

**Report Number: 214-TRC-06-011**

**Safety Compliance Testing For FMVSS 214**

**Side Impact Protection**

**Indicant**

**General Motors De Mexico**

**2008 Saturn Vue XE MPV**

**NHTSA Number: C80100**

**Transportation Research Center Inc.**

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**P. O. Box B-67**

**East Liberty, OH 43319**



**Test Date: September 25, 2007**

**Final Report: October 8, 2007**

**U. S. Department Of Transportation  
National Highway Traffic Safety Administration**

**Enforcement**

**Office of Vehicle Safety Compliance**

**1200 New Jersey Avenue, S. E.**

**NVS-220, Room W43-503**

**Washington, DC 20590**

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16. Abstract <p>This 55/28 km/h 90° Impact (Moving Deformable Barrier) Compliance Test was conducted on the subject vehicle, a 2008 Saturn Vue XE MPV in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-06 (except the test was conducted 8 km/h (5 mph) faster than the standard specifies) to determine FMVSS 214 Side Impact Protection compliance. This test was conducted by Transportation Research Center Inc. in East Liberty, Ohio, on September 25, 2007.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 62.0 km/h, and the ambient temperature at the struck (driver) side of the target vehicle at the time of impact was 21° C. The target vehicle's post-test maximum crush was 264 mm at Level 3.</p> <p>The test or target vehicle's performance is given below (with FIR filter):</p> <table border="0" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 40%;"></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Front SID HIII</u></th> <th style="width: 10%;"></th> <th style="text-align: center; border-bottom: 1px solid black;"><u>Rear SID HIII</u></th> <th style="width: 10%;"></th> </tr> </thead> <tbody> <tr> <td>Left Upper Rib Acceleration:</td> <td style="text-align: center; border-bottom: 1px solid black;">27.6</td> <td style="text-align: center;">g's</td> <td style="text-align: center; border-bottom: 1px solid black;">39.4</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Left Lower Rib Acceleration:</td> <td style="text-align: center; border-bottom: 1px solid black;">33.1</td> <td style="text-align: center;">g's</td> <td style="text-align: center; border-bottom: 1px solid black;">35.2</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Lower Spine Acceleration:</td> <td style="text-align: center; border-bottom: 1px solid black;">30.4</td> <td style="text-align: center;">g's</td> <td style="text-align: center; border-bottom: 1px solid black;">45.4</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Thoracic Trauma Index, (TTI):</td> <td style="text-align: center; border-bottom: 1px solid black;">31.8</td> <td style="text-align: center;">g's</td> <td style="text-align: center; border-bottom: 1px solid black;">42.4</td> <td style="text-align: center;">g's</td> </tr> <tr> <td>Pelvis Acceleration (PEV):</td> <td style="text-align: center; border-bottom: 1px solid black;">57.4</td> <td style="text-align: center;">g's</td> <td style="text-align: center; border-bottom: 1px solid black;">58.7</td> <td style="text-align: center;">g's</td> </tr> </tbody> </table> <p>The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during side impact event.</p>					<u>Front SID HIII</u>		<u>Rear SID HIII</u>		Left Upper Rib Acceleration:	27.6	g's	39.4	g's	Left Lower Rib Acceleration:	33.1	g's	35.2	g's	Lower Spine Acceleration:	30.4	g's	45.4	g's	Thoracic Trauma Index, (TTI):	31.8	g's	42.4	g's	Pelvis Acceleration (PEV):	57.4	g's	58.7	g's
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17. Key Words Compliance Testing Side Impact Protection FMVSS 214 Side Impact Dummy (SID HIII)		18. Distribution Statement <u>Copies of this report are available from:</u> NHTSA Technical Information Services (TIS) Room W43-503, 1200 New Jersey Ave., S.E. Washington, DC 20590 Telephone No. (202) 366-4946 Attn: Robert Hornicle																															
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## Section 1

### Purpose and Test Procedure

This side impact test is part of the FMVSS 214 Side Impact Protection Compliance Test Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-02-D-11114. The purpose of this test was to evaluate side impact protection in a 2008 Saturn Vue XE MPV. The test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure (TP-214D-06, dated July 2001) (except the test was conducted 8 km/h (5 mph) faster than the standard specifies).

## Section 2

### Summary of Side Impact Test

A 2008 Saturn Vue XE MPV was impacted on the left side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 62.0 km/h (38.5 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on September 25, 2007. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (SID HIIIs) are included in Appendix A.

Two restrained Side Impact Dummies (SID HIIIs) were placed in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions according to the instructions specified in the OVSC Side Impact Laboratory Test Procedure (TP-214D-06, dated July 2001). Both SID HIII dummies were certified prior to this test. The side impact test was documented by one real-time camera and 9 high-speed cameras. Camera locations and other pertinent camera information are included in this report.

The SID HIIIs were instrumented with the following accelerometers:

1. Head (HED) triaxial and redundant accelerometers (X, Y, and Z-directions)
2. Neck (NEK) triaxial force and moment load cells (X, Y, and Z-directions)
3. Left Upper Rib (LUR) uniaxial and redundant accelerometer (Y-direction)
4. Left Lower Rib (LLR) uniaxial and redundant accelerometer (Y-direction)
5. Lower Thoracic Spine (T<sub>12</sub>) uniaxial and redundant accelerometer (Y-direction)
6. Pelvic (PEV) section uniaxial and redundant accelerometer (Y-direction)

A summary of the side impact dummy (SID HIII) configuration and verification test data can be found in Appendix C. A total of 68 channels of data were recorded. Appendix B contains the vehicle, MDB, and dummy response data traces.

The following tables summarize the results of the test:

Injury Criteria	Front SID HIII	Rear SID HIII
TTI (g)	31.8	42.4
PEV (g)	57.4	58.7

### Data Acquisition Explanations

The vehicle's left side sill at front seat Y-axis acceleration data channel, 14SILBRF0000ACYA, exceeded full-scale between 34 and 36 milliseconds. This affected the velocity and displacement calculations.

The vehicle's left side sill at rear seat Y-axis acceleration data channel, 14SILBRE0000ACYA, exceeded full-scale between 8 and 15 milliseconds. This affected the velocity and displacement calculations.

The vehicle's left lower A-post Y-axis acceleration data channel, 14APILLO0000ACYA, exceeded full-scale at 30 milliseconds and recorded questionable data thereafter. This affected the velocity and displacement calculations. The sensor was found damaged after the test.

The vehicle's left upper A-post Y-axis acceleration data channel, 11APILUP0000ACYA, exceeded full-scale at 19 milliseconds and recorded questionable data thereafter. This affected the velocity calculation. The cable was found damaged after the test.

The vehicle's left upper B-post Y-axis acceleration data channel, 14BPILUP0000ACYA, recorded questionable data after 4 milliseconds. This affected the velocity calculation. The cable was found damaged after the test.

Section 3

Summary of Test Results

Data Sheet 1

General Test Vehicle Parameter Data

Test Vehicle Information:

Vehicle Year/Make/Model: 2008 Saturn Vue XE  
Vehicle Body Style/Color: MPV/Silver VIN: 3GSCL33P18S500546  
Vehicle NHTSA No.: C80100 Build Date: 04/07  
Engine Data: 4 Cylinders;      CID; 2.4 Liters; 2400 cc  
Placement: X Longitudinal; or - Lateral; or - Horizontal  
Transmission: 4 Speed;      Manual;      Automatic; X Overdrive  
Final Drive: - RWD; X FWD; - Four-Wheel Drive  
Odometer Reading: 52 miles  
Options: X A/C; X Power steering; X Power brakes; X Power windows

Data From Vehicle's Tire Placard:

Tire Pressure (at capacity)<sup>1</sup> 210 kPa Front; 210 kPa Rear  
Recommended Tire Size: P235/65/R16  
Tires on Test Vehicle: P236/65R16 Manufacturer: Firestone, Destination LE

Vehicle Capacity Data:

Number of Occupants: 2 Front; 3 Rear; N/A 3rd seat; 5 Total  
Type of Front Seats: X Bucket; - Bench; - Split bench  
Type of Front Seat Back: - Fixed; X Adjustable with X Lever or - Knob  
Vehicle Max. Capacity Loading = 474 kg (A)  
No. of Occupants x 68.04 kg. = 340 kg (B)  
Vehicle Cargo Capacity (A-B) = 134 kg

Test Vehicle Delivered Weight With Maximum Fluids:

Left Front	=	<u>488.6</u> kg	Left Rear	=	<u>368.8</u> kg
Right Front	=	<u>471.6</u> kg	Right Rear	=	<u>368.6</u> kg
Total Front	=	<u>960.2</u> kg	Total Rear	=	<u>737.4</u> kg
Front % of Total Weight	=	<u>56.6</u> %	Rear % of Total Weight	=	<u>43.4</u> %
Total Weight	=	<u>1697.6</u> kg			

<sup>1</sup> Tire pressure used in test.

Data Sheet 1 (Continued)

General Test Vehicle Parameter Data

Calculation Of Vehicle's Target Test Weight:

Total Test Vehicle Delivered Weight With Max. Fluids	=	<u>1697.6</u>	kg (A)
Maximum Cargo Carrying Capacity of Test Vehicle	=	<u>134.0</u>	kg (B)
Weight of Instrumented Side Impact Dummies (2 X <u>76.0</u> kg)	=	<u>152.0</u>	kg (C)
Test Vehicle Target Weight:	=	<u>1983.6</u>	kg (A+B+C)

Fully Loaded Test Vehicle (UDW + 2 SID HIII s + Cargo):

Left Front	=	<u>533.6</u>	kg	Left Rear	=	<u>493.9</u>	kg
Right Front	=	<u>478.1</u>	kg	Right Rear	=	<u>478.0</u>	kg
Total Front	=	<u>1011.7</u>	kg	Total Rear	=	<u>971.9</u>	kg
Front % of Total Weight	=	<u>51.0</u>	%	Rear % of Total Weight	=	<u>49.0</u>	%
Total Weight	=	<u>1983.6</u>	kg				

As Tested Weight of Test Vehicle (2 SID HIII s + Cargo + Equipment & Instrumentation):

Left Front	=	<u>476.4</u>	kg	Left Rear	=	<u>477.0</u>	kg
Right Front	=	<u>532.4</u>	kg	Right Rear	=	<u>490.0</u>	kg
Total Front	=	<u>1008.8</u>	kg	Total Rear	=	<u>967.0</u>	kg
Front % of Total Weight	=	<u>51.1</u>	%	Rear % of Total Weight	=	<u>48.9</u>	%
Total Weight	=	<u>1975.8</u>	kg				

Test Vehicle Attitude (all dimensions in millimeters):

As Delivered	Fully Loaded	Ready For Test
Right Front <u>798</u>	Right Front <u>798</u>	Right Front <u>791</u>
Left Front <u>790</u>	Left Front <u>780</u>	Left Front <u>776</u>
Right Rear <u>810</u>	Right Rear <u>780</u>	Right Rear <u>776</u>
Left Rear <u>800</u>	Left Rear <u>760</u>	Left Rear <u>762</u>

Data Sheet 1 (Continued)

General Test Vehicle Parameter Data

Test Vehicle Attitude:

	Left Sill Pitch	Right Sill Pitch	Front Bumper L-R Roll	Rear Bumper L-R Roll
As Delivered:	0°	0°	0°	0.5°
Fully Loaded:	0.5°	0.6°	0.5°	1.0°
As Tested:	0.2°	0°	0.9°	0.5°
Negative Pitch Angle	=	Vehicle front down		
Negative Roll Angle	=	Driver side down		

Test Vehicle Wheelbase: 2705 mm

C.G. = 1175 mm rearward of front wheel centerline

Total Vehicle Length:

Right Side = 4230 mm

Left Side = 4230 mm

Centerline = 4560 mm

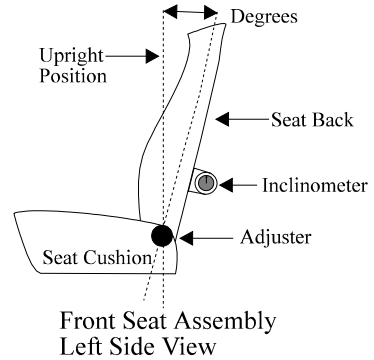
Data Sheet 1 (Continued)

General Test Vehicle Parameter Data

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

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



Front Seat Cushion Placement: Detent 12 of 24

Total Length of Fore/Aft Adjustment Travel: 270 mm

Total Number of Adjustment Positions or Detents: 24

Front Seat Back Adjustment Position: The seat back was adjusted to the 1.7° at headrest support post.

Seat Back Torso Angle: N/A degrees

Second Position Seat Placement: Fixed

Total Length Of Fore/Aft Adjustment Travel: N/A mm

Seat Back Adjustment Position: Fixed

Adjustable Steering Column Position: 27.0°; middle of geometric range of travel

Window Positions:

Right Front: Open Right Rear: Open

Left Front: Closed Left Rear: Closed

Note: Windows will be in closed position on struck side of test vehicle and in open position on opposite side.

Amount of Stoddard Solvent In Fuel Tank:

75.7 liters (fuel tank usable capacity)

70.4 liters used in test (92% - 94% of fuel tank usable capacity)

Location of Impact Point On Test Vehicle Side To Be Impacted:

Wheelbase = 2705 millimeters

Intended impact point is 420 millimeters rearward of front axle centerline  
(which is 940 millimeters forward of the wheelbase midpoint)

Actual Impact Point is 431 millimeters rearward of front axle centerline

Data Sheet 2

Test Vehicle Summary of Results

Vehicle Year/Make/Model: 2008/Saturn/Vue XE

Body Style: MPV

VIN: 3GSCL33P18S500546

NHTSA No.: C80100

Build Date: 04/07

Test Date: 09/25/07

Vehicle Overall Length = 4560 mm

Overall Width = 1850 mm

Vehicle Test Weight (Pre-Test):

Left Front = 476.4 kg      Left Rear = 477.0 kg

Right Front = 532.4 kg      Right Rear = 490.0 kg

Total Front = 1008.8 kg      Total Rear = 967.0 kg

Total Weight = 1975.8 kg

Wheelbase = 2705 mm

Longitudinal C.G. From Center Of Front Axle = 1175 mm

Impact Angle With Respect To Impactor = 90 degrees

Impact Point:

Actual Impact Point is 11 mm Right of nominal impact ref. line (Lateral)

Actual Impact Point is 7 mm Up from nominal impact point (Vertical)

Maximum Exterior Static Crush:

1. Level 1 ( 320 mm above ground) = 67 mm

2. Level 2 ( 752 mm above ground) = 262 mm

3. Level 3 ( 775 mm above ground) = 264 mm

4. Level 4 ( 1098 mm above ground) = 116 mm

5. Level 5 ( 1656 mm above ground) = -17 mm

Maximum Post-Test Intrusion = 264 mm

Occupants:

Front Passenger

Rear Passenger

Dummy Identification      066

059

Restraints Used      3-pt. seat belt, side curtain  
and torso airbags

3-pt. seat belt, side  
curtain airbag

Instrumentation:

Number of Vehicle Data Channels: = 21

Number of Cameras: Onboard = 3      Offboard = 6      Total = 9

Data Sheet 3

Moving Deformable Barrier (MDB) Summary

MDB Face Manufacturer And Serial Number:

Cellbond, GK334

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Position Of Impactor (MDB) On Monorail:

Crabbed 27° to the left

MDB Specifications:

Overall Width of Framework Carriage	=	<u>1251</u>	mm
Overall Length of MDB (Incl. honeycomb impact face)	=	<u>4014</u>	mm
Wheelbase of Framework Carriage	=	<u>2591</u>	mm
Track of Framework Carriage (Front & Rear)	=	<u>1881</u>	mm
C.G. Location Rearward of Front Axle	=	<u>1116</u>	mm

MDB Weight:

Left Front	=	<u>384.2</u>	kg	Left Rear	=	<u>297.4</u>	kg
Right Front	=	<u>393.2</u>	kg	Right Rear	=	<u>290.6</u>	kg
Total Front	=	<u>777.4</u>	kg	Total Rear	=	<u>588.0</u>	kg
Total MDB Weight	=	<u>1365.4</u>	kg				
Impact Angle (MDB C/L to Target Vehicle C/L)	=	<u>90</u>	degrees				
Impact Speed	=	<u>62.0</u>	km/h				

Maximum Static Crush of Honeycomb Impact Face:

1. Row A at Center of Bumper Level	=	<u>185</u>	millimeters
2. Row B at Top of Bumper Level	=	<u>70</u>	millimeters
3. Row C at Mid Level	=	<u>79</u>	millimeters
4. Row D at Top of Stack Level	=	<u>147</u>	millimeters

Instrumentation:

Number of MDB Data Channels = 7

Data Sheet 4

Post-Test Observations

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Visible Dummy Contact Points:

	<u>Left Front SID HIII</u>	<u>Left Rear SID HIII</u>
Head:	<u>Side curtain airbag</u>	<u>Side curtain airbag, C-pillar</u>
Upper Torso:	<u>Torso airbag</u>	<u>Door liner</u>
Lower Torso:	<u>Torso airbag</u>	<u>Door liner</u>
Left Knee:	<u>None</u>	<u>None</u>
Right Knee:	<u>None</u>	<u>None</u>

Door Opening:

	<u>Left Side</u>	<u>Right Side</u>
Front:	<u>Jammed and latched</u>	<u>Easy</u>
Rear:	<u>Jammed and latched</u>	<u>Easy</u>

MDB Distance From Target Impact Point:

Vertical: 7 mm up from target  
Horizontal: 11 mm right from target

Arm Rest Locations:

Front: 268 mm below the bottom of the window  
Rear: 281 mm below the bottom of the window

Seat Movement:

Front: None  
Rear: None

Glazing Damage:

Windshield: None  
Window: None

Pillar Separation: None

Sill Separation: None

Other Notable Impact Effects:

None

Section 4

Occupant and Vehicle Information

Data Sheet 5

SID HIII Instrumentation Data

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Test Number: 070925

Driver Dummy Serial Number: 066

Location	Positive Direction		Negative Direction	
	Max. (g)	Time (ms)	Max. (g)	Time (ms)
Left Upper Rib Acceleration				
Lateral (P)	27.6	50.0	1.7	205.6
Lateral (R)	28.4	50.0	1.7	206.9
Left Lower Rib Acceleration				
Lateral (P)	33.1	49.4	3.0	76.9
Lateral (R)	34.0	49.4	2.5	76.9
Lower Spine Acceleration				
Lateral (P)	30.4	41.9	2.9	66.2
Lateral (R)	30.2	41.9	2.9	66.3
Pelvis Acceleration				
Lateral (P)	57.4	38.8	10.9	60.0
TTI	31.8			

Positive Direction

Longitudinal: Forward  
Lateral: Rightward  
Vertical: Downward

Negative Direction

Longitudinal: Rearward  
Lateral: Leftward  
Vertical: Upward

Data Sheet 5 (Continued)

SID Instrumentation Data

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Test Number: 070925

Left Rear Dummy Serial Number: 059

Location	Positive Direction		Negative Direction	
	Max. (g)	Time (ms)	Max. (g)	Time (ms)
Left Upper Rib Acceleration				
Lateral (P)	39.4	56.9	3.9	206.9
Lateral (R)	40.3	56.9	3.9	206.9
Left Lower Rib Acceleration				
Lateral (P)	35.2	55.0	11.7	71.3
Lateral (R)	35.9	55.0	12.1	71.3
Lower Spine Acceleration				
Lateral (P)	45.4	45.0	15.2	70.0
Lateral (R)	46.3	45.0	15.0	70.0
Pelvis Acceleration				
Lateral (P)	58.7	39.4	11.7	70.0
TTI	42.4			

Positive Direction

Longitudinal: Forward  
Lateral: Rightward  
Vertical: Downward

Negative Direction

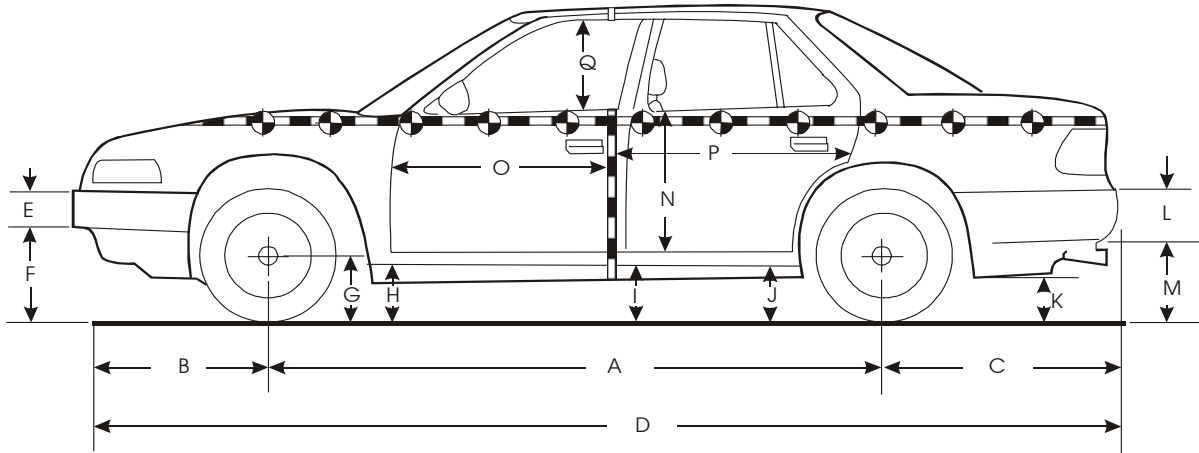
Longitudinal: Rearward  
Lateral: Leftward  
Vertical: Upward

Data Sheet 6

Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



Left Side View

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

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2705	2705	2692	13
B	905	905	891	14
C	950	950	937	13
D	4560	4560	4555	5
E	112	112	112	0
F	395	595	630	-35
G	334	335	325	10
H	372	360	376	-16
I	360	340	364	-24
J1	276	252	230	22
J2	370	343	358	-15
K	468	425	425	0
L	197	197	197	0
M	493	450	447	3
N	875	875	778	97
O	715	715	709	6
P	1313	1313	1264	49
Q	438	438	428	10
R	4230	4230	4284	-54
S	4230	4230	4239	-9
T	1287	1287	1215	72

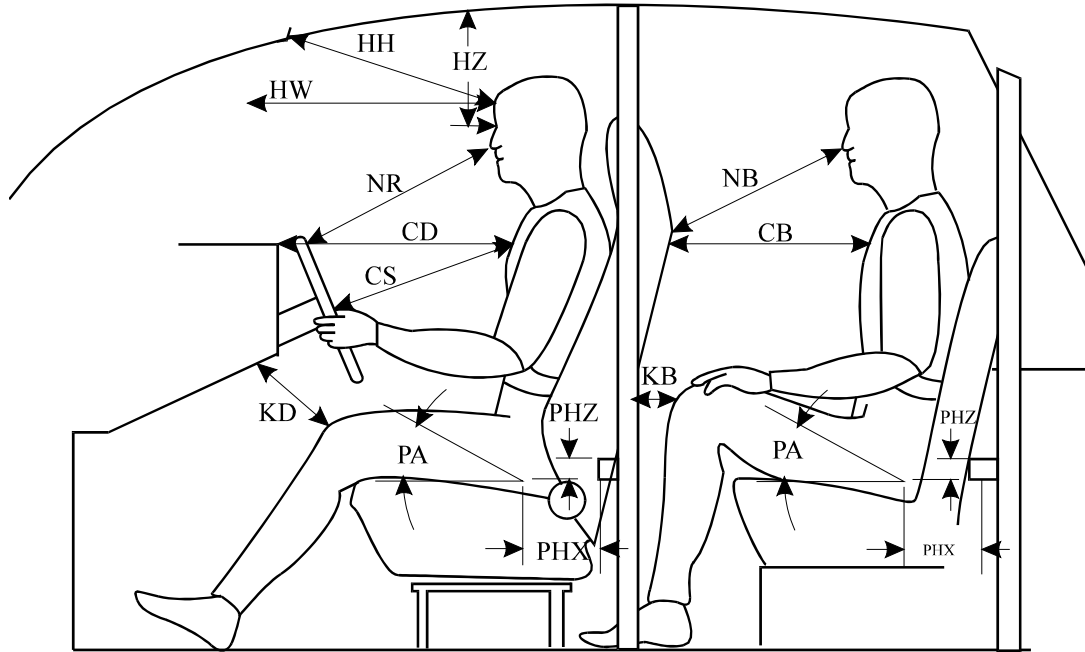
D = Length at centerline      E and L = Bumper Thickness      R = Right Side Length  
 S = Left Side Length      T = Width at B-pillar      J1 = To Pinch Weld      J2 = To Sill

Data Sheet 7

SID HIII Longitudinal Clearance Dimensions

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



Left Side View

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

Measurement	Driver SID HIII # 066	Left Rear Pass. SID HIII # 059
HH	425	N/A
HW	730	N/A
HZ	230	215
NR/NB	498	595
CD/CB	524	522
CS	344	N/A
KDL(KDA°)/KBL(KBA°)	63/(18.8°)	140/(18.5°)
KDR(KDA°)/KBR(KBA°)	68/(18.8°)	138/(18.2°)
PA°	24.4°	23.6°
PHX	231	258
PHZ	128	234

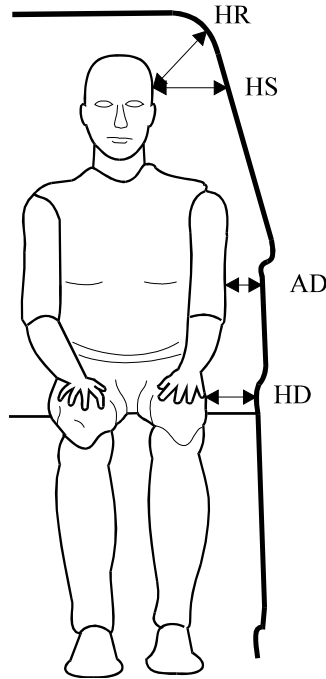
Note: 2-door vehicle shown. Rear dummy PHX and PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

Data Sheet 8

SID HIII Lateral Clearance Dimensions

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



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

Measurement	Driver SID HIII # 066	Left Rear Pass. SID HIII # 059
HR	225	213
HS	269	262
AD*	Lower: 118      Upper: 116	Lower: 128      Upper: 106
HD	156	155

\* Lower measurement is taken laterally at center of the lower rib accelerometer height from the SID HIII arm segment to the closest part of the vehicle side.

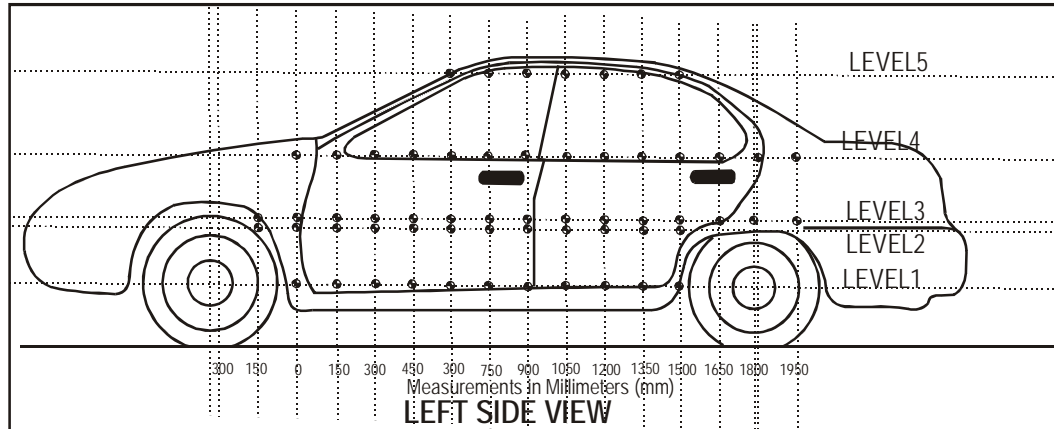
Upper measurement is taken laterally at center of the upper rib accelerometer height from the SID HIII arm segment to the closest part of the vehicle side.

Data Sheet 9

Vehicle Side Measurements

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



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 shown above:

Level 5 @ Window Top	=	<u>1656</u>	mm
Level 4 @ Window Sill	=	<u>1098</u>	mm
Level 3 @ Mid Door	=	<u>775</u>	mm
Level 2 @ Occupant H-Point	=	<u>752</u>	mm
Level 1 @ Axle Centerline Height (or Sill Top Height)	=	<u>320</u>	mm

Data Sheet 10

Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Location	Height		(mm) From Impact Point														
			-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750	
Level 1 Side Sill	320	Pre	---	---	---	---	---	---	---	---	---	---	843	836	836	836	835
		Post	---	---	---	---	---	---	---	---	---	---	841	828	823	818	813
		Crush	---	---	---	---	---	---	---	---	---	---	2	8	13	18	22
Level 2 H-Point	752	Pre	---	747	811	861	905	---	---	911	898	888	888	888	888	889	
		Post	---	782	842	882	921	---	---	931	888	726	700	679	664	656	
		Crush	---	-35	-31	-21	-16	---	---	-20	10	162	188	209	224	233	
Level 3 Mid-Door	775	Pre	---	---	807	856	903	---	---	906	898	889	889	889	889	889	
		Post	---	---	839	878	920	---	---	927	892	730	694	674	663	657	
		Crush	---	---	-32	-22	-17	---	---	-21	6	159	195	215	226	232	
Level 4 Window Sill	1098	Pre	---	---	---	---	---	682	728	762	788	806	821	833	843	852	
		Post	---	---	---	---	---	707	751	776	796	825	816	814	809	804	
		Crush	---	---	---	---	---	-25	-23	-14	-8	-19	5	19	34	48	
Level 5 Window Top	1656	Pre	---	---	---	---	---	---	---	---	---	751	737	706	671	639	613
		Post	---	---	---	---	---	---	---	---	---	768	754	721	685	650	623
		Crush	---	---	---	---	---	---	---	---	---	-17	-17	-15	-14	-11	-10

All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of  $\pm 0.1$  mm.

Data Sheet 10 (Continued)  
Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Location	Height		(mm) From Impact Point												
			900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
Level 1 Side Sill	320	Pre	833	832	831	829	827	824	832	---	---	---	---	---	---
		Post	808	803	798	792	786	776	765	---	---	---	---	---	---
		Crush	25	29	33	37	41	48	67	---	---	---	---	---	---
Level 2 H-Point	752	Pre	888	888	887	886	884	883	885	896	---	---	---	922	883
		Post	650	654	657	648	624	621	634	759	---	---	---	920	869
		Crush	238	234	230	238	260	262	251	137	---	---	---	2	14
Level 3 Mid-Door	775	Pre	889	889	888	887	885	884	886	894	---	---	---	916	880
		Post	650	660	647	639	622	620	630	751	---	---	---	913	860
		Crush	239	229	241	248	263	264	256	143	---	---	---	3	20
Level 4 Window Sill	1098	Pre	858	863	866	870	871	871	869	867	864	858	851	841	826
		Post	795	783	750	765	775	785	789	815	835	818	816	832	820
		Crush	63	80	116	105	96	86	80	52	29	40	35	9	6
Level 5 Window Top	1656	Pre	597	587	583	583	584	587	590	594	598	---	---	---	---
		Post	605	592	585	585	585	588	591	595	599	---	---	---	---
		Crush	-8	-5	-2	-2	-1	-1	-1	-1	-1	---	---	---	---

All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of  $\pm 0.1$  mm.

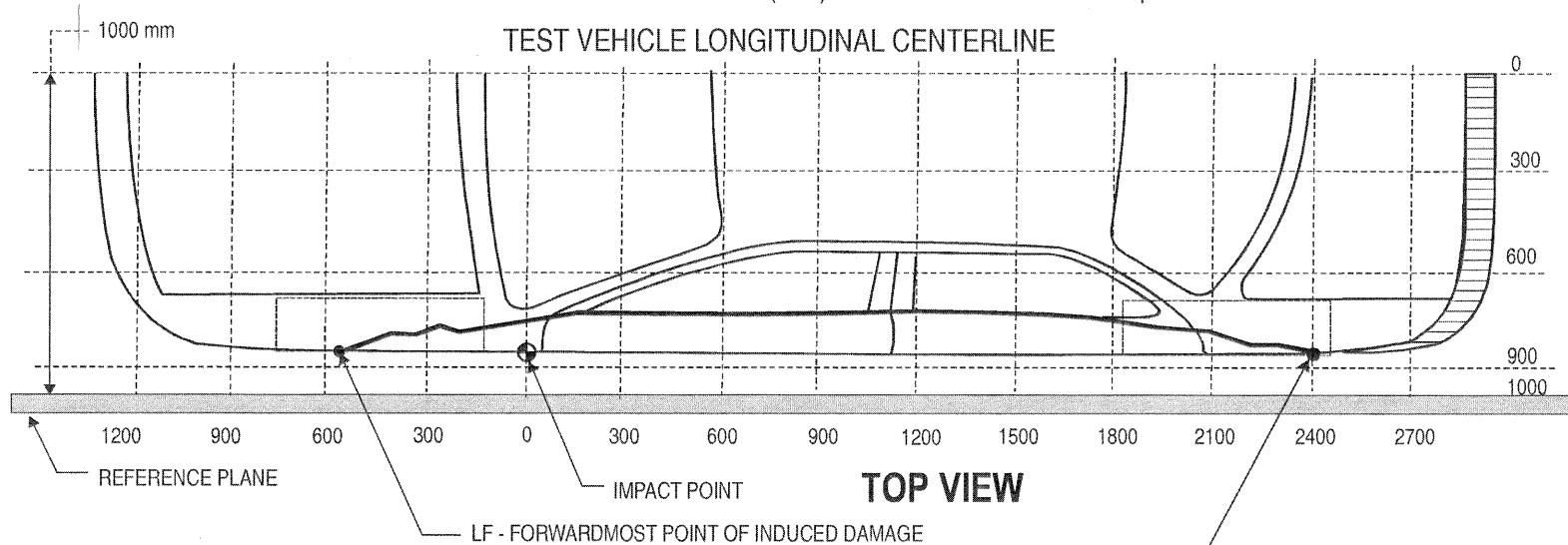
Data Sheet 11

Vehicle Damage Profile Distances

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

NOTE: All measurements are in millimeters (mm) and should be accurate to plus or minus 3mm.



MEASUREMENT CONVENTIONS:

Forward of the impact point (towards front of vehicle) is considered negative (-)

Rearward of the impact point (towards rear end of vehicle) is considered positive (+)

LR - REARWARDMOST POINT OF INDUCED DAMAGE

DPD Measurements	Pre-Test (mm)	Post-Test (mm)	Static Crush (mm)
6: LF = -1050 mm (Level 2)	747	782	-35
5: -300 mm (Level 4)	728	751	-22
4: 450 mm (Level 3)	889	674	215
3: 1200 mm (Level 3)	888	647	242
2: 1950 mm (Level 3)	894	751	143
1: LR = 2700 mm (Level 3)	880	860	20

Full length of induced damage was 3750 mm.

4-10

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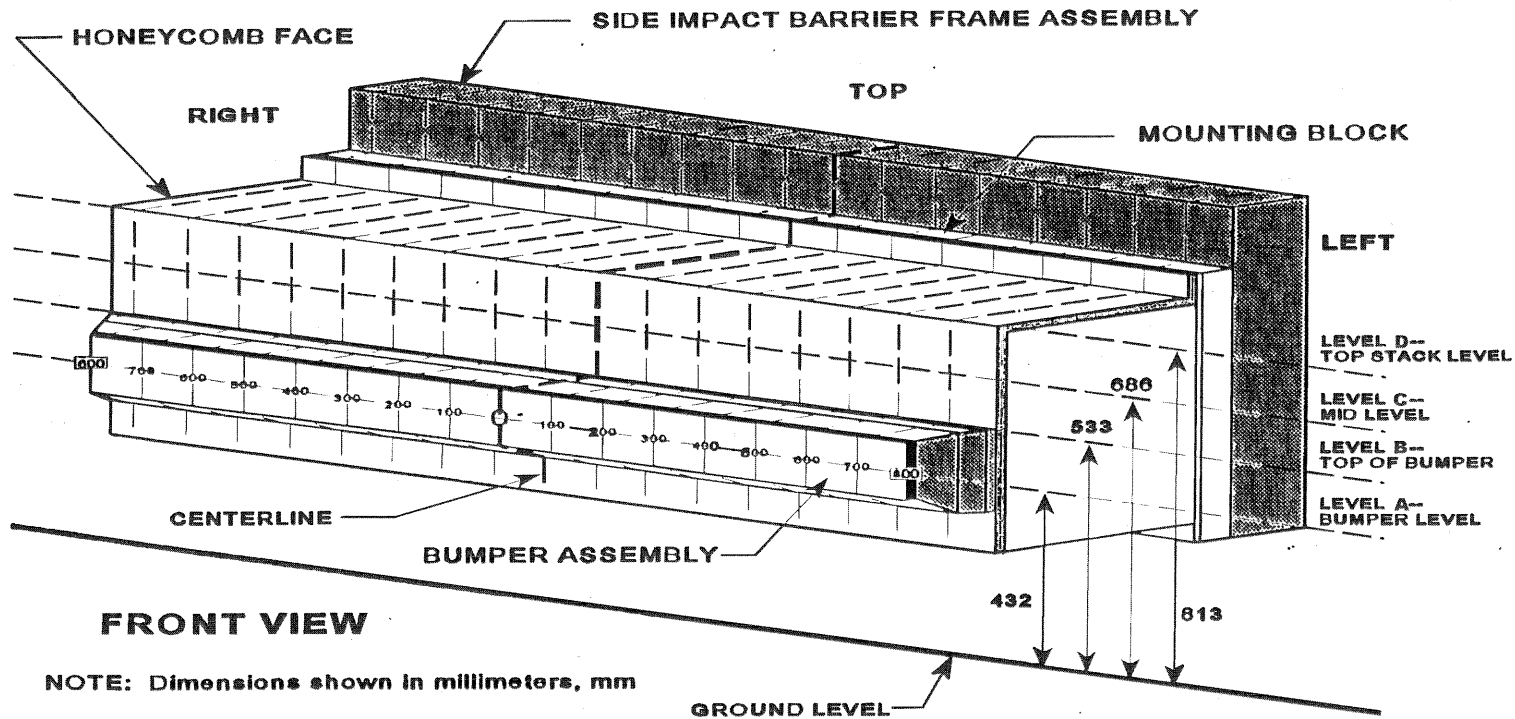
Data Sheet 12

Exterior Static Crush For Impactor Face

(Grid as looking at MDB from front)

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



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Data Sheet 12 (Continued)  
Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Location	Height At CL	Distance Right of Center (mm)									Distance Left of Center (mm)								
		800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800	
Top Stack Level - Level D	535	-56	-41	-36	-34	-33	-55	-72	-65	-54	-53	-50	-54	-55	-64	-72	-104	-147	
Mid Level Level C	406	-33	-34	-32	-45	-47	-50	-61	-34	-26	-23	-21	-21	-27	-39	-51	-62	-79	
Top Bumper Level-Level B	280	-69	-70	-64	-62	-62	-62	-69	-62	-59	-54	-52	-50	-50	-50	-52	-57	-86	
Mid Bumper Level - Level A	153	-183	-185	-184	-183	-183	-183	-181	-180	-178	-176	-175	-174	-175	-175	-175	-177	-175	

All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of  $\pm 0.1$  mm.

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Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

Deformable Barrier Face Profile

NHTSA No.: C80100

Pre-Test

Index	Xmm	Ymm	Zmm
1	-383.8	801.9	-50.3
2	-383.6	701.9	-50.0
3	-383.6	602.2	-50.3
4	-383.8	501.9	-50.2
5	-384.0	401.9	-50.7
6	-384.1	301.8	-51.0
7	-384.1	202.1	-50.8
8	-384.2	102.4	-51.4
9	-384.2	2.0	-52.0
10	-384.1	-97.8	-52.1
11	-384.0	-198.0	-52.3
12	-383.9	-297.8	-52.9
13	-383.7	-398.0	-53.0
14	-383.6	-497.8	-53.4
15	-383.5	-598.0	-53.5
16	-383.3	-697.8	-54.2
17	-383.4	-797.6	-54.6
18	-383.4	803.1	-178.2
19	-383.4	703.4	-177.9
20	-383.4	602.9	-178.7
21	-383.5	502.8	-179.1
22	-383.6	403.0	-179.6
23	-383.7	302.7	-179.5

Post-Test

Index	Xmm	Ymm	Zmm
1	-328.3	748.8	-106.2
2	-342.4	650.0	-103.1
3	-348.1	550.7	-104.2
4	-350.2	450.4	-105.7
5	-351.4	351.6	-106.3
6	-328.9	253.6	-110.3
7	-312.1	159.4	-111.1
8	-319.1	62.2	-109.5
9	-329.8	-34.4	-111.3
10	-330.7	-133.6	-108.0
11	-333.8	-230.0	-98.0
12	-330.3	-329.4	-92.8
13	-328.3	-429.3	-86.3
14	-319.7	-528.2	-82.5
15	-311.2	-626.0	-78.4
16	-279.7	-717.8	-80.5
17	-236.7	-806.8	-90.9
18	-350.6	753.3	-228.0
19	-349.8	653.8	-229.7
20	-351.4	553.4	-231.6
21	-338.1	454.3	-230.9
22	-336.9	354.6	-232.6
23	-333.8	254.9	-233.7

Difference

Index	Xmm	Ymm	Zmm
1	-55.5	53.1	55.9
2	-41.2	51.9	53.1
3	-35.5	51.5	53.9
4	-33.6	51.5	55.5
5	-32.6	50.3	55.6
6	-55.2	48.2	59.3
7	-72.0	42.7	60.3
8	-65.1	40.2	58.1
9	-54.4	36.4	59.3
10	-53.4	35.8	55.9
11	-50.2	32.0	45.7
12	-53.6	31.6	39.9
13	-55.4	31.3	33.3
14	-63.9	30.4	29.1
15	-72.3	28.0	24.9
16	-103.6	20.0	26.3
17	-146.7	9.2	36.3
18	-32.8	49.8	49.8
19	-33.6	49.6	51.8
20	-32.0	49.5	52.9
21	-45.4	48.5	51.8
22	-46.7	48.4	53.0
23	-49.9	47.8	54.2

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

Deformable Barrier Face Profile Cont'd.

NHTSA No.: C80100

Pre-Test

Index	Xmm	Ymm	Zmm
24	-383.8	202.7	-180.0
25	-383.8	102.6	-180.2
26	-383.8	2.6	-180.8
27	-383.8	-97.1	-181.2
28	-383.7	-197.3	-181.1
29	-383.7	-297.4	-181.6
30	-383.8	-397.5	-182.1
31	-383.4	-497.1	-182.5
32	-383.2	-597.3	-182.5
33	-383.2	-697.4	-183.3
34	-383.1	-797.2	-183.1
35	-383.0	802.9	-306.8
36	-383.1	702.6	-307.9
37	-383.1	603.3	-307.2
38	-383.2	503.3	-307.0
39	-383.3	403.1	-307.2
40	-383.5	303.0	-307.3
41	-383.6	202.4	-307.1
42	-383.5	102.8	-307.4
43	-383.7	2.8	-307.8
44	-383.6	-97.5	-307.7
45	-383.7	-197.2	-308.2
46	-383.6	-297.7	-307.8

Post-Test

Index	Xmm	Ymm	Zmm
24	-322.8	157.7	-238.7
25	-350.2	61.7	-234.0
26	-357.5	-37.9	-230.3
27	-360.5	-137.5	-226.3
28	-362.4	-237.3	-220.6
29	-362.6	-337.5	-214.8
30	-356.6	-437.2	-209.2
31	-344.5	-535.9	-204.0
32	-332.0	-635.3	-198.5
33	-321.3	-734.7	-193.8
34	-304.0	-832.7	-189.9
35	-314.4	756.0	-340.2
36	-312.9	655.3	-343.7
37	-318.8	557.0	-338.4
38	-320.7	456.8	-338.9
39	-321.5	356.8	-340.6
40	-321.8	257.3	-349.4
41	-314.2	156.4	-353.0
42	-321.4	55.2	-349.4
43	-324.3	-43.5	-346.5
44	-329.4	-144.2	-340.7
45	-331.4	-244.1	-335.6
46	-333.2	-344.6	-330.5

Difference

Index	Xmm	Ymm	Zmm
24	-61.0	45.0	58.7
25	-33.6	40.9	53.8
26	-26.3	40.5	49.5
27	-23.3	40.4	45.1
28	-21.3	40.0	39.5
29	-21.1	40.1	33.2
30	-27.2	39.7	27.1
31	-38.9	38.8	21.5
32	-51.2	38.0	16.0
33	-61.9	37.3	10.5
34	-79.1	35.5	6.8
35	-68.6	46.9	33.4
36	-70.2	47.3	35.8
37	-64.3	46.3	31.2
38	-62.5	46.5	31.9
39	-61.8	46.3	33.4
40	-61.7	45.7	42.1
41	-69.4	46.0	45.9
42	-62.1	47.6	42.0
43	-59.4	46.3	38.7
44	-54.2	46.7	33.0
45	-52.3	46.9	27.4
46	-50.4	46.9	22.7

Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

Deformable Barrier Face Profile Cont'd.

NHTSA No.: C80100

Pre-Test

Index	Xmm	Ymm	Zmm
47	-383.4	-397.6	-308.3
48	-383.4	-497.8	-308.3
49	-383.2	-597.7	-308.5
50	-383.0	-697.5	-308.8
51	-382.8	-797.5	-308.6
52	-471.2	801.6	-433.0
53	-484.7	704.3	-432.5
54	-484.9	604.2	-432.9
55	-485.1	504.2	-433.1
56	-485.3	404.2	-433.4
57	-485.3	304.3	-433.4
58	-485.3	203.6	-433.8
59	-485.3	104.1	-434.1
60	-485.3	4.6	-434.4
61	-485.4	-95.7	-434.4
62	-485.4	-195.4	-434.6
63	-485.4	-295.6	-434.6
64	-485.4	-395.7	-435.3
65	-485.2	-495.9	-436.6
66	-485.0	-595.9	-435.7
67	-484.9	-695.7	-435.4
68	-472.0	-792.8	-436.3

Post-Test

Index	Xmm	Ymm	Zmm
47	-333.0	-444.7	-325.1
48	-332.9	-544.9	-319.7
49	-331.5	-645.1	-314.7
50	-326.3	-745.9	-309.3
51	-296.3	-841.0	-306.6
52	-288.1	752.5	-467.9
53	-300.0	655.0	-476.0
54	-301.2	555.0	-475.8
55	-302.1	454.9	-475.1
56	-302.7	354.9	-474.2
57	-302.0	255.1	-471.7
58	-304.3	154.6	-472.4
59	-304.9	54.8	-471.3
60	-307.1	-44.6	-472.3
61	-309.8	-145.0	-472.8
62	-310.4	-244.7	-471.7
63	-310.9	-344.9	-470.3
64	-310.7	-445.0	-469.2
65	-310.0	-545.2	-468.5
66	-309.9	-645.3	-465.3
67	-308.2	-745.0	-461.4
68	-296.8	-842.4	-451.6

Difference

Index	Xmm	Ymm	Zmm
47	-50.4	47.1	16.8
48	-50.5	47.1	11.4
49	-51.7	47.4	6.2
50	-56.7	48.4	0.5
51	-86.5	43.5	-2.0
52	-183.1	49.1	34.9
53	-184.7	49.3	43.5
54	-183.7	49.2	42.9
55	-183.0	49.3	42.0
56	-182.6	49.3	40.8
57	-183.3	49.2	38.3
58	-181.0	49.0	38.6
59	-180.4	49.3	37.2
60	-178.2	49.2	37.9
61	-175.6	49.3	38.4
62	-175.0	49.3	37.1
63	-174.5	49.3	35.7
64	-174.7	49.3	33.9
65	-175.2	49.3	31.9
66	-175.1	49.4	29.6
67	-176.7	49.3	26.0
68	-175.2	49.6	15.3

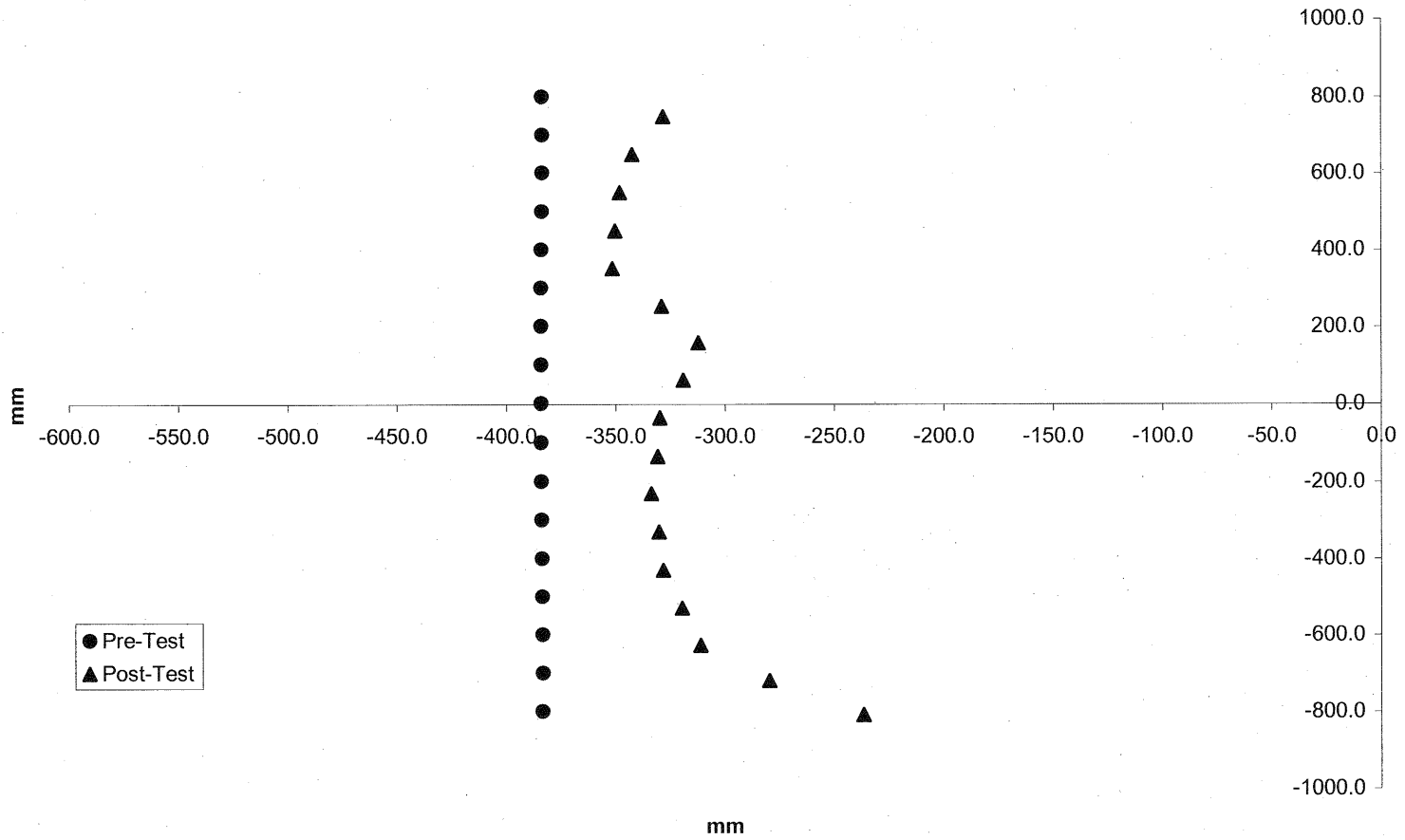
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Deformable Barrier Face Profile 1-17



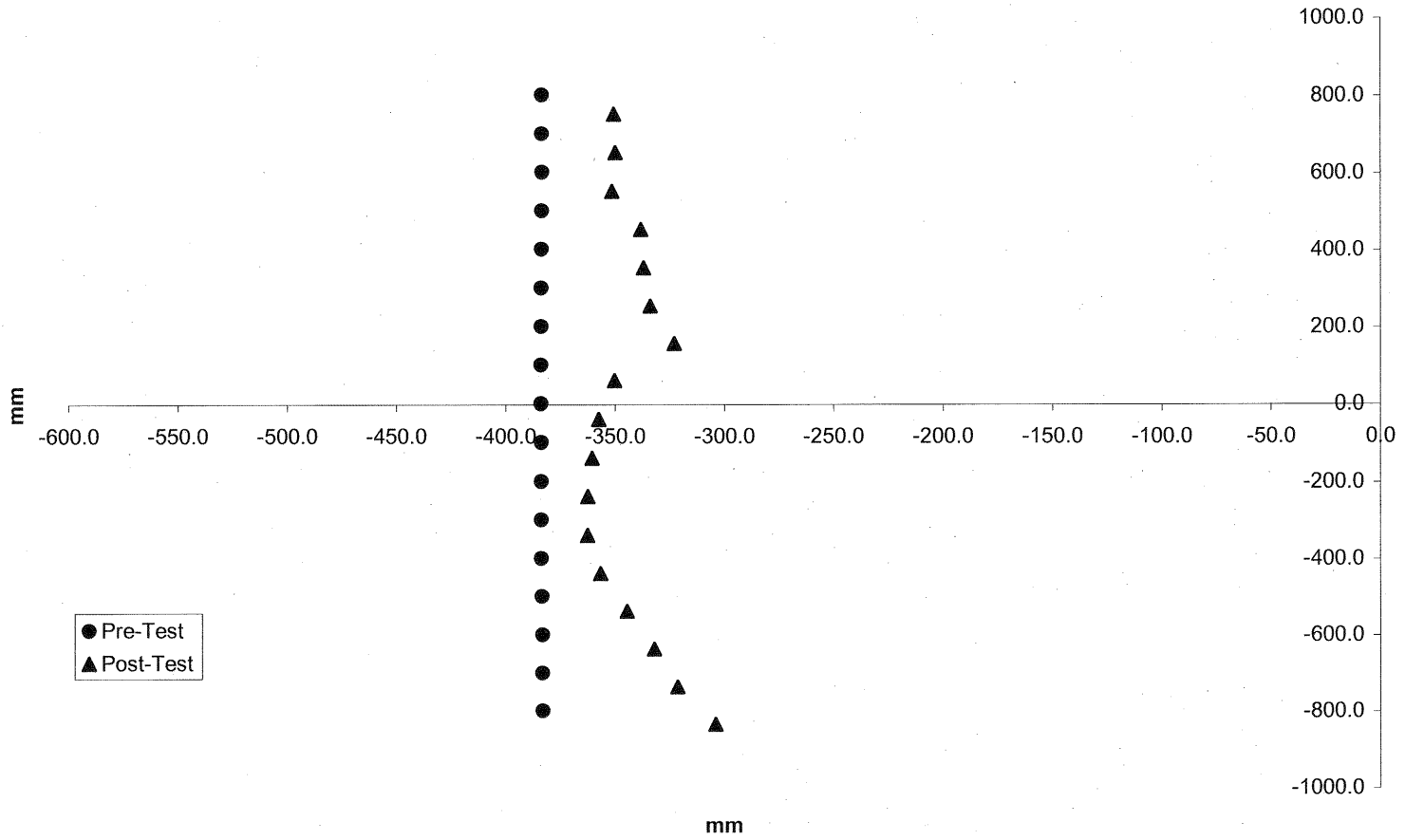
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

**Deformable Barrier Face Profile 18-34**



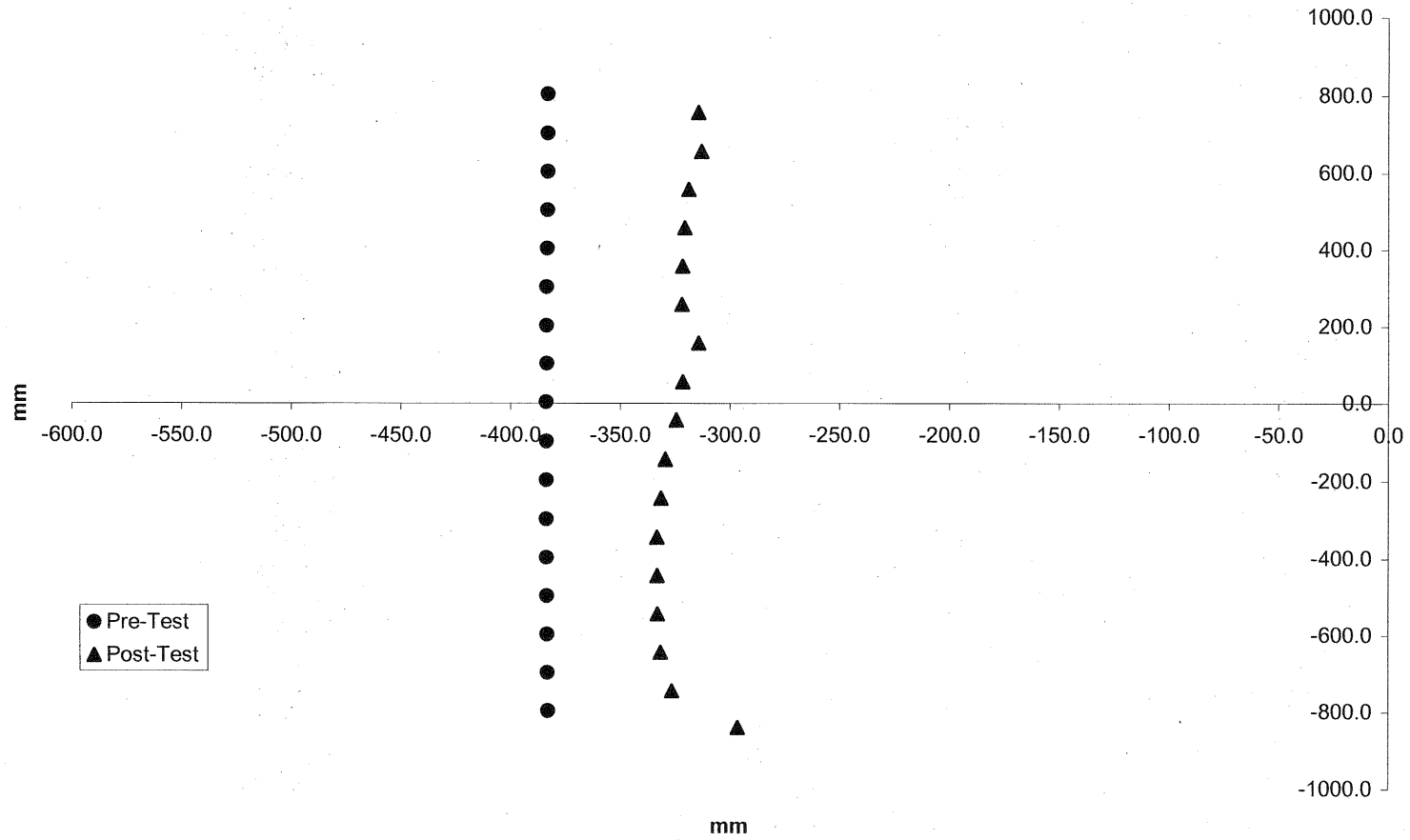
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Deformable Barrier Face Profile 35-51



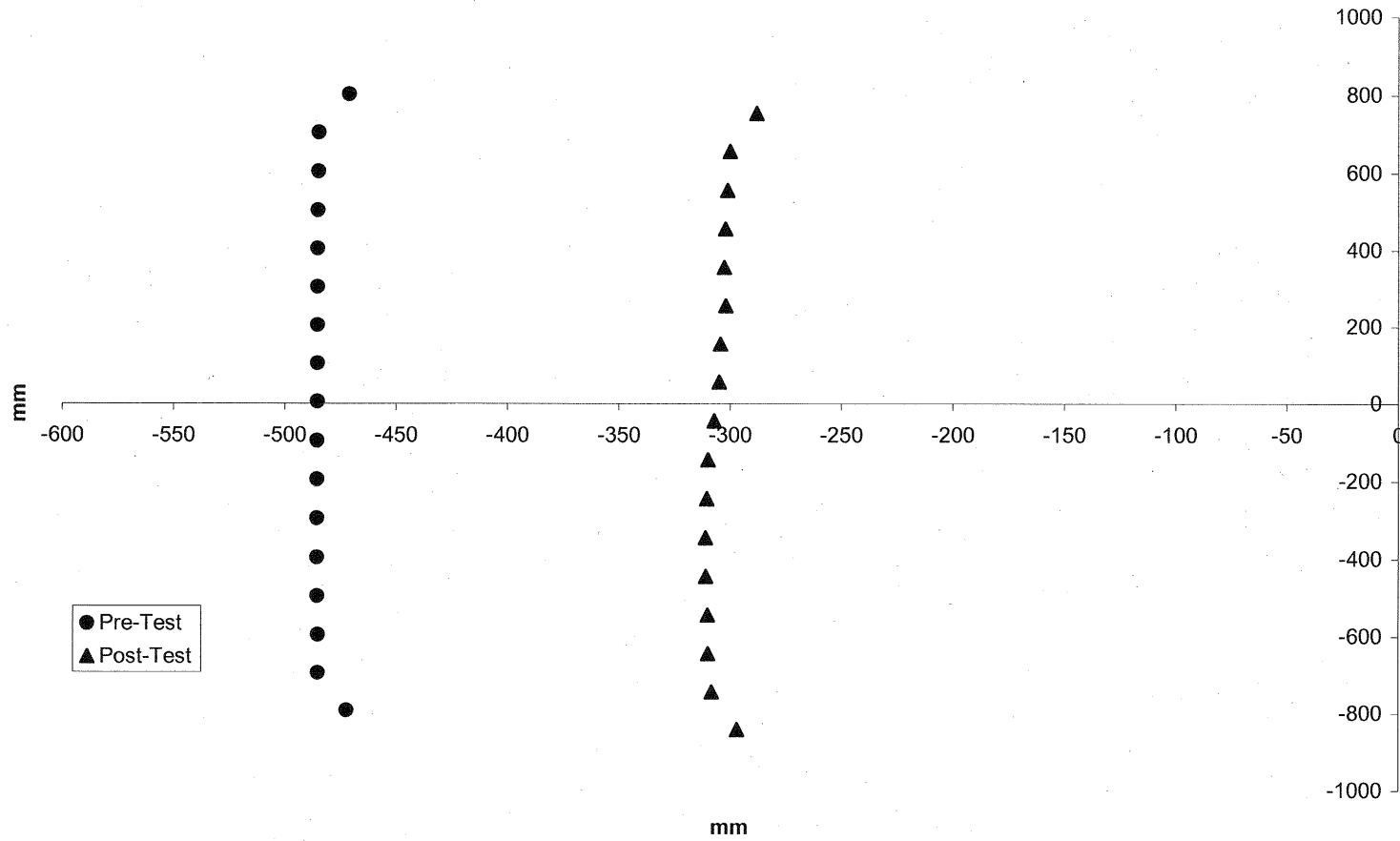
Data Sheet 12 (Continued)

Exterior Static Crush For Impactor Face

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

**Deformable Barrier Face Profile 52-68**



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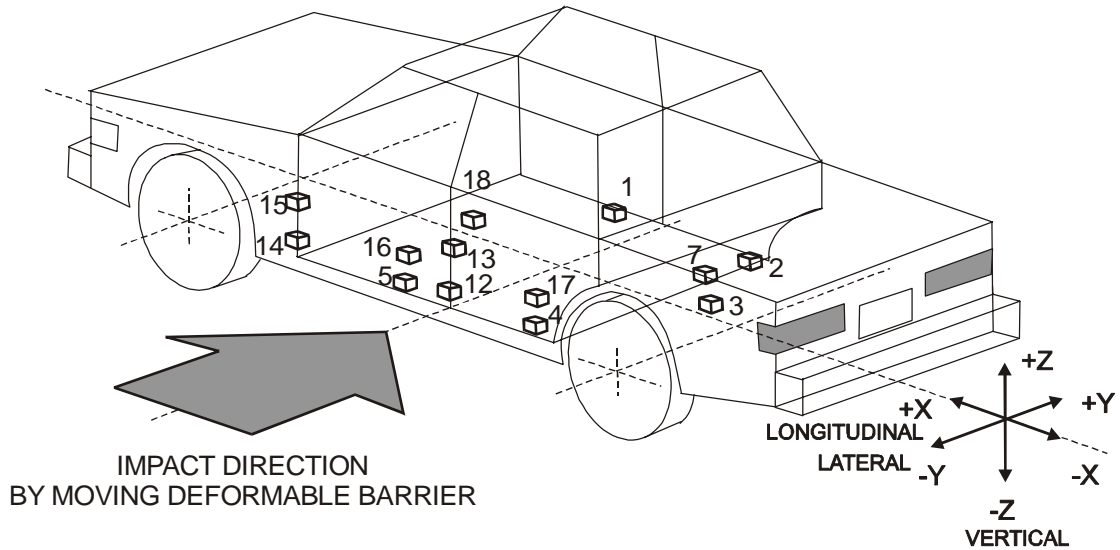
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Data Sheet 13

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



- 1-Right Side Sill at Front Seat
- 2-Right Side Sill at Rear Seat
- 3-Rear Floorpan above Axle
- 4-Left Side Sill at Rear Seat
- 5-Left Side Sill at Front Seat
- 7-Right Rear Occupant Compartment
- 12-Left Side Lower B-pillar

- 13-Left Side Upper B-pillar
- 14-Left Side Lower A-pillar
- 15-Left Side Upper A-pillar
- 16-Left Side Front Seat Track at H-point
- 17-Left Rear Seat Track at H-point
- 18-Vehicle Center of Gravity

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
1 Right Side Sill at Front Seat	3277	670	-414				
Longitudinal				3.3	58.5	6.4	12.2
Lateral				30.7	6.2	2.4	121.7
Vertical				5.2	70.5	10.6	11.4
Resultant				30.7	6.2		
2 Right Side Sill at Rear Seat	2247	670	-514				
Longitudinal				3.3	58.6	6.4	11.4
Lateral				36.7	6.8	3.7	13.0
Vertical				5.6	47.0	6.8	17.0
Resultant				36.8	6.7		
3 Rear Floorpan Above Axle	1260	0	-534				
Longitudinal				2.5	58.2	4.9	15.0
Lateral				24.5	8.3	3.3	89.4
Vertical				9.0	14.6	7.2	11.0
Resultant				24.8	8.4		
4 Left Side Sill at Rear Seat	2255	-670	-383				
Longitudinal							
Lateral <sup>1</sup>				105.9	5.0	635.3	10.2
Vertical							
Resultant							
5 Left Side Sill at Front Seat	3270	-650	-390				
Longitudinal							
Lateral <sup>1</sup>				37.7	3.8	48.7	34.4
Vertical							
Resultant							

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
7 Right Rear Occupant Compartment	2117	600	-456				
Longitudinal							
Lateral				38.7	6.6	7.7	13.0
Vertical							
Resultant							
12 Left Lower B-Pillar	2455	-788	-683				
Longitudinal							
Lateral				108.5	4.5	556.0	34.6
Vertical							
Resultant							
13 Left Upper B-Pillar	2428	-790	-940				
Longitudinal							
Lateral <sup>1</sup>				1605.0	33.7	114.8	25.4
Vertical							
Resultant							
14 Left Lower A-Pillar	3548	-830	-645				
Longitudinal							
Lateral <sup>1</sup>				120.5	21.0	1593.5	32.9
Vertical							
Resultant							
15 Left Upper A-Pillar	3515	-820	-920				
Longitudinal							
Lateral <sup>1</sup>				72.8	15.7	1624.6	23.9
Vertical							
Resultant							

Data Sheet 13 (Continued)

Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
16 Left Front Seat Track	2750	-546	-450				
Longitudinal							
Lateral				43.0	20.8	26.8	35.9
Vertical							
Resultant							
17 Left Rear Seat Track	1965	-497	-504				
Longitudinal							
Lateral				37.7	12.4	15.2	26.5
Vertical							
Resultant							
18 Vehicle CG	2740	0	-515				
Longitudinal				5.9	28.3	11.1	39.3
Lateral				51.8	27.6	27.7	34.5
Vertical				18.4	56.7	24.5	51.7
Resultant				52.1	27.8		

Reference: X: + Forward from rear bumper  
Y: + Rightward from vehicle centerline  
Z: + Downward from ground level

For acceleration data sign convention see Report Sign Convention in Appendix D.

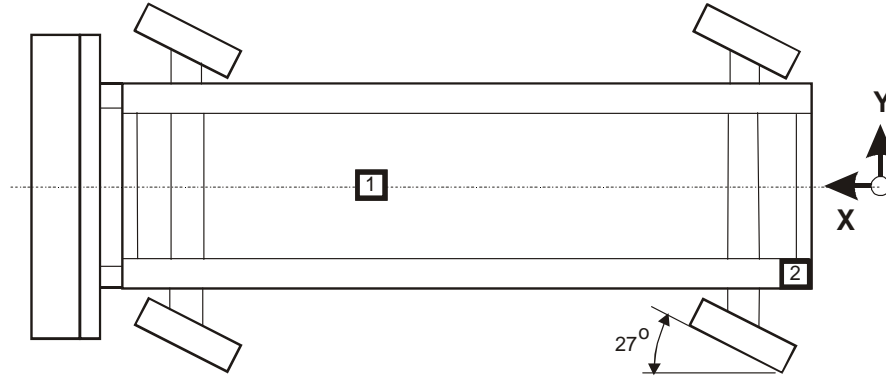
<sup>1</sup> See Data Acquisition Explanations

Data Sheet 14

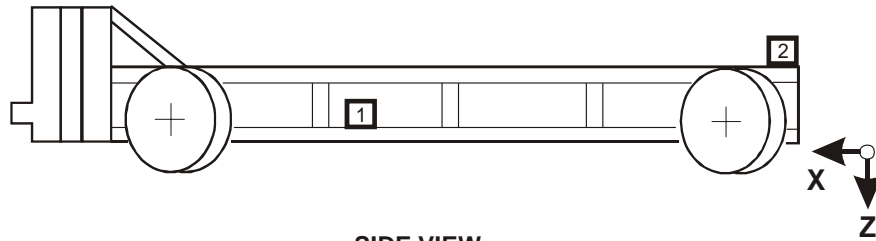
MDB Accelerometer Locations and Data Summary

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



**TOP VIEW**



**SIDE VIEW**

Accel. No.	Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
		X*	Y*	Z*	Max. (g)	Time (ms)	Max. (g)	Time (ms)
1	MDB Center of Gravity	1855	0	-520				
	Longitudinal X				2.7	110.7	22.9	13.4
	Lateral Y				1.7	79.3	8.3	29.8
	Vertical Z				6.4	47.7	6.1	22.7
	Resultant R				23.6	13.3		
2	Rear Frame Member	412	-677	-625				
	Longitudinal X				2.4	118.6	23.5	33.0
	Lateral Y				4.1	31.6	4.3	146.1

\*Reference: X = Rear Bumper (+ Forward)  
 Y = Vehicle Centerline (+ To Right)  
 Z = Ground Level (+ Down)

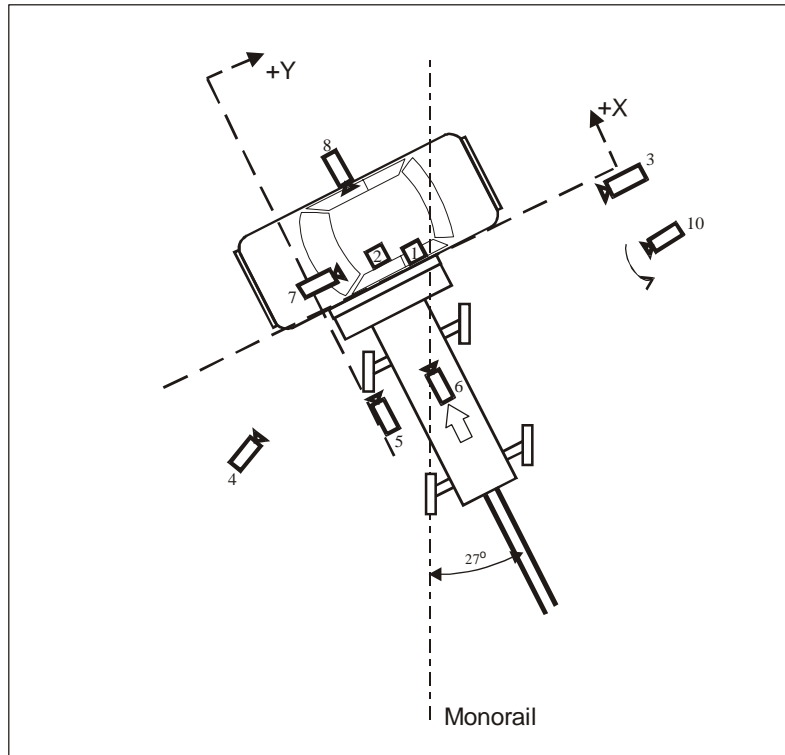
All measurements accurate to within  $\pm 3$  mm.

Data Sheet 15

High-Speed Camera Locations and Data Summary

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100



Impact Area

Camera Number	Location	Location, mm			Angle (deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Overhead wide	0	350	-7000	-90.0	12.5	1000
2	Overhead tight	0	600	-7000	-90.0	25	1000
3	Right side of MDB	0	9250	-1330	-2.1	25	1000
4	Left side of MDB	2250	5150	-1290	-4.4	12.5	1000
5	Onboard MDB left side	1720	890	-850	-0.5	12.5	1000
6	Onboard MDB center	2590	0	-1400	-4.6	12.5	1000
7	Onboard vehicle front	530	1340	-1320	-3.2	12.5	1000
8	Onboard side front door	1700	130	-1350	-8.1	6.5	1000
9	Onboard side rear door	1700	790	-1390	-15.4	6.5	1000
10	Documentary/Panning	N/A	N/A	N/A	N/A	Zoom	30

+X: Forward (referenced to MDB) from impact point  
 +Y: Rightward (referenced to MDB) from impact point  
 +Z: Downward from ground level

Section 5

Vehicle Fuel System Integrity

Data Sheet 16

FMVSS 301 Fuel System Integrity Data

NHTSA No.: C80100

Test Date: 09/25/07

Vehicle Year/Make/Model/Body Style: 2008 Saturn Vue XE MPV

\*\*\*\*\*

Test Vehicle Impact Type :

\_\_\_\_\_ Frontal (48.3 km/h)  
\_\_\_\_\_ Oblique (48.3 km/h) with \_\_\_\_\_° barrier face  
first contacting the (driver/passenger) side  
\_\_\_\_\_ Rear Moving Barrier (48.3 km/h)  
\_\_\_\_\_ Lateral Moving Barrier (32.2 km/h)  
  X   Side Impact Moving Deformable Barrier (62.0  
km/h) contacting the driver side

Fuel Spillage Measurement:

1. From impact until vehicle motion ceases
2. For five-minute period after vehicle motion ceases
3. For next 25 minutes.

Actual	Maximum Allowed
0 g	28 g
0 g	142 g
0 g	28 g/1 minute

Solvent Spillage Details :

None

---

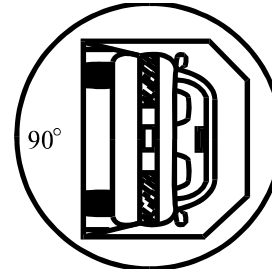
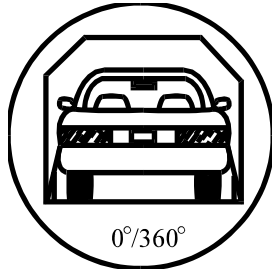
Data Sheet 17

FMVSS 301 Rollover Data

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

0 - 90 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time	<u>  1  </u> minutes	<u>  30  </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>  30  </u> seconds
Next whole minute interval	<u>  7  </u> minutes	

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

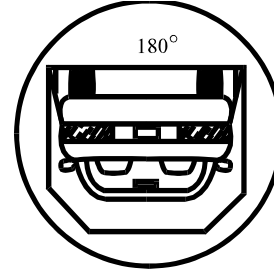
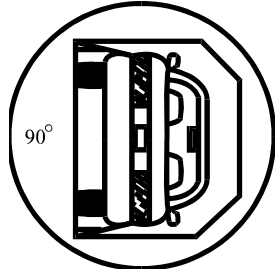
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

90 - 180 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time        1   minutes        30   seconds  
(Spec. Range = 1 to 3 minutes)  
FMVSS 301 Position Hold Time +        5   minutes        0   seconds  
Total        6   minutes        30   seconds  
Next whole minute interval        7   minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

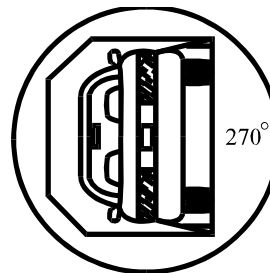
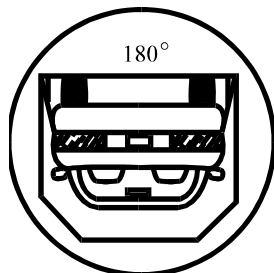
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

180 - 270 Degrees



1. Determination of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time        1   minutes        30   seconds  
(Spec. Range = 1 to 3 minutes)  
FMVSS 301 Position Hold Time +        5   minutes        0   seconds  
Total        6   minutes        30   seconds  
Next whole minute interval        7   minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

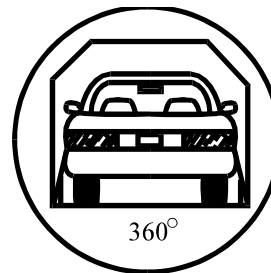
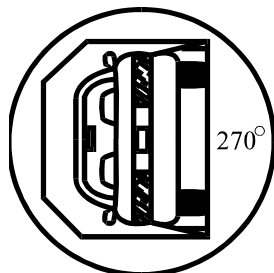
Data Sheet 17 (Continued)

FMVSS 301 Rollover Data

Vehicle: 2008 Saturn Vue XE MPV

NHTSA No.: C80100

270 - 360 Degrees



1. Determination Of Solvent Collection Time Period:

Rollover Fixture 90° Rotation Time        1   minutes        30   seconds  
(Spec. Range = 1 to 3 minutes)  
FMVSS 301 Position Hold Time +        5   minutes        0   seconds  
Total        6   minutes        30   seconds  
Next whole minute interval        7   minutes

2. FMVSS 301 Requirements:

(1) Time Period

First 5 minutes from onset of rotation	6th min.	7th min.	8th min. (if required)
--	----------	----------	------------------------

(2) Maximum Allowable Solvent Spillage

142 g	28 g	28 g	28 g
-------	------	------	------

3. Actual Test Vehicle Solvent Spillage:

0 g	0 g	0 g	N/A
-----	-----	-----	-----

Note: Record spillage for whole minute intervals only as determined above.

4. Solvent Spillage Location(s):

None

Appendix A

Photographs

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Figure A-1 Pre-Test Front View of Test Vehicle



Figure A-2 Post-Test Front 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 Impacted Side View of Test Vehicle



Figure A-6 Post-Test Impacted Side View of Test Vehicle



Figure A-7 Pre-Test Left Rear View of Test Vehicle

A-11

070925



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

A-15

070925



Figure A-12 Post-Test Right Rear View of Test Vehicle



Figure A-13 Pre-Test Right Side View of Test Vehicle

A-17

070925



Figure A-14 Post-Test Right Side View of Test Vehicle

A-18

070925



Figure A-15 Pre-Test Right Front View of Test Vehicle



Figure A-16 Post-Test Right Front View of Test Vehicle

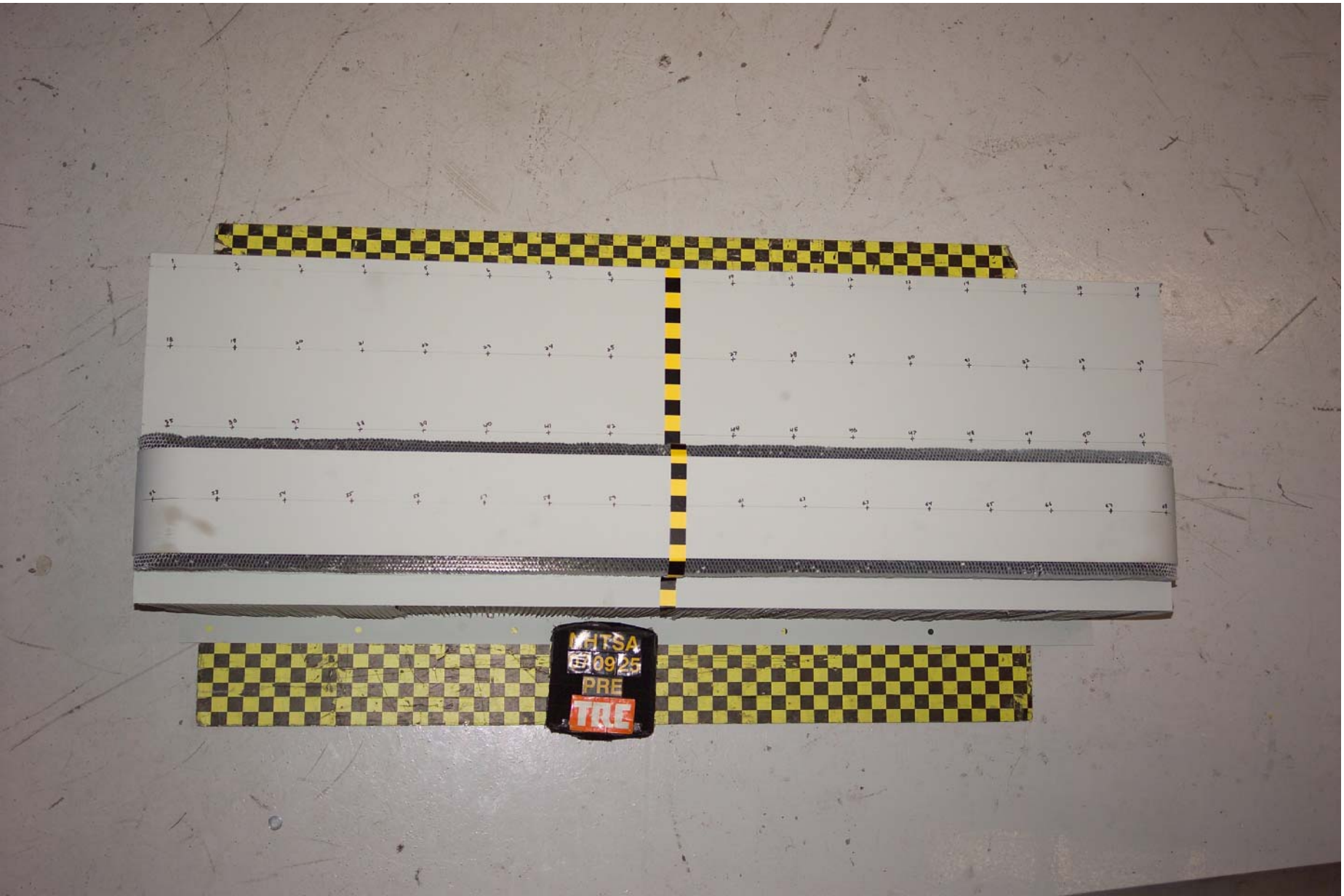


Figure A-17 Pre-Test Frontal View of Impactor Face



Figure A-18 Post-Test Frontal View of Impactor Face



**Figure A-19 Pre-Test Left Side View of Impactor Face**

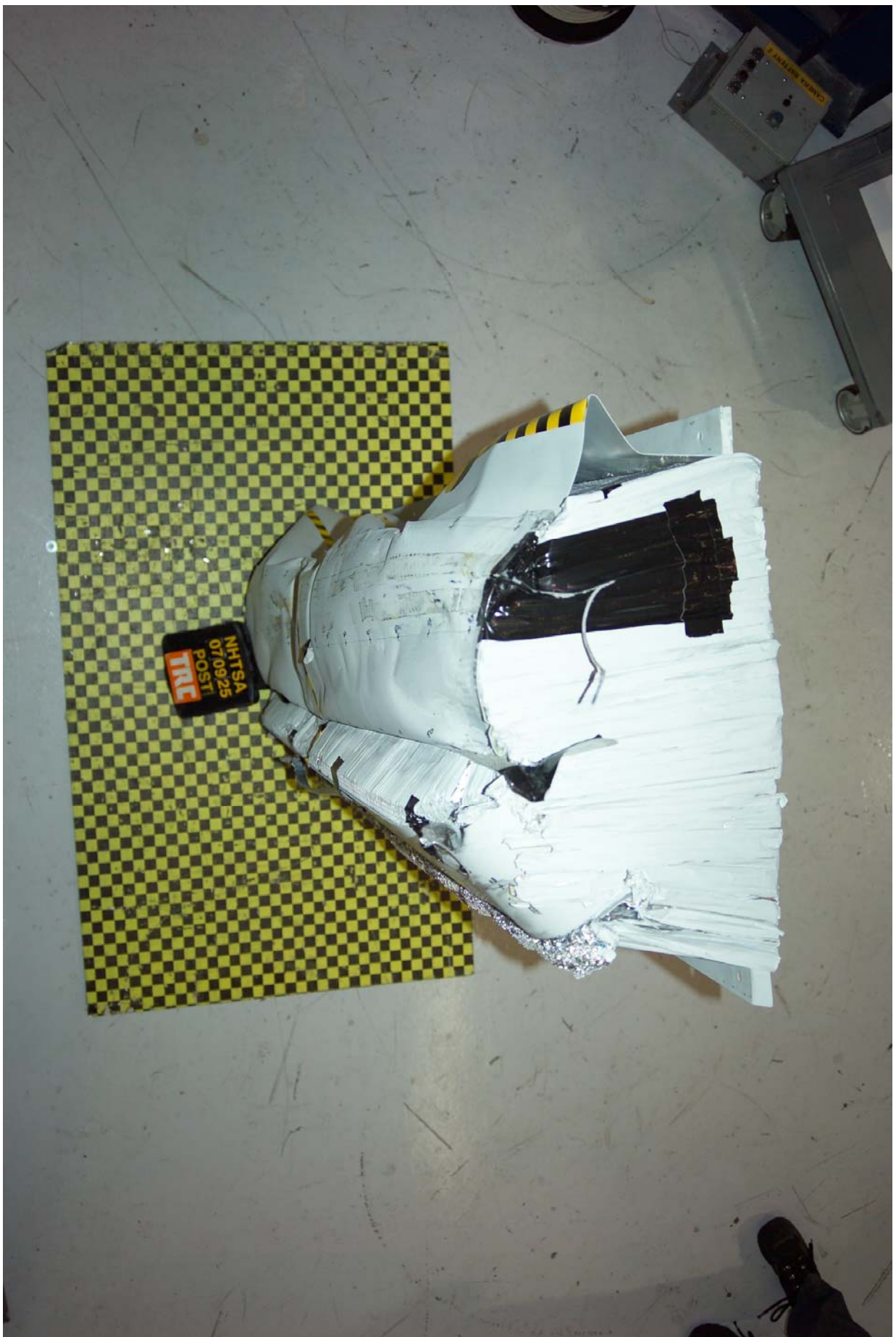


Figure A-20 Post-Test Left Side View of Impactor Face



**Figure A-21 Pre-Test Right Side View of Impactor Face**



**Figure A-22 Post-Test Right Side View of Impactor Face**

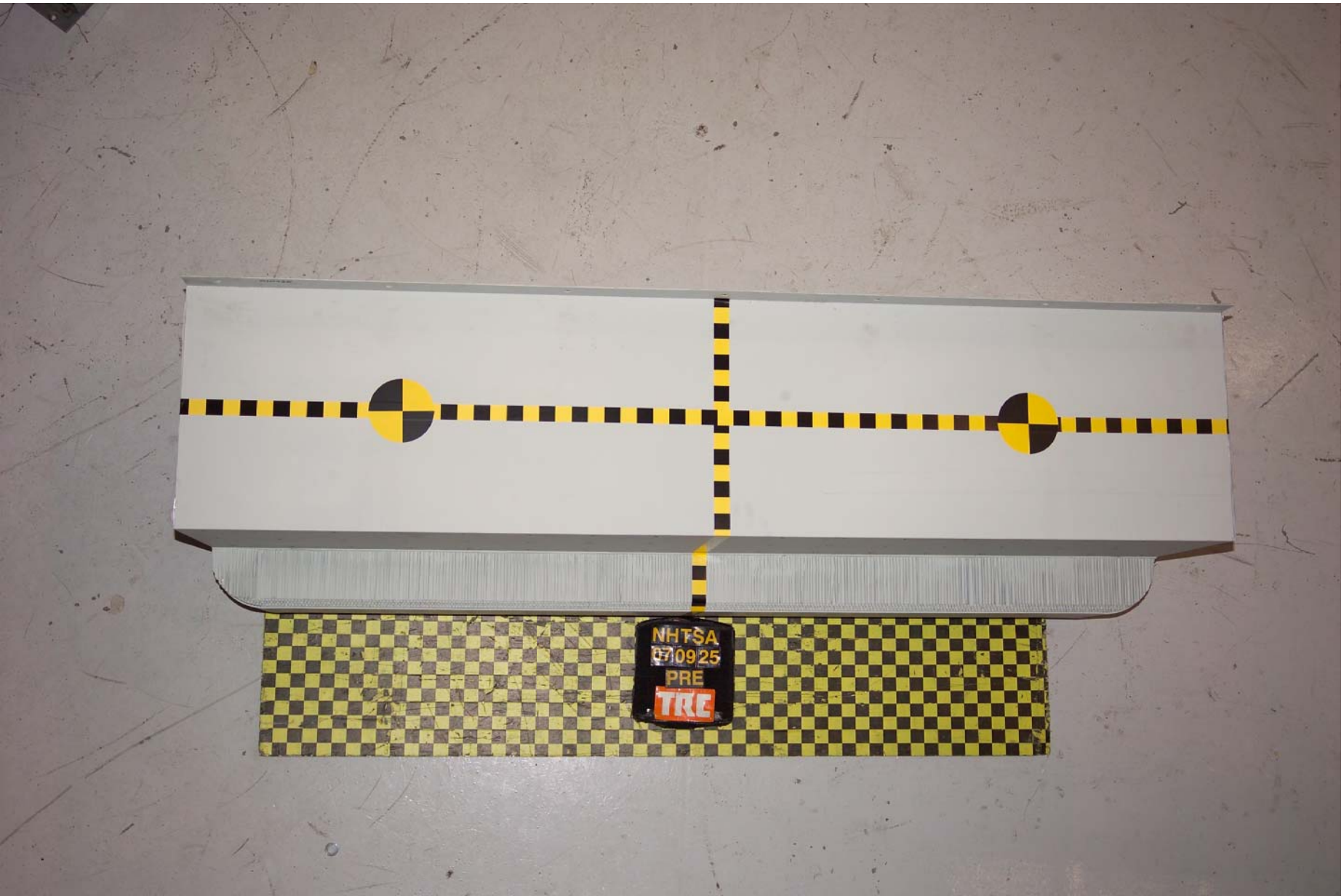


Figure A-23 Pre-Test Top View of Impactor Face

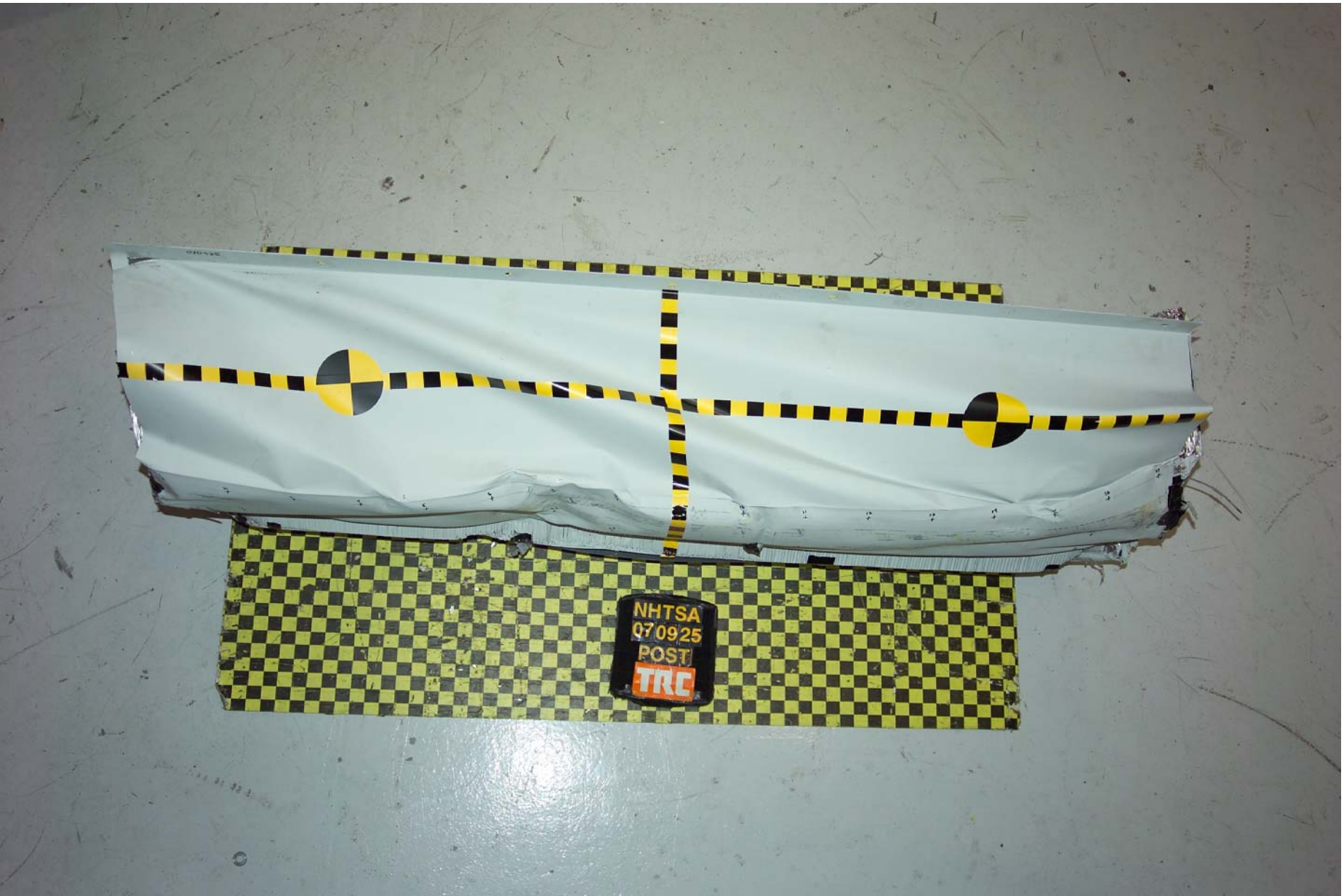


Figure A-24 Post-Test Top View of Impactor Face



Figure A-25 Pre-Test Left Side View of Impactor

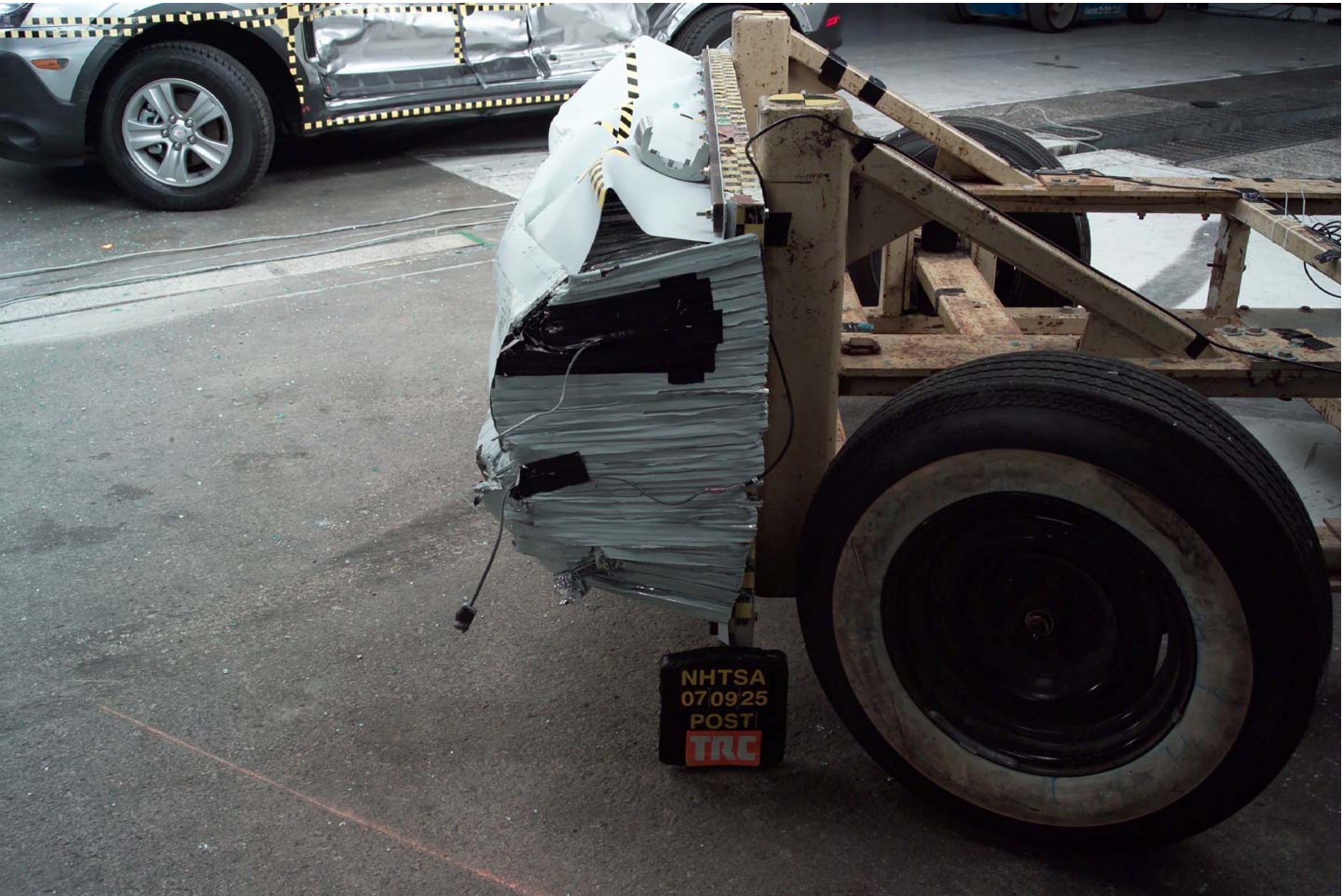


Figure A-26 Post-Test Left Side View of Impactor



Figure A-27 Pre-Test Right Side View of Impactor



Figure A-28 Post-Test Right Side View of Impactor



Figure A-29 Pre-Test Top View of Impactor



Figure A-30 Post-Test Top View of Impactor

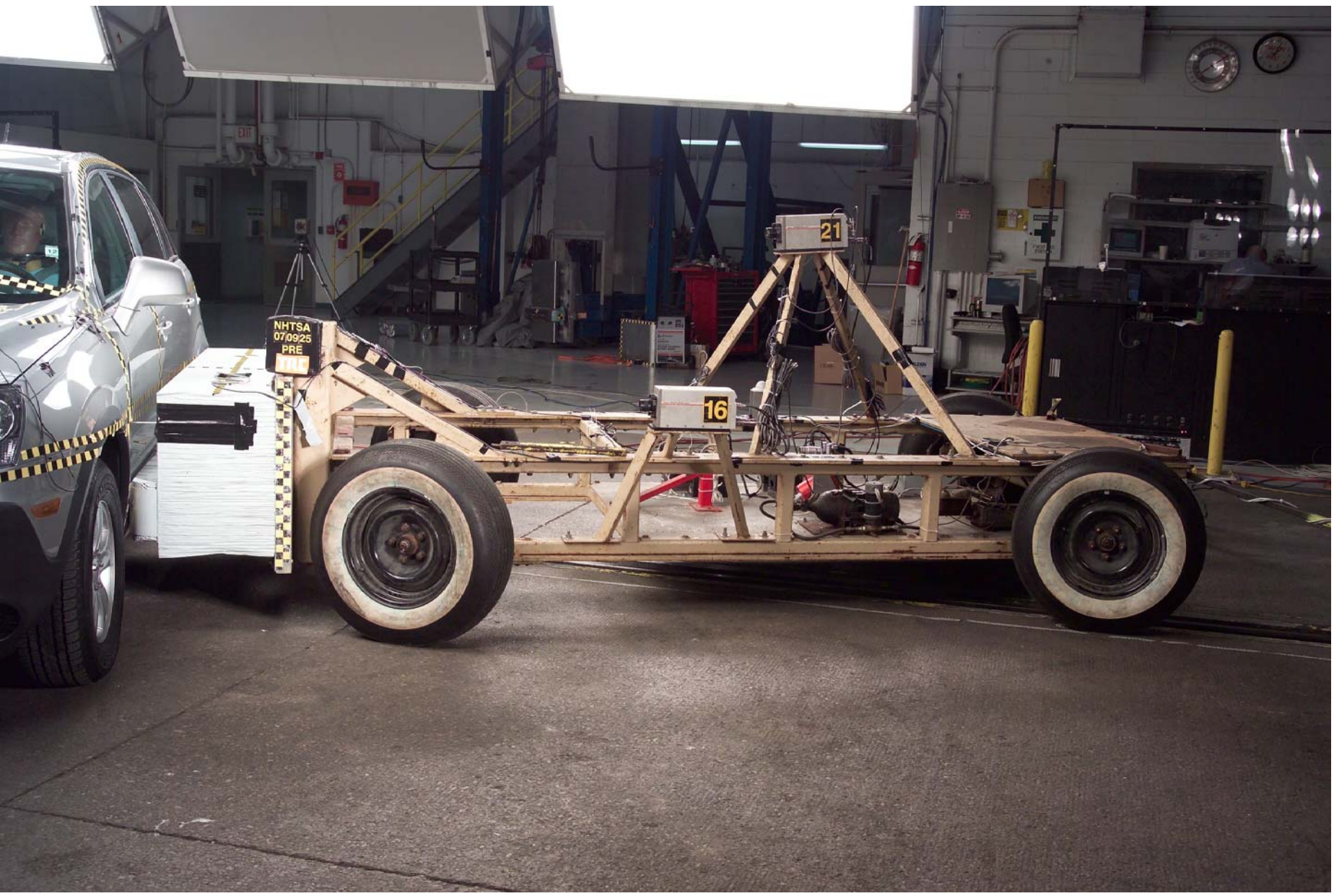


Figure A-31 Pre-Test Left Side Overall View of Impactor



Figure A-32 Post-Test Left Side Overall View of Impactor



Figure A-33 Pre-Test Rear Overall View of Impactor



**Figure A-34 Post-Test Rear Overall View of Impactor**

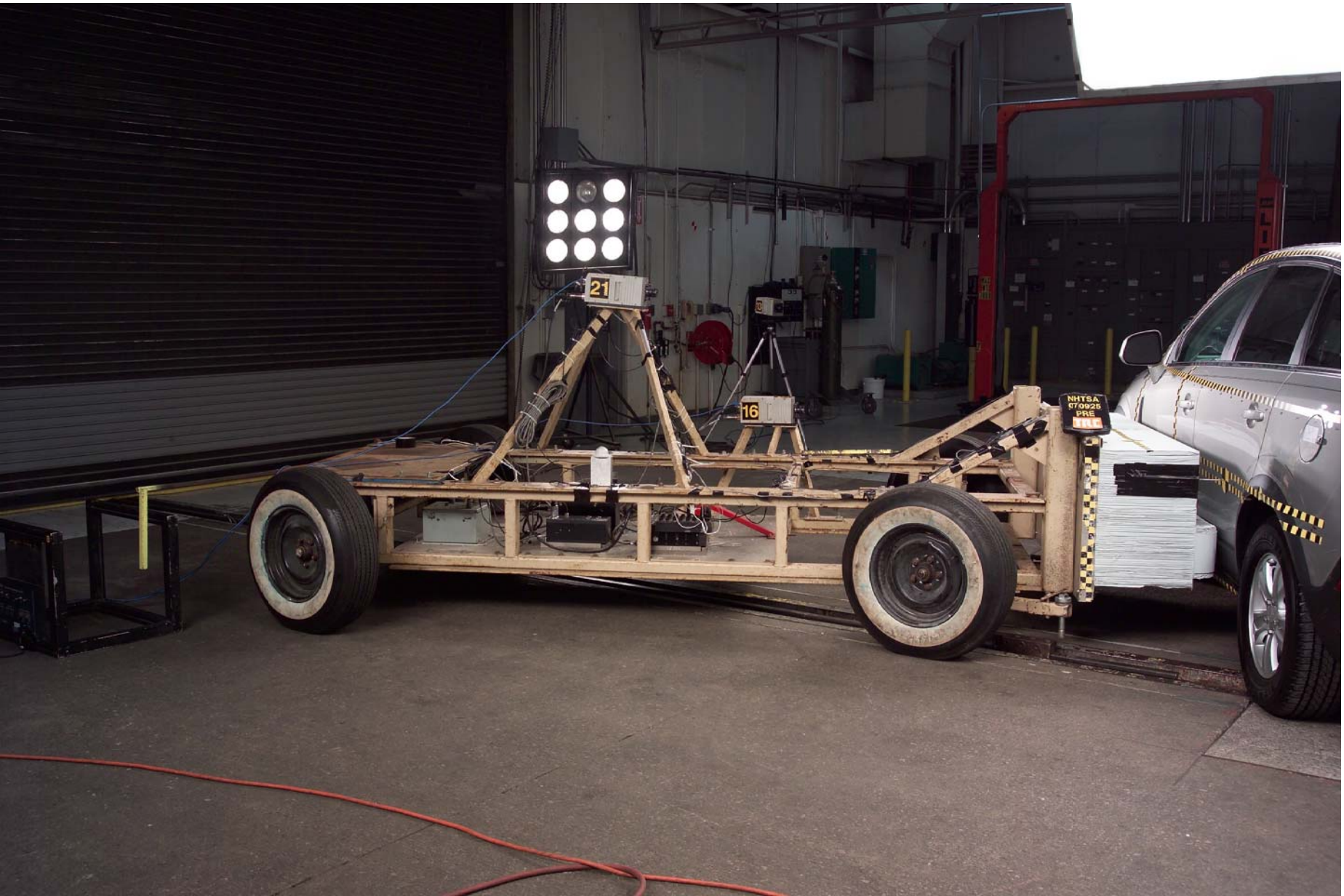


Figure A-35 Pre-Test Right Side Overall View of Impactor



Figure A-36 Post-Test Right Side Overall View of Impactor



Figure A-37 Pre-Test View of MDB Showing Contact Switches in Place



Figure A-38 Post-Test View of MDB Showing Contact Switches in Place



**Figure A-39 Pre-Test Overhead View of MDB Aligned with Vehicle**



**Figure A-40 Post-Test Overhead View of MDB and Vehicle**



**Figure A-41 Pre-Test Right Occupant Compartment View of Front SID**



Figure A-42 Post-Test Right Occupant Compartment View of Front SID



**Figure A-43 Pre-Test Right Occupant Compartment View of Rear SID**



Figure A-44 Post-Test Right Occupant Compartment View of Rear SID



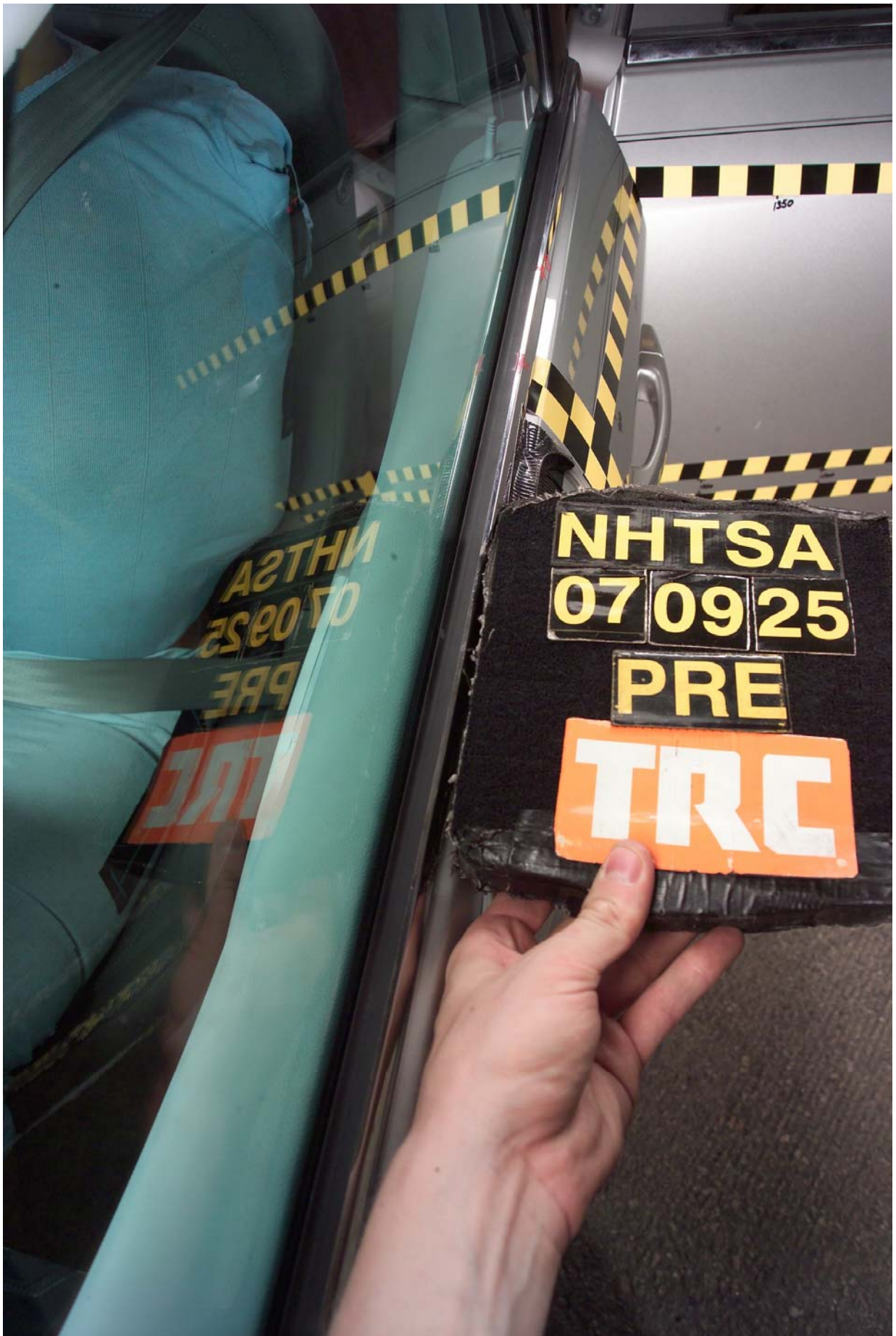
Figure A-45 Pre-Test Left View of Front SID



Figure A-46 Post-Test Left View of Front SID



**Figure A-47 Pre-Test Left View of Front SID and Belt Position**



**Figure A-48 Pre-Test Left View of Front SID and Door Clearance**



**Figure A-49 Post-Test Left View of Front SID and Door Clearance**



Figure A-50 Pre-Test Left View of Rear SID

A-54

070925



Figure A-51 Post-Test Left View of Rear SID



Figure A-52 Pre-Test Left View of Rear SID and Belt Position



**Figure A-53 Pre-Test Left View of Rear SID and Door Clearance**



**Figure A-54 Post-Test Left View of Rear SID and Door Clearance**



Figure A-55 Pre-Test Interior of Front Door

A-59

070925



**Figure A-56 Post-Test Interior of Front Door Showing SID Impact Locations**

A-60

070925



Figure A-57 Post-Test Front SID Contact – View 1



Figure A-58 Post-Test Front SID Contact – View 2



Figure A-59 Pre-Test Interior of Rear Door



**Figure A-60 Post-Test Interior of Rear Door Showing SID Impact Locations**



Figure A-61 Post-Test Rear SID Contact – View 1



Figure A-62 Post-Test Rear SID Contact – View 2



Figure A-63 Post-Test Rear SID Contact – View 3



Figure A-64 Pre-Test Left Side View of MDB with Impactor Face in Position



Figure A-65 Post-Test Left Side View of MDB with Impactor Face in Position



Figure A-66 Pre-Test Primary Impact Point View



Figure A-67 Post-Test Primary Impact Point View



Figure A-68 Pre-Test Right Side View of MDB with Impactor Face in Position



Figure A-69 Post-Test Right Side View of MDB with Impactor Face in Position



Figure A-70 Pre-Test Secondary Impact Point View



Figure A-71 Post-Test Secondary Impact Point View

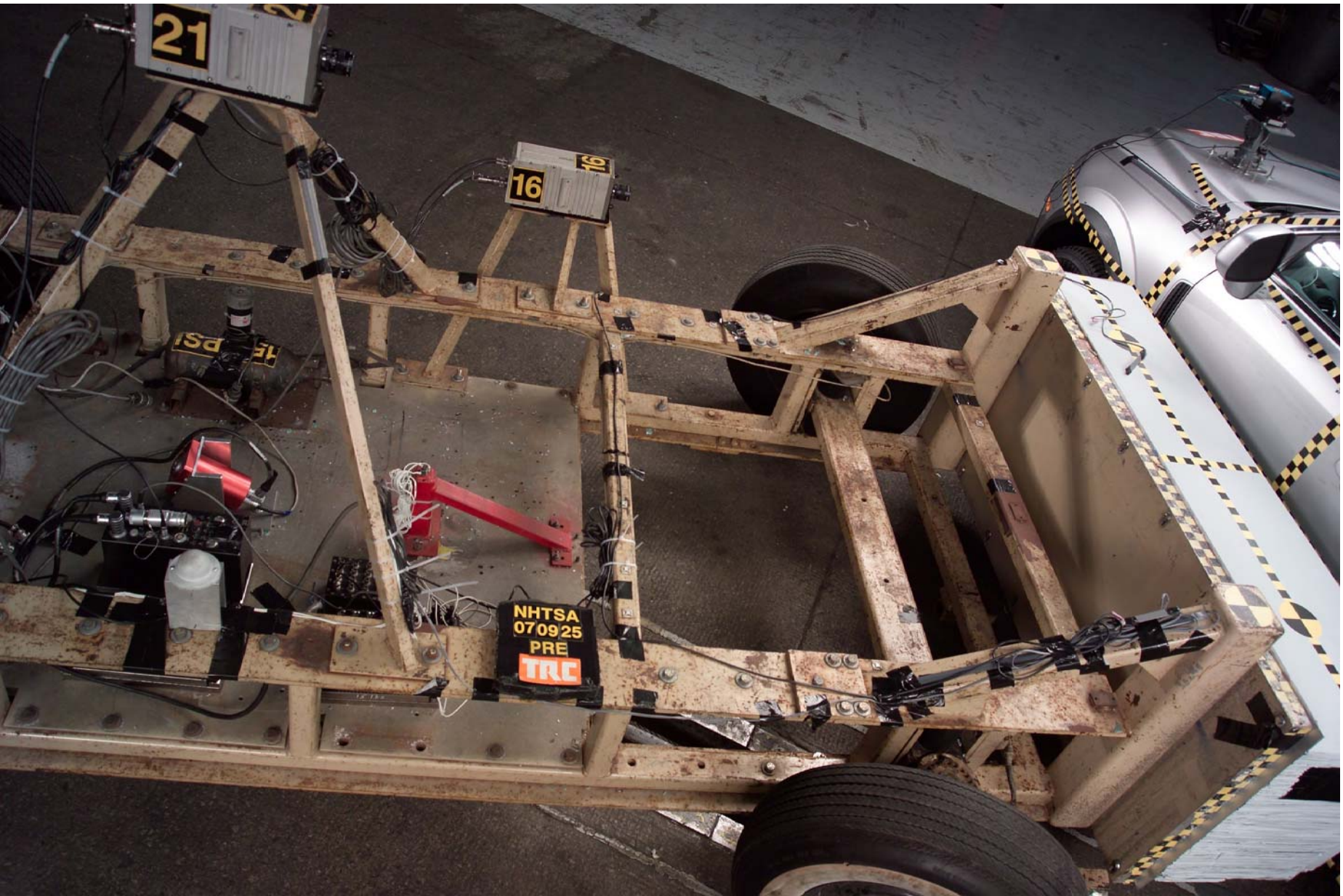


Figure A-72 Pre-Test Overhead View of MDB with Impactor Face in Position



Figure A-73 Pre-Test Ballast View

A-77

070925


**GM** MFD BY GENERAL MOTORS DE MEXICO, S. DE R.L. DE C.V. 04/07

GVWR	GAWR FRT	GAWR RR
2189KG(4825LB)	1130KG(2491LB)	1280KG(2822LB)

THIS VEHICLE CONFORMS TO ALL APPLICABLE U.S. FEDERAL MOTOR VEHICLE SAFETY AND THEFT PREVENTION STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE.


**3GSCL33P18S500546** TYPE: M.P.V.

MODEL: LF26				
LBD7	TIRE SIZE	SPEED RTG	RIM	COLD TIRE PRESSURE
FRT	P235/65R16	S	16X6.5J	210KPA(30PSI)
RR	P235/65R16	S	16X6.5J	210KPA(30PSI)
SPA	T135/70R16	M	16X4T	420KPA(60PSI)

SEE OWNER'S MANUAL  FOR MORE INFORMATION.

ION  
 YEAR 04/07  
 SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION

Figure A-74 Pre-Test Vehicle Certification Label View



### TIRE AND LOADING INFORMATION

SEATING CAPACITY	TOTAL 5	FRONT 2	REAR 3
------------------	---------	---------	--------

The combined weight of occupants and cargo should never exceed 474 kg or 1045 lbs.

TIRE	ORIGINAL SIZE	COLD TIRE PRESSURE	<b>SEE OWNER'S MANUAL FOR ADDITIONAL INFORMATION</b>
FRONT	P235/65R16 S	210 kPa, 30 PSI	
REAR	P235/65R16 S	210 kPa, 30 PSI	
SPARE	T135/70R16 M	420 kPa, 60 PSI	

3GSC133P18S500546

Figure A-75 Pre-Test Vehicle Recommended Tire Pressure Label View

# TDAS VELOCITY MEASUREMENT SYSTEM

38.55

MPH

POWER

A B  
AVG

ALIGNMENT

DATA COMMUNIC

1 2 3 4

Figure A-76 Post-Test Light Trap Digital Readout – View 1

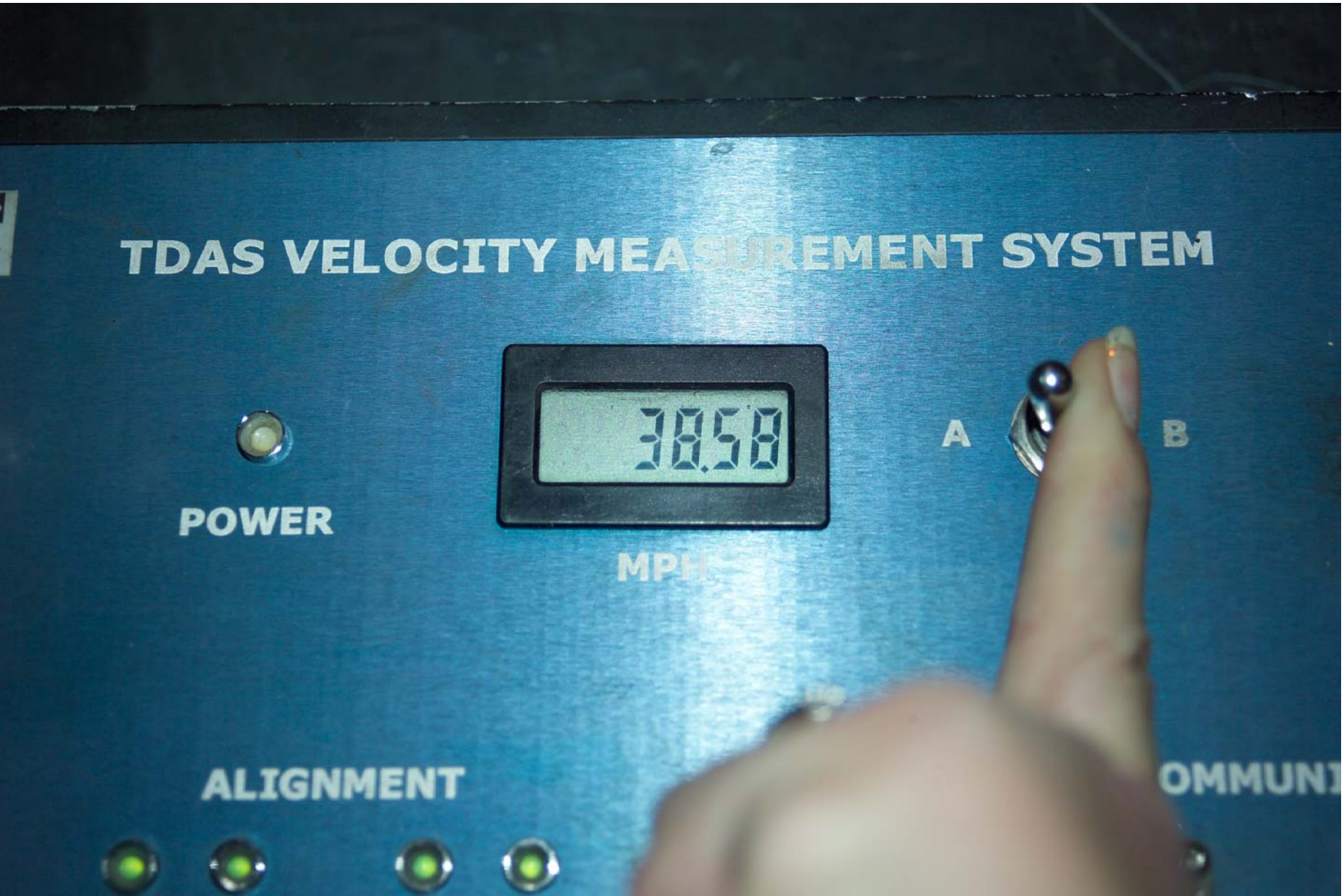


Figure A-77 Post-Test Light Trap Digital Readout – View 2

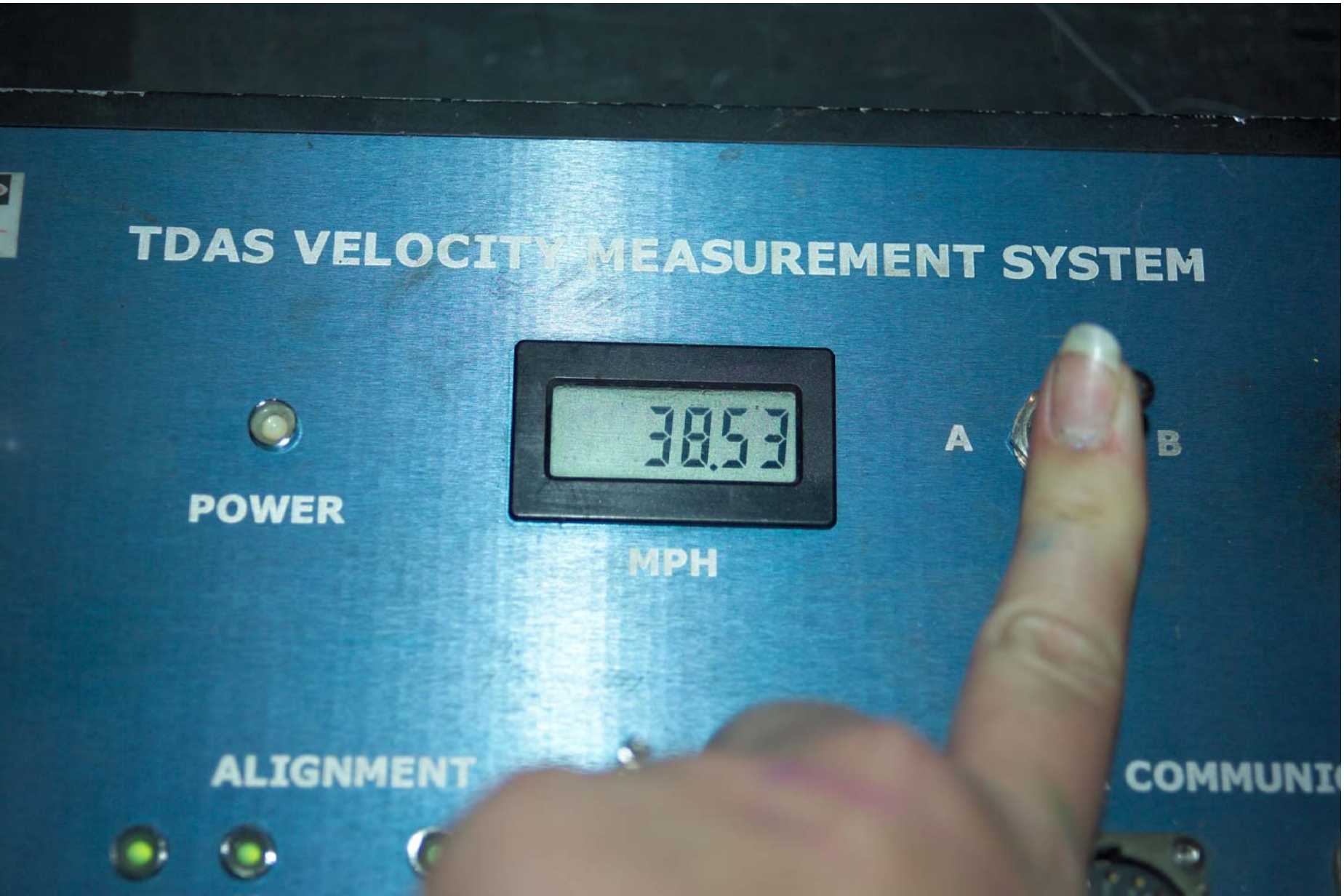


Figure A-78 Post-Test Light Trap Digital Readout – View 3



Figure A-79 Impact Event



Figure A-80 Pre-Test Fuel Cap



Figure A-81 Post-Test Fuel Cap



Figure A-82 FMVSS 301 Rollover View at 90°

A-86

070925



Figure A-83 FMVSS 301 Rollover View at 180°

A-87

070925

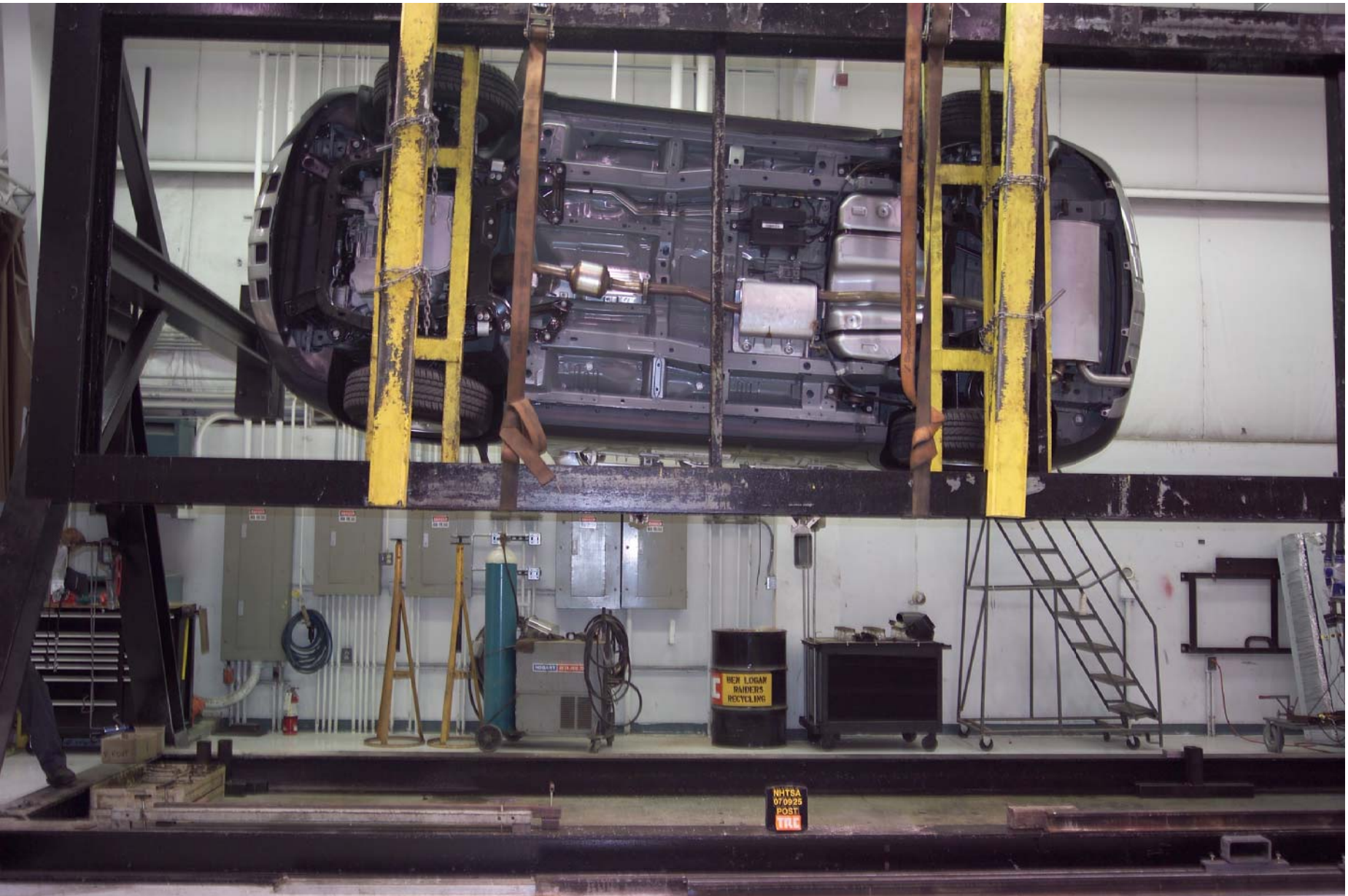


Figure A-84 FMVSS 301 Rollover View at 270°

A-88

070925



Figure A-85 FMVSS 301 Rollover View at 360°

Appendix B

Data Plots

Table of Data Plots

Driver and Passenger Dummy Instrumentation Plots

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

Contact Data - Filter Class 1000

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
1	Driver Head X-Axis Acceleration	B-10
2	Driver Head X-Axis Velocity	B-11
3	Driver Head Y-Axis Acceleration	B-12
4	Driver Head Y-Axis Velocity	B-13
5	Driver Head Z-Axis Acceleration	B-14
6	Driver Head Z-Axis Velocity	B-15
7	Driver Head Resultant Acceleration	B-16
8	Driver Neck X-Axis Shear Force	B-17
9	Driver Neck Y-Axis Shear Force	B-18
10	Driver Neck Z-Axis Axial Force	B-19
11	Driver Neck Moment about X Axis	B-20
12	Driver Neck Moment about Y Axis	B-21
13	Driver Neck Moment about Z Axis	B-22
14	Driver Neck Occipital Condyle Moment about X Axis	B-23
15	Driver Upper Rib Y-Axis Acceleration	B-24
16	Driver Upper Rib Y-Axis Velocity	B-25
17	Driver Lower Rib Y-Axis Acceleration	B-26
18	Driver Lower Rib Y-Axis Velocity	B-27
19	Driver Lower Spine Y-Axis Acceleration	B-28
20	Driver Lower Spine Y-Axis Velocity	B-29
21	Driver Pelvis Y-Axis Acceleration	B-30
22	Driver Pelvis Y-Axis Velocity	B-31
23	Left Rear Passenger Head X-Axis Acceleration	B-32
24	Left Rear Passenger Head X-Axis Velocity	B-33

Table of Data Plots (Continued)

Driver and Passenger Dummy Instrumentation Plots (Continued)

Acceleration Data - Filter Class 1000

Integration Data - Filter Class 180

Force Data - Filter Class 1000

Moment Data - Filter Class 600

Contact Data - Filter Class 1000

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
25	Left Rear Passenger Head Y-Axis Acceleration	B-34
26	Left Rear Passenger Head Y-Axis Velocity	B-35
27	Left Rear Passenger Head Z-Axis Acceleration	B-36
28	Left Rear Passenger Head Z-Axis Velocity	B-37
29	Left Rear Passenger Head Resultant Acceleration	B-38
30	Left Rear Passenger Neck X-Axis Shear Force	B-39
31	Left Rear Passenger Neck Y-Axis Shear Force	B-40
32	Left Rear Passenger Neck Z-Axis Axial Force	B-41
33	Left Rear Passenger Neck Moment about X Axis	B-42
34	Left Rear Passenger Neck Moment about Y Axis	B-43
35	Left Rear Passenger Neck Moment about Z Axis	B-44
36	Left Rear Passenger Neck Occipital Condyle Moment about X Axis	B-45
37	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-46
38	Left Rear Passenger Upper Rib Y-Axis Velocity	B-47
39	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-48
40	Left Rear Passenger Lower Rib Y-Axis Velocity	B-49
41	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-50
42	Left Rear Passenger Lower Spine Y-Axis Velocity	B-51
43	Left Rear Passenger Pelvis Y-Axis Acceleration	B-52
44	Left Rear Passenger Pelvis Y-Axis Velocity	B-53

Table of Data Plots (Continued)

Driver and Passenger Dummy Redundant Instrumentation Plots  
Acceleration Data - Filter Class 1000 - Redundant  
Integration Data - Filter Class 180 - Redundant

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
45	Driver Head X-Axis Redundant Acceleration	B-55
46	Driver Head X-Axis Redundant Velocity	B-56
47	Driver Head Y-Axis Redundant Acceleration	B-57
48	Driver Head Y-Axis Redundant Velocity	B-58
49	Driver Head Z-Axis Redundant Acceleration	B-59
50	Driver Head Z-Axis Redundant Velocity	B-60
51	Driver Head Resultant Redundant Acceleration	B-61
52	Driver Upper Rib Y-Axis Redundant Acceleration	B-62
53	Driver Upper Rib Y-Axis Redundant Velocity	B-63
54	Driver Lower Rib Y-Axis Redundant Acceleration	B-64
55	Driver Lower Rib Y-Axis Redundant Velocity	B-65
56	Driver Lower Spine Y-Axis Redundant Acceleration	B-66
57	Driver Lower Spine Y-Axis Redundant Velocity	B-67
58	Left Rear Passenger Head X-Axis Redundant Acceleration	B-68
59	Left Rear Passenger Head X-Axis Redundant Velocity	B-69
60	Left Rear Passenger Head Y-Axis Redundant Acceleration	B-70
61	Left Rear Passenger Head Y-Axis Redundant Velocity	B-71
62	Left Rear Passenger Head Z-Axis Redundant Acceleration	B-72
63	Left Rear Passenger Head Z-Axis Redundant Velocity	B-73
64	Left Rear Passenger Head Resultant Redundant Acceleration	B-74
65	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-75
66	Left Rear Passenger Upper Rib Y-Axis Redundant Velocity	B-76
67	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-77
68	Left Rear Passenger Lower Rib Y-Axis Redundant Velocity	B-78
69	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-79
70	Left Rear Passenger Lower Spine Y-Axis Redundant Velocity	B-80

Table of Data Plots (Continued)  
 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>
71	Right Side Sill at Front Seat X-Axis Acceleration	B-82
72	Right Side Sill at Front Seat X-Axis Velocity	B-83
73	Right Side Sill at Front Seat Y-Axis Acceleration	B-84
74	Right Side Sill at Front Seat Y-Axis Velocity	B-85
75	Right Side Sill at Front Seat Z-Axis Acceleration	B-86
76	Right Side Sill at Front Seat Z-Axis Velocity	B-87
77	Right Side Sill at Front Seat Resultant Acceleration	B-88
78	Right Side Sill at Rear Seat X-Axis Acceleration	B-89
79	Right Side Sill at Rear Seat X-Axis Velocity	B-90
80	Right Side Sill at Rear Seat Y-Axis Acceleration	B-91
81	Right Side Sill at Rear Seat Y-Axis Velocity	B-92
82	Right Side Sill at Rear Seat Z-Axis Acceleration	B-93
83	Right Side Sill at Rear Seat Z-Axis Velocity	B-94
84	Right Side Sill at Rear Seat Resultant Acceleration	B-95
85	Rear Floorpan Above Axle X-Axis Acceleration	B-96
86	Rear Floorpan Above Axle X-Axis Velocity	B-97
87	Rear Floorpan Above Axle Y-Axis Acceleration	B-98
88	Rear Floorpan Above Axle Y-Axis Velocity	B-99
89	Rear Floorpan Above Axle Z-Axis Acceleration	B-100
90	Rear Floorpan Above Axle Z-Axis Velocity	B-101
91	Rear Floorpan Above Axle Resultant Acceleration	B-102
92	Left Side Sill at Front Seat Y-Axis Acceleration	B-103
93	Left Side Sill at Front Seat Y-Axis Velocity	B-104
94	Left Side Sill at Front Seat Y-Axis Displacement	B-105

Table of Data Plots (Continued)  
 Test Vehicle Instrumentation Plots (Continued)  
 Acceleration Data - Filter Class 60  
 Integration Data - Filter Class 180

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
95	Left Side Sill at Rear Seat Y-Axis Acceleration	B-106
96	Left Side Sill at Rear Seat Y-Axis Velocity	B-107
97	Left Side Sill at Rear Seat Y-Axis Displacement	B-108
98	Right Rear Occupant Compartment Y-Axis Acceleration	B-109
99	Right Rear Occupant Compartment Y-Axis Velocity	B-110
100	Right Rear Occupant Compartment Y-Axis Displacement	B-111
101	Left Lower A-Post Y-Axis Acceleration	B-112
102	Left Lower A-Post Y-Axis Velocity	B-113
103	Left Upper A-Post Y-Axis Acceleration	B-114
104	Left Upper A-Post Y-Axis Velocity	B-115
105	Left Lower B-Post Y-Axis Acceleration	B-116
106	Left Lower B-Post Y-Axis Velocity	B-117
107	Left Upper B-Post Y-Axis Acceleration	B-118
108	Left Upper B-Post Y-Axis Velocity	B-119
109	Left Front Seat Track Y-Axis Acceleration	B-120
110	Left Front Seat Track Y-Axis Velocity	B-121
111	Left Rear Seat Track Y-Axis Acceleration	B-122
112	Left Rear Seat Track Y-Axis Velocity	B-123
113	Vehicle Center of Gravity X-Axis Acceleration	B-124
114	Vehicle Center of Gravity X-Axis Velocity	B-125
115	Vehicle Center of Gravity Y-Axis Acceleration	B-126
116	Vehicle Center of Gravity Y-Axis Velocity	B-127
117	Vehicle Center of Gravity Z-Axis Acceleration	B-128
118	Vehicle Center of Gravity Z-Axis Velocity	B-129
119	Vehicle Center of Gravity Resultant Acceleration	B-130

Table of Data Plots (Continued)  
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>
120	MDB Center of Gravity X-Axis Acceleration	B-132
121	MDB Center of Gravity X-Axis Velocity	B-133
122	MDB Center of Gravity Y-Axis Acceleration	B-134
123	MDB Center of Gravity Y-Axis Velocity	B-135
124	MDB Center of Gravity Z-Axis Acceleration	B-136
125	MDB Center of Gravity Z-Axis Velocity	B-137
126	MDB Center of Gravity Resultant Acceleration	B-138
127	MDB Left Rear X-Axis Acceleration	B-139
128	MDB Left Rear X-Axis Velocity	B-140
129	MDB Left Rear Y-Axis Acceleration	B-141
130	MDB Left Rear Y-Axis Velocity	B-142
131	MDB Right Side Contact Switch	B-143
132	MDB Left Side Contact Switch	B-144

Table of Data Plots (Continued)  
 Driver and Passenger Dummy Instrumentation Plots  
 Acceleration Data - FIR Filtered

<u>Plot No.</u>	<u>Data Plot Title</u>	<u>Page</u>
133	Driver Upper Rib Y-Axis Acceleration	B-146
134	Driver Lower Rib Y-Axis Acceleration	B-147
135	Driver Lower Spine Y-Axis Acceleration	B-148
136	Driver Pelvis Y-Axis Acceleration	B-149
137	Left Rear Passenger Upper Rib Y-Axis Acceleration	B-150
138	Left Rear Passenger Lower Rib Y-Axis Acceleration	B-151
139	Left Rear Passenger Lower Spine Y-Axis Acceleration	B-152
140	Left Rear Passenger Pelvis Y-Axis Acceleration	B-153
141	Driver Upper Rib Y-Axis Redundant Acceleration	B-154
142	Driver Lower Rib Y-Axis Redundant Acceleration	B-155
143	Driver Lower Spine Y-Axis Redundant Acceleration	B-156
144	Left Rear Passenger Upper Rib Y-Axis Redundant Acceleration	B-157
145	Left Rear Passenger Lower Rib Y-Axis Redundant Acceleration	B-158
146	Left Rear Passenger Lower Spine Y-Axis Redundant Acceleration	B-159

Driver and Passenger Dummy Instrumentation Plots



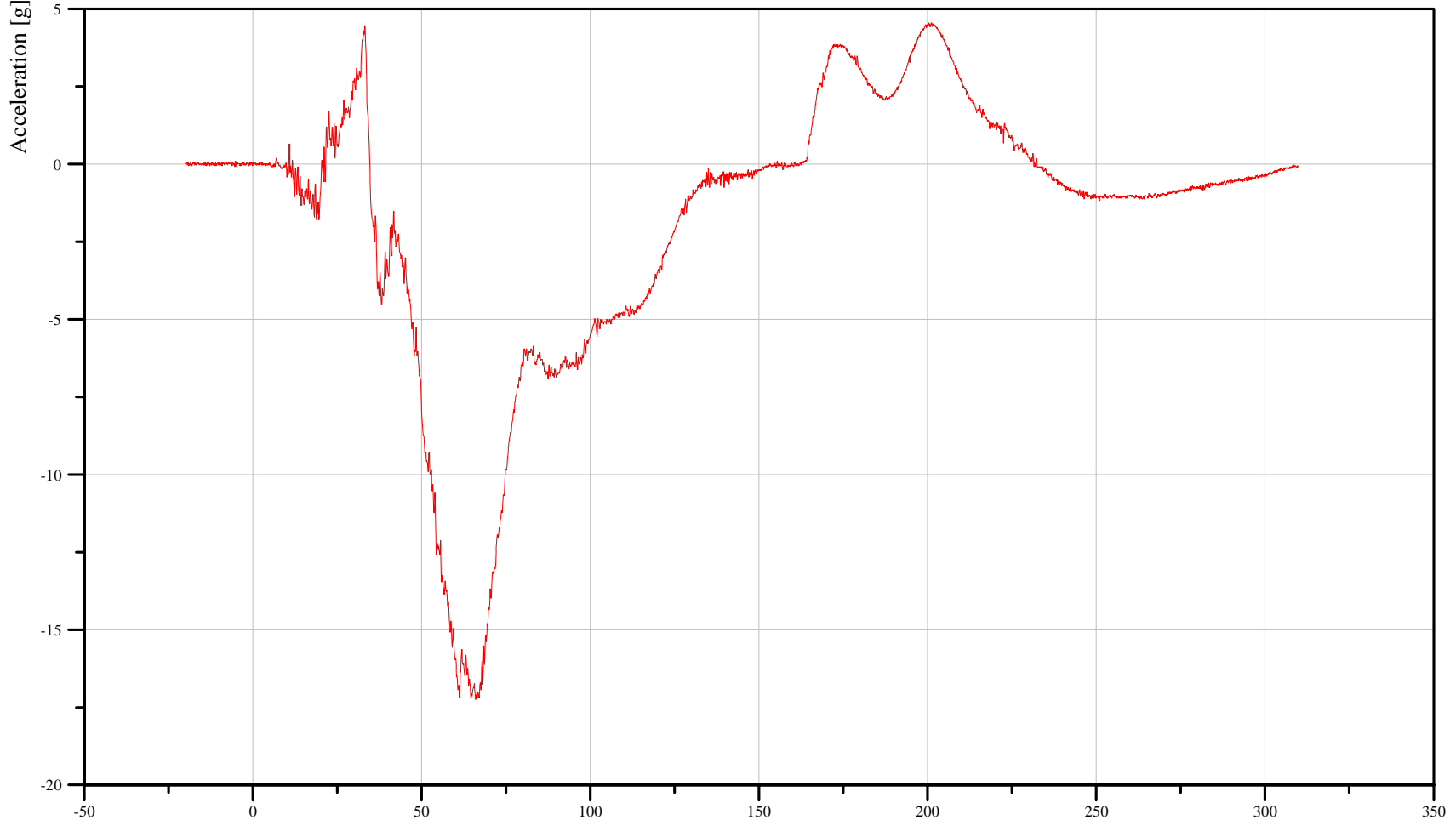
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCG00SHACXA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-17.25 g at 64.64 ms

**Max. Value**  
4.56 g at 200.32 ms

Time [ms]

B-10

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

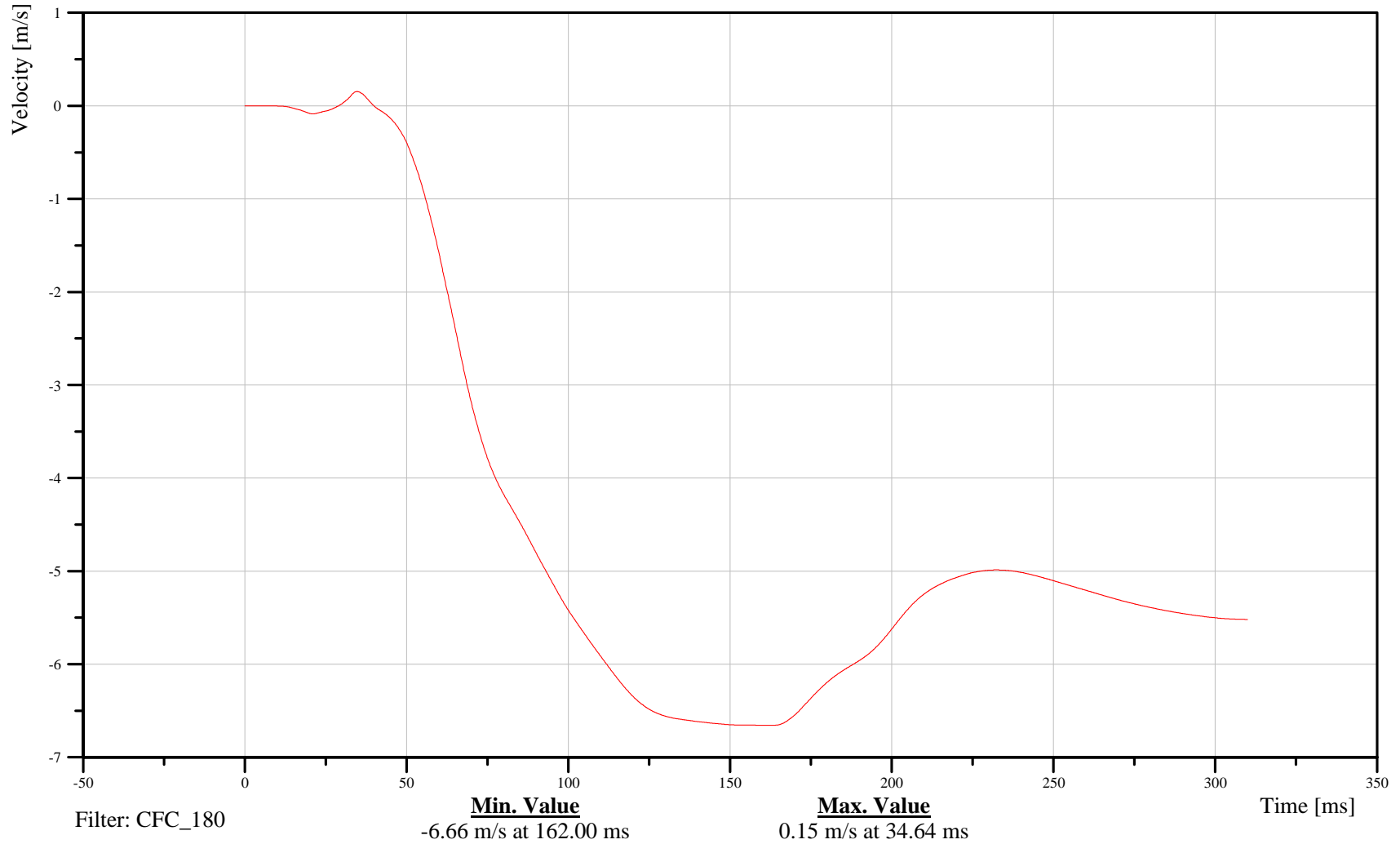
Time: 14:40

### DRIVER HEAD X-AXIS VELOCITY

Customer: NHTSA  
Test Number: C80100

# 11HEADCG00SHVEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-11

070925



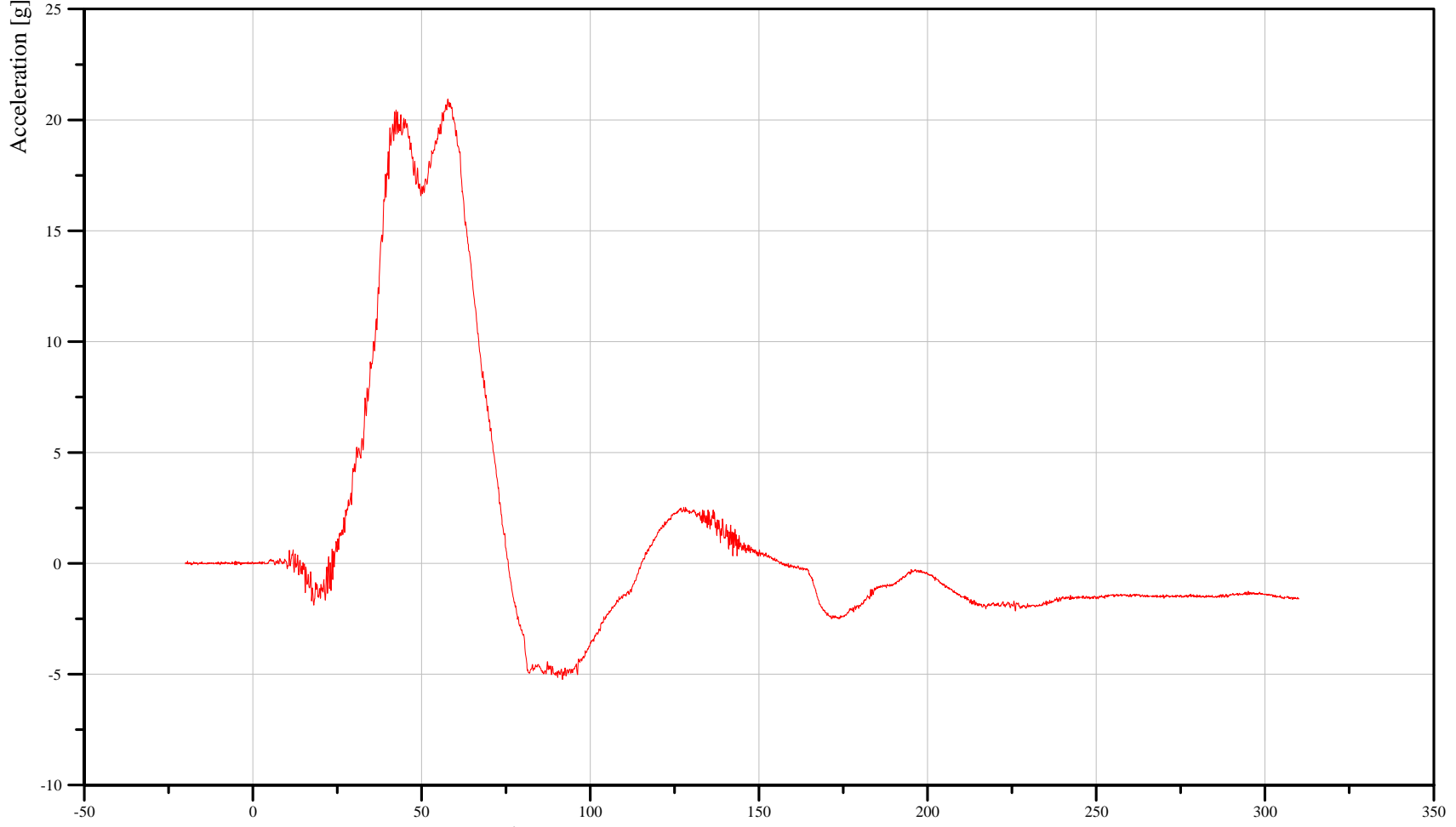
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCG00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-5.23 g at 91.76 ms

**Max. Value**  
20.94 g at 57.84 ms

Time [ms]

B-12

070925



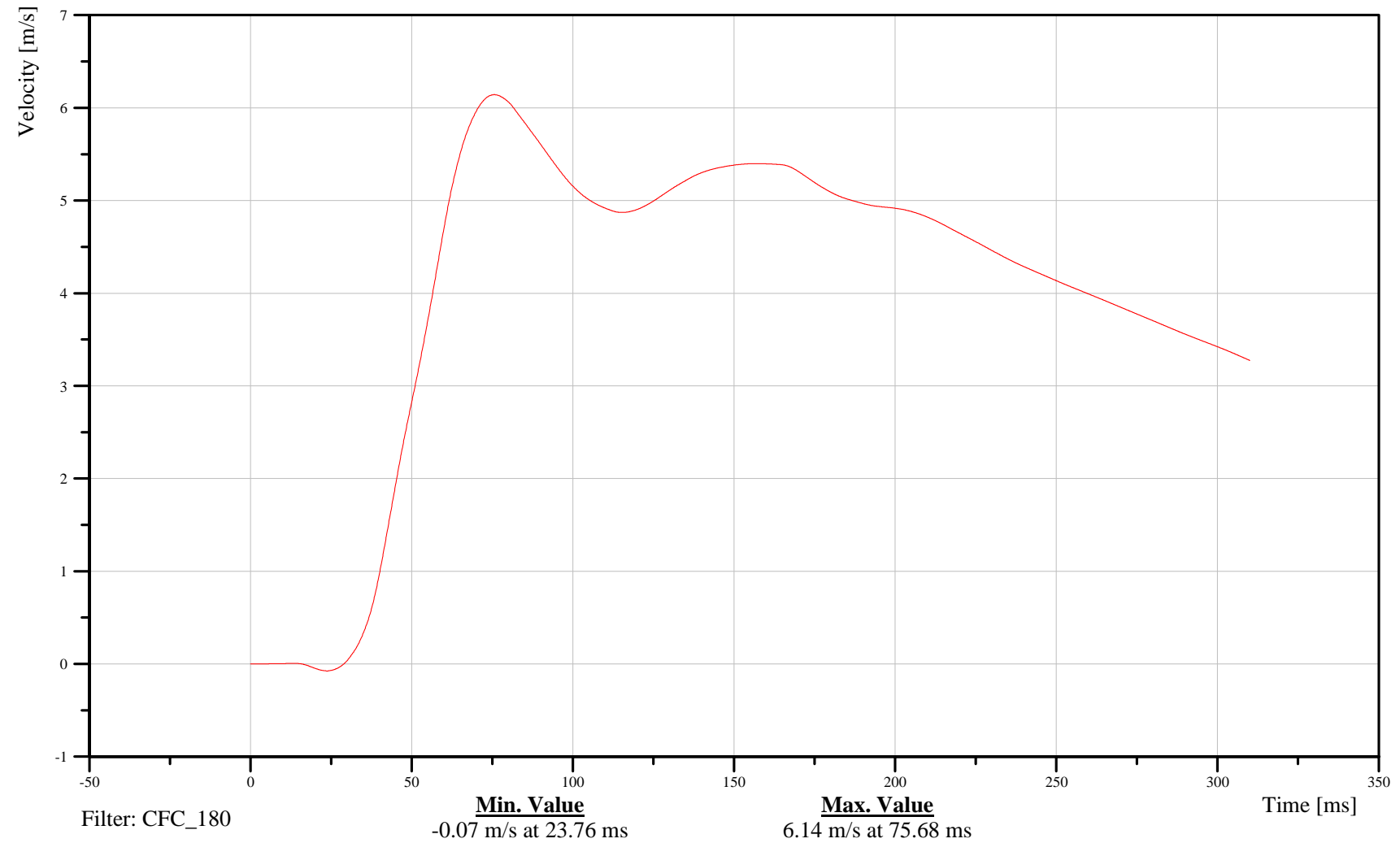
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCG00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-13

070925



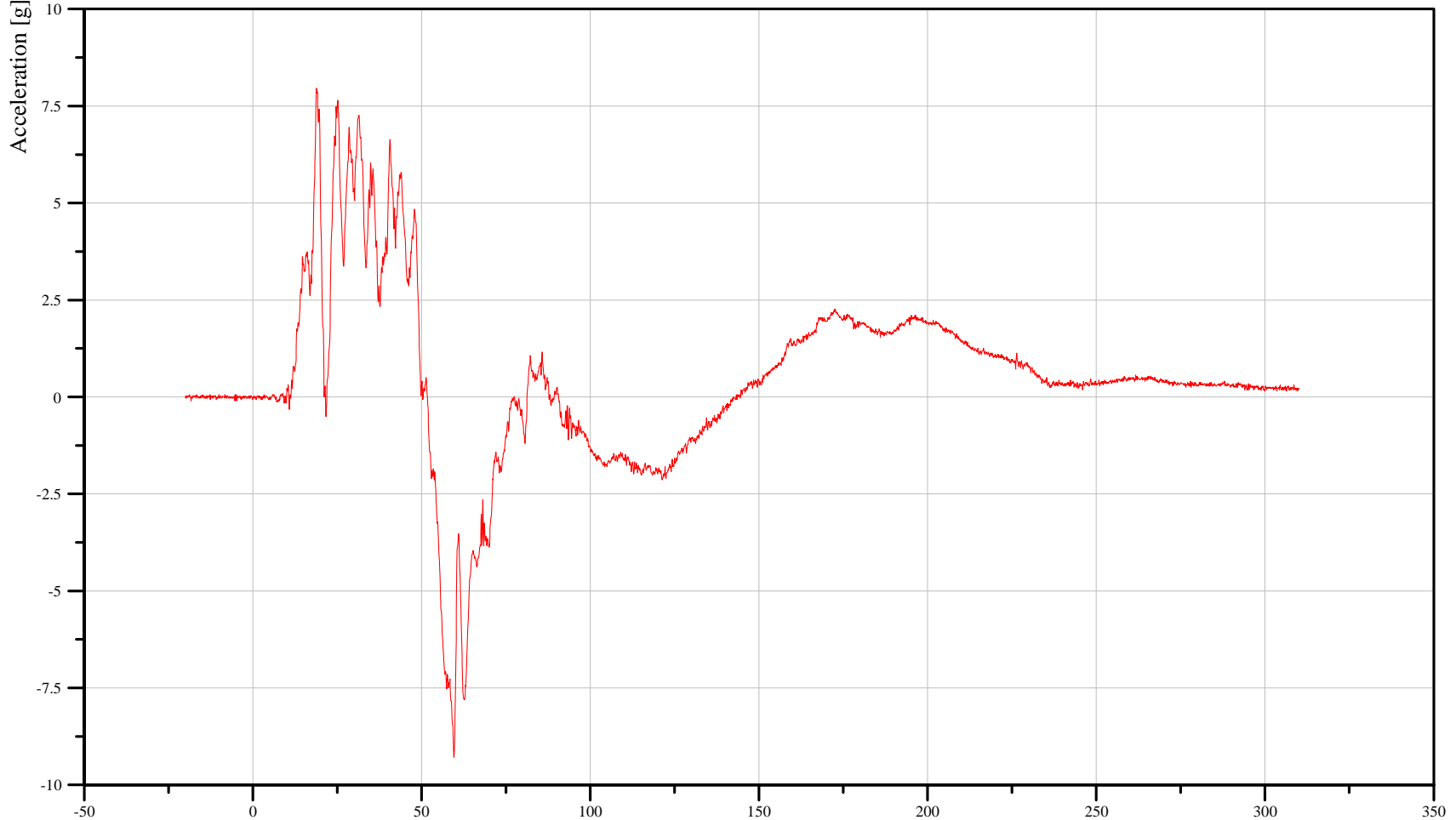
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Z-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCG00SHACZA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

Min. Value  
-9.28 g at 59.60 ms

Max. Value  
7.96 g at 18.80 ms

Time [ms]

B-14

070925



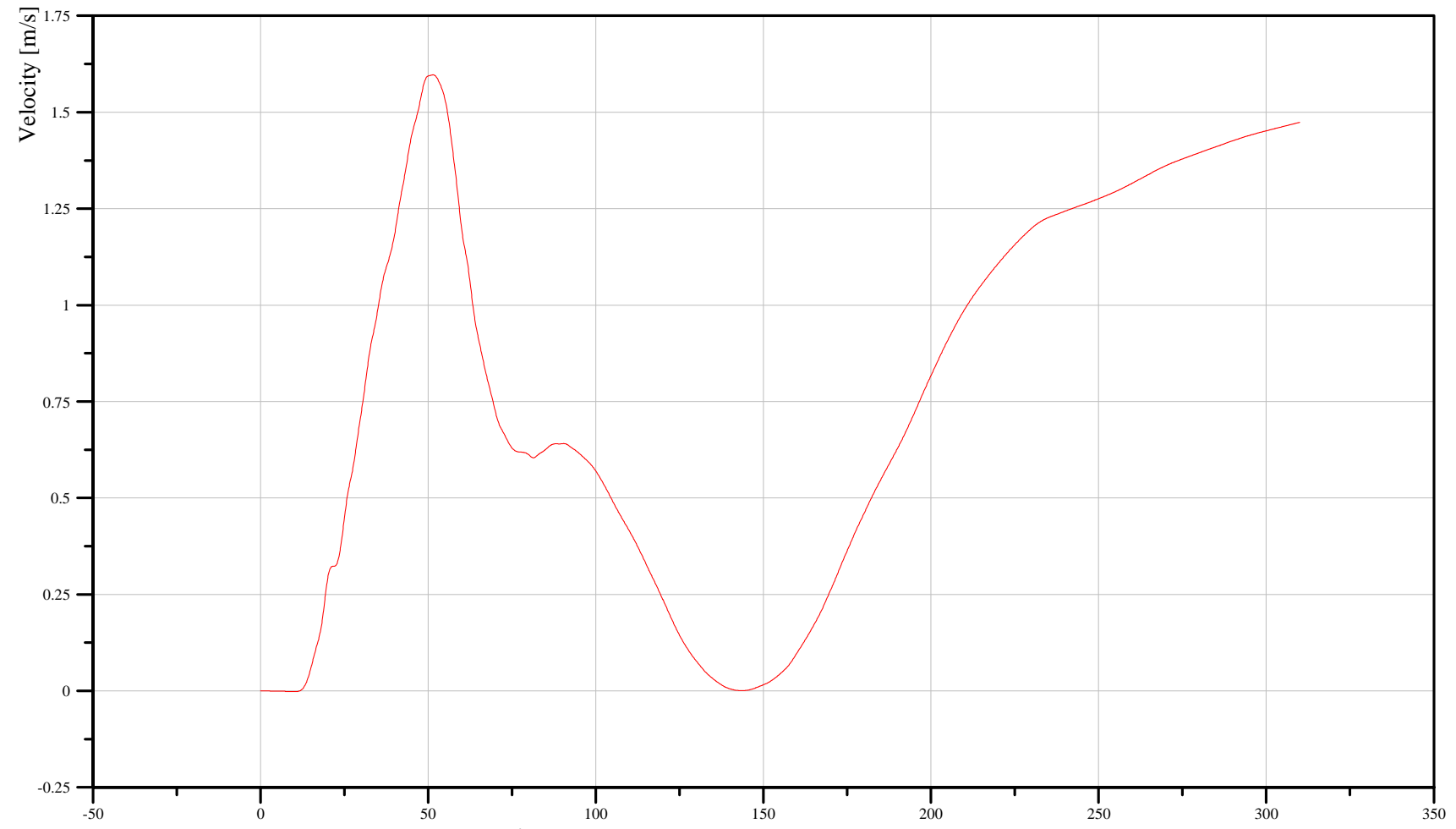
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Z-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCG00SHVEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
0.00 m/s at 9.92 ms

**Max. Value**  
1.60 m/s at 51.52 ms

Time [ms]

B-15

070925



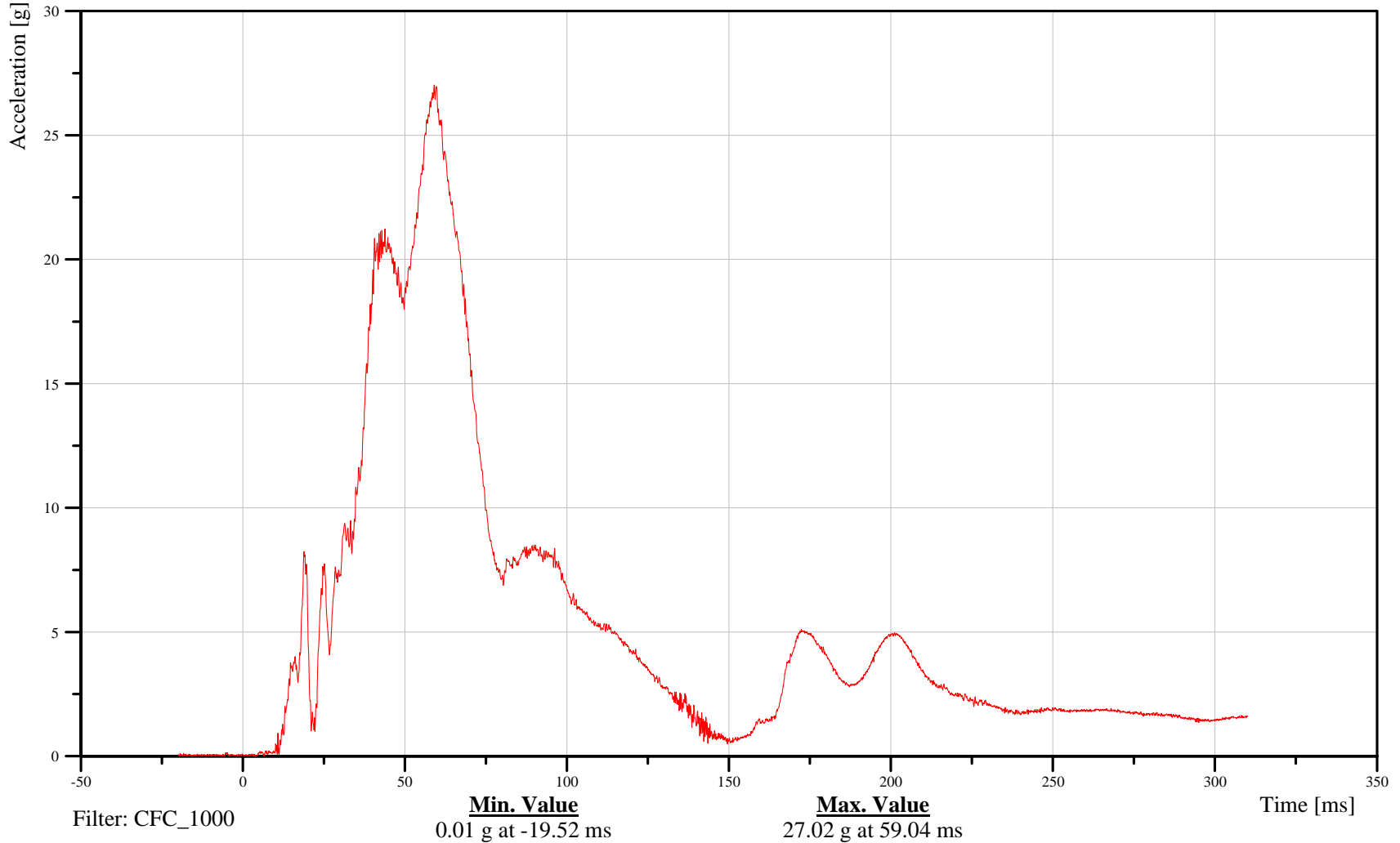
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD RESULTANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCG00SHACRA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-16

070925



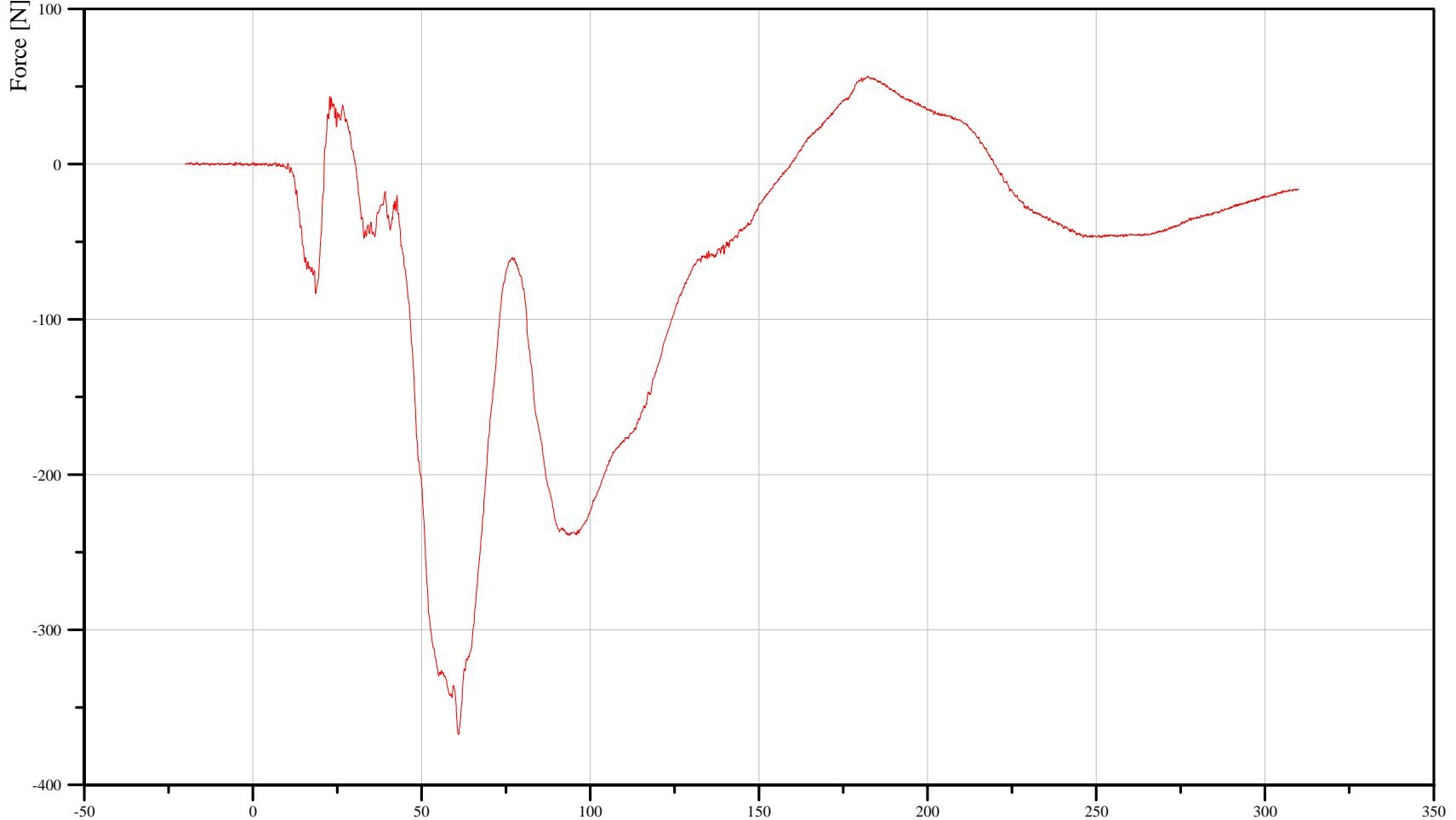
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER NECK X-AXIS SHEAR FORCE Time: 14:40

Customer: NHTSA  
Test Number: C80100

11NECKUP00SHFOXA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-367.51 N at 60.96 ms

**Max. Value**  
56.76 N at 182.24 ms

Time [ms]

B-17

070925



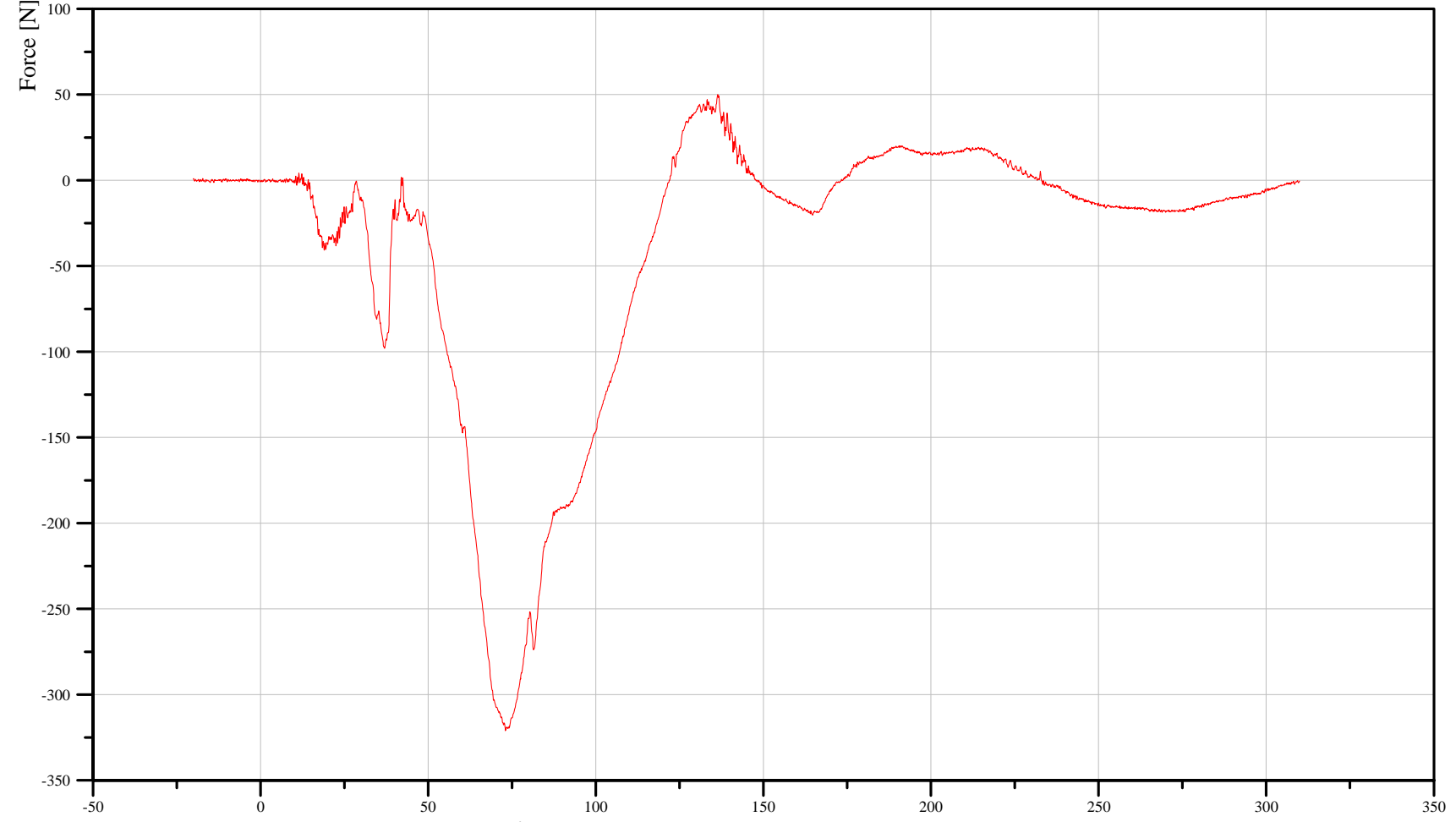
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER NECK Y-AXIS SHEAR FORCE Time: 14:40

Customer: NHTSA  
Test Number: C80100

11NECKUP00SHFOYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-321.08 N at 73.04 ms

**Max. Value**  
50.07 N at 136.40 ms

Time [ms]

B-18

070925



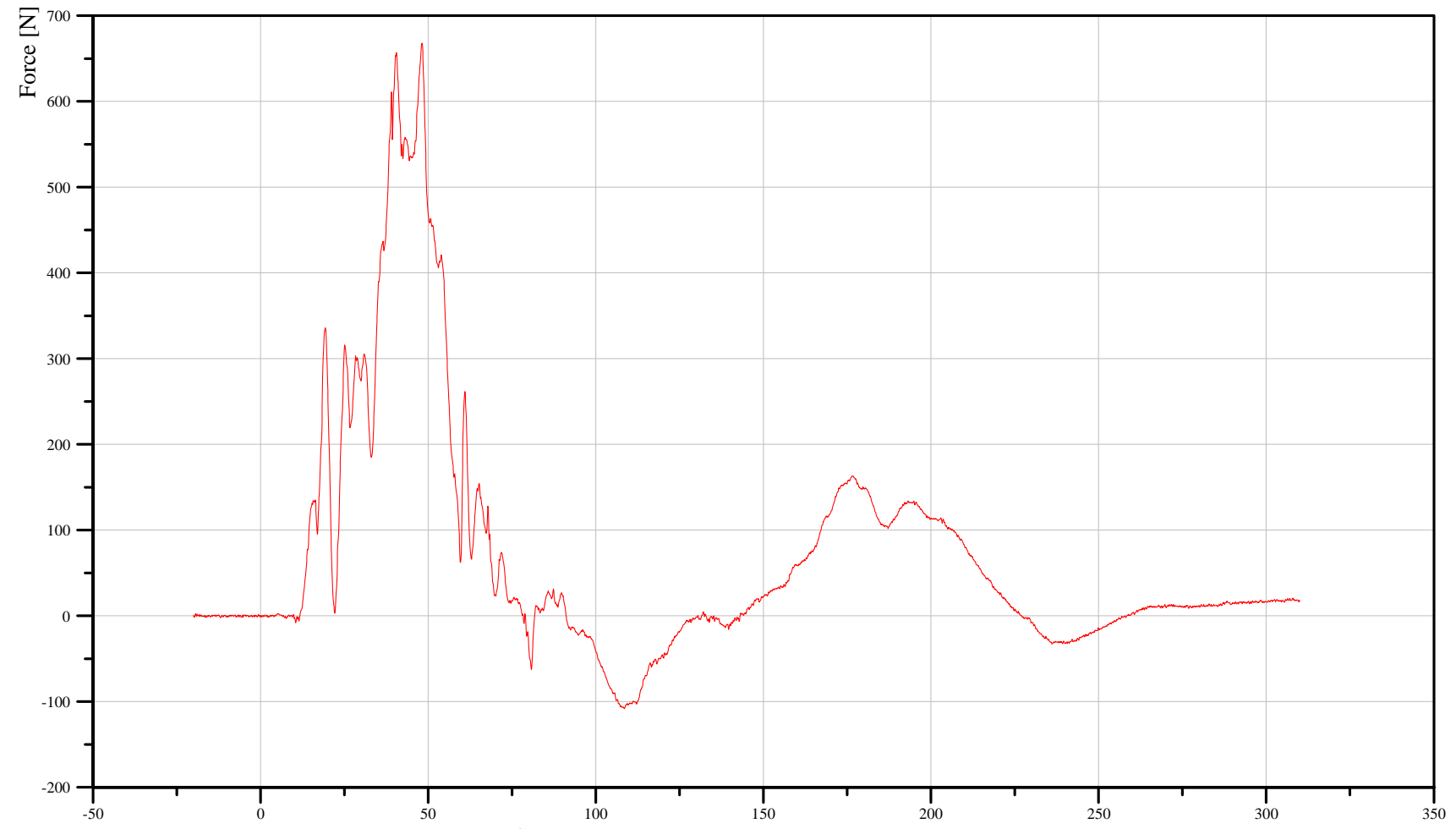
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER NECK Z-AXIS AXIAL FORCE Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 11NECKUP00SHFOZA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-107.92 N at 108.40 ms

**Max. Value**  
667.94 N at 48.16 ms

Time [ms]

B-19

070925



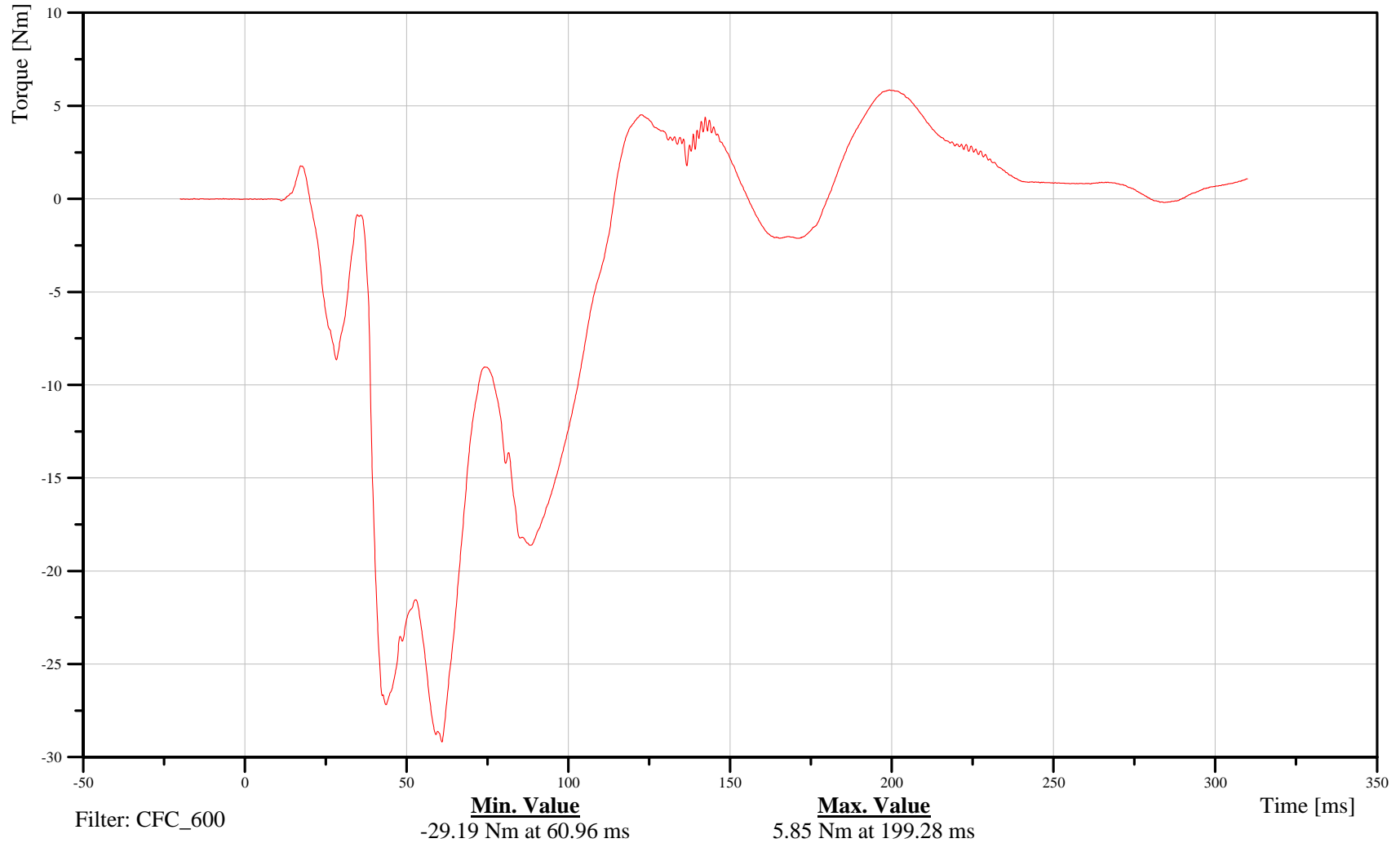
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER NECK MOMENT ABOUT X AXIS Time: 14:40

Customer: NHTSA  
Test Number: C80100

11NECKUP00SHMOXB

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-20

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

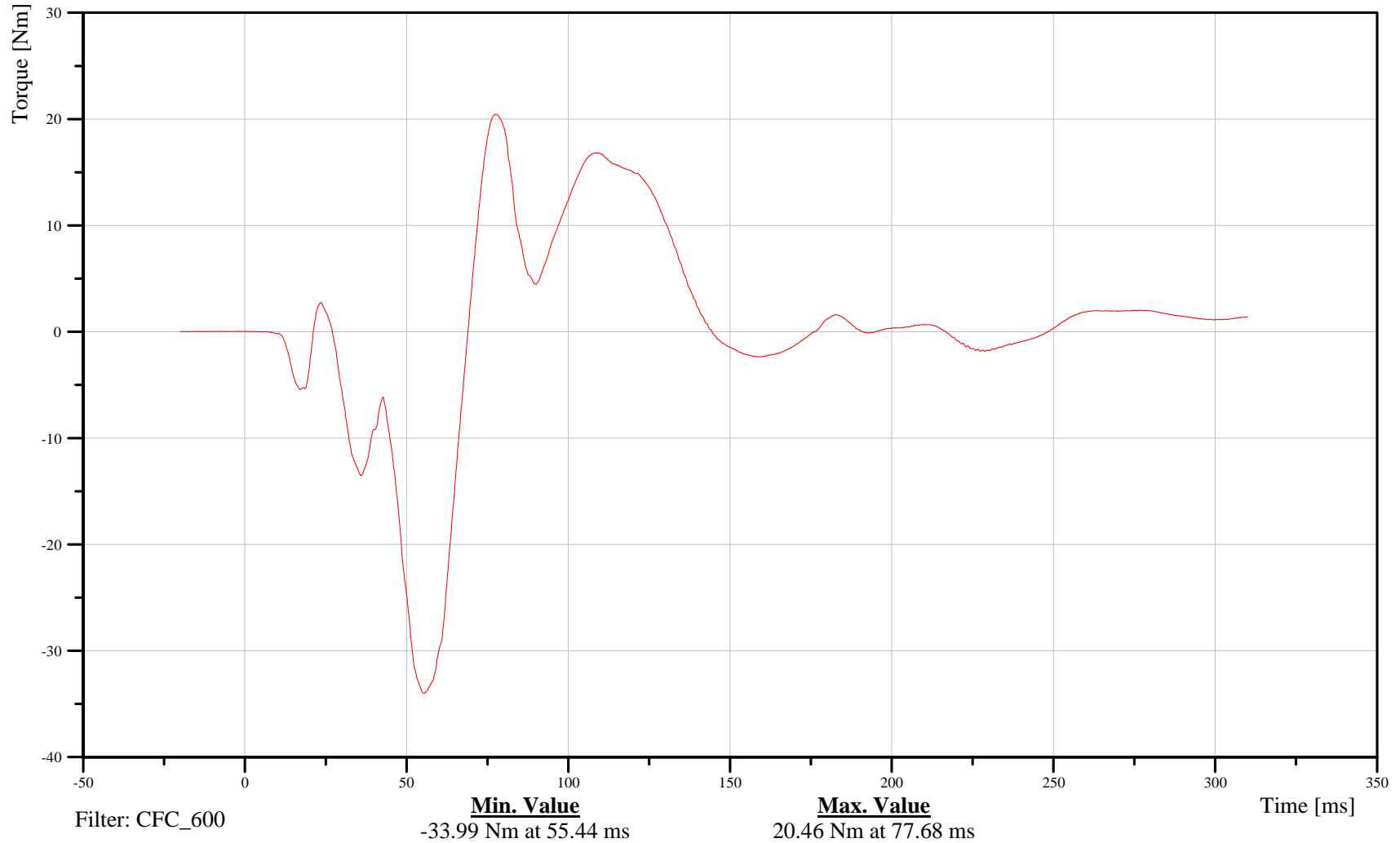
Time: 14:40

### DRIVER NECK MOMENT ABOUT Y AXIS

Customer: NHTSA  
Test Number: C80100

# 11NECKUP00SHMOYB

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-21

070925



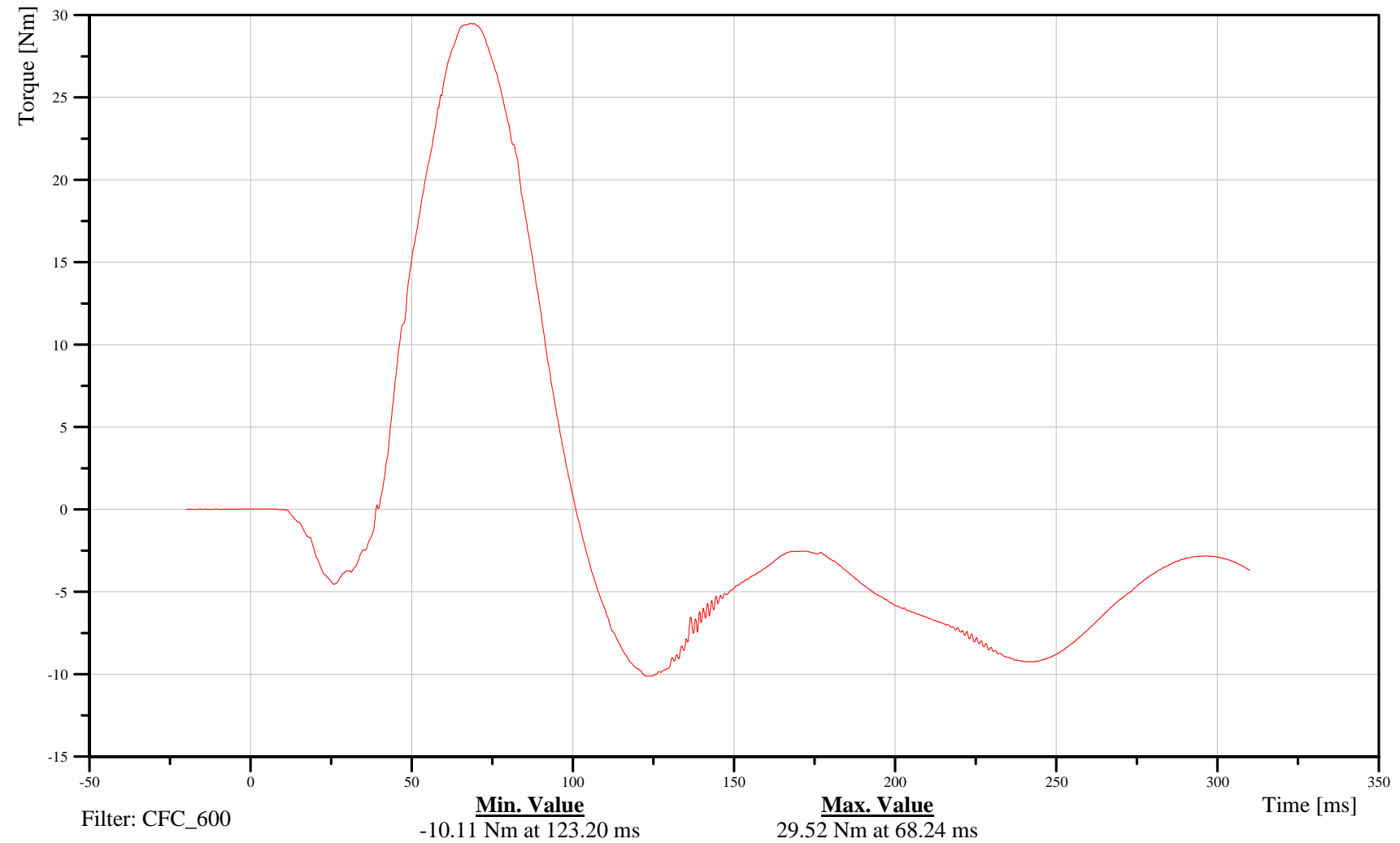
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER NECK MOMENT ABOUT Z AXIS Time: 14:40

Customer: NHTSA  
Test Number: C80100

11NECKUP00SHMOZB

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-22

070925



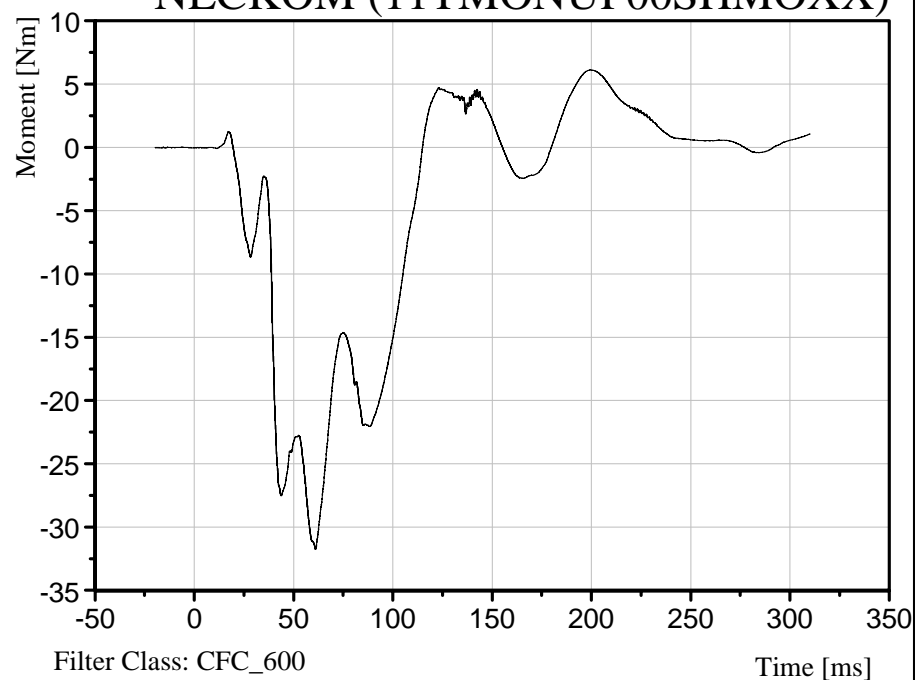
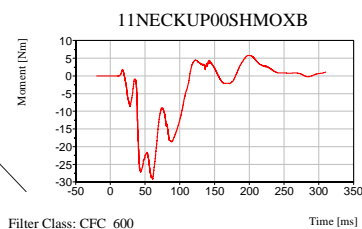
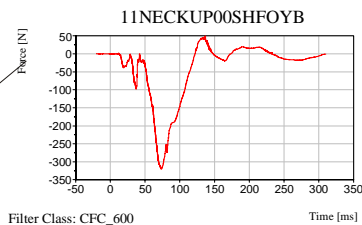
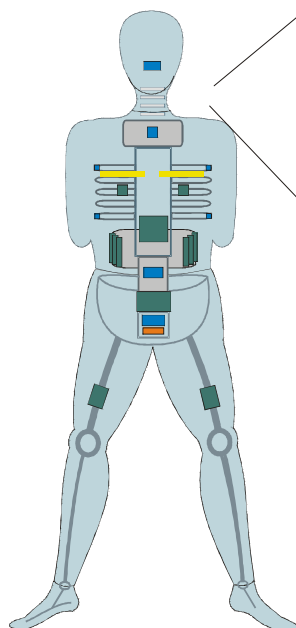
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue  
 Neck Moment about the Occipital Condyle (NECK OM) Date: 09/25/2007  
Time: 14:40

Customer: NHTSA  
 Test Number: C80100

TRC Inc. Test Lab: CTF  
 Test Number: 070925

Test Orientation = Side

NECKOM (11TMONUP00SHMOXX)



[Max.] 6.13 Nm at 199.36 ms

[Min.] -31.75 Nm at 60.96 ms

Dummy: HIII/SID  
 Seating Position:  
 Driver

Neck OM Source Code:  $M_x + (D * F_y)$

B-23

070925



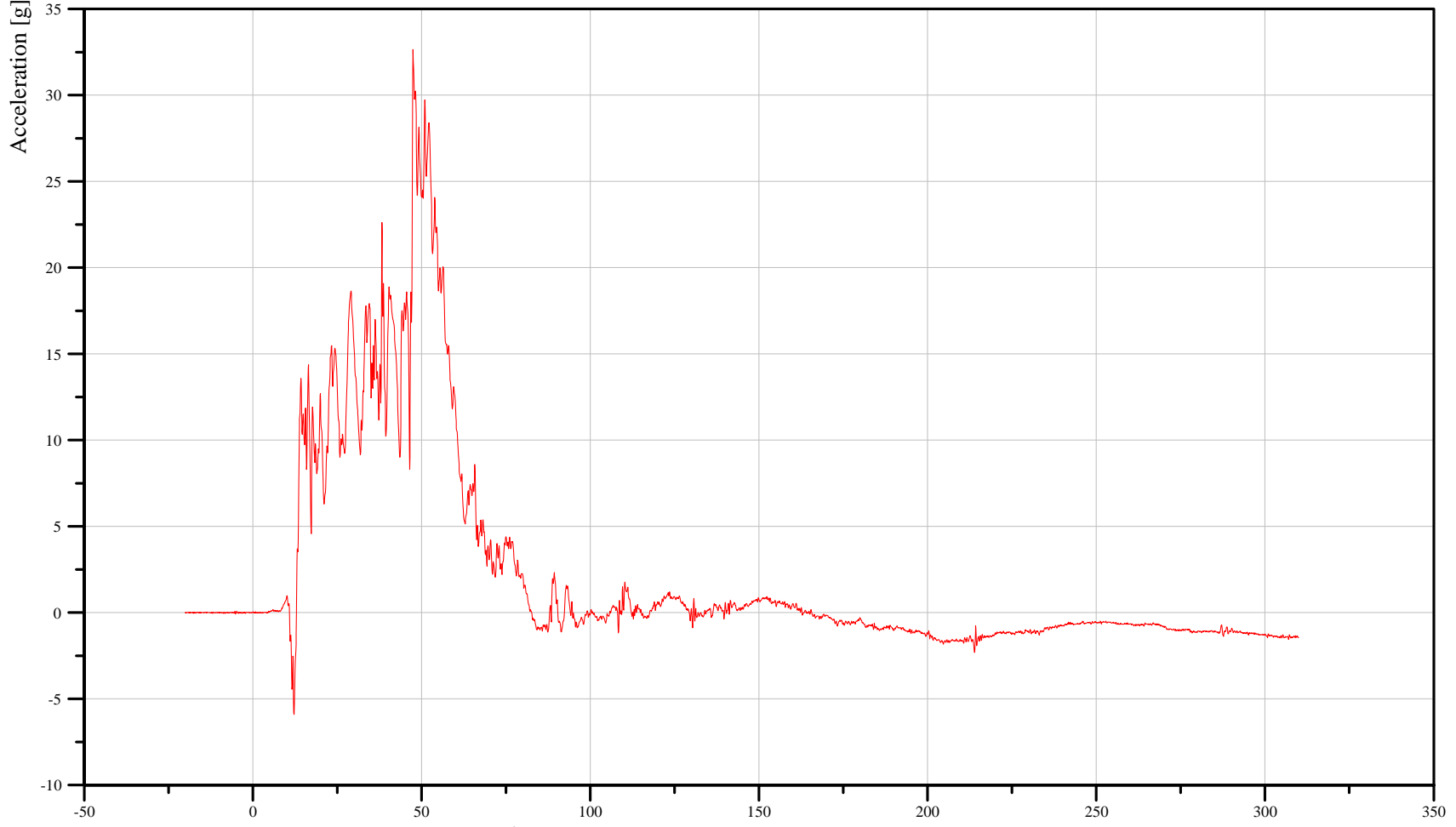
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER UPPER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLU00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

Min. Value  
-5.90 g at 12.24 ms

Max. Value  
32.65 g at 47.44 ms

B-24

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

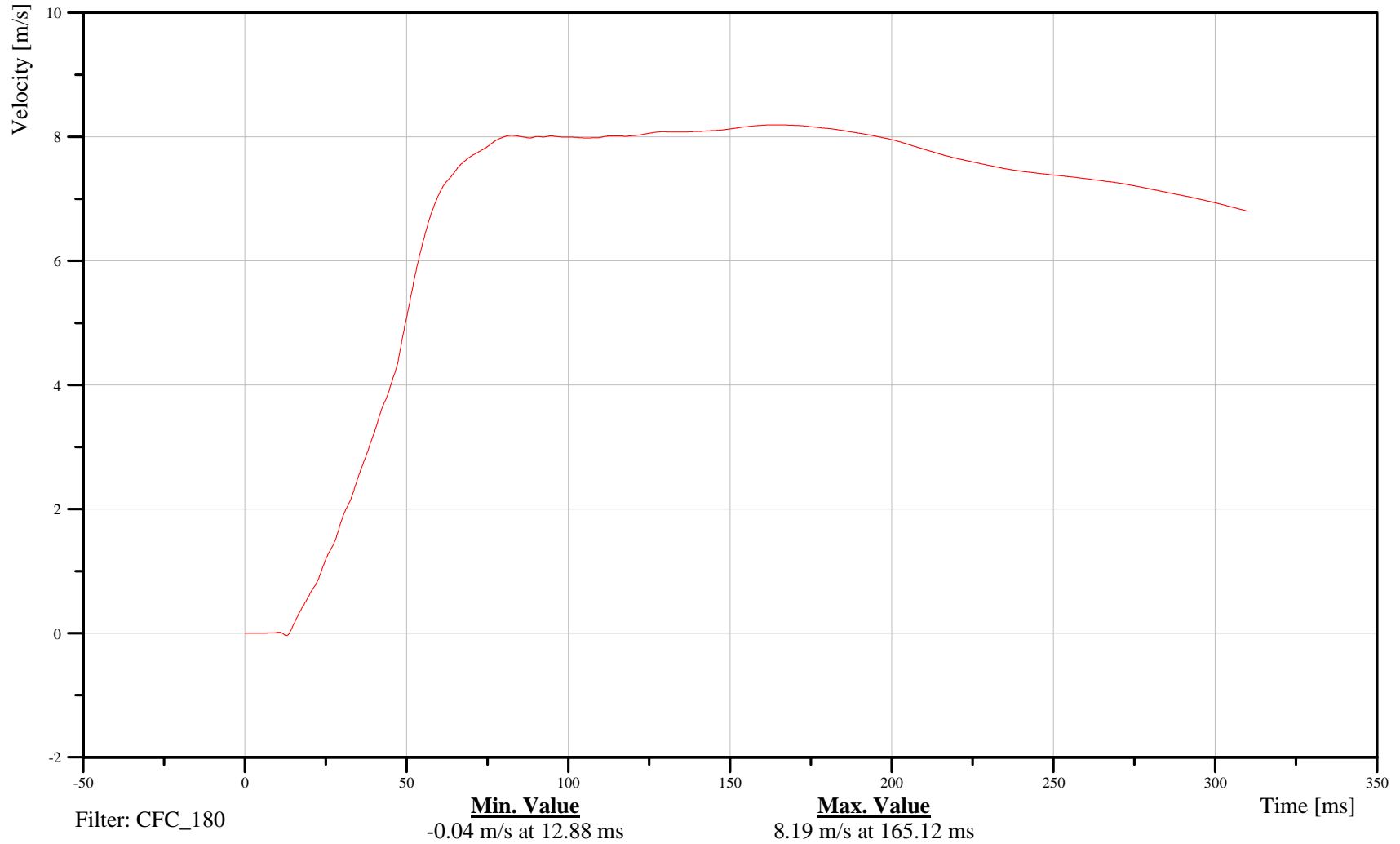
Time: 14:40

DRIVER UPPER RIB Y-AXIS VELOCITY

Customer: NHTSA  
Test Number: C80100

11RIBSLU00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-25

070925



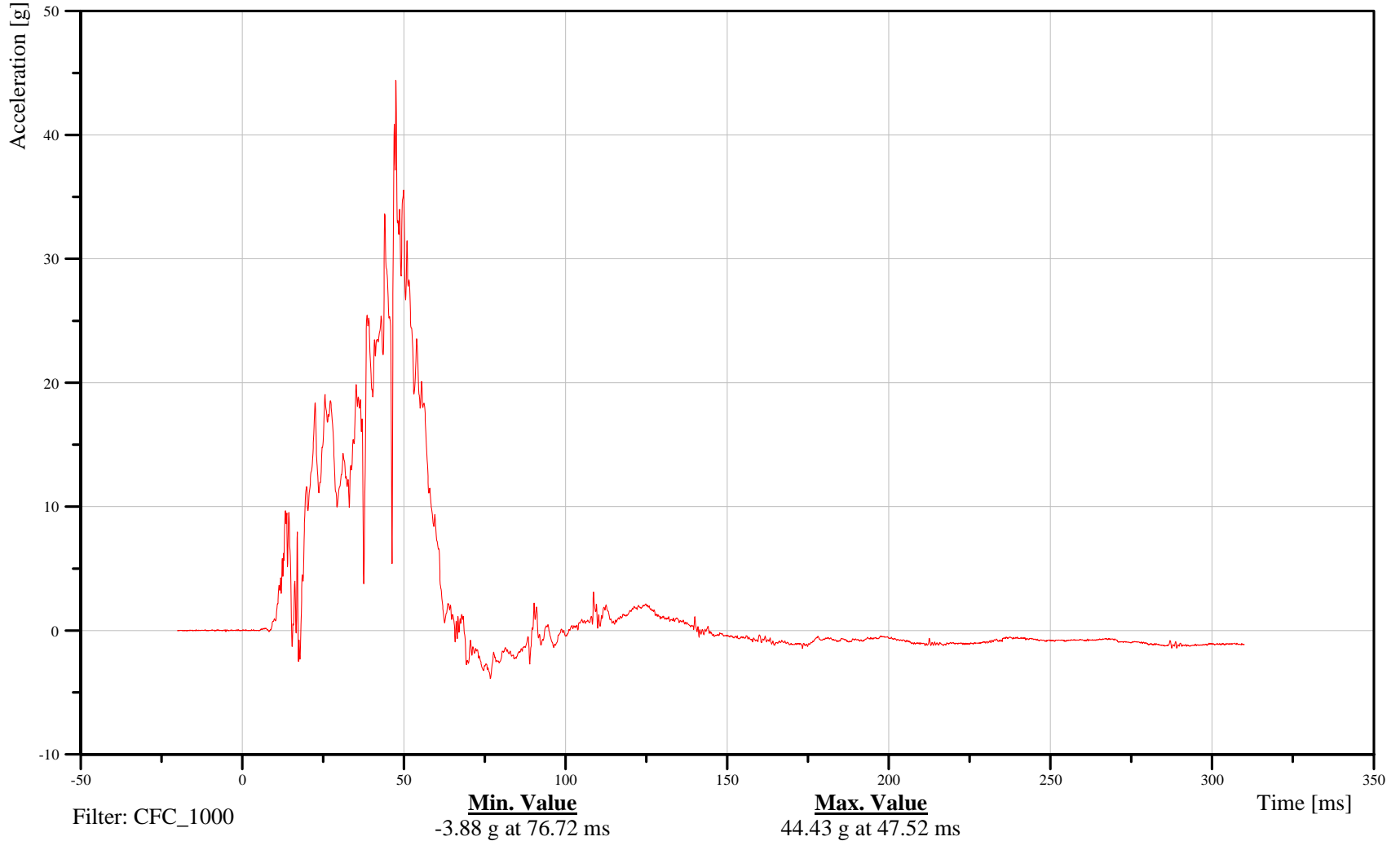
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLL00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-26

070925



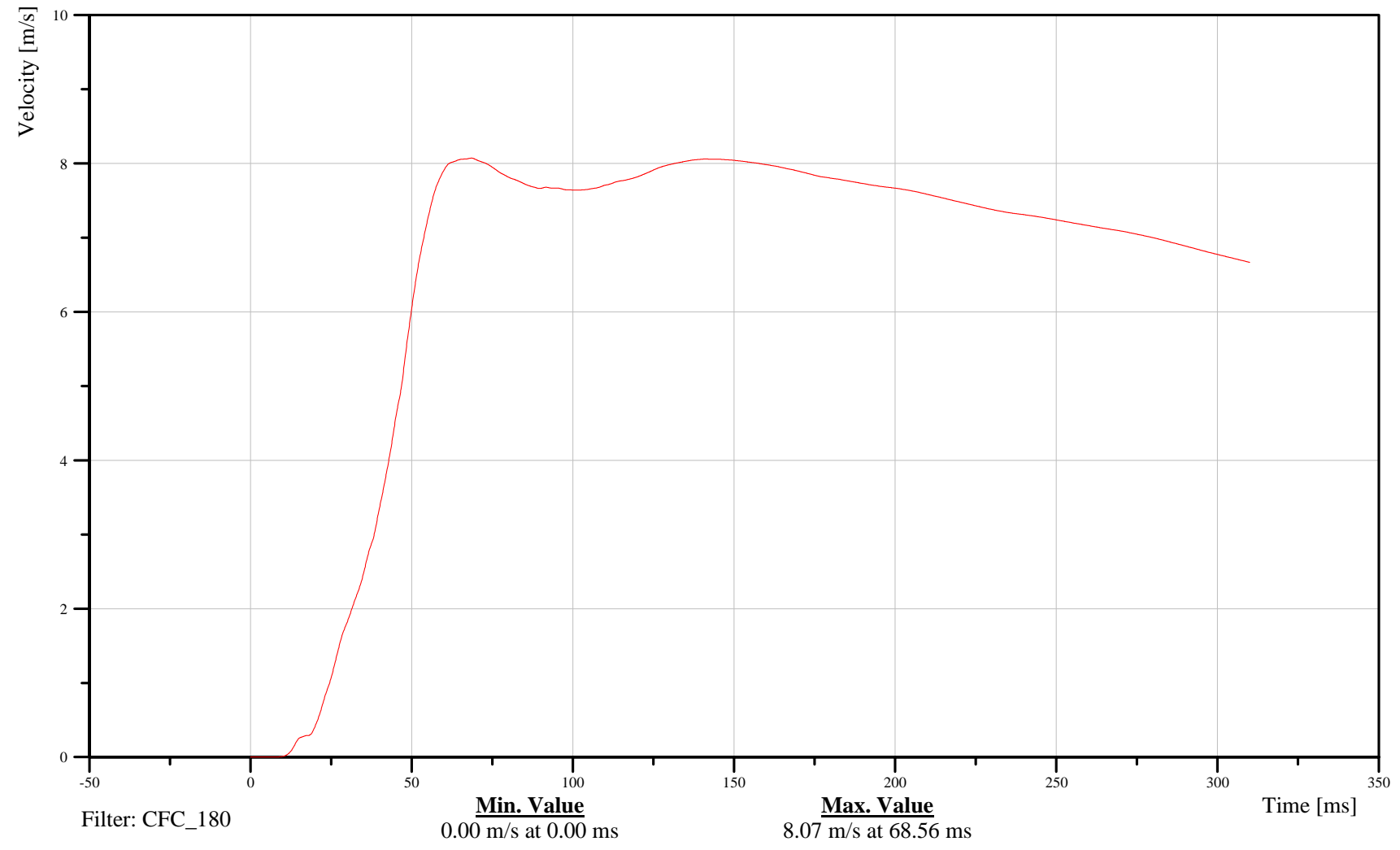
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER RIB Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLL00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-27

070925



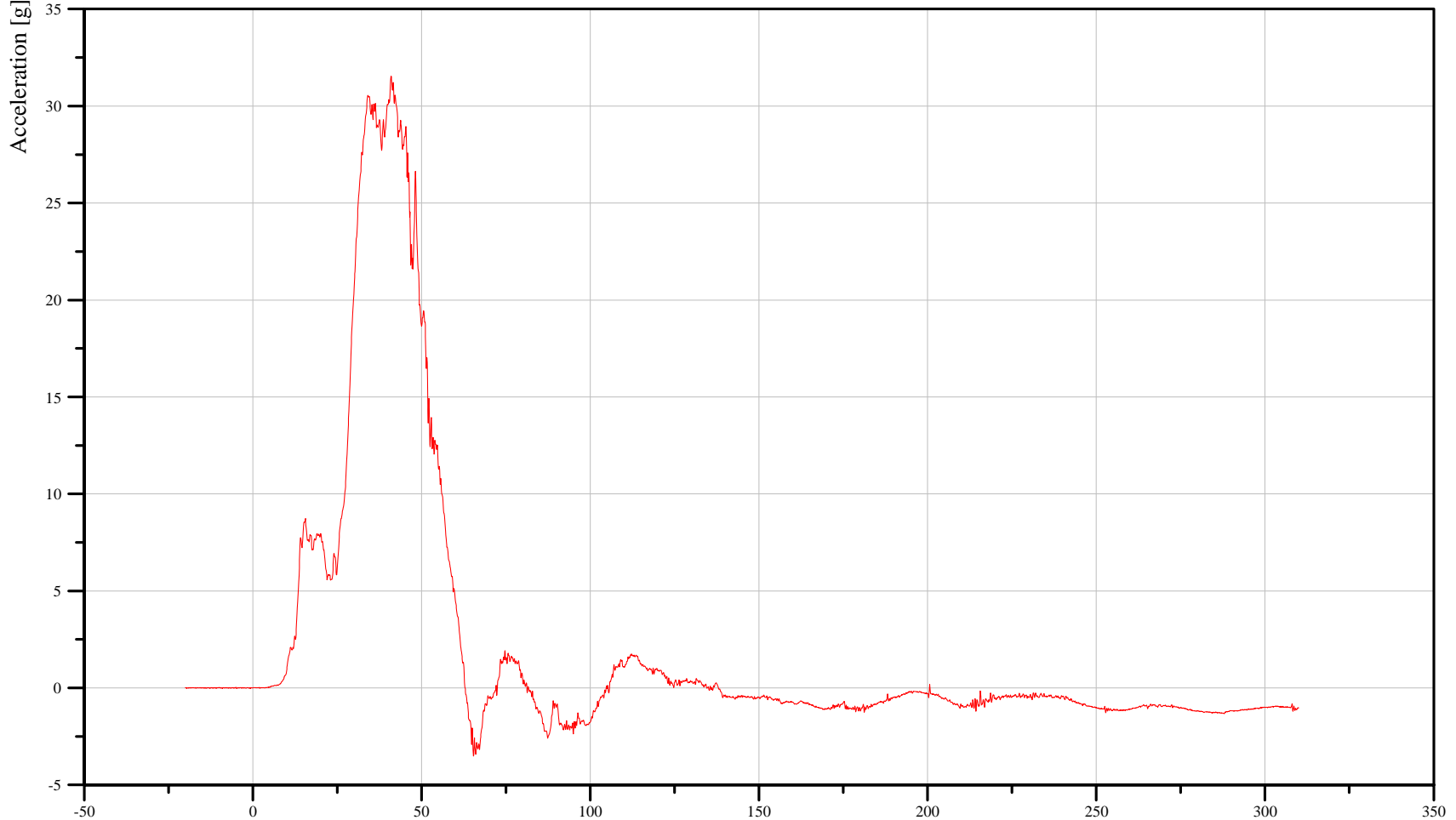
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER SPINE Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SPIN1200SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-3.51 g at 65.36 ms

**Max. Value**  
31.54 g at 40.96 ms

Time [ms]

B-28

070925



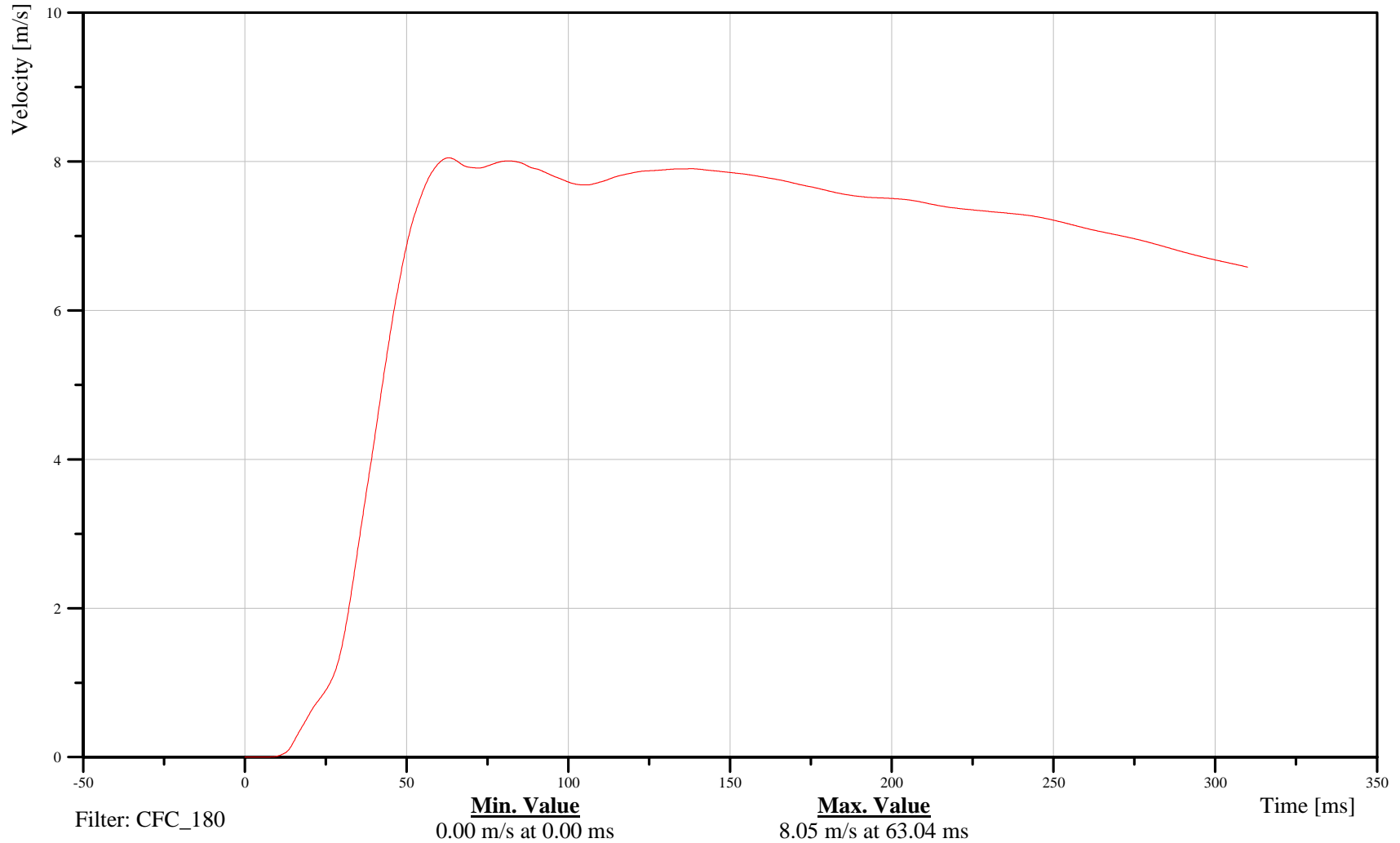
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER SPINE Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SPIN1200SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-29

070925



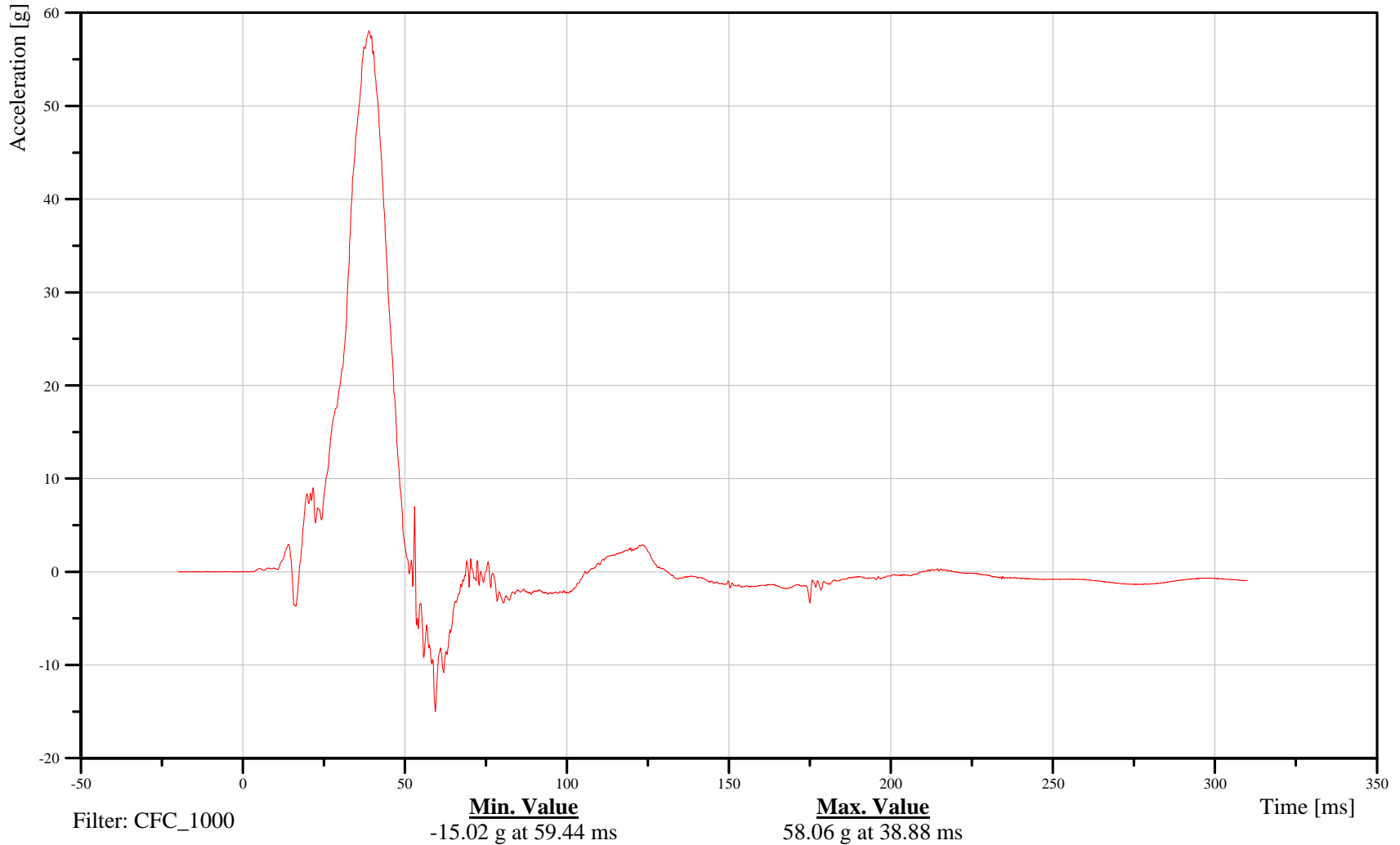
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER PELVIS Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11PELVCG00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-30

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

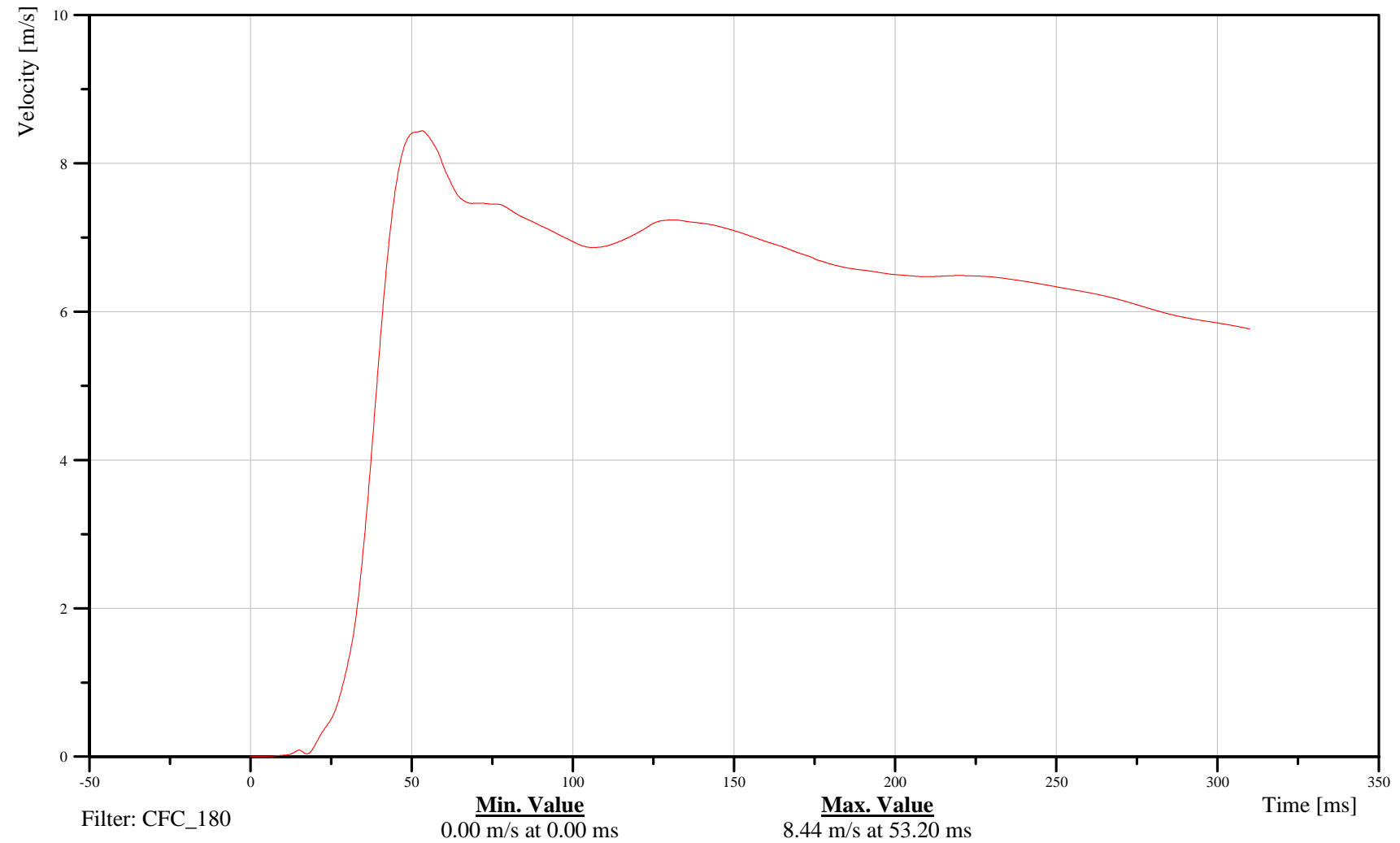
DRIVER PELVIS Y-AXIS VELOCITY

Time: 14:40

Customer: NHTSA  
Test Number: C80100

11PELVCG00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-31

070925



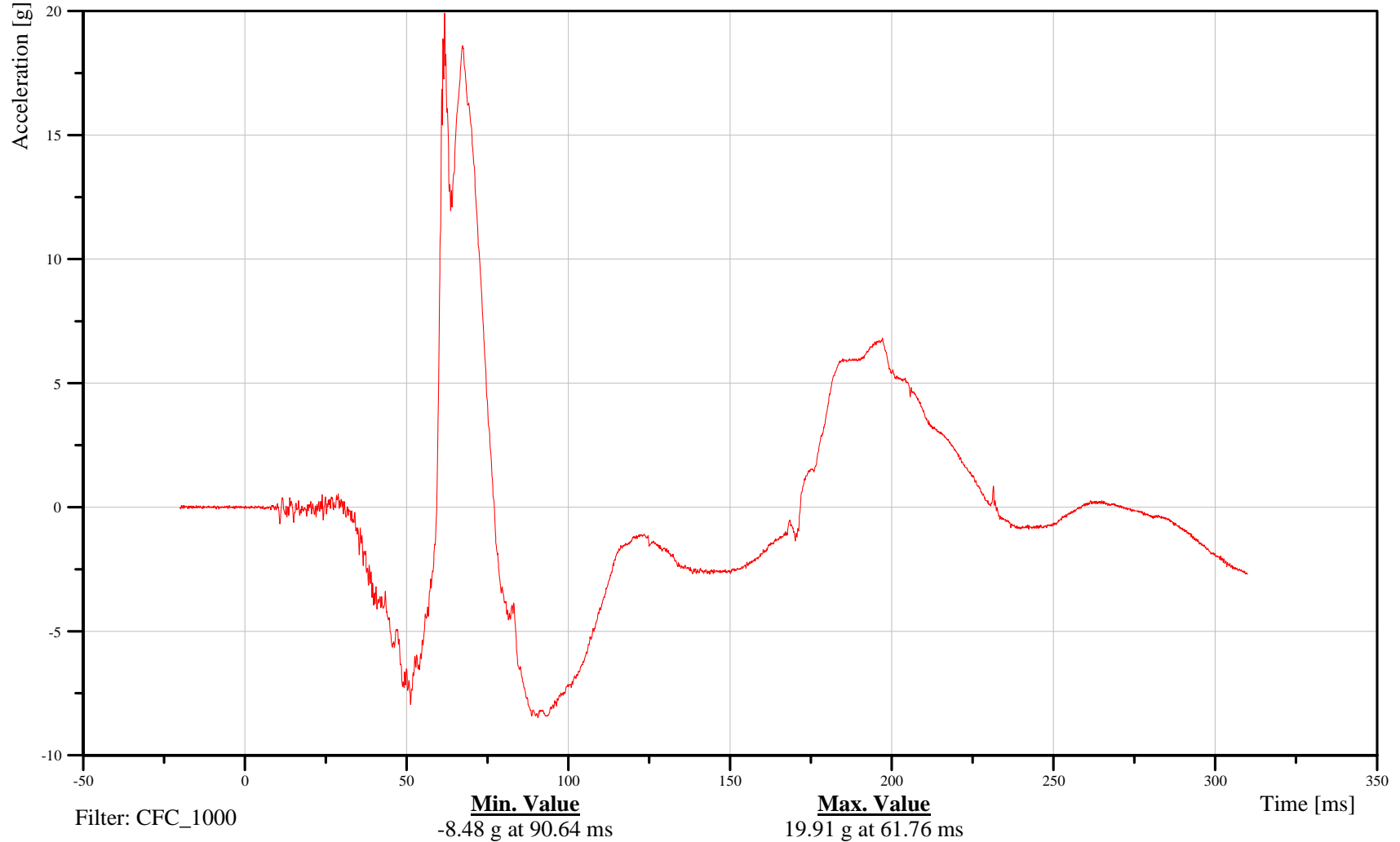
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14HEADCG00SHACXA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-32

070925



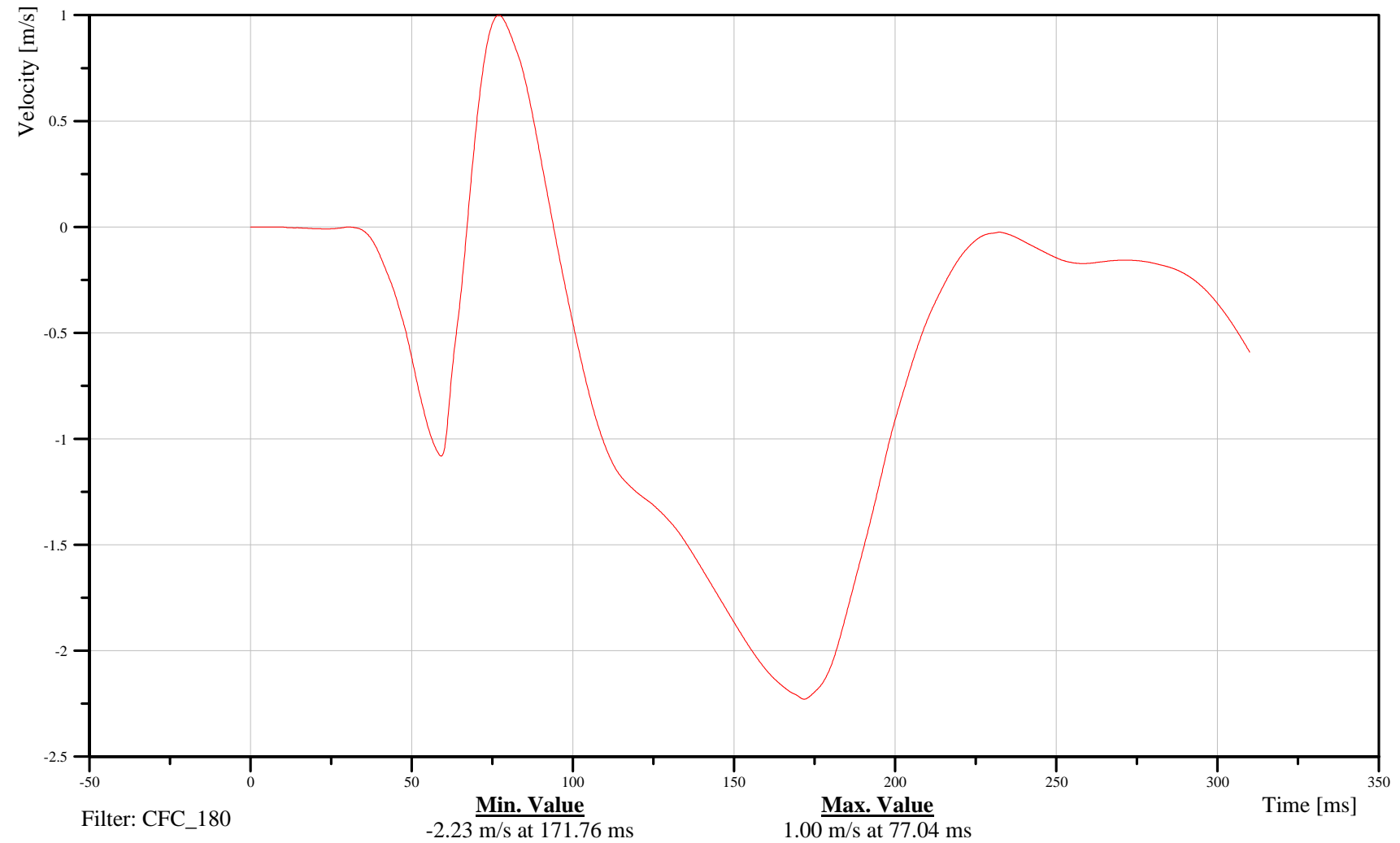
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD X-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14HEADCG00SHVEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-33

070925



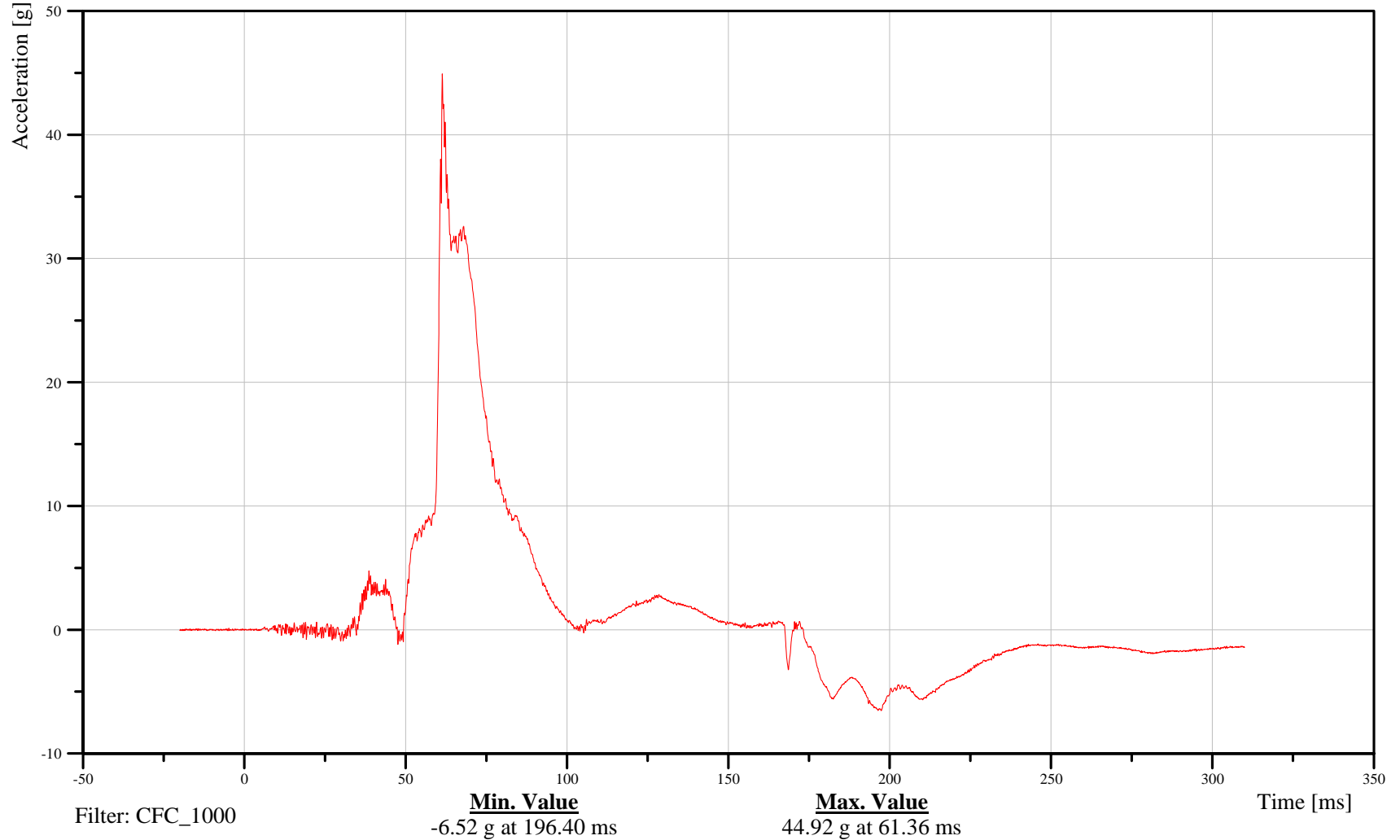
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14HEADCG00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-34

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

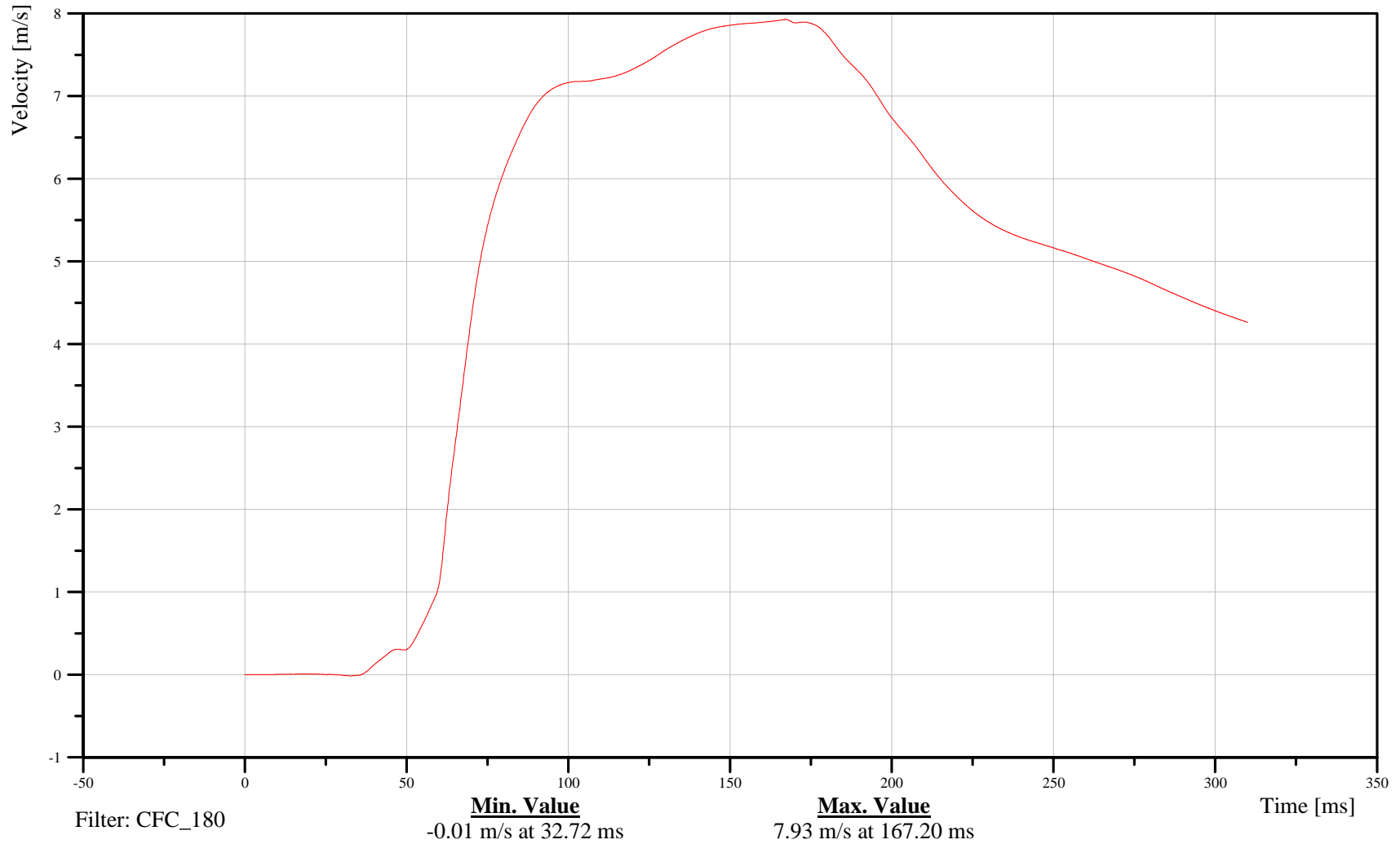
Time: 14:40

LEFT REAR PASSENGER HEAD Y-AXIS VELOCITY

Customer: NHTSA  
Test Number: C80100

14HEADCG00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-35

070925



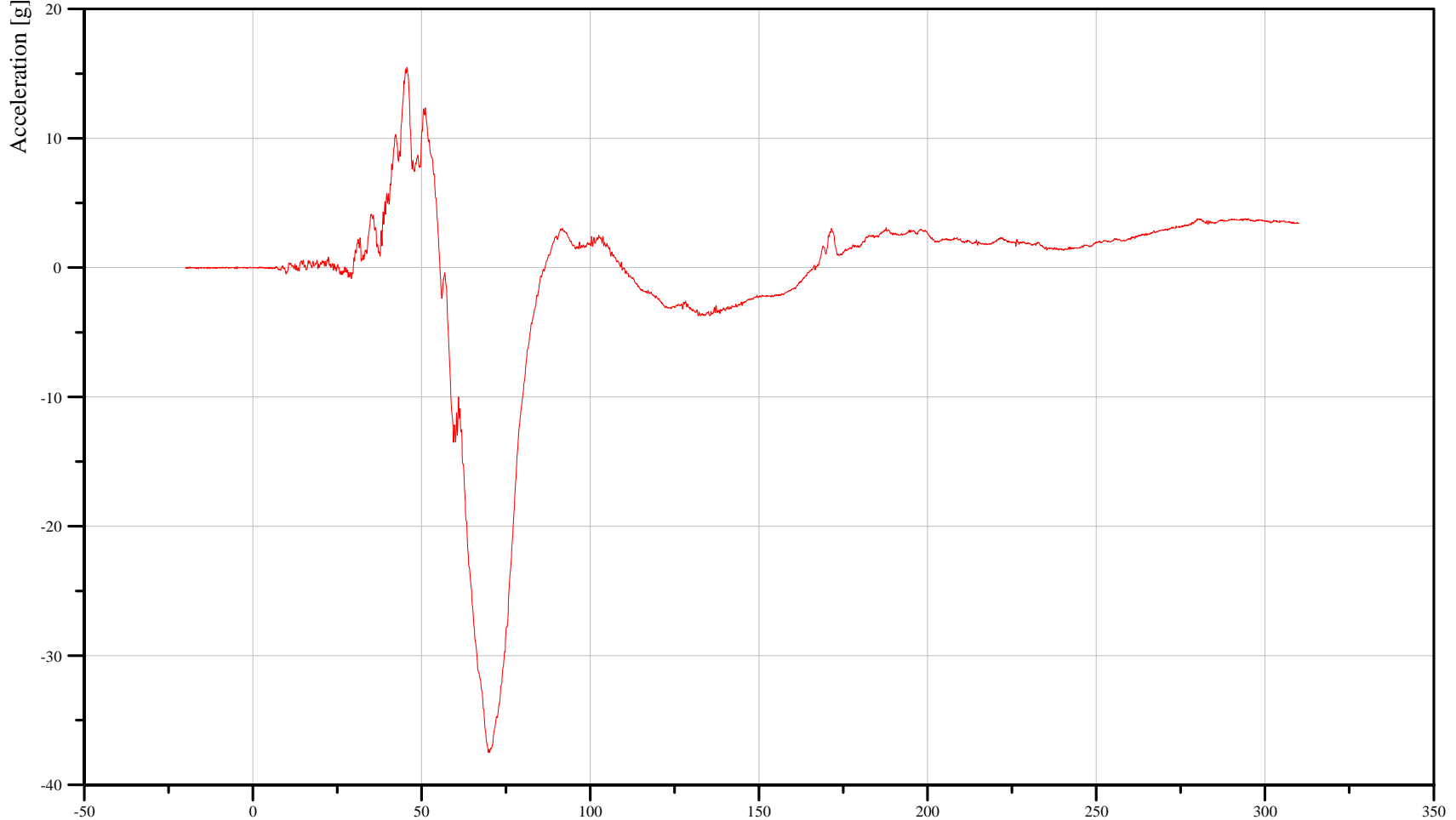
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14HEADCG00SHACZA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-37.49 g at 69.84 ms

**Max. Value**  
15.48 g at 45.68 ms

Time [ms]

B-36

070925



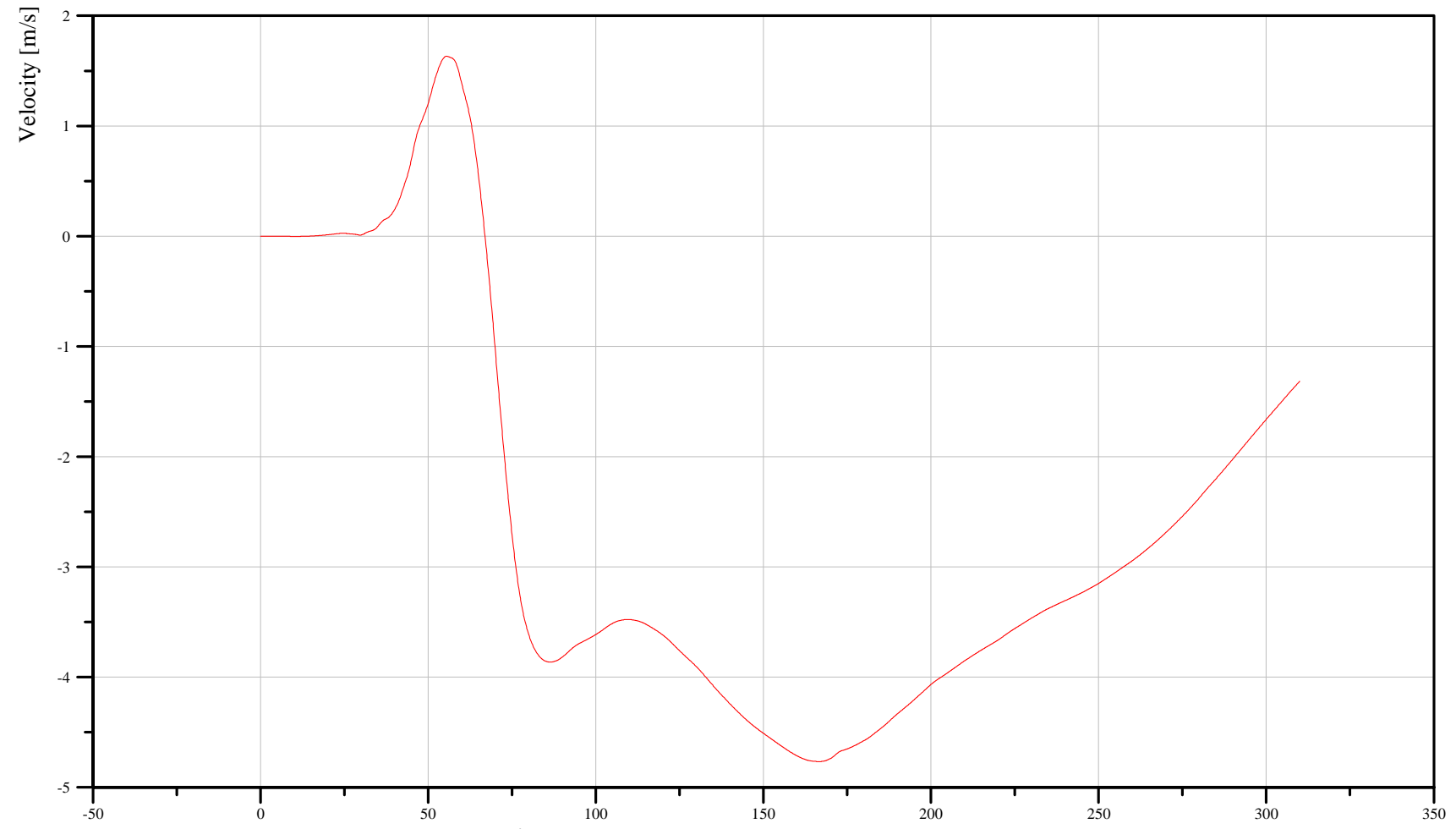
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD Z-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14HEADCG00SHVEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-4.77 m/s at 166.56 ms

**Max. Value**  
1.63 m/s at 55.52 ms

Time [ms]

B-37

070925



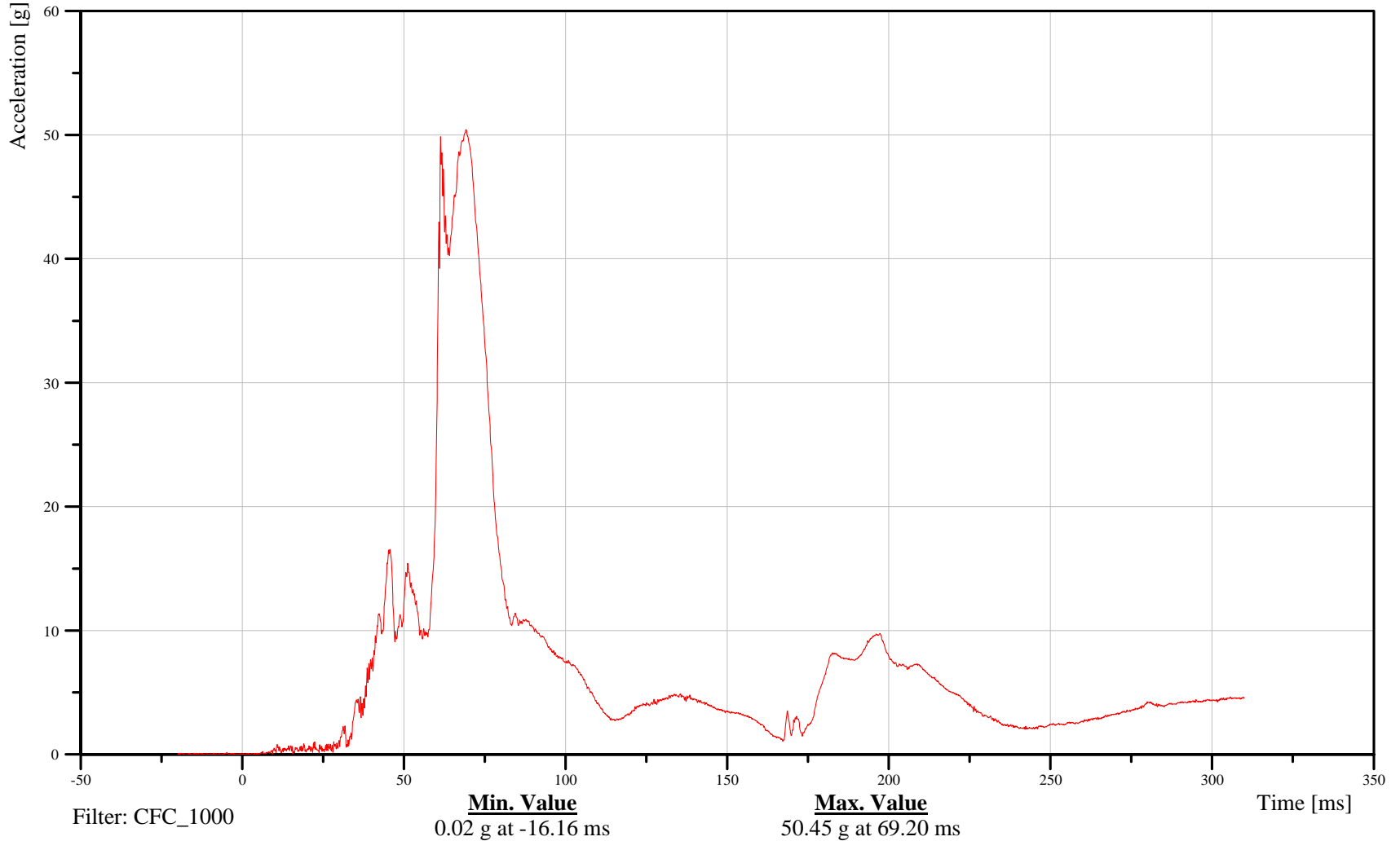
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14HEADCG00SHACRA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-38

070925



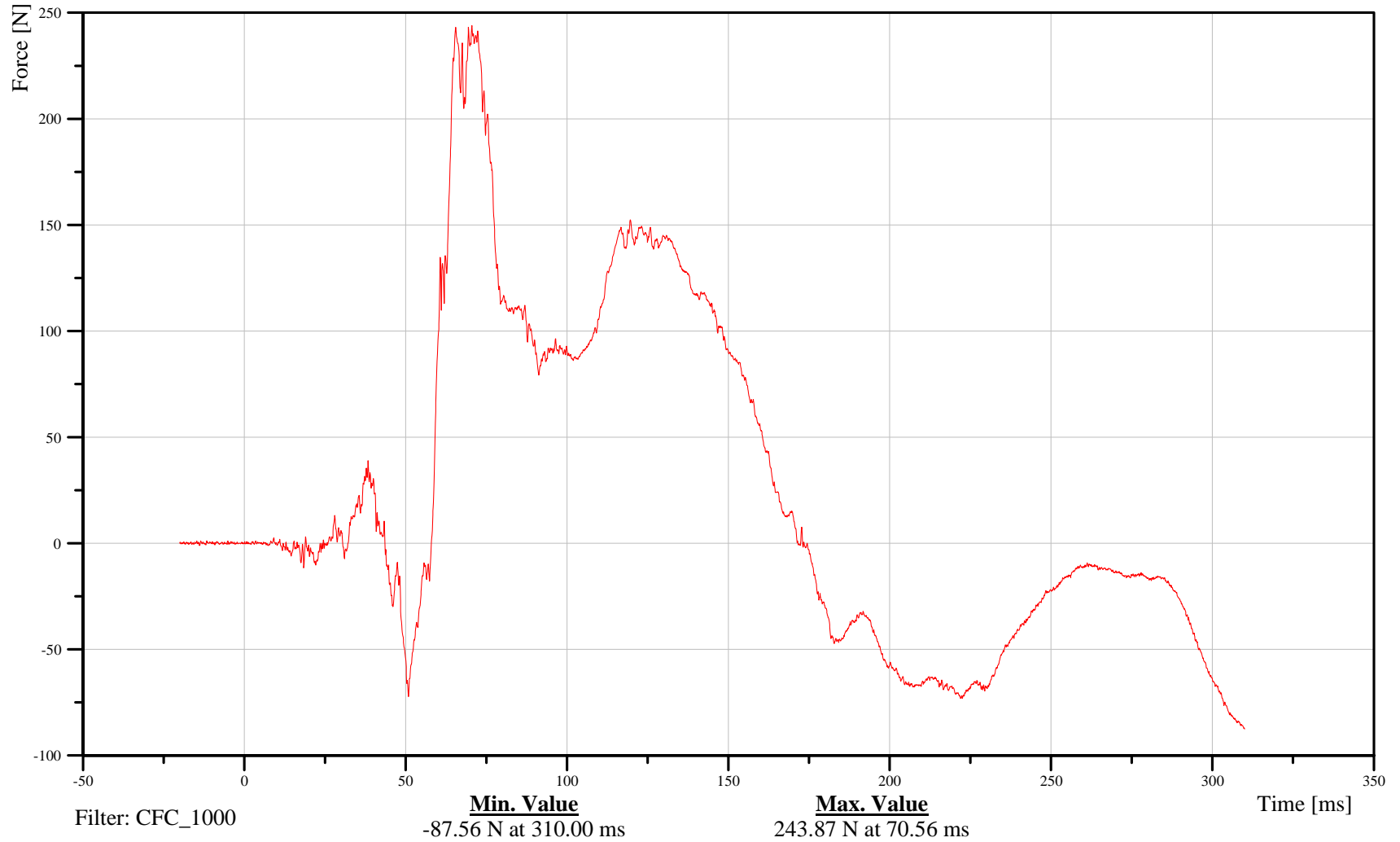
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER NECK X-AXIS SHEAR FORCE Time: 14:40

Customer: NHTSA  
Test Number: C80100

14NECKUP00SHFOXA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-39

070925



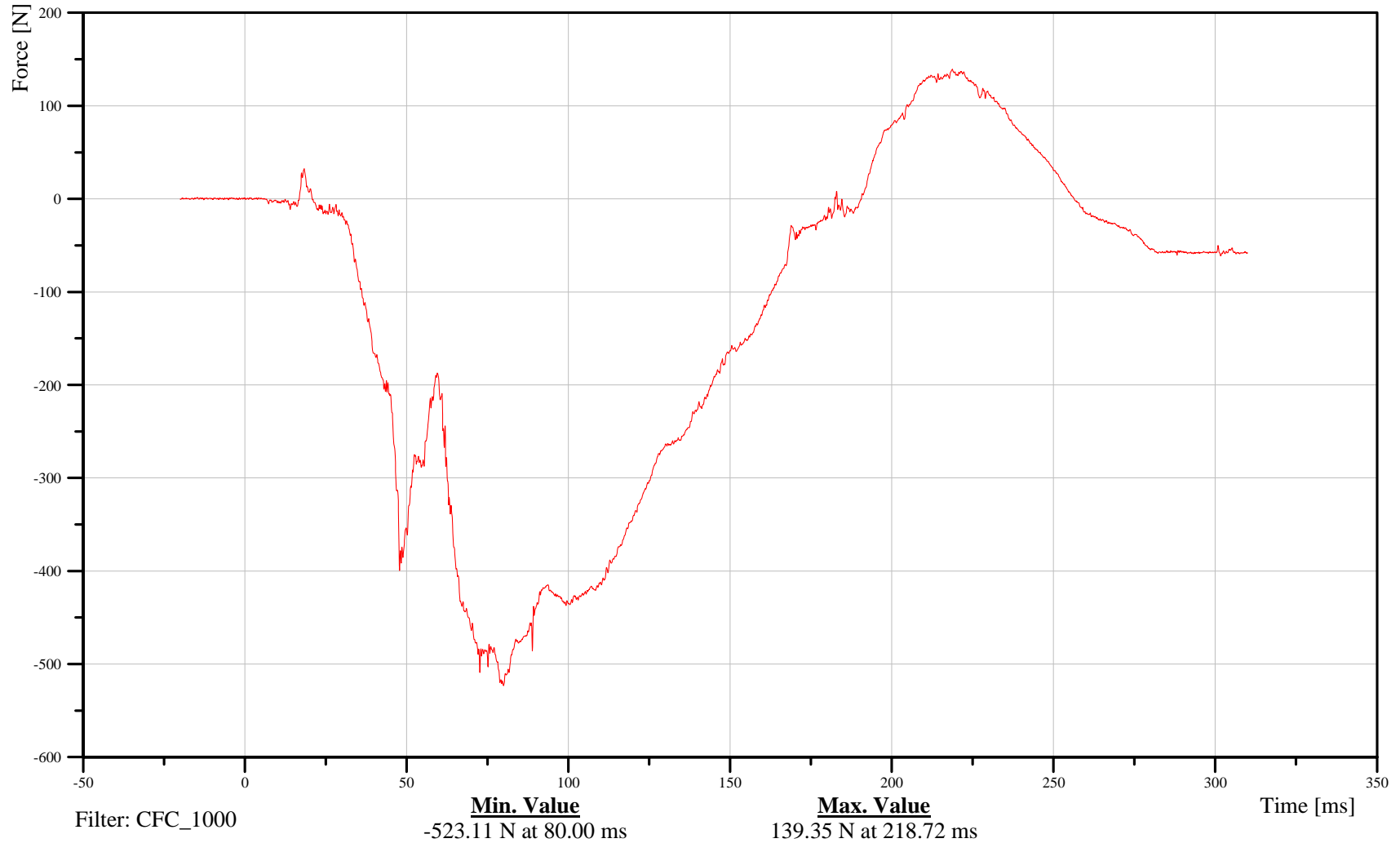
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER NECK Y-AXIS SHEAR FORCE Time: 14:40

Customer: NHTSA  
Test Number: C80100

14NECKUP00SHFOYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-40

070925



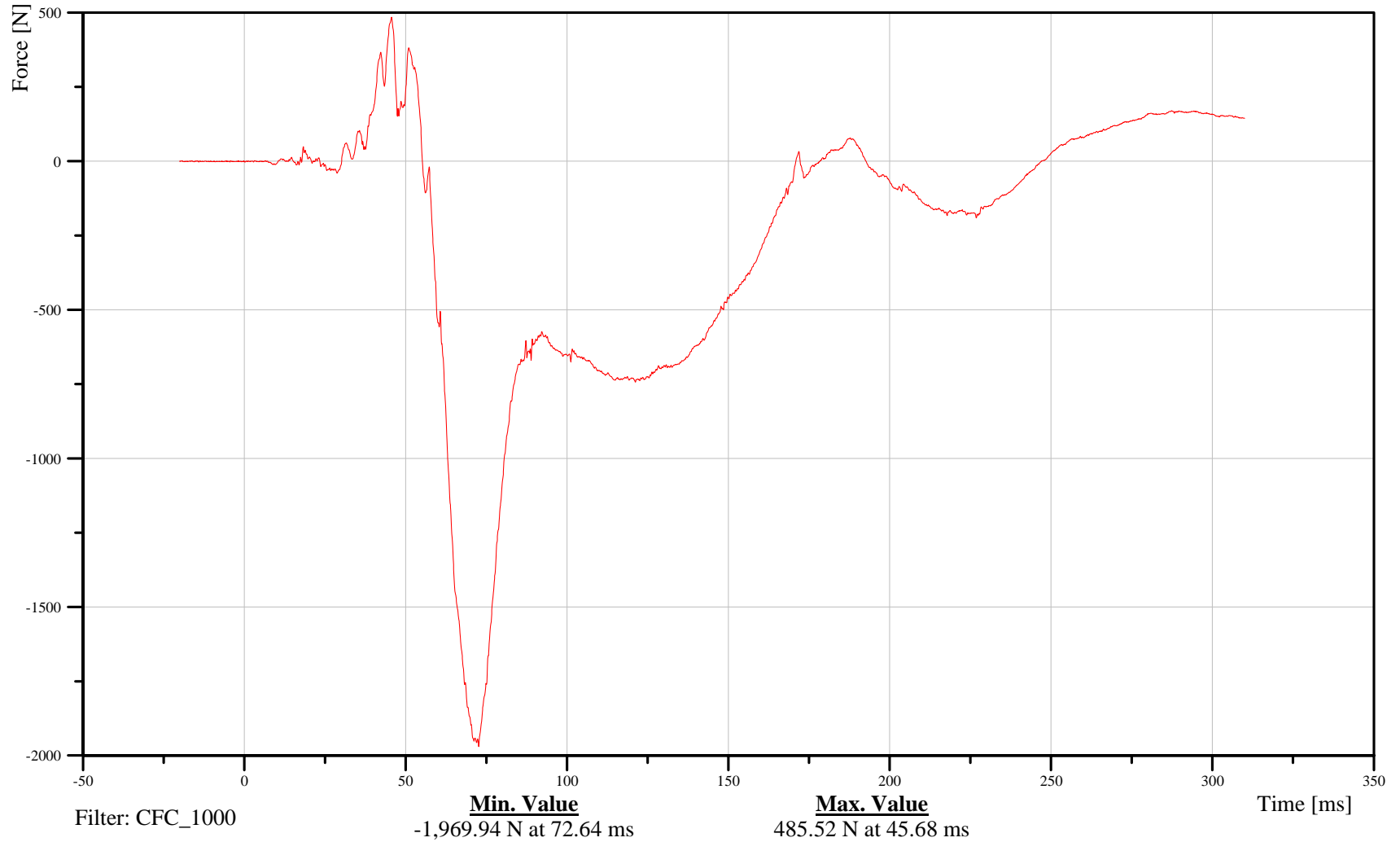
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER NECK Z-AXIS AXIAL FORCE Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14NECKUP00SHFOZA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-41

070925



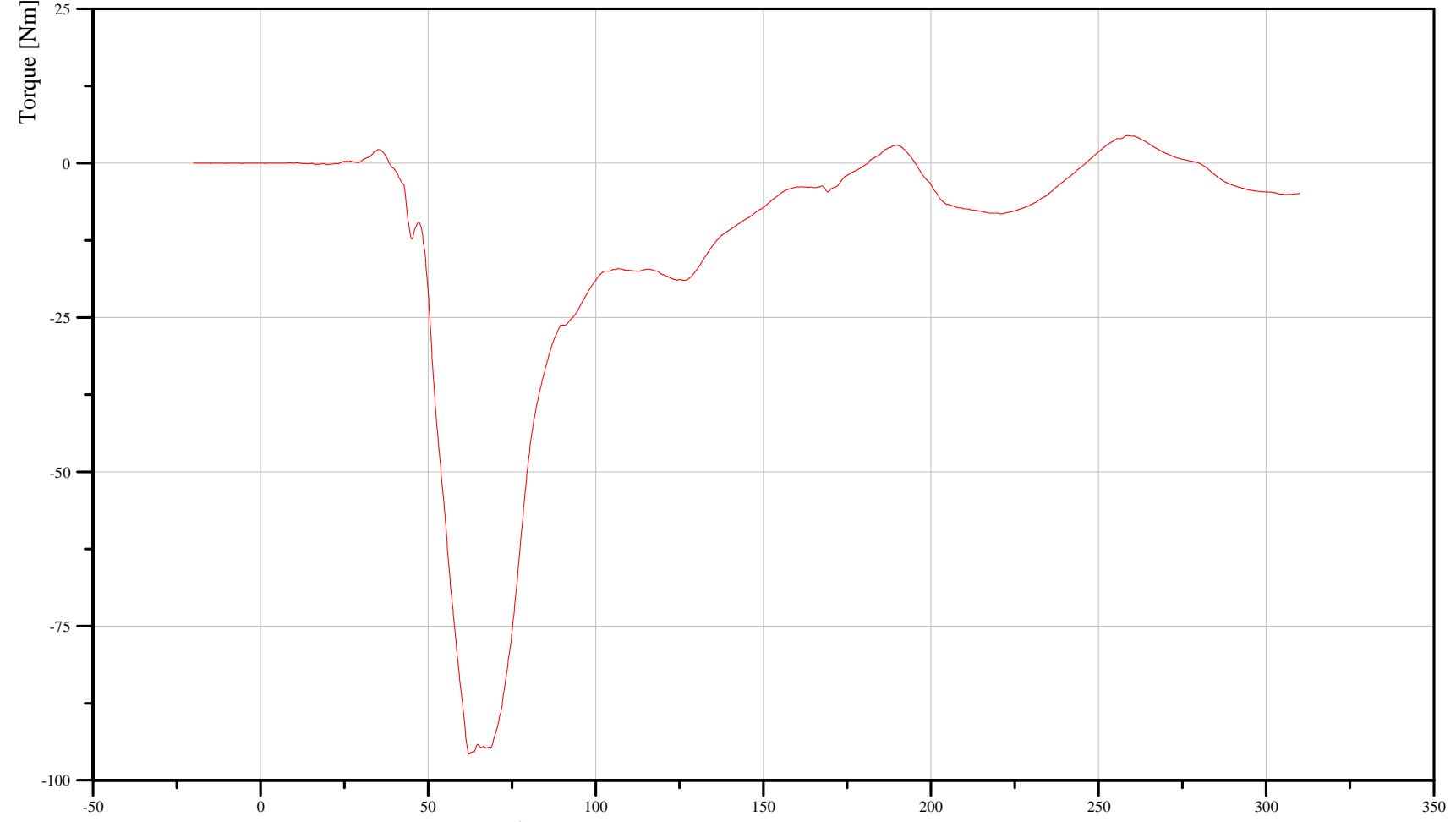
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER NECK MOMENT ABOUT X AXIS Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14NECKUP00SHMOXB

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_600

**Min. Value**  
-95.73 Nm at 62.32 ms

**Max. Value**  
4.49 Nm at 258.72 ms

Time [ms]

B-42

070925



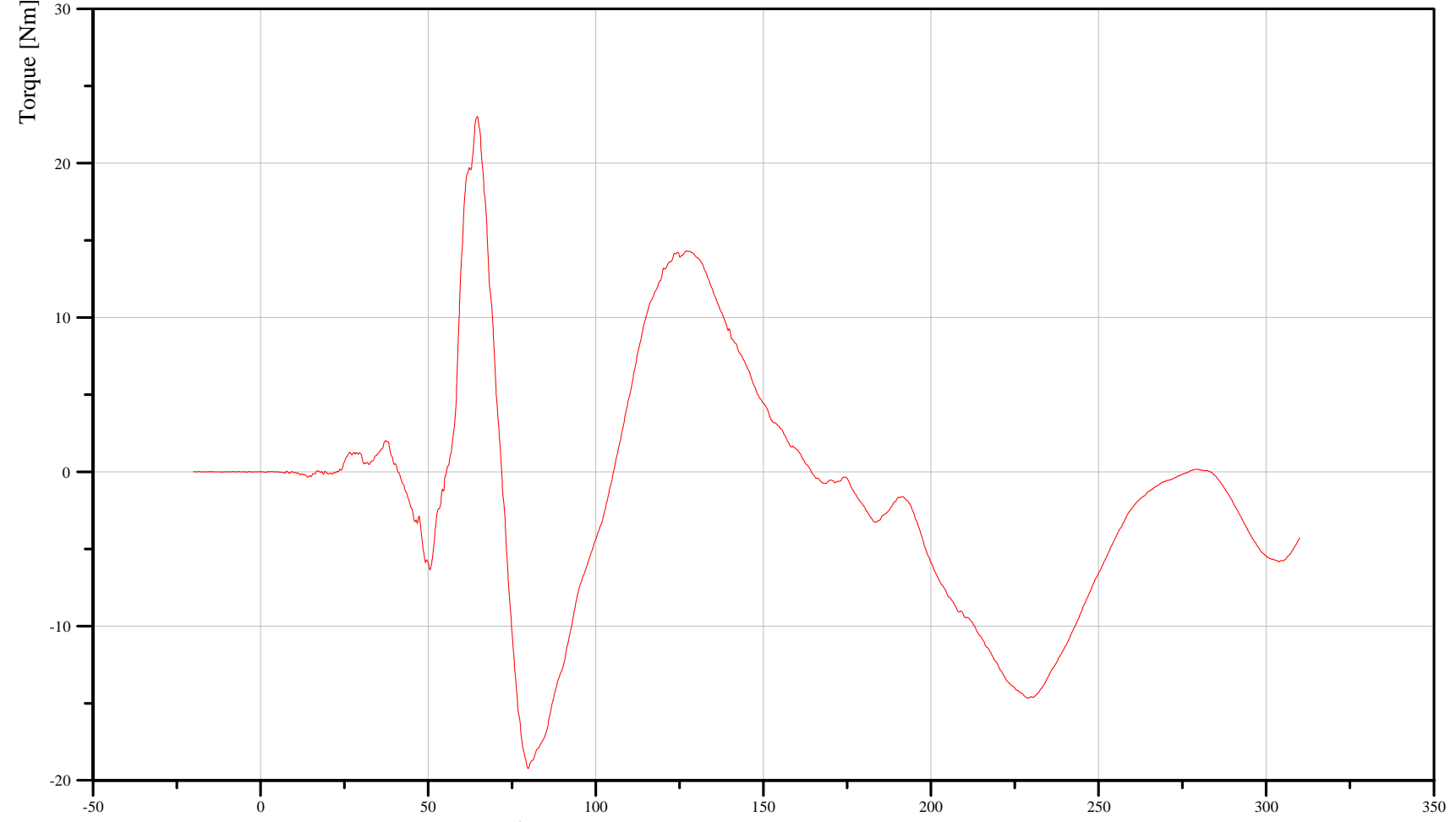
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER NECK MOMENT ABOUT Y AXIS Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14NECKUP00SHMOYB

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_600

**Min. Value**  
-19.23 Nm at 79.84 ms

**Max. Value**  
23.02 Nm at 64.64 ms

Time [ms]

B-43

070925



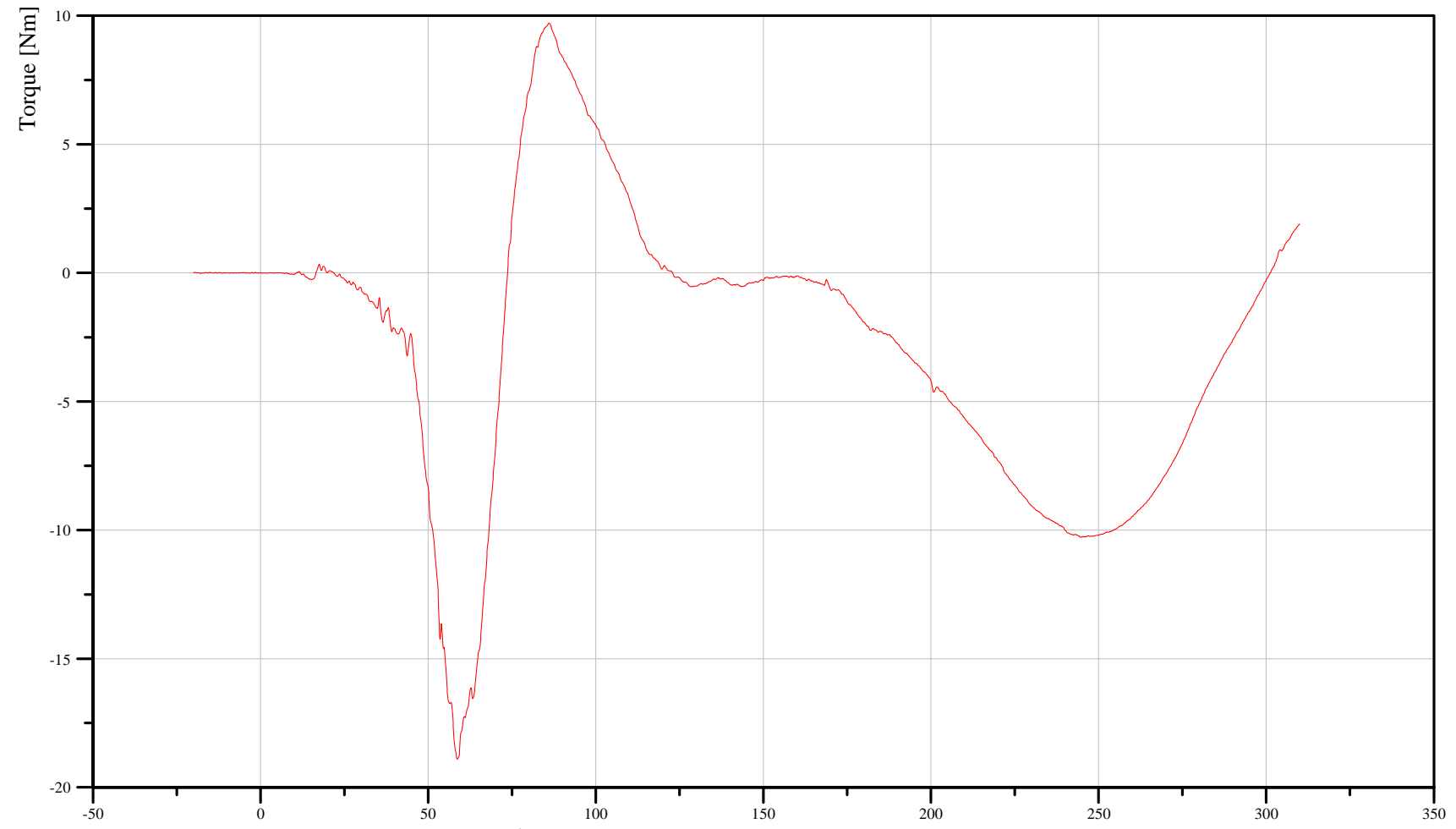
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER NECK MOMENT ABOUT Z AXIS Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14NECKUP00SHMOZB

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_600

**Min. Value**  
-18.90 Nm at 58.72 ms

**Max. Value**  
9.70 Nm at 86.08 ms

Time [ms]

B-44

070925



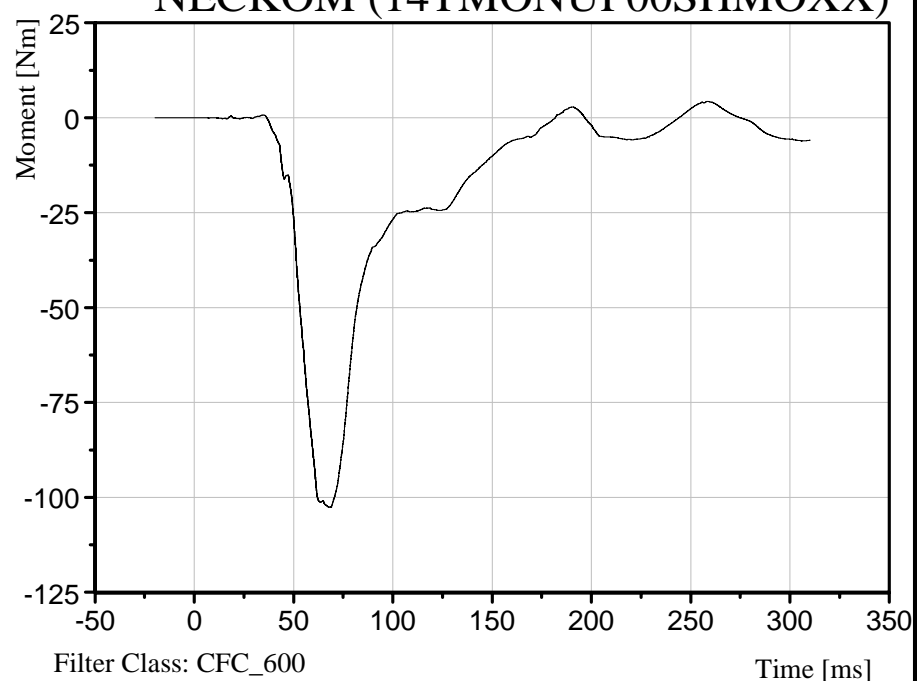
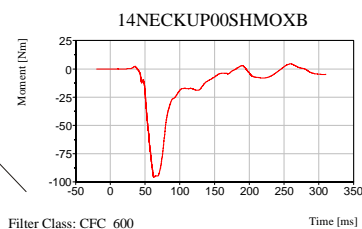
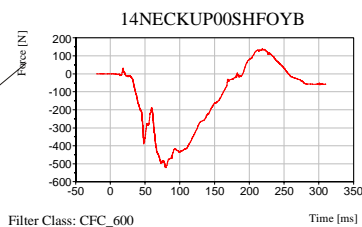
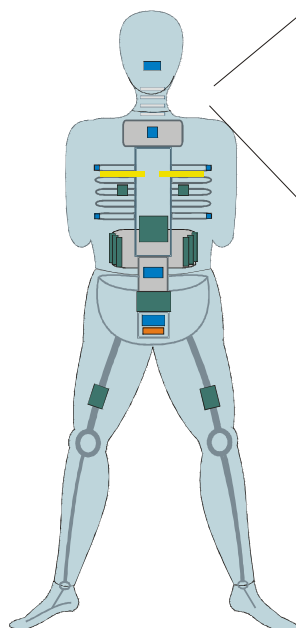
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007  
Time: 14:40  
**Neck Moment about the Occipital Condyle (NECK OM)**

**Customer: NHTSA**  
**Test Number: C80100**

**TRC Inc. Test Lab: CTF**  
**Test Number: 070925**

Test Orientation = Side

**NECKOM (14TMONUP00SHMOXX)**



[Max.] 4.32 Nm at 258.08 ms  
 [Min.] -102.57 Nm at 68.80 ms

Dummy: HIII/SID  
 Seating Position:  
 Left Rear Passenger  
 Neck OM Source Code: Mx + (D\*Fy)

B-45

070925



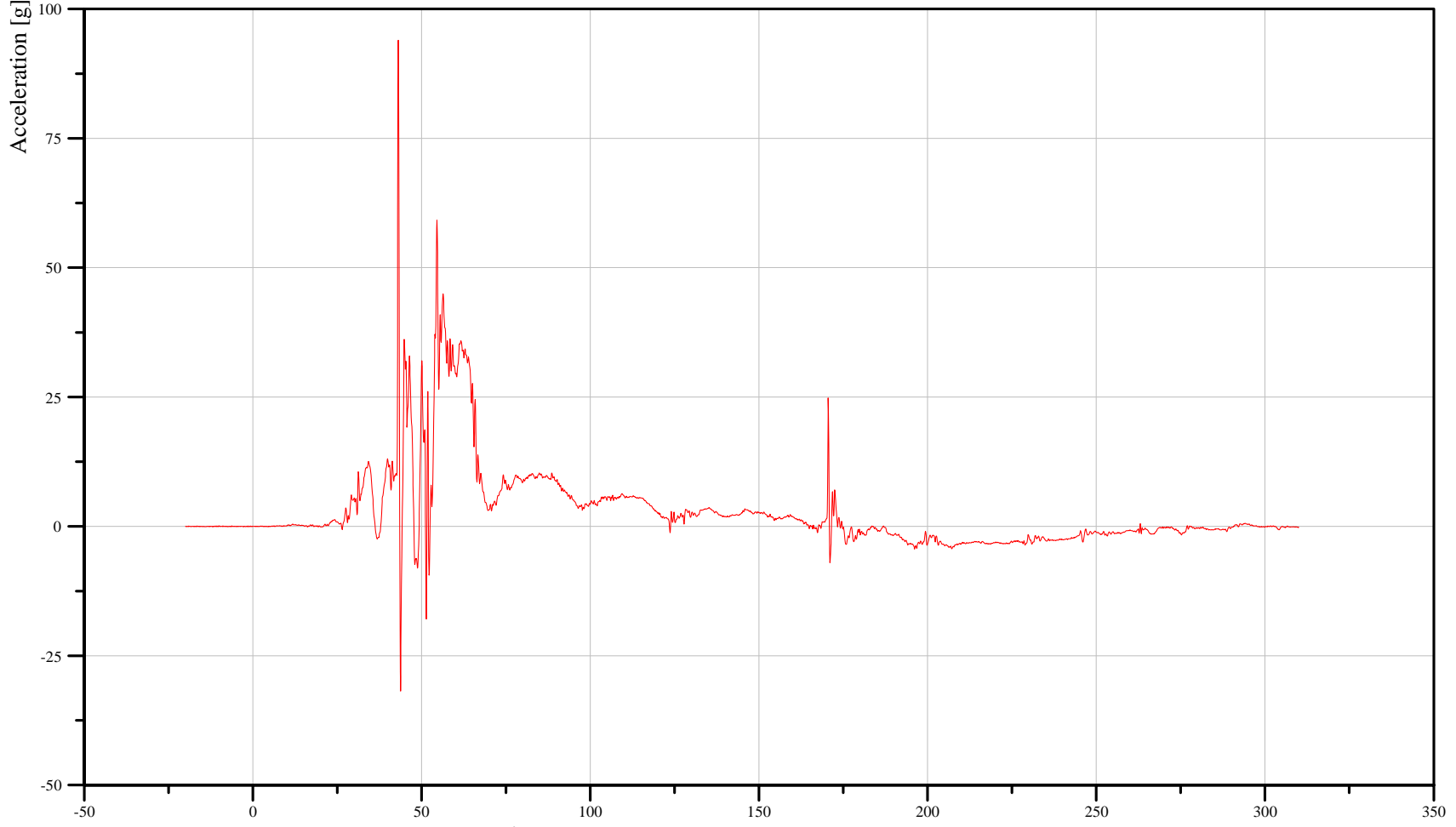
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLU00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-31.81 g at 43.76 ms

**Max. Value**  
93.94 g at 43.12 ms

Time [ms]

B-46

070925



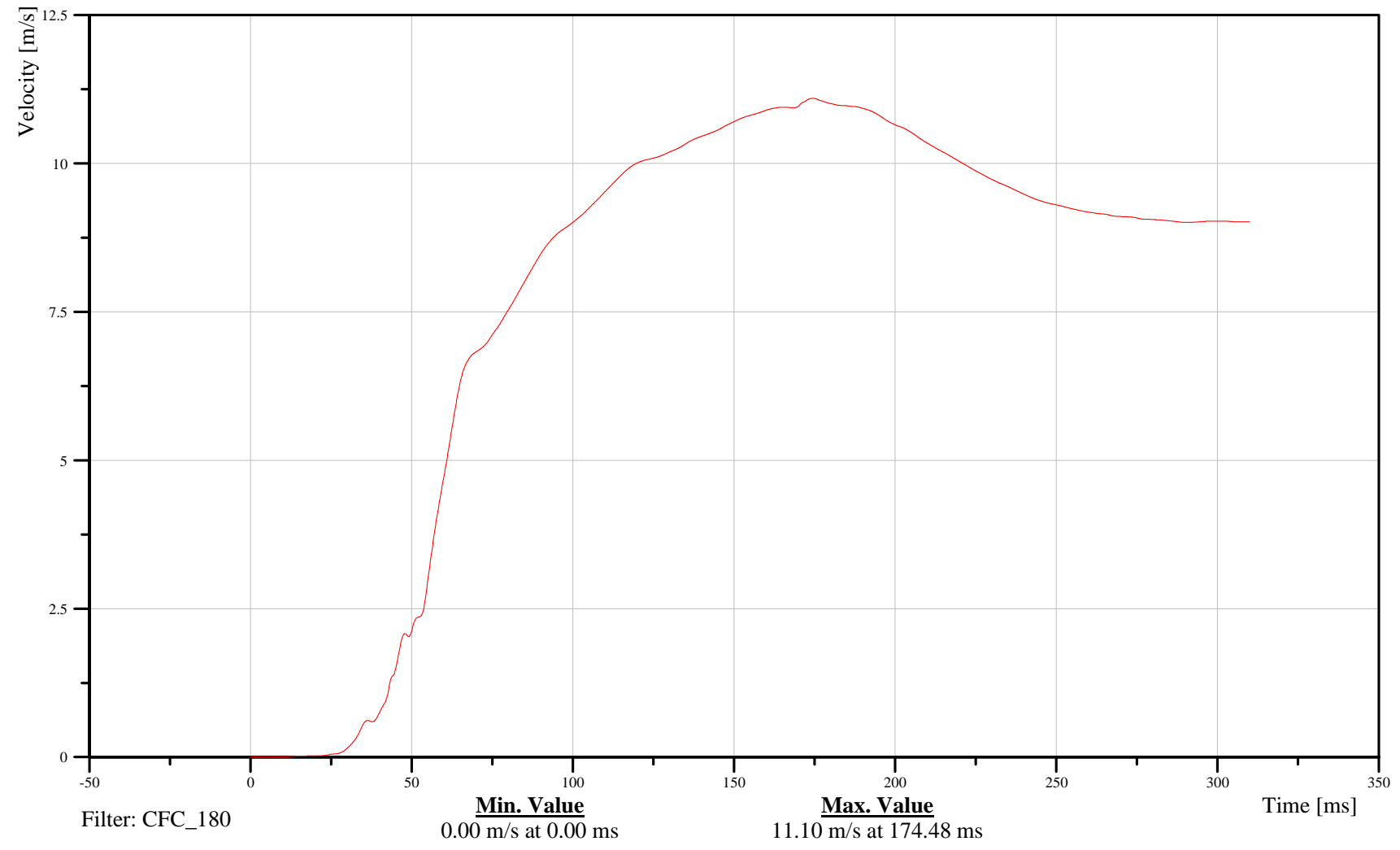
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER UPPER RIB Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLU00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-47

070925



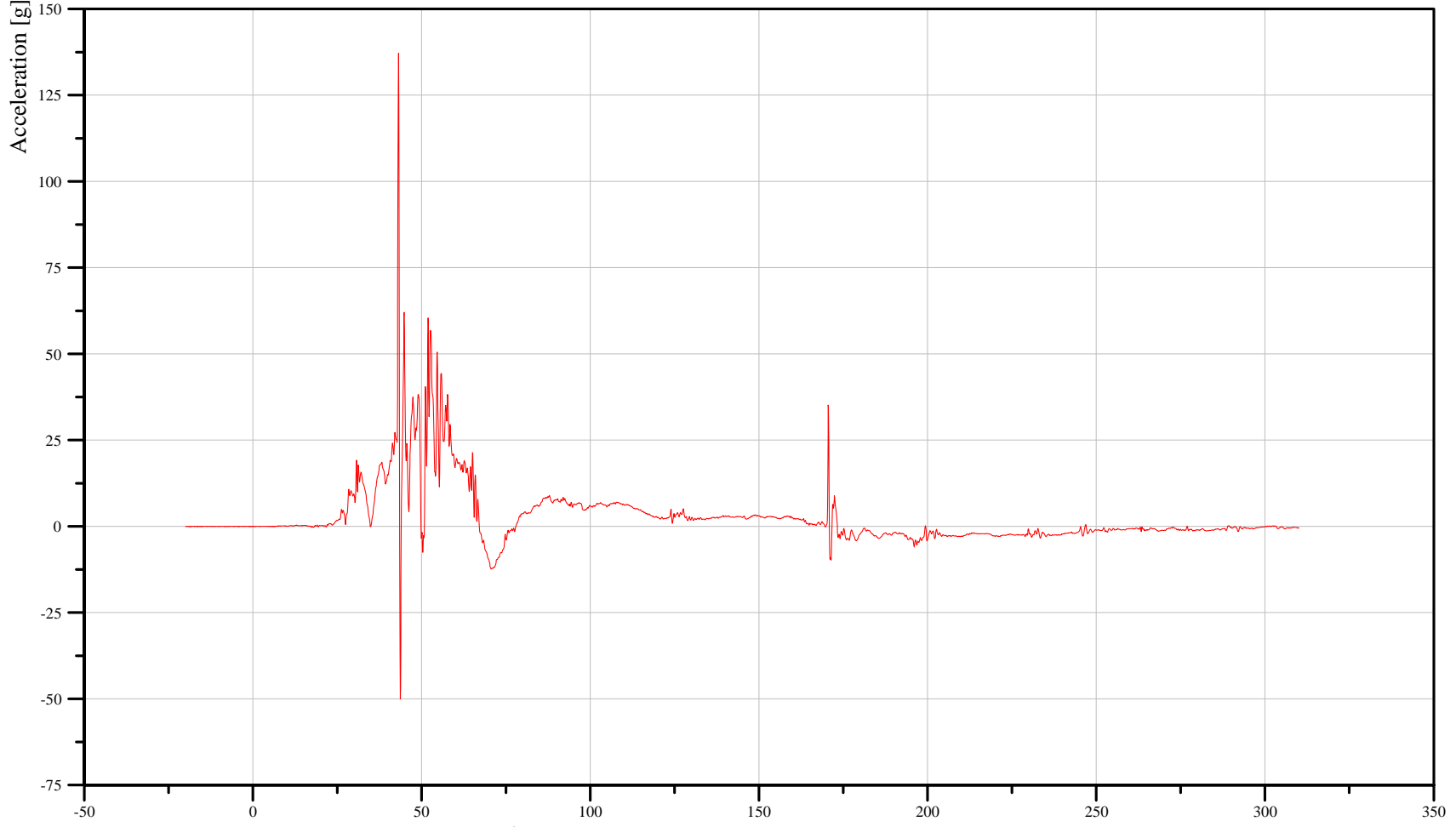
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLL00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-50.04 g at 43.68 ms

**Max. Value**  
137.12 g at 43.20 ms

Time [ms]

B-48

070925



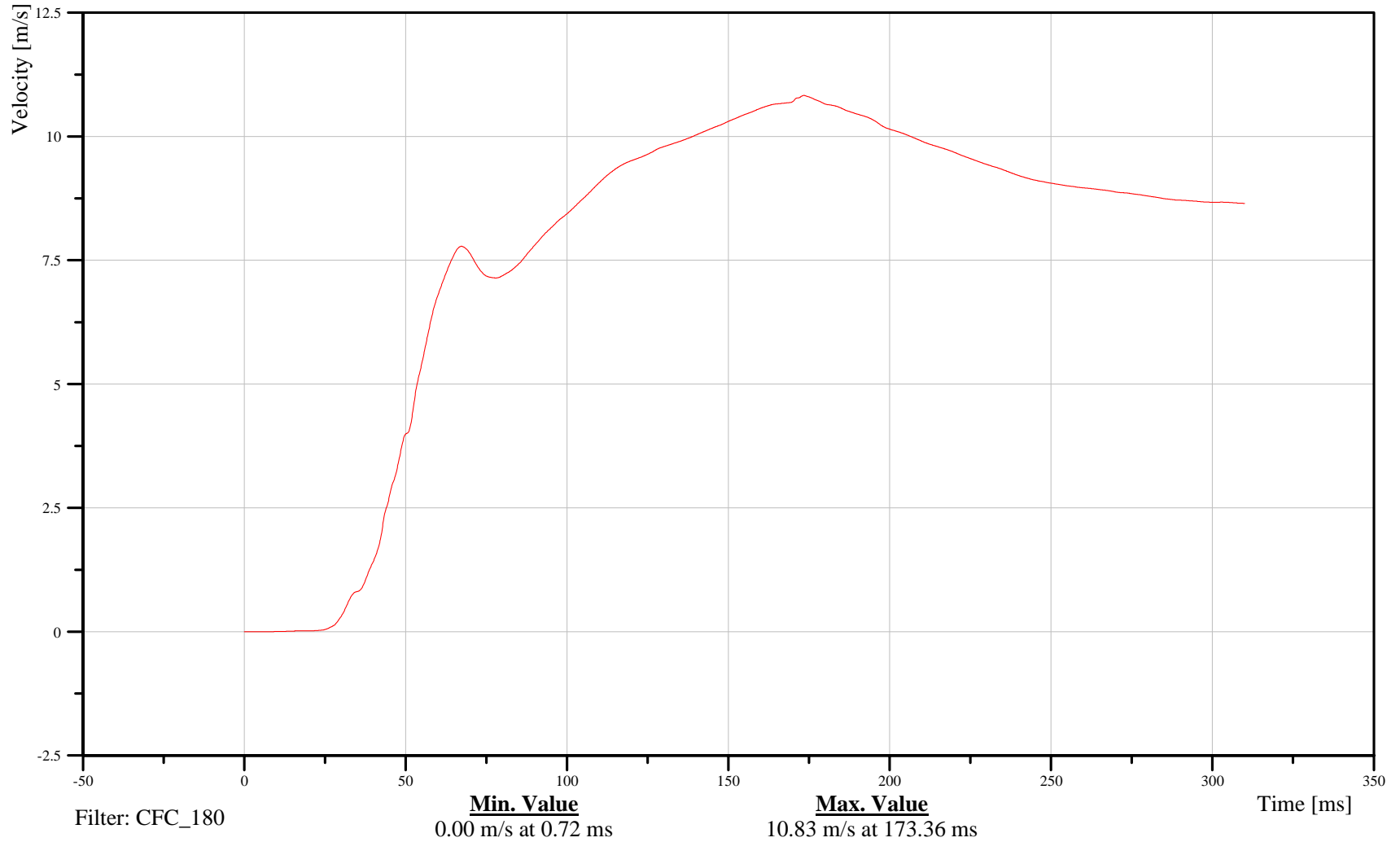
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER RIB Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLL00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-49

070925



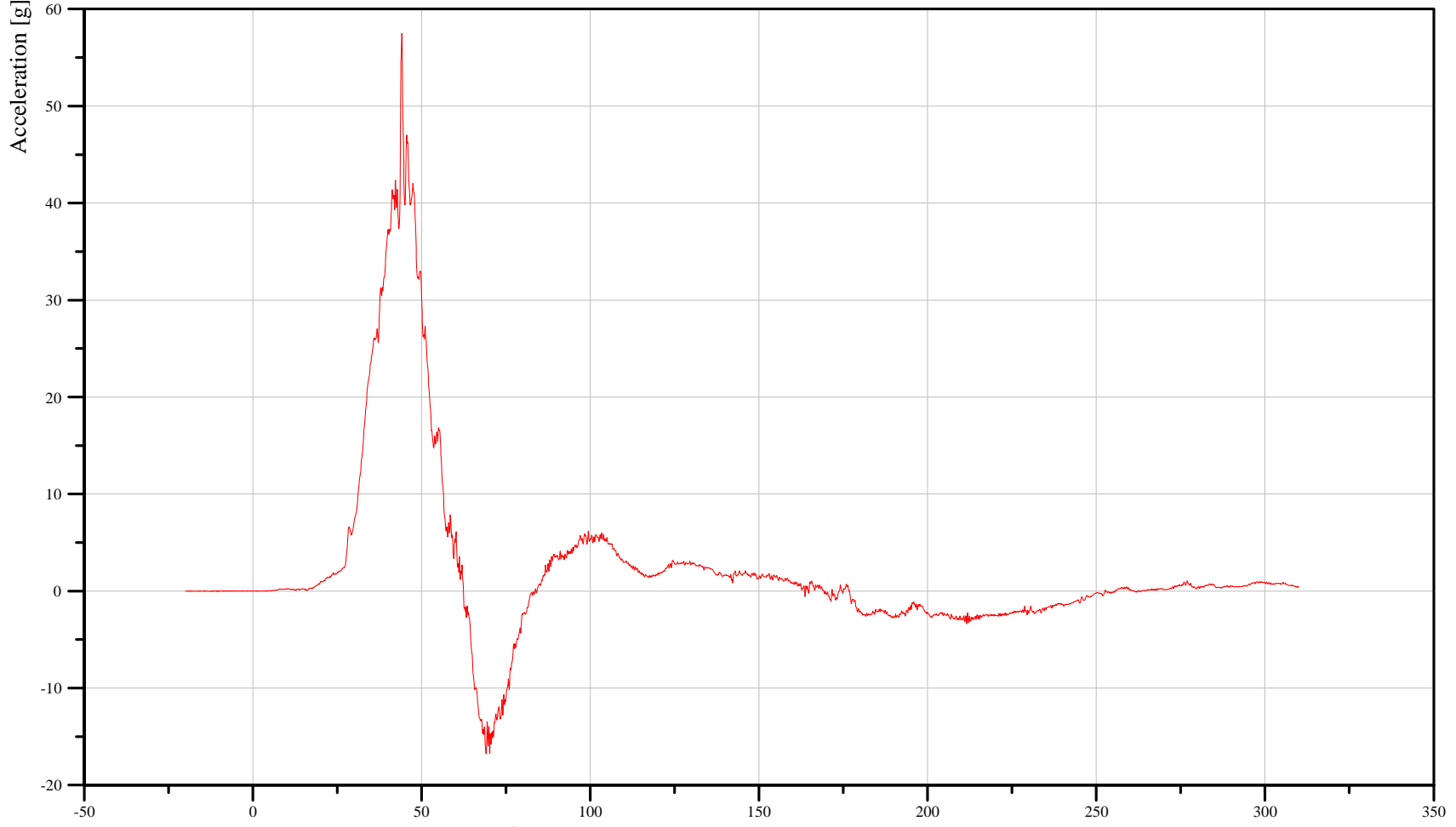
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14SPIN1200SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-16.77 g at 69.12 ms

**Max. Value**  
57.48 g at 44.16 ms

Time [ms]

B-50

070925



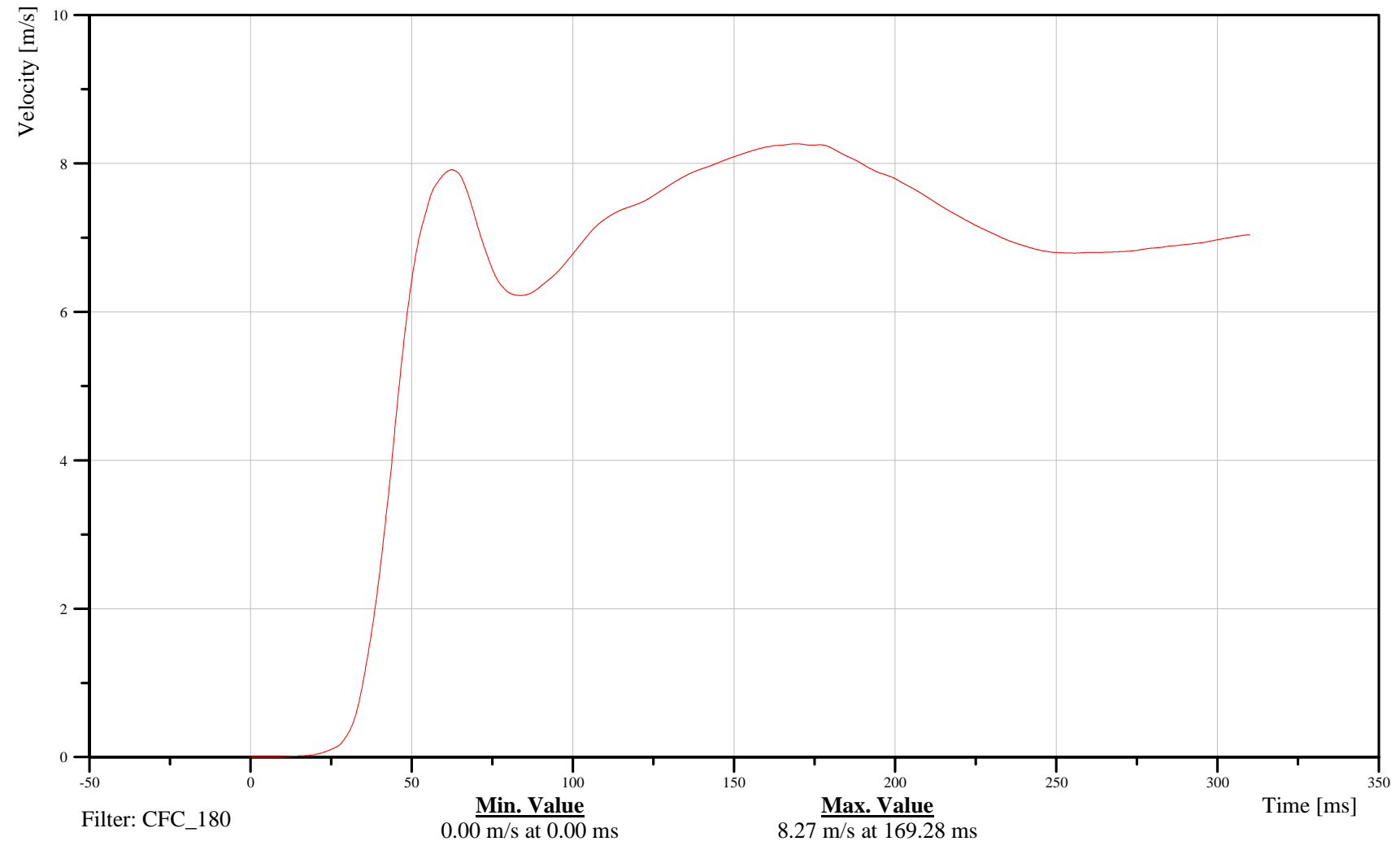
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER SPINE Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SPIN1200SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-51

070925



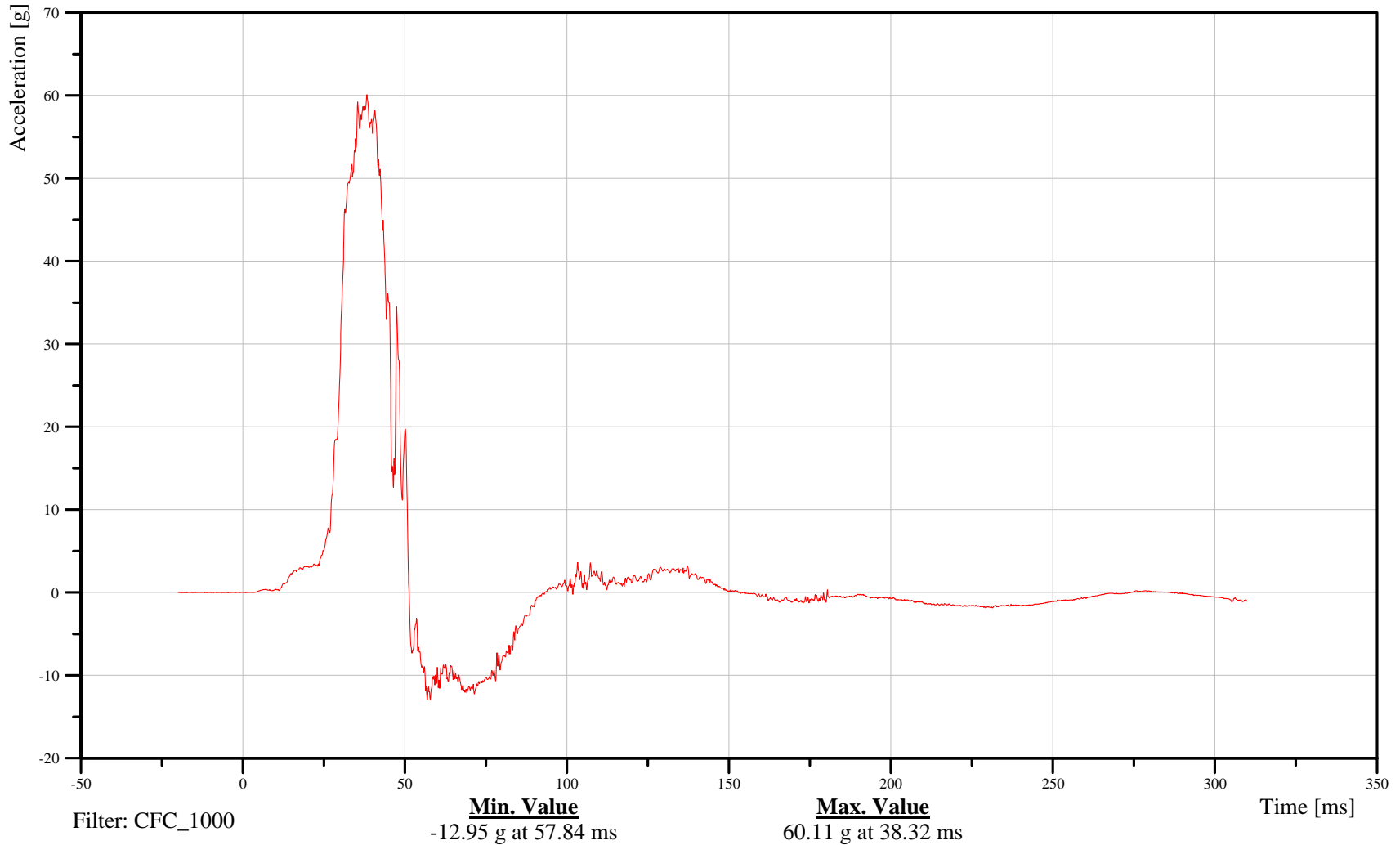
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14PELVCG00SHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-52

070925



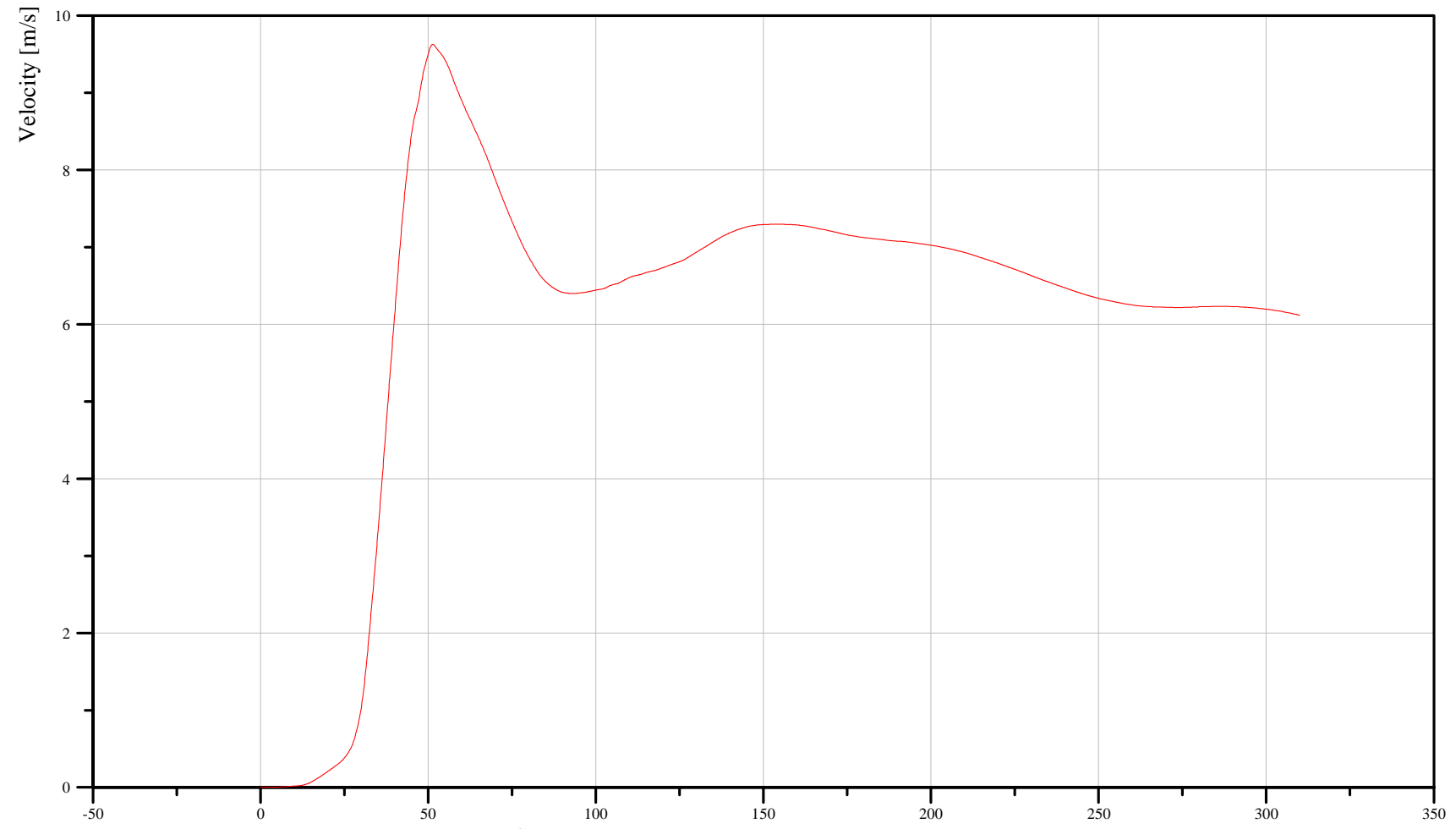
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER PELVIS Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14PELVCG00SHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
0.00 m/s at 0.00 ms

Max. Value  
9.63 m/s at 51.36 ms

Time [ms]

B-53

070925

Driver and Passenger Dummy Redundant Instrumentation Plots



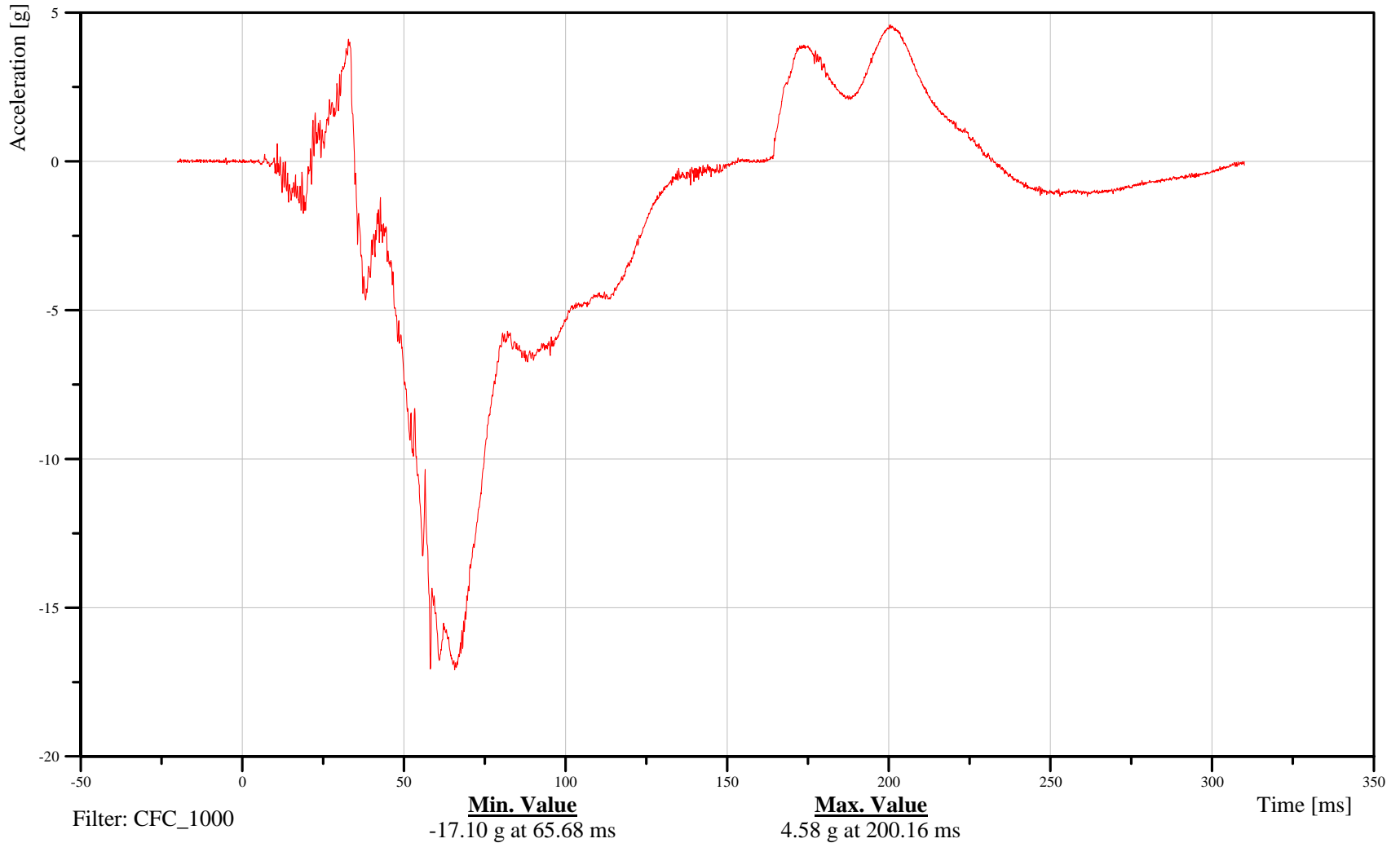
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD X-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCGRDSHACXA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-55

070925



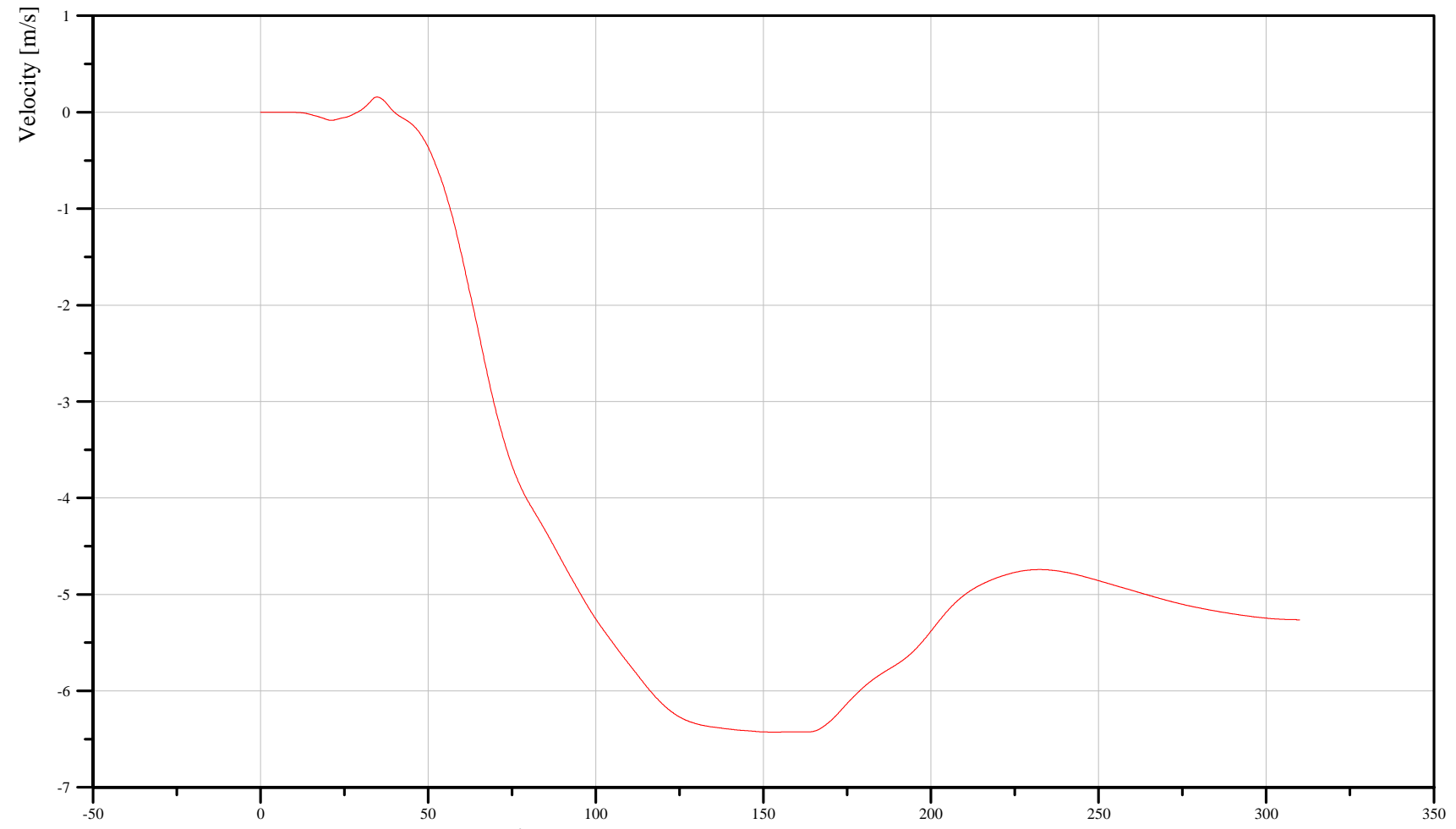
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD X-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 11HEADCGRDSHVEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-6.43 m/s at 152.96 ms

**Max. Value**  
0.16 m/s at 34.72 ms

Time [ms]

B-56

070925



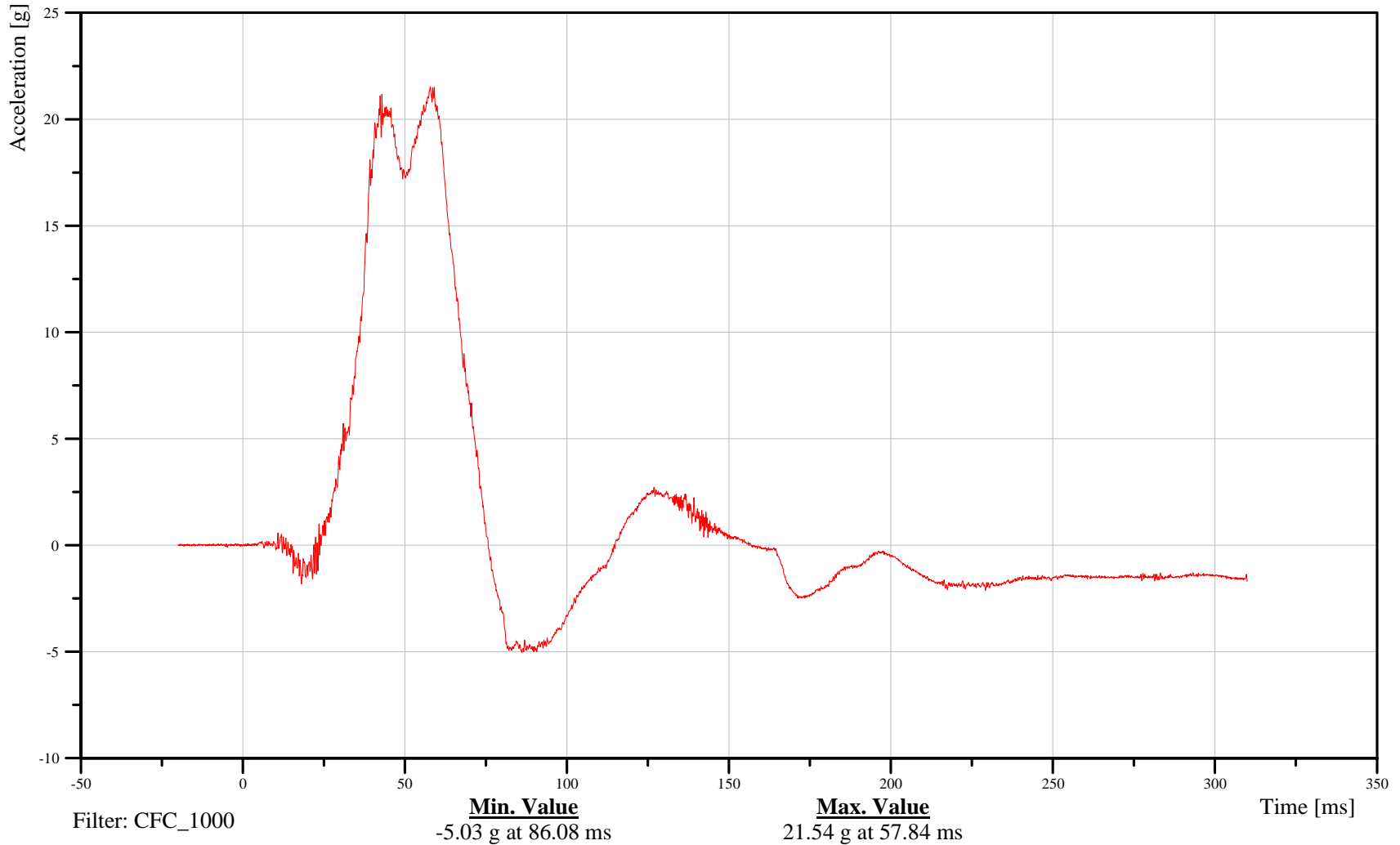
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCGRDSHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-57

070925



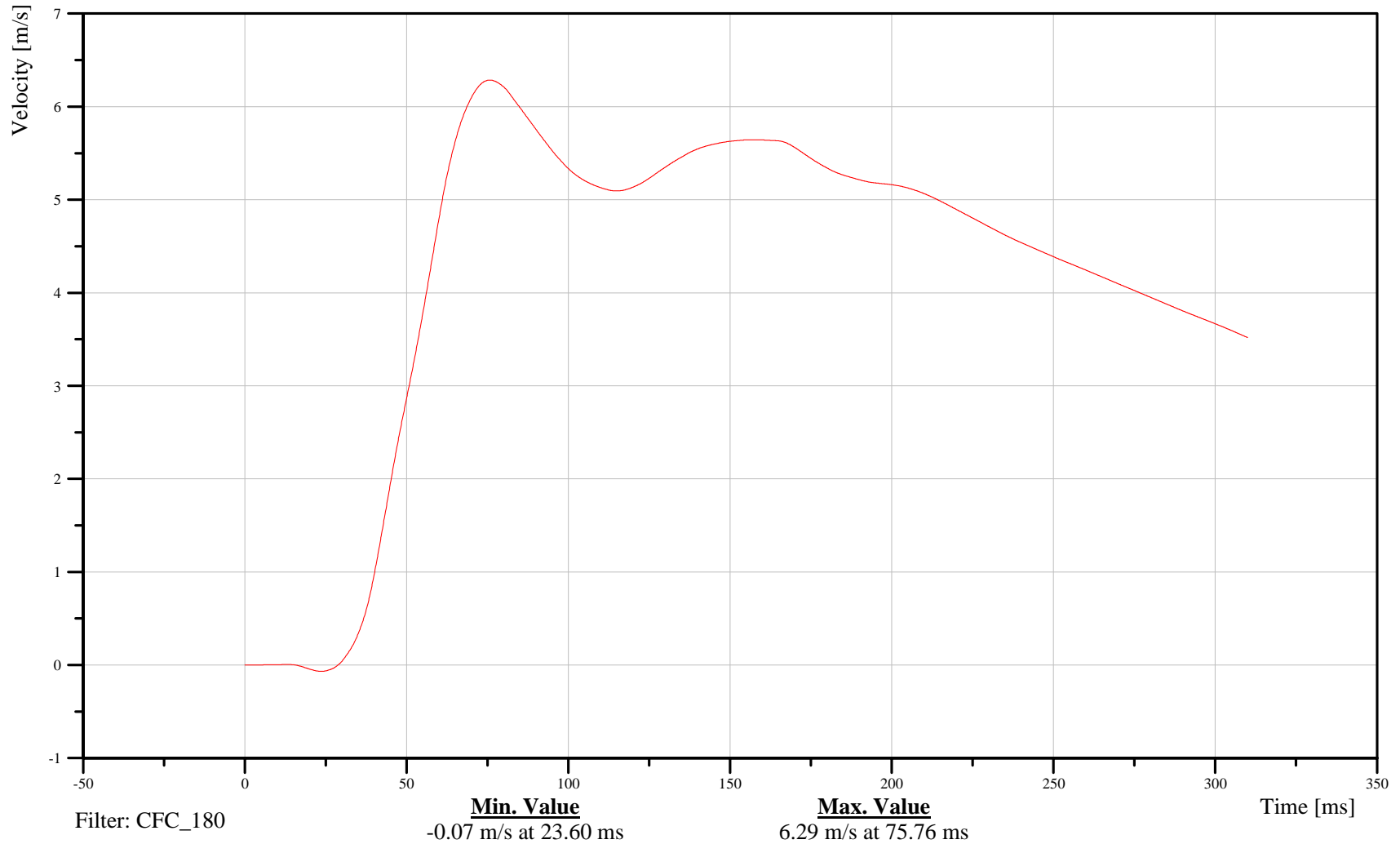
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11HEADCGRDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-58

070925



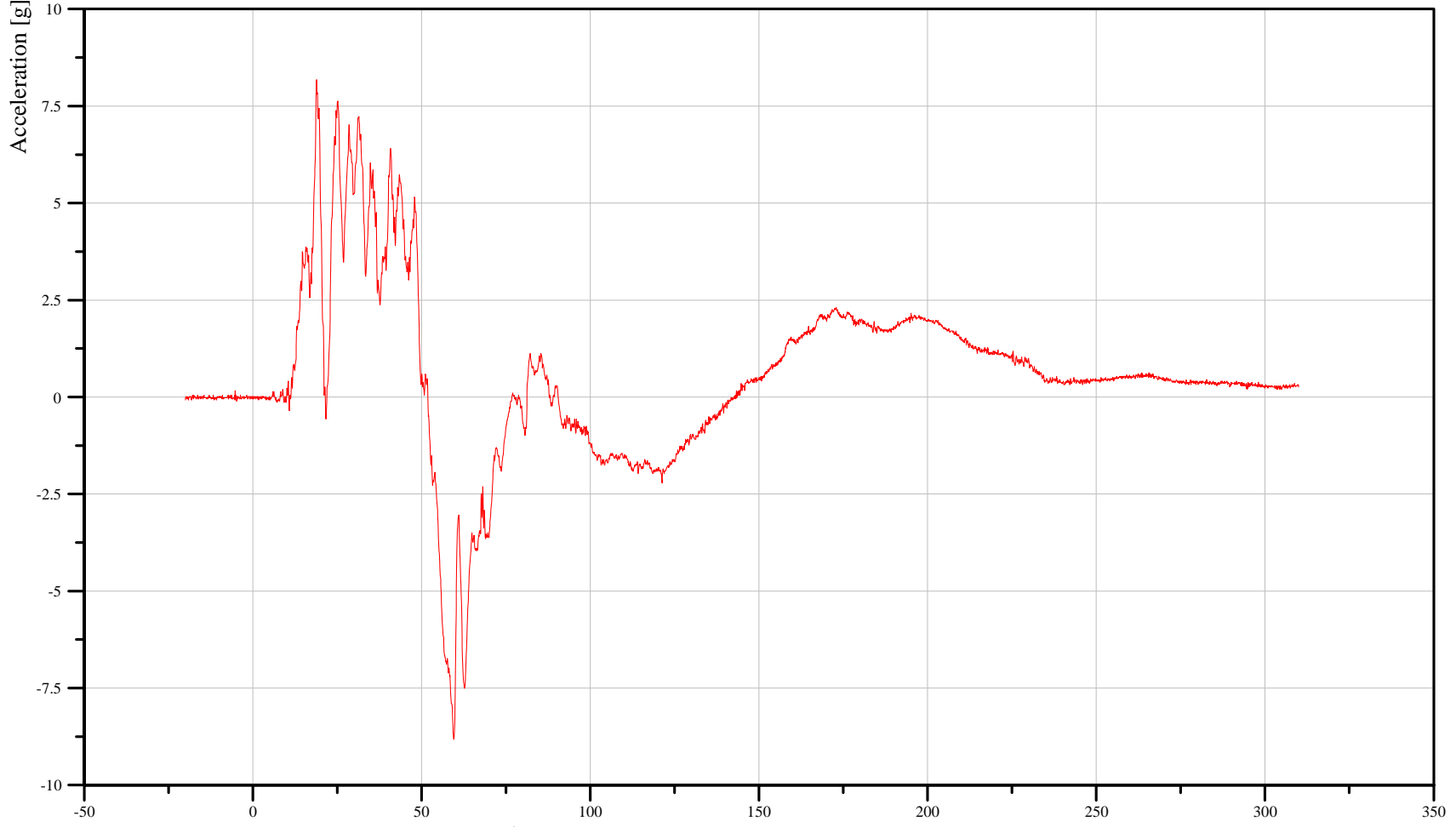
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Z-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 11HEADCGRDSHACZA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-8.82 g at 59.60 ms

**Max. Value**  
8.18 g at 18.88 ms

Time [ms]

B-59

070925



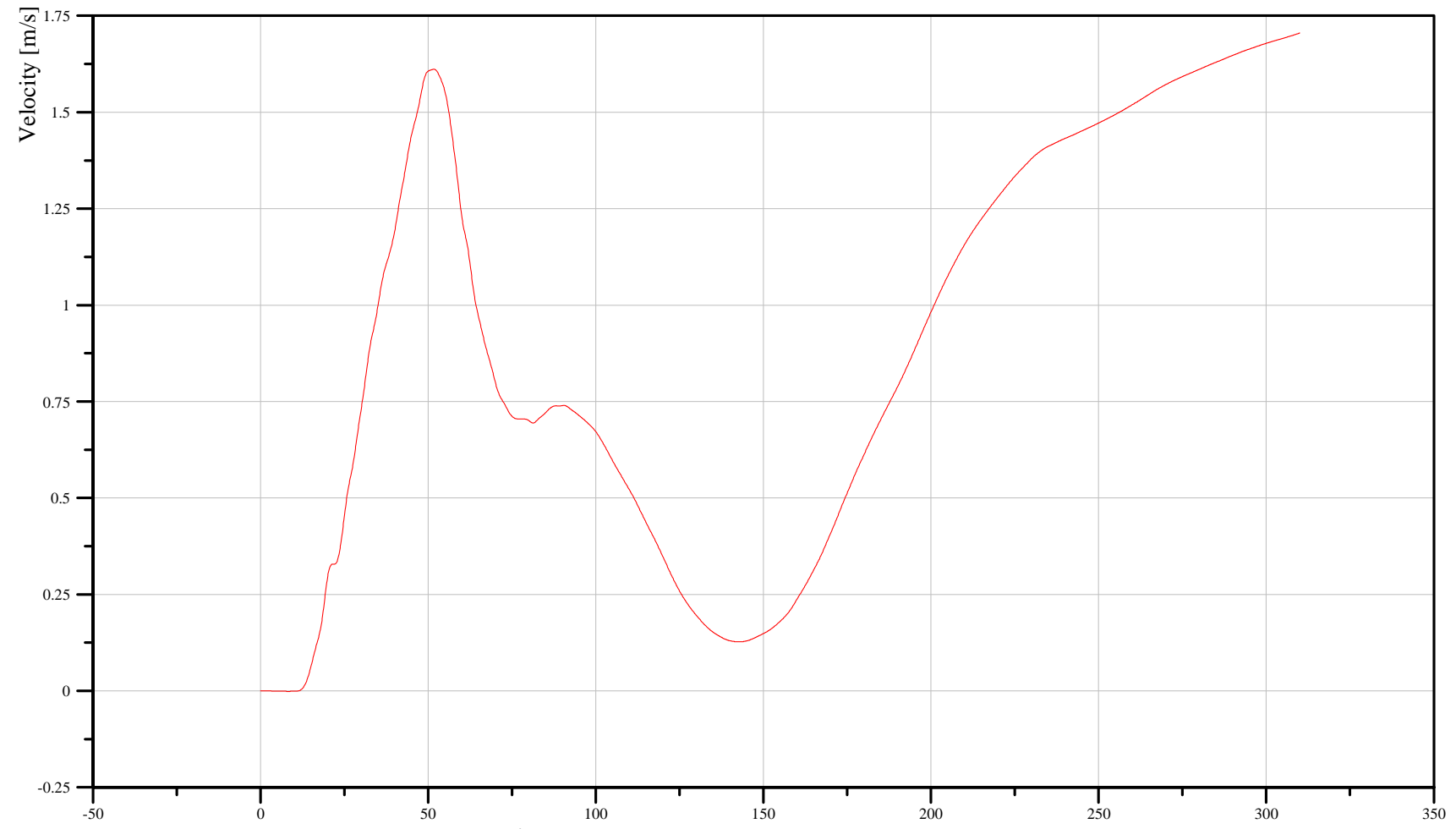
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD Z-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 11HEADCGRDISHVEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
0.00 m/s at 8.16 ms

Max. Value  
1.71 m/s at 310.00 ms

Time [ms]

B-60

070925



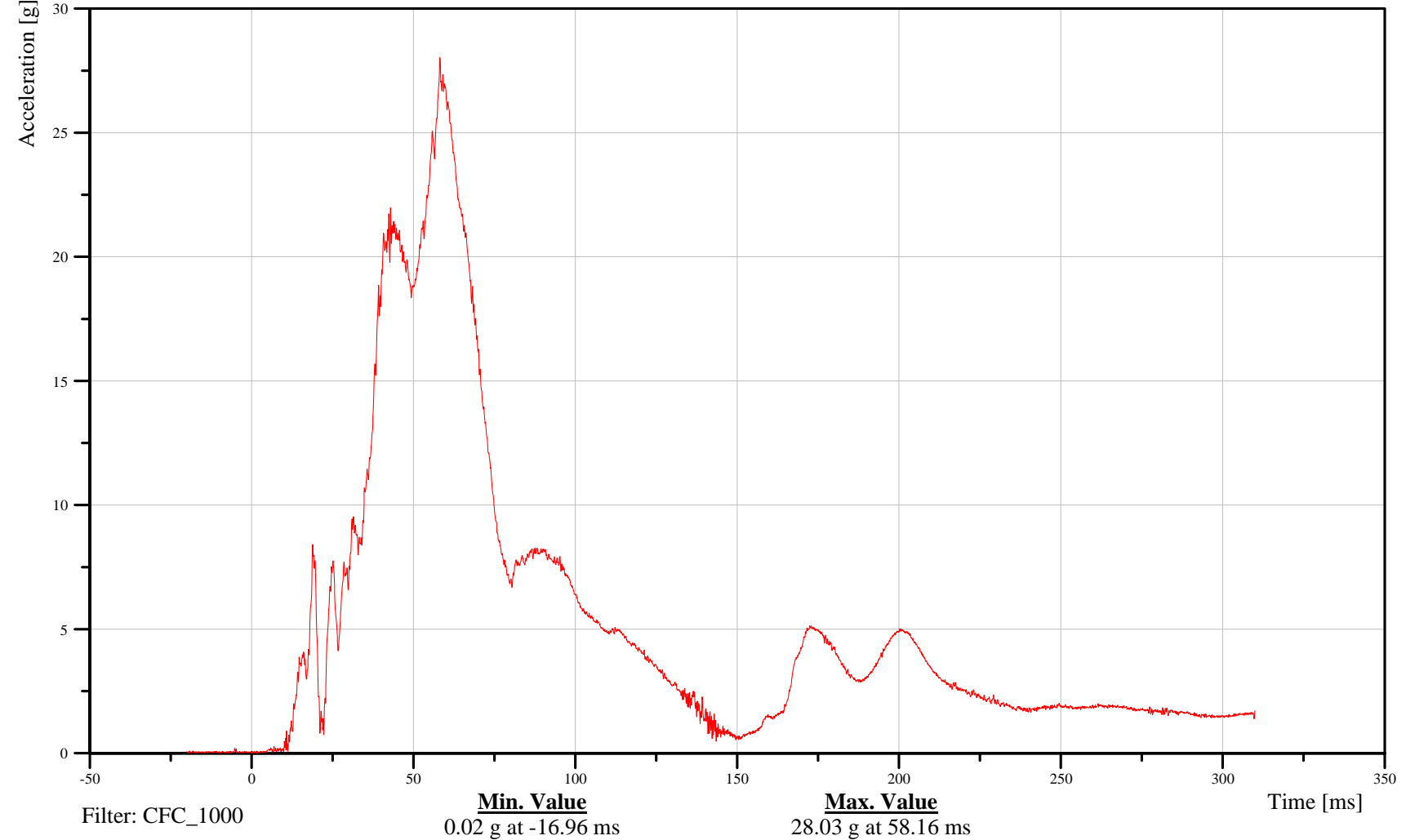
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER HEAD RESULTANT REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 11HEADCGRDSHACRA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-61

070925



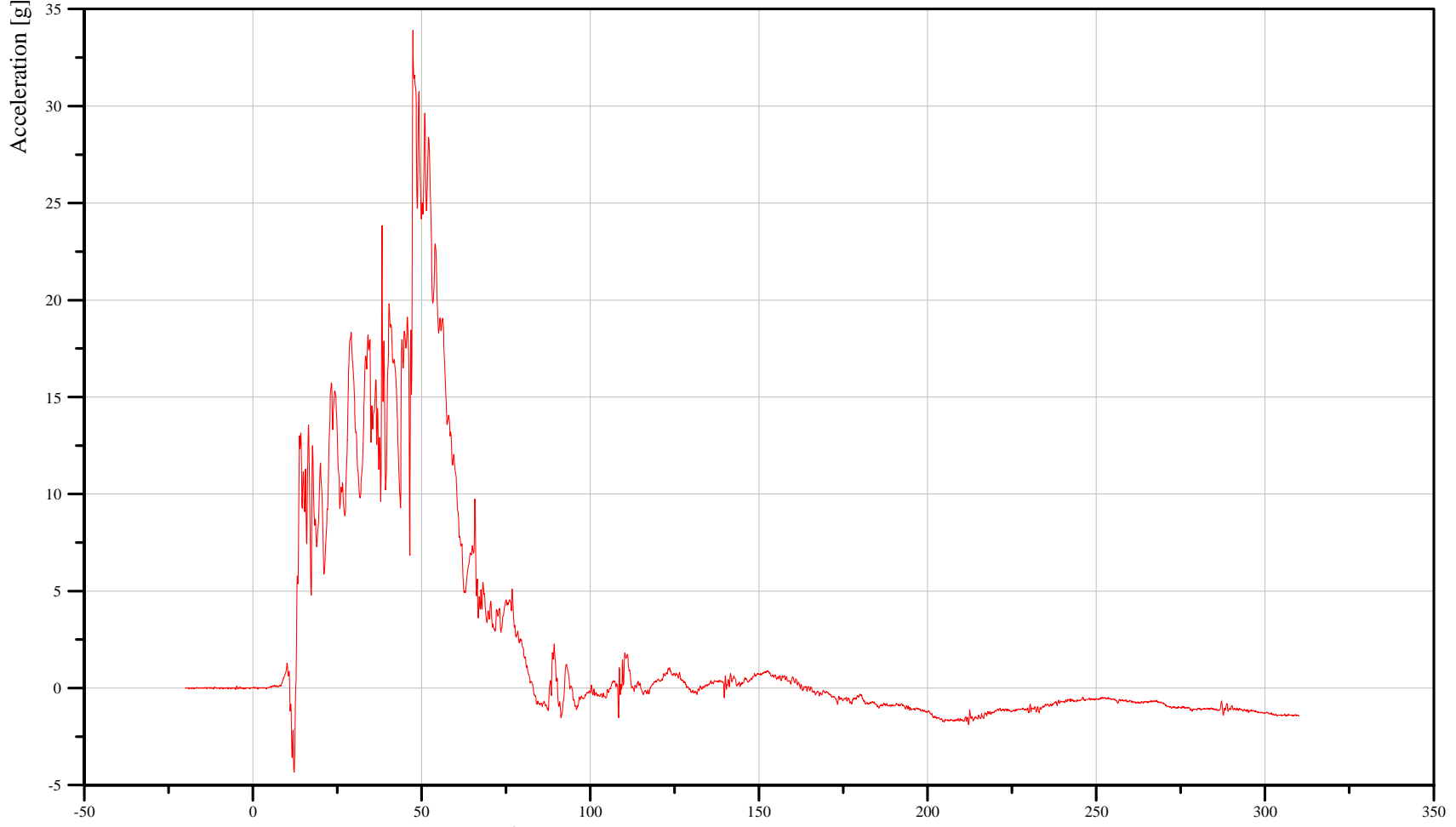
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 11RIBSLURDASHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-4.34 g at 12.24 ms

**Max. Value**  
33.90 g at 47.44 ms

Time [ms]

B-62

070925



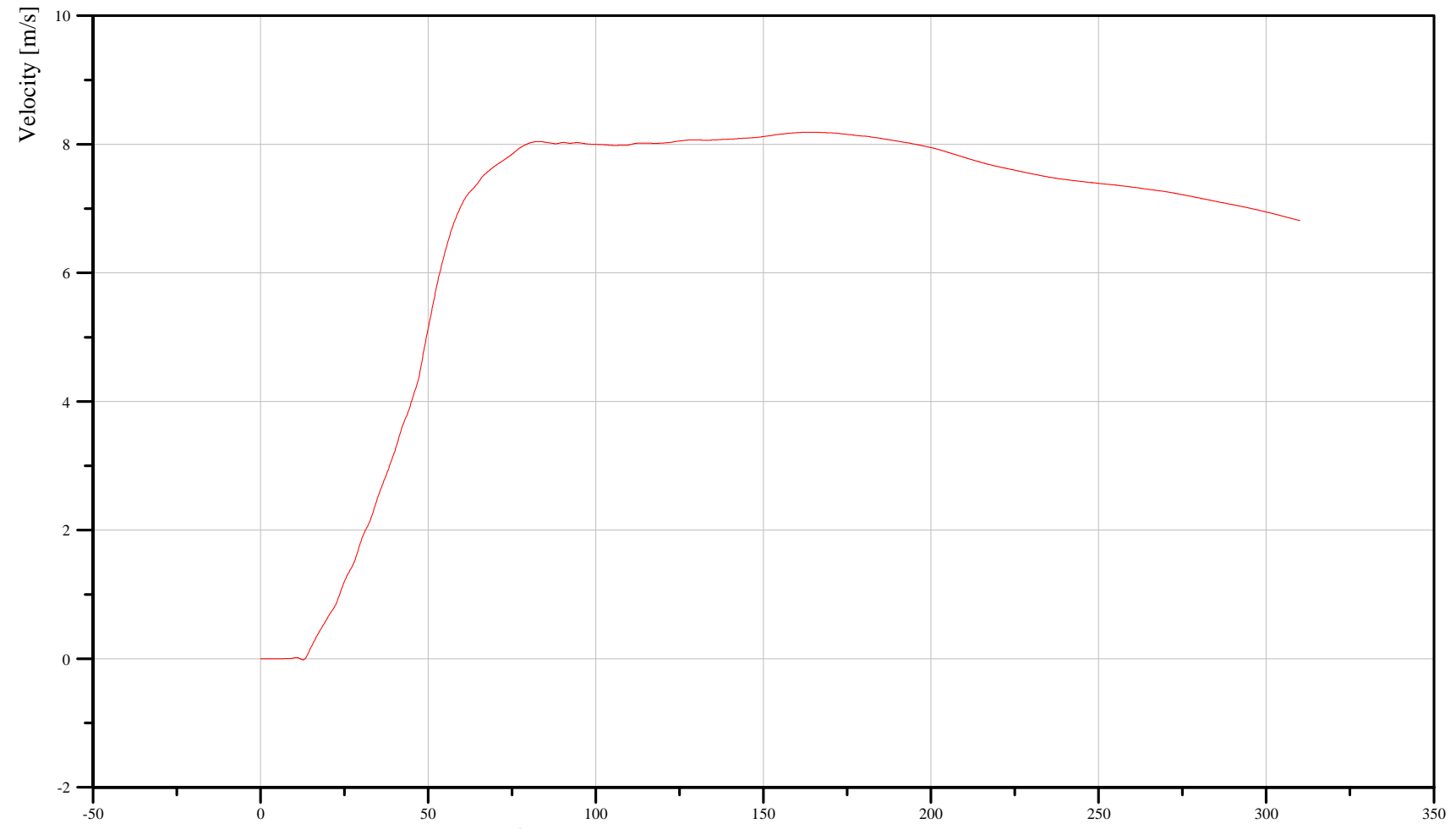
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER UPPER RIB Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLURDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-0.02 m/s at 12.64 ms

**Max. Value**  
8.19 m/s at 164.64 ms

Time [ms]

B-63

070925



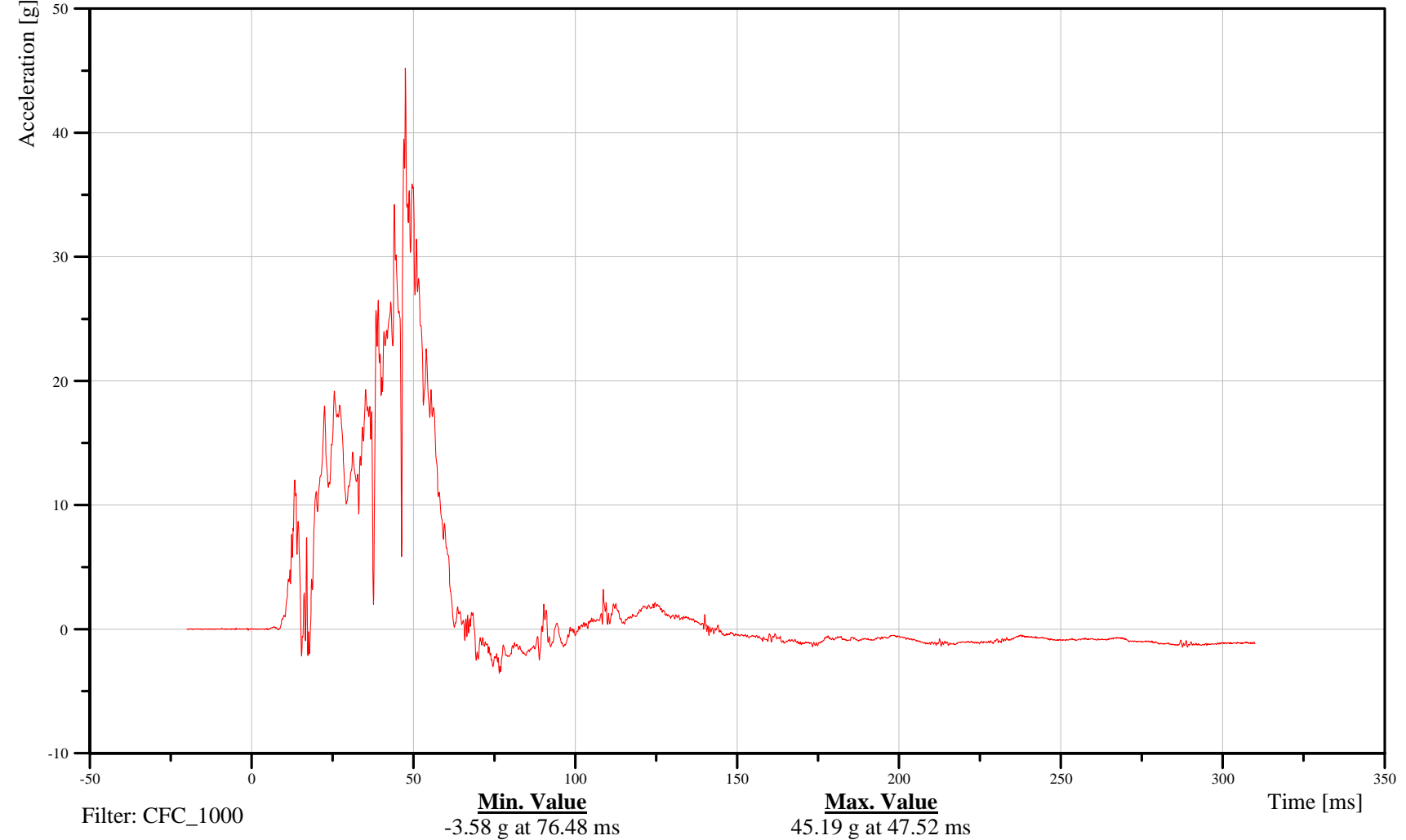
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLLRDSHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-64

070925



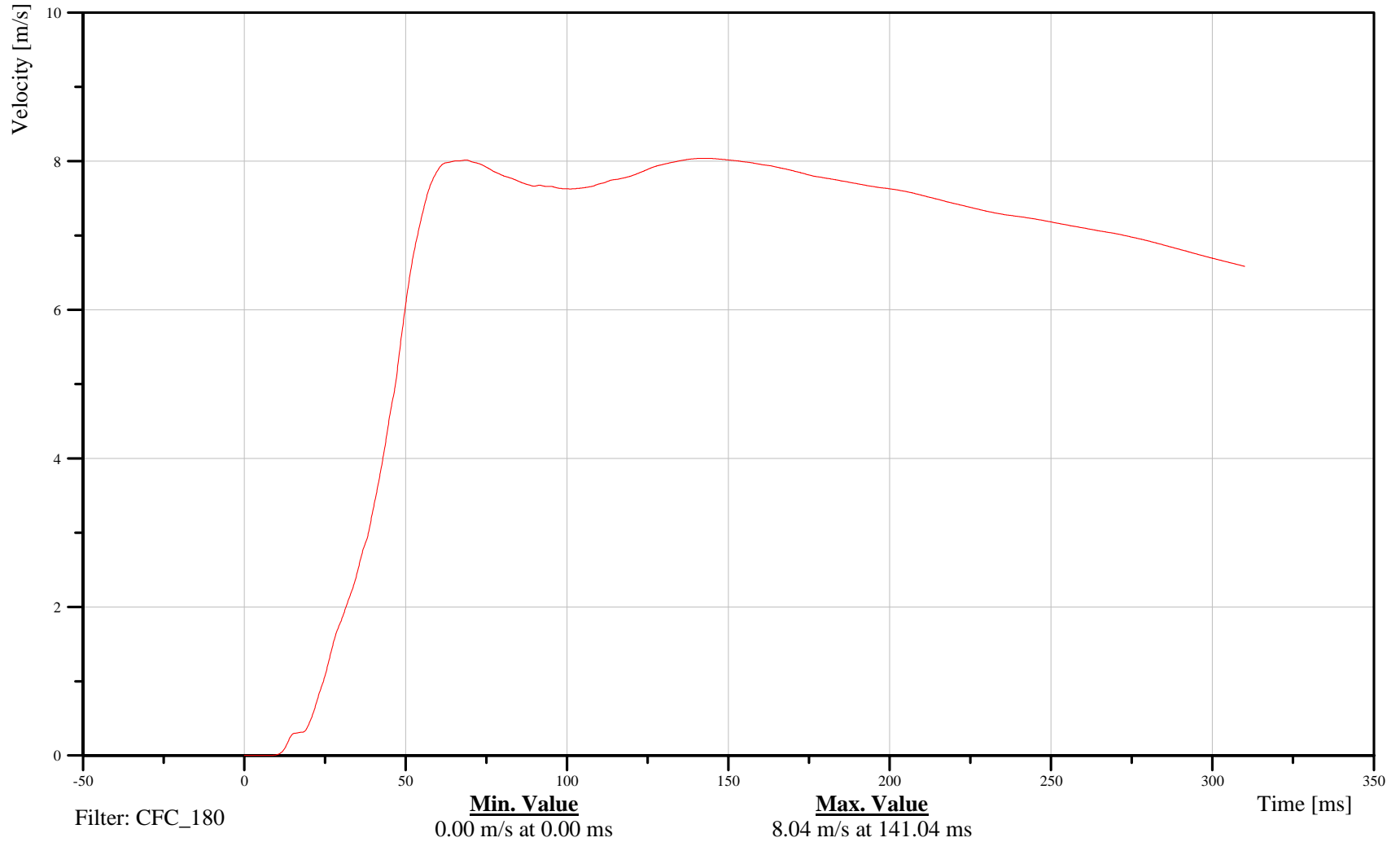
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER RIB Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLLRDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-65

070925



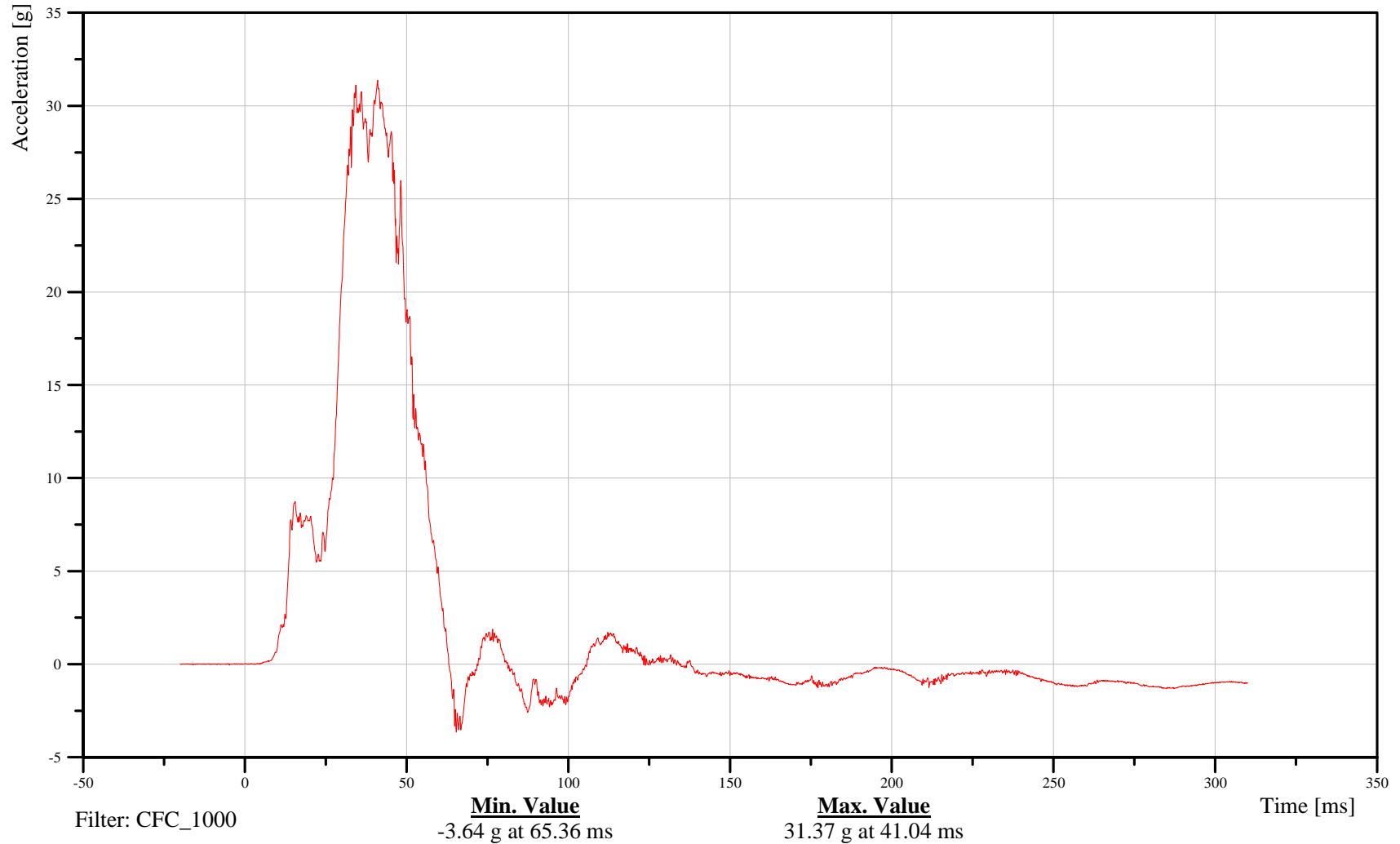
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SPIN12RDSHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-66

070925



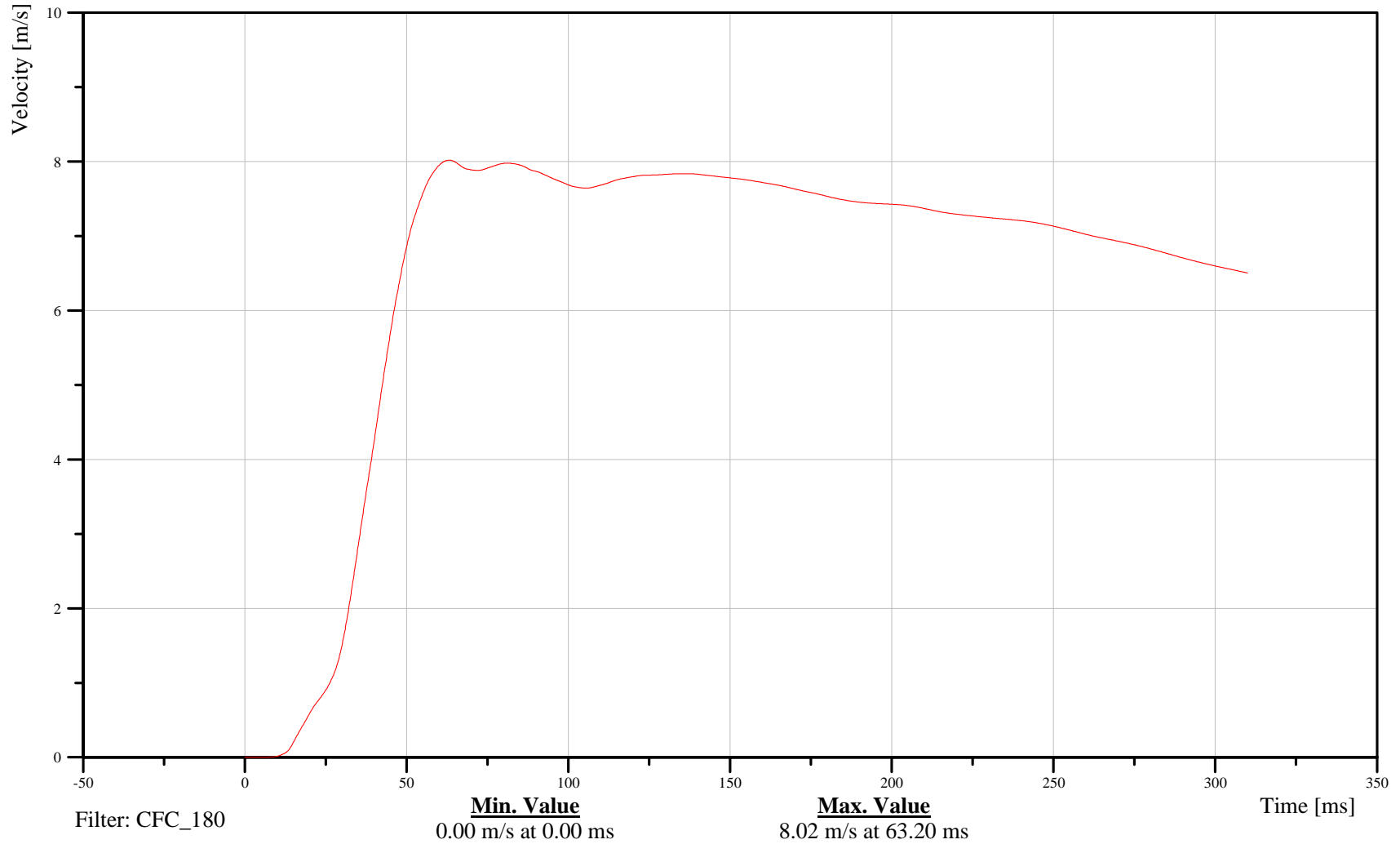
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER SPINE Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SPIN12RDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-67

070925



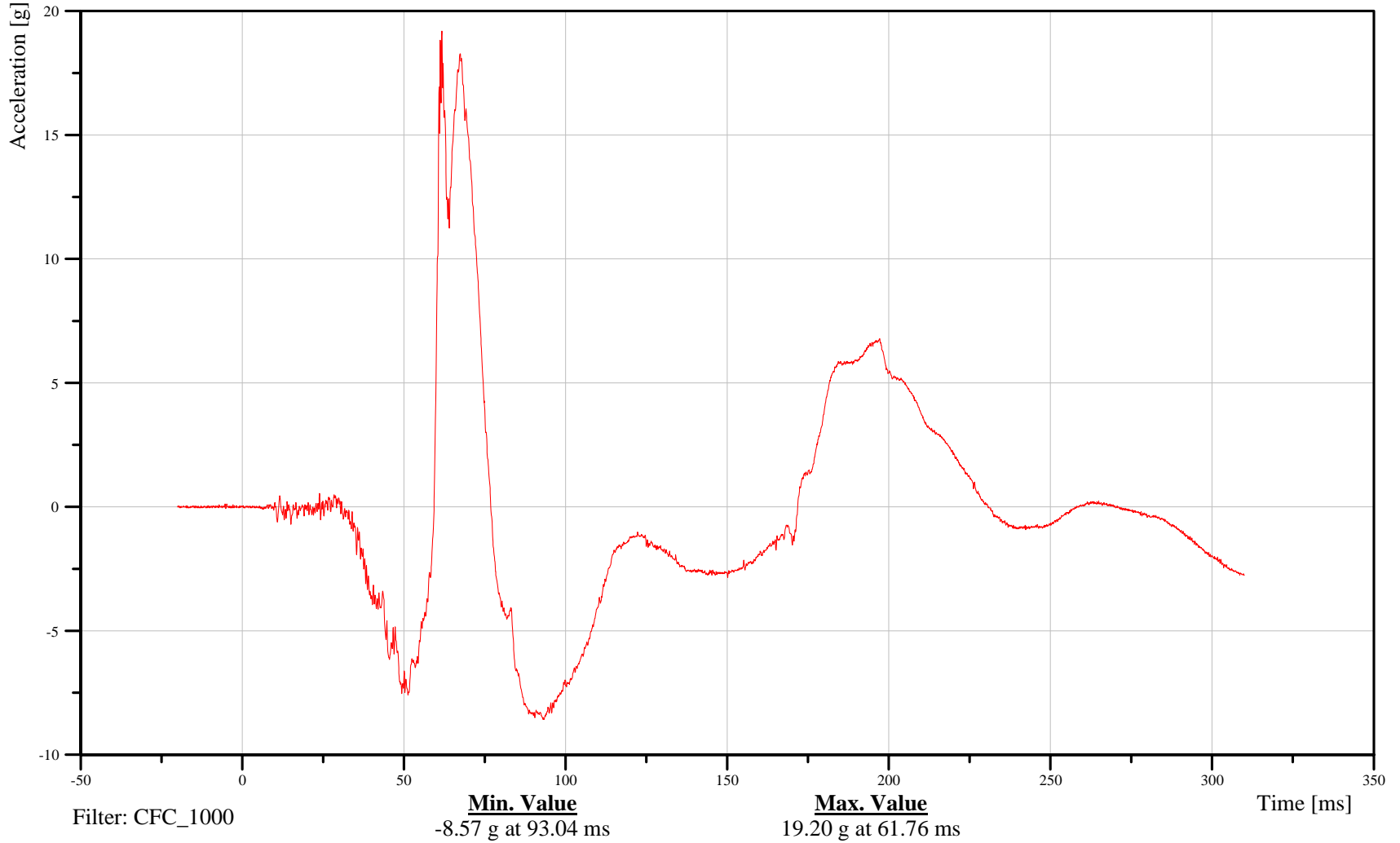
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14HEADCGRDSHACXA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-68

070925



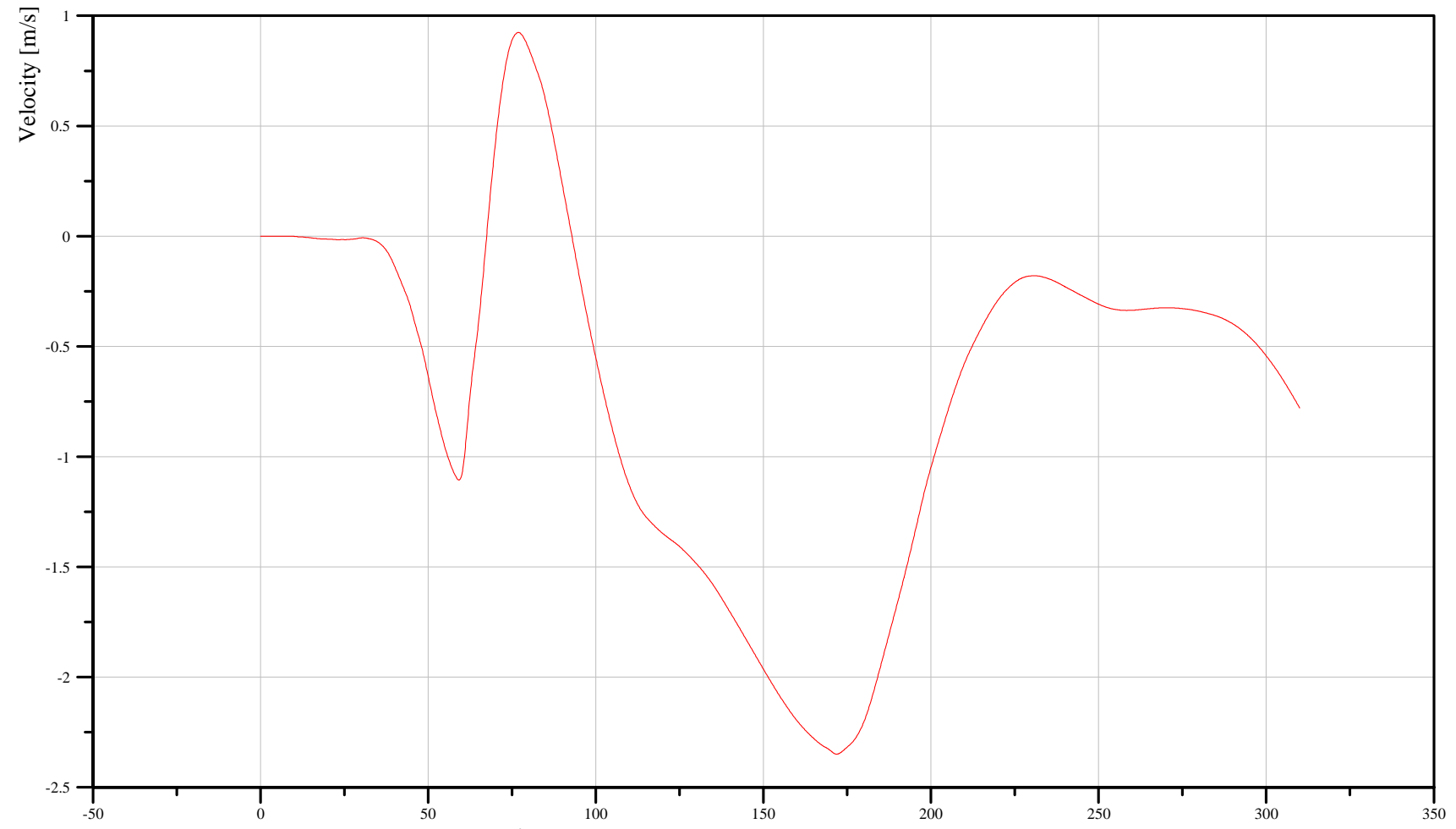
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14HEADCGRDSHVEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
-2.35 m/s at 171.84 ms

Max. Value  
0.92 m/s at 76.96 ms

Time [ms]

B-69

070925



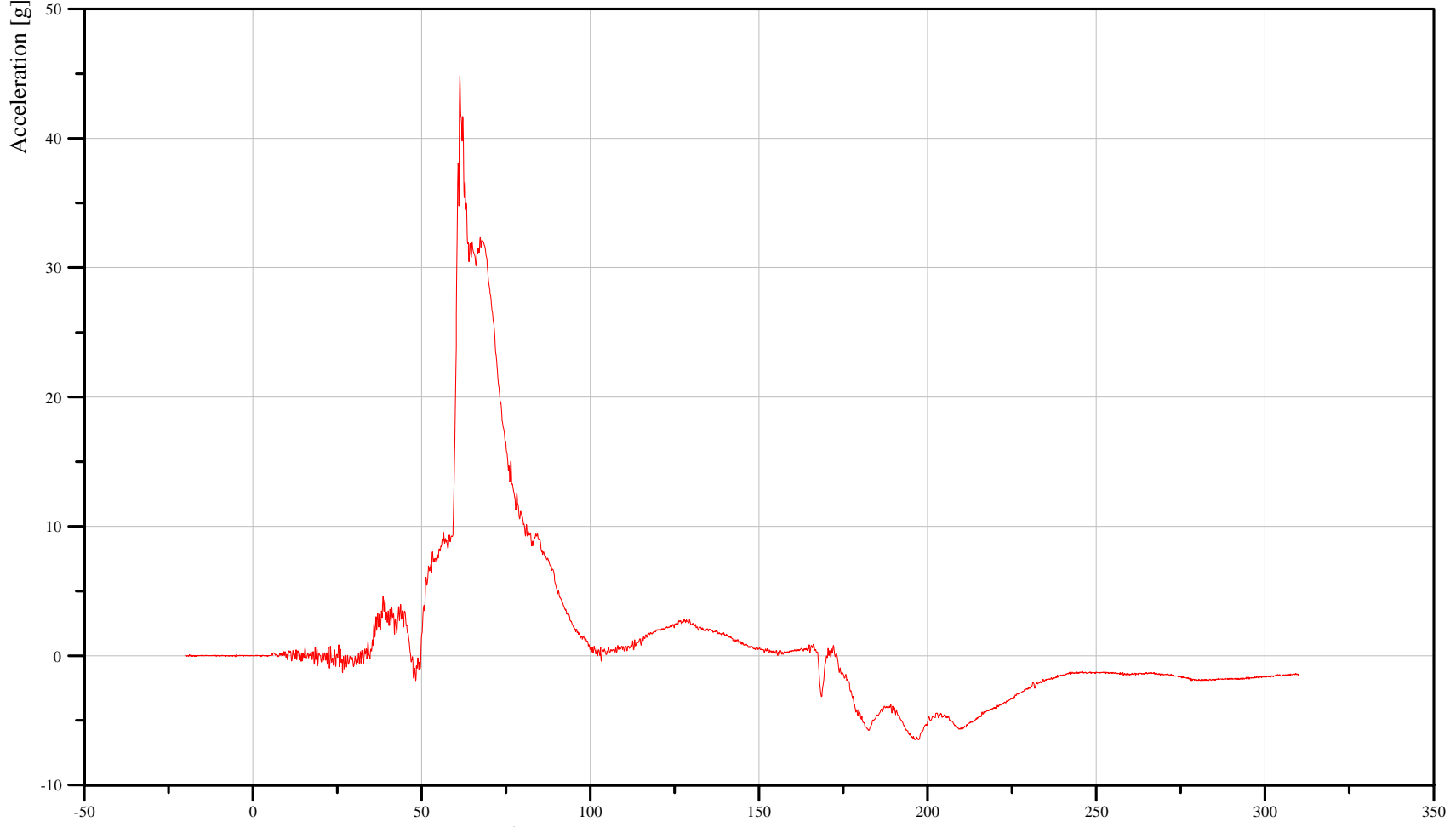
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14HEADCGRDSHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-6.49 g at 196.40 ms

**Max. Value**  
44.82 g at 61.36 ms

B-70

070925



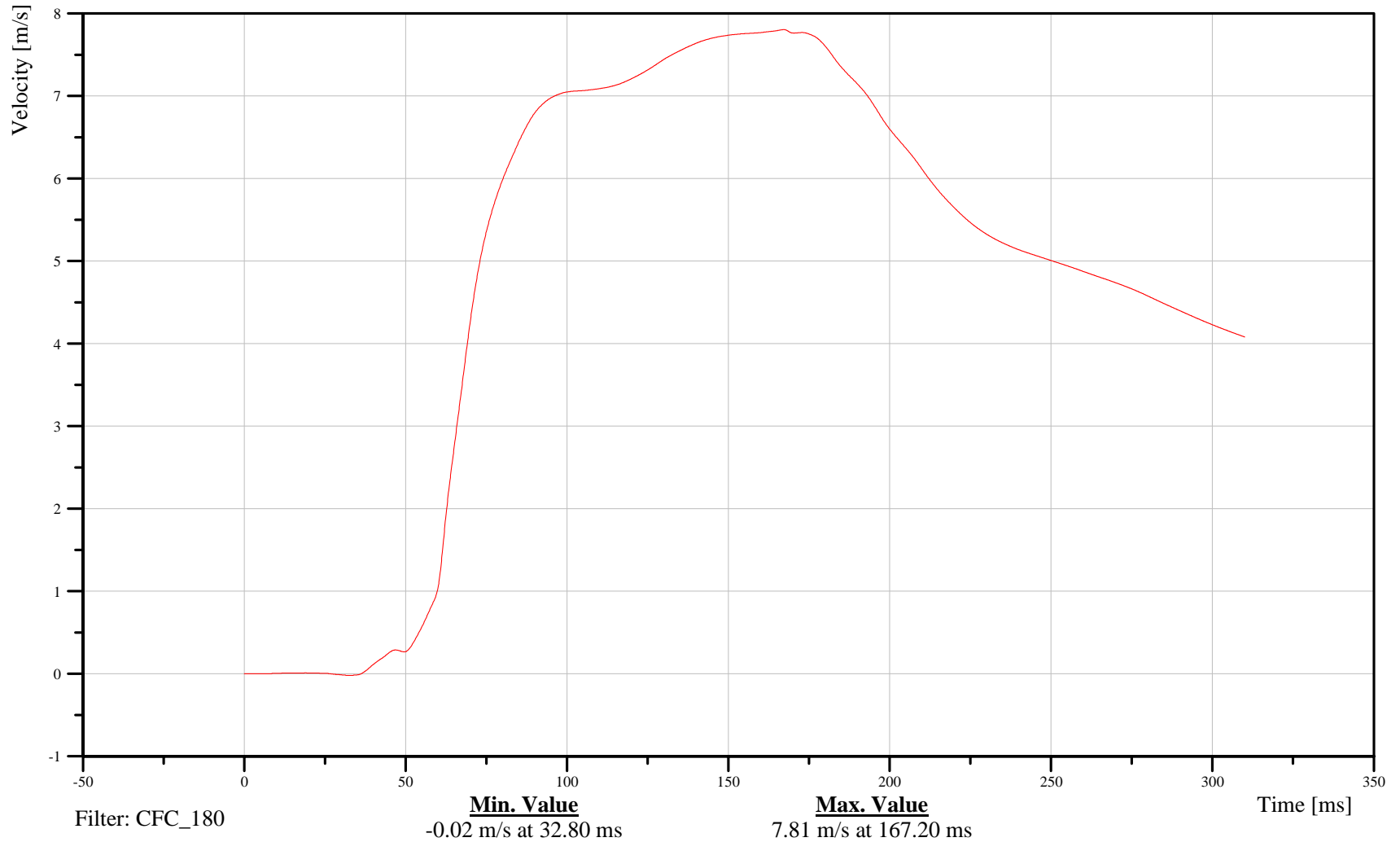
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14HEADCGRDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-71

070925



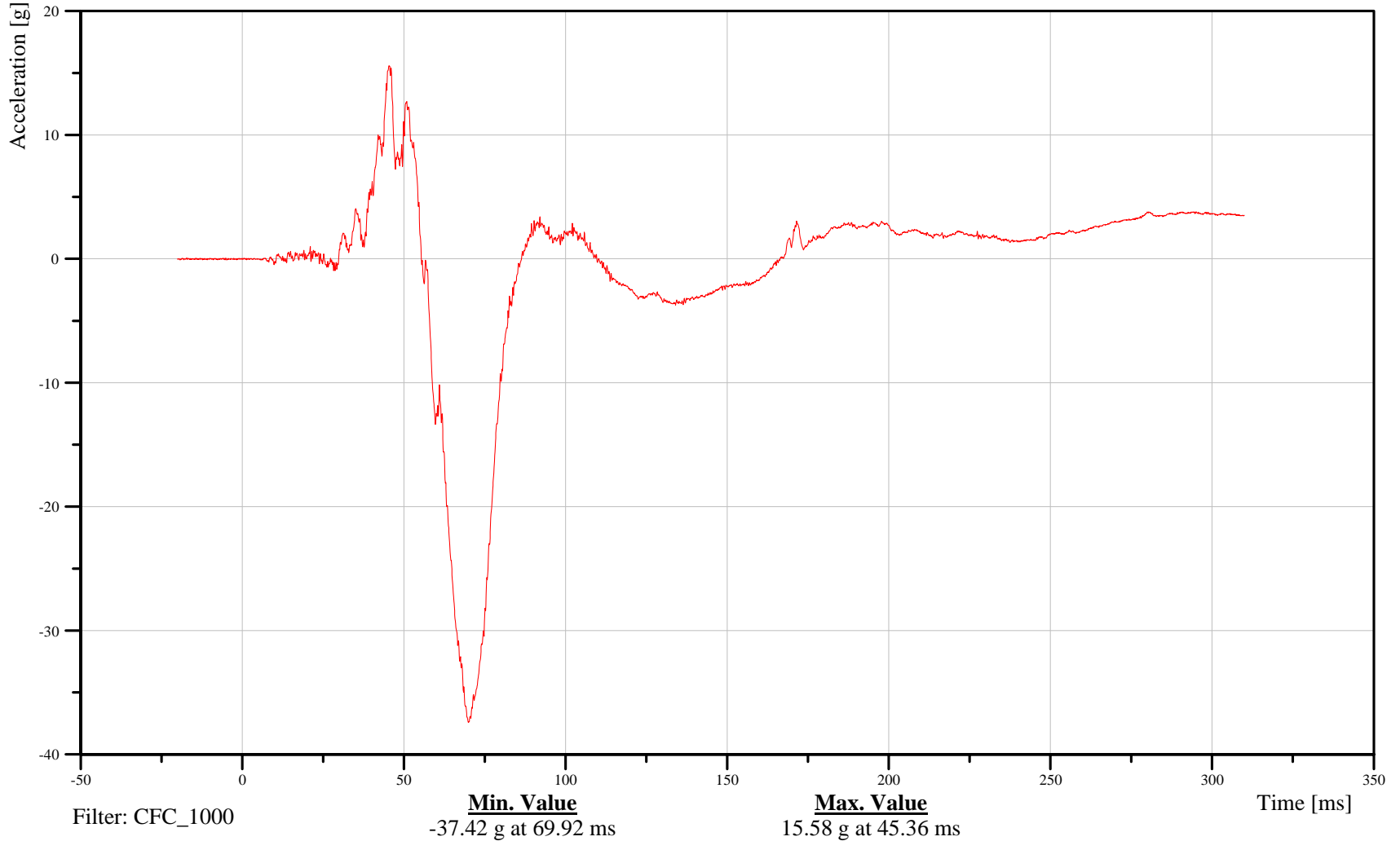
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14HEADCGRDSHACZA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-72

070925



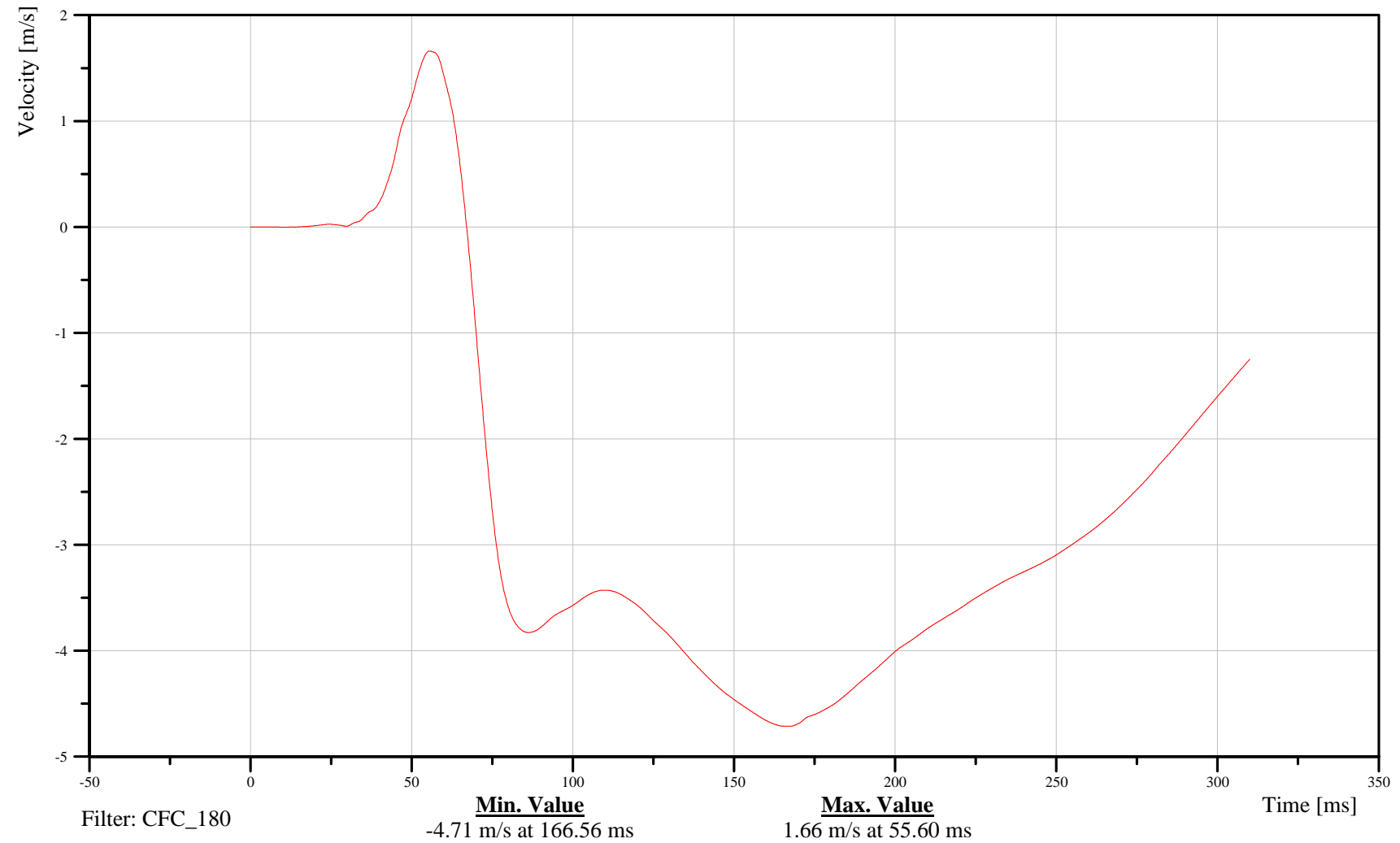
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14HEADCGRDSHVEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-73

070925



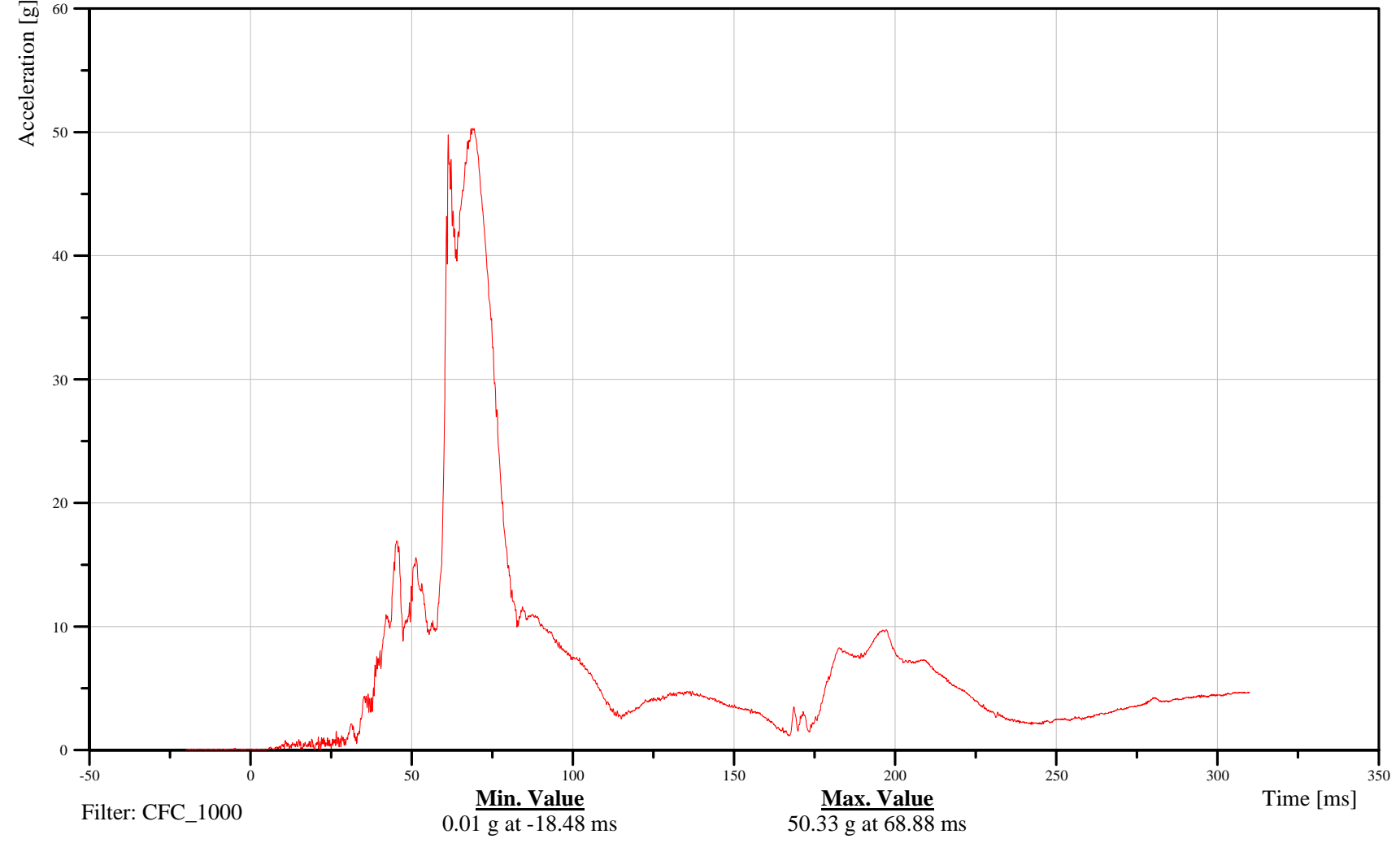
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER HEAD RESULTANT REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14HEADCGRDSHACRA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-74

070925



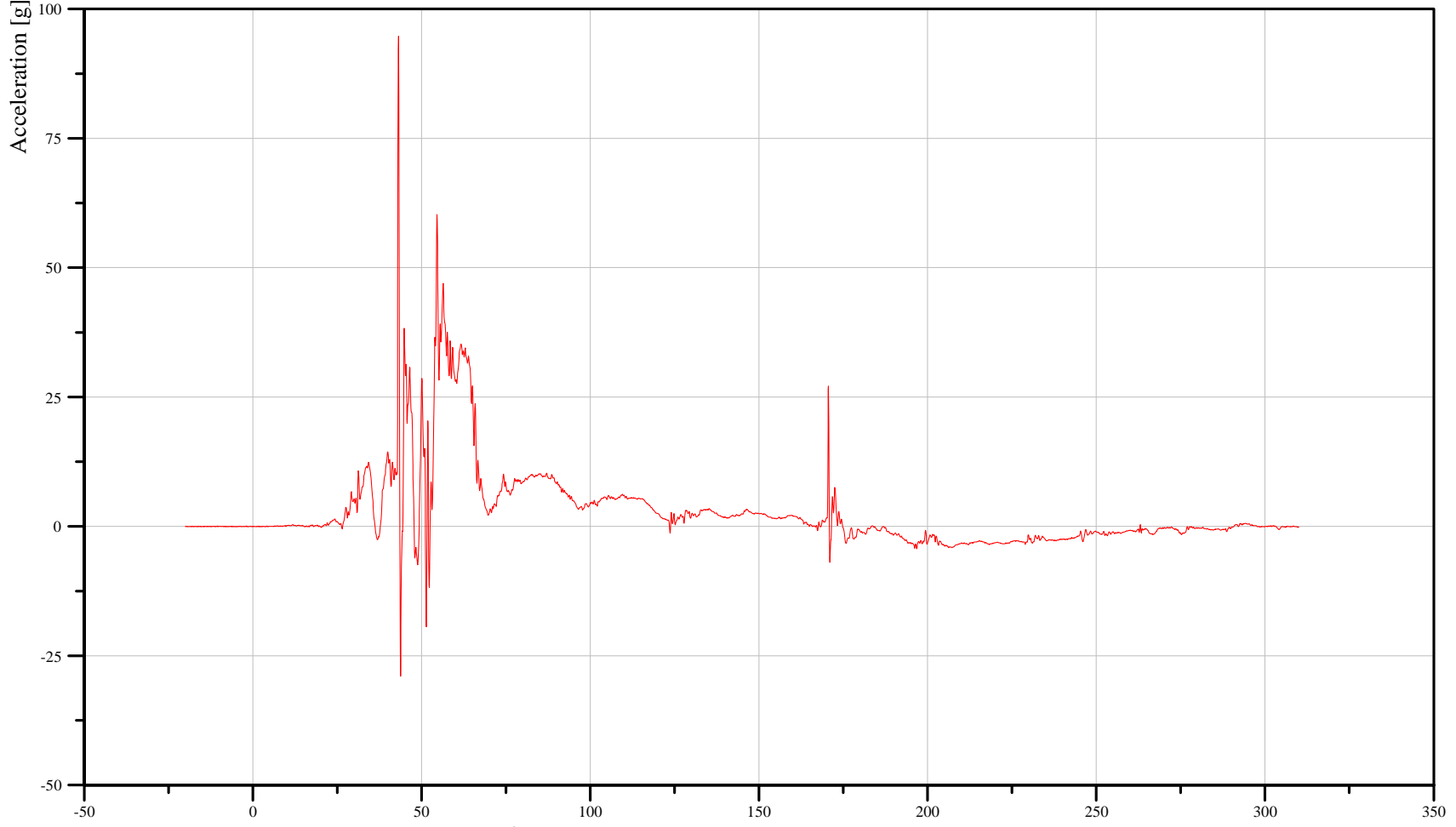
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14RIBSLURDASHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-28.96 g at 43.76 ms

**Max. Value**  
94.73 g at 43.20 ms

Time [ms]

B-75

070925



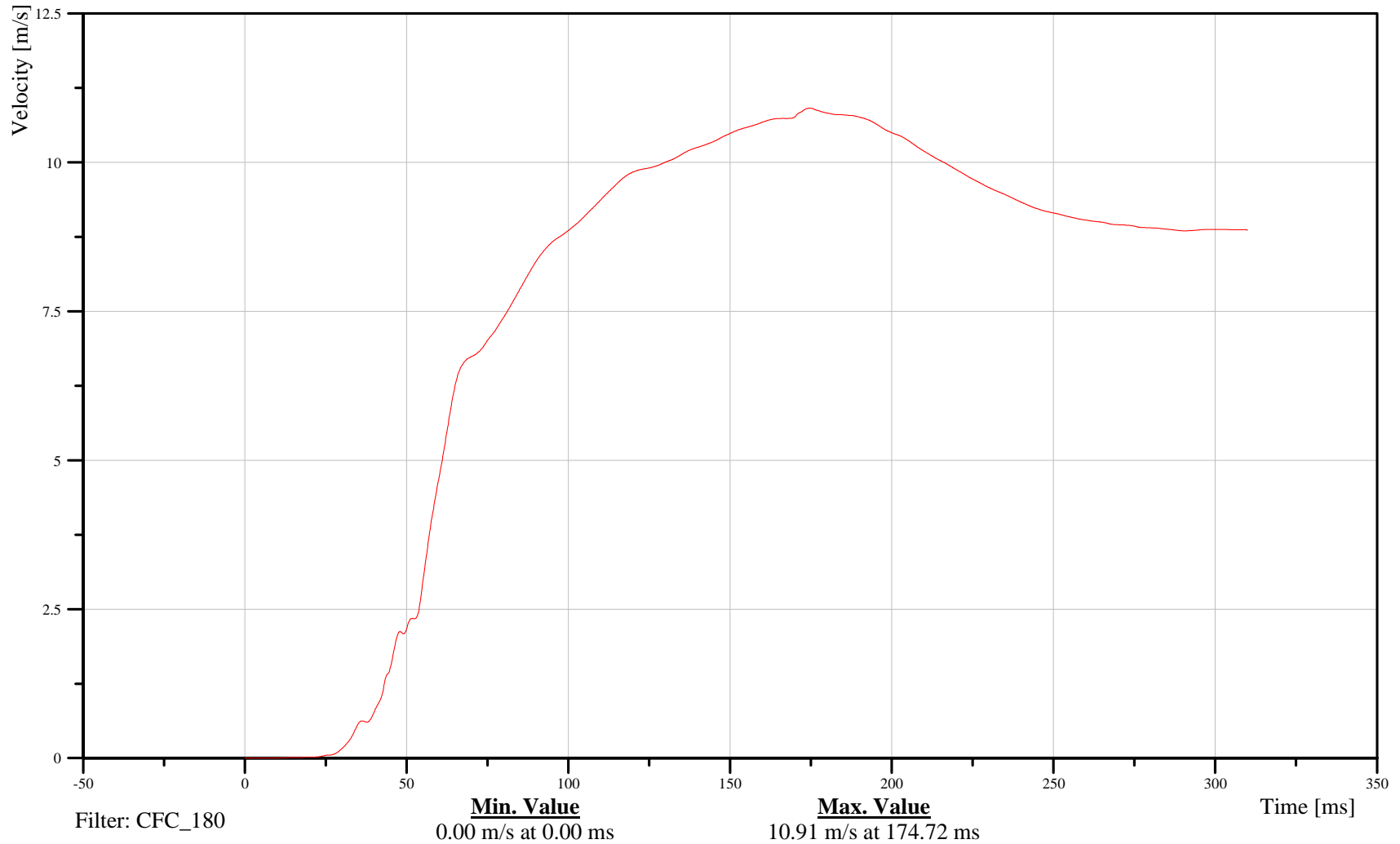
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLURDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-76

070925



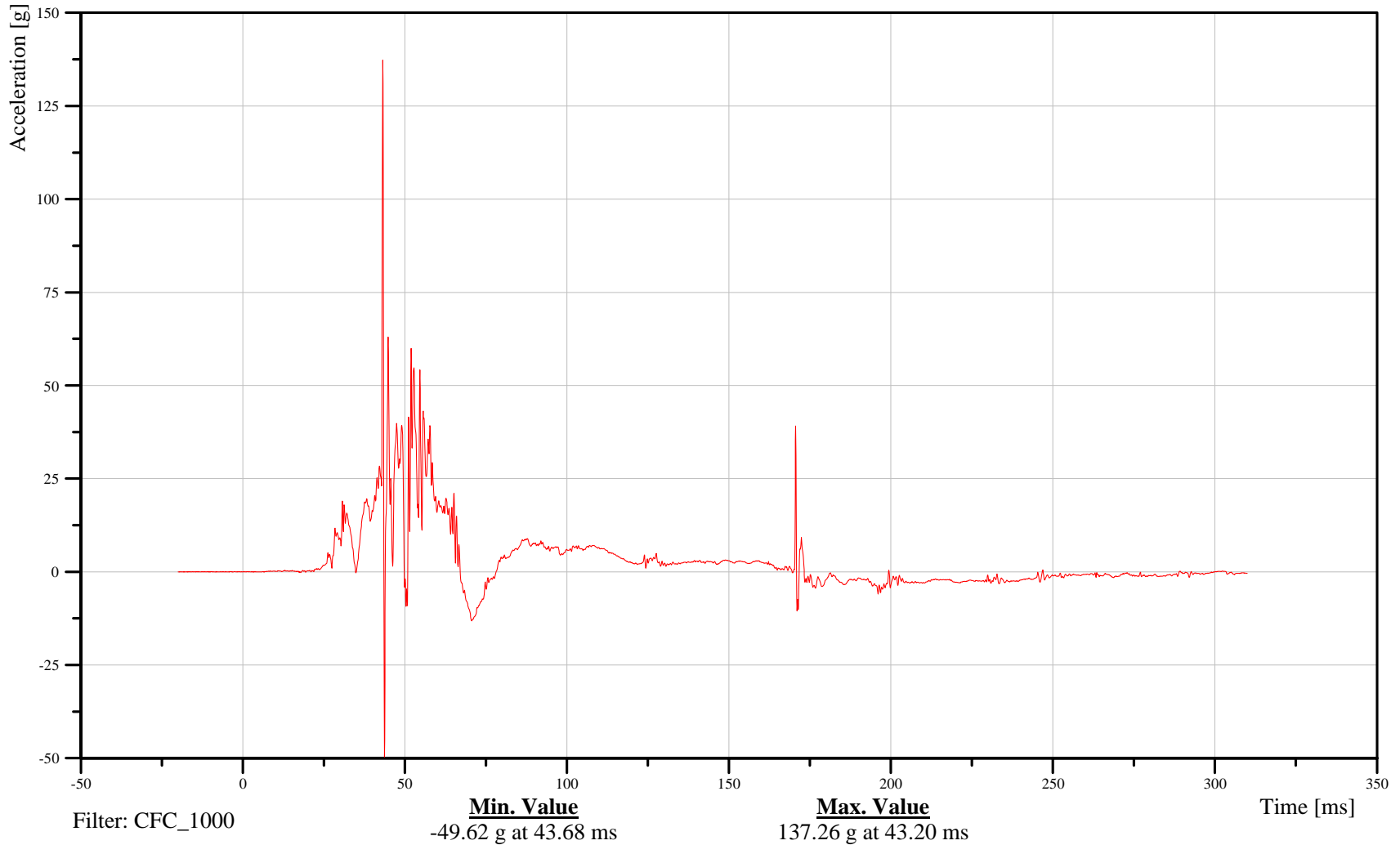
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14RIBSLLRDSHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-77

070925



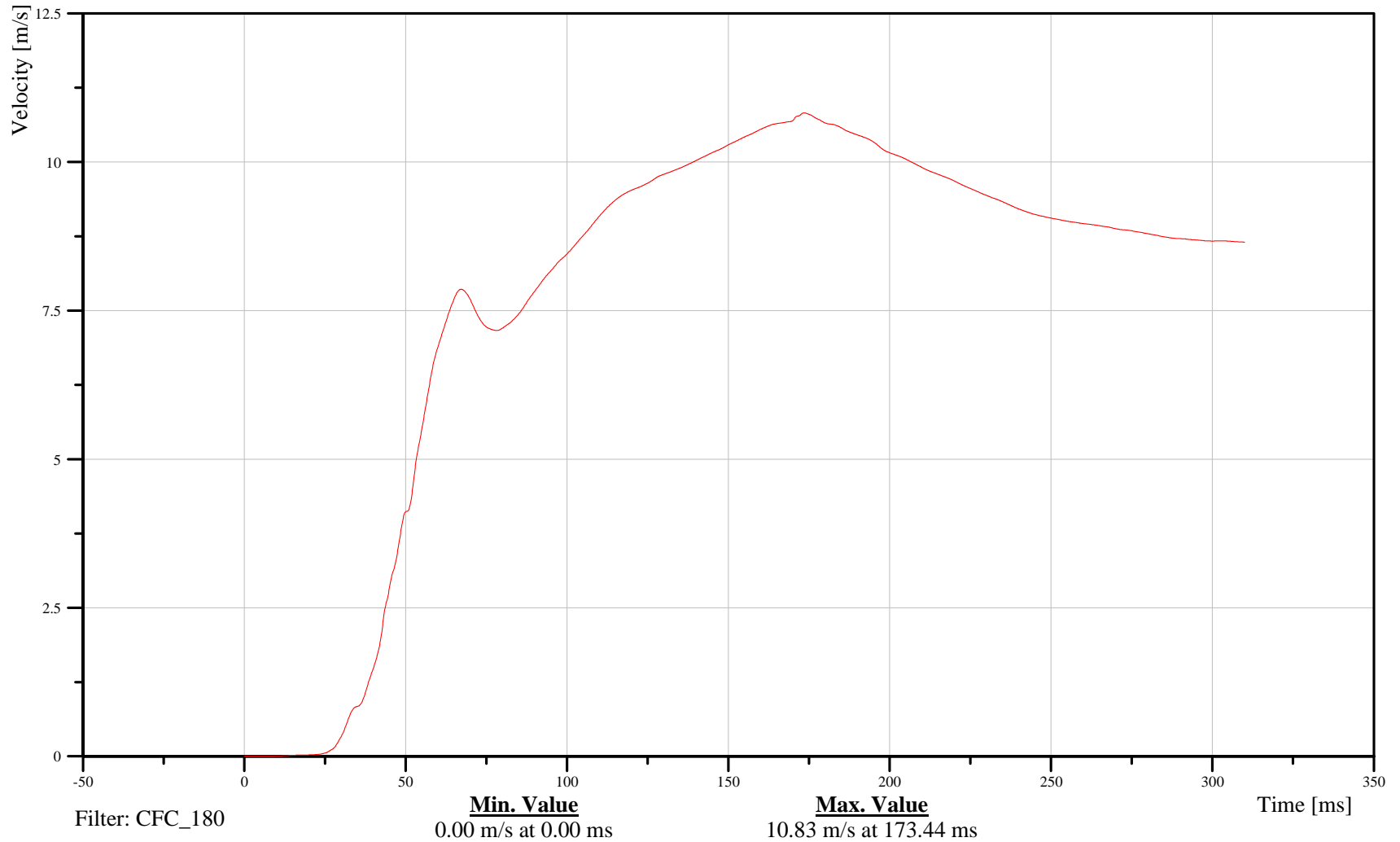
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLLRDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-78

070925



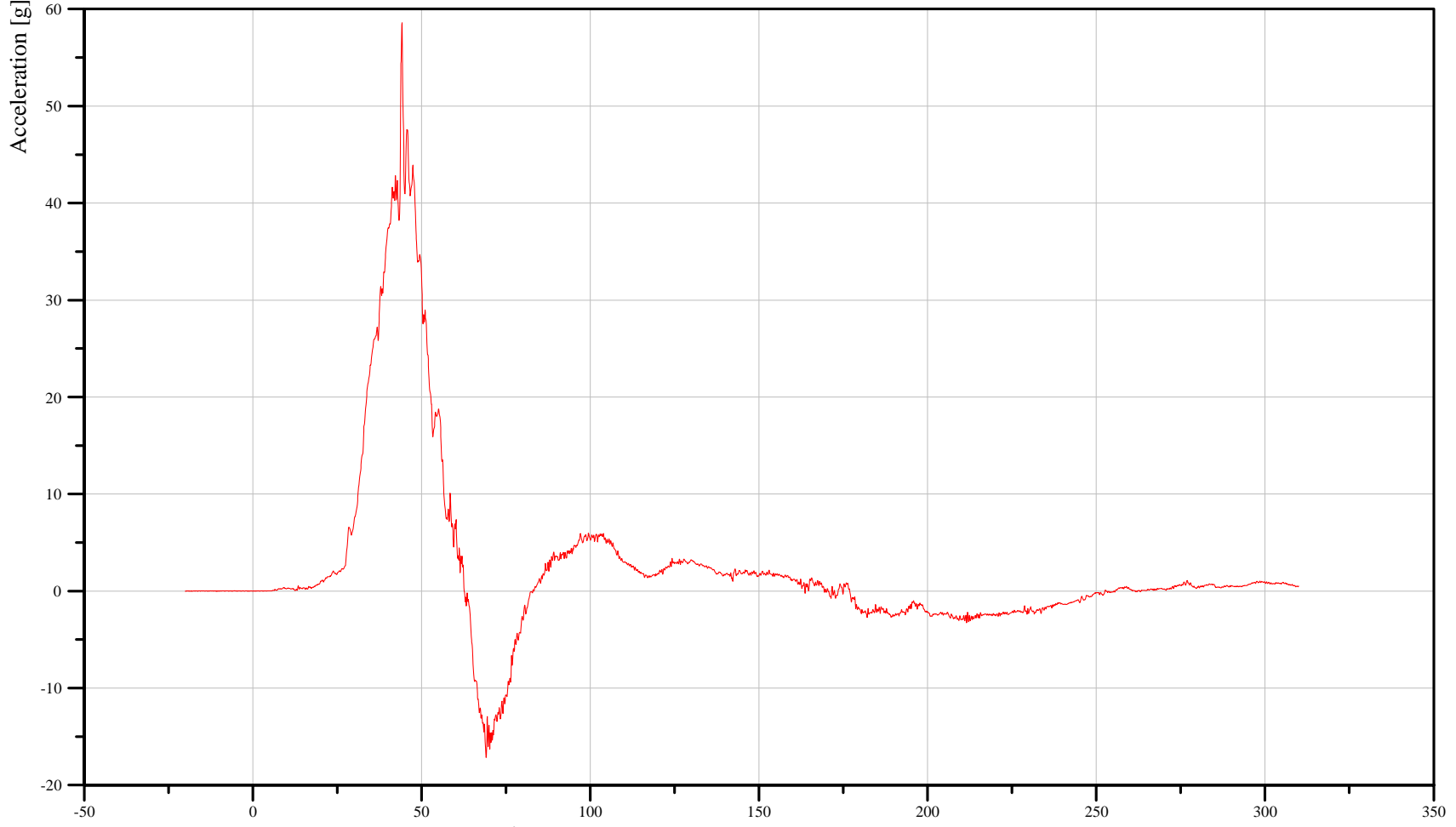
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 14SPIN12RDSHACYA

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_1000

**Min. Value**  
-17.14 g at 69.12 ms

**Max. Value**  
58.58 g at 44.24 ms

Time [ms]

B-79

070925



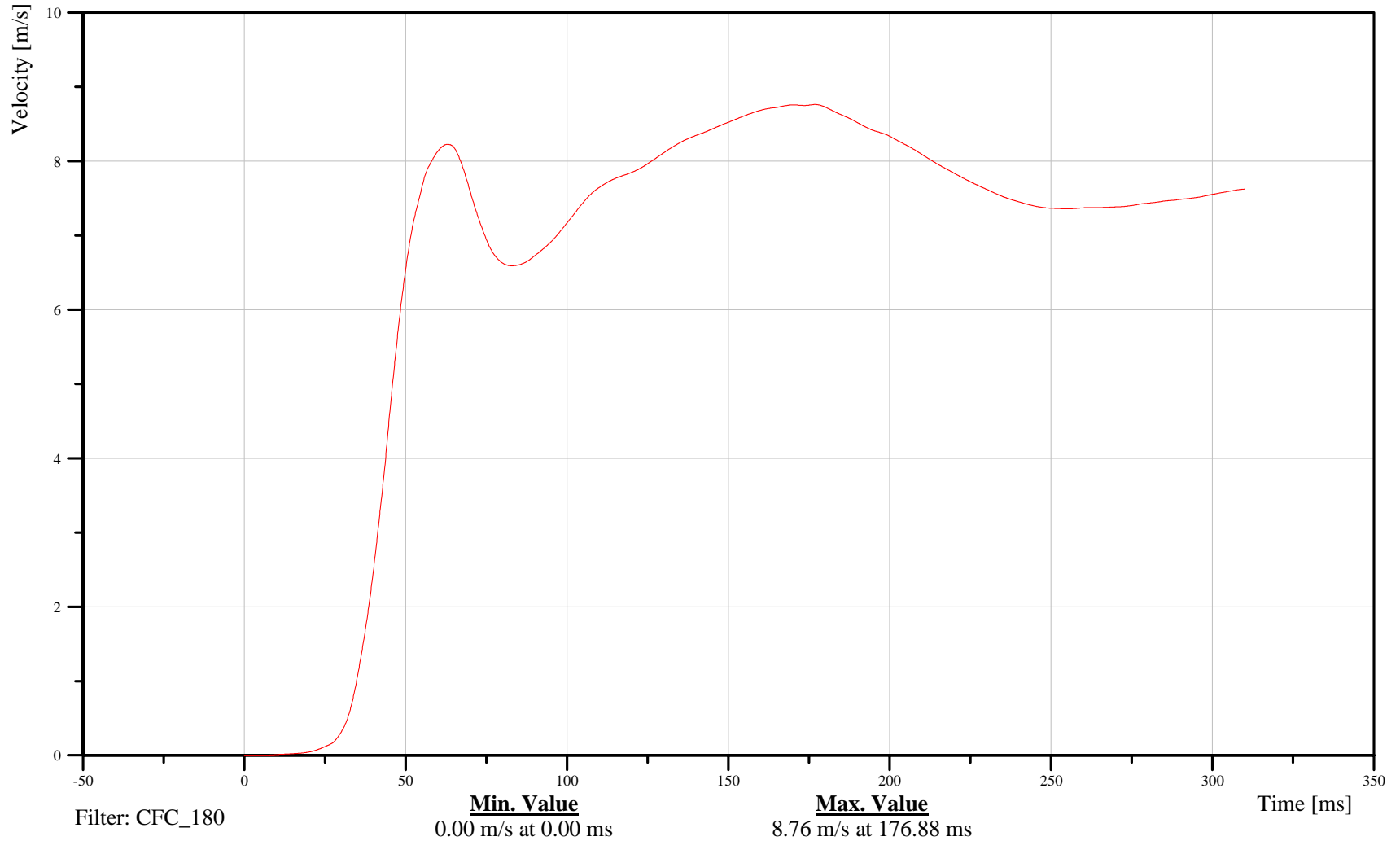
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SPIN12RDSHVEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-80

070925

Test Vehicle Instrumentation Plots



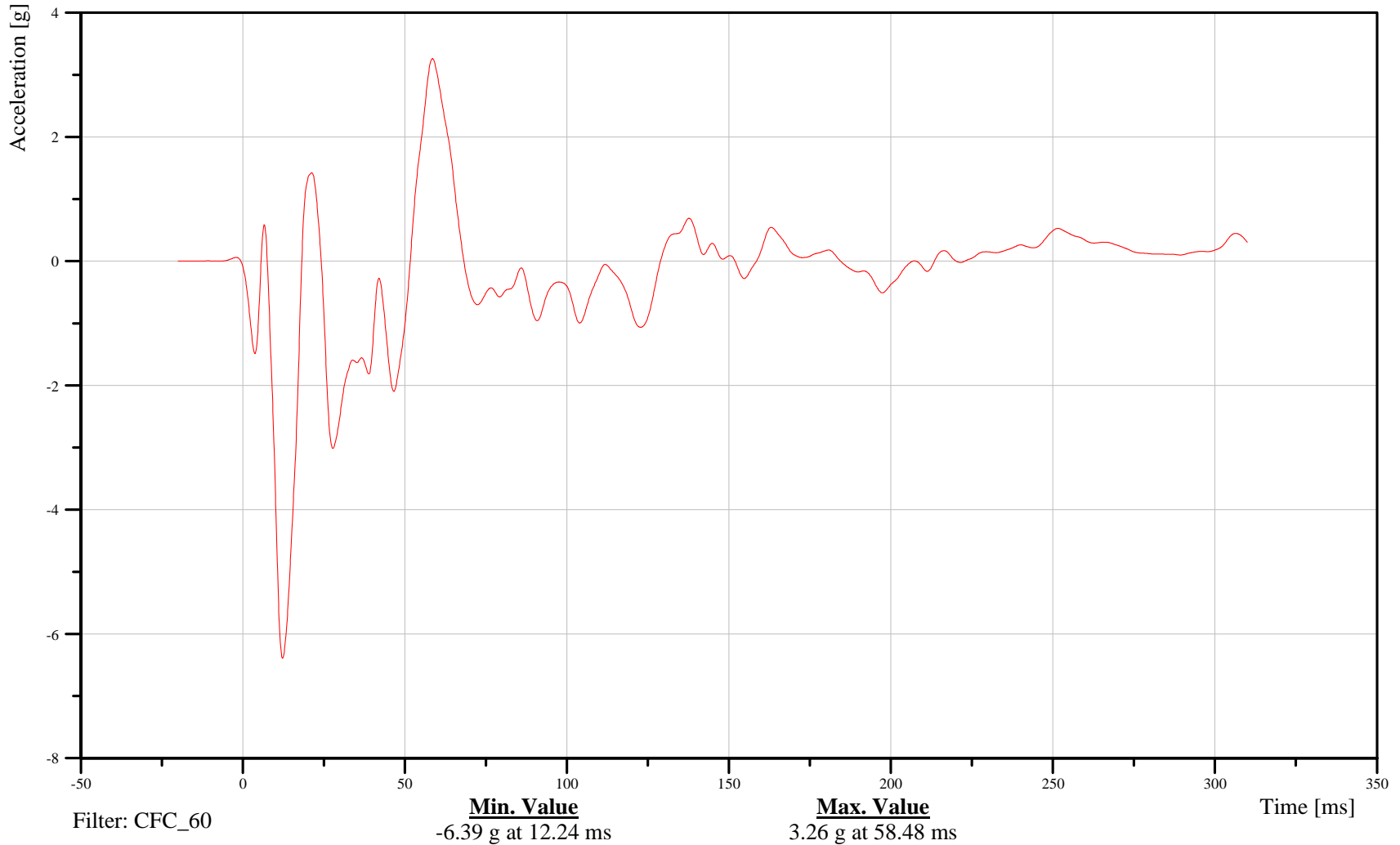
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT FRONT SEAT X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBFR0000ACXD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-82

070925



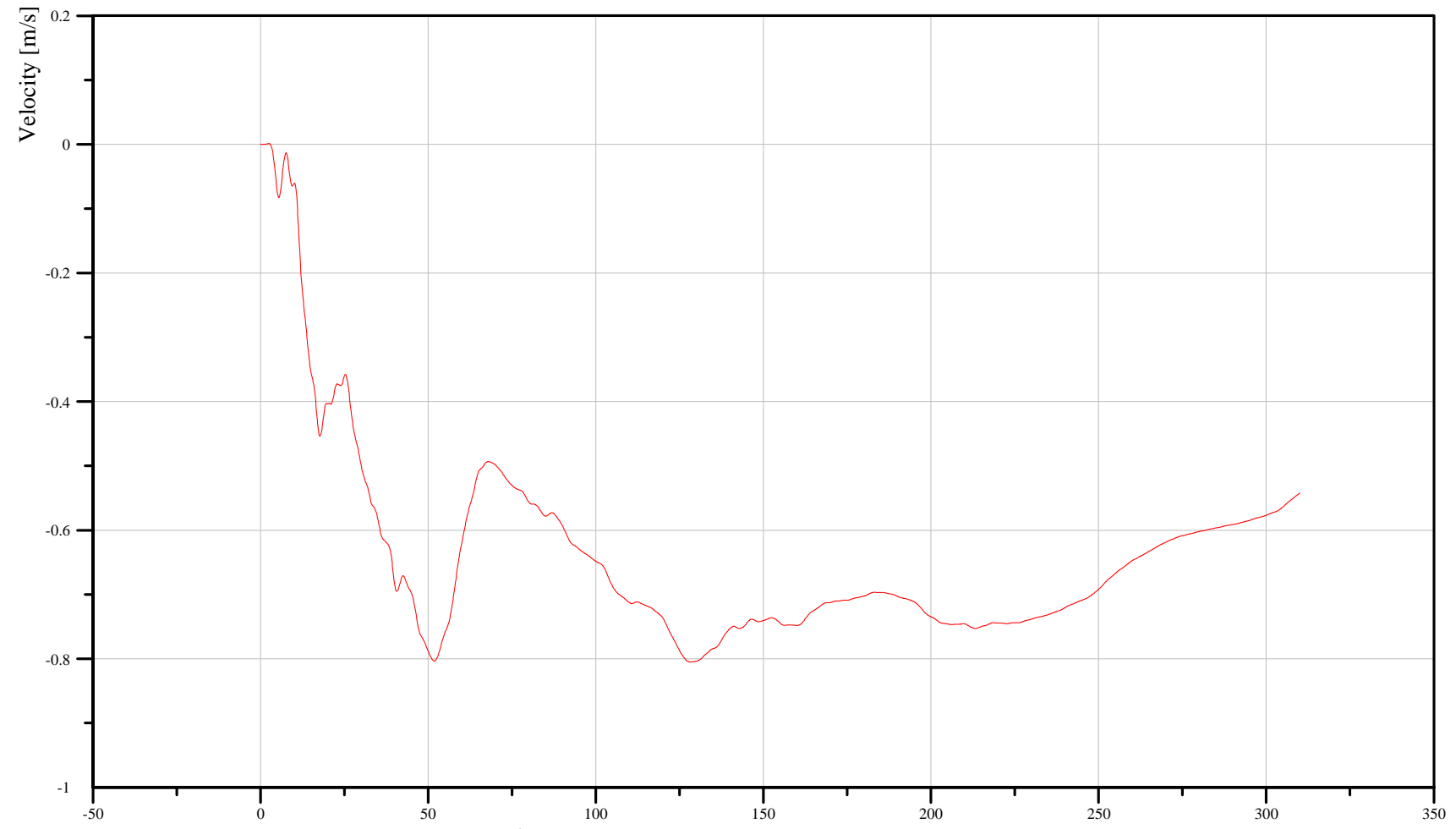
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT FRONT SEAT X-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBFR0000VEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
-0.81 m/s at 128.16 ms

Max. Value  
0.00 m/s at 2.48 ms

B-83

070925



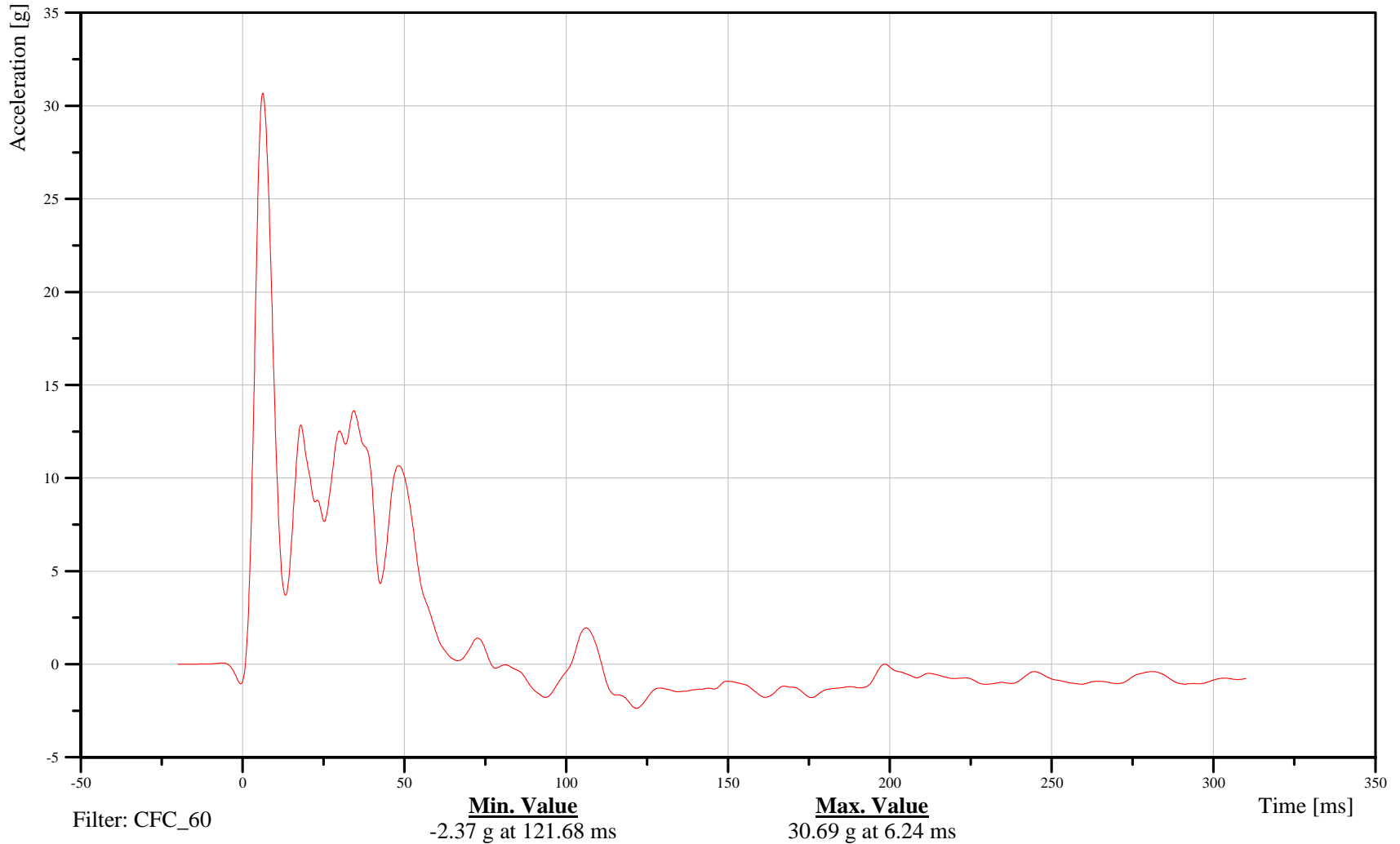
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBFR0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-84

070925



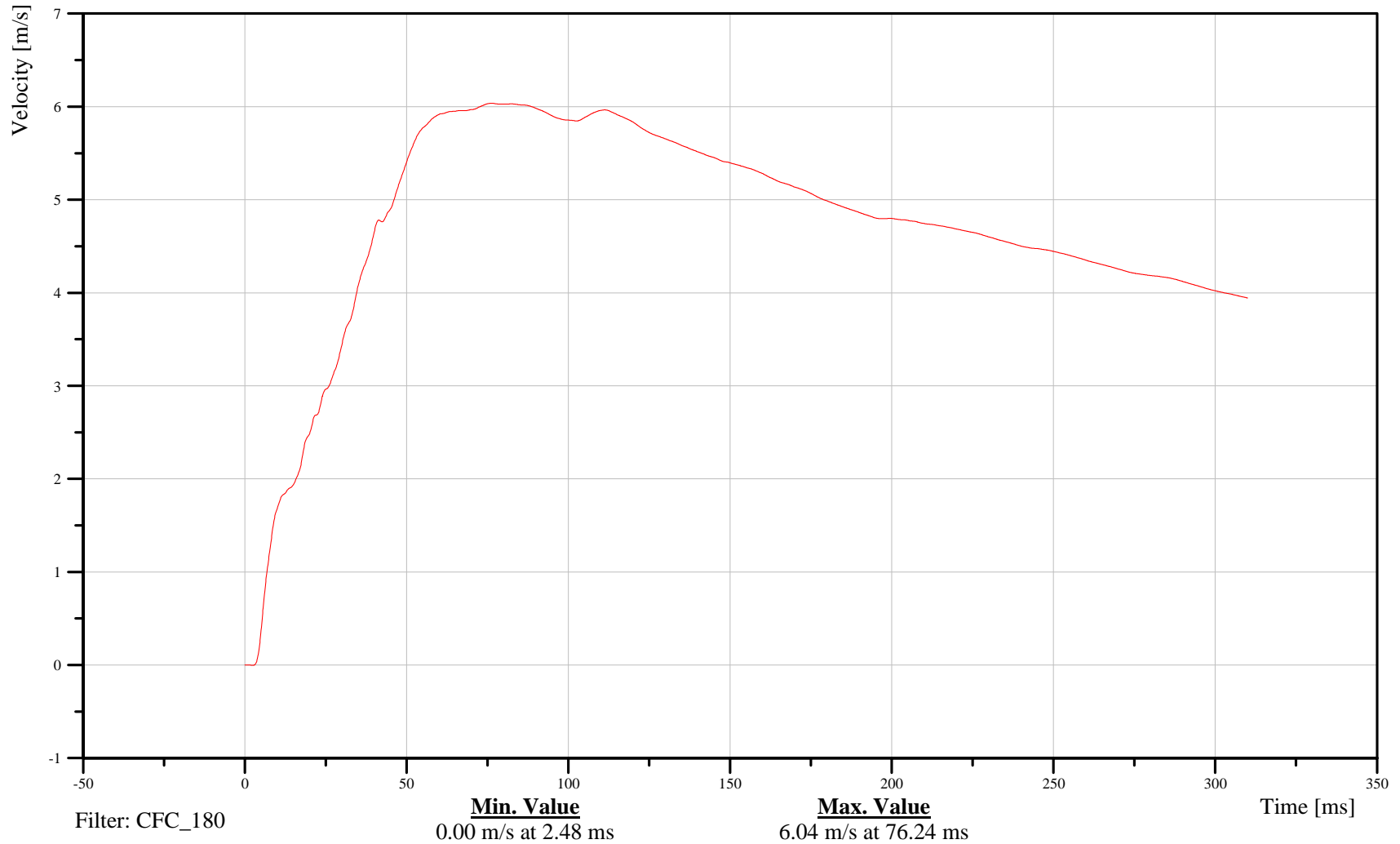
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBFR0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-85

070925



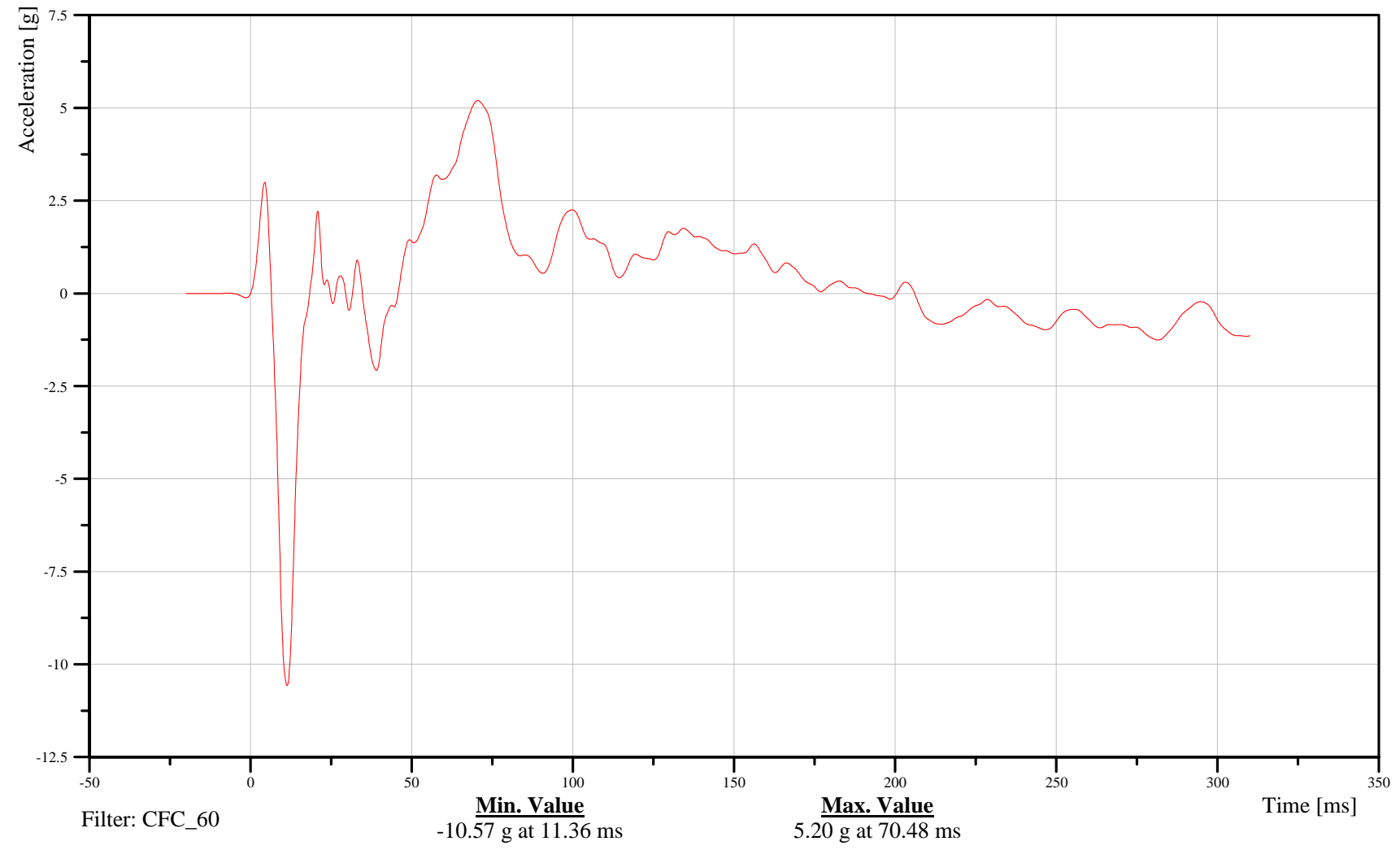
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT FRONT SEAT Z-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBFR0000ACZD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-86

070925



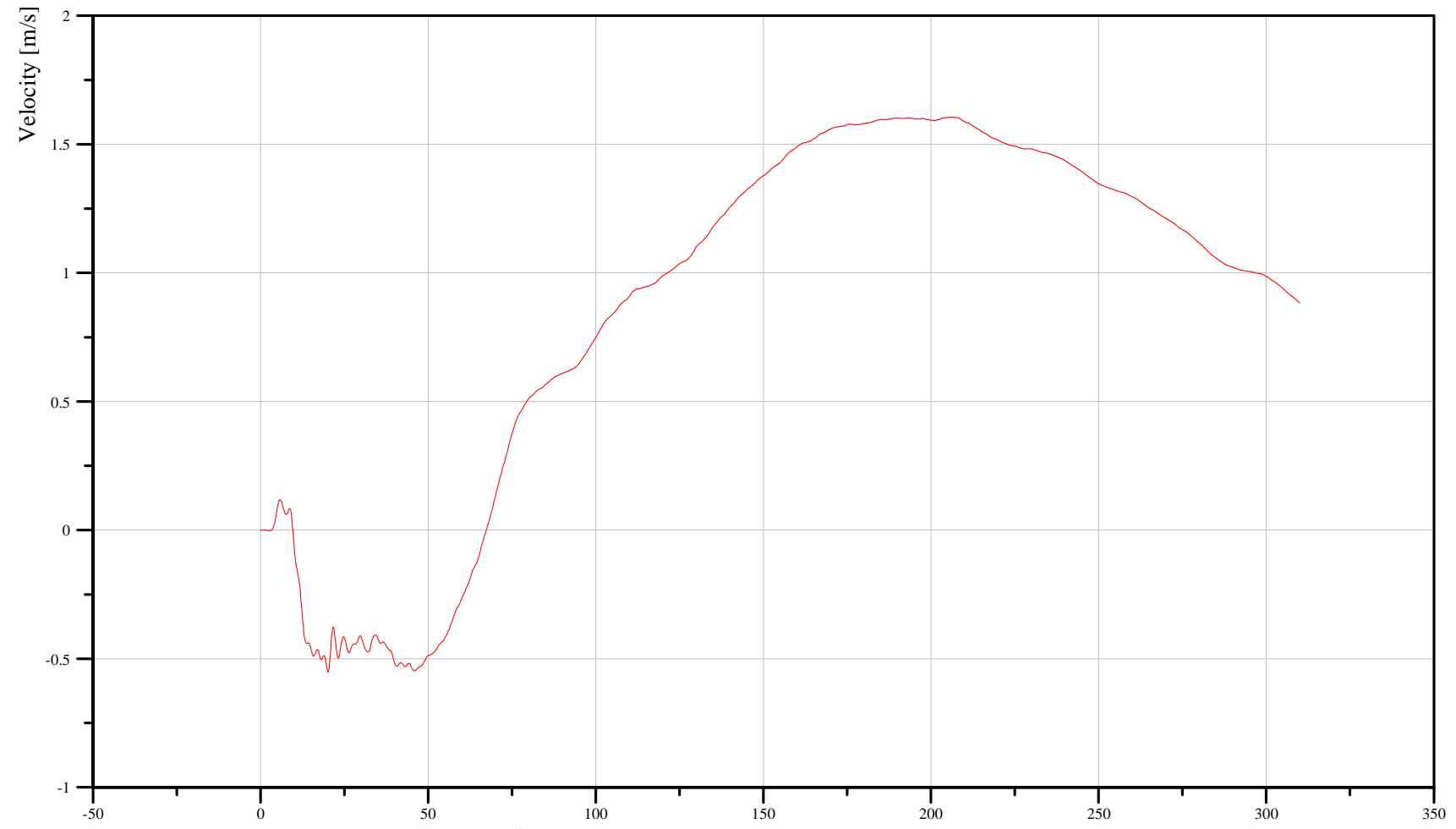
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT FRONT SEAT Z-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBFR0000VEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
-0.55 m/s at 20.16 ms

Max. Value  
1.61 m/s at 206.16 ms

B-87

070925



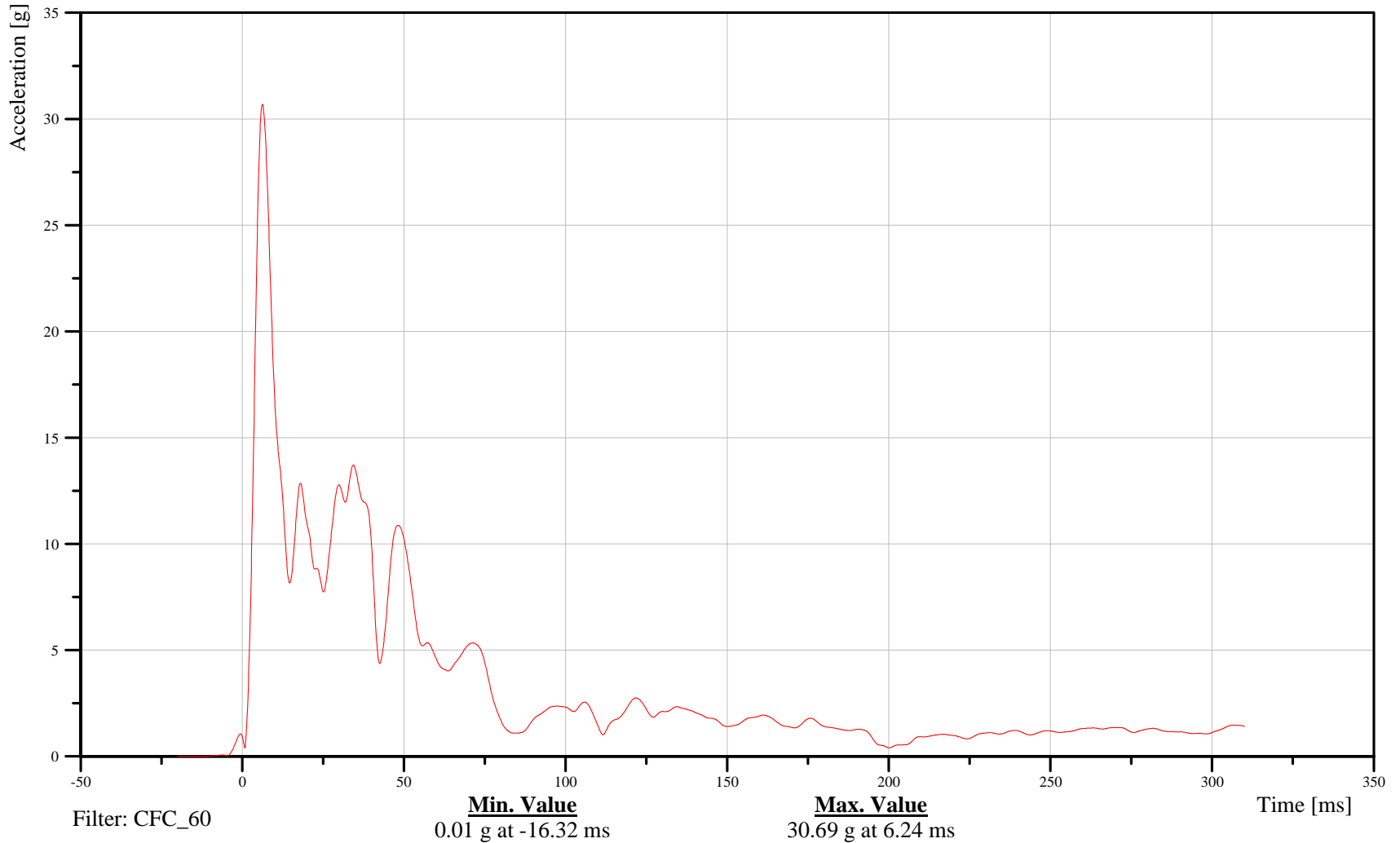
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBFR0000ACRD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-88

070925



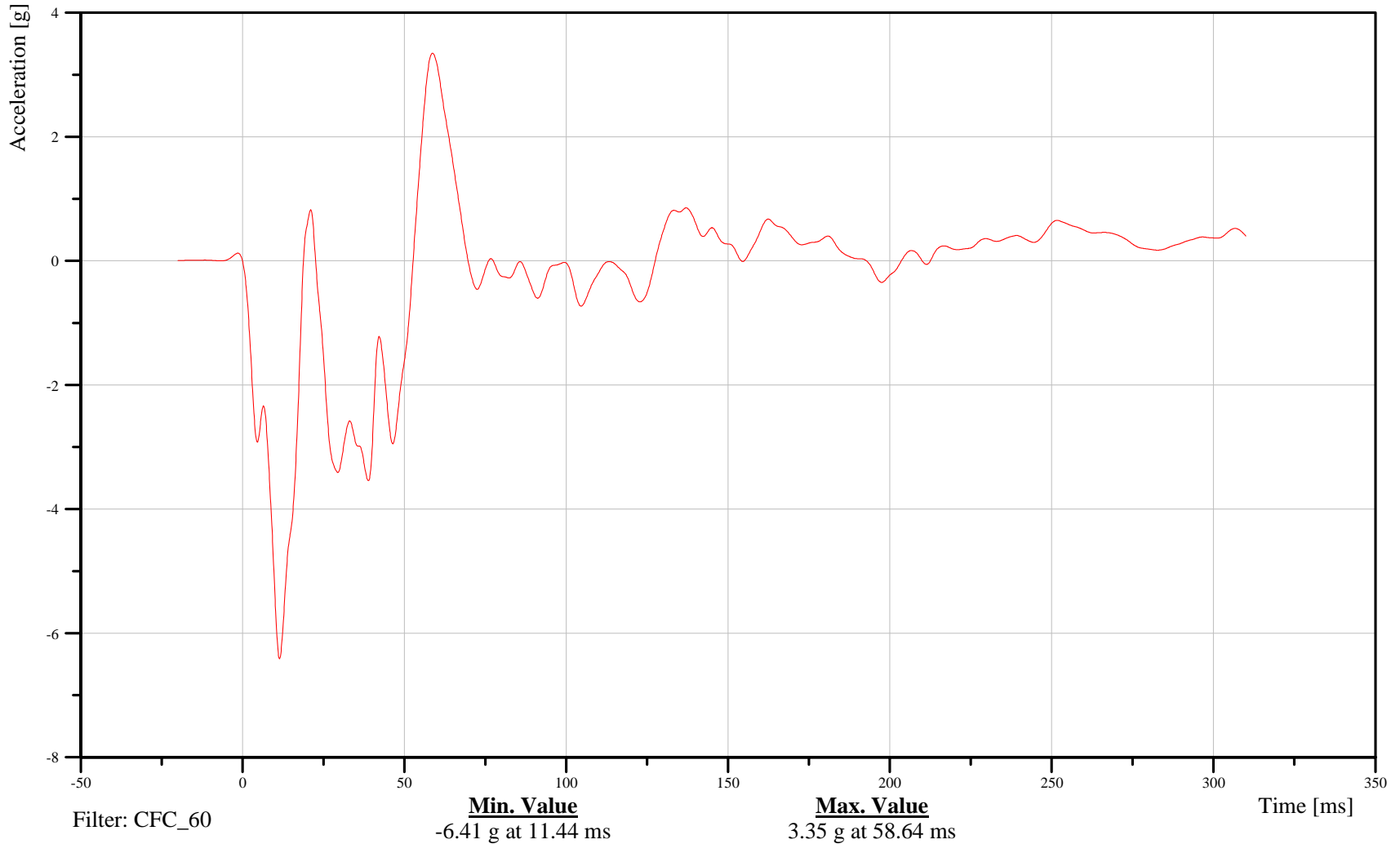
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT REAR SEAT X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBRE0000ACXD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-89

070925



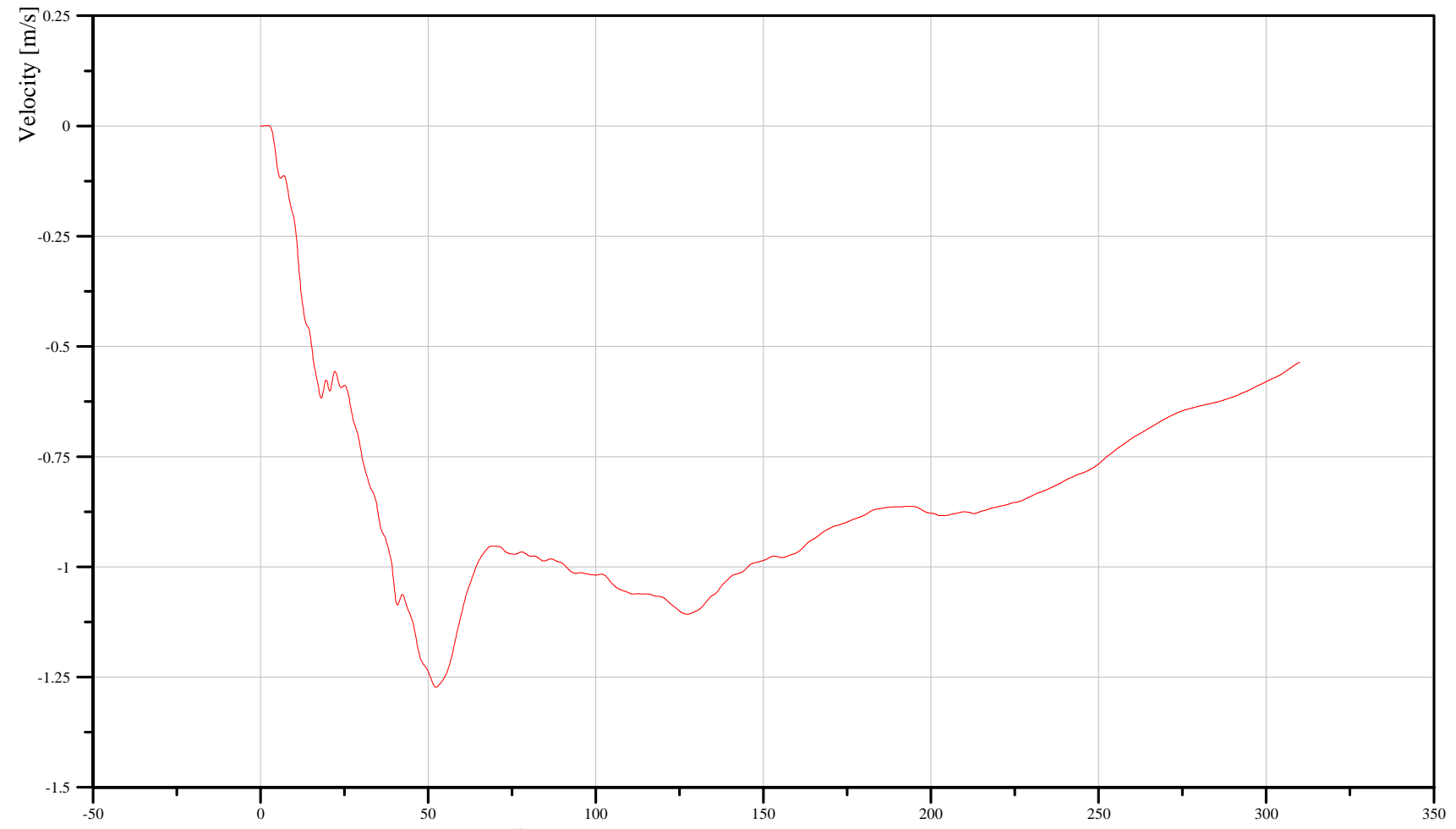
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT REAR SEAT X-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBRE0000VEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
-1.27 m/s at 52.32 ms

Max. Value  
0.00 m/s at 2.24 ms

B-90

070925



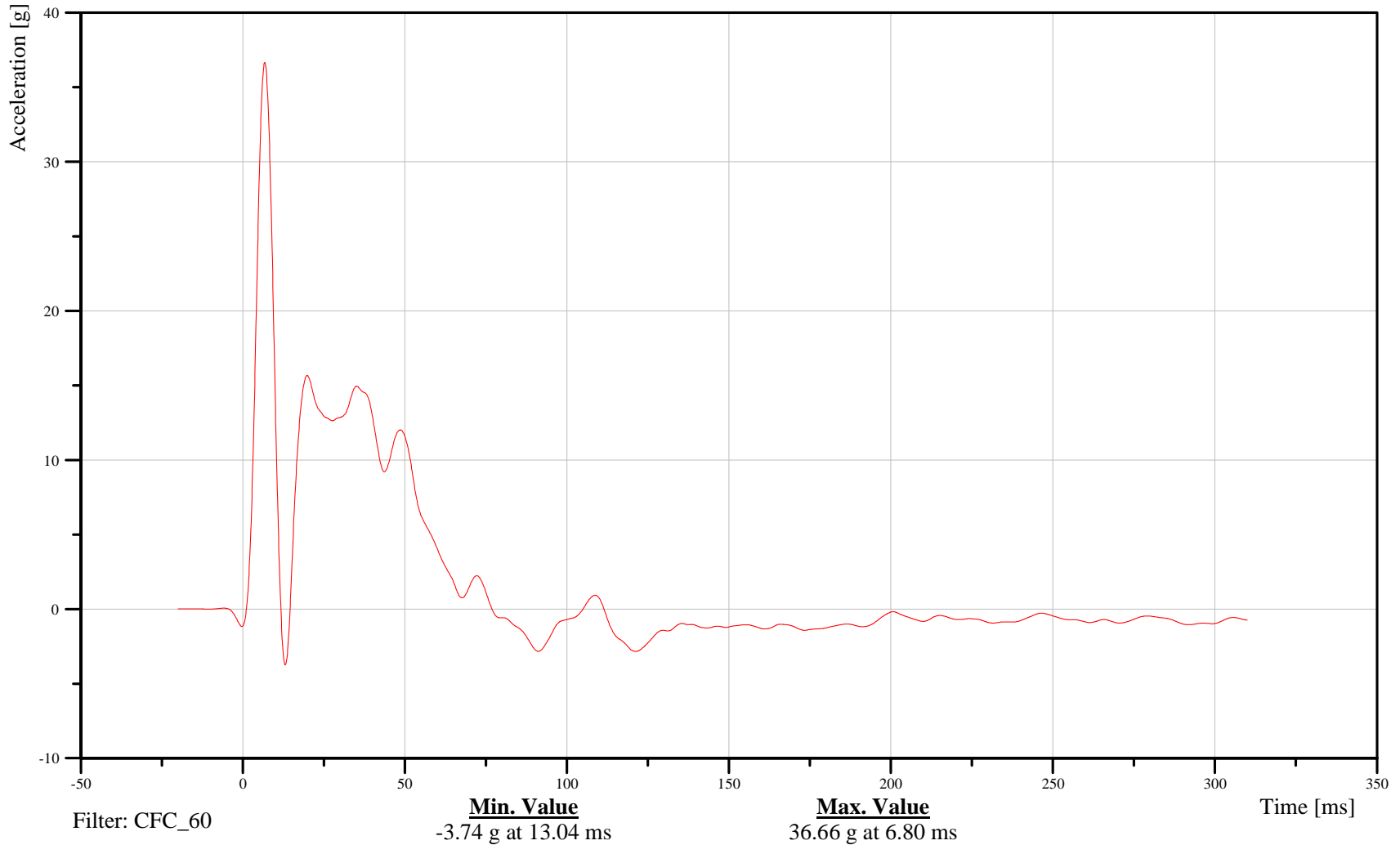
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBRE0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-91

070925



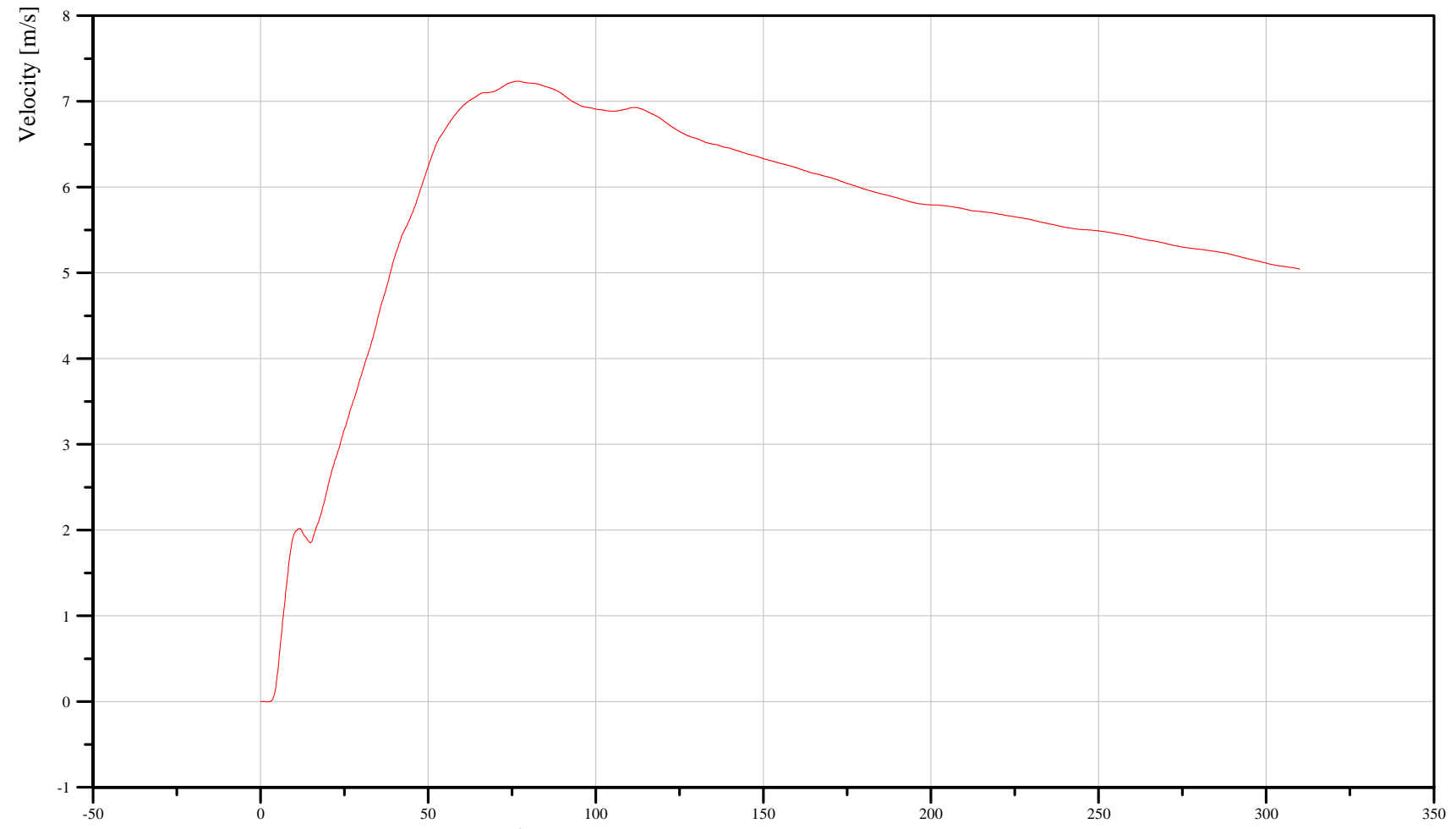
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBRE0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
0.00 m/s at 2.40 ms

**Max. Value**  
7.24 m/s at 76.72 ms

Time [ms]

B-92

070925



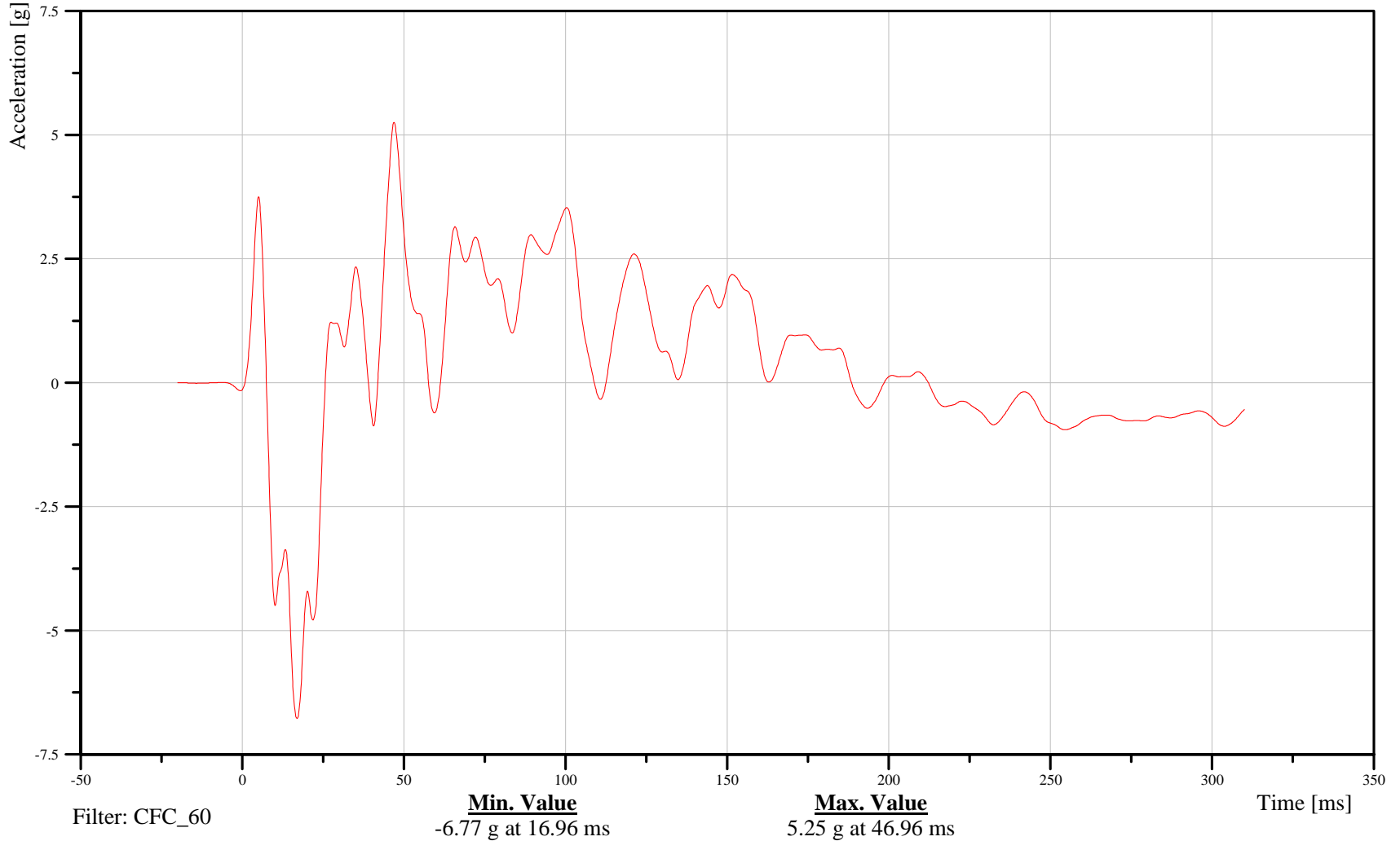
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT REAR SEAT Z-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBRE0000ACZD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-93

070925



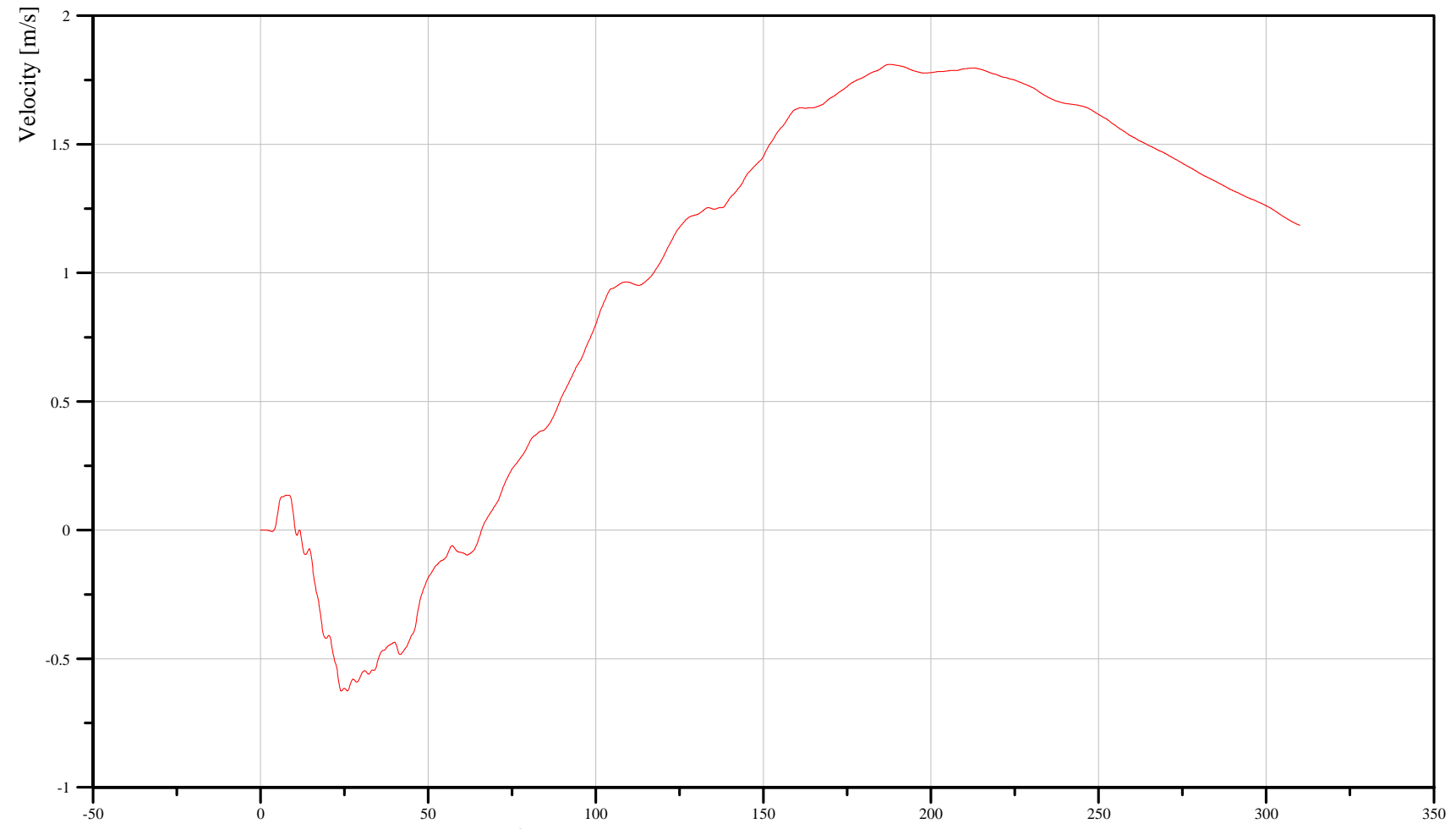
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT REAR SEAT Z-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBRE0000VEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
-0.63 m/s at 24.16 ms

Max. Value  
1.81 m/s at 187.60 ms

Time [ms]

B-94

070925



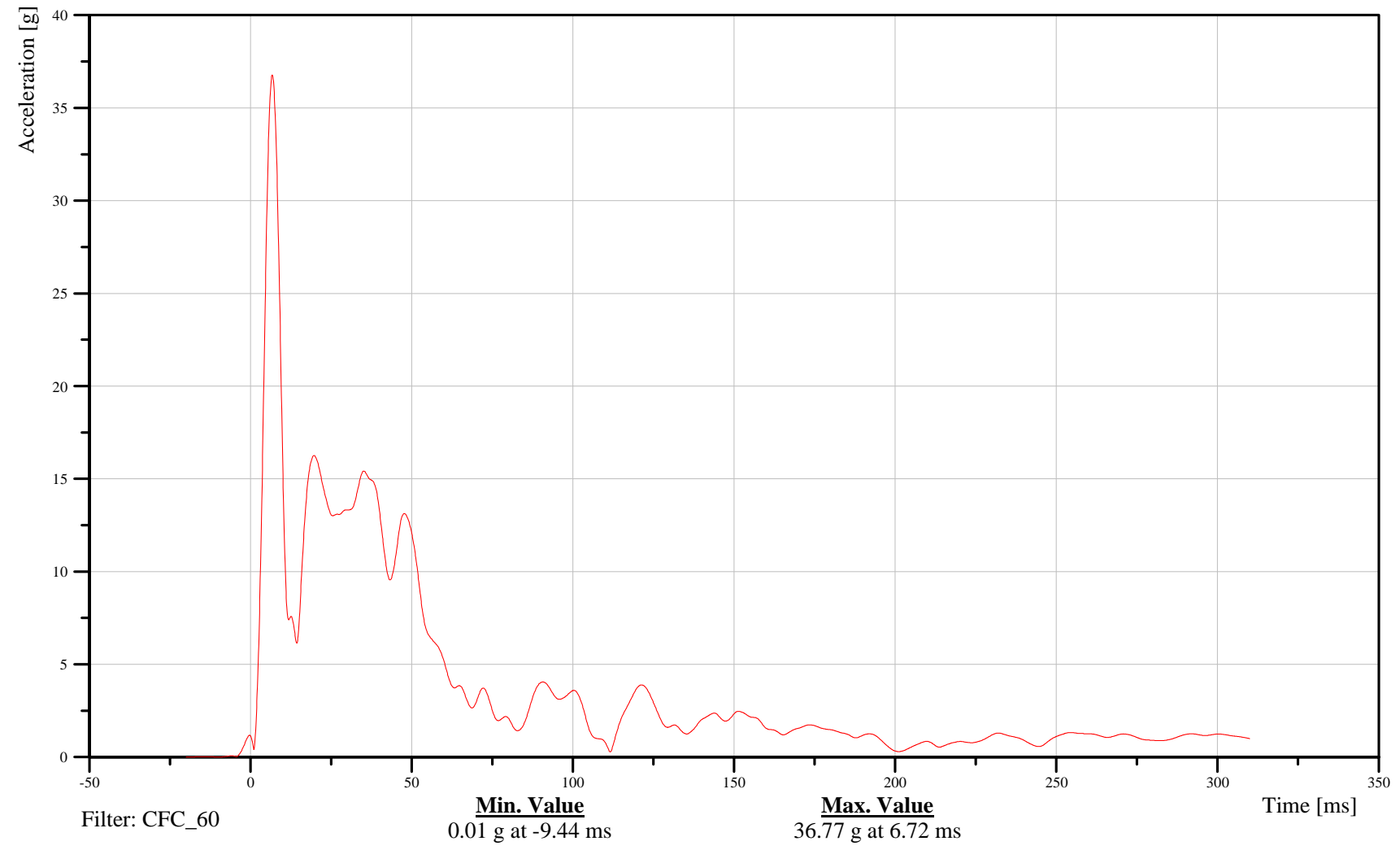
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16SILBRE0000ACRD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-95

070925



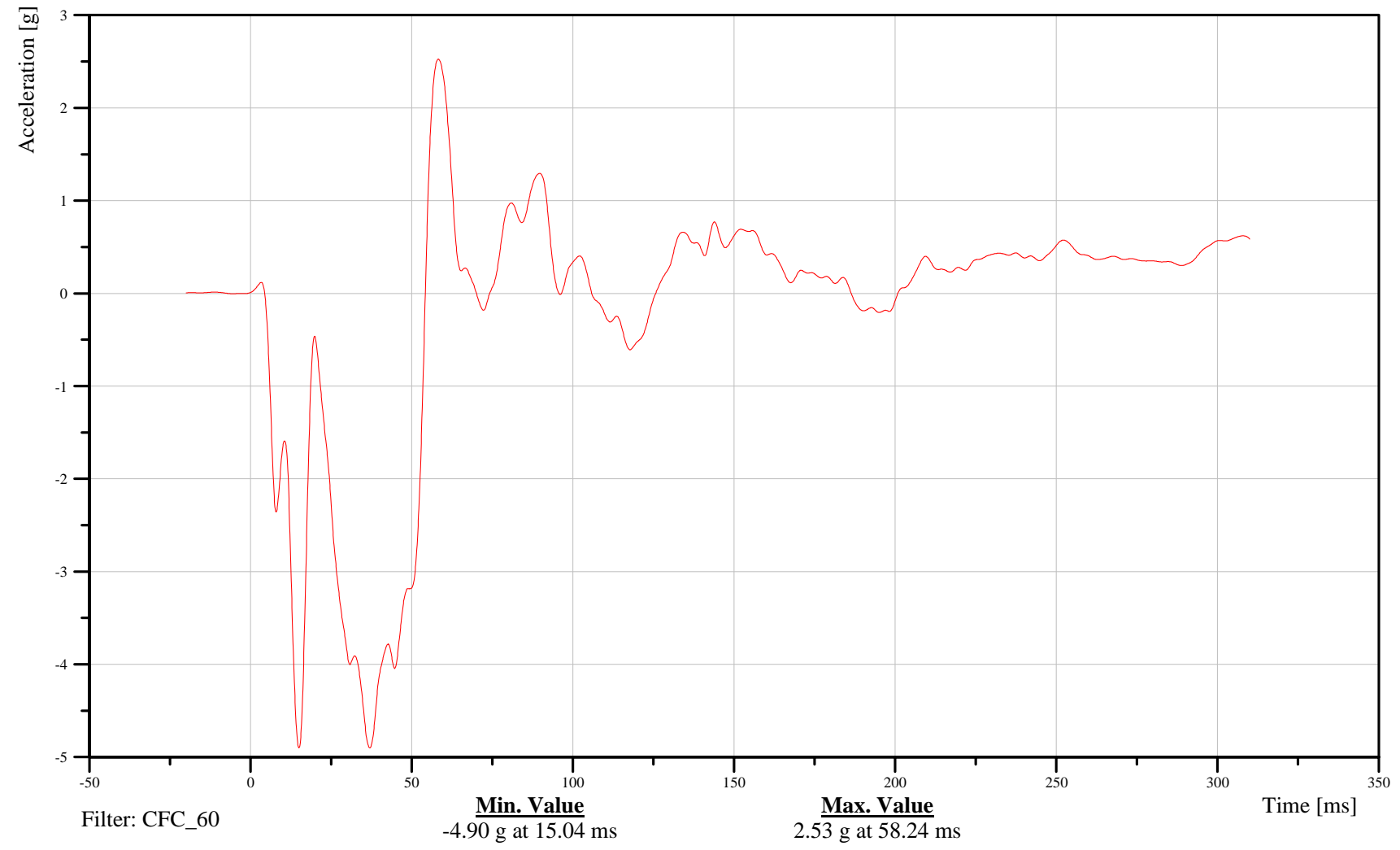
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

REAR FLOORPAN ABOVE AXLE X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

18FORA000000ACXD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-96

070925



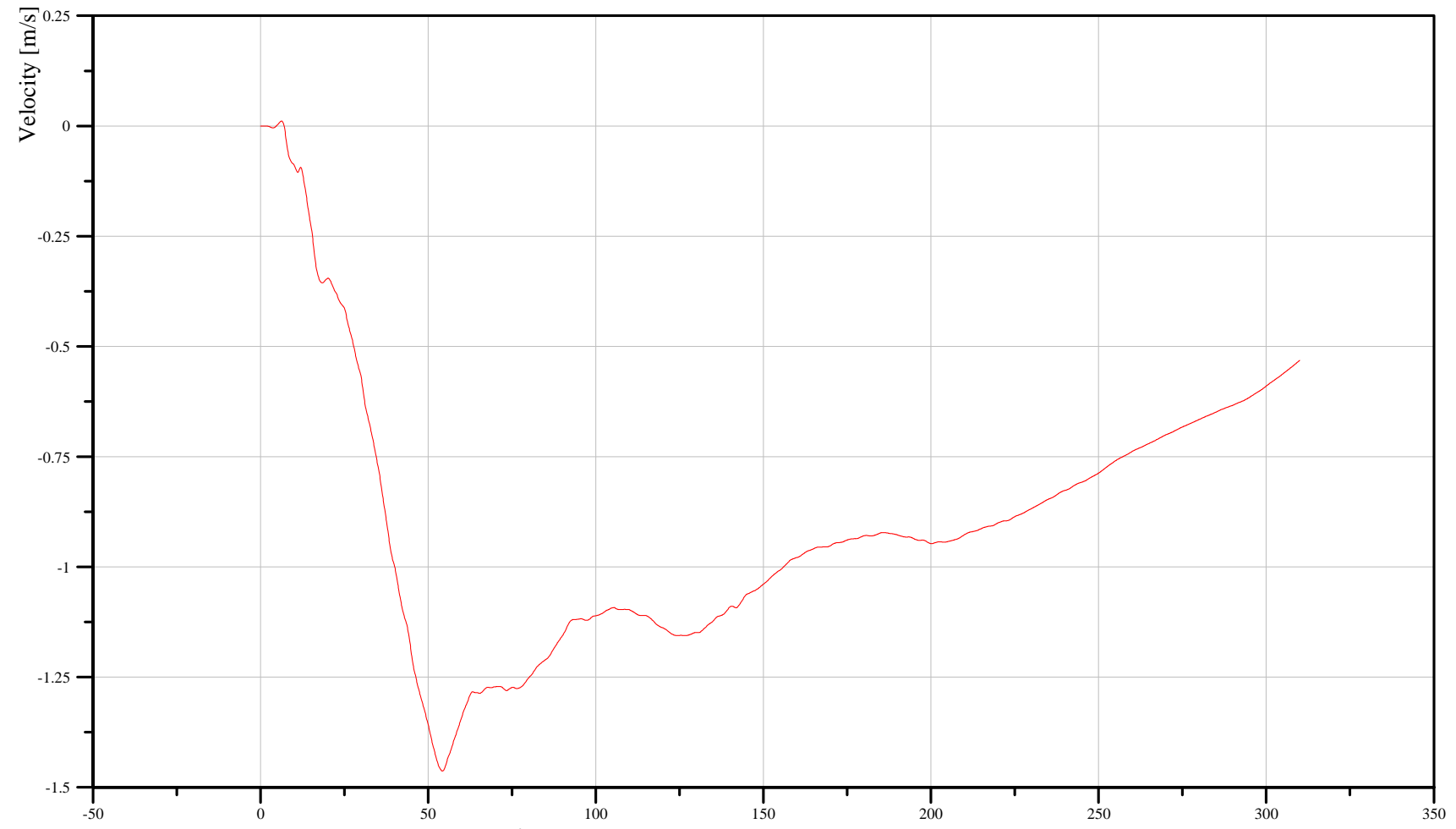
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

REAR FLOORPAN ABOVE AXLE X-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

18FORA000000VEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
-1.46 m/s at 54.24 ms

Max. Value  
0.01 m/s at 6.32 ms

Time [ms]

B-97

070925



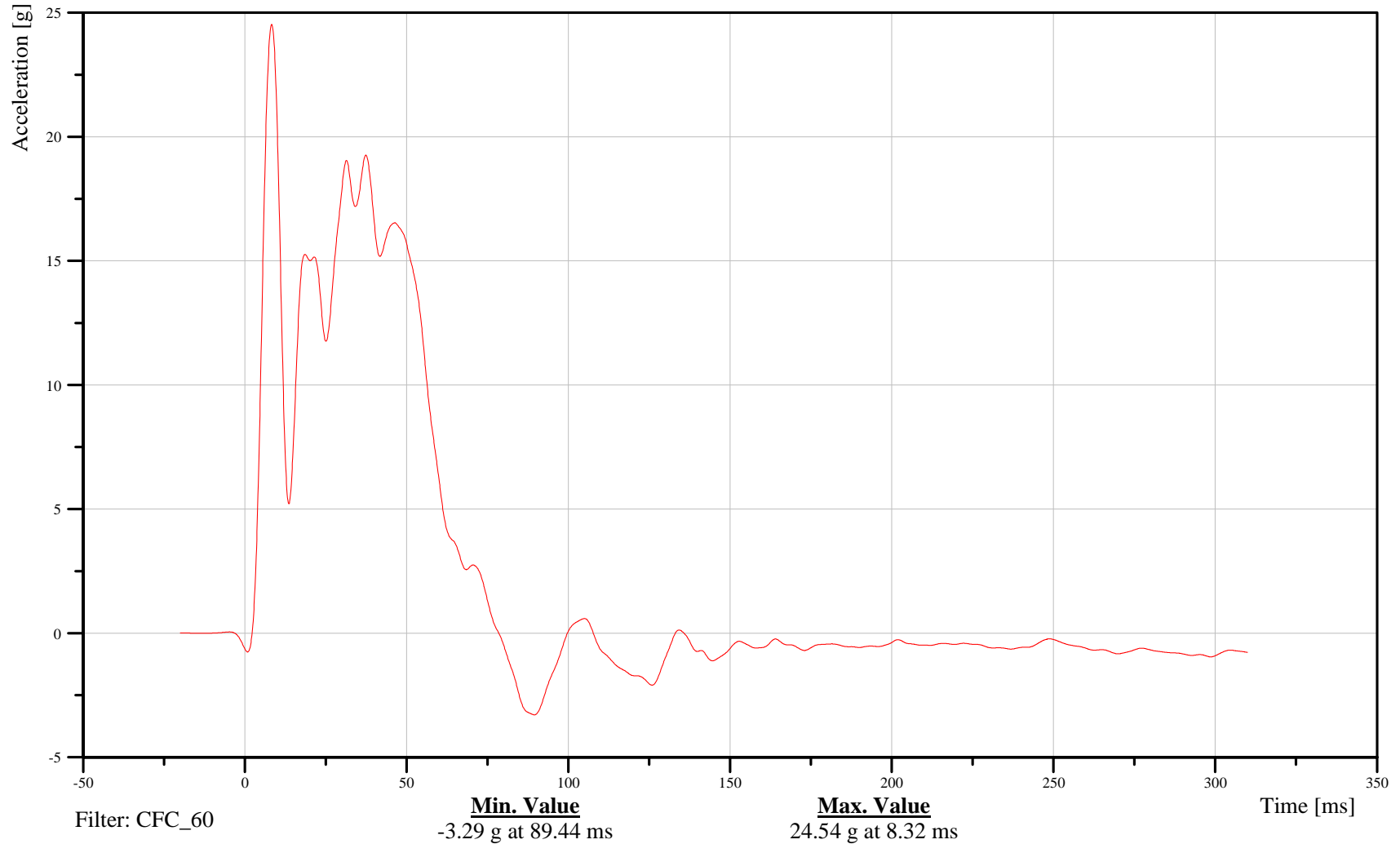
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

REAR FLOORPAN ABOVE AXLE Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

18FORA000000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-98

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

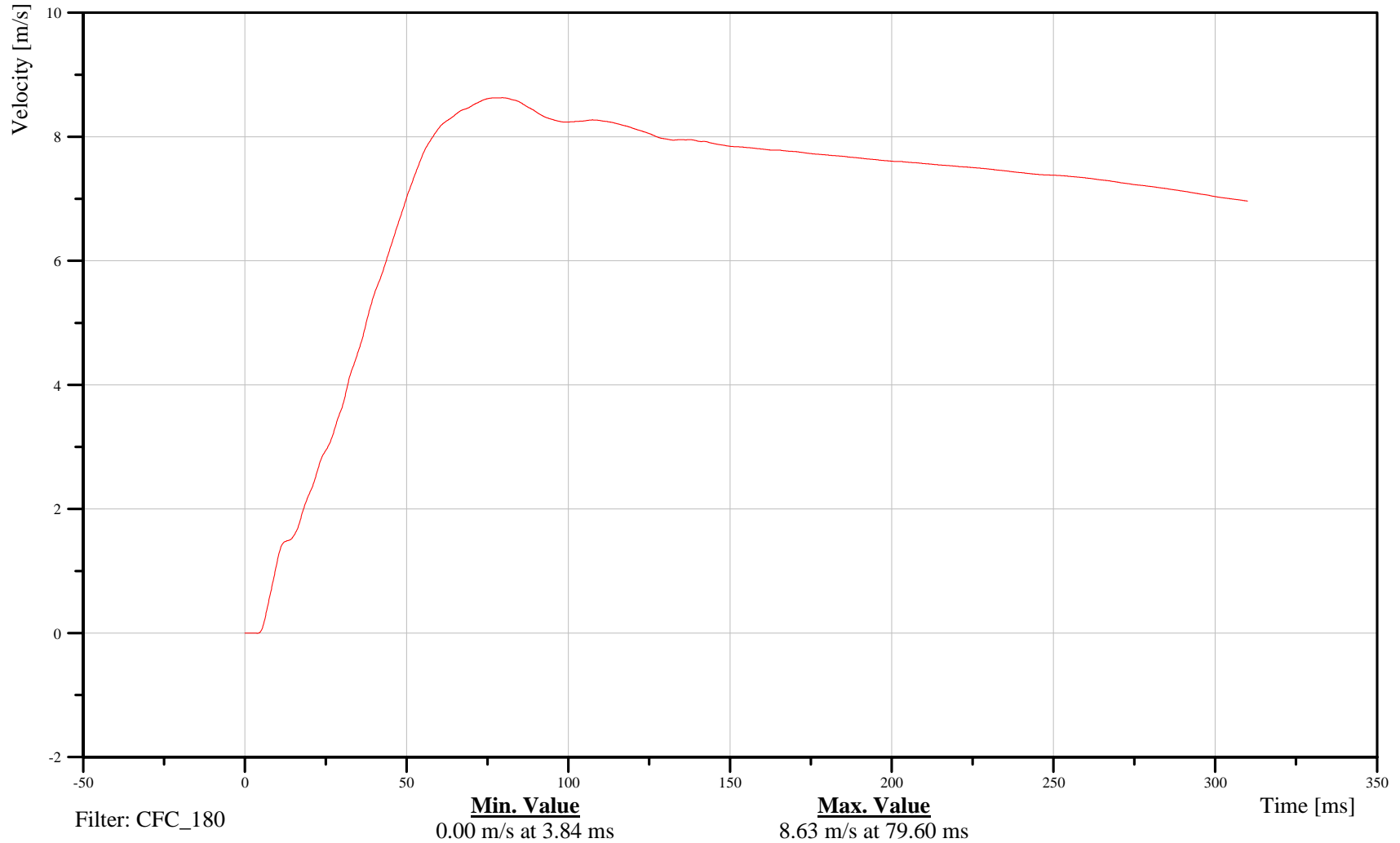
Time: 14:40

REAR FLOORPAN ABOVE AXLE Y-AXIS VELOCITY

Customer: NHTSA  
Test Number: C80100

18FORA000000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-99

070925



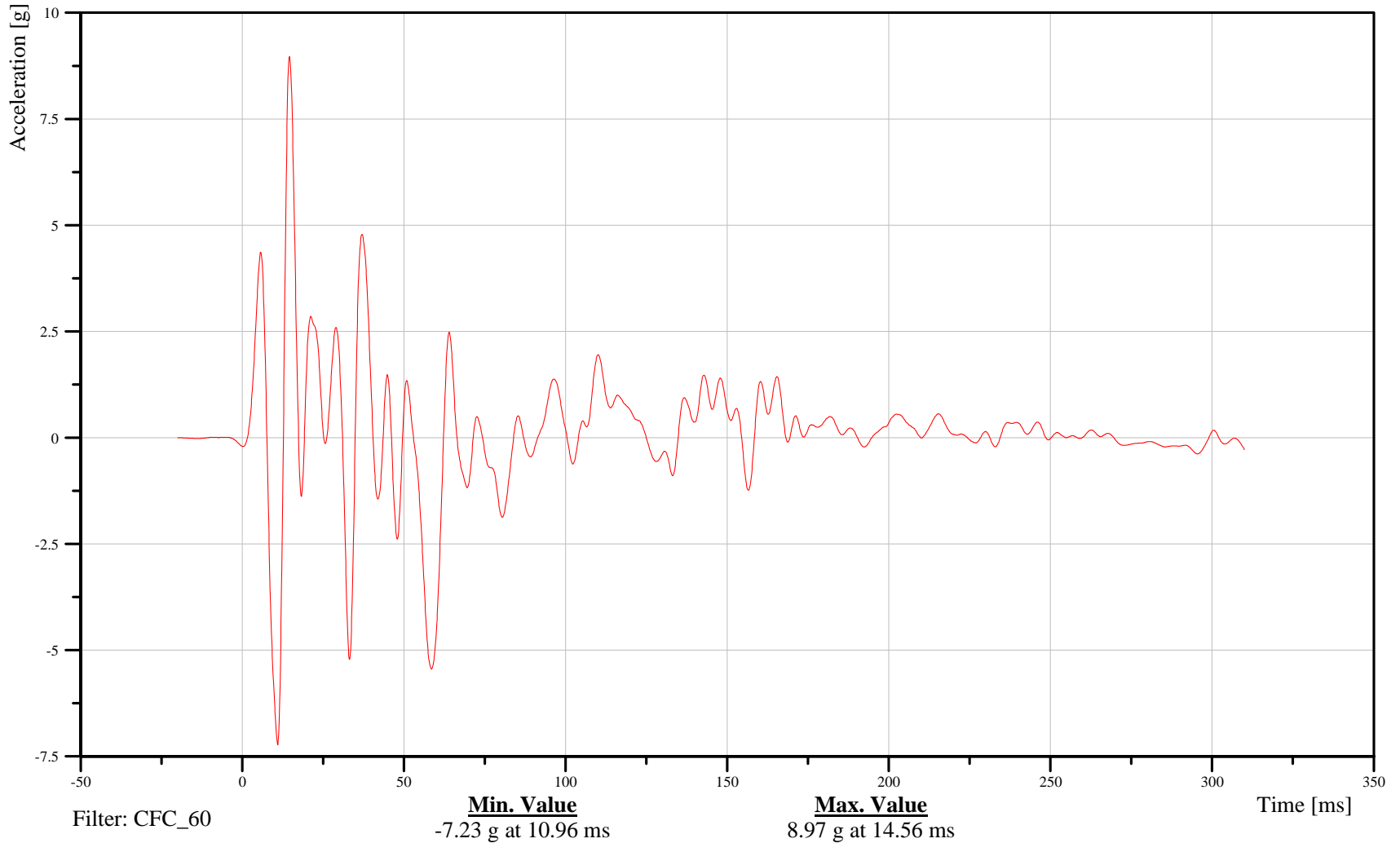
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

REAR FLOORPAN ABOVE AXLE Z-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

18FORA000000ACZD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-100

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

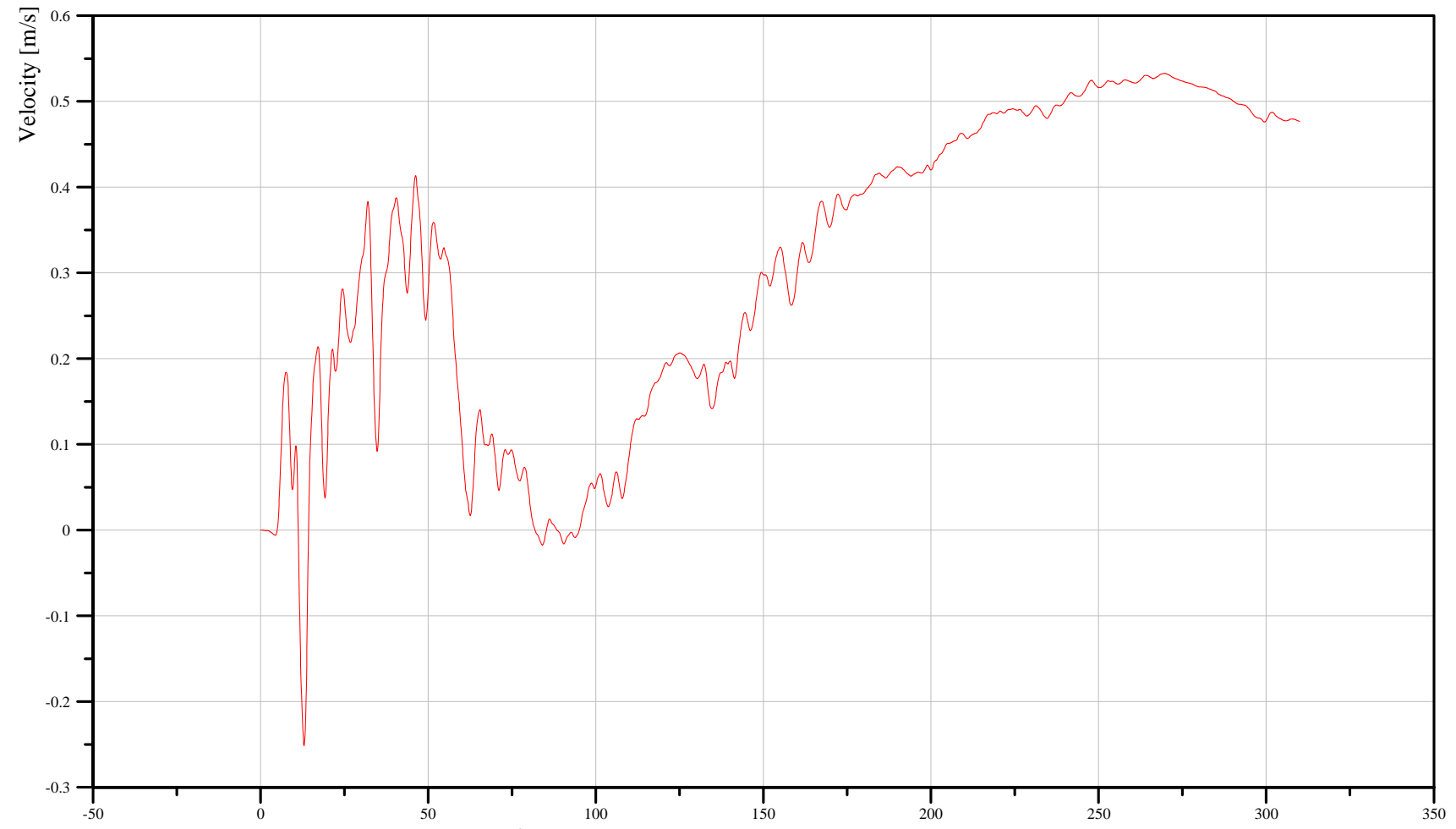
REAR FLOORPAN ABOVE AXLE Z-AXIS VELOCITY

Time: 14:40

Customer: NHTSA  
Test Number: C80100

18FORA000000VEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-0.25 m/s at 13.04 ms

**Max. Value**  
0.53 m/s at 269.76 ms

Time [ms]

B-101

070925



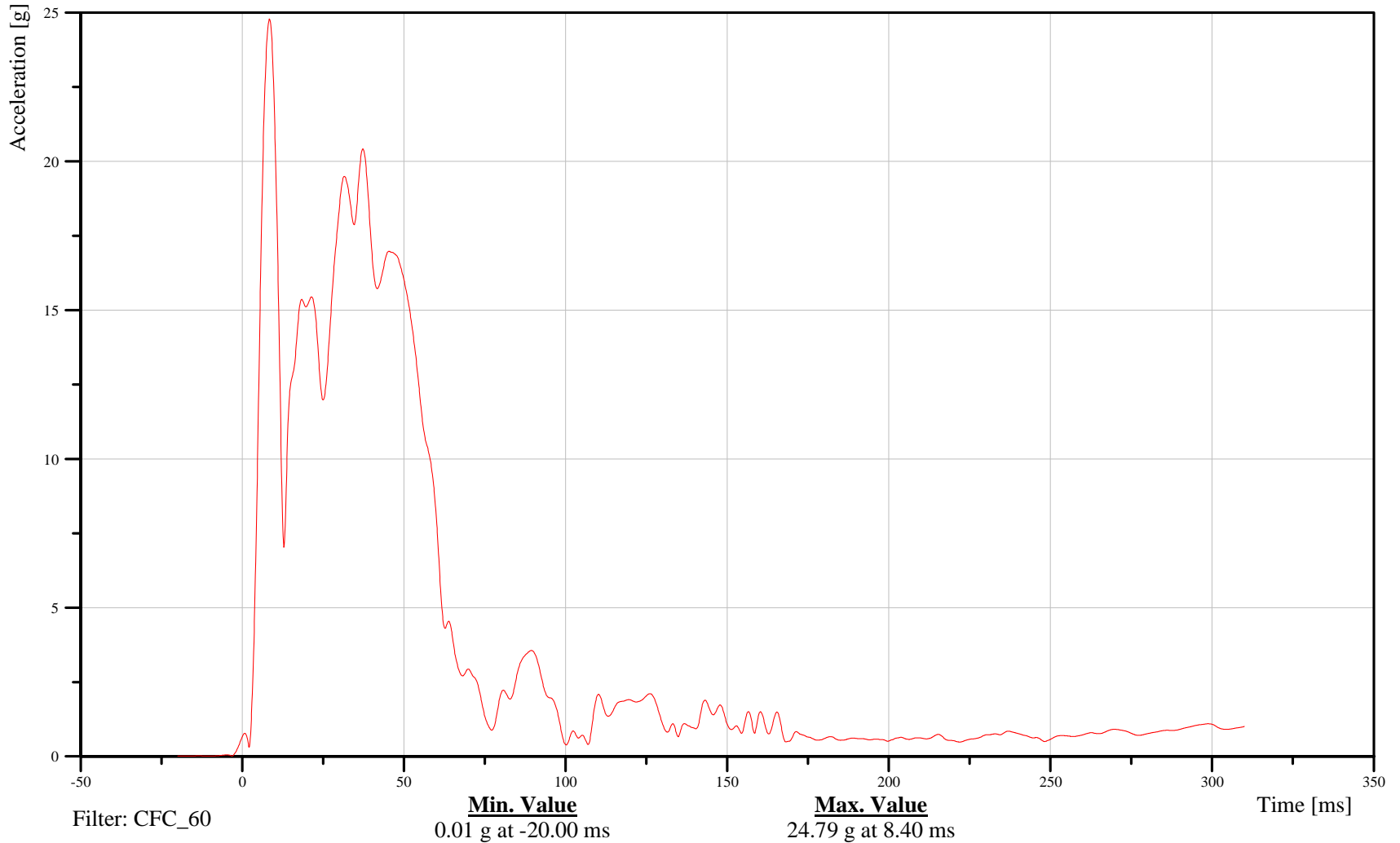
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

18FORA000000ACRD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-102

070925



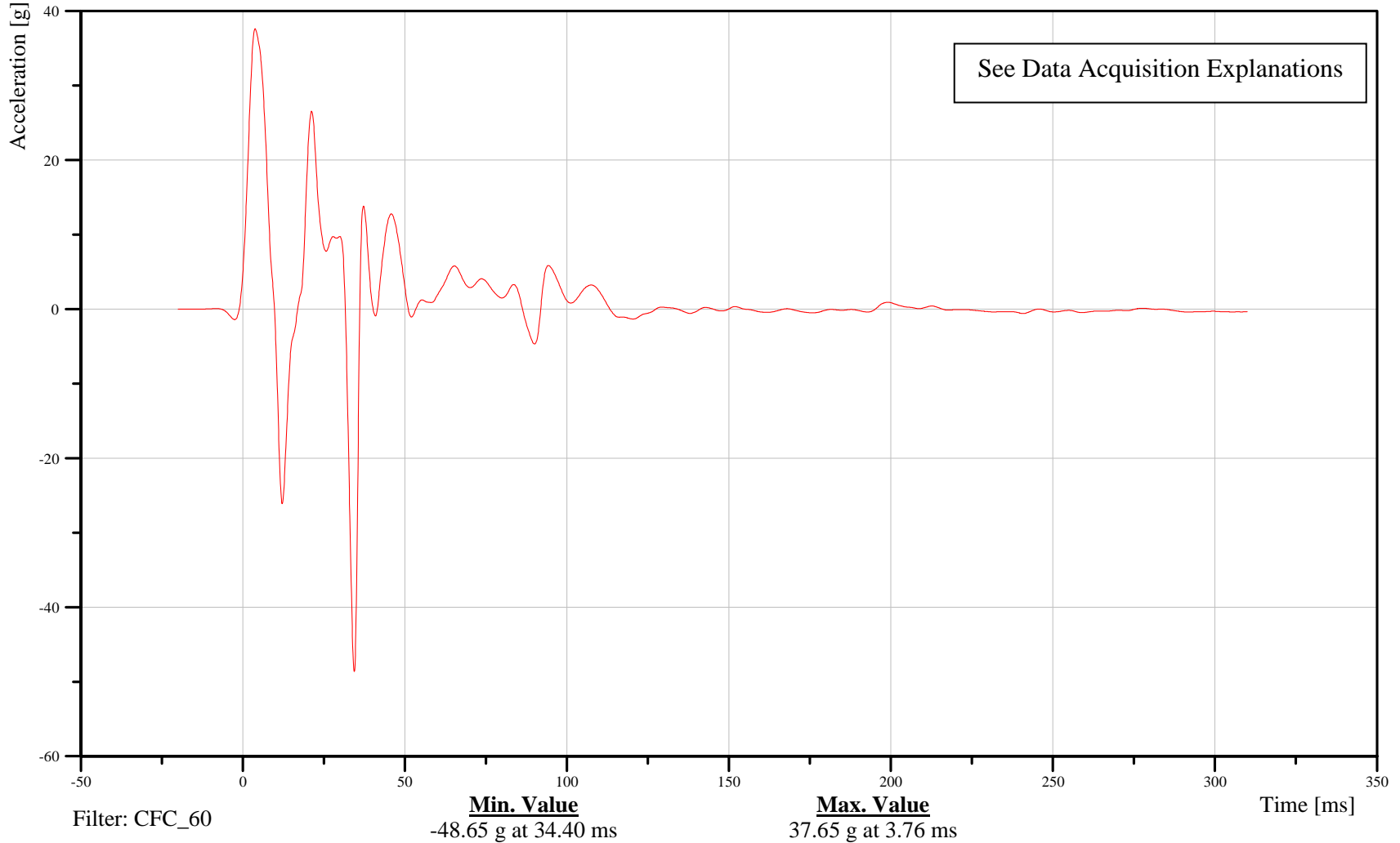
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SILBFR0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-103

070925



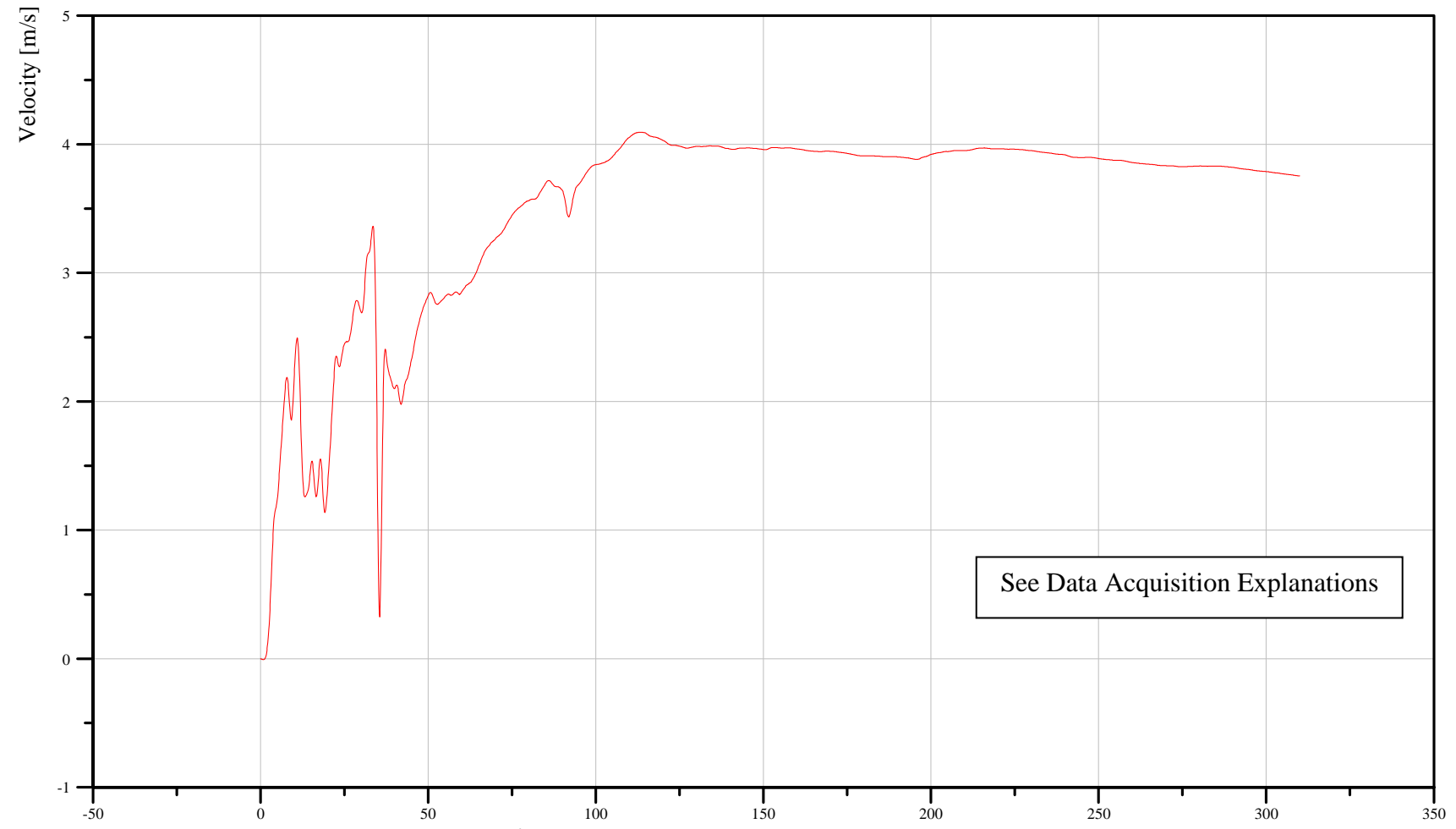
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SILBFR0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-0.01 m/s at 0.88 ms

**Max. Value**  
4.09 m/s at 113.36 ms

Time [ms]

B-104

070925



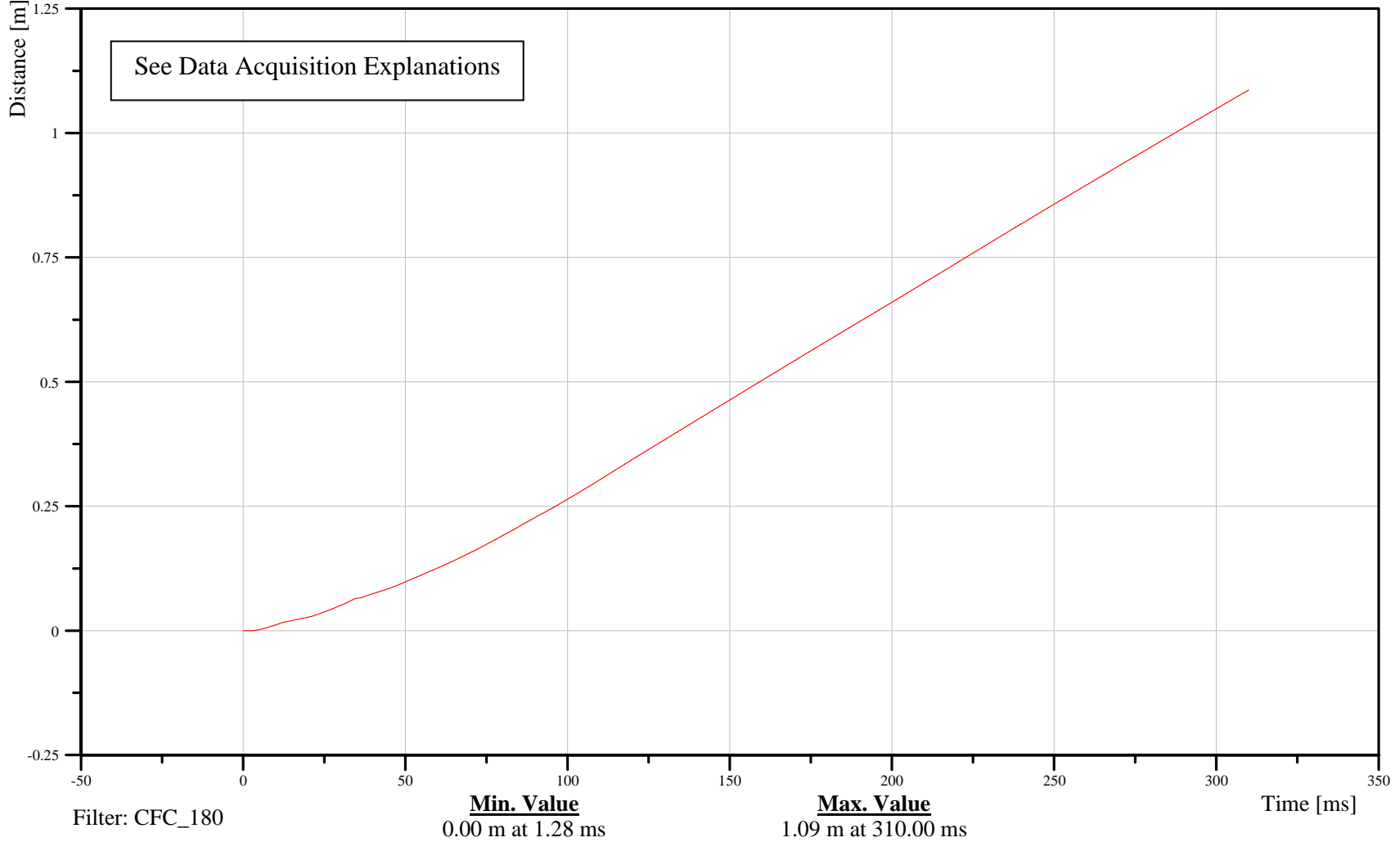
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT SIDE SILL AT FRONT SEAT Y-AXIS DISPLACEMENT Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SILBFR0000DCYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-105

070925



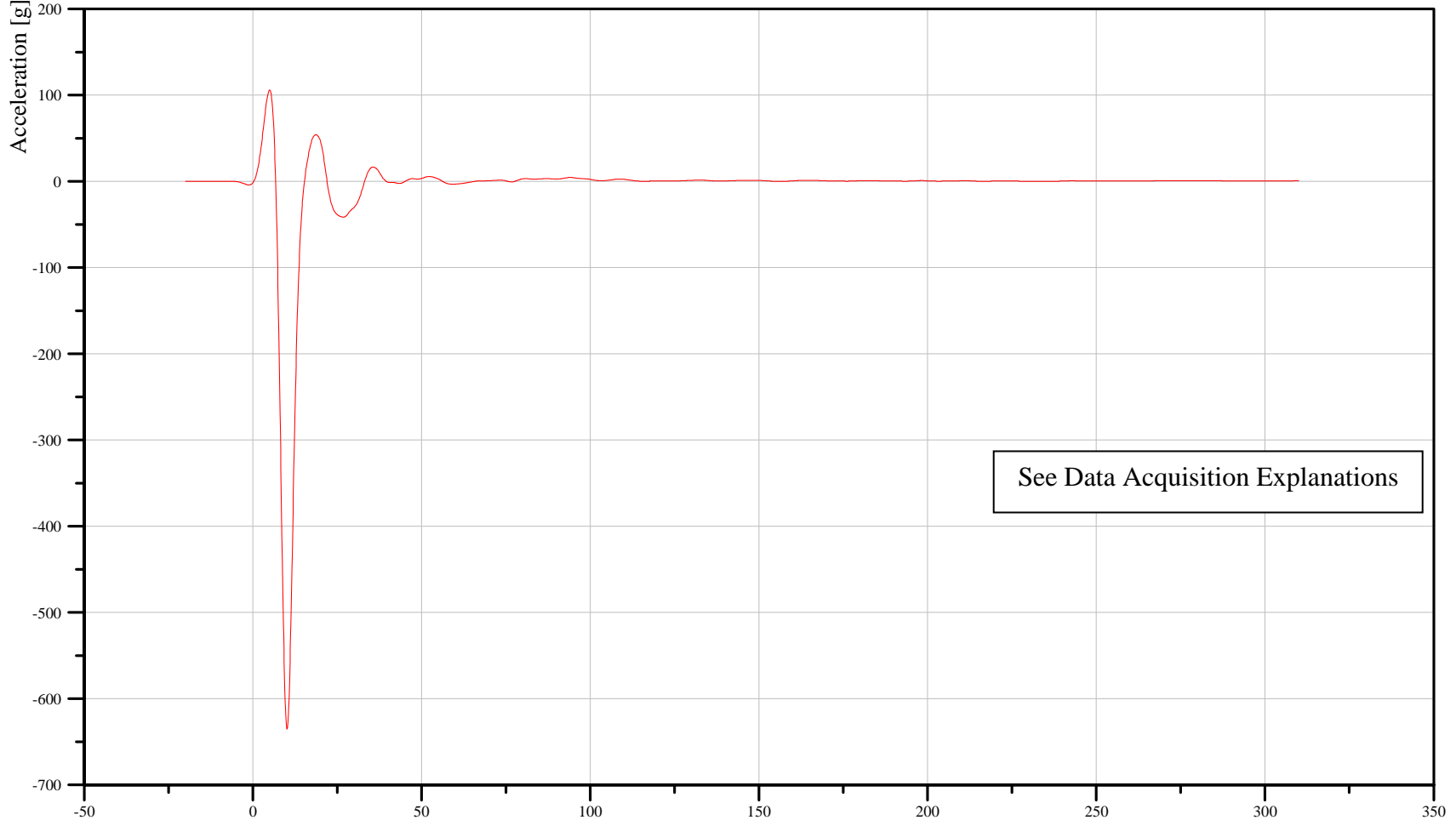
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SILBRE0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



See Data Acquisition Explanations

Filter: CFC\_60

**Min. Value**  
-635.34 g at 10.16 ms

**Max. Value**  
105.89 g at 4.96 ms

Time [ms]

B-106

070925



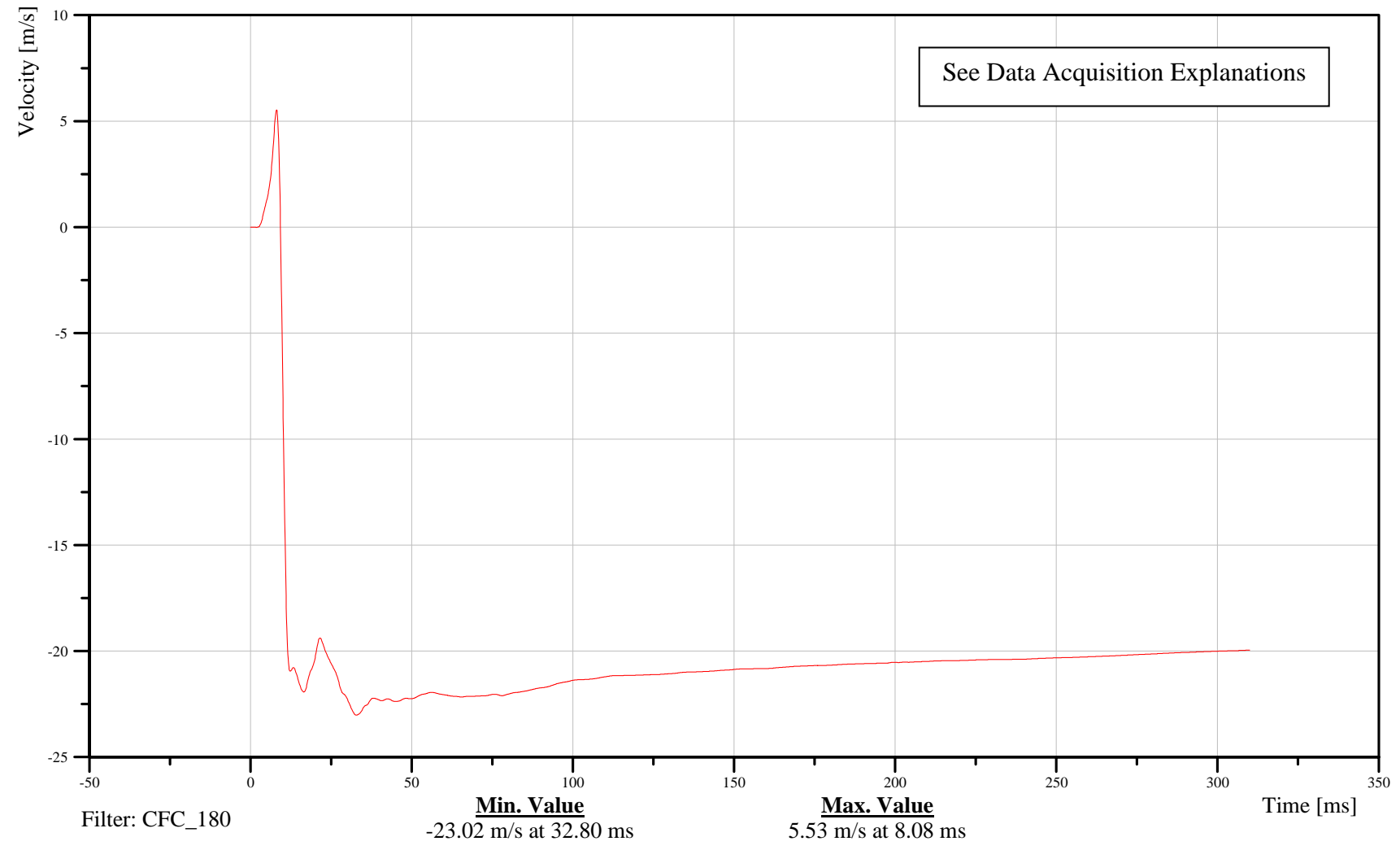
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SILBRE0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-107

070925



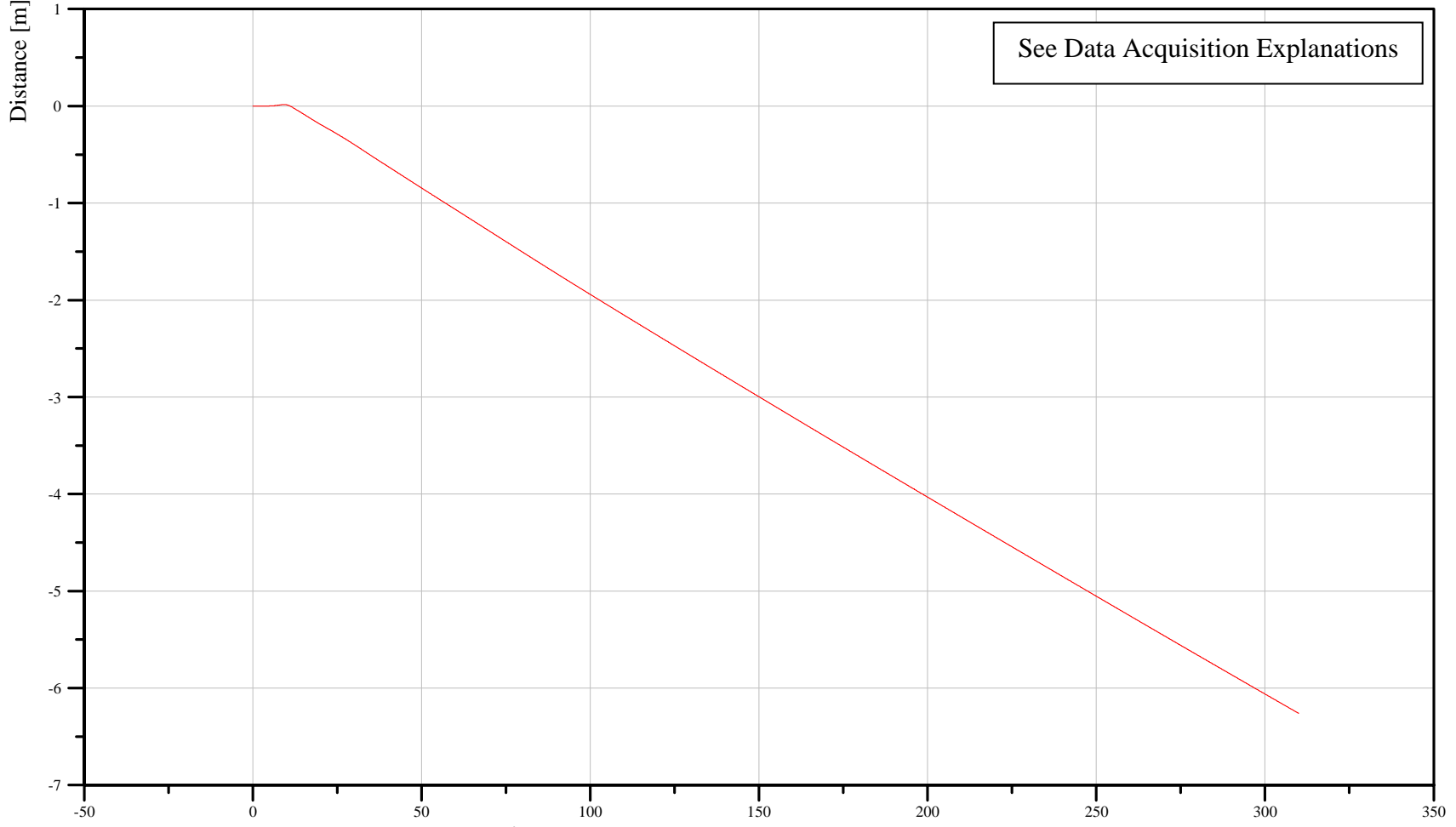
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT SIDE SILL AT REAR SEAT Y-AXIS DISPLACEMENT Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SILBRE0000DCYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-6.26 m at 310.00 ms

**Max. Value**  
0.02 m at 9.28 ms

Time [ms]

B-108

070925



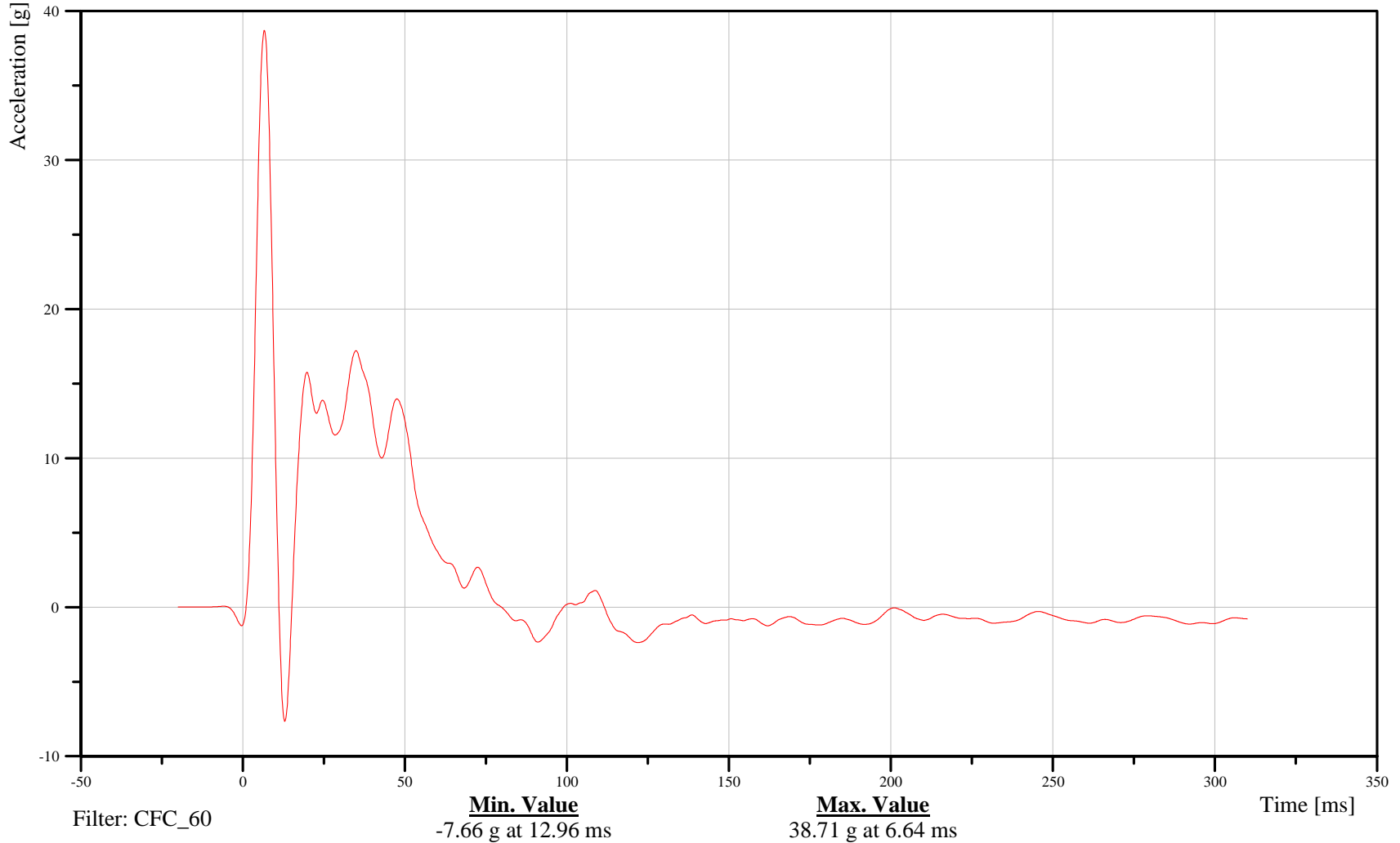
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

16VEHCRE0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-109

070925



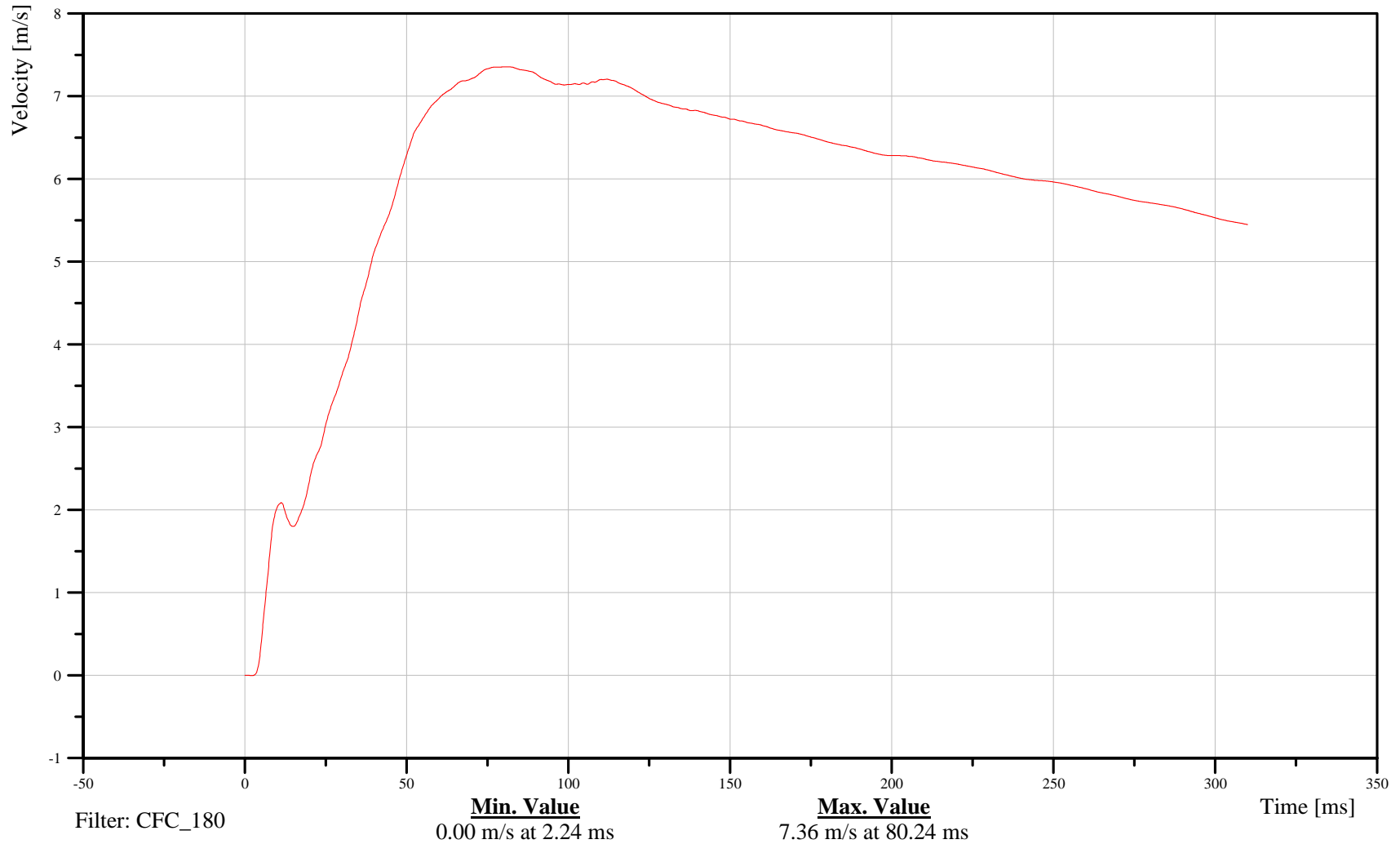
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

16VEHCRE0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-110

070925



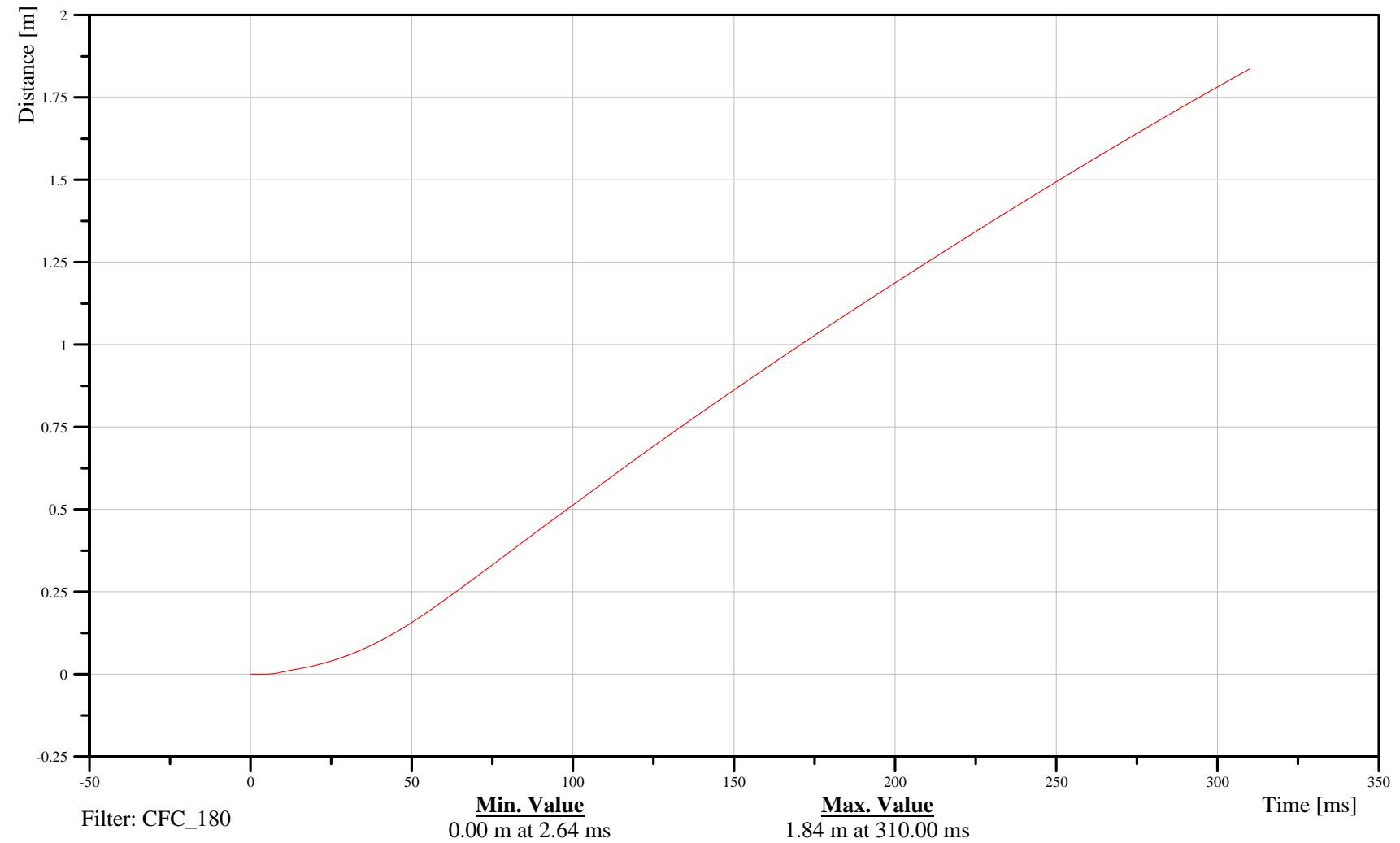
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS DISPLACEMENT Time: 14:40

Customer: NHTSA  
Test Number: C80100

16VEHCRE0000DCYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-111

070925



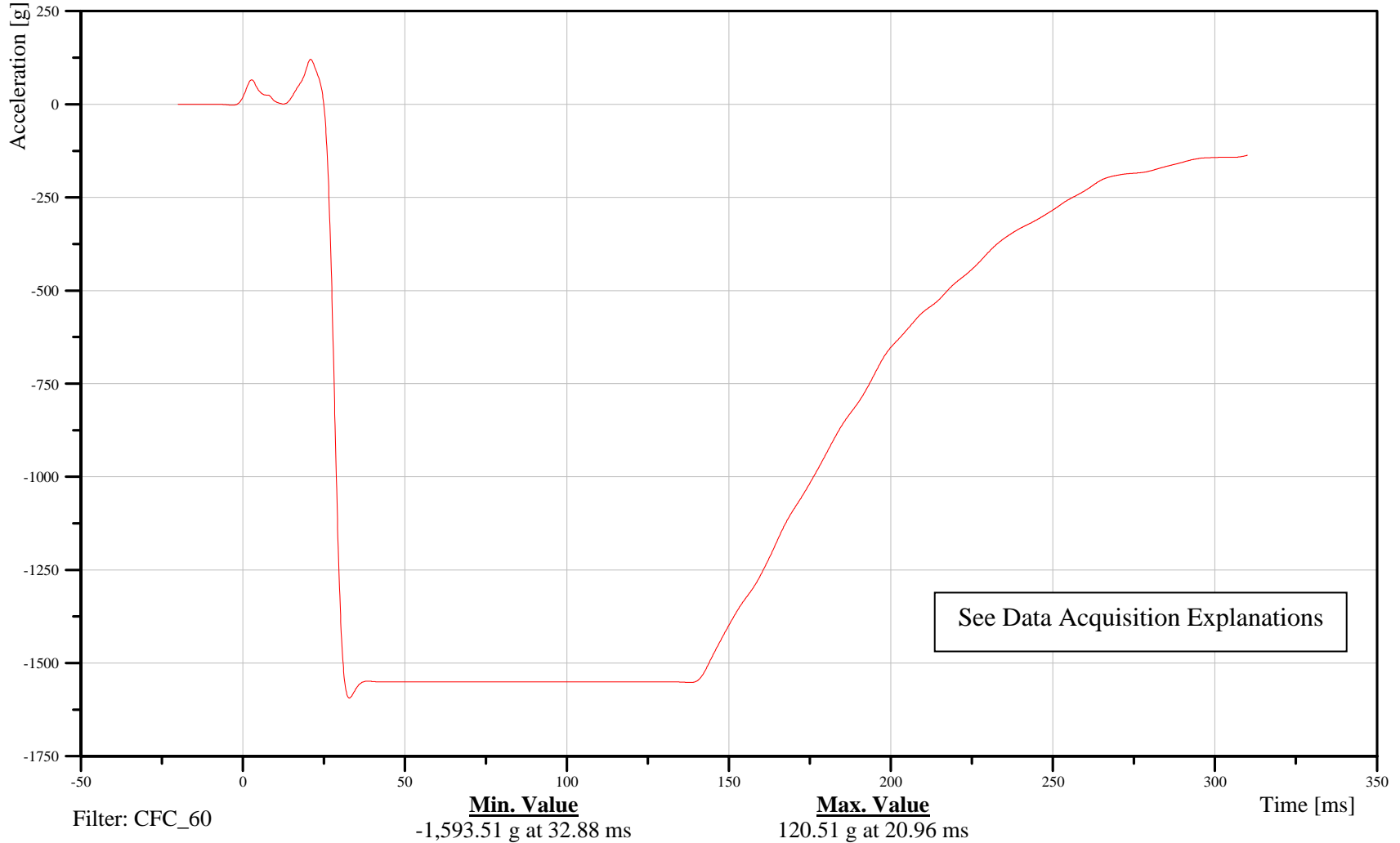
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT LOWER A-POST Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11APIILLO0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-112

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

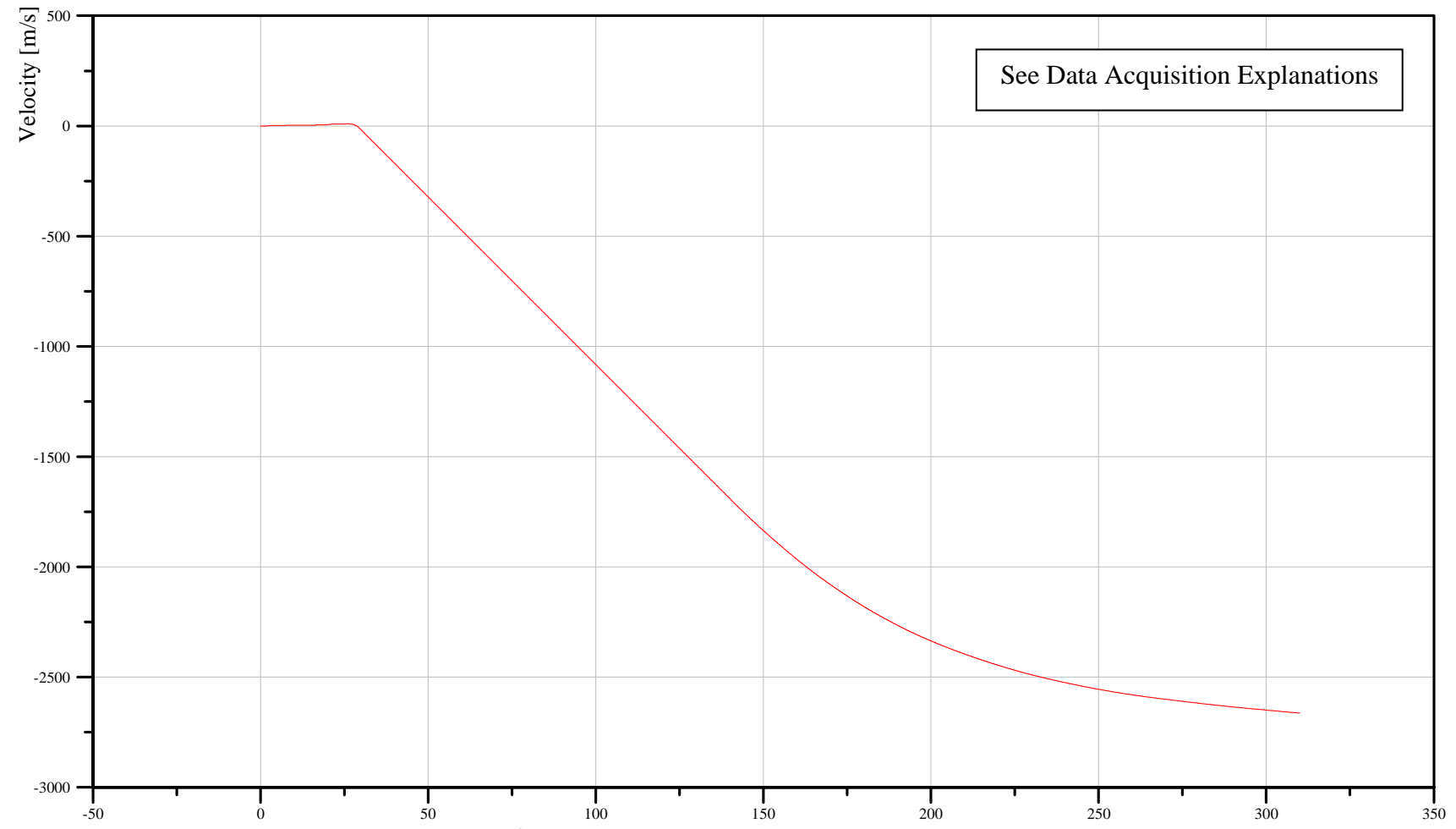
LEFT LOWER A-POST Y-AXIS VELOCITY

Time: 14:40

Customer: NHTSA  
Test Number: C80100

11APILLO0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-2,663.20 m/s at 310.00 ms

**Max. Value**  
9.61 m/s at 26.00 ms

Time [ms]

B-113

070925



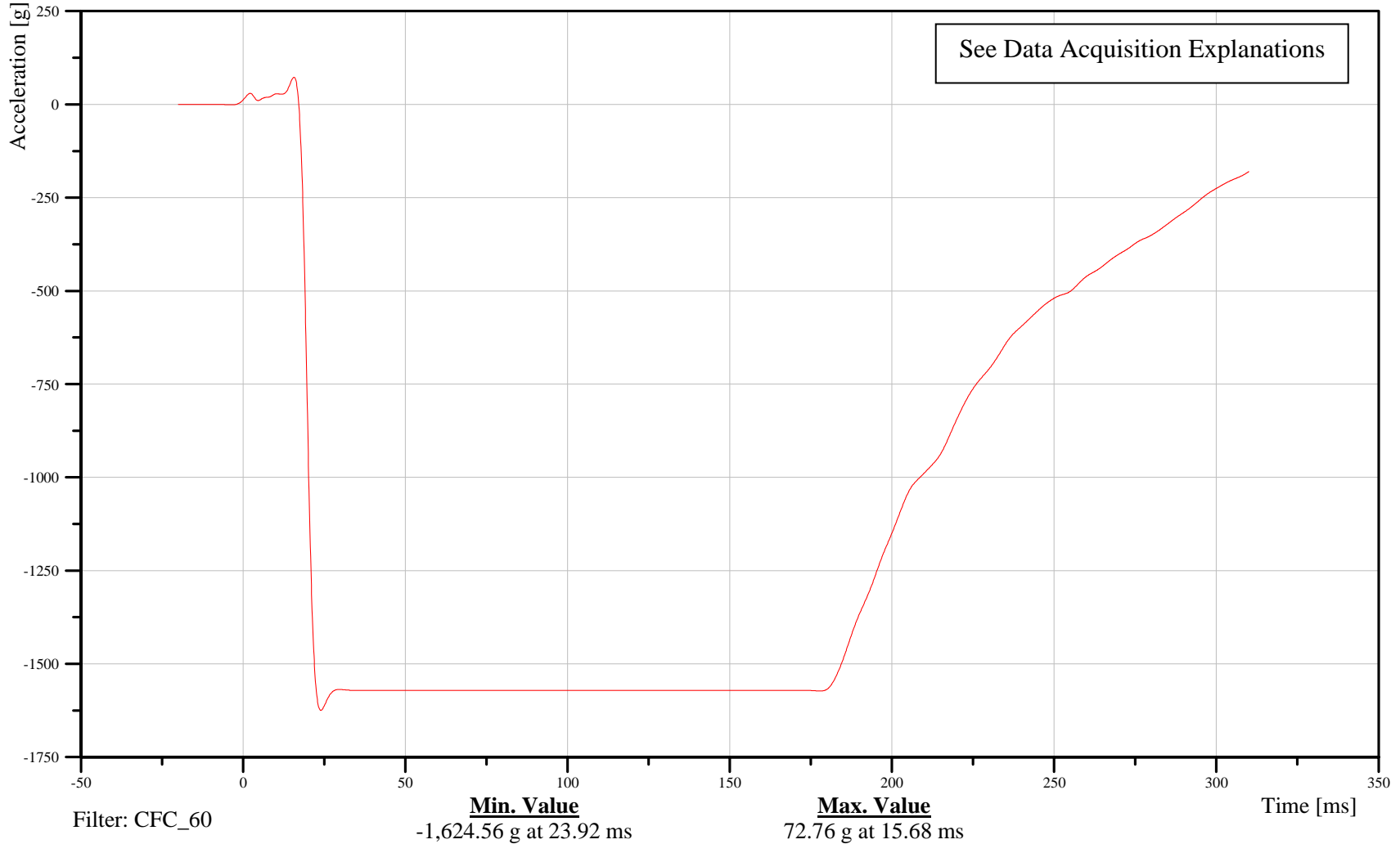
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT UPPER A-POST Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11APILUP0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-114

070925



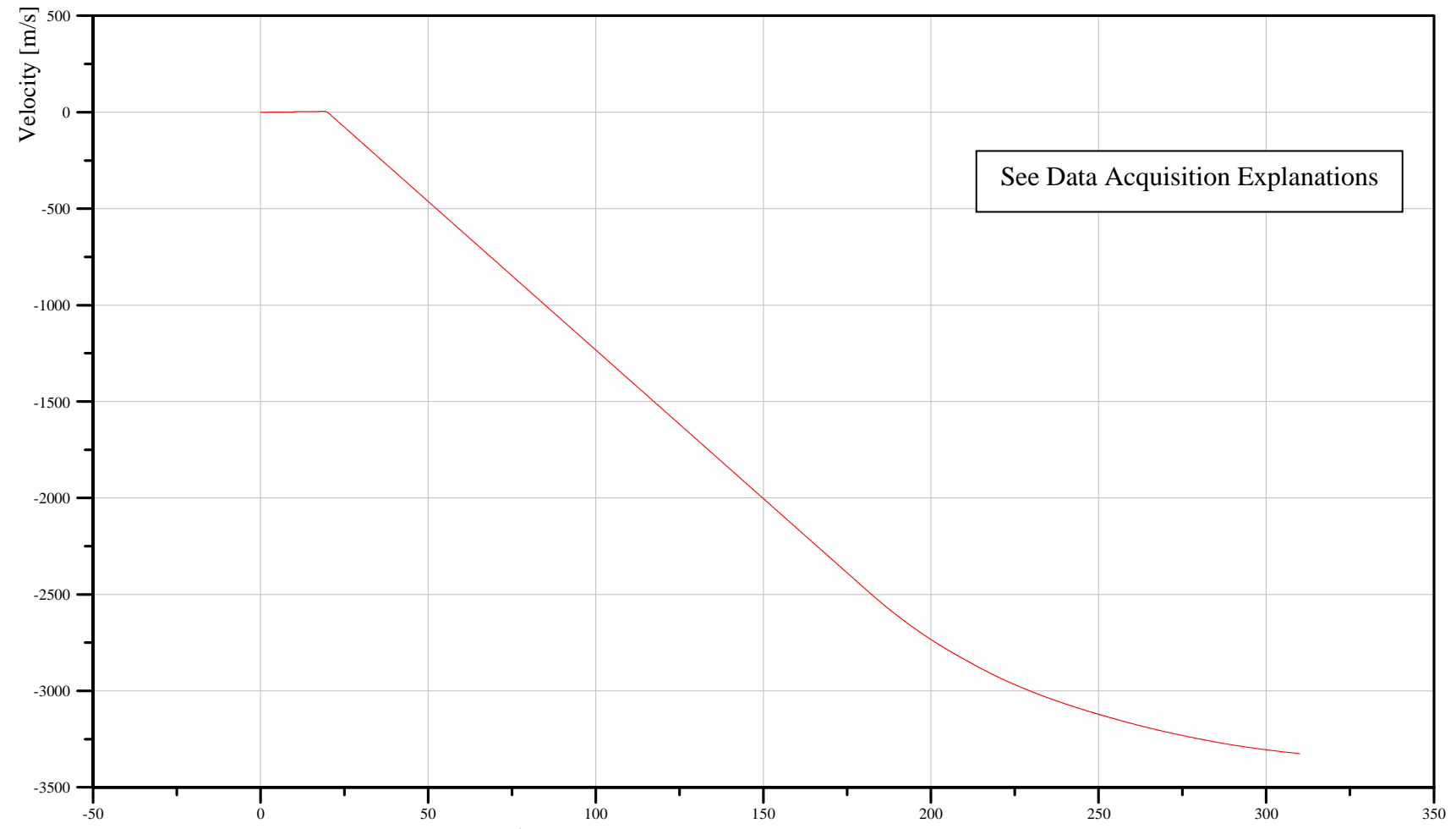
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT UPPER A-POST Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11APILUP0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-3,324.98 m/s at 310.00 ms

**Max. Value**  
4.61 m/s at 18.80 ms

Time [ms]

B-115

070925



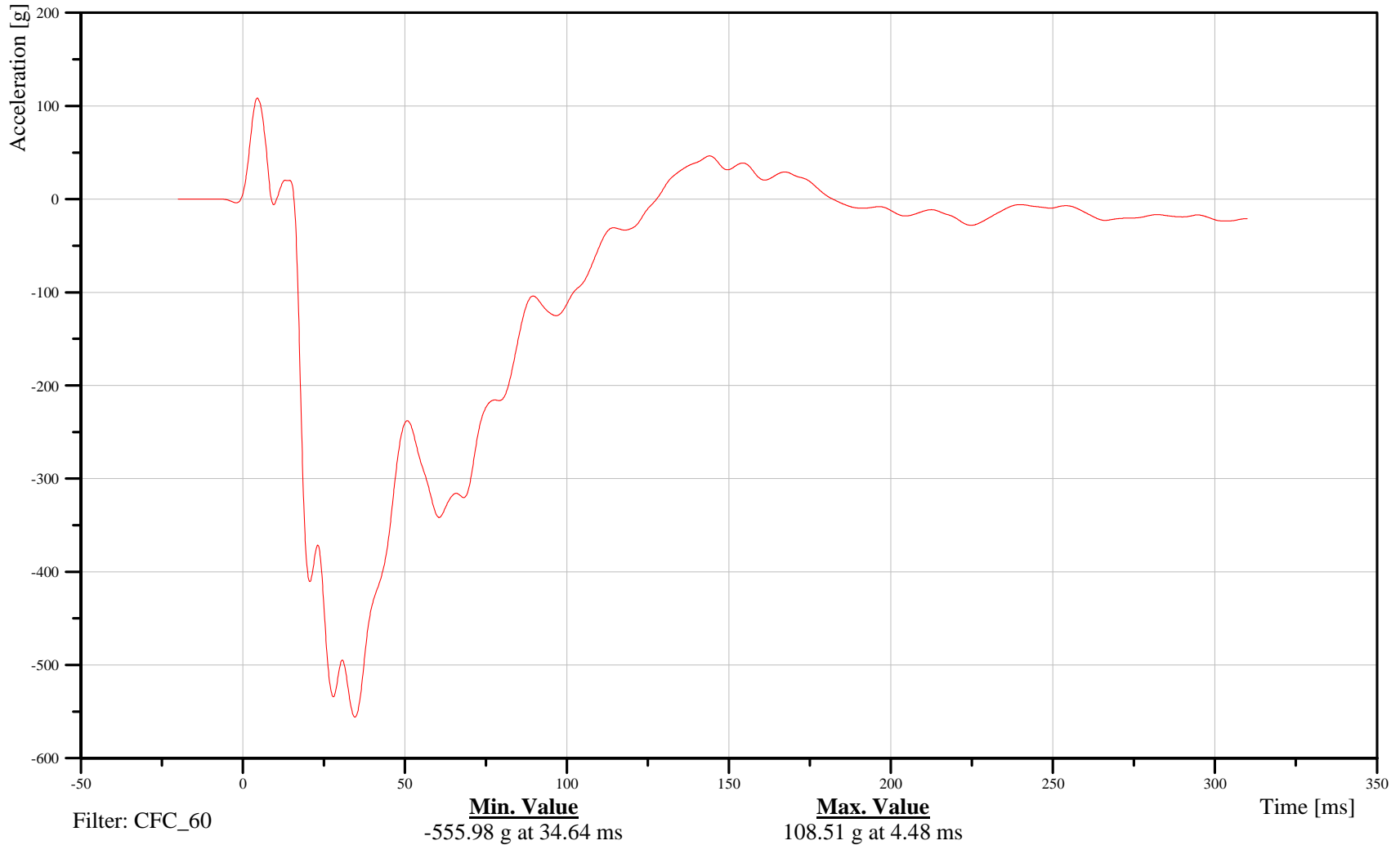
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT LOWER B-POST Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14BPILLO0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-116

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

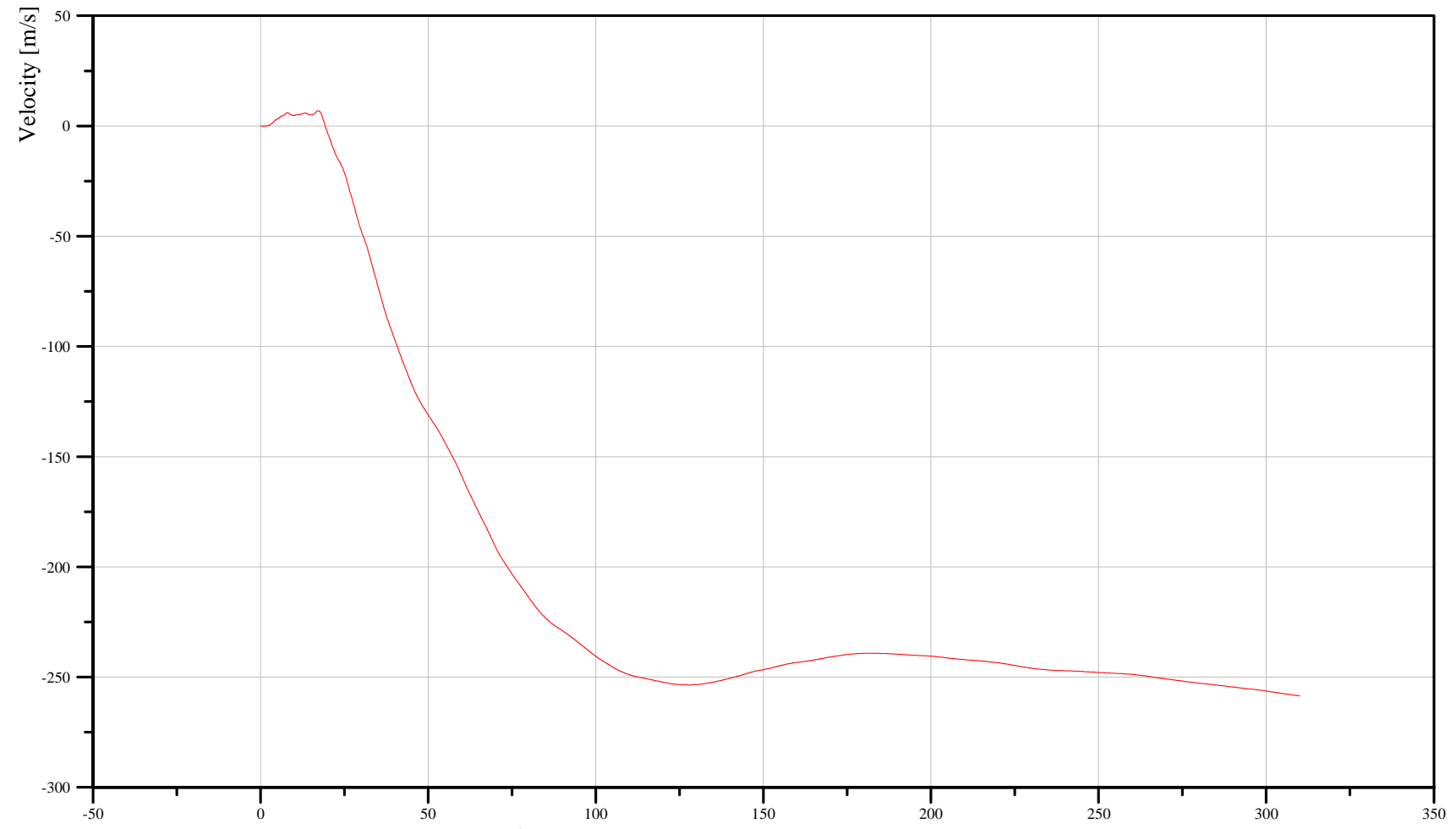
LEFT LOWER B-POST Y-AXIS VELOCITY

Time: 14:40

Customer: NHTSA  
Test Number: C80100

14BPILLO0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-258.50 m/s at 310.00 ms

**Max. Value**  
6.94 m/s at 17.28 ms

Time [ms]

B-117

070925



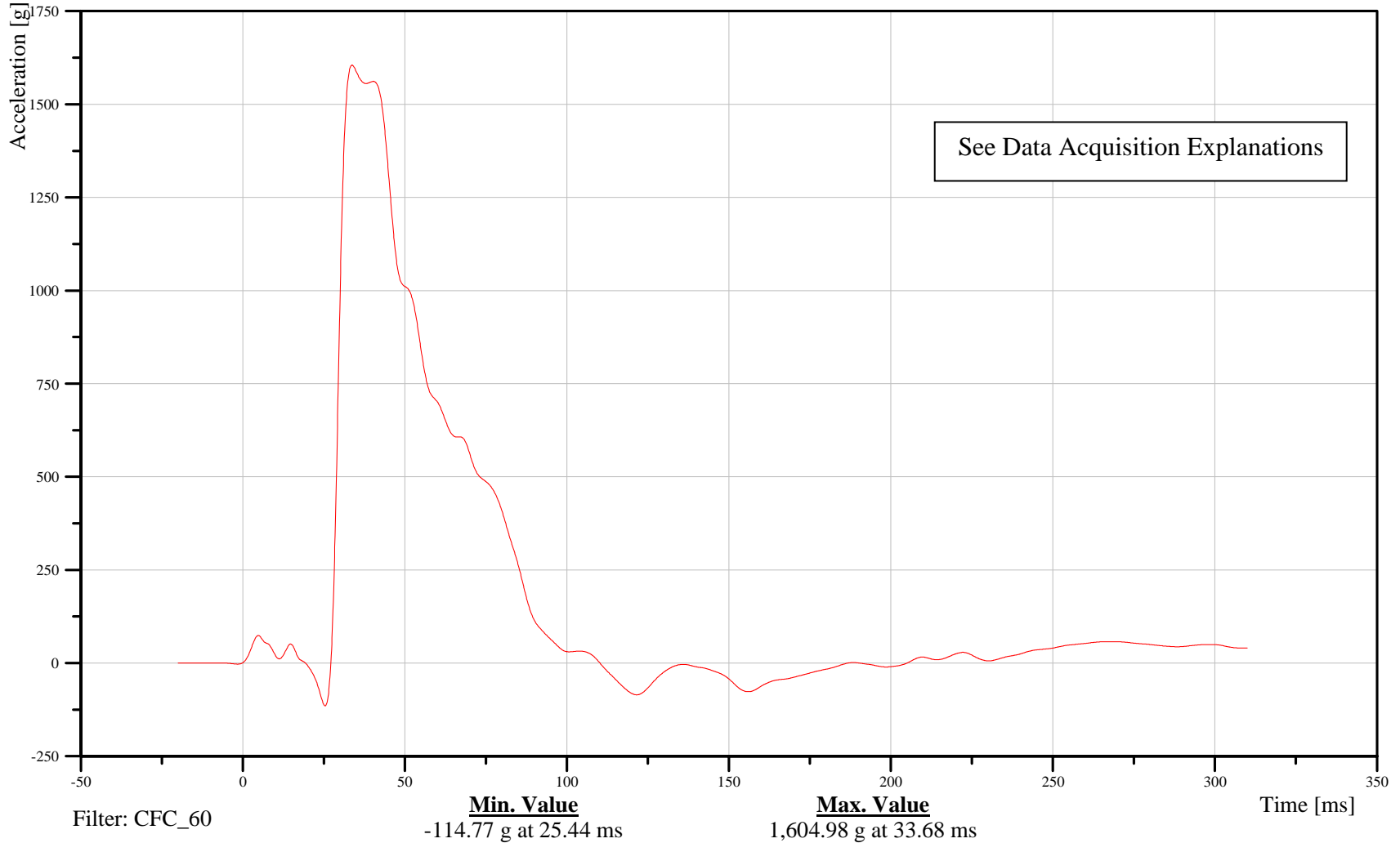
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT UPPER B-POST Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14BPILUP0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-118

070925



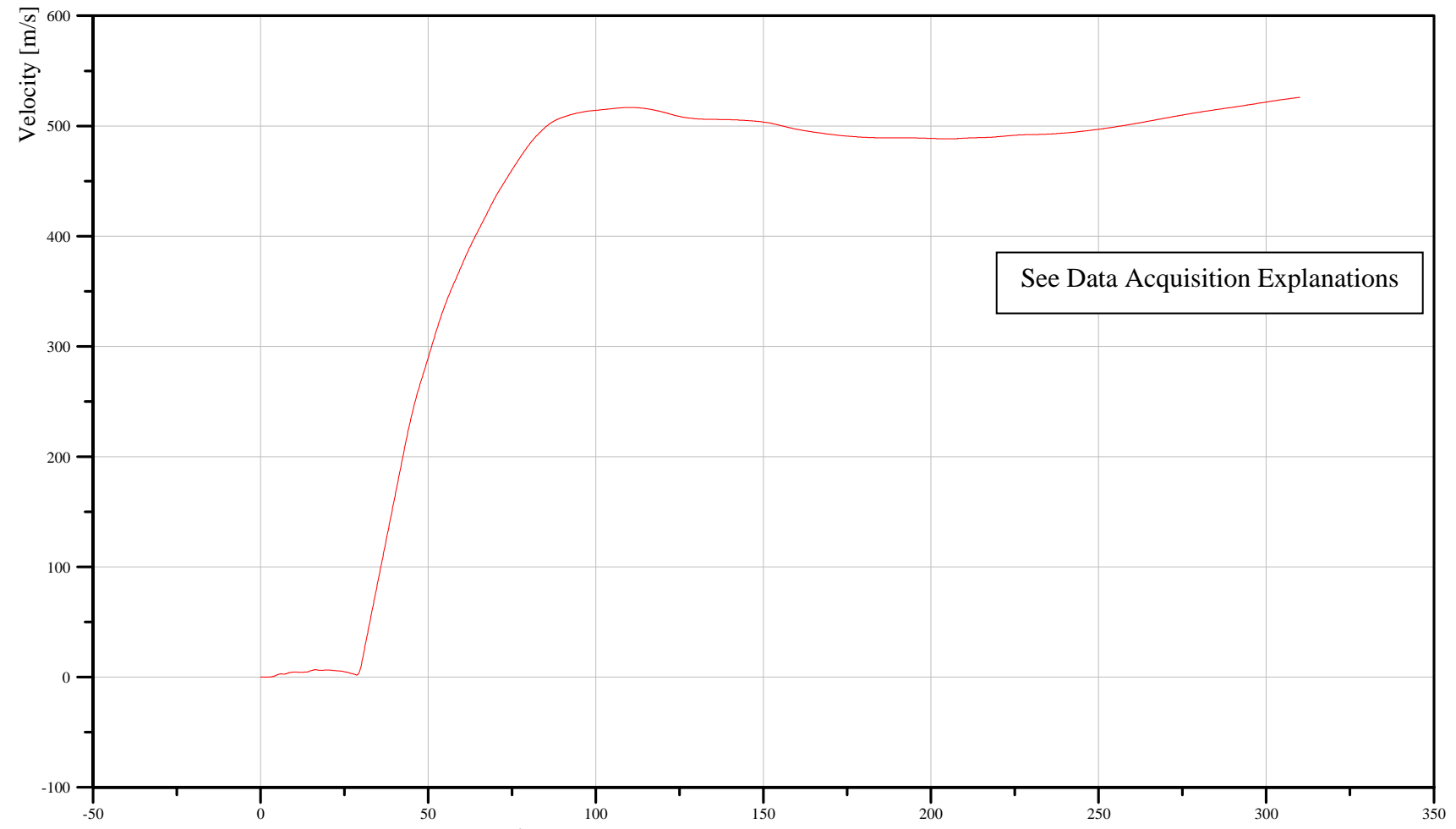
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT UPPER B-POST Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14BPILUP0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-0.01 m/s at 1.60 ms

**Max. Value**  
526.01 m/s at 310.00 ms

Time [ms]

B-119

070925



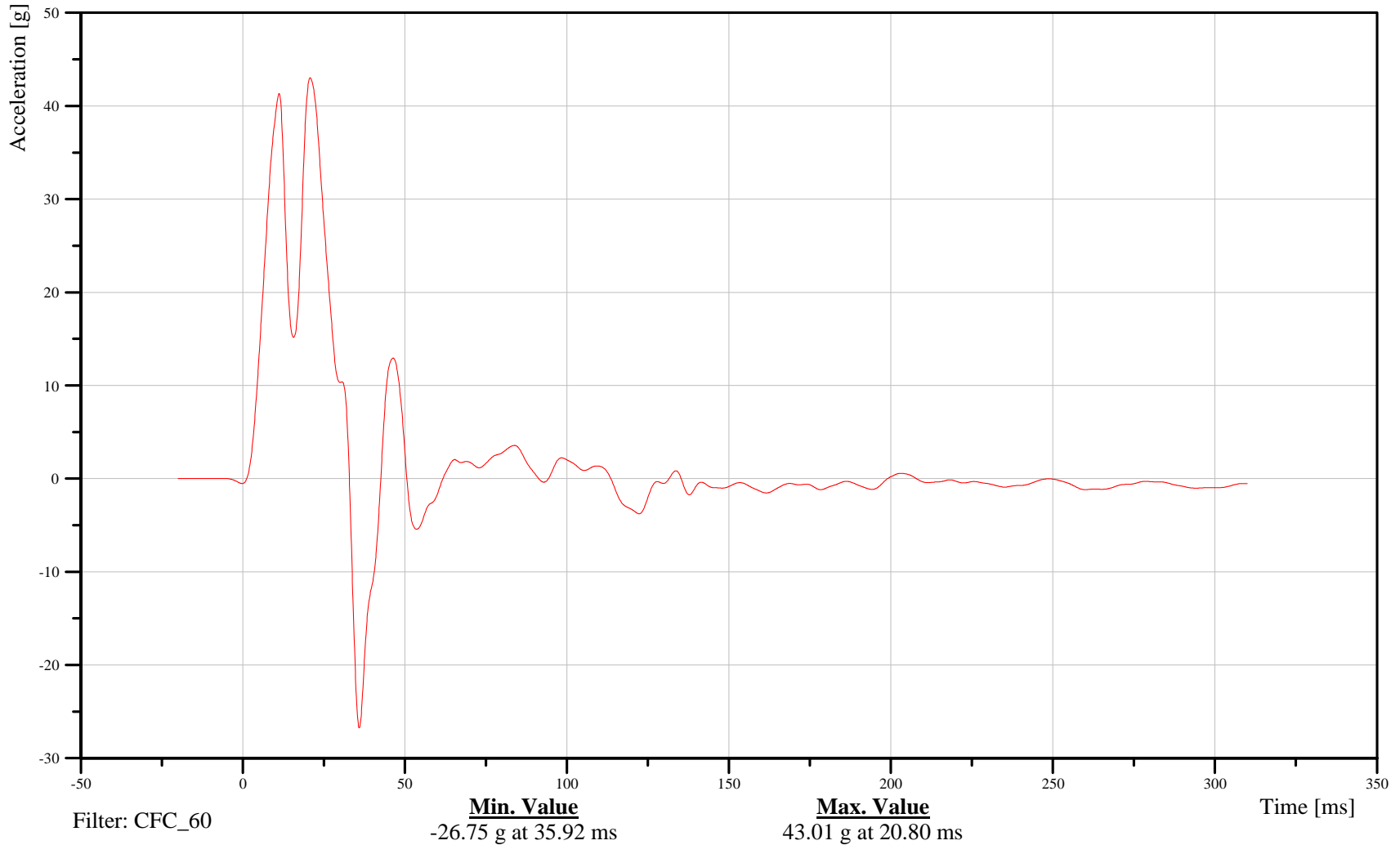
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT FRONT SEAT TRACK Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SETRFR0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-120

070925



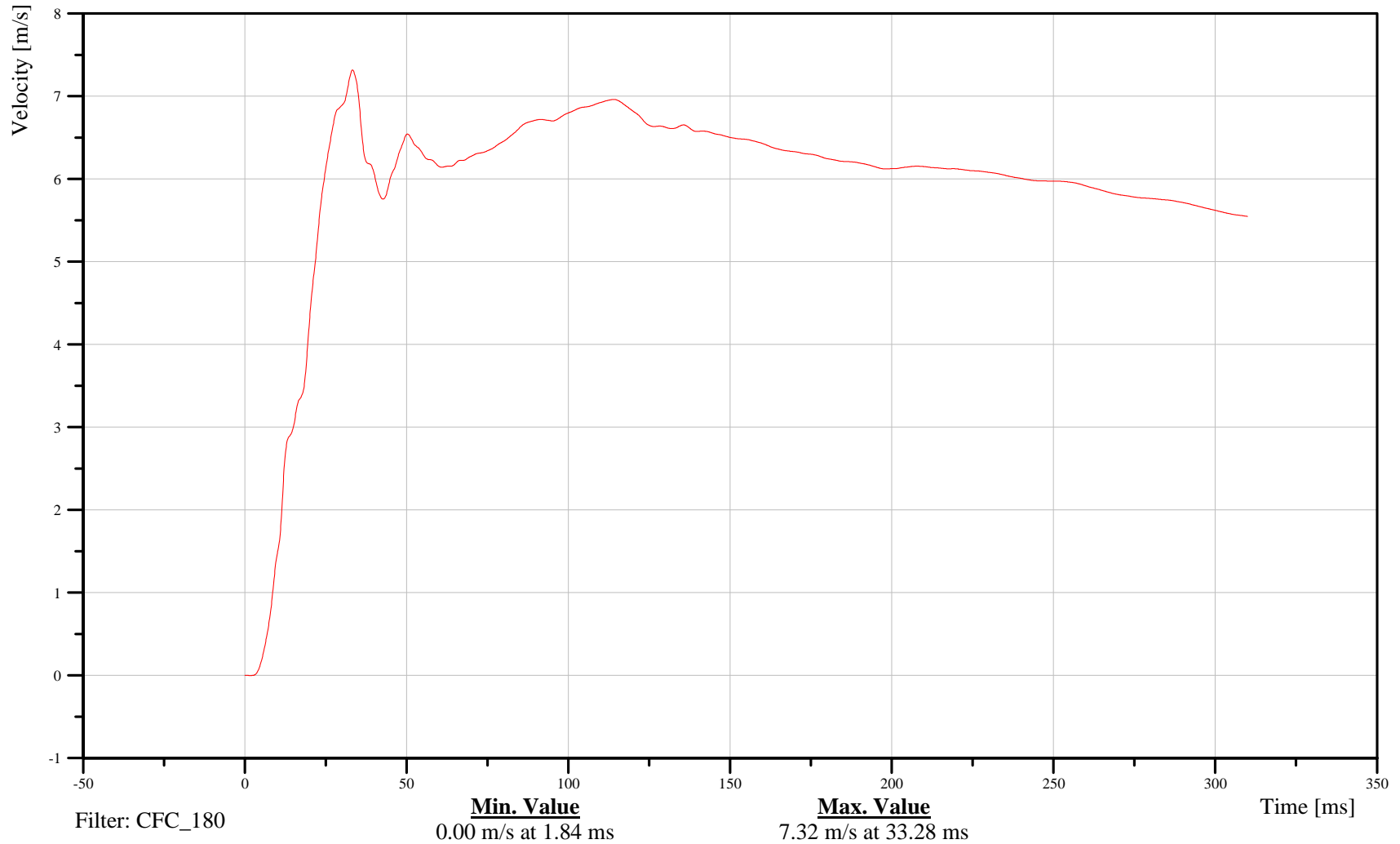
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT FRONT SEAT TRACK Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SETRFR0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-121

070925



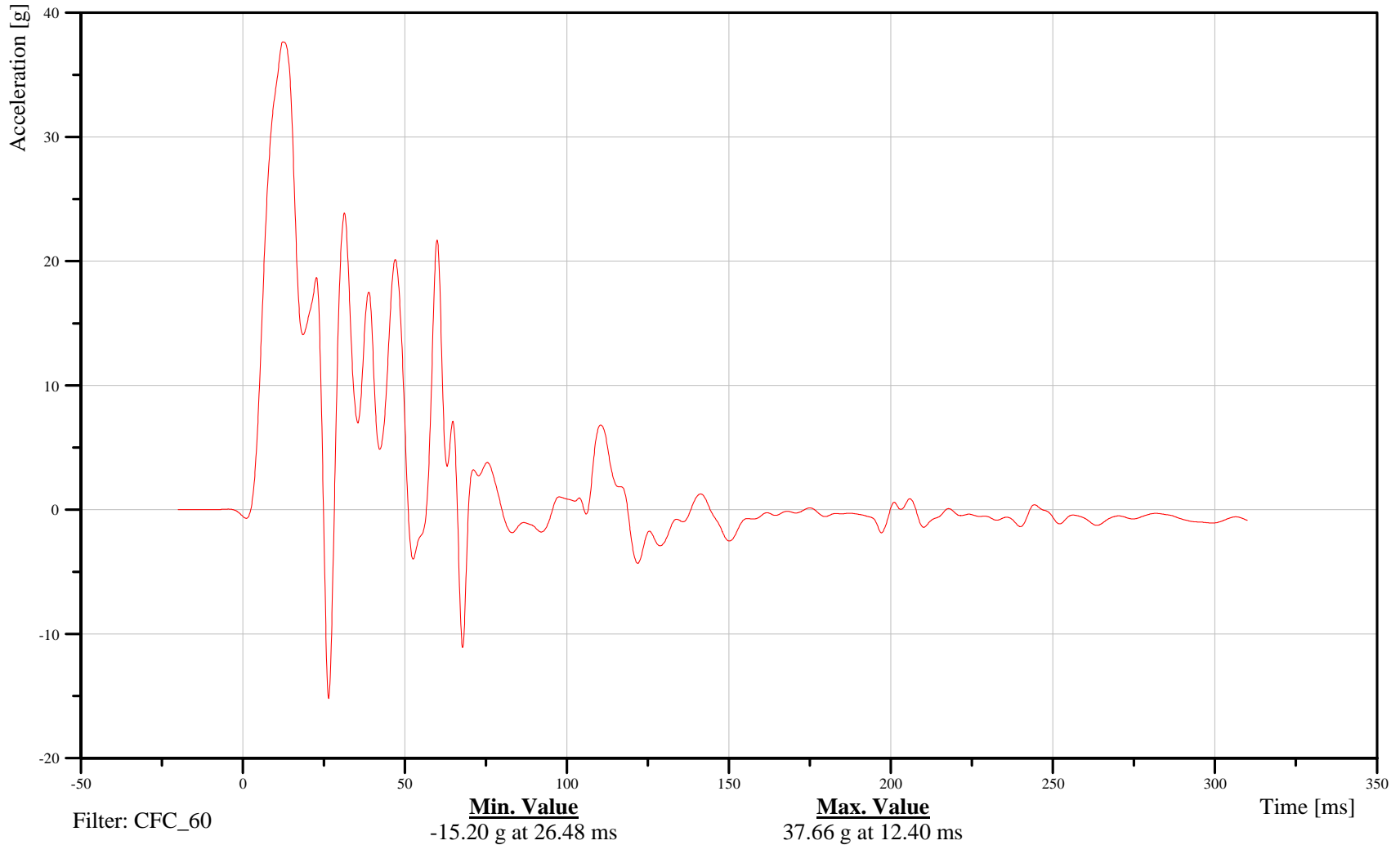
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR SEAT TRACK Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SETRRE0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-122

070925



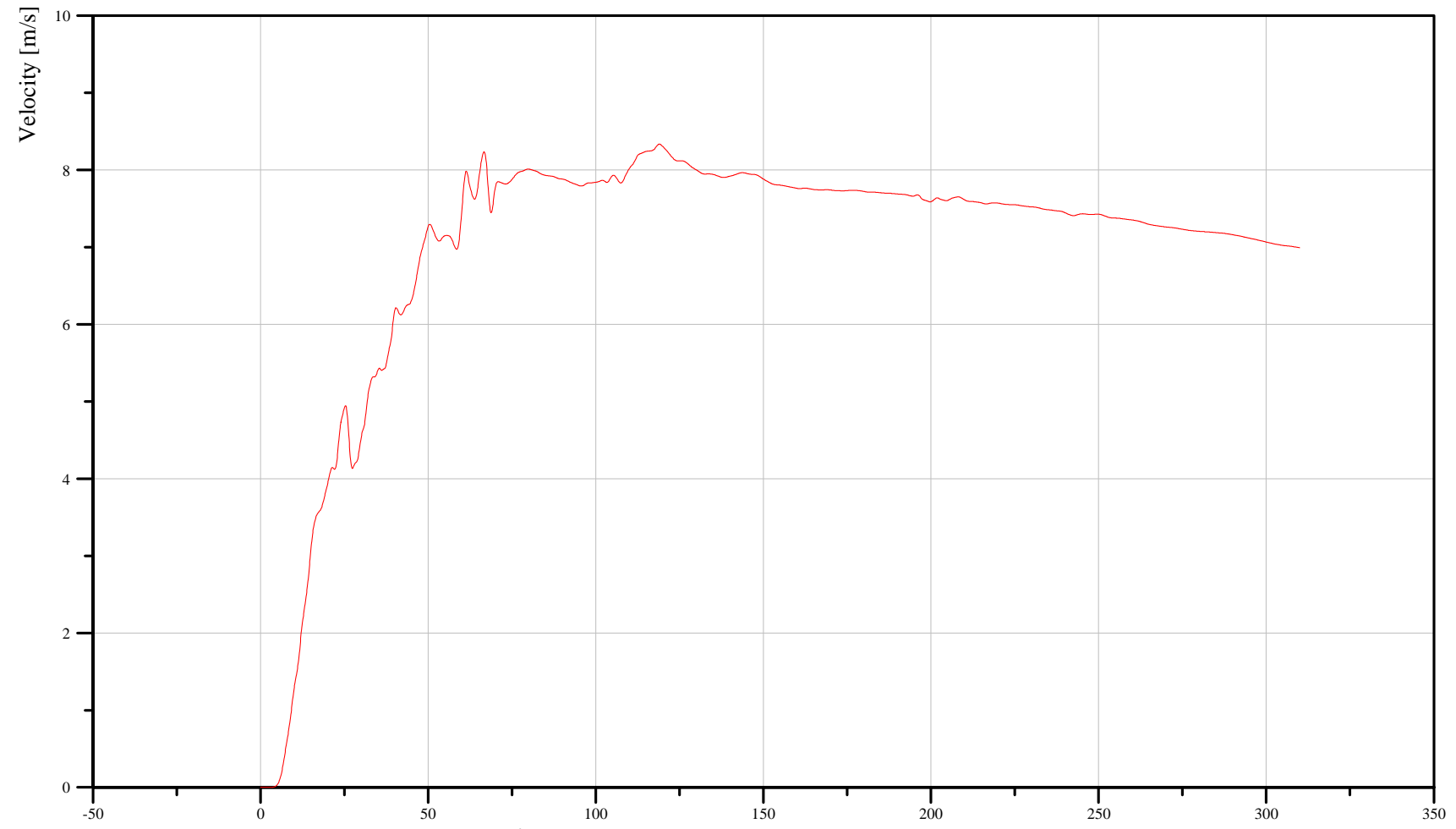
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR SEAT TRACK Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SETRRE0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
0.00 m/s at 0.00 ms

**Max. Value**  
8.34 m/s at 118.96 ms

Time [ms]

B-123

070925



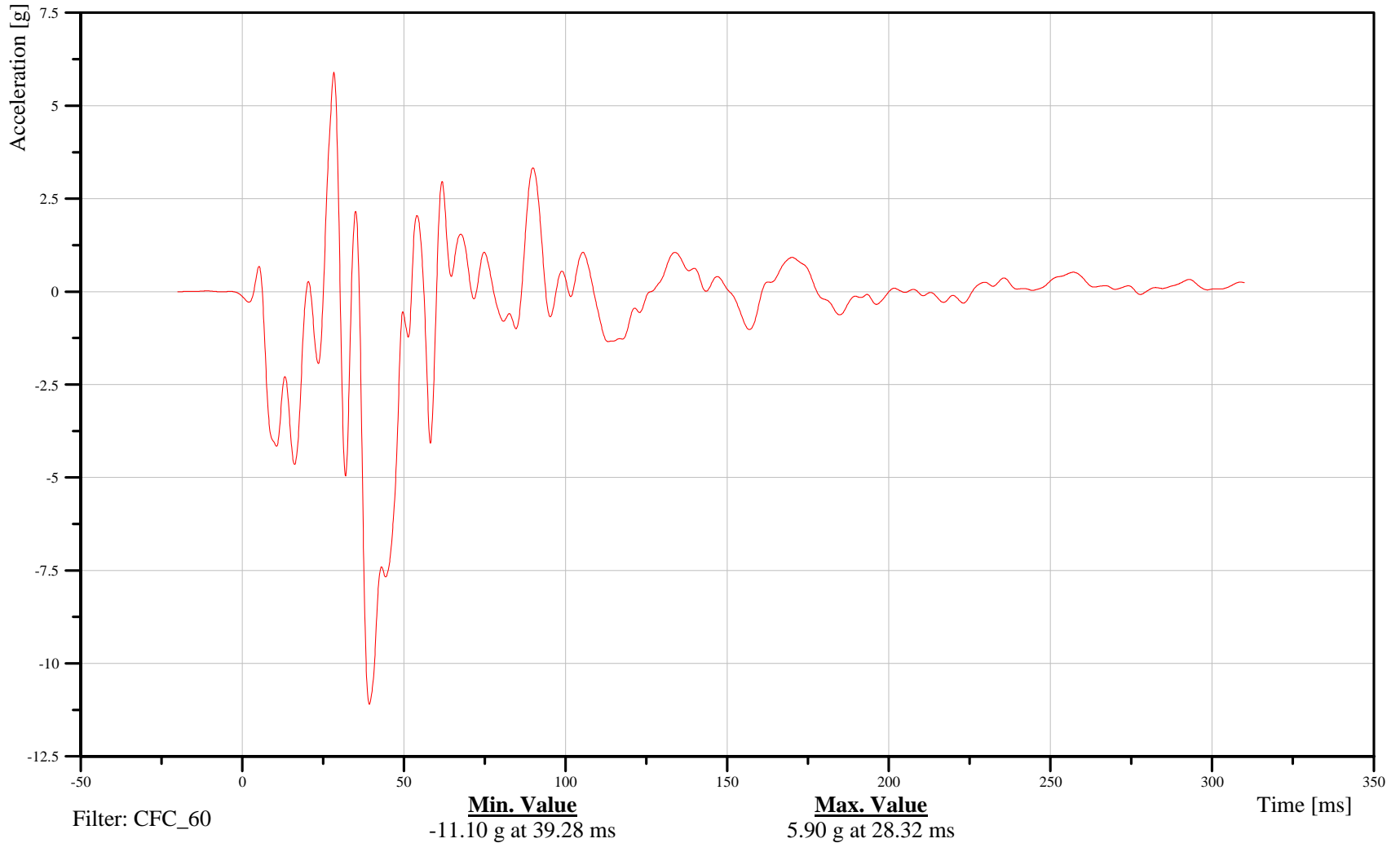
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-124

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

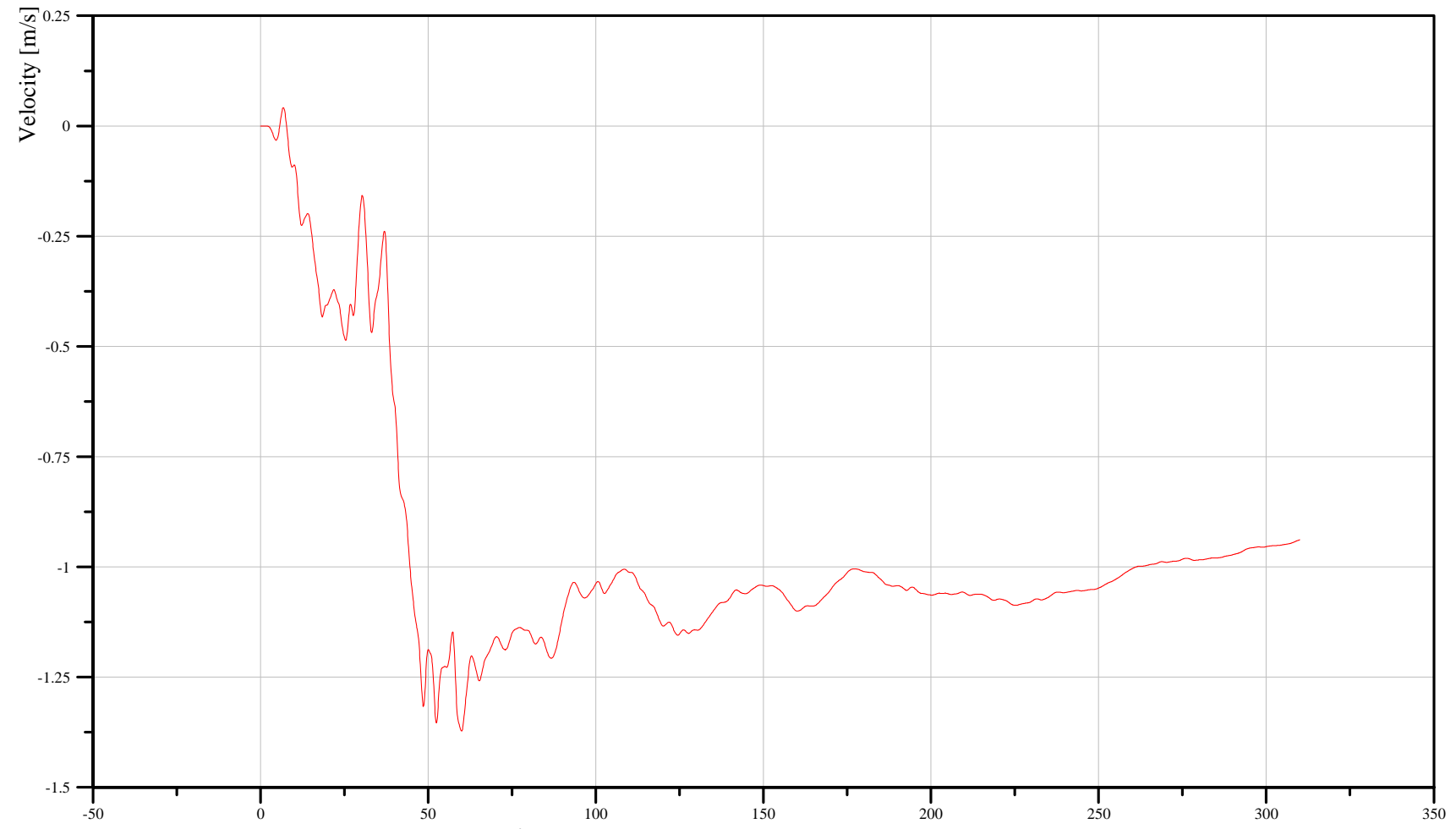
VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY

Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 10VEHCCG0000VEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

**Min. Value**  
-1.37 m/s at 60.00 ms

**Max. Value**  
0.04 m/s at 6.80 ms

B-125

070925



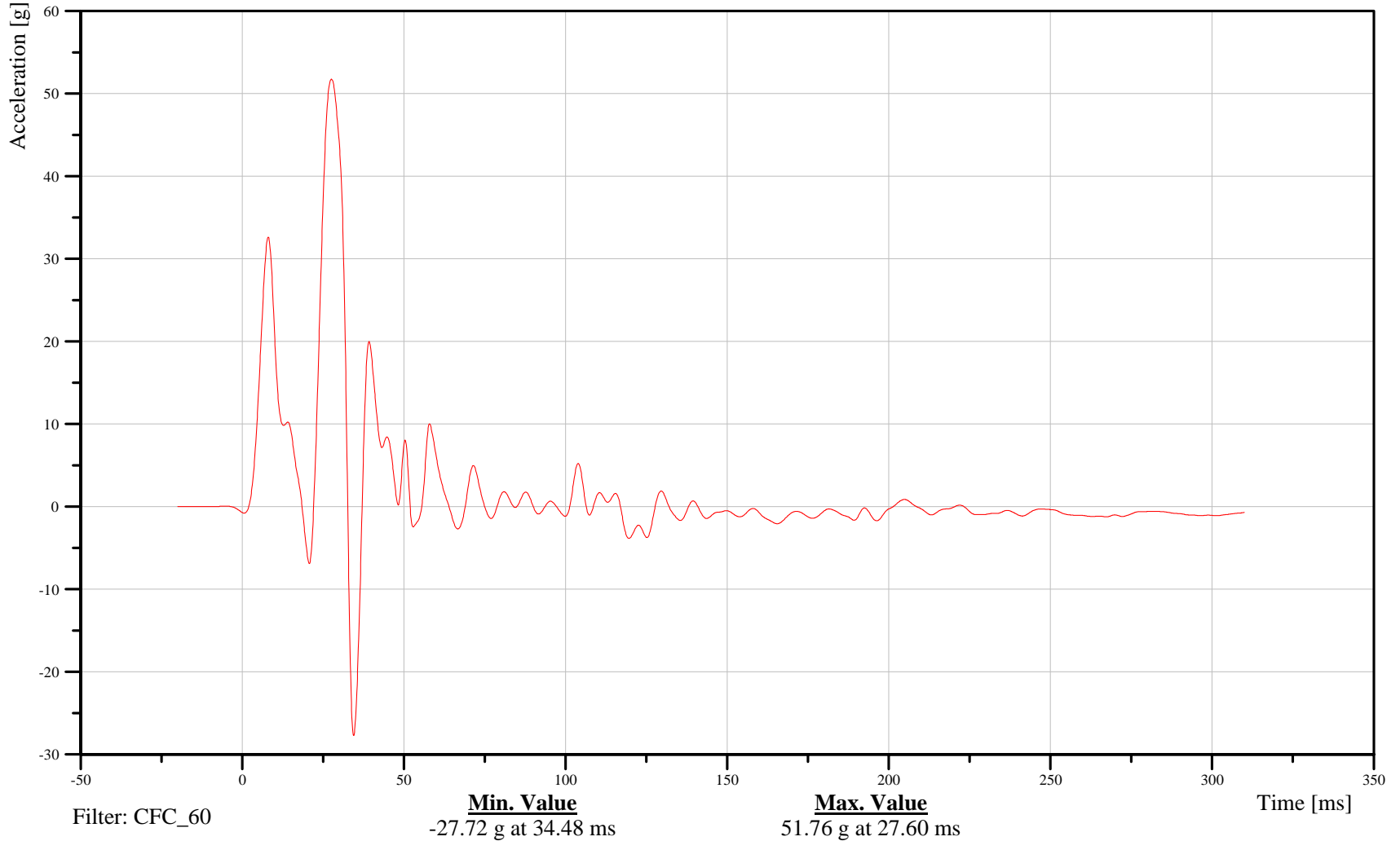
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-126

070925



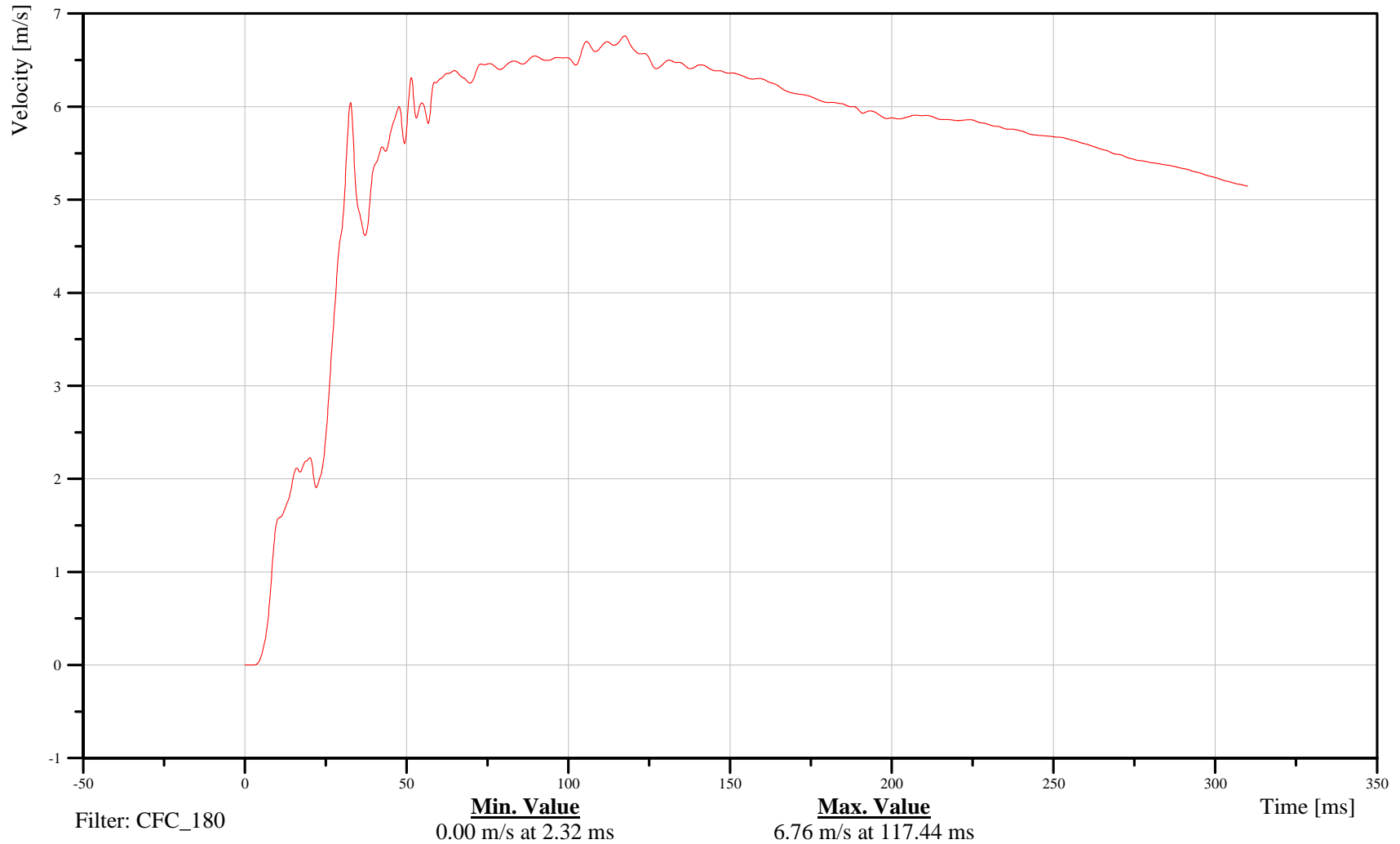
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

10VEHCCG0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-127

070925



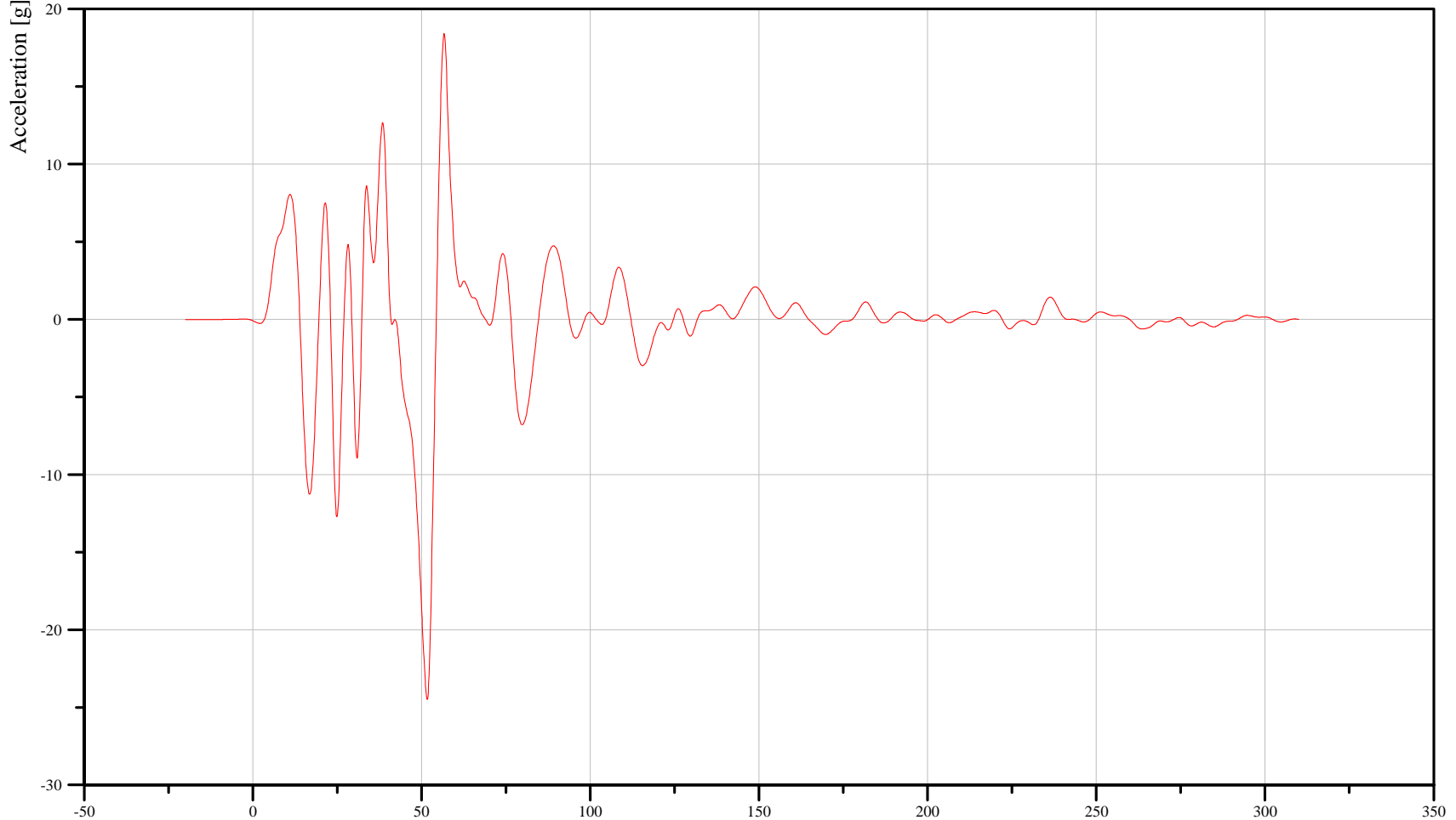
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_60

**Min. Value**  
-24.49 g at 51.68 ms

**Max. Value**  
18.42 g at 56.72 ms

Time [ms]

B-128

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

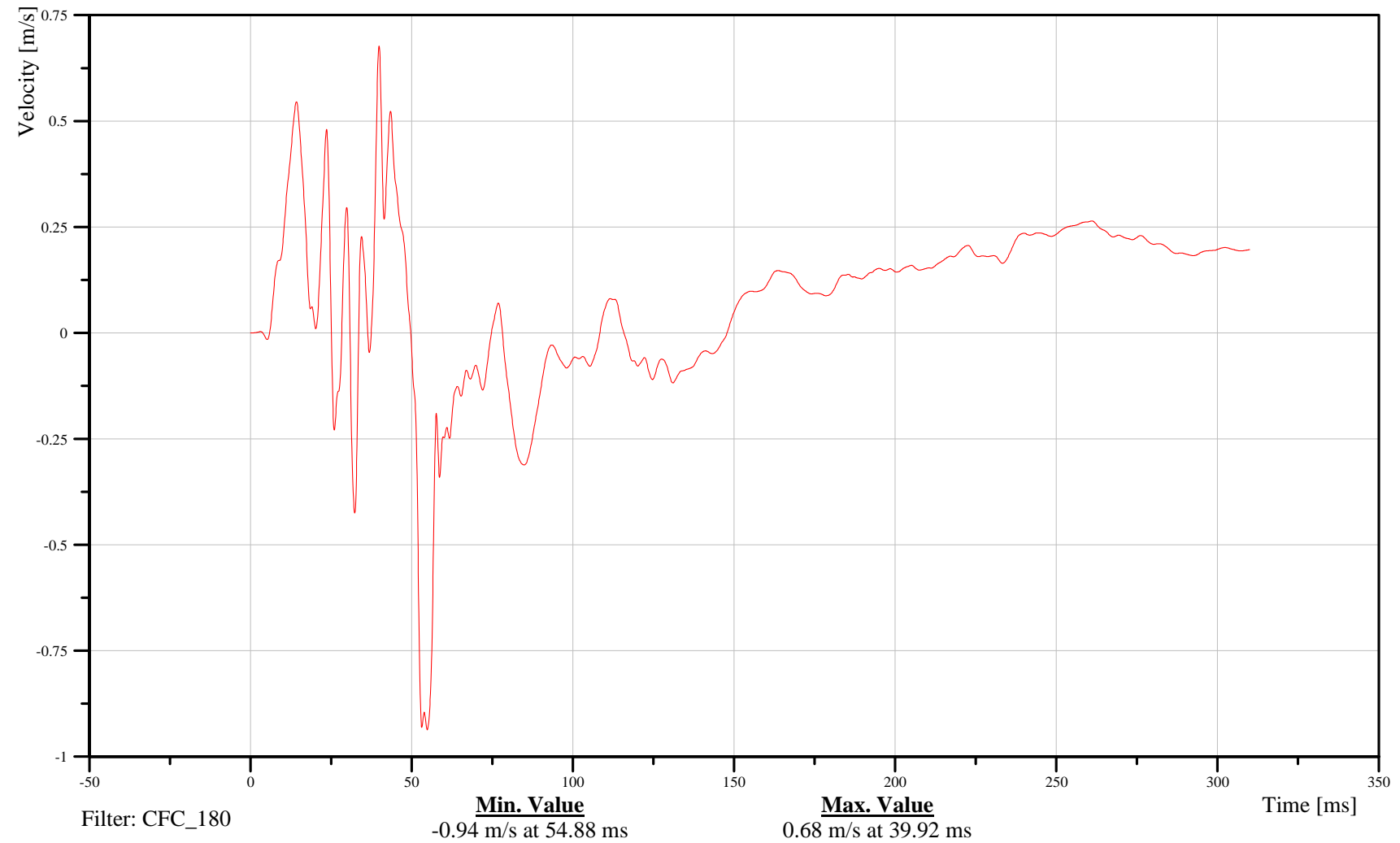
VEHICLE CENTER OF GRAVITY Z-AXIS VELOCITY

Time: 14:40

Customer: NHTSA  
Test Number: C80100

10VEHCCG0000VEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-129

070925



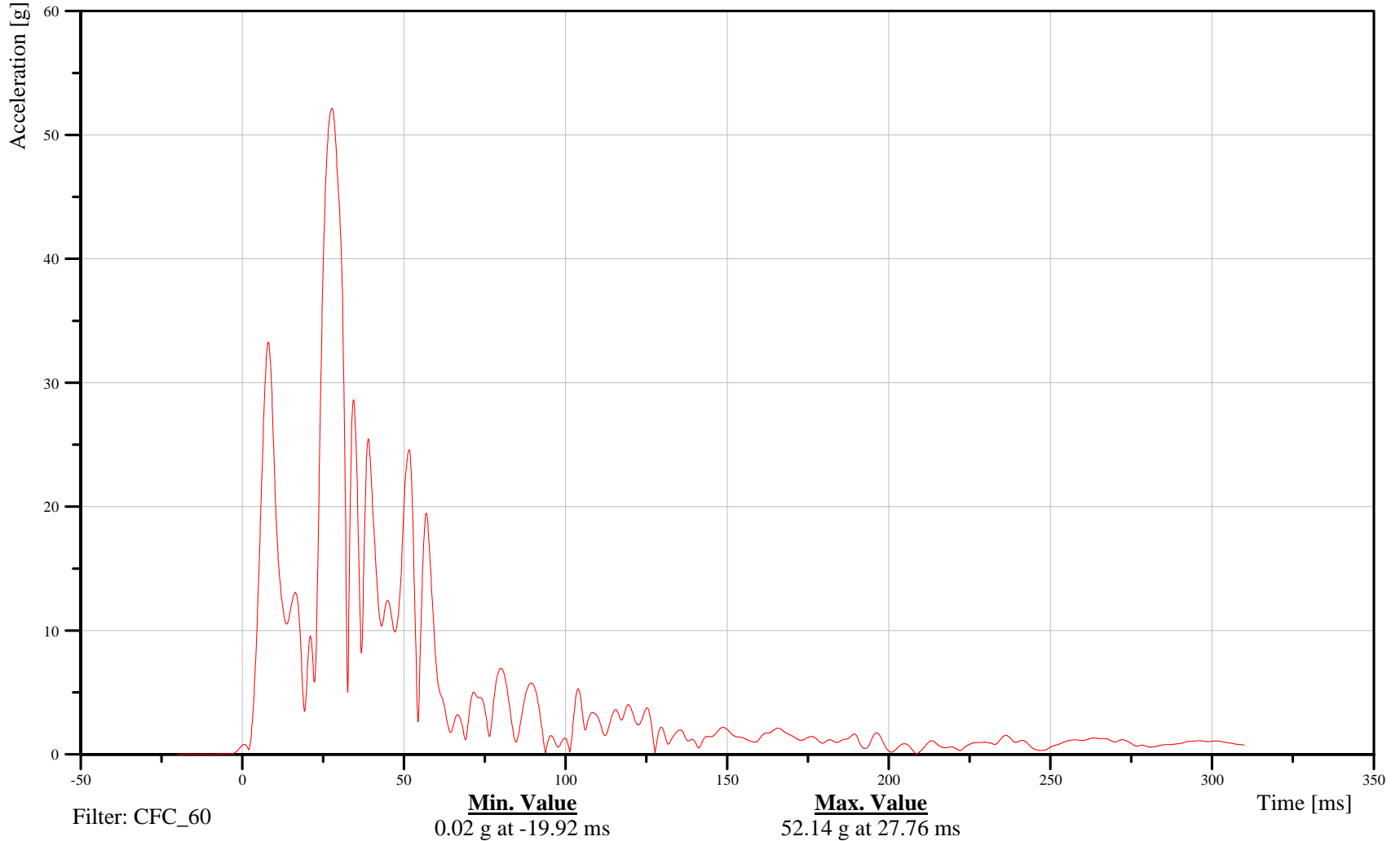
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-130

070925

MDB Instrumentation Plots



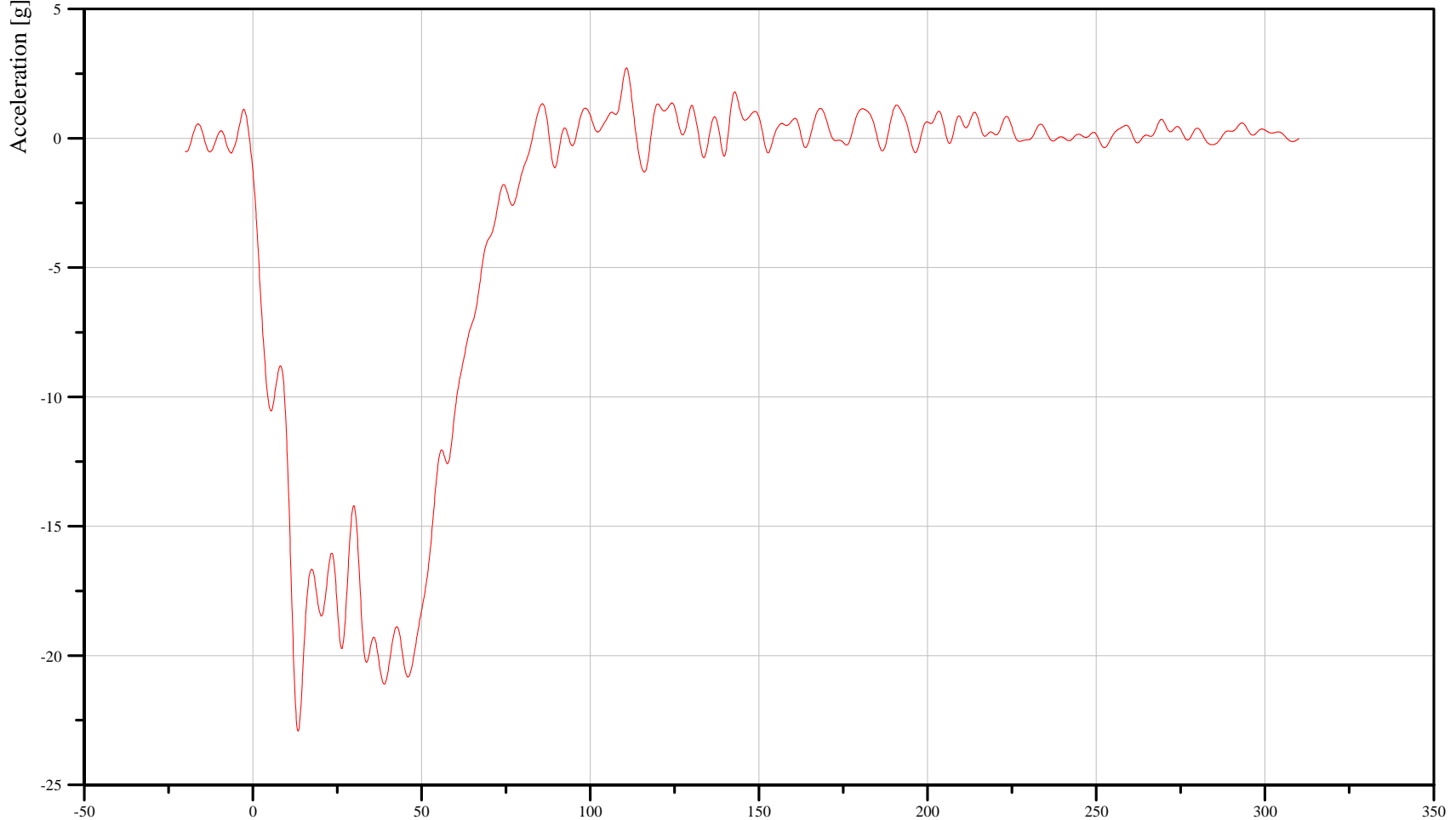
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB CENTER OF GRAVITY X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

M0VEHCCG0000ACXD

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_60

**Min. Value**  
-22.92 g at 13.44 ms

**Max. Value**  
2.72 g at 110.72 ms

Time [ms]

B-132

070925



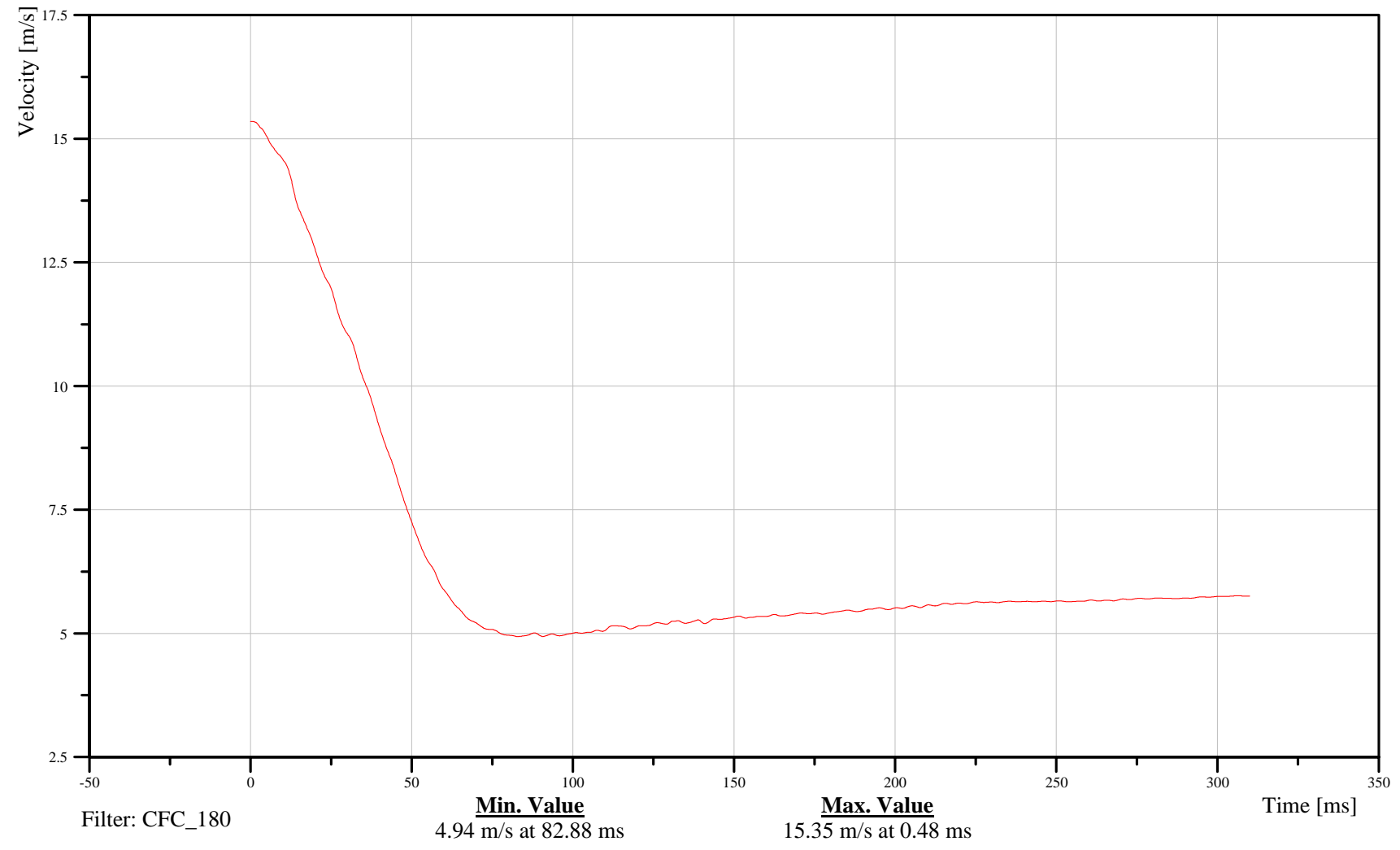
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB CENTER OF GRAVITY X-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

M0VEHCCG0000VEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-133

070925



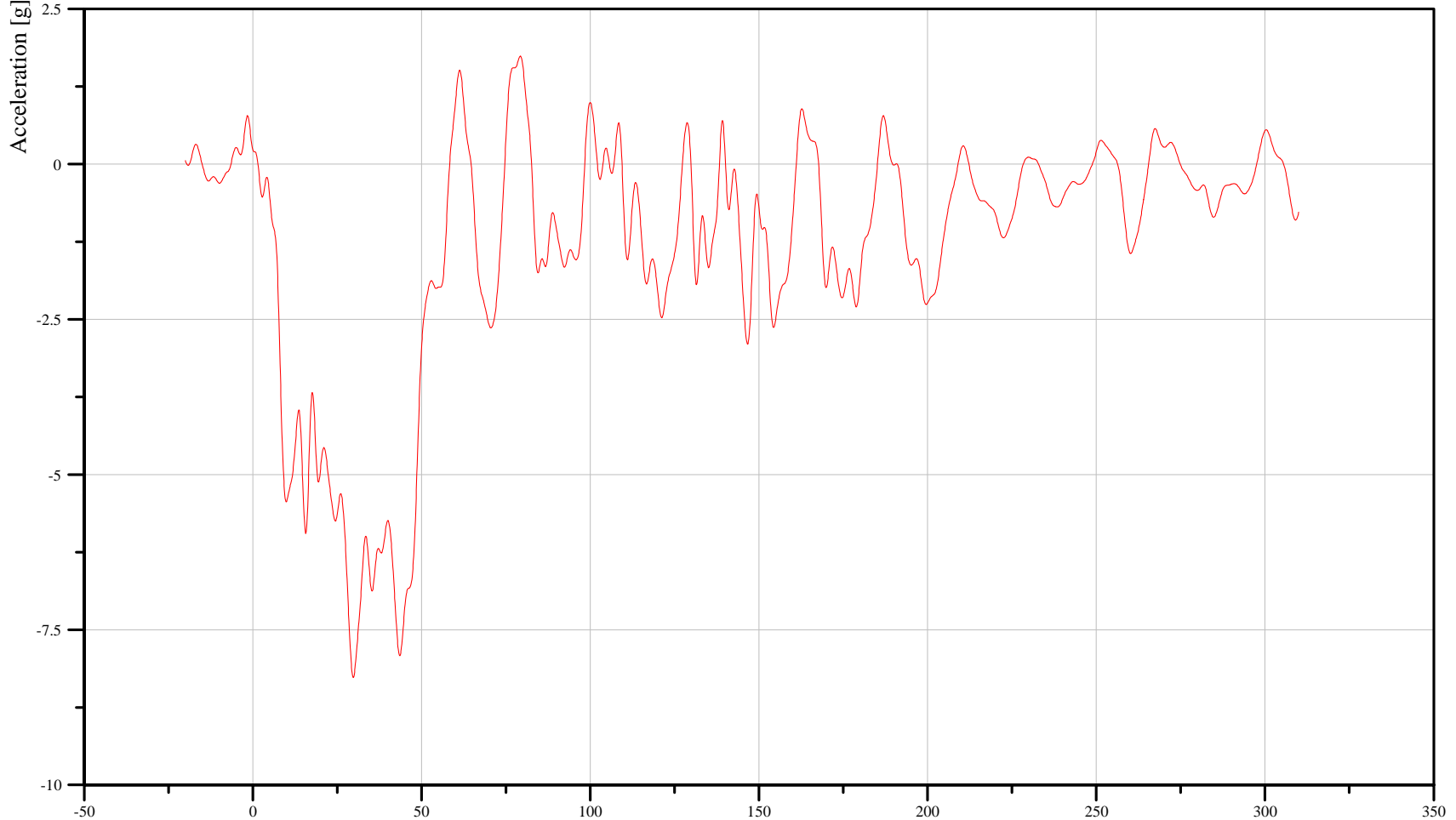
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB CENTER OF GRAVITY Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

M0VEHCCG0000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_60

**Min. Value**  
-8.27 g at 29.76 ms

**Max. Value**  
1.74 g at 79.28 ms

Time [ms]

B-134

070925



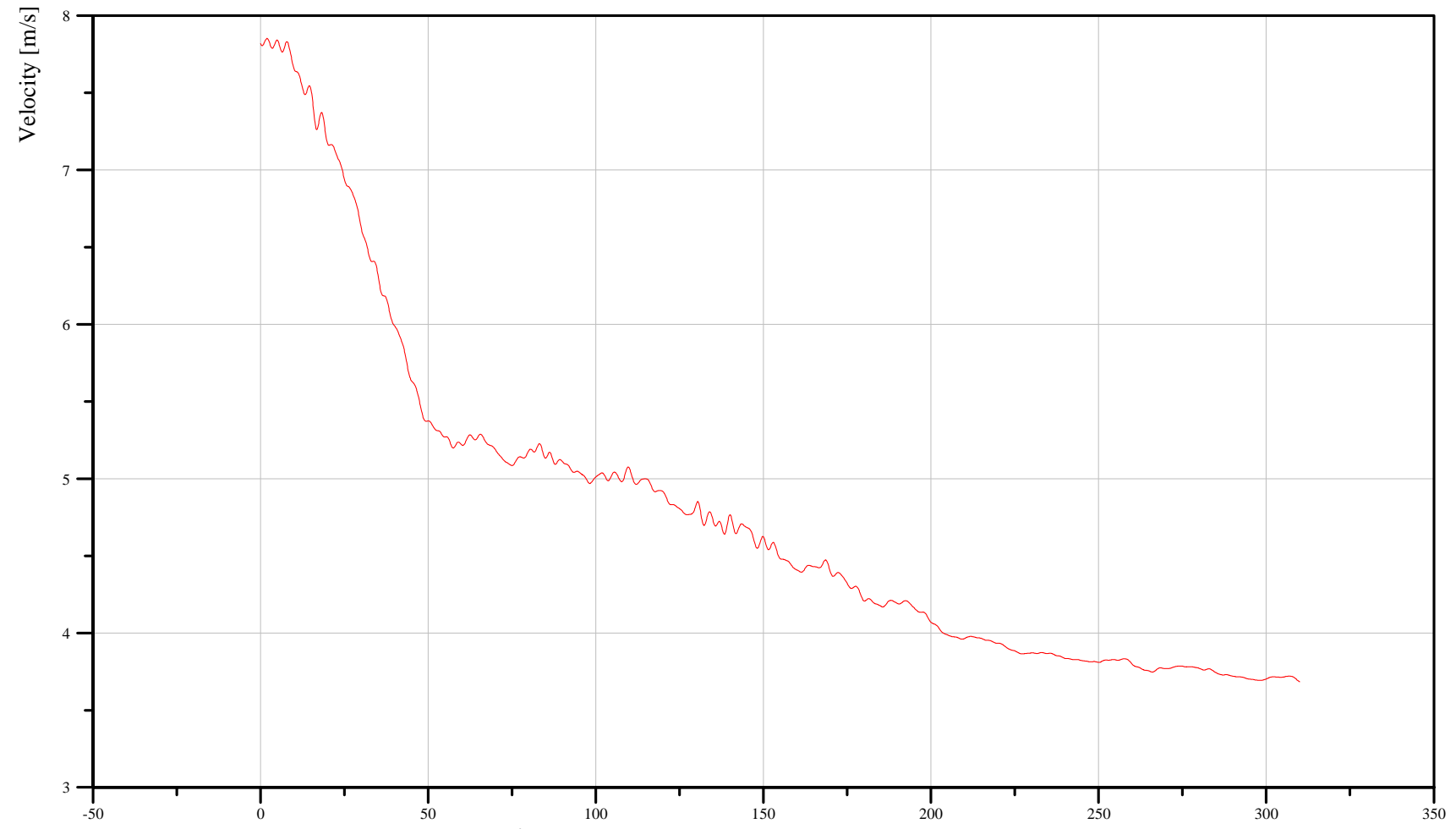
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB CENTER OF GRAVITY Y-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

M0VEHCCG0000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
3.68 m/s at 310.00 ms

Max. Value  
7.85 m/s at 1.92 ms

Time [ms]

B-135

070925



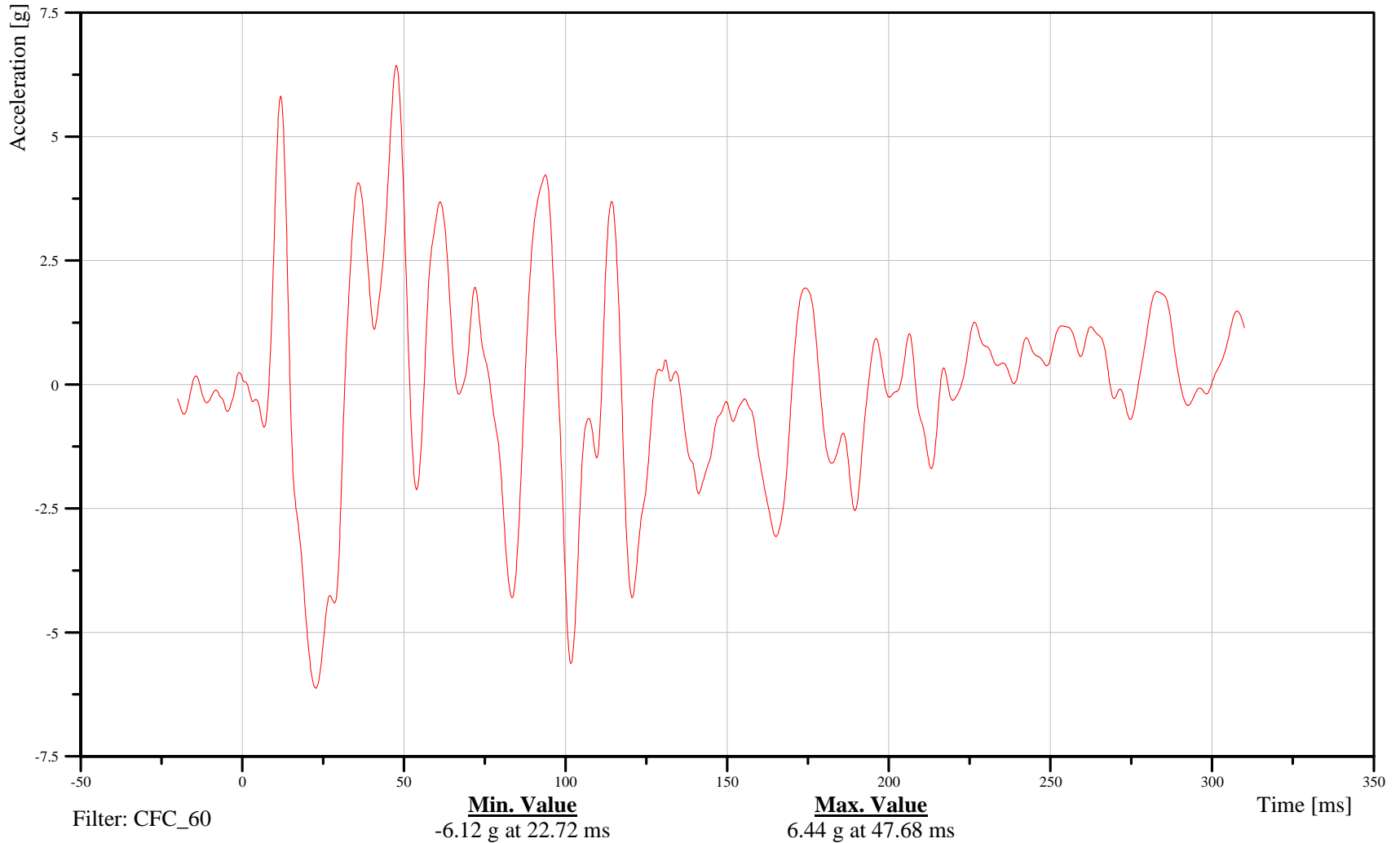
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB CENTER OF GRAVITY Z-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

M0VEHCCG0000ACZD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-136

070925



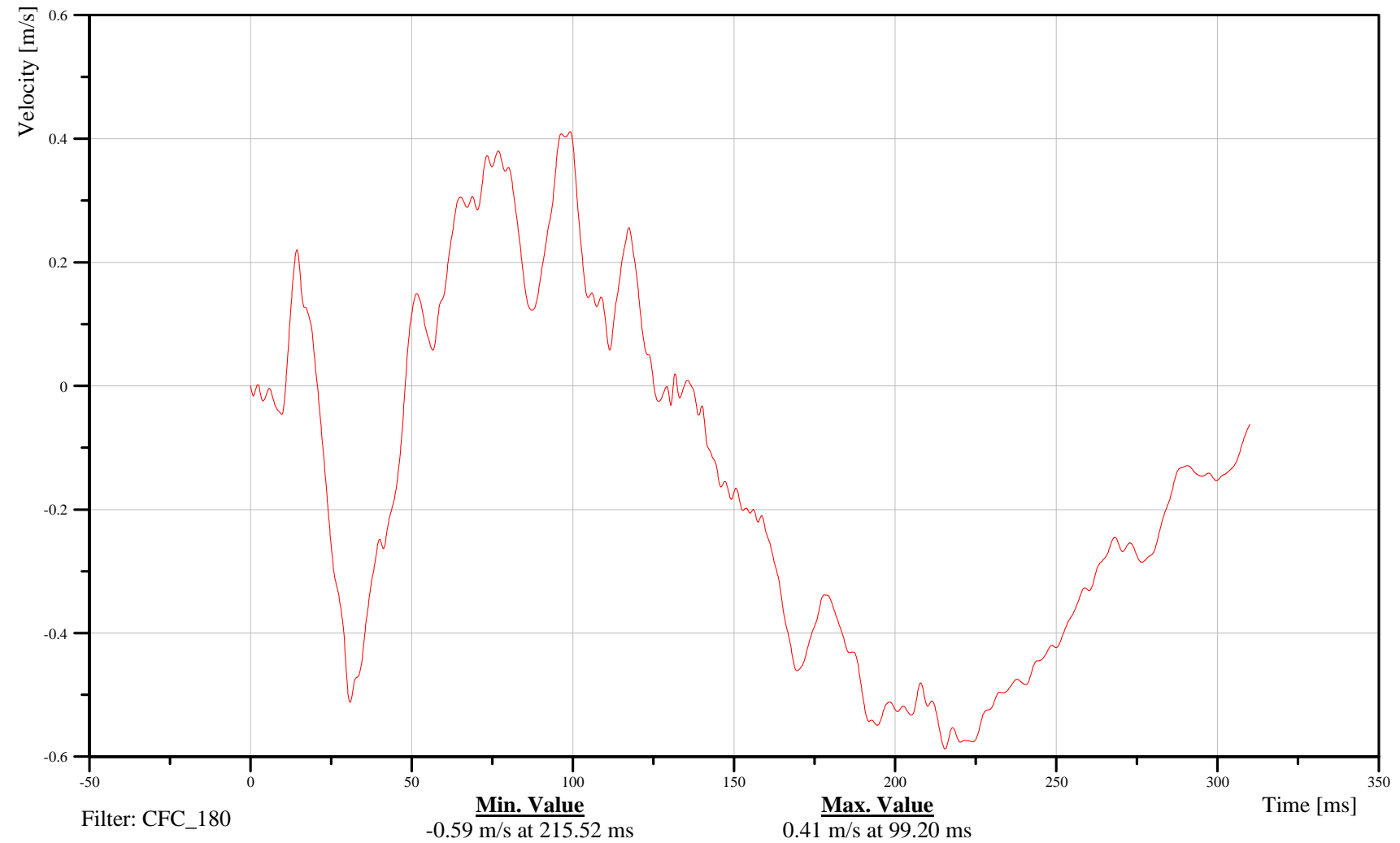
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB CENTER OF GRAVITY Z-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

# MOVEHCCG0000VEZC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-137

070925



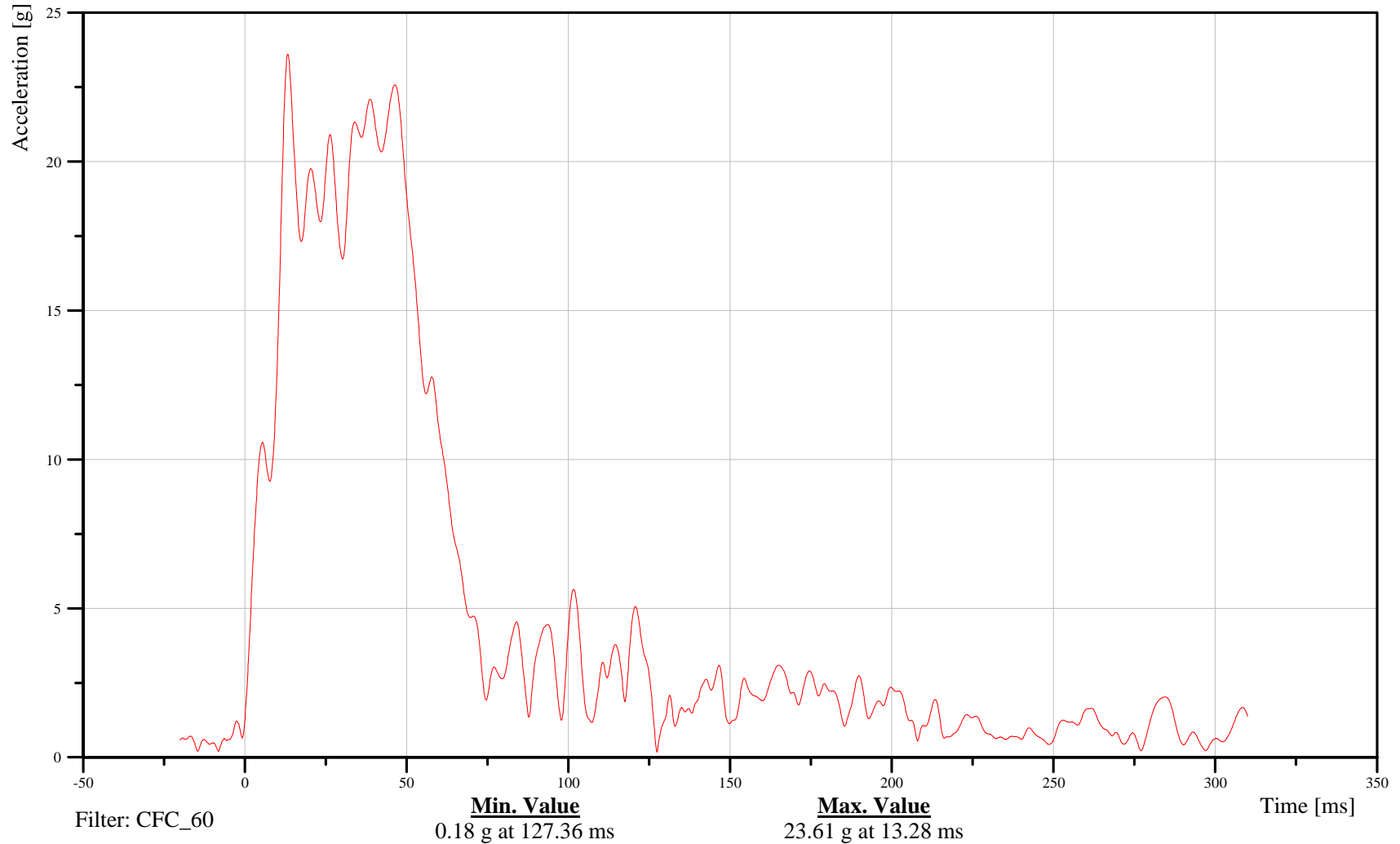
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB CENTER OF GRAVITY RESULTANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

M0VEHCCG0000ACRD

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-138

070925



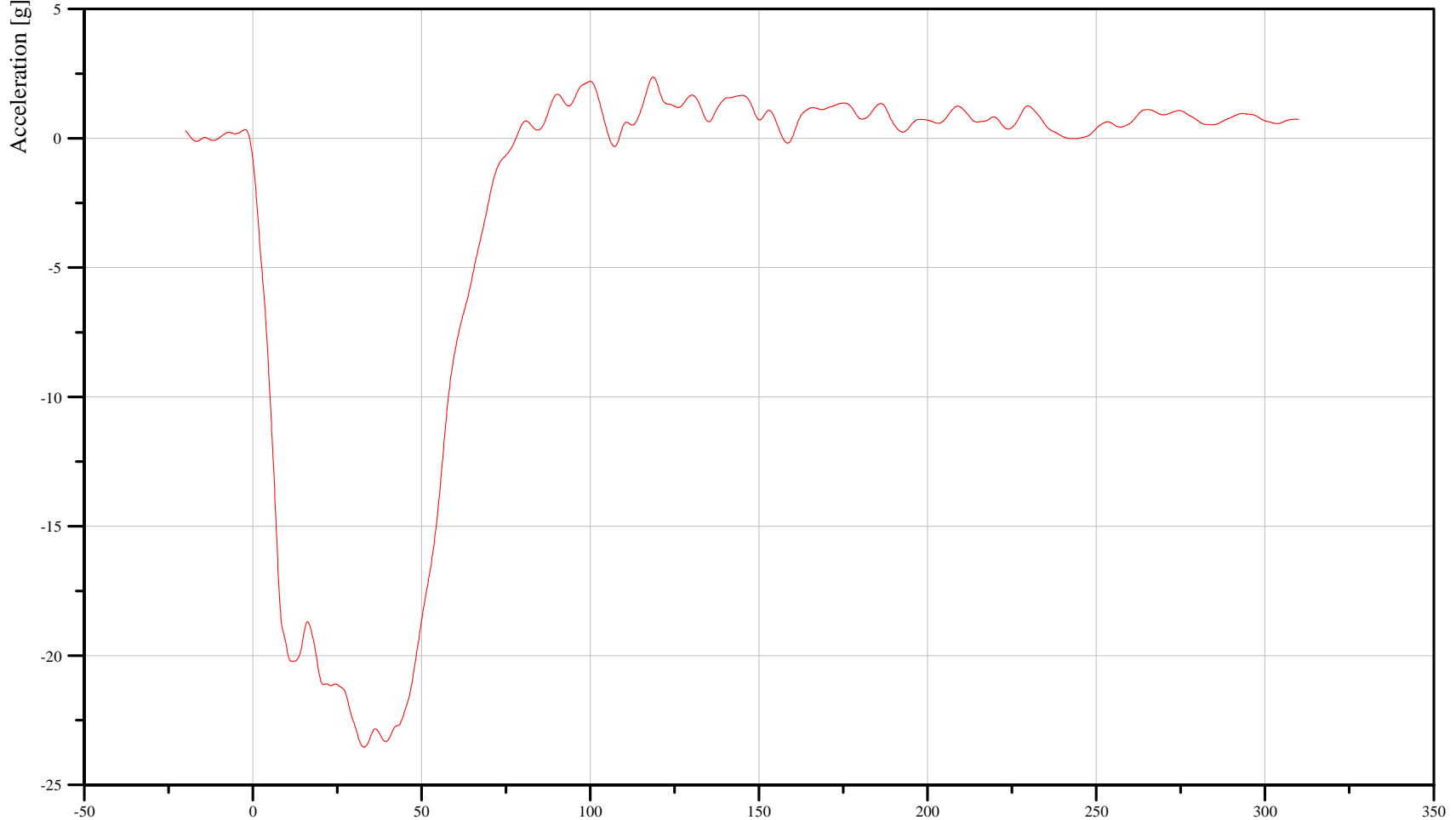
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB REAR X-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

M7FRAM000000ACXD

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_60

**Min. Value**  
-23.54 g at 32.96 ms

**Max. Value**  
2.37 g at 118.64 ms

Time [ms]

B-139

070925



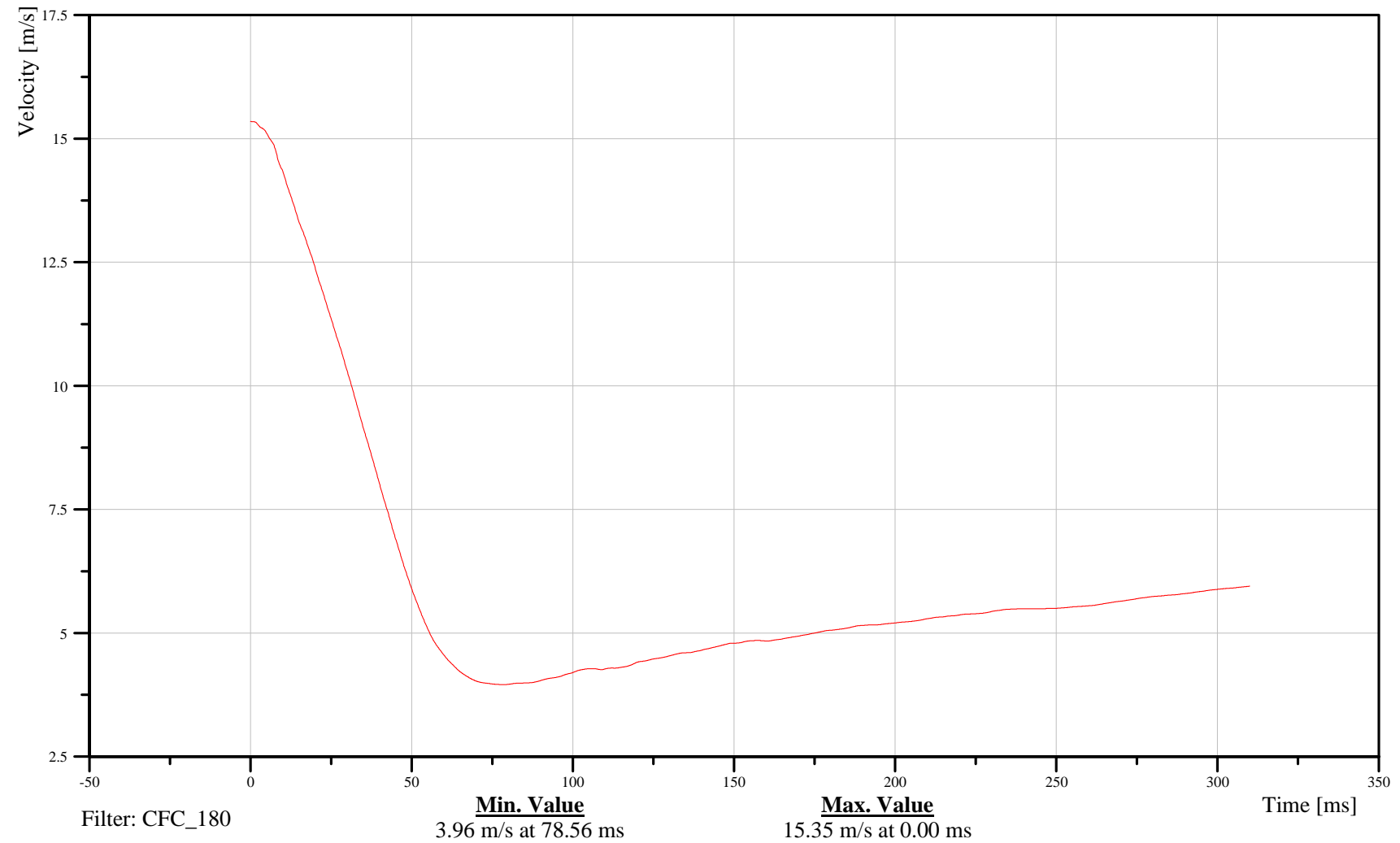
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB REAR X-AXIS VELOCITY Time: 14:40

Customer: NHTSA  
Test Number: C80100

M7FRAM000000VEXC

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-140

070925



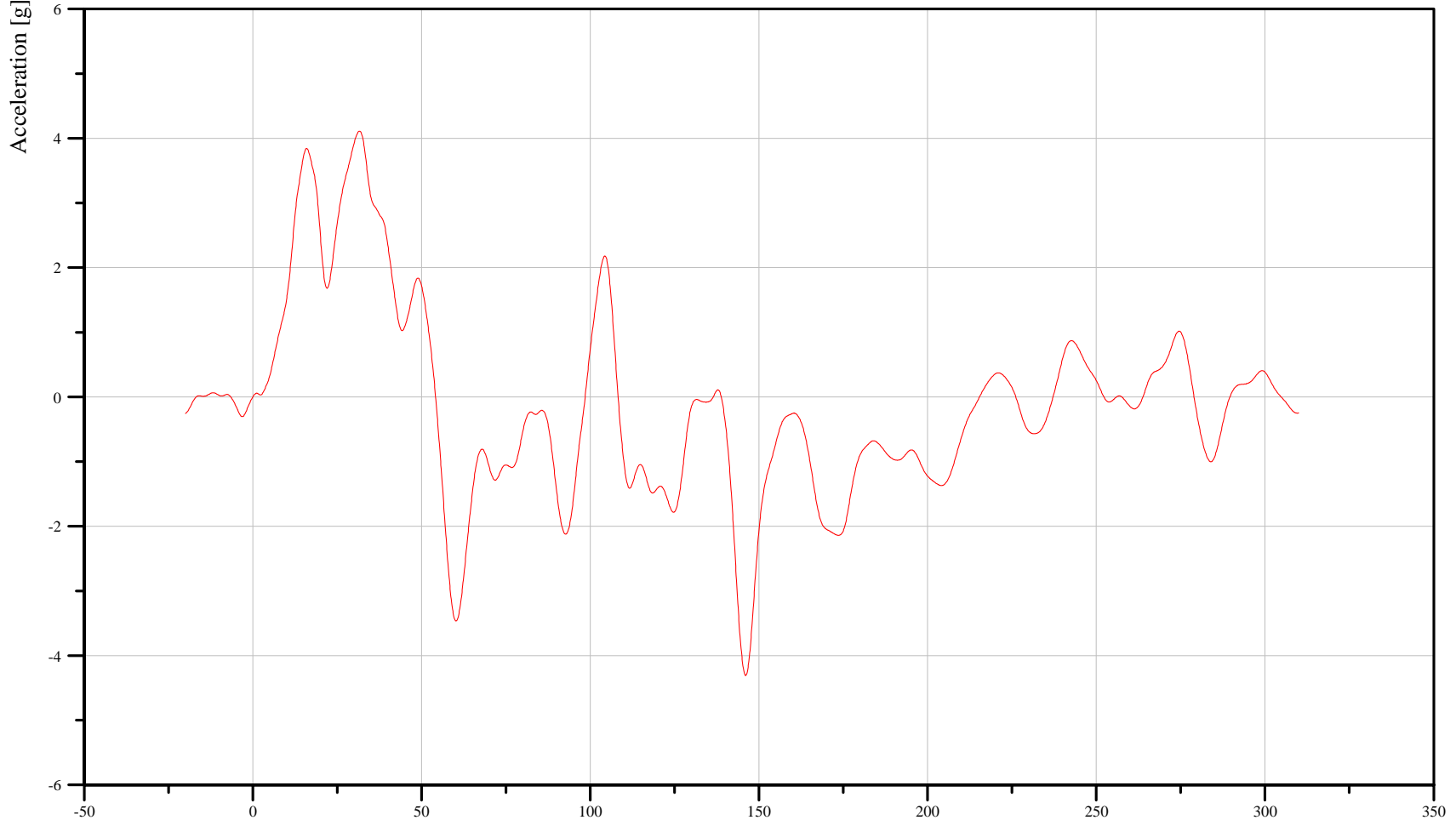
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

MDB REAR Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

M7FRAM000000ACYD

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_60

**Min. Value**  
-4.31 g at 146.08 ms

**Max. Value**  
4.11 g at 31.60 ms

Time [ms]

B-141

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

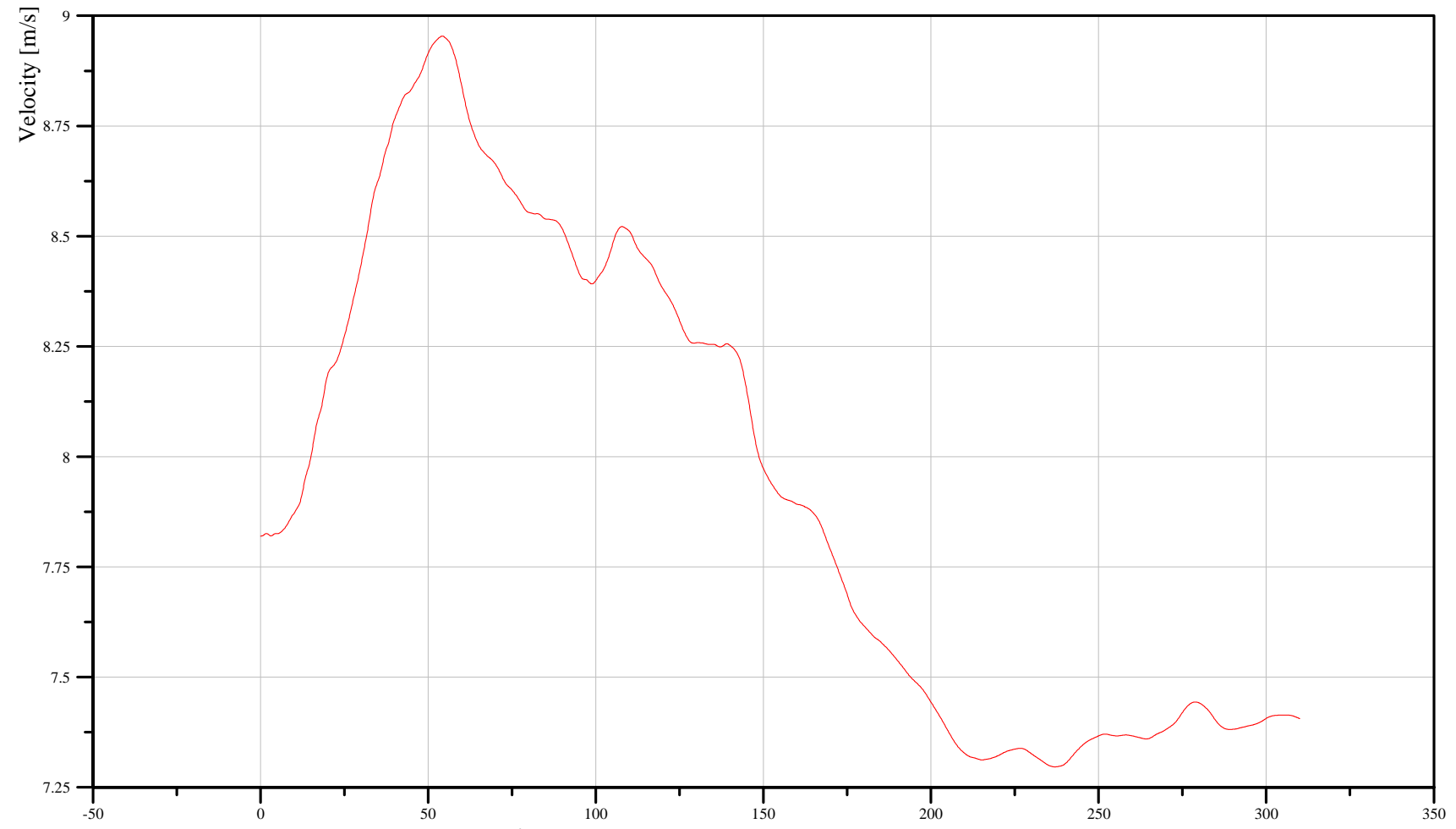
MDB REAR Y-AXIS VELOCITY

Time: 14:40

Customer: NHTSA  
Test Number: C80100

M7FRAM000000VEYC

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: CFC\_180

Min. Value  
7.30 m/s at 236.96 ms

Max. Value  
8.95 m/s at 54.24 ms

Time [ms]

B-142

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

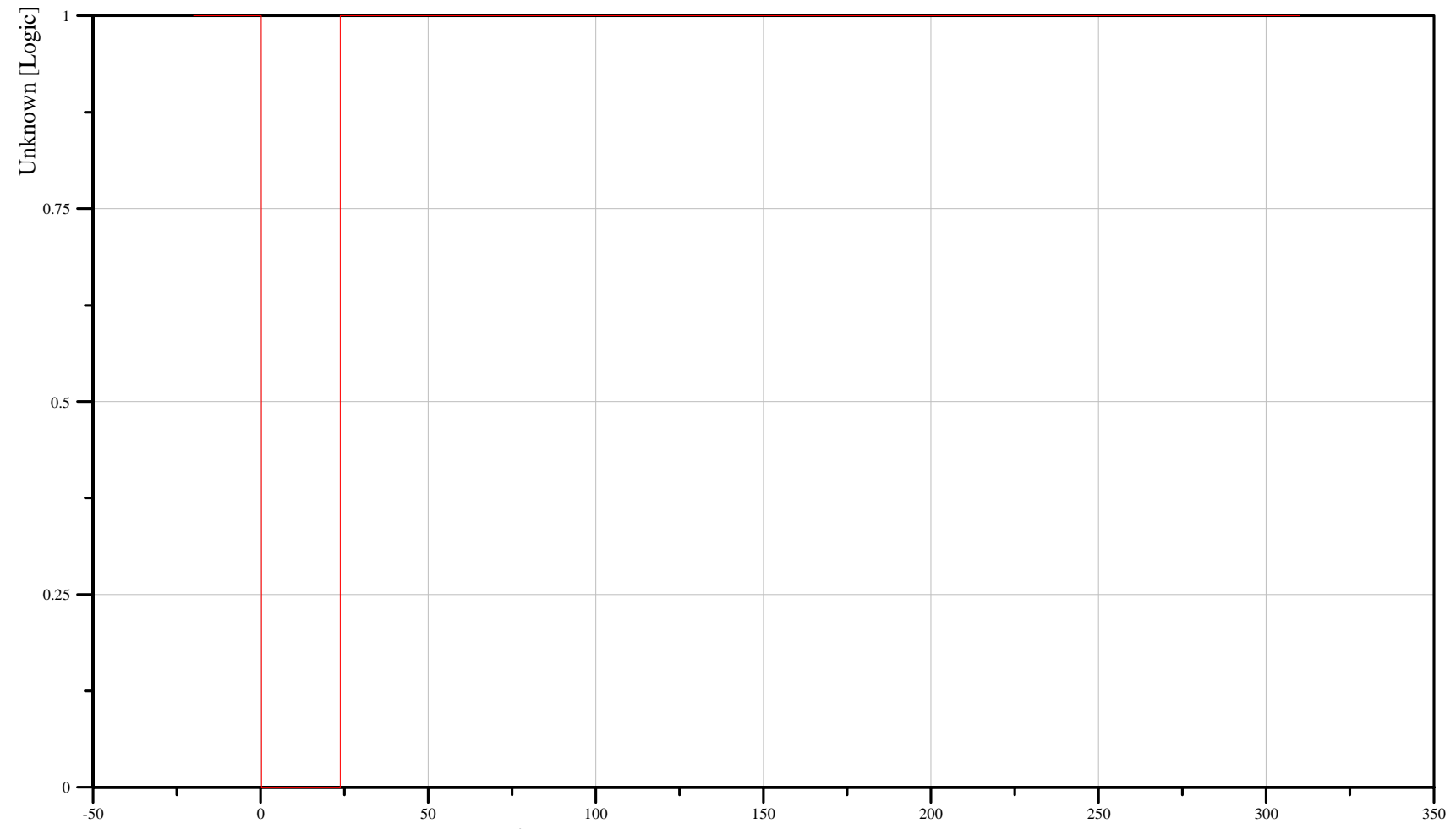
MDB RIGHT CONTACT SWITCH

Time: 14:40

Customer: NHTSA  
Test Number: C80100

M3CONT000000V000

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: Unfiltered

Min. Value  
0.00 Logic at 0.32 ms

Max. Value  
1.00 Logic at -20.00 ms

Time [ms]

B-143

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

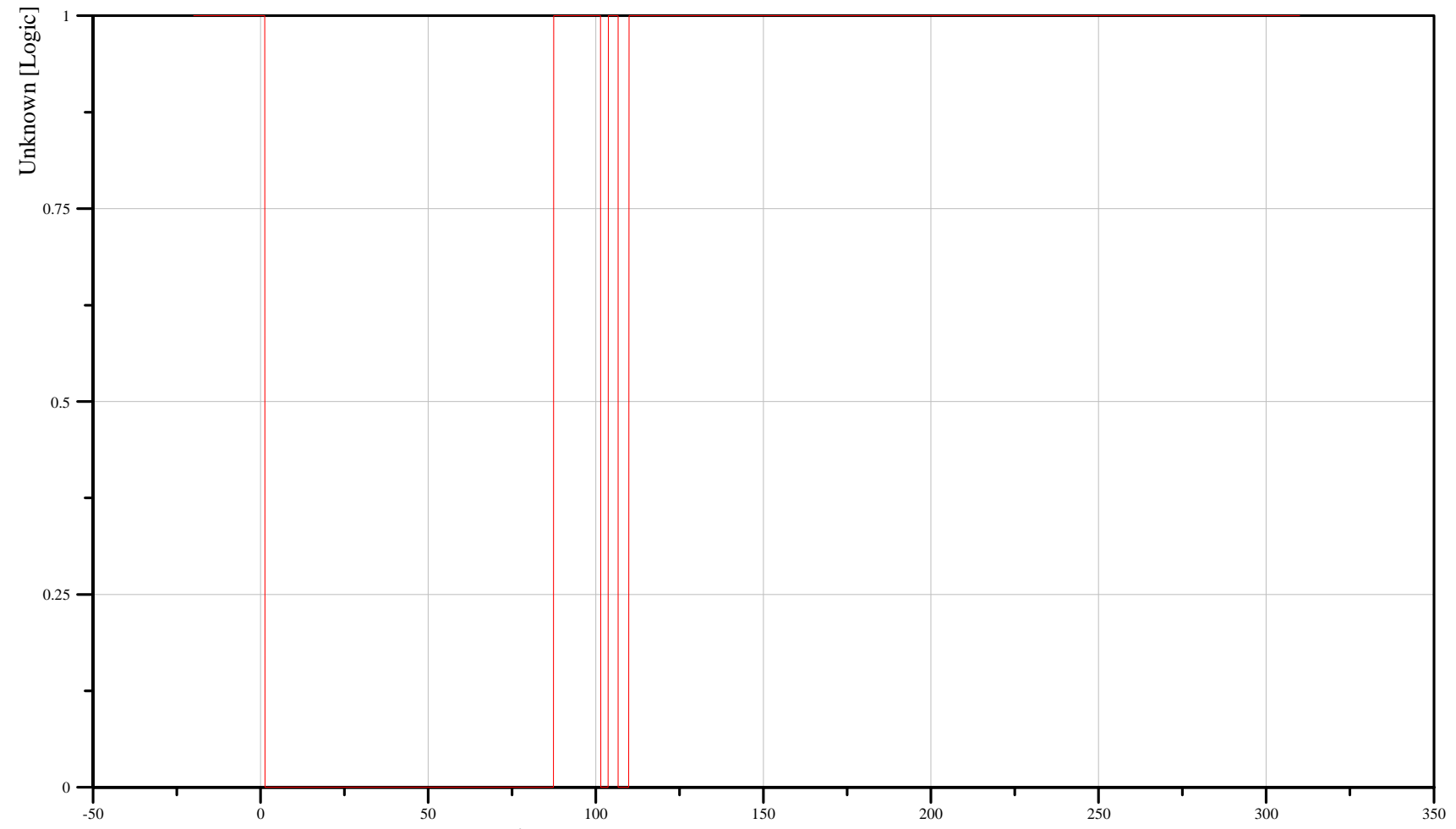
MDB LEFT CONTACT SWITCH

Time: 14:40

Customer: NHTSA  
Test Number: C80100

M1CONT000000V000

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: Unfiltered

Min. Value  
0.00 Logic at 1.36 ms

Max. Value  
1.00 Logic at -20.00 ms

B-144

070925

Driver and Passenger Dummy Instrumentation Plots



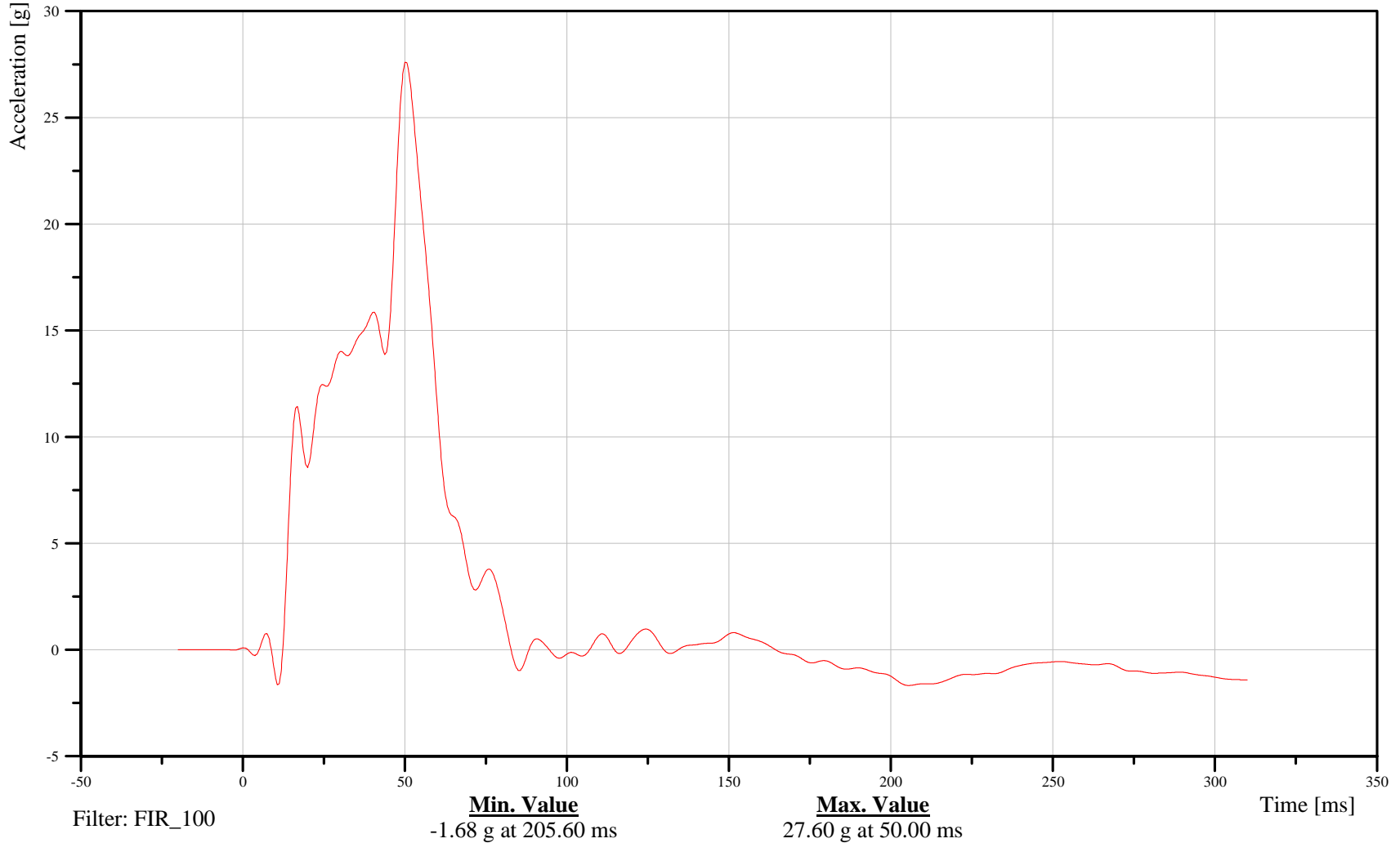
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER UPPER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLU00SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-146

070925



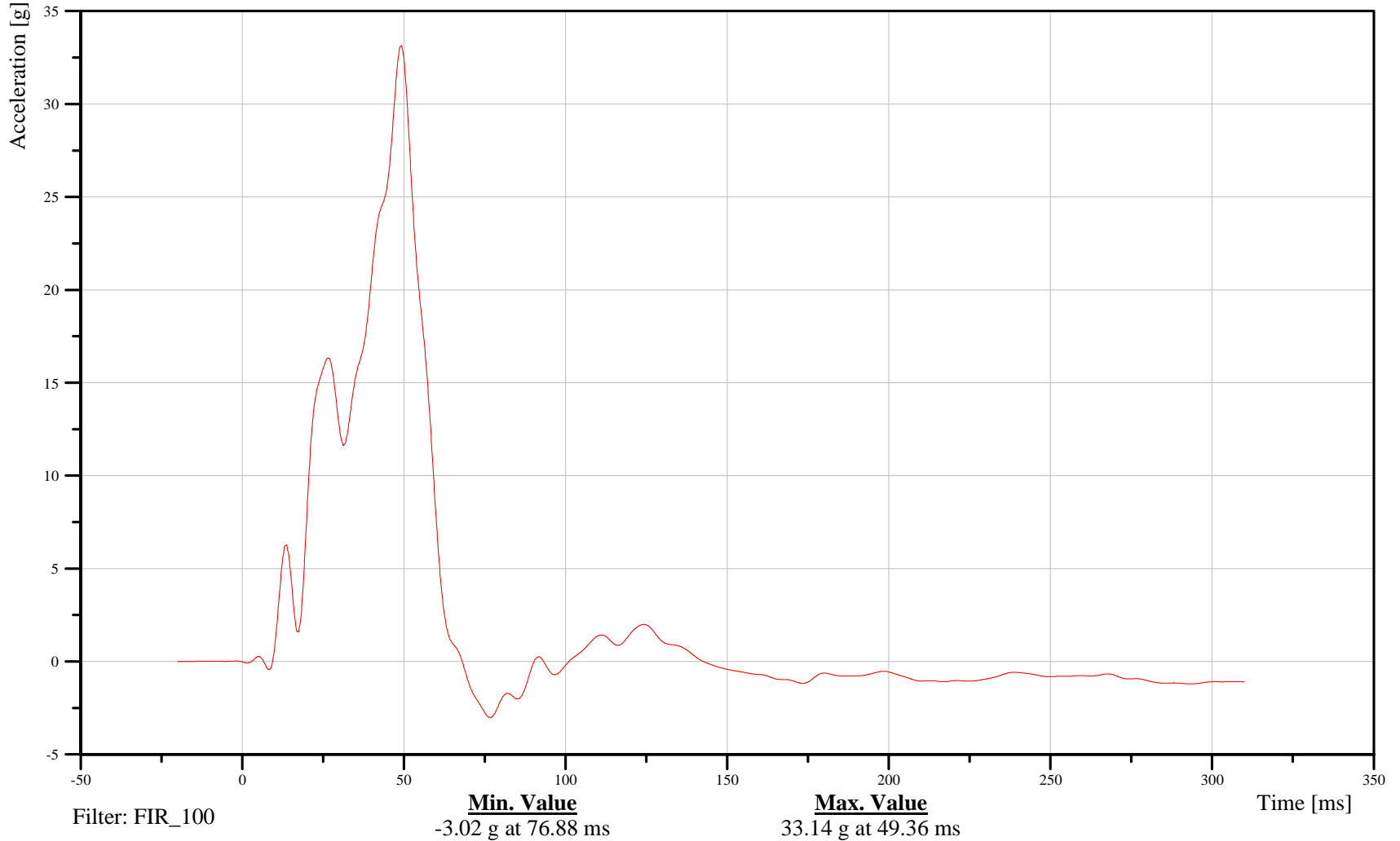
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLL00SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-147

070925



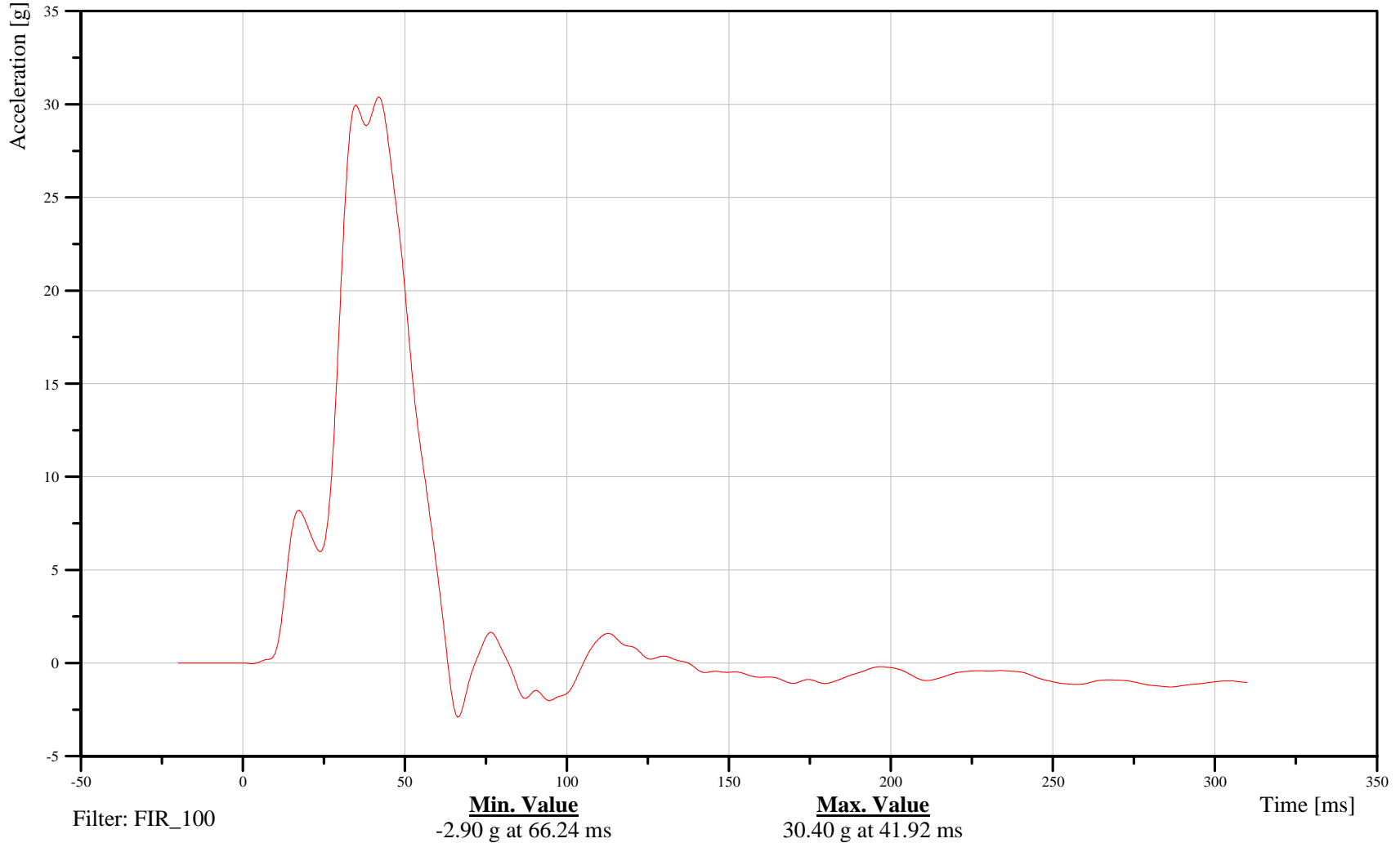
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER SPINE Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SPIN1200SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-148

070925



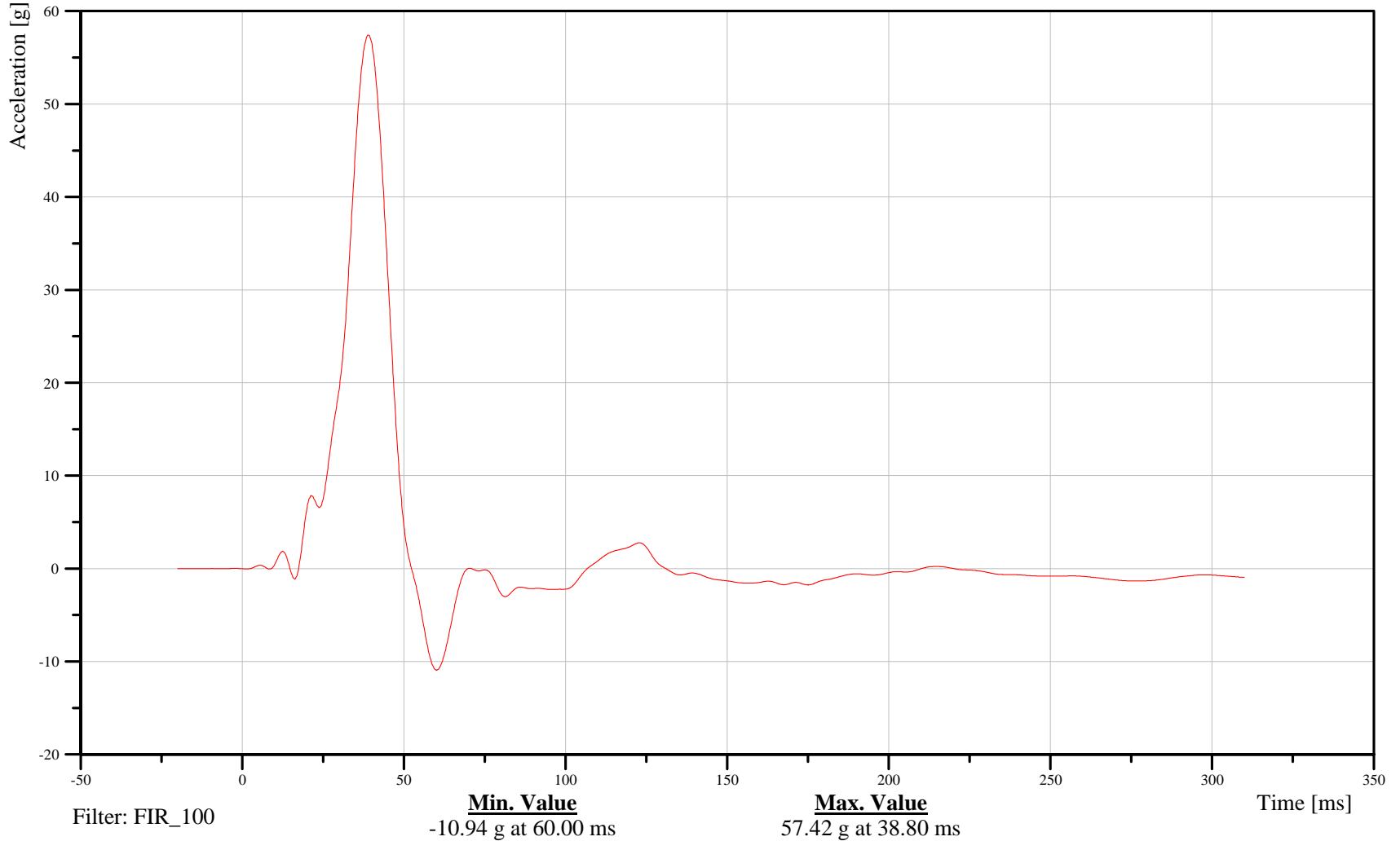
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER PELVIS Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11PELVCG00SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-149

070925



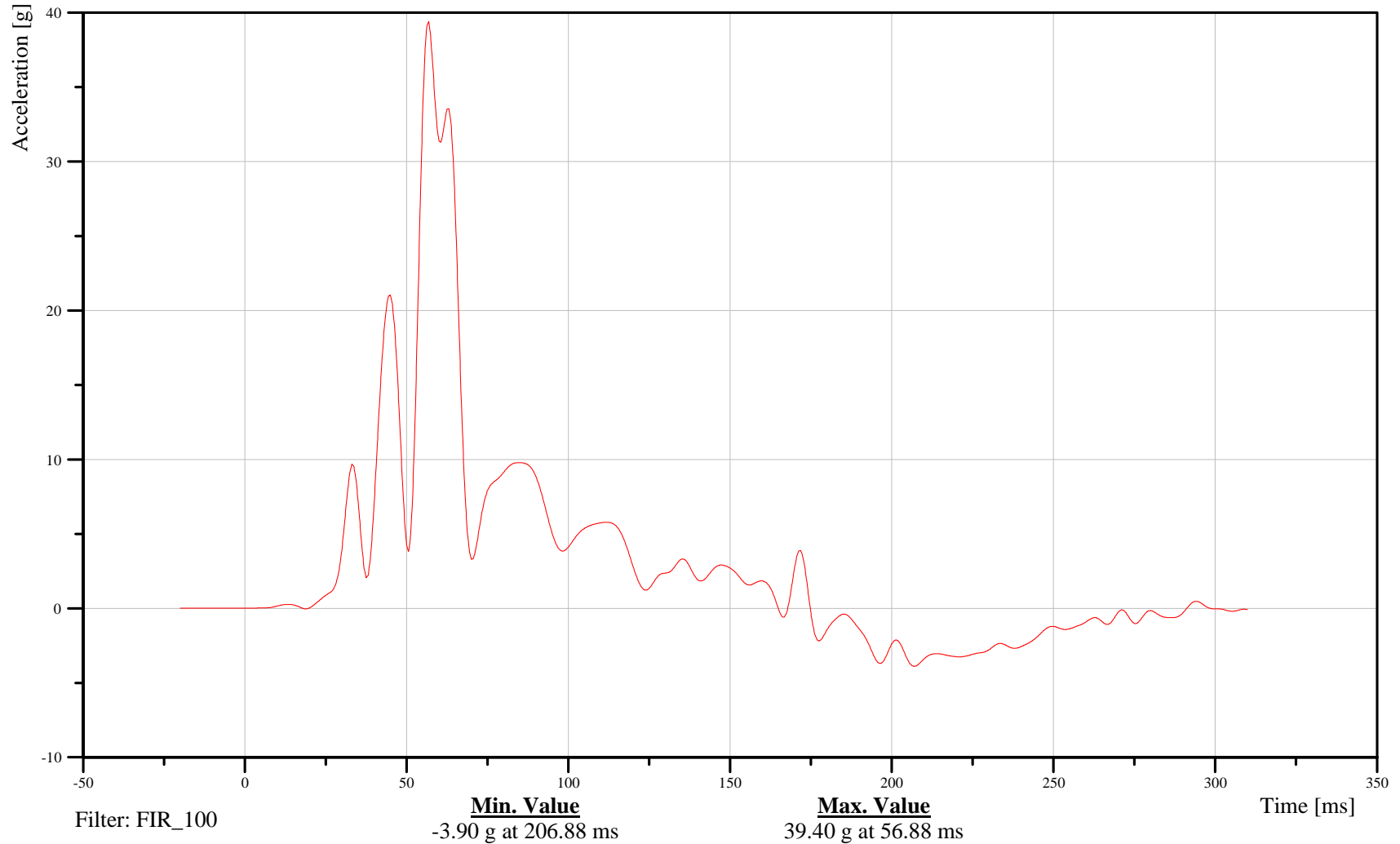
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLU00SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-150

070925



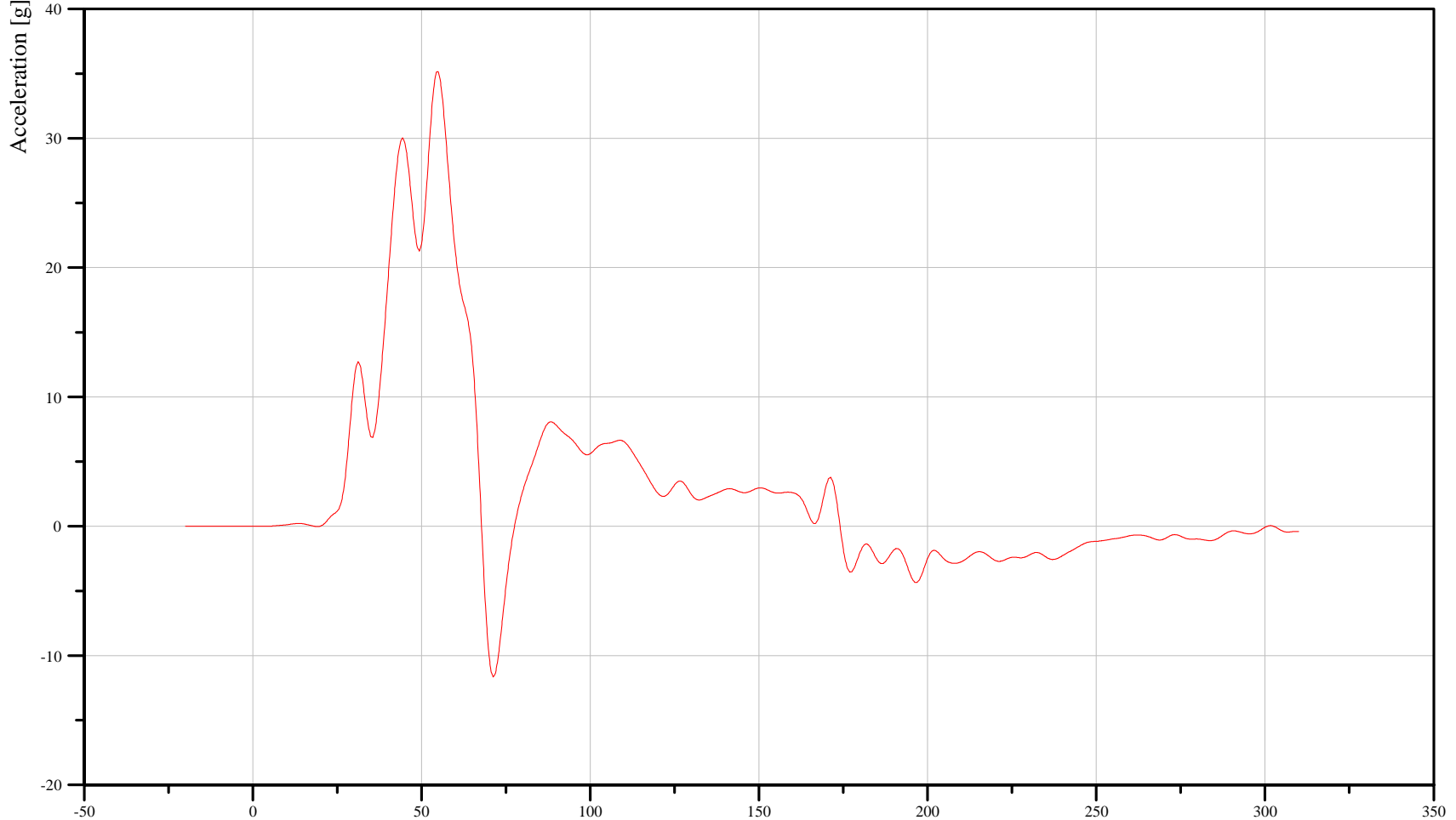
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLL00SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: FIR\_100

**Min. Value**  
-11.66 g at 71.28 ms

**Max. Value**  
35.16 g at 54.96 ms

Time [ms]

B-151

070925



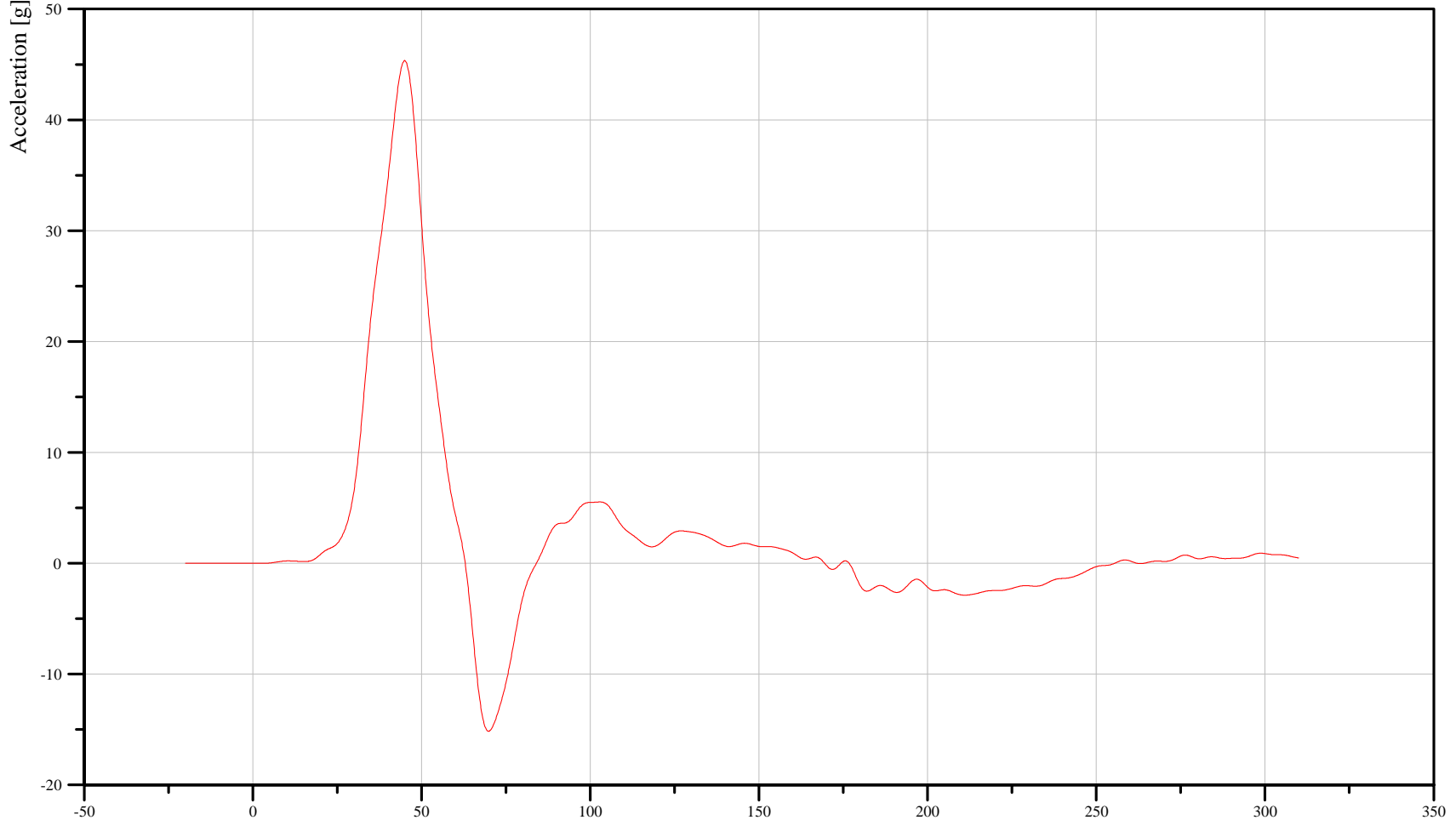
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SPIN1200SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: FIR\_100

Min. Value  
-15.17 g at 70.00 ms

Max. Value  
45.37 g at 44.96 ms

Time [ms]

B-152

070925



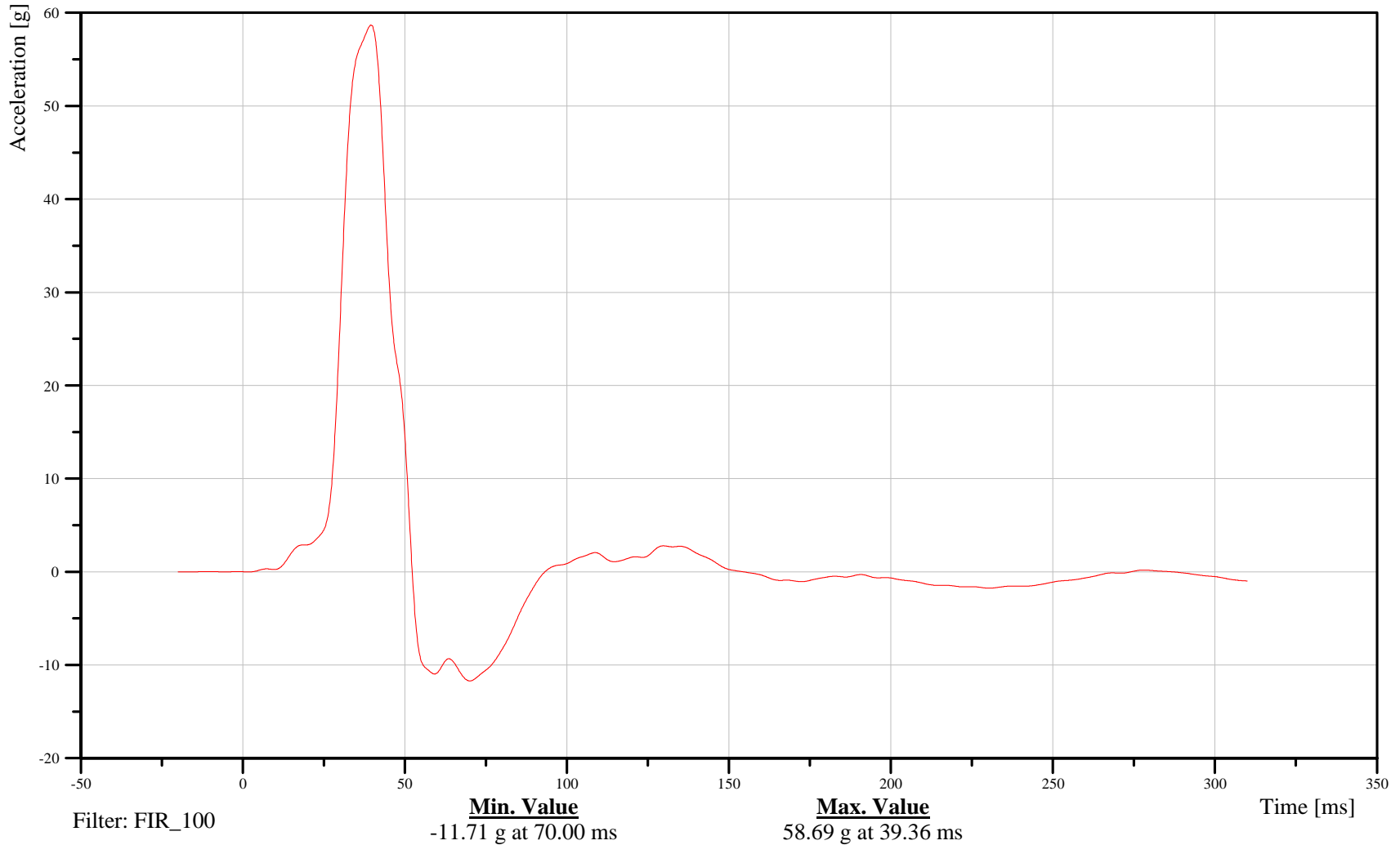
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14PELVCG00SHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-153

070925



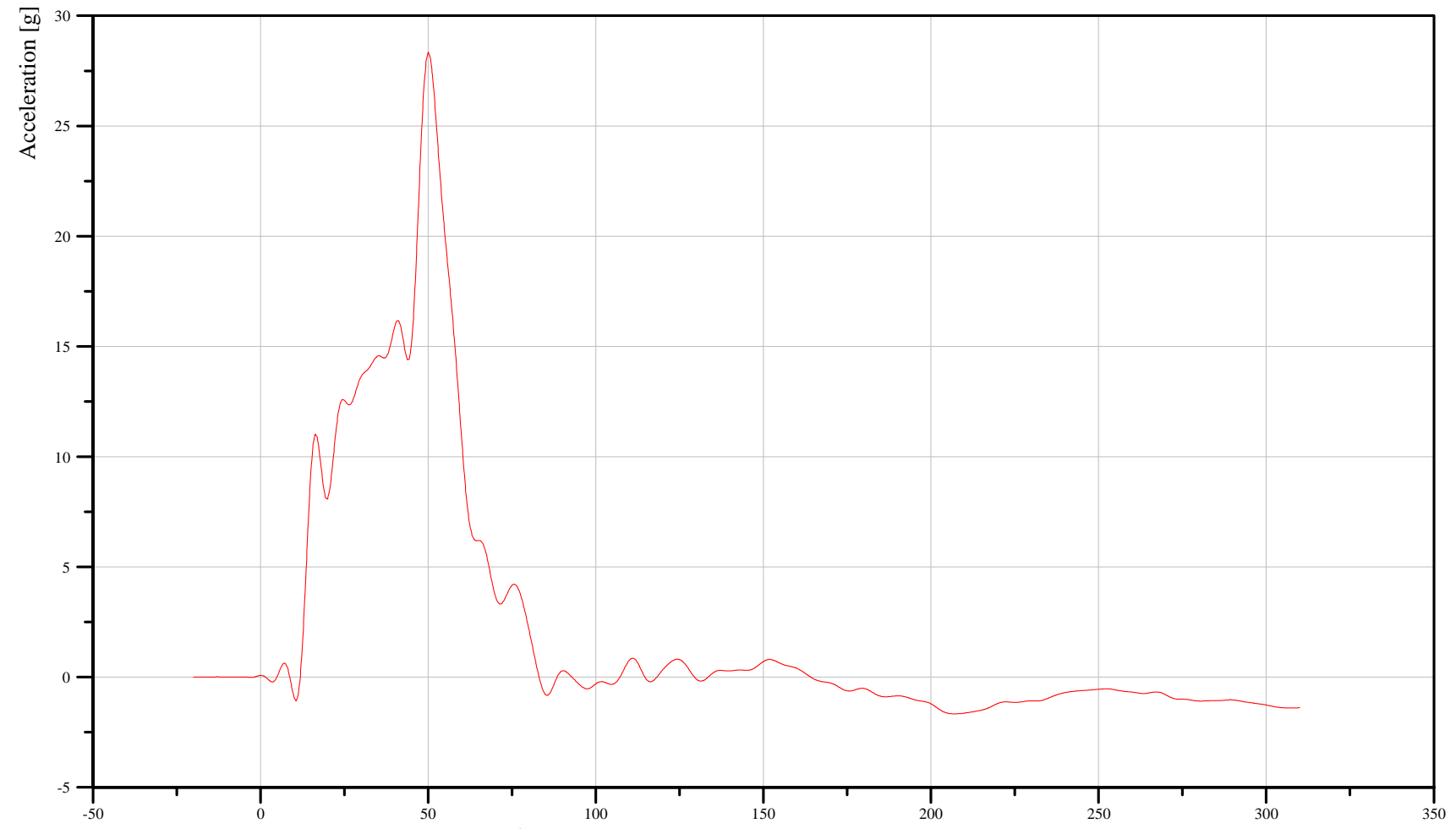
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

# 11RIBSLURDASHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



Filter: FIR\_100

**Min. Value**  
-1.66 g at 206.88 ms

**Max. Value**  
28.35 g at 50.00 ms

Time [ms]

B-154

070925



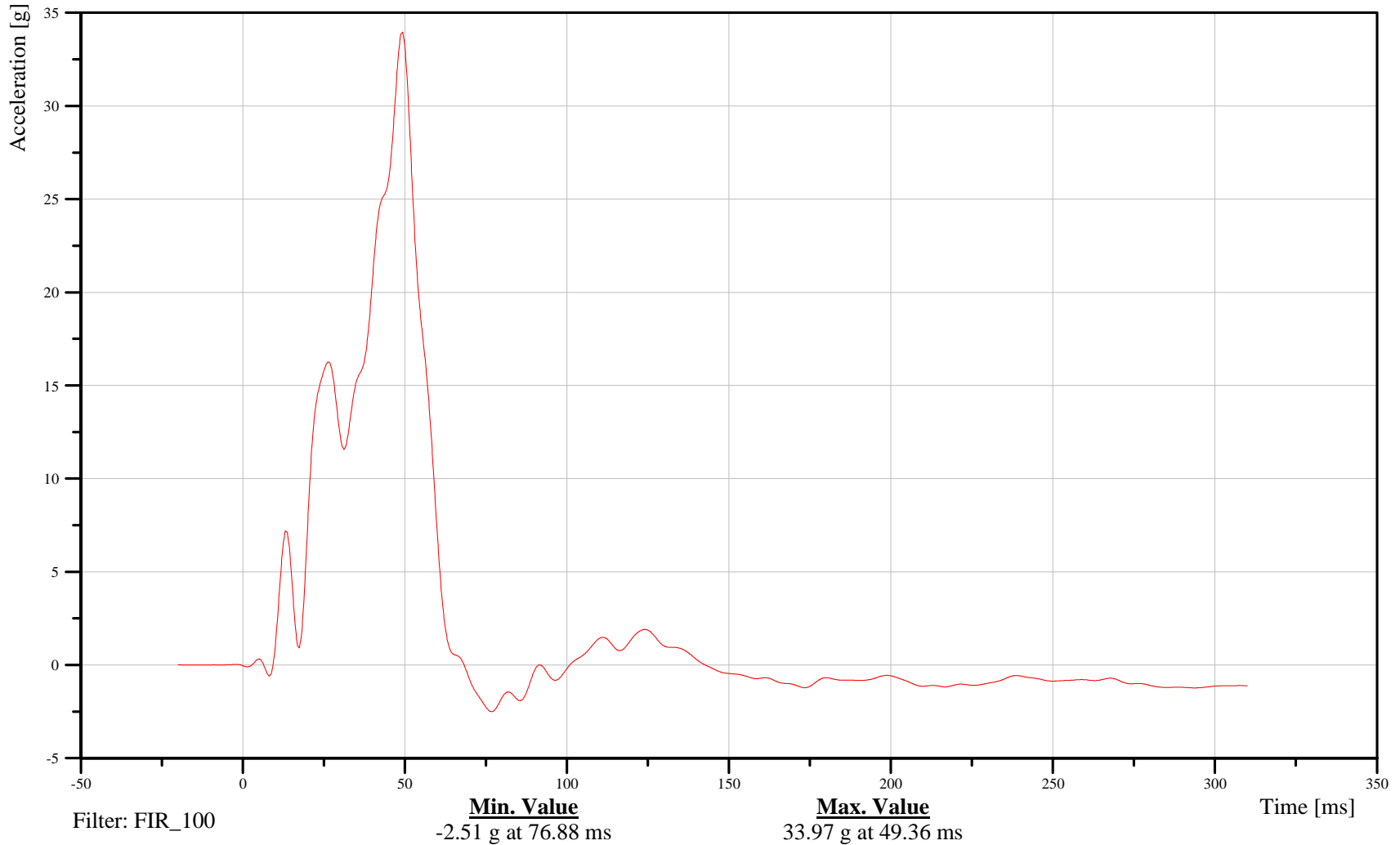
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11RIBSLLRDSHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-155

070925



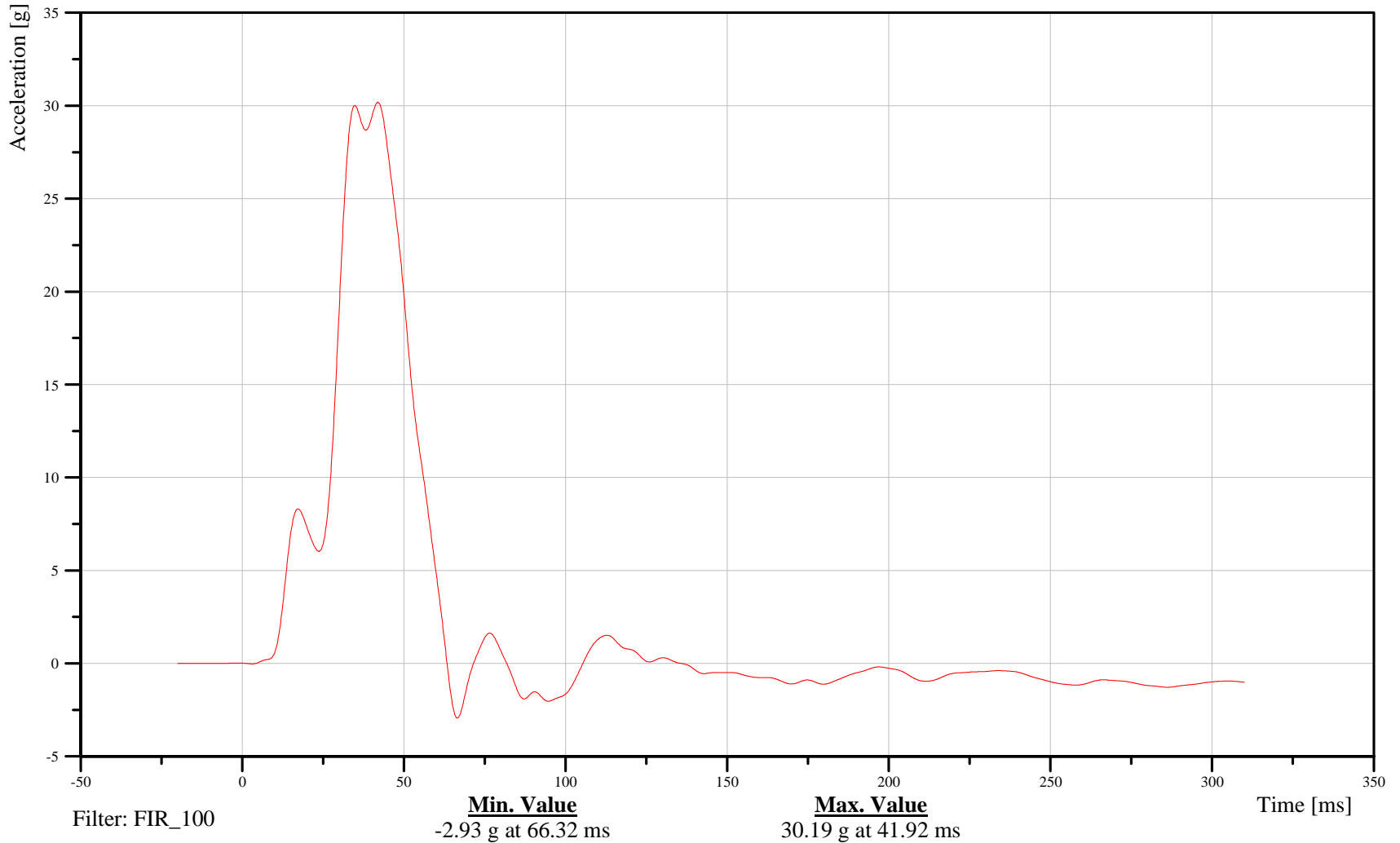
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

11SPIN12RDSHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-156

070925



55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

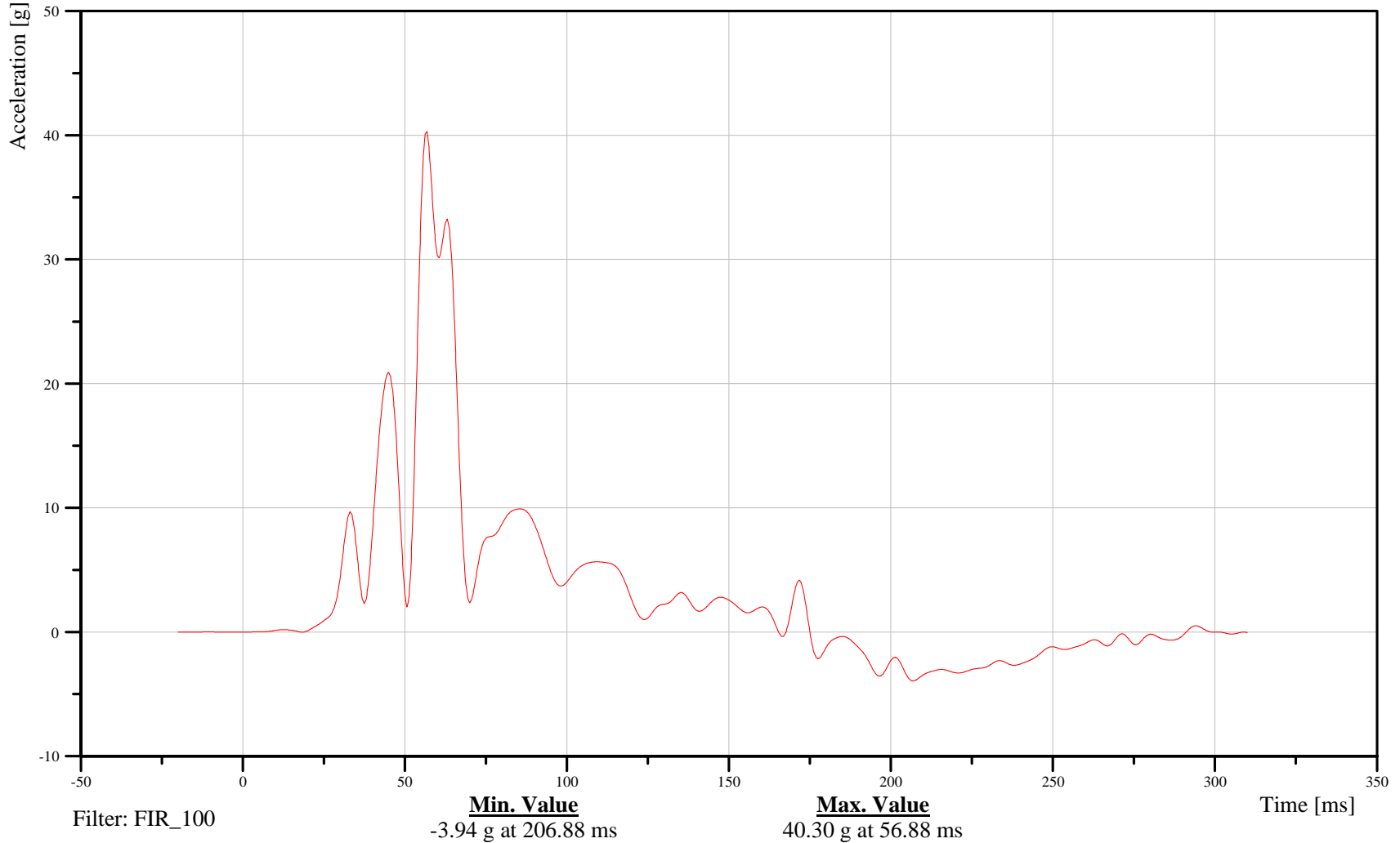
Time: 14:40

LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION

Customer: NHTSA  
Test Number: C80100

# 14RIBSLURDSHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-157

070925



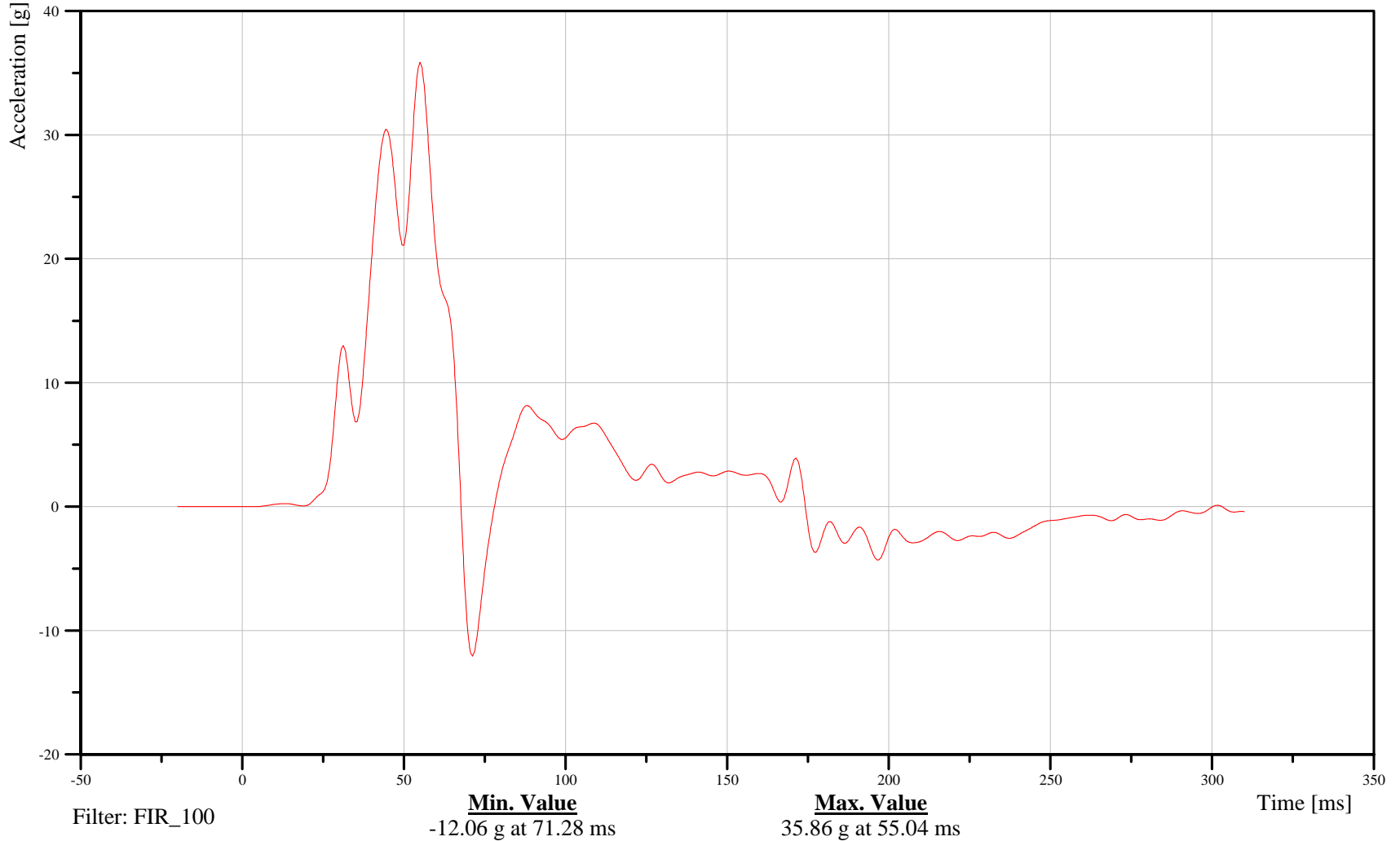
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14RIBSLLRDSHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-158

070925



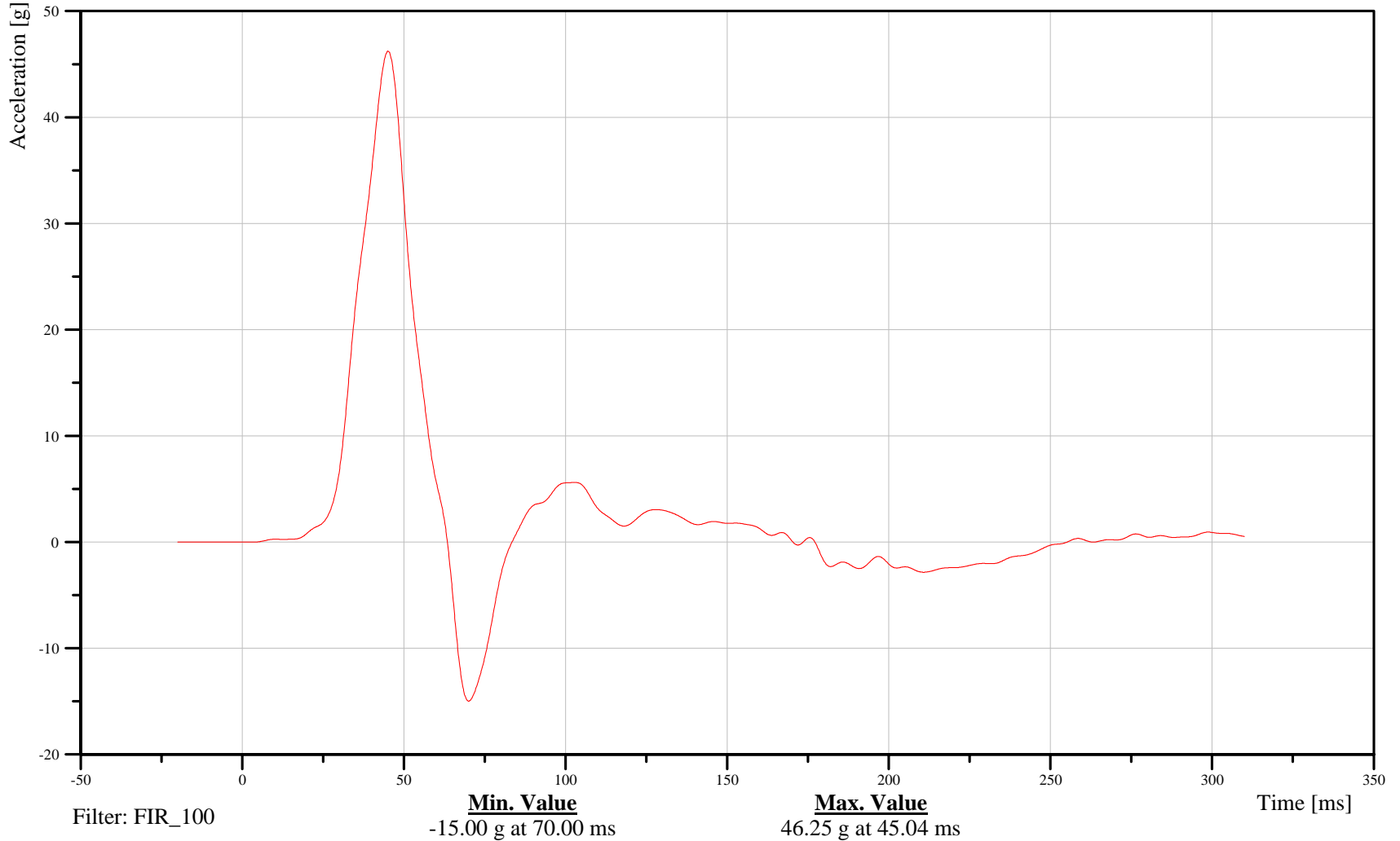
55/28 kph 90 Degree Side Impact (MDB) into Left Side of 2008 Saturn Vue Date: 09/25/2007

LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION Time: 14:40

Customer: NHTSA  
Test Number: C80100

14SPIN12RDSHACY1

TRC Inc. Test Lab: CTF  
Test Number: 070925



B-159

070925

Appendix C

SID HIII Configuration and Performance Verification Data

Summary  
 SID HIII Pre-Test and Post-Test Calibration  
 Configured For Left Side Impact

Date: 08/01/07 - 10/02/07 TRC Inc. Test Number: S/N 066 & S/N 059

Laboratory Technicians: R. Benavides, C. Hall, R.

Stoner

Test Parameter	Specification	SID HIII 066		SID HIII 059	
		Pre-Test	Post-Test	Pre-Test	Post-Test
SH - Seated Height (mm)	889-909	905	904	904	905
RH - Rib Height (mm)	502-520	514	515	510	511
HP - Hip Pivot Height (mm)	99 ref	99.1	99.1	99.1	99.1
KH - Knee Pivot from Back Line (mm)	511-526	523	523	520	522
KV - Knee Pivot to Floor (mm)	490-505	498	498	498	498
HW - Hip Width (mm)	356-391	363	365	364	366
Thorax Impacts					
Temperature (°C)	18.9-25.5	21.1	21.4	20.9	21.4
Relative Humidity (%)	10-70	55	56	55	55
Probe Speed (m/s)	4.27-4.33	4.286	4.273	4.280	4.286
Upper Rib (g's)	37-46	43.4	42.9	42.6	41.0
Lower Rib (g's)	37-46	43.8	41.8	42.6	40.7
Lower Spine (g's)	15-22	20.7	20.2	20.5	18.5
Pelvis Impacts					
Temperature (°C)	18.9-25.5	21.1	21.3	21.4	21.2
Relative Humidity (%)	10-70	54	58	58	56
Probe Speed (m/s)	4.27-4.33	4.292	4.316	4.286	4.282
Pelvis (g's)	40-60	46.5	50.6	43.4	42.1

## Calibration Test Results

Pre-Test

SID HIII: 066

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was tested for a previous calibration series.

**Transportation Research Center Inc.**  
**572M SID/HIII Dummy**  
**External Dimensions**  
**Serial No. 066 Calibration No. 22**

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	905 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	514 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	523 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	363 mm	Yes
Top Rib Width From CL	RW-1	165.1 - 180.3 mm	172 mm	Yes
Bottom Rib Width From CL	RW-2	165.1 - 180.3 mm	172 mm	Yes
Difference Between Top & Bottom Rib Width from CL		<= 2.5 mm	0.0 mm	Yes

Technician

Charles W. Bell

Approved

Ron Stoner



# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 066 Certification No. 22-2

Test Date: 8/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	139.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-8.9 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

Rand Beaul

Approved

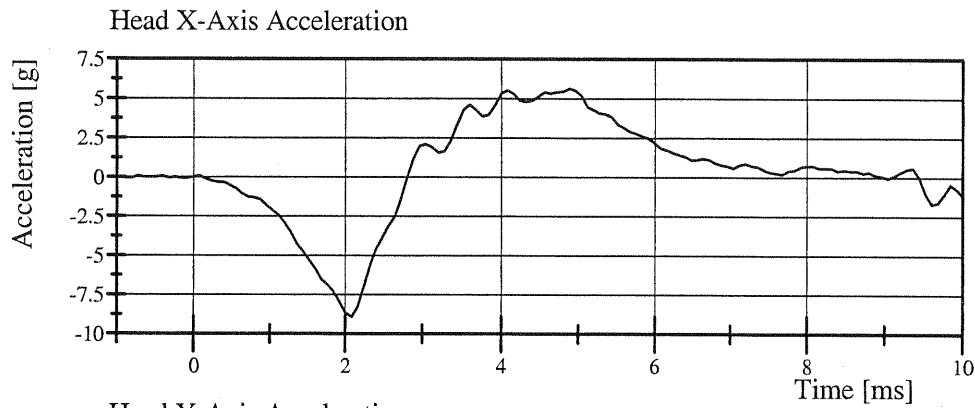
Ron Stoner

# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 066 Certification No. 22-2

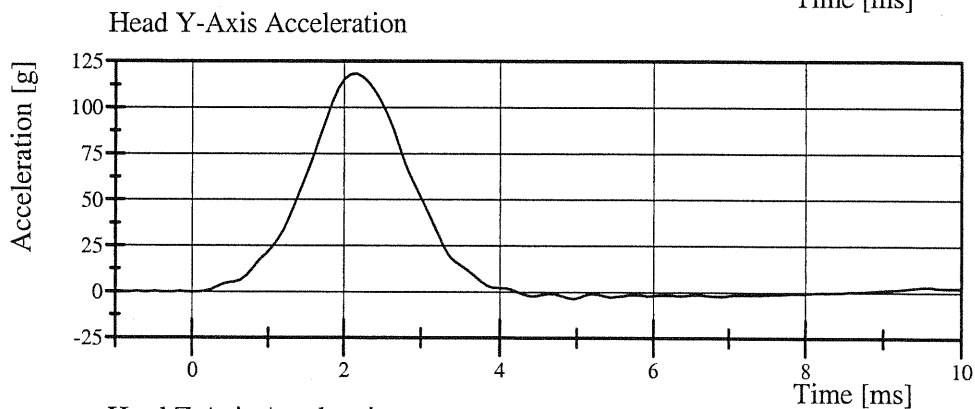
Test Date: 8/2/2007



Filter Class: CFC\_1000

Max: 5.7 g at 4.9 ms

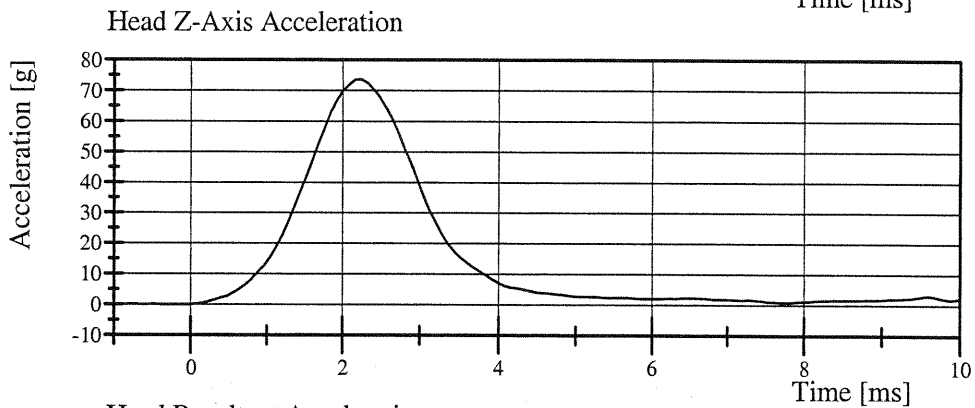
Min: -8.9 g at 2.1 ms



Filter Class: CFC\_1000

Max: 118.5 g at 2.2 ms

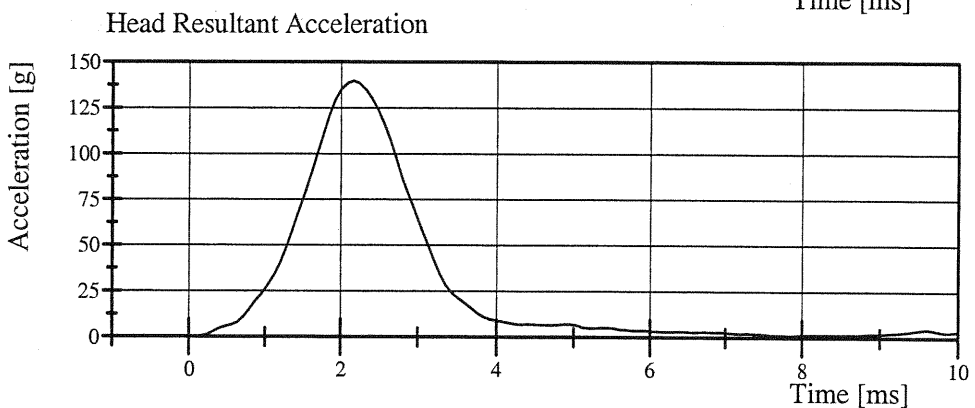
Min: -3.8 g at 5.0 ms



Filter Class: CFC\_1000

Max: 73.8 g at 2.2 ms

Min: -0.0 g at -1.0 ms



Filter Class: CFC\_1000

Max: 139.8 g at 2.2 ms

Min: 0.0 g at 0.0 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 22-11

Test Date: 9/4/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-6.941 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.170 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.273 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	5.989 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.154 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-67.4 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	59.4 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	76.6 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	50.2 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	8.1 ms	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

Ron Stennis

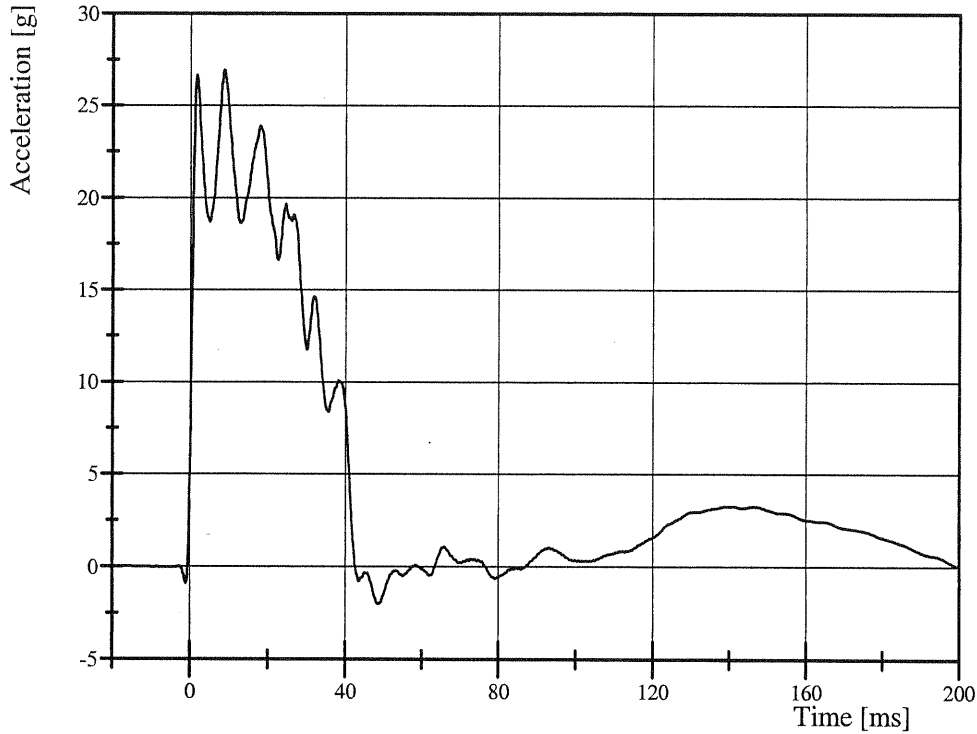
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 22-11

Test Date: 9/4/2007

Pendulum Acceleration

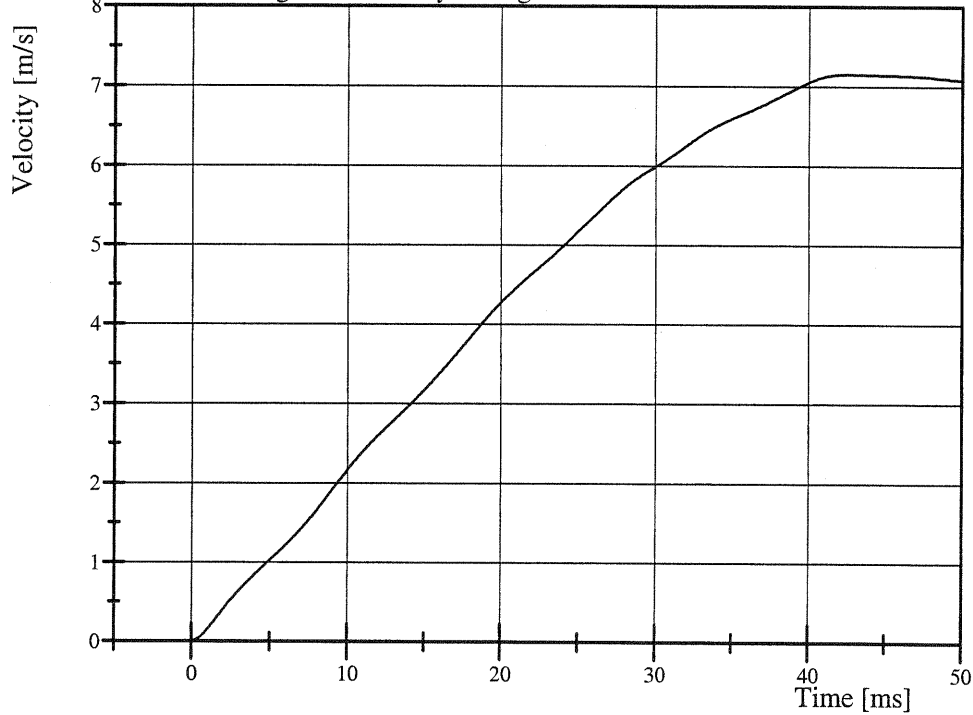


Filter Class: CFC\_180

Max: 26.9 g at 8.7 ms

Min: -2.0 g at 48.5 ms

Pendulum Integrated Velocity Change



Filter Class: CFC\_180

Max: 7.2 m/s at 42.6 ms

Min: 0.0 m/s at 0.0 ms

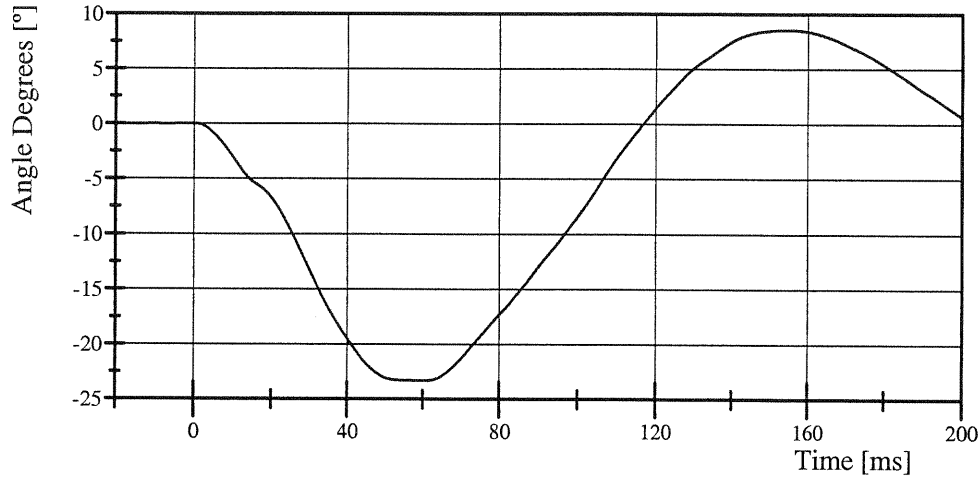
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 22-11

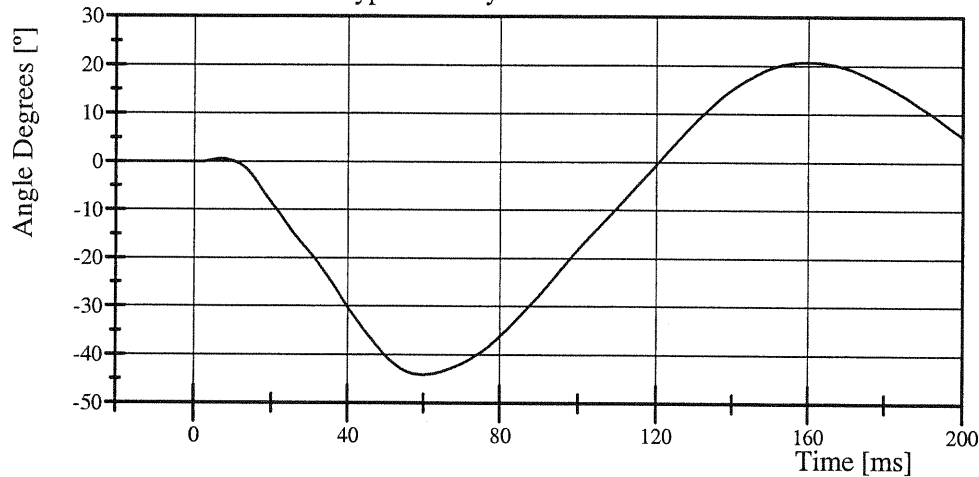
Test Date: 9/4/2007

Pot Rotation at the Base of Neck



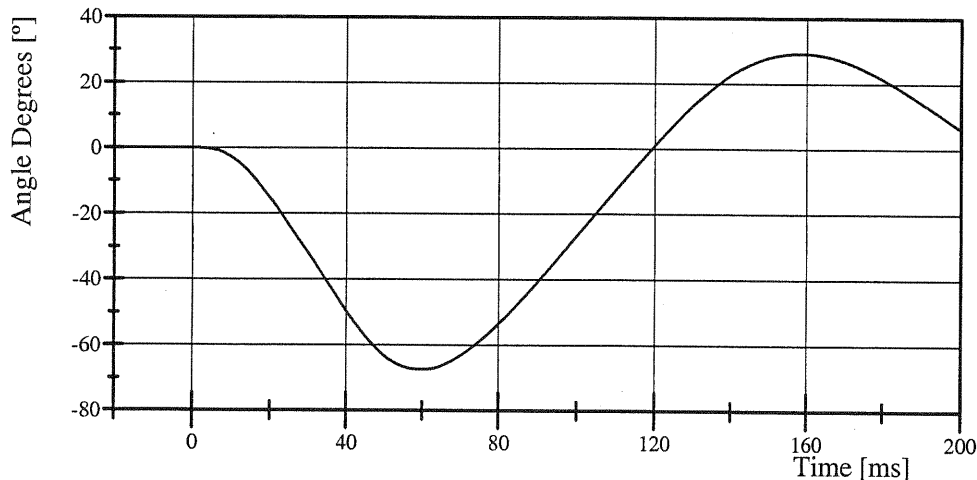
Filter Class: CFC\_60  
Max: 8.6 ° at 154.6 ms  
Min: -23.3 ° at 60.2 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 20.8 ° at 159.8 ms  
Min: -44.1 ° at 60.0 ms

Total Head D-Plane Rotation



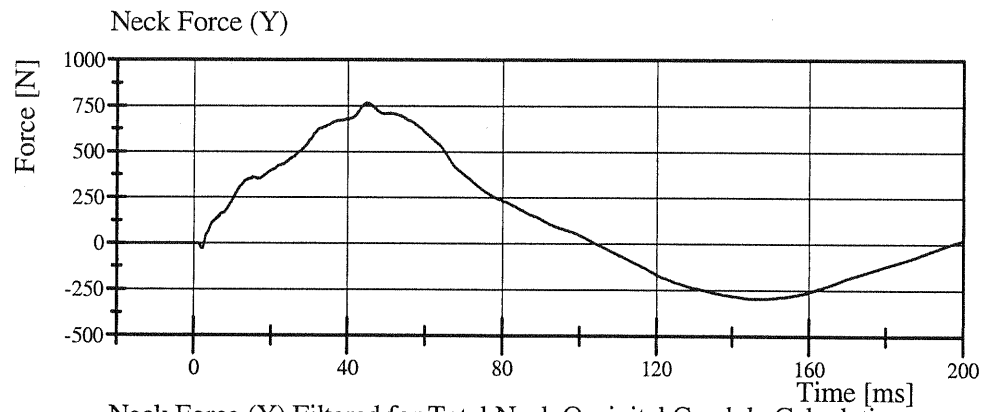
Filter Class: CFC\_60  
Max: 29.2 ° at 158.2 ms  
Min: -67.4 ° at 60.0 ms

# Transportation Research Center Inc.

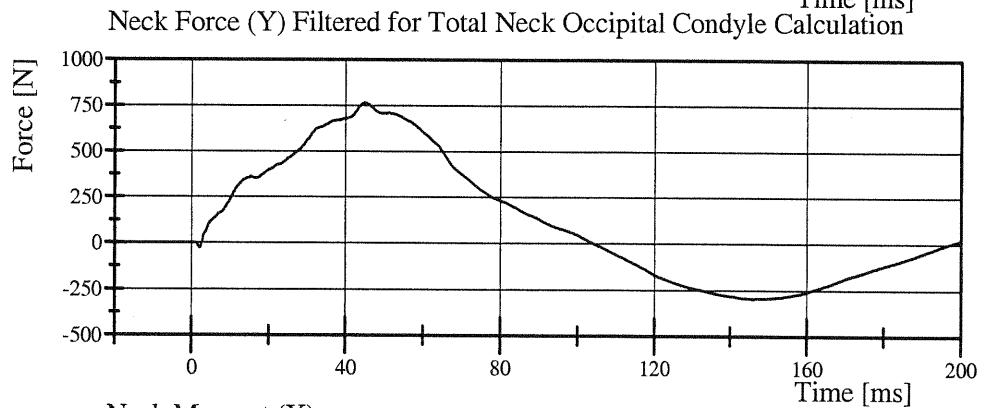
Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 22-11

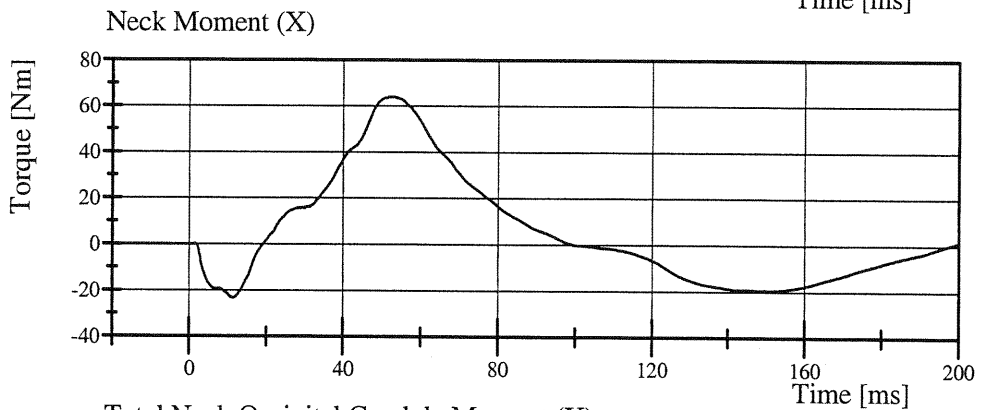
Test Date: 9/4/2007



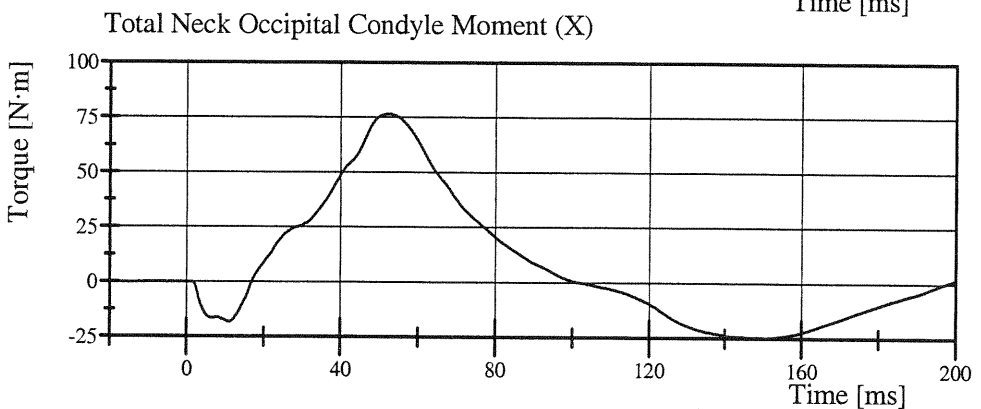
Filter Class: CFC\_1000  
Max: 766.6 N at 44.8 ms  
Min: -297.2 N at 147.8 ms



Filter Class: CFC\_600  
Max: 765.4 N at 44.9 ms  
Min: -296.6 N at 146.1 ms



Filter Class: CFC\_600  
Max: 64.0 Nm at 51.9 ms  
Min: -23.3 Nm at 11.3 ms



Filter Class: CFC\_600  
Max: 76.6 N·m at 51.9 ms  
Min: -24.7 N·m at 150.7 ms

# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 066 Certification No. 22-1

Test Date: 8/3/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.286 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	43.4 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	43.8 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	20.7 g	Yes

**Test meets specifications.**

**Comments:**

Technician

Rant Beard

Approved

Ron Stoner

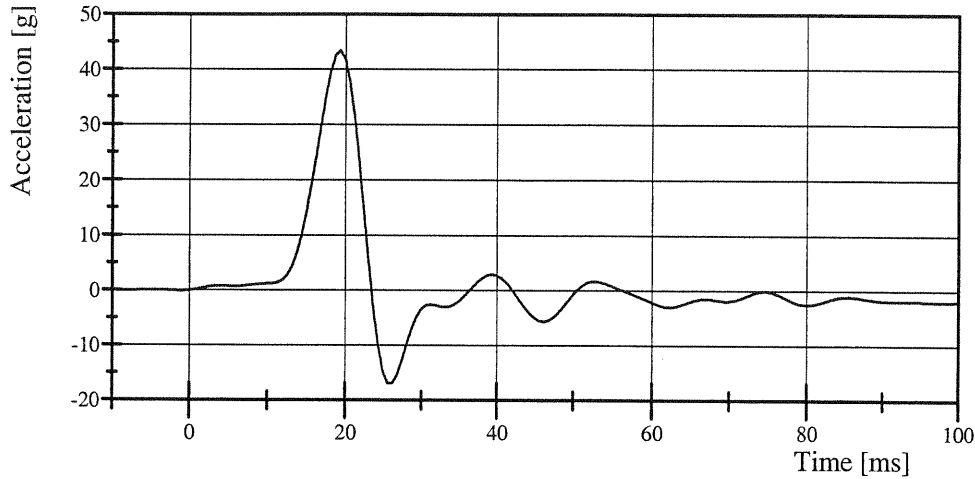
# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 066 Certification No. 22-1

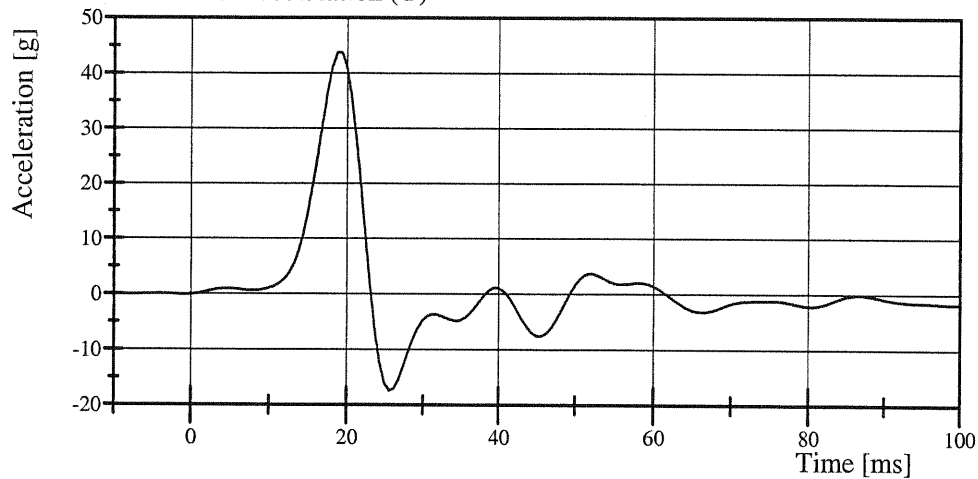
Test Date: 8/3/2007

Upper Rib Acceleration (Y)



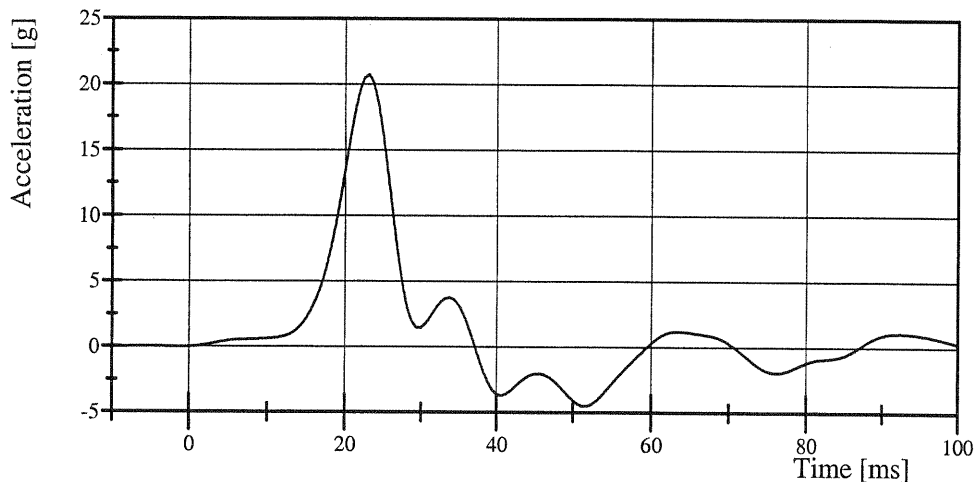
Filter Class: FIR\_100  
Max: 43.4 g at 19.3 ms  
Min: -16.9 g at 26.2 ms

Lower Rib Acceleration (Y)



Filter Class: FIR\_100  
Max: 43.8 g at 19.3 ms  
Min: -17.4 g at 25.6 ms

Lower Spine Acceleration (Y)



Filter Class: FIR\_100  
Max: 20.7 g at 23.0 ms  
Min: -4.5 g at 51.8 ms

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 066 Certification No. 22-5

Test Date: 8/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.769 mm/s	Yes

**Test meets specifications.**

**Comments:**

Technician

*Rene Bonaudis*

Approved

*Ron Stoner*

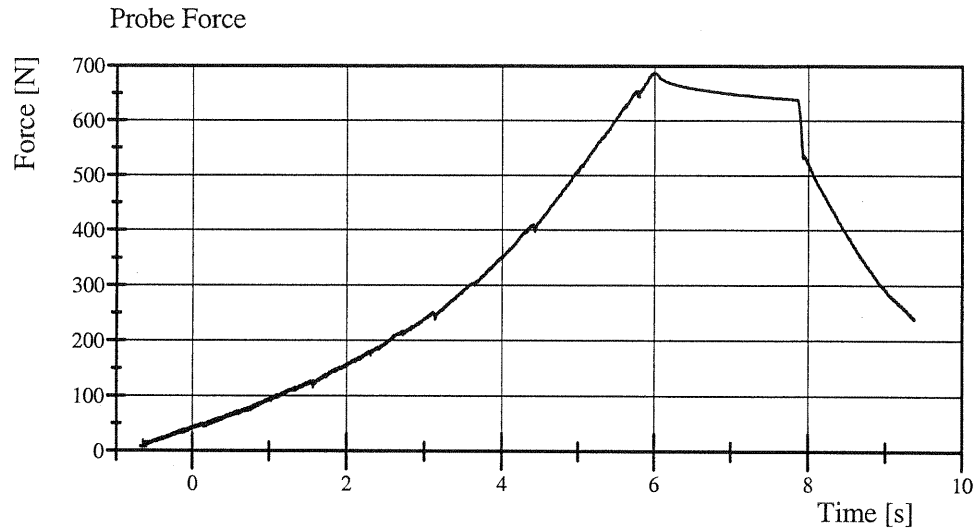


# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 066 Certification No. 22-5

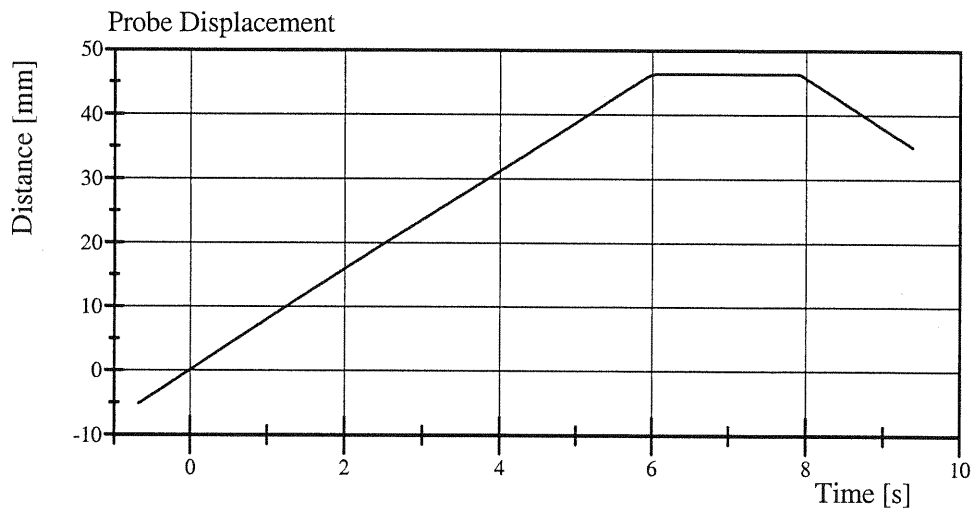
Test Date: 8/1/2007



Filter Class: CFC\_600

Max: 686.9 N at 6.0 s

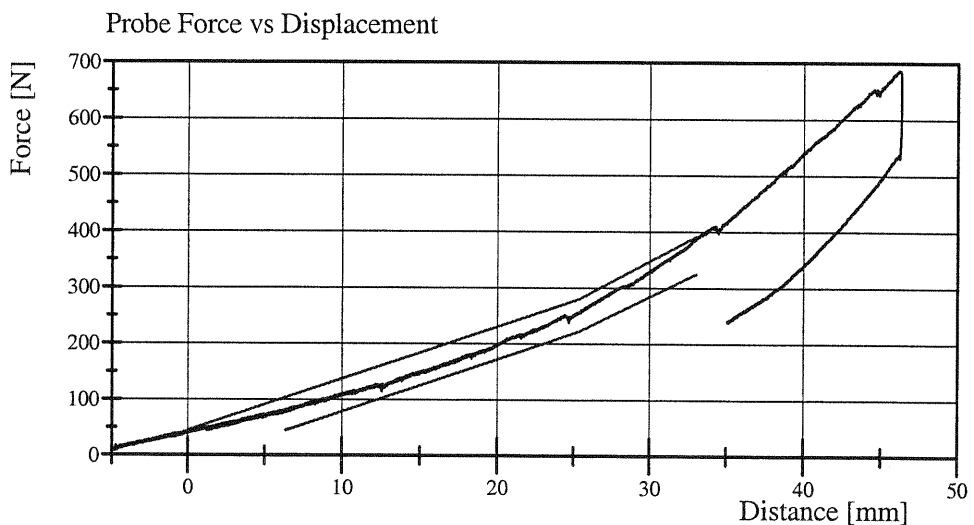
Min: 7.5 N at -0.6 s



Filter Class: CFC\_180

Max: 46.3 mm at 7.6 s

Min: -5.1 mm at -0.7 s



Filter Class: CFC\_600

Max: 686.9 N at 46.2 mm

Min: 7.5 N at -4.8 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 01-Aug-07

TRC, INC.

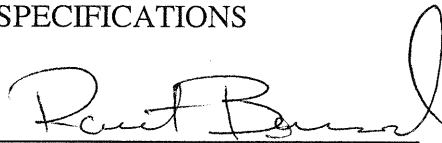
TEST NO: LUFL-01

572B SN 066 TORSO FLEX CAL 01

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME	NA	1100
TEMPERATURE	18.9 – 25.6° C	21.4 C
RELATIVE HUMIDITY	10 – 70 %	58 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	106.7 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	160.1 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	217.9 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	0.0 °

TEST MEETS SPECIFICATIONS

TECHNICIAN



# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 066 Certification No. 22-1

Test Date: 8/3/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.292 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.3 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	46.5 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician



Approved

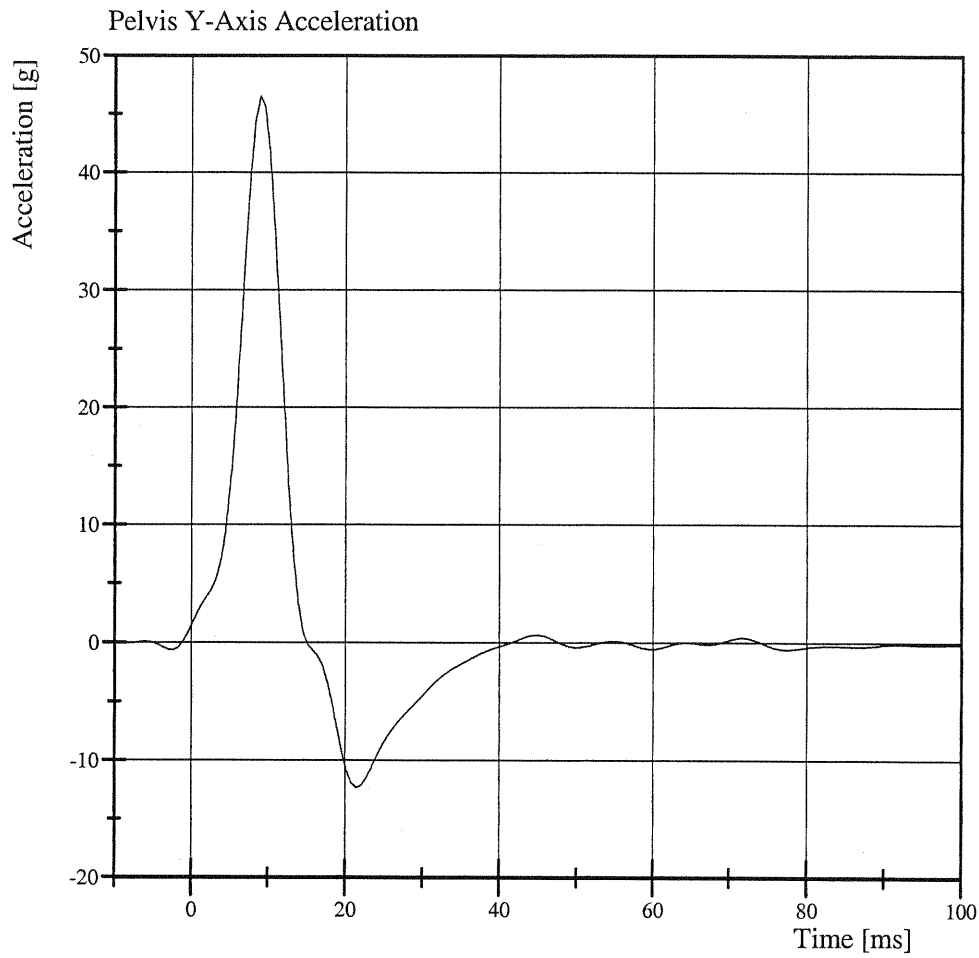


# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 066 Certification No. 22-1

Test Date: 8/3/2007



Filter Class: FIR\_100  
Max: 46.5 g at 9.0 ms  
Min: -12.3 g at 21.4 ms



Calibration Test Results

Pre-Test

SID HIII: 059

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber was tested on October 20, 2006 for a previous calibration series.

**Transportation Research Center Inc.**  
**SID/HIII Dummy Post-Test**  
**External Dimensions**  
**Serial No. 059 Calibration No. 22**

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	904 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	510 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	520 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	364 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	172 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	172 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	0.0 mm	Yes

Technician

*Charles W. Bell*

Approved

*Ron Stoner*



# Transportation Research Center Inc.

Left Lateral Head Drop  
SID-HIII Serial No. 059 Certification No. 22-1  
Test Date: 8/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	146.2 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-8.0 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Hall

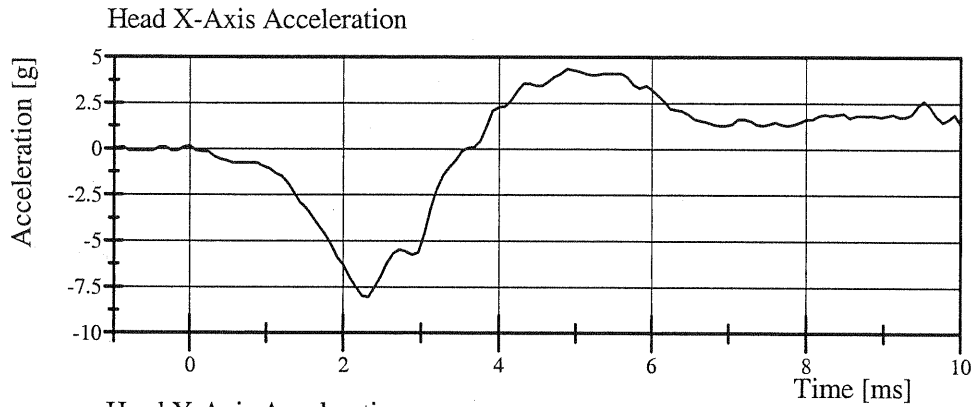
Approved

Ron Stoner

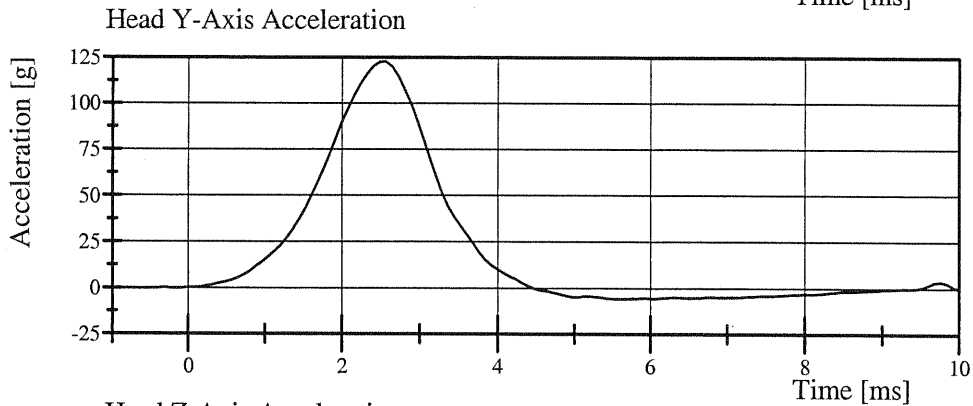


# Transportation Research Center Inc.

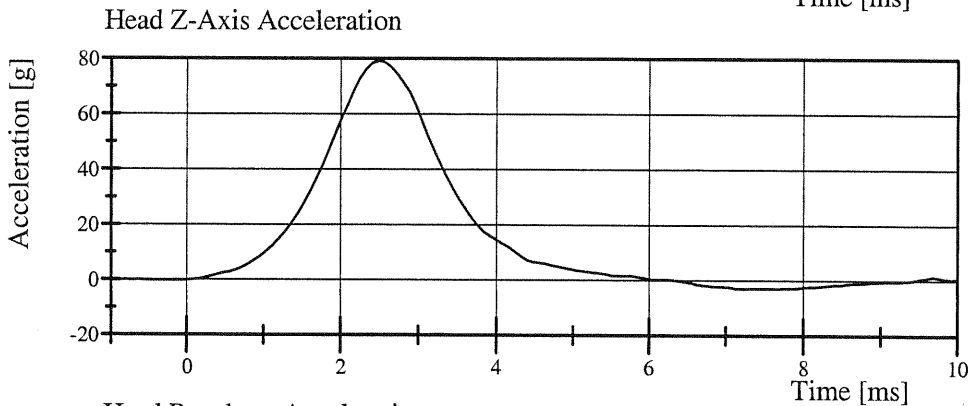
Left Lateral Head Drop  
SID-HIII Serial No. 059 Certification No. 22-1  
Test Date: 8/2/2007



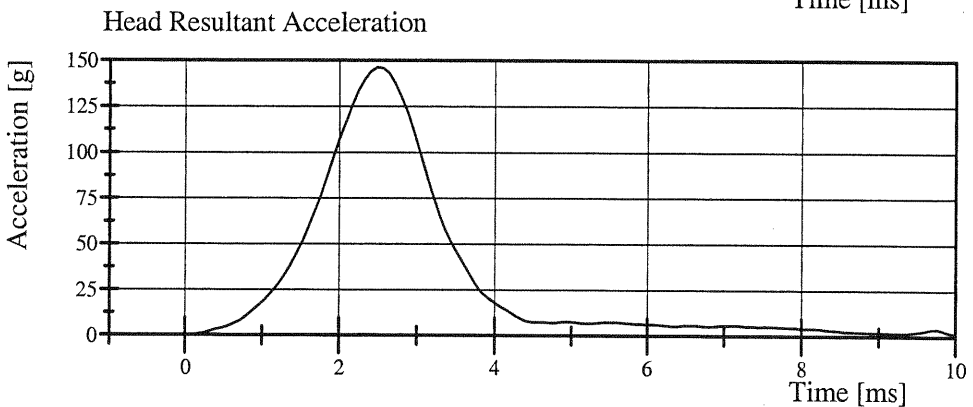
Filter Class: CFC\_1000  
Max: 4.4 g at 4.9 ms  
Min: -8.0 g at 2.3 ms



Filter Class: CFC\_1000  
Max: 122.7 g at 2.6 ms  
Min: -5.9 g at 5.5 ms



Filter Class: CFC\_1000  
Max: 79.3 g at 2.5 ms  
Min: -3.0 g at 7.2 ms



Filter Class: CFC\_1000  
Max: 146.2 g at 2.5 ms  
Min: 0.1 g at -0.5 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 22-8

Test Date: 9/4/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-6.948 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.369 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.733 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.756 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.229 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-72.6 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	59.4 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	86.4 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	51.8 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	9.6 ms	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

Ron Stoner

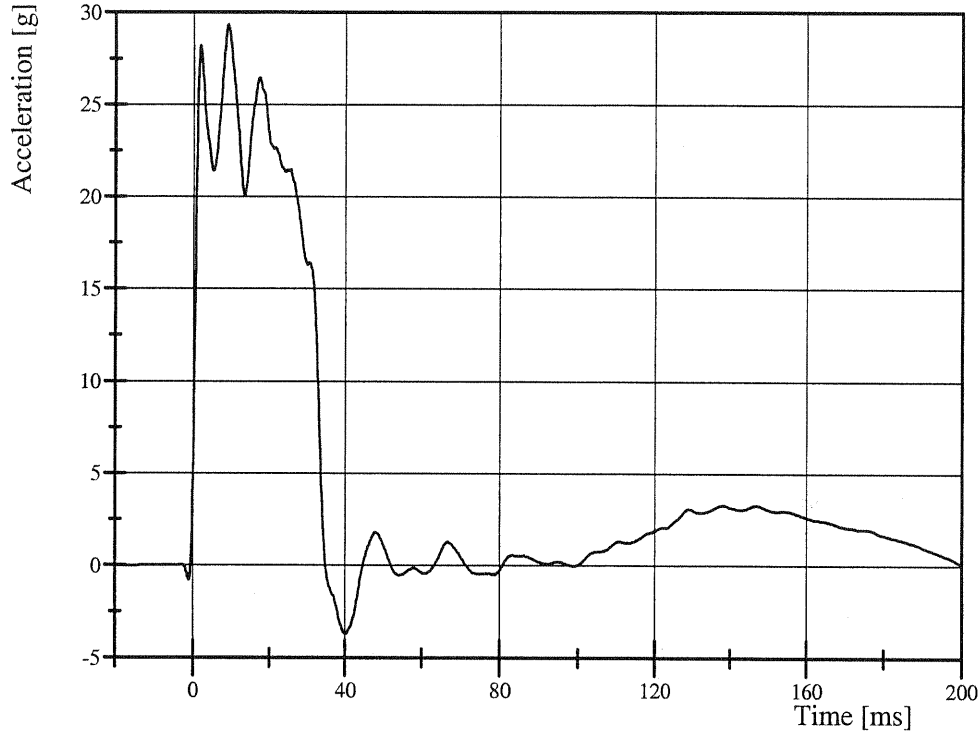
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 22-8

Test Date: 9/4/2007

Pendulum Acceleration

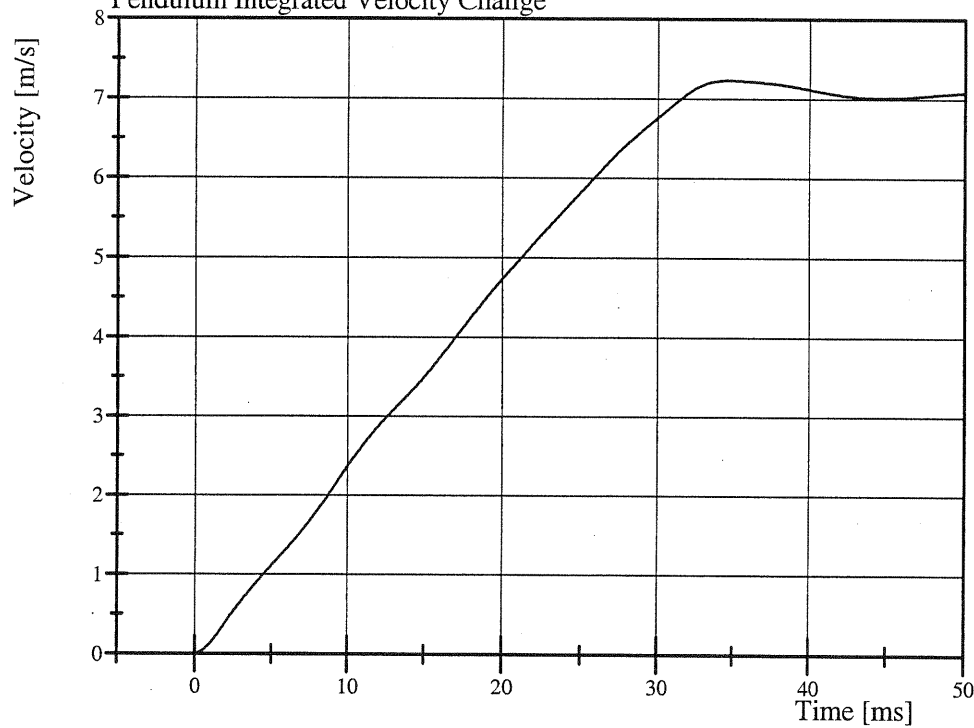


Filter Class: CFC\_180

Max: 29.4 g at 9.0 ms

Min: -3.7 g at 40.2 ms

Pendulum Integrated Velocity Change



Filter Class: CFC\_180

Max: 7.2 m/s at 34.7 ms

Min: 0.0 m/s at 0.0 ms

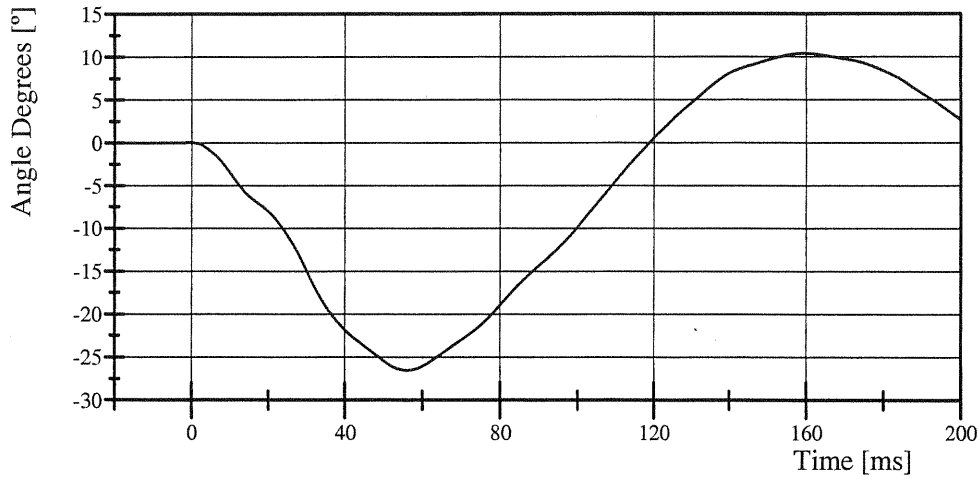
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 22-8

Test Date: 9/4/2007

Pot Rotation at the Base of Neck

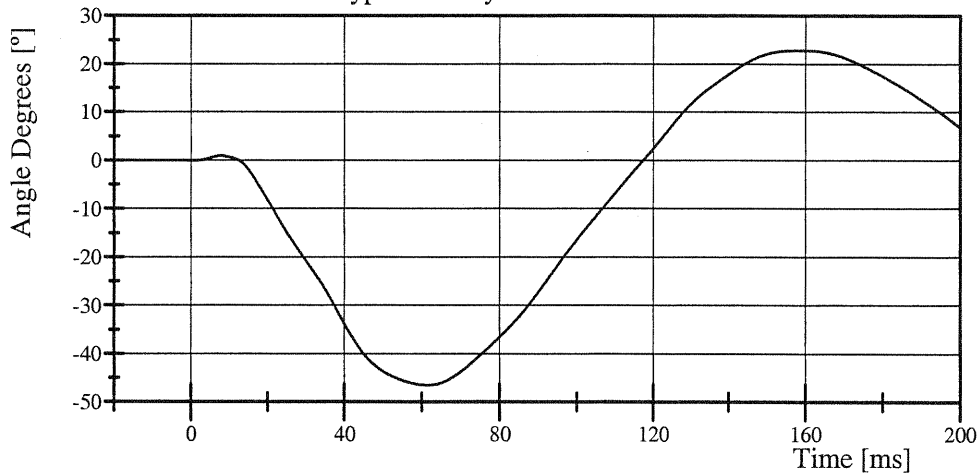


Filter Class: CFC\_60

Max: 10.4 ° at 159.5 ms

Min: -26.5 ° at 56.2 ms

Head Rotation at Occipital Condyles

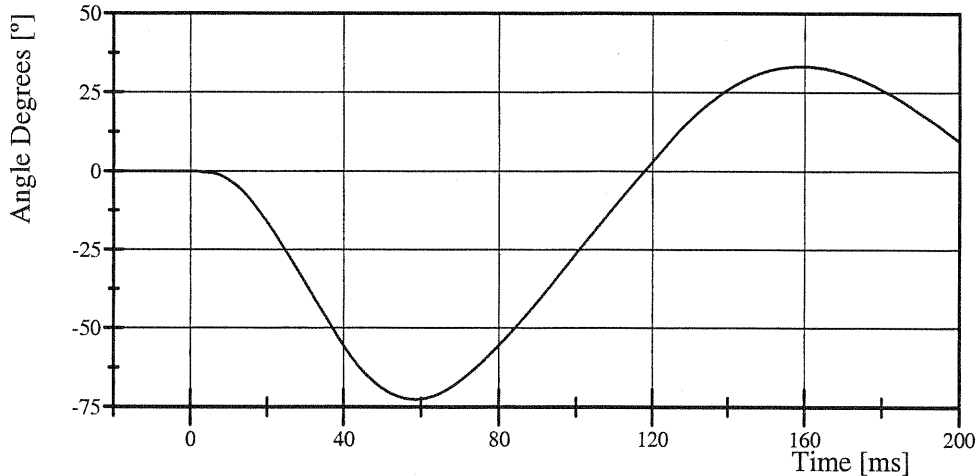


Filter Class: CFC\_60

Max: 22.8 ° at 159.0 ms

Min: -46.5 ° at 61.5 ms

Total Head D-Plane Rotation



Filter Class: CFC\_60

Max: 33.3 ° at 159.3 ms

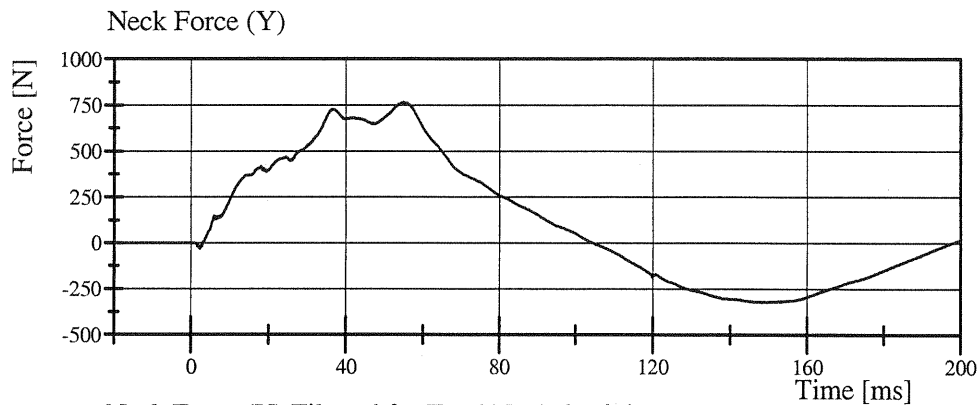
Min: -72.6 ° at 58.6 ms

# Transportation Research Center Inc.

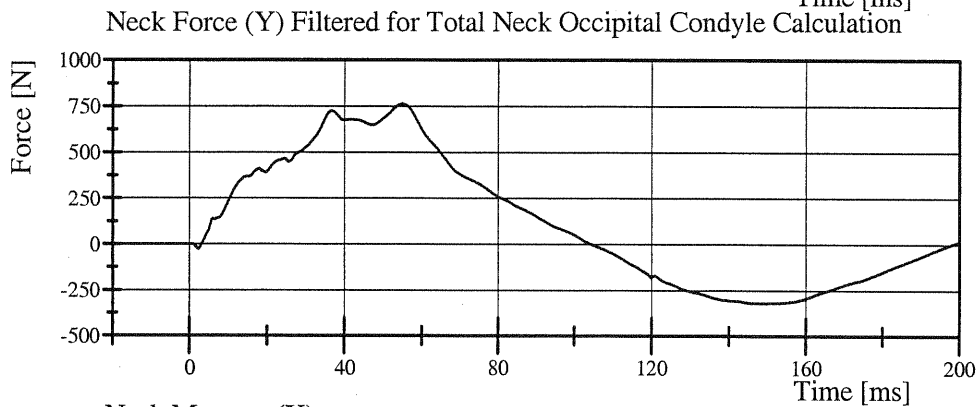
Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 22-8

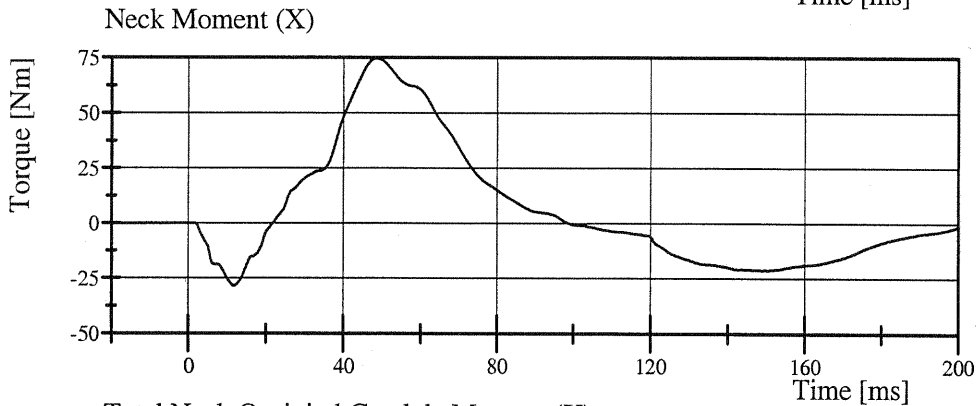
Test Date: 9/4/2007



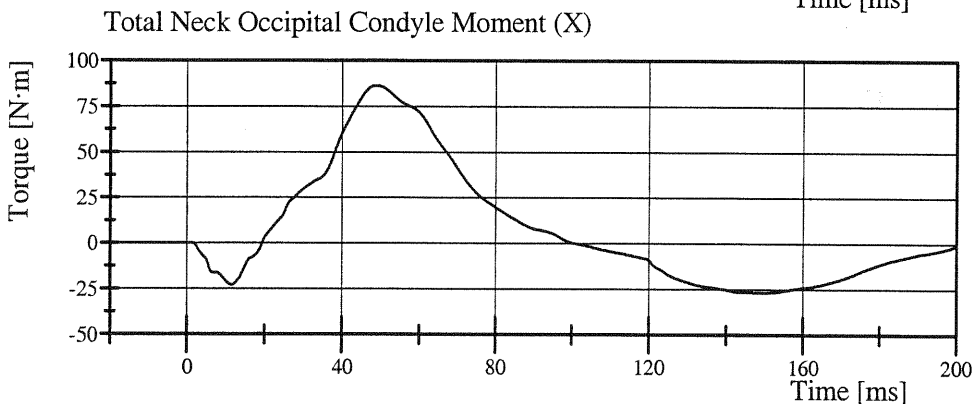
Filter Class: CFC\_1000  
Max: 764.5 N at 54.7 ms  
Min: -320.9 N at 148.5 ms



Filter Class: CFC\_600  
Max: 764.4 N at 54.8 ms  
Min: -320.9 N at 149.5 ms



Filter Class: CFC\_600  
Max: 74.7 Nm at 48.3 ms  
Min: -28.3 Nm at 11.8 ms



Filter Class: CFC\_600  
Max: 86.4 N·m at 49.0 ms  
Min: -26.8 N·m at 148.9 ms

# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 059 Certification No. 22-1

Test Date: 8/31/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.280 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	42.6 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	42.6 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	20.5 g	Yes

**Test meets specifications.**

**Comments:**

Technician

Rout Borawski

Approved

Ron Stoner



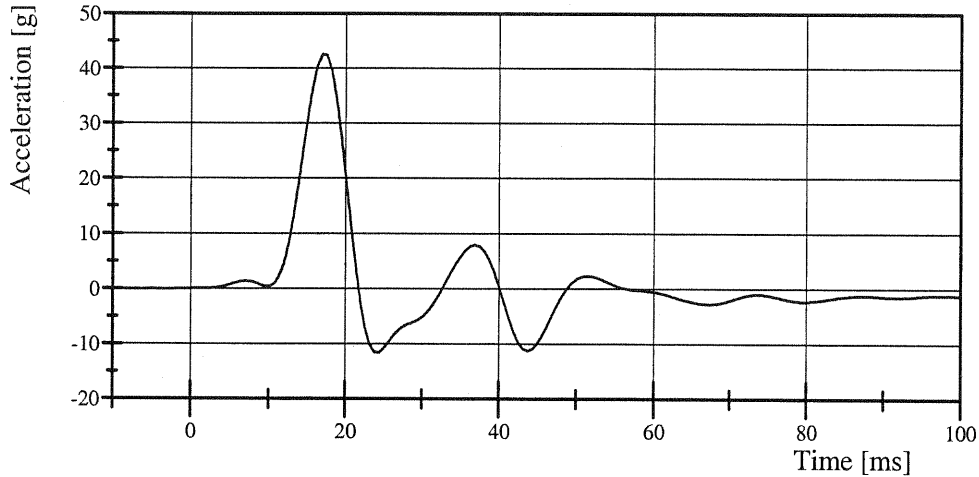
# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 059 Certification No. 22-1

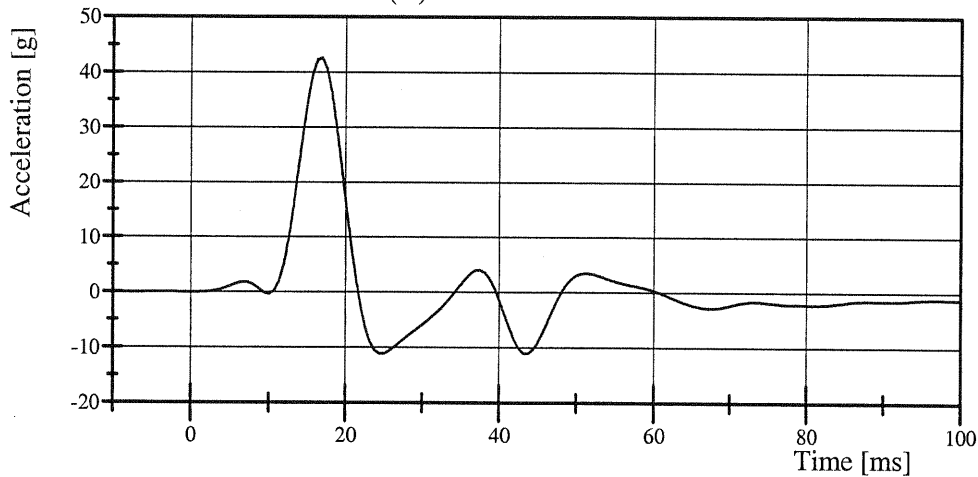
Test Date: 8/31/2007

Upper Rib Acceleration (Y)



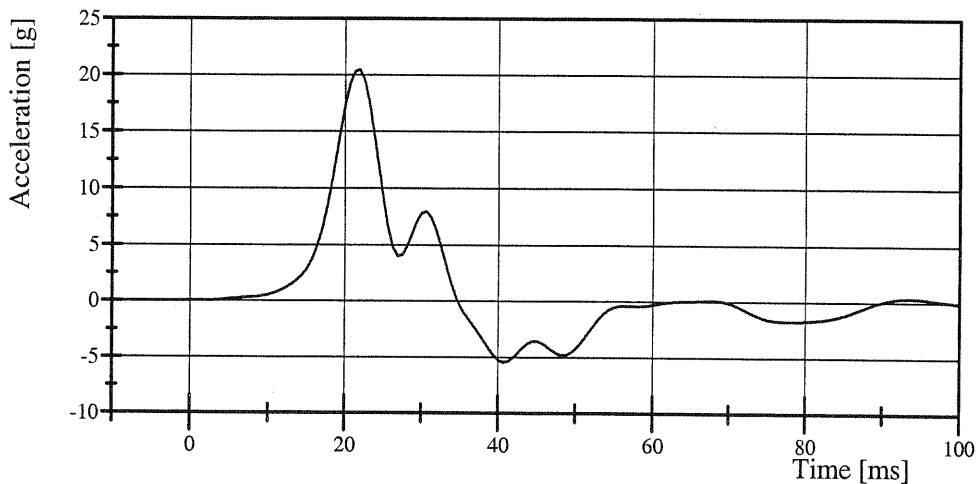
Filter Class: FIR\_100  
Max: 42.6 g at 17.0 ms  
Min: -11.6 g at 24.4 ms

Lower Rib Acceleration (Y)



Filter Class: FIR\_100  
Max: 42.6 g at 16.9 ms  
Min: -11.1 g at 25.0 ms

Lower Spine Acceleration (Y)



Filter Class: FIR\_100  
Max: 20.5 g at 21.9 ms  
Min: -5.4 g at 40.7 ms

# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 17-1  
Test Date: 10/20/2006

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	37 %	Yes
Maximum Force at Test Velocity	849 - 1,137 N	929.1 N	Yes
Maximum Displacement at Test Velocity	30.19 - 35.17 mm	30.962 mm	Yes

**Test meets specifications.**

**Comments:**

Actual Impactor Velocity (m/s): 3.064

Damper Setting: 5.5

Technician

Rand Barnd

Approved

Ron Stoner



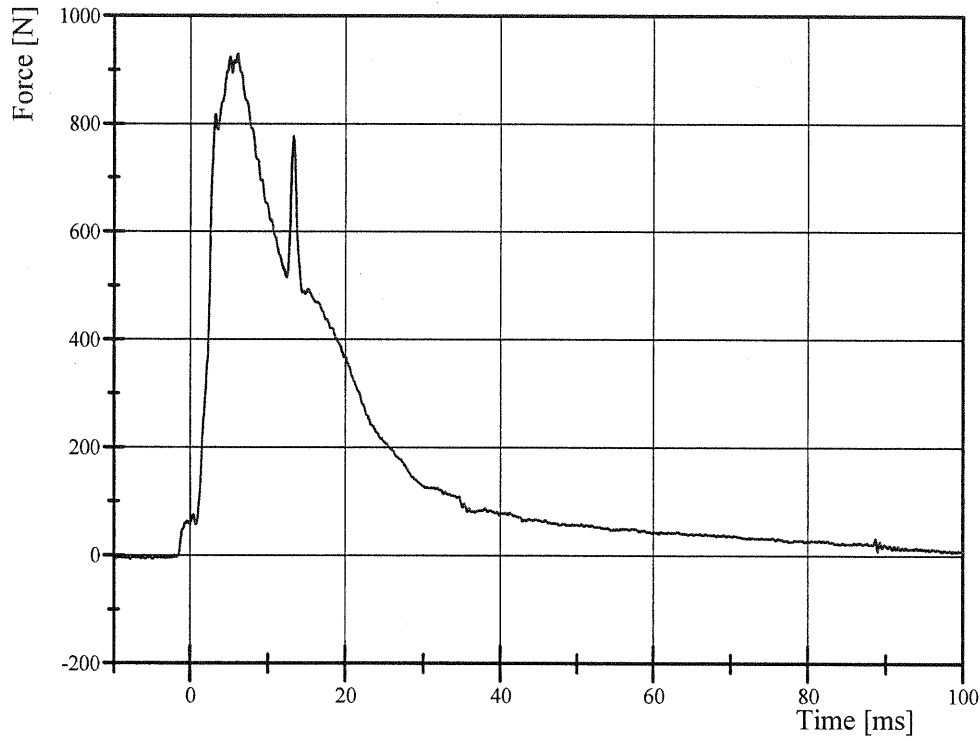
# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 059 Certification No. 17-1

Test Date: 10/20/2006

Shock Absorber Resistive Force

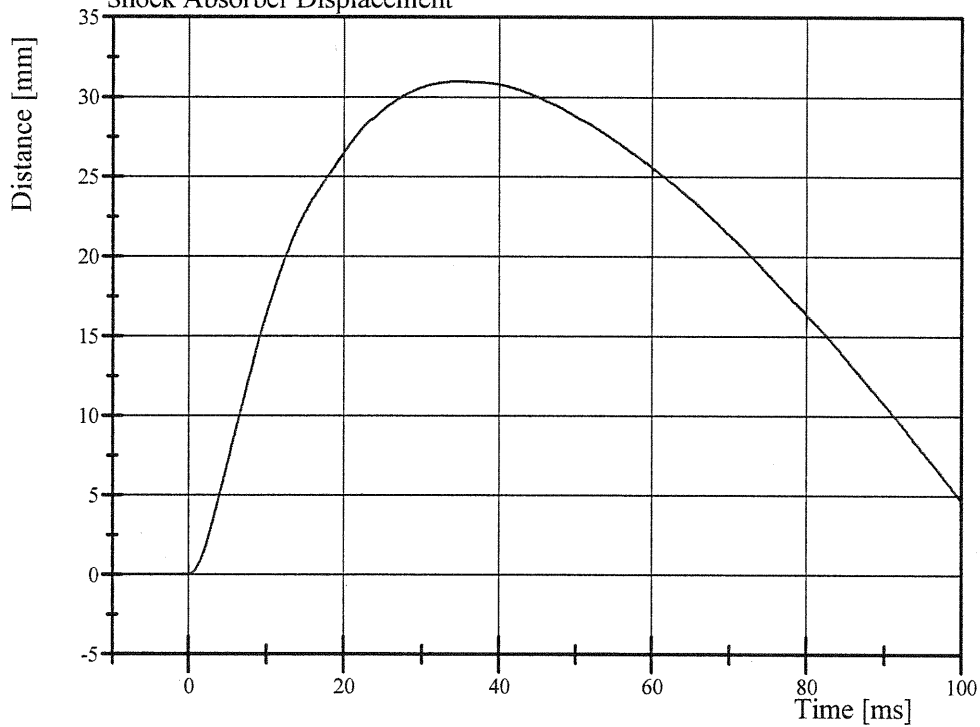


Filter Class: CFC\_1000

Max: 929.1 N at 6.1 ms

Min: -8.2 N at -7.8 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 31.0 mm at 34.9 ms

Min: -0.0 mm at -9.7 ms



# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 17-1  
Test Date: 10/20/2006

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	38 %	Yes
Maximum Force at Test Velocity	1,744 - 2,108 N	1,859.9 N	Yes
Maximum Displacement at Test Velocity	31.69 - 37.24 mm	33.640 mm	Yes

**Test meets specifications.**

**Comments:**

Actual Impactor Velocity (m/s): 4.278

Damper Setting: 5.5

Technician

*Raul Borja*

Approved

*Ron Stone*



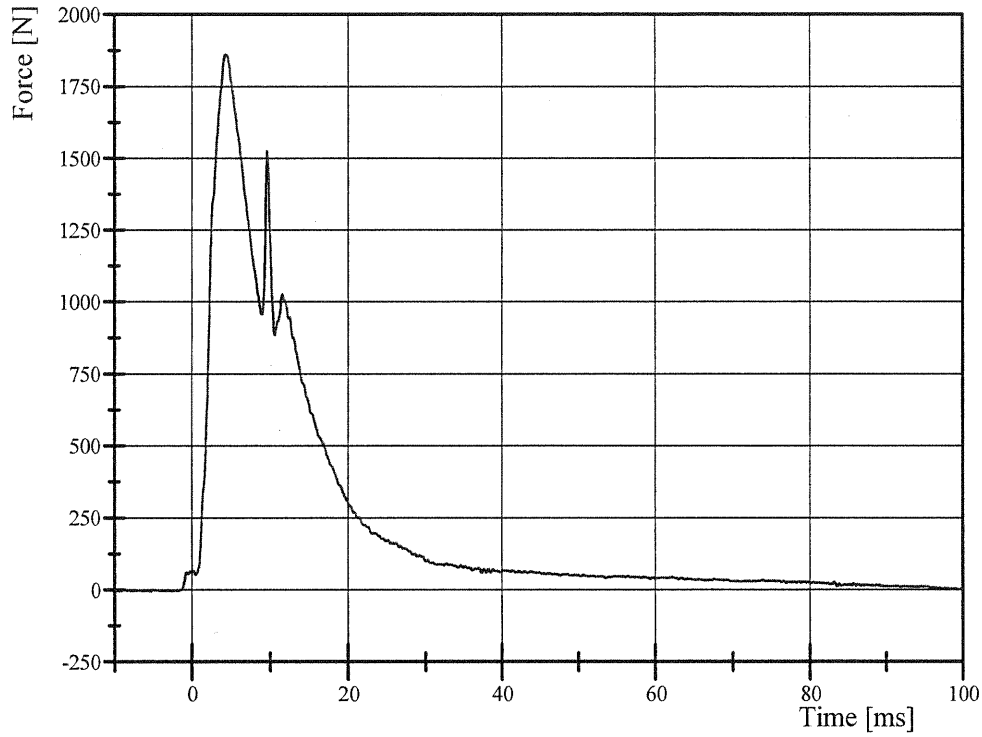
# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 059 Certification No. 17-1

Test Date: 10/20/2006

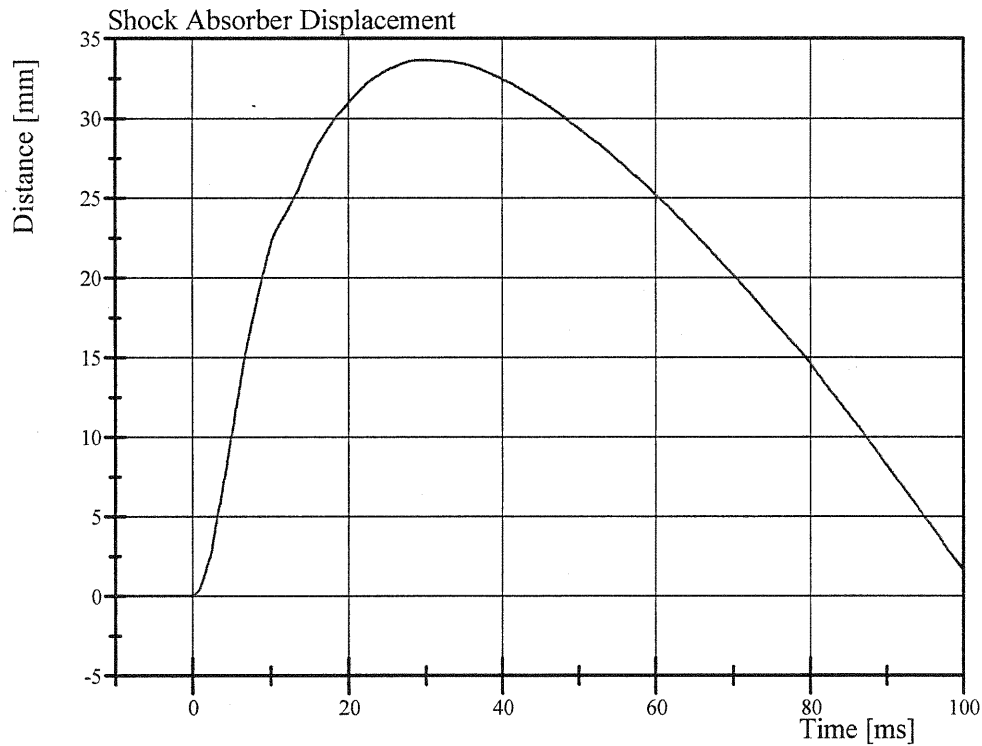
Shock Absorber Resistive Force



Filter Class: CFC\_1000

Max: 1,859.9 N at 4.2 ms

Min: -6.4 N at -5.3 ms



Filter Class: CFC\_1000

Max: 33.6 mm at 29.5 ms

Min: -0.0 mm at -8.6 ms



# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 17-1  
Test Date: 10/20/2006

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Maximum Force at Test Velocity	3,732 - 4,424 N	4,229.0 N	Yes
Maximum Displacement at Test Velocity	33.36 - 39.56 mm	37.024 mm	Yes

**Test meets specifications.**

**Comments:**

Actual Impactor Velocity (m/s): 6.086

Damper Setting: 5.5

Technician

Paul Beal

Approved

Ron Stouder



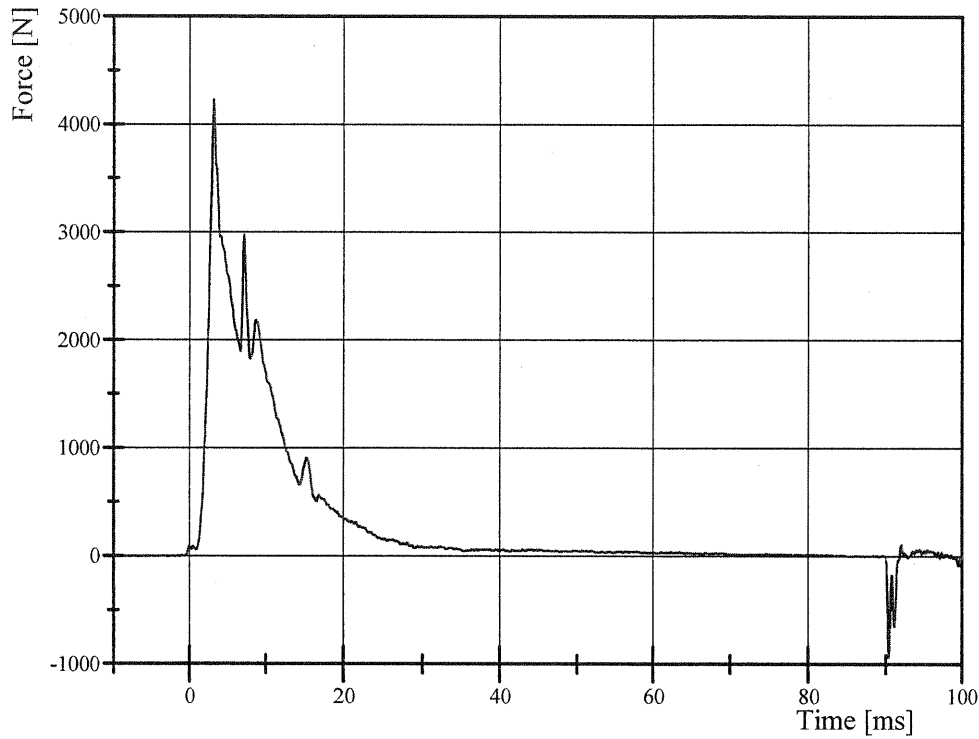
# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 059 Certification No. 17-1

Test Date: 10/20/2006

Shock Absorber Resistive Force

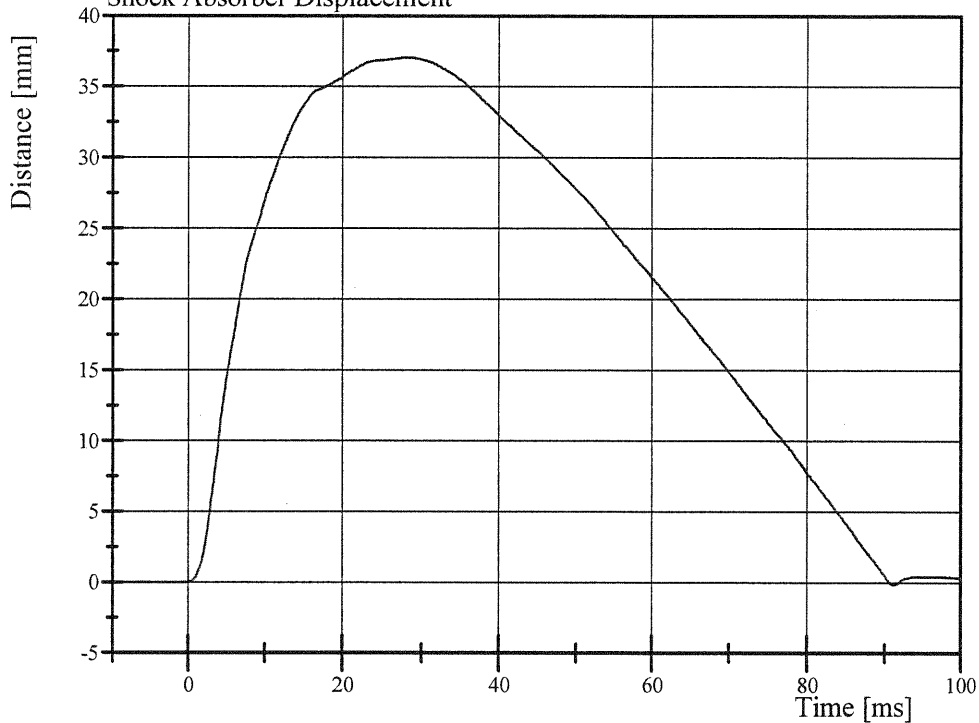


Filter Class: CFC\_1000

Max: 4,229.0 N at 3.1 ms

Min: -939.9 N at 90.4 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 37.0 mm at 28.1 ms

Min: -0.2 mm at 91.2 ms



# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 059 Certification No. 22-6

Test Date: 8/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	59 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.714 mm/s	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Hall

Approved

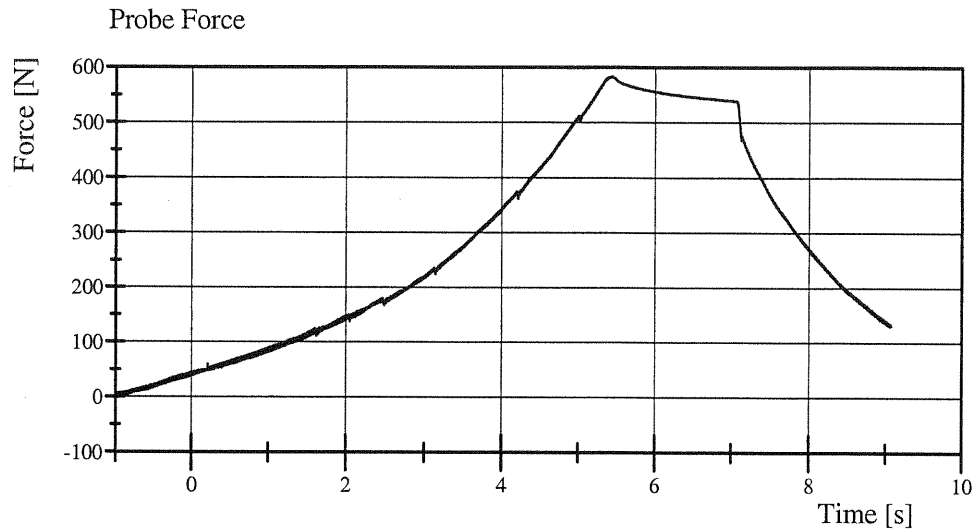
Ron Stoner

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 059 Certification No. 22-6

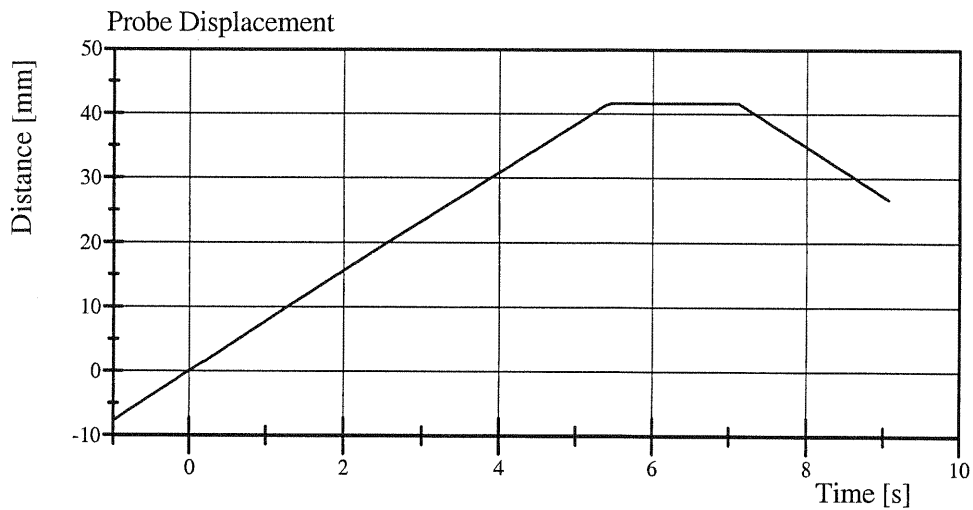
Test Date: 8/1/2007



Filter Class: CFC\_600

Max: 582.5 N at 5.4 s

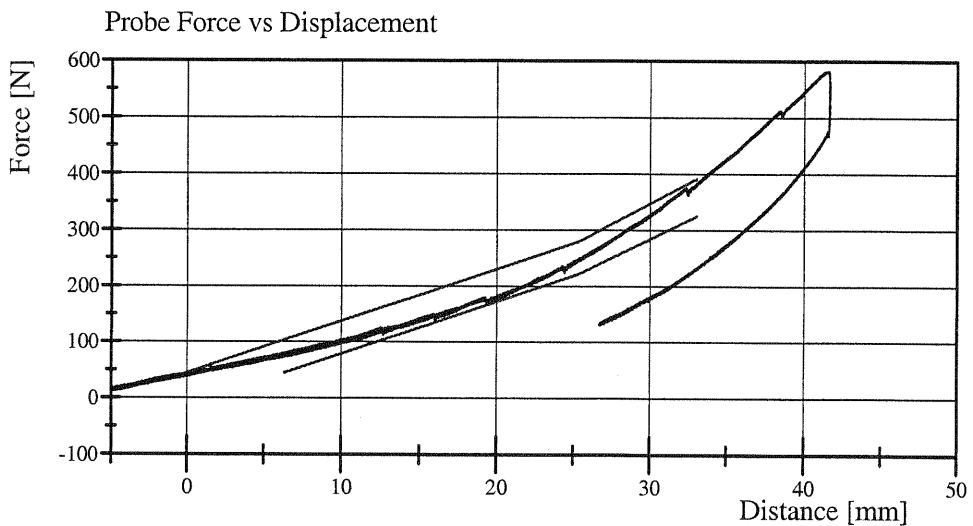
Min: -1.4 N at -1.0 s



Filter Class: CFC\_180

Max: 41.7 mm at 6.0 s

Min: -7.6 mm at -1.0 s



Filter Class: CFC\_600

Max: 582.5 N at 41.5 mm

Min: -1.4 N at -7.5 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 01-Aug-07

TRC, INC.

TEST NO: LUFL-01

572B SN 059 TORSO FLEX CAL 22

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME	NA	1216
TEMPERATURE	18.9 – 25.6° C	20.9 C
RELATIVE HUMIDITY	10 – 70 %	54 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	120.1 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	160.1 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	204.6 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	5.4 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Charles W. Bell

# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 059 Certification No. 22-1

Test Date: 8/31/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.286 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.5 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	43.4 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

Rout Barande

Approved

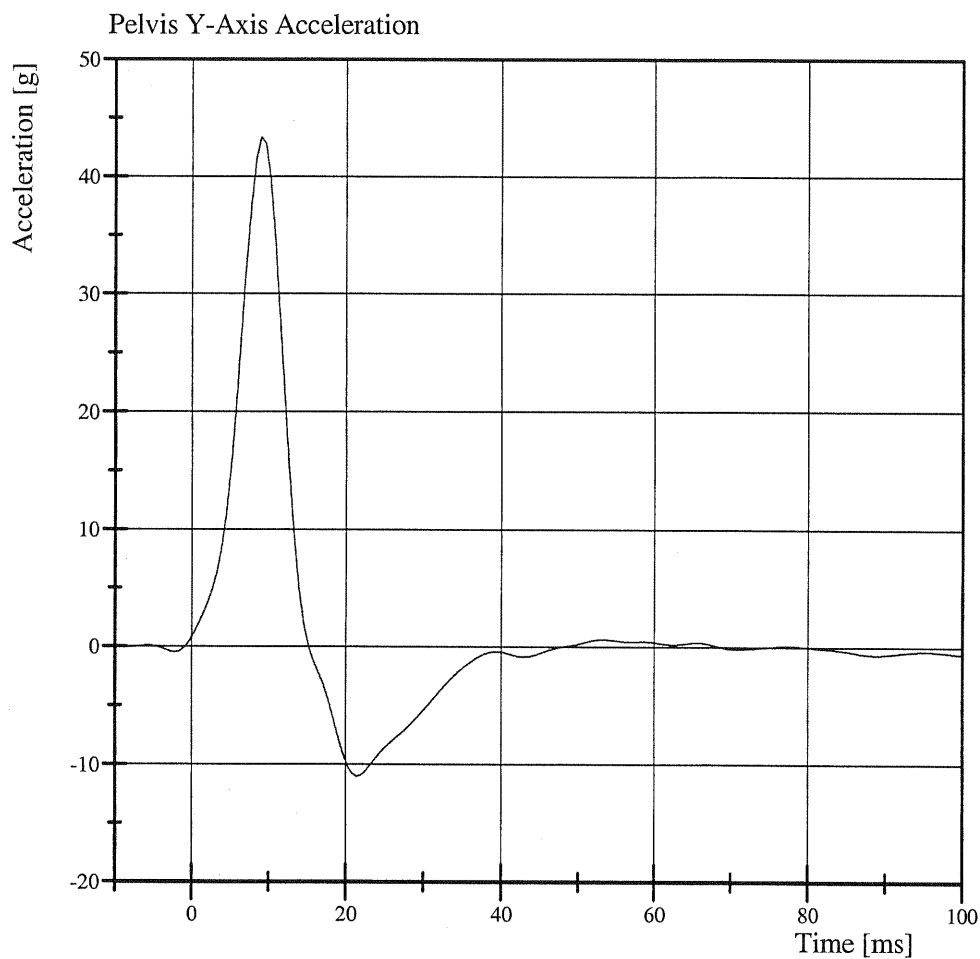
Jon Storer

# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 059 Certification No. 22-1

Test Date: 8/31/2007



Filter Class: FIR\_100

Max: 43.4 g at 9.0 ms

Min: -11.0 g at 21.4 ms

Calibration Test Results

Post-Test

SID HIII: 066

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements.

**Transportation Research Center Inc.**  
**572M SID/HIII Dummy**  
**External Dimensions**  
**Serial No. 066 Calibration No. 23**

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	904 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	515 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	523 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	365 mm	Yes
Top Rib Width From CL	RW-1	165.1 - 180.3 mm	173 mm	Yes
Bottom Rib Width From CL	RW-2	165.1 - 180.3 mm	173 mm	Yes
Difference Between Top & Bottom Rib Width from CL		<= 2.5 mm	0.0 mm	Yes

Technician

Rant Barrels

Approved

Ron Stoner



# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 066 Certification No. 23-1

Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	132.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-5.8 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

Ron Stoner

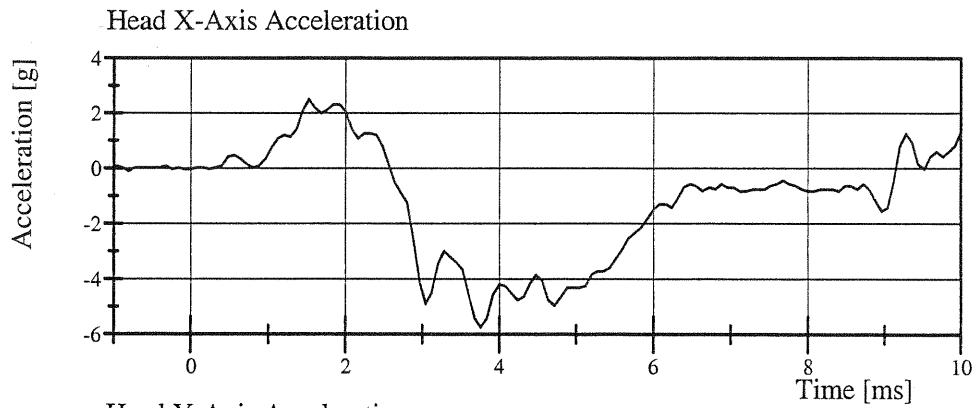


# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 066 Certification No. 23-1

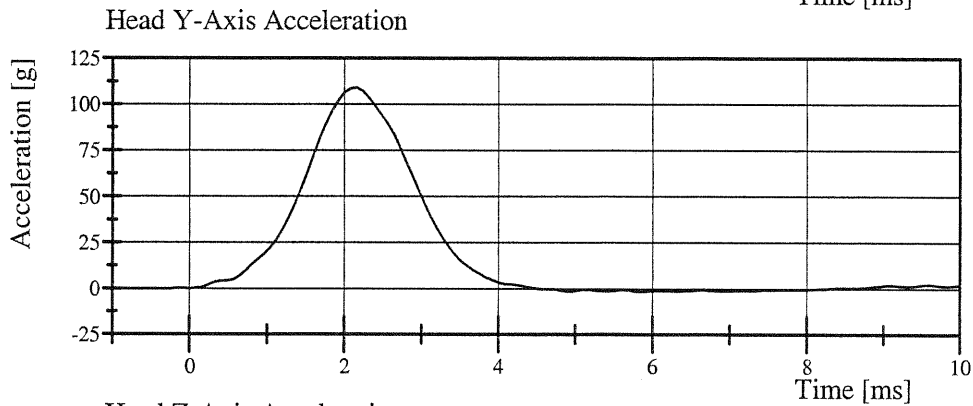
Test Date: 10/2/2007



Filter Class: CFC\_1000

Max: 2.5 g at 1.5 ms

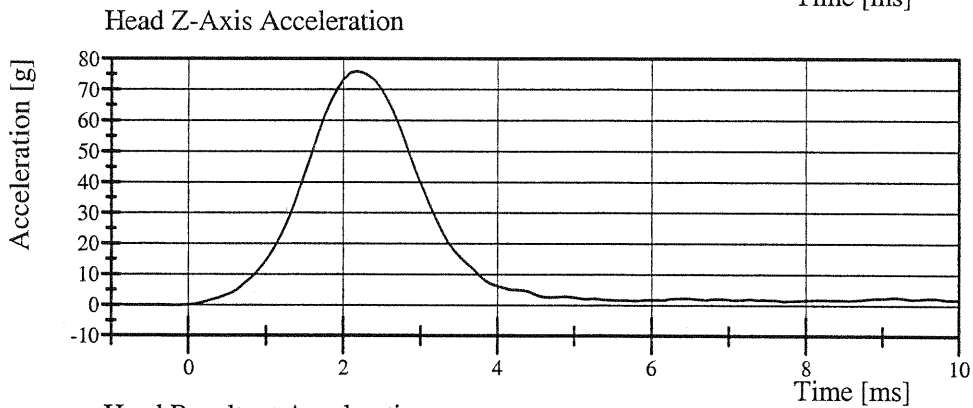
Min: -5.8 g at 3.8 ms



Filter Class: CFC\_1000

Max: 109.0 g at 2.2 ms

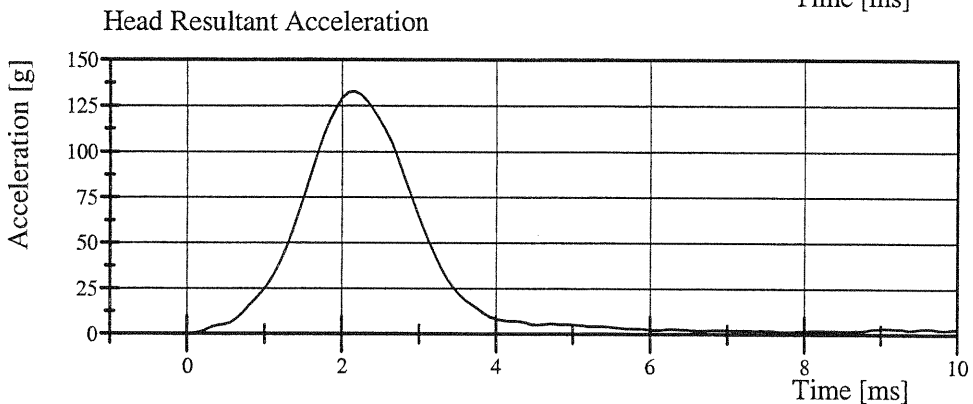
Min: -1.7 g at 5.0 ms



Filter Class: CFC\_1000

Max: 75.9 g at 2.2 ms

Min: -0.1 g at -0.2 ms



Filter Class: CFC\_1000

Max: 132.8 g at 2.2 ms

Min: 0.0 g at -0.7 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 23-1

Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-6.948 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.162 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.305 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.238 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.159 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-72.7 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	59.8 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	86.4 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	53.4 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	9.3 ms	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Hall

Approved

Ron Stoner

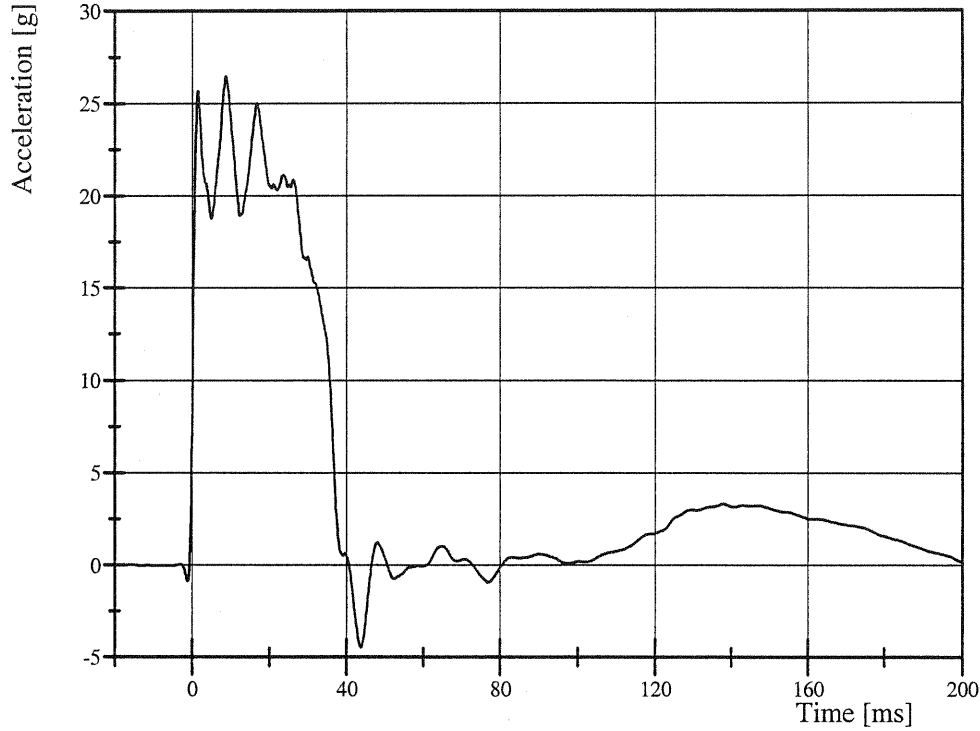
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 23-1

Test Date: 10/2/2007

### Pendulum Acceleration

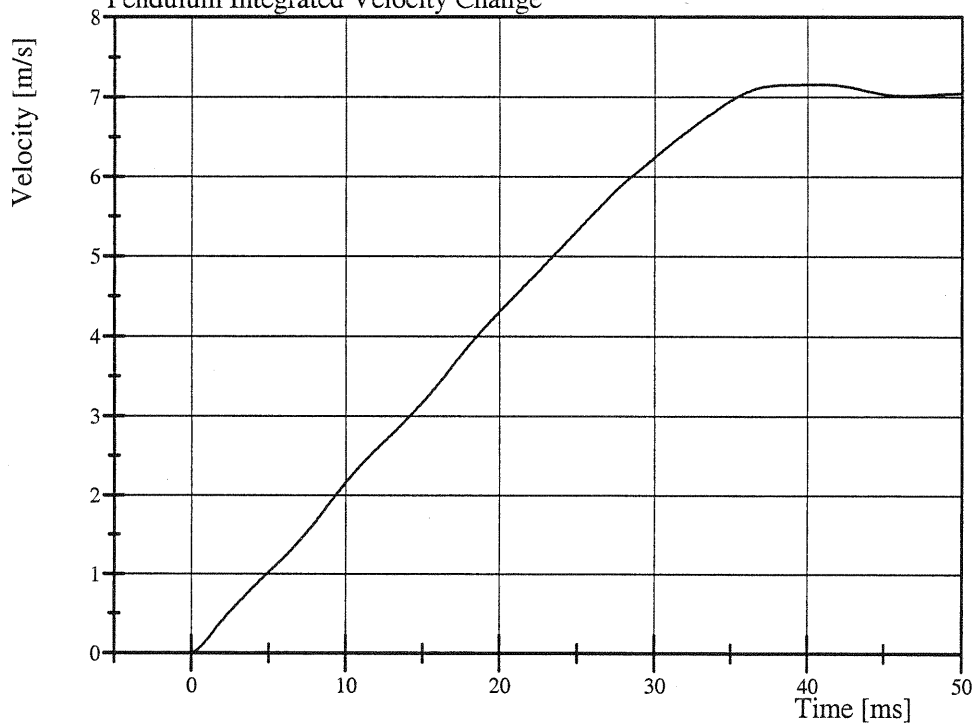


Filter Class: CFC\_180

Max: 26.4 g at 8.6 ms

Min: -4.5 g at 43.8 ms

### Pendulum Integrated Velocity Change



Filter Class: CFC\_180

Max: 7.2 m/s at 40.7 ms

Min: 0.0 m/s at 0.0 ms

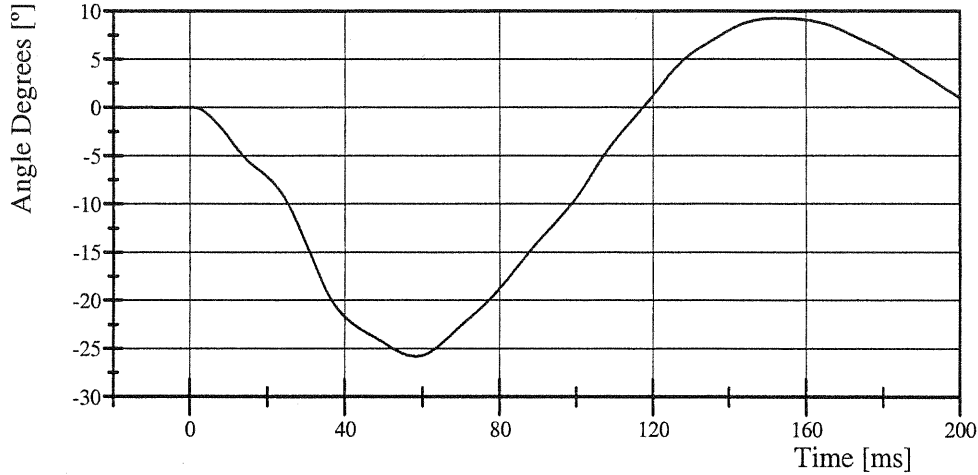
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 23-1

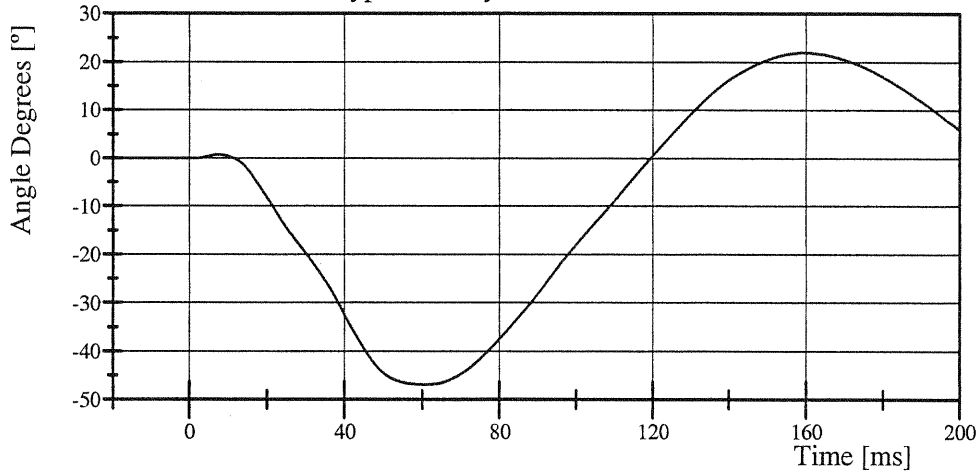
Test Date: 10/2/2007

Pot Rotation at the Base of Neck



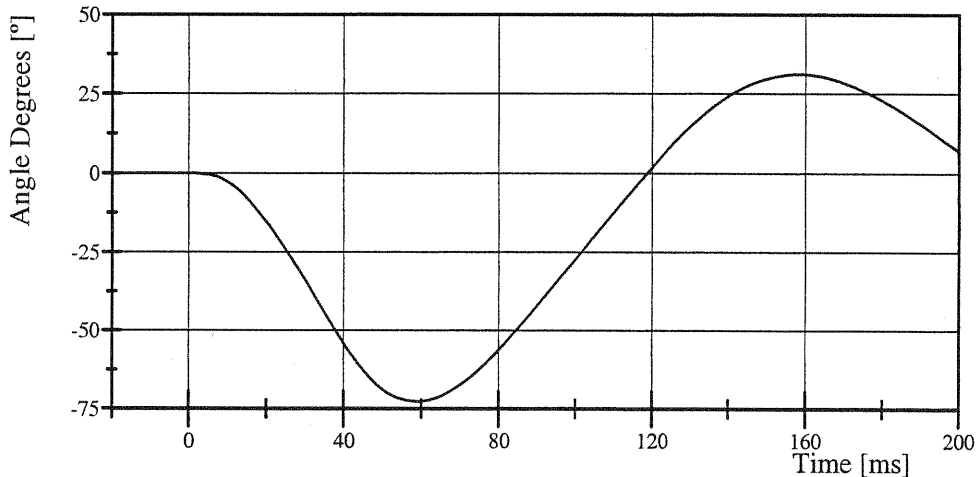
Filter Class: CFC\_60  
Max: 9.2 ° at 152.8 ms  
Min: -25.8 ° at 58.3 ms

Head Rotation at Occypital Condyles



Filter Class: CFC\_60  
Max: 22.0 ° at 159.5 ms  
Min: -46.9 ° at 60.8 ms

Total Head D-Plane Rotation



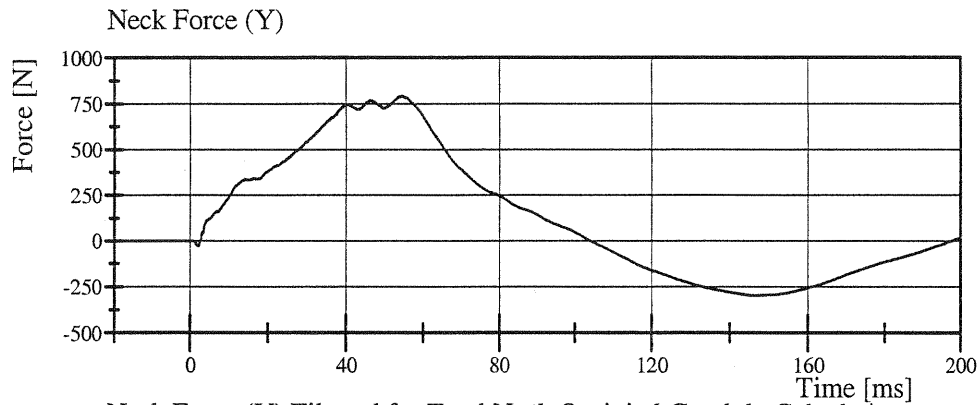
Filter Class: CFC\_60  
Max: 31.1 ° at 158.3 ms  
Min: -72.7 ° at 59.0 ms

# Transportation Research Center Inc.

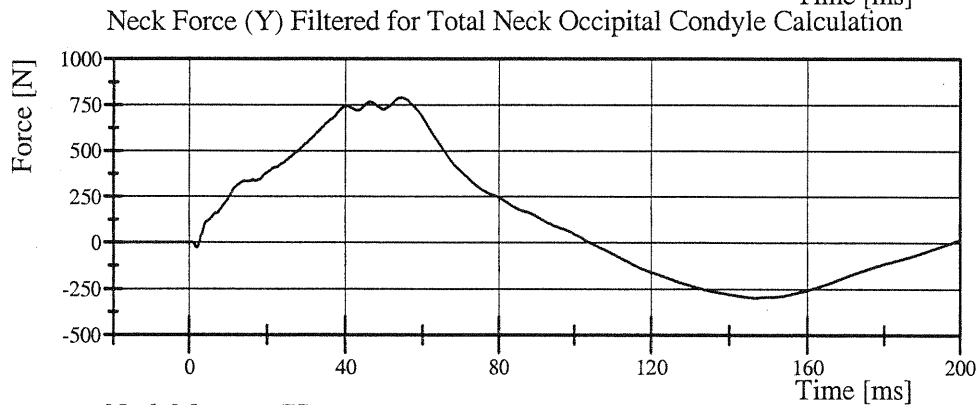
Left Lateral Neck

SID-HIII Serial No. 066 Certification No. 23-1

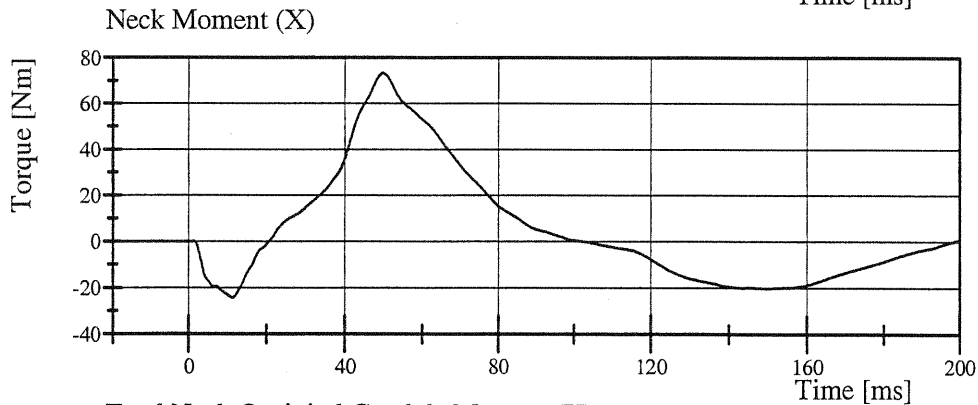
Test Date: 10/2/2007



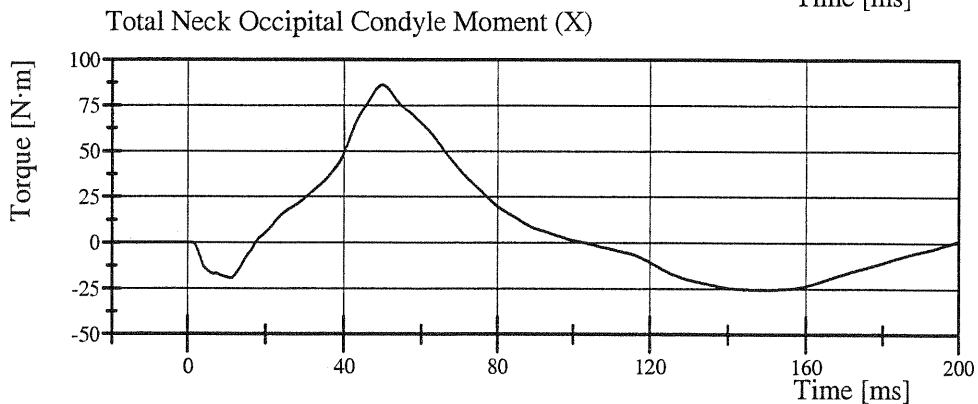
Filter Class: CFC\_1000  
Max: 793.1 N at 54.6 ms  
Min: -297.6 N at 146.6 ms



Filter Class: CFC\_600  
Max: 791.9 N at 54.5 ms  
Min: -297.4 N at 146.7 ms



Filter Class: CFC\_600  
Max: 73.4 Nm at 49.8 ms  
Min: -24.3 Nm at 11.3 ms



Filter Class: CFC\_600  
Max: 86.4 N·m at 49.8 ms  
Min: -25.4 N·m at 150.0 ms

# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 066 Certification No. 23-5

Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.273 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	42.9 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	41.8 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	20.2 g	Yes

**Test meets specifications.**

Comments:

Technician

Charles W. Bell

Approved

Ron Stone

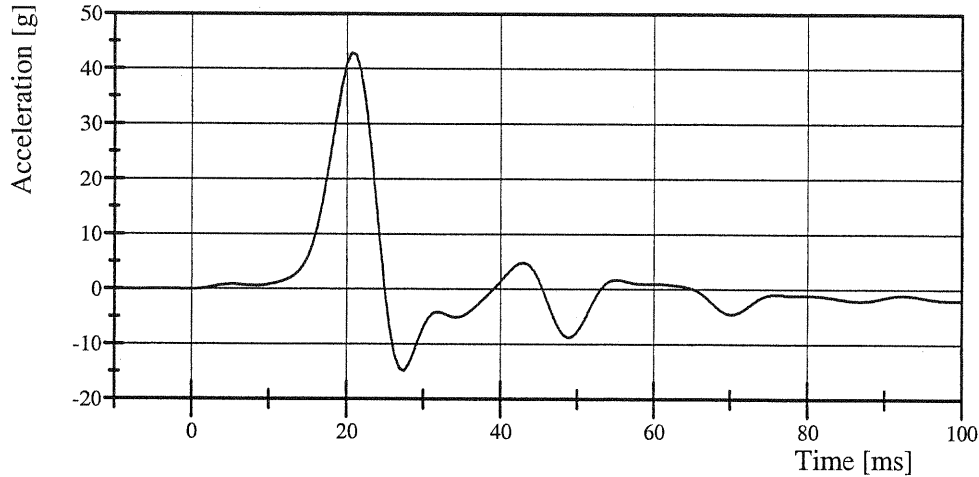
# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 066 Certification No. 23-5

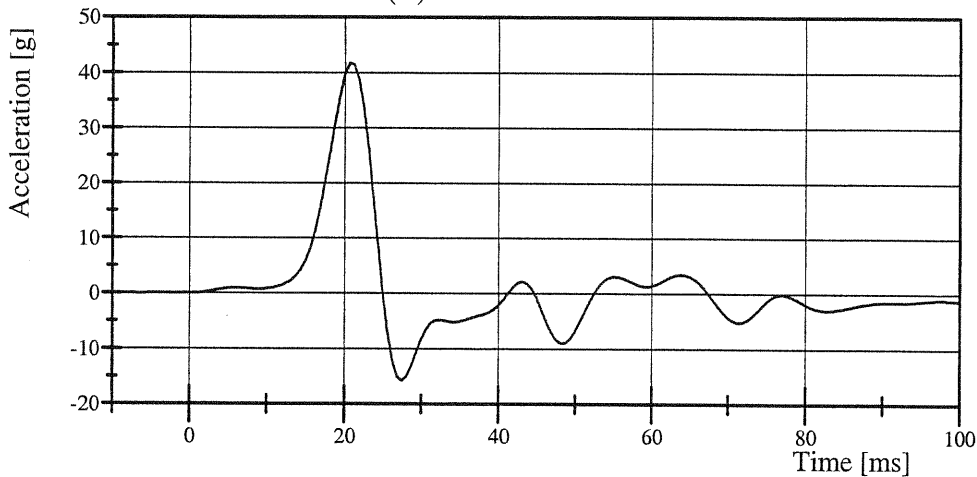
Test Date: 10/2/2007

Upper Rib Acceleration (Y)



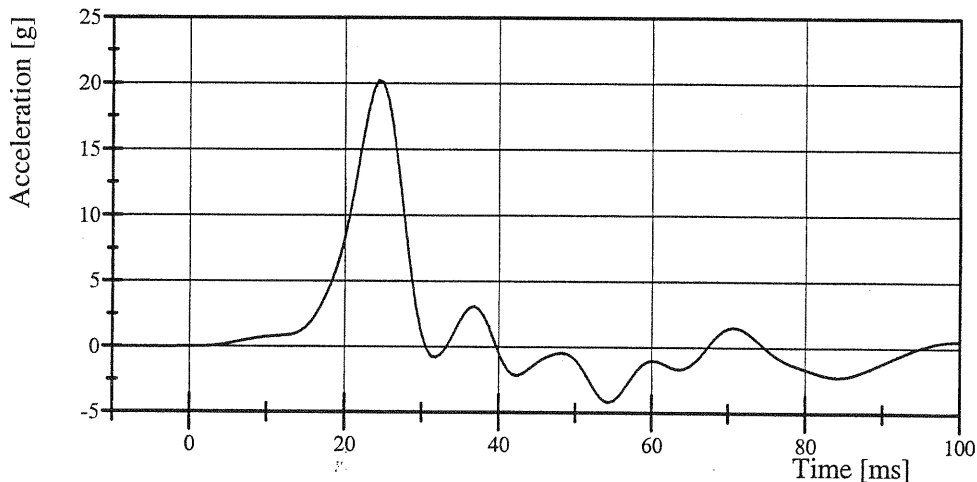
Filter Class: FIR\_100  
Max: 42.9 g at 20.6 ms  
Min: -14.8 g at 27.4 ms

Lower Rib Acceleration (Y)



Filter Class: FIR\_100  
Max: 41.8 g at 20.6 ms  
Min: -15.8 g at 27.5 ms

Lower Spine Acceleration (Y)



Filter Class: FIR\_100  
Max: 20.2 g at 24.4 ms  
Min: -4.2 g at 54.3 ms

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 066 Certification No. 23-1

Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.697 mm/s	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

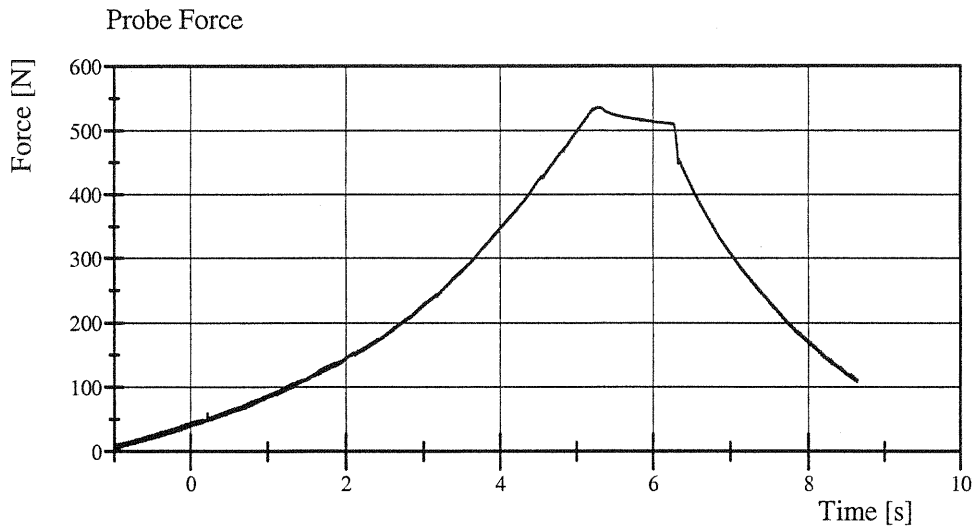
Ron Stoner

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 066 Certification No. 23-1

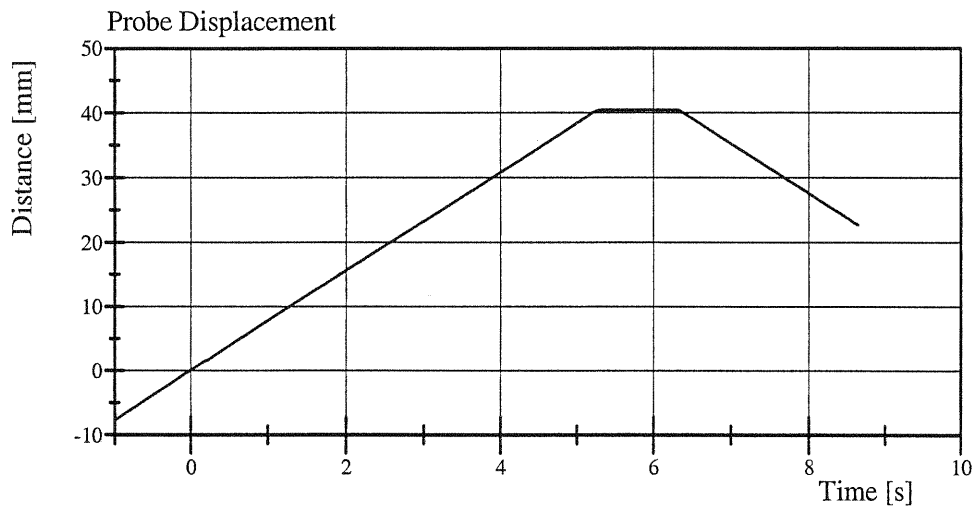
Test Date: 10/2/2007



Filter Class: CFC\_600

Max: 535.8 N at 5.3 s

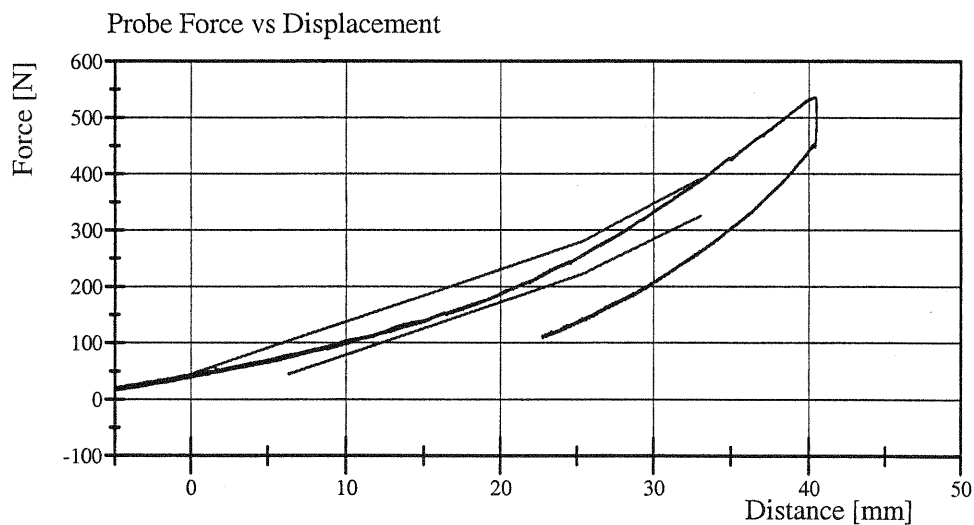
Min: 4.6 N at -1.0 s



Filter Class: CFC\_180

Max: 40.5 mm at 6.2 s

Min: -7.8 mm at -1.0 s



Filter Class: CFC\_600

Max: 535.8 N at 40.4 mm

Min: -3.3 N at -10.9 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 02-Oct-07

TRC, INC.

TEST NO: LUFL-01

572B SN 066 TORSO FLEX CAL 23

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME	NA	1455
TEMPERATURE	18.9 – 25.6° C	21.2 C
RELATIVE HUMIDITY	10 – 70 %	56 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	0 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	133.45 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	195.72 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	240.20 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	6 °

TEST MEETS SPECIFICATIONS

TECHNICIAN

Charles W. Bell

# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 066 Certification No. 23-1


Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	58 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.316 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	5.6 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	50.6 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

  
\_\_\_\_\_

Approved

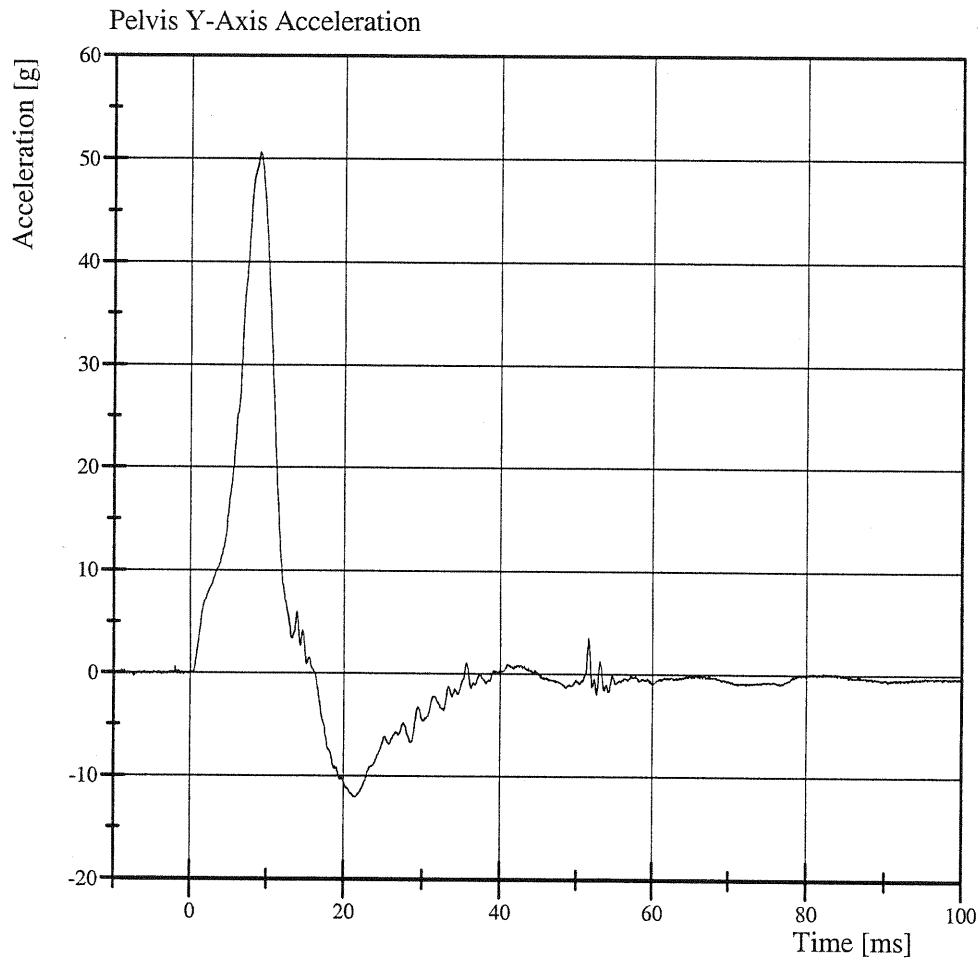
  
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# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 066 Certification No. 23-1

Test Date: 10/2/2007



Filter Class: FIR\_100  
Max: 50.6 g at 9.0 ms  
Min: -12.0 g at 21.3 ms

# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 066 Certification No. 23-2  
Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Maximum Force at Test Velocity	852 - 1,141 N	900.3 N	Yes
Maximum Displacement at Test Velocity	30.19 - 35.18 mm	34.115 mm	Yes

**Test meets specifications.**

**Comments:**

Actual Impactor Velocity (m/s): 3.069

Damper Setting: 5.5

Technician

*Rout Berube*

Approved

*Ron Stoner*

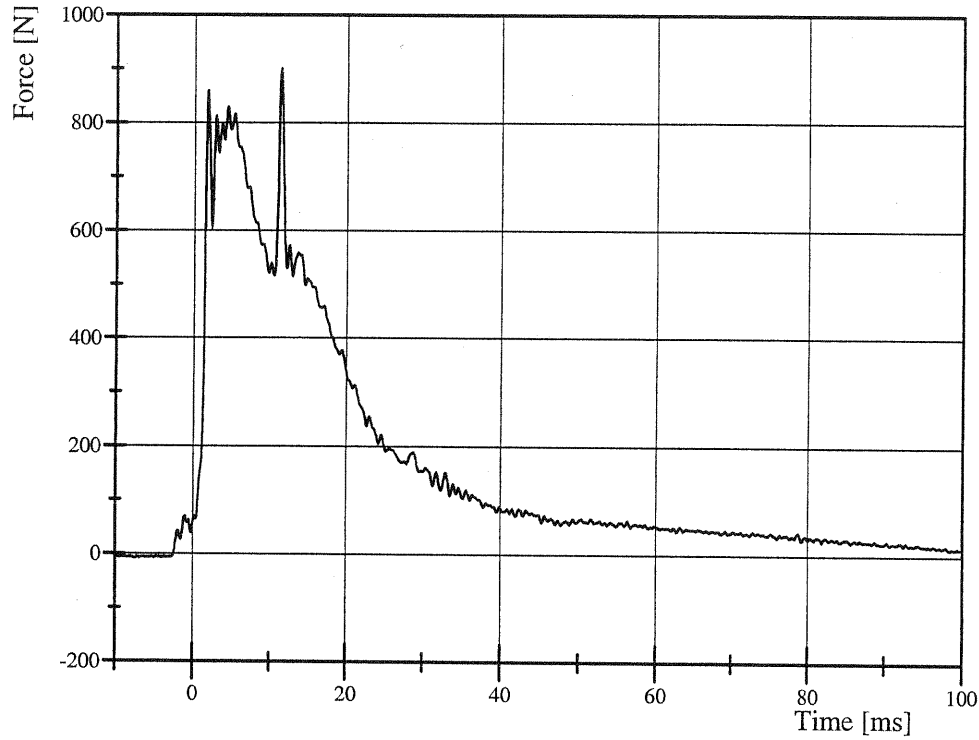
# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 066 Certification No. 23-2

Test Date: 10/2/2007

Shock Absorber Resistive Force

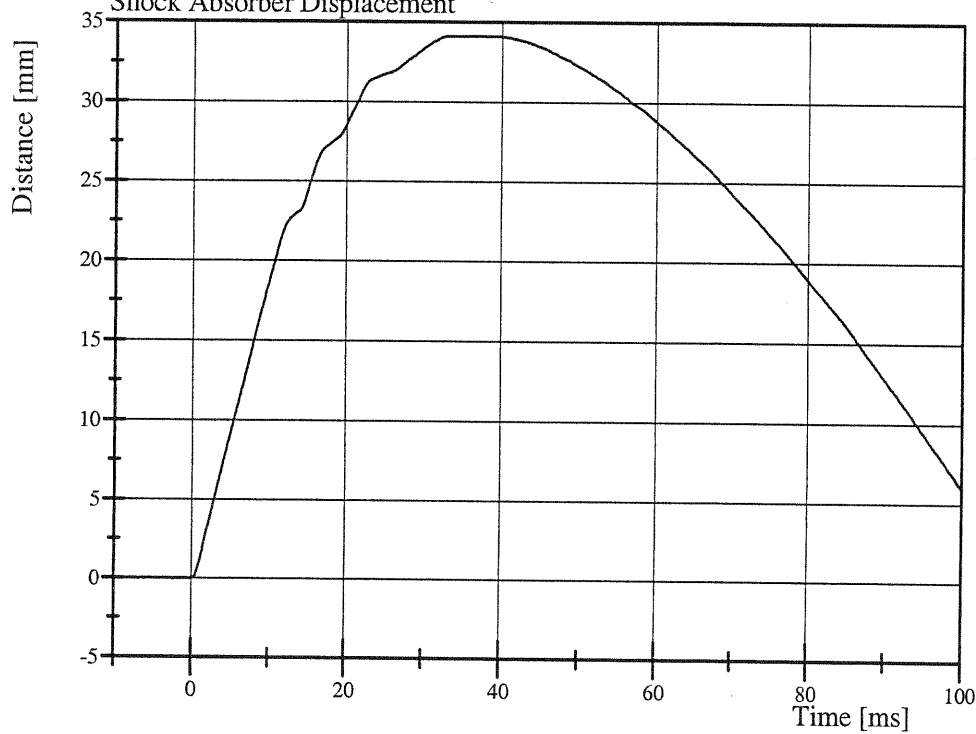


Filter Class: CFC\_1000

Max: 900.3 N at 11.3 ms

Min: -7.9 N at -7.4 ms

Shock Absorber Displacement



Filter Class: CFC\_1000

Max: 34.1 mm at 37.8 ms

Min: -0.0 mm at -0.1 ms

# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 066 Certification No. 23-7  
Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Maximum Force at Test Velocity	1,749 - 2,114 N	1,969.5 N	Yes
Maximum Displacement at Test Velocity	31.69 - 37.25 mm	36.559 mm	Yes

**Test meets specifications.**

**Comments:**

Actual Impactor Velocity (m/s): 4.283

Damper Setting: 5.5

Technician

Rout Barab

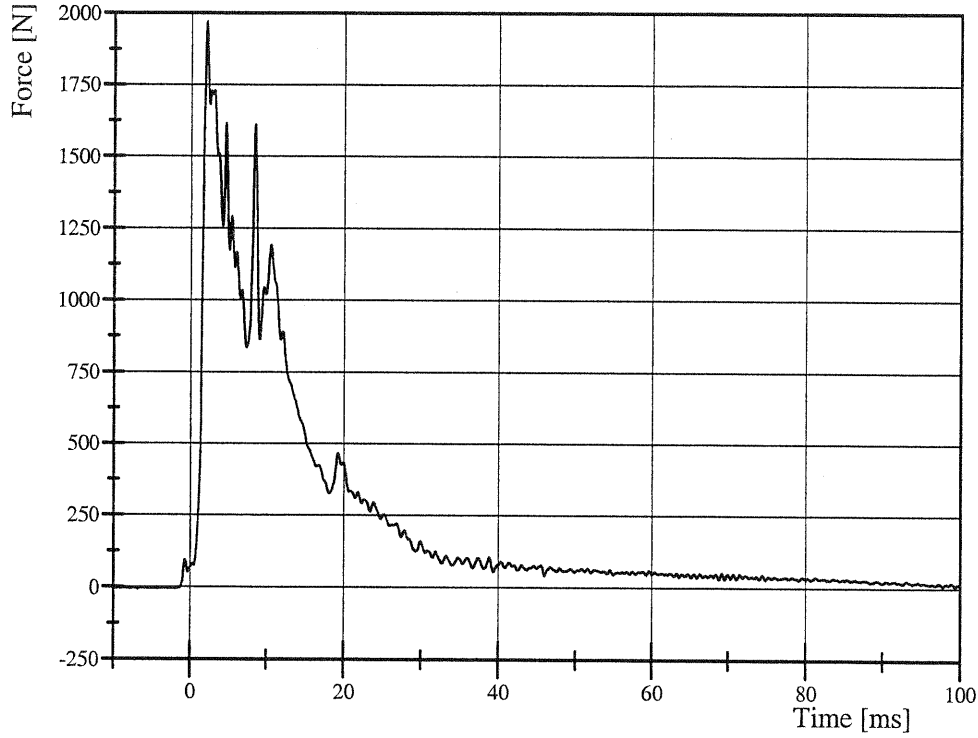
Approved

Ron Stone

# Transportation Research Center Inc.

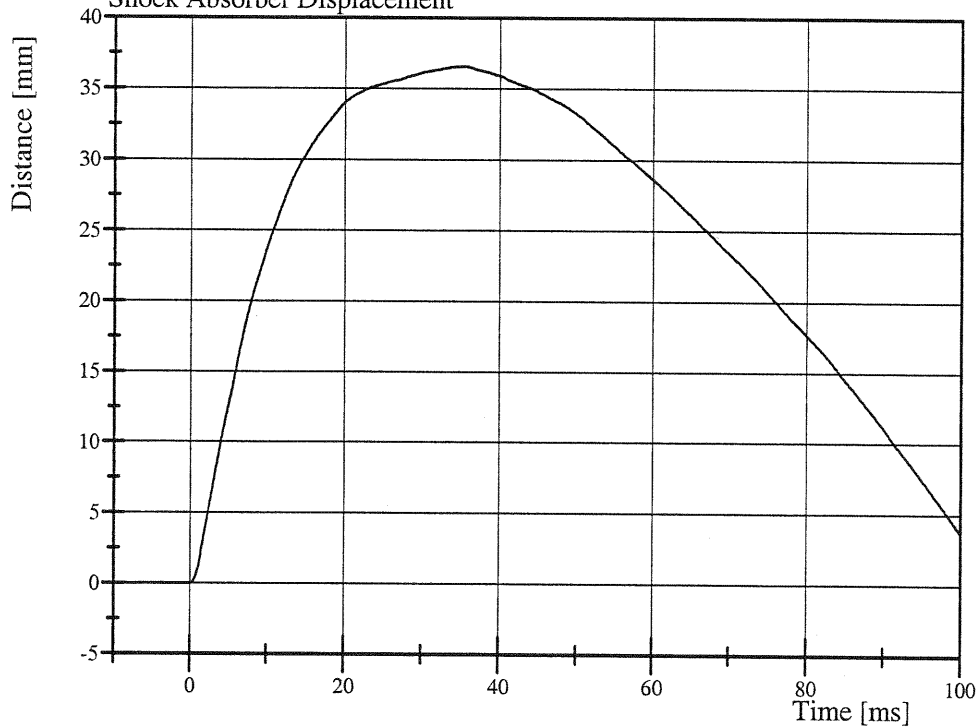
4.27 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 066 Certification No. 23-7  
Test Date: 10/2/2007

Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 1,969.5 N at 2.1 ms  
Min: -6.0 N at -6.8 ms

Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 36.6 mm at 35.4 ms  
Min: -0.0 mm at -9.7 ms

# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 066 Certification No. 23-3

Test Date: 10/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Maximum Force at Test Velocity	3,803 - 4,507 N	3,981.5 N	Yes
Maximum Displacement at Test Velocity	33.4 - 39.62 mm	39.422 mm	Yes

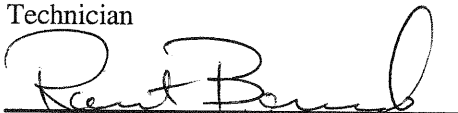
**Test meets specifications.**

**Comments:**

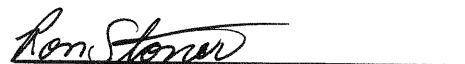
Actual Impactor Velocity (m/s): 6.140

Damper Setting: 5.5

Technician



Approved

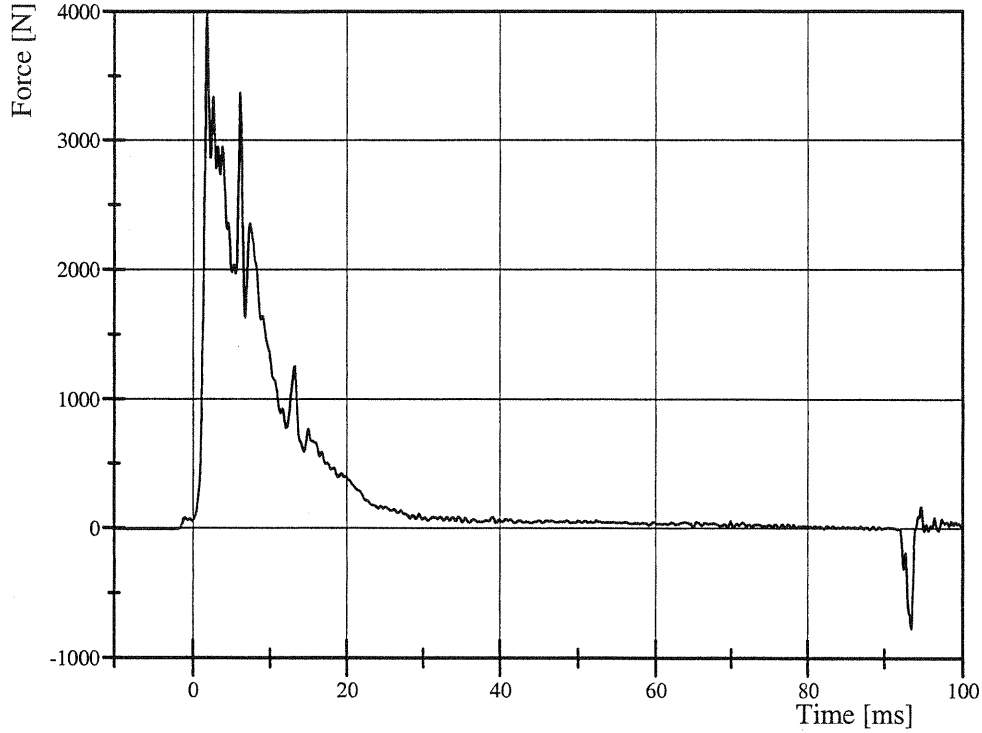




# Transportation Research Center Inc.

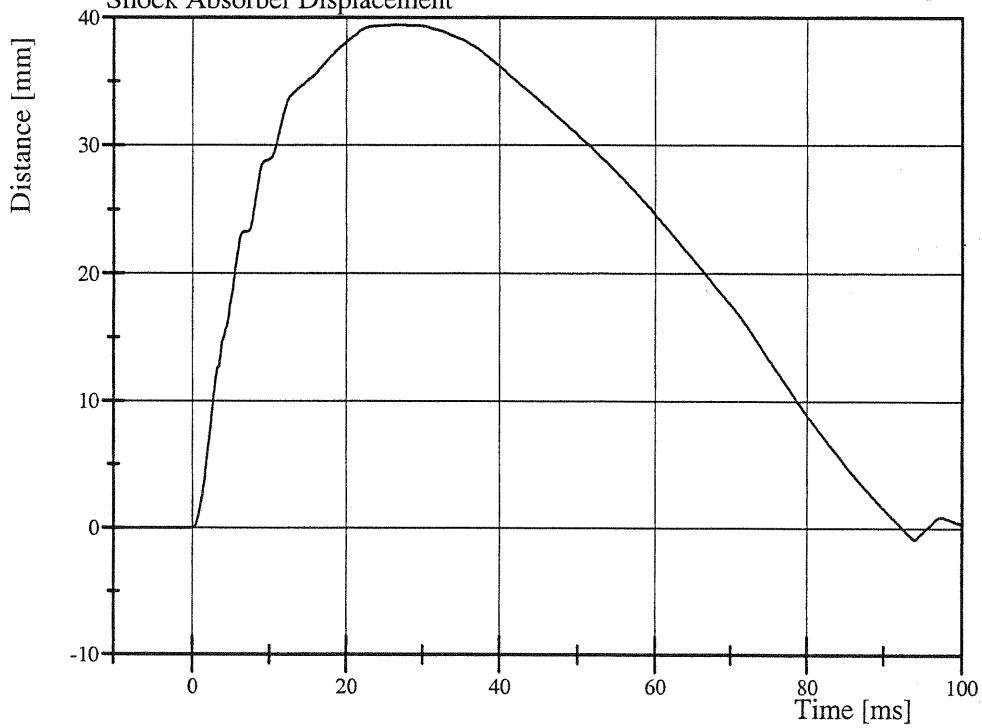
6.10 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 066 Certification No. 23-3  
Test Date: 10/1/2007

### Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 3,981.5 N at 1.8 ms  
Min: -768.5 N at 93.4 ms

### Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 39.4 mm at 26.8 ms  
Min: -0.9 mm at 93.9 ms

## Calibration Test Results

Post-Test

SID HIII: 059

Configured for Left Side Impact

External Dimensions:	The dummy passed all external dimension requirements.
Lateral Head Drop Test:	The head passed all lateral drop test requirements.
Lateral Neck Test:	The neck passed all impact test requirements.
Lateral Thorax Impact Test:	The thorax passed all impact test requirements.
Lumbar Flexion Test:	The dummy met the lumbar flexion test requirements.
Abdominal Compression Test:	The abdomen met the compression test requirements.
Pelvis Impact Test:	The lateral pelvis passed all impact test requirements.
Thoracic Shock Absorber Test:	The thoracic shock absorber passed all test requirements.

**Transportation Research Center Inc.**  
**SID/HIII Dummy Post-Test**  
**External Dimensions**  
**Serial No. 059 Calibration No. 23**

Test Parameter	Dimension	Specification	Results	Pass
Seated Height	SH	889.0 - 909.3 mm	905 mm	Yes
Rib Height	RH	501.7 - 520.7 mm	511 mm	Yes
Hip Pivot Height	HP	99.1 REF mm	99.1 mm	
Knee Pivot From Backline	KH	510.5 - 525.8 mm	522 mm	Yes
Knee Pivot From Floor	KV	490.2 - 505.5 mm	498 mm	Yes
Hip Width	HW	355.6 - 391.2 mm	366 mm	Yes
Top Rib Width From C/L	RW-1	165.1 - 180.3 mm	172 mm	Yes
Bottom Rib Width From C/L	RW-2	165.1 - 180.3 mm	172 mm	Yes
Difference Between Top & Bottom Rib Width from C/L		<= 2.5 mm	0.0 mm	Yes

Technician

Charles W. Bell

Approved

Ron Stoner



# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 059 Certification No. 23-5

Test Date: 10/3/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	57 %	Yes
Peak Head Resultant Acceleration	120 - 150 g	147.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	7.8 g	Yes
Is Head Resultant Acceleration Curve Unimodal Within 15% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

*Paul Baran*

Approved

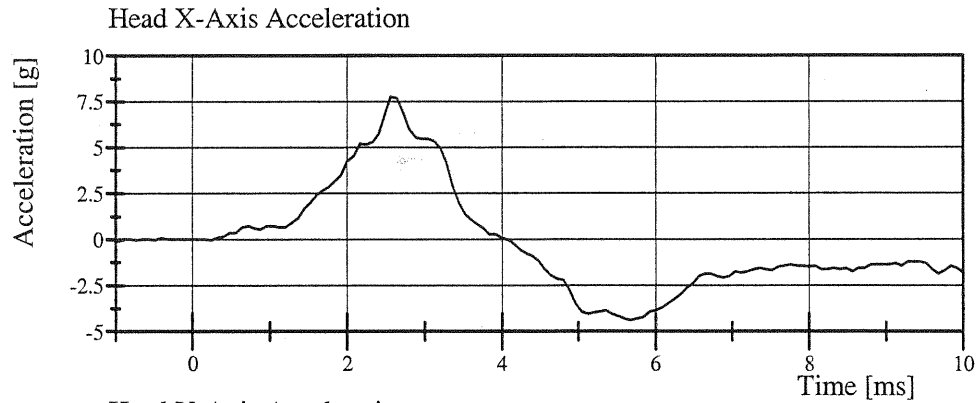
*Ron Stover*

# Transportation Research Center Inc.

Left Lateral Head Drop

SID-HIII Serial No. 059 Certification No. 23-5

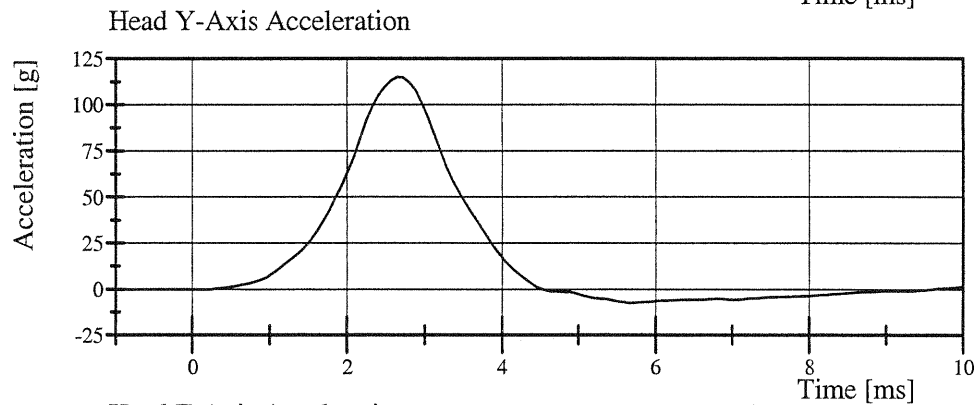
Test Date: 10/3/2007



Filter Class: CFC\_1000

Max: 7.8 g at 2.6 ms

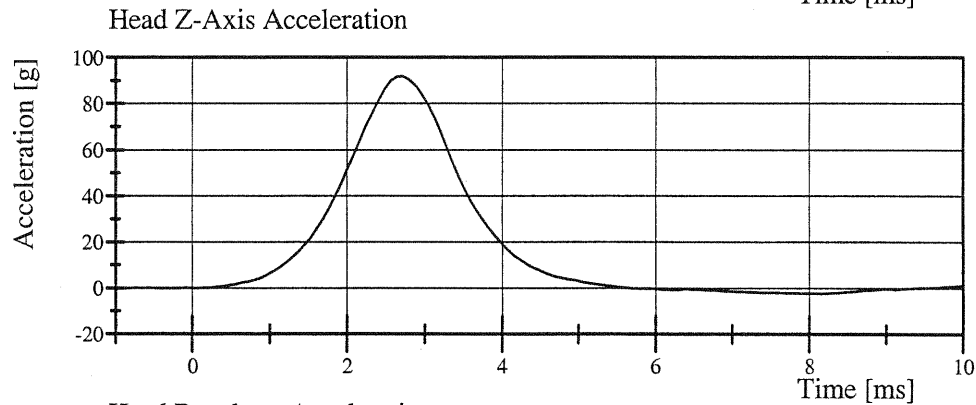
Min: -4.4 g at 5.7 ms



Filter Class: CFC\_1000

Max: 115.0 g at 2.6 ms

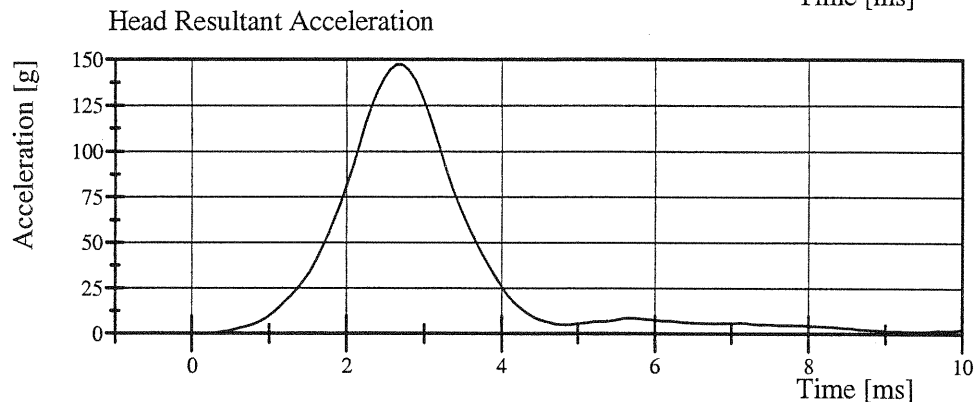
Min: -7.4 g at 5.7 ms



Filter Class: CFC\_1000

Max: 91.9 g at 2.7 ms

Min: -2.4 g at 8.2 ms



Filter Class: CFC\_1000

Max: 147.3 g at 2.6 ms

Min: 0.0 g at -0.9 ms

# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 23-3

Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Pendulum Velocity	(-6.89) - (-7.13) m/s	-6.955 m/s	Yes
Pendulum Integrated Velocity Change at 10 ms	1.96 - 2.55 m/s	2.197 m/s	Yes
Pendulum Integrated Velocity Change at 20 ms	4.12 - 5.10 m/s	4.399 m/s	Yes
Pendulum Integrated Velocity Change at 30 ms	5.73 - 7.01 m/s	6.380 m/s	Yes
Pendulum Integrated Velocity Change at 40 to 70 ms	6.27 - 7.64 m/s	7.192 m/s	Yes
Total Head D-Plane Rotation	(-66) - (-82) °	-74.9 °	Yes
Total Head D-Plane Rotation Time to 0° after Peak Rotation	58 - 67 ms	64.0 ms	Yes
Total Neck Occipital Condyle Moment	73 - 88 N·m	83.8 N·m	Yes
Total Neck Occipital Condyle Moment Time to 0 N·m after Peak Moment	49 - 64 ms	56.5 ms	Yes
Time from Peak Moment to Peak Rotation	2 - 16 ms	9.9 ms	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

Ron Stone

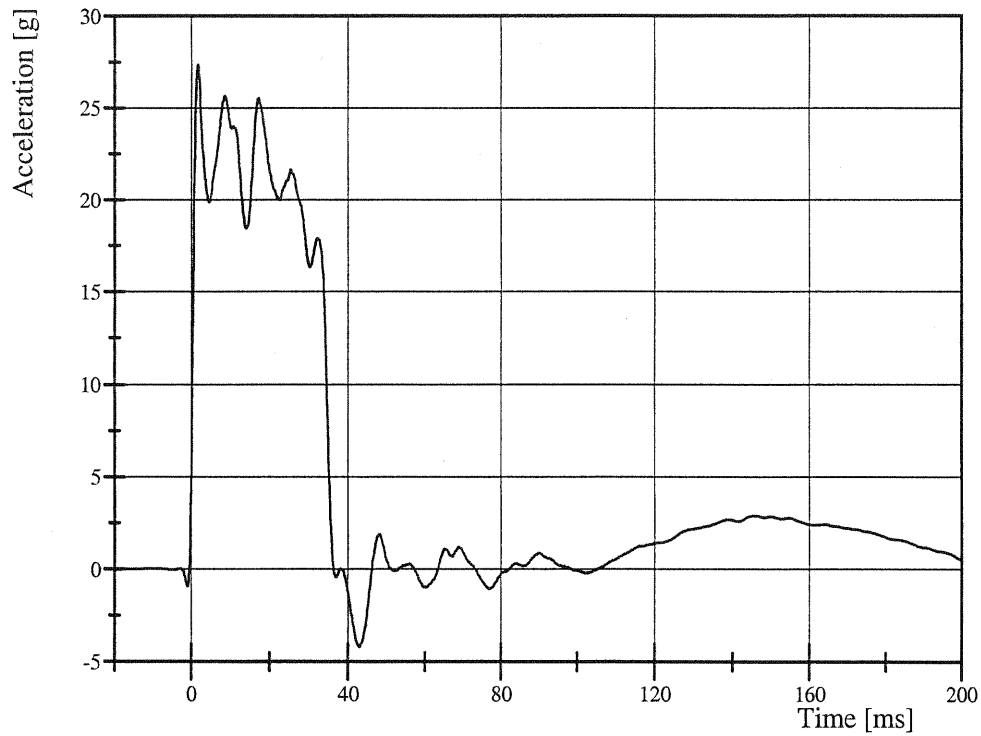
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 23-3

Test Date: 10/2/2007

Pendulum Acceleration

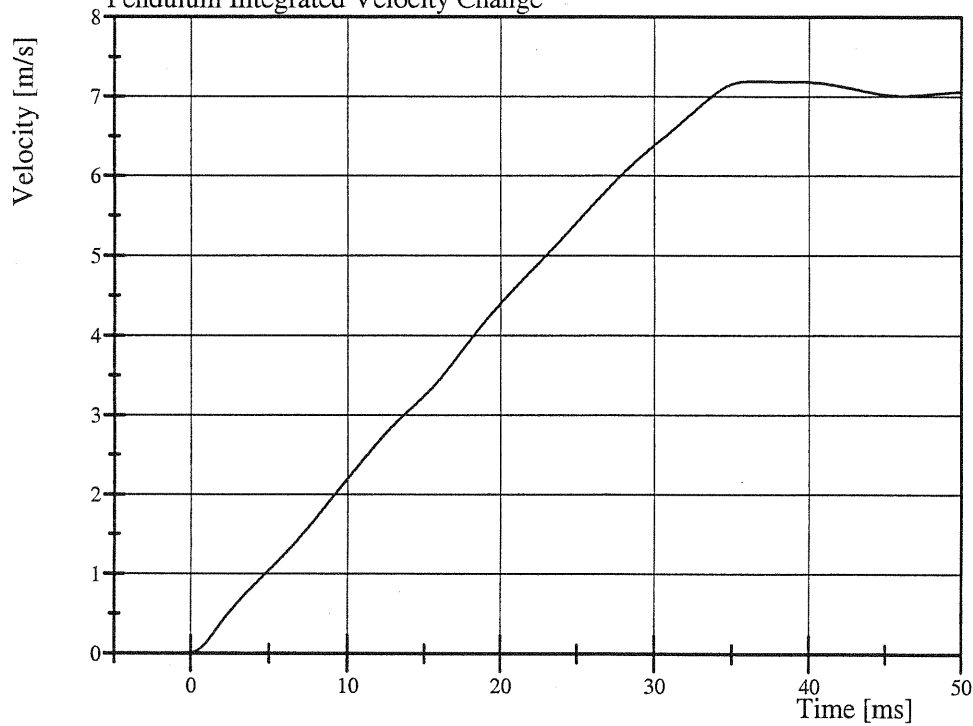


Filter Class: CFC\_180

Max: 27.3 g at 1.8 ms

Min: -4.2 g at 43.0 ms

Pendulum Integrated Velocity Change



Filter Class: CFC\_180

Max: 7.2 m/s at 36.4 ms

Min: 0.0 m/s at 0.0 ms

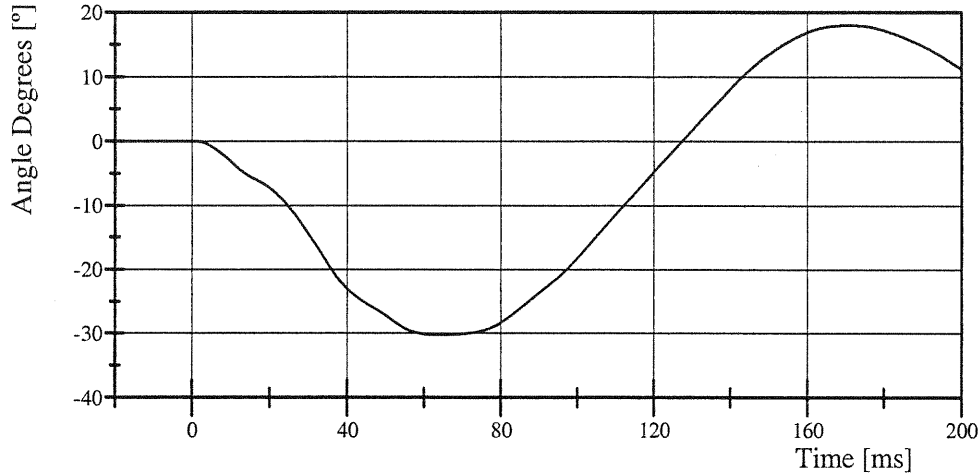
# Transportation Research Center Inc.

Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 23-3

Test Date: 10/2/2007

### Pot Rotation at the Base of Neck

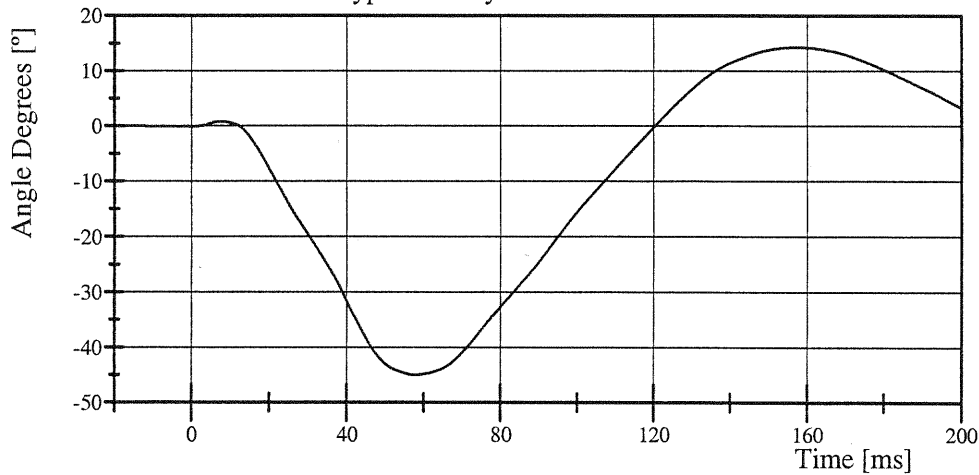


Filter Class: CFC\_60

Max: 17.9 ° at 170.9 ms

Min: -30.3 ° at 63.8 ms

### Head Rotation at Occypital Condyles

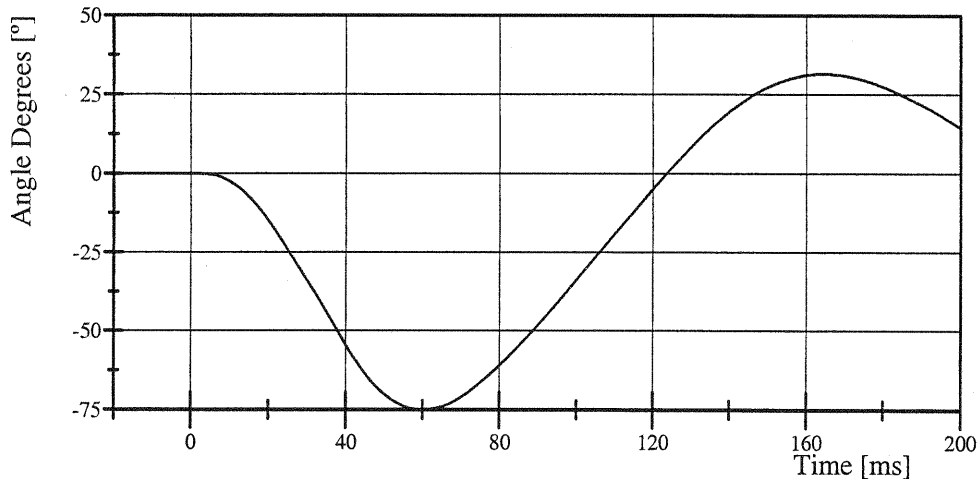


Filter Class: CFC\_60

Max: 14.3 ° at 157.4 ms

Min: -45.0 ° at 57.9 ms

### Total Head D-Plane Rotation



Filter Class: CFC\_60

Max: 31.5 ° at 164.4 ms

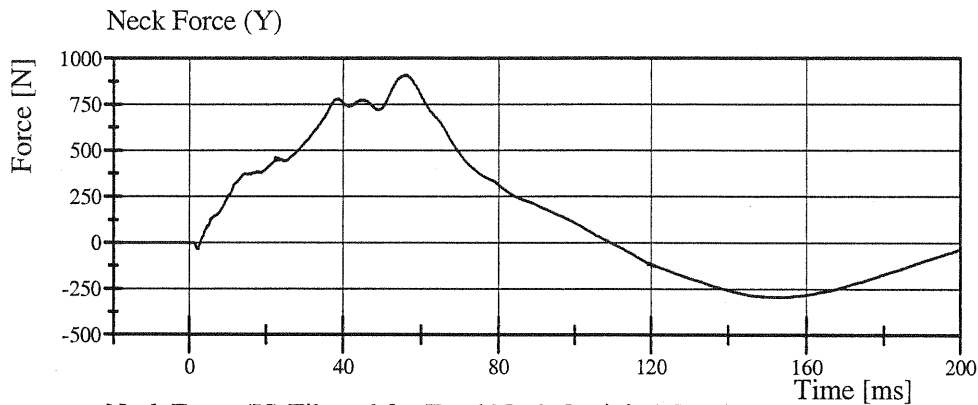
Min: -74.9 ° at 59.7 ms

# Transportation Research Center Inc.

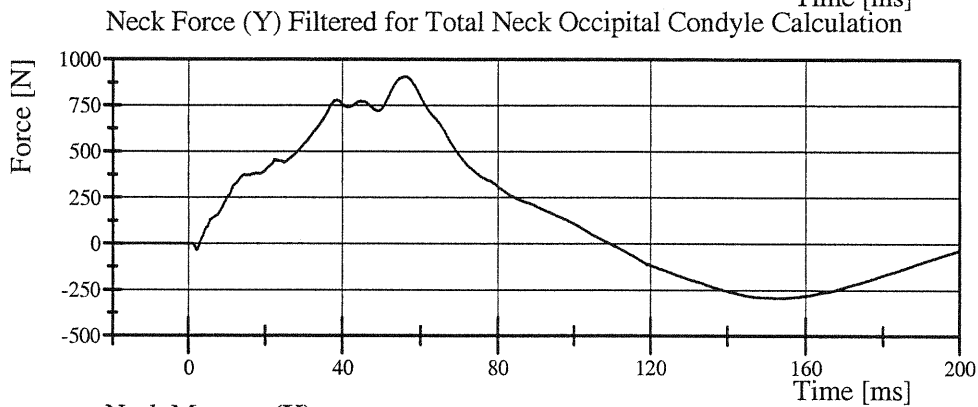
Left Lateral Neck

SID-HIII Serial No. 059 Certification No. 23-3

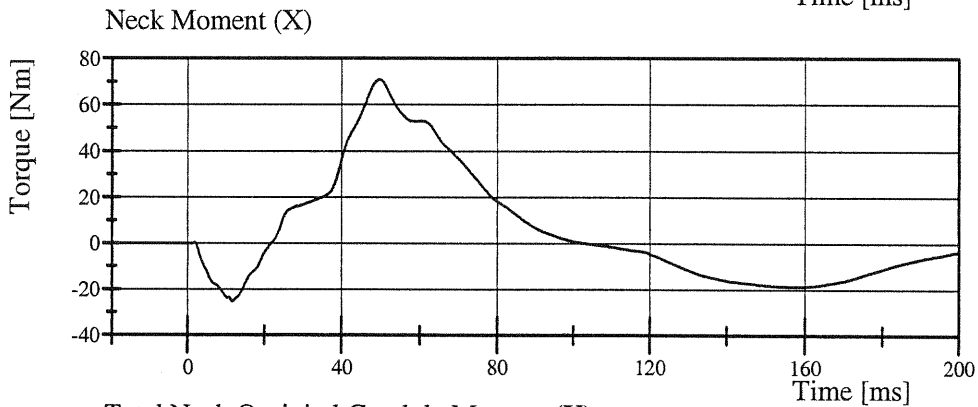
Test Date: 10/2/2007



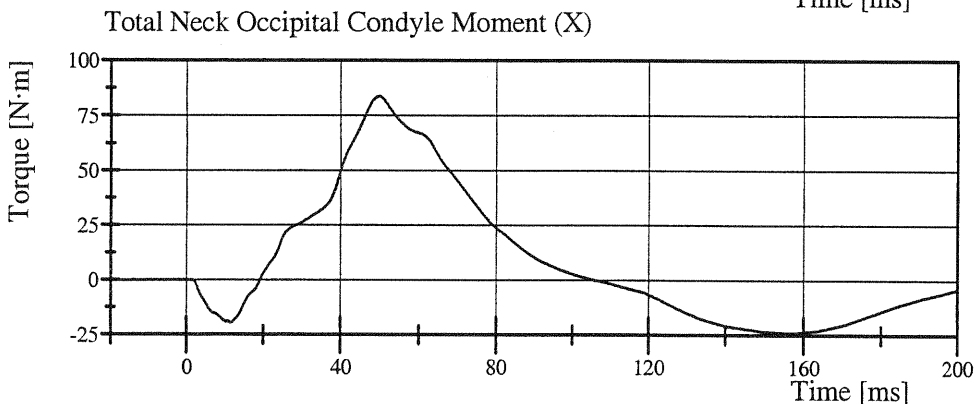
Filter Class: CFC\_1000  
Max: 909.5 N at 56.3 ms  
Min: -294.1 N at 153.4 ms



Filter Class: CFC\_600  
Max: 907.7 N at 56.3 ms  
Min: -293.8 N at 153.4 ms



Filter Class: CFC\_600  
Max: 70.9 Nm at 49.6 ms  
Min: -25.2 Nm at 11.8 ms



Filter Class: CFC\_600  
Max: 83.8 N·m at 49.8 ms  
Min: -23.8 N·m at 157.4 ms

# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 059 Certification No. 23-1

Test Date: 10/3/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.6 °C	21.4 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.286 m/s	Yes
Upper Rib Lateral Acceleration	37 - 46 g	41.0 g	Yes
Lower Rib Lateral Acceleration	37 - 46 g	40.7 g	Yes
Lower Spine Lateral Acceleration	15 - 22 g	18.5 g	Yes

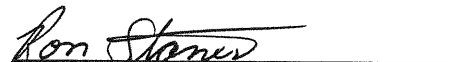
**Test meets specifications.**

**Comments:**

Technician



Approved



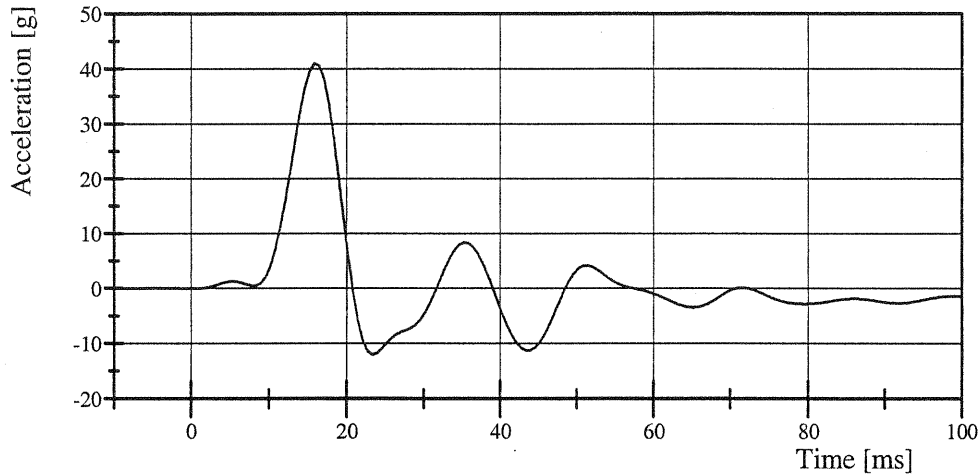
# Transportation Research Center Inc.

Left Lateral Thorax

SID-HIII Serial No. 059 Certification No. 23-1

Test Date: 10/3/2007

Upper Rib Acceleration (Y)

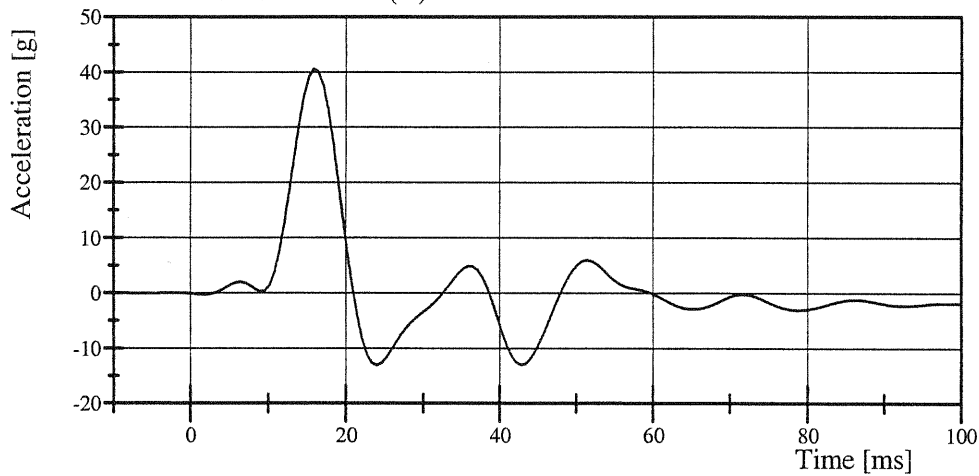


Filter Class: FIR\_100

Max: 41.0 g at 15.8 ms

Min: -12.0 g at 23.4 ms

Lower Rib Acceleration (Y)

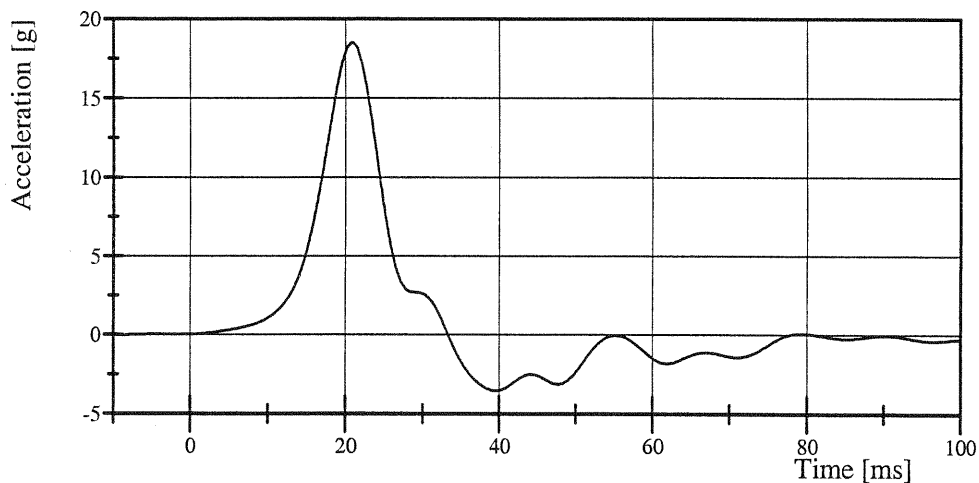


Filter Class: FIR\_100

Max: 40.7 g at 15.8 ms

Min: -13.0 g at 24.0 ms

Lower Spine Acceleration (Y)



Filter Class: FIR\_100

Max: 18.5 g at 20.9 ms

Min: -3.5 g at 39.6 ms

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 059 Certification No. 23-7

Test Date: 10/2/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Probe Force within Corridor	Yes	Yes	Yes
Probe Velocity	6.35 - 8.89 mm/s	7.728 mm/s	Yes

**Test meets specifications.**

**Comments:**

Technician

*Rast Brouil*

Approved

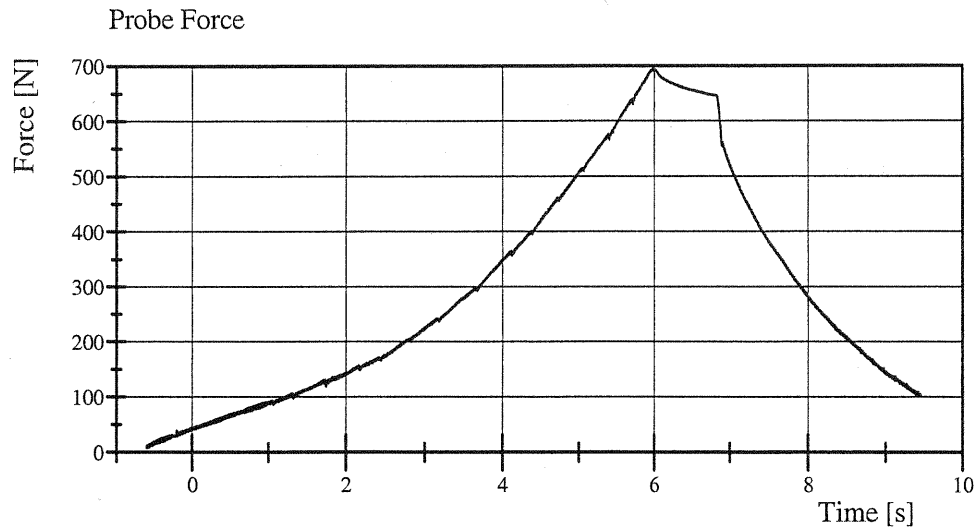
*Ron Stoner*

# Transportation Research Center Inc.

Abdomen Compression

SID-HIII Serial No. 059 Certification No. 23-7

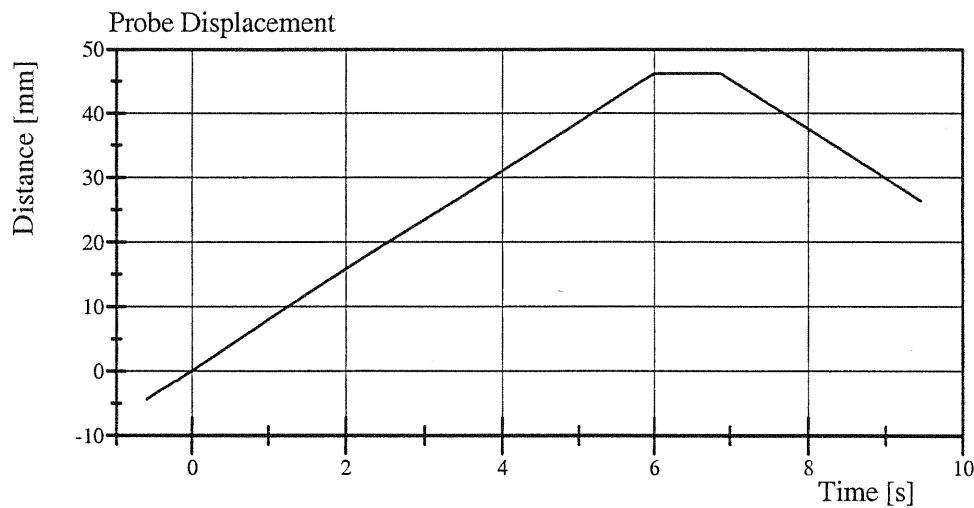
Test Date: 10/2/2007



Filter Class: CFC\_600

Max: 693.0 N at 6.0 s

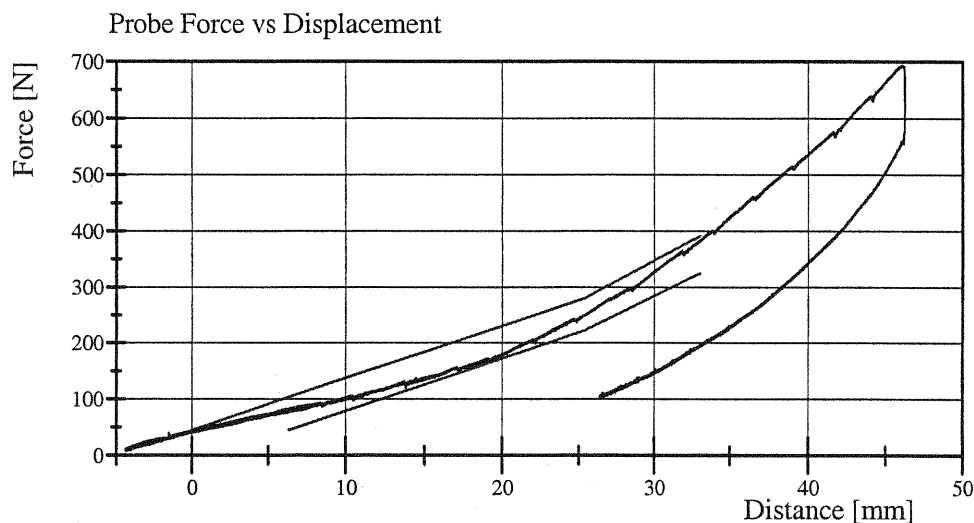
Min: 8.2 N at -0.6 s



Filter Class: CFC\_180

Max: 46.2 mm at 6.7 s

Min: -4.4 mm at -0.6 s



Filter Class: CFC\_600

Max: 693.0 N at 46.0 mm

Min: 8.2 N at -4.2 mm

TRANSPORTATION RESEARCH CENTER INC.

LUMBAR FLEXION TEST

SID PART 572B

CAL DATE: 02-Oct-07

TRC, INC.

TEST NO: LUFL-01

572B SN 059 TORSO FLEX CAL 23

TEST PARAMETER	SPECIFICATION	TEST RESULTS
TIME	NA	1345
TEMPERATURE	18.9 – 25.6° C	21.4 C
RELATIVE HUMIDITY	10 – 70 %	56 %
FORCE AT 0 DEG. FLEXION	-27 – 27 N	2.22 N
FORCE AT 20 DEG OF FLEXION	98 – 151 N	133.45 N
FORCE AT 30 DEG OF FLEXION	151 – 205 N	195.72 N
FORCE AT 40 DEG OF FLEXION	205 – 258 N	235.76 N
NET RETURN ANGLE AFTER 3 MINUTES	< 12 °	5 °

TEST MEETS SPECIFICATIONS

TECHNICIAN Charles W. Bell

# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 059 Certification No. 23-1

Test Date: 10/3/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	56 %	Yes
Impactor Velocity	4.27 - 4.33 m/s	4.282 m/s	Yes
Pelvis Lateral Acceleration Duration above 20g	3 - 7 ms	6.6 ms	Yes
Pelvis Lateral Acceleration	40 - 60 g	42.1 g	Yes
Is Acceleration Curve Unimodal Above 20g?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

Charles W. Bell

Approved

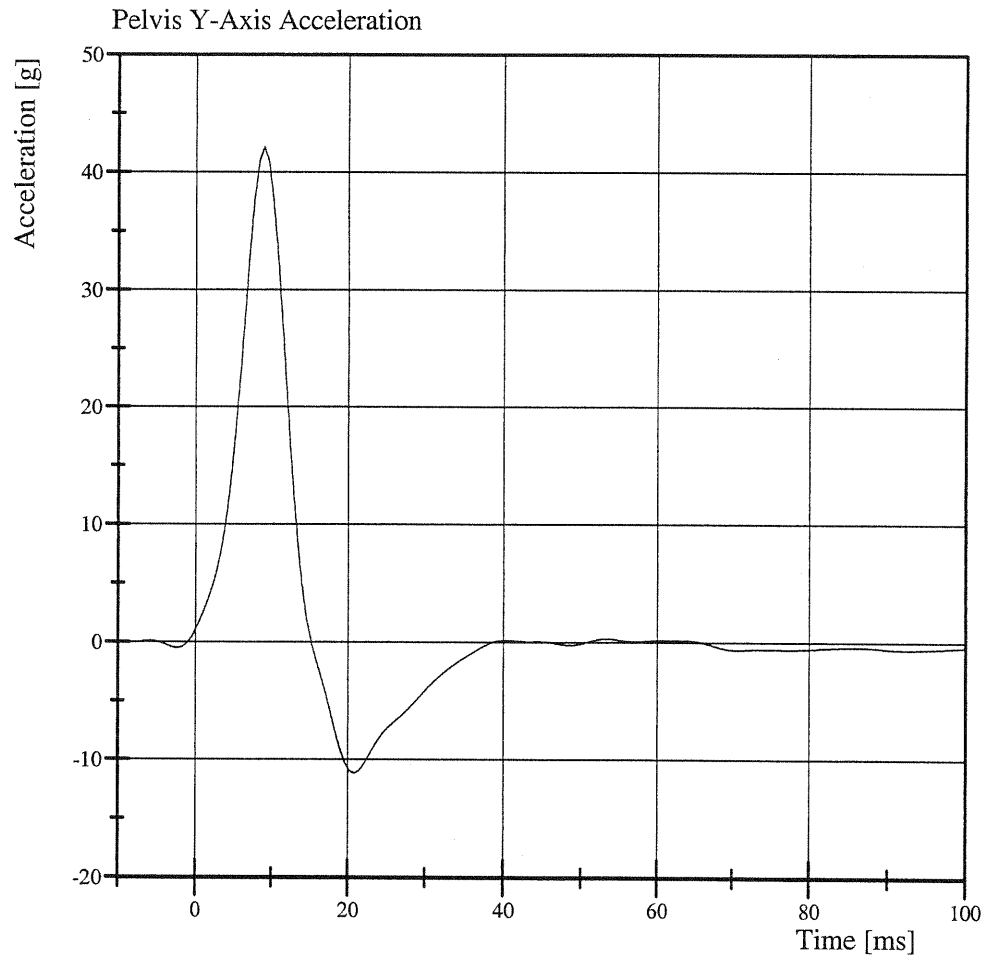
Ron Stoner

# Transportation Research Center Inc.

Left Lateral Pelvis

SID-HIII Serial No. 059 Certification No. 23-1

Test Date: 10/3/2007



Filter Class: FIR\_100  
Max: 42.1 g at 9.0 ms  
Min: -11.2 g at 20.8 ms

# Transportation Research Center Inc.

3.05 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 23-1  
Test Date: 10/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	44 %	Yes
Maximum Force at Test Velocity	848 - 1,136 N	906.3 N	Yes
Maximum Displacement at Test Velocity	30.18 - 35.16 mm	31.319 mm	Yes

**Test meets specifications.**

**Comments:**

Actual Impactor Velocity (m/s): 3.063

Damper Setting: 5.5

Technician

Charles W. Bell

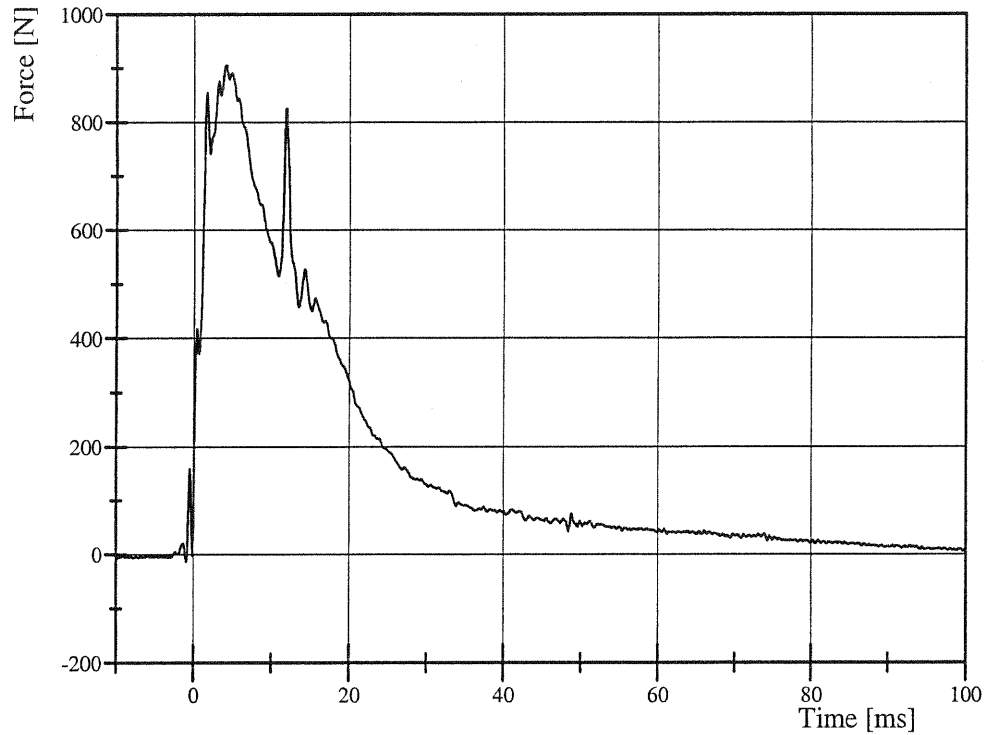
Approved

Ron Stone

# Transportation Research Center Inc.

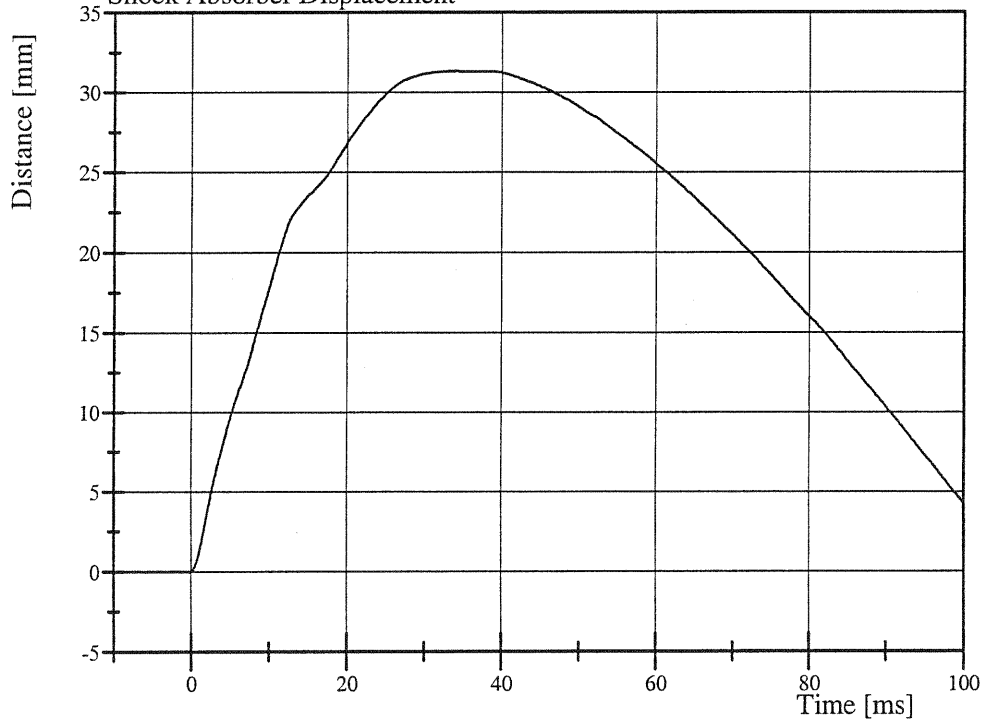
3.05 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 23-1  
Test Date: 10/1/2007

### Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 906.3 N at 4.1 ms  
Min: -12.9 N at -1.0 ms

### Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 31.3 mm at 33.7 ms  
Min: -0.0 mm at -8.6 ms

# Transportation Research Center Inc.

4.27 m/s Thoracic Shock Absorber Compression

SID-HIII Serial No. 059 Certification No. 23-1

Test Date: 10/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	47 %	Yes
Maximum Force at Test Velocity	1,749 - 2,114 N	1,803.2 N	Yes
Maximum Displacement at Test Velocity	31.69 - 37.25 mm	34.412 mm	Yes

**Test meets specifications.**

### Comments:

Actual Impactor Velocity (m/s): 4.283

Damper Setting: 5.5

Technician

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Approved

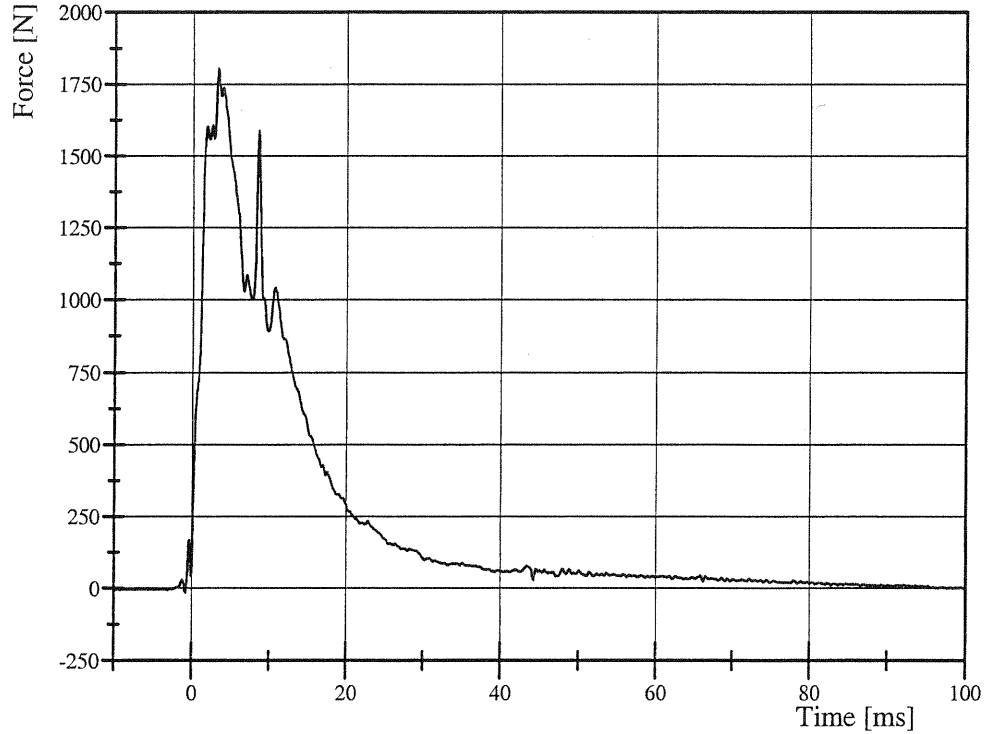
*Ron Stones*

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# Transportation Research Center Inc.

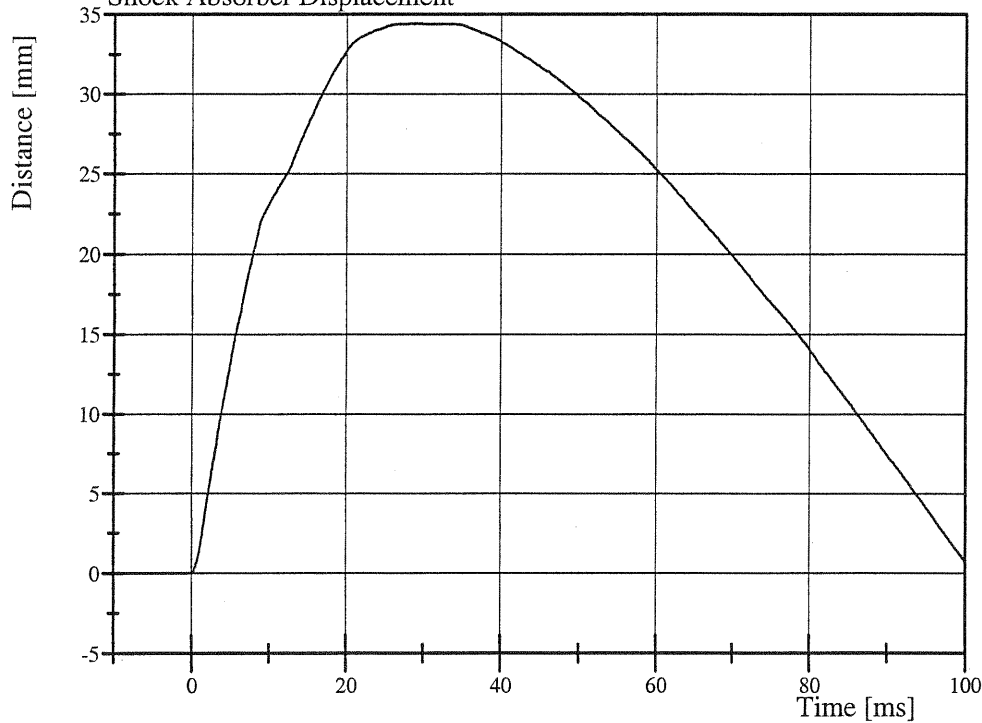
4.27 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 23-1  
Test Date: 10/1/2007

Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 1,803.2 N at 3.2 ms  
Min: -14.1 N at -0.8 ms

Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 34.4 mm at 28.6 ms  
Min: -0.0 mm at -4.6 ms

# Transportation Research Center Inc.

6.10 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 23-2  
Test Date: 10/1/2007

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	46 %	Yes
Maximum Force at Test Velocity	3,810 - 4,515 N	3,926.2 N	Yes
Maximum Displacement at Test Velocity	33.4 - 39.62 mm	37.892 mm	Yes

**Test meets specifications.**

**Comments:**

Actual Impactor Velocity (m/s): 6.145

Damper Setting: 5.5

Technician

Charles W. Bell

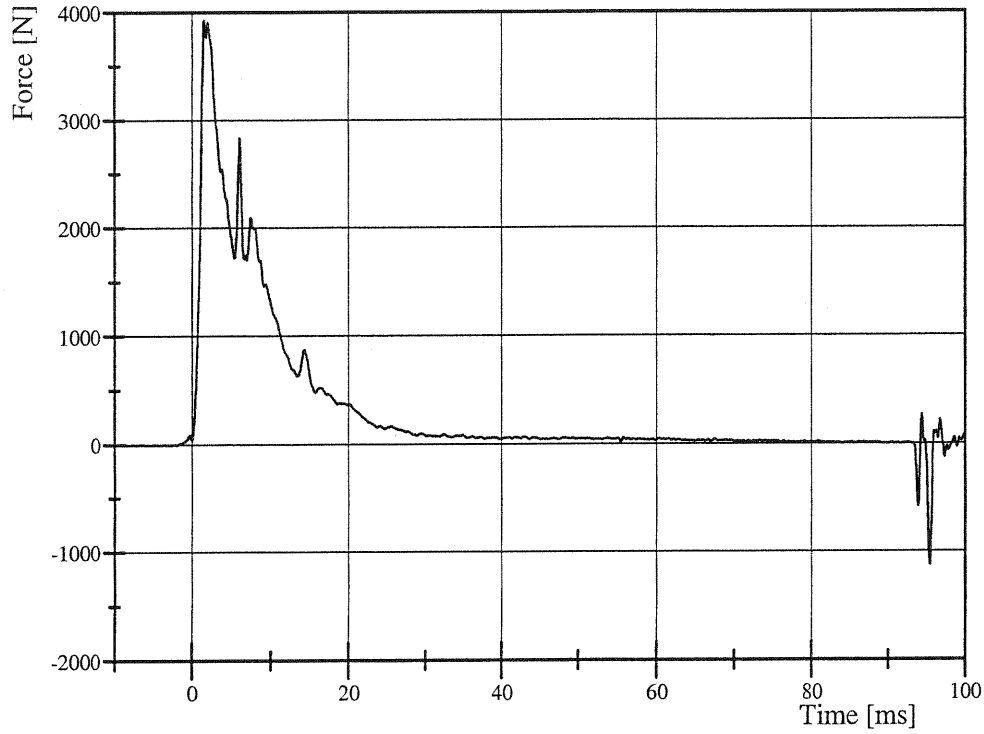
Approved

Ron Stone

# Transportation Research Center Inc.

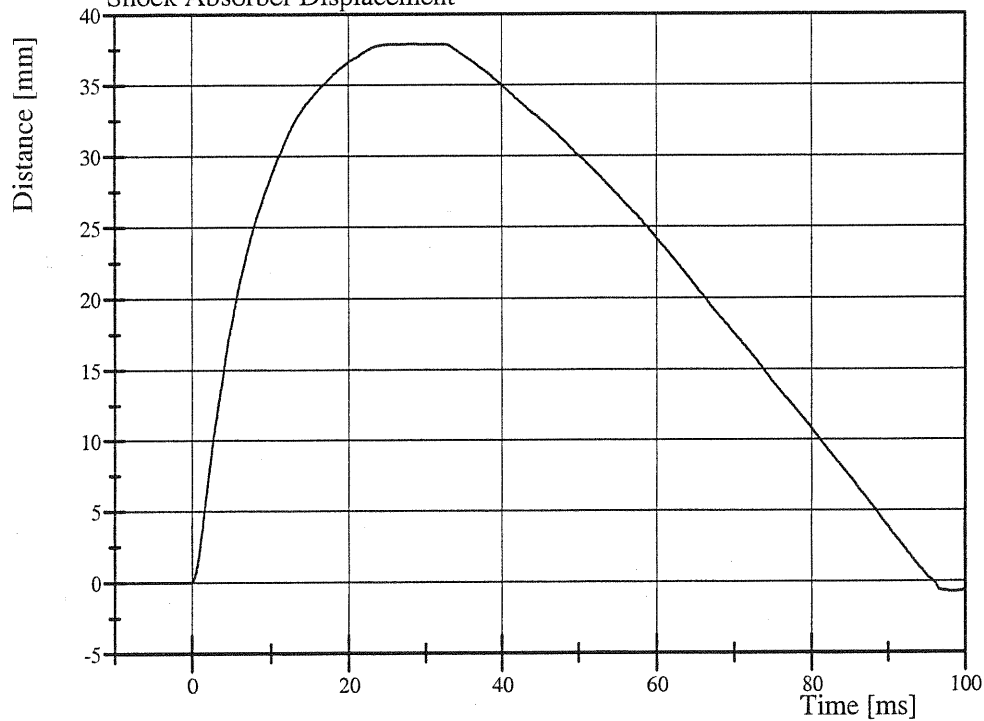
6.10 m/s Thoracic Shock Absorber Compression  
SID-HIII Serial No. 059 Certification No. 23-2  
Test Date: 10/1/2007

Shock Absorber Resistive Force



Filter Class: CFC\_1000  
Max: 3,926.2 N at 1.5 ms  
Min: -1,125.5 N at 95.4 ms

Shock Absorber Displacement



Filter Class: CFC\_1000  
Max: 37.9 mm at 27.7 ms  
Min: -0.7 mm at 98.4 ms





Test Date: 09/25/07

Type: SID/HIII S/N: 066 Mfg.: Denton

Proj./Seg. No.: 20020455/ 1170 Test Eng: Emad Al-Tabakha

ITEM	PRE-USE	POST-USE
<b>HEAD:</b>		
Skull Cap Bolts: tight and no wires pinched	X	
Head Skin Condition	X	X
* Neck Load Cell Cables: secure, taped, and with strain relief	N/A	
Accel. Cable Exit (left or right)	N/A	
<b>NECK:</b>		
Rubber Condition and Separation From End Caps	X	X
<b>NECK - SID/HIII only:</b>		
Condyle Pin, Set Screws	N/A	
* Neck Cable Torque (10-14 in lb) Actual:	N/A	
* Nodding Blocks Condition and Position (Post-test Joint Function)	N/A	X
<b>THORAX:</b>		
Jacket & Abdomen Condition	X	X
Stacked Shoulder Foams and Bolts	X	X
Rib Wrap Condition	X	X
Rib Cage Spring and Support Assembly	X	X
Rib Cage Bolts	X	X
Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	X
Location and Adjustment of Chest Pot Bracket and Collars	N/A	N/A
Chest Pot Rod End Nuts and Eyebolt	N/A	
Arm Foam Orientation/Condition	X	X
Thorax/Lumbar Spine Bolts / Condition and Separation from End Caps	X	X
Adjust rib cage position to full extension	X	
<b>PELVIS:</b>		
Iliac Crest Bone	X	X
Flesh Condition	X	X
Tightness and Alignment of H-Point Tool Insert	X	
Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
<b>LEGS AND FEET:</b>		
Knee Skins and Castings Condition	X	X
Femur Load Cell Bolts	X	
Breakaway Femur Bolts - function	X	
Knee Joint Function and Range of Motion	X	X
Leg Skin Condition and Position	X	X
Ankle Range of Motion	X	X
Foot Condition	X	X
<b>OTHER:</b>		
Cleanliness	X	
Target Position	X	
Clothes and Shoes BLUE	X	
One G Joint Adjustments	X	
Verify channels against assembly and Check connectors (intact & labeled)	X	
ATTACH TEMPERATURE LOGGER TO DUMMY / DOWNLOAD	X	X

\* Items checked during calibration; these items need checked when the dummy is used without recalibration

Pre Test Inspection Completed By: J. Clarridge Date: 09/24/07

Post Test Inspection Completed By: J. Clarridge Date: 09/26/07



Test Date: 09/25/07

Type: SID/HIII S/N: 059 Mfg.: ASTC

Proj./Seg. No.: 20020455/ 1170 Test Eng: Emad Al-Tabakha

ITEM	PRE-USE	POST-USE
<b>HEAD:</b>		
Skull Cap Bolts: tight and no wires pinched	X	
Head Skin Condition	X	X
* Neck Load Cell Cables: secure, taped, and with strain relief	N/A	
Accel. Cable Exit (left or right)	N/A	
<b>NECK:</b>		
Rubber Condition and Separation From End Caps	X	X
<b>NECK - SID/HIII only:</b>		
Condyle Pin, Set Screws	N/A	
* Neck Cable Torque (10-14 in lb) Actual:	N/A	
* Nodding Blocks Condition and Position (Post-test Joint Function)	N/A	N/A
<b>THORAX:</b>		
Jacket & Abdomen Condition	X	X
Stacked Shoulder Foams and Bolts	X	X
Rib Wrap Condition	X	X
Rib Cage Spring and Support Assembly	X	X
Rib Cage Bolts	X	X
Damper Rear Attachment Ring, Pivot Pins, and Bracket	X	X
Location and Adjustment of Chest Pot Bracket and Collars	N/A	N/A
Chest Pot Rod End Nuts and Eyebolt	N/A	
Arm Foam Orientation/Condition	X	X
Thorax/Lumbar Spine Bolts / Condition and Separation from End Caps	X	X
Adjust rib cage position to full extension	X	
<b>PELVIS:</b>		
Iliac Crest Bone	X	X
Flesh Condition	X	X
Tightness and Alignment of H-Point Tool Insert	X	
Hips Range of Motion and 1-2g Adjustment (before calibration only)	X	
Upper Femur Bolt Adjustment and Position	X	
<b>LEGS AND FEET:</b>		
Knee Skins and Castings Condition	X	X
Femur Load Cell Bolts	X	
Breakaway Femur Bolts - function	X	
Knee Joint Function and Range of Motion	X	X
Leg Skin Condition and Position	X	X
Ankle Range of Motion	X	X
Foot Condition	X	X
<b>OTHER:</b>		
Cleanliness	X	
Target Position	X	
Clothes and Shoes BLUE	X	
One G Joint Adjustments	X	
Verify channels against assembly and Check connectors (intact & labeled)	X	
ATTACH TEMPERATURE LOGGER TO DUMMY / DOWNLOAD	X	X

\* Items checked during calibration; these items need checked when the dummy is used without recalibration

Pre Test Inspection Completed By: J. Clarridge Date: 09/24/07

Post Test Inspection Completed By: J. Clarridge Date: 09/26/07

Appendix D

Test Equipment List and Calibration Information

Sign Convention  
SAE J211 MAR95

Accelerometers:

+X: Forward  
+Y: Rightward  
+Z: Downward

Potentiometers:

+Chest longitudinal deflection: Outward  
+Chest lateral deflection: Rightward  
+Seat belt displacement: Outward  
+Seat belt extension: Elongation  
+Knee slider displacement: Distance between femur and tibia increased (in relation to a seated dummy)

Rotation potentiometers:

+About the X-axis: Left foot-eversion  
Right foot-inversion  
+About the Y-axis: Left/right foot-dorsiflexion  
+About the Z-axis: Left foot-internal  
Right foot-external

Load cells:

+Femur force: Tension  
+Seat belt force: Tension  
+Barrier force: Tension

Neck load cells:

+X force: Head pushed rearward  
+Y force: Head pushed leftward  
+Z force: Head pulled upward (tension on neck)  
+X moment: Left ear rotating toward left shoulder  
+Y moment: Chin rotating toward chest  
+Z moment: Chin rotating toward left shoulder

Tibia load cells:

+X force: Ankle forward, knee rearward  
+Y force: Ankle rightward, knee leftward  
+Z force: Tension  
+X moment: Bottom of tibia moving leftward  
+Y moment: Bottom of tibia moving rearward

Sign Convention (Continued)  
SAE J211 MAR95

Lumbar load cells: +X force: Chest rearward, pelvis forward  
+Y force: Chest leftward, pelvis rightward  
+Z force: Chest upward, pelvis downward  
+X moment: Left shoulder toward left hip  
+Y moment: Sternum toward front of legs  
+Z moment: Right shoulder forward, left shoulder rearward

Frequency Response Classes  
SAE J211 MAR95

<u>Typical Test Measurements</u>	<u>Channel Class</u>
Vehicle Structural Accelerations for use in:	
Total vehicle comparison	60
Collision simulation input	60
Component analysis	600
Integration for velocity or displacement	180
Barrier Face Forces	60
Belt Restraint System Loads	60
Anthropomorphic Test Device	
Head accelerations (linear and angular)	1000
Neck	
Forces	1000
Moments	600
Thorax	
Spine accelerations	180
Rib accelerations	1000
Sternum accelerations	1000
Deflections	600
Lumbar	
Forces	1000
Moments	1000
Pelvis	
Accelerations	1000
Forces	1000
Moments	1000
Femur/Knee/Tibia/Ankle	
Forces	600
Moments	600
Displacements	180
Sled Accelerations	60
Steering Column Loads	600
Head Form Accelerations	1000

The direction column on the following sheets describes the transducer output as mounted and wired in the test location. The polarity column indicates whether a polarity change occurred during data acquisition to conform to J211 MAR95. See Report Sign Convention sheet for description of data output as presented in the report: occasionally channels have been adjusted in post-acquisition processing to conform to J211 MAR95.

**Channel Report Test Number 070925**

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	DAS			Assembly
					Units	Flip	Positive Polarity	
1	Trig D1	10ZERO00000V00A	EVENT		1 Logic	+	Bipolar	
2	P45012	11HEADCG00SHACXA	Head Accel X	1000	g	-	Rearward	1-066 SID/HIII ASTC.001
3	P49031	11HEADCG00SHACYA	Head Accel Y	1000	g	-	Leftward	1-066 SID/HIII ASTC.002
4	P49049	11HEADCG00SHACZA	Head Accel Z	1000	g	-	Upward	1-066 SID/HIII ASTC.003
5	P46517	11HEADCGRDSHACXA	Head Accel X Red	1000	g	-	Rearward	1-066 SID/HIII ASTC.004
6	P49042	11HEADCGRDSHACYA	Head Accel Y Red	1000	g	-	Leftward	1-066 SID/HIII ASTC.005
7	P45017	11HEADCGRDSHACZA	Head Accel Z Red	1000	g	-	Upward	1-066 SID/HIII ASTC.006
			Neck Force X	8896	N	-	Head forward, chest rearward	1-066 SID/HIII ASTC.007
8	IF-205-289-FX	11NECKUP00SHFOXA	Neck Force Y	8896	N	+	Head leftward, chest rightward	1-066 SID/HIII ASTC.008
9	IF-205-289-FY	11NECKUP00SHFOYA	Neck Force Z	13344	N	+	Head upward, chest downward	1-066 SID/HIII ASTC.009
10	IF-205-289-FZ	11NECKUP00SHFOZA	Neck Moment X	282.5	Nm	-	Right ear toward right shoulder	1-066 SID/HIII ASTC.010
11	IF-205-289-MX	11NECKUP00SHMOXA	Neck Moment Y	282.5	Nm	+	Chin toward sternum	1-066 SID/HIII ASTC.011
12	IF-205-289-MY	11NECKUP00SHMOYA	Neck Moment Z	282.5	Nm	+	Chin toward left shoulder	1-066 SID/HIII ASTC.012
13	IF-205-289-MZ	11NECKUP00SHMOZA						
14	P49041	11RIBSLU00SHACYA	Left Upper Rib Y	800	g	+	Rightward	1-066 SID/HIII ASTC.013
15	P46516	11RIBSLURDSHACYA	Left Upper Rid Red Y	800	g	+	Rightward	1-066 SID/HIII ASTC.014
16	P49044	11RIBSLL00SHACYA	Left Lower Rib Y	800	g	+	Rightward	1-066 SID/HIII ASTC.015
17	P46510	11RIBSLLRDSHACYA	Left Lower Rib Red Y	800	g	+	Rightward	1-066 SID/HIII ASTC.016
18	P49035	11SPIN1200SHACYA	Lower Spine Y	400	g	-	Leftward	1-066 SID/HIII ASTC.017
19	P49022	11SPIN12RDSHACYA	Lower Spine Red Y	400	g	-	Leftward	1-066 SID/HIII ASTC.018
20	P46509	11PELVCG00SHACYA	Pelvis Accel Y	400	g	-	Leftward	1-066 SID/HIII ASTC.019
21	P45016	11PELVCGRDSHACYA	Pelvis Accel Red Y	400	g	-	Leftward	1-066 SID/HIII ASTC.020
22	P46512	14HEADCG00SHACXA	Head Accel X	1000	g	+	Forward	4-059 SID/HIII ASTC.001
23	P49052	14HEADCG00SHACYA	Head Accel Y	1000	g	+	Rightward	4-059 SID/HIII ASTC.002
24	P49038	14HEADCG00SHACZA	Head Accel Z	1000	g	-	Upward	4-059 SID/HIII ASTC.003
25	P49030	14HEADCGRDSHACXA	Head Accel X Red	1000	g	+	Forward	4-059 SID/HIII ASTC.004
26	P49043	14HEADCGRDSHACYA	Head Accel Y Red	1000	g	+	Rightward	4-059 SID/HIII ASTC.005
27	P49039	14HEADCGRDSHACZA	Head Accel Z Red	1000	g	-	Upward	4-059 SID/HIII ASTC.006
			Neck Force X	8896.4	N	-	Head forward, chest rearward	4-059 SID/HIII ASTC.007
28	1716A-1624-FX	14NECKUP00SHFOXA	Neck Force Y	8896.4	N	+	Head leftward, chest rightward	4-059 SID/HIII ASTC.008
29	1716A-1624-FY	14NECKUP00SHFOYA	Neck Force Z	13344.6	N	+	Head upward, chest downward	4-059 SID/HIII ASTC.009
30	1716A-1624-FZ	14NECKUP00SHFOZA	Neck Moment X	282.5	Nm	-	Right ear toward right shoulder	4-059 SID/HIII ASTC.010
31	1716A-1624-MX	14NECKUP00SHMOXA	Neck Moment Y	282.5	Nm	+	Chin toward sternum	4-059 SID/HIII ASTC.011
32	1716A-1624-MY	14NECKUP00SHMOYA	Neck Moment Z	282.5	Nm	+	Chin toward left shoulder	4-059 SID/HIII ASTC.012
33	1716A-1624-MZ	14NECKUP00SHMOZA						
34	P44972	14RIBSLU00SHACYA	Left Upper Rib Y	800	g	+	Rightward	4-059 SID/HIII ASTC.013

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Channel Report Test Number 070925

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	DAS		Assembly
						Flip	Positive Polarity	
35	P46514	14RIBSLURDSHACYA	Left Upper Rid Red Y	800	g	+	Rightward	4-059 SID/HIII ASTC.014
36	p54294	14RIBSLL00SHACYA	Left Lower Rib Y	800	g	+	Rightward	4-059 SID/HIII ASTC.015
37	P44985	14RIBSLLRDSHACYA	Left Lower Rib Red Y	800	g	+	Rightward	4-059 SID/HIII ASTC.016
38	P49055	14SPIN1200SHACYA	Lower Spine Y	400	g	-	Leftward	4-059 SID/HIII ASTC.017
39	P49046	14SPIN12RDSHACYA	Lower Spine Red Y	400	g	-	Leftward	4-059 SID/HIII ASTC.018
40	P49047	14PELVCG00SHACYA	Pelvis Accel Y	400	g	-	Leftward	4-059 SID/HIII ASTC.019
41	P45023	14PELVCGRDSHACYA	Pelvis Accel Red Y	400	g	-	Leftward	4-059 SID/HIII ASTC.020
42	P56967	16SILBFR0000ACXA	RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME (#1)	400	g	+	Forward	
43	P56940	16SILBFR0000ACYA	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME (#1)	1000	g	+	Rightward	
44	P56965	16SILBFR0000ACZA	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME (#1)	400	g	-	Upward	
45	P56985	16SILBRE0000ACXA	RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME (#2)	400	g	+	Forward	
46	P56916	16SILBRE0000ACYA	RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME (#2)	1000	g	-	Leftward	
47	P57028	16SILBRE0000ACZA	RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME (#2)	400	g	-	Upward	
48	P47556	18FORA000000ACXA	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME (#3)	1000	g	+	Forward	
49	P54843	18FORA000000ACYA	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME (#3)	1000	g	-	Leftward	
50	P47386	18FORA000000ACZA	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME (#3)	1000	g	-	Upward	
51	P54534	14SILBFR0000ACYA	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME (#5)	1000	g	+	Rightward	
52	P46607	14SILBRE0000ACYA	LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	1000	g	+	Rightward	
53	P56923	16VEHCRE0000ACYA	RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME (#7)	1500	g	+	Rightward	
54	P47508	11APILLO0000ACYA	LEFT LOWER A-POST (Y) ACCELERATION VS TIME (#14)	1500	g	-	Leftward	
55	P50930	11APILUP0000ACYA	LEFT UPPER A-POST (Y) ACCELERATION VS TIME (#15)	1500	g	-	Leftward	
56	P56939	14BPILLO0000ACYA	LEFT LOWER B-POST (Y) ACCELERATION VS TIME (#12)	1500	g	-	Leftward	
57	P48538	14BPILUP0000ACYA	LEFT UPPER B-POST (Y) ACCELERATION VS TIME (#13)	1500	g	-	Leftward	
58	P54821	11SETRFR0000ACYA	LEFT FRONT SEAT TRACK (Y) ACCELERATION VS TIME (#16)	1500	g	+	Rightward	
59	P54765	14SETRRE0000ACYA	LEFT REAR SEAT TRACK (Y) ACCELERATION VS TIME	1500	g	+	Rightward	
60	P57014	10VEHCCG0000ACXA	VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME (#18)	1000	g	+	Forward	
61	P56964	10VEHCCG0000ACYA	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME (#18)	1000	g	-	Leftward	
62	P57016	10VEHCCG0000ACZA	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME (#18)	1000	g	-	Upward	
63	P56920	M0VEHCCG0000ACXA	MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME (#1)	600	g	+	Forward	
64	P57025	M0VEHCCG0000ACYA	MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME(#1)	600	g	+	Rightward	
65	P56886	M0VEHCCG0000ACZA	MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME(#1)	600	g	-	Upward	
66	P57013	M7FRAM000000ACXA	MDB REAR (X) ACCELERATION VS TIME (#2)	600	g	+	Forward	
67	P57007	M7FRAM000000ACYA	MDB REAR (Y) ACCELERATION VS TIME (#2)	600	g	-	Leftward	
68	Bit.00	M3CONT000000VO00	MDB RIGHT CONTACT SWITCH	1	Logic	+	Bipolar	
69	Bit.01	M1CONT000000VO00	MDB LEFT CONTACT SWITCH	1	Logic	+	Bipolar	

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## Command File Test Number 070925

Channel	ISO Mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
1	11HEADCG00SHACXA	DRIVER HEAD X-AXIS ACCELERATION	1000	+	yes	1000
1A	11HEADCG00SHVEXA	DRIVER HEAD X-AXIS VELOCITY	180			
2	11HEADCG00SHACYA	DRIVER HEAD Y-AXIS ACCELERATION	1000	+	yes	1000
2A	11HEADCG00SHVEYA	DRIVER HEAD Y-AXIS VELOCITY	180			
3	11HEADCG00SHACZA	DRIVER HEAD Z-AXIS ACCELERATION	1000	+	yes	1000
3A	11HEADCG00SHVEZA	DRIVER HEAD Z-AXIS VELOCITY	180			
3B	11HEADCG00SHACRA	DRIVER HEAD RESULTANT ACCELERATION	1000			
4	11NECKUP00SHFOXA	DRIVER NECK X-AXIS SHEAR FORCE	1000	+	yes	8896
5	11NECKUP00SHFOYA	DRIVER NECK Y-AXIS SHEAR FORCE	1000	+	yes	8896
6	11NECKUP00SHFOZA	DRIVER NECK Z-AXIS AXIAL FORCE	1000	+	yes	13344
7	11NECKUP00SHMOXA	DRIVER NECK MOMENT ABOUT X AXIS	600	+	yes	282.5
8	11NECKUP00SHMOYA	DRIVER NECK MOMENT ABOUT Y AXIS	600	+	yes	282.5
9	11NECKUP00SHMOZA	DRIVER NECK MOMENT ABOUT Z AXIS	600	+	yes	282.5
10	11RIBSLU00SHACYA	DRIVER UPPER RIB Y-AXIS ACCELERATION	1000	+	yes	800
10A	11RIBSLU00SHVEYA	DRIVER UPPER RIB Y-AXIS VELOCITY	180			
11	11RIBSLL00SHACYA	DRIVER LOWER RIB Y-AXIS ACCELERATION	1000	+	yes	800
11A	11RIBSLL00SHVEYA	DRIVER LOWER RIB Y-AXIS VELOCITY	180			
12	11SPIN1200SHACYA	DRIVER LOWER SPINE Y-AXIS ACCELERATION	1000	+	yes	400
12A	11SPIN1200SHVEYA	DRIVER LOWER SPINE Y-AXIS VELOCITY	180			
13	11PELVCG00SHACYA	DRIVER PELVIS Y-AXIS ACCELERATION	1000	+	yes	400
13A	11PELVCG00SHVEYA	DRIVER PELVIS Y-AXIS VELOCITY	180			
14	14HEADCG00SHACXA	LEFT REAR PASSENGER HEAD X-AXIS ACCELERATION	1000	+	yes	1000
14A	14HEADCG00SHVEXA	LEFT REAR PASSENGER HEAD X-AXIS VELOCITY	180			
15	14HEADCG00SHACYA	LEFT REAR PASSENGER HEAD Y-AXIS ACCELERATION	1000	+	yes	1000
15A	14HEADCG00SHVEYA	LEFT REAR PASSENGER HEAD Y-AXIS VELOCITY	180			
16	14HEADCG00SHACZA	LEFT REAR PASSENGER HEAD Z-AXIS ACCELERATION	1000	+	yes	1000
16A	14HEADCG00SHVEZA	LEFT REAR PASSENGER HEAD Z-AXIS VELOCITY	180			
16B	14HEADCG00SHACRA	LEFT REAR PASSENGER HEAD RESULTANT ACCELERATION	1000			
17	14NECKUP00SHFOXA	LEFT REAR PASSENGER NECK X-AXIS SHEAR FORCE	1000	+	yes	8896.4
18	14NECKUP00SHFOYA	LEFT REAR PASSENGER NECK Y-AXIS SHEAR FORCE	1000	+	yes	8896.4
19	14NECKUP00SHFOZA	LEFT REAR PASSENGER NECK Z-AXIS AXIAL FORCE	1000	+	yes	13344.6
20	14NECKUP00SHMOXA	LEFT REAR PASSENGER NECK MOMENT ABOUT X AXIS	600	+	yes	282.5
21	14NECKUP00SHMOYA	LEFT REAR PASSENGER NECK MOMENT ABOUT Y AXIS	600	+	yes	282.5
22	14NECKUP00SHMOZA	LEFT REAR PASSENGER NECK MOMENT ABOUT Z AXIS	600	+	yes	282.5
23	14RIBSLU00SHACYA	LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION	1000	+	yes	800
23A	14RIBSLU00SHVEYA	LEFT REAR PASSENGER UPPER RIB Y-AXIS VELOCITY	180			
24	14RIBSLL00SHACYA	LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION	1000	+	yes	800
24A	14RIBSLL00SHVEYA	LEFT REAR PASSENGER LOWER RIB Y-AXIS VELOCITY	180			
25	14SPIN1200SHACYA	LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION	1000	+	yes	400
25A	14SPIN1200SHVEYA	LEFT REAR PASSENGER LOWER SPINE Y-AXIS VELOCITY	180			
26	14PELVCG00SHACYA	LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION	1000	-	yes	400

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Channel	ISO Mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
26A	14PELVCG00SHVEYA	LEFT REAR PASSENGER PELVIS Y-AXIS VELOCITY	180			
27	11HEADCGRDSHACXA	DRIVER HEAD X-AXIS REDUNDANT ACCELERATION	1000	+	yes	1000
27A	11HEADCGRDSHVEXA	DRIVER HEAD X-AXIS REDUNDANT VELOCITY	180			
28	11HEADCGRDSHACYA	DRIVER HEAD Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	1000
28A	11HEADCGRDSHVEYA	DRIVER HEAD Y-AXIS REDUNDANT VELOCITY	180			
29	11HEADCGRDSHACZA	DRIVER HEAD Z-AXIS REDUNDANT ACCELERATION	1000	+	yes	1000
29A	11HEADCGRDSHVEZA	DRIVER HEAD Z-AXIS REDUNDANT VELOCITY	180			
29B	11HEADCGRDSHACRA	DRIVER HEAD RESULTANT REDUNDANT ACCELERATION	1000			
30	11RIBSLURDSHACYA	DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	800
30A	11RIBSLURDSHVEYA	DRIVER UPPER RIB Y-AXIS REDUNDANT VELOCITY	180			
31	11RIBSLLRDSHACYA	DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	800
31A	11RIBSLLRDSHVEYA	DRIVER LOWER RIB Y-AXIS REDUNDANT VELOCITY	180			
32	11SPIN12RDSHACYA	DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	400
32A	11SPIN12RDSHVEYA	DRIVER LOWER SPINE Y-AXIS REDUNDANT VELOCITY	180			
33	14HEADCGRDSHACXA	LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT ACCELERATION	1000	+	yes	1000
33A	14HEADCGRDSHVEXA	LEFT REAR PASSENGER HEAD X-AXIS REDUNDANT VELOCITY	180			
34	14HEADCGRDSHACYA	LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	1000
34A	14HEADCGRDSHVEYA	LEFT REAR PASSENGER HEAD Y-AXIS REDUNDANT VELOCITY	180			
35	14HEADCGRDSHACZA	LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT ACCELERATION	1000	+	yes	1000
35A	14HEADCGRDSHVEZA	LEFT REAR PASSENGER HEAD Z-AXIS REDUNDANT VELOCITY	180			
35B	14HEADCGRDSHACRA	LEFT REAR PASSENGER HEAD RESULTANT REDUNDANT ACCELERATION	1000			
36	14RIBSLURDSHACYA	LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	800
36A	14RIBSLURDSHVEYA	LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT VELOCITY	180			
37	14RIBSLLRDSHACYA	LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	800
37A	14RIBSLLRDSHVEYA	LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT VELOCITY	180			
38	14SPIN12RDSHACYA	LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION	1000	+	yes	400
38A	14SPIN12RDSHVEYA	LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT VELOCITY	180			
39	16SILBFR0000ACXA	RIGHT SIDE SILL AT FRONT SEAT X-AXIS ACCELERATION	60	+	yes	400
39A	16SILBFR0000VEXA	RIGHT SIDE SILL AT FRONT SEAT X-AXIS VELOCITY	180			
40	16SILBFR0000ACYA	RIGHT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION	60	+	yes	1000
40A	16SILBFR0000VEYA	RIGHT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY	180			
41	16SILBFR0000ACZA	RIGHT SIDE SILL AT FRONT SEAT Z-AXIS ACCELERATION	60	+	yes	400
41A	16SILBFR0000VEZA	RIGHT SIDE SILL AT FRONT SEAT Z-AXIS VELOCITY	180			
41B	16SILBFR0000ACRA	RIGHT SIDE SILL AT FRONT SEAT RESULTANT ACCELERATION	60			
42	16SILBRE0000ACXA	RIGHT SIDE SILL AT REAR SEAT X-AXIS ACCELERATION	60	+	yes	400
42A	16SILBRE0000VEXA	RIGHT SIDE SILL AT REAR SEAT X-AXIS VELOCITY	180			
43	16SILBRE0000ACYA	RIGHT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION	60	+	yes	1000
43A	16SILBRE0000VEYA	RIGHT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY	180			
44	16SILBRE0000ACZA	RIGHT SIDE SILL AT REAR SEAT Z-AXIS ACCELERATION	60	+	yes	400
44A	16SILBRE0000VEZA	RIGHT SIDE SILL AT REAR SEAT Z-AXIS VELOCITY	180			
44B	16SILBRE0000ACRA	RIGHT SIDE SILL AT REAR SEAT RESULTANT ACCELERATION	60			

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**Command File Test Number 070925**

Channel	ISO Mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
45	18FORA000000ACXA	REAR FLOORPAN ABOVE AXLE X-AXIS ACCELERATION	60	+	yes	1000
45A	18FORA000000VEXA	REAR FLOORPAN ABOVE AXLE X-AXIS VELOCITY	180			
46	18FORA000000ACYA	REAR FLOORPAN ABOVE AXLE Y-AXIS ACCELERATION	60	+	yes	1000
46A	18FORA000000VEYA	REAR FLOORPAN ABOVE AXLE Y-AXIS VELOCITY	180			
47	18FORA000000ACZA	REAR FLOORPAN ABOVE AXLE Z-AXIS ACCELERATION	60	+	yes	1000
47A	18FORA000000VEZA	REAR FLOORPAN ABOVE AXLE Z-AXIS VELOCITY	180			
47B	18FORA000000ACRA	REAR FLOORPAN ABOVE AXLE RESULTANT ACCELERATION	60			
48	14SILBFR0000ACYA	LEFT SIDE SILL AT FRONT SEAT Y-AXIS ACCELERATION	60	+	yes	1000
48A	14SILBFR0000VEYA	LEFT SIDE SILL AT FRONT SEAT Y-AXIS VELOCITY	180			
48B	14SILBFR0000DCYA	LEFT SIDE SILL AT FRONT SEAT Y-AXIS DISPLACEMENT	180			
49	14SILBRE0000ACYA	LEFT SIDE SILL AT REAR SEAT Y-AXIS ACCELERATION	60	+	yes	1000
49A	14SILBRE0000VEYA	LEFT SIDE SILL AT REAR SEAT Y-AXIS VELOCITY	180			
49B	14SILBRE0000DCYA	LEFT SIDE SILL AT REAR SEAT Y-AXIS DISPLACEMENT	180			
50	16VEHCRE0000ACYA	RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS ACCELERATION	60	+	yes	1500
50A	16VEHCRE0000VEYA	RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS VELOCITY	180			
50B	16VEHCRE0000DCYA	RIGHT REAR OCCUPANT COMPARTMENT Y-AXIS DISPLACEMENT	180			
51	11APILLO0000ACYA	LEFT LOWER A-POST Y-AXIS ACCELERATION	60	+	yes	1500
51A	11APILLO0000VEYA	LEFT LOWER A-POST Y-AXIS VELOCITY	180			
52	11APILUP0000ACYA	LEFT UPPER A-POST Y-AXIS ACCELERATION	60	+	yes	1500
52A	11APILUP0000VEYA	LEFT UPPER A-POST Y-AXIS VELOCITY	180			
53	14BPILLO0000ACYA	LEFT LOWER B-POST Y-AXIS ACCELERATION	60	+	yes	1500
53A	14BPILLO0000VEYA	LEFT LOWER B-POST Y-AXIS VELOCITY	180			
54	14BPILUP0000ACYA	LEFT UPPER B-POST Y-AXIS ACCELERATION	60	+	yes	1500
54A	14BPILUP0000VEYA	LEFT UPPER B-POST Y-AXIS VELOCITY	180			
55	11SETRFR0000ACYA	LEFT FRONT SEAT TRACK Y-AXIS ACCELERATION	60	+	yes	1500
55A	11SETRFR0000VEYA	LEFT FRONT SEAT TRACK Y-AXIS VELOCITY	180			
56	14SETRRE0000ACYA	LEFT REAR SEAT TRACK Y-AXIS ACCELERATION	60	+	yes	1500
56A	14SETRRE0000VEYA	LEFT REAR SEAT TRACK Y-AXIS VELOCITY	180			
57	10VEHCCG0000ACXA	VEHICLE CENTER OF GRAVITY X-AXIS ACCELERATION	60	+	yes	1000
57A	10VEHCCG0000VEXA	VEHICLE CENTER OF GRAVITY X-AXIS VELOCITY	180			
58	10VEHCCG0000ACYA	VEHICLE CENTER OF GRAVITY Y-AXIS ACCELERATION	60	+	yes	1000
58A	10VEHCCG0000VEYA	VEHICLE CENTER OF GRAVITY Y-AXIS VELOCITY	180			
59	10VEHCCG0000ACZA	VEHICLE CENTER OF GRAVITY Z-AXIS ACCELERATION	60	+	yes	1000
59A	10VEHCCG0000VEZA	VEHICLE CENTER OF GRAVITY Z-AXIS VELOCITY	180			
59B	10VEHCCG0000ACRA	VEHICLE CENTER OF GRAVITY RESULTANT ACCELERATION	60			
60	M0VEHCCG0000ACXA	MDB CENTER OF GRAVITY X-AXIS ACCELERATION	60	+	yes	600
60A	M0VEHCCG0000VEXA	MDB CENTER OF GRAVITY X-AXIS VELOCITY	180			
61	M0VEHCCG0000ACYA	MDB CENTER OF GRAVITY Y-AXIS ACCELERATION	60	+	yes	600
61A	M0VEHCCG0000VEYA	MDB CENTER OF GRAVITY Y-AXIS VELOCITY	180			
62	M0VEHCCG0000ACZA	MDB CENTER OF GRAVITY Z-AXIS ACCELERATION	60	+	yes	600
62A	M0VEHCCG0000VEZA	MDB CENTER OF GRAVITY Z-AXIS VELOCITY	180			

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**Command File Test Number 070925**

Channel	ISO Mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
62B	M0VEHCCG0000ACRA	MDB CENTER OF GRAVITY RESULTANT ACCELERATION	60			
63	M7FRAM000000ACXA	MDB REAR X-AXIS ACCELERATION	60	+	yes	600
63A	M7FRAM000000VEXA	MDB REAR X-AXIS VELOCITY	180			
64	M7FRAM000000ACYA	MDB REAR Y-AXIS ACCELERATION	60	+	yes	600
64A	M7FRAM000000VEYA	MDB REAR Y-AXIS VELOCITY	180			
65	M3CONT000000VO00	MDB RIGHT CONTACT SWITCH	0	+	no	1
66	M1CONT000000VO00	MDB LEFT CONTACT SWITCH	0	+	no	1
67A	11RIBSLU00SHACYA	DRIVER UPPER RIB Y-AXIS ACCELERATION	100	+	yes	800
67B	11RIBSLL00SHACYA	DRIVER LOWER RIB Y-AXIS ACCELERATION	100	+	yes	800
67C	11SPIN1200SHACYA	DRIVER LOWER SPINE Y-AXIS ACCELERATION	100	+	yes	400
67D	11PELVCG00SHACYA	DRIVER PELVIS Y-AXIS ACCELERATION	100	+	yes	400
67E	14RIBSLU00SHACYA	LEFT REAR PASSENGER UPPER RIB Y-AXIS ACCELERATION	100	+	yes	800
67F	14RIBSLL00SHACYA	LEFT REAR PASSENGER LOWER RIB Y-AXIS ACCELERATION	100	+	yes	800
67G	14SPIN1200SHACYA	LEFT REAR PASSENGER LOWER SPINE Y-AXIS ACCELERATION	100	+	yes	400
67H	14PELVCG00SHACYA	LEFT REAR PASSENGER PELVIS Y-AXIS ACCELERATION	100	-	yes	400
67I	11RIBSLURDASHACYA	DRIVER UPPER RIB Y-AXIS REDUNDANT ACCELERATION	100	+	yes	800
67J	11RIBSLLRDASHACYA	DRIVER LOWER RIB Y-AXIS REDUNDANT ACCELERATION	100	+	yes	800
67K	11SPIN12RDASHACYA	DRIVER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION	100	+	yes	400
67L	14RIBSLURDASHACYA	LEFT REAR PASSENGER UPPER RIB Y-AXIS REDUNDANT ACCELERATION	100	+	yes	800
67M	14RIBSLLRDASHACYA	LEFT REAR PASSENGER LOWER RIB Y-AXIS REDUNDANT ACCELERATION	100	+	yes	800
67N	14SPIN12RDASHACYA	LEFT REAR PASSENGER LOWER SPINE Y-AXIS REDUNDANT ACCELERATION	100	+	yes	400

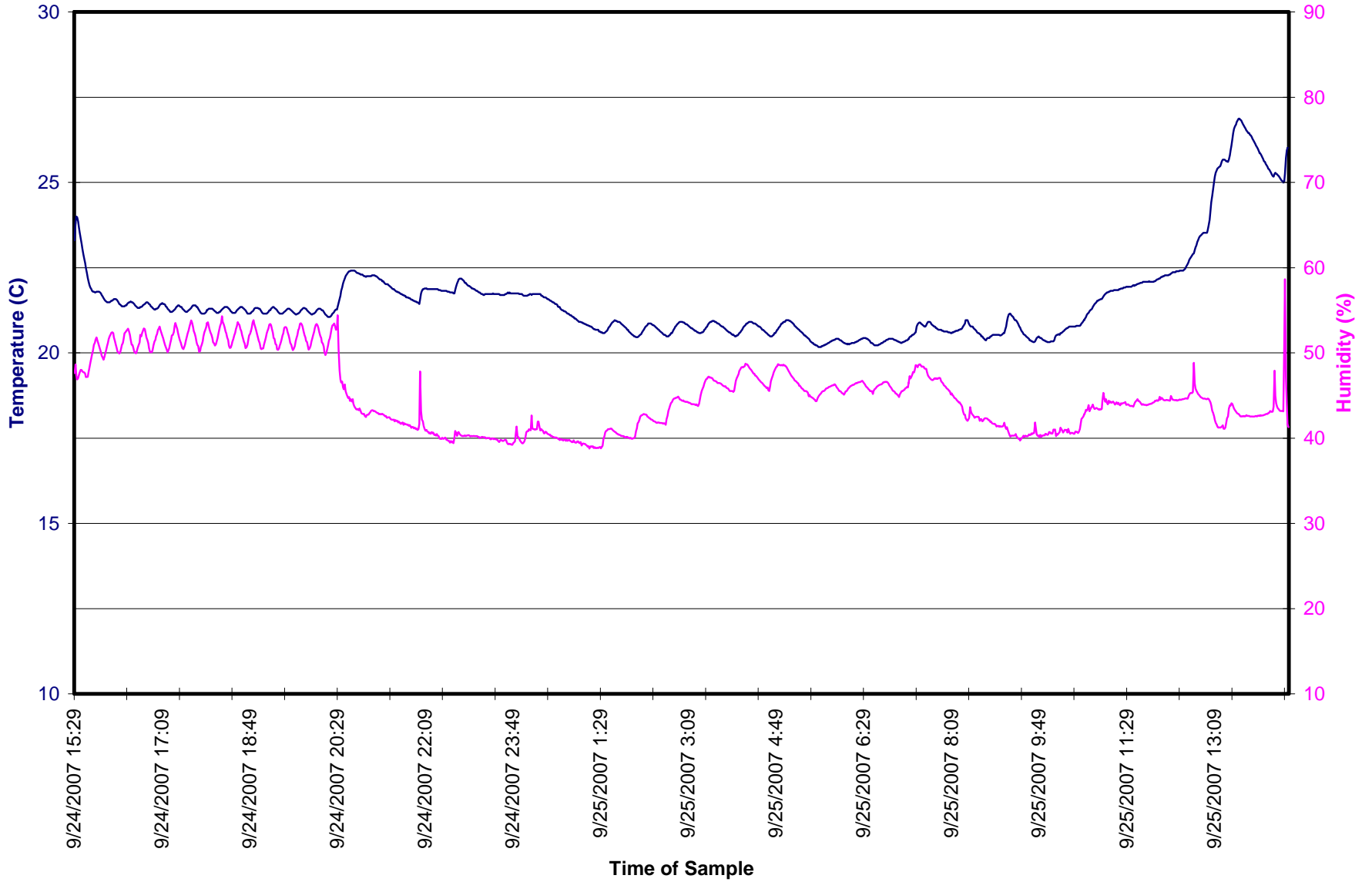
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# CERTIFICATE OF CONFORMITY

Certificate No. **29880**  
Serial No. **GK334**

Cellbond Composites Ltd  
5 Stukeley Business Centre  
Blackstone Road  
Huntingdon  
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Product Description	FMVSS 214 - 1750x740x550mm Spec with 1.6 3/8 5052 Painted Grey
Cellbond Part No.	70NHTSASIUS G

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	Test Results	GR No.	Blk No.
1	21868-8	CHC13030094GJ	N/A
2	20406-8	CHC0509024GD	N/A

### Declaration.

The above moving deformable barrier has been manufactured in accordance with the provisions of FMVSS 214.

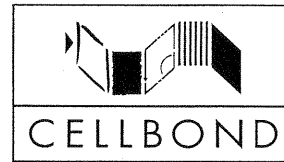
### Additional Information...

company registration  
England 1944904

registered office  
5 Stukeley Business Centre  
Blackstone Road  
Huntingdon  
Cambridgeshire  
PE29 6EF

Cellbond Offices  
United Kingdom  
United States of America





NHTSA / IIHS DEFORMABLE SIDE IMPACT BARRIER  
 ALUMINIUM HONEYCOMB CERTIFICATION  
 STATIC TEST RESULTS

MAIN BLOCK  
 Core: 1.6 3/8 5052

Required Crush Strength  
 42.5 PSI to 47.5 PSI

Test No: 21868-8

GR No: CHC13030094GJ

Block No: N/A

	Crush Strength (PSI)			RESULT
	0.25 to 0.38 inch	0.38 to 0.52 inch	0.52 to 0.65 inch	
Sample* 1	46.384	46.432	47.110	PASS
Sample 2	45.561	45.801	45.718	PASS
Sample 3	45.276	45.050	45.026	PASS
Sample 4	43.496	44.568	44.016	PASS
Sample 5	42.543	42.947	43.194	PASS
Sample 6	44.412	44.047	44.627	PASS
Sample 7	42.773	43.535	43.724	PASS
Sample 8	45.121	46.457	46.758	PASS

Seven out of the eight samples must fulfil the crush strength requirement in order to pass the block certification

\*Sample size and location as per R94.

**RESULT: PASSED**

NHTSA / IIHS DEFORMABLE SIDE IMPACT BARRIER  
MAIN BLOCK

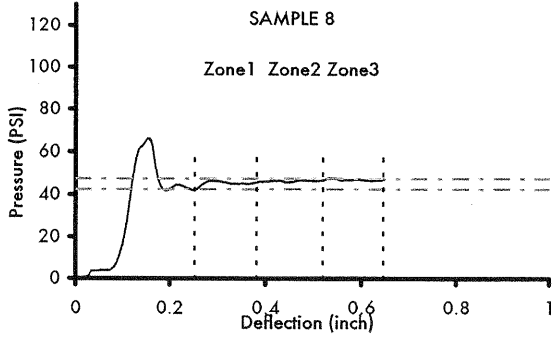
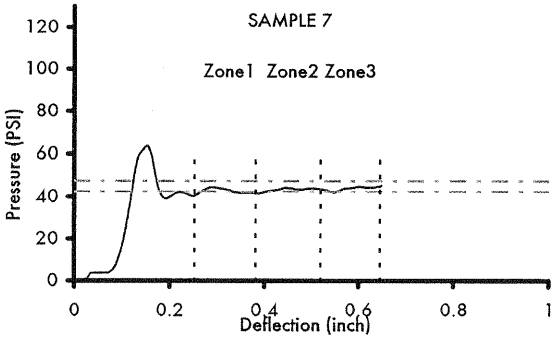
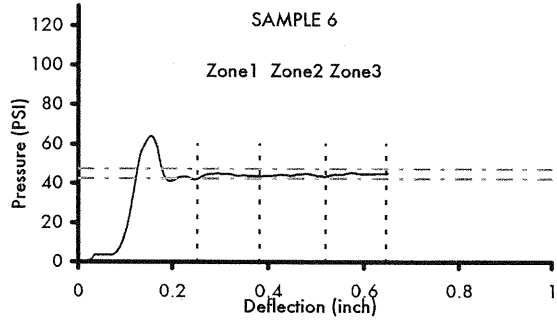
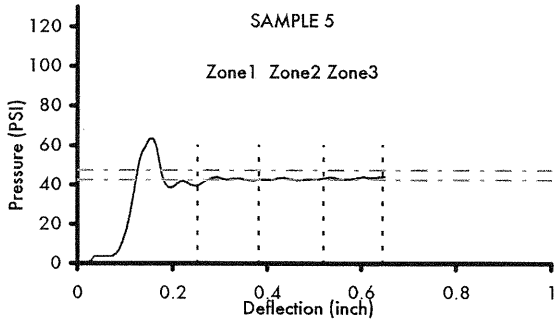
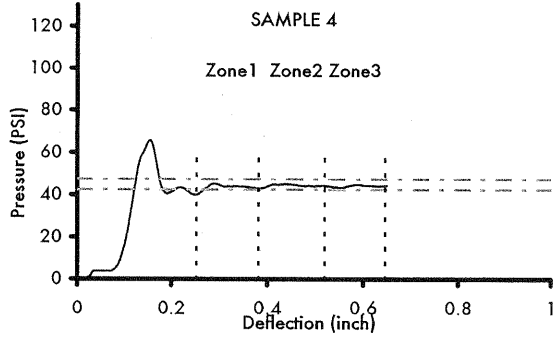
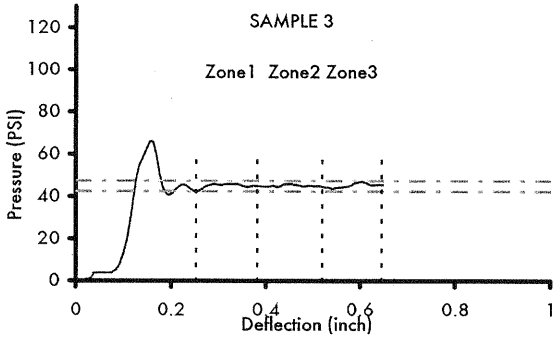
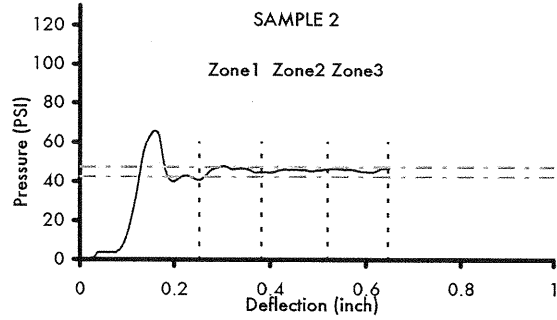
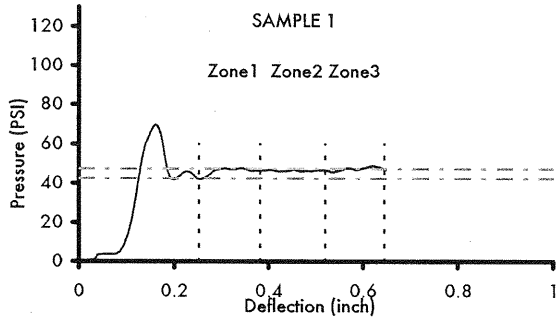
Honeycomb Type: 1.6 3/8 5052  
Higher Acceptable Crush Strength Limit: 47.5 PSI  
Lower Acceptable Crush Strength Limit: 42.5 PSI

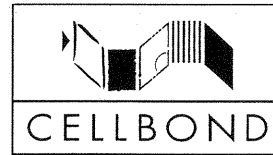
Section 1: 0.25 - 0.38 inch  
Section 2: 0.38 - 0.52 inch  
Section 3: 0.52 - 0.65 inch  
Speed: 0.25 inch/min

Test No: 21868-8

GR No: CHC13030094GJ

Block No: N/A





NHTSA / IIHS DEFORMABLE SIDE IMPACT BARRIER  
ALUMINIUM HONEYCOMB CERTIFICATION  
STATIC TEST RESULTS

BUMPER

Core: 5.2 1/4 3003

Required Crush Strength  
230 PSI to 260 PSI

Test No: 20406-8

GR No: CHC0509024GD

Block No: N/A

	Crush Strength (PSI)			RESULT
	0.25 to 0.38	0.38 to 0.52	0.52 to 0.65	
Sample* 1	242.14	241.66	244.90	PASS
Sample 2	230.86	233.90	235.32	PASS
Sample 3	240.41	243.52	244.86	PASS
Sample 4	244.34	246.20	244.84	PASS
Sample 5	246.46	249.51	247.10	PASS
Sample 6	234.10	239.08	239.75	PASS
Sample 7	238.13	239.80	240.12	PASS
Sample 8	239.59	239.30	237.99	PASS

Seven out of the eight samples must fulfil the crush strength requirement in order to pass the block certification

\*Sample size and location as per R94.

**RESULT: PASSED**

NHTSA / IIHS DEFORMABLE SIDE IMPACT BARRIER  
BUMPER

Honeycomb Type: 5.2 1/4 3003  
Higher Acceptable Crush Strength Limit: 260 PSI  
Lower Acceptable Crush Strength Limit: 230 PSI

Section 1: 0.25 - 0.38 inch  
Section 2: 0.38 - 0.52 inch  
Section 3: 0.52 - 0.65 inch  
Speed: 0.25 inch/min

Test No: 20406-8

GR No: CHC0509024GD

Block No: N/A

