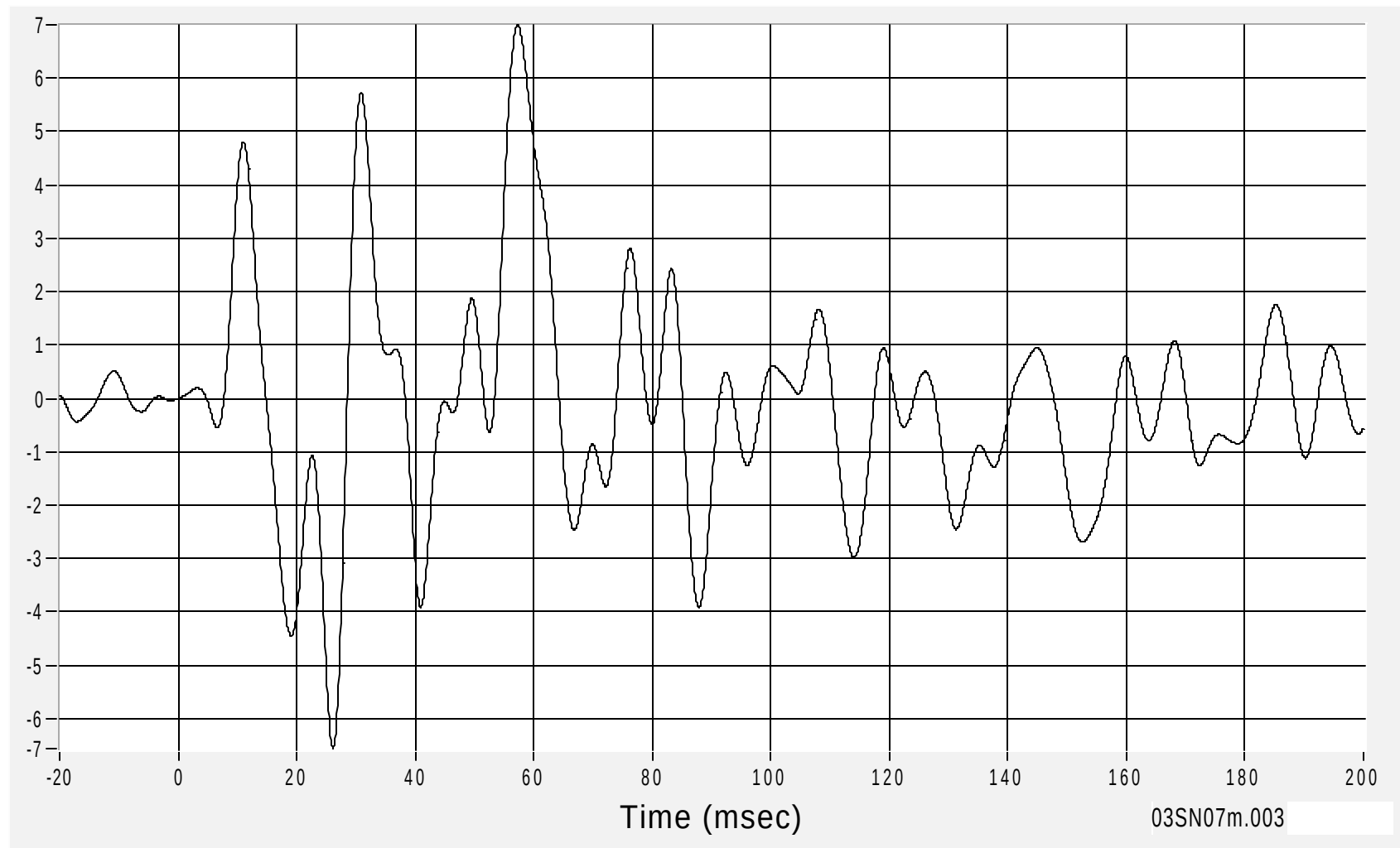
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Z) Acceleration

Acceleration (G's) CFC60

Max 7.0 G's at 57.3 msec
Min -6.6 G's at 26.1 msec



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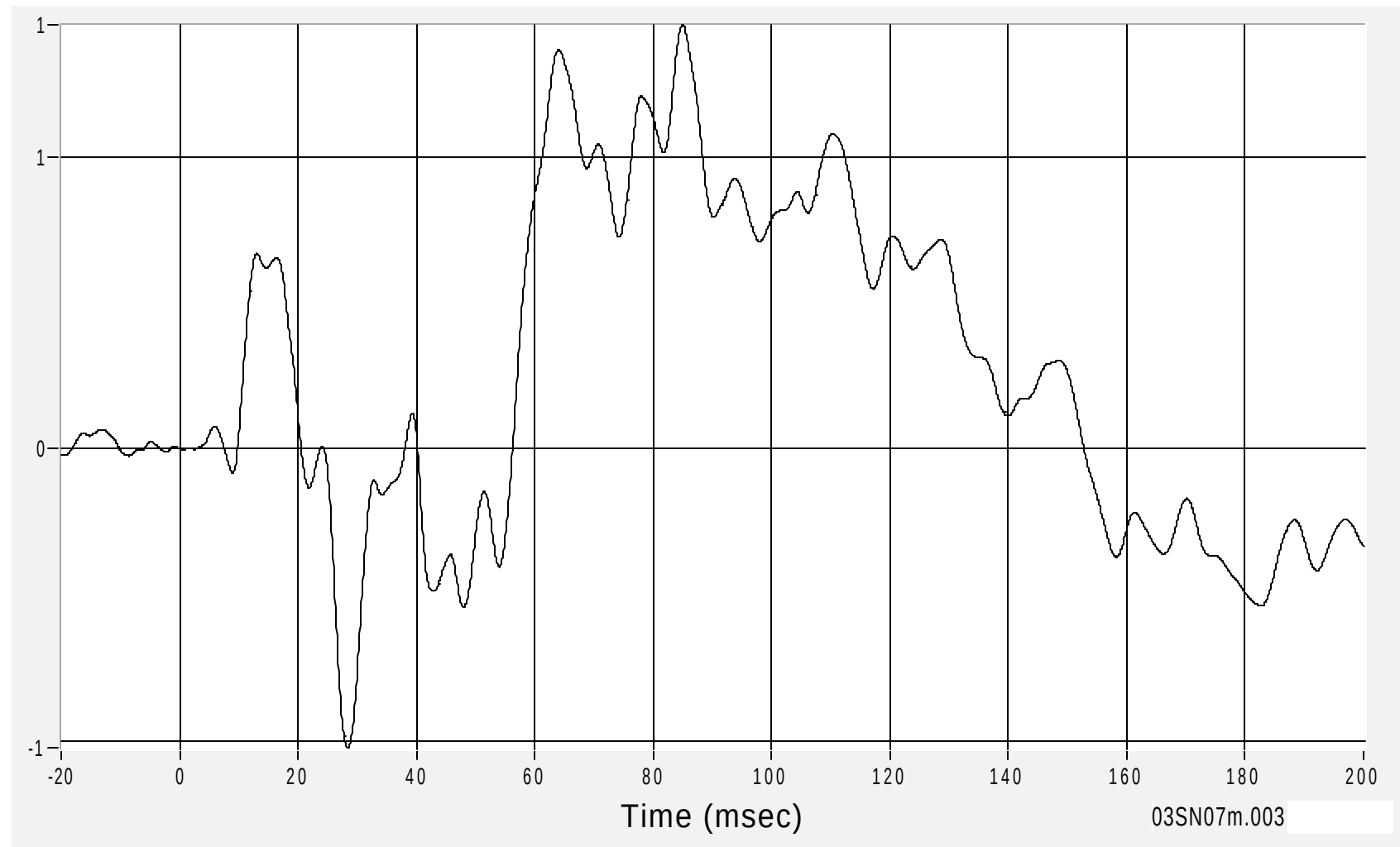
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity (Z) Velocity

Velocity (km/h) CFC180

Max 1.5 km/h at 85.0 msec
Min -1.0 km/h at 28.4 msec



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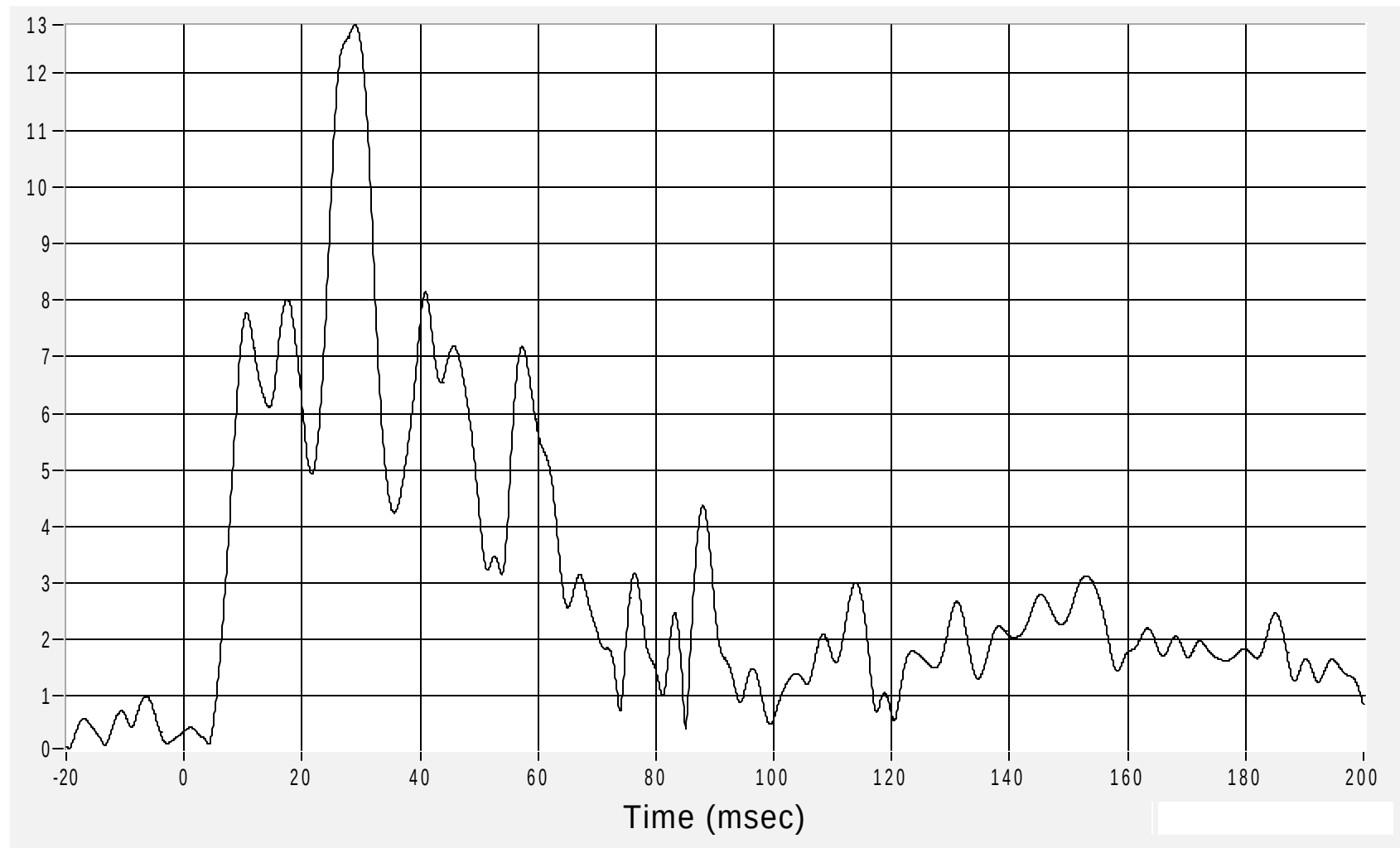
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Center of Gravity Resultant Acceleration

Acceleration (G's) CFC60

Max 12.9 G's at 29.0 msec
Min 0.2 G's at 4.2 msec



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28 February 2003

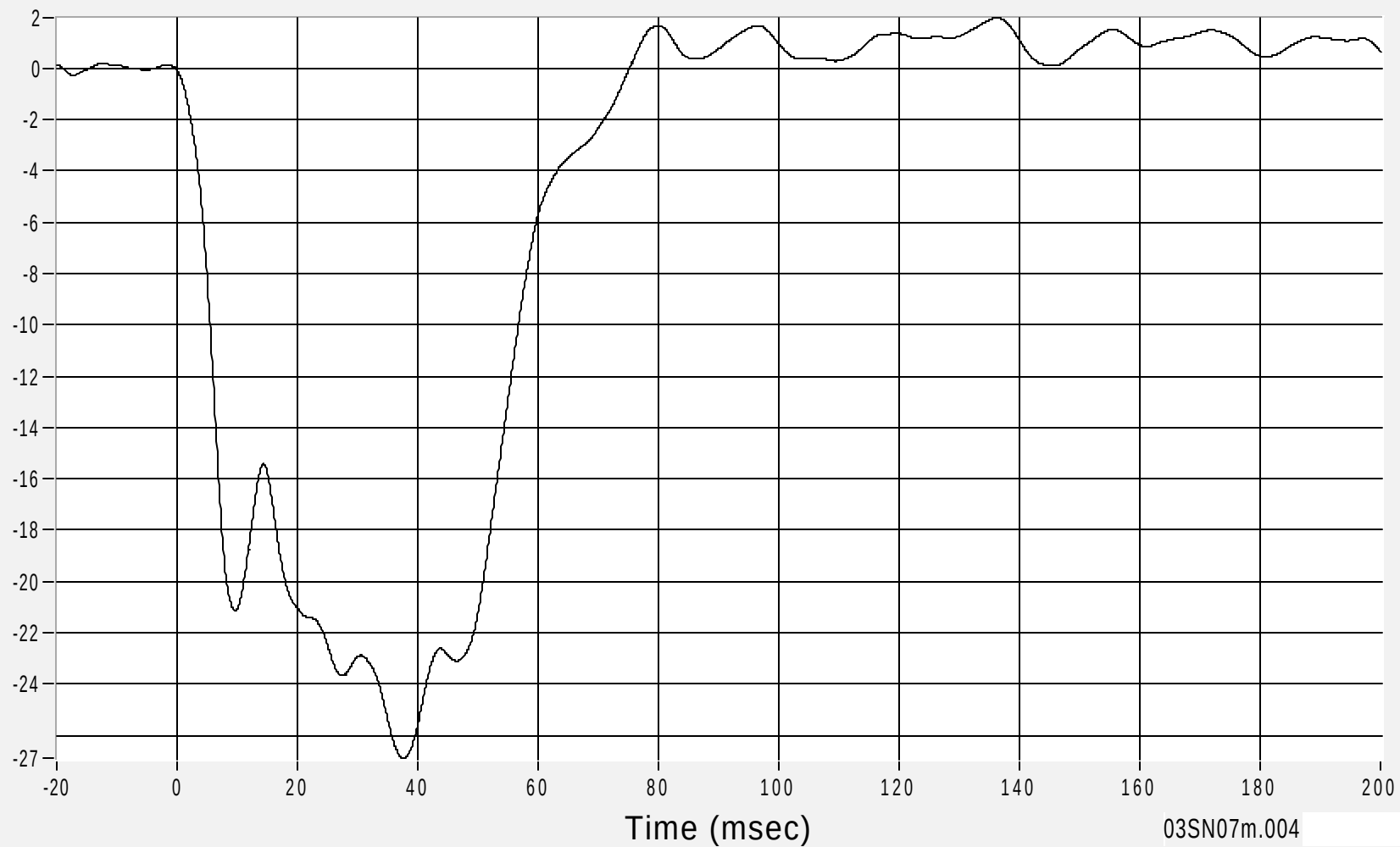
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Rear (X) Acceleration

Acceleration (G's) CFC60

Max 2.0 G's at 136.3 msec

Min -26.9 G's at 37.6 msec



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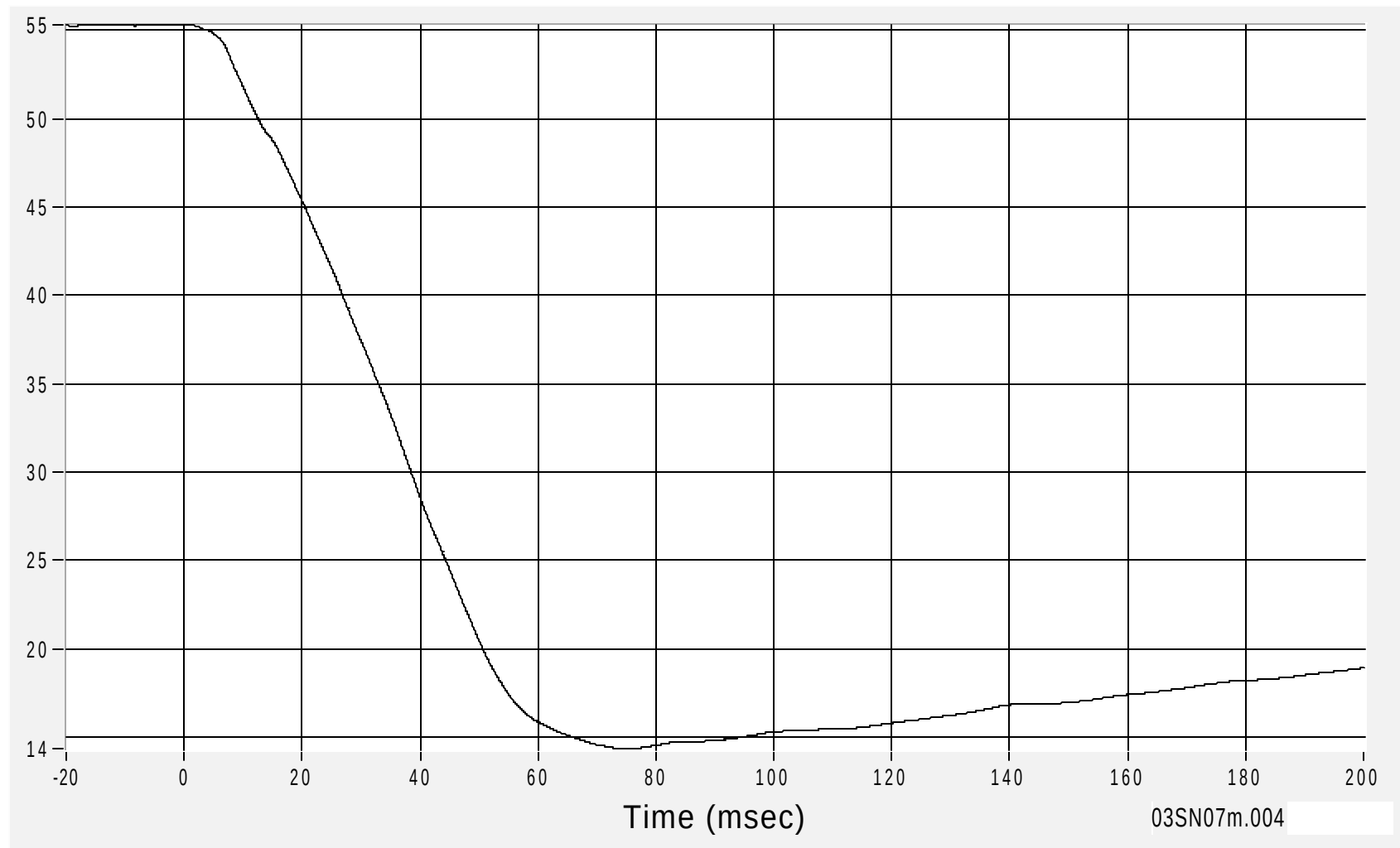
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Rear (X) Velocity

Velocity (km/h) CFC180

Max 55.3 km/h at 1.2 msec
Min 14.3 km/h at 75.8 msec



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28 February 2003

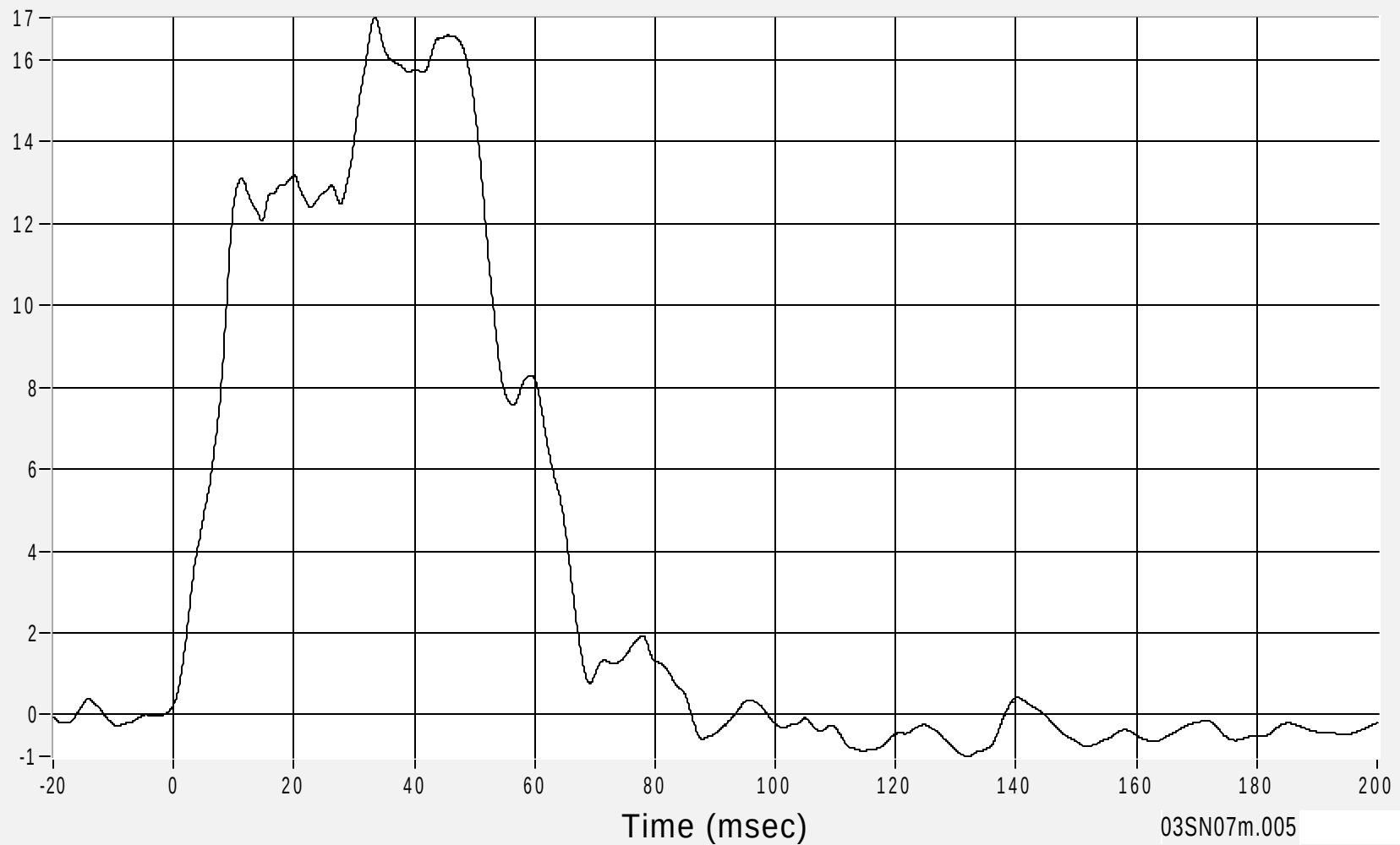
Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Rear (Y) Acceleration

Acceleration (G's) CFC60

Max 17.0 G's at 33.4 msec

Min -1.0 G's at 132.0 msec



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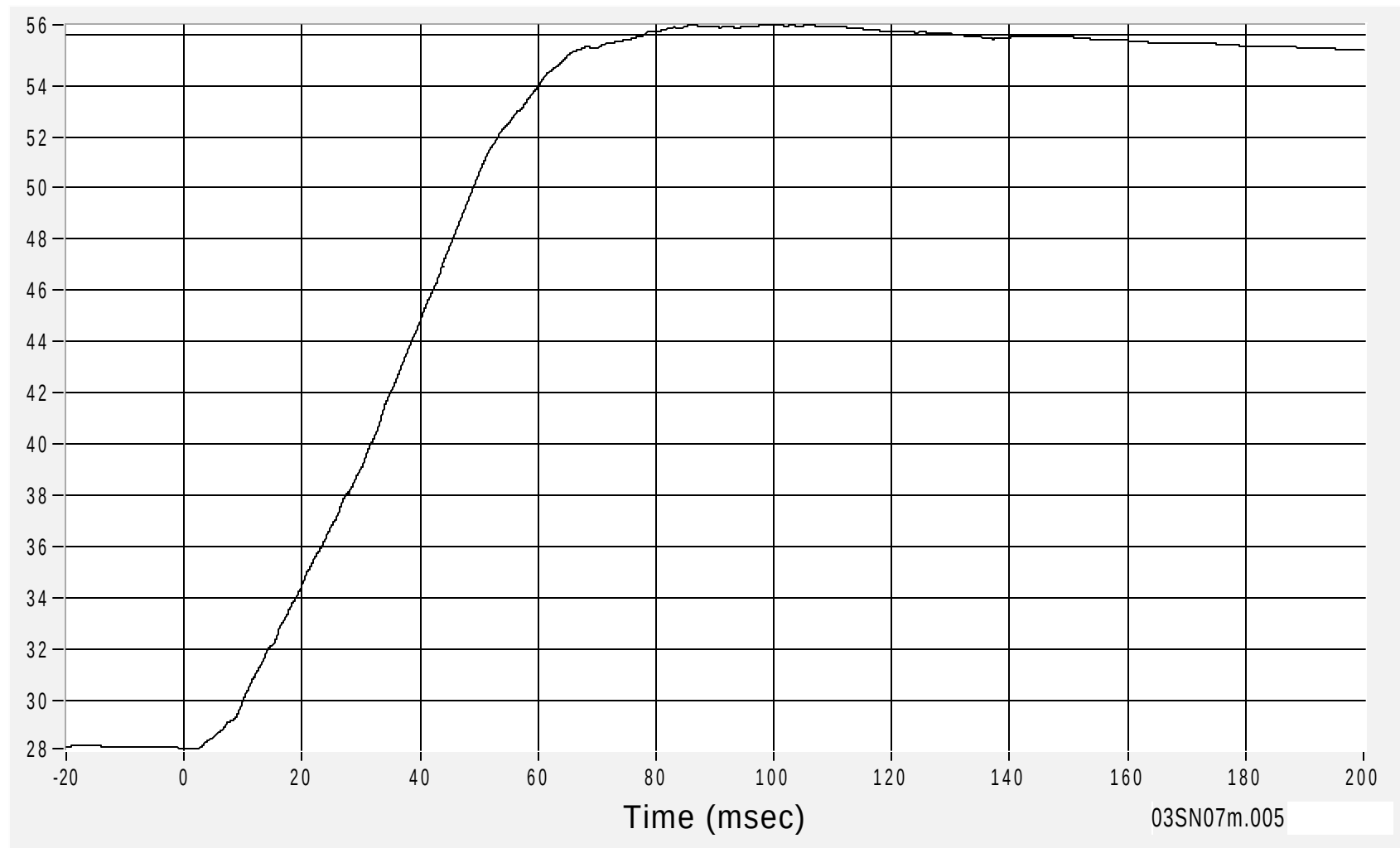
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

MDB Rear (Y) Velocity

Velocity (km/h) CFC180

Max 56.4 km/h at 105.8 msec
Min 28.1 km/h at 0.8 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

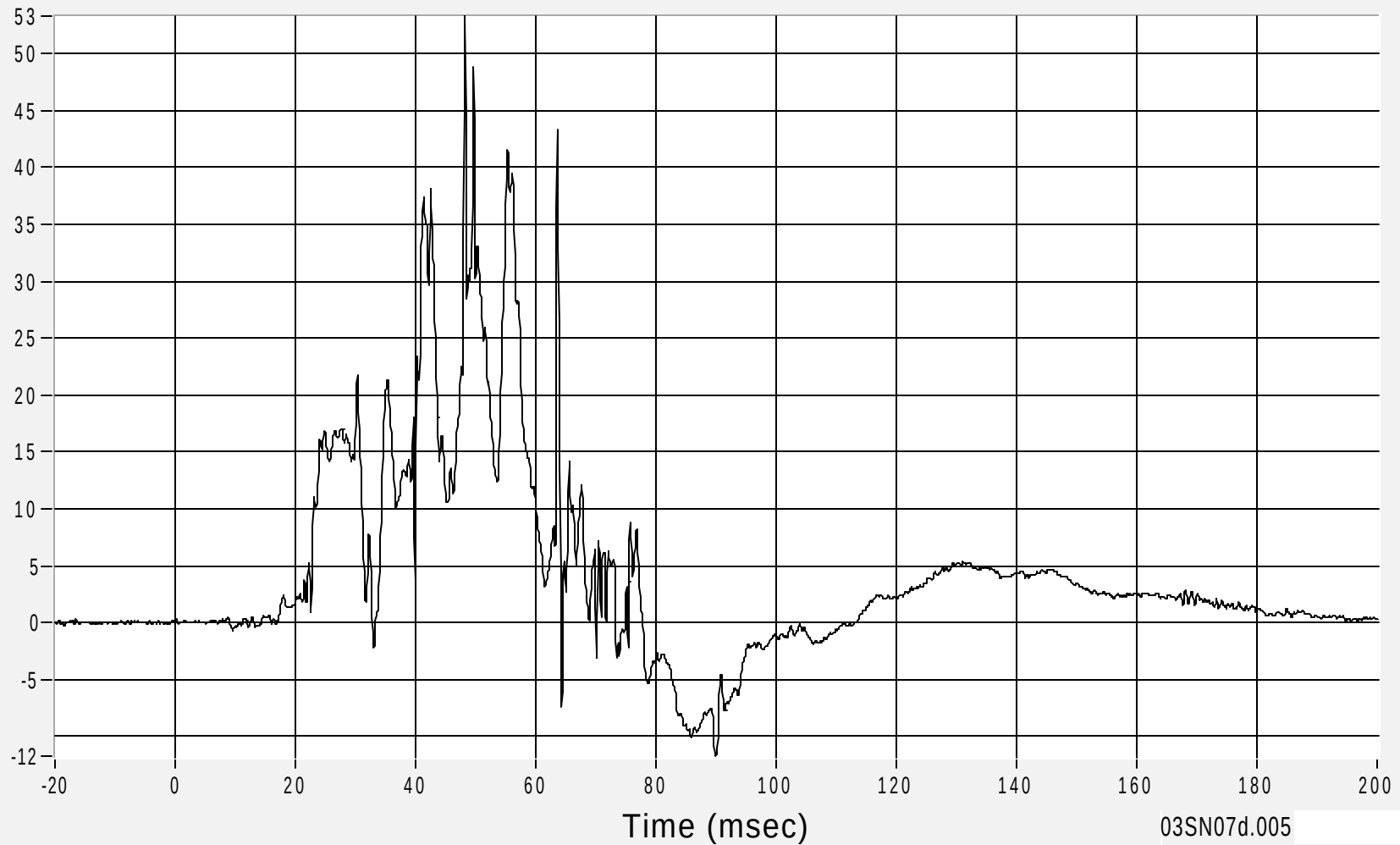
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 53.3 G's at 48.2 msec
Min -11.7 G's at 89.9 msec



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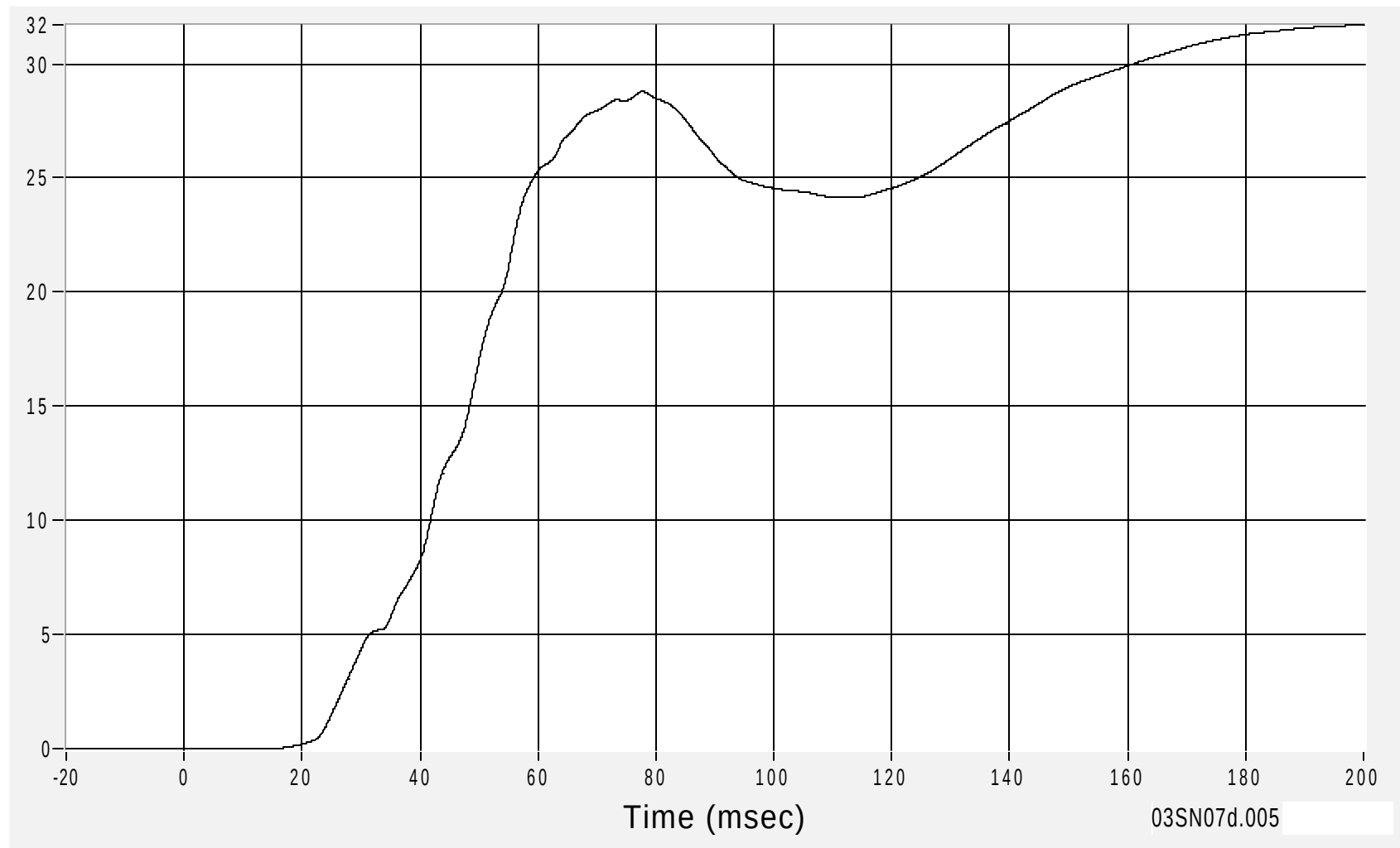
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Upper Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 31.7 km/h at 199.9 msec
Min 0.0 km/h at 0.0 msec



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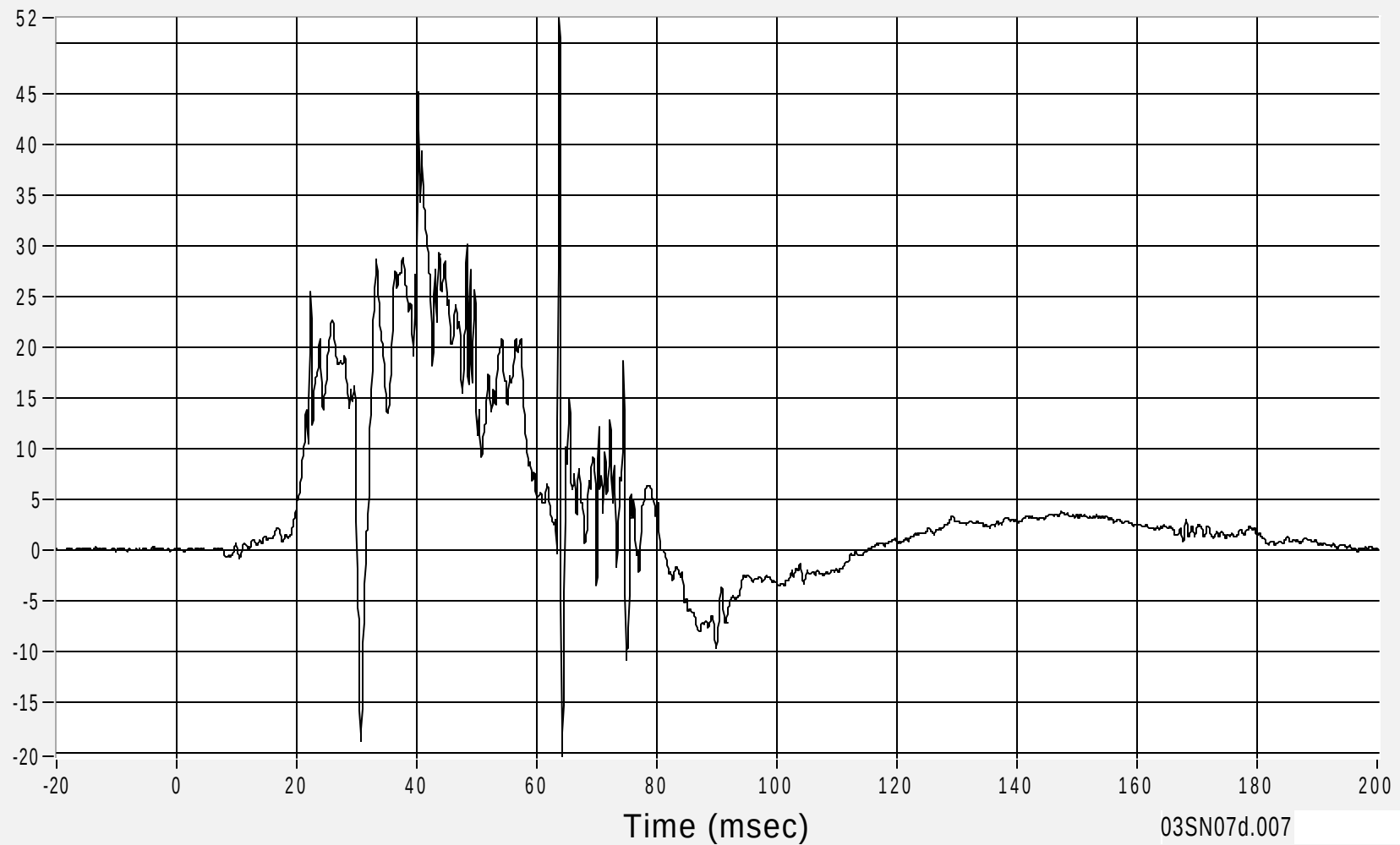
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 52.4 G's at 63.8 msec
Min -20.4 G's at 64.2 msec



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28 February 2003

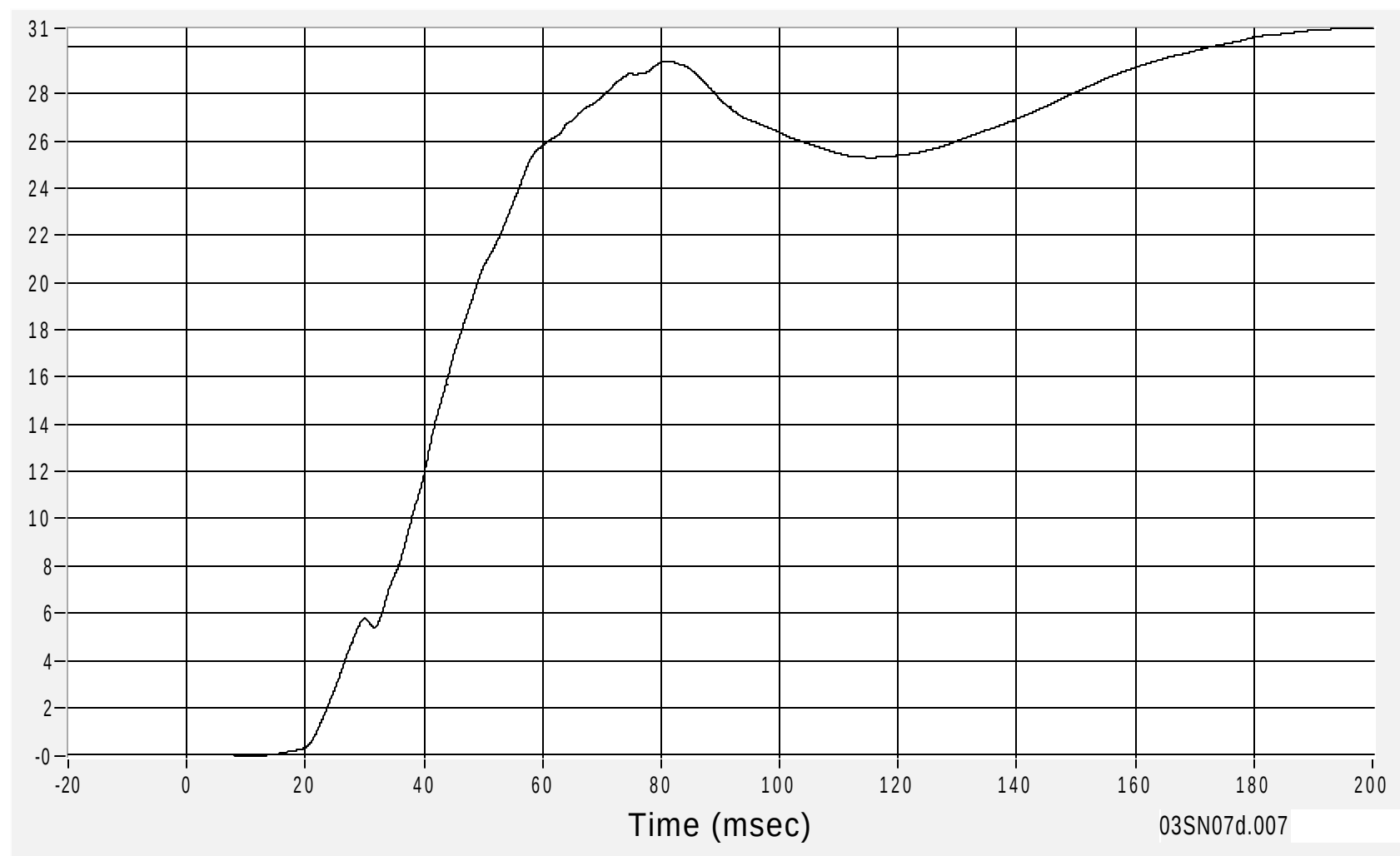
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 30.8 km/h at 199.8 msec

Min 0.0 km/h at 11.0 msec



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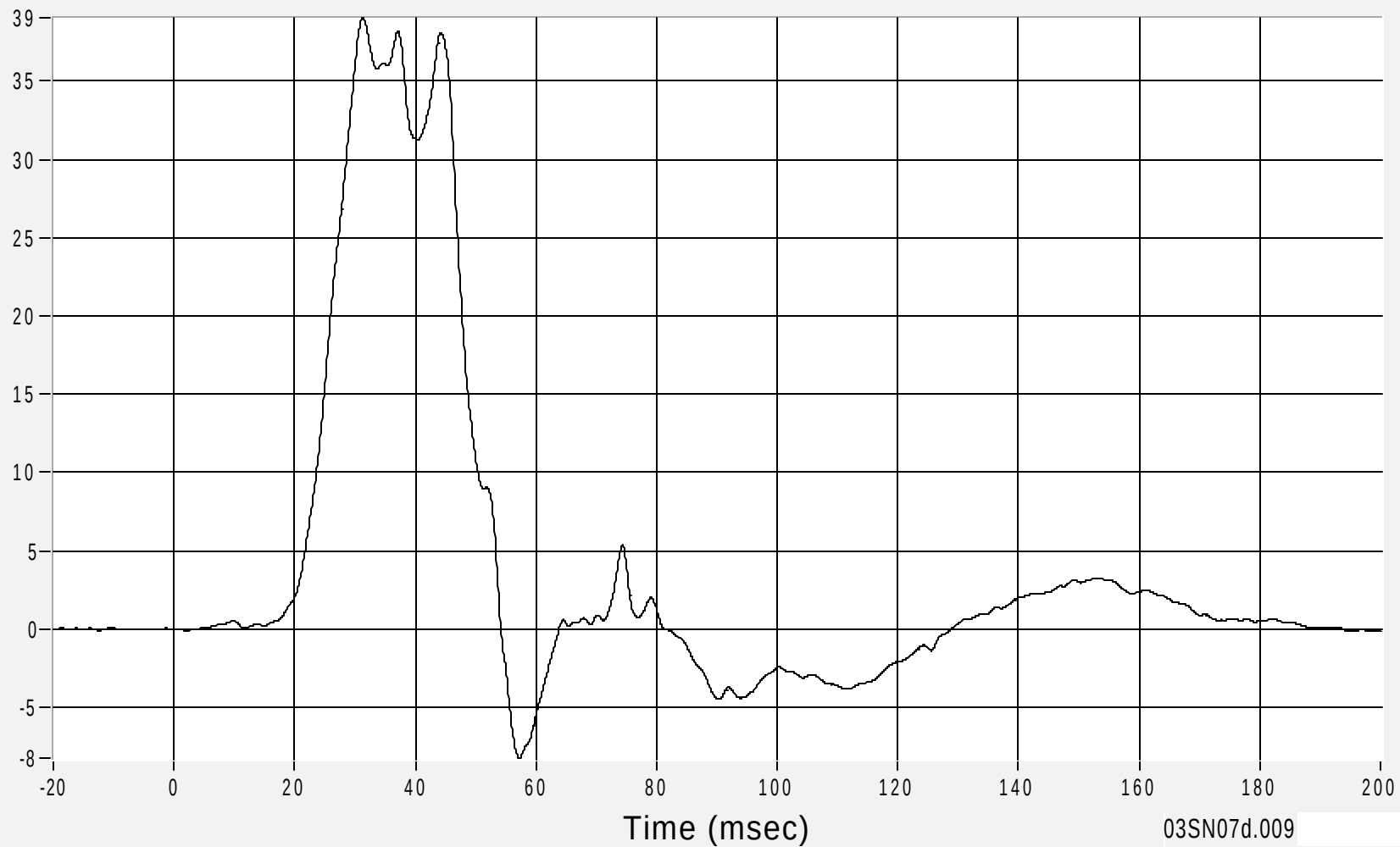
28 February 2003

*Medical College of Wisconsin
Vehicle Crashworthiness Lab*

Driver Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) CFC180

Max 39.1 G's at 31.3 msec
Min -8.2 G's at 57.3 msec



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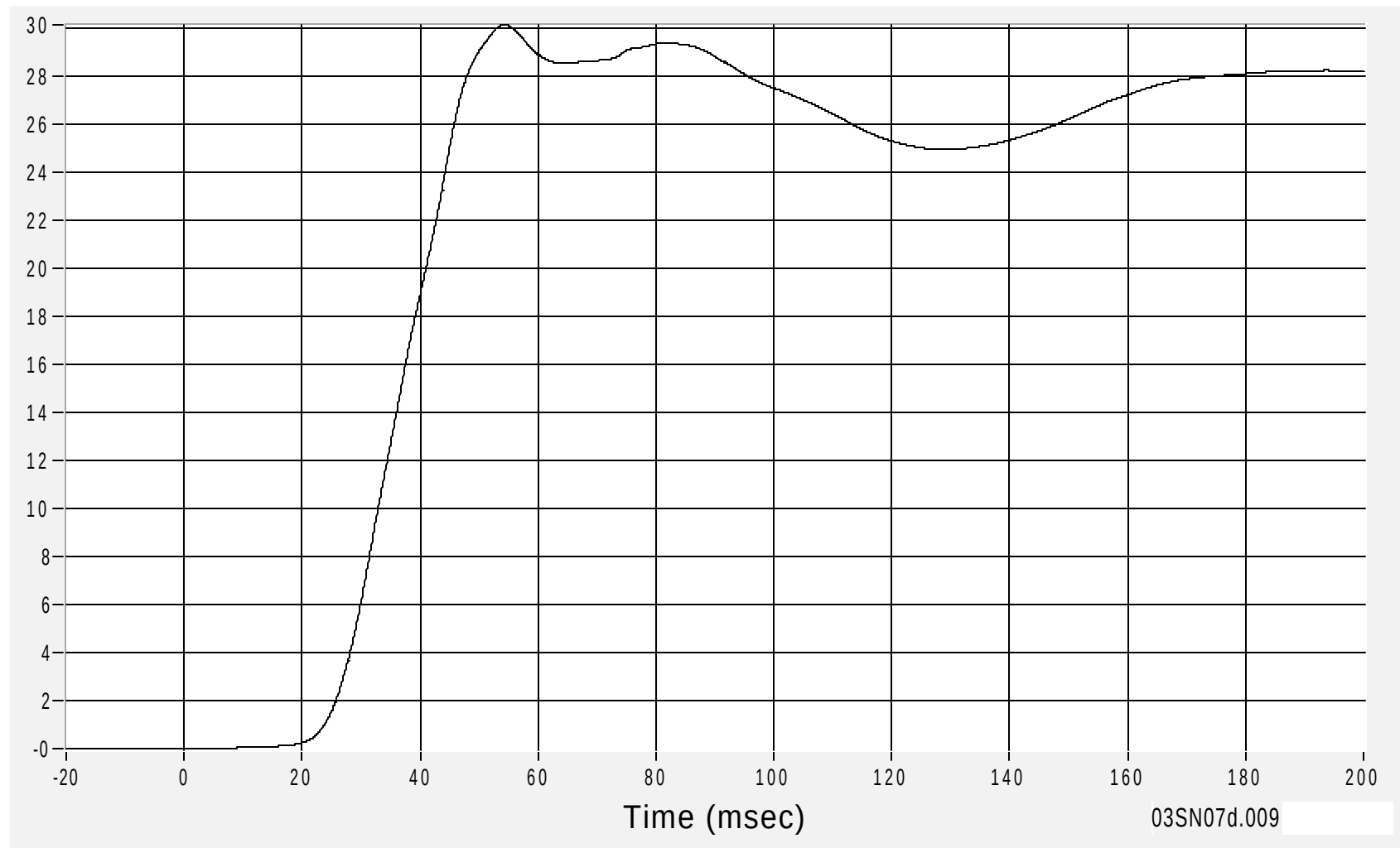
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 30.2 km/h at 54.2 msec
Min 0.0 km/h at 4.0 msec



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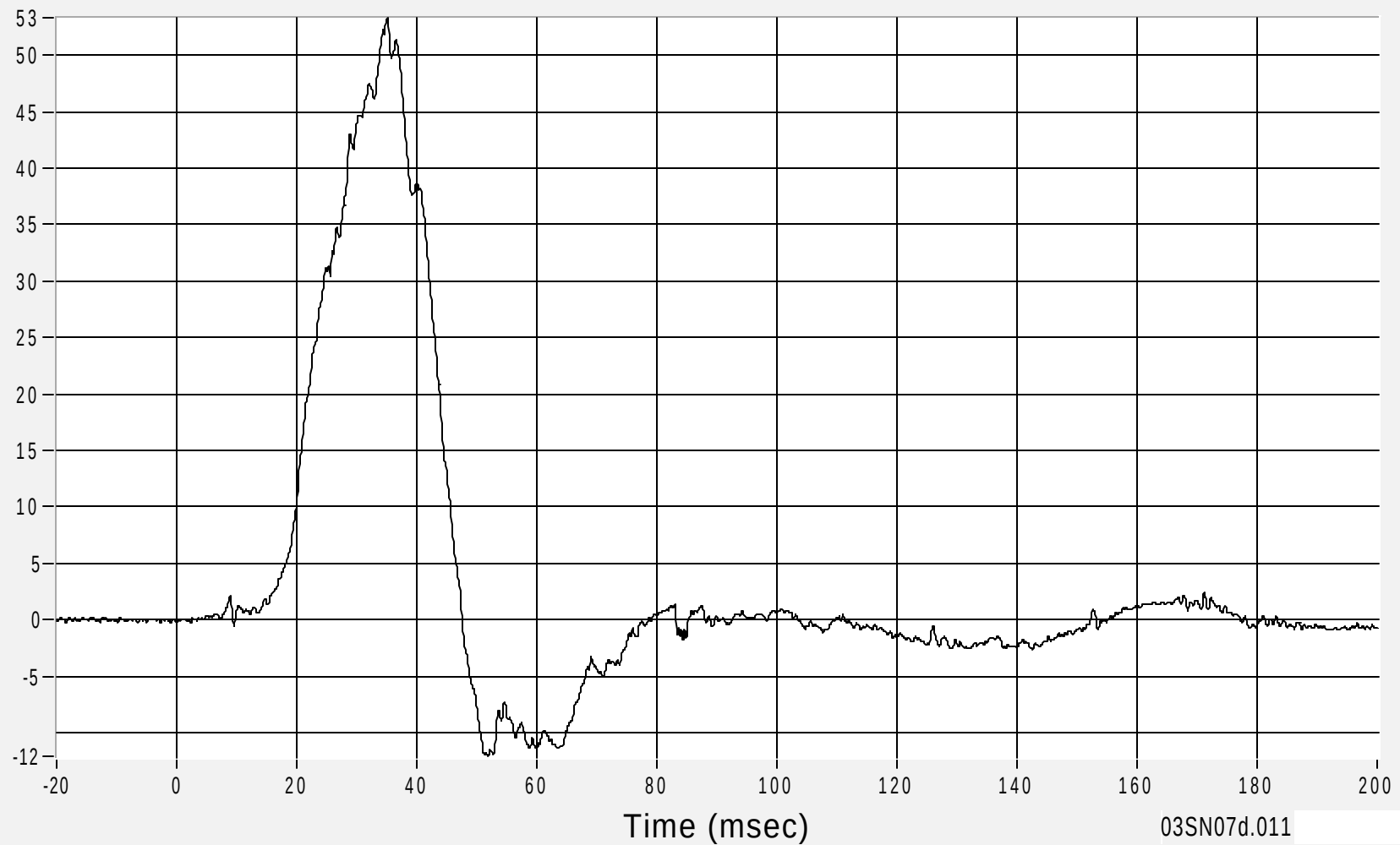
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 53.3 G's at 35.1 msec
Min -12.1 G's at 51.8 msec



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28 February 2003

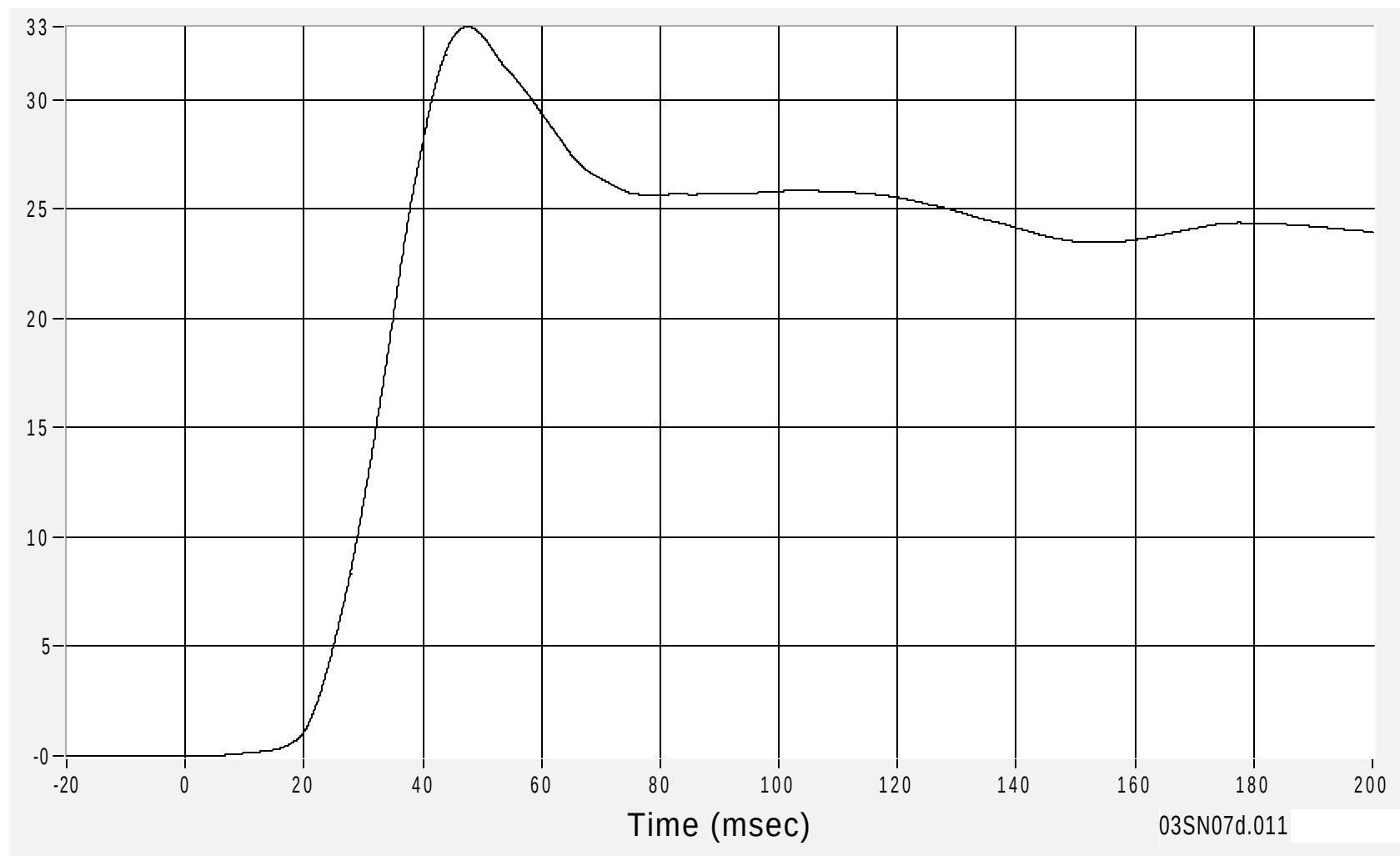
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 33.3 km/h at 47.5 msec

Min 0.0 km/h at 3.2 msec



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28 February 2003

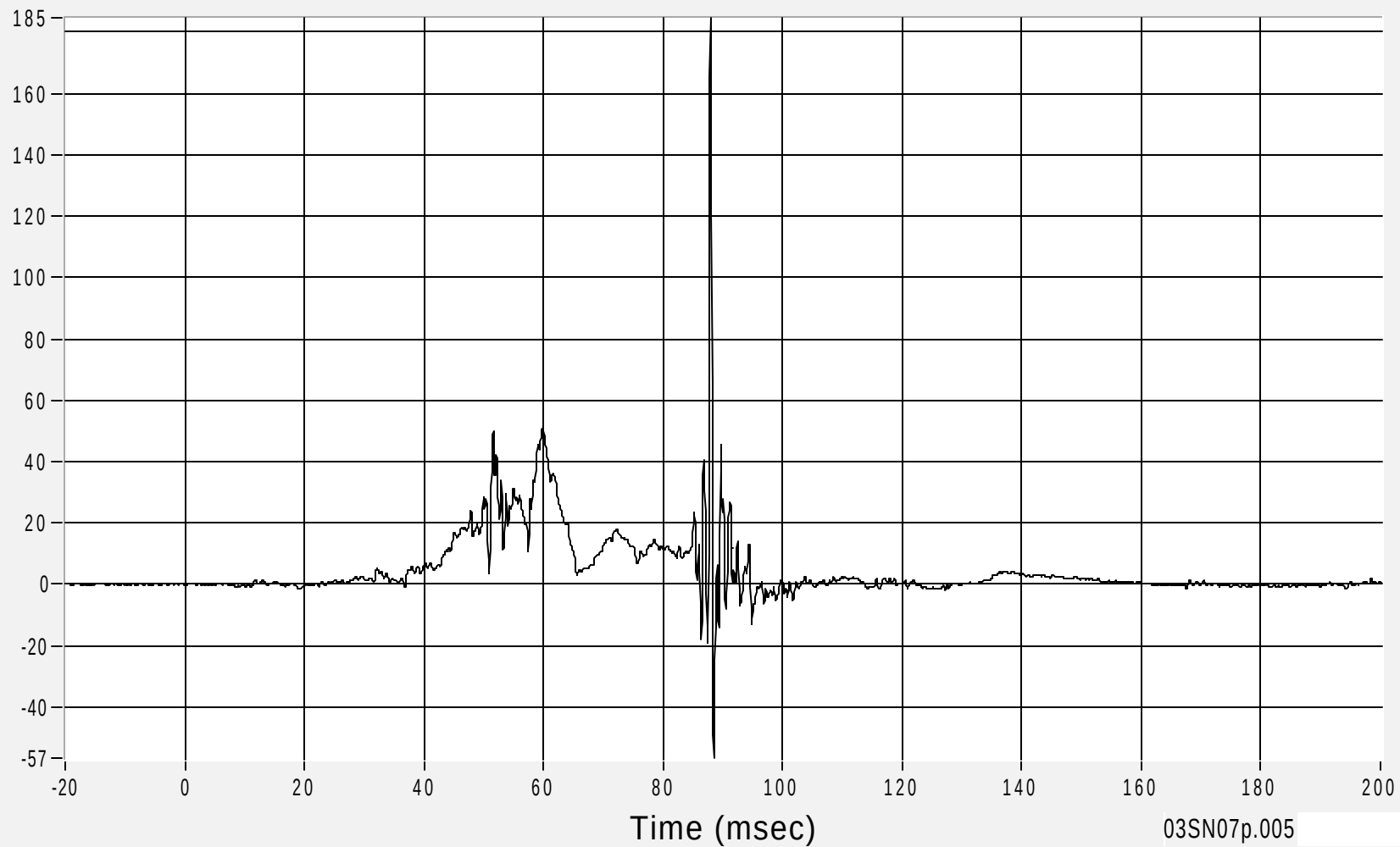
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 184.6 G's at 87.9 msec

Min -56.6 G's at 88.5 msec



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28 February 2003

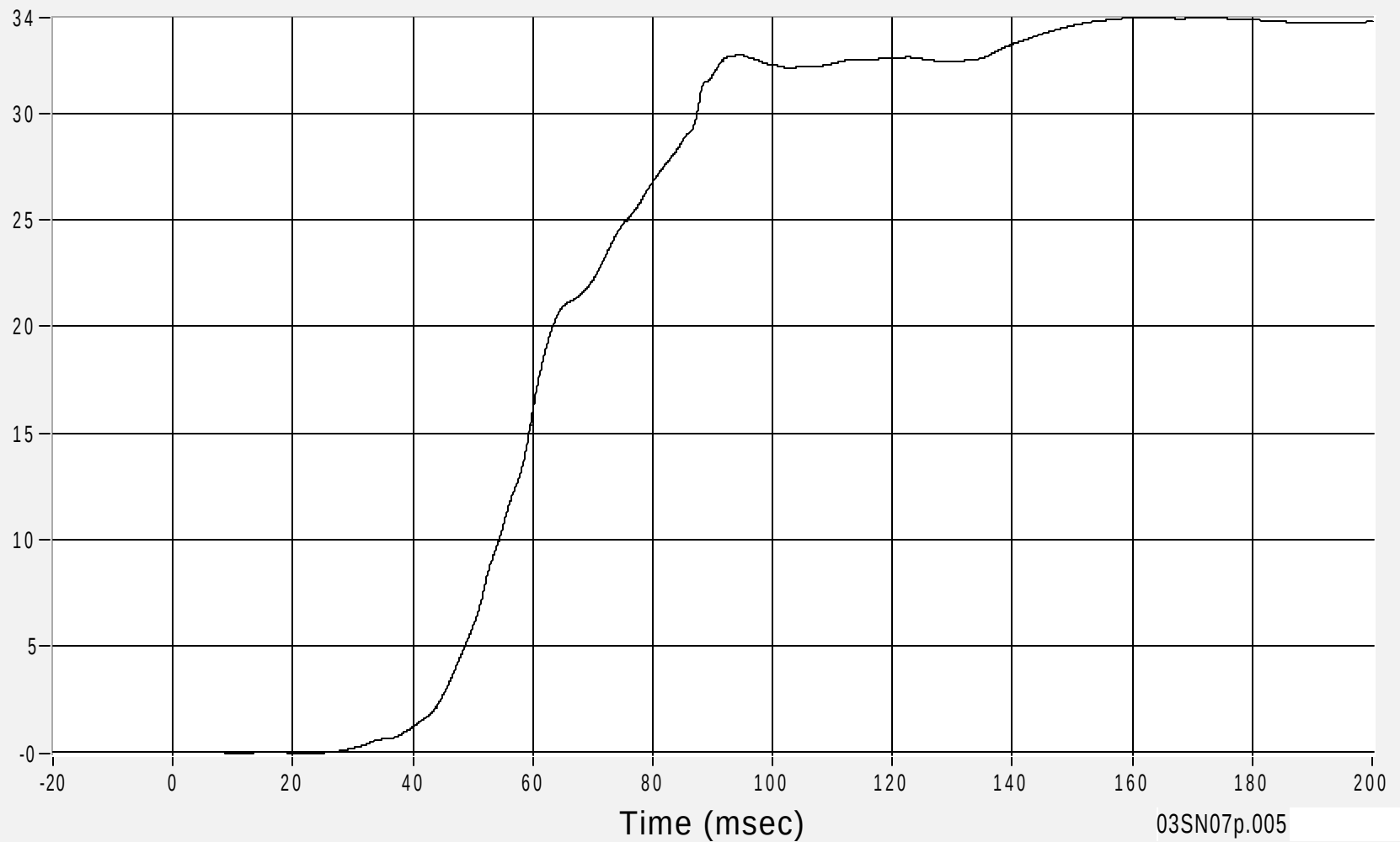
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 34.5 km/h at 161.4 msec

Min 0.0 km/h at 22.3 msec



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28 February 2003

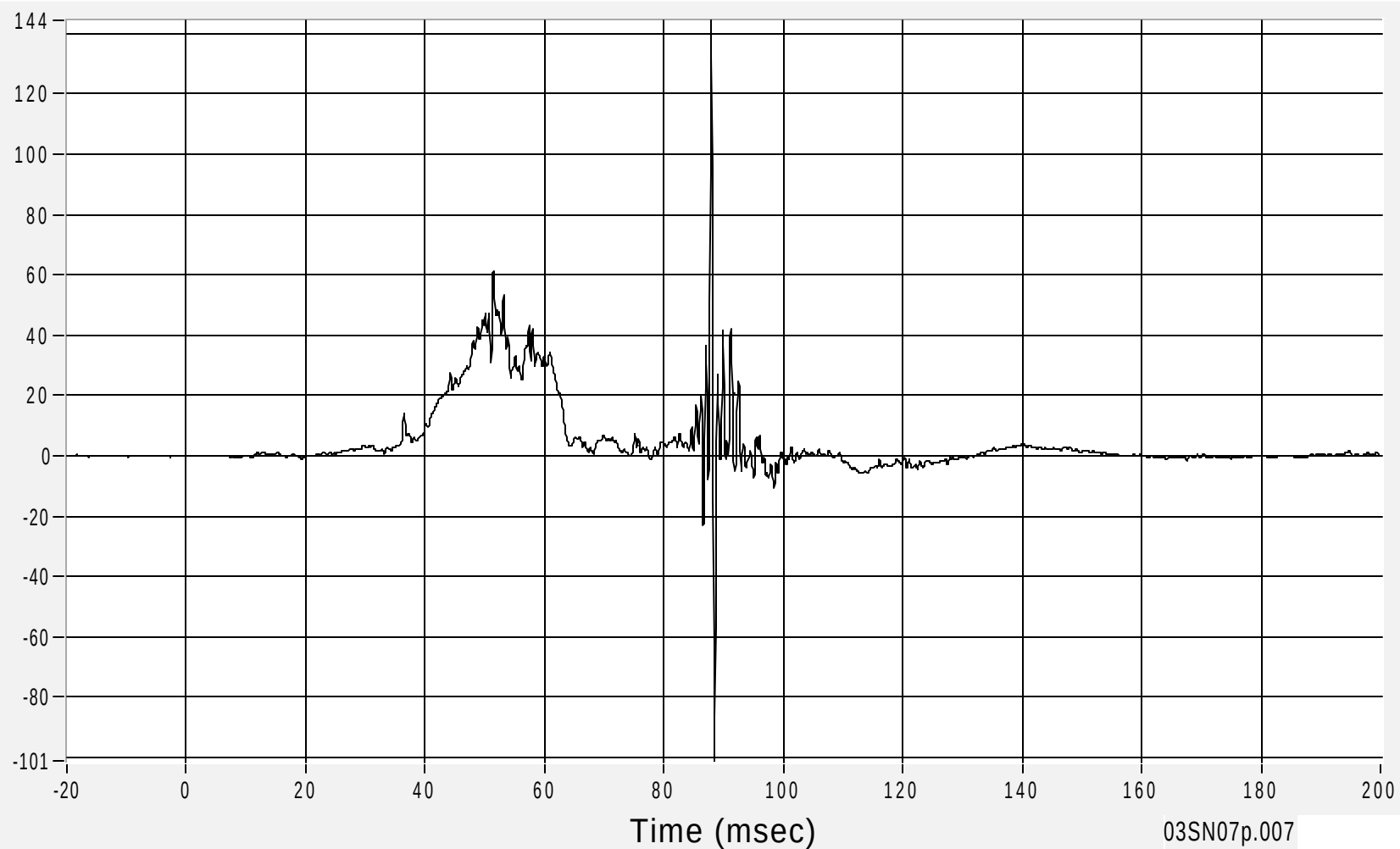
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 144.4 G's at 87.9 msec

Min -101.1 G's at 88.5 msec



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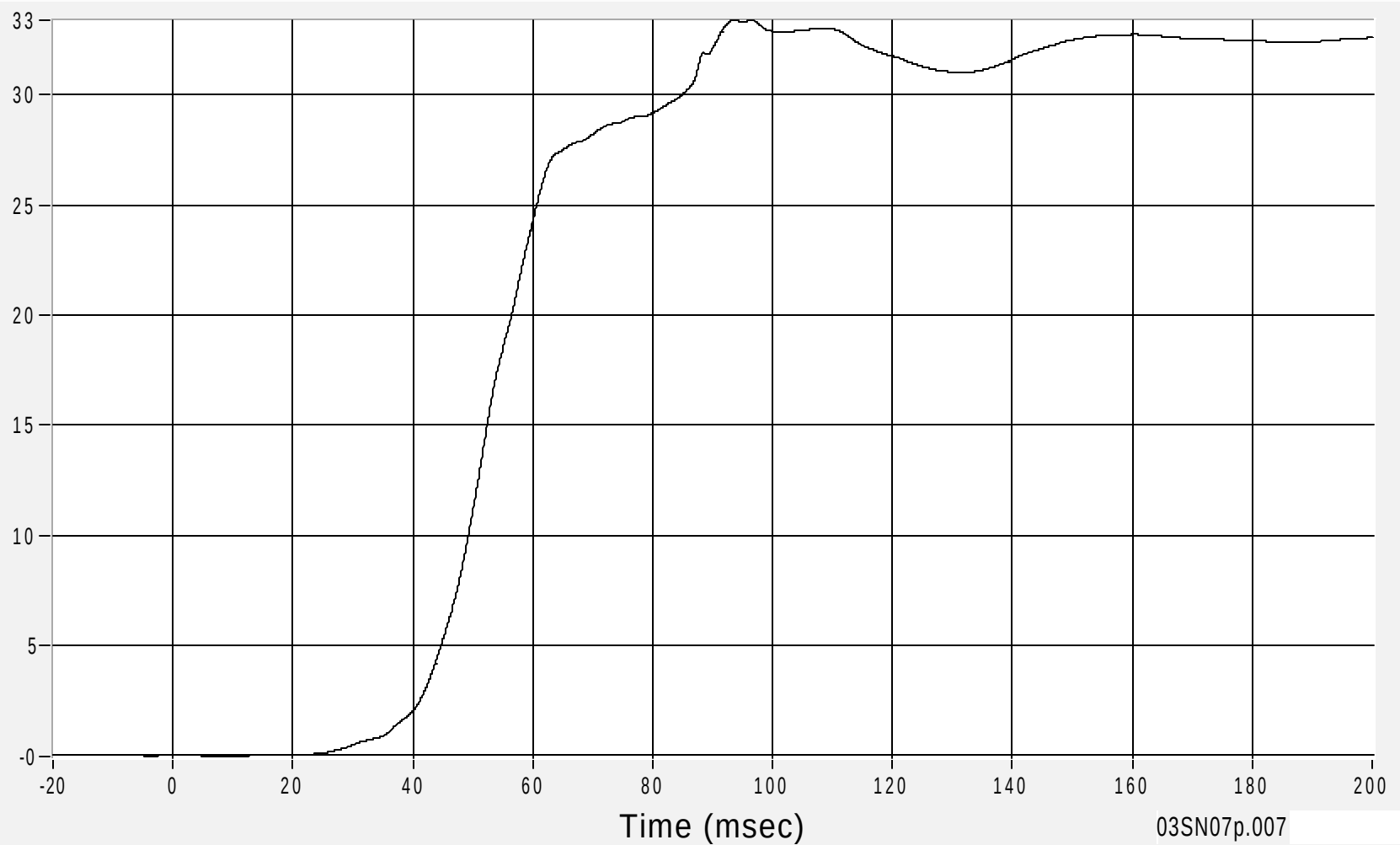
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 33.4 km/h at 96.4 msec
Min 0.0 km/h at 10.9 msec



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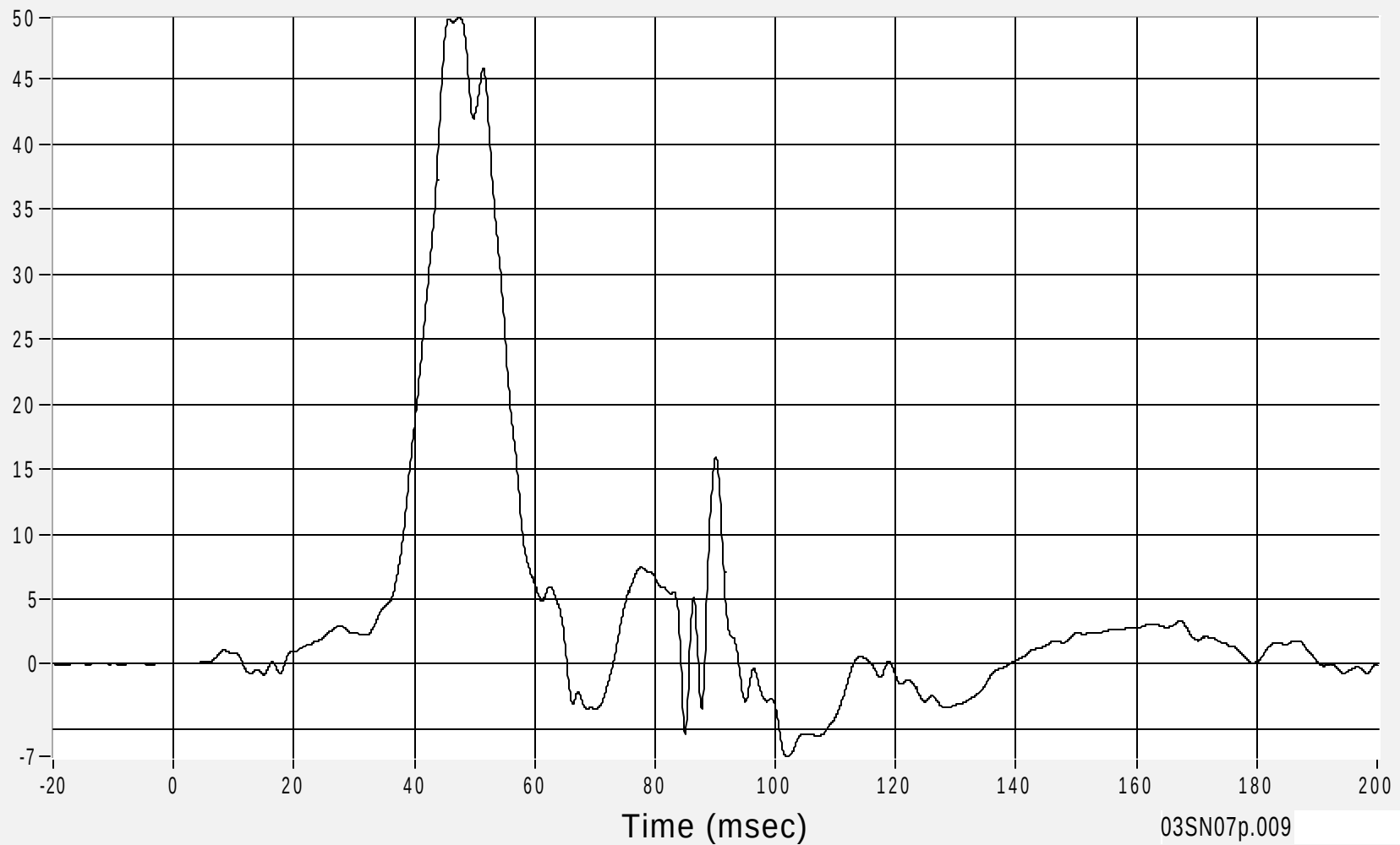
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) CFC180

Max 49.7 G's at 47.6 msec
Min -7.1 G's at 101.9 msec



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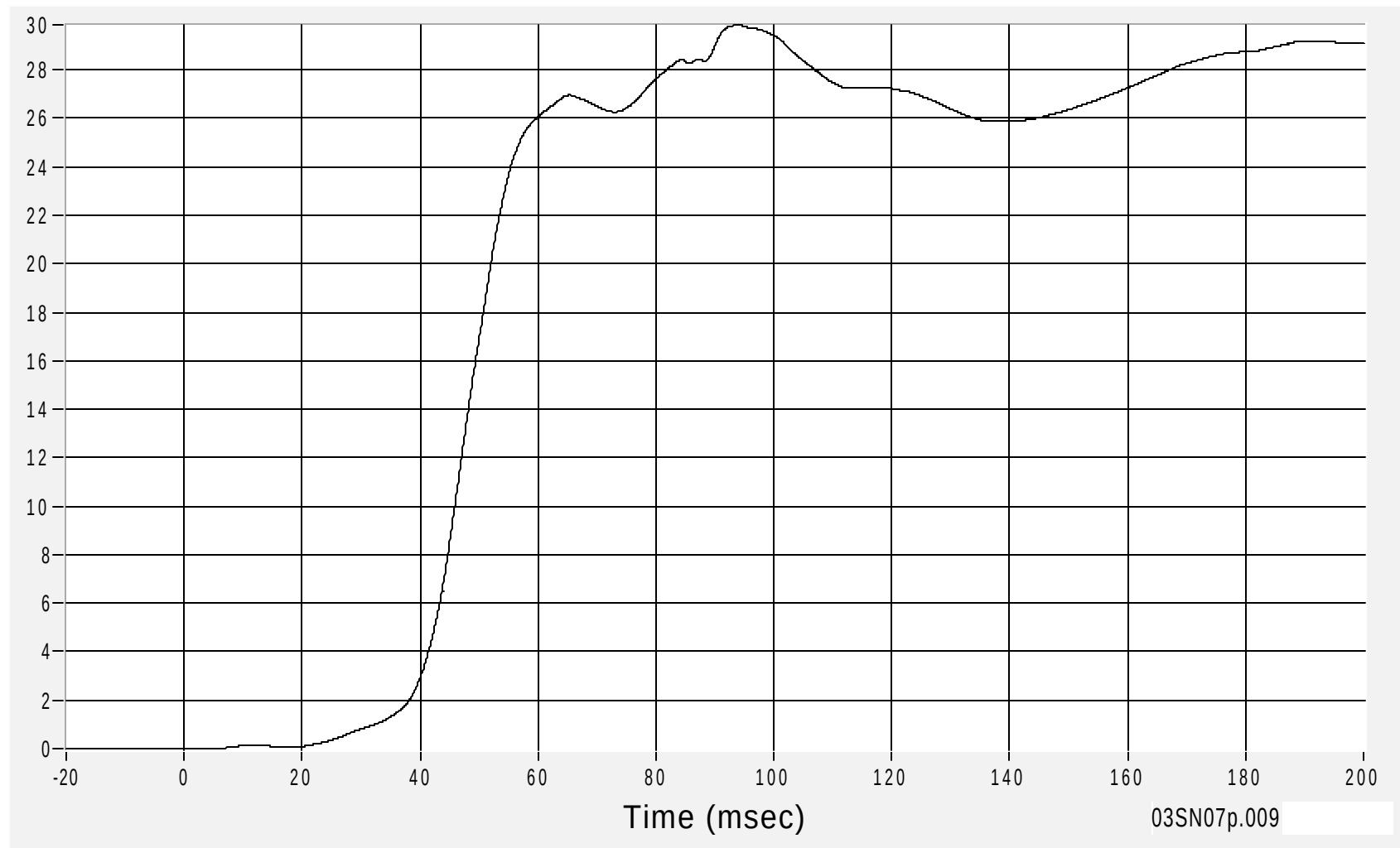
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 29.9 km/h at 93.9 msec
Min 0.0 km/h at 0.0 msec



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28 February 2003

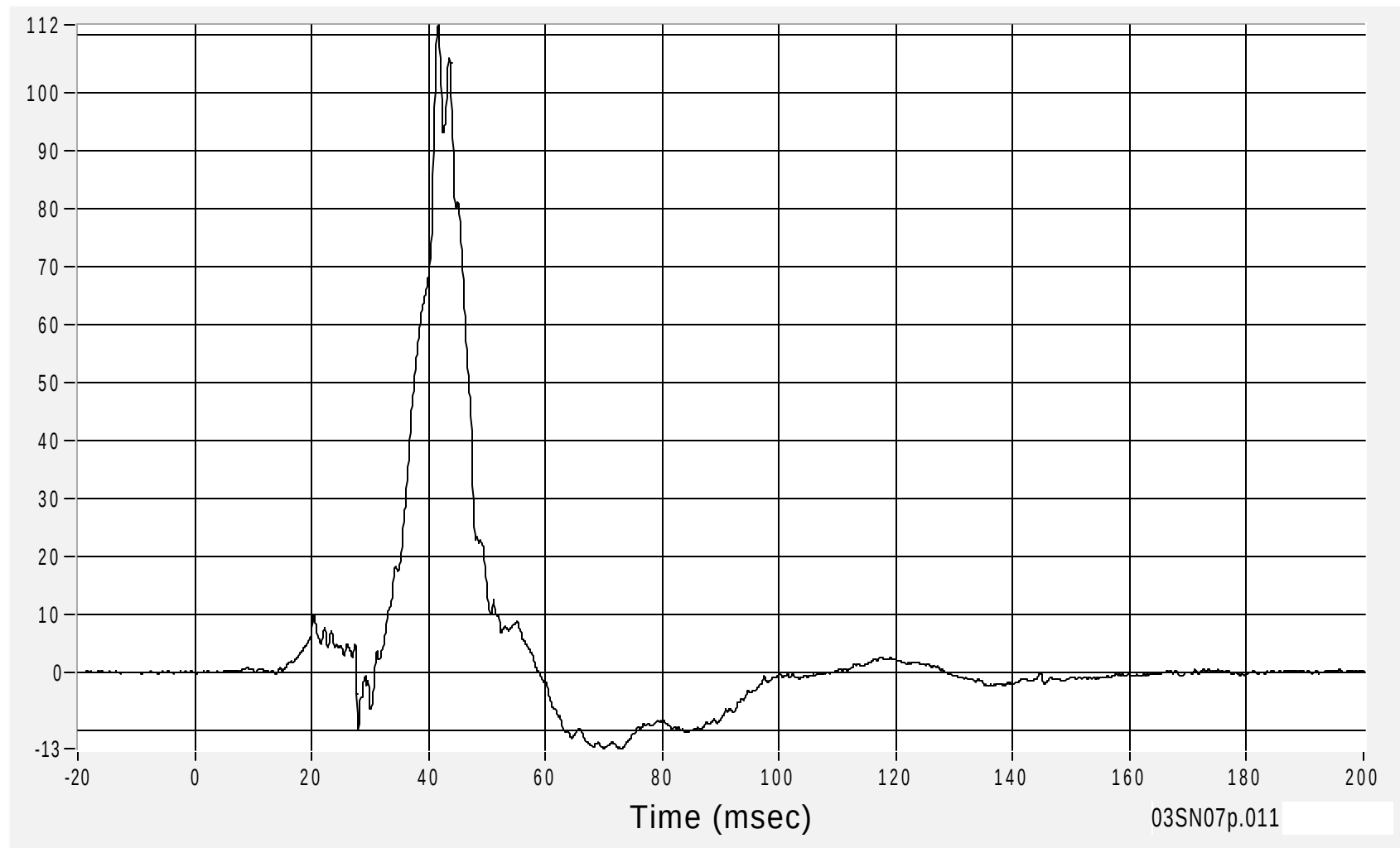
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Acceleration - Redundant

Acceleration (G's) CFC1000

Max 111.7 G's at 41.7 msec

Min -13.1 G's at 69.9 msec



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28 February 2003

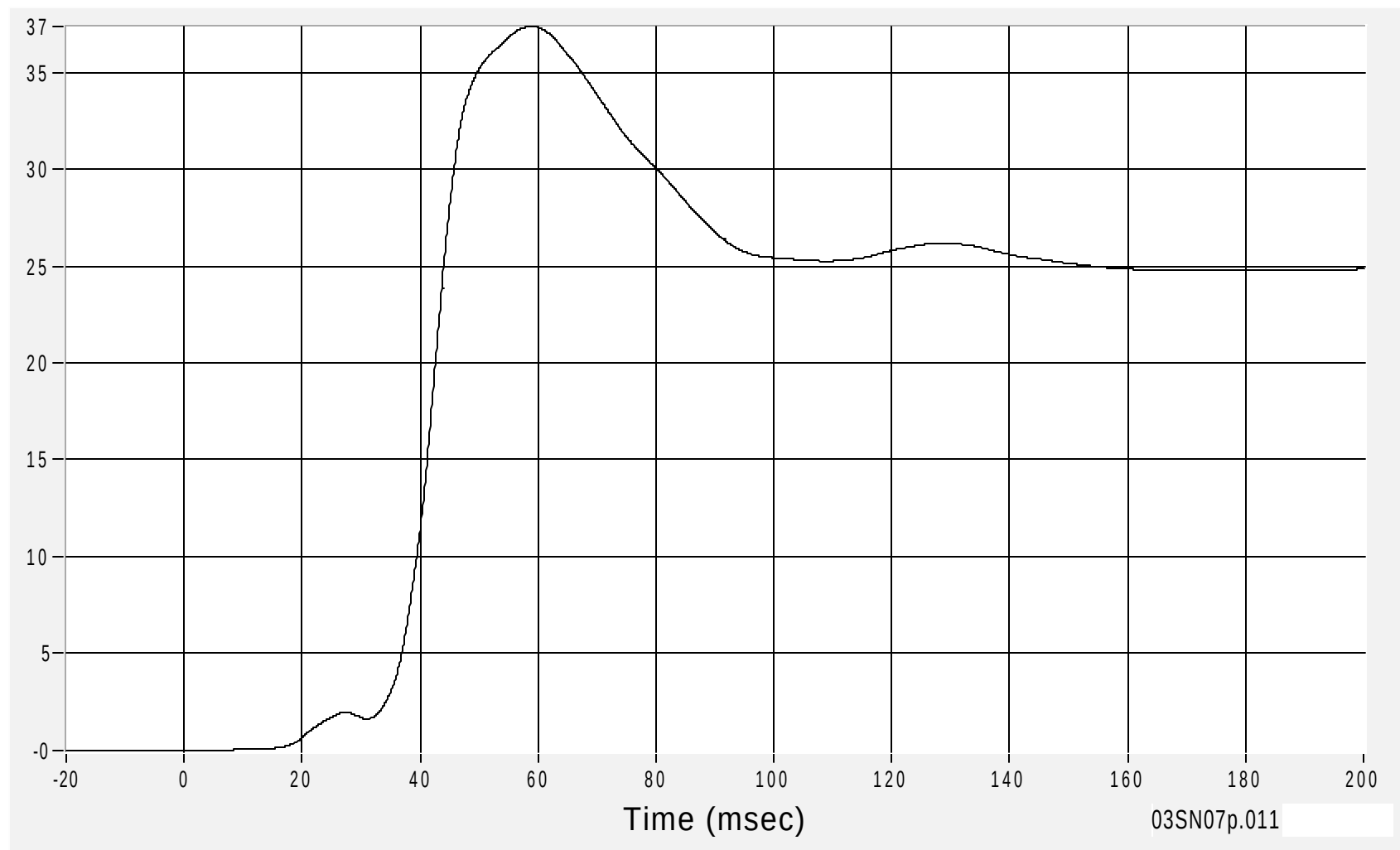
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 37.4 km/h at 58.8 msec

Min 0.0 km/h at 1.8 msec



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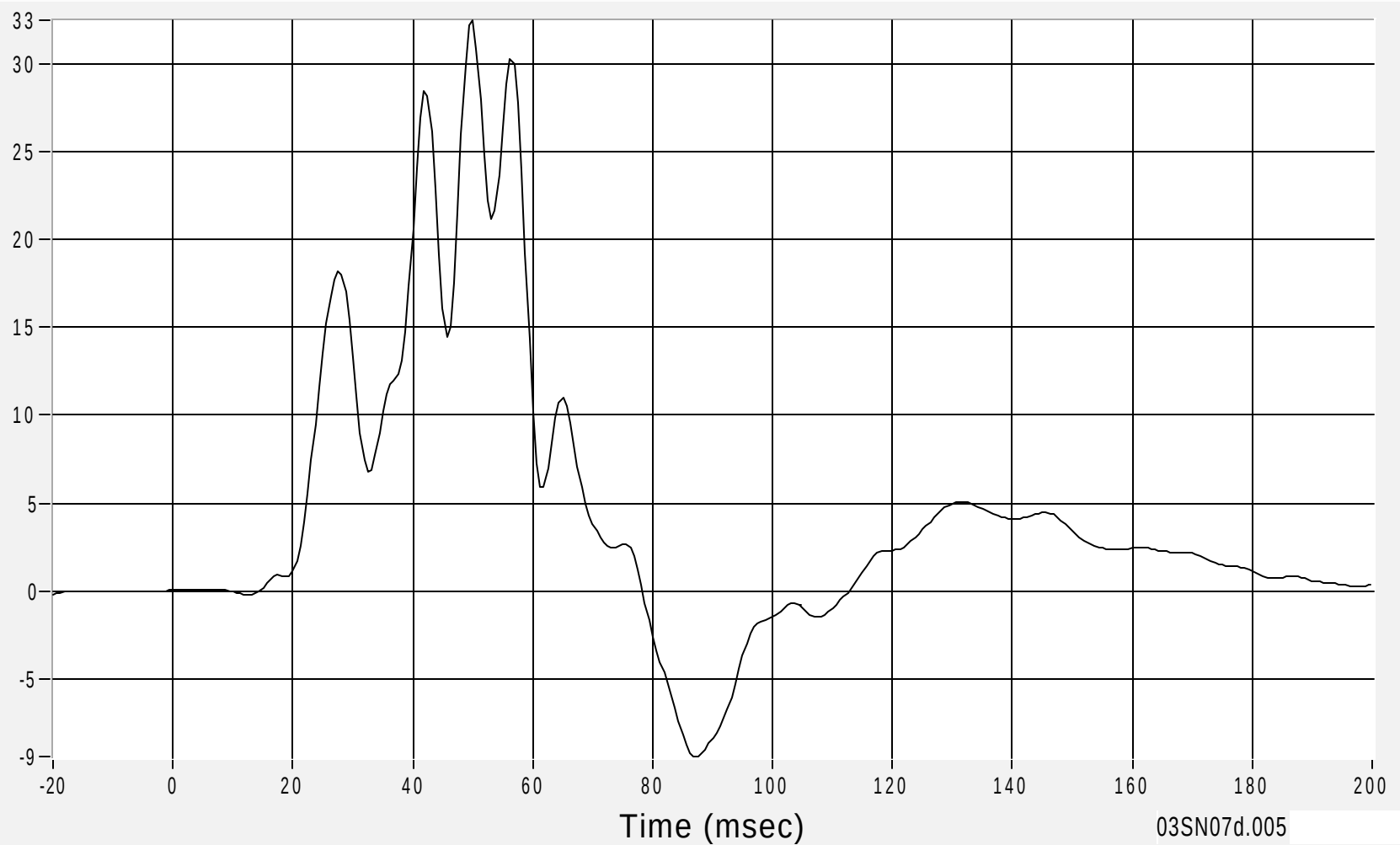
28 February 2003

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

Acceleration (G's) FIR100

Max 32.5 G's at 50.0 msec
Min -9.4 G's at 87.5 msec



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28 February 2003

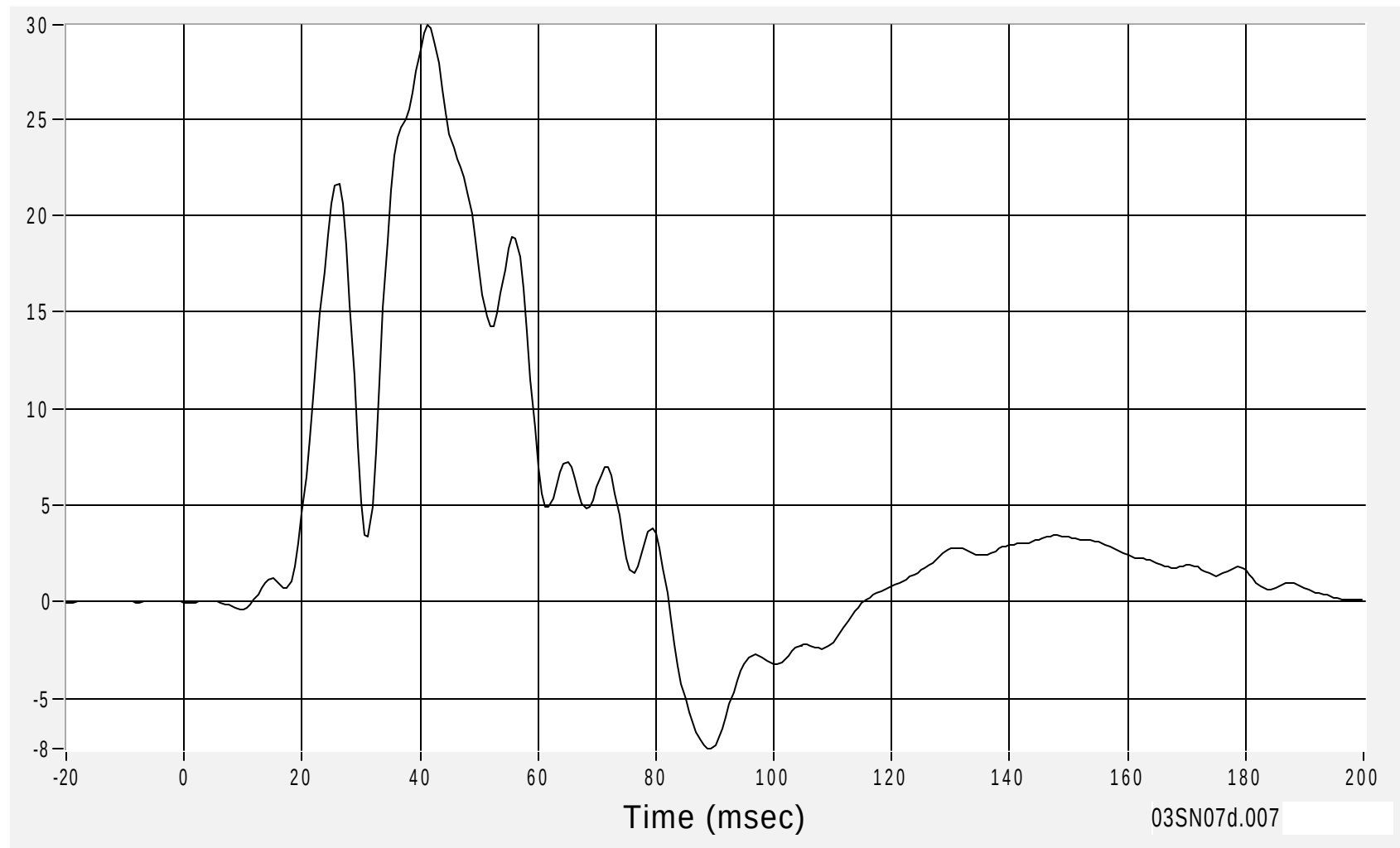
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 29.9 G's at 41.2 msec

Min -7.6 G's at 88.8 msec



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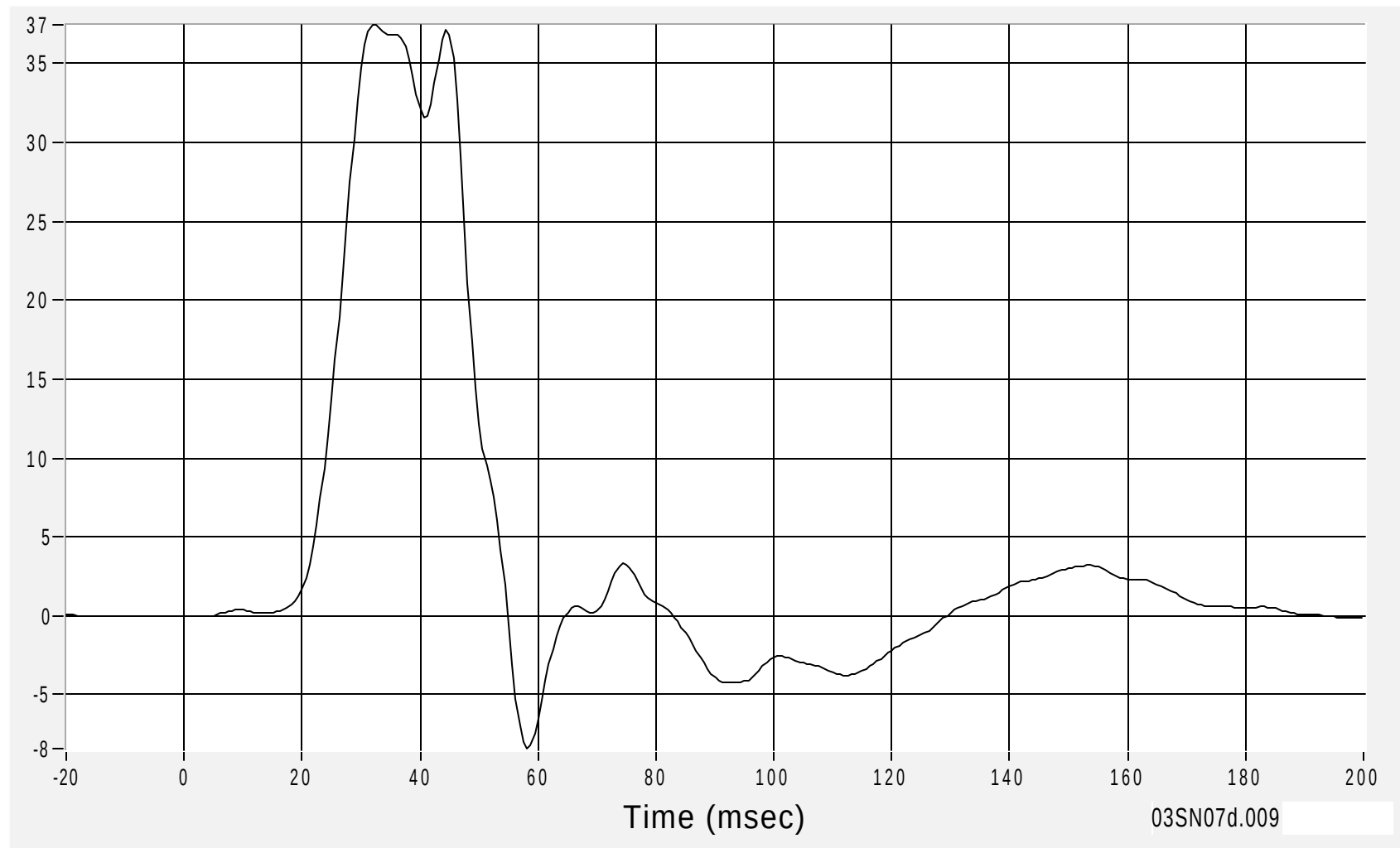
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 37.5 G's at 32.5 msec
Min -8.4 G's at 58.1 msec



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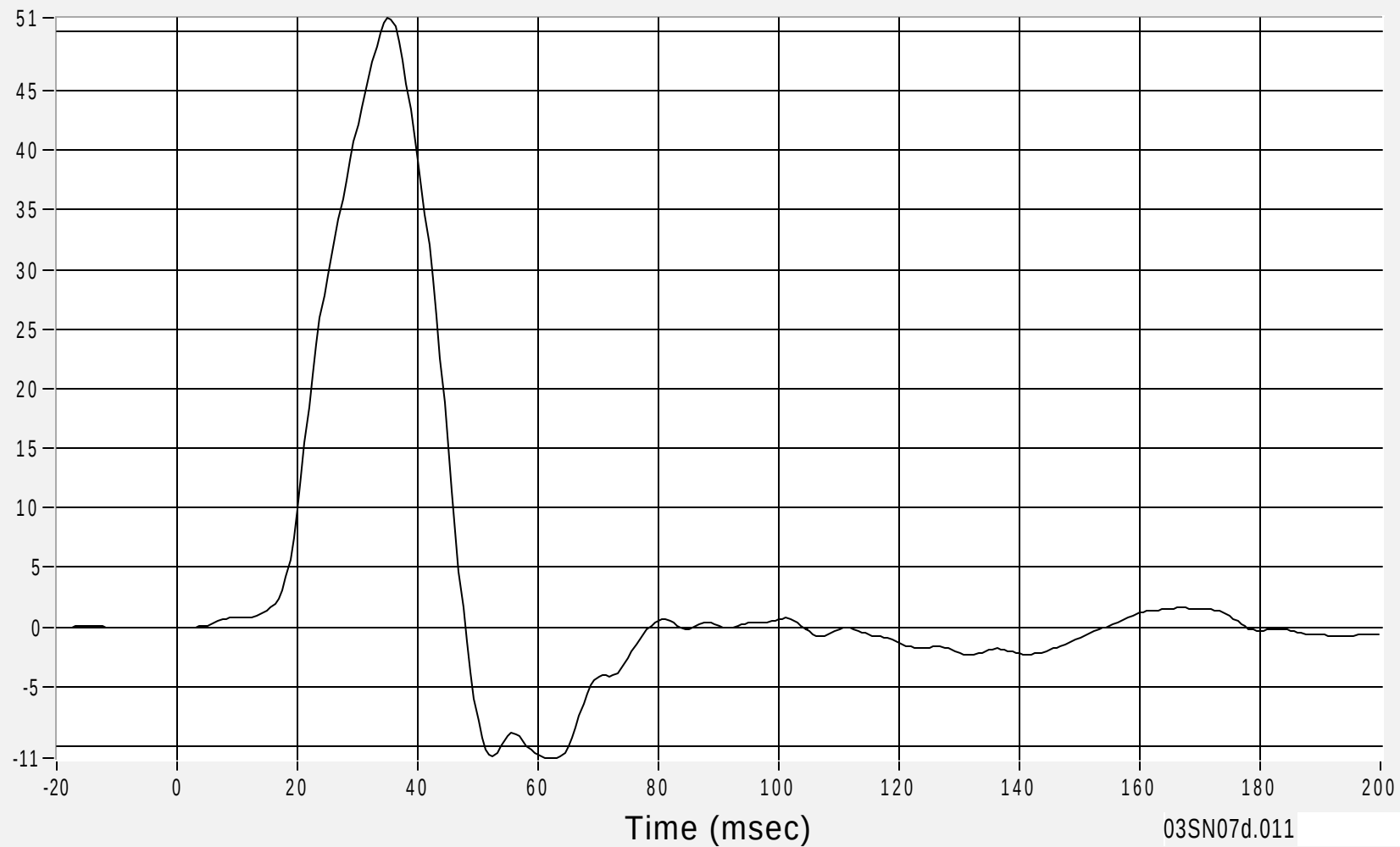
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Driver Pelvic (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 51.1 G's at 35.0 msec
Min -11.0 G's at 62.5 msec



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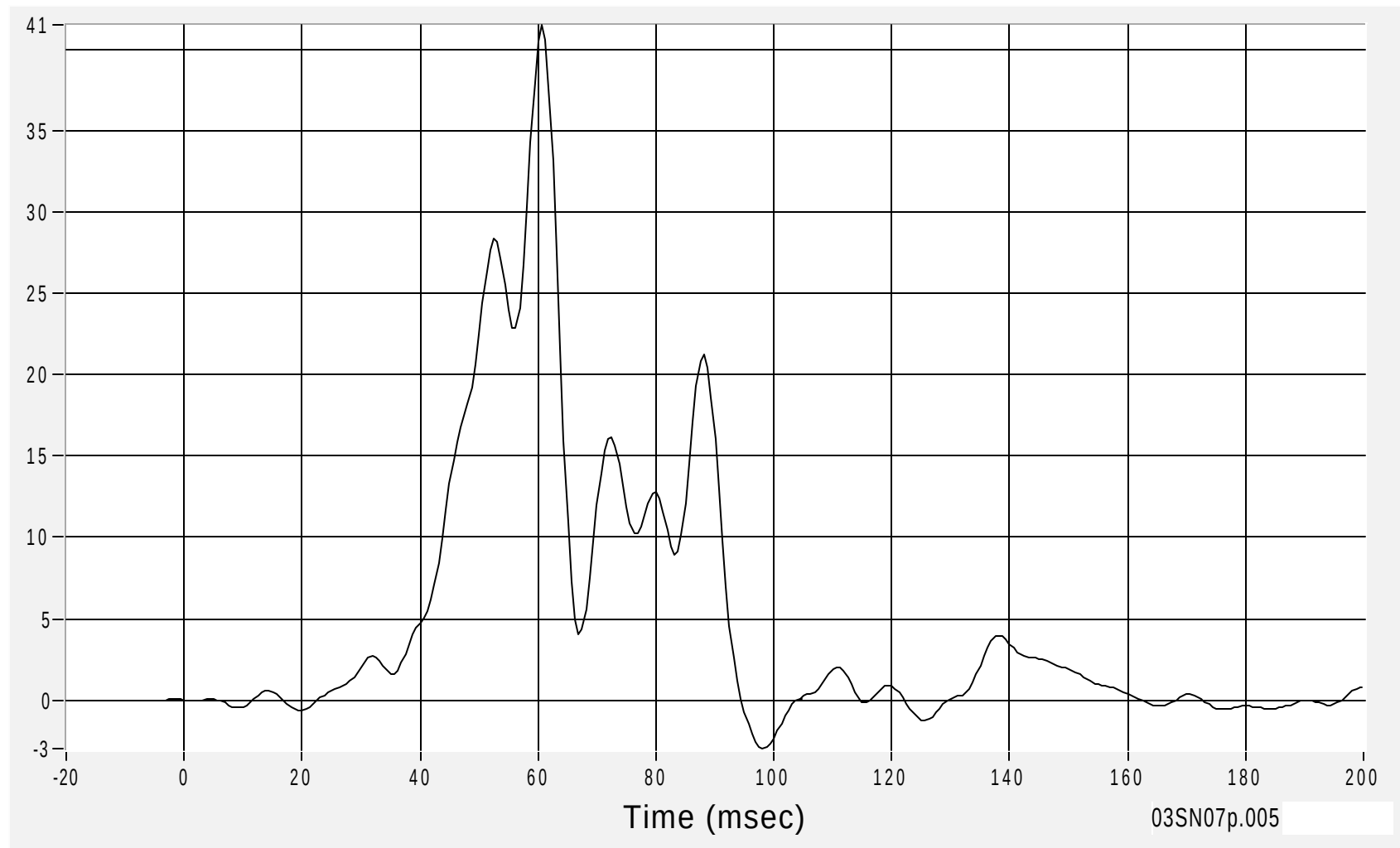
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Upper Rib (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 41.5 G's at 60.6 msec
Min -3.0 G's at 98.1 msec



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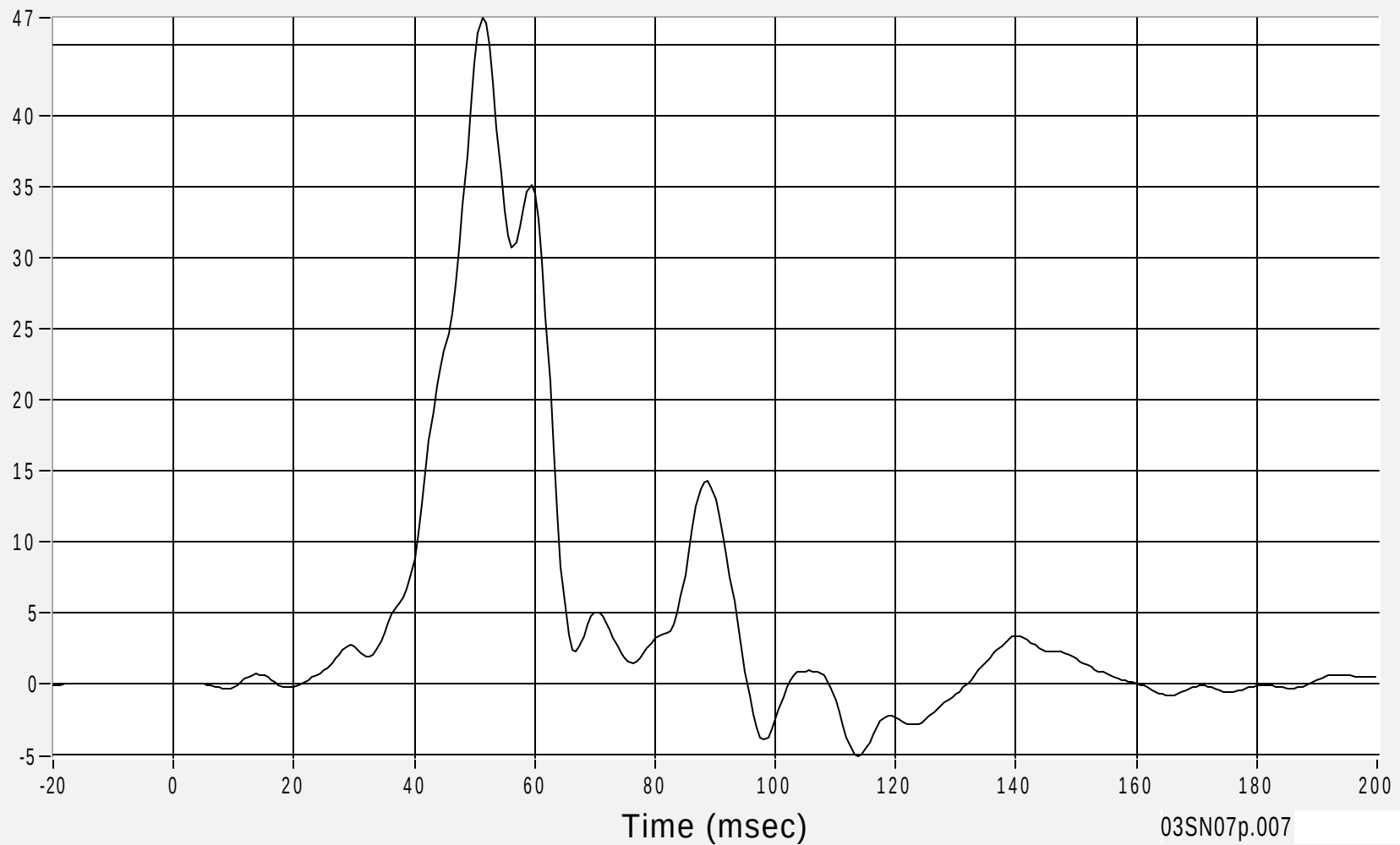
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Rib (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 46.9 G's at 51.2 msec
Min -5.1 G's at 113.8 msec



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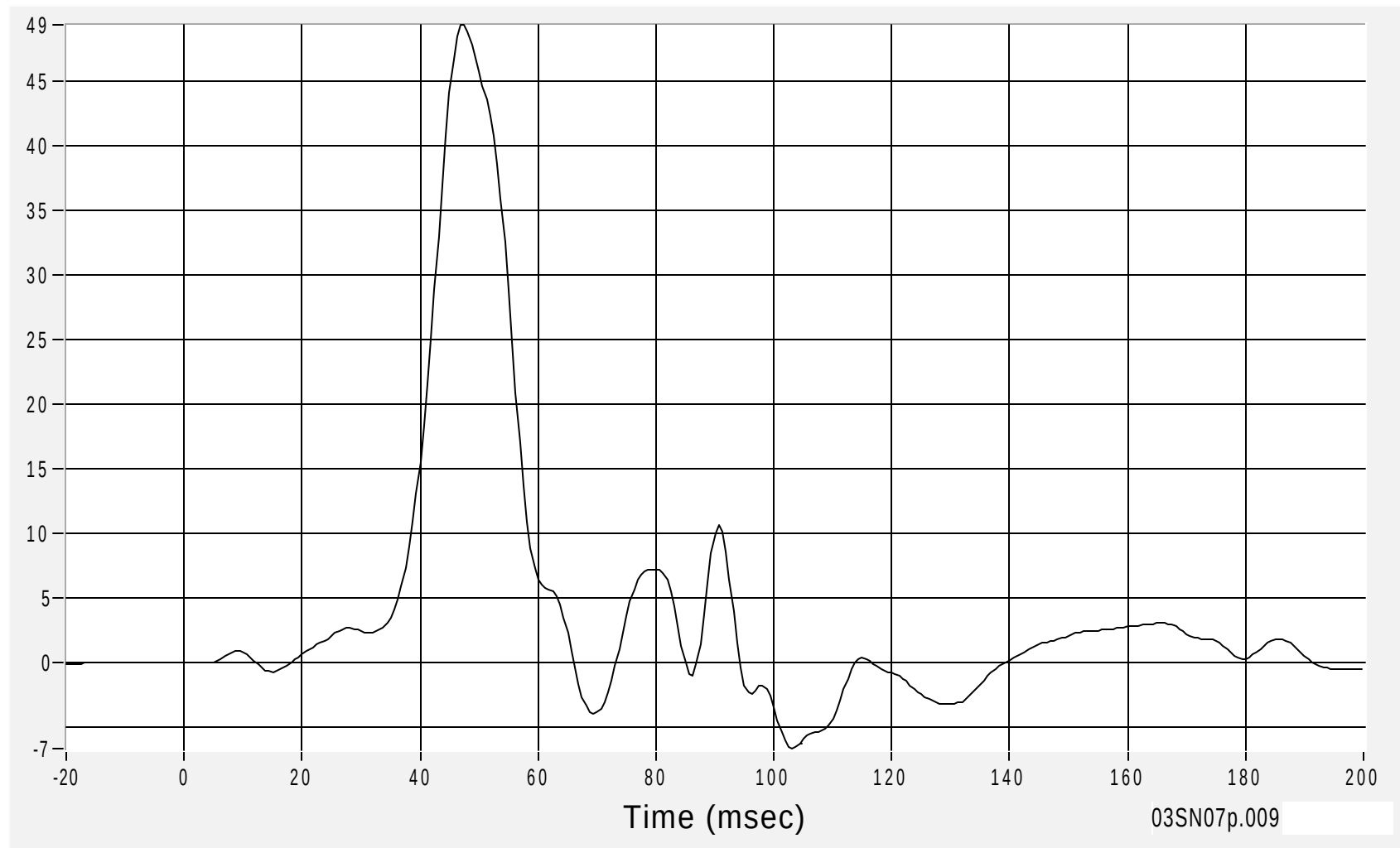
28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Lower Spine (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 49.3 G's at 47.5 msec
Min -6.6 G's at 103.1 msec



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28 February 2003

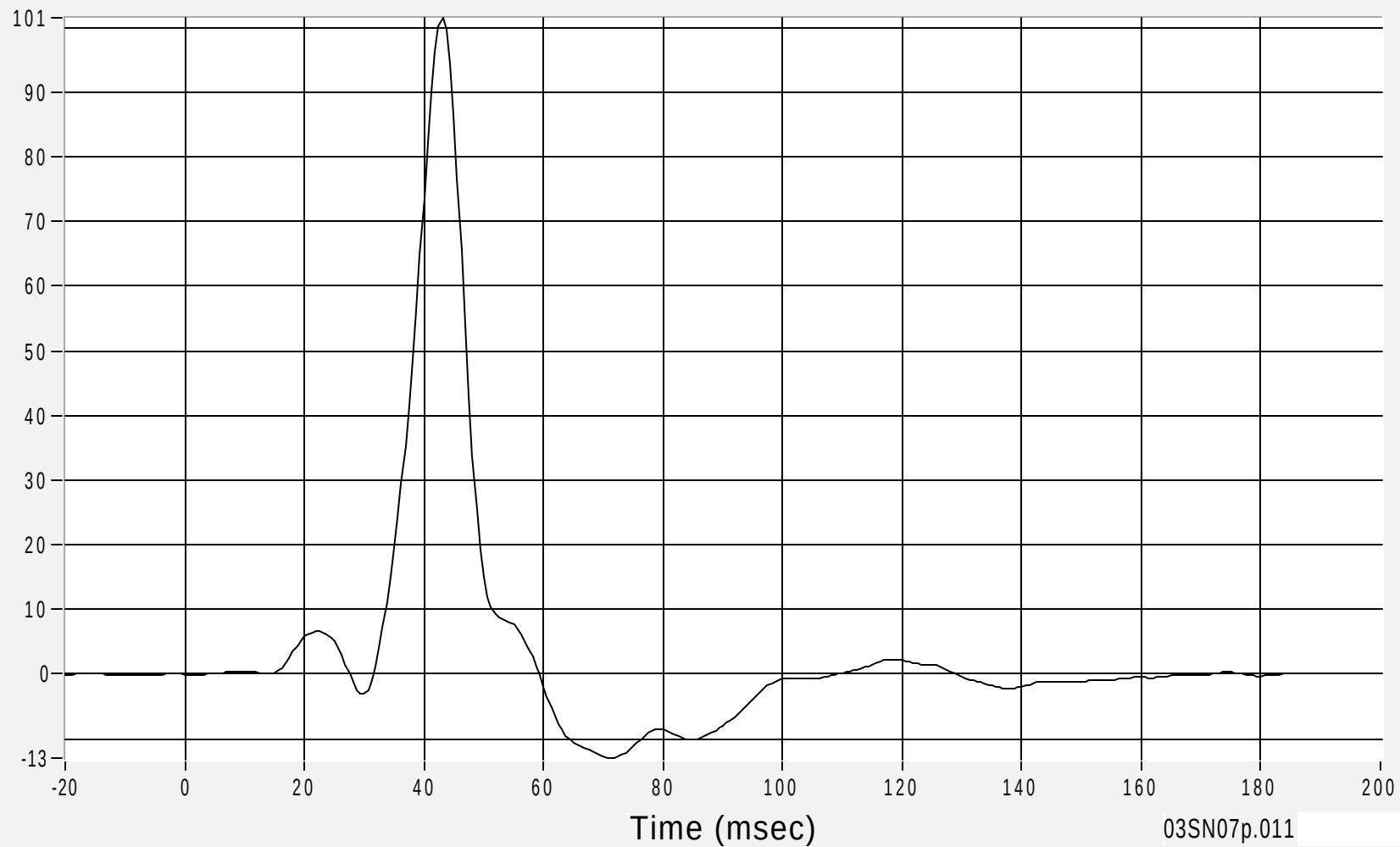
Medical College of Wisconsin
Vehicle Crashworthiness Lab

Passenger Pelvic (Y) Acceleration - Redundant

Acceleration (G's) FIR100

Max 101.5 G's at 43.1 msec

Min -13.0 G's at 71.2 msec



03SN07 - 2003 TOYOTA HIGHLANDER 4 DOOR MPV

28 February 2003

Medical College of Wisconsin
Vehicle Crashworthiness Lab

APPENDIX C

SID CONFIGURATION AND VERIFICATION RESULTS

TABLE OF CONTENTS

VERIFICATION TEST RESULTS SUMMARY PRE AND POST TEST	Page No.
SUMMARY SID PRE AND POST VERIFICATION	C-3
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 06 and 07

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		
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		
LUMBAR FLEXION	Pass all requirements	Mark Meyer		
HYBRID III LATERAL NECK TEST	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer
HYBRID III LATERAL HEAD DROP	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer

SID Serial Number SID H3 058 Test Sequences 07 and 08

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		
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		
LUMBAR FLEXION	Pass all requirements	Mark Meyer		
HYBRID III LATERAL NECK TEST	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer
HYBRID III LATERAL HEAD DROP	Pass all requirements	Mark Meyer	Pass all requirements	Mark Meyer

SUMMARY
SID PRE AND POST VERIFICATION

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number	SID H3 056 SID H3 058	Test Sequences	06 and 07 (056) 07 and 08 (058)
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TEST PARAMETER	SPECIFICATION	SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
MEASUREMENTS					
Date	-	26 Feb 03	10 Mar 03	26 Feb 03	11 Mar 03
Sequential Test Number	-	06	07	07	08
Temperature (°C)	18.9-25.5	22.4	20.7	20.8	19.9
Relative Humidity (%)	10-70	17.3	15.0	19.1	16.7
SH – Seated Height (mm)	889-909	907	904	909	909
RH – Rib Height (mm)	501-521	506	503	513	511
HP – Hip Pivot Height (mm)	99	99/99	99/99	99/99	99/99
RD – Rib From Back Line (mm)	229-241	229	229	233	233
KH – Knee Pivot from Back Line (mm)	511-526	522/520	522/522	524/522	524/521
KV – Knee Pivot to Floor (mm)	490-505	500/495	500/500	501/493	497/497
HW – Hip Width (mm)	356-391	364	367	356	357
THORAX IMPACTS					
Date	-	26 Feb 03	10 Mar 03	26 Feb 03	11 Mar 03
Sequential Test Number	-	06	07	07	08
Temperature (°C)	18.9-25.5	22.4	20.7	20.8	19.9
Relative Humidity (%)	10-70	17.3	15.0	19.1	16.7
Probe Speed (m/s)	4.21-4.33	4.27	4.23	4.30	4.24
Upper Rib Acceleration (G)	37-46	42.5	43.1	45.7	41.8
Lower Rib Acceleration (G)	37-46	43.0	43.6	42.9	41.2
Lower Spine Acceleration (G)	15-22	20.8	21.1	20.4	19.1
PELVIS IMPACTS					
Date	-	26 Feb 03	10 Mar 03	26 Feb 03	11 Mar 03
Sequential Test Number	-	06	07	07	08
Temperature (°C)	18.9-25.5	22.4	20.7	20.8	20.2
Relative Humidity (%)	10-70	17.3	15.4	19.1	16.7
Probe Speed (m/s)	4.21-4.33	4.27	4.30	4.28	4.25
Pelvis Acceleration (G)	40-60	53.4	55.9	47.8	45.1
THORACIC SHOCK ABSORBER					
Shock Absorber ID Number	-	406	-	03130164	-
Damper Setting	1-10	6.2	-	5	-
Date	-	14 Feb 03	-	14 Feb 03	-
Sequential Test Number	-	02	-	02	-
Temperature	18.9-25.5	19.2	-	21.0	-
Relative Humidity	10-70	16.5	-	17.7	-
Probe Speed (m/s) Low	3.05	3.05	-	3.02	-
Force (N)	836 – 1125	1016.4	-	888.9	-
Displacement (mm)	30 – 35	32.1	-	30.0	-
Probe Speed (m/s) Middle	4.27	4.27	-	4.27	-
Force (N)	1730 – 2099	1754.4	-	1788.3	-
Displacement (mm)	32 – 37	36.0	-	34.0	-
Probe Speed (m/s) High	6.10	6.10	-	6.13	-
Force (N)	3741 – 4448	3869.7	-	4132.0	-
Displacement (mm)	33 - 40	38.8	-	36.5	-

TEST PARAMETER	SPECIFICATION	SID H3 056		SID H3 058	
		PRE	POST	PRE	POST
ABDOMINAL COMPRESSION					
Date	-	17 Feb 03	-	17 Feb 03	-
Sequential Test Number	-	2	-	2	-
Temperature (°C)	18.9-25.5	23.7	-	22.4	-
Relative Humidity (%)	10-70	16.7	-	16.6	-
Force at 13 mm (N)	104-162	121.6	-	130.7	-
Force at 19 mm (N)	163-221	178.1	-	195.0	-
Force at 25 mm (N)	222-280	257.9	-	269.5	-
Force at 33 mm (N)	325-391	389.8	-	374.6	-
LUMBAR FLEXION					
Date	-	17 Feb 03	-	17 Feb 03	-
Sequential Test Number	-	2	-	2	-
Temperature (°C)	18.9-25.5	20.7	-	21.3	-
Relative Humidity (%)	10-70	17.9	-	18.2	-
Force at 0° (N)	0-26.7	0	-	22.5	-
Force at 0° (N)	97.8-151.2	108.7	-	134.2	-
Force at 0° (N)	151.2-204.6	158.5	-	166.6	-
Force at 0° (N)	204.6-258	212.7	-	207.9	-
Return Angle	12° Maximum	2.5	-	4.3	-
HYBRID III LATERAL NECK					
Date	-	25 Feb 03	7 Mar 03	25 Feb 03	6 Mar 03
Sequential Test Number	-	06	07	07	08
Temperature (°C)	18.9-25.5	20.8	21.1	21.7	20.5
Relative Humidity (%)	10-70	17.3	18.4	15.8	17.9
Pendulum Speed (m/s)	6.89-7.13	7.1	7.1	6.92	6.90
Pendulum Pulse 10ms (m/s)	1.96-2.55	2.24	2.39	2.12	1.96
Pendulum Pulse 20ms (m/s)	4.12-5.10	4.65	4.86	4.72	4.50
Pendulum Pulse 30ms (m/s)	5.73-7.01	6.56	6.82	6.74	6.56
Pendulum Pulse 40 –70 ms (m/s)	6.27-7.64	6.47	6.61	6.70	6.86
Max Head rotation (deg)	64-78	67.7	77.3	77.1	76.5
Head angle crosses zero (ms)	50-70	51.1	56.6	51.9	53.4
Peak Moment (Nm)	88-108	92.8	88.7	89.5	88.1
Moment crosses zero (ms)	40-60	49.4	48.2	48.6	47.7
Max rotation wrt peak moment (ms)	0-20	7.2	8.80	7.38	4.48
HYBRID III LATERAL HEAD DROP					
Date	-	24 Feb 03	3 Mar 03	24 Feb 03	4 Mar 03
Sequential Test Number	-	06	07	07	08
Temperature (°C)	18.9-25.5	21	18.9	21.1	19.2
Relative Humidity (%)	10-70	19	15.5	19.3	16.0
Resultant Max (G)	120-150	126.9	123.9	138.6	142.8
Longitudinal Max (G)	<15	14.7	10.4	7.2	7.2

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

SID Serial Number

SID H3 056

SID H3 058

Test Sequences

06 and 07 (056)

07and 08 (058))

		SID H3 058		SID H3 056	
		PRE	POST	PRE	POST
	Date	27 Feb 03	03 Mar 03	27 Feb 03	03 Mar 03
	Performed By	Mark Meyer	Mark Meyer	Mark Meyer	Mark Meyer
PART	INSPECTION	Pass	Pass	Pass	Pass
Skin	Visual	Pass	Pass	Pass	Pass
Head	Visual, Ballast, Accelerometer Mount	Pass	Pass	Pass	Pass
Neck	Visual and Palpated, Cable Torque	Pass	Pass	Pass	Pass
Spine Box	Visual, Ballast, Weldment, Accelerometer Mount	Pass	Pass	Pass	Pass
Rib Cage	Visual, Palpated, Measured, Stiffness	Pass	Pass	Pass	Pass
Sternum	Visual	Pass	Pass	Pass	Pass
Lumbar Spine	Visual	Pass	Pass	Pass	Pass
Abdomen	Visual	Pass	Pass	Pass	Pass
Pelvis	Visual, Palpated, Accelerometer Mount	Pass	Pass	Pass	Pass
Upper Legs	Visual	Pass	Pass	Pass	Pass
Knees	Visual, Stops, Inserts	Pass	Pass	Pass	Pass
Lower Legs	Visual, Range of Motion	Pass	Pass	Pass	Pass
Ankles	Visual, Range of Motion	Pass	Pass	Pass	Pass
Feet	Visual, Range of Motion	Pass	Pass	Pass	Pass
Joints	1 to 2 G Range	Pass	Pass	Pass	Pass
Other		None	None	None	None

APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

TABLE OF CONTENTS

Section	Page No.
SID INSTRUMENTATION	D-3
VEHICLE INSTRUMENTATION	D-4
MDB INSTRUMENTATION	D-4

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

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X ACCELERATION	P22283	ENDEVCO	15Nov02
HEAD Y ACCELERATION	J19089	ENDEVCO	05Nov02
HEAD Z ACCELERATION	J34364	ENDEVCO	05Nov02
SIX AXIS UPPER NECK LOAD CELL (FX, FY, FZ, MX, MY, MZ)	0452	DENTON ATD	18Nov02
UPPER RIB ACCELERATION	J36031	ENDEVCO	04Nov02
LOWER RIB ACCELERATION	J35932	ENDEVCO	06Nov02
LOWER SPINE ACCELERATION	J21552	ENDEVCO	05Nov02
PELVIS ACCELERATION	J35937	ENDEVCO	04Nov02
UPPER RIB REDUNDANT ACCELERATION	J18553	ENDEVCO	01Nov02
LOWER RIB REDUNDANT ACCELERATION	J36616	ENDEVCO	05Nov02
LOWER SPINE REDUNDANT ACCELERATION	J35839	ENDEVCO	04Nov02
PELVIS REDUNDANT ACCELERATION	J32565	ENDEVCO	15Nov02

REAR SID H3 NO. 056

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X ACCELERATION	P13835	ENDEVCO	13Dec02
HEAD Y ACCELERATION	P13819	ENDEVCO	14Nov02
HEAD Z ACCELERATION	J23579	ENDEVCO	14Nov02
SIX AXIS UPPER NECK LOAD CELL (FX, FY, FZ, MX, MY, MZ)	274	FTSS	12Nov02
UPPER RIB ACCELERATION	J21551	ENDEVCO	05Nov02
LOWER RIB ACCELERATION	J36614	ENDEVCO	05Nov02
LOWER SPINE ACCELERATION	J36603	ENDEVCO	01Nov02
PELVIS ACCELERATION	J36617	ENDEVCO	04Nov02
UPPER RIB REDUNDANT ACCELERATION	J32665	ENDEVCO	01Nov02
LOWER RIB REDUNDANT ACCELERATION	J22318	ENDEVCO	15Nov02
LOWER SPINE REDUNDANT ACCELERATION	J32662	ENDEVCO	04Nov02
PELVIS REDUNDANT ACCELERATION	J22189	ENDEVCO	14Nov02

VEHICLE INSTRUMENTATION

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL X	P13846	ENDEVCO	14Nov02
RIGHT FRONT SILL Y	P22230	ENDEVCO	15Nov02
RIGHT FRONT SILL Z	P13725	ENDEVCO	06Nov02
RIGHT REAR SILL X	P22993	ENDEVCO	15Nov02
RIGHT REAR SILL Y	P12825	ENDEVCO	14Nov02
RIGHT REAR SILL Z	P21820	ENDEVCO	14Nov02
REAR FLOORPAN ABOVE AXLE X	98G98D22-Z04	ENTRAN	15Nov02
REAR FLOORPAN ABOVE AXLE Y	98B98A26-D05	ENTRAN	15Nov02
REAR FLOORPAN ABOVE AXLE Z	98G98E11-K02	ENTRAN	15Nov02
LEFT REAR SILL Y	P13837	ENDEVCO	14Nov02
LEFT FRONT SILL Y	P22239	ENDEVCO	14Nov02
LEFT FRONT DOOR CENTERLINE Y	P22311	ENTRAN	13Dec02
RIGHT REAR OCCUPANT COMP Y	P23595	ENDEVCO	15Nov02
MID-REAR OF LEFT FRONT DOOR Y	P22366	ENDEVCO	13Dec02
LEFT FRONT DOOR UPPER C/L Y	P23020	ENDEVCO	15Nov02
MID-REAR OF LEFT REAR DOOR Y	P22951	ENDEVCO	13Dec02
LEFT REAR DOOR UPPER C/L Y	P13836	ENDEVCO	14Nov02
LEFT LOWER B-PILLAR Y	P22315	ENDEVCO	13Dec02
LEFT MIDDLE B-PILLAR Y	P22539	ENDEVCO	13Dec02
LEFT LOWER A-PILLAR Y	P12746	ENDEVCO	14Nov02
LEFT UPPER A-PILLAR	P13838	ENDEVCO	06Nov02
FRONT SEAT TRACK Y	P22965	ENDEVCO	13Dec02
REAR SEAT TRACK Y	P22312	ENDEVCO	13Dec02
VEHICLE CG X	P13598	ENDEVCO	14Nov02
VEHICLE CG Y	P13868	ENDEVCO	15Nov02
VEHICLE CG Z	P13869	ENDEVCO	14Nov02

MDB INSTRUMENTATION

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