

REPORT NO. MCW-DOT-02SN09

**NEW CAR ASSESSMENT PROGRAM
SIDE IMPACT TESTING**

SUZUKI MOTOR CORPORATION
2002 SUZUKI GRAND VITARA MPV

NHTSA NUMBER: M2 0513

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



9 MAY 2002

FINAL REPORT

U.S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Safety Performance Standards
Office of Crashworthiness Standards
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Washington, DC 20590

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15. Supplementary Notes																					
16. Abstract A 55/28 km/h 90° Impact Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2002 Suzuki Grand Vitara 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 9 May 2002. The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 km/h, and the ambient temperature at the struck side (driver's) of the target vehicle at the time of impact was 22.5° C. The target vehicle post-test maximum crush was 390 mm at Level 1. 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">42.5</td><td align="center">34.9</td></tr> <tr> <td>Left Lower Rib Acceleration G</td><td align="center">42.9</td><td align="center">37.6</td></tr> <tr> <td>Lower Spine Acceleration G</td><td align="center">54.4</td><td align="center">27.3</td></tr> <tr> <td>Thoracic Trauma Index TTI</td><td align="center">49</td><td align="center">32</td></tr> <tr> <td>Pelvis Acceleration G</td><td align="center">85</td><td align="center">42</td></tr> </tbody> </table> The doors on the struck side of the vehicle did not separate from the body at the hinges or latches, and the opposite doors did not open and remained latched during the side impact event.					<u>DRIVER</u>	<u>PASSENGER</u>	Left Upper Rib Acceleration G	42.5	34.9	Left Lower Rib Acceleration G	42.9	37.6	Lower Spine Acceleration G	54.4	27.3	Thoracic Trauma Index TTI	49	32	Pelvis Acceleration G	85	42
	<u>DRIVER</u>	<u>PASSENGER</u>																			
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Lower Spine Acceleration G	54.4	27.3																			
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Pelvis Acceleration G	85	42																			
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB Side Impact Dummy (SID) NHTSA No. M2 0513		18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Technical Reference Division, Room 5108(NAD-52) 400 Seventh Street, S.W. Washington, D.C. 20590																			
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SECTION 1

PURPOSE AND TEST PROCEDURE

This side impact test was part of the FY02 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 2002 Suzuki Grand Vitara 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 2002 Suzuki Grand Vitara MPV was impacted on the left or driver's side by a Moving Deformable Barrier (MDB) that was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.0 km/h (38.5 mph). The target vehicle was stationary and positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Medical College of Wisconsin in Milwaukee, Wisconsin, on 9 May 2002.

Two restrained Side Impact Dummies (SIDs) 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 nine high-speed cameras, one real-time camera, and one high-speed video. Camera locations and other pertinent camera information can be found in this report.

The SIDs 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)

Pre- and post-test photographs of the test vehicle, the MDB, and the side impact dummies (SIDs) are included in Appendix A. Appendix B contains the vehicle, MDB, and dummy response data traces. A summary of the side impact dummy (SID) 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	Rear SID
TTI (G)	49	32
PELVIS (G)	85	42
HIC36	110	1194

SECTION 3
SUMMARY OF TEST RESULTS

DATA SHEET NO. 1

GENERAL VEHICLE TEST PARAMETER DATA

TEST VEHICLE INFORMATION

Year/ Make/ Model/ Body Style				2002 Suzuki Grand Vitara MPV			
Vehicle NHTSA NO.				M2 0513	VIN	JS3TD62V324156964	
Vehicle Body Color				Black	Build Date	December 2001	
Engine Data	<u>6</u>	Cylinders		CID	<u>2.5</u>	Liter	<u> </u> cc
Placement	<u>X</u>	Longitudinal		Lateral			
Transmission	<u>5</u>	Speed	<u>X</u>	Manual		Automatic	<u>X</u> Overdrive
Final Drive		Rear Wheel Drive		Front Wheel Drive	<u>X</u>	Four Wheel Drive	
Odometer Reading	<u>29</u>	Date	<u>22 April 2002</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>26</u>	PSI Front
	<u>26</u>	PSI Rear
Recommended Tire Size	<u>P235/60R16</u>	
Tires on Test Vehicle	<u>P235/60R16</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
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		Bench		Split Bench		
Type of Front Seat Back		Fixed	<u>X</u>	Adjustable w/	<u>X</u>	Lever		Knob
Vehicle Max Capacity Loading				<u>400.9</u>	kg	(A)		
No. of Occupants X 68.04 kg				<u>340.9</u>	kg	(B)		
Cargo Capacity (A) – (B)				<u>60.0</u>	kg			

TEST VEHICLE DELIVERED WEIGHT WITH MAXIMUM FLUIDS:

Left Front	=	<u>396.8</u>	kg	Left Rear	=	<u>336.8</u>	kg
Right Front	=	<u>401.4</u>	kg	Right Rear	=	<u>350.5</u>	kg
TOTAL FRONT	=	<u>798.2</u>	kg	TOTAL REAR	=	<u>687.3</u>	kg
% Total Weight	=	<u>53.7</u>	%	%Total Weight	=	<u>46.3</u>	%
TOTAL WEIGHT	=	<u>1485.5</u>	kg				

DATA SHEET 1 (continued)

GENERAL VEHICLE TEST PARAMETER DATA

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

CALCULATION OF VEHICLE'S TARGET TEST WEIGHT:

Total Test Vehicle Delivered Weight with Max Fluids	=	<u>1485.5</u>	kg	(A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>60.0</u>	kg	(B)
Weight of (2) instrumented Side Impact Dummies	=	<u>161.8</u>	kg	(C)
TEST VEHICLE TARGET WEIGHT	=	<u>1707.3</u>	kg	(A+B+C)

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

Left Front	=	<u>436.8</u>	kg	Left Rear	=	<u>432.7</u>	kg
Right Front	=	<u>414.5</u>	kg	Right Rear	=	<u>423.2</u>	kg
TOTAL FRONT	=	<u>851.3</u>	kg	TOTAL REAR	=	<u>855.9</u>	kg
% Total Weight	=	<u>49.9</u>	%	%Total Weight	=	<u>50.1</u>	%
TOTAL WEIGHT	=	<u>1707.3</u>	kg				

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

Left Front	=	<u>435</u>	kg	Left Rear	=	<u>429.1</u>	kg
Right Front	=	<u>416.4</u>	kg	Right Rear	=	<u>420</u>	kg
TOTAL FRONT	=	<u>851.4</u>	kg	TOTAL REAR	=	<u>849.1</u>	kg
% Total Weight	=	<u>50.1</u>	%	%Total Weight	=	<u>49.9</u>	%
TOTAL WEIGHT	=	<u>1700.5</u>	kg				

TEST VEHICLE ATTITUDE (all dimensions in millimeters):

AS DELIVERED

Left Front	<u>797</u>	Right Front	<u>786</u>	Left Rear	<u>804</u>	Right Rear	<u>792</u>
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FULLY LOADED

Left Front	<u>784</u>	Right Front	<u>780</u>	Left Rear	<u>764</u>	Right Rear	<u>764</u>
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AS TESTED

Left Front	<u>785</u>	Right Front	<u>782</u>	Left Rear	<u>765</u>	Right Rear	<u>765</u>
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Test Vehicle Wheelbase 2480 mm

As Tested CG = 1238 mm rearward of front wheel centerline

TOTAL VEHICLE LENGTH:

Right Side	=	<u>3821</u>	mm
Left Side	=	<u>3821</u>	mm
Centerline	=	<u>4060</u>	mm

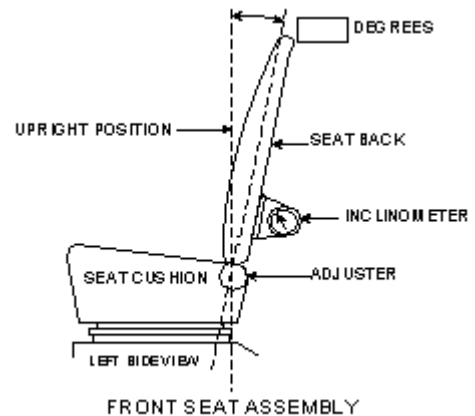
DATA SHEET 1 (continued)

GENERAL TEST VEHICLE PARAMETER DATA

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

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		300 mm	
Total Number of Detents	14	Test Position	8

FRONT SEAT BACK ADJUSTMENT:

Seat Back Angle	22 degrees measured along back of seat
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SECOND POSITION SEAT:

Total Length Fore/Aft Adjustment	N/A
Seat Back Adjustment Position	20 degrees measure along back of seat

ADJUSTABLE STEERING COLUMN POSITION:

Mid-position	
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WINDOW POSITIONS:

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

AMOUNT OF STODDARD SOLVENT IN FUEL TANK:

Fuel System usable Capacity	64.0 L	
Test Volume	59.5 L	93% usable capacity

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

Wheelbase	2480 mm	
Impact Point is	305 mm rearward	of front axle centerline
Actual Impact Point is	315 mm rearward	of front axle centerline

DATA SHEET 2
TEST VEHICLE SUMMARY

VEHICLE IDENTIFICATION:

Year/Make/Model/Body Style	2002 Suzuki Grand Vitara MPV		
Body Color	Black	VIN	JS3TD62V324156964
NHTSA No.	M2 0513	Test Date	9 May 2002
Overall Length	4060 mm	Overall Width	1734 mm

VEHICLE TEST WEIGHT (Pre-Test):

Left Front	=	435	kg	Left Rear	=	429.1	kg
Right Front	=	416.4	kg	Right Rear	=	420	kg
TOTAL FRONT	=	851.4	kg	TOTAL REAR	=	849.1	kg
% Total Weight	=	50.1	%	%Total Weight	=	49.9	%
TOTAL WEIGHT	=	1700.5	kg				
Wheelbase				=		2480	mm
Longitudinal CG from Center of Front Axle				=		1238	mm
Impact Angle with Respect to Impactor				=		90	degrees

ACTUAL IMPACT POINT

Actual Impact Point is 10 mm rearward of nominal impact reference line (lateral)

Actual Impact Point is 0 mm from nominal impact line (vertical)

MAXIMUM EXTERIOR STATIC CRUSH:

1. LEVEL 1	(351 mm above ground)	=	390	mm
2. LEVEL 2	(698 mm above ground)	=	348	mm
3. LEVEL 3	(735 mm above ground)	=	347	mm
4. LEVEL 4	(1054 mm above ground)	=	218	mm
5. LEVEL 5	(1539 mm above ground)	=	41	mm

Maximum Post-Test intrusion at Level 1 is 390 mm

OCCUPANTS

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

INSTRUMENTATION:

Number of Vehicle Data Channels		43
Number of Cameras	Onboard	3
	Off board	5
	MDB	2
	TOTAL	10

DATA SHEET NO. 3**MOVING DEFORMABLE BARRIER (MDB) SUMMARY**Vehicle: 2002 Suzuki Grand VitaraNHTSA No. M2 0513**MDB FACE MANUFACTURER AND SERIAL NUMBER:**Plascore Serial Number 058C0901-3 020C1001**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>90°</u>	
Impact Speed	Primary	<u>62.0 km/h</u>	<u>38.5 mph</u>
	Secondary	<u>61.8 km/h</u>	<u>38.4 mph</u>
	On-Board	<u>62.3 km/h</u>	<u>38.7 mph</u>

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE:

1. Row A Center of Bumper	=	<u>115</u>	mm
2. Row B Top of Bumper	=	<u>81</u>	mm
3. Row C Mid-Level	=	<u>116</u>	mm
4. Row D Top of Stack	=	<u>148</u>	mm

INSTRUMENTATION:

Number of MDB Data Channels	=	<u>5</u>
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DATA SHEET NO. 4

POST-TEST OBSERVATIONS

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

VISIBLE DUMMY CONTACT POINTS:

	<u>LEFT FRONT SID</u>	<u>LEFT REAR SID</u>
Head		Left side of face to upper front of C-pillar; back of head to top of C-pillar; left top of head to upper C-pillar
Upper Torso	Left bottom side of head to seatbelt anchor	To left rear door at window sill
Lower Torso	To left front door at window sill	To left rear door at rear of armrest
Left Knee	To left front door above rear of armrest	To left rear door 280 mm below window sill, just rearward of B-pillar
Left Upper Leg	To left front door 150 mm below automatic window switch	Just below armrest
	To left front door 60 mm above seat cushion	

DOOR OPENING:

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

MDB DISTANCE FROM TARGET IMPACT POINT:

Horizontal	10 mm rearward	Vertical	0 mm
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ARM REST LOCATIONS:

Front	215 mm below window sill
Rear	195 mm below window sill

SEAT MOVEMENT:

Front	Seat bottom crushed approximately 65 mm; seat back crushed approximately 20 mm
Rear	Seat bottom separated from seat track , seat back crushed approximately 5 mm.

GLAZING DAMAGE

Windshield	Diagonal cracks lower left corner
Window	Front and rear left windows shattered at impact

PILLAR PERFORMANCE:

None noted

SILL SEPARATION

None noted

AIRBAG DEPLOYMENT STATUS:

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

OTHER NOTABLE IMPACT EFFECTS:

None noted

SECTION 4
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET 5

SID INSTRUMENTATION DATA

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

	Front Dummy ID 056 Accelerations				Rear Dummy ID 058 Accelerations			
	Max		Min		Max		Min	
	G's	msec	G's	msec	G's	msec	G's	msec
HEAD ACCELERATIONS								
Longitudinal (X)	27.1	95.0	-27.7	41.1	29.3	66.5	-29.1	82.7
Lateral (Y)	9.0	95.0	-56.2	41.1	150.9	65.8	-35.5	74.1
Vertical (Z)	19.8	86.6	-11.1	53.3	22.4	61.2	-36.9	74.6
Resultant (R)	62.7	41.1			153.5	65.8		
HIC36	109.8				1193.9			
RIB ACCELERATIONS								
Upper Rib Lateral (Y)	42.5	53.8	-7.9	95.6	34.9	60.0	-1.4	37.5
Upper Rib Lateral (Y _R)	43.1	53.8	-8.4	95.6	34.1	60.0	-1.5	37.5
Lower Rib Lateral (Y)	42.9	36.2	-6.5	73.8	37.6	57.5	-2.4	166.2
Lower Rib Lateral (Y _R)	43.1	35.6	-7.2	73.8	37.3	57.5	-2.1	166.2
SPINE ACCELERATIONS								
Lower Lateral (Y)	54.4	40.6	-22.0	67.5	27.3	51.9	-2.9	174.4
Lower Lateral (Y _R)	53.7	45.0	-22.4	66.9	26.8	51.9	-2.9	174.4
PELVIS ACCELERATIONS								
Lateral (Y)	85.1	36.9	-19.8	82.5	42.4	47.5	-15.2	81.9
Lateral (Y _R)	85.6	36.2	-17.3	82.5	41.2	46.9	-12.4	80.6

REFERENCE:

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

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

Head Accelerations have been filtered at SAE Class 1000

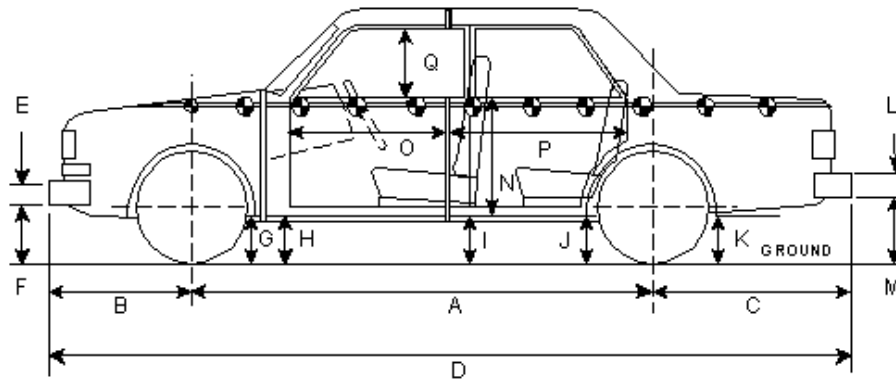
Y_R denotes redundant Y-direction accelerometer

DATA SHEET 6

VEHICLE PRE- AND POST- MEASUREMENTS

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



LEFT SIDE VIEW

	PRE-TEST As delivered (mm)	PRE-TEST As Tested (mm)	POST-TEST (mm)	Δ CHANGE (mm)
A	2480	-	2461	-19
B	604	-	620	16
C	737	-	698	-39
D	4060	-	4055	-5
E	289	-	297	8
F	335	336	370	34
G	288	271	246	-25
H	293	274	243	-31
I	309	285	*	*
J1	301	267	305	38
J2	302	270	*	*
K	435	390	397	7
L	135	-	136	1
M	456	402	393	-9
N	745	-	708	-37
O	1049	-	1032	-17
P	859	-	845	-14
Q	526	-	563	37
R	3821	-	3837	16
S	3821	-	3779	-42
T	1734	-	1382	-352

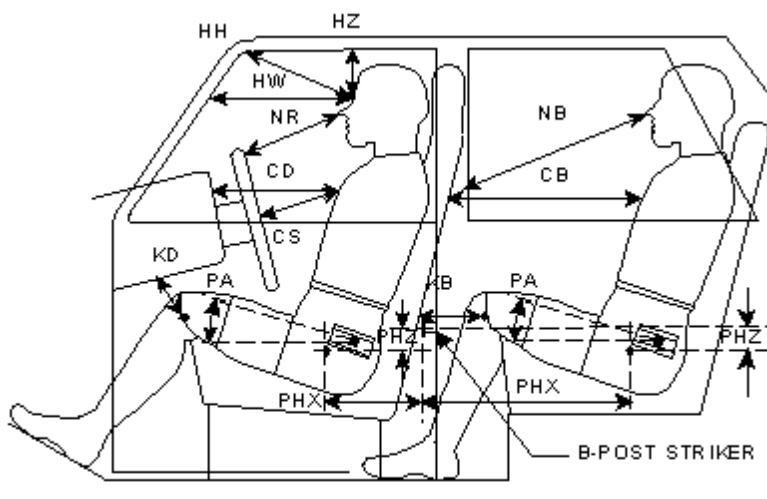
* Plastic trim separated from car on impact

DATA SHEET 7

SID LONGITUDINAL CLEARANCE DIMENSIONS

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



LEFT SIDE VIEW

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

	DRIVER ID# 056	LEFT REAR PASSENGER ID# 058
HH	497	N/A
HW	695	N/A
HZ	233	222
NR/NB	484	520
CD/CB	598	420
CS	376	N/A
KDL(KDA°)/KBL(KDA°)	117 (13°)	94 (-3.8°)
KDR(KDA°)/KBR(KDA°)	120 (22°)	119 (-2.4°)
PA°	23.1°	24.3°
PHX	177 forward	221 forward
PHZ	58 below	189 below

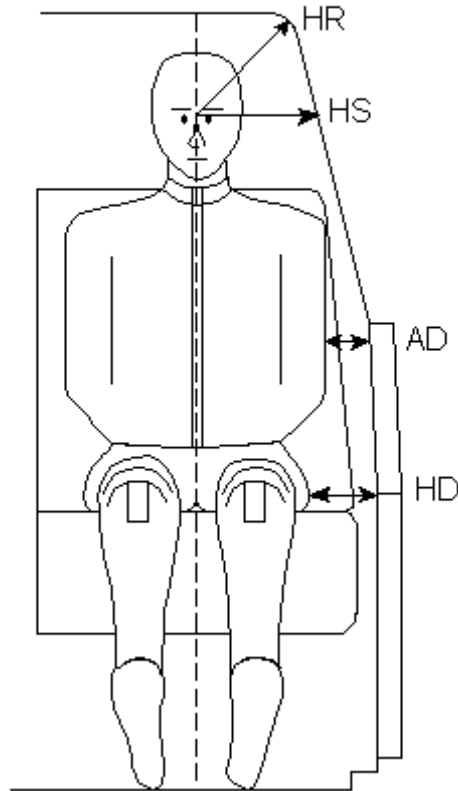
Note: 2-door vehicle shown. Rear dummy PHX & PHZ measurements for 4-door vehicle would use the C-Pillar striker as a reference point

DATASHEET 8

SID LATERAL CLEARANCE DIMENSIONS

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



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

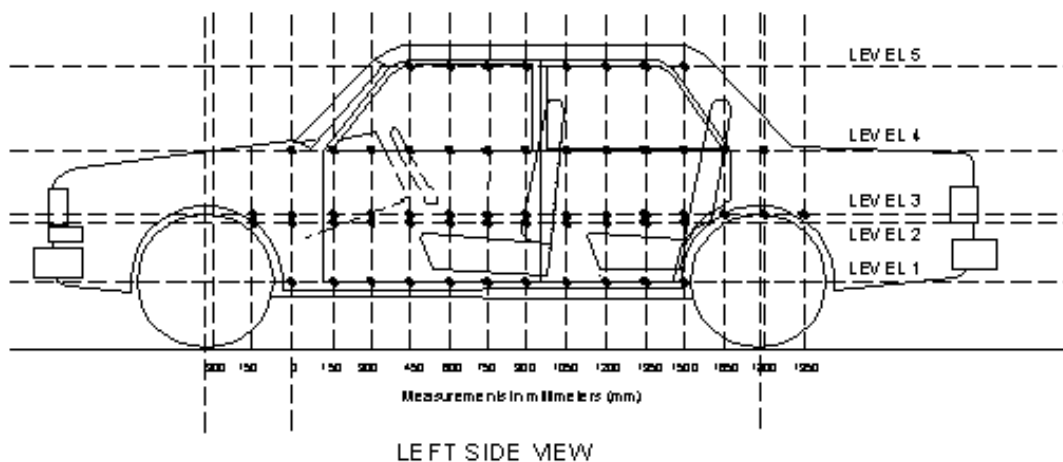
	DRIVER ID# 056		LEFT REAR PASSENGER ID# 058	
HR	218		240	
HS	278		325	
AD	Upper 69	Lower 57	Upper 130	Lower 116
HD	107		159	

DATA SHEET 9

VEHICLE SIDE MEASUREMENTS

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



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	1539 mm
Level 4 @ Window Sill	1054 mm
Level 3 @ Mid-Door	735 mm
Level 2 @ Occupant H-Point	698 mm
Level 1 @ Axle Centerline or Sill Top Height	351 mm

DATA SHEET 10

VEHICLE EXTERIOR CRUSH PROFILES – ALL LEVELS

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

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	351	PRE								200	226	230	229	228	228	228	229	230	229	219										
		POST								406	453	530	552	571	594	606	615	620	606	586										
		CRUSH								206	227	300	323	343	366	378	386	390	377	367										
LEVEL 2	698	PRE		249					177	225	229	230	230	230	230	230	230	230	232	232	226	184			180	230	244			
		POST		250					307	404	488	527	536	540	547	561	566	578	580	555	480	386			253	272	263			
		CRUSH		1					130	179	259	297	306	310	317	331	336	348	348	323	254	202			73	42	19			
LEVEL 3	735	PRE		253	181				185	225	225	232	235	235	236	237	238	238	240	235	226	195	180	178	196	232	246			
		POST		222	192				312	397	491	527	537	542	550	560	570	585	580	547	471	365	295	276	265	274	264			
		CRUSH		-31	11				127	172	266	295	302	307	314	323	332	347	340	312	245	170	115	98	69	42	18			
LEVEL 4	1054	PRE		332	310	300	295	293	290	290	293	304	306	311	312	315	315	317	319	321	323	325	327	327	330	339	350			
		POST		297	288	293	305	316	325	343	370	391	400	407	426	456	490	535	492	448	409	390	371	392	383	371	366			
		CRUSH		-35	-22	-7	10	23	35	53	77	87	94	96	114	141	175	218	173	127	86	65	44	65	53	32	16			
LEVEL 5	1539	PRE												493	497	502	505	507	507	506	502	498	503	503	503	503				
		POST												530	537	543	546	547	545	545	541	534	5340	525	525	525				
		CRUSH												37	40	41	41	40	38	39	39	36	31	22	22	22				

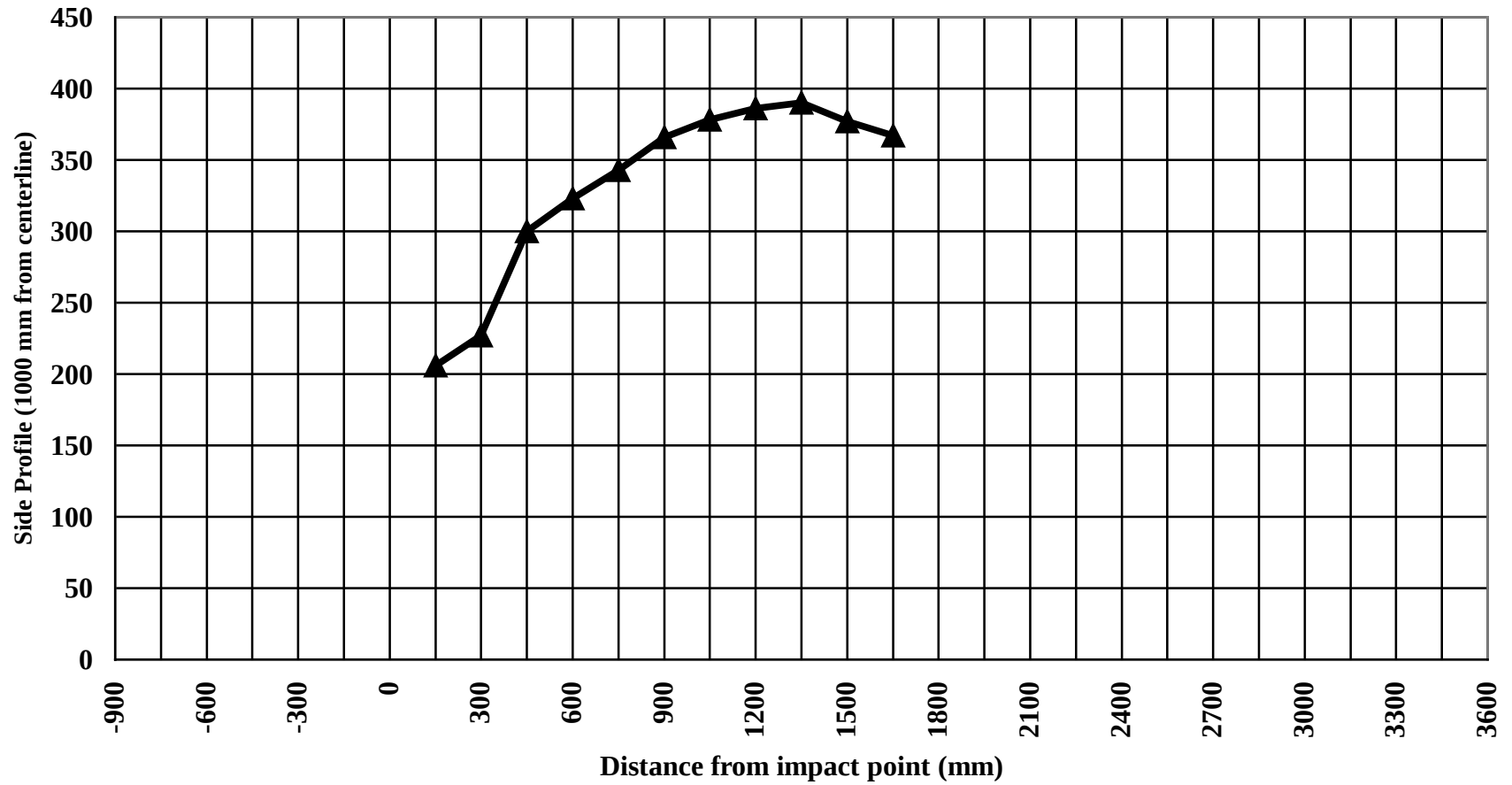
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

SIDE PROFILE LEVEL 1 -351 mm above ground



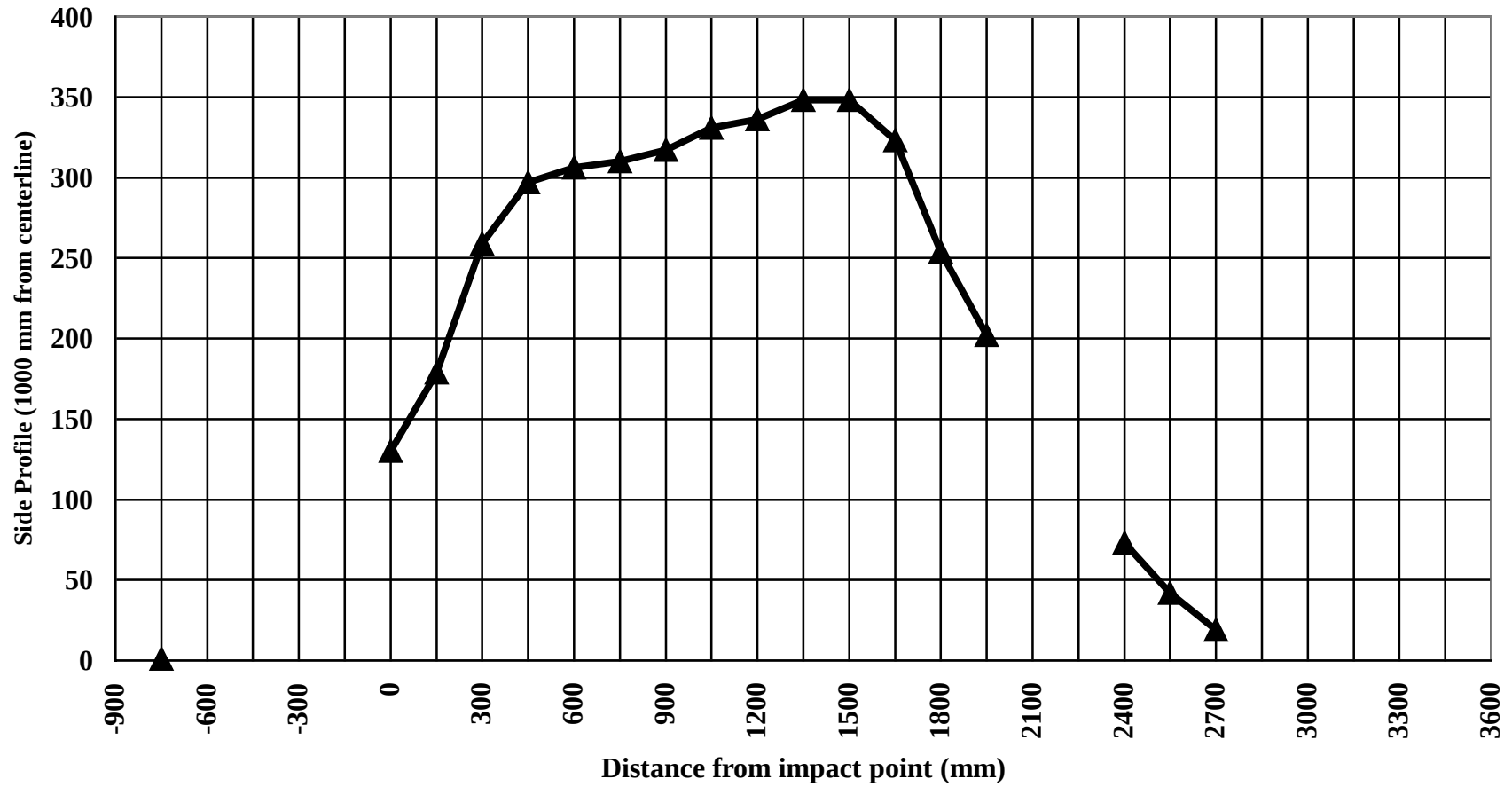
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

SIDE PROFILE LEVEL 2 - 698 mm above ground



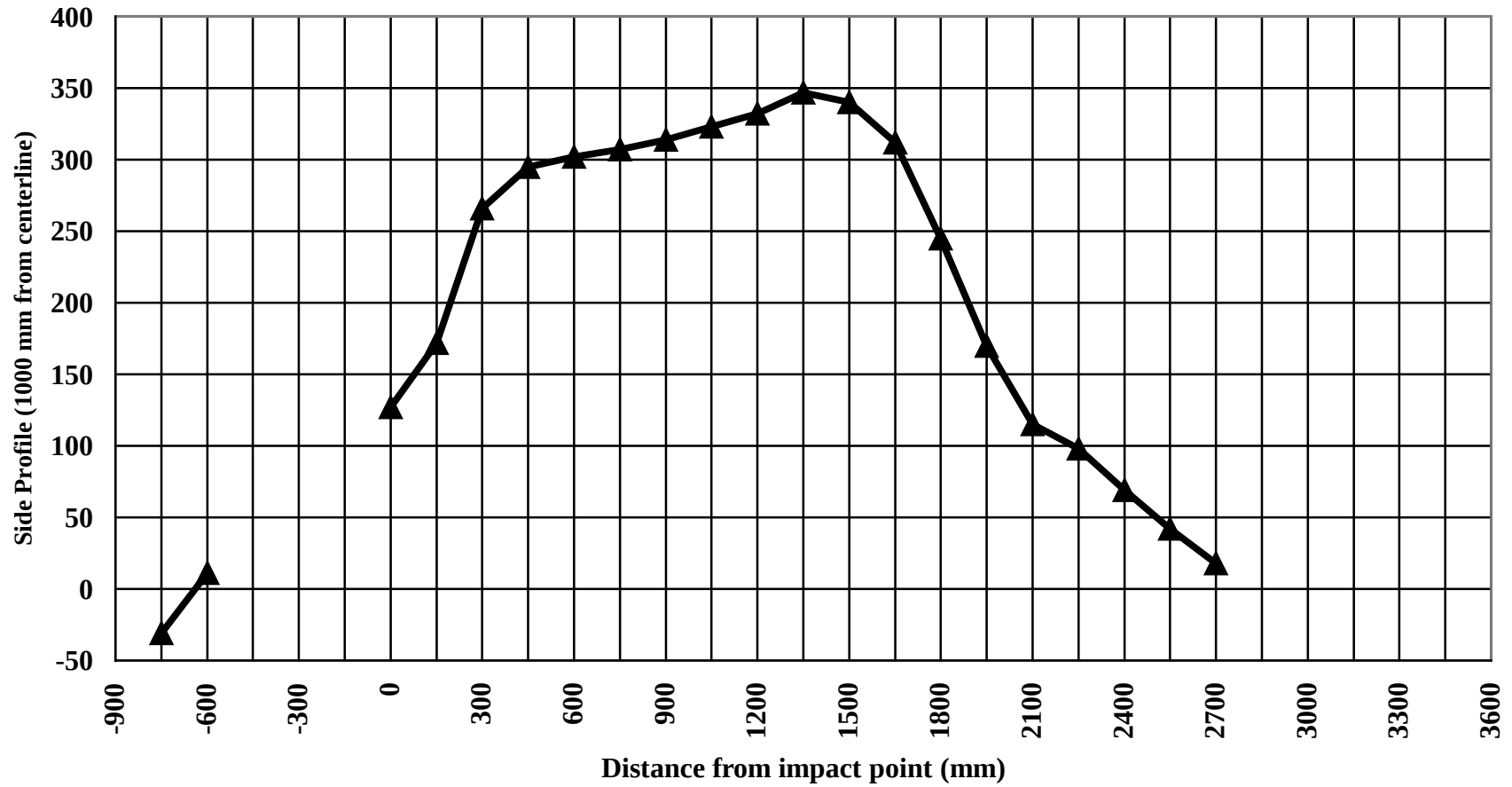
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

SIDE PROFILE LEVEL 3 - 735 mm above ground



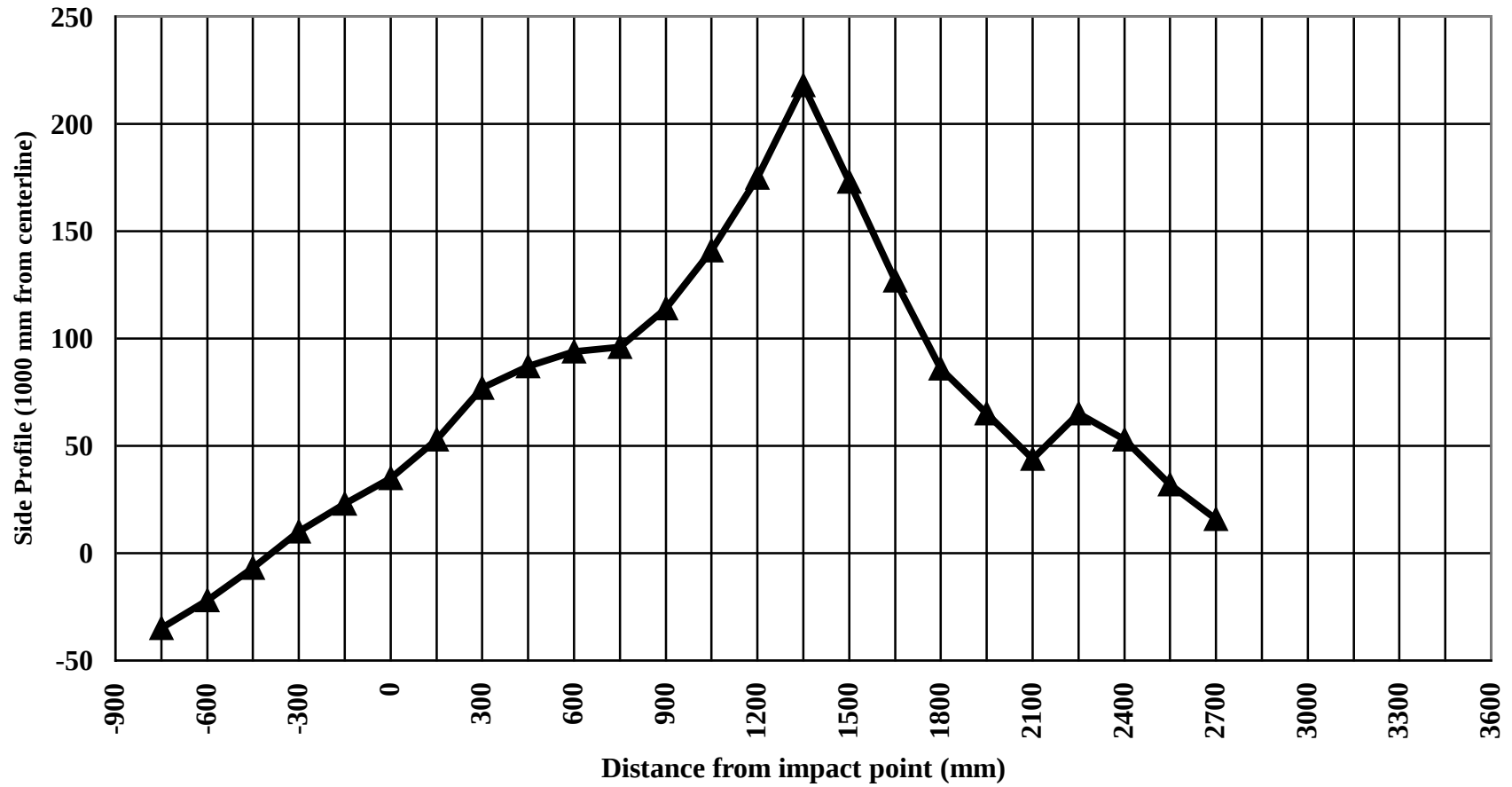
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

SIDE PROFILE LEVEL 4 - 930 mm above ground



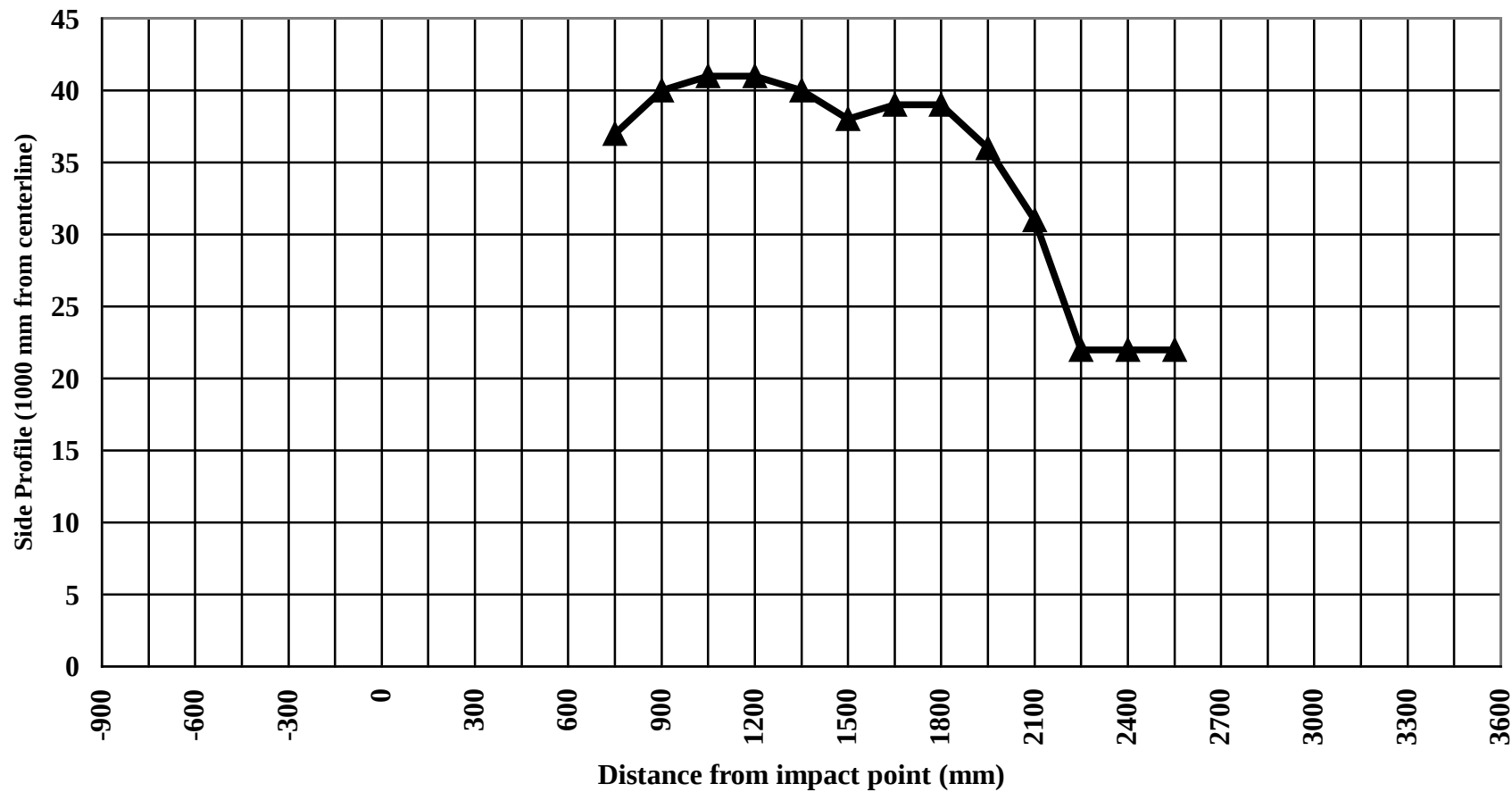
DATA SHEET 10 (continued)

VEHICLE EXTERIOR CRUSH PROFILES

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

SIDE PROFILE LEVEL 5 - 1933 mm above ground

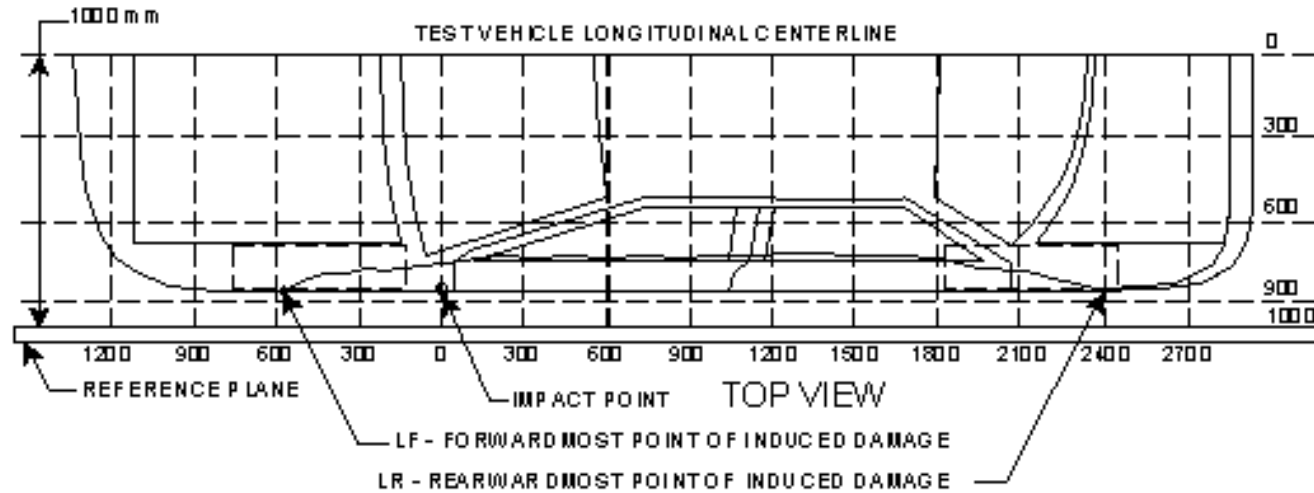


DATA SHEET 11

VEHICLE DAMAGE PROFILE DISTANCES

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



DPD MEASUREMENTS (mm)		POST-TEST (mm)	PRE-TEST (mm)	STATIC CRUSH (mm)
1	-150	181	181	0
2	270	408	181	227
3	690	547	181	366
4	1110	601	181	420
5	1530	612	181	431
6	1950	182	182	0

DATA SHEET 12

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

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

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

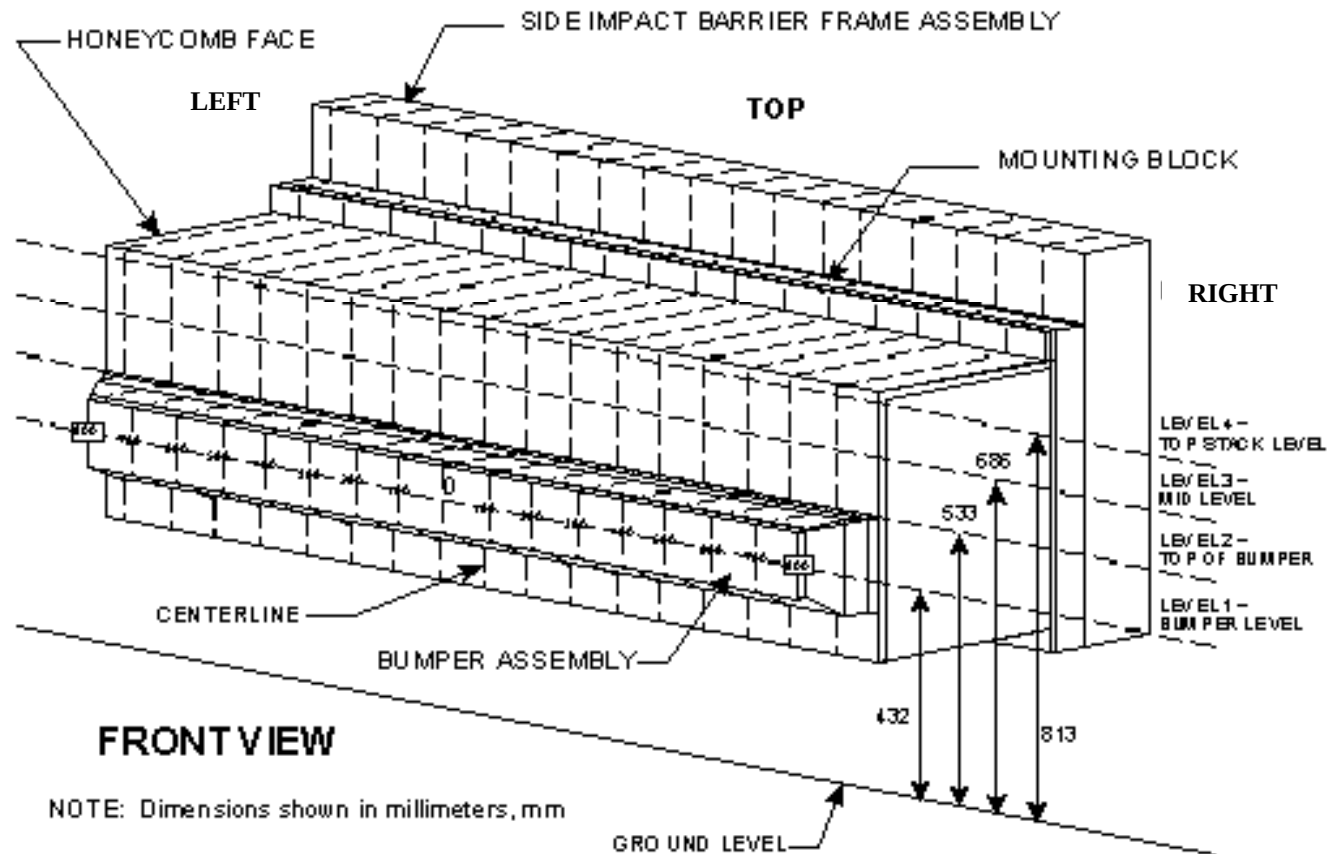
LEVEL	HEIGHT AT CL (mm)		DISTANCE LEFT OF CENTER								0	DISTANCE RIGHT OF CENTER							
			800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
LEVEL 4 TOP STACK	810	PRE-	530	530	530	529	529	529	529	530	530	529	529	529	529	529	529	529	529
		POST-	658	605	582	558	542	551	540	540	540	550	555	560	568	580	617	675	677
		CRUSH	128	75	582	29	13	22	11	10	10	21	26	31	39	51	88	146	148
LEVEL 3 MID- LEVEL	685	PRE-	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527	527
		POST-	643	563	535	531	529	532	530	531	531	533	534	536	538	541	548	585	604
		CRUSH	116	36	8	4	2	5	3	4	4	6	7	9	11	14	21	58	77
LEVEL 2 TOP BUMPER	560	PRE-	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525	525
		POST-	606	575	554	534	528	528	530	531	531	536	542	546	550	557	568	582	591
		CRUSH	81	50	29	9	3	3	5	6	6	11	17	21	25	32	43	57	66
LEVEL 1 MID- BUMPER	432	PRE-	433	420	420	420	420	420	420	420	420	420	420	420	420	421	422	422	433
		POST-	524	507	482	462	452	450	452	450	450	462	467	472	478	488	505	525	548
		CRUSH	91	87	82	42	32	30	32	30	30	42	47	52	58	67	83	103	115

DATA SHEET 12 (continued)

STATIC CRUSH OF IMPACTOR FACE

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

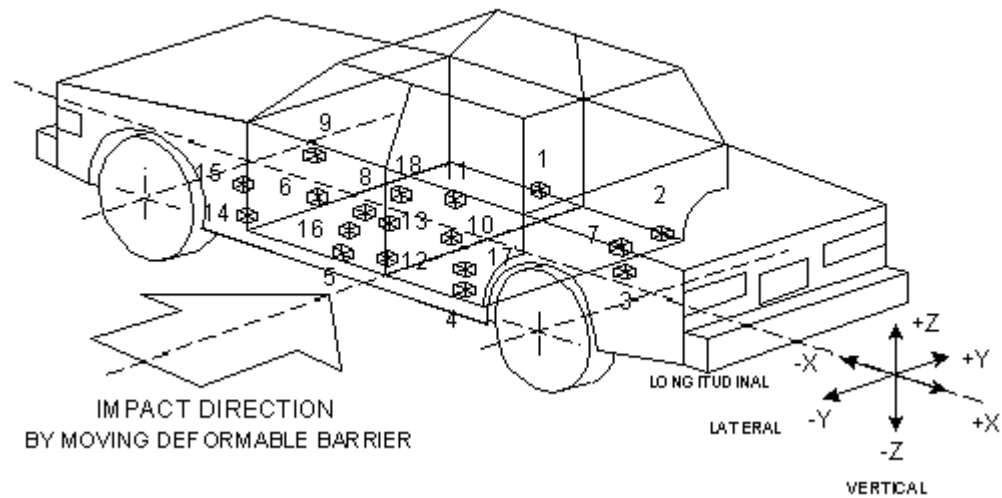


DATA SHEET 13

TEST VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



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

VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

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	2459	630	242	4.1	34.9	-7.5	9.3	37.2	35.5	-5.0	62.1	0.9	11.3	-10.9†	29.9†		
2	Right Side Sill at Rear Seat	1390	582	216	11.6 †	29.9 †	-6.2 †	9.2 †	24.9 †	8.5 †	-2.0 †	20.2 †	2.0 †	8.2 †	-8.8 †	19.8 †		
3	Rear Floorpan Above Axle	850	28	-136	5.2	34.5	-9.9	18.7	31.9	8.5	-7.8	20.2	11.9	24.4	-13.6	48.2	32.0	8.4
4	Left Side Sill at Rear Seat	1410	-737	210					206.7 ‡	9.4 ‡	-185.6 ‡	18.9 ‡						
5	Left Side Sill at Front Seat	2453	-689	246					131.1	7.9	-51.2	19.0						
6	Left Front Door on Centerline	Accelerometer not requested																
7	Right Rear Occupant Compartment	1240	318	-240					33.5	7.7	-2.3	21.8						
8	Midrear of Left Front Door	Accelerometer not requested																
9	Left Front Door Upper Centerline	Accelerometer not requested																
10	Midrear of Left Rear Door	Accelerometer not requested																

Axis Origin X – Rear Bumper Axis Orientation +(X) Forward
 Y – Vehicle Centerline +(Y) Right
 Z – Middle of rear bumper +(Z) Down

† Accelerometer wires cut approximately 30 msec after impact

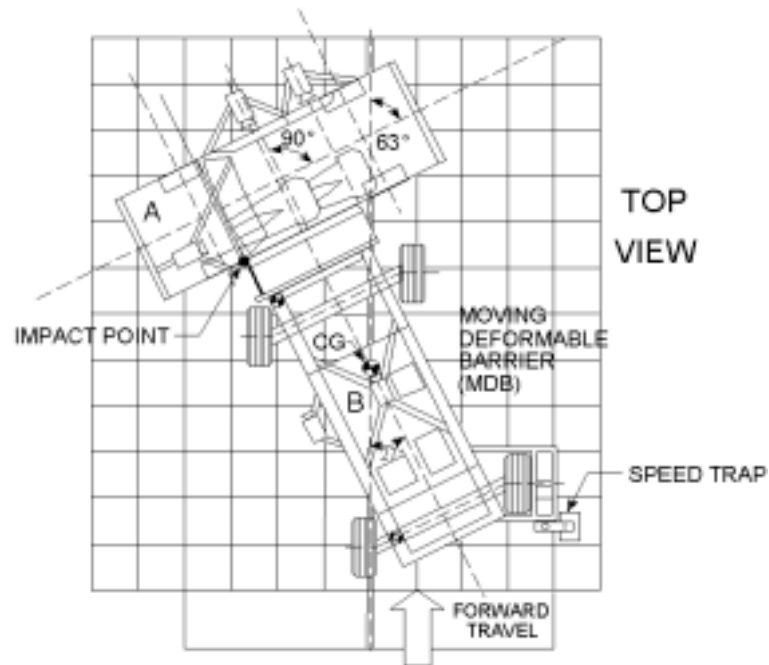
‡ Accelerometer wire cut approximately 19 msec after impact

VEHICLE ACCELEROMETER LOCATIONS AND SUMMARY DATA

NHTSA No. M2 0513

Axis Origin	X – Rear Bumper	Axis Orientation	+(X) Forward
	Y – Vehicle Centerline		+(Y) Right
	Z – Middle of rear bumper		+(Z) Down

DATA SHEET 14
MDB ACCELEROMETER LOCATIONS AND DATA SUMMARY



Location		Coordinates			Longitudinal (X)				Lateral (Y)				Vertical (Z)				Resultant	
		X mm	Y mm	Z mm	Max		Min		Max		Min		Max		Min		Max	
					G's	msec	G's	msec	G's	msec	G's	msec	G's	msec	G's	msec	G's	msec
1	MDB Center of Gravity	1113	-1	311	1.1	114.6	-19.6	41.6	1.3	56.7	-6.7	40.5	6.5	56.8	-6.4	30.3	21.2	40.8
2	MDB Rear Frame Member	2812	-614	585	1.8	184.8	-22.6	39.2	4.2	40.4	-1.3	71.8						

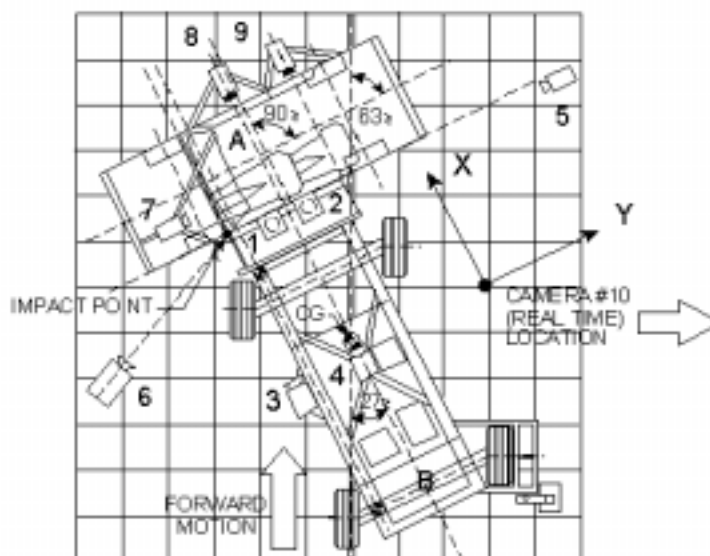
Axis Origin	X – Rear Bumper	Axis Orientation	+(X) Forward
	Y – Vehicle Centerline		+(Y) Right
	Z – Middle of rear bumper		+(Z) Down

DATA SHEET 15

HIGH-SPEED CAMERA LOCATIONS AND DATA SUMMARY

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



Camera No.	View	Coordinates (mm)*			Angle wrt Horiz.	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead view of test vehicle	110	990	4623	-90	7	1000
2	Overhead close-up view of impact plane	30	305	4629	-90	12	1000
3	MDB onboard close-up view of impact point	-2333	-60	-32	0.4	13	1000
4	MDB onboard view of driver dummy	-2262	840	468	-3.9	13	1000
5	Right side ground level overall view	3900	13577	620	-4.2	45	1000
6	Left side ground level overall view	-401	-4447	820	-13.1	8	1000
7	Test vehicle onboard driver front view	635	-50	380	-10°	10	1000
8	Test vehicle onboard driver side view	1285	1024	188	-5°	7.5	1000
9	Test vehicle onboard passenger side view	1292	1704	205	-5°	7.5	1000
10	Real-time film coverage of test	-	-	-	-	-	-

* Reference: (from point of impact)
+ X = Forward
+ Y = To Right
+ Z = Upward

SECTION 5
FUEL SYSTEM INTEGRITY

DATA SHEET 16

FUEL SYSTEM INTEGRITY DATA

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513

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	29.6 ml
2. For 5 minute period after vehicle motion ceases	0	147.9 ml
3. For next 25 minutes	0	29.6 ml / 1 min.

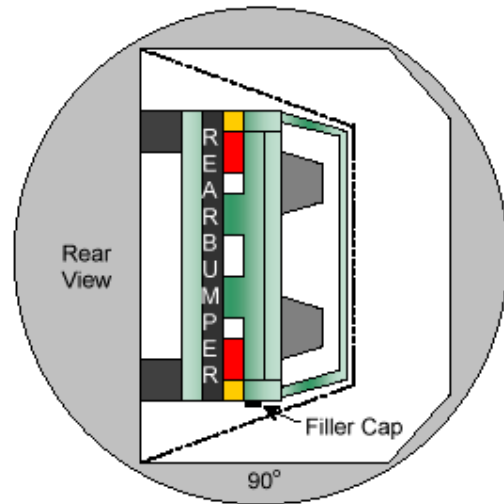
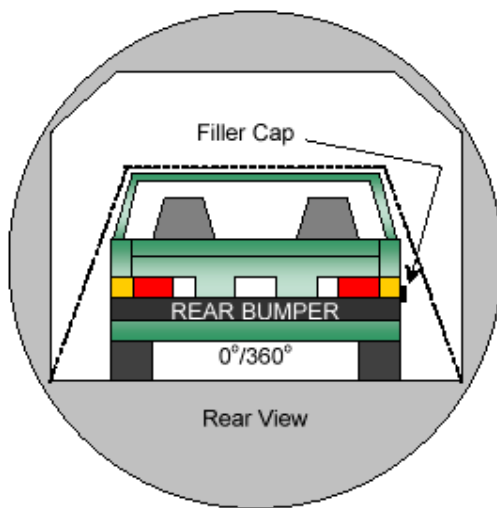
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17

ROLLOVER DATA

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



0° TO 90°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	1	minutes	8	seconds
(Spec Range =1 to 3 minutes)				
FMVSS 301 Position Hold Time	5	minutes	0	seconds
TOTAL	6	minutes	8	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	147.9 ml.
2. Sixth Minute From Onset of Rotation	0	29.6 ml.
3. Seventh Minute From Onset of Rotation	0	29.6 ml
4. Eighth Minute if Required	-	29.6 ml

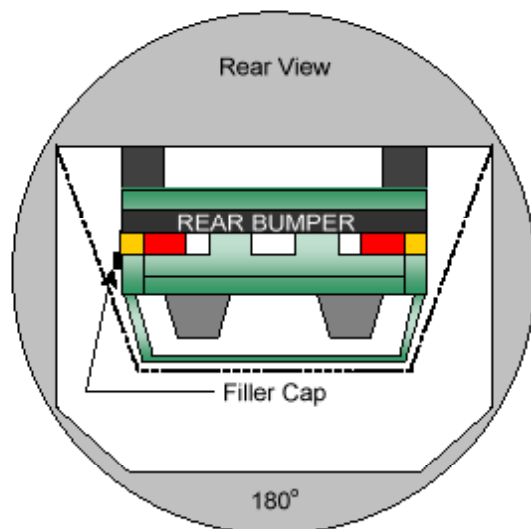
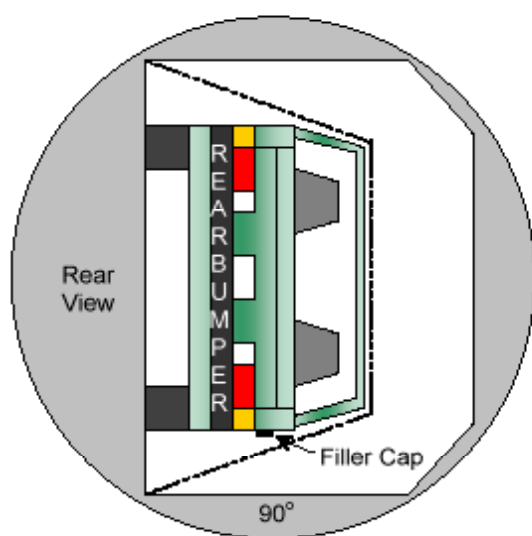
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



90° TO 180°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>7</u> seconds
(Spec Range =1 to 3 minutes)		
FMVSS 301 Position Hold Time	<u>5</u> minutes	<u>4</u> seconds
TOTAL	<u>6</u> minutes	<u>11</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	147.9 ml.
2. Sixth Minute From Onset of Rotation	0	29.6 ml.
3. Seventh Minute From Onset of Rotation	0	29.6 ml
4. Eighth Minute if Required	-	29.6 ml

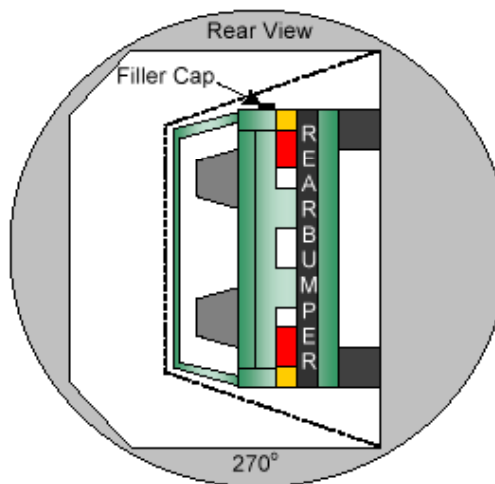
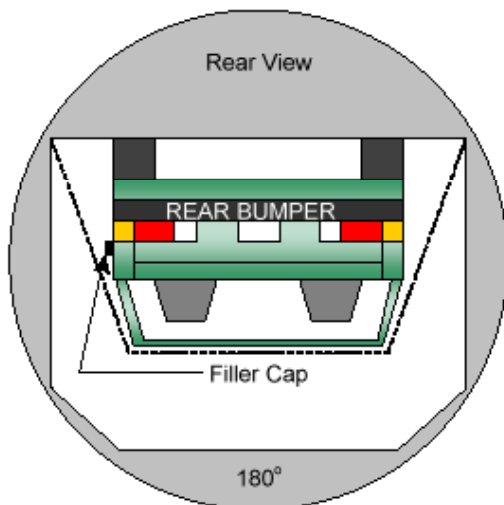
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



180° TO 270°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

Rollover Fixture 90° Rotation Time	<u>1</u> minutes	<u>6</u> seconds
(Spec Range =1 to 3 minutes)		
FMVSS 301 Position Hold Time	<u>5</u> minutes	<u>0</u> seconds
TOTAL	<u>6</u> minutes	<u>6</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	147.9 ml.
2. Sixth Minute From Onset of Rotation	0	29.6 ml.
3. Seventh Minute From Onset of Rotation	0	29.6 ml
4. Eighth Minute From Onset of Rotation	-	29.6 ml

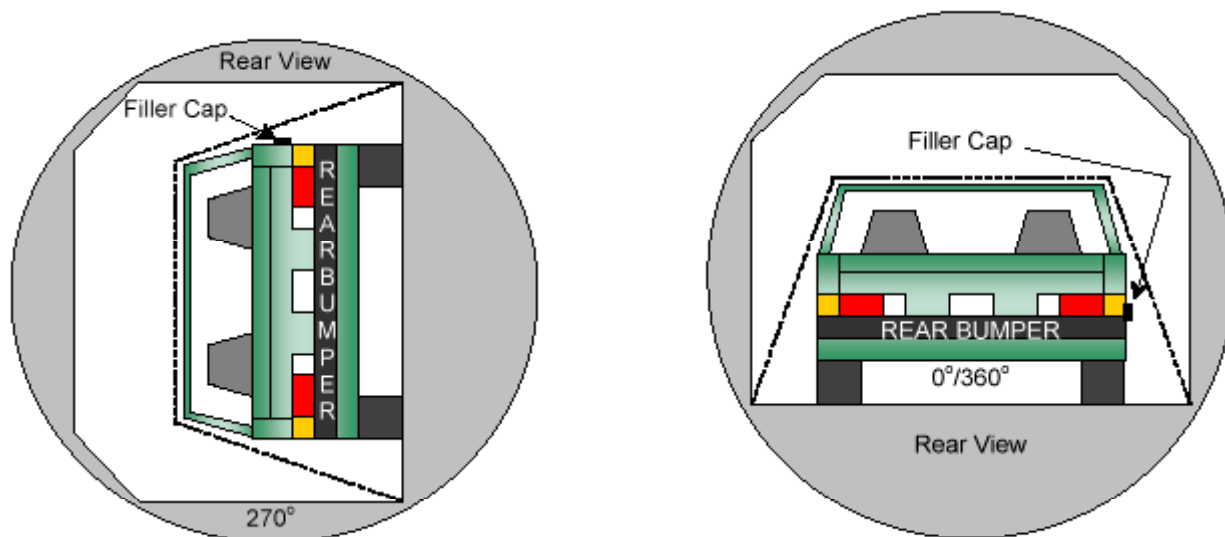
FUEL SPILLAGE LOCATION(S): None

DATA SHEET 17 (continued)

ROLLOVER VEHICLE

Vehicle: 2002 Suzuki Grand Vitara

NHTSA No. M2 0513



270° TO 360°

DETERMINATION OF SOLVENT COLLECTION TIME PERIOD:

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

FUEL SPILLAGE MEASUREMENT:

270° TO 360° ROTATION	TEST RESULTS	MAXIMUM ALLOWABLE
1. First 5 Minutes From Onset of Rotation	0	147.9 ml.
2. Sixth Minute From Onset of Rotation	0	29.6 ml.
3. Seventh Minute From Onset of Rotation	0	29.6 ml
4. Eighth Minute if Required	-	29.6 ml

FUEL SPILLAGE LOCATION(S): None

APPENDIX A
PHOTOGRAPHS

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



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



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



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



Figure A-37: CLOSE-UP OF VEHICLE'S CERTIFICATION LABELS

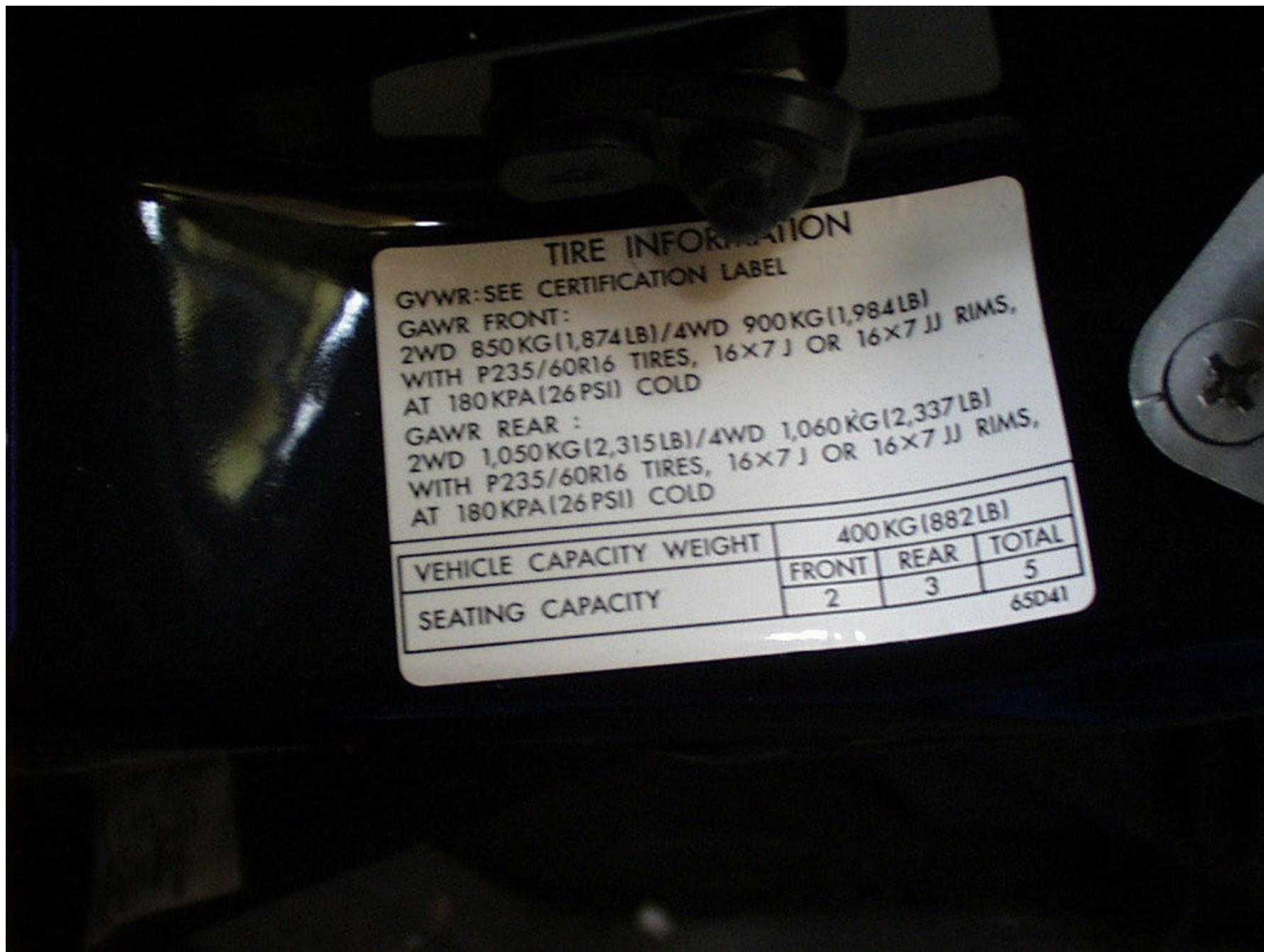


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Figure A-39: IMPACT



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Figure A-41: ROLLOVER 90 DEGREES



Figure A-42: ROLLOVER 180 DEGREES

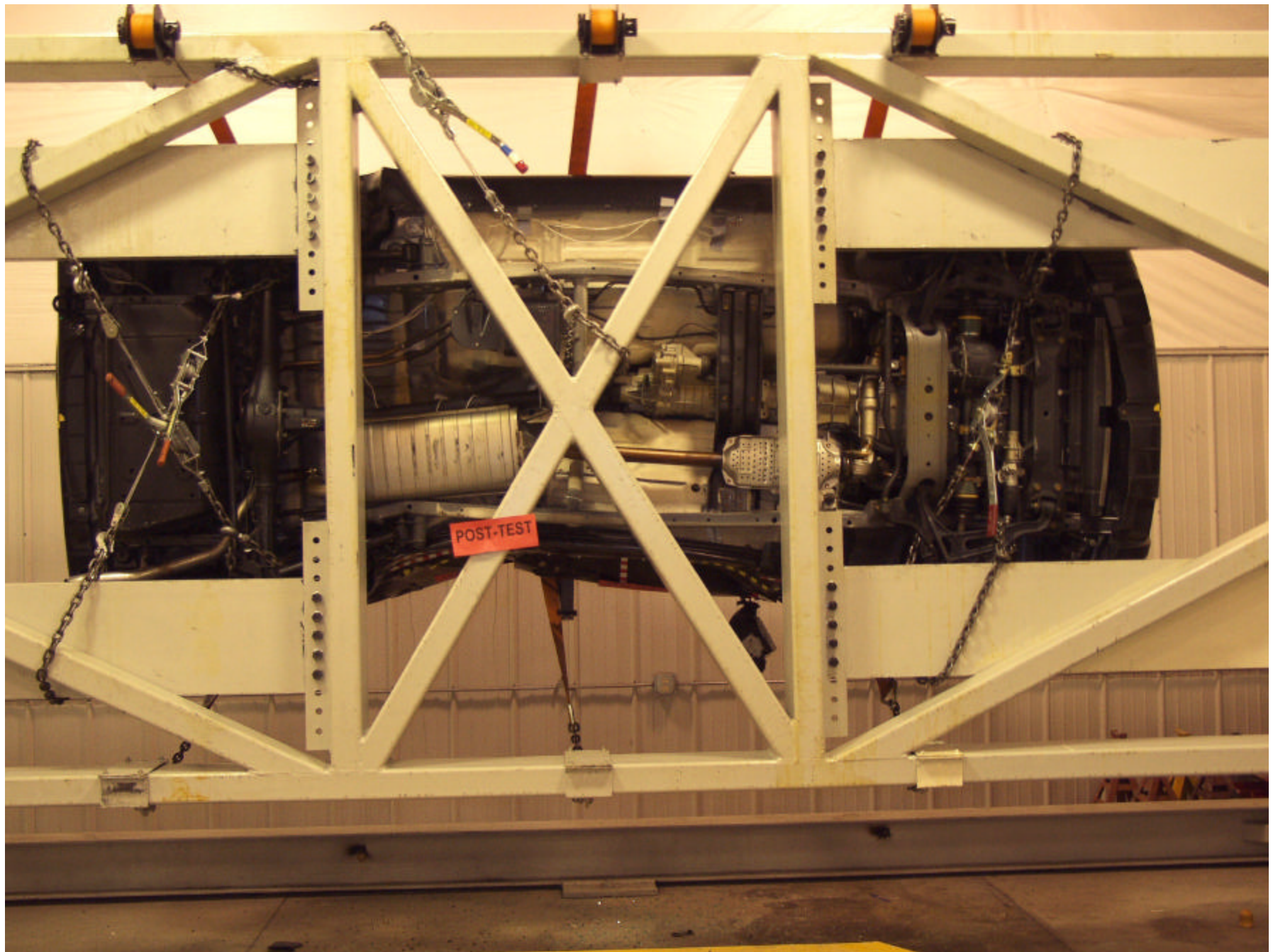


Figure A-43: ROLLOVER 270 DEGREES



Figure A-44: ROLLOVER 360 DEGREES



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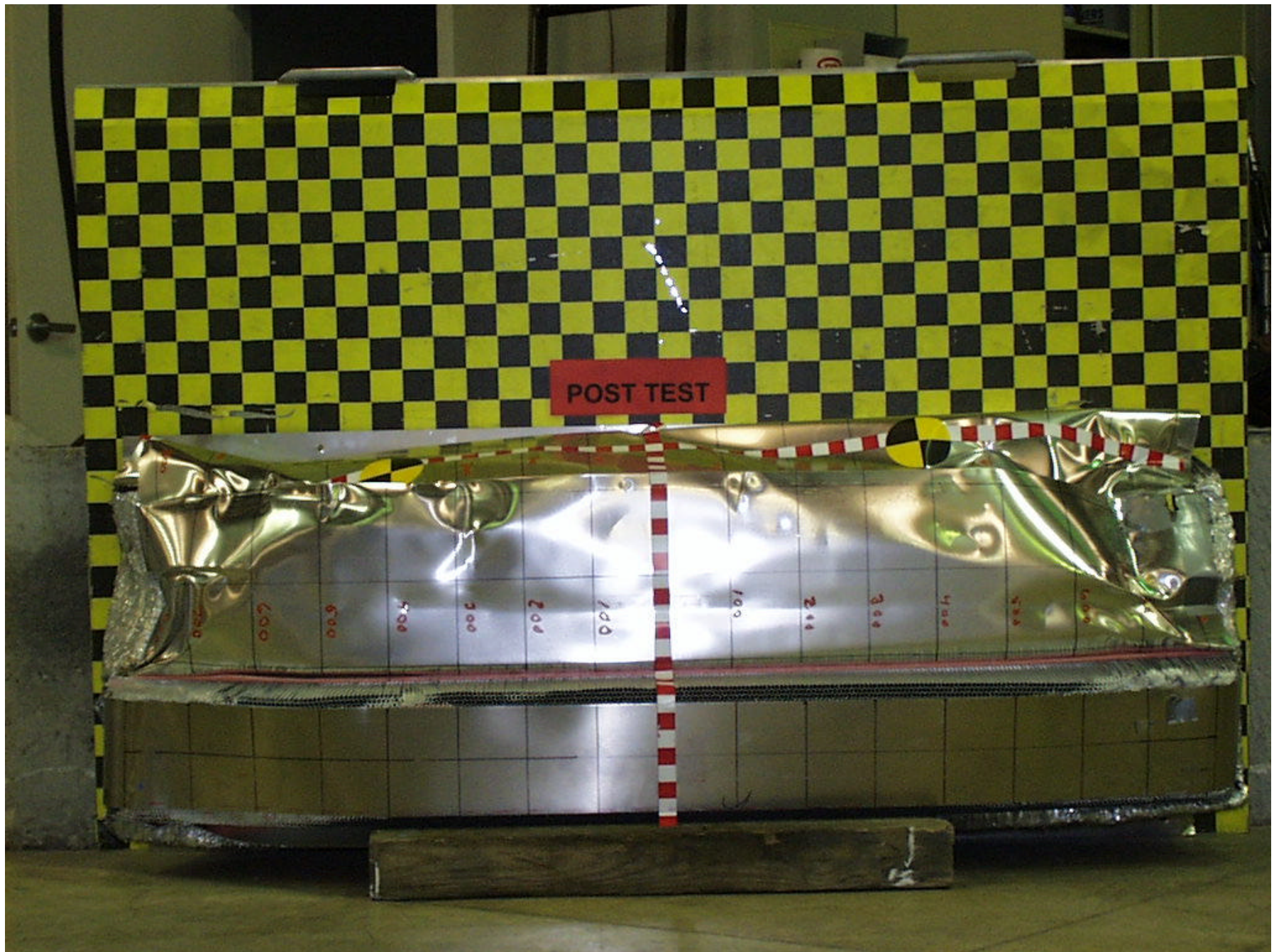


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Figure A-47: PRE-TEST ALUMINUM BARRIER LEFT SIDE



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VEHICLE, MDB, AND SID RESPONSE DATA

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ACCELERATION DATA – FIR FILTERED

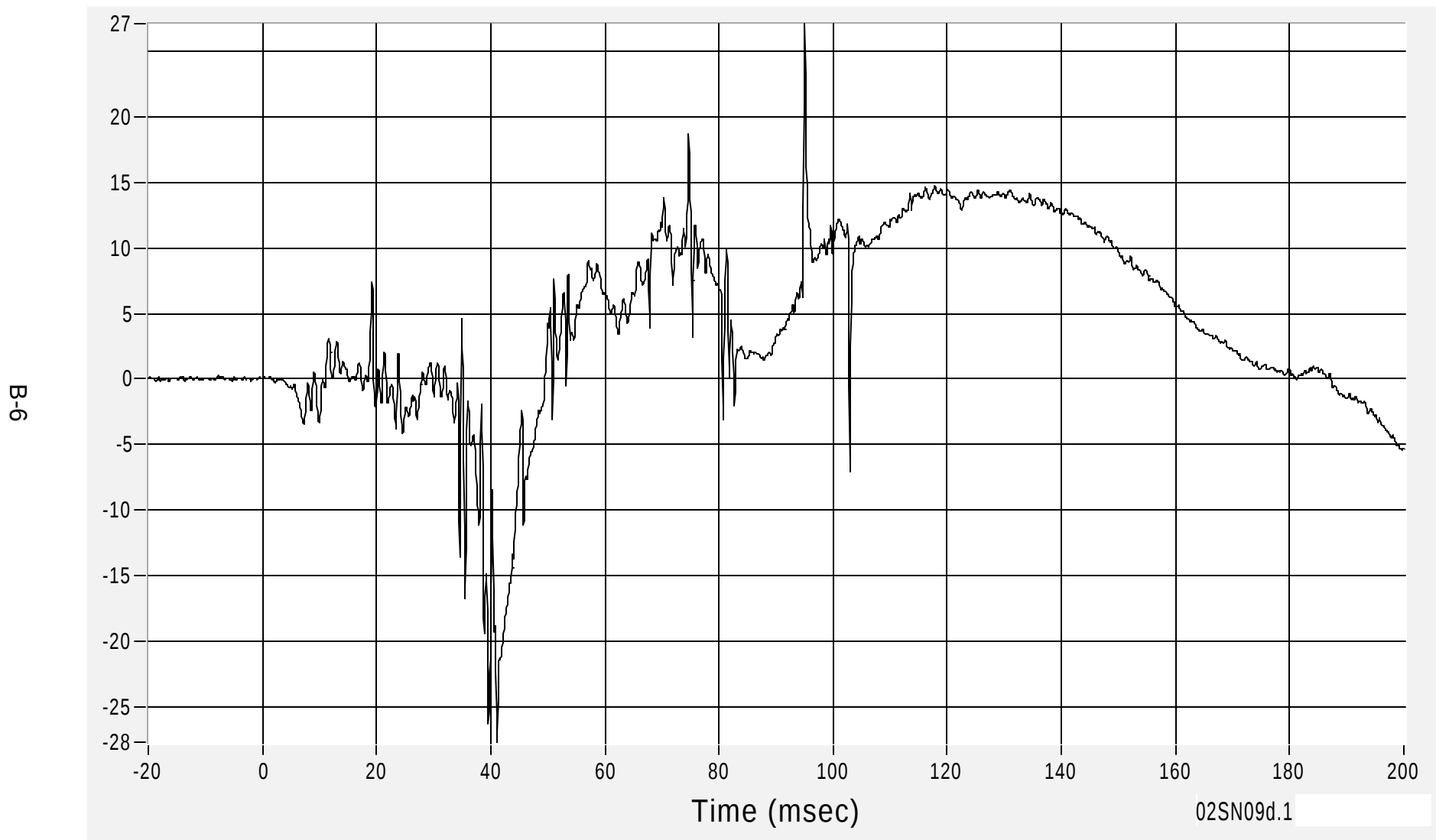
<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
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Driver Head CG (X) Acceleration

Max 27.1 G's at 95.0 msec

Acceleration (G's) CFC1000

Min -27.7 G's at 41.1 msec



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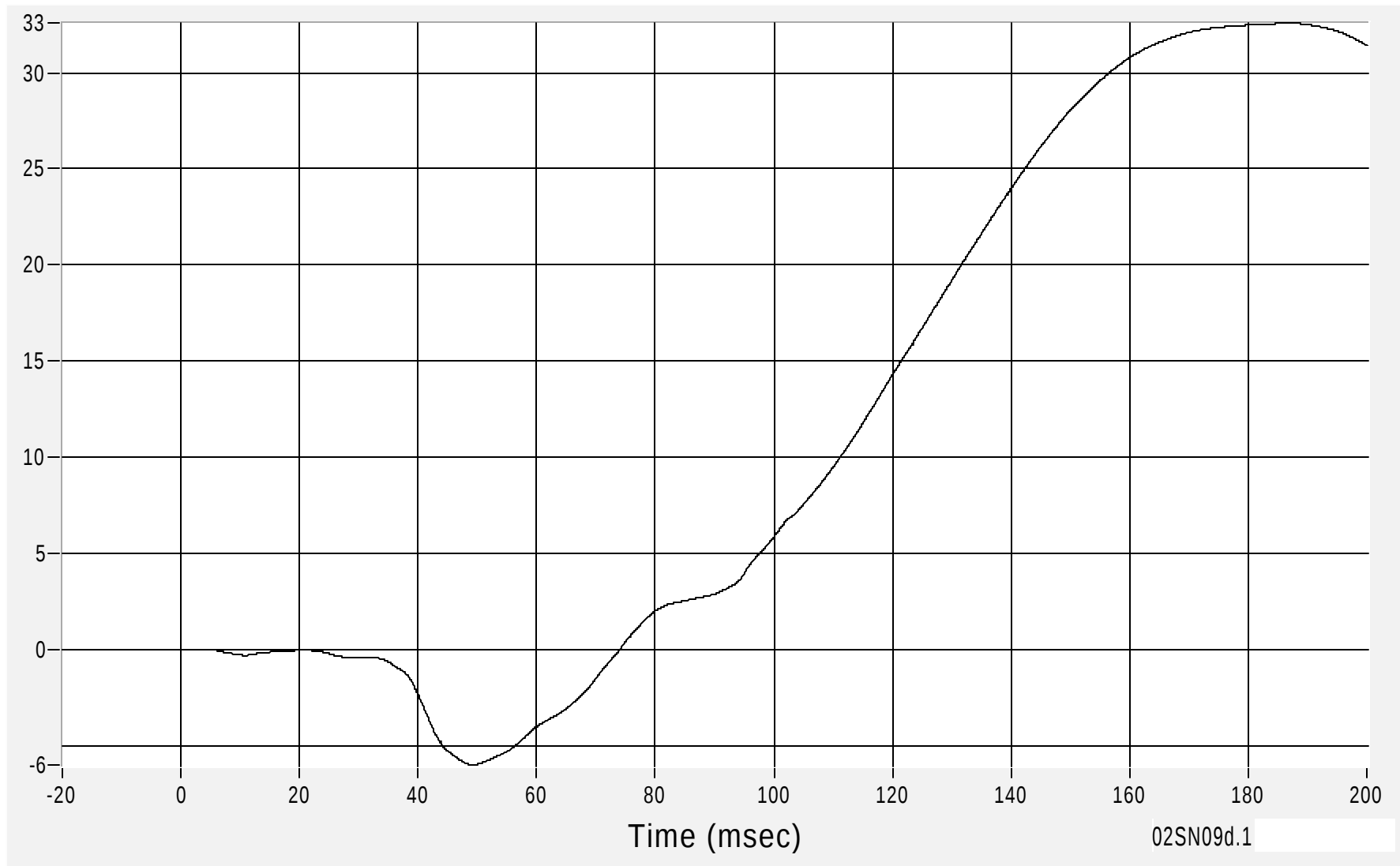
Driver Head CG (X) Velocity

Max 32.6 km/h at 187.0 msec

Velocity (km/h) CFC180

Min -6.0 km/h at 49.3 msec

B-7



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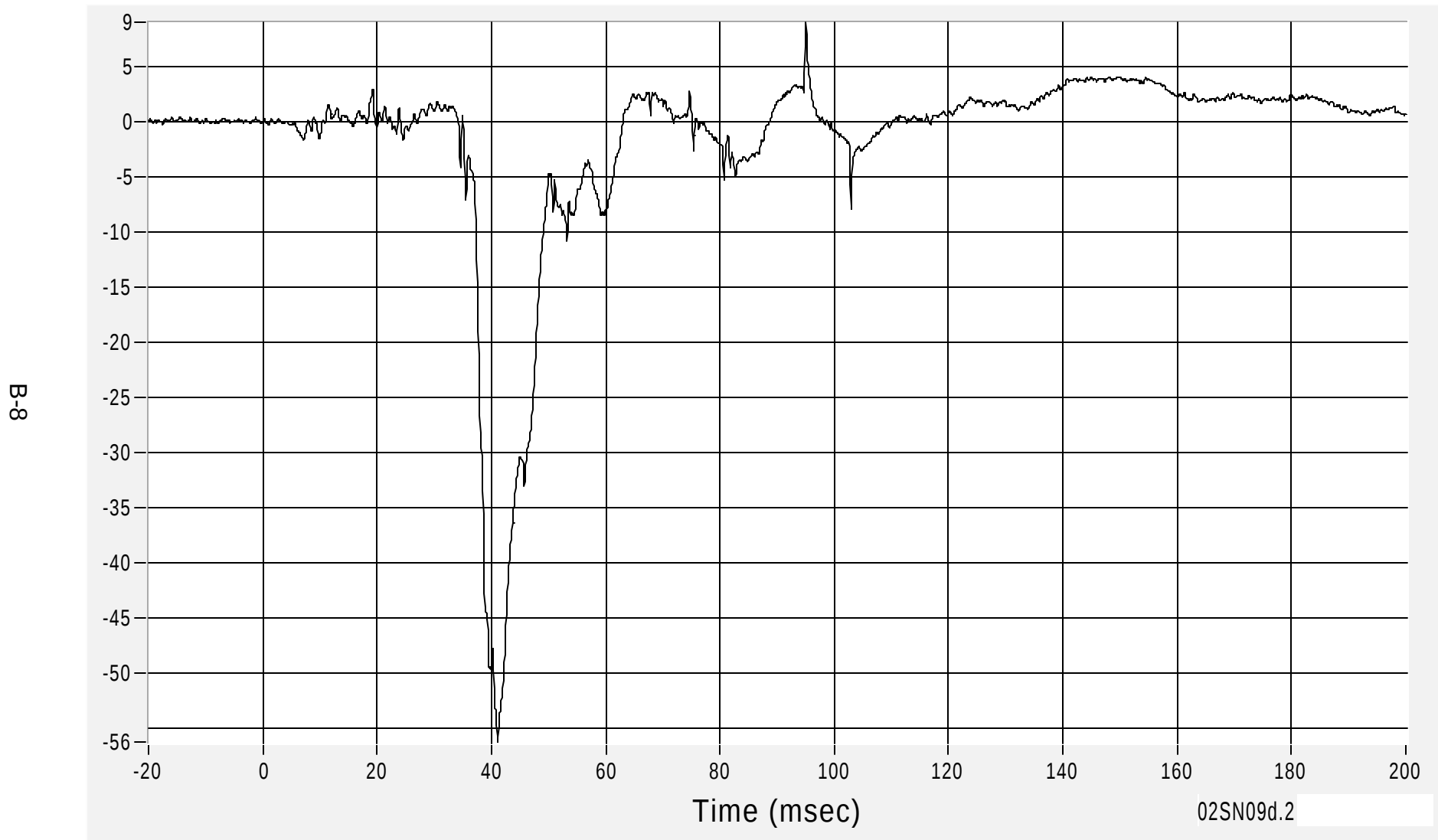
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Driver Head CG (Y) Acceleration

Max 9.0 G's at 95.0 msec

Acceleration (G's) CFC1000

Min -56.2 G's at 41.1 msec



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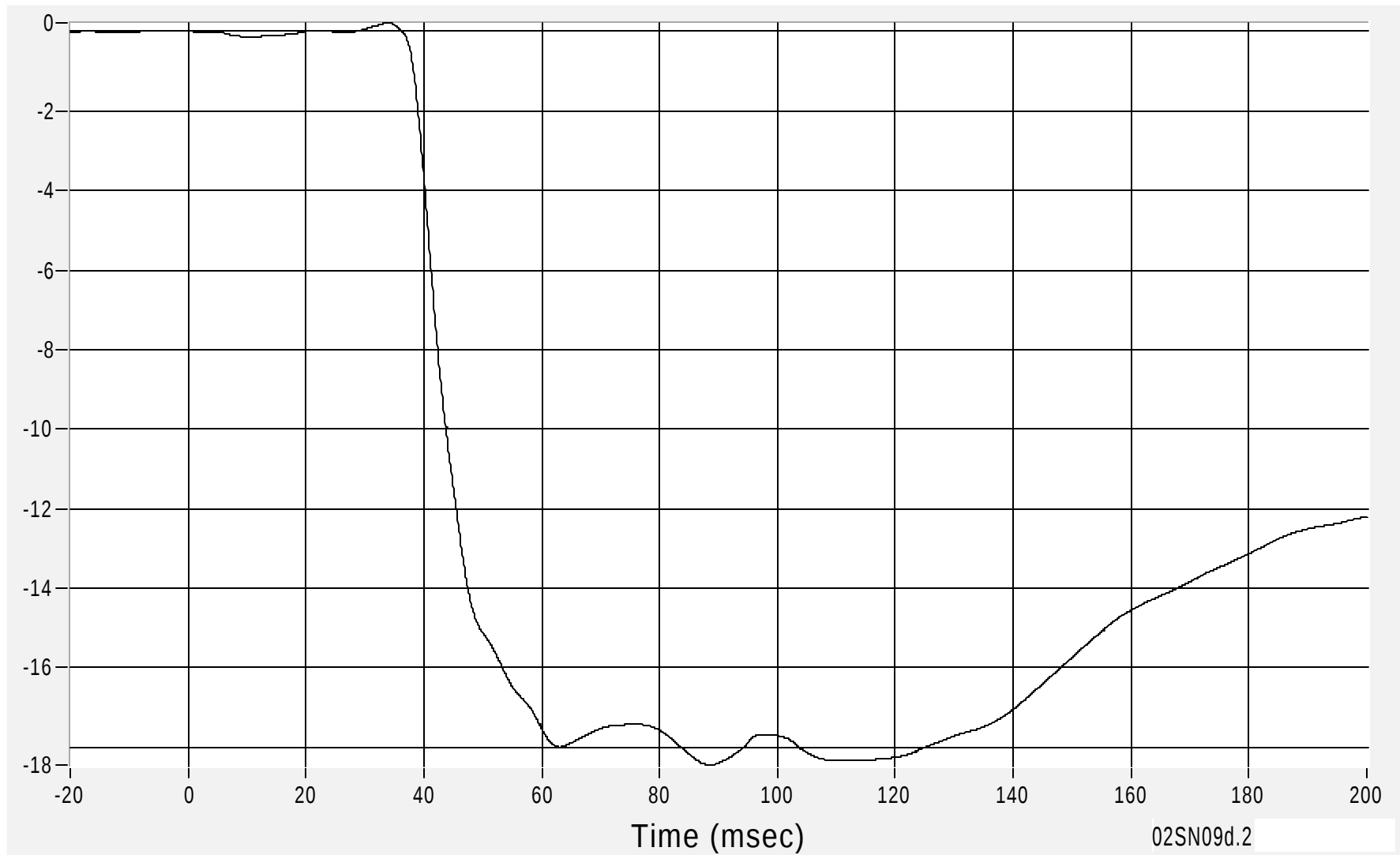
Driver Head CG (Y) Velocity

Max 0.2 km/h at 33.9 msec

Velocity (km/h) CFC180

Min -18.4 km/h at 88.6 msec

B-9



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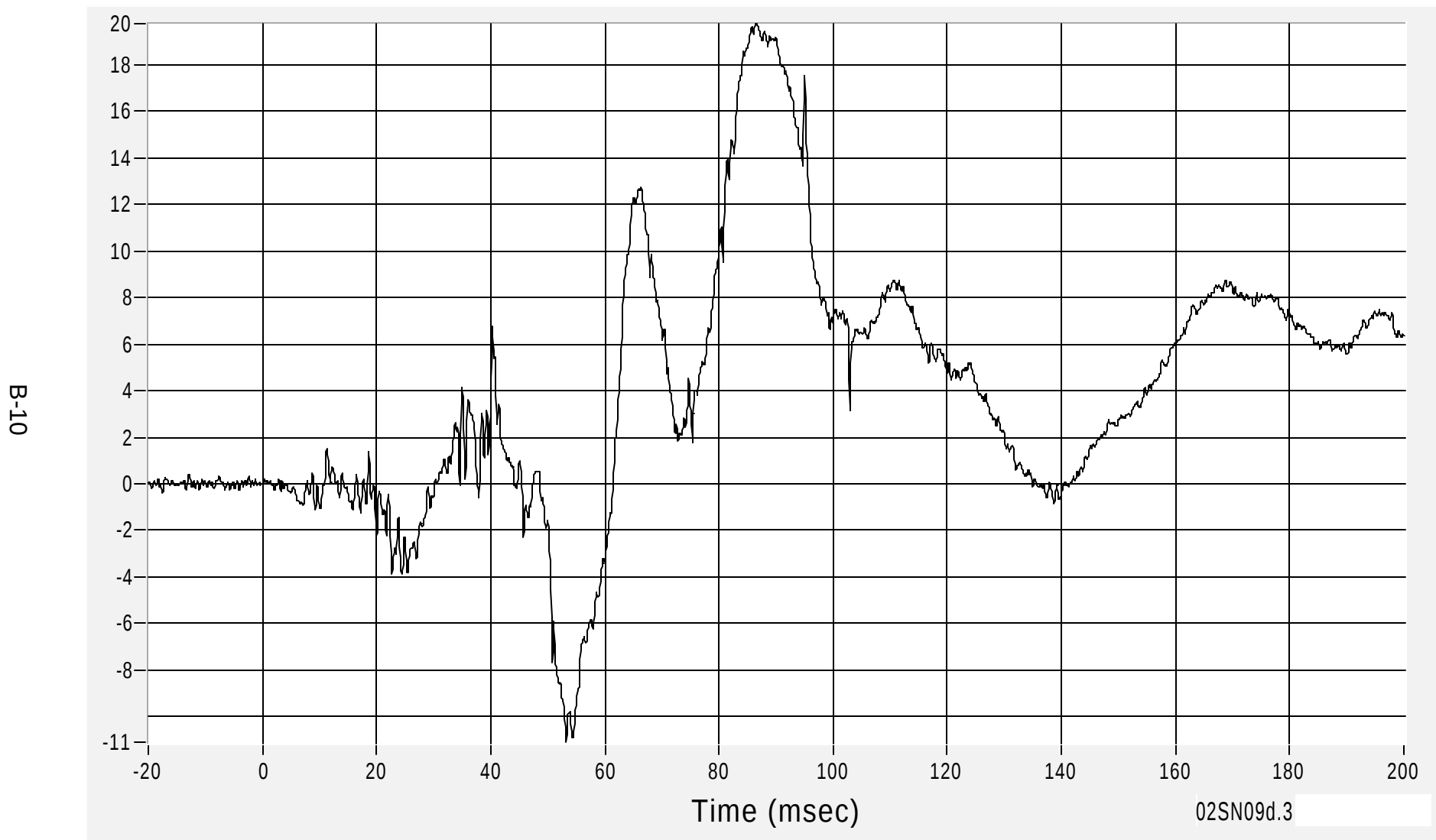
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Driver Head CG (Z) Acceleration

Max 19.8 G's at 86.6 msec

Acceleration (G's) CFC1000

Min -11.1 G's at 53.3 msec



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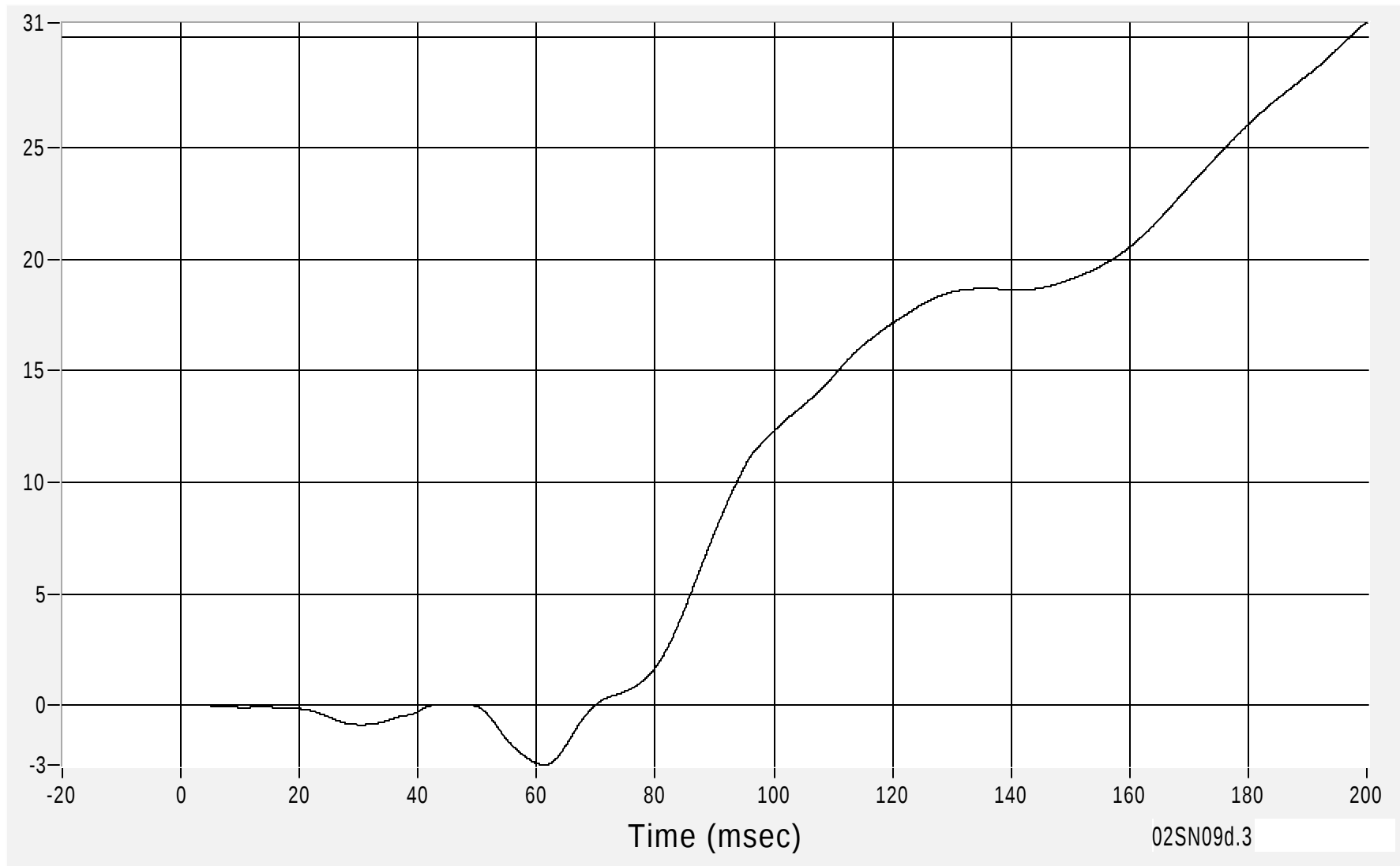
Driver Head CG (Z) Velocity

Max 30.6 km/h at 199.9 msec

Velocity (km/h) CFC180

Min -2.7 km/h at 61.3 msec

B-11



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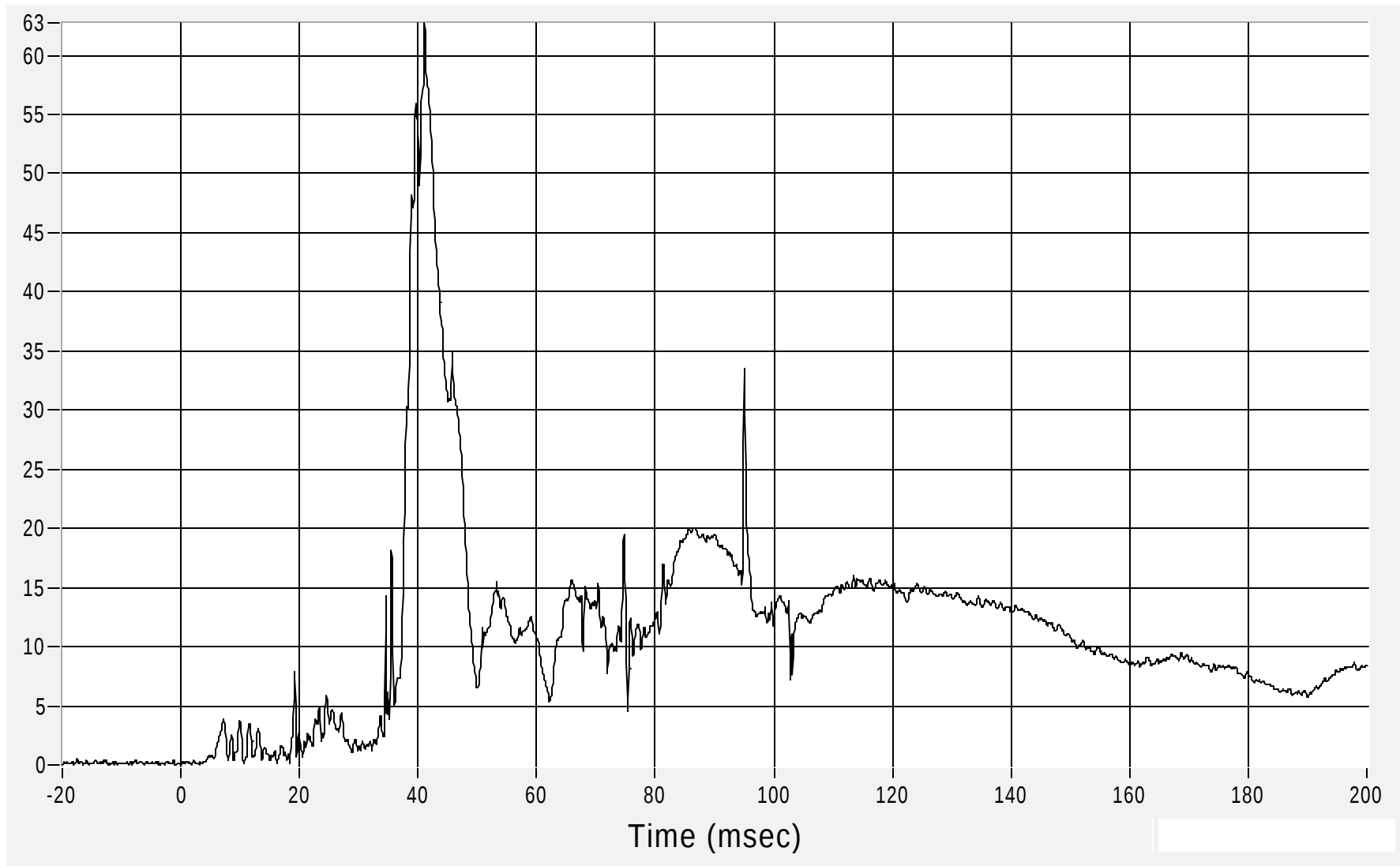
Driver Head Resultant Acceleration

Max 62.7 G's at 41.1 msec

Acceleration (G's) CFC1000

Min 0.0 G's at 0.0 msec

B-12



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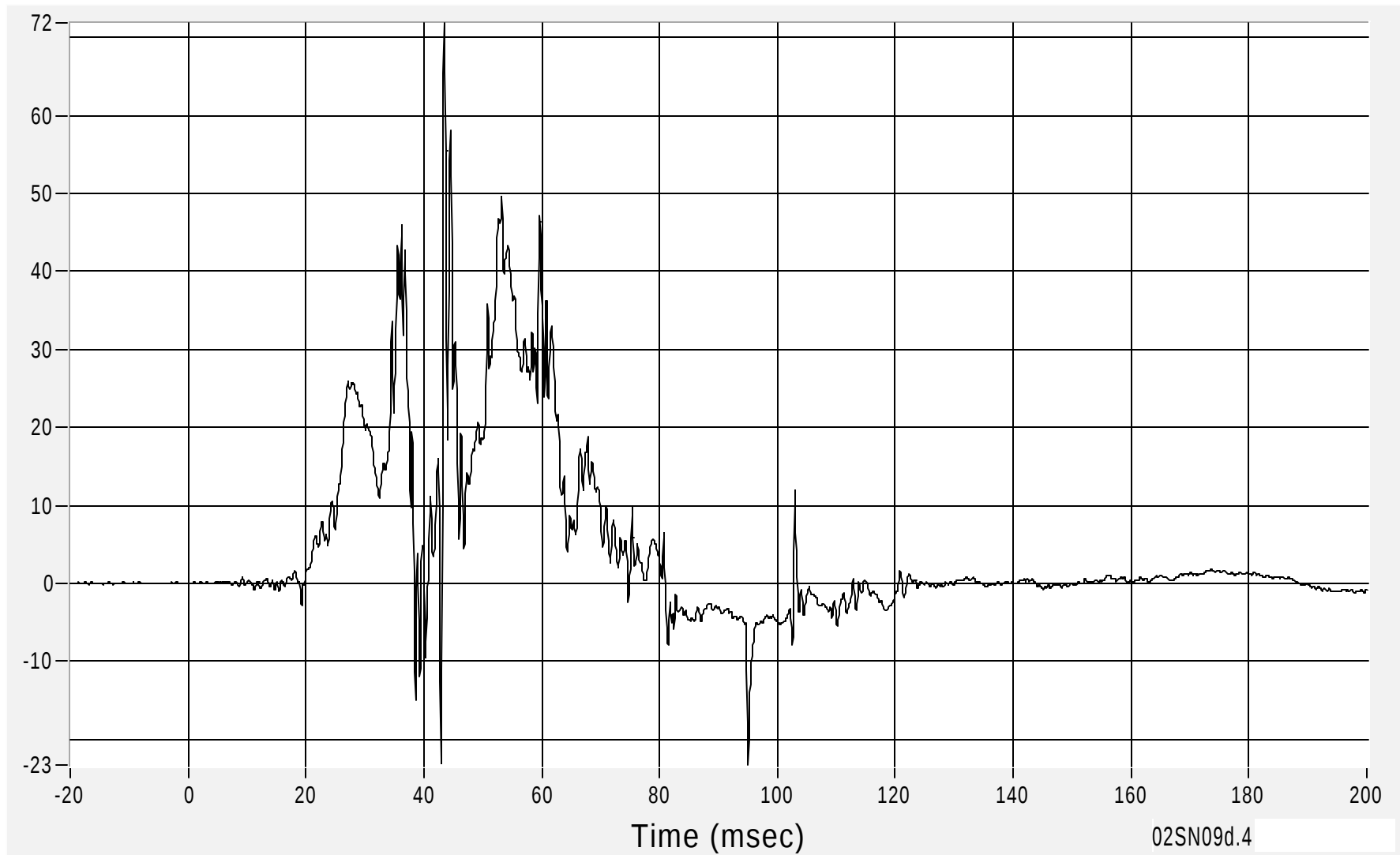
Driver Upper Rib (Y) Acceleration

Max 71.9 G's at 43.4 msec

Acceleration (G's) CFC1000

Min -23.3 G's at 95.0 msec

B-13



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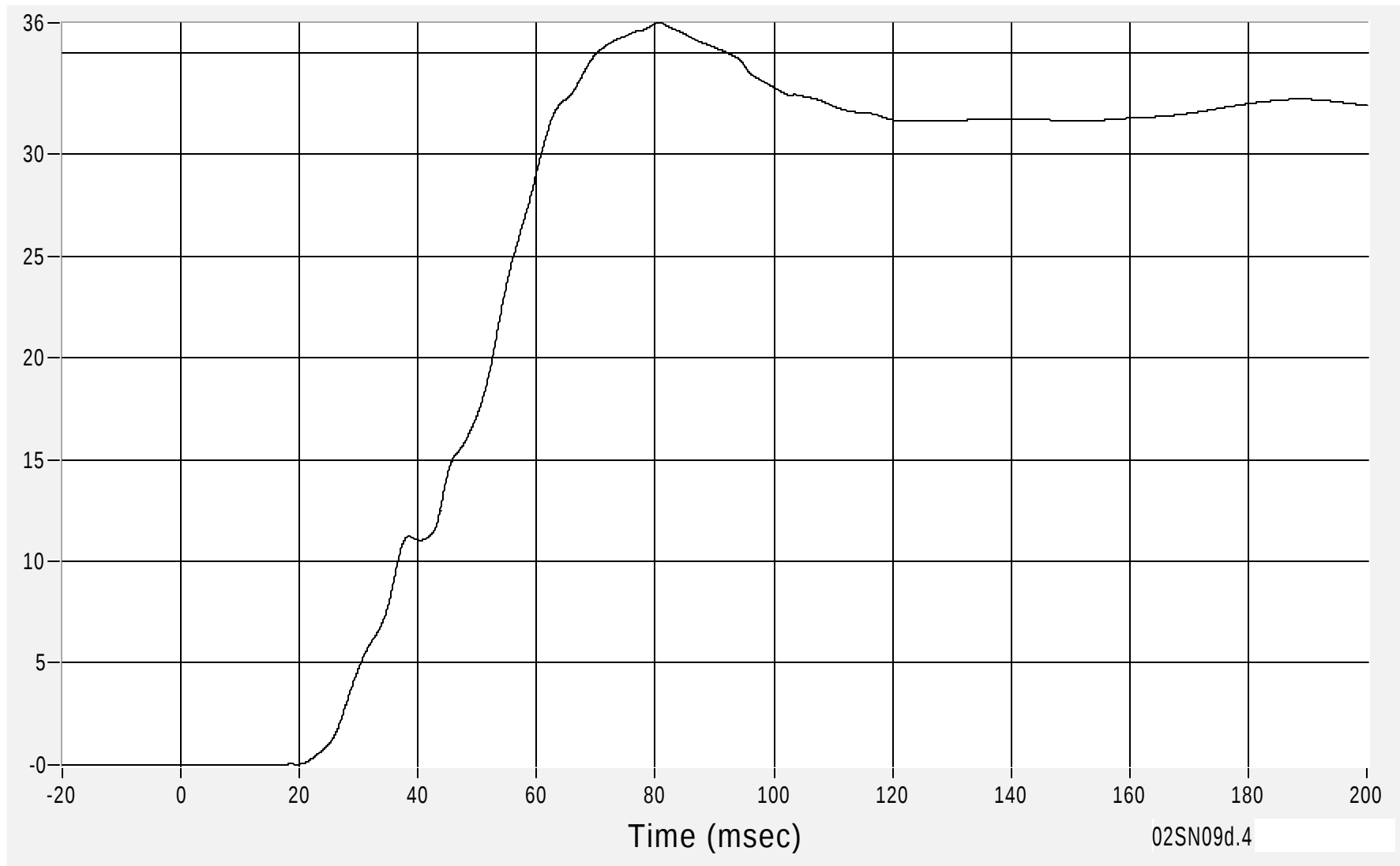
Driver Upper Rib (Y) Velocity

Max 36.5 km/h at 80.7 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 16.2 msec

B-14



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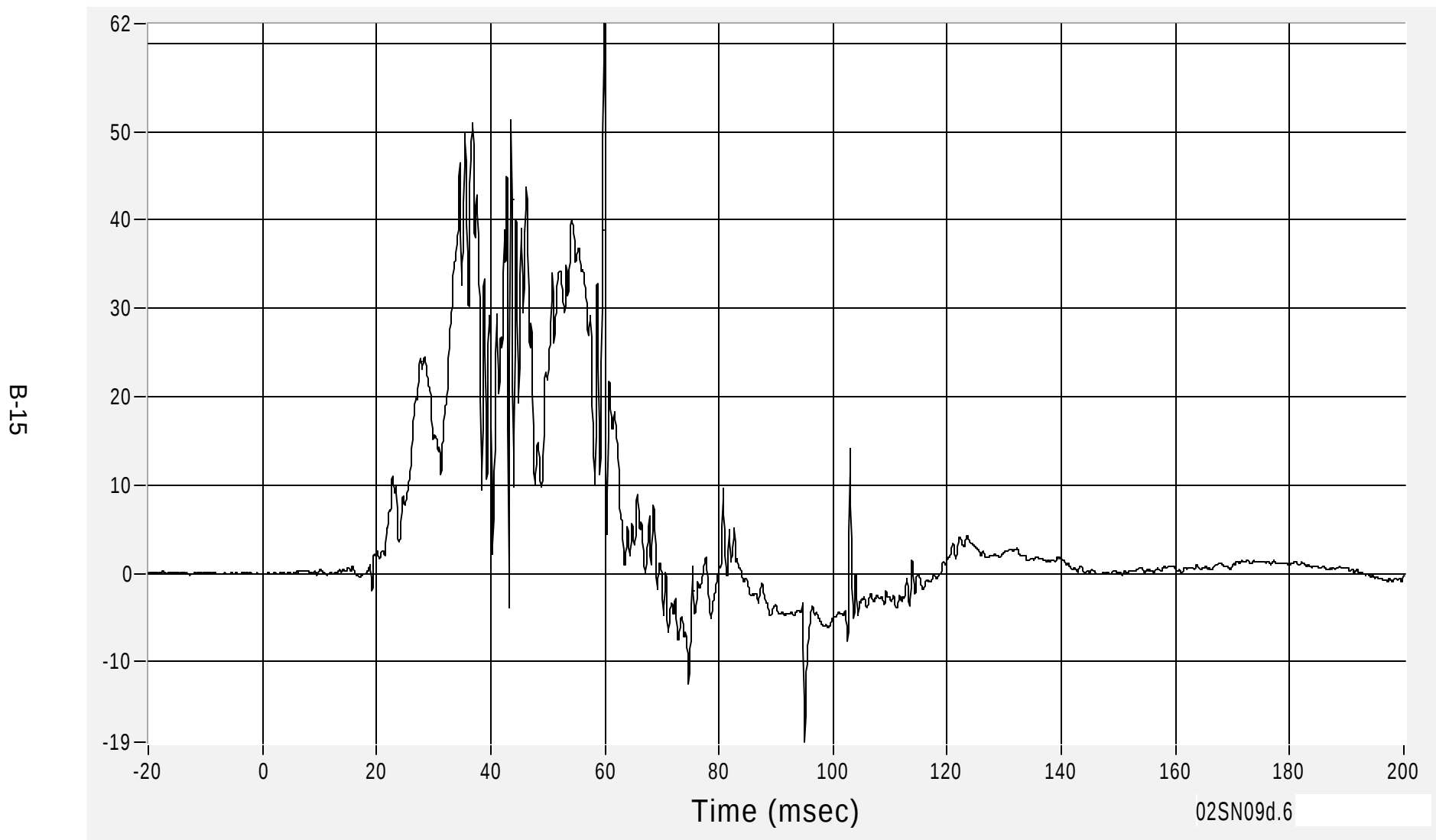
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Driver Lower Rib (Y) Acceleration

Max 62.2 G's at 59.8 msec

Acceleration (G's) CFC1000

Min -19.1 G's at 95.0 msec



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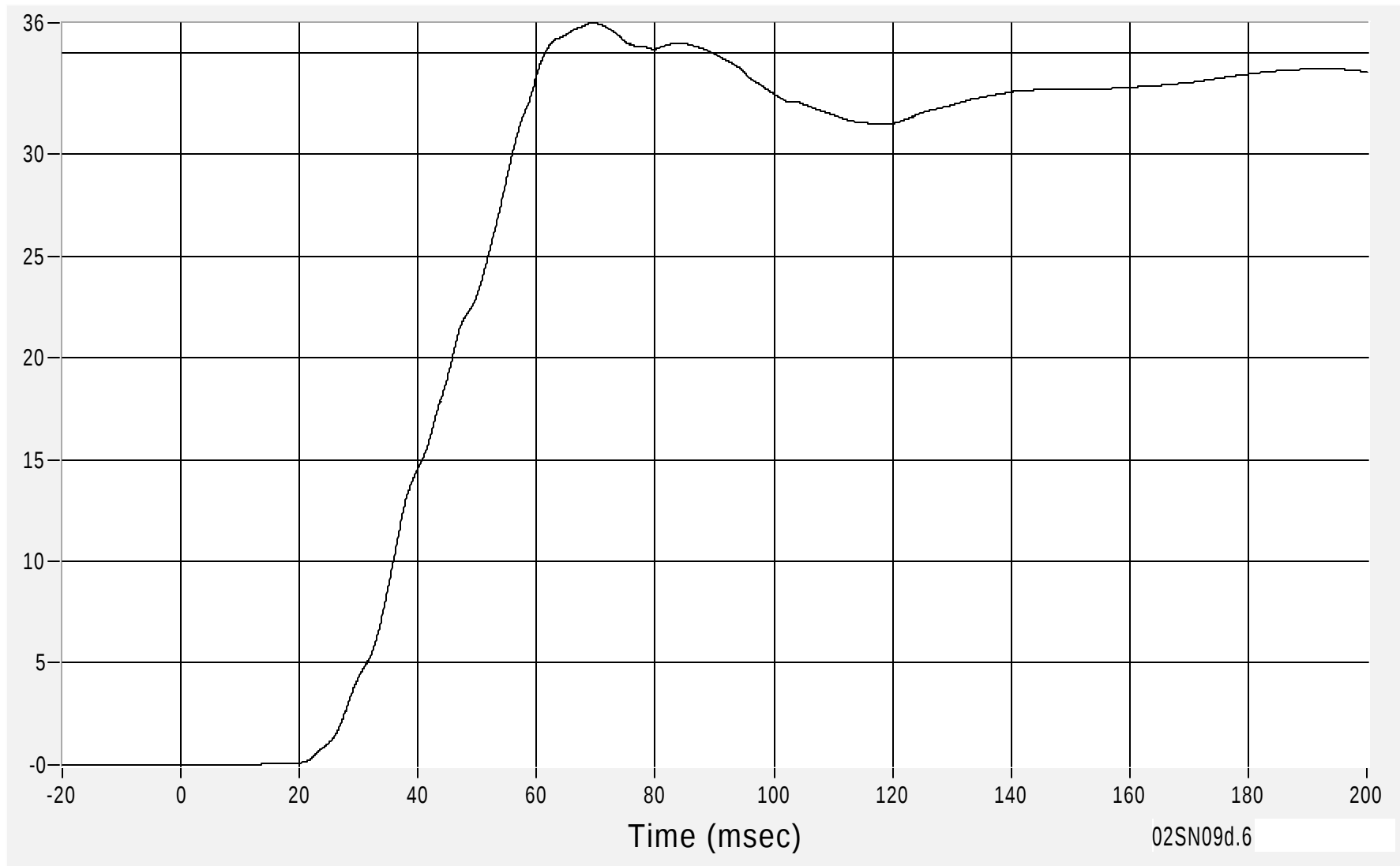
Driver Lower Rib (Y) Velocity

Velocity (km/h) CFC180

Max 36.5 km/h at 69.5 msec

Min 0.0 km/h at 5.4 msec

B-16



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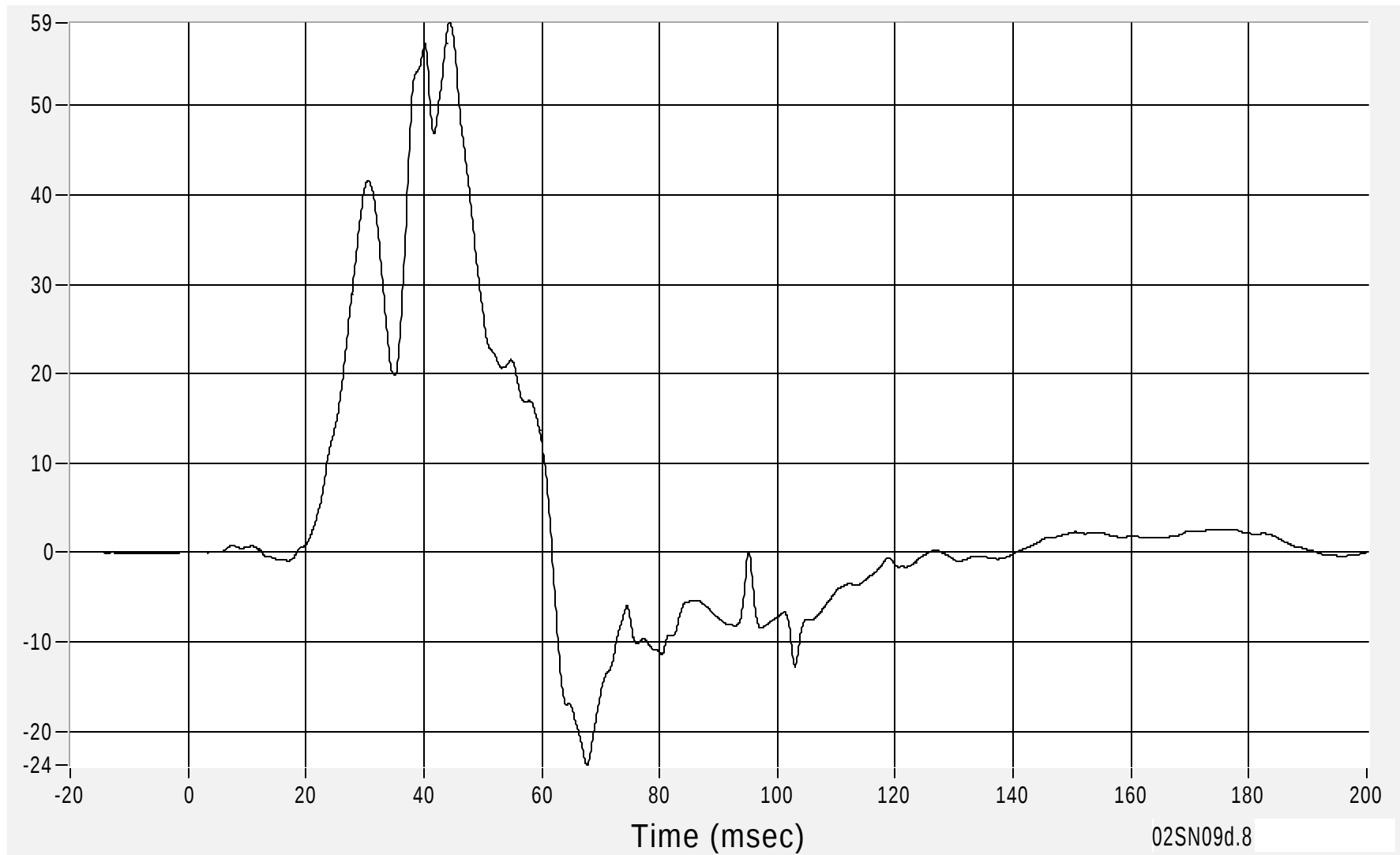
Driver Lower Spine (Y) Acceleration

Max 59.2 G's at 44.3 msec

Acceleration (G's) CFC180

Min -23.8 G's at 67.7 msec

B-17



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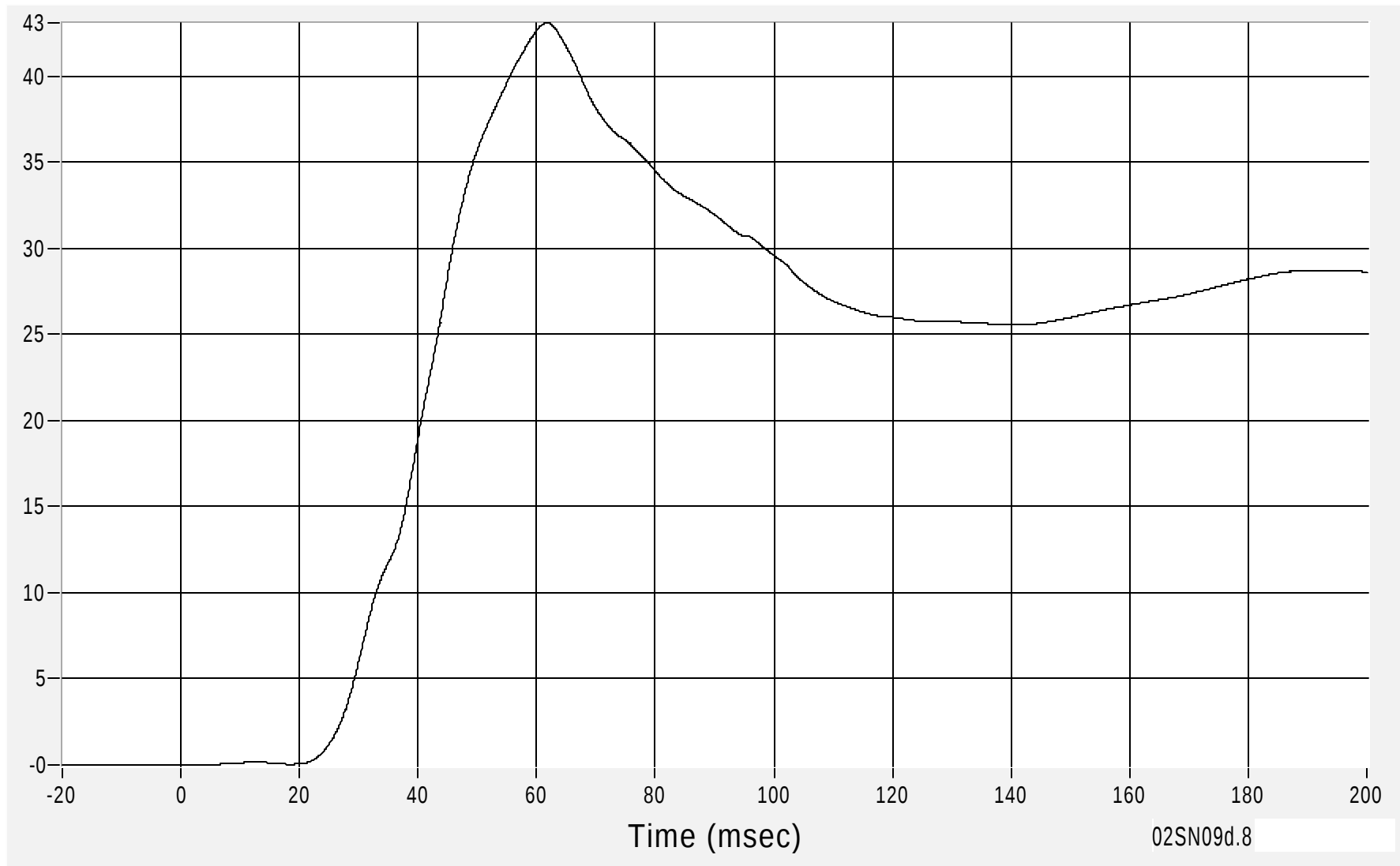
Driver Lower Spine (Y) Velocity

Velocity (km/h) CFC180

Max 43.1 km/h at 61.8 msec

Min 0.0 km/h at 0.0 msec

B-18



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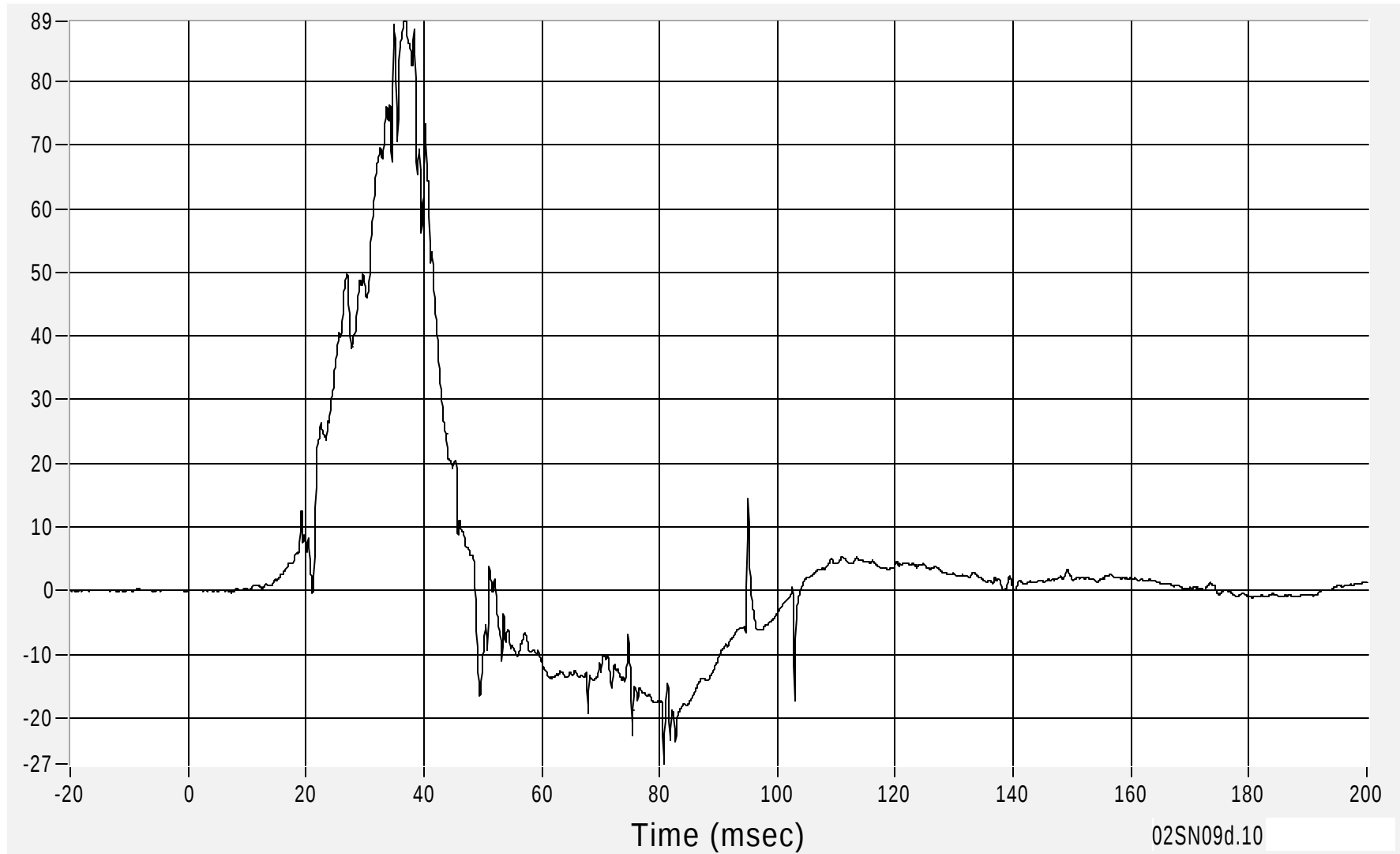
Driver Pelvic (Y) Acceleration

Max 89.4 G's at 36.7 msec

Acceleration (G's) CFC1000

Min -27.2 G's at 80.7 msec

B-19



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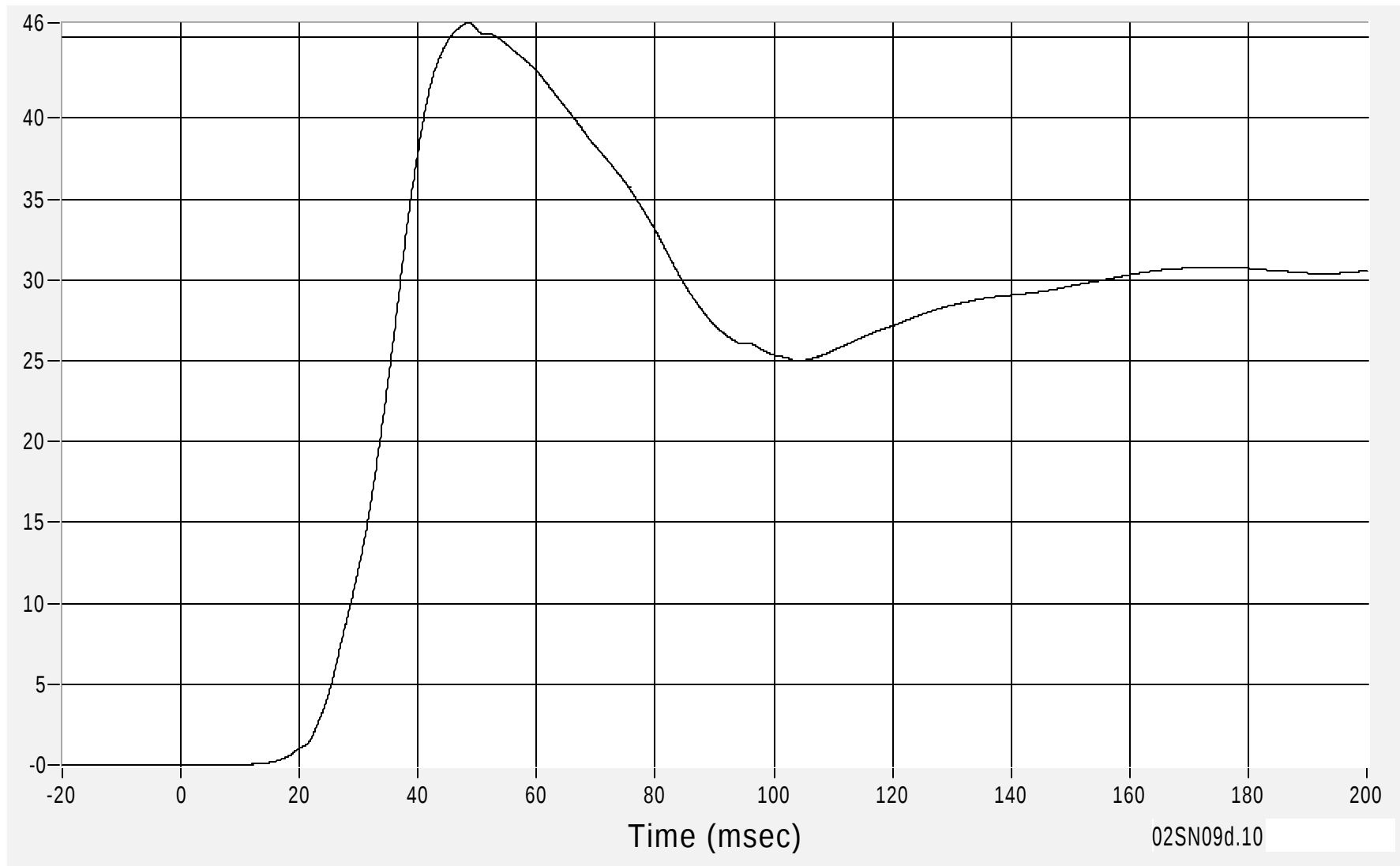
Driver Pelvic (Y) Velocity

Max 45.9 km/h at 48.5 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 7.8 msec

B-20



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9 May 2002

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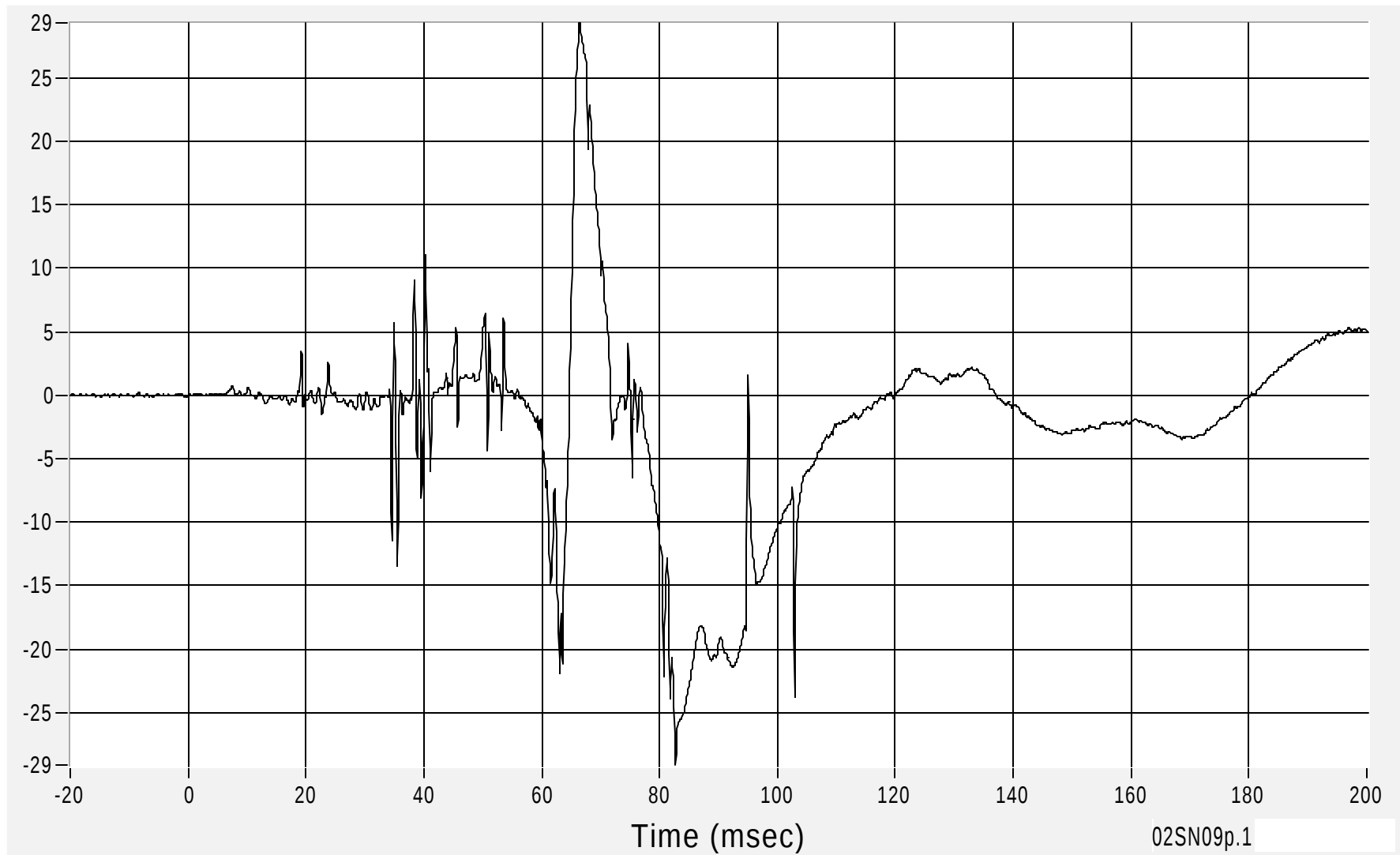
Passenger Head CG (X) Acceleration

Max 29.3 G's at 66.5 msec

Acceleration (G's) CFC1000

Min -29.1 G's at 82.7 msec

B-21



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9 May 2002

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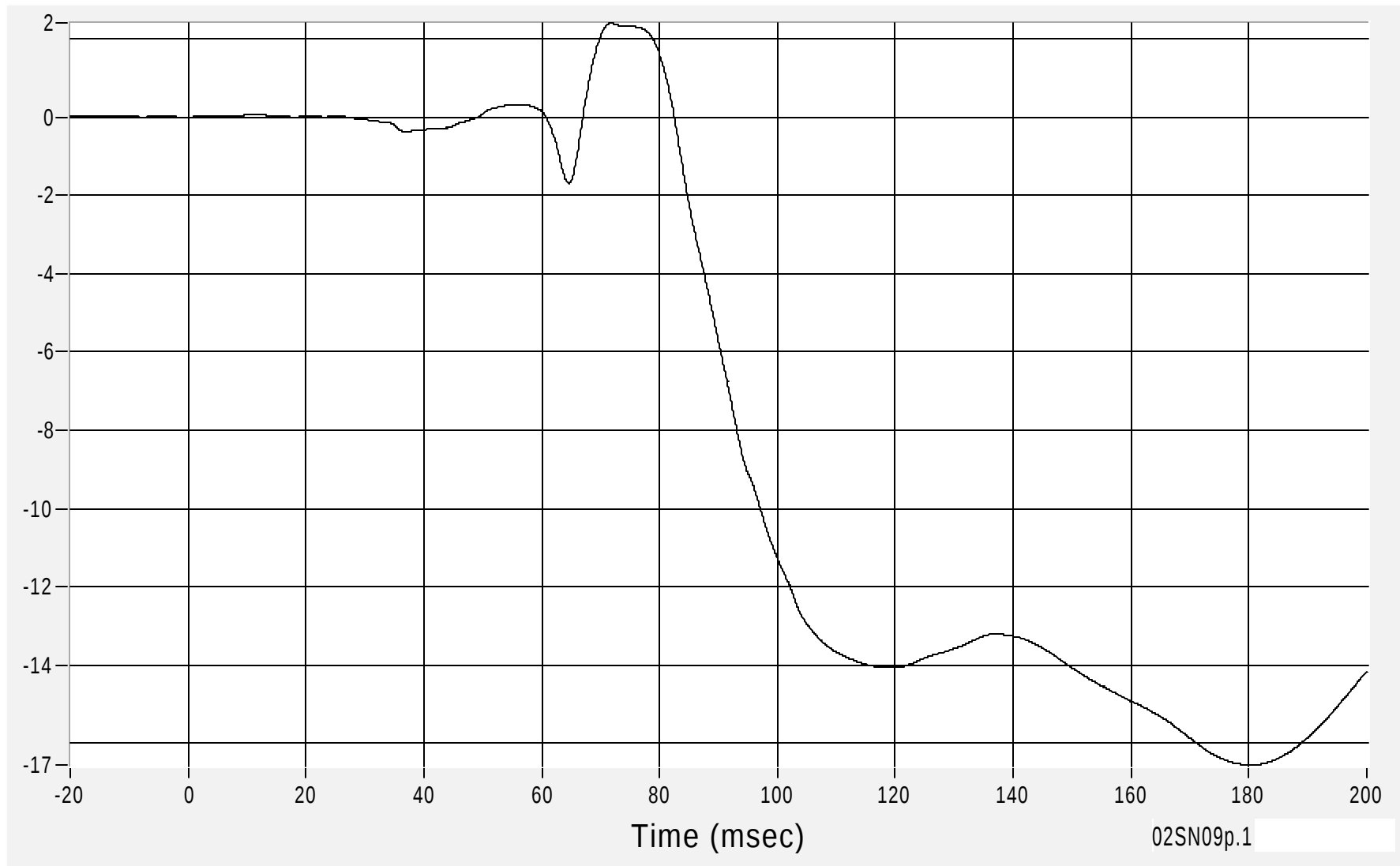
Passenger Head CG (X) Velocity

Velocity (km/h) CFC180

Max 2.4 km/h at 71.7 msec

Min -16.6 km/h at 180.2 msec

B-22



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9 May 2002

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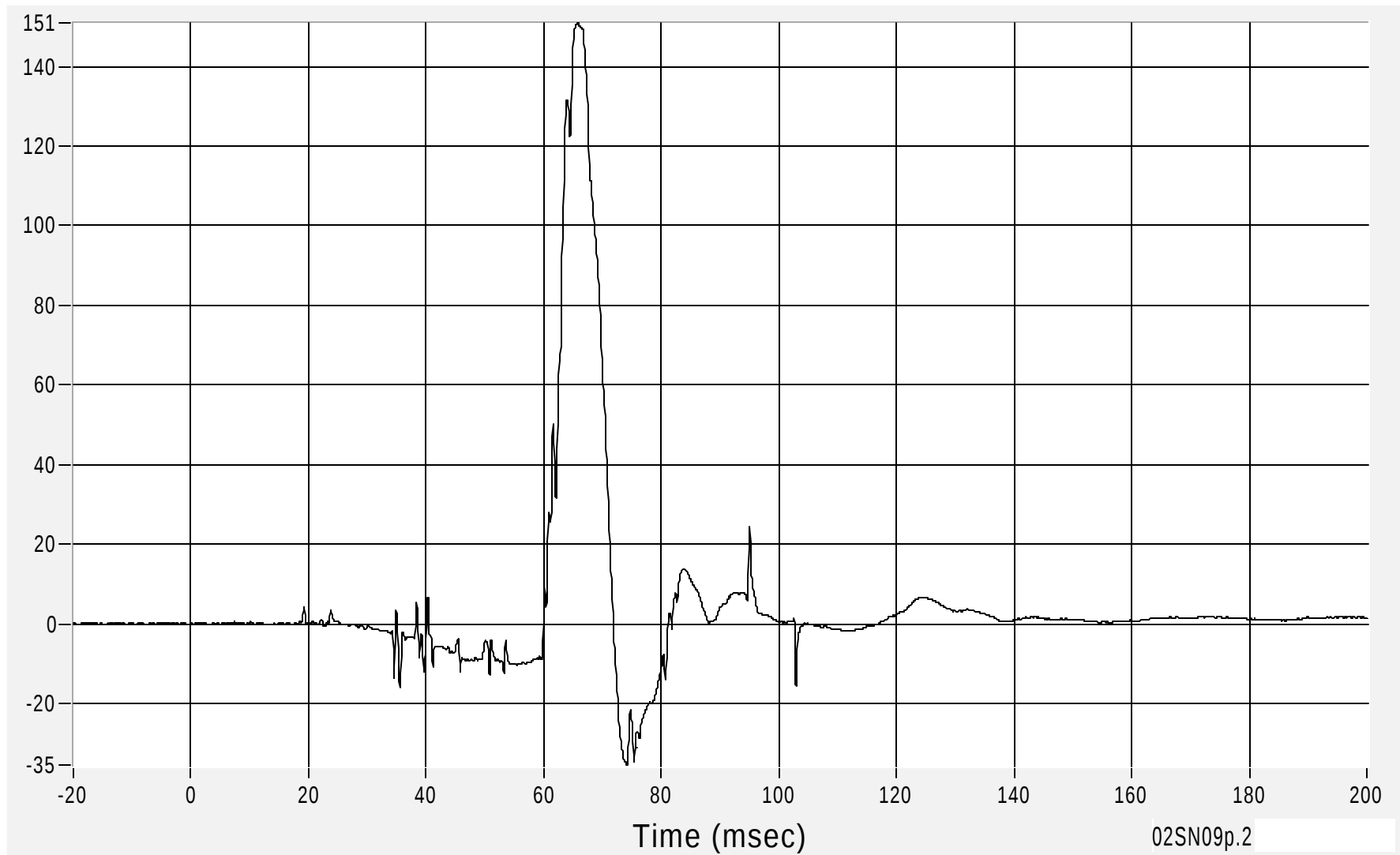
Passenger Head CG (Y) Acceleration

Max 150.9 G's at 65.8 msec

Acceleration (G's) CFC1000

Min -35.5 G's at 74.1 msec

B-23



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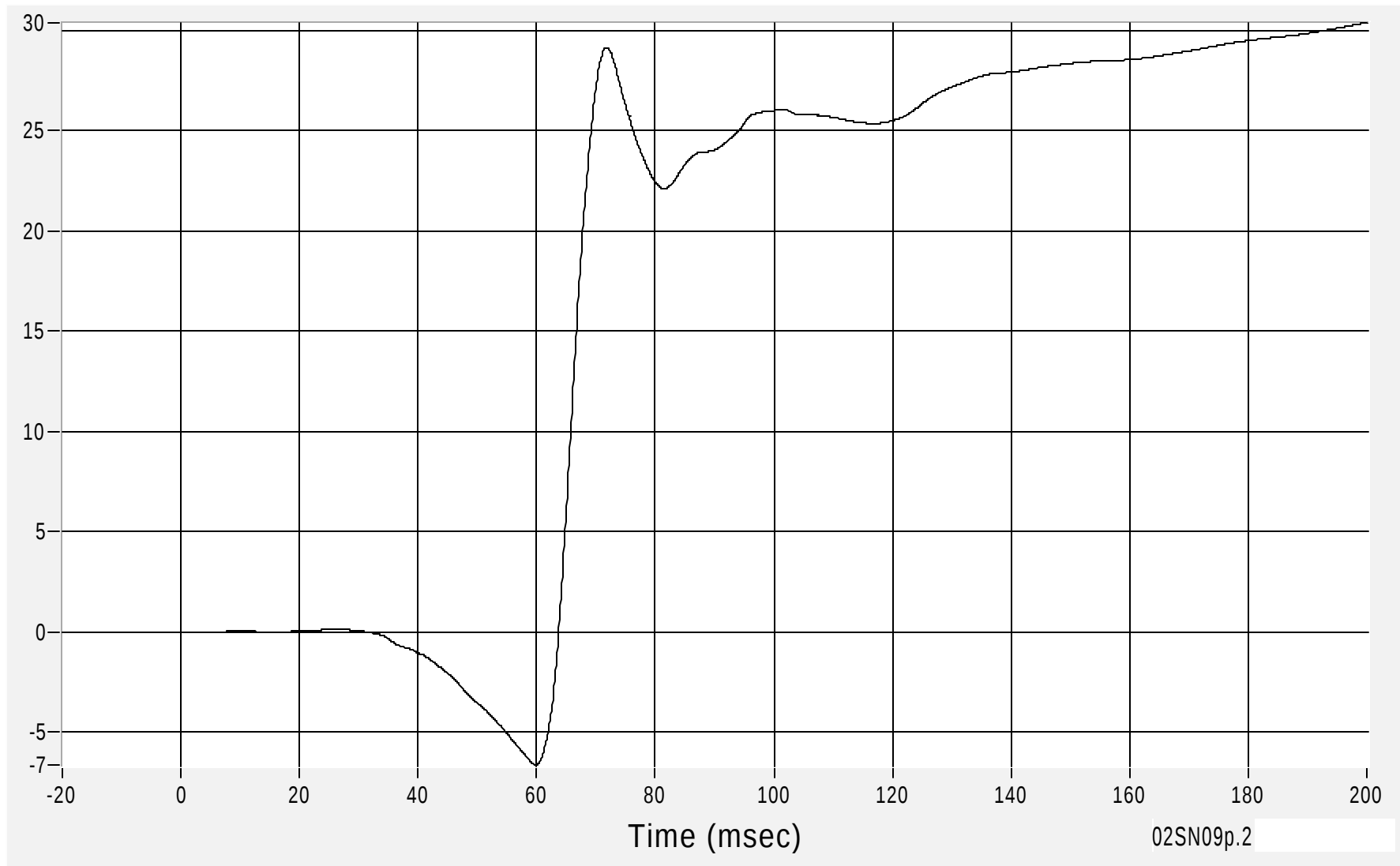
Passenger Head CG (Y) Velocity

Max 30.4 km/h at 199.9 msec

Velocity (km/h) CFC180

Min -6.7 km/h at 59.8 msec

B-24



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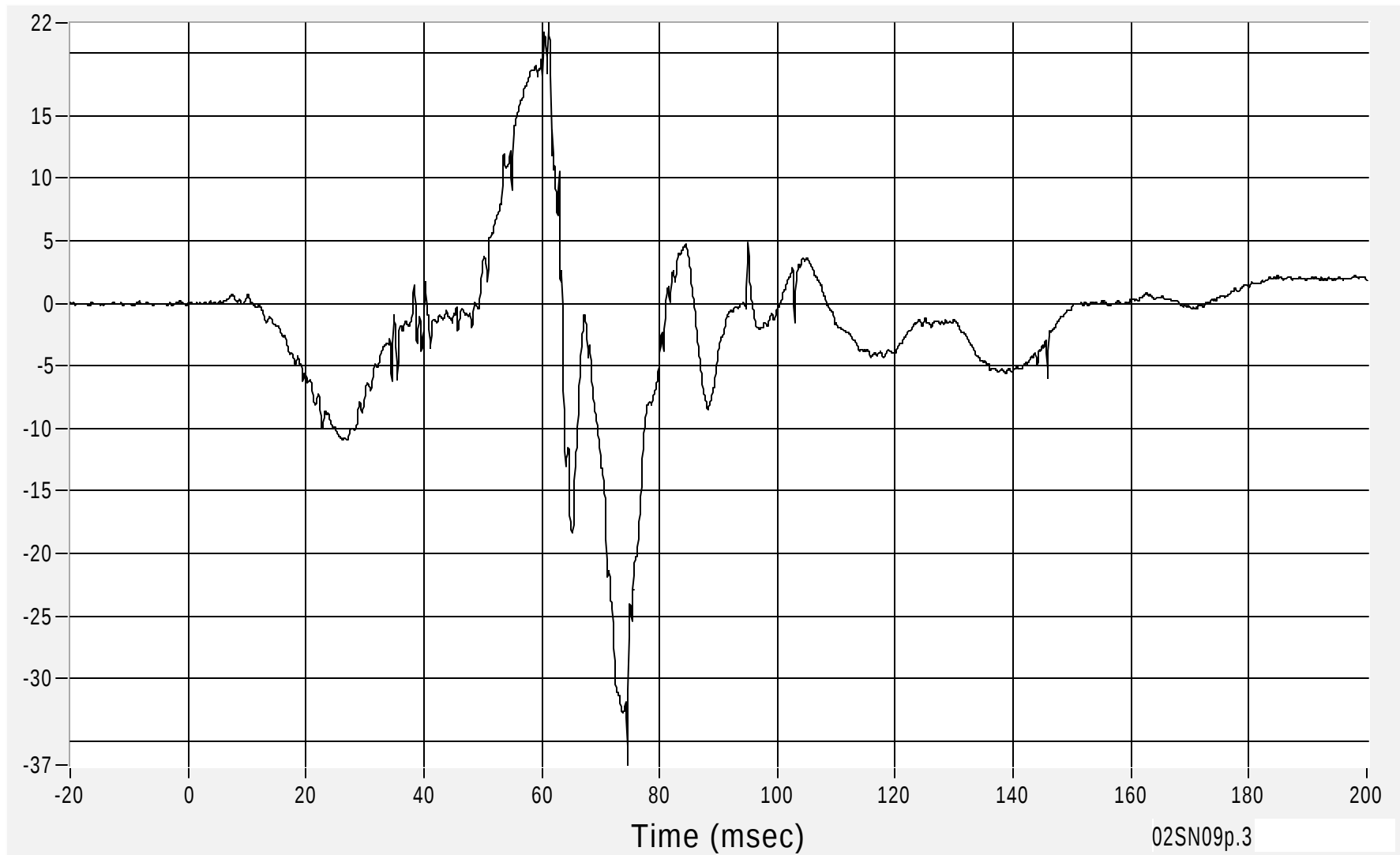
Passenger Head CG (Z) Acceleration

Max 22.4 G's at 61.2 msec

Acceleration (G's) CFC1000

Min -36.9 G's at 74.6 msec

B-25



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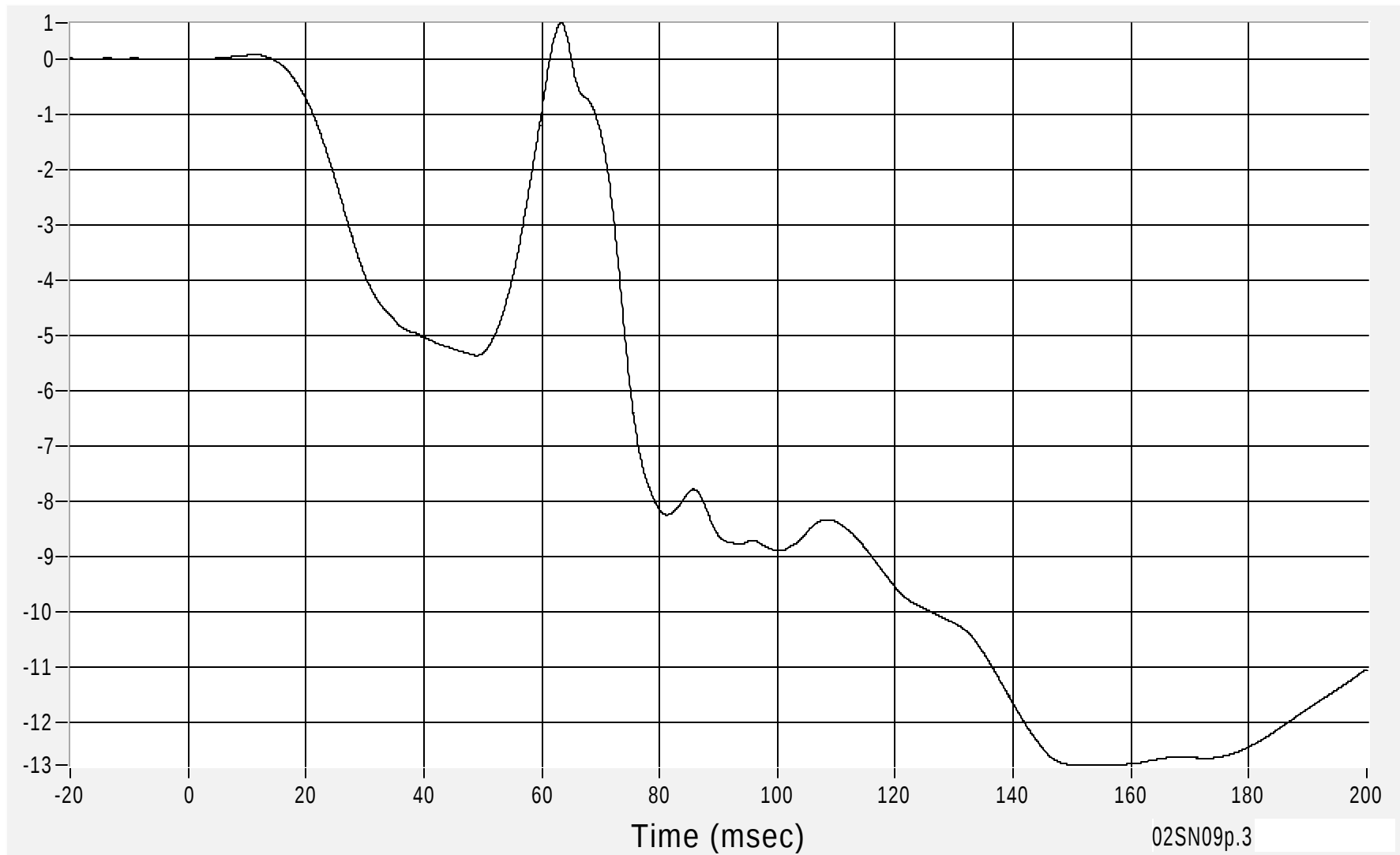
Passenger Head CG (Z) Velocity

Max 0.7 km/h at 63.3 msec

Min -12.8 km/h at 150.6 msec

Velocity (km/h) CFC180

B-26



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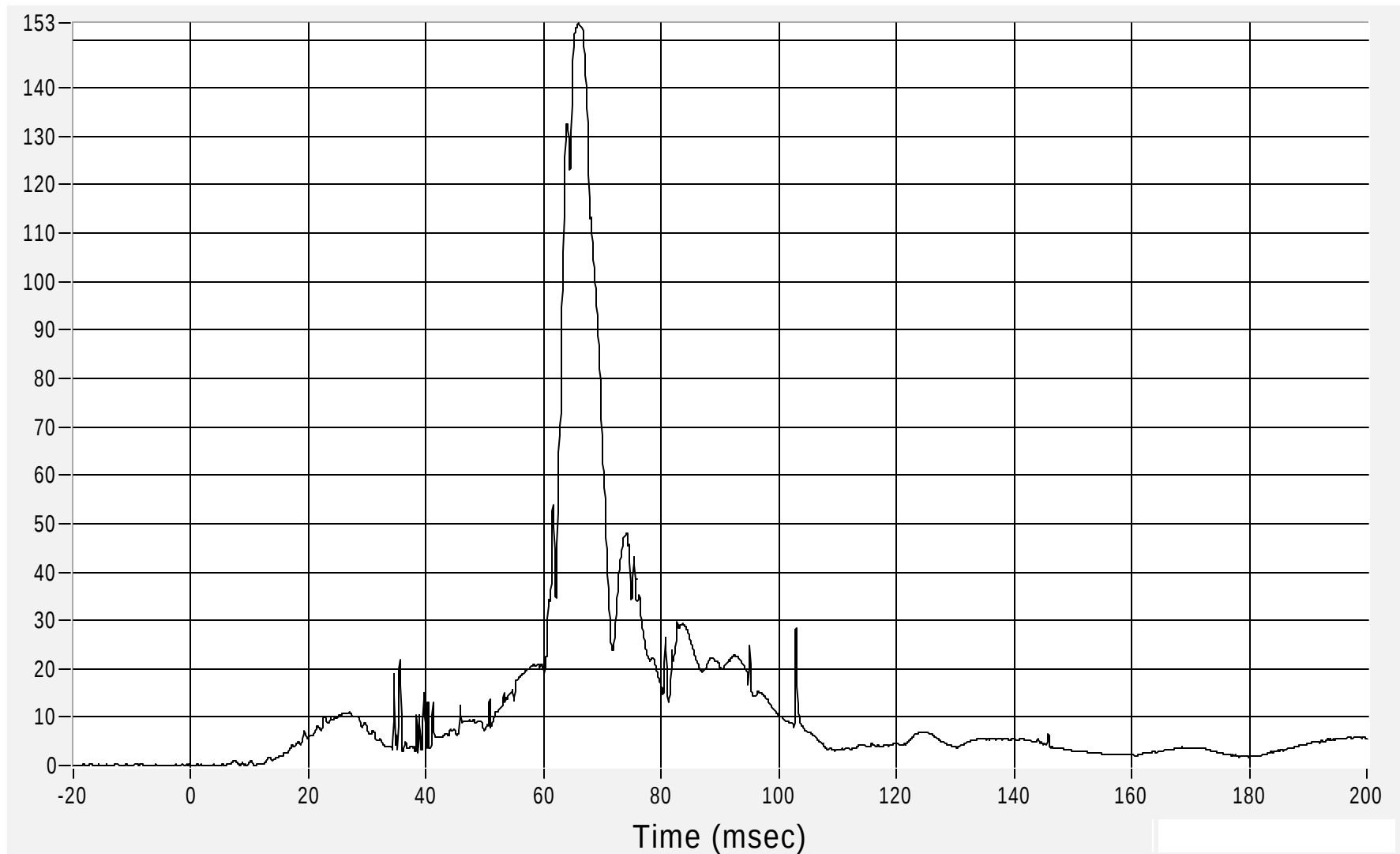
Passenger Head Resultant Acceleration

Max 153.5 G's at 65.8 msec

Acceleration (G's) CFC1000

Min 0.0 G's at 3.4 msec

B-27



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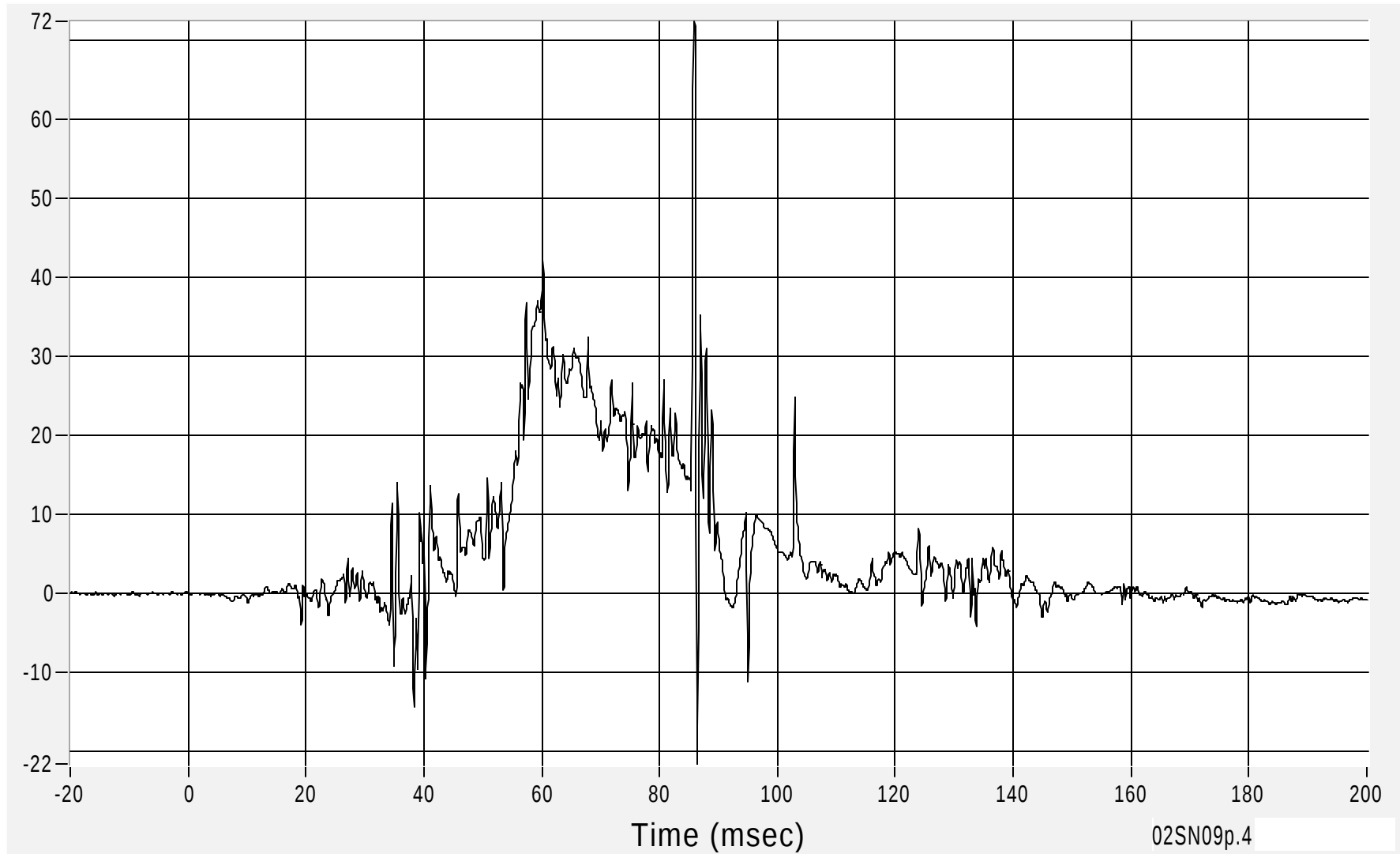
Passenger Upper Rib (Y) Acceleration

Max 72.4 G's at 85.9 msec

Acceleration (G's) CFC1000

Min -21.6 G's at 86.4 msec

B-28



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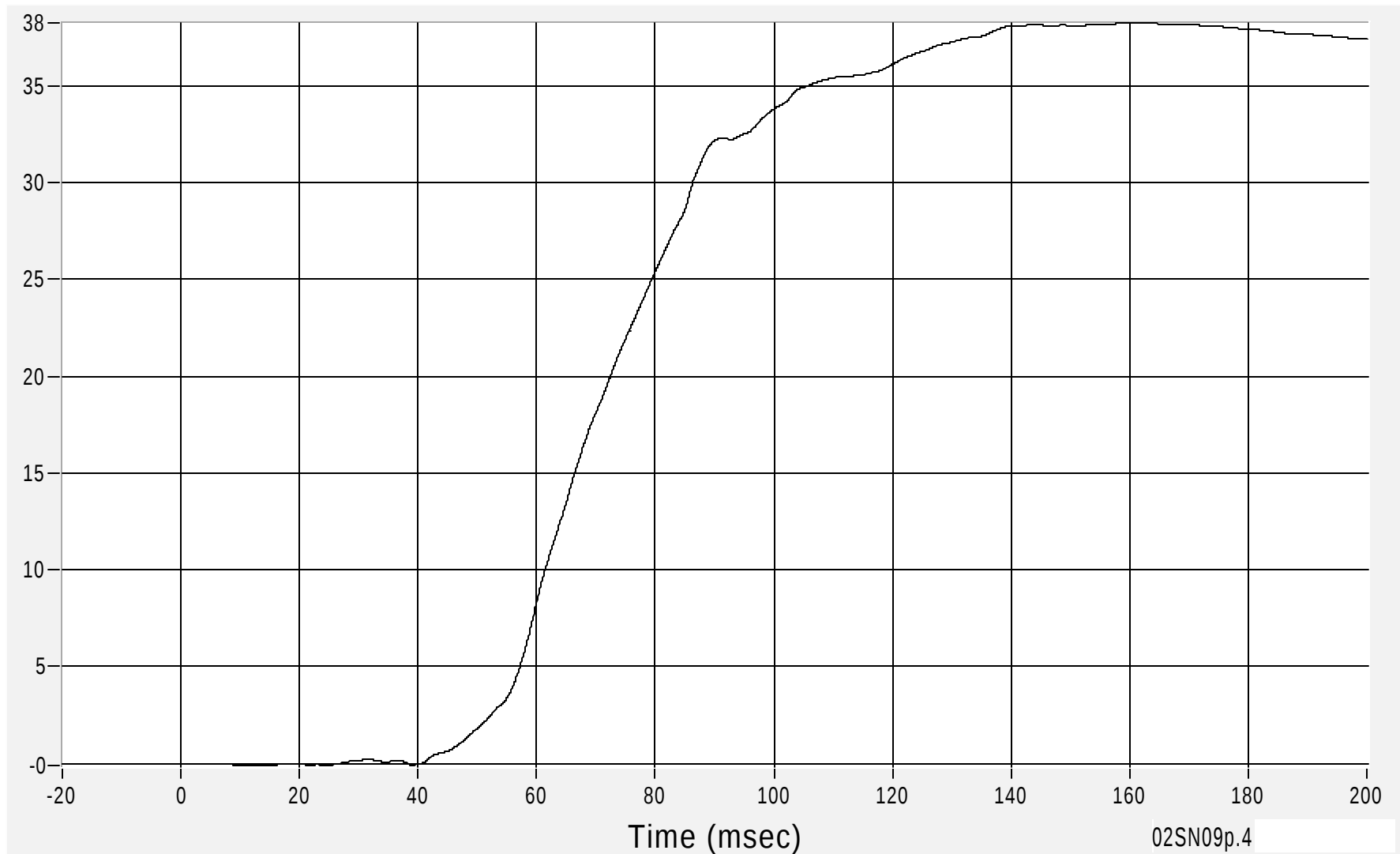
Passenger Upper Rib (Y) Velocity

Max 38.2 km/h at 161.8 msec

Velocity (km/h) CFC180

Min -0.1 km/h at 12.3 msec

B-29



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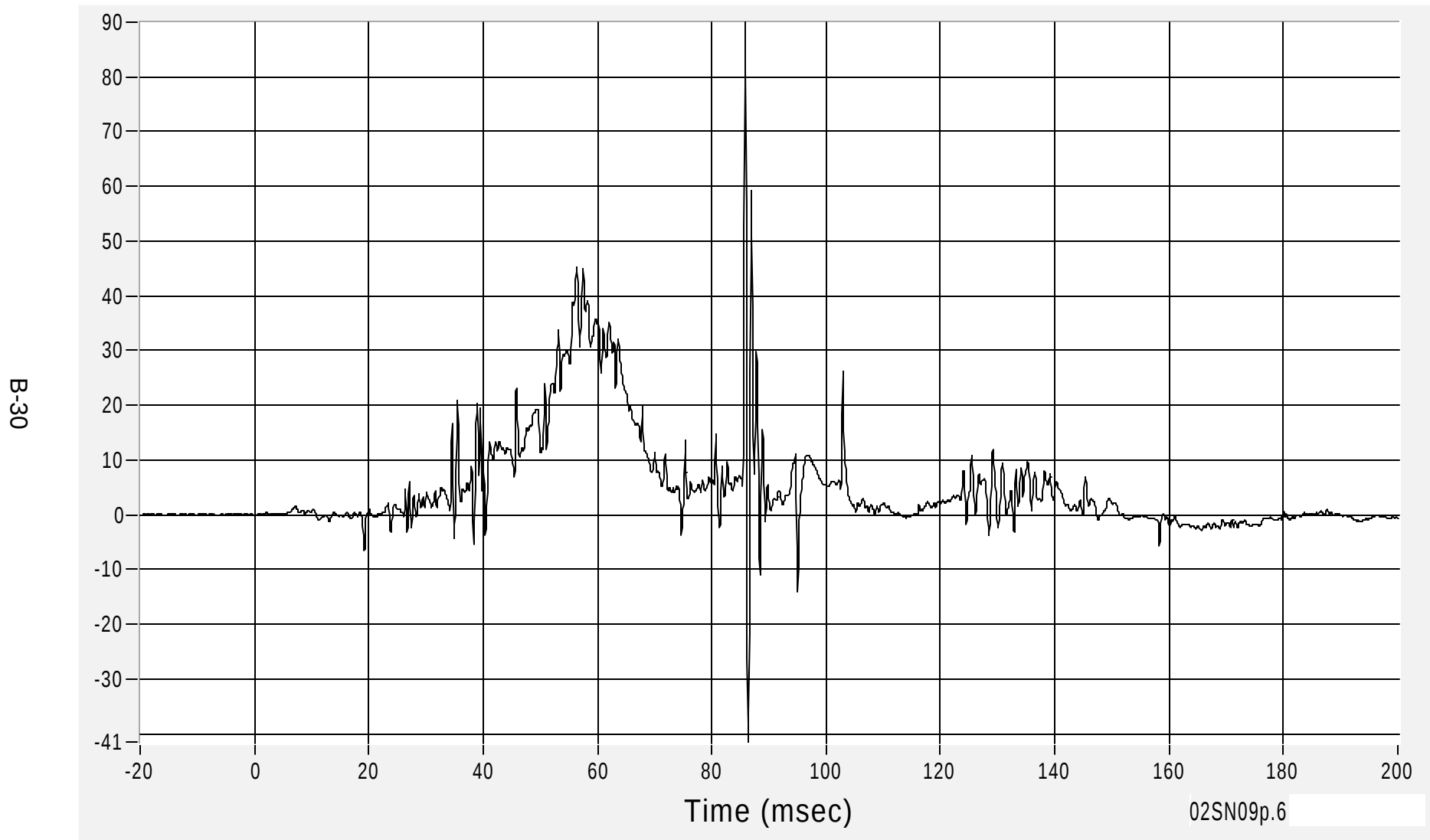
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Passenger Lower Rib (Y) Acceleration

Max 90.0 G's at 85.8 msec

Acceleration (G's) CFC1000

Min -41.5 G's at 86.4 msec



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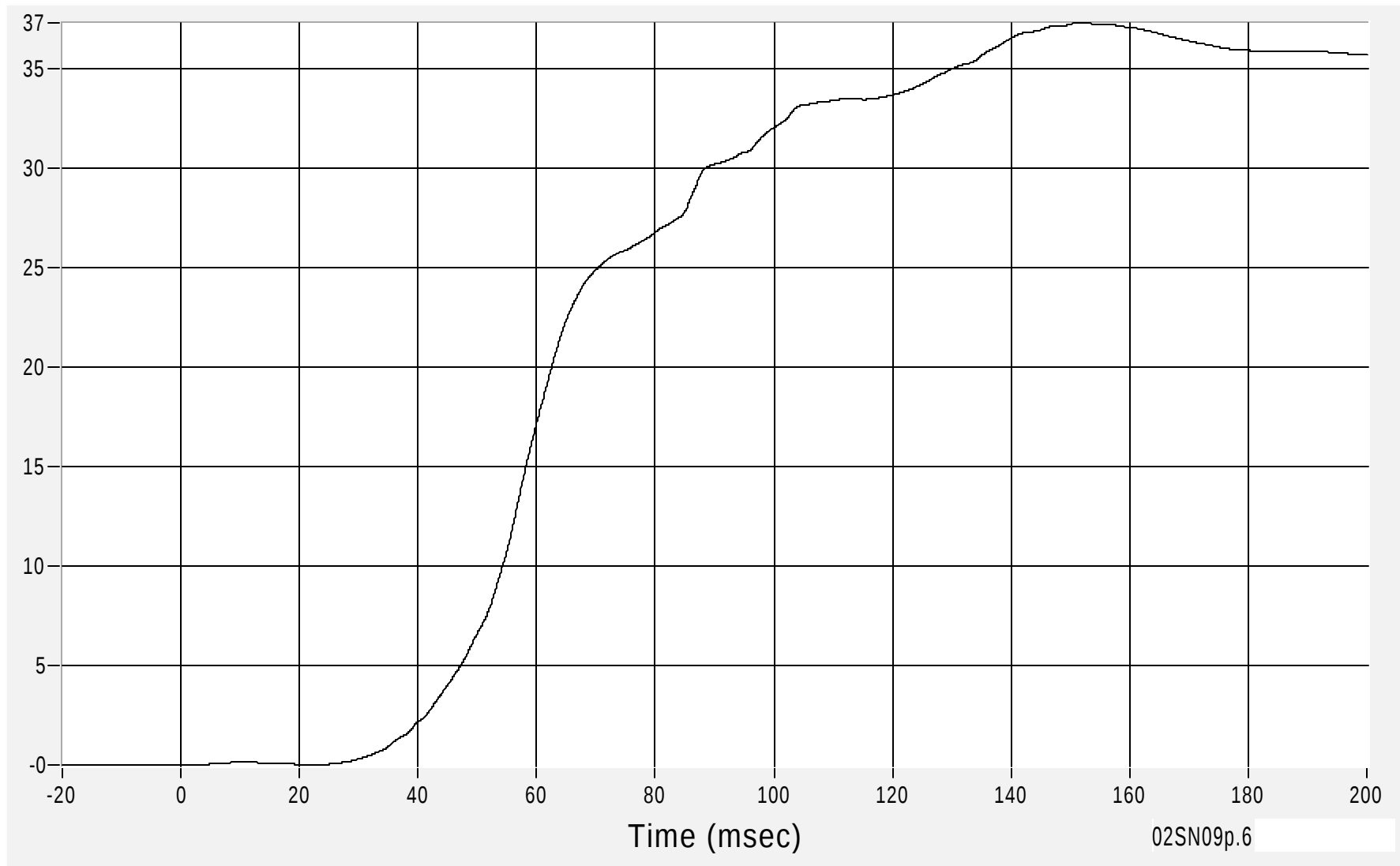
Passenger Lower Rib (Y) Velocity

Max 37.3 km/h at 151.6 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 21.7 msec

B-31



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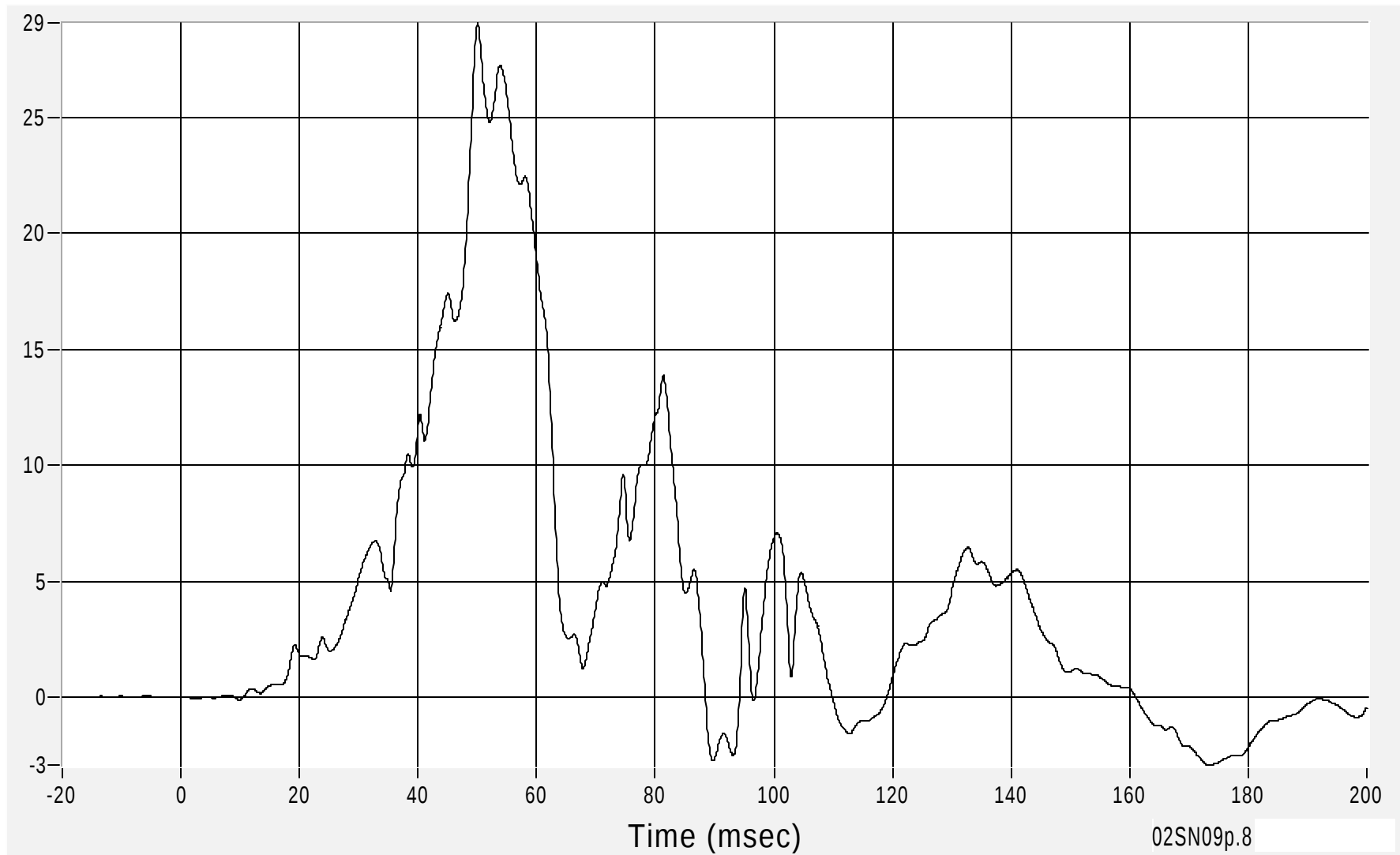
Passenger Lower Spine (Y) Acceleration

Max 29.1 G's at 50.0 msec

Acceleration (G's) CFC180

Min -2.9 G's at 173.2 msec

B-32



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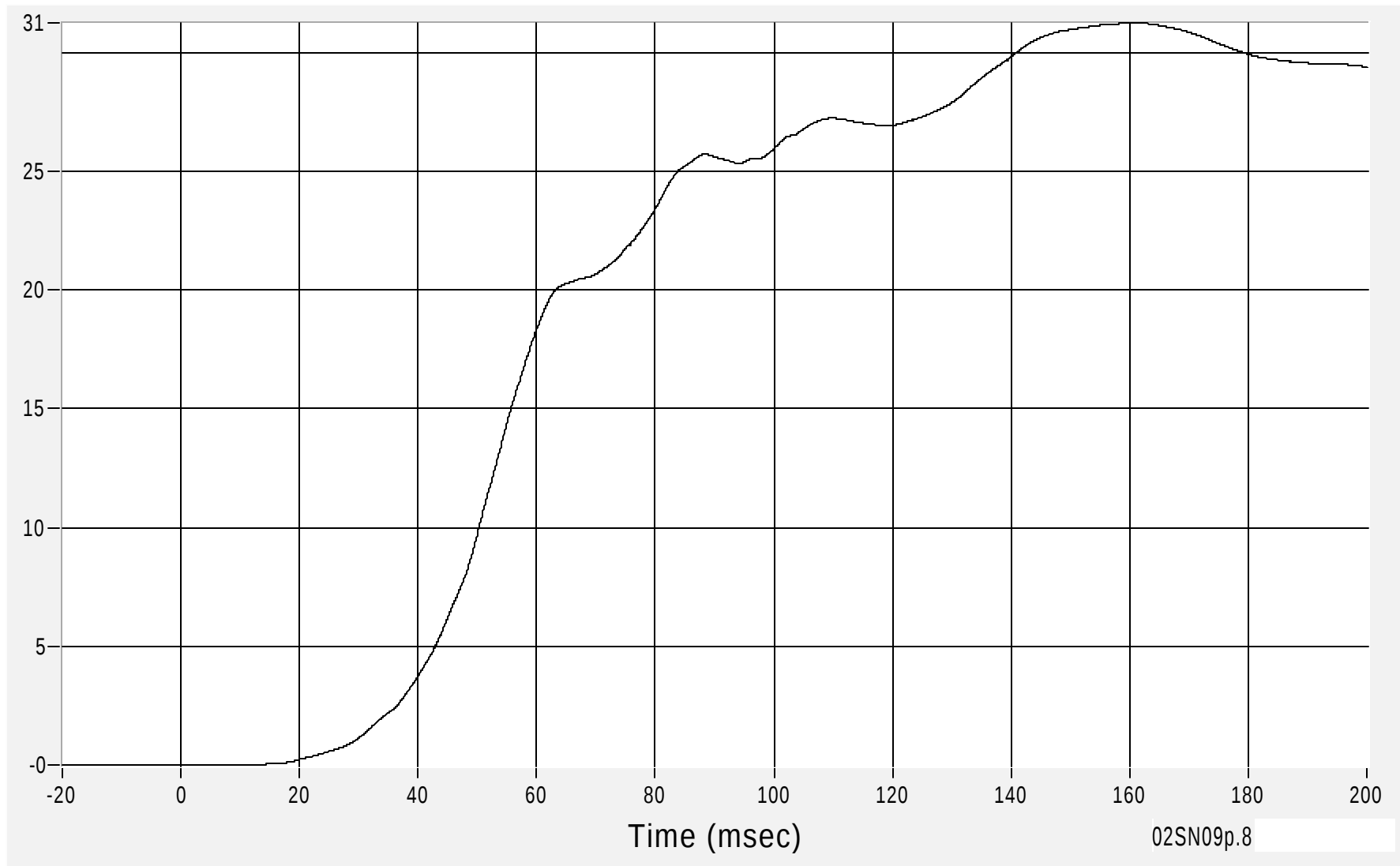
Passenger Lower Spine (Y) Velocity

Max 31.3 km/h at 161.0 msec

Min 0.0 km/h at 6.6 msec

Velocity (km/h) CFC180

B-33



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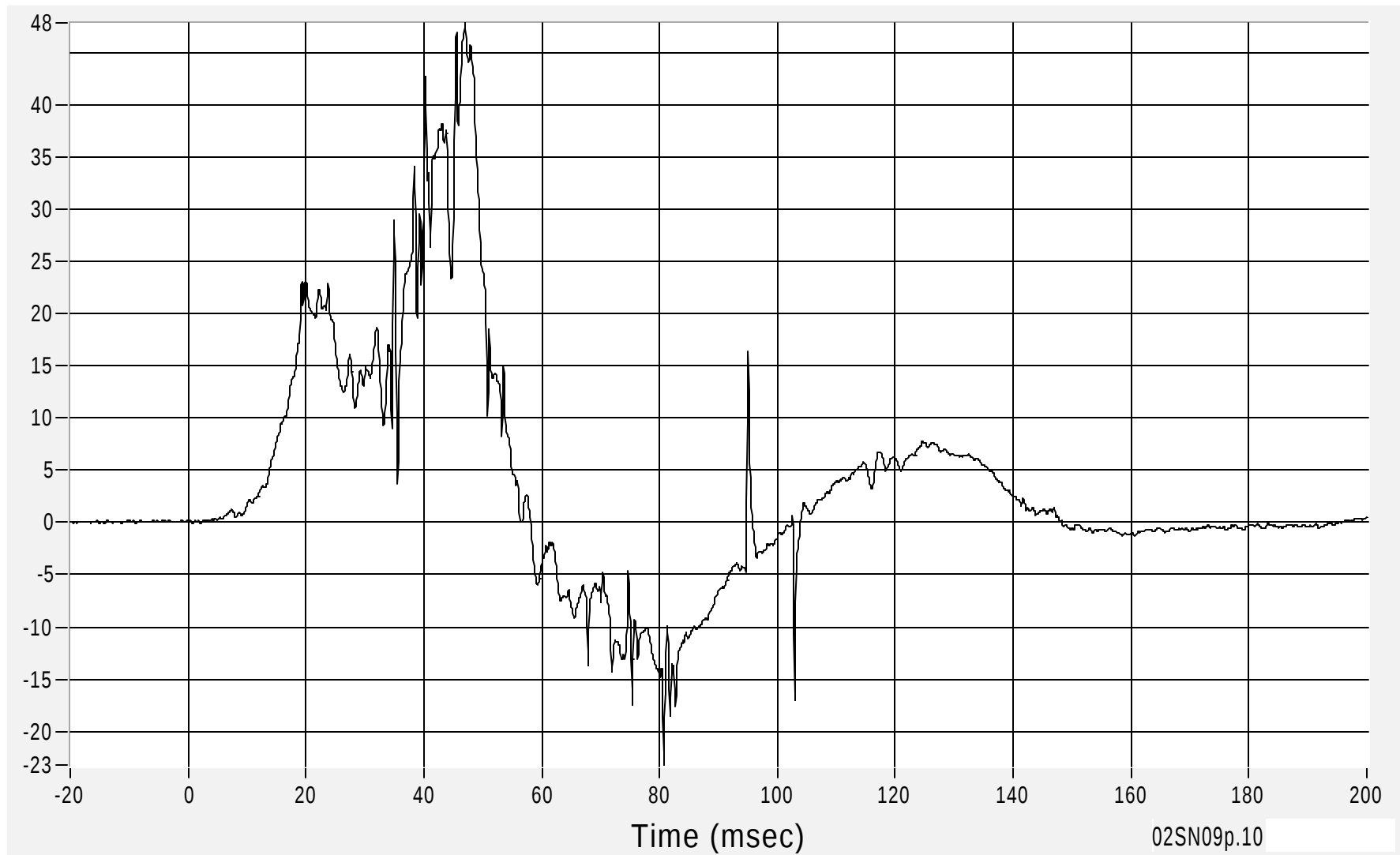
Passenger Pelvic (Y) Acceleration

Max 47.8 G's at 47.0 msec

Acceleration (G's) CFC1000

Min -23.2 G's at 80.7 msec

B-34



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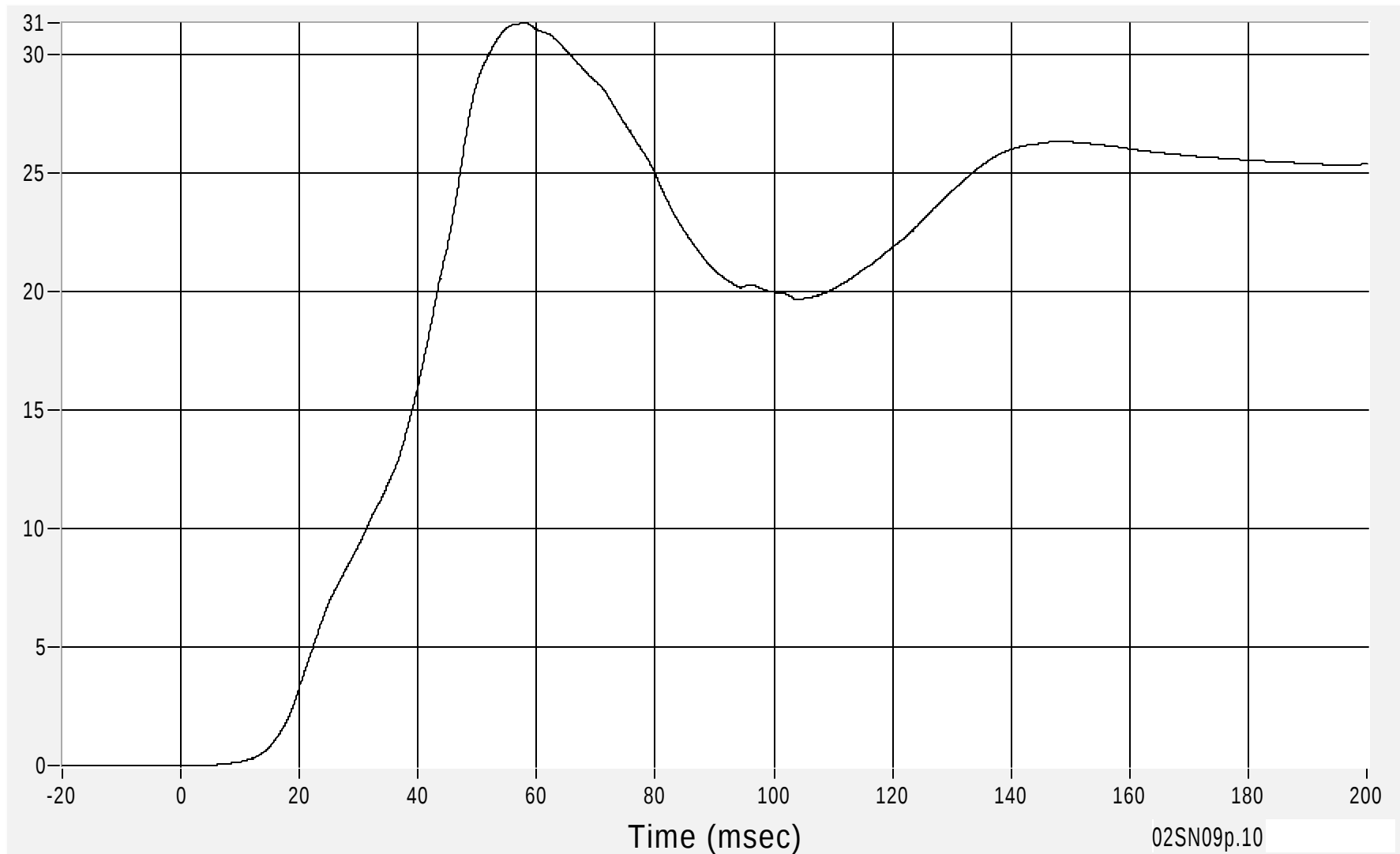
Passenger Pelvic (Y) Velocity

Max 31.4 km/h at 57.9 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 0.0 msec

B-35



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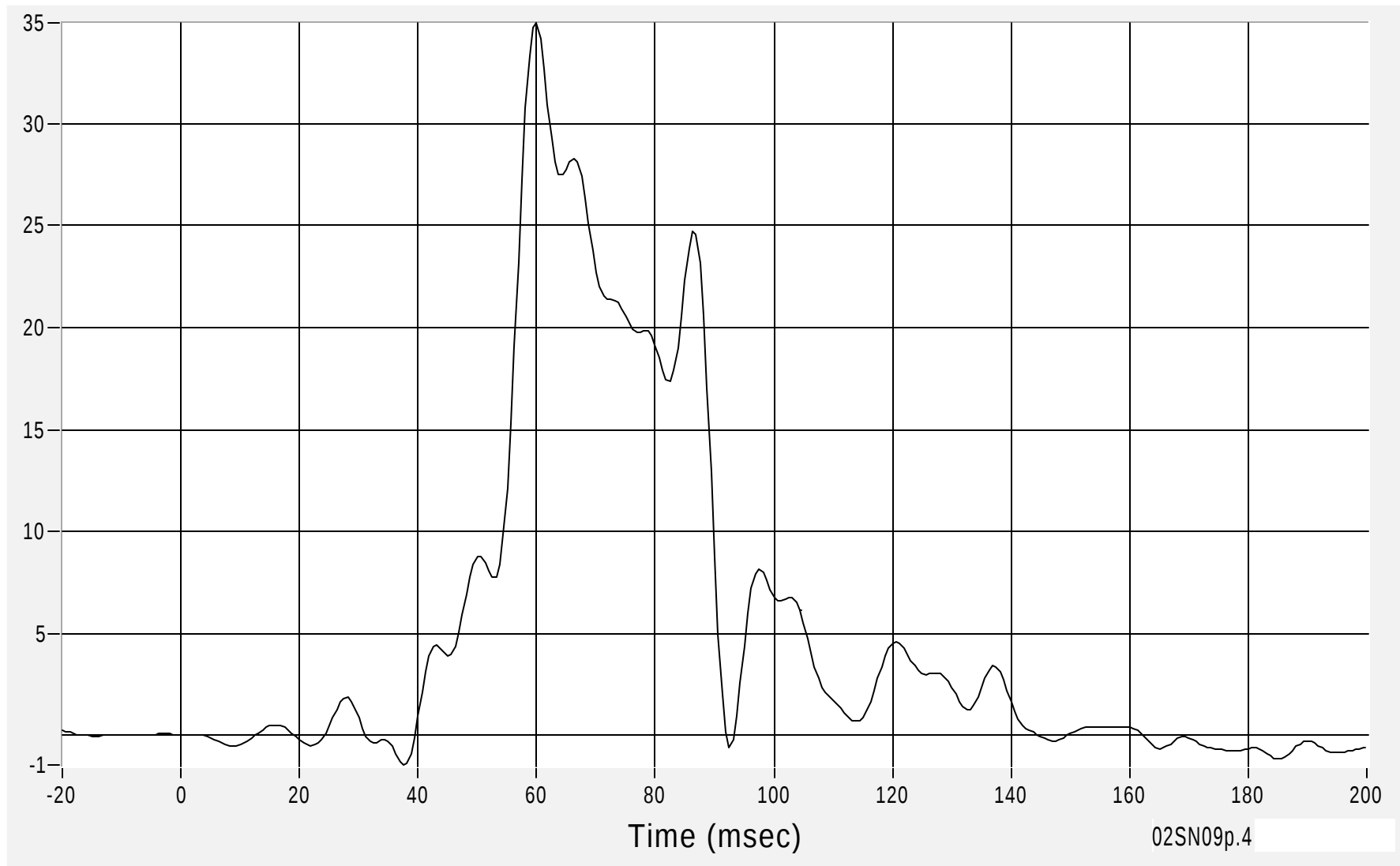
Passenger Upper Rib (Y) Acceleration

Max 34.9 G's at 60.0 msec

Acceleration (G's) FIR100

Min -1.4 G's at 37.5 msec

B-36



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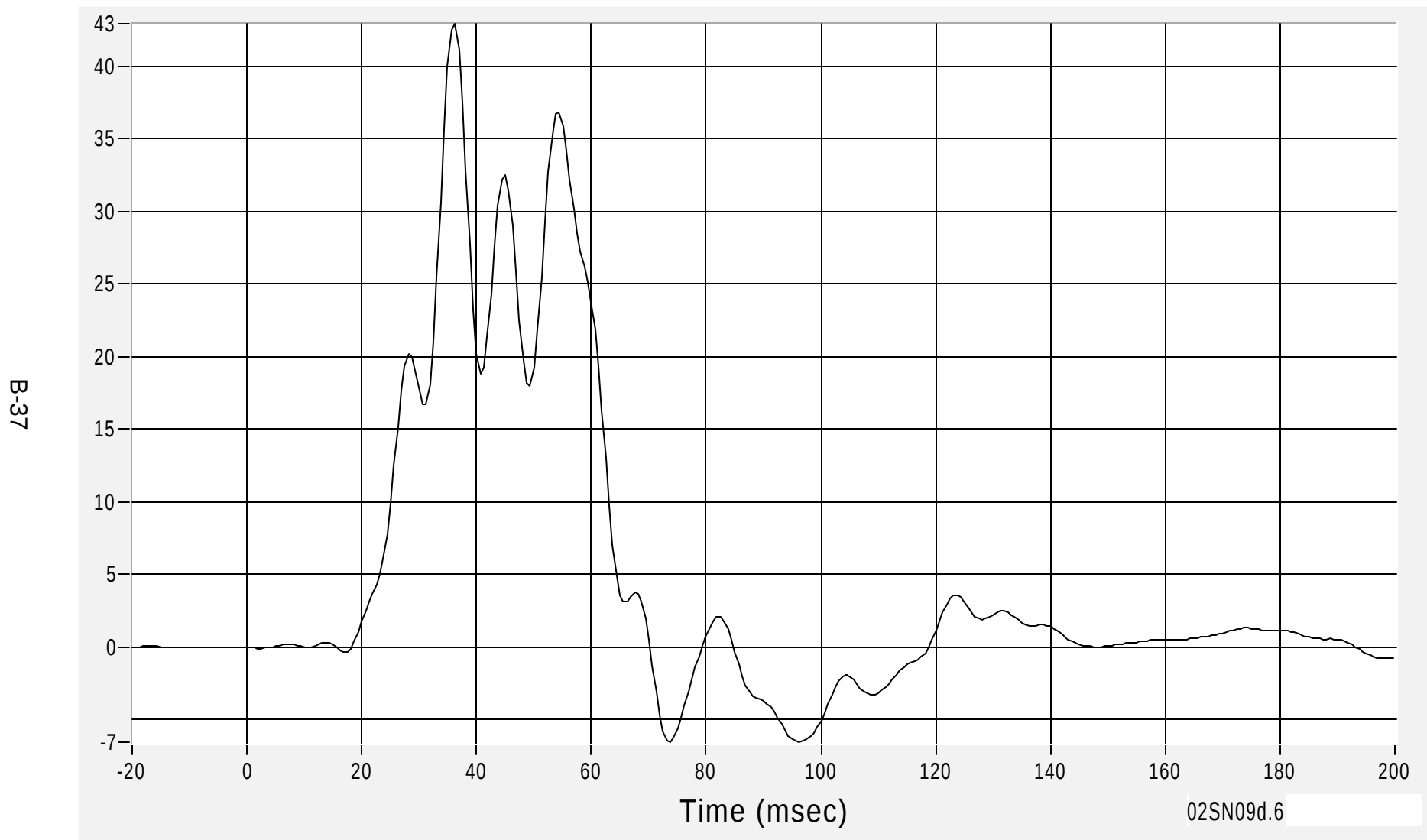
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Driver Lower Rib (Y) Acceleration

Max 42.9 G's at 36.2 msec

Acceleration (G's) FIR100

Min -6.5 G's at 73.8 msec



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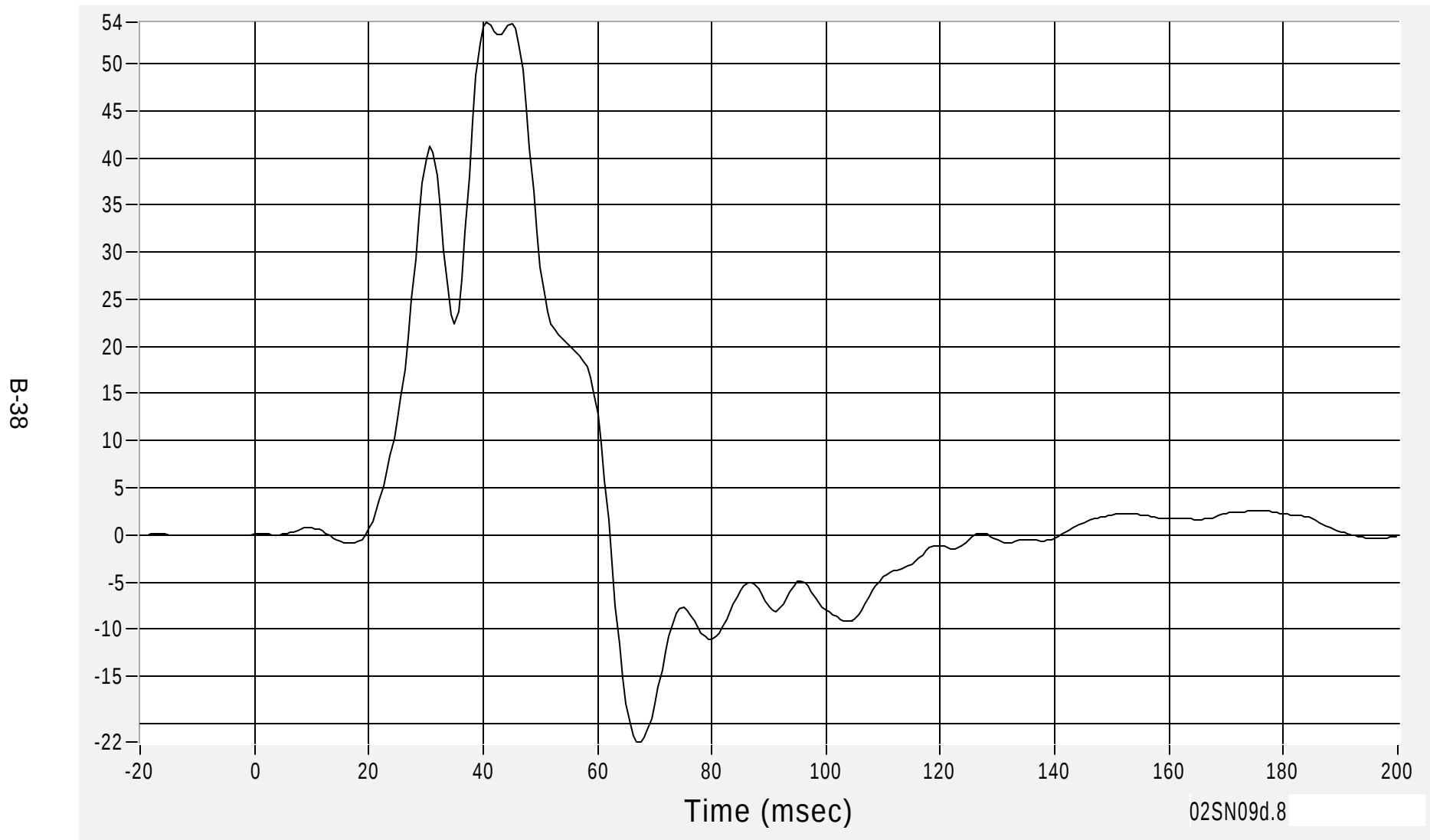
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Driver Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 54.4 G's at 40.6 msec

Min -22.0 G's at 67.5 msec



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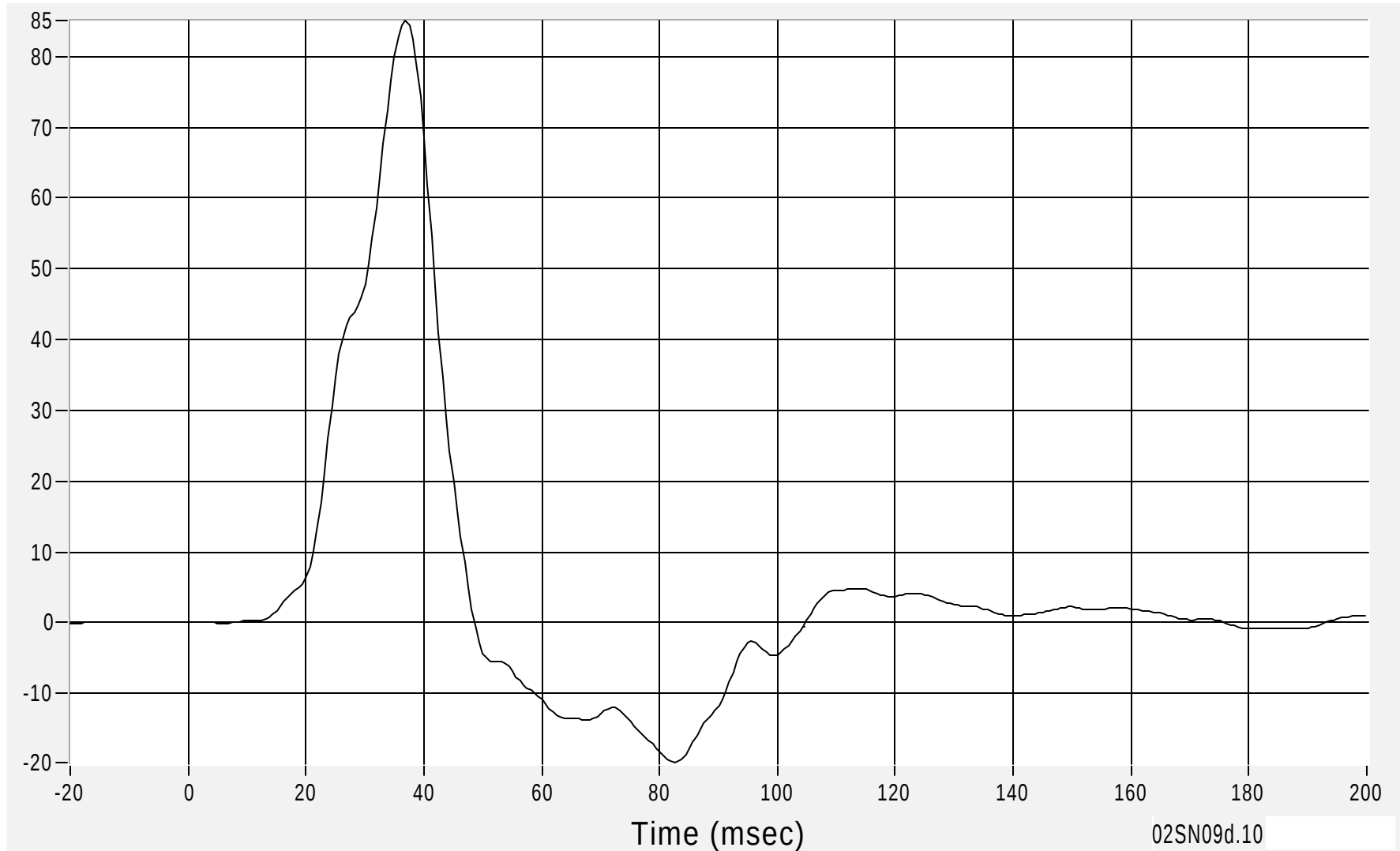
Driver Pelvic (Y) Acceleration

Max 85.1 G's at 36.9 msec

Acceleration (G's) FIR100

Min -19.8 G's at 82.5 msec

B-39



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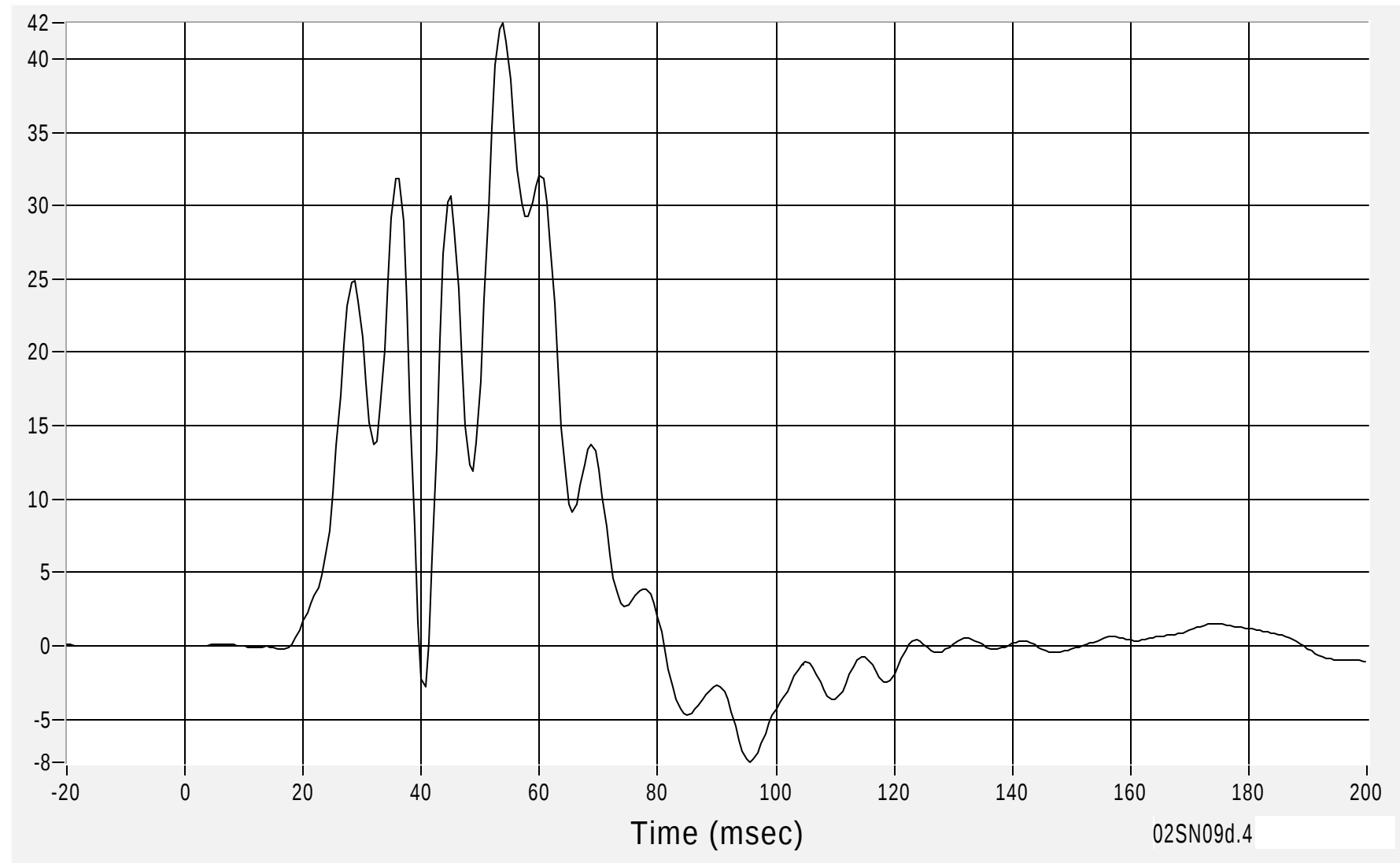
Driver Upper Rib (Y) Acceleration

Max 42.5 G's at 53.8 msec

Acceleration (G's) FIR100

Min -7.9 G's at 95.6 msec

B-40



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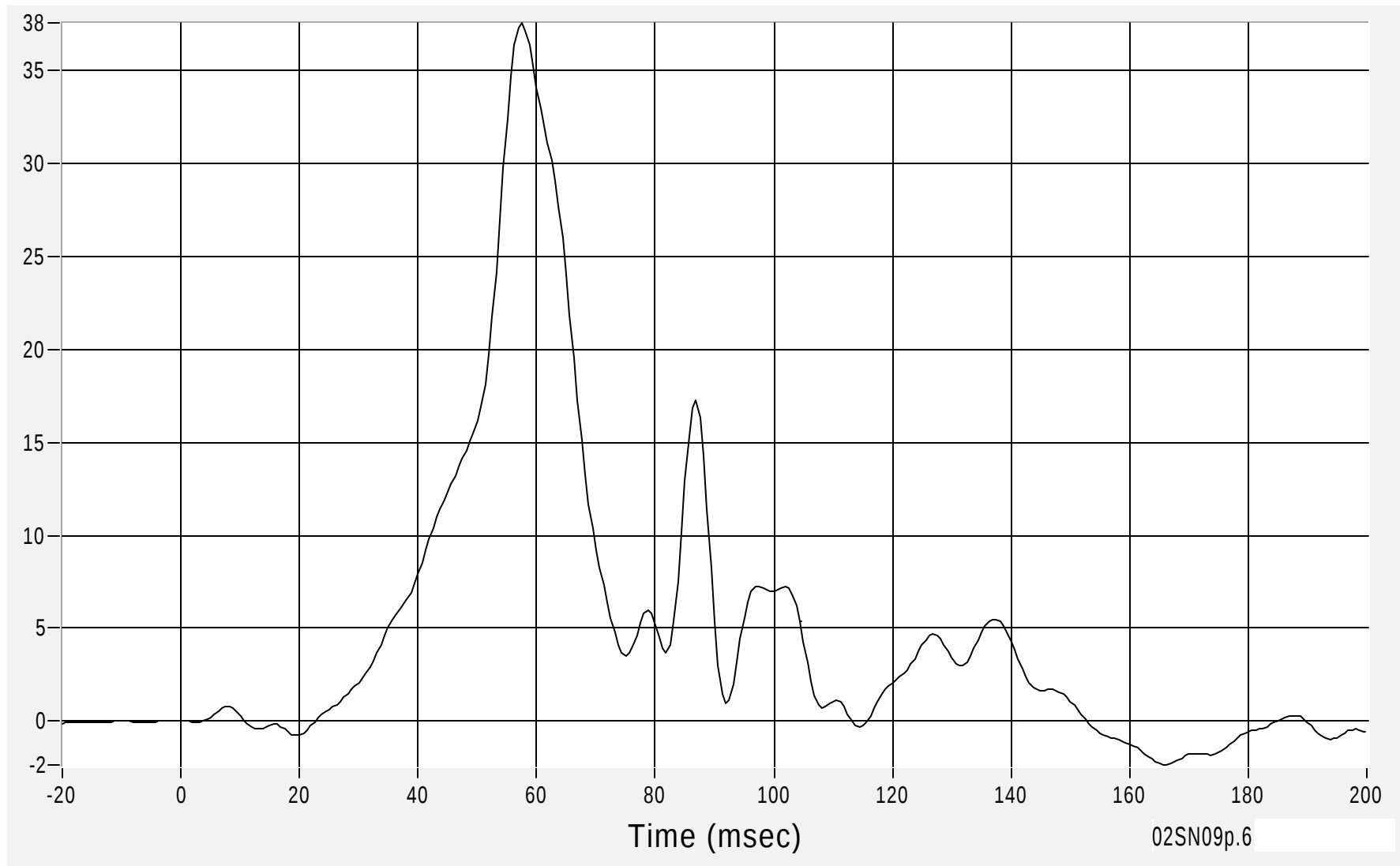
Passenger Lower Rib (Y) Acceleration

Acceleration (G's) FIR100

Max 37.6 G's at 57.5 msec

Min -2.4 G's at 166.2 msec

B-41



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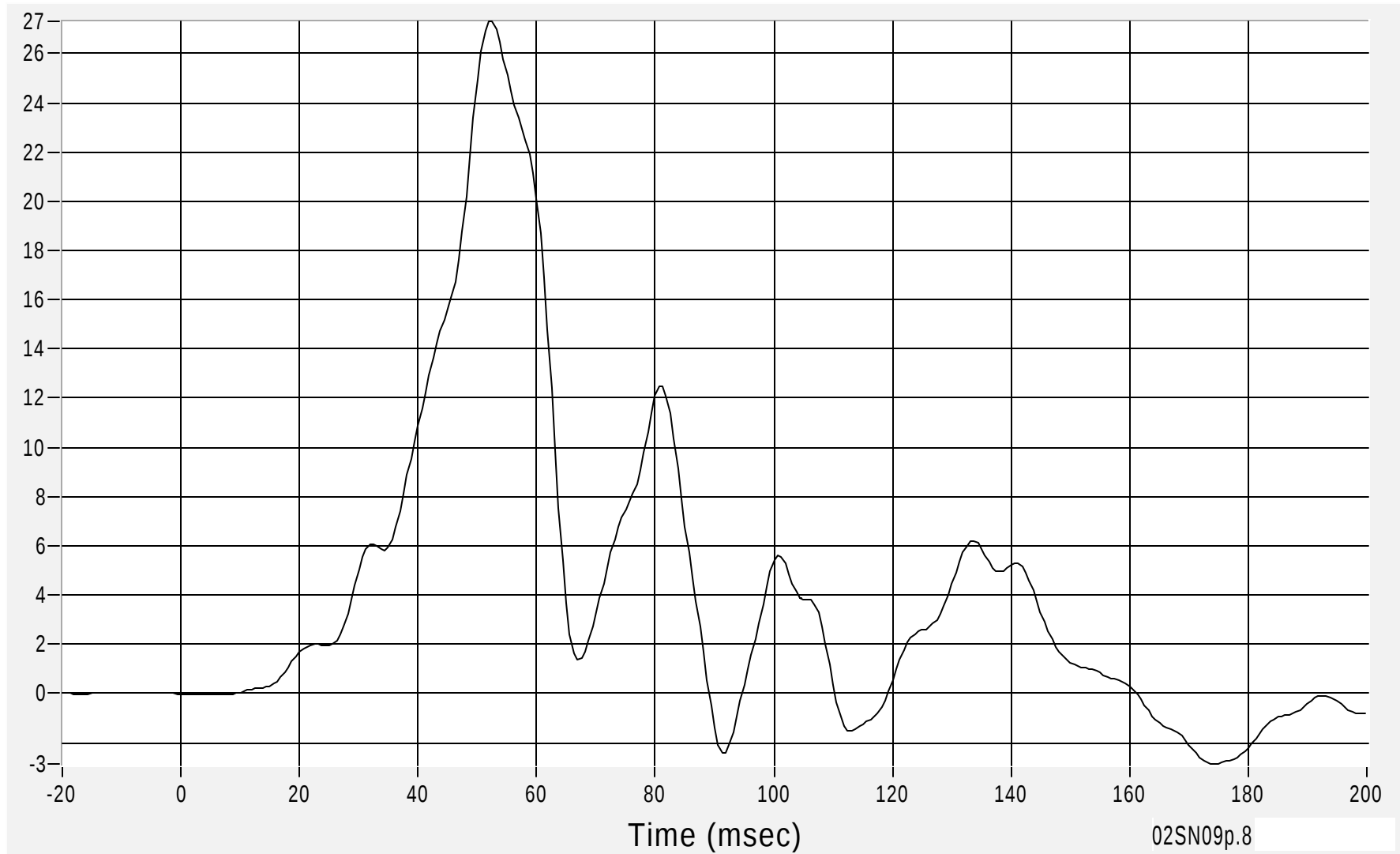
Passenger Lower Spine (Y) Acceleration

Acceleration (G's) FIR100

Max 27.3 G's at 51.9 msec

Min -2.9 G's at 174.4 msec

B-42



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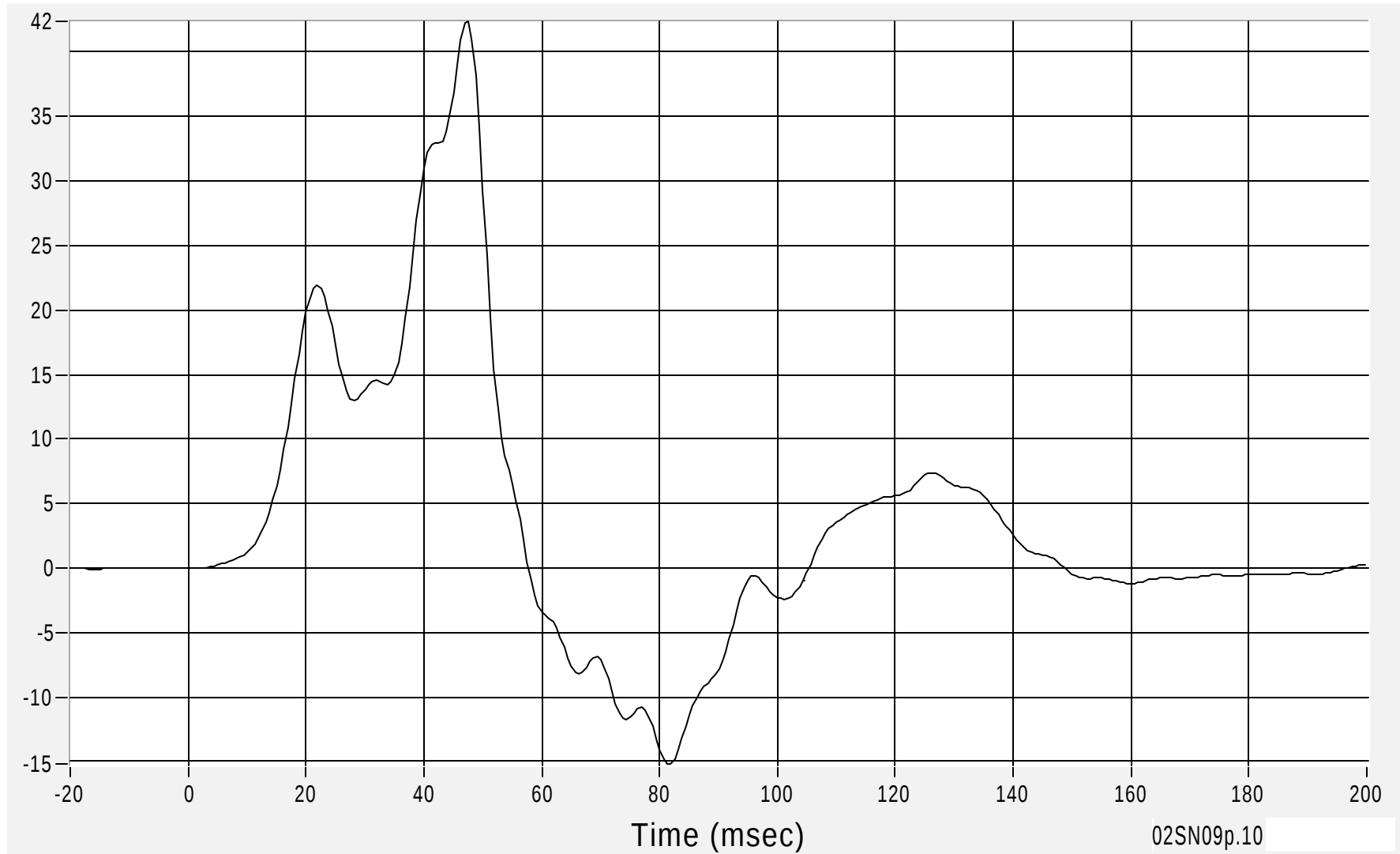
Passenger Pelvic (Y) Acceleration

Max 42.4 G's at 47.5 msec

Acceleration (G's) FIR100

Min -15.2 G's at 81.9 msec

B-43



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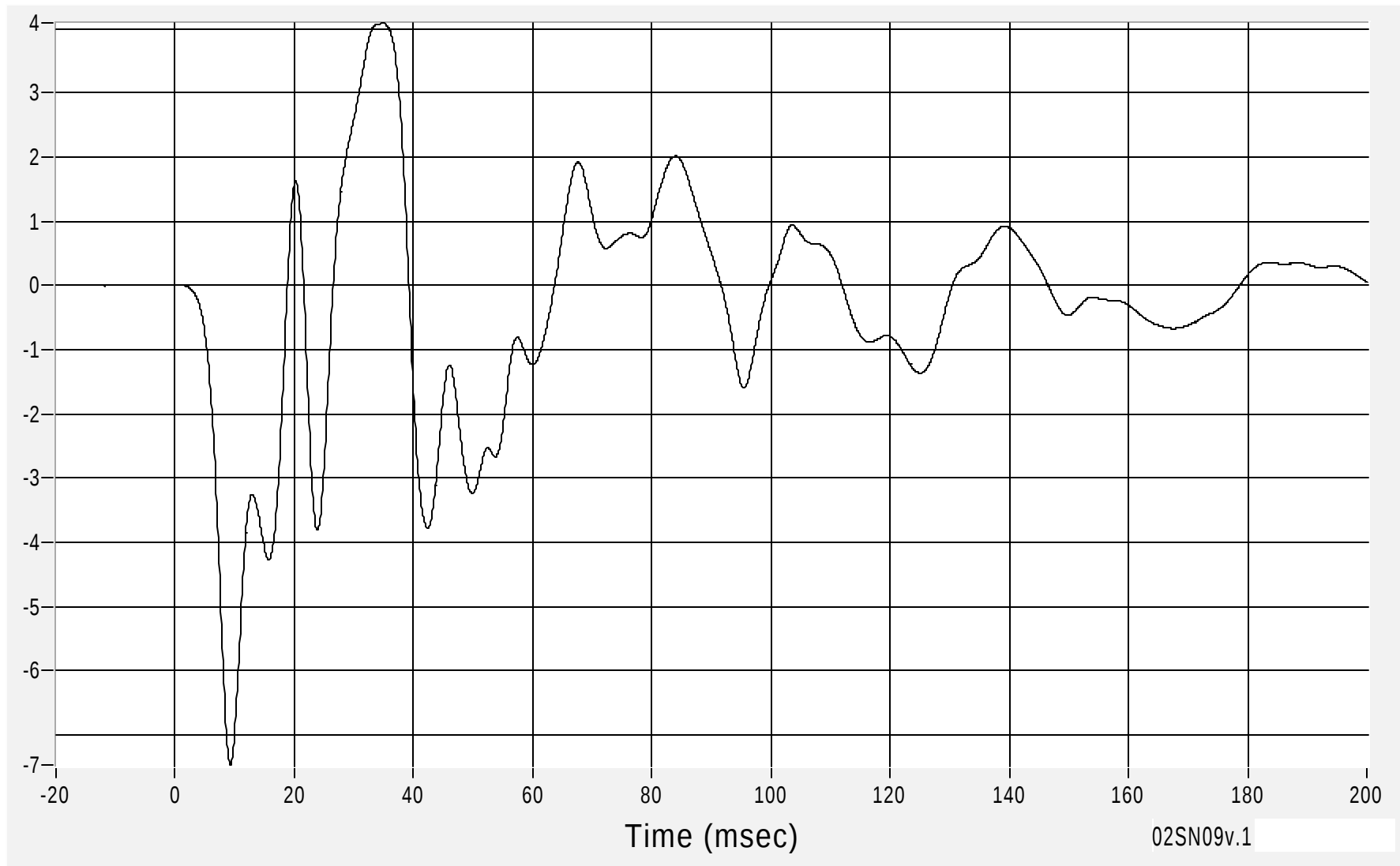
Right Side Sill at Front Seat (X) Acceleration

Max 4.1 G's at 34.9 msec

Acceleration (G's) CFC60

Min -7.5 G's at 9.3 msec

B-44



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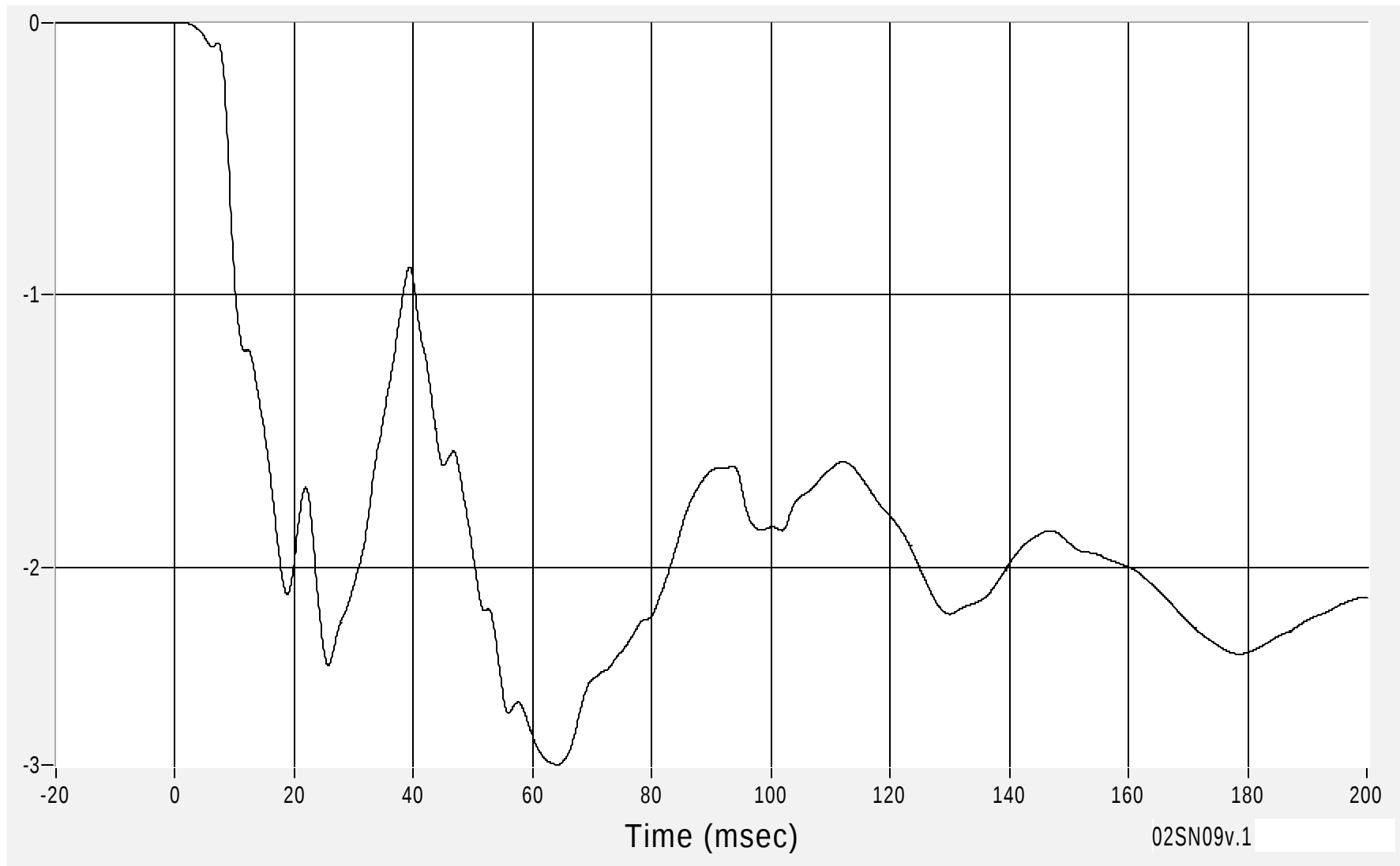
Right Side Sill at Front Seat (X) Velocity

Max 0.0 km/h at 0.4 msec

Velocity (km/h) CFC180

Min -2.7 km/h at 64.2 msec

B-45



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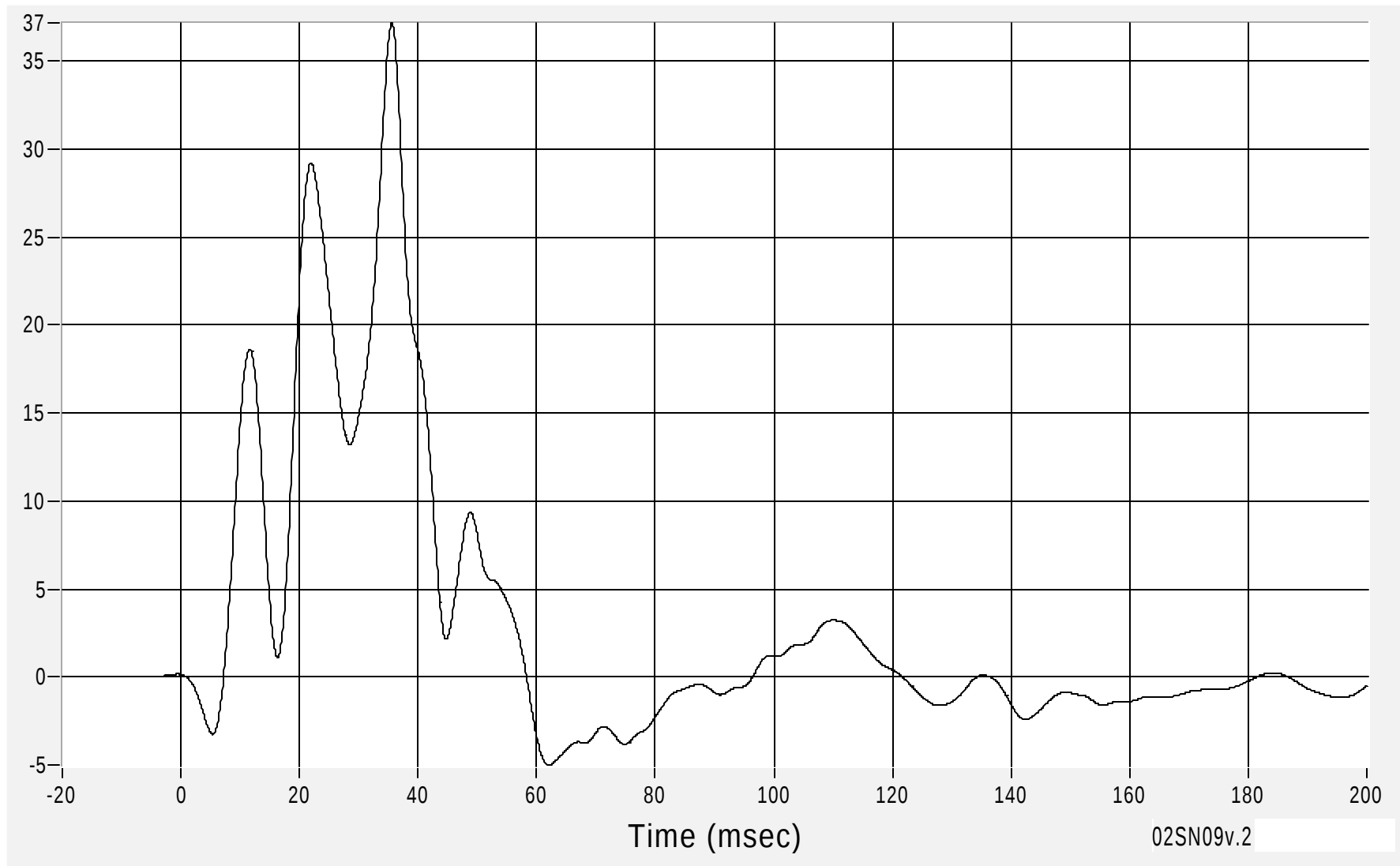
Right Side Sill at Front Seat (Y) Acceleration

Max 37.2 G's at 35.5 msec

Acceleration (G's) CFC60

Min -5.0 G's at 62.1 msec

B-46



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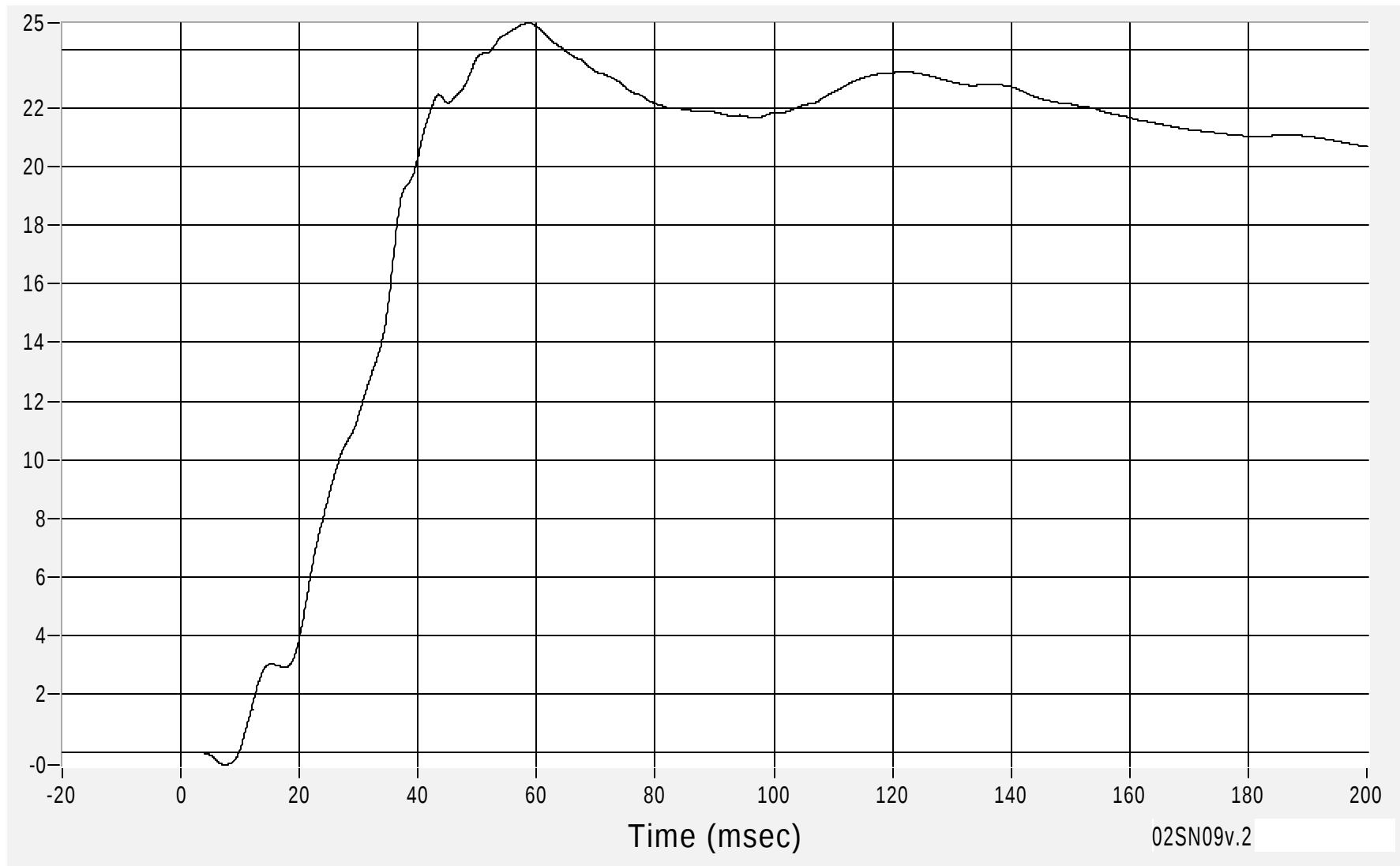
Right Side Sill at Front Seat (Y) Velocity

Max 24.9 km/h at 58.7 msec

Min -0.4 km/h at 7.4 msec

Velocity (km/h) CFC180

B-47



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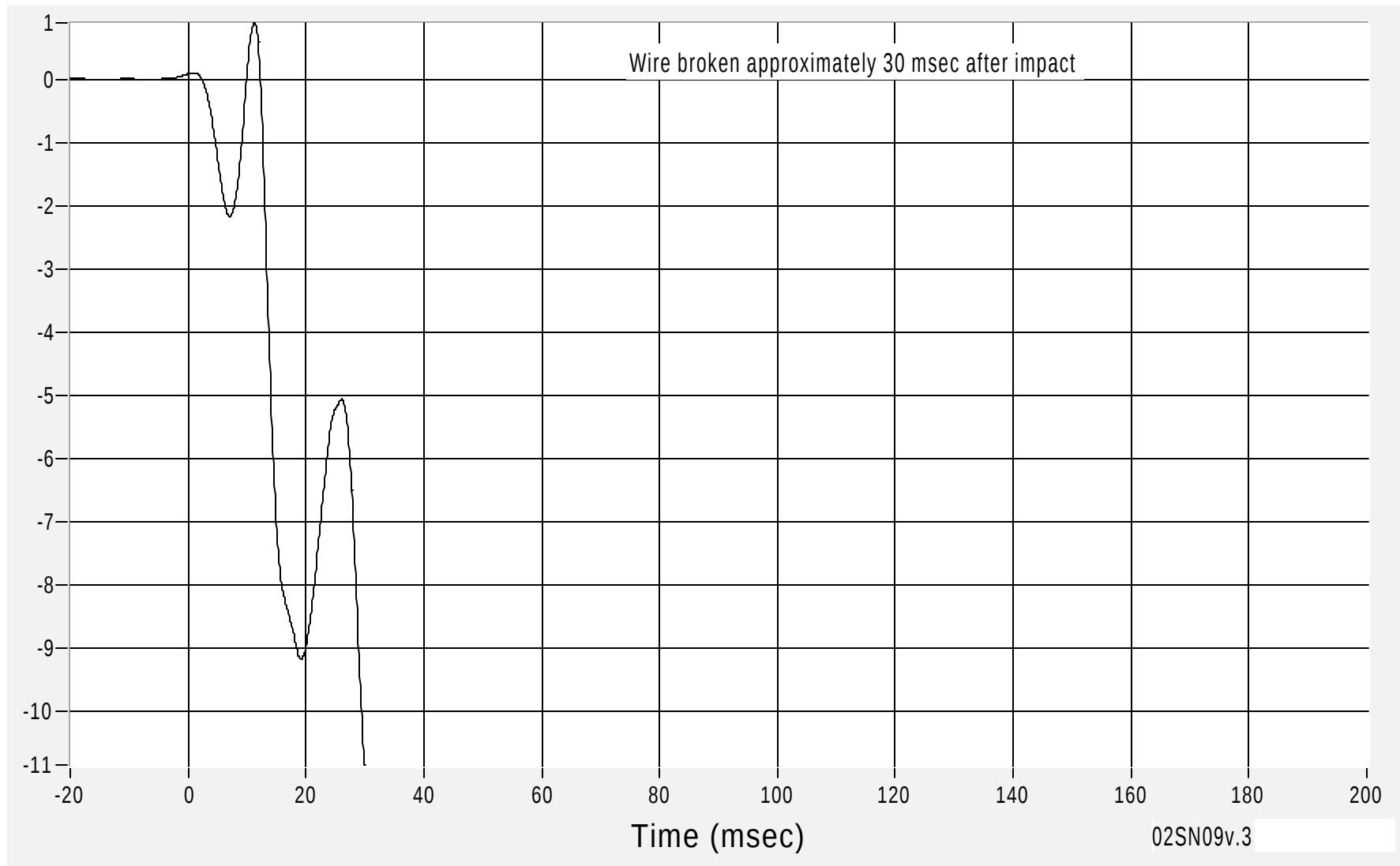
Right Side Sill at Front Seat (Z) Acceleration

Max 0.9 G's at 11.3 msec

Min -10.9 G's at 29.9 msec

Acceleration (G's) CFC60

B-48



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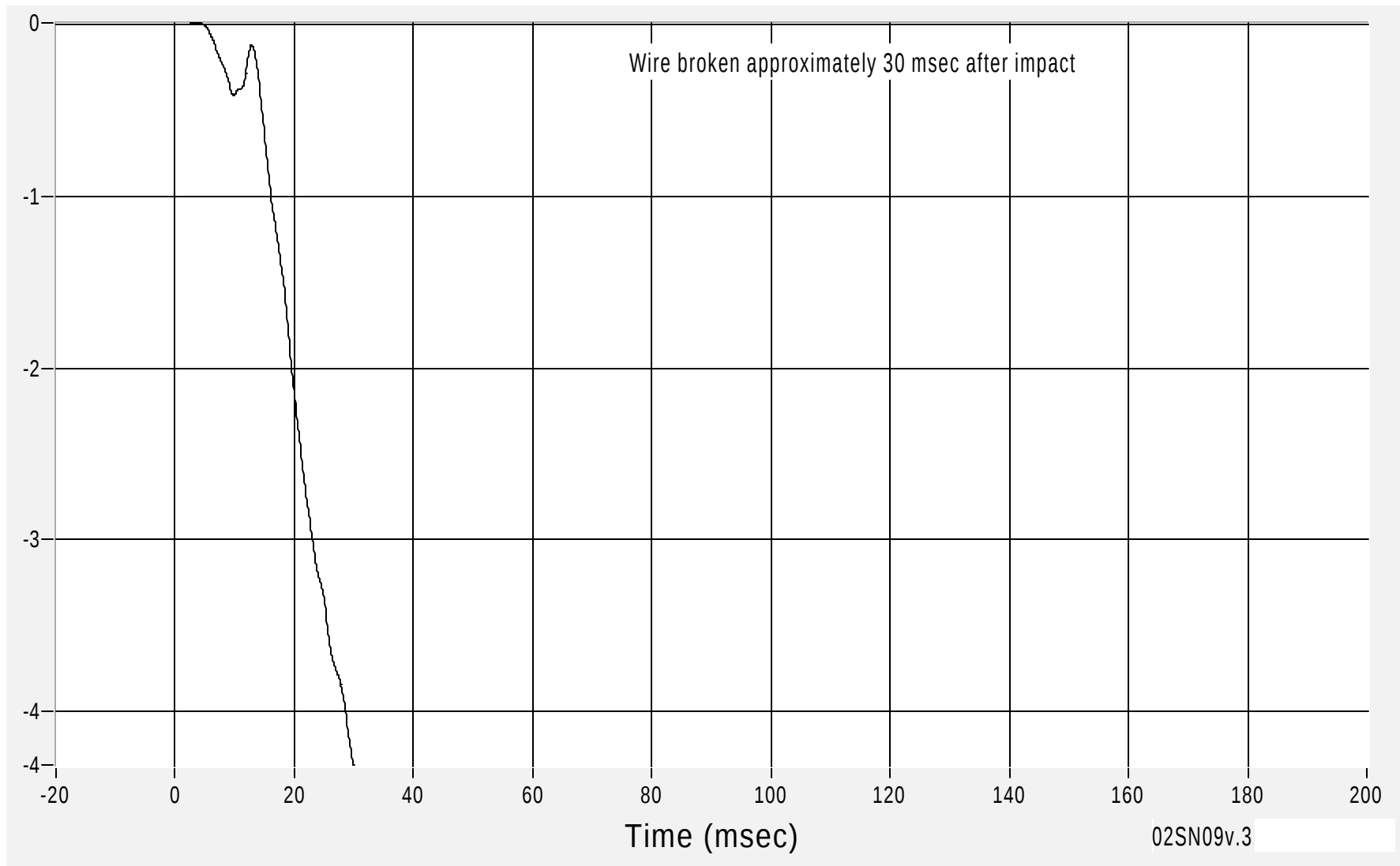
Right Side Sill at Front Seat (Z) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 3.8 msec

Min -4.3 km/h at 29.9 msec

B-49



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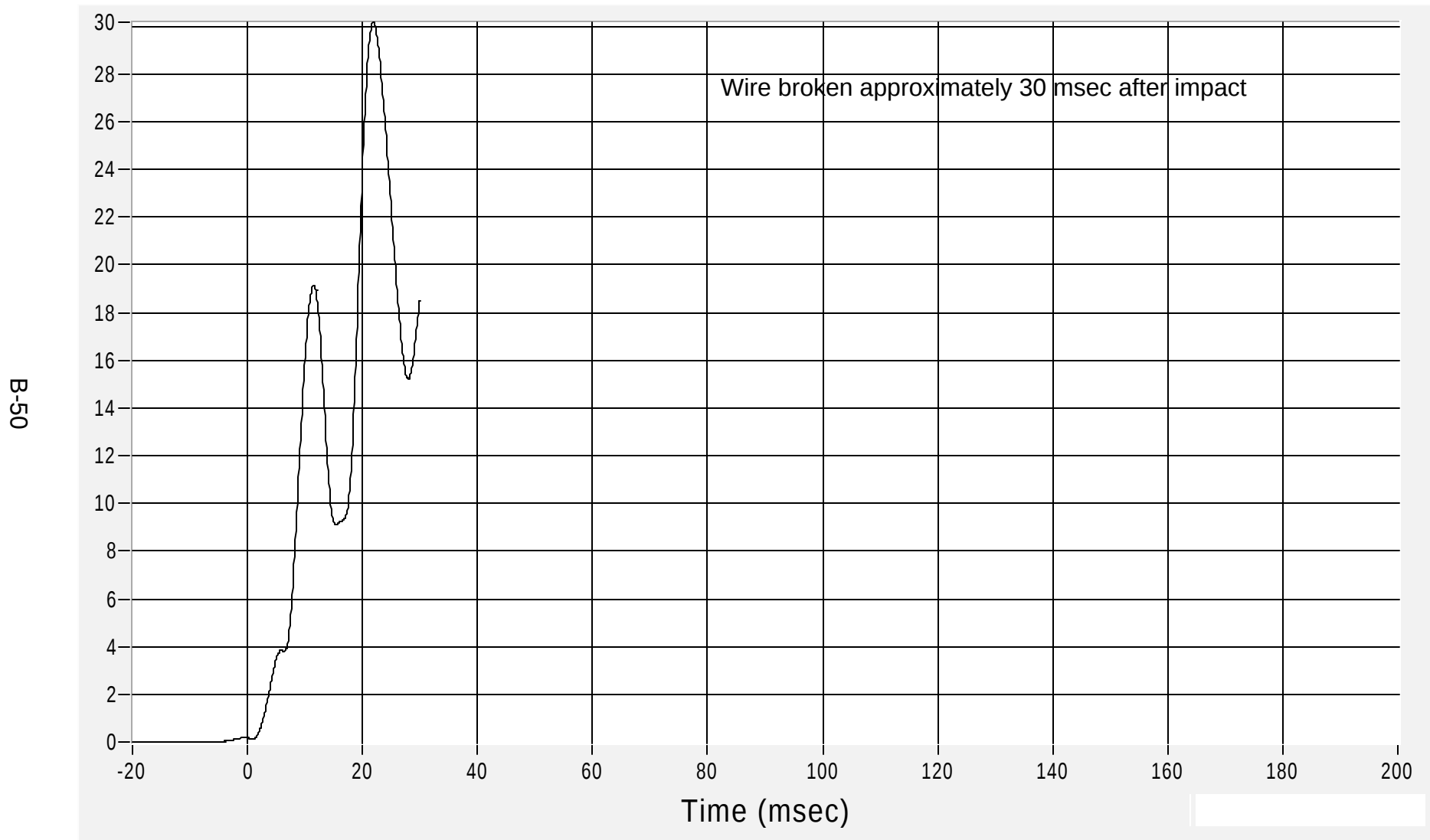
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Right Side Sill at Front Seat Resultant Acceleration

Max 30.2 G's at 21.9 msec

Acceleration (G's) CFC60

Min 0.1 G's at 1.0 msec



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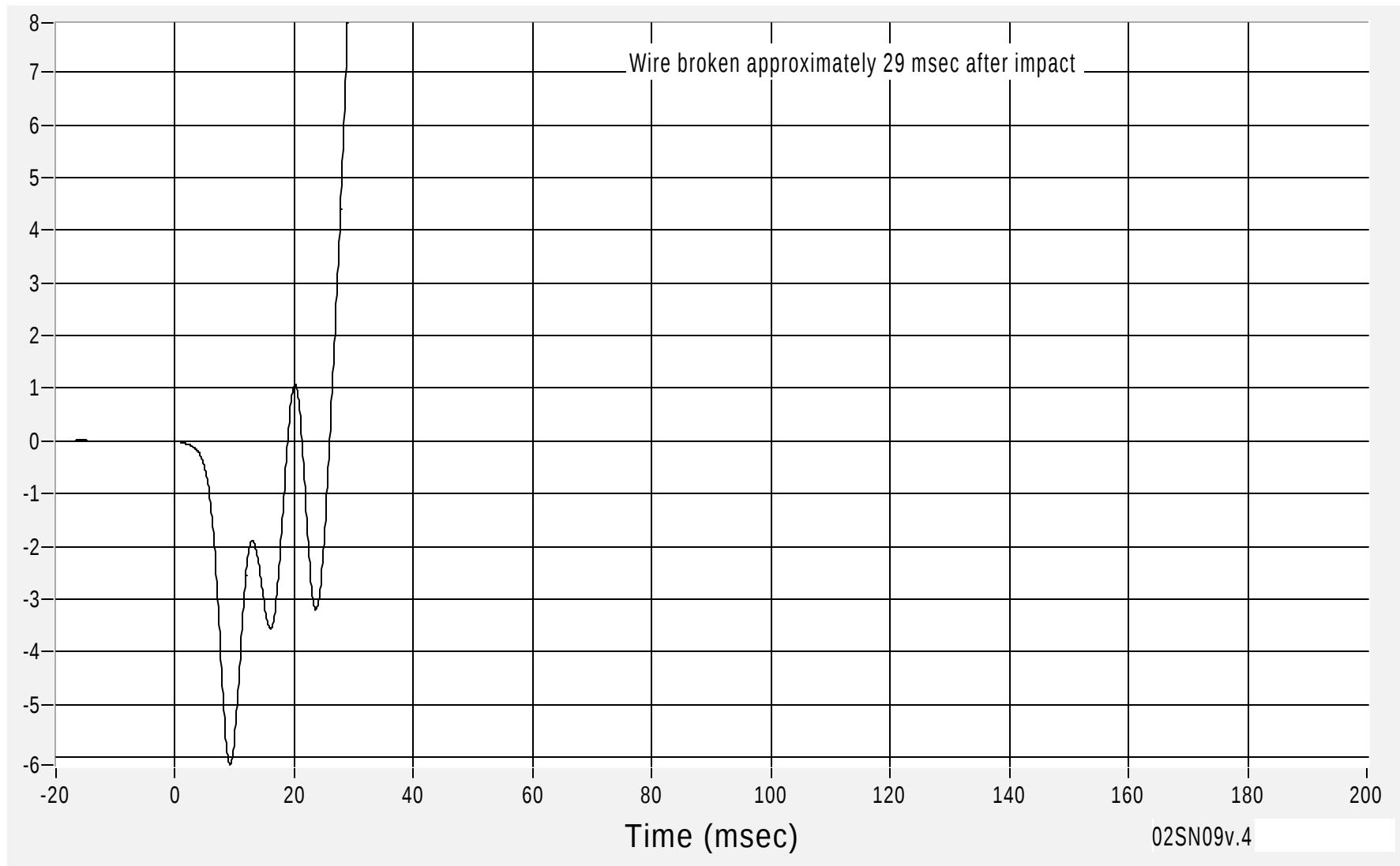
Right Side Sill at Rear Seat (X) Acceleration

Max 7.9 G's at 28.9 msec

Acceleration (G's) CFC60

Min -6.1 G's at 9.2 msec

B-51



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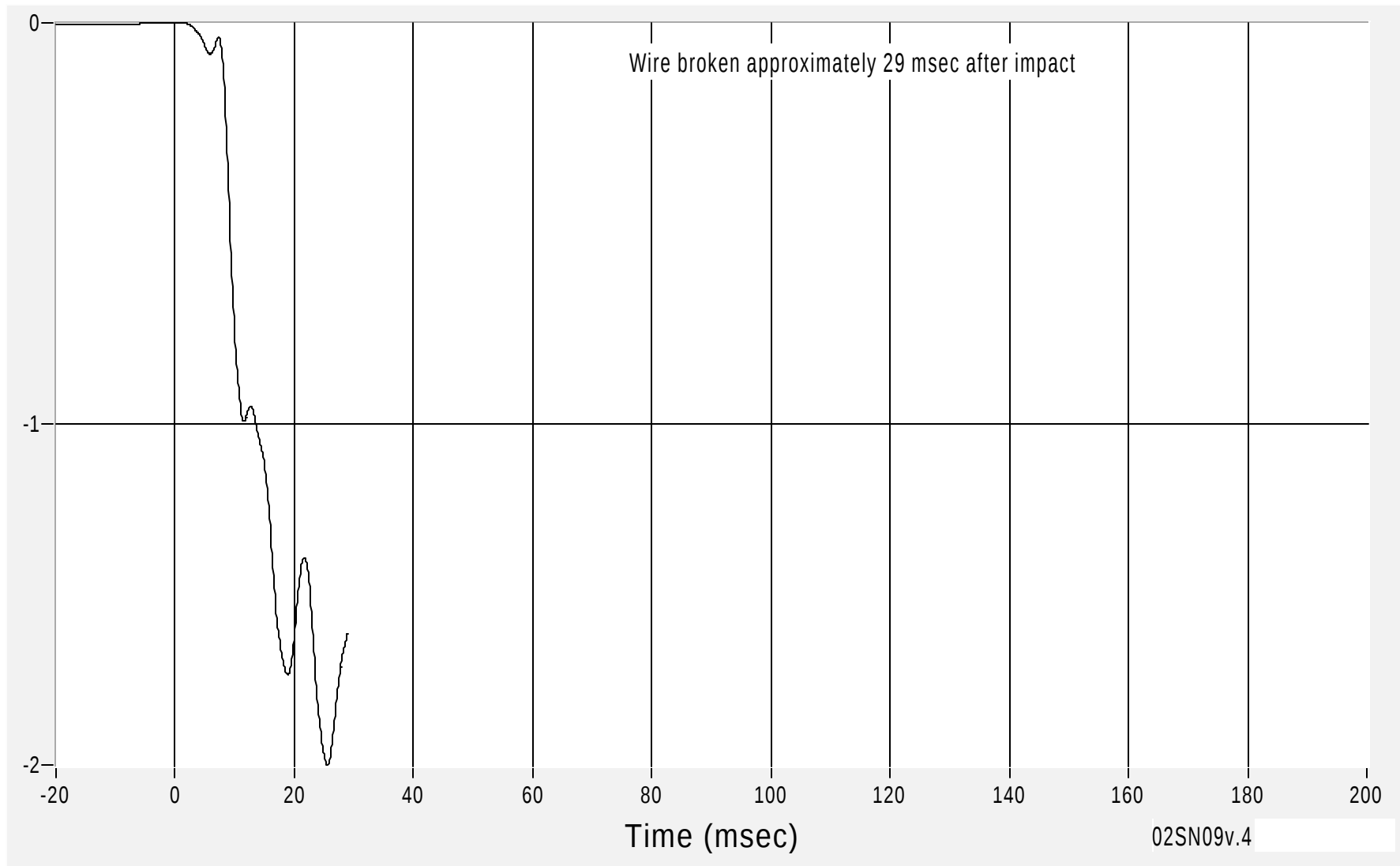
Right Side Sill at Rear Seat (X) Velocity

Velocity (km/h) CFC180

Max 0.0 km/h at 0.9 msec

Min -1.8 km/h at 25.5 msec

B-52



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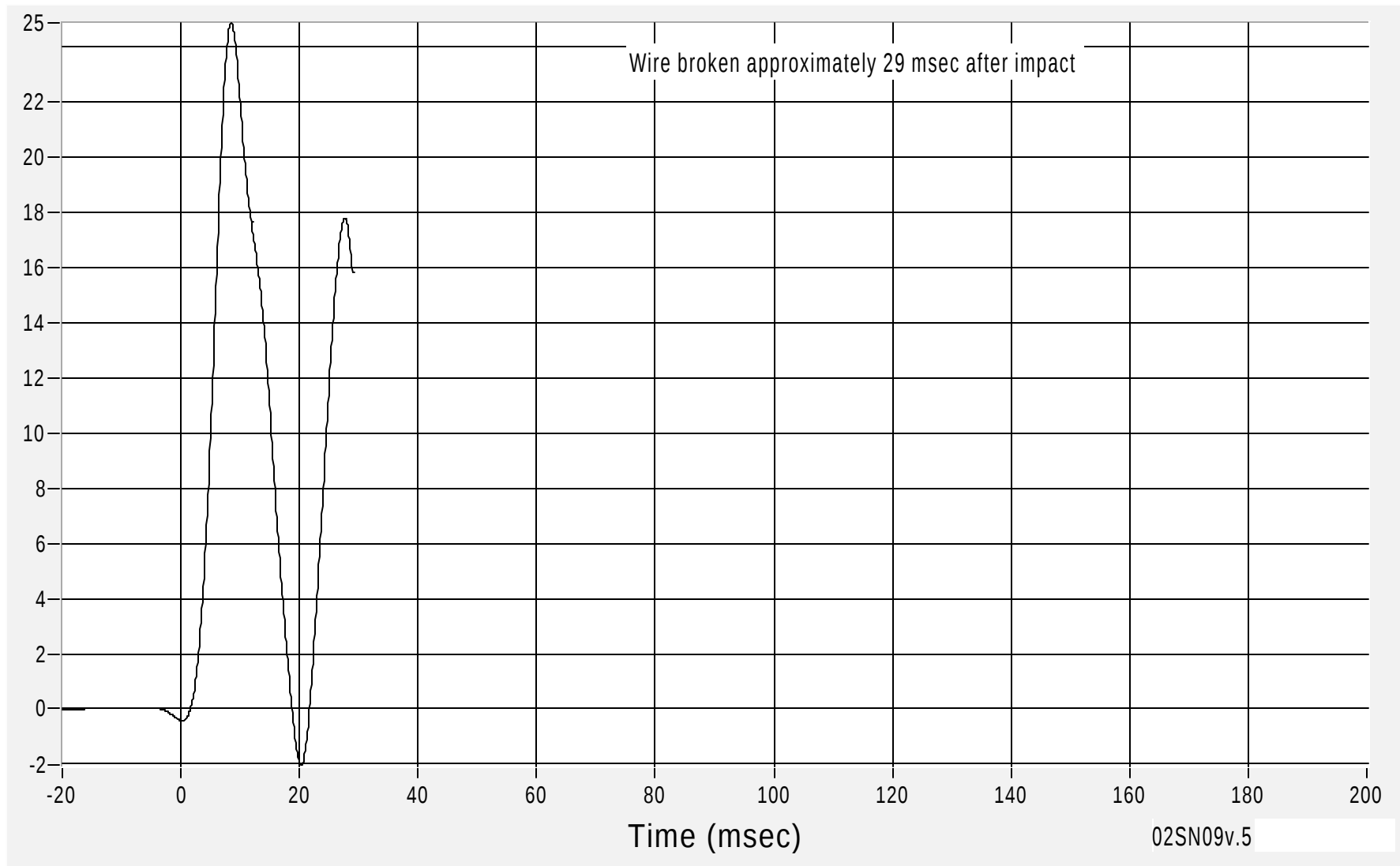
Right Side Sill at Rear Seat (Y) Acceleration

Max 24.9 G's at 8.5 msec

Min -2.0 G's at 20.2 msec

Acceleration (G's) CFC60

B-53



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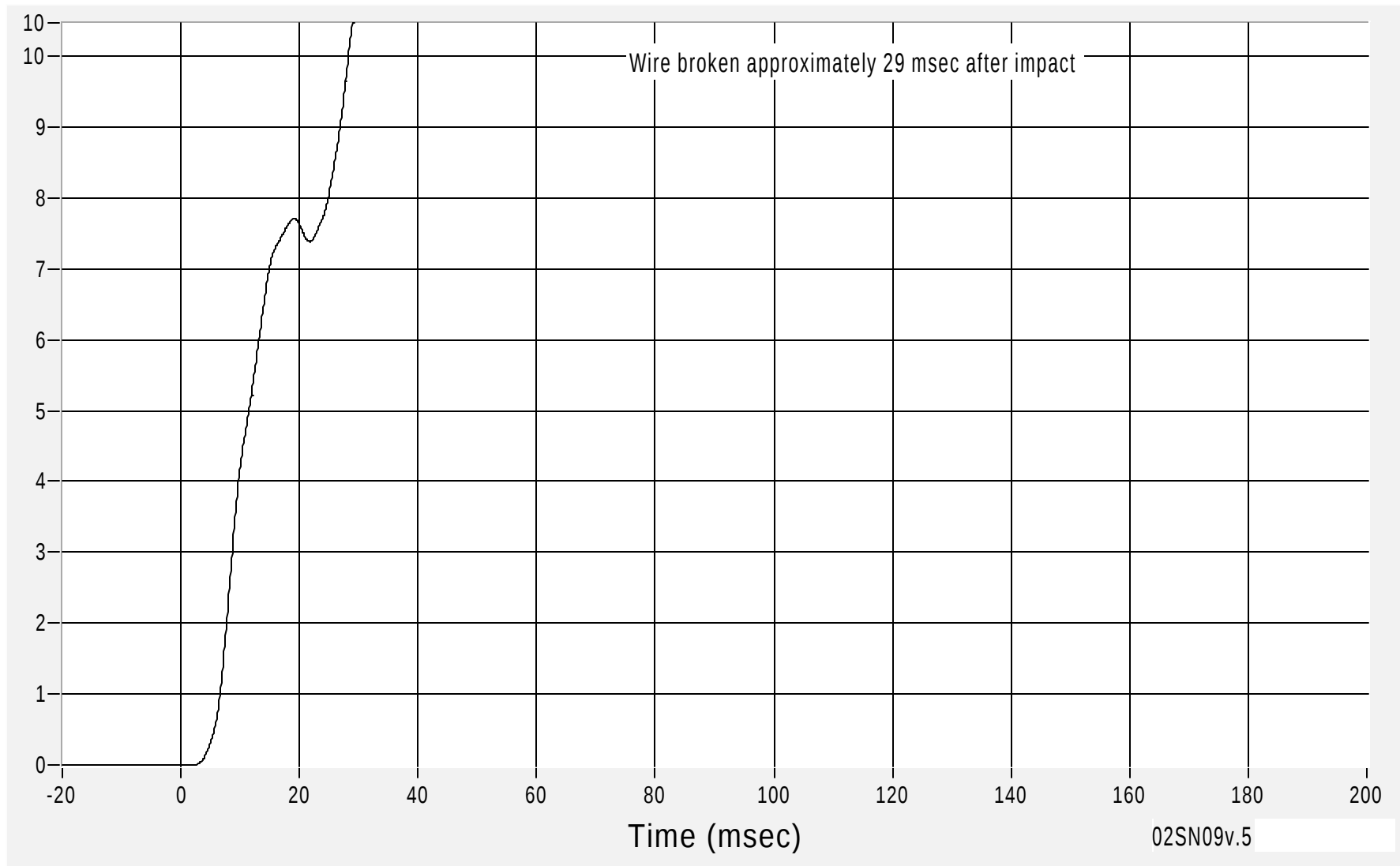
Right Side Sill at Rear Seat (Y) Velocity

Velocity (km/h) CFC180

Max 10.5 km/h at 28.9 msec

Min 0.0 km/h at 0.0 msec

B-54



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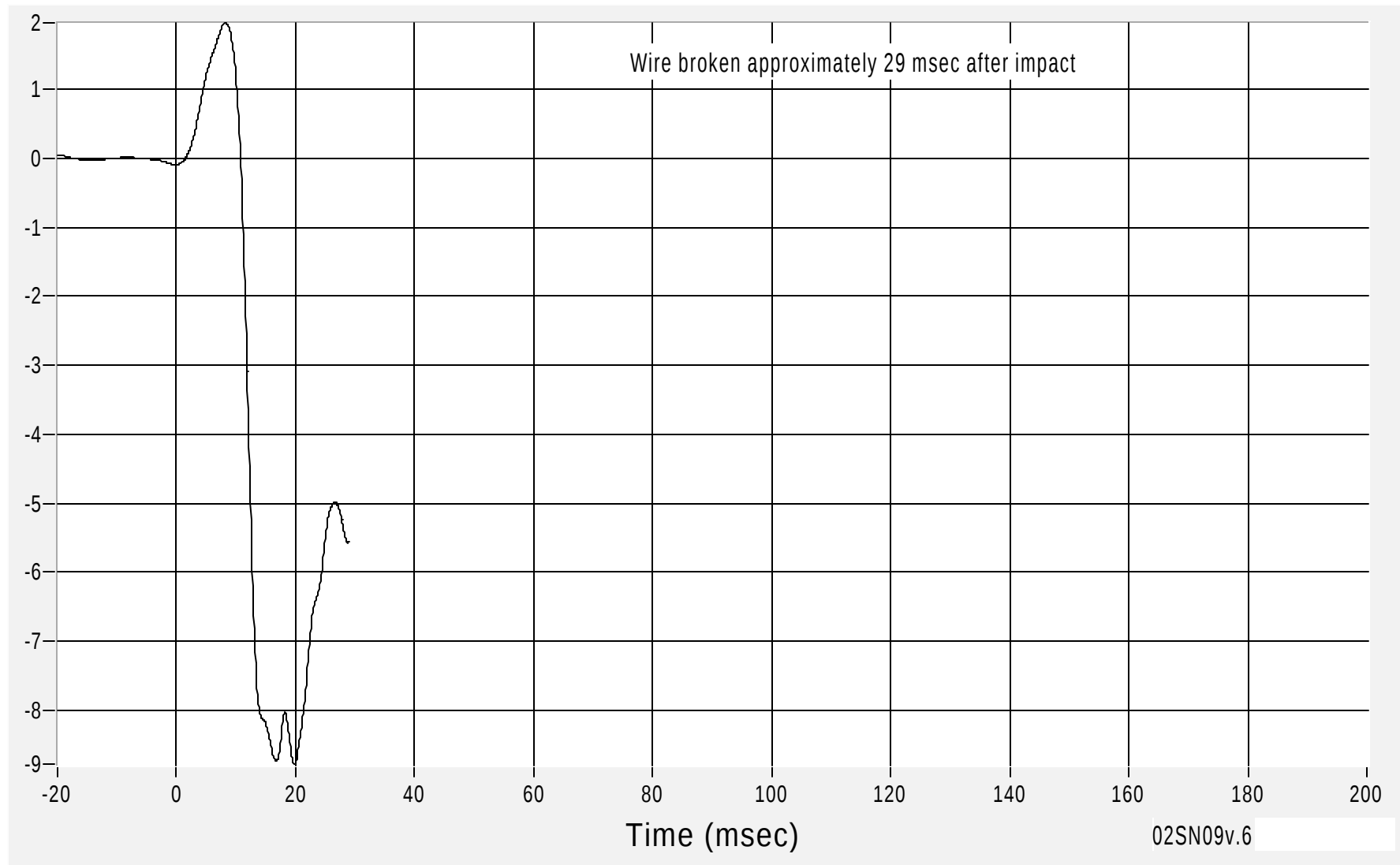
Right Side Sill at Rear Seat (Z) Acceleration

Max 2.0 G's at 8.2 msec

Min -8.8 G's at 19.8 msec

Acceleration (G's) CFC60

B-55



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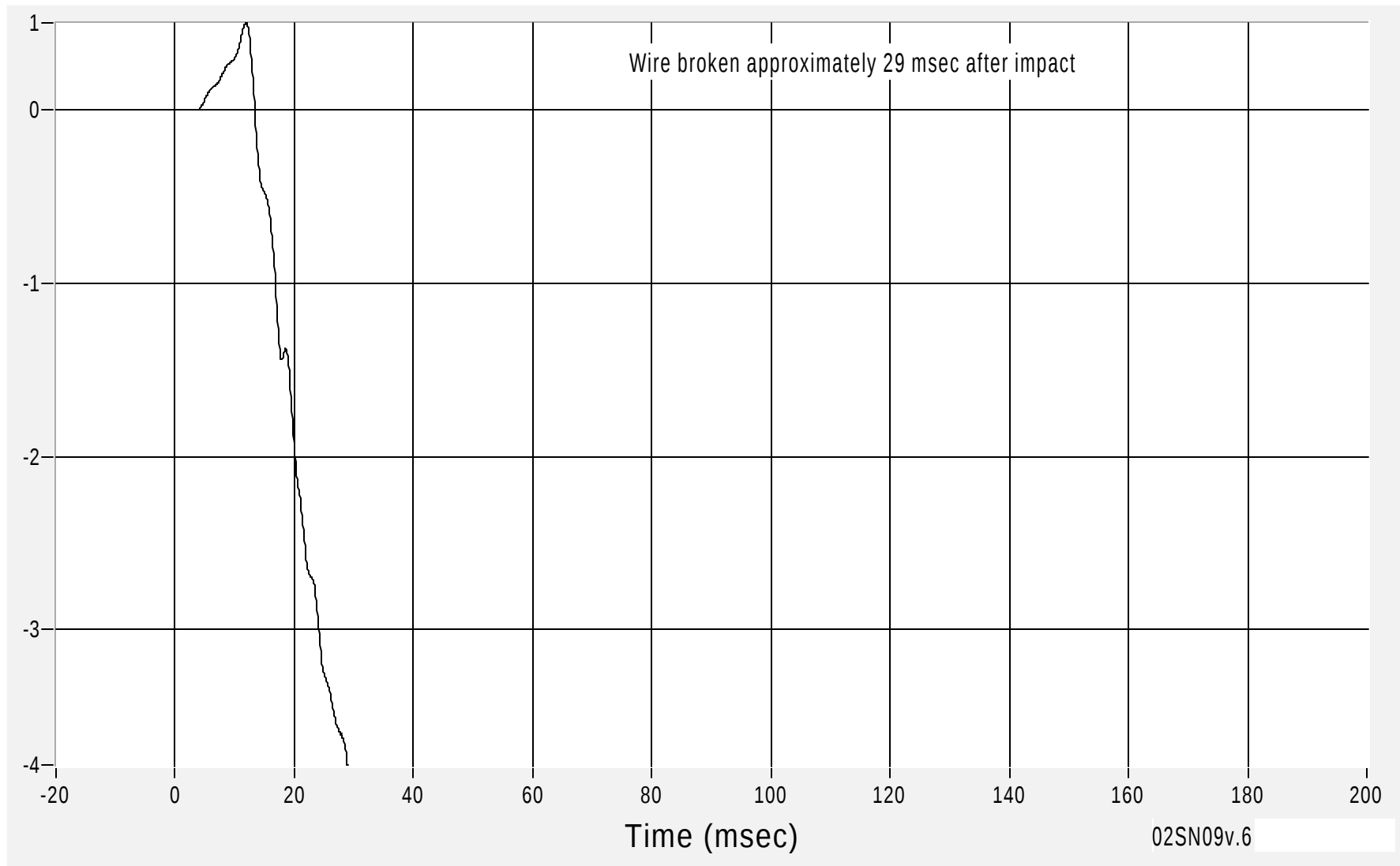
Right Side Sill at Rear Seat (Z) Velocity

Max 0.5 km/h at 11.8 msec

Min -3.8 km/h at 28.9 msec

Velocity (km/h) CFC180

B-56



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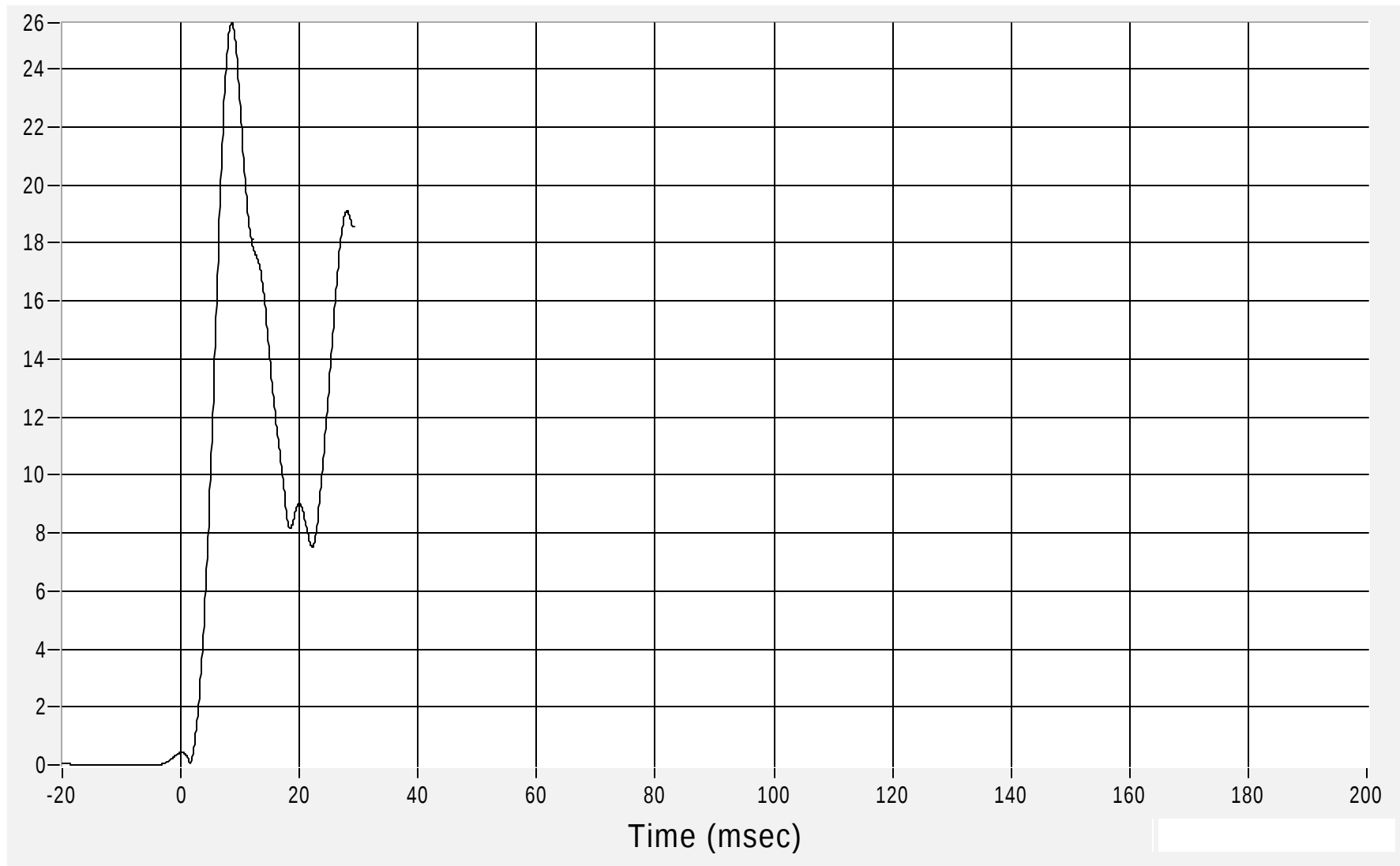
Right Side Sill at Rear Seat Resultant Acceleration

Max 25.6 G's at 8.6 msec

Acceleration (G's) CFC60

Min 0.0 G's at 1.6 msec

B-57



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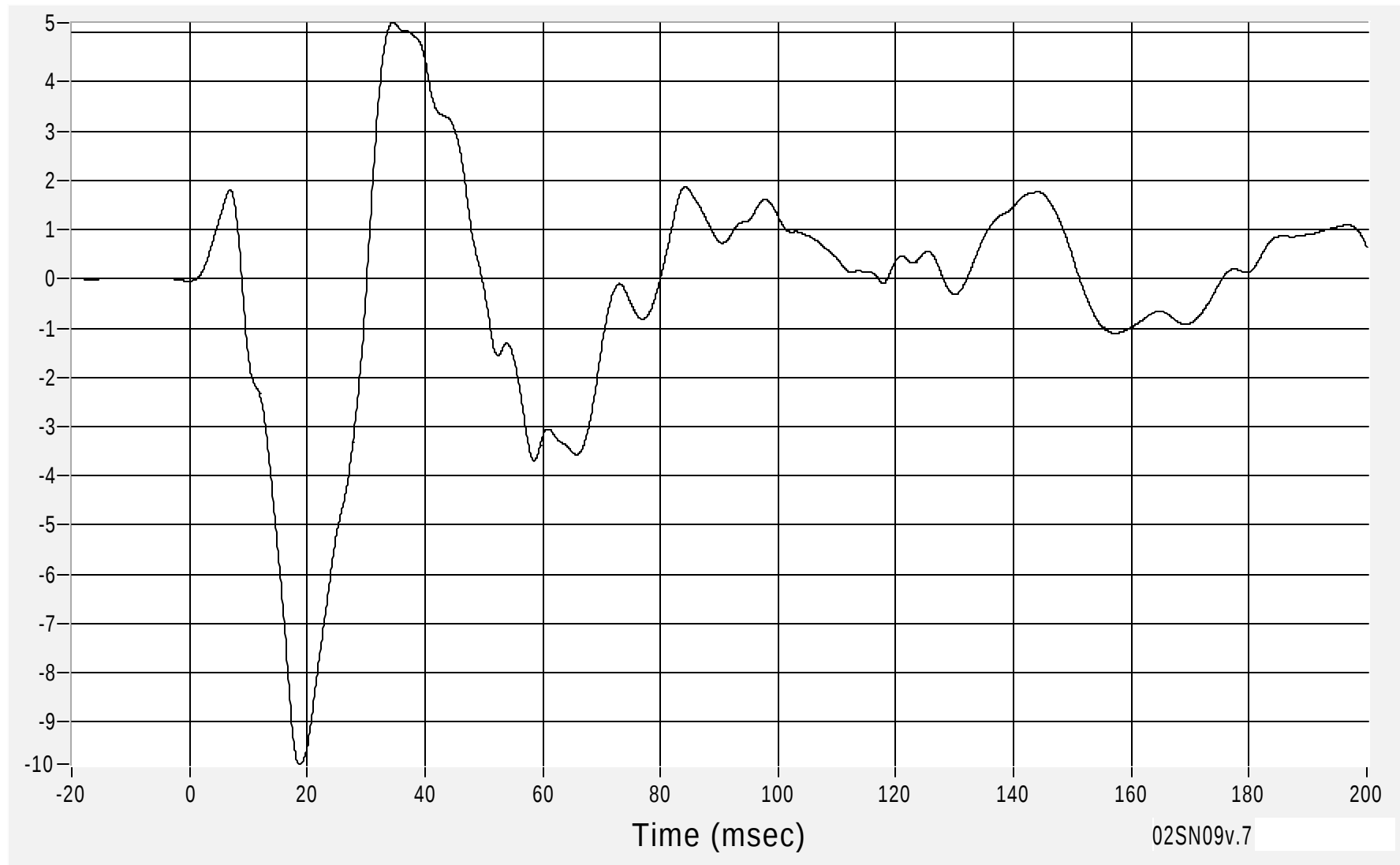
Rear Floorpan Above Axle (X) Acceleration

Max 5.2 G's at 34.5 msec

Min -9.9 G's at 18.7 msec

Acceleration (G's) CFC60

B-58



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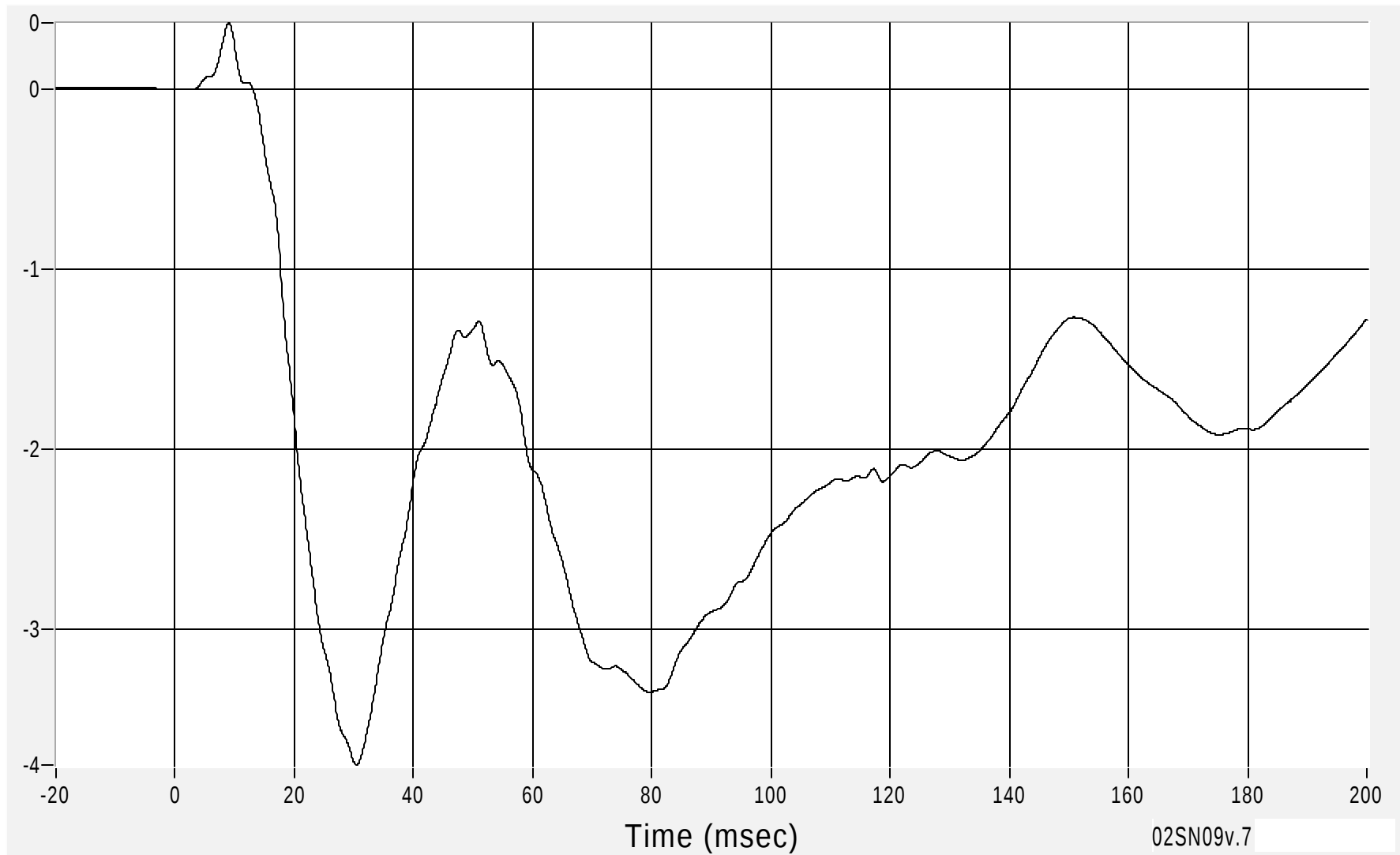
Rear Floorpan Above Axle (X) Velocity

Max 0.4 km/h at 9.0 msec

Min -3.8 km/h at 30.4 msec

Velocity (km/h) CFC180

B-59



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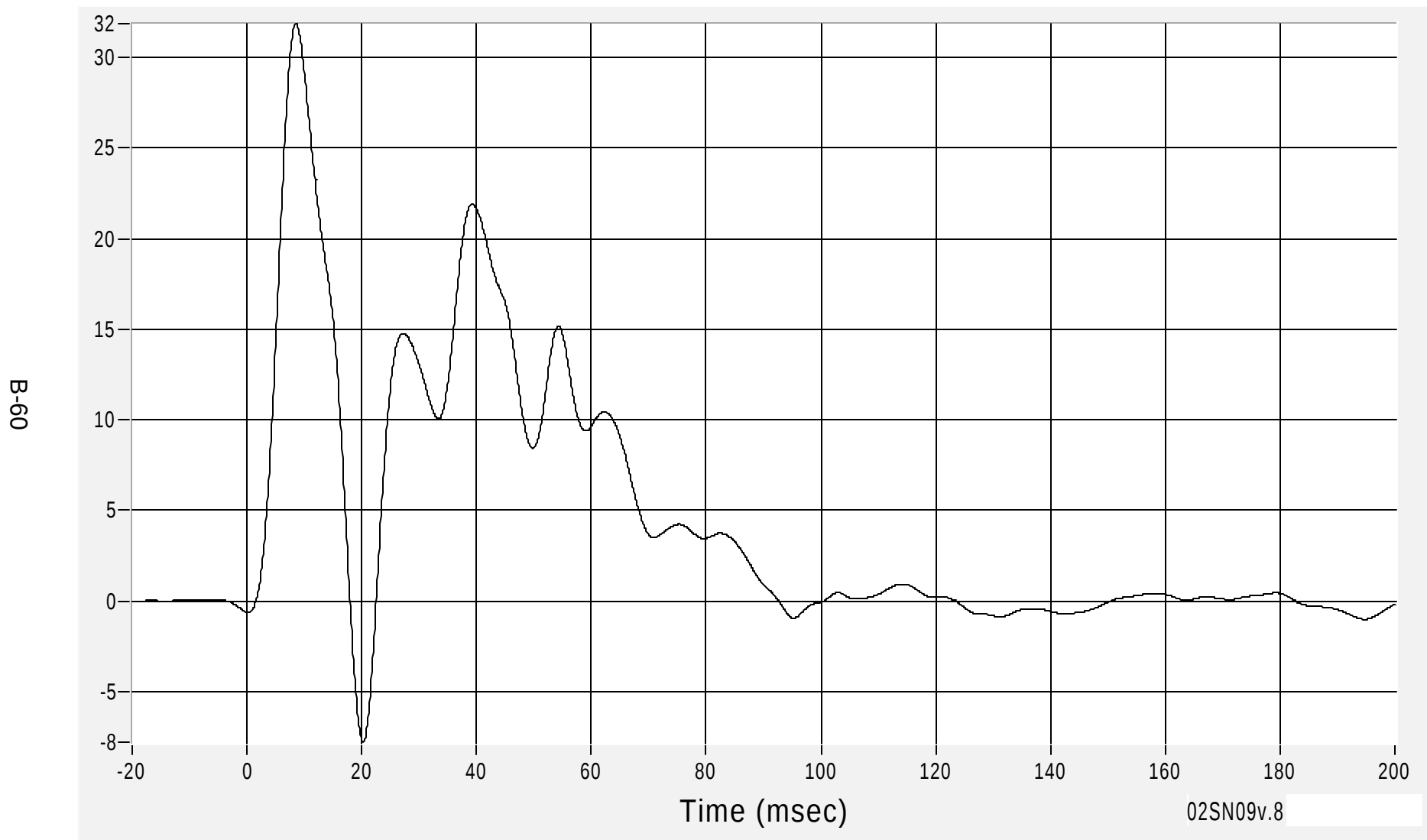
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Rear Floorpan Above Axle (Y) Acceleration

Max 31.9 G's at 8.5 msec

Min -7.8 G's at 20.2 msec

Acceleration (G's) CFC60



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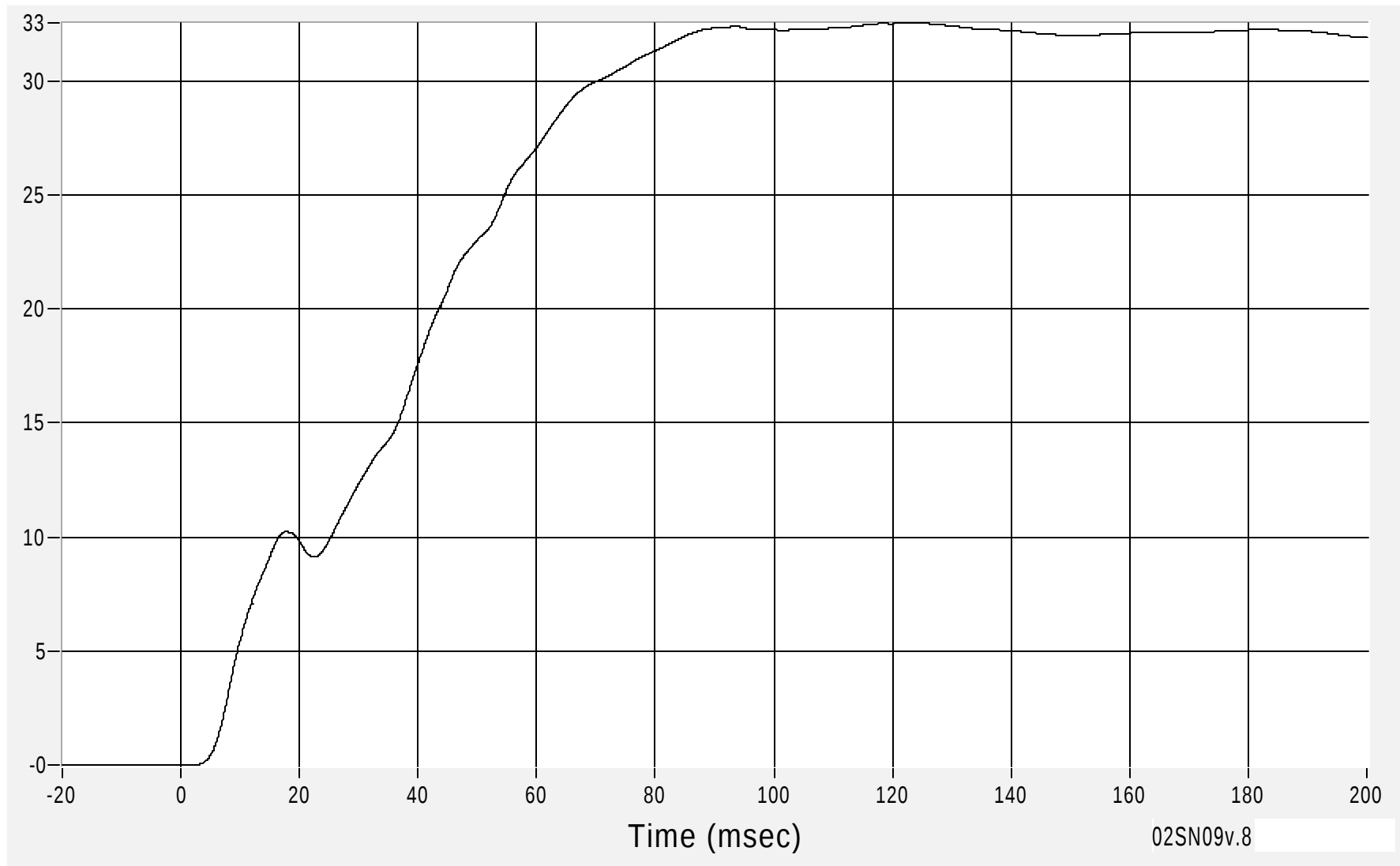
Rear Floorpan Above Axle (Y) Velocity

Max 32.5 km/h at 123.7 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 2.0 msec

B-61



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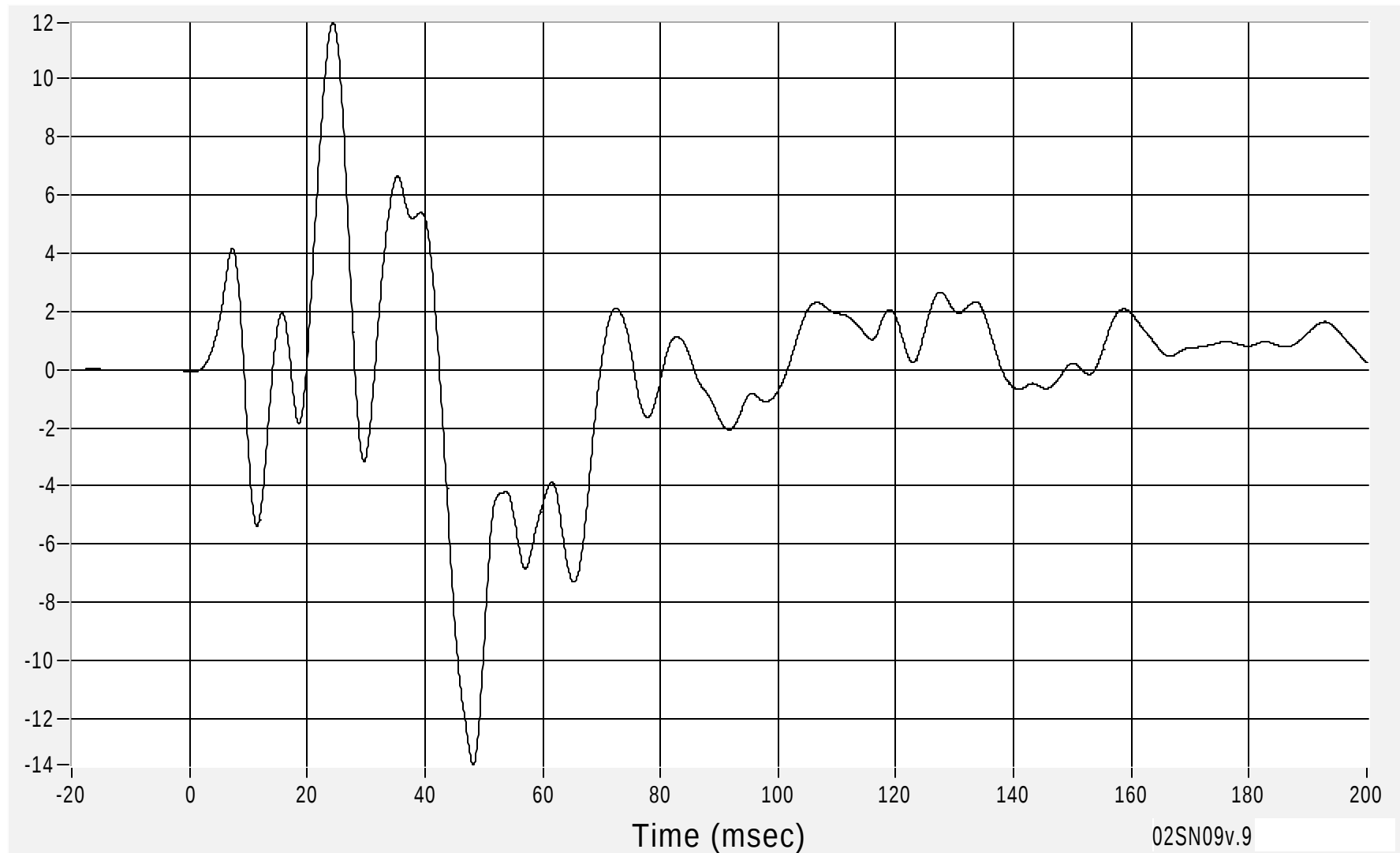
Rear Floorpan Above Axle (Z) Acceleration

Max 11.9 G's at 24.4 msec

Min -13.6 G's at 48.2 msec

Acceleration (G's) CFC60

B-62



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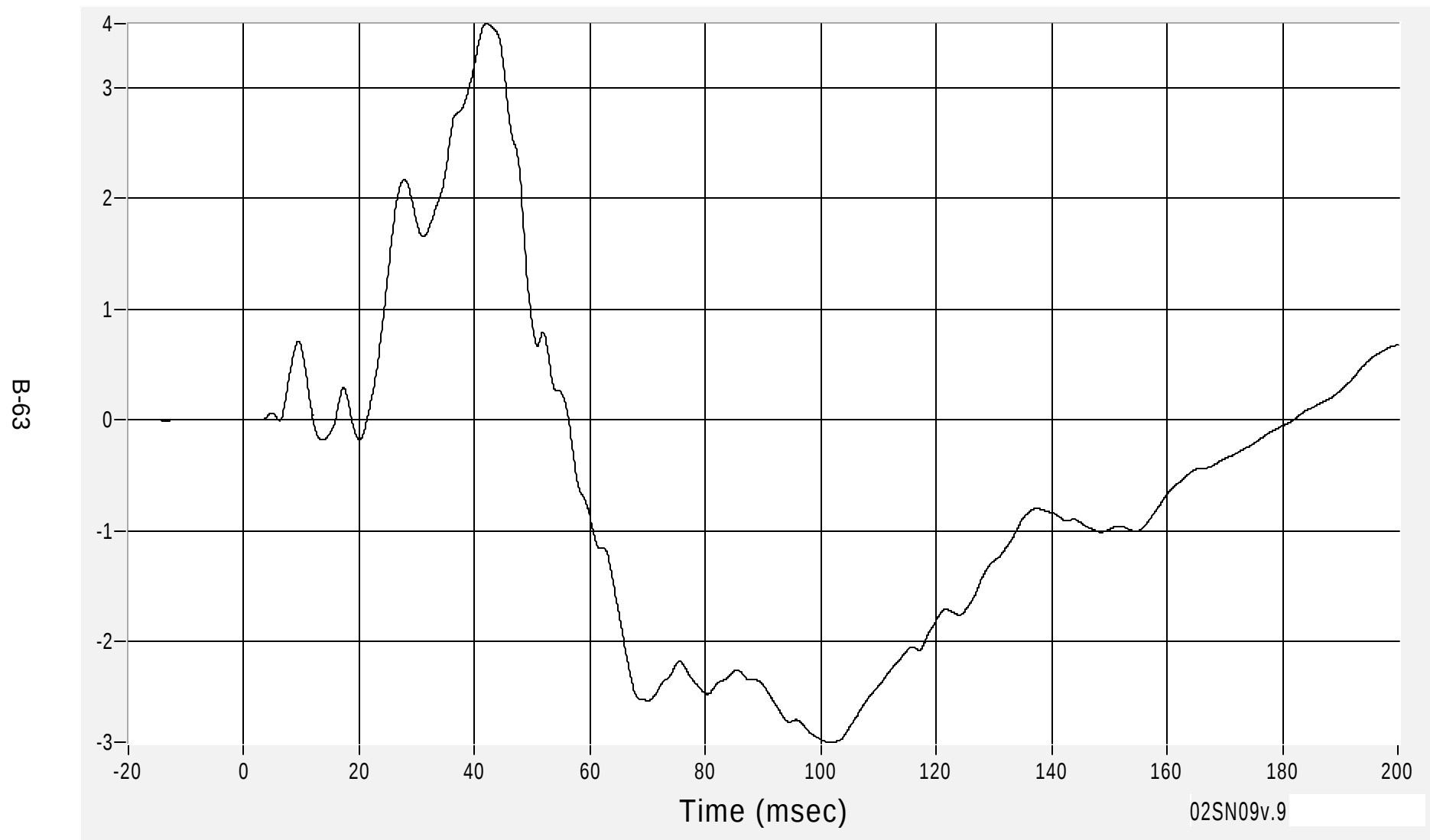
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Rear Floorpan Above Axle (Z) Velocity

Max 3.6 km/h at 42.1 msec

Velocity (km/h) CFC180

Min -2.9 km/h at 101.5 msec



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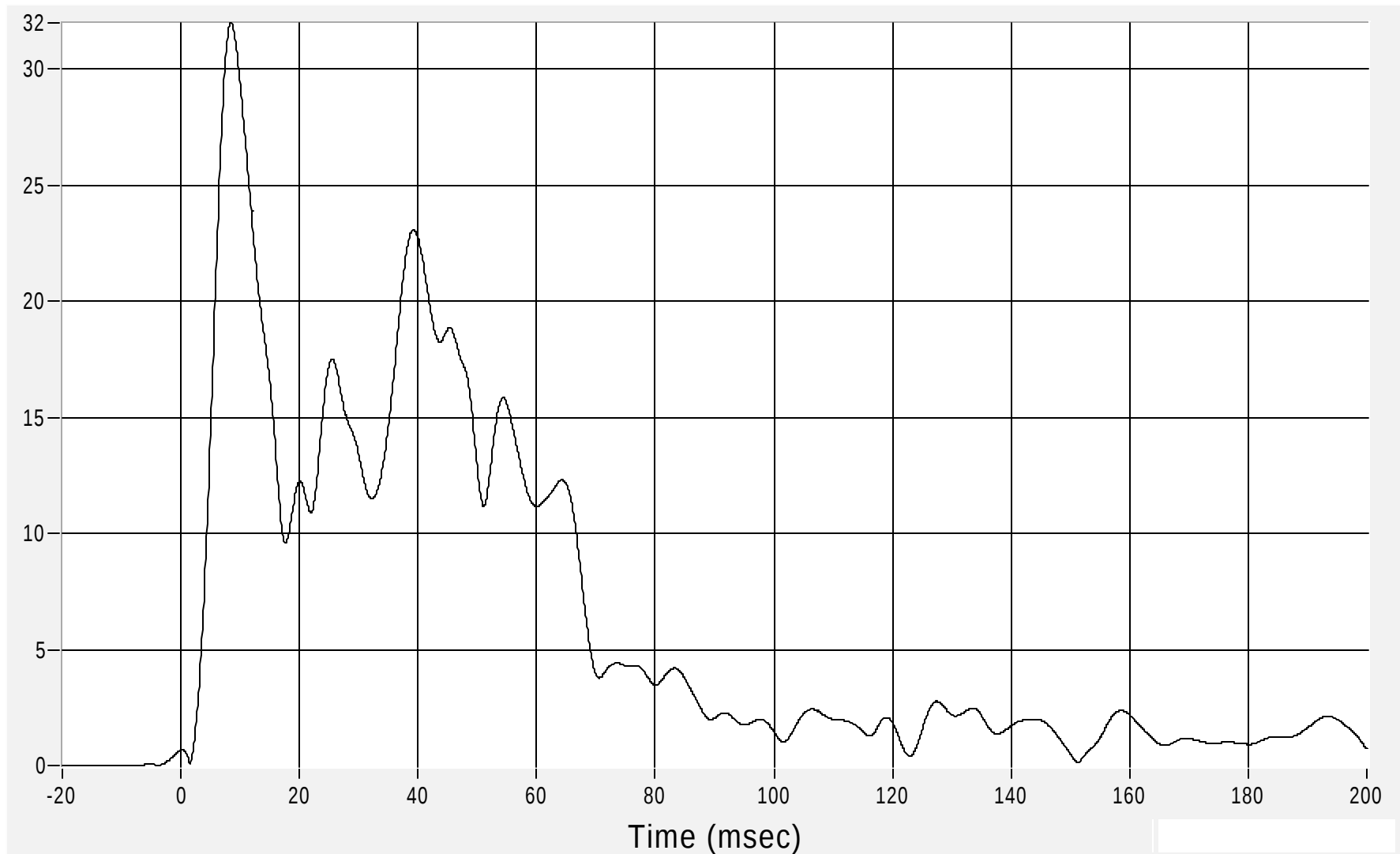
Rear Floorpan Above Axle Resultant Acceleration

Max 32.0 G's at 8.4 msec

Min 0.1 G's at 1.6 msec

Acceleration (G's) CFC60

B-64



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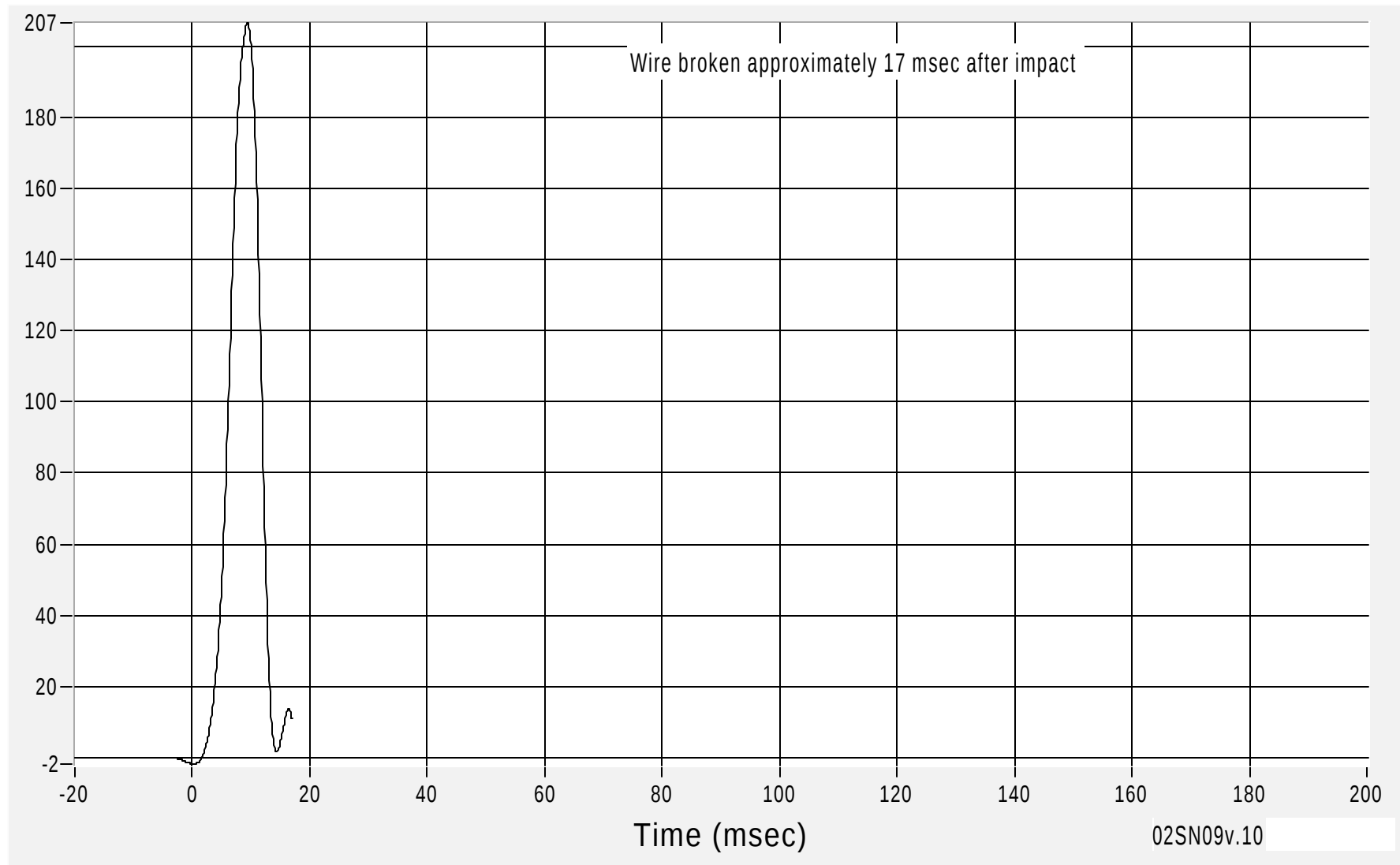
Left Side Sill at Rear Seat (Y) Acceleration

Max 206.7 G's at 9.4 msec

Min -1.9 G's at 0.2 msec

Acceleration (G's) CFC60

B-65



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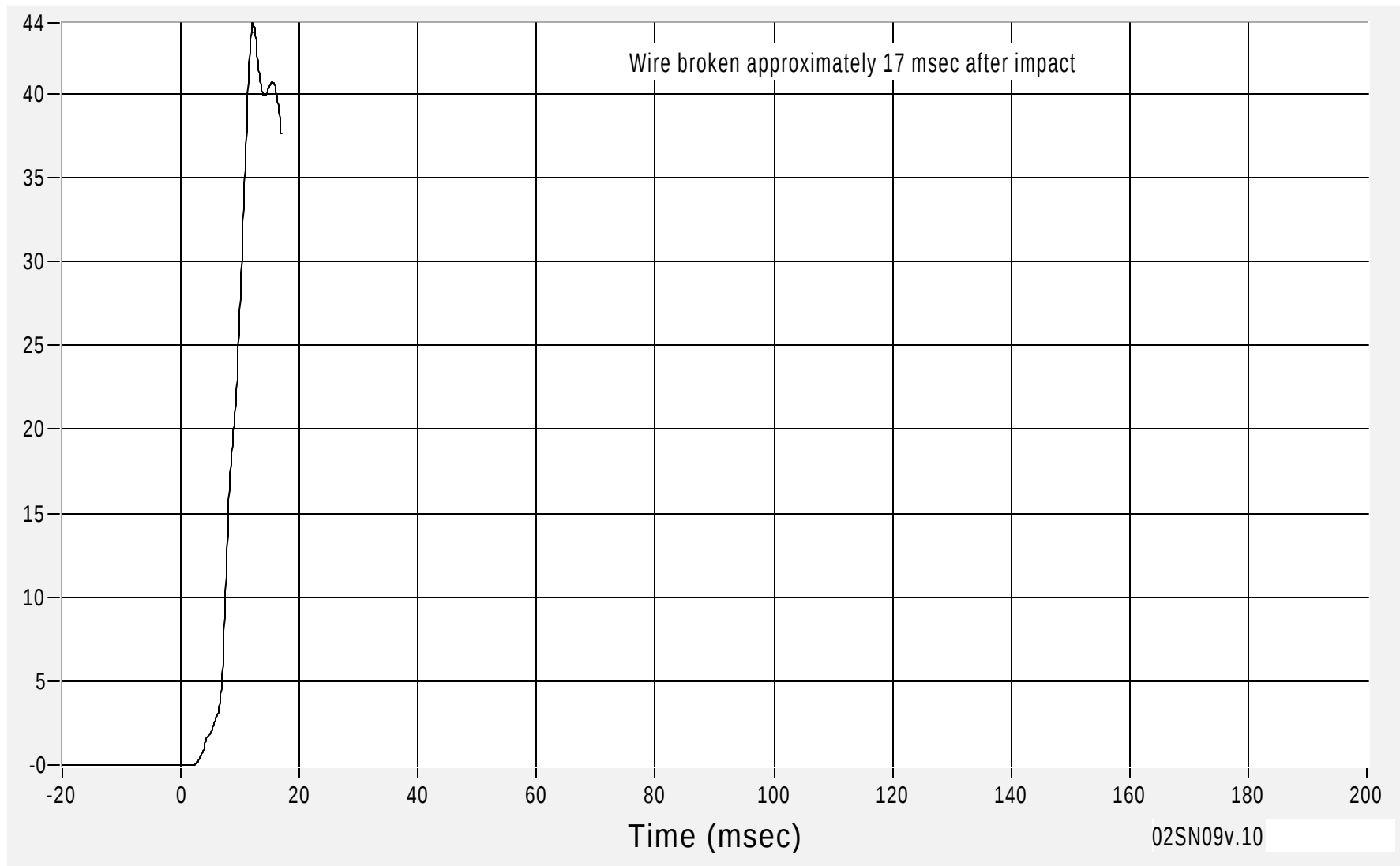
Left Side Sill at Rear Seat (Y) Velocity

Max 44.2 km/h at 12.2 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 1.5 msec

B-66



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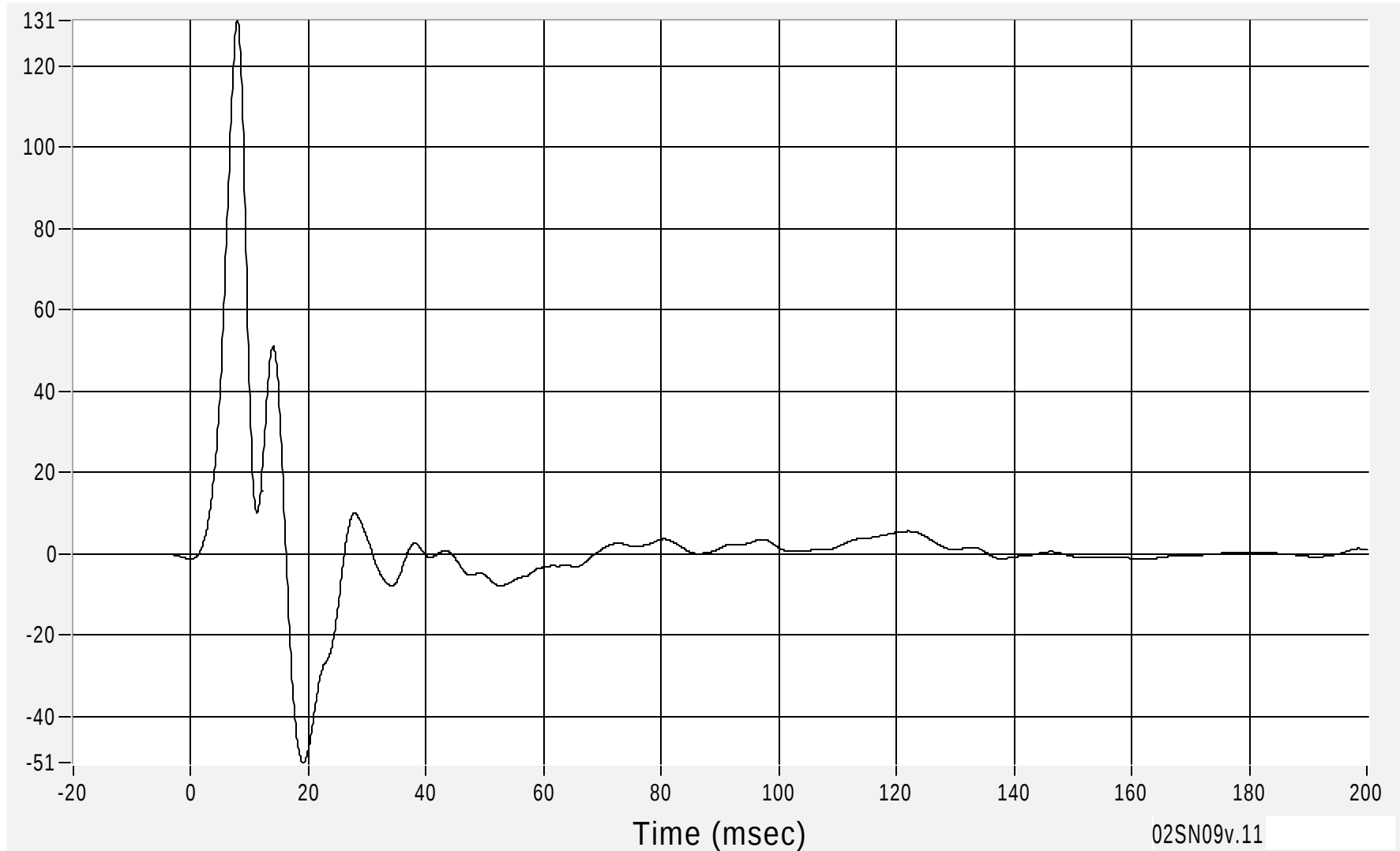
Left Side Sill at Front Seat (Y) Acceleration

Max 131.1 G's at 7.9 msec

Min -51.2 G's at 19.0 msec

Acceleration (G's) CFC60

B-67



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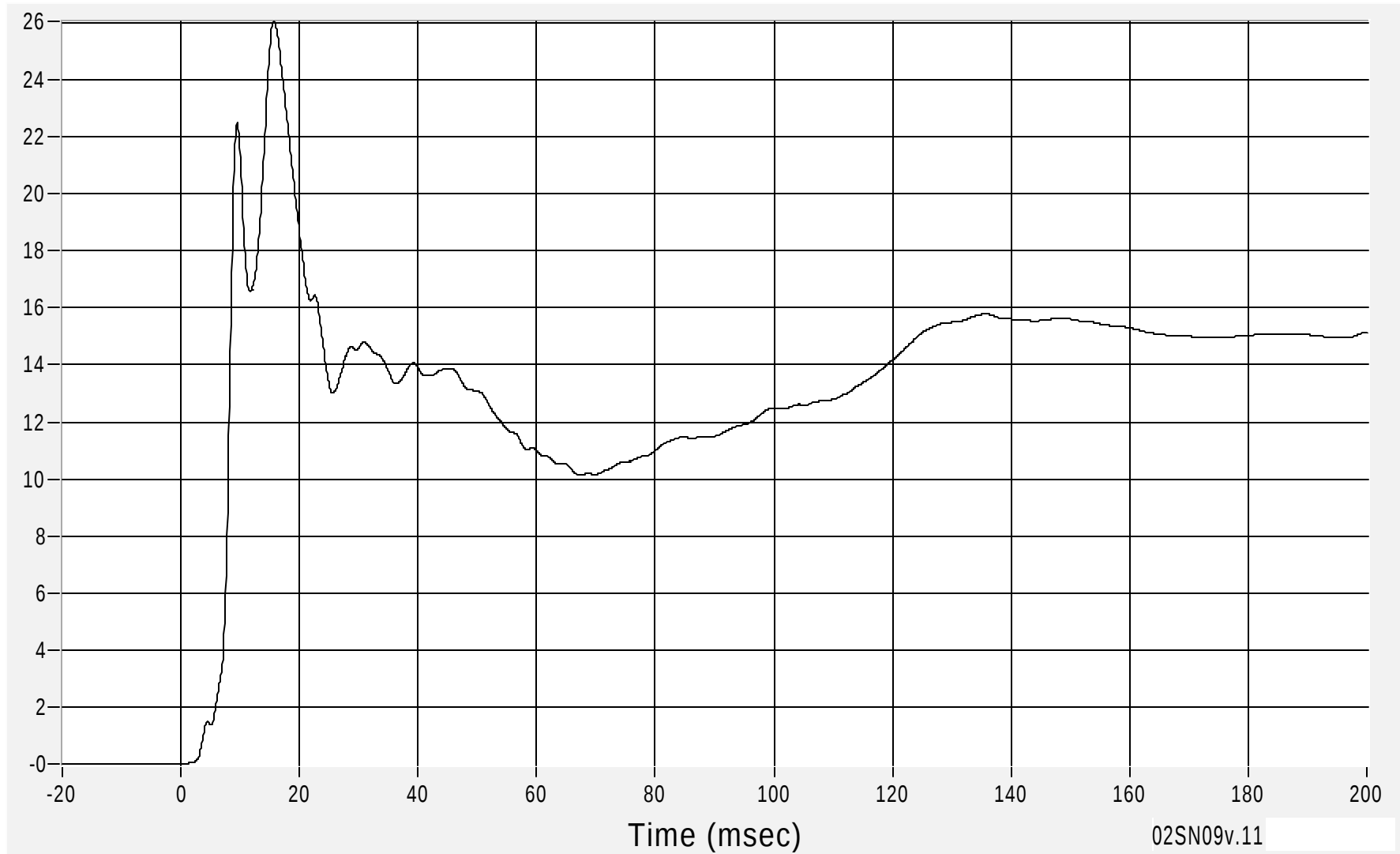
Left Side Sill at Front Seat (Y) Velocity

Max 26.1 km/h at 15.7 msec

Min 0.0 km/h at 0.0 msec

Velocity (km/h) CFC180

B-68



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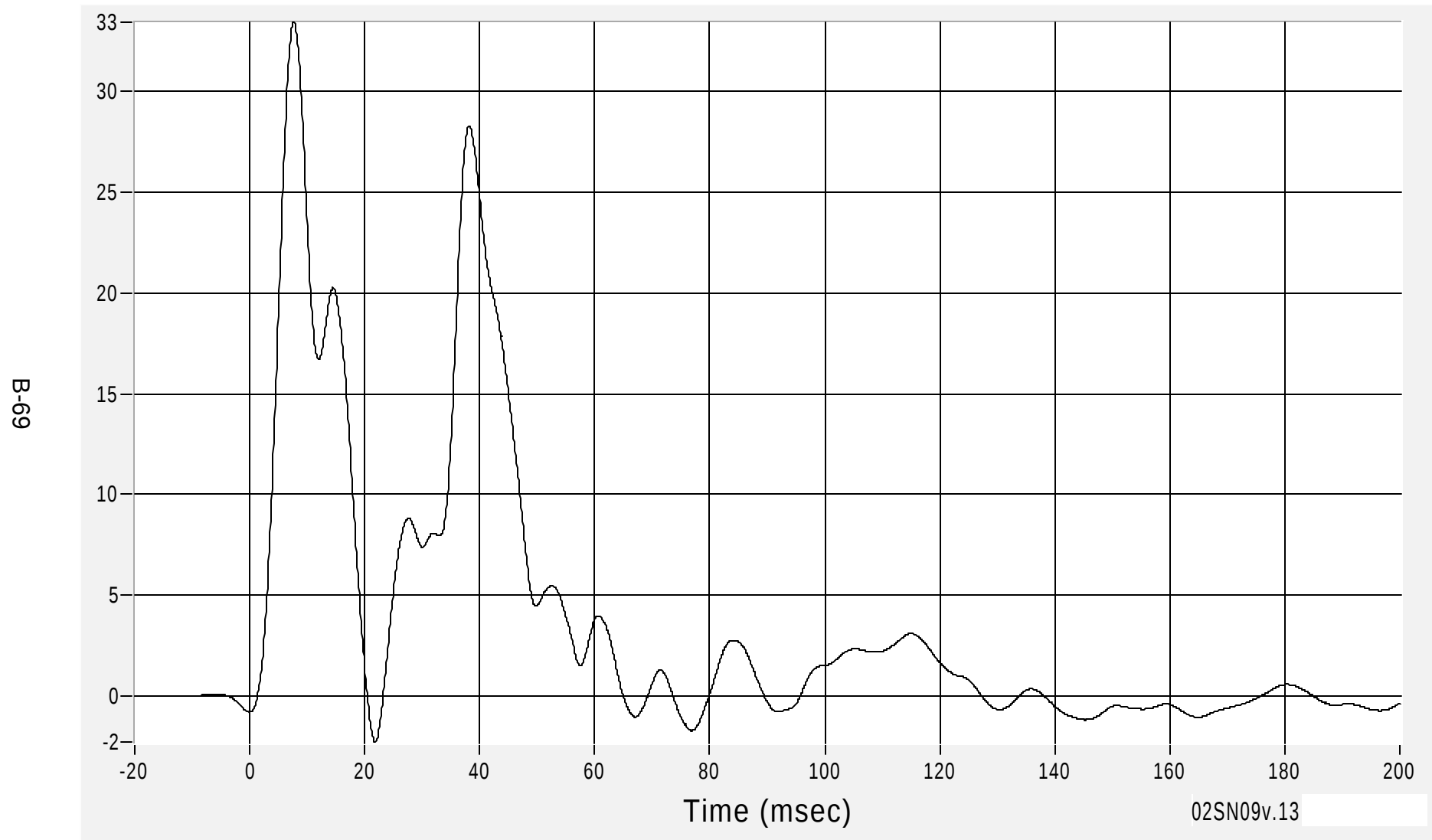
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Right Rear Occupant Compartment (Y) Acceleration

Max 33.5 G's at 7.7 msec

Acceleration (G's) CFC60

Min -2.3 G's at 21.8 msec



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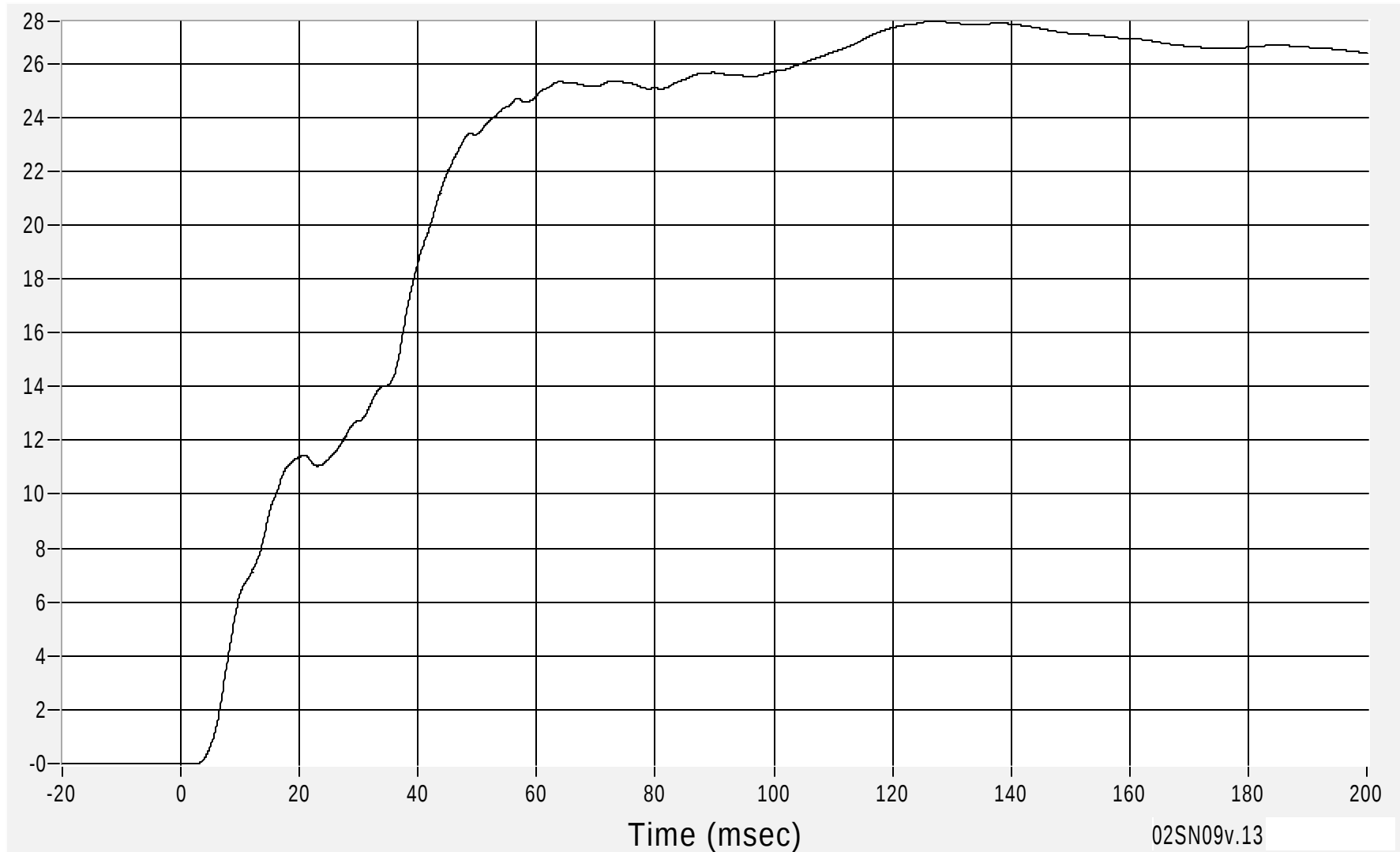
Right Rear Occupant Compartment (Y) Velocity

Max 27.6 km/h at 127.0 msec

Min 0.0 km/h at 2.4 msec

Velocity (km/h) CFC180

B-70



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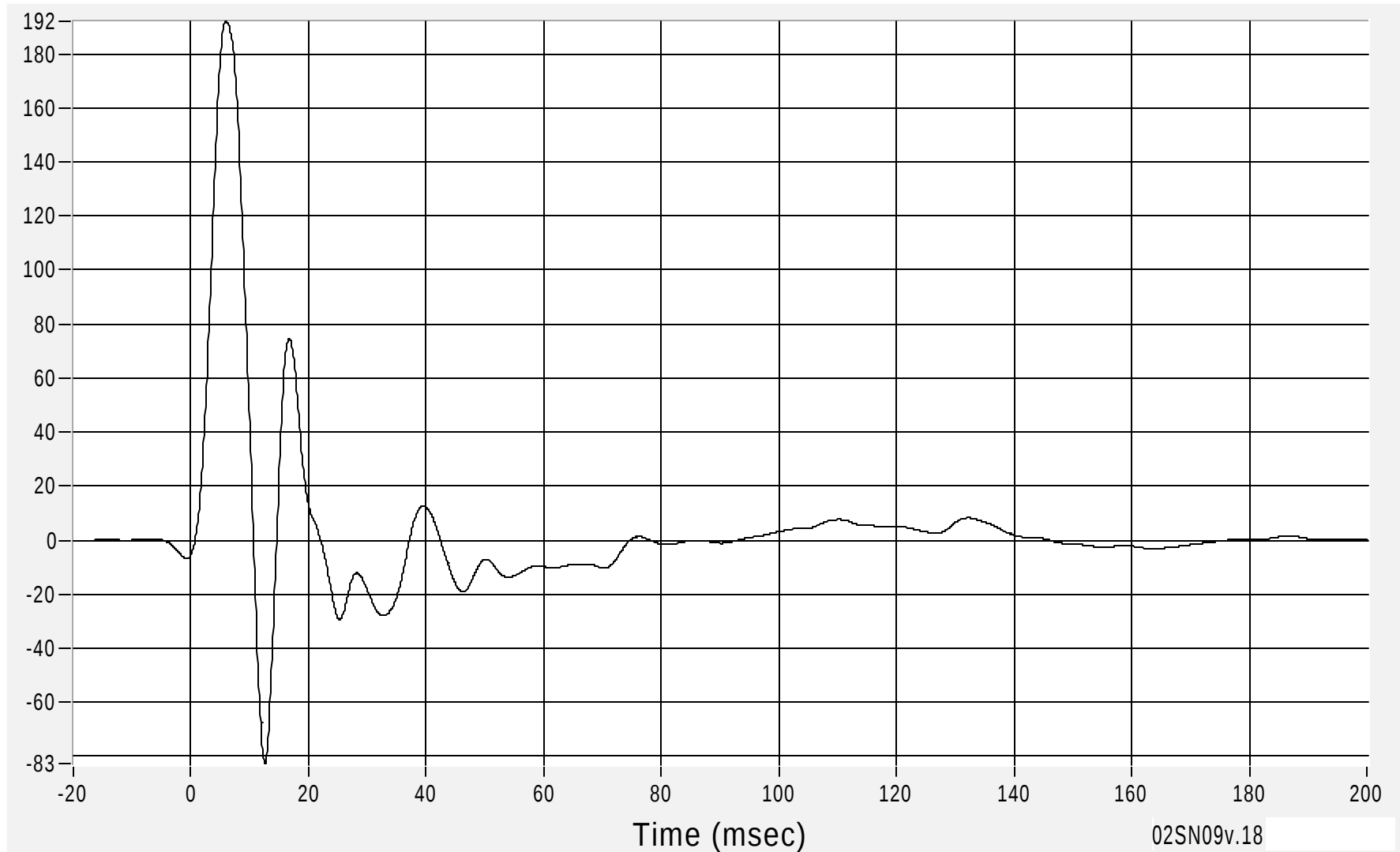
Left Lower B-Pillar (Y) Acceleration

Max 192.0 G's at 6.0 msec

Min -82.7 G's at 12.6 msec

Acceleration (G's) CFC60

B-71



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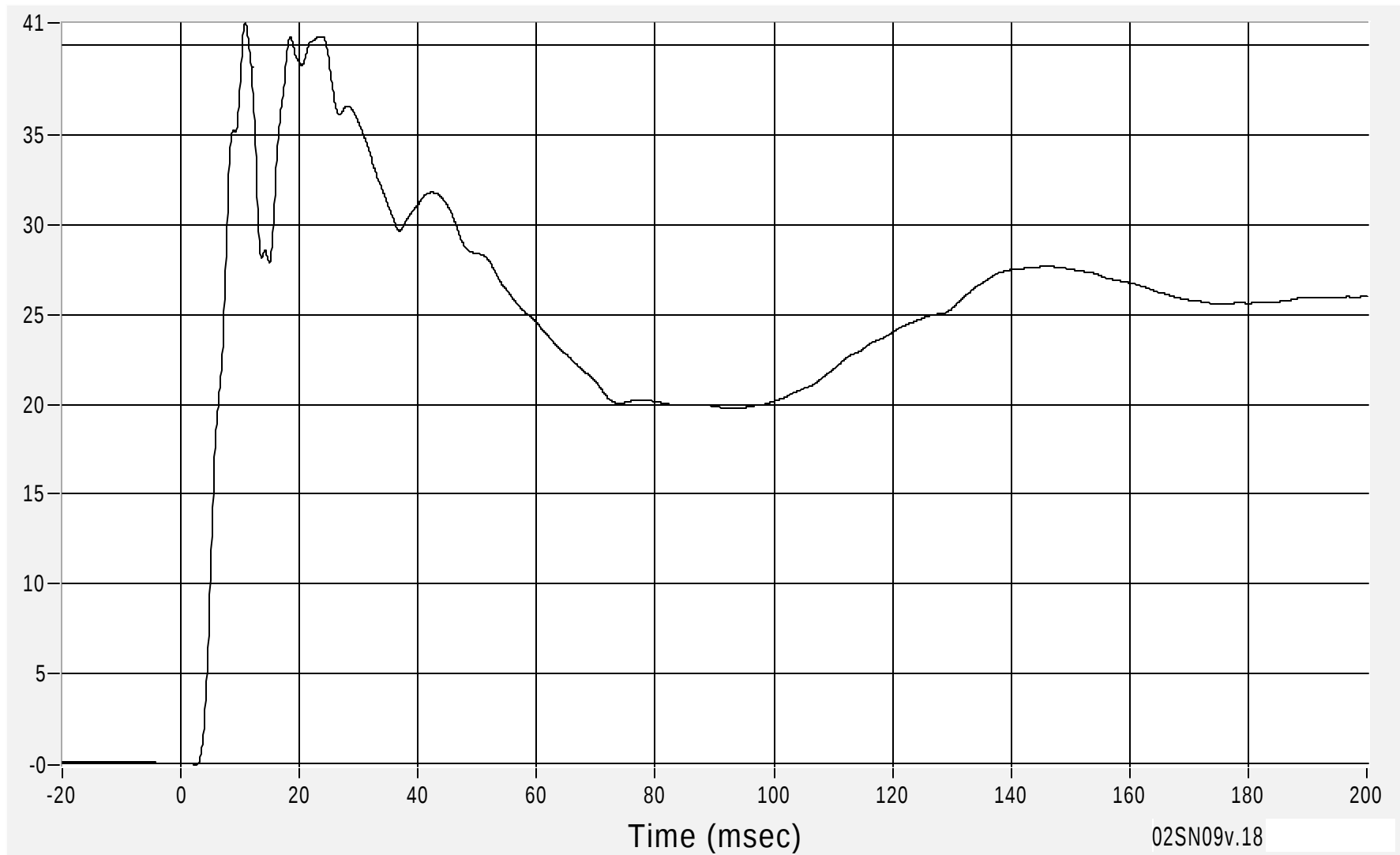
Left Lower B-Pillar (Y) Velocity

Max 41.3 km/h at 10.9 msec

Min -0.1 km/h at 2.5 msec

Velocity (km/h) CFC180

B-72



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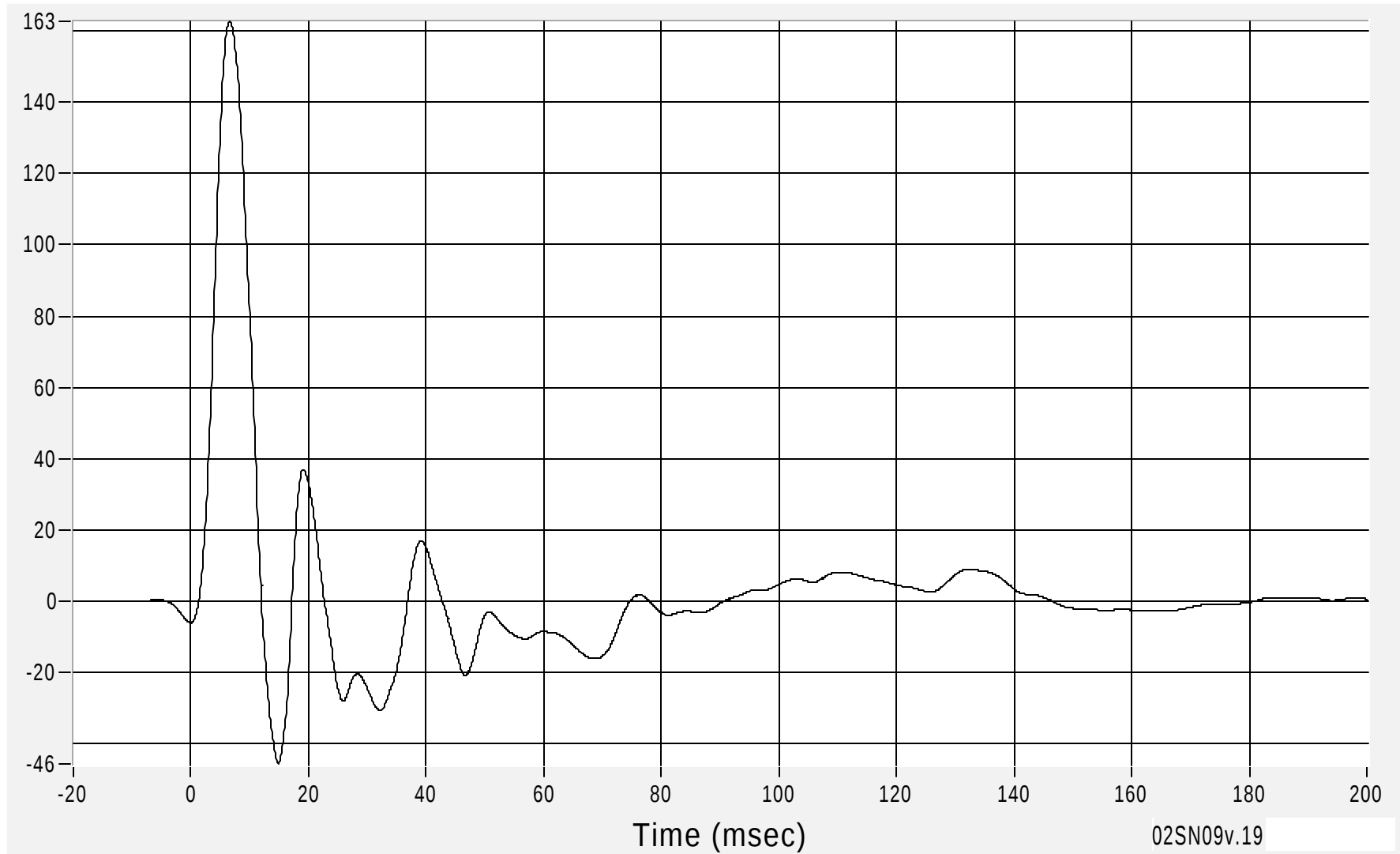
Left Middle B-Pillar (Y) Acceleration

Max 162.7 G's at 6.6 msec

Acceleration (G's) CFC60

Min -45.6 G's at 14.9 msec

B-73



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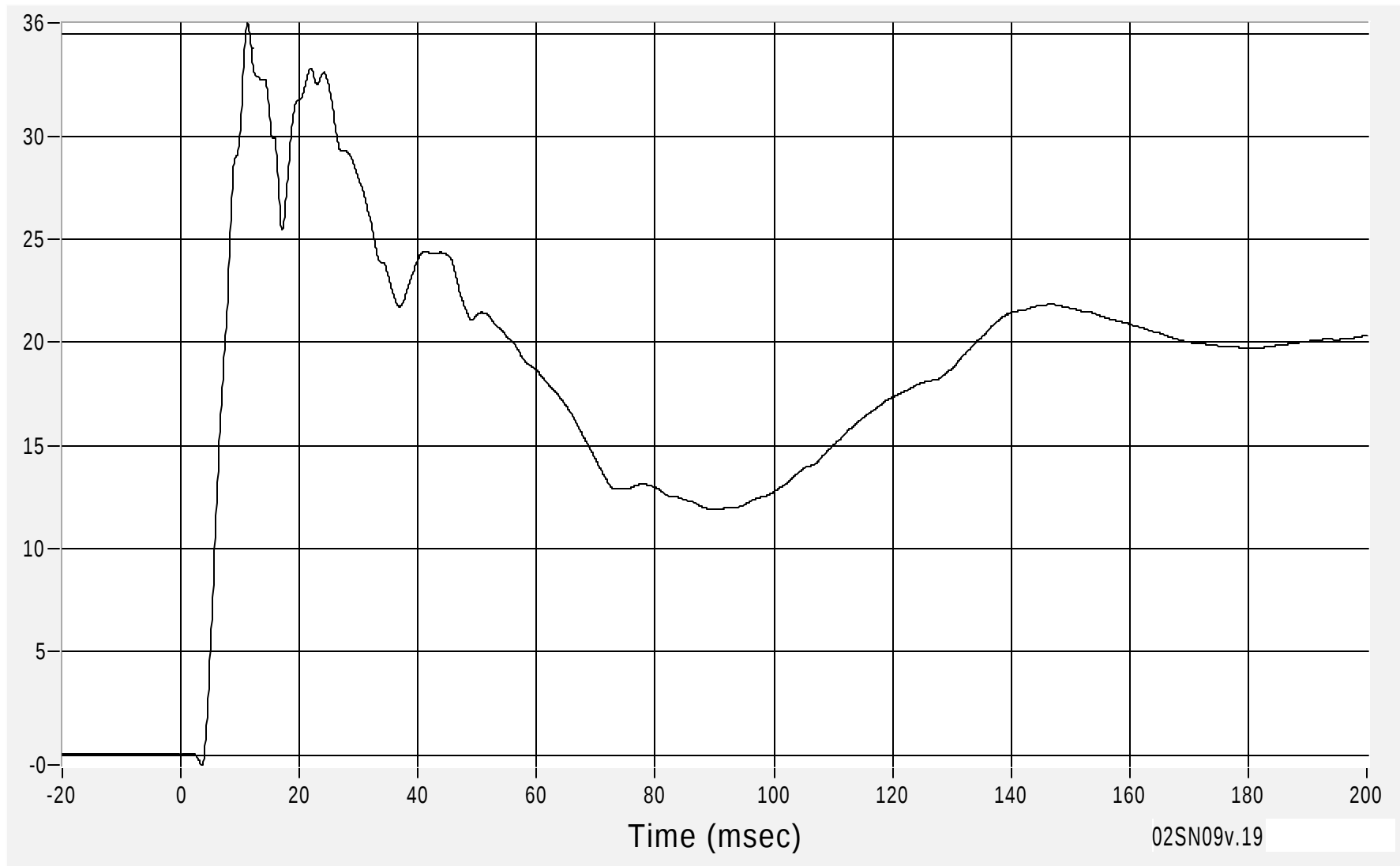
Left Middle B-Pillar (Y) Velocity

Max 35.5 km/h at 11.2 msec

Min -0.5 km/h at 3.4 msec

Velocity (km/h) CFC180

B-74



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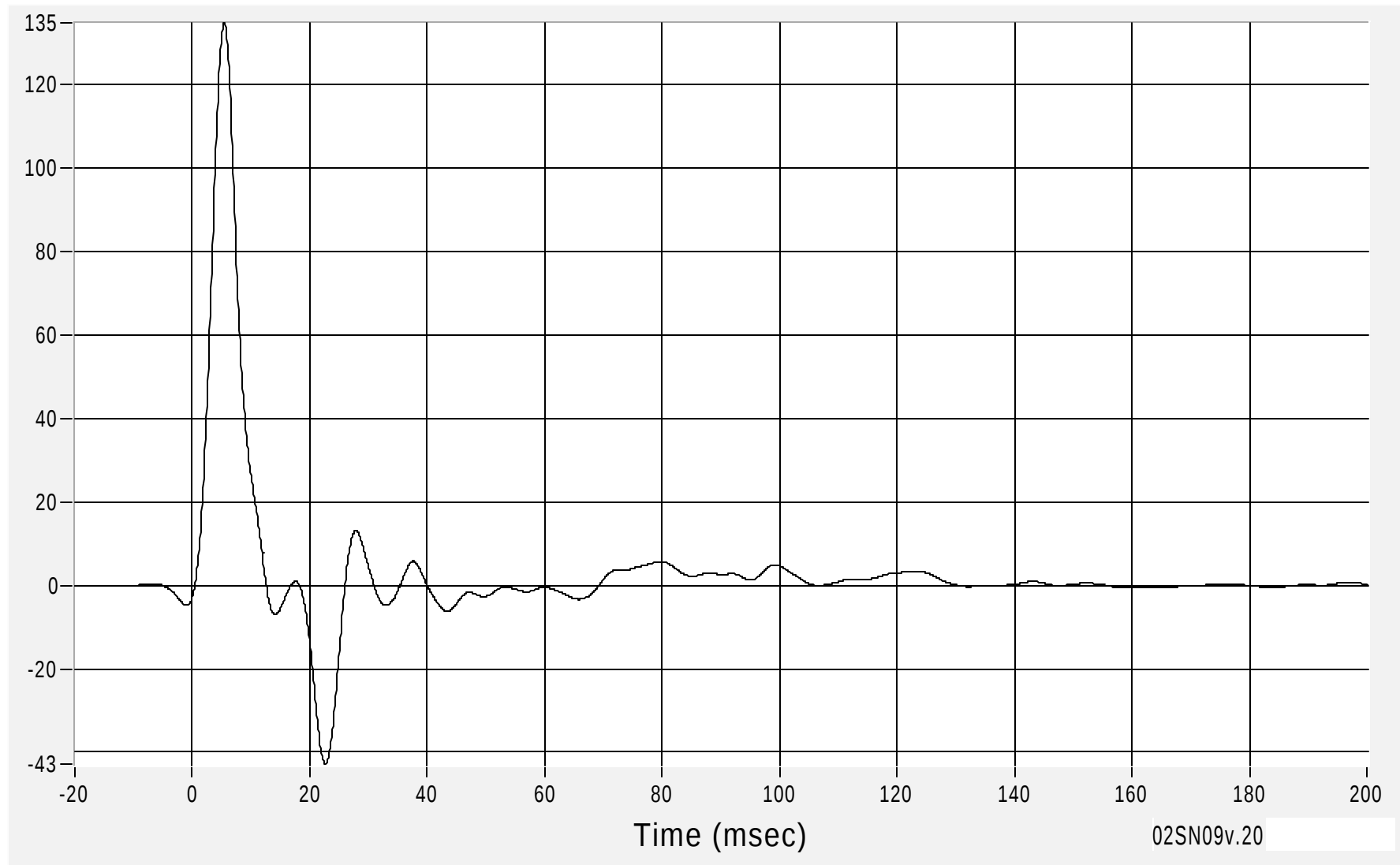
Left Lower A-Pillar (Y) Acceleration

Max 134.9 G's at 5.4 msec

Acceleration (G's) CFC60

Min -42.9 G's at 22.6 msec

B-75



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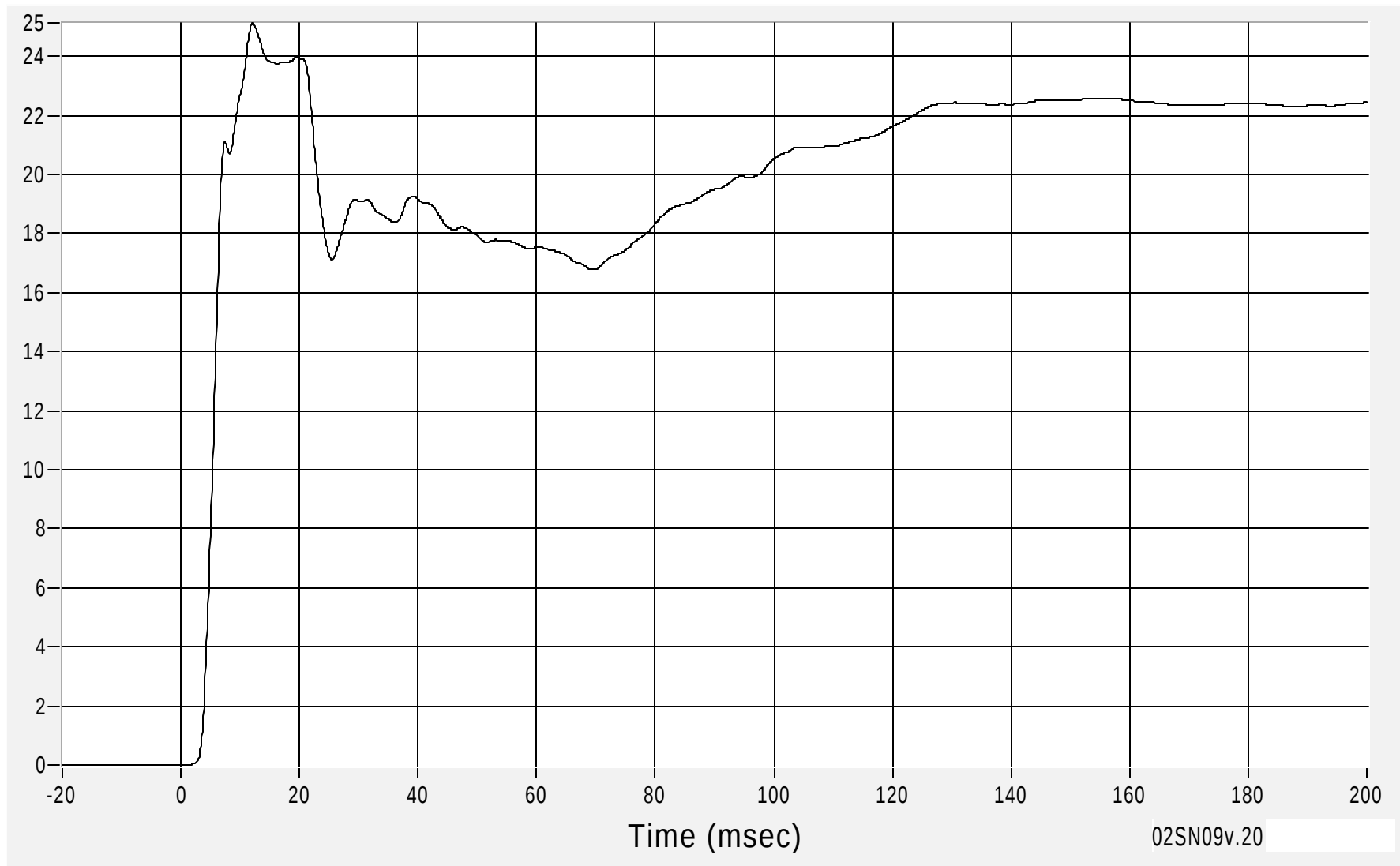
Left Lower A-Pillar (Y) Velocity

Max 25.1 km/h at 12.1 msec

Min 0.0 km/h at 0.0 msec

Velocity (km/h) CFC180

B-76



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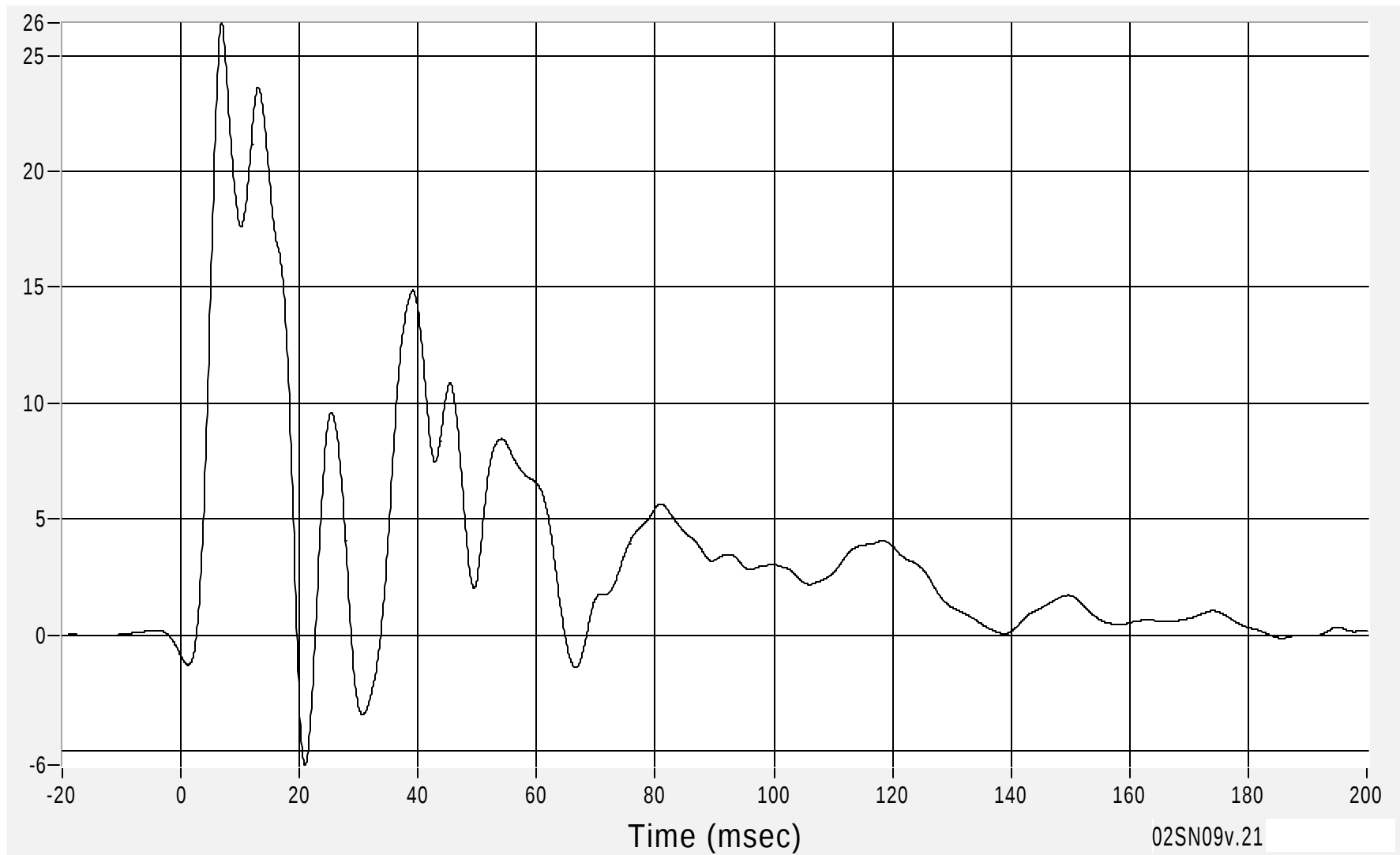
Left Middle A-Pillar (Y) Acceleration

Max 26.4 G's at 6.9 msec

Acceleration (G's) CFC60

Min -5.6 G's at 21.0 msec

B-77



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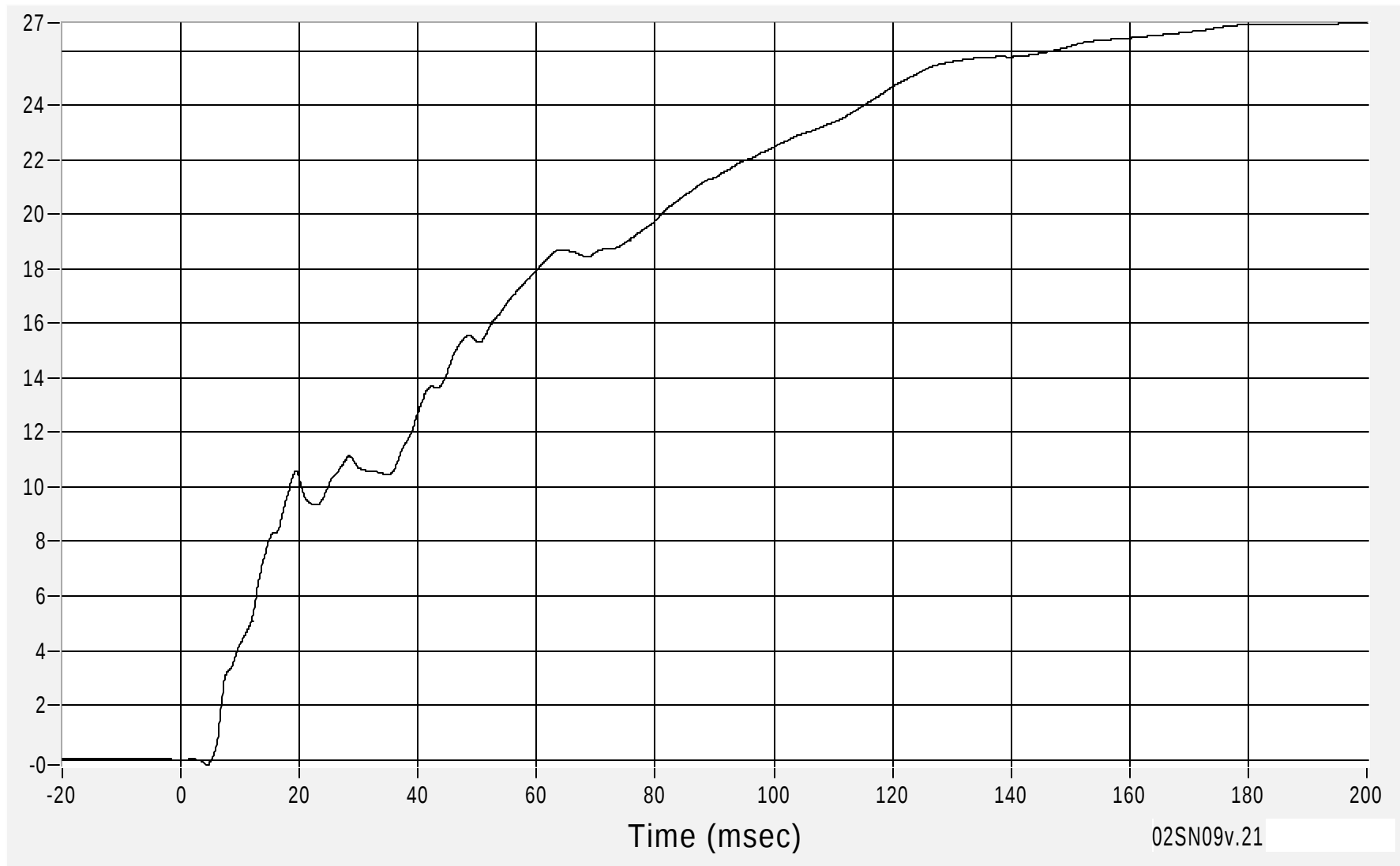
Left Middle A-Pillar (Y) Velocity

Max 27.0 km/h at 199.9 msec

Velocity (km/h) CFC180

Min -0.2 km/h at 4.4 msec

B-78



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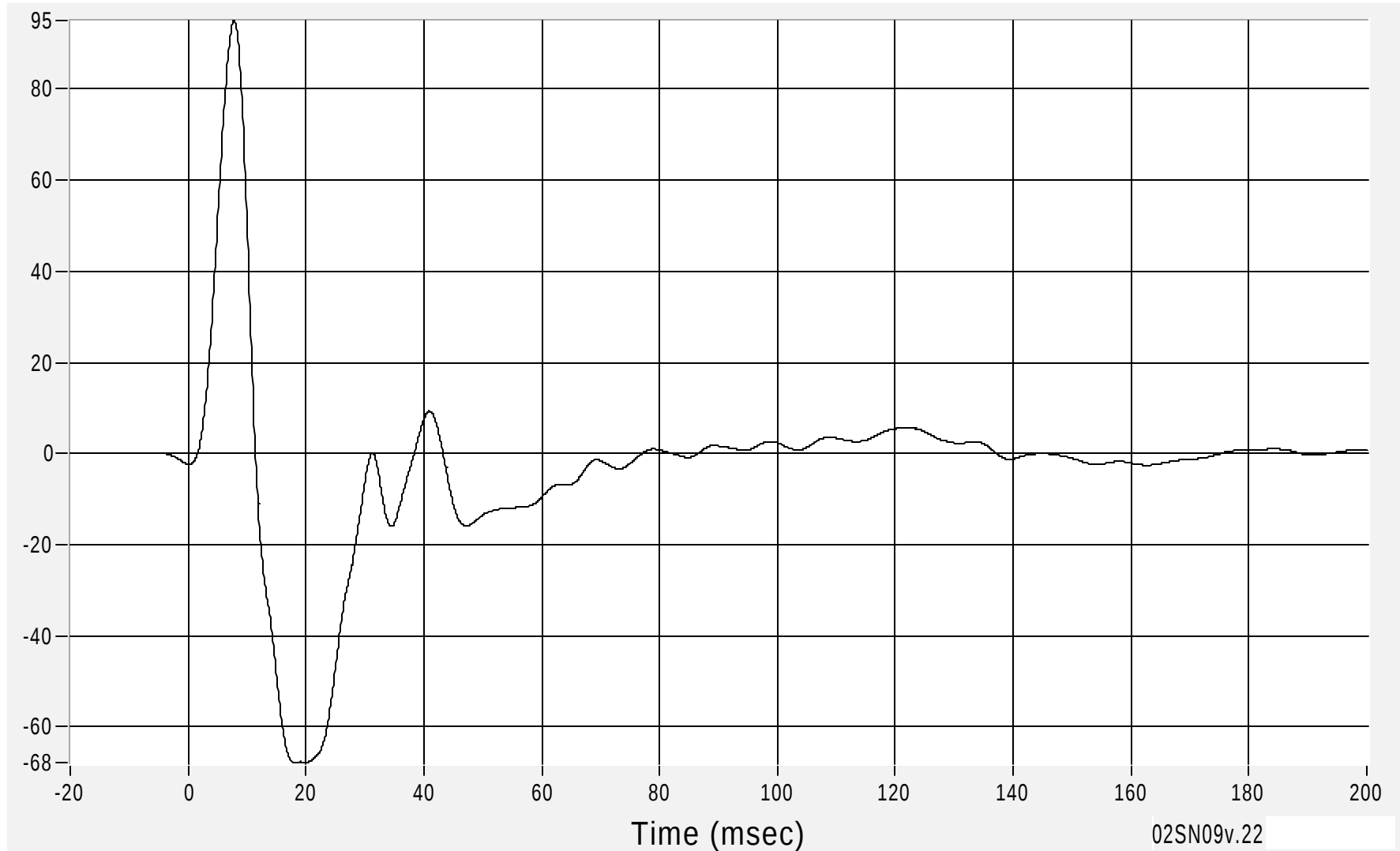
Front Seat Track (Y) Acceleration

Max 95.1 G's at 7.8 msec

Acceleration (G's) CFC60

Min -67.8 G's at 18.0 msec

B-79



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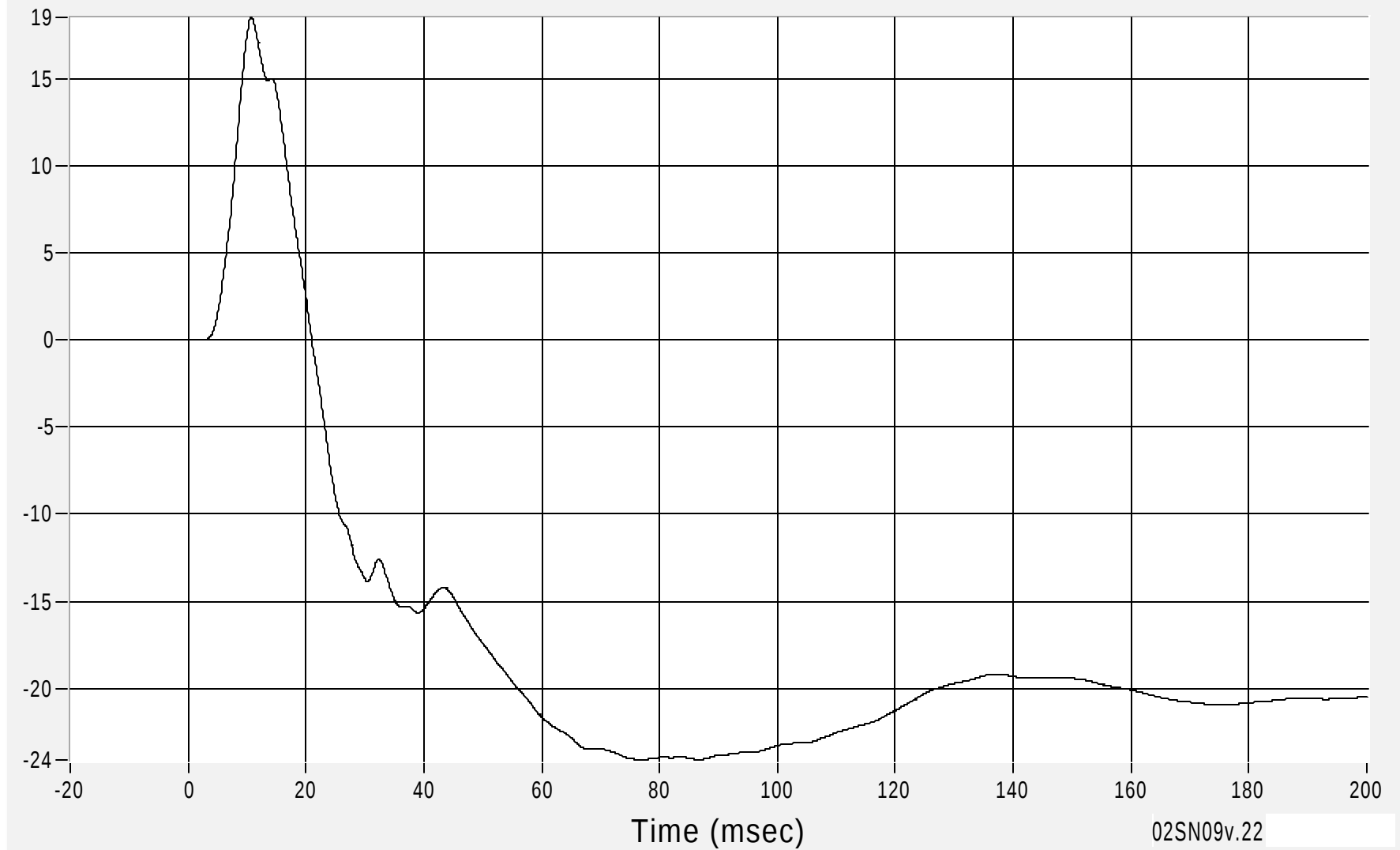
Front Seat Track (Y) Velocity

Max 18.5 km/h at 10.7 msec

Min -24.1 km/h at 77.1 msec

Velocity (km/h) CFC180

B-80



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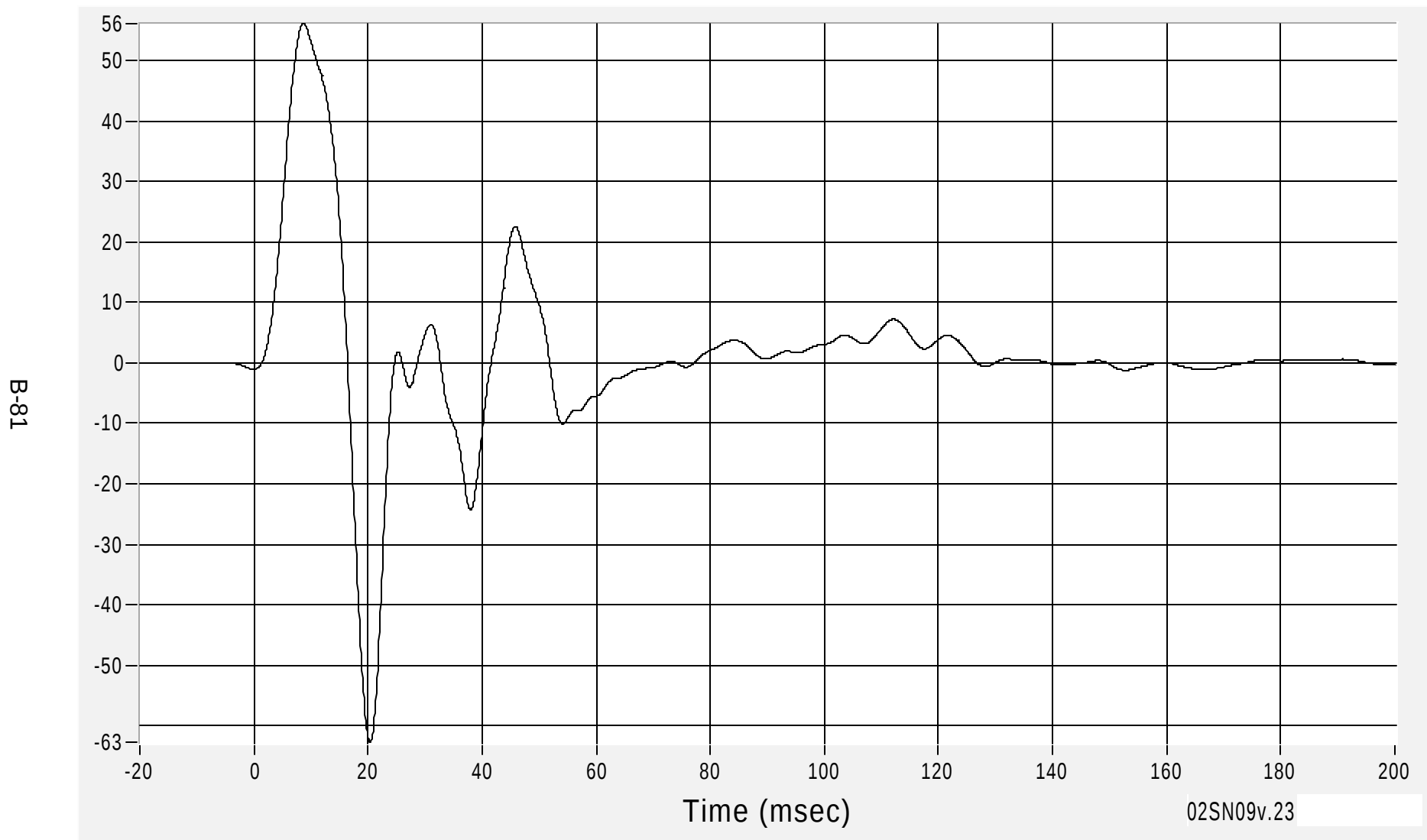
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Rear Seat Track (Y) Acceleration

Max 56.0 G's at 8.6 msec

Acceleration (G's) CFC60

Min -62.7 G's at 20.3 msec



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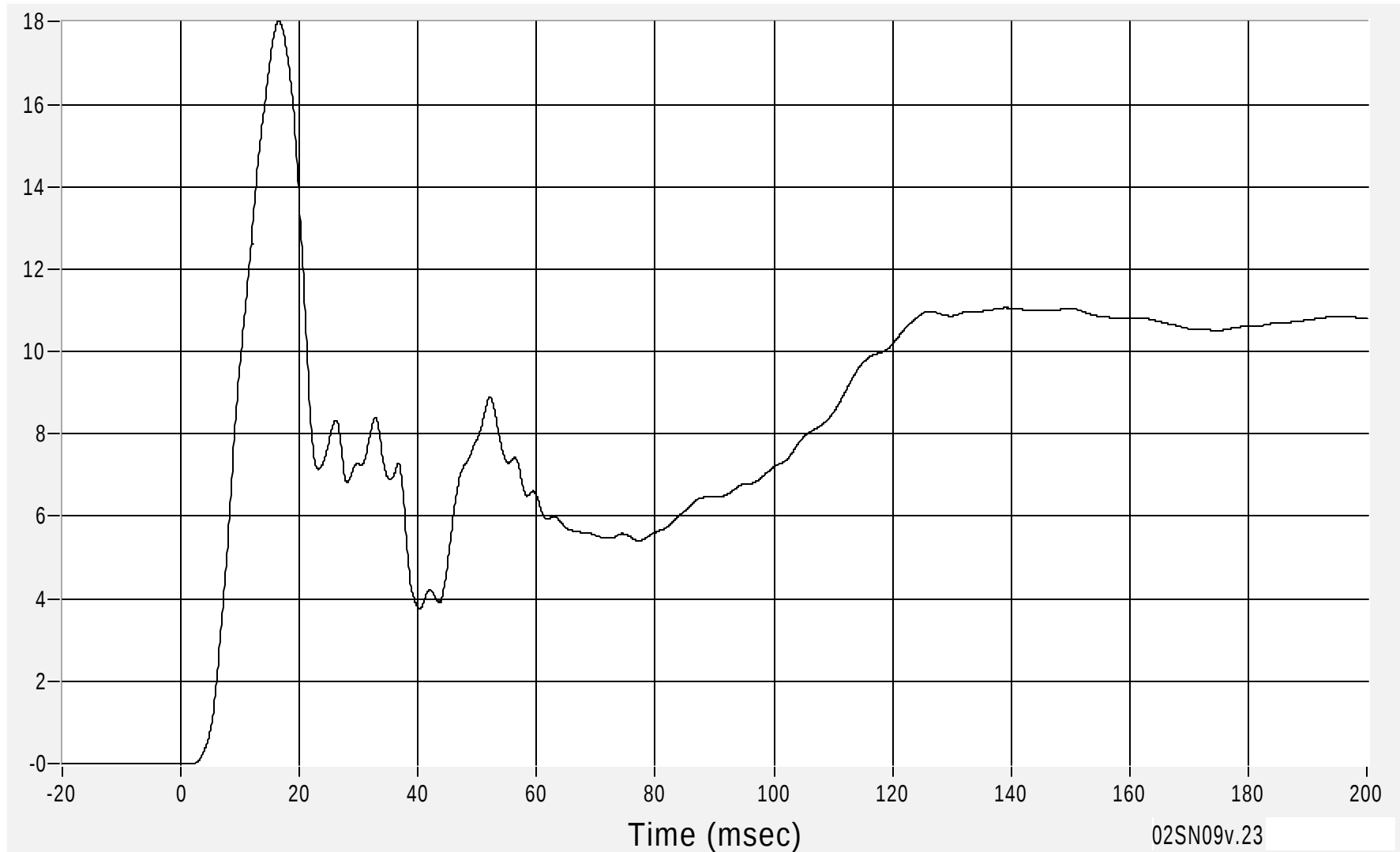
Rear Seat Track (Y) Velocity

Max 18.0 km/h at 16.5 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 1.8 msec

B-82



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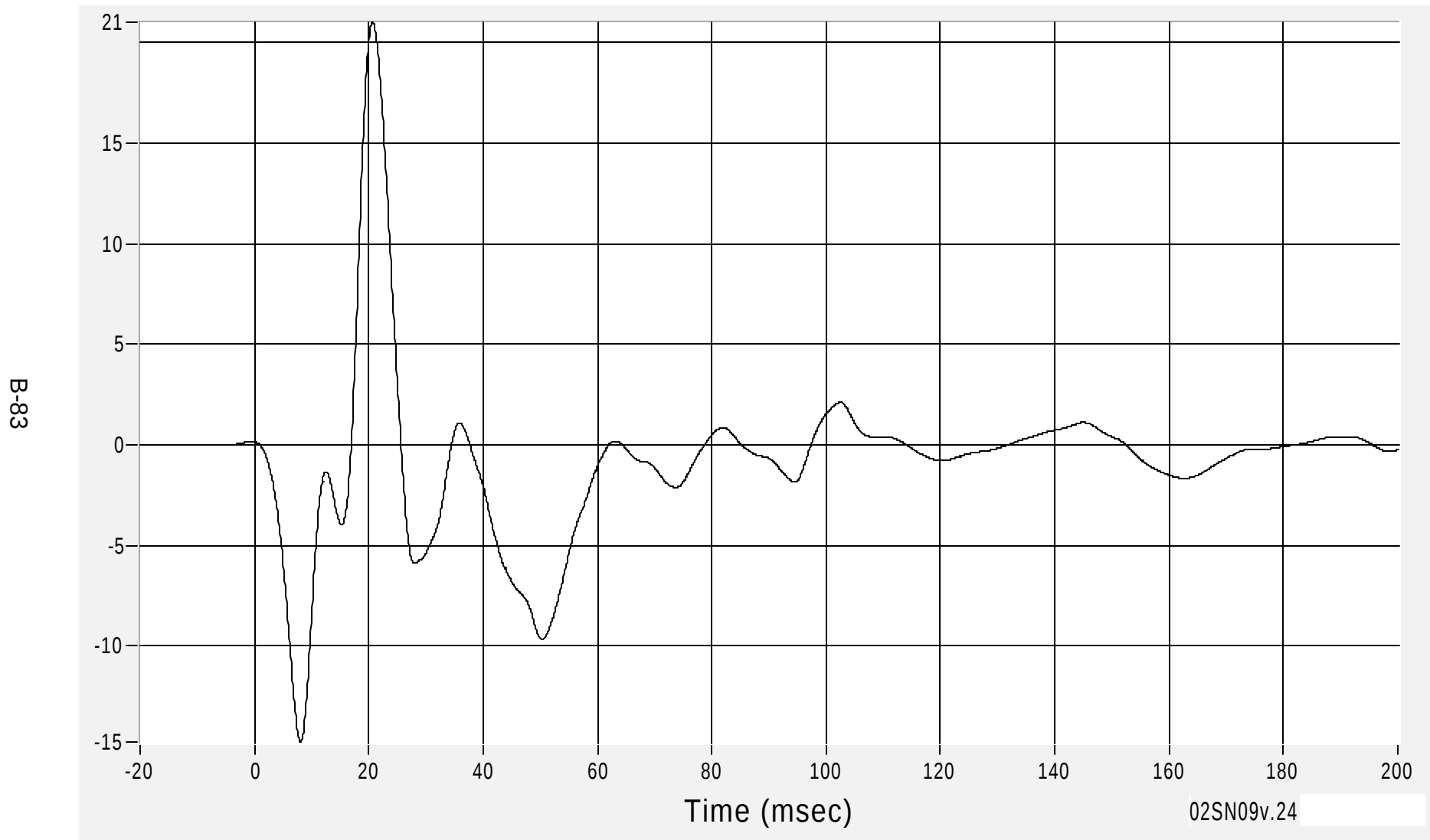
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Vehicle Center of Gravity (X) Acceleration

Max 21.0 G's at 20.6 msec

Acceleration (G's) CFC60

Min -14.8 G's at 8.1 msec



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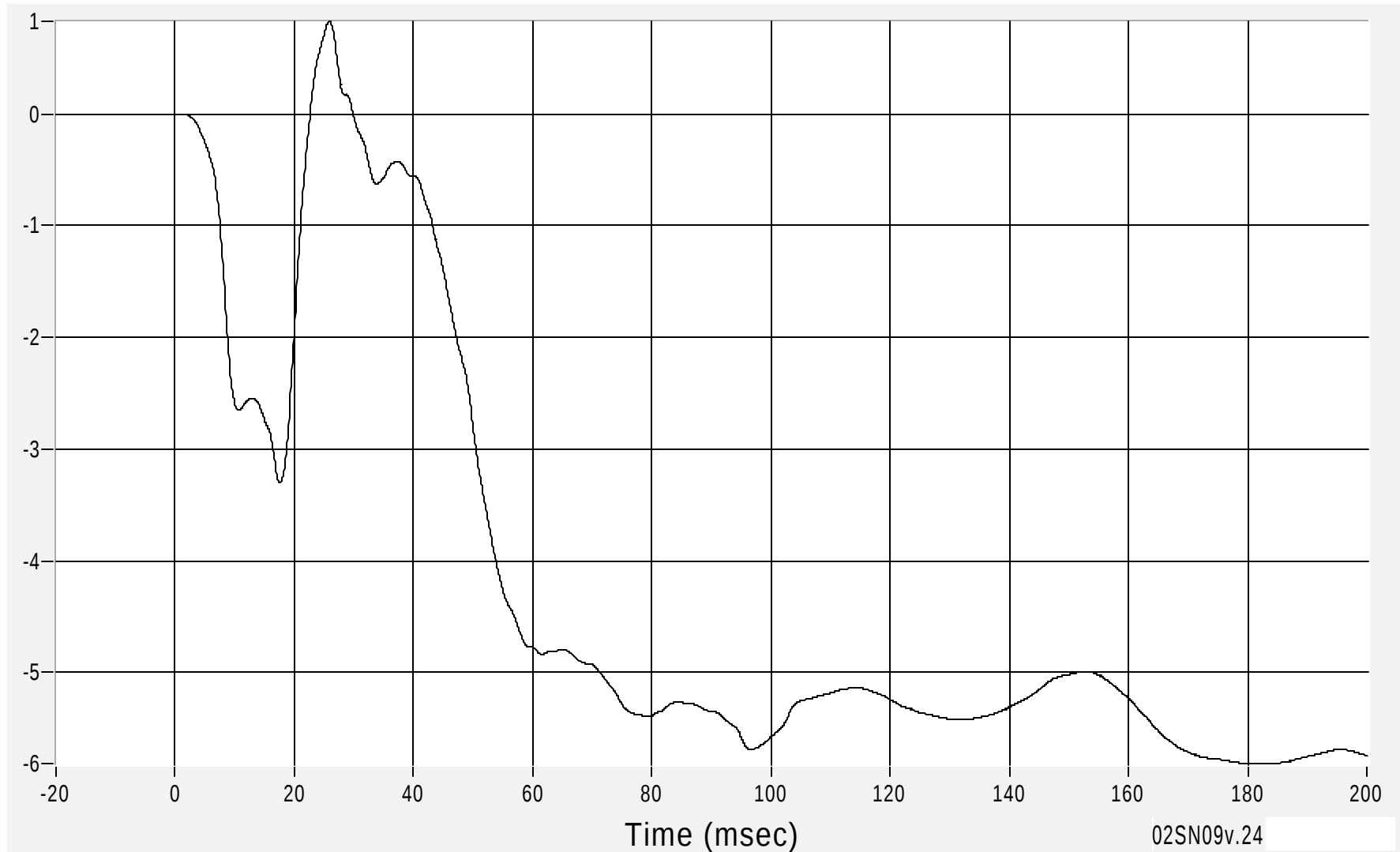
Vehicle Center of Gravity (X) Velocity

Max 0.8 km/h at 25.9 msec

Velocity (km/h) CFC180

Min -5.8 km/h at 182.6 msec

B-84



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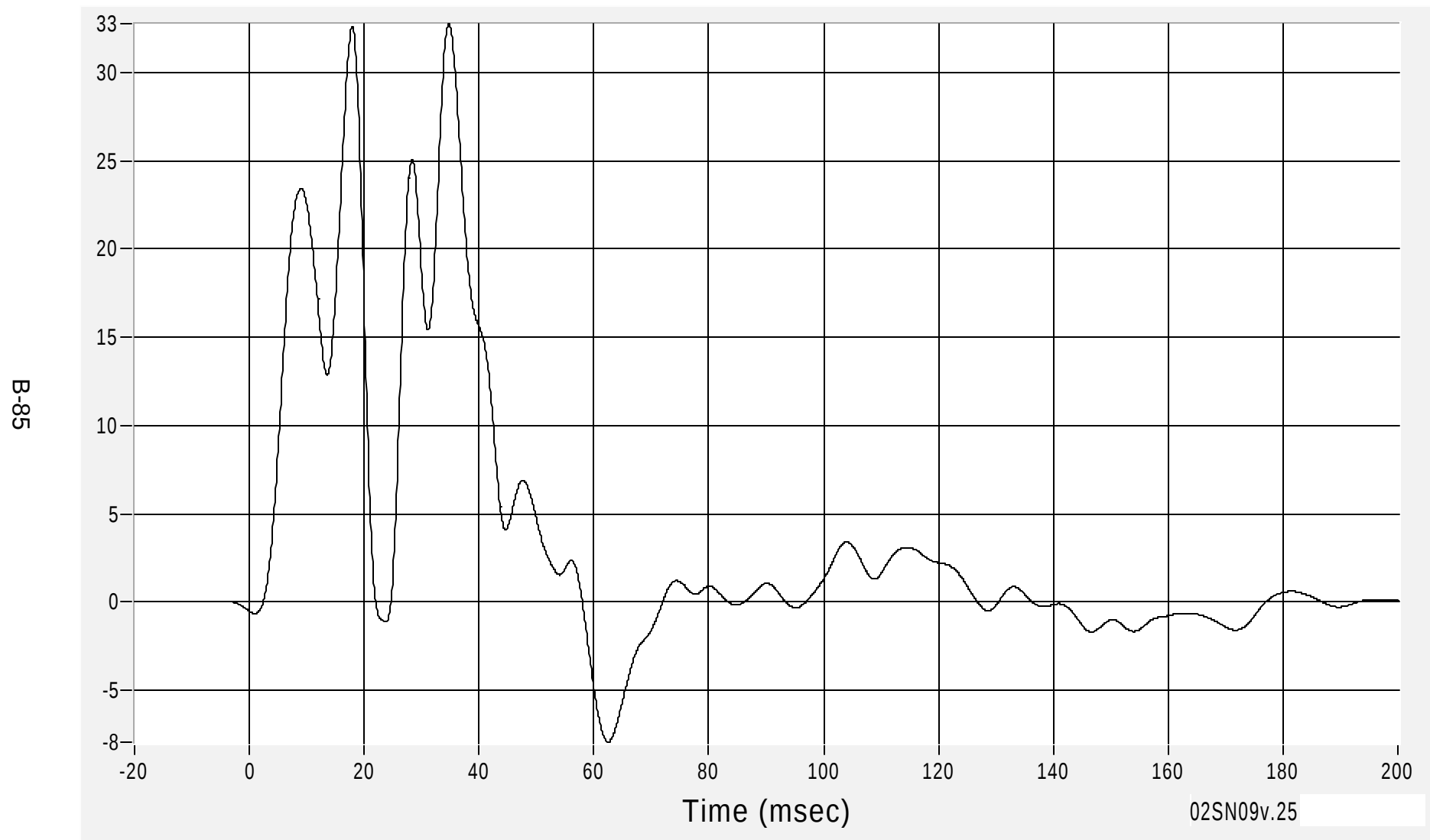
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Vehicle Center of Gravity (Y) Acceleration

Max 32.8 G's at 34.7 msec

Min -7.9 G's at 62.5 msec

Acceleration (G's) CFC60



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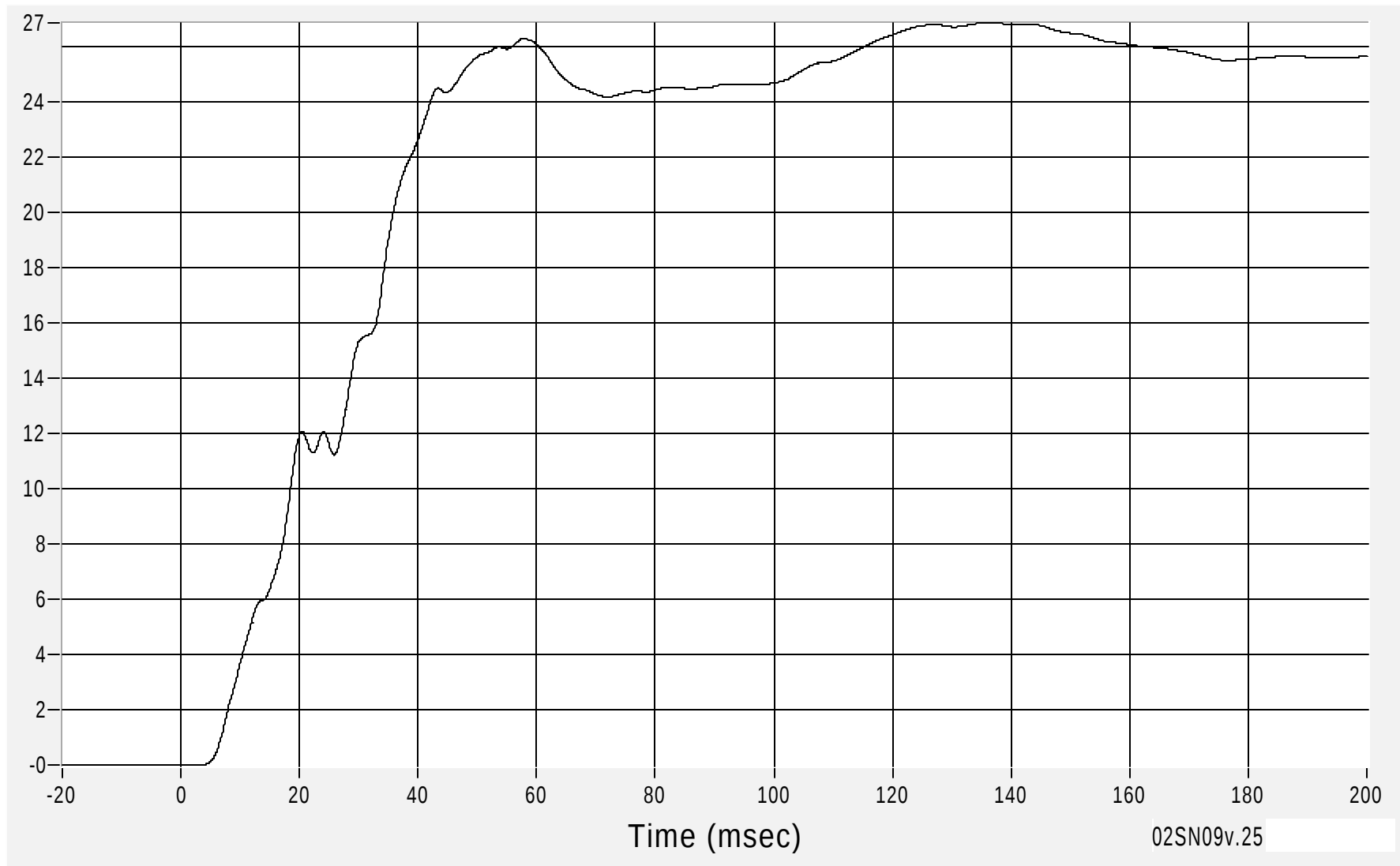
Vehicle Center of Gravity (Y) Velocity

Max 26.9 km/h at 135.4 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 3.1 msec

B-86



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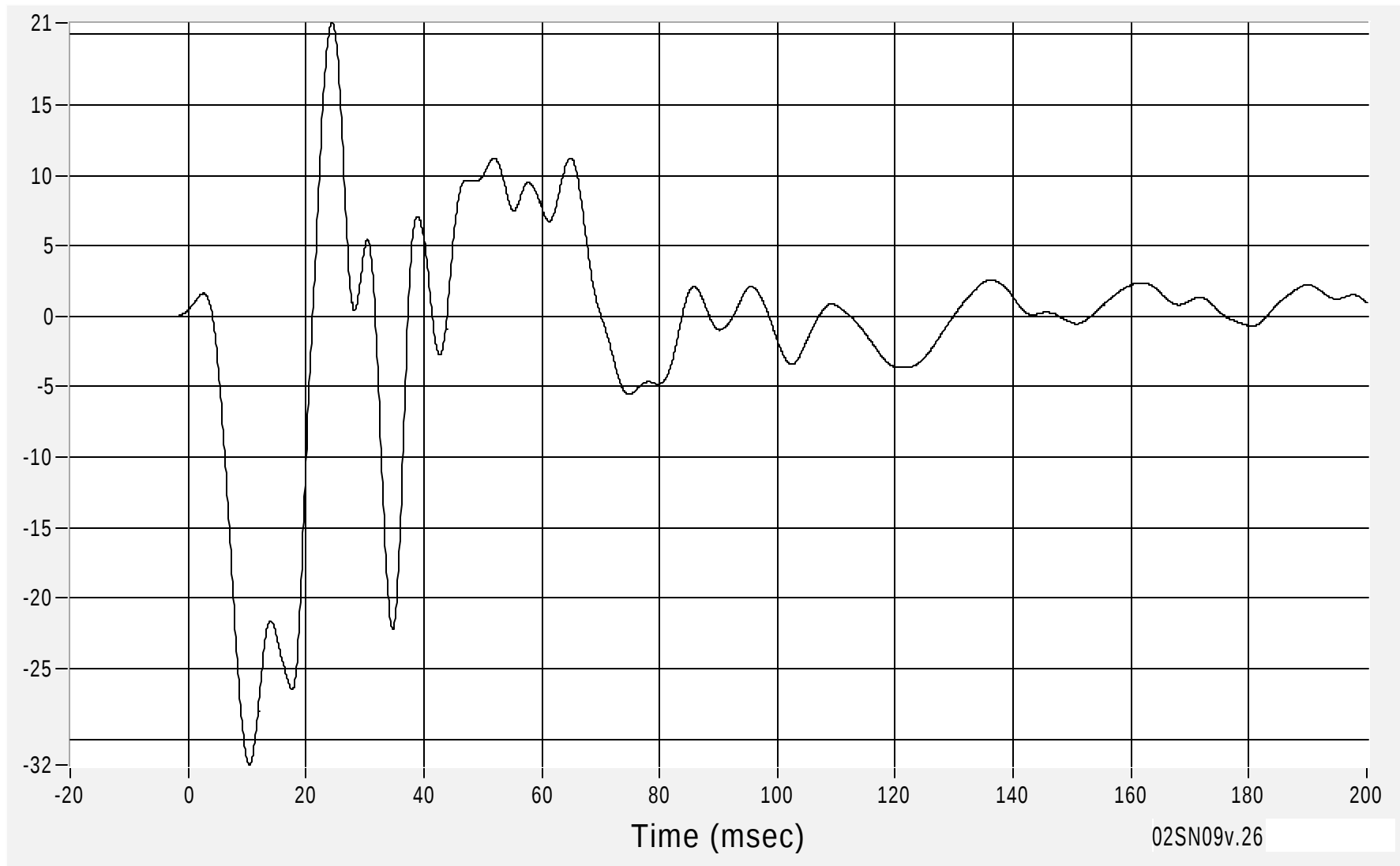
Vehicle Center of Gravity (Z) Acceleration

Max 20.8 G's at 24.5 msec

Min -31.8 G's at 10.4 msec

Acceleration (G's) CFC60

B-87



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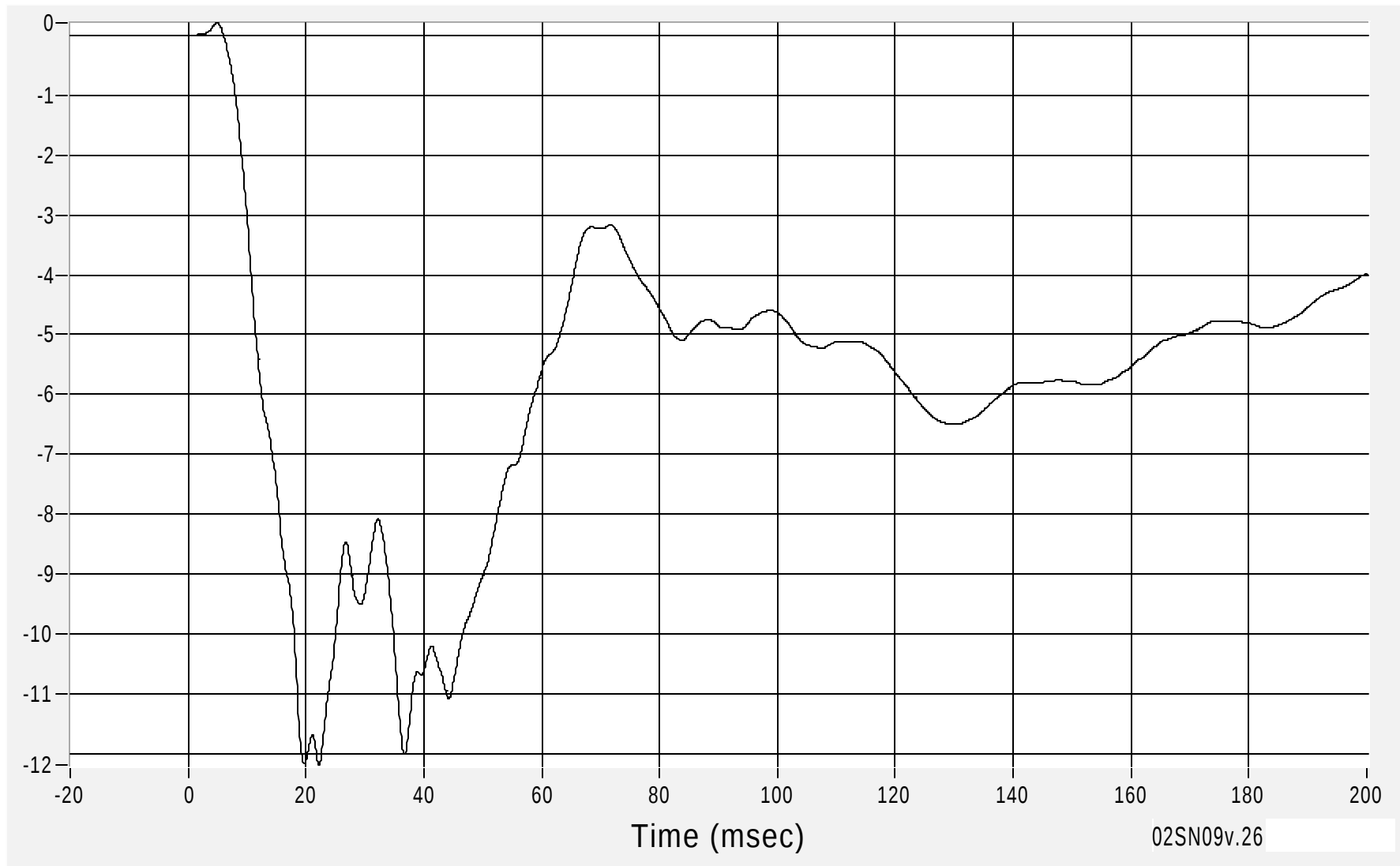
Vehicle Center of Gravity (Z) Velocity

Max 0.2 km/h at 4.9 msec

Min -12.2 km/h at 22.2 msec

Velocity (km/h) CFC180

B-88



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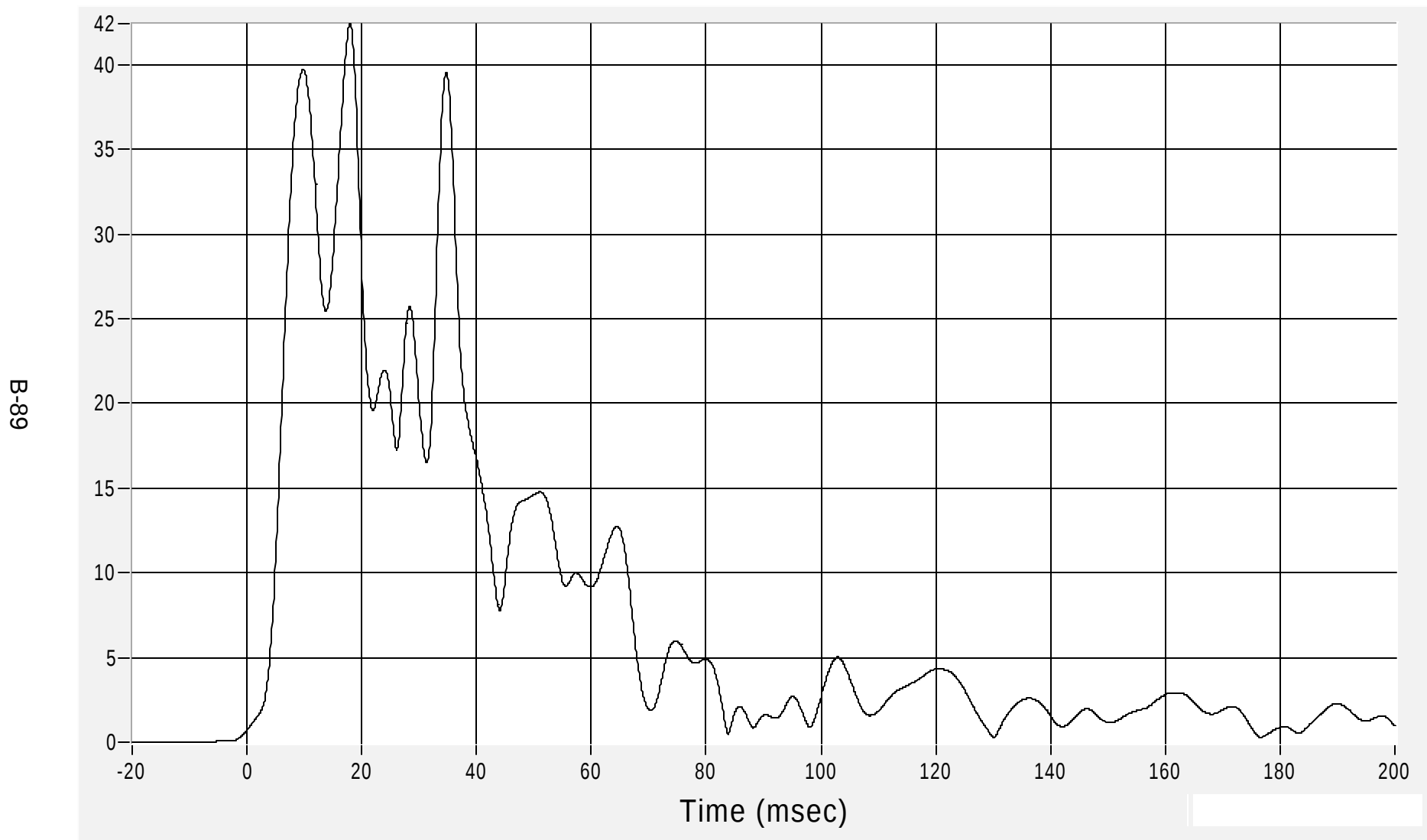
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Vehicle Center of Gravity Resultant Acceleration

Max 42.4 G's at 17.9 msec

Acceleration (G's) CFC60

Min 0.3 G's at 130.1 msec



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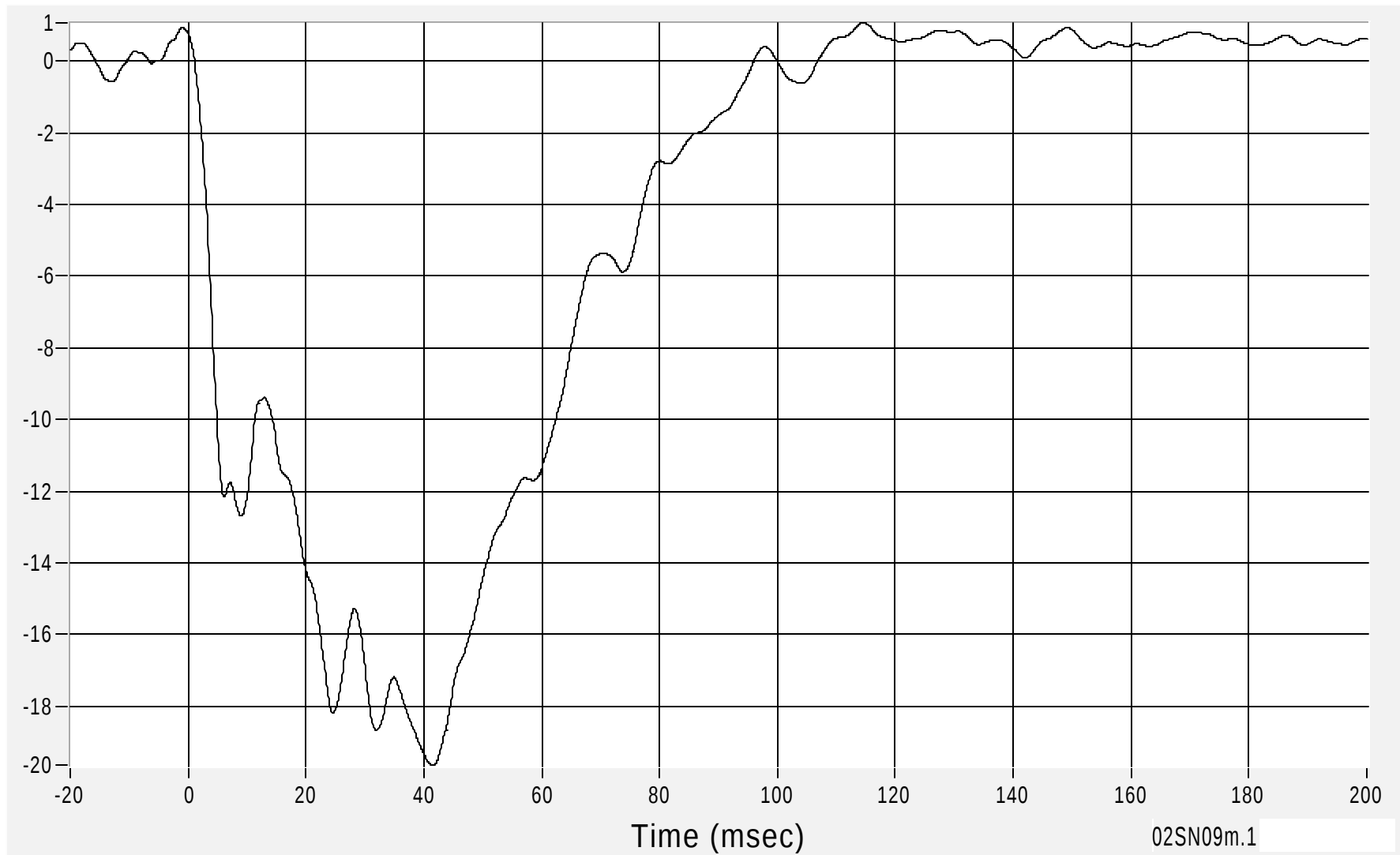
MDB Center of Gravity (X) Acceleration

Max 1.1 G's at 114.6 msec

Acceleration (G's) CFC60

Min -19.6 G's at 41.6 msec

B-90



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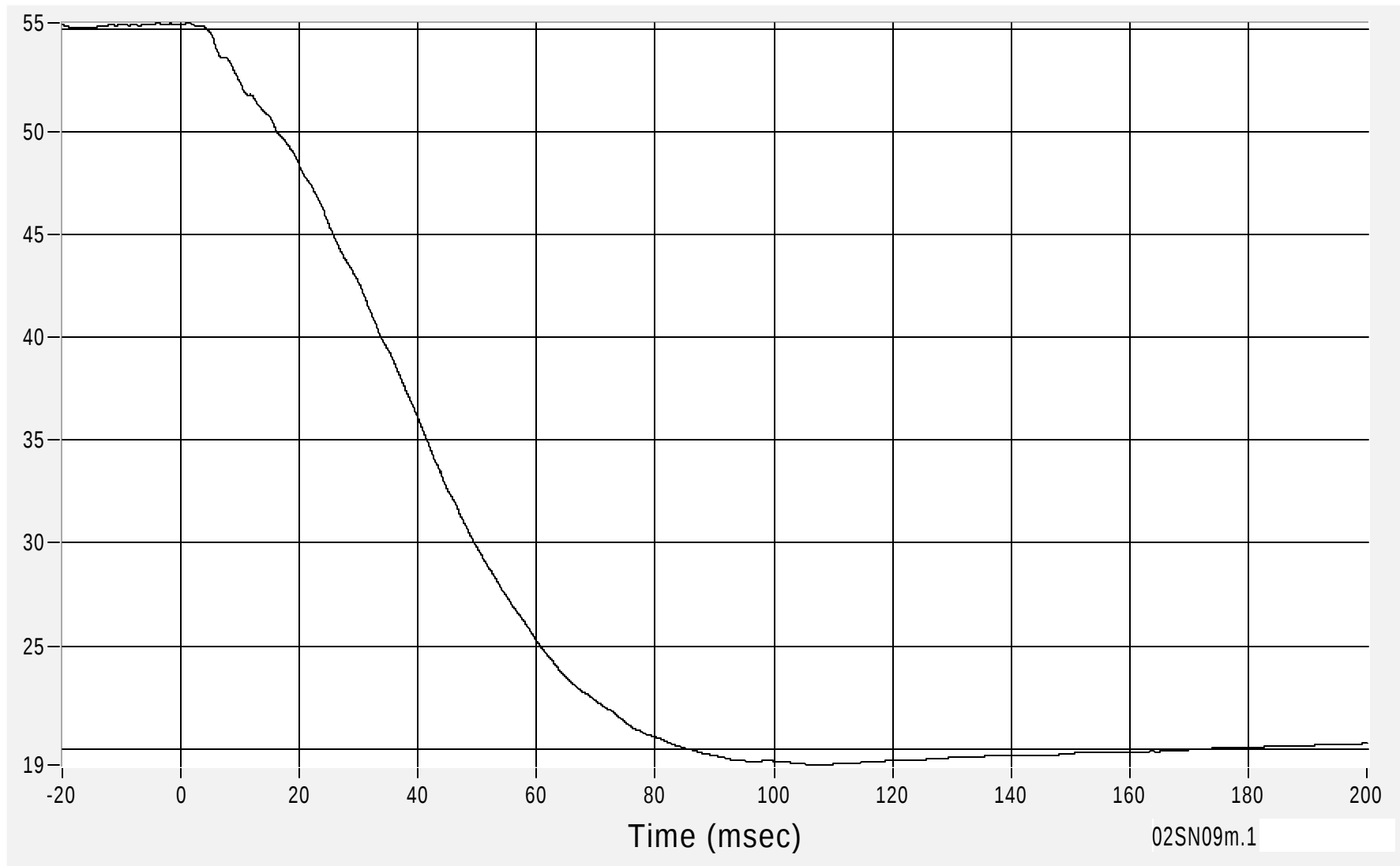
MDB Center of Gravity (X) Velocity

Max 55.3 km/h at 1.3 msec

Min 19.2 km/h at 106.3 msec

Velocity (km/h) CFC180

B-91



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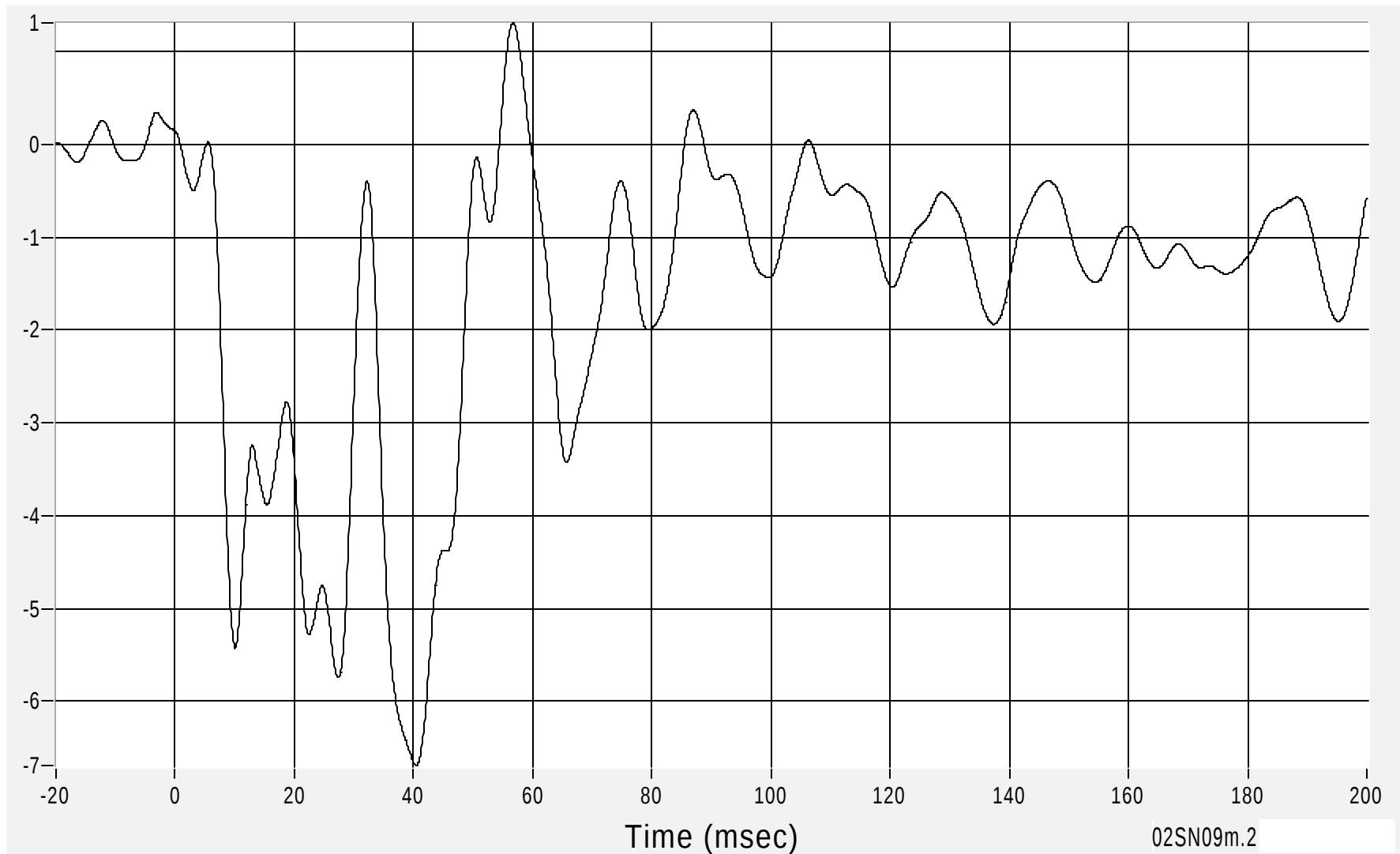
MDB Center of Gravity (Y) Acceleration

Max 1.3 G's at 56.7 msec

Acceleration (G's) CFC60

Min -6.7 G's at 40.5 msec

B-92



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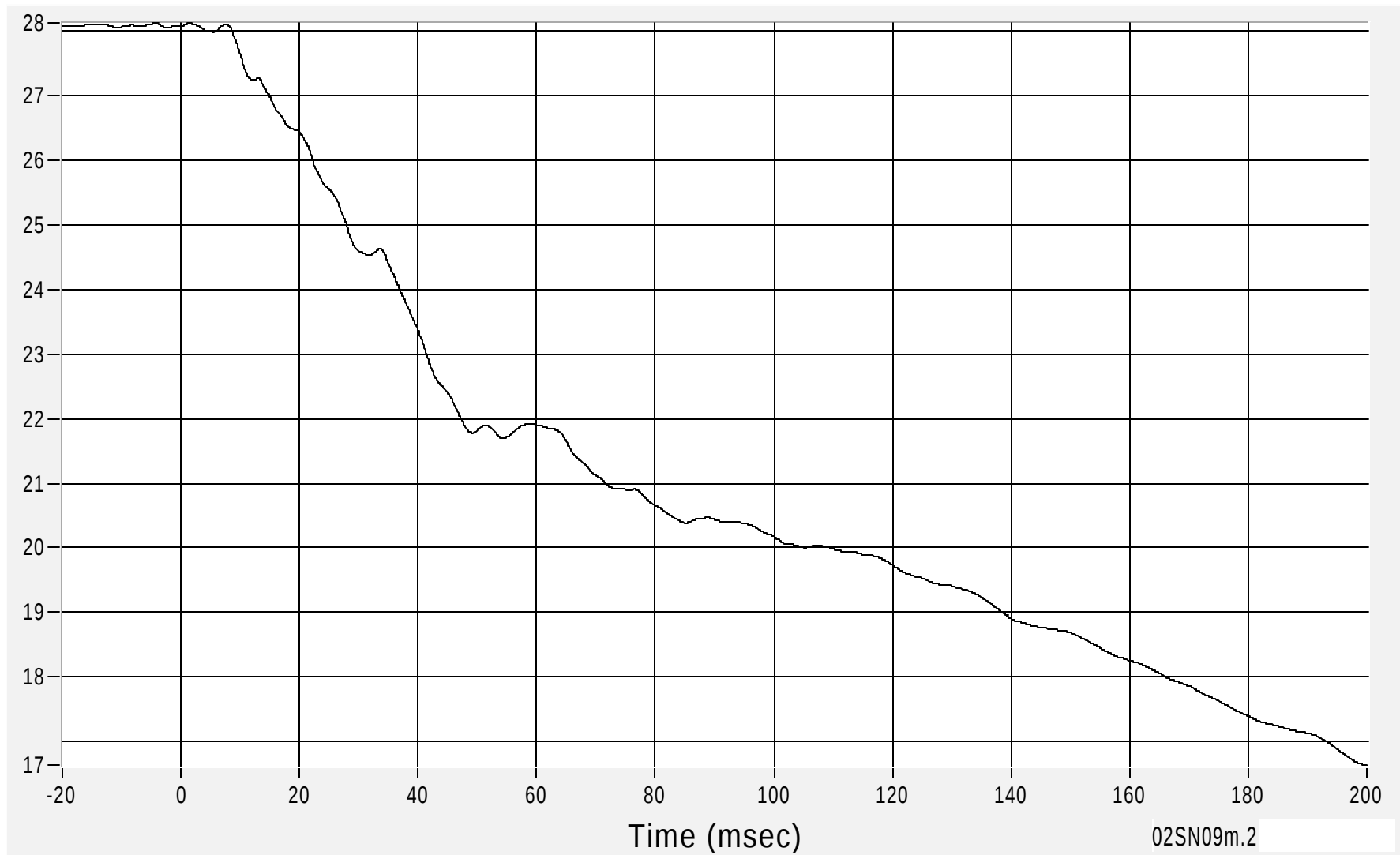
MDB Center of Gravity (Y) Velocity

Max 28.1 km/h at 1.4 msec

Min 16.6 km/h at 199.9 msec

Velocity (km/h) CFC180

B-93



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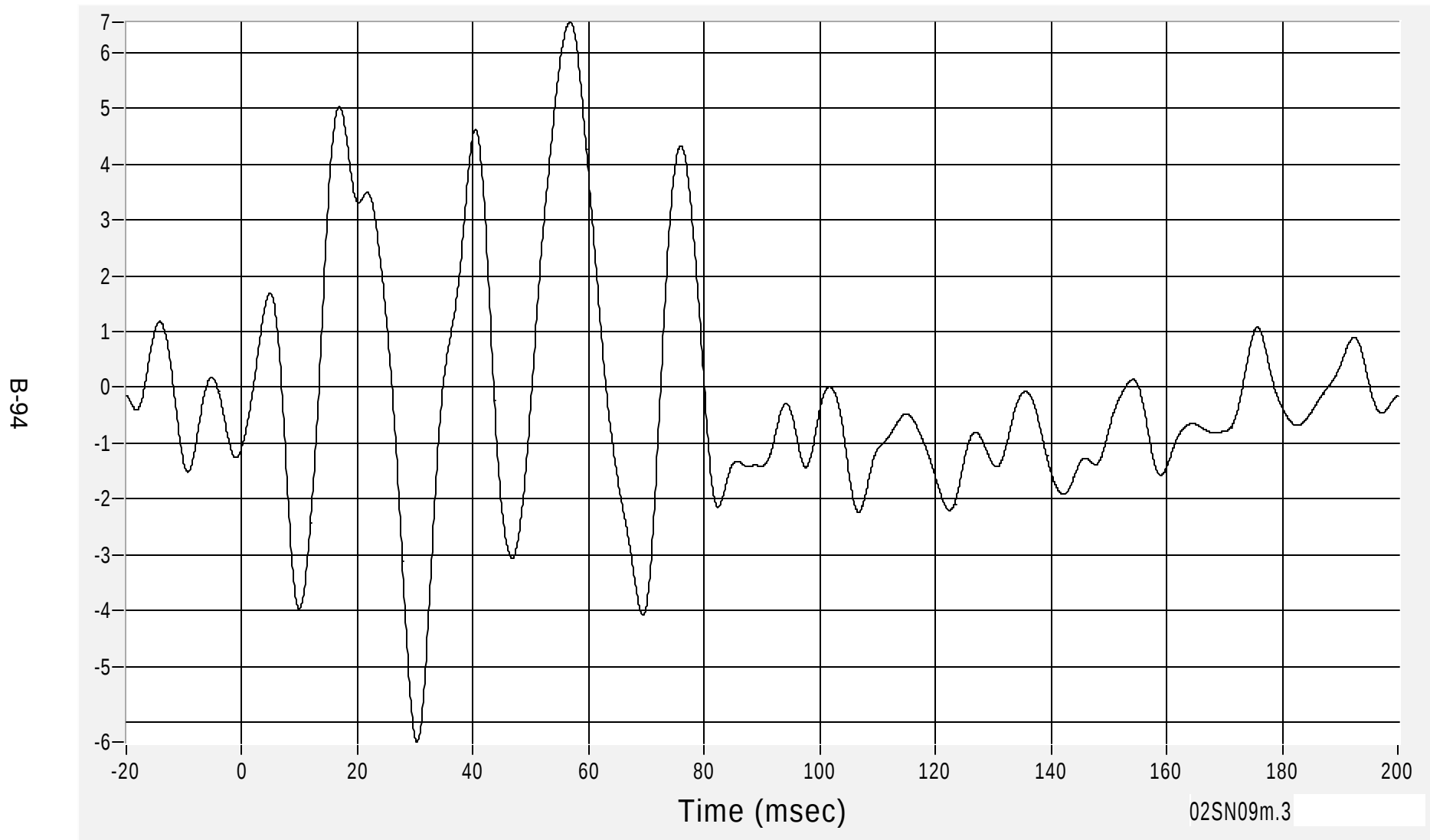
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MDB Center of Gravity (Z) Acceleration

Max 6.5 G's at 56.8 msec

Acceleration (G's) CFC60

Min -6.4 G's at 30.3 msec



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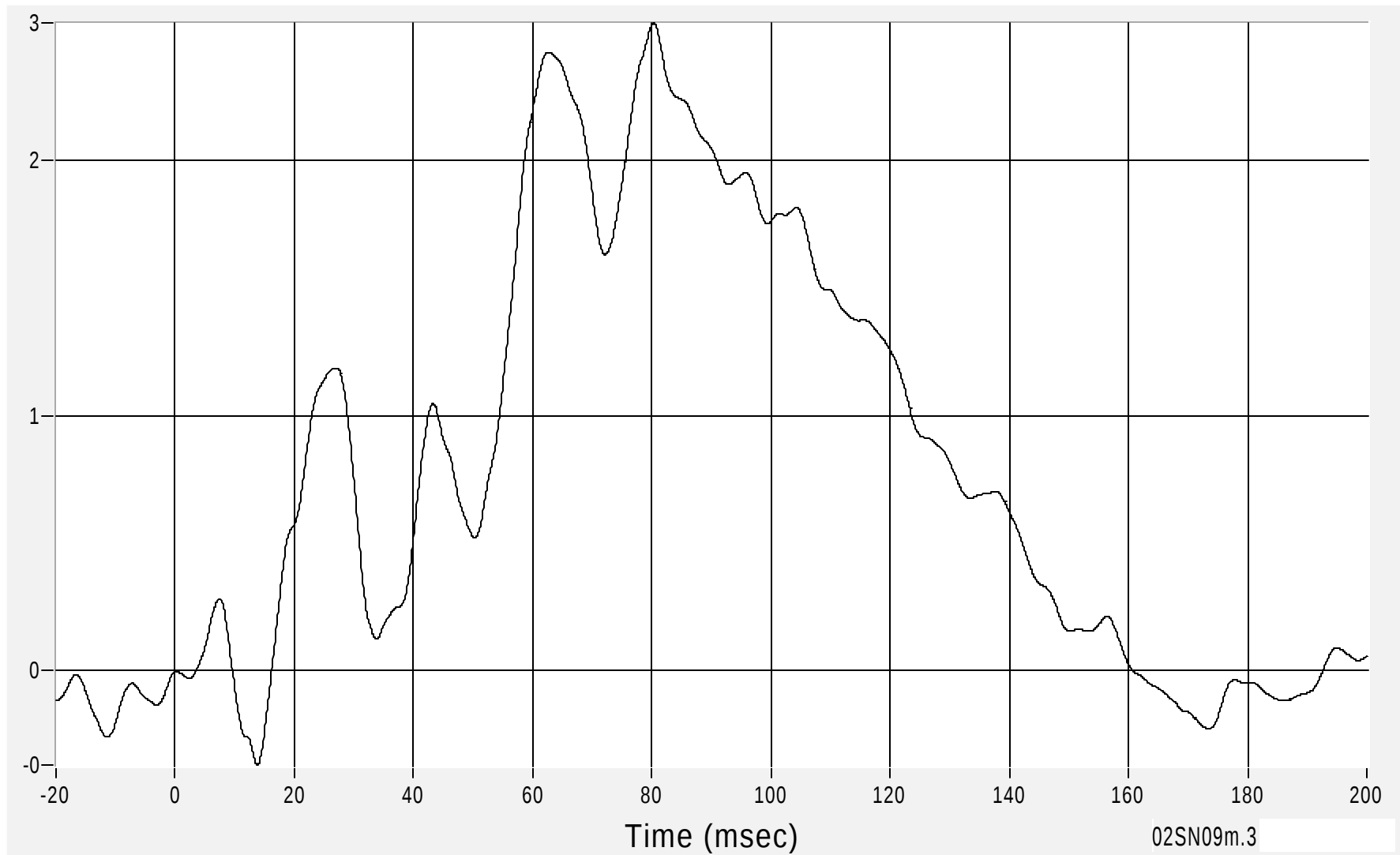
MDB Center of Gravity (Z) Velocity

Max 2.5 km/h at 80.3 msec

Velocity (km/h) CFC180

Min -0.4 km/h at 13.8 msec

B-95



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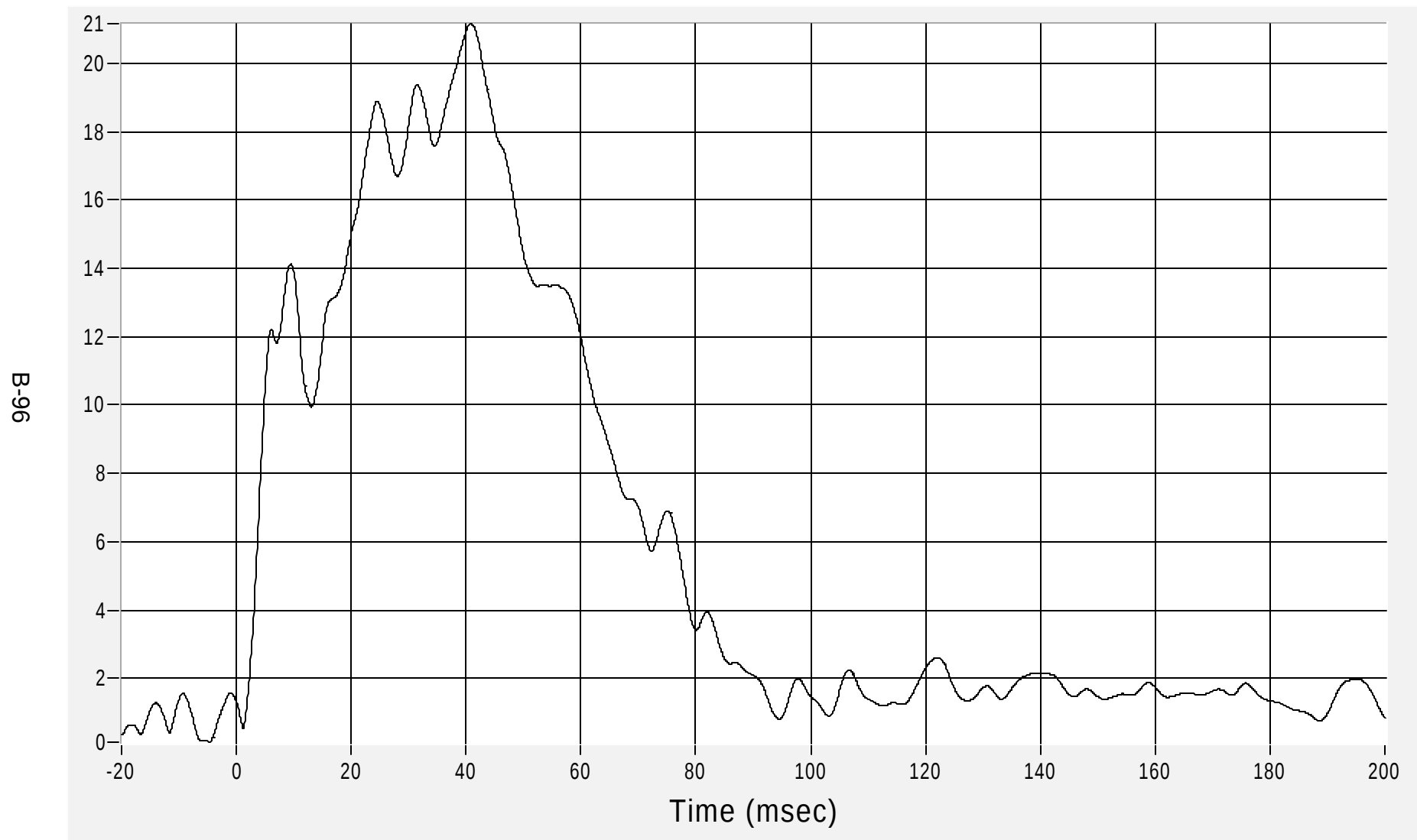
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MDB Center of Gravity Resultant Acceleration

Max 21.2 G's at 40.8 msec

Acceleration (G's) CFC60

Min 0.5 G's at 1.2 msec



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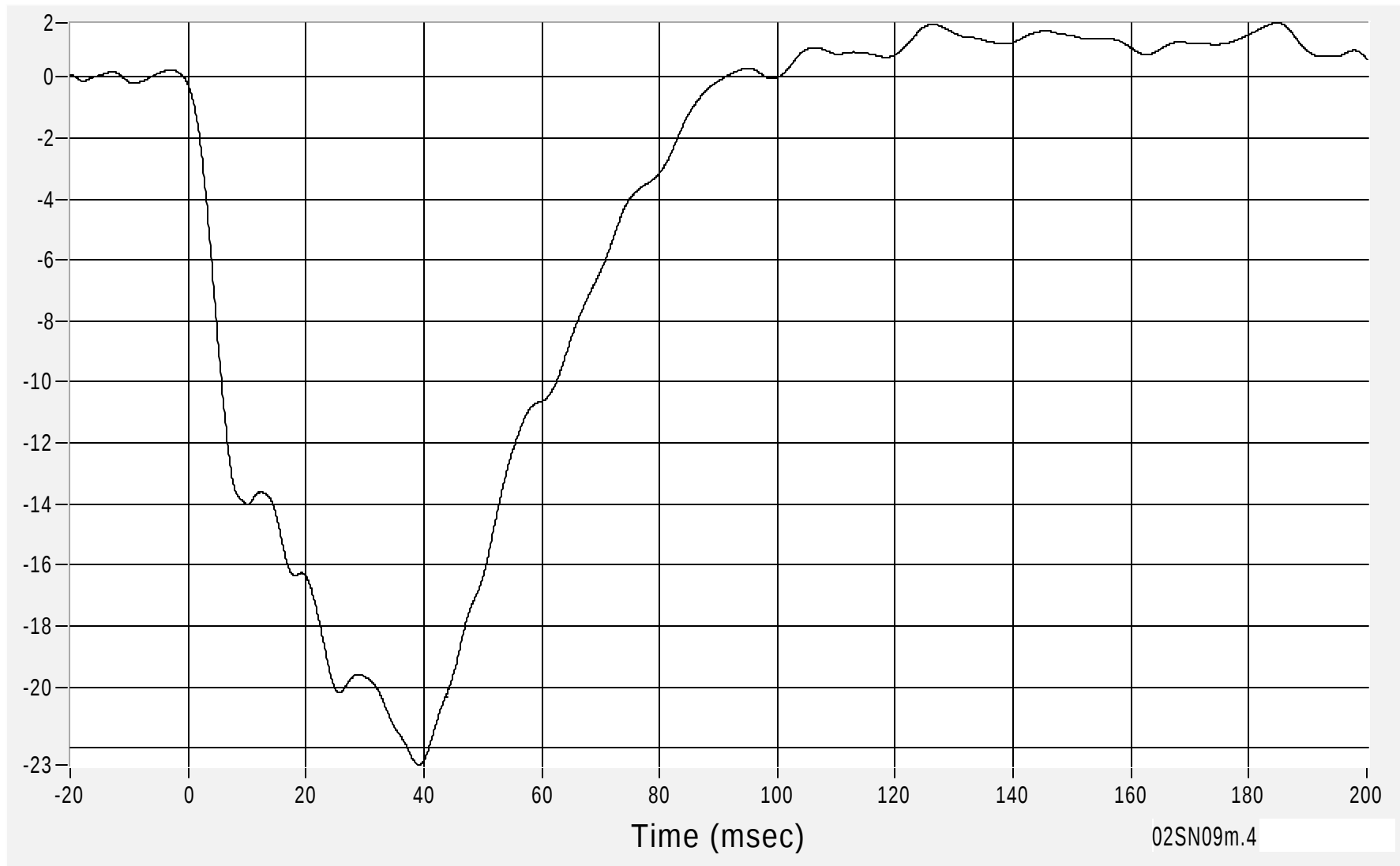
MDB Rear (X) Acceleration

Max 1.8 G's at 184.8 msec

Acceleration (G's) CFC60

Min -22.6 G's at 39.2 msec

B-97



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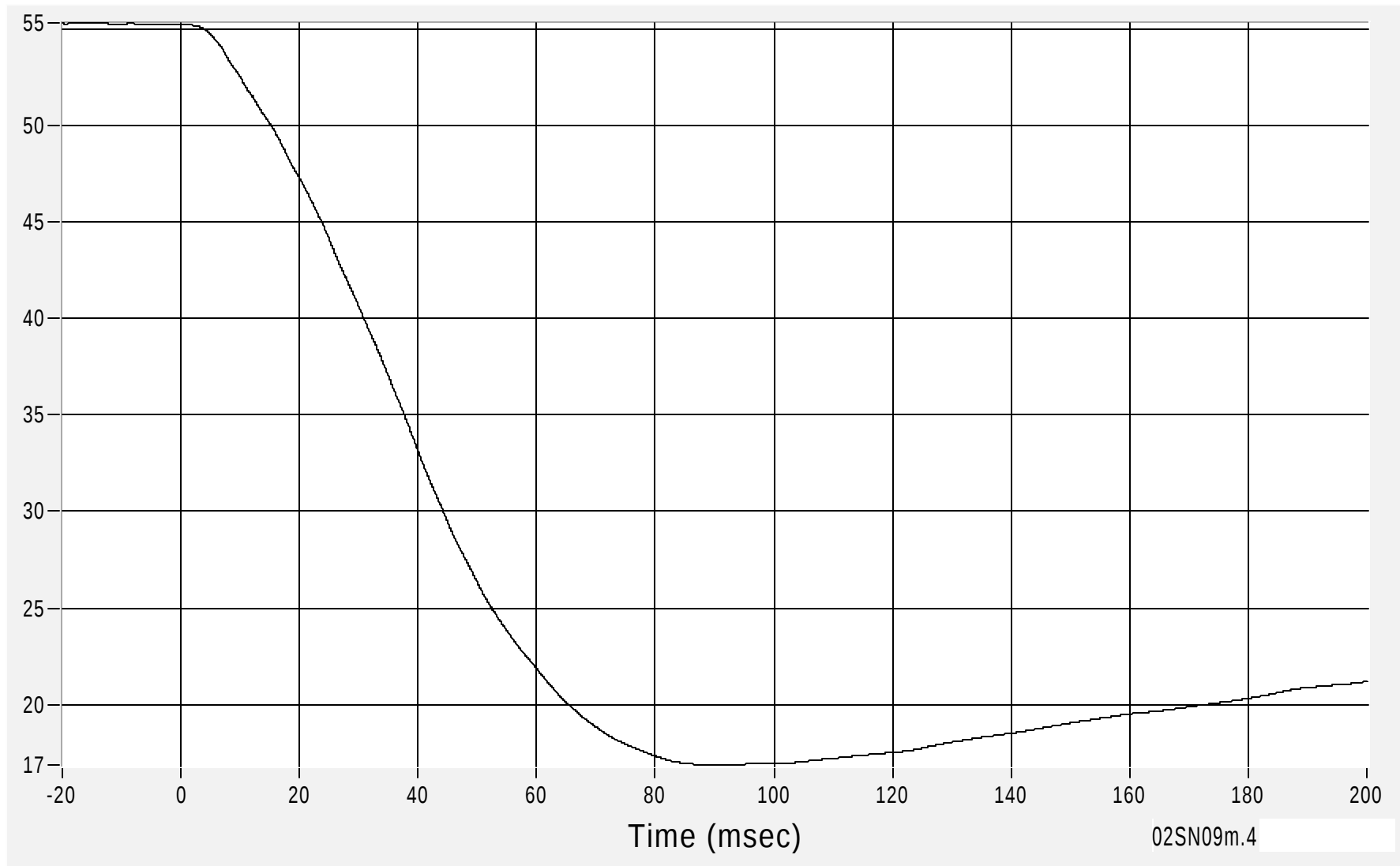
MDB Rear (X) Velocity

Max 55.2 km/h at 0.0 msec

Min 16.9 km/h at 90.8 msec

Velocity (km/h) CFC180

B-98



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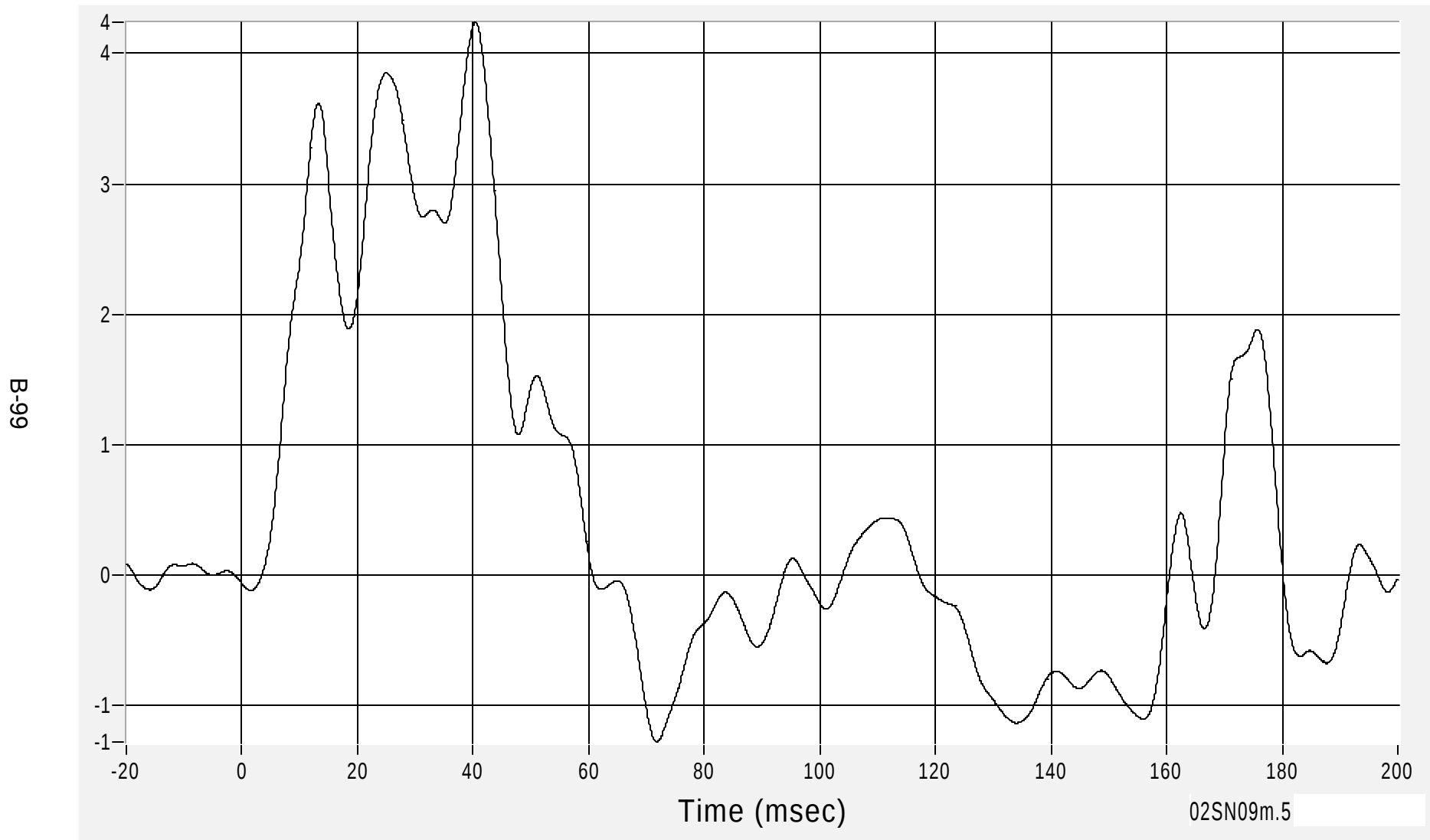
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MDB Rear (Y) Acceleration

Max 4.2 G's at 40.4 msec

Acceleration (G's) CFC60

Min -1.3 G's at 71.8 msec



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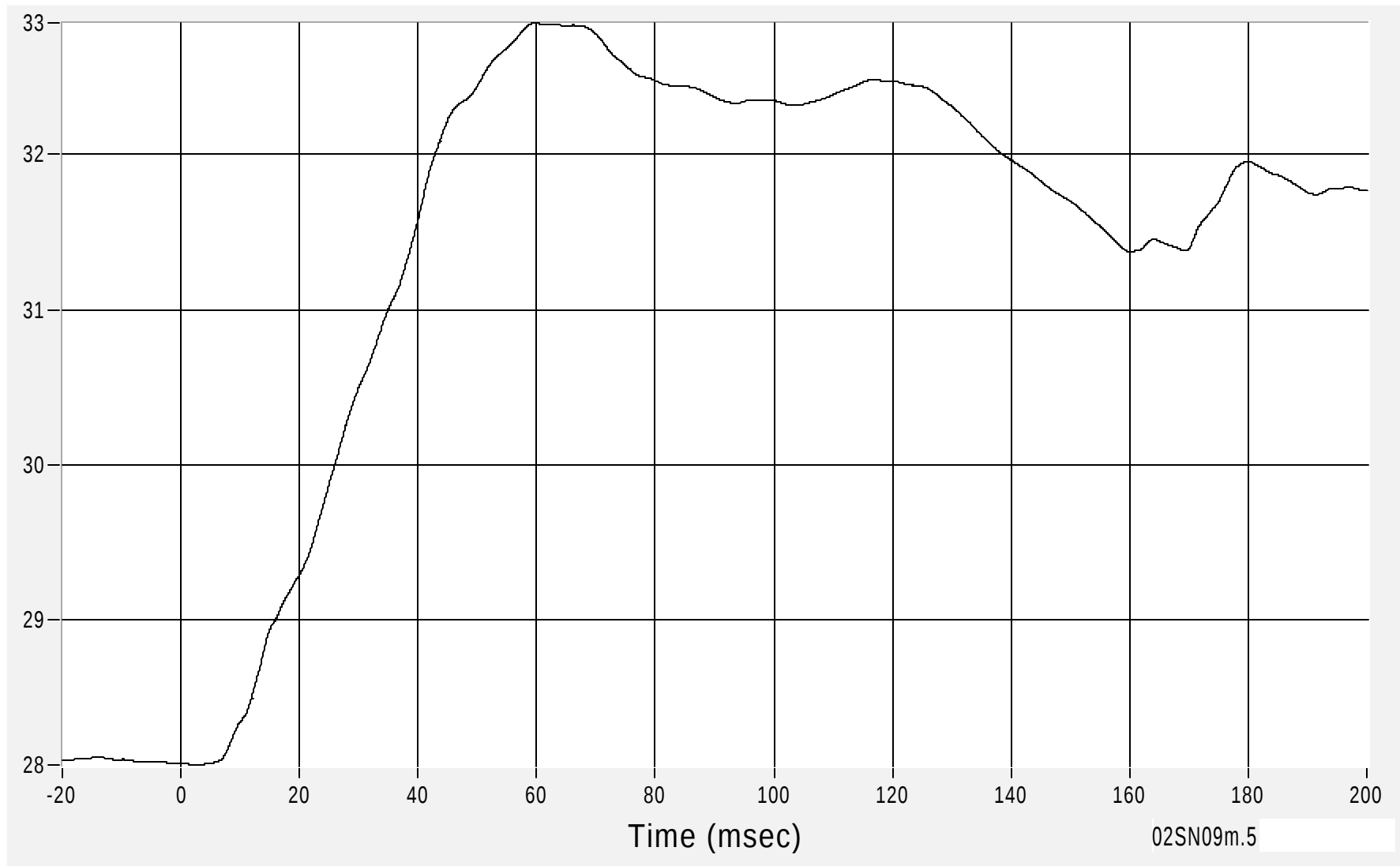
MDB Rear (Y) Velocity

Max 32.8 km/h at 59.7 msec

Velocity (km/h) CFC180

Min 28.1 km/h at 2.9 msec

B-100



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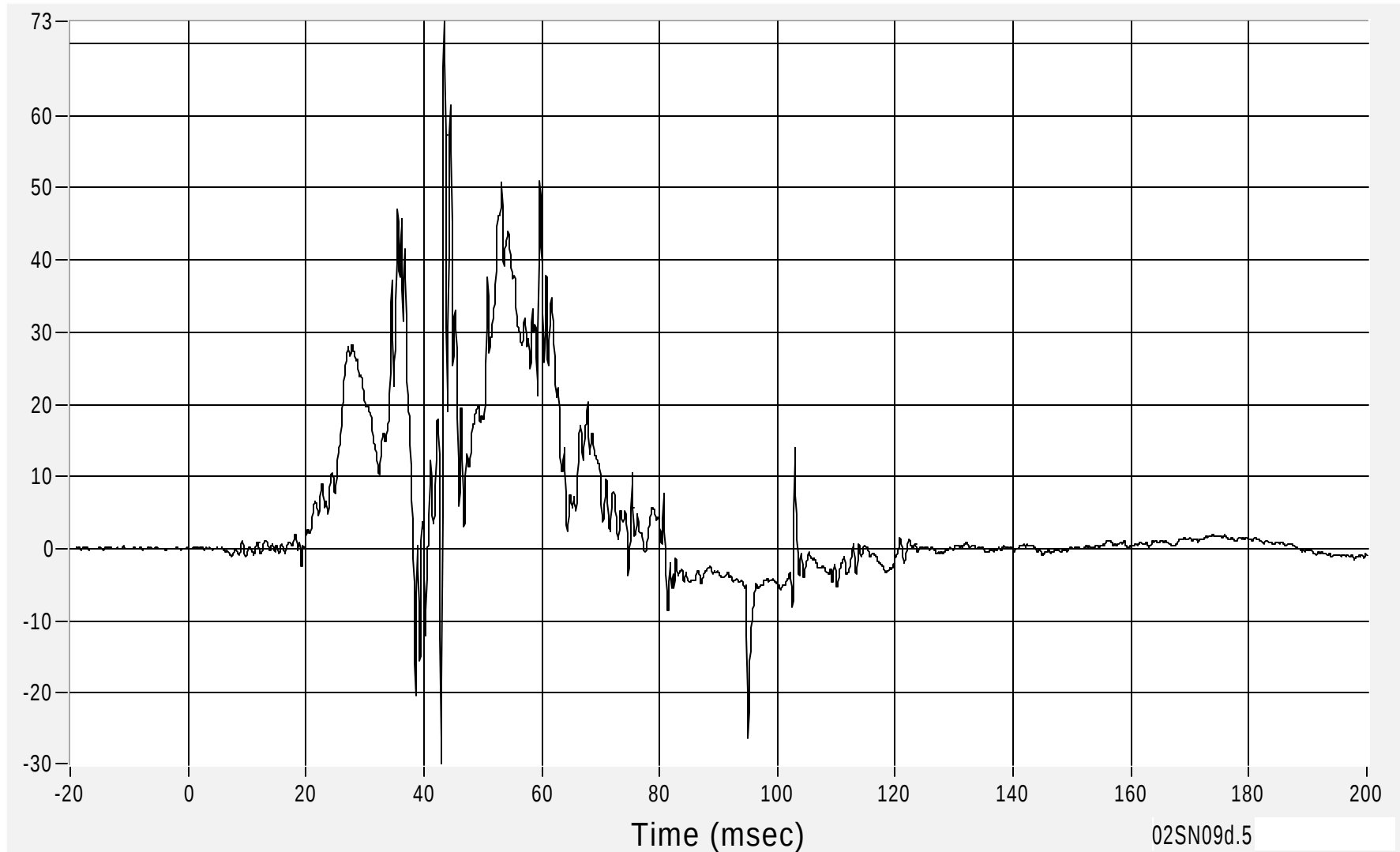
Driver Upper Rib (Y) Acceleration - Redundant

Max 73.1 G's at 43.5 msec

Acceleration (G's) CFC1000

Min -29.8 G's at 43.0 msec

B-101



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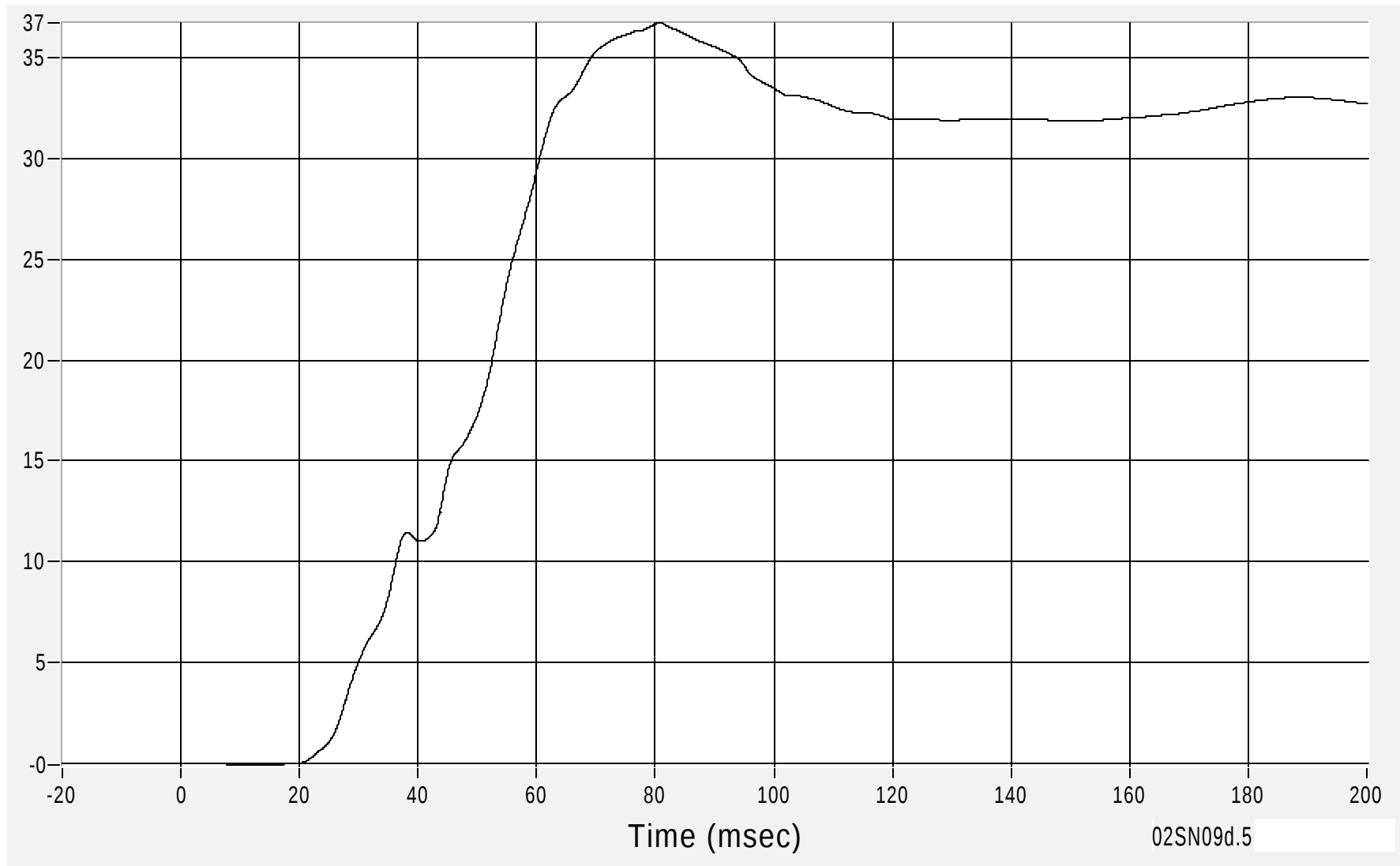
Driver Upper Rib (Y) Velocity - Redundant

Max 36.7 km/h at 80.7 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 11.5 msec

B-102



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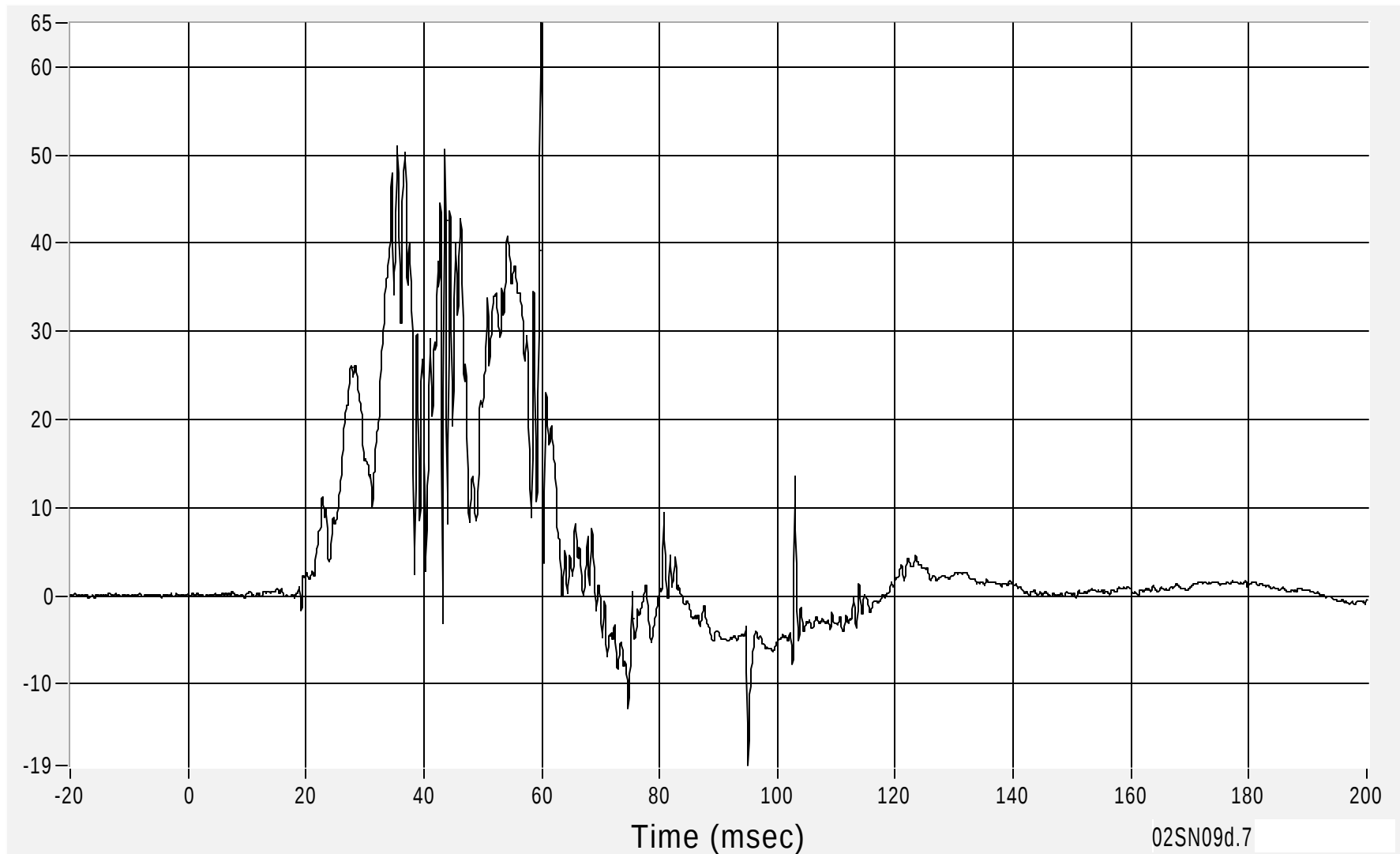
Driver Lower Rib (Y) Acceleration - Redundant

Max 65.0 G's at 59.8 msec

Acceleration (G's) CFC1000

Min -19.3 G's at 95.0 msec

B-103



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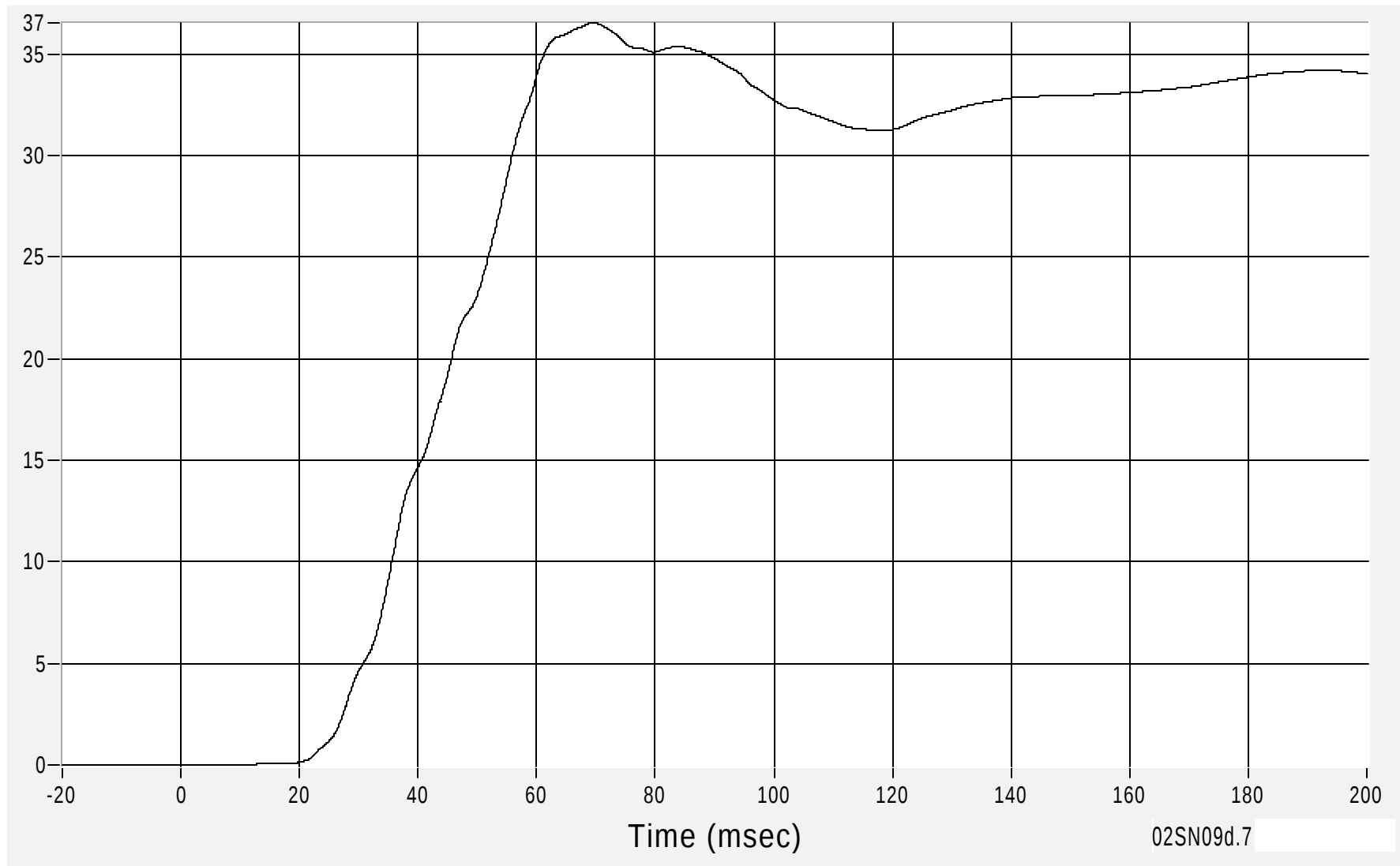
Driver Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 36.5 km/h at 69.5 msec

Min 0.0 km/h at 0.0 msec

B-104



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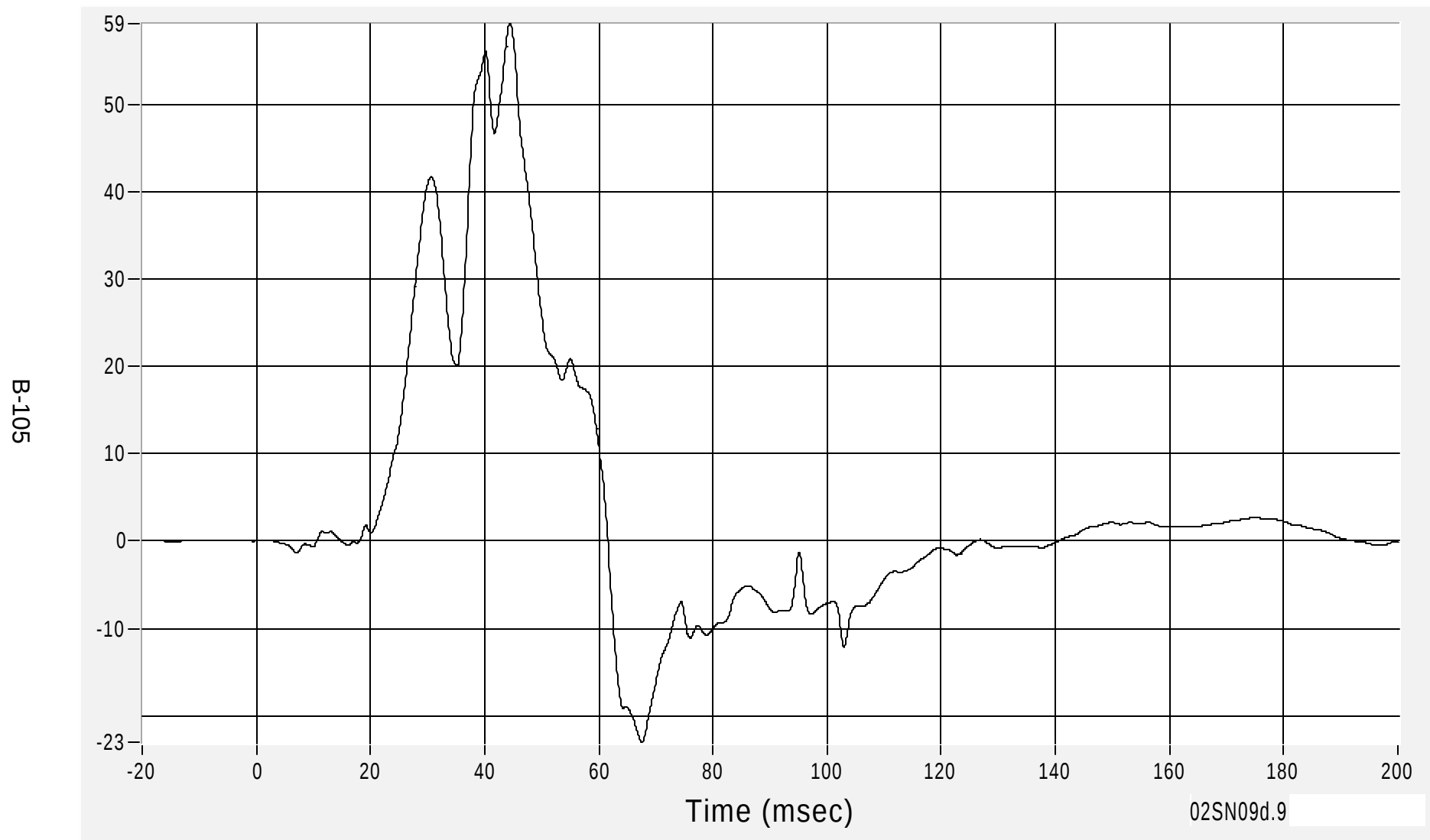
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Driver Lower Spine (Y) Acceleration - Redundant

Max 59.2 G's at 44.4 msec

Acceleration (G's) CFC180

Min -23.0 G's at 67.6 msec



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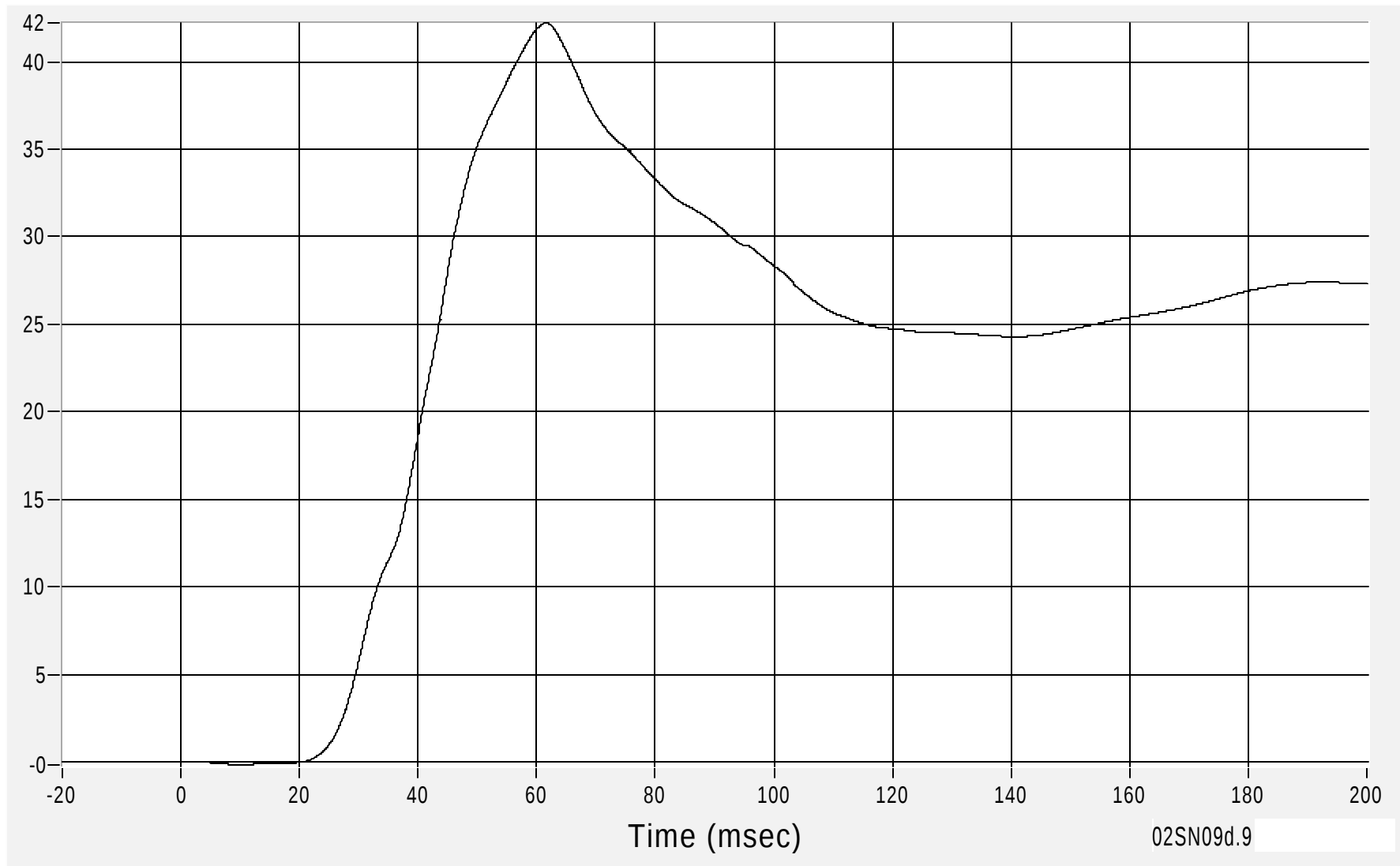
Driver Lower Spine (Y) Velocity - Redundant

Max 42.2 km/h at 61.6 msec

Velocity (km/h) CFC180

Min -0.1 km/h at 10.6 msec

B-106



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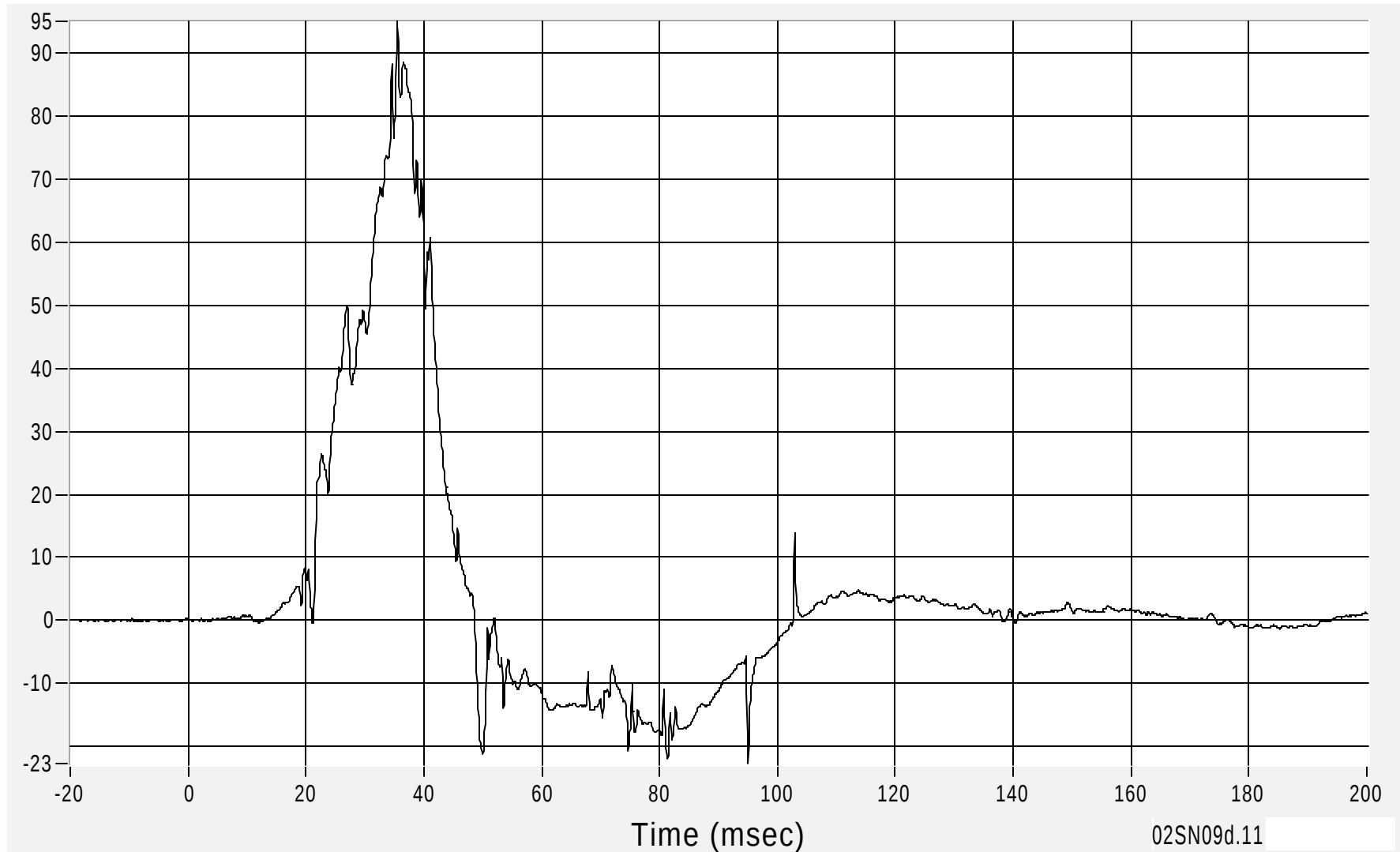
Driver Pelvic (Y) Acceleration - Redundant

Max 95.0 G's at 35.5 msec

Acceleration (G's) CFC1000

Min -22.7 G's at 95.0 msec

B-107



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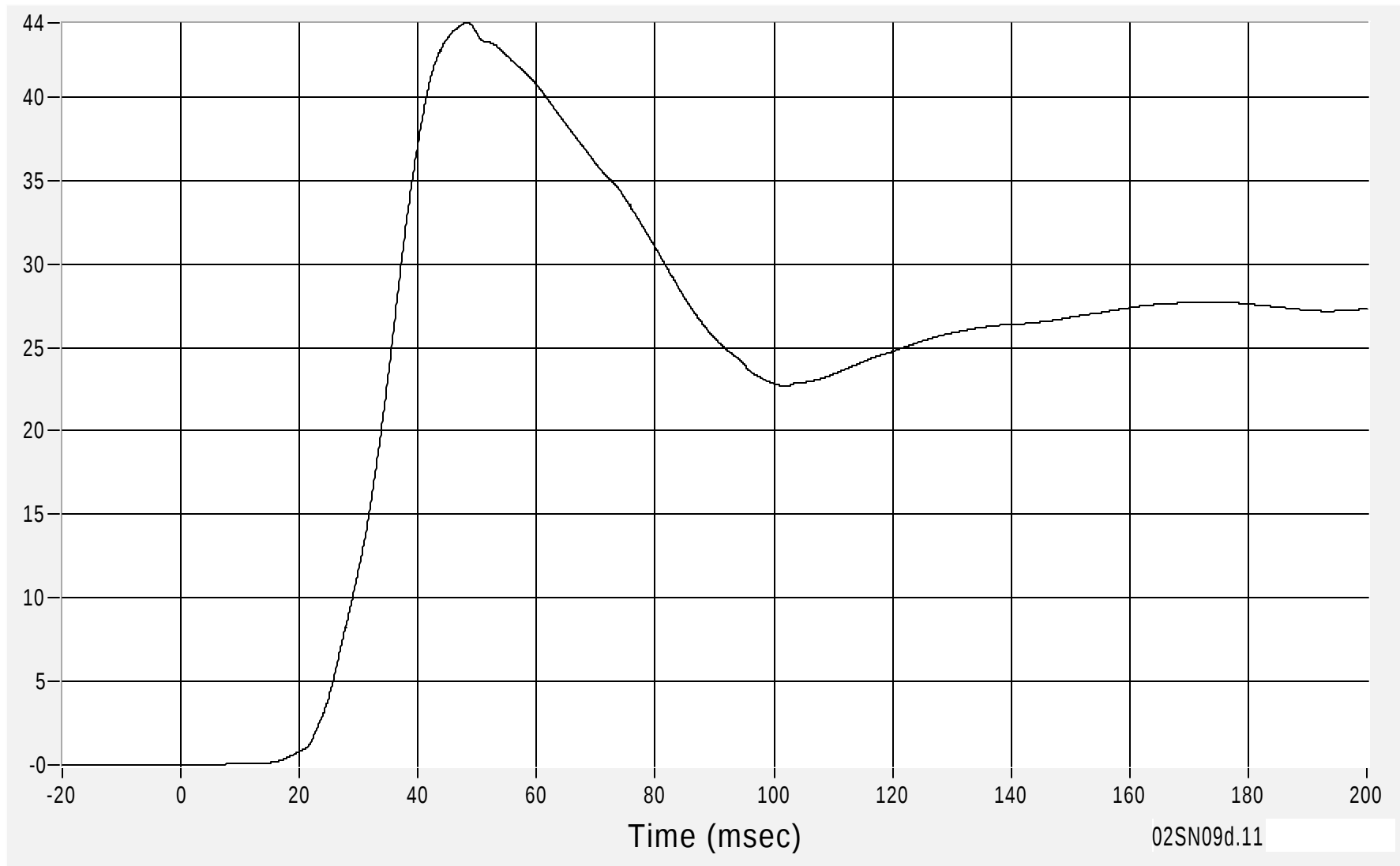
Driver Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 44.4 km/h at 48.3 msec

Min 0.0 km/h at 3.7 msec

B-108



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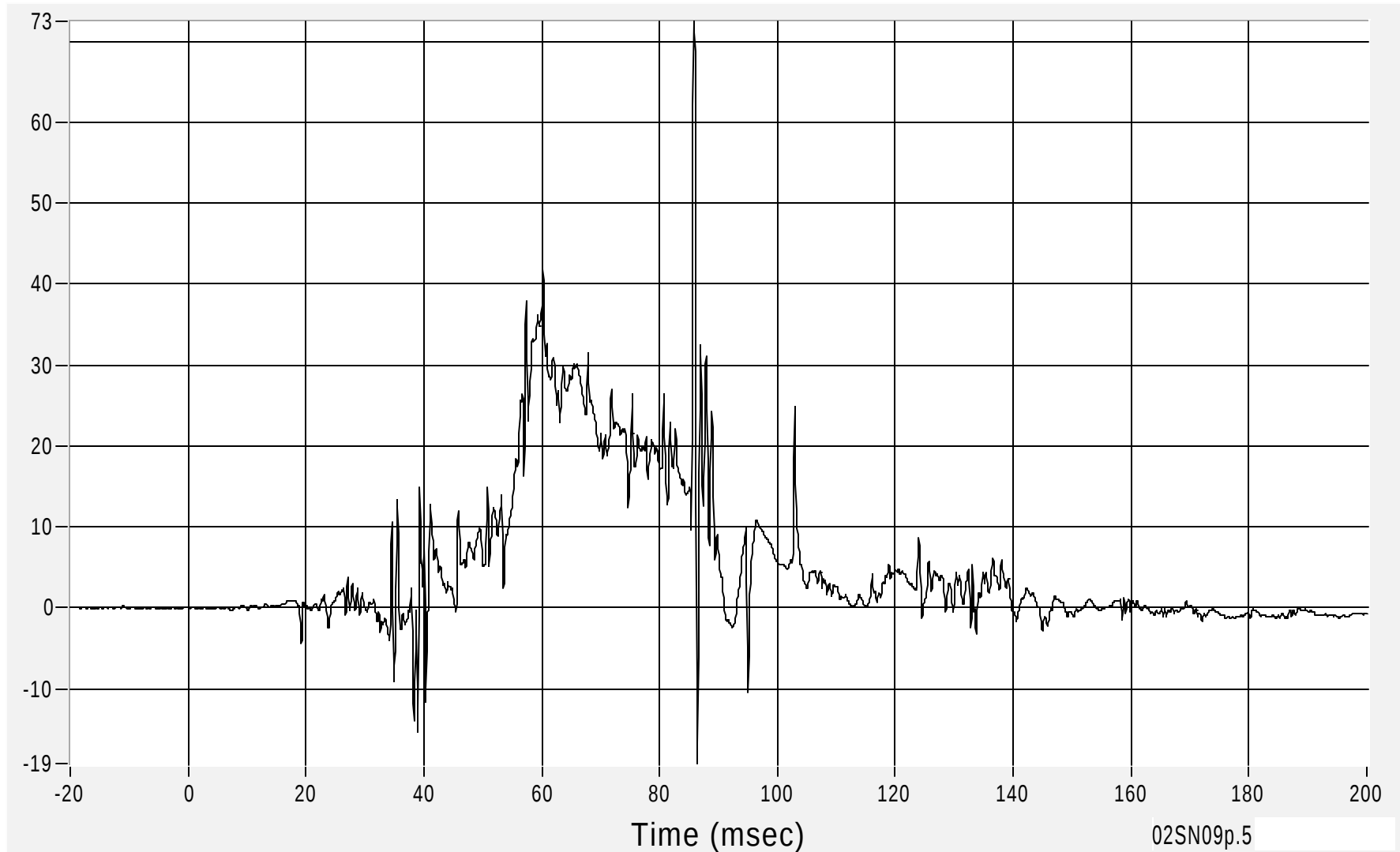
Passenger Upper Rib (Y) Acceleration - Redundant

Max 72.5 G's at 85.8 msec

Acceleration (G's) CFC1000

Min -19.3 G's at 86.4 msec

B-109



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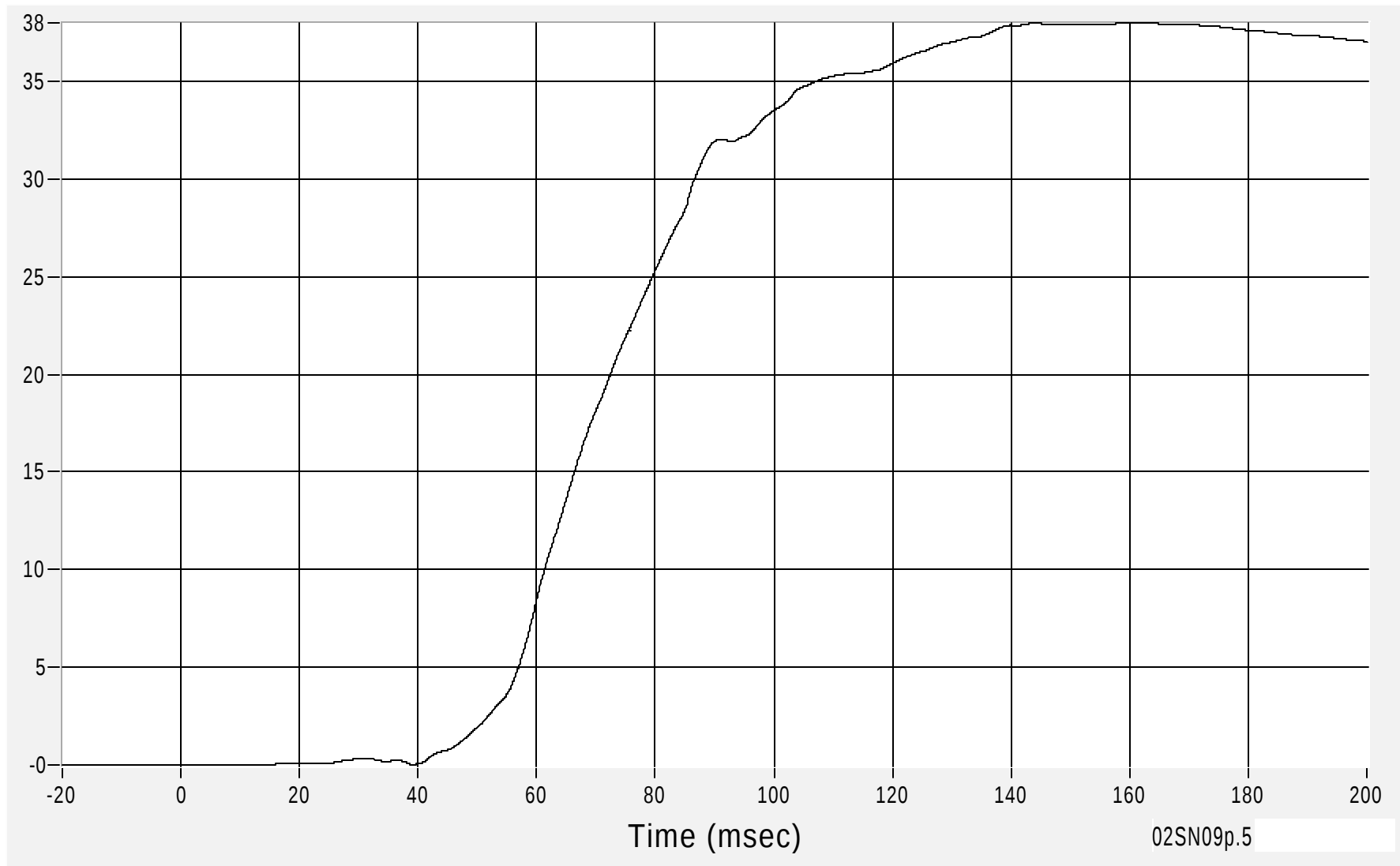
Passenger Upper Rib (Y) Velocity - Redundant

Max 38.0 km/h at 161.7 msec

Velocity (km/h) CFC180

Min 0.0 km/h at 8.3 msec

B-110



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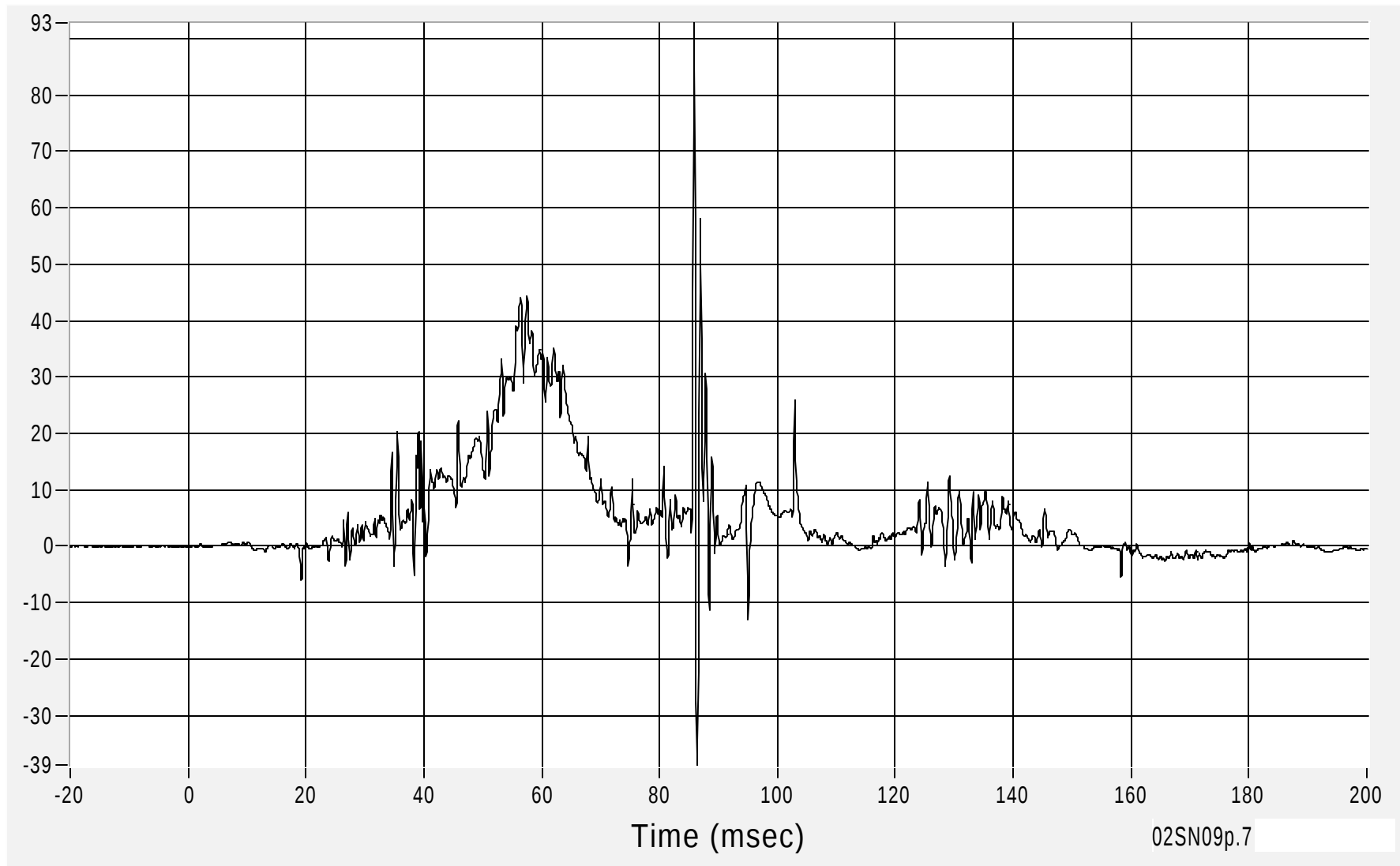
Passenger Lower Rib (Y) Acceleration - Redundant

Max 92.8 G's at 85.8 msec

Acceleration (G's) CFC1000

Min -38.8 G's at 86.4 msec

B-111



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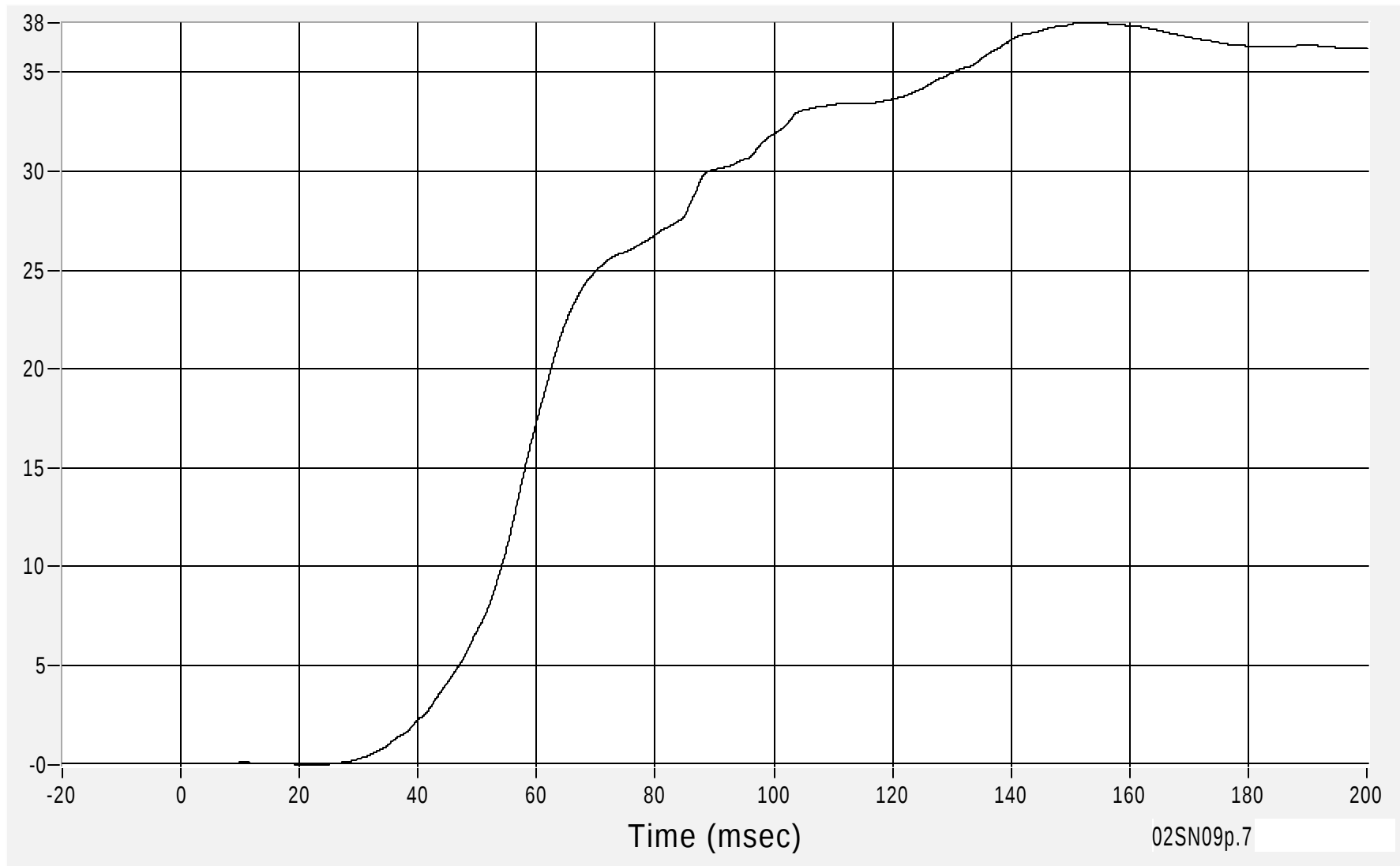
Passenger Lower Rib (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 37.5 km/h at 151.8 msec

Min 0.0 km/h at 21.6 msec

B-112



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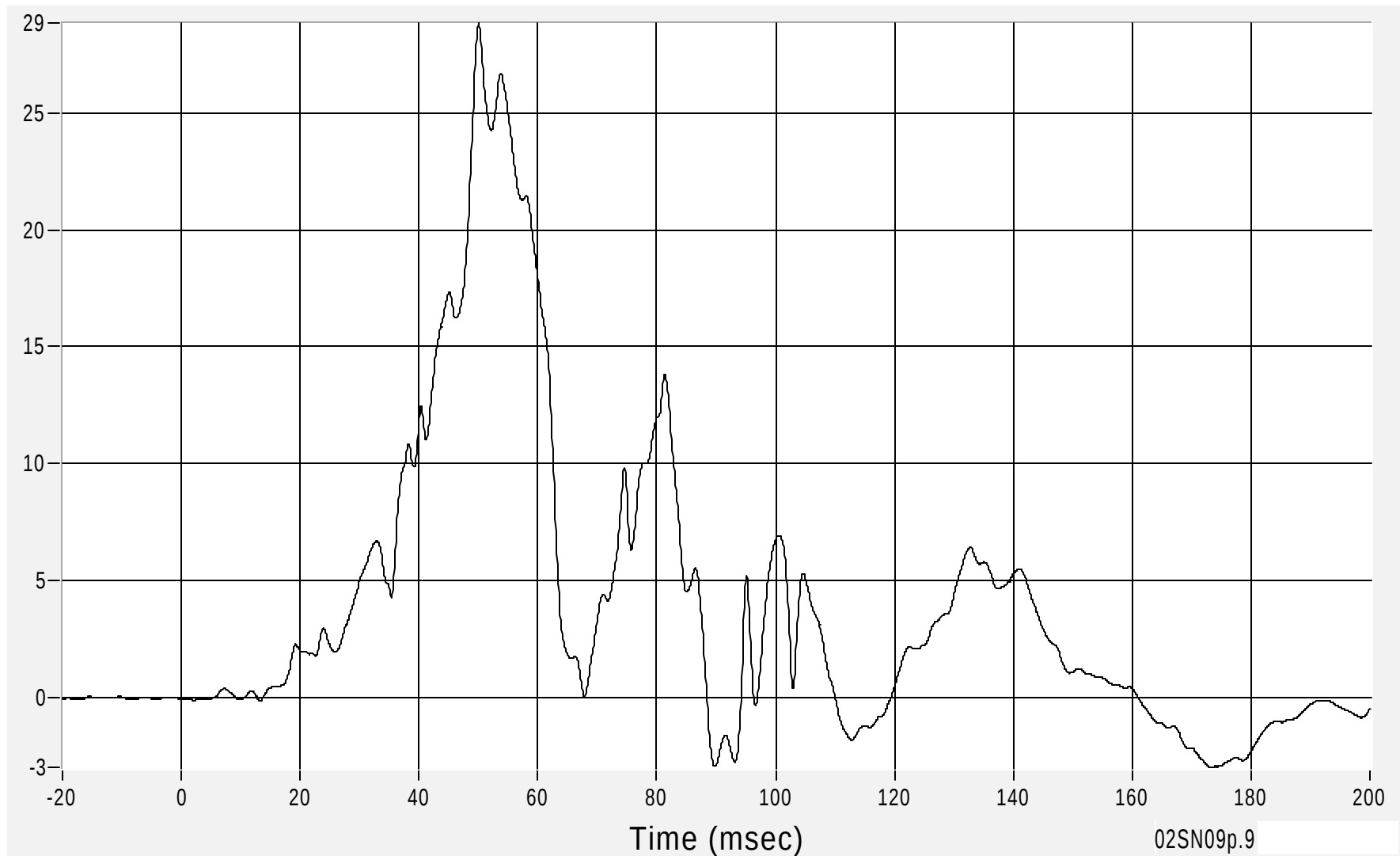
Passenger Lower Spine (Y) Acceleration - Redundant

Max 28.8 G's at 50.0 msec

Acceleration (G's) CFC180

Min -3.0 G's at 173.2 msec

B-113



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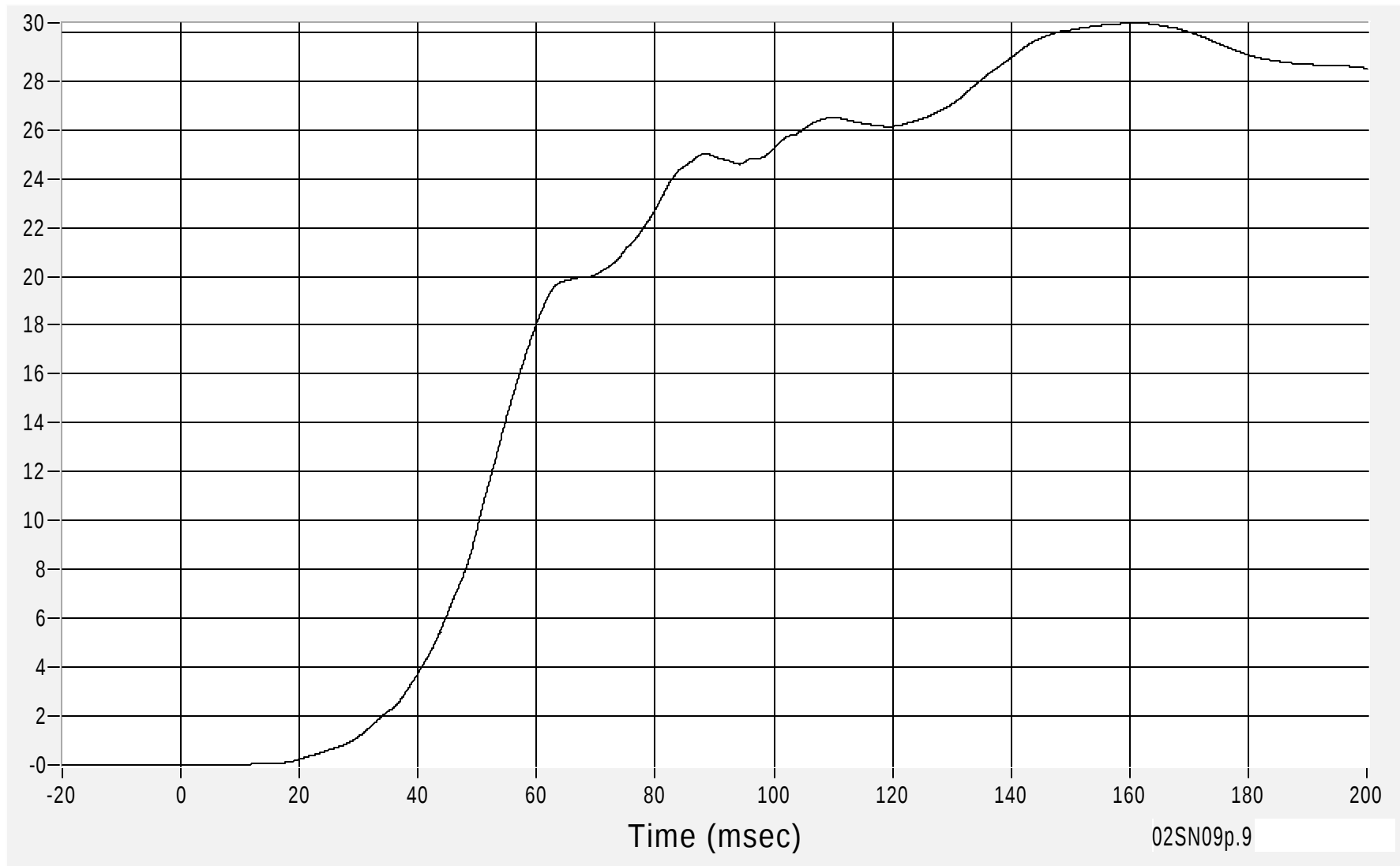
Passenger Lower Spine (Y) Velocity - Redundant

Max 30.4 km/h at 161.0 msec

Min 0.0 km/h at 5.5 msec

Velocity (km/h) CFC180

B-114



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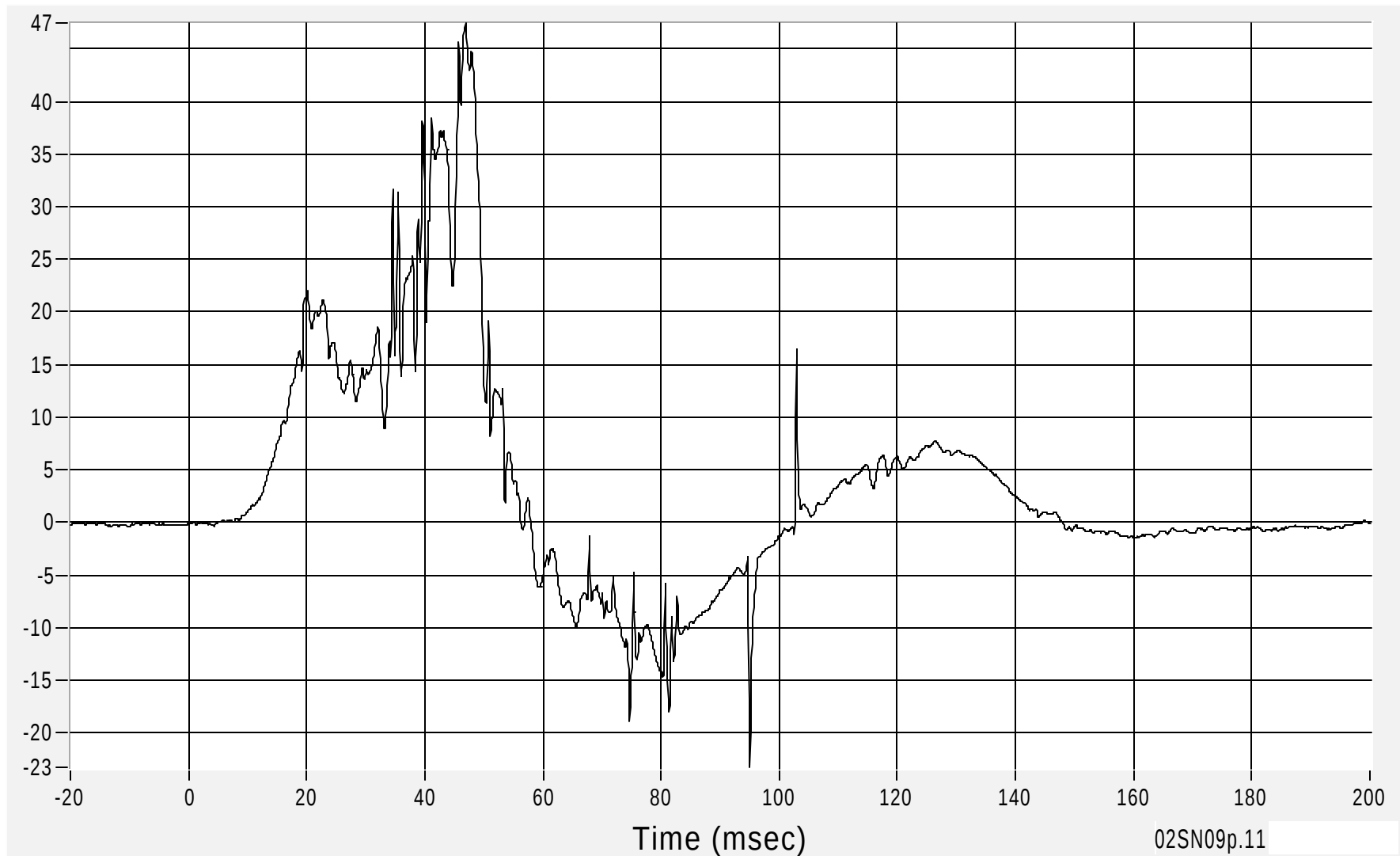
Passenger Pelvic (Y) Acceleration - Redundant

Max 47.5 G's at 47.0 msec

Acceleration (G's) CFC1000

Min -23.3 G's at 95.0 msec

B-115



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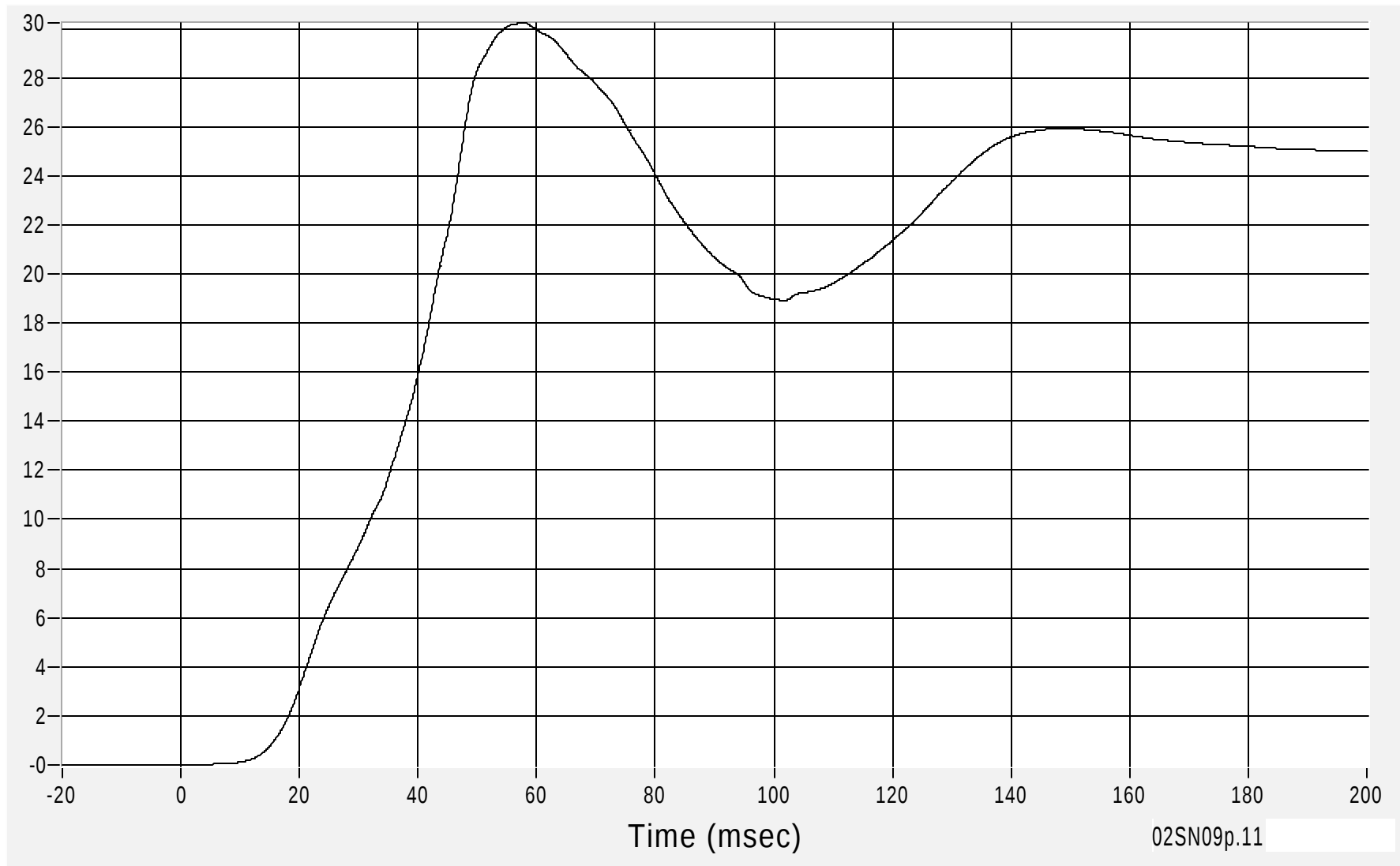
Passenger Pelvic (Y) Velocity - Redundant

Velocity (km/h) CFC180

Max 30.3 km/h at 57.8 msec

Min 0.0 km/h at 0.0 msec

B-116



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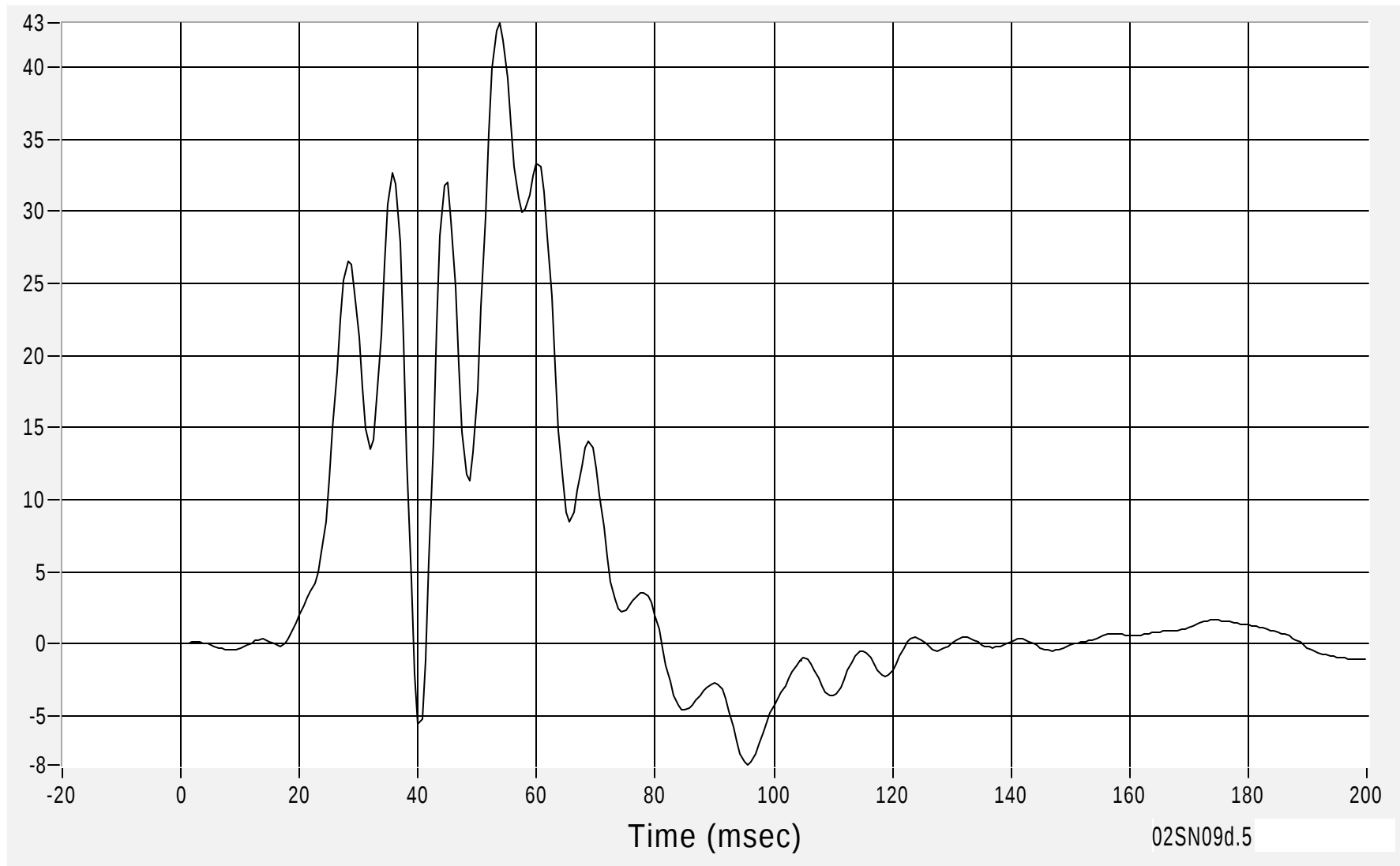
Driver Upper Rib (Y) Acceleration - Redundant

Max 43.1 G's at 53.8 msec

Acceleration (G's) FIR100

Min -8.4 G's at 95.6 msec

B-117



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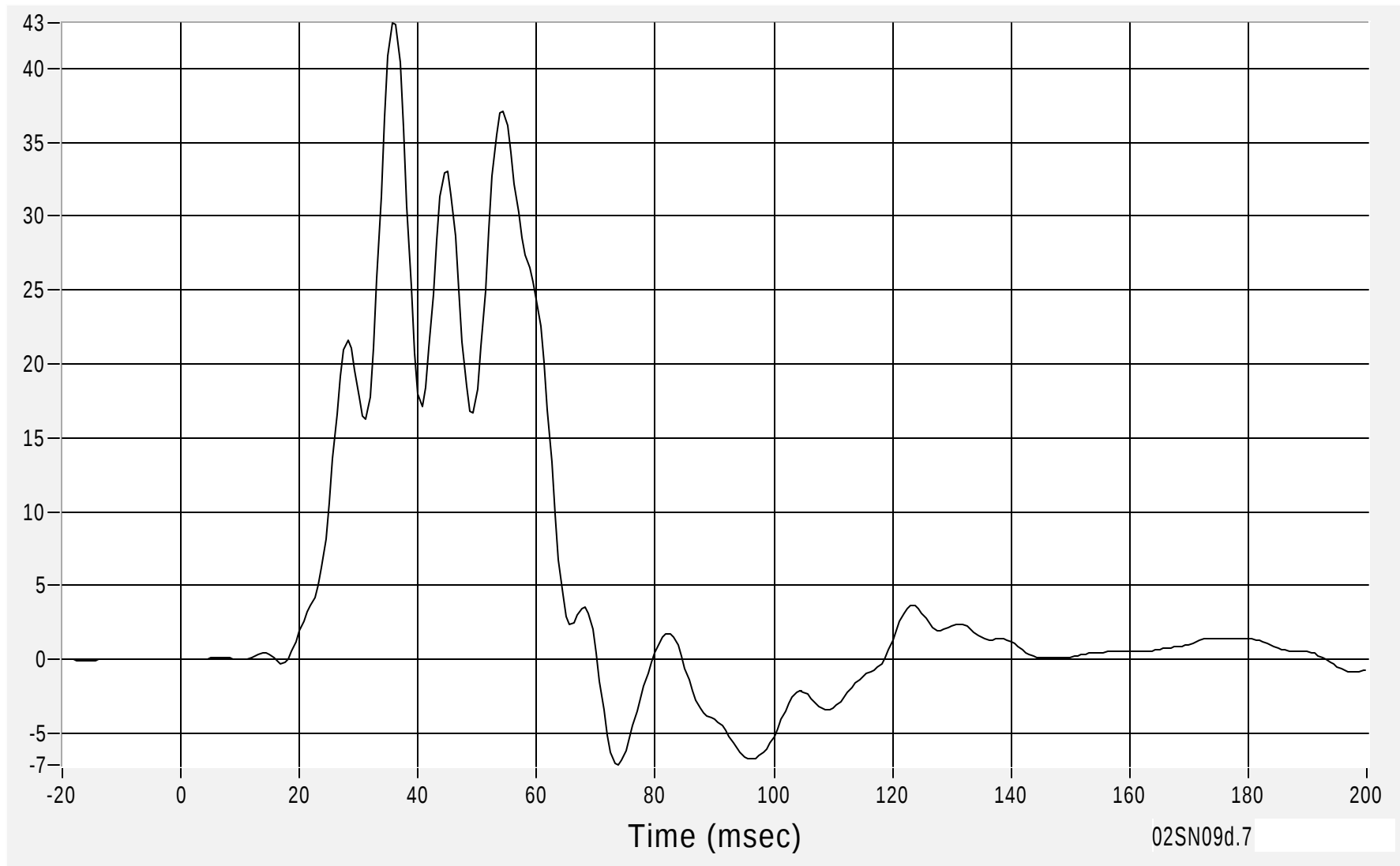
Driver Lower Rib (Y) Acceleration - Redundant

Max 43.1 G's at 35.6 msec

Min -7.2 G's at 73.8 msec

Acceleration (G's) FIR100

B-118



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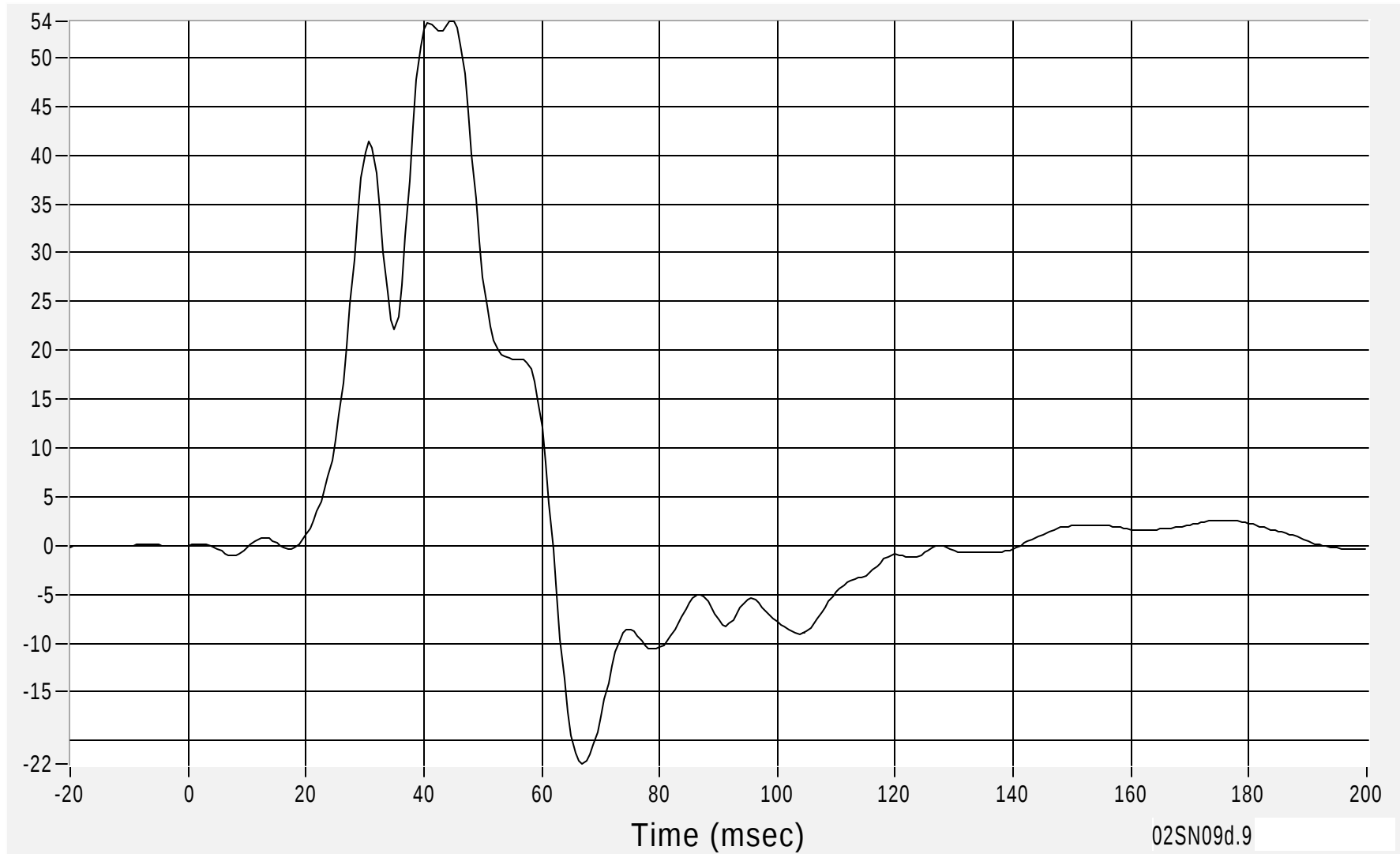
Driver Lower Spine (Y) Acceleration - Redundant

Max 53.7 G's at 45.0 msec

Acceleration (G's) FIR100

Min -22.4 G's at 66.9 msec

B-119



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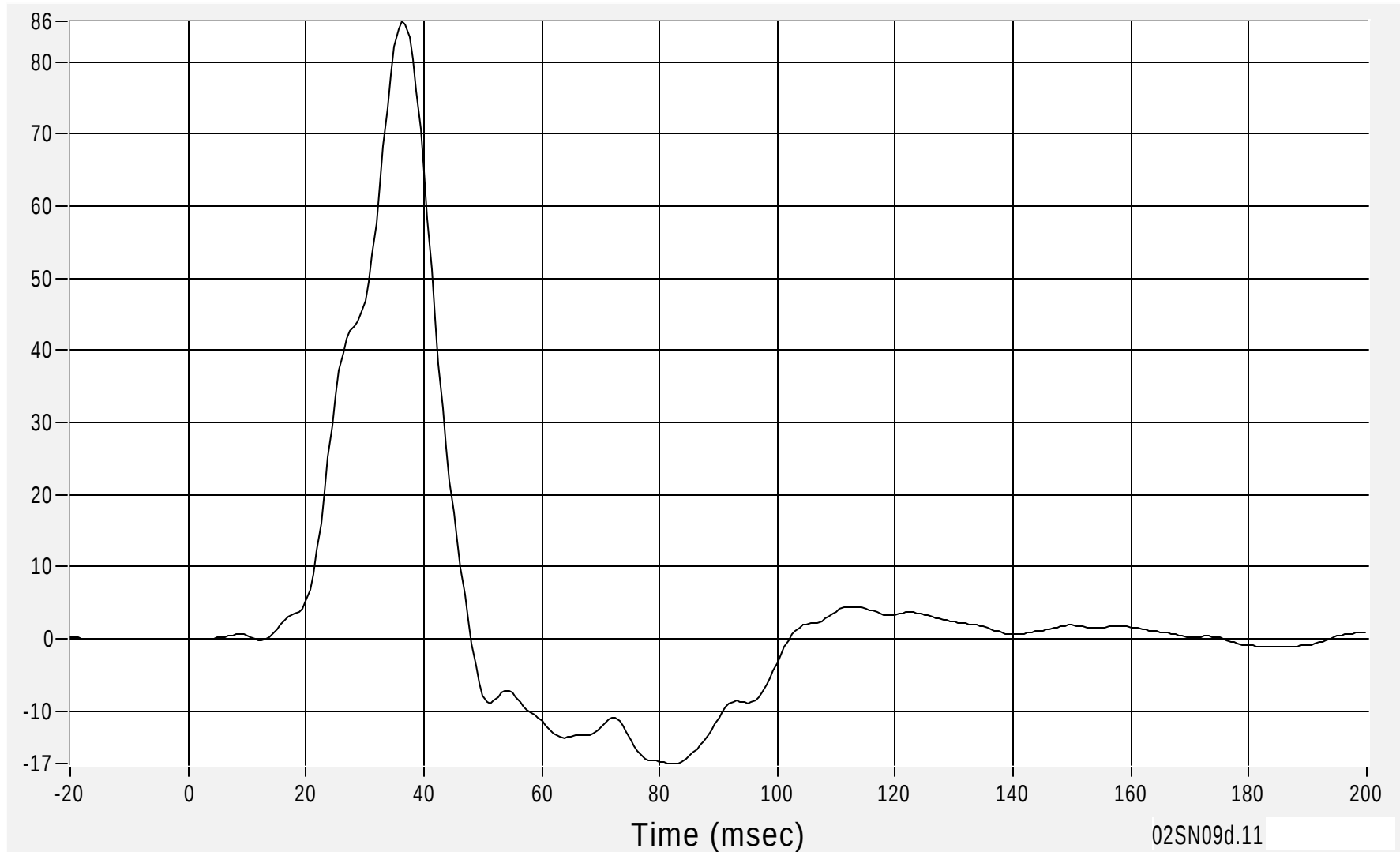
Driver Pelvic (Y) Acceleration - Redundant

Max 85.6 G's at 36.2 msec

Min -17.3 G's at 82.5 msec

Acceleration (G's) FIR100

B-120



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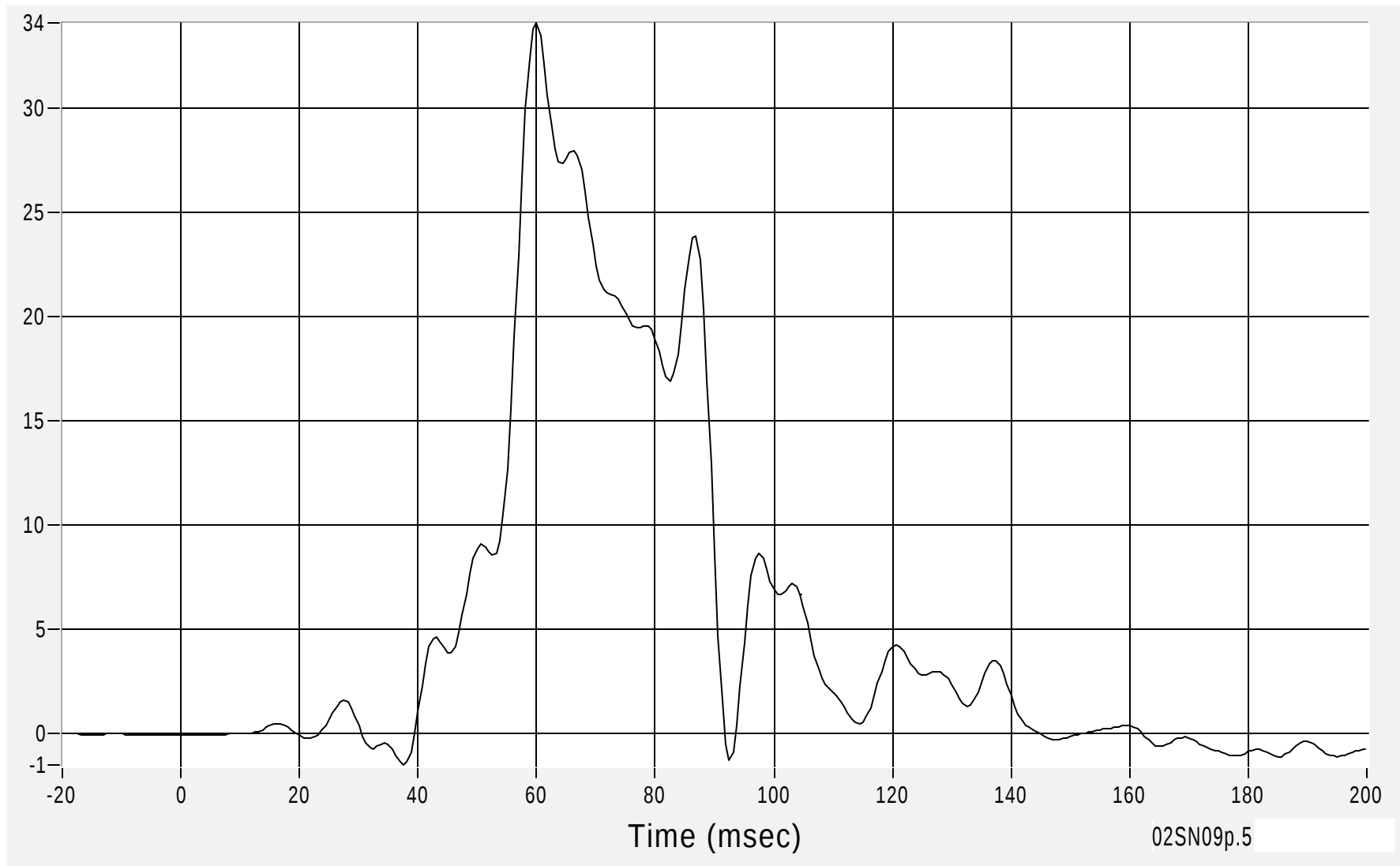
Passenger Upper Rib (Y) Acceleration - Redundant

Max 34.1 G's at 60.0 msec

Acceleration (G's) FIR100

Min -1.5 G's at 37.5 msec

B-121



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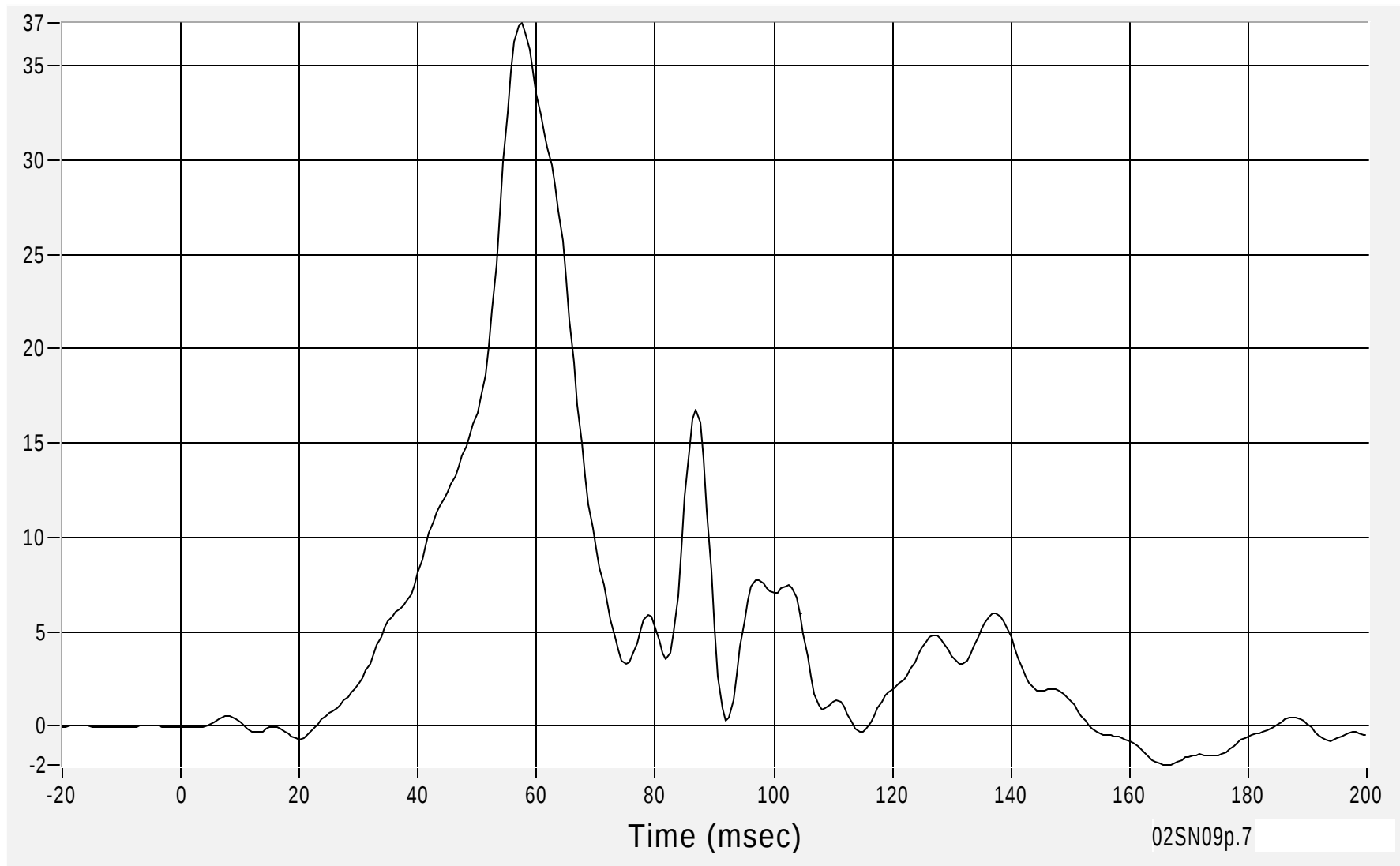
Passenger Lower Rib (Y) Acceleration - Redundant

Max 37.3 G's at 57.5 msec

Acceleration (G's) FIR100

Min -2.1 G's at 166.2 msec

B-122



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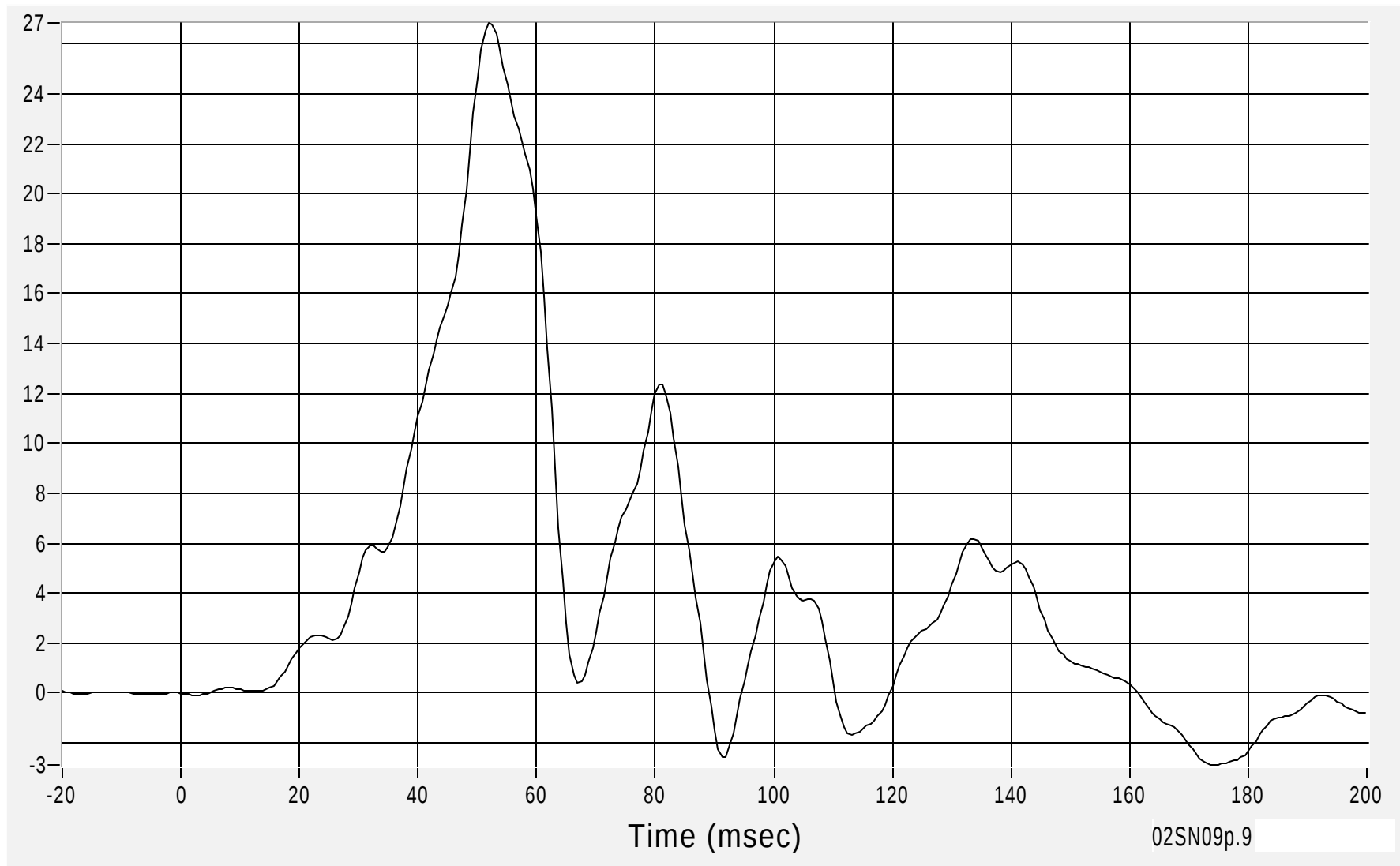
Passenger Lower Spine (Y) Acceleration - Redundant

Max 26.8 G's at 51.9 msec

Min -2.9 G's at 174.4 msec

Acceleration (G's) FIR100

B-123



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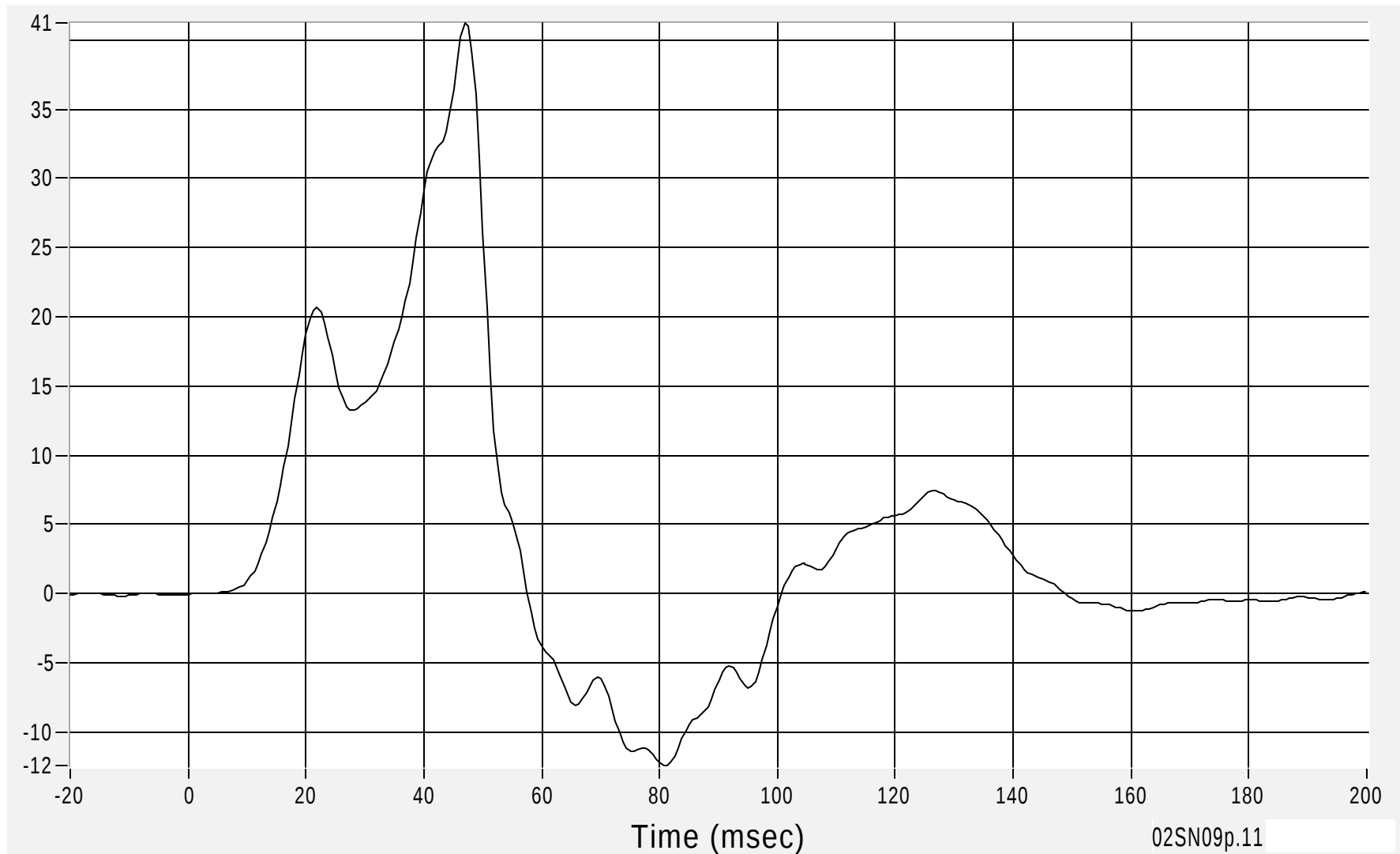
Passenger Pelvic (Y) Acceleration - Redundant

Max 41.2 G's at 46.9 msec

Acceleration (G's) FIR100

Min -12.4 G's at 80.6 msec

B-124



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Medical College of Wisconsin
Vehicle Crashworthiness Lab

APPENDIX C

SID CONFIGURATION AND VERIFICATION RESULTS

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SUMMARY SID PRE AND POST VERIFICATION	C-4
DUMMY INSPECTION LIST PRE AND POST TEST	C-5

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

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number 056 Test Sequences 08 and 09

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		

SID Serial Number 058 Test Sequences 09 and 10

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		

SUMMARY
SID PRE AND POST VERIFICATION

CONFIGURED FOR LEFT SIDE IMPACT

SID Serial Number 056 and 058

Test Sequences

08 and 09 (056)

09 and 10 (058)

TEST PARAMETER	SPECIFICATION	056		058	
		PRE	POST	PRE	POST
MEASUREMENTS					
Date	-	06May02	14May02	06May02	14May02
Sequential Test Number	-	08	09	09	10
Temperature (°C)	18.9-25.5	21.5	22.1	21.5	22.1
Relative Humidity (%)	10-70	32	31	32	31
SH – Seated Height (mm)	889-909	895	896	898	900
RH – Rib Height (mm)	501-521	502	503	507	506
HP – Hip Pivot Height (mm)	99	99/99	99/99	99/99	99/99
RD – Rib From Back Line (mm)	229-241	229	229	229	230
KH – Knee Pivot from Back Line (mm)	511-526	519/522	522/518	518/524	520/524
KV – Knee Pivot to Floor (mm)	490-505	503/499	502/500	502/498	494/
HW – Hip Width (mm)	356-391	366	364	359	357
THORAX IMPACTS					
Date	-	06May02	14May02	06May02	14May02
Sequential Test Number	-	08	09	09	10
Temperature (°C)	18.9-25.5	21.5	22.1	21.5	22.1
Relative Humidity (%)	10-70	32	31	32	31
Probe Speed (m/s)	4.21-4.33	4.22	4.21	4.22	4.21
Upper Rib Acceleration (G)	37-46	43.7	40.8	39.5	39.1
Lower Rib Acceleration (G)	37-46	41.0	39.8	38.7	38.4
Lower Spine Acceleration (G)	15-22	19.0	19.1	19.1	19.9
PELVIS IMPACTS					
Date	-	06May02	14May02	06May	14May02
Sequential Test Number	-	08	09	09	10
Temperature (°C)	18.9-25.5	21.5	22.1	21.5	22.1
Relative Humidity (%)	10-70	32	31	32	31
Probe Speed (m/s)	4.21-4.33	4.22	4.21	4.22	4.21
Pelvis Acceleration (G)	40-60	44.2	47.1	46.0	50.1
THORACIC SHOCK ABSORBER					
Shock Absorber ID Number	-	486	-	03130164	-
Damper Setting	1-10	6	-	5	-
Date	-	23Apr02		23Apr02	-
Sequential Test Number	-	03		03	-
Temperature	18.9-25.5	22.0	-	22.0	-
Relative Humidity	10-70	29	-	29	-
Probe Speed (m/s) Low	3.05	3.05	-	3.05	-
Force (N)	836 – 1125	1013	-	970	-
Displacement (mm)	30 – 35	31.8	-	30.7	-
Probe Speed (m/s) Middle	4.27	4.27	-	4.27	-
Force (N)	1730 – 2099	1790	-	1800	-
Displacement (mm)	32 – 37	35.3	-	34.4	-
Probe Speed (m/s) High	6.10	6.10	-	6.10	-
Force (N)	3741 – 4448	4250	-	4266	-
Displacement (mm)	33 - 40	38.2	-	36.1	-

TEST PARAMETER	SPECIFICATION	056		058	
		PRE	POST	PRE	POST
ABDOMINAL COMPRESSION					
Date	-	24Apr02	-	24Apr02	-
Sequential Test Number	-	03	-	03	-
Temperature (°C)	18.9-25.5	22.4	-	22.4	-
Relative Humidity (%)	10-70	41.4	-	41.4	-
Force at 13 mm (N)	104-162	131	-	129	-
Force at 19 mm (N)	163-221	185	-	180	-
Force at 25 mm (N)	222-280	241	-	237	-
Force at 33 mm (N)	325-391	343	-	338	-
LUMBAR FLEXION					
Date	-	24Apr02	-	24Apr02	-
Sequential Test Number	-	03	-	03	-
Temperature (°C)	18.9-25.5	22.4	-	22.4	-
Relative Humidity (%)	10-70	41.4	-	41.4	-
Force at 0° (N)	0-26.7	0	-	0	-
Force at 0° (N)	97.8-151.2	134	-	147	-
Force at 0° (N)	151.2-204.6	195	-	169	-
Force at 0° (N)	204.6-258	244	-	229	-
Return Angle	12° Maximum	4.3	-	7.0	-

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

SID Serial Number 056 and 058

Test Sequences

08 and 09 (056)

09 and 10 (058)

		SID 056		SID 058	
		PRE	POST	PRE	POST
	Date	06May02	14May02	06May02	14May02
	Performed By	Mark Meyer	Mark Meyer	Mark Meyer	Mark Meyer
PART	INSPECTION	Pass	Pass	Pass	Pass
Skin	Visual	Pass	Pass	Pass	Pass
Head	Visual, Ballast, Accelerometer Mount	Pass	Pass	Pass	Pass
Neck	Visual and Palpated, Cable Torque	Pass	Pass	Pass	Pass
Spine Box	Visual, Ballast, Weldment, Accelerometer Mount	Pass	Pass	Pass	Pass
Rib Cage	Visual, Palpated, Measured, Stiffness	Pass	Pass	Pass	Pass
Sternum	Visual	Pass	Pass	Pass	Pass
Lumbar Spine	Visual	Pass	Pass	Pass	Pass
Abdomen	Visual	Pass	Pass	Pass	Pass
Pelvis	Visual, Palpated, Accelerometer Mount	Pass	Pass	Pass	Pass
Upper Legs	Visual	Pass	Pass	Pass	Pass
Knees	Visual, Stops, Inserts	Pass	Pass	Pass	Pass
Lower Legs	Visual, Range of Motion	Pass	Pass	Pass	Pass
Ankles	Visual, Range of Motion	Pass	Pass	Pass	Pass
Feet	Visual, Range of Motion	Pass	Pass	Pass	Pass
Joints	1 to 2 G Range	Pass	Pass	Pass	Pass
Other		None	None	None	None

APPENDIX D

TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

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VEHICLE INSTRUMENTATION	D-4
MDB INSTRUMENTATION	D-4

SID INSTRUMENTATION**FRONT SID NO. 058**

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X	J32566	ENDEVCO	14Nov01
HEAD Y	P22965	ENDEVCO	14Nov01
HEAD Z	P13835	ENDEVCO	14Nov01
UPPER RIB	J21342	ENDEVCO	14Nov01
LOWER RIB	J36616	ENDEVCO	14Nov01
LOWER SPINE	J21551	ENDEVCO	14Nov01
PELVIS	J21466	ENDEVCO	14Nov01
UPPER RIB REDUNDANT	J34385	ENDEVCO	14Nov01
LOWER RIB REDUNDANT	J18553	ENDEVCO	14Nov01
LOWER SPINE REDUNDANT	J36659	ENDEVCO	14Nov01
PELVIS REDUNDANT	J19089	ENDEVCO	14Nov01

REAR SID NO. 056

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
HEAD X	J35932	ENDEVCO	14Nov01
HEAD Y	J36031	ENDEVCO	14Nov01
HEAD Z	J35641	ENDEVCO	14Nov01
UPPER RIB	J35839	ENDEVCO	14Nov01
LOWER RIB	J32665	ENDEVCO	14Nov01
LOWER SPINE	J35937	ENDEVCO	14Nov01
PELVIS	J36603	ENDEVCO	14Nov01
UPPER RIB REDUNDANT	J36617	ENDEVCO	14Nov01
LOWER RIB REDUNDANT	J32662	ENDEVCO	14Nov01
LOWER SPINE REDUNDANT	J36614	ENDEVCO	14Nov01
PELVIS REDUNDANT	J34364	ENDEVCO	14Nov01

VEHICLE INSTRUMENTATION

	SERIAL NUMBER	MANUFACTURER	CALIBRATION DATE
RIGHT FRONT SILL X	P13836	ENDEVCO	14Nov01
RIGHT FRONT SILL Y	P12931	ENDEVCO	14Nov01
RIGHT FRONT SILL Z	P22993	ENDEVCO	14Nov01
RIGHT REAR SILL X	P22239	ENDEVCO	14Nov01
RIGHT REAR SILL Y	P22230	ENDEVCO	14Nov01
RIGHT REAR SILL Z	P23570	ENDEVCO	14Nov01
REAR FLOORPAN ABOVE AXLE X	P13598	ENTRAN	14Nov01
REAR FLOORPAN ABOVE AXLE Y	P13819	ENTRAN	14Nov01
REAR FLOORPAN ABOVE AXLE Z	P13837	ENTRAN	14Nov01
LEFT REAR SILL Y	P22998	ENDEVCO	14Nov01
LEFT FRONT SILL Y	P21137	ENDEVCO	14Nov01
LEFT FRONT DOOR CENTERLINE Y	N/A	N/A	N/A
RIGHT REAR OCCUPANT COMP Y	P22311	ENDEVCO	14Nov01
MID-REAR OF LEFT FRONT DOOR Y	N/A	N/A	N/A
LEFT FRONT DOOR UPPER C/L Y	N/A	N/A	N/A
MID-REAR OF LEFT REAR DOOR Y	N/A	N/A	N/A
LEFT REAR DOOR UPPER C/L Y	N/A	N/A	N/A
LEFT LOWER B-PILLAR Y	P22318	ENDEVCO	14Nov01
LEFT MIDDLE B-PILLAR Y	P12746	ENDEVCO	14Nov01
LEFT LOWER A-PILLAR Y	P22539	ENDEVCO	14Nov01
LEFT UPPER A-PILLAR	P22323	ENDEVCO	14Nov01
FRONT SEAT TRACK Y	P23579	ENDEVCO	14Nov01
REAR SEAT TRACK Y	P13868	ENDEVCO	14Nov01
VEHICLE CG X	P23573	ENDEVCO	14Nov01
VEHICLE CG Y	P13869	ENDEVCO	14Nov01
VEHICLE CG Z	P14233	ENDEVCO	14Nov01

MDB INSTRUMENTATION

MDB CG X	P19211	ENDEVCO	14Nov01
MDB CG Y	P23595	ENDEVCO	14Nov01
MDB CG Z	P19145	ENDEVCO	14Nov01
MDB REAR FRAME MEMBER X	P21151	ENDEVCO	14Nov01
MDB REAR FRAME MEMBER Y	P22978	ENDEVCO	14Nov01