

**Vehicle Research and Test Center
MDB into Left Side of
2005 VW Jetta
World SID Evaluation
TRC Inc. Test Number: 080911-2**

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Section 1.0

Purpose and Test Procedure

Purpose

This side impact test is part of the current FMVSS 214D Side Impact Protection Regulation, dated September 7, 2007. It was conducted for the National Highway Traffic Safety Administration (NHTSA) and Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC Inc.). The purpose of this test was to evaluate the 50th percentile male WorldSID dummy in a 2005 VW Jetta in the moving deformable barrier test configuration. The test was conducted in accordance with the National Highway Traffic Safety Administration's Laboratory Test Procedure for FMVSS 214 "Dynamics" Side Protection (TP214D-08, dated December 15, 2006).

Section 2.0

Side Impact Test

Summary of Side Impact Test

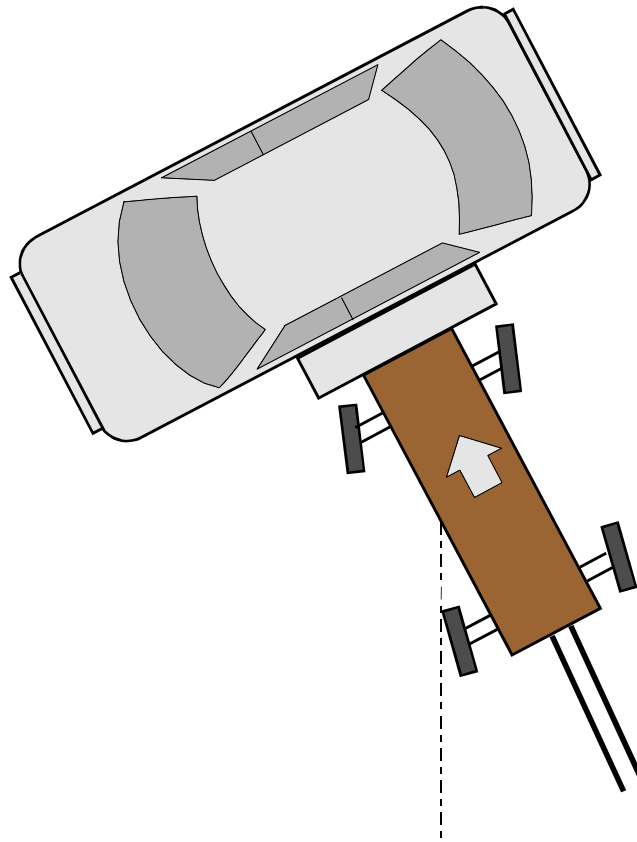
A 2005 VW Jetta was impacted on the driver's side by a moving deformable barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 52.9 km/h (32.9 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on September 11, 2008. Pre-test and post-test photographs of the test vehicle, the moving deformable barrier (MDB), and the side impact dummies (World SID) are included in Appendix A.

The MDB was equipped with a 214 style deformable barrier face and eight (8) accelerometers to measure longitudinal, lateral, and vertical axis accelerations. The barrier's specified impact velocity range was 52.0 to 53.6 km/h.

Two restrained Side Impact Dummies (World SID) were seated in the driver (Pos. #1) and left rear (Pos. #4) designated seating positions using instructions specified in the World SID Seating Procedure Draft 1.0 and VRTC personnel. Both World SIDs were calibrated prior to this test and were restrained by 3-point seat belts and a side curtain airbag. The side impact test was documented by one (1) real-time camera and nine (9) high-speed digital cameras. Camera locations and other pertinent camera information are included in this report.

The World SID instrumentation is detailed in Table 4. One hundred twenty-eight (128) dummy channels of acceleration, force, moment, and displacement data were collected for this test.

A summary of the side impact dummy (World SID) configuration and verification test data can be found in Appendix C. A total of 182 channels of data were recorded. Appendix B contains the vehicle, barrier, and dummy response data traces.



	Front World SID (#014)	Rear World SID (#016)
HIC36 (g) CFC 1000	131	131
Upper Rib Deflection (mm) CFC 600		
Rib 1	36 mm	14 mm
Rib 2	40 mm	17 mm
Rib 3	35 mm	18 mm
Lower Rib Deflection (mm) CFC 600		
Rib 1	27 mm	21 mm
Rib 2	21 mm	23 mm
Lower Spine Resultant (g) CFC 180	48 g	38 g
Pubic Symph. Force (N) CFC 600	1355 N	871 N

	2005 VW Jetta
Vehicle Test Weight	1739.2 kg (3834.3 lbs)
Impact Point (Horizontal)-behind center of front axle	355 mm
Maximum Crush	186 mm Level 3
Impact Speed	32.9 mph

Data Acquisition Explanations

The vehicle's driver lap belt load cell force data channel, 11SEBE0000B5FO0A, over scaled at 13.04 milliseconds.

Section 3

Summary of Test Results

Table 1 General Test Vehicle Parameter Data

Test Vehicle: 2005 VW Jetta

Test Date: 09/11/08

TEST VEHICLE INFORMATION

Make	Volkswagen
Model	Jetta
Body Style	Passenger Car
VIN	3VWRF71K55M626157
Color	Silver
Odometer Reading	61,963
Transmission	6-Speed Automatic
Final Drive	Front wheel drive
Number of Cylinders	5
Engine Displacement	2.5 L
Engine Placement	Straight
Air Conditioning	Yes
Power Windows	Yes
Power Seats	No
Cruise Control	Yes
Tinted Glass	Yes
Keyless Entry	Yes

TEST VEHICLE OPTIONS

Driver Front Airbag	Yes
Driver Side Curtain Airbag	Yes
Driver Side Torso Airbag	Yes
Rear Passenger Side/Curtain Airbag	Yes
Rear Passenger Side Torso Airbag	No
Power Steering	Yes
Power Door Locks	Yes
Tilt Wheel	Yes
Anti-lock Brakes	Yes
Traction Control	No
Bucket Seats	Yes
Rear Defroster	Yes
2-Door/4-Door	4
AM/FM Radio	Yes
CD Player	Yes
Sun Roof	No
Telescoping Steering Wheel/Column	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Volkswagen De Mexico
Date of Manufacture	04/05

GVWR (lb)	4343
GAWR Front (lb)	2337
GAWR Rear (lb)	2116

Measured Parameter	Front	Mid	Rear	Total
Type of Seats	Bucket	N/A	Split-Bench	
Number Of Occupants	2	N/A	3	5
Capacity Wt. (VCW) (kg)				441
Cargo Wt. (RCLW) (kg)				101

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2005 VW Jetta

Test Date 09/11/08

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	445.6	296.2		479.8	396.6	
Right	kg	439.8	304.6		454.6	408.2	
Ratio	%	59.6	40.4		53.7	46.3	
Totals	kg	885.4	600.8	1486.2	934.4	804.8	1739.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1486.2
Weight of World SID ATD (2)	kg	76.0
Rated Cargo/Luggage Weight (RCLW)	kg	101.0
Calculated Vehicle Target Weight (TVTW)	kg	1739.2

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	678	663	694	667	1039
As Tested	mm	664	654	646	644	1189
Fully Loaded	mm	669	665	640	640	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	2570
Total Vehicle Length at Left Side	mm	4310
Total Vehicle Length at Centerline	mm	4557
Total Vehicle Length at Right Side	mm	4310
Weight of Ballast in Trunk	kg	45.4
Amount of Stoddard Solvent in Fuel Tank	liters	51.1

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Impact Reference Line From Front Axle	mm	350
Impact Point	mm	355
Impact Point Difference	mm	5 mm Right

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2005 VW Jetta

Test Date 09/11/08

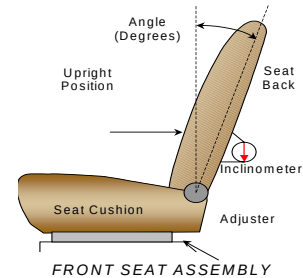
WORLD SID RIDING POSITION

The driver and passenger seat back is positioned to the manufacturer's designated angle.

Driver: Total Number of detents: 38

Test detent (with the forward-most detent defined as 0): 20

Driver seat back angle: The back was adjusted to 6.7° forward of vertical measured at the head restraint.



Was the driver seatback adjusted during seating: ___ No X Yes

If yes, how far and final angle: The seatback was adjusted 1 notch, final angle 8.9°.

Was the rear passenger seatback adjusted during seating: ___ No ___ Yes X N/A

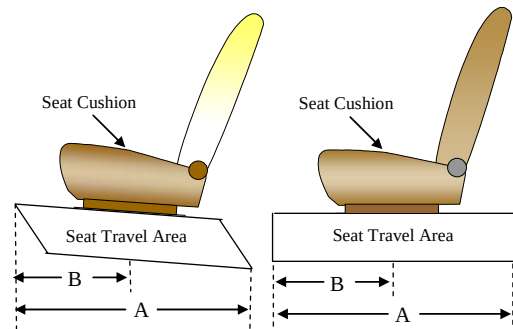
If yes, how far and final angle: _____.

SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with vertical adjustment at the lowest position obtainable for both the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	250 mm	Mid
Rear Seat	Fixed	Fixed



SEAT BELT UPPER ANCHORAGE

	Total No. of Positions	Placed in Position No.
Driver Seat	5	3
Rear Seat	Fixed	N/A

Position number one is the uppermost adjustment position.

Table 1 General Test Vehicle Parameter Data, Continued

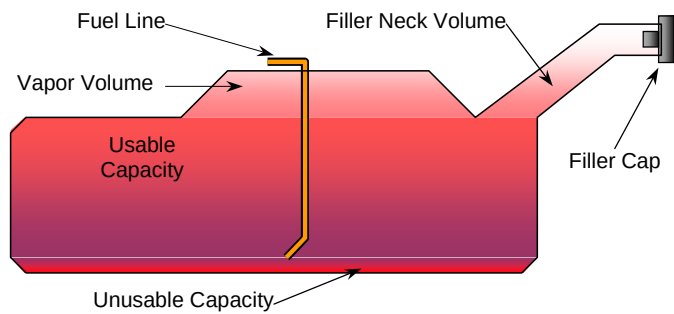
Test Vehicle: 2005 VW Jetta

Test Date 09/11/08

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	54.9
Usable Capacity used for FMVSS 301	54.9
Actual Amount of Solvent used	51.1

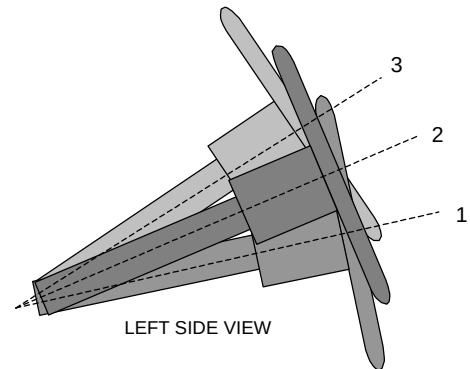
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies the area under the rear seat.



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. An aluminum plate is placed across the rim of the steering wheel, an inclinometer is placed on the plate and the angle is measured.



STEERING COLUMN ASSEMBLY

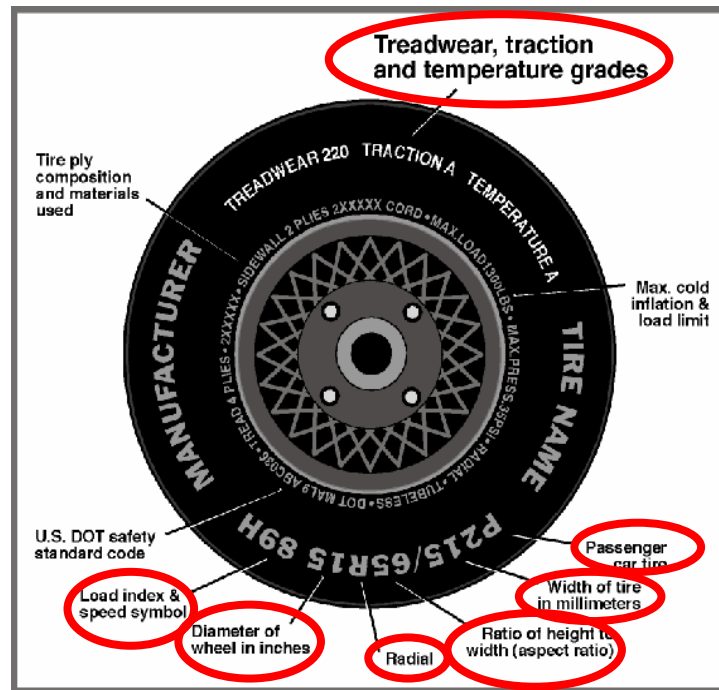
STEERING WHEEL/COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost Position	23.6	0
Geometric Center Position	25.3	27.5
Uppermost Position	28.5	55

Table 2 Test Vehicle Tire Information

Test Vehicle: 2005 VW Jetta

Test Date 09/11/08



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	220	220
Recommended Tire Size	P205/55R16	P205/55R16
Tire Size on Vehicle	P205/55R16	P205/55R16
Tire Manufacturer	Michelin	Michelin
Tire Name	Primacy	Primacy
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	91H	91H
Treadwear	620	620
Traction Grade	A	A
Temperature Grade	A	A

Table 3 Post-Test Observations

Test Vehicle: 2005 VW Jetta

Test Date 09/11/08

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Front Seat World SID	Rear Seat World SID
Dummy Type / Serial No.	World SID / 014	World SID / 016
Head Contact	Side curtain airbag	Side curtain airbag, side header
Upper Torso Contact	Side airbag	Door panel
Lower Torso Contact	Door panel	Door panel
Left Knee Contact	Door panel	Door panel
Right Knee Contact	None	None

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Unlocked
Left Side Door Opening	Jammed & Latched	Jammed & Latched
Right Side Door Opening	Closed & Latched	Closed & Latched
Seat Movement	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Did not separate from vehicle
Sill Separation	Did not separate from vehicle
Windshield Damage	None
Window Damage	Left front and rear broken
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 01		Left Rear (Passenger) Occupant Location 04	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	No	N/A	N/A
Side Airbag	Yes	Yes	No	N/A
Head Airbag	No	N/A	No	N/A
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	No	Yes	No
Seat Belt Load Limiter	No	N/A	No	N/A

Section 4

Occupant and Vehicle Information

Table 4 World SID Instrumentation Data

Vehicle: 2005 VW Jetta

Test Number: 080911-2

Driver Dummy Serial Number: 014

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Head Acceleration	X	9.2	165.5	15.1	59.2
	Y	35.9	51.0	8.2	230.9
	Z	6.8	202.3	14.3	60.2
	R	37.9	51.0		
Head Angular Displacement	X	1322.0	36.2	1525.2	53.0
	Y	1948.1	83.0	1946.3	47.4
	Z	1445.1	66.5	2329.7	47.0
Upper Neck Force	X	116.6	99.0	219.8	169.8
	Y	66.5	157.9	427.2	66.7
	Z	931.7	66.6	248.7	211.6
Upper Neck Moment	X	45.0	55.1	10.2	82.4
	Y	22.3	83.1	26.7	57.7
	Z	16.9	61.4	6.0	244.7
Lower Neck Force	X	214.2	57.0	274.4	167.4
	Y	742.6	54.6	322.7	82.6
	Z	1101.2	67.0	134.3	211.5
Lower Neck Moment	X	11.7	54.1	52.9	235.6
	Y	47.2	184.6	21.5	96.6
	Z	17.5	68.3	5.0	128.7
Shoulder Force	X	307.9	48.2	84.1	86.6
	Y	2223.6	51.4	154.1	84.1
	Z	122.4	114.1	561.2	55.0
Shoulder Displacement	Y	50.2	55.0	2.8	201.0
Shoulder Acceleration	X	30.9	32.6	44.3	36.5
	Y	98.9	33.2	96.7	32.7
	Z	120.6	34.2	197.3	32.7
	R	219.8	32.7		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 VW Jetta

Test Number: 080911-2

Driver Dummy Serial Number: 014

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
T1 Acceleration	X	5.8	125.6	10.7	48.8
	Y	6.3	186.1	40.3	53.8
	Z	6.0	58.2	3.1	33.9
	R	41.7	53.8		
T4 Acceleration	X	4.8	125.4	10.1	48.1
	Y	6.8	157.2	41.9	52.6
	Z	5.0	34.5	6.0	62.6
	R	43.0	52.6		
T12 Acceleration	X	8.4	65.1	8.3	35.5
	Y	6.9	158.8	48.1	49.8
	Z	3.8	34.6	4.7	79.9
	R	48.4	49.7		
Thorax Rib 1 Displacement	Y	36.1	54.4	1.3	80.6
Thorax Rib 1 Acceleration	X	27.0	86.1	35.8	45.7
	Y	92.2	40.4	116.4	43.5
	Z	77.3	43.4	140.0	43.7
	R	149.5	43.6		
Thorax Rib 2 Displacement	Y	39.6	53.3	3.2	295.8
Thorax Rib 2 Acceleration	X	36.6	45.7	25.6	37.4
	Y	63.9	40.2	131.5	36.0
	Z	45.2	35.8	99.7	36.1
	R	138.7	36.0		
Thorax Rib 3 Displacement	Y	35.0	51.8	3.0	181.3
Thorax Rib 3 Acceleration	X	42.9	47.2	29.3	37.2
	Y	53.1	40.4	97.7	36.7
	Z	45.4	46.9	91.1	36.9
	R	105.6	36.7		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 VW Jetta

Test Number: 080911-2

Driver Dummy Serial Number: 014

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Abdominal Rib 1 Displacement	Y	27.2	50.2	7.9	114.5
Abdominal Rib 1 Acceleration	X	30.1	43.3	18.4	76.6
	Y	93.2	41.0	55.0	40.7
	Z	58.9	40.6	116.3	40.8
	R	120.0	40.8		
Abdominal Rib 2 Displacement	Y	21.2	49.8	4.7	188.7
Abdominal Rib 2 Acceleration	X	30.0	90.9	28.1	71.4
	Y	77.6	38.8	20.2	88.2
	Z	30.3	38.4	62.4	38.6
	R	77.7	38.8		
Lumbar Force	X	216.6	67.0	415.5	29.8
	Y	1121.7	49.2	177.1	101.4
	Z	170.9	32.2	444.9	85.1
Lumbar Moment	X	83.7	47.3	17.4	99.8
	Y	22.1	33.4	17.0	65.5
	Z	1.0	15.4	11.1	180.9
Pelvis Acceleration	X	7.9	35.0	15.7	28.6
	Y	41.5	40.2	7.9	71.6
	Z	7.7	66.2	12.0	39.3
	R	44.2	40.2		
Pubic Force	Y	1355.5	39.5	65.6	67.6

Positive Direction

Longitudinal: Forward
 Lateral: Rightward
 Vertical: Downward

Negative Direction

Longitudinal: Rearward
 Lateral: Leftward
 Vertical: Upward

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 VW Jetta

Test Number: 080911-2

Passenger Dummy Serial Number: 016

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Head Acceleration	X	7.7	230.0	11.4	52.2
	Y	35.8	54.6	5.1	285.6
	Z	13.1	46.4	3.7	23.4
	R	37.4	54.6		
Head Angular Displacement	X	1366.8	54.6	1575.0	30.3
	Y	749.1	30.2	709.5	13.4
	Z	831.3	30.8	1616.2	43.5
Upper Neck Force	X	154.5	49.8	212.9	238.6
	Y	394.5	49.8	112.0	263.9
	Z	525.6	46.2	221.8	64.2
Upper Neck Moment	X	10.2	137.2	30.6	44.5
	Y	6.4	115.8	18.8	49.4
	Z	3.7	49.8	3.6	248.4
Lower Neck Force	X	278.2	240.0	170.2	48.3
	Y	777.8	45.8	141.1	214.6
	Z	600.5	46.2	191.0	64.8
Lower Neck Moment	X	59.9	55.4	25.9	195.7
	Y	16.5	137.1	53.6	235.4
	Z	3.8	63.0	10.2	232.4
Shoulder Force	X	61.8	166.9	227.2	15.4
	Y	210.1	67.6	1410.2	41.6
	Z	7.9	204.5	435.1	47.2
Shoulder Displacement	Y	24.9	45.8	1.9	100.1
Shoulder Acceleration	X	63.5	19.8	47.8	19.9
	Y	54.1	20.4	110.9	19.8
	Z	65.8	21.5	128.1	19.8
	R	170.0	19.8		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 VW Jetta

Test Number: 080911-2

Passenger Dummy Serial Number: 016

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
T1 Acceleration	X	2.7	170.6	6.0	77.0
	Y	27.3	37.4	5.4	129.2
	Z	5.2	64.1	3.1	21.4
	R	27.6	37.4		
T4 Acceleration	X	2.3	166.5	4.8	76.6
	Y	26.6	32.6	5.9	128.6
	Z	4.6	63.4	4.5	21.2
	R	26.8	44.1		
T12 Acceleration	X	3.3	60.2	7.0	21.0
	Y	38.0	31.1	10.1	91.0
	Z	4.3	69.9	2.9	21.3
	R	38.3	31.1		
Thorax Rib 1 Displacement	Y	13.7	37.9	1.6	123.4
Thorax Rib 1 Acceleration	X	17.6	26.3	35.4	39.1
	Y	82.4	19.1	29.7	22.6
	Z	34.7	27.0	68.1	33.1
	R	84.3	19.2		
Thorax Rib 2 Displacement	Y	17.2	41.0	0.8	237.0
Thorax Rib 2 Acceleration	X	40.0	12.2	43.3	13.0
	Y	73.4	17.8	44.1	27.7
	Z	38.3	27.5	32.7	27.8
	R	75.4	17.8		
Thorax Rib 3 Displacement	Y	17.8	42.1	0.9	236.6
Thorax Rib 3 Acceleration	X	32.0	27.6	36.3	27.8
	Y	62.5	27.8	104.2	27.4
	Z	99.2	27.4	144.5	27.5
	R	166.8	27.5		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 VW Jetta

Test Number: 080911-2

Passenger Dummy Serial Number: 016

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Abdominal Rib 1 Displacement	Y	20.8	36.2	1.5	206.6
Abdominal Rib 1 Acceleration	X	44.2	13.7	46.0	36.7
	Y	67.5	13.7	124.8	27.8
	Z	97.9	28.1	164.0	27.9
	R	165.3	27.9		
Abdominal Rib 2 Displacement	Y	22.9	36.2	2.7	257.0
Abdominal Rib 2 Acceleration	X	45.1	20.6	94.6	15.4
	Y	121.0	15.4	45.7	20.6
	Z	42.9	21.0	73.9	20.7
	R	151.6	15.4		
Lumbar Force	X	172.2	132.1	233.6	229.8
	Y	659.9	26.9	508.4	90.7
	Z	1158.0	59.4	154.4	98.3
Lumbar Moment	X	37.3	31.8	45.7	95.0
	Y	11.1	18.5	8.7	134.0
	Z	8.6	136.3	4.8	67.4
Pelvis Acceleration	X	8.1	29.6	10.9	17.4
	Y	46.0	23.3	13.6	70.8
	Z	12.5	23.4	14.2	52.8
	R	47.4	23.3		
Pubic Force	Y	871.2	27.1	76.9	266.9

Positive Direction

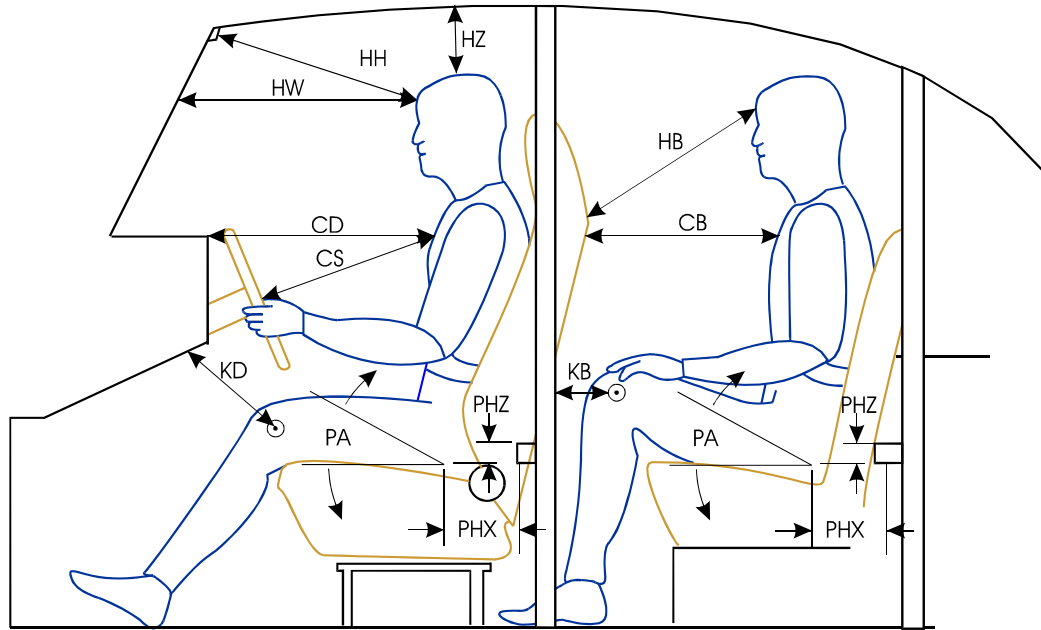
Longitudinal: Forward
 Lateral: Rightward
 Vertical: Downward

Negative Direction

Longitudinal: Rearward
 Lateral: Leftward
 Vertical: Upward

Figure 1 World SID Longitudinal Clearance Dimensions

Vehicle: 2005 VW Jetta



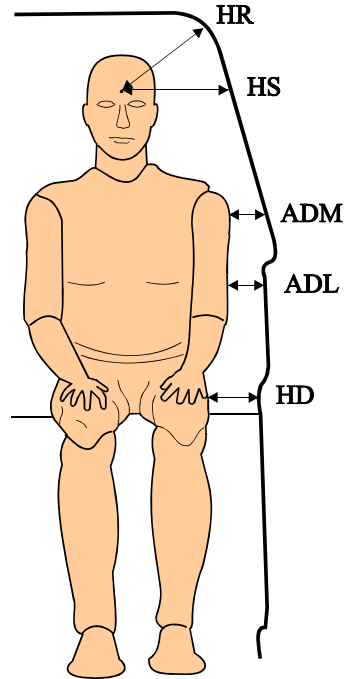
Left Side View

Driver Code	Pass. Code	Measurement Description	Driver S/N 014		Passenger S/N 016	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	453			
HW		Head to Windshield	773			
HZ		Head to Roof	222			
NR	NB	Nose to Rim/Nose to Seatback	498		519	
CD	CB	Chest to Dash or Seatback	639		492	
CS		Chest to Steering Wheel	436			
KDL	KBL	Left Knee to Dash or Seatback	157	22.0	71	32.7
KDR	KBR	Right Knee to Dash or Seatback	158	25.6	88	47.1
PA°	PA°	Pelvic Angle		44.6		39.6
PHX	PHX	H-Point to Striker (X-Axis)	165		204	
PHZ	PHZ	H-Point to Striker (Z-Axis)	219		208	

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

Figure 2 World SID Lateral Clearance Dimensions

Vehicle: 2005 VW Jetta



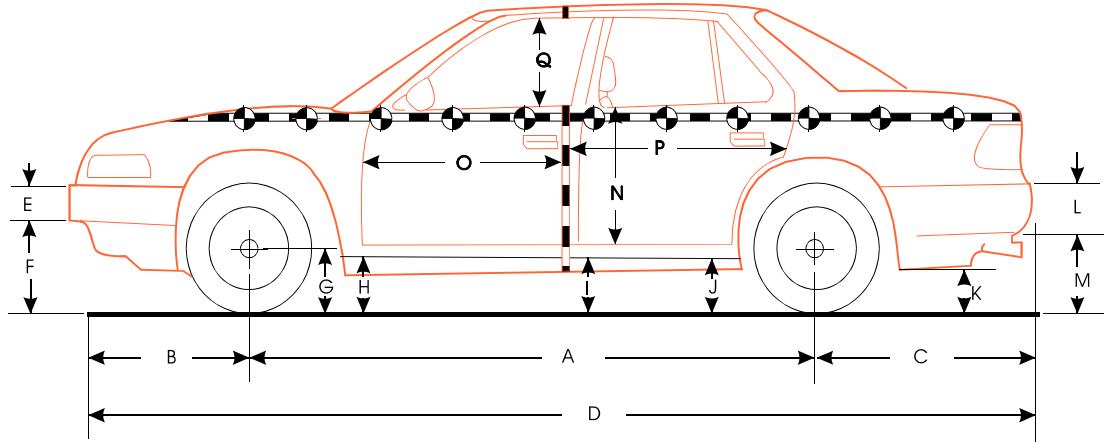
Code	Measurement Description	Units	Driver S/N 014	Passenger S/N 016
HR	Head to Side Header	mm	241	203
HS	Head to Side Window	mm	375	316
AD	Arm to Door, Upper	mm	124	102
AD	Arm to Door, Lower	mm	133	63
HD	H-Point to Door	mm	125	95

		Driver Angles Degrees	Passenger Angles Degrees
Head	X	-0.1	-1.6
	Y	1.9	2.2
Thorax	X	-0.4	-0.4
	Y	-0.5	1.5
Pelvis	X	0.7	-4.5
	Y	-0.3	2.3

Measured from the tilt sensors in the dummy
Passenger legs hitting seatback put pelvis in slight bind.

Figure 3 Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2005 VW Jetta



Left Side View

Note: All dimensions are in millimeters with tolerance of ± 0.1 mm

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	2570	2570	2573	-3
B	885	885	925	-40
C	1102	1102	1127	-25
D	4557	4557	4561	-4
E	129	129	129	0
F	450	454	434	20
G	297	297	259	38
G1	266	254	251	3
H	269	256	254	2
I	300	275	279	-4
J1	293	176	174	2
J2	311	272	274	-2
K	280	228	236	-8
L	218	218	218	0
M	438	382	400	-18
N	698	698	668	30
O	755	755	743	12
P	1284	1284	1256	28
Q	420	420	403	17
R	4310	4310	4305	5
S	4310	4310	4291	19
T	1293	1293	1157	136

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

Table 5 Vehicle Structural Measurements^{1,2}

	Elements	Pre-Test
1	Total Length	4557
2	Total Width	1760
3	Bumper Top Height	540
4	Bumper Bottom Height	365
5	Longitudinal Member Top Height	492
6	Longitudinal Member Bottom Height	406
7	Distance Between Longitudinal Members	1040
7'	Longitudinal Member Width	62
8	Engine Top Height	852
9	Engine Bottom Height	158
10	Engine and Gearbox Width	800
11	Front Bumper - Engine Distance	365
12	Front Shock Absorber Fixing Height	865
13	Bonnet Leading Edge Height	695
14	Front Shock Absorber Fixing Width	1130
15	Front Bumper - Front Axle Distance	885
16	Front Axle - A Pillar Distance	510
17	A Pillar - B Pillar Distance	1000
18	B Pillar - Rear Axle Distance	1050
19	B Pillar - C Pillar Distance	890
20	Roof Sill Bottom Height	1288
21	Roof Sill Top Height	1360
22	Floor Sill Bottom Height	293
23	Floor Sill Top Height	388

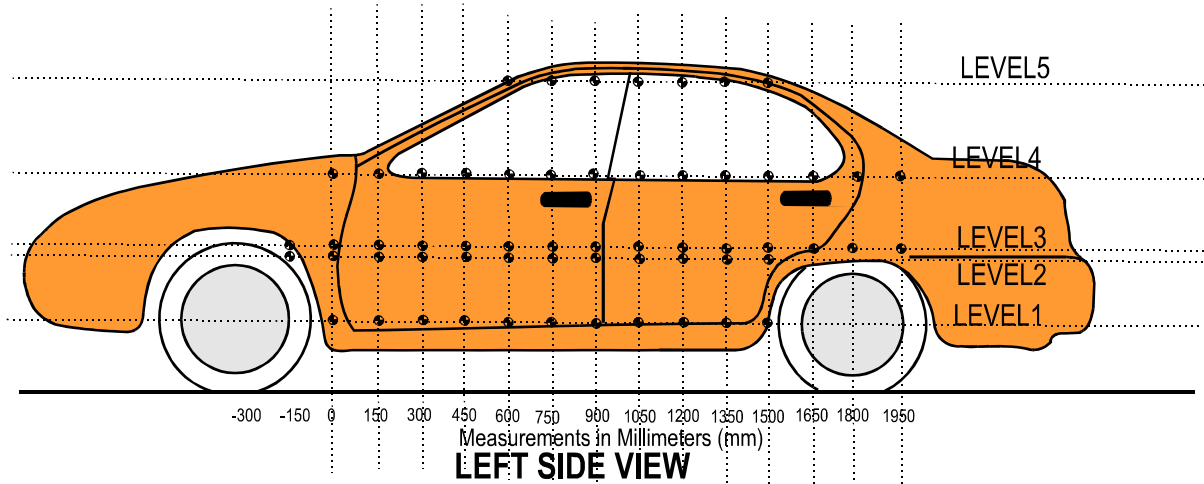
All distance measurements are in millimeters.

¹ Taken from INSIA report, “Structural Survey of Cars, Methodology of the Main Resistant Elements in the Car Body”, March 1999.

² The vertical measurements from the ground are adjusted based on the test vehicle’s pre-test attitude measurements.

Figure 4 Vehicle Side Measurements

Vehicle: 2005 VW Jetta



Measurements are taken when the vehicle is in the “As Tested” configuration.

Measurements along the vertical 750 mm line shown above.

Measurements vehicle forward of the impact line are negative.

All measurements below in mm.

Level	Measurement Description	Height Above Ground
5	Window Top	1385
4	Window Sill	910
3	Mid Door	635
2	Occupant H-Point	495
1	Side Sill	280

Table 6 Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2005 VW Jetta

Location	Height		(mm) From Impact Point													
			-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750
Level 1 Side Sill	280	Pre										852	854	855	856	855
		Post										821	812	800	796	788
		Crush										31	42	55	60	67
Level 2 H-Point	495	Pre									873	864	866	866	867	867
		Post									829	791	737	704	690	689
		Crush									44	73	129	162	177	178
Level 3 Mid-Door	635	Pre								878	867	867	871	873	875	876
		Post								867	824	789	745	730	716	706
		Crush								11	43	78	126	143	159	170
Level 4 Window Sill	910	Pre								795	806	810	817	823	827	832
		Post								809	812	789	784	779	770	760
		Crush								-14	-6	21	33	44	57	72
Level 5 Window Top	1385	Pre										738	700	662	628	607
		Post										738	702	664	629	607
		Crush										0	-2	-2	-1	0

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

Note: Negative measurements are vehicle forward of the impact point.

The crush profile grid is established prior to test day based on an estimated impact point.

Table 6 Vehicle Exterior Crush Profiles - All Levels, Continued

Vehicle: 2005 VW Jetta

Location	Height		(mm) From Impact Point												
			900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
Level 1 Side Sill	280	Pre	854	854	853	852	850	847	844						
		Post	777	764	756	762	766	766	807						
		Crush	77	90	97	90	84	81	37						
Level 2 H-Point	495	Pre	867	866	864	861	858	854	858						
		Post	700	711	719	696	698	701	767						
		Crush	167	155	145	165	160	153	91						
Level 3 Mid-Door	635	Pre	876	876	874	872	869	866	863	869					
		Post	707	736	736	709	683	692	764	804					
		Crush	169	140	138	163	186	174	99	65					
Level 4 Window Sill	910	Pre	834	836	837	836	835	834	830	822	820	813	805	794	
		Post	755	772	767	756	744	730	725	772	814	794	798	795	
		Crush	79	64	70	80	91	104	105	50	6	19	7	-1	
Level 5 Window Top	1385	Pre	594	585	579	576	574	576	580	593	637	694			
		Post	593	585	579	576	574	574	579	593	636	692			
		Crush	1	0	0	0	0	2	1	0	1	2			

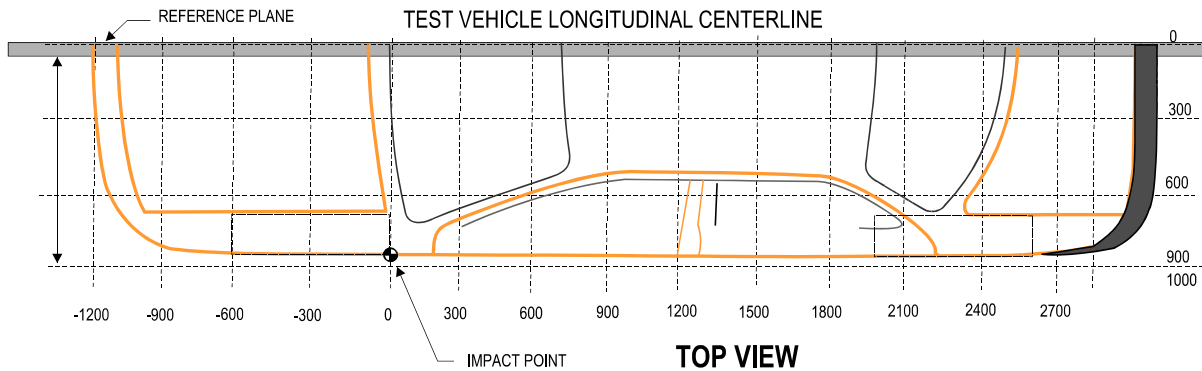
All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of ± 0.1 mm.

Figure 5 Vehicle Damage Profile Distances

Test Vehicle: 2005 VW Jetta

Test Date: 09/11/08

NOTE: All measurements were recorded using TRC Inc.'s FARO Arm with a tolerance of plus or minus 0.1 mm.



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 (+)

DAMAGE PROFILE DISTANCES

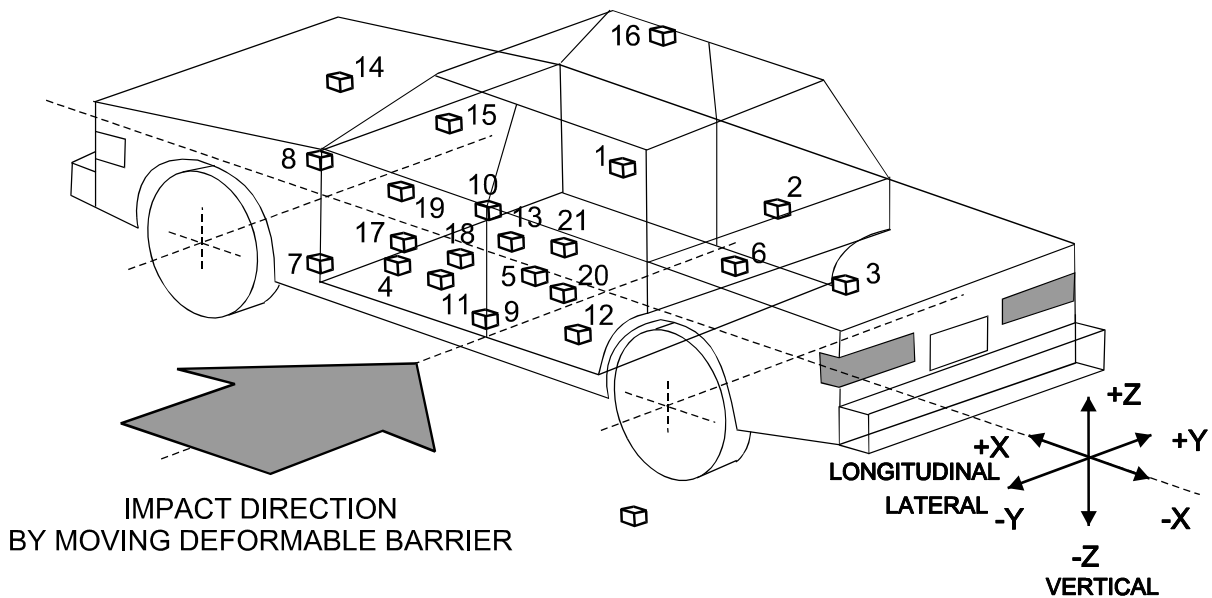
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2550 mm	4	794	795	-1
2	1950 mm	3	869	804	65
3	1350 mm	2	861	696	165
4	750 mm	2	867	689	178
5	150 mm	3	867	789	78
6	-150 mm	4	795	809	-14

Reference plane is parallel to test vehicle longitudinal centerline.

Given dimensions = Reference plane to car body.

Figure 6 Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2005 VW Jetta



- 1-Right Side Sill at Front Seat
- 2-Right Side Sill at Rear Seat
- 3-Rear Floorpan at Rear Seat
- 4-Left Side Sill at Front Seat
- 5-Left Side Sill at Rear Seat
- 6-Right Rear Occupant Compartment
- 7-Left Lower A-Pillar
- 8-Left Upper A-Pillar
- 9-Left Lower B-Pillar
- 10-Left Upper B-Pillar
- 11-Left Front Seat Track

- 12-Left Rear Seat Track
- 13-Vehicle Center of Gravity
- 14-Top of Engine
- 15-Center of Firewall
- 16-Right Roof Rail at Impact
- 17-Left Front Door Centerline
- 18-Left Front Door Mid Rear
- 19-Left Front Door Upper Centerline
- 20-Left Rear Door Mid Rear
- 21-Left Rear Door Upper Centerline

Table 7 Test Vehicle Accelerometer Locations and Data Summary

Vehicle: 2005 VW Jetta

Location	Coordinates (millimeters)			Positive Direction Max. Time (g) (ms)		Negative Direction Max. Time (g) (ms)	
	X	Y	Z				
1 Right Side Sill at Front Seat	3205	720	268				
Longitudinal				2.7	35.8	5.4	19.6
Lateral				18.2	28.9	2.0	128.4
Vertical				3.2	65.9	5.4	12.1
Resultant				18.5	29.0		
2 Right Side Sill at Rear Seat	2230	665	218				
Longitudinal				2.4	58.1	5.8	19.4
Lateral				18.9	8.2	2.2	122.5
Vertical				2.9	61.7	5.6	11.5
Resultant				19.4	8.3		
3 Rear Floorpan Above Axle	1330	0	455				
Longitudinal				1.9	8.9	6.9	14.0
Lateral				20.1	27.6	2.3	89.5
Vertical				6.2	17.8	5.6	13.0
Resultant				20.2	27.5		
4 Left Side Sill at Front Seat	3210	720	285				
Longitudinal							
Lateral				32.1	8.9	15.6	19.4
Vertical							
5 Left Side Sill at Rear Seat	2285	665	263				
Longitudinal							
Lateral				63.0	4.9	14.9	11.6
Vertical							

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2005 VW Jetta

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
6 Right Rear Occupant Compartment	2020	500	420				
Longitudinal							
Lateral				2.0	90.6	19.2	7.5
Vertical							
7 Left Lower A-Pillar	3460	800	505				
Longitudinal							
Lateral				52.2	2.0	29.5	20.2
Vertical							
8 Left Upper A-Pillar	3460	800	805				
Longitudinal							
Lateral				40.1	13.1	8.9	21.0
Vertical							
9 Left Lower B-Pillar	2400	786	560				
Longitudinal							
Lateral				73.6	3.4	31.6	15.0
Vertical							
10 Left Upper B-Pillar	2400	790	840				
Longitudinal							
Lateral				105.0	4.4	44.3	12.7
Vertical							
11 Left Front Seat Track	4490	595	294				
Longitudinal							
Lateral				37.7	14.2	7.9	20.2
Vertical							

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2005 VW Jetta

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
12 Left Rear Seat Track	1805	500	405				
Longitudinal							
Lateral				2.2	89.5	20.1	26.2
Vertical							
13 Vehicle Center of Gravity	2720	0	364				
Longitudinal				2.7	59.8	9.8	38.1
Lateral				29.5	18.2	5.3	26.2
Vertical				12.4	26.4	14.9	18.2
Resultant				33.2	18.2		
14 Top of Engine	4111	182	770				
Longitudinal				9.9	39.9	12.7	78.2
Lateral				19.6	42.1	3.1	93.4
Vertical							
15 Center Firewall	3831	35	745				
Longitudinal				3.2	68.0	11.9	24.5
Lateral				1.7	129.5	13.4	27.8
Vertical							
16 Right Roof Rail	2750	565	1262				
Longitudinal				8.6	23.9	4.5	32.5
Lateral				20.6	9.0	2.0	173.1
Vertical							
17 Left Front Door on Centerline	2932	790	646				
Longitudinal							
Lateral				149.6	5.3	74.8	23.6
Vertical							

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2005 VW Jetta

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
18 Left Front Door Mid Rear	2602	780	648				
Longitudinal							
Lateral				131.6	4.3	50.7	15.5
Vertical							
19 Left Front Door Upper Centerline	2932	790	847				
Longitudinal							
Lateral				61.8	17.5	63.6	22.4
Vertical							
20 Left Rear Door Mid Rear	1815	730	660				
Longitudinal							
Lateral				134.3	4.6	75.4	16.8
Vertical							
21 Left Rear Door Upper Centerline	1957	735	918				
Longitudinal							
Lateral				96.0	21.8	29.8	32.8
Vertical							

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.

Table 8 Deformable Barrier Face Profile

Vehicle: 2005 VW Jetta

Pre-Test			
Index	Xmm	Ymm	Zmm
1	-384.9	799.7	-51.8
2	-385.1	699.3	-51.7
3	-385.1	598.7	-52.6
4	-385.0	498.9	-52.9
5	-385.1	398.8	-52.9
6	-385.1	298.8	-52.9
7	-385.1	198.7	-53.4
8	-385.1	98.9	-53.4
9	-385.1	-1.9	-53.6
10	-385.1	-101.5	-54.0
11	-385.1	-201.4	-53.8
12	-385.1	-301.5	-53.9
13	-385.0	-401.2	-54.3
14	-384.8	-501.4	-54.4
15	-384.8	-601.0	-54.8
16	-384.5	-701.3	-54.7
17	-384.6	-801.2	-55.2
18	-384.6	800.2	-180.9
19	-384.8	699.5	-180.6
20	-384.7	599.2	-181.3
21	-384.9	498.7	-182.0
22	-384.6	399.7	-182.6

Post-Test			
Index	Xmm	Ymm	Zmm
1	-335.7	748.7	-101.6
2	-354.0	651.6	-97.6
3	-354.8	552.6	-94.9
4	-349.4	454.1	-91.7
5	-340.4	355.0	-87.3
6	-305.8	261.6	-86.0
7	-282.2	164.1	-84.3
8	-293.9	63.0	-84.0
9	-322.9	-34.0	-80.6
10	-359.8	-124.3	-70.6
11	-364.9	-221.3	-68.4
12	-357.6	-320.8	-67.9
13	-349.6	-420.4	-66.5
14	-338.5	-519.4	-66.0
15	-331.5	-618.4	-62.9
16	-321.5	-718.1	-58.1
17	-273.8	-804.4	-58.4
18	-333.0	744.7	-221.8
19	-355.1	647.8	-226.1
20	-355.0	548.1	-223.3
21	-352.9	448.1	-219.3
22	-349.3	348.5	-215.2

Difference			
Index	Xmm	Ymm	Zmm
1	-49.2	51.0	49.8
2	-31.1	47.7	45.9
3	-30.3	46.1	42.3
4	-35.6	44.8	38.8
5	-44.7	43.8	34.4
6	-79.3	37.2	33.1
7	-102.9	34.6	30.9
8	-91.2	35.9	30.6
9	-62.2	32.1	27.0
10	-25.3	22.8	16.6
11	-20.2	19.9	14.6
12	-27.5	19.3	14.0
13	-35.4	19.2	12.2
14	-46.3	18.0	11.6
15	-53.3	17.4	8.1
16	-63.0	16.8	3.4
17	-110.8	3.2	3.2
18	-51.6	55.5	40.9
19	-29.7	51.7	45.5
20	-29.7	51.1	42.0
21	-32.0	50.6	37.3
22	-35.3	51.2	32.6

Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 VW Jetta

Pre-Test			
Index	Xmm	Ymm	Zmm
23	-384.7	299.2	-182.8
24	-384.8	198.6	-183.1
25	-384.9	98.5	-182.7
26	-384.6	-0.9	-183.2
27	-384.7	-101.6	-183.6
28	-384.7	-201.5	-183.8
29	-384.6	-301.1	-184.1
30	-384.6	-401.3	-184.5
31	-384.4	-501.6	-184.8
32	-384.4	-601.3	-185.2
33	-384.2	-701.4	-185.5
34	-384.3	-801.7	-185.6
35	-384.1	800.1	-308.3
36	-384.3	699.9	-308.7
37	-384.3	599.6	-309.6
38	-384.3	499.2	-309.7
39	-384.1	400.1	-310.0
40	-384.1	299.9	-310.2
41	-384.5	200.0	-309.4
42	-384.0	100.2	-311.4
43	-384.1	-0.7	-311.5
44	-384.1	-100.4	-311.7

Post-Test			
Index	Xmm	Ymm	Zmm
23	-333.5	250.2	-210.2
24	-300.6	158.4	-209.0
25	-331.0	67.4	-203.6
26	-363.7	-25.0	-200.4
27	-376.0	-124.4	-198.5
28	-376.0	-224.1	-196.6
29	-373.1	-324.5	-194.5
30	-368.2	-423.8	-192.8
31	-356.5	-523.8	-191.2
32	-340.9	-621.6	-189.9
33	-323.7	-720.4	-188.4
34	-275.6	-806.2	-188.3
35	-271.2	741.9	-326.1
36	-281.2	644.2	-327.1
37	-288.7	544.0	-329.7
38	-290.9	443.7	-327.2
39	-288.2	343.5	-322.0
40	-282.6	244.9	-316.2
41	-282.3	145.3	-311.9
42	-309.0	52.4	-318.9
43	-333.0	-40.8	-314.2
44	-349.1	-129.6	-313.0

Difference			
Index	Xmm	Ymm	Zmm
23	-51.2	49.0	27.4
24	-84.2	40.2	25.9
25	-53.9	31.1	20.9
26	-20.9	24.1	17.2
27	-8.7	22.8	14.9
28	-8.7	22.6	12.8
29	-11.5	23.4	10.4
30	-16.4	22.5	8.3
31	-27.9	22.2	6.4
32	-43.5	20.3	4.7
33	-60.5	19.0	2.9
34	-108.7	4.5	2.7
35	-112.9	58.2	17.8
36	-103.1	55.7	18.4
37	-95.6	55.6	20.1
38	-93.4	55.5	17.5
39	-95.9	56.6	12.0
40	-101.5	55.0	6.0
41	-102.2	54.7	2.5
42	-75.0	47.8	7.5
43	-51.1	40.1	2.7
44	-35.0	29.2	1.3

Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 VW Jetta

Pre-Test				Post-Test				Difference			
Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm
45	-384.1	-200.5	-311.5	45	-361.5	-226.3	-320.2	45	-22.6	25.8	8.7
46	-384.1	-300.7	-311.0	46	-364.5	-326.2	-320.0	46	-19.6	25.5	9.0
47	-384.2	-401.1	-310.9	47	-361.3	-426.0	-317.6	47	-22.9	24.9	6.7
48	-384.1	-501.2	-311.2	48	-356.3	-525.7	-316.4	48	-27.8	24.5	5.2
49	-383.9	-600.9	-311.8	49	-344.9	-625.1	-315.0	49	-39.0	24.2	3.2
50	-383.8	-701.7	-311.7	50	-325.5	-722.8	-313.2	50	-58.3	21.1	1.5
51	-383.9	-801.9	-311.2	51	-285.0	-813.2	-312.2	51	-98.9	11.3	1.0
52	-471.4	800.5	-435.0	52	-319.3	733.8	-444.2	52	-152.1	66.7	9.2
53	-486.8	703.2	-435.3	53	-342.7	639.0	-446.4	53	-144.1	64.2	11.1
54	-487.0	603.0	-435.3	54	-348.4	539.8	-445.3	54	-138.6	63.2	10.0
55	-487.0	503.2	-435.3	55	-353.8	439.4	-444.7	55	-133.2	63.8	9.4
56	-487.1	403.5	-435.5	56	-351.8	340.2	-443.0	56	-135.3	63.3	7.5
57	-487.0	303.8	-435.5	57	-347.2	241.0	-441.4	57	-139.8	62.8	5.9
58	-487.0	203.5	-435.6	58	-350.2	140.8	-439.1	58	-136.8	62.7	3.5
59	-487.1	102.6	-436.1	59	-362.4	41.7	-436.8	59	-124.7	60.9	0.7
60	-487.3	2.3	-436.2	60	-376.2	-57.1	-433.6	60	-111.1	59.4	-2.6
61	-486.9	-96.7	-436.5	61	-388.4	-156.5	-430.7	61	-98.5	59.8	-5.8
62	-486.9	-196.7	-436.6	62	-396.4	-255.9	-427.9	62	-90.5	59.2	-8.7
63	-487.0	-296.6	-436.7	63	-397.0	-355.4	-425.4	63	-90.0	58.8	-11.3
64	-486.9	-397.3	-436.9	64	-390.9	-456.2	-423.4	64	-96.0	58.9	-13.5
65	-486.6	-496.0	-437.5	65	-378.8	-554.7	-421.9	65	-107.8	58.7	-15.6
66	-486.5	-596.7	-437.4	66	-360.4	-652.9	-420.9	66	-126.1	56.2	-16.5
67	-486.5	-697.5	-437.5	67	-334.9	-750.6	-421.2	67	-151.6	53.1	-16.3
68	-473.2	-794.4	-438.6	68	-303.7	-844.2	-424.7	68	-169.5	49.8	-13.9

Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 VW Jetta

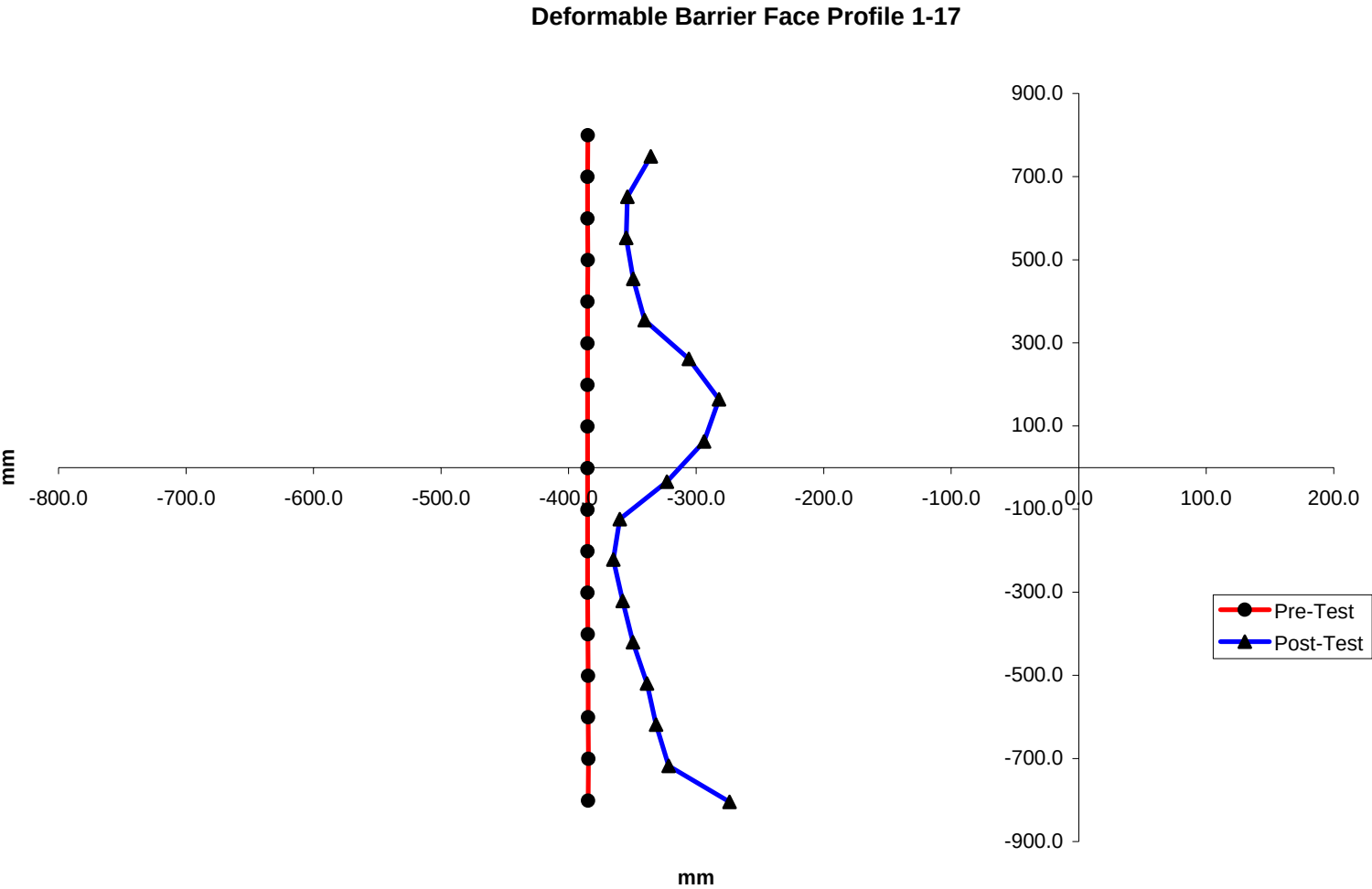


Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 VW Jetta

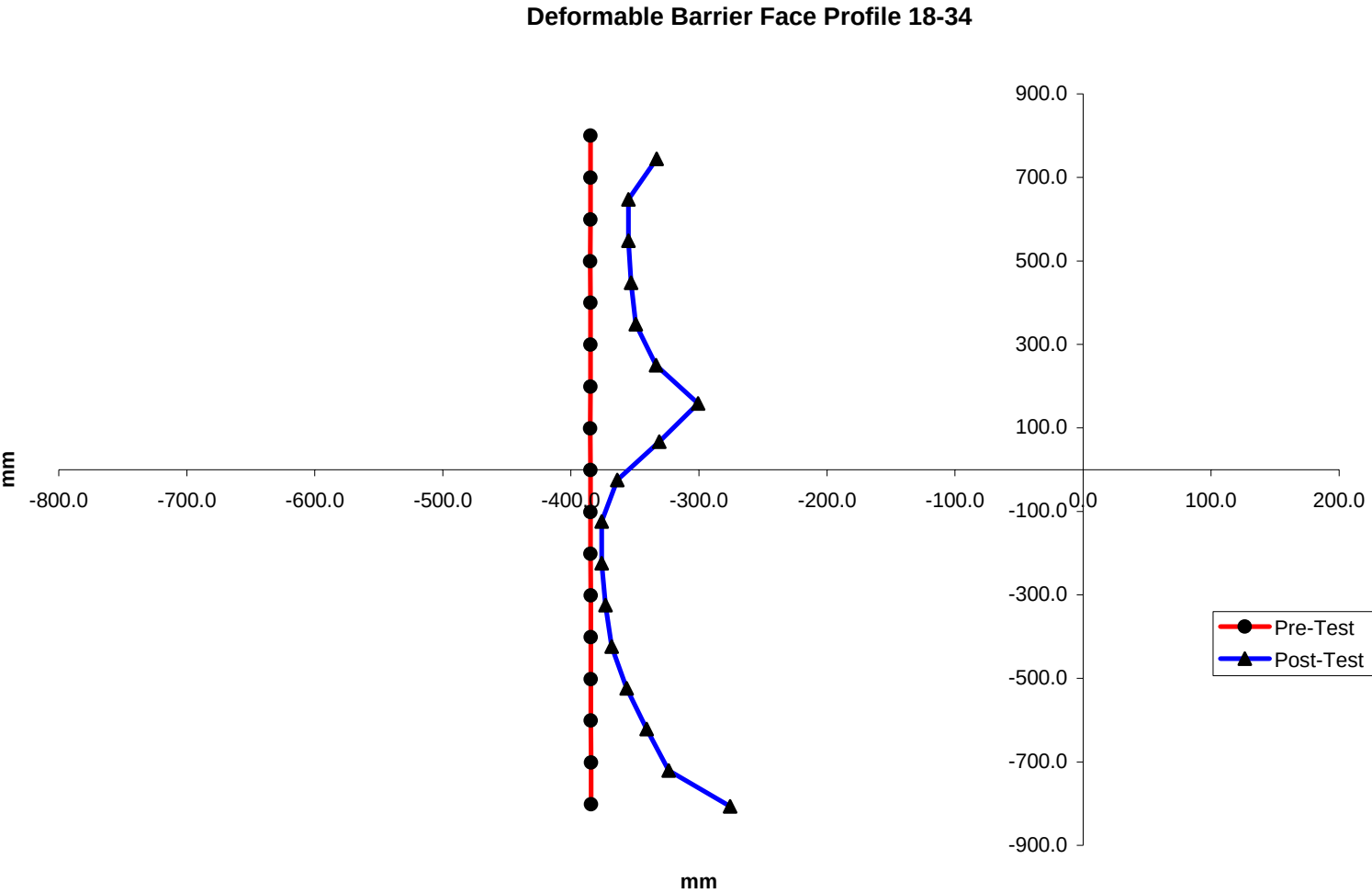


Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 VW Jetta

Deformable Barrier Face Profile 35-51

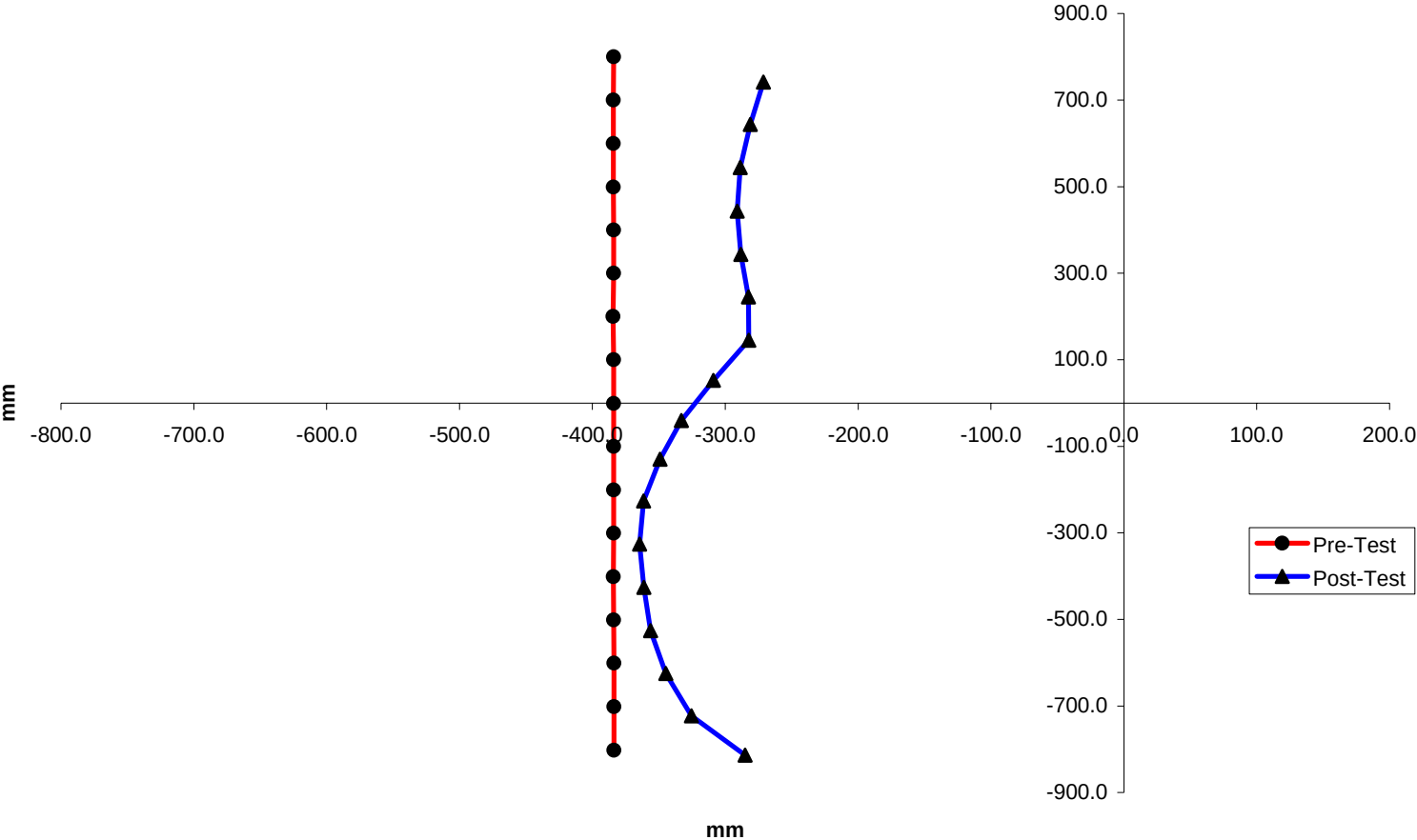


Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 VW Jetta

Deformable Barrier Face Profile 52-68

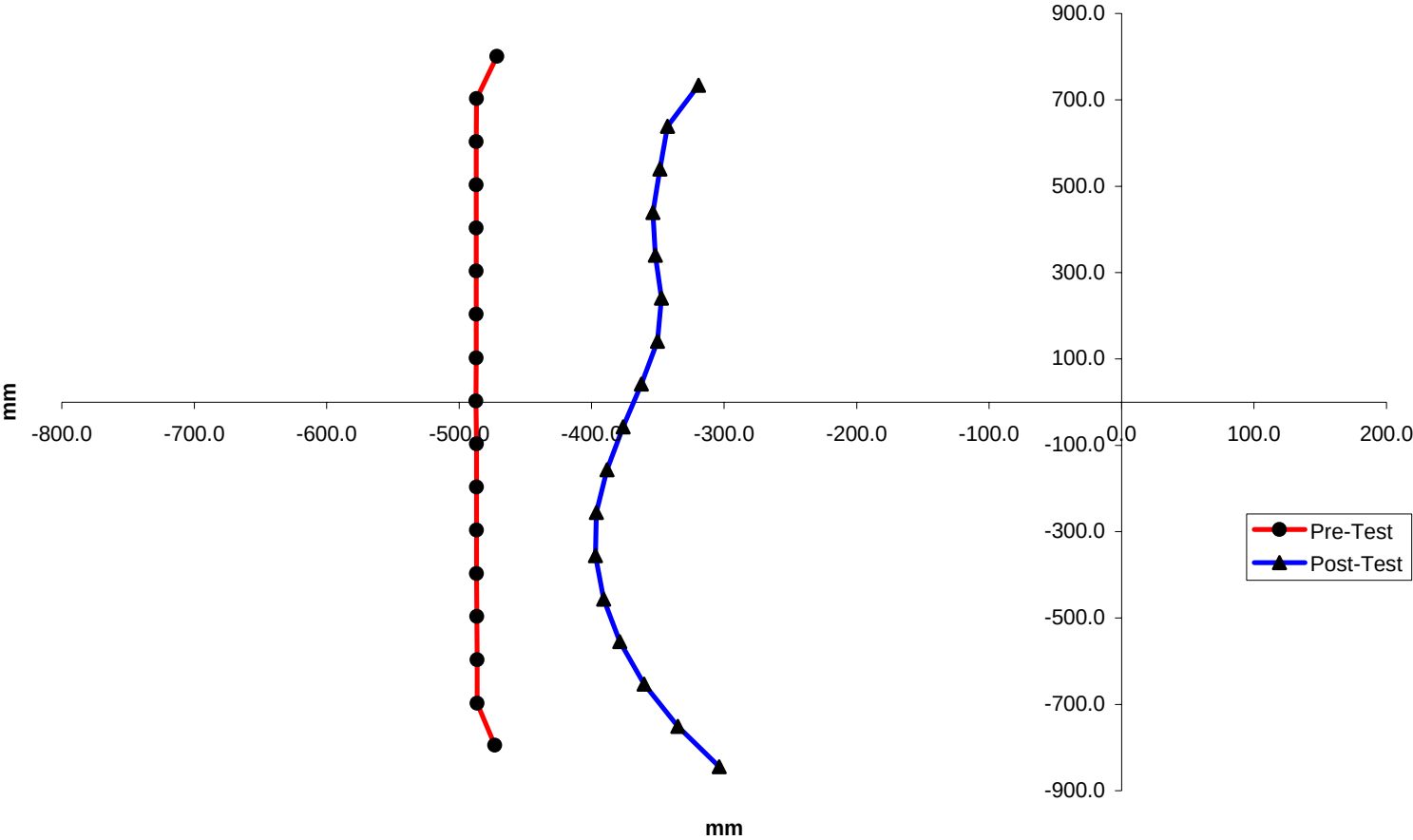
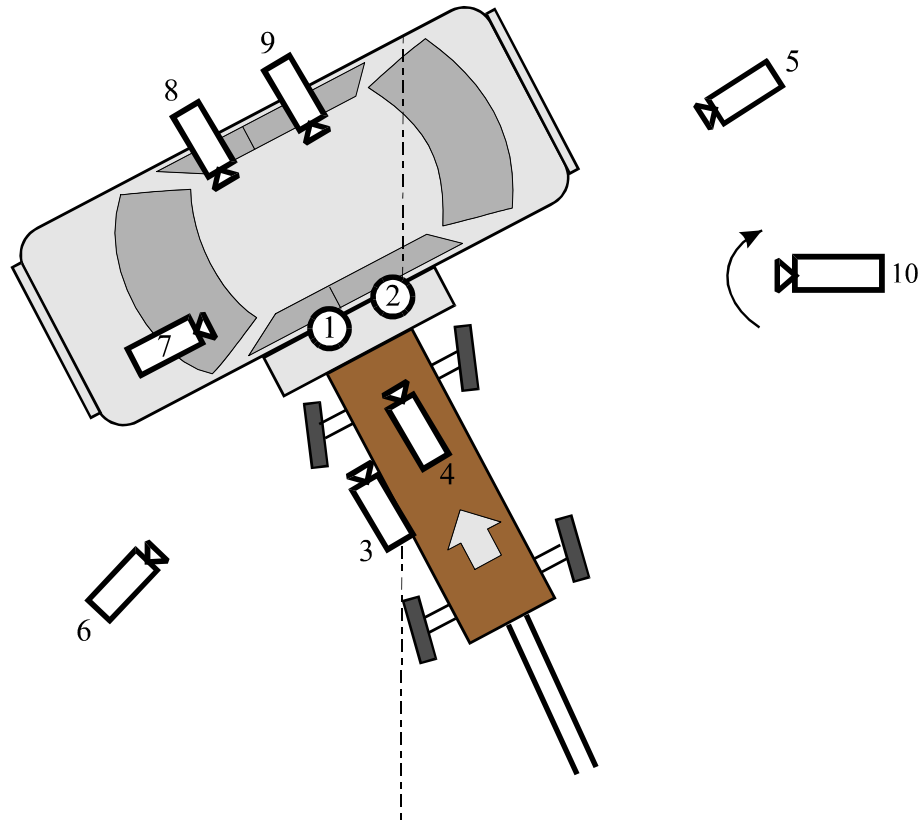


Figure 7 High-Speed Camera Locations and Data Summary

Vehicle: 2005 VW Jetta



No.	Camera View	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	MDB Left Front	1680	870	-820	0.1	12.5	1000
4	MDB Centerline Impact	2380	0	-1450	5.0	12.5	1000
5	Left Rear	0	10210	-1010	0.6	25	1000
6	Left Side	3380	4100	-1130	3.8	12.5	1000
7	Onboard Front-Driver	400	1450	-1400	4.1	25	1000
8	Onboard Right Side Front	0	1180	-1200	9.8	12.5	1000
9	Onboard Right Side Rear	0	1180	-1300	14.7	12.5	1000
10	Panning	N/A	N/A	N/A	N/A	Zoom	24

+X: Forward from impact point
+Y: Rightward from impact point
+Z: Downward from ground level

Appendix A

Photographs



Figure A-1 Pre-Test Front View

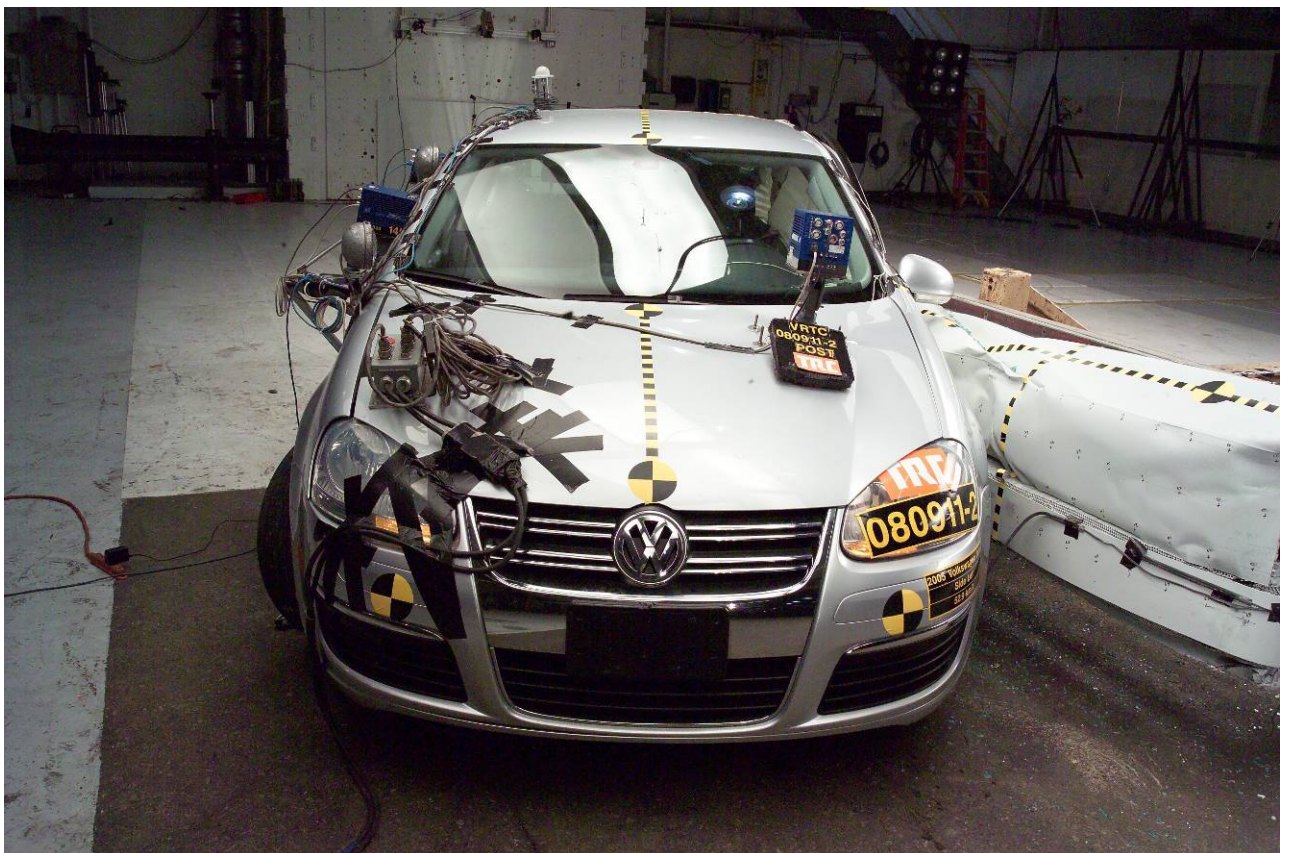


Figure A-2 Post-Test Front View



Figure A-3 Pre-Test Left Front View

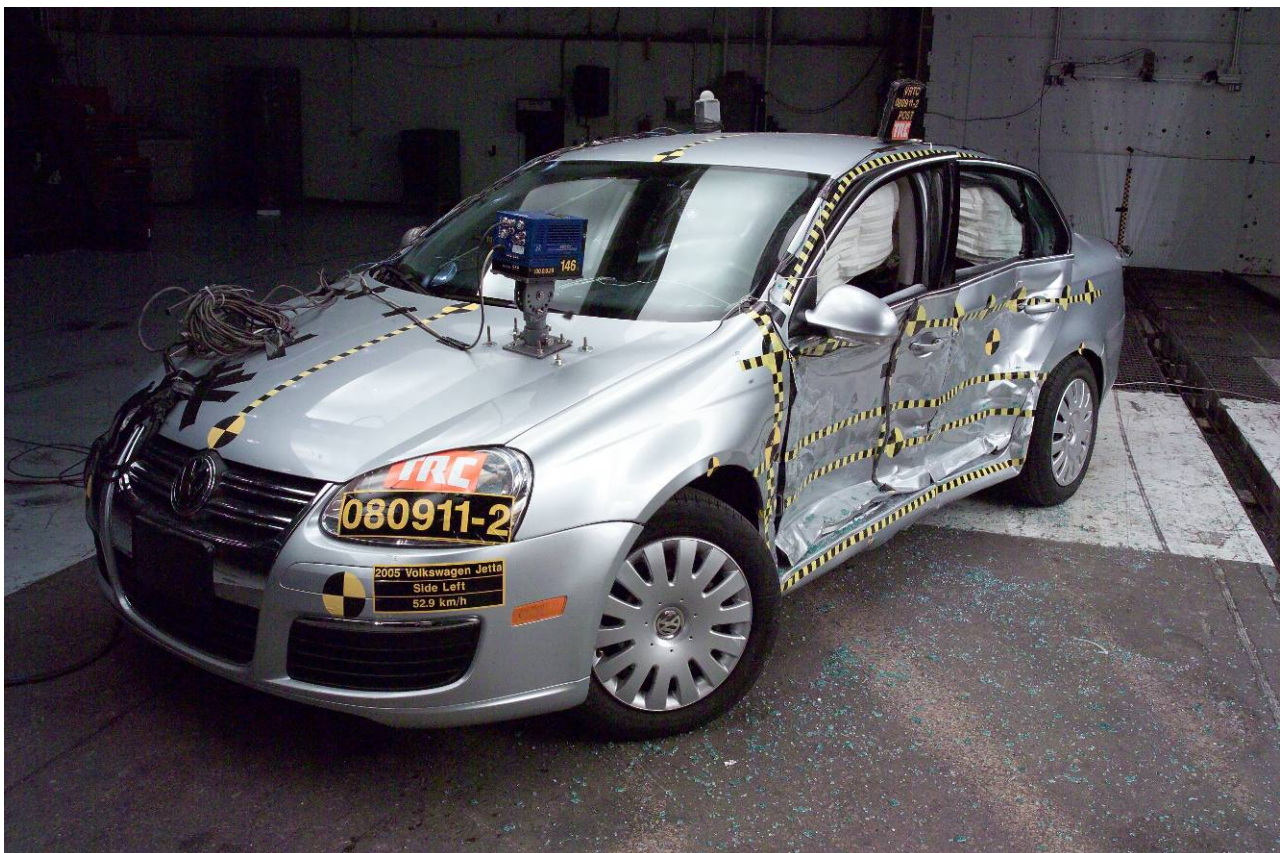


Figure A-4 Post-Test Left Front View



Figure A-5 Pre-Test Left Side View



Figure A-6 Post-Test Left Side View



Figure A-7 Pre-Test Left Rear View



Figure A-8 Post-Test Left Rear View



Figure A-9 Pre-Test Rear View



Figure A-10 Post-Test Rear View



Figure A-11 Pre-Test Right Side View

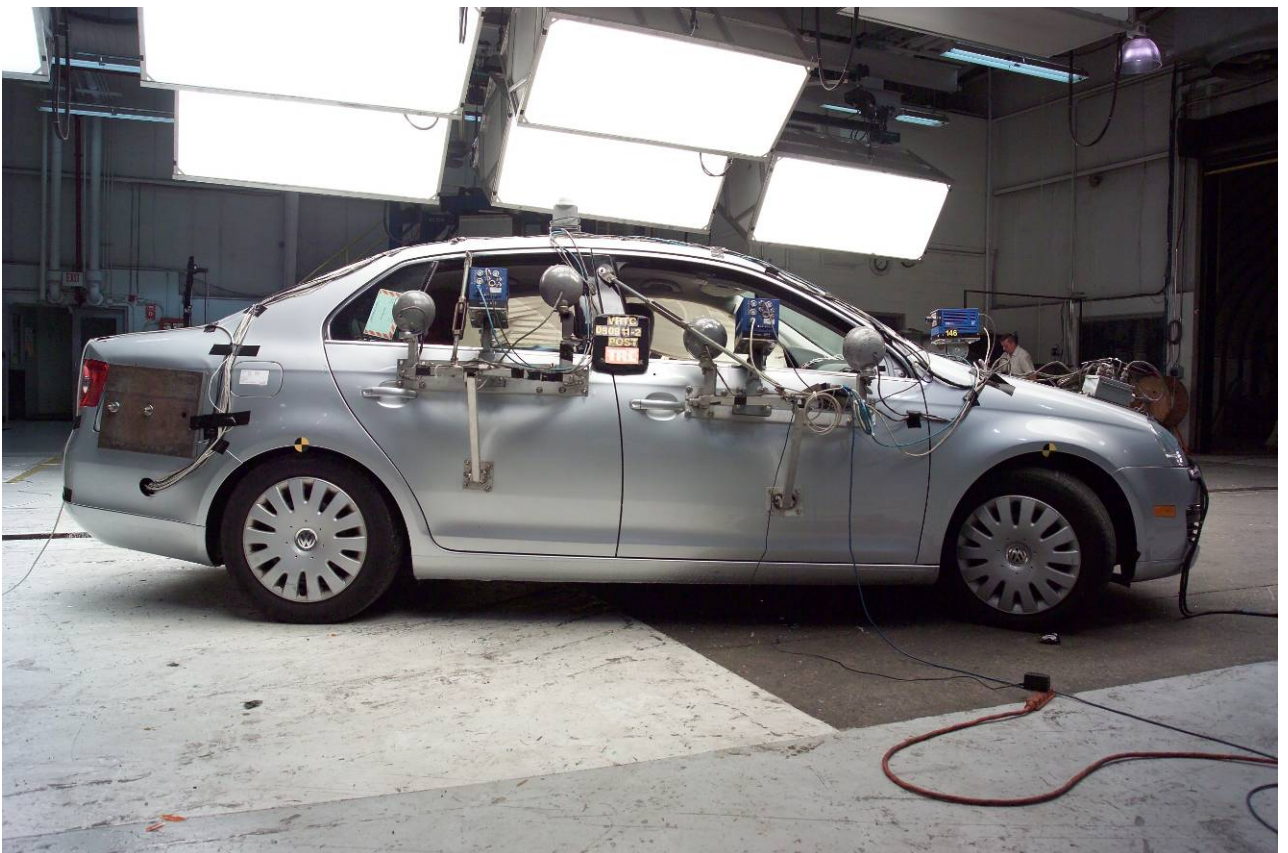


Figure A-12 Post-Test Right Side View

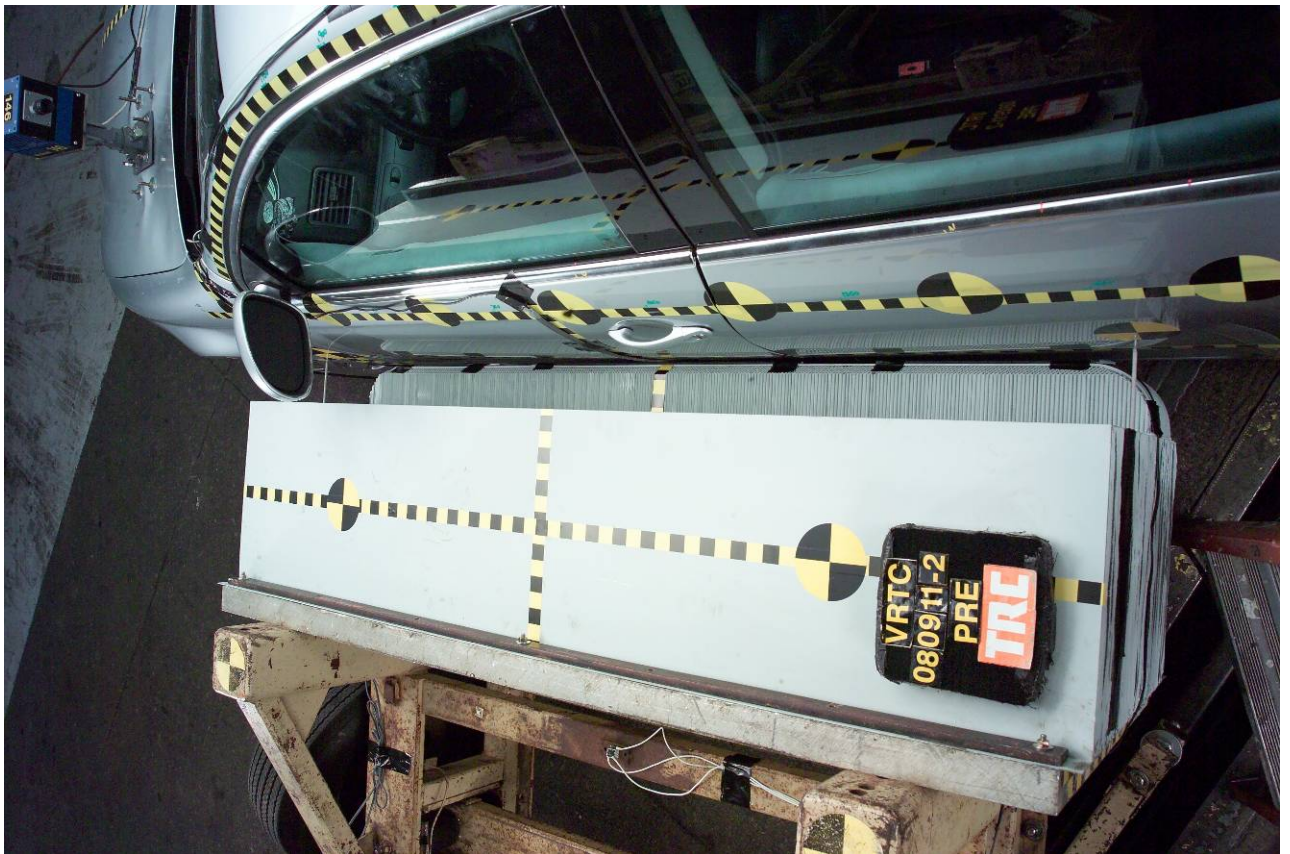


Figure A-13 Pre-Test Impact Alignment View



Figure A-14 Post-Test Impact Alignment View



Figure A-15 Pre-Test Primary Impact Point View



Figure A-16 Post-Test Primary Impact Point View



Figure A-17 Pre-Test Secondary Impact Point View



Figure A-18 Post-Test Secondary Impact Point View



Figure A-19 Pre-Test MDB Face Left Side View



Figure A-20 Post-Test MDB Face Left Side View



Figure A-21 Pre-Test MDB Face Right Side View

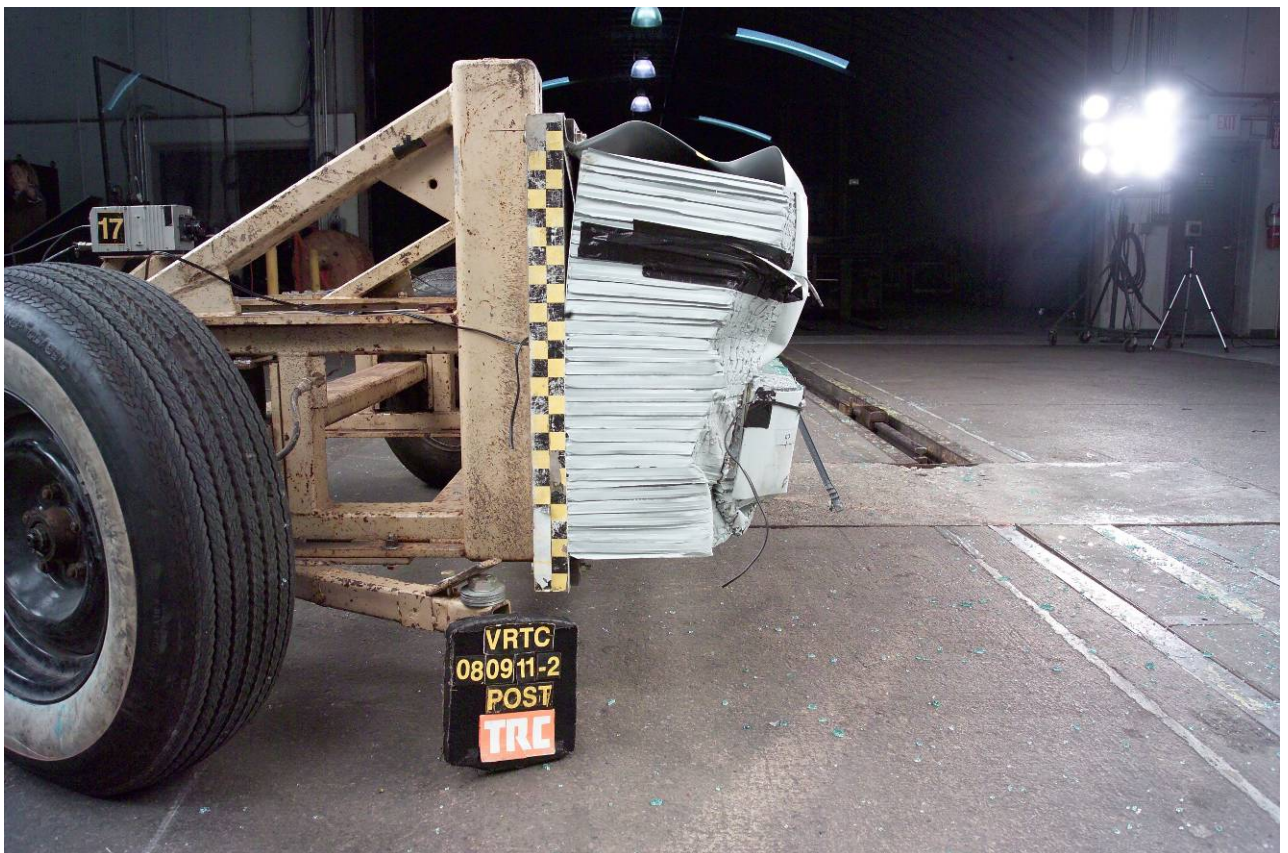


Figure A-22 Post-Test MDB Face Right Side View

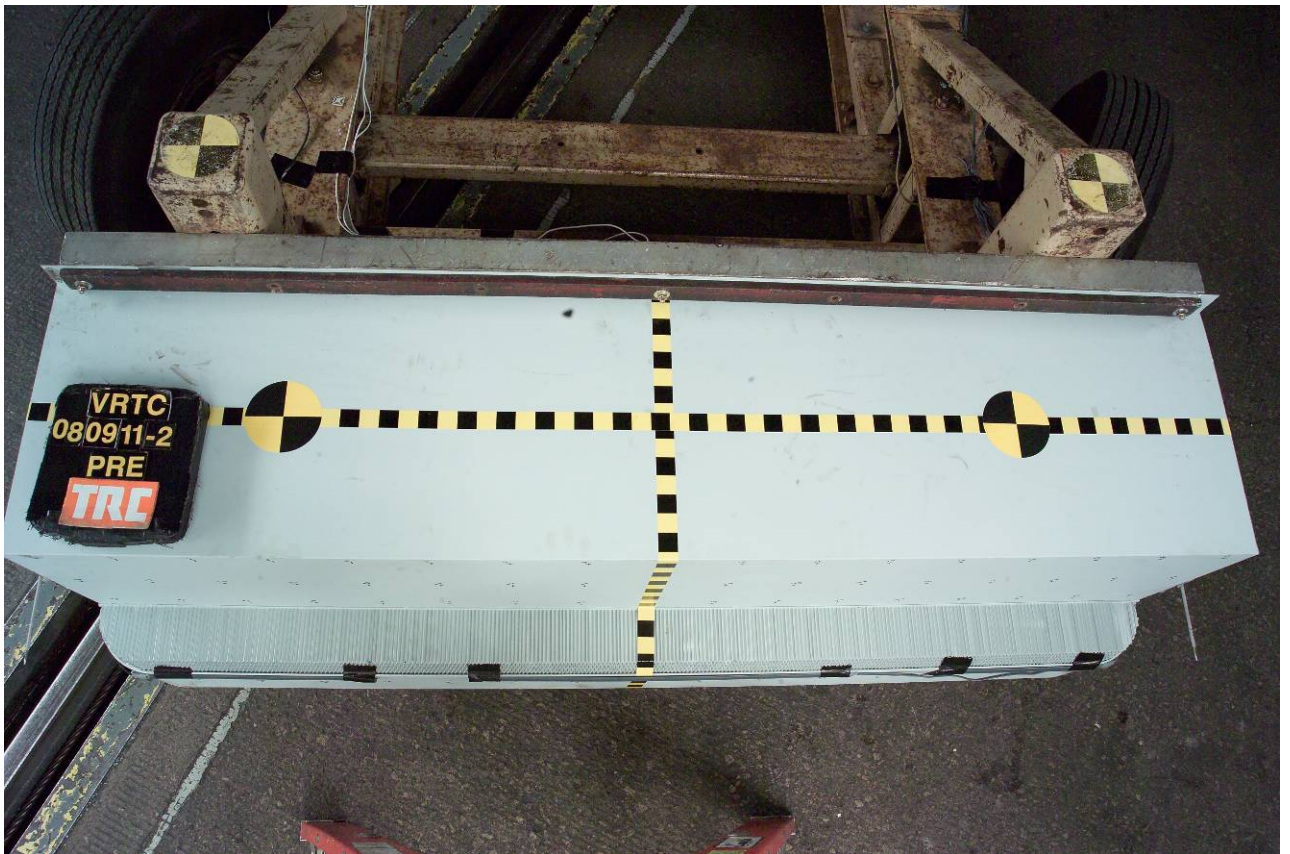


Figure A-23 Pre-Test MDB Face Overhead View

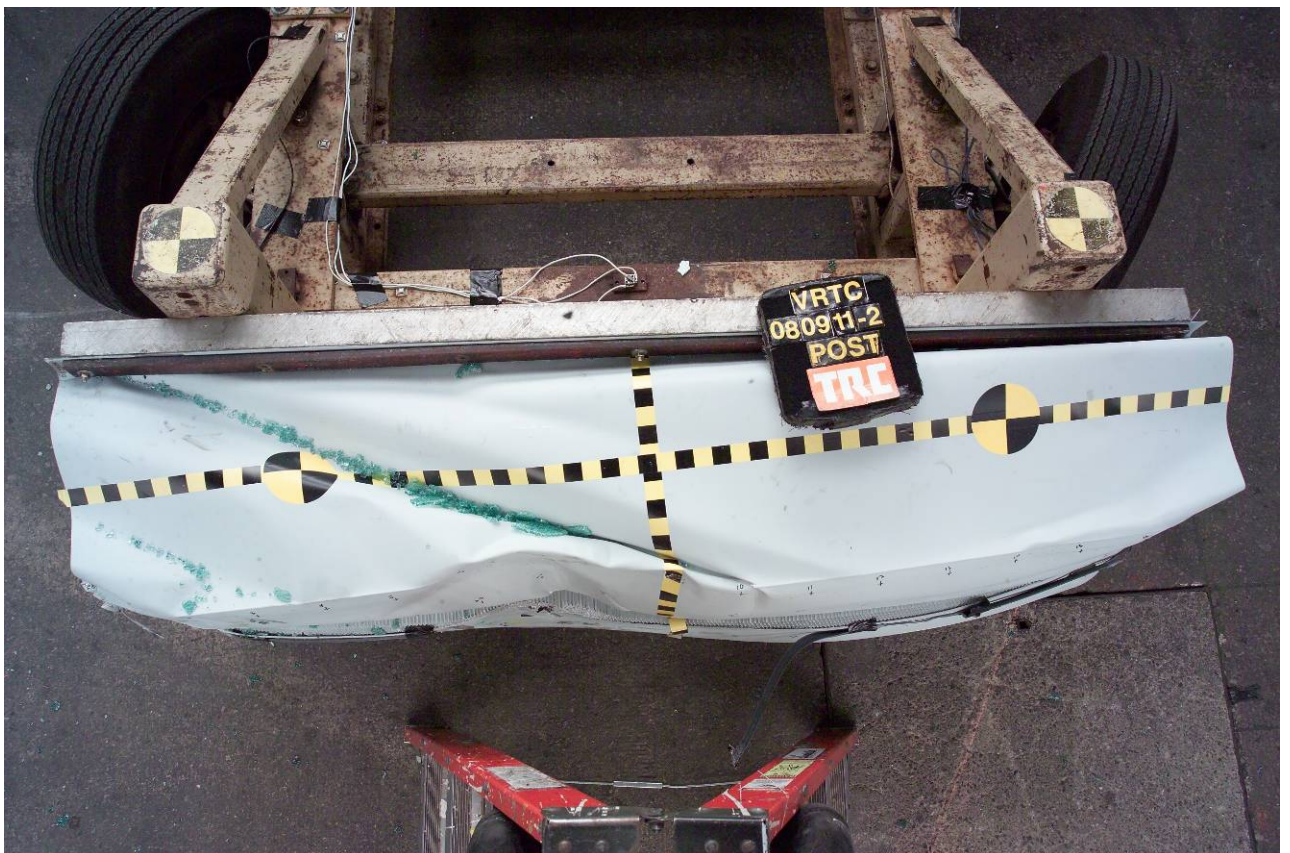


Figure A-24 Post-Test MDB Face Overhead View



Figure A-25 Pre-Test MDB Front View with Contact Switches in Place



Figure A-26 Post-Test MDB Front View with Contact Switches in Place



Figure A-27 Pre-Test MDB with Vehicle Left Side Overall View



Figure A-28 Post-Test MDB with Vehicle Left Side Overall View



Figure A-29 Pre-Test MDB with Vehicle Left Front View

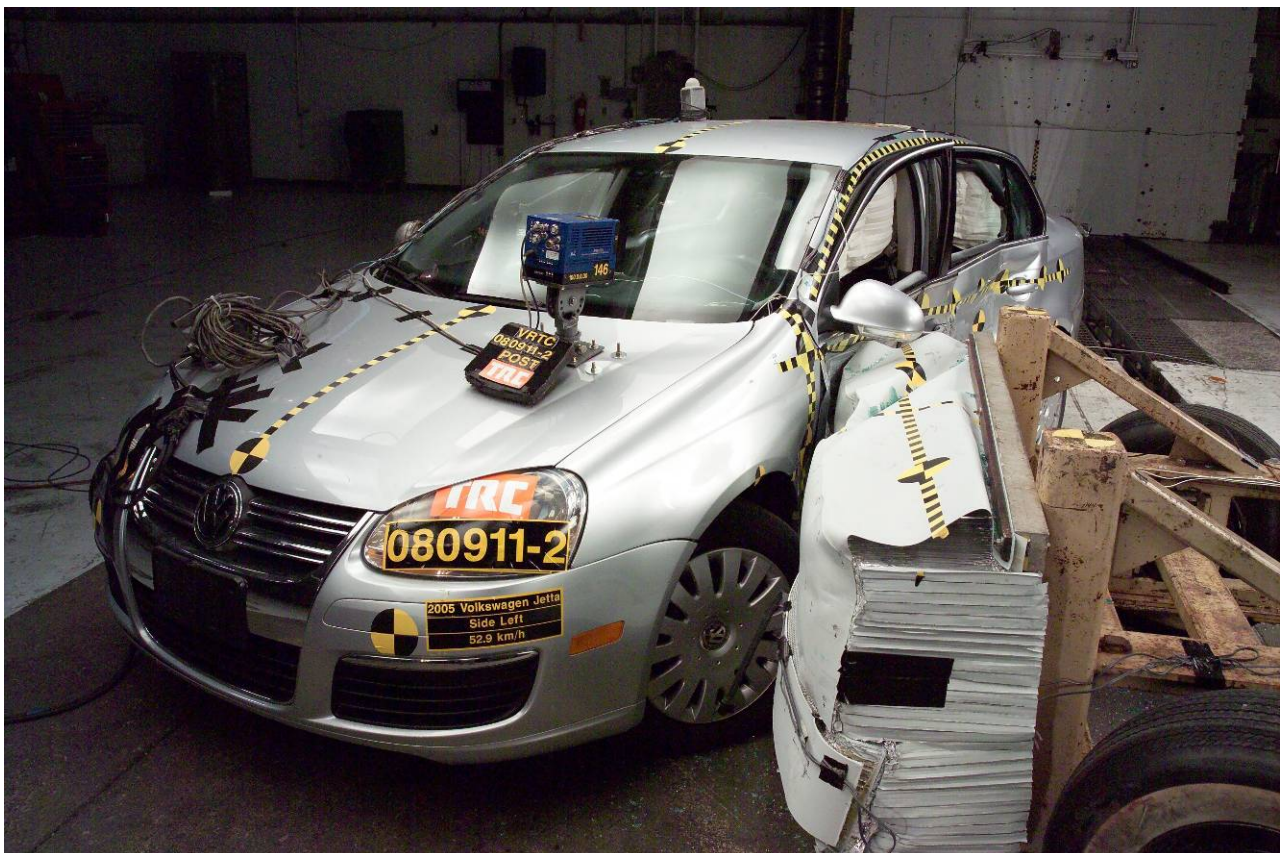


Figure A-30 Post-Test MDB with Vehicle Left Front View



Figure A-31 Pre-Test MDB with Vehicle Right Side Overall View



Figure A-32 Post-Test MDB with Vehicle Right Side Overall View



Figure A-33 Pre-Test MDB with Vehicle Right Front View



Figure A-34 Post-Test MDB with Vehicle Right Front View



Figure A-35 Pre-Test MDB Left Side Overall View

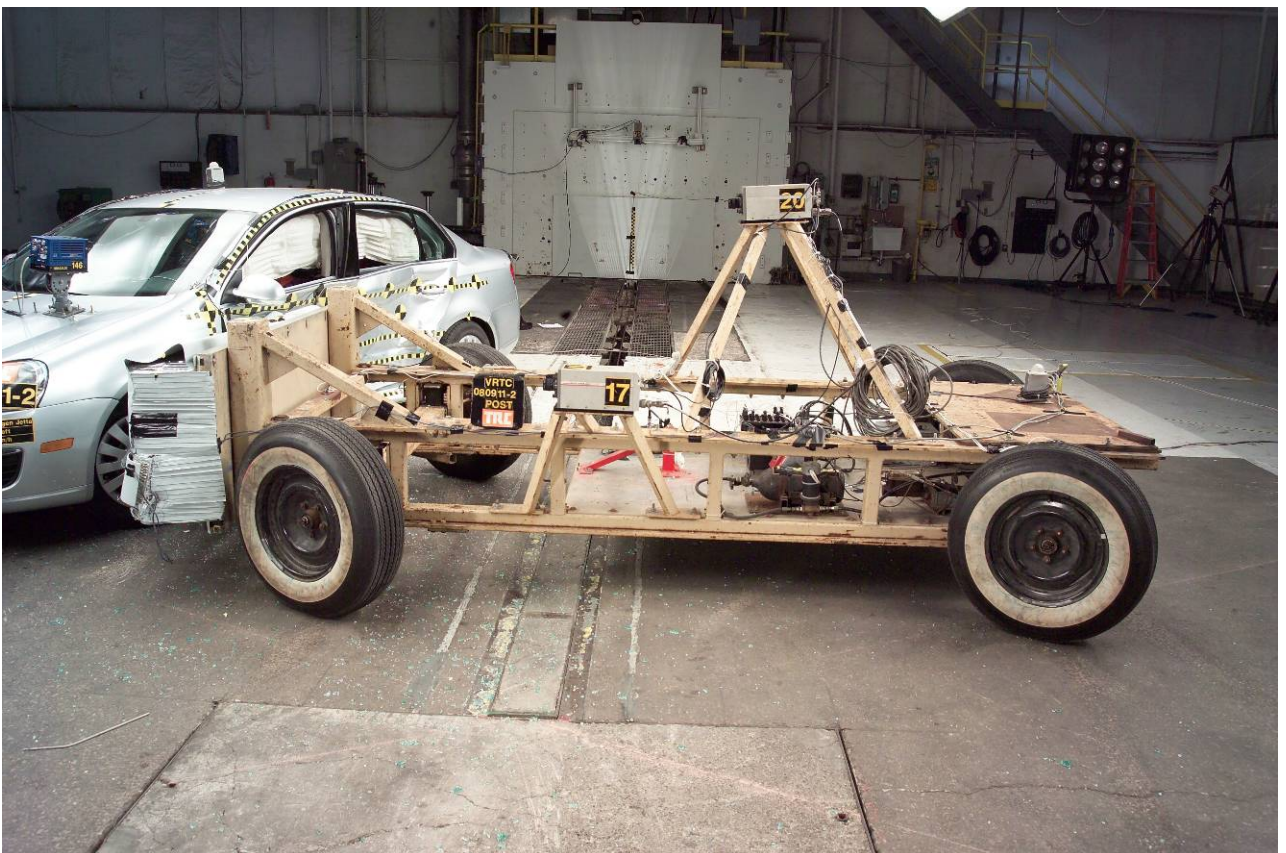


Figure A-36 Post-Test MDB Left Side Overall View

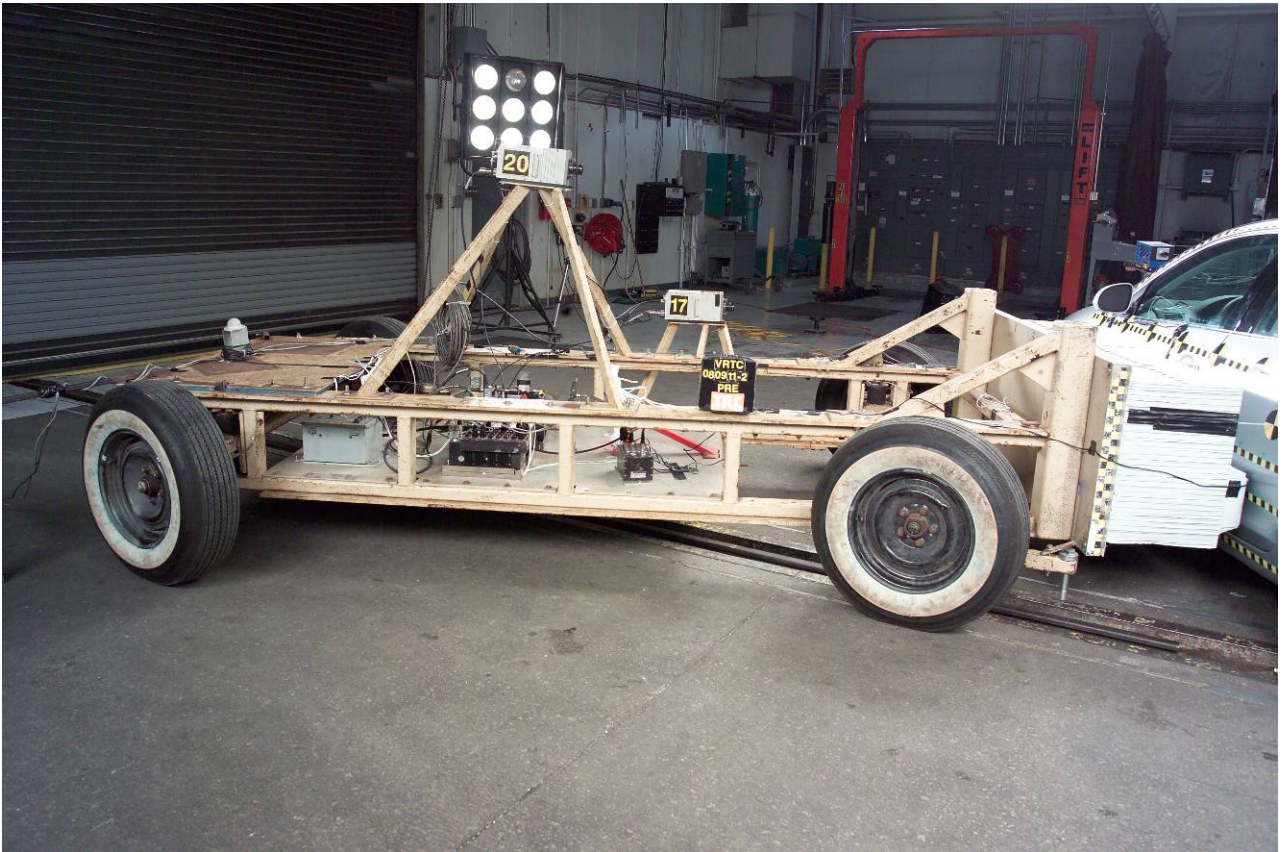


Figure A-37 Pre-Test MDB Right Side Overall View

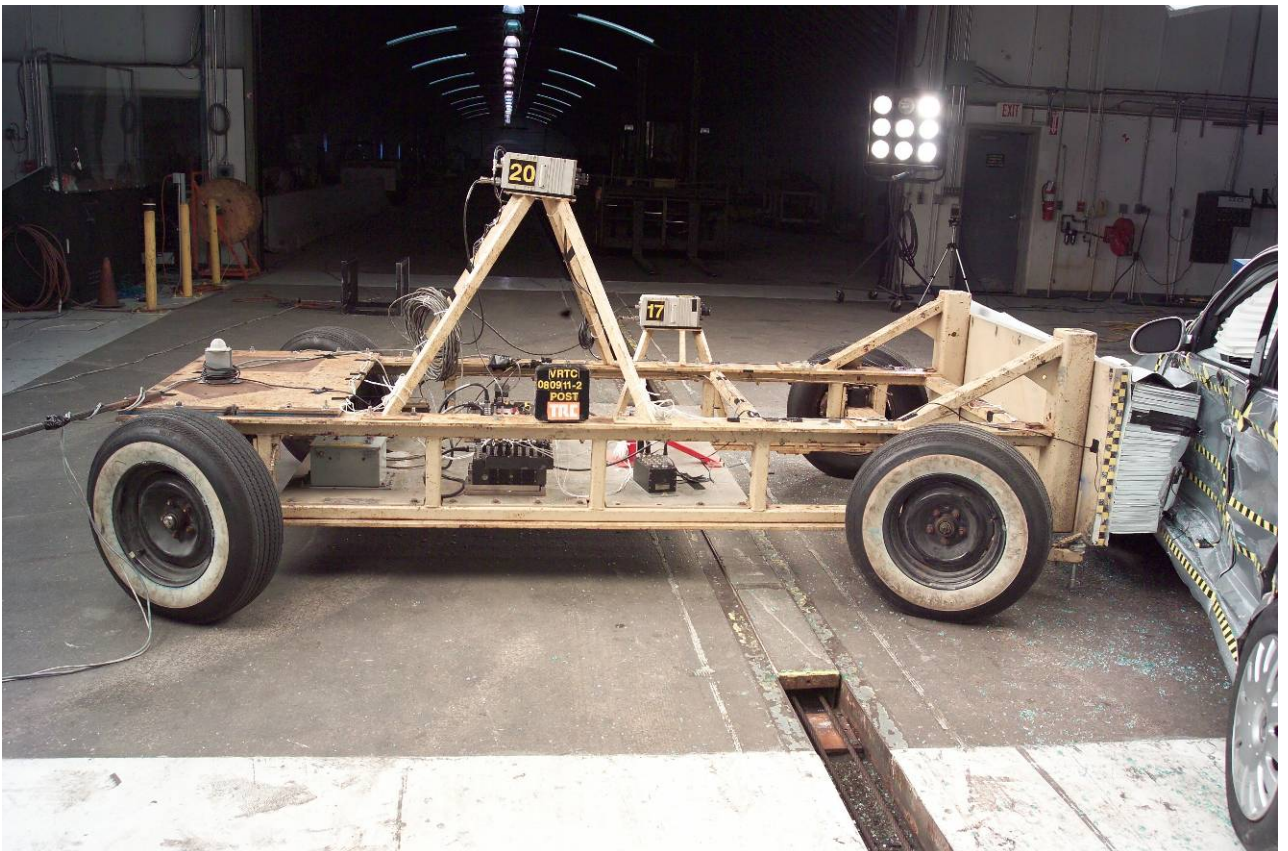


Figure A-38 Post-Test MDB Right Side Overall View



Figure A-39 Pre-Test MDB Alignment Overhead View

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Figure A-40 Pre-Test Driver Dummy Side View

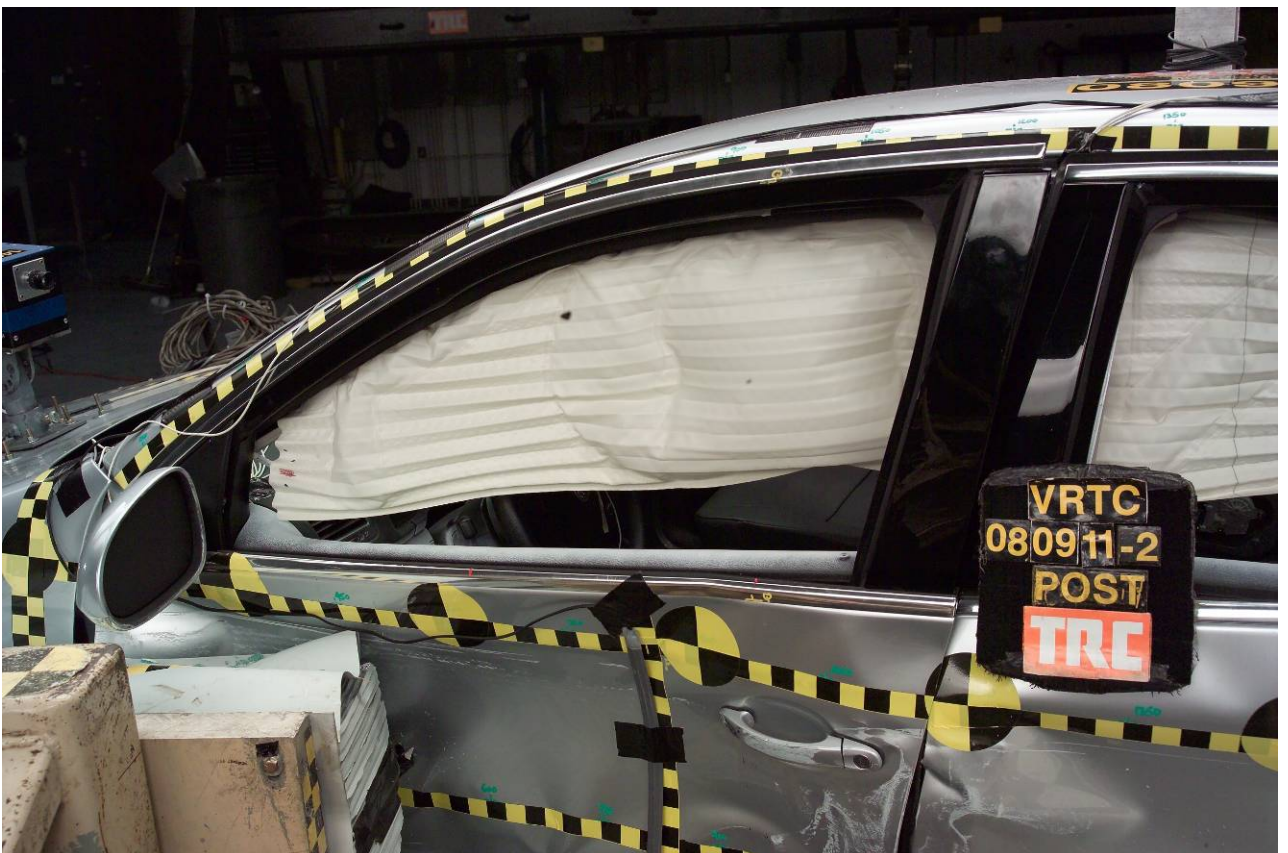


Figure A-41 Post-Test Driver Dummy Side View



Figure A-42 Pre-Test Right Side Dummy Occupant Compartment View



Figure A-43 Post-Test Right Side Dummy Occupant Compartment View



Figure A-44 Pre-Test Driver Dummy and Door Clearance View



Figure A-45 Post-Test Driver Dummy and Door Clearance View



Figure A-46 Pre-Test Driver Dummy Showing Belts, Chalking, and Contact Switches

Intentionally Left Blank



Figure A-47 Pre-Test Driver Door Panel View



Figure A-48 Post-Test Driver Door Panel View



Figure A-49 Post-Test Driver Dummy Overall View



Figure A-50 Post-Test Driver Dummy Head Contact View



Figure A-51 Post-Test Driver Dummy Torso Contact View

Intentionally Left Blank



Figure A-52 Pre-Test Passenger Dummy Side View



Figure A-53 Post-Test Passenger Dummy Side View



Figure A-54 Pre-Test Right Side Dummy Occupant Compartment View



Figure A-55 Post-Test Right Side Dummy Occupant Compartment View



Figure A-56 Pre-Test Passenger Dummy and Door Clearance View



Figure A-57 Post-Test Passenger Dummy and Door Clearance View



Figure A-58 Pre-Test Passenger Dummy Showing Belts, Chalking, and Contact Switches

Intentionally Left Blank



Figure A-59 Pre-Test Passenger Door Panel View



Figure A-60 Post-Test Passenger Door Panel View



Figure A-61 Post-Test Passenger Dummy Overall View



Figure A-62 Post-Test Passenger Dummy Head Contact View



Figure A-63 Post-Test Passenger Dummy Torso Contact View



Figure A-64 Post-Test Passenger Dummy Left Leg Contact View

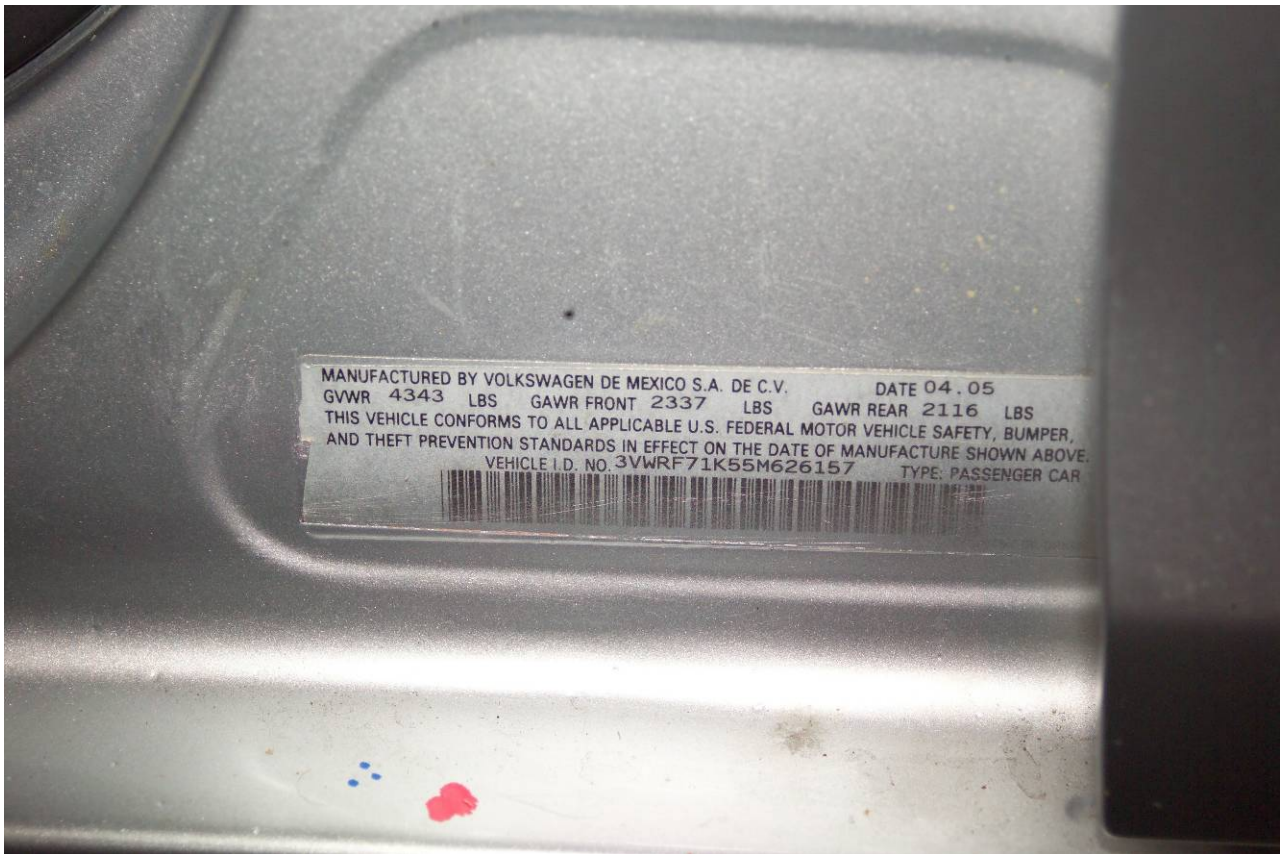


Figure A-65 Certification Label View



Figure A-66 Recommended Tire Pressure Label View



Figure A-67 Pre-Test Ballast View

Intentionally Left Blank

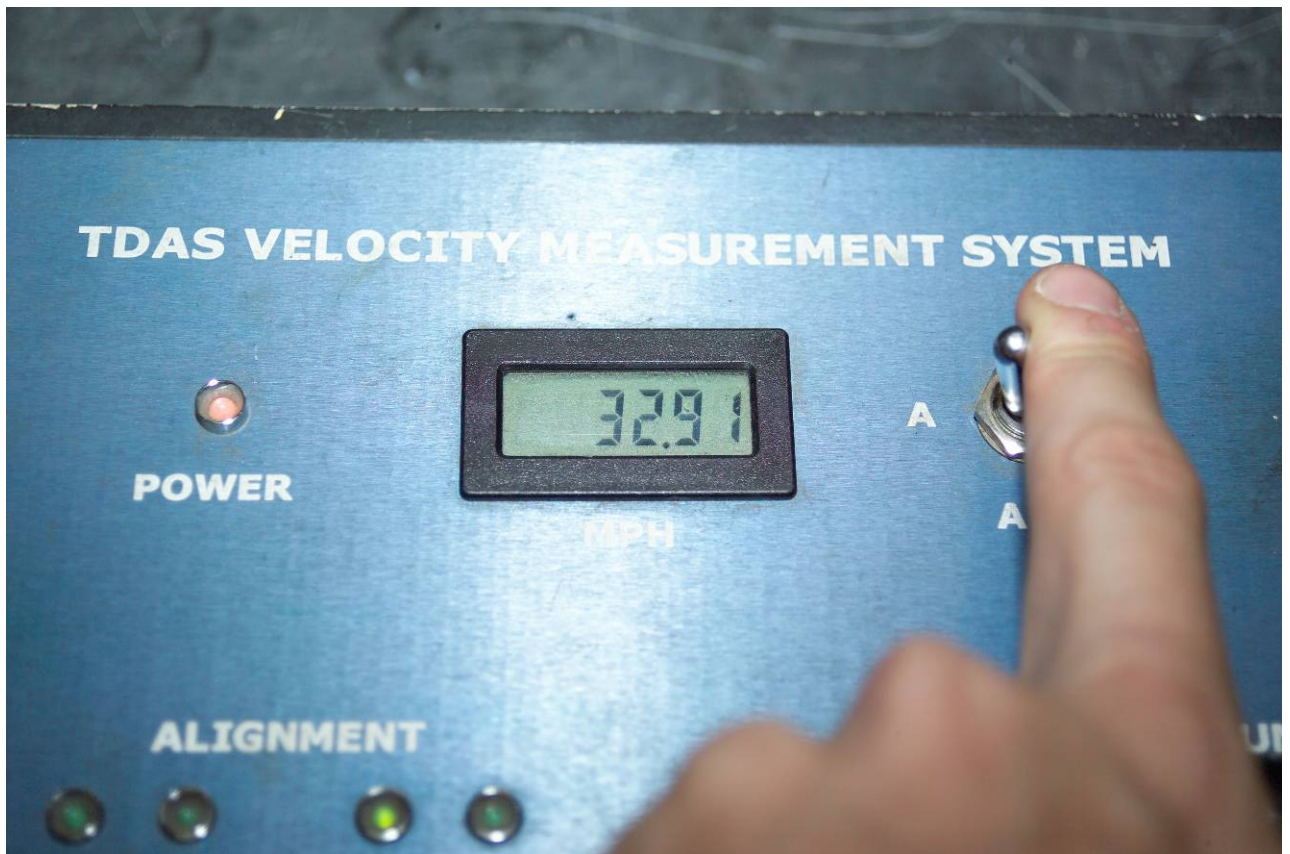


Figure A-68 Post-Test Digital Light Trap Read-Out - View 1

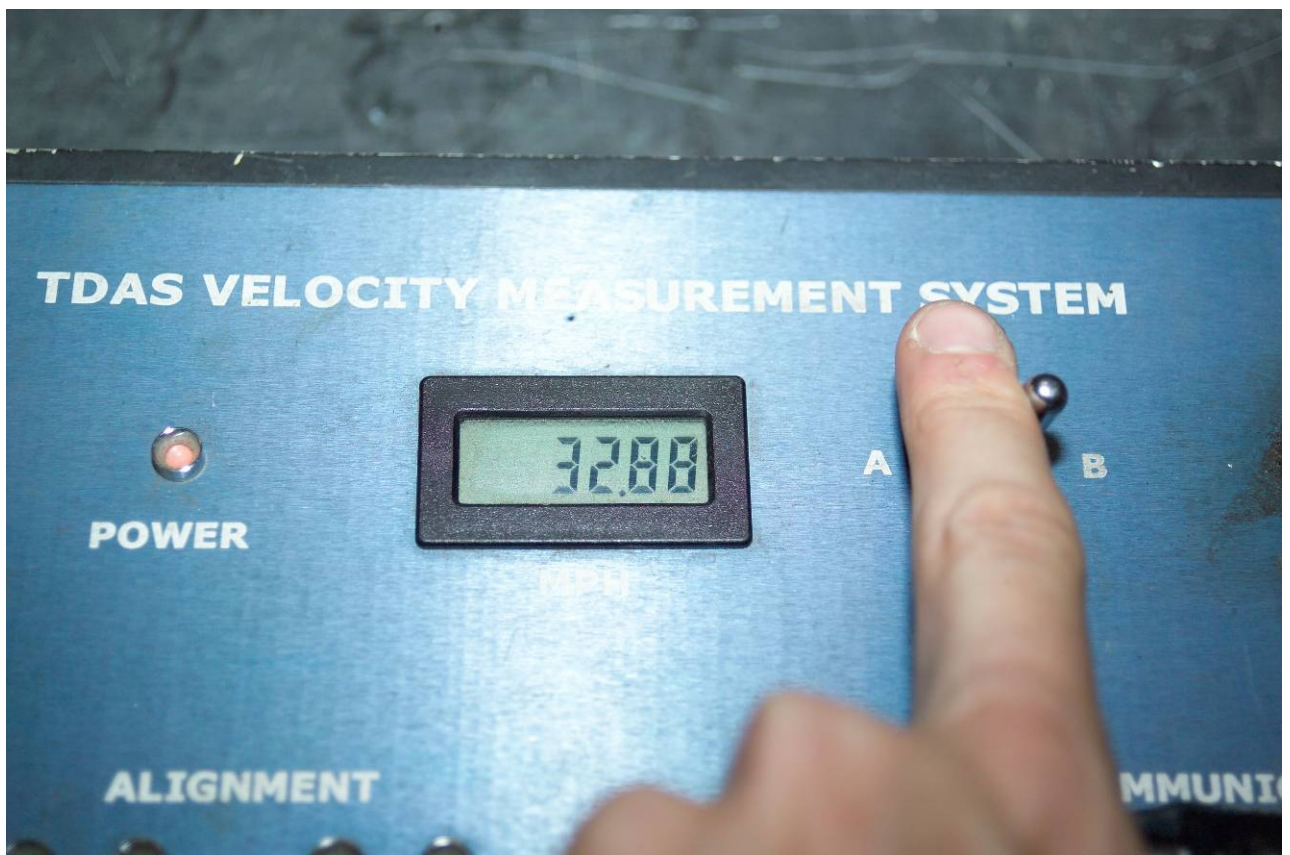


Figure A-69 Post-Test Digital Light Trap Read-Out - View 2

Appendix B

Data Plots



World SID Evaluation

Date: 09/11/2008
Time: 16:22

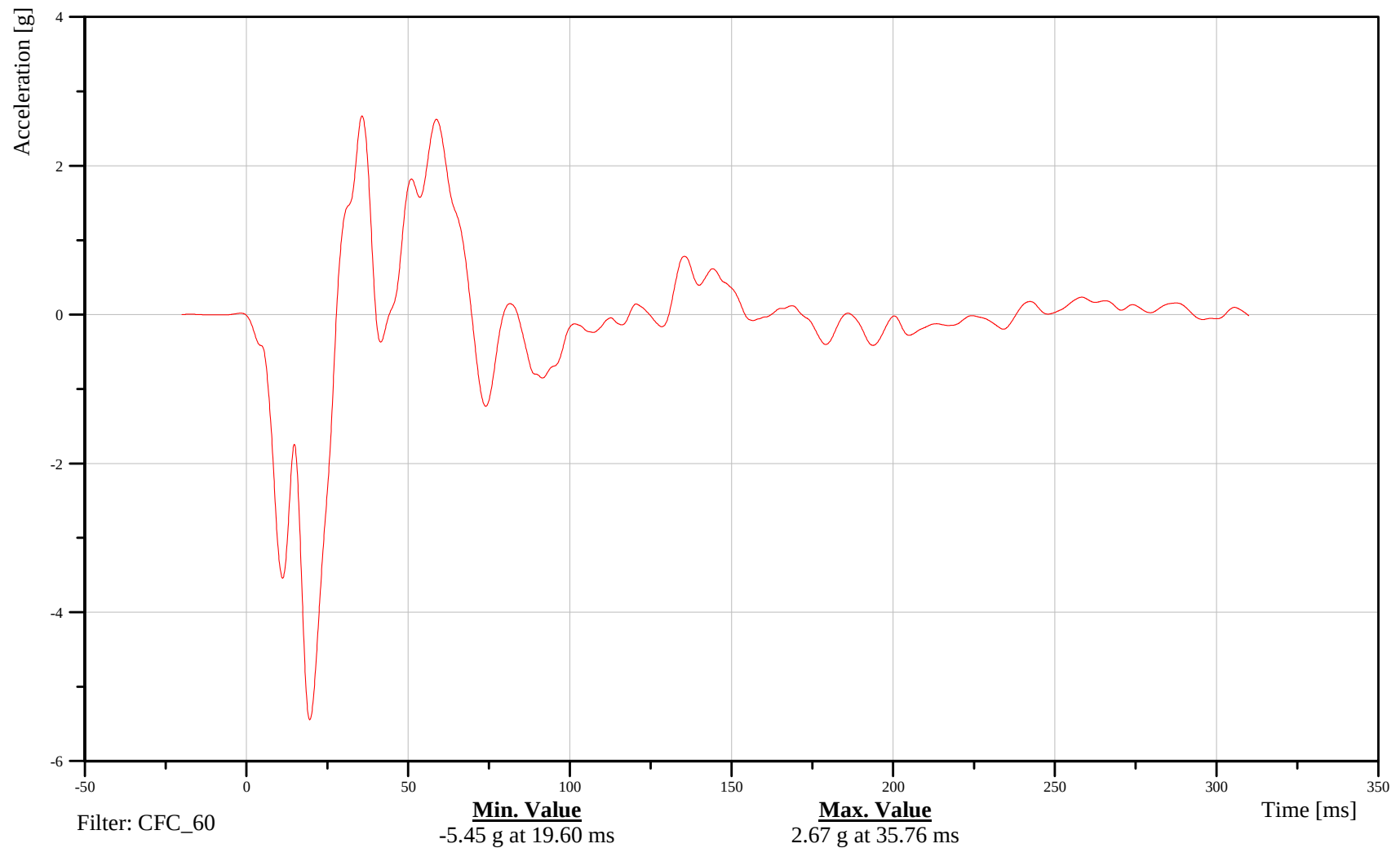
Right Side Sill at Front Seat X-Axis Acceleration

Customer: VRTC

16SILBFR0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-2

080911-2



World SID Evaluation
Right Side Sill at Front Seat X-Axis Velocity

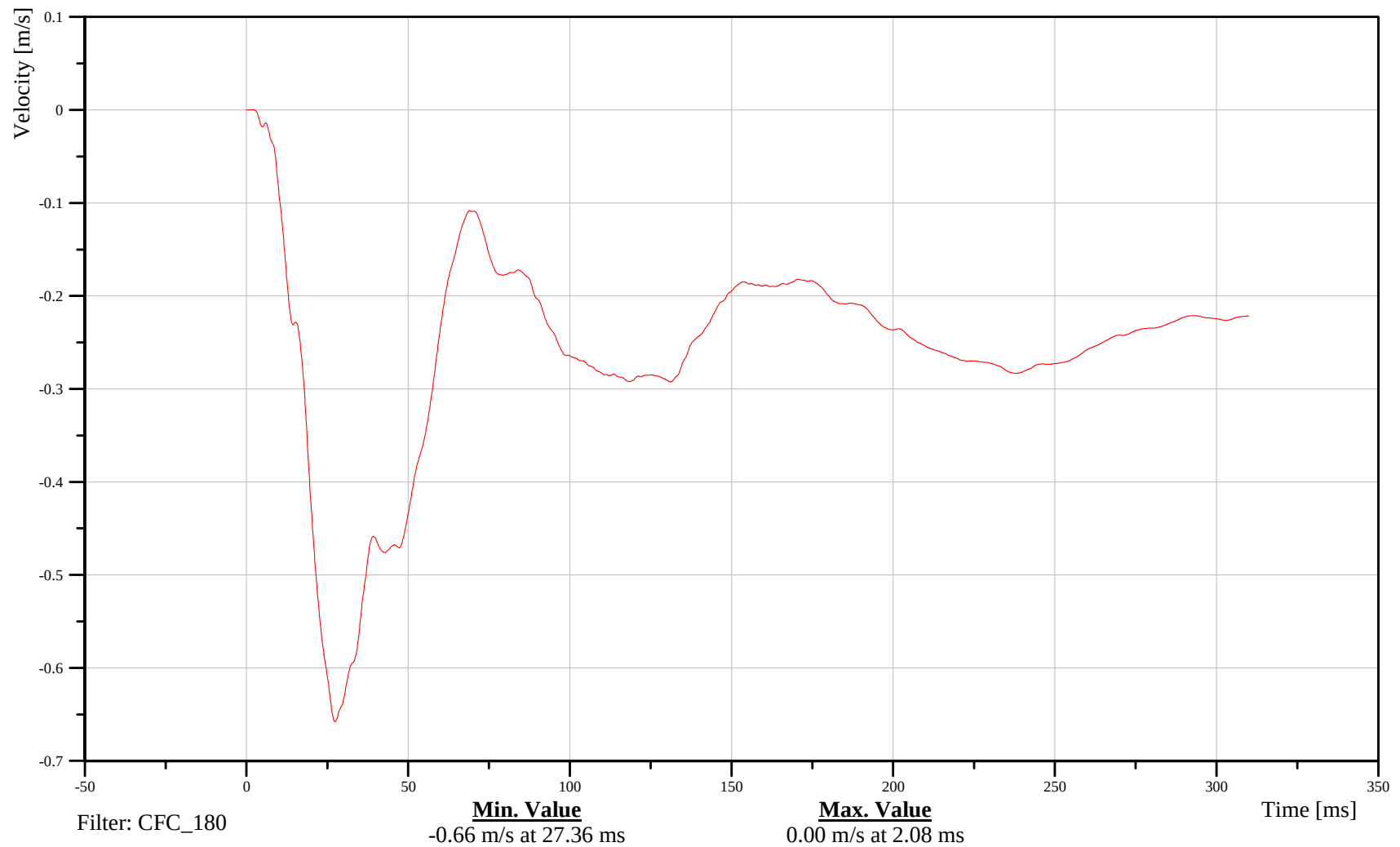
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Time: 16:22

Customer: VRTC

16SILBFR0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-3

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

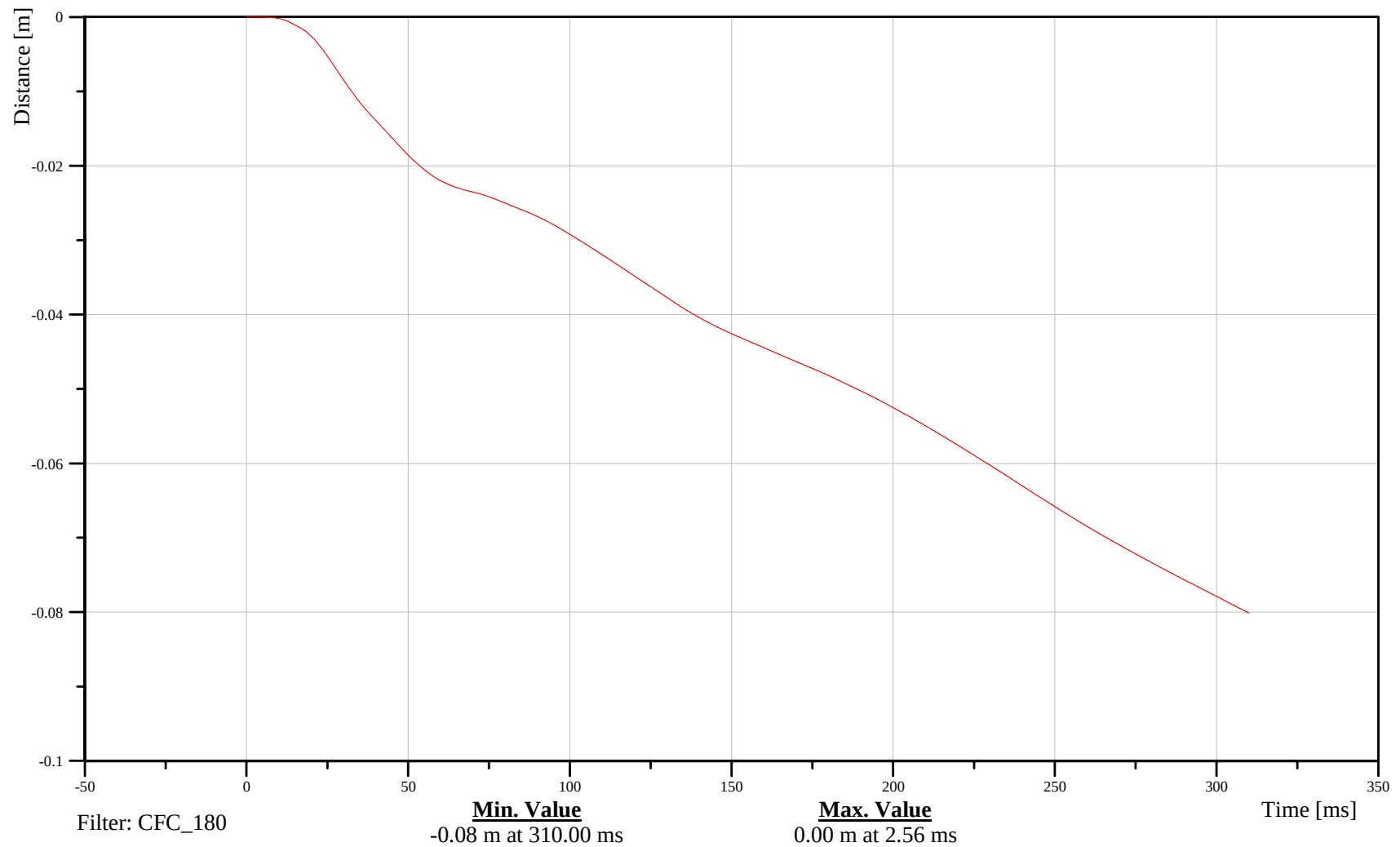
Right Side Sill at Front Seat X-Axis Displacement

Customer: VRTC

16SILBFR0000DCXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-4

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

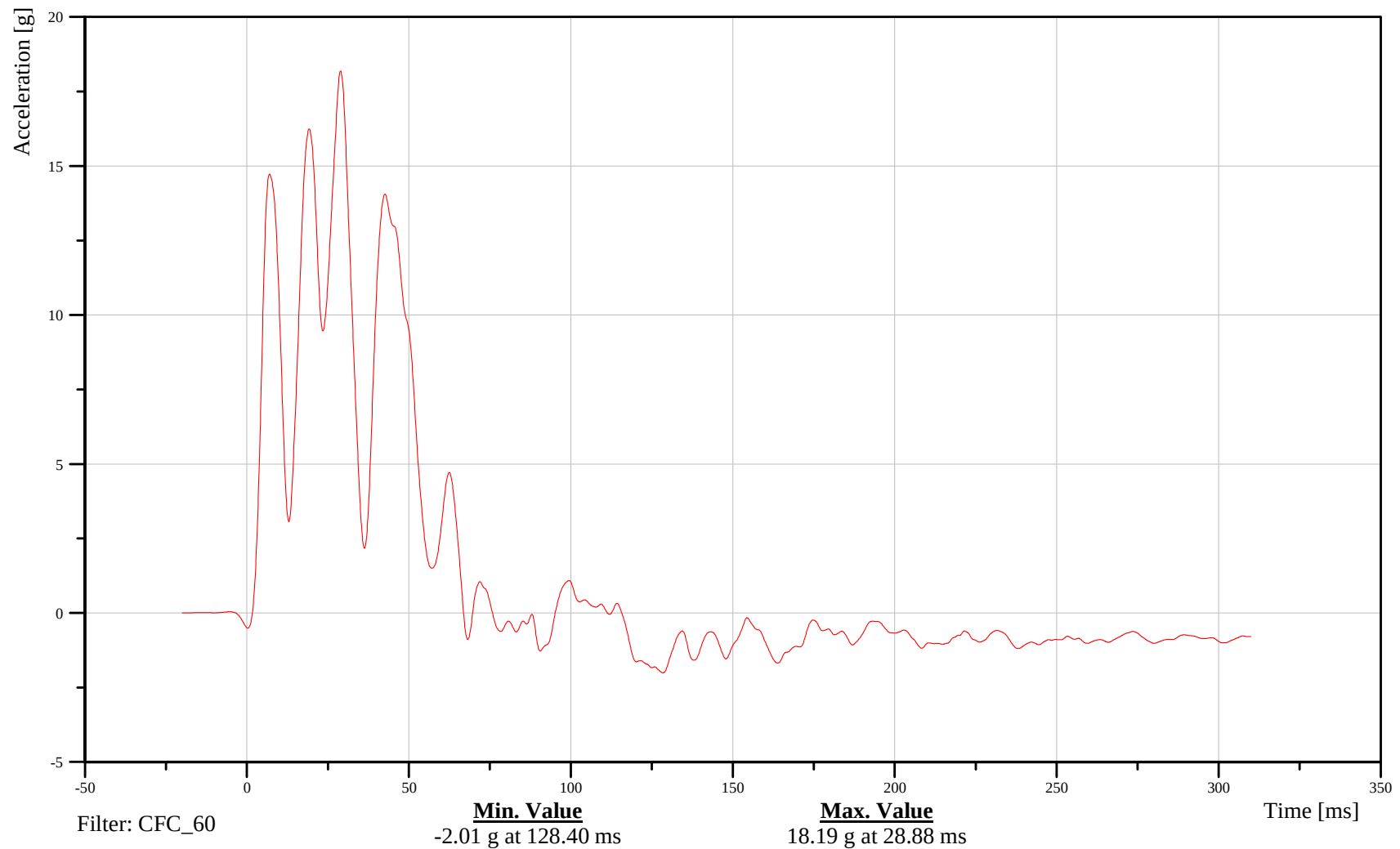
Right Side Sill at Front Seat Y-Axis Acceleration

Customer: VRTC

16SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Right Side Sill at Front Seat Y-Axis Velocity

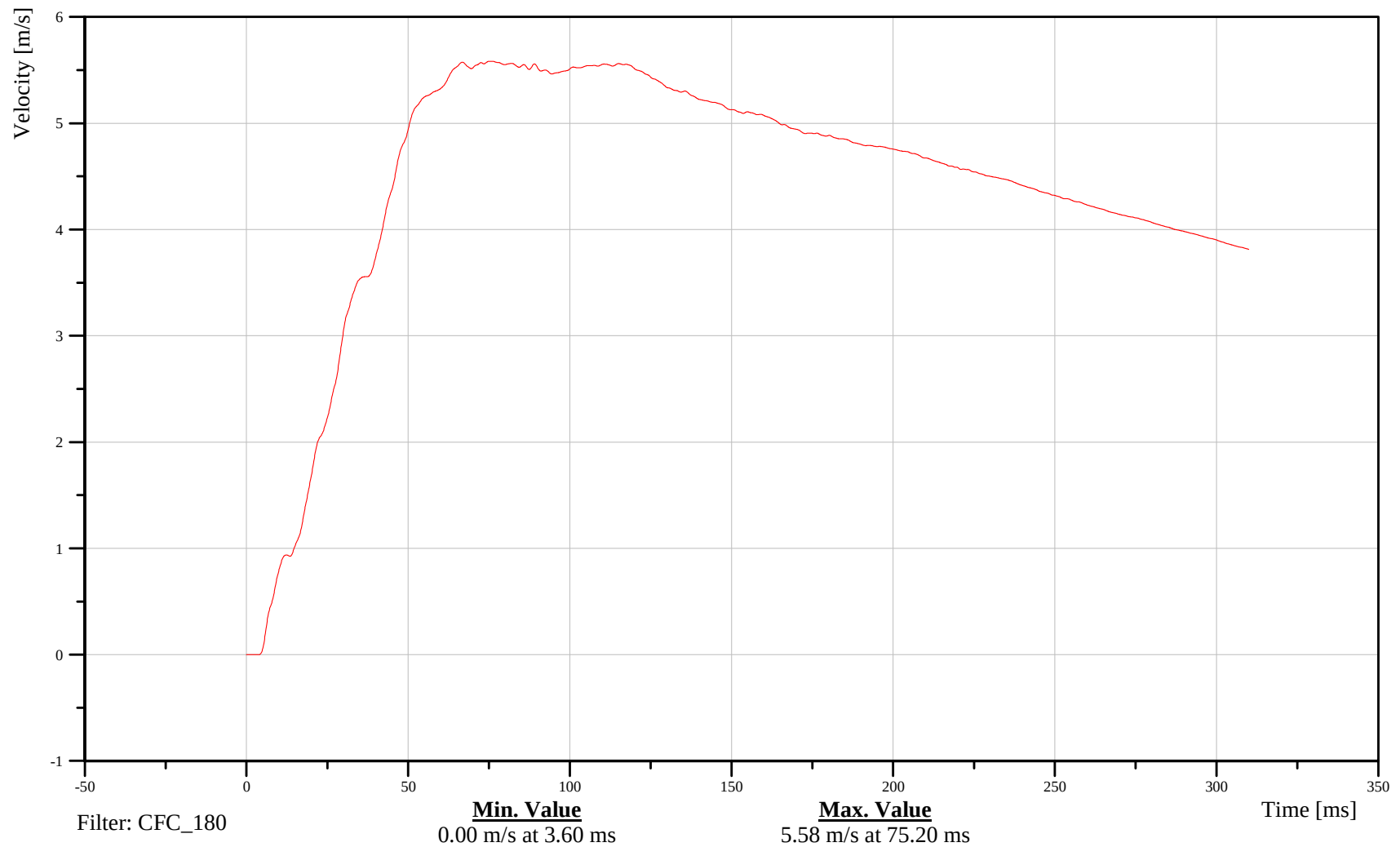
Date: 09/11/2008
Time: 16:22

Customer: VRTC

16SILBFR0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-6

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

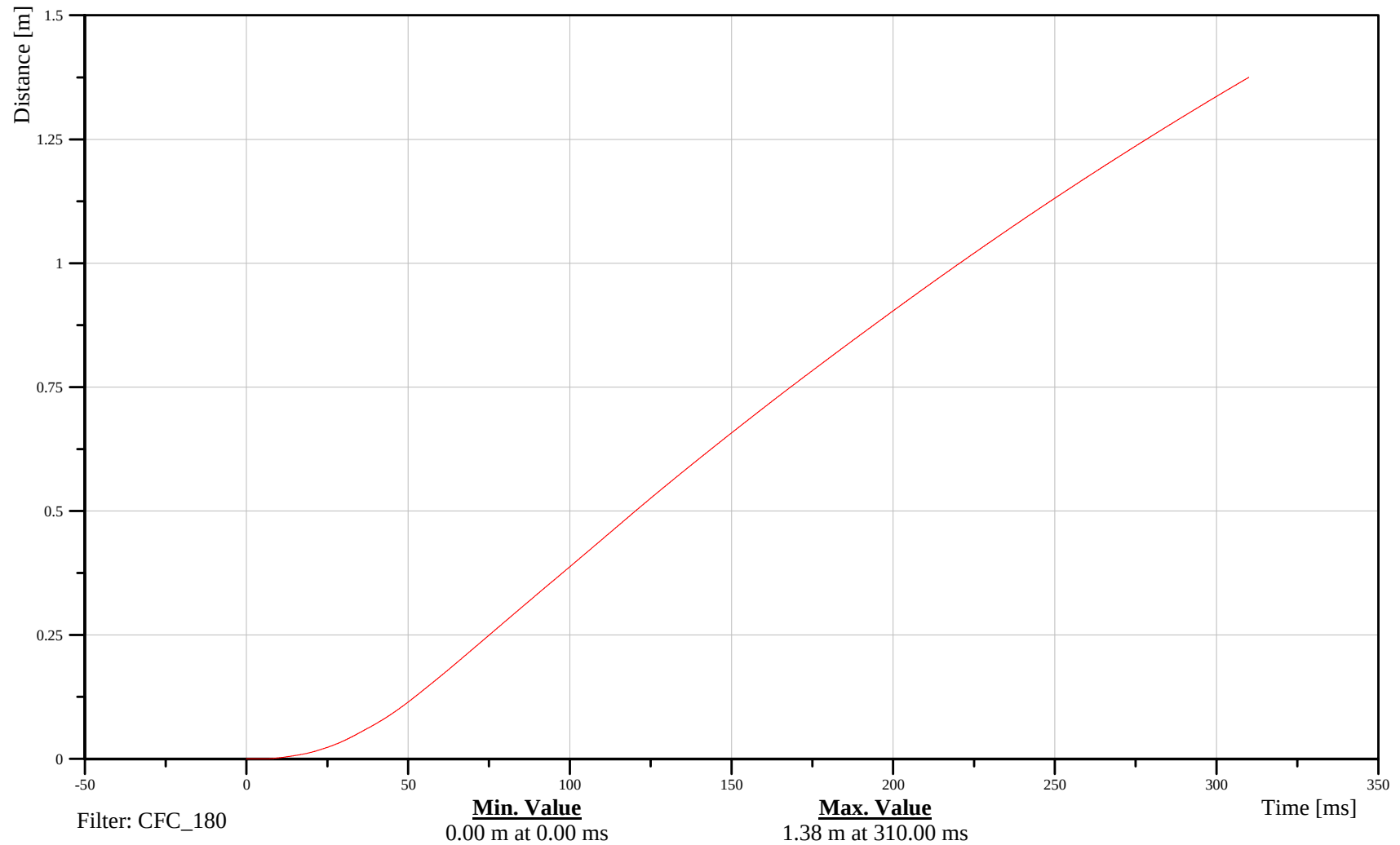
Right Side Sill at Front Seat Y-Axis Displacement

Customer: VRTC

16SILBFR0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

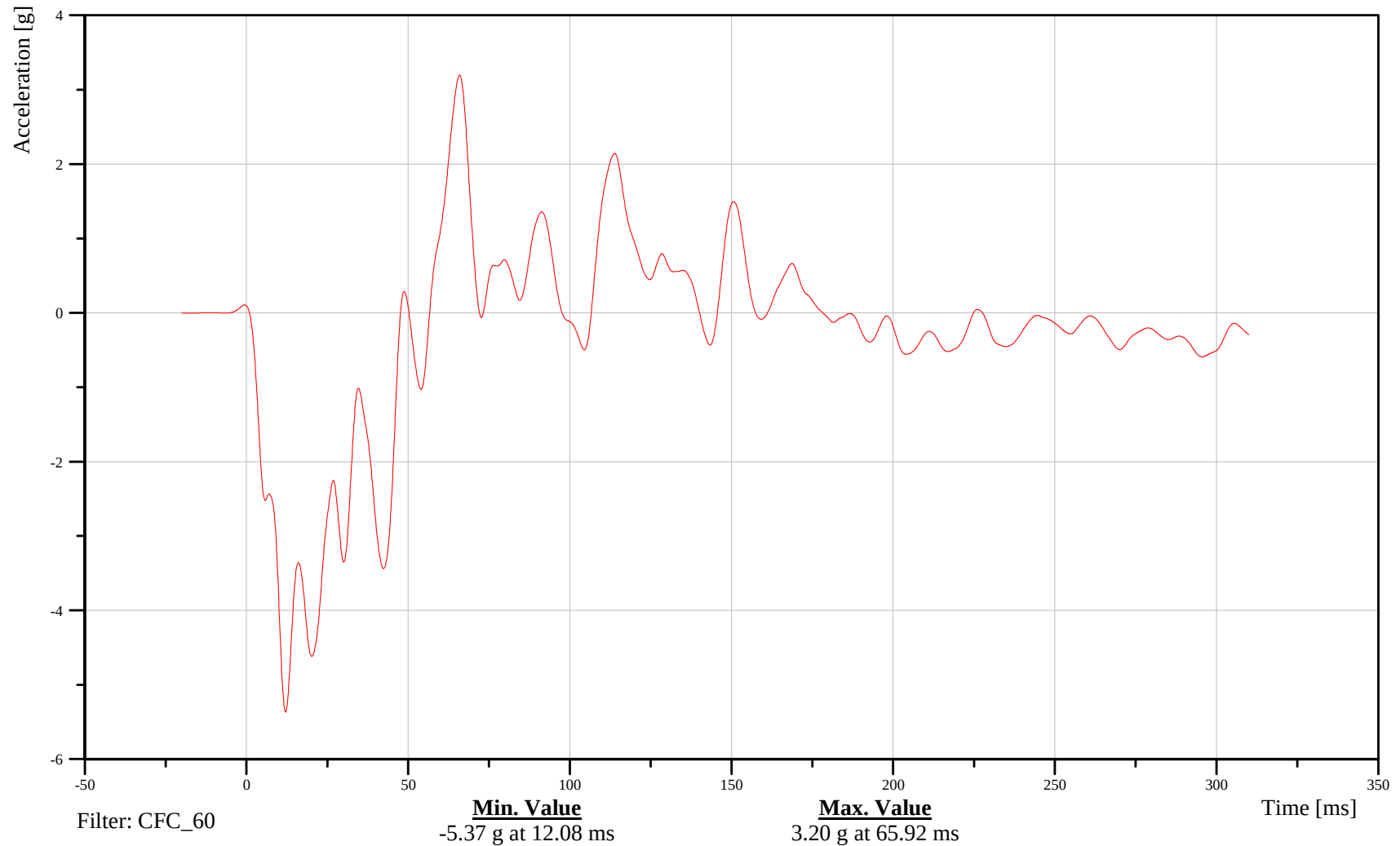
Right Side Sill at Front Seat Z-Axis Acceleration

Customer: VRTC

16SILBFR0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

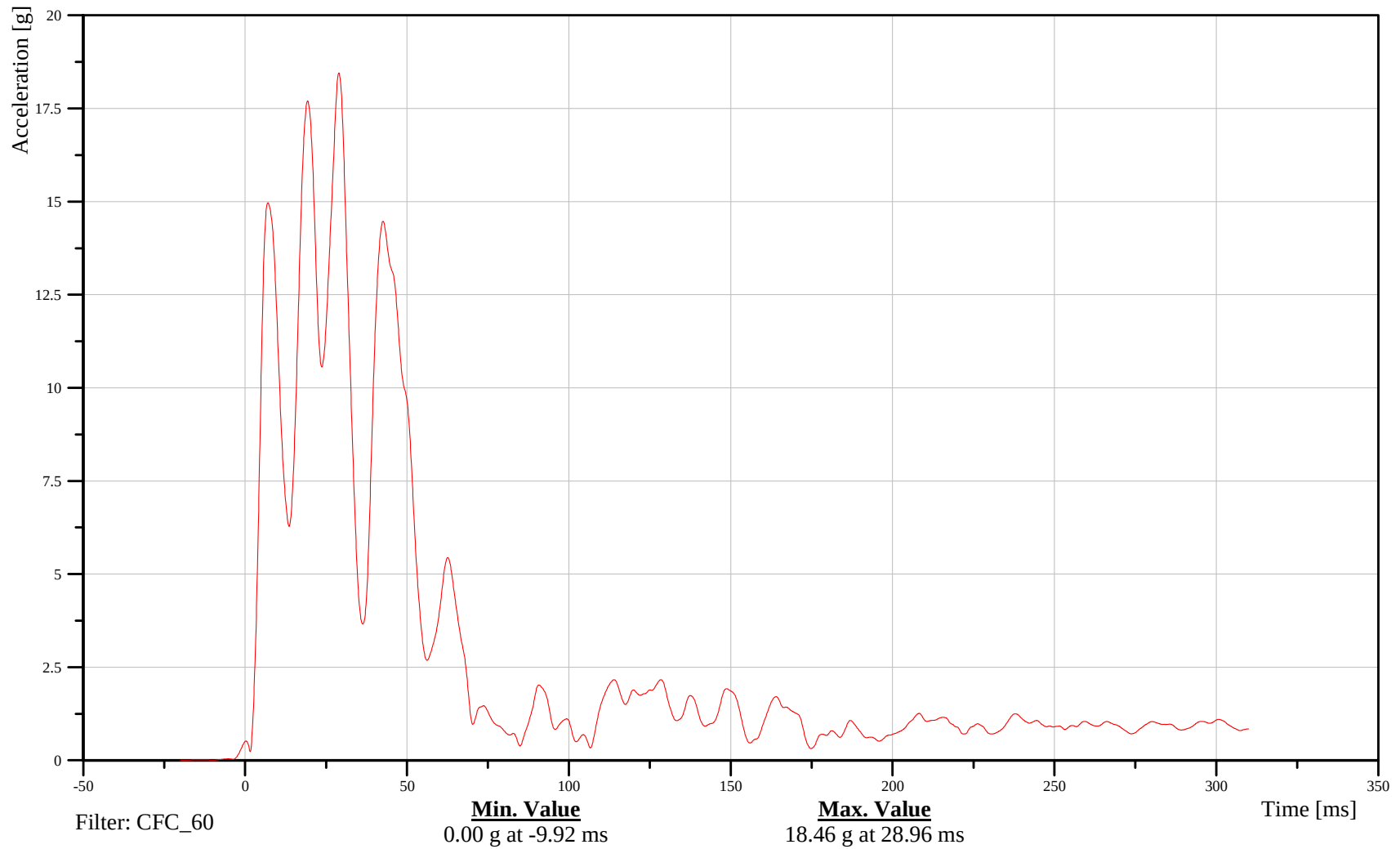
Right Side Sill at Front Seat Resultant Acceleration

Customer: VRTC

16SILBFR0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

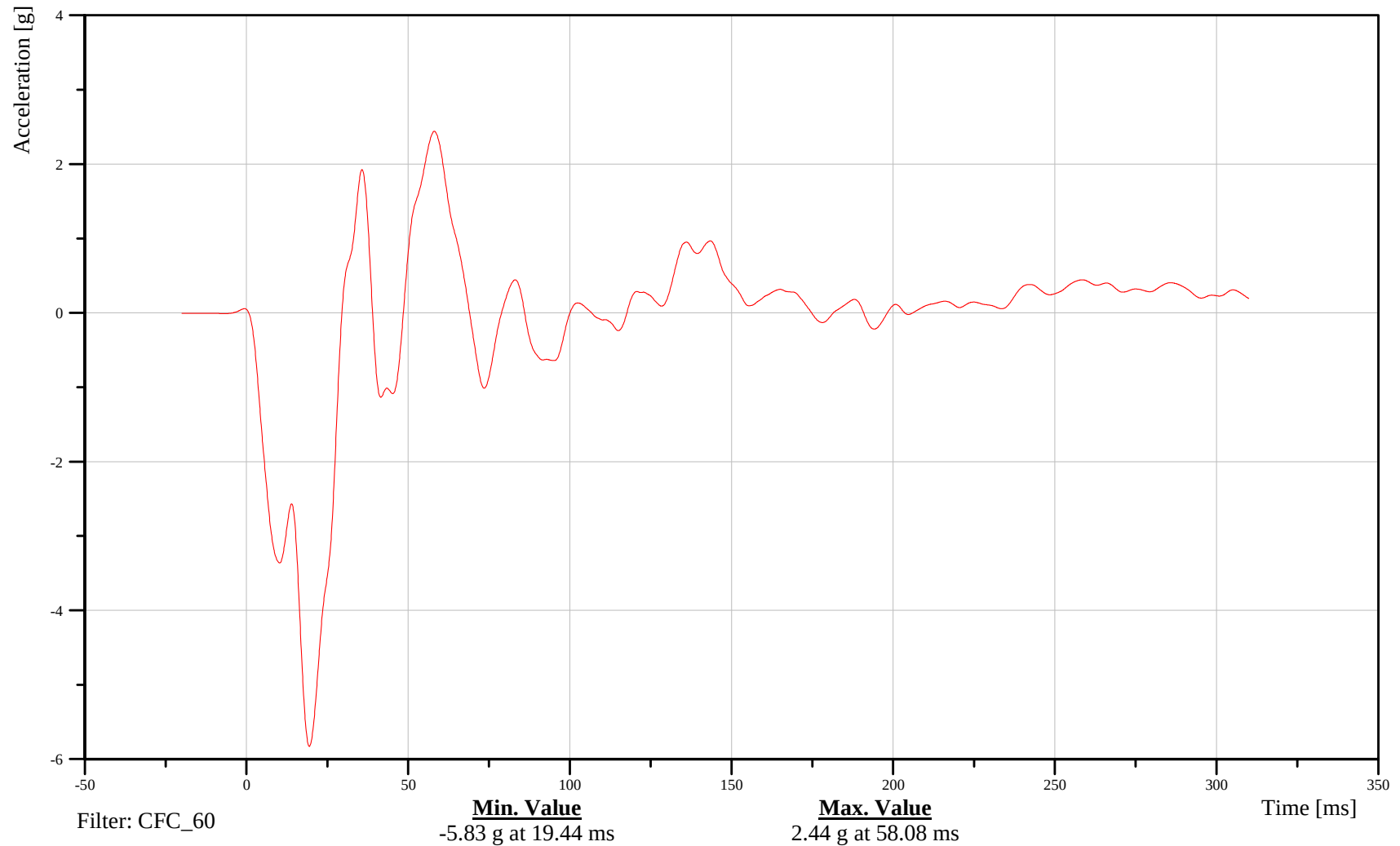
Right Side Sill at Rear Seat X-Axis Acceleration

Customer: VRTC

16SILBRE0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-10

080911-2



World SID Evaluation
Right Side Sill at Rear Seat X-Axis Velocity

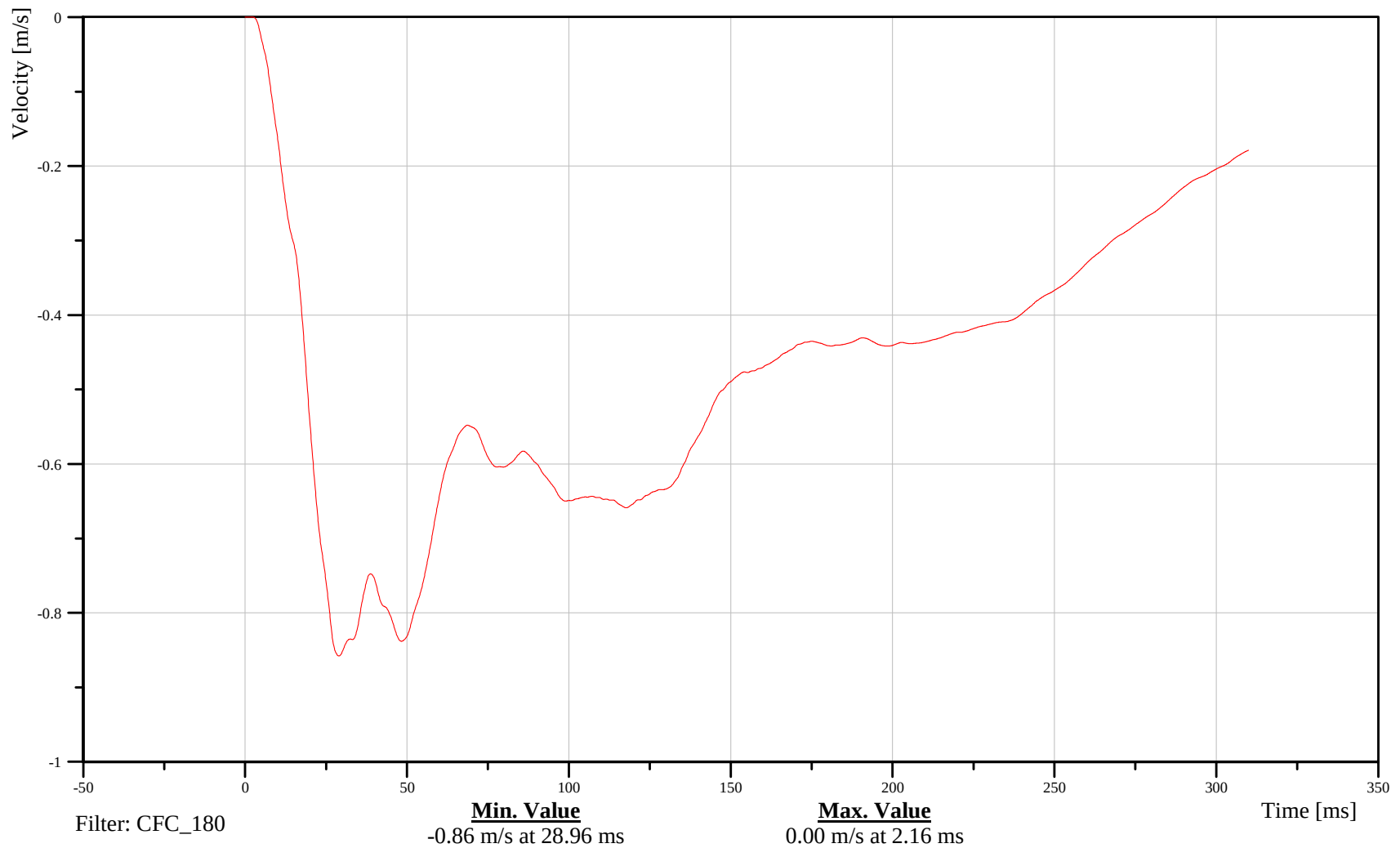
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Time: 16:22

Customer: VRTC

16SILBRE0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-11

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

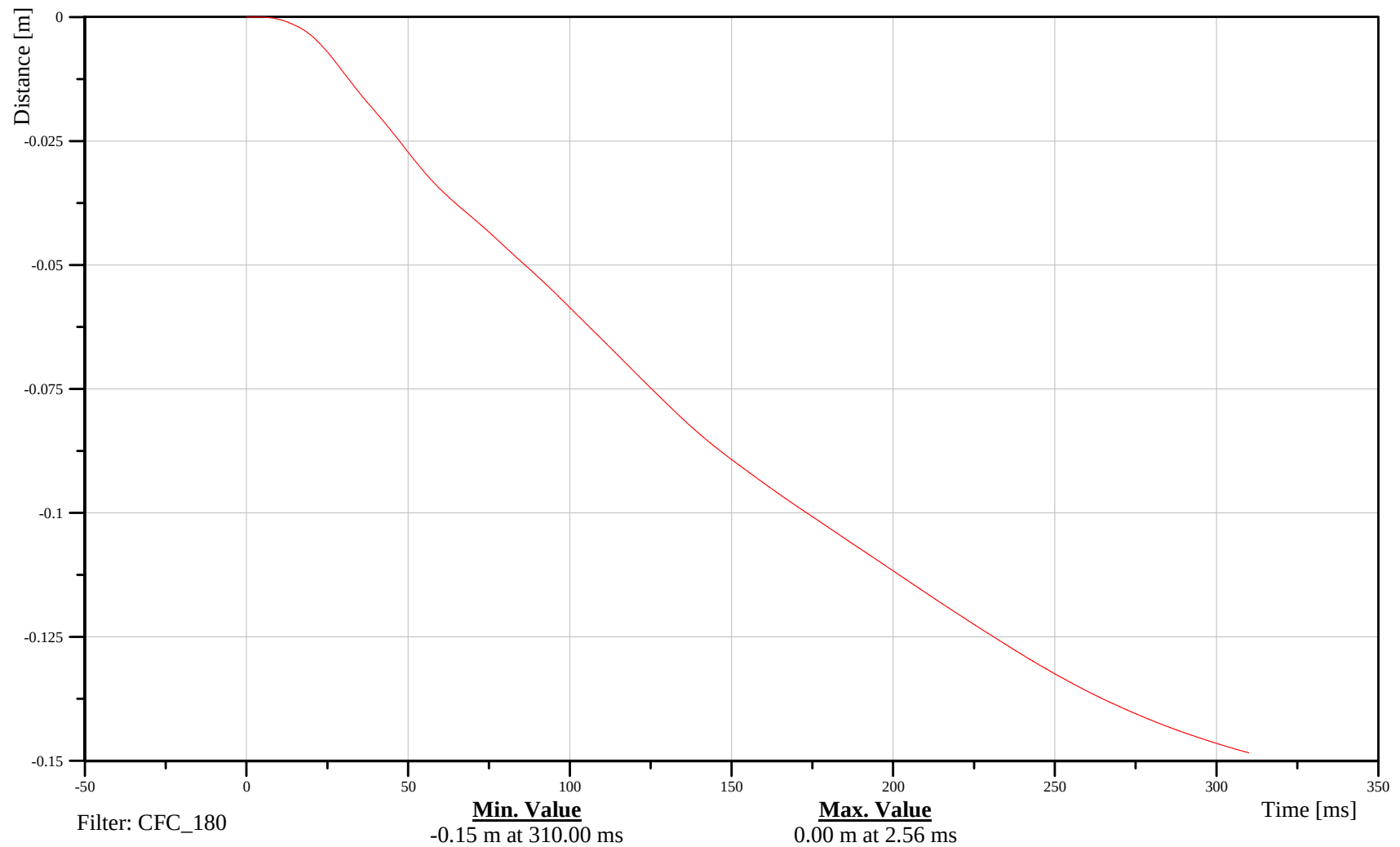
Right Side Sill at Rear Seat X-Axis Displacement

Customer: VRTC

16SILBRE0000DCXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-12

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

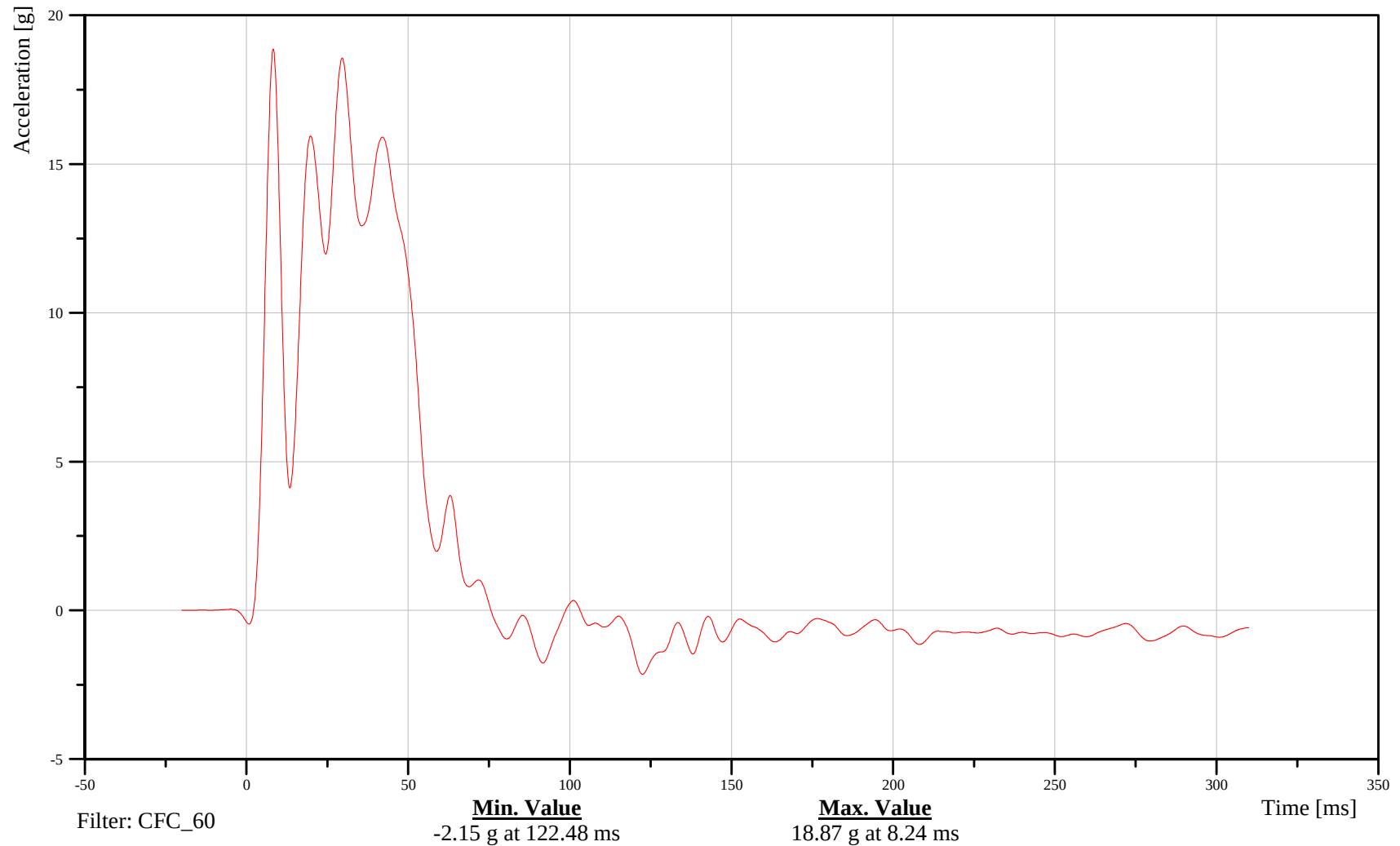
Right Side Sill at Rear Seat Y-Axis Acceleration

Customer: VRTC

16SILBRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-13

080911-2



World SID Evaluation
Right Side Sill at Rear Seat Y-Axis Velocity

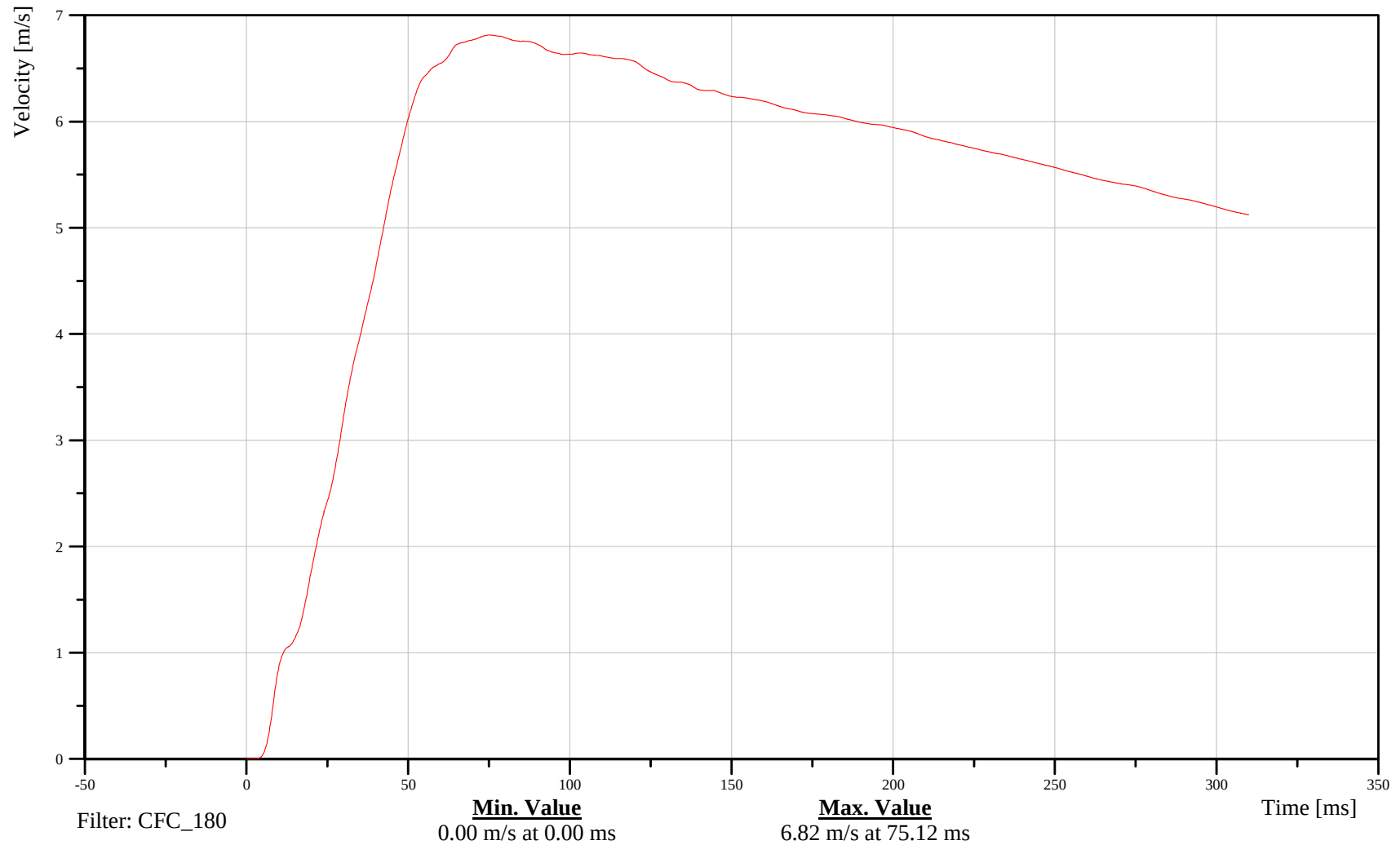
Date: 09/11/2008
Time: 16:22

Customer: VRTC

16SILBRE0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-14

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

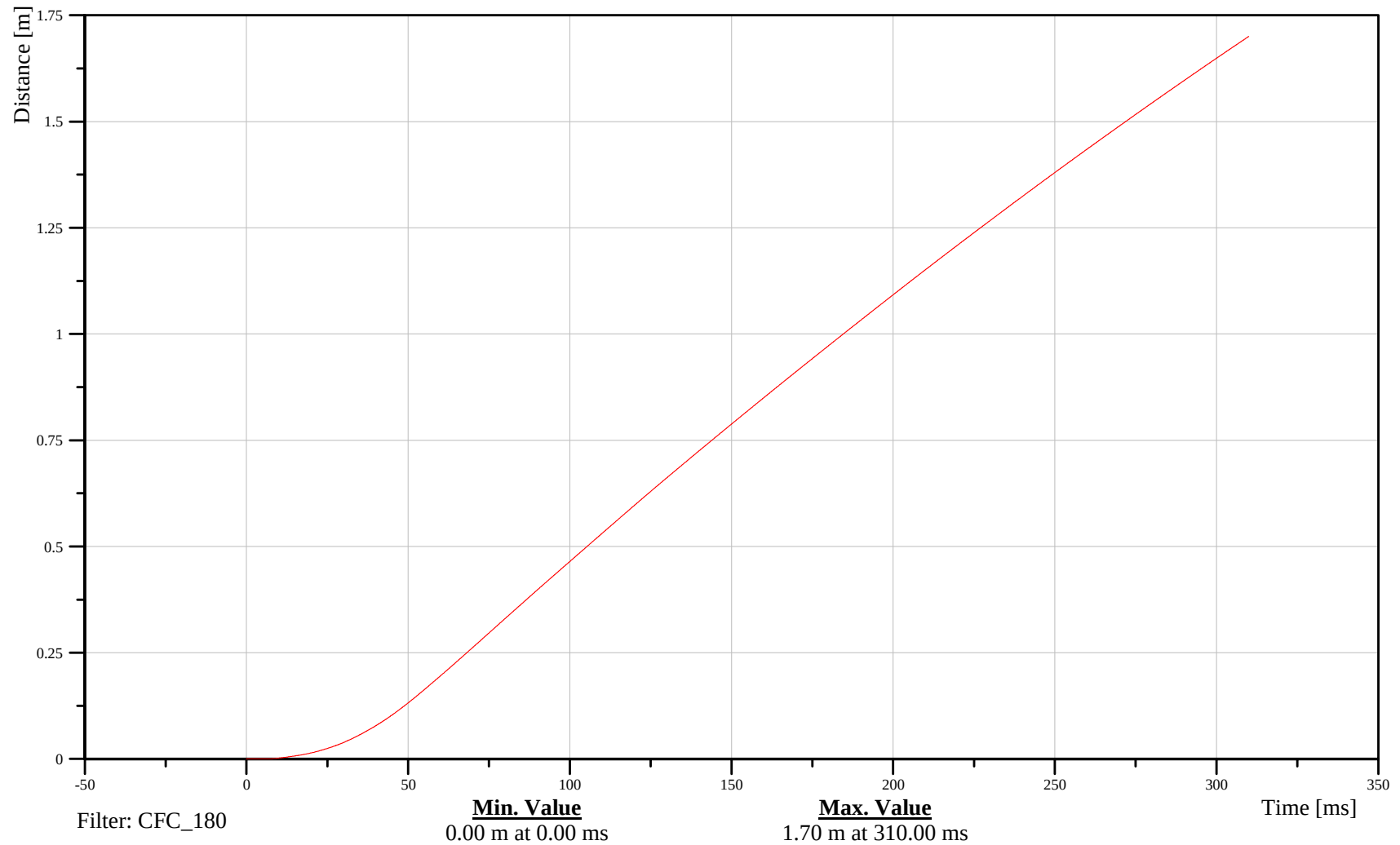
Right Side Sill at Rear Seat Y-Axis Displacement

Customer: VRTC

16SILBRE0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-15

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

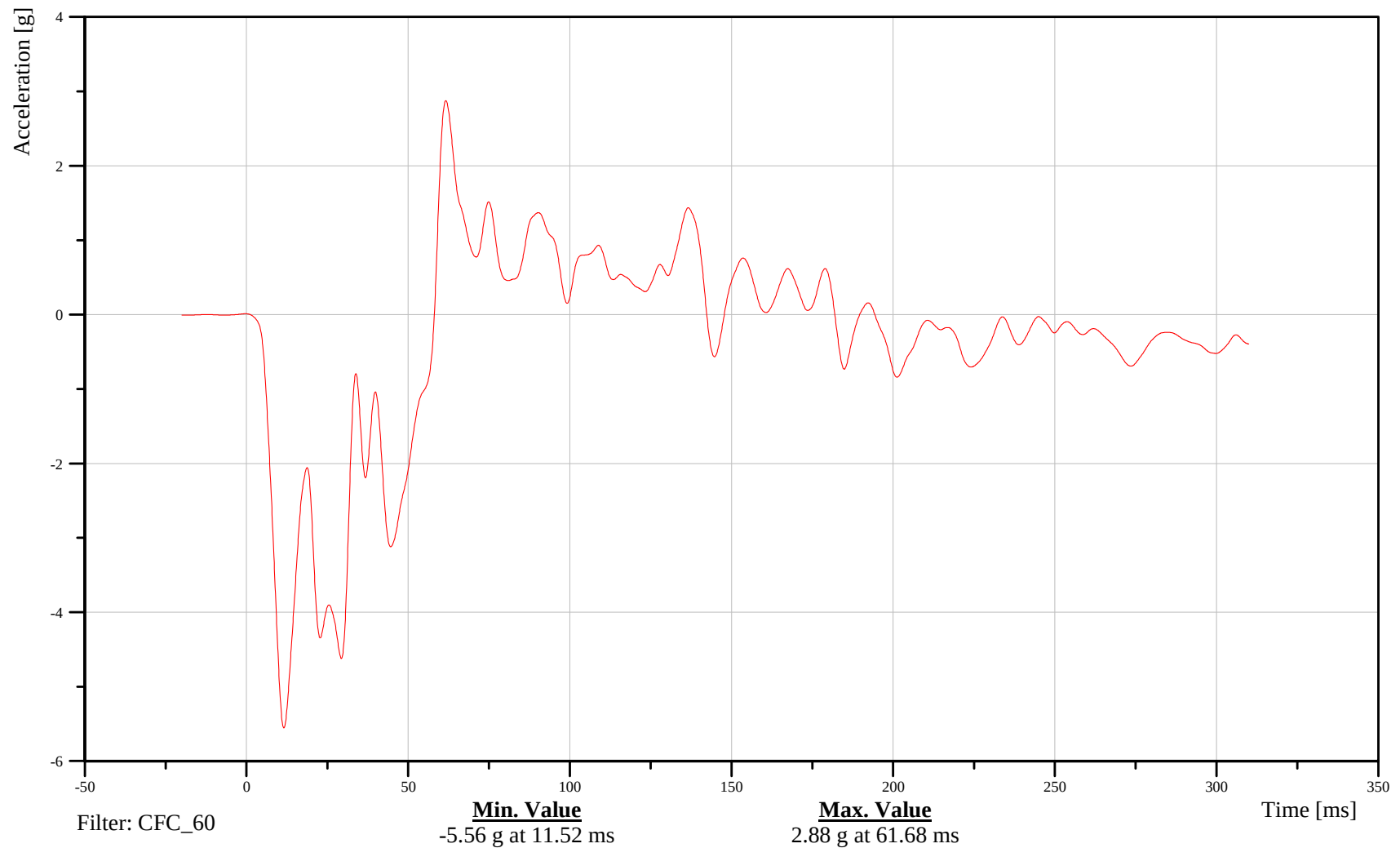
Right Side Sill at Rear Seat Z-Axis Acceleration

Customer: VRTC

16SILBRE0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-16

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

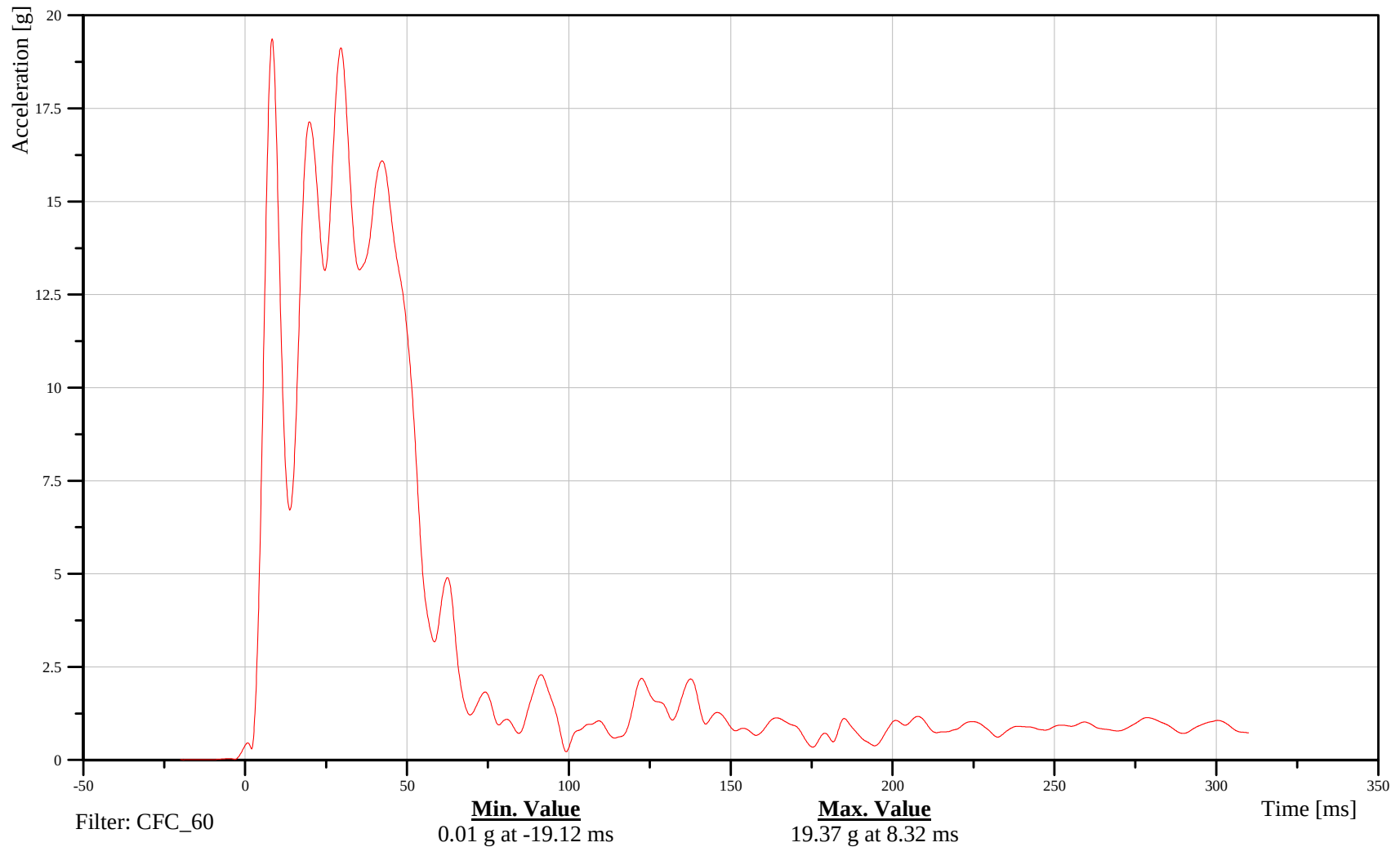
Right Side Sill at Rear Seat Resultant Acceleration

Customer: VRTC

16SILBRE0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-17

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

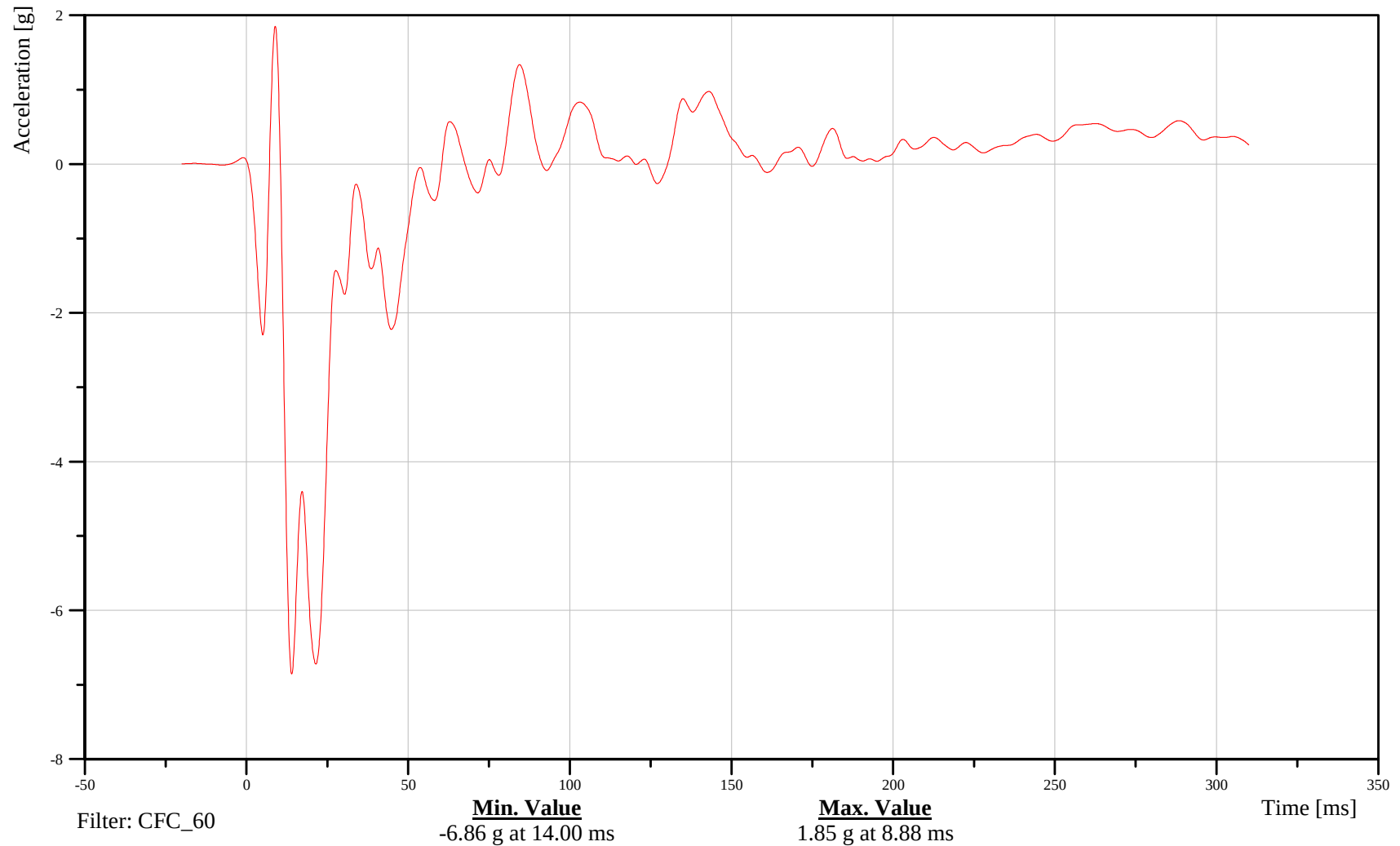
Rear Floorpan Above Axle X-Axis Acceleration

Customer: VRTC

18FORA000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-18

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

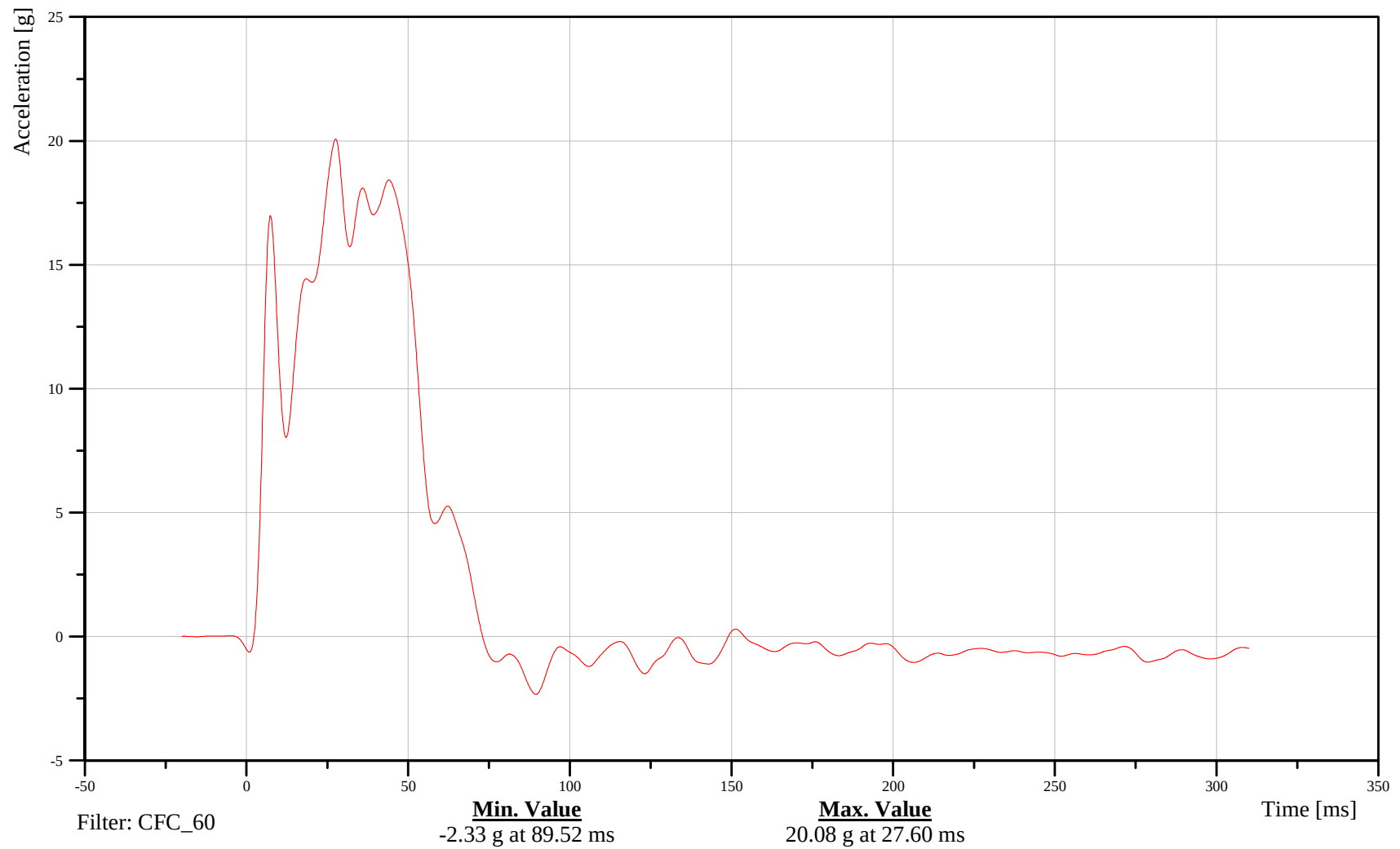
Rear Floorpan Above Axle Y-Axis Acceleration

Customer: VRTC

18FORA000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-19

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

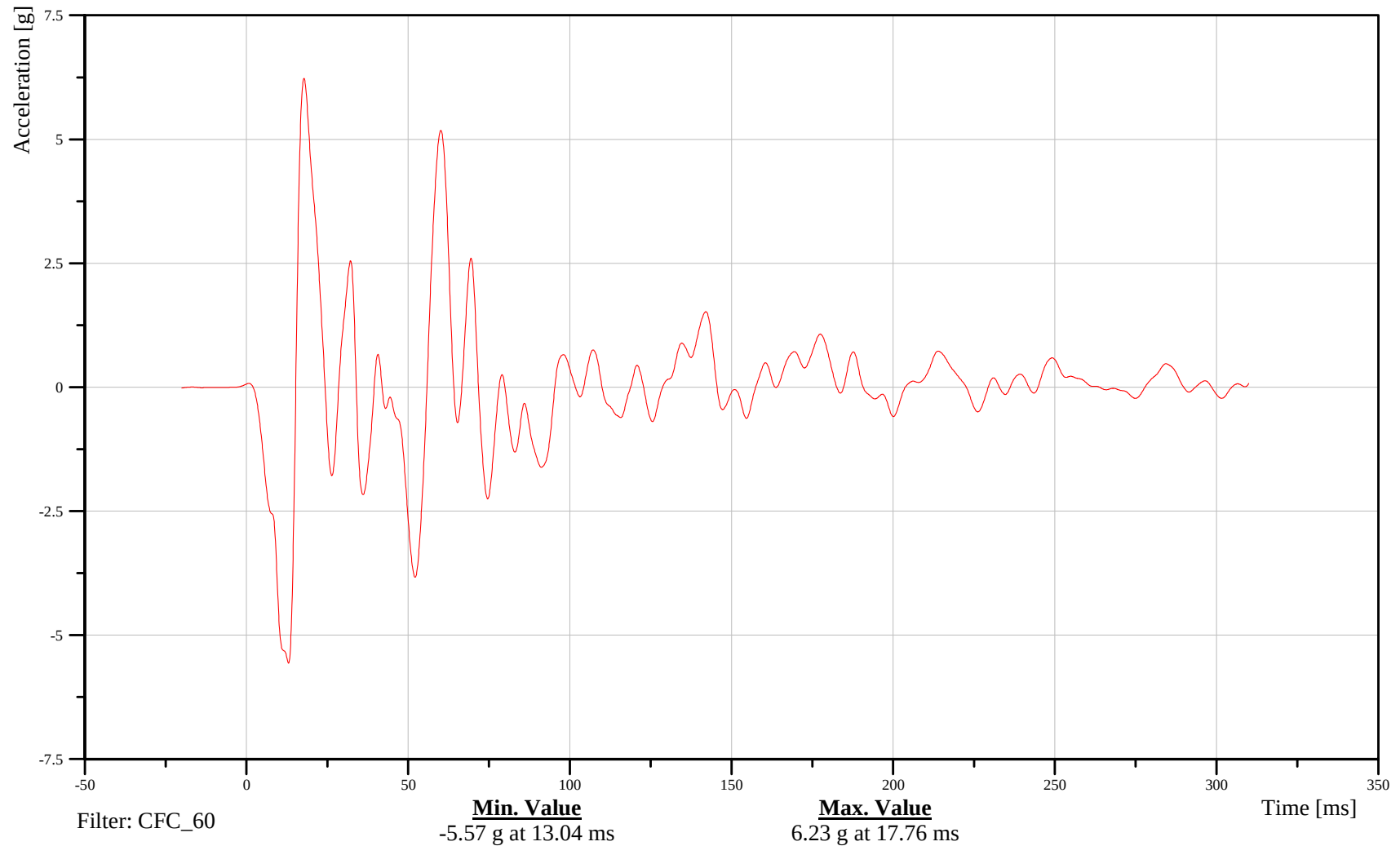
Rear Floorpan Above Axle Z-Axis Acceleration

Customer: VRTC

18FORA000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

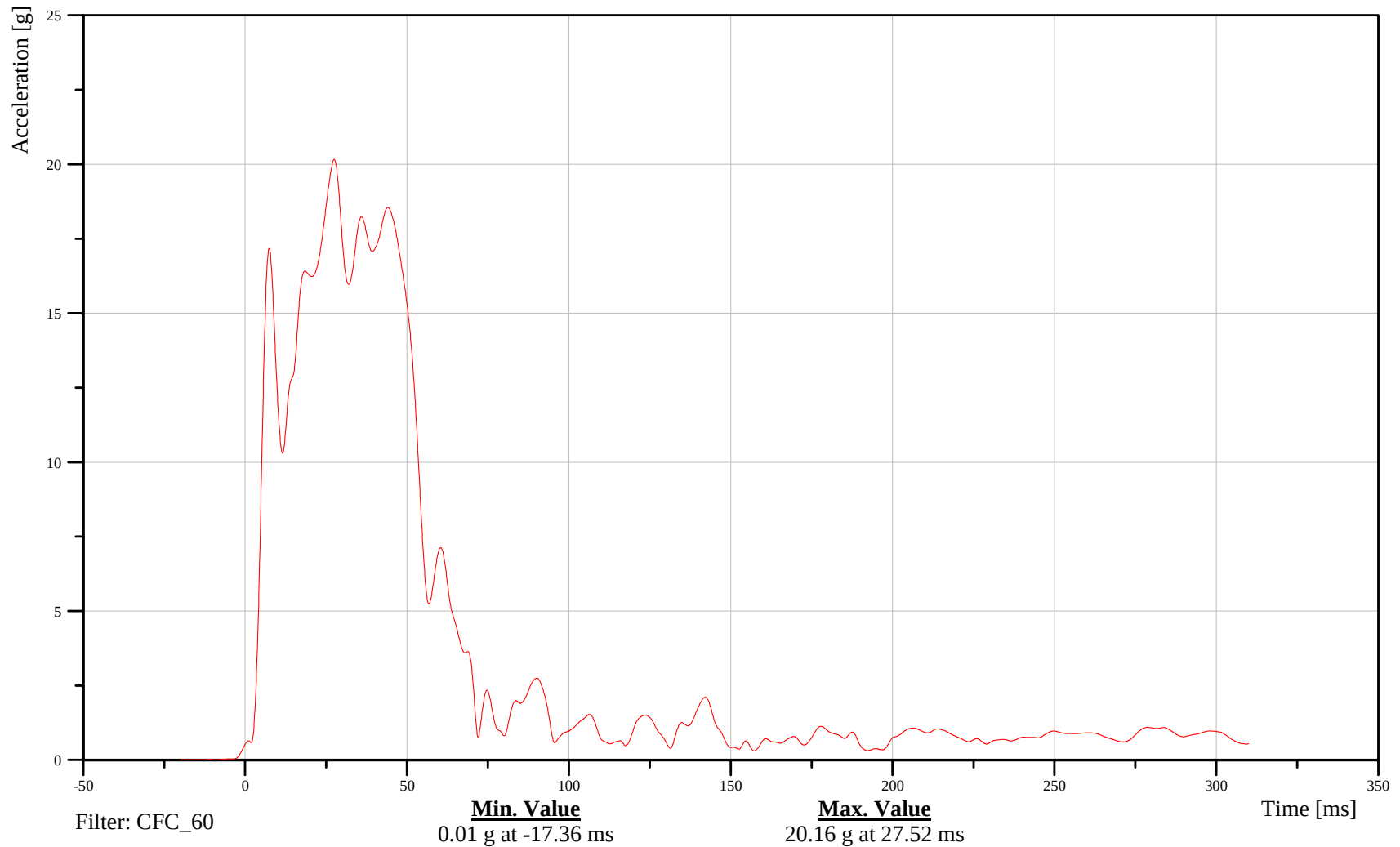
Rear Floorpan Above Axle Resultant Acceleration

Customer: VRTC

18FORA000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

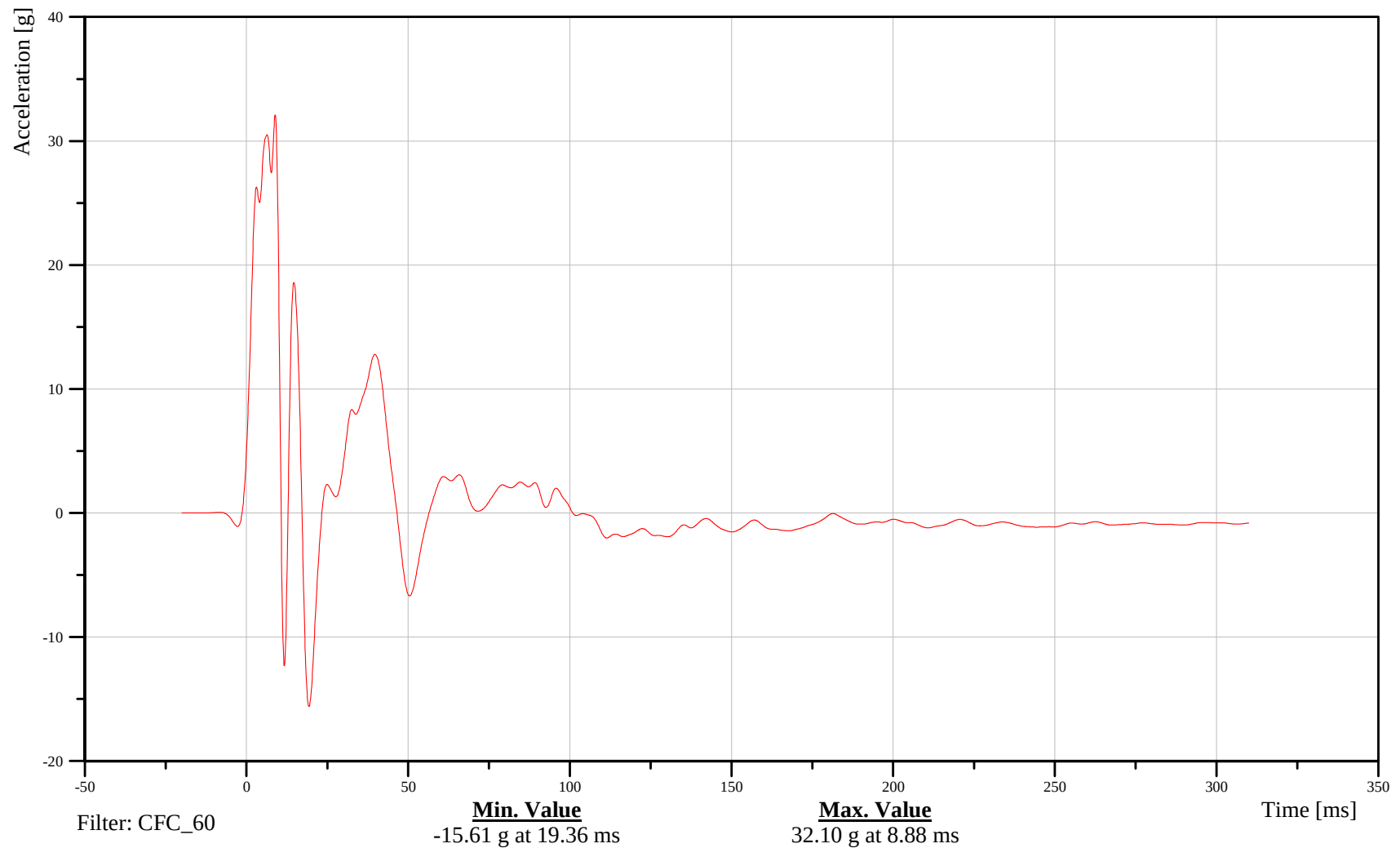
Left Floor Sill at Front Seat Y-Axis Acceleration

Customer: VRTC

14SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

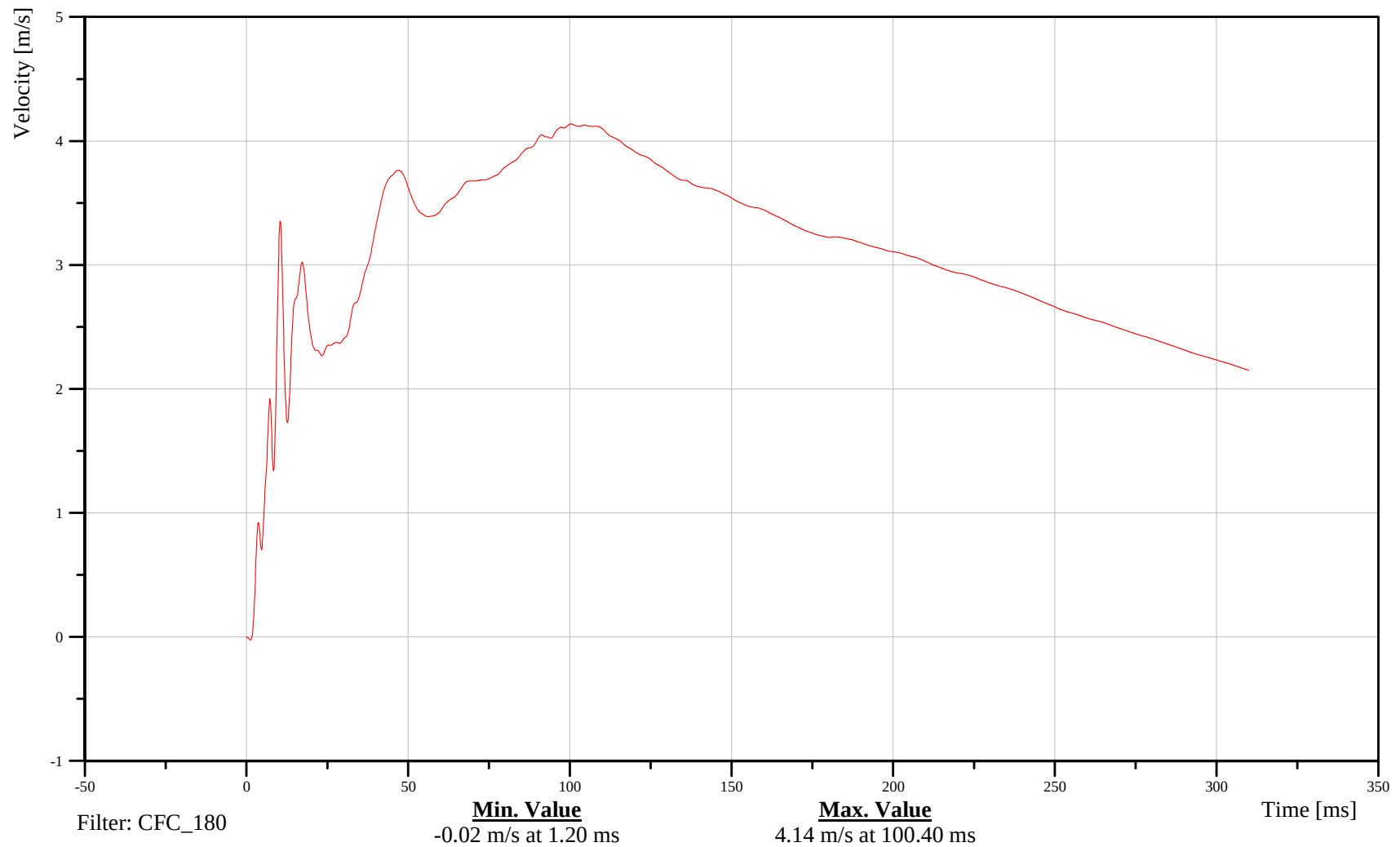
Left Floor Sill at Front Seat Y-Axis Velocity

Customer: VRTC

14SILBFR0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

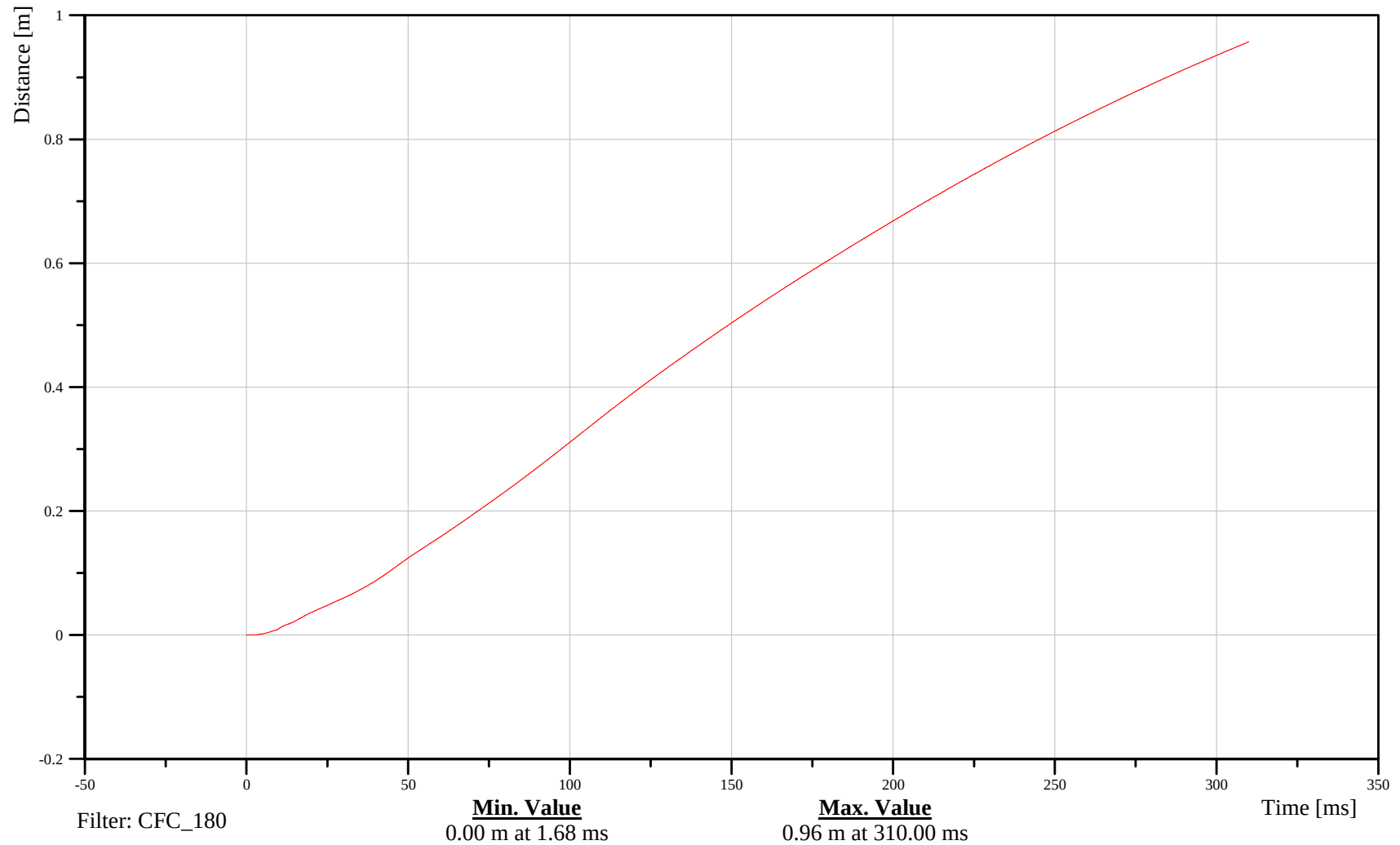
Left Floor Sill at Front Seat Y-Axis Displacement

Customer: VRTC

14SILBFR0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-24

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

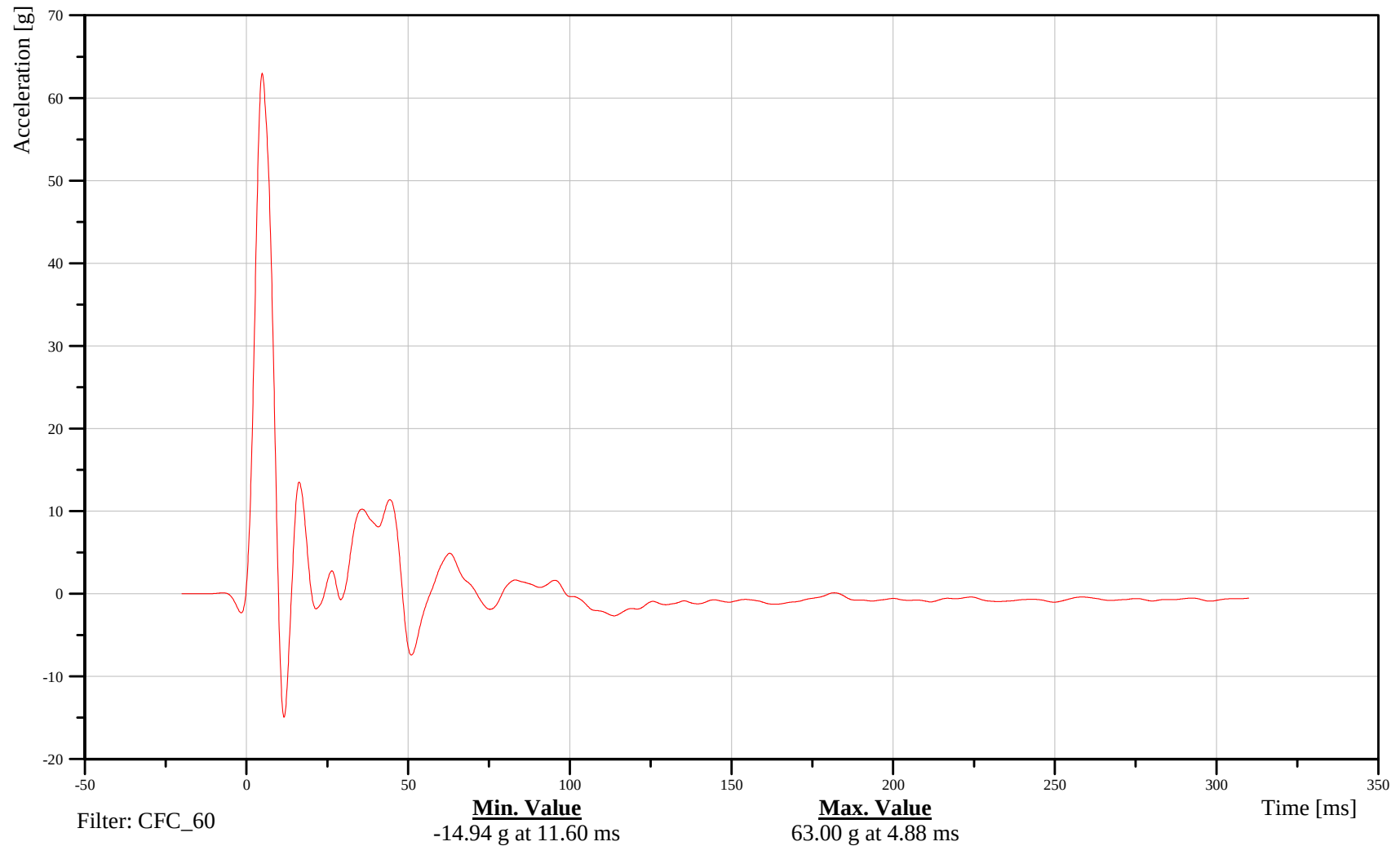
Left Floor Sill at Rear Seat Y-Axis Acceleration

Customer: VRTC

14SILBRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



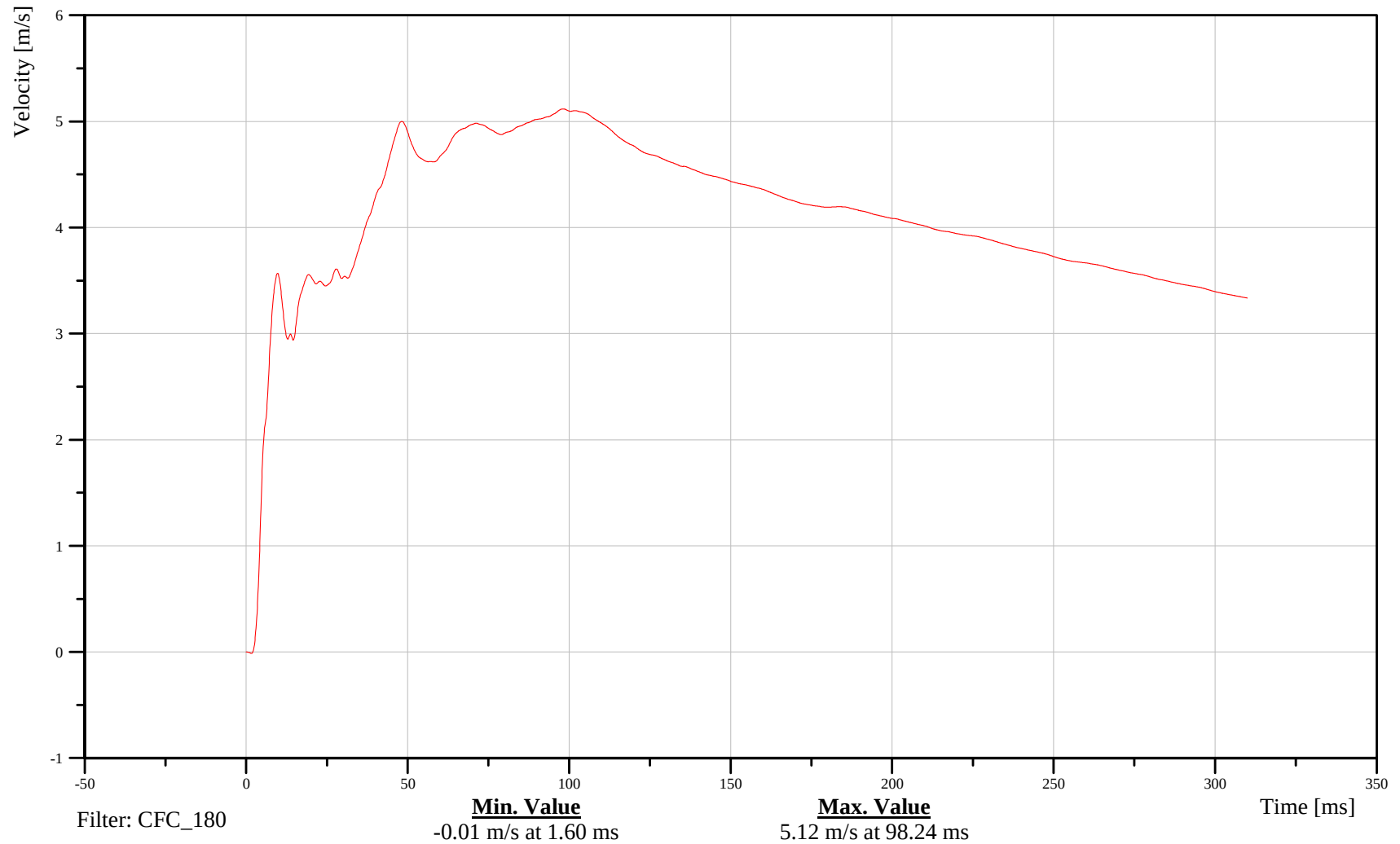
World SID Evaluation
Left Floor Sill at Rear Seat Y-Axis Velocity

Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SILBRE0000VEYC

TRC Inc. Test Lab: CTF
Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

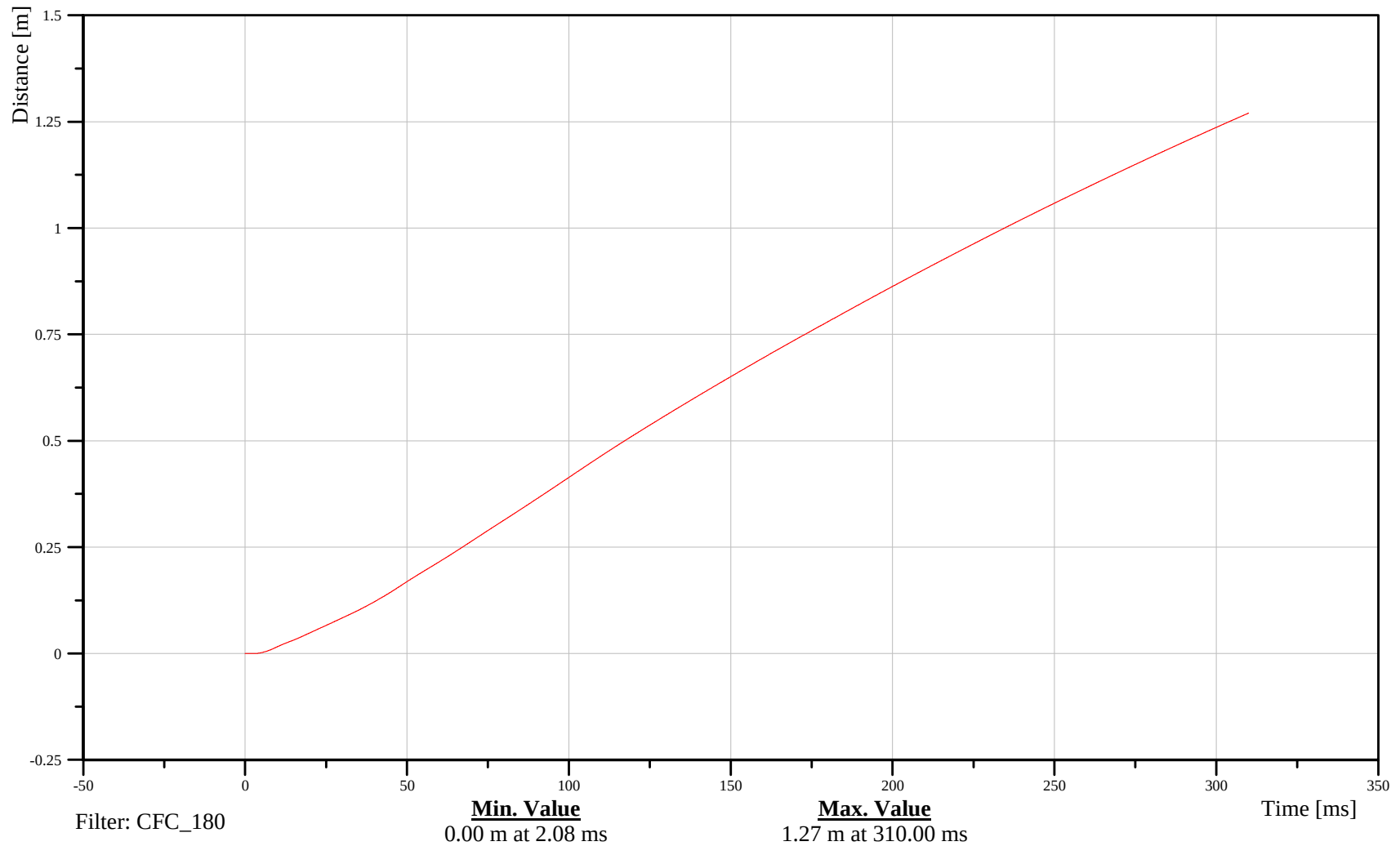
Left Floor Sill at Rear Seat Y-Axis Displacement

Customer: VRTC

14SILBRE0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

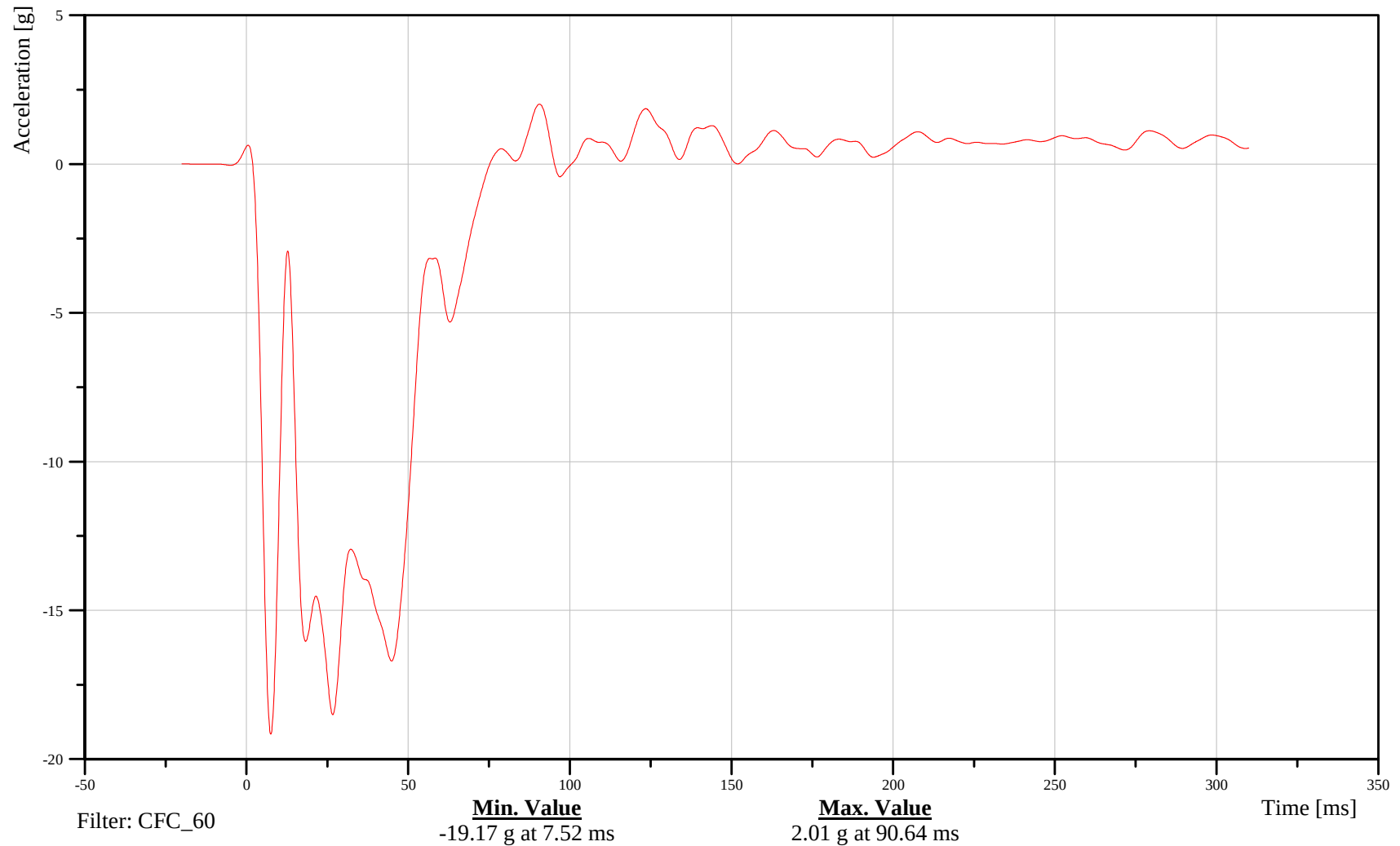
Right Rear Occupant Compartment Y-Axis Acceleration

Customer: VRTC

16VEHCRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-28

080911-2



World SID Evaluation
Left Lower A-Post Y-Axis Acceleration

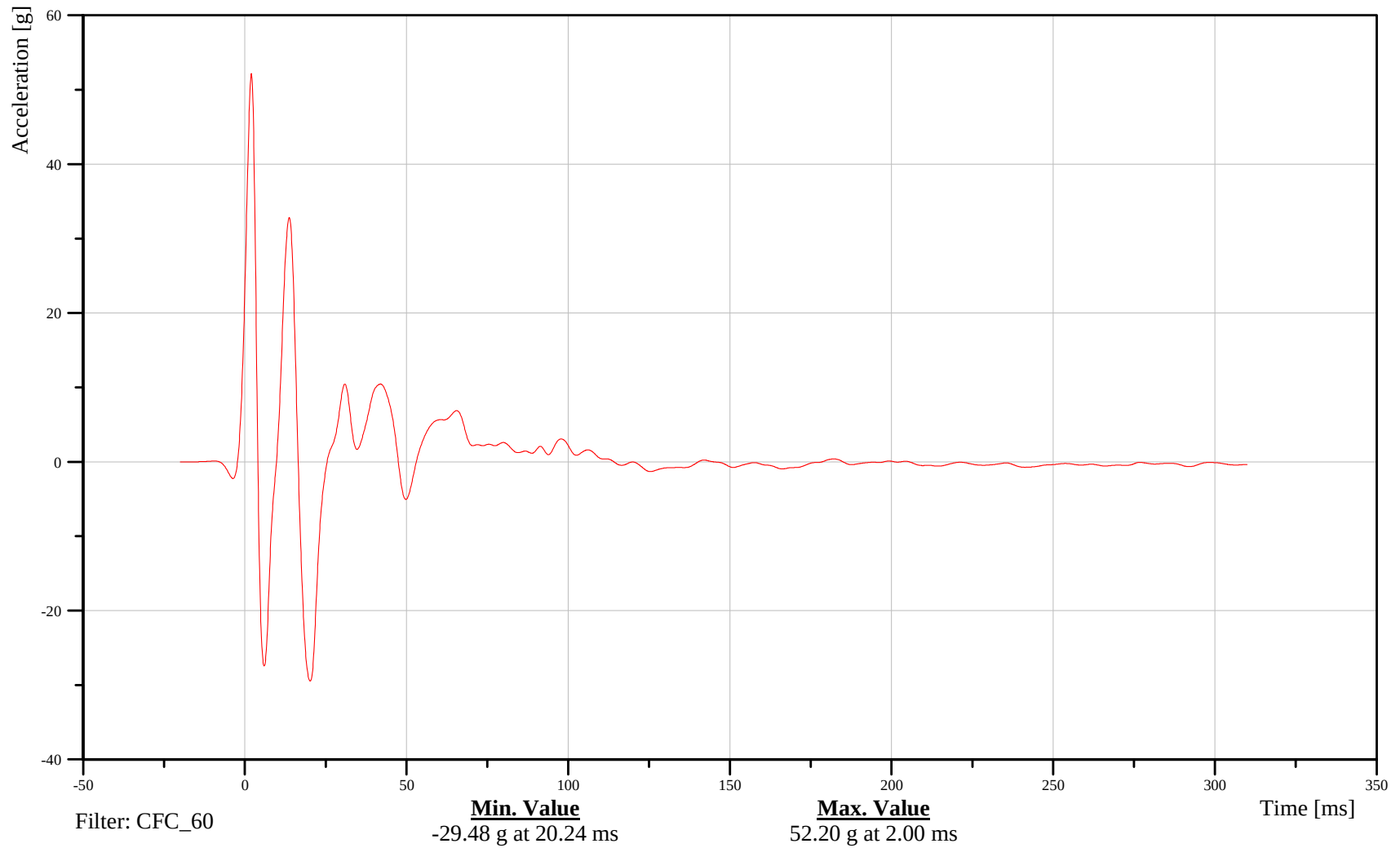
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11APILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Left Upper A-Post Y-Axis Acceleration

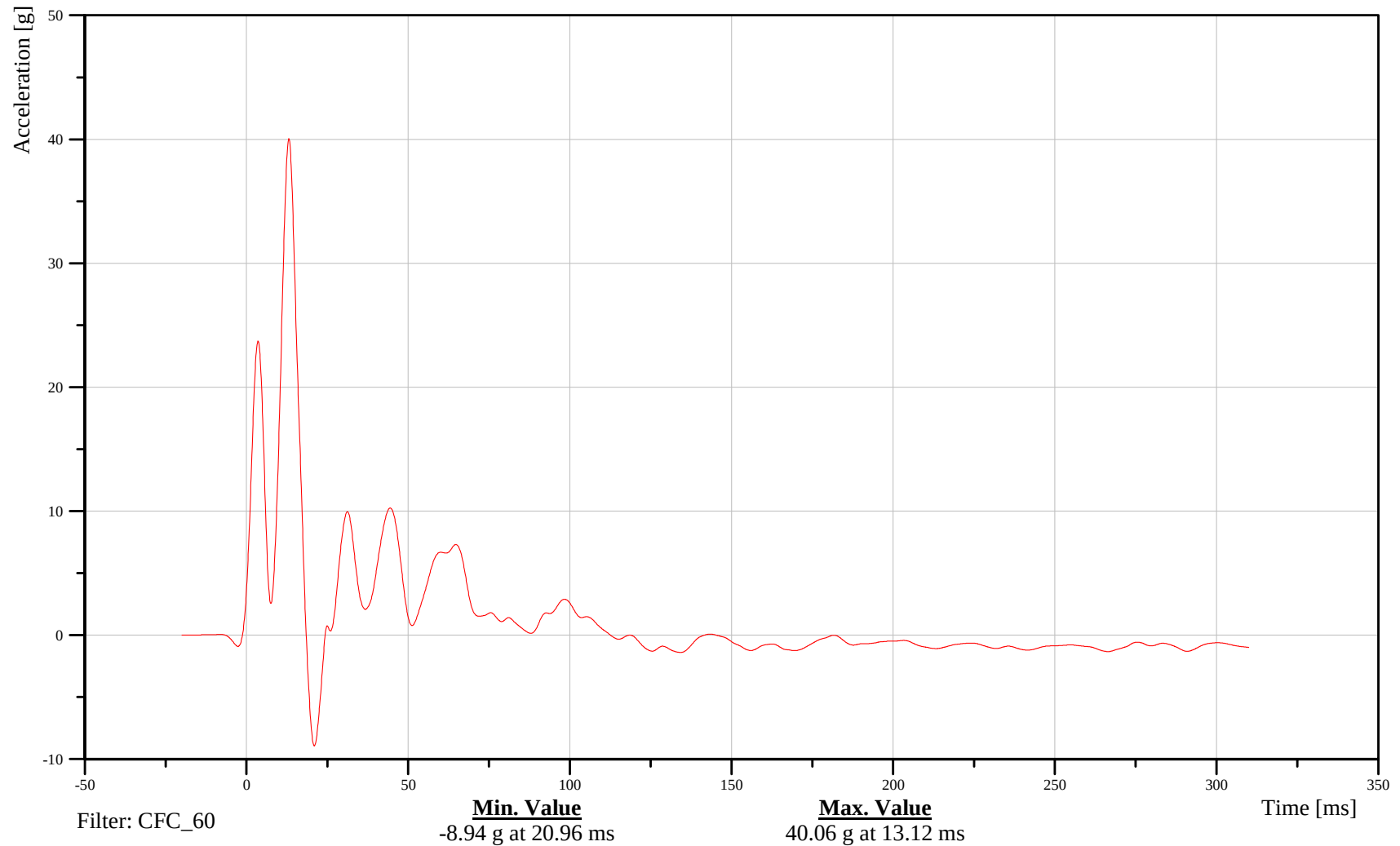
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11APILUP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Left Lower B-Post Y-Axis Acceleration

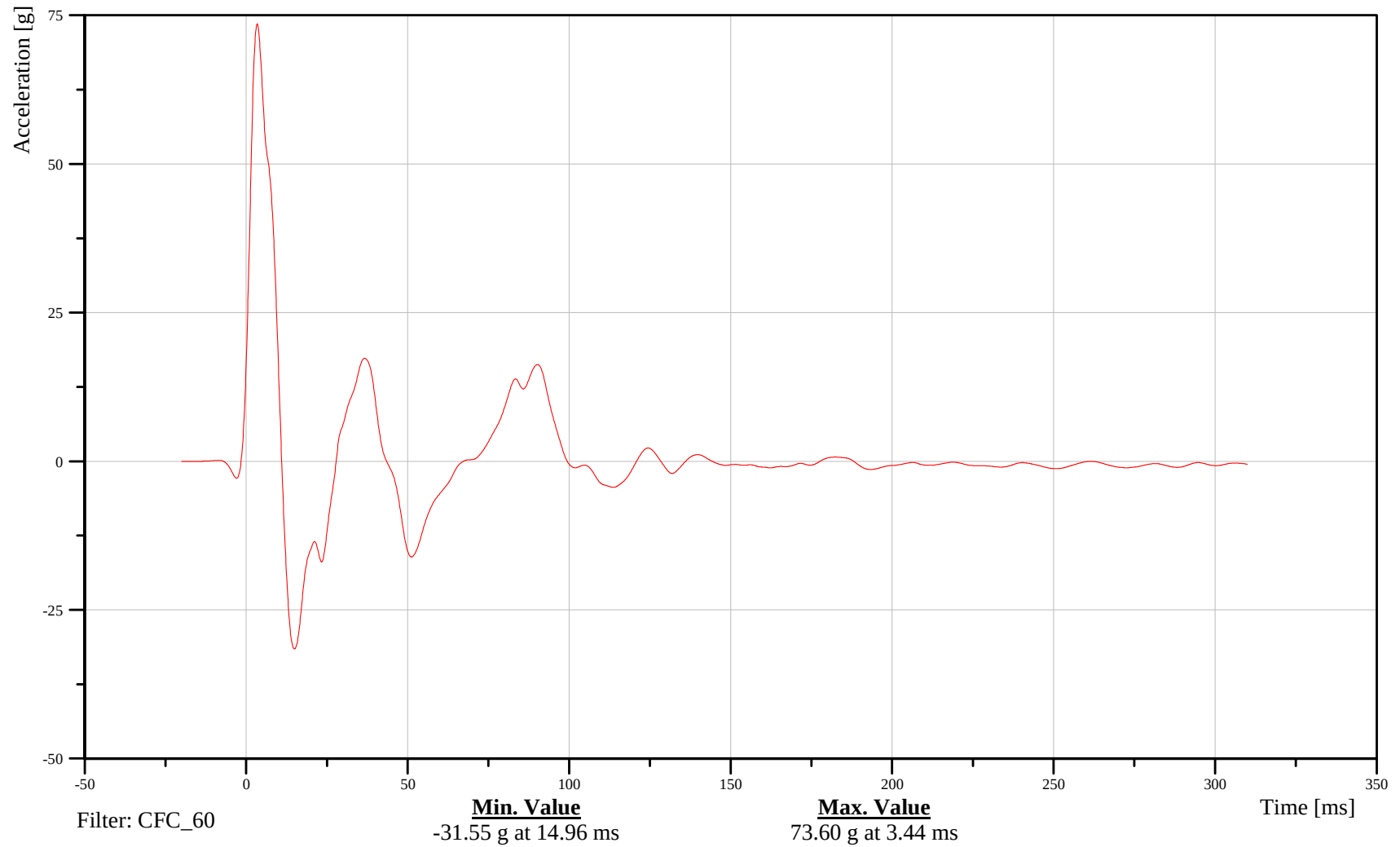
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14BPILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Left Upper B-Post Y-Axis Acceleration

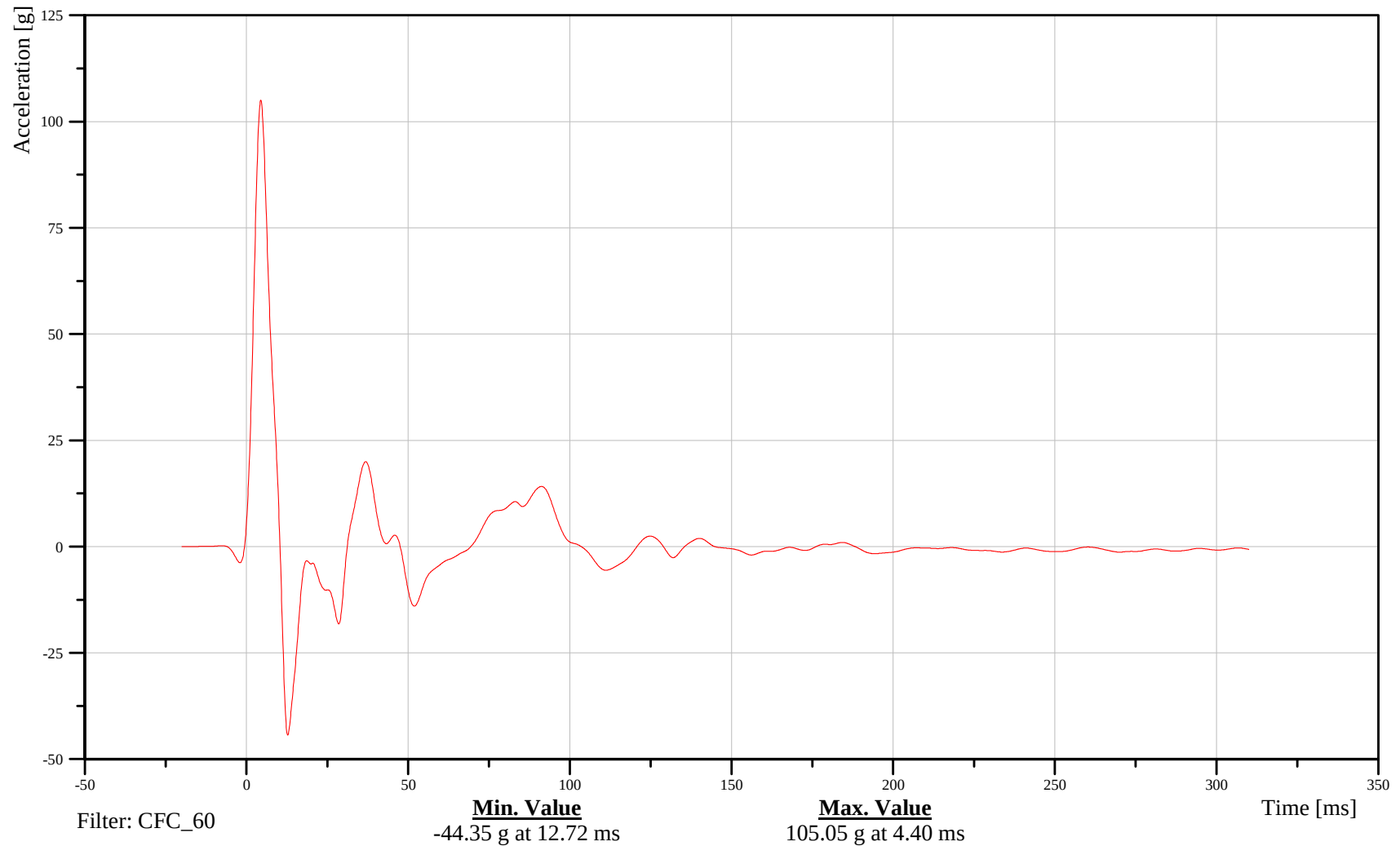
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14BPILUP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Left Front Seat Track Y-Axis Acceleration

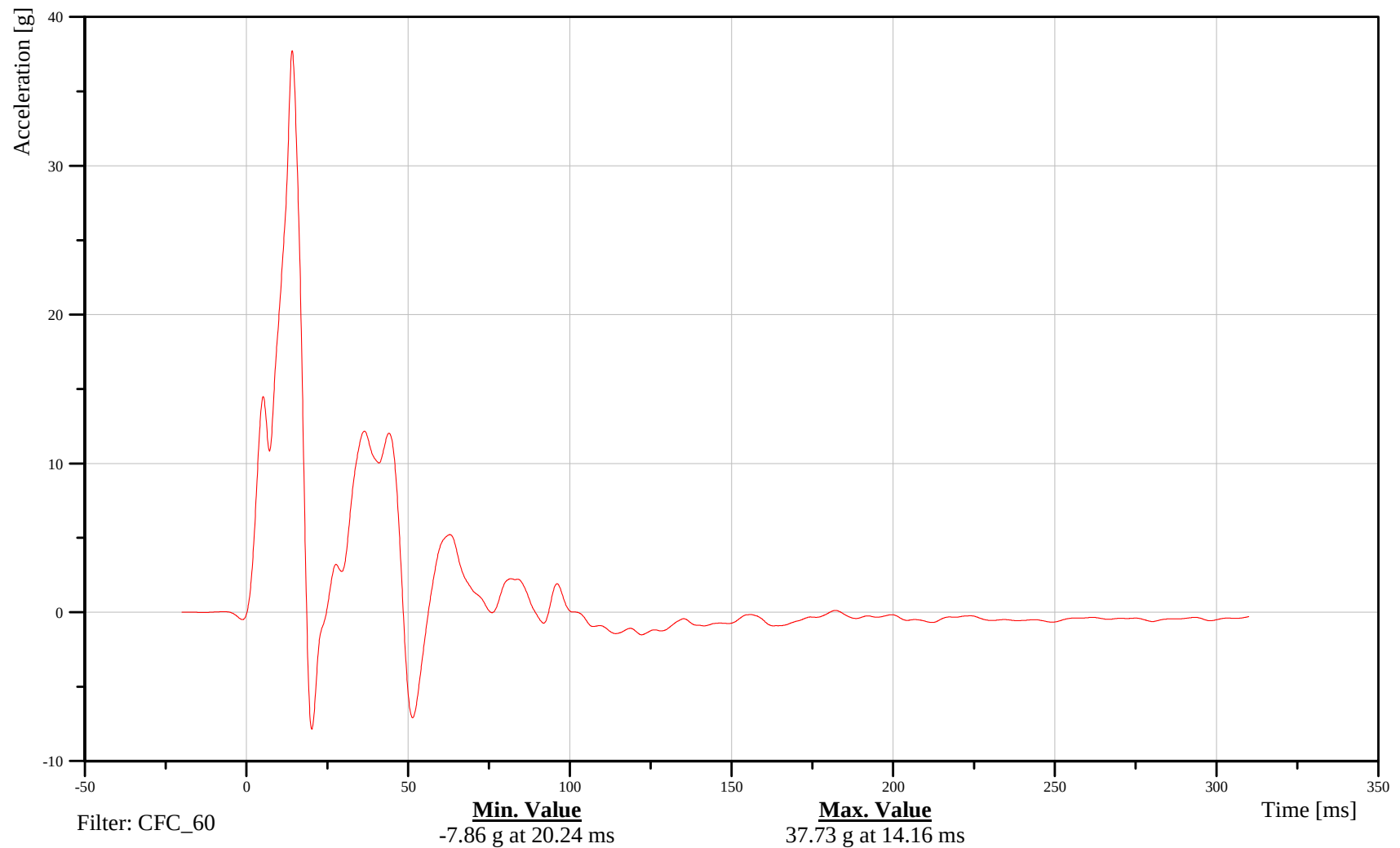
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SETRFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Left Rear Seat Track Y-Axis Acceleration

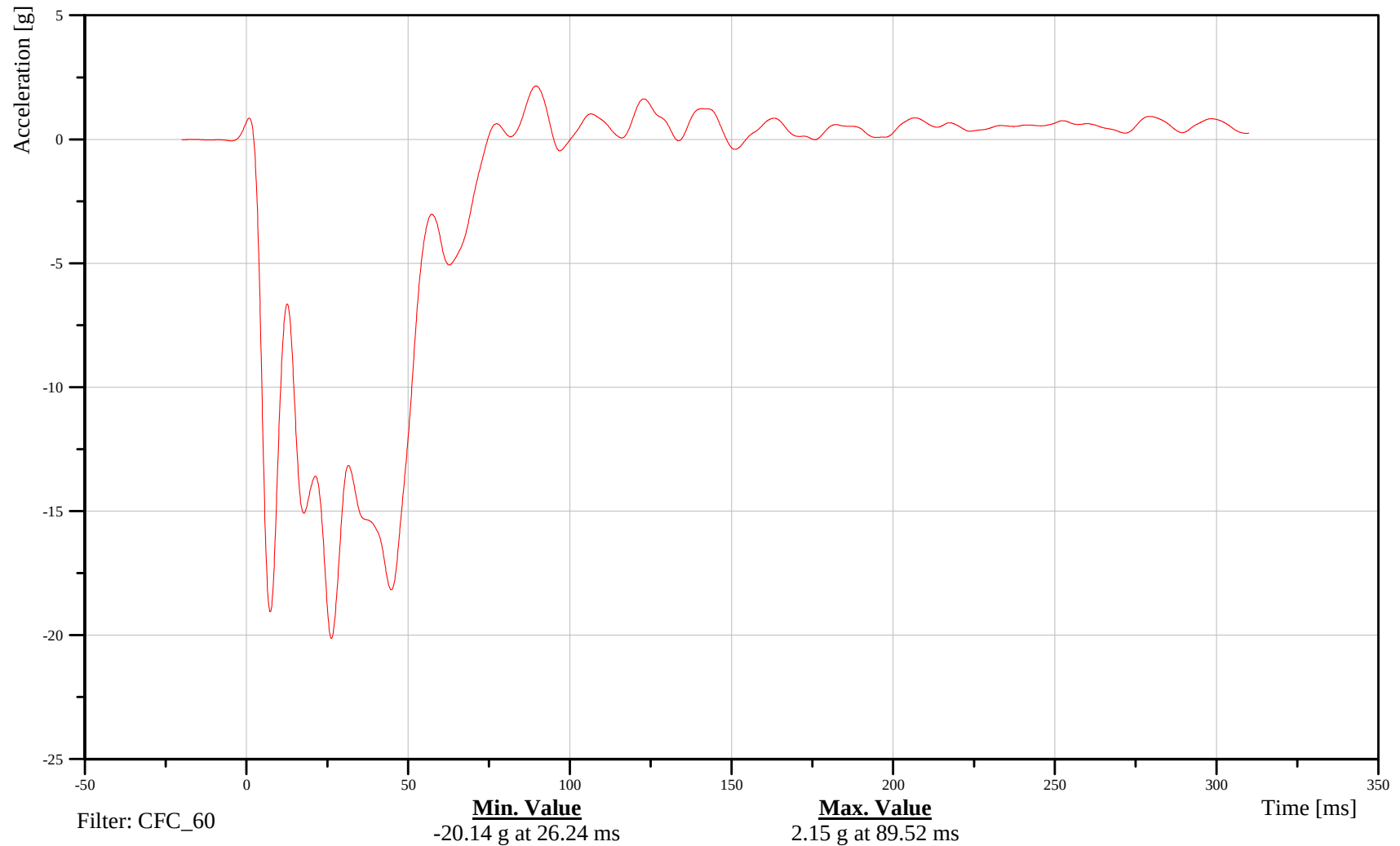
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SETRRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Vehicle Center of Gravity X-Axis Acceleration

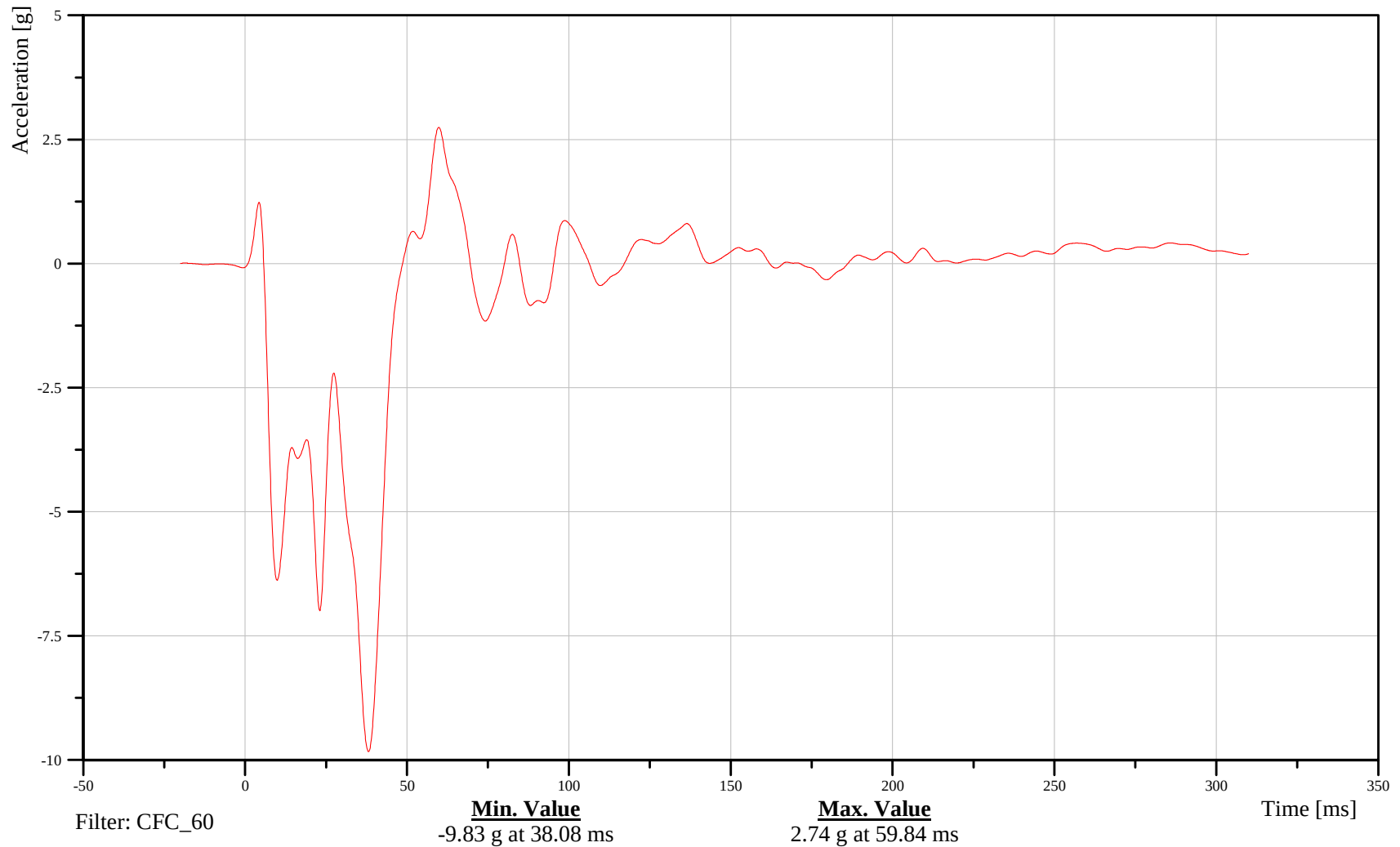
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Vehicle Center of Gravity Y-Axis Acceleration

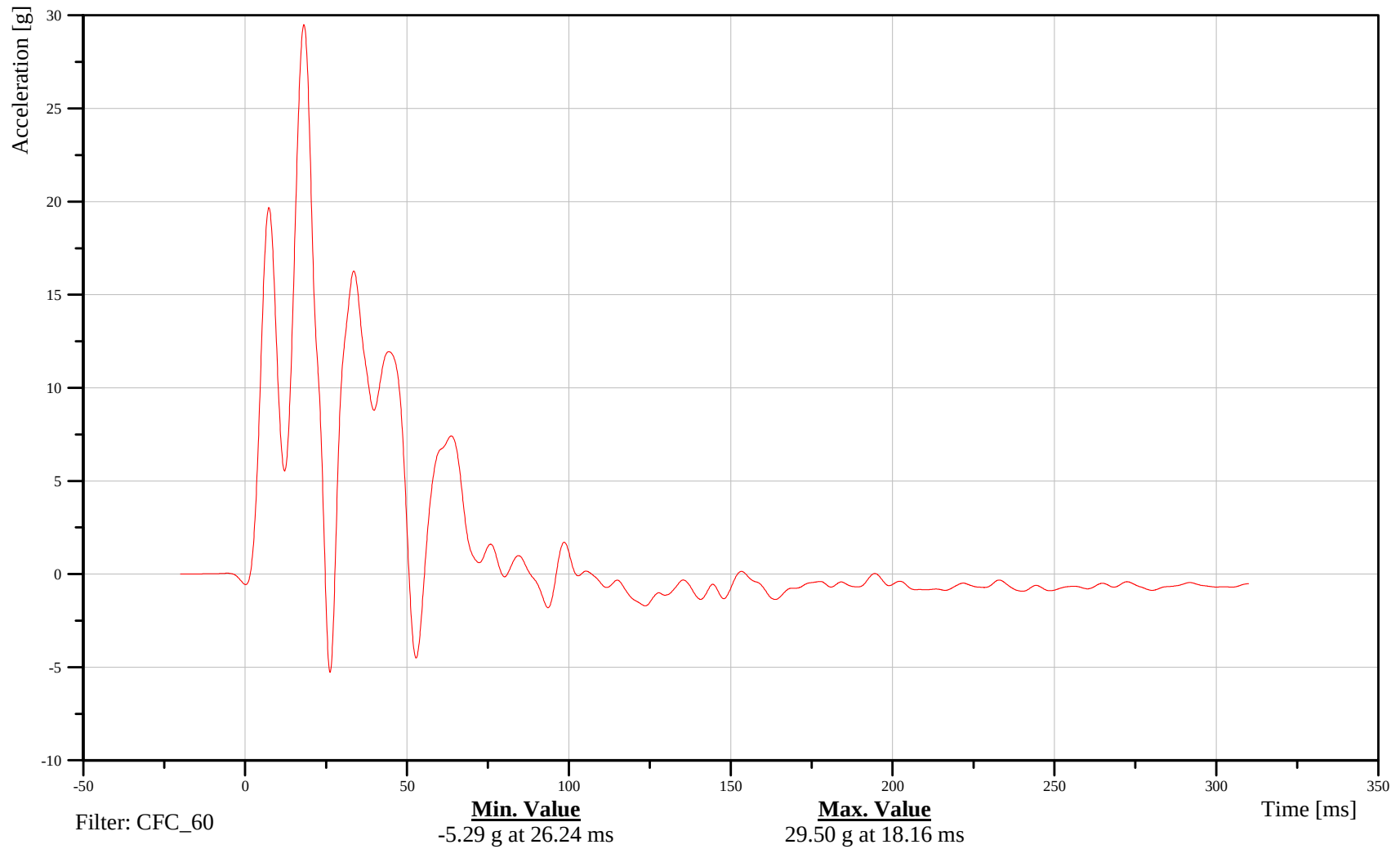
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Vehicle Center of Gravity Z-Axis Acceleration

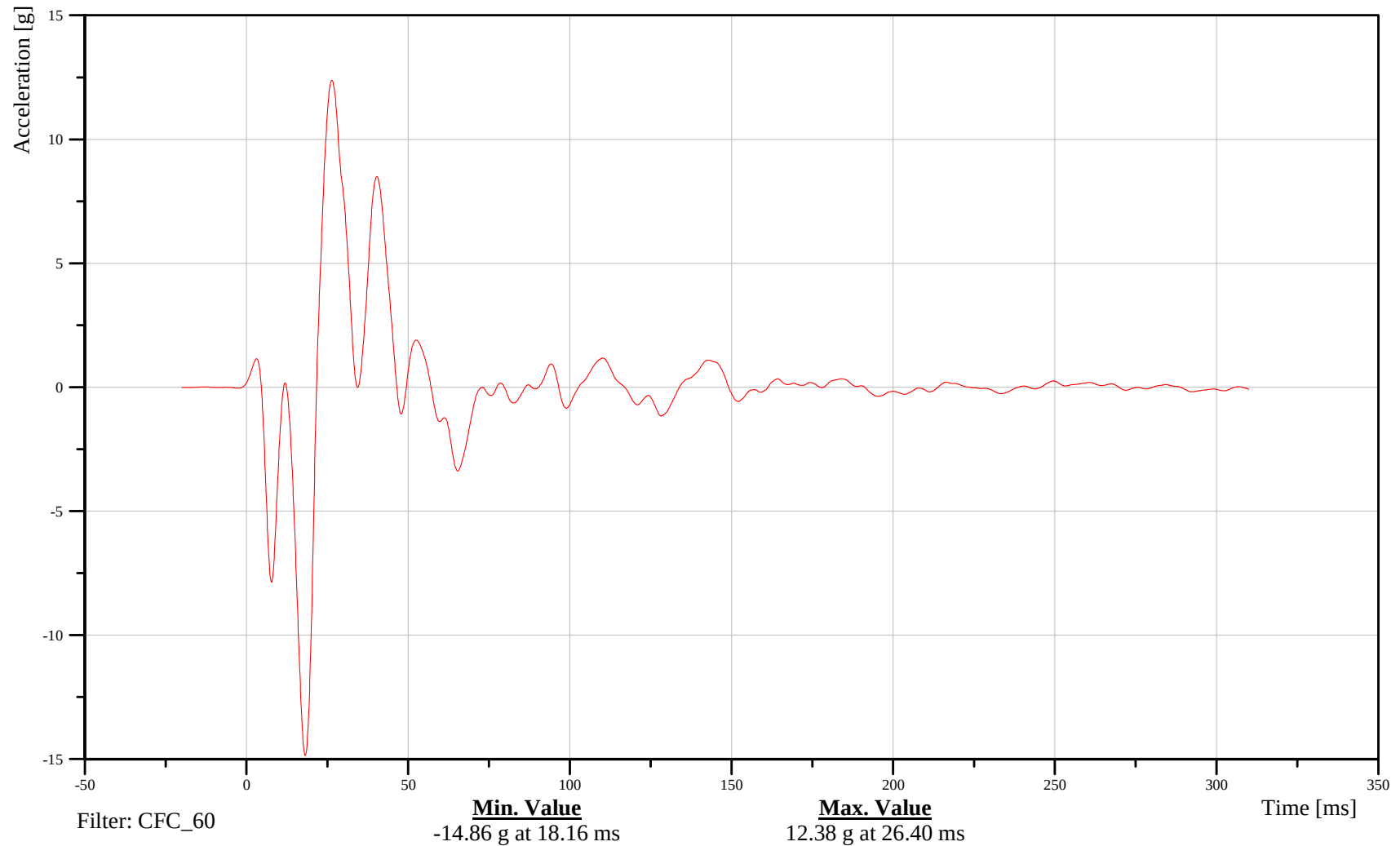
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Vehicle Center of Gravity Resultant Acceleration

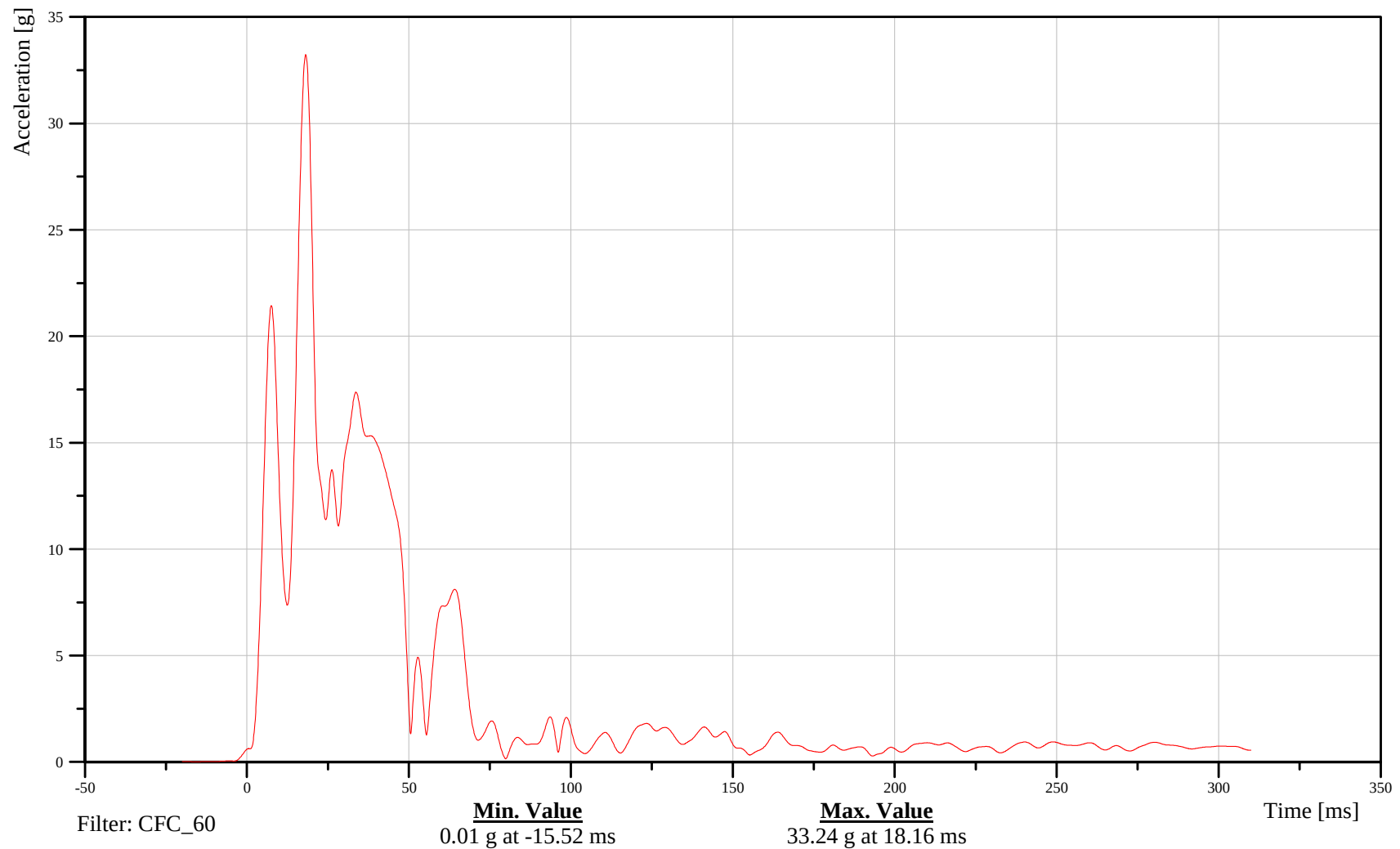
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Top of Engine X-Axis Acceleration

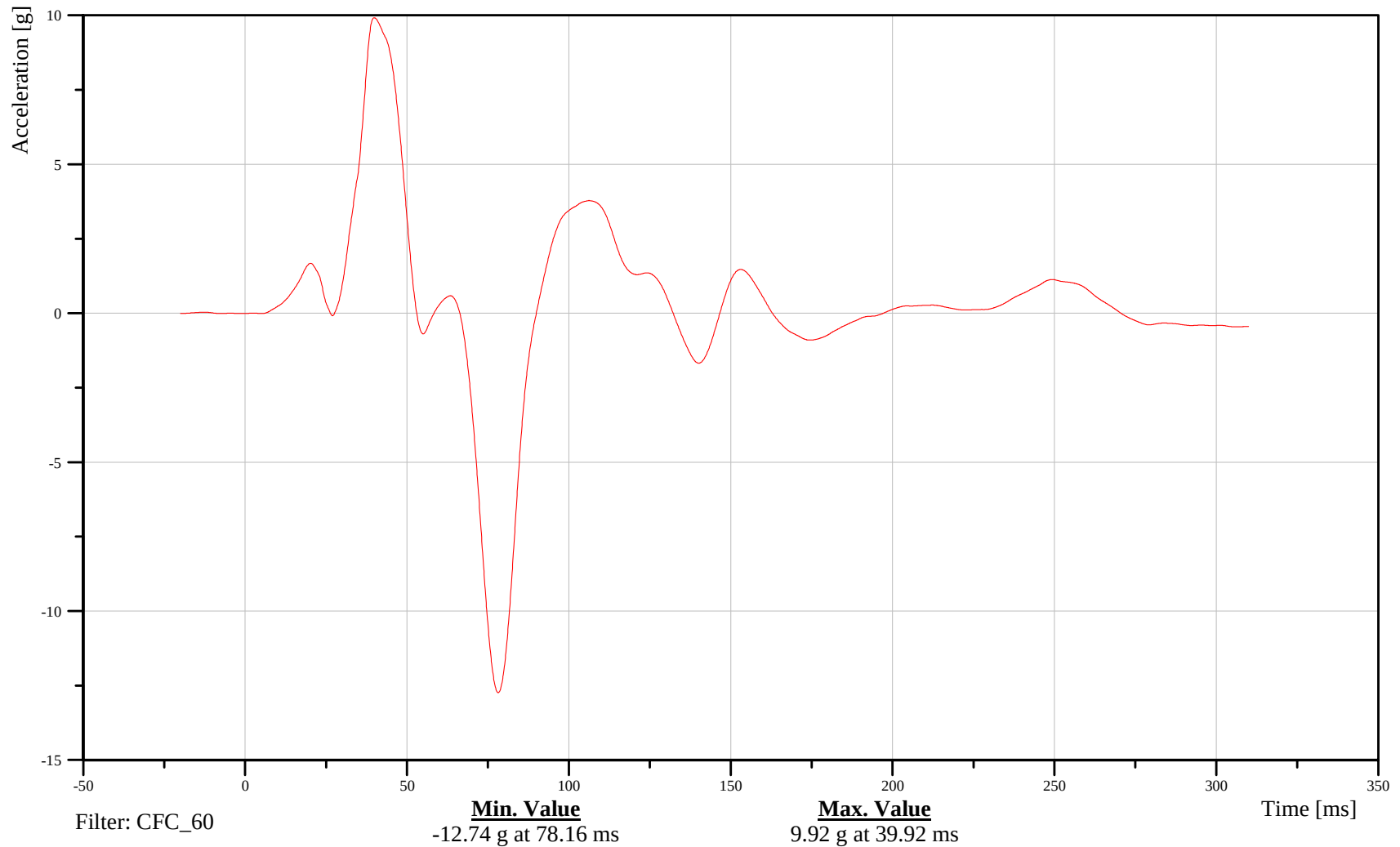
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10ENGNTTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Top of Engine Y-Axis Acceleration

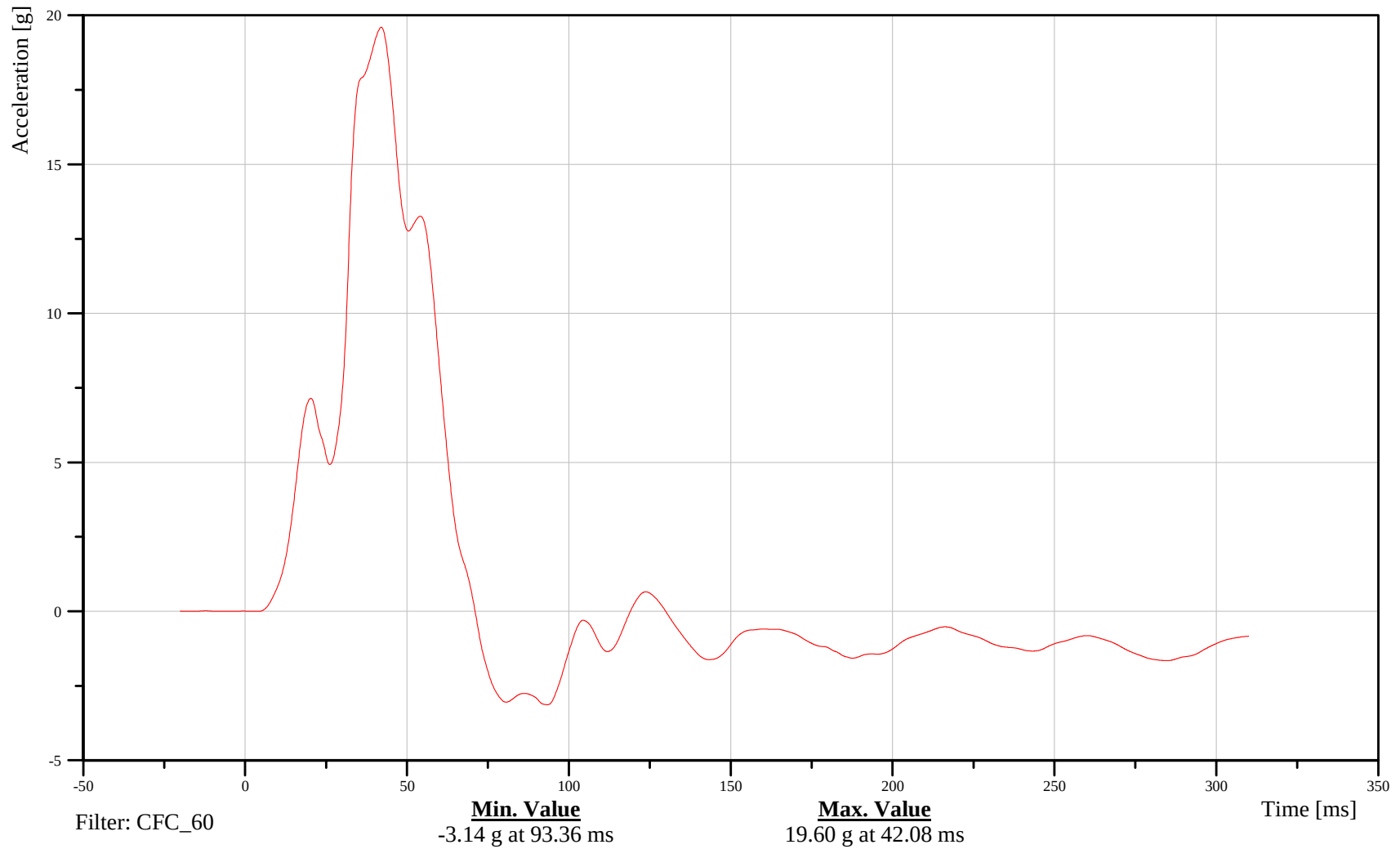
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Center Firewall X-Axis Acceleration

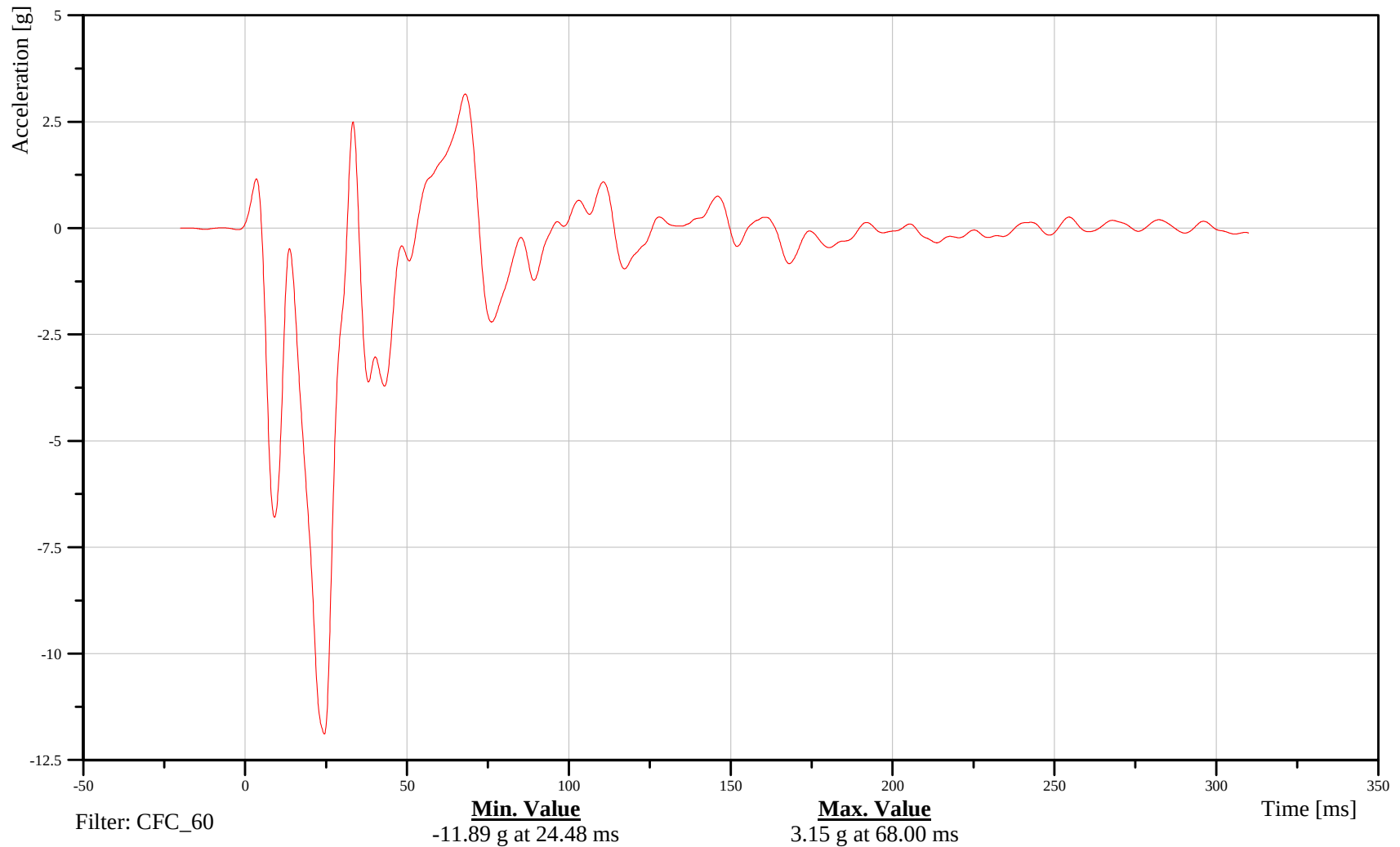
Date: 09/11/2008
Time: 16:22

Customer: VRTC

102FIRCX0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Center Firewall Y-Axis Acceleration

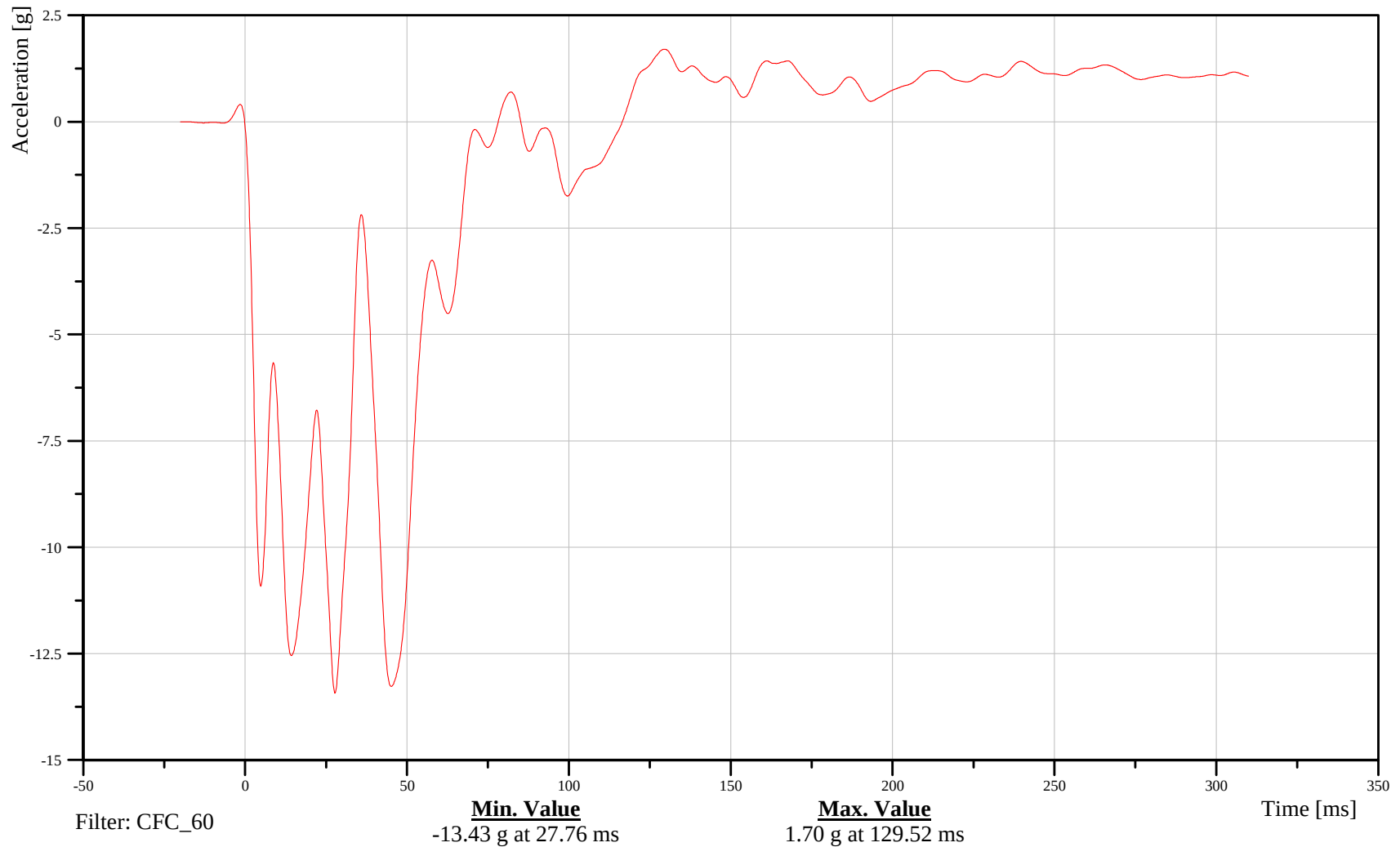
Date: 09/11/2008
Time: 16:22

Customer: VRTC

102FIRCX0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Right Side Roof Rail X-Axis Acceleration

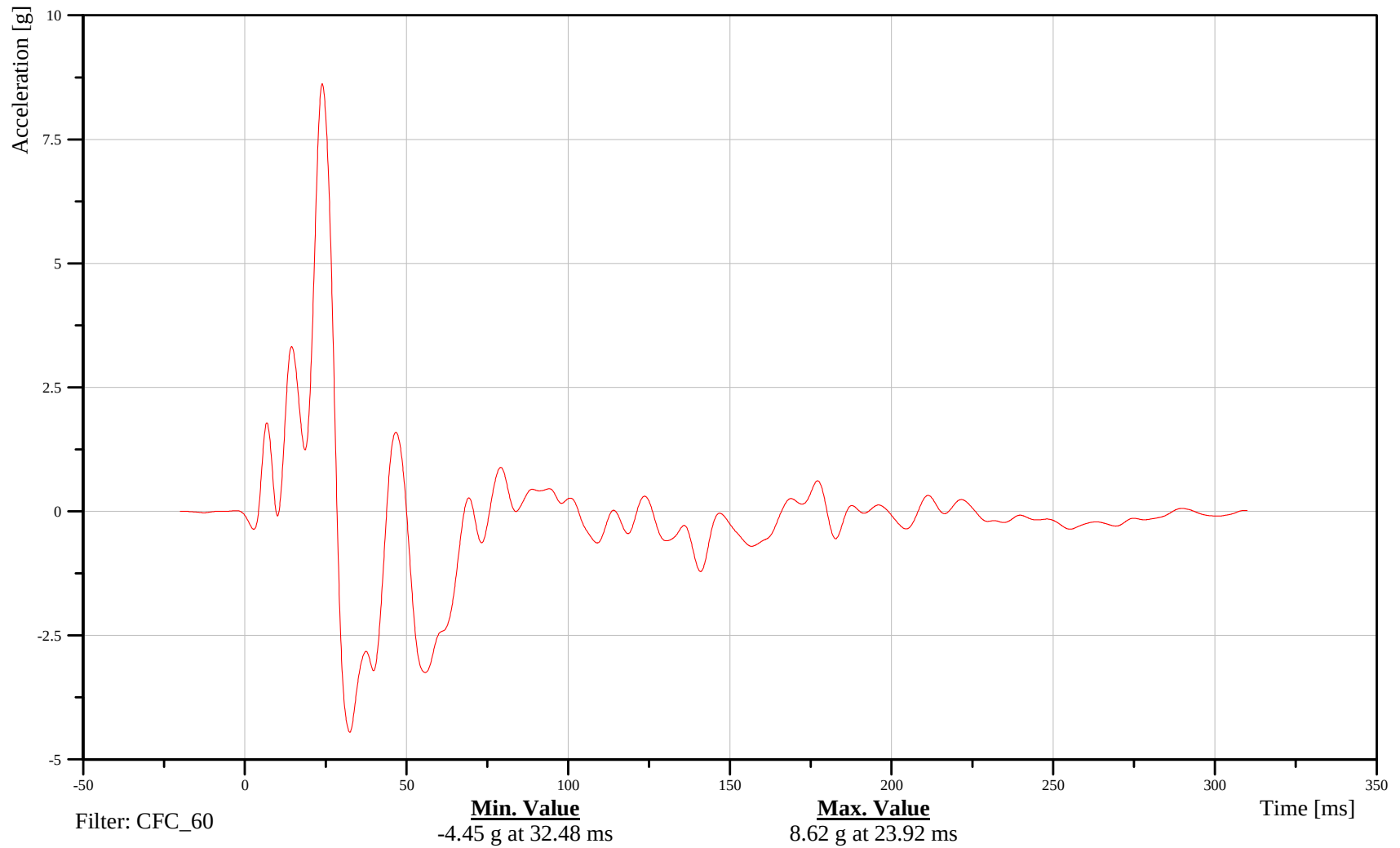
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10ROOFRI2100ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Right Side Roof Rail Y-Axis Acceleration

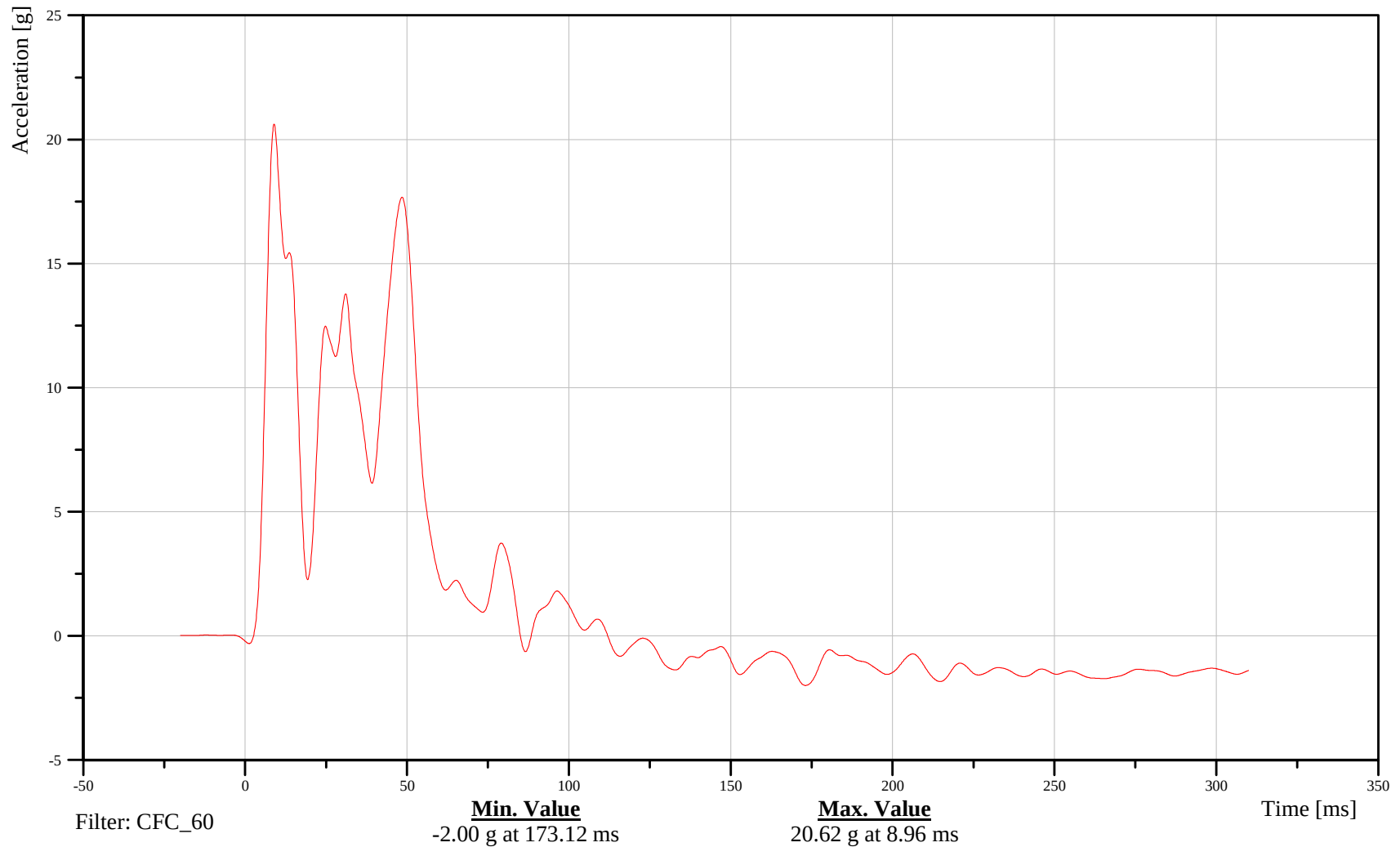
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10ROOFRI2100ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Front Door Centerline Y-Axis Acceleration

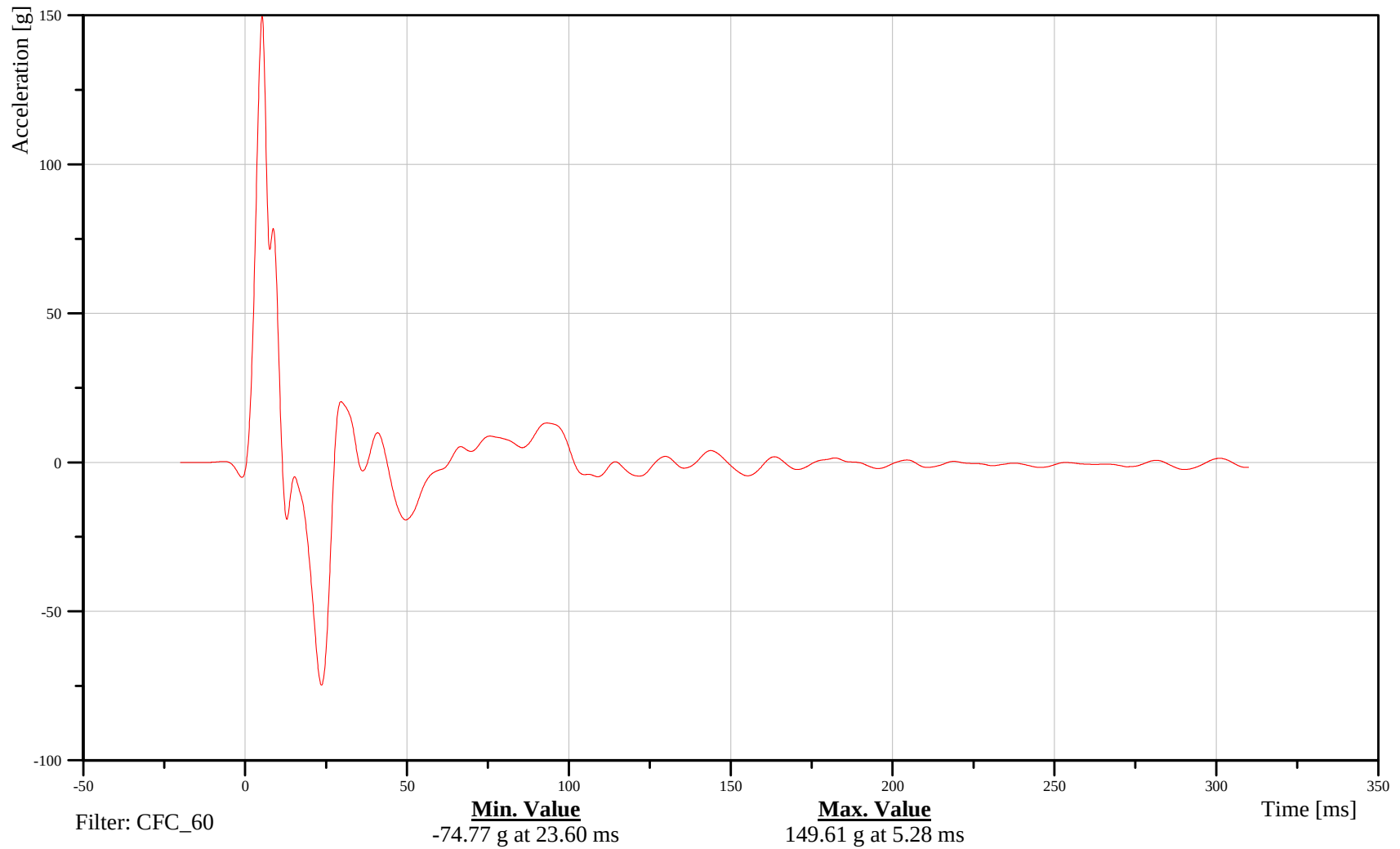
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11DOORMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

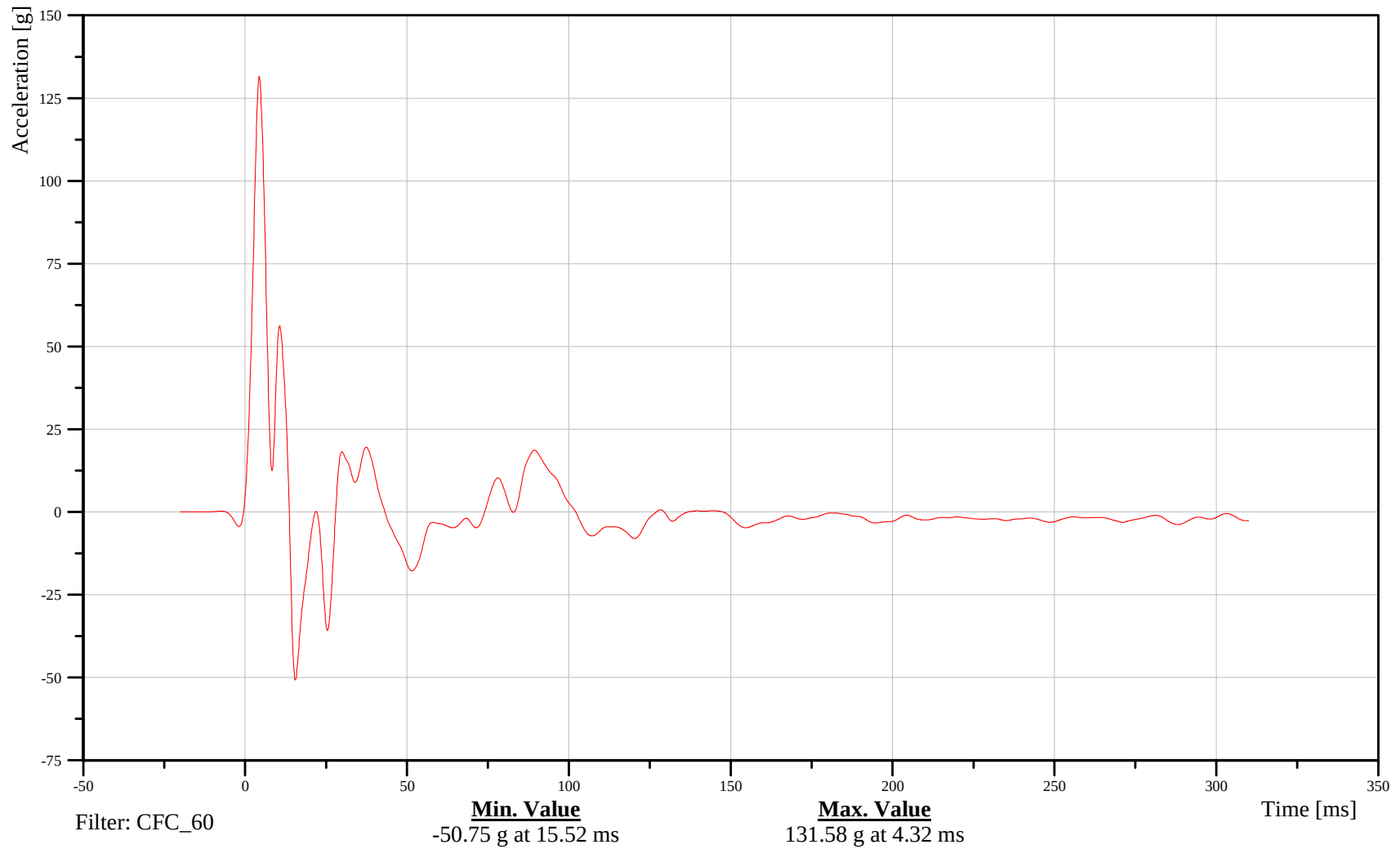
Front Door Mid-Rear Y-Axis Acceleration

Customer: VRTC

11DOORMIRE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

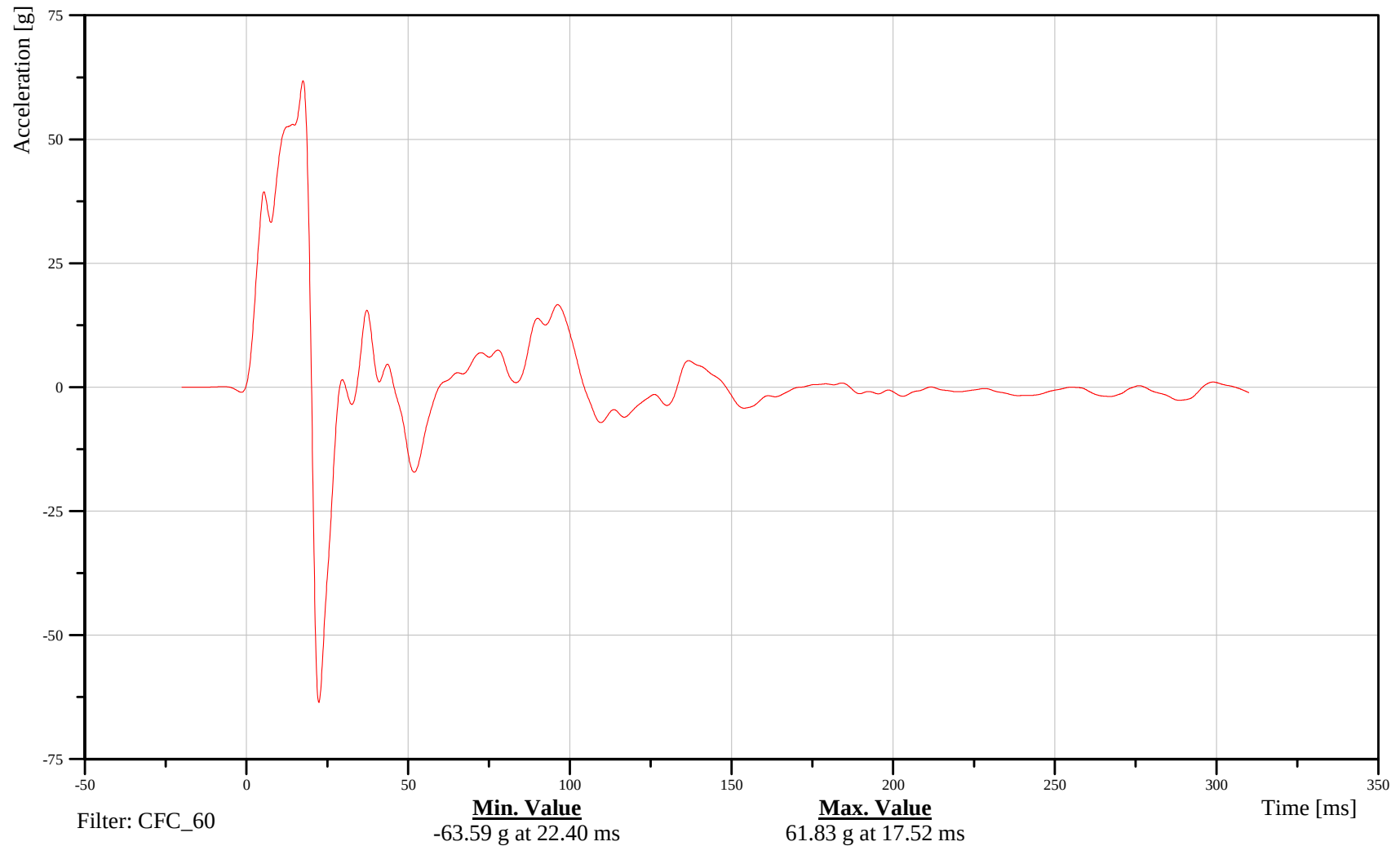
Front Door Upper Centerline Y-Axis Acceleration

Customer: VRTC

11DOORUPMI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

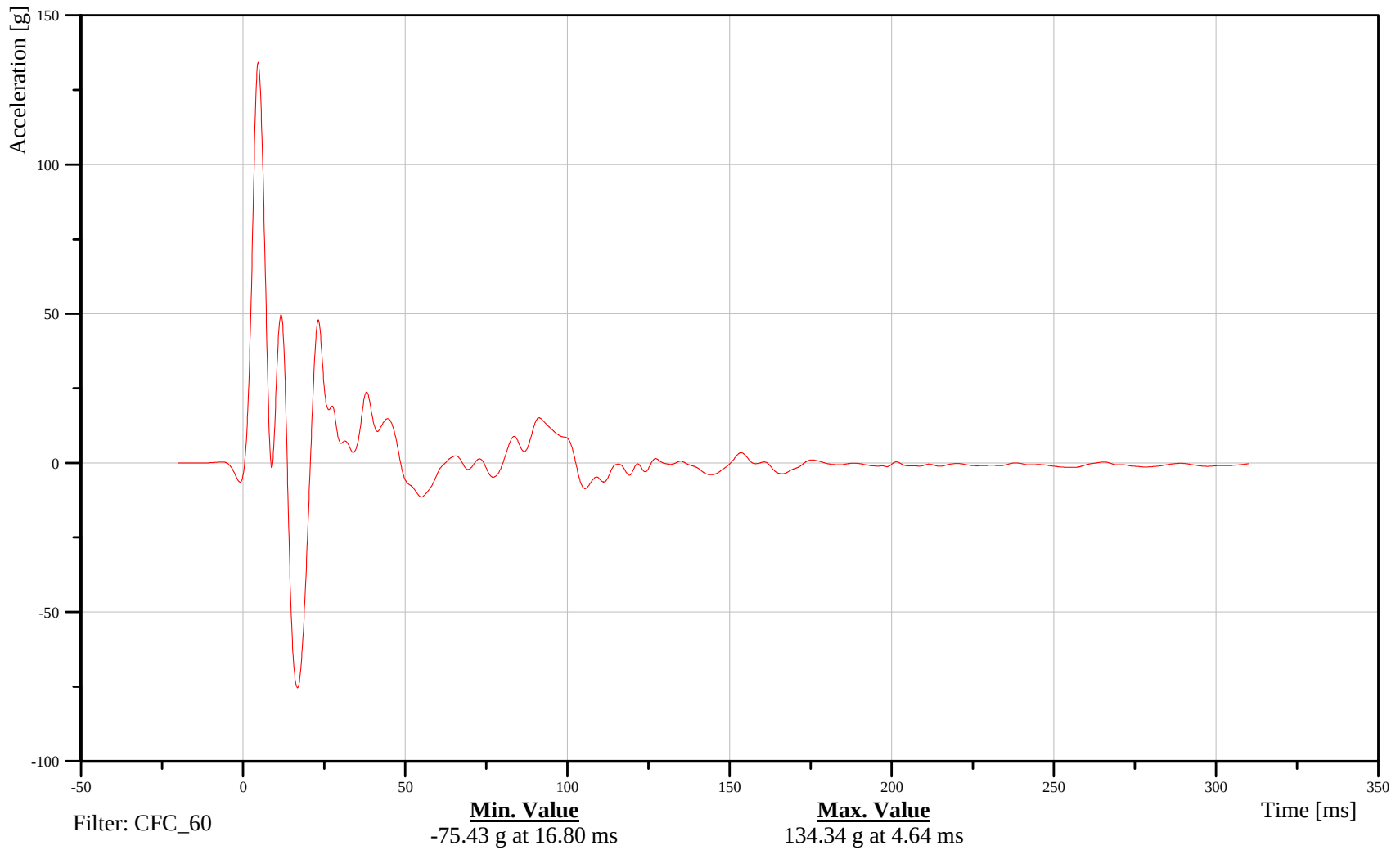
Rear Door Mid-Rear Y-Axis Acceleration

Customer: VRTC

14DOORMIRE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

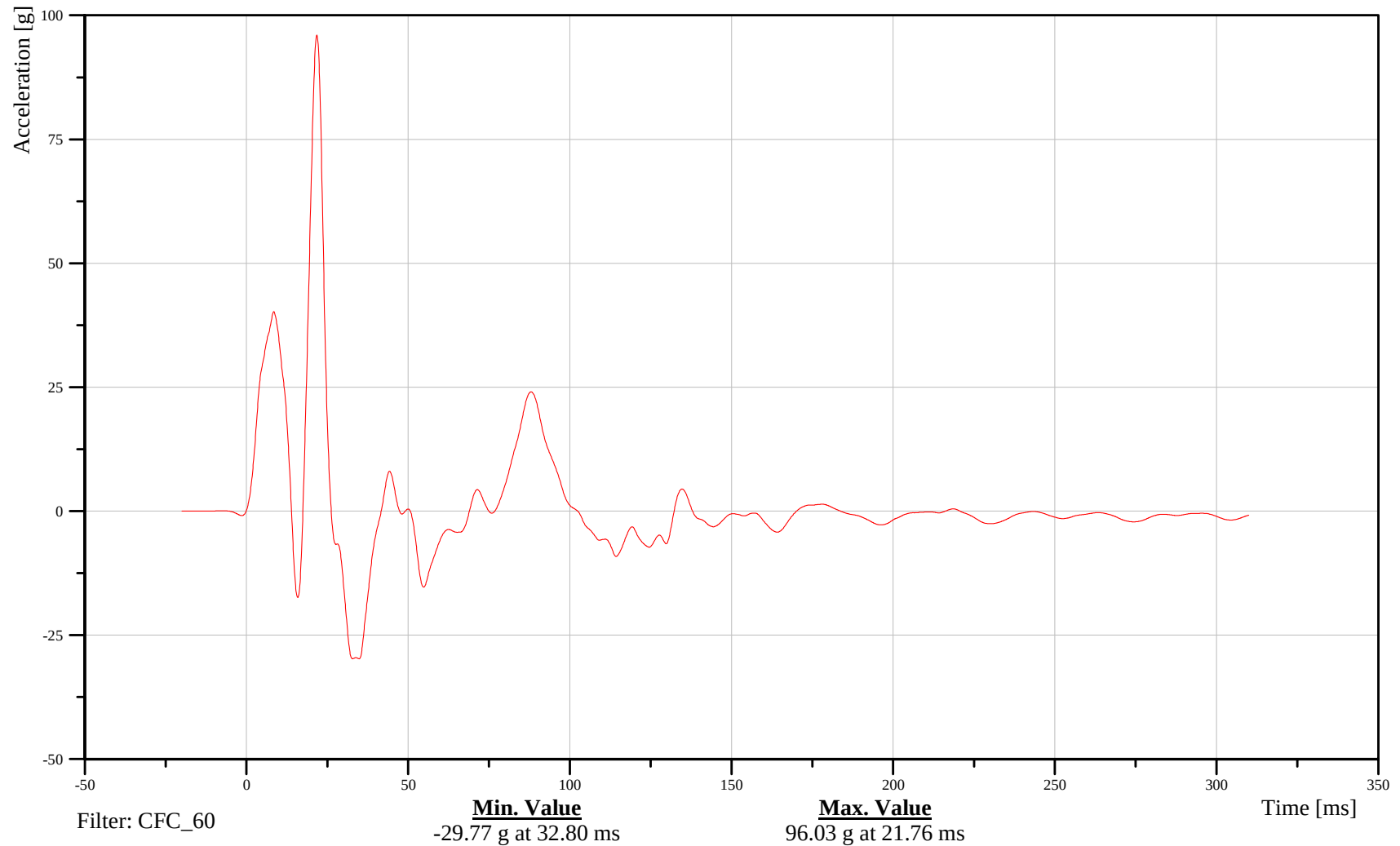
Rear Door Upper Centerline Y-Axis Acceleration

Customer: VRTC

14DOORUPMI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Driver Side Airbag

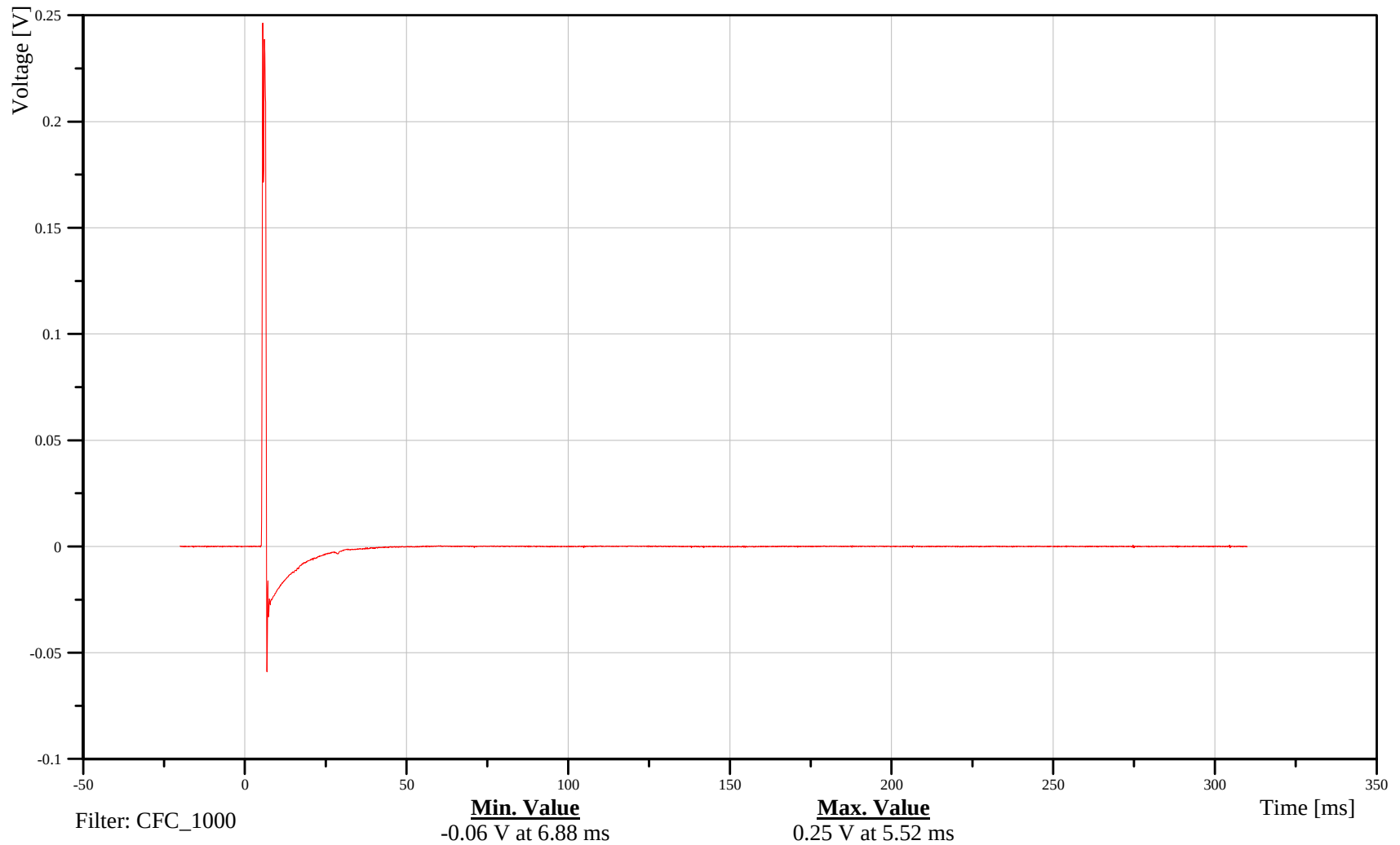
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10AIRBLE2200CU0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
Driver Curtain Airbag

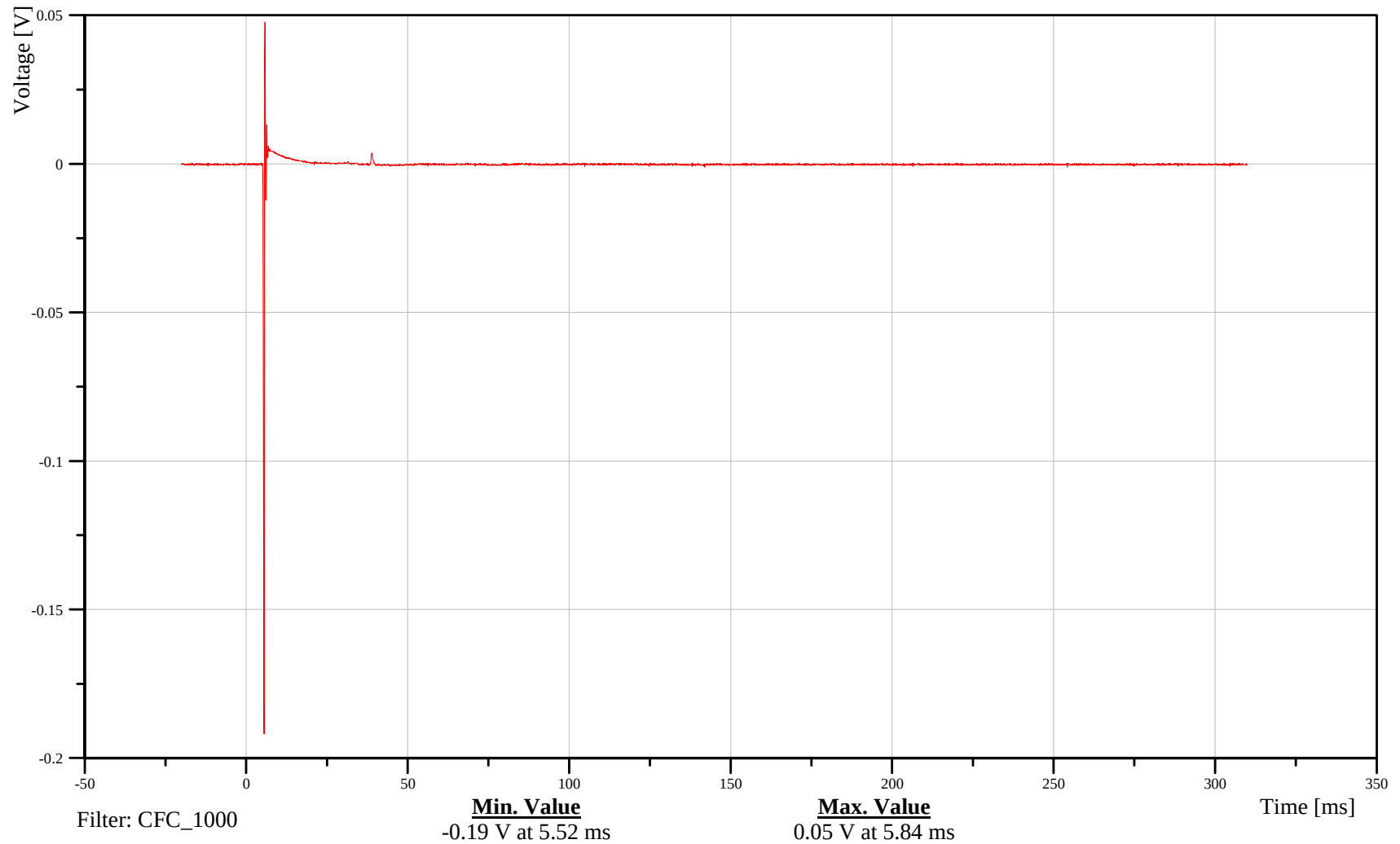
Date: 09/11/2008
Time: 16:22

Customer: VRTC

10AIRBLE2300CU0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Driver ELR Pretensioner

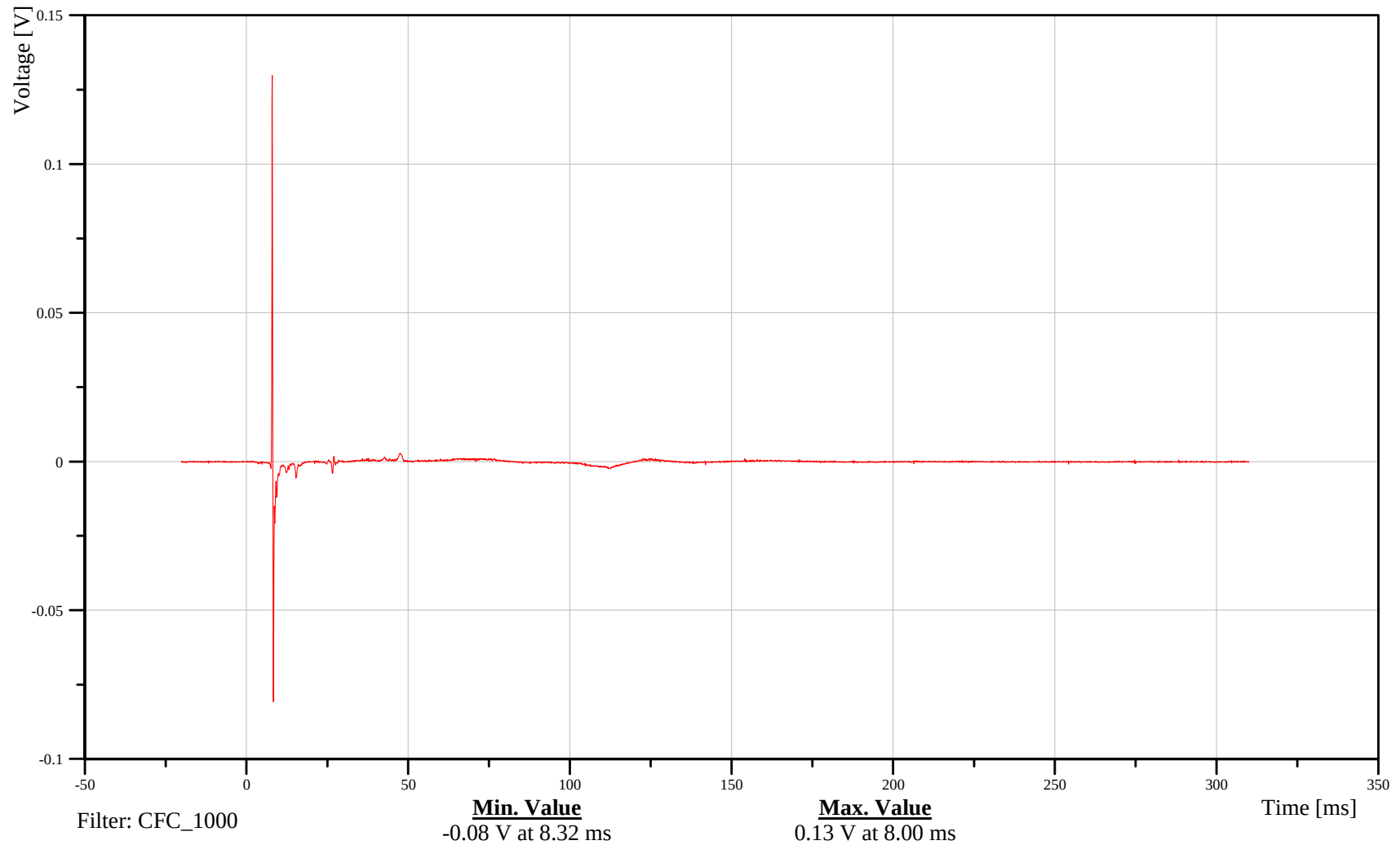
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11PRET000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Driver Head Contact Switch

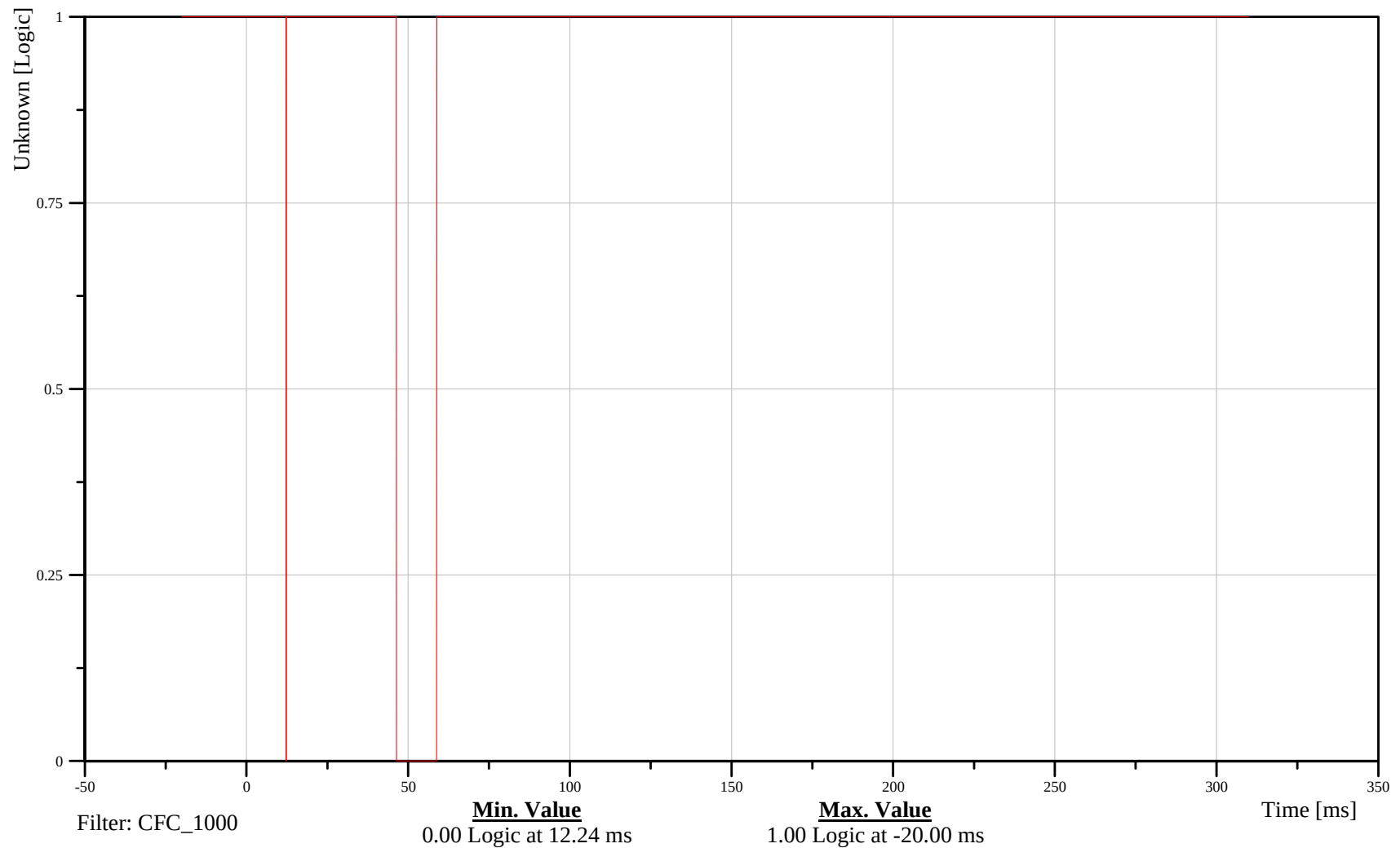
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11HEAD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Driver Shoulder Contact Switch

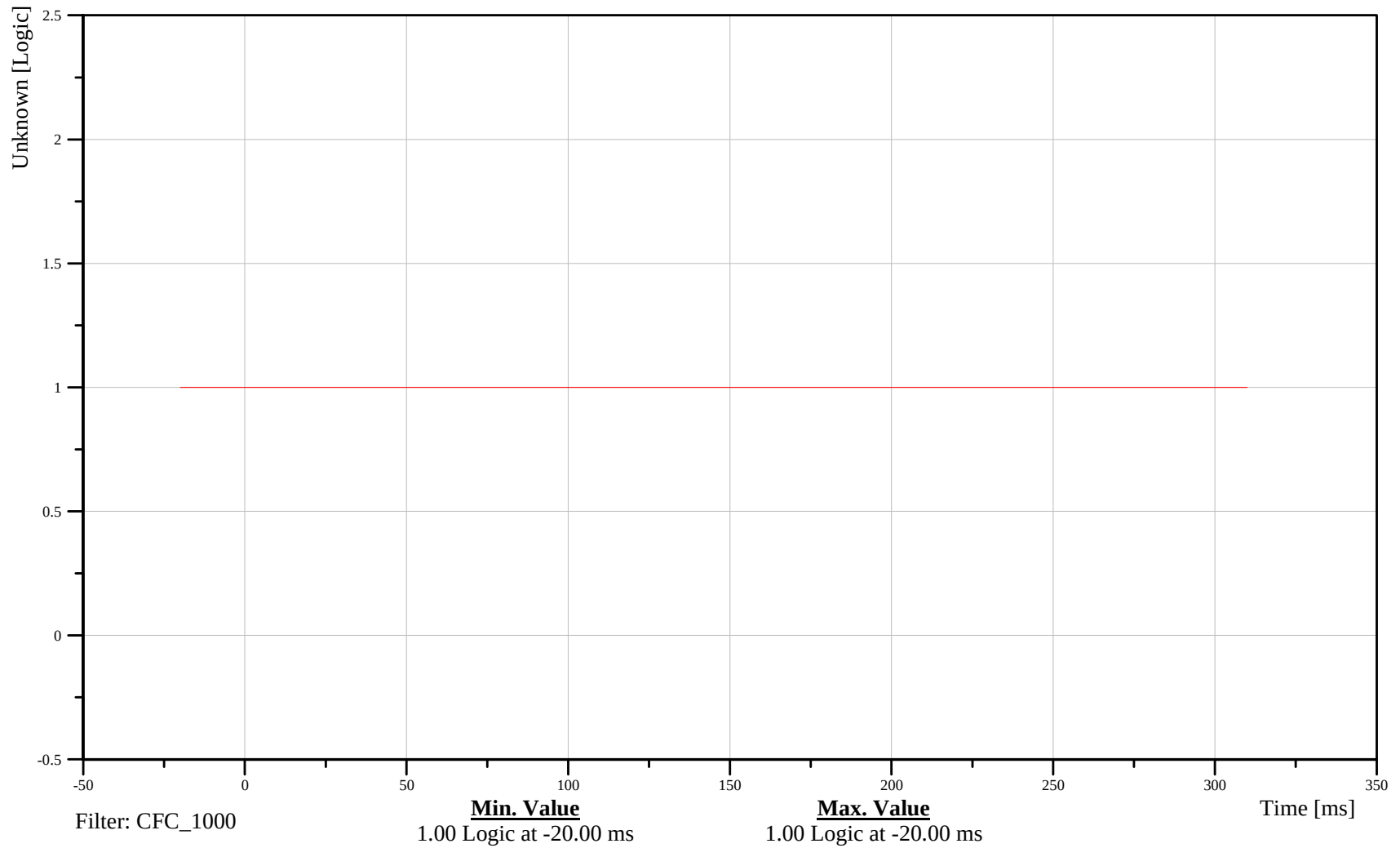
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Driver Torso Contact Switch

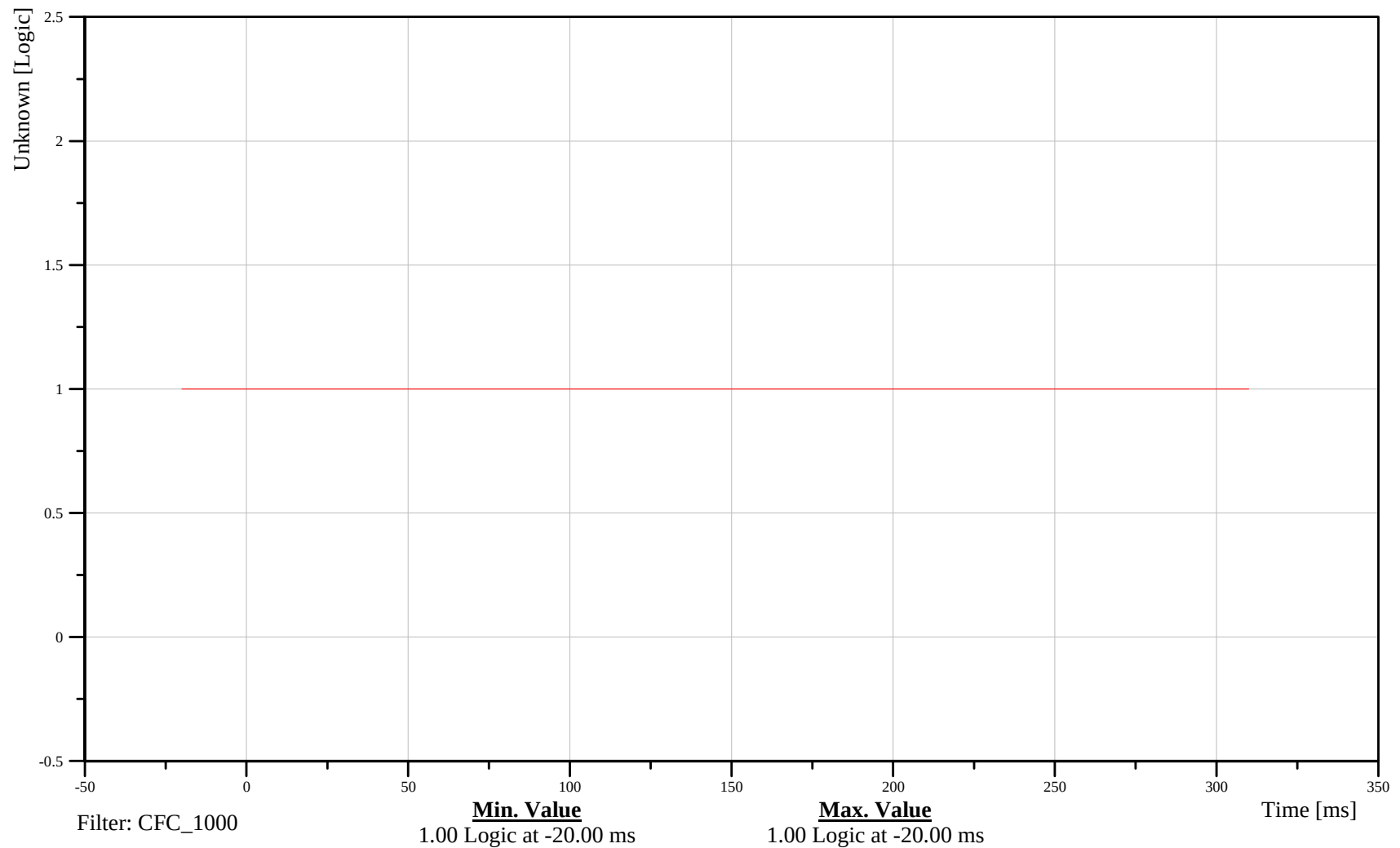
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TORS000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Driver Leg Contact Switch

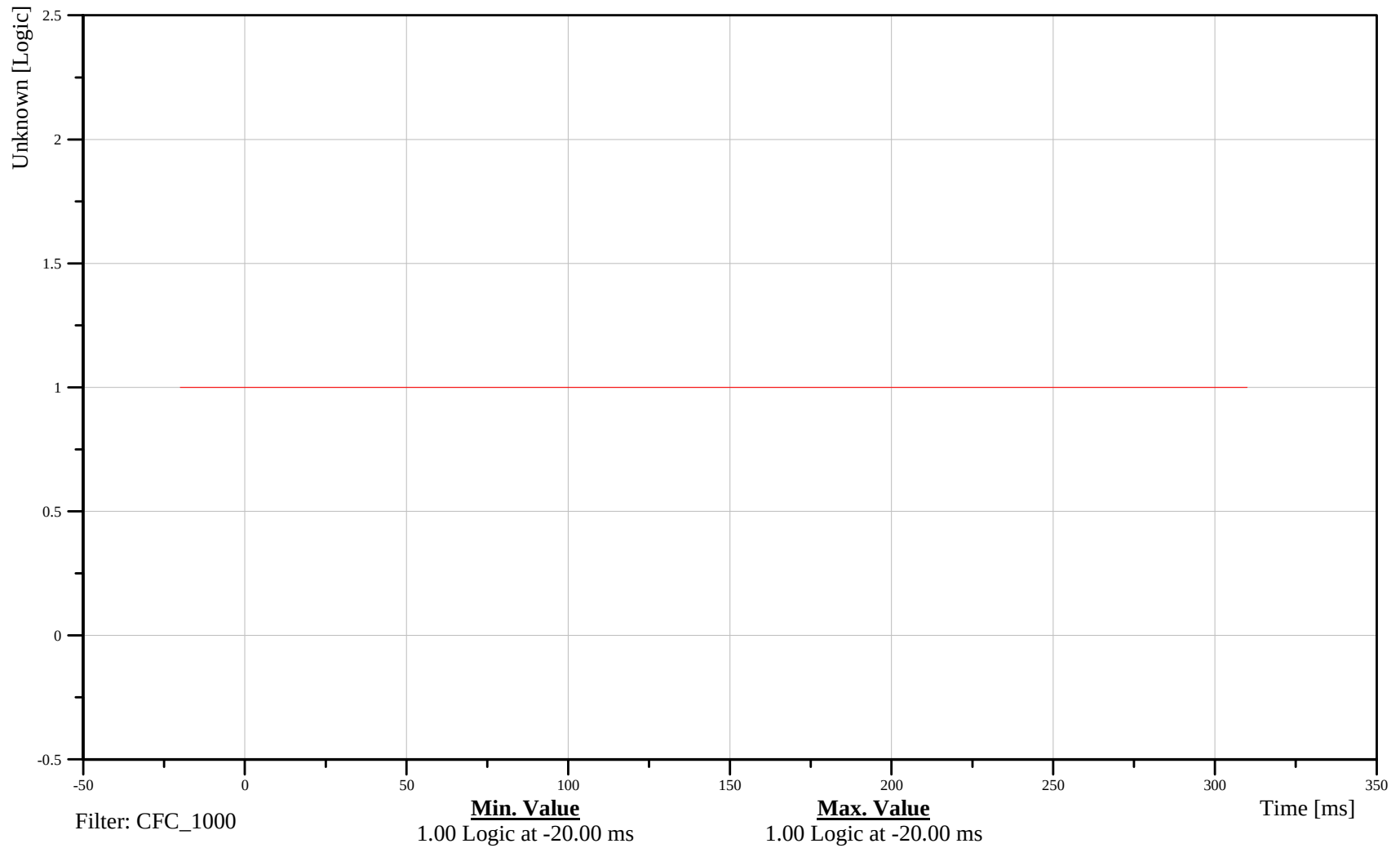
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11LEGLE00000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Passenger Head Contact Switch

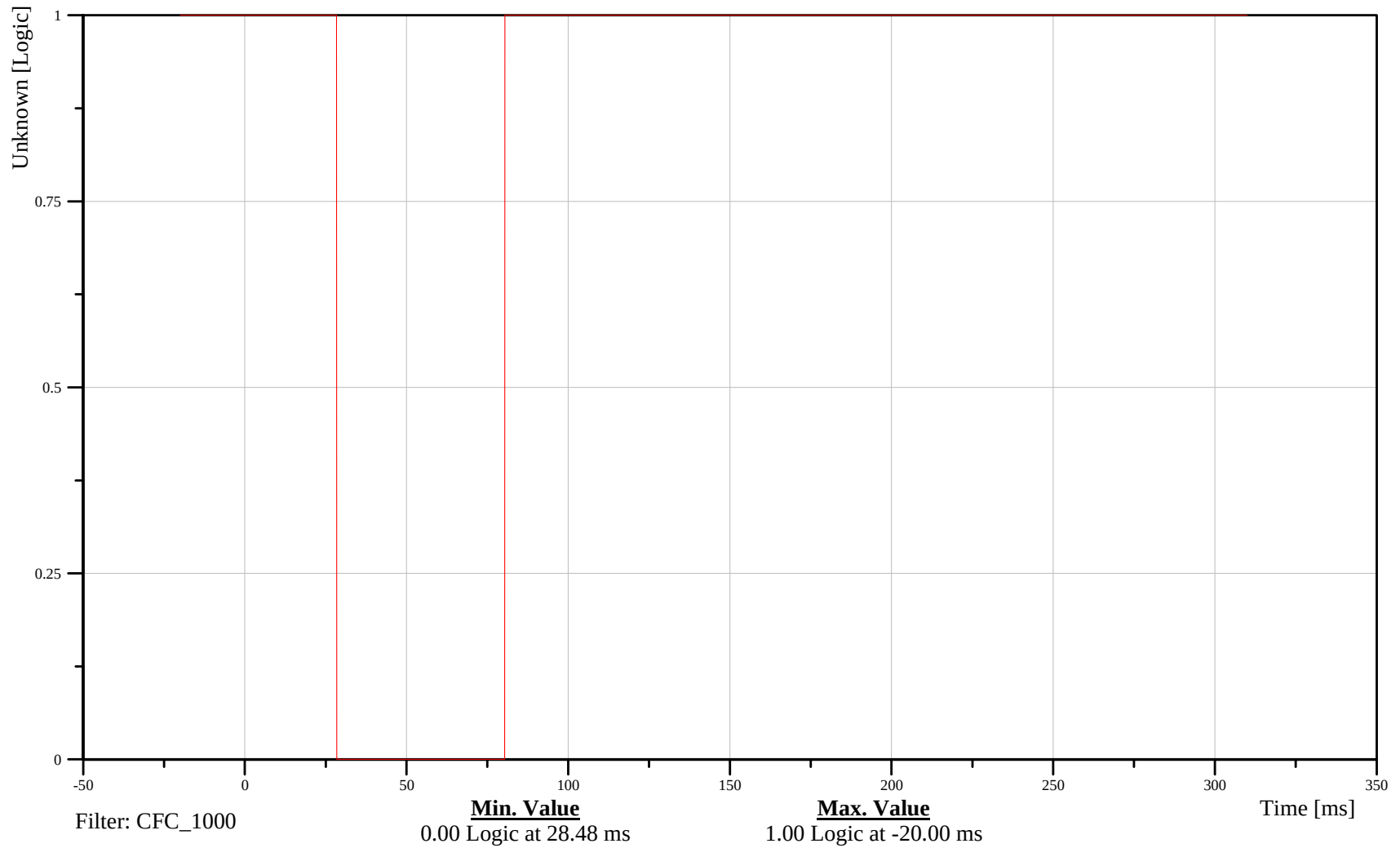
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14HEAD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Passenger Shoulder Contact Switch

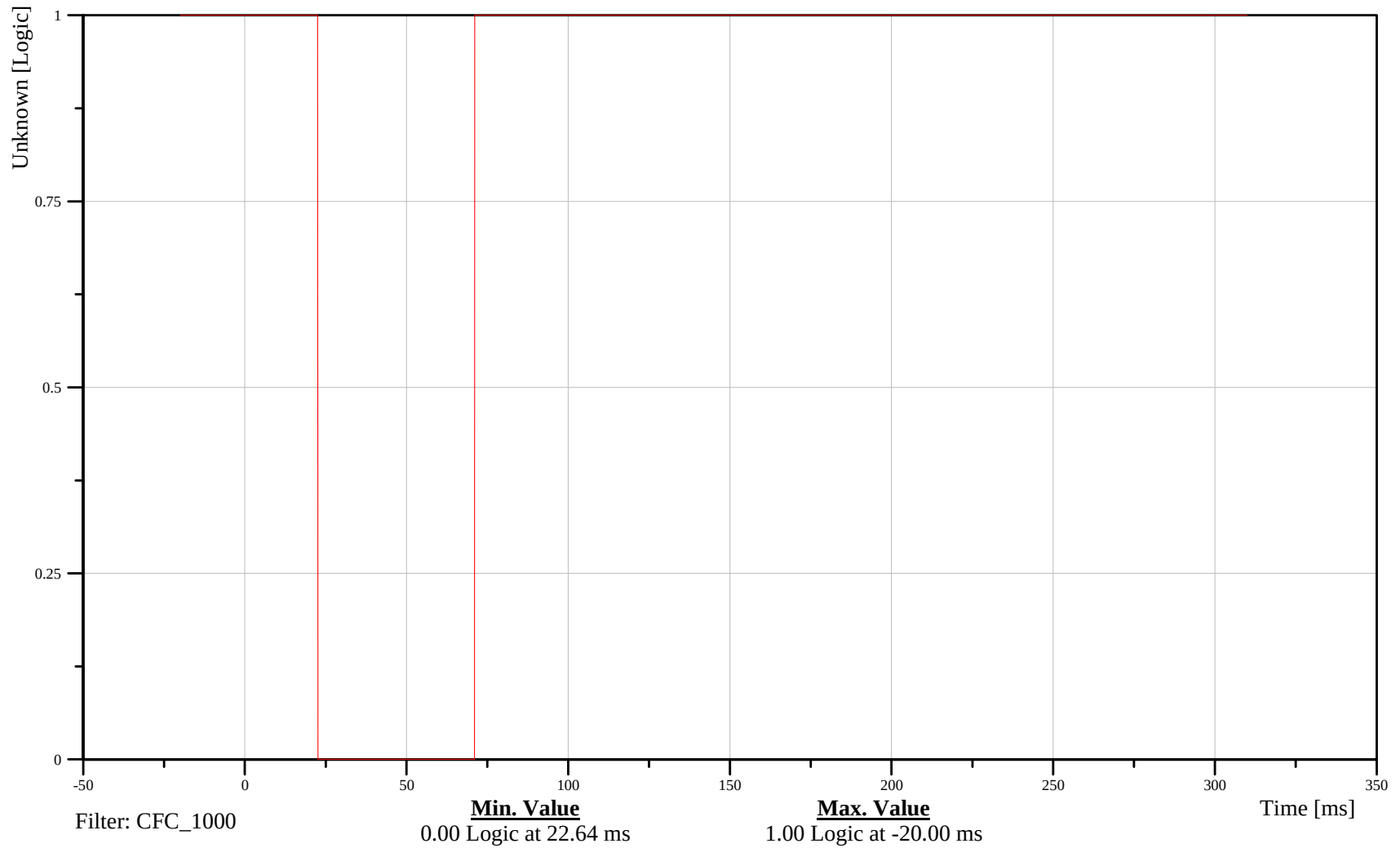
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Passenger Torso Contact Switch

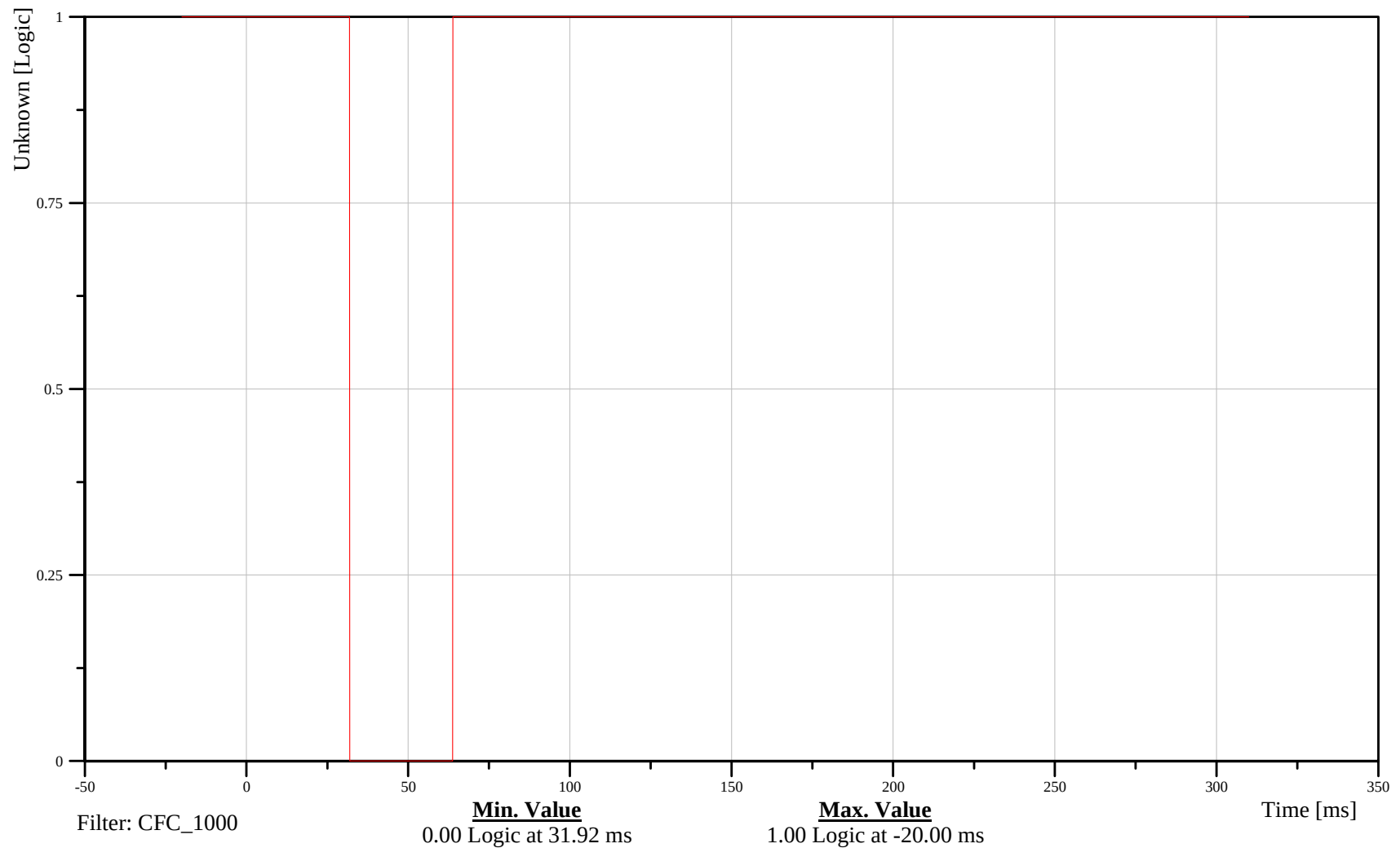
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TORS000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



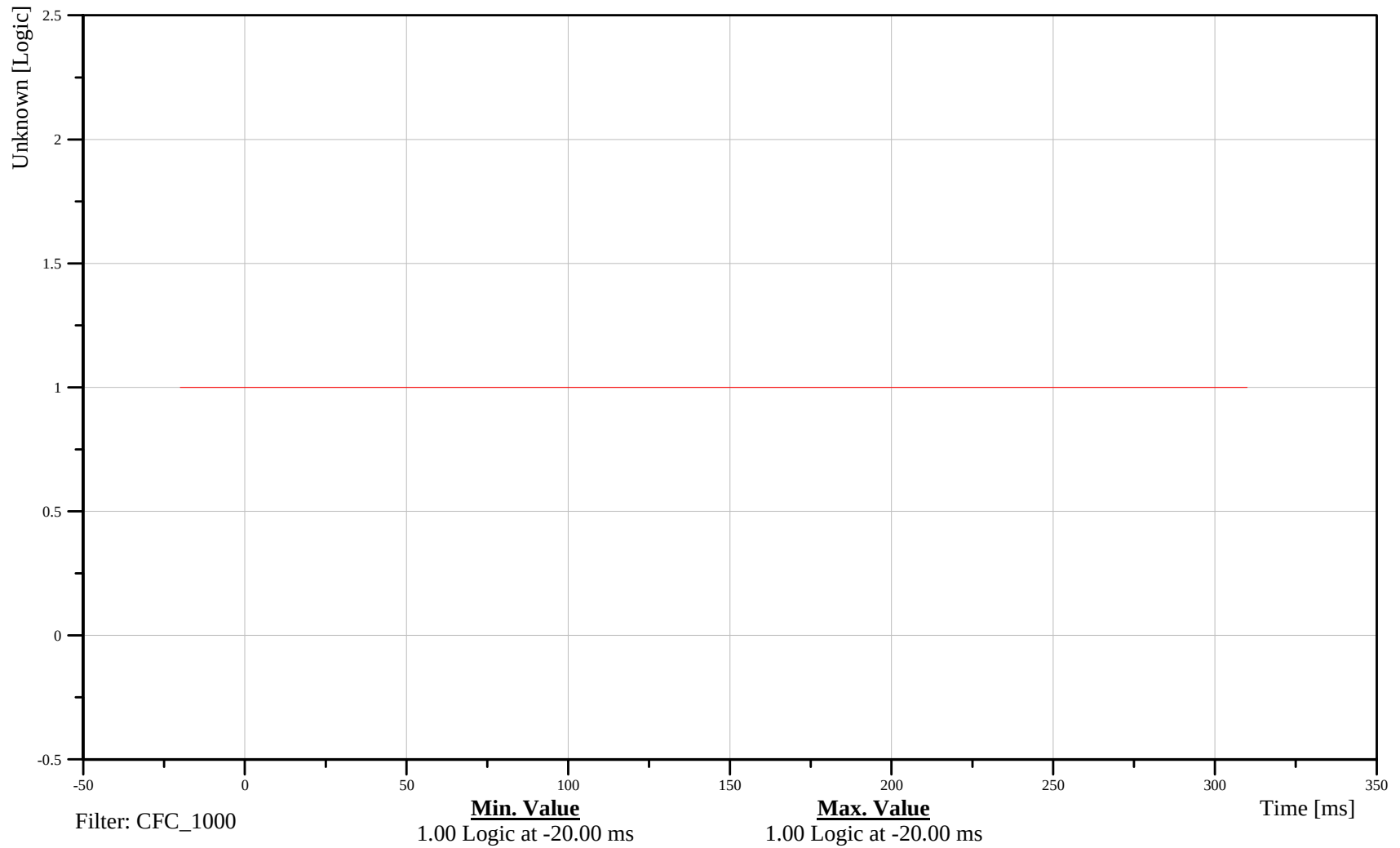
World SID Evaluation
Passenger Leg Contact Switch

Date: 09/11/2008
Time: 16:22

Customer: VRTC

14LEGLE00000VO0A

TRC Inc. Test Lab: CTF
Test Number: 080911-2



B-60

080911-2



World SID Evaluation

Driver Shoulder Belt Force

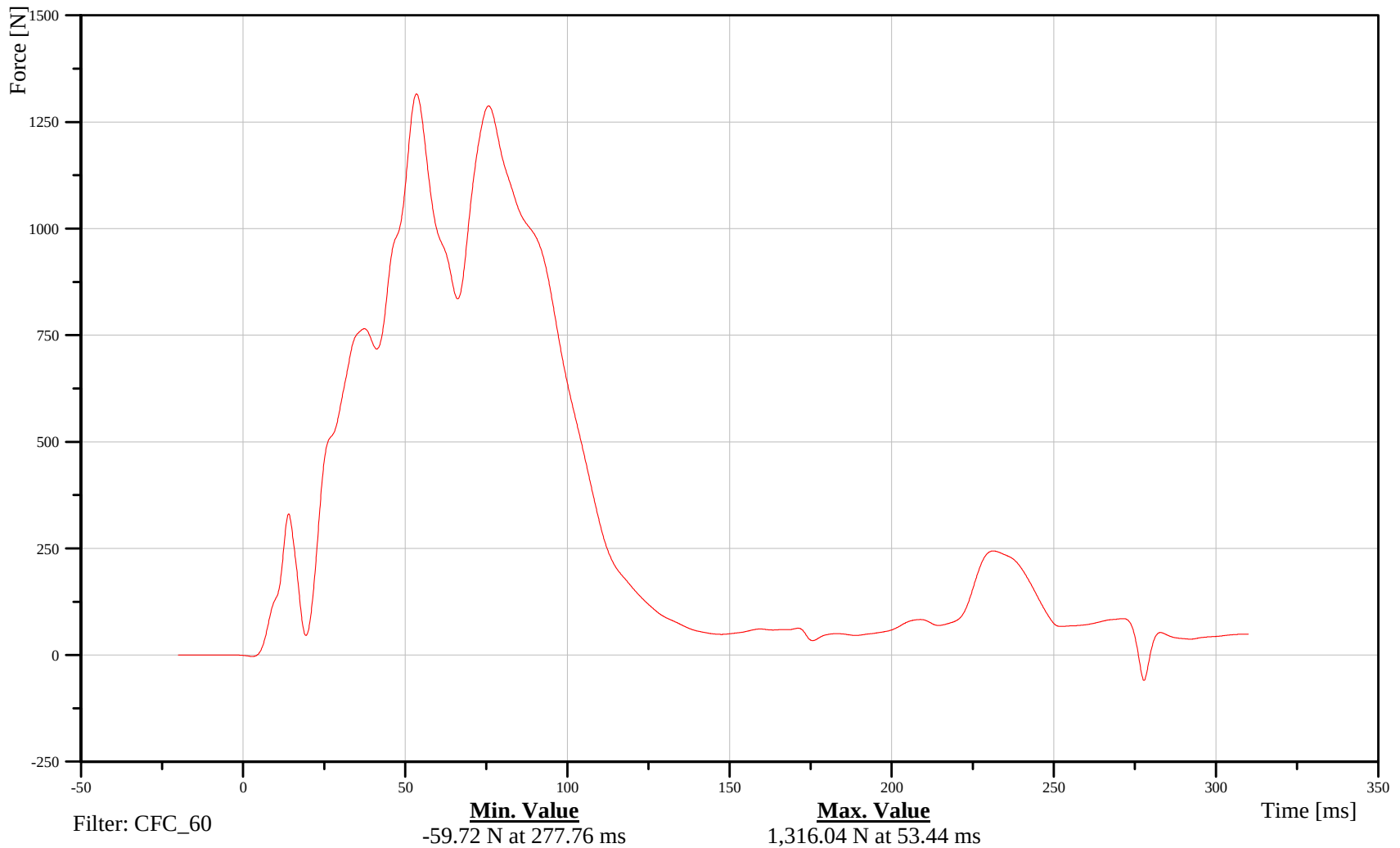
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Driver Lap Belt Force

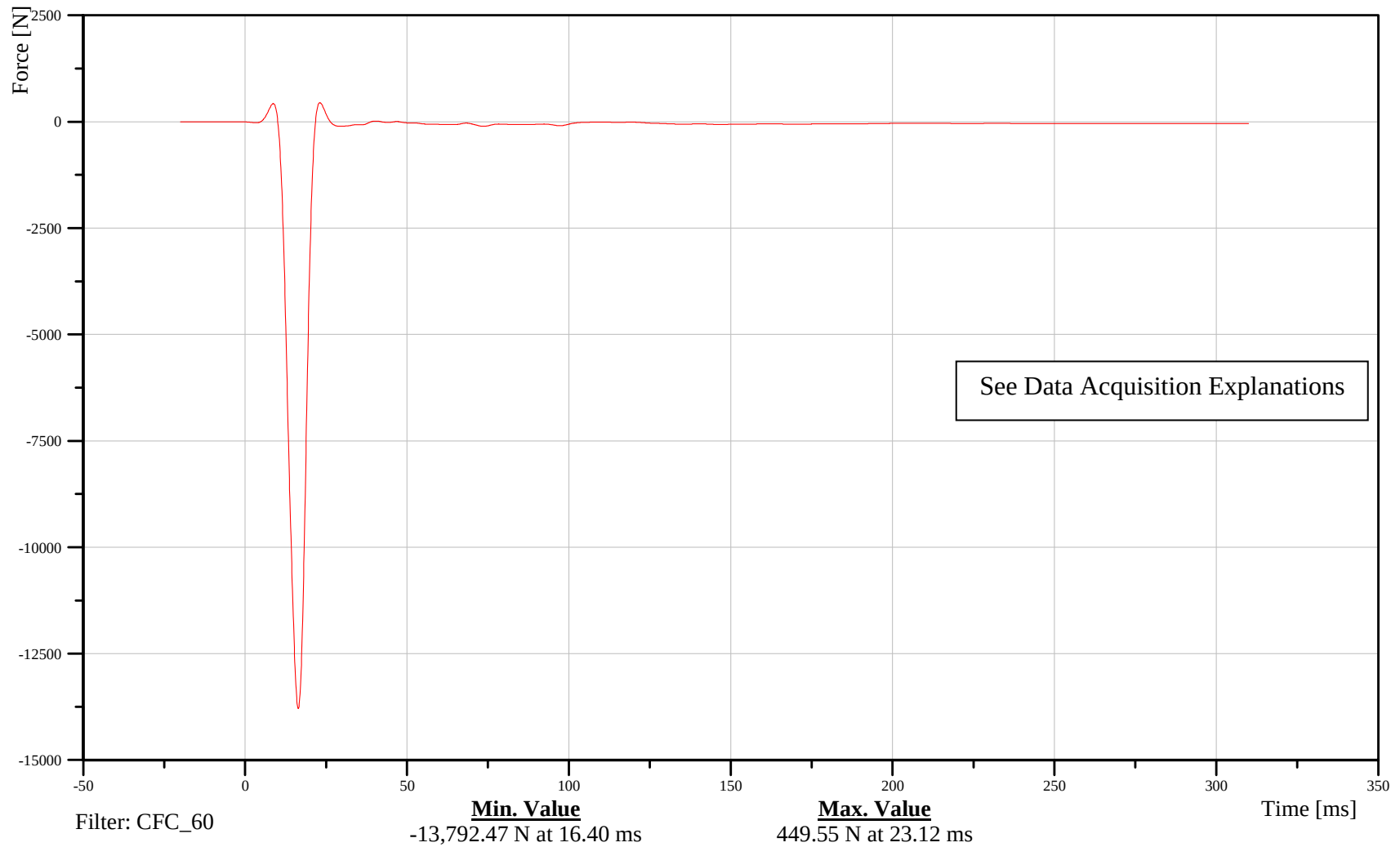
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Passenger Shoulder Belt Force

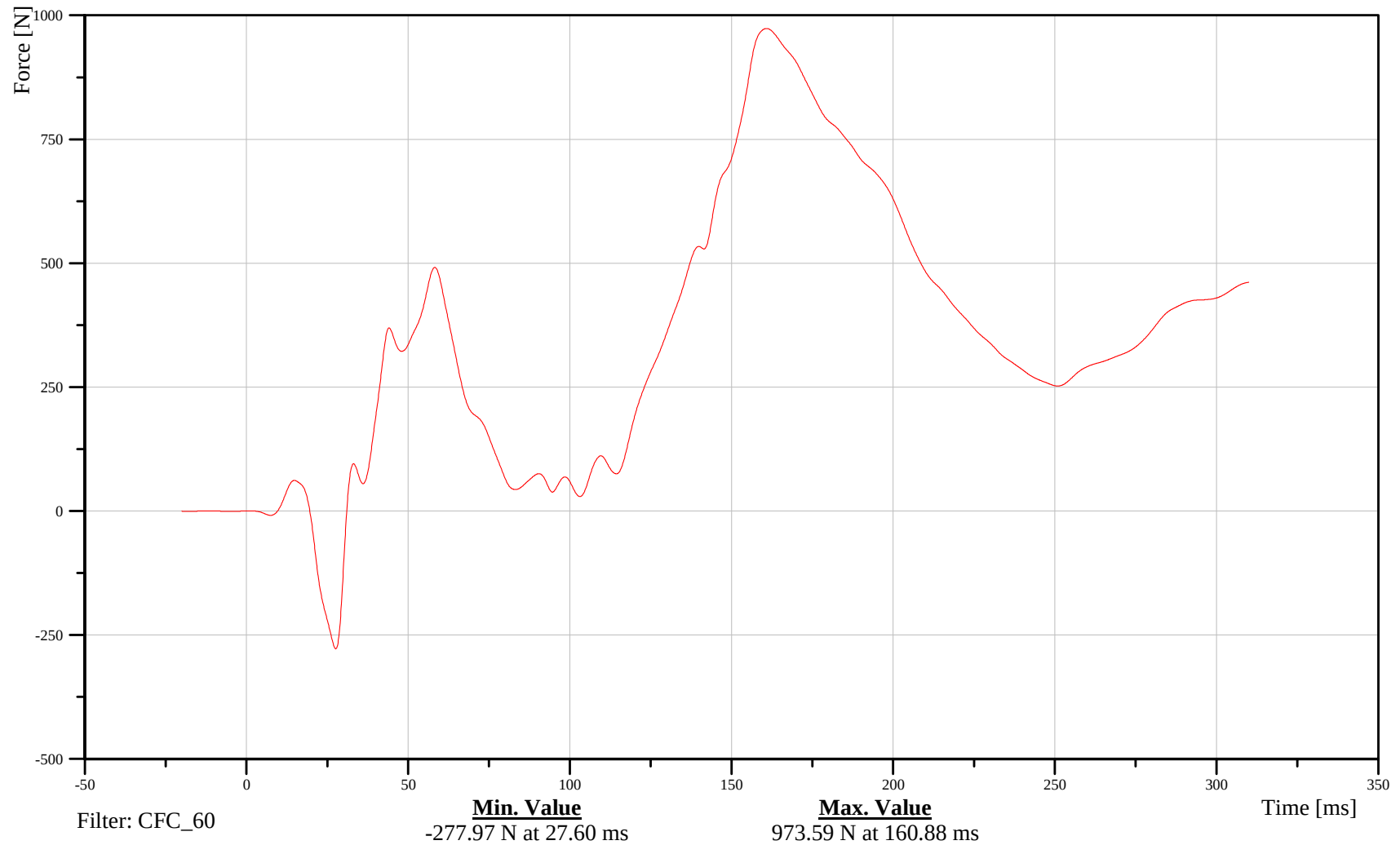
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Passenger Lap Belt Force

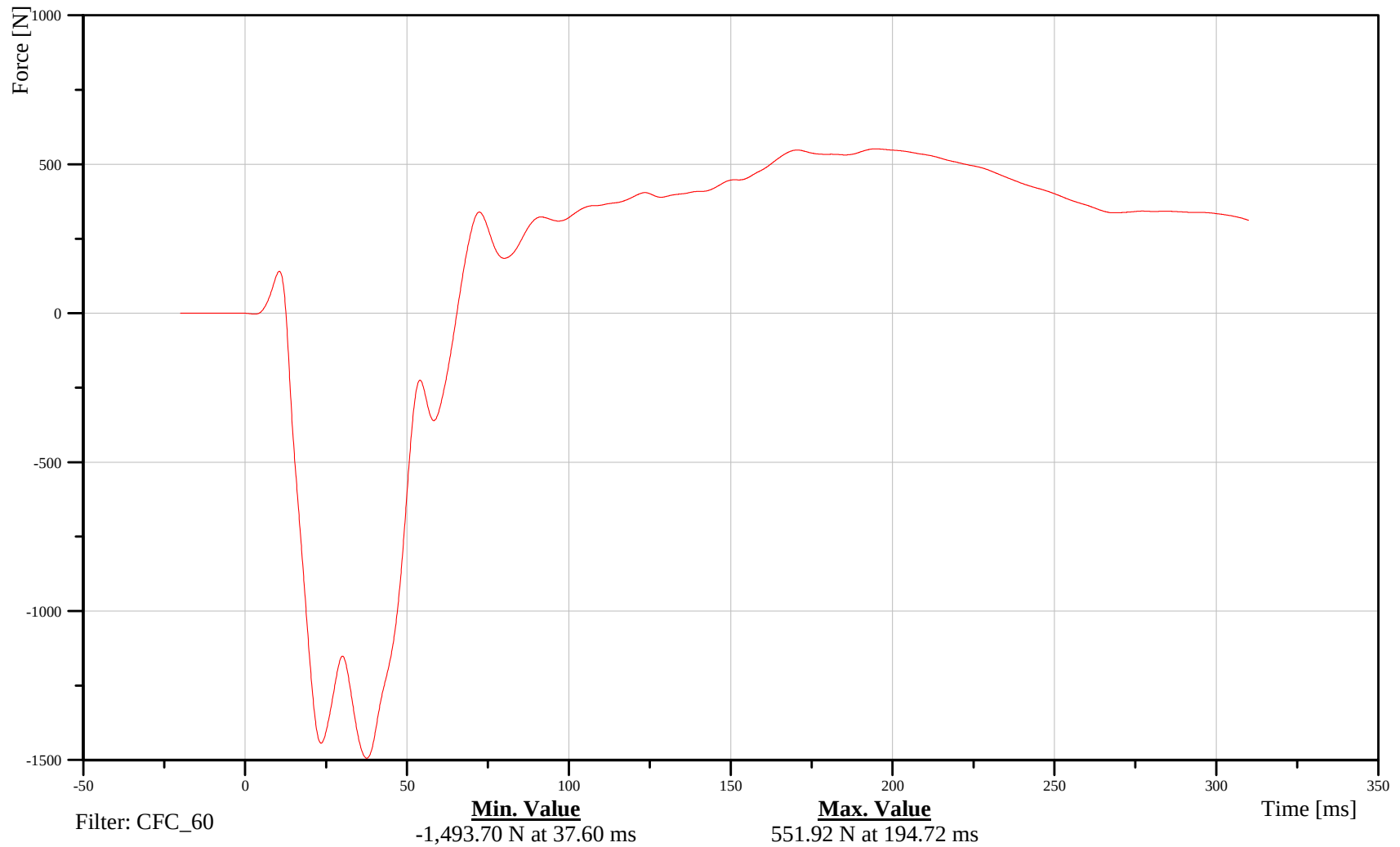
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

MDB Rear X-Axis Acceleration

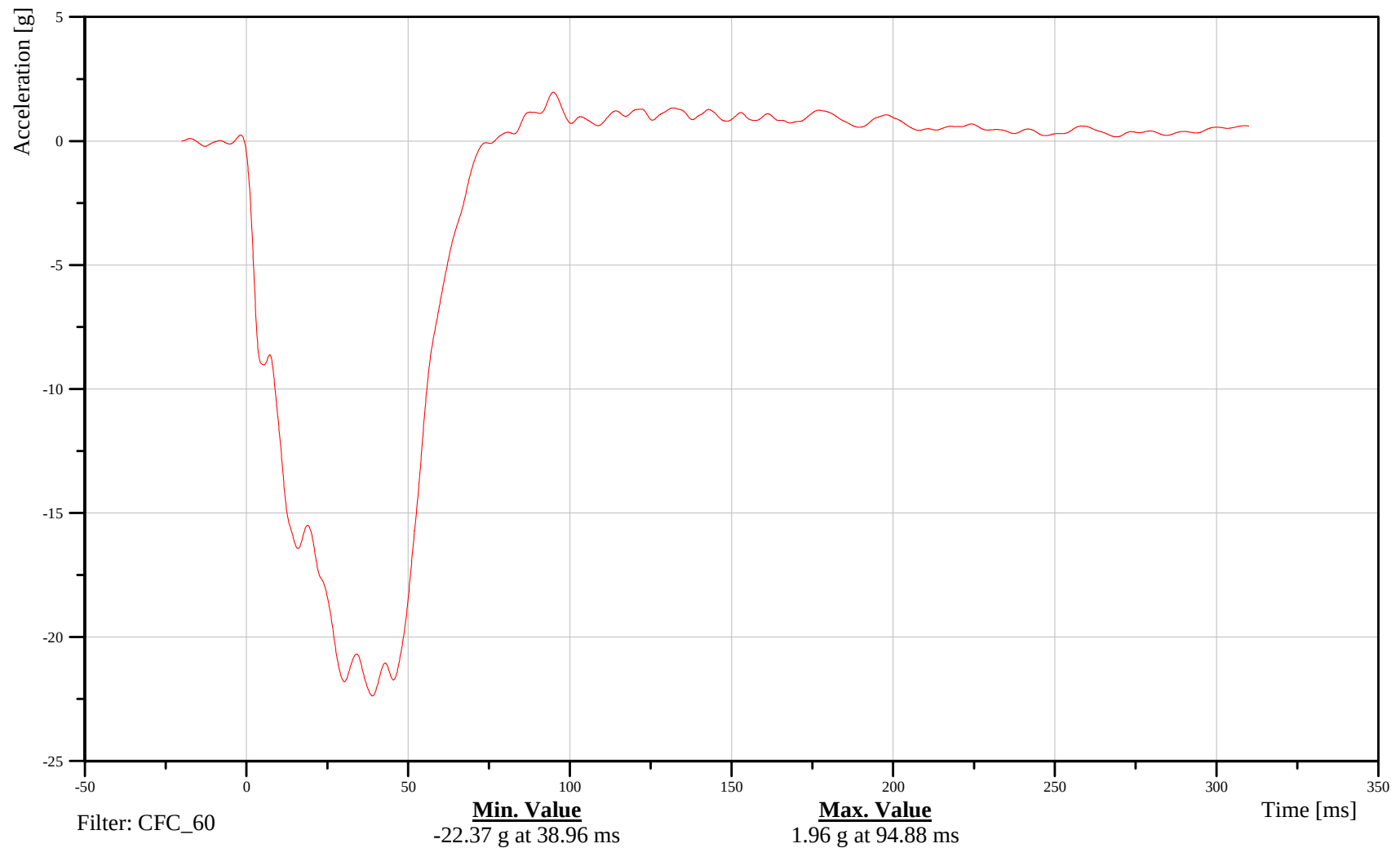
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M7FRAM000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

MDB Rear Y-Axis Acceleration

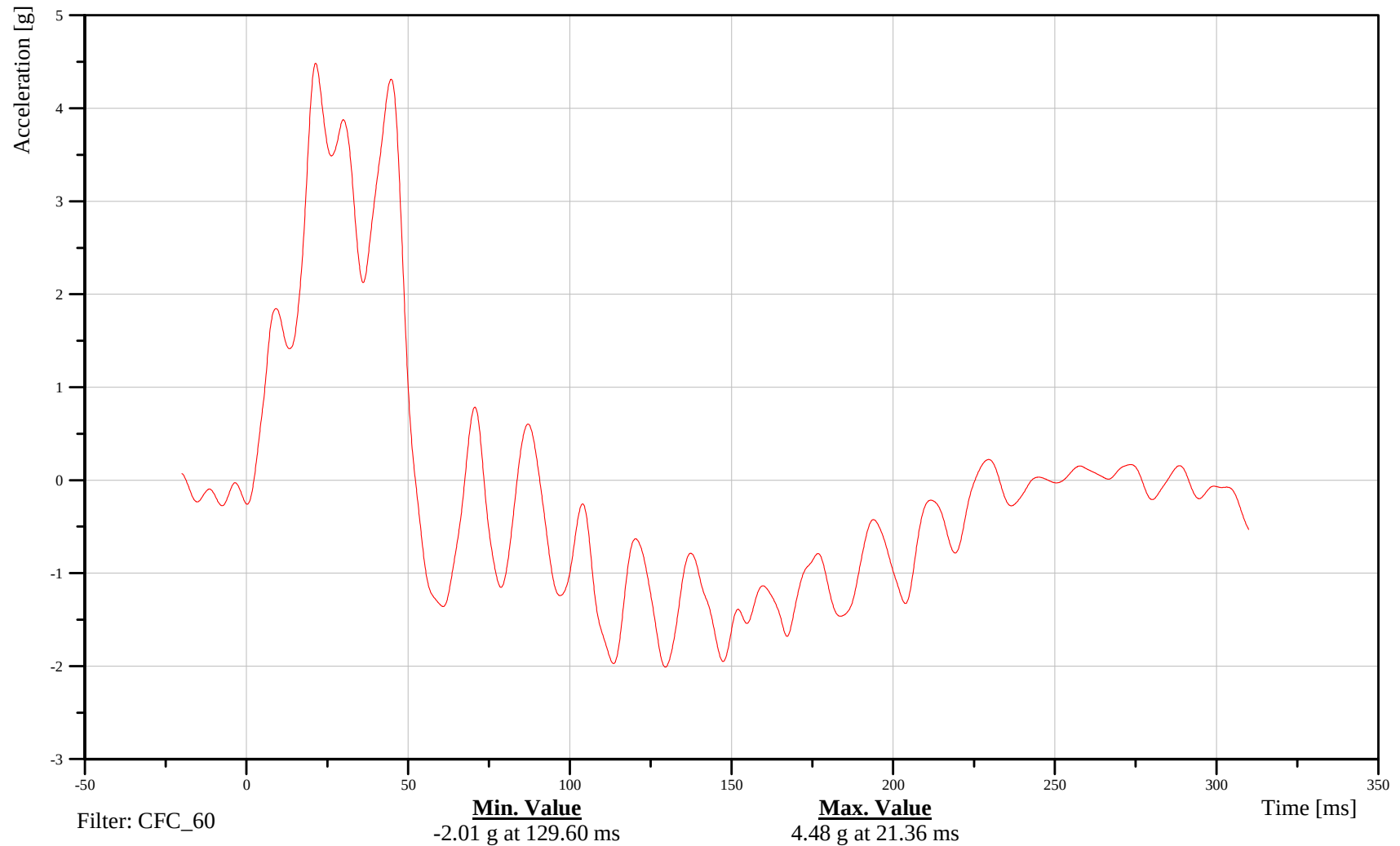
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M7FRAM000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

MDB Center of Gravity X-Axis Acceleration

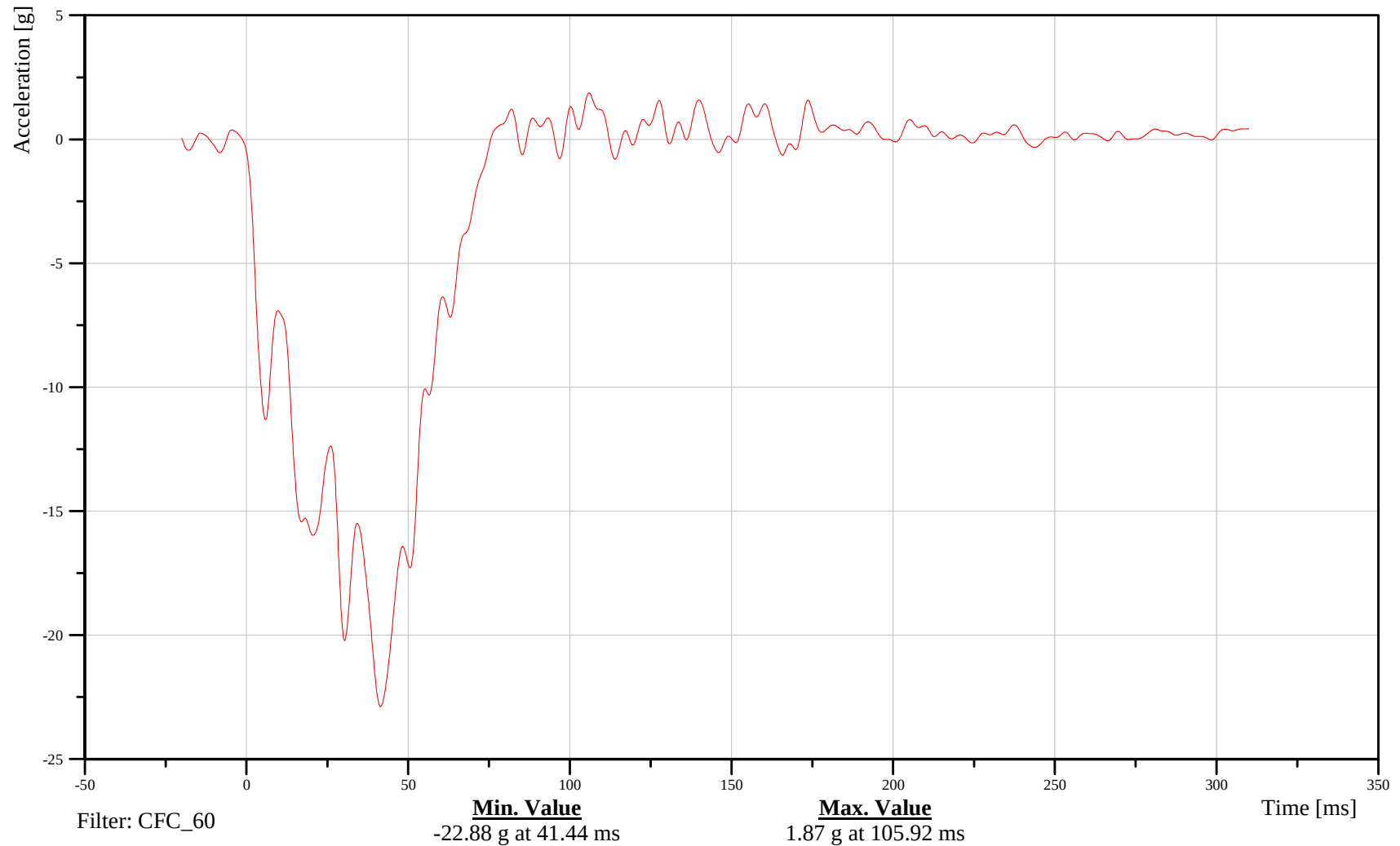
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M0VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
MDB Center of Gravity X-Axis Velocity

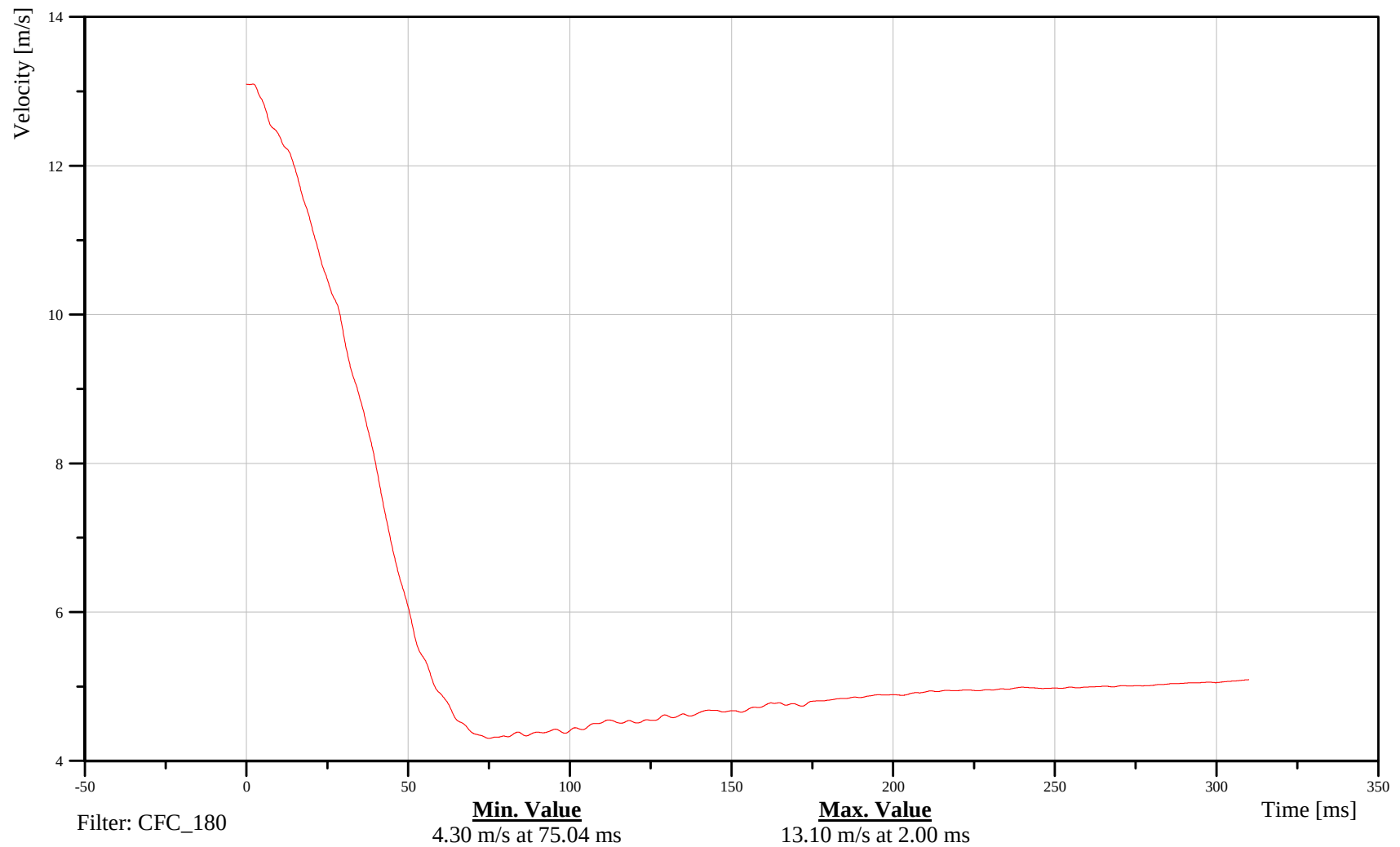
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M0VEHCCG0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation
MDB Center of Gravity Y-Axis Acceleration

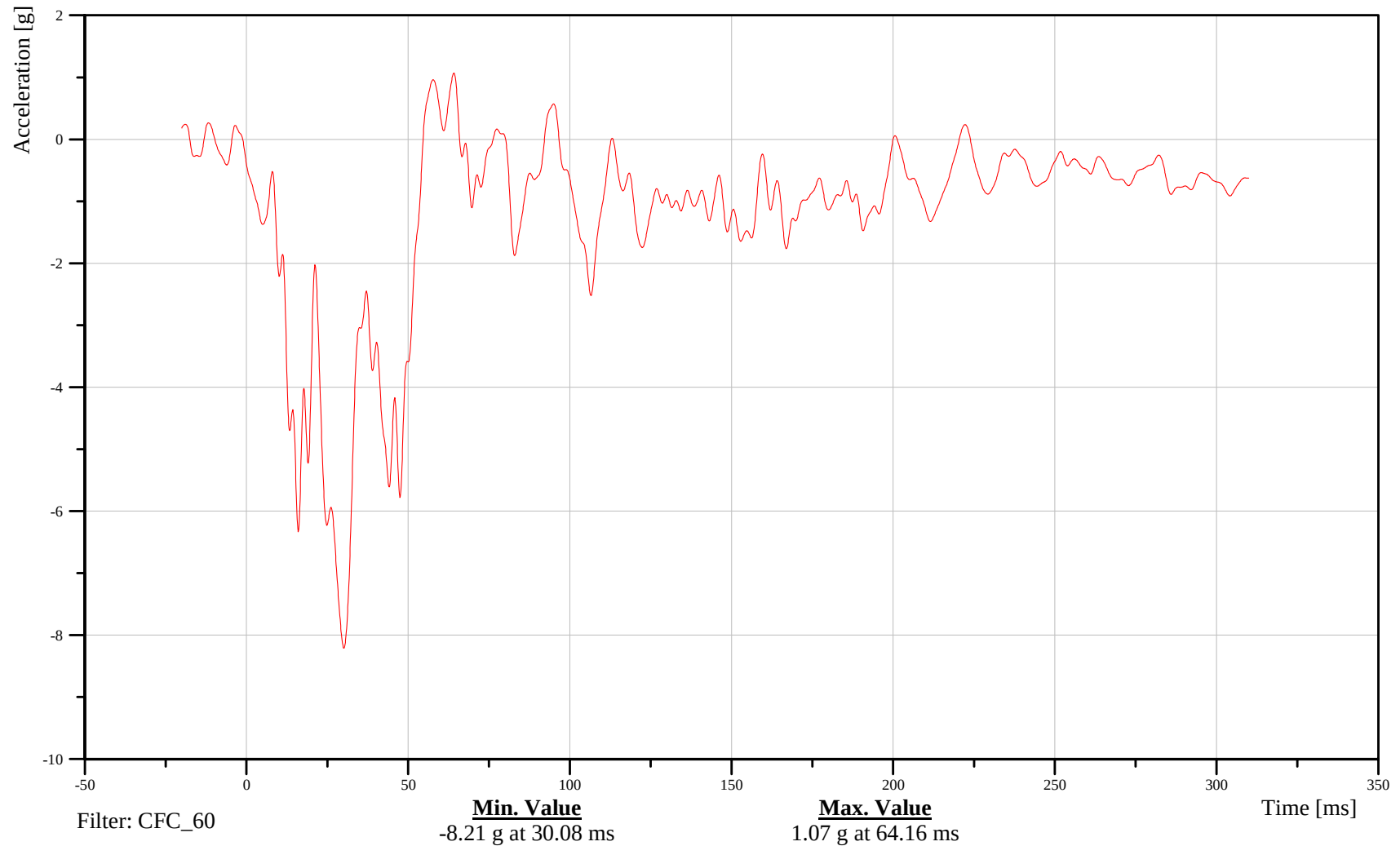
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M0VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

MDB Center of Gravity Y-Axis Velocity

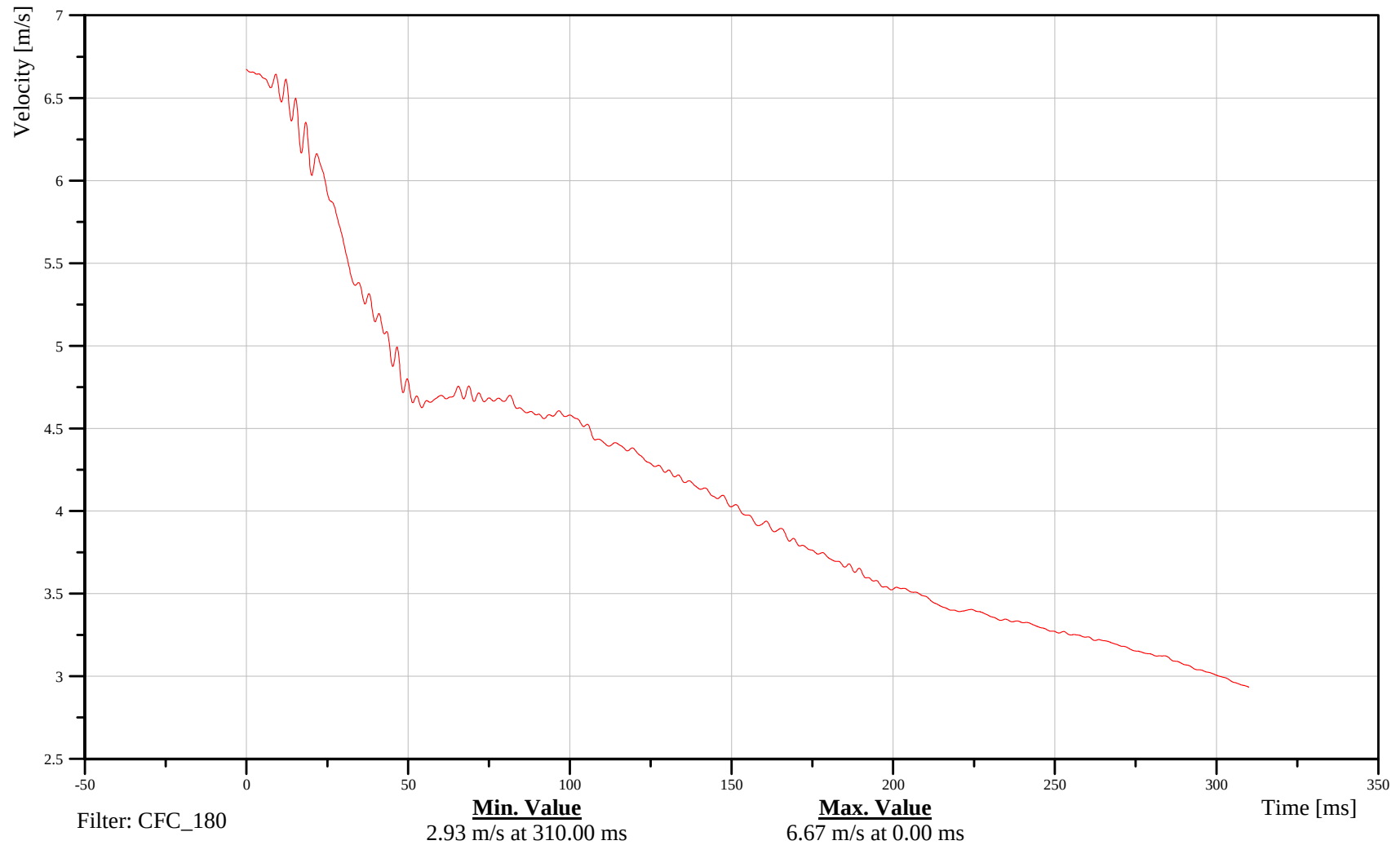
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M0VEHCCG0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-70

080911-2



World SID Evaluation

MDB Center of Gravity Z-Axis Acceleration

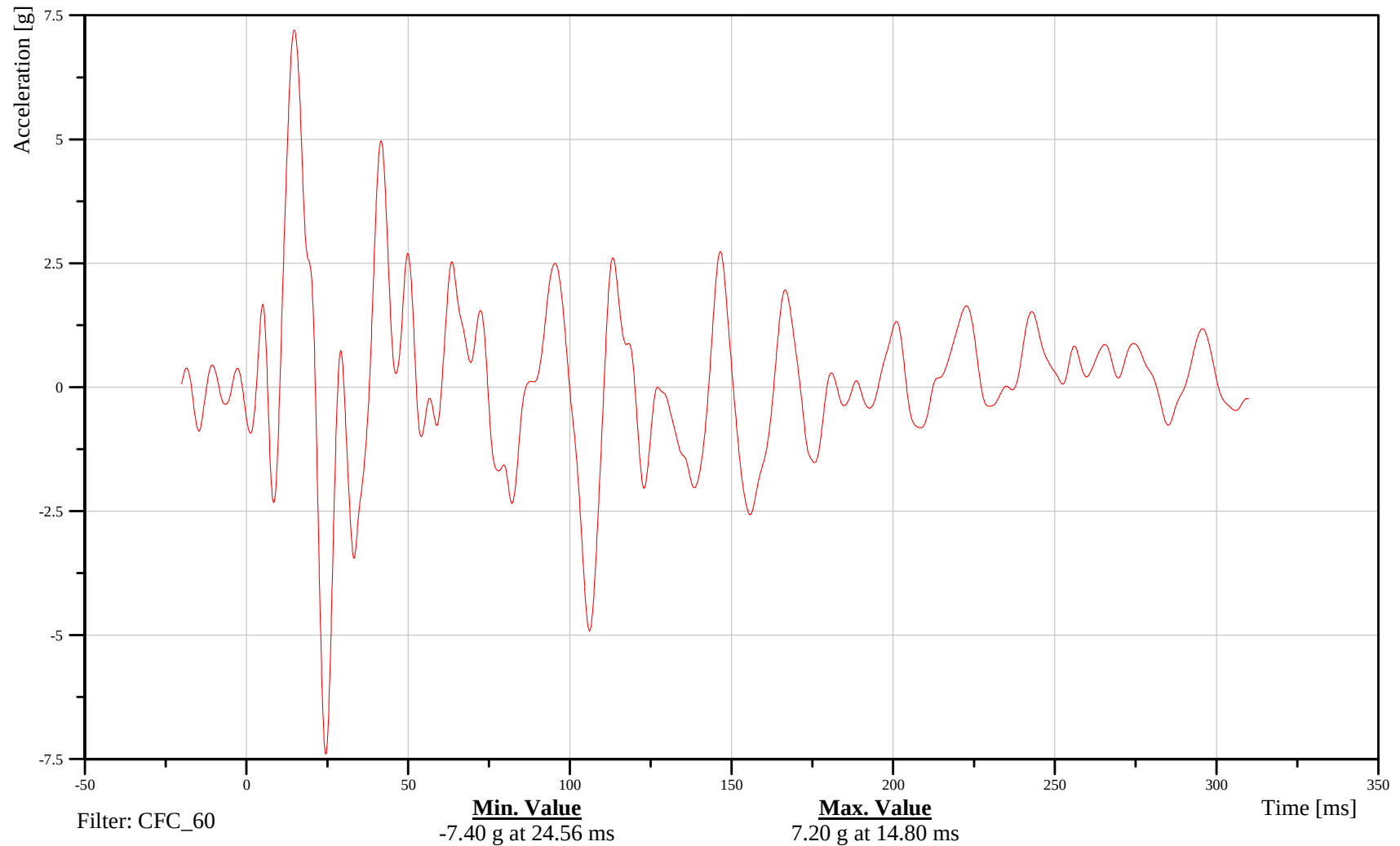
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M0VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-71

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

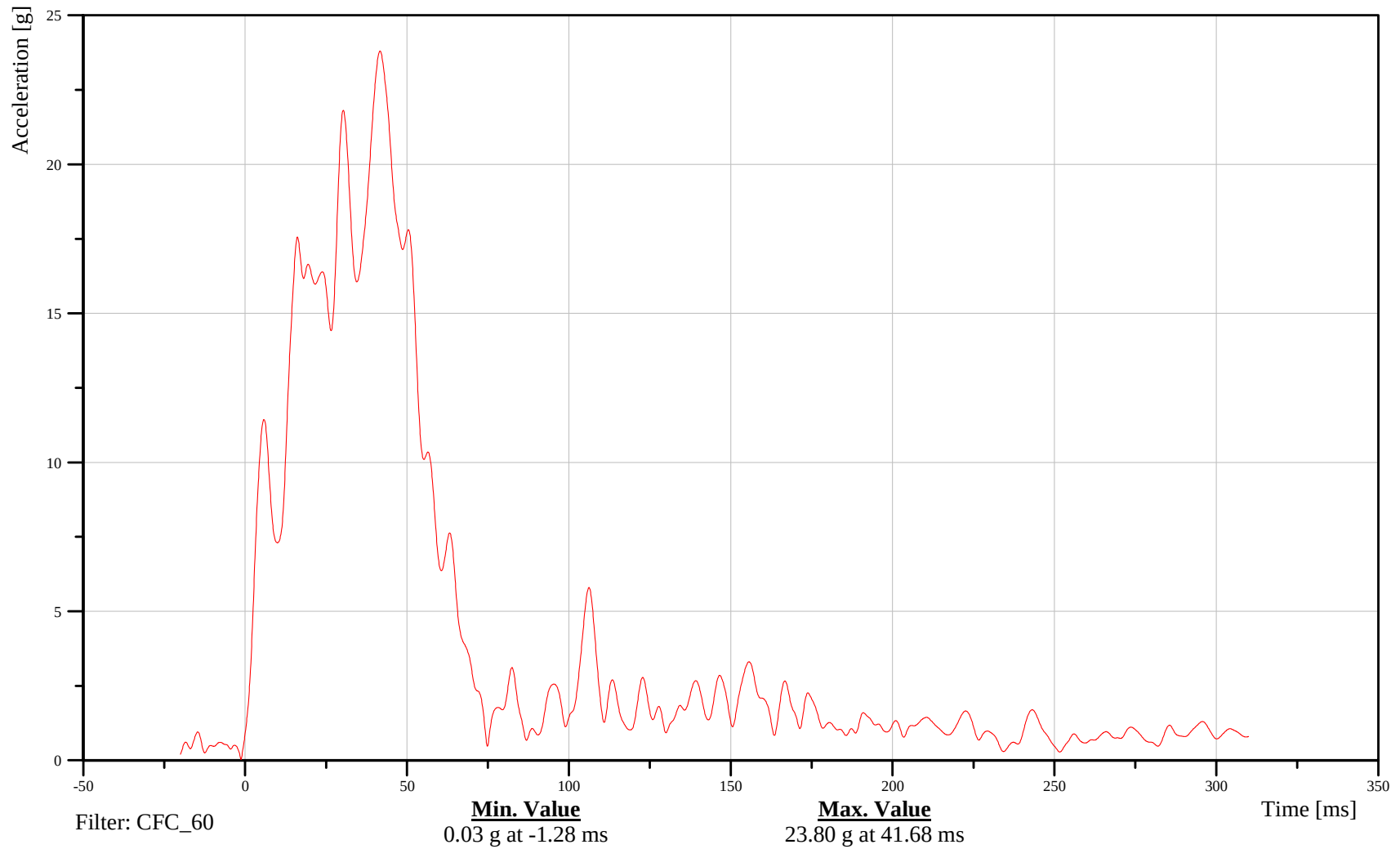
MDB Center of Gravity Resultant Acceleration

Customer: VRTC

M0VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-72

080911-2



World SID Evaluation

MDB Left Contact Switch

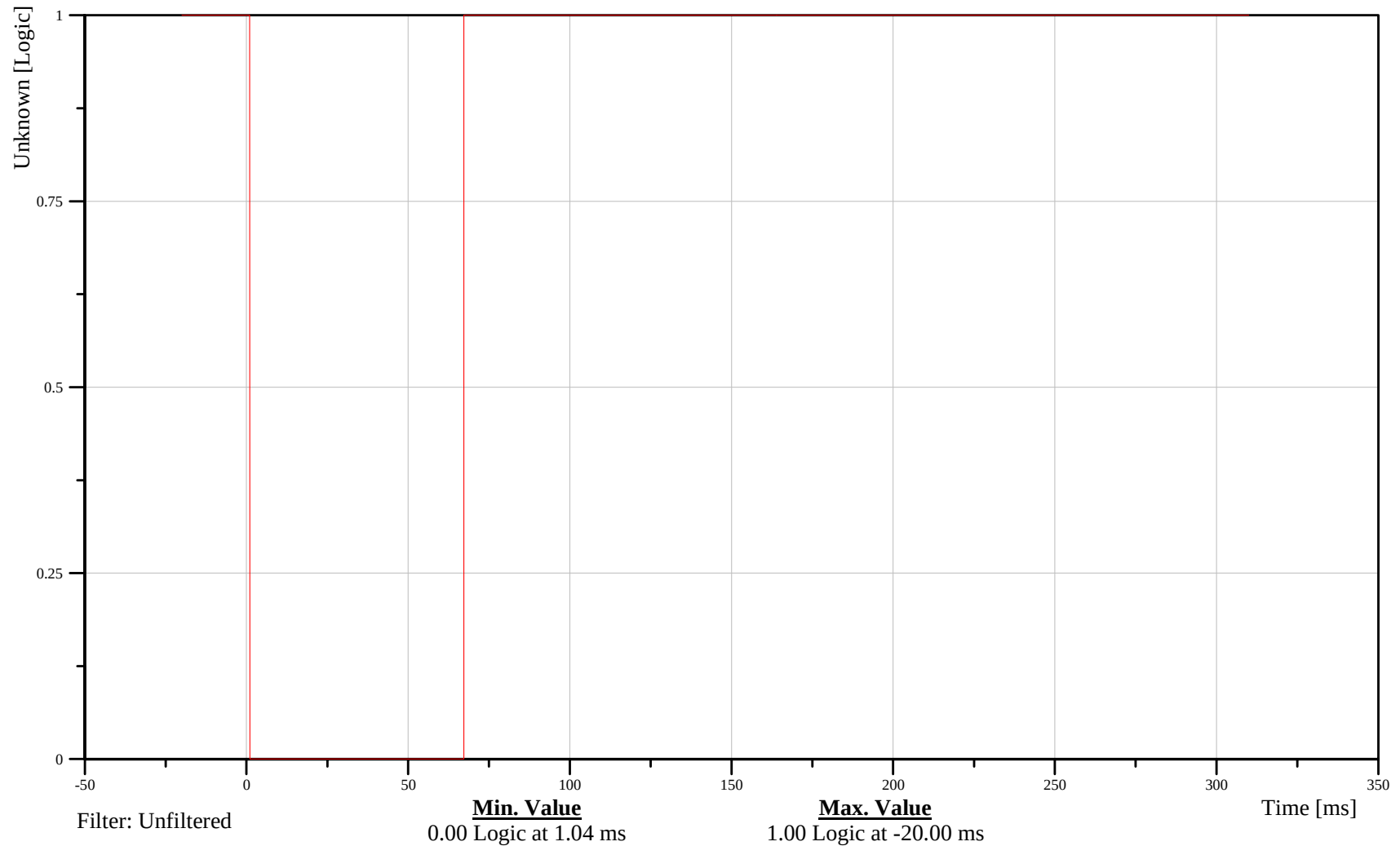
Date: 09/11/2008
Time: 16:22

Customer: VRTC

M1CONT000000VO00

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-73

080911-2



World SID Evaluation

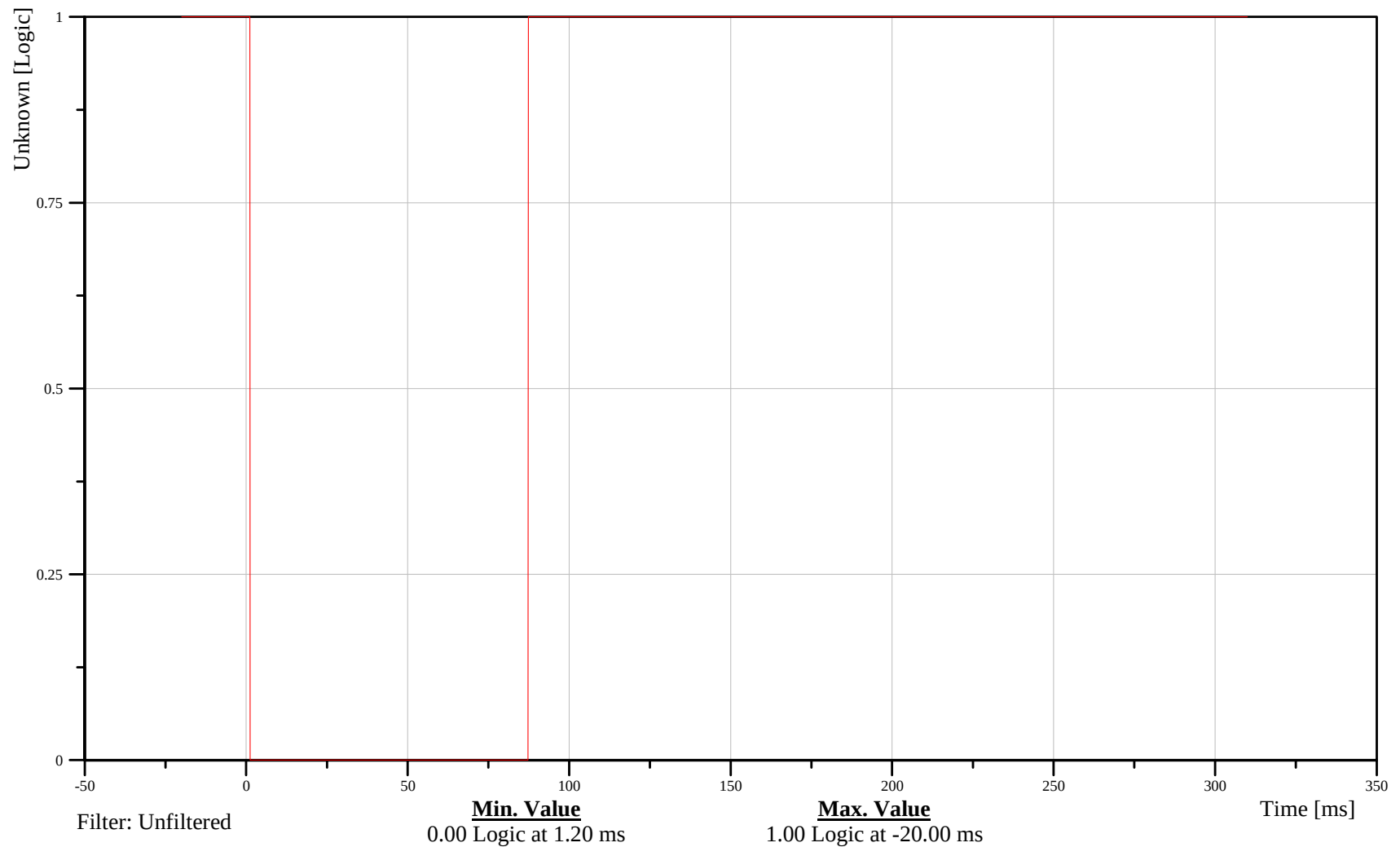
MDB Right Contact Switch

Date: 09/11/2008
Time: 16:22

Customer: VRTC

M3CONT000000VO00

TRC Inc. Test Lab: CTF
Test Number: 080911-2



B-74

080911-2



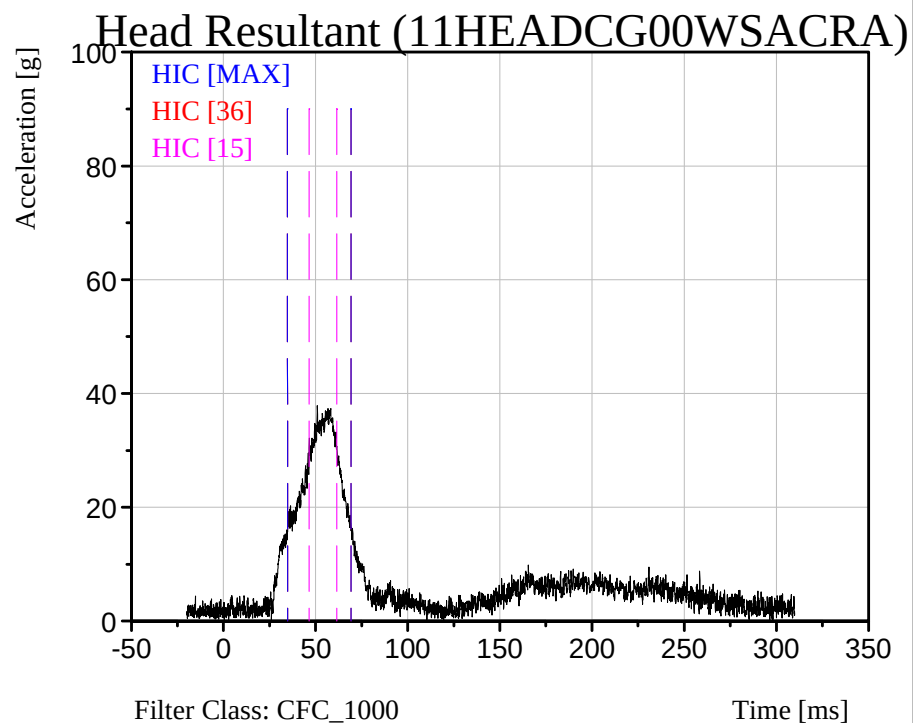
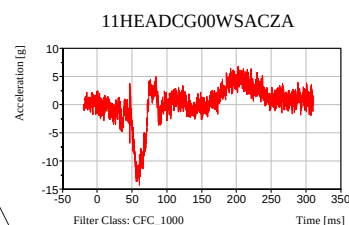
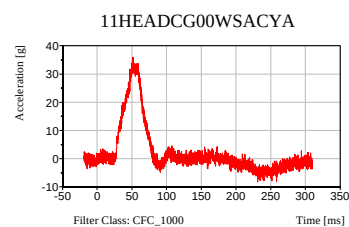
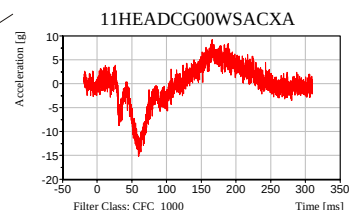
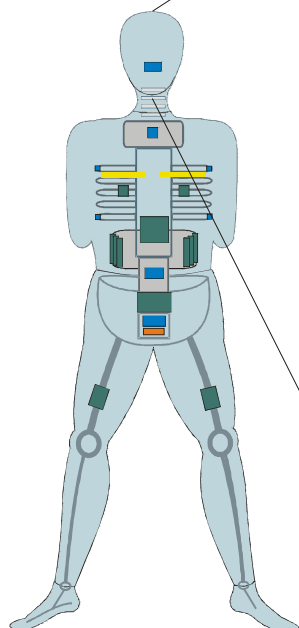
World SID Evaluation Head Injury Criterion (HIC)

Date: 09/11/2008
Time: 16:22

Customer: VRTC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



	<u>T1</u> (Begin)	<u>T2</u> (End)	<u>Avg. g T1 to T2</u>
HIC [Max.] = 131.07	34.80 ms	69.28 ms	27.01 g
HIC [36] = 131.07	34.80 ms	69.28 ms	27.01 g
HIC [15] = 99.14	46.56 ms	61.60 ms	33.68 g

Dummy:
Seating Position:
Driver

HIC Source Code: SAE J2052 ISO/TC22/SC12/WG3 N 282 (Issued 1990-03-16)

B-75

080911-2



World SID Evaluation
Driver Head X-Axis Acceleration

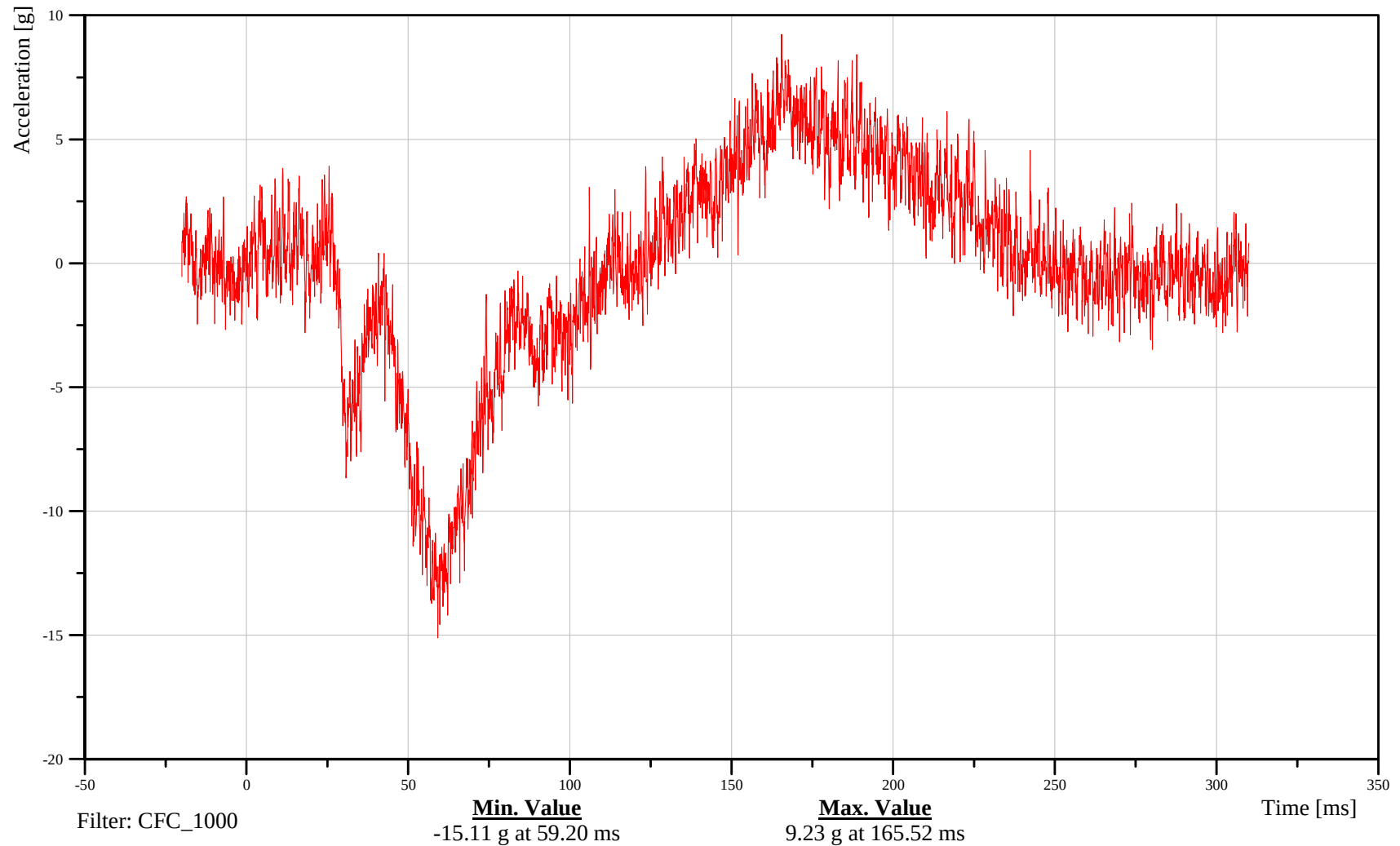
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11HEADCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-76

080911-2



World SID Evaluation

Driver Head Y-Axis Acceleration

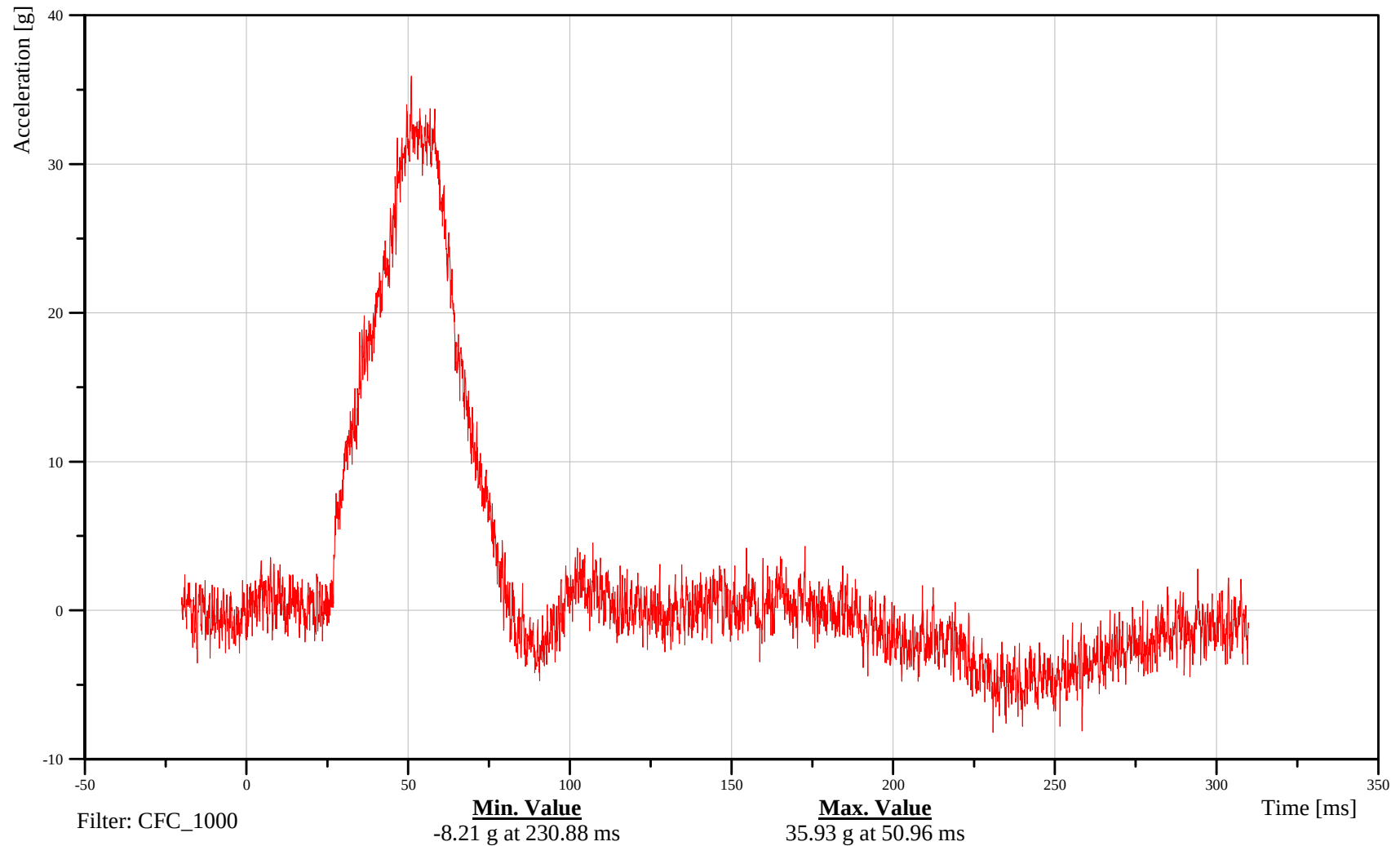
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11HEADCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-77

080911-2



World SID Evaluation
Driver Head Z-Axis Acceleration

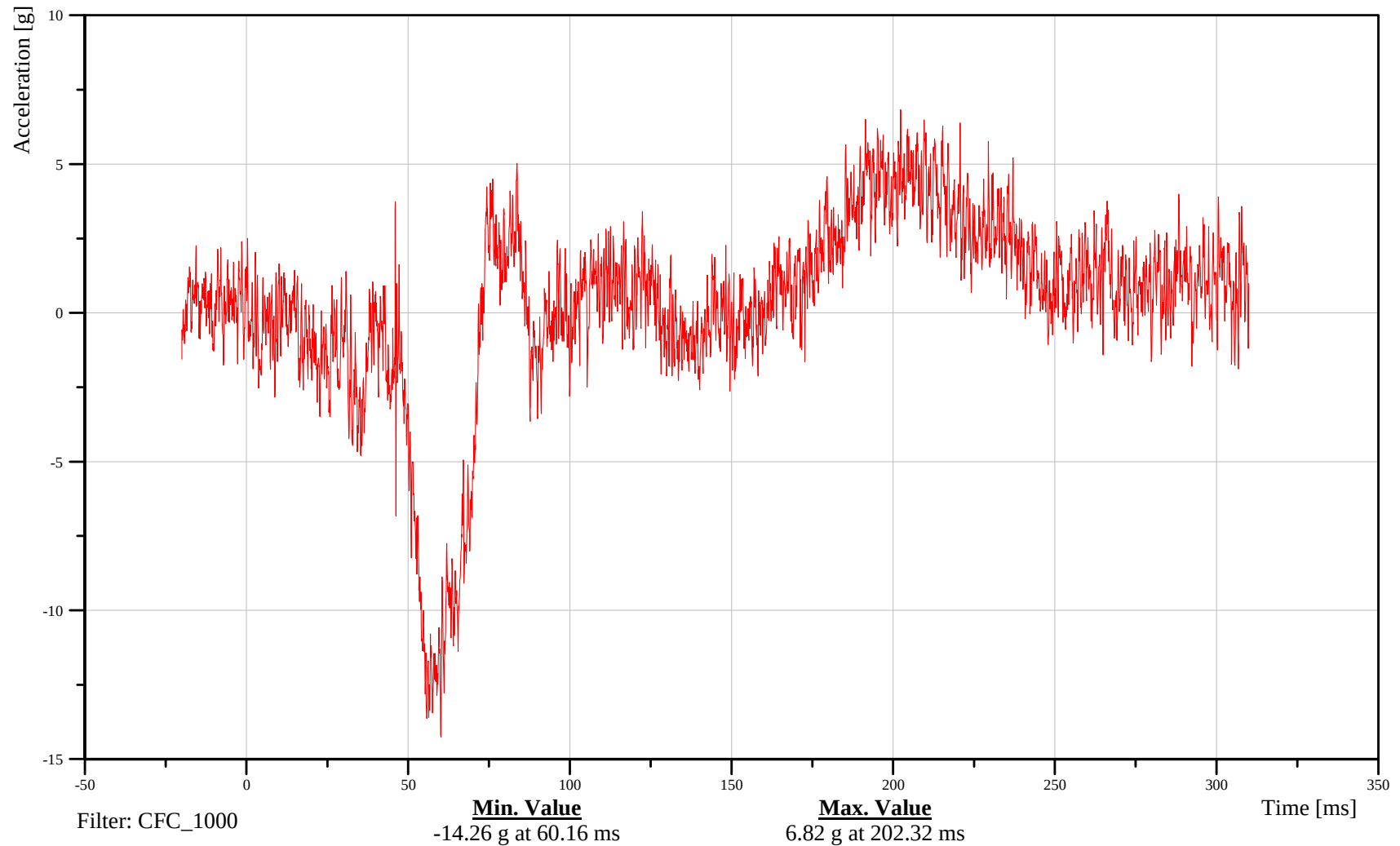
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11HEADCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-78

080911-2



World SID Evaluation
Driver Head Resultant Acceleration

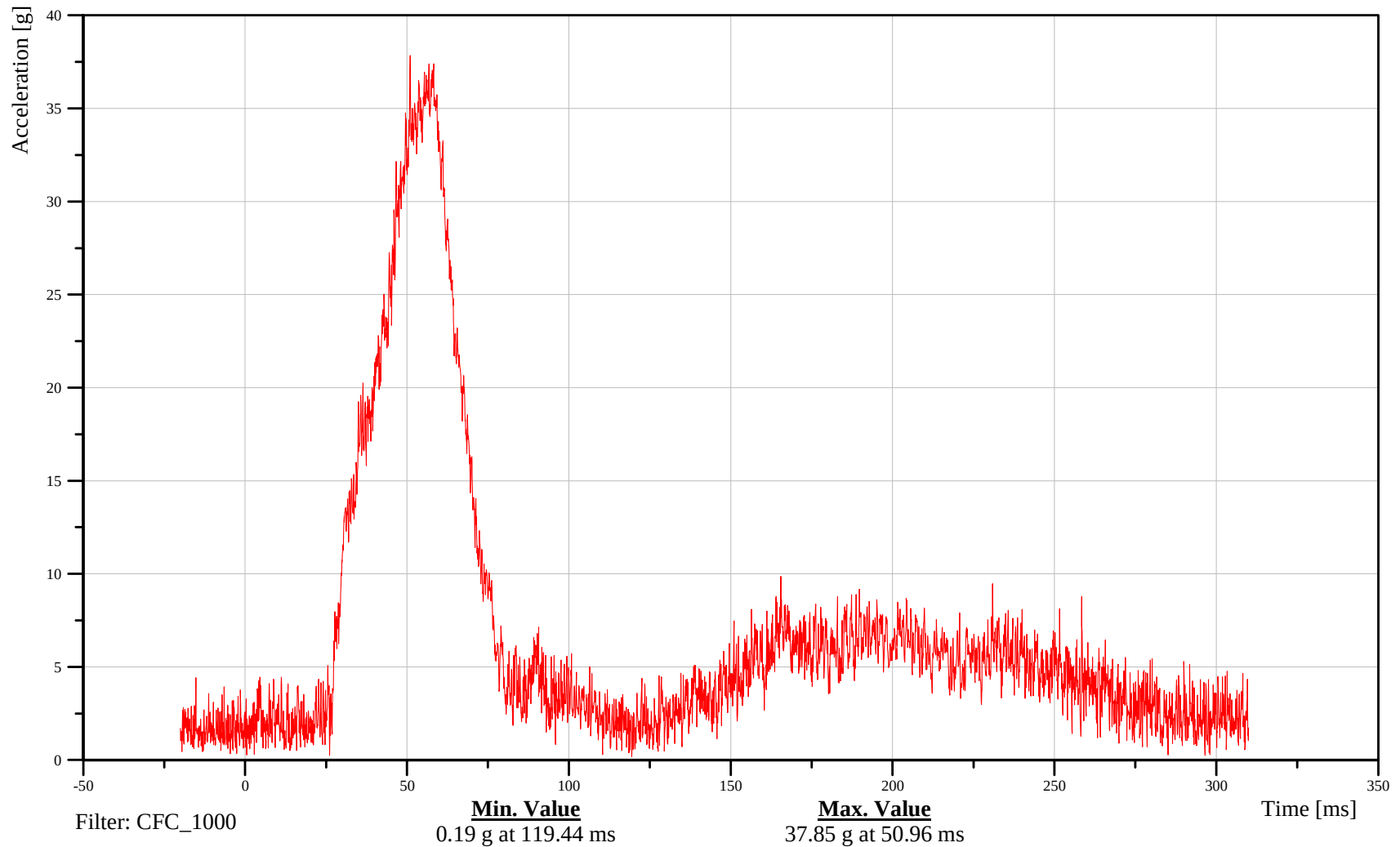
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11HEADCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



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080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

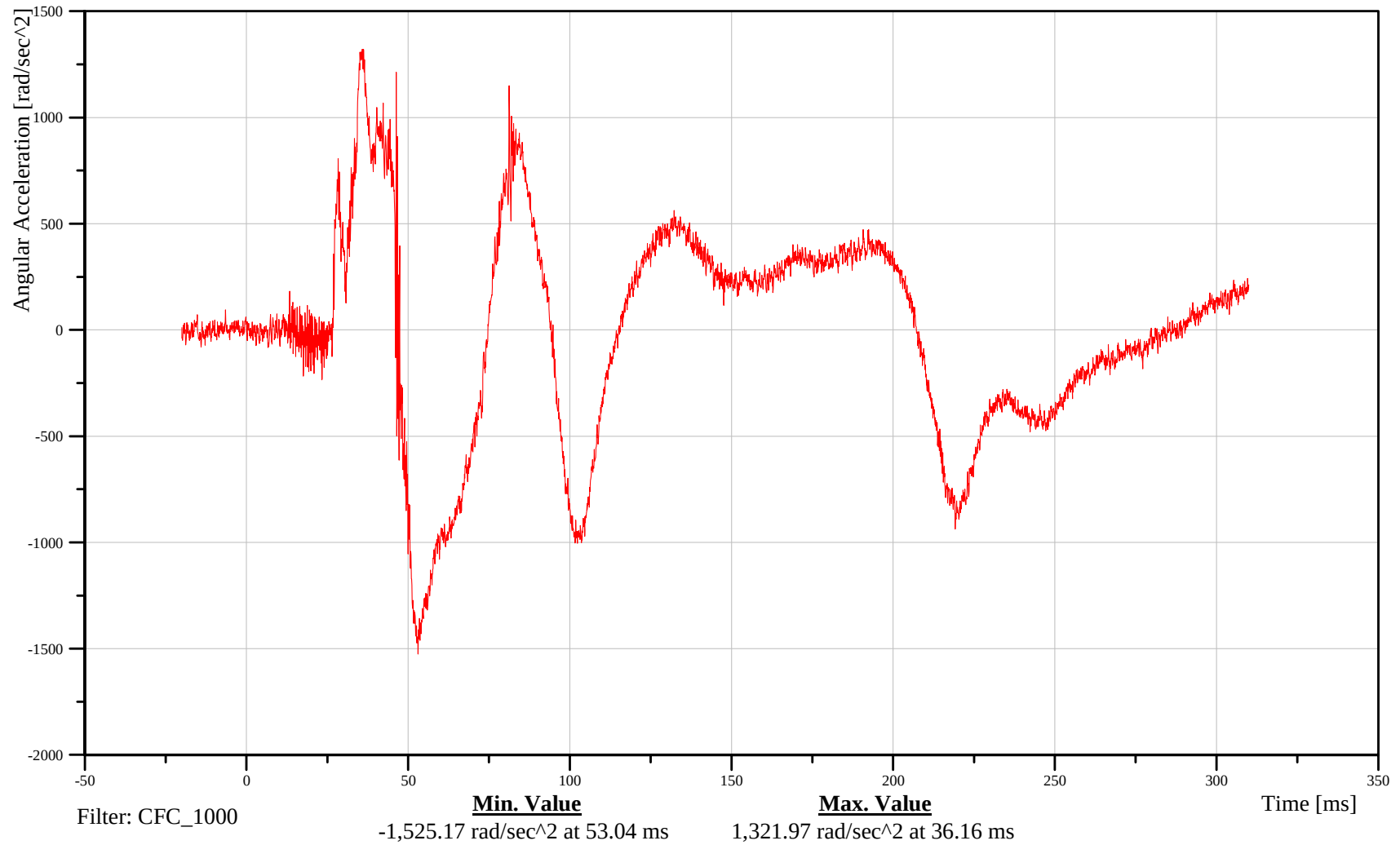
Driver Head X-Axis Angular Displacement

Customer: VRTC

11HEADCG00WSANXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-80

080911-2



World SID Evaluation

Driver Head Y-Axis Angular Displacement

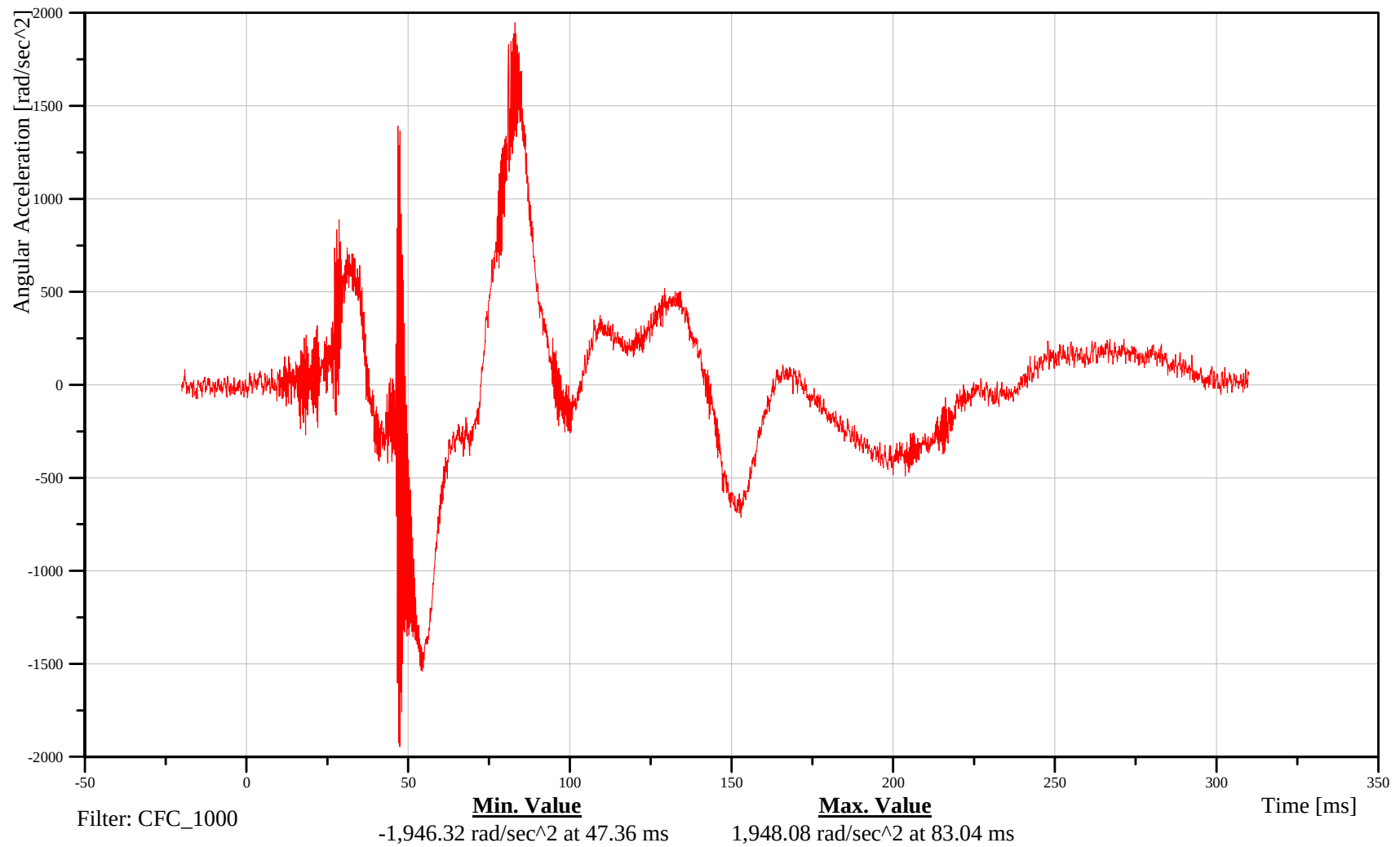
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11HEADCG00WSANYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-81

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

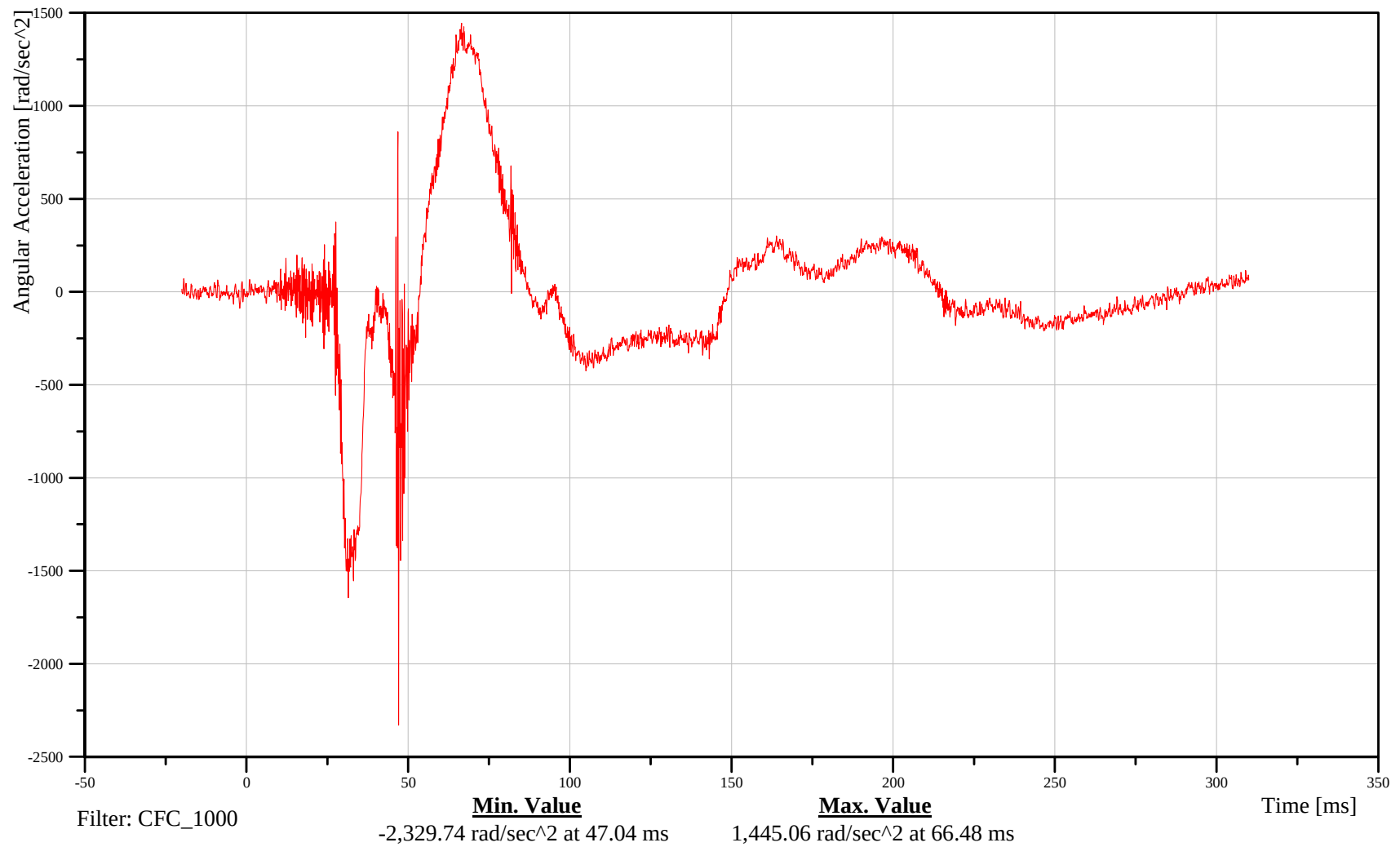
Driver Head Z-Axis Angular Displacement

Customer: VRTC

11HEADCG00WSANZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-82

080911-2



World SID Evaluation
Driver Upper Neck X-Axis Force

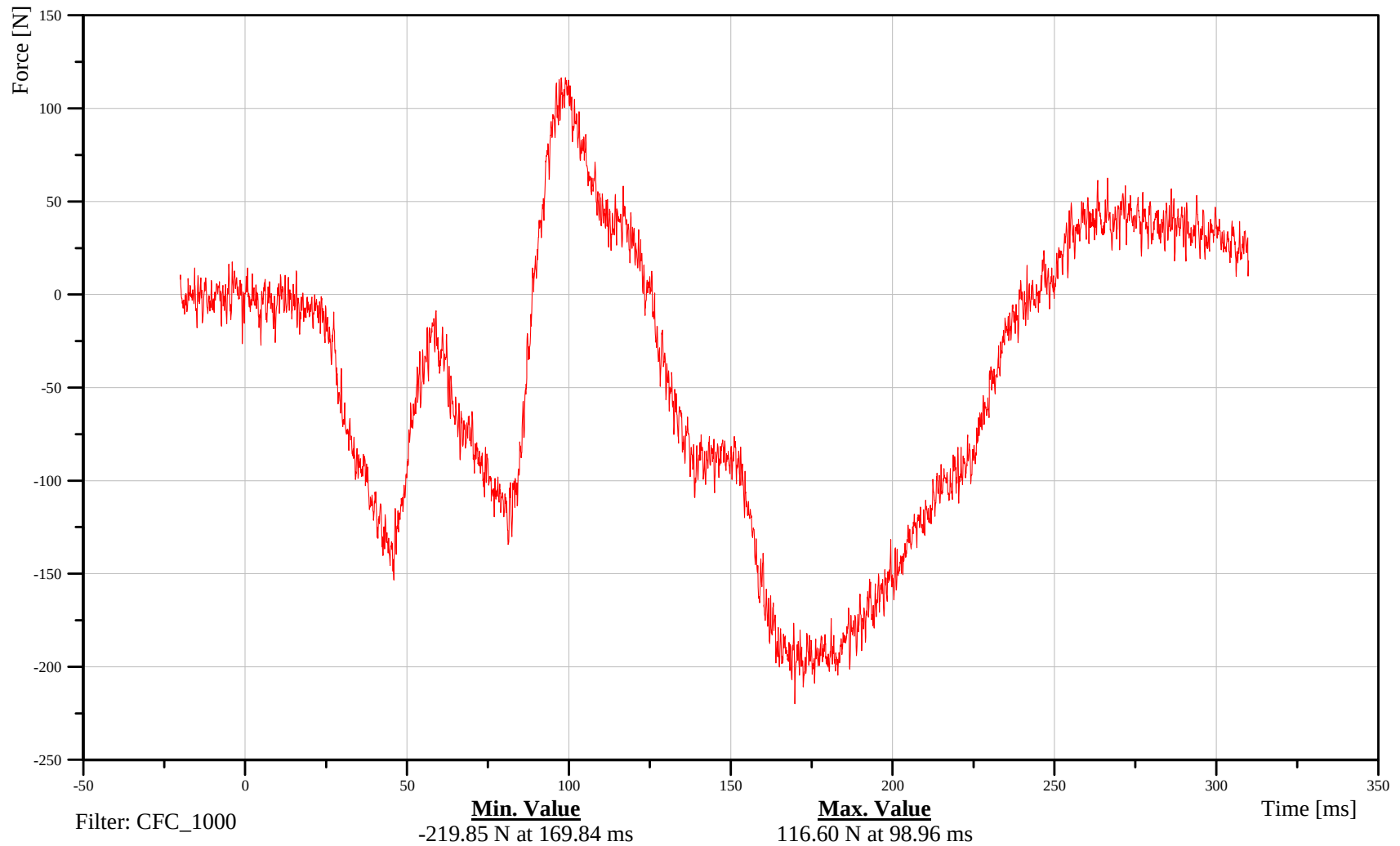
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKUP00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-83

080911-2



World SID Evaluation
Driver Upper Neck Y-Axis Force

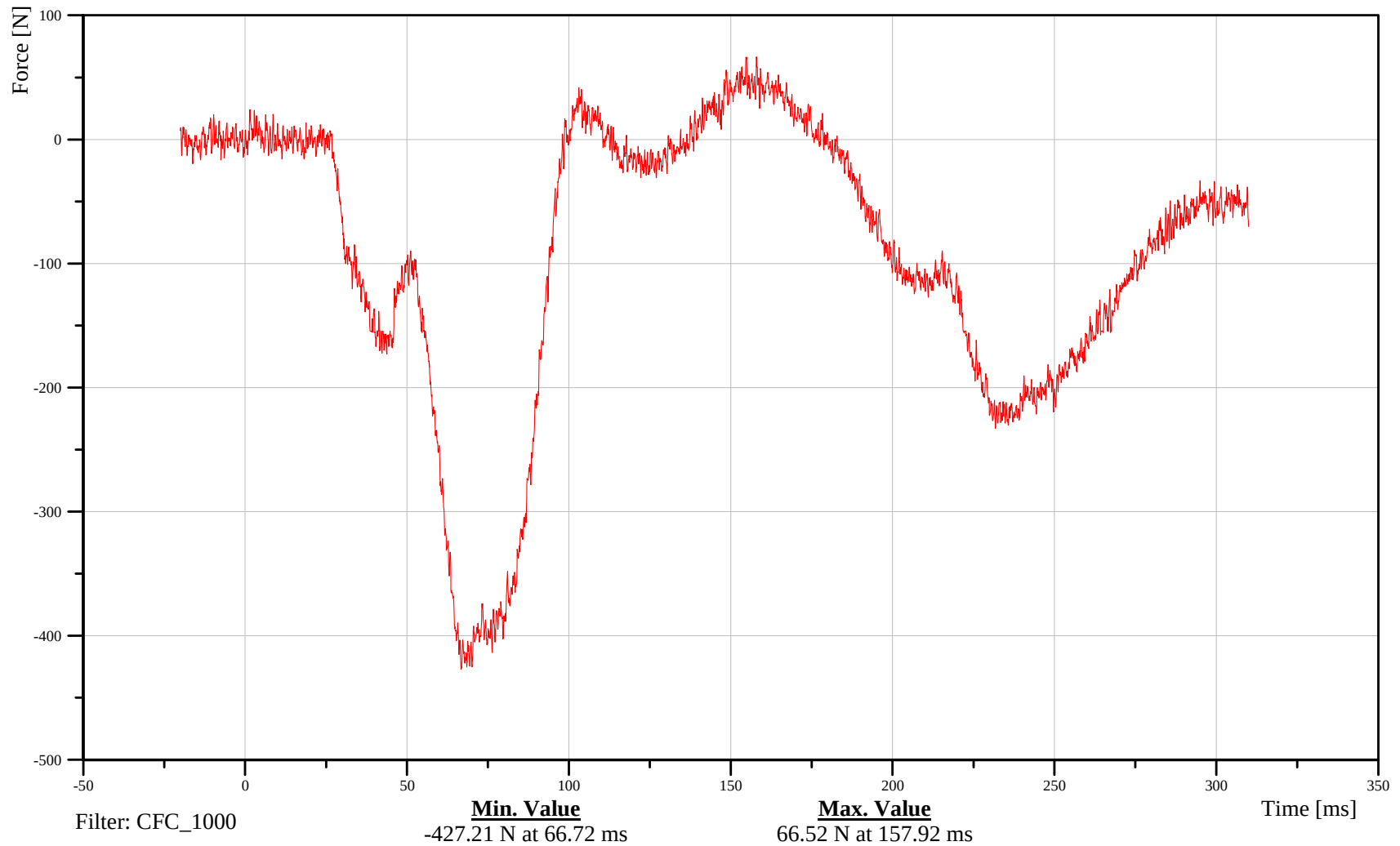
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKUP00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-84

080911-2



World SID Evaluation
Driver Upper Neck Z-Axis Force

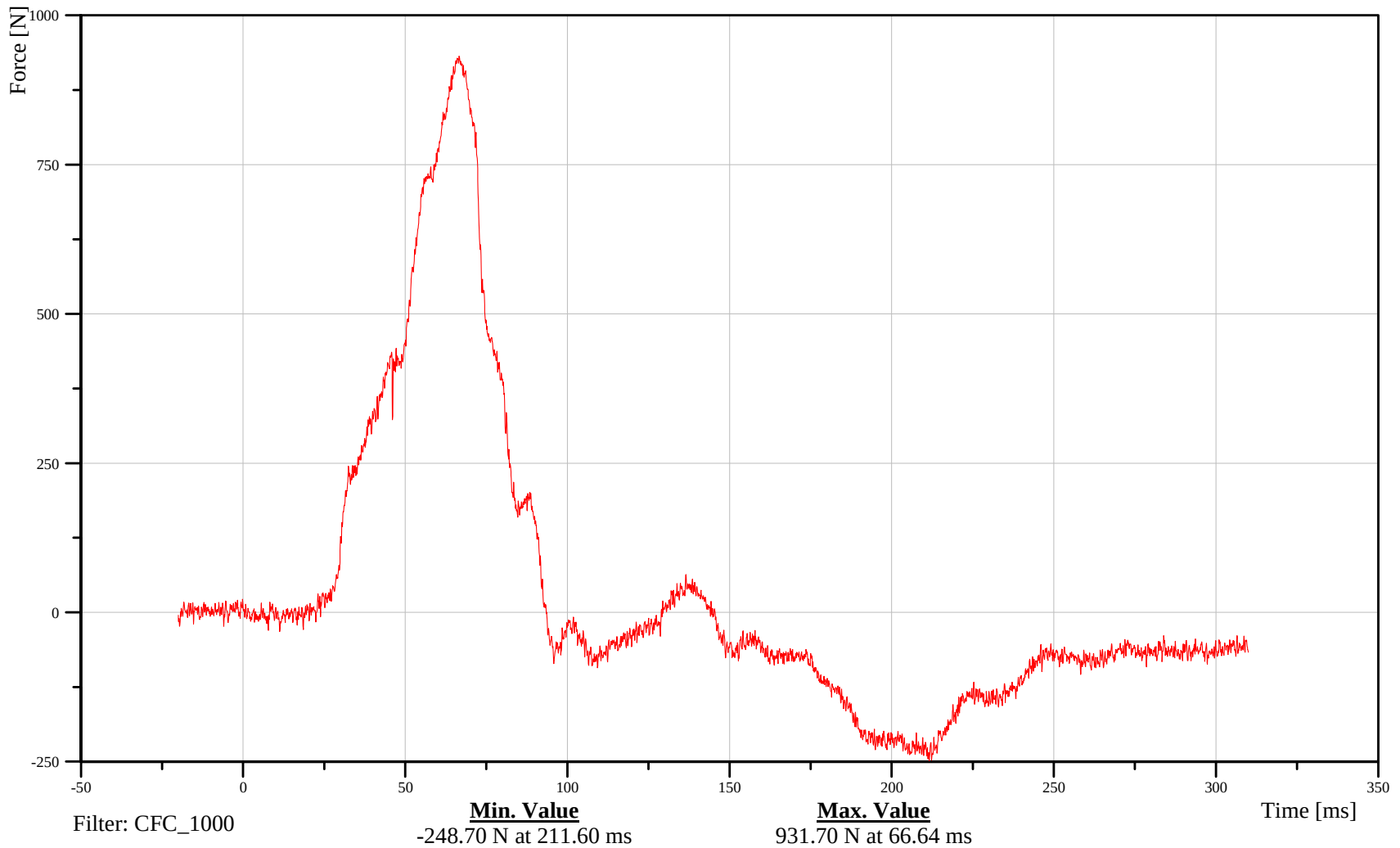
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKUP00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-85

080911-2



World SID Evaluation

Driver Upper Neck Moment About X Axis

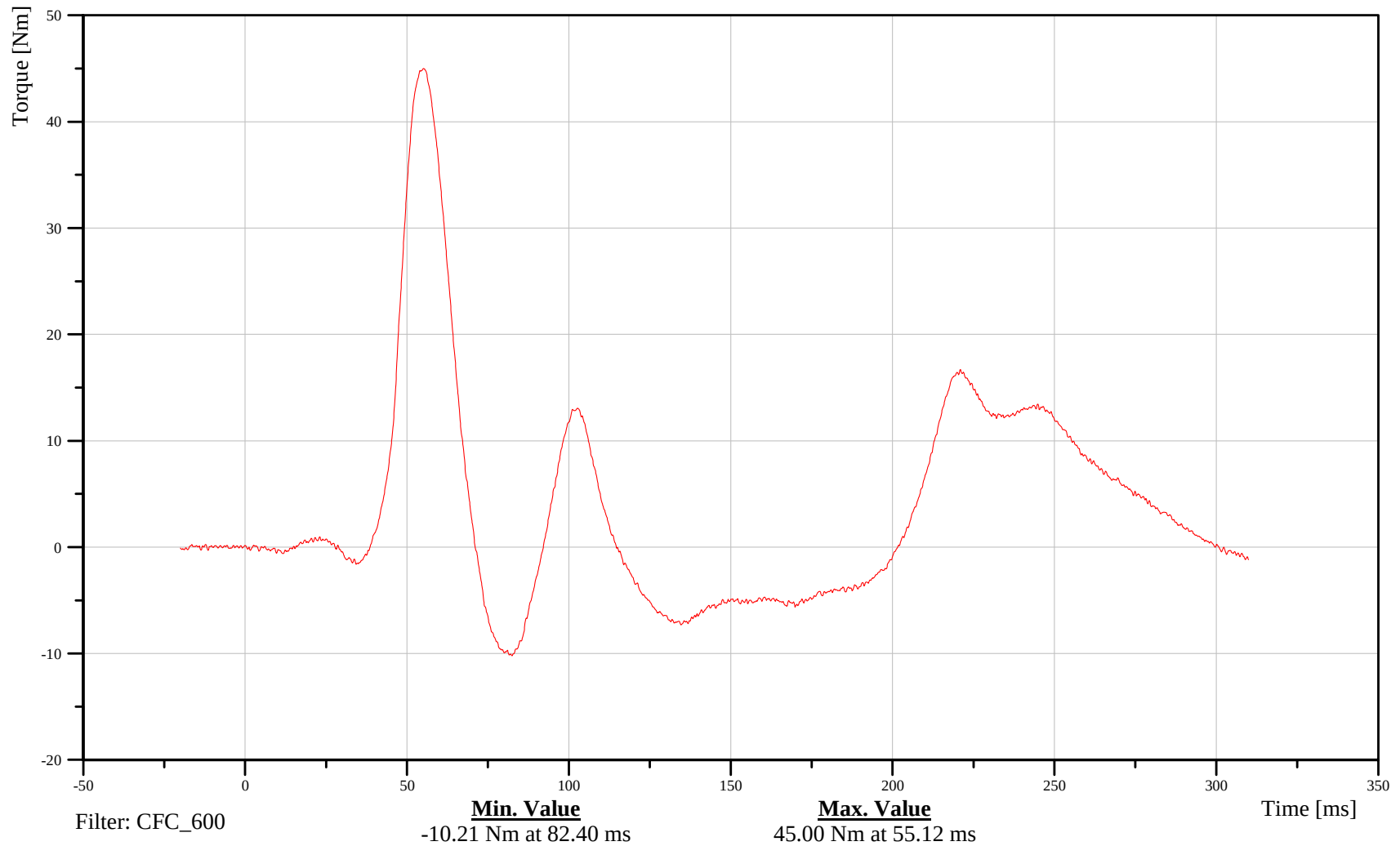
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKUP00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-86

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

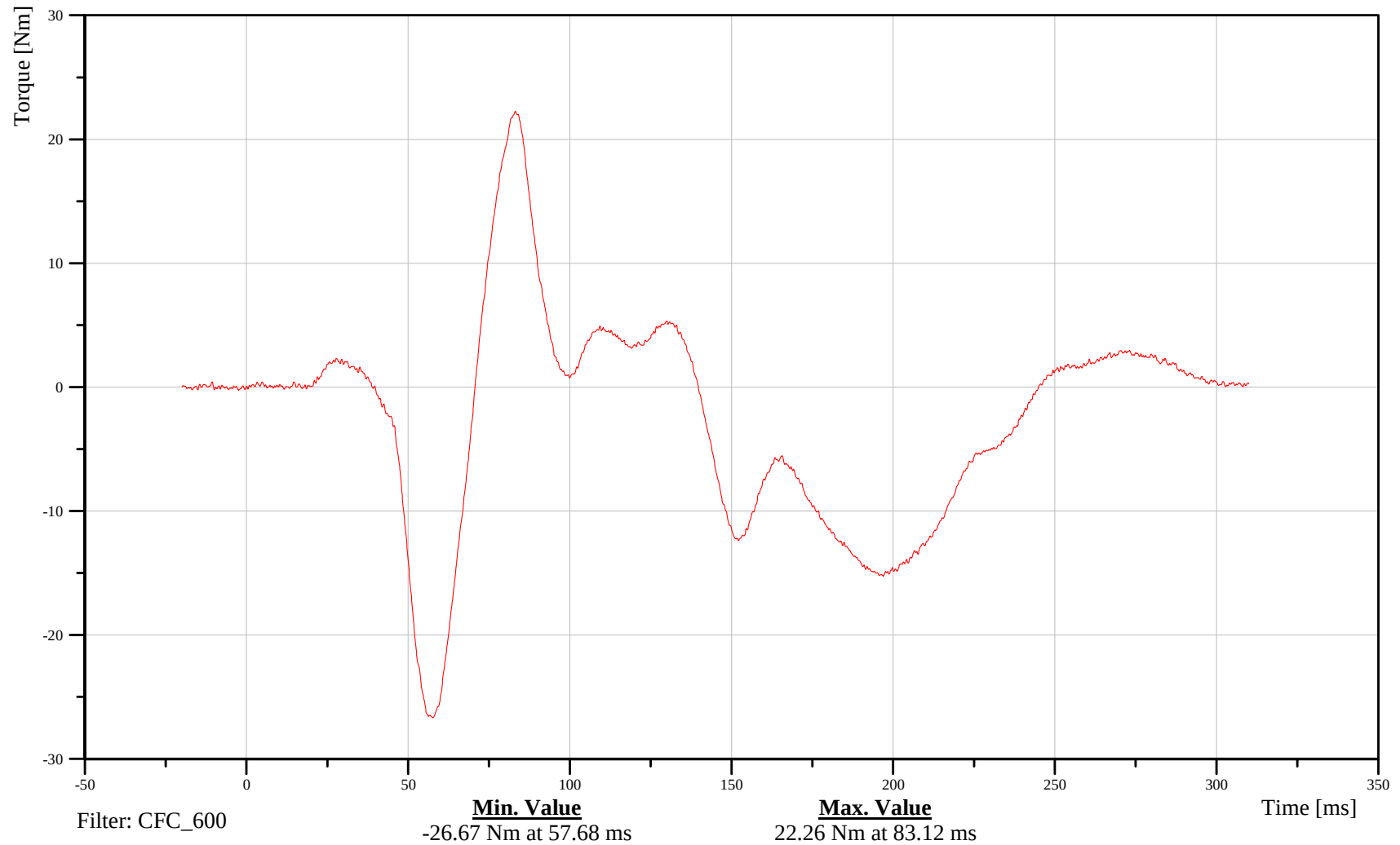
Driver Upper Neck Moment About Y Axis

Customer: VRTC

11NECKUP00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-87

080911-2



World SID Evaluation

Driver Upper Neck Moment About Z Axis

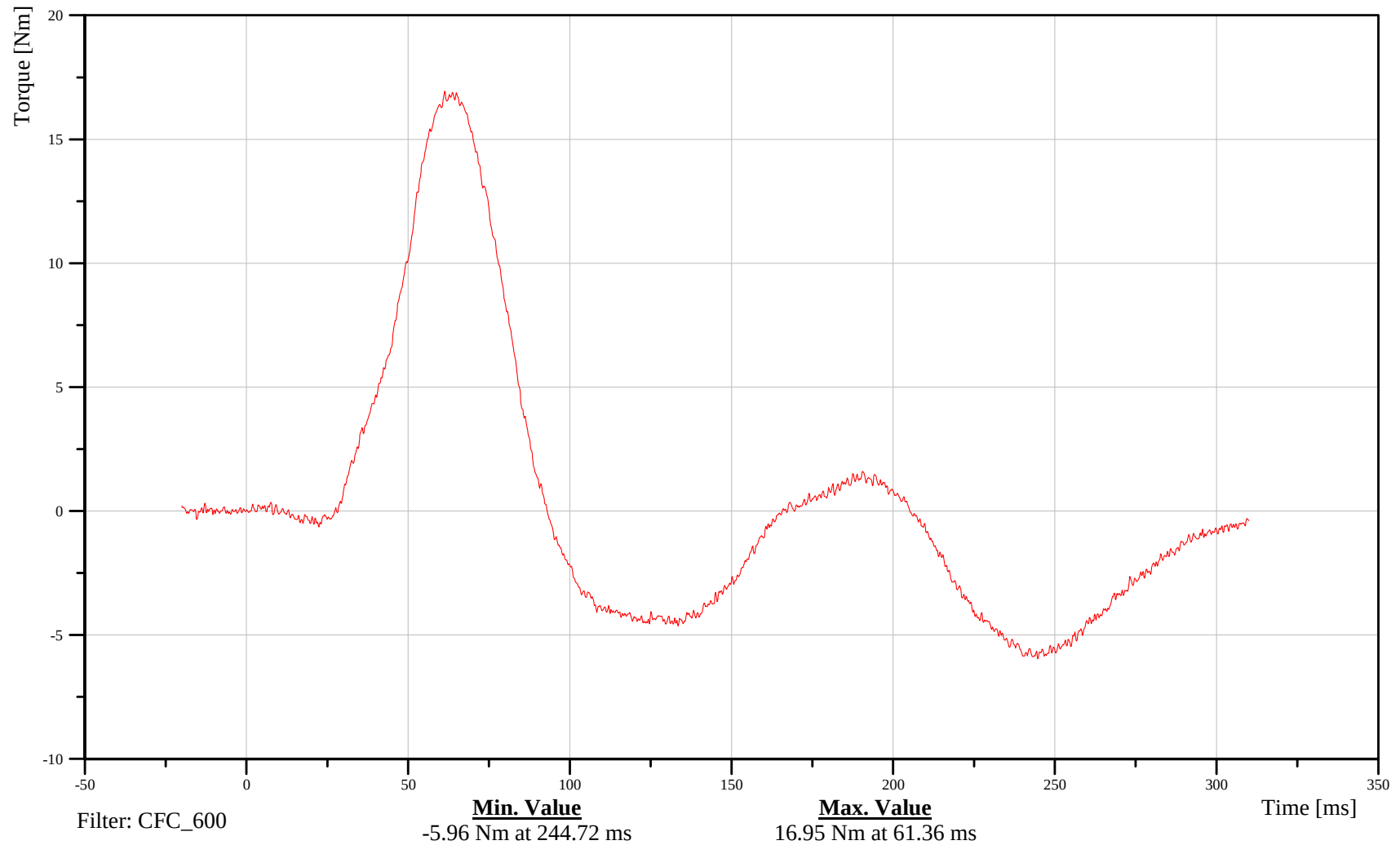
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKUP00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-88

080911-2



World SID Evaluation
Driver Lower Neck X-Axis Force

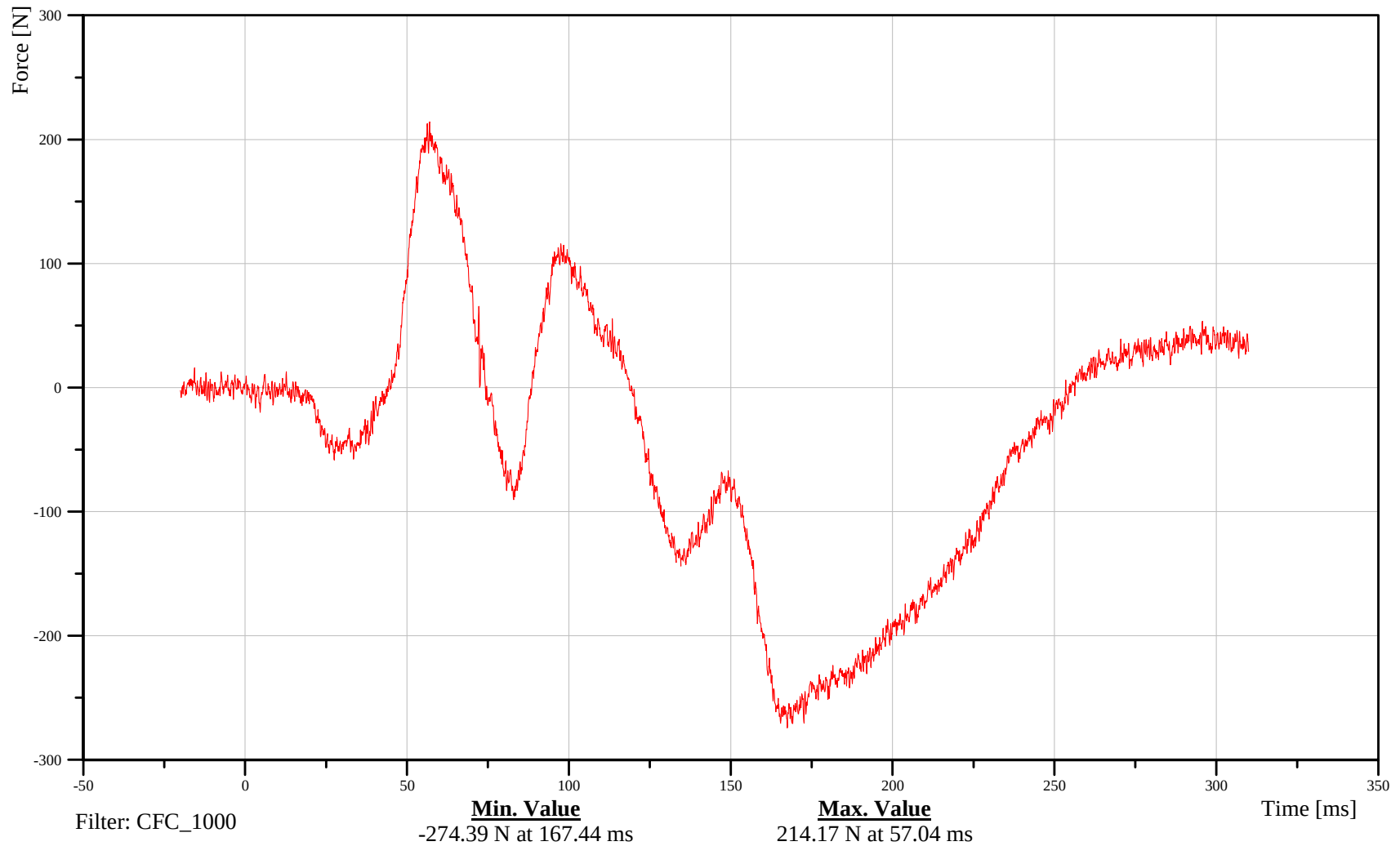
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKLO00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-89

080911-2



World SID Evaluation
Driver Lower Neck Y-Axis Force

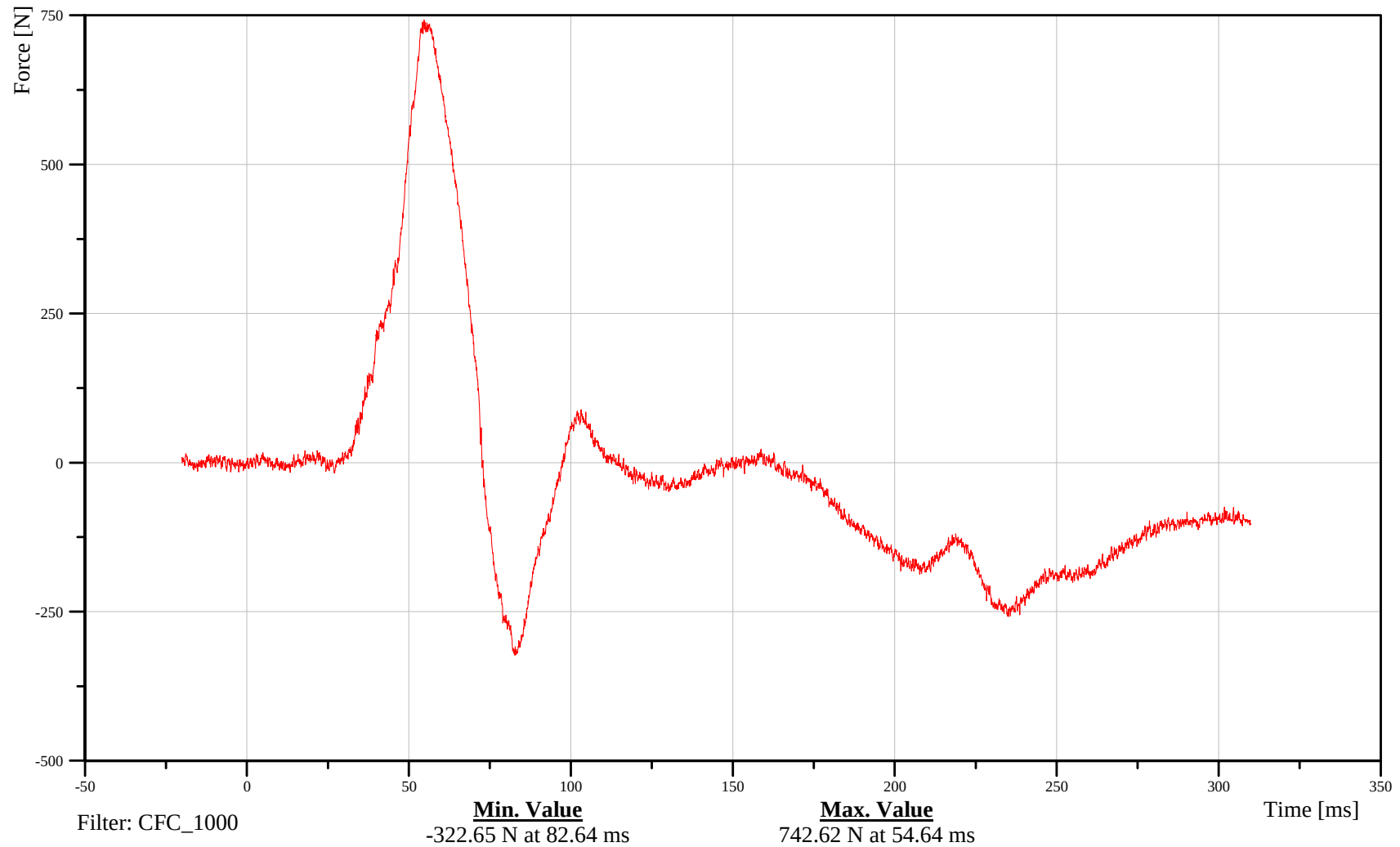
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKLO00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-90

080911-2



World SID Evaluation
Driver Lower Neck Z-Axis Force

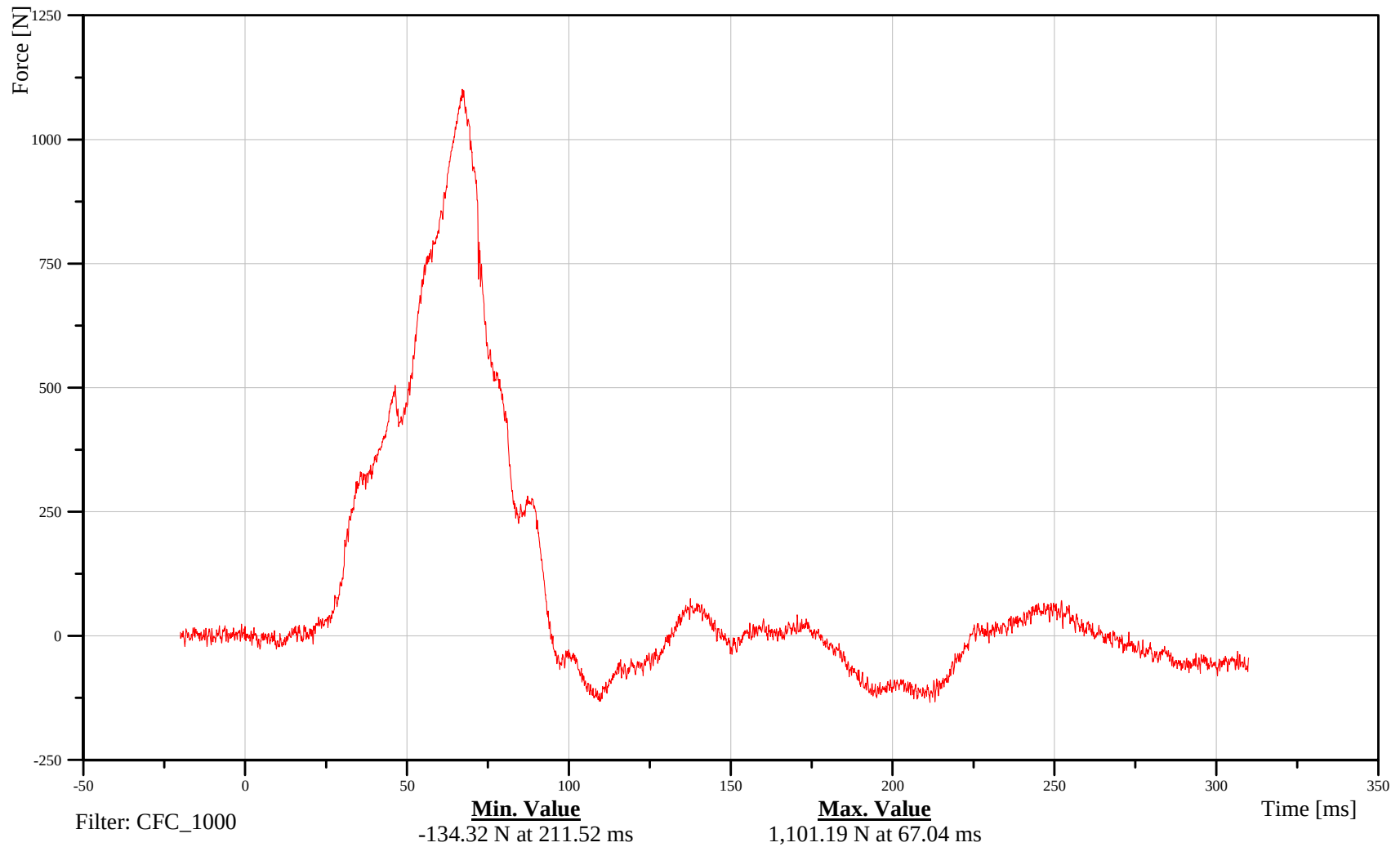
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKLO00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-91

080911-2



World SID Evaluation

Driver Lower Neck Moment About X Axis

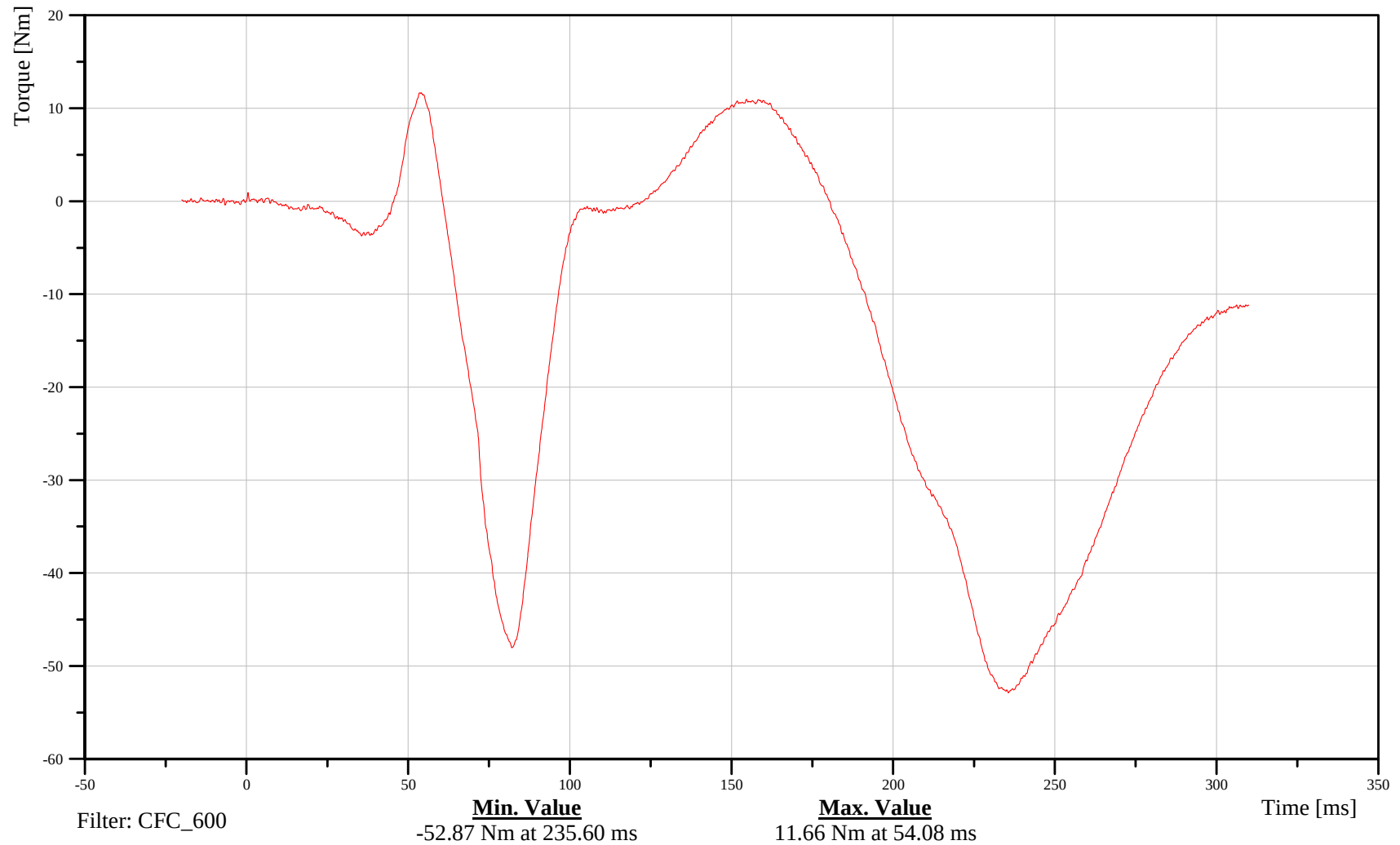
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKLO00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-92

080911-2



World SID Evaluation

Driver Lower Neck Moment About Y Axis

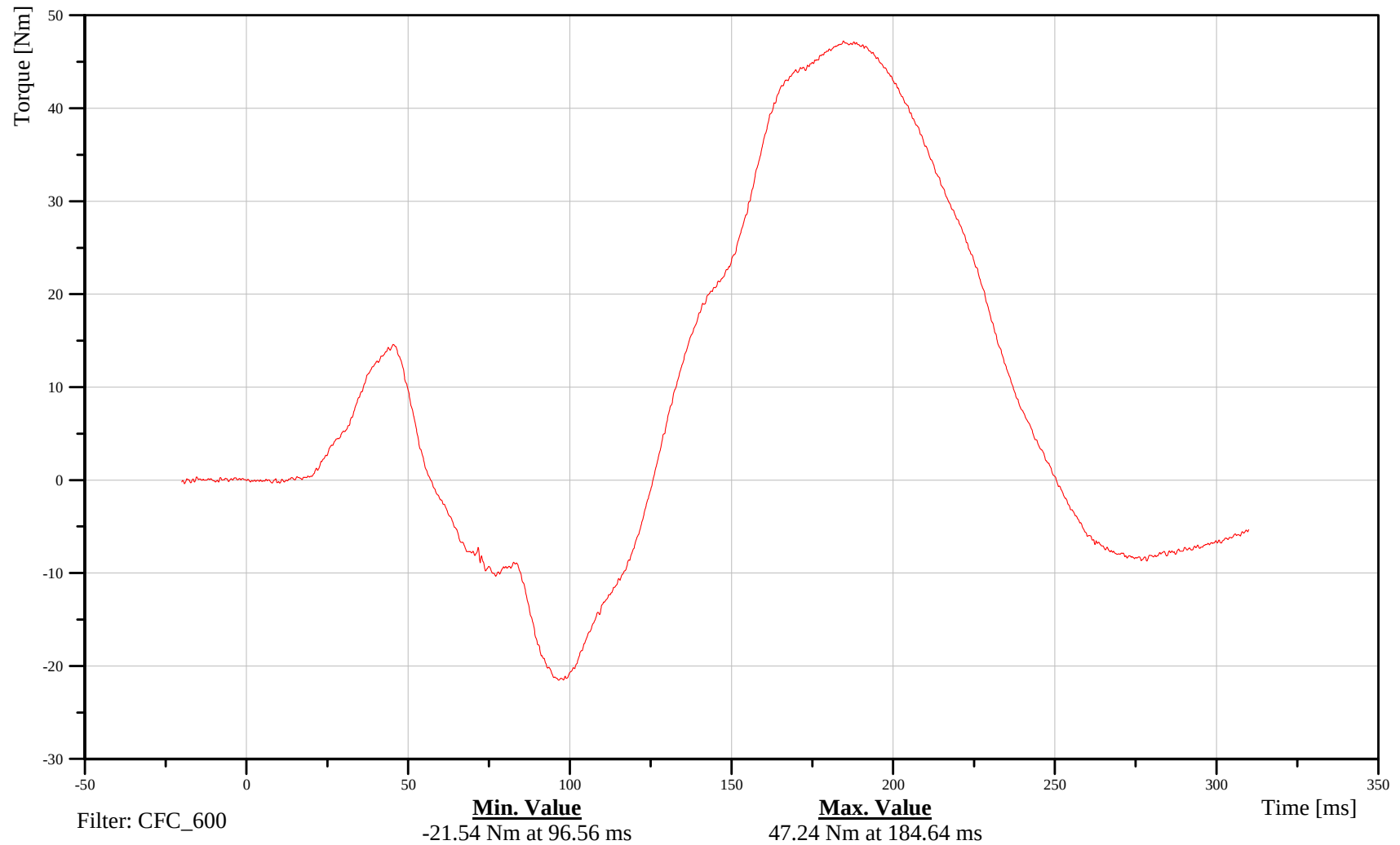
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKLO00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-93

080911-2



World SID Evaluation

Driver Lower Neck Moment About Z Axis

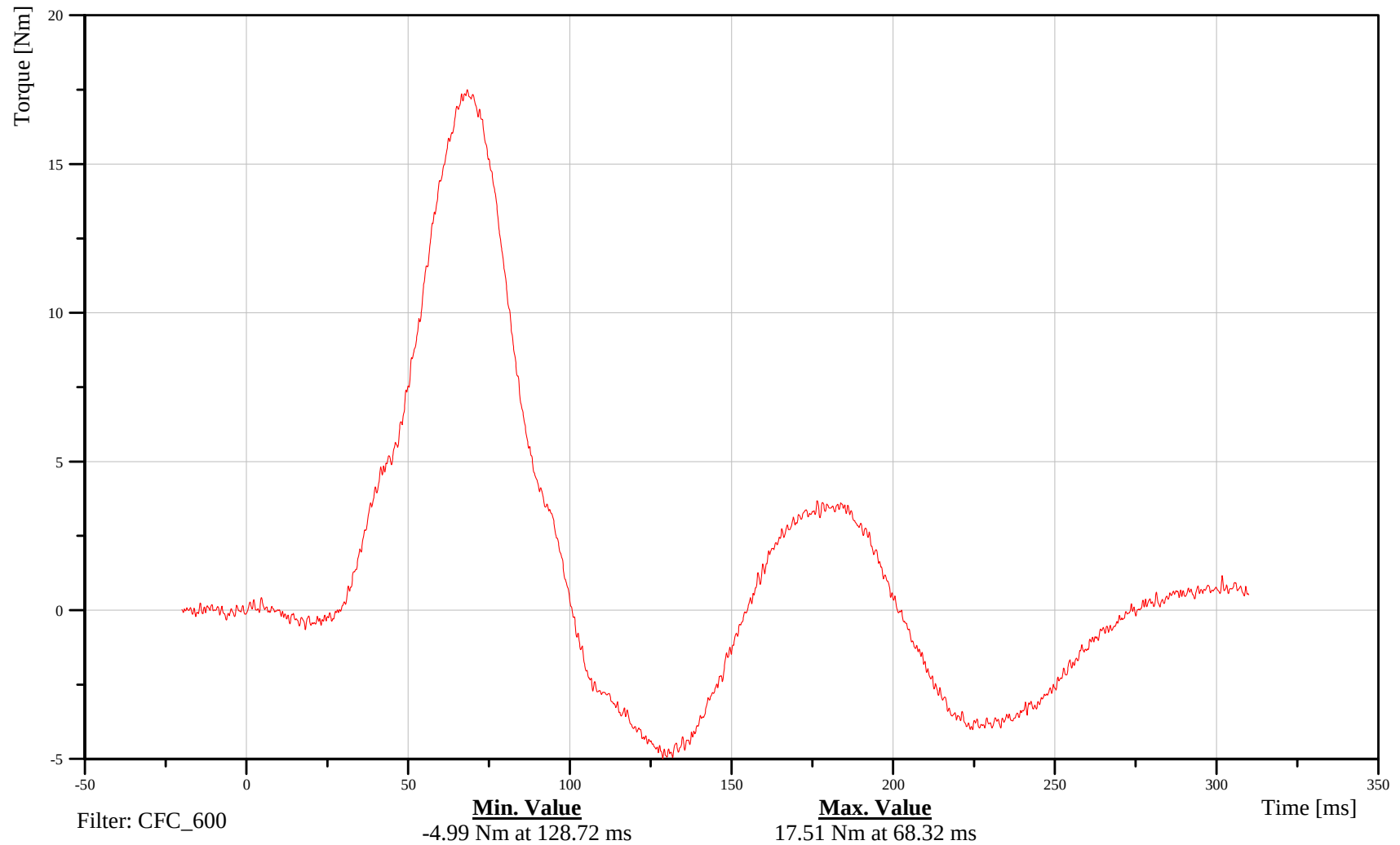
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11NECKLO00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-94

080911-2



World SID Evaluation

Driver Shoulder X-Axis Force

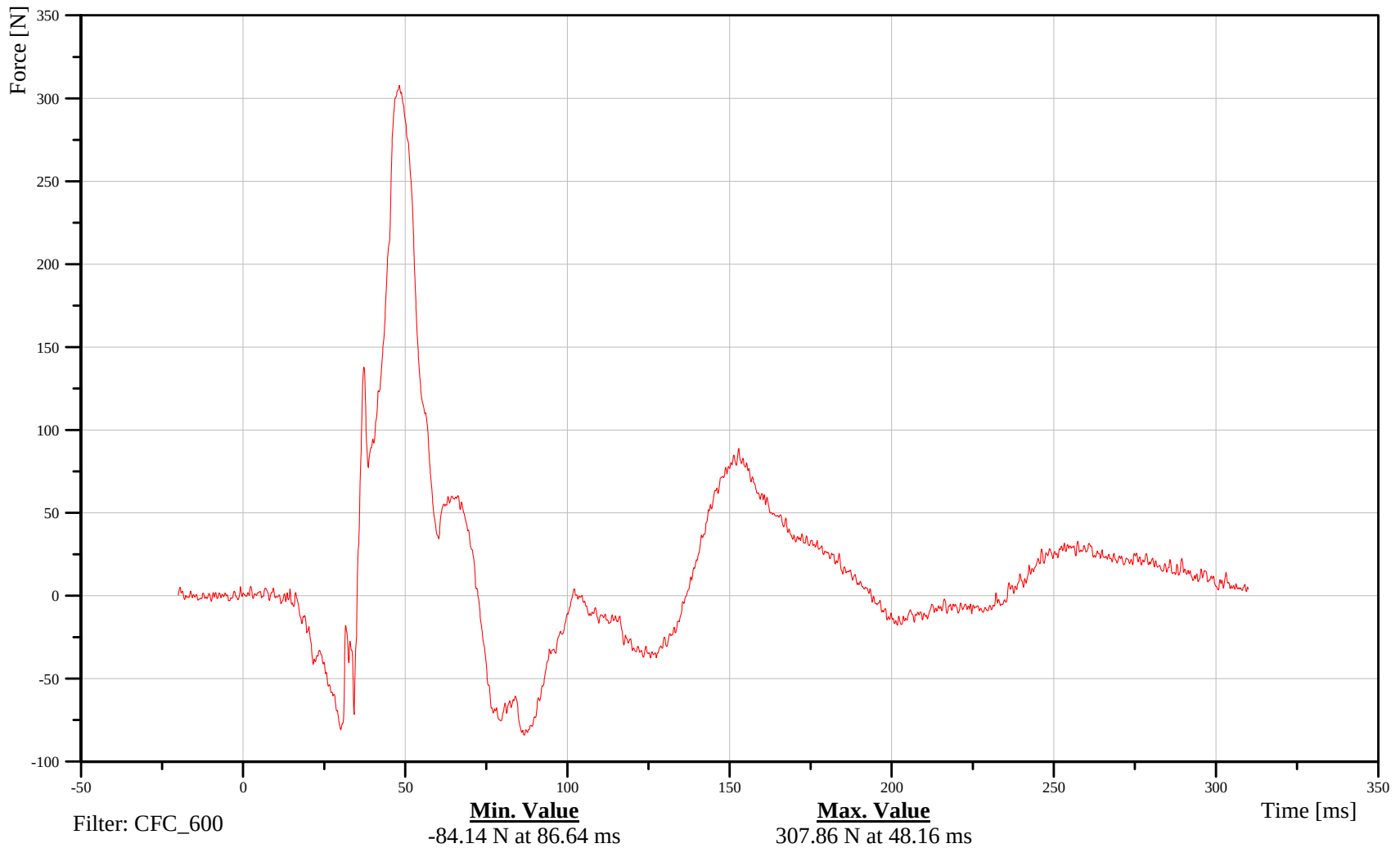
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-95

080911-2



World SID Evaluation

Driver Shoulder Y-Axis Force

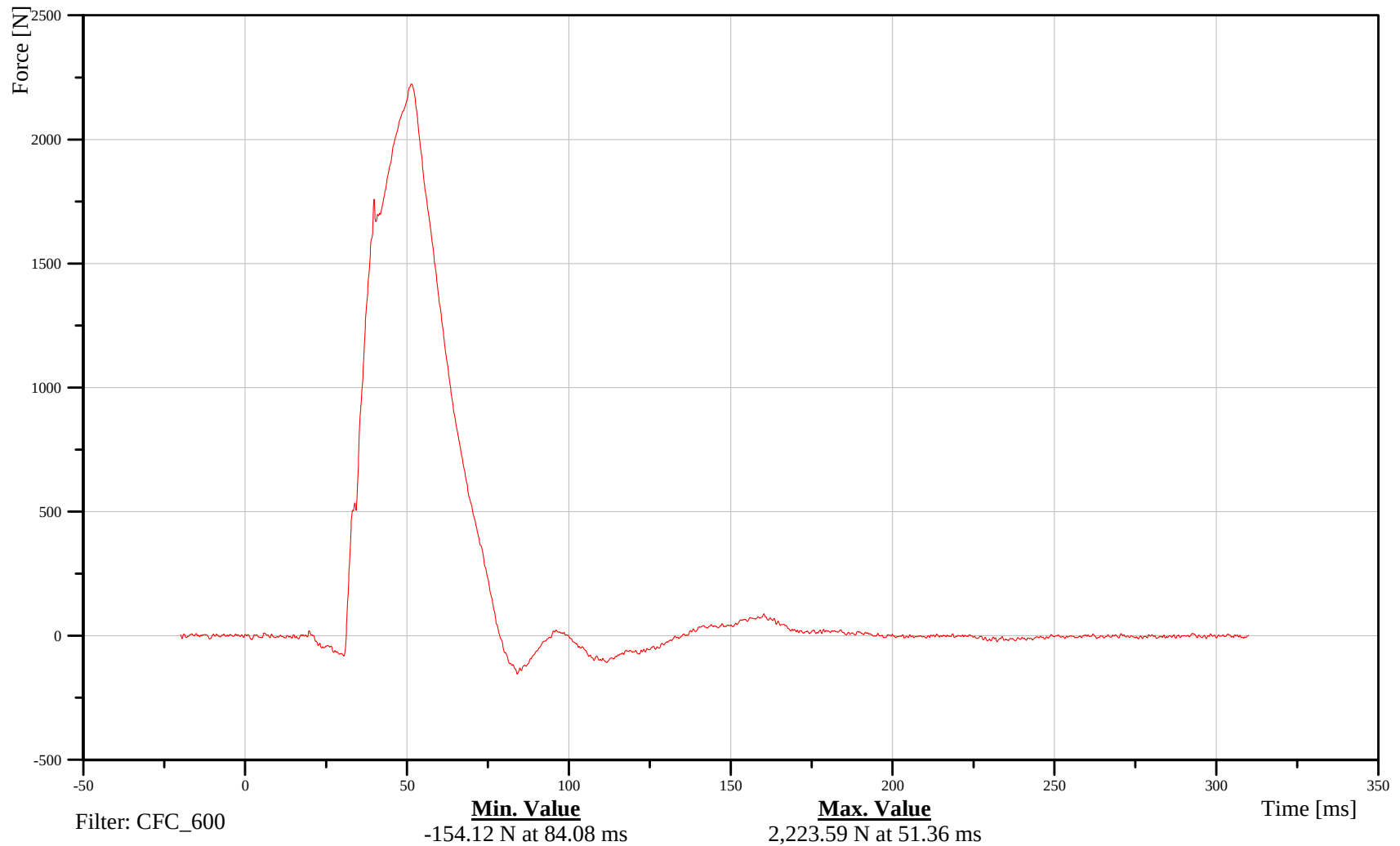
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-96

080911-2



World SID Evaluation

Driver Shoulder Z-Axis Force

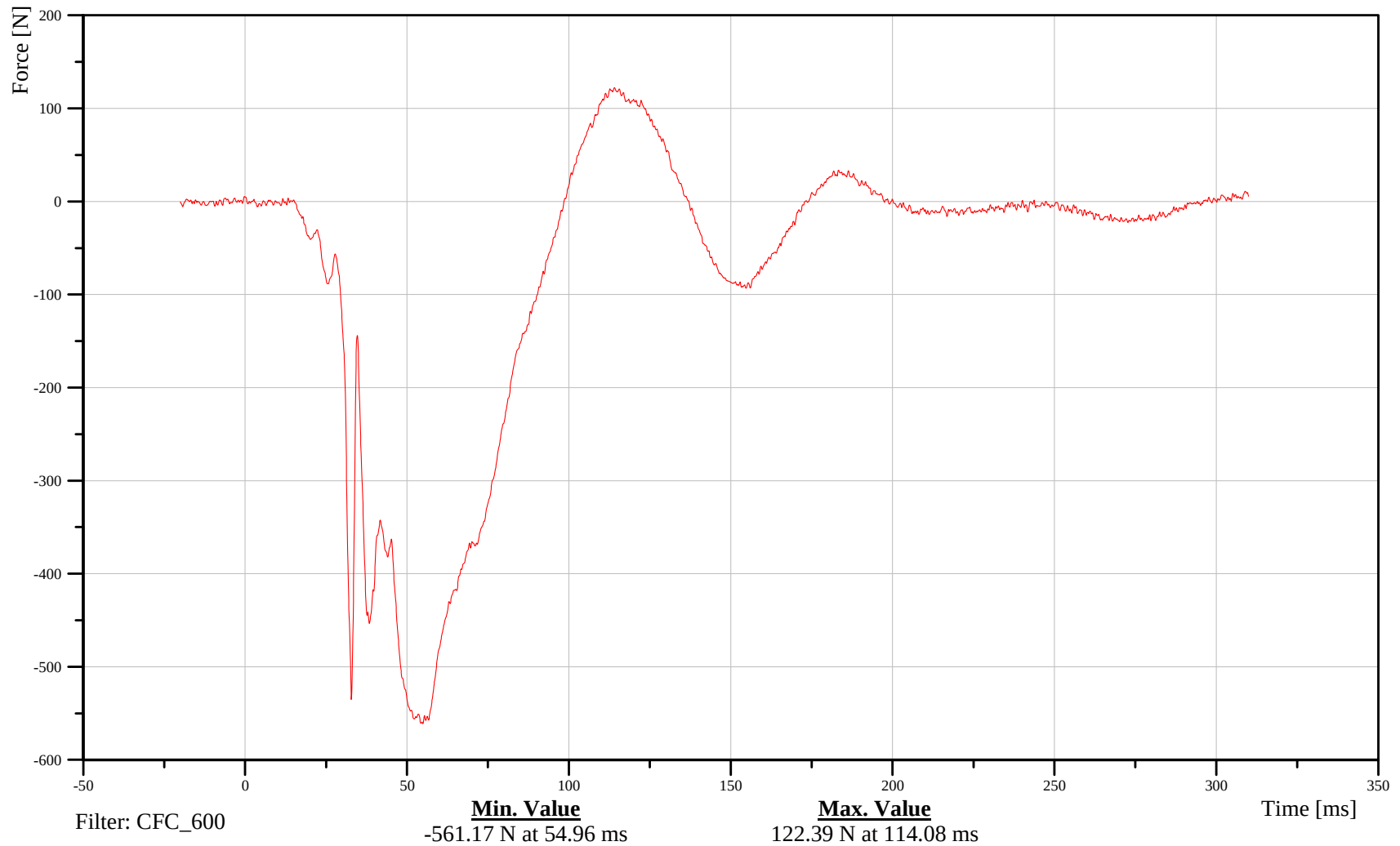
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-97

080911-2



World SID Evaluation
Driver Shoulder Y-Axis Displacement

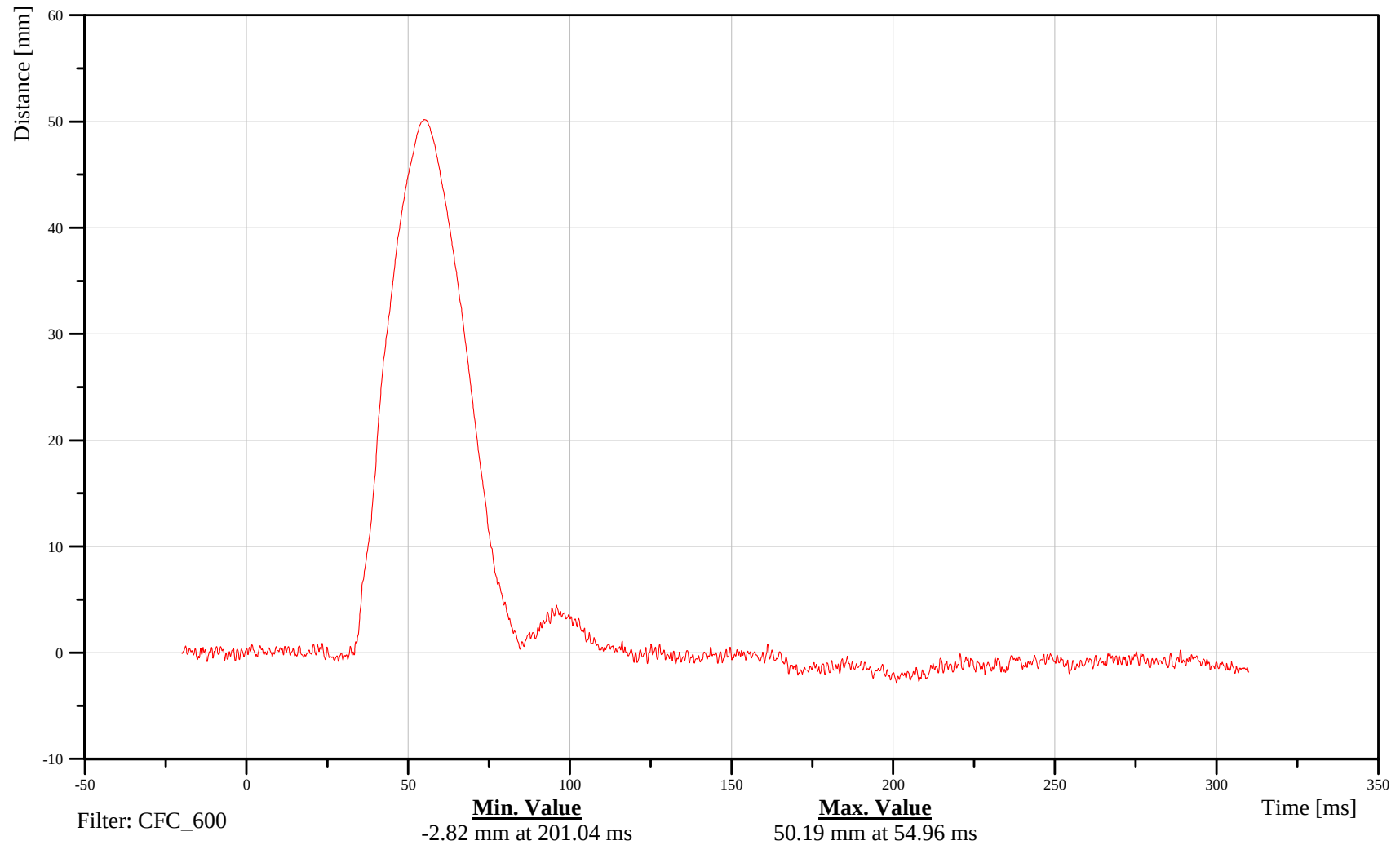
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-98

080911-2



World SID Evaluation

Driver Shoulder X-Axis Acceleration

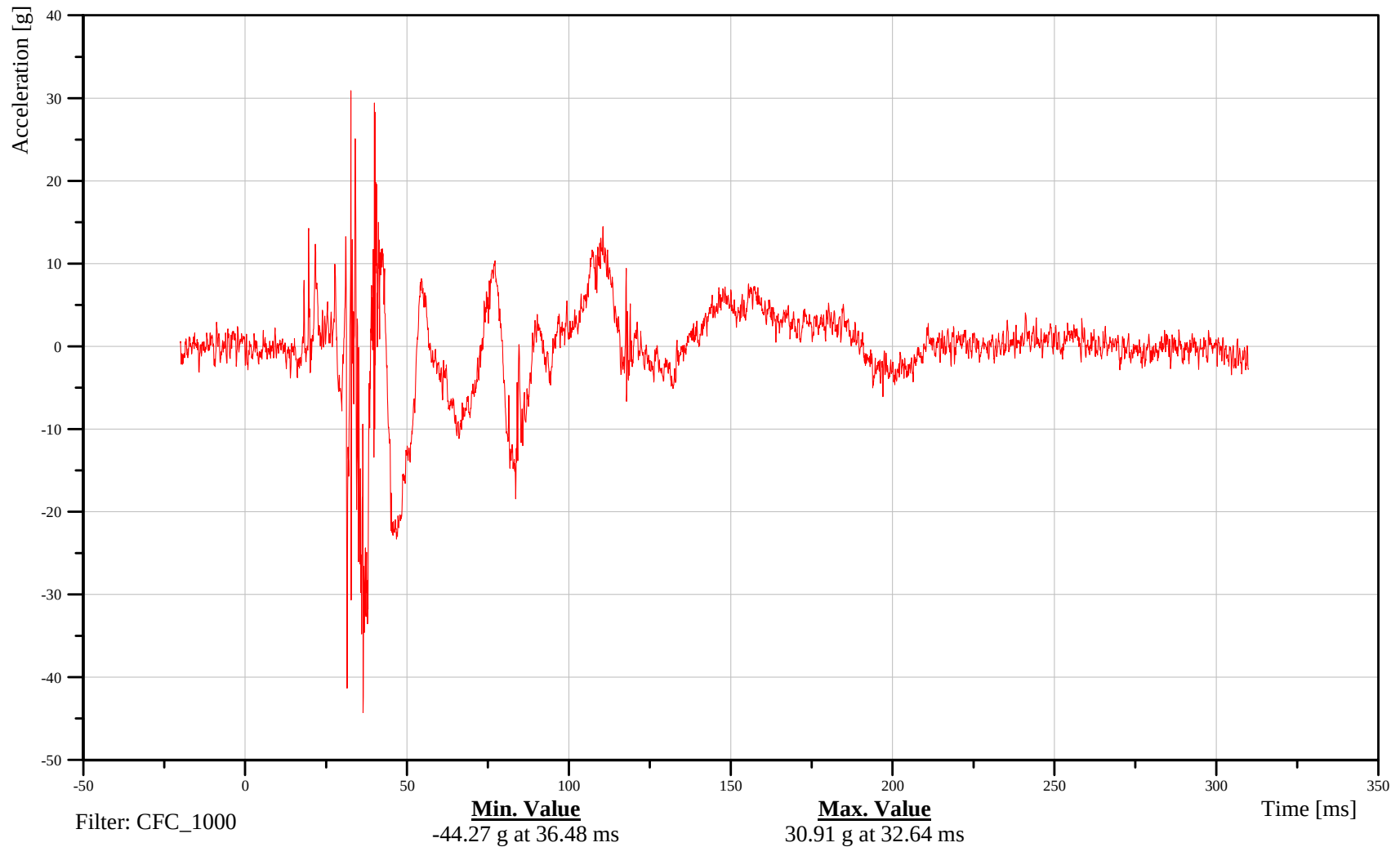
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-99

080911-2



World SID Evaluation

Driver Shoulder Y-Axis Acceleration

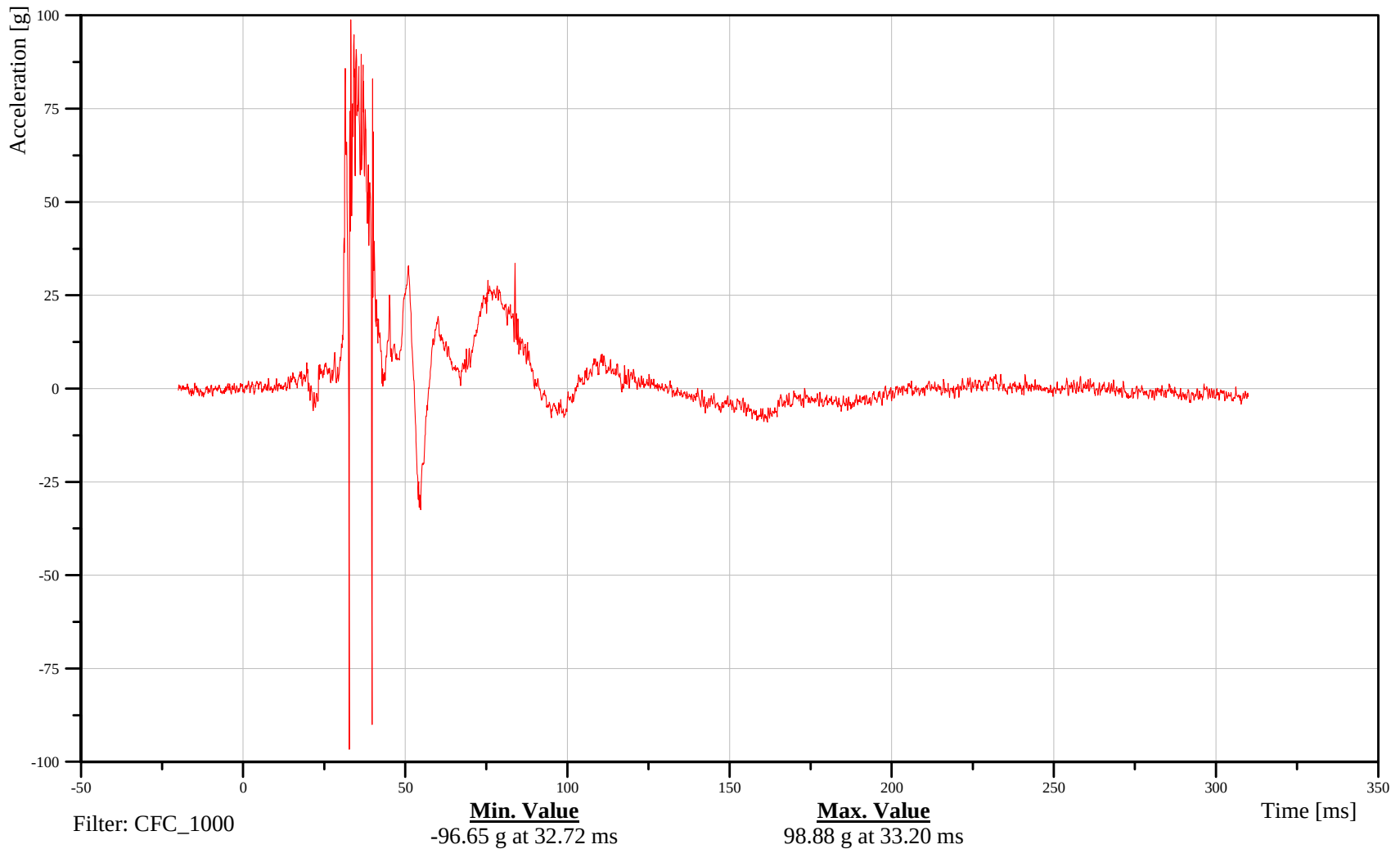
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-100

080911-2



World SID Evaluation
Driver Shoulder Z-Axis Acceleration

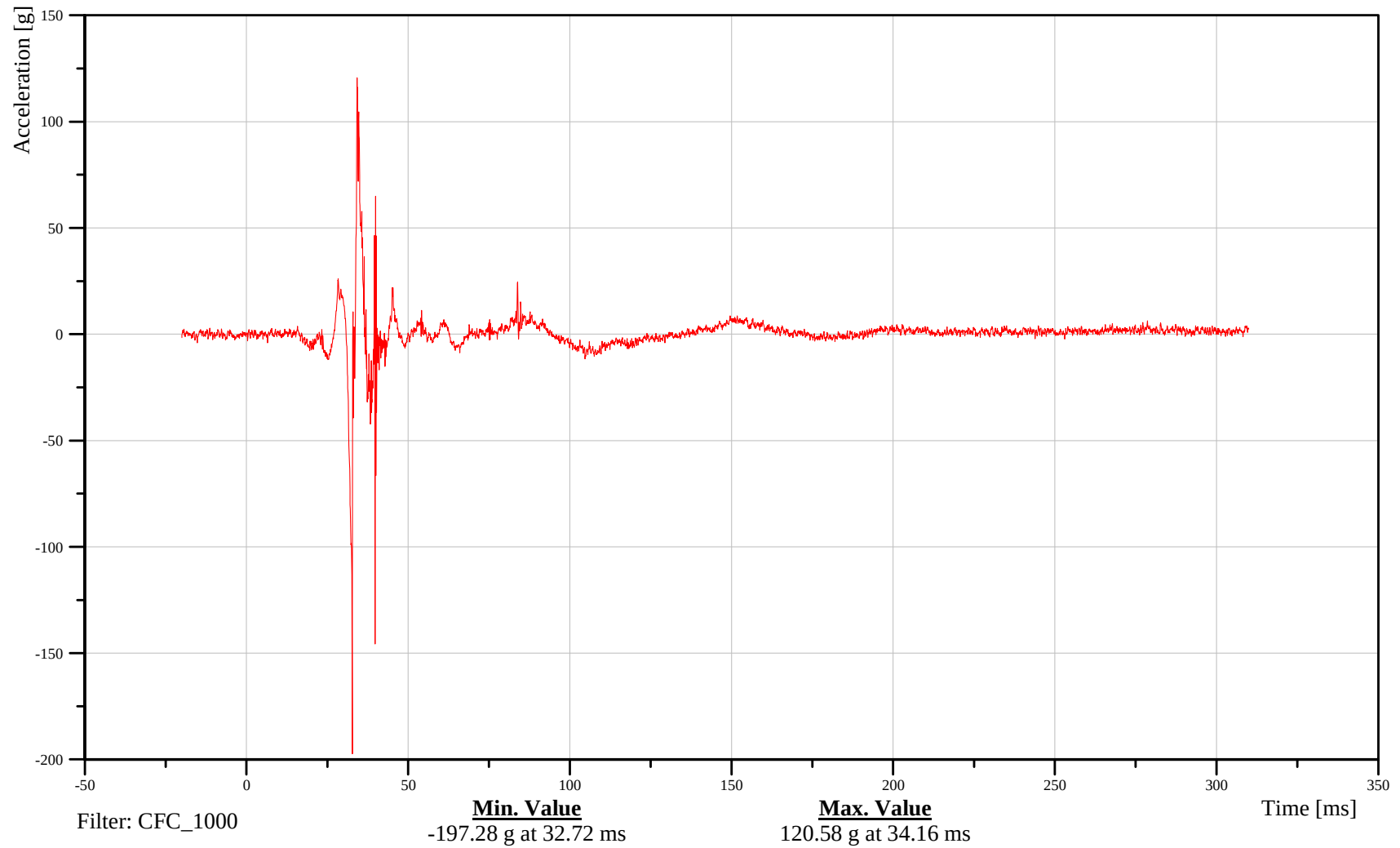
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-101

080911-2



World SID Evaluation
Driver Shoulder Resultant Acceleration

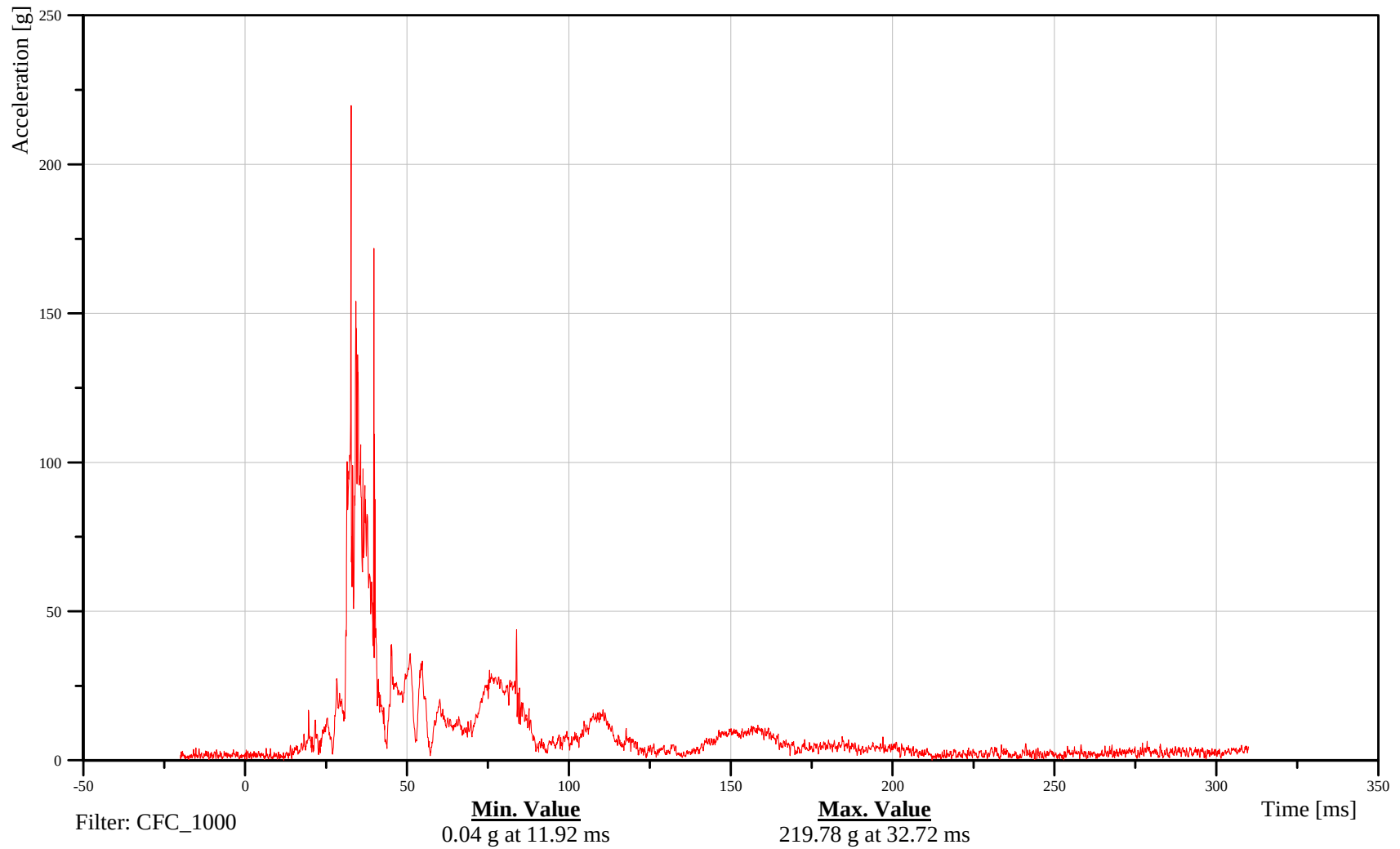
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11SHLDLE00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-102

080911-2



World SID Evaluation

Driver T1 X-Axis Acceleration

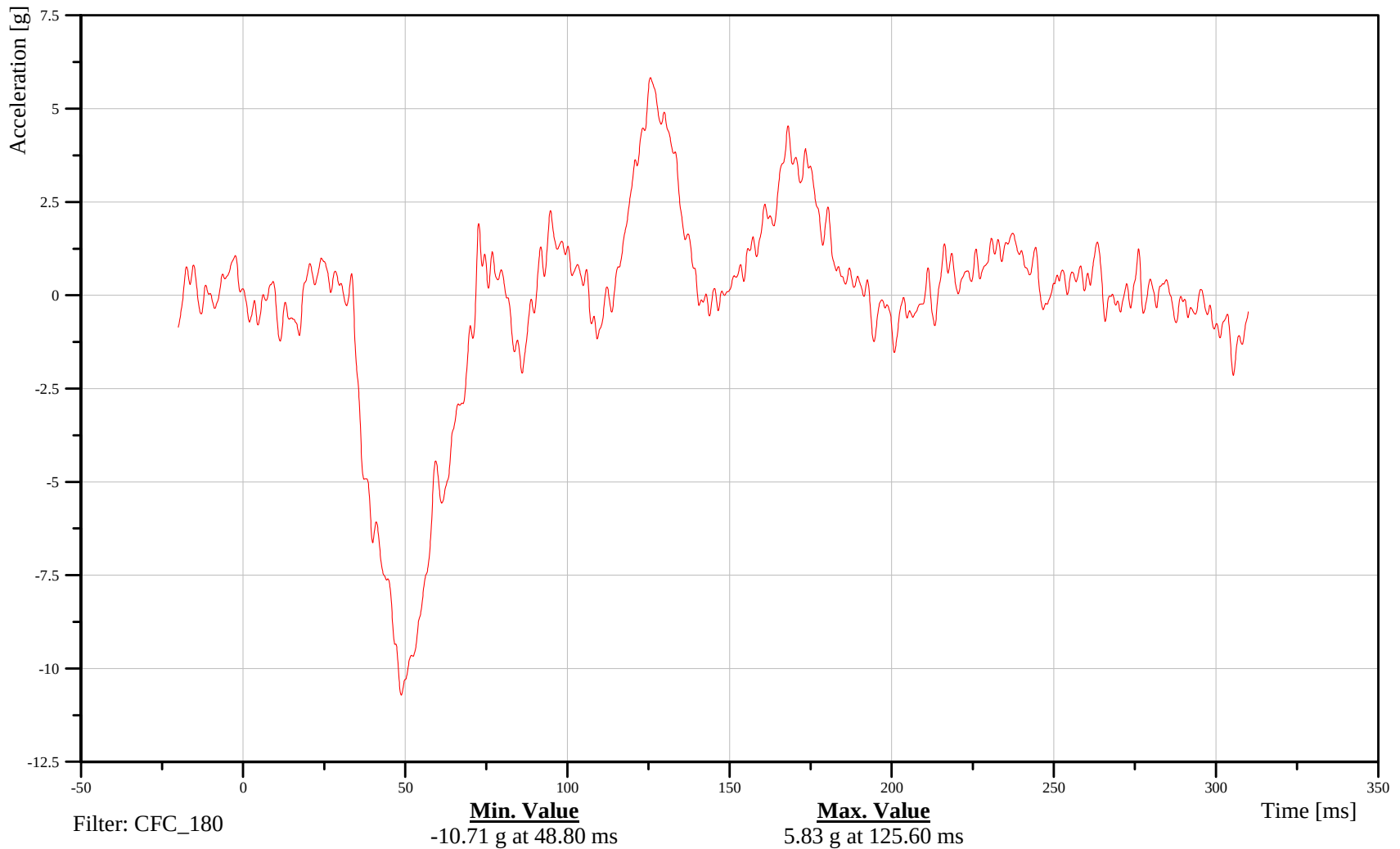
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0100WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-103

080911-2



World SID Evaluation

Driver T1 Y-Axis Acceleration

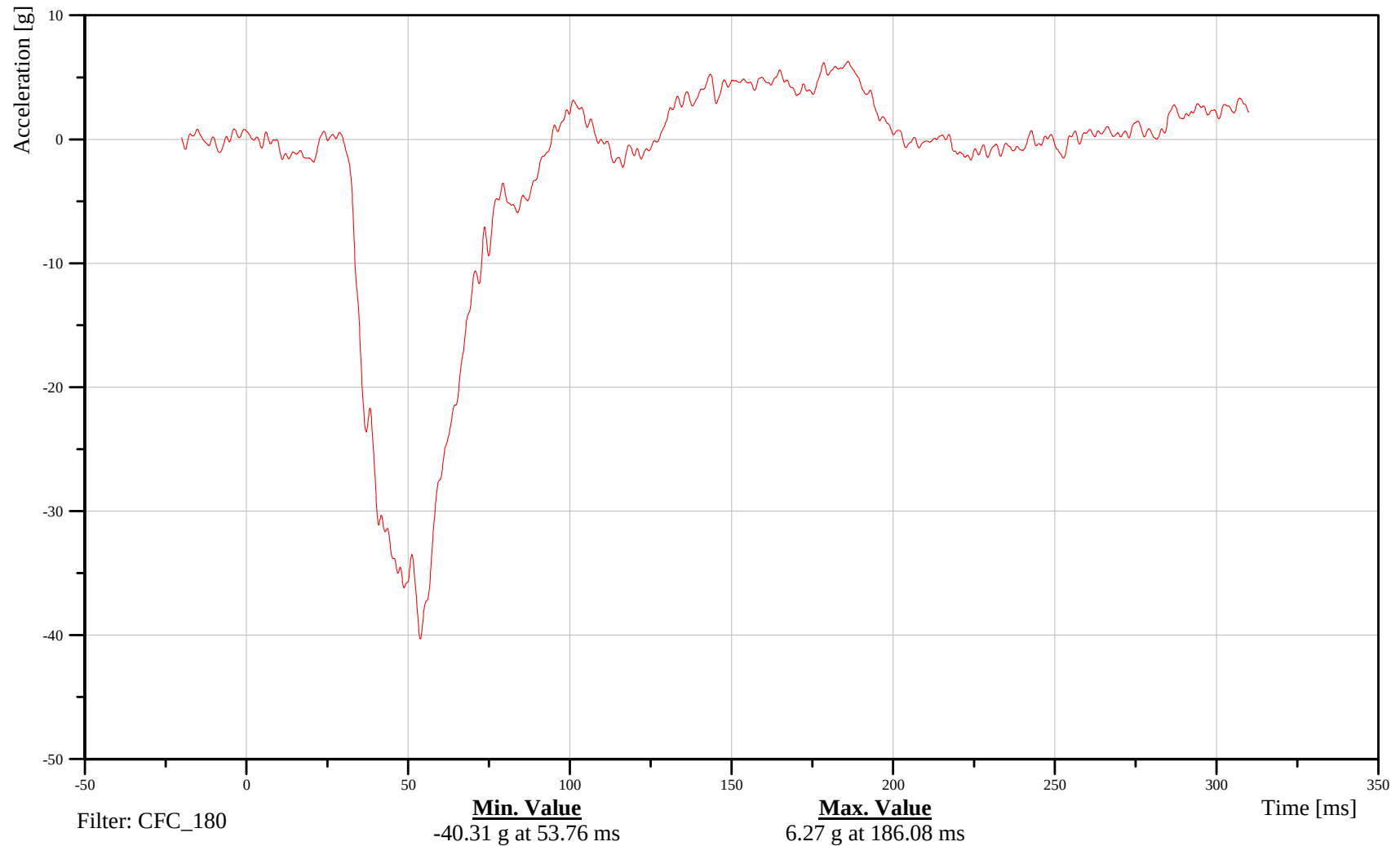
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0100WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-104

080911-2



World SID Evaluation

Driver T1 Z-Axis Acceleration

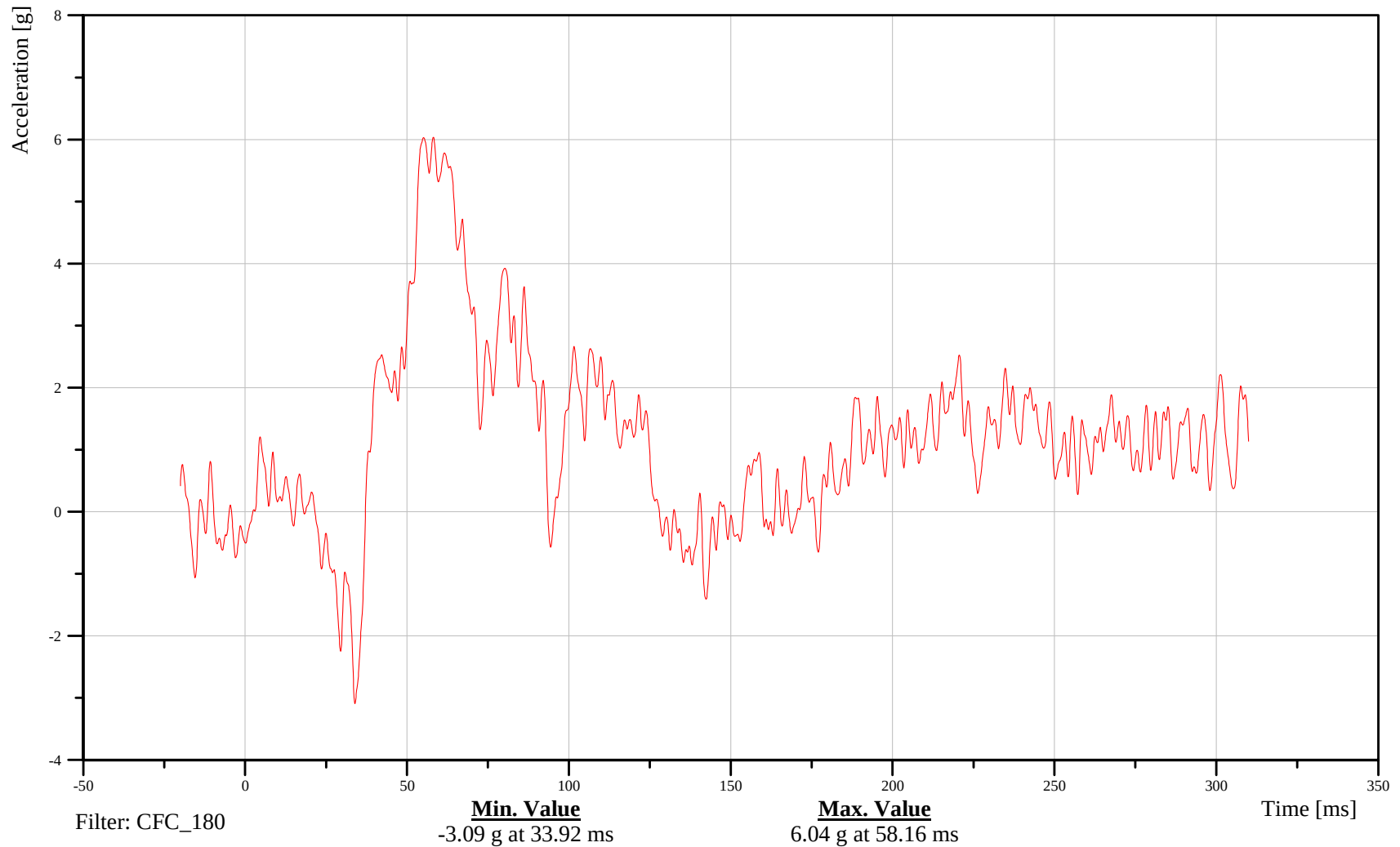
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0100WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-105

080911-2



World SID Evaluation
Driver T1 Resultant Acceleration

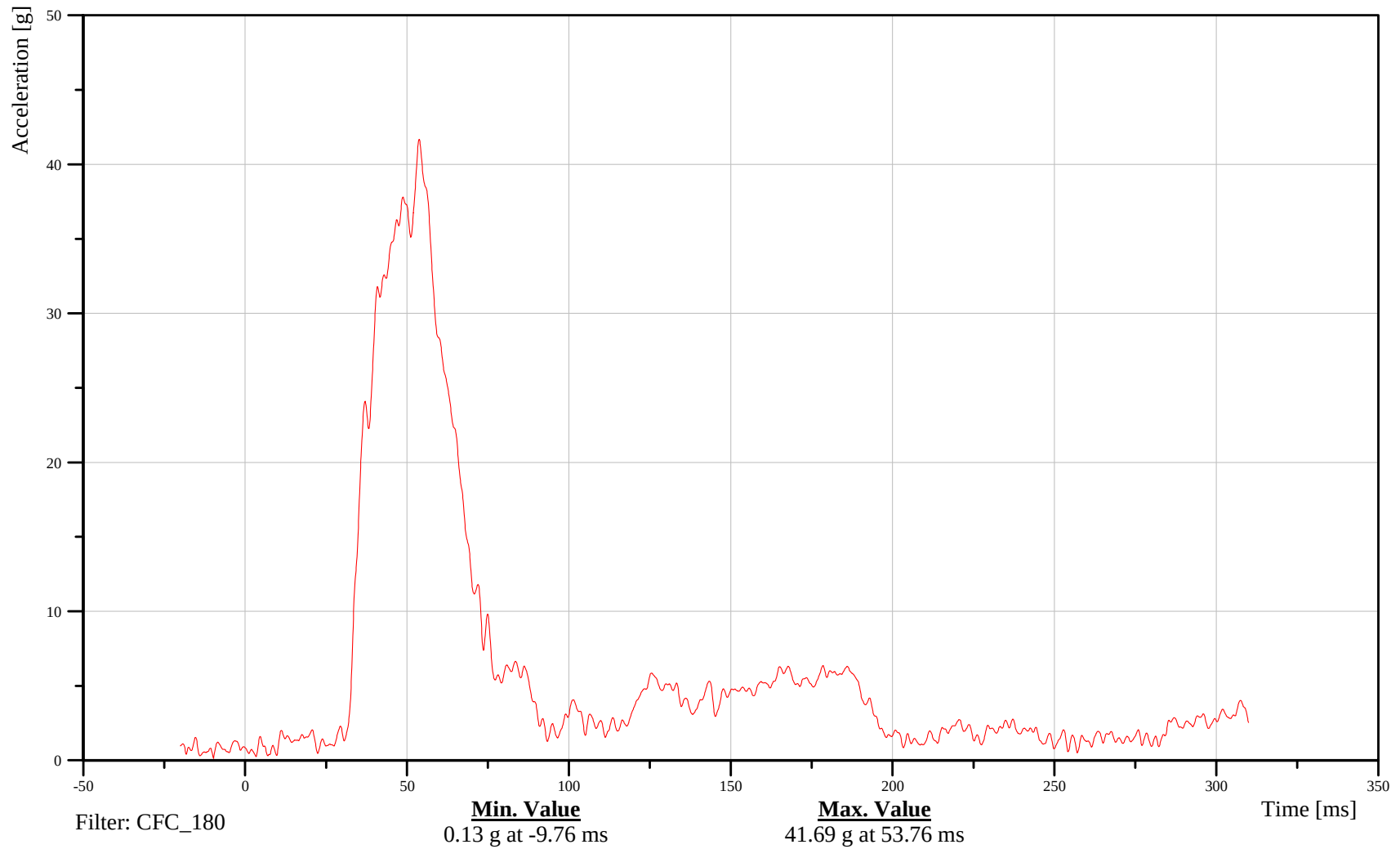
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0100WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-106

080911-2



World SID Evaluation

Driver T4 X-Axis Acceleration

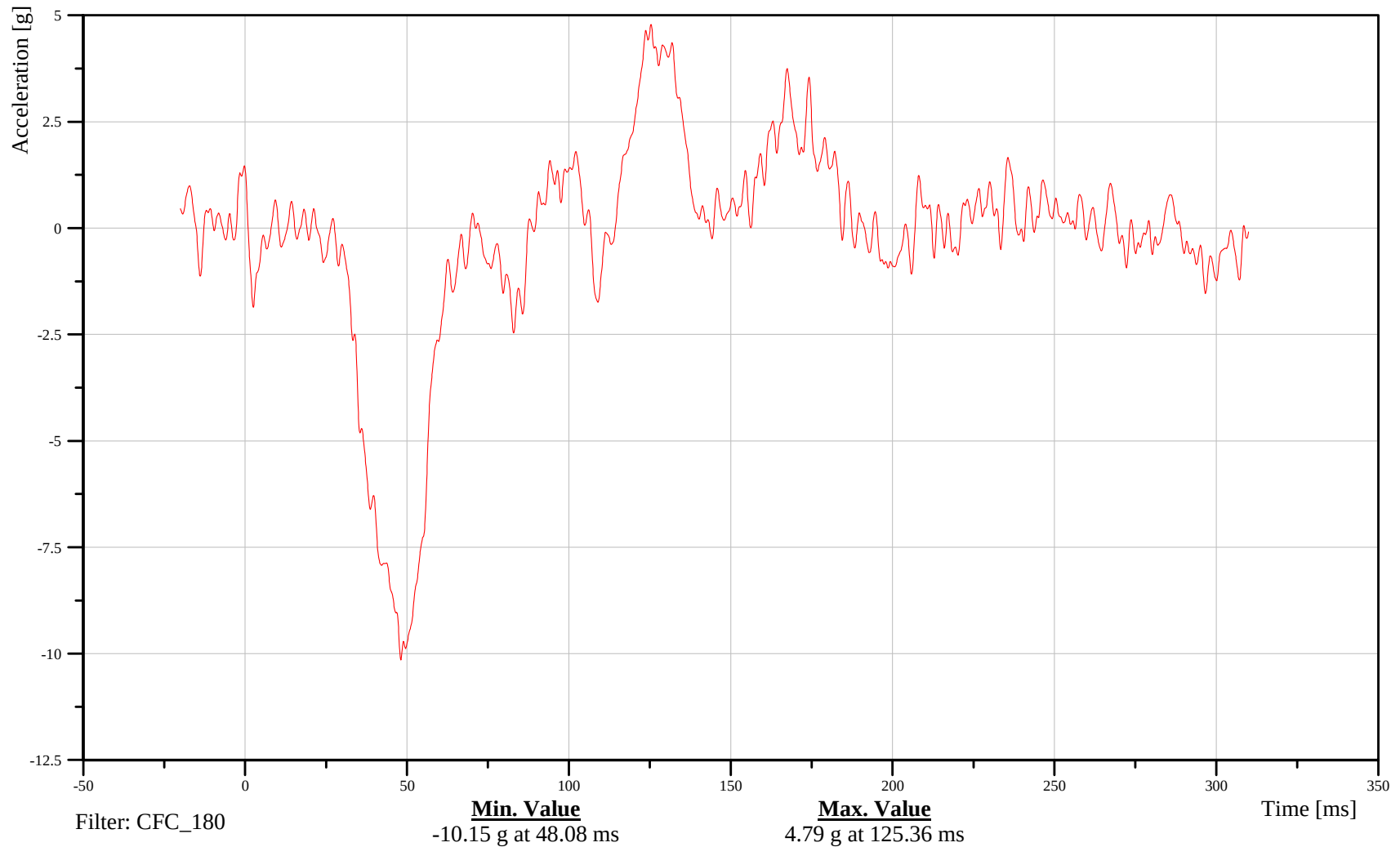
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0400WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-107

080911-2



World SID Evaluation
Driver T4 Y-Axis Acceleration

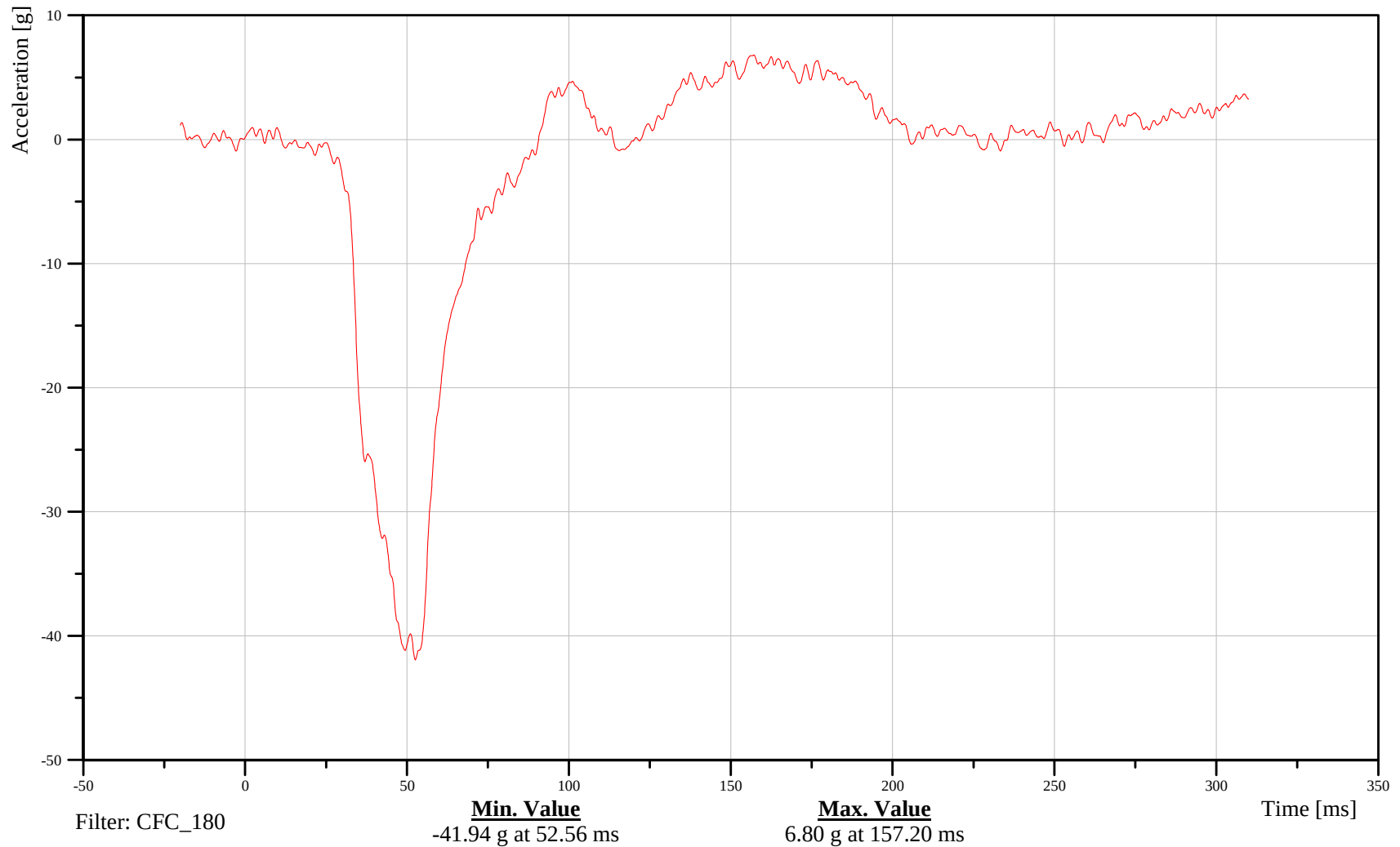
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0400WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-108

080911-2



World SID Evaluation Driver T4 Z-Axis Acceleration

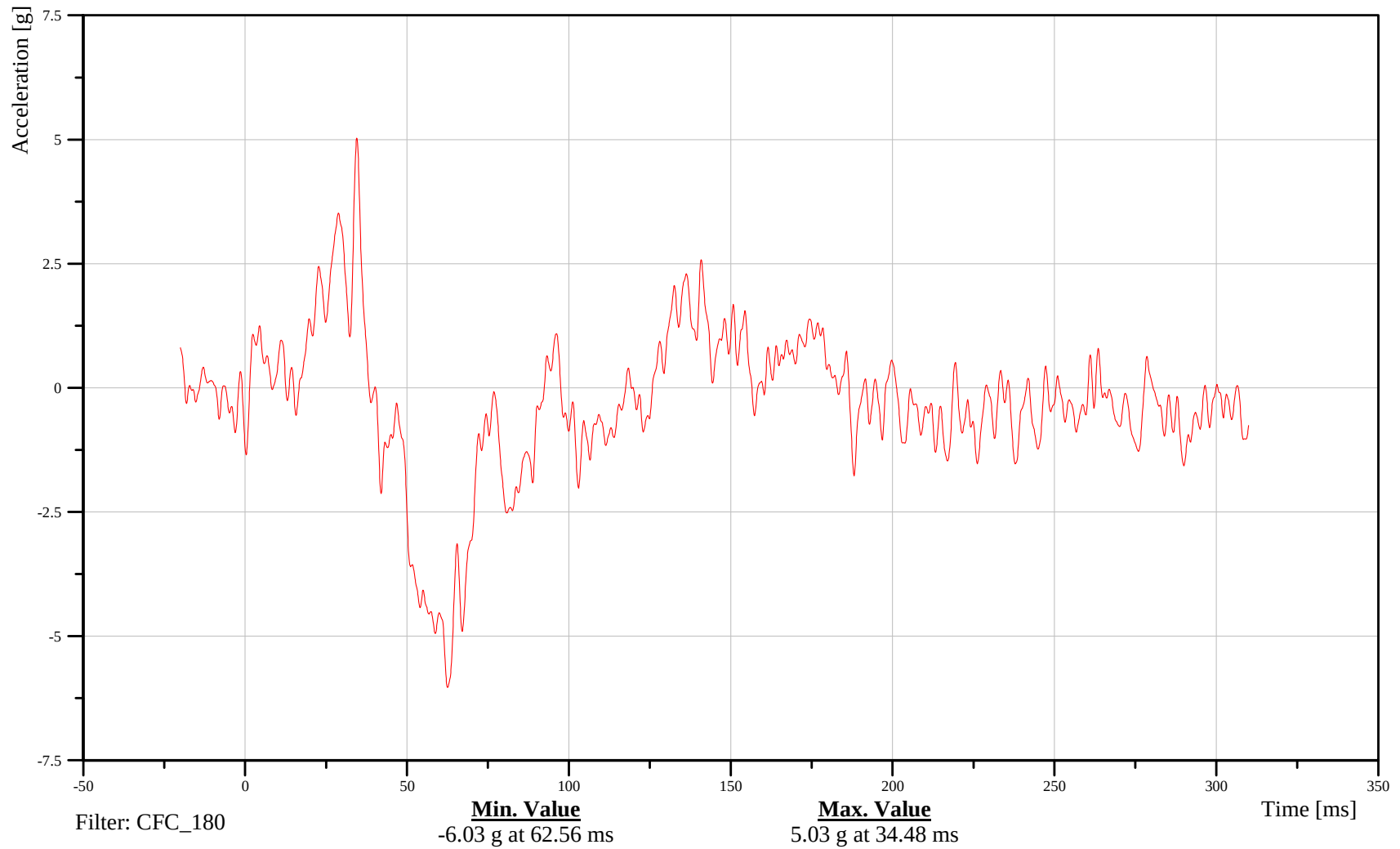
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0400WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-109

080911-2



World SID Evaluation

Driver T4 Resultant Acceleration

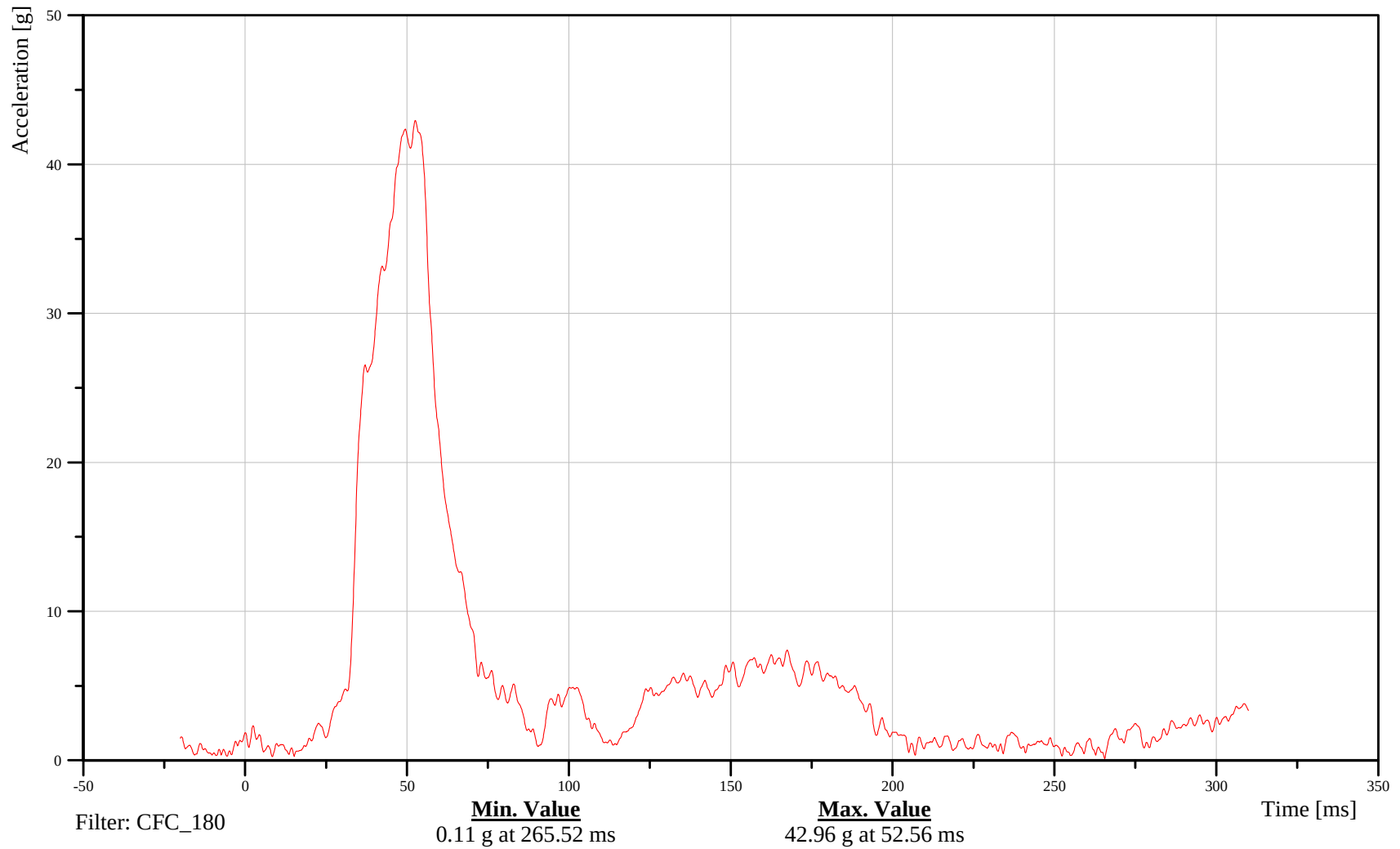
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP0400WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-110

080911-2



World SID Evaluation

Driver T12 X-Axis Acceleration

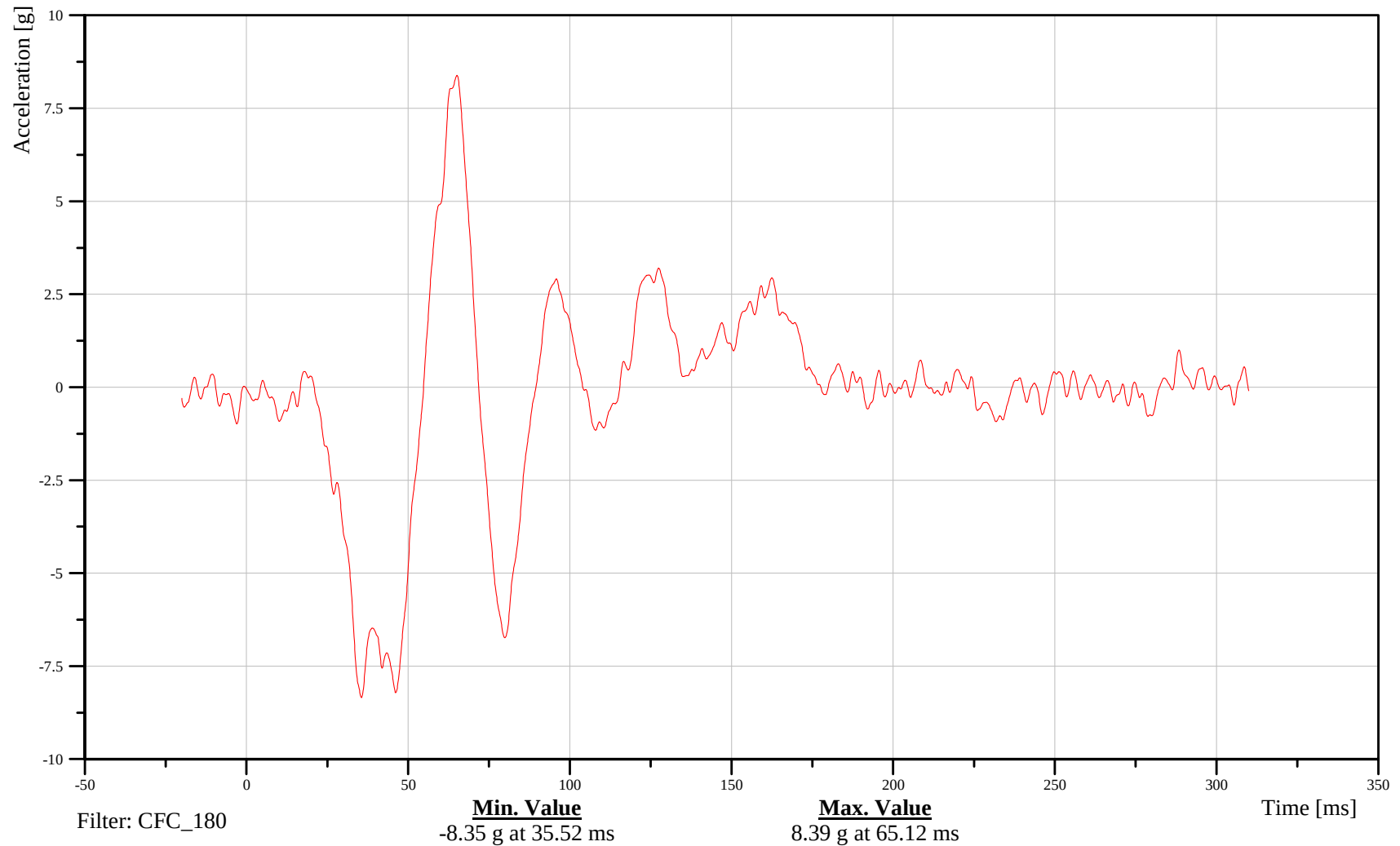
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP1200WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-111

080911-2



World SID Evaluation
Driver T12 Y-Axis Acceleration

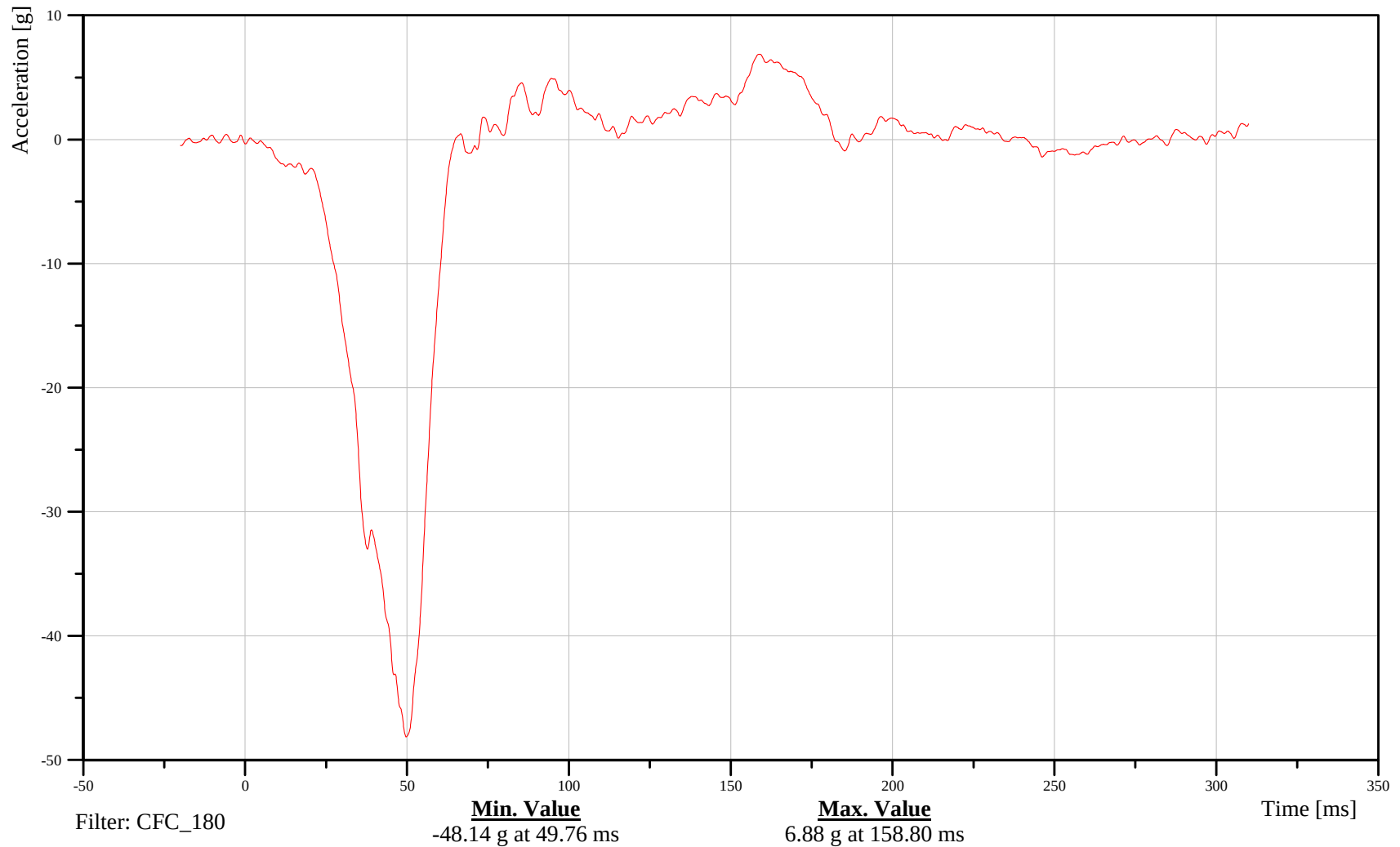
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP1200WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-112

080911-2



World SID Evaluation

Driver T12 Z-Axis Acceleration

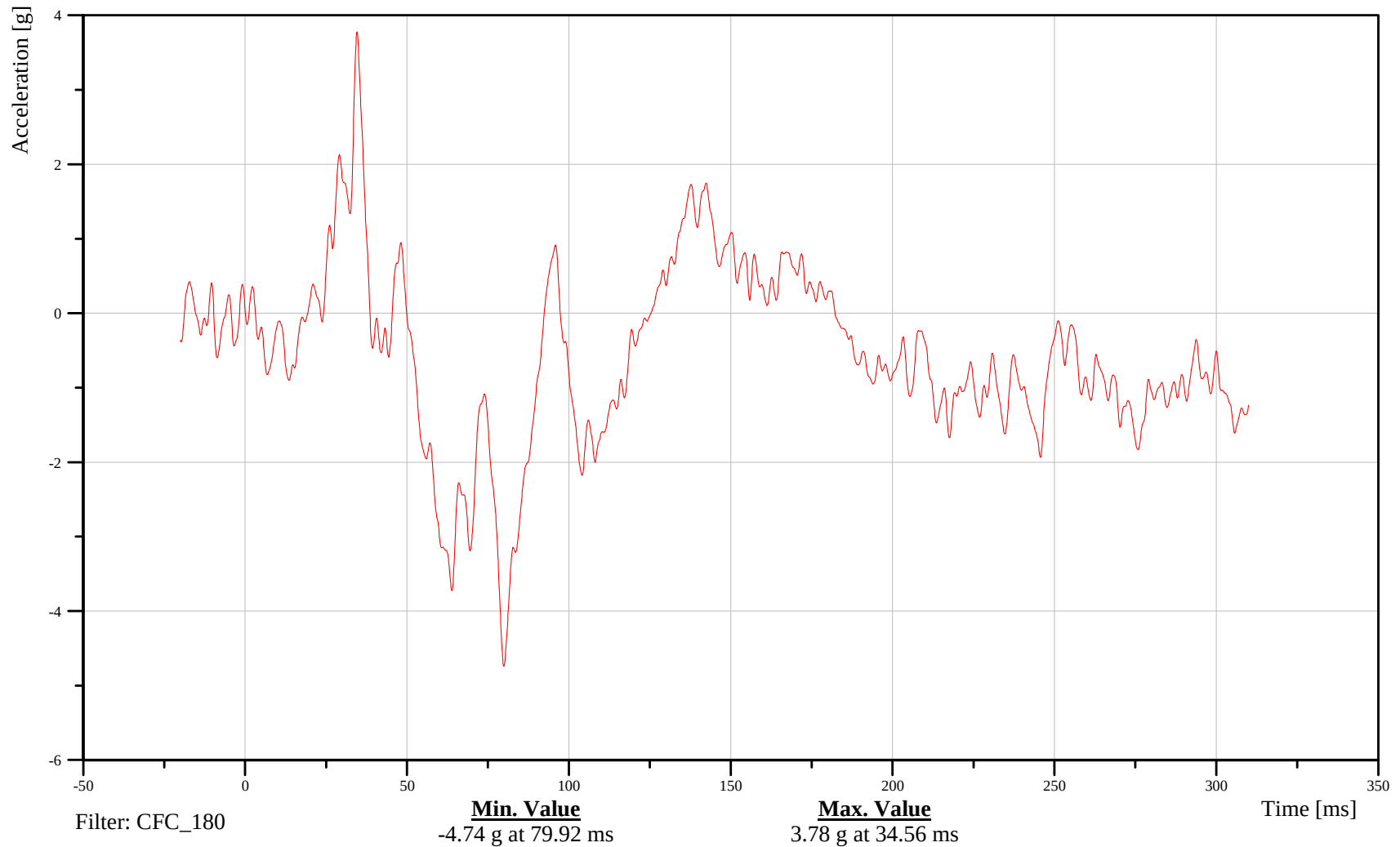
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP1200WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-113

080911-2



World SID Evaluation
Driver T12 Resultant Acceleration

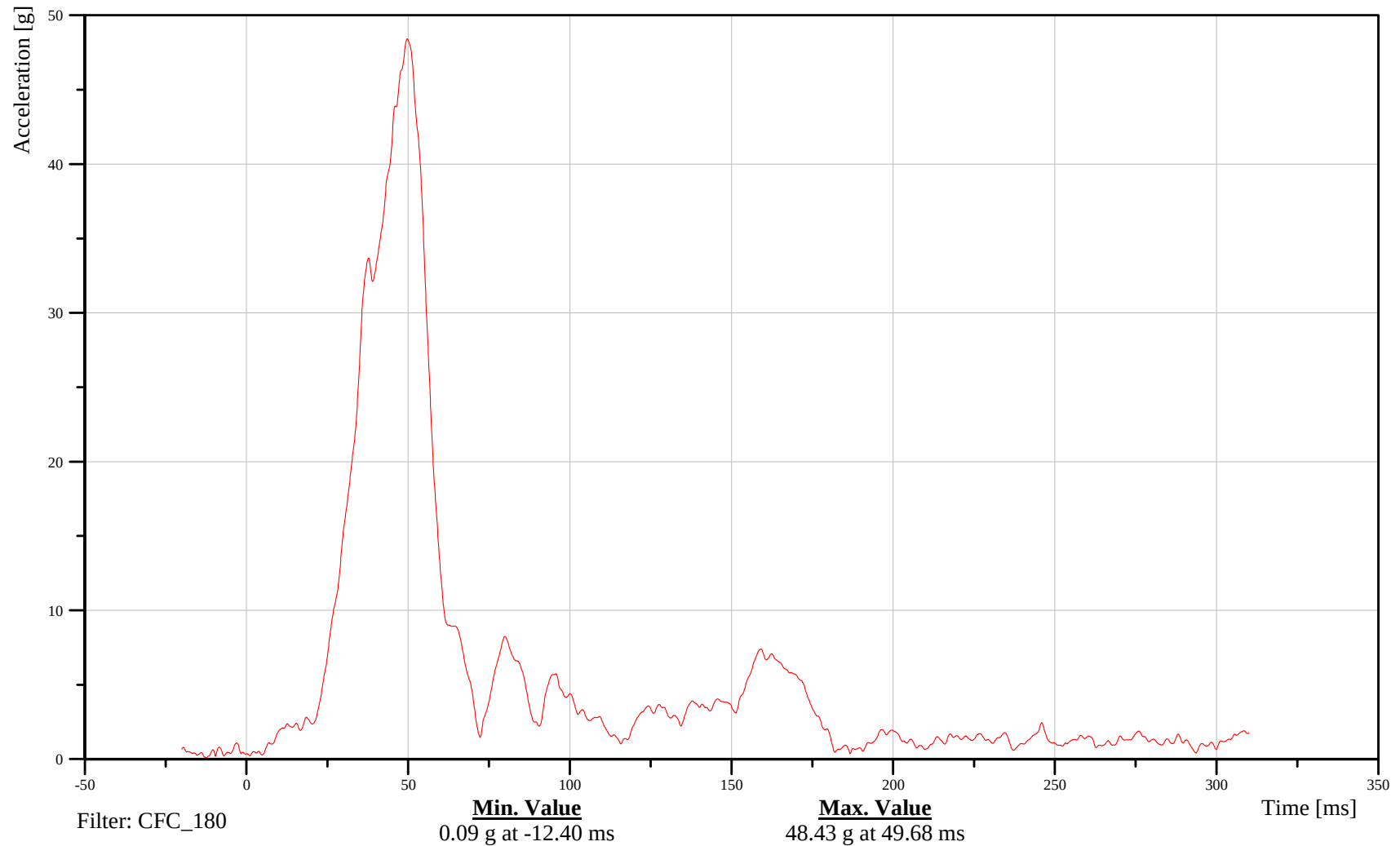
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11THSP1200WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-114

080911-2



World SID Evaluation
Driver Thorax Rib 1 Y-Axis Displacement

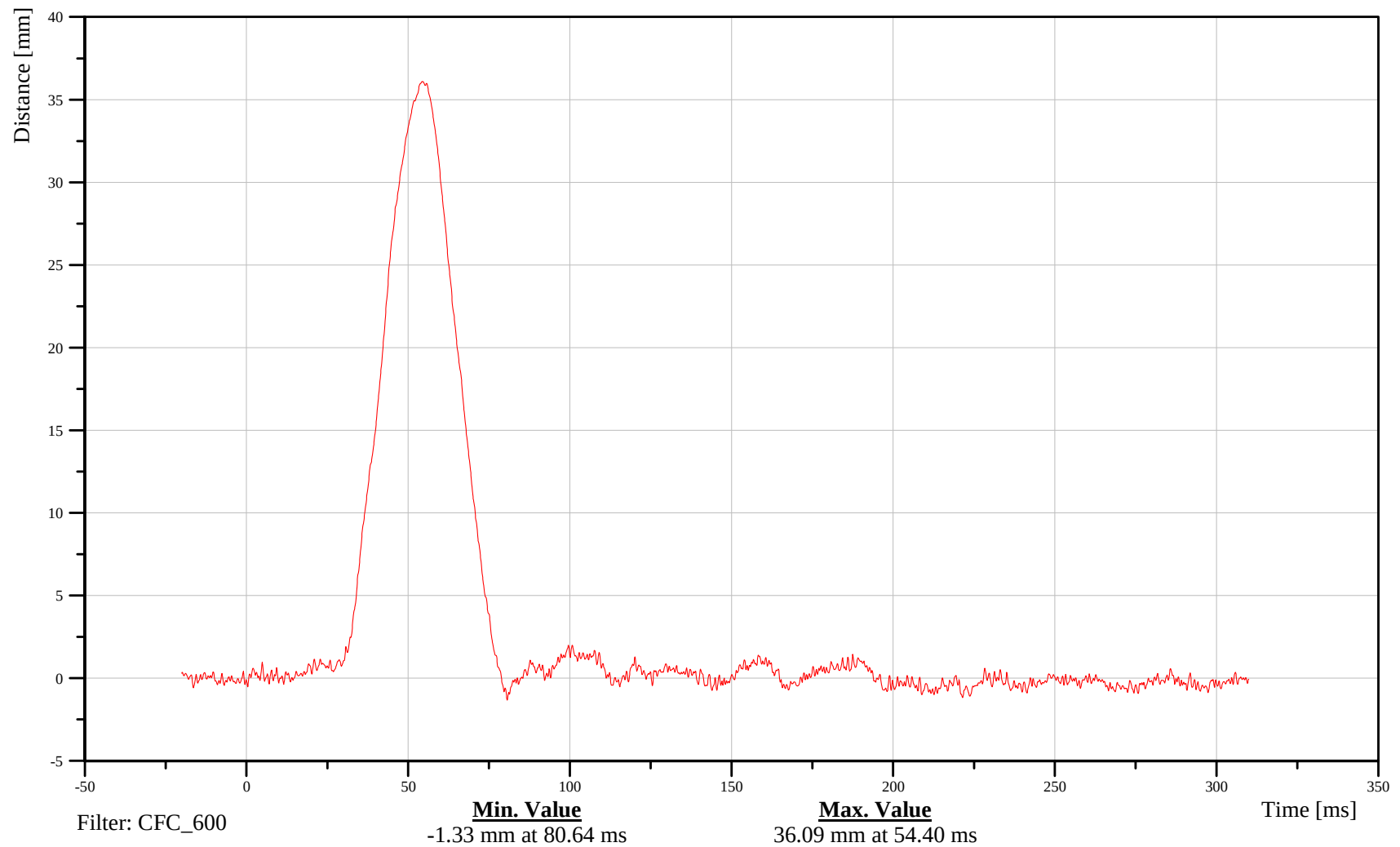
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-115

080911-2



World SID Evaluation

Driver Thorax Rib 1 X-Axis Acceleration

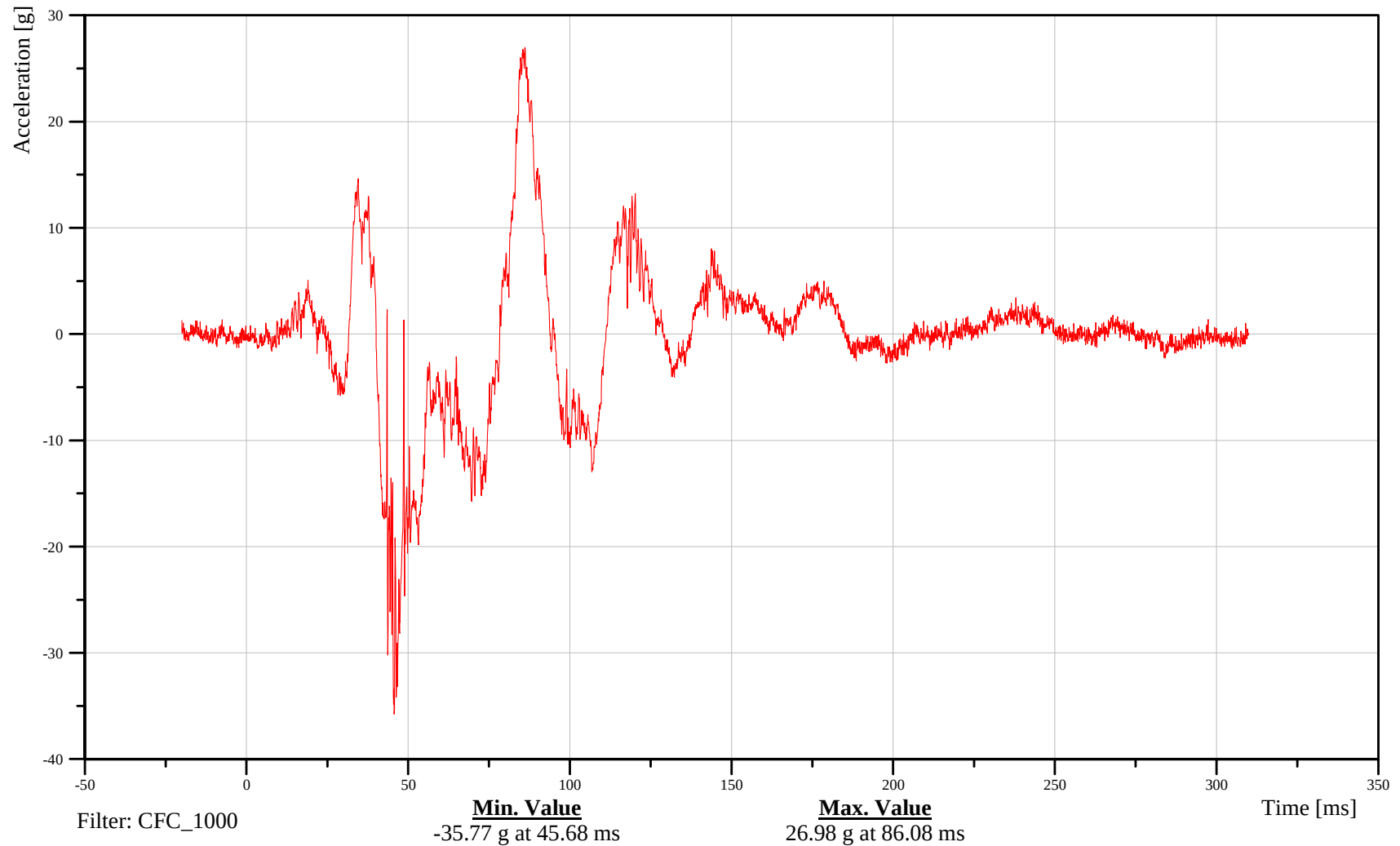
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-116

080911-2



World SID Evaluation
Driver Thorax Rib 1 Y-Axis Acceleration

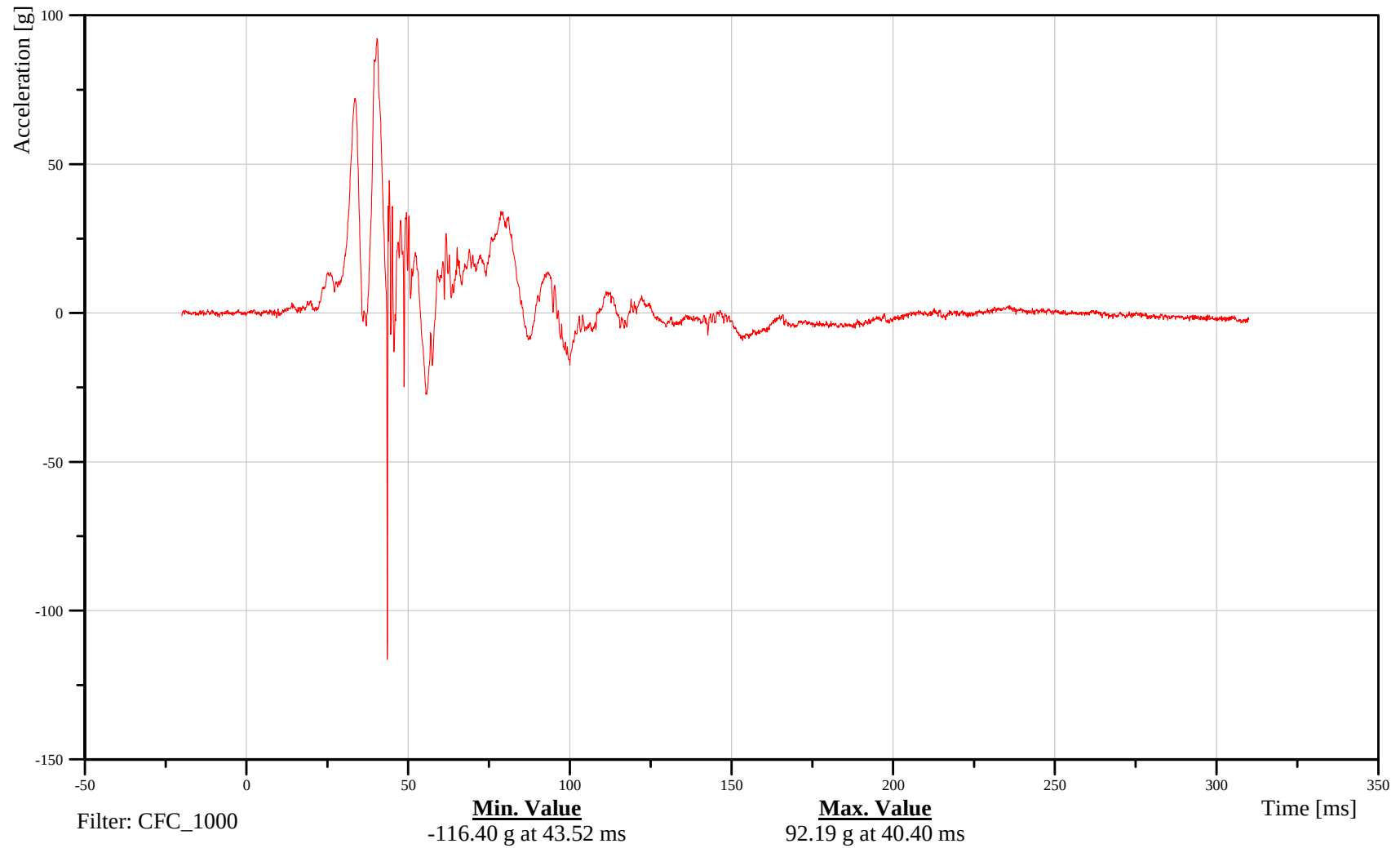
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-117

080911-2



World SID Evaluation
Driver Thorax Rib 1 Z-Axis Acceleration

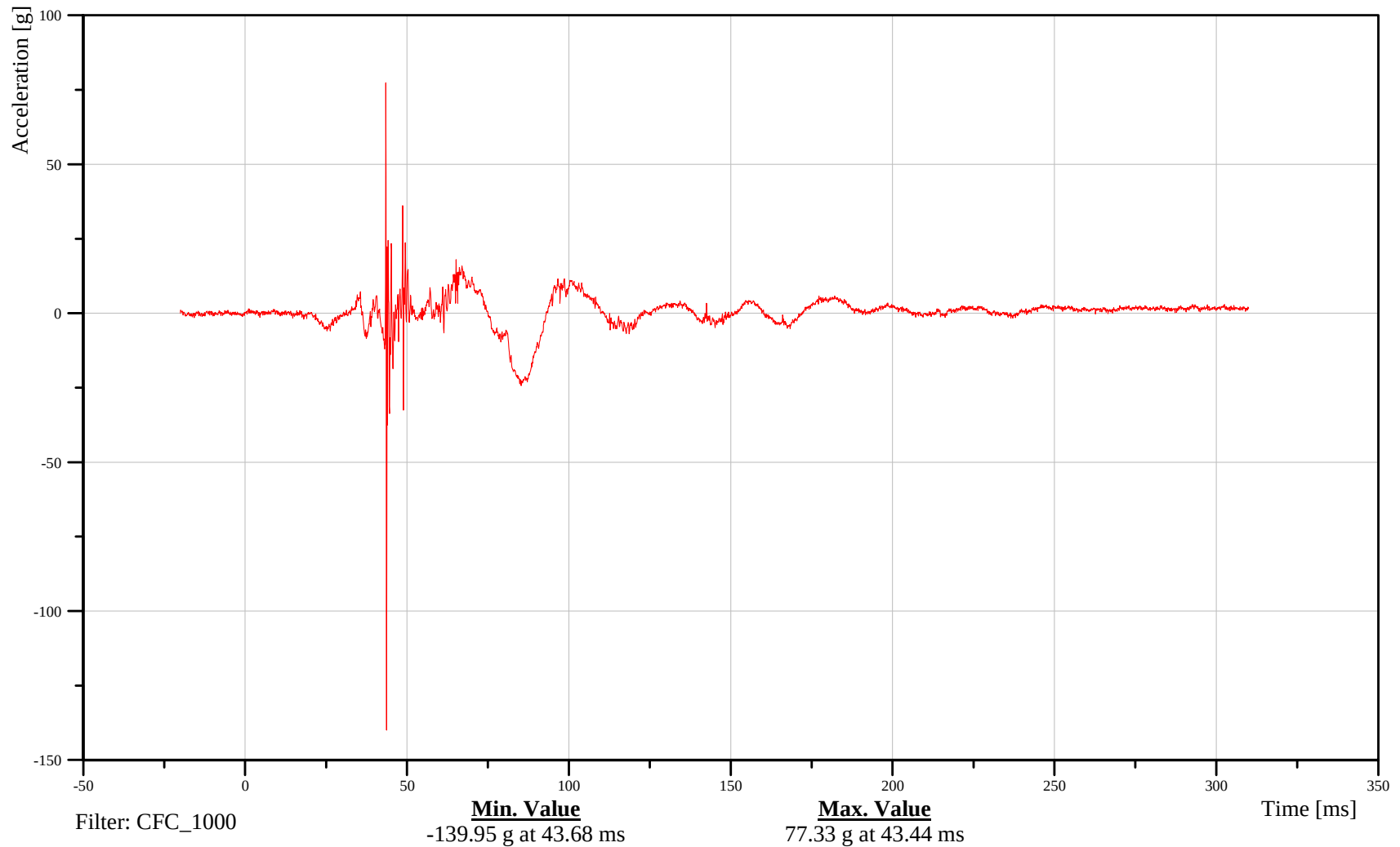
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-118

080911-2



World SID Evaluation
Driver Thorax Rib 1 Resultant Acceleration

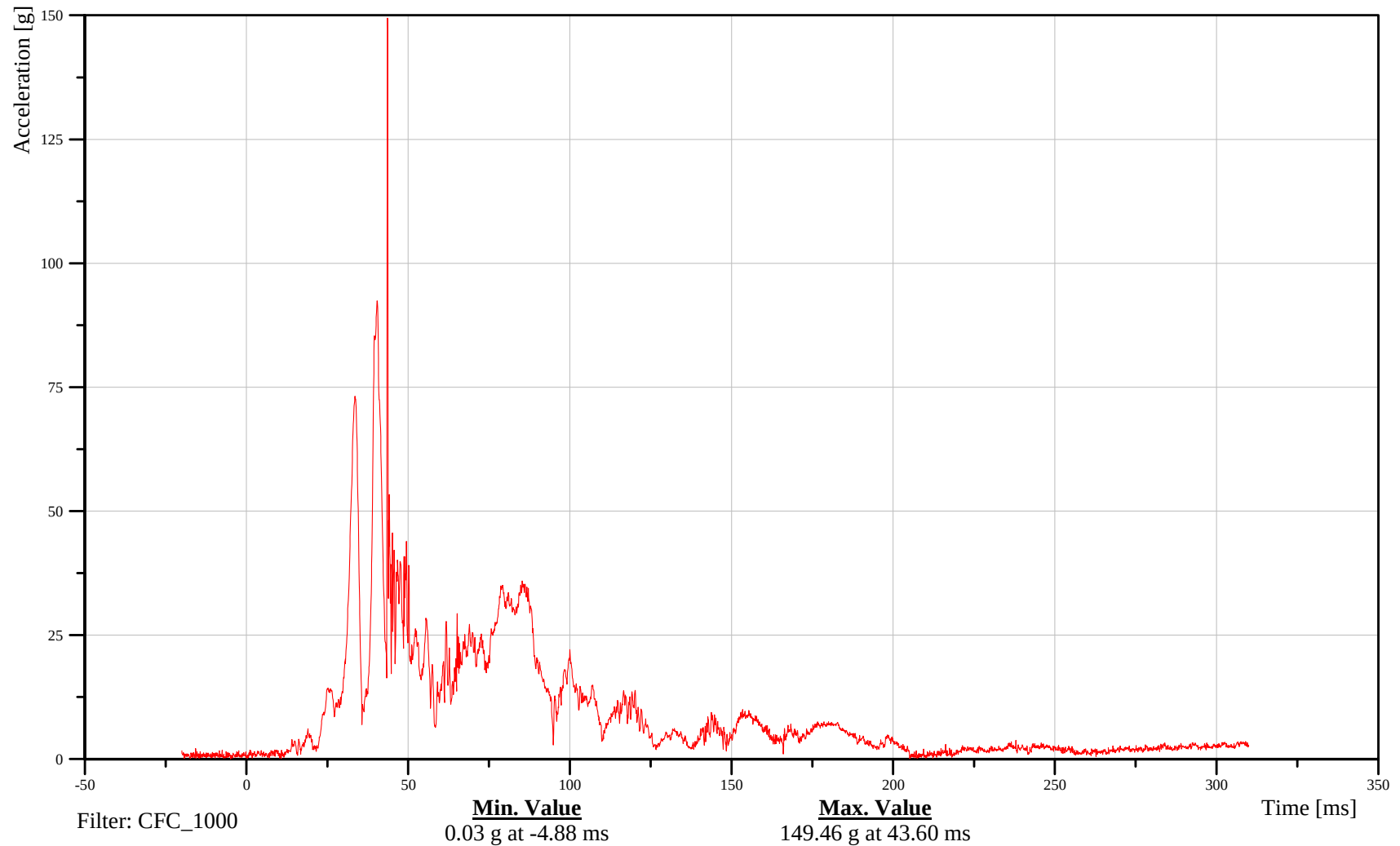
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-119

080911-2



World SID Evaluation
Driver Thorax Rib 2 Y-Axis Displacement

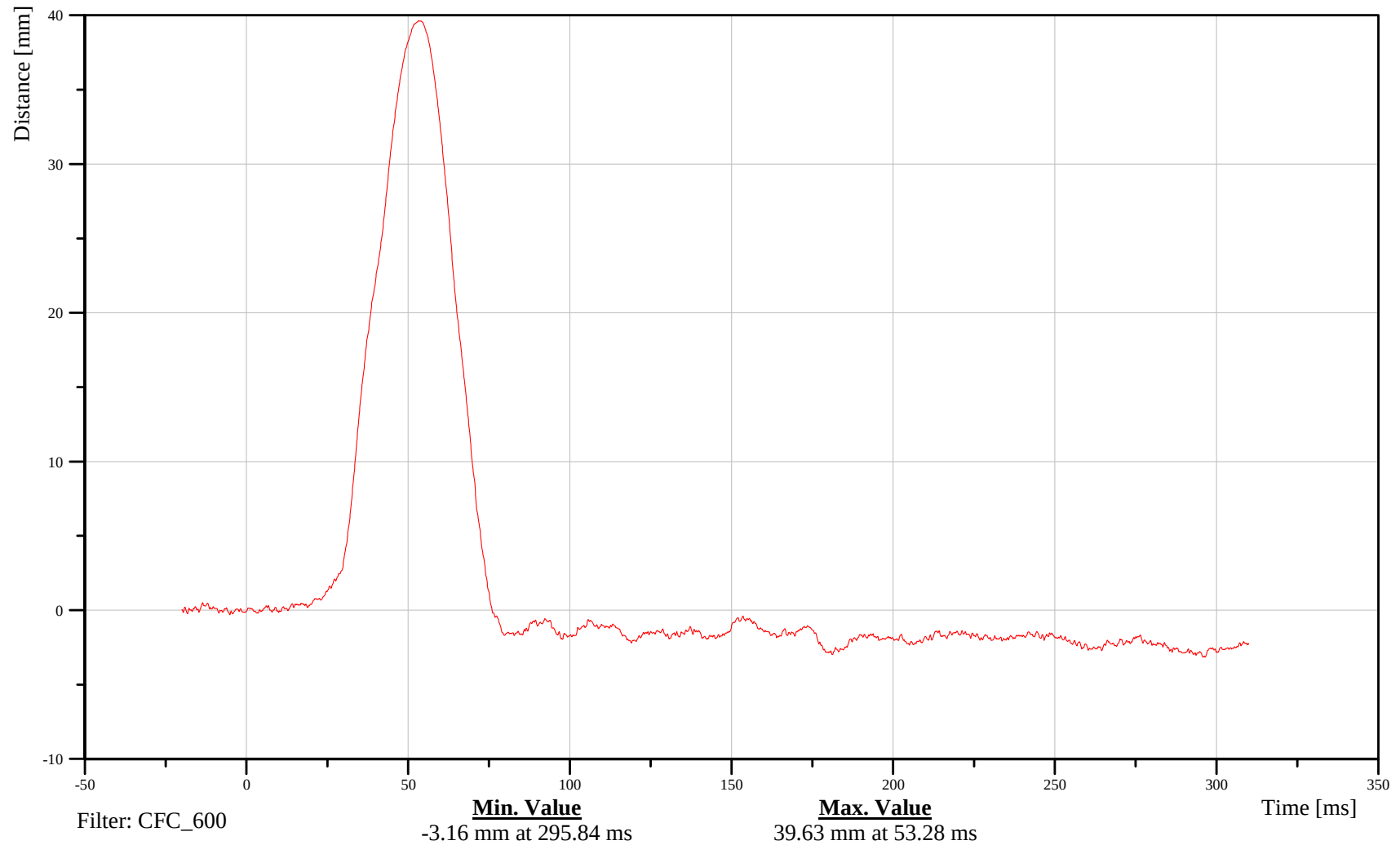
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-120

080911-2



World SID Evaluation

Driver Thorax Rib 2 X-Axis Acceleration

Date: 09/11/2008

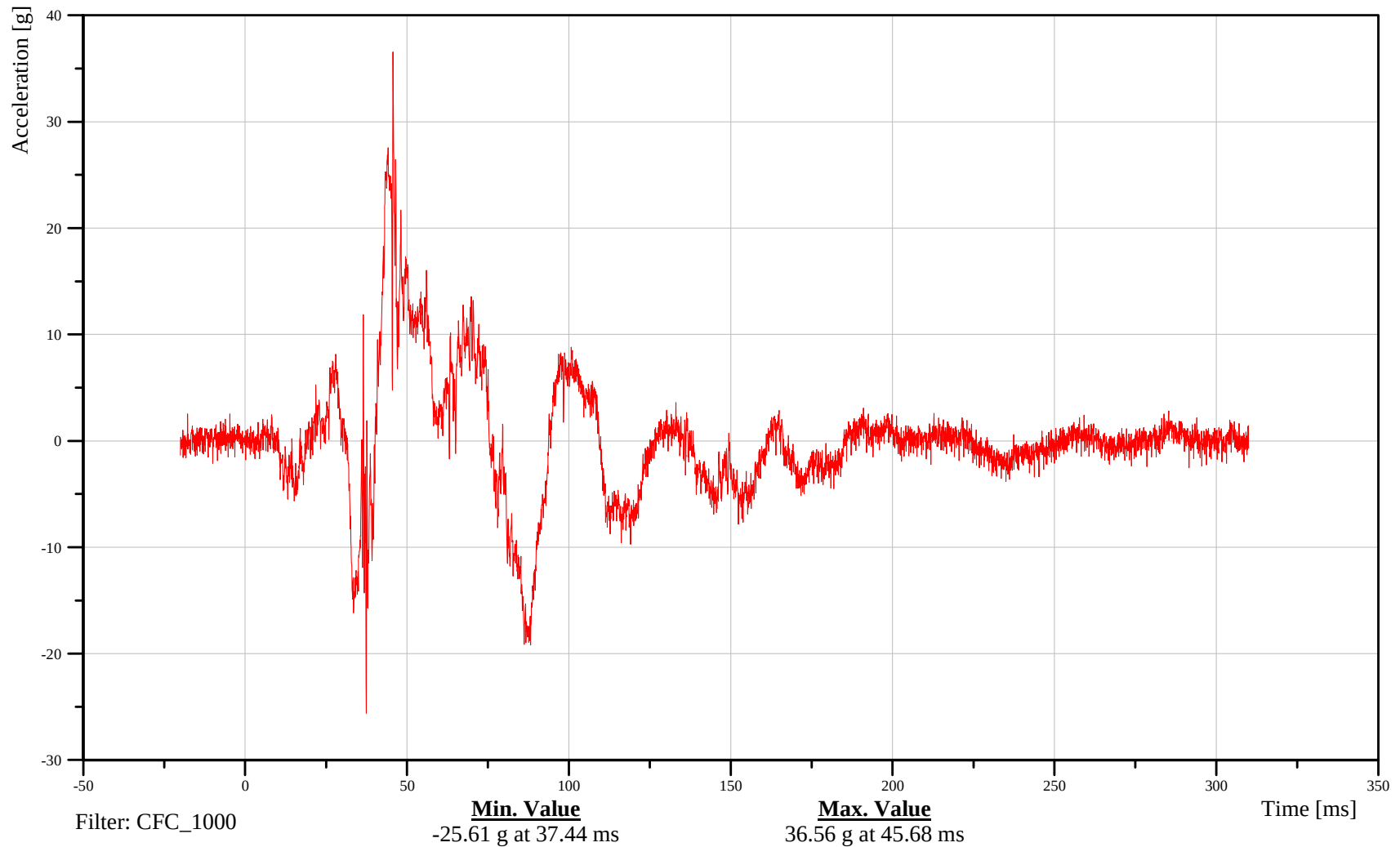
Time: 16:22

Customer: VRTC

11TRRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-121

080911-2



World SID Evaluation
Driver Thorax Rib 2 Y-Axis Acceleration

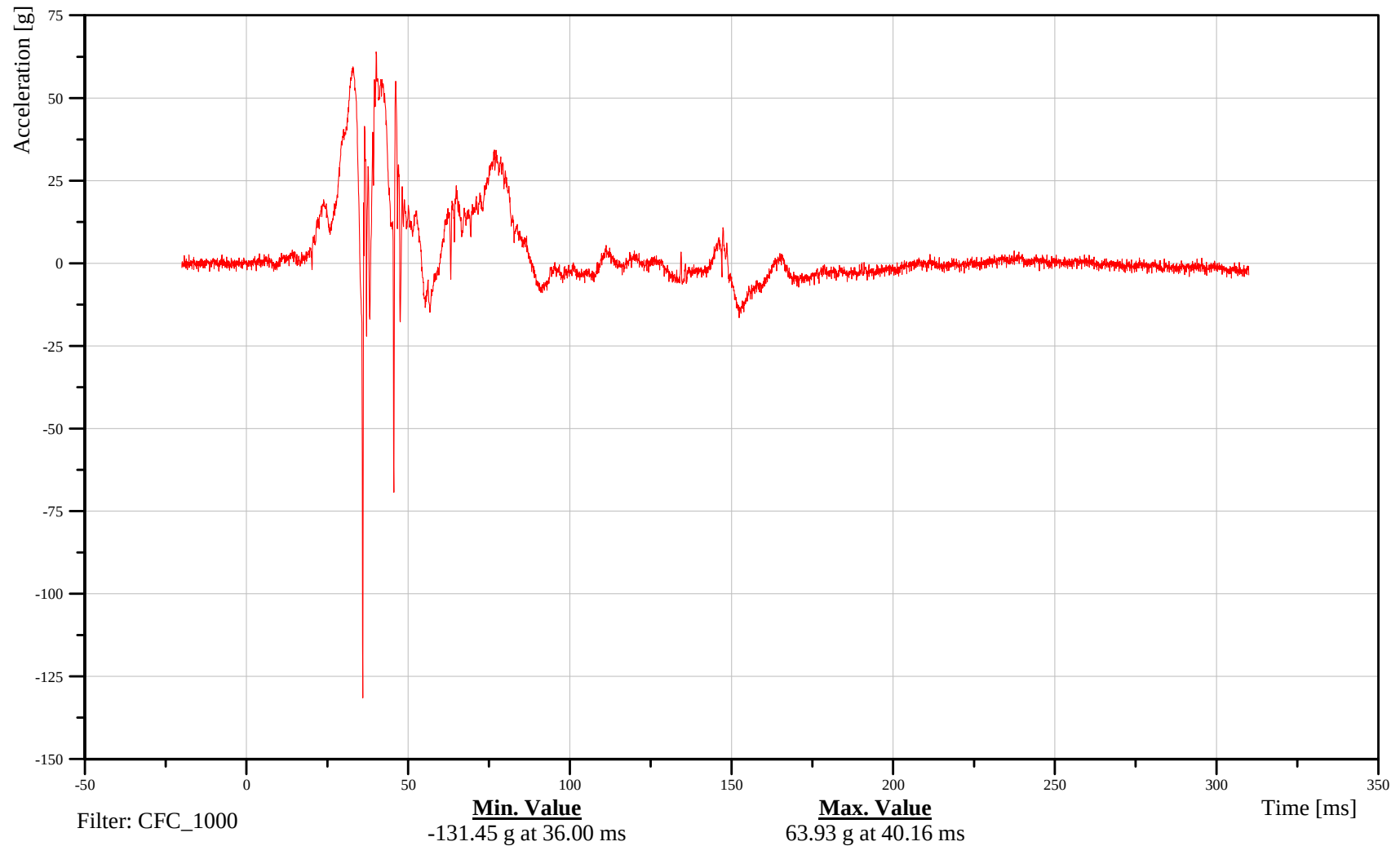
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-122

080911-2



World SID Evaluation
Driver Thorax Rib 2 Z-Axis Acceleration

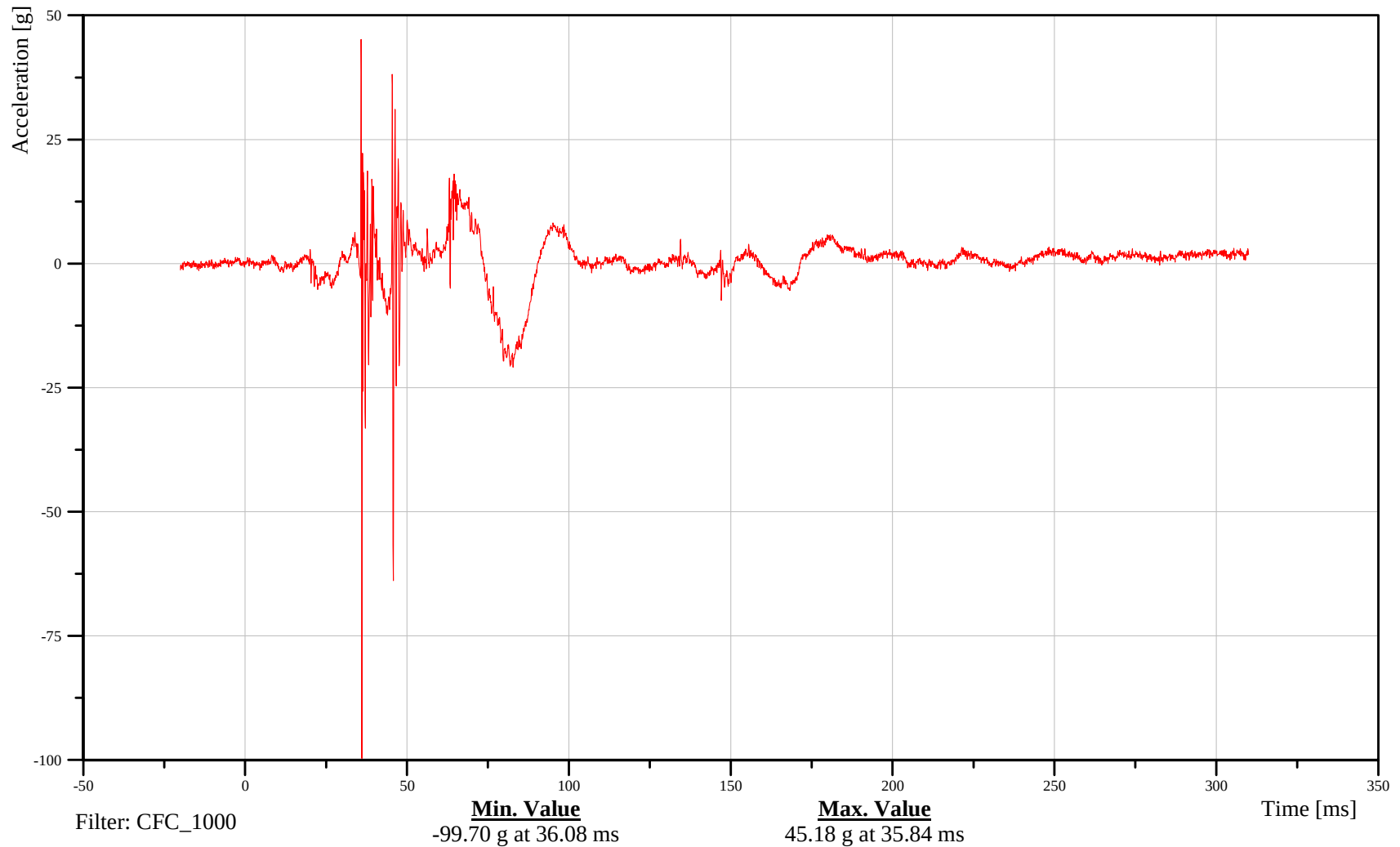
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-123

080911-2



World SID Evaluation
Driver Thorax Rib 2 Resultant Acceleration

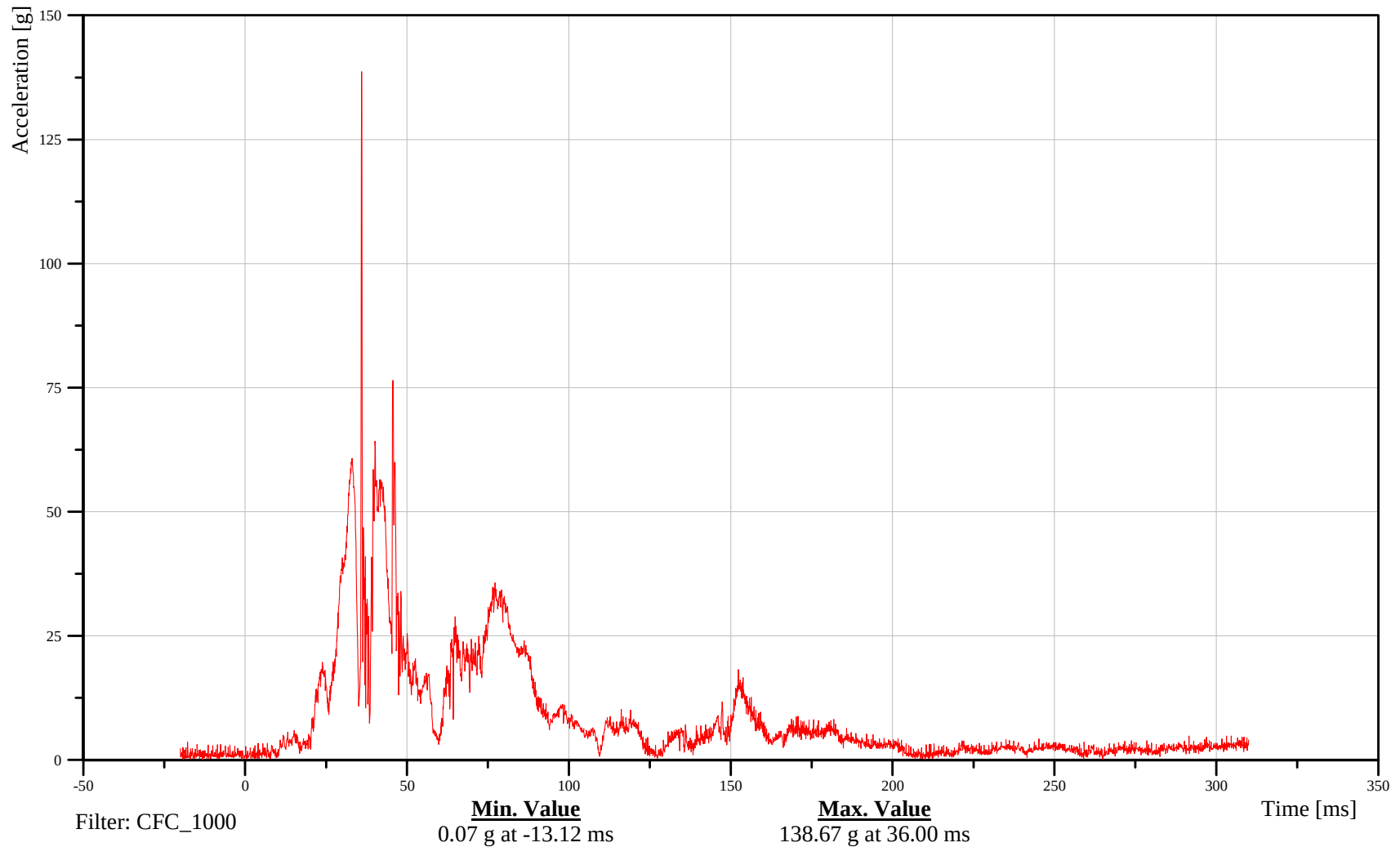
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-124

080911-2



World SID Evaluation
Driver Thorax Rib 3 Y-Axis Displacement

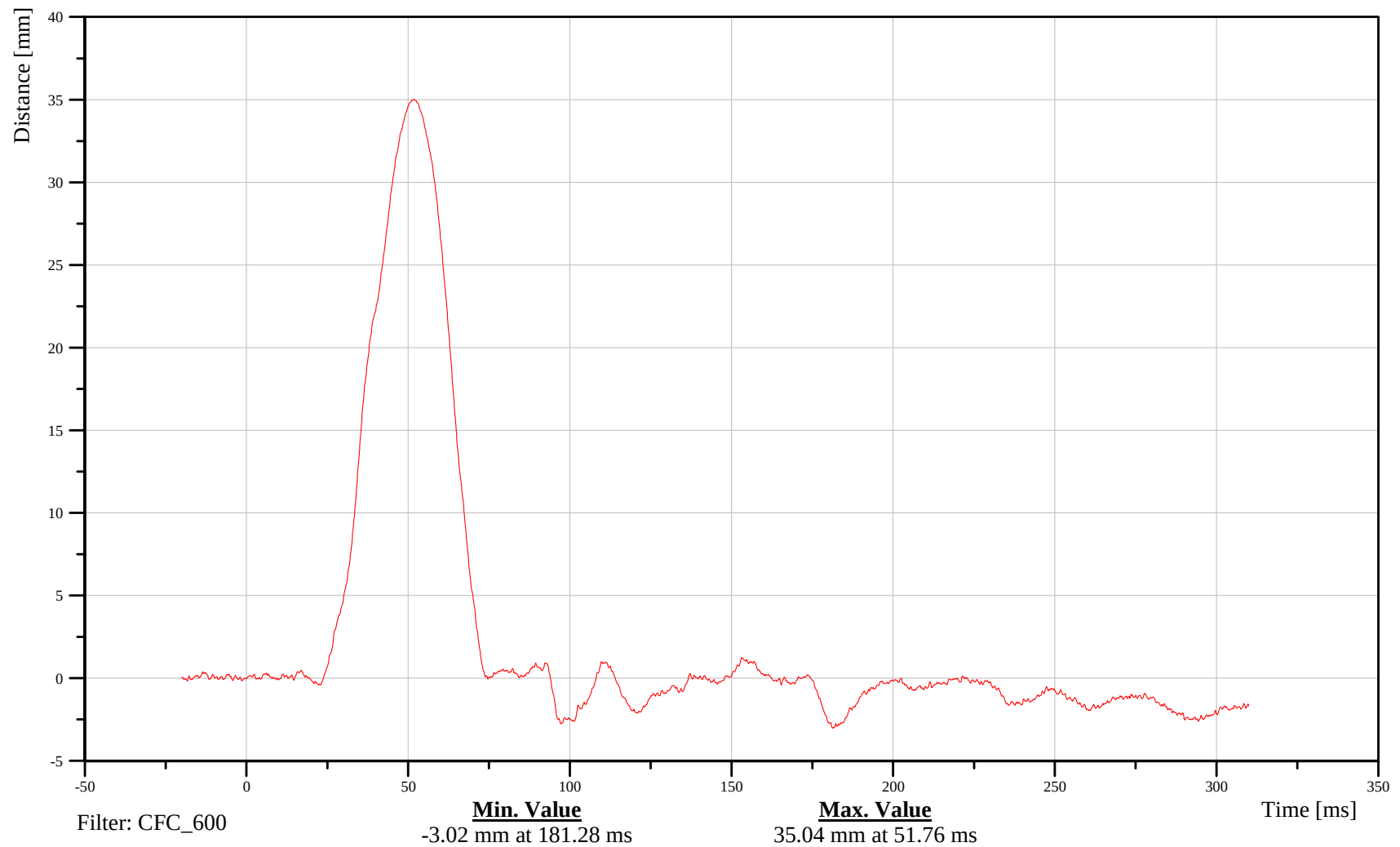
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE03WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-125

080911-2



World SID Evaluation

Driver Thorax Rib 3 X-Axis Acceleration

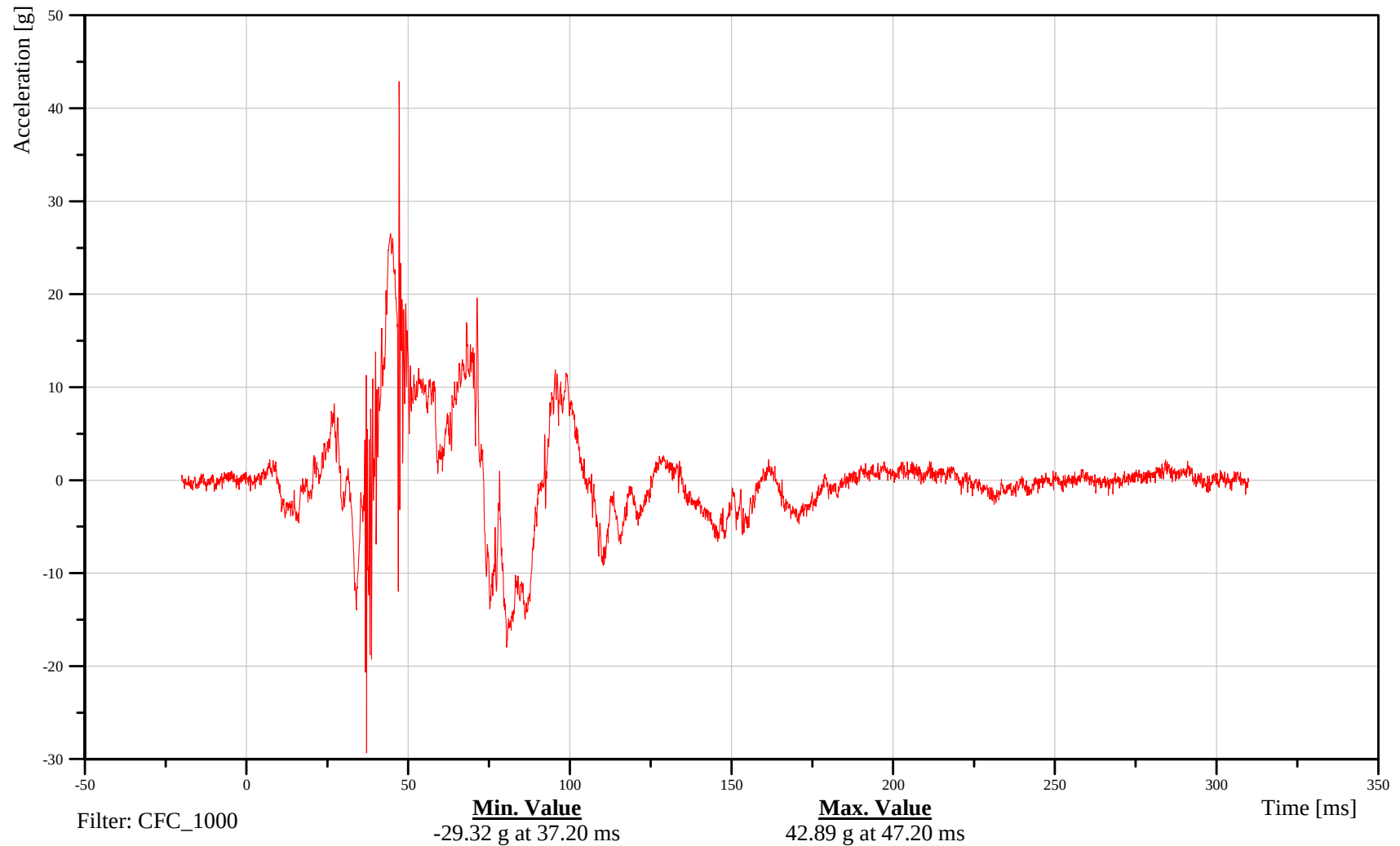
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE03WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-126

080911-2



World SID Evaluation
Driver Thorax Rib 3 Y-Axis Acceleration

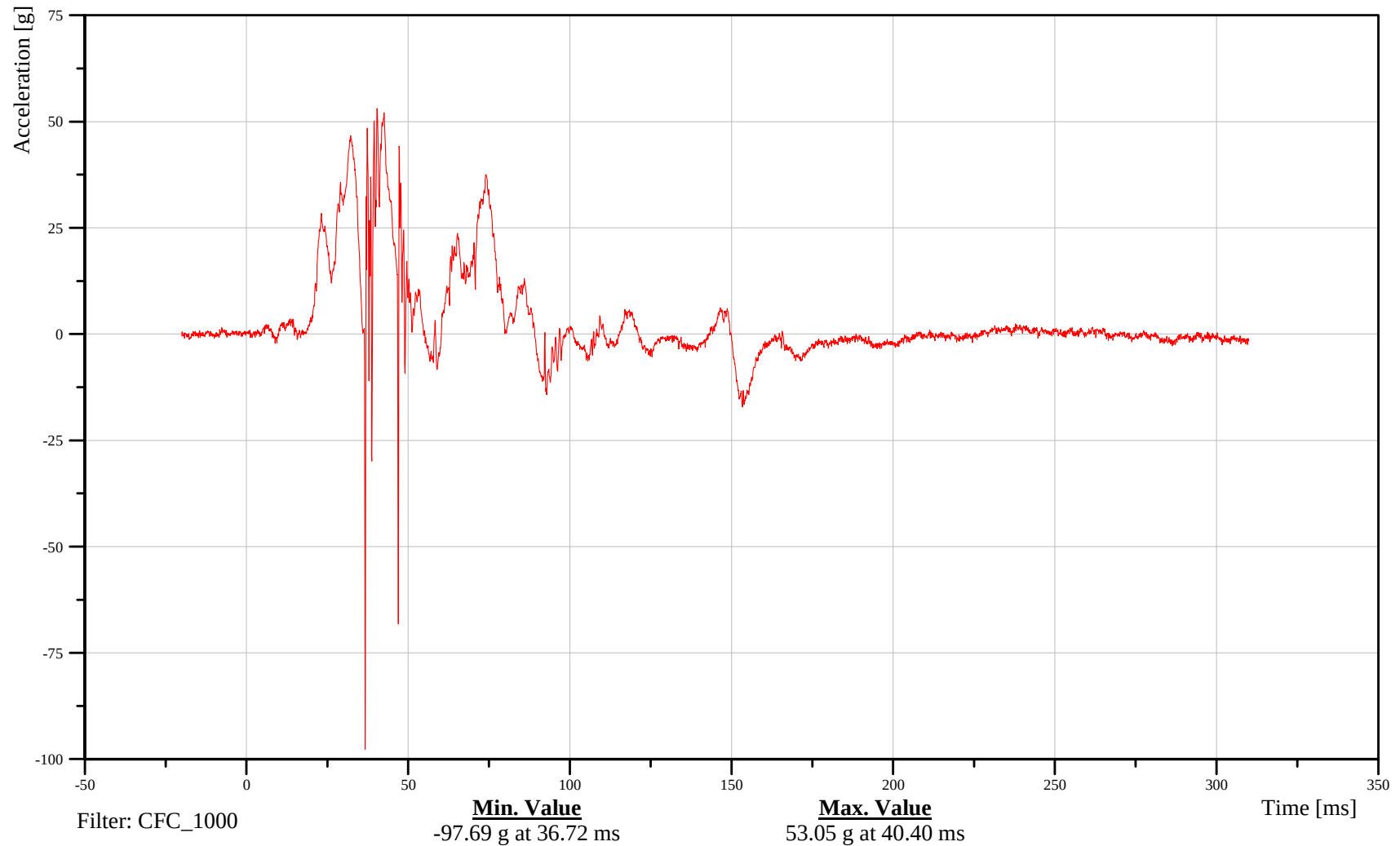
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE03WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-127

080911-2



World SID Evaluation
Driver Thorax Rib 3 Z-Axis Acceleration

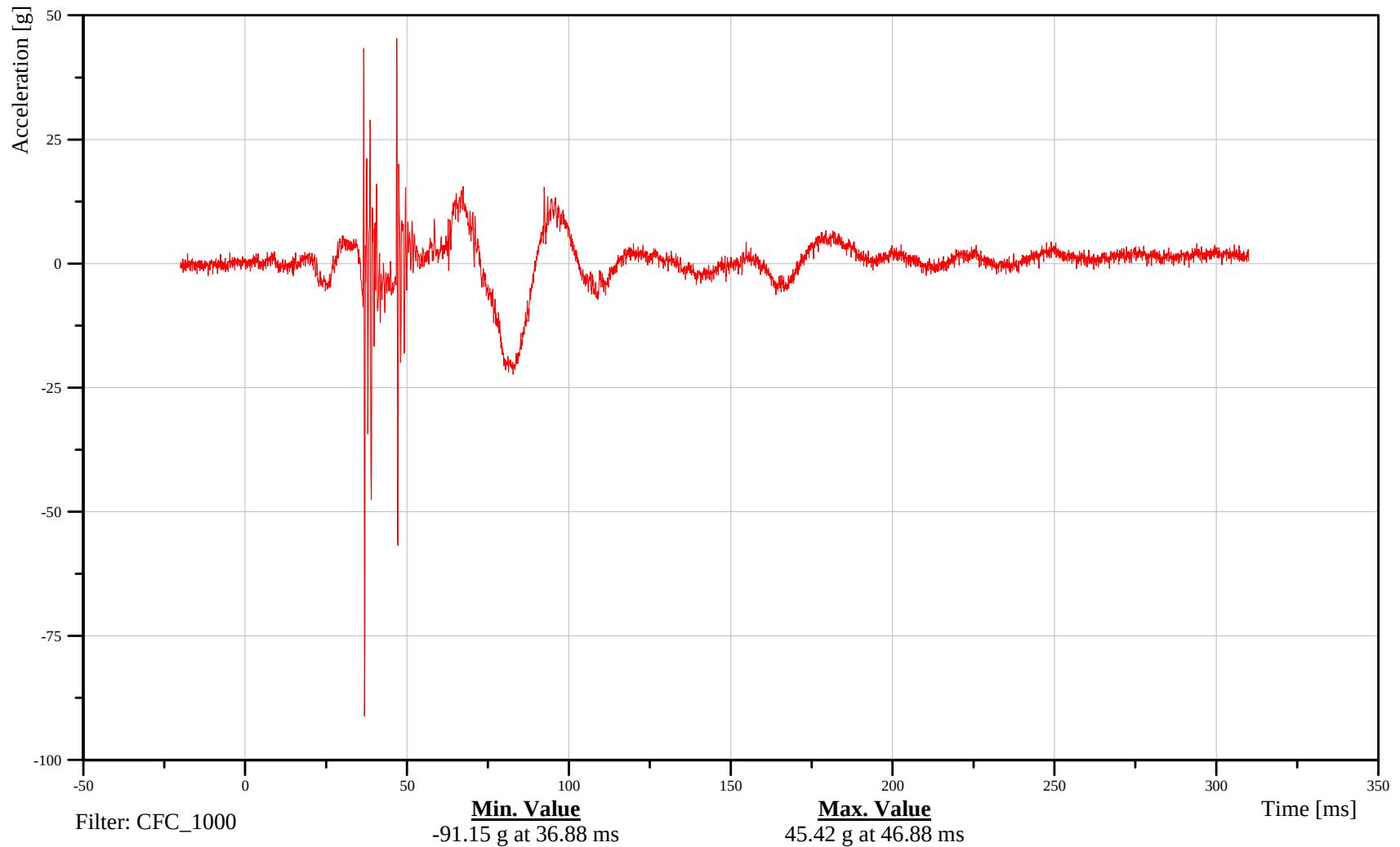
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE03WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-128

080911-2



World SID Evaluation
Driver Thorax Rib 3 Resultant Acceleration

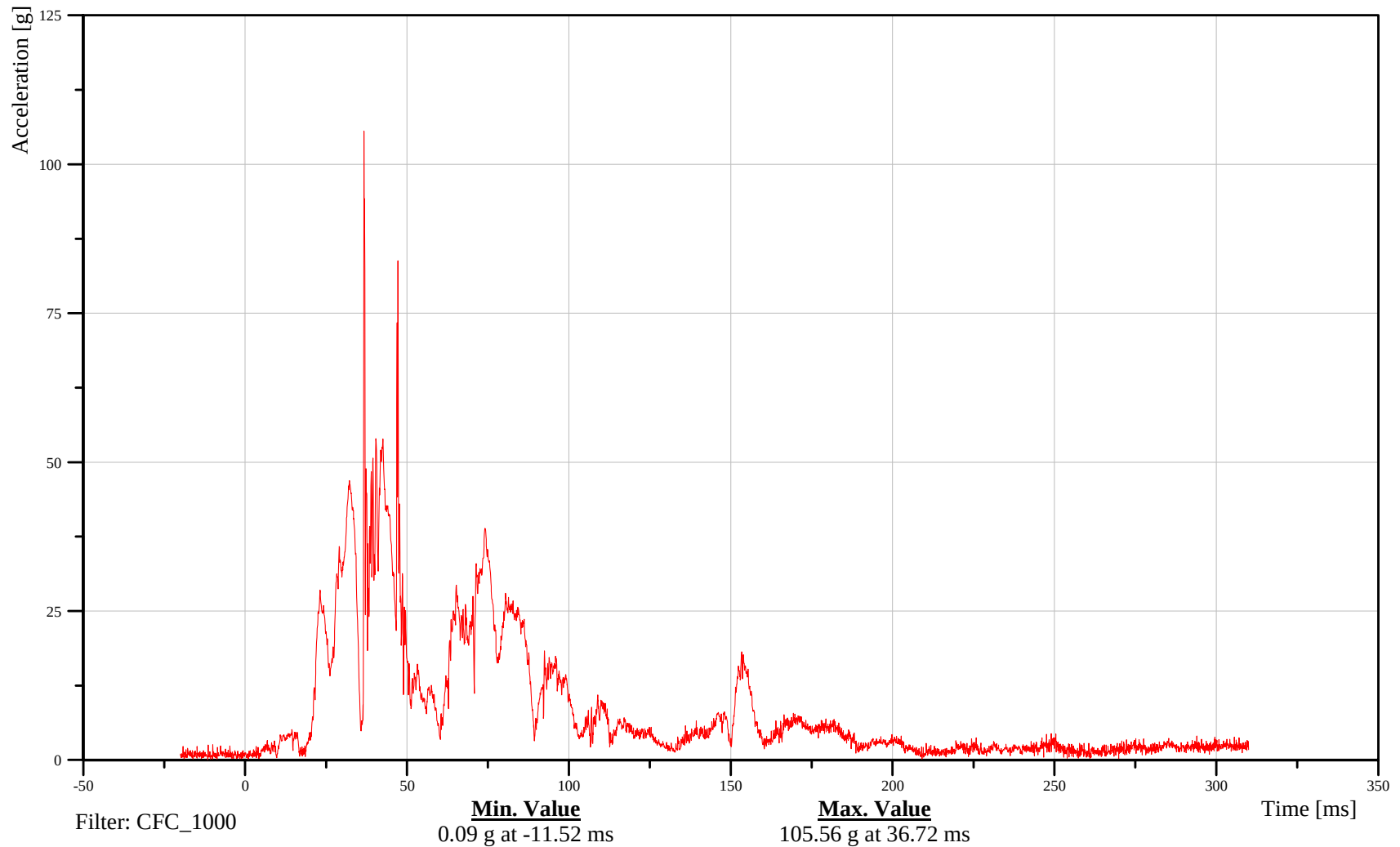
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11TRRILE03WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-129

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

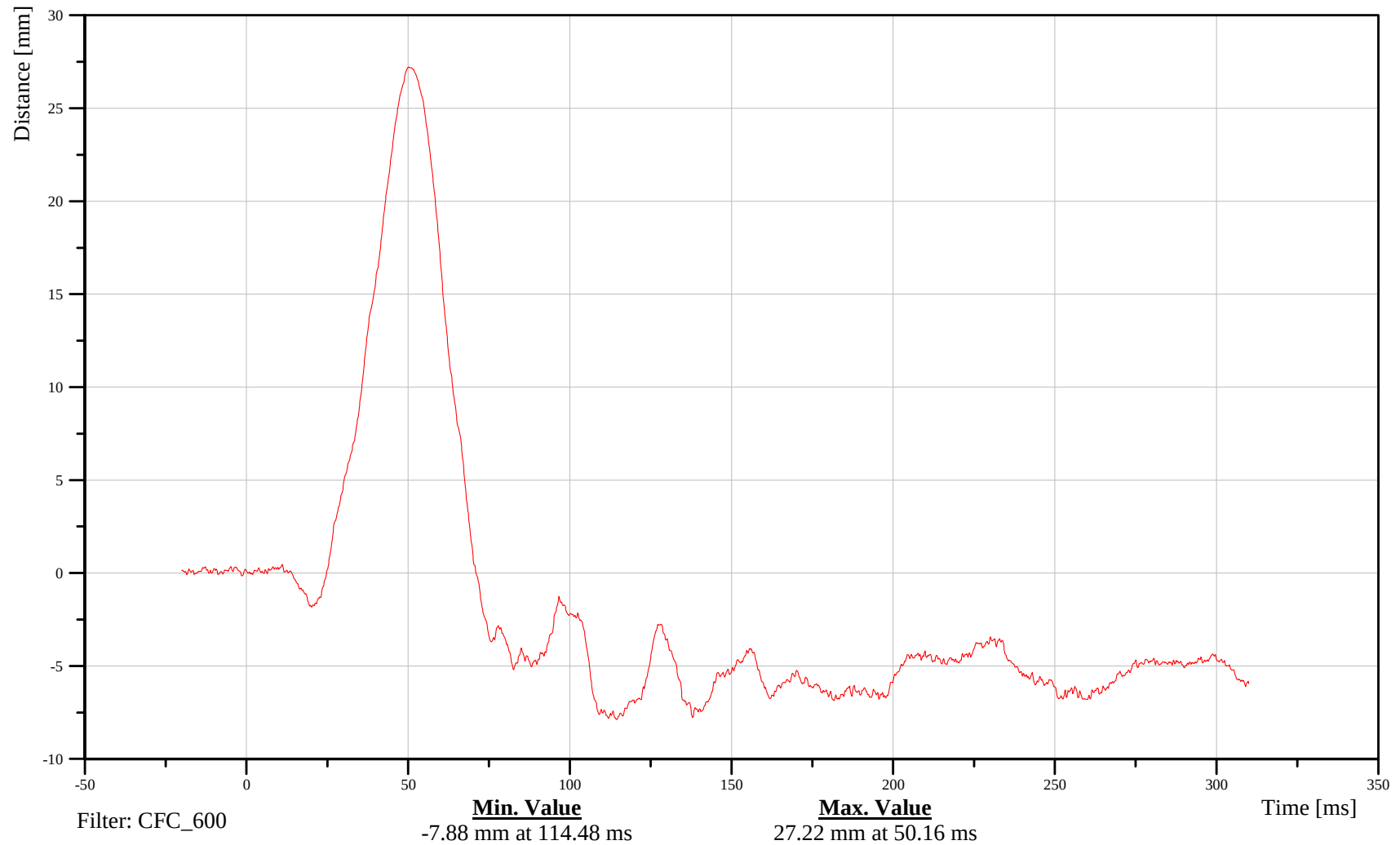
Driver Abdominal Rib 1 Y-Axis Displacement

Customer: VRTC

11ABRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-130

080911-2



World SID Evaluation
Driver Abdominal Rib 1 X-Axis Acceleration

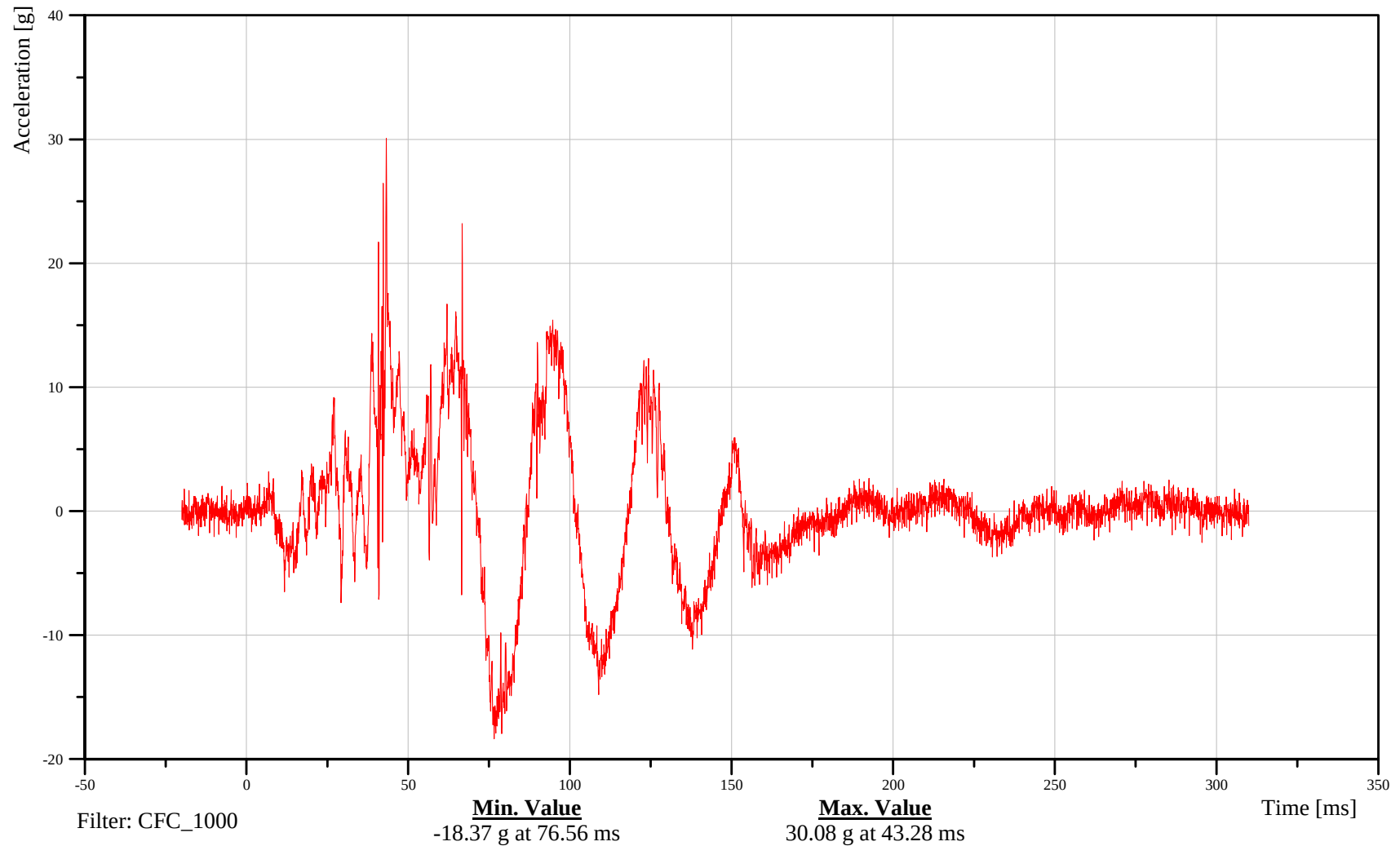
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-131

080911-2



World SID Evaluation
Driver Abdominal Rib 1 Y-Axis Acceleration

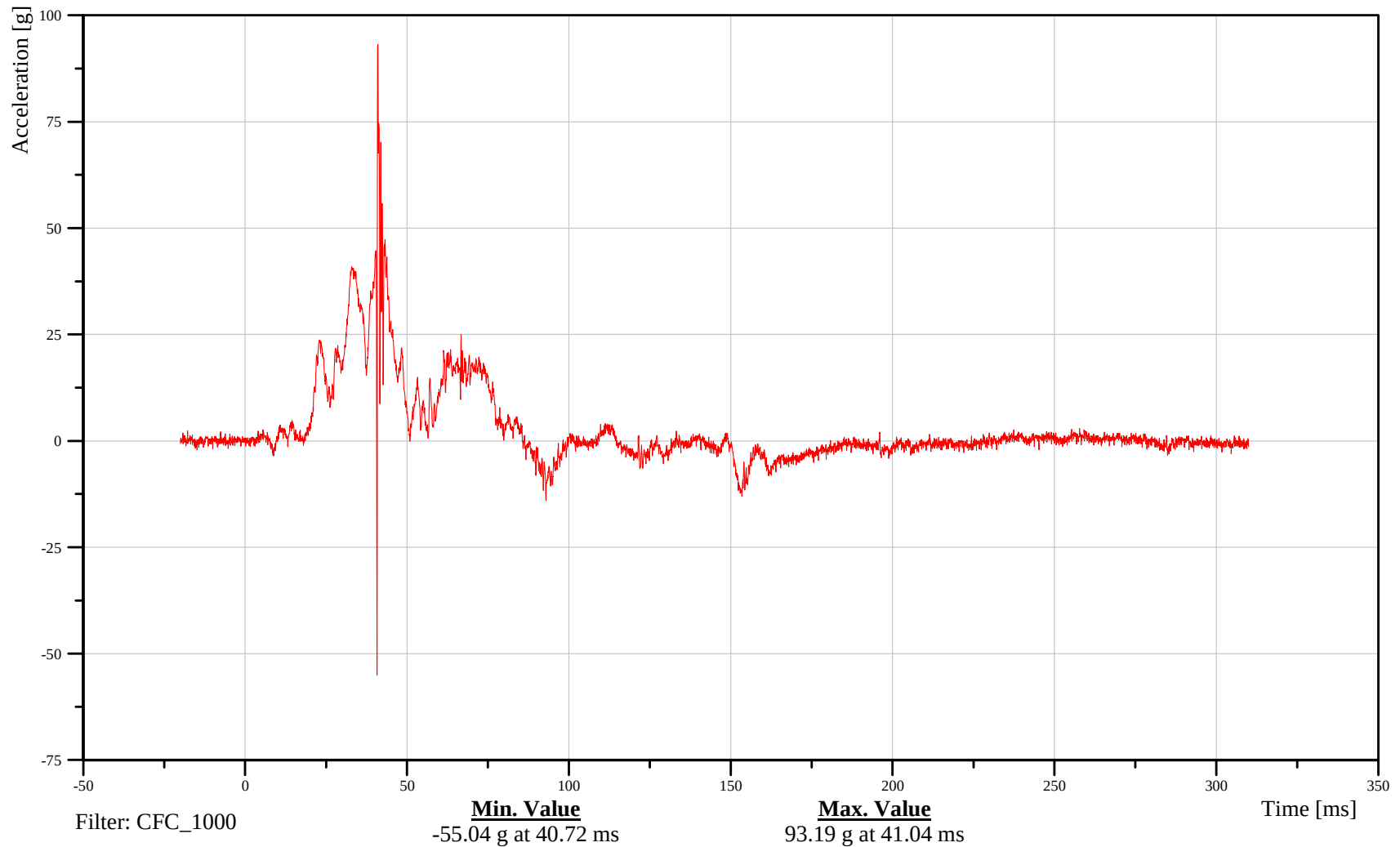
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-132

080911-2



World SID Evaluation
Driver Abdominal Rib 1 Z-Axis Acceleration

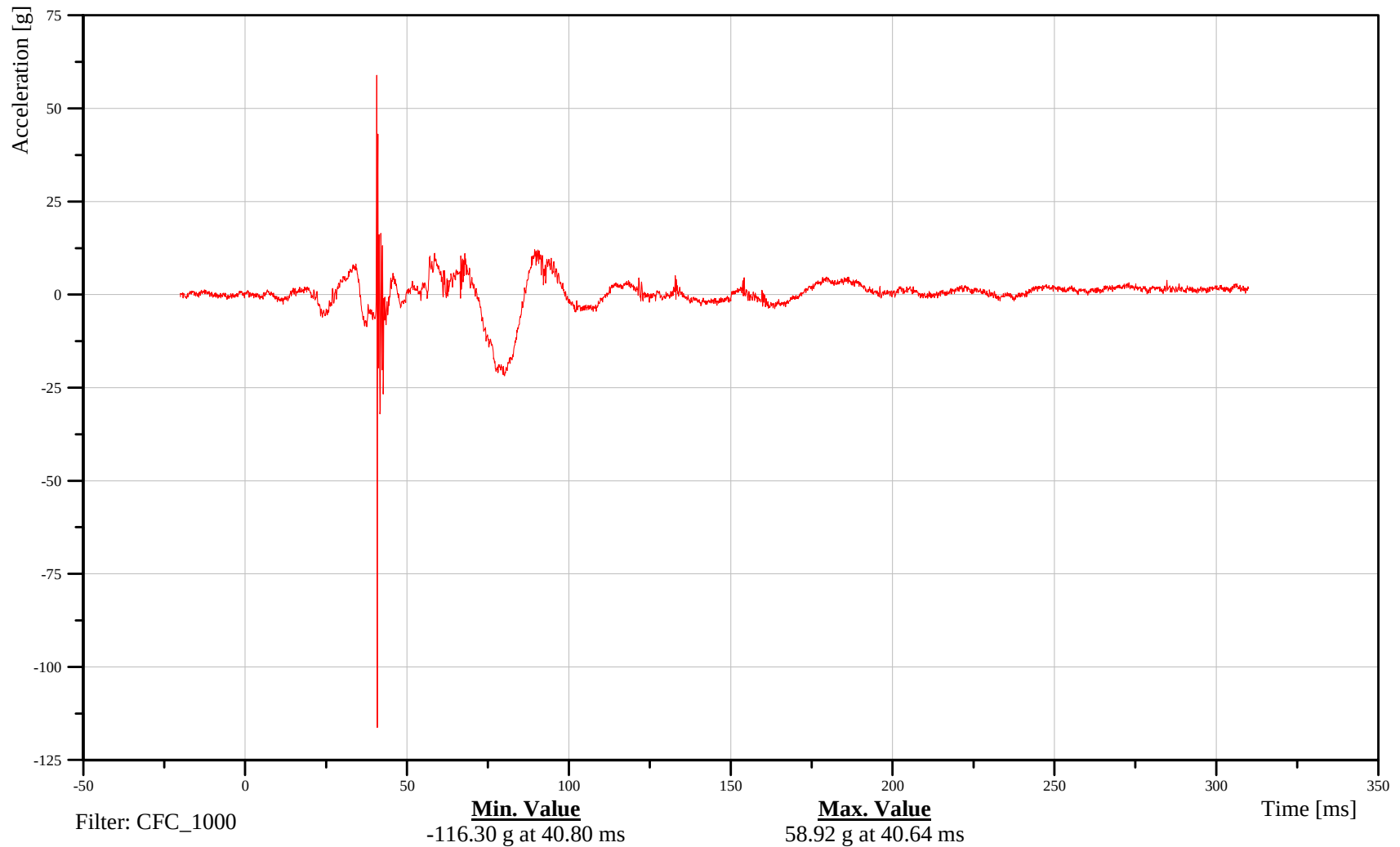
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-133

080911-2



World SID Evaluation
Driver Abdominal Rib 1 Resultant Acceleration

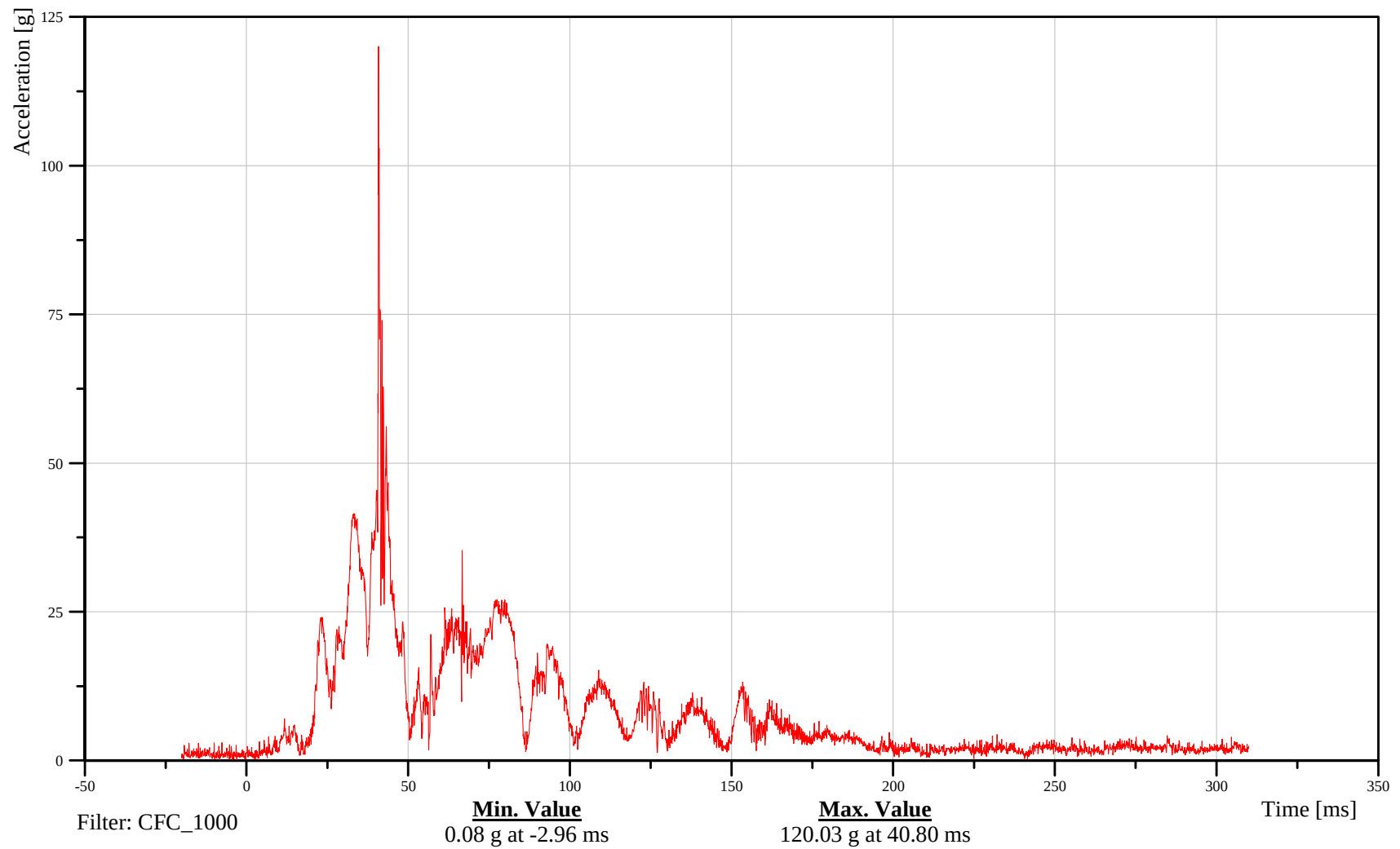
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-134

080911-2



World SID Evaluation

Driver Abdominal Rib 2 Y-Axis Displacement

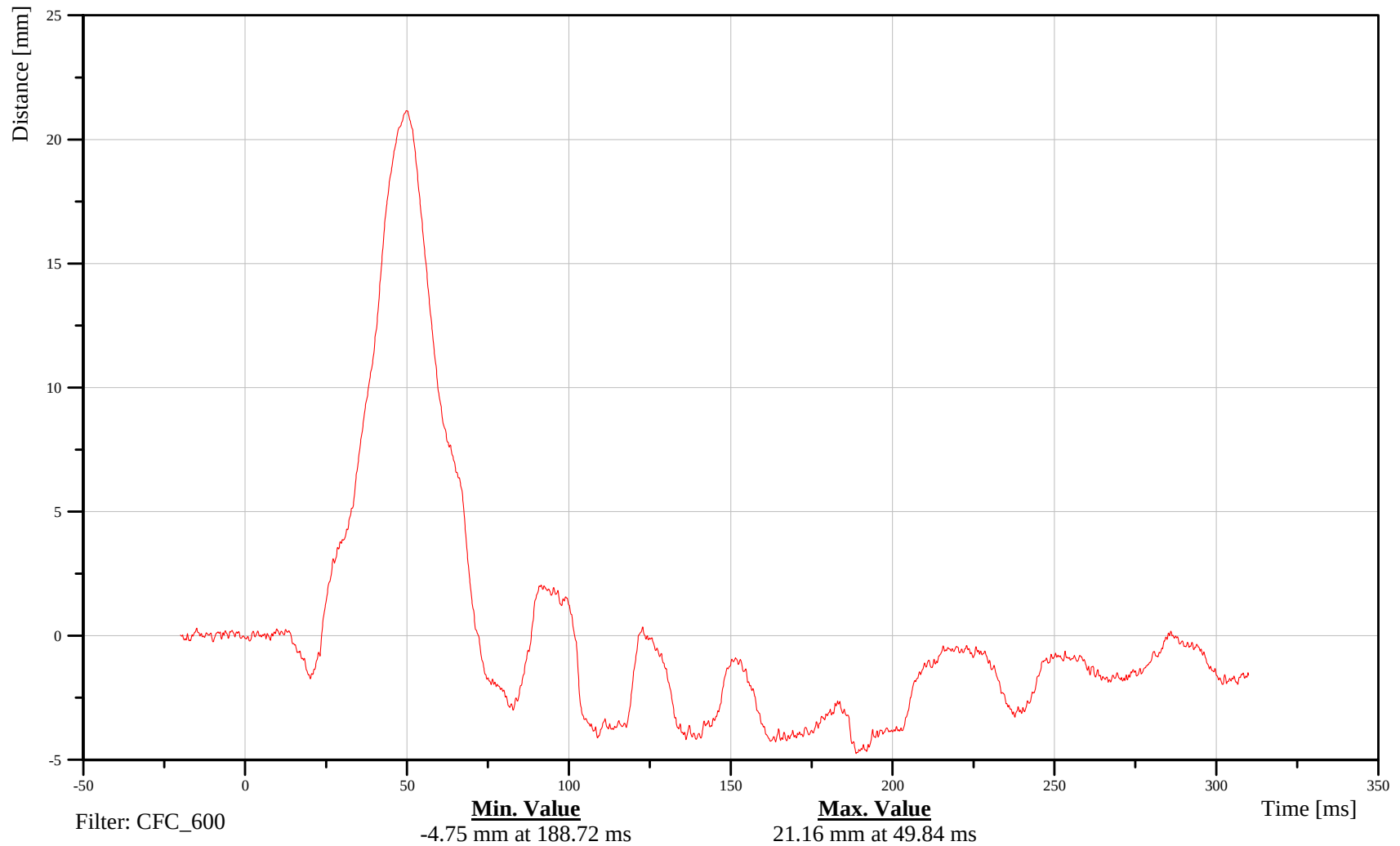
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-135

080911-2



World SID Evaluation

Driver Abdominal Rib 2 X-Axis Acceleration

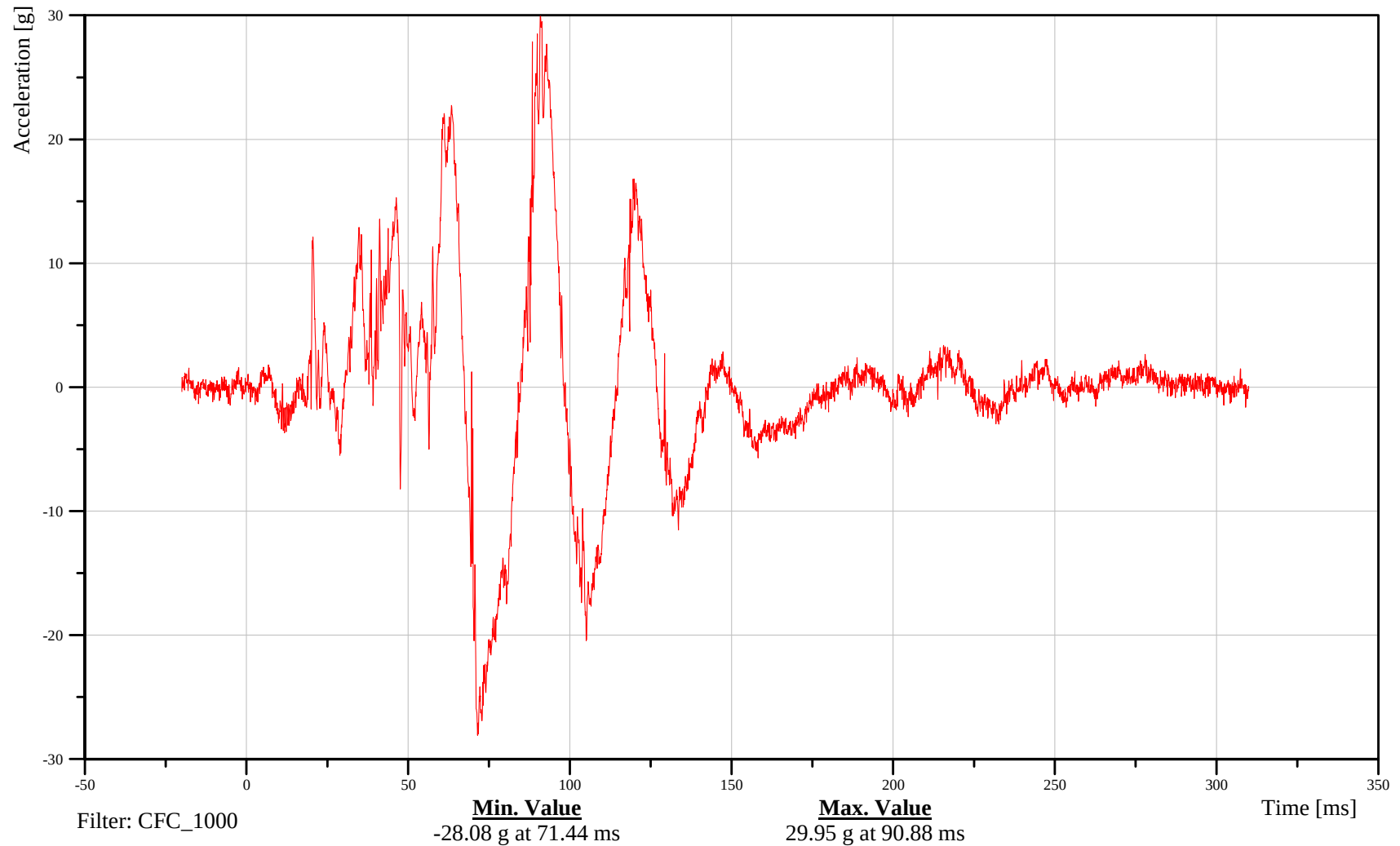
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-136

080911-2



World SID Evaluation
Driver Abdominal Rib 2 Y-Axis Acceleration

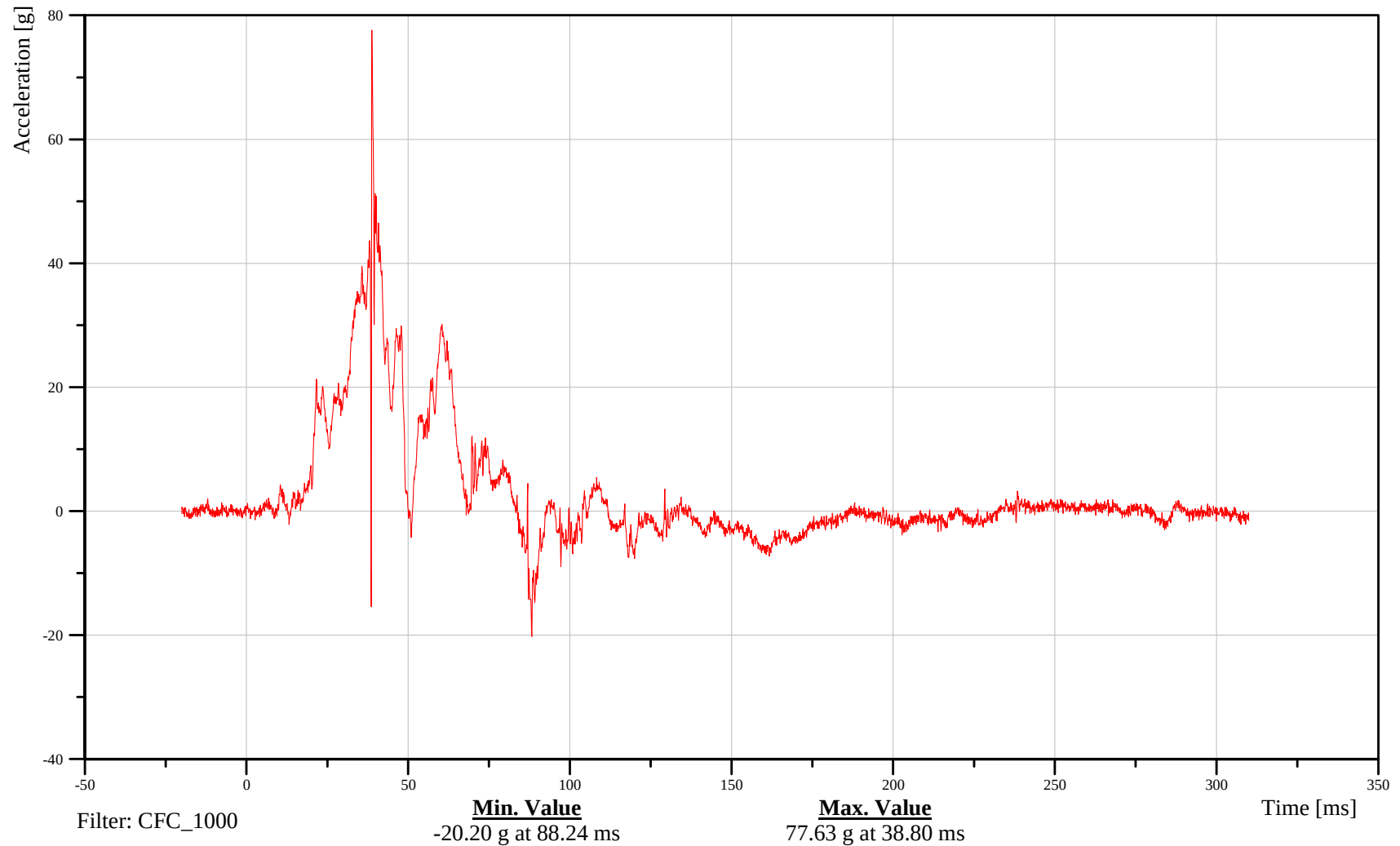
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-137

080911-2



World SID Evaluation
Driver Abdominal Rib 2 Z-Axis Acceleration

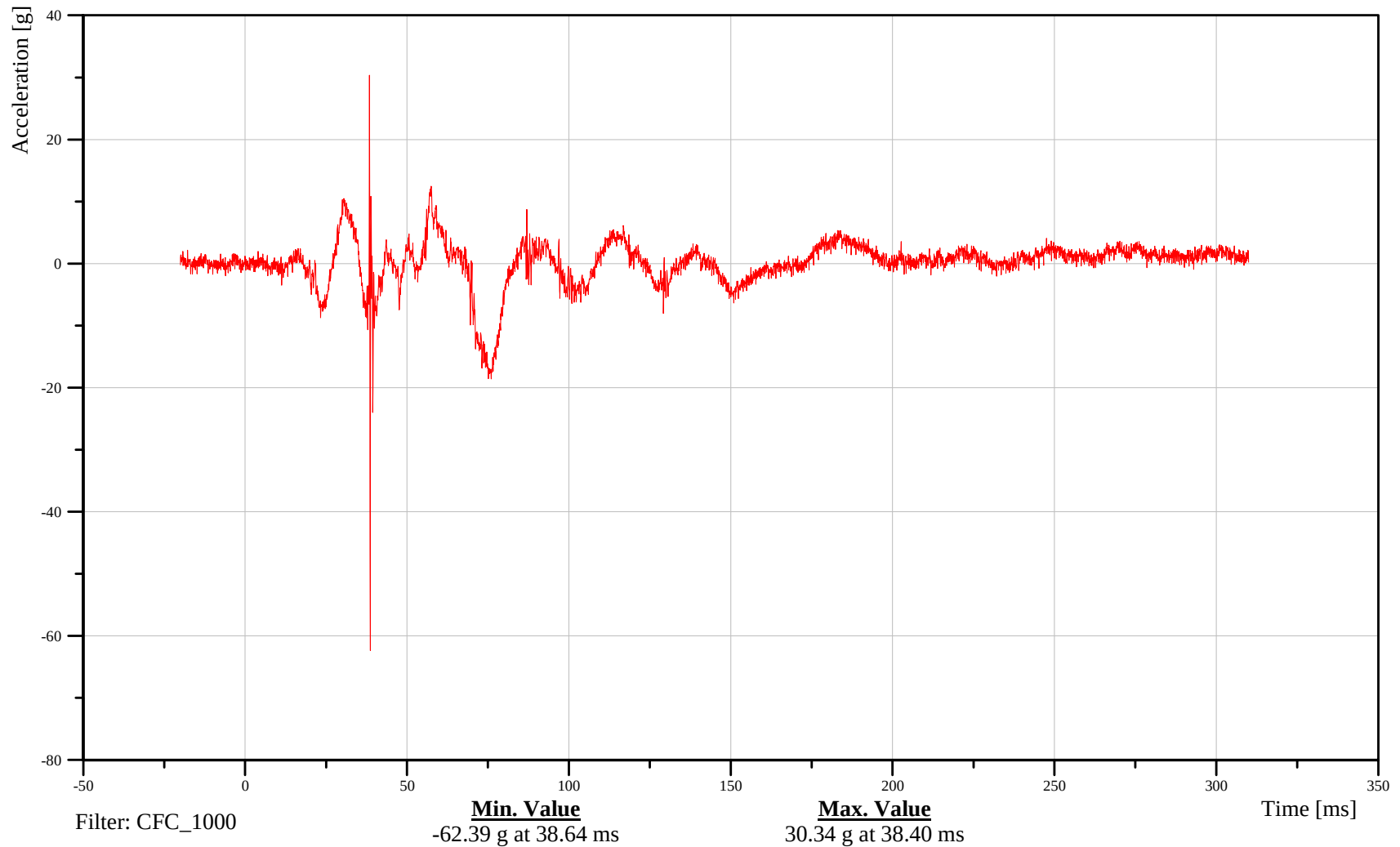
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-138

080911-2



World SID Evaluation
Driver Abdominal Rib 2 Resultant Acceleration

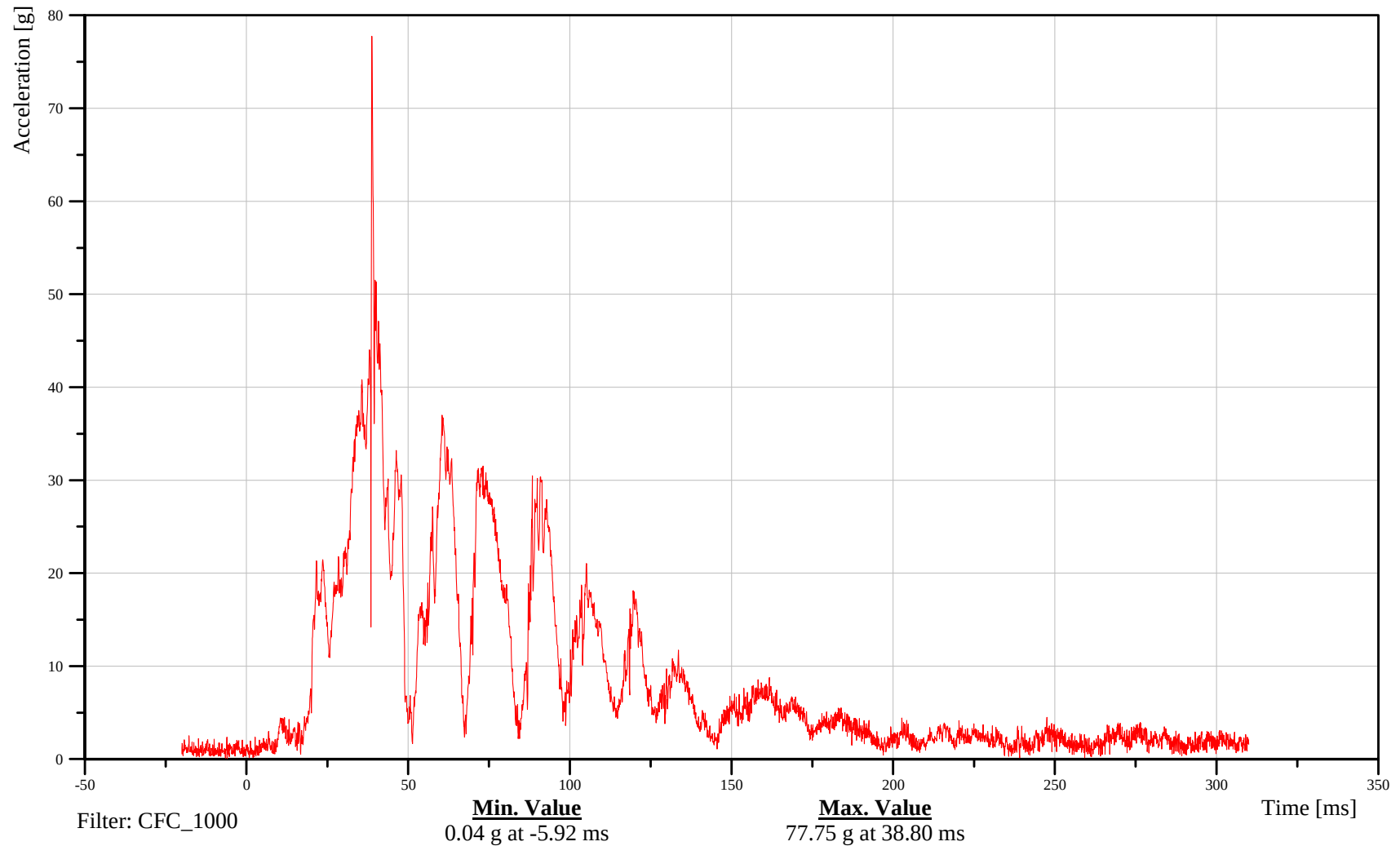
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11ABRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-139

080911-2



World SID Evaluation

Driver Lumbar X-Axis Force

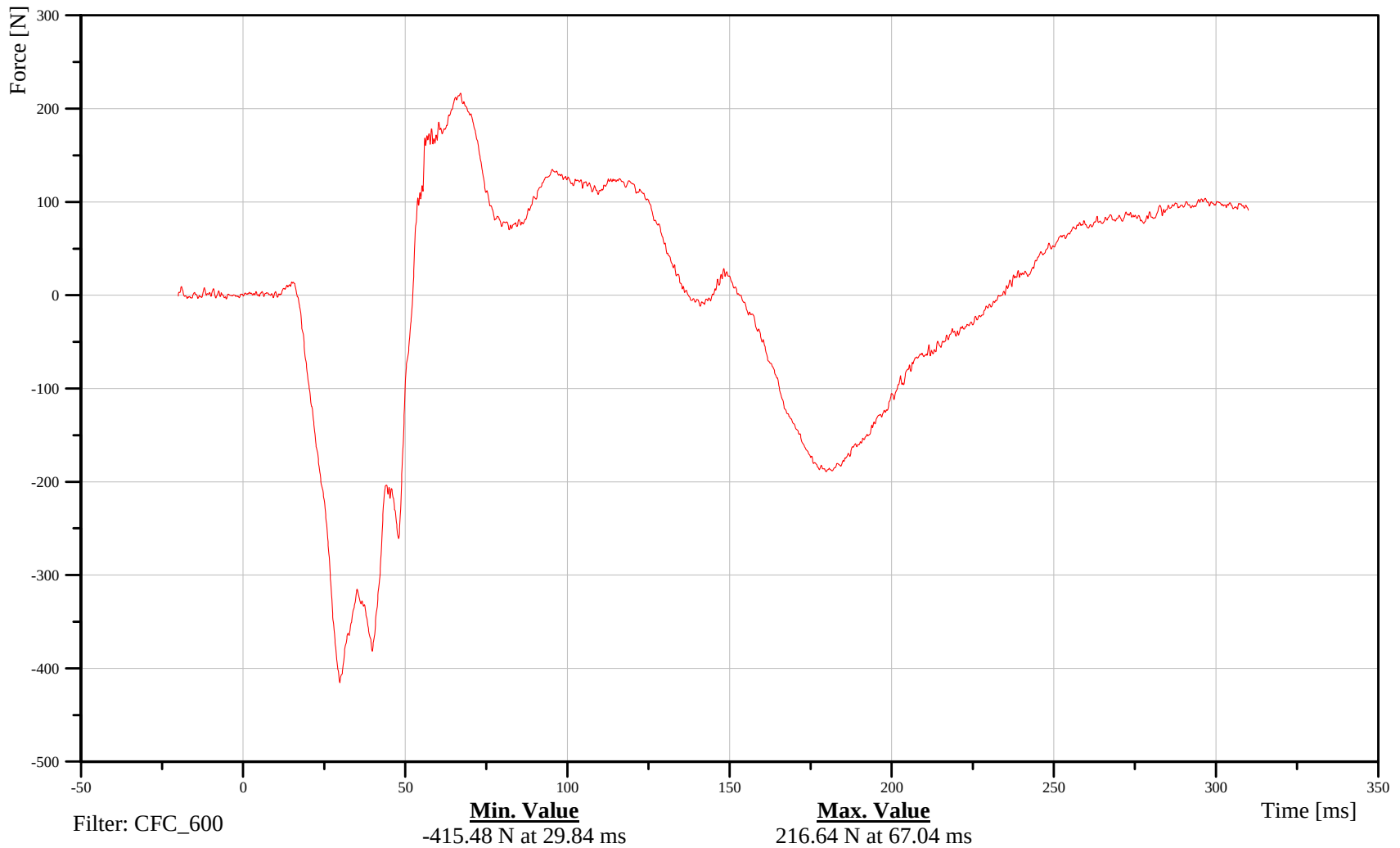
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11LUSP0000WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-140

080911-2



World SID Evaluation

Driver Lumbar Y-Axis Force

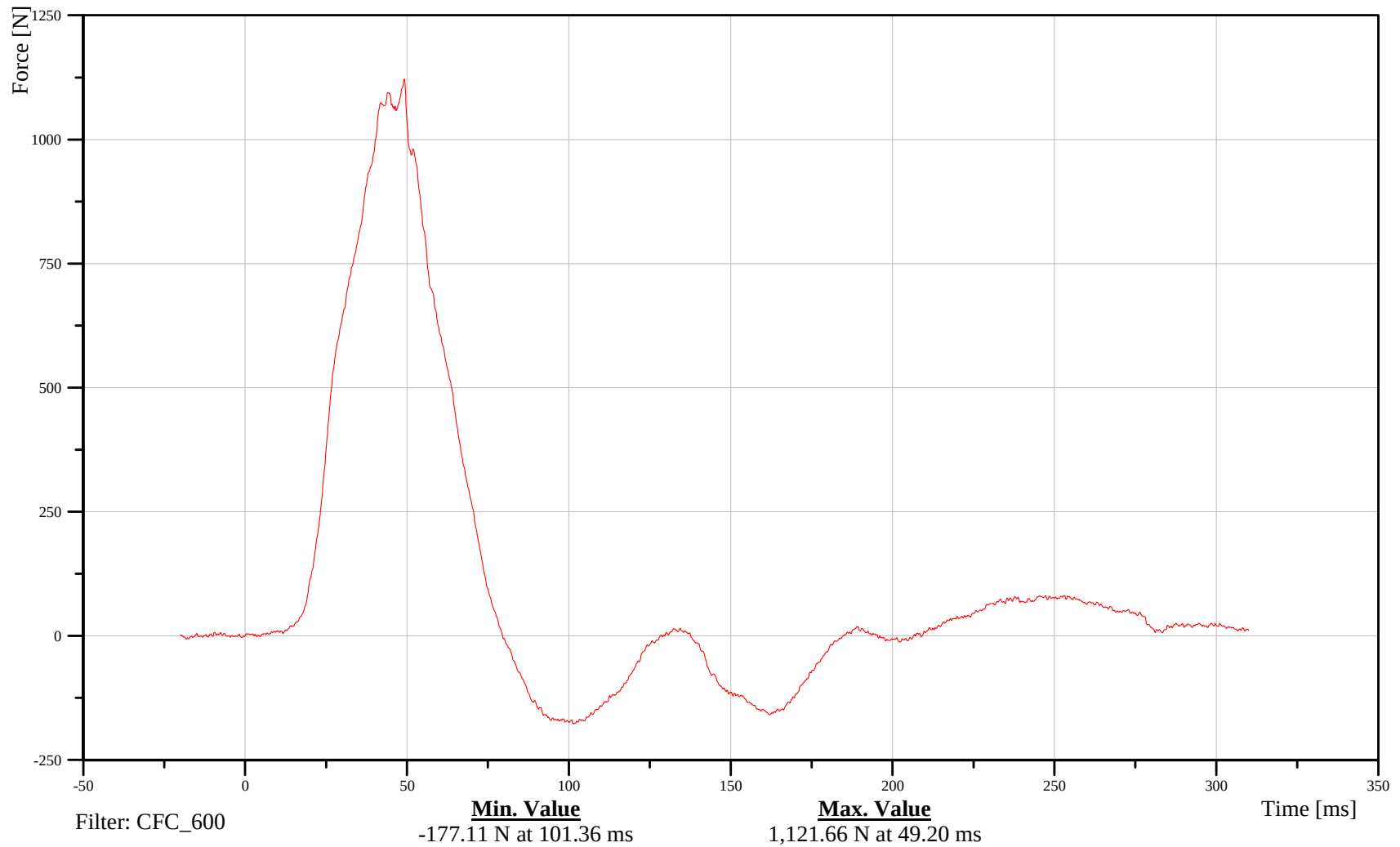
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11LUSP0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-141

080911-2



World SID Evaluation Driver Lumbar Z-Axis Force

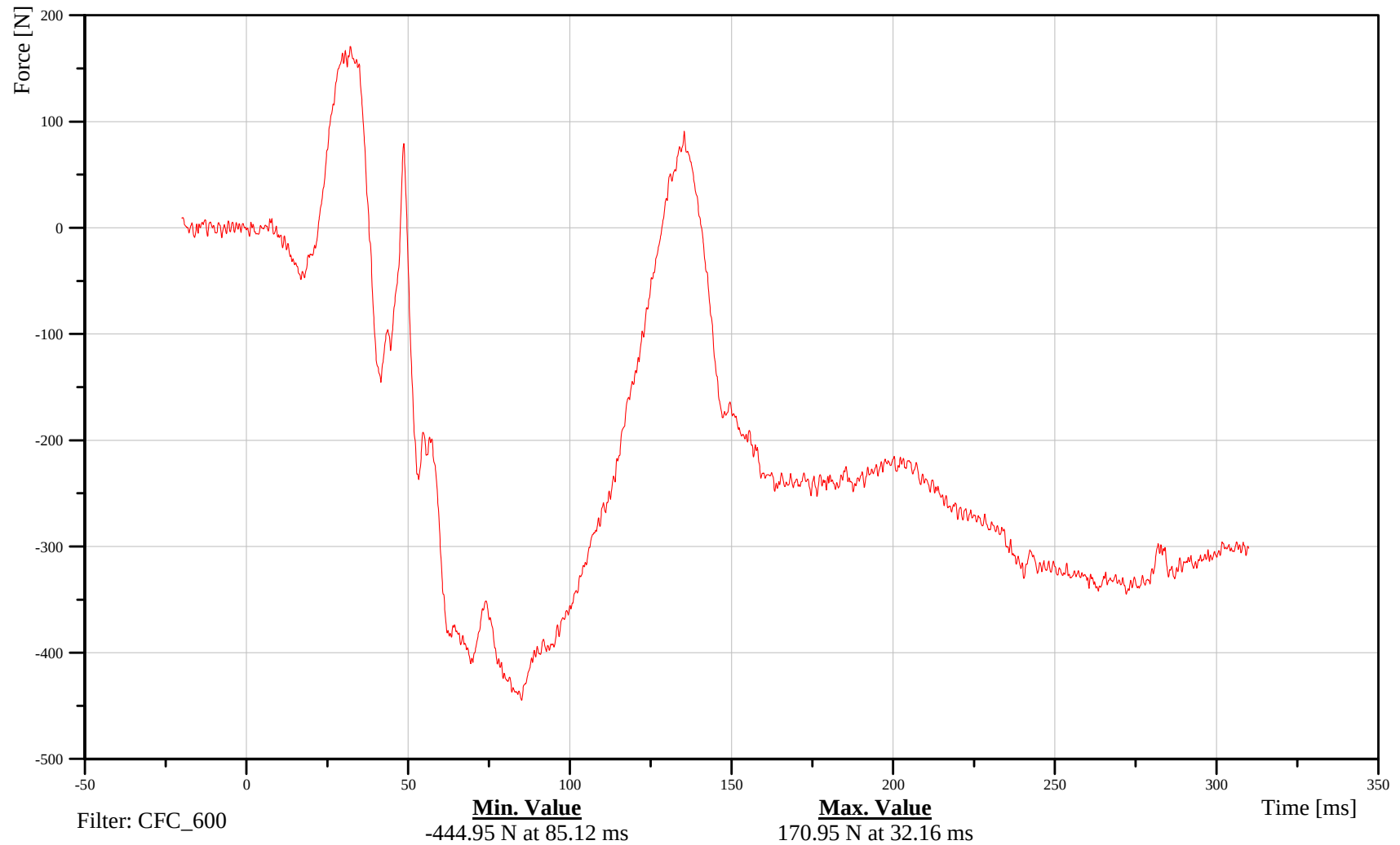
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11LUSP0000WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-142

080911-2



World SID Evaluation

Driver Lumbar Moment About X Axis

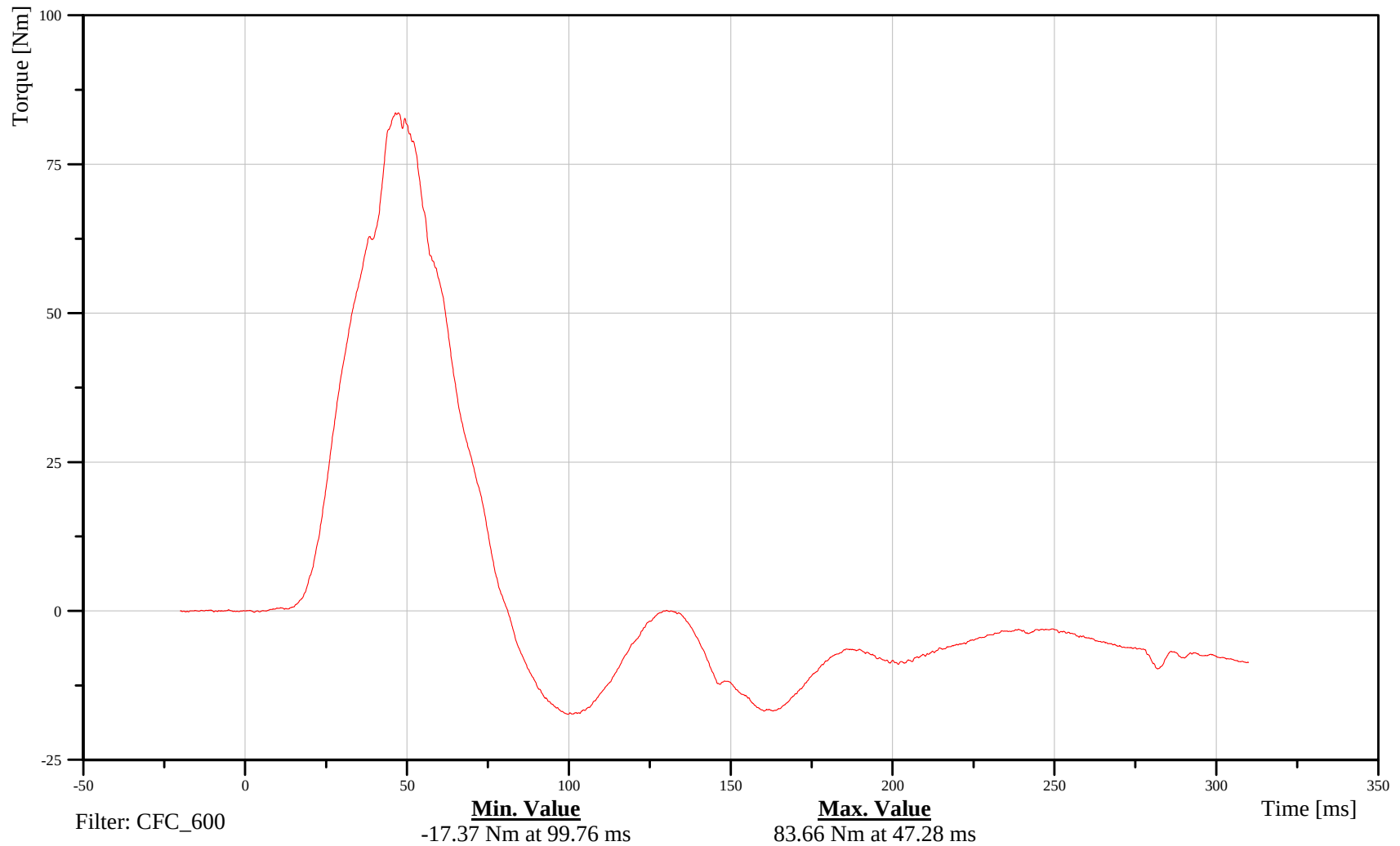
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11LUSP0000WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-143

080911-2



World SID Evaluation

Driver Lumbar Moment About Y Axis

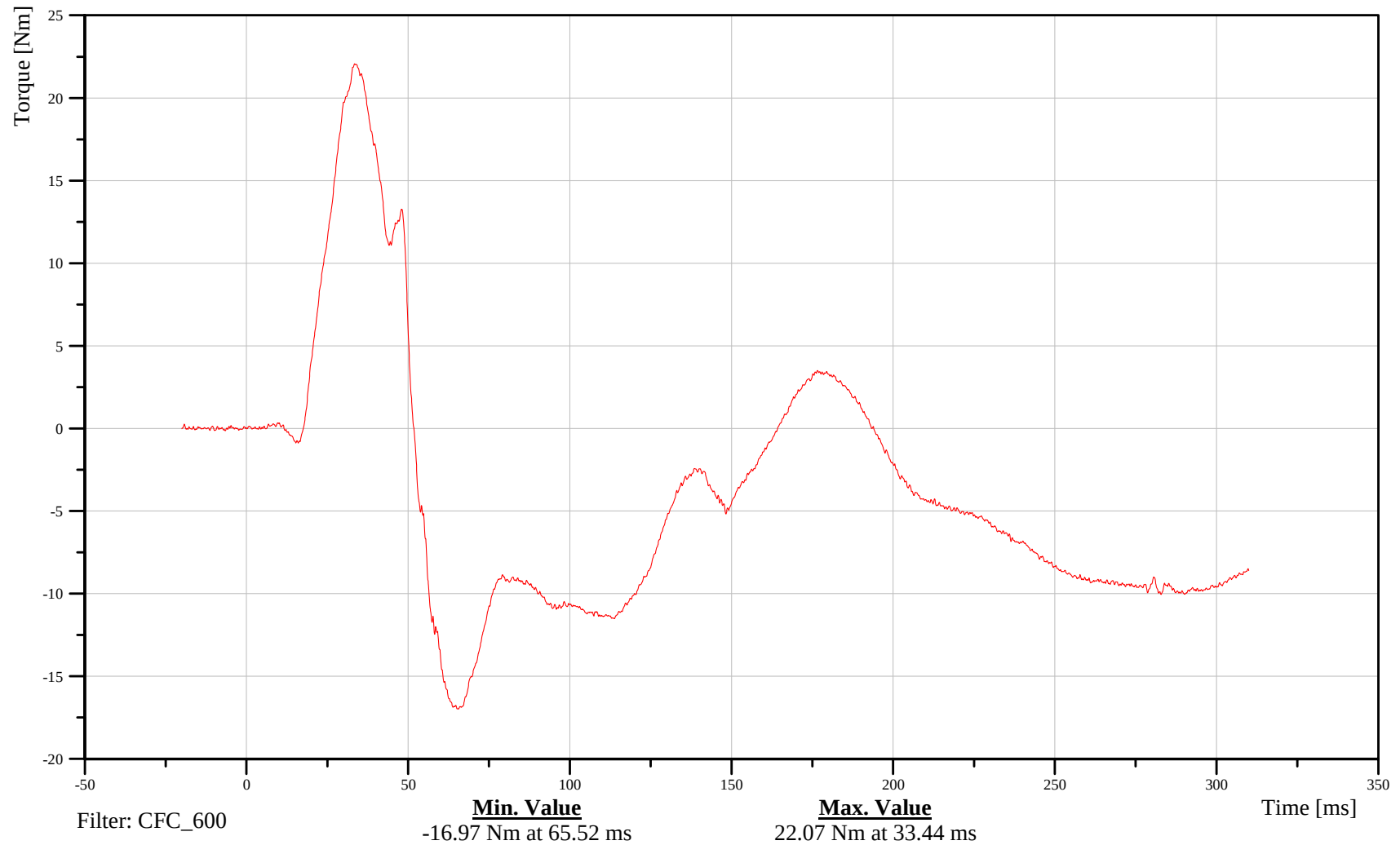
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11LUSP0000WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-144

080911-2



World SID Evaluation

Driver Lumbar Moment About Z Axis

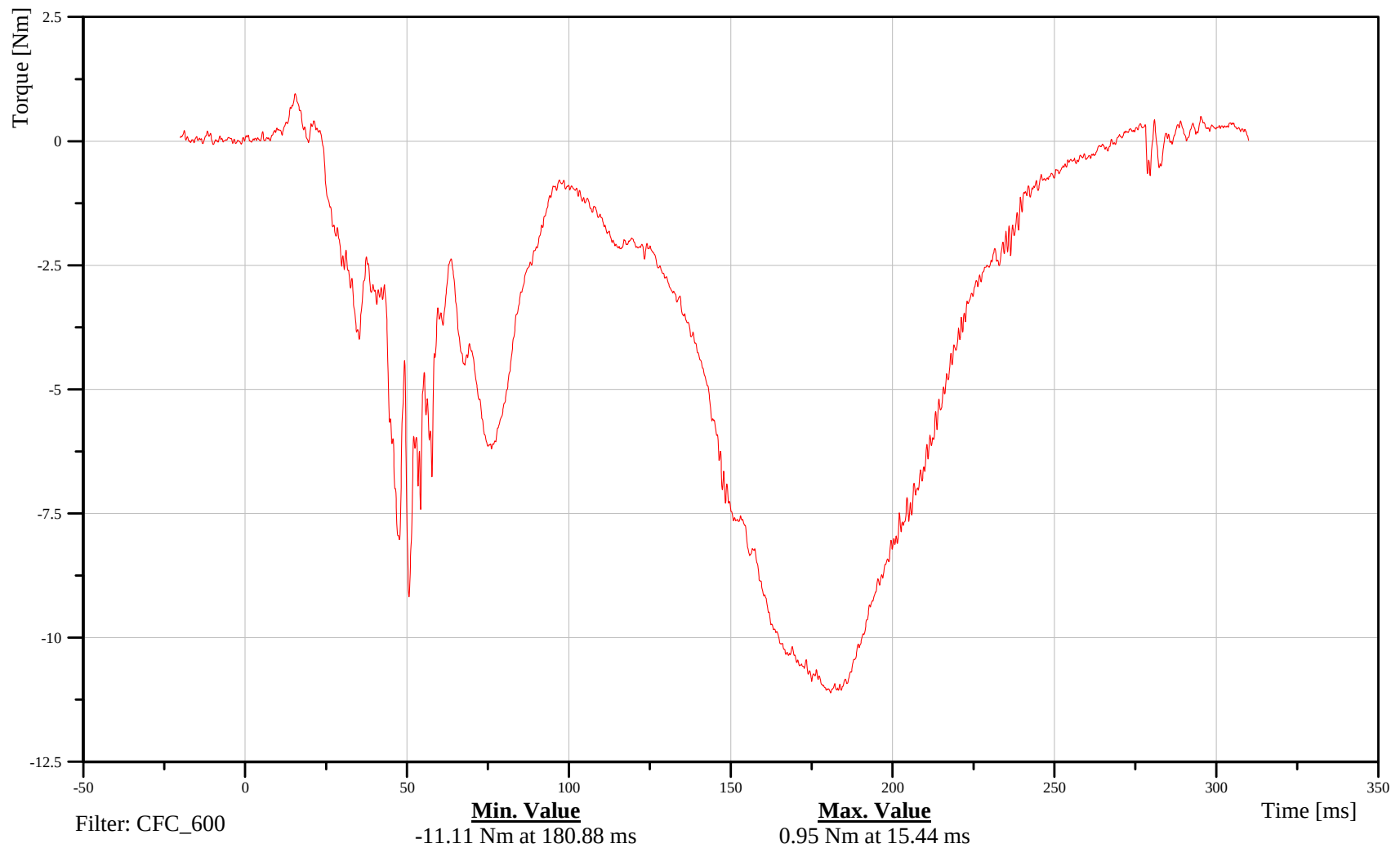
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11LUSP0000WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-145

080911-2



World SID Evaluation
Driver Pelvis X-Axis Acceleration

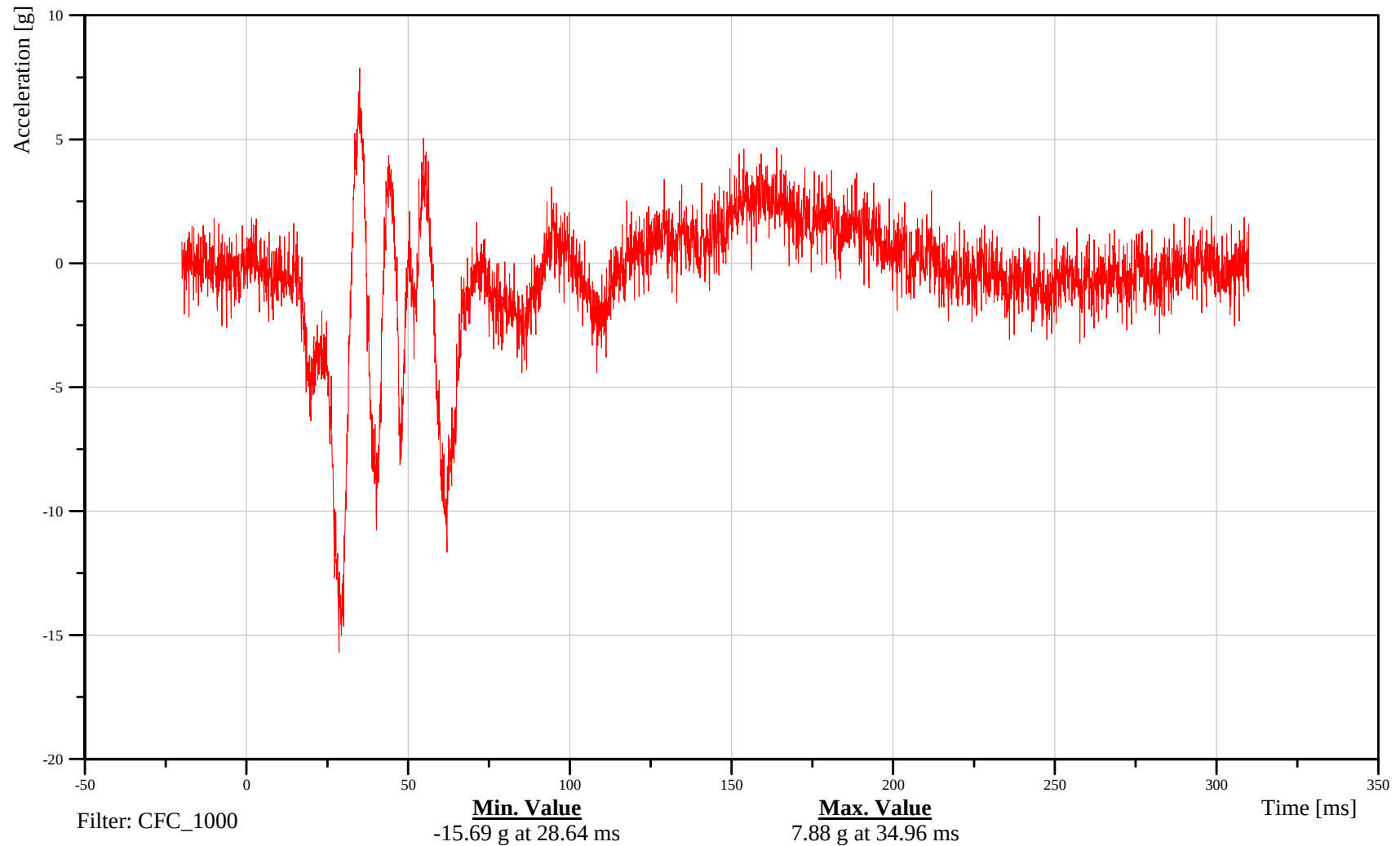
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11PELVCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-146

080911-2



World SID Evaluation
Driver Pelvis Y-Axis Acceleration

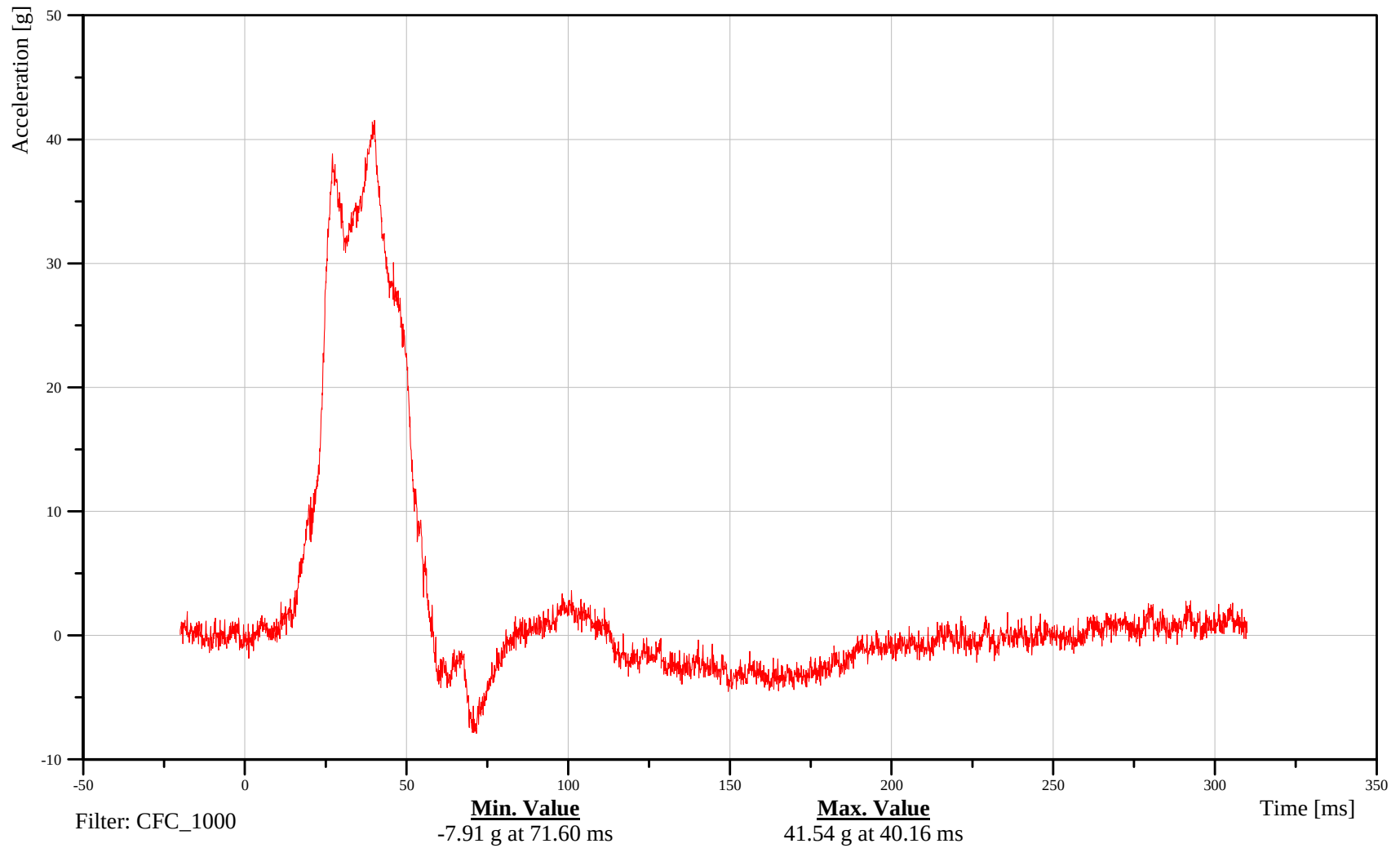
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11PELVCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-147

080911-2



World SID Evaluation
Driver Pelvis Z-Axis Acceleration

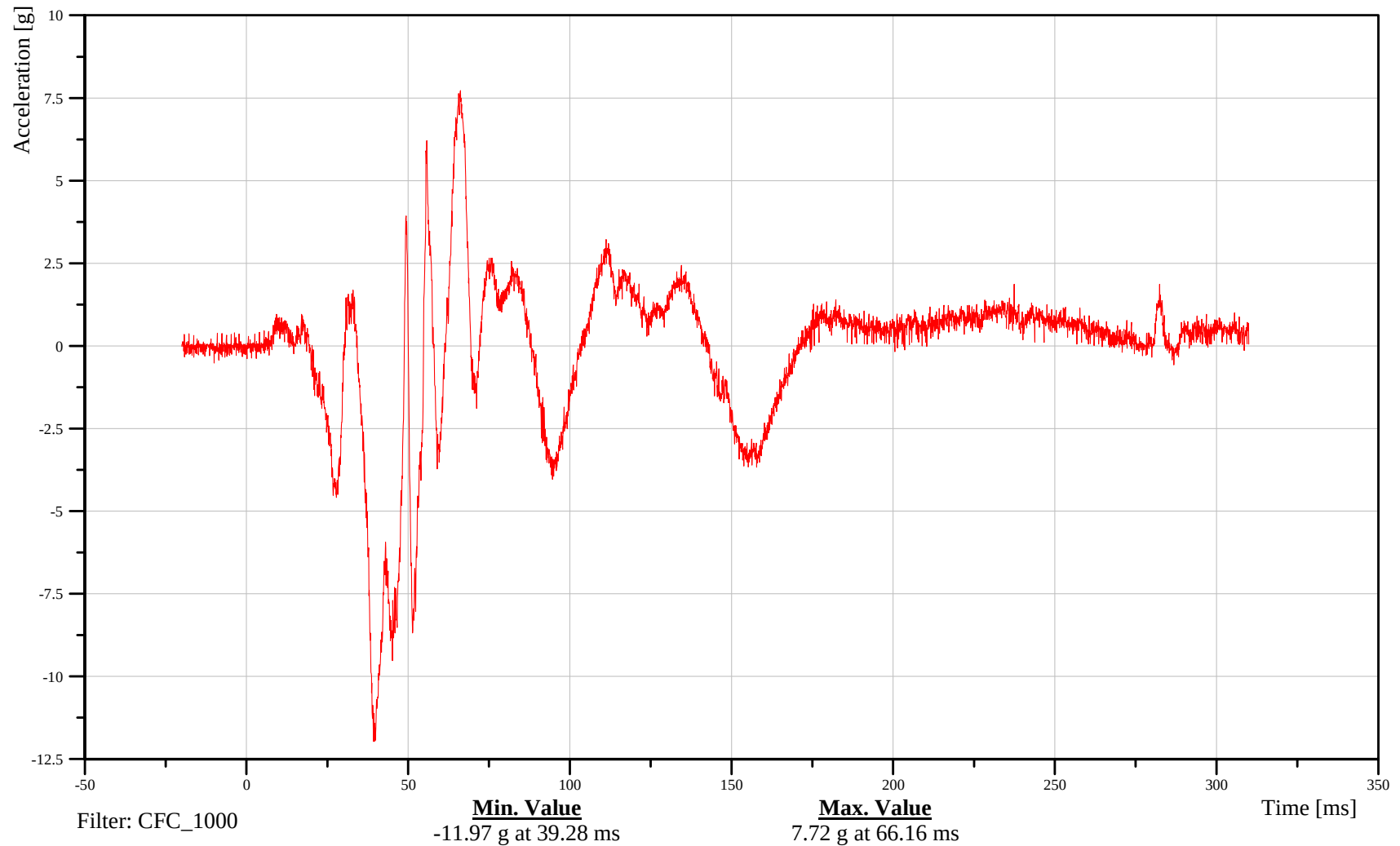
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11PELVCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-148

080911-2



World SID Evaluation

Driver Pelvis Resultant Acceleration

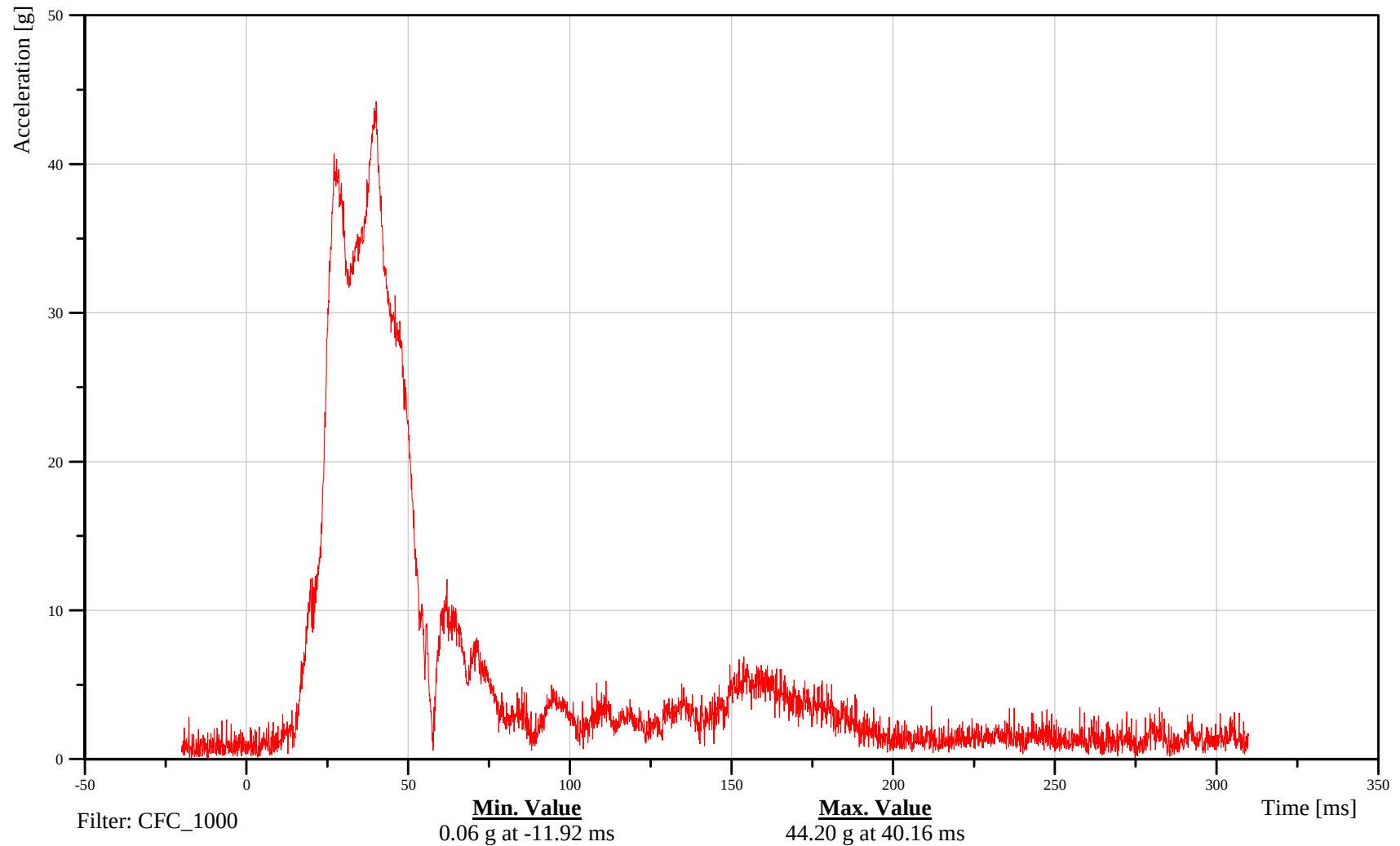
Date: 09/11/2008
Time: 16:22

Customer: VRTC

11PELVCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-149

080911-2



World SID Evaluation

Driver Pubic Y-Axis Force

Date: 09/11/2008

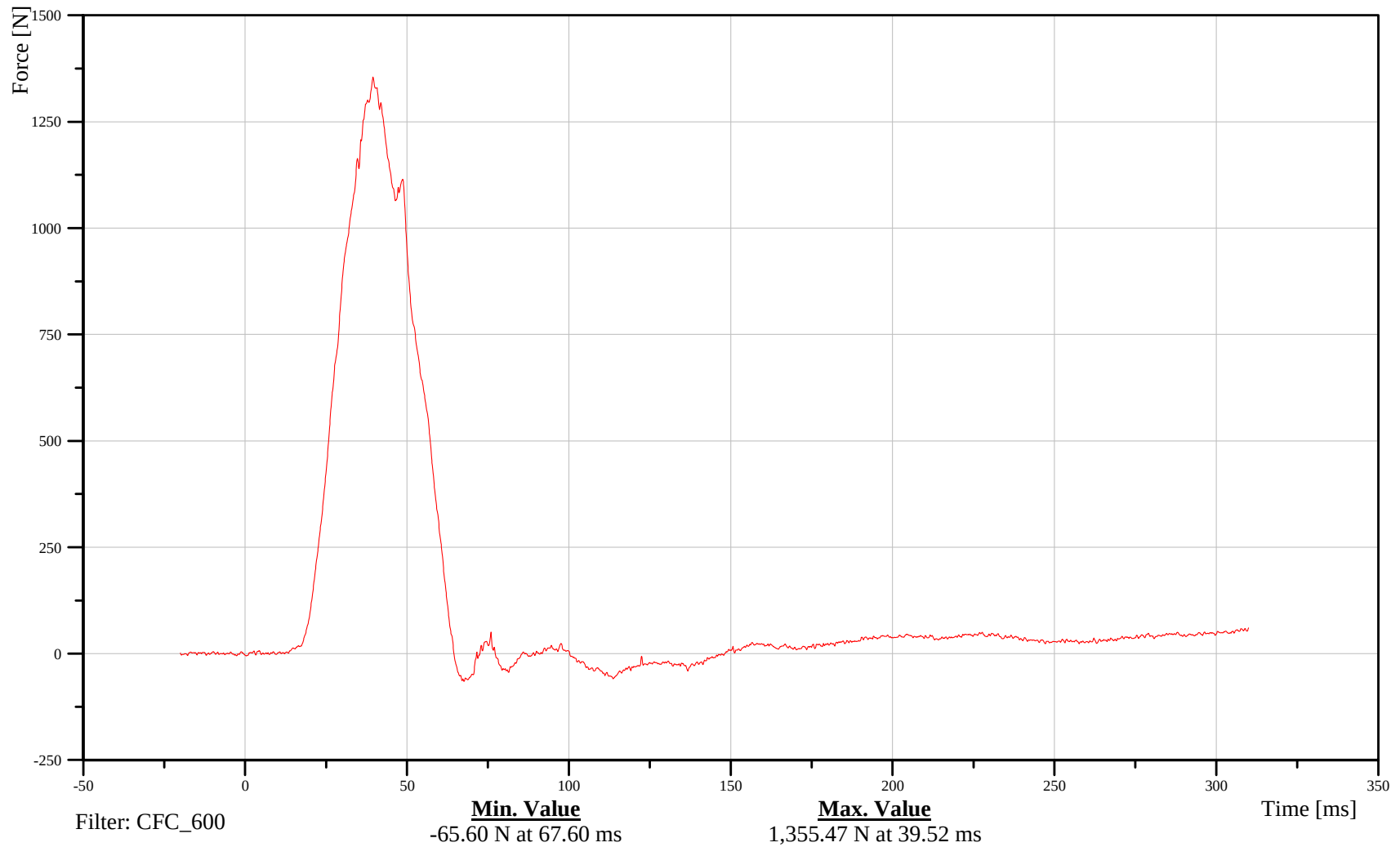
Time: 16:22

Customer: VRTC

11PUBC0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-150

080911-2



World SID Evaluation

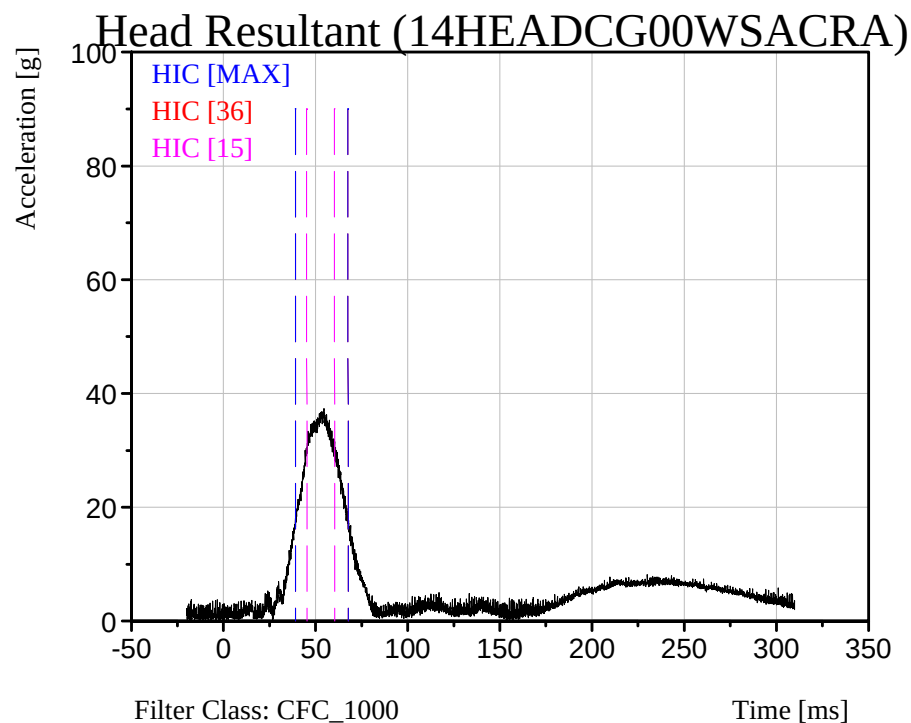
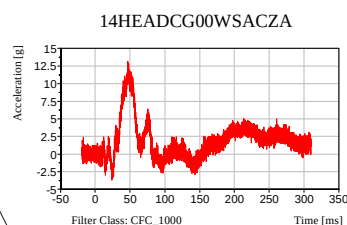
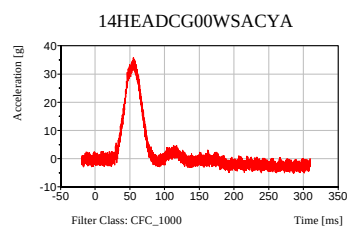
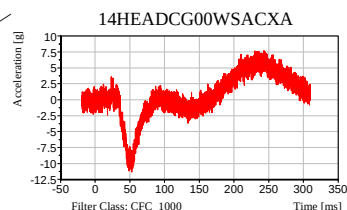
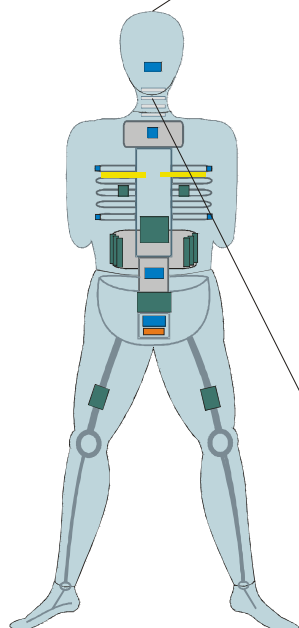
Head Injury Criterion (HIC)

Date: 09/11/2008
Time: 16:22

Customer: VRTC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



	<u>T1</u> (Begin)	<u>T2</u> (End)	<u>Avg. g T1 to T2</u>
HIC [Max.] = 130.74	39.20 ms	67.68 ms	29.12 g
HIC [36] = 130.74	39.20 ms	67.68 ms	29.12 g
HIC [15] = 100.37	45.28 ms	60.32 ms	33.85 g

Dummy:
Seating Position:
Left Rear Passenger

HIC Source Code: SAE J2052 ISO/TC22/SC12/WG3 N 282 (Issued 1990-03-16)

B-151

080911-2



World SID Evaluation
Passenger Head X-Axis Acceleration

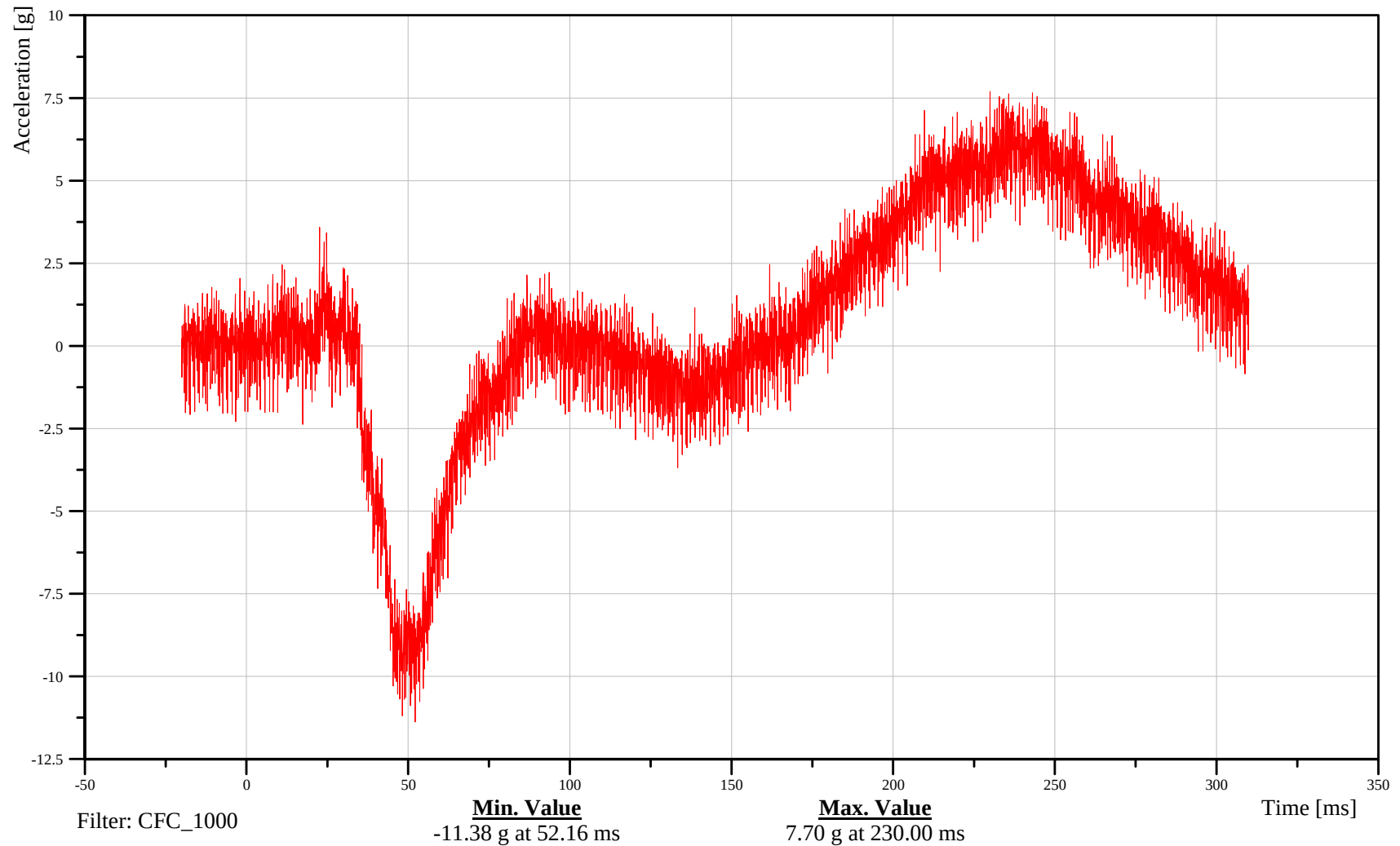
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14HEADCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-152

080911-2



World SID Evaluation
Passenger Head Y-Axis Acceleration

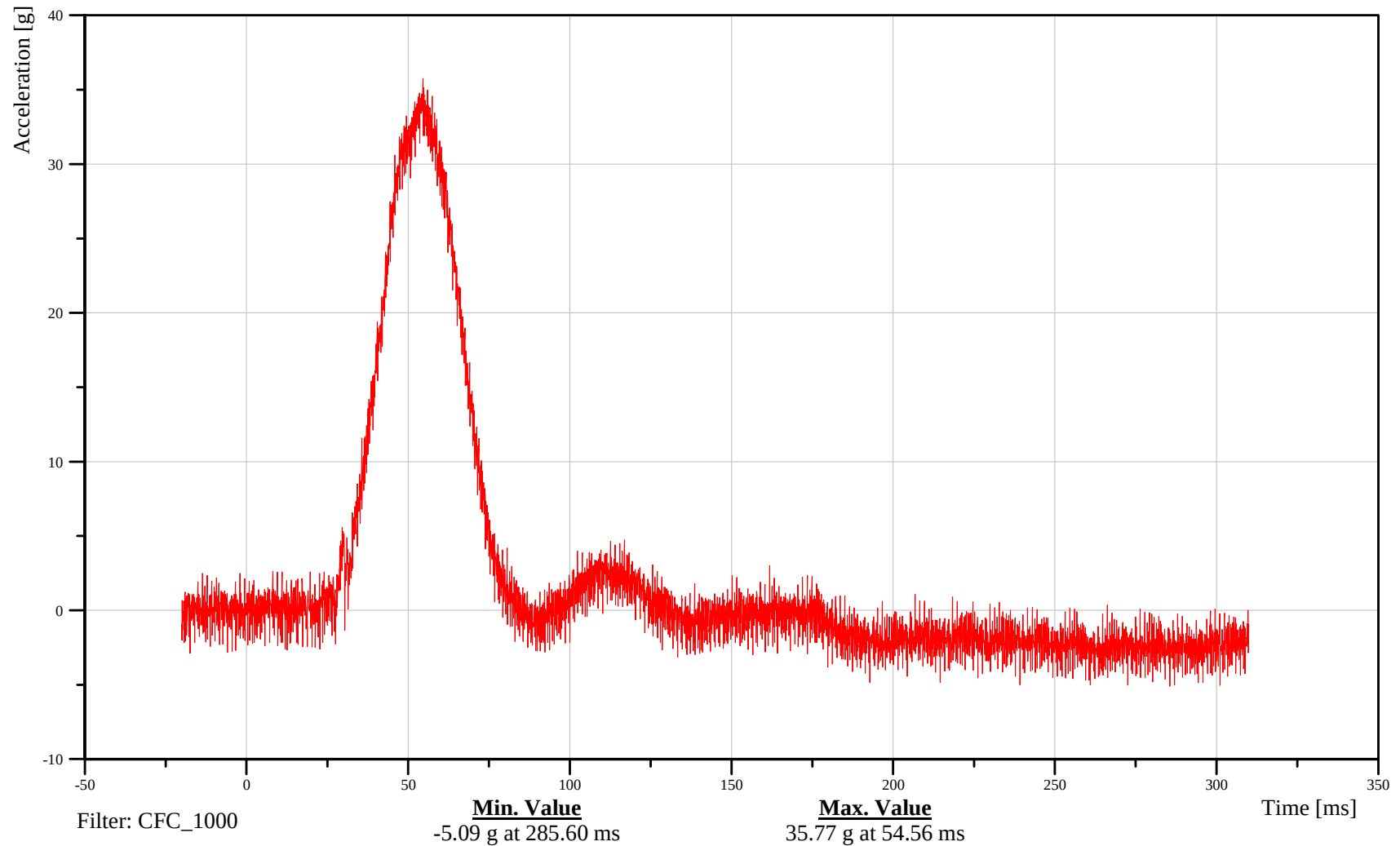
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14HEADCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-153

080911-2



World SID Evaluation
Passenger Head Z-Axis Acceleration

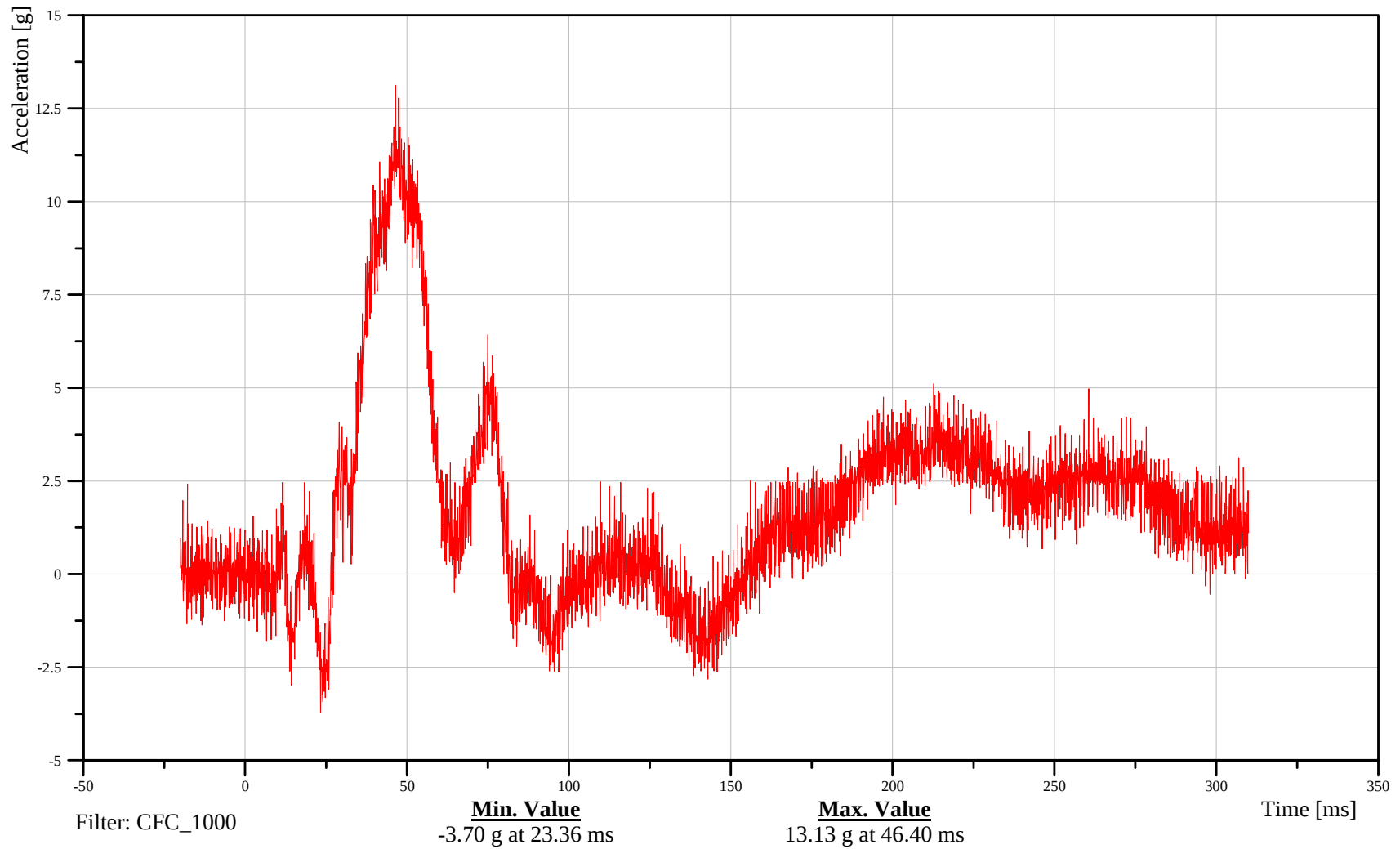
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14HEADCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-154

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

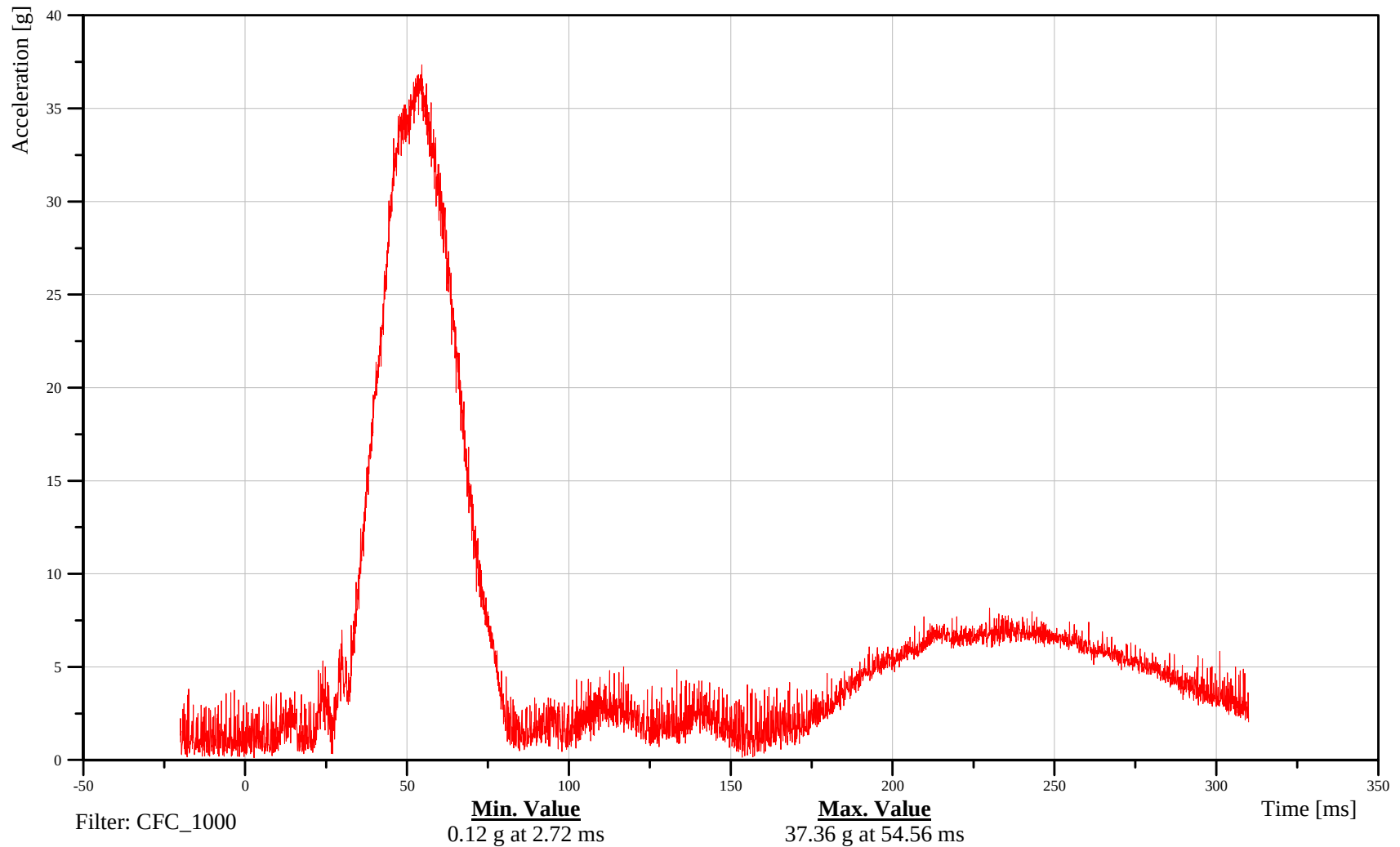
Passenger Head Resultant Acceleration

Customer: VRTC

14HEADCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-155

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

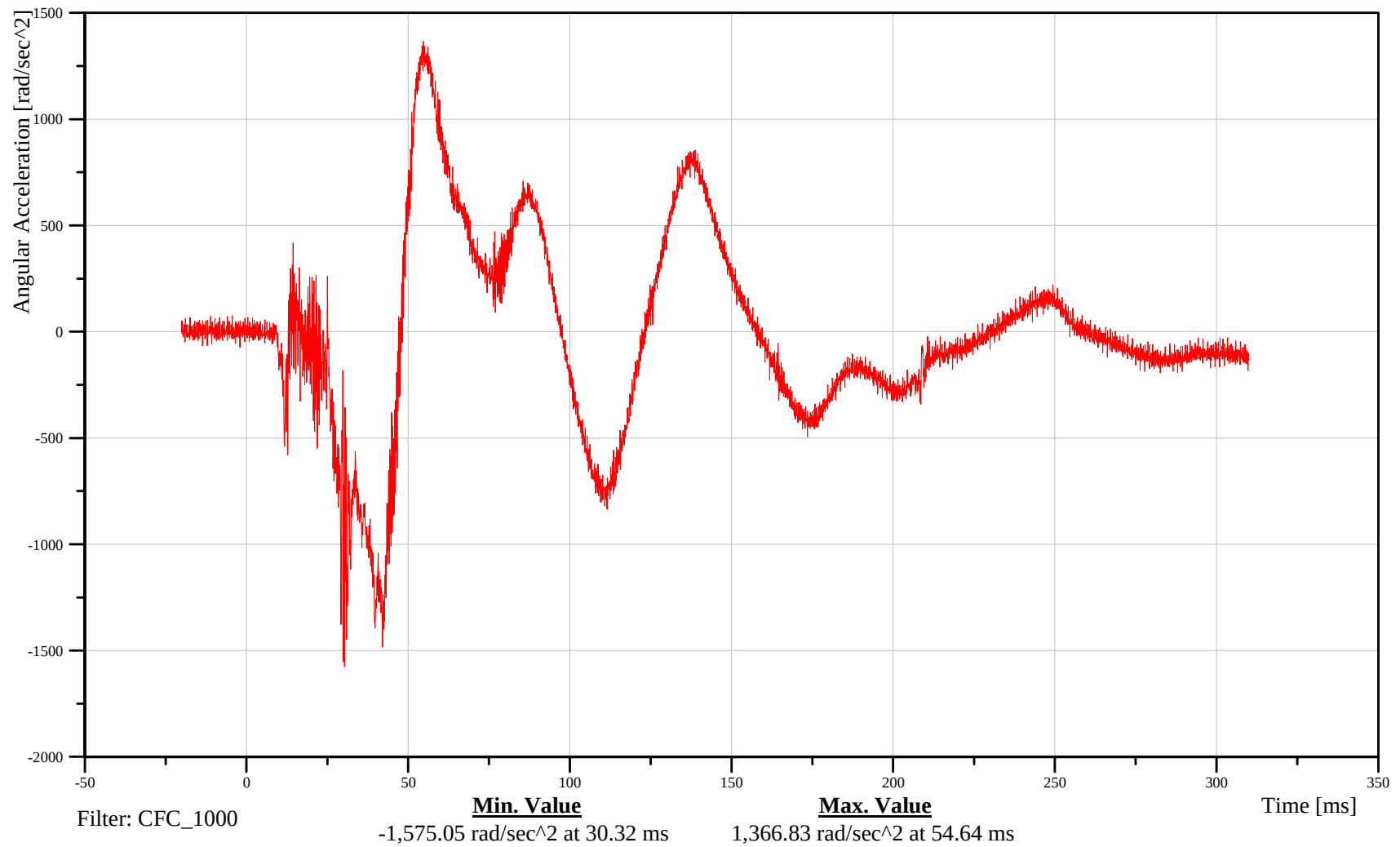
Passenger Head X-Axis Angular Displacement

Customer: VRTC

14HEADCG00WSANXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-156

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

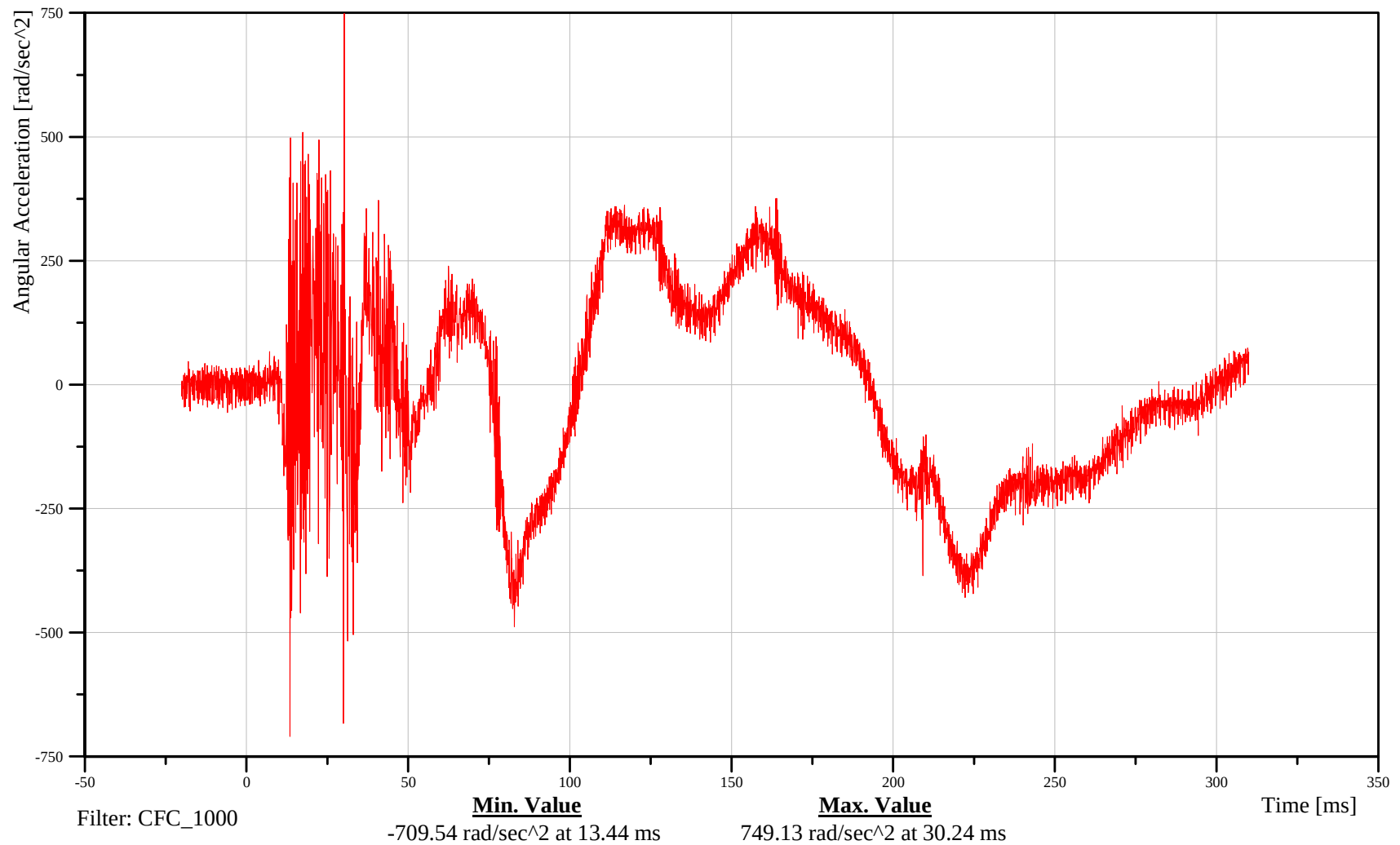
Passenger Head Y-Axis Angular Displacement

Customer: VRTC

14HEADCG00WSANYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-157

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

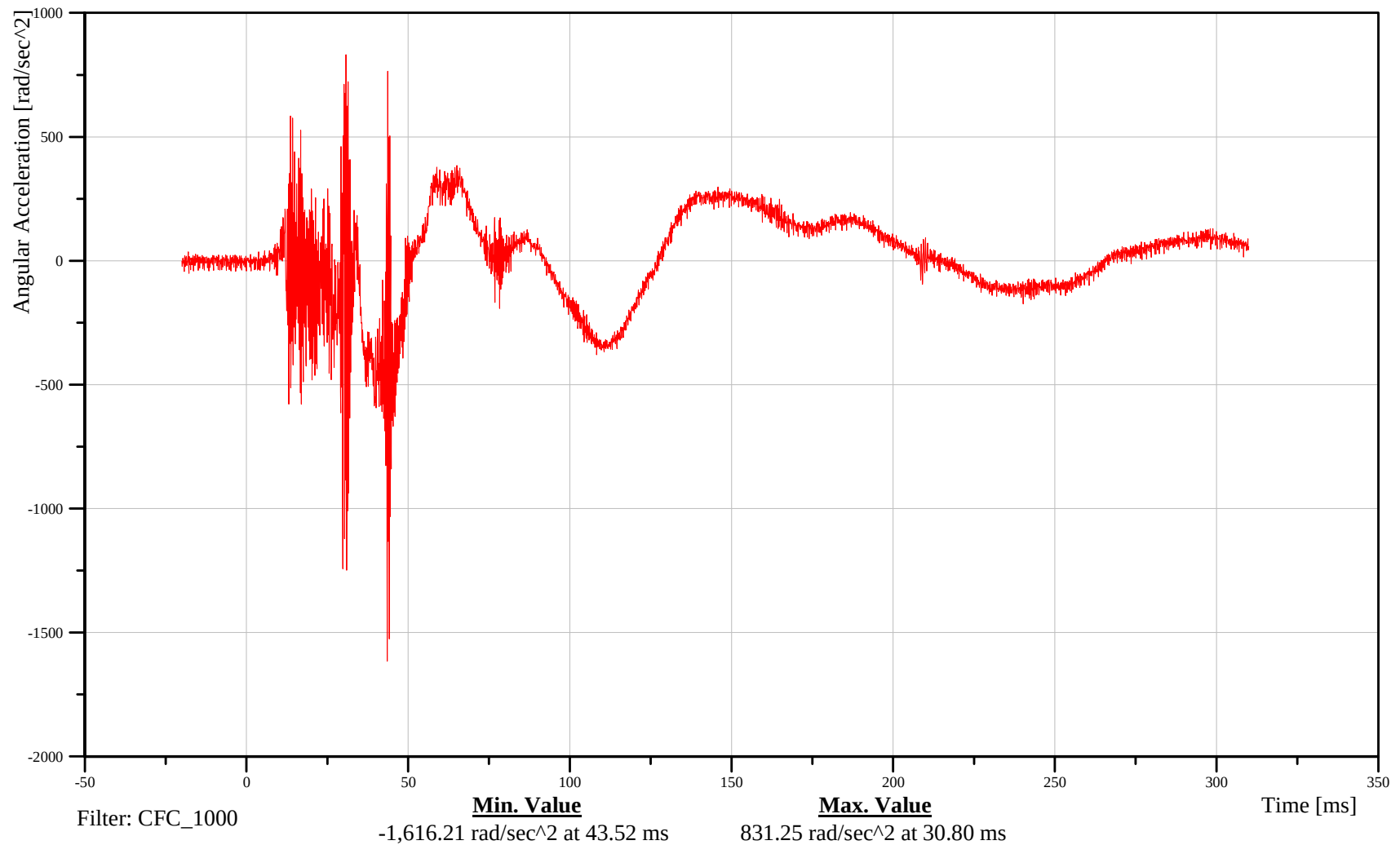
Passenger Head Z-Axis Angular Displacement

Customer: VRTC

14HEADCG00WSANZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-158

080911-2



World SID Evaluation
Passenger Upper Neck X-Axis Force

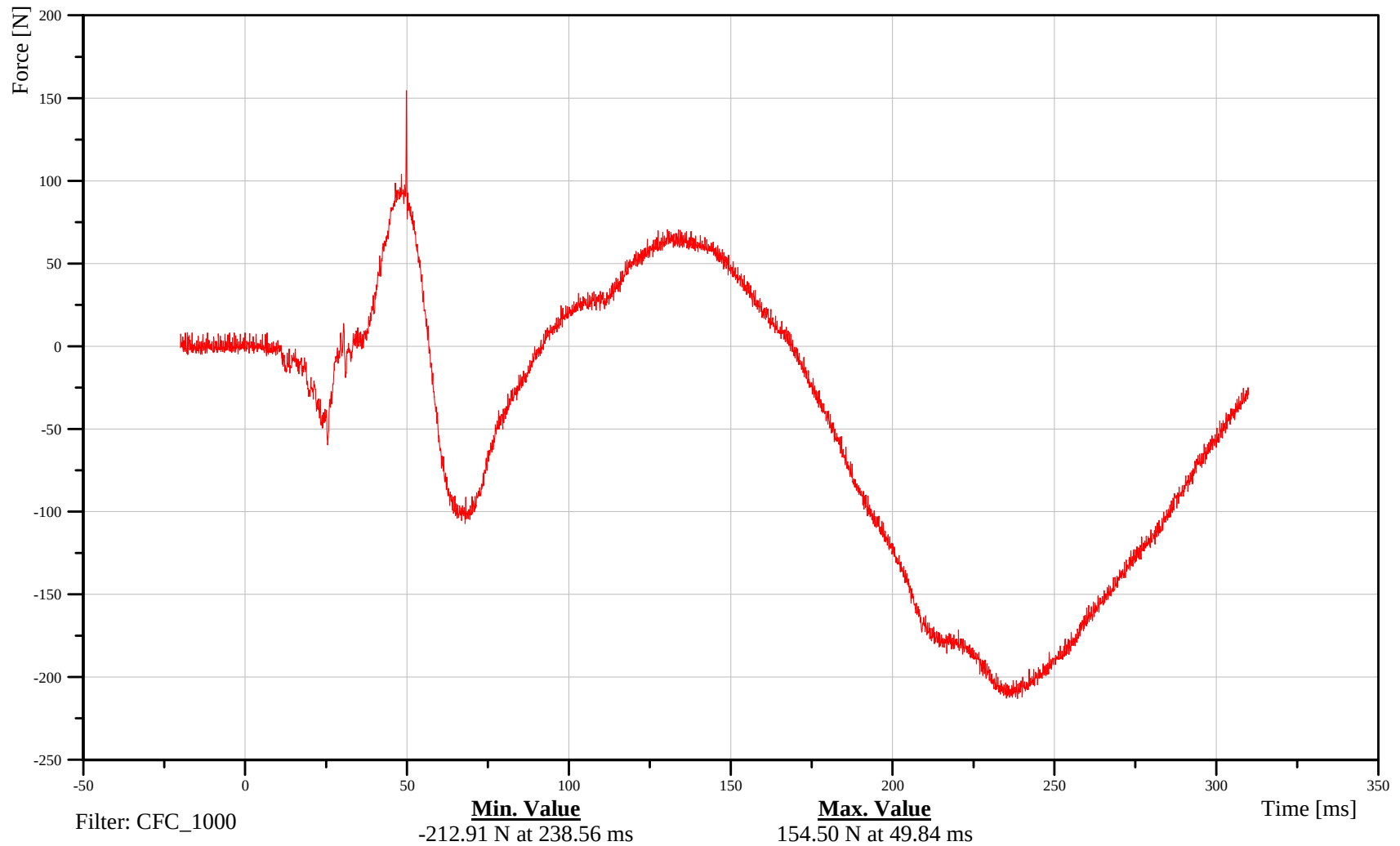
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14NECKUP00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-159

080911-2



World SID Evaluation
Passenger Upper Neck Y-Axis Force

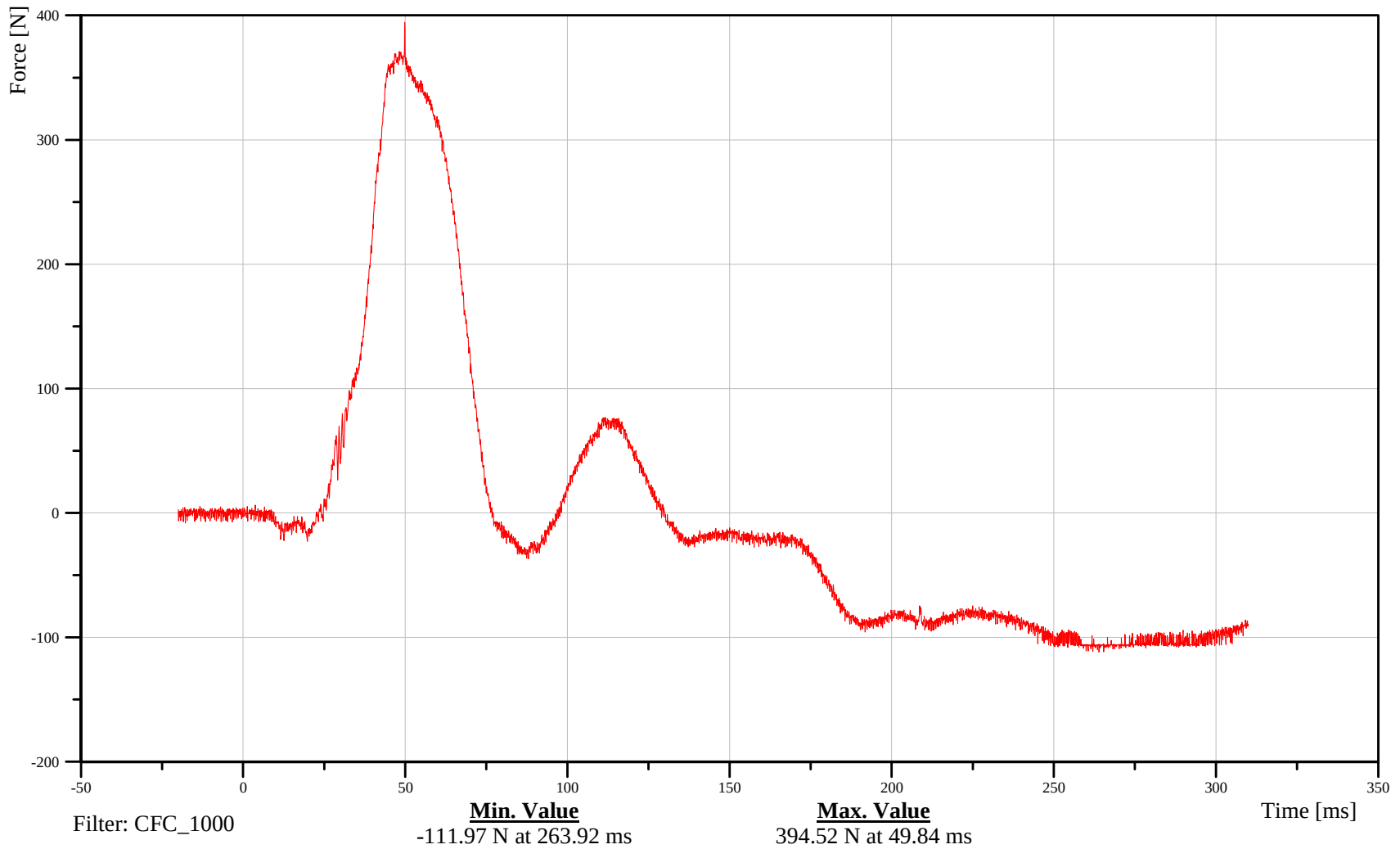
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14NECKUP00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-160

080911-2



World SID Evaluation
Passenger Upper Neck Z-Axis Force

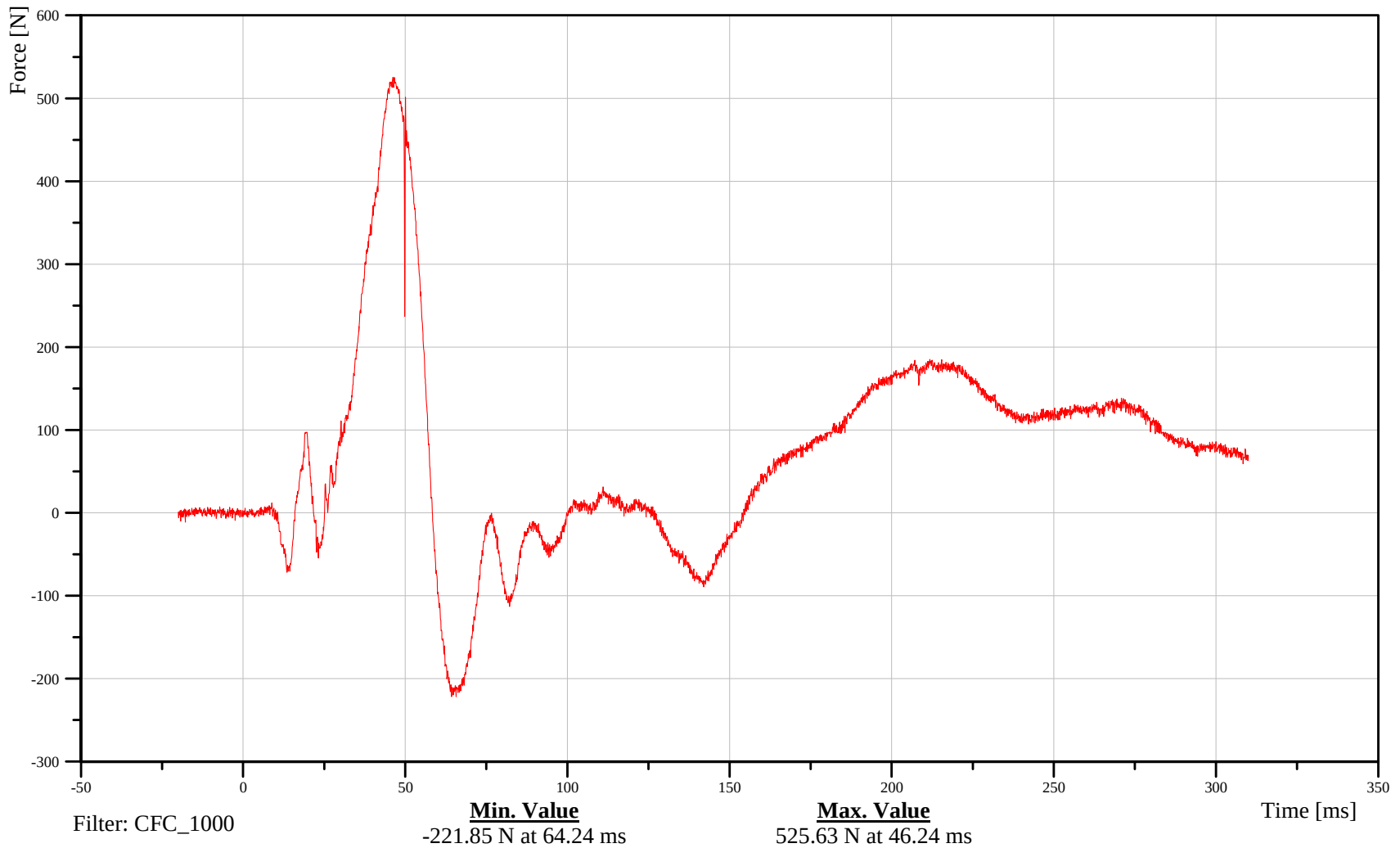
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14NECKUP00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-161

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

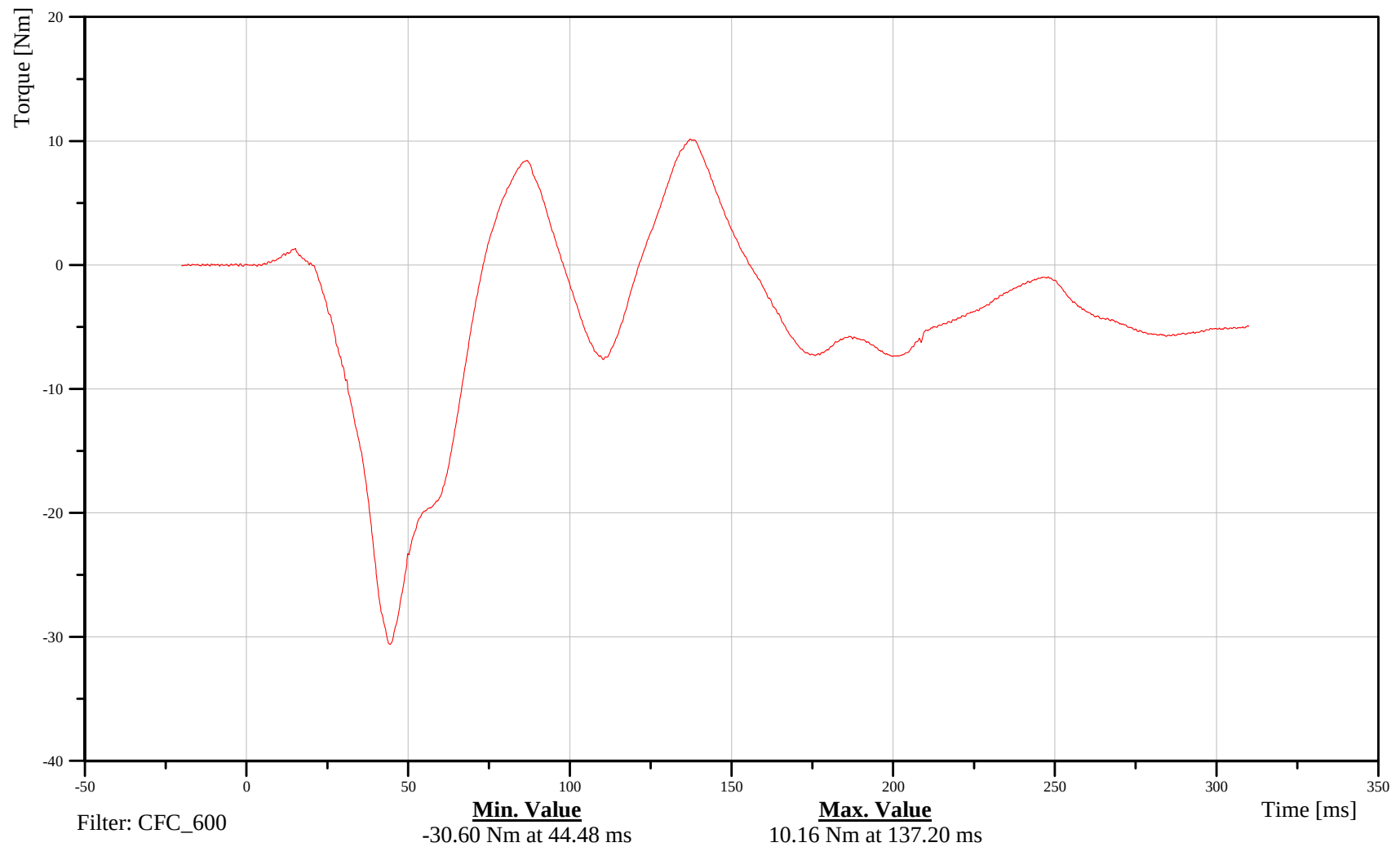
Passenger Upper Neck Moment About X Axis

Customer: VRTC

14NECKUP00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-162

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

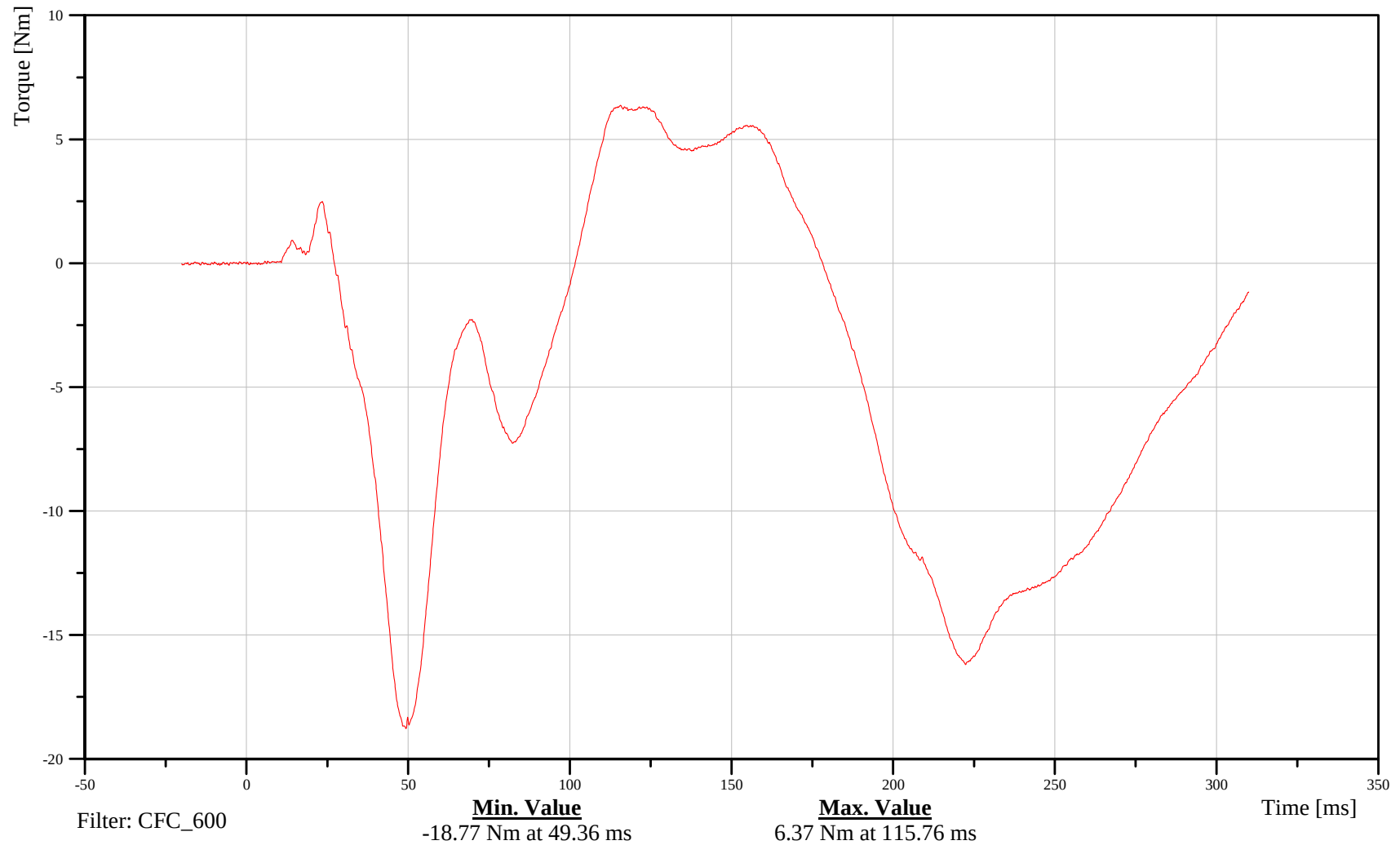
Passenger Upper Neck Moment About Y Axis

Customer: VRTC

14NECKUP00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-163

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

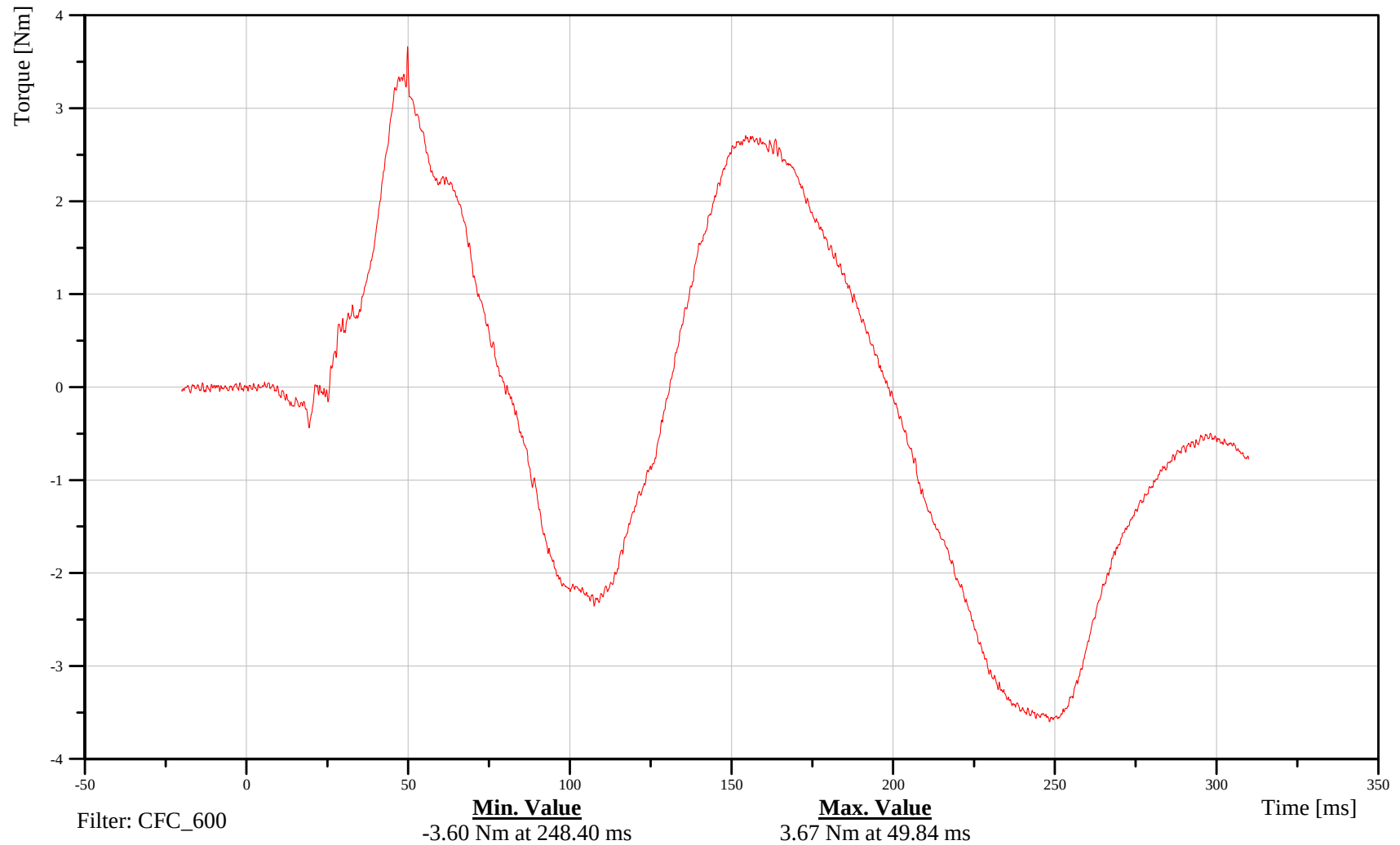
Passenger Upper Neck Moment About Z Axis

Customer: VRTC

14NECKUP00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-164

080911-2



World SID Evaluation
Passenger Lower Neck X-Axis Force

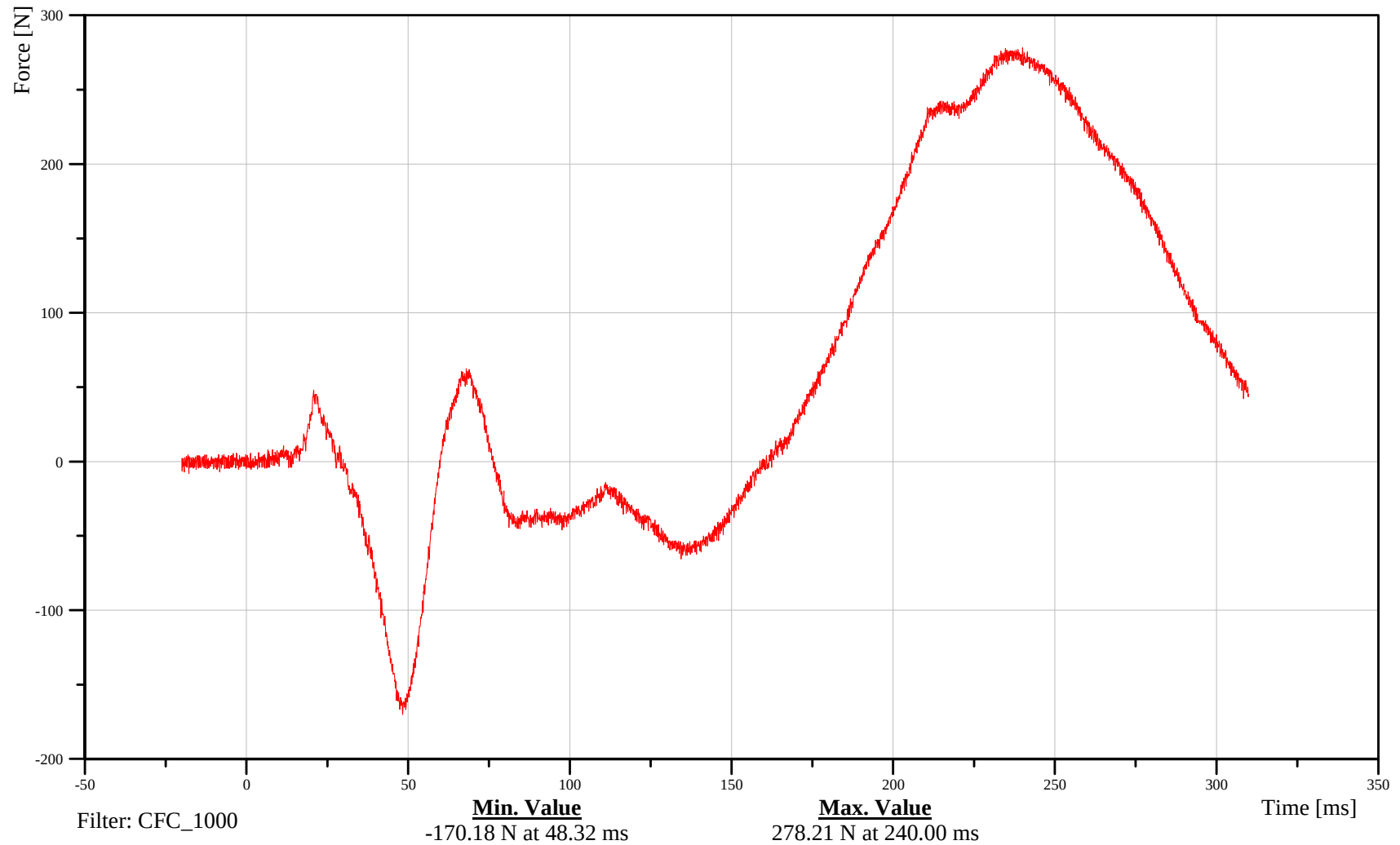
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14NECKLO00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-165

080911-2



World SID Evaluation
Passenger Lower Neck Y-Axis Force

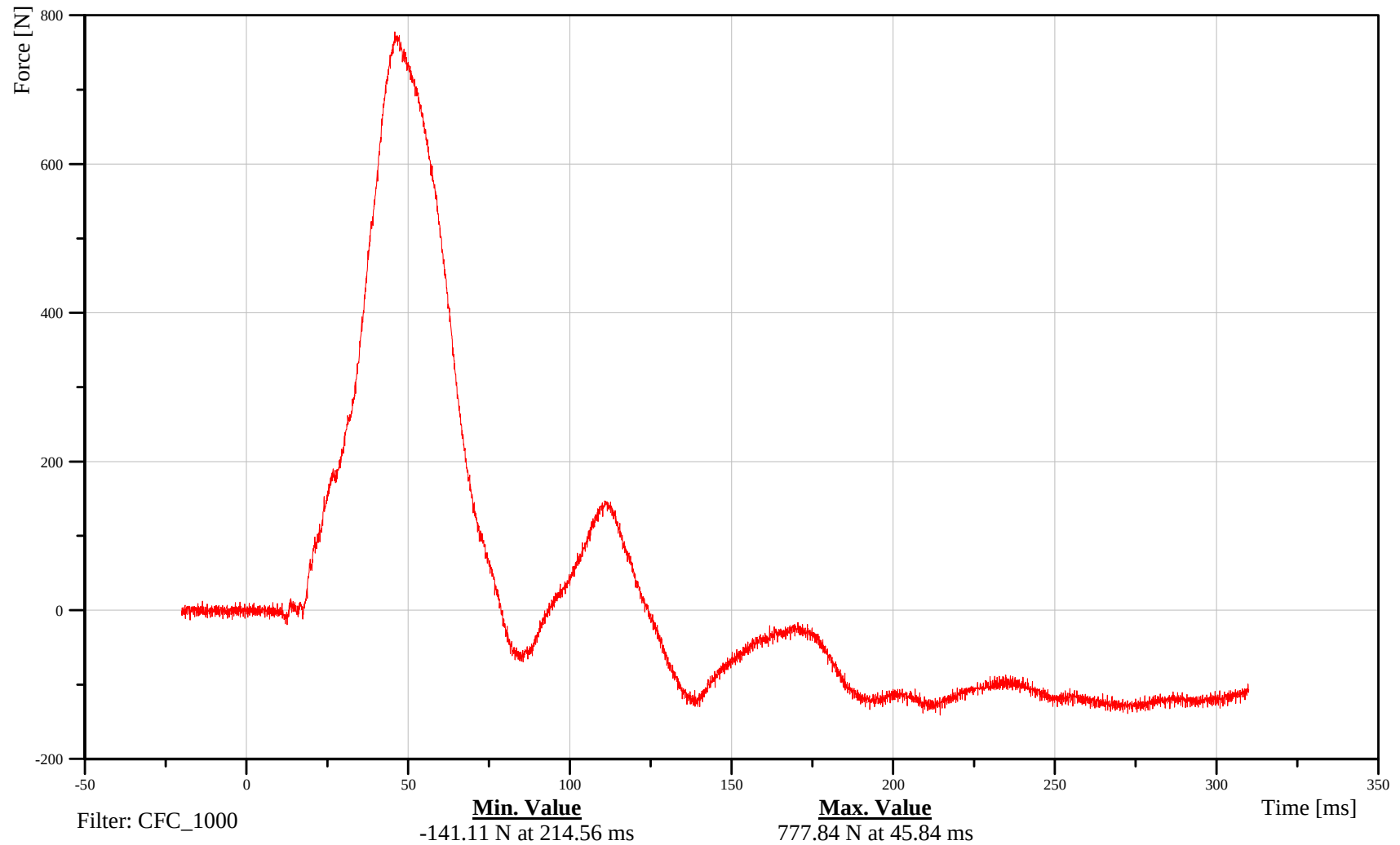
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14NECKLO00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-166

080911-2



World SID Evaluation
Passenger Lower Neck Z-Axis Force

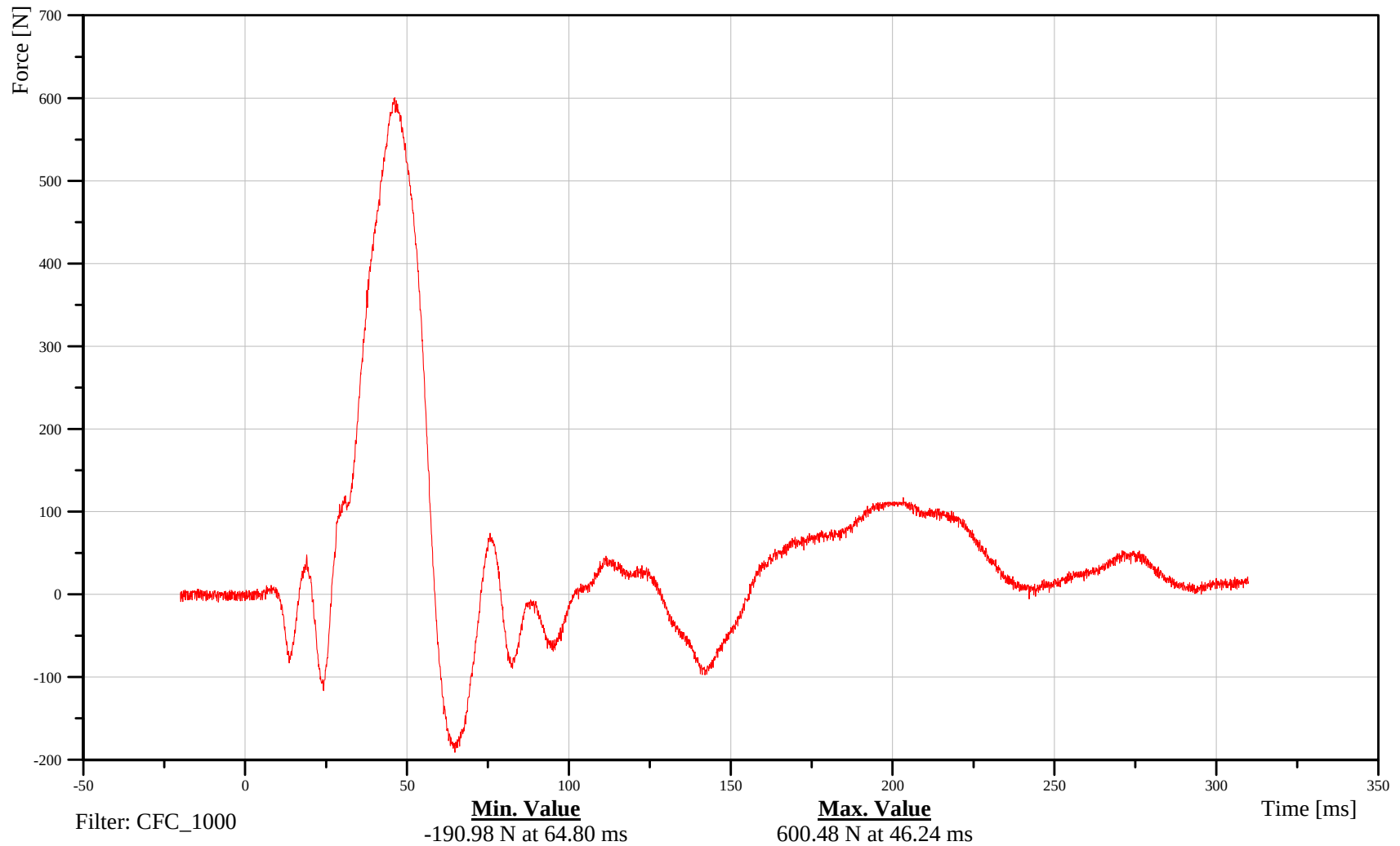
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14NECKLO00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-167

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

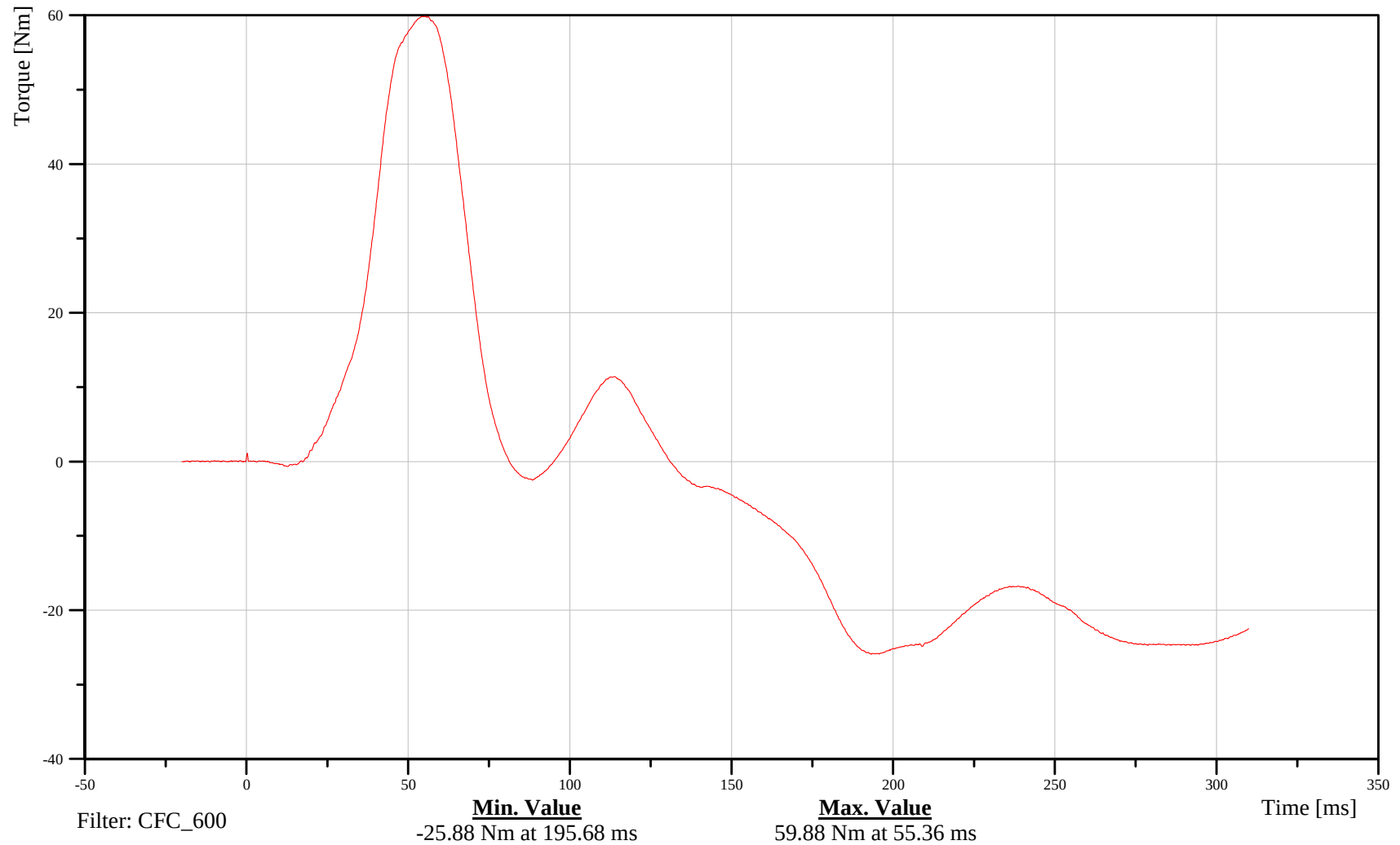
Passenger Lower Neck Moment About X Axis

Customer: VRTC

14NECKLO00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-168

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

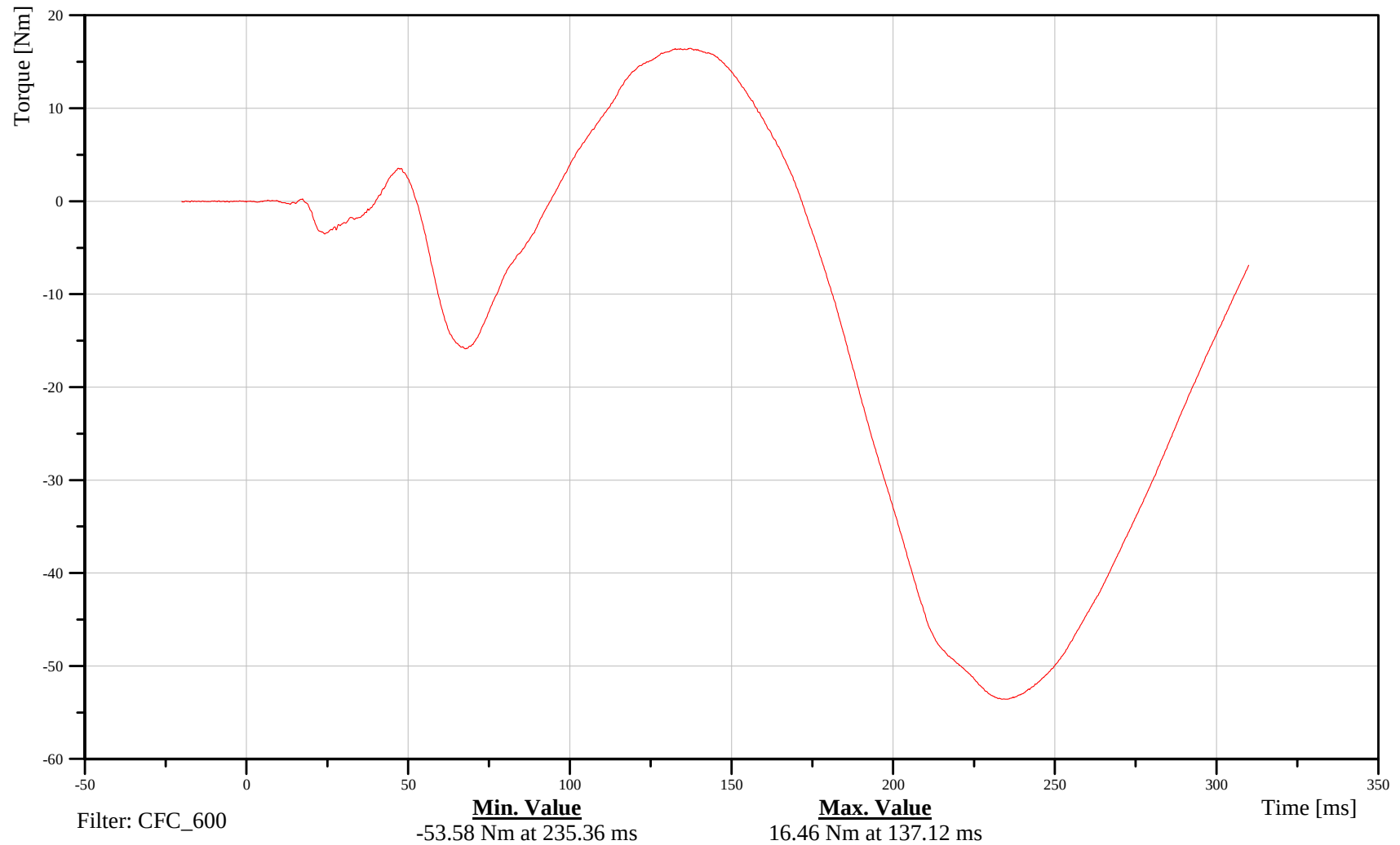
Passenger Lower Neck Moment About Y Axis

Customer: VRTC

14NECKLO00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-169

080911-2



World SID Evaluation

Passenger Lower Neck Moment About Z Axis

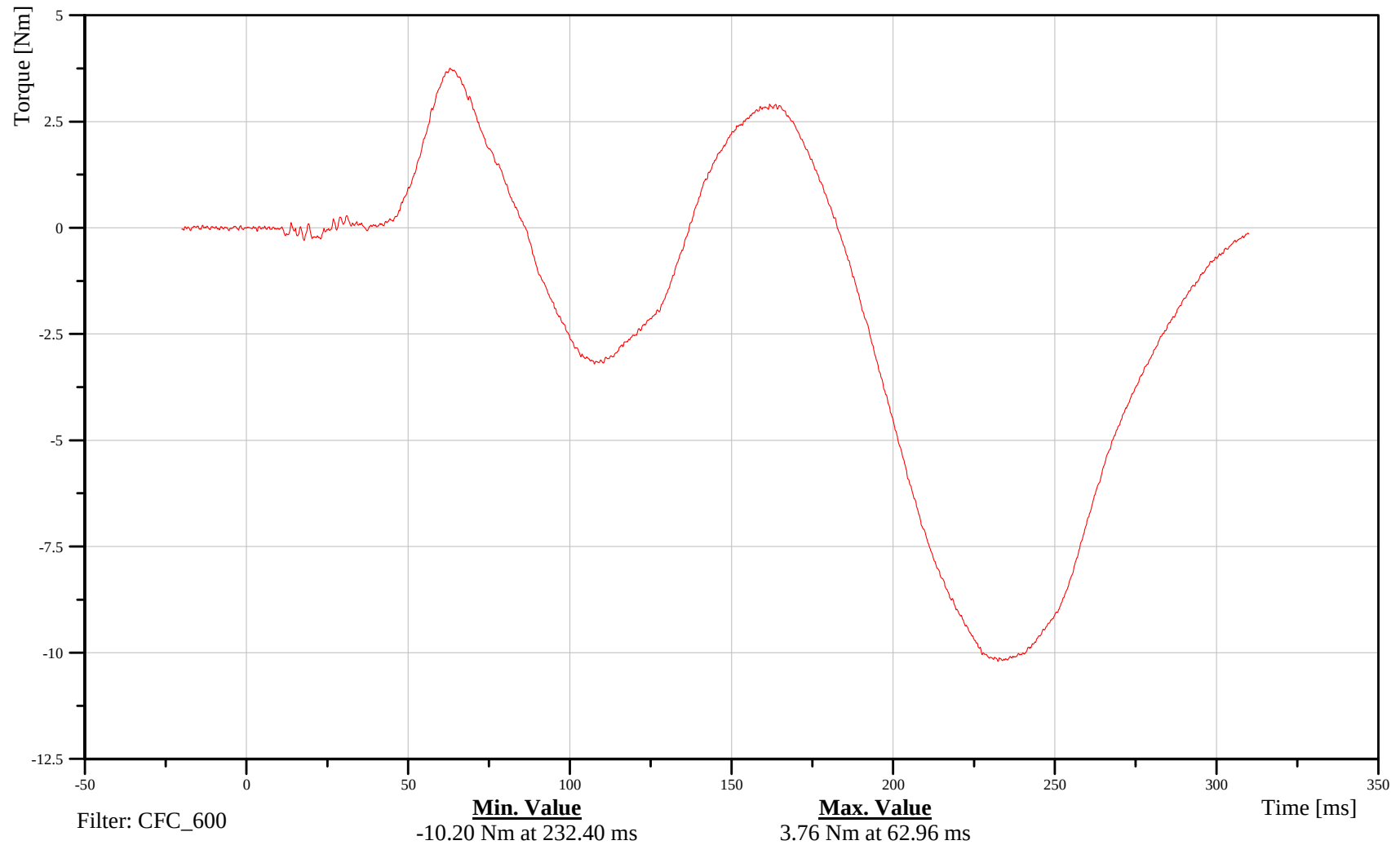
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14NECKLO00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-170

080911-2



World SID Evaluation
Passenger Shoulder X-Axis Force

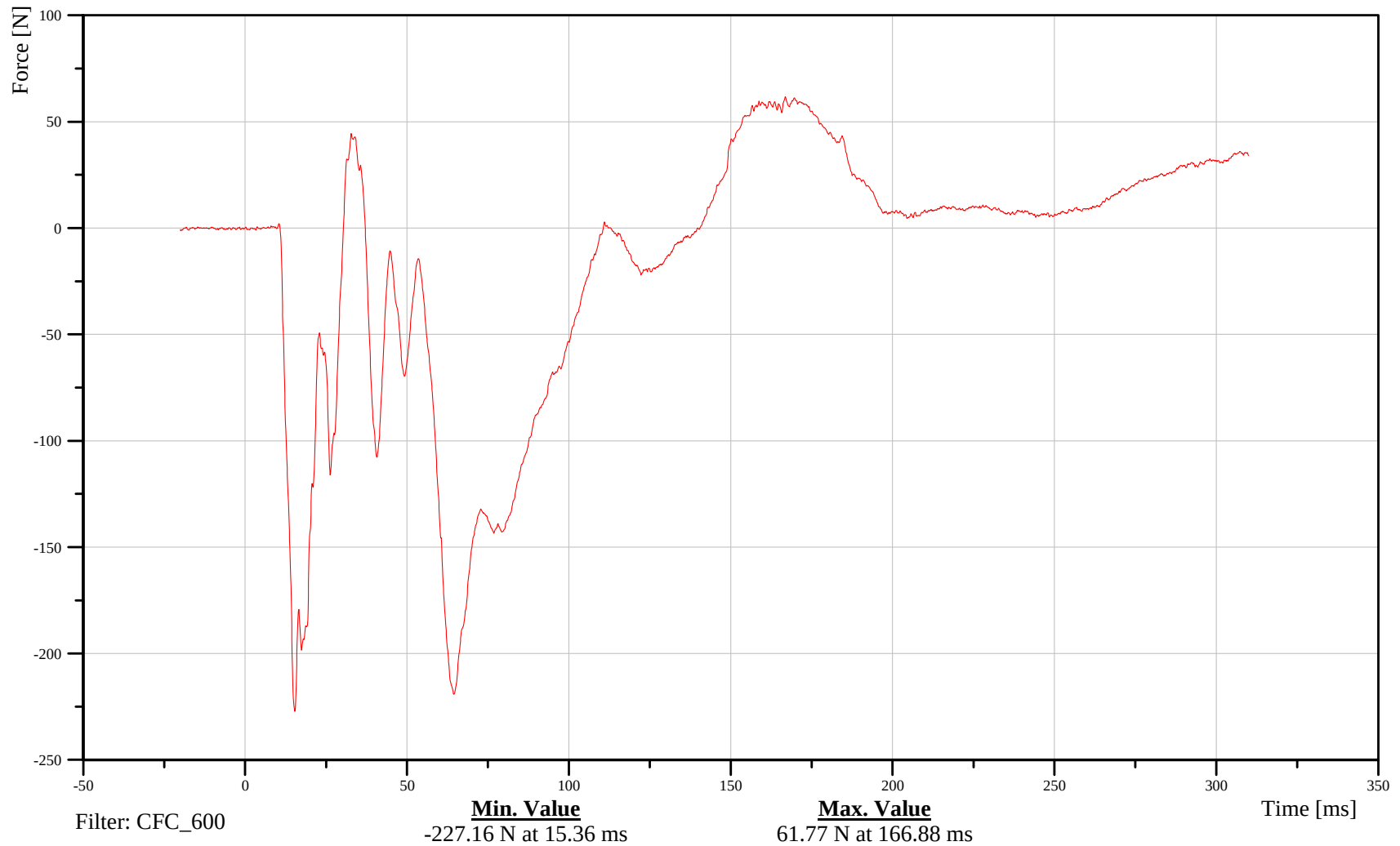
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLDLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-171

080911-2



World SID Evaluation
Passenger Shoulder Y-Axis Force

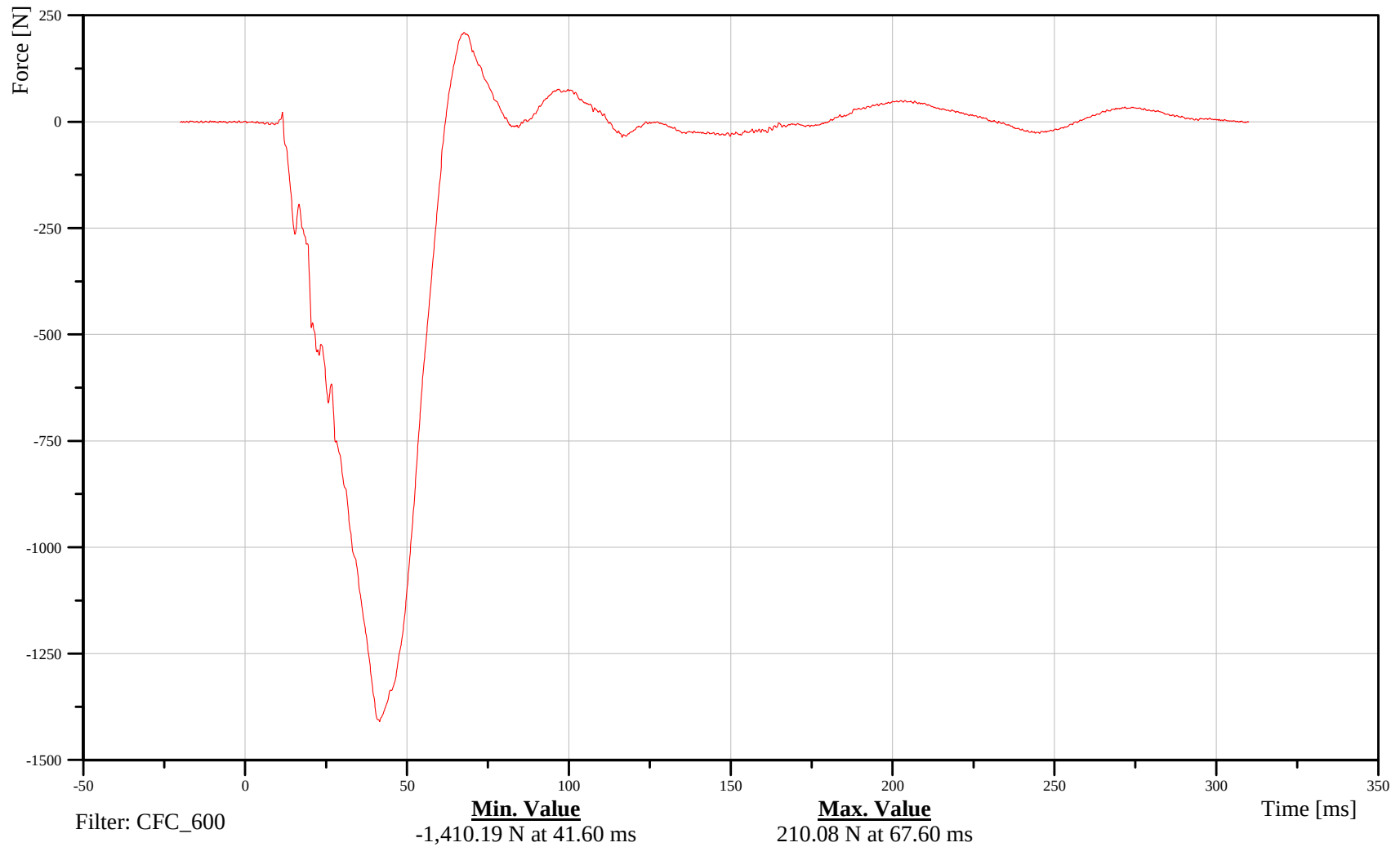
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLDLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-172

080911-2



World SID Evaluation
Passenger Shoulder Z-Axis Force

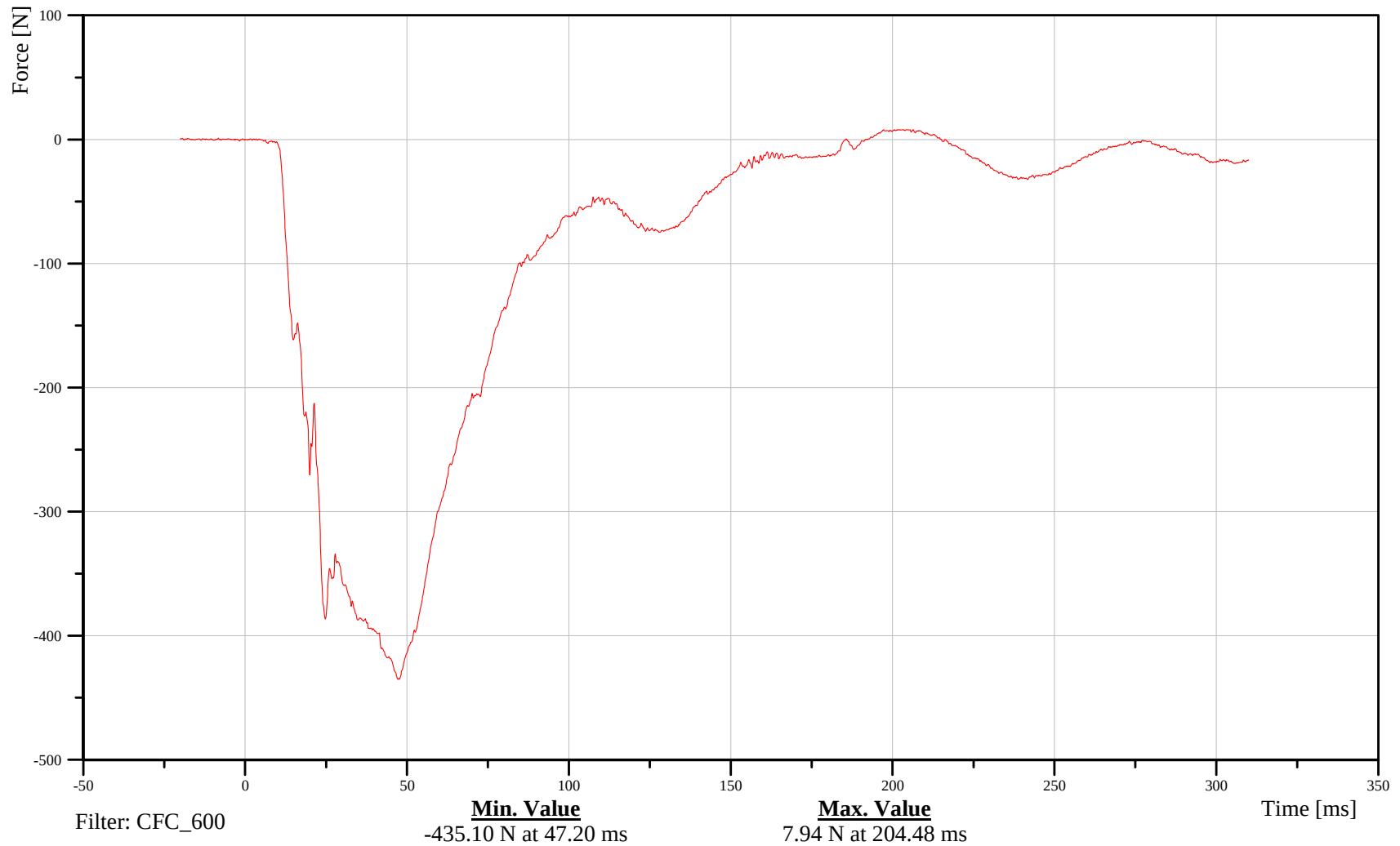
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLDLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-173

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

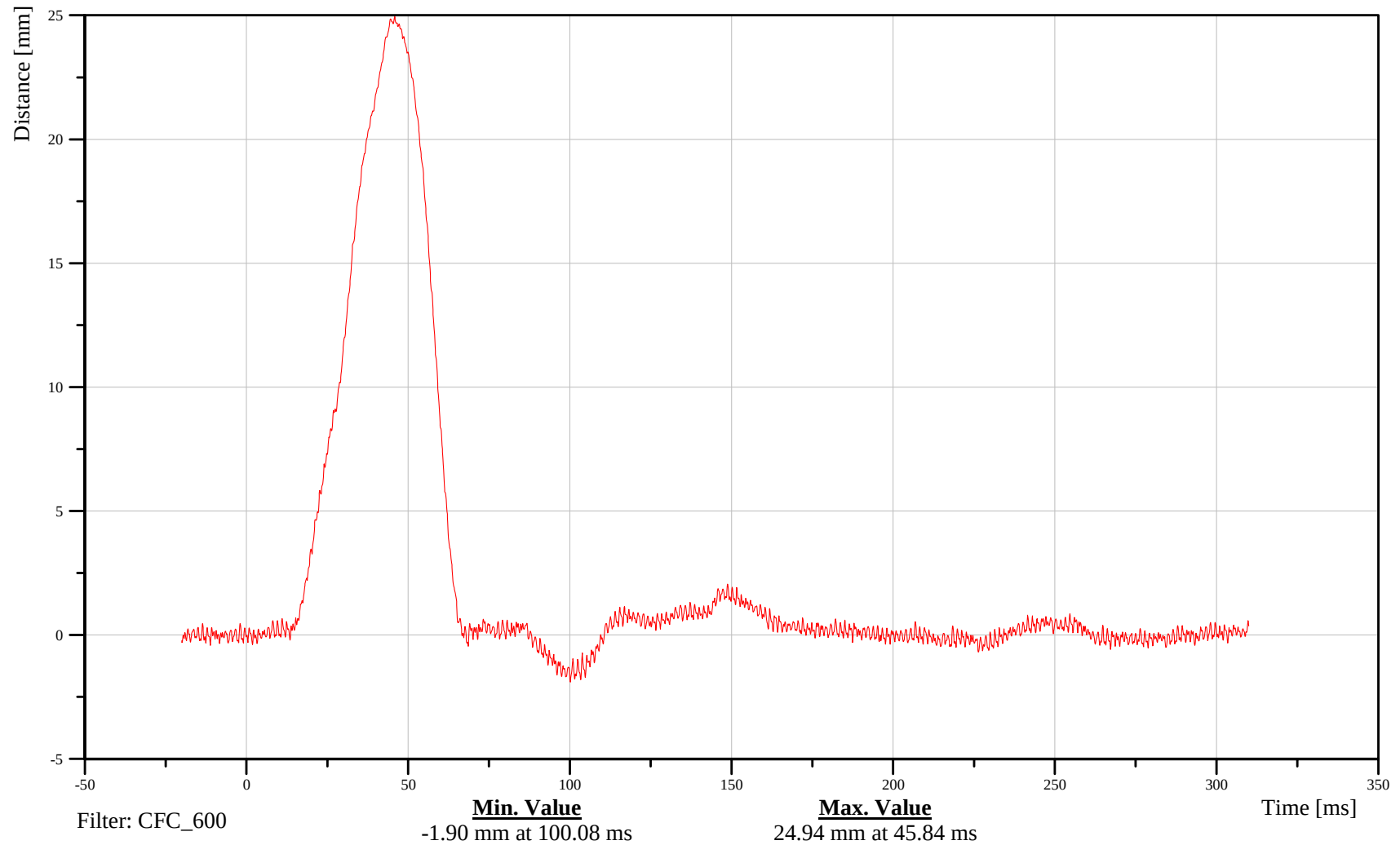
Passenger Shoulder Y-Axis Displacement

Customer: VRTC

14SHLDLE00WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-174

080911-2



World SID Evaluation
Passenger Shoulder X-Axis Acceleration

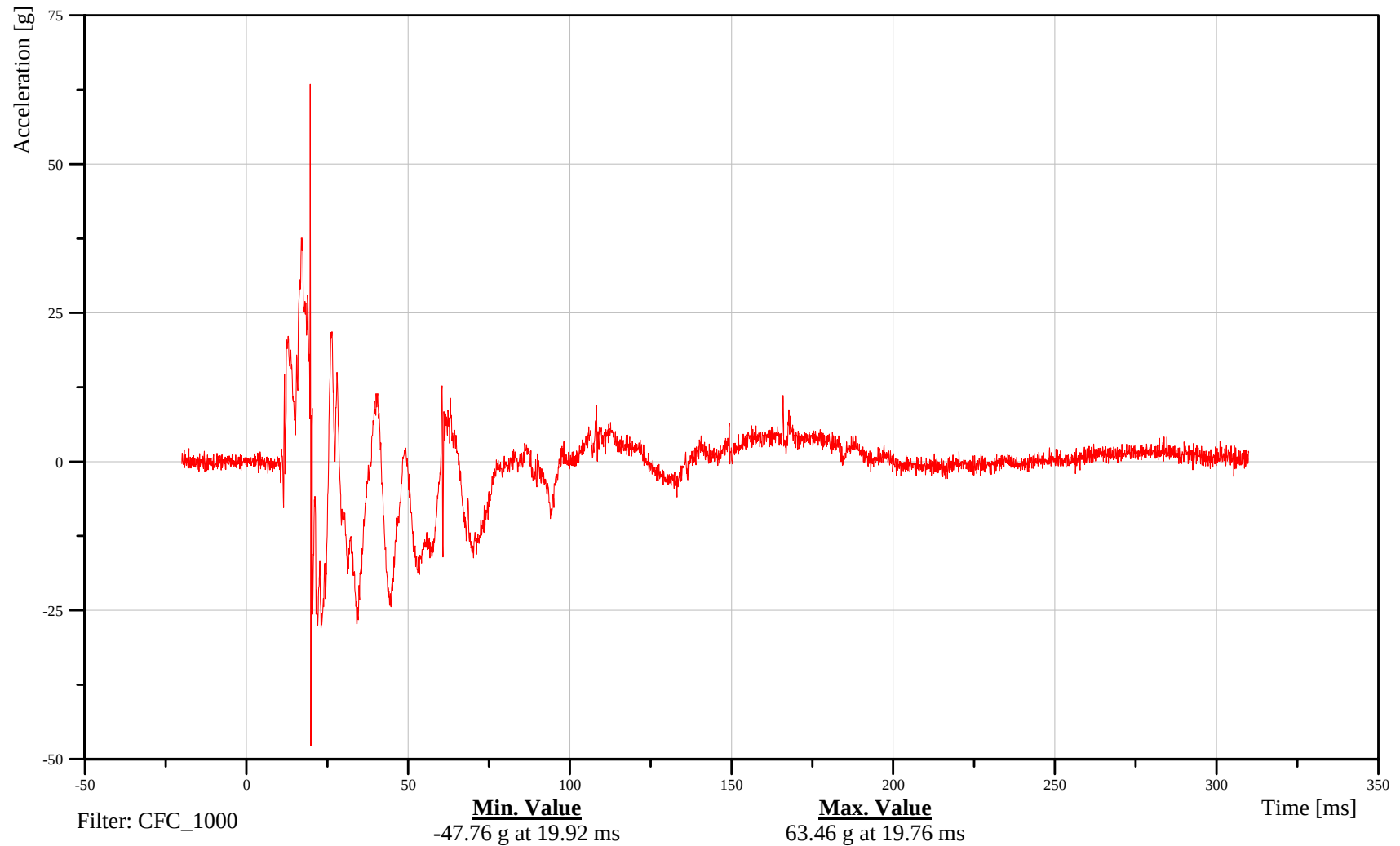
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLDLE00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-175

080911-2



World SID Evaluation
Passenger Shoulder Y-Axis Acceleration

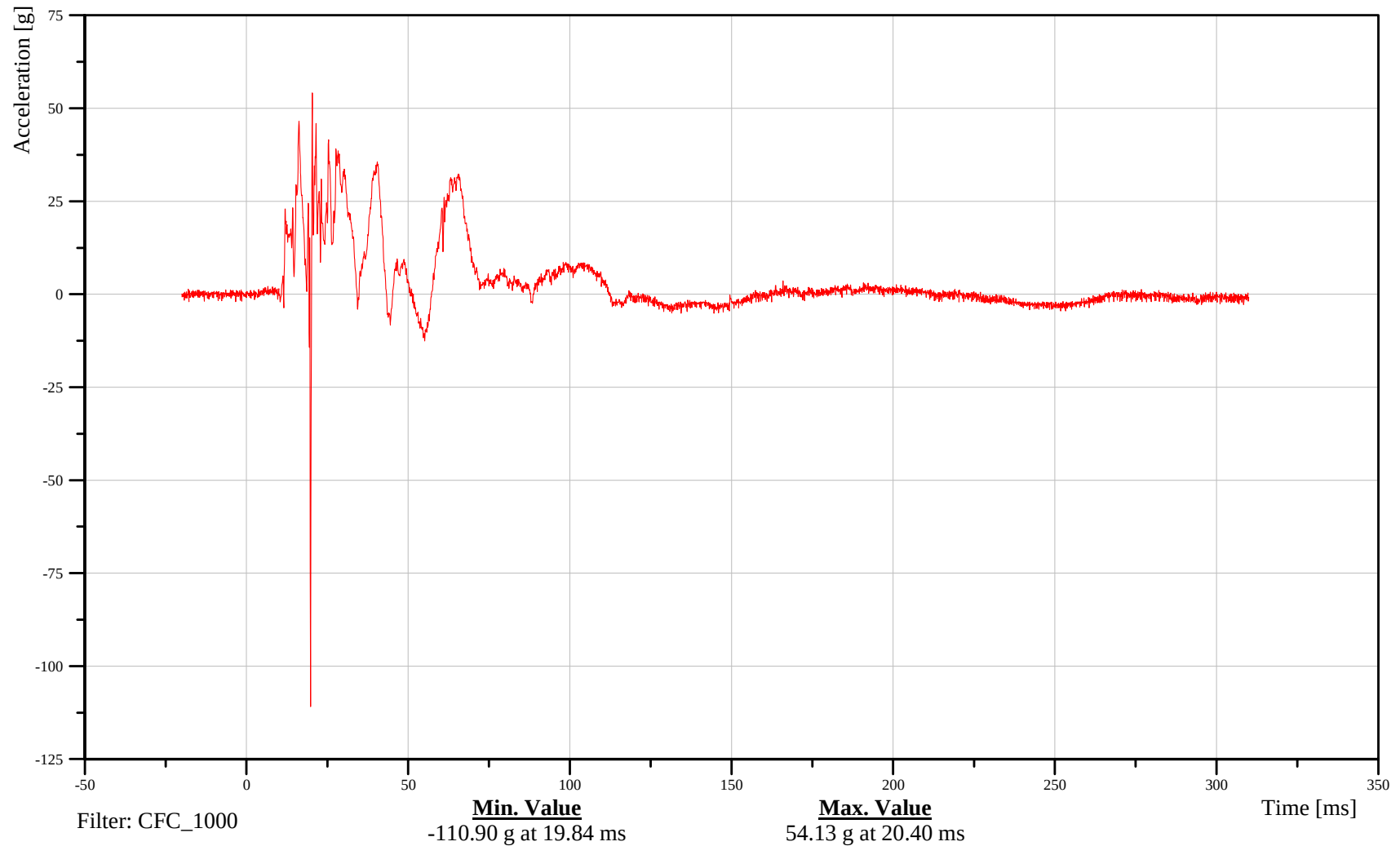
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLDLE00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-176

080911-2



World SID Evaluation
Passenger Shoulder Z-Axis Acceleration

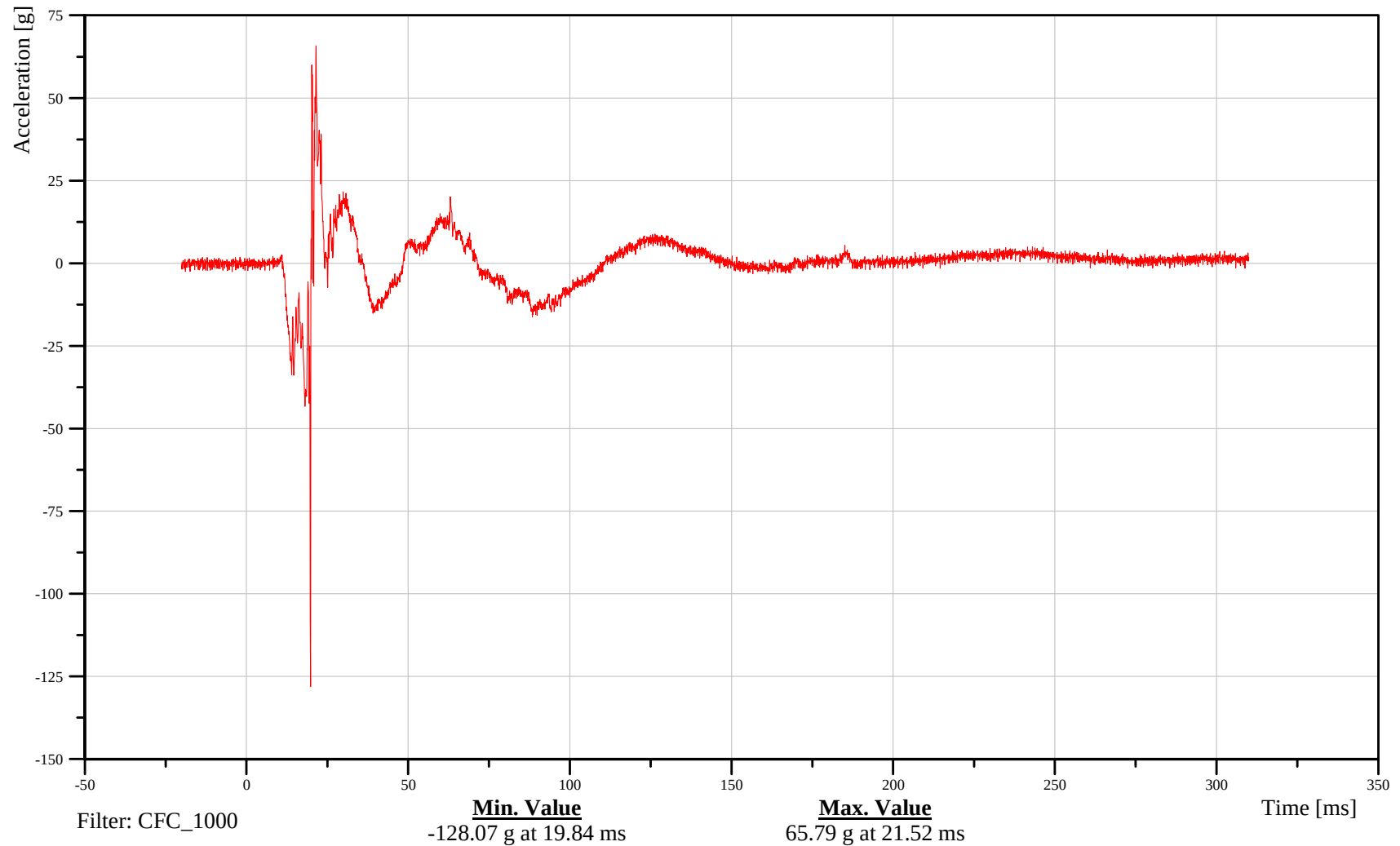
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLDLE00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-177

080911-2



World SID Evaluation

Passenger Shoulder Resultant Acceleration

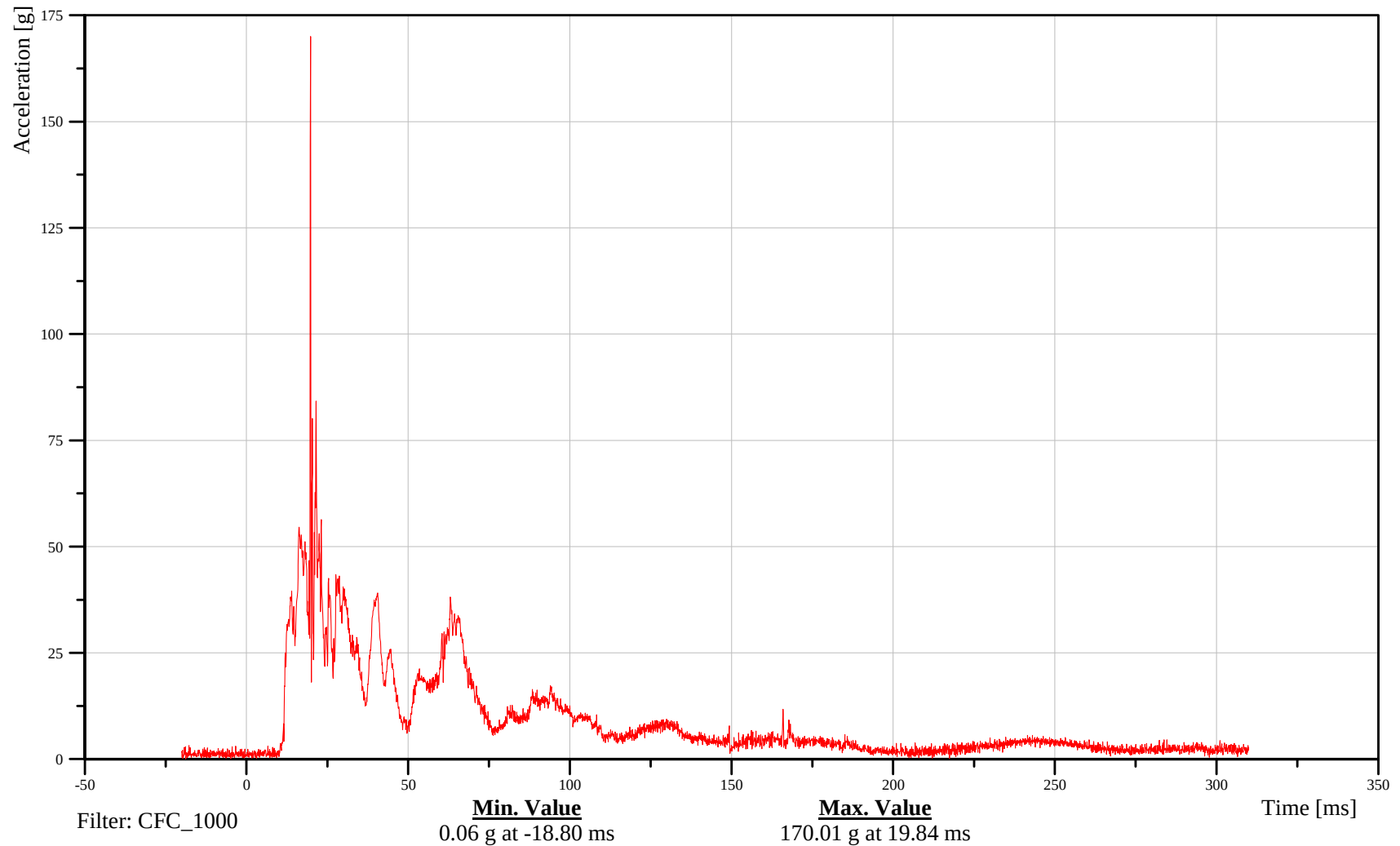
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14SHLDLE00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-178

080911-2



World SID Evaluation
Passenger T1 X-Axis Acceleration

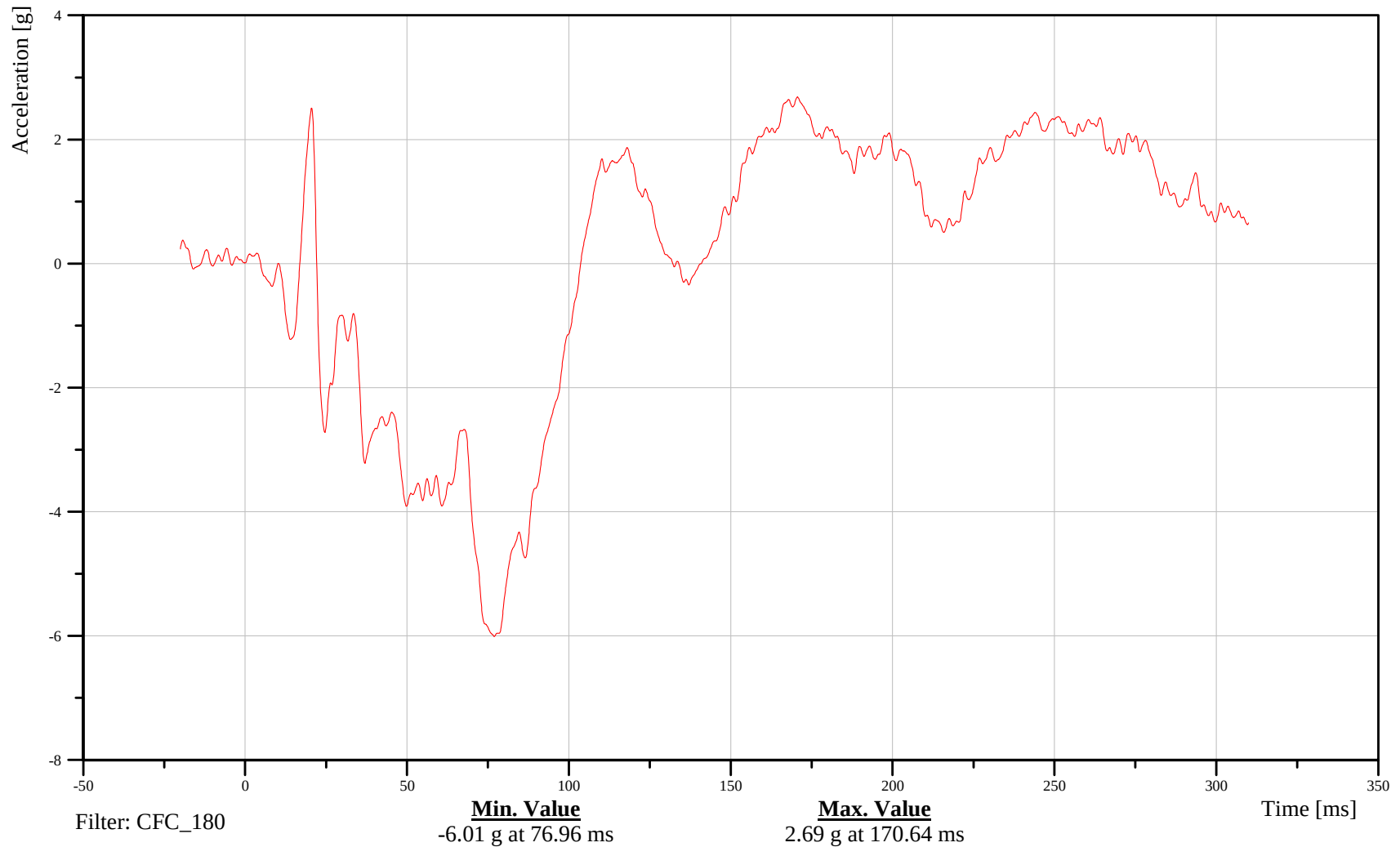
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0100WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-179

080911-2



World SID Evaluation
Passenger T1 Y-Axis Acceleration

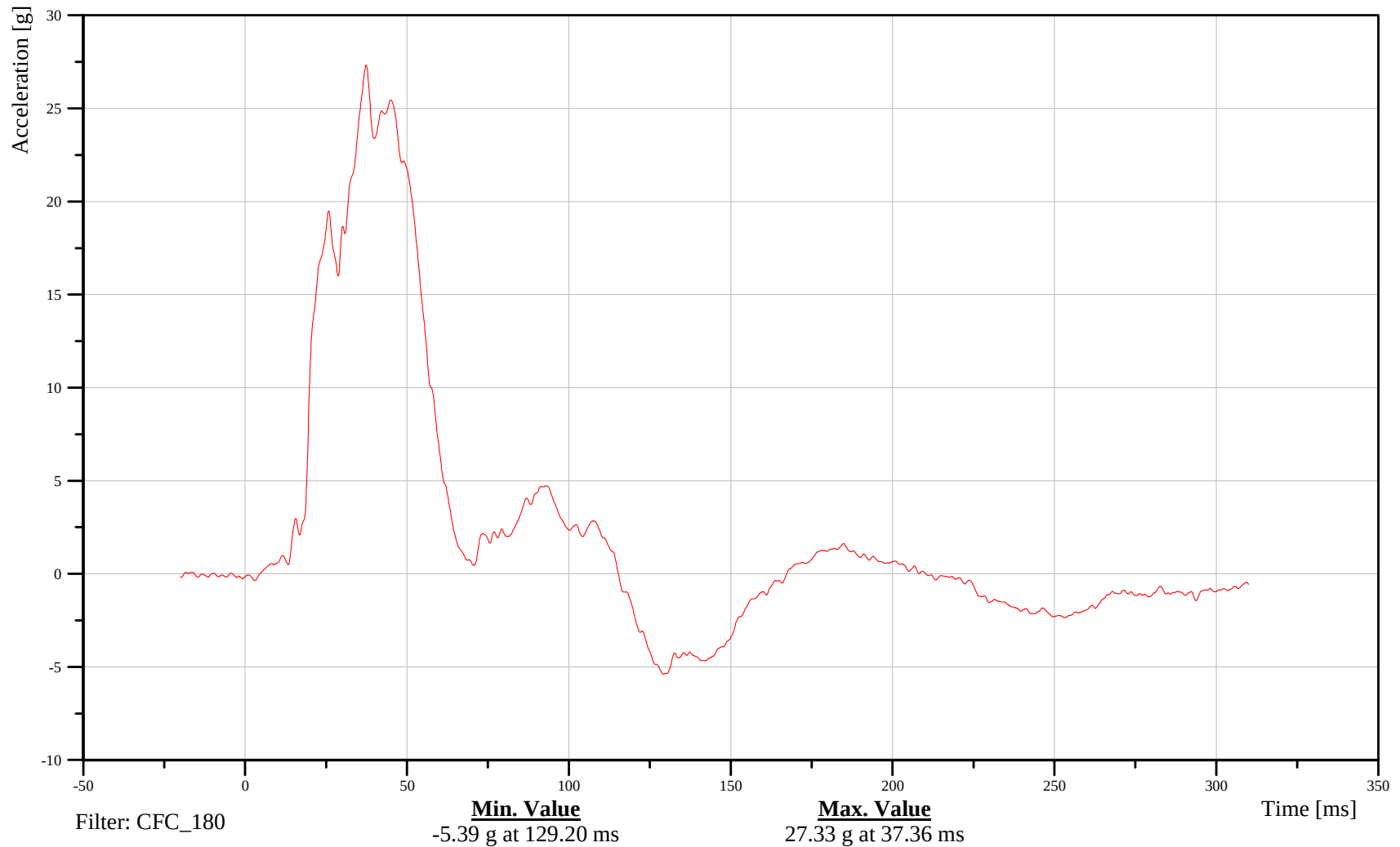
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0100WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-180

080911-2



World SID Evaluation
Passenger T1 Z-Axis Acceleration

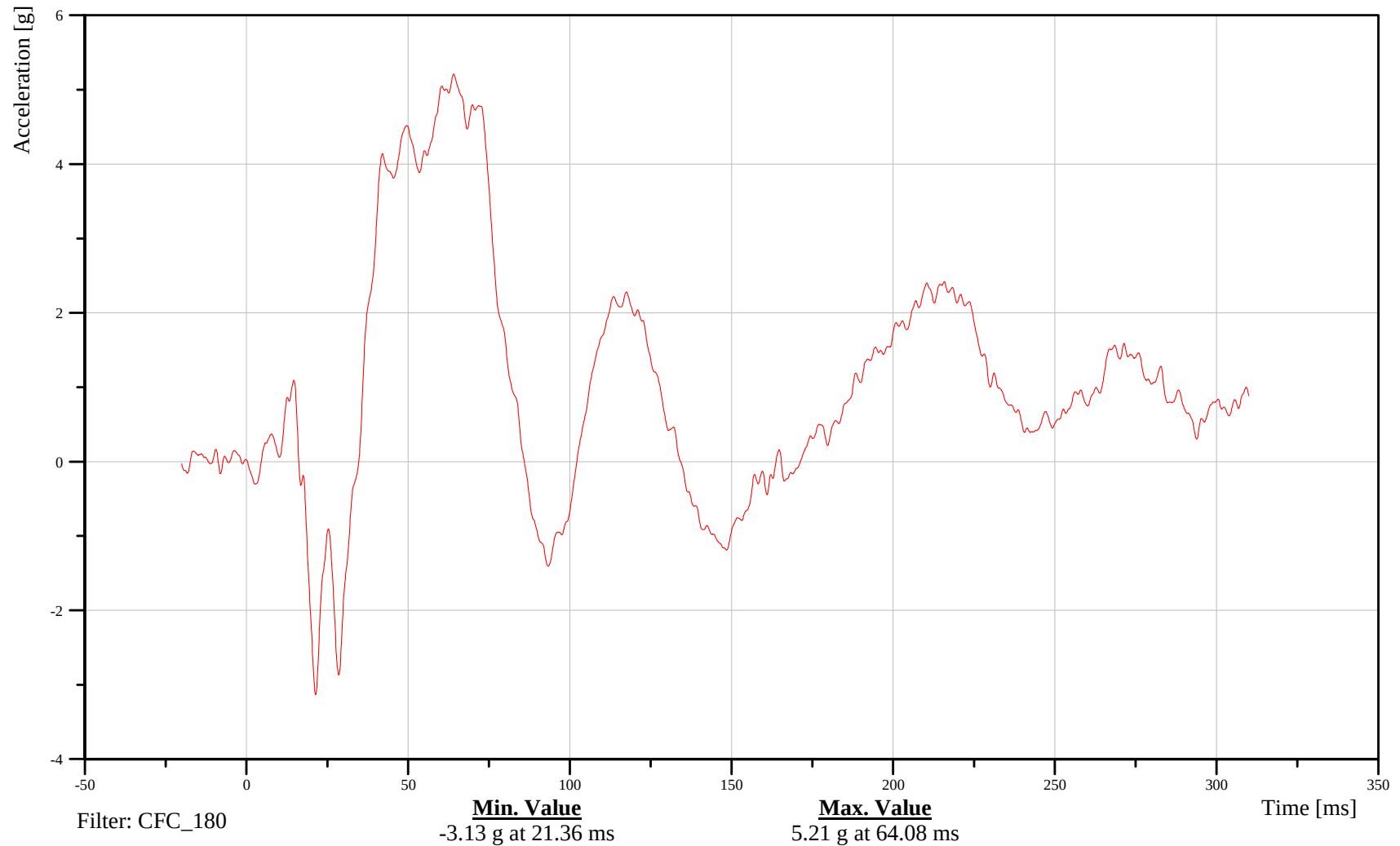
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0100WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-181

080911-2



World SID Evaluation
Passenger T1 Resultant Acceleration

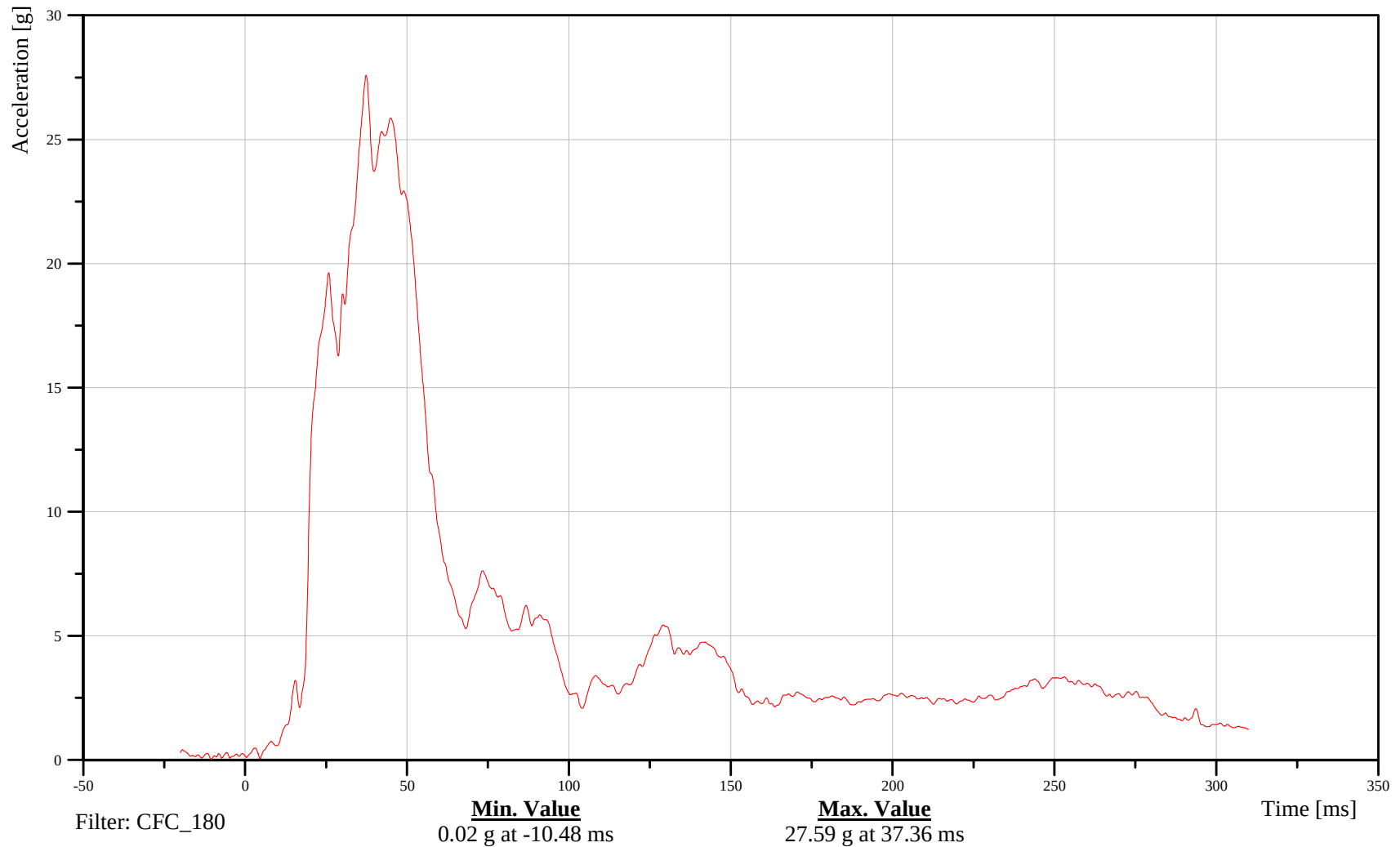
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0100WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-182

080911-2



World SID Evaluation
Passenger T4 X-Axis Acceleration

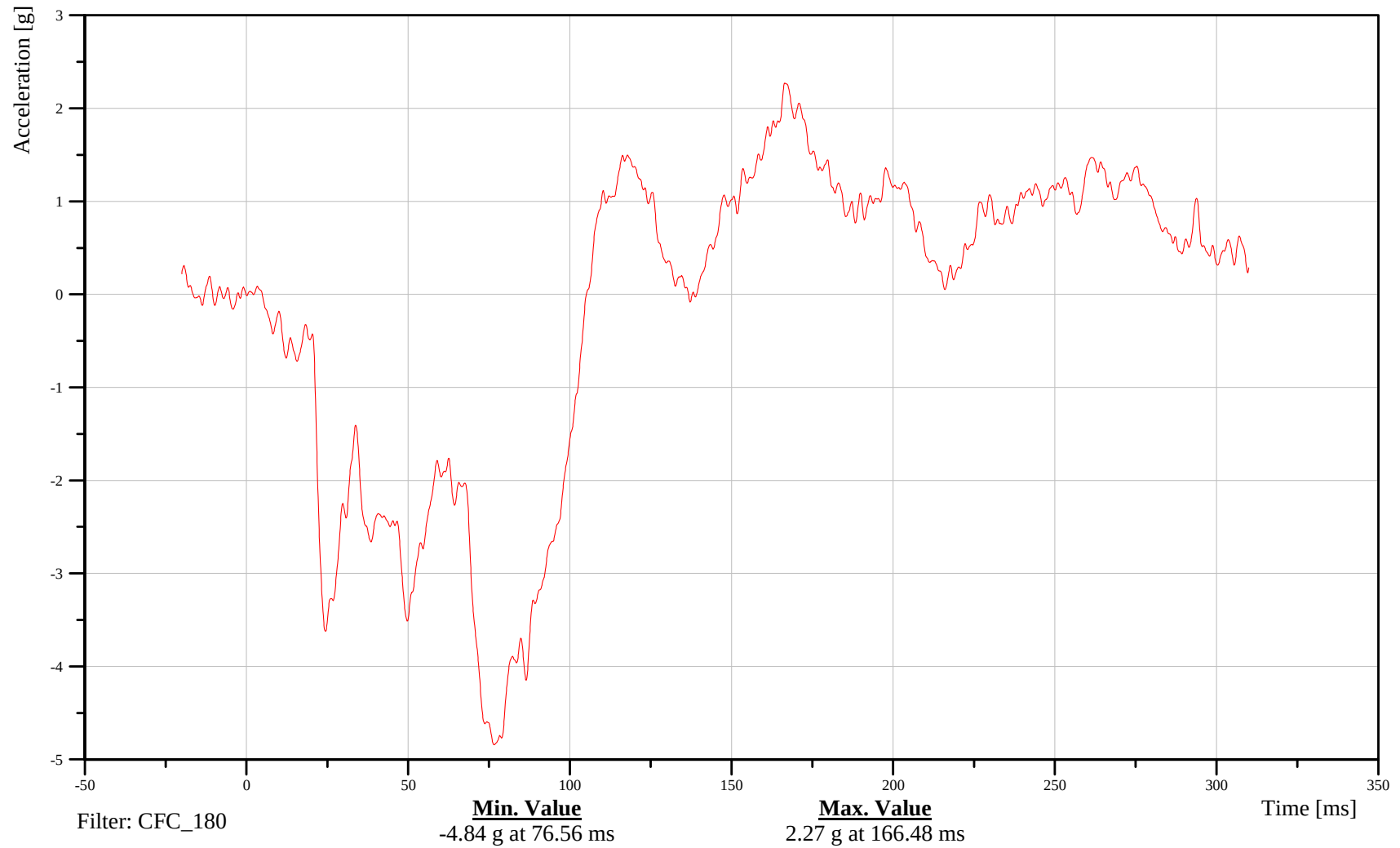
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0400WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-183

080911-2



World SID Evaluation
Passenger T4 Y-Axis Acceleration

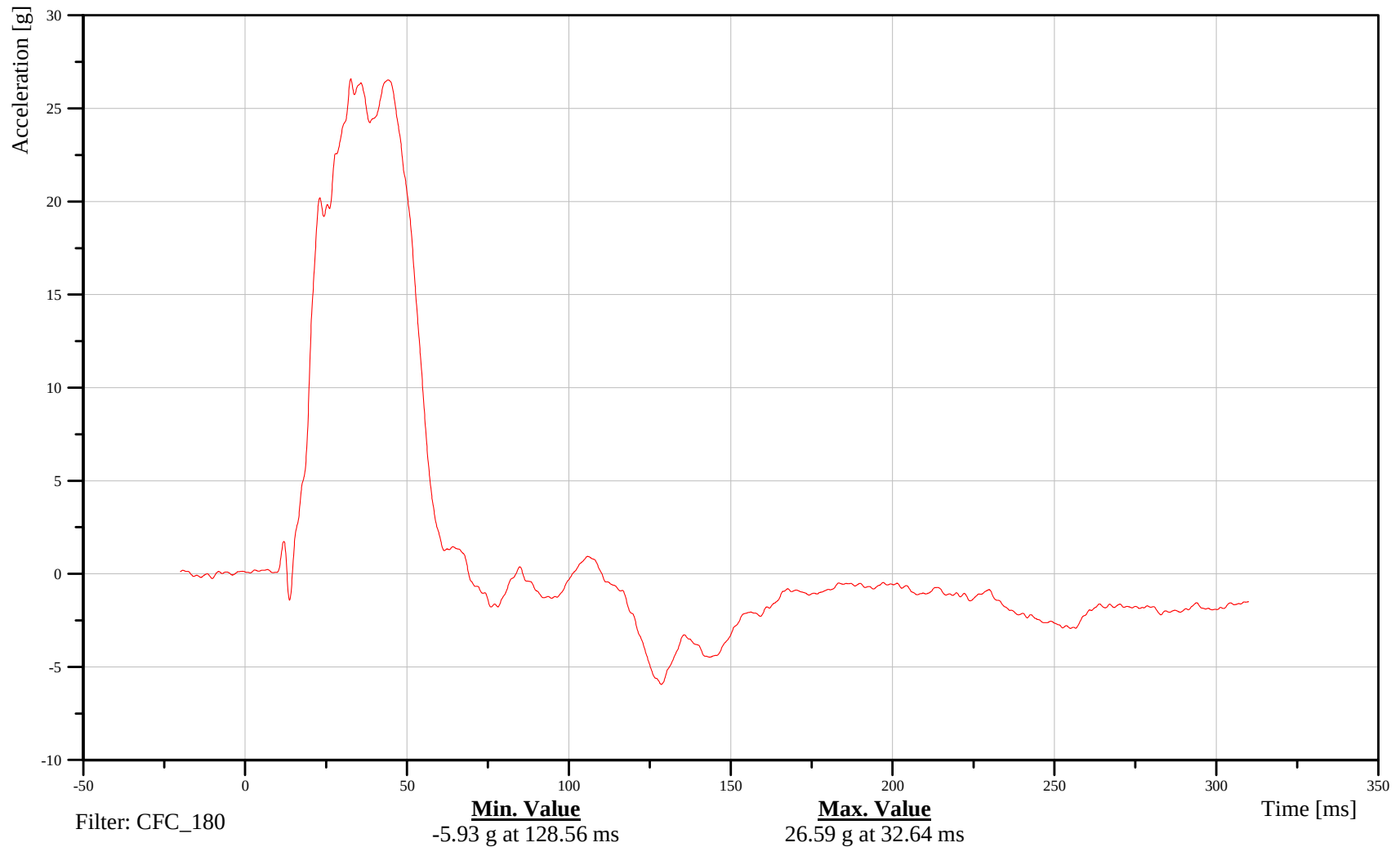
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0400WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-184

080911-2



World SID Evaluation
Passenger T4 Z-Axis Acceleration

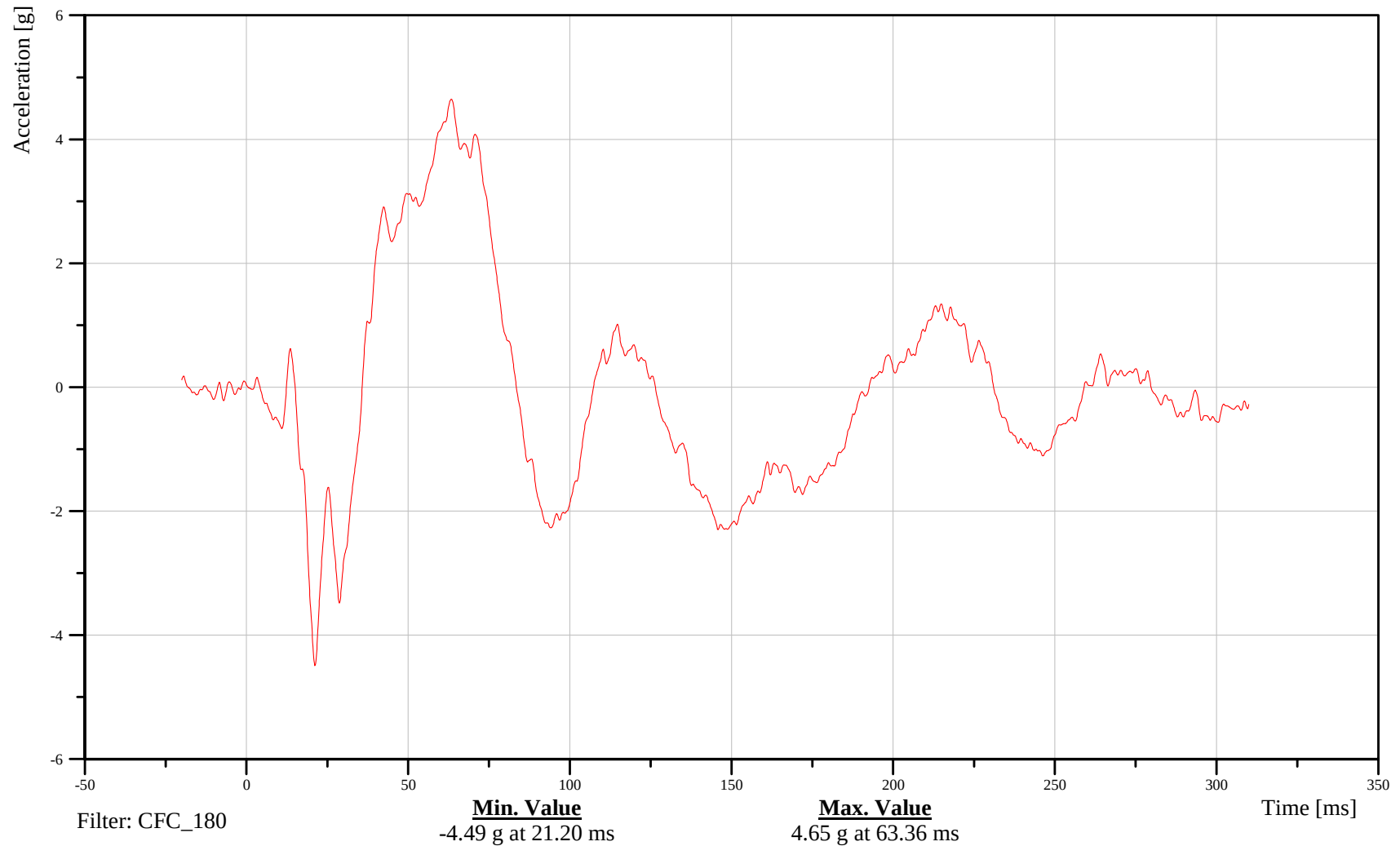
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0400WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-185

080911-2



World SID Evaluation
Passenger T4 Resultant Acceleration

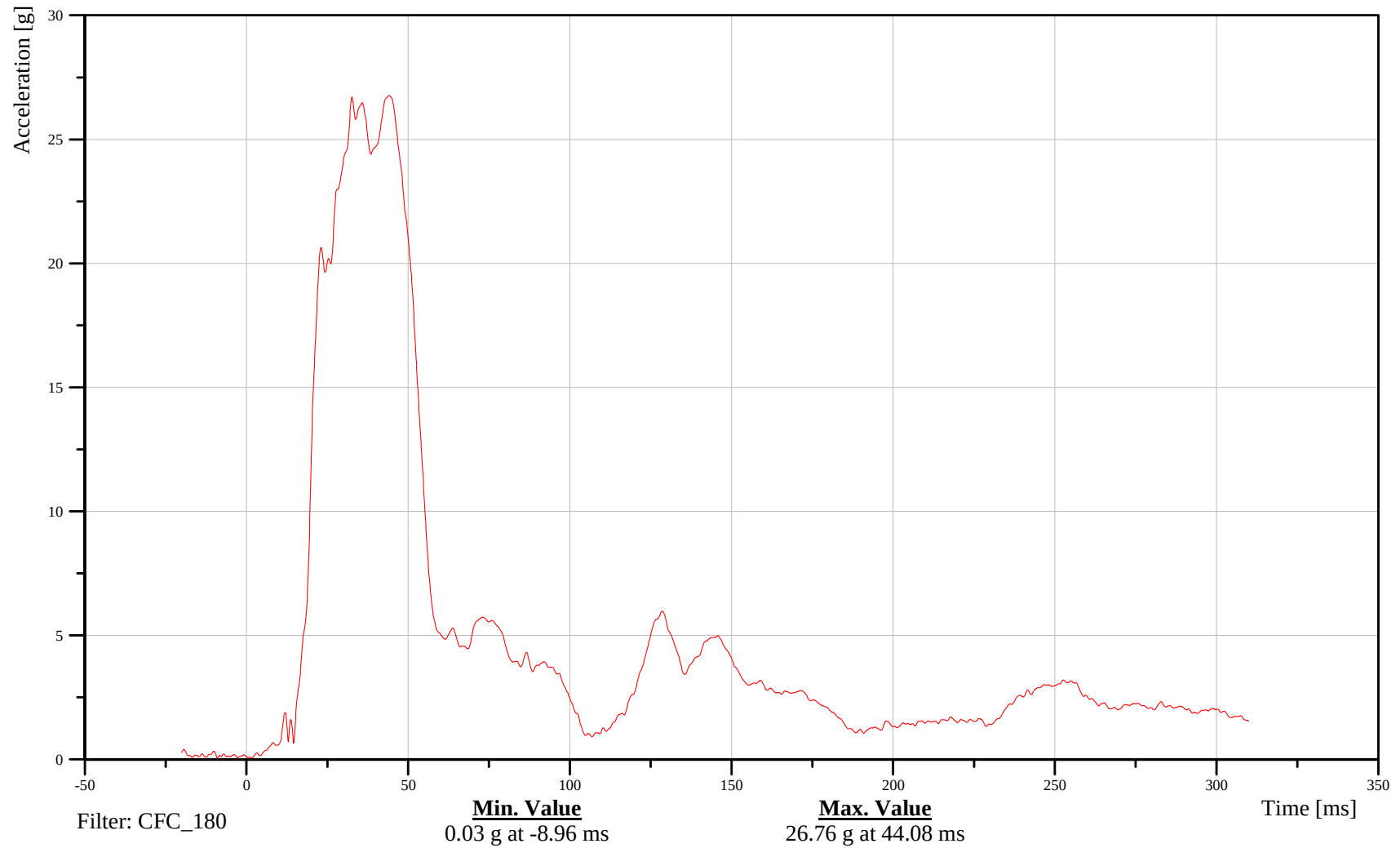
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP0400WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-186

080911-2



World SID Evaluation

Passenger T12 X-Axis Acceleration

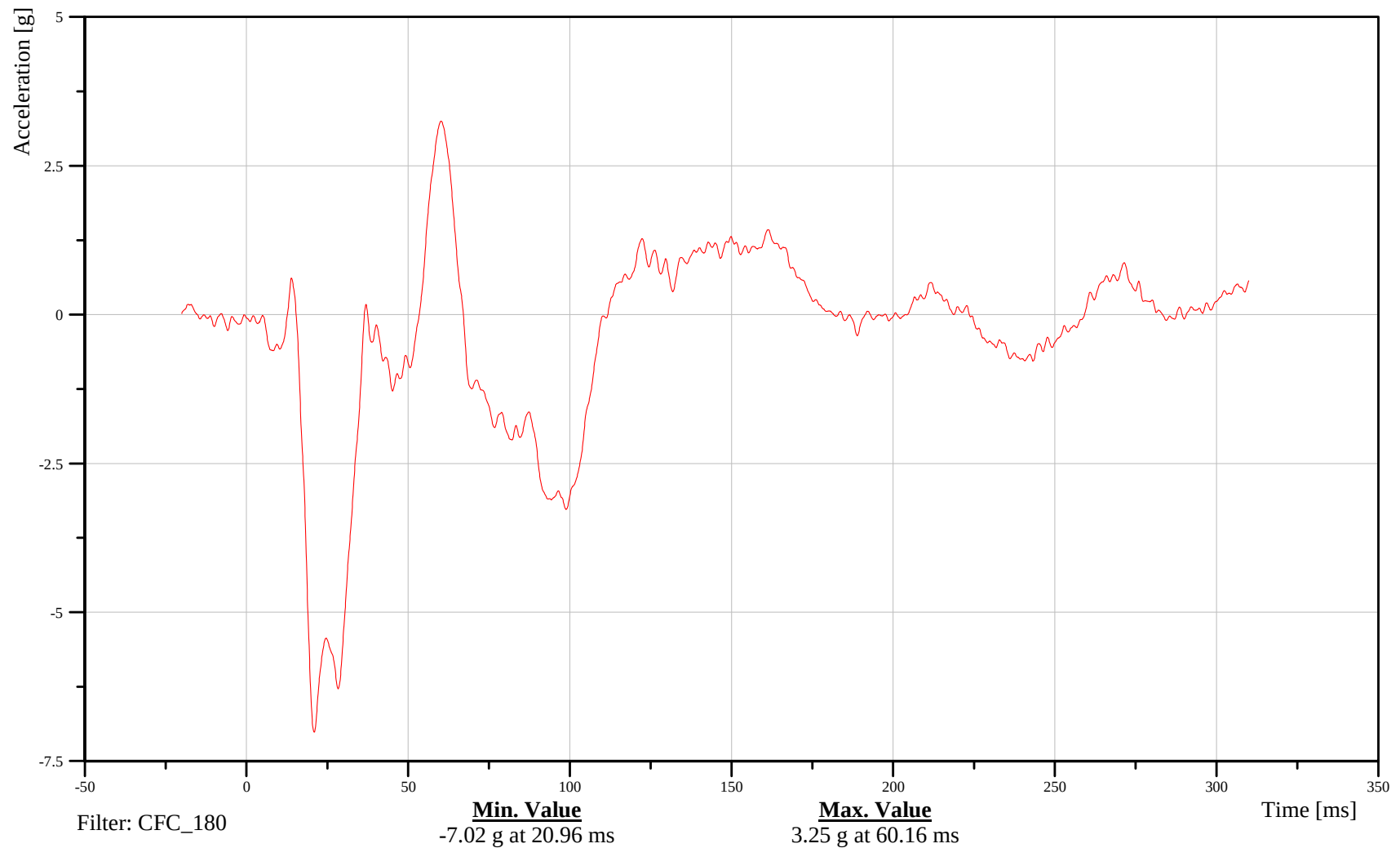
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP1200WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-187

080911-2



World SID Evaluation
Passenger T12 Y-Axis Acceleration

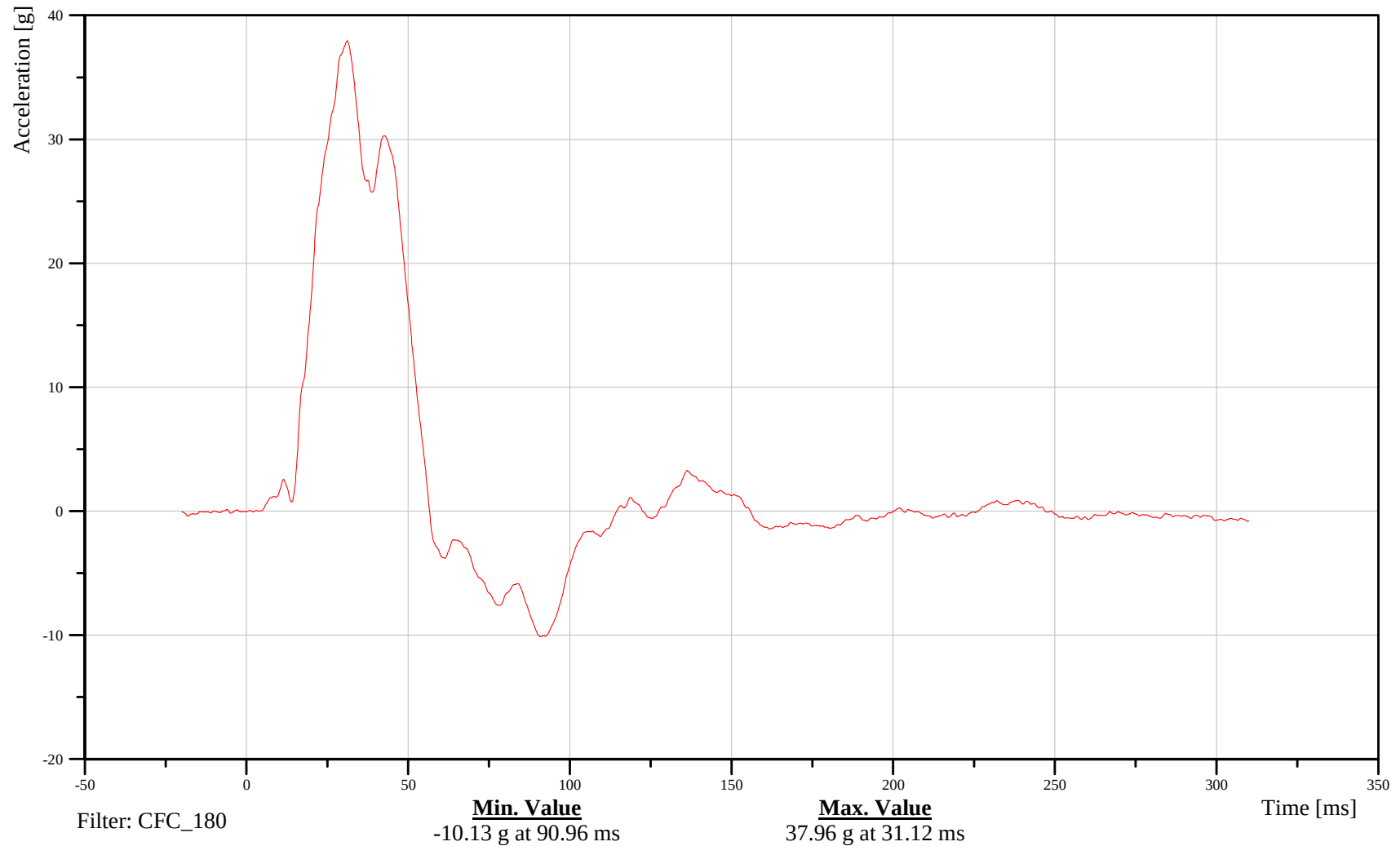
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP1200WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-188

080911-2



World SID Evaluation
Passenger T12 Z-Axis Acceleration

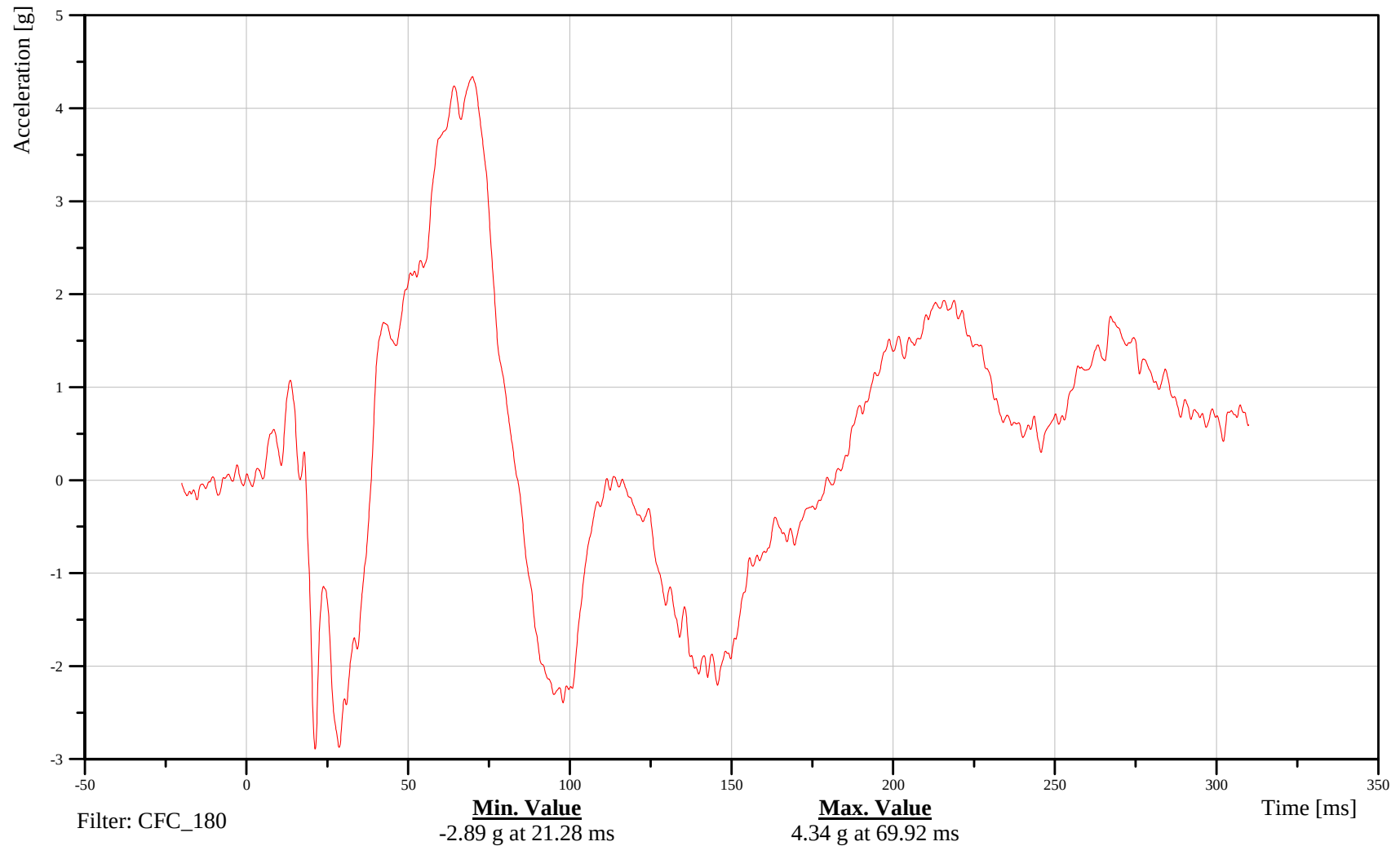
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP1200WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-189

080911-2



World SID Evaluation
Passenger T12 Resultant Acceleration

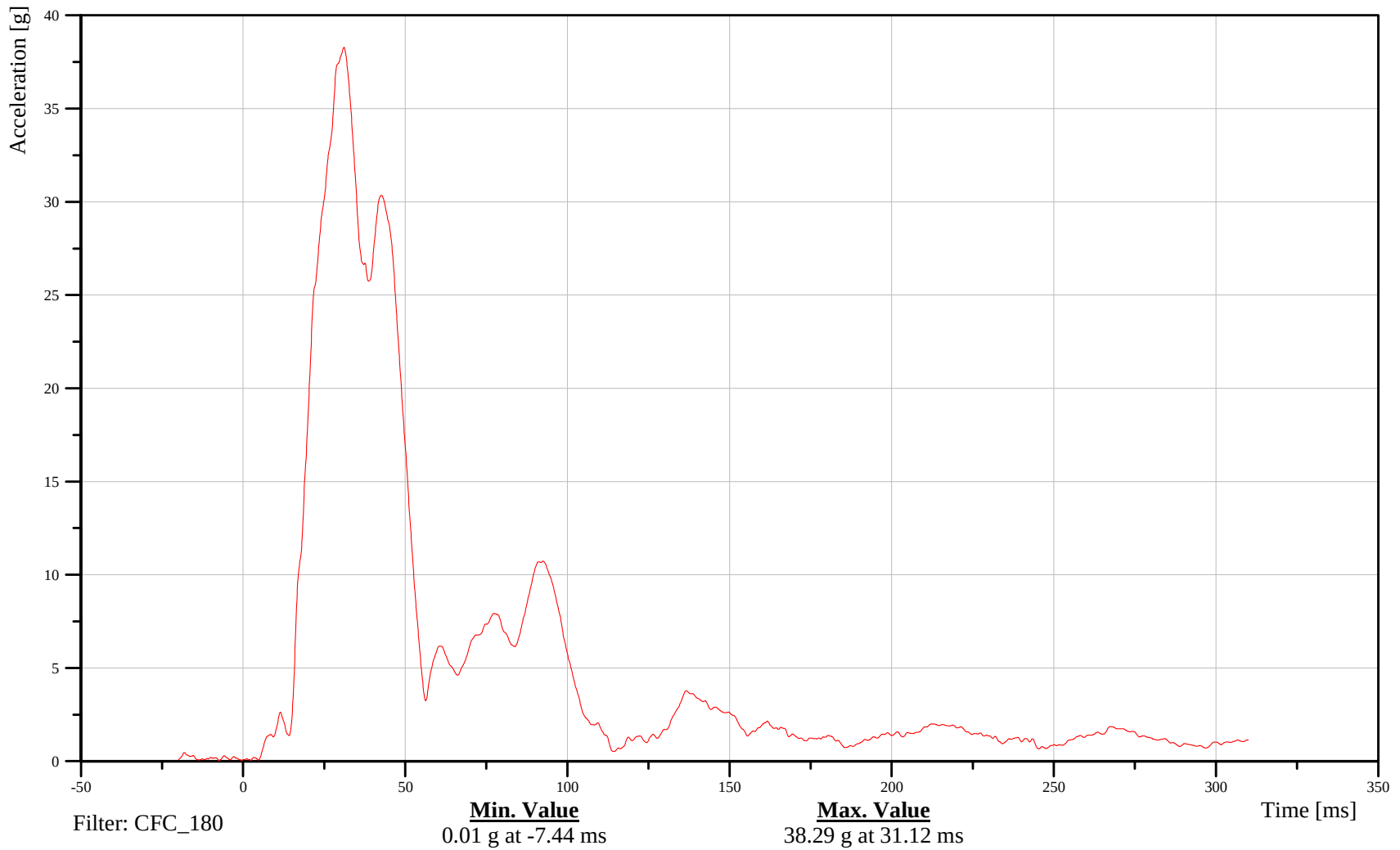
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14THSP1200WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-190

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

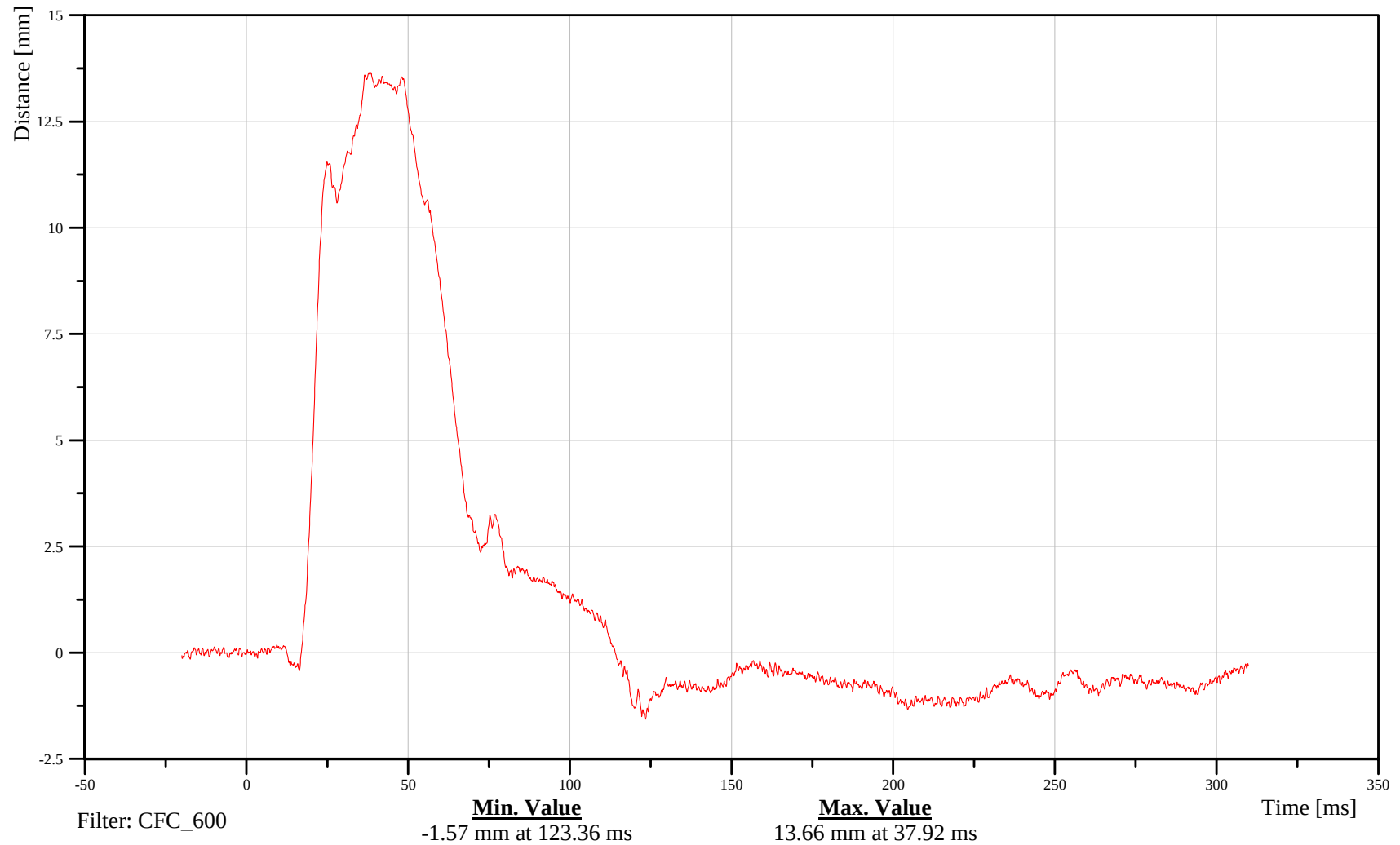
Passenger Thorax Rib 1 Y-Axis Displacement

Customer: VRTC

14TRRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-191

080911-2



World SID Evaluation
Passenger Thorax Rib 1 X-Axis Acceleration

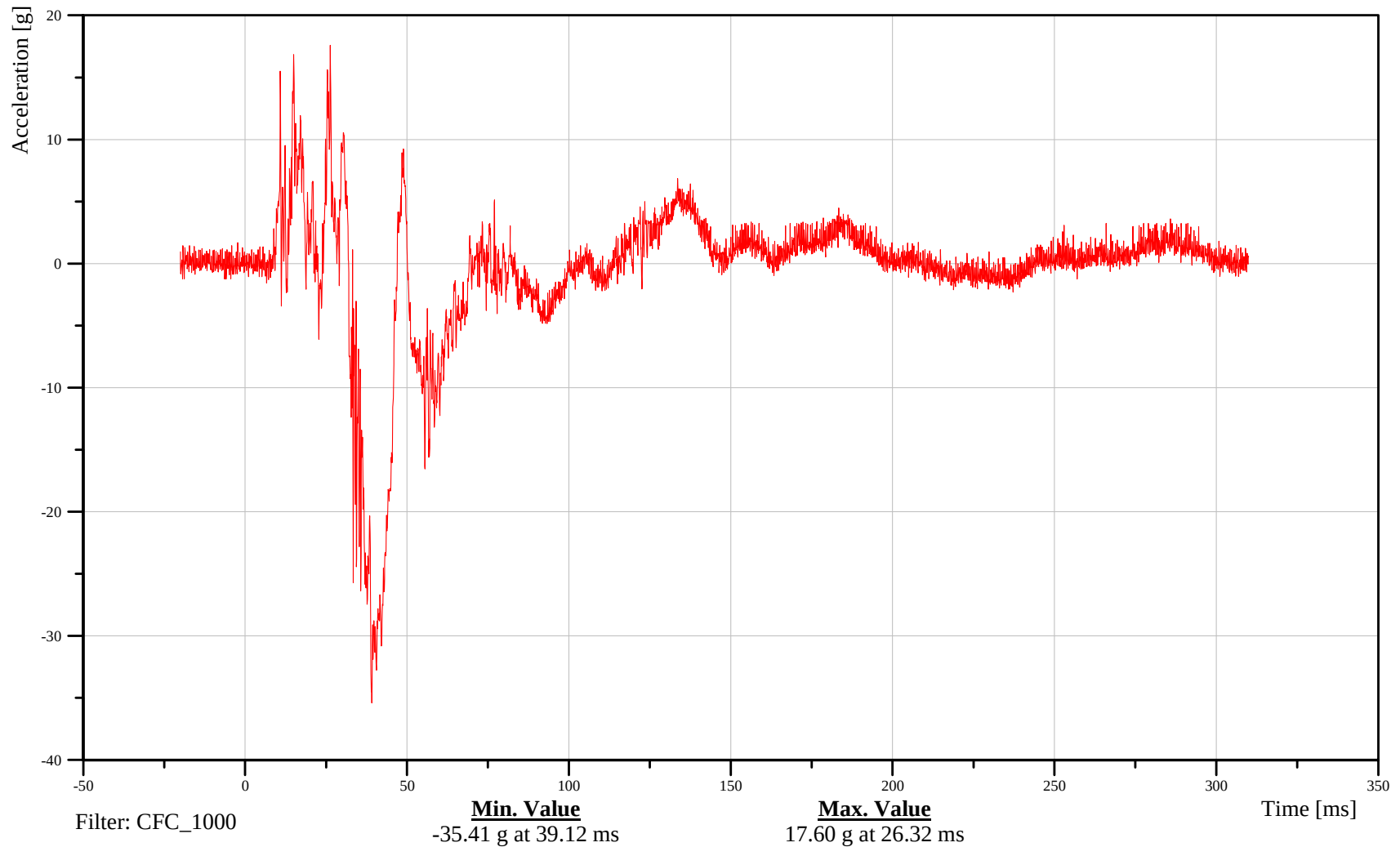
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-192

080911-2



World SID Evaluation
Passenger Thorax Rib 1 Y-Axis Acceleration

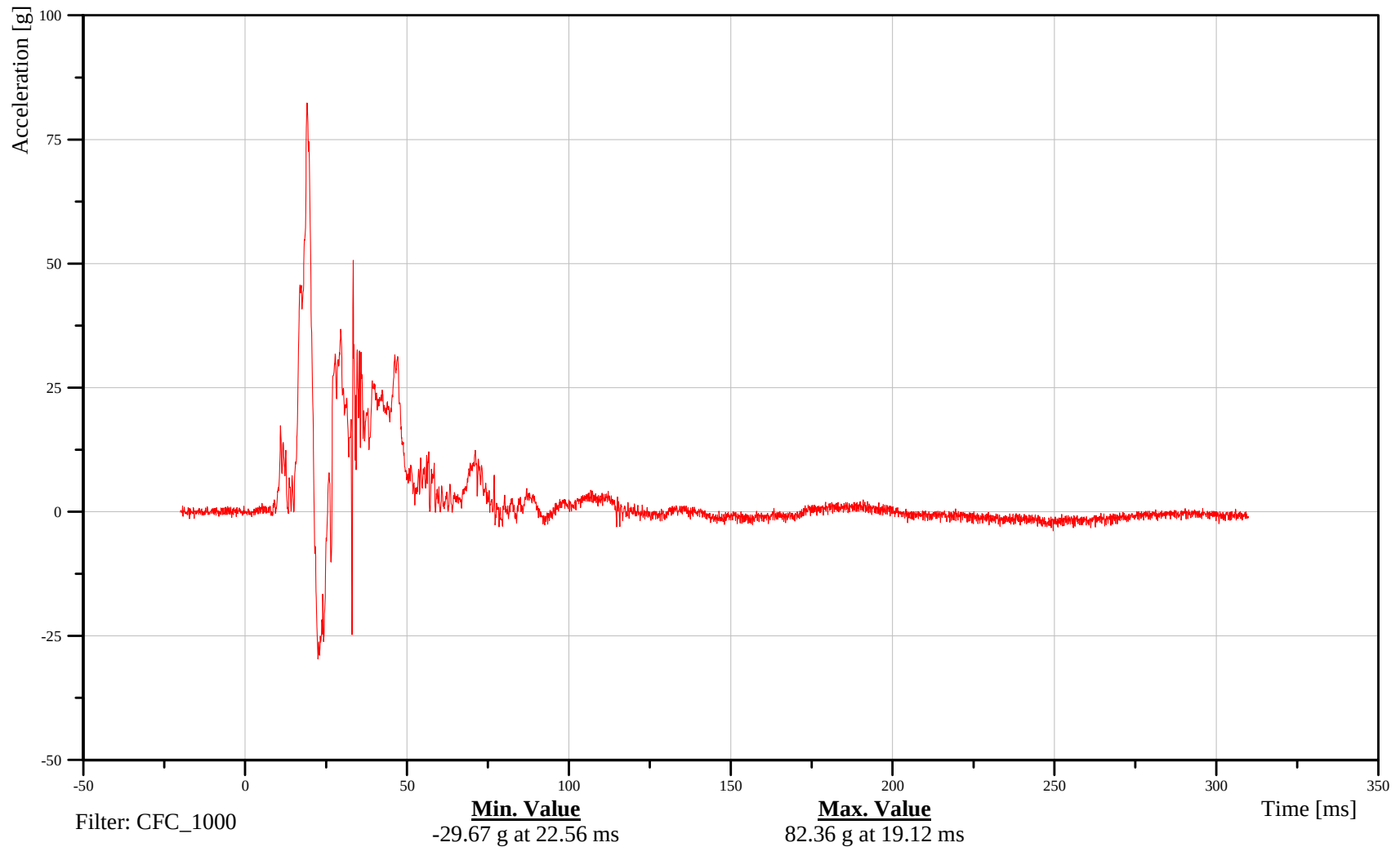
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-193

080911-2



World SID Evaluation
Passenger Thorax Rib 1 Z-Axis Acceleration

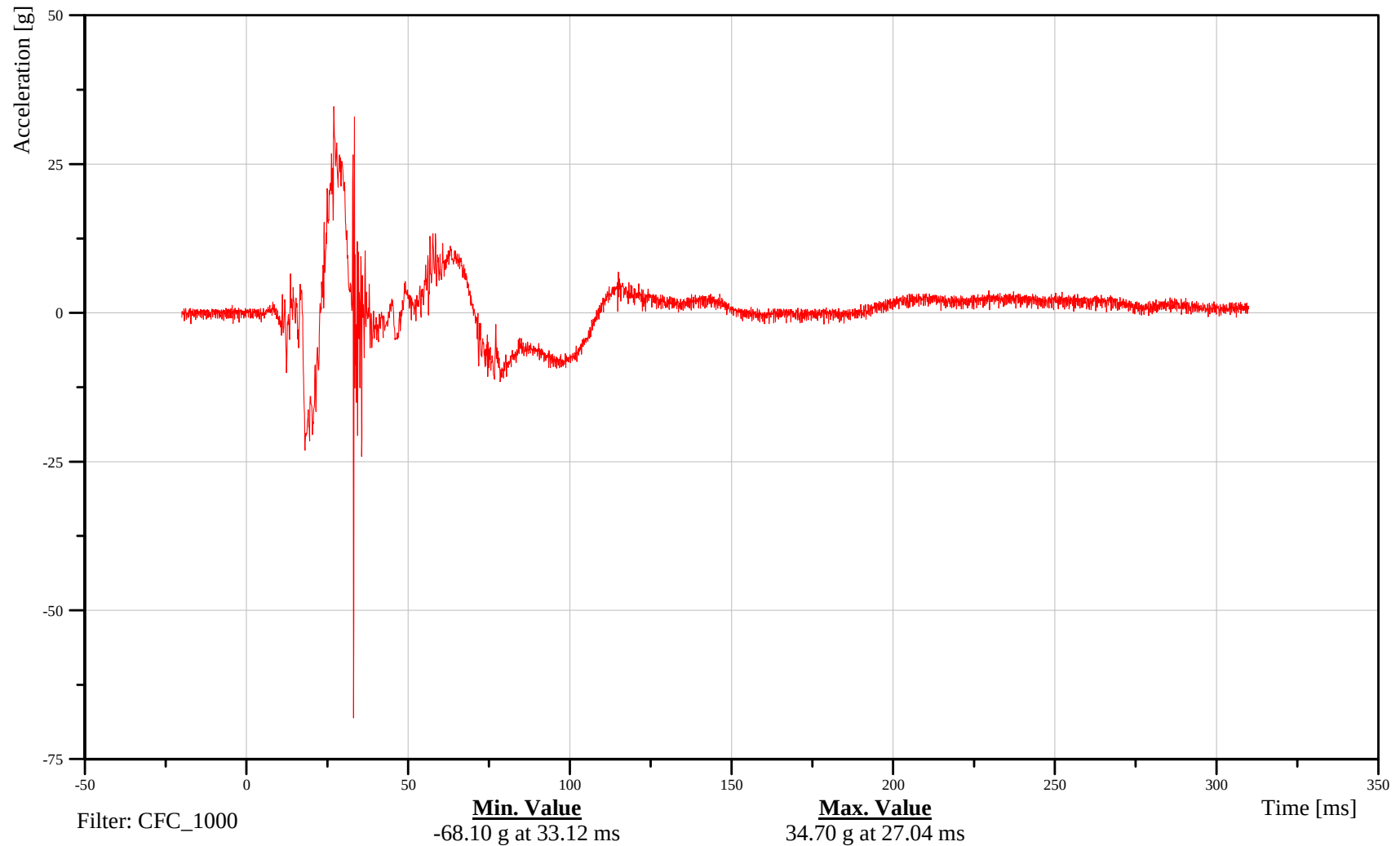
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-194

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

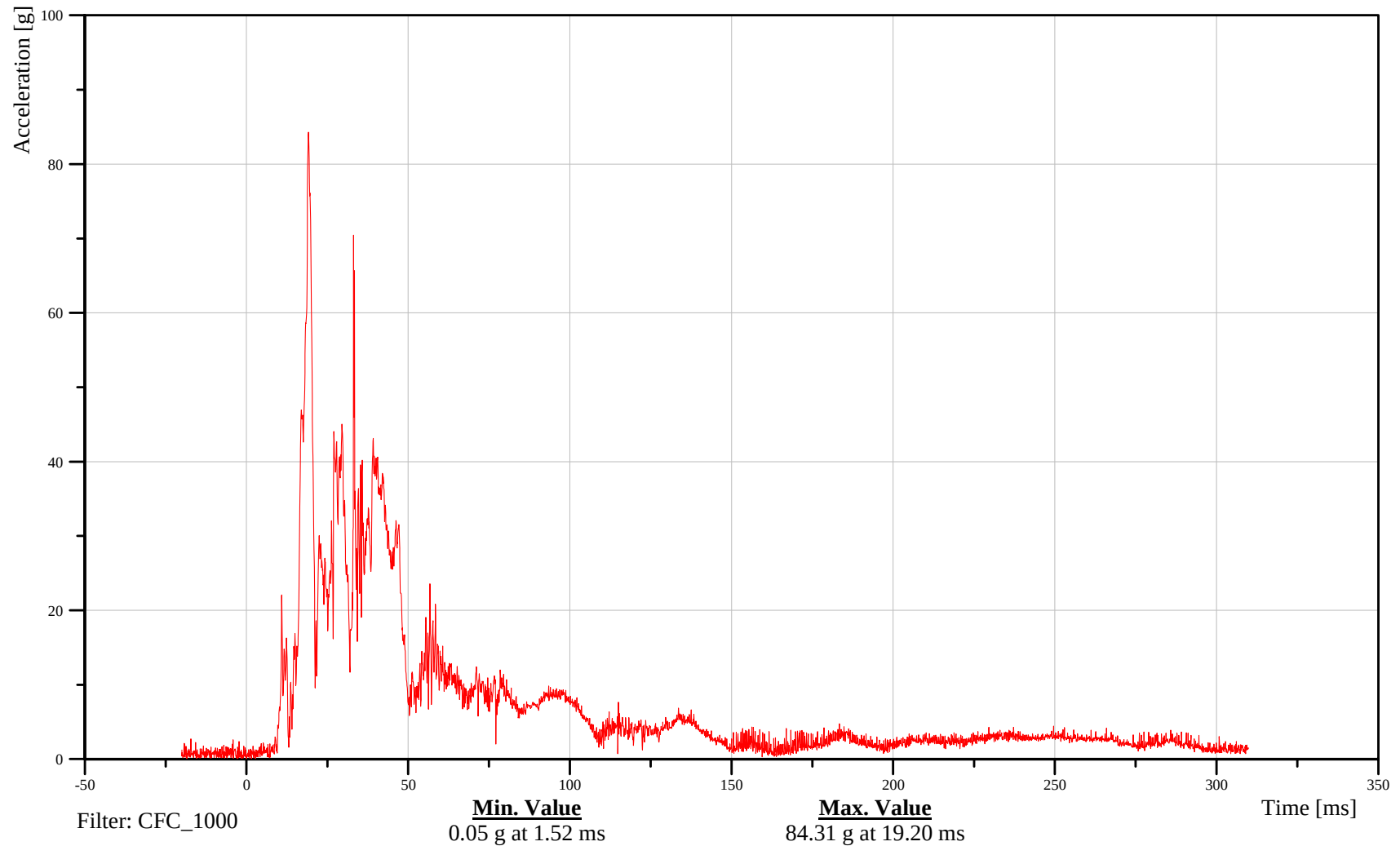
Passenger Thorax Rib 1 Resultant Acceleration

Customer: VRTC

14TRRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-195

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

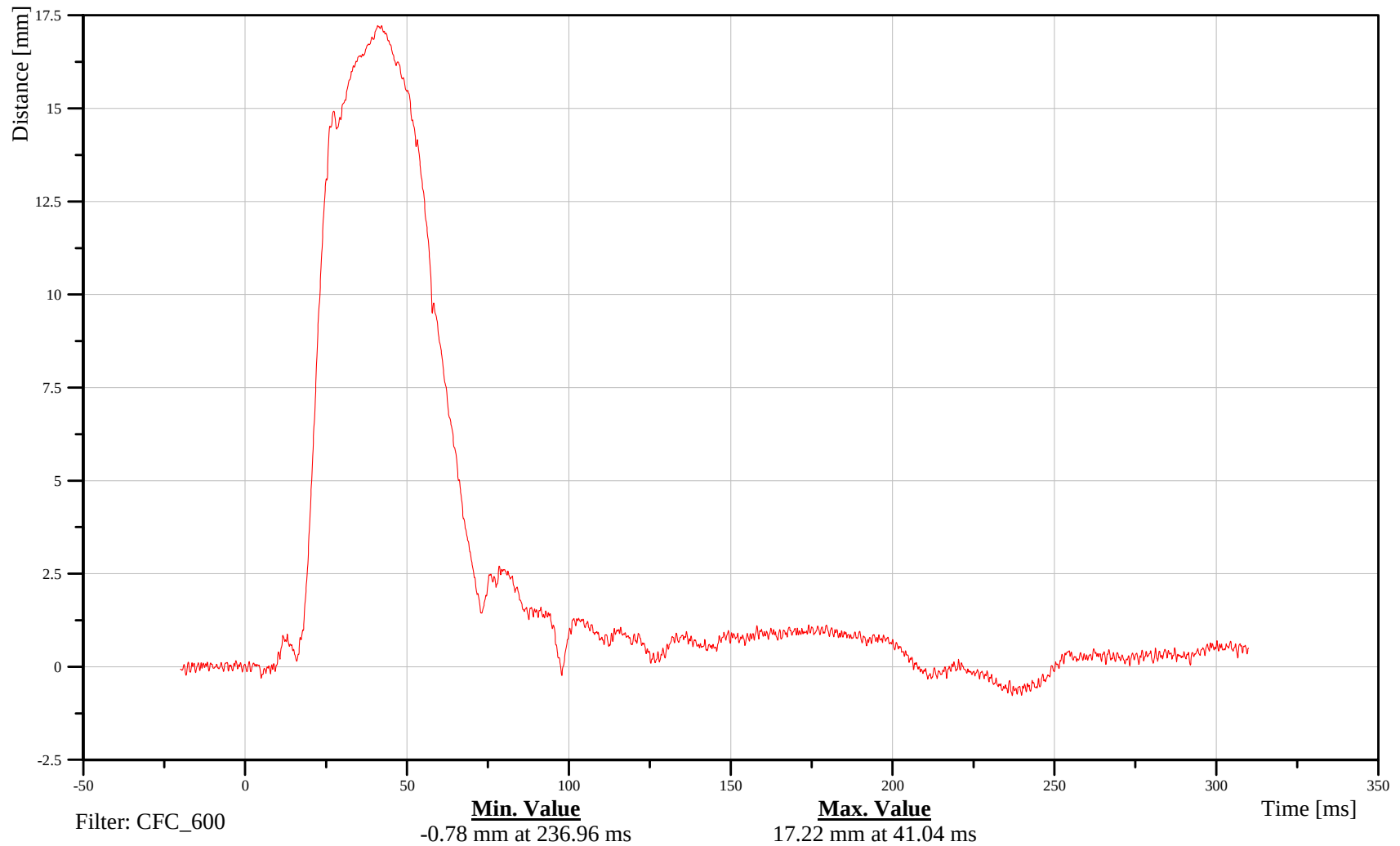
Passenger Thorax Rib 2 Y-Axis Displacement

Customer: VRTC

14TRRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-196

080911-2



World SID Evaluation
Passenger Thorax Rib 2 X-Axis Acceleration

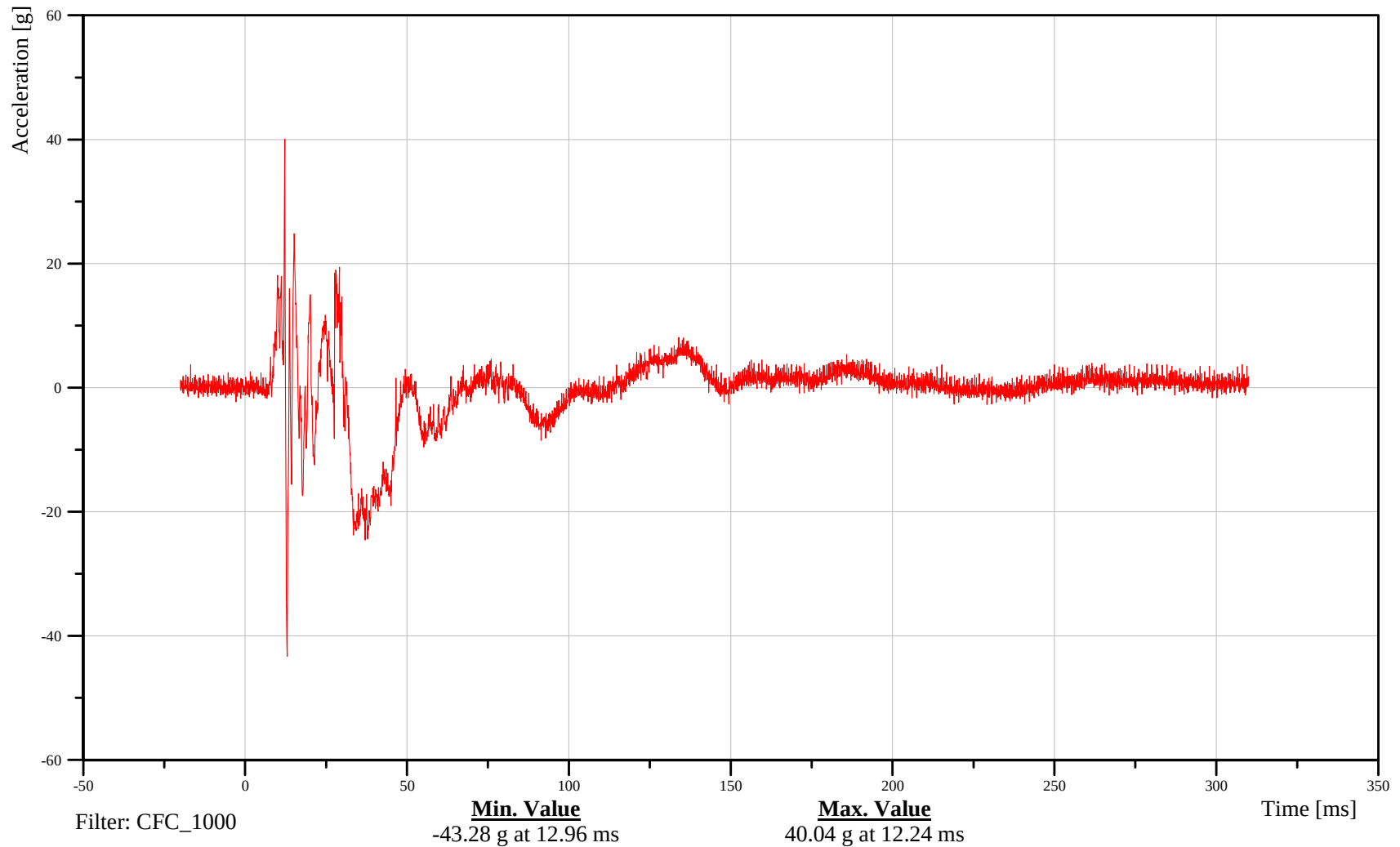
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-197

080911-2



World SID Evaluation
Passenger Thorax Rib 2 Y-Axis Acceleration

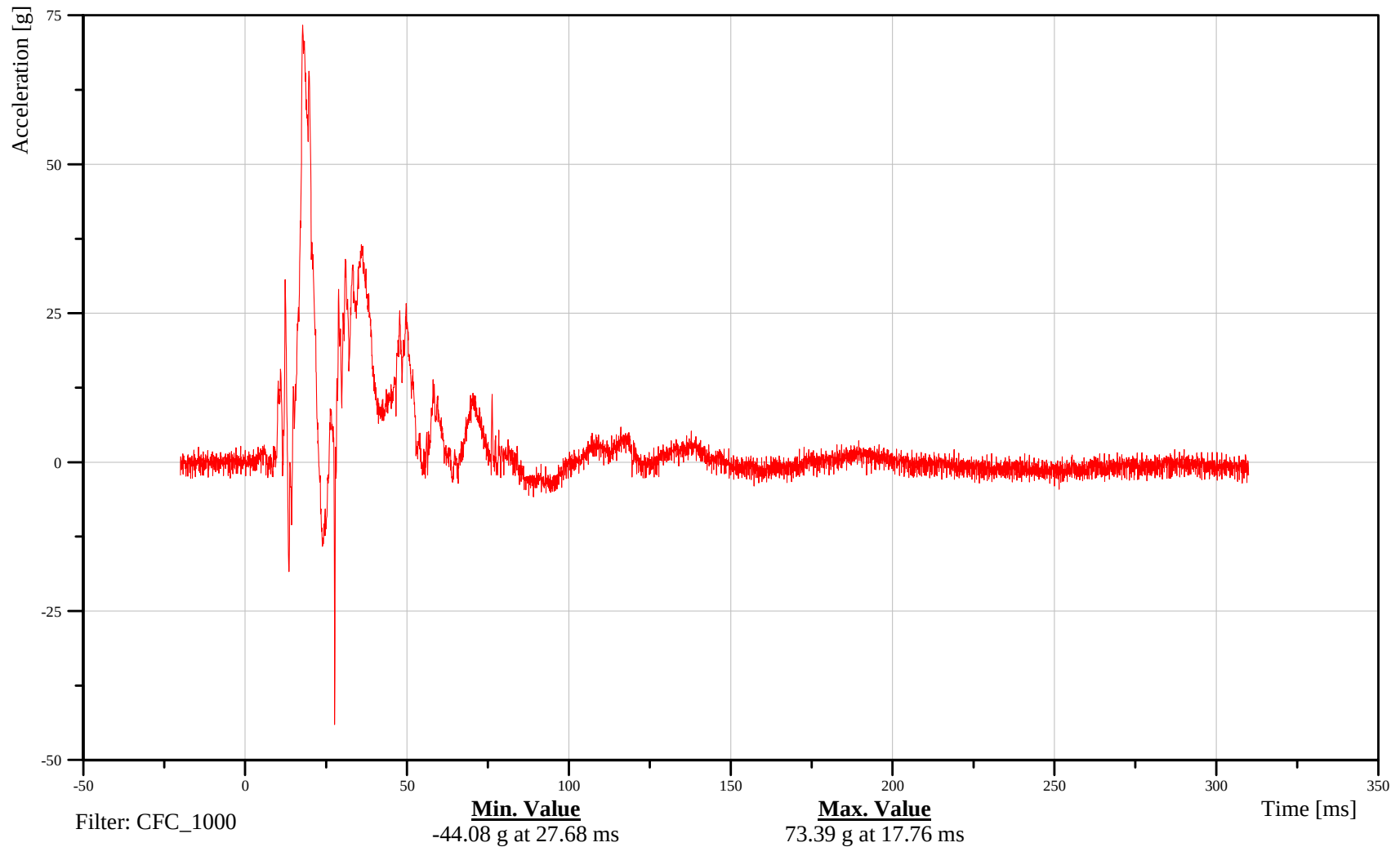
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-198

080911-2



World SID Evaluation
Passenger Thorax Rib 2 Z-Axis Acceleration

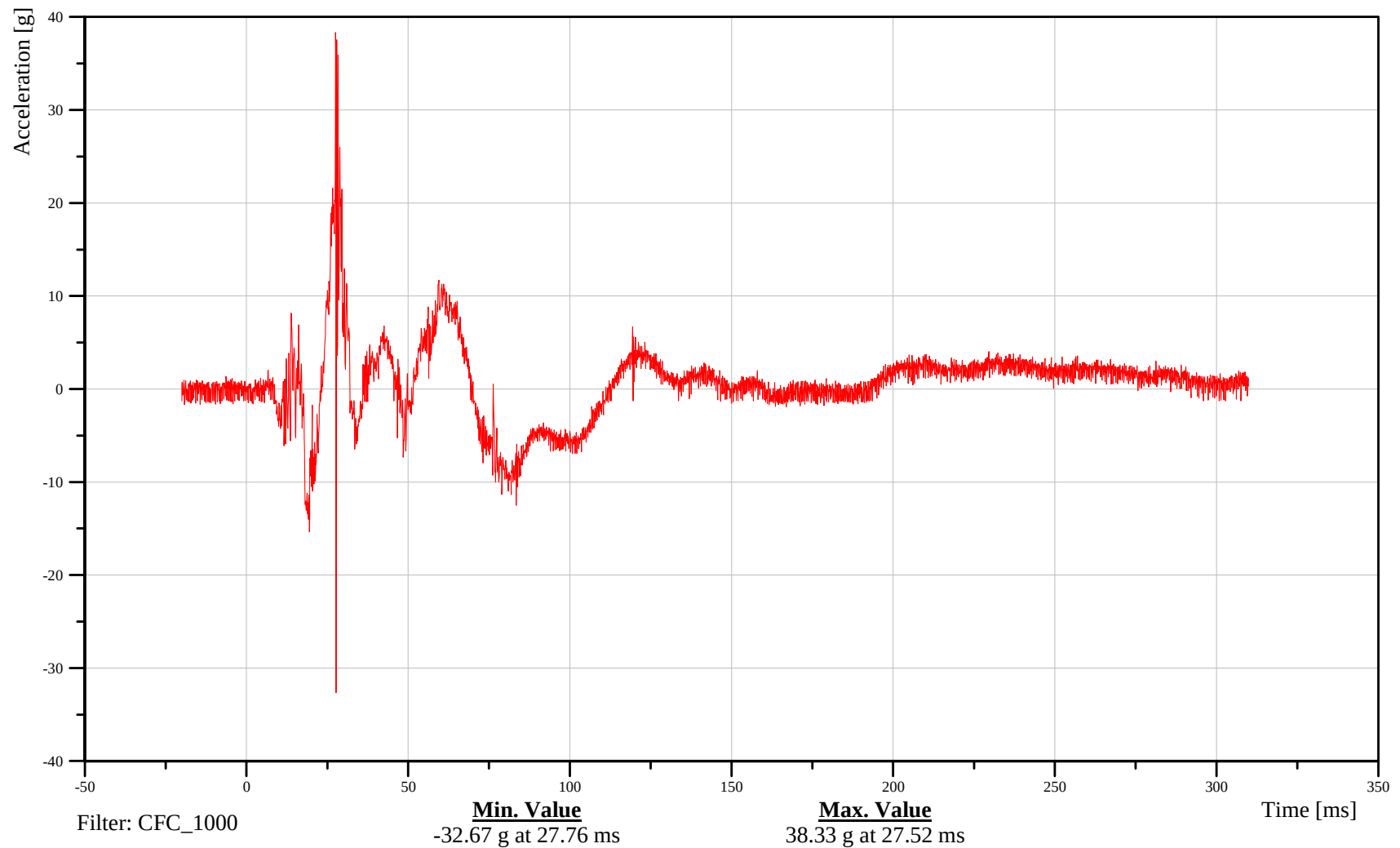
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-199

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

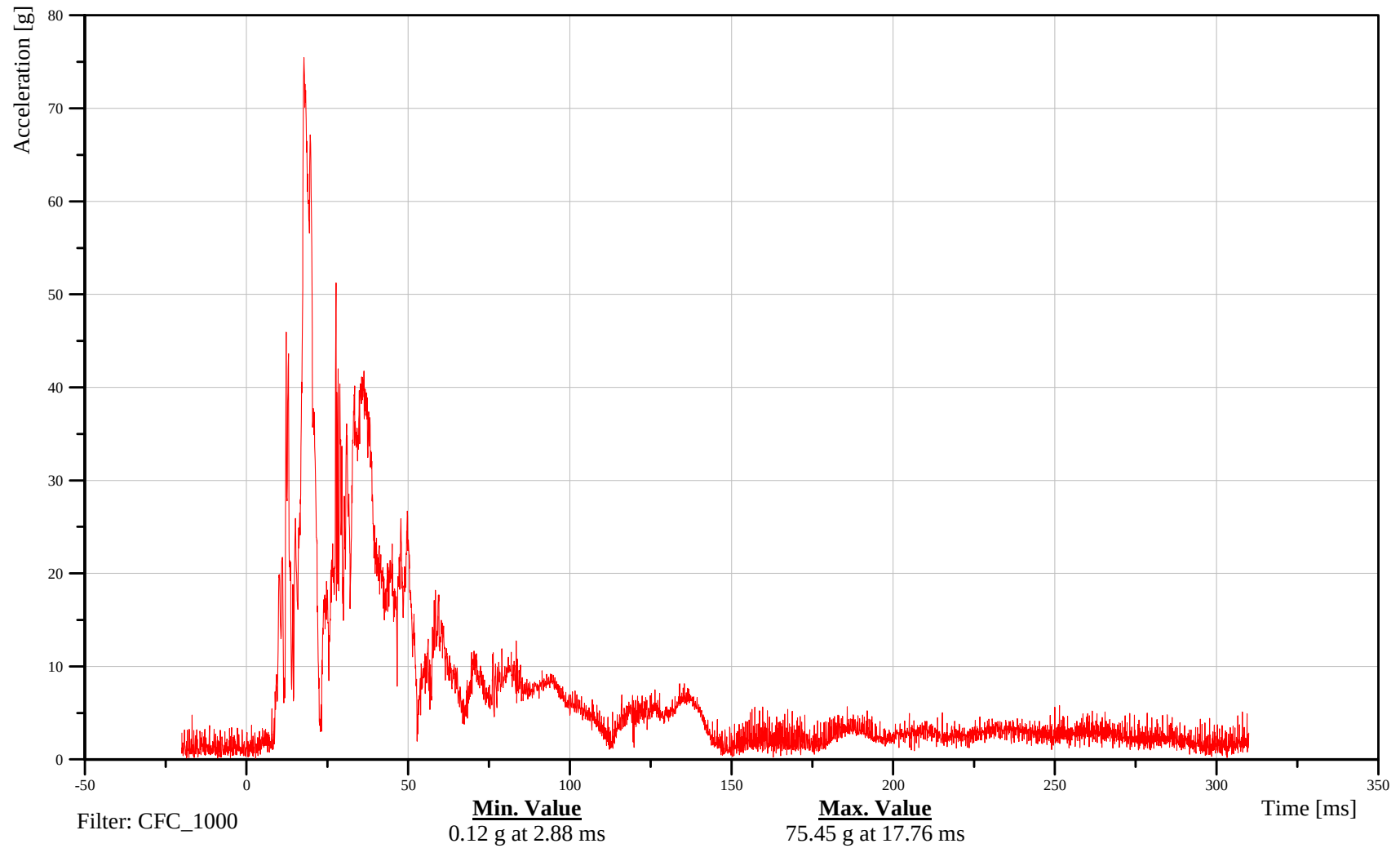
Passenger Thorax Rib 2 Resultant Acceleration

Customer: VRTC

14TRRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-200

080911-2



World SID Evaluation

Passenger Thorax Rib 3 Y-Axis Displacement

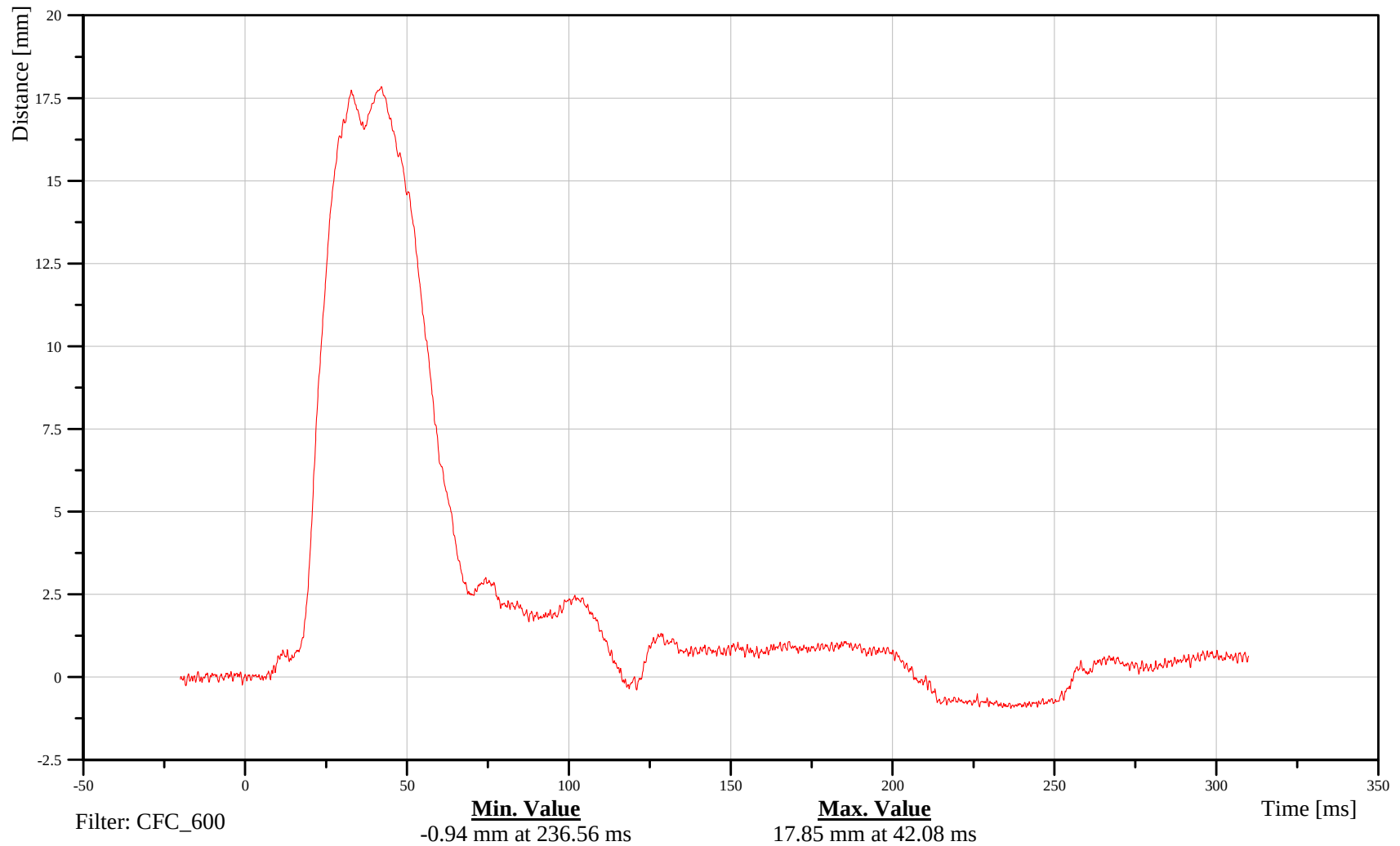
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE03WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-201

080911-2



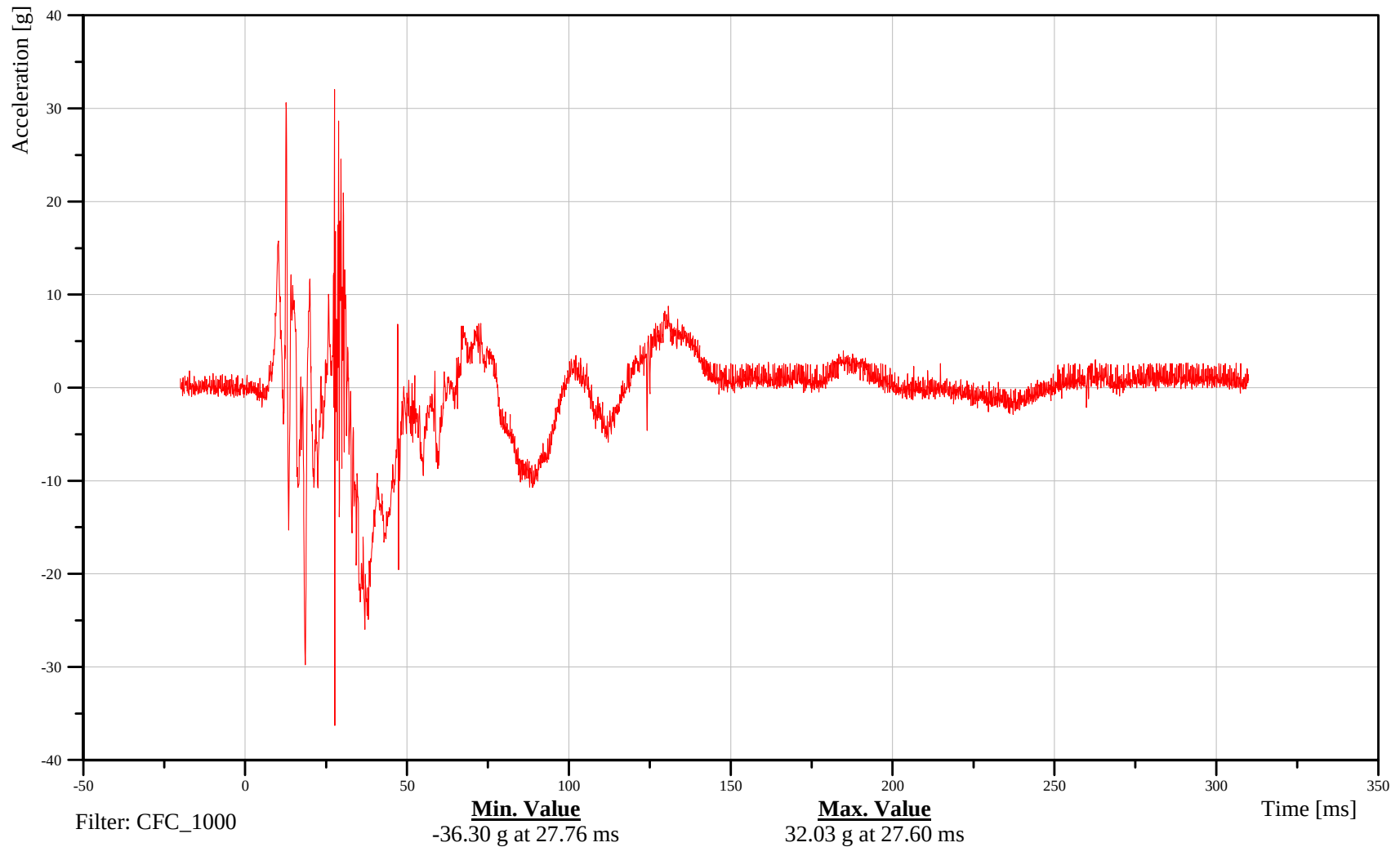
World SID Evaluation
Passenger Thorax Rib 3 X-Axis Acceleration

Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE03WSACXA

TRC Inc. Test Lab: CTF
Test Number: 080911-2



B-202

080911-2



World SID Evaluation
Passenger Thorax Rib 3 Y-Axis Acceleration

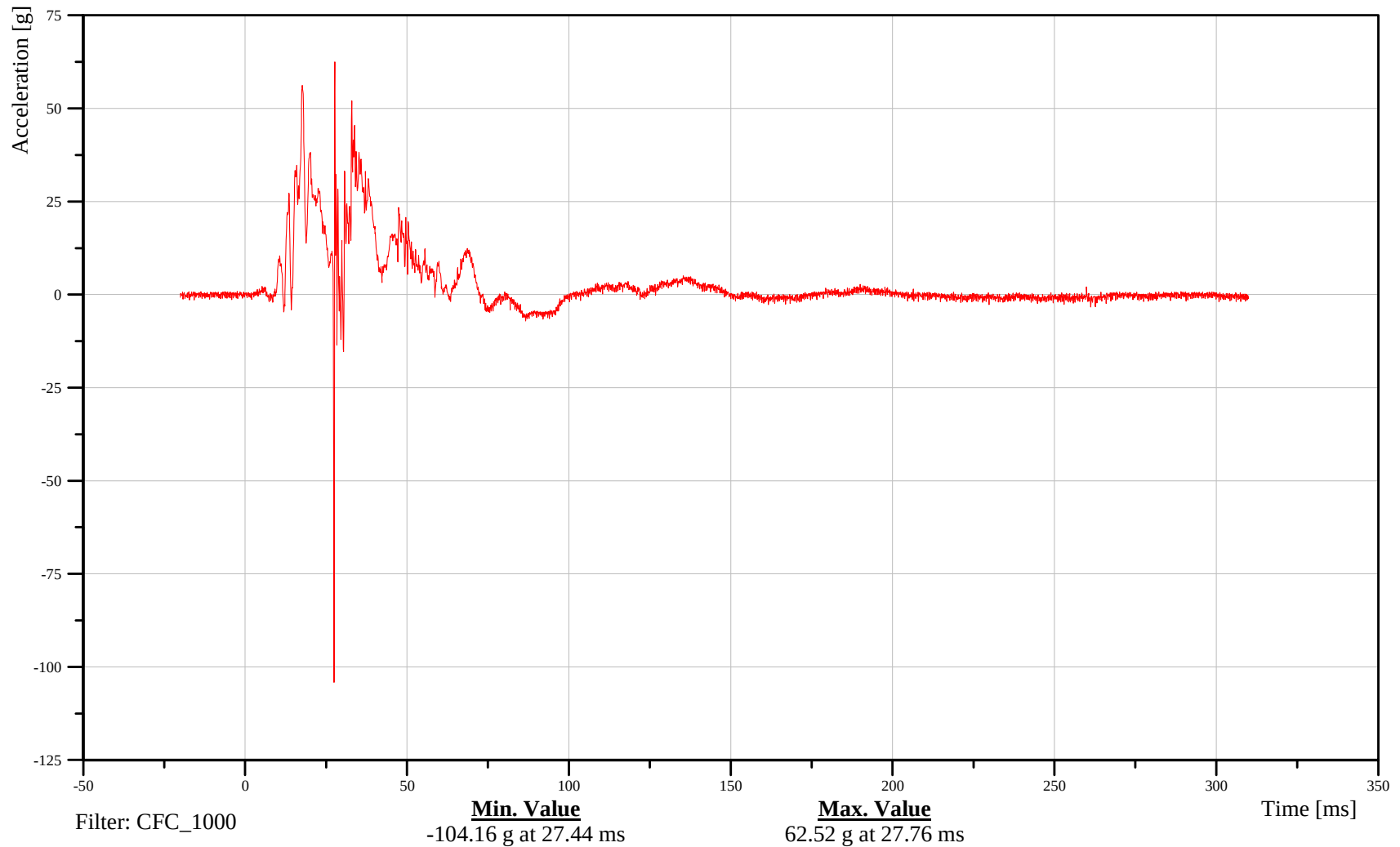
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE03WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-203

080911-2



World SID Evaluation
Passenger Thorax Rib 3 Z-Axis Acceleration

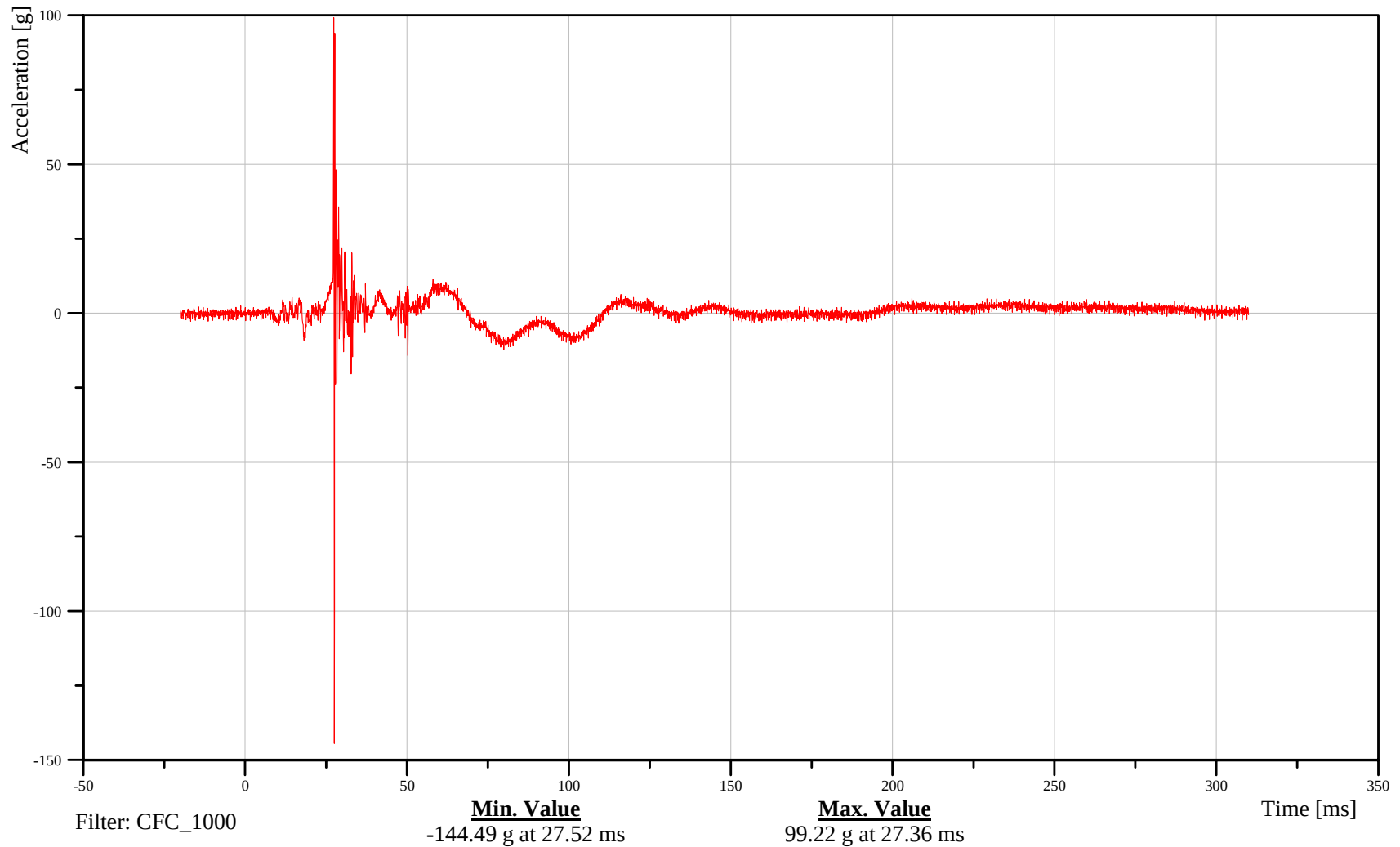
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE03WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-204

080911-2



World SID Evaluation

Passenger Thorax Rib 3 Resultant Acceleration

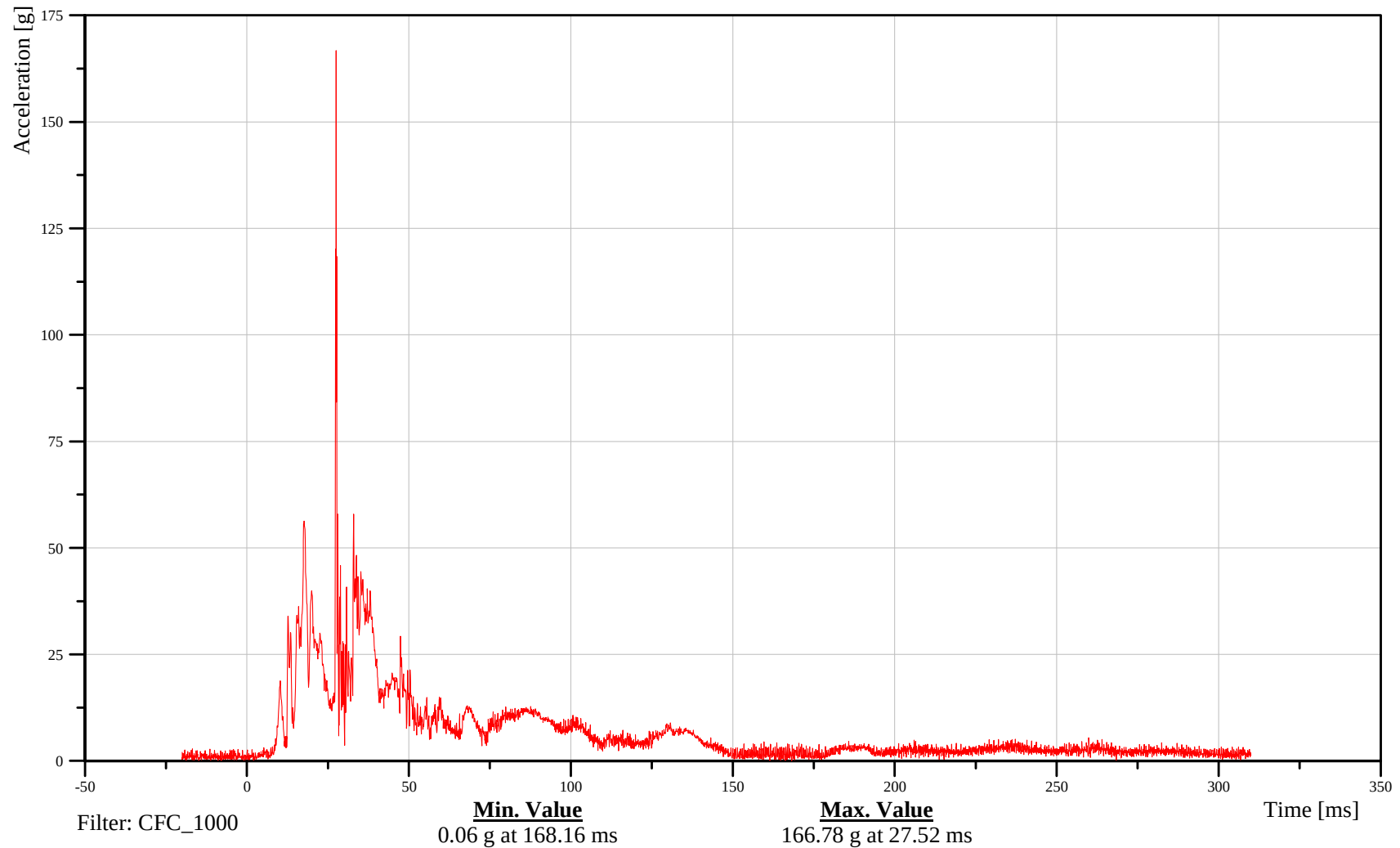
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14TRRILE03WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-205

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

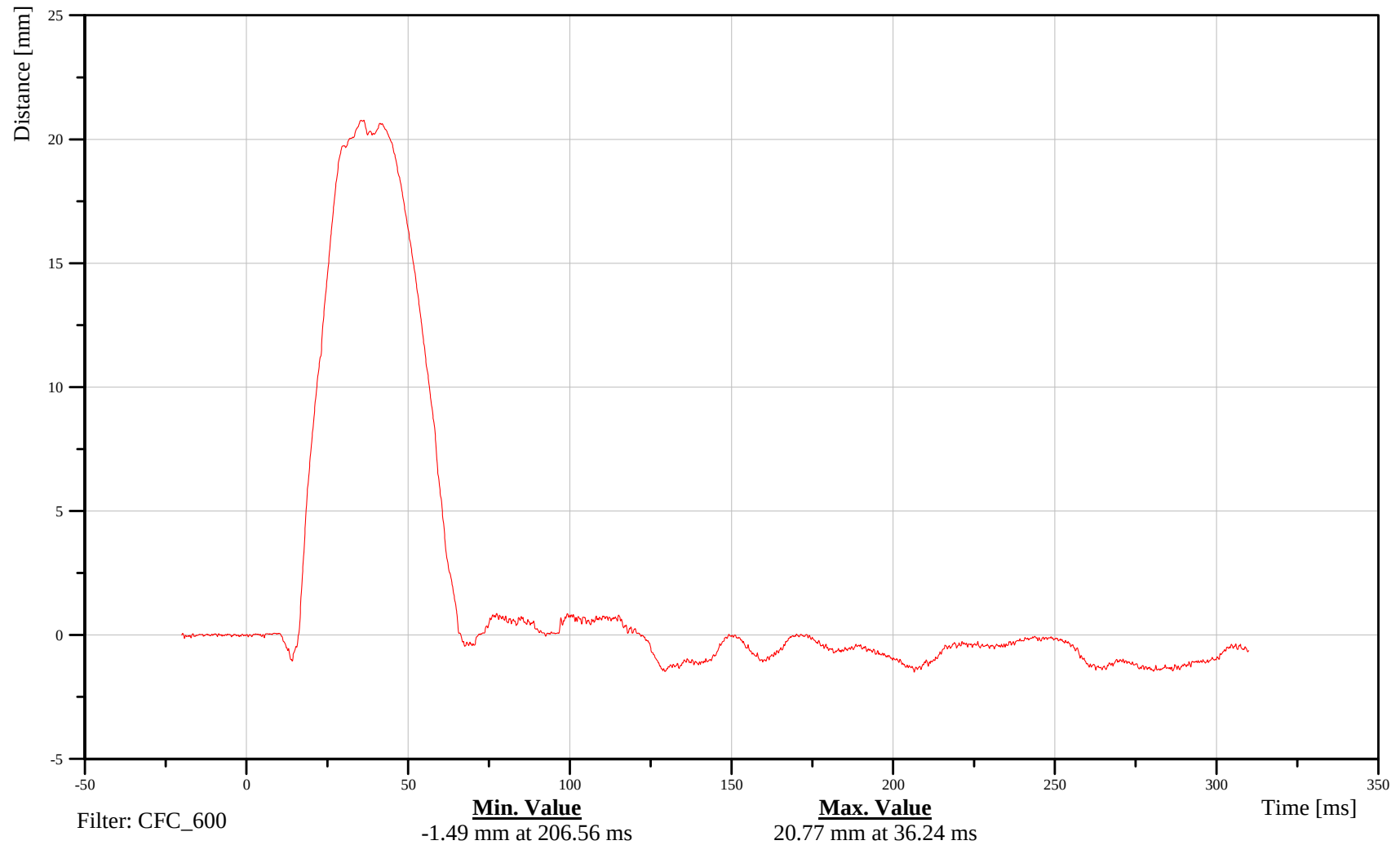
Passenger Abdominal Rib 1 Y-Axis Displacement

Customer: VRTC

14ABRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-206

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

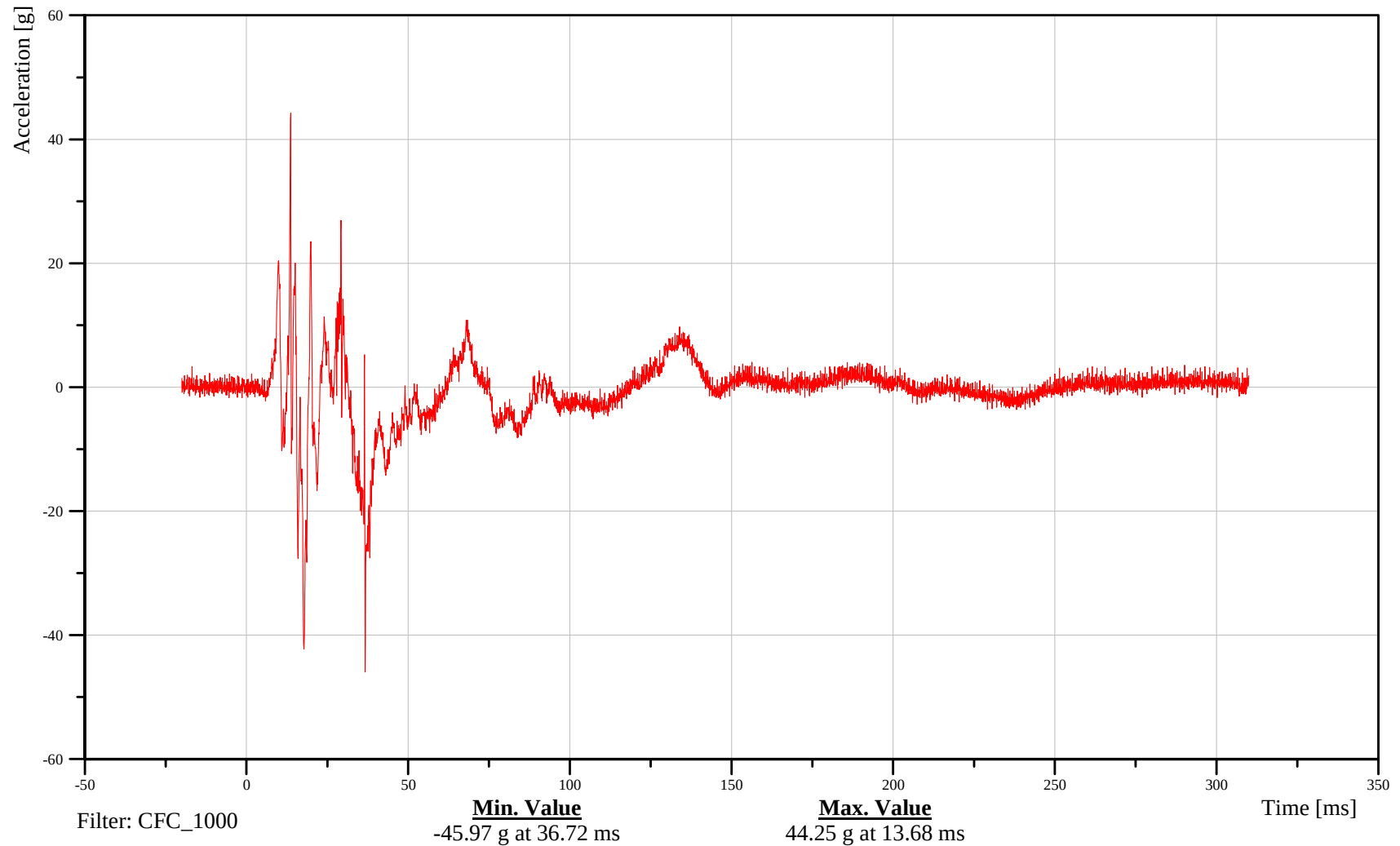
Passenger Abdominal Rib 1 X-Axis Acceleration

Customer: VRTC

14ABRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-207

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

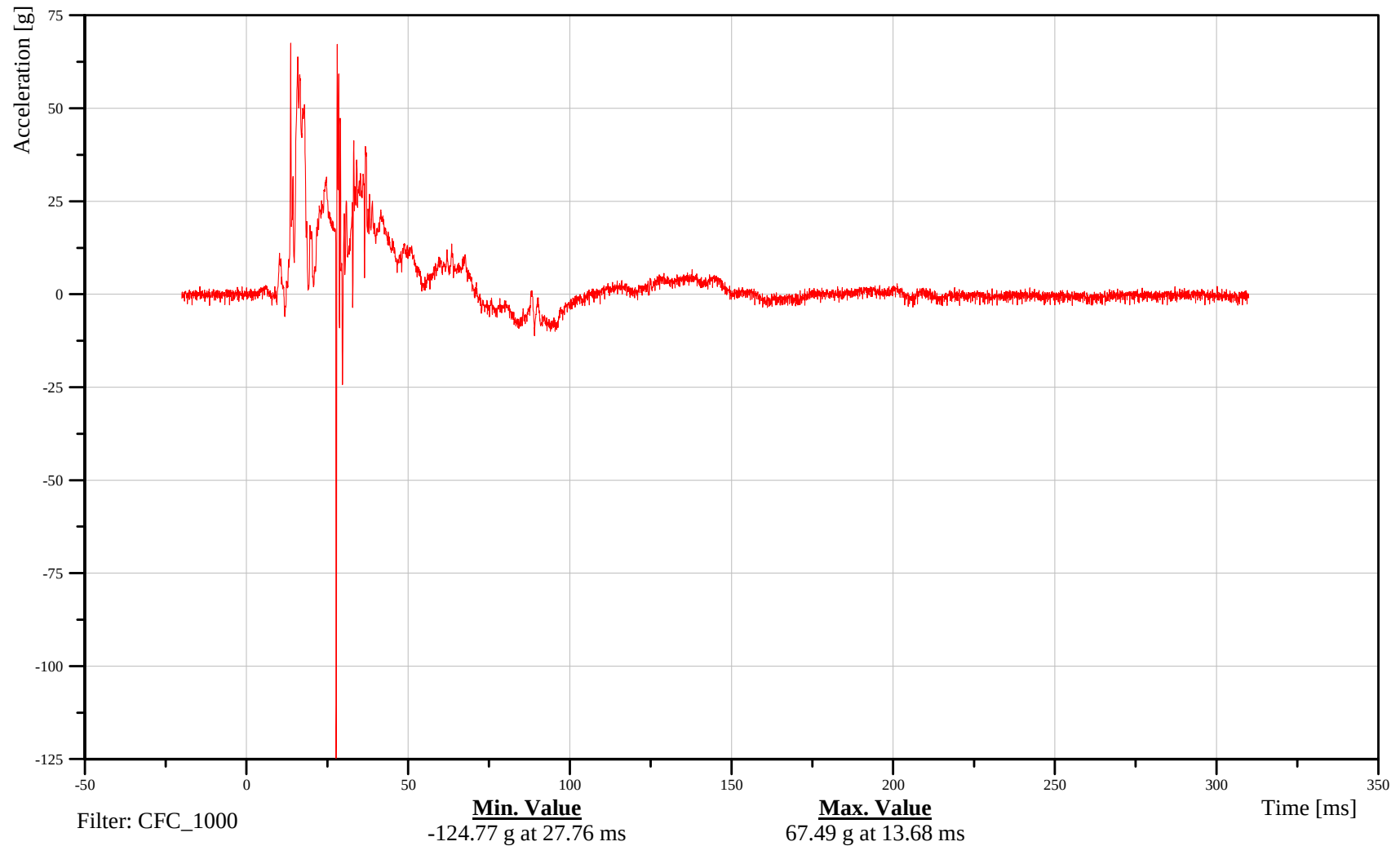
Passenger Abdominal Rib 1 Y-Axis Acceleration

Customer: VRTC

14ABRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-208

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

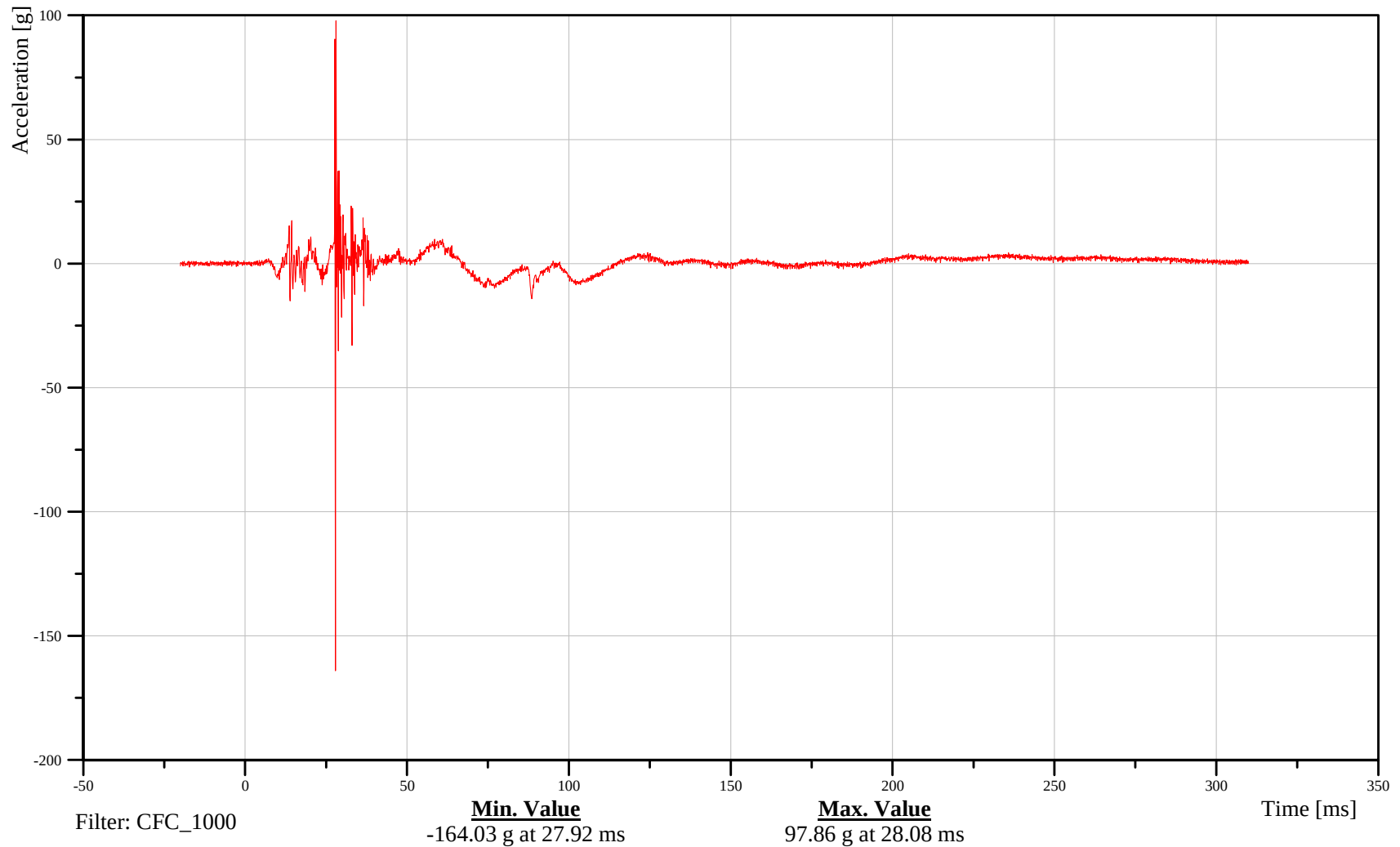
Passenger Abdominal Rib 1 Z-Axis Acceleration

Customer: VRTC

14ABRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-209

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

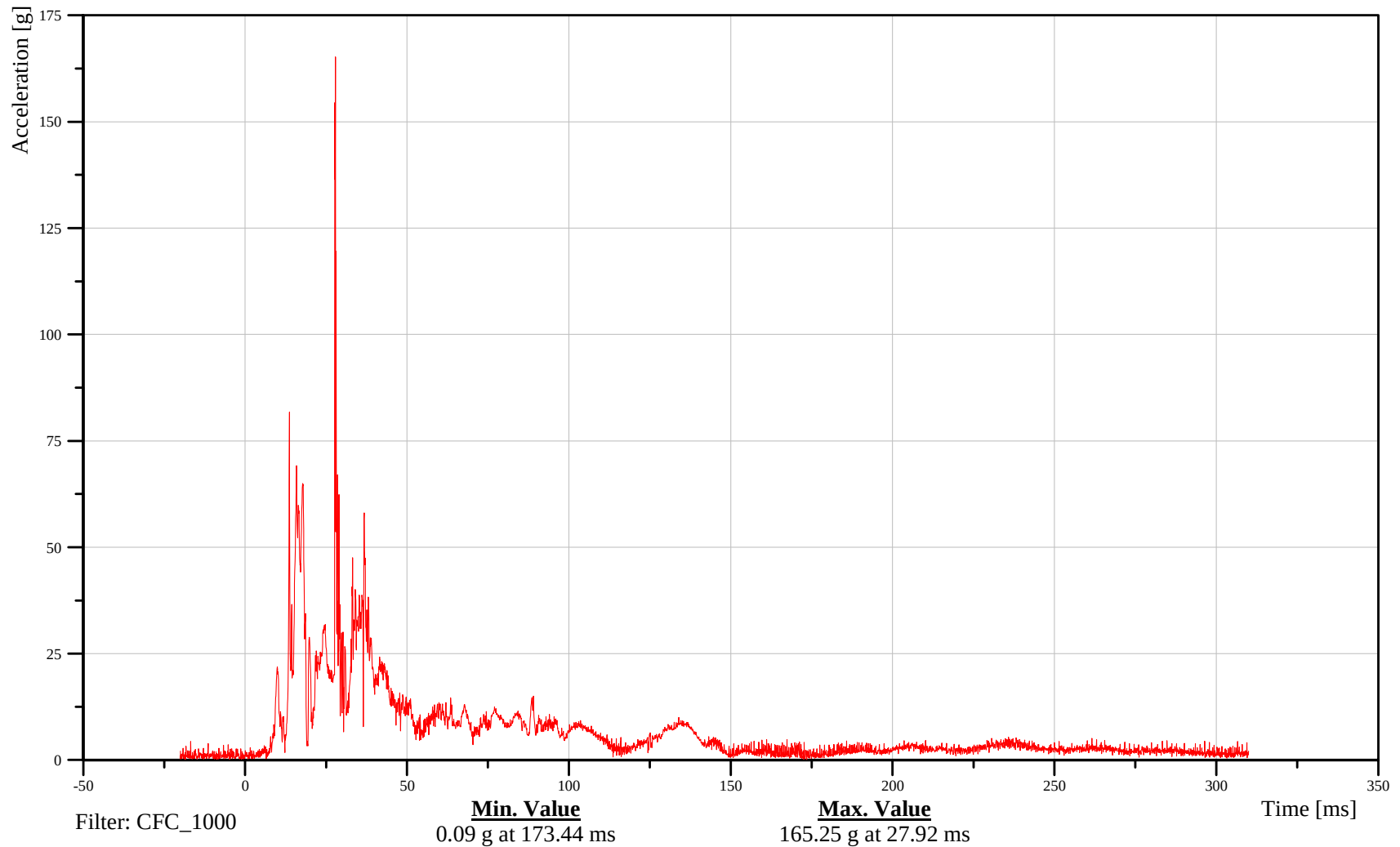
Passenger Abdominal Rib 1 Resultant Acceleration

Customer: VRTC

14ABRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-210

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

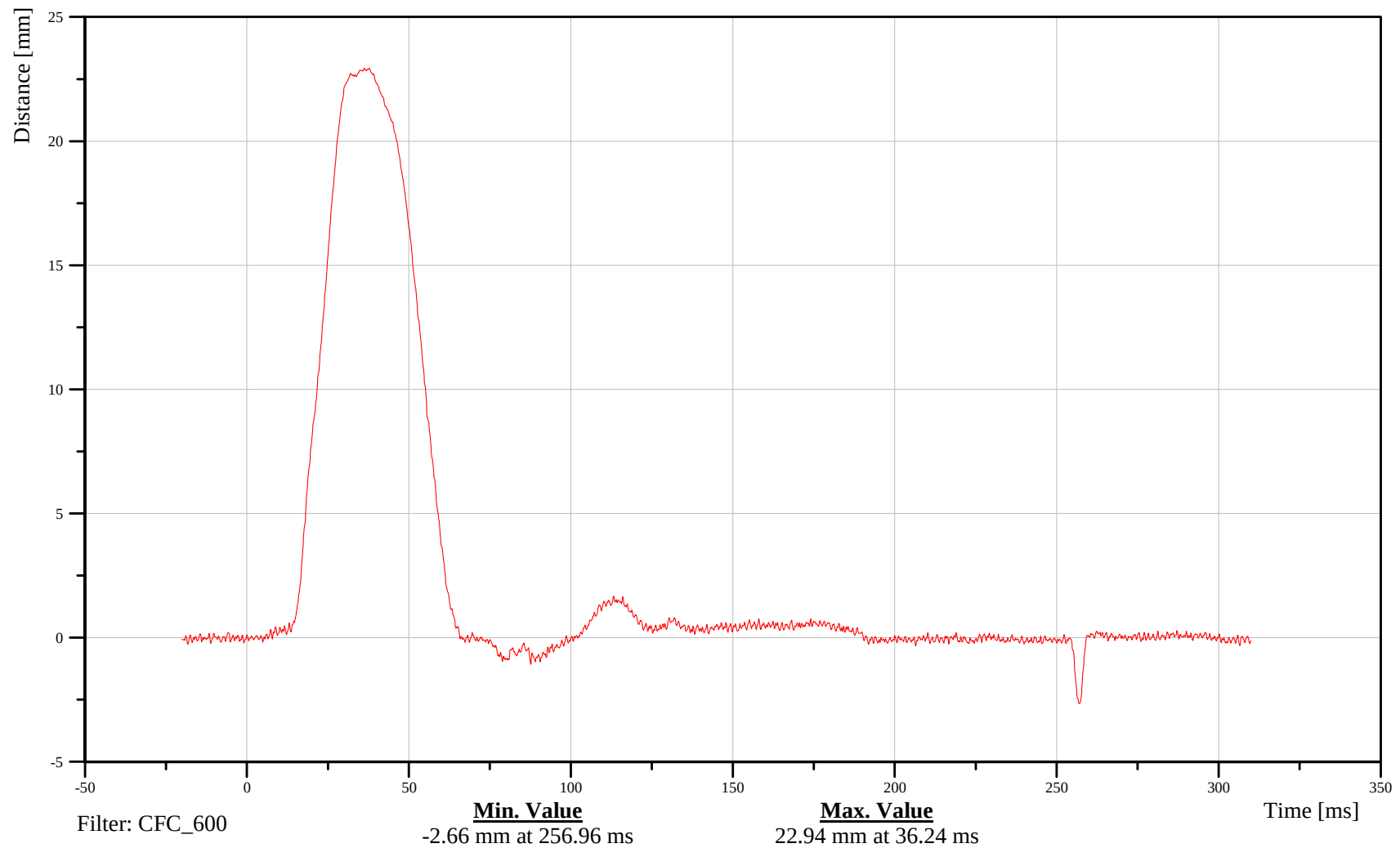
Passenger Abdominal Rib 2 Y-Axis Displacement

Customer: VRTC

14ABRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-211

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

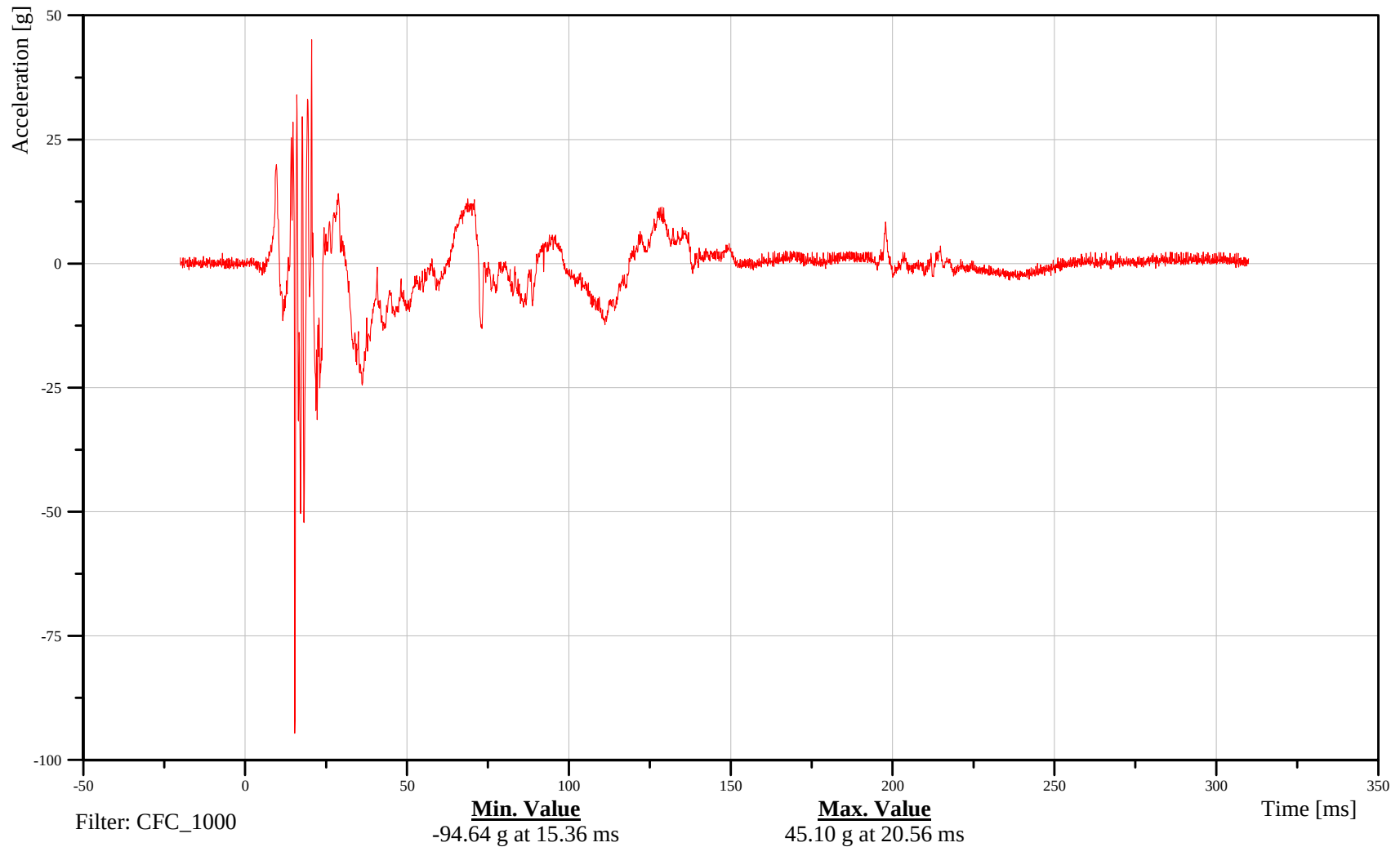
Passenger Abdominal Rib 2 X-Axis Acceleration

Customer: VRTC

14ABRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-212

080911-2



World SID Evaluation

Passenger Abdominal Rib 2 Y-Axis Acceleration

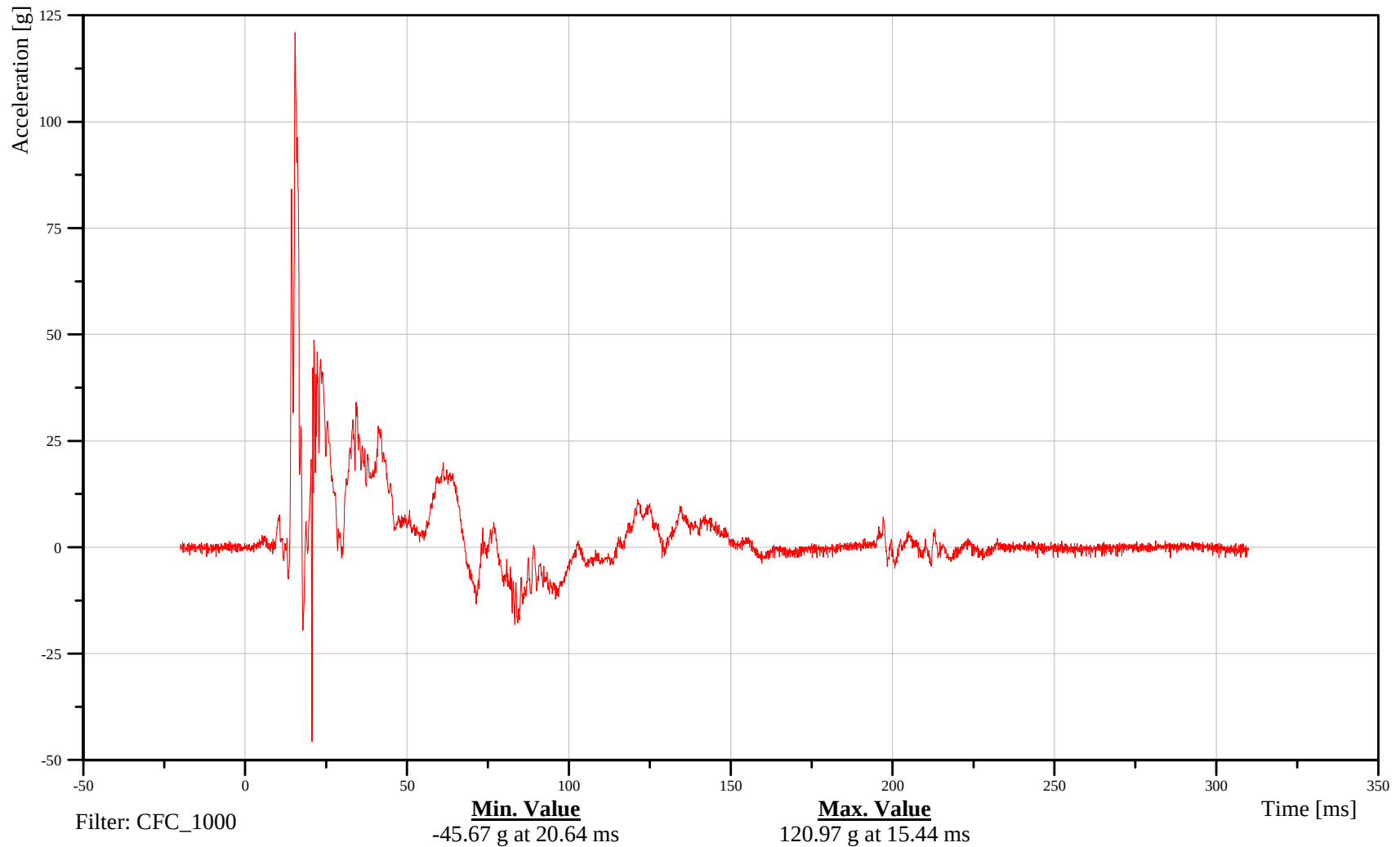
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14ABRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-213

080911-2



World SID Evaluation

Passenger Abdominal Rib 2 Z-Axis Acceleration

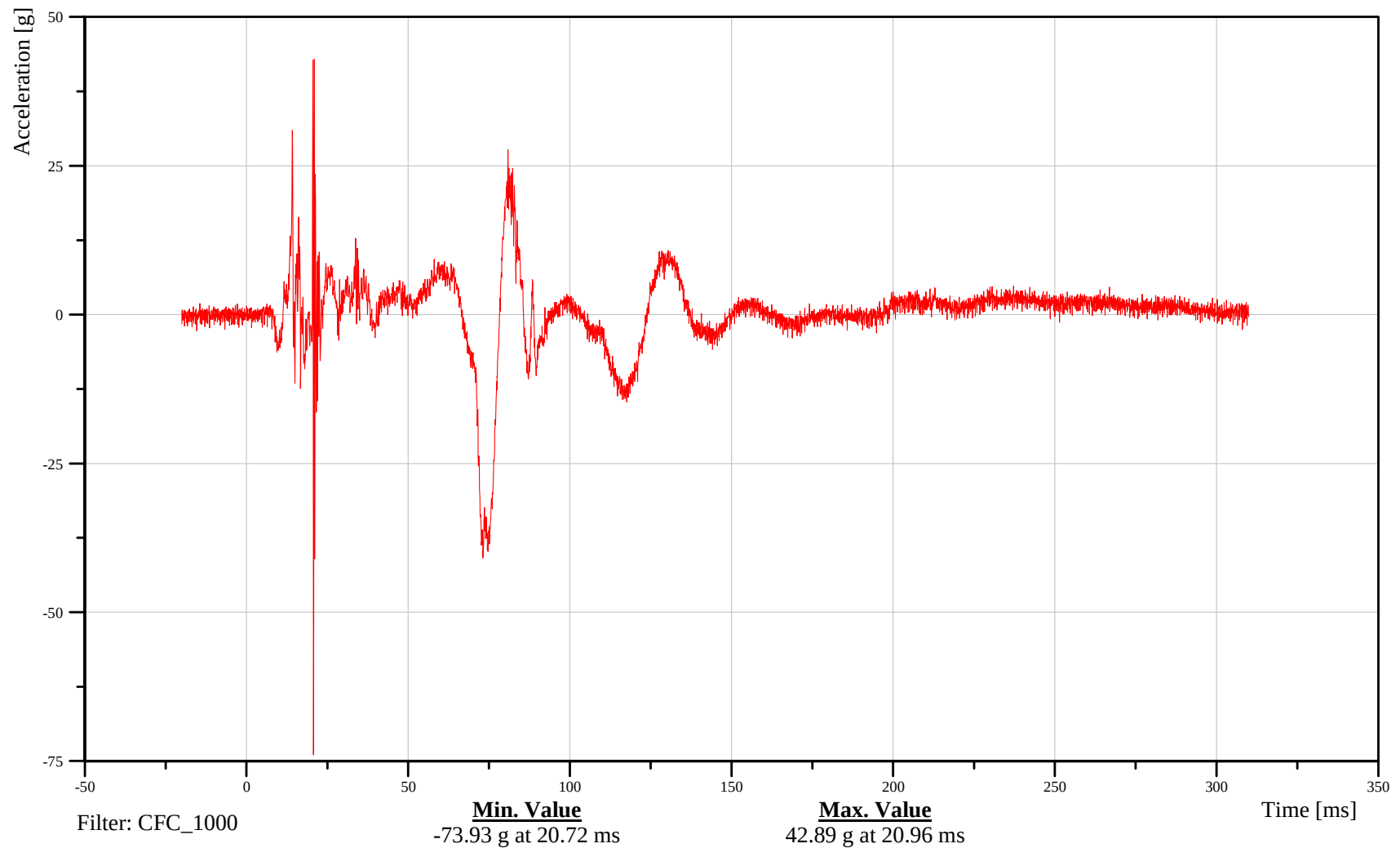
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14ABRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-214

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

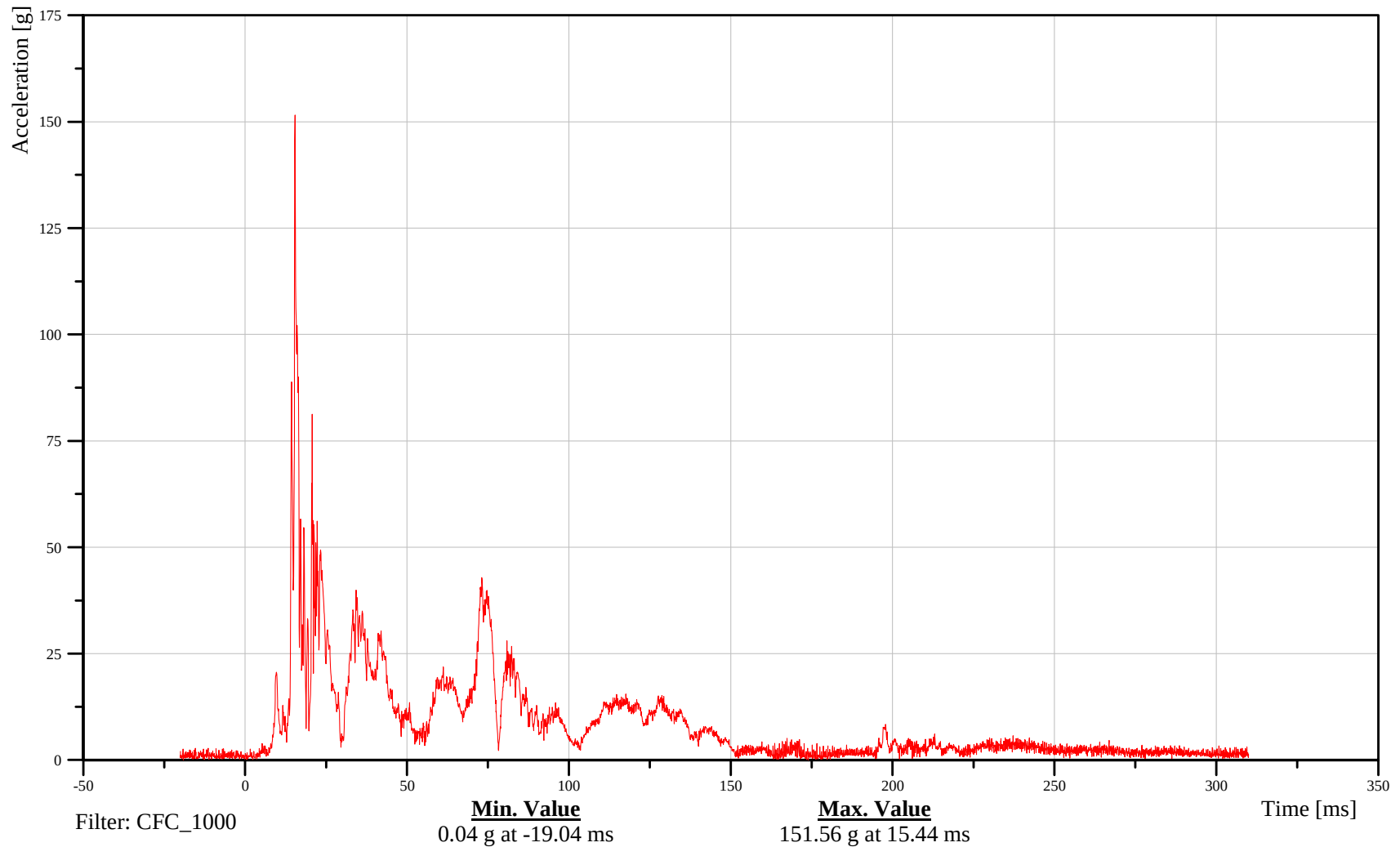
Passenger Abdominal Rib 2 Resultant Acceleration

Customer: VRTC

14ABRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-215

080911-2



World SID Evaluation
Passenger Lumbar X-Axis Force

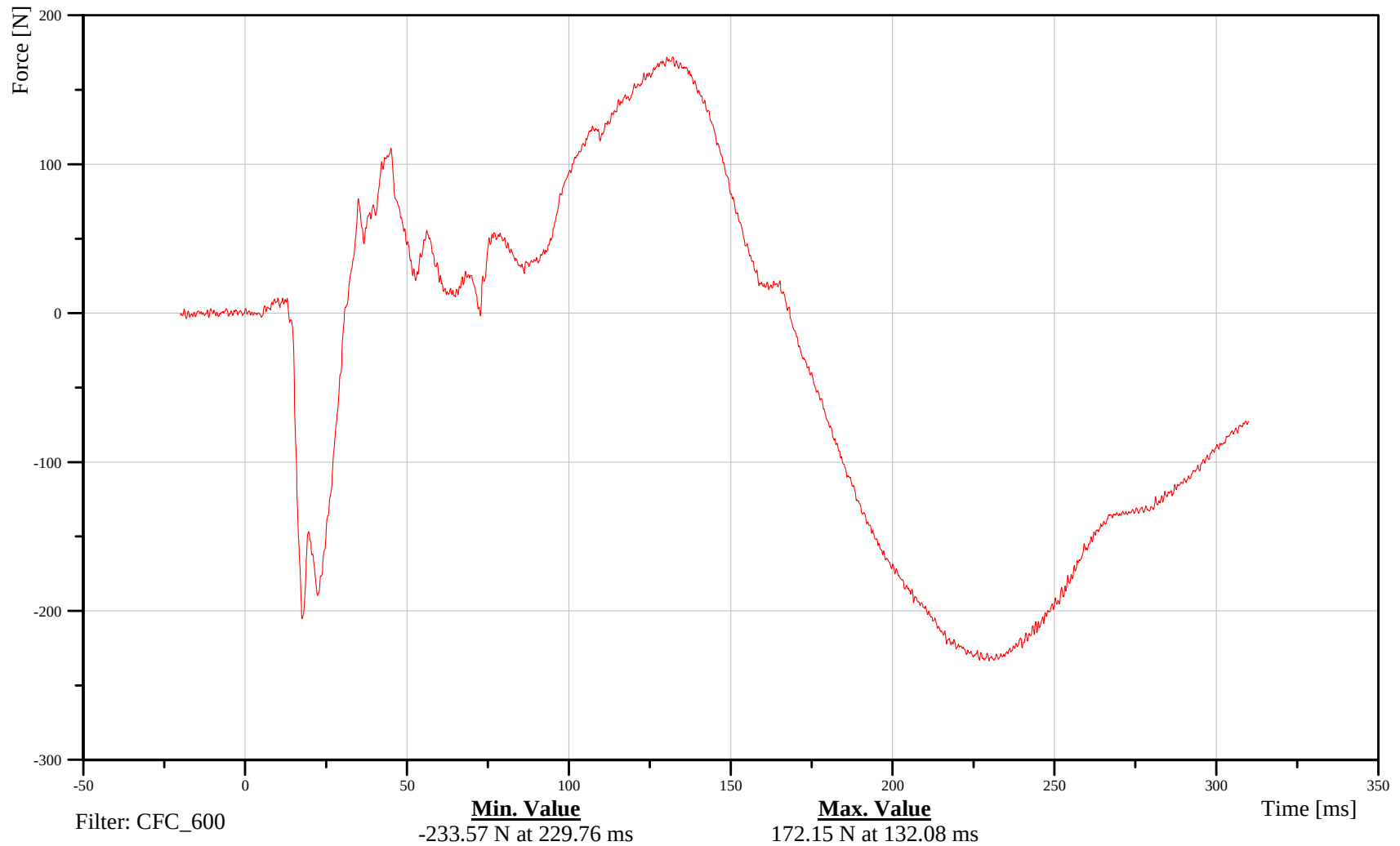
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14LUSP0000WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-216

080911-2



World SID Evaluation
Passenger Lumbar Y-Axis Force

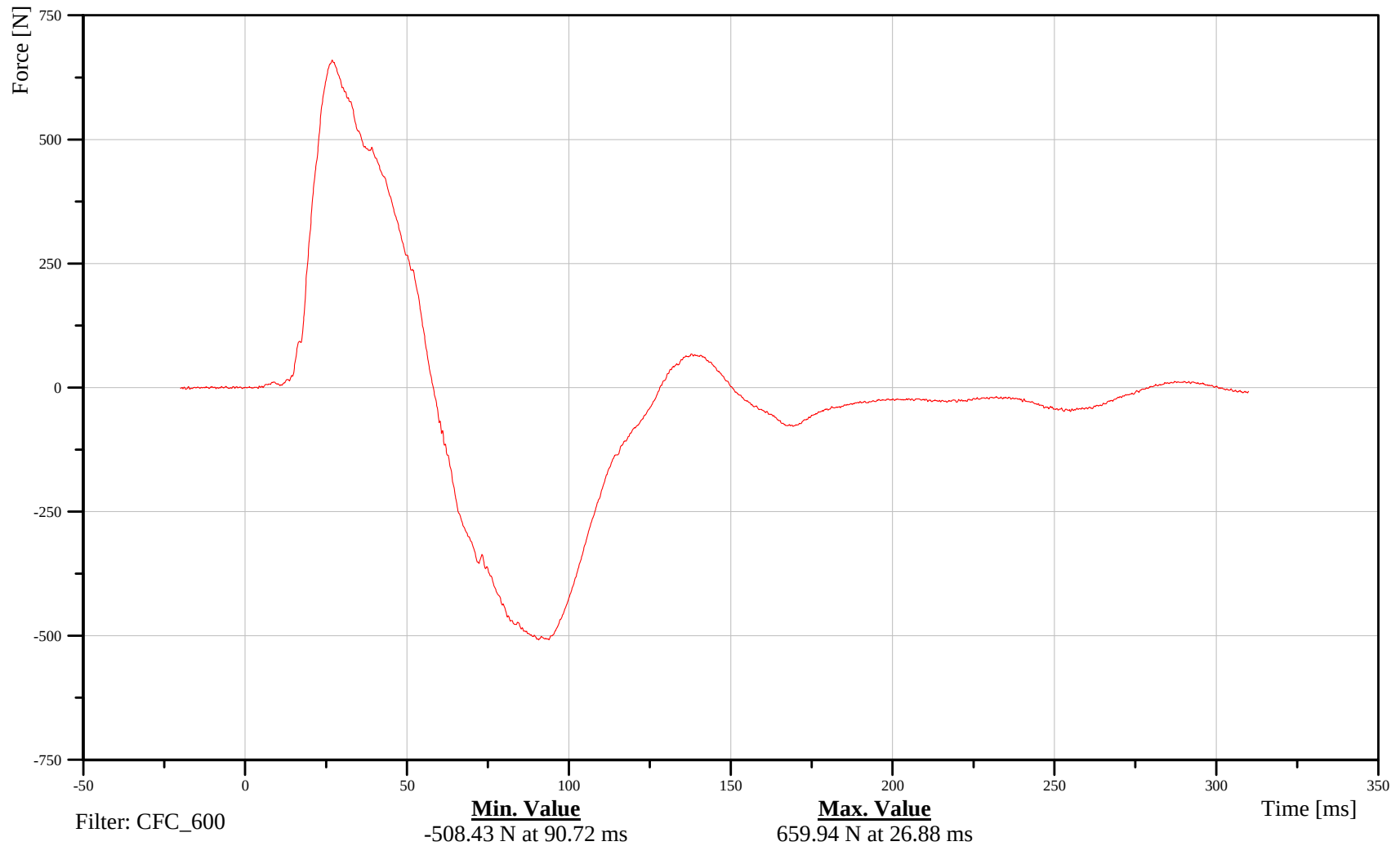
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14LUSP0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-217

080911-2



World SID Evaluation
Passenger Lumbar Z-Axis Force

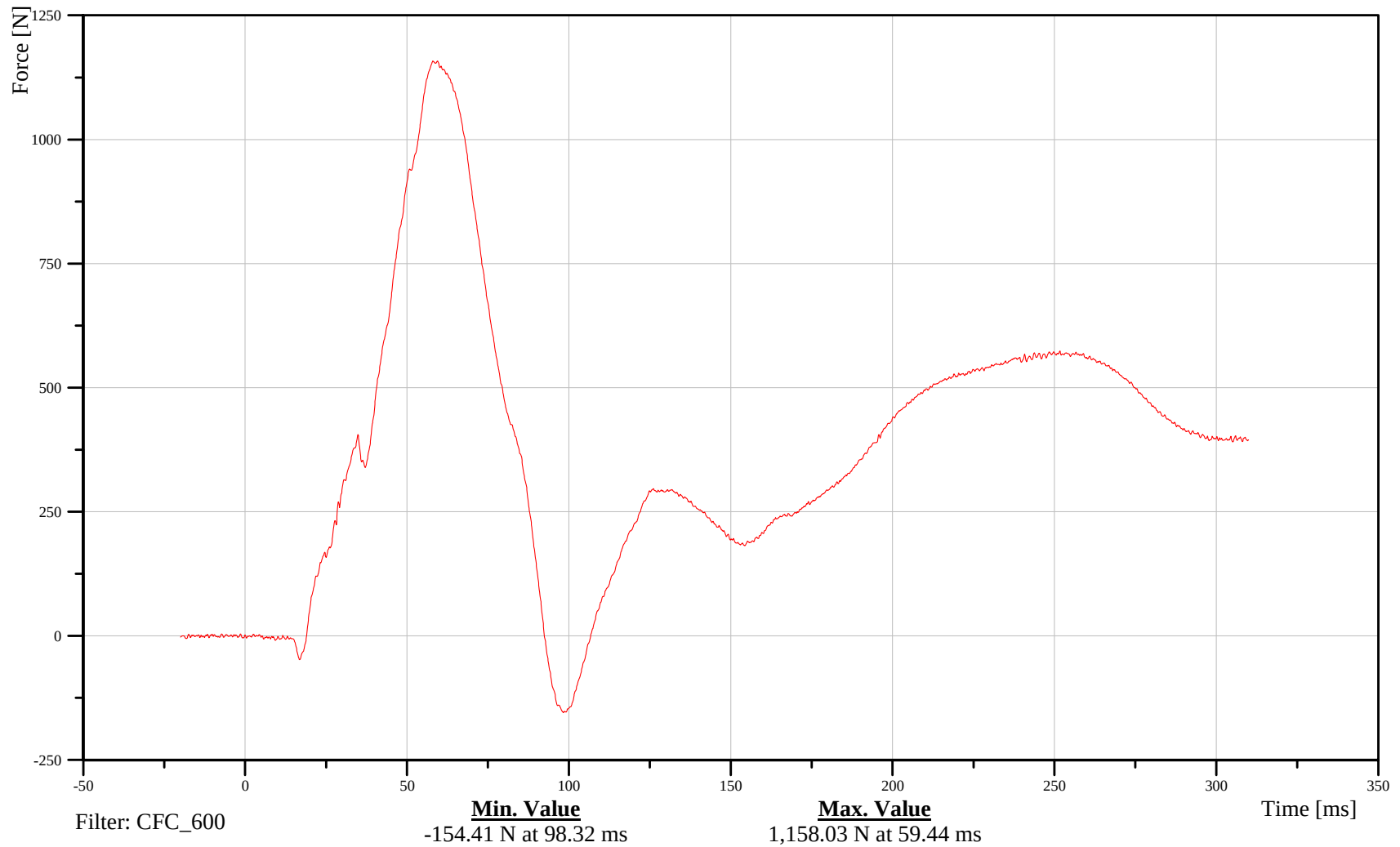
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14LUSP0000WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-218

080911-2



World SID Evaluation

Passenger Lumbar Moment About X Axis

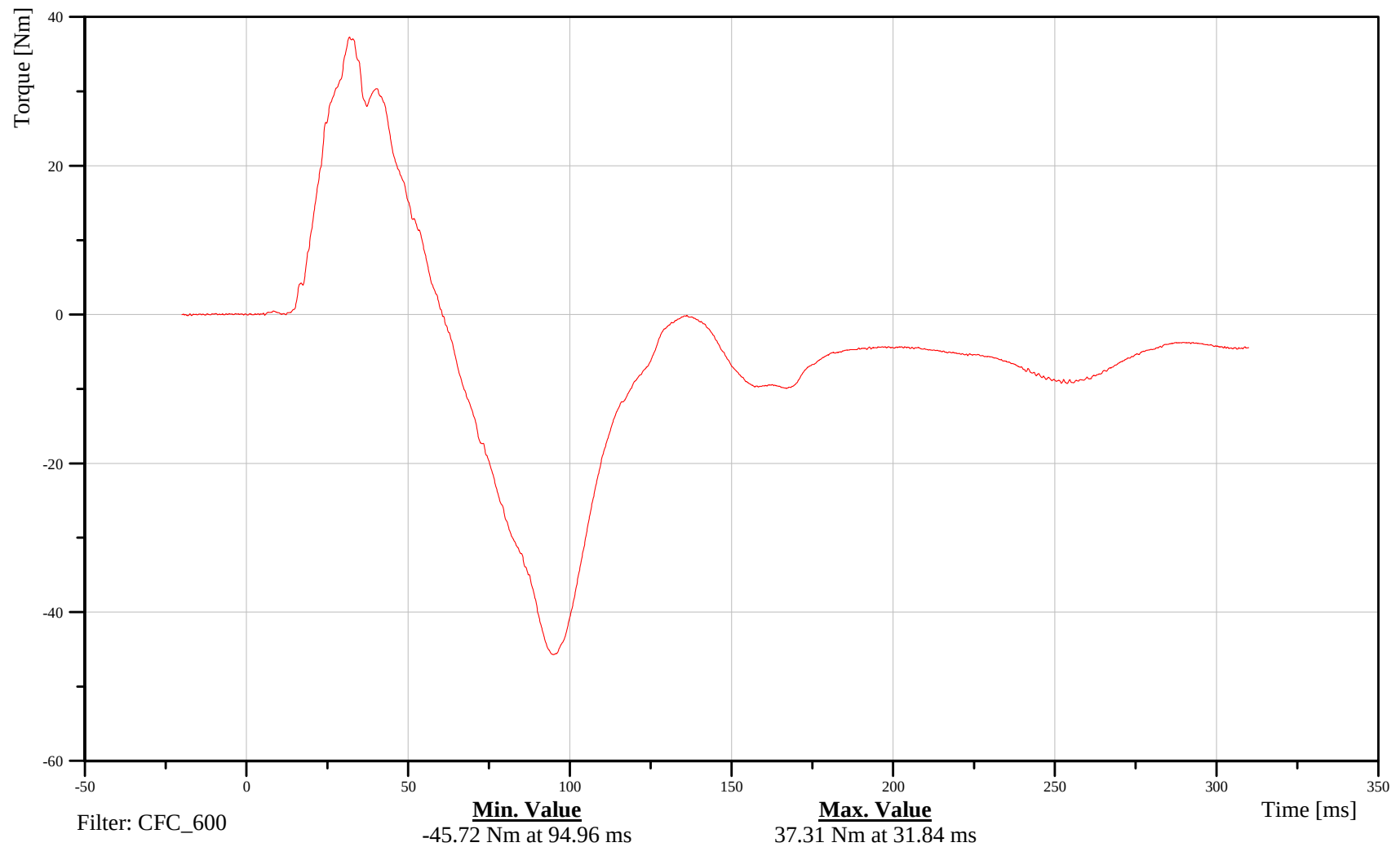
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14LUSP0000WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-219

080911-2



World SID Evaluation

Passenger Lumbar Moment About Y Axis

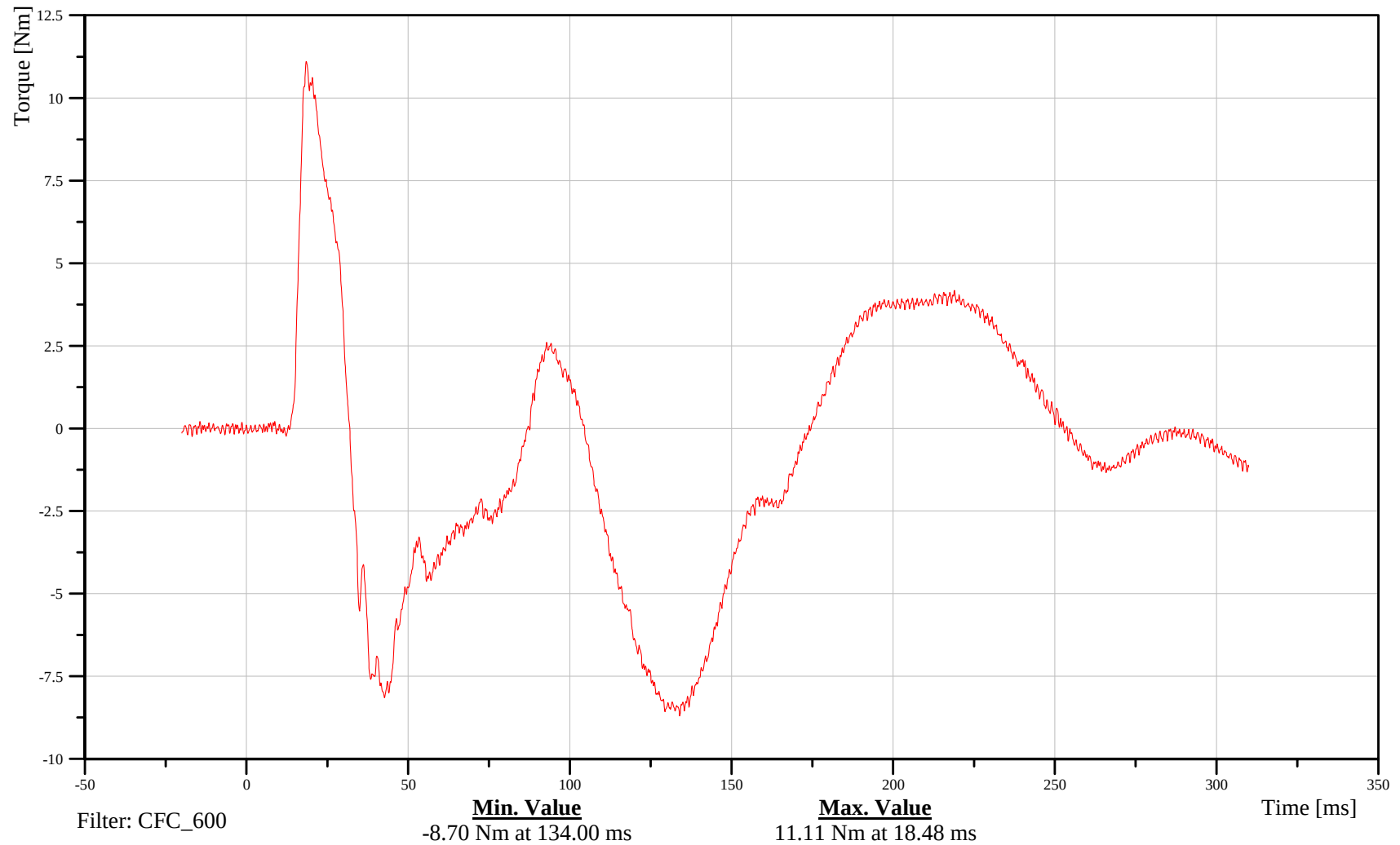
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14LUSP0000WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-220

080911-2



World SID Evaluation
Passenger Lumbar Moment About Z Axis

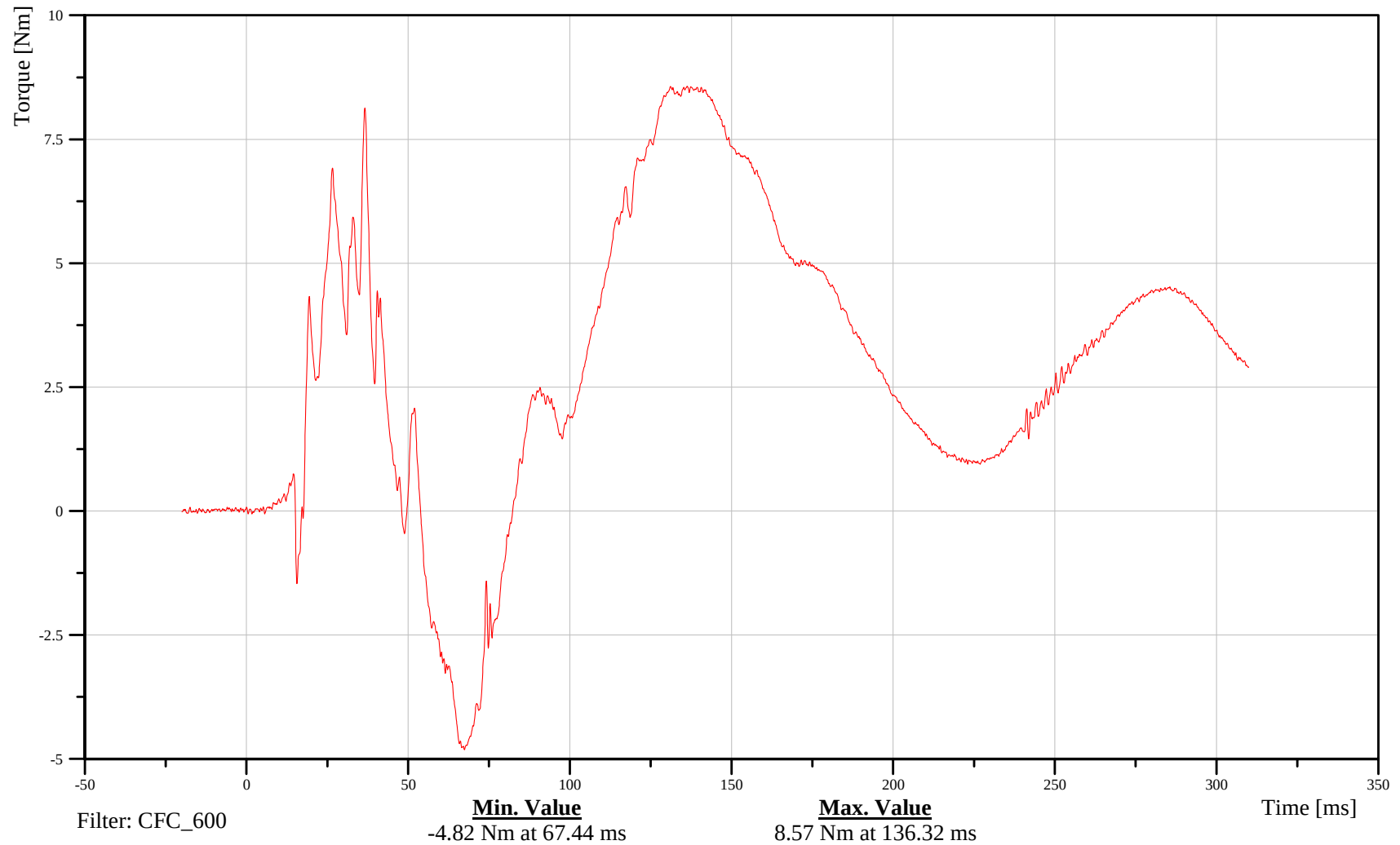
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14LUSP0000WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-221

080911-2



World SID Evaluation
Passenger Pelvis X-Axis Acceleration

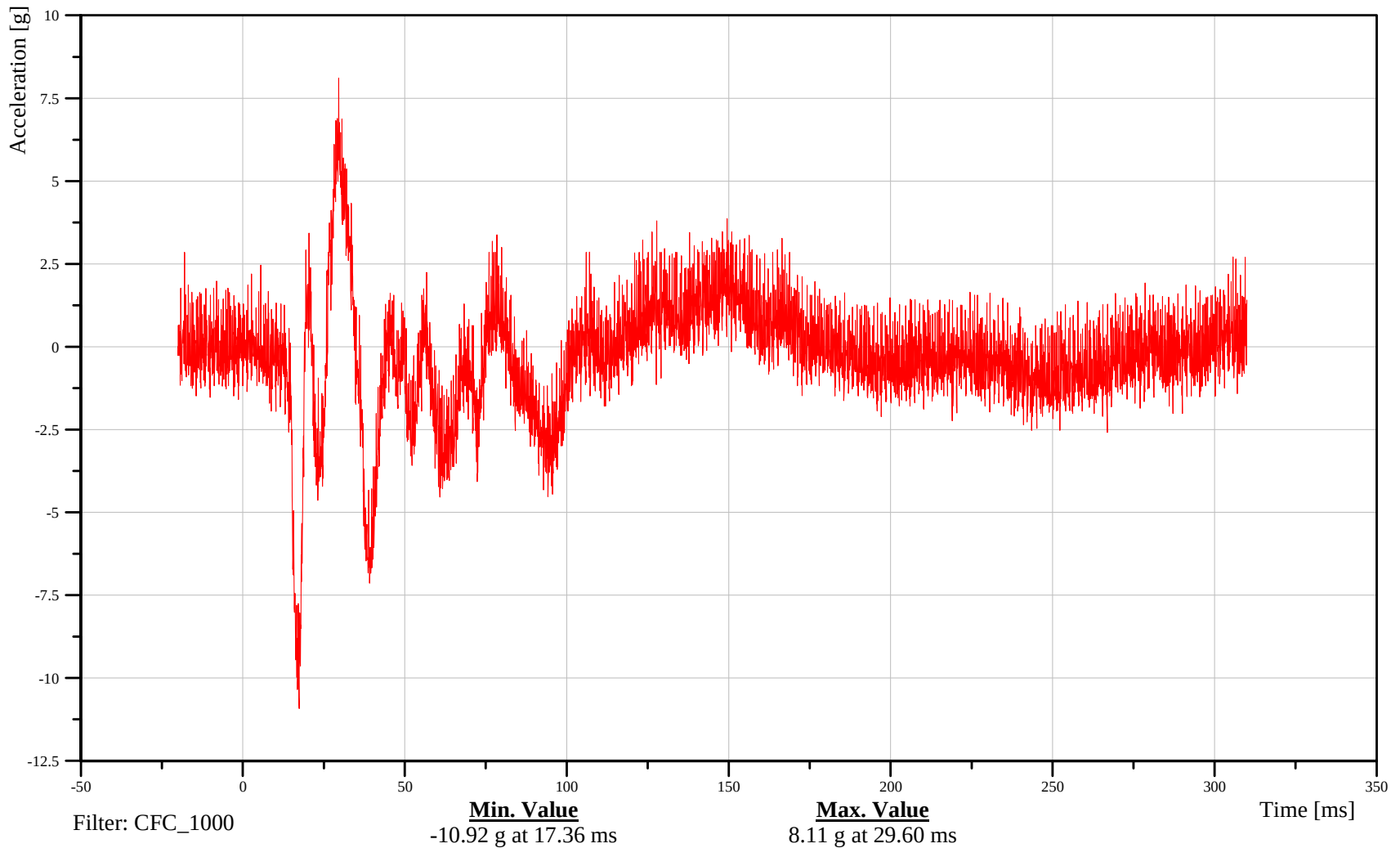
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14PELVCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-222

080911-2



World SID Evaluation
Passenger Pelvis Y-Axis Acceleration

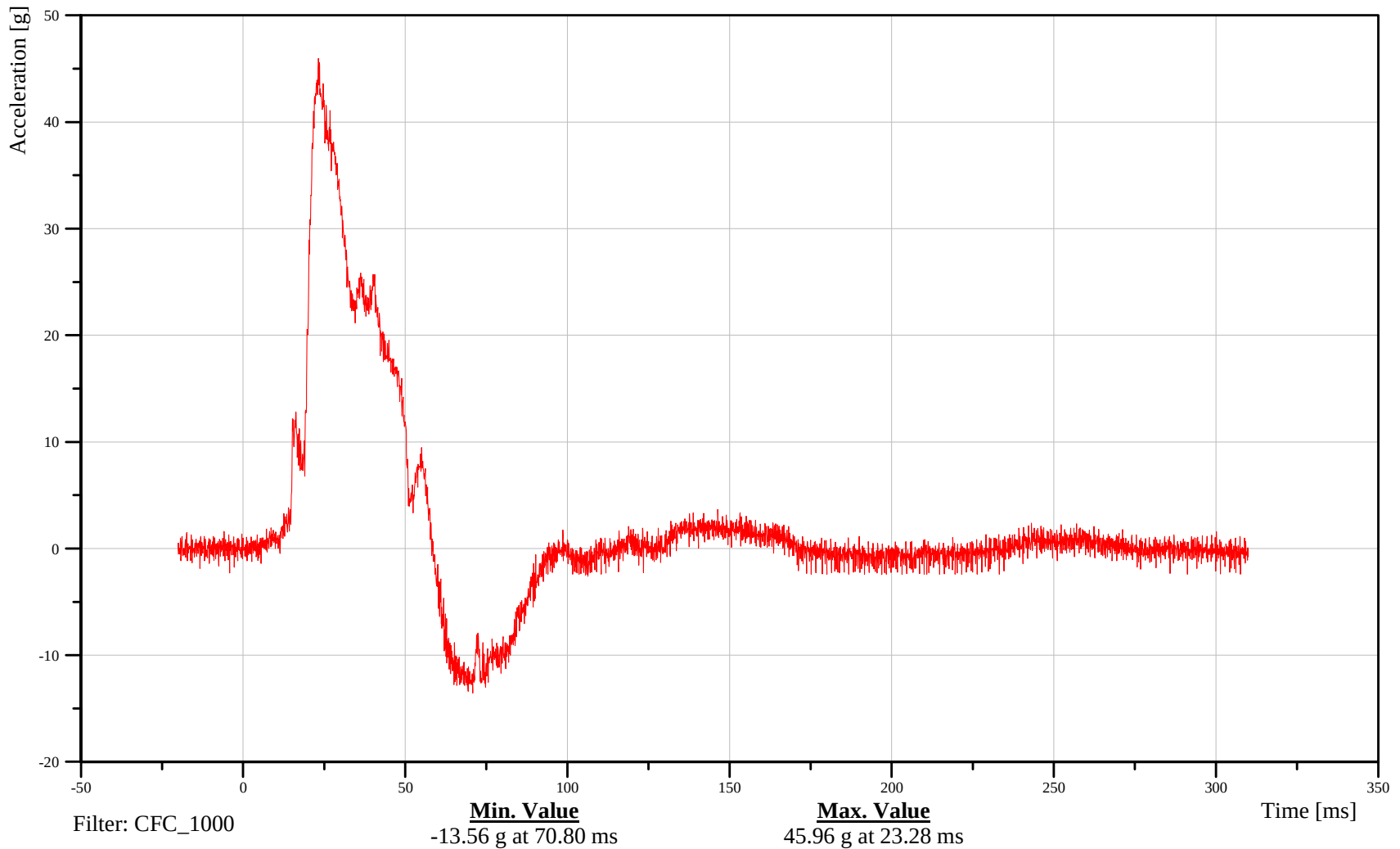
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14PELVCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-223

080911-2



World SID Evaluation
Passenger Pelvis Z-Axis Acceleration

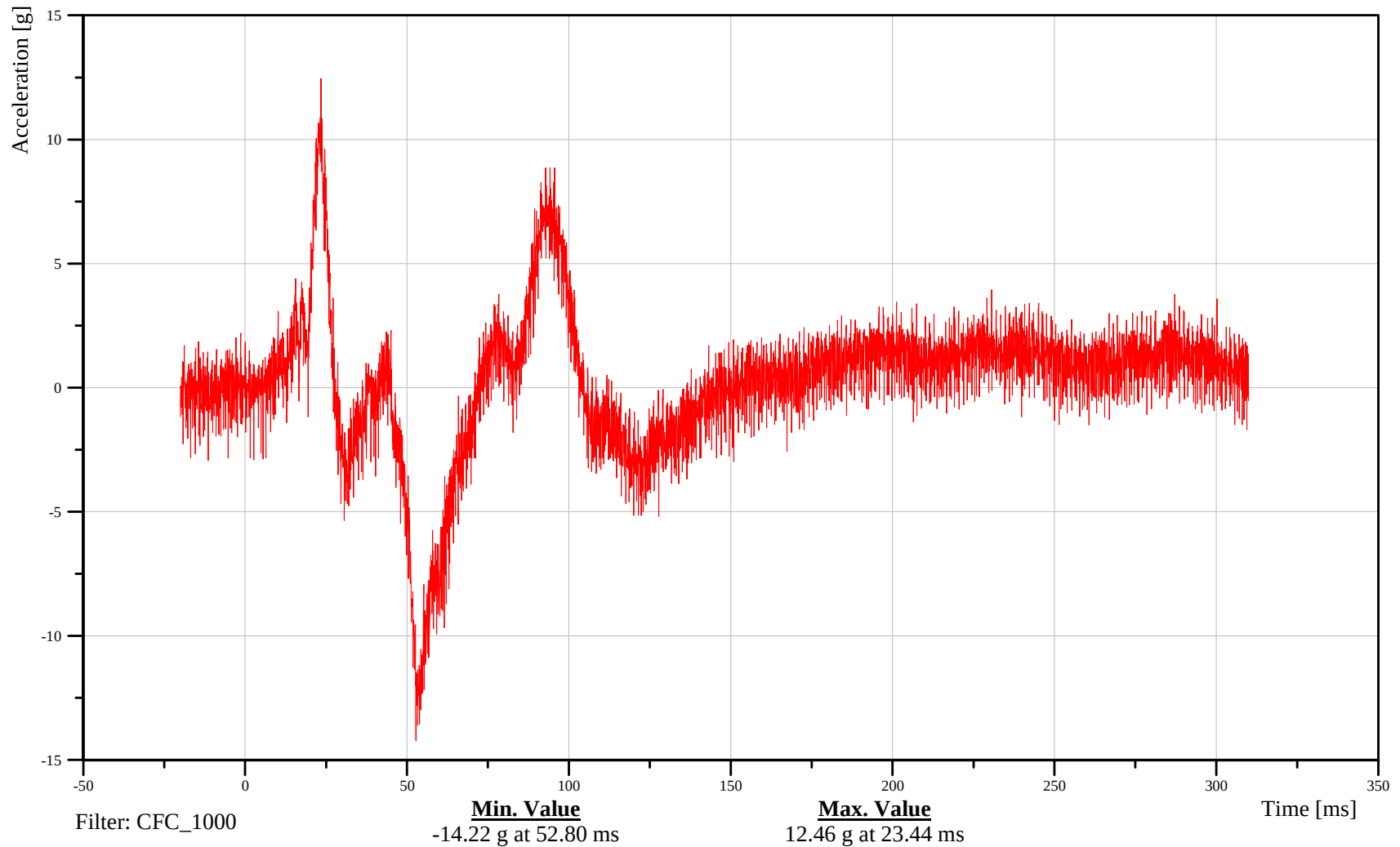
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14PELVCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-224

080911-2



World SID Evaluation

Date: 09/11/2008
Time: 16:22

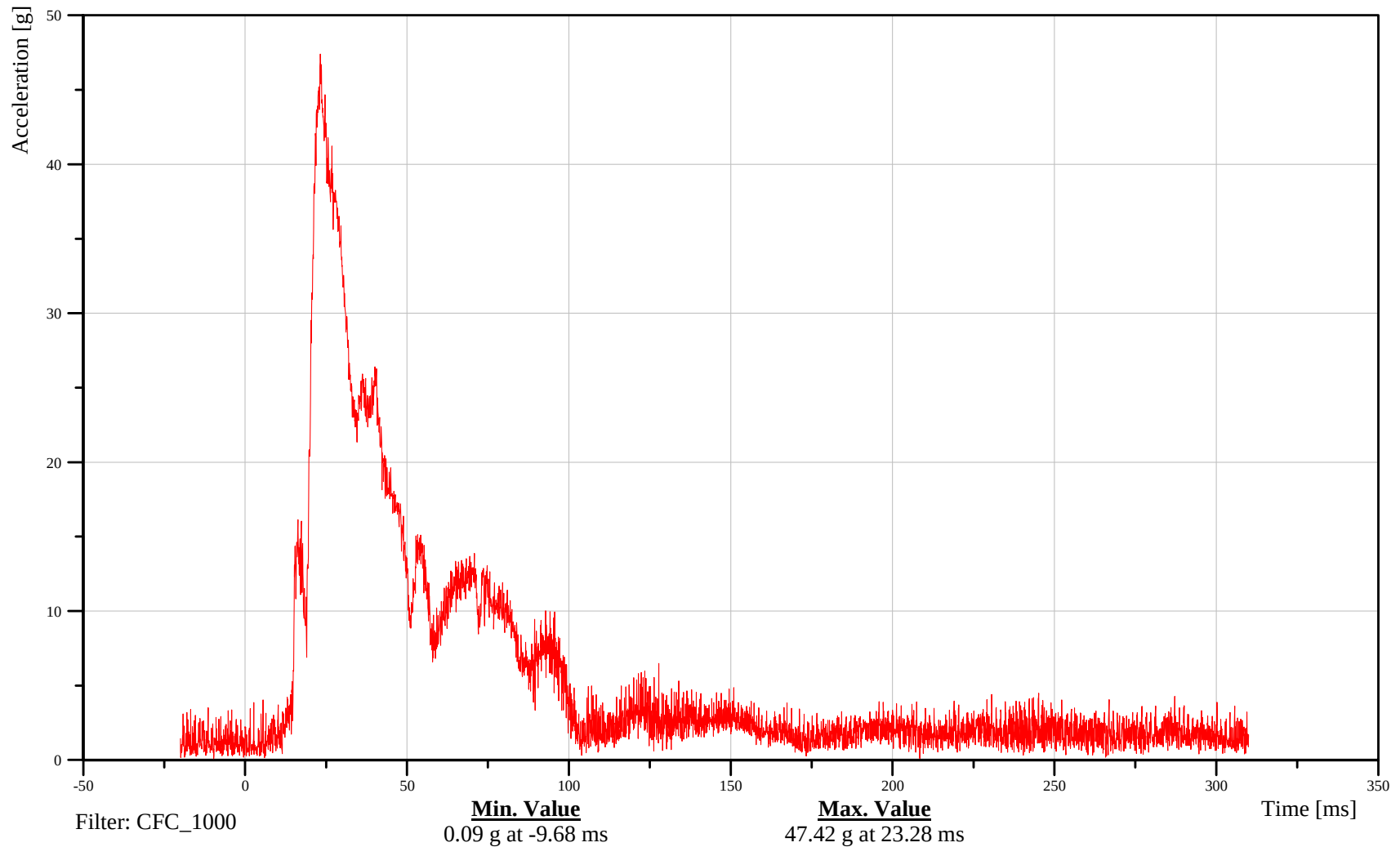
Passenger Pelvis Resultant Acceleration

Customer: VRTC

14PELVCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-225

080911-2



World SID Evaluation
Passenger Pubic Y-Axis Force

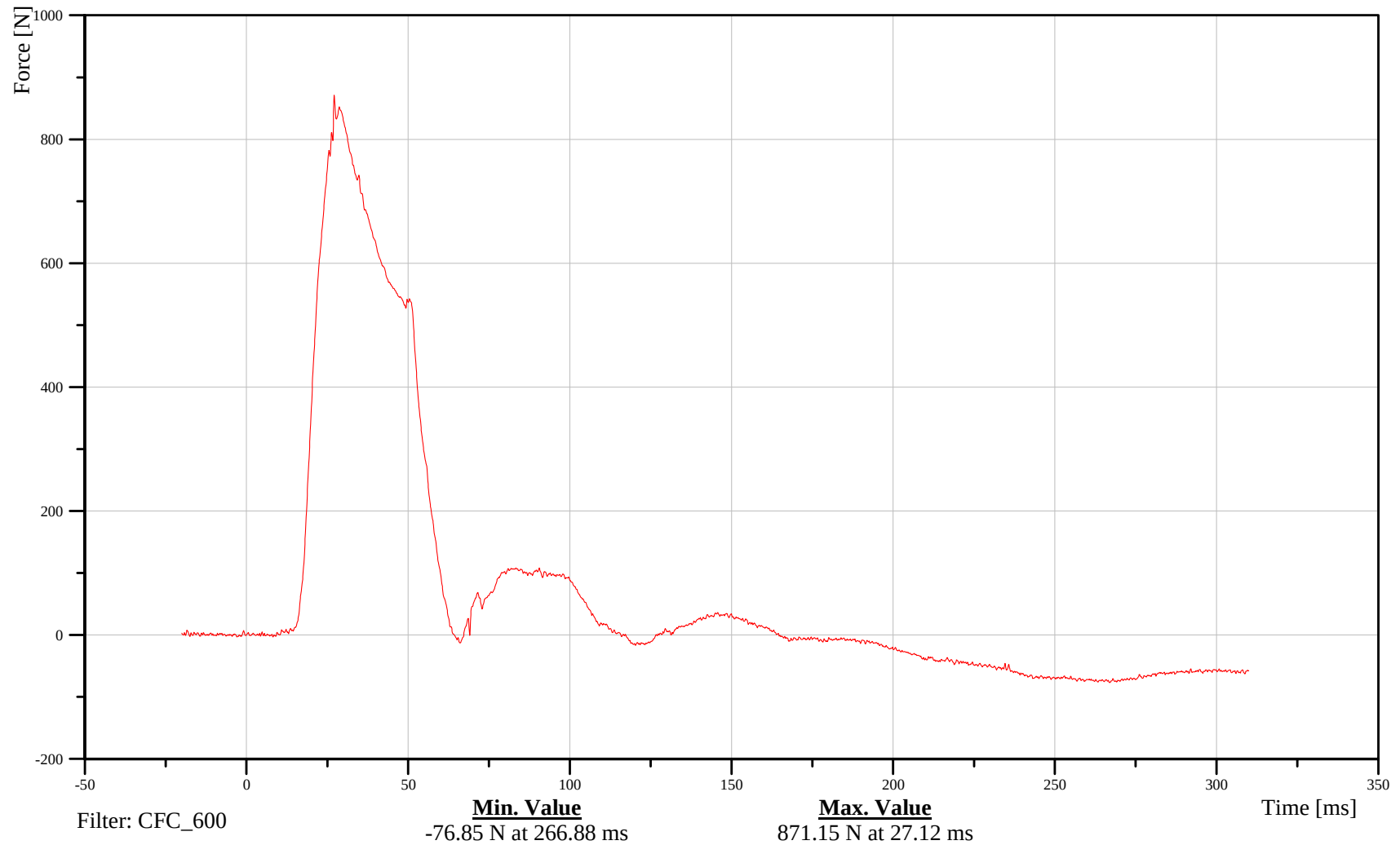
Date: 09/11/2008
Time: 16:22

Customer: VRTC

14PUBC0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080911-2



B-226

080911-2

Appendix C

World SID Configuration and Performance Verification Data

Calibration Test Results

Pre-Test

World SID: 014

Configured for Left Side Impact

Transportation Research Center Inc.

Front Head Drop

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

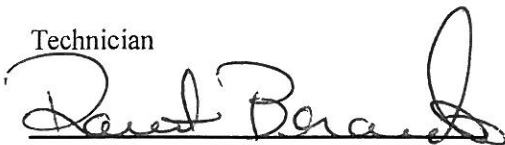
Test Date: 8/18/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	268.8 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	3.7 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved

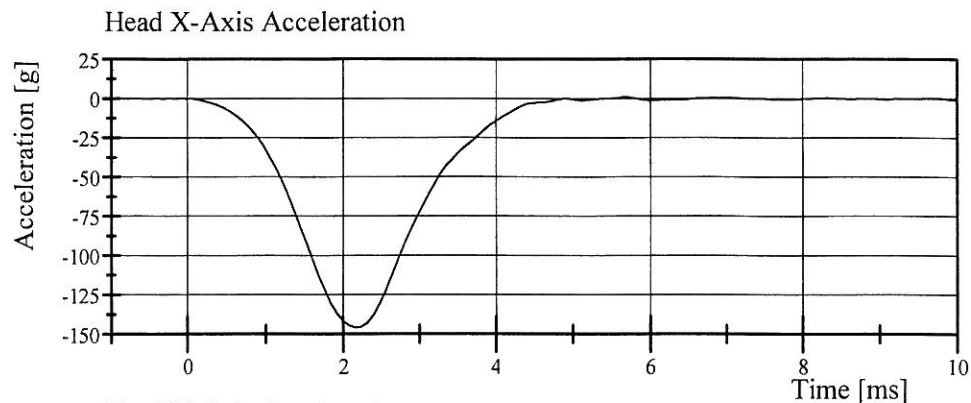


Transportation Research Center Inc.

Front Head Drop

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

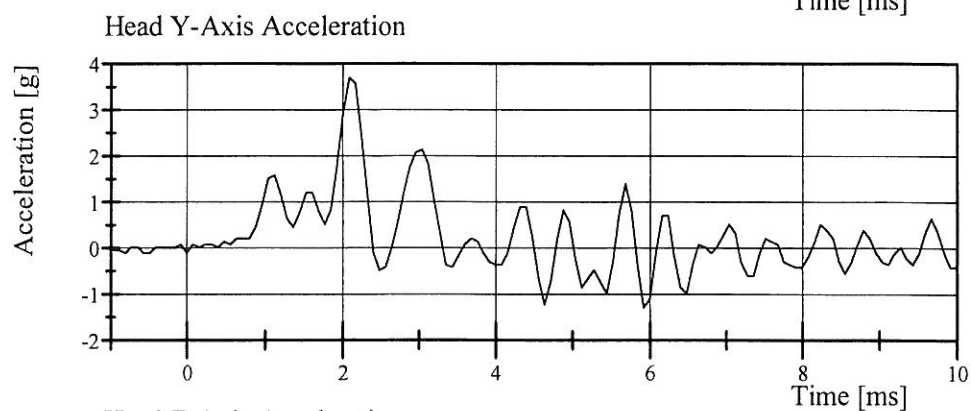
Test Date: 8/18/2008



Filter Class: CFC_1000

Max: 1.0 g at 5.7 ms

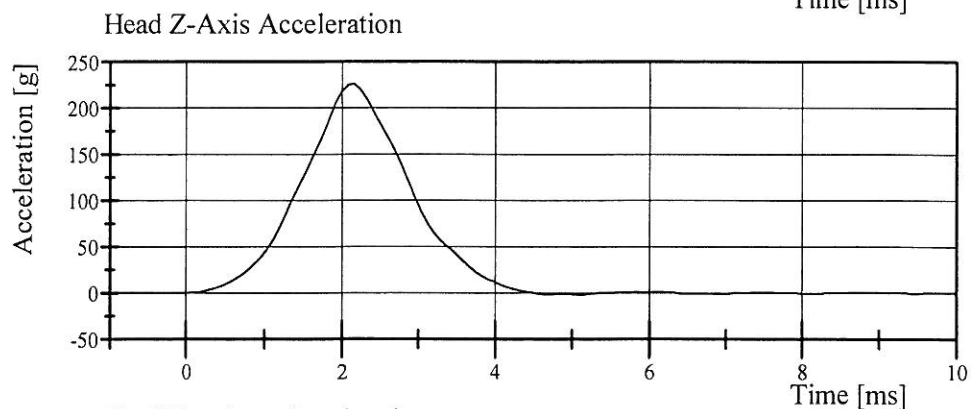
Min: -145.8 g at 2.2 ms



Filter Class: CFC_1000

Max: 3.7 g at 2.1 ms

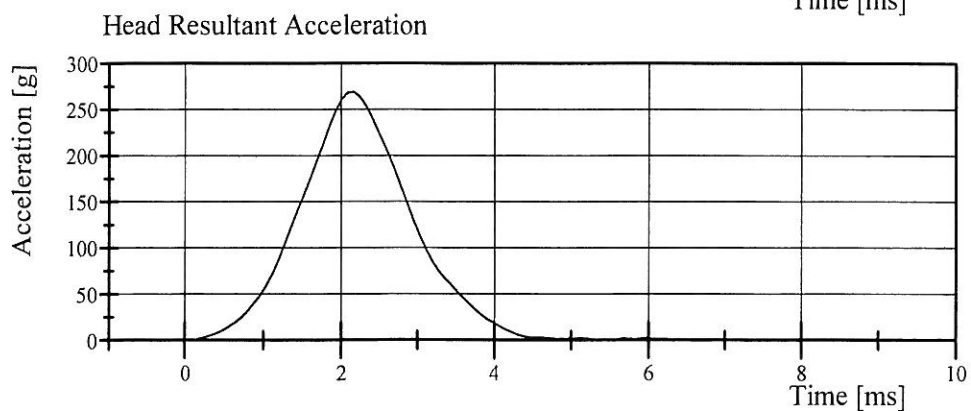
Min: -1.3 g at 5.9 ms



Filter Class: CFC_1000

Max: 225.8 g at 2.2 ms

Min: -2.1 g at 5.1 ms



Filter Class: CFC_1000

Max: 268.8 g at 2.2 ms

Min: 0.0 g at -0.6 ms

Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-2

Test Date: 8/18/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	109.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

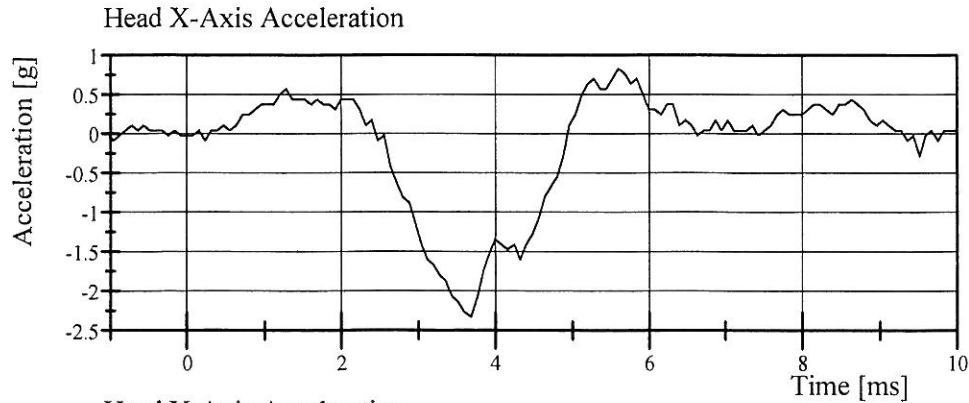
Ron Stover

Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-2

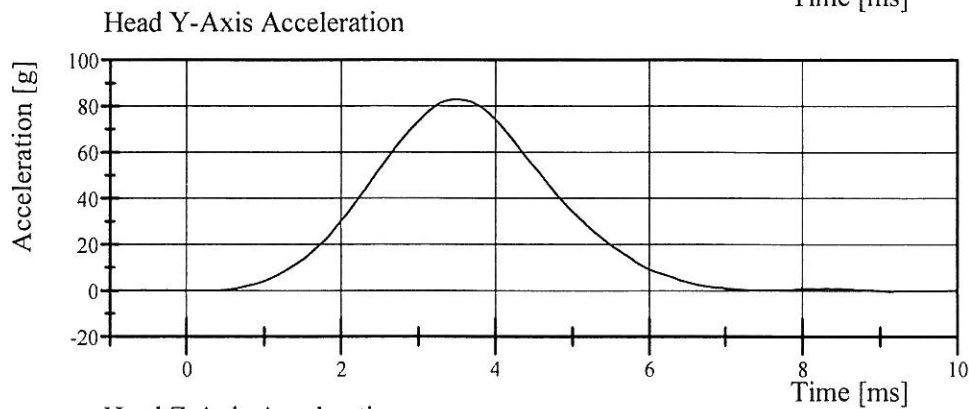
Test Date: 8/18/2008



Filter Class: CFC_1000

Max: 0.8 g at 5.6 ms

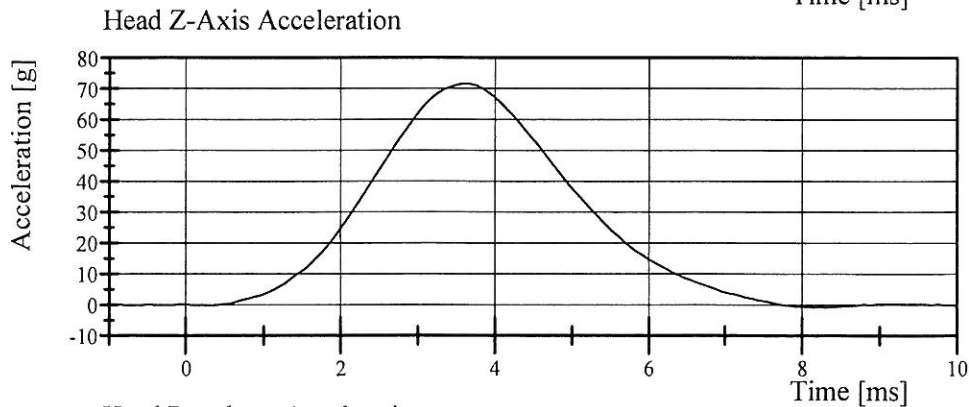
Min: -2.3 g at 3.7 ms



Filter Class: CFC_1000

Max: 82.9 g at 3.5 ms

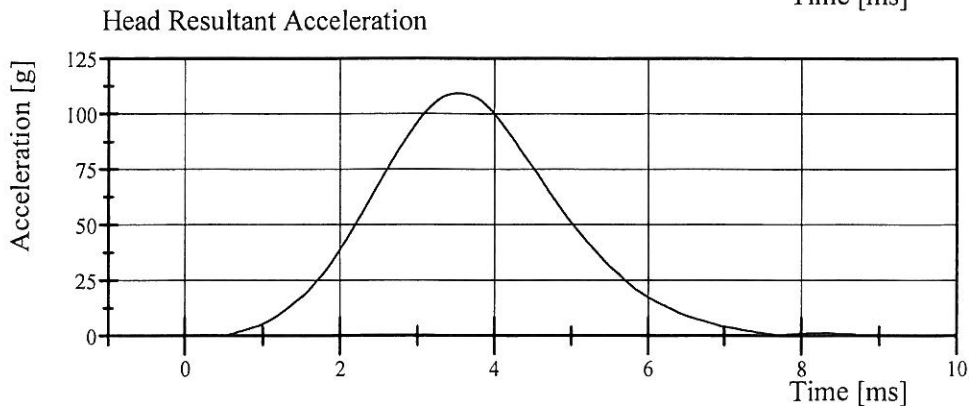
Min: -0.3 g at 9.1 ms



Filter Class: CFC_1000

Max: 71.6 g at 3.6 ms

Min: -0.8 g at 8.2 ms



Filter Class: CFC_1000

Max: 109.3 g at 3.5 ms

Min: 0.0 g at -0.2 ms

Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 8/18/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	113.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-5.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

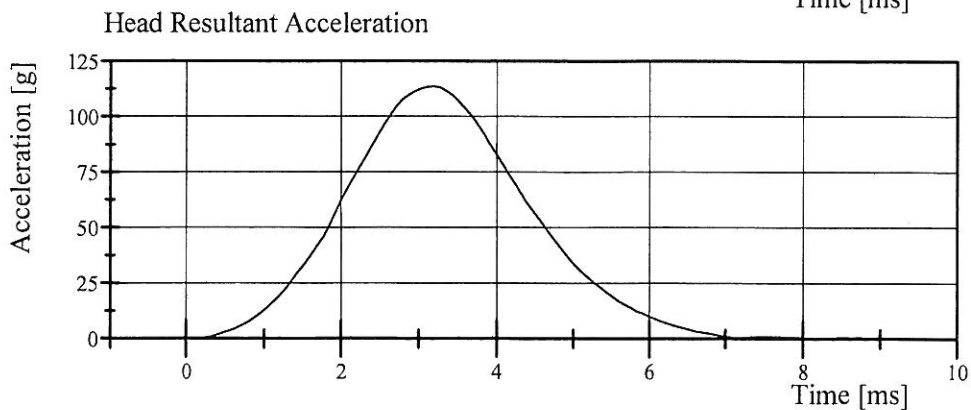
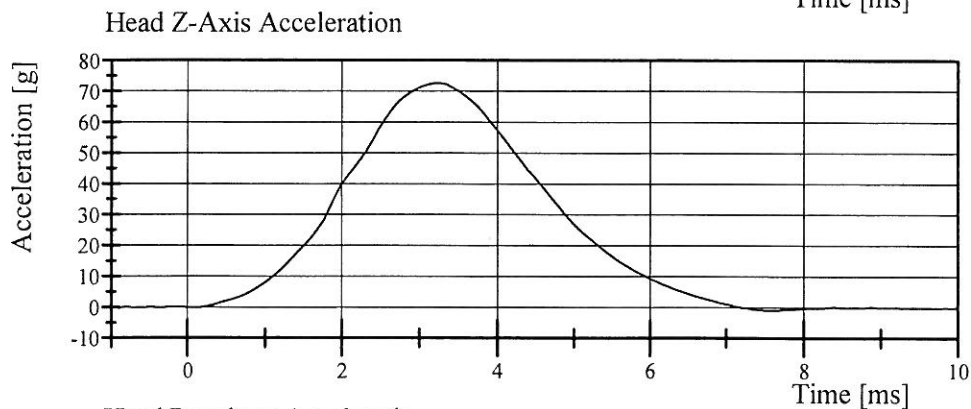
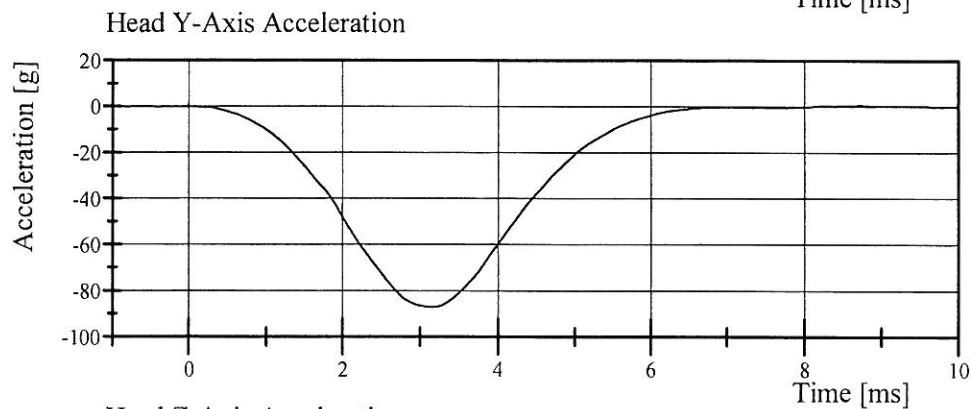
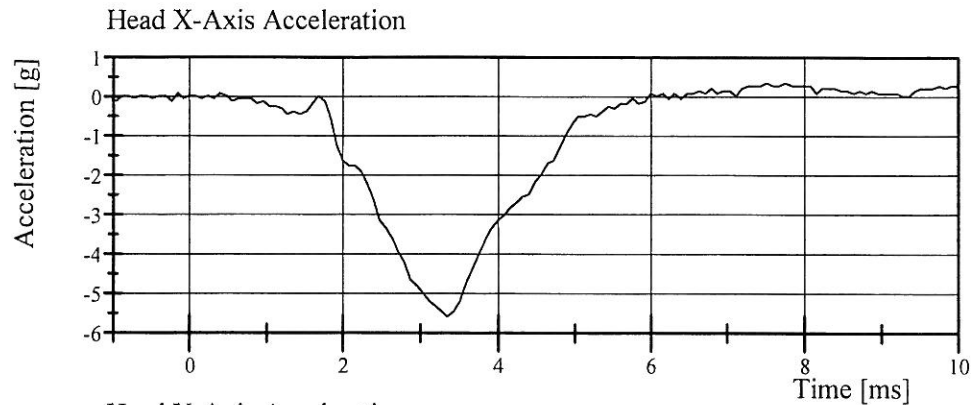
Ron Steward

Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 8/18/2008



Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 8/18/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.35 m/s	Yes
Pendulum Integrated Velocity			
Change at 4 ms	0.77 - 1.04 m/s	0.890 m/s	Yes
Change at 8 ms	1.6 - 2.16 m/s	1.918 m/s	Yes
Change at 12 ms	2.43 - 3.29 m/s	3.070 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-54.2 deg	Yes
Headform Flexion Decay			
- from Peak to Zero Degrees	58 - 72 ms	63.4 ms	Yes
Total Neck Occipital Condyles Moment	55 - 68 N·m	61.4 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	71 - 87 ms	79.0 ms	Yes
Maximum Forward Pot Rotation			
Peak	(-32) - (-39) °	-35.1 °	Yes
Time of Peak	56 - 68 ms	59.2 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-30) - (-37) °	-31.7 °	Yes
Time of Peak	56 - 68 ms	62.8 ms	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

Ron Stoner

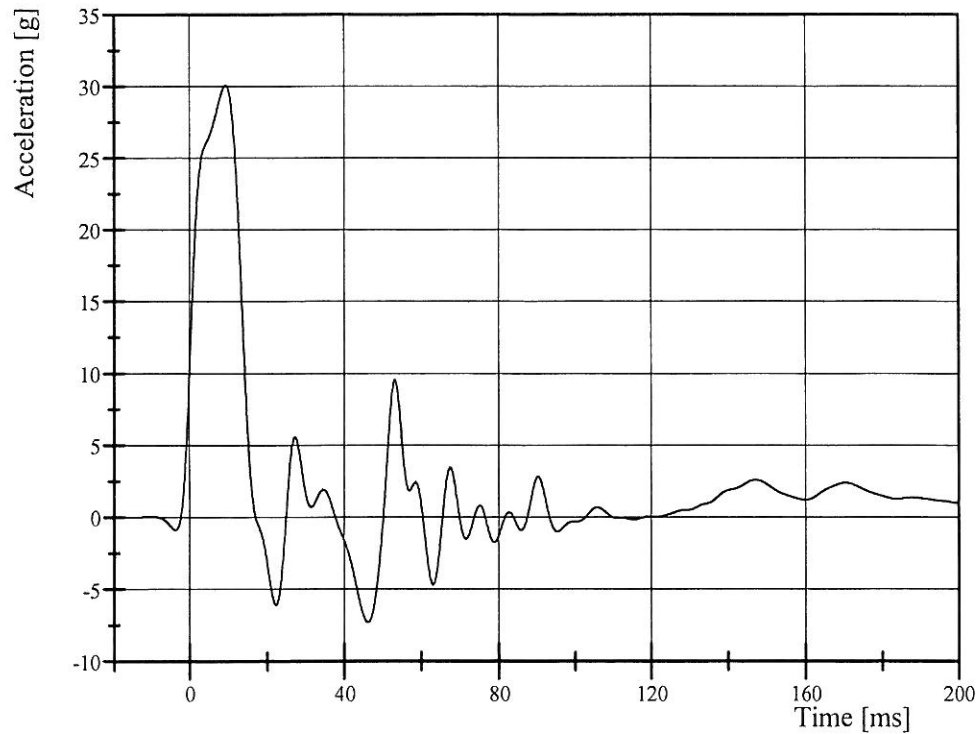
Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 8/18/2008

Pendulum Acceleration

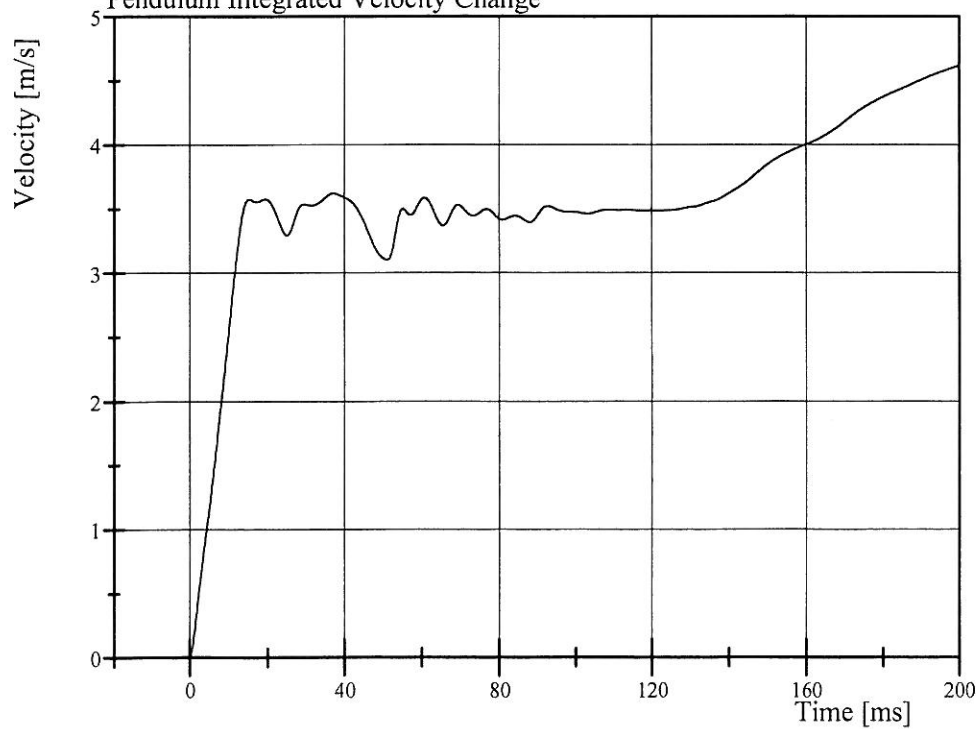


Filter Class: CFC_60

Max: 30.1 g at 9.4 ms

Min: -7.3 g at 46.2 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180

Max: 4.6 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

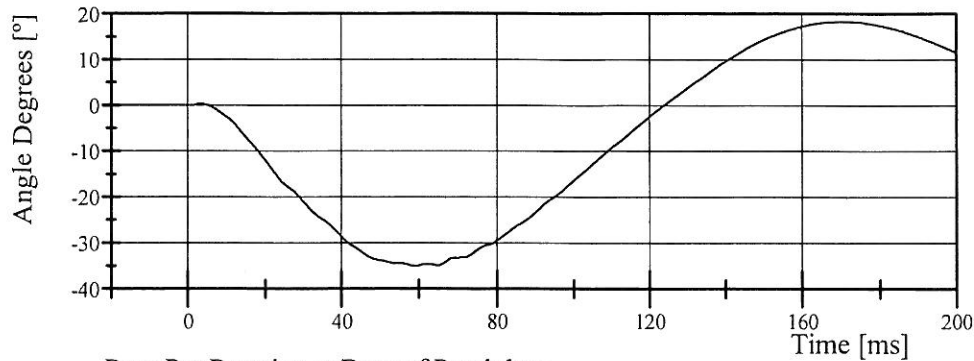
Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 8/18/2008

Forward Pot Rotation at Base of Pendulum

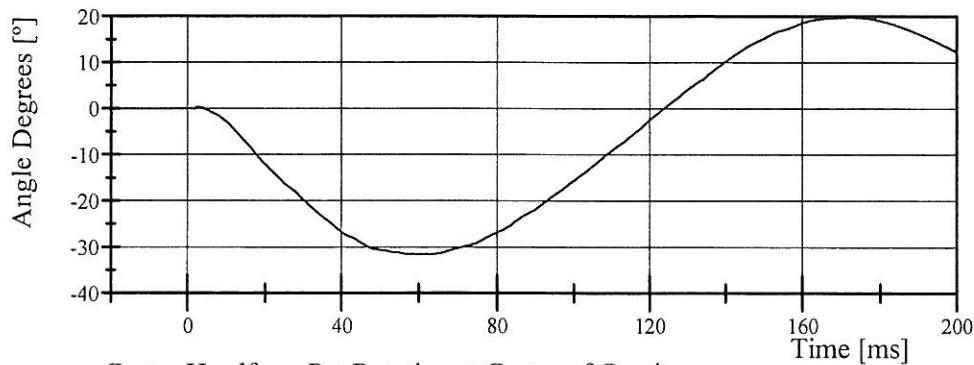


Filter Class: CFC_1000

Max: 18.3 ° at 170.2 ms

Min: -35.1 ° at 59.2 ms

Rear Pot Rotation at Base of Pendulum

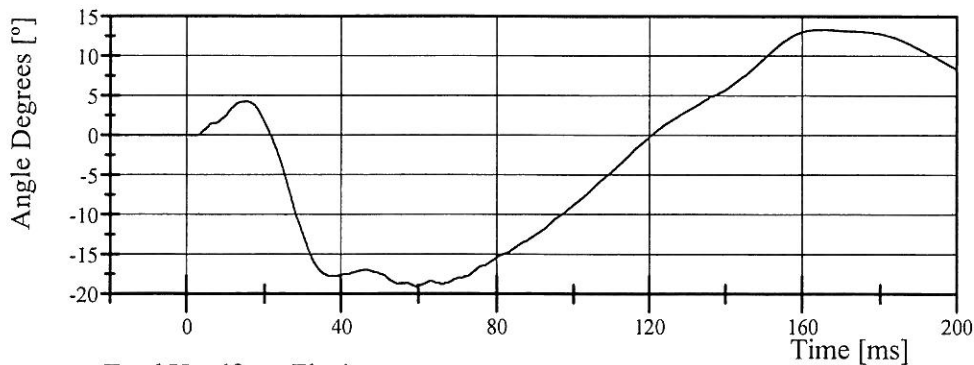


Filter Class: CFC_1000

Max: 19.8 ° at 172.6 ms

Min: -31.7 ° at 62.8 ms

Center Headform Pot Rotation at Center of Gravity

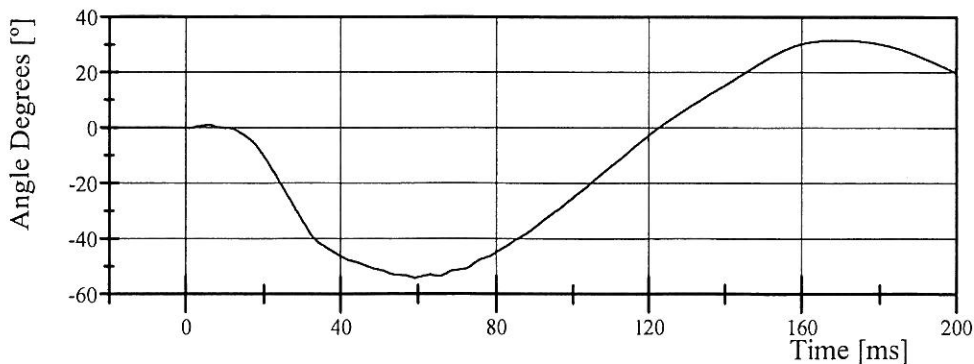


Filter Class: CFC_1000

Max: 13.4 ° at 165.7 ms

Min: -19.1 ° at 59.2 ms

Total Headform Flexion



Filter Class: CFC_1000

Max: 31.6 ° at 168.5 ms

Min: -54.2 ° at 59.2 ms

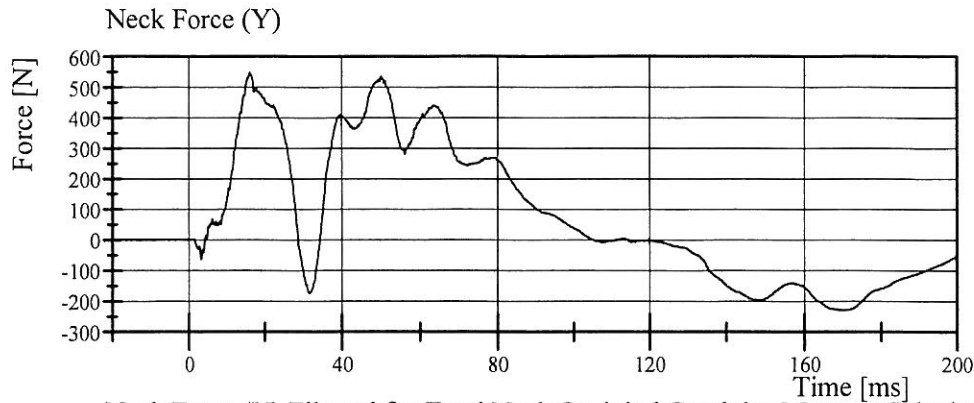


Transportation Research Center Inc.

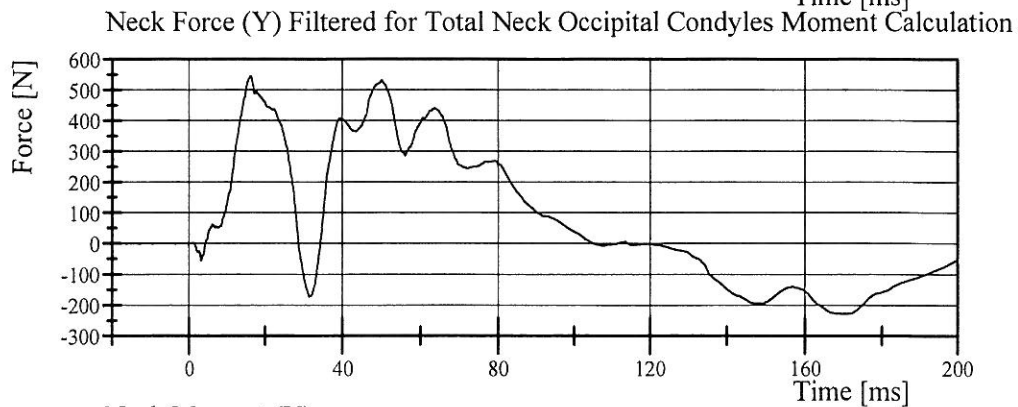
Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

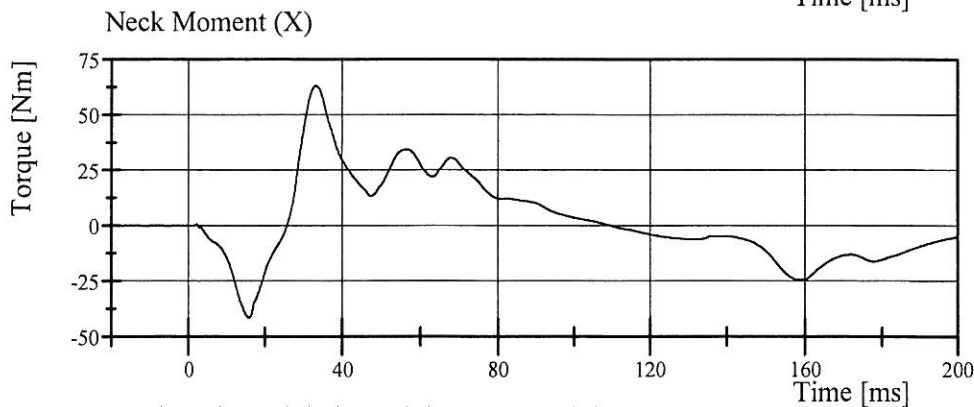
Test Date: 8/18/2008



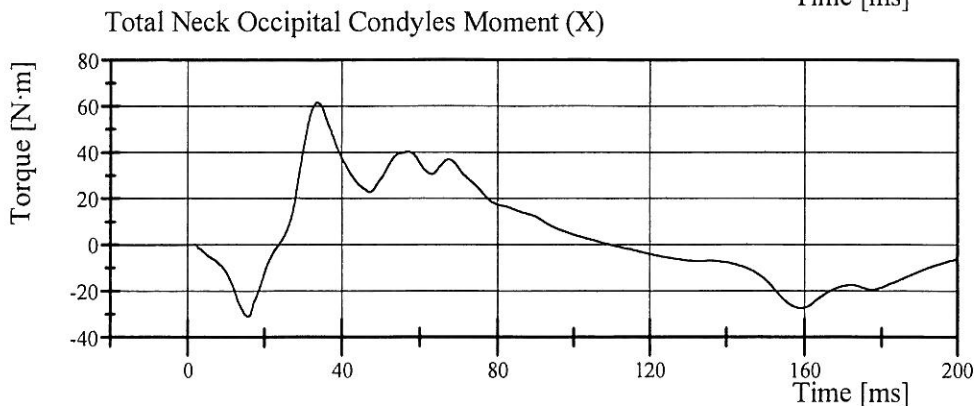
Filter Class: CFC_1000
Max: 547.4 N at 16.2 ms
Min: -229.4 N at 170.3 ms



Filter Class: CFC_600
Max: 545.3 N at 16.2 ms
Min: -229.1 N at 170.3 ms



Filter Class: CFC_600
Max: 63.2 Nm at 33.2 ms
Min: -41.4 Nm at 15.9 ms



Filter Class: CFC_600
Max: 61.4 N·m at 33.8 ms
Min: -31.0 N·m at 15.8 ms

Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 1/27/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-3,119.1 N	Yes
Shoulder Displacement	35 - 44 mm	41.5 mm	Yes

Test meets specifications.

Comments:

Technician

Rod Barrios

Approved

Ron Stoner

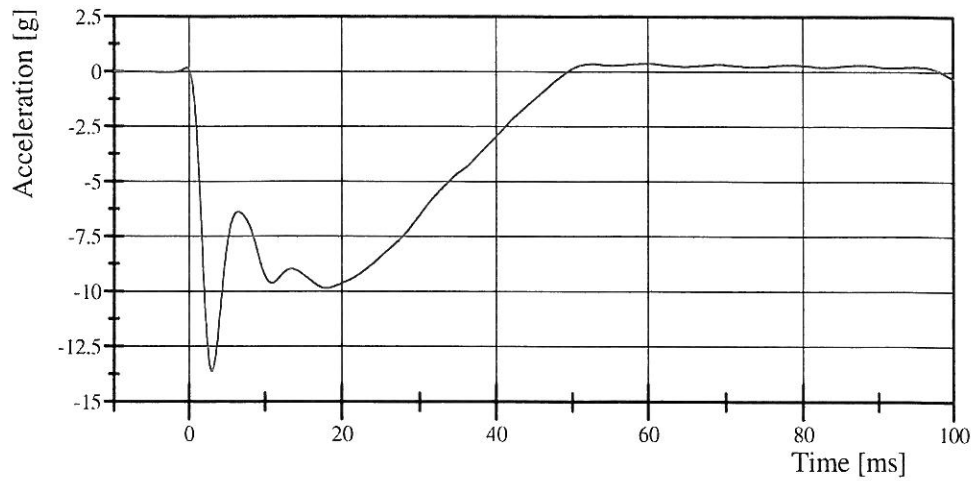
Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 1/27/2009

Impactor Acceleration

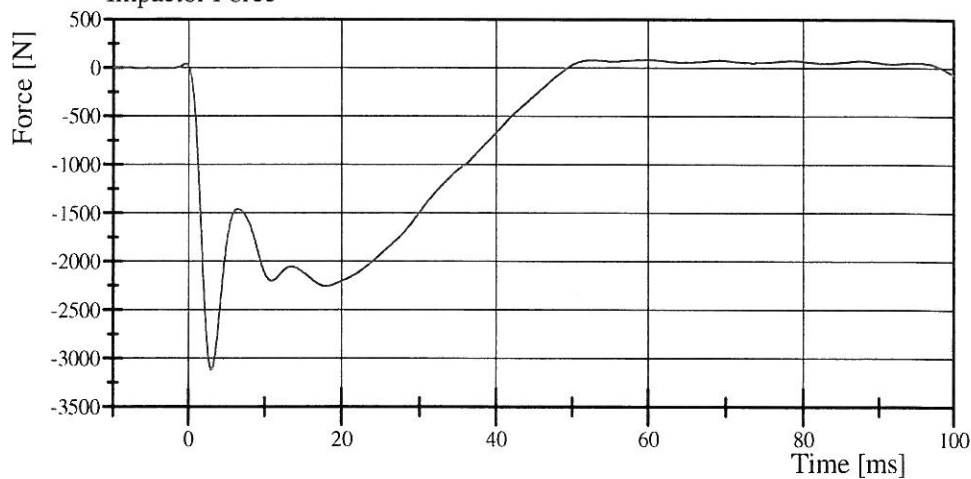


Filter Class: CFC_180

Max: 0.4 g at 60.3 ms

Min: -13.6 g at 3.0 ms

Impactor Force

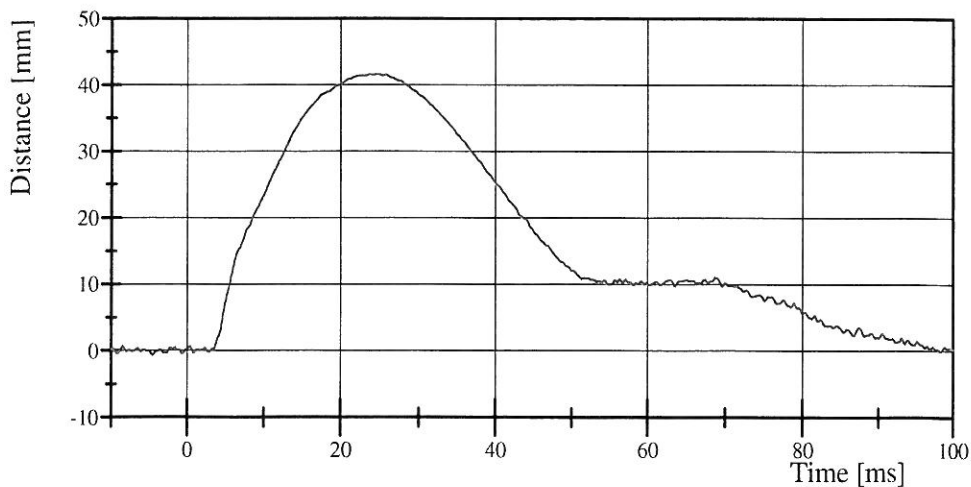


Filter Class: CFC_180

Max: 83.6 N at 60.3 ms

Min: -3,119.1 N at 3.0 ms

Shoulder Displacement



Filter Class: CFC_600

Max: 41.5 mm at 24.5 ms

Min: -0.6 mm at -4.6 ms

Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 8/20/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.75 m/s	Yes
Impactor Force	(-4,700) - (-6,400) N	-5,340.5 N	Yes
Upper Thorax Rib Displacement	35 - 47 mm	41.7 mm	Yes
Center Thorax Rib Displacement	42 - 57 mm	51.2 mm	Yes
Lower Thorax Rib Displacement	40 - 54 mm	44.0 mm	Yes
Upper Spine Lateral Acceleration	24 - 33 g	28.4 g	Yes
Lower Spine Lateral Acceleration	20 - 28 g	21.8 g	Yes

Test meets specifications.

Comments:

Technician

Raul Barrios

Approved

Ron Starn

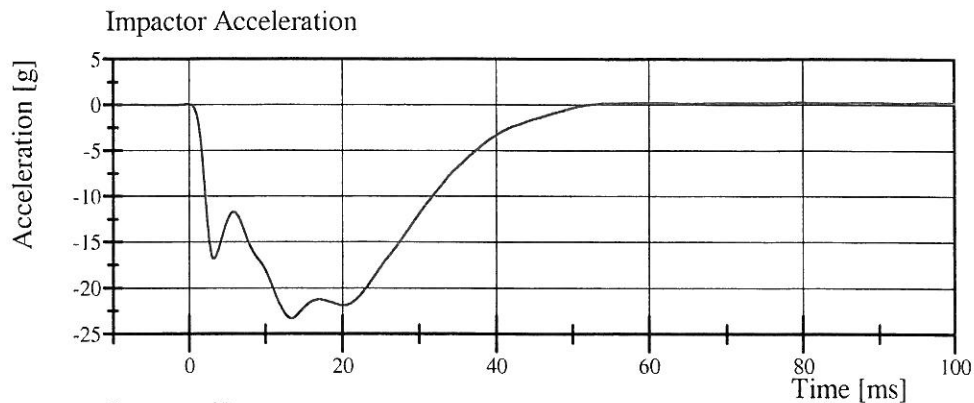


Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

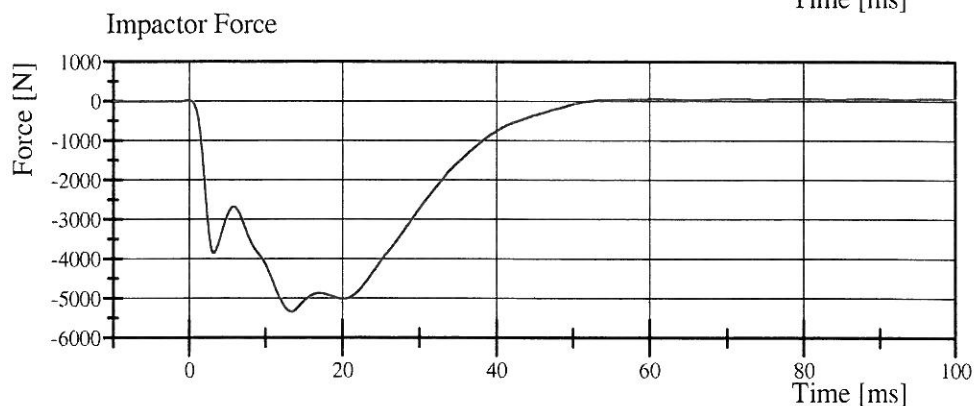
Test Date: 8/20/2008



Filter Class: CFC_180

Max: 0.3 g at 79.8 ms

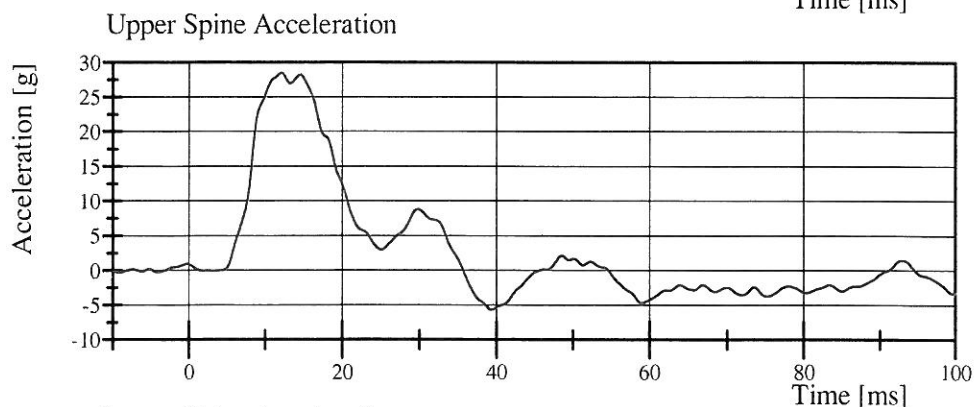
Min: -23.3 g at 13.5 ms



Filter Class: CFC_180

Max: 67.7 N at 79.8 ms

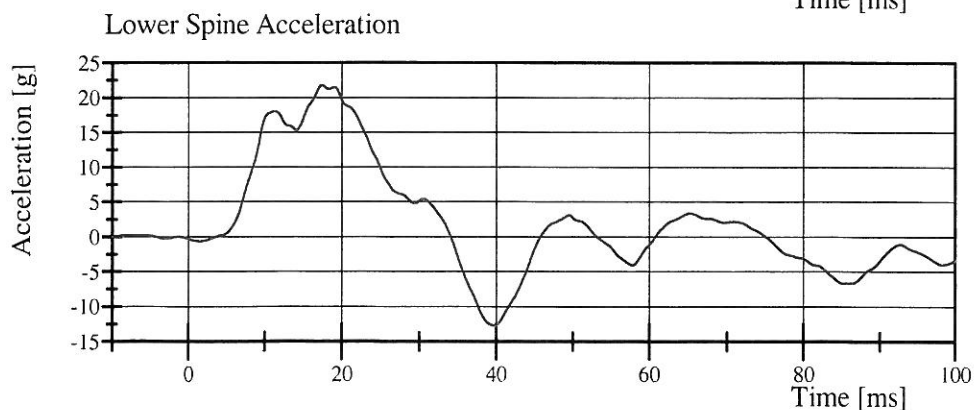
Min: -5,340.5 N at 13.5 ms



Filter Class: CFC_180

Max: 28.4 g at 12.2 ms

Min: -5.7 g at 39.4 ms



Filter Class: CFC_180

Max: 21.8 g at 17.5 ms

Min: -12.7 g at 39.7 ms

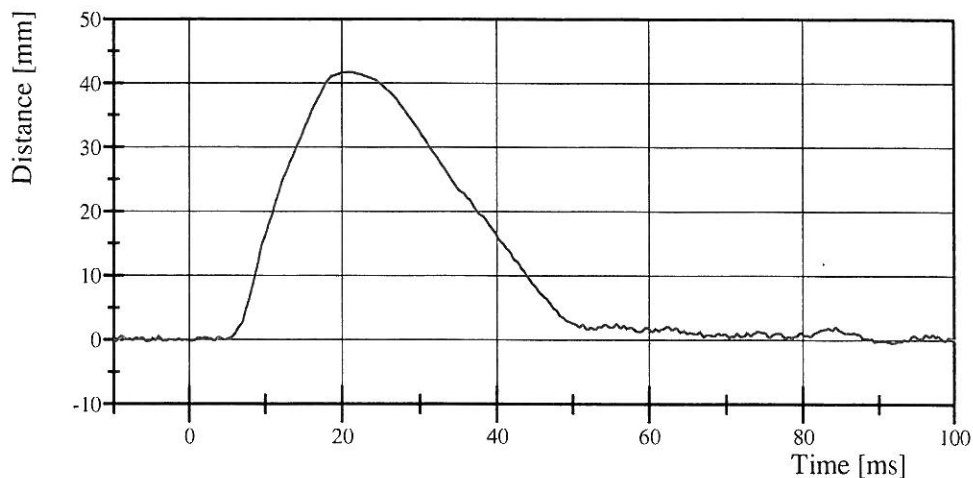
Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-1

Test Date: 8/20/2008

Upper Thorax Rib Displacement

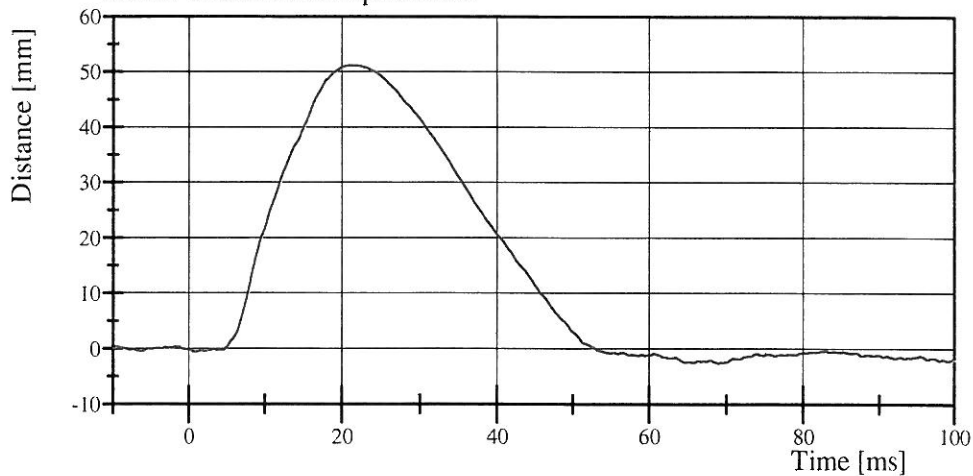


Filter Class: CFC_600

Max: 41.7 mm at 20.9 ms

Min: -0.4 mm at 92.2 ms

Center Thorax Rib Displacement

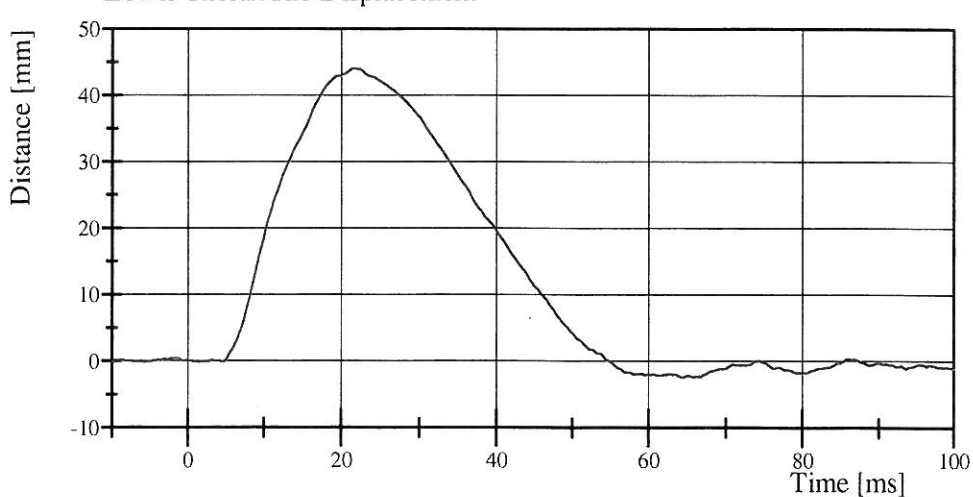


Filter Class: CFC_600

Max: 51.2 mm at 21.5 ms

Min: -2.6 mm at 69.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600

Max: 44.0 mm at 21.7 ms

Min: -2.5 mm at 64.5 ms

Transportation Research Center Inc.

Left Lateral Thorax without Arm
WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-3
Test Date: 8/20/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.406 m/s	No
Impactor Force	(-3,200) - (-3,900) N	-3,512.9 N	Yes
Upper Thorax Rib Displacement	34 - 43 mm	38.6 mm	Yes
Center Thorax Rib Displacement	34 - 43 mm	42.7 mm	Yes
Lower Thorax Rib Displacement	34 - 43 mm	39.7 mm	Yes
Upper Spine Lateral Acceleration	12 - 17 g	14.1 g	Yes
Lower Spine Lateral Acceleration	15 - 21 g	14.7 g	No

Test does not meet specifications.

Comments:

Technician

Raul Barrios

Approved

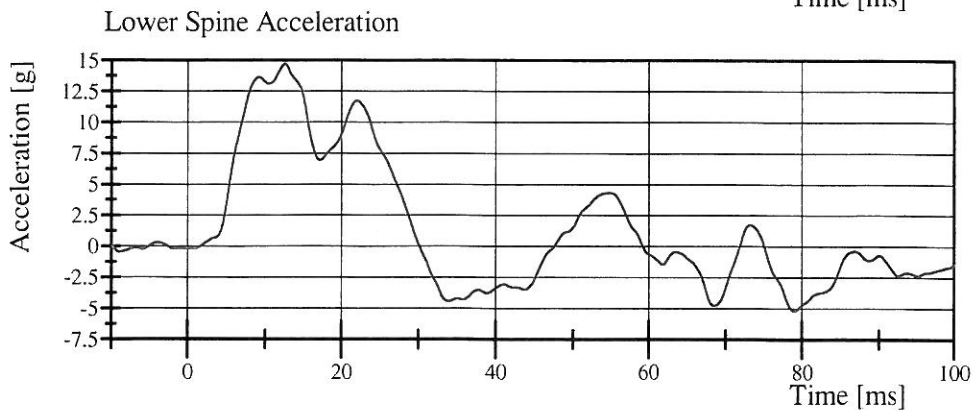
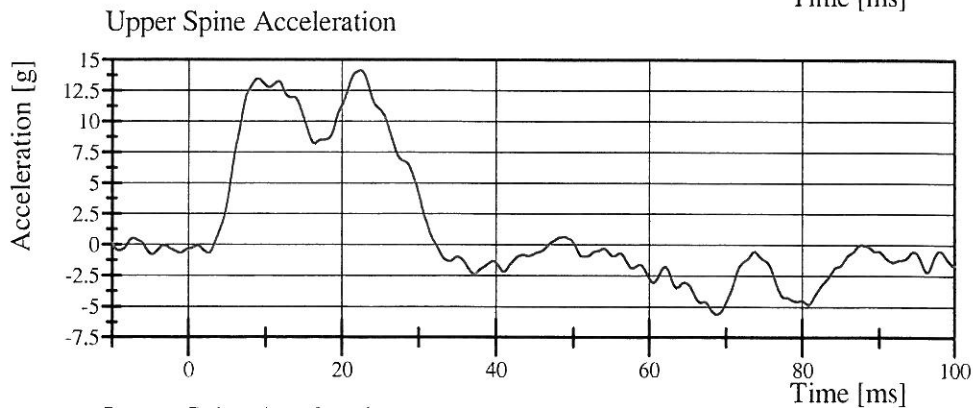
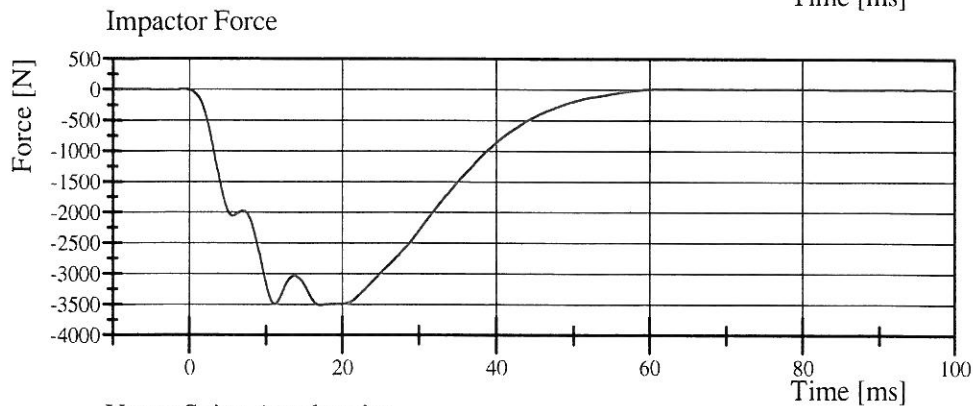
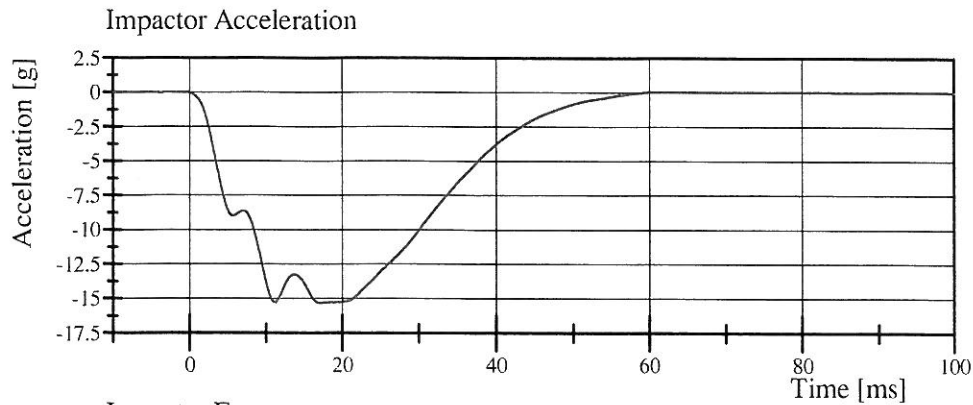
Ken Starnes

Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-3

Test Date: 8/20/2008



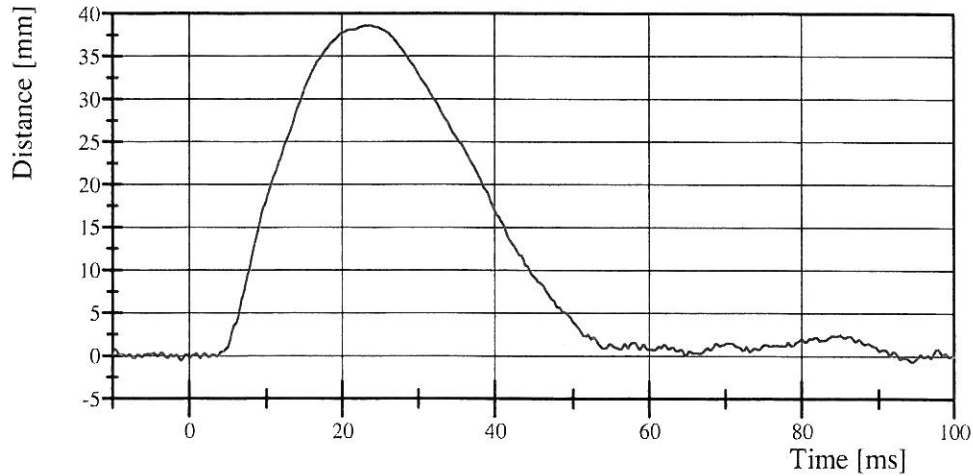
Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-3

Test Date: 8/20/2008

Upper Thorax Rib Displacement

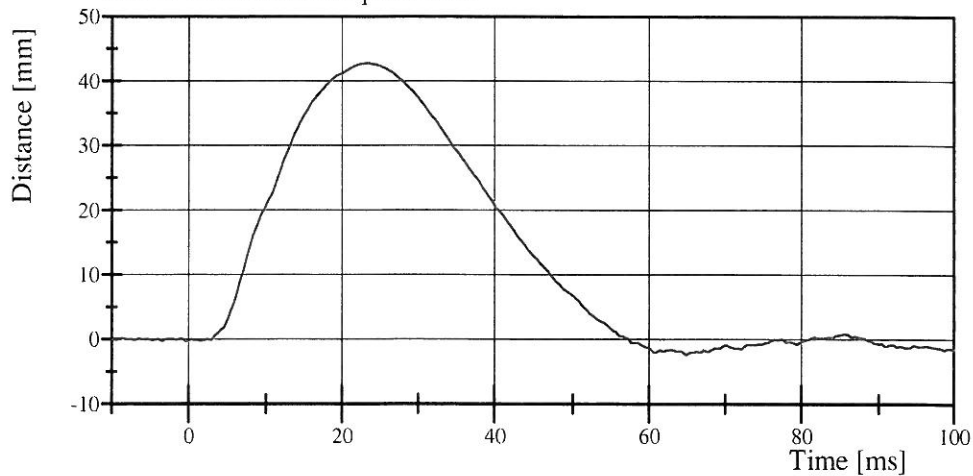


Filter Class: CFC_600

Max: 38.6 mm at 23.8 ms

Min: -0.7 mm at 94.5 ms

Center Thorax Rib Displacement

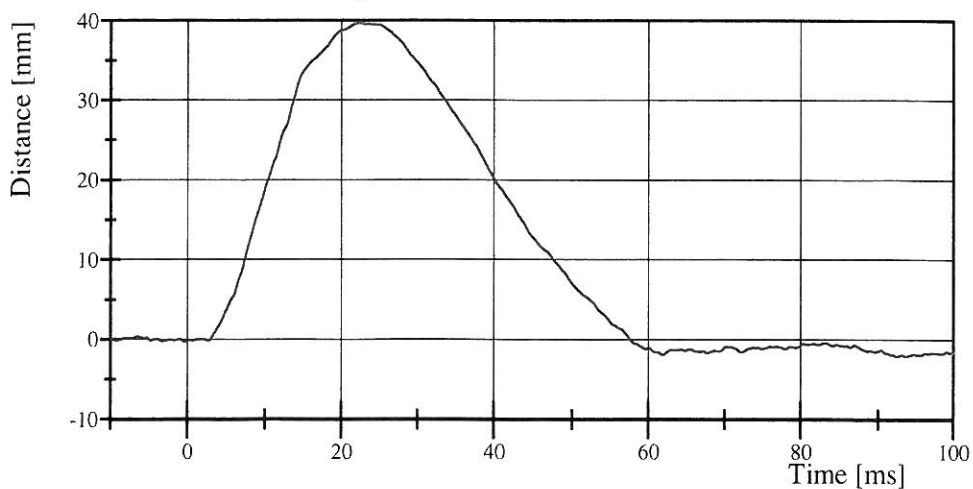


Filter Class: CFC_600

Max: 42.7 mm at 23.6 ms

Min: -2.4 mm at 65.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600

Max: 39.7 mm at 22.4 ms

Min: -2.2 mm at 92.5 ms

Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-2

Test Date: 8/20/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.38 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-3,046.9 N	Yes
Upper Abdominal Rib Displacement	33 - 41 mm	35.7 mm	Yes
Lower Abdominal Rib Displacement	31 - 39 mm	33.9 mm	Yes
Lower Spine Lateral Acceleration	15 - 20 g	16.5 g	Yes

Test meets specifications.

Comments:

Technician

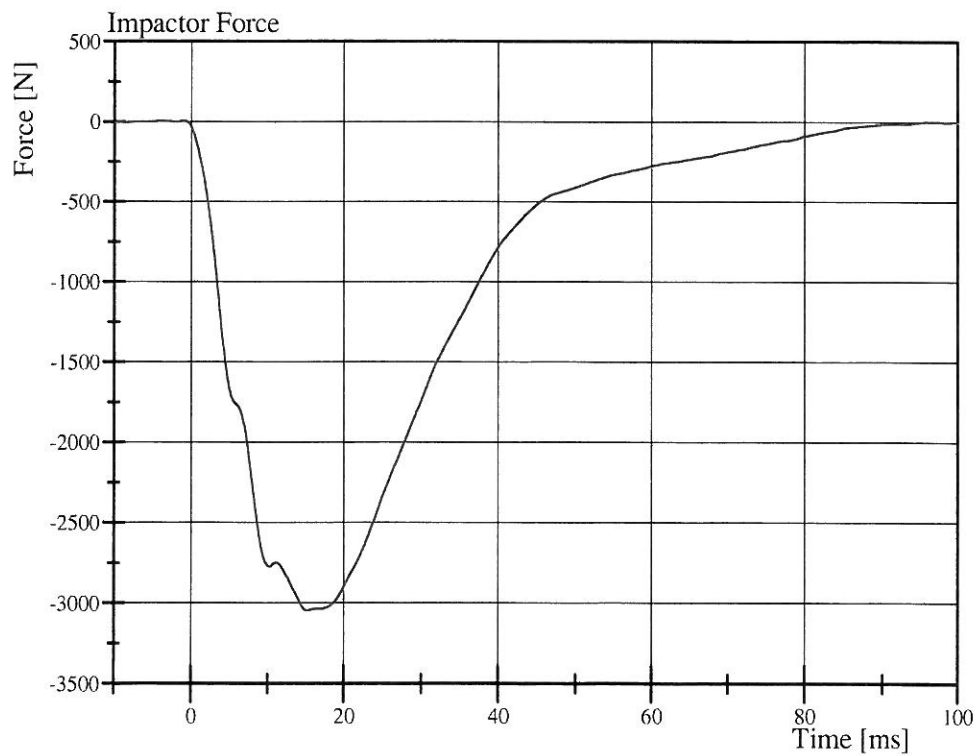
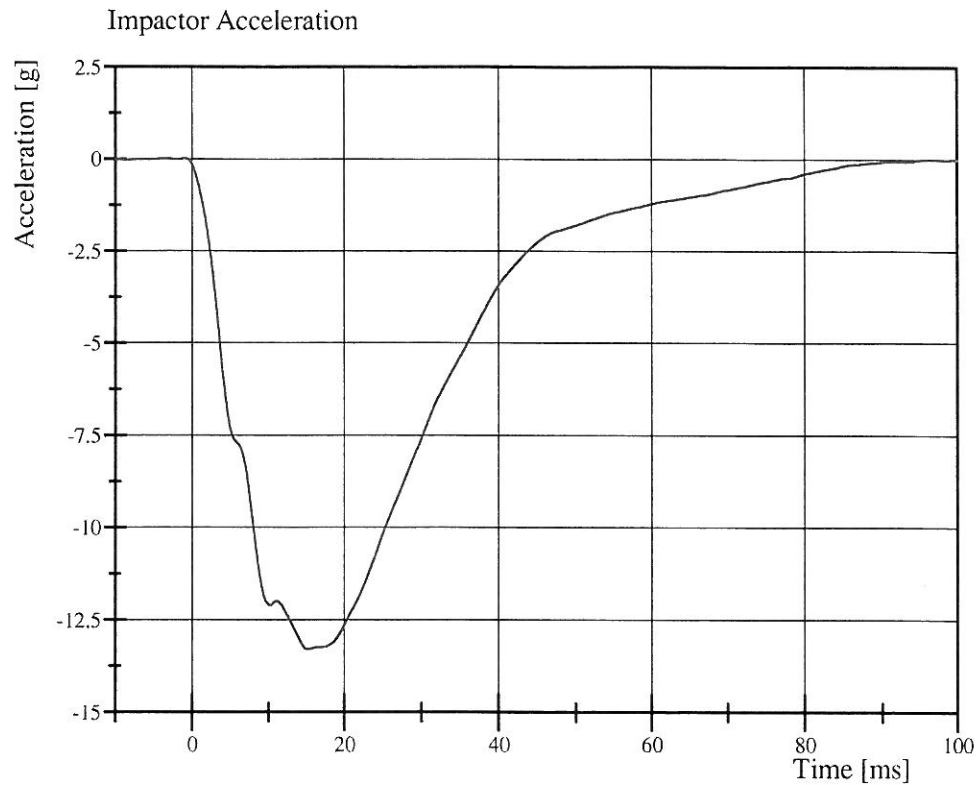
Raul Beranides

Approved

Ron Stokes

Transportation Research Center Inc.

Left Lateral Abdomen
WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-2
Test Date: 8/20/2008



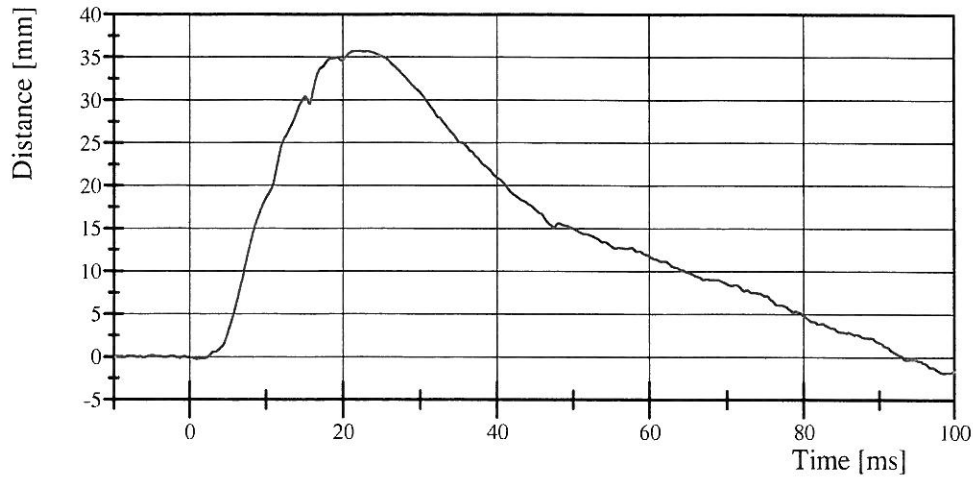
Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-2

Test Date: 8/20/2008

Upper Abdominal Rib Displacement

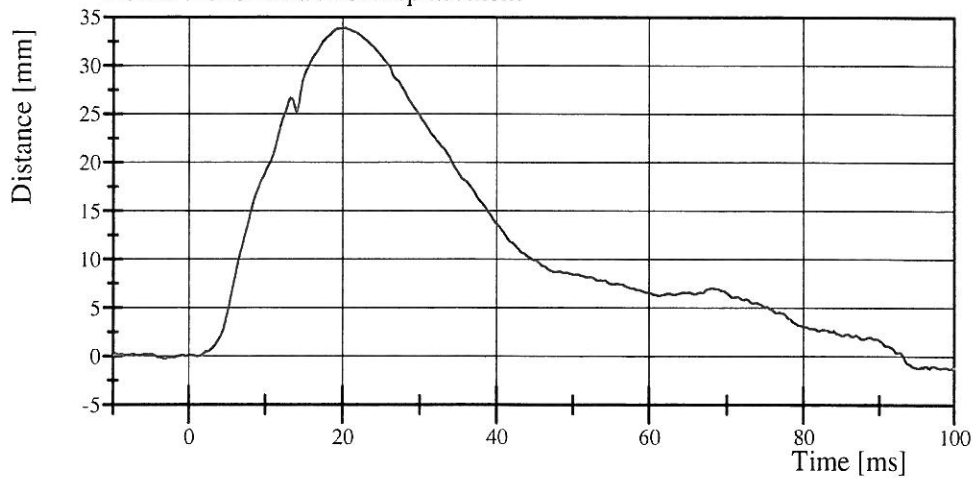


Filter Class: CFC_600

Max: 35.7 mm at 21.7 ms

Min: -1.9 mm at 98.7 ms

Lower Abdominal Rib Displacement

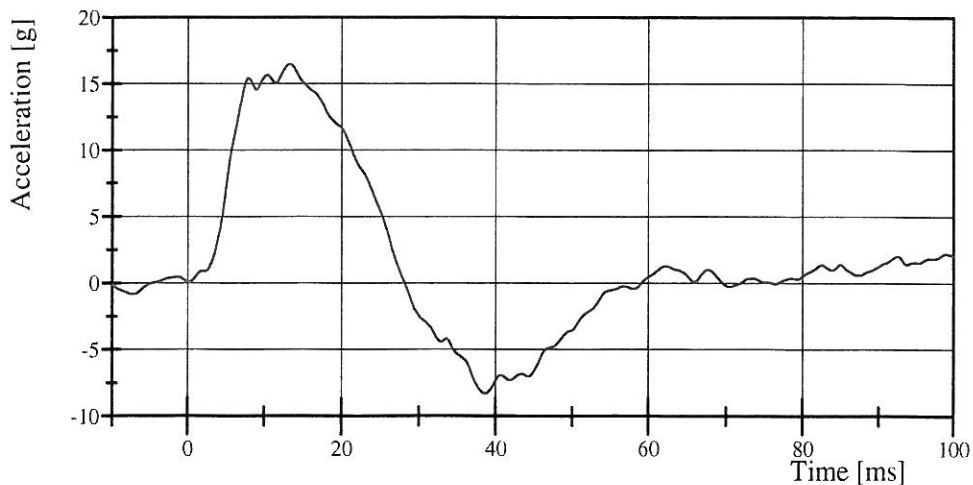


Filter Class: CFC_600

Max: 33.9 mm at 20.3 ms

Min: -1.3 mm at 99.5 ms

Lower Spine Acceleration (Y)



Filter Class: CFC_180

Max: 16.5 g at 13.3 ms

Min: -8.3 g at 38.6 ms

Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-2

Test Date: 8/20/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.69 m/s	Yes
Impactor Force	(-6,300) - (-7,800) N	-7,506.7 N	Yes
Pelvis Lateral Acceleration	41 - 51 g	40.5 g	No
Lower Spine Lateral Acceleration	10 - 14 g	12.1 g	Yes

Test does not meet specifications.

Comments:

Technician

Charles W. Hark

Approved

Ron Storus



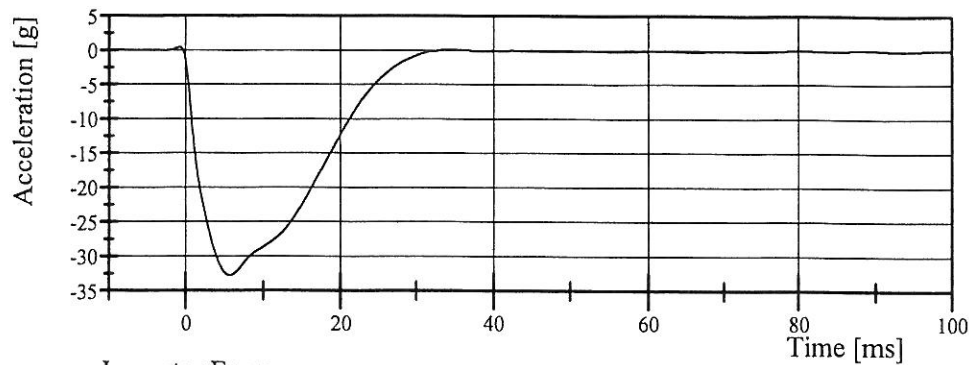
Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 014 Certification No. 2-2

Test Date: 8/20/2008

Impactor Acceleration

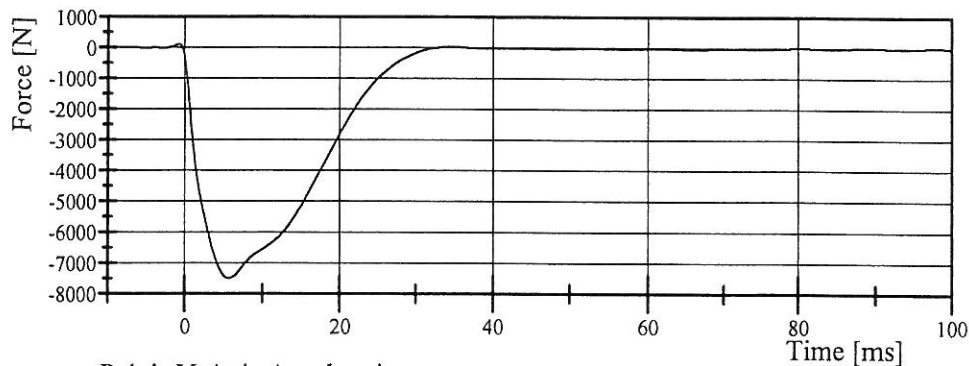


Filter Class: CFC_180

Max: 0.5 g at -0.7 ms

Min: -32.8 g at 5.7 ms

Impactor Force

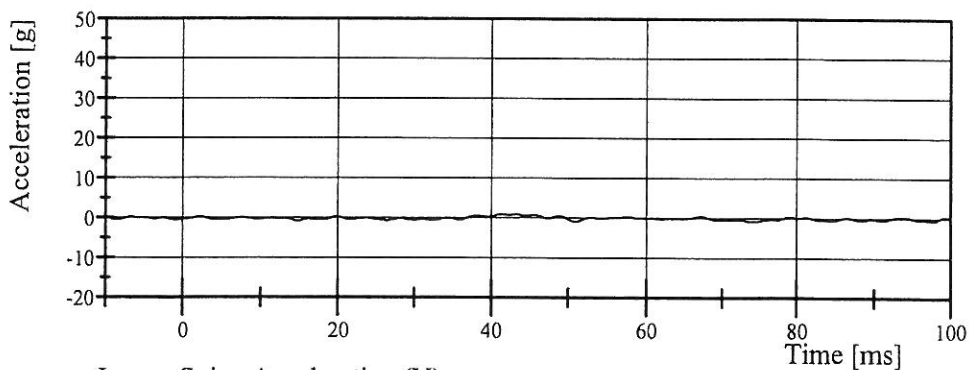


Filter Class: CFC_180

Max: 110.6 N at -0.7 ms

Min: -7,506.7 N at 5.7 ms

Pelvis Y-Axis Acceleration

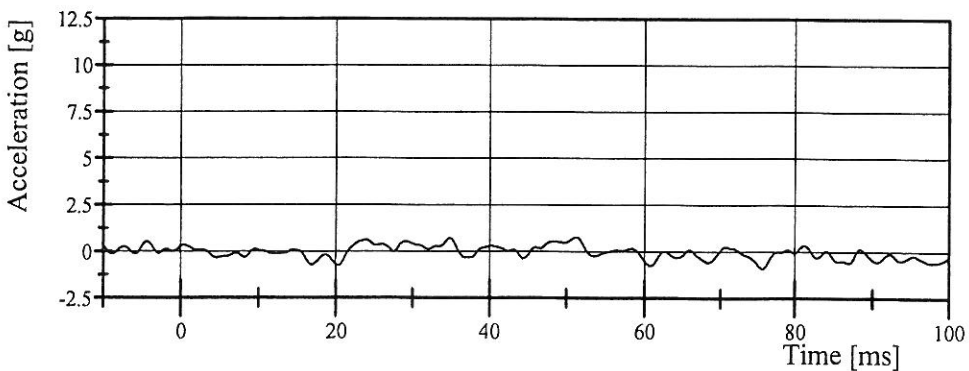


Filter Class: CFC_180

Max: 40.5 g at 0.0 ms

Min: -16.3 g at 0.0 ms

Lower Spine Acceleration (Y)



Filter Class: CFC_180

Max: 12.1 g at 0.0 ms

Min: -2.0 g at 0.0 ms



Calibration Test Results

Pre-Test

World SID: 016

Configured for Left Side Impact

Transportation Research Center Inc.

Front Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/18/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	252.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	8.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Hill

Approved

Ron Stoner

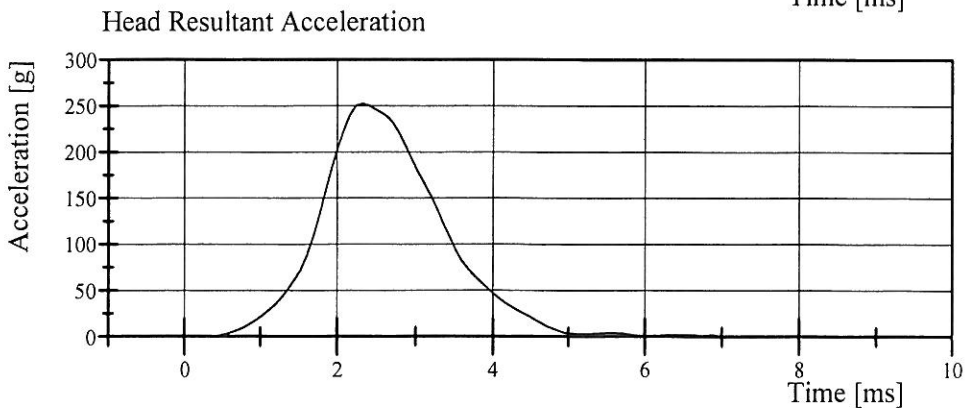
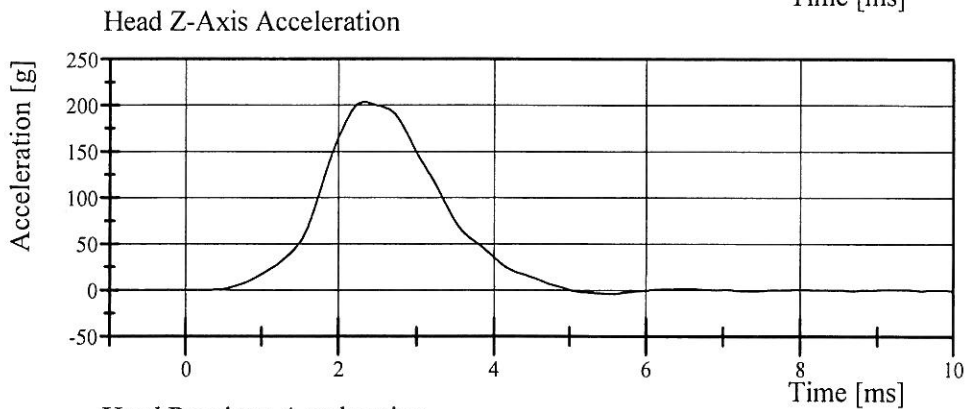
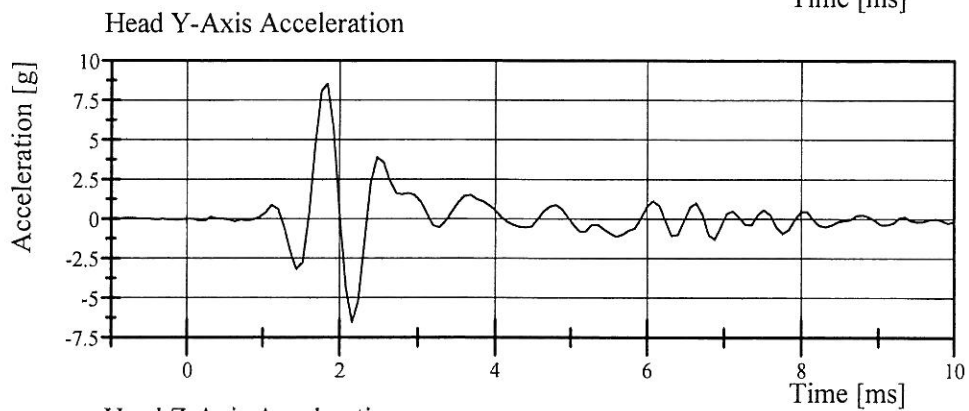
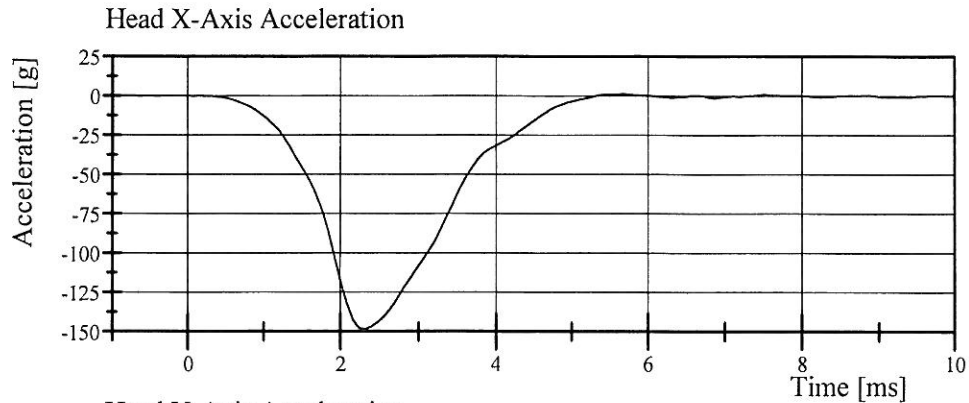


Transportation Research Center Inc.

Front Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/18/2008



Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/18/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	107.3 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.4 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

Ron Storer



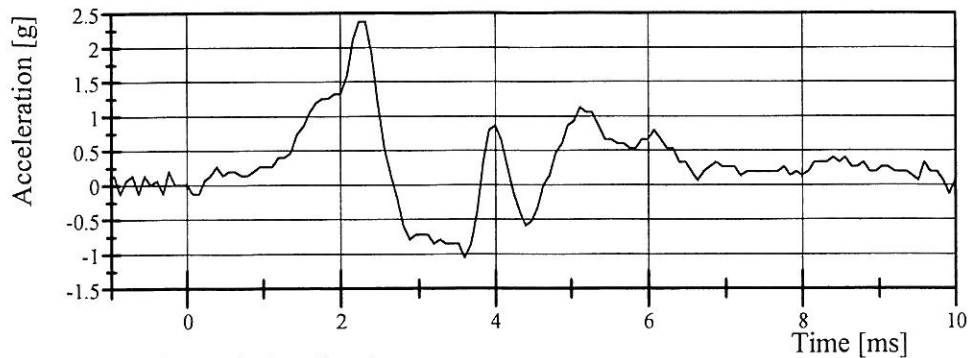
Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/18/2008

Head X-Axis Acceleration

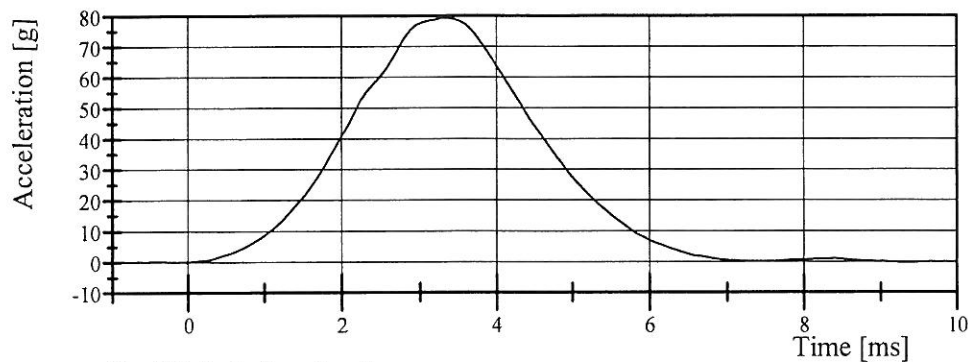


Filter Class: CFC_1000

Max: 2.4 g at 2.2 ms

Min: -1.1 g at 3.6 ms

Head Y-Axis Acceleration

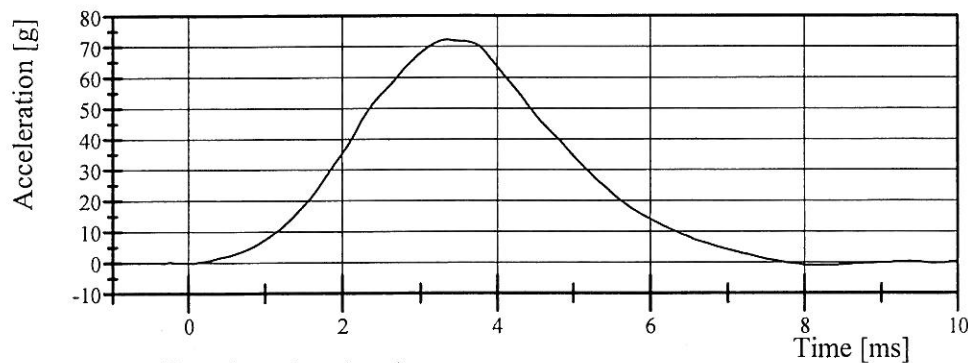


Filter Class: CFC_1000

Max: 79.3 g at 3.3 ms

Min: -0.4 g at 9.4 ms

Head Z-Axis Acceleration

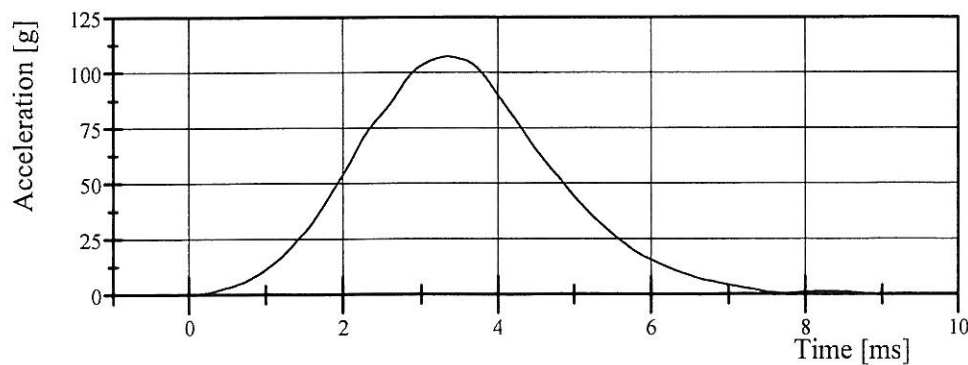


Filter Class: CFC_1000

Max: 72.3 g at 3.4 ms

Min: -1.0 g at 8.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 107.3 g at 3.4 ms

Min: 0.0 g at -0.2 ms

Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/18/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	109.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-1.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

Ron Stoner

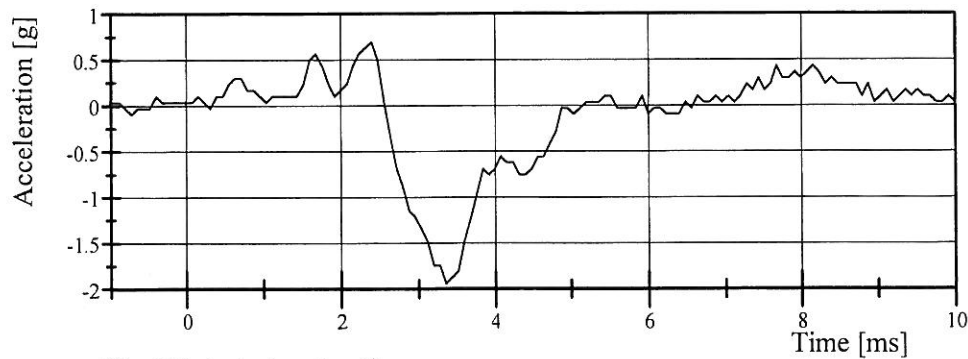
Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/18/2008

Head X-Axis Acceleration

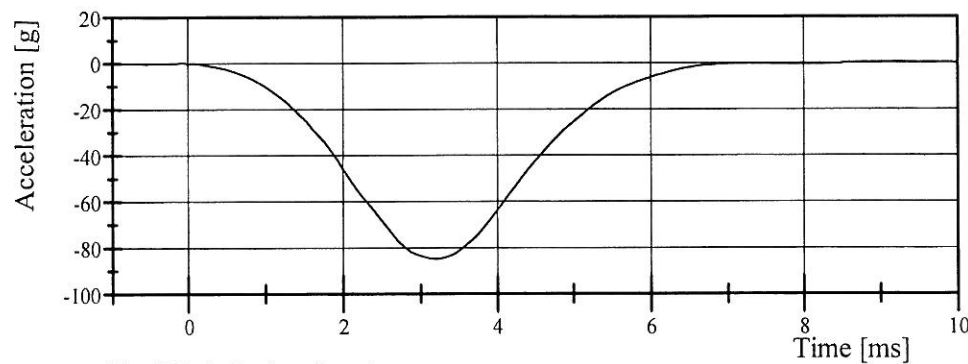


Filter Class: CFC_1000

Max: 0.7 g at 2.4 ms

Min: -1.9 g at 3.4 ms

Head Y-Axis Acceleration

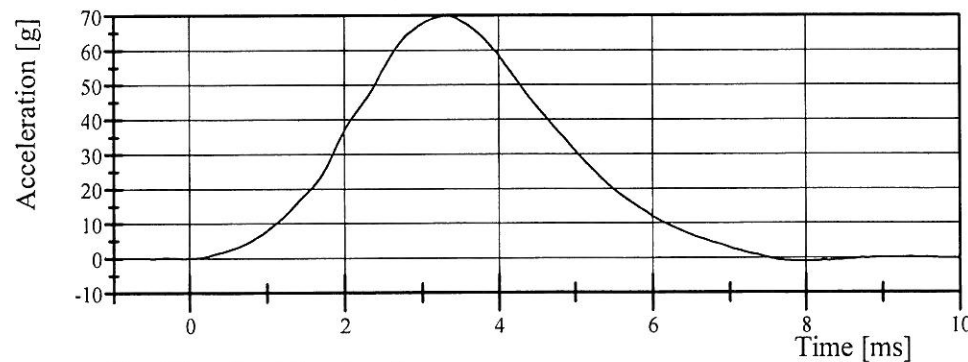


Filter Class: CFC_1000

Max: 0.6 g at 9.1 ms

Min: -84.9 g at 3.2 ms

Head Z-Axis Acceleration

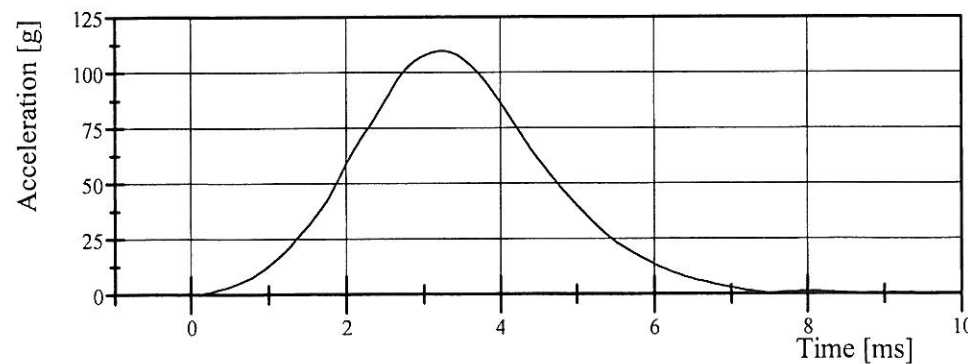


Filter Class: CFC_1000

Max: 69.9 g at 3.4 ms

Min: -1.0 g at 8.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 109.8 g at 3.3 ms

Min: 0.0 g at -1.0 ms

Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

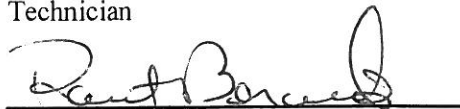
Test Date: 8/20/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.35 m/s	Yes
Pendulum Integrated Velocity			
Change at 4 ms	0.77 - 1.04 m/s	0.928 m/s	Yes
Change at 8 ms	1.6 - 2.16 m/s	1.976 m/s	Yes
Change at 12 ms	2.43 - 3.29 m/s	3.084 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-55.4 deg	Yes
Headform Flexion Decay			
- from Peak to Zero Degrees	58 - 72 ms	64.1 ms	Yes
Total Neck Occipital Condyles Moment	55 - 68 N·m	59.8 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	71 - 87 ms	79.0 ms	Yes
Maximum Forward Pot Rotation			
Peak	(-32) - (-39) °	-35.9 °	Yes
Time of Peak	56 - 68 ms	60.2 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-30) - (-37) °	-32.2 °	Yes
Time of Peak	56 - 68 ms	60.9 ms	Yes

Test meets specifications.

Comments:

Technician



Approved



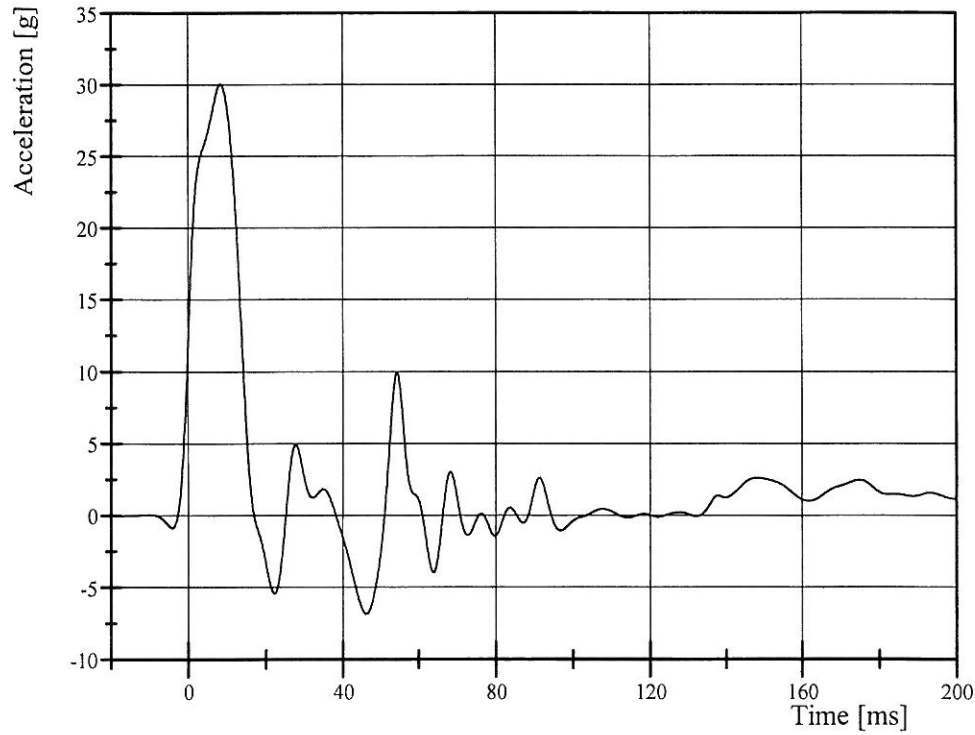
Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/20/2008

Pendulum Acceleration

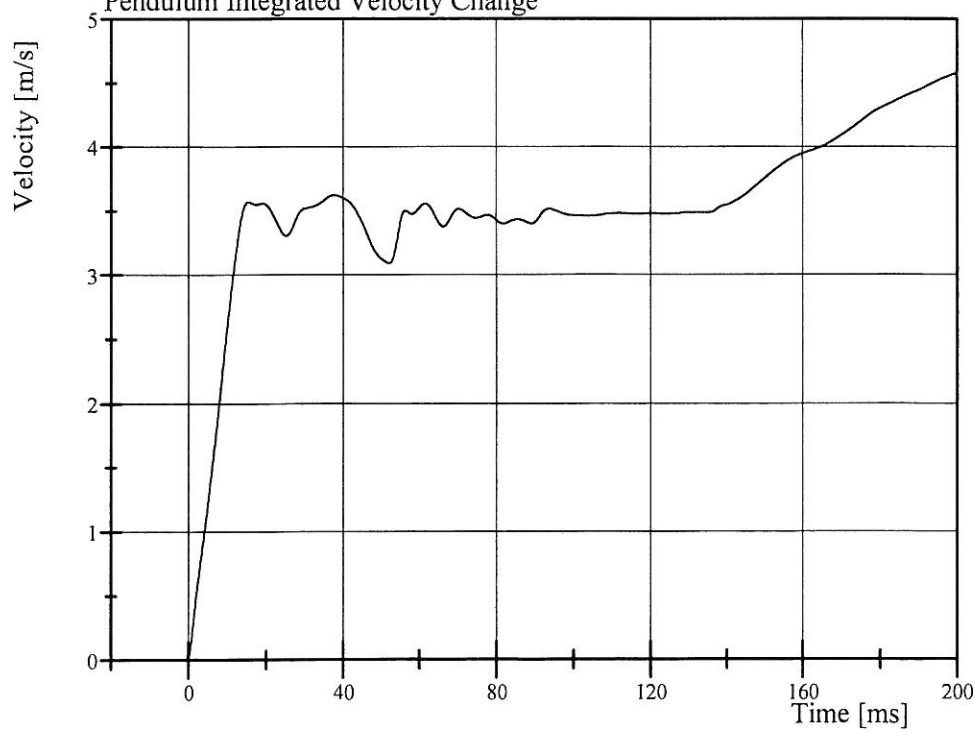


Filter Class: CFC_60

Max: 30.0 g at 8.6 ms

Min: -6.8 g at 46.3 ms

Pendulum Integrated Velocity Change



Filter Class: CFC_180

Max: 4.6 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

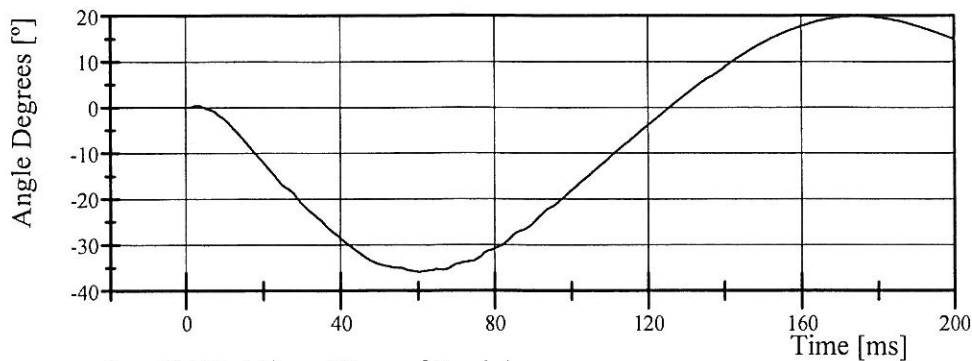
Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/20/2008

Forward Pot Rotation at Base of Pendulum

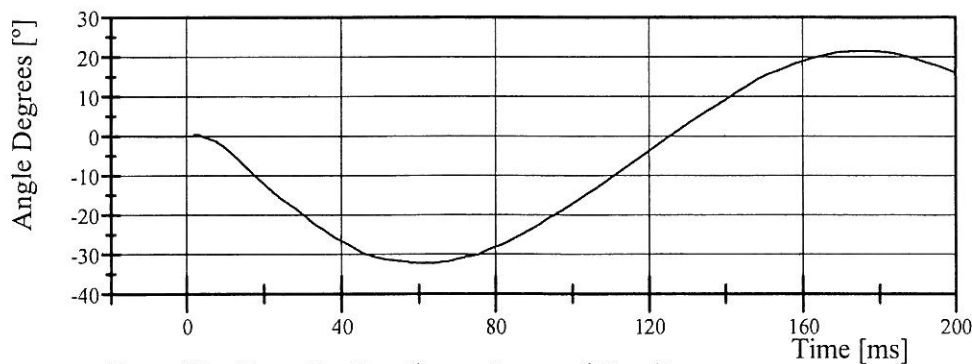


Filter Class: CFC_1000

Max: 19.9 ° at 175.1 ms

Min: -35.9 ° at 60.2 ms

Rear Pot Rotation at Base of Pendulum

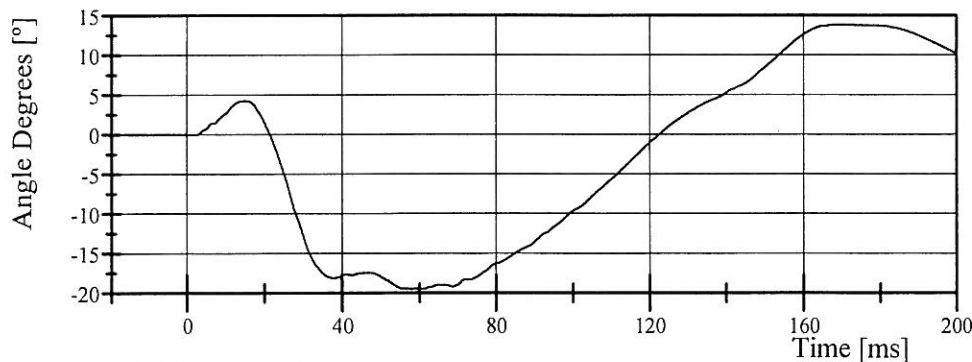


Filter Class: CFC_1000

Max: 21.6 ° at 176.7 ms

Min: -32.2 ° at 60.9 ms

Center Headform Pot Rotation at Center of Gravity

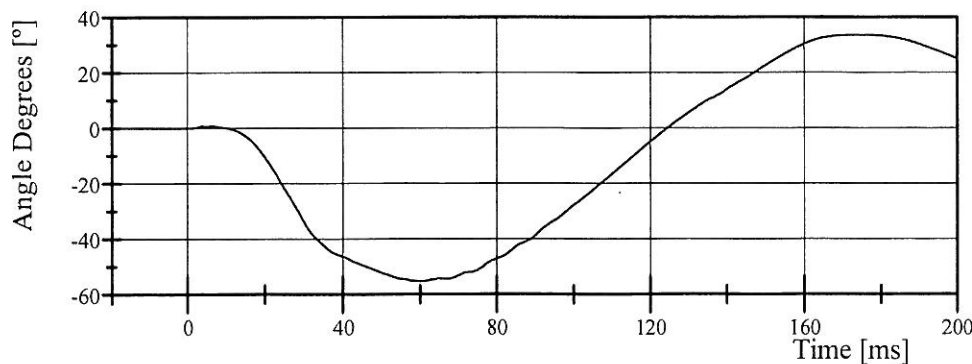


Filter Class: CFC_1000

Max: 13.9 ° at 170.4 ms

Min: -19.5 ° at 57.8 ms

Total Headform Flexion



Filter Class: CFC_1000

Max: 33.7 ° at 174.7 ms

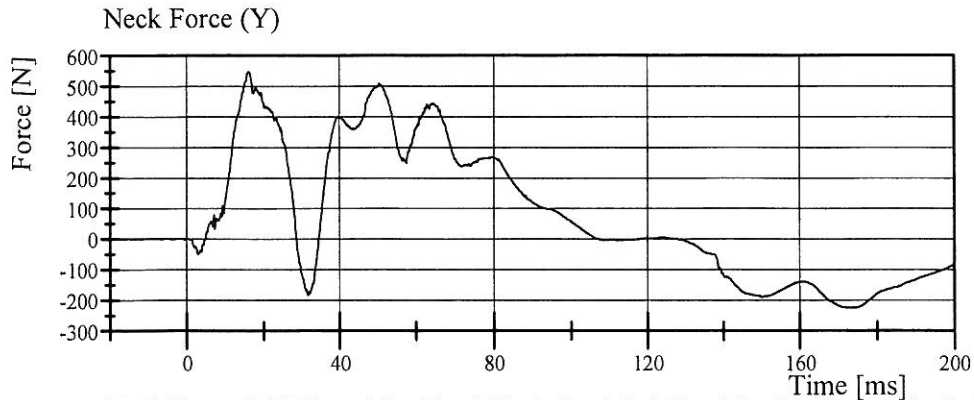
Min: -55.4 ° at 60.5 ms

Transportation Research Center Inc.

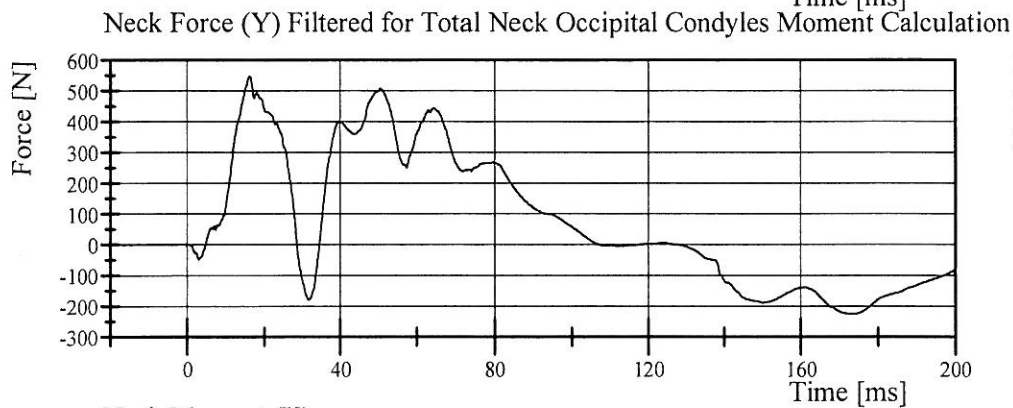
Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

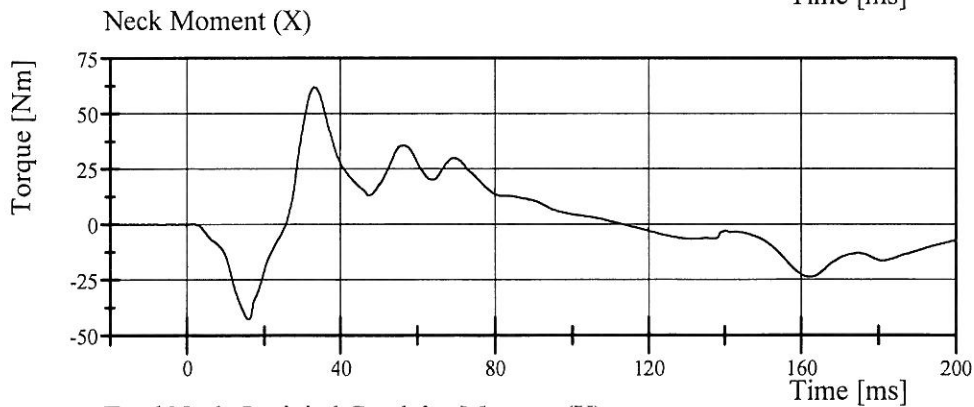
Test Date: 8/20/2008



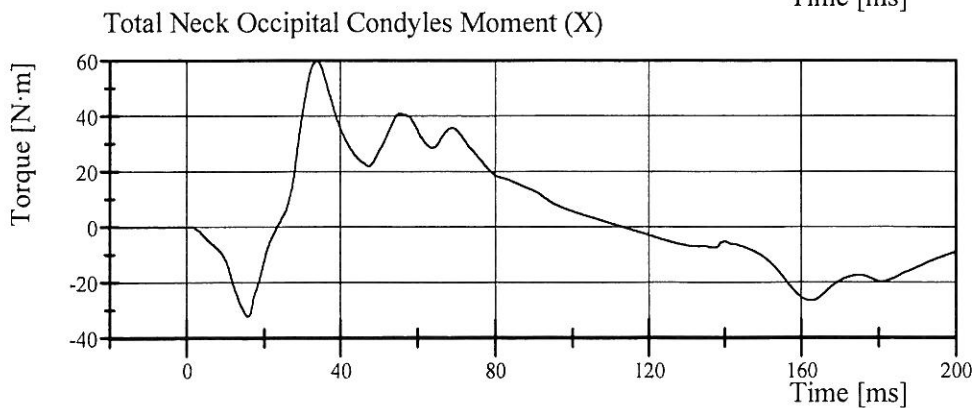
Filter Class: CFC_1000
Max: 547.8 N at 16.2 ms
Min: -225.1 N at 172.4 ms



Filter Class: CFC_600
Max: 547.4 N at 16.2 ms
Min: -224.7 N at 173.0 ms



Filter Class: CFC_600
Max: 61.8 Nm at 33.2 ms
Min: -42.7 Nm at 15.9 ms



Filter Class: CFC_600
Max: 59.8 N·m at 33.7 ms
Min: -32.2 N·m at 15.7 ms

Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 016WSD05 TA Certification No. 4-4

Test Date: 8/19/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.80 m/s	Yes
Impactor Force	(-4,700) - (-6,400) N	-5,645.9 N	Yes
Upper Thorax Rib Displacement	35 - 47 mm	35.1 mm	Yes
Center Thorax Rib Displacement	42 - 57 mm	44.4 mm	Yes
Lower Thorax Rib Displacement	40 - 54 mm	39.3 mm	No
Upper Spine Lateral Acceleration	24 - 33 g	31.0 g	Yes
Lower Spine Lateral Acceleration	20 - 28 g	23.2 g	Yes

Test does not meet specifications.

Comments:

Technician

Charles W. Bell

Approved

Ron Storno

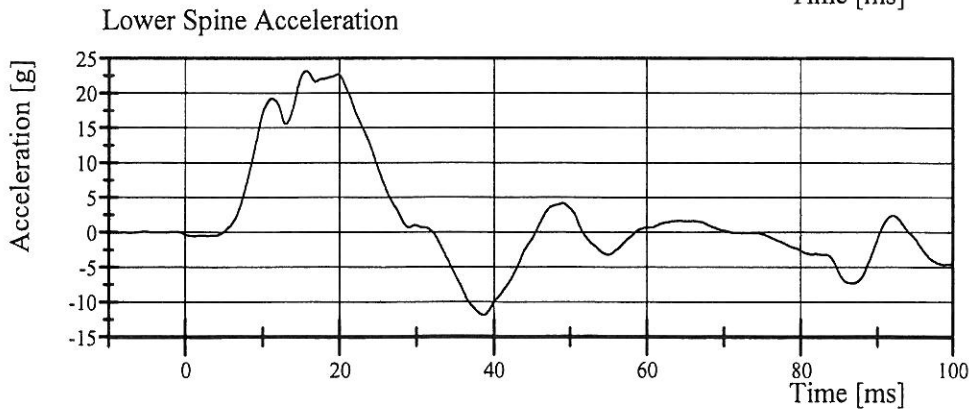
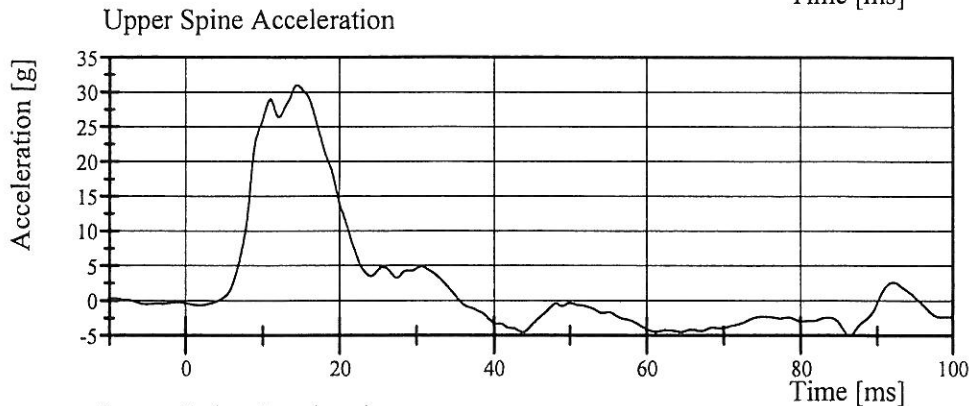
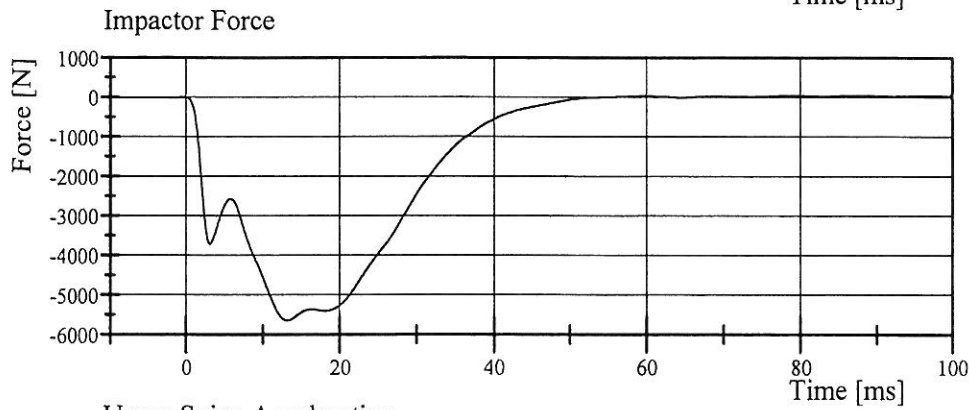
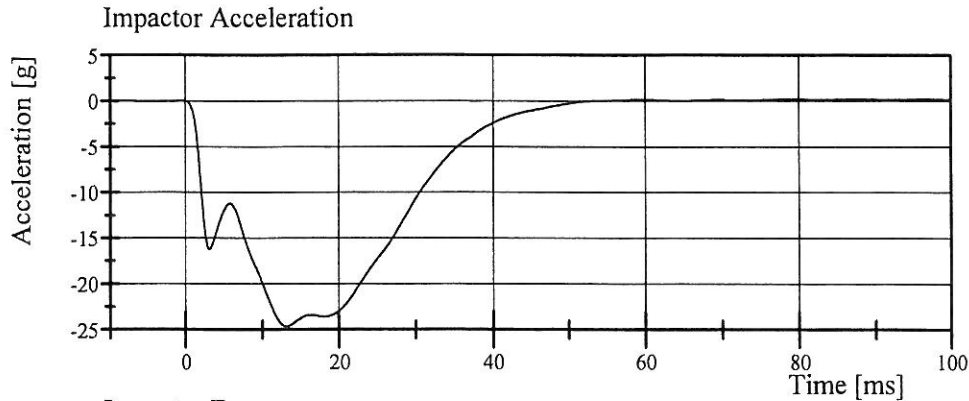


Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 016WSD05 TA Certification No. 4-4

Test Date: 8/19/2008



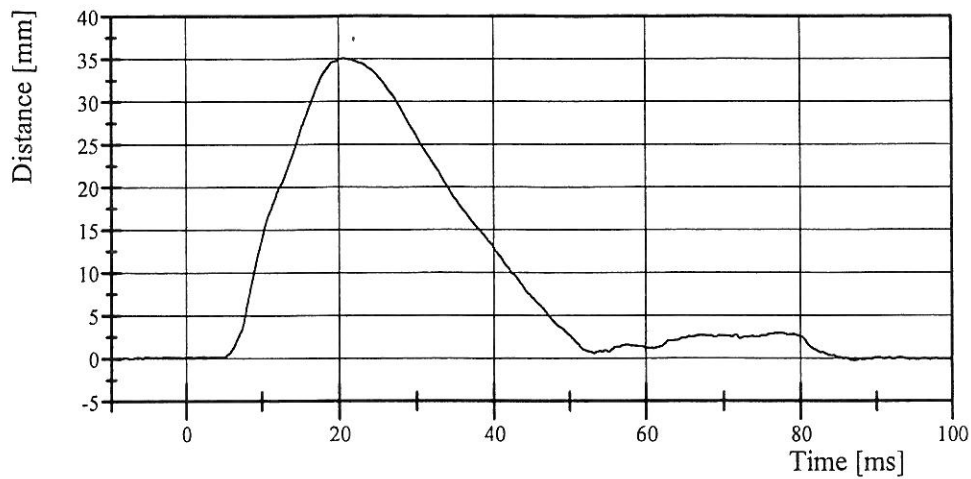
Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 016WSD05 TA Certification No. 4-4

Test Date: 8/19/2008

Upper Thorax Rib Displacement

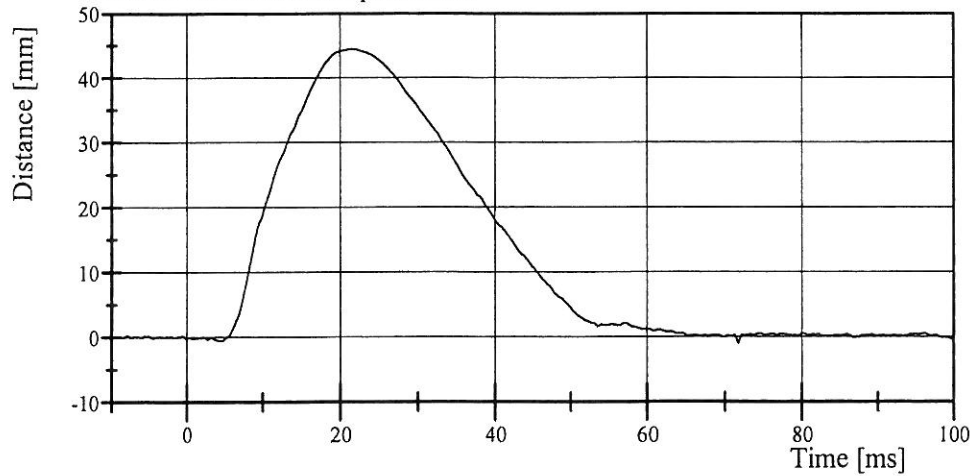


Filter Class: CFC_600

Max: 35.1 mm at 20.7 ms

Min: -0.3 mm at 87.2 ms

Center Thorax Rib Displacement

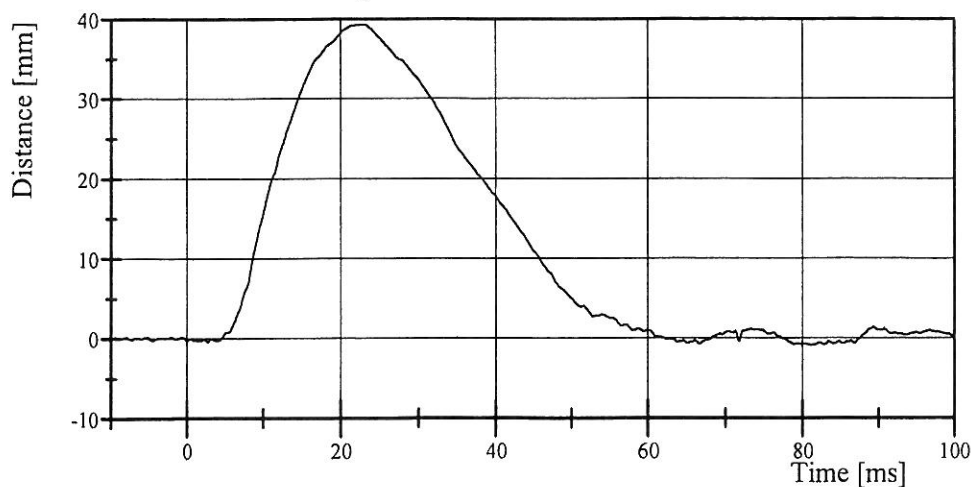


Filter Class: CFC_600

Max: 44.4 mm at 21.5 ms

Min: -1.0 mm at 71.8 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600

Max: 39.3 mm at 23.1 ms

Min: -0.9 mm at 81.2 ms



Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/19/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-2,759.6 N	Yes
Upper Abdominal Rib Displacement	33 - 41 mm	37.0 mm	Yes
Lower Abdominal Rib Displacement	31 - 39 mm	34.9 mm	Yes
Lower Spine Lateral Acceleration	15 - 20 g	15.5 g	Yes

Test meets specifications.

Comments:

Technician

Raul Benito

Approved

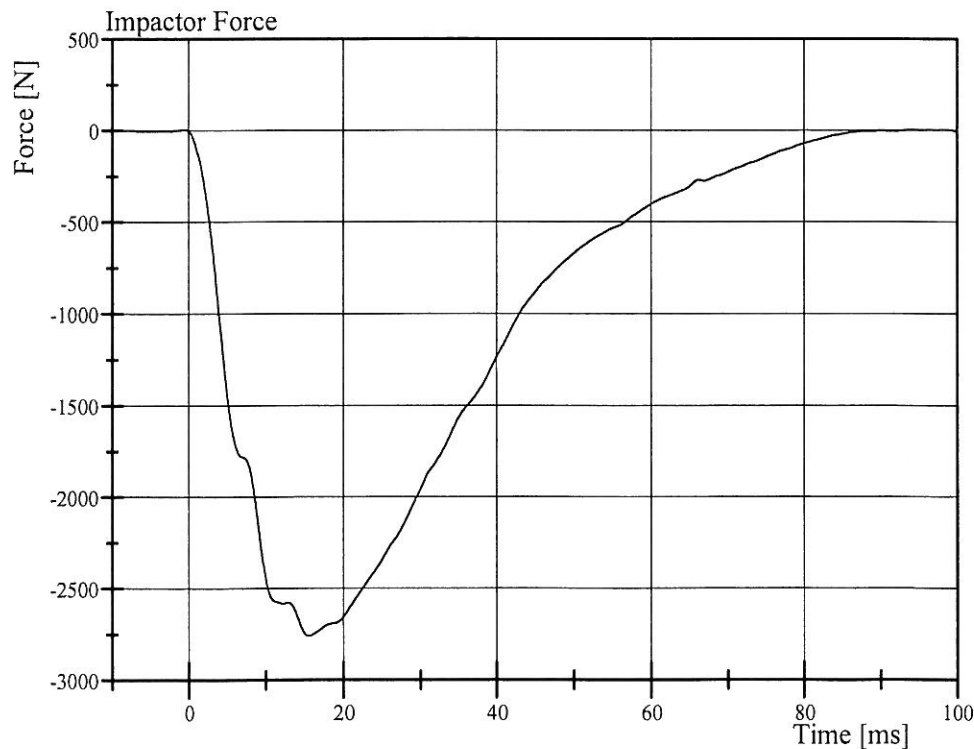
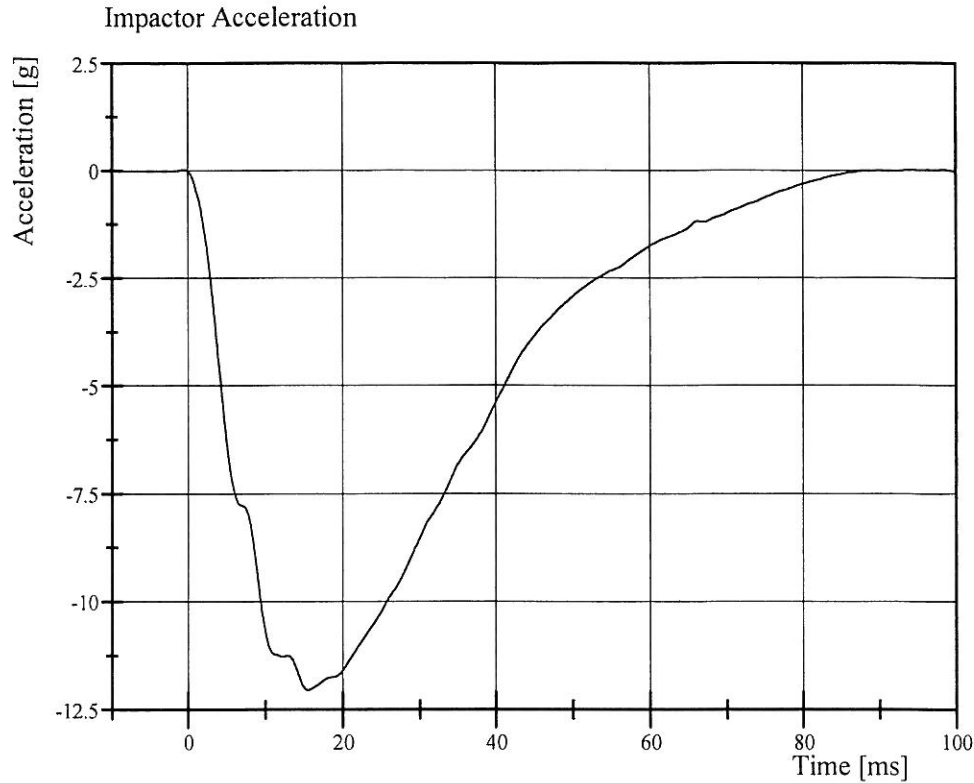
Ron Storvick

Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/19/2008



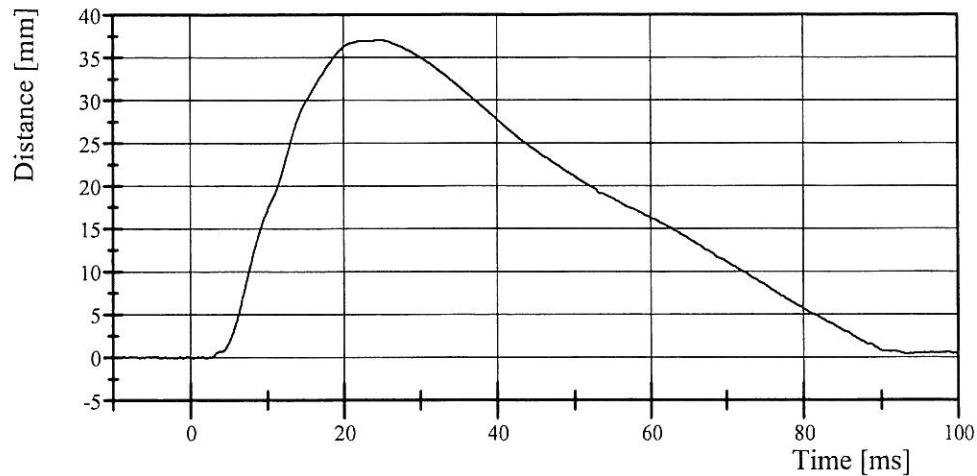
Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-1

Test Date: 8/19/2008

Upper Abdominal Rib Displacement

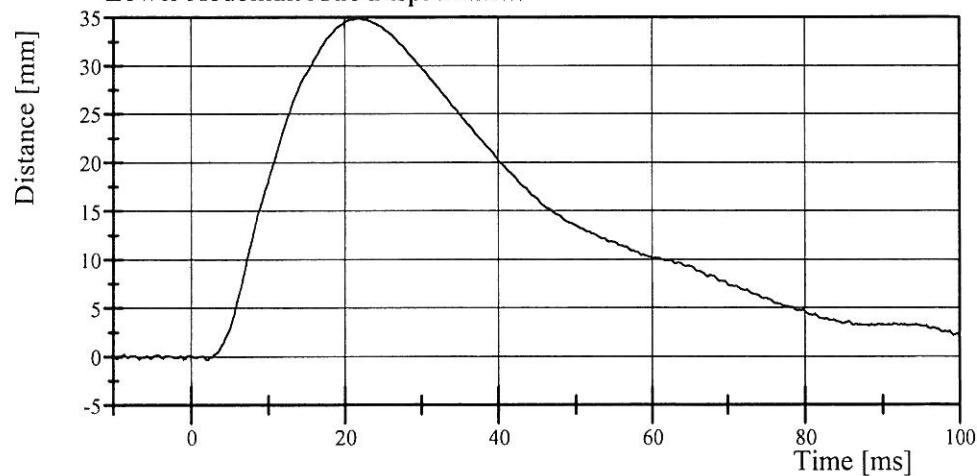


Filter Class: CFC_600

Max: 37.0 mm at 24.8 ms

Min: -0.1 mm at 0.4 ms

Lower Abdominal Rib Displacement

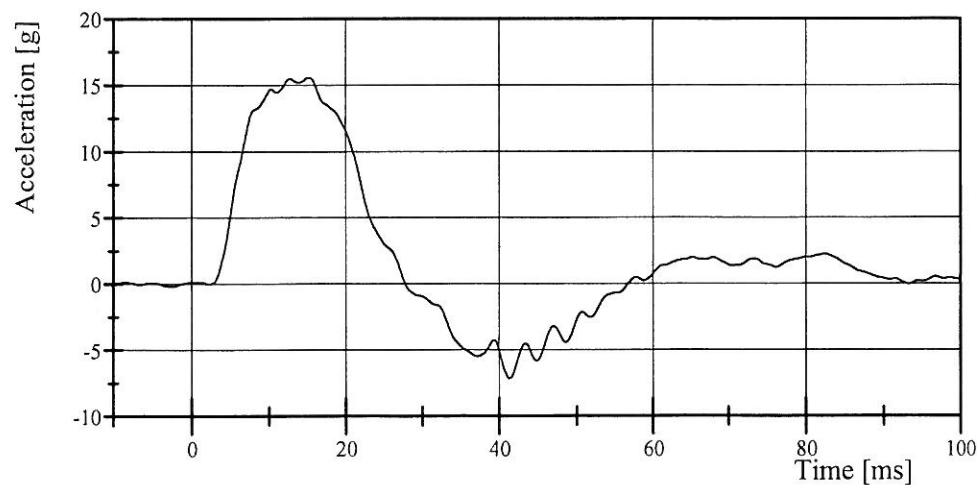


Filter Class: CFC_600

Max: 34.9 mm at 21.9 ms

Min: -0.4 mm at 2.1 ms

Lower Spine Acceleration (Y)



Filter Class: CFC_180

Max: 15.5 g at 15.2 ms

Min: -7.2 g at 41.4 ms

Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-4

Test Date: 8/20/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.76 m/s	Yes
Impactor Force	(-6,300) - (-7,800) N	-7,306.9 N	Yes
Pelvis Lateral Acceleration	41 - 51 g	39.0 g	No
Lower Spine Lateral Acceleration	10 - 14 g	13.5 g	Yes

Test does not meet specifications.

Comments:

Technician

Charles W. Bely

Approved

Ron Storvick

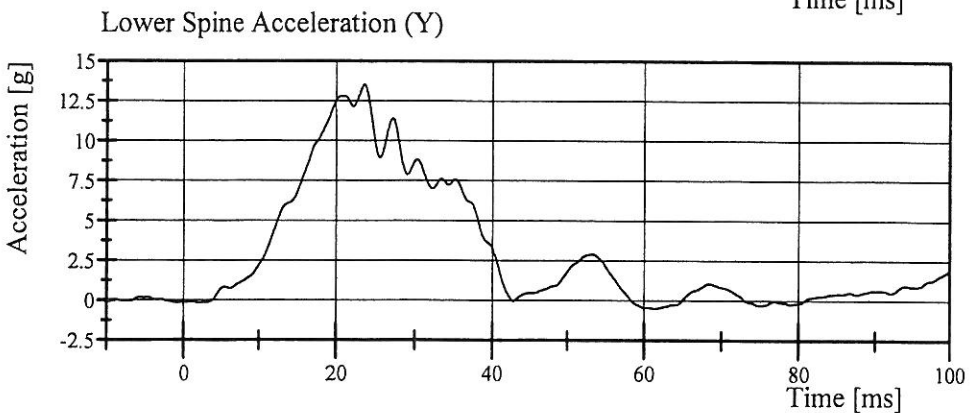
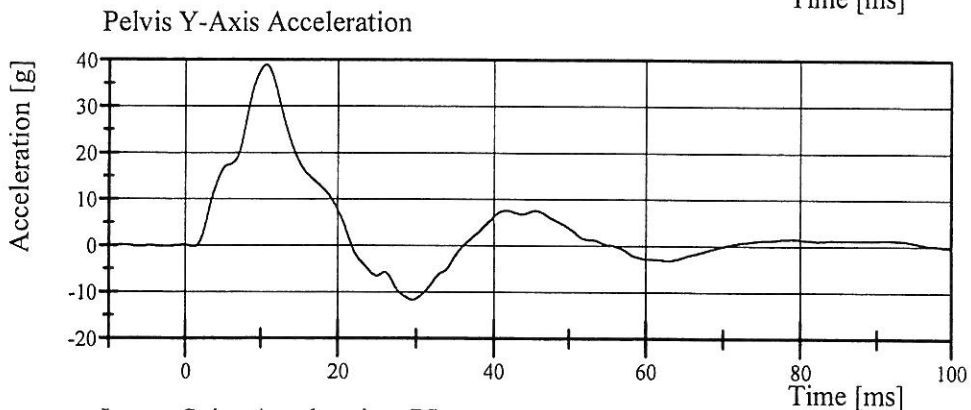
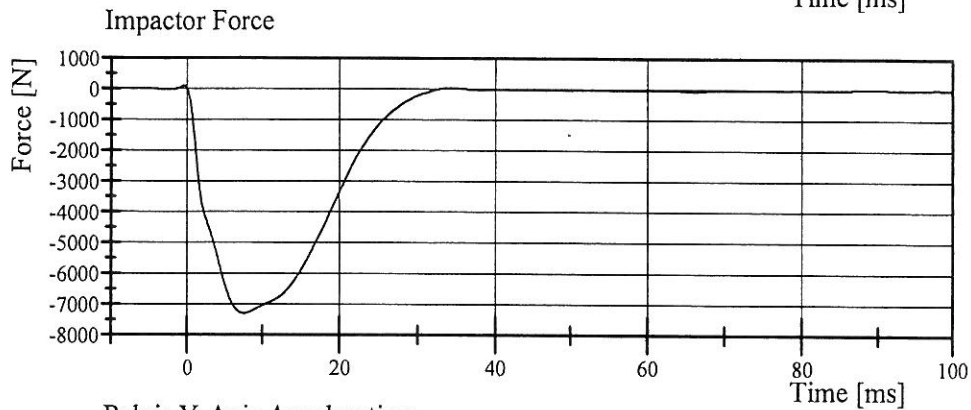
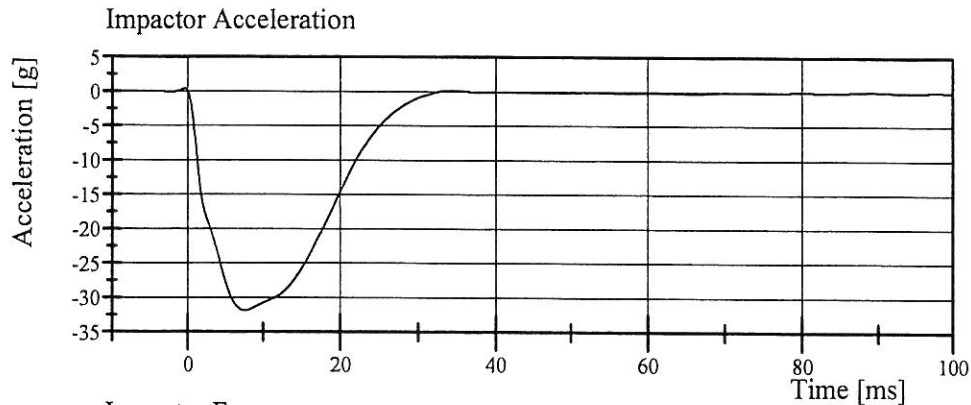


Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 016 Certification No. 5-4

Test Date: 8/20/2008



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

<u>Lumbar load cells:</u>	+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 080911-2

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity
1	Trig D1	10ZERO00000VO0A	EVENT	1	Logic	Bipolar
2	P61268	16SILBFR0000ACXA	RIGHT SIDE SILL AT FRONT SEAT (X) ACCELERATION VS TIME (#1)	400	g	Bipolar
3	P61385	16SILBFR0000ACYA	RIGHT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME (#1)	1000	g	-Bipolar
4	p57800	16SILBFR0000ACZA	RIGHT SIDE SILL AT FRONT SEAT (Z) ACCELERATION VS TIME (#1)	400	g	-Bipolar
5	P46517	16SILBRE0000ACXA	RIGHT SIDE SILL AT REAR SEAT (X) ACCELERATION VS TIME (#2)	400	g	Bipolar
6	P57821	16SILBRE0000ACYA	RIGHT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME (#2)	1000	g	-Bipolar
7	P61536	16SILBRE0000ACZA	RIGHT SIDE SILL AT REAR SEAT (Z) ACCELERATION VS TIME (#2)	400	g	-Bipolar
8	P57824	18FORA000000ACXA	REAR FLOORPAN ABOVE AXLE (X) ACCELERATION VS TIME (#3)	1000	g	Bipolar
9	P46509	18FORA000000ACYA	REAR FLOORPAN ABOVE AXLE (Y) ACCELERATION VS TIME (#3)	1000	g	-Bipolar
10	P61341	18FORA000000ACZA	REAR FLOORPAN ABOVE AXLE (Z) ACCELERATION VS TIME (#3)	1000	g	-Bipolar
11	P54850	14SILBFR0000ACYA	LEFT SIDE SILL AT FRONT SEAT (Y) ACCELERATION VS TIME (#5)	1000	g	Bipolar
12	P45017	14SILBRE0000ACYA	LEFT SIDE SILL AT REAR SEAT (Y) ACCELERATION VS TIME	1000	g	Bipolar
13	P58574	16VEHCRE0000ACYA	RIGHT REAR OCCUPANT COMPARTMENT (Y) ACCELERATION VS TIME (#7)	1500	g	Bipolar
14	P42293	11APILLO0000ACYA	LEFT LOWER A-POST (Y) ACCELERATION VS TIME (#14)	1500	g	-Bipolar
15	P61394	11APILUP0000ACYA	LEFT UPPER A-POST (Y) ACCELERATION VS TIME (#15)	1500	g	-Bipolar
16	P61389	14BPILLO0000ACYA	LEFT LOWER B-POST (Y) ACCELERATION VS TIME (#12)	1500	g	-Bipolar
17	P58673	14BPILUP0000ACYA	LEFT UPPER B-POST (Y) ACCELERATION VS TIME (#13)	1500	g	-Bipolar
18	P61428	11SETRFR0000ACYA	LEFT FRONT SEAT TRACK (Y) ACCELERATION VS TIME (#16)	1500	g	Bipolar
19	P57789	14SETRRE0000ACYA	LEFT REAR SEAT TRACK (Y) ACCELERATION VS TIME	1500	g	Bipolar
20	P61430	10VEHCCG0000ACXA	VEHICLE CENTER OF GRAVITY (X) ACCELERATION VS TIME (#18)	1000	g	Bipolar
21	P61424	10VEHCCG0000ACYA	VEHICLE CENTER OF GRAVITY (Y) ACCELERATION VS TIME (#18)	1000	g	-Bipolar
22	P58576	10VEHCCG0000ACZA	VEHICLE CENTER OF GRAVITY (Z) ACCELERATION VS TIME (#18)	1000	g	-Bipolar
23	P61282	10ENGNTTP0000ACXA	Top of Engine X-axis Accel	2000	g	-Bipolar
24	P61319	10ENGNTTP0000ACYA	Top of Engine Y-axis Accel	2000	g	-Bipolar
25	P57876	102FIRCX0000ACXA	Center of Firewall X-axis Accel	2000	g	Bipolar
26	P61262	102FIRCX0000ACYA	Center of Firewall Y-axis Accel	2000	g	Bipolar
27	P61449	10ROOFRI2100ACXA	Right Roof Rail in line with Impact X-Axis Accel	2000	g	Bipolar
28	P57857	10ROOFRI2100ACYA	Right Roof Rail in line with Impact Y-Axis Accel	2000	g	-Bipolar
29	P61391	11DOORMI0000ACYA	FRONT DOOR CENTERLINE (#6) Y-Axis Accel	2000	g	Bipolar
30	P57333	11DOORMIRE00ACYA	FRONT DOOR MID REAR (#8) Y-Axis Accel	2000	g	Bipolar
31	P61441	11DOORUPMI00ACYA	FRONT DOOR UPPER CENTER (#9) Y-Axis Accel	2000	g	Bipolar
32	P44322	14DOORMIRE00ACYA	REAR DOOR MID REAR (#10) Y-Axis Accel	2000	g	Bipolar
33	P61327	14DOORUPMI00ACYA	REAR DOOR UPPER CENTER (#11) Y-Axis Accel	2000	g	Bipolar
34	3419T-808	11SEBE0000B3FO0A	Driver Shoulder Belt Load Cell	15568	N	Bipolar
35	3419-830	11SEBE0000B5FO0A	Driver Lap Belt Load Cell (J 13)	15568	N	Bipolar
36	3419-807	14SEBE0000B3FO0A	Left rear Shoulder Belt Load Cell (D 107)	15568	N	Bipolar
37	3419T-828	14SEBE0000B5FO0A	Left rear Lap Belt Load Cell	15568	N	Bipolar

Channel Report Test Number 080911-2

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity
38	ABFire1	10AIRBLE2200CU0A	Driver Side airbag (if equipped) (IP 1010)	5	V	Bipolar
39	ABFire2	10AIRBLE2300CU0A	Driver Curtain airbag (if equipped) (IP 1013)	5	V	Bipolar
40	ABFire3	11PRET000000CU0A	ELR P/T DRIV (IP 40)	5	V	Bipolar
41	Bit.01	11HEAD000000VO0A	01 DUMMY HEAD CONTACT SWITCH (T)	1	Logic	Bipolar
42	Bit.02	11SHLD000000VO0A	01 DUMMY SHOULDER CONTACT SWITCH (Z)	1	Logic	Bipolar
43	Bit.03	11TORS000000VO0A	01 DUMMY TORSO CONTACT SWITCH (P)	1	Logic	Bipolar
44	Bit.04	11LEGLE000000VO0A	01 DUMMY LEFT LEGS CONTACT SWITCH (S)	1	Logic	Bipolar
45	Bit.06	14HEAD000000VO0A	04 DUMMY HEAD CONTACT SWITCH (F)	1	Logic	Bipolar
46	Bit.07	14SHLD000000VO0A	04 DUMMY SHOULDER CONTACT SWITCH (J)	1	Logic	Bipolar
47	Bit.08	14TORS000000VO0A	04 DUMMY TORSO CONTACT SWITCH (K)	1	Logic	Bipolar
48	Bit.09	14LEGLE000000VO0A	04 DUMMY LEFT LEGS CONTACT SWITCH (R)	1	Logic	Bipolar
49	P49049	M0VEHCCG0000ACXA	MDB CENTER OF GRAVITY (X) ACCELERATION VS TIME (#1)	2000	g	Bipolar
50	P61466	M0VEHCCG0000ACYA	MDB CENTER OF GRAVITY (Y) ACCELERATION VS TIME(#1)	2000	g	Bipolar
51	P49041	M0VEHCCG0000ACZA	MDB CENTER OF GRAVITY (Z) ACCELERATION VS TIME(#1)	2000	g	-Bipolar
52	P49022	M7FRAM000000ACXA	MDB REAR (X) ACCELERATION VS TIME (#2)	2000	g	Bipolar
53	P45016	M7FRAM000000ACYA	MDB REAR (Y) ACCELERATION VS TIME (#2)	2000	g	-Bipolar
54	P45012	M70000000000ACXA	MDB Front Center Rail X	2000	g	Bipolar
55	Bit.00	M3CONT000000VO00	MDB RIGHT CONTACT SWITCH	1	Logic	Bipolar
56	Bit.01	M1CONT000000VO00	MDB LEFT CONTACT SWITCH	1	Logic	Bipolar

Command File Test Number 080911-2

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
1	16SILBFR0000ACXA	Right Side Sill at Front Seat X-Axis Acceleration	60	+	yes	400
1A	16SILBFR0000VEXA	Right Side Sill at Front Seat X-Axis Velocity	180			
1B	16SILBFR0000DCXA	Right Side Sill at Front Seat X-Axis Displacement	180			
2	16SILBFR0000ACYA	Right Side Sill at Front Seat Y-Axis Acceleration	60	+	yes	1000
2A	16SILBFR0000VEYA	Right Side Sill at Front Seat Y-Axis Velocity	180			
2B	16SILBFR0000DCYA	Right Side Sill at Front Seat Y-Axis Displacement	180			
3	16SILBFR0000ACZA	Right Side Sill at Front Seat Z-Axis Acceleration	60	+	yes	400
3A	16SILBFR0000ACRA	Right Side Sill at Front Seat Resultant Acceleration	60			
4	16SILBRE0000ACXA	Right Side Sill at Rear Seat X-Axis Acceleration	60	+	yes	400
4A	16SILBRE0000VEXA	Right Side Sill at Rear Seat X-Axis Velocity	180			
4B	16SILBRE0000DCXA	Right Side Sill at Rear Seat X-Axis Displacement	180			
5	16SILBRE0000ACYA	Right Side Sill at Rear Seat Y-Axis Acceleration	60	+	yes	1000
5A	16SILBRE0000VEYA	Right Side Sill at Rear Seat Y-Axis Velocity	180			
5B	16SILBRE0000DCYA	Right Side Sill at Rear Seat Y-Axis Displacement	180			
6	16SILBRE0000ACZA	Right Side Sill at Rear Seat Z-Axis Acceleration	60	+	yes	400
6A	16SILBRE0000ACRA	Right Side Sill at Rear Seat Resultant Acceleration	60			
7	18FORA000000ACXA	Rear Floorpan Above Axle X-Axis Acceleration	60	+	yes	1000
8	18FORA000000ACYA	Rear Floorpan Above Axle Y-Axis Acceleration	60	+	yes	1000
9	18FORA000000ACZA	Rear Floorpan Above Axle Z-Axis Acceleration	60	+	yes	1000
9A	18FORA000000ACRA	Rear Floorpan Above Axle Resultant Acceleration	60			
10	14SILBFR0000ACYA	Left Floor Sill at Front Seat Y-Axis Acceleration	60	+	yes	1000
10A	14SILBFR0000VEYA	Left Floor Sill at Front Seat Y-Axis Velocity	180			
10B	14SILBFR0000DCYA	Left Floor Sill at Front Seat Y-Axis Displacement	180			
11	14SILBRE0000ACYA	Left Floor Sill at Rear Seat Y-Axis Acceleration	60	+	yes	1000
11A	14SILBRE0000VEYA	Left Floor Sill at Rear Seat Y-Axis Velocity	180			
11B	14SILBRE0000DCYA	Left Floor Sill at Rear Seat Y-Axis Displacement	180			
12	16VEHCRE0000ACYA	Right Rear Occupant Compartment Y-Axis Acceleration	60	+	yes	1500
13	11APILLO0000ACYA	Left Lower A-Post Y-Axis Acceleration	60	+	yes	1500
14	11APILUP0000ACYA	Left Upper A-Post Y-Axis Acceleration	60	+	yes	1500
15	14BPILLO0000ACYA	Left Lower B-Post Y-Axis Acceleration	60	+	yes	1500
16	14BPILUP0000ACYA	Left Upper B-Post Y-Axis Acceleration	60	+	yes	1500
17	11SETRFR0000ACYA	Left Front Seat Track Y-Axis Acceleration	60	+	yes	1500
18	14SETRRE0000ACYA	Left Rear Seat Track Y-Axis Acceleration	60	+	yes	1500
19	10VEHCCG0000ACXA	Vehicle Center of Gravity X-Axis Acceleration	60	+	yes	1000
20	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-Axis Acceleration	60	+	yes	1000
21	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-Axis Acceleration	60	+	yes	1000
21A	10VEHCCG0000ACRA	Vehicle Center of Gravity Resultant Acceleration	60			
22	10ENGNTPO000ACXA	Top of Engine X-Axis Acceleration	60	+	yes	2000

Command File Test Number 080911-2

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
23	10ENGNT00000ACYA	Top of Engine Y-Axis Acceleration	60	+	yes	2000
24	102FIRC00000ACXA	Center Firewall X-Axis Acceleration	60	+	yes	2000
25	102FIRC00000ACYA	Center Firewall Y-Axis Acceleration	60	+	yes	2000
26	10ROOFRI2100ACXA	Right Side Roof Rail X-Axis Acceleration	60	+	yes	2000
27	10ROOFRI2100ACYA	Right Side Roof Rail Y-Axis Acceleration	60	+	yes	2000
28	11DOORMI00000ACYA	Front Door Centerline Y-Axis Acceleration	60	+	yes	2000
29	11DOORMIRE00ACYA	Front Door Mid-Rear Y-Axis Acceleration	60	+	yes	2000
30	11DOORUPMI00ACYA	Front Door Upper Centerline Y-Axis Acceleration	60	+	yes	2000
31	14DOORMIRE00ACYA	Rear Door Mid-Rear Y-Axis Acceleration	60	+	yes	2000
32	14DOORUPMI00ACYA	Rear Door Upper Centerline Y-Axis Acceleration	60	+	yes	2000
33	10AIRBLE2200CU0A	Driver Side Airbag	1000	+	no	5
34	10AIRBLE2300CU0A	Driver Curtain Airbag	1000	+	no	5
35	11PRET0000000CU0A	Driver ELR Pretensioner	1000	+	no	5
36	11HEAD0000000VO0A	Driver Head Contact Switch	1000	+	no	1
37	11SHLD0000000VO0A	Driver Shoulder Contact Switch	1000	+	no	1
38	11TORS0000000VO0A	Driver Torso Contact Switch	1000	+	no	1
39	11LEGLE000000VO0A	Driver Leg Contact Switch	1000	+	no	1
40	14HEAD0000000VO0A	Passenger Head Contact Switch	1000	+	no	1
41	14SHLD0000000VO0A	Passenger Shoulder Contact Switch	1000	+	no	1
42	14TORS0000000VO0A	Passenger Torso Contact Switch	1000	+	no	1
43	14LEGLE000000VO0A	Passenger Leg Contact Switch	1000	+	no	1
44	11SEBE0000B3FO0A	Driver Shoulder Belt Force	60	+	yes	15568
45	11SEBE0000B5FO0A	Driver Lap Belt Force	60	+	yes	15568
46	14SEBE0000B3FO0A	Passenger Shoulder Belt Force	60	+	yes	15568
47	14SEBE0000B5FO0A	Passenger Lap Belt Force	60	+	yes	15568
48	M7FRAM0000000ACXA	MDB Rear X-Axis Acceleration	60	+	yes	2000
49	M7FRAM0000000ACYA	MDB Rear Y-Axis Acceleration	60	+	yes	2000
50	M0VEHCCG00000ACXA	MDB Center of Gravity X-Axis Acceleration	60	+	yes	2000
50A	M0VEHCCG00000VEXA	MDB Center of Gravity X-Axis Velocity	180			
51	M0VEHCCG00000ACYA	MDB Center of Gravity Y-Axis Acceleration	60	+	yes	2000
51A	M0VEHCCG00000VEYA	MDB Center of Gravity Y-Axis Velocity	180			
52	M0VEHCCG00000ACZA	MDB Center of Gravity Z-Axis Acceleration	60	+	yes	2000
52A	M0VEHCCG00000ACRA	MDB Center of Gravity Resultant Acceleration	60			
53	M1CONT0000000VO00	MDB Left Contact Switch	0	+	no	1
54	M3CONT0000000VO00	MDB Right Contact Switch	0	+	no	1
55	11HEADCG00WSACXA	Driver Head X-Axis Acceleration	1000	+	yes	2000
56	11HEADCG00WSACYA	Driver Head Y-Axis Acceleration	1000	+	yes	2000
57	11HEADCG00WSACZA	Driver Head Z-Axis Acceleration	1000	+	yes	2000

Command File Test Number 080911-2

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
57A	11HEADCG00WSACRA	Driver Head Resultant Acceleration	1000			
58	11HEADCG00WSANXA	Driver Head X-Axis Angular Displacement	1000	+	yes	50000
59	11HEADCG00WSANYA	Driver Head Y-Axis Angular Displacement	1000	+	yes	50000
60	11HEADCG00WSANZA	Driver Head Z-Axis Angular Displacement	1000	+	yes	50000
61	11NECKUP00WSFOXA	Driver Upper Neck X-Axis Force	1000	+	yes	10000
62	11NECKUP00WSFOYA	Driver Upper Neck Y-Axis Force	1000	+	yes	10000
63	11NECKUP00WSFOZA	Driver Upper Neck Z-Axis Force	1000	+	yes	12000
64	11NECKUP00WSMOXA	Driver Upper Neck Moment About X Axis	600	+	yes	300
65	11NECKUP00WSMOYA	Driver Upper Neck Moment About Y Axis	600	+	yes	300
66	11NECKUP00WSMOZA	Driver Upper Neck Moment About Z Axis	600	+	yes	200
67	11NECKLO00WSFOXA	Driver Lower Neck X-Axis Force	1000	+	yes	10000
68	11NECKLO00WSFOYA	Driver Lower Neck Y-Axis Force	1000	+	yes	10000
69	11NECKLO00WSFOZA	Driver Lower Neck Z-Axis Force	1000	+	yes	12000
70	11NECKLO00WSMOXA	Driver Lower Neck Moment About X Axis	600	+	yes	300
71	11NECKLO00WSMOYA	Driver Lower Neck Moment About Y Axis	600	+	yes	300
72	11NECKLO00WSMOZA	Driver Lower Neck Moment About Z Axis	600	+	yes	200
73	11SHLDLE00WSFOXA	Driver Shoulder X-Axis Force	600	+	yes	5000
74	11SHLDLE00WSFOYA	Driver Shoulder Y-Axis Force	600	+	yes	10000
75	11SHLDLE00WSFOZA	Driver Shoulder Z-Axis Force	600	+	yes	5000
76	11SHLDLE00WSDSYA	Driver Shoulder Y-Axis Displacement	600	+	yes	90
77	11SHLDLE00WSACXA	Driver Shoulder X-Axis Acceleration	1000	+	yes	2000
78	11SHLDLE00WSACYA	Driver Shoulder Y-Axis Acceleration	1000	+	yes	2000
79	11SHLDLE00WSACZA	Driver Shoulder Z-Axis Acceleration	1000	+	yes	2000
79A	11SHLDLE00WSACRA	Driver Shoulder Resultant Acceleration	1000			
80	11THSP0100WSACXA	Driver T1 X-Axis Acceleration	180	+	yes	2000
81	11THSP0100WSACYA	Driver T1 Y-Axis Acceleration	180	+	yes	2000
82	11THSP0100WSACZA	Driver T1 Z-Axis Acceleration	180	+	yes	2000
82A	11THSP0100WSACRA	Driver T1 Resultant Acceleration	180			
83	11THSP0400WSACXA	Driver T4 X-Axis Acceleration	180	+	yes	2000
84	11THSP0400WSACYA	Driver T4 Y-Axis Acceleration	180	+	yes	2000
85	11THSP0400WSACZA	Driver T4 Z-Axis Acceleration	180	+	yes	2000
85A	11THSP0400WSACRA	Driver T4 Resultant Acceleration	180			
86	11THSP1200WSACXA	Driver T12 X-Axis Acceleration	180	+	yes	2000
87	11THSP1200WSACYA	Driver T12 Y-Axis Acceleration	180	+	yes	2000
88	11THSP1200WSACZA	Driver T12 Z-Axis Acceleration	180	+	yes	2000
88A	11THSP1200WSACRA	Driver T12 Resultant Acceleration	180			
89	11TRRILE01WSDSYA	Driver Thorax Rib 1 Y-Axis Displacement	600	+	yes	90
90	11TRRILE01WSACXA	Driver Thorax Rib 1 X-Axis Acceleration	1000	+	yes	2000

Command File Test Number 080911-2

Channel	ISO mnemonic	Channel Title	Filter	Class	Flip	Zero	Full Scale
91	11TRRILE01WSACYA	Driver Thorax Rib 1 Y-Axis Acceleration	1000	+	yes		2000
92	11TRRILE01WSACZA	Driver Thorax Rib 1 Z-Axis Acceleration	1000	+	yes		2000
92A	11TRRILE01WSACRA	Driver Thorax Rib 1 Resultant Acceleration	1000				
93	11TRRILE02WSDSYA	Driver Thorax Rib 2 Y-Axis Displacement	600	+	yes		90
94	11TRRILE02WSACXA	Driver Thorax Rib 2 X-Axis Acceleration	1000	+	yes		2000
95	11TRRILE02WSACYA	Driver Thorax Rib 2 Y-Axis Acceleration	1000	+	yes		2000
96	11TRRILE02WSACZA	Driver Thorax Rib 2 Z-Axis Acceleration	1000	+	yes		2000
96A	11TRRILE02WSACRA	Driver Thorax Rib 2 Resultant Acceleration	1000				
97	11TRRILE03WSDSYA	Driver Thorax Rib 3 Y-Axis Displacement	600	+	yes		90
98	11TRRILE03WSACXA	Driver Thorax Rib 3 X-Axis Acceleration	1000	+	yes		2000
99	11TRRILE03WSACYA	Driver Thorax Rib 3 Y-Axis Acceleration	1000	+	yes		2000
100	11TRRILE03WSACZA	Driver Thorax Rib 3 Z-Axis Acceleration	1000	+	yes		2000
100A	11TRRILE03WSACRA	Driver Thorax Rib 3 Resultant Acceleration	1000				
101	11ABRILE01WSDSYA	Driver Abdominal Rib 1 Y-Axis Displacement	600	+	yes		90
102	11ABRILE01WSACXA	Driver Abdominal Rib 1 X-Axis Acceleration	1000	+	yes		2000
103	11ABRILE01WSACYA	Driver Abdominal Rib 1 Y-Axis Acceleration	1000	+	yes		2000
104	11ABRILE01WSACZA	Driver Abdominal Rib 1 Z-Axis Acceleration	1000	+	yes		2000
104A	11ABRILE01WSACRA	Driver Abdominal Rib 1 Resultant Acceleration	1000				
105	11ABRILE02WSDSYA	Driver Abdominal Rib 2 Y-Axis Displacement	600	+	yes		90
106	11ABRILE02WSACXA	Driver Abdominal Rib 2 X-Axis Acceleration	1000	+	yes		2000
107	11ABRILE02WSACYA	Driver Abdominal Rib 2 Y-Axis Acceleration	1000	+	yes		2000
108	11ABRILE02WSACZA	Driver Abdominal Rib 2 Z-Axis Acceleration	1000	+	yes		2000
108A	11ABRILE02WSACRA	Driver Abdominal Rib 2 Resultant Acceleration	1000				
109	11LUSP0000WSFOXA	Driver Lumbar X-Axis Force	600	+	yes		10000
110	11LUSP0000WSFOYA	Driver Lumbar Y-Axis Force	600	+	yes		10000
111	11LUSP0000WSFOZA	Driver Lumbar Z-Axis Force	600	+	yes		12000
112	11LUSP0000WSMOXA	Driver Lumbar Moment About X Axis	600	+	yes		300
113	11LUSP0000WSMOYA	Driver Lumbar Moment About Y Axis	600	+	yes		300
114	11LUSP0000WSMOZA	Driver Lumbar Moment About Z Axis	600	+	yes		200
115	11PELVCG00WSACXA	Driver Pelvis X-Axis Acceleration	1000	+	yes		2000
116	11PELVCG00WSACYA	Driver Pelvis Y-Axis Acceleration	1000	+	yes		2000
117	11PELVCG00WSACZA	Driver Pelvis Z-Axis Acceleration	1000	+	yes		2000
117A	11PELVCG00WSACRA	Driver Pelvis Resultant Acceleration	1000				
118	11PUBC0000WSFOYA	Driver Pubic Y-Axis Force	600	+	yes		12000
119	14HEADCG00WSACXA	Passenger Head X-Axis Acceleration	1000	+	yes		2000
120	14HEADCG00WSACYA	Passenger Head Y-Axis Acceleration	1000	+	yes		2000
121	14HEADCG00WSACZA	Passenger Head Z-Axis Acceleration	1000	+	yes		2000
121A	14HEADCG00WSACRA	Passenger Head Resultant Acceleration	1000				

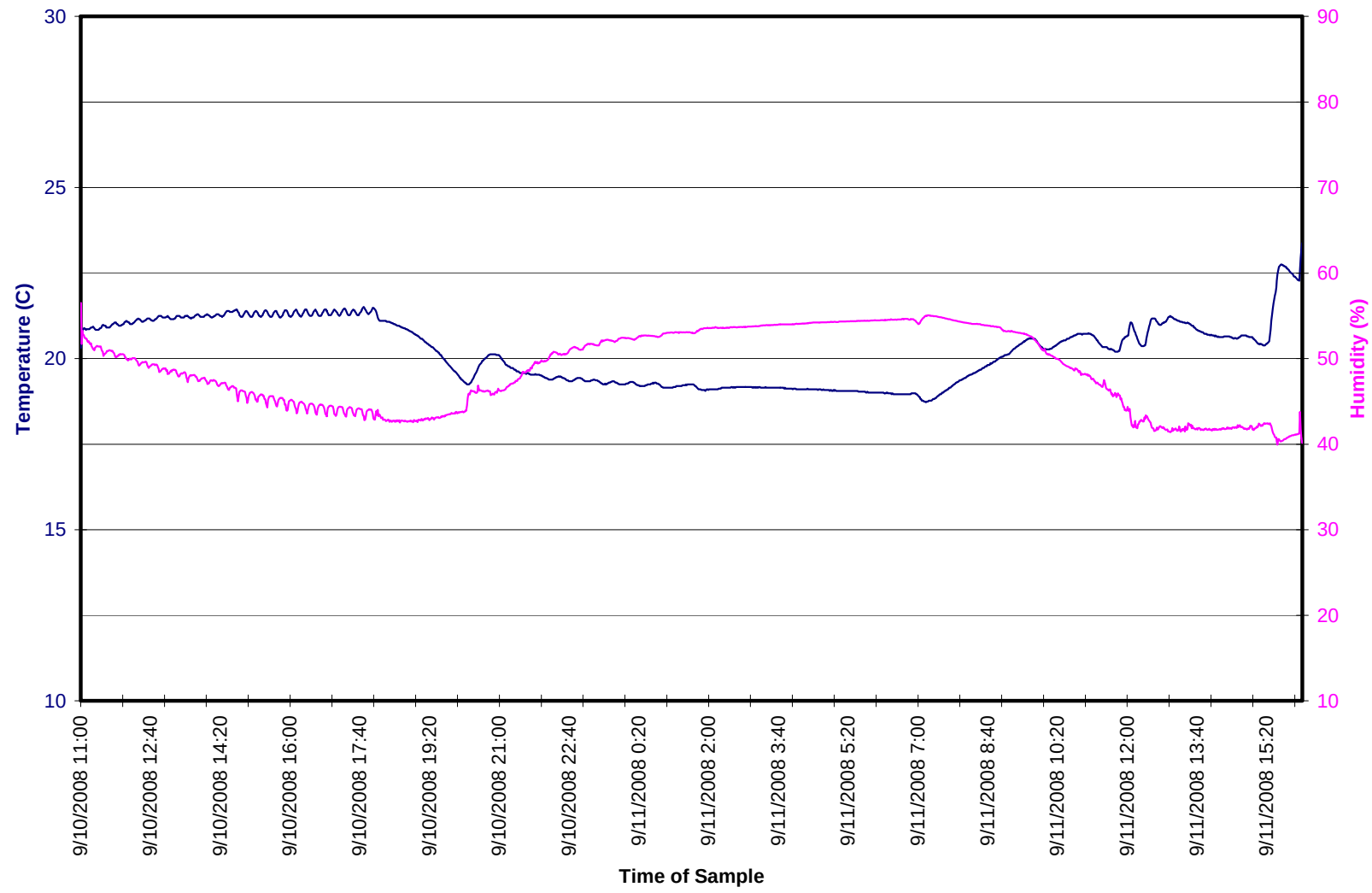
Command File Test Number 080911-2

Channel	ISO mnemonic	Channel Title	Filter	Class	Flip	Zero	Full Scale
122	14HEADCG00WSANXA	Passenger Head X-Axis Angular Displacement	1000	+	yes	50000	
123	14HEADCG00WSANYA	Passenger Head Y-Axis Angular Displacement	1000	+	yes	50000	
124	14HEADCG00WSANZA	Passenger Head Z-Axis Angular Displacement	1000	+	yes	50000	
125	14NECKUP00WSFOXA	Passenger Upper Neck X-Axis Force	1000	+	yes	10000	
126	14NECKUP00WSFOYA	Passenger Upper Neck Y-Axis Force	1000	+	yes	10000	
127	14NECKUP00WSFOZA	Passenger Upper Neck Z-Axis Force	1000	+	yes	12000	
128	14NECKUP00WSMOXA	Passenger Upper Neck Moment About X Axis	600	+	yes	300	
129	14NECKUP00WSMOYA	Passenger Upper Neck Moment About Y Axis	600	+	yes	300	
130	14NECKUP00WSMOZA	Passenger Upper Neck Moment About Z Axis	600	+	yes	200	
131	14NECKLO00WSFOXA	Passenger Lower Neck X-Axis Force	1000	+	yes	10000	
132	14NECKLO00WSFOYA	Passenger Lower Neck Y-Axis Force	1000	+	yes	10000	
133	14NECKLO00WSFOZA	Passenger Lower Neck Z-Axis Force	1000	+	yes	12000	
134	14NECKLO00WSMOXA	Passenger Lower Neck Moment About X Axis	600	+	yes	300	
135	14NECKLO00WSMOYA	Passenger Lower Neck Moment About Y Axis	600	+	yes	300	
136	14NECKLO00WSMOZA	Passenger Lower Neck Moment About Z Axis	600	+	yes	200	
137	14SHLDLE00WSFOXA	Passenger Shoulder X-Axis Force	600	+	yes	5000	
138	14SHLDLE00WSFOYA	Passenger Shoulder Y-Axis Force	600	+	yes	10000	
139	14SHLDLE00WSFOZA	Passenger Shoulder Z-Axis Force	600	+	yes	5000	
140	14SHLDLE00WSDSYA	Passenger Shoulder Y-Axis Displacement	600	+	yes	90	
141	14SHLDLE00WSACXA	Passenger Shoulder X-Axis Acceleration	1000	+	yes	2000	
142	14SHLDLE00WSACYA	Passenger Shoulder Y-Axis Acceleration	1000	+	yes	2000	
143	14SHLDLE00WSACZA	Passenger Shoulder Z-Axis Acceleration	1000	+	yes	2000	
143A	14SHLDLE00WSACRA	Passenger Shoulder Resultant Acceleration	1000				
144	14THSP0100WSACXA	Passenger T1 X-Axis Acceleration	180	+	yes	2000	
145	14THSP0100WSACYA	Passenger T1 Y-Axis Acceleration	180	+	yes	2000	
146	14THSP0100WSACZA	Passenger T1 Z-Axis Acceleration	180	+	yes	2000	
146A	14THSP0100WSACRA	Passenger T1 Resultant Acceleration	180				
147	14THSP0400WSACXA	Passenger T4 X-Axis Acceleration	180	+	yes	2000	
148	14THSP0400WSACYA	Passenger T4 Y-Axis Acceleration	180	+	yes	2000	
149	14THSP0400WSACZA	Passenger T4 Z-Axis Acceleration	180	+	yes	2000	
149A	14THSP0400WSACRA	Passenger T4 Resultant Acceleration	180				
150	14THSP1200WSACXA	Passenger T12 X-Axis Acceleration	180	+	yes	2000	
151	14THSP1200WSACYA	Passenger T12 Y-Axis Acceleration	180	+	yes	2000	
152	14THSP1200WSACZA	Passenger T12 Z-Axis Acceleration	180	+	yes	2000	
152A	14THSP1200WSACRA	Passenger T12 Resultant Acceleration	180				
153	14TRRILE01WSDSYA	Passenger Thorax Rib 1 Y-Axis Displacement	600	+	yes	90	
154	14TRRILE01WSACXA	Passenger Thorax Rib 1 X-Axis Acceleration	1000	+	yes	2000	
155	14TRRILE01WSACYA	Passenger Thorax Rib 1 Y-Axis Acceleration	1000	+	yes	2000	

Command File Test Number 080911-2

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
156	14TRRILE01WSACZA	Passenger Thorax Rib 1 Z-Axis Acceleration	1000	+	yes	2000
156A	14TRRILE01WSACRA	Passenger Thorax Rib 1 Resultant Acceleration	1000			
157	14TRRILE02WSDSYA	Passenger Thorax Rib 2 Y-Axis Displacement	600	+	yes	90
158	14TRRILE02WSACXA	Passenger Thorax Rib 2 X-Axis Acceleration	1000	+	yes	2000
159	14TRRILE02WSACYA	Passenger Thorax Rib 2 Y-Axis Acceleration	1000	+	yes	2000
160	14TRRILE02WSACZA	Passenger Thorax Rib 2 Z-Axis Acceleration	1000	+	yes	2000
160A	14TRRILE02WSACRA	Passenger Thorax Rib 2 Resultant Acceleration	1000			
161	14TRRILE03WSDSYA	Passenger Thorax Rib 3 Y-Axis Displacement	600	+	yes	90
162	14TRRILE03WSACXA	Passenger Thorax Rib 3 X-Axis Acceleration	1000	+	yes	2000
163	14TRRILE03WSACYA	Passenger Thorax Rib 3 Y-Axis Acceleration	1000	+	yes	2000
164	14TRRILE03WSACZA	Passenger Thorax Rib 3 Z-Axis Acceleration	1000	+	yes	2000
164A	14TRRILE03WSACRA	Passenger Thorax Rib 3 Resultant Acceleration	1000			
165	14ABRILE01WSDSYA	Passenger Abdominal Rib 1 Y-Axis Displacement	600	+	yes	90
166	14ABRILE01WSACXA	Passenger Abdominal Rib 1 X-Axis Acceleration	1000	+	yes	2000
167	14ABRILE01WSACYA	Passenger Abdominal Rib 1 Y-Axis Acceleration	1000	+	yes	2000
168	14ABRILE01WSACZA	Passenger Abdominal Rib 1 Z-Axis Acceleration	1000	+	yes	2000
168A	14ABRILE01WSACRA	Passenger Abdominal Rib 1 Resultant Acceleration	1000			
169	14ABRILE02WSDSYA	Passenger Abdominal Rib 2 Y-Axis Displacement	600	+	yes	90
170	14ABRILE02WSACXA	Passenger Abdominal Rib 2 X-Axis Acceleration	1000	+	yes	2000
171	14ABRILE02WSACYA	Passenger Abdominal Rib 2 Y-Axis Acceleration	1000	+	yes	2000
172	14ABRILE02WSACZA	Passenger Abdominal Rib 2 Z-Axis Acceleration	1000	+	yes	2000
172A	14ABRILE02WSACRA	Passenger Abdominal Rib 2 Resultant Acceleration	1000			
173	14LUSP0000WSFOXA	Passenger Lumbar X-Axis Force	600	+	yes	10000
174	14LUSP0000WSFOYA	Passenger Lumbar Y-Axis Force	600	+	yes	10000
175	14LUSP0000WSFOZA	Passenger Lumbar Z-Axis Force	600	+	yes	12000
176	14LUSP0000WSMOXA	Passenger Lumbar Moment About X Axis	600	+	yes	300
177	14LUSP0000WSMOYA	Passenger Lumbar Moment About Y Axis	600	+	yes	300
178	14LUSP0000WSMOZA	Passenger Lumbar Moment About Z Axis	600	+	yes	200
179	14PELVCG00WSACXA	Passenger Pelvis X-Axis Acceleration	1000	+	yes	2000
180	14PELVCG00WSACYA	Passenger Pelvis Y-Axis Acceleration	1000	+	yes	2000
181	14PELVCG00WSACZA	Passenger Pelvis Z-Axis Acceleration	1000	+	yes	2000
181A	14PELVCG00WSACRA	Passenger Pelvis Resultant Acceleration	1000			
182	14PUBC0000WSFOYA	Passenger Pubic Y-Axis Force	600	+	yes	12000

SIDE IMPACT (MDB) INTO LEFT SIDE OF 2005 VW JETTA



D-14

080911-2

CERTIFICATE OF CONFORMITY

Serial No. **13669**

Certificate No. **37291**

Description	FMVSS 214 - 1750x740x550mm Spec with 1.6 3/8 5052 Painted Grey
Cellbond Part No.	70NHTSASIUS G

Cellbond Composites Ltd
5 Stukeley Business Centre
Blackstone Road
Huntingdon
Cambridgeshire
PE29 6EF
United Kingdom

T. +44 (0)1480 435302
F. +44 (0)1480 450181
E. sales@cellbond.com
www.cellbond.com

	Test Results	GR No.	Blk No.
1	47565-8	13074	N/A
2	47308-8	13030	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
Spain





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: 47565-8

GR No: 13074
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	45.454	45.454	44.420	PASS
Sample 2	41.966	41.540	42.355	FAIL
Sample 3	43.827	43.702	44.679	PASS
Sample 4	45.140	44.990	45.375	PASS
Sample 5	42.882	43.008	43.510	PASS
Sample 6	44.928	44.406	44.506	PASS
Sample 7	45.341	45.059	44.629	PASS
Sample 8	44.872	44.541	44.401	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

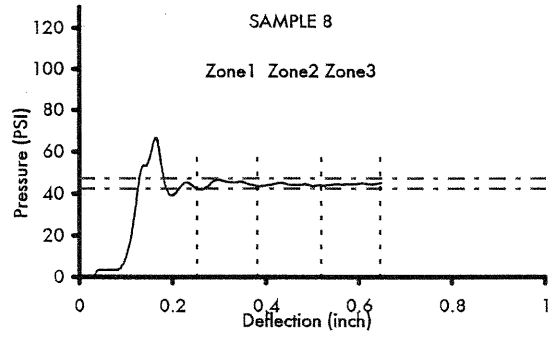
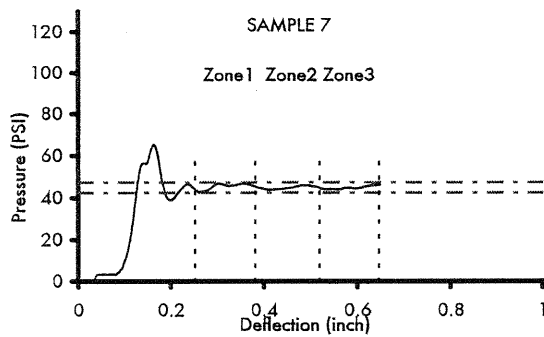
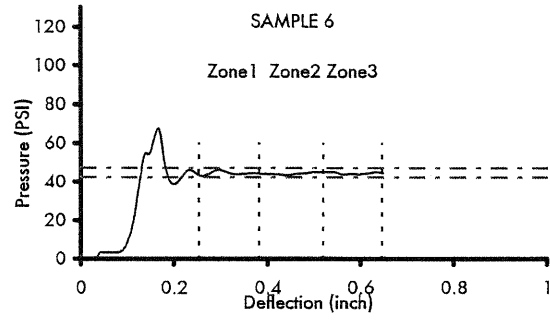
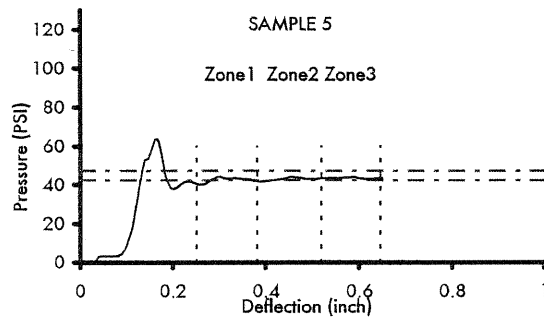
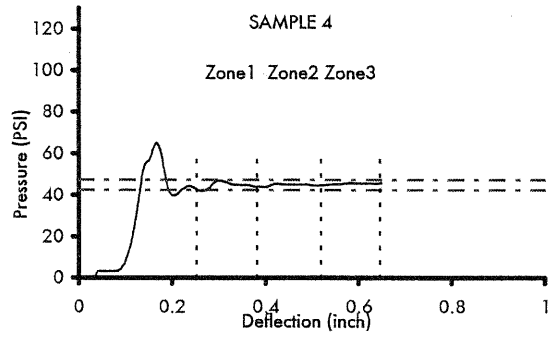
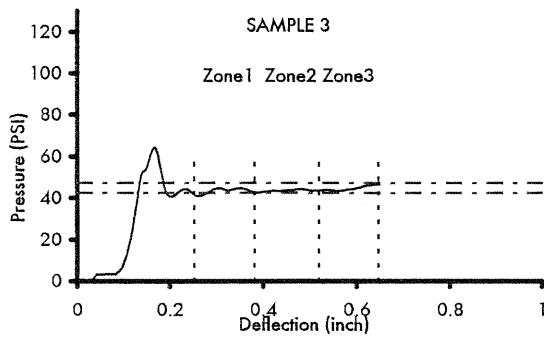
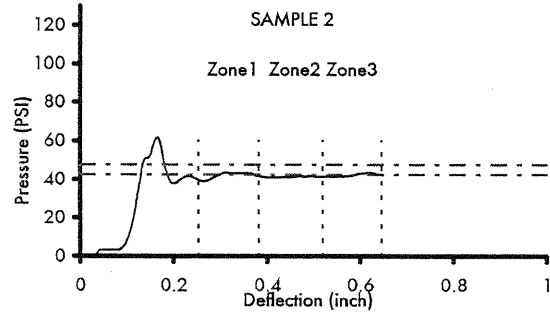
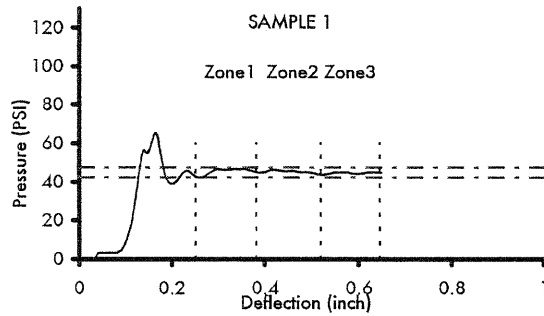
NHTSA / IIHS DEFORMABLE SIDE IMPACT BARRIER
MAIN BLOCK

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
Block No: N/A

Test No: 47565-8

GR No: 13074





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: 47308-8

GR No: 13030

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	237.72	239.09	239.72	PASS
Sample 2	233.69	235.74	236.03	PASS
Sample 3	232.92	236.07	232.55	PASS
Sample 4	235.02	234.60	232.38	PASS
Sample 5	238.77	237.28	237.26	PASS
Sample 6	237.32	236.54	233.16	PASS
Sample 7	240.26	240.56	239.86	PASS
Sample 8	237.04	236.82	237.61	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
Block No: N/A

Test No: 47308-8

GR No: 13030

