

**Vehicle Research and Test Center
MDB into Left Side of
2005 Subaru Forester
World SID Evaluation
TRC Inc. Test Number: 080729**

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**Prepared For
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Table of Contents

<u>Section</u>	<u>Description</u>	<u>Page</u>
1	Purpose and Test Procedure	1-1
2	Side Impact Test Results	2-1
3	Summary of Test Results	3-1
4	Occupant and Vehicle Information	4-1
Appendix A	Photographs	A-1
Appendix B	Data Plots	B-1
Appendix C	World SID Configuration and Performance Verification Data	C-1
Appendix D	Miscellaneous Test Information	D-1

List of Tables

<u>Number</u>	<u>Description</u>	<u>Page</u>
1	General Vehicle Test Parameter Data	3-2
2	Test Vehicle Tire Information	3-6
3	Post-Test Observations	3-7
4	World SID Instrumentation Data	4-2
5	Vehicle Structural Measurements	4-11
6	Vehicle Exterior Crush Profiles - All Levels	4-13
7	Test Vehicle Accelerometer Locations and Data Summary	4-17
8	Deformable Barrier Face Profile	4-21

List of Figures

<u>Number</u>	<u>Description</u>	<u>Page</u>
1	World SID Longitudinal Clearance Dimensions	4-8
2	World SID Lateral Clearance Dimensions	4-9
3	Vehicle Pre-Test and Post-Test Measurements	4-10
4	Vehicle Side Measurements	4-12
5	Vehicle Damage Profile Distances	4-15
6	Test Vehicle Accelerometer Locations and Data Summary	4-16
7	High-Speed Camera Locations and Data	4-28

List of Photographs

<u>Description</u>	<u>Figure</u>
Pre-Test Front View	A-1
Post-Test Front View	A-2
Pre-Test Left Front View	A-3
Post-Test Left Front View	A-4
Pre-Test Left Side View	A-5
Post-Test Left Side View	A-6
Pre-Test Left Rear View	A-7
Post-Test Left Rear View	A-8
Pre-Test Rear View	A-9
Post-Test Rear View	A-10
Pre-Test Right Side View	A-11
Post-Test Right Side View	A-12
Pre-Test Impact Alignment View	A-13
Post-Test Impact Alignment View	A-14
Pre-Test Primary Impact Point View	A-15
Post-Test Primary Impact Point View	A-16
Pre-Test Secondary Impact Point View	A-17
Post-Test Secondary Impact Point View	A-18
Pre-Test MDB Face Left Side View	A-19
Post-Test MDB Face Left Side View	A-20
Pre-Test MDB Face Right Side View	A-21
Post-Test MDB Face Right Side View	A-22
Pre-Test MDB Face Overhead View	A-23
Post-Test MDB Face Overhead View	A-24
Pre-Test MDB Front View with Contact Switches in Place	A-25
Post-Test MDB Front View with Contact Switches in Place	A-26
Pre-Test MDB with Vehicle Left Side Overall View	A-27
Post-Test MDB with Vehicle Left Side Overall View	A-28

List of Photographs, Continued

<u>Description</u>	<u>Figure</u>
Pre-Test MDB with Vehicle Right Side Overall View	A-29
Post-Test MDB with Vehicle Right Side Overall View	A-30
Pre-Test MDB Left Side Overall View	A-31
Post-Test MDB Left Side Overall View	A-32
Pre-Test MDB Right Side Overall View	A-33
Post-Test MDB Right Side Overall View	A-34
Pre-Test MDB Alignment Overhead View	A-35
Pre-Test Driver Dummy Side View	A-36
Post-Test Driver Dummy Side View	A-37
Pre-Test Right Side Dummy Occupant Compartment View	A-38
Post-Test Right Side Dummy Occupant Compartment View	A-39
Pre-Test Driver Dummy and Door Clearance View	A-40
Post-Test Driver Dummy and Door Clearance View	A-41
Pre-Test Driver Dummy Showing Belts, Chalking, and Contact Switches	A-42
Pre-Test Driver Door Panel View	A-43
Post-Test Driver Door Panel View	A-44
Post-Test Driver Dummy Overall View	A-45
Post-Test Driver Dummy Head Contact View	A-46
Post-Test Driver Dummy Torso Contact View	A-47
Pre-Test Passenger Dummy Side View	A-48
Post-Test Passenger Dummy Side View	A-49
Pre-Test Right Side Dummy Occupant Compartment View	A-50
Post-Test Right Side Dummy Occupant Compartment View	A-51
Pre-Test Passenger Dummy and Door Clearance View	A-52
Post-Test Passenger Dummy and Door Clearance View	A-53
Pre-Test Passenger Dummy Showing Belts, Chalking, and Contact Switches	A-54
Pre-Test Passenger Door Panel View	A-55
Post-Test Passenger Door Panel View	A-56

List of Photographs, Continued

<u>Description</u>	<u>Figure</u>
Post-Test Passenger Dummy Overall View	A-57
Post-Test Passenger Dummy Head Contact View	A-58
Post-Test Passenger Dummy Torso Contact - View 1	A-59
Post-Test Passenger Dummy Torso Contact - View 2	A-60
Certification Label View	A-61
Recommended Tire Pressure Label View	A-62
Pre-Test Ballast View	A-63
Post-Test Digital Light Trap Read-Out - View 1	A-64
Post-Test Digital Light Trap Read-Out - View 2	A-65

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 in a 2005 Subaru Forester 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

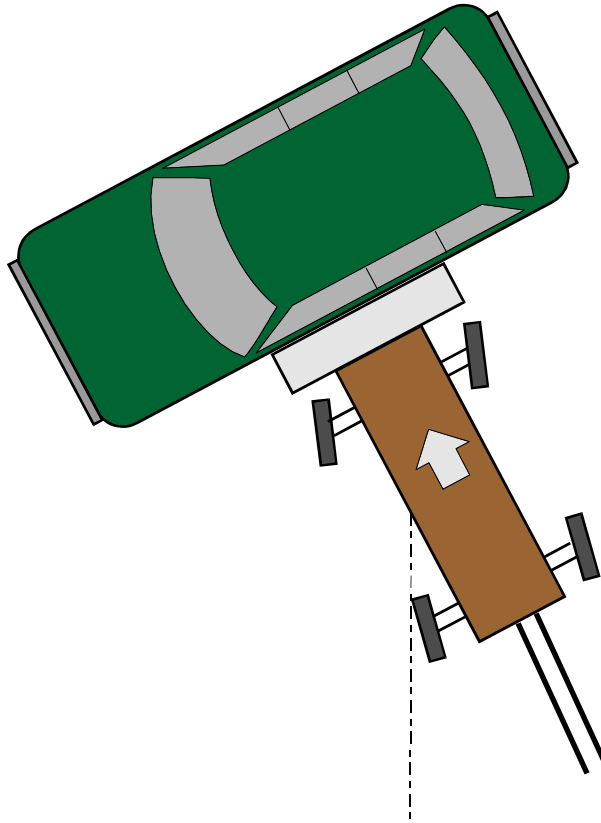
A 2005 Subaru Forester was impacted on the driver's side by a moving deformable barrier (MDB) which was moving forward in a 27° crabbed position to the monorail at a velocity of 52.9 km/h (32.9 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on July 29, 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 181 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	33	122
Upper Rib Deflection (mm) CFC 600		
Rib 1	22 mm	15 mm
Rib 2	10 mm	18 mm
Rib 3	10 mm	21 mm
Lower Rib Deflection (mm) CFC 600		
Rib 1	9 mm	25 mm
Rib 2	6 mm	30 mm
Lower Spine Resultant (g) CFC 180	35 g	36 g
Pubic Symph. Force (N) CFC 600	849 N	N/A ¹

	2005 Subaru Forester
Vehicle Test Weight	1679.8 kg (3703.3 lbs)
Impact Point (Horizontal)-behind center of front axle	1232 mm
Maximum Crush	193 mm Level 2
Impact Speed	32.9 mph

¹ Data anomaly

Data Acquisition Explanations

The vehicle's left upper A-pillar Y-axis acceleration data channel, 11APILUP0000ACYA, began recording suspicious data at approximately 35 milliseconds.

The passenger dummy's pubic Y-axis force data channel, 14PUBC0000WSFOYA, recorded no useful data.

Section 3

Summary of Test Results

Table 1 General Test Vehicle Parameter Data

Test Vehicle: 2005 Subaru Forester

Test Date: 07/29/08

TEST VEHICLE INFORMATION

Make	Subaru
Model	Forester
Body Style	Passenger Car
VIN	JF1SG636X5H700274
Color	Green
Odometer Reading	54,803
Transmission	4-Speed Automatic
Final Drive	Four wheel drive
Number of Cylinders	4
Engine Displacement	2.5 L
Engine Placement	Straight
Air Conditioning	Yes
Power Windows	Yes
Power Seats	No
Cruise Control	Yes
Tinted Glass	No
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	Yes
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	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Fuji Heavy Ind. LTD., Japan
Date of Manufacture	04/04

GVWR (lb)	4150
GAWR Front (lb)	2050
GAWR Rear (lb)	2200

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)				408
Cargo Wt. (RCLW) (kg)				68

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2005 Subaru Forester

Test Date 07/29/08

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	394.8	343.8		426.4	439.0	
Right	kg	412.6	310.0		432.0	382.4	
Ratio	%	55.3	44.7		51.1	48.9	
Totals	kg	807.4	653.8	1461.2	858.4	821.4	1679.8

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1461.2
Weight of World SID ATD (2)	kg	74.9
Rated Cargo/Luggage Weight (RCLW)	kg	68.0
Calculated Vehicle Target Weight (TVTW)	kg	1679.0

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	755	754	740	744	1128
As Tested	mm	729	738	699	711	1232
Fully Loaded	mm	738	747	715	727	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	2520
Total Vehicle Length at Left Side	mm	4160
Total Vehicle Length at Centerline	mm	4447
Total Vehicle Length at Right Side	mm	4176
Weight of Ballast in Trunk	kg	22.7
Amount of Stoddard Solvent in Fuel Tank	liters	98.4

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measurement Description	Units	Value
Impact Reference Line From Front Axle	mm	345
Impact Point	mm	346
Impact Point Difference	mm	1 mm Right

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2005 Subaru Forester

Test Date 07/29/08

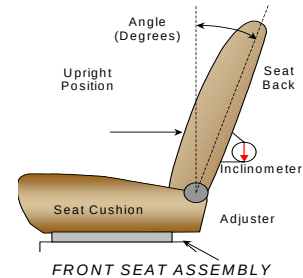
WORLD SID RIDING POSITION

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

Driver: Total Number of detents: 17

Test detent (with the forward-most detent defined as 0): 9

Driver seat back angle: The back was adjusted to 8.1° forward of vertical measured at the head restraint.



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

If yes, how far and final angle: _____.

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

If yes, how far and final angle: _____.

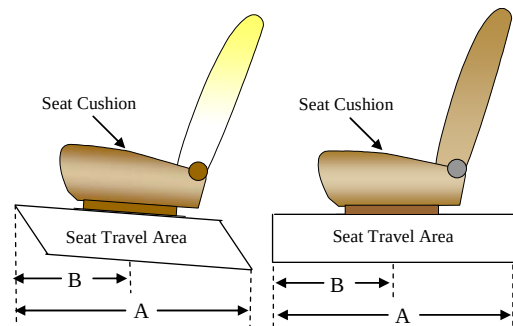
*Measurements were within the required angles and were not recorded for this test.

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	215 mm	Mid
Rear Seat	Fixed	Fixed



SEAT BELT UPPER ANCHORAGE

	Total No. of Positions	Placed in Position No.
Driver Seat	5	1
Rear Seat	Fixed	N/A

Position number one is the uppermost adjustment position.

Table 1 General Test Vehicle Parameter Data, Continued

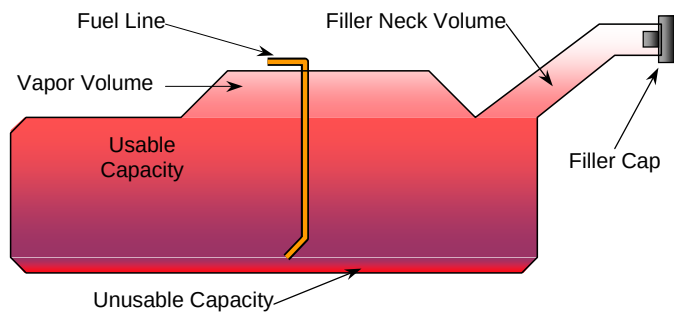
Test Vehicle: 2005 Subaru Forester

Test Date 07/29/08

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	60.2
Usable Capacity used for FMVSS 301	60.2
Actual Amount of Solvent used	56.0

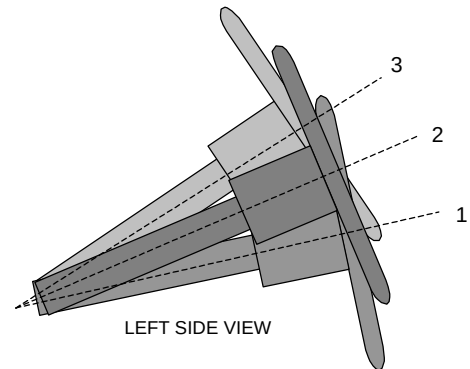
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the "ON" position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies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

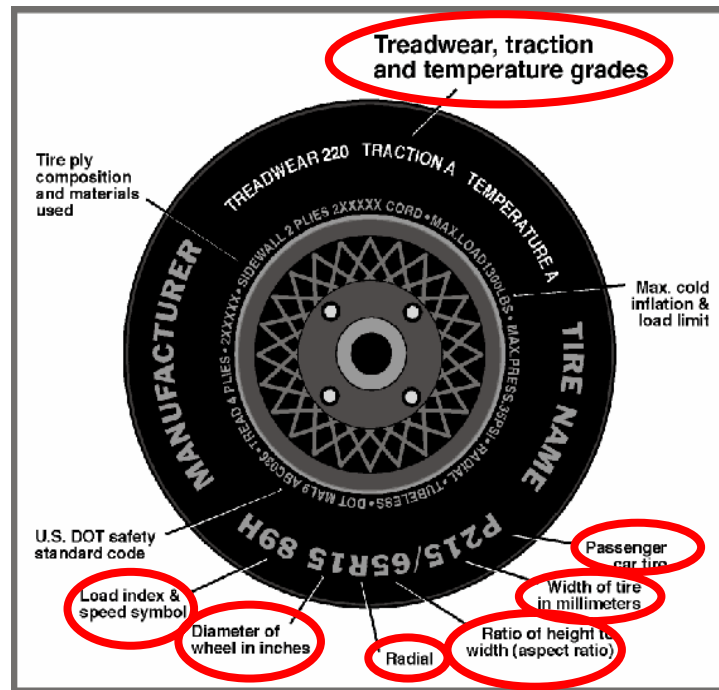
STEERING WHEEL/COLUMN POSITIONS

	Degrees	Fore/Aft Position, mm
Lowermost Position	22.7	N/A
Geometric Center Position	24.1	N/A
Uppermost Position	25.6	N/A

Table 2 Test Vehicle Tire Information

Test Vehicle: 2005 Subaru Forester

Test Date 07/29/08



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	200	193
Cold / Test Pressure (kPa)	200	190
Recommended Tire Size	P215/60R16	P215/60R16
Tire Size on Vehicle	P215/60R16	P215/60R16
Tire Manufacturer	Uniroyal	Uniroyal
Tire Name	Tiger Paw	Tiger Paw
Radial	R	R
Wheel Diameter	16	16
Load Index & Speed Symbol	94T	94T
Treadwear	620	620
Traction Grade	A	A
Temperature Grade	B	B

Table 3 Post-Test Observations

Test Vehicle: 2005 Subaru Forester

Test Date 07/29/08

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, head restraint	C-pillar
Upper Torso Contact	Door panel	Door panel
Lower Torso Contact	Door panel	Door panel
Left Knee Contact	None	None
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	Driver's side window shattered
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	Yes	N/A	N/A
Side Airbag	Yes	Yes	No	No
Head Airbag	No	No	No	No
Curtain Airbag	No	No	No	No
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 Subaru Forester

Test Number: 080729

Driver Dummy Serial Number: 014

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Head Acceleration	X	6.3	34.8	10.3	102.0
	Y	20.1	61.6	7.9	305.4
	Z	18.2	55.2	5.0	32.6
	R	24.1	61.4		
Head Angular Displacement	X	3940.1	77.7	2302.5	27.7
	Y	2795.4	77.7	2763.8	45.3
	Z	5596.7	45.4	4907.5	45.6
Upper Neck Force	X	312.6	101.6	138.8	34.2
	Y	517.1	64.6	174.2	285.7
	Z	150.2	31.4	602.7	57.8
Upper Neck Moment	X	20.3	27.8	37.8	78.1
	Y	21.3	121.8	25.7	48.6
	Z	14.2	80.0	4.7	289.0
Lower Neck Force	X	276.2	103.1	269.5	34.3
	Y	505.9	61.6	247.6	43.7
	Z	193.6	31.5	699.3	74.6
Lower Neck Moment	X	80.2	62.7	36.5	285.0
	Y	27.7	197.0	54.1	109.2
	Z	11.9	77.0	10.4	115.6
Shoulder Force	X	46.8	19.0	484.6	15.4
	Y	1498.4	17.9	314.1	83.6
	Z	18.8	29.0	463.1	13.1
Shoulder Displacement	Y	23.5	22.4	4.1	87.7
Shoulder Acceleration	X	226.1	15.3	137.2	15.8
	Y	233.2	12.7	131.6	15.6
	Z	299.9	15.4	237.5	14.6
	R	383.8	15.4		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 Subaru Forester

Test Number: 080729

Driver Dummy Serial Number: 014

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
T1 Acceleration	X	9.5	26.9	10.6	15.5
	Y	9.5	27.8	31.2	18.9
	Z	5.8	82.2	4.2	135.4
	R	31.3	18.9		
T4 Acceleration	X	6.5	29.0	6.7	15.2
	Y	5.2	93.6	23.2	17.7
	Z	4.3	128.0	4.9	81.8
	R	23.7	17.6		
T12 Acceleration	X	3.2	37.5	7.0	74.8
	Y	9.4	92.6	35.2	31.1
	Z	4.5	53.0	4.8	80.9
	R	35.5	31.1		
Thorax Rib 1 Displacement	Y	22.2	22.1	0.7	308.3
Thorax Rib 1 Acceleration	X	181.1	11.9	82.0	27.3
	Y	153.0	14.5	158.4	18.5
	Z	48.0	25.4	45.8	18.6
	R	182.3	11.9		
Thorax Rib 2 Displacement	Y	9.8	22.5	1.9	233.4
Thorax Rib 2 Acceleration	X	617.6	12.4	653.8	11.9
	Y	387.8	11.8	143.4	15.9
	Z	108.5	12.4	93.4	12.1
	R	728.0	11.9		
Thorax Rib 3 Displacement	Y	10.5	17.1	2.2	233.3
Thorax Rib 3 Acceleration	X	207.2	12.6	350.8	12.1
	Y	356.7	12.2	197.0	16.3
	Z	136.3	12.1	91.2	13.5
	R	503.8	12.1		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 Subaru Forester

Test Number: 080729

Driver Dummy Serial Number: 014

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Abdominal Rib 1 Displacement	Y	9.5	48.0	4.4	105.4
Abdominal Rib 1 Acceleration	X	89.2	17.8	96.3	12.5
	Y	125.3	12.8	74.5	15.7
	Z	60.9	40.2	127.2	100.4
	R	149.8	12.7		
Abdominal Rib 2 Displacement	Y	5.6	48.6	10.1	114.2
Abdominal Rib 2 Acceleration	X	60.6	80.6	60.2	80.8
	Y	57.3	28.0	112.4	100.5
	Z	136.2	100.4	64.2	94.3
	R	174.5	100.5		
Lumbar Force	X	313.8	110.0	151.9	17.8
	Y	532.4	47.3	211.9	100.3
	Z	12.4	9.8	922.8	71.9
Lumbar Moment	X	41.9	48.7	13.0	102.0
	Y	5.6	18.2	17.6	105.6
	Z	4.7	16.7	8.3	61.1
Pelvis Acceleration	X	9.0	53.0	12.5	29.4
	Y	54.9	32.6	10.9	57.4
	Z	8.9	21.4	11.8	57.0
	R	55.4	32.6		
Pubic Force ¹	Y	849.2	37.6	44.8	188.8

Positive Direction

Longitudinal: Forward
 Lateral: Rightward
 Vertical: Downward

Negative Direction

Longitudinal: Rearward
 Lateral: Leftward
 Vertical: Upward

¹ See Data Acquisition Explanations

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 Subaru Forester

Test Number: 080729

Passenger Dummy Serial Number: 016

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Head Acceleration	X	17.8	67.4	12.9	74.0
	Y	49.6	66.9	11.1	76.9
	Z	29.2	66.4	6.1	72.4
	R	59.0	66.6		
Head Angular Displacement	X	2726.3	67.0	2376.2	53.6
	Y	1710.2	87.4	2793.4	67.5
	Z	6175.4	75.9	5226.7	63.3
Upper Neck Force	X	457.9	70.6	41.4	214.5
	Y	174.4	54.9	72.2	68.6
	Z	843.5	77.9	960.7	70.6
Upper Neck Moment	X	16.2	138.1	25.4	54.2
	Y	21.4	86.6	33.8	71.4
	Z	32.0	86.5	11.3	137.4
Lower Neck Force	X	68.2	309.2	401.8	75.4
	Y	512.5	57.2	46.2	212.2
	Z	897.8	77.6	981.5	71.0
Lower Neck Moment	X	48.0	104.7	7.0	212.2
	Y	64.9	111.0	10.8	219.9
	Z	30.6	86.3	17.4	134.0
Shoulder Force	X	165.7	63.6	112.1	31.0
	Y	96.5	26.3	1550.7	58.6
	Z	82.4	201.0	473.3	49.0
Shoulder Displacement	Y	28.1	62.6	2.4	148.8
Shoulder Acceleration	X	19.5	41.0	30.8	35.9
	Y	60.3	49.2	42.8	40.8
	Z	14.2	72.2	43.9	40.7
	R	62.2	49.2		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 Subaru Forester

Test Number: 080729

Passenger Dummy Serial Number: 016

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
T1 Acceleration	X	6.0	75.1	5.0	84.6
	Y	34.0	57.4	3.8	137.2
	Z	9.0	69.4	4.9	44.0
	R	34.0	57.4		
T4 Acceleration	X	3.5	74.6	4.3	84.3
	Y	32.0	56.6	5.9	98.2
	Z	8.1	69.7	6.1	43.8
	R	32.1	56.6		
T12 Acceleration	X	6.0	98.8	8.4	42.1
	Y	35.6	53.0	9.5	99.2
	Z	7.4	84.6	6.3	45.2
	R	35.9	53.0		
Thorax Rib 1 Displacement	Y	15.3	60.8	1.6	119.4
Thorax Rib 1 Acceleration	X	19.3	78.7	21.6	47.8
	Y	40.3	50.8	32.8	45.0
	Z	28.4	45.0	48.5	45.1
	R	54.3	45.1		
Thorax Rib 2 Displacement	Y	18.0	57.9	1.4	271.8
Thorax Rib 2 Acceleration	X	15.0	36.1	21.1	46.2
	Y	44.9	43.7	35.0	43.4
	Z	30.4	43.7	46.0	43.5
	R	54.7	43.7		
Thorax Rib 3 Displacement	Y	21.0	52.3	1.1	270.4
Thorax Rib 3 Acceleration	X	16.3	78.2	31.5	43.5
	Y	54.2	42.1	63.5	41.8
	Z	70.0	41.8	109.0	41.9
	R	116.1	41.9		

Table 4 World SID Instrumentation Data, Continued

Vehicle: 2005 Subaru Forester

Test Number: 080729

Passenger Dummy Serial Number: 016

		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
Location		(g)	(ms)	(g)	(ms)
Abdominal Rib 1 Displacement	Y	25.2	53.2	1.7	139.0
Abdominal Rib 1 Acceleration	X	16.7	33.6	19.4	38.2
	Y	87.1	36.0	105.9	35.8
	Z	64.5	35.7	138.9	35.9
	R	144.9	35.8		
Abdominal Rib 2 Displacement	Y	29.7	52.3	0.5	278.6
Abdominal Rib 2 Acceleration	X	23.8	34.7	61.1	35.7
	Y	119.4	35.7	67.4	35.4
	Z	99.6	35.4	175.6	35.5
	R	180.4	35.5		
Lumbar Force	X	481.4	102.3	337.9	37.7
	Y	979.8	46.0	372.1	99.6
	Z	1058.1	96.8	461.6	37.7
Lumbar Moment	X	69.8	45.9	23.1	95.8
	Y	21.8	41.6	25.7	103.2
	Z	11.8	166.8	6.4	55.1
Pelvis Acceleration	X	10.2	42.3	16.5	36.0
	Y	42.0	42.2	7.5	72.0
	Z	8.9	65.4	13.2	46.6
	R	43.3	41.3		
Pubic Force	Y	1.7	29.8	1.6	34.9

Positive Direction

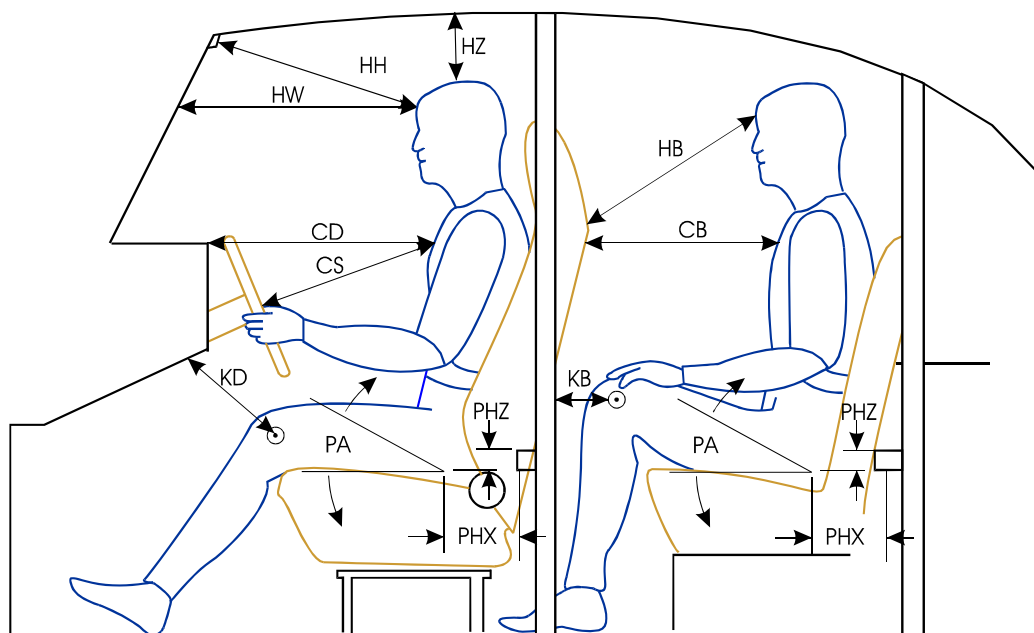
Longitudinal: Forward
 Lateral: Rightward
 Vertical: Downward

Negative Direction

Longitudinal: Rearward
 Lateral: Leftward
 Vertical: Upward

Figure 1 World SID Longitudinal Clearance Dimensions

Vehicle: 2005 Subaru Forester



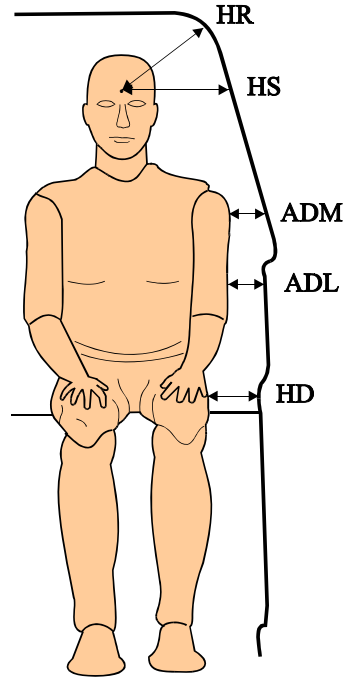
Left Side View

Driver Code	Pass. Code	Measurement Description	Driver S/N 014		Passenger S/N 016	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	420			
HW		Head to Windshield	657			
HZ		Head to Roof	233			
NR	NB	Nose to Rim/Nose to Seatback	454		520	
CD	CB	Chest to Dash or Seatback	593		495	
CS		Chest to Steering Wheel	363			
KDL	KBL	Left Knee to Dash or Seatback	48	9.3	43	10.7
KDR	KBR	Right Knee to Dash or Seatback	46	19.1	44	15.0
PA°	PA°	Pelvic Angle		N/A		N/A
PHX	PHX	H-Point to Striker (X-Axis)	173		270	
PHZ	PHZ	H-Point to Striker (Z-Axis)	83		307	

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 Subaru Forester



Code	Measurement Description	Units	Driver S/N 014	Passenger S/N 016
HR	Head to Side Header	mm	235	239
HS	Head to Side Window	mm	328	317
AD	Arm to Door, Upper	mm	115	117
AD	Arm to Door, Lower	mm	92	37
HD	H-Point to Door	mm	90	88

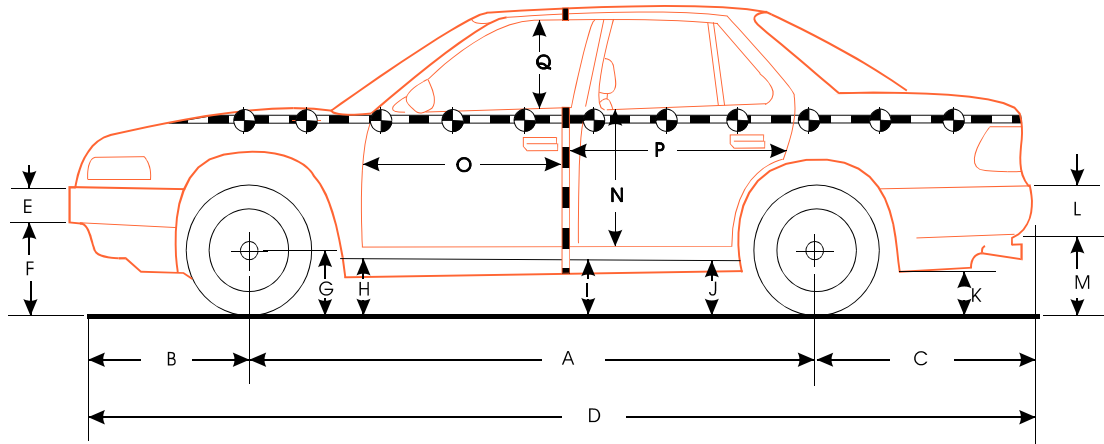
		Driver Angles Degrees ¹	Passenger Angles Degrees ¹
Head	X		
	Y		
Thorax	X		
	Y		
Pelvis	X		
	Y		

Measured from the tilt sensors in the dummy

¹ Measurements were within the required angles and were not recorded for this test.

Figure 3 Vehicle Pre-Test And Post-Test Measurements

Vehicle: 2005 Subaru Forester



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	2520	2520	2489	31
B	905	905	909	-4
C	1022	1022	1032	-10
D	4447	4447	4449	-2
E	150	150	150	0
F	440	452	469	-17
G	317	306	315	-9
G1	252	250	233	17
H	260	255	239	16
I	247	234	247	-13
J1	245	233	227	6
J2	273	256	300	-44
K	327	307	283	24
L	172	172	172	0
M	483	458	423	35
N	728	728	661	67
O	810	810	961	-151
P	1152	1152	1087	65
Q	431	431	439	-8
R	4176	4176	4210	-34
S	4160	4160	4164	-4
T	1240	1240	1169	71

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	4447
2	Total Width	1745
3	Bumper Top Height	597
4	Bumper Bottom Height	417
5	Longitudinal Member Top Height	574
6	Longitudinal Member Bottom Height	486
7	Distance Between Longitudinal Members	1040
7'	Longitudinal Member Width	70
8	Engine Top Height	860
9	Engine Bottom Height	237
10	Engine and Gearbox Width	740
11	Front Bumper - Engine Distance	380
12	Front Shock Absorber Fixing Height	930
13	Bonnet Leading Edge Height	820
14	Front Shock Absorber Fixing Width	1170
15	Front Bumper - Front Axle Distance	905
16	Front Axle - A Pillar Distance	520
17	A Pillar - B Pillar Distance	980
18	B Pillar - Rear Axle Distance	1004
19	B Pillar - C Pillar Distance	870
20	Roof Sill Bottom Height	1418
21	Roof Sill Top Height	1442
22	Floor Sill Bottom Height	380
23	Floor Sill Top Height	432

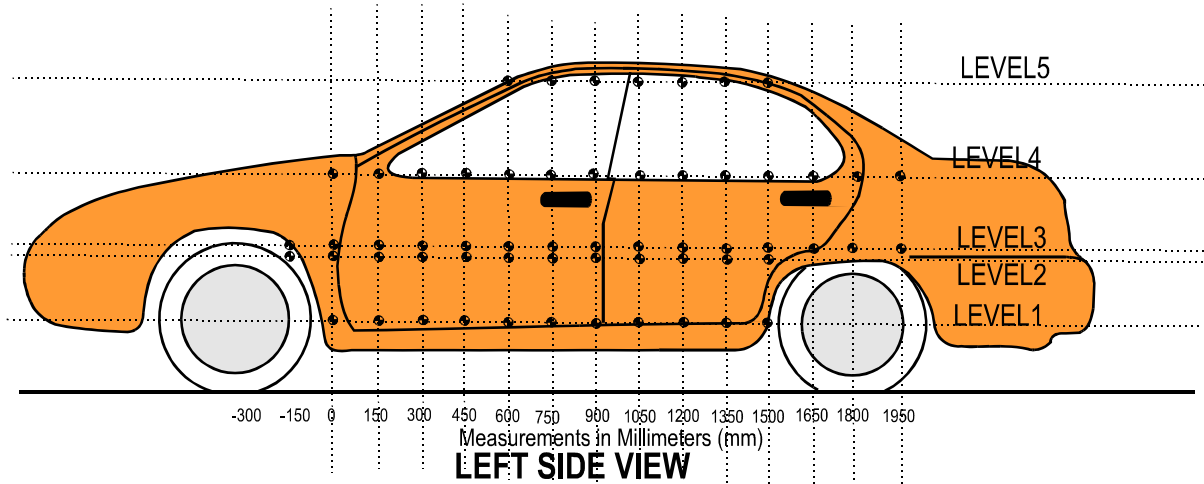
All distance measurements are in millimeters.

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 Subaru Forester



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	1491
4	Window Sill	980
3	Mid Door	678
2	Occupant H-Point	630
1	Side Sill	340

Table 6 Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2005 Subaru Forester

			(mm) From Impact Point													
Location	Height		-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750
Level 1 Side Sill	340	Pre										798	776	775	775	775
		Post										831	805	800	792	785
		Crush										-33	-29	-25	-17	-10
Level 2 H-Point	630	Pre									861	853	849	851	853	855
		Post									856	757	747	740	719	703
		Crush									5	96	102	111	134	152
Level 3 Mid-Door	678	Pre									864	848	849	851	852	852
		Post									860	768	757	749	741	734
		Crush									4	80	92	102	111	118
Level 4 Window Sill	980	Pre								771	784	791	797	800	804	807
		Post								828	834	827	818	801	795	789
		Crush								-57	-50	-36	-21	-1	9	18
Level 5 Window Top	1491	Pre										771	736	689	640	602
		Post										807	772	723	670	628
		Crush										-36	-36	-34	-30	-26

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 Subaru Forester

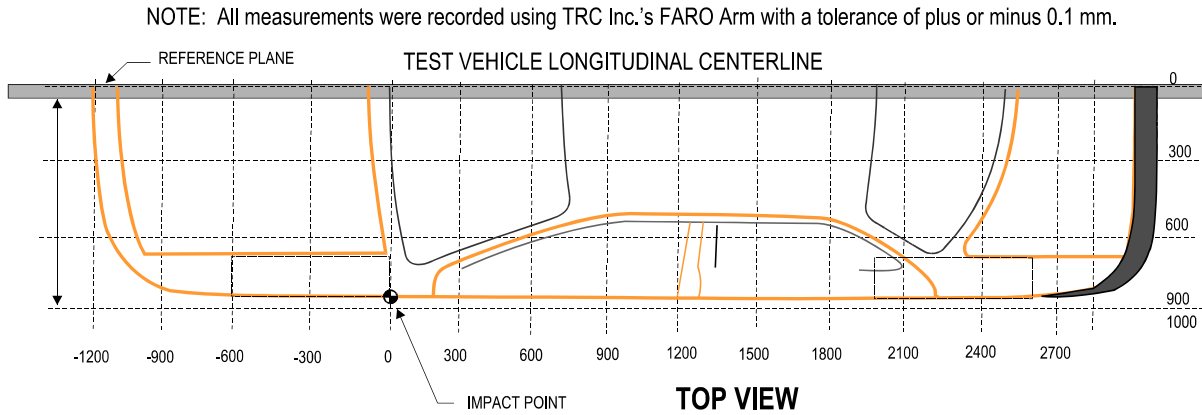
Location	Height		(mm) From Impact Point												
			900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700
Level 1 Side Sill	340	Pre	775	775	775	776	776	782	804						
		Post	778	770	763	755	749	748	765						
		Crush	-3	5	12	21	27	34	39						
Level 2 H-Point	630	Pre	856	857	856	856	855	855	856						
		Post	717	729	719	707	686	662	716						
		Crush	139	128	137	149	169	193	140						
Level 3 Mid-Door	678	Pre	853	852	851	850	848	846	850	863					
		Post	727	715	714	685	674	662	706	817					
		Crush	126	137	137	165	174	184	144	46					
Level 4 Window Sill	980	Pre	809	812	815	817	817	817	816	807	814	812	808	802	794
		Post	785	785	736	746	752	760	764	782	795	791	783	790	792
		Crush	24	27	79	71	65	57	52	25	19	21	25	12	2
Level 5 Window Top	1491	Pre	586	581	577	574	572	570	568	568	565	562	560	555	546
		Post	607	592	586	580	577	572	569	569	565	560	554	547	535
		Crush	-21	-11	-9	-6	-5	-2	-1	-1	0	2	6	8	11

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 Subaru Forester

Test Date: 07/29/08



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

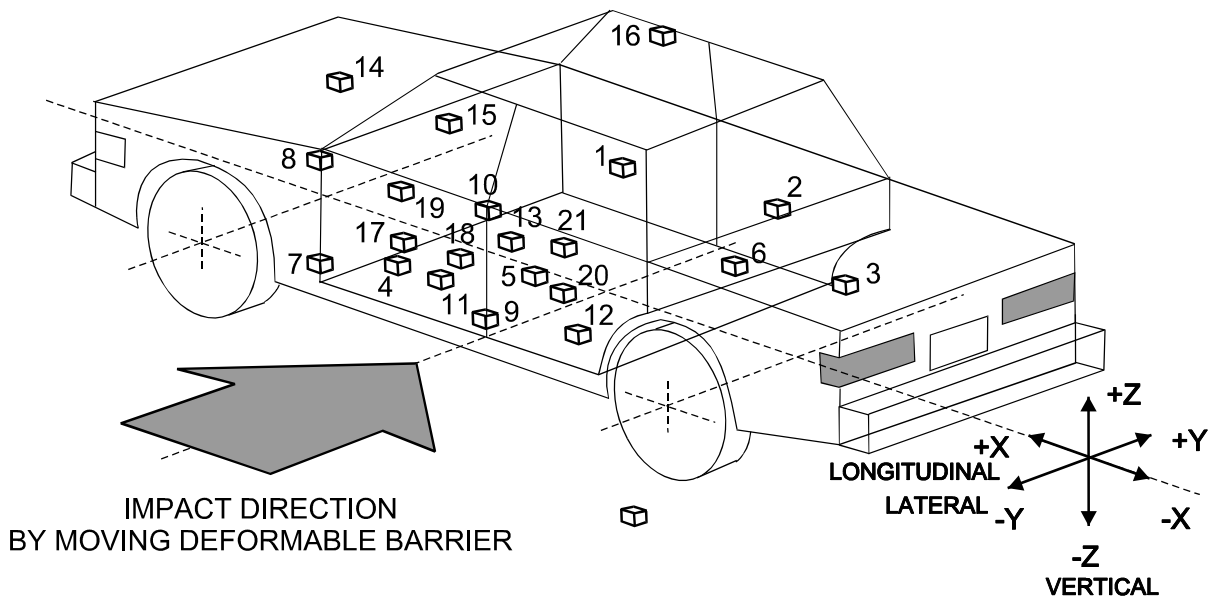
DPD	Distance from Impact Point in mm	Level	Pre-Test (mm)	Post-Test (mm)	Max. Static Crush (mm)
1	2700 mm	5	546	535	11
2	2100 mm	4	814	795	19
3	1500 mm	3	848	674	174
4	900 mm	2	856	717	139
5	300 mm	2	849	747	102
6	-150 mm	4	771	828	-57

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 Subaru Forester



- 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 Subaru Forester

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	3170	660	346				
Longitudinal				2.9	54.1	5.4	21.0
Lateral				24.3	30.7	5.4	11.8
Vertical				3.4	86.5	10.8	19.7
Resultant				25.9	7.5		
2 Right Side Sill at Rear Seat	2800	660	304				
Longitudinal				3.2	55.4	4.8	21.3
Lateral				21.7	8.1	2.4	84.6
Vertical				4.8	95.6	5.0	23.8
Resultant				21.8	8.2		
3 Rear Floorpan Above Axle	1598	30	603				
Longitudinal				2.4	59.2	5.1	25.8
Lateral				19.6	37.0	1.9	122.0
Vertical				4.3	69.2	4.1	26.1
Resultant				19.9	37.2		
4 Left Side Sill at Front Seat	3200	660	327				
Longitudinal							
Lateral				61.8	5.4	24.4	17.7
Vertical							
5 Left Side Sill at Rear Seat	2291	660	314				
Longitudinal							
Lateral				49.8	6.7	5.5	49.0
Vertical							

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2005 Subaru Forester

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
6 Right Rear Occupant Compartment	2225	560	331				
Longitudinal							
Lateral				20.2	8.2	2.6	84.7
Vertical							
7 Left Lower A-Pillar	3510	790	640				
Longitudinal							
Lateral				69.6	4.6	54.9	21.7
Vertical							
8 Left Upper A-Pillar	3510	770	882				
Longitudinal							
Lateral ¹				40.6	5.1	532.0	49.7
Vertical							
9 Left Lower B-Pillar	2512	775	574				
Longitudinal							
Lateral ¹				119.1	6.2	20.8	17.7
Vertical							
10 Left Upper B-Pillar	2470	810	889				
Longitudinal							
Lateral				114.4	6.2	52.6	12.0
Vertical							
11 Left Front Seat Track	2722	600	325				
Longitudinal							
Lateral				61.5	16.5	16.5	51.3
Vertical							

¹ See Data Acquisition Explanations

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2005 Subaru Forester

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
12 Left Rear Seat Track	1986	520	446				
Longitudinal							
Lateral				35.3	23.9	9.0	34.0
Vertical							
13 Vehicle Center of Gravity	2137	0	526				
Longitudinal				5.6	6.4	10.8	11.3
Lateral				21.4	19.2	1.7	159.4
Vertical				4.4	47.8	8.1	26.1
Resultant				22.0	19.4		
14 Top of Engine	3752	0	883				
Longitudinal				7.1	81.9	13.6	41.8
Lateral				21.4	51.1	6.0	103.1
Vertical							
15 Center Firewall	3363	35	909				
Longitudinal				4.5	57.2	13.3	21.6
Lateral				14.5	7.4	1.9	159.8
Vertical							
16 Right Roof Rail	2875	585	1418				
Longitudinal				5.2	57.0	6.6	10.4
Lateral				17.5	30.4	3.1	87.0
Vertical							
17 Left Front Door on Centerline	2973	722	687				
Longitudinal							
Lateral				82.4	11.1	50.7	29.3
Vertical							

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Vehicle: 2005 Subaru Forester

Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
	X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
18 Left Front Door Mid Rear	2685	726	687				
Longitudinal							
Lateral				127.9	5.8	46.9	18.3
Vertical							
19 Left Front Door Upper Centerline	2973	719	946				
Longitudinal							
Lateral ¹				141.9	17.4	86.8	29.7
Vertical							
20 Left Rear Door Mid Rear	1855	723	695				
Longitudinal							
Lateral				101.4	6.2	27.2	34.2
Vertical							
21 Left Rear Door Upper Centerline	2060	715	965				
Longitudinal							
Lateral				93.7	21.1	134.3	32.9
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 Subaru Forester

Pre-Test				Post-Test				Difference			
Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm
1	-383.3	799.3	-55.7	1	-333.4	762.2	-100.4	1	-49.9	37.1	44.7
2	-383.7	699.2	-55.4	2	-354.4	664.6	-97.3	2	-29.3	34.6	41.9
3	-383.5	599.2	-55.2	3	-359.6	565.1	-97.7	3	-23.9	34.1	42.5
4	-383.4	499.1	-54.6	4	-362.1	465.2	-97.6	4	-21.3	33.9	43.0
5	-383.4	399.5	-54.7	5	-358.2	366.0	-98.5	5	-25.2	33.5	43.8
6	-383.5	299.3	-53.9	6	-327.7	270.5	-102.2	6	-55.8	28.8	48.3
7	-383.8	199.3	-55.1	7	-311.7	171.4	-104.8	7	-72.1	27.9	49.7
8	-384.0	99.2	-55.3	8	-340.9	74.9	-100.0	8	-43.1	24.3	44.7
9	-383.9	-0.9	-55.2	9	-363.9	-21.8	-96.1	9	-20.0	20.9	40.9
10	-383.8	-100.7	-54.2	10	-365.6	-121.2	-91.6	10	-18.2	20.5	37.4
11	-384.0	-201.0	-54.1	11	-363.7	-221.1	-88.4	11	-20.3	20.1	34.3
12	-383.9	-301.4	-54.4	12	-359.5	-321.4	-84.5	12	-24.4	20.0	30.1
13	-383.7	-401.3	-53.9	13	-355.3	-420.9	-79.6	13	-28.4	19.6	25.7
14	-384.1	-500.7	-54.0	14	-347.1	-519.9	-76.0	14	-37.0	19.2	22.0
15	-383.3	-601.0	-54.1	15	-334.2	-618.7	-72.0	15	-49.1	17.7	17.9
16	-383.6	-700.8	-54.9	16	-295.9	-709.8	-79.9	16	-87.7	9.0	25.0
17	-383.8	-800.7	-55.6	17	-257.2	-799.6	-86.3	17	-126.6	-1.1	30.7
18	-383.0	799.7	-183.8	18	-350.5	763.0	-222.5	18	-32.5	36.7	38.7
19	-382.9	699.9	-184.6	19	-372.6	667.1	-224.5	19	-10.3	32.8	39.9
20	-382.9	600.1	-184.1	20	-373.3	567.3	-224.8	20	-9.6	32.8	40.7
21	-383.2	499.6	-184.1	21	-372.3	467.0	-226.0	21	-10.9	32.6	41.9
22	-383.3	399.9	-184.4	22	-369.0	367.1	-227.5	22	-14.3	32.8	43.1

Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 Subaru Forester

Pre-Test				Post-Test				Difference			
Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm	Index	Xmm	Ymm	Zmm
23	-382.9	299.9	-184.2	23	-352.9	268.8	-229.2	23	-30.0	31.1	45.0
24	-383.2	199.7	-183.8	24	-333.4	170.5	-231.2	24	-49.8	29.2	47.4
25	-383.7	99.6	-184.8	25	-351.6	72.4	-227.9	25	-32.1	27.2	43.1
26	-383.6	-0.5	-184.3	26	-360.3	-27.0	-223.7	26	-23.3	26.5	39.4
27	-383.5	-100.4	-184.8	27	-365.9	-126.6	-219.9	27	-17.6	26.2	35.1
28	-382.7	-200.6	-184.4	28	-367.0	-227.0	-215.1	28	-15.7	26.4	30.7
29	-383.4	-301.3	-184.6	29	-367.5	-327.7	-211.2	29	-15.9	26.4	26.6
30	-383.2	-401.5	-184.5	30	-363.7	-427.8	-206.9	30	-19.5	26.3	22.4
31	-382.8	-500.6	-184.2	31	-356.3	-526.9	-202.1	31	-26.5	26.3	17.9
32	-382.7	-600.6	-184.9	32	-348.0	-627.0	-198.4	32	-34.7	26.4	13.5
33	-382.5	-701.2	-184.8	33	-337.5	-727.2	-194.1	33	-45.0	26.0	9.3
34	-382.9	-800.9	-184.8	34	-317.2	-823.4	-191.9	34	-65.7	22.5	7.1
35	-382.7	800.0	-313.3	35	-298.8	766.4	-323.5	35	-83.9	33.6	10.2
36	-382.4	699.3	-312.0	36	-302.9	667.0	-326.3	36	-79.5	32.3	14.3
37	-382.6	599.3	-311.9	37	-303.8	567.0	-324.9	37	-78.8	32.3	13.0
38	-382.5	499.7	-311.7	38	-304.9	467.5	-325.5	38	-77.6	32.2	13.8
39	-382.6	399.9	-311.9	39	-305.0	367.1	-326.2	39	-77.6	32.8	14.3
40	-382.9	299.9	-311.7	40	-307.7	266.9	-326.3	40	-75.2	33.0	14.6
41	-382.8	199.8	-311.5	41	-308.1	163.8	-330.7	41	-74.7	36.0	19.2
42	-383.0	99.5	-312.2	42	-311.6	63.6	-335.3	42	-71.4	35.9	23.1
43	-382.8	-0.6	-311.8	43	-316.1	-34.4	-334.2	43	-66.7	33.8	22.4
44	-382.8	-100.6	-311.2	44	-322.6	-132.3	-330.0	44	-60.2	31.7	18.8

Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 Subaru Forester

Pre-Test			
Index	Xmm	Ymm	Zmm
45	-382.8	-200.9	-311.6
46	-382.8	-300.9	-311.1
47	-382.7	-401.5	-310.6
48	-382.6	-500.8	-311.1
49	-383.0	-601.4	-310.9
50	-382.4	-701.2	-311.0
51	-383.0	-800.3	-311.3
52	-470.1	799.3	-435.1
53	-484.9	702.7	-436.6
54	-484.9	602.9	-436.5
55	-485.1	502.8	-436.7
56	-485.1	402.5	-436.3
57	-485.2	302.6	-435.8
58	-485.5	202.5	-436.5
59	-485.5	102.3	-436.0
60	-485.6	2.3	-436.2
61	-485.7	-97.3	-436.3
62	-485.6	-197.9	-436.1
63	-485.6	-298.2	-436.4
64	-485.5	-398.1	-436.2
65	-485.5	-497.8	-436.4
66	-485.2	-597.8	-436.0
67	-485.2	-697.7	-436.3
68	-472.8	-794.6	-436.5

Post-Test			
Index	Xmm	Ymm	Zmm
45	-322.9	-233.0	-325.2
46	-324.2	-332.9	-321.3
47	-324.1	-432.7	-317.5
48	-323.9	-532.4	-314.6
49	-323.5	-632.8	-313.0
50	-316.1	-732.3	-307.5
51	-314.7	-831.7	-305.5
52	-339.5	762.8	-451.2
53	-361.5	668.6	-456.2
54	-362.9	568.9	-455.3
55	-363.9	468.8	-454.1
56	-364.3	368.5	-452.8
57	-357.8	268.8	-449.3
58	-366.5	169.5	-449.6
59	-372.7	69.4	-449.0
60	-380.4	-30.2	-449.1
61	-382.2	-130.1	-448.1
62	-383.0	-230.7	-446.6
63	-383.5	-331.0	-445.2
64	-384.0	-430.9	-443.9
65	-384.5	-530.7	-442.6
66	-384.1	-630.7	-440.7
67	-377.9	-730.5	-438.2
68	-362.9	-827.4	-434.4

Difference			
Index	Xmm	Ymm	Zmm
45	-59.9	32.1	13.6
46	-58.6	32.0	10.2
47	-58.6	31.2	6.9
48	-58.7	31.6	3.5
49	-59.5	31.4	2.1
50	-66.3	31.1	-3.5
51	-68.3	31.4	-5.8
52	-130.6	36.5	16.1
53	-123.4	34.1	19.6
54	-122.0	34.0	18.8
55	-121.2	34.0	17.4
56	-120.8	34.0	16.5
57	-127.4	33.8	13.5
58	-119.0	33.0	13.1
59	-112.8	32.9	13.0
60	-105.2	32.5	12.9
61	-103.5	32.8	11.8
62	-102.6	32.8	10.5
63	-102.1	32.8	8.8
64	-101.5	32.8	7.7
65	-101.0	32.9	6.2
66	-101.1	32.9	4.7
67	-107.3	32.8	1.9
68	-109.9	32.8	-2.1

Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 Subaru Forester

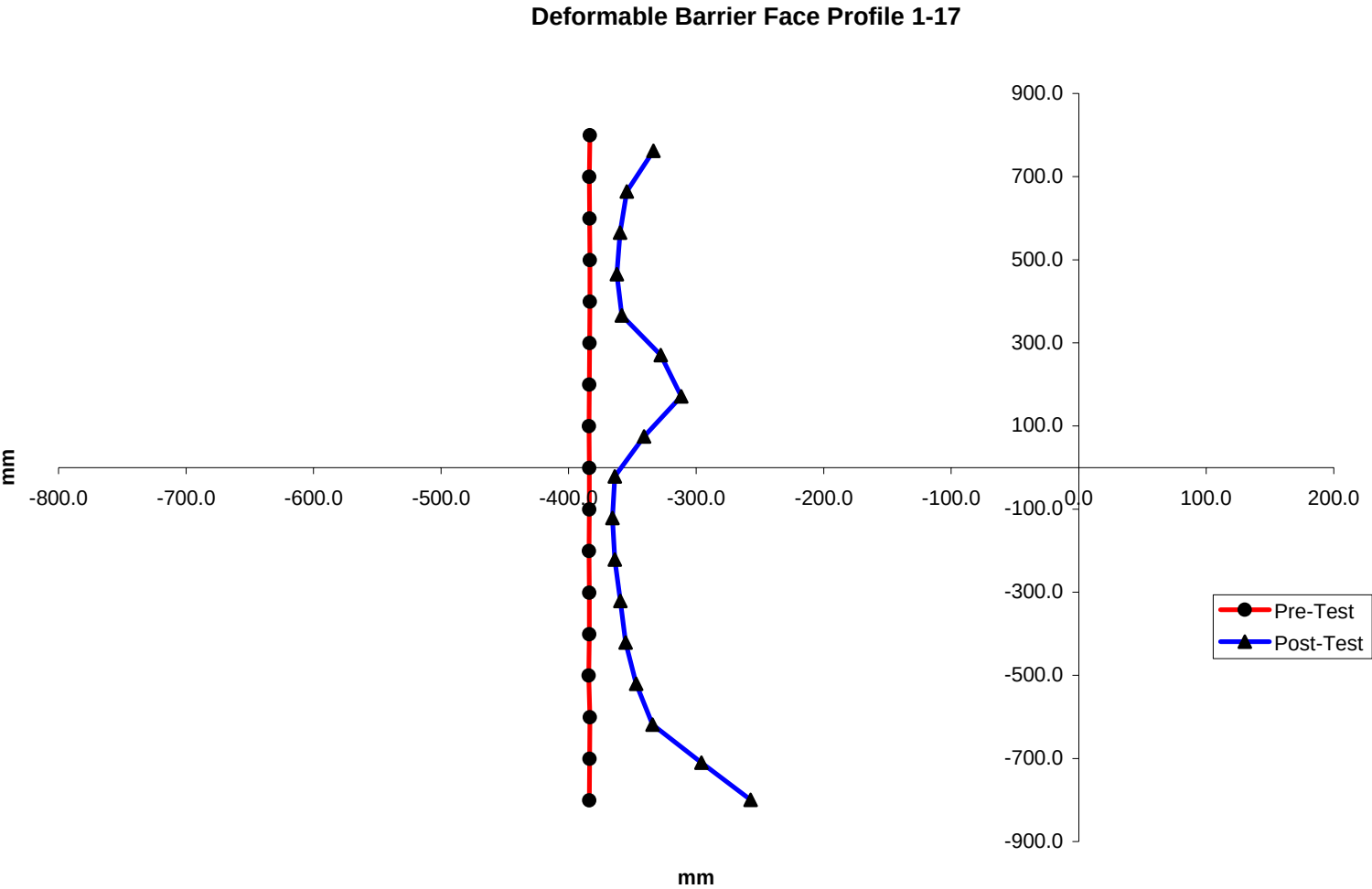


Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 Subaru Forester

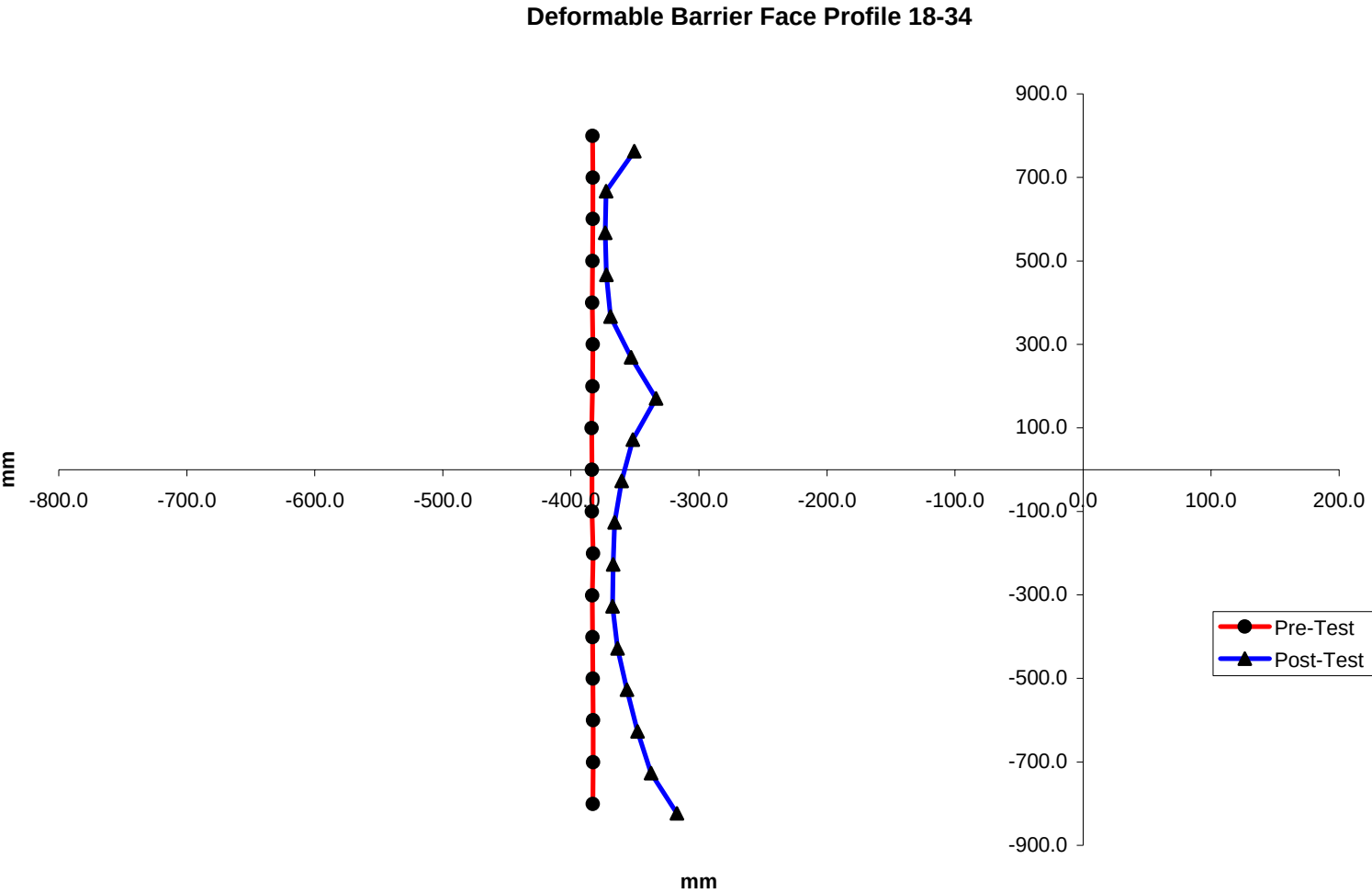


Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 Subaru Forester

Deformable Barrier Face Profile 35-51

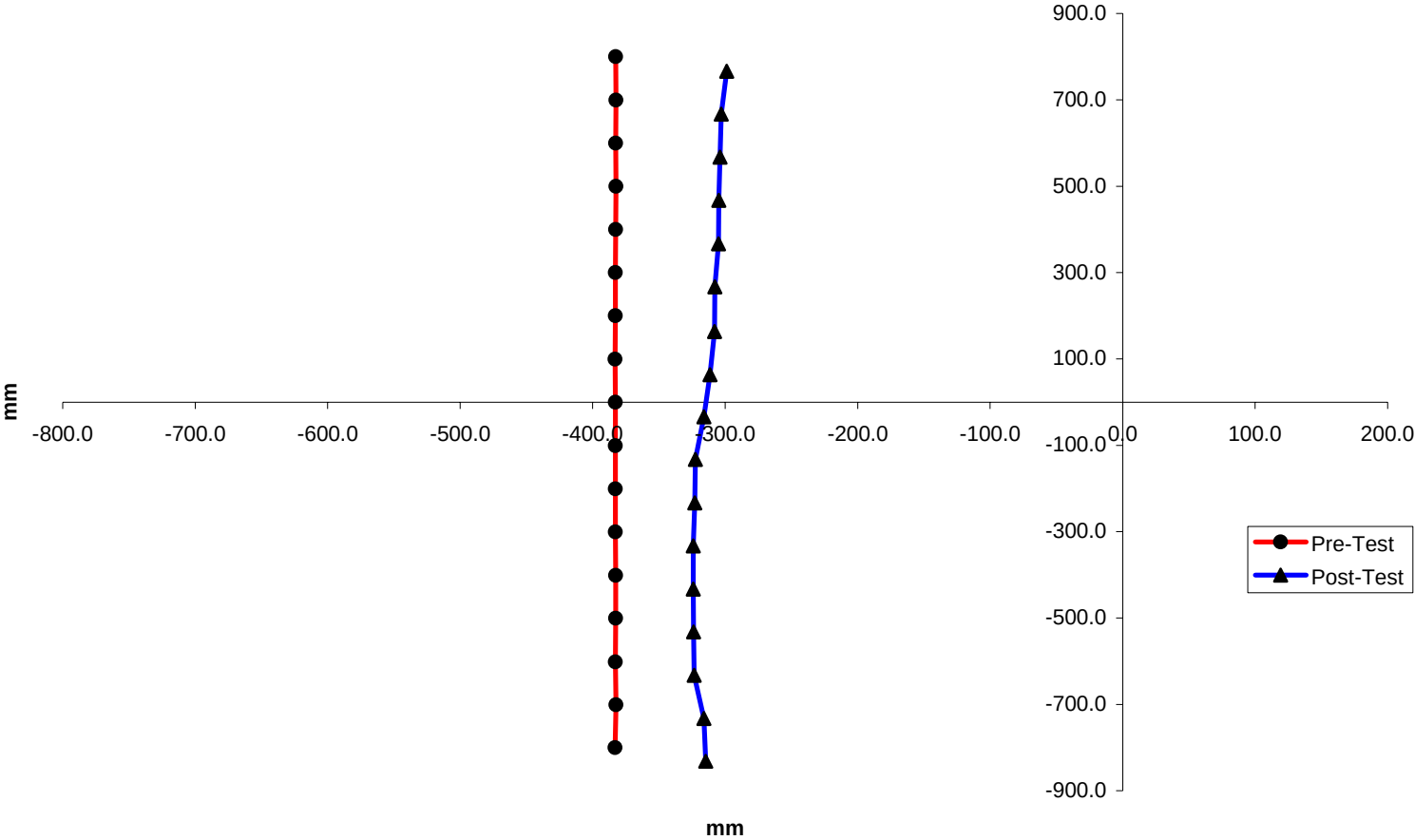


Table 8 Deformable Barrier Face Profile, Continued

Vehicle: 2005 Subaru Forester

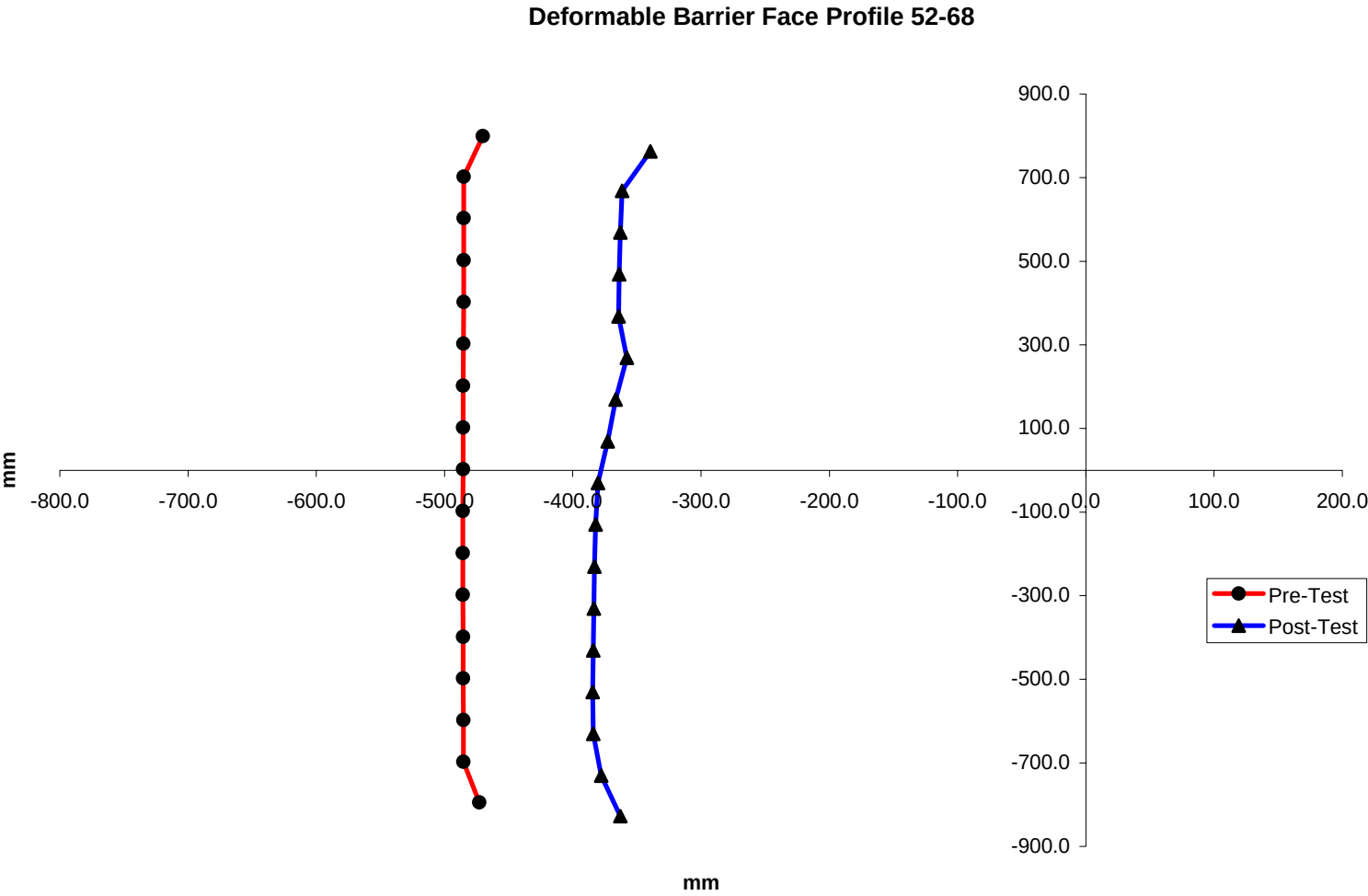
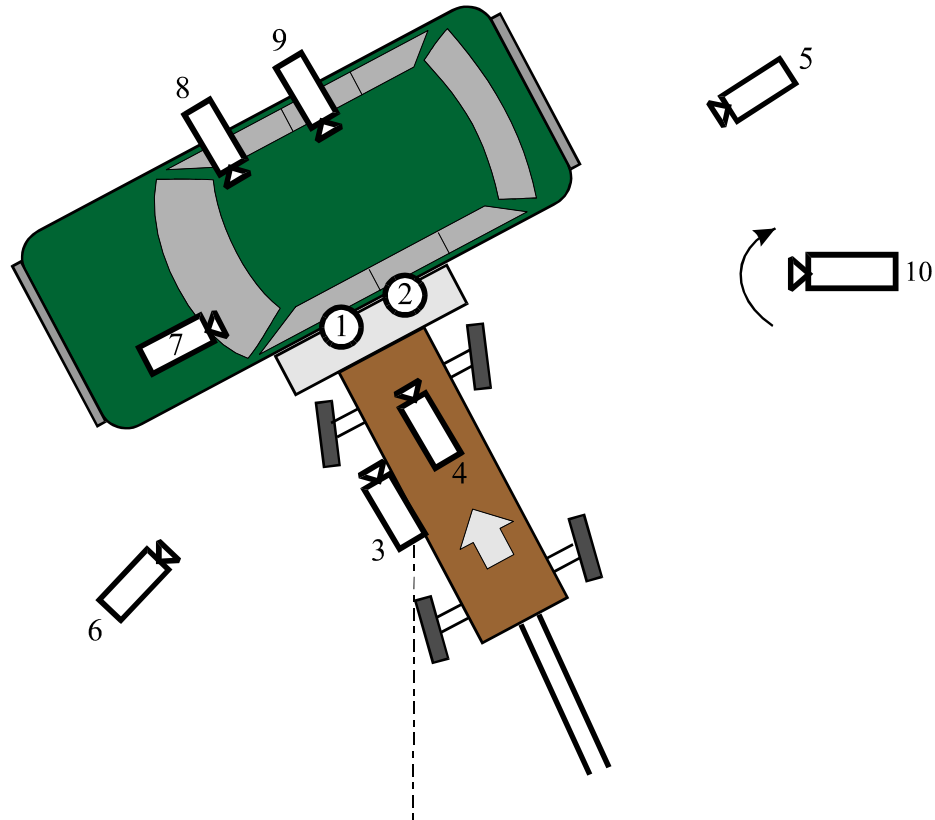


Figure 7 High-Speed Camera Locations and Data Summary

Vehicle: 2005 Subaru Forester



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	0.2	12.5	1000
4	MDB Centerline Impact	2380	0	-1450	4.3	12.5	1000
5	Left Rear	0	8270	-1200	2.6	12.5	1000
6	Left Front	2590	5640	-1300	7.0	25	1000
7	Onboard Front-Driver	700	1240	-1240	3.1	12.5	1000
8	Onboard Right Side Front	1710	0	-1120	0.1	8.5	1000
9	Onboard Right Side Rear	1710	770	-1120	0.5	8.5	1000
10	Panning	N/A	N/A	N/A	N/A	Zoom	24

+X: Forward (referenced to Pole) from impact point
+Y: Rightward (referenced to Pole) from impact point
+Z: Downward from ground level
Vehicle was at a 15° angle to the rigid pole.

Appendix A

Photographs

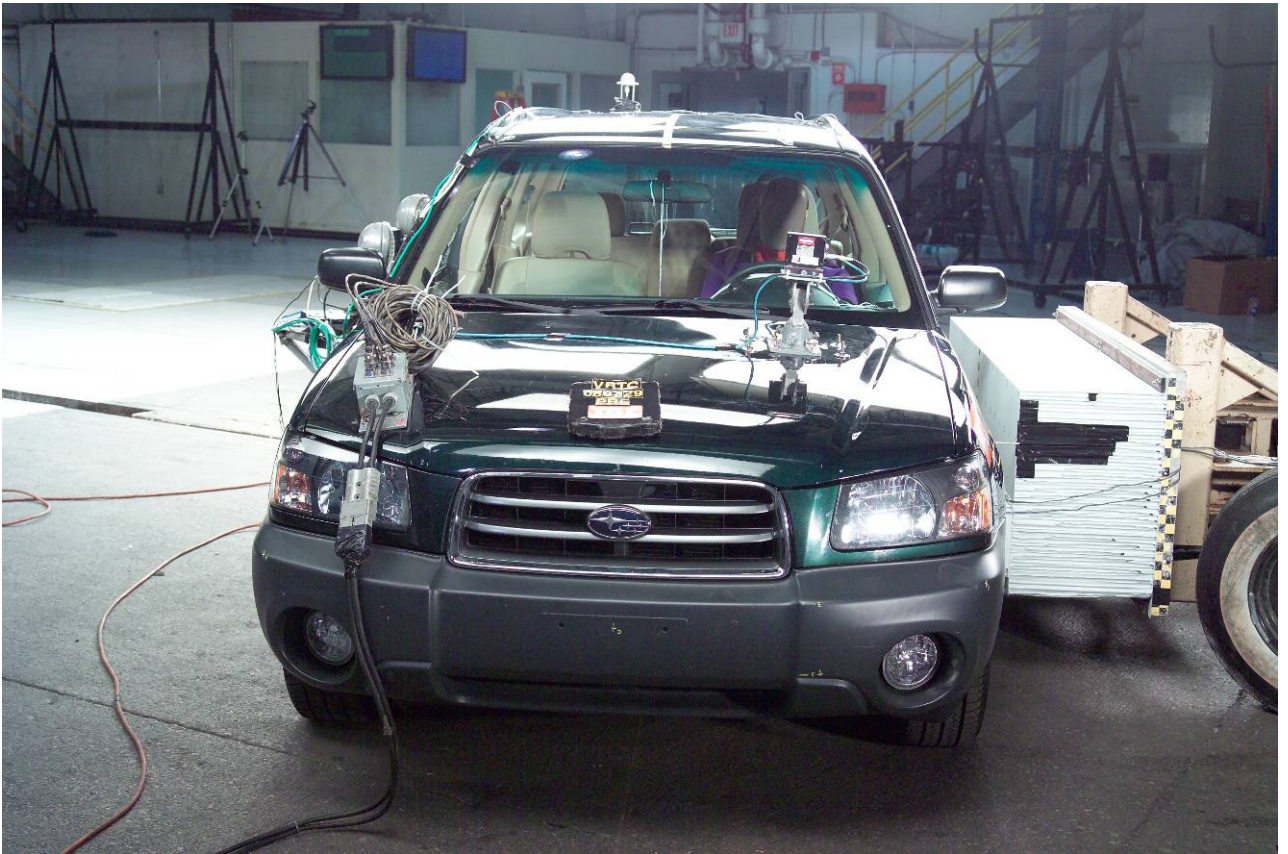


Figure A-1 Pre-Test Front View

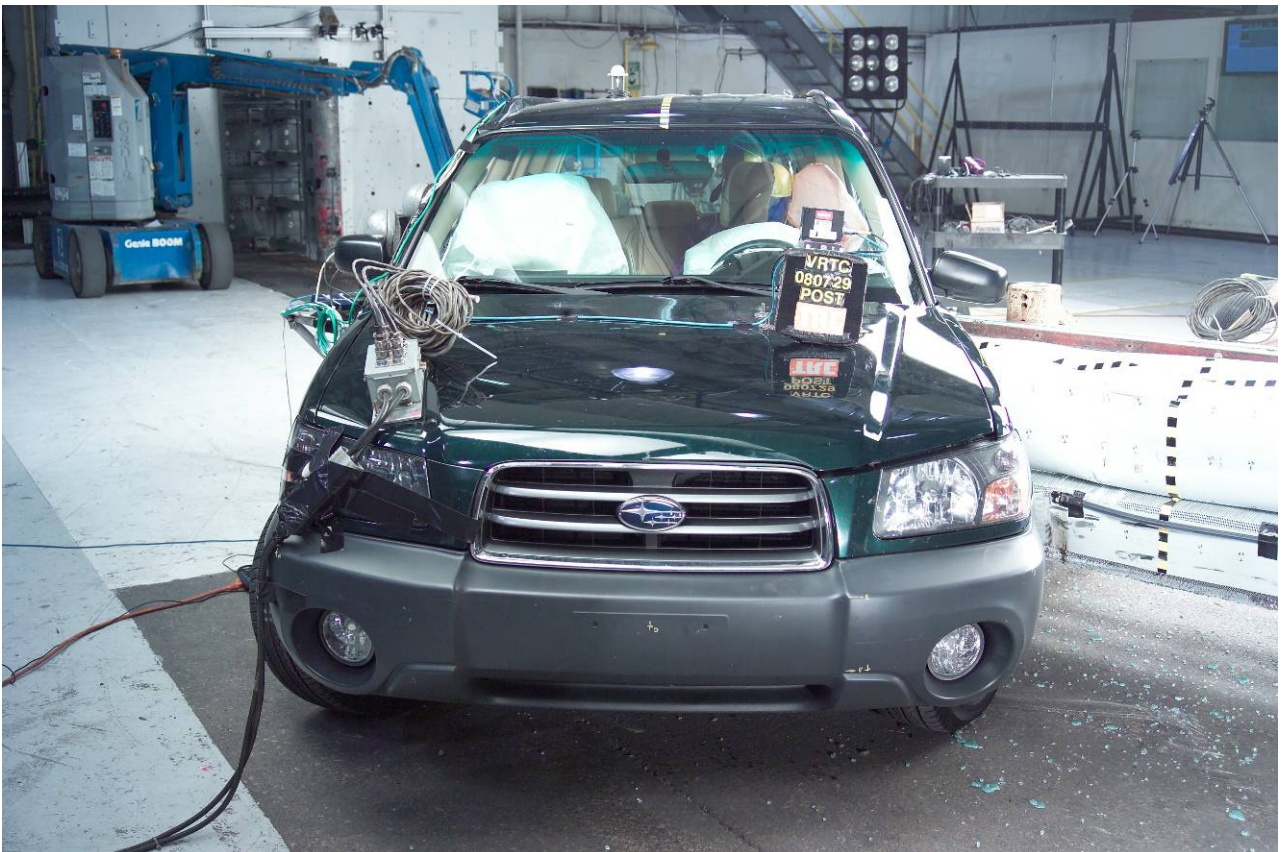


Figure A-2 Post-Test Front View



Figure A-3 Pre-Test Left Front View

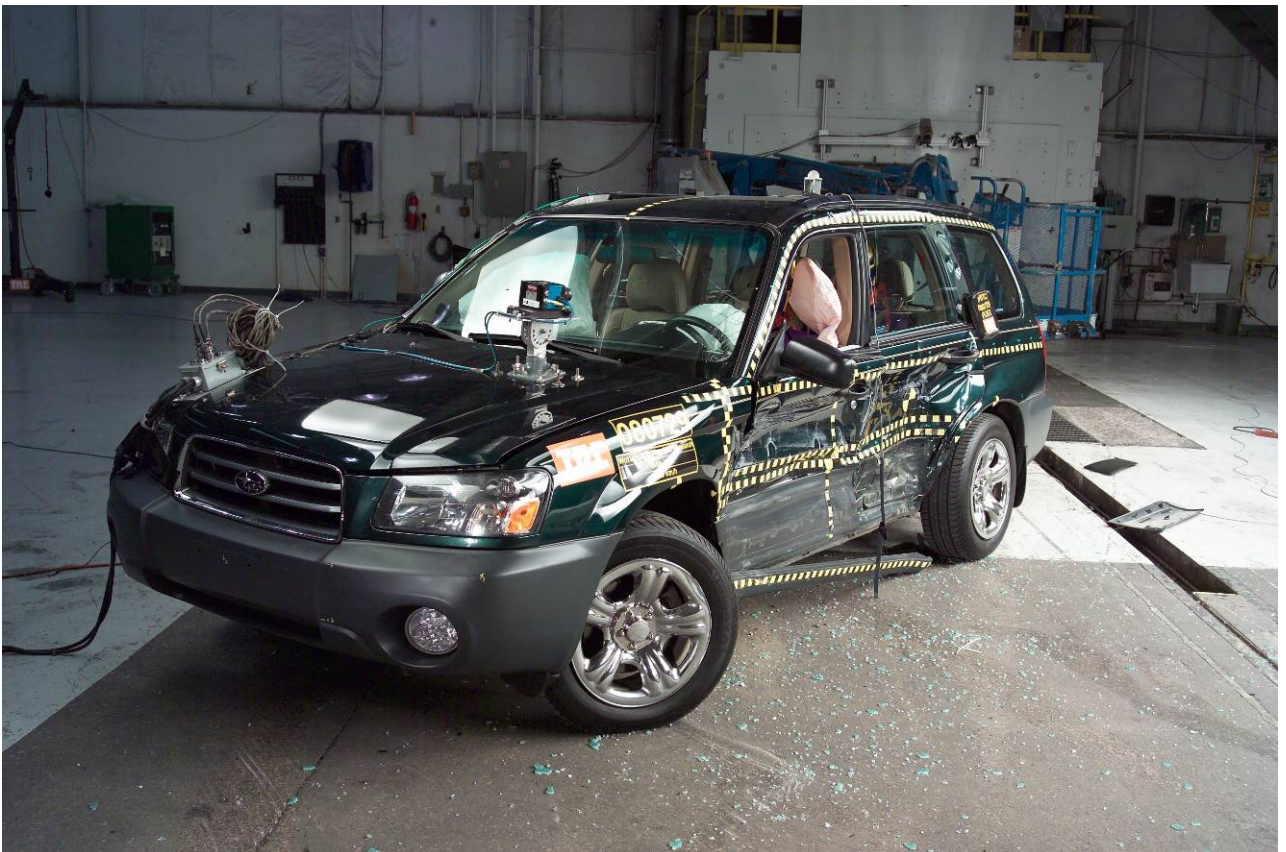


Figure A-4 Post-Test Left Front View



Figure A-5 Pre-Test Left Side View



Figure A-6 Post-Test Left Side View



Figure A-7 Pre-Test Left Rear View

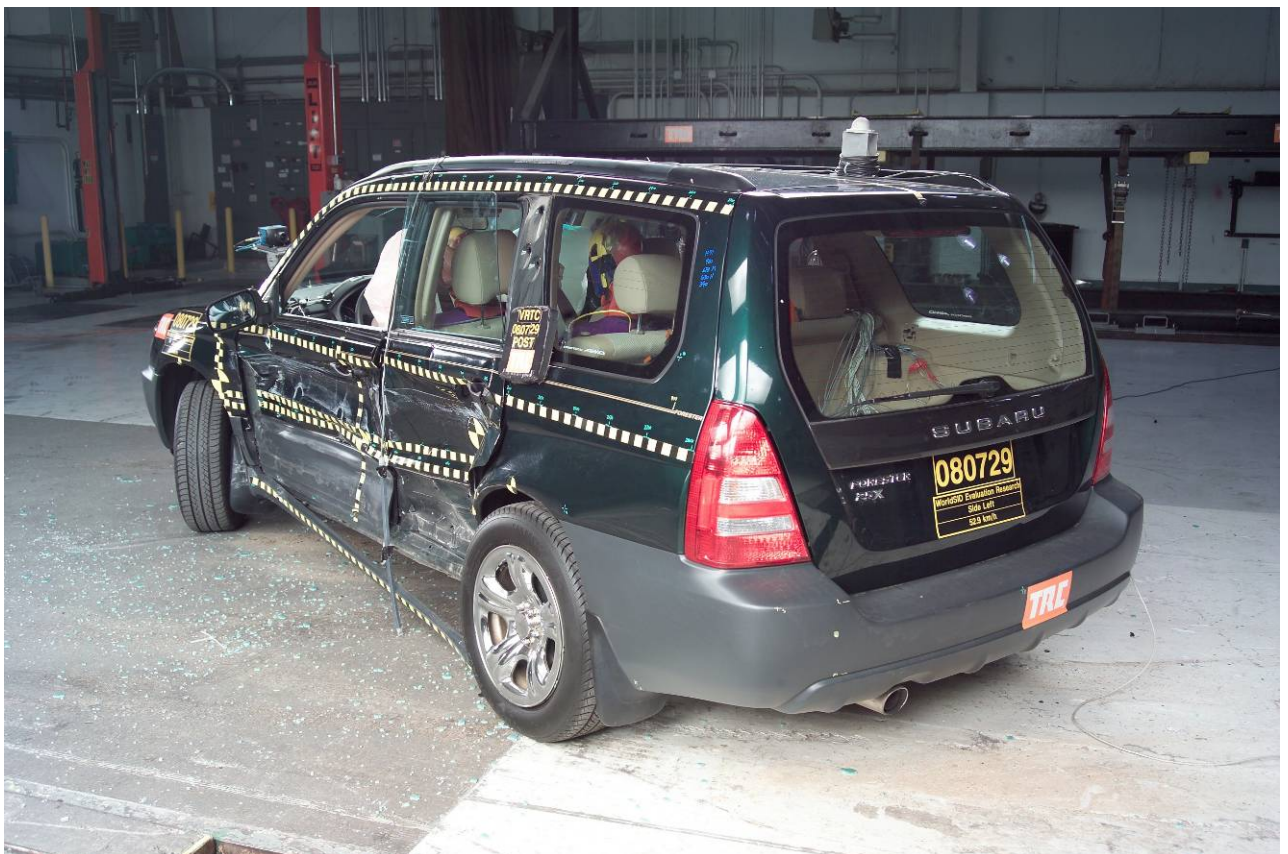


Figure A-8 Post-Test Left Rear View



Figure A-9 Pre-Test Rear View



Figure A-10 Post-Test Rear View

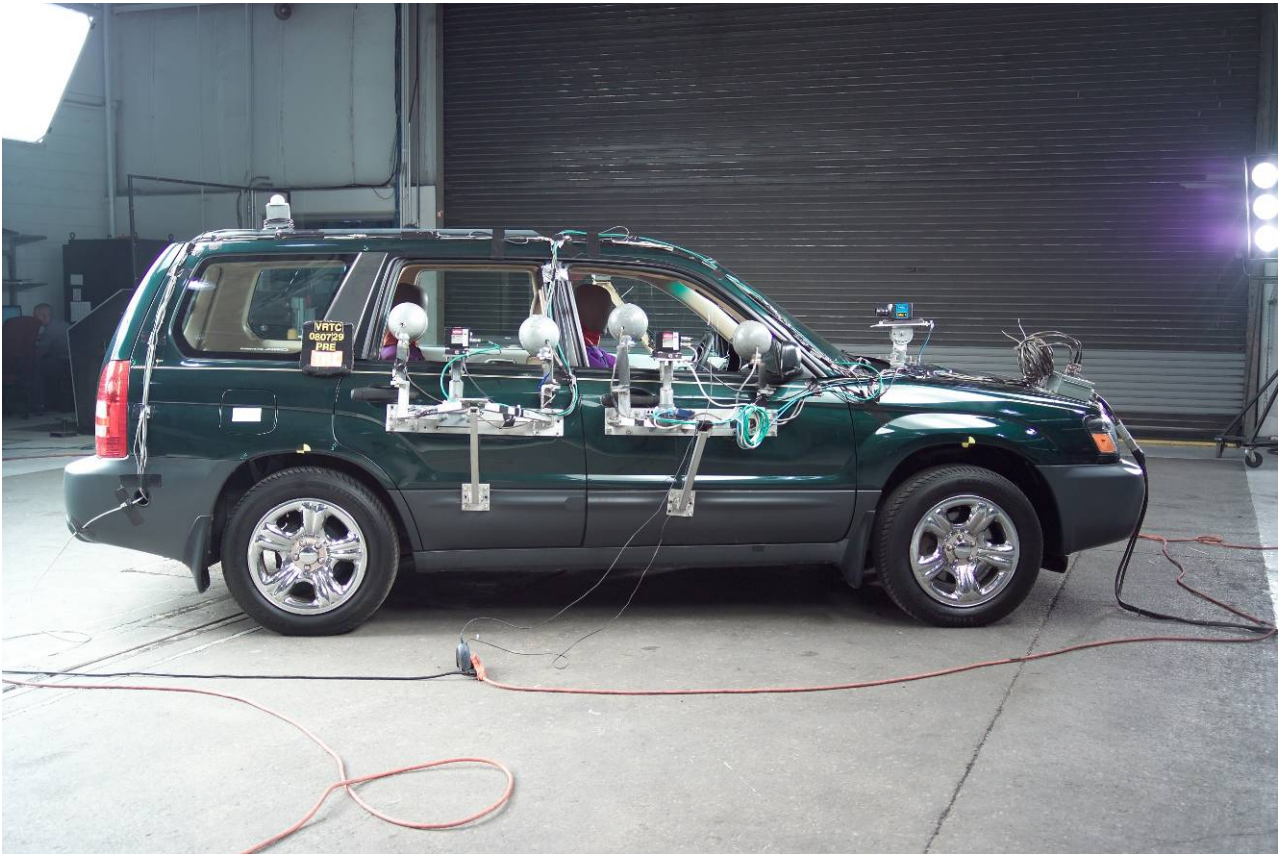


Figure A-11 Pre-Test Right Side View

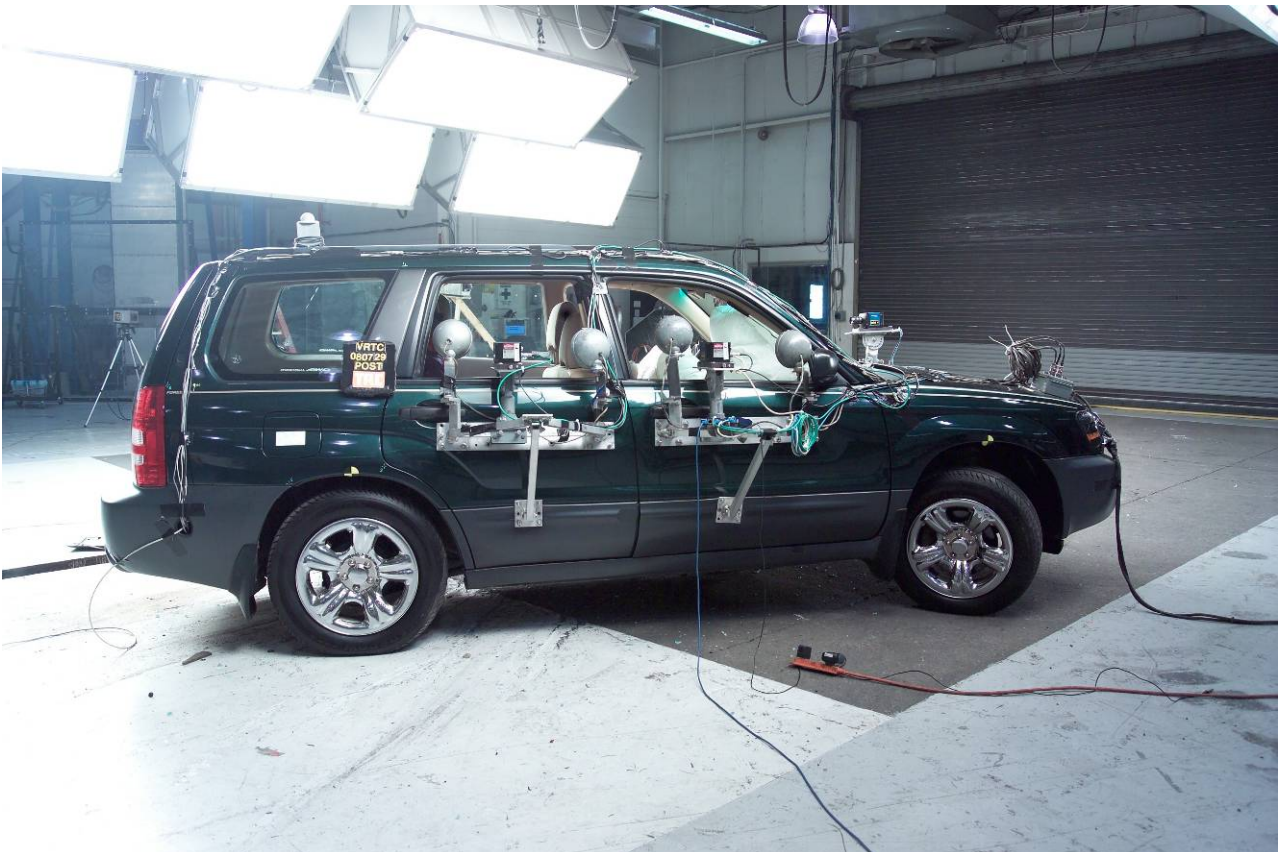


Figure A-12 Post-Test Right Side View

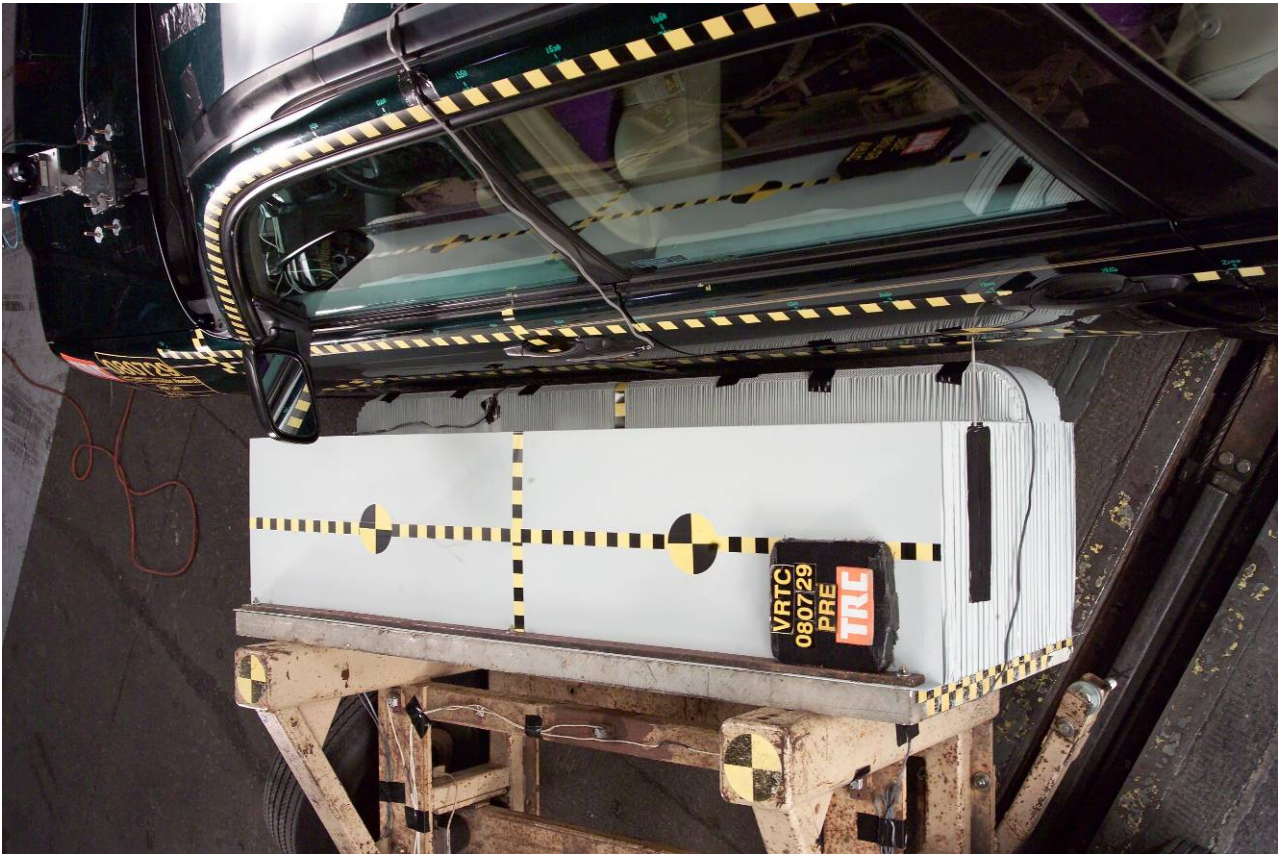


Figure A-13 Pre-Test Impact Alignment View



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

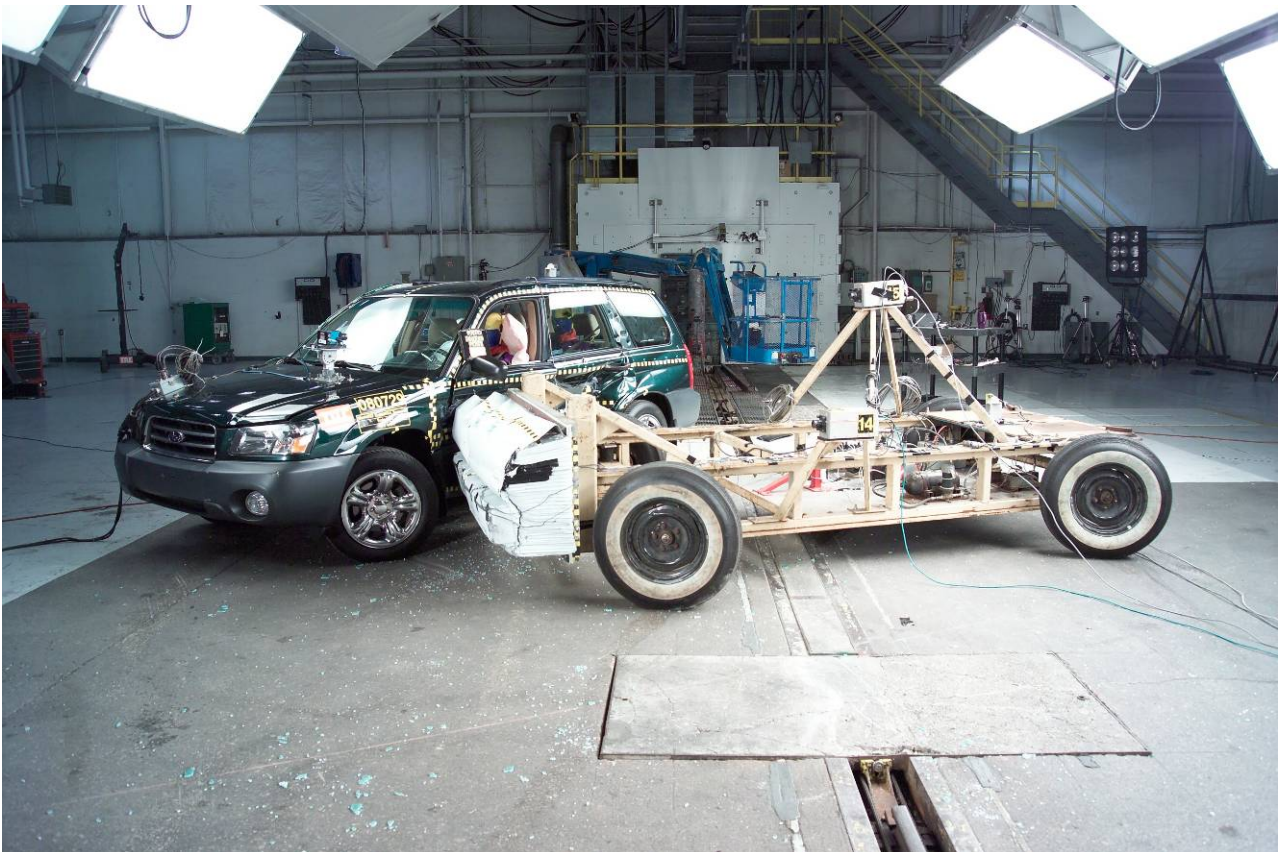


Figure A-28 Post-Test MDB with Vehicle Left Side Overall View



Figure A-29 Pre-Test MDB with Vehicle Right Side Overall View



Figure A-30 Post-Test MDB with Vehicle Right Side Overall View



Figure A-31 Pre-Test MDB Left Side Overall View

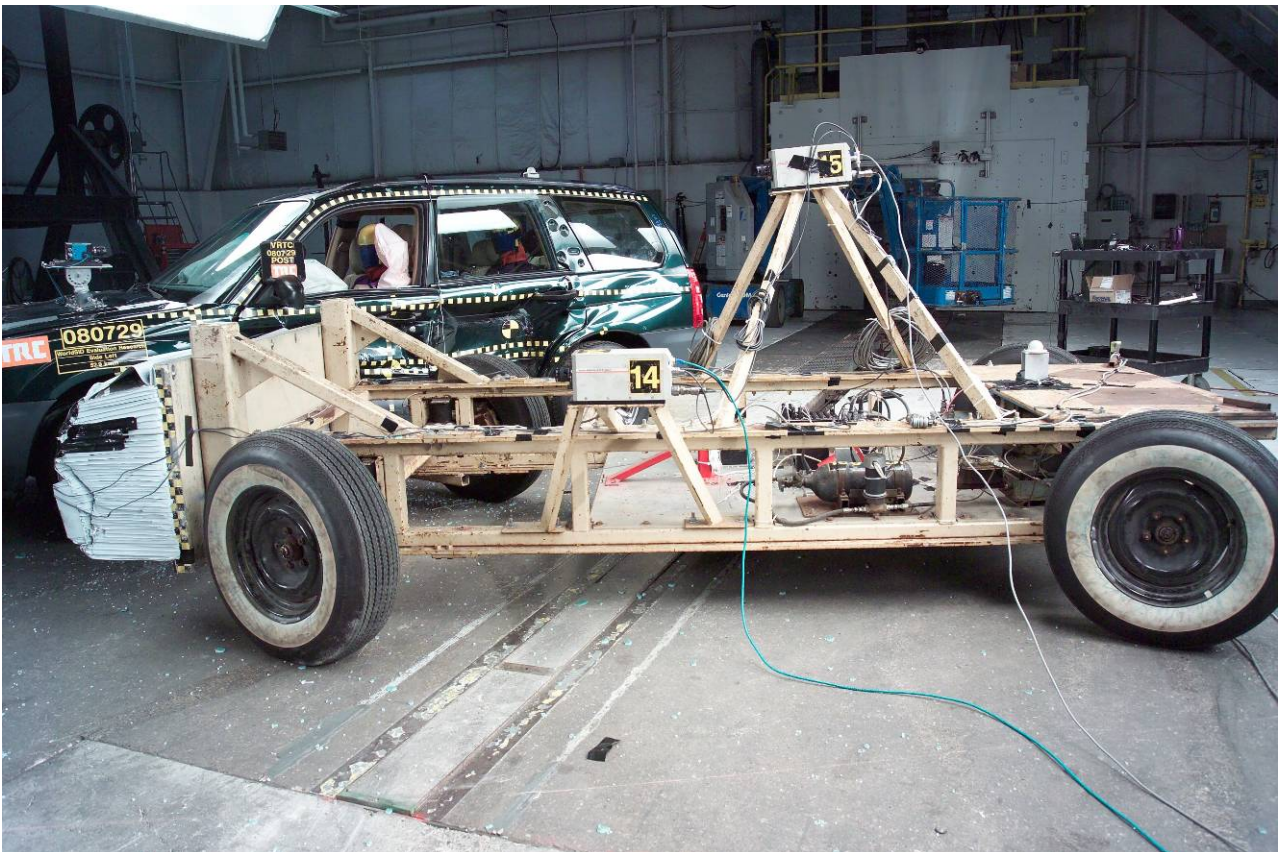


Figure A-32 Post-Test MDB Left Side Overall View



Figure A-33 Pre-Test MDB Right Side Overall View

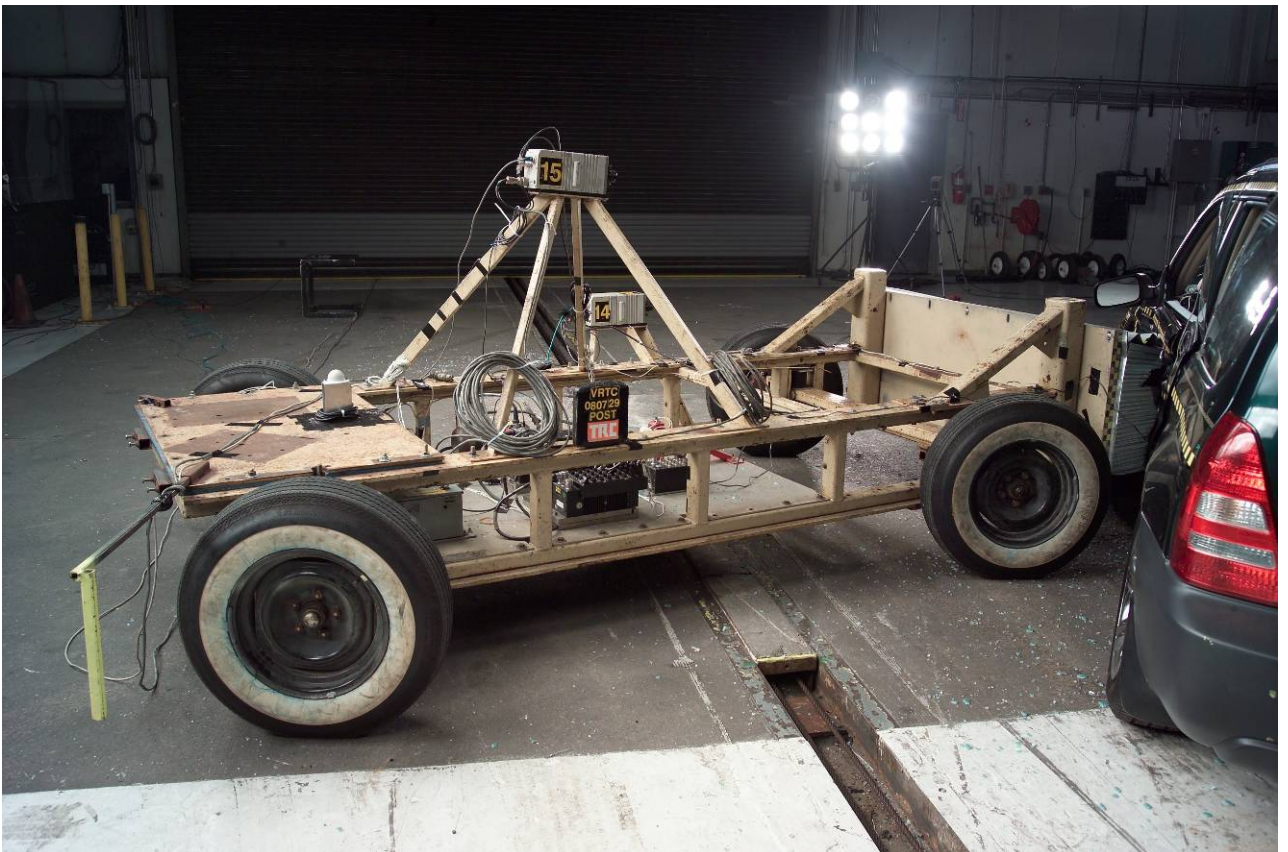


Figure A-34 Post-Test MDB Right Side Overall View

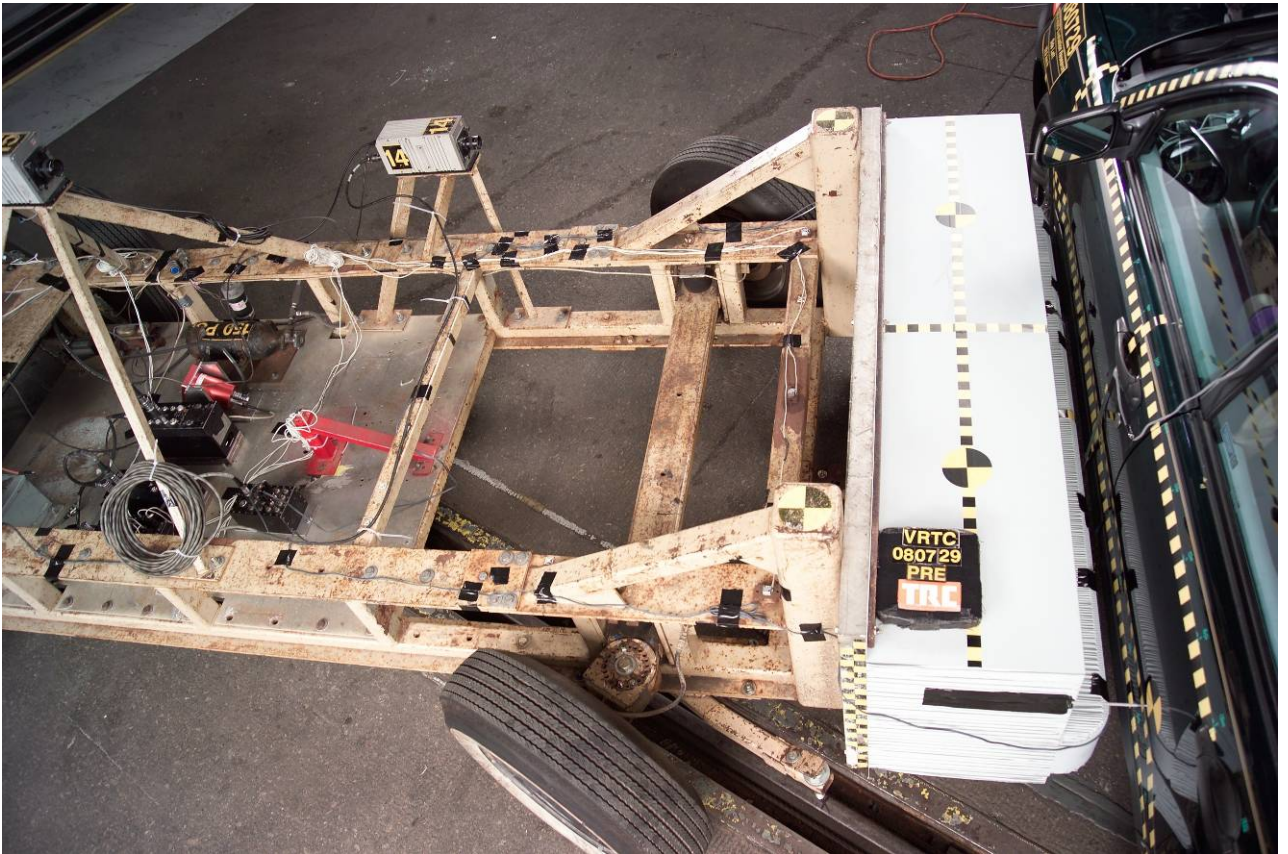


Figure A-35 Pre-Test MDB Alignment Overhead View

Intentionally Left Blank



Figure A-36 Pre-Test Driver Dummy Side View



Figure A-37 Post-Test Driver Dummy Side View



Figure A-38 Pre-Test Right Side Dummy Occupant Compartment View



Figure A-39 Post-Test Right Side Dummy Occupant Compartment View



Figure A-40 Pre-Test Driver Dummy and Door Clearance View



Figure A-41 Post-Test Driver Dummy and Door Clearance View



Figure A-42 Pre-Test Driver Dummy Showing Belts, Chalking, and Contact Switches

Intentionally Left Blank



Figure A-43 Pre-Test Driver Door Panel View



Figure A-44 Post-Test Driver Door Panel View

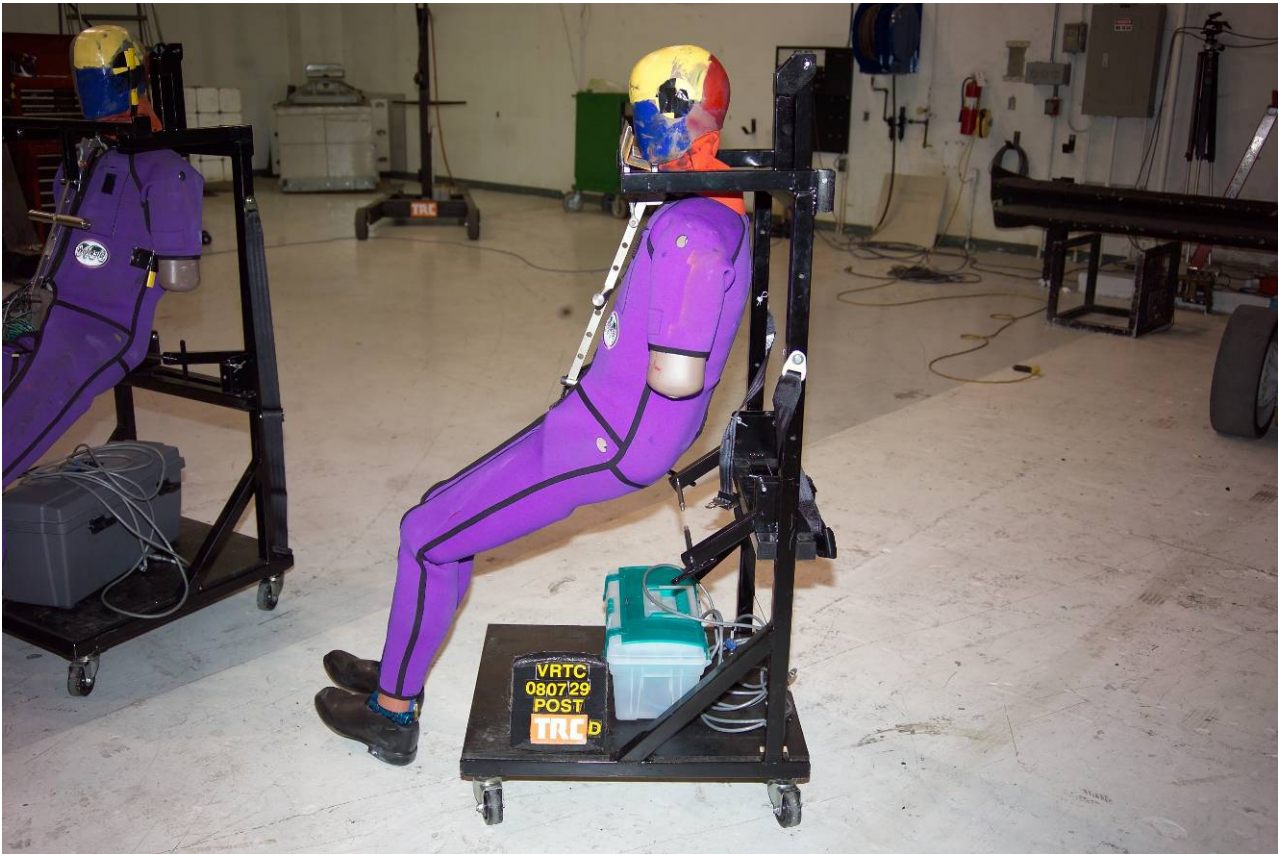


Figure A-45 Post-Test Driver Dummy Overall View



Figure A-46 Post-Test Driver Dummy Head Contact View



Figure A-47 Post-Test Driver Dummy Torso Contact View

Intentionally Left Blank



Figure A-48 Pre-Test Passenger Dummy Side View



Figure A-49 Post-Test Passenger Dummy Side View



Figure A-50 Pre-Test Right Side Dummy Occupant Compartment View



Figure A-51 Post-Test Right Side Dummy Occupant Compartment View



Figure A-52 Pre-Test Passenger Dummy and Door Clearance View



Figure A-53 Post-Test Passenger Dummy and Door Clearance View



Figure A-54 Pre-Test Passenger Dummy Showing Belts, Chalking, and Contact Switches

Intentionally Left Blank



Figure A-55 Pre-Test Passenger Door Panel View



Figure A-56 Post-Test Passenger Door Panel View



Figure A-57 Post-Test Passenger Dummy Overall View



Figure A-58 Post-Test Passenger Dummy Head Contact View



Figure A-59 Post-Test Passenger Dummy Torso Contact - View 1



Figure A-60 Post-Test Passenger Dummy Torso Contact - View 2

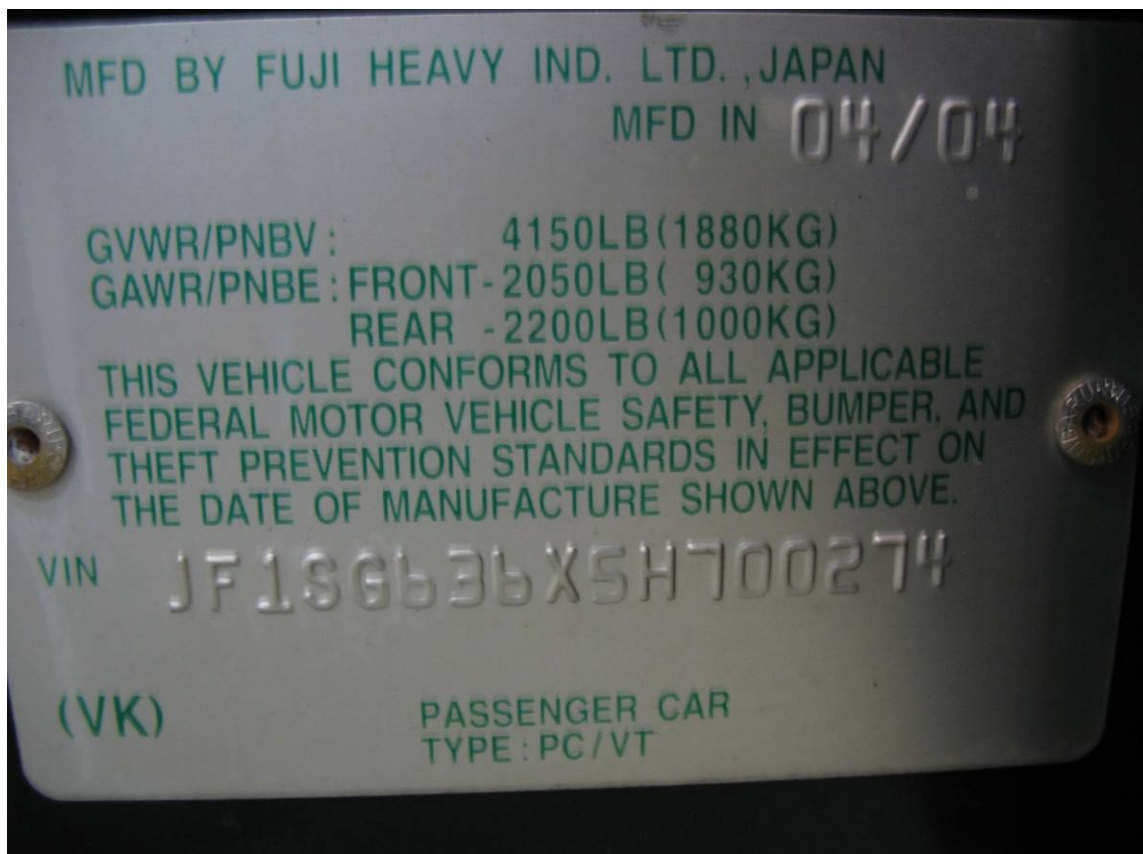


Figure A-61 Certification Label View



Figure A-62 Recommended Tire Pressure Label View

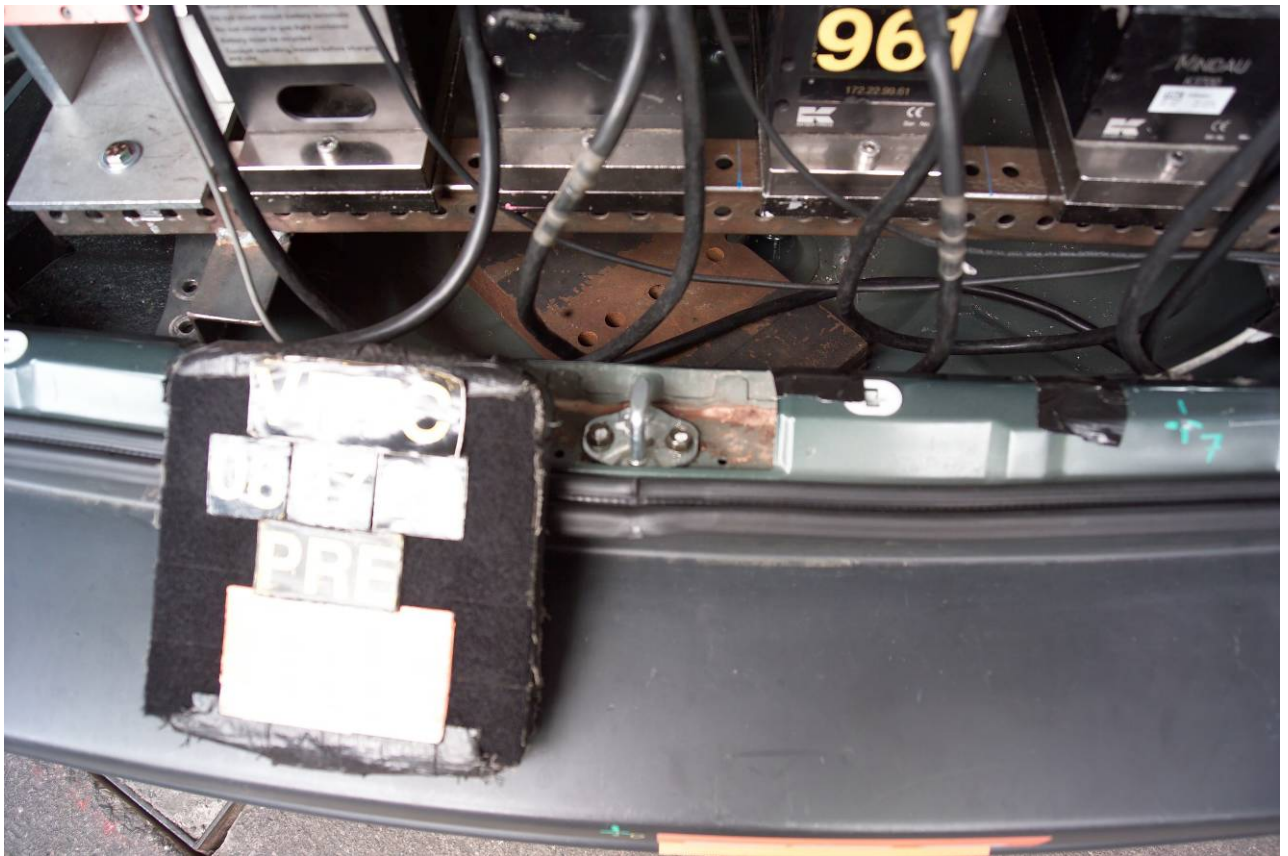


Figure A-63 Pre-Test Ballast View

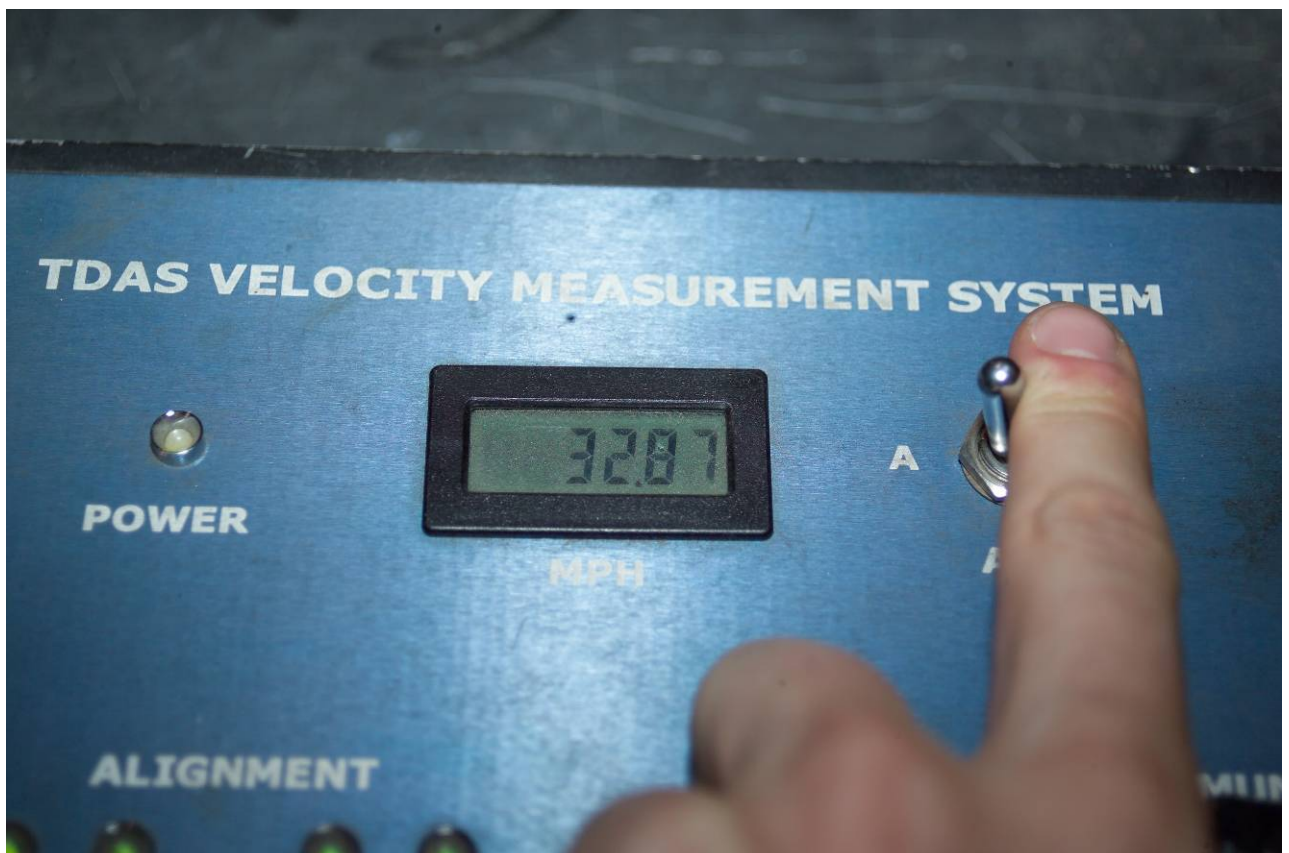


Figure A-64 Post-Test Digital Light Trap Read-Out - View 1

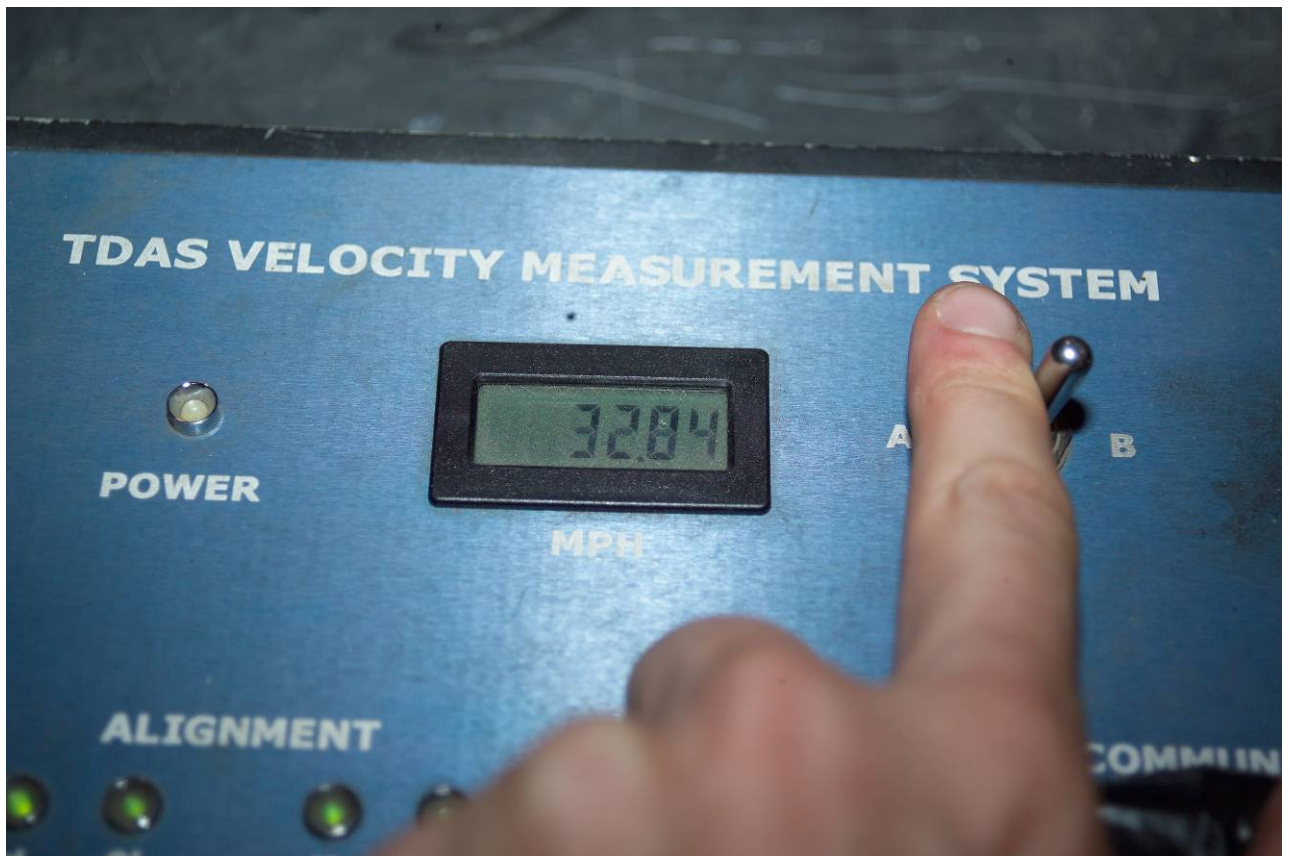


Figure A-65 Post-Test Digital Light Trap Read-Out - View 2

Appendix B

Data Plots



World SID Evaluation

Date: 07/29/2008
Time: 14:50

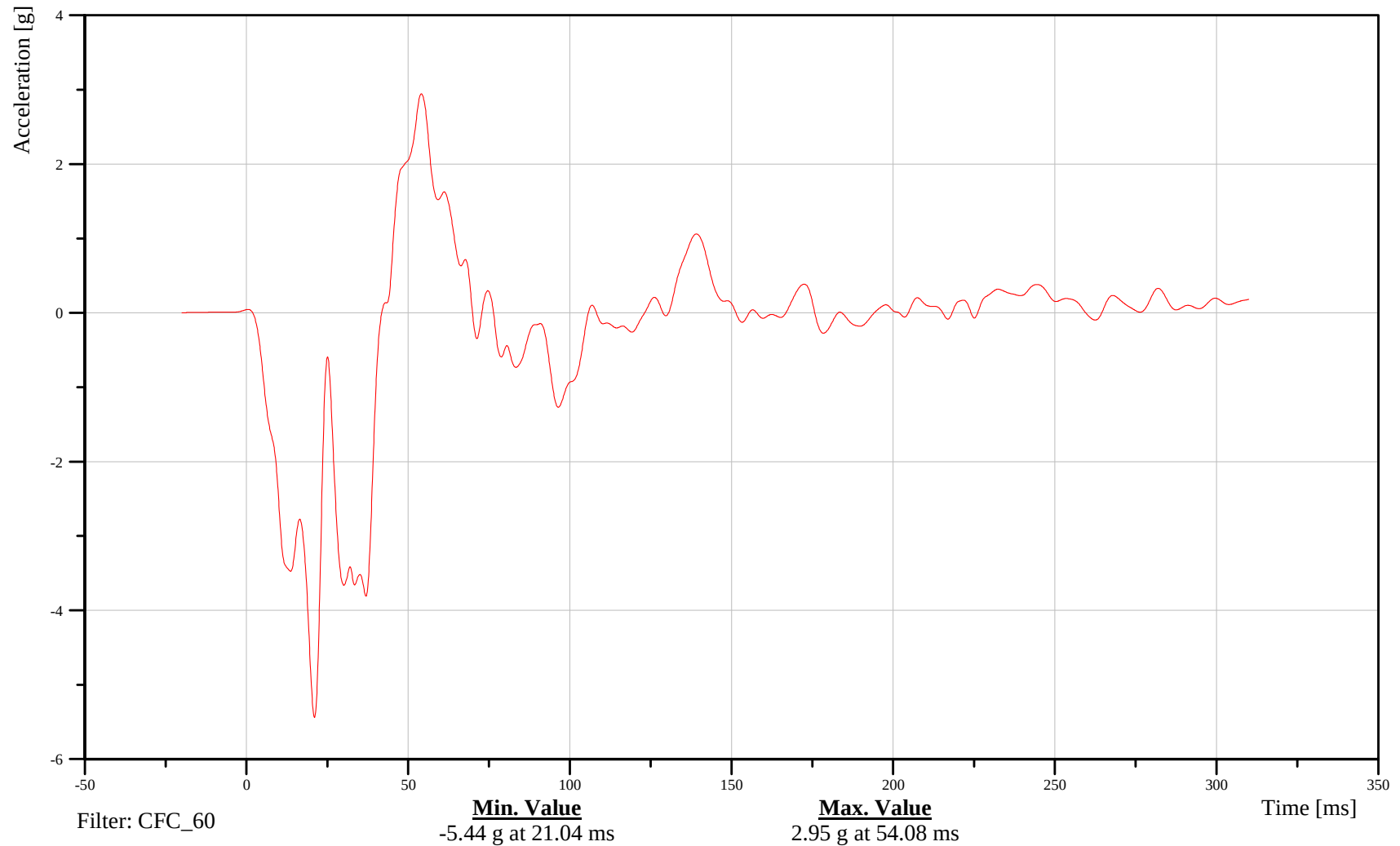
Right Side Sill at Front Seat X-Axis Acceleration

Customer: VRTC

16SILBFR0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-2

080729



World SID Evaluation

Right Side Sill at Front Seat X-Axis Velocity

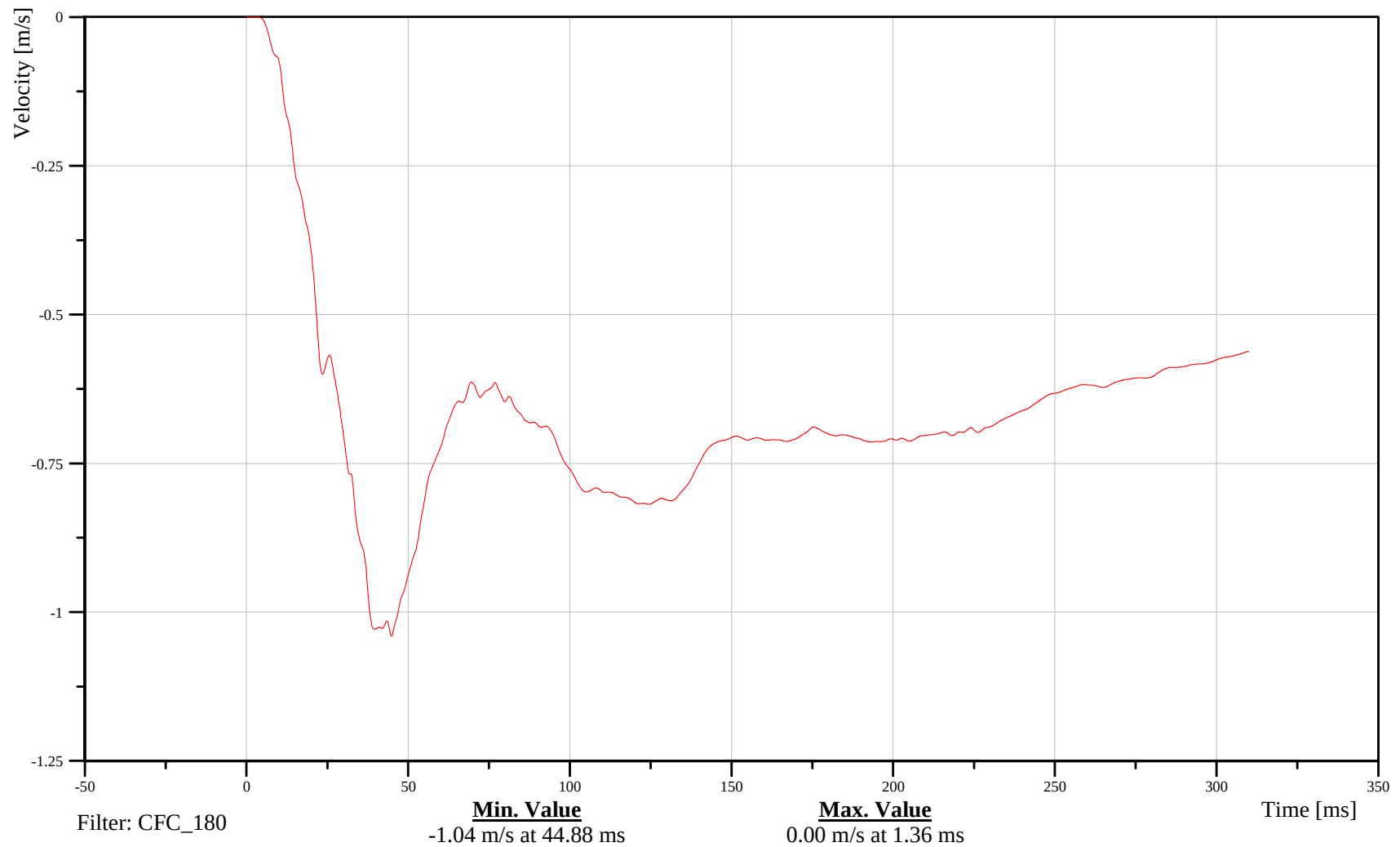
Date: 07/29/2008
Time: 14:50

Customer: VRTC

16SILBFR0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-3

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

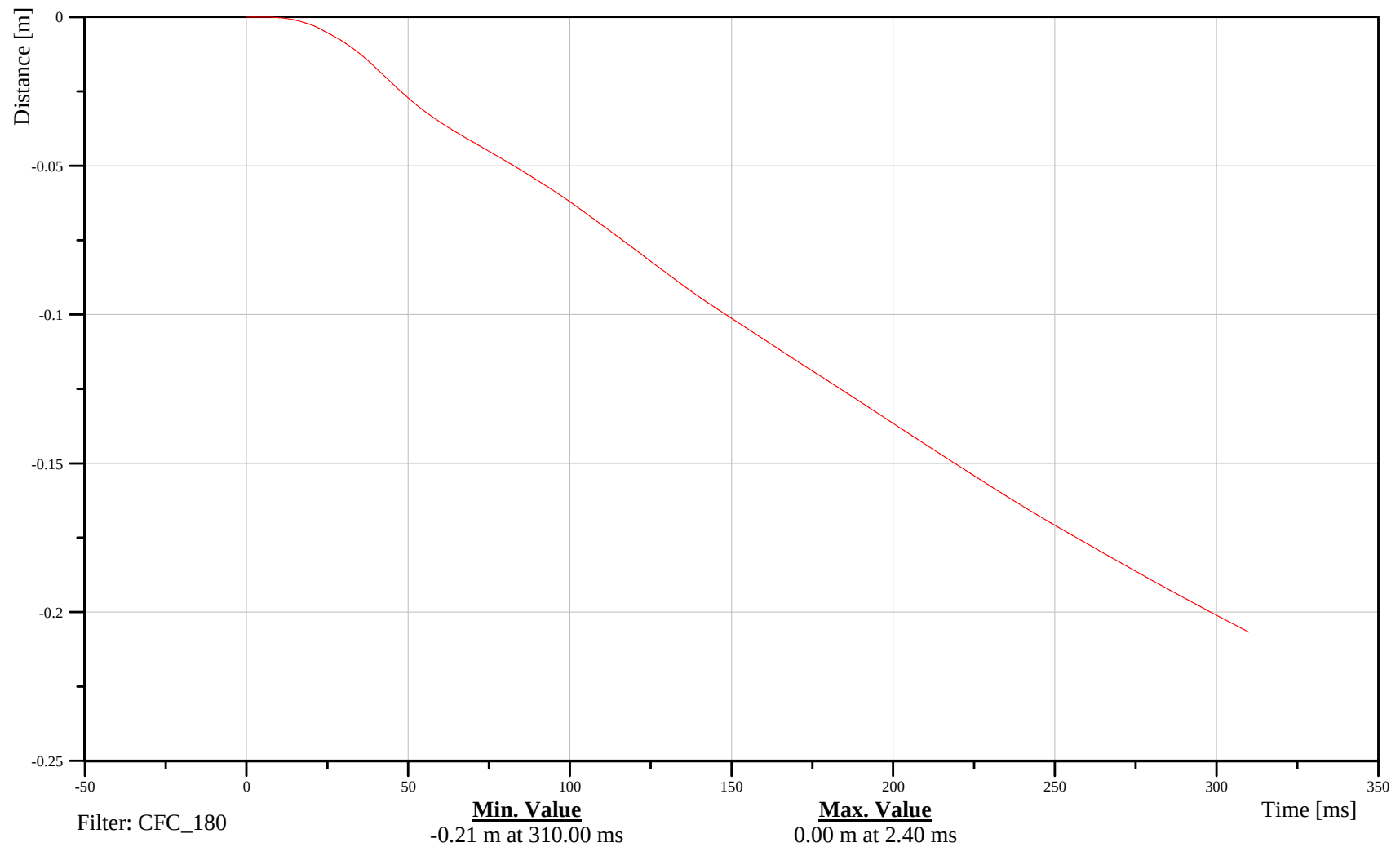
Right Side Sill at Front Seat X-Axis Displacement

Customer: VRTC

16SILBFR0000DCXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-4

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

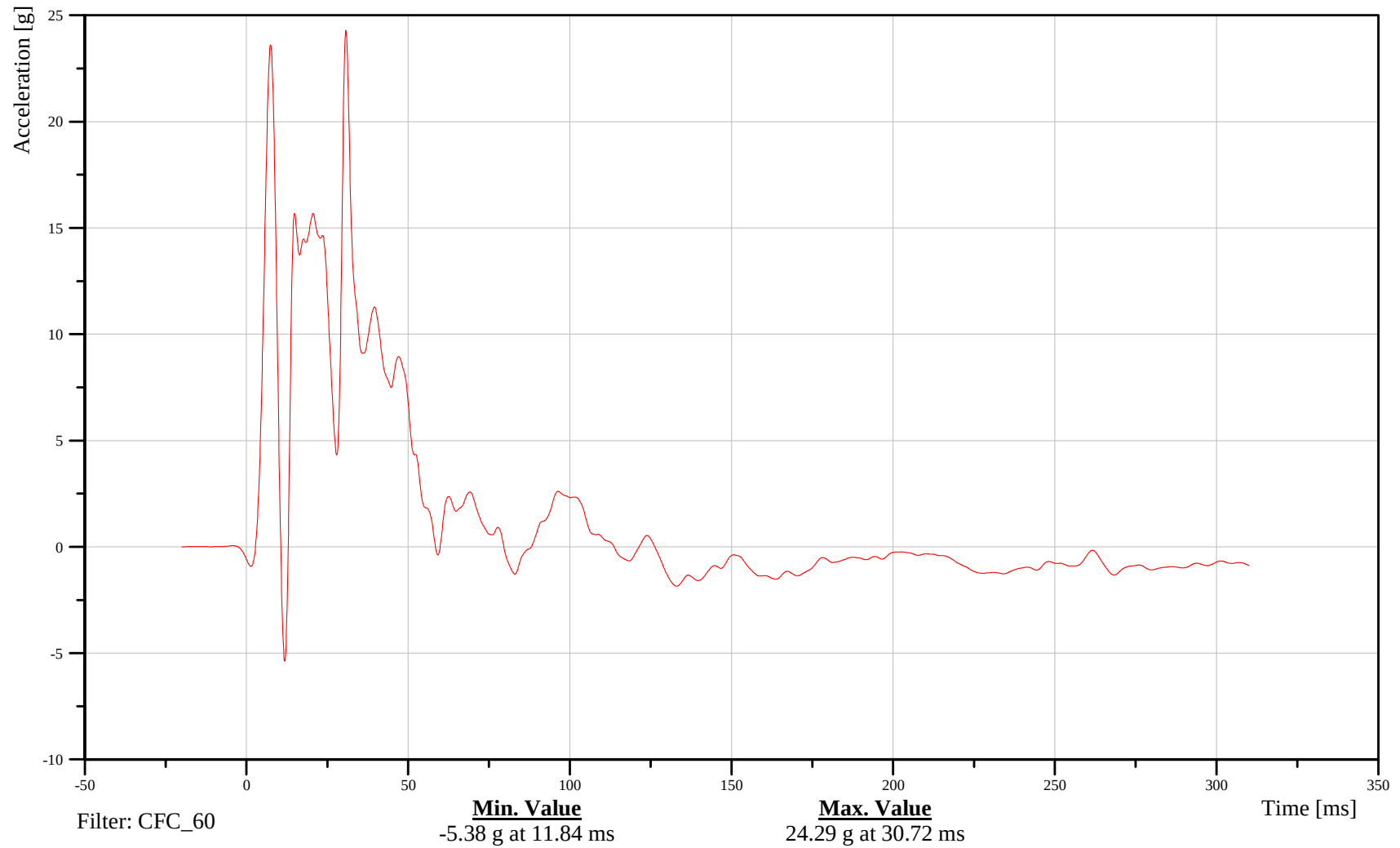
Right Side Sill at Front Seat Y-Axis Acceleration

Customer: VRTC

16SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-5

080729



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

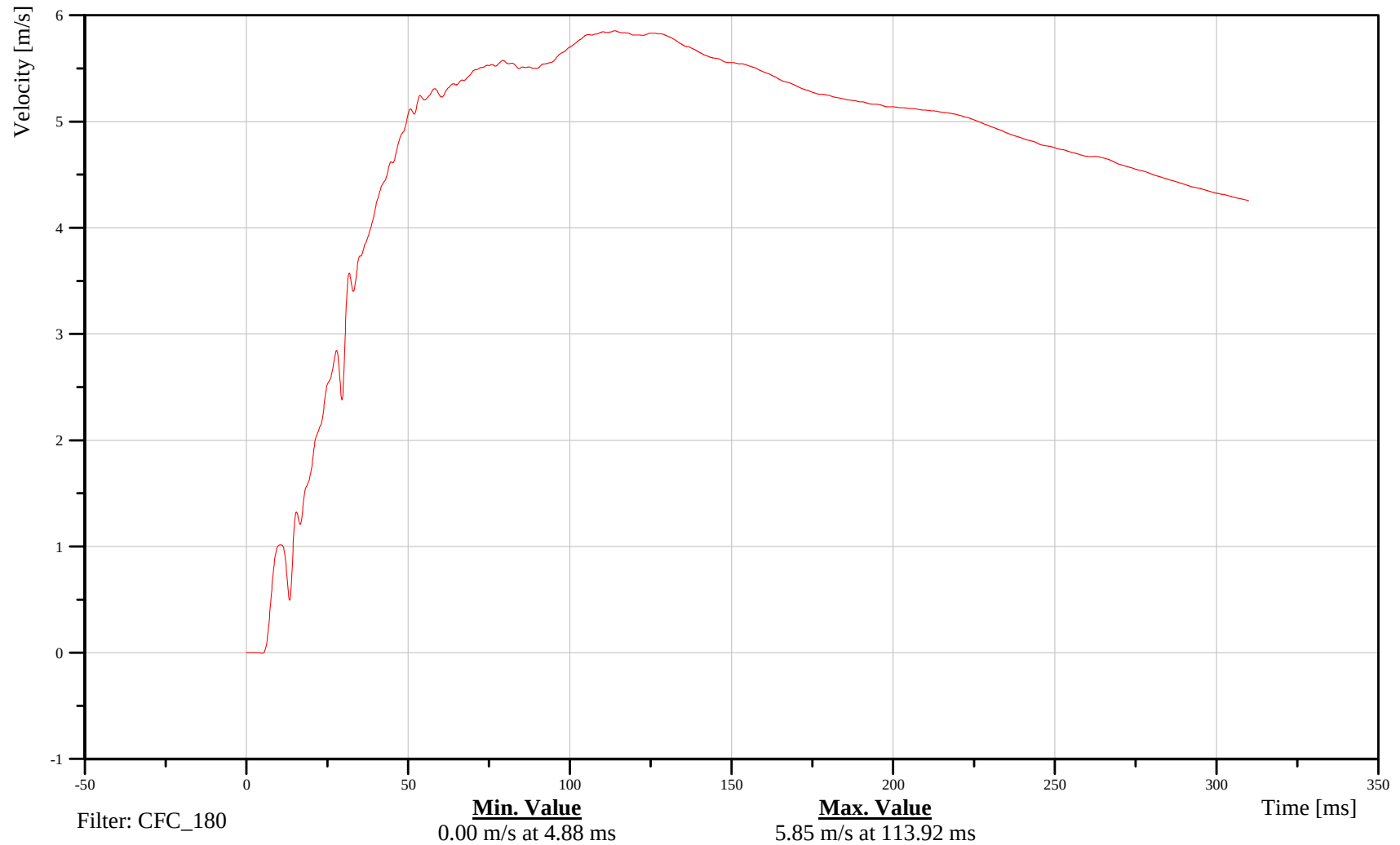
Date: 07/29/2008
Time: 14:50

Customer: VRTC

16SILBFR0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-6

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

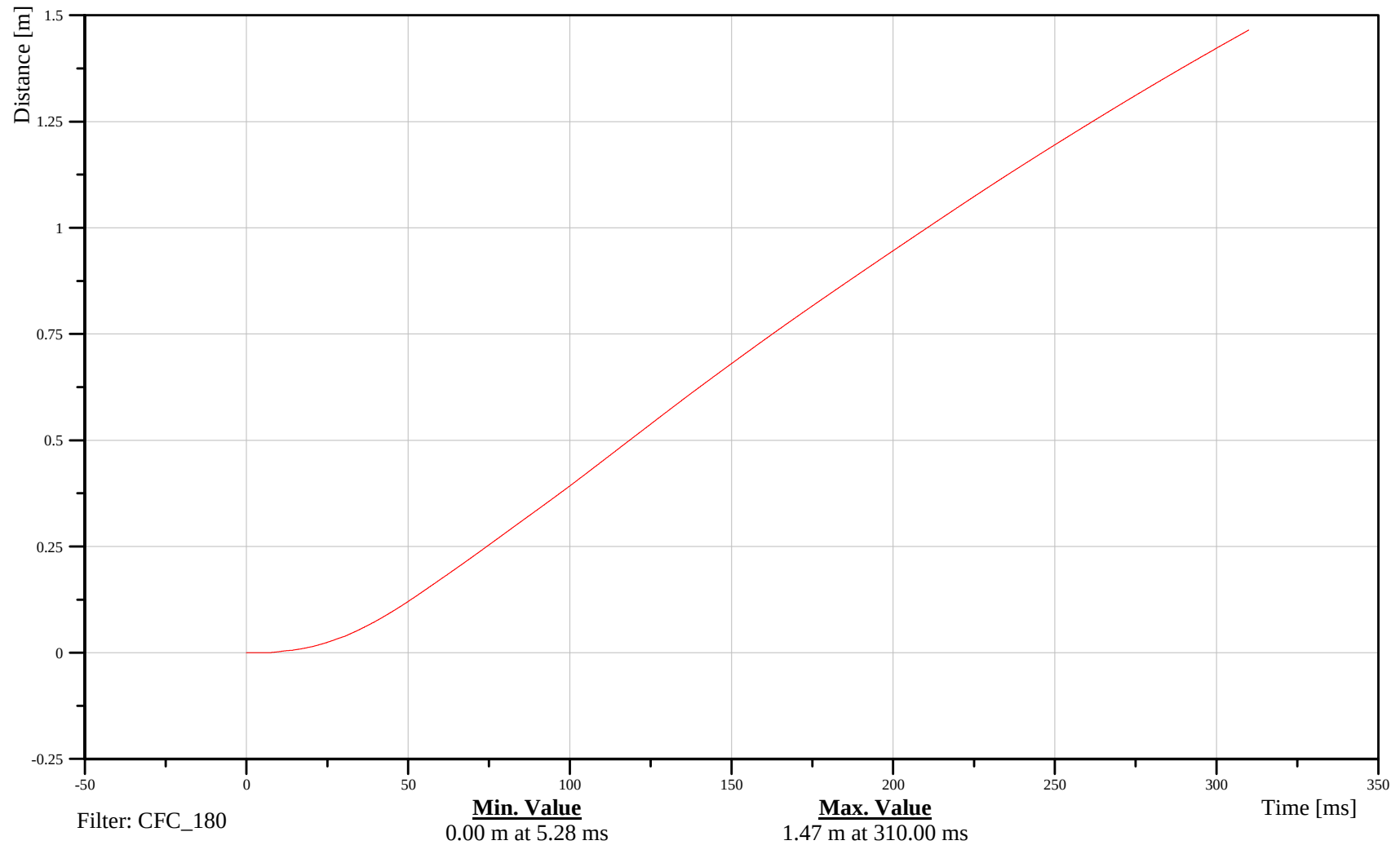
Right Side Sill at Front Seat Y-Axis Displacement

Customer: VRTC

16SILBFR0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-7

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

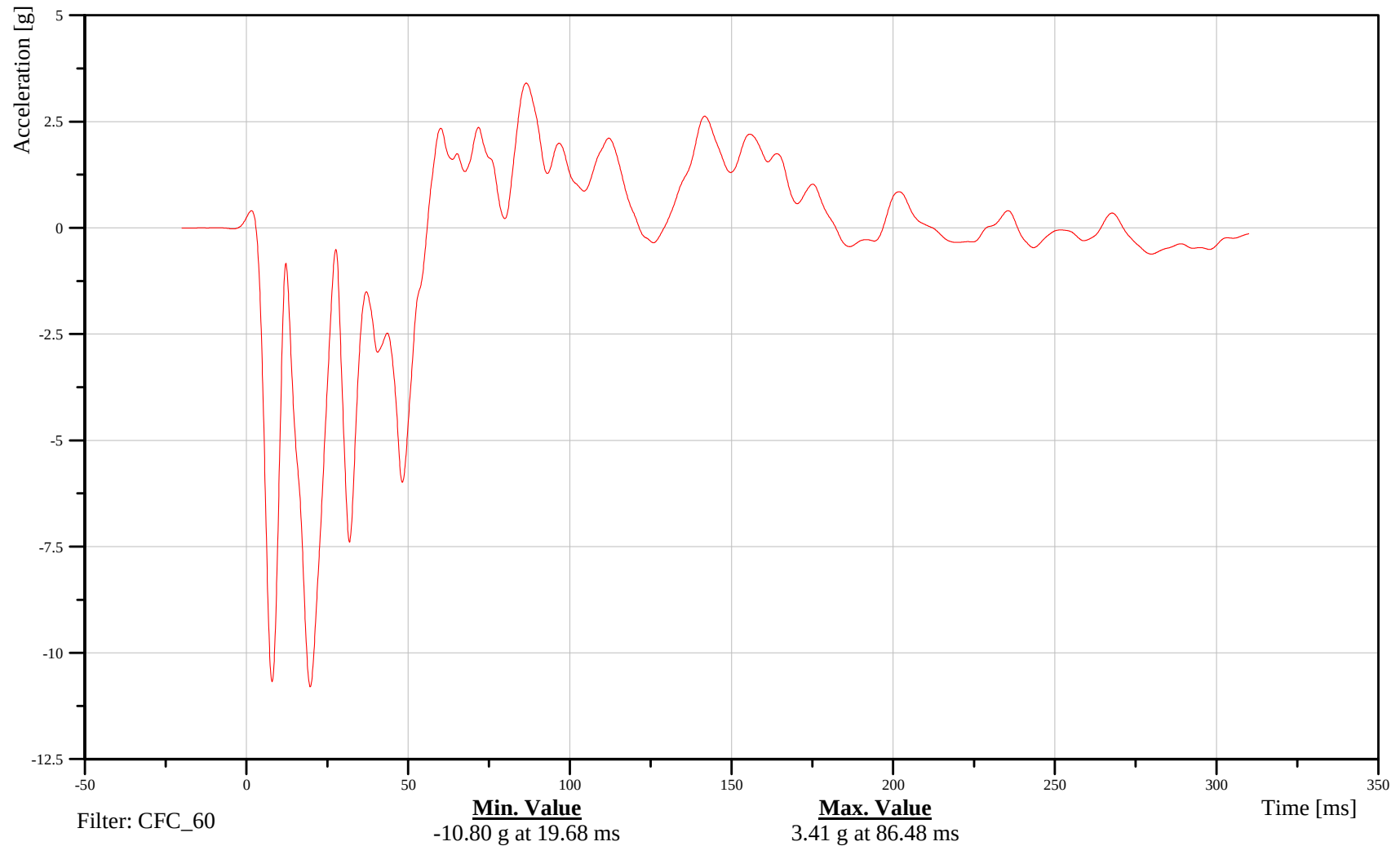
Right Side Sill at Front Seat Z-Axis Acceleration

Customer: VRTC

16SILBFR0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-8

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

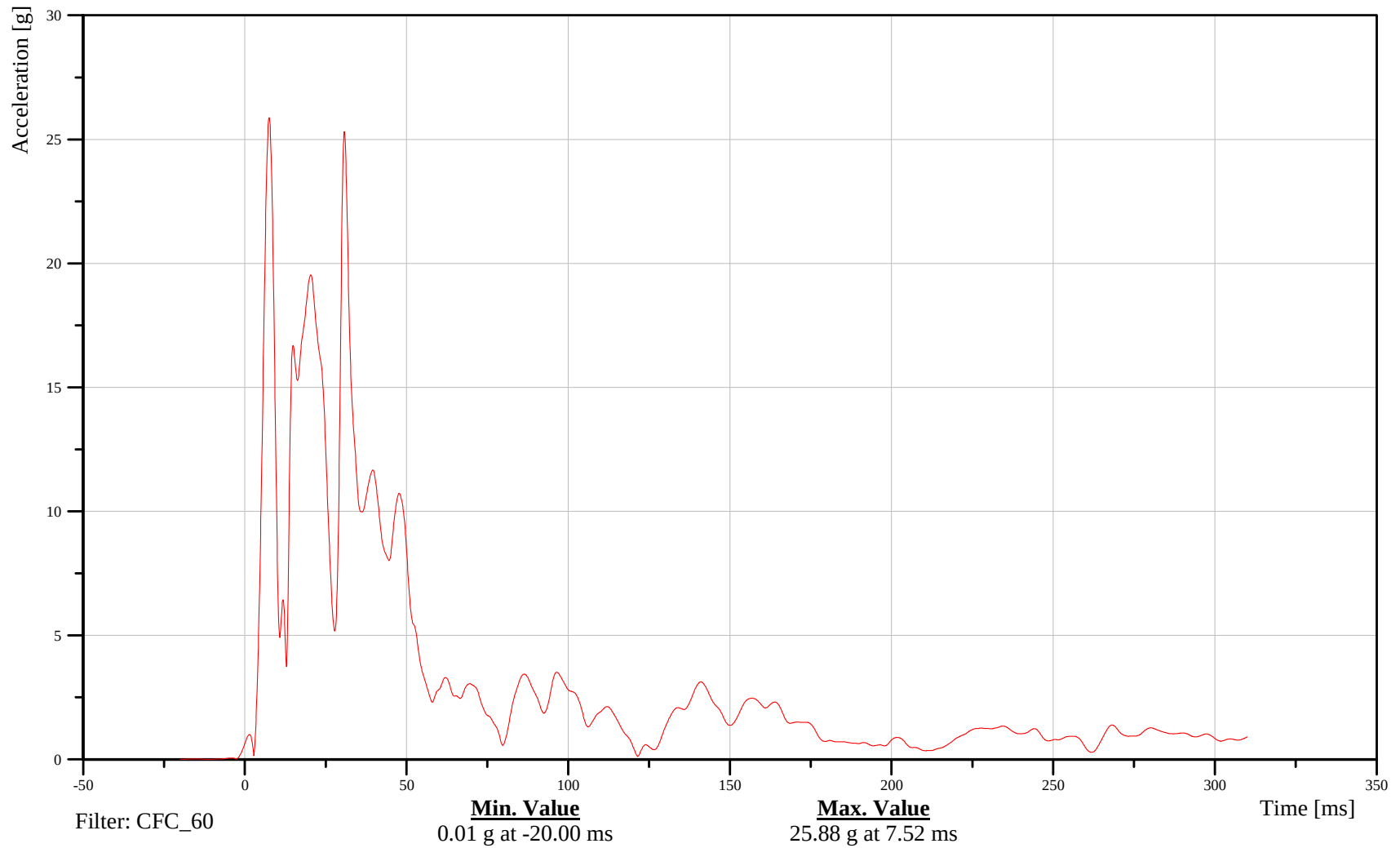
Right Side Sill at Front Seat Resultant Acceleration

Customer: VRTC

16SILBFR0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-9

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

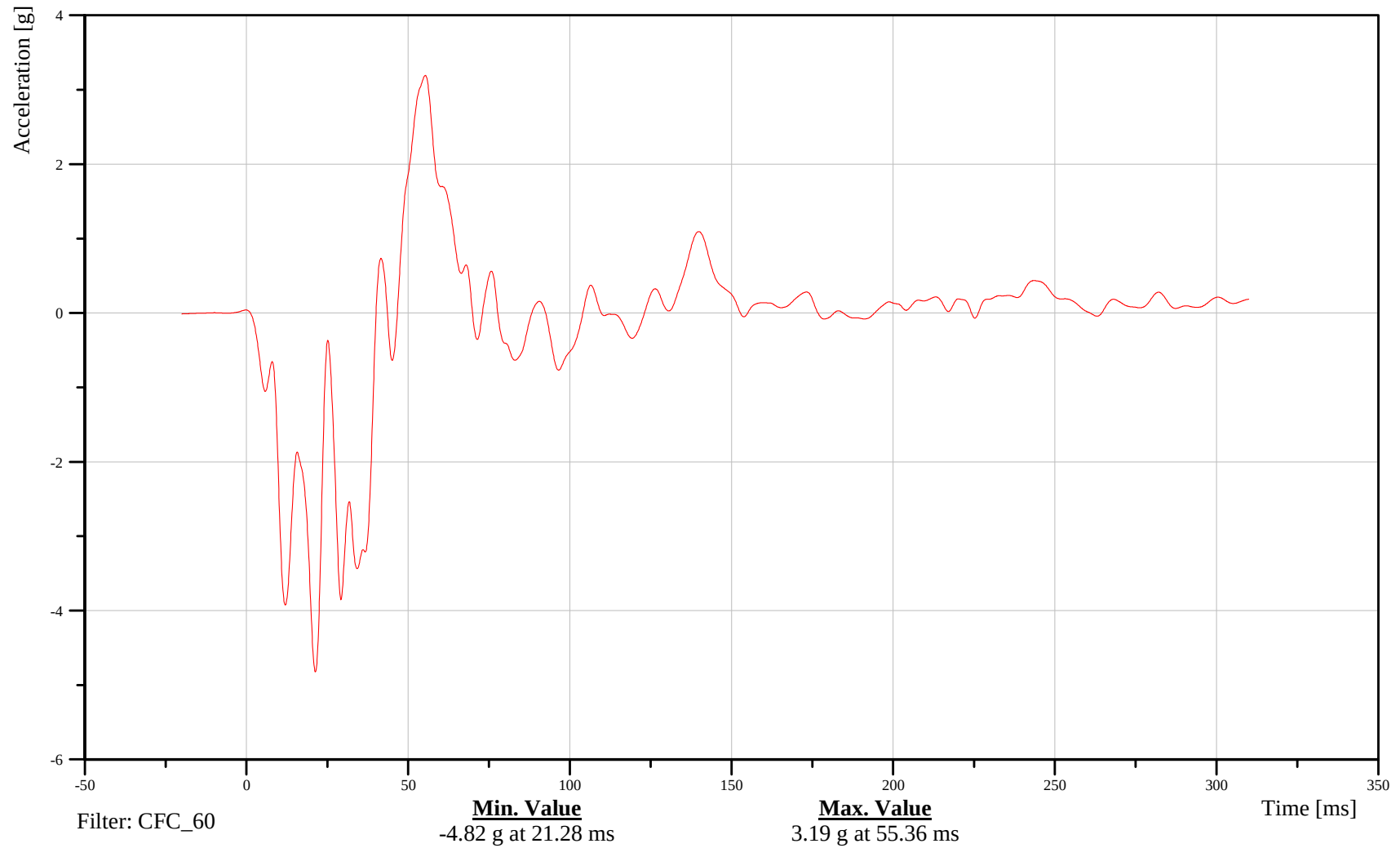
Right Side Sill at Rear Seat X-Axis Acceleration

Customer: VRTC

16SILBRE0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-10

080729



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

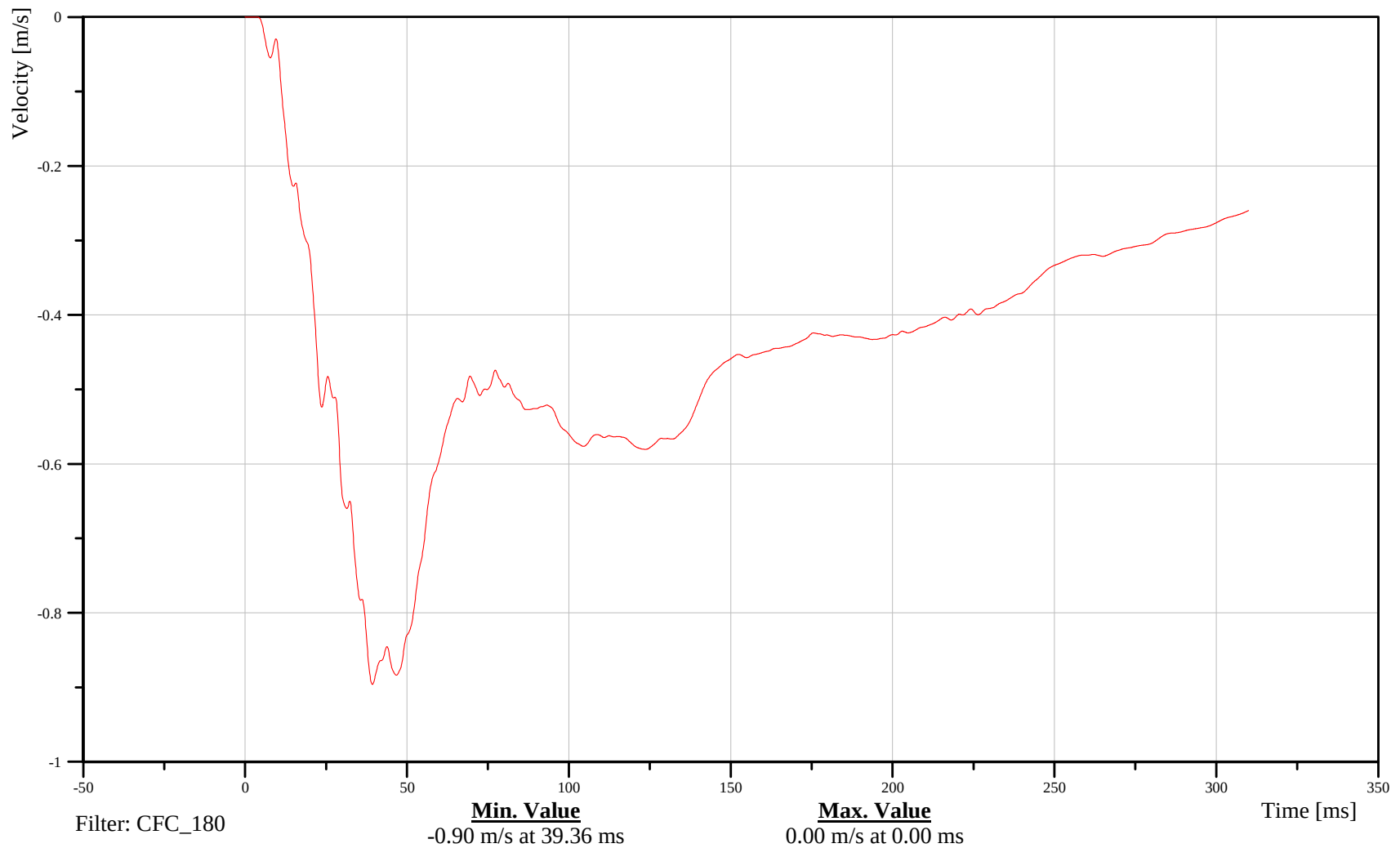
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Time: 14:50

Customer: VRTC

16SILBRE0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-11

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

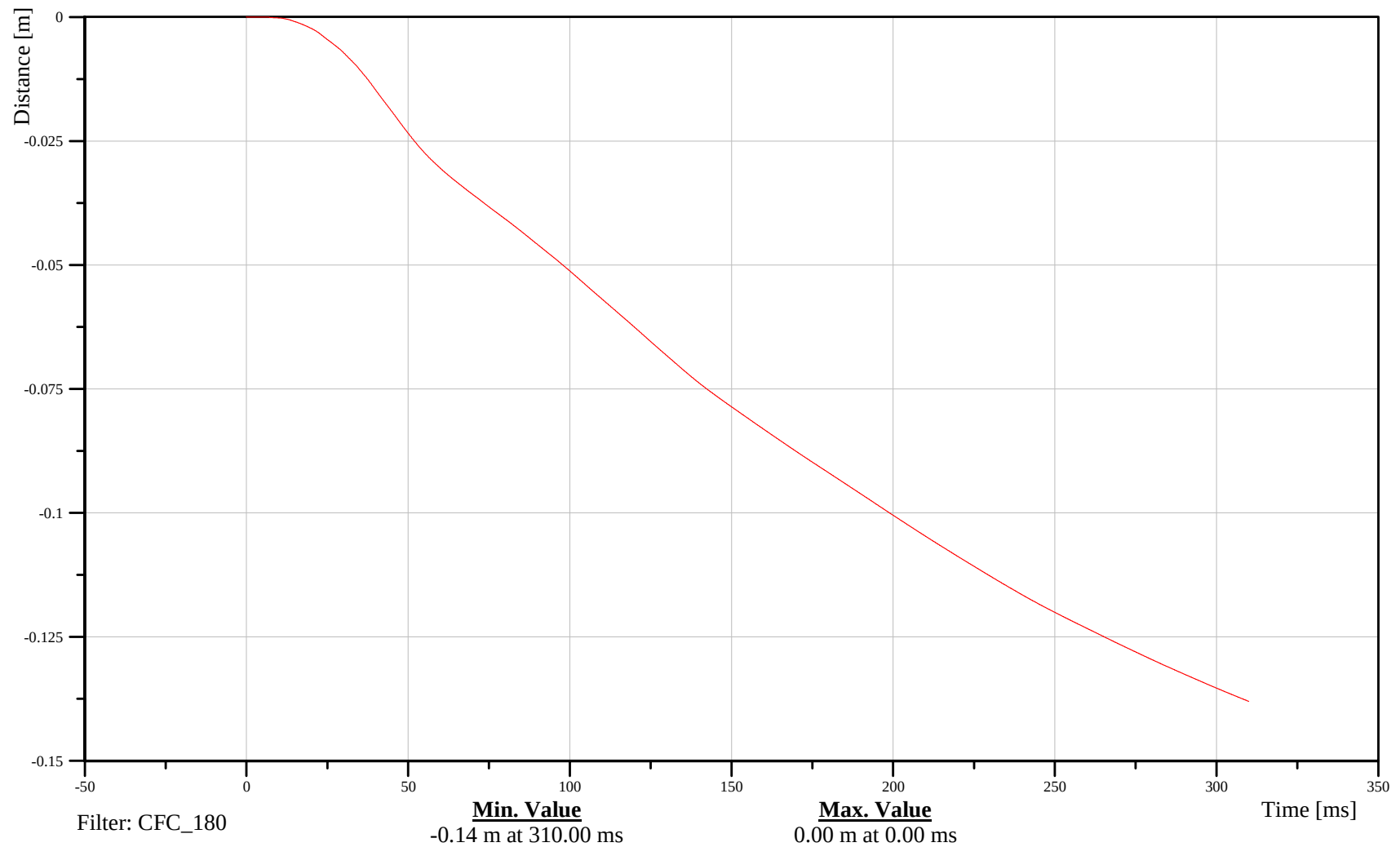
Right Side Sill at Rear Seat X-Axis Displacement

Customer: VRTC

16SILBRE0000DCXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-12

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

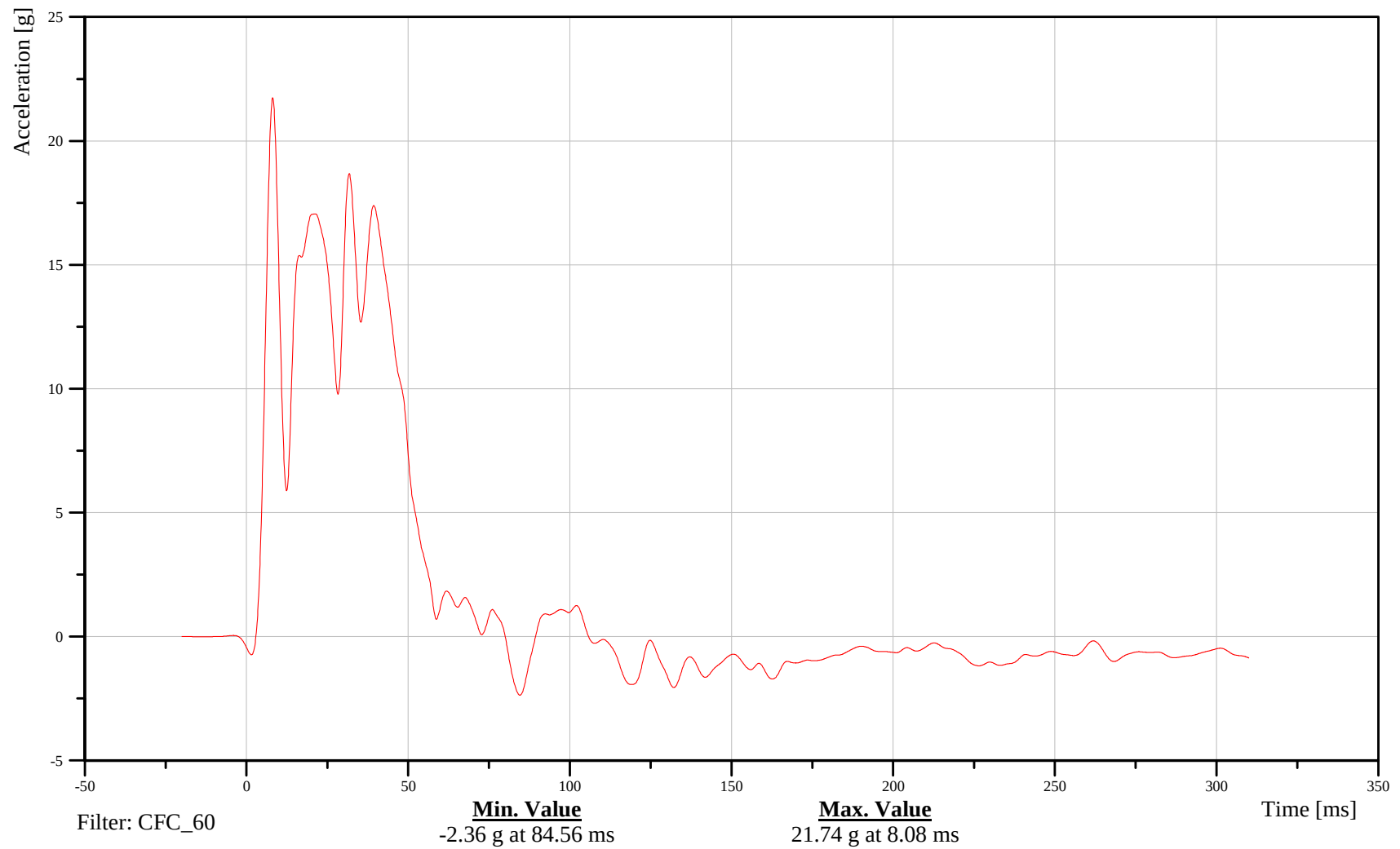
Right Side Sill at Rear Seat Y-Axis Acceleration

Customer: VRTC

16SILBRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-13

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

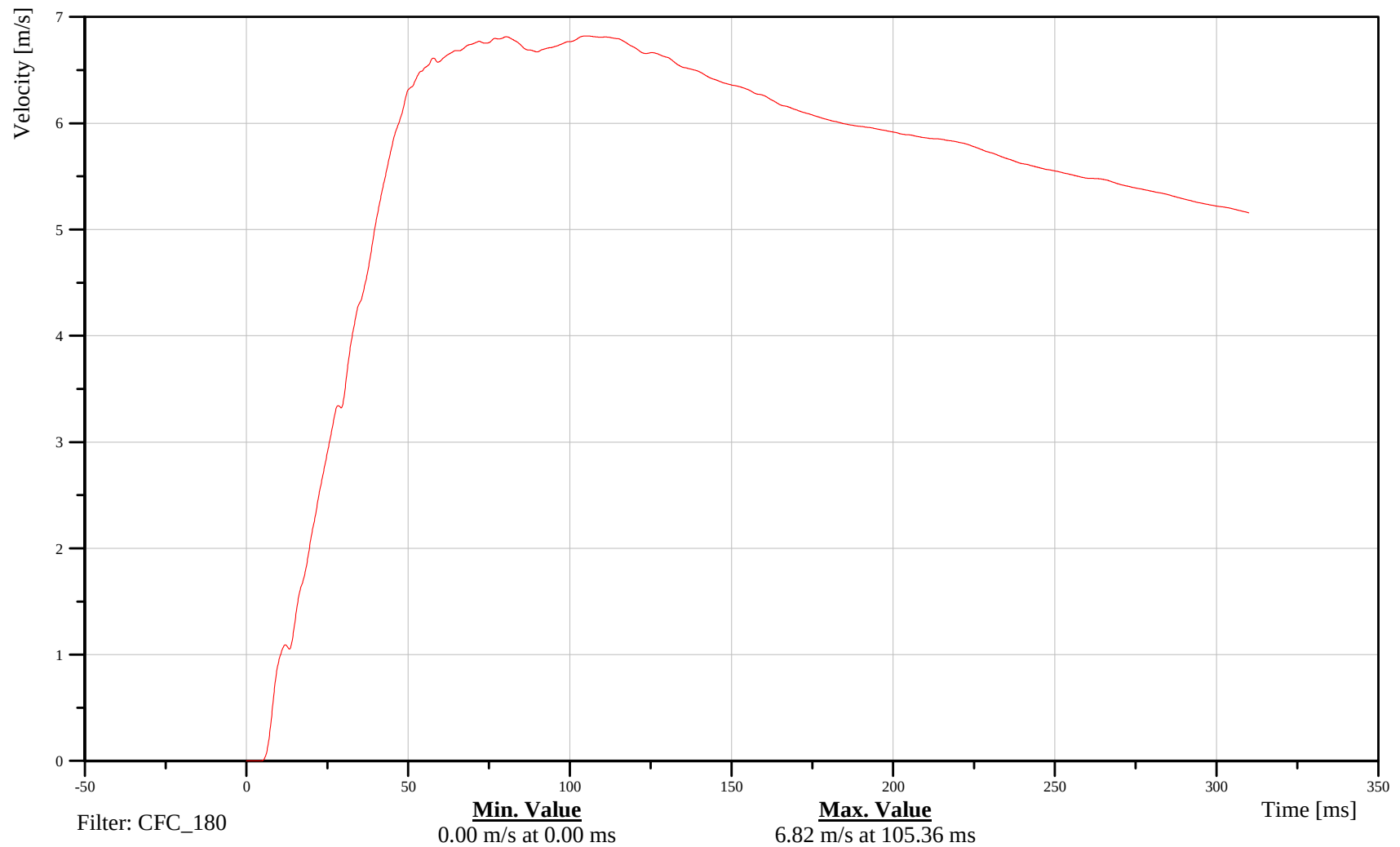
Right Side Sill at Rear Seat Y-Axis Velocity

Customer: VRTC

16SILBRE0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1





World SID Evaluation

Date: 07/29/2008
Time: 14:50

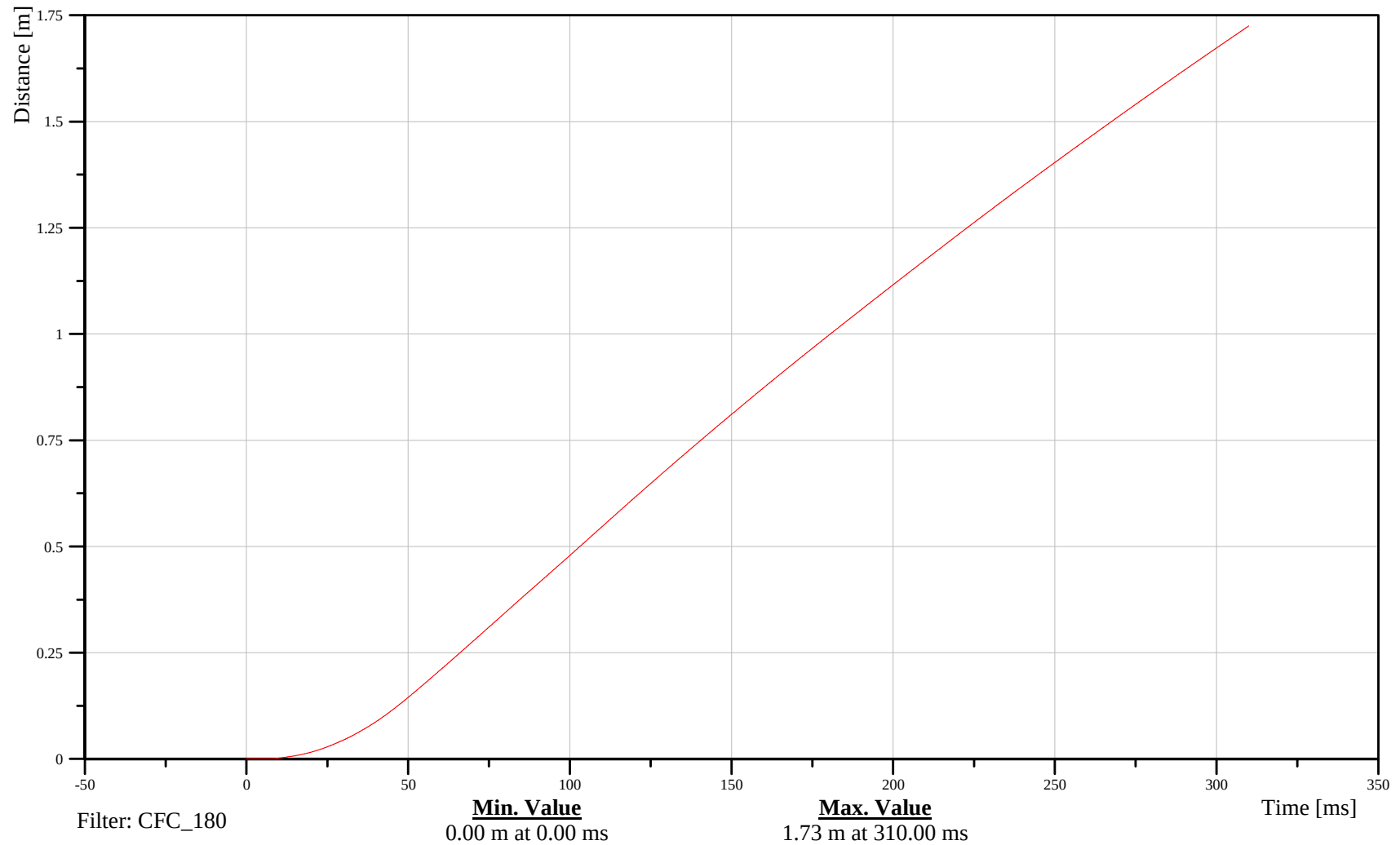
Right Side Sill at Rear Seat Y-Axis Displacement

Customer: VRTC

16SILBRE0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-15

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

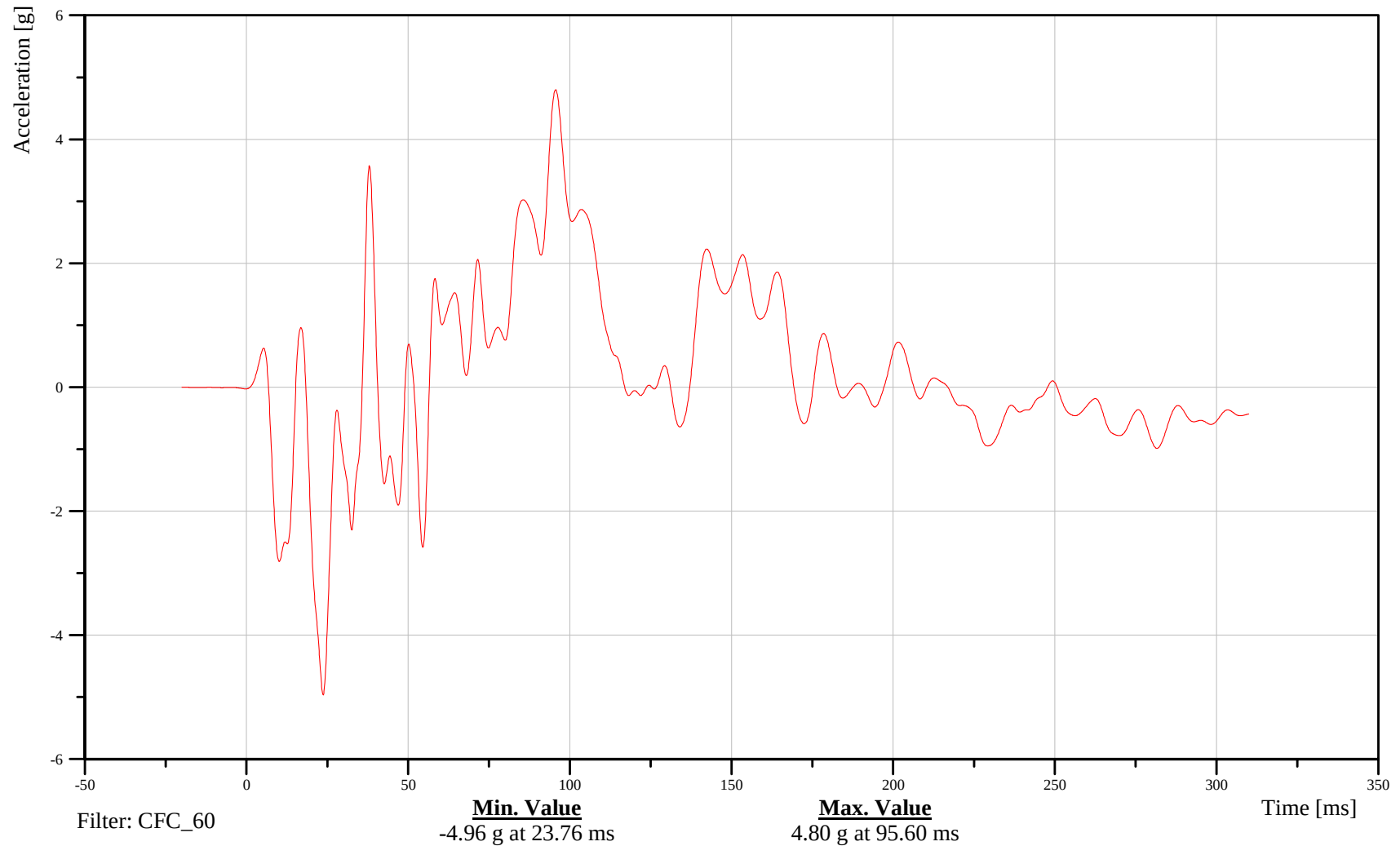
Right Side Sill at Rear Seat Z-Axis Acceleration

Customer: VRTC

16SILBRE0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-16

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

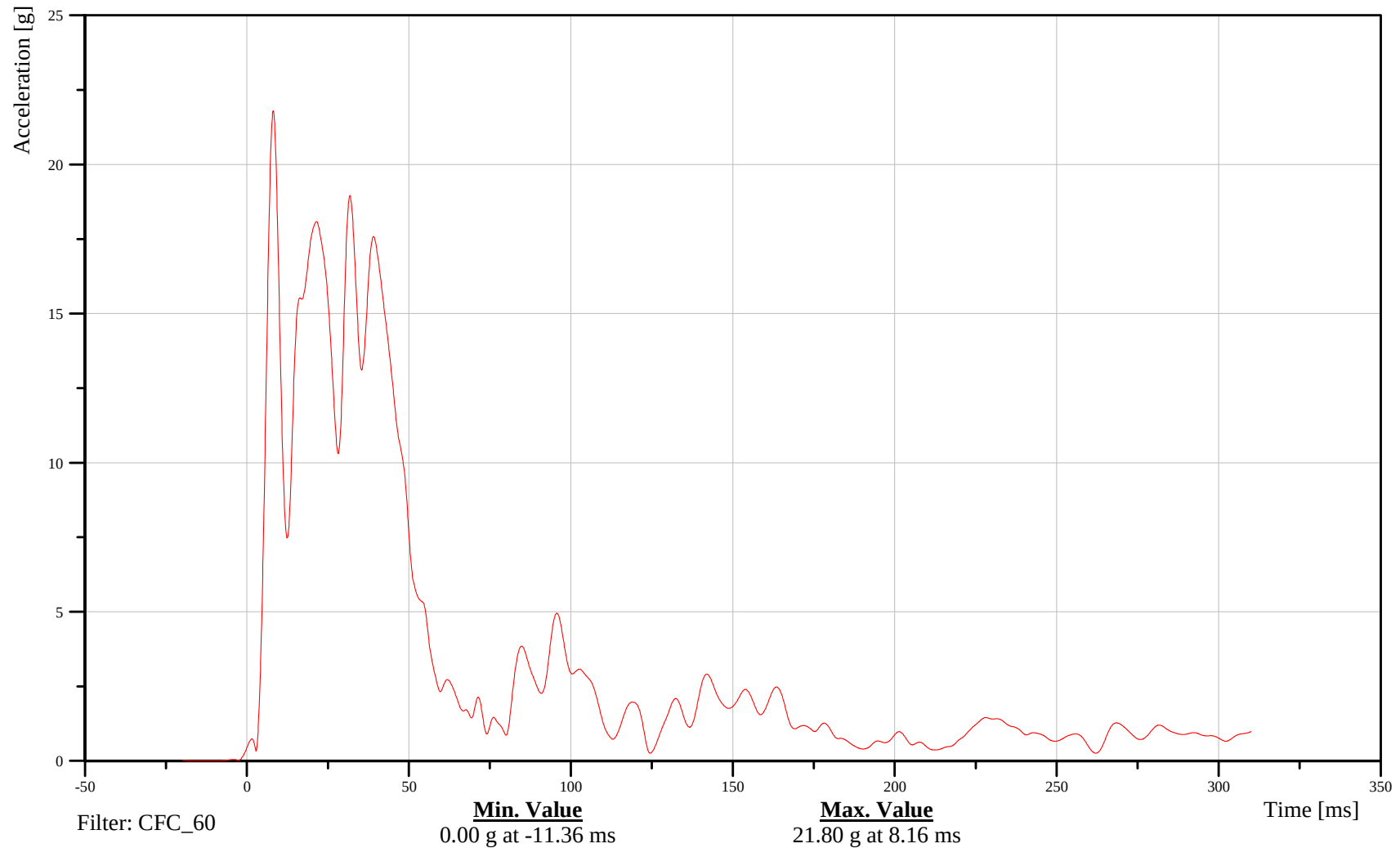
Right Side Sill at Rear Seat Resultant Acceleration

Customer: VRTC

16SILBRE0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-17

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

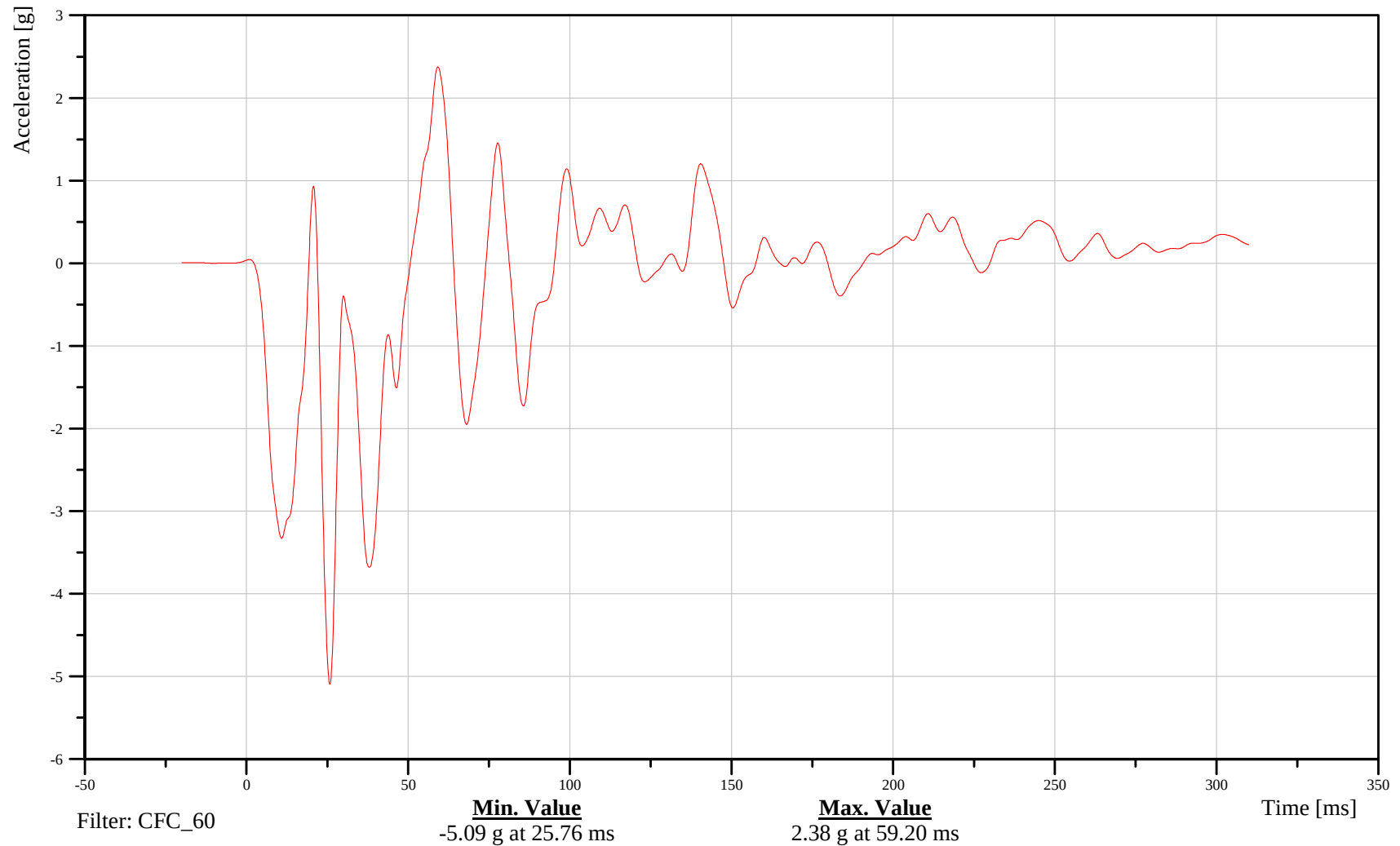
Rear Floorpan Above Axle X-Axis Acceleration

Customer: VRTC

18FORA000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-18

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

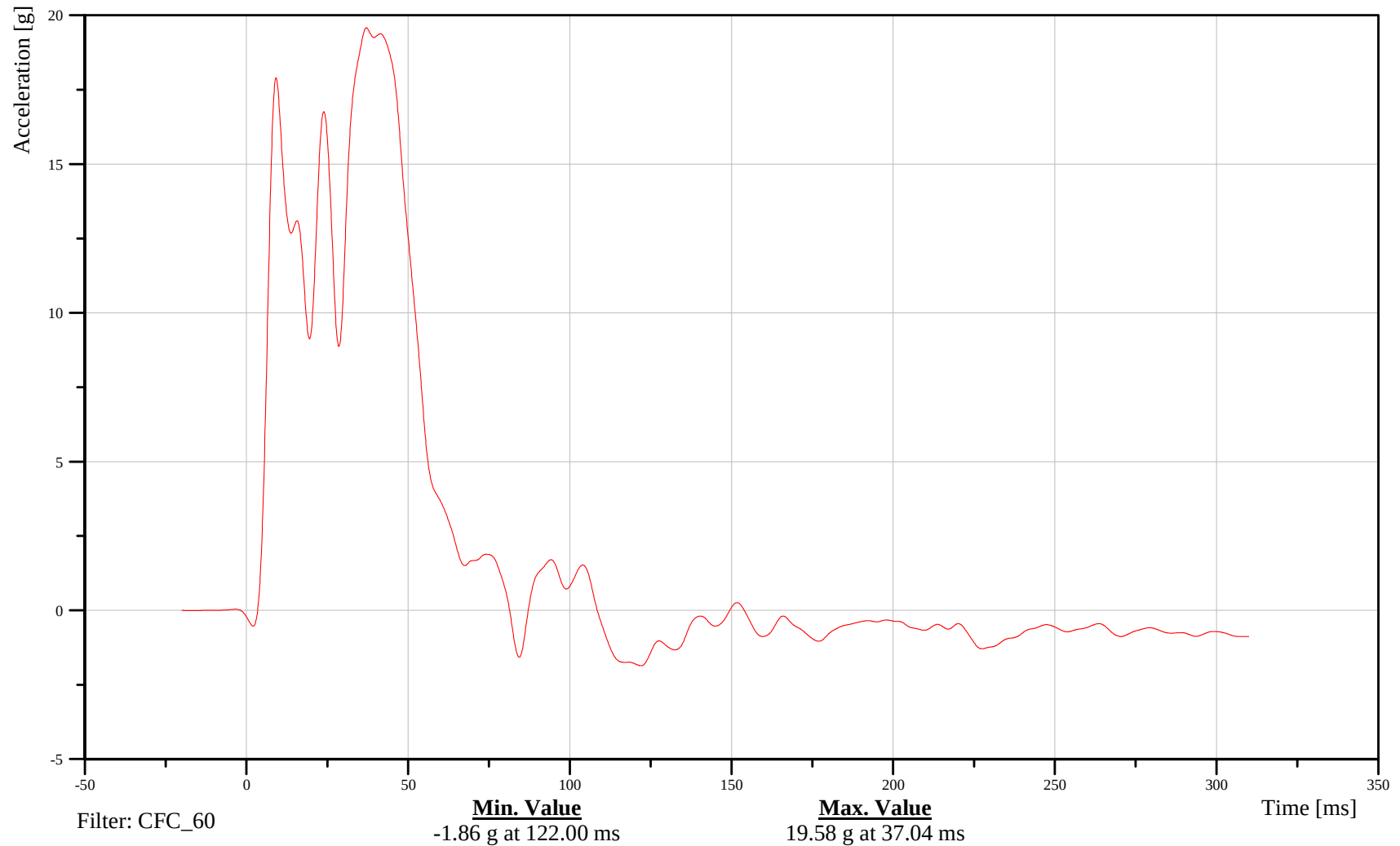
Rear Floorpan Above Axle Y-Axis Acceleration

Customer: VRTC

18FORA000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-19

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

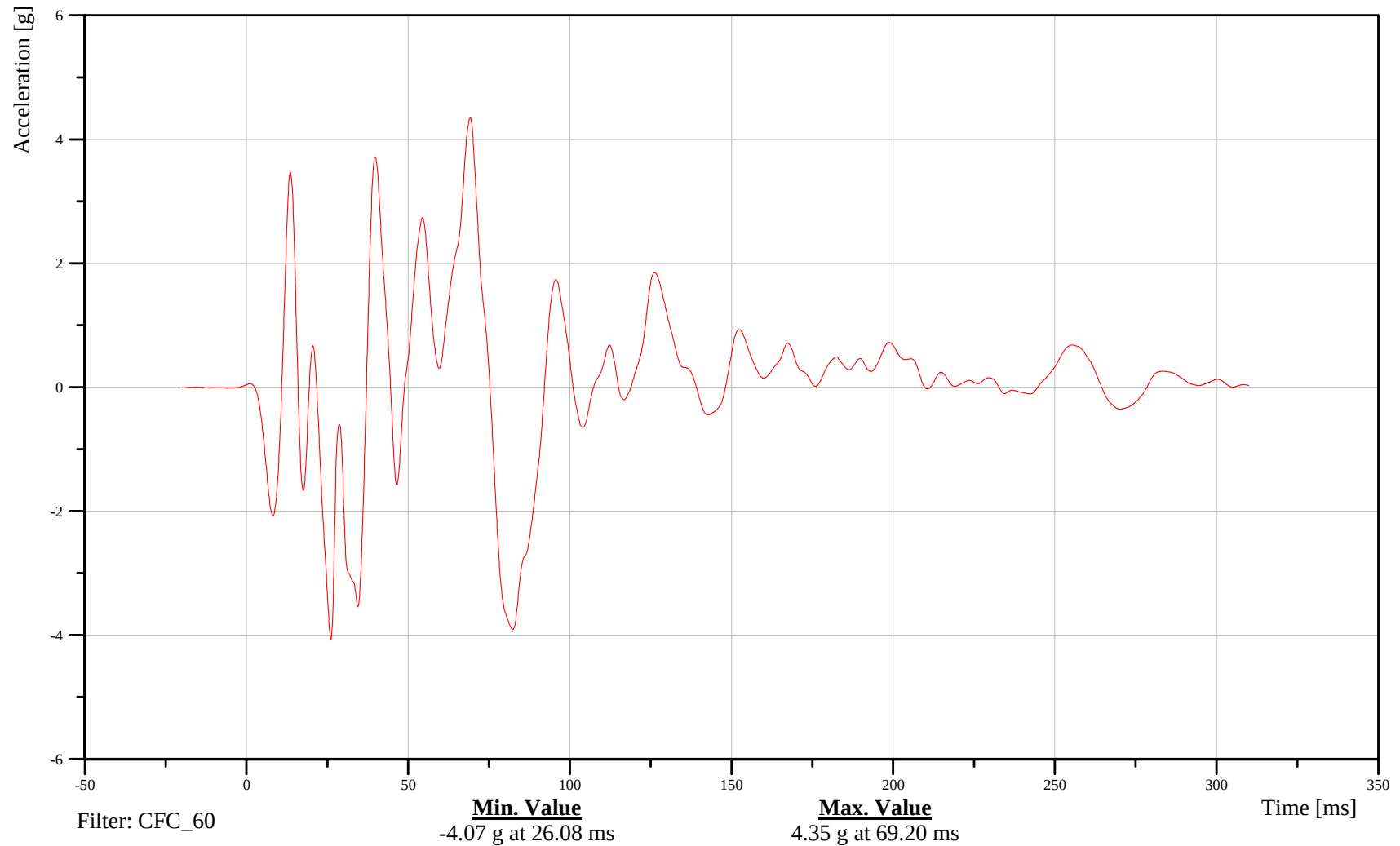
Rear Floorpan Above Axle Z-Axis Acceleration

Customer: VRTC

18FORA000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-20

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

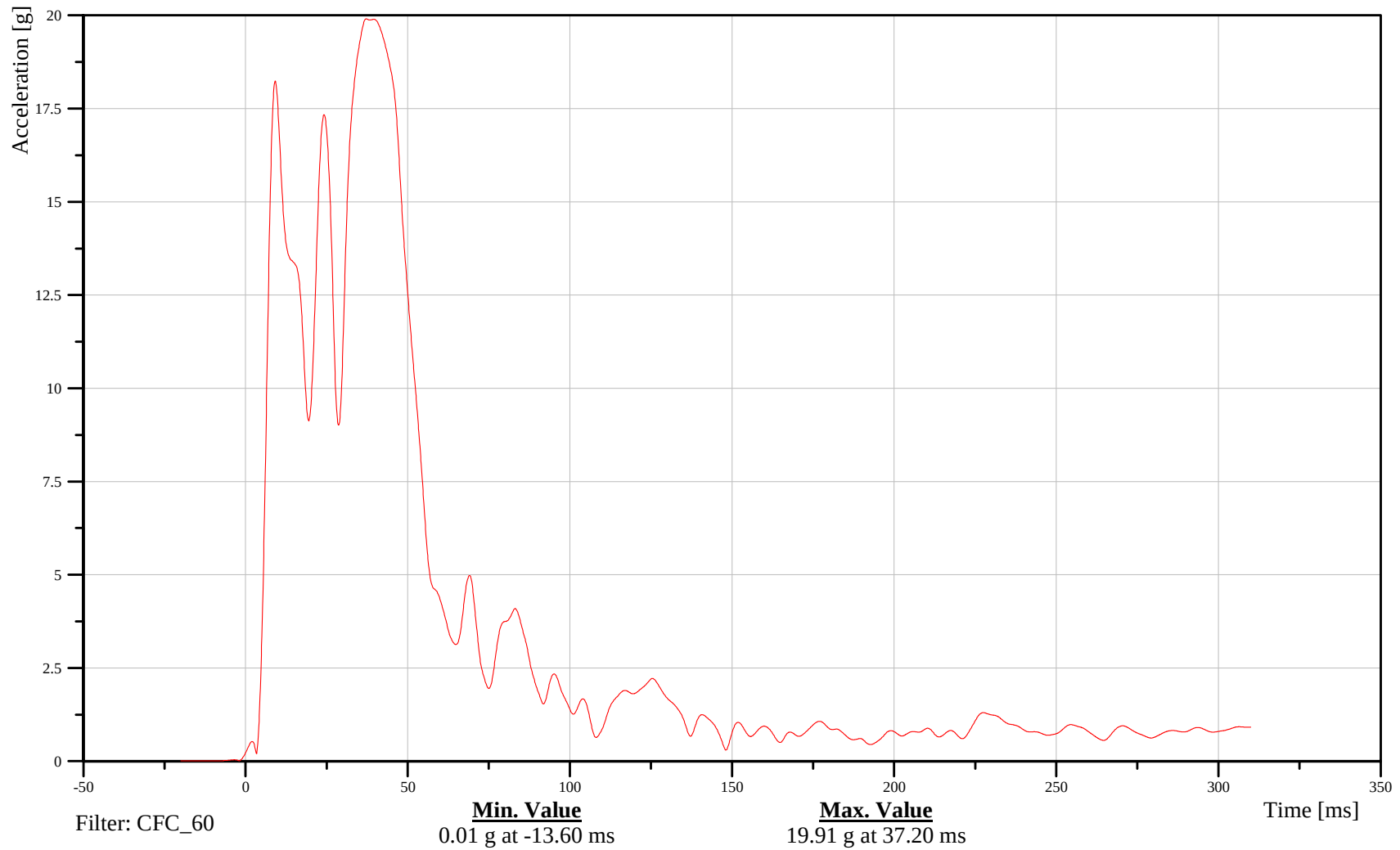
Rear Floorpan Above Axle Resultant Acceleration

Customer: VRTC

18FORA000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-21

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

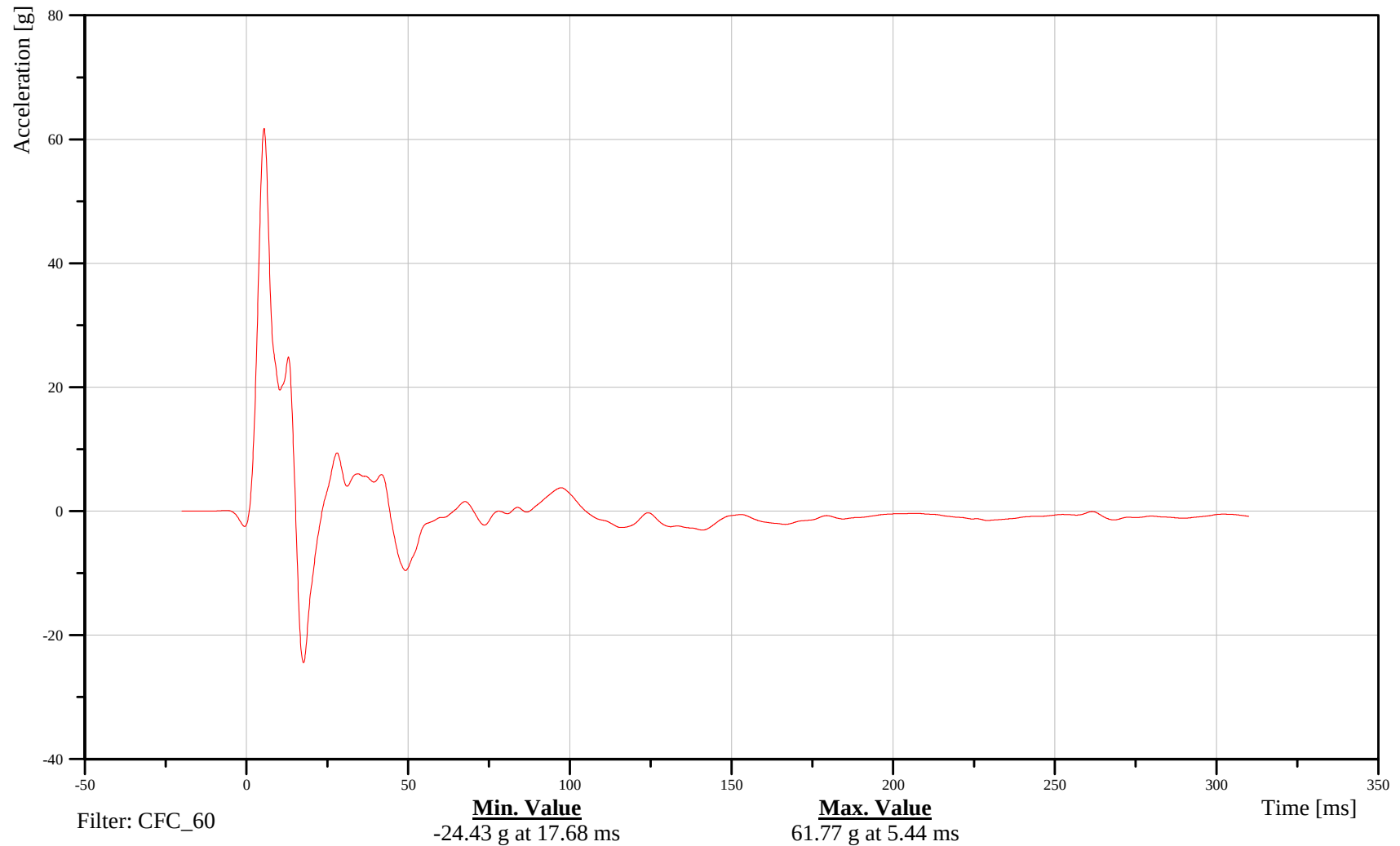
Left Floor Sill at Front Seat Y-Axis Acceleration

Customer: VRTC

14SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-22

080729



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

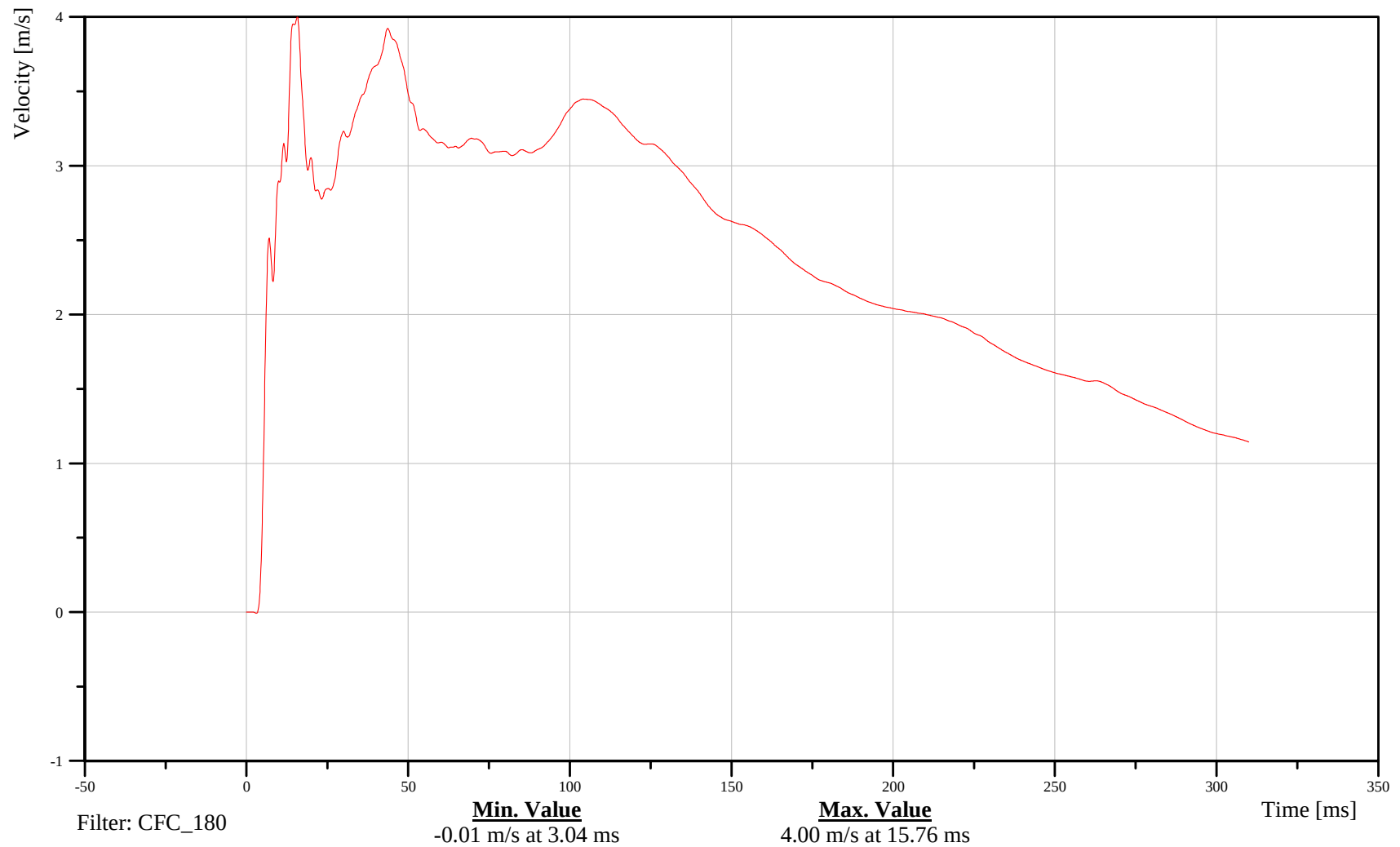
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SILBFR0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-23

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

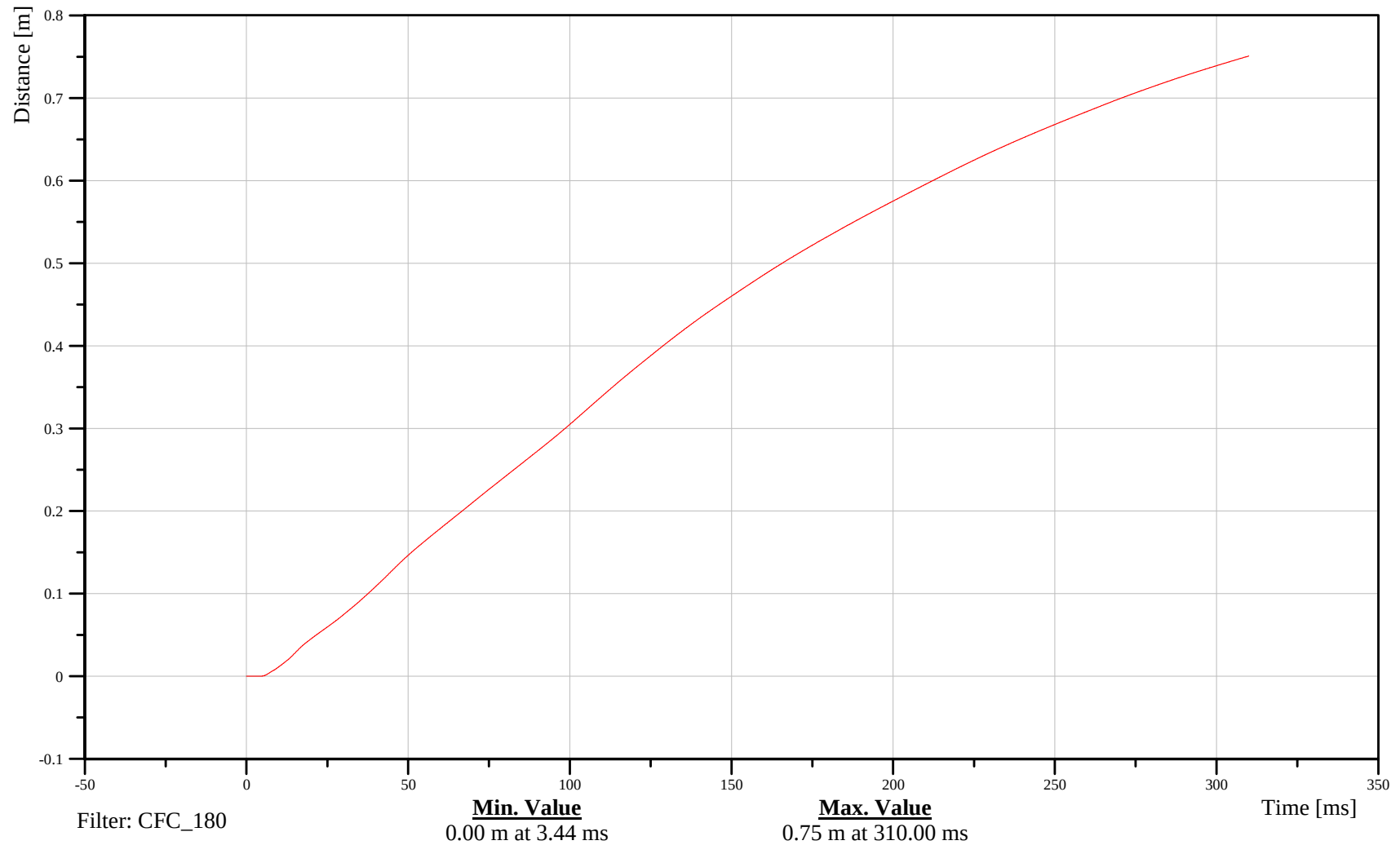
Left Floor Sill at Front Seat Y-Axis Displacement

Customer: VRTC

14SILBFR0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-24

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

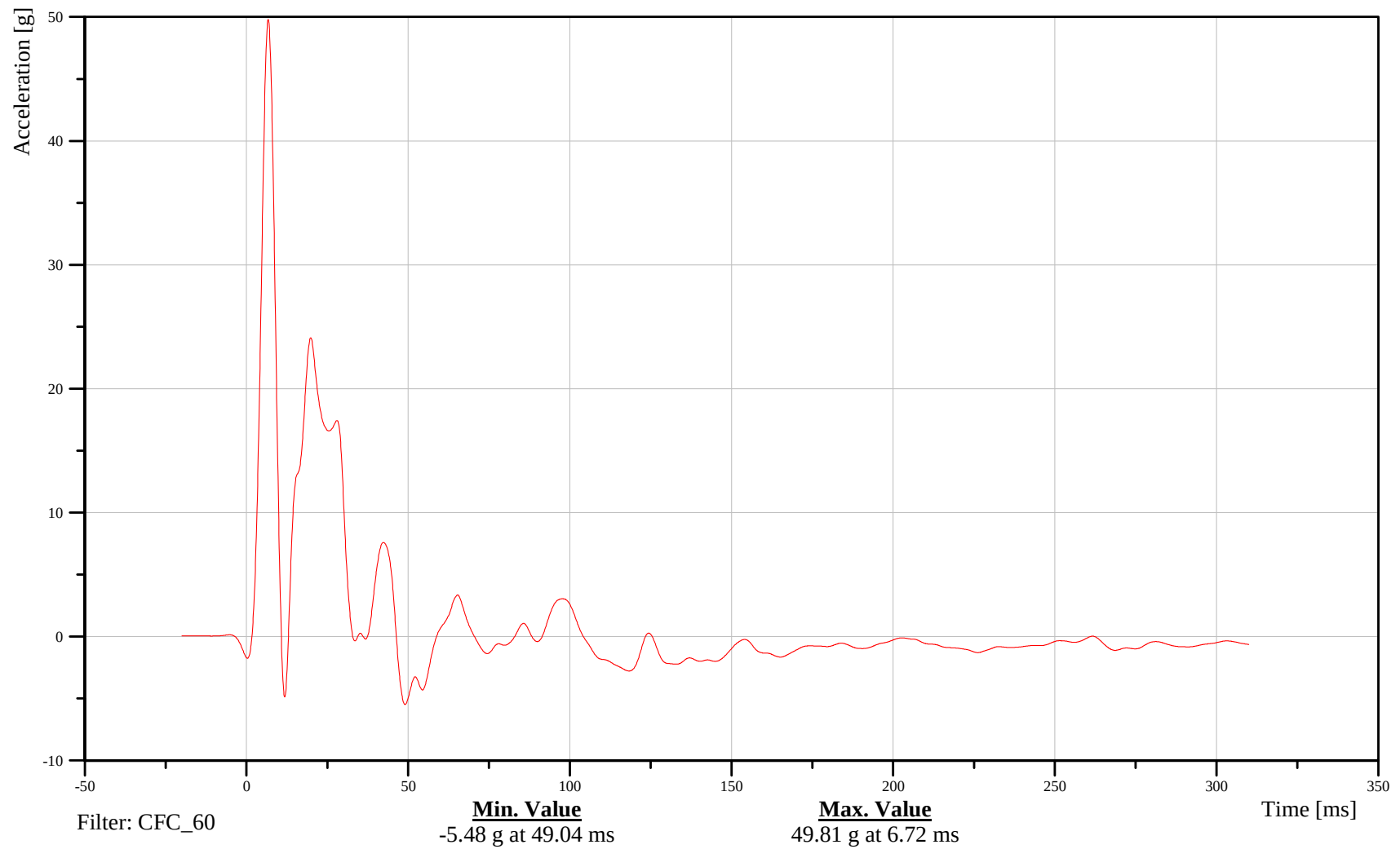
Left Floor Sill at Rear Seat Y-Axis Acceleration

Customer: VRTC

14SILBRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-25

080729



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

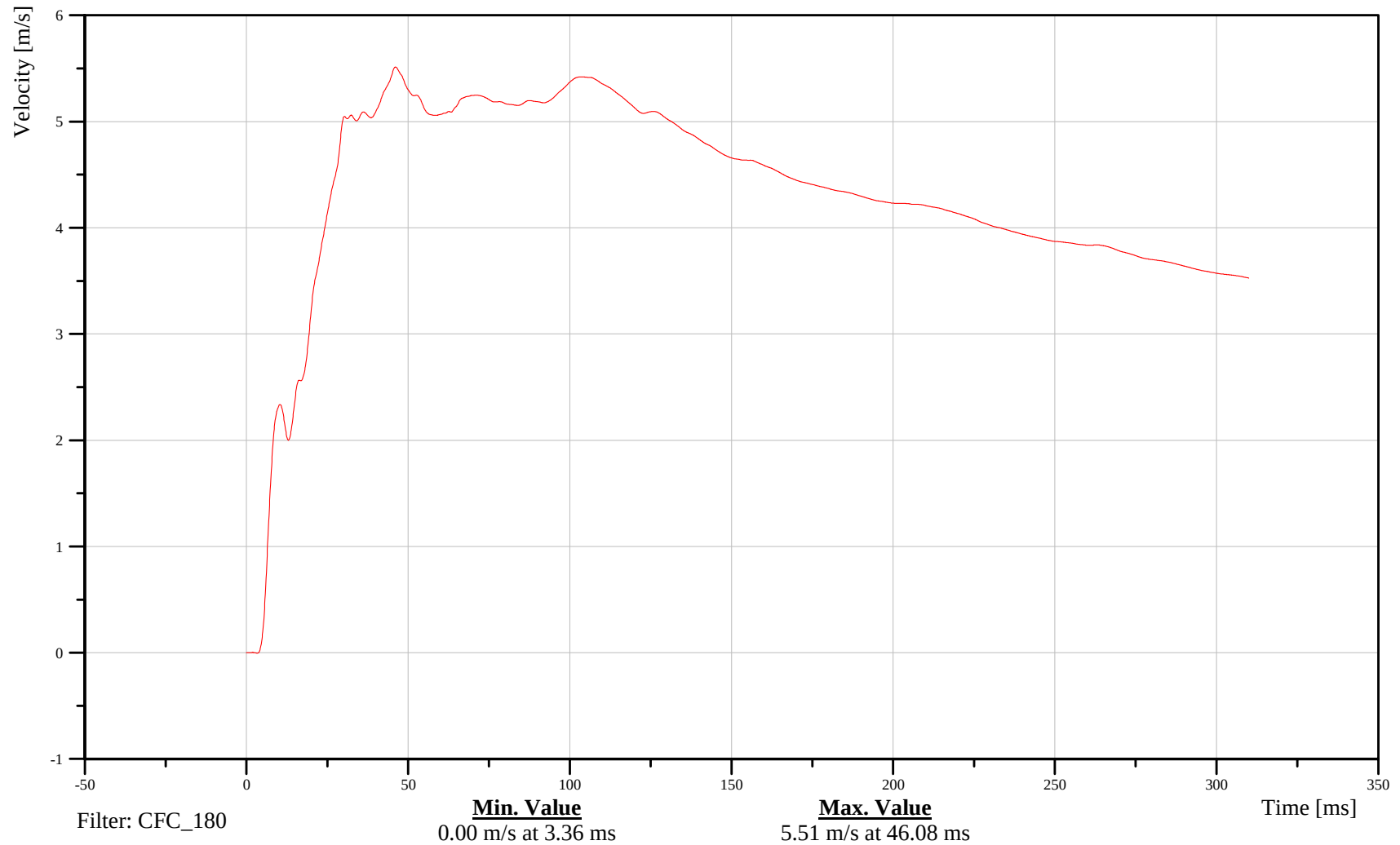
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SILBRE0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1





World SID Evaluation

Date: 07/29/2008
Time: 14:50

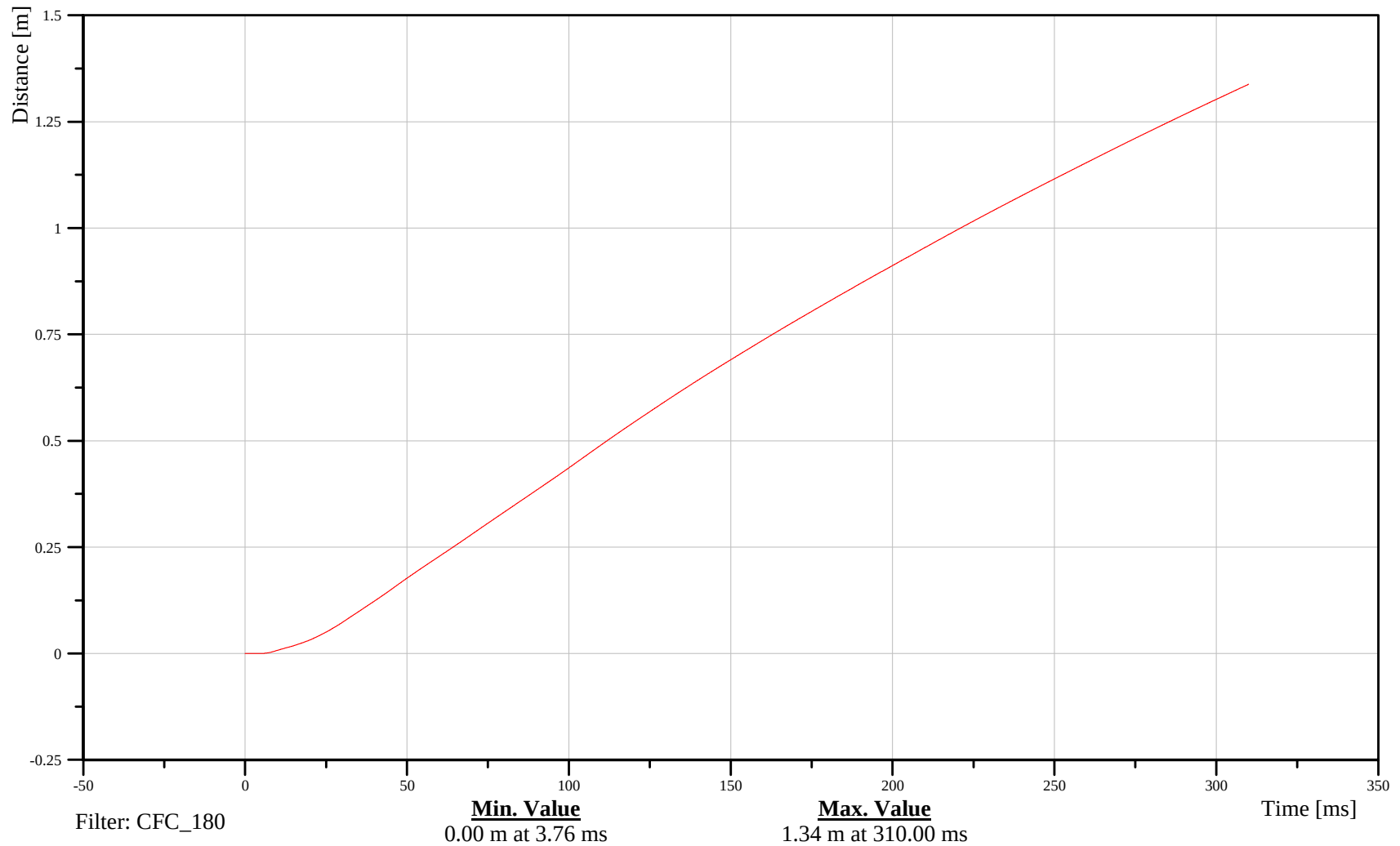
Left Floor Sill at Rear Seat Y-Axis Displacement

Customer: VRTC

14SILBRE0000DCYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-27

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

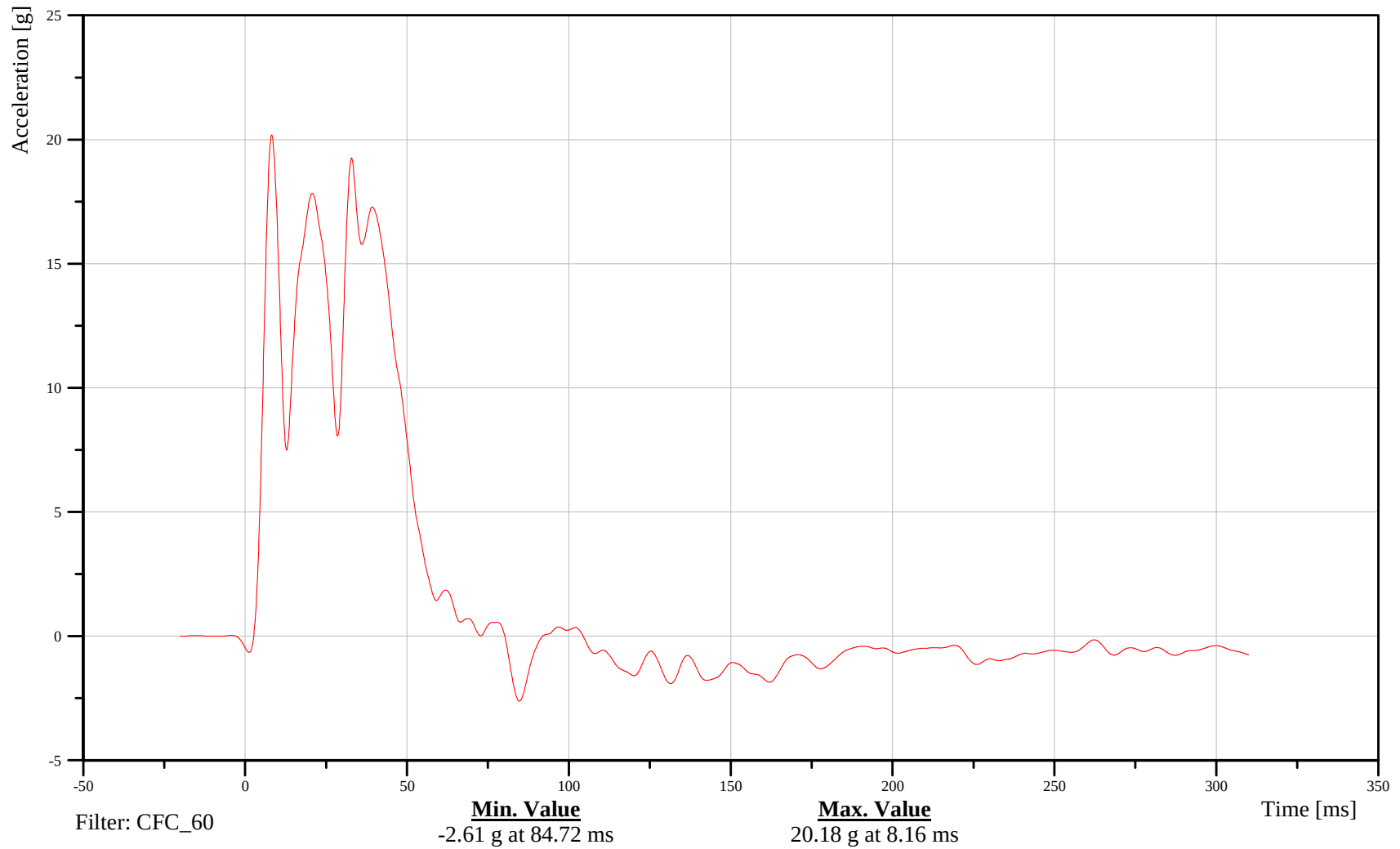
Right Rear Occupant Compartment Y-Axis Acceleration

Customer: VRTC

16VEHCRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-28

080729



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

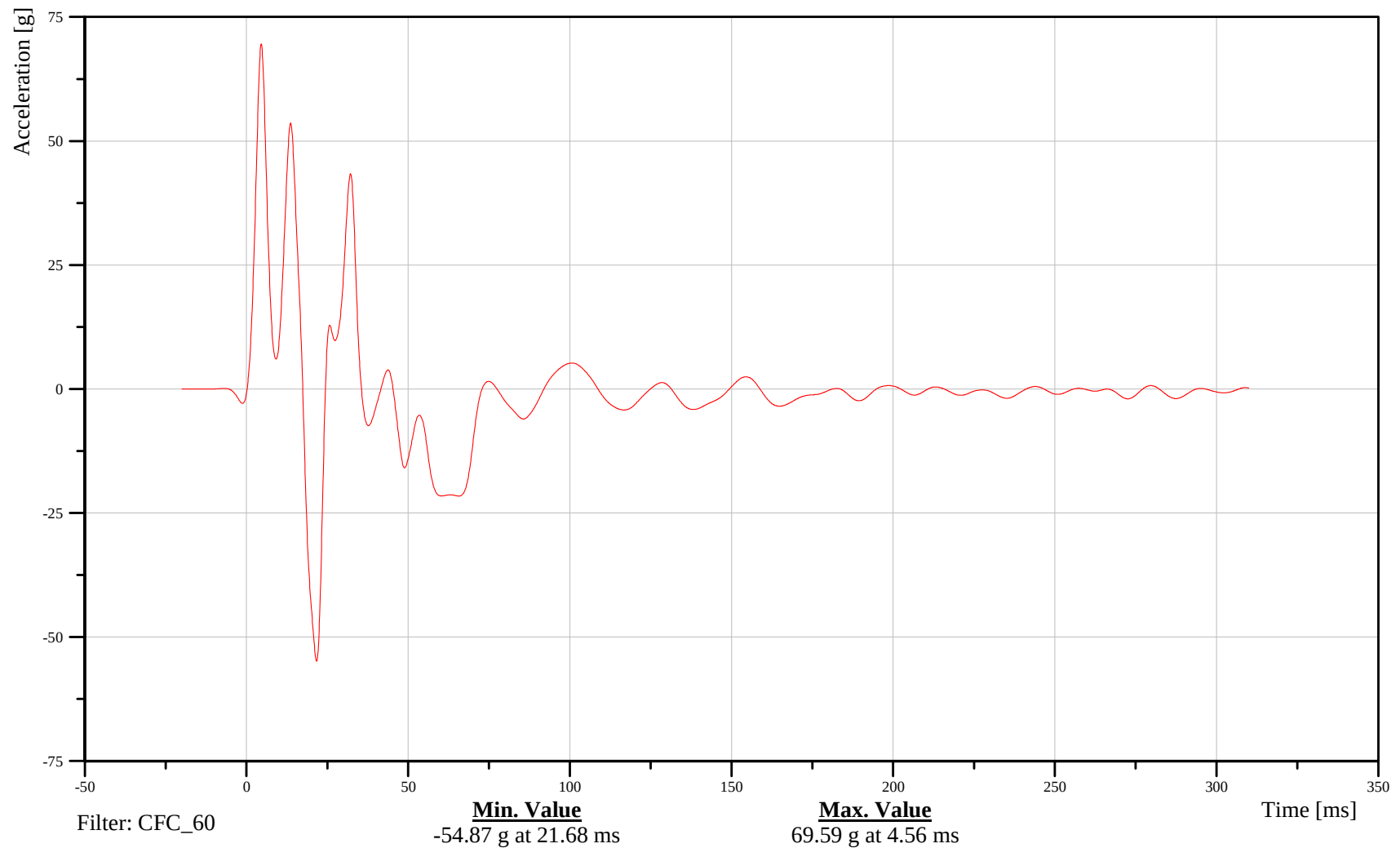
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11APILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-29

080729



World SID Evaluation

Left Upper A-Post Y-Axis Acceleration

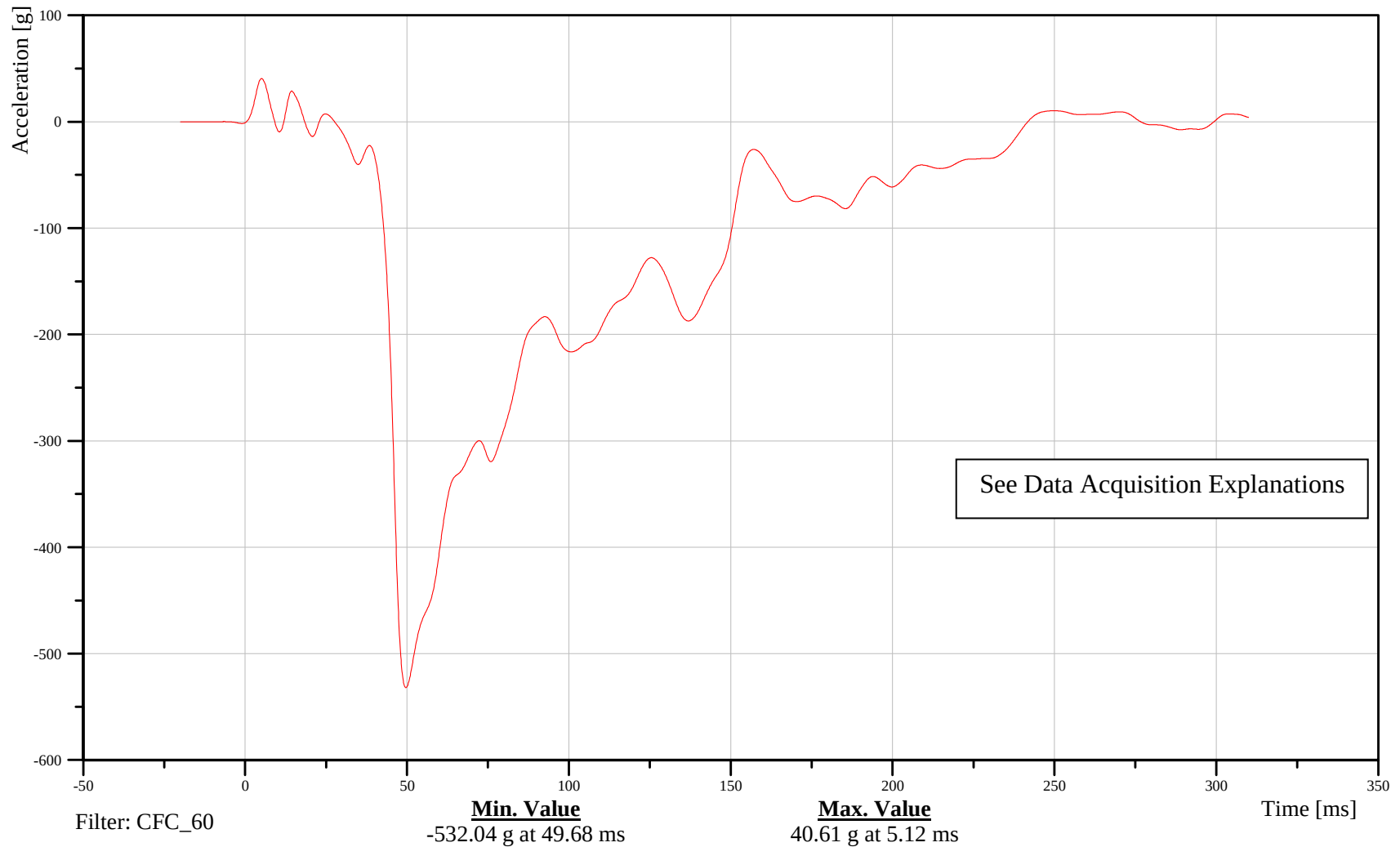
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11APILUP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-30

080729



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

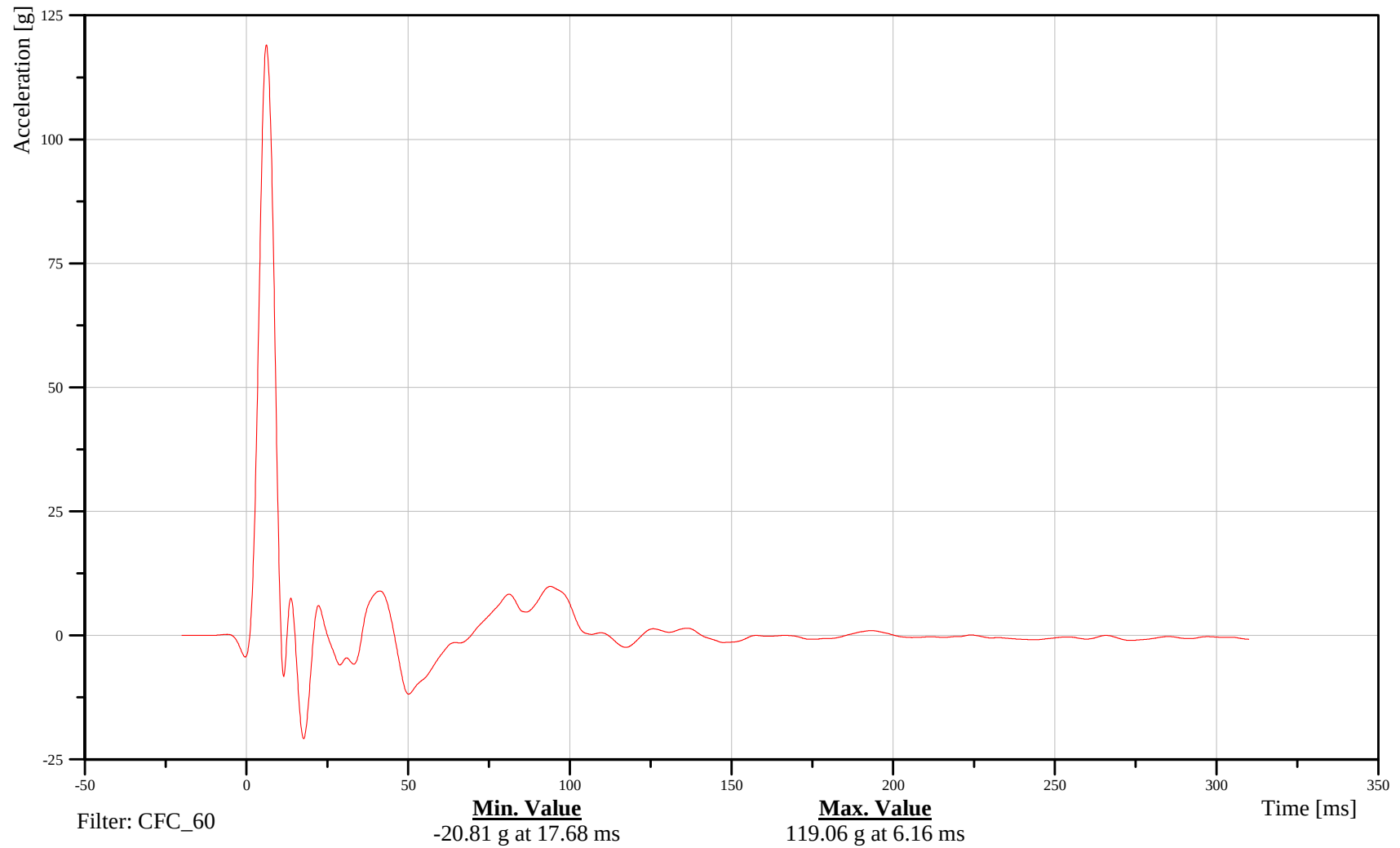
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14BPILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-31

080729



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

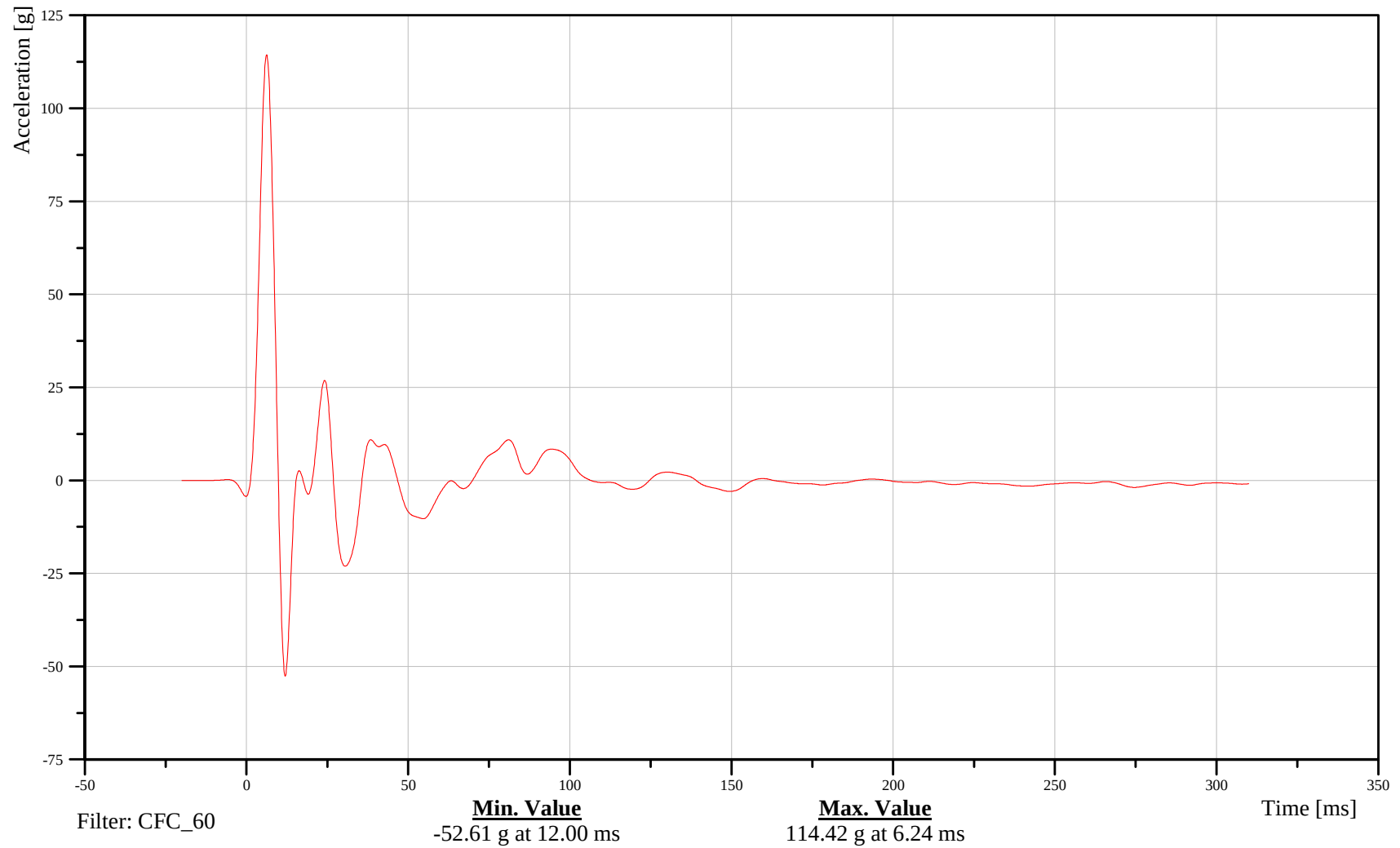
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14BPILUP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-32

080729



World SID Evaluation

Left Front Seat Track Y-Axis Acceleration

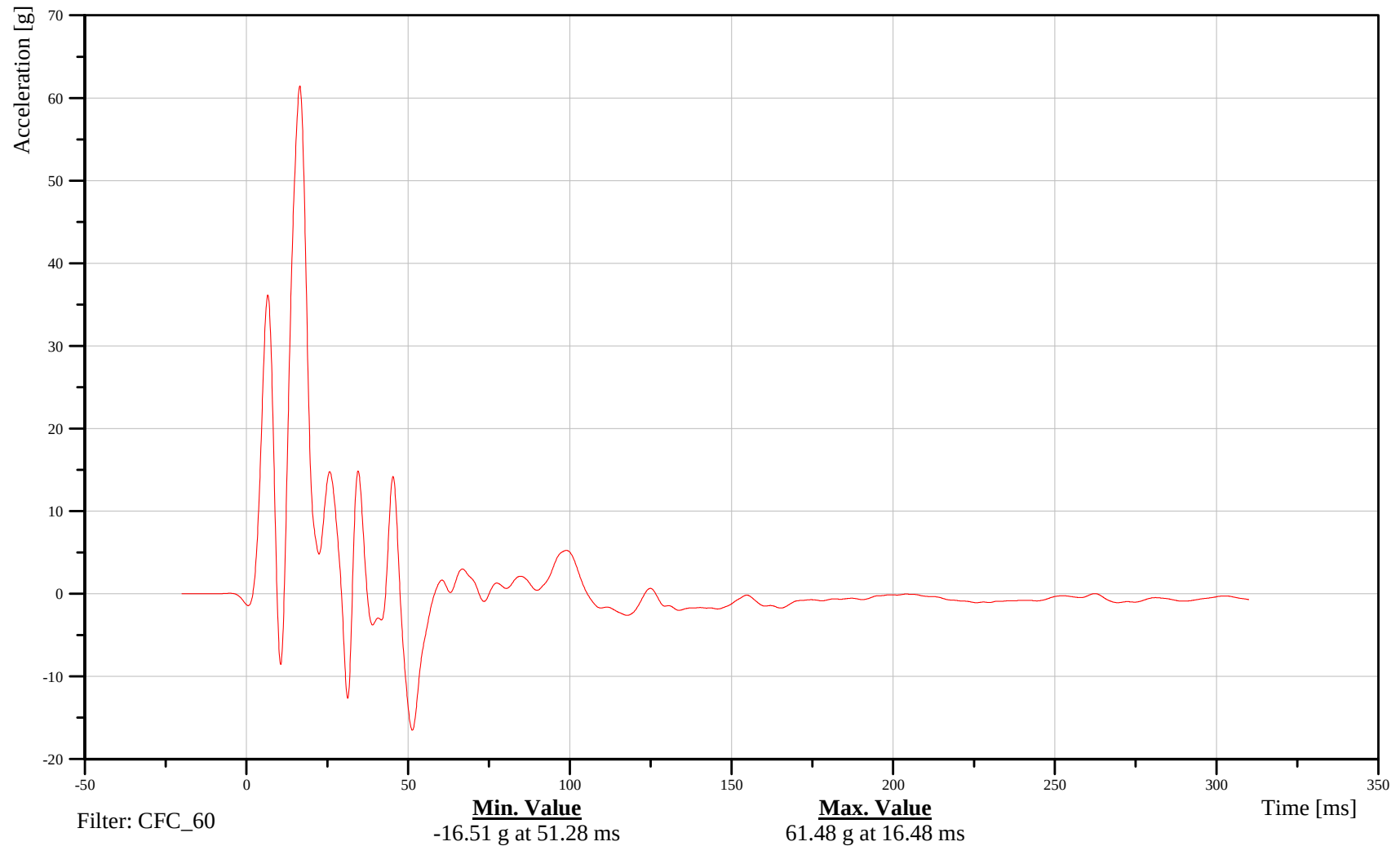
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SETRFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-33

080729



World SID Evaluation
Left Rear Seat Track Y-Axis Acceleration

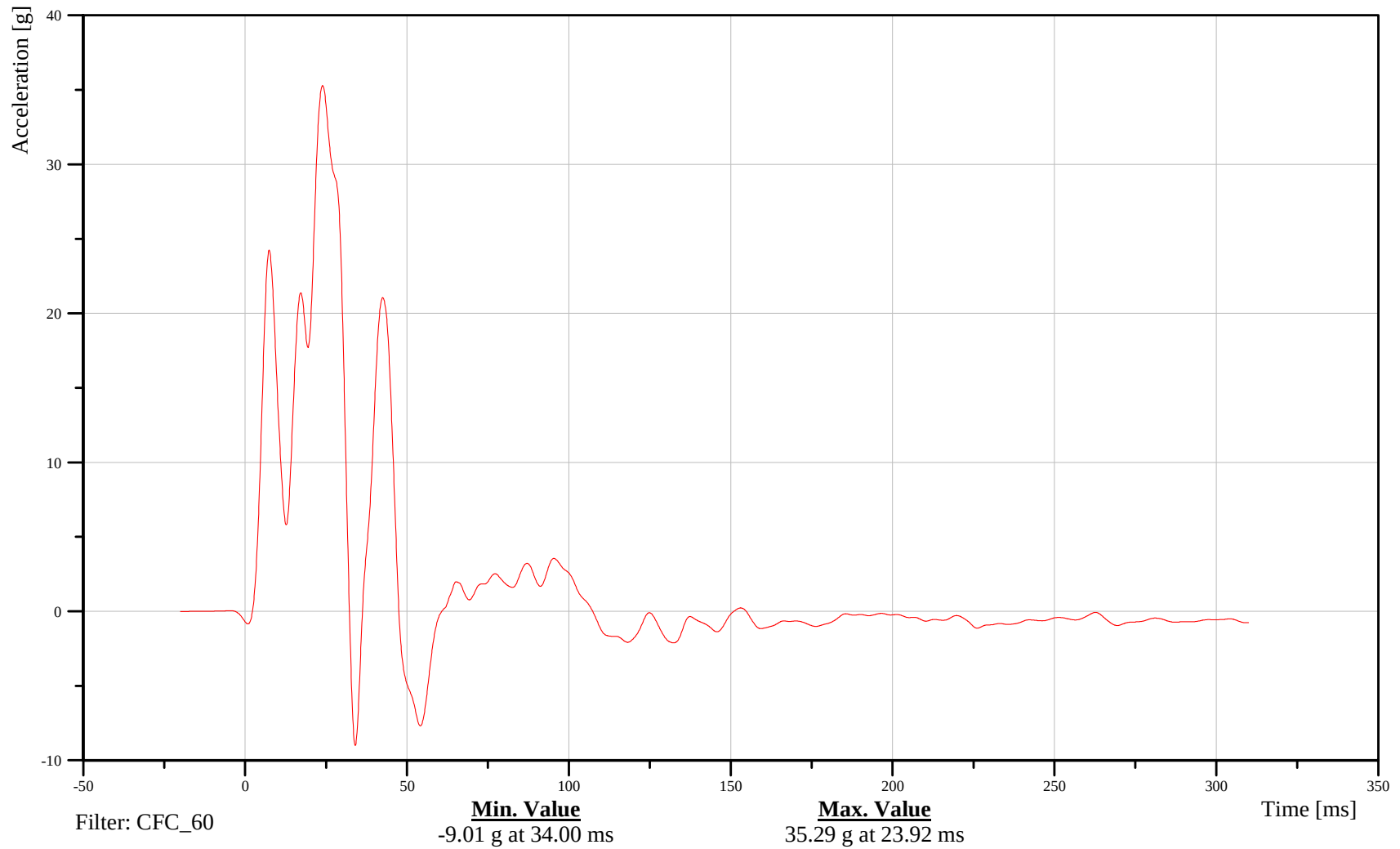
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SETRRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-34

080729



World SID Evaluation
Vehicle Center of Gravity X-Axis Acceleration

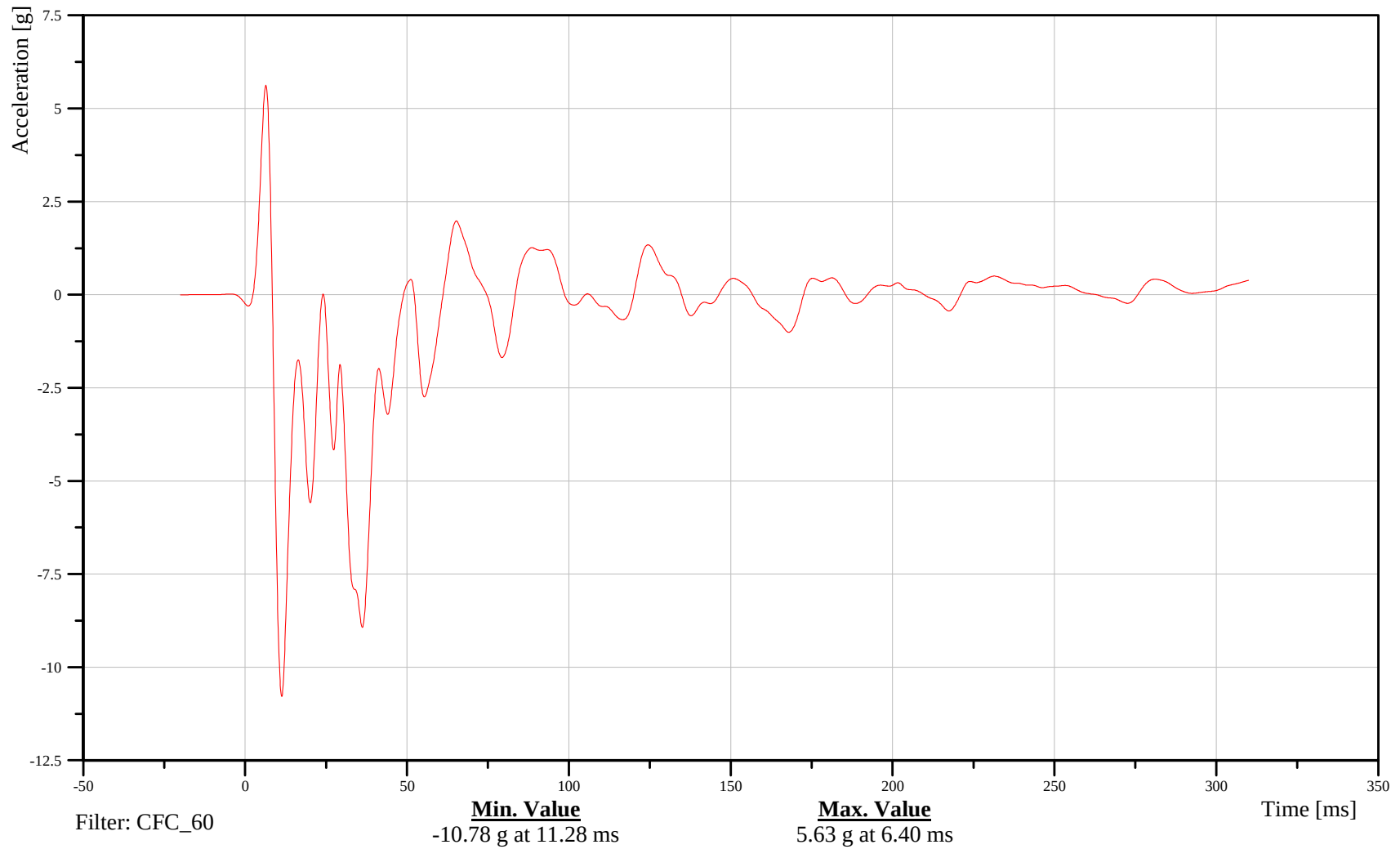
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-35

080729



World SID Evaluation
Vehicle Center of Gravity Y-Axis Acceleration

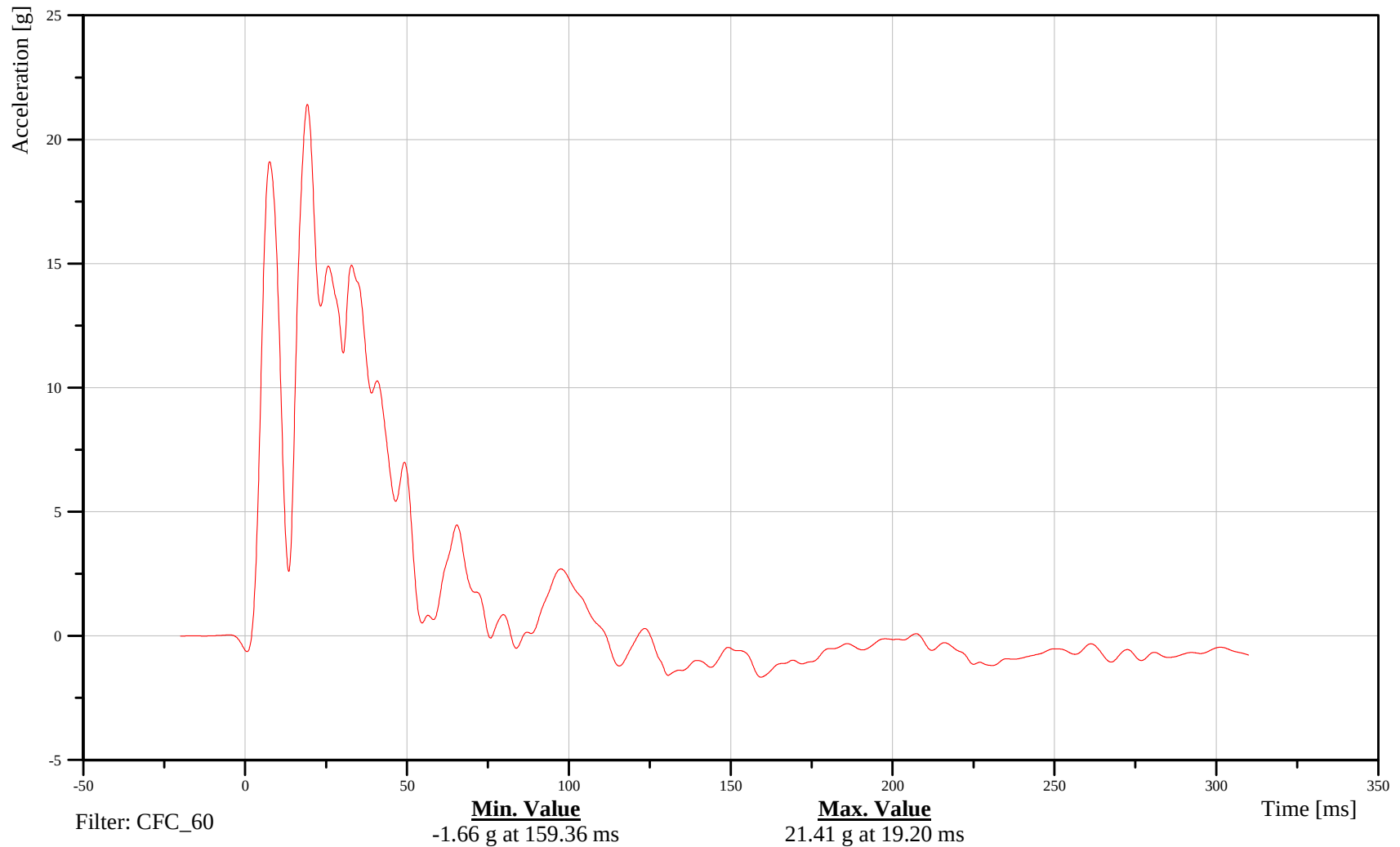
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-36

080729



World SID Evaluation

Vehicle Center of Gravity Z-Axis Acceleration

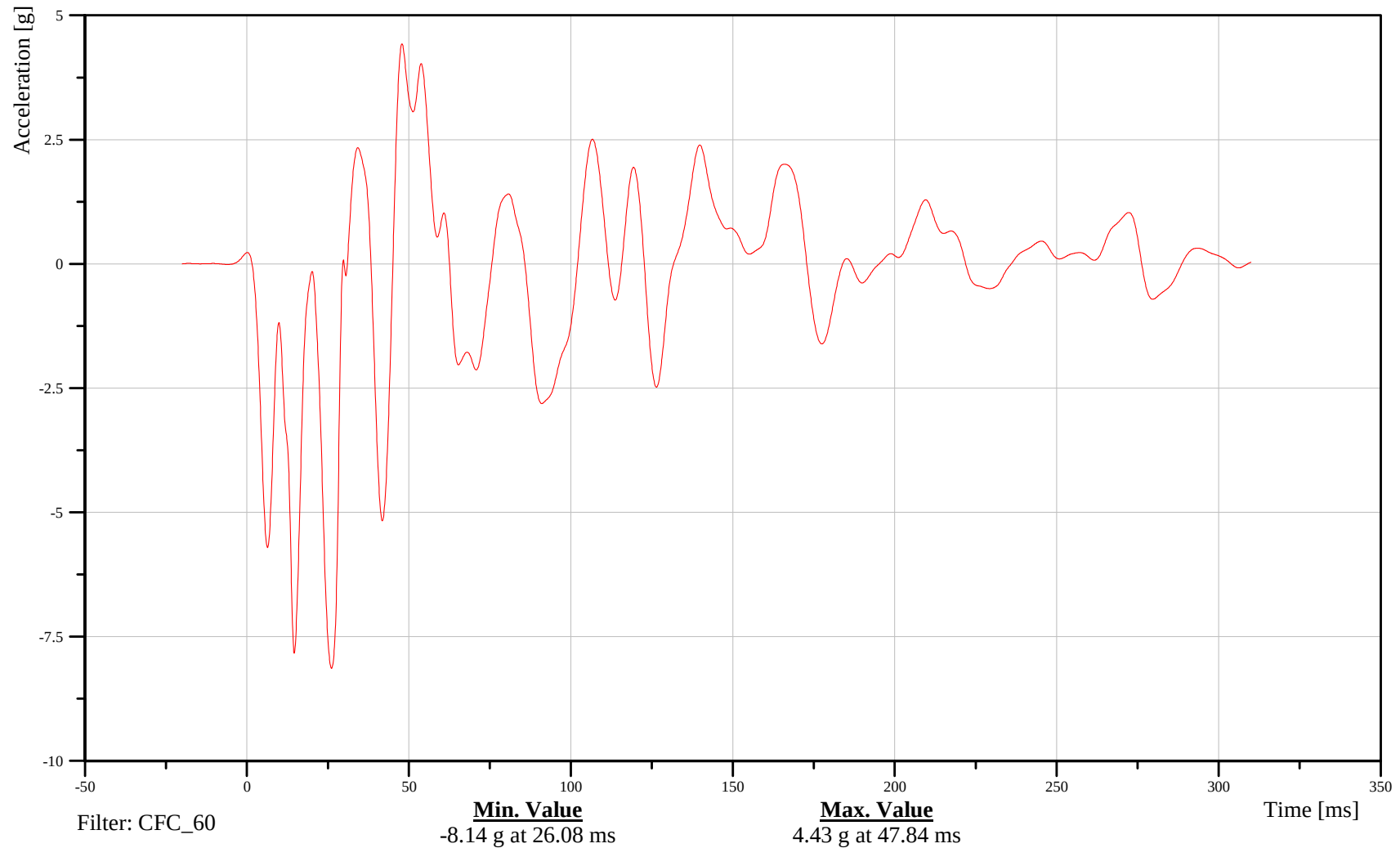
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-37

080729



World SID Evaluation

Vehicle Center of Gravity Resultant Acceleration

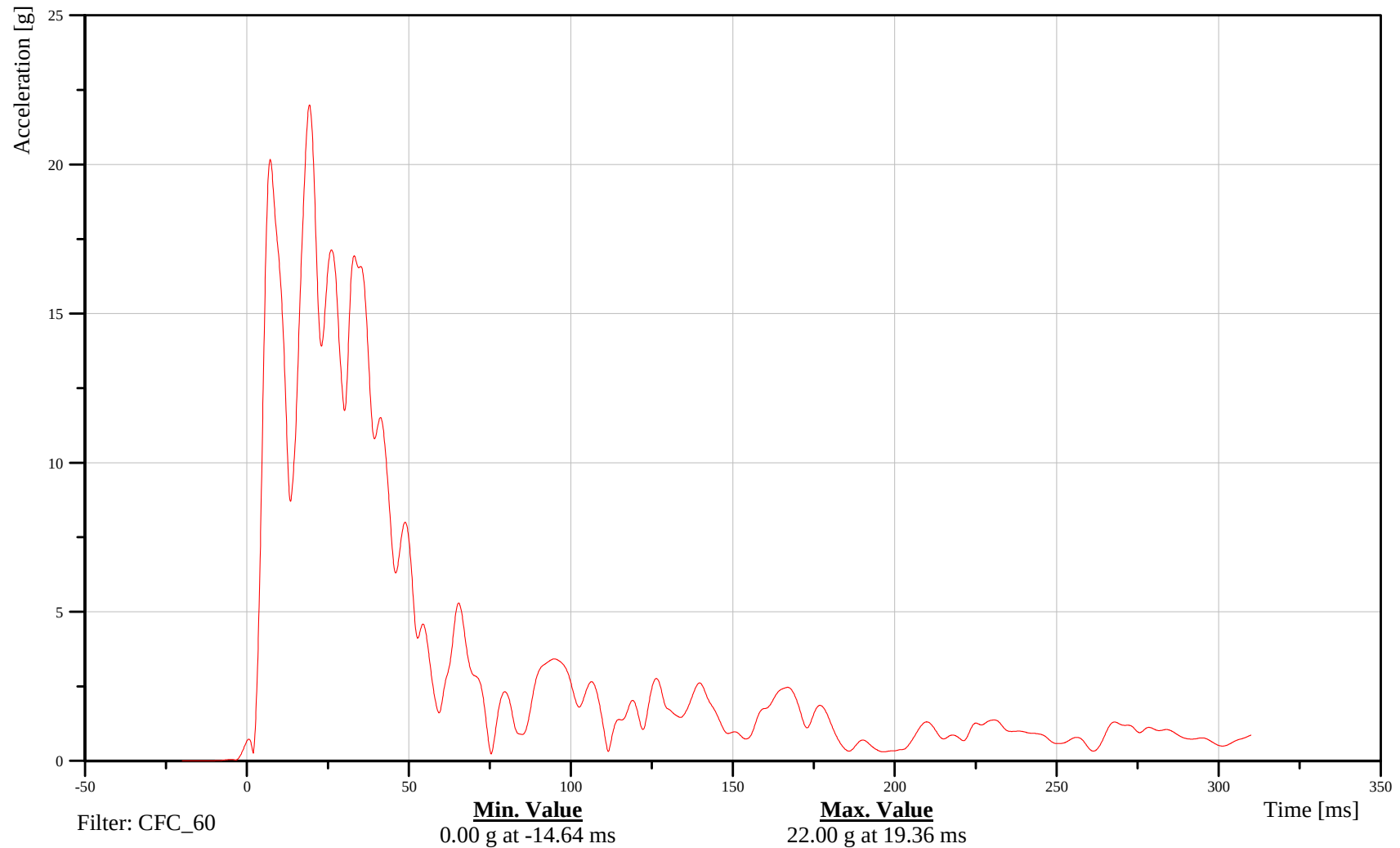
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-38

080729



World SID Evaluation
Top of Engine X-Axis Acceleration

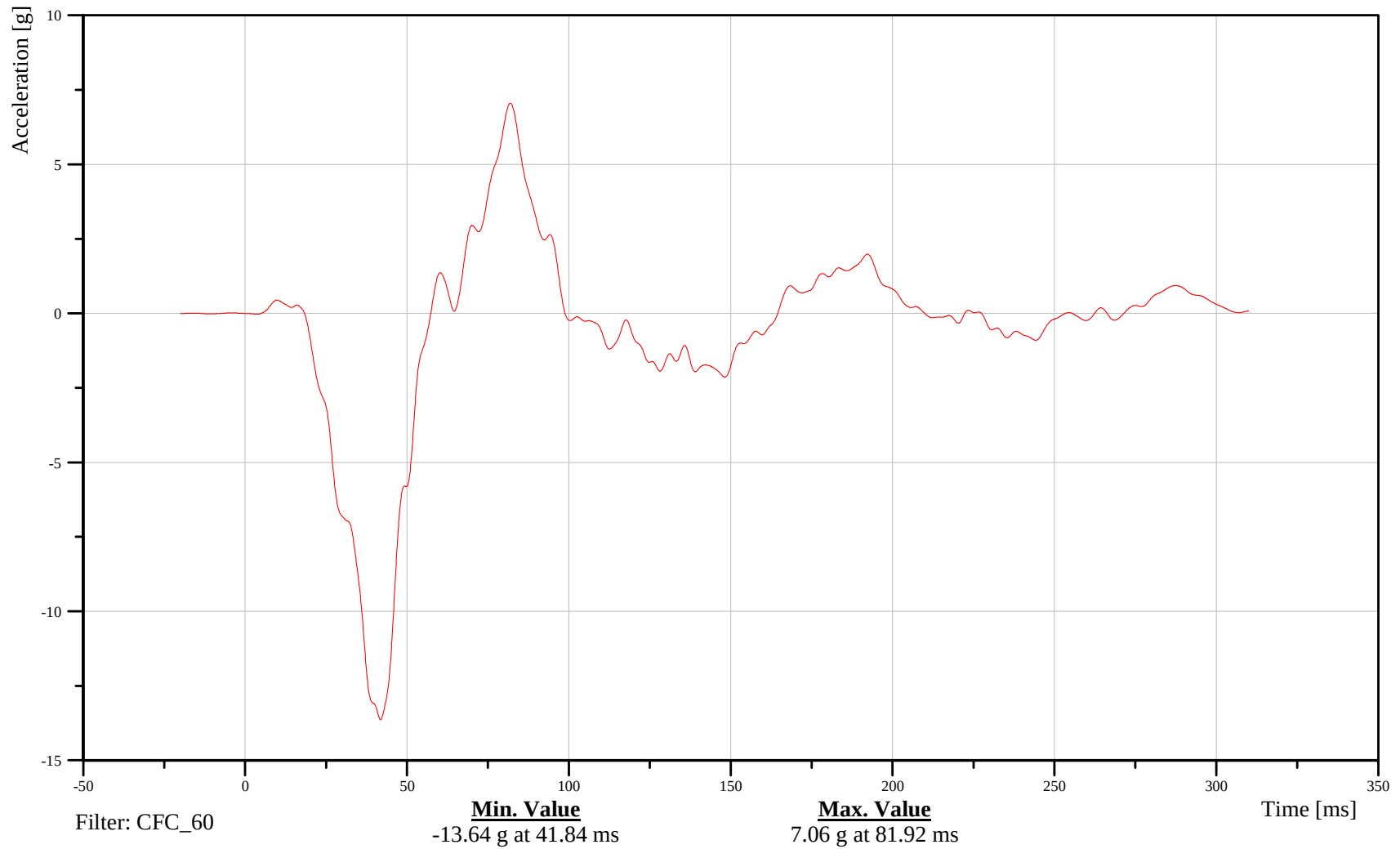
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10ENGNTTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-39

080729



World SID Evaluation

Top of Engine Y-Axis Acceleration

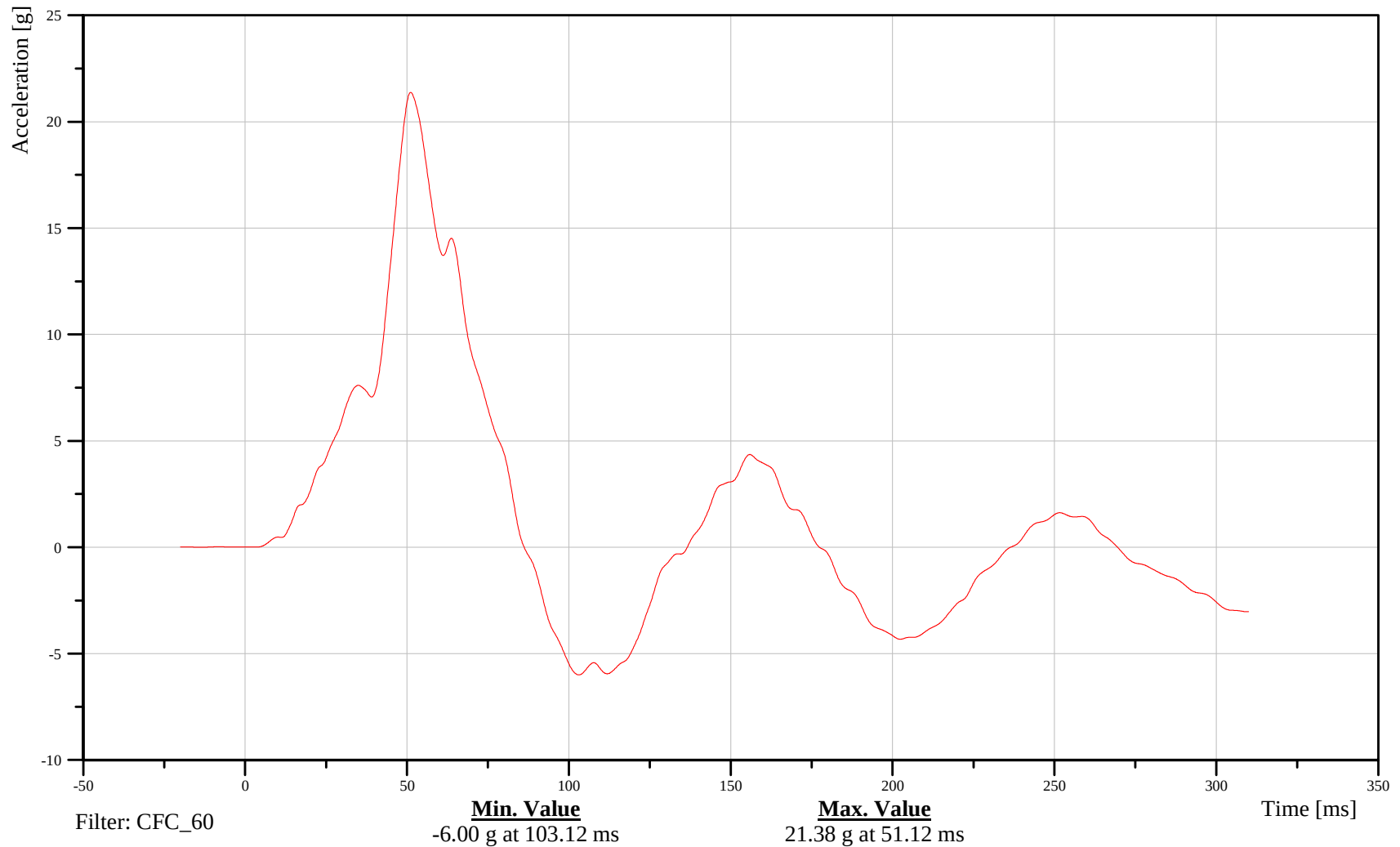
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-40

080729



World SID Evaluation

Center Firewall X-Axis Acceleration

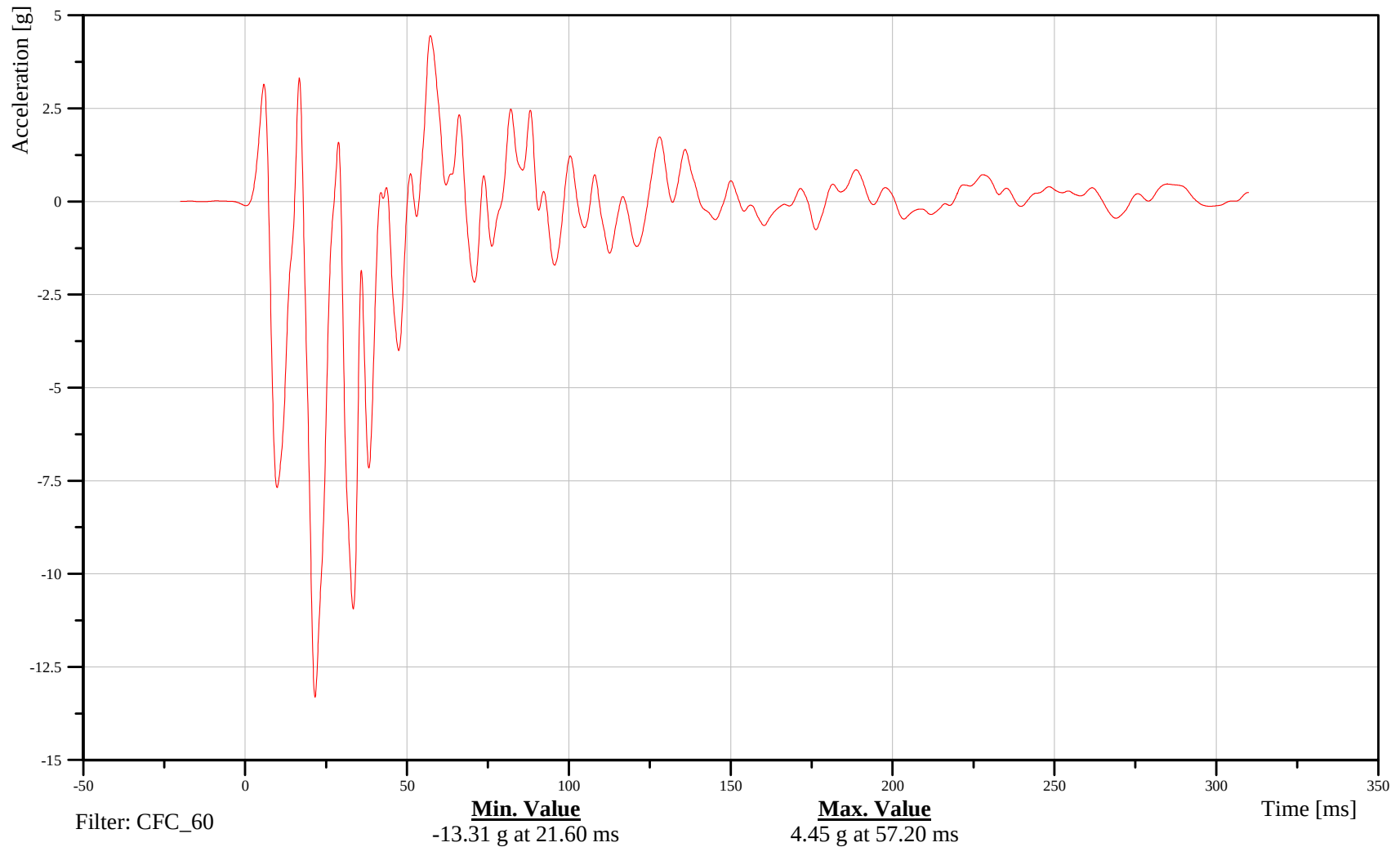
Date: 07/29/2008
Time: 14:50

Customer: VRTC

102FIRCX0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-41

080729



World SID Evaluation

Center Firewall Y-Axis Acceleration

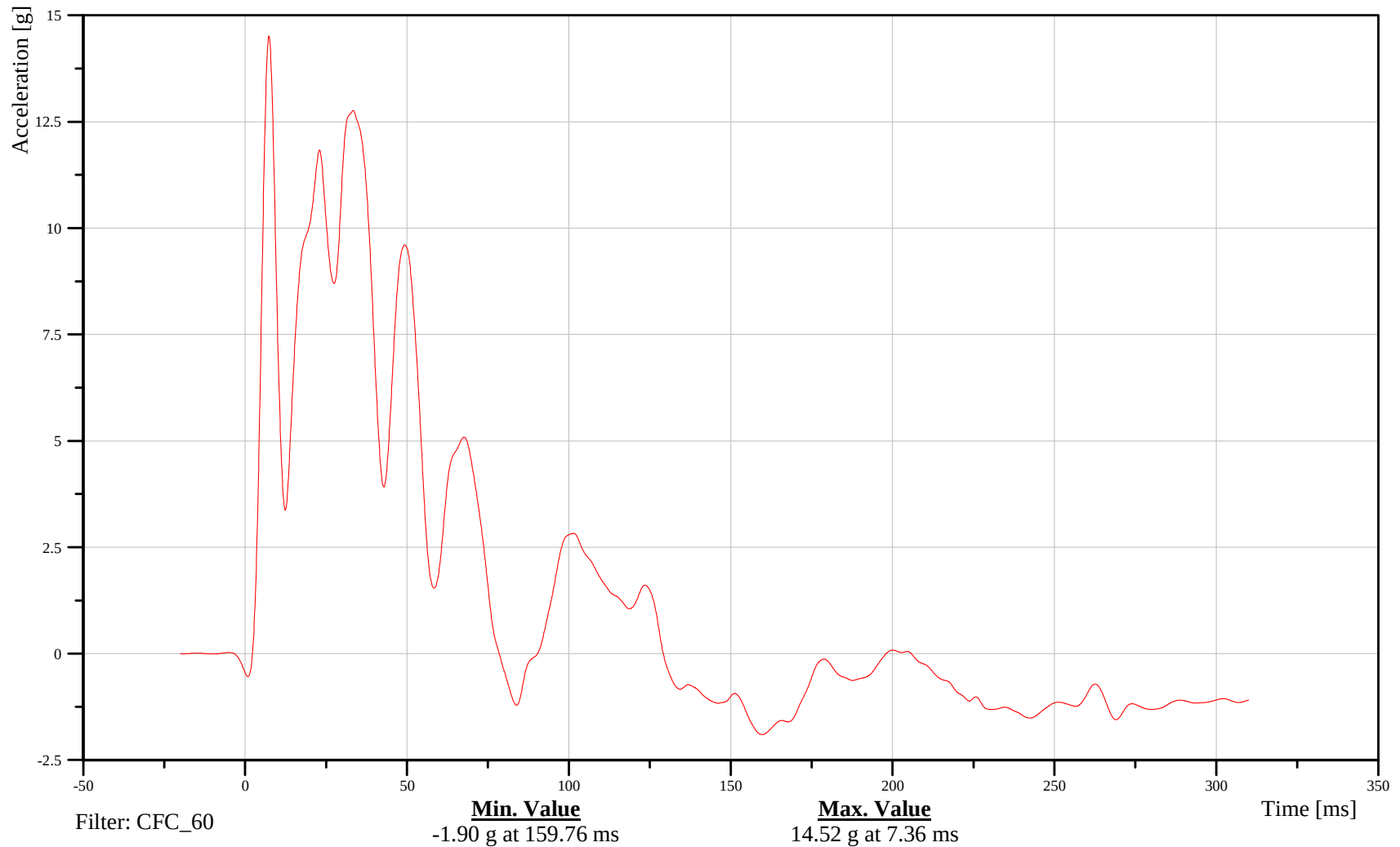
Date: 07/29/2008
Time: 14:50

Customer: VRTC

102FIRCX0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-42

080729



World SID Evaluation
Right Side Roof Rail X-Axis Acceleration

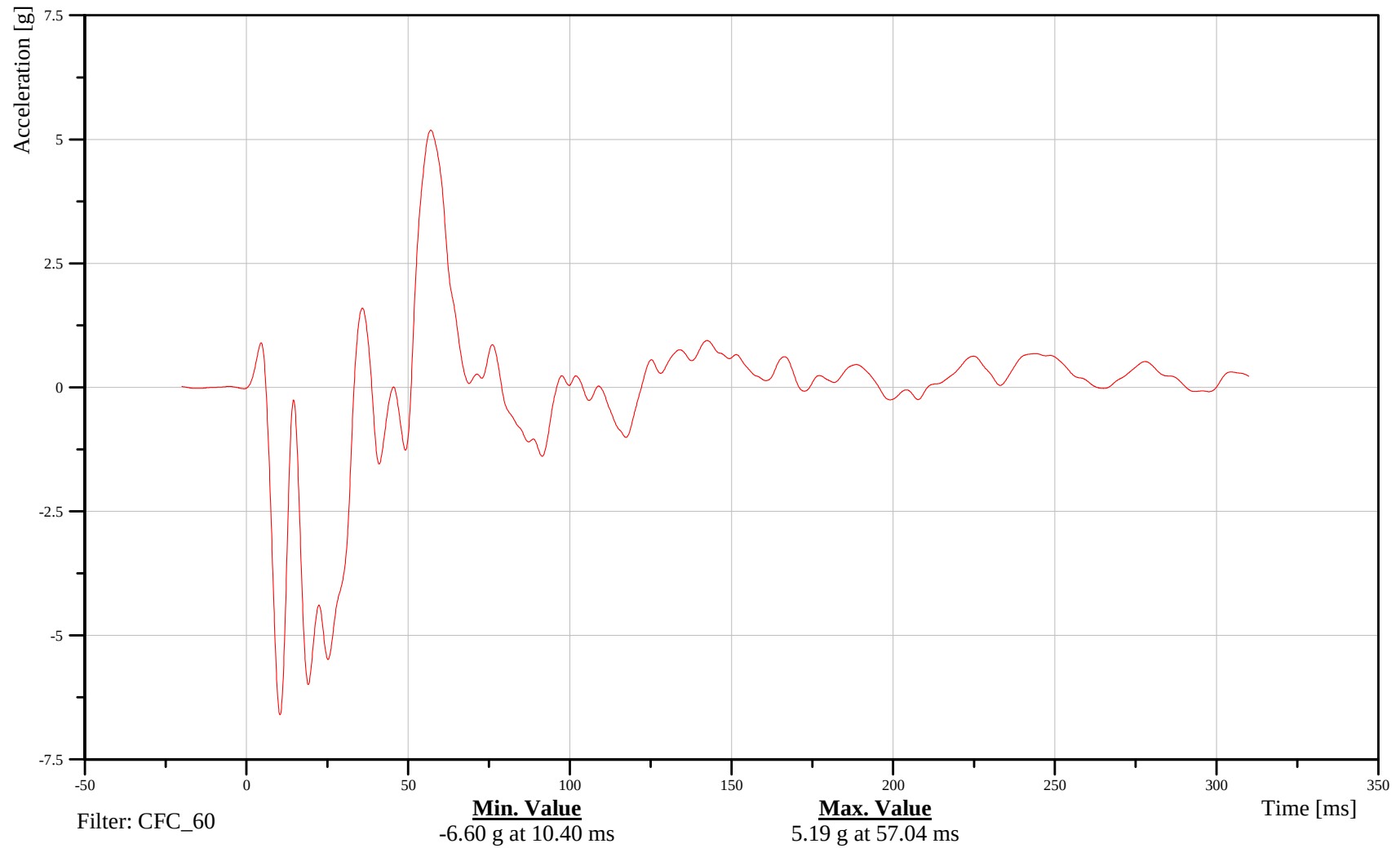
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10ROOFRI2100ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-43

080729



World SID Evaluation
Right Side Roof Rail Y-Axis Acceleration

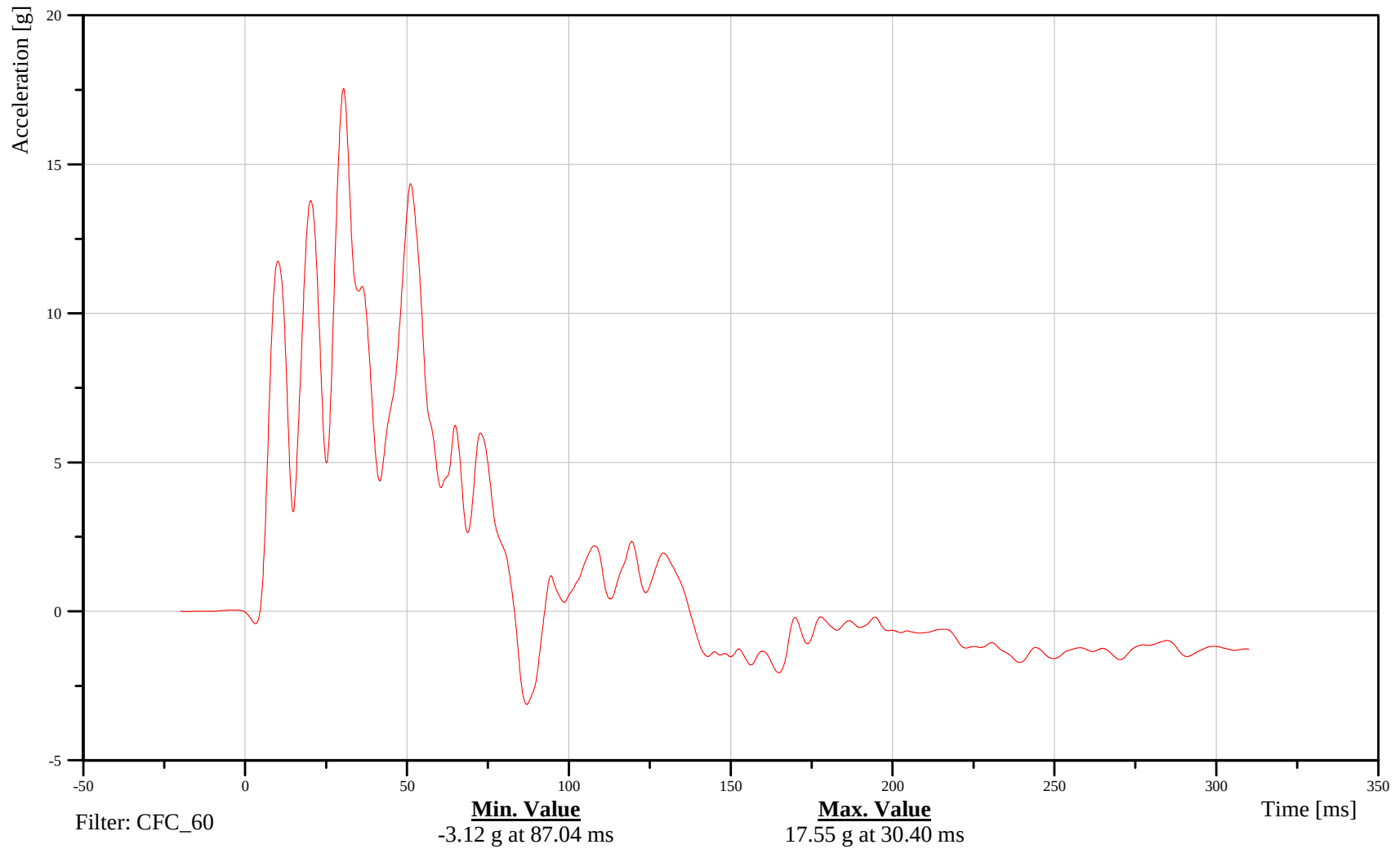
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10ROOFRI2100ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-44

080729



World SID Evaluation

Front Door Centerline Y-Axis Acceleration

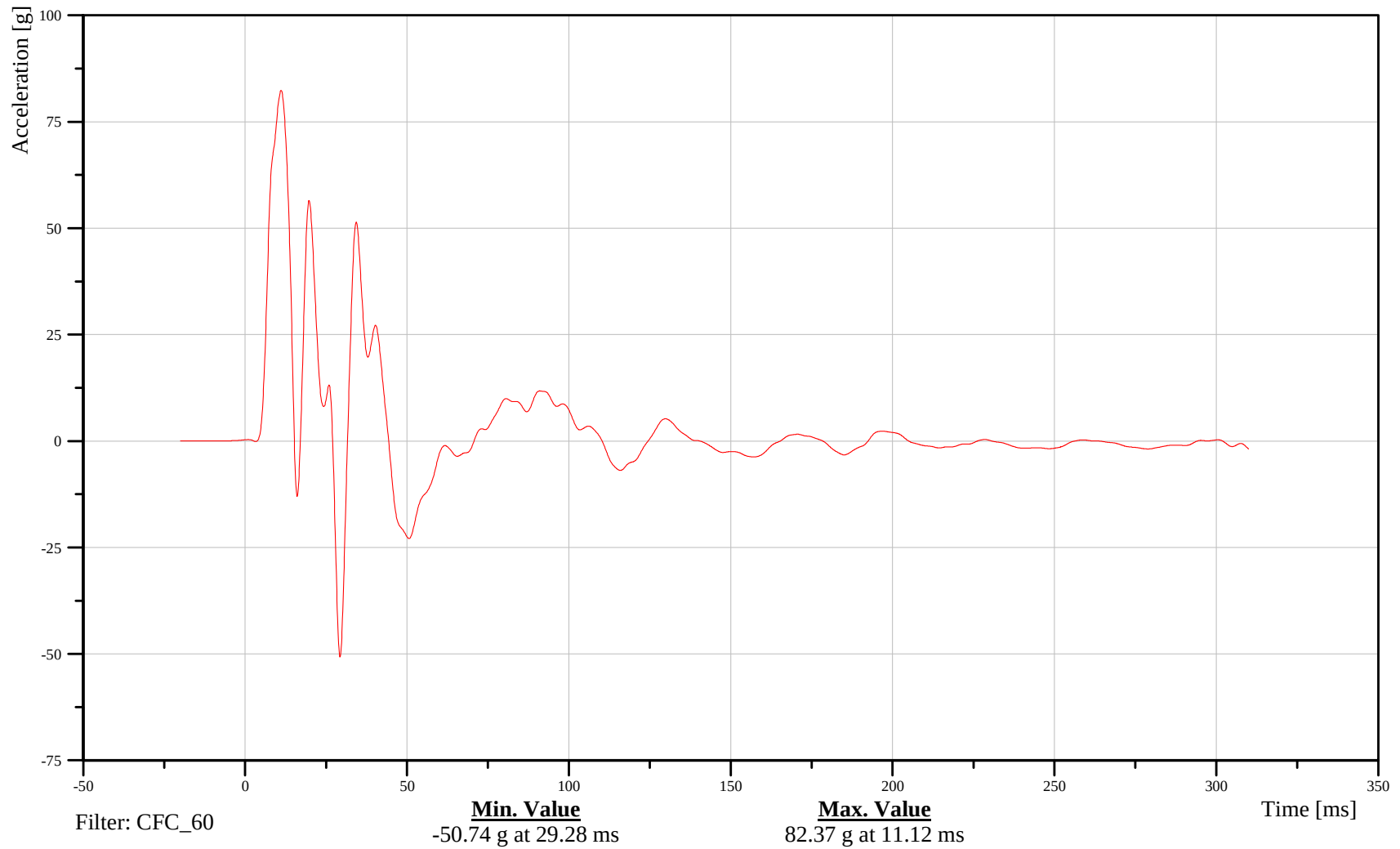
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11DOORMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-45

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

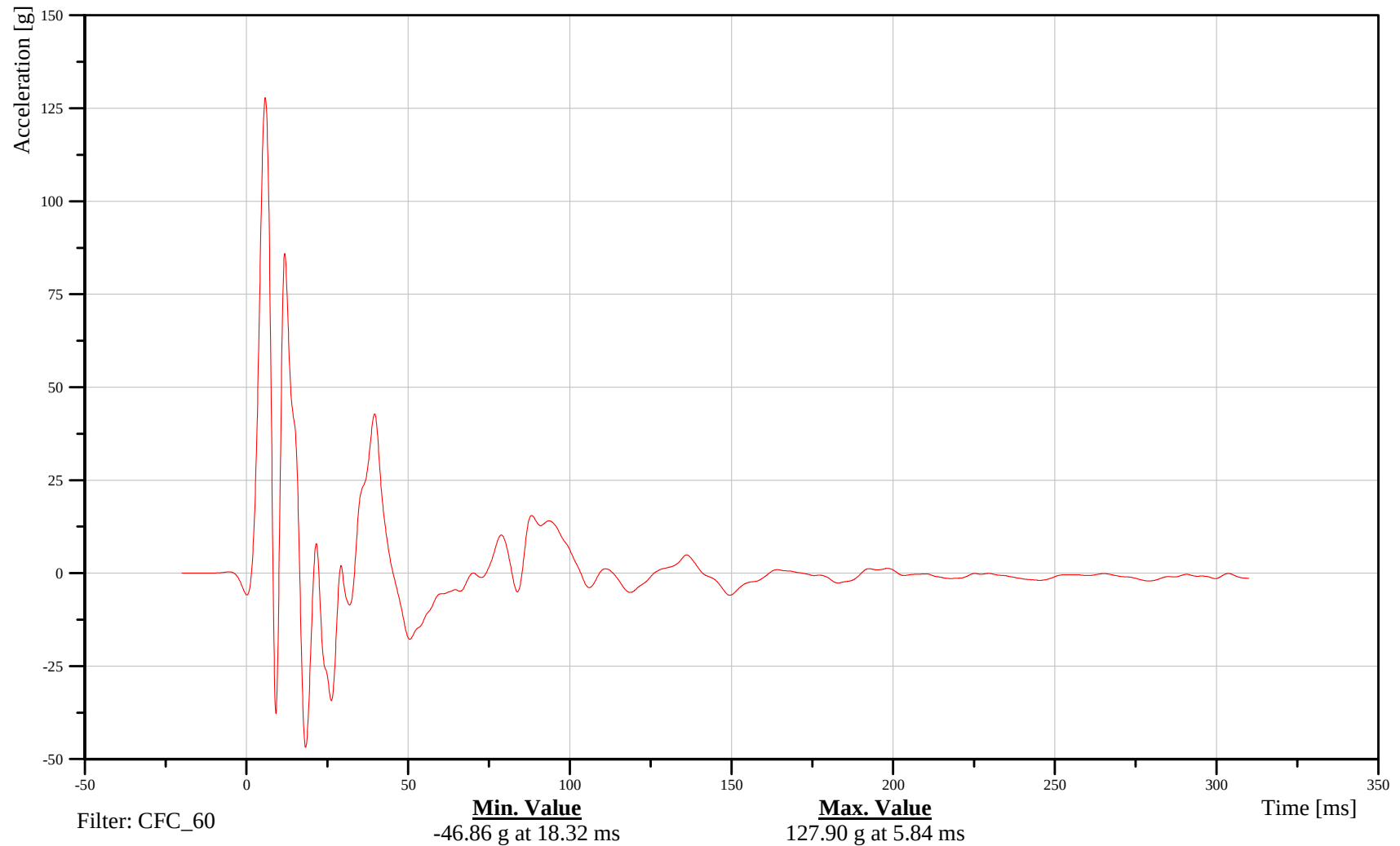
Front Door Mid-Rear Y-Axis Acceleration

Customer: VRTC

11DOORMIRE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-46

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

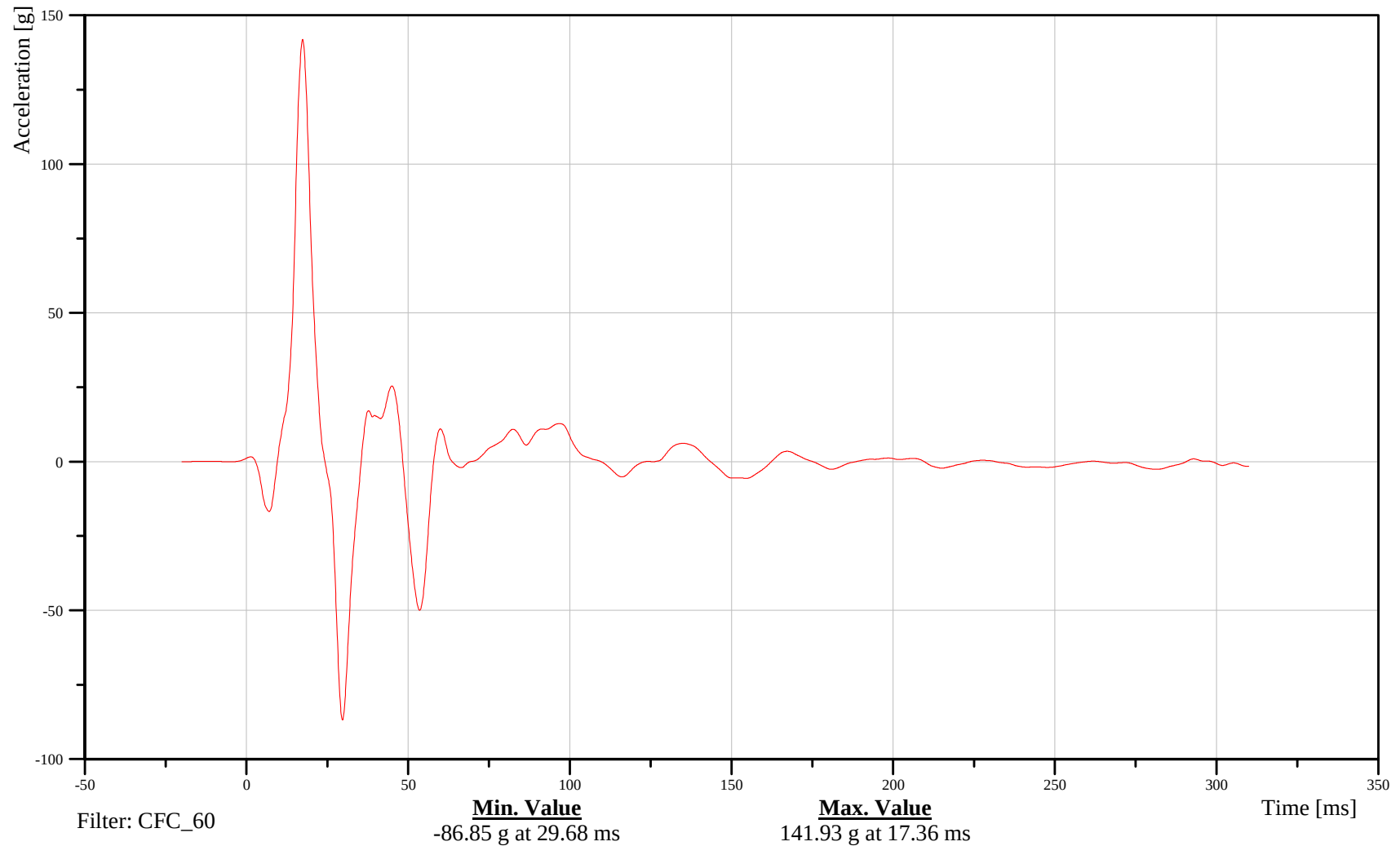
Front Door Upper Centerline Y-Axis Acceleration

Customer: VRTC

11DOORUPMI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-47

080729



World SID Evaluation

Rear Door Mid-Rear Y-Axis Acceleration

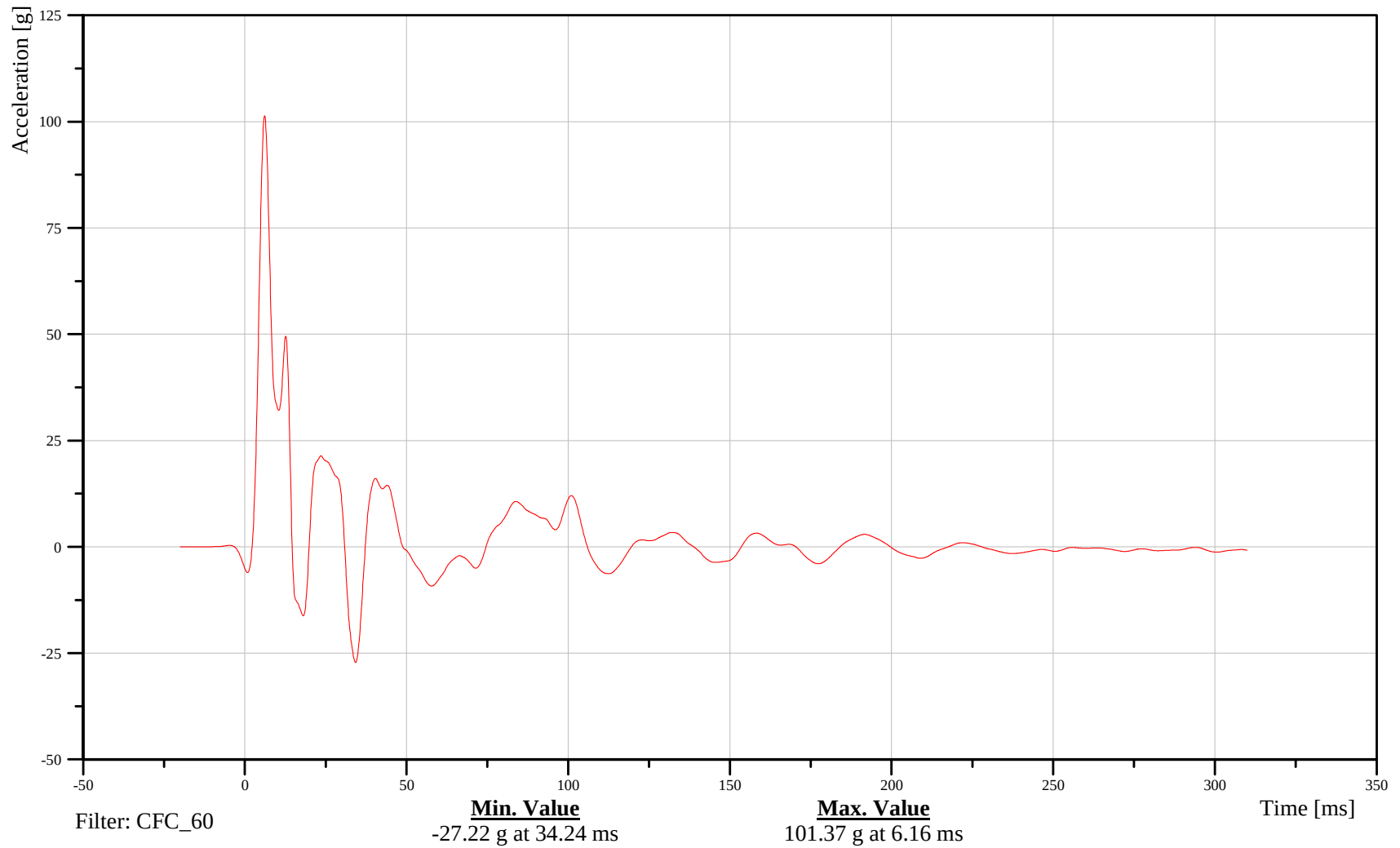
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14DOORMIRE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-48

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

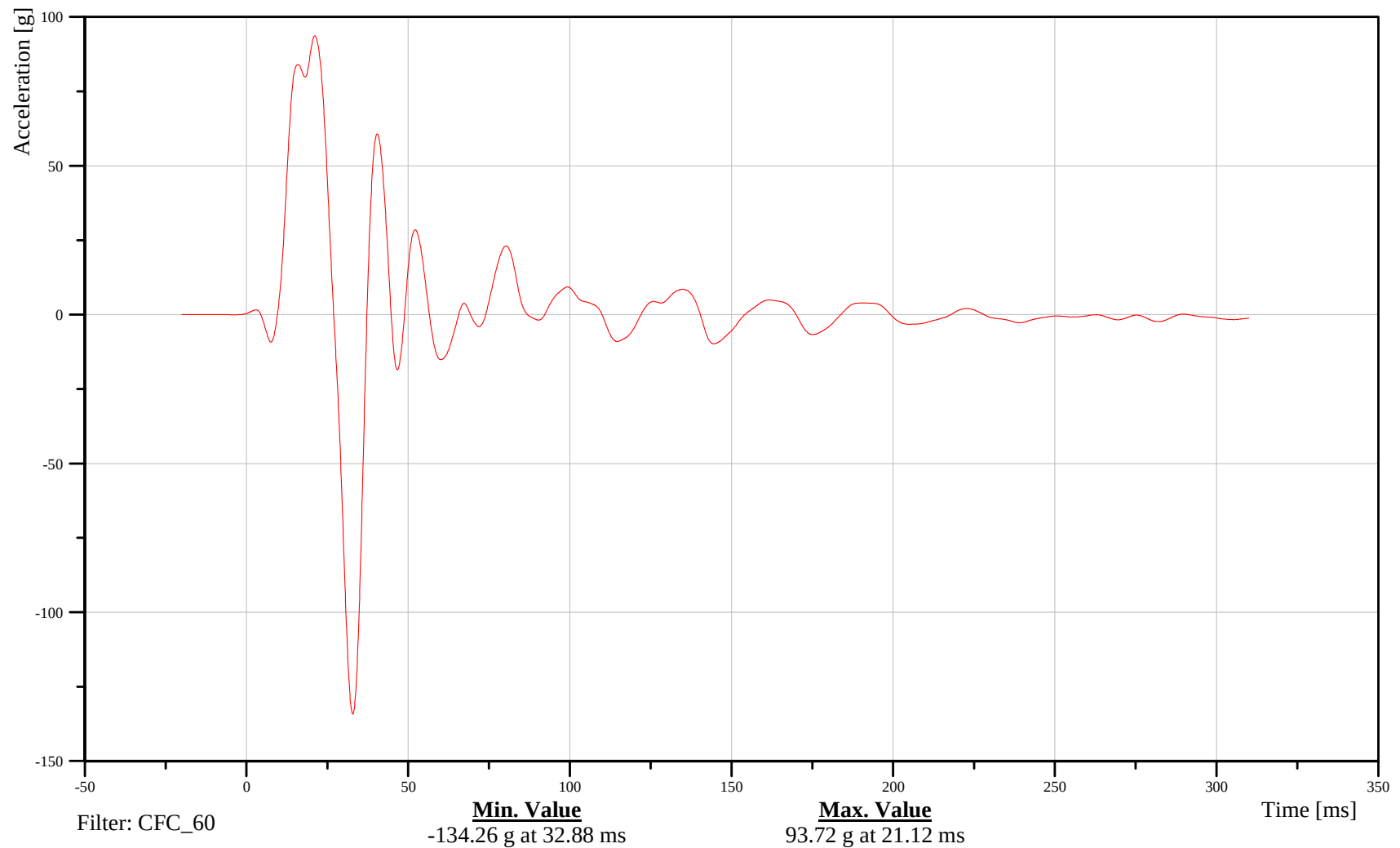
Rear Door Upper Centerline Y-Axis Acceleration

Customer: VRTC

14DOORUPMI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-49

080729



World SID Evaluation

Driver Side Airbag

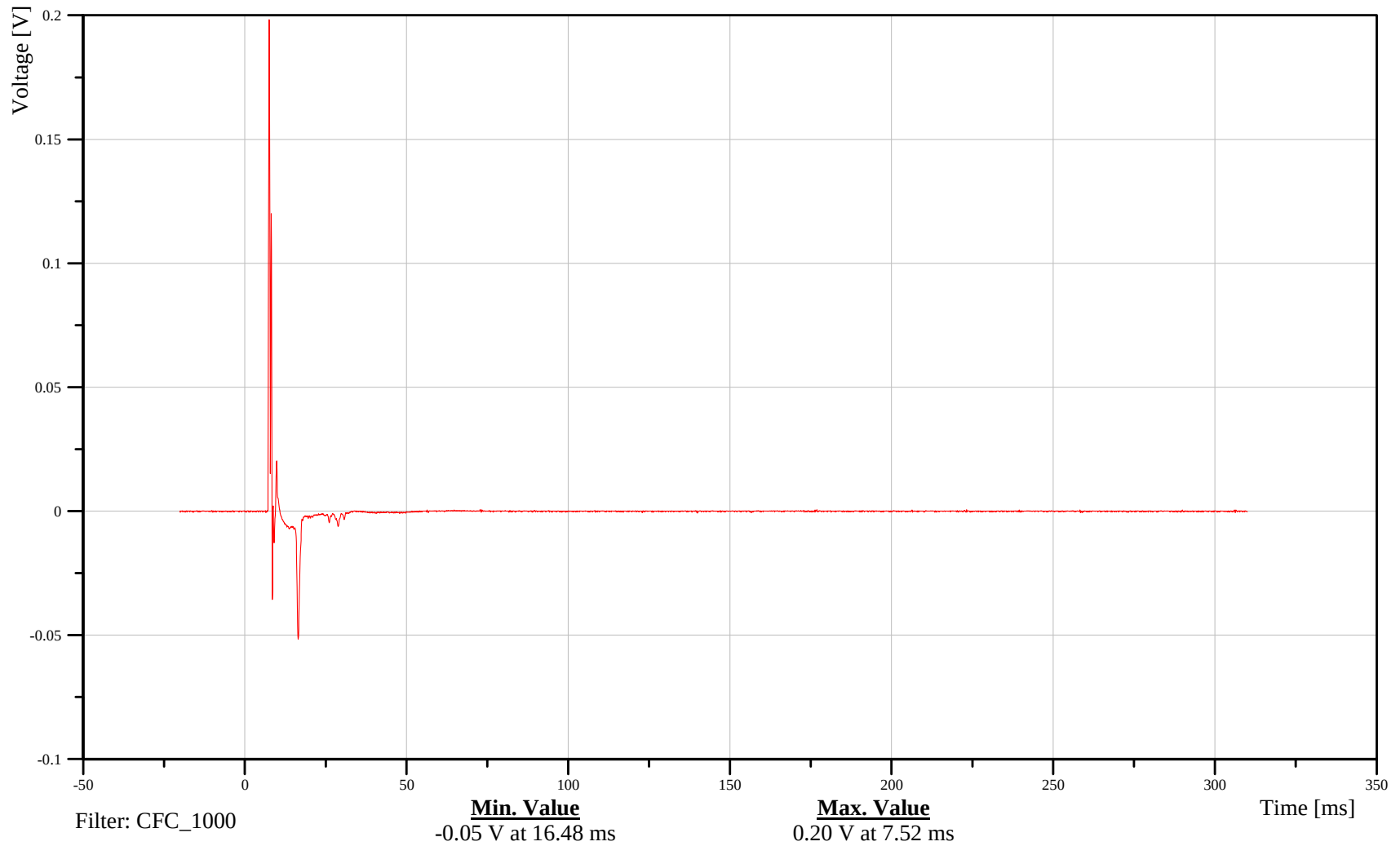
Date: 07/29/2008
Time: 14:50

Customer: VRTC

10AIRBLE2200EV0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-50

080729



World SID Evaluation

Driver ELR Pretensioner

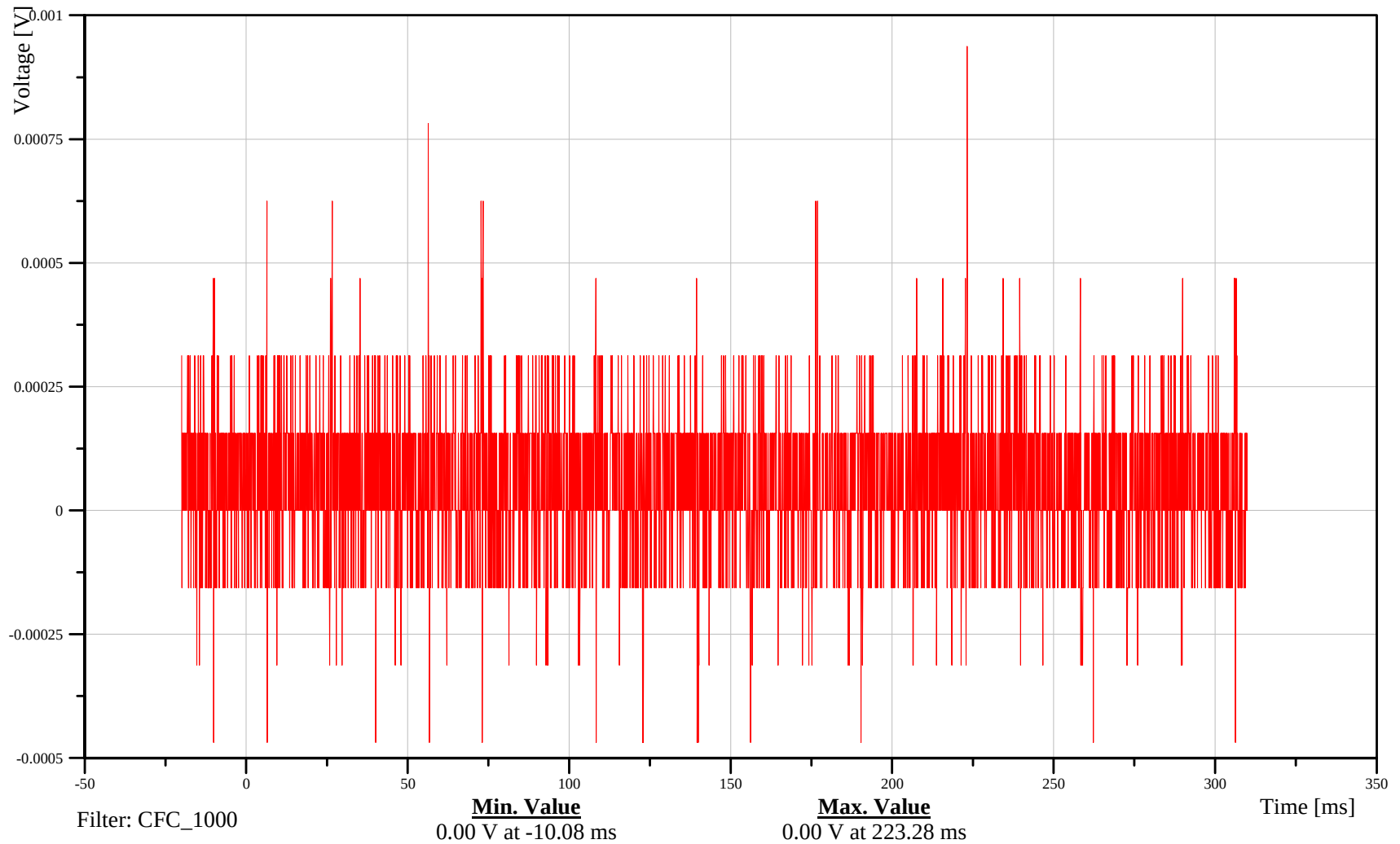
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11PRET000000EVOA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-51

080729



World SID Evaluation
Driver Inner Buckle Pretensioner

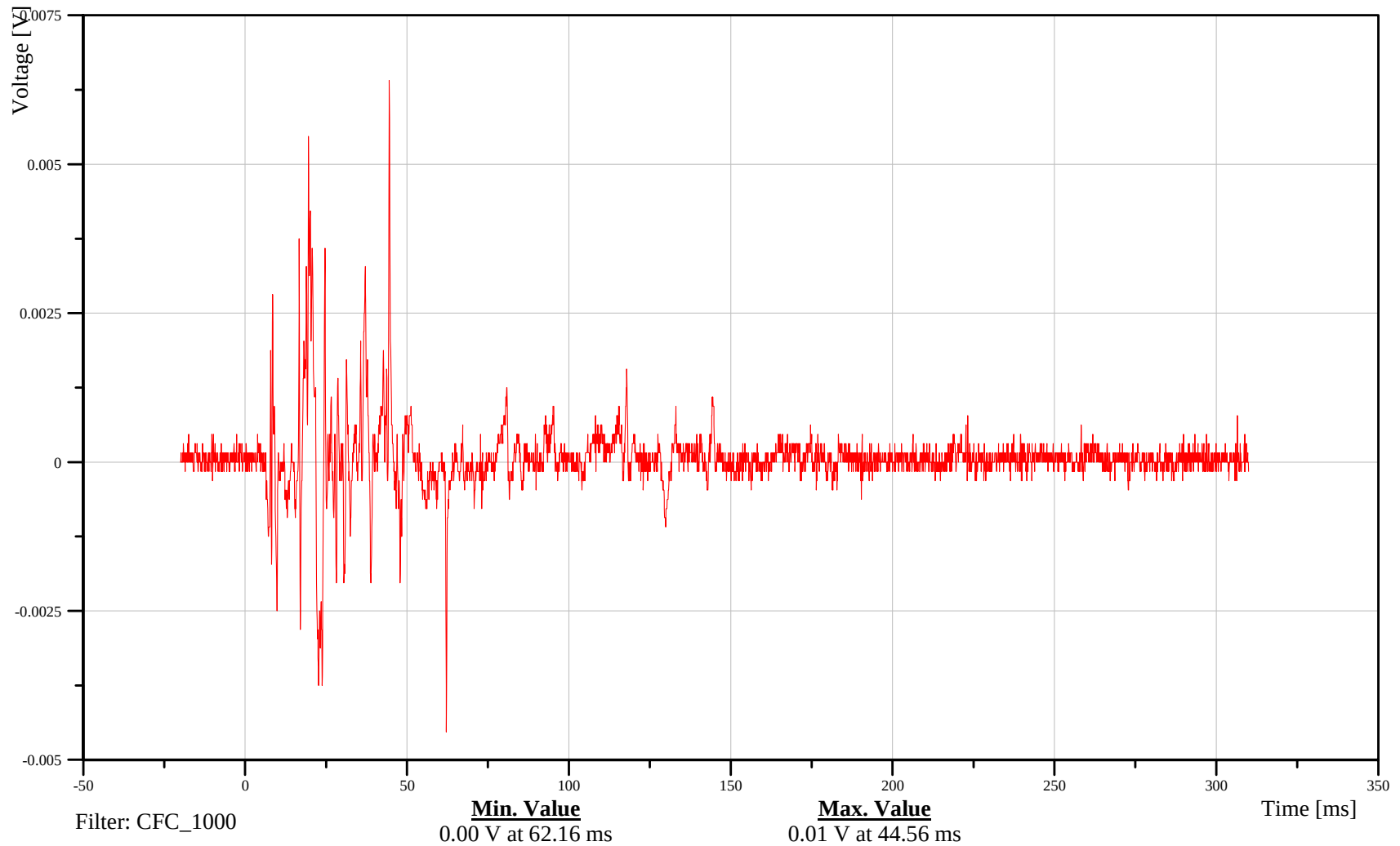
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11PRETIN0000EV0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-52

080729



World SID Evaluation

Driver Head Contact Switch

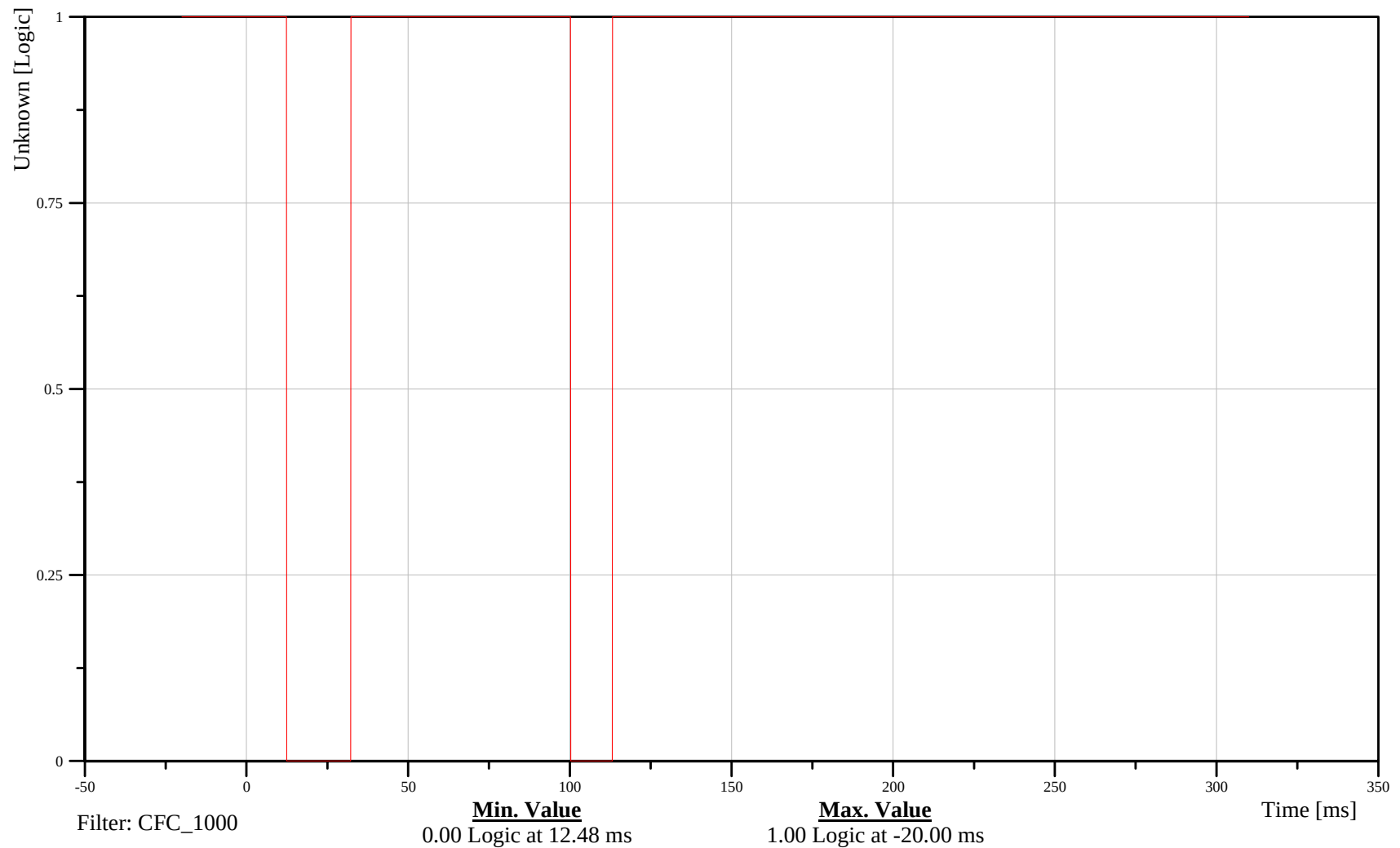
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11HEAD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-53

080729



World SID Evaluation

Driver Shoulder Contact Switch

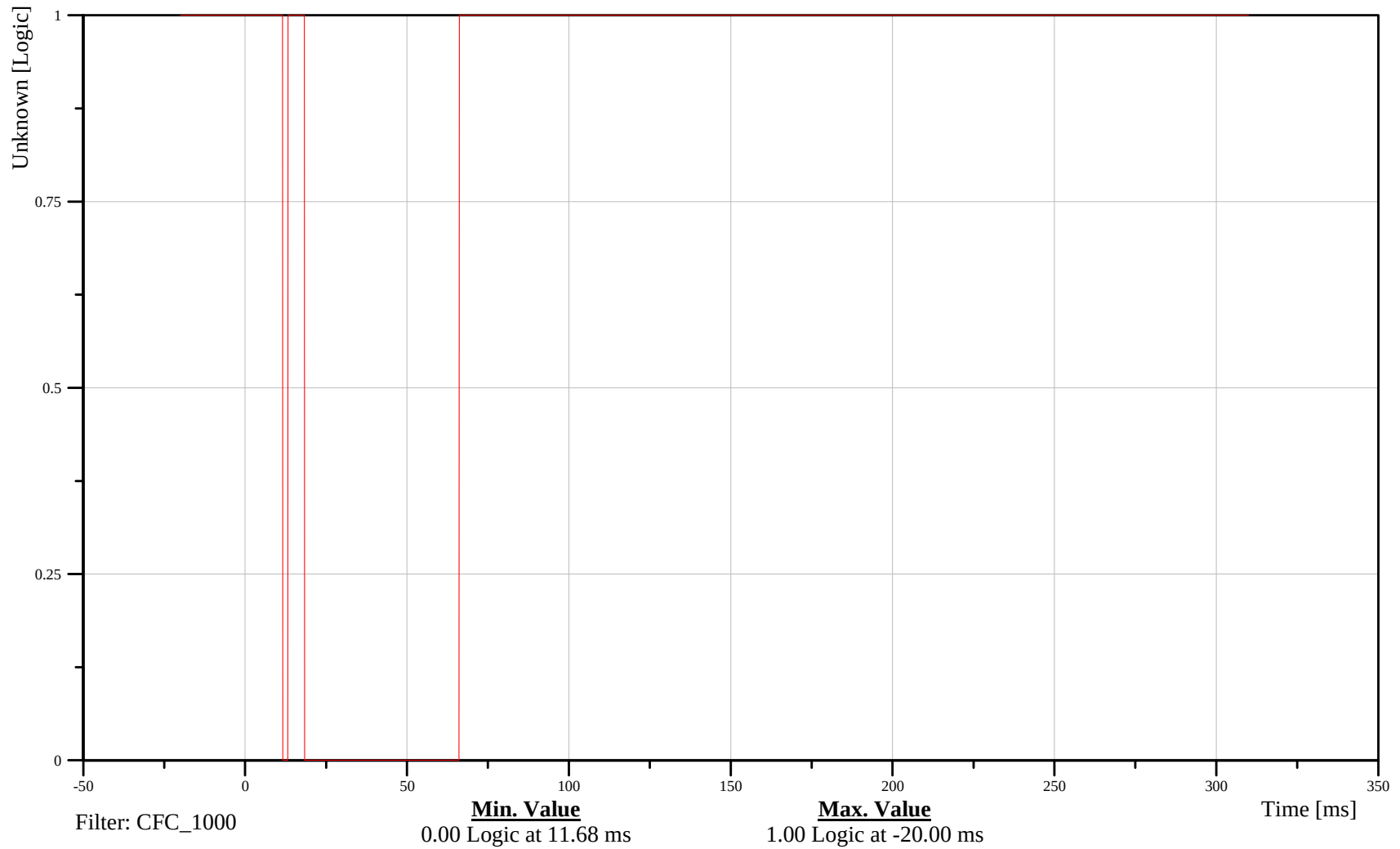
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-54

080729



World SID Evaluation

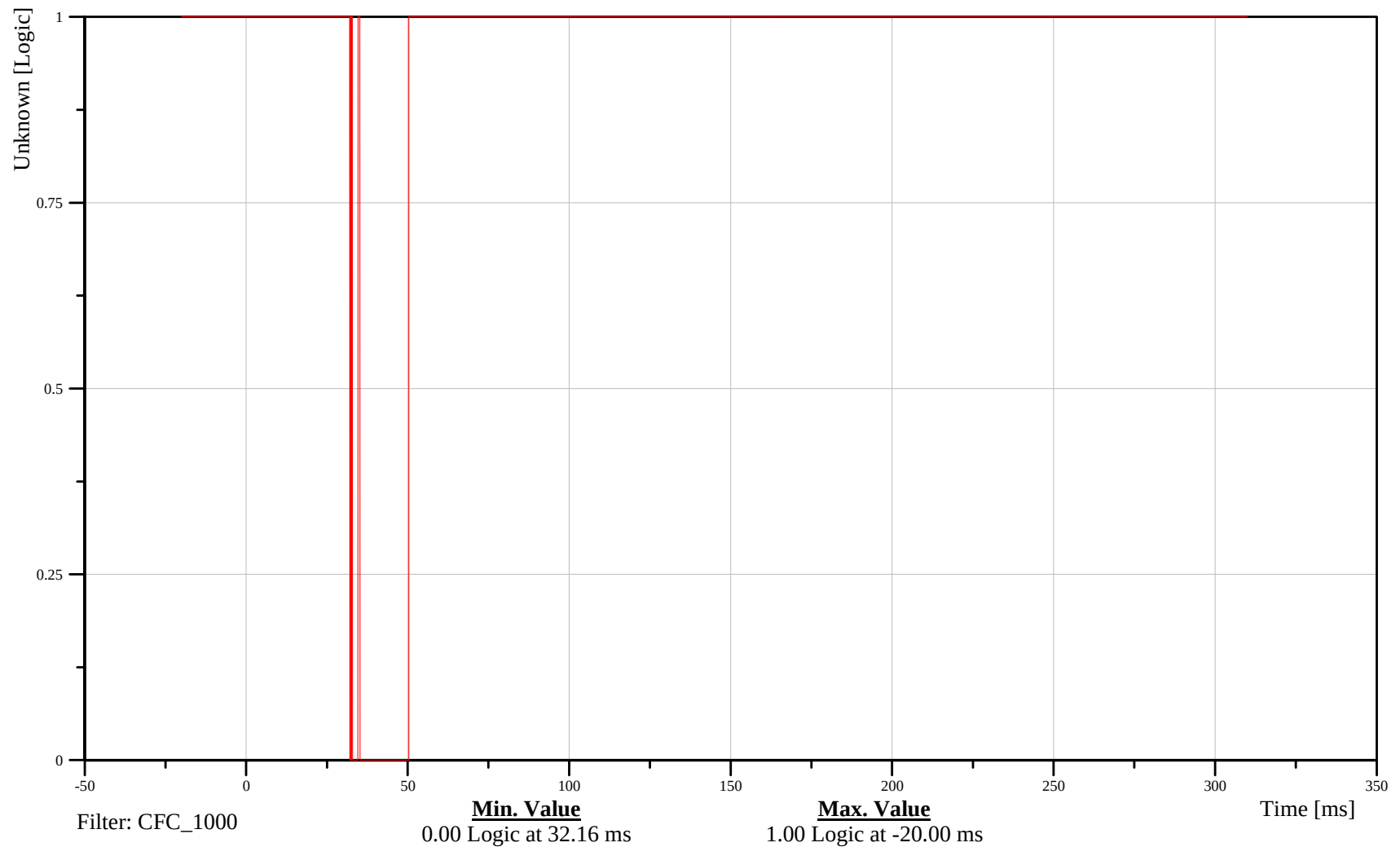
Driver Torso Contact Switch

Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TORS000000VO0A

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-55

080729



World SID Evaluation

Driver Leg Contact Switch

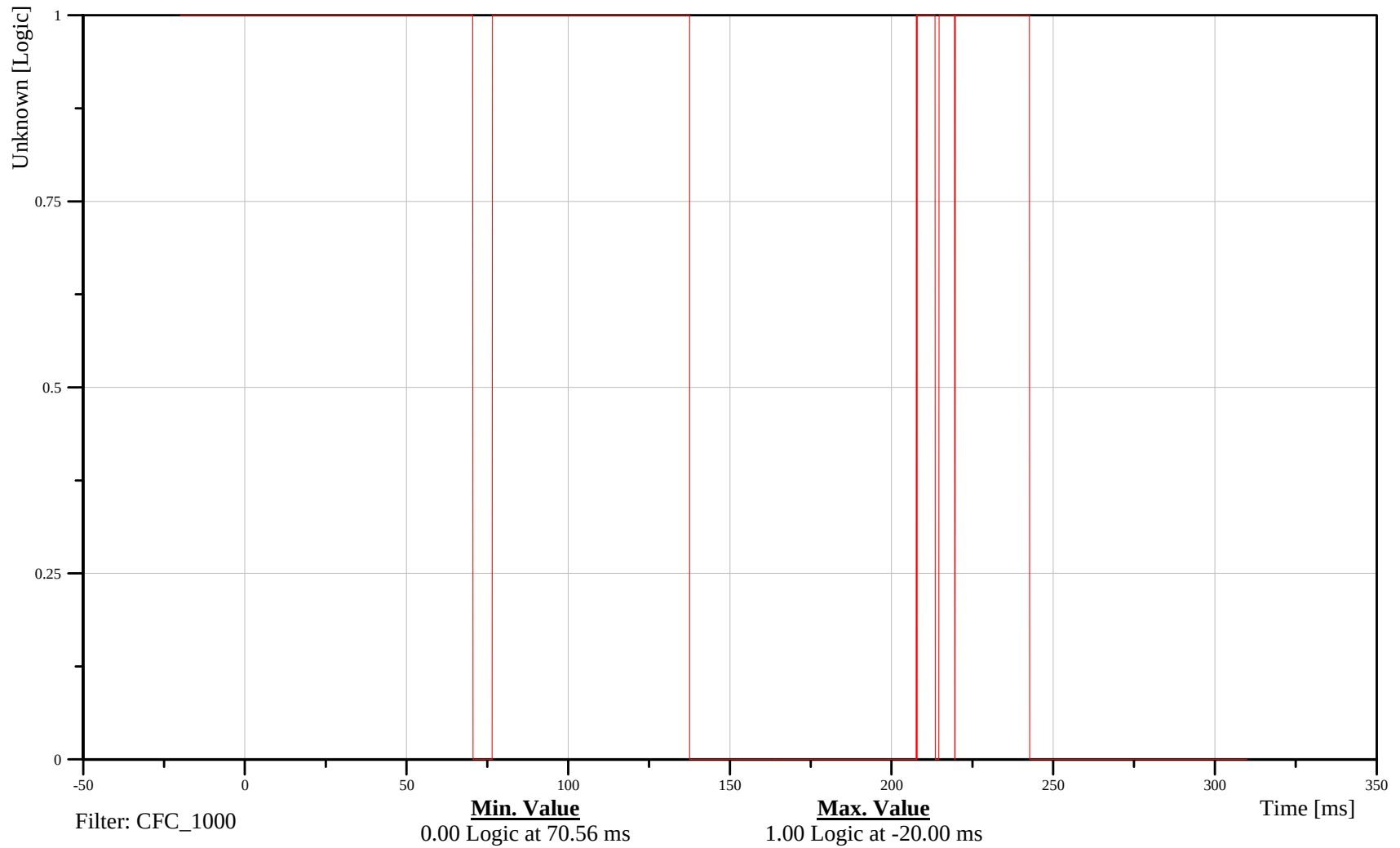
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11LEGLE00000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-56

080729



World SID Evaluation
Passenger Head Contact Switch

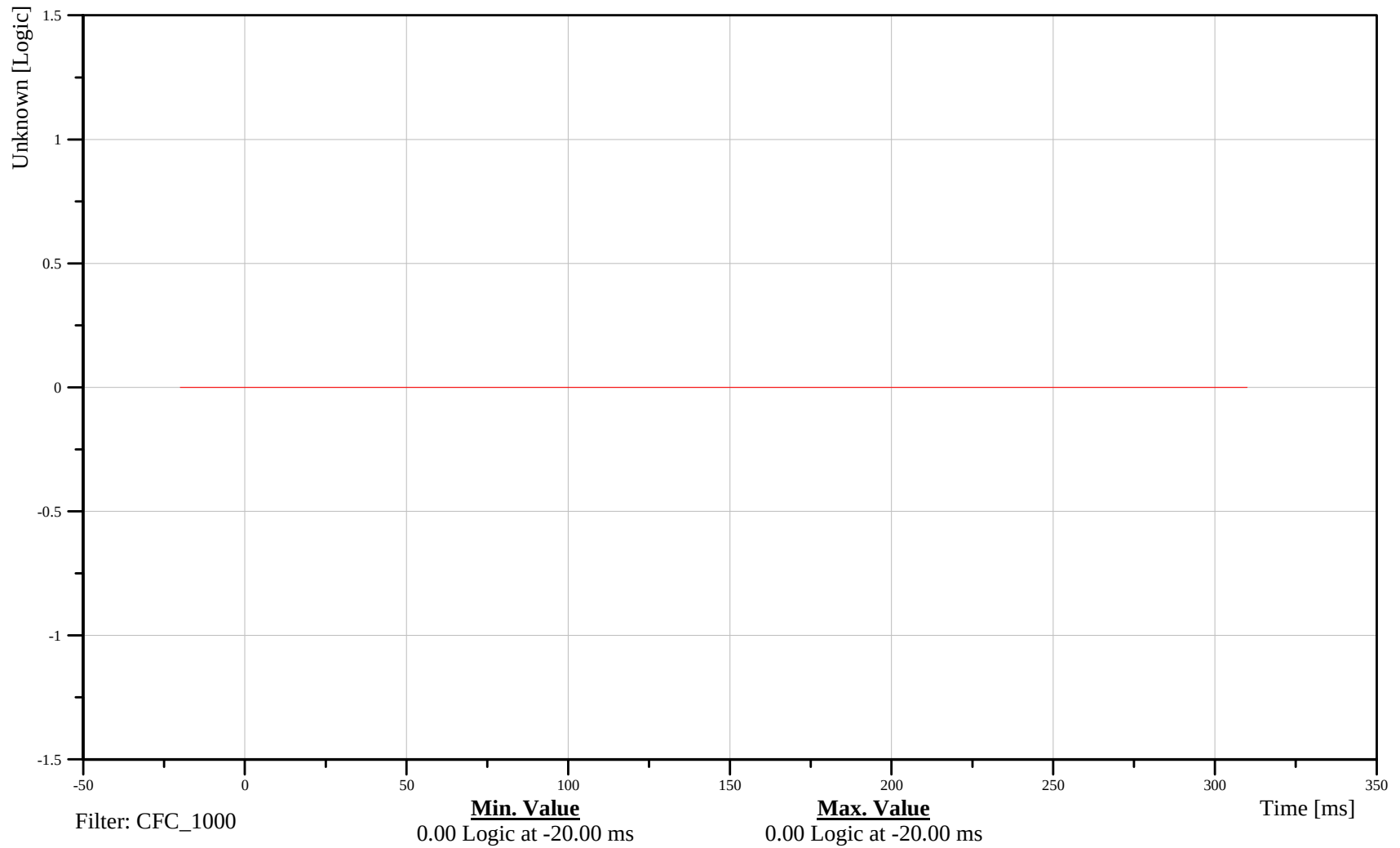
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14HEAD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-57

080729



World SID Evaluation

Passenger Shoulder Contact Switch

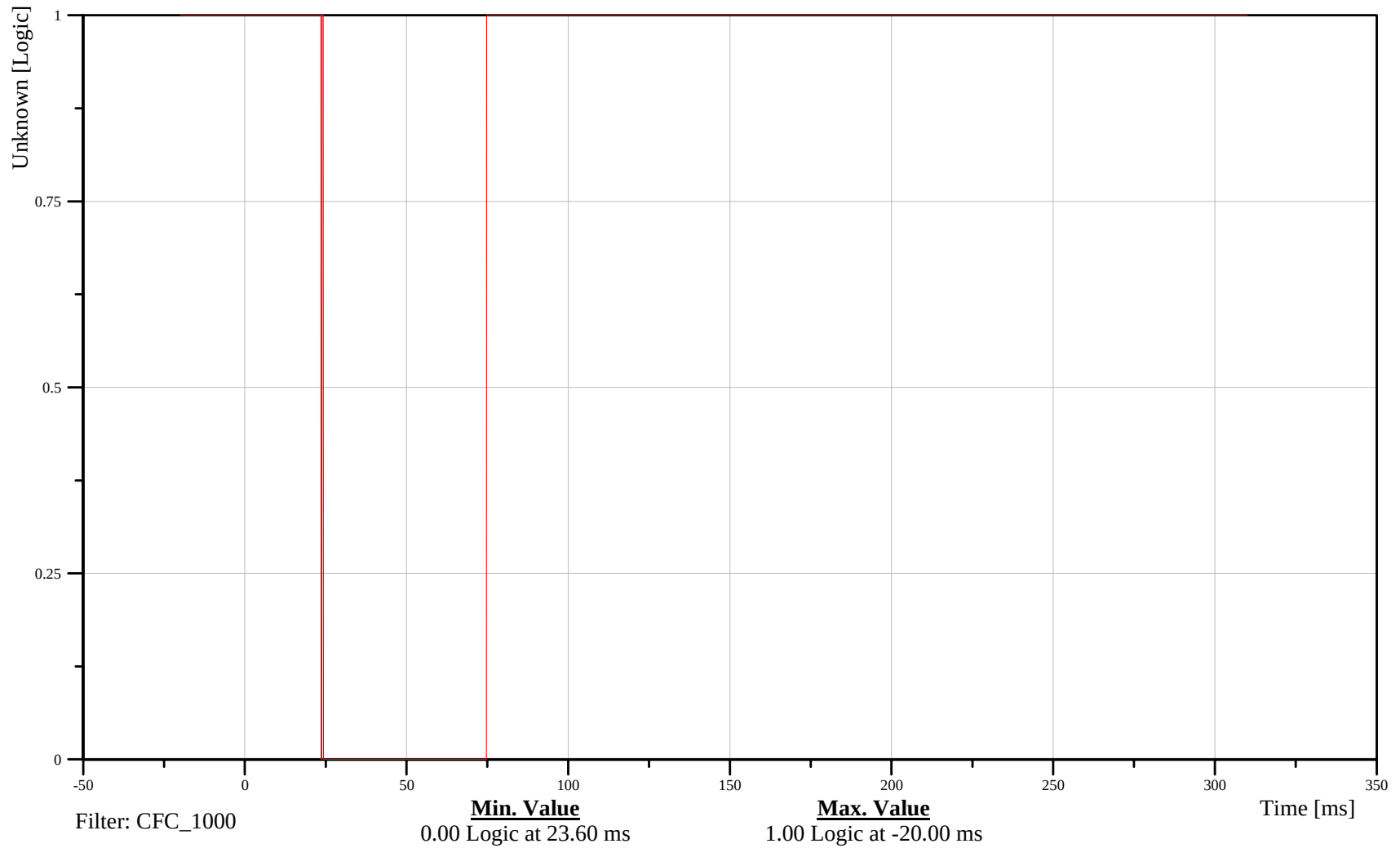
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLD000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-58

080729



World SID Evaluation

Passenger Torso Contact Switch

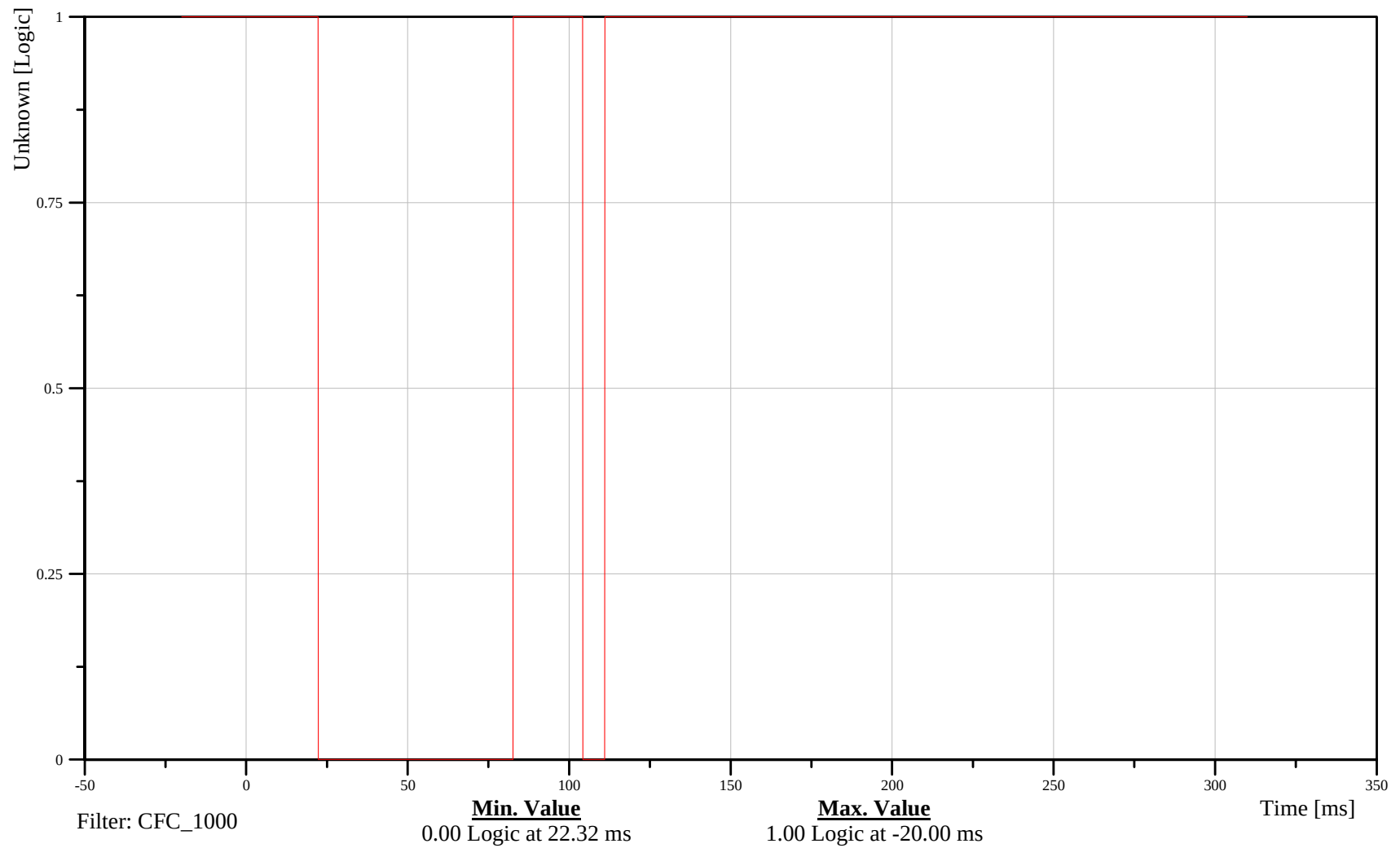
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TORS000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-59

080729



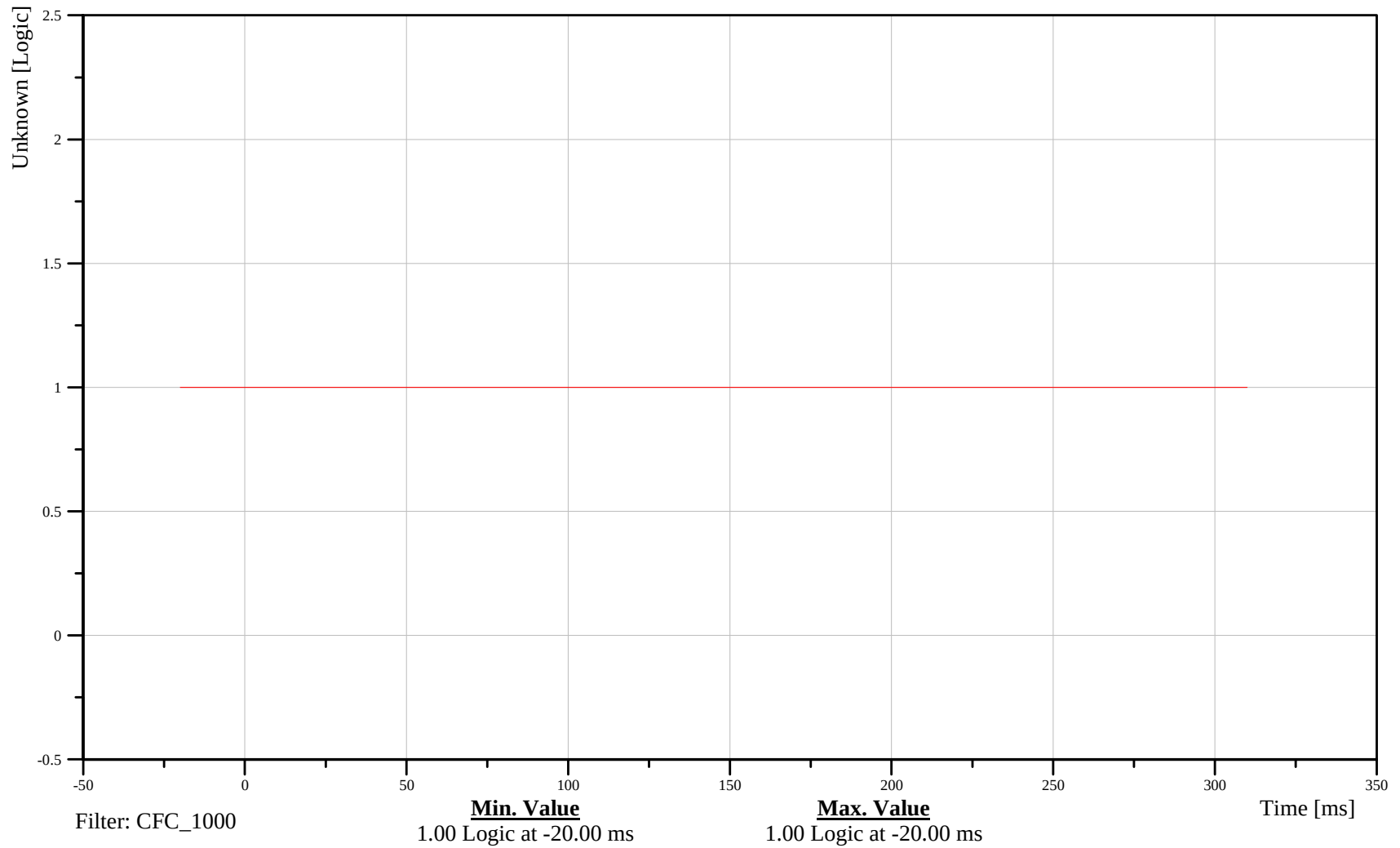
World SID Evaluation
Passenger Leg Contact Switch

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14LEGLE00000VO0A

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-60

080729



World SID Evaluation
MDB Left Frame X-Axis Acceleration

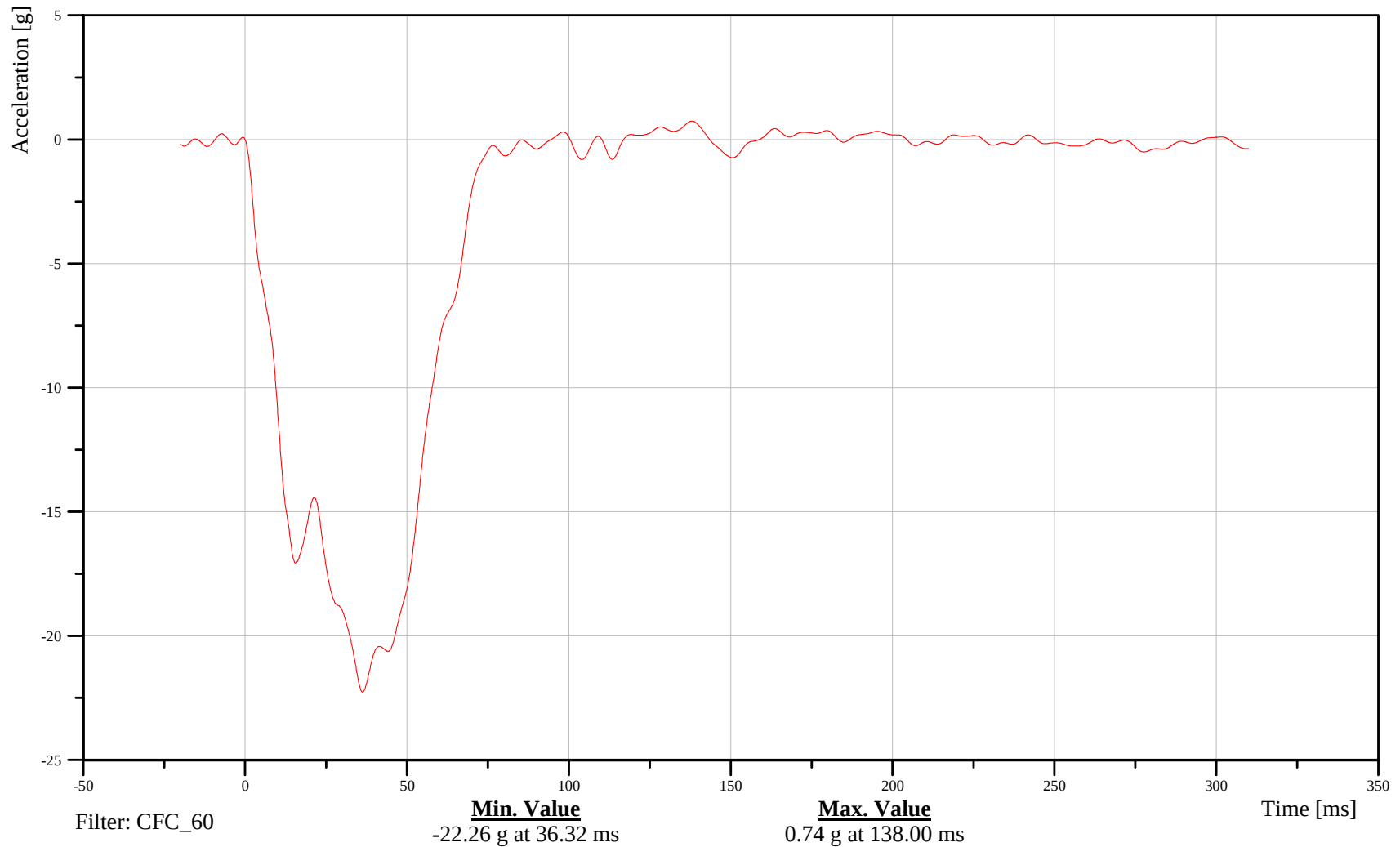
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0FRAMLE0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-61

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

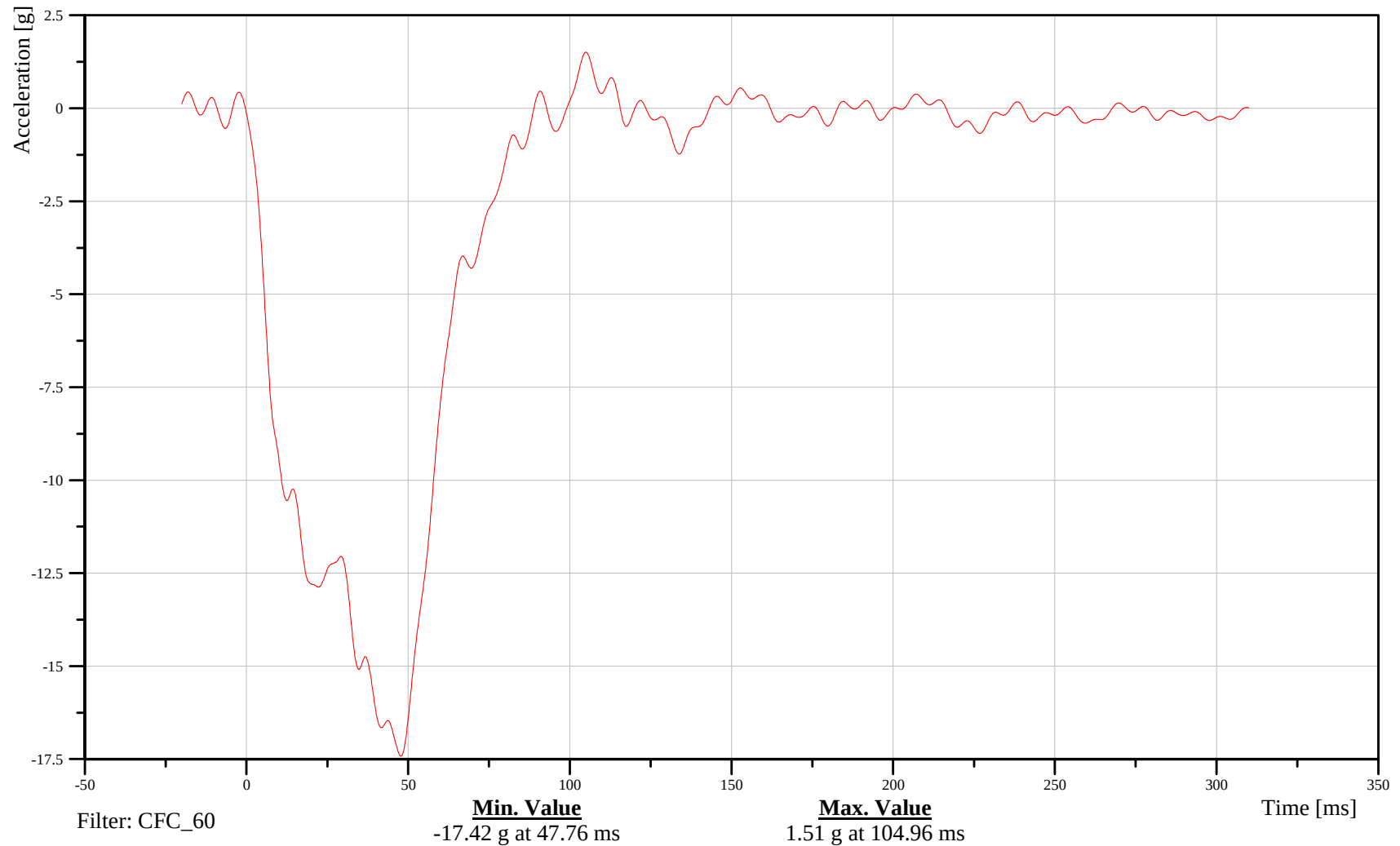
MDB Right Frame X-Axis Acceleration

Customer: VRTC

M0FRAMRI0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-62

080729



World SID Evaluation
MDB Top Frame X-Axis Acceleration

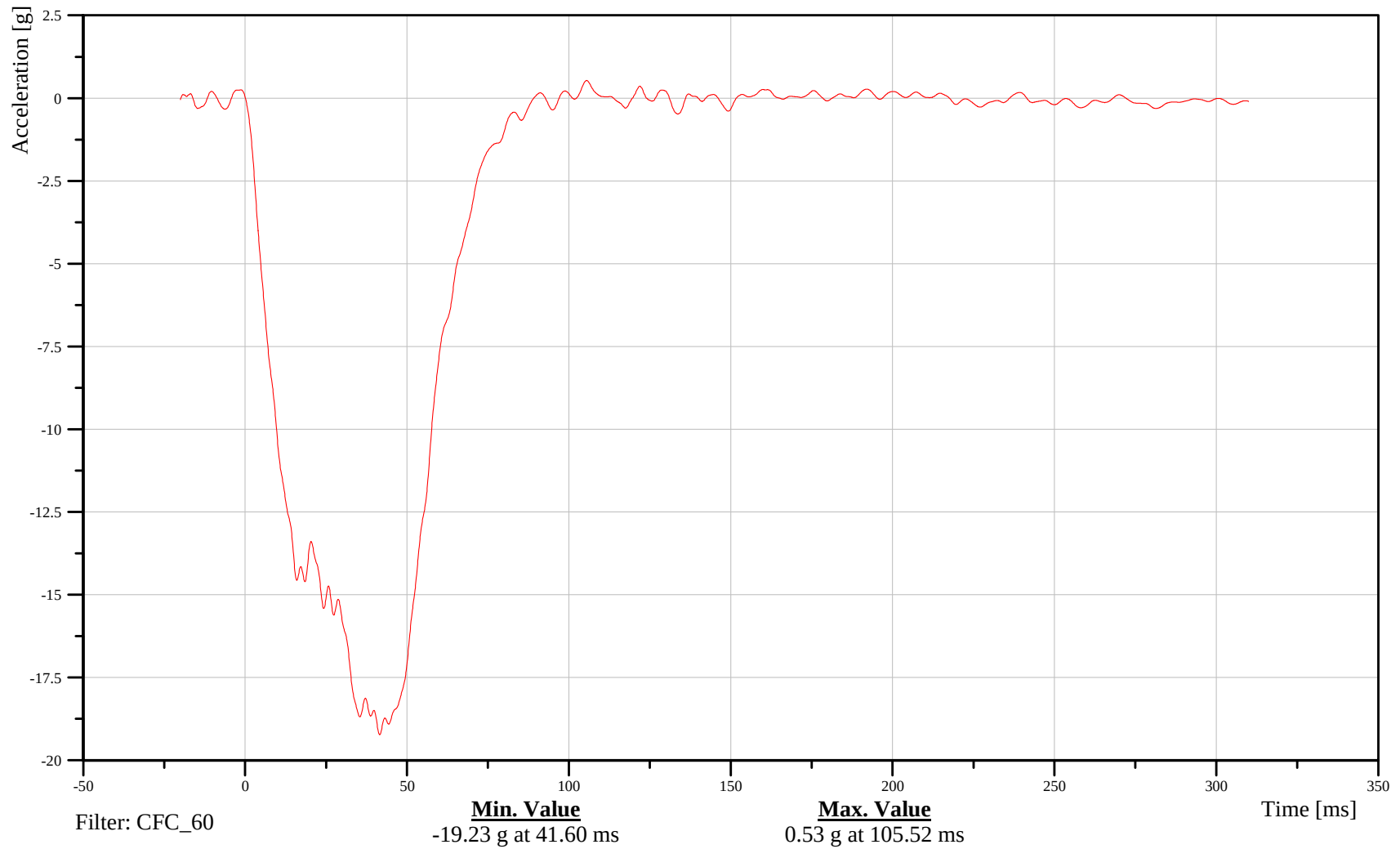
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0FRAMTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-63

080729



World SID Evaluation
MDB Left Rear X-Axis Acceleration

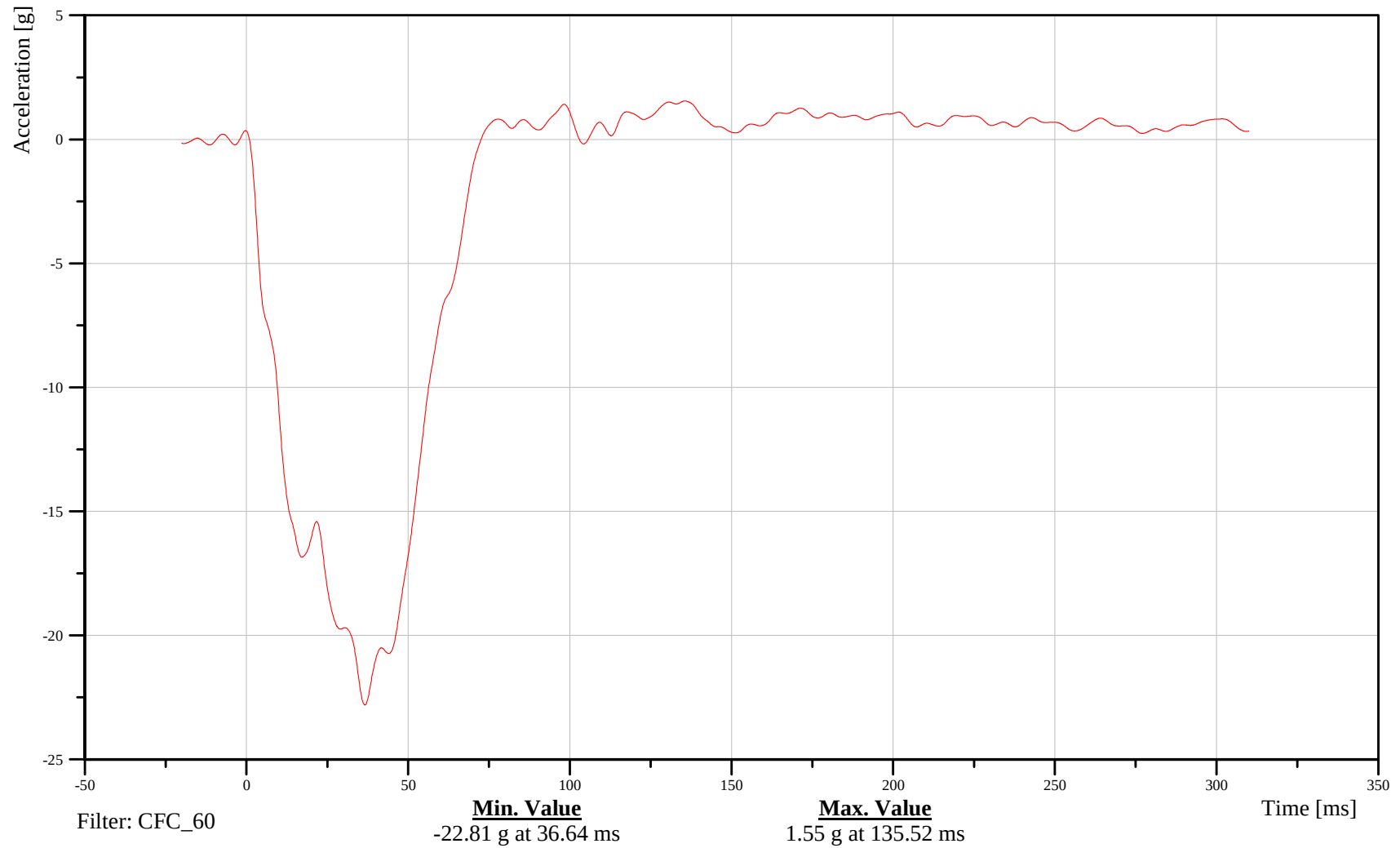
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0FRAMLERE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-64

080729



World SID Evaluation
MDB Left Rear Y-Axis Acceleration

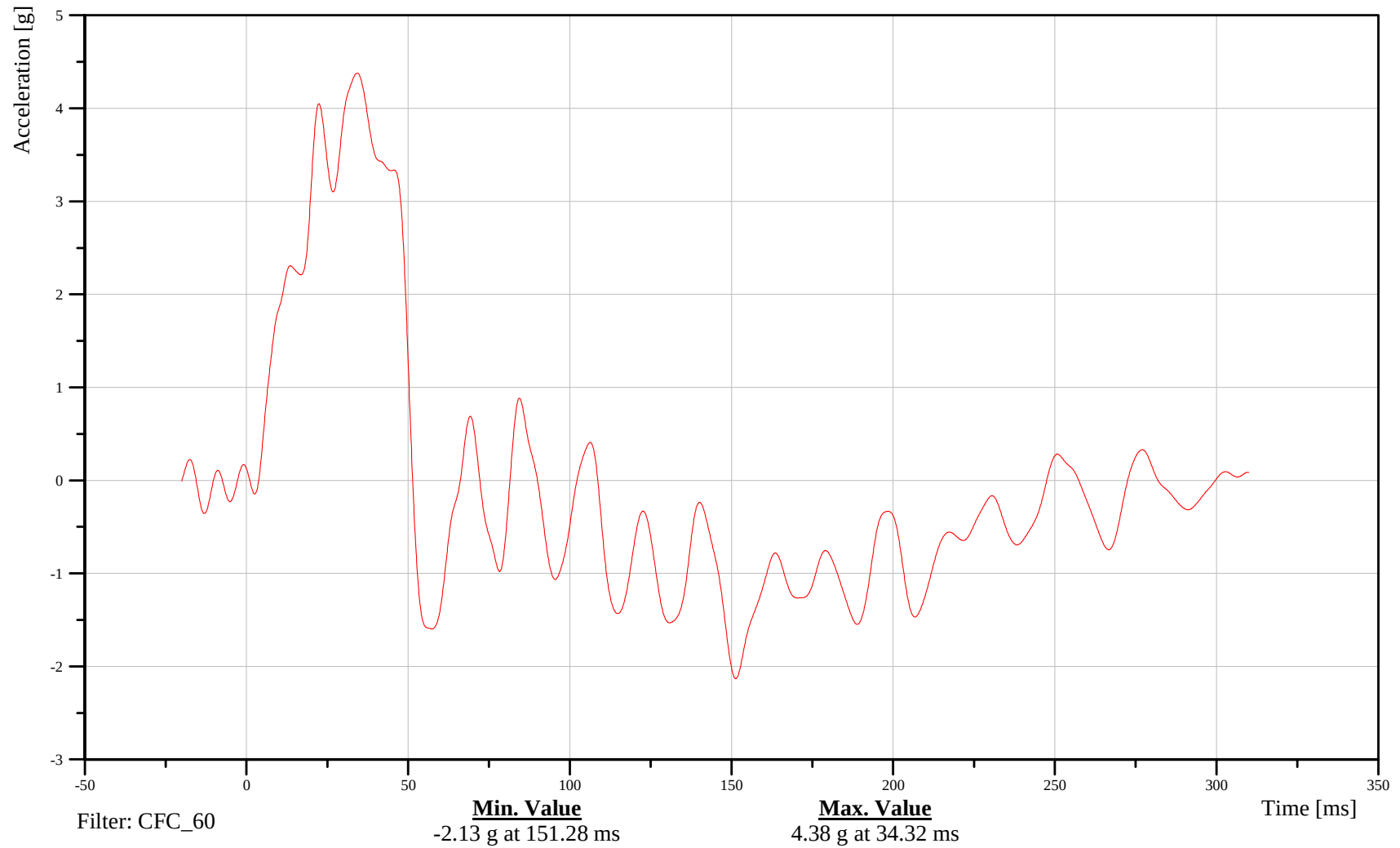
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0FRAMLERE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-65

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

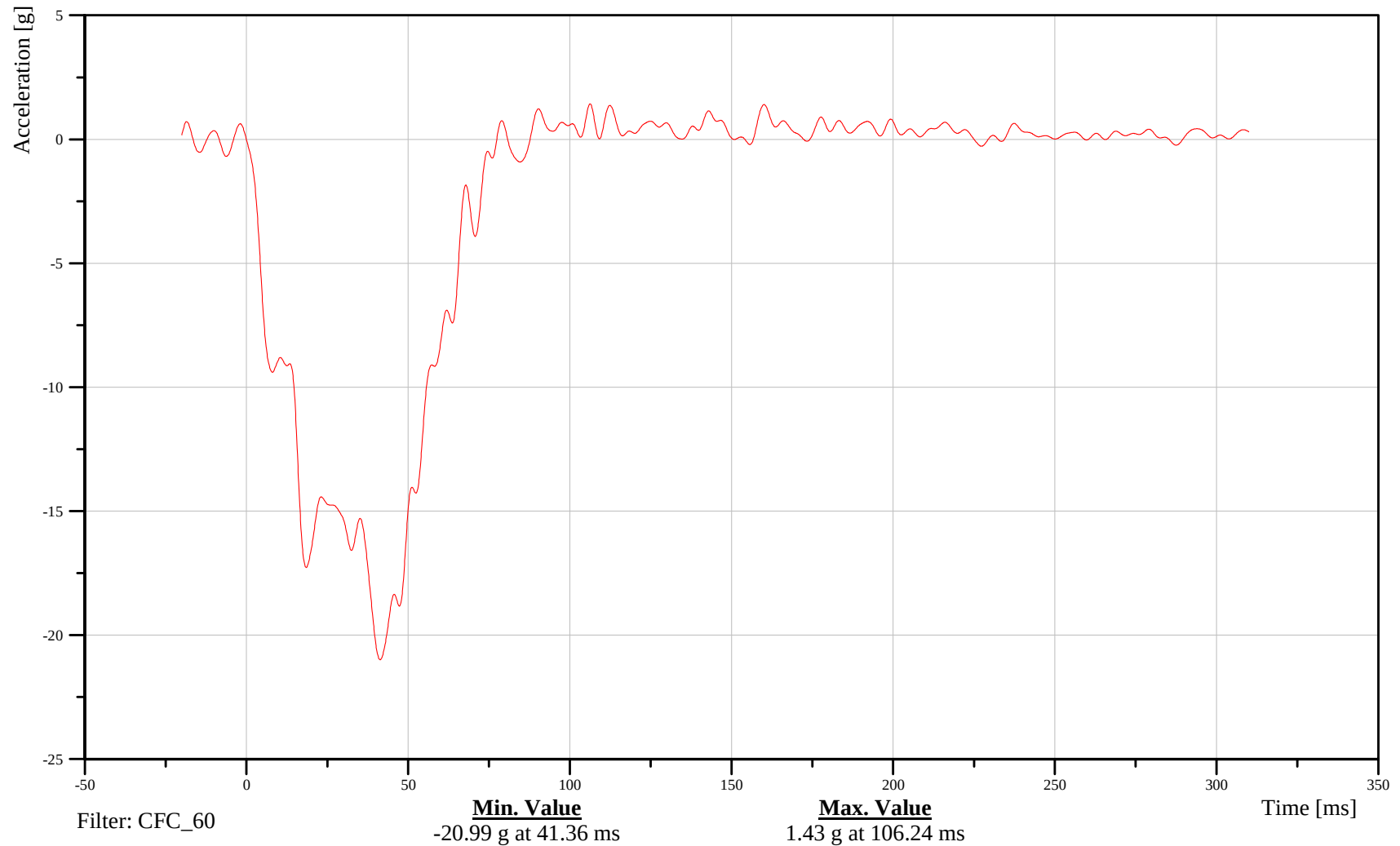
MDB Center of Gravity X-Axis Acceleration

Customer: VRTC

M0MBARCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-66

080729



World SID Evaluation
MDB Center of Gravity X-Axis Velocity

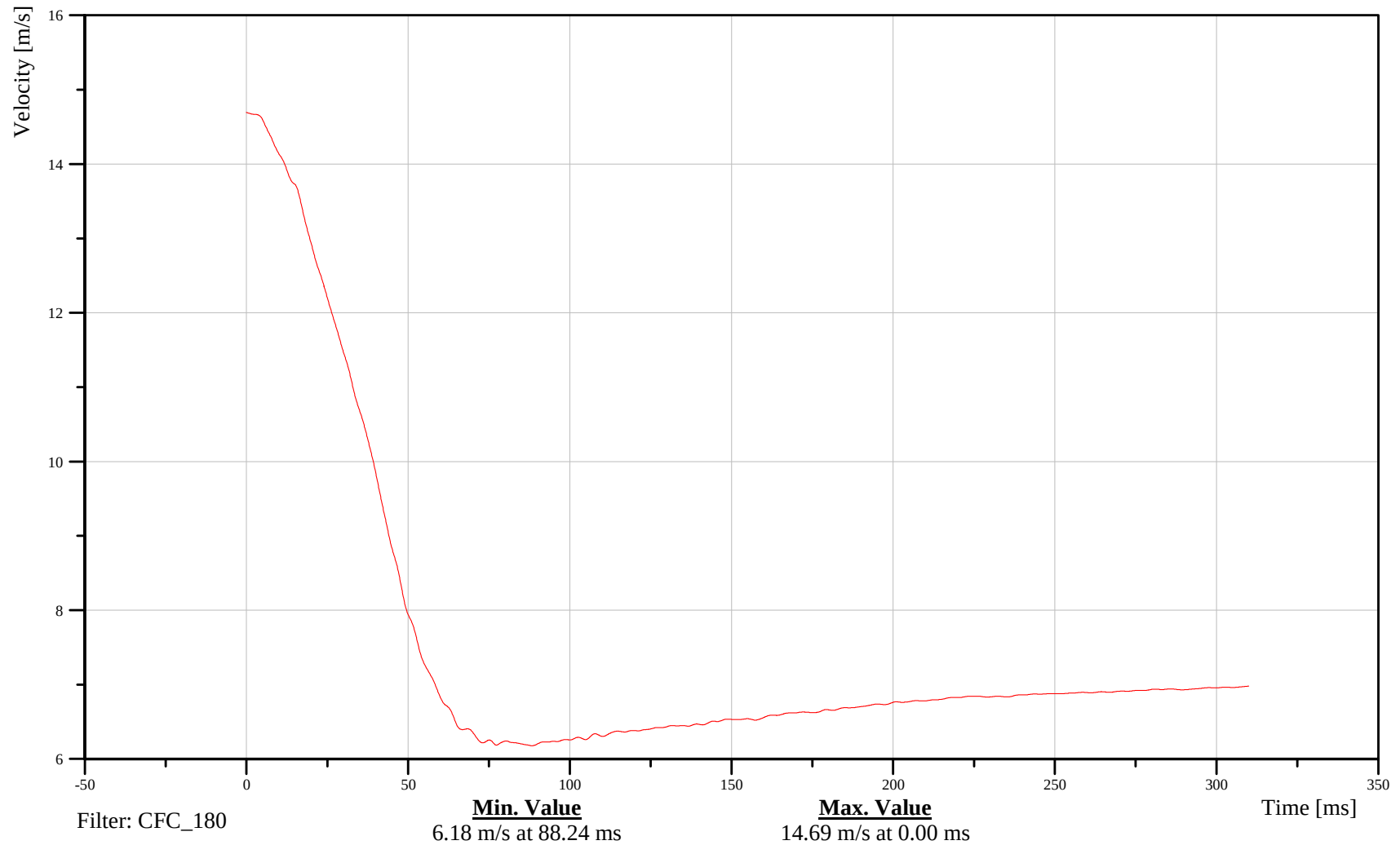
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0MBARCG0000VEXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-67

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

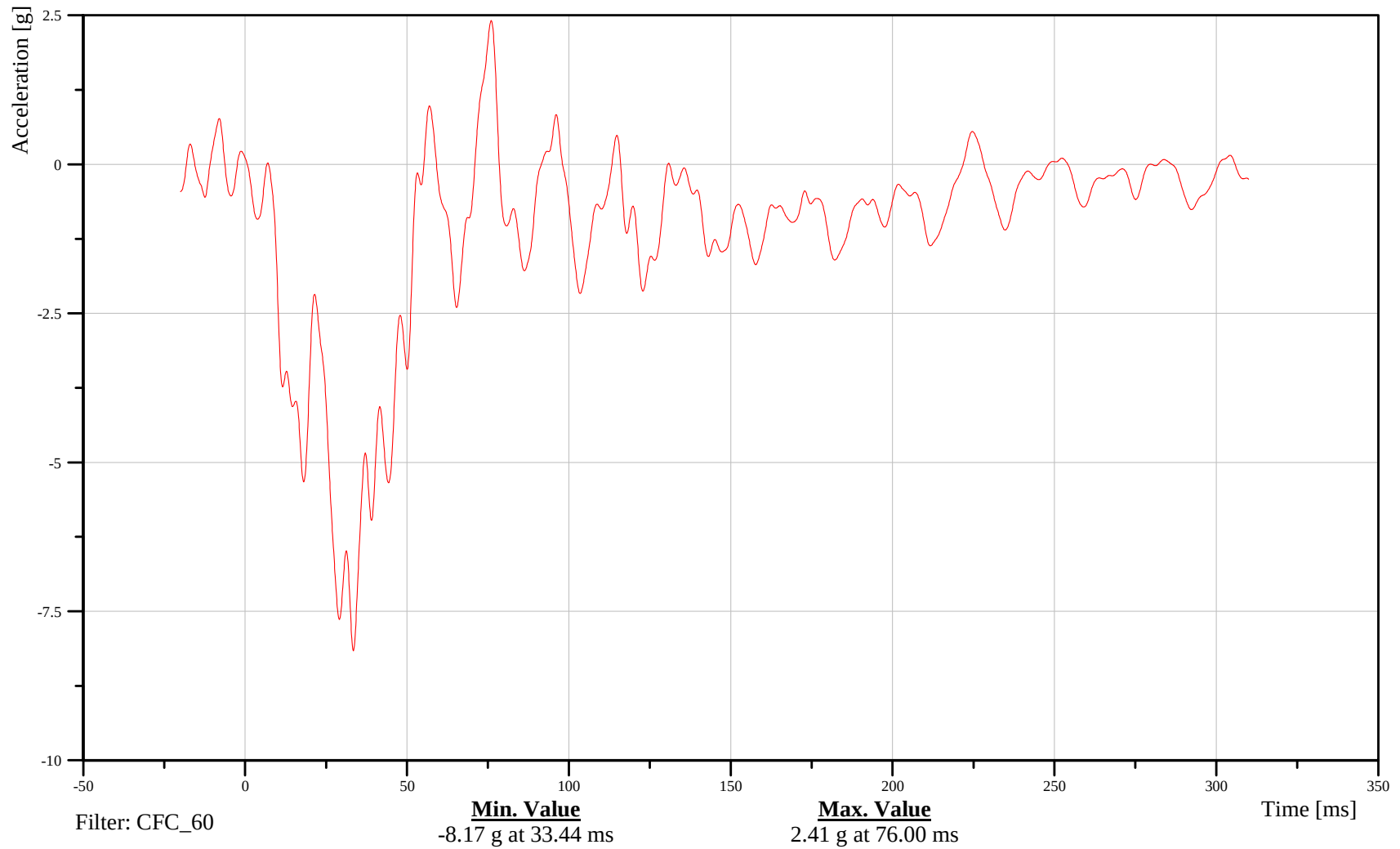
MDB Center of Gravity Y-Axis Acceleration

Customer: VRTC

M0MBARCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-68

080729



World SID Evaluation
MDB Center of Gravity Y-Axis Velocity

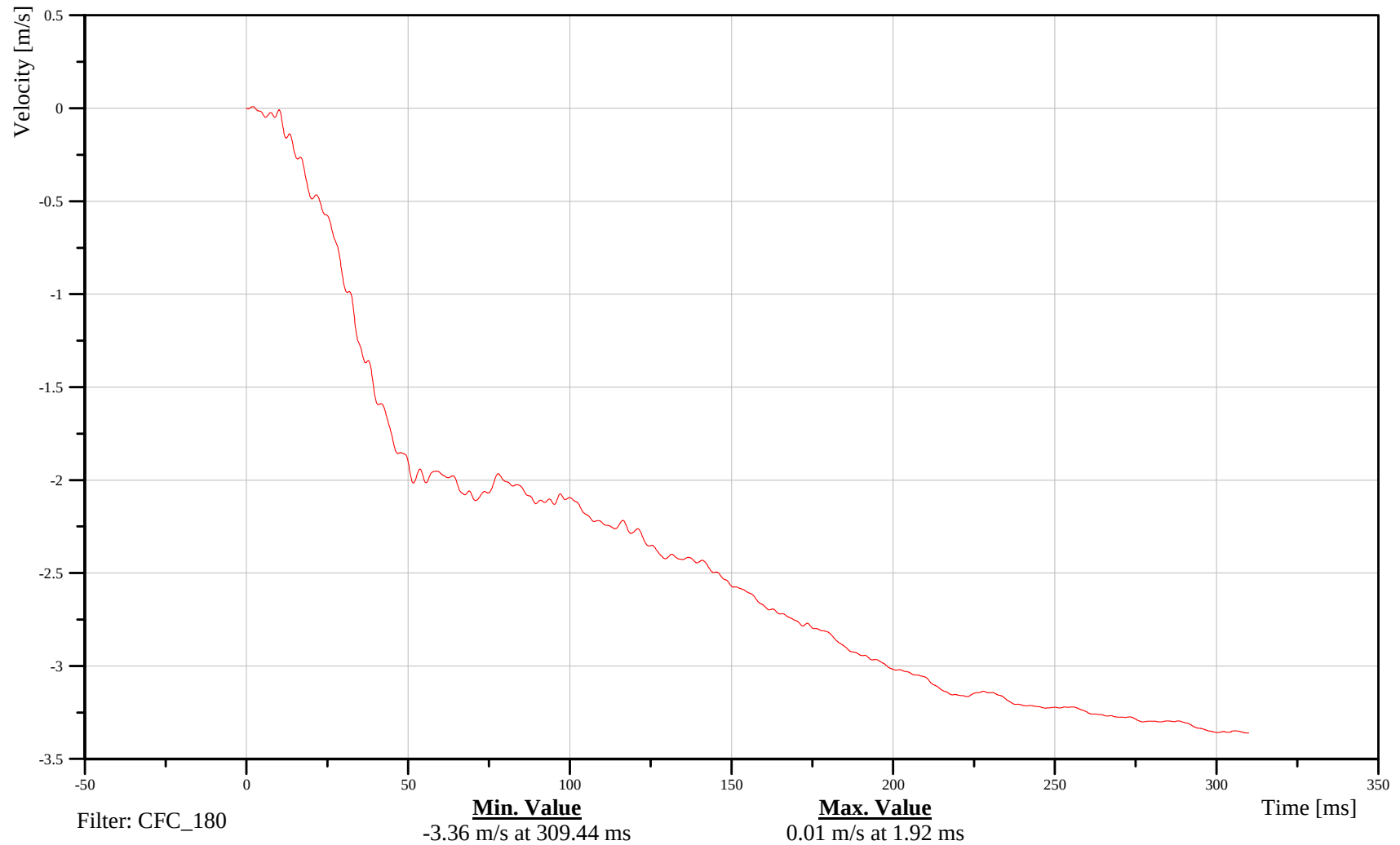
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0MBARCG0000VEYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-69

080729



World SID Evaluation

MDB Center of Gravity Z-Axis Acceleration

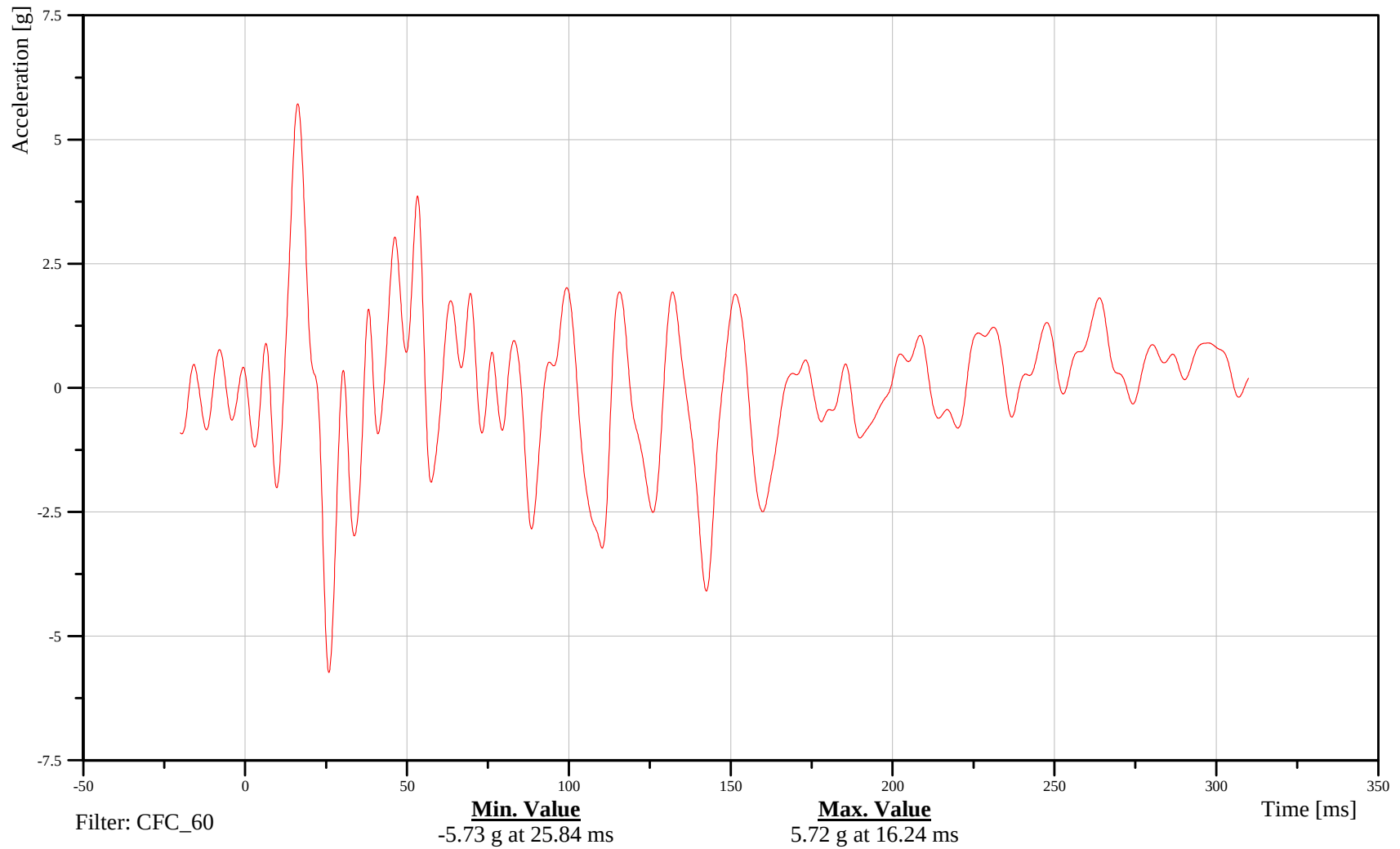
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0MBARCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-70

080729



World SID Evaluation

MDB Center of Gravity Resultant Acceleration

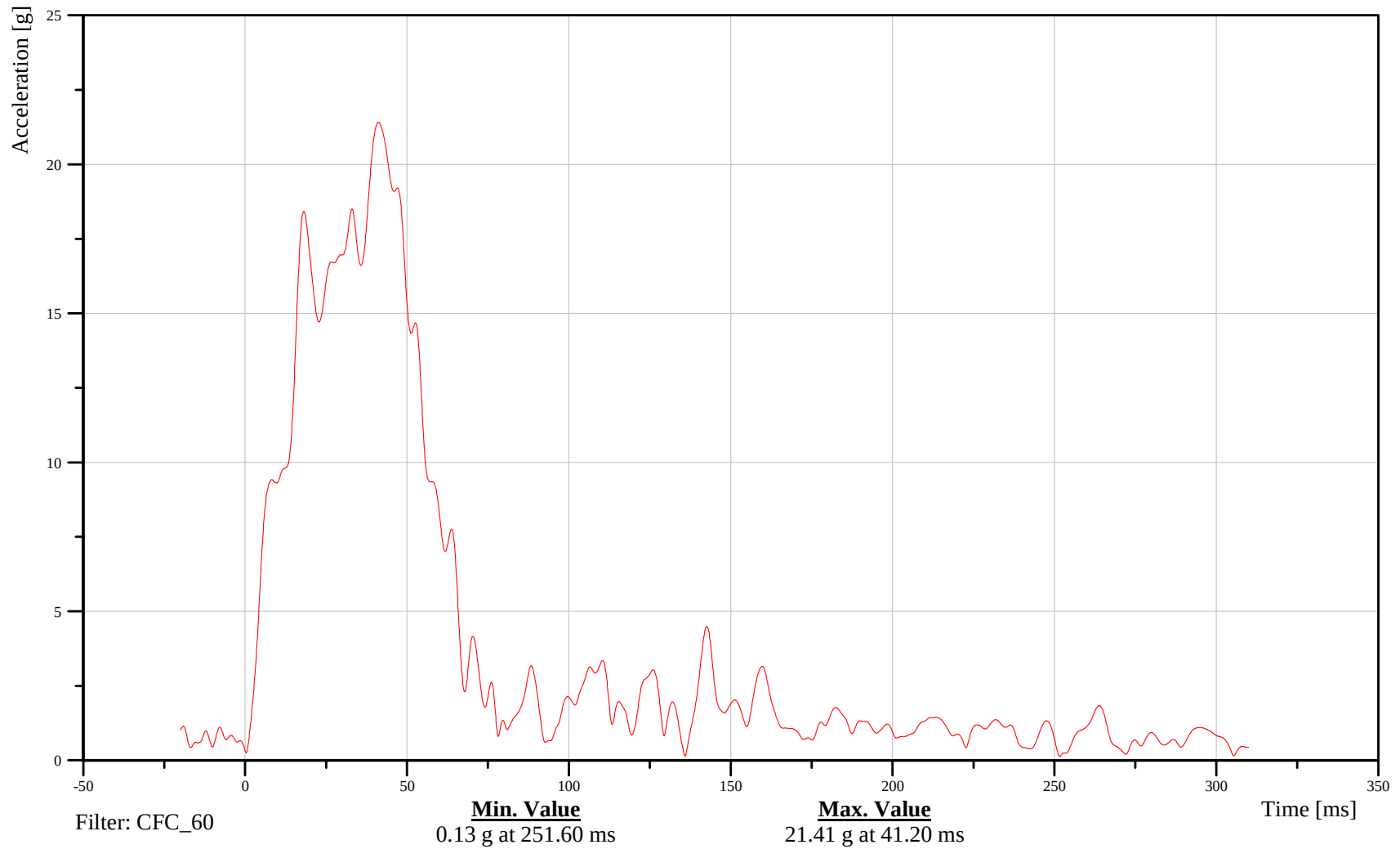
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M0MBARCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-71

080729



World SID Evaluation

MDB Left Contact Switch

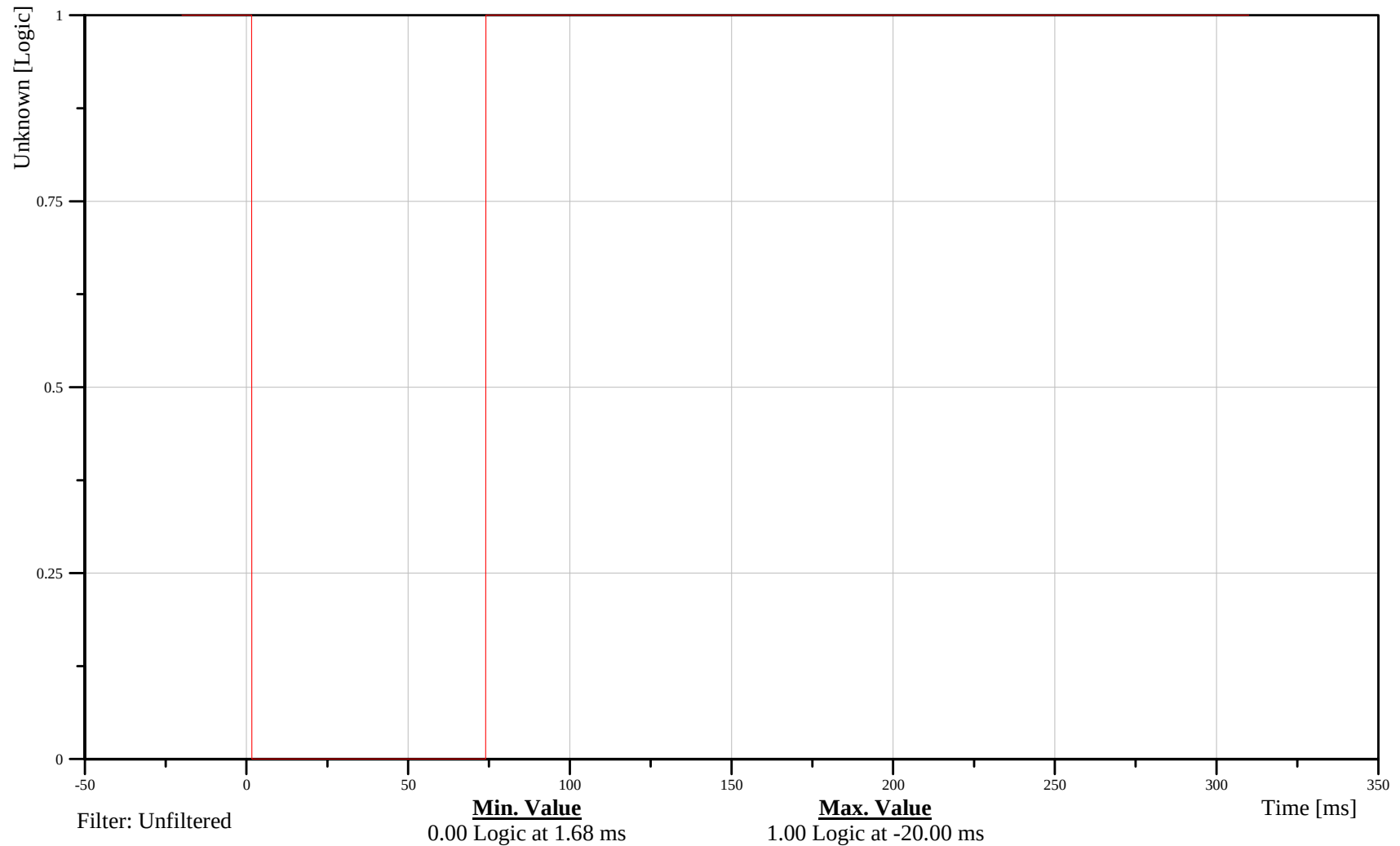
Date: 07/29/2008
Time: 14:50

Customer: VRTC

M1CONT000000VO00

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-72

080729



World SID Evaluation

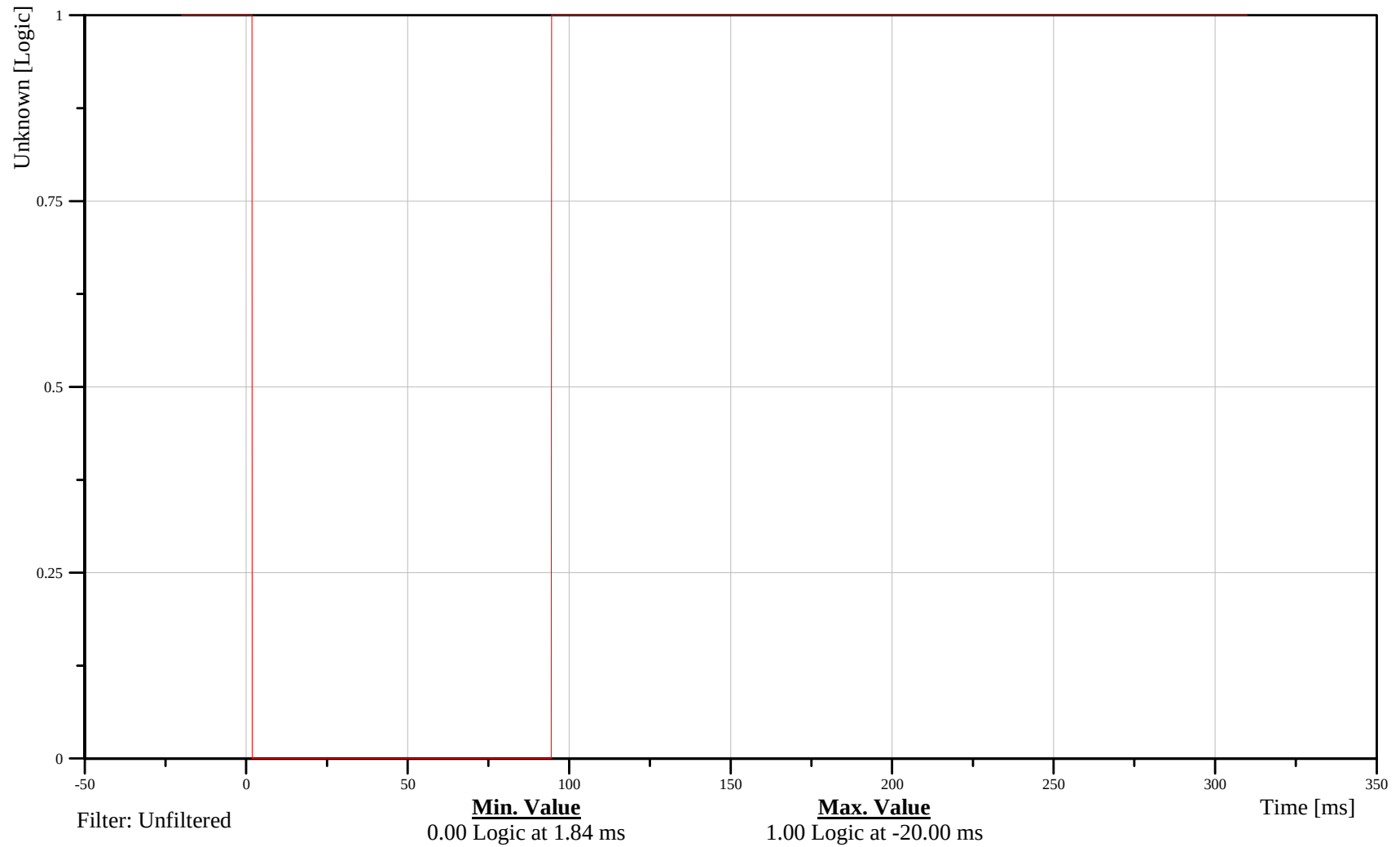
MDB Right Contact Switch

Date: 07/29/2008
Time: 14:50

Customer: VRTC

M3CONT000000VO00

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-73

080729



World SID Evaluation

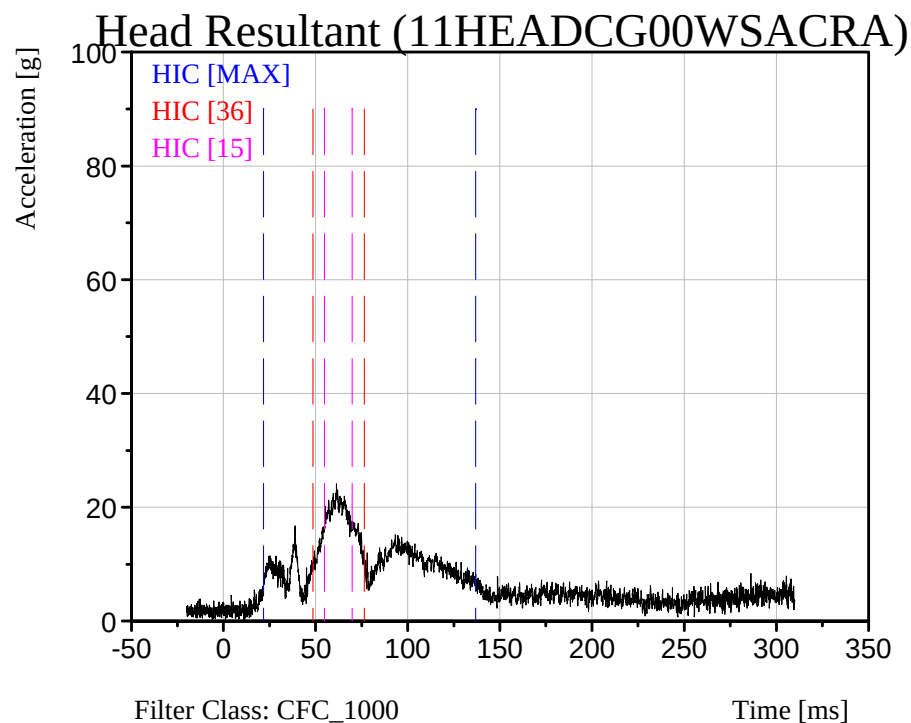
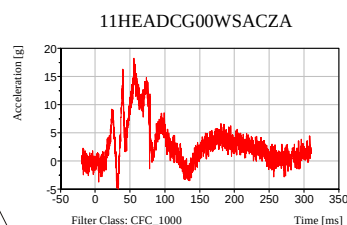
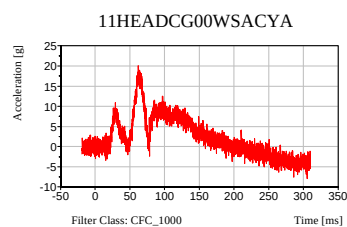
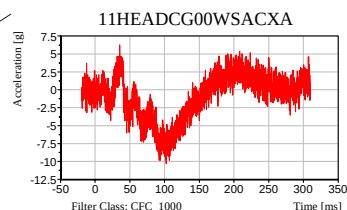
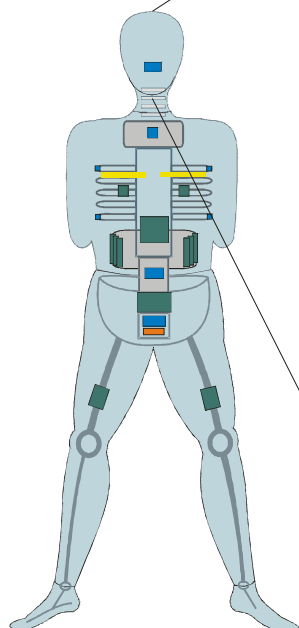
Head Injury Criterion (HIC)

Date: 07/29/2008
Time: 14:50

Customer: VRTC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



	<u>T1</u> (Begin)	<u>T2</u> (End)	<u>Avg. g T1 to T2</u>
HIC [Max.] = 49.34	21.76 ms	136.96 ms	11.29 g
HIC [36] = 32.53	48.64 ms	76.48 ms	16.85 g
HIC [15] = 25.38	54.80 ms	69.84 ms	19.52 g

Dummy:
Seating Position:
Driver

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

B-74

080729



World SID Evaluation

Driver Head X-Axis Acceleration

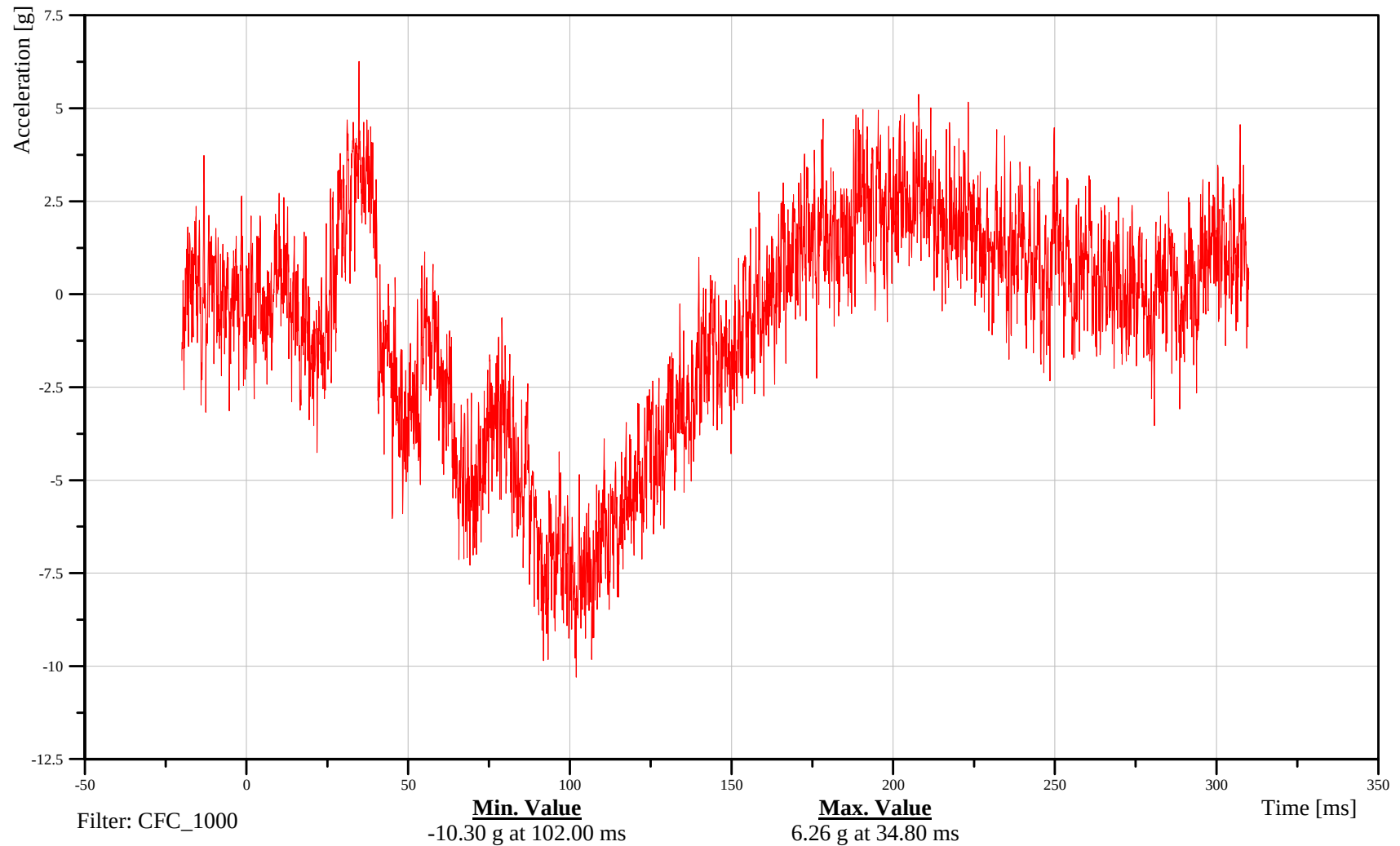
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11HEADCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-75

080729



World SID Evaluation

Driver Head Y-Axis Acceleration

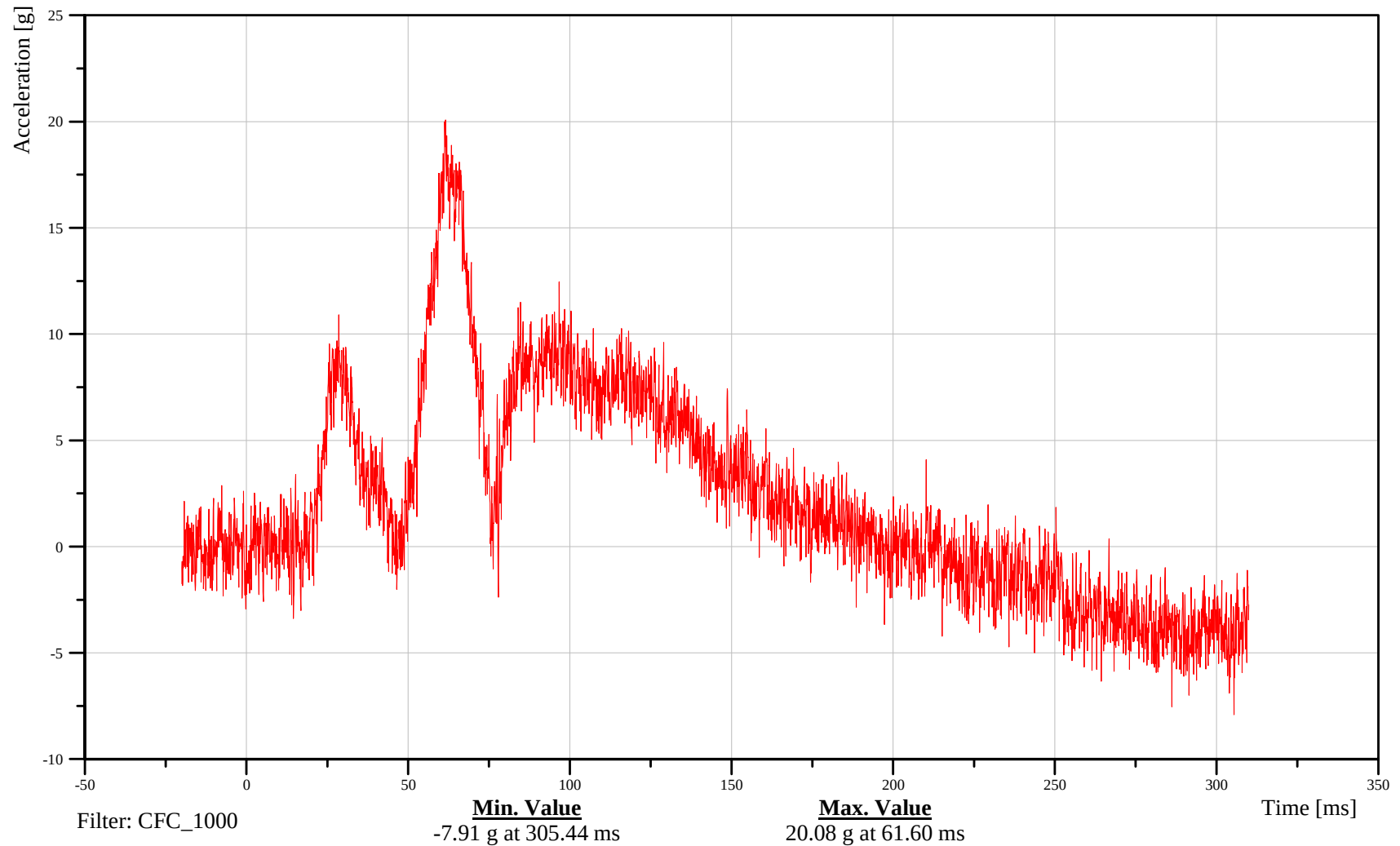
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11HEADCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-76

080729



World SID Evaluation

Driver Head Z-Axis Acceleration

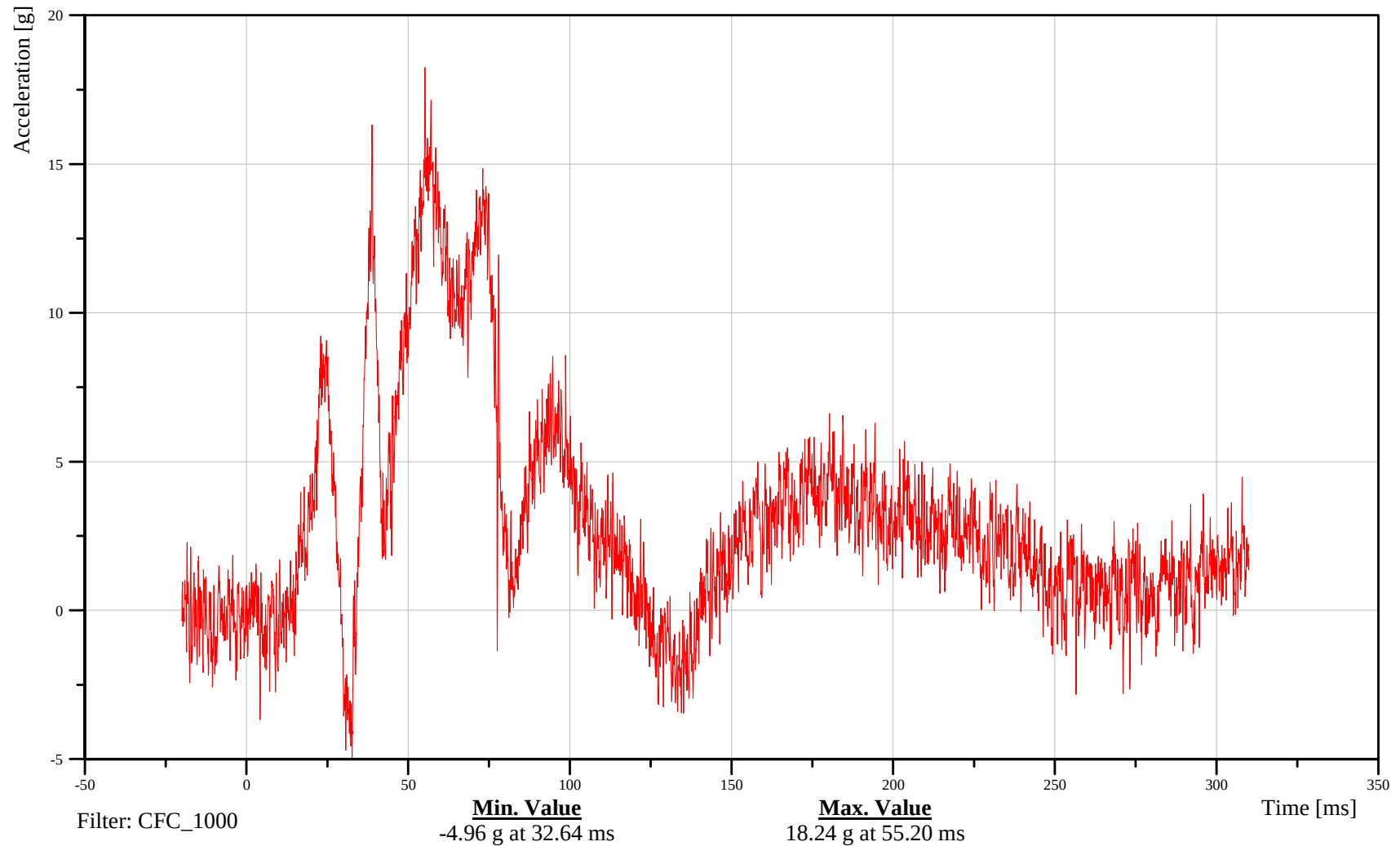
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11HEADCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-77

080729



World SID Evaluation
Driver Head Resultant Acceleration

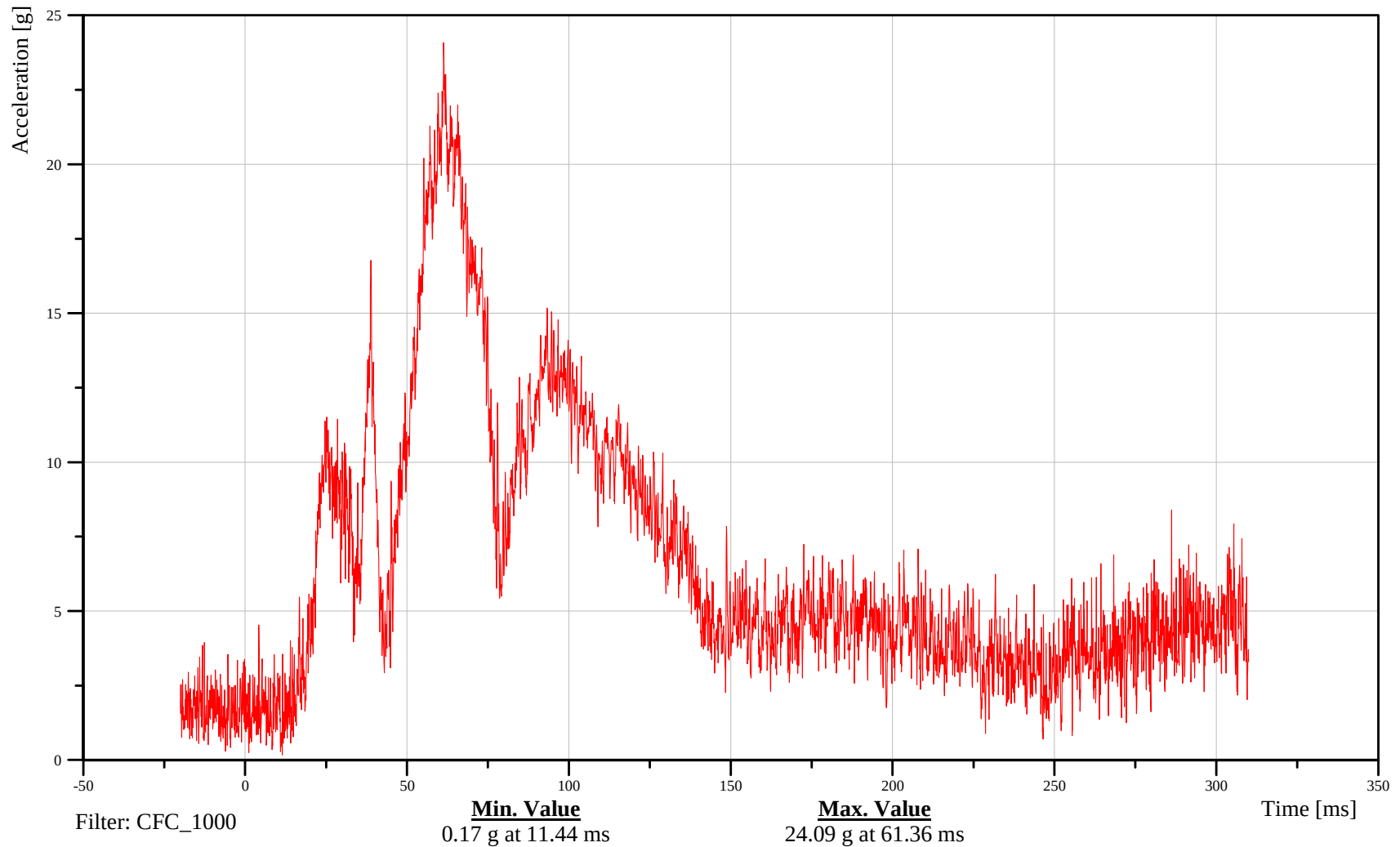
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11HEADCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-78

080729



World SID Evaluation

Driver Head X-Axis Angular Displacement

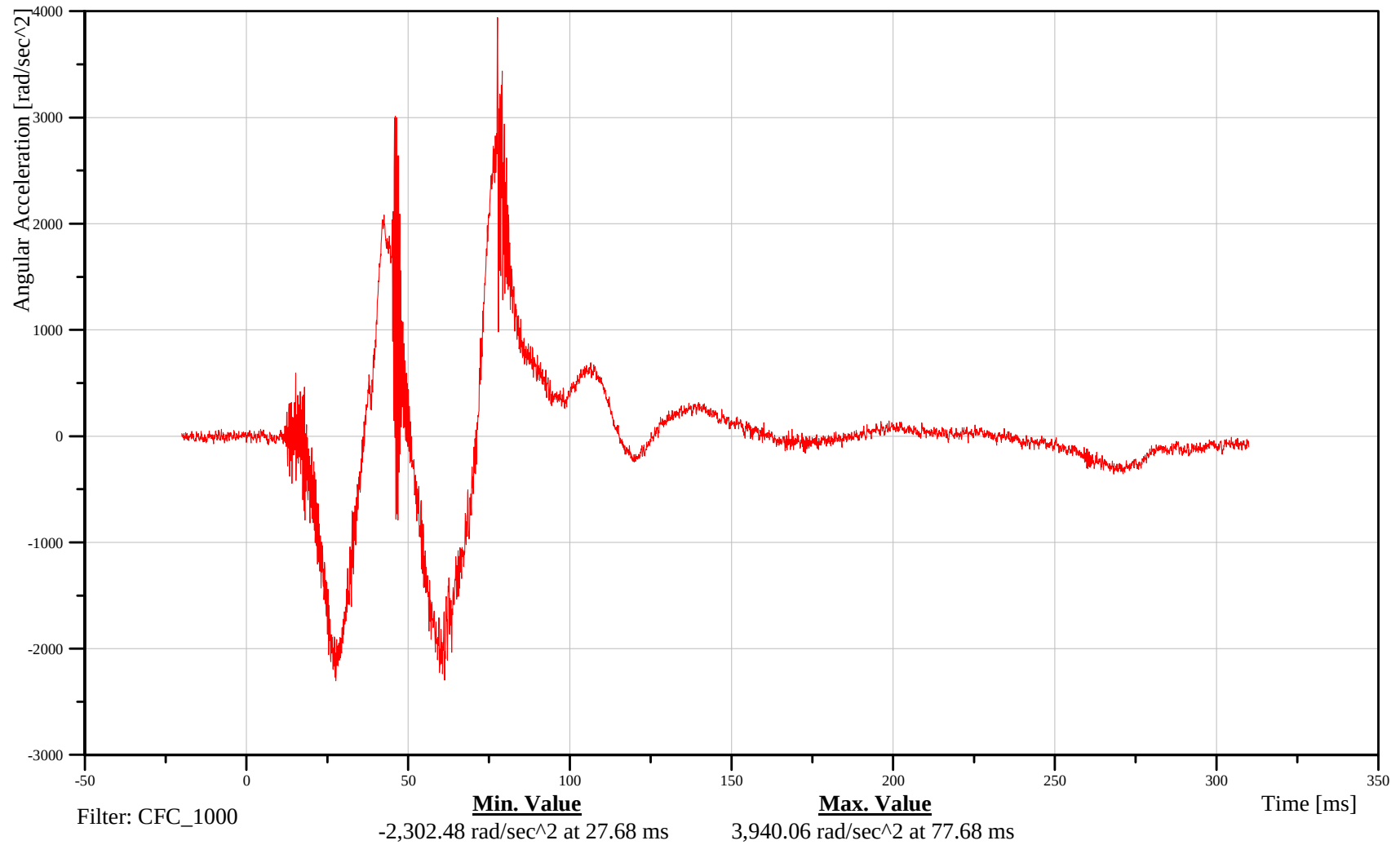
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11HEADCG00WSANXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-79

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

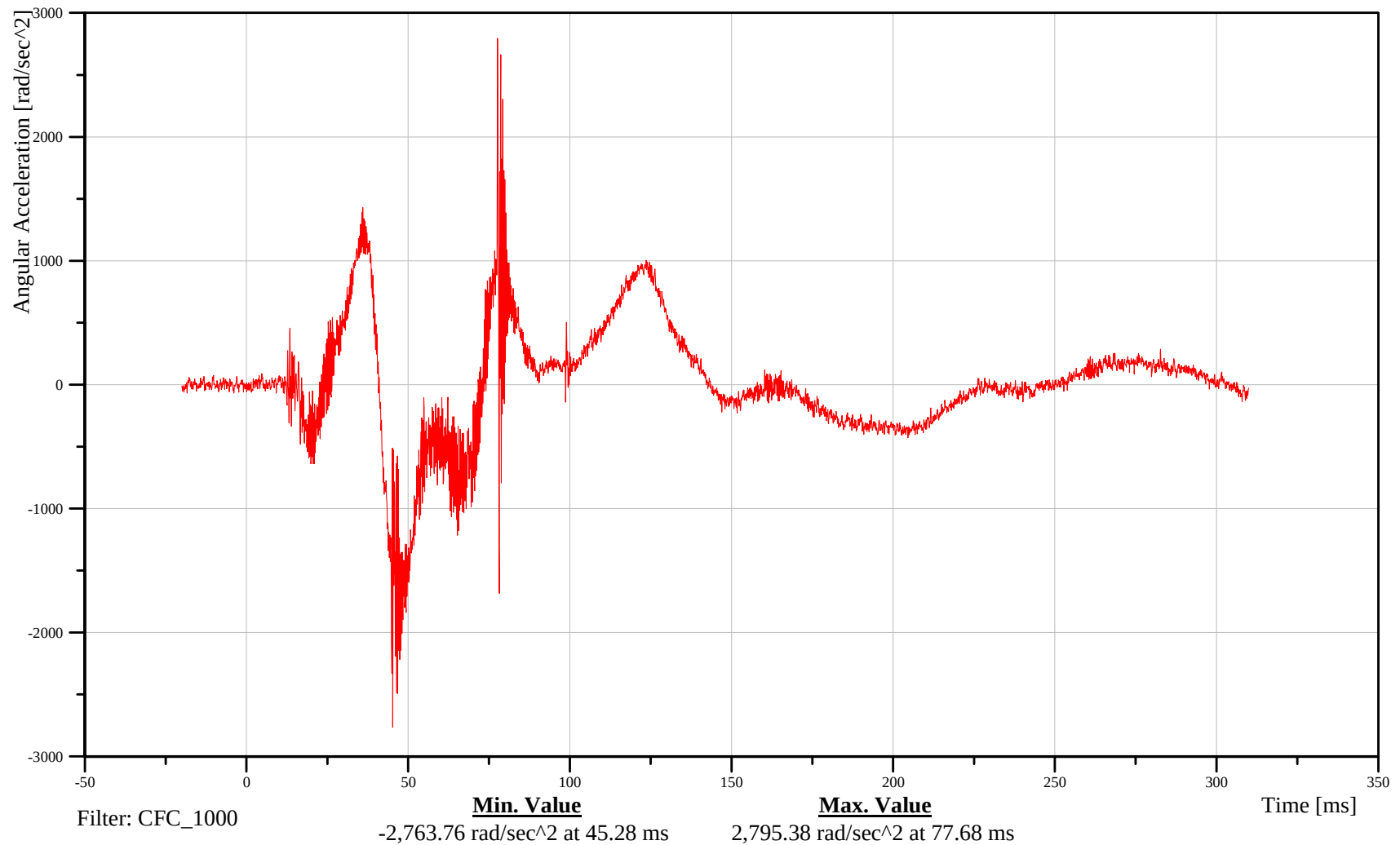
Driver Head Y-Axis Angular Displacement

Customer: VRTC

11HEADCG00WSANYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-80

080729



World SID Evaluation

Driver Head Z-Axis Angular Displacement

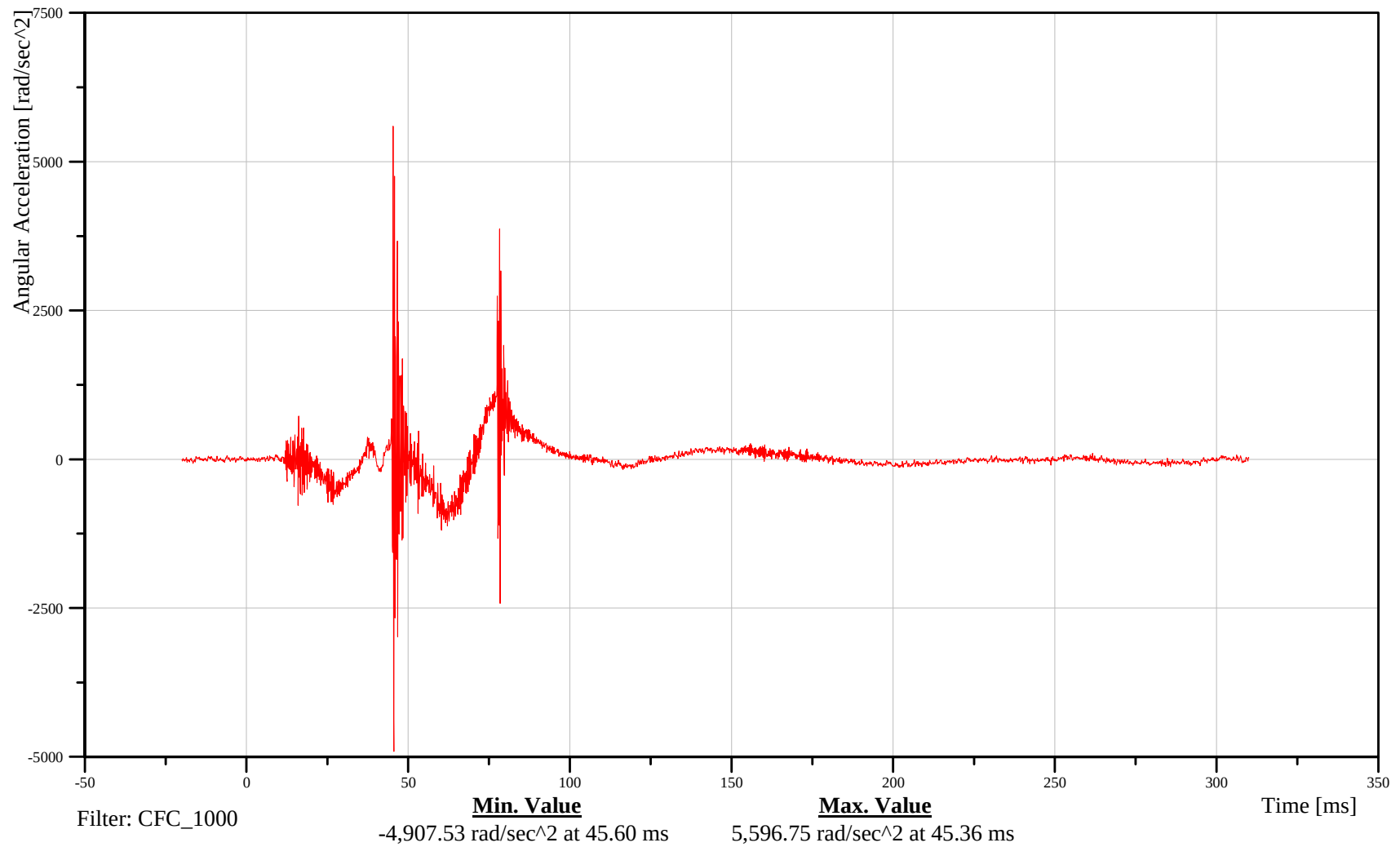
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11HEADCG00WSANZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-81

080729



World SID Evaluation
Driver Upper Neck X-Axis Force

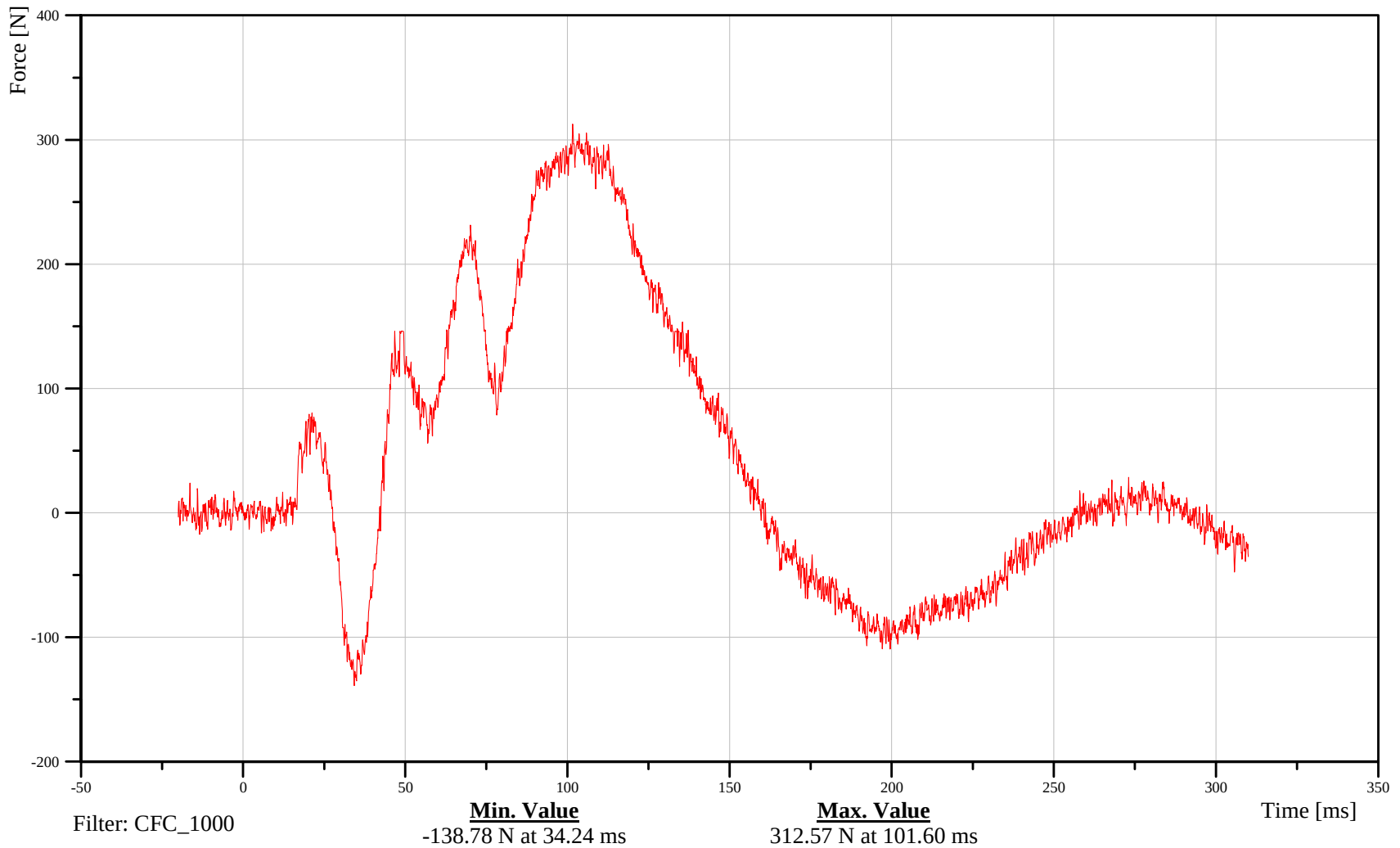
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKUP00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-82

080729



World SID Evaluation
Driver Upper Neck Y-Axis Force

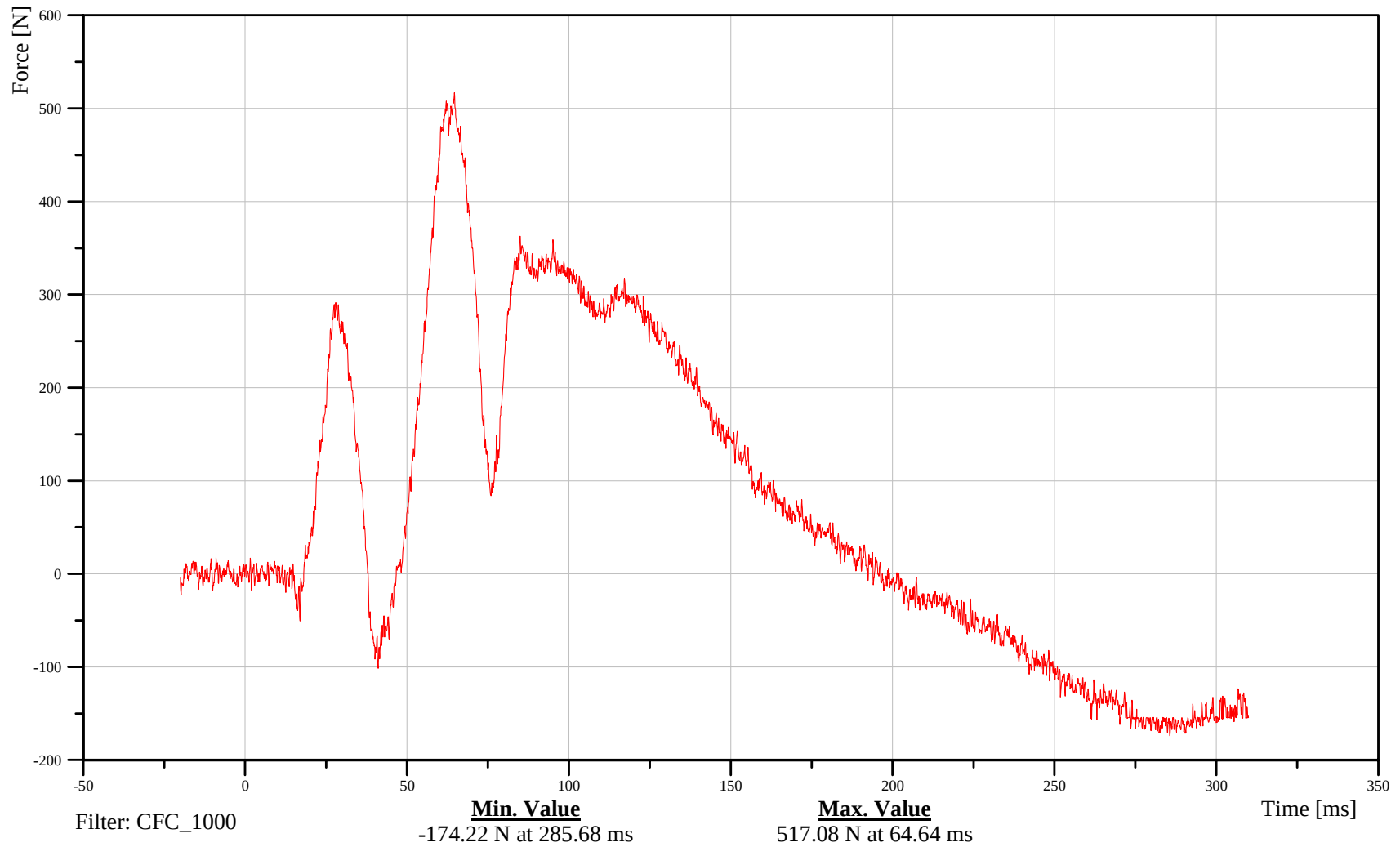
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKUP00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-83

080729



World SID Evaluation
Driver Upper Neck Z-Axis Force

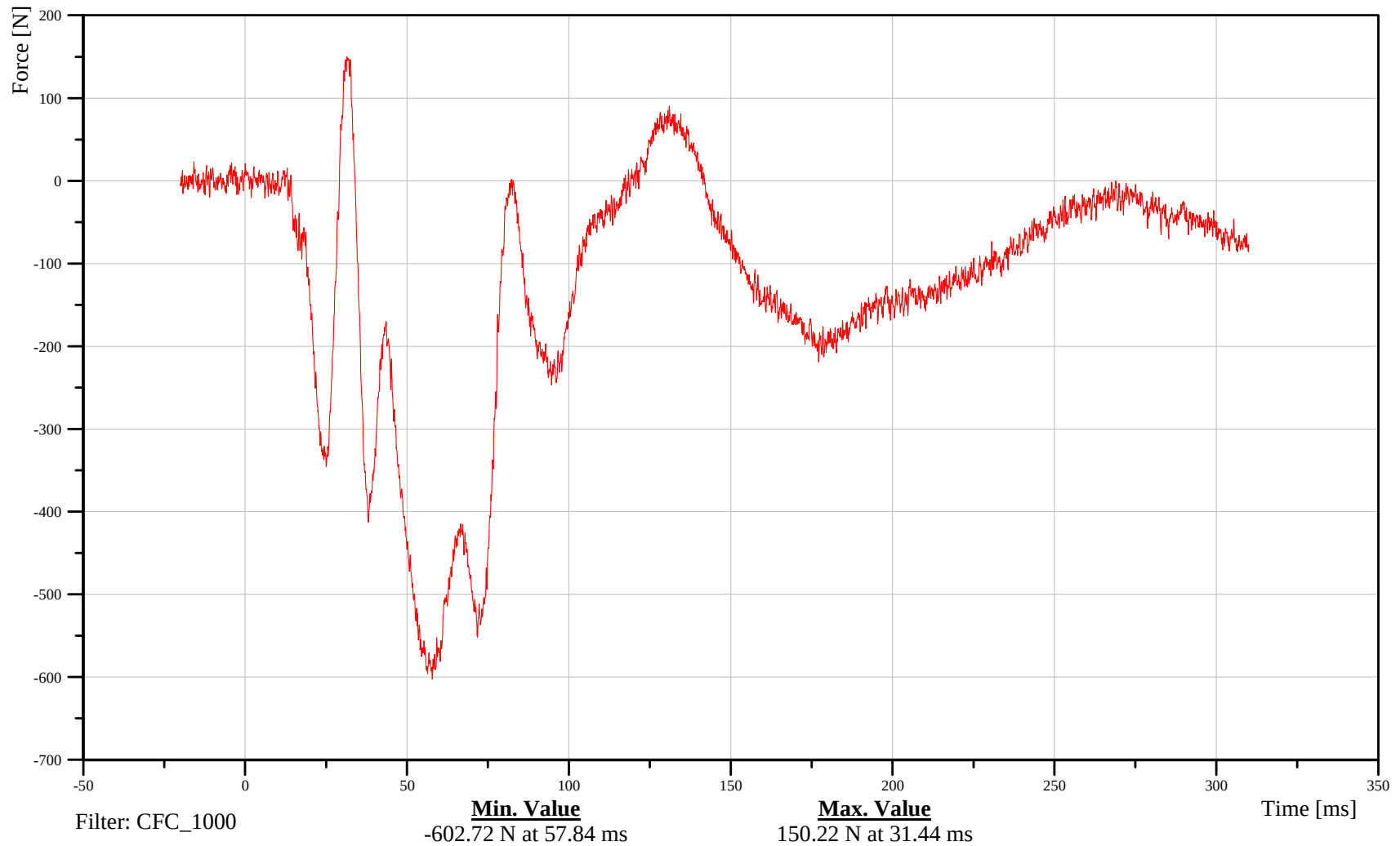
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKUP00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-84

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

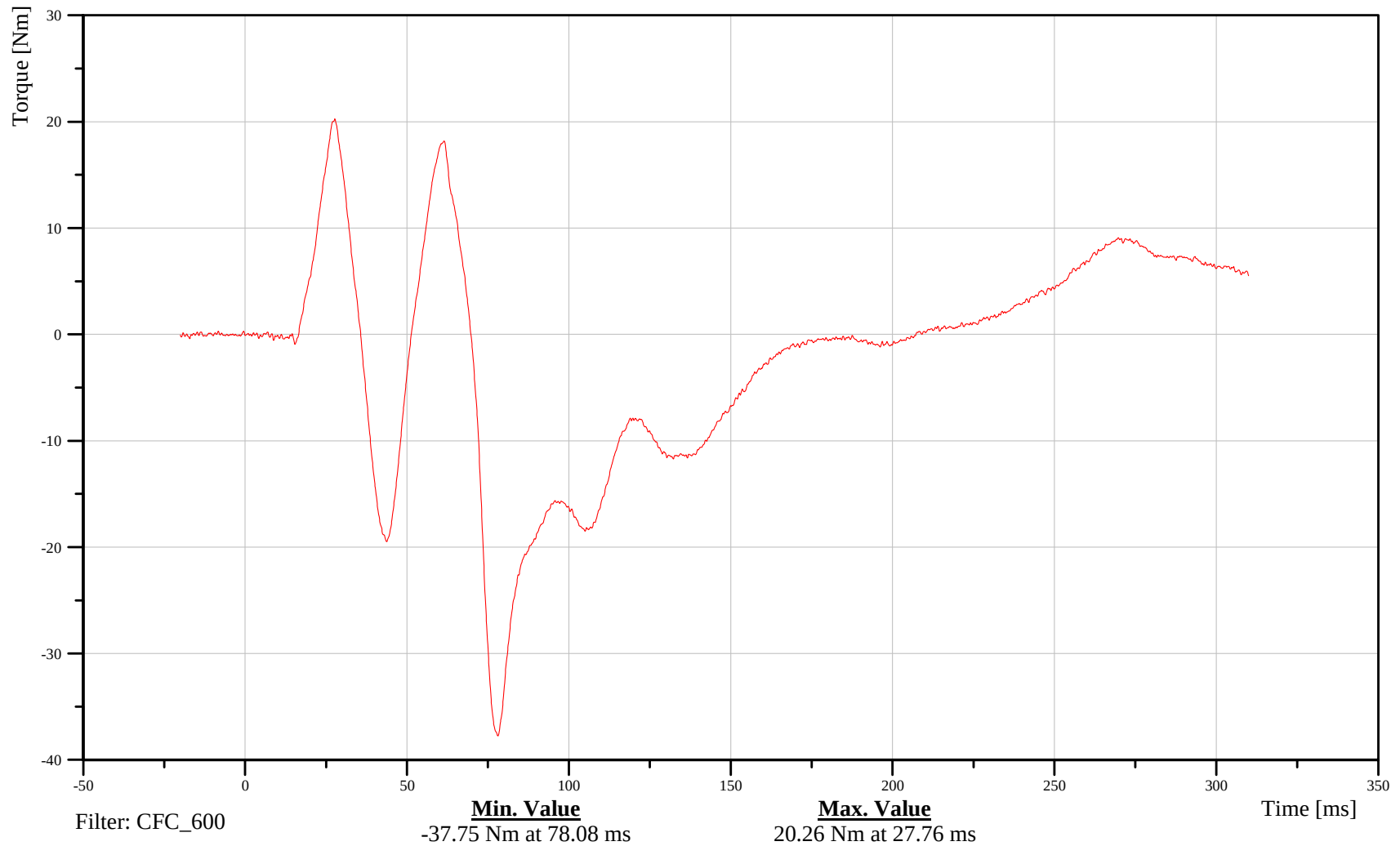
Driver Upper Neck Moment About X Axis

Customer: VRTC

11NECKUP00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-85

080729



World SID Evaluation

Driver Upper Neck Moment About Y Axis

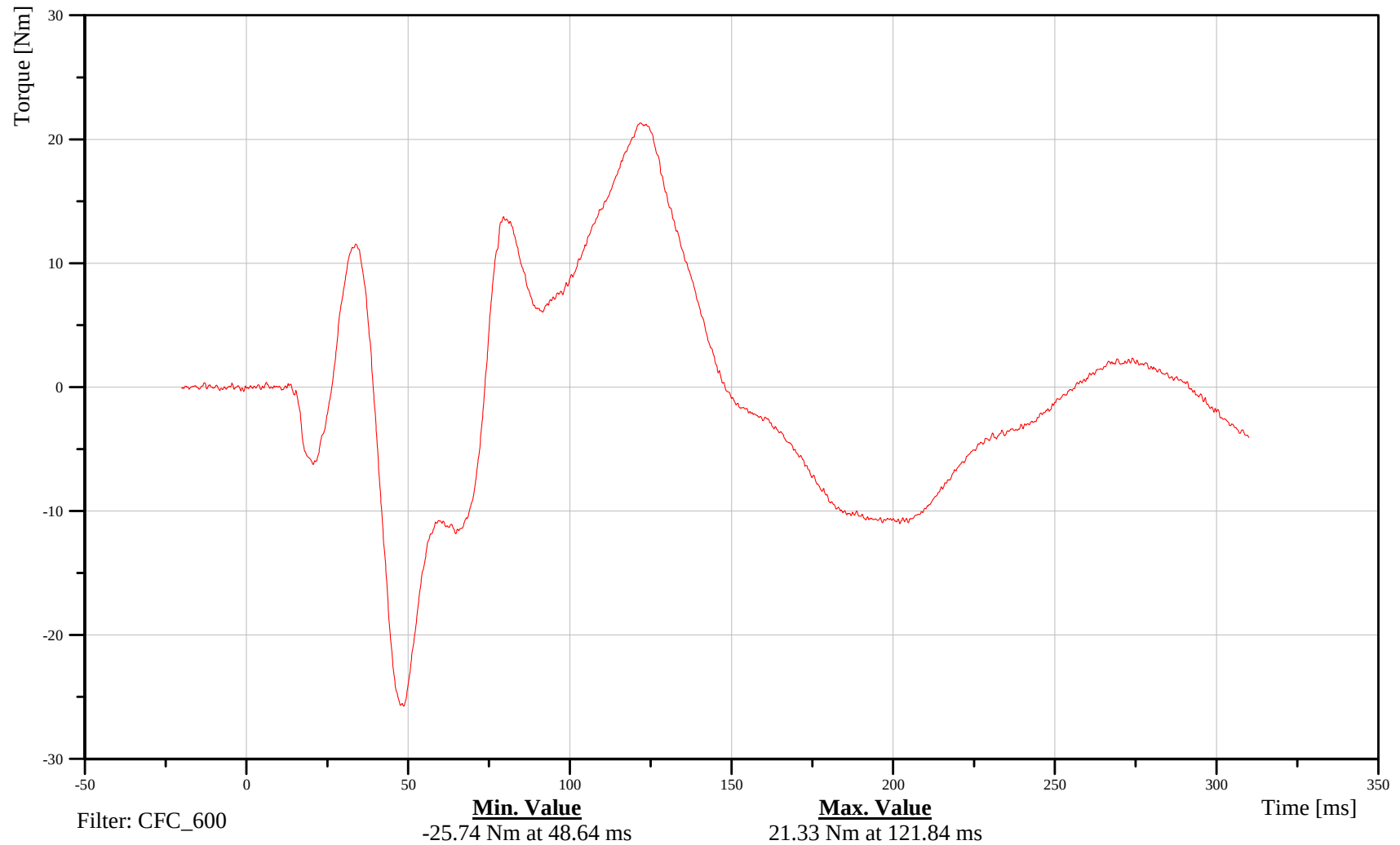
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKUP00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-86

080729



World SID Evaluation

Driver Upper Neck Moment About Z Axis

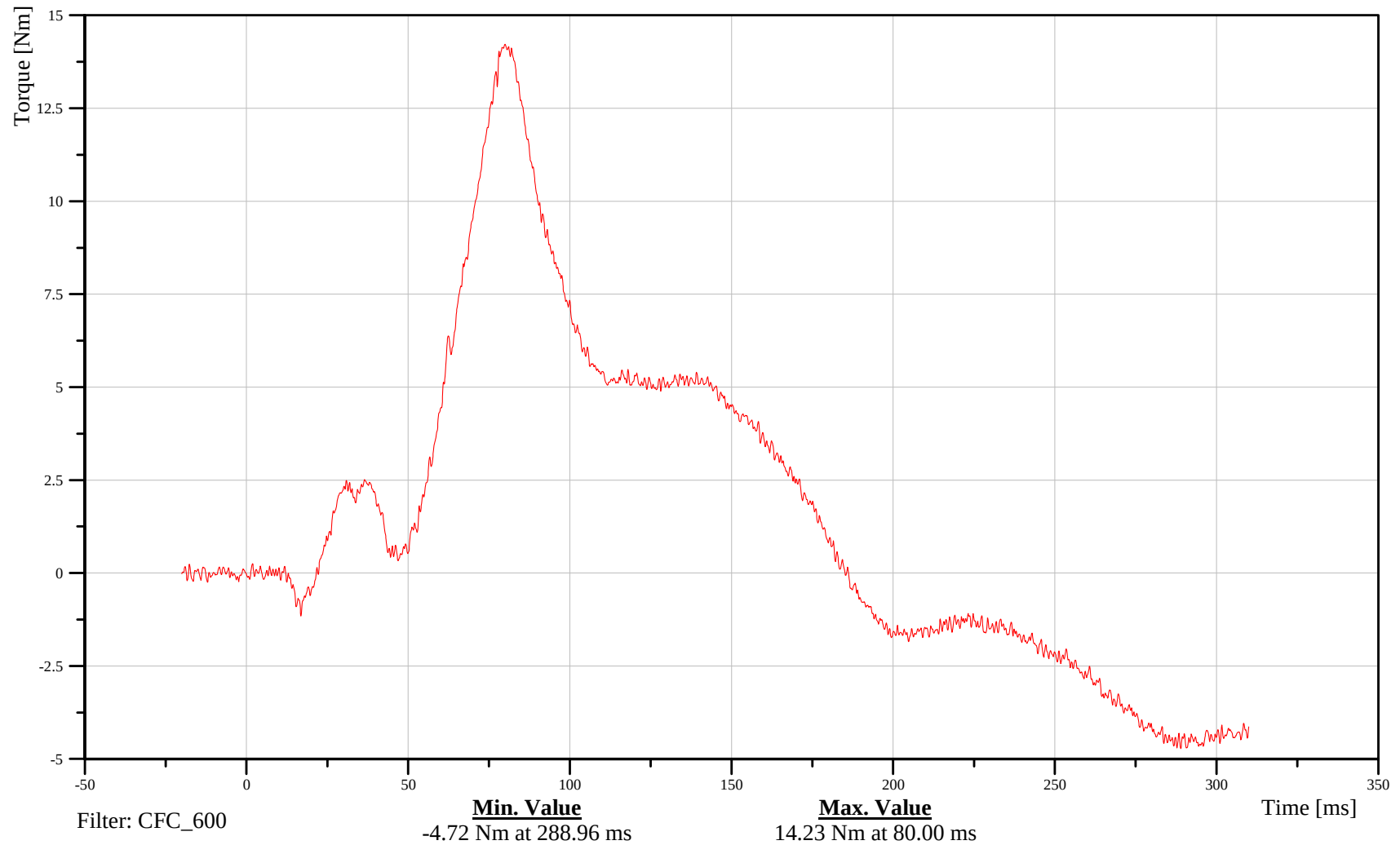
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKUP00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-87

080729



World SID Evaluation
Driver Lower Neck X-Axis Force

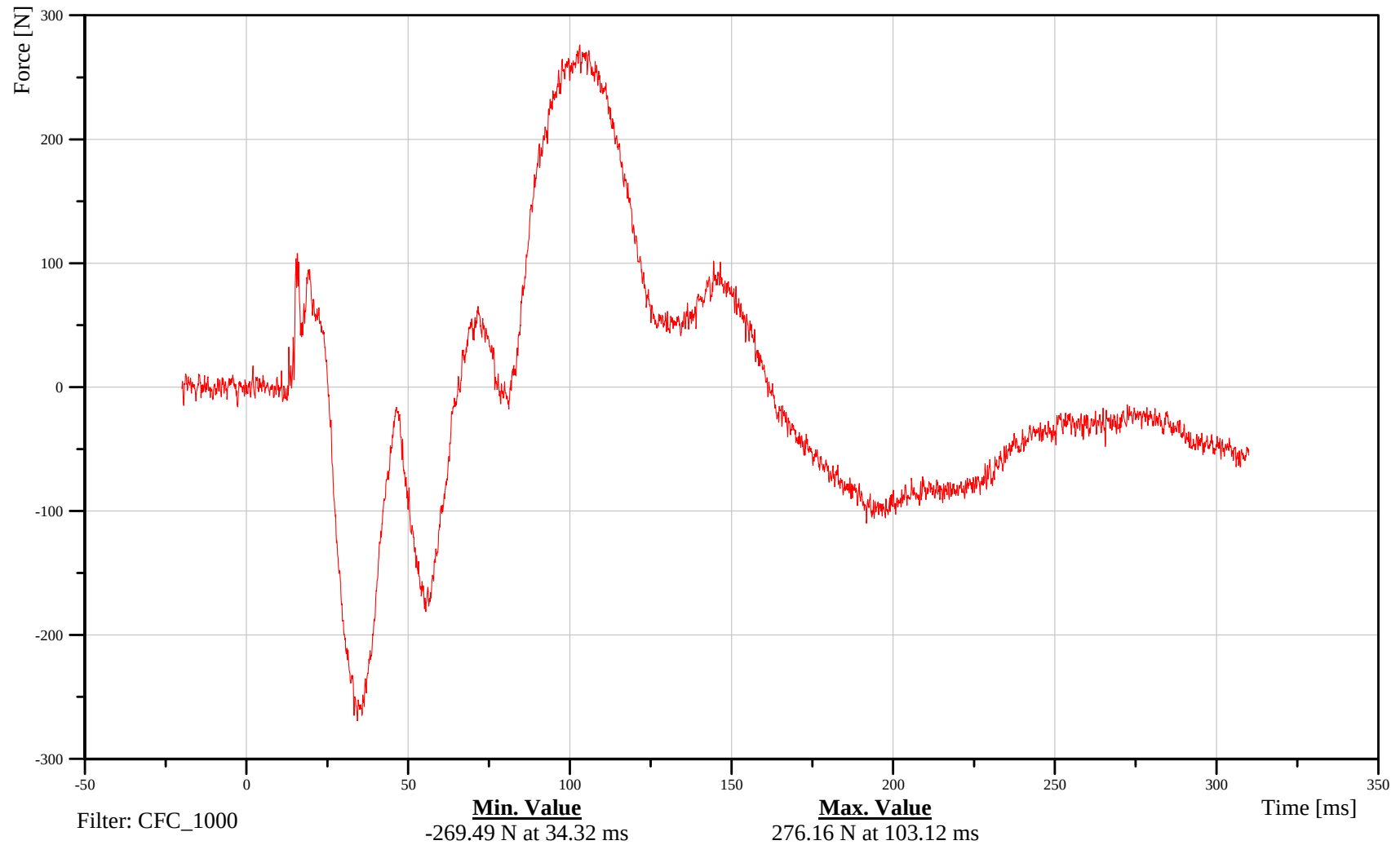
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKLO00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-88

080729



World SID Evaluation
Driver Lower Neck Y-Axis Force

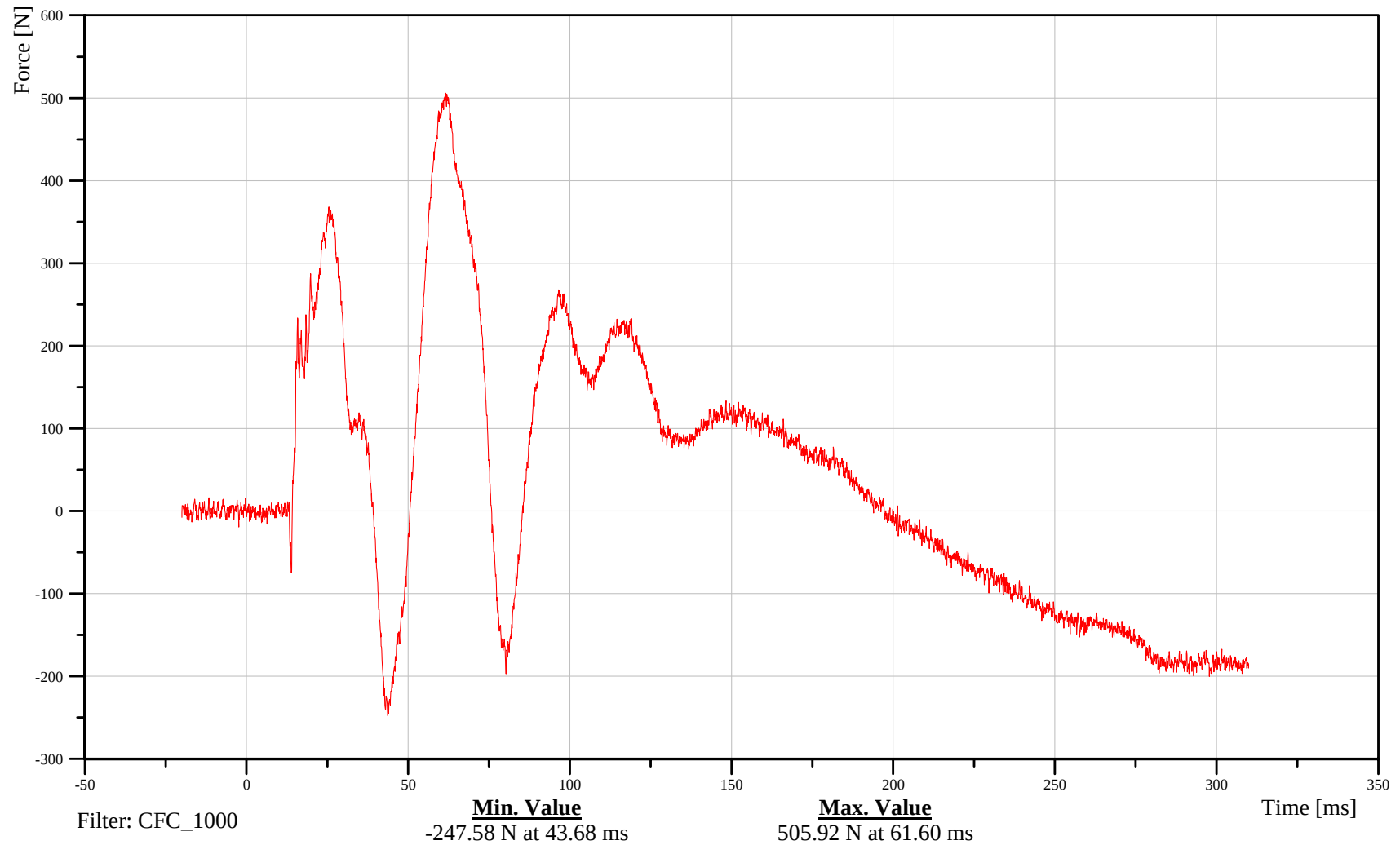
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKLO00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-89

080729



World SID Evaluation
Driver Lower Neck Z-Axis Force

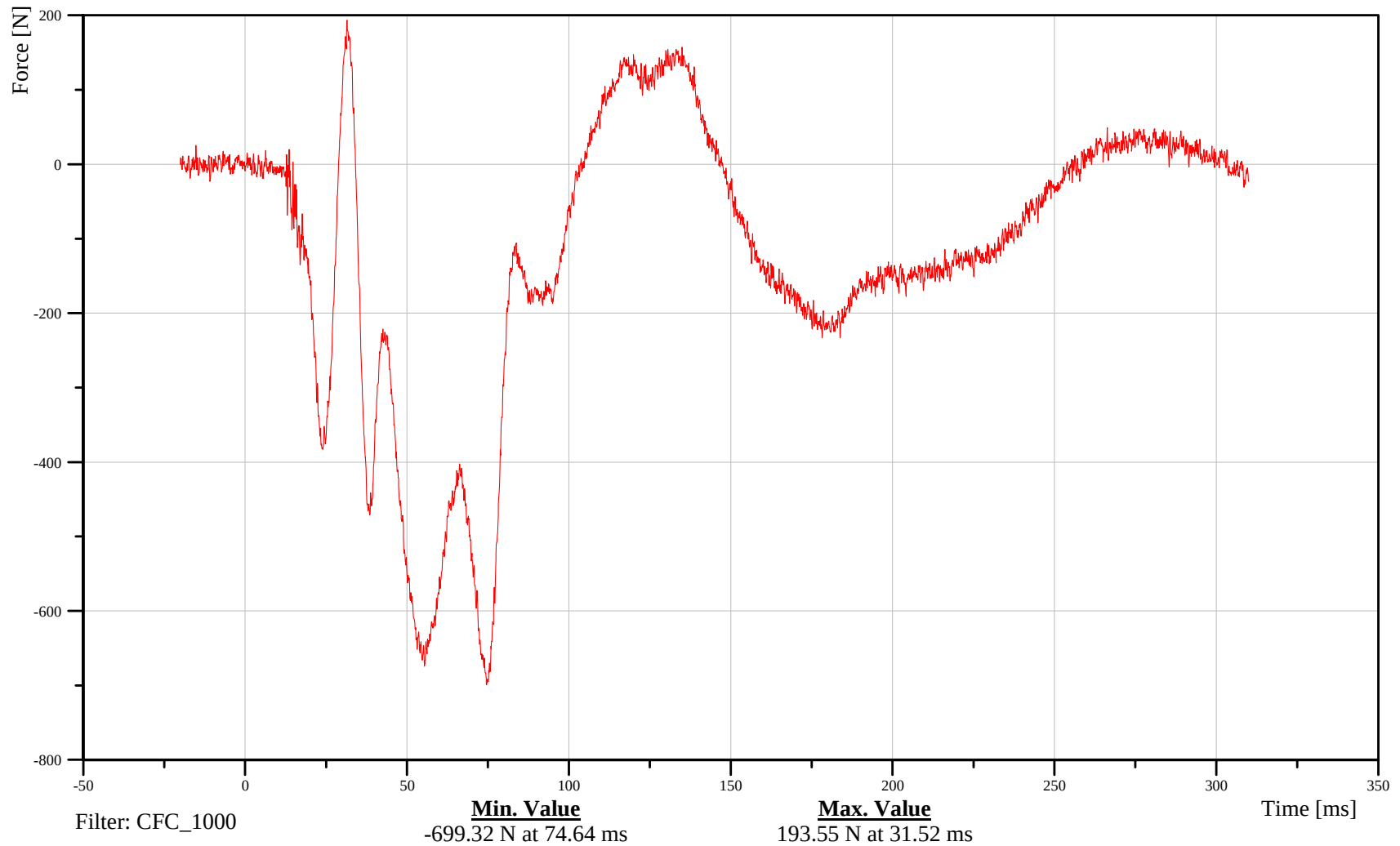
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKLO00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-90

080729



World SID Evaluation

Driver Lower Neck Moment About X Axis

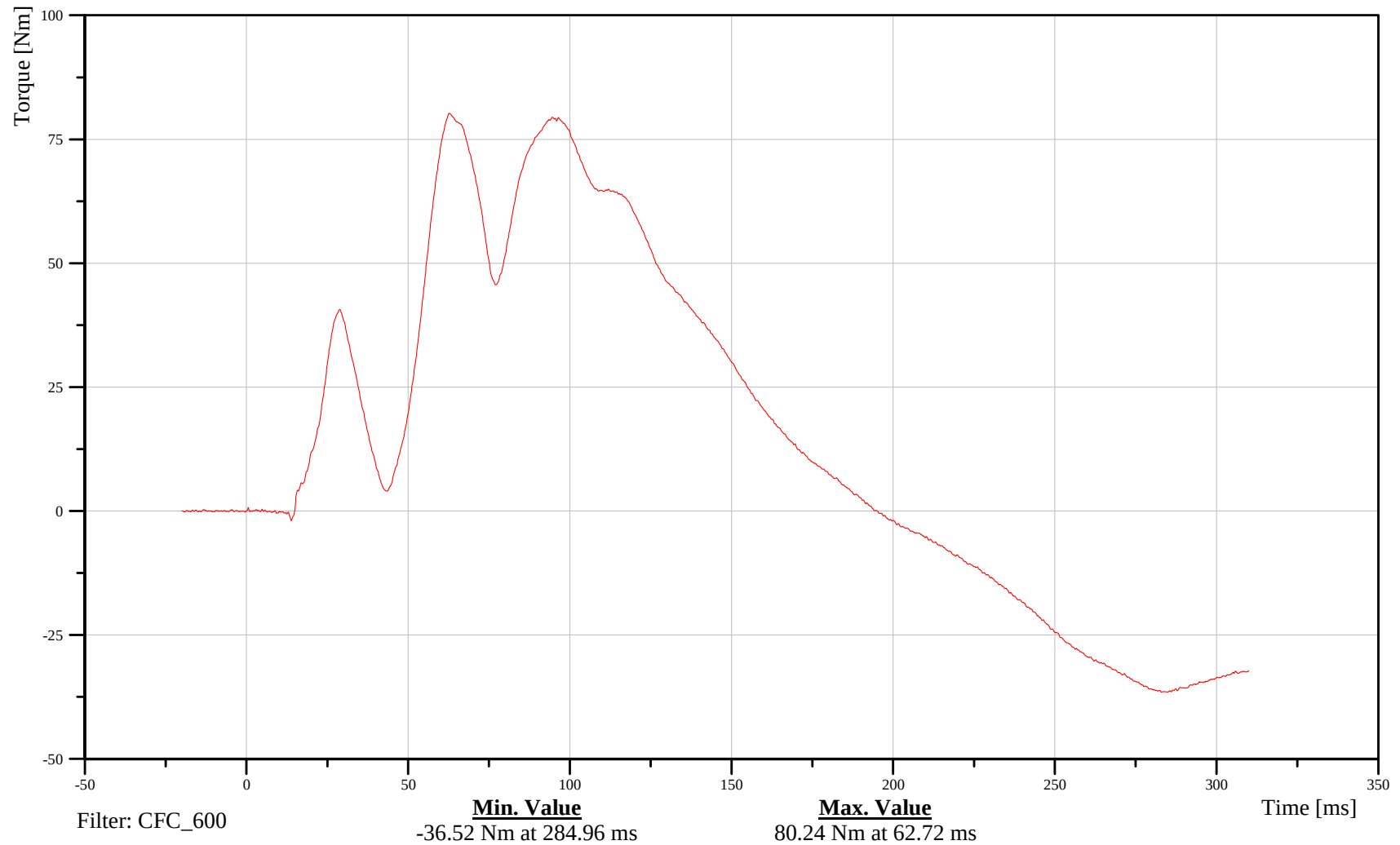
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKLO00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-91

080729



World SID Evaluation

Driver Lower Neck Moment About Y Axis

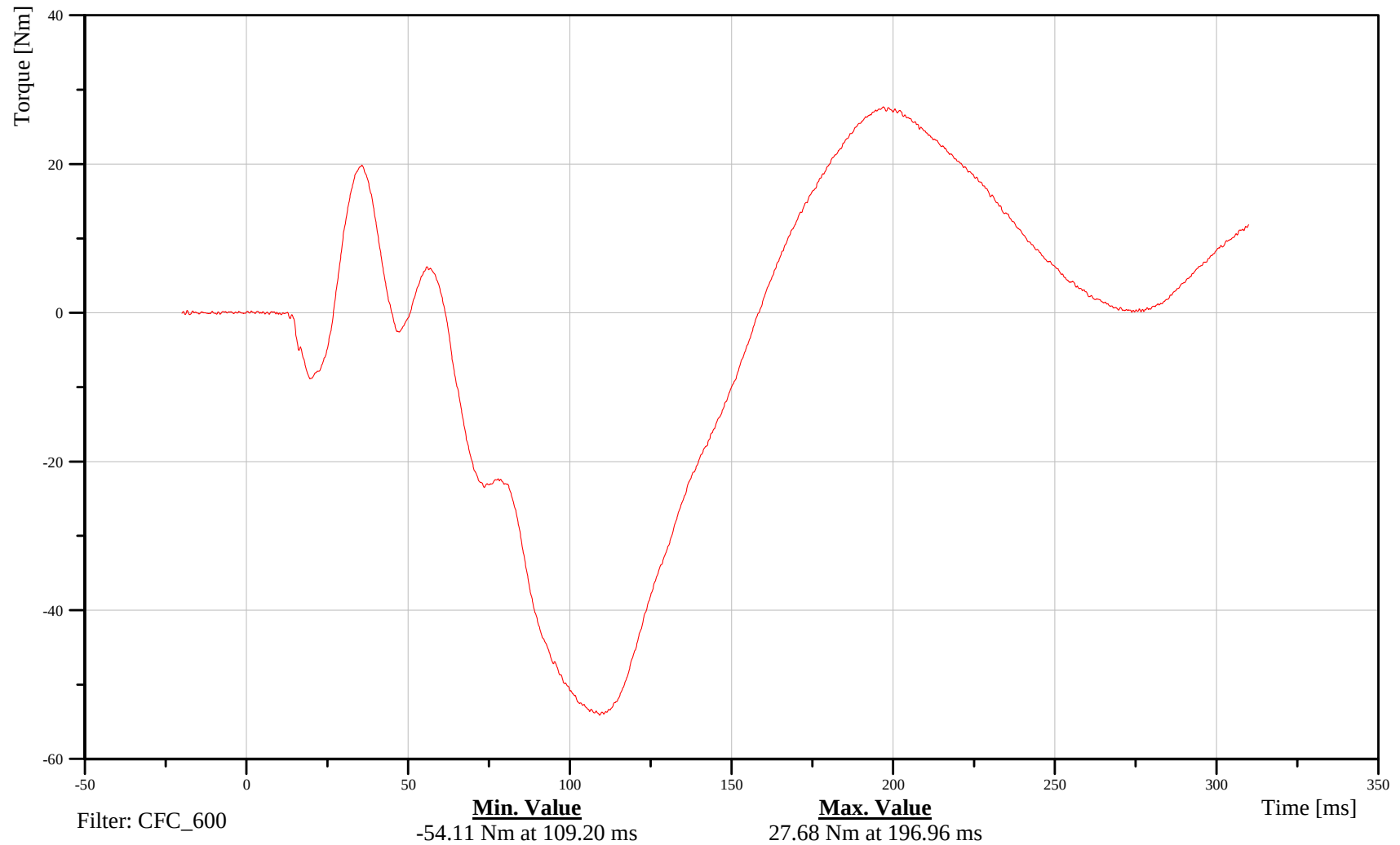
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKLO00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-92

080729



World SID Evaluation

Driver Lower Neck Moment About Z Axis

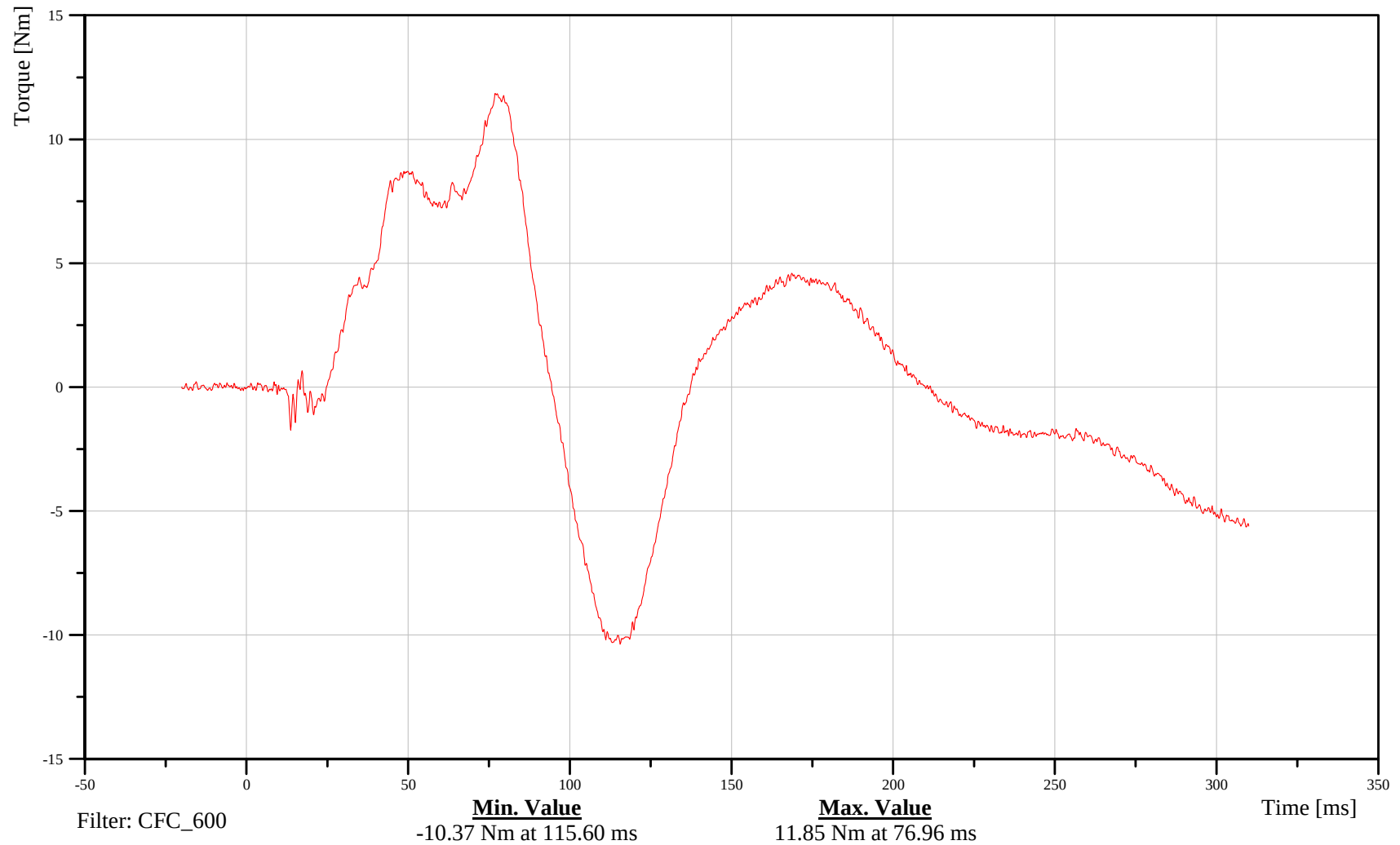
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11NECKLO00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-93

080729



World SID Evaluation

Driver Shoulder X-Axis Force

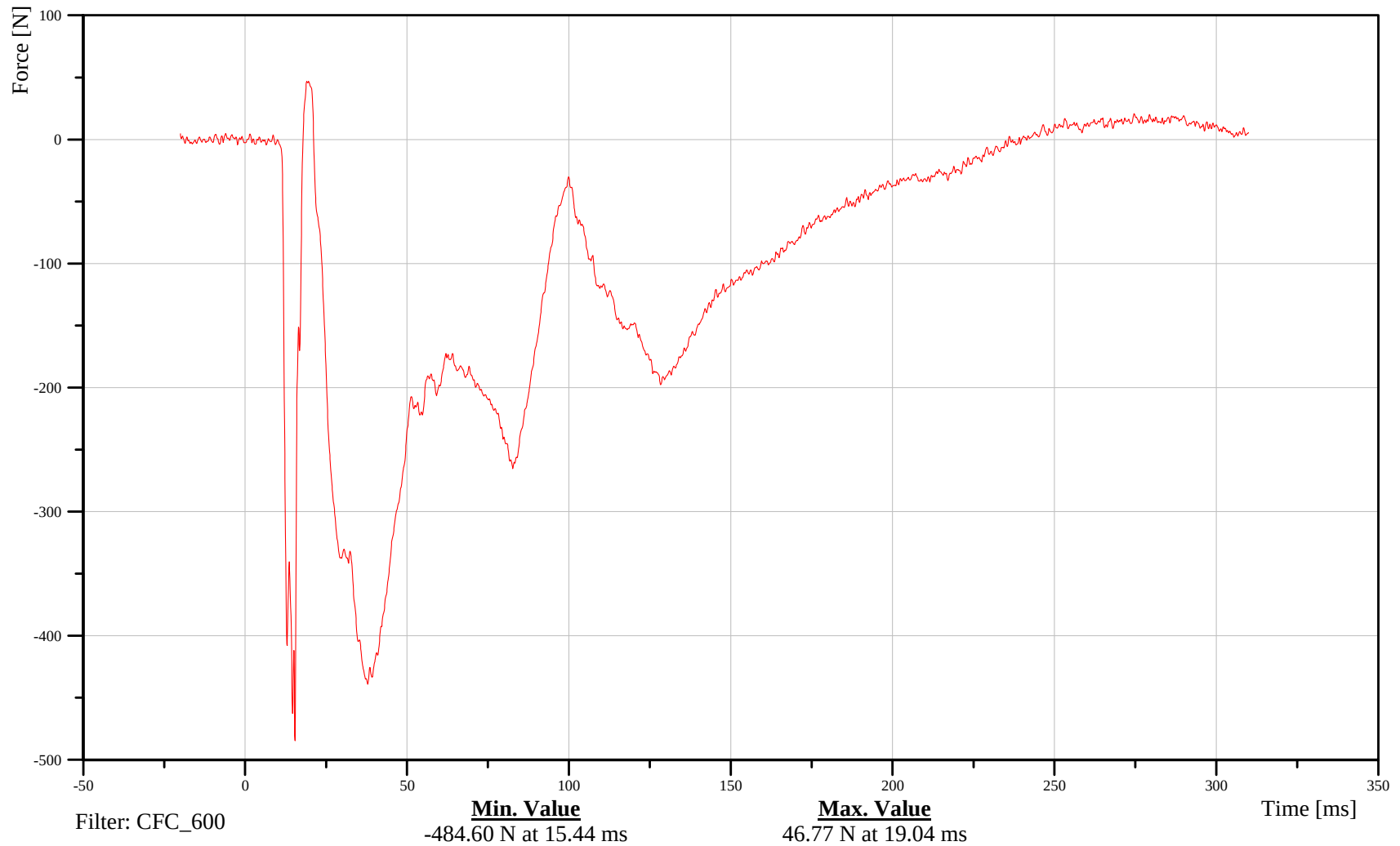
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-94

080729



World SID Evaluation

Driver Shoulder Y-Axis Force

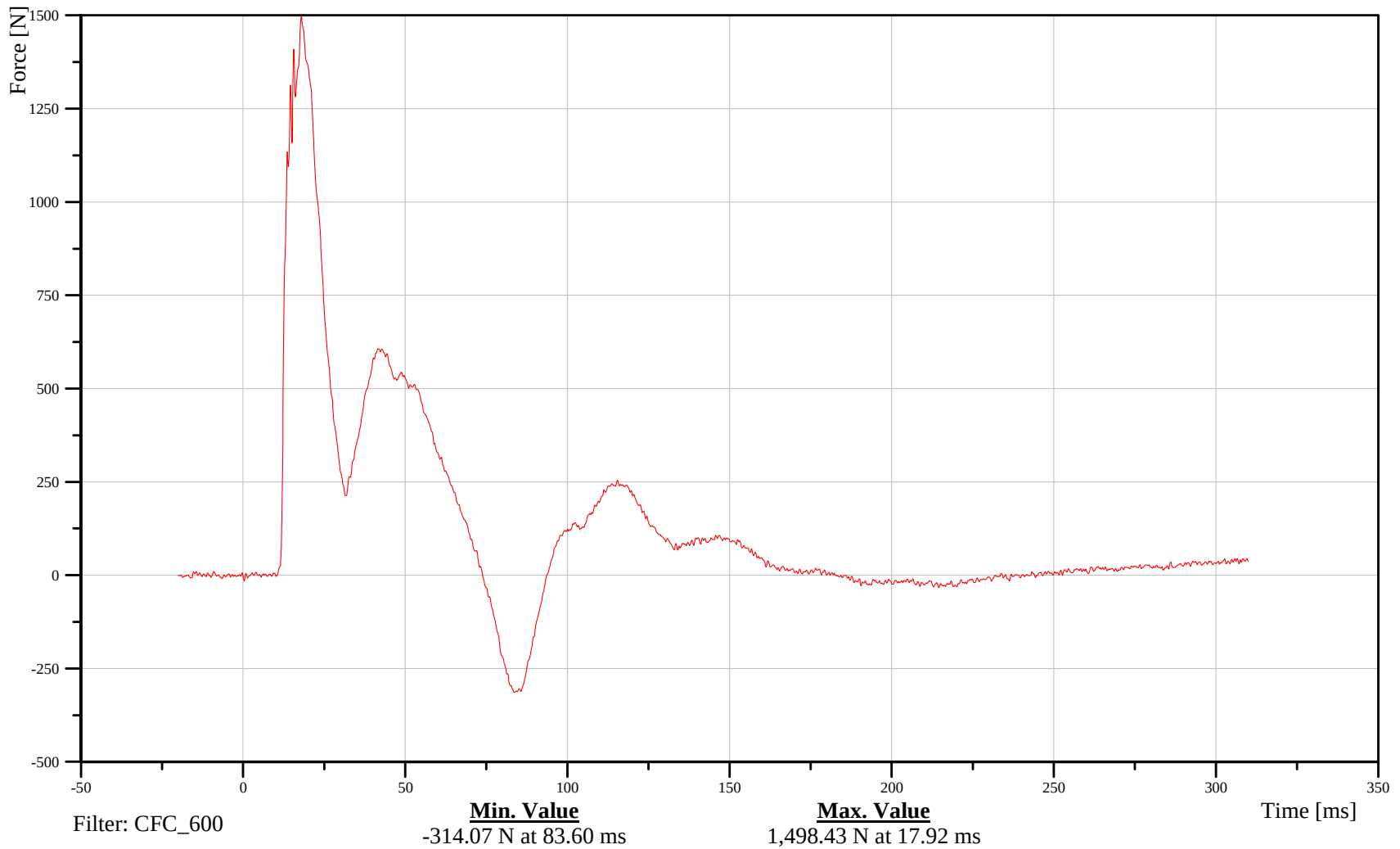
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-95

080729



World SID Evaluation Driver Shoulder Z-Axis Force

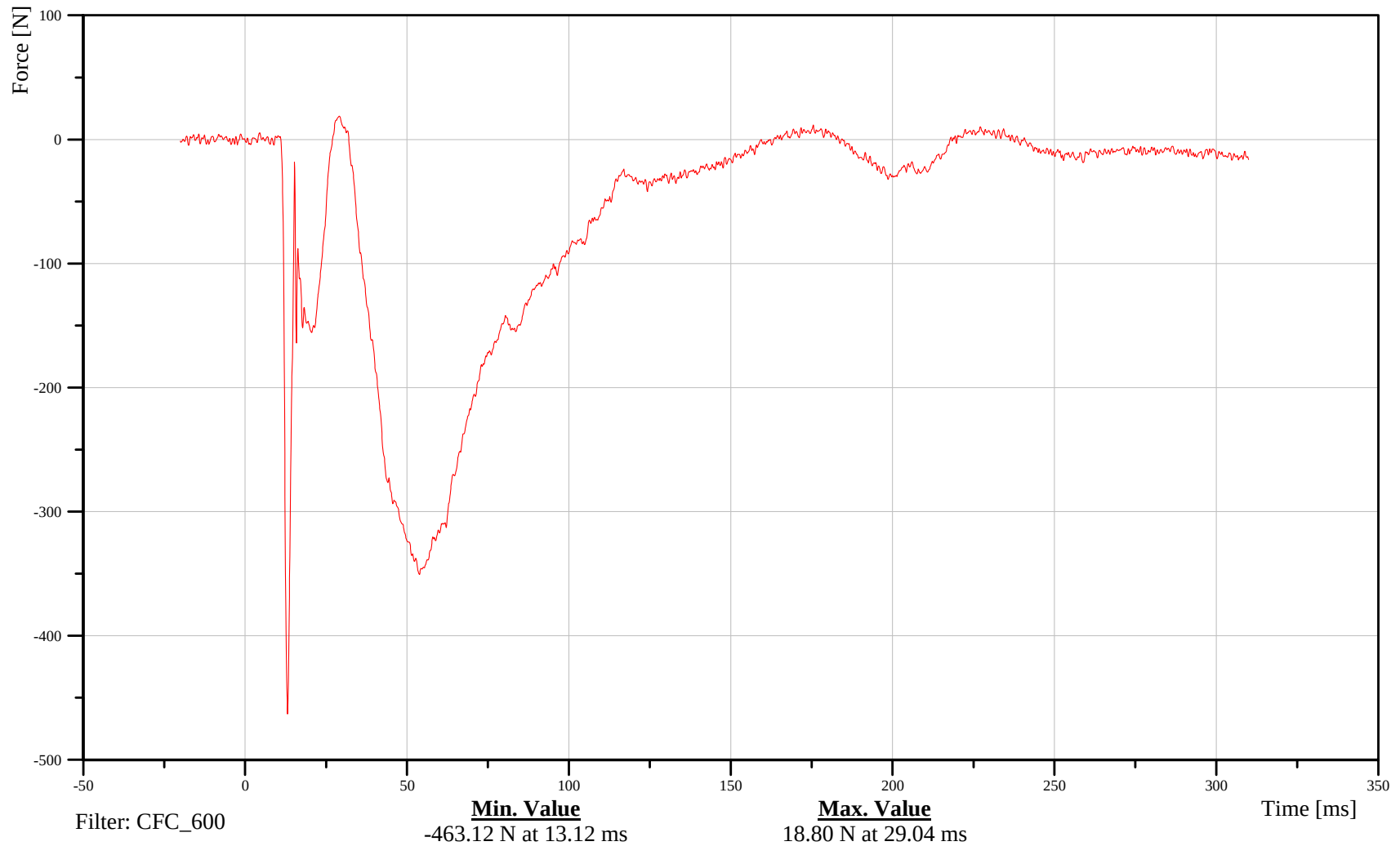
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-96

080729



World SID Evaluation

Driver Shoulder Y-Axis Displacement

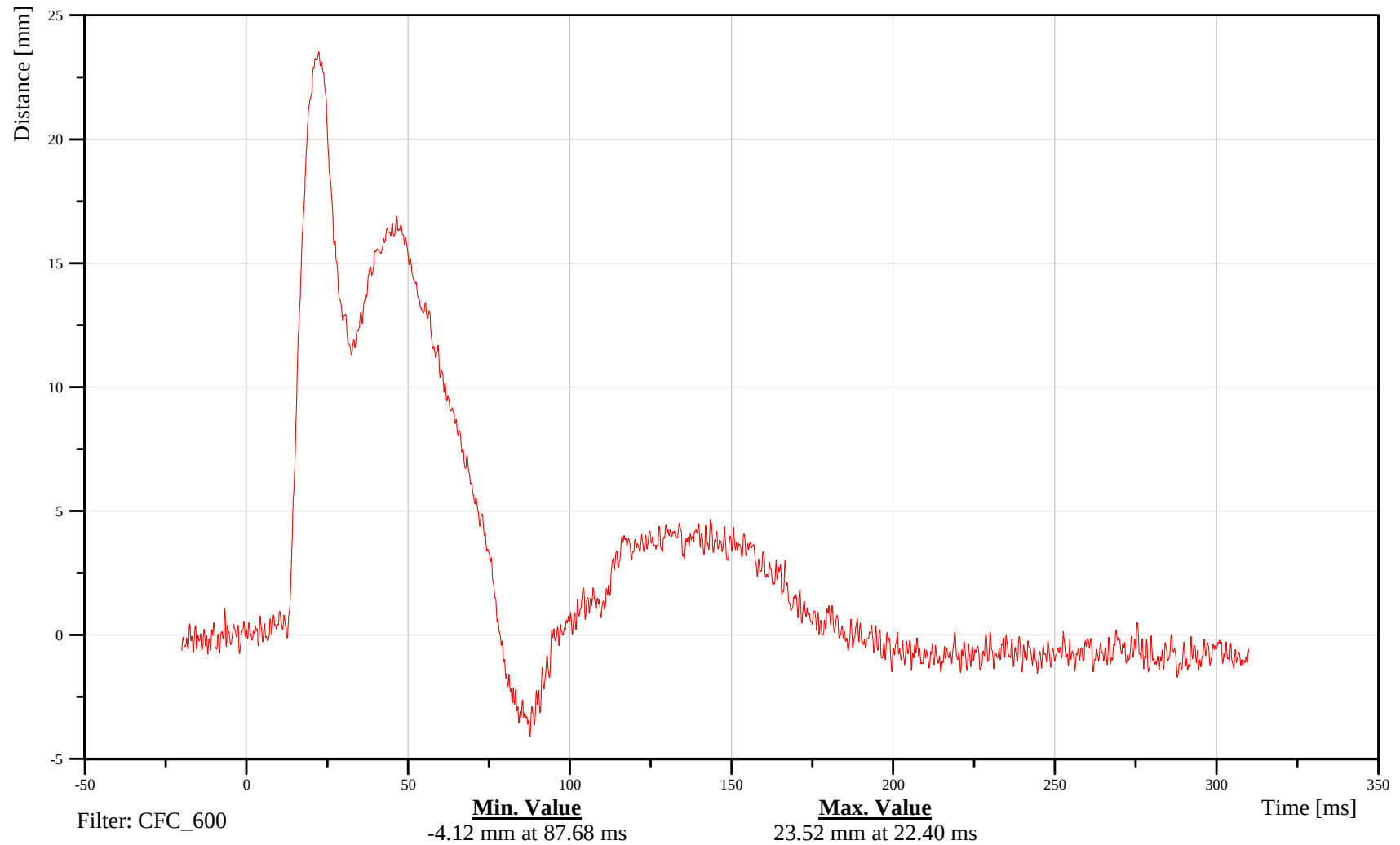
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-97

080729



World SID Evaluation

Driver Shoulder X-Axis Acceleration

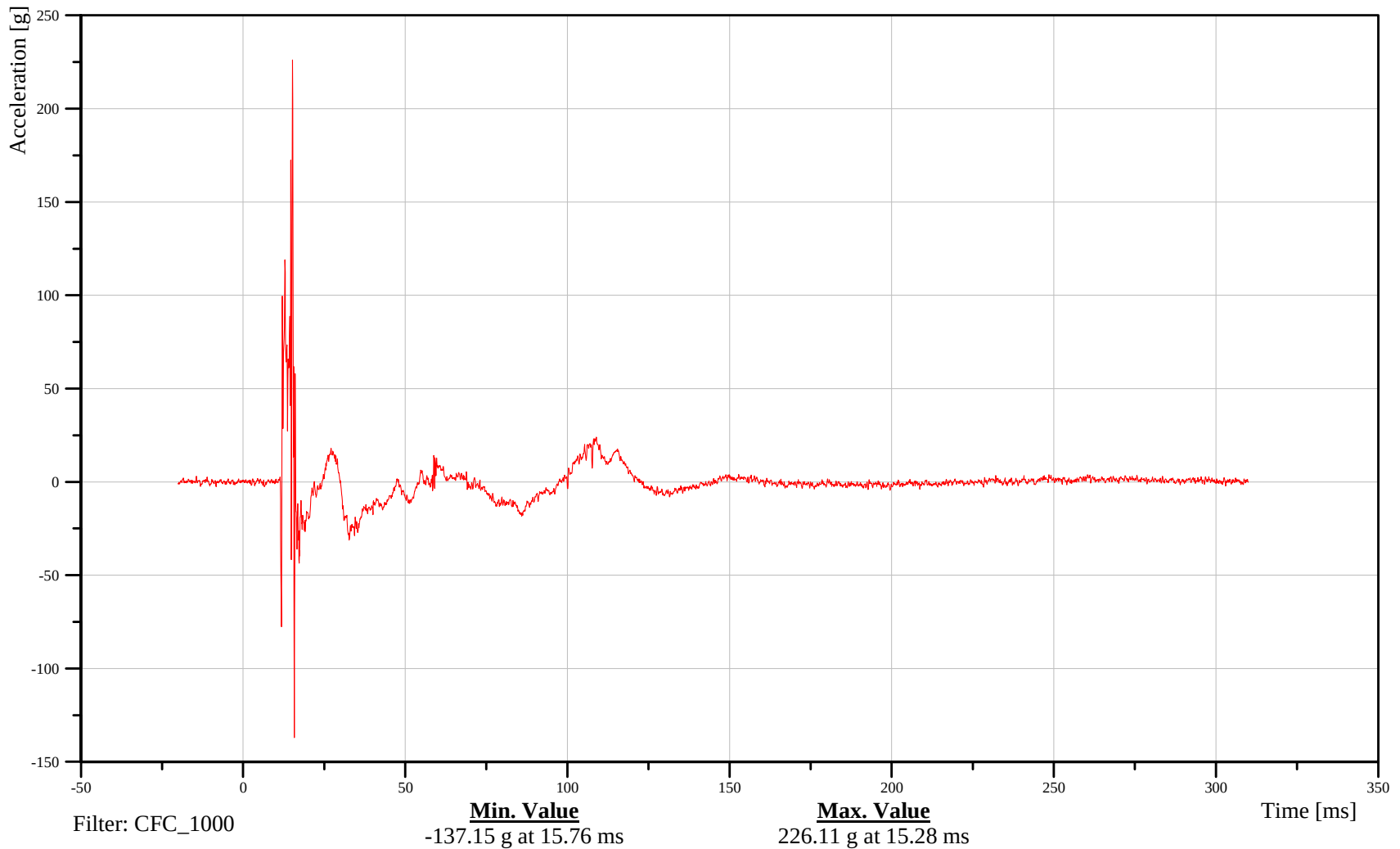
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-98

080729



World SID Evaluation

Driver Shoulder Y-Axis Acceleration

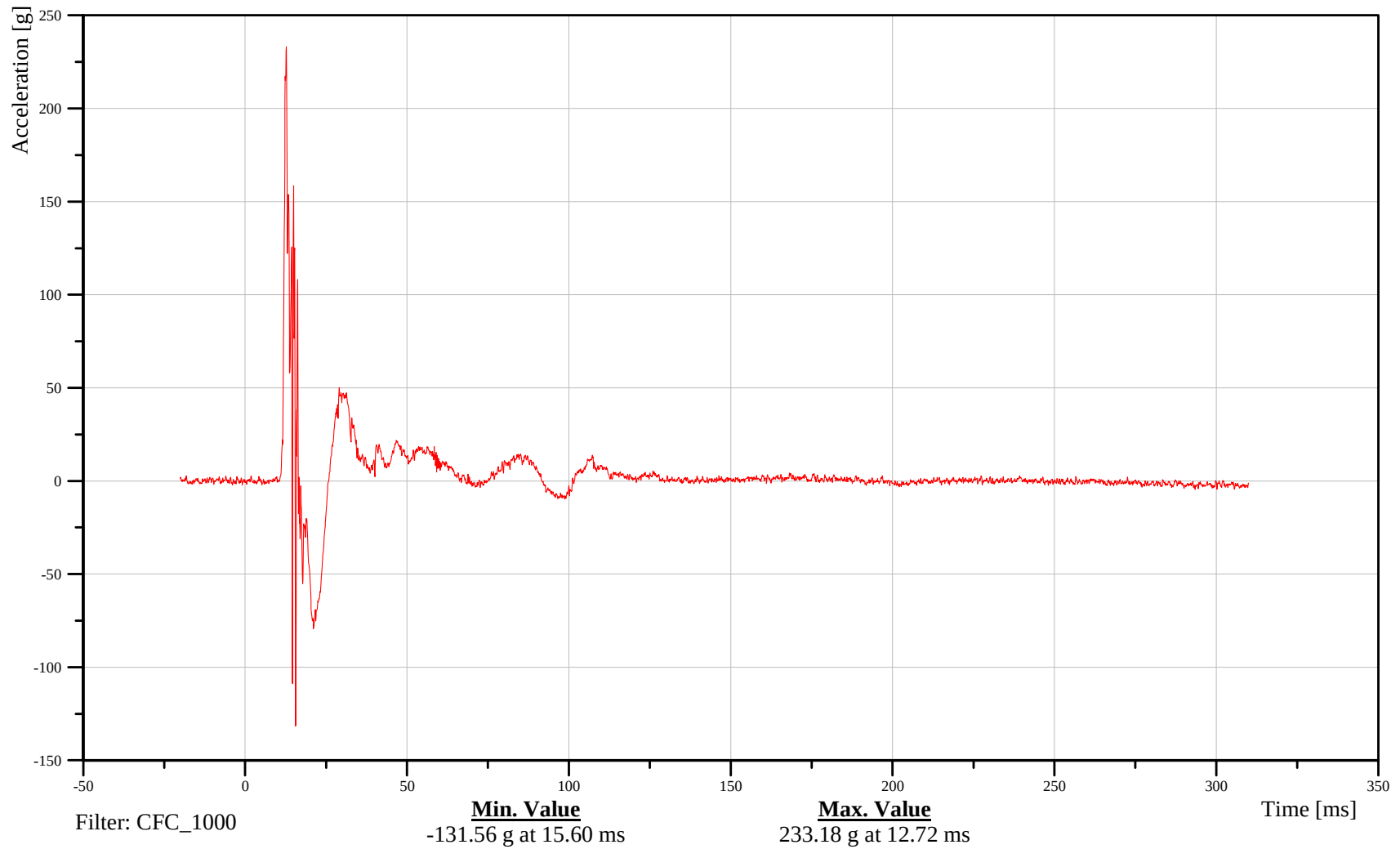
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-99

080729



World SID Evaluation
Driver Shoulder Z-Axis Acceleration

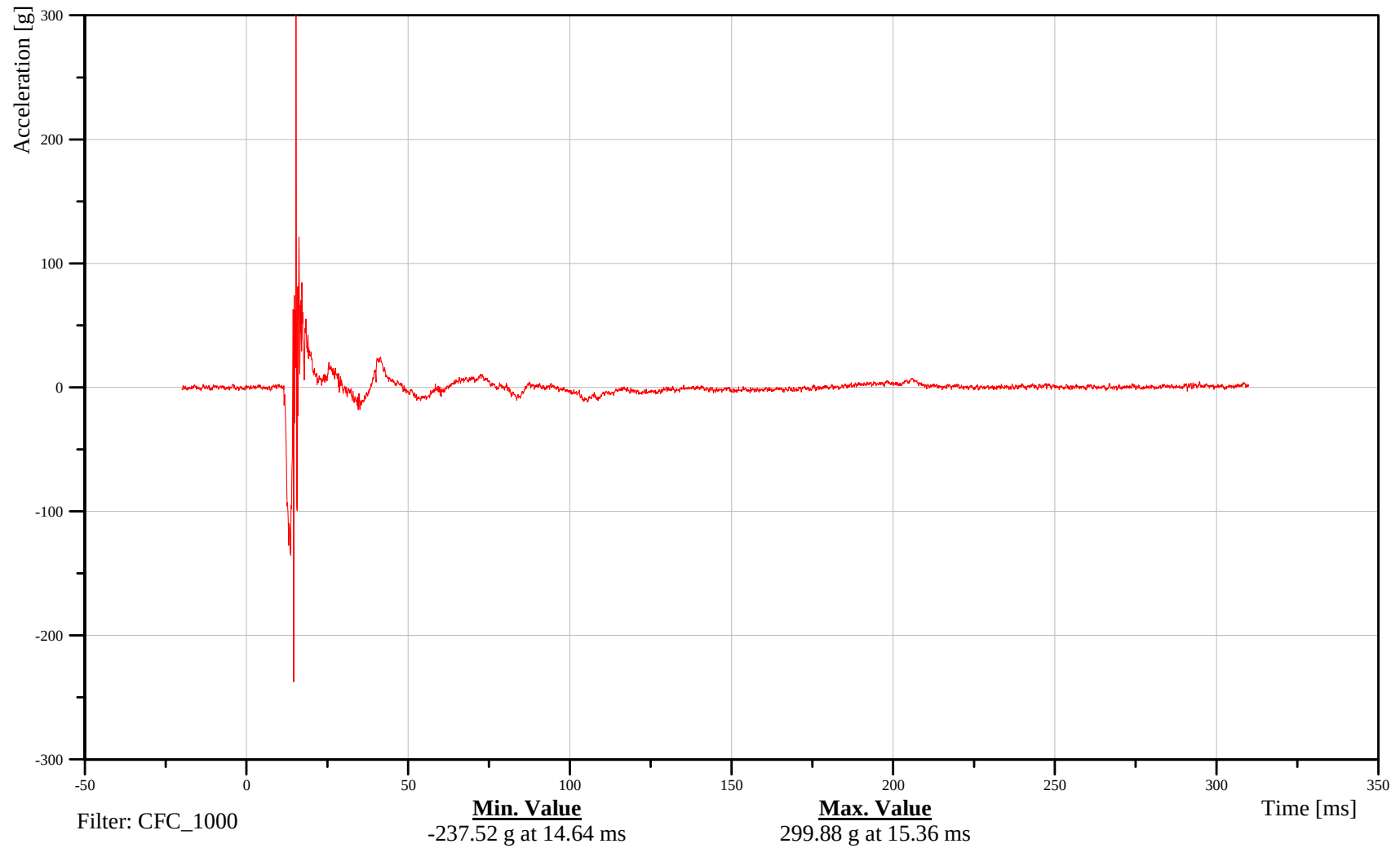
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-100

080729



World SID Evaluation

Driver Shoulder Resultant Acceleration

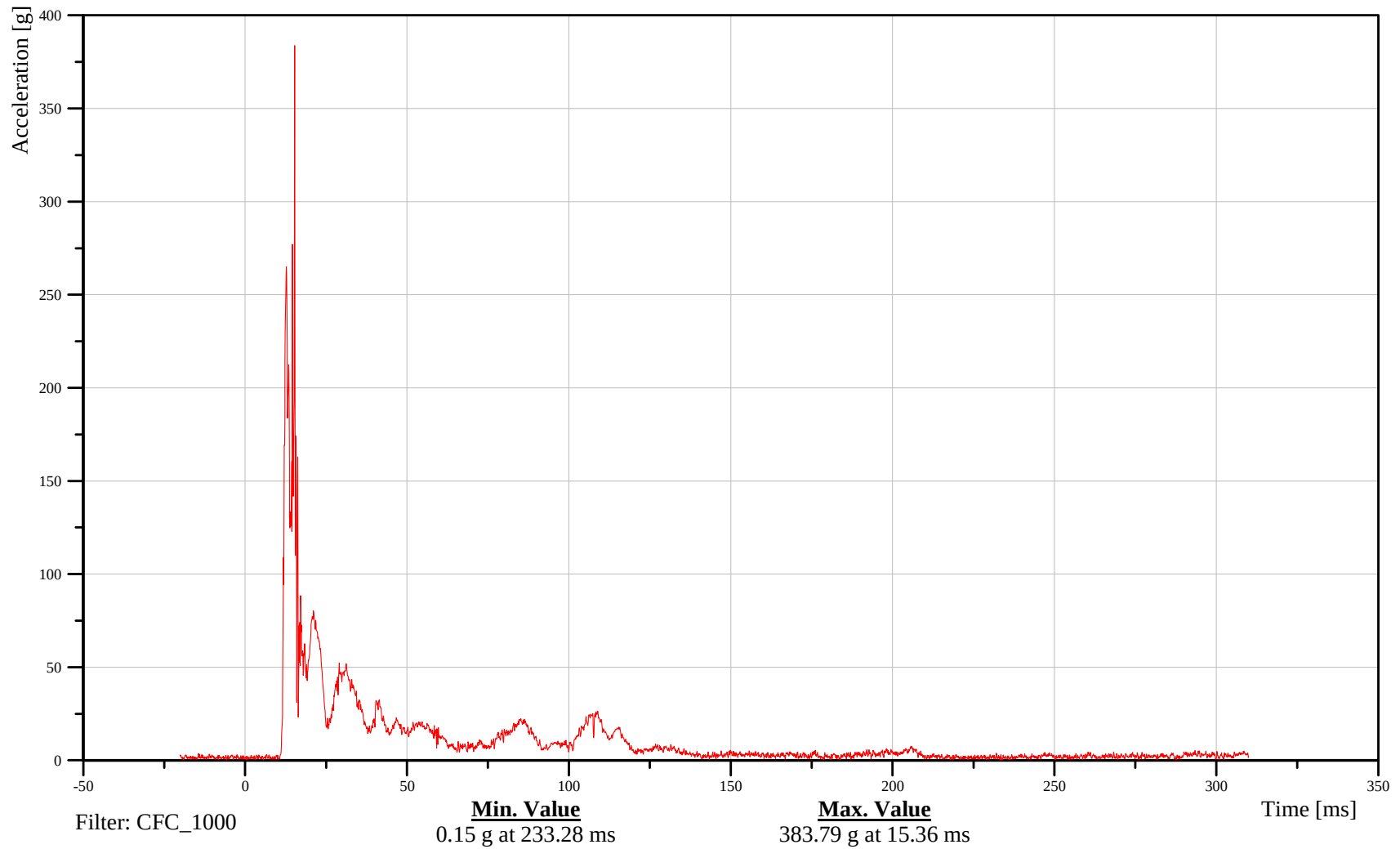
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11SHLDLE00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-101

080729



World SID Evaluation

Driver T1 X-Axis Acceleration

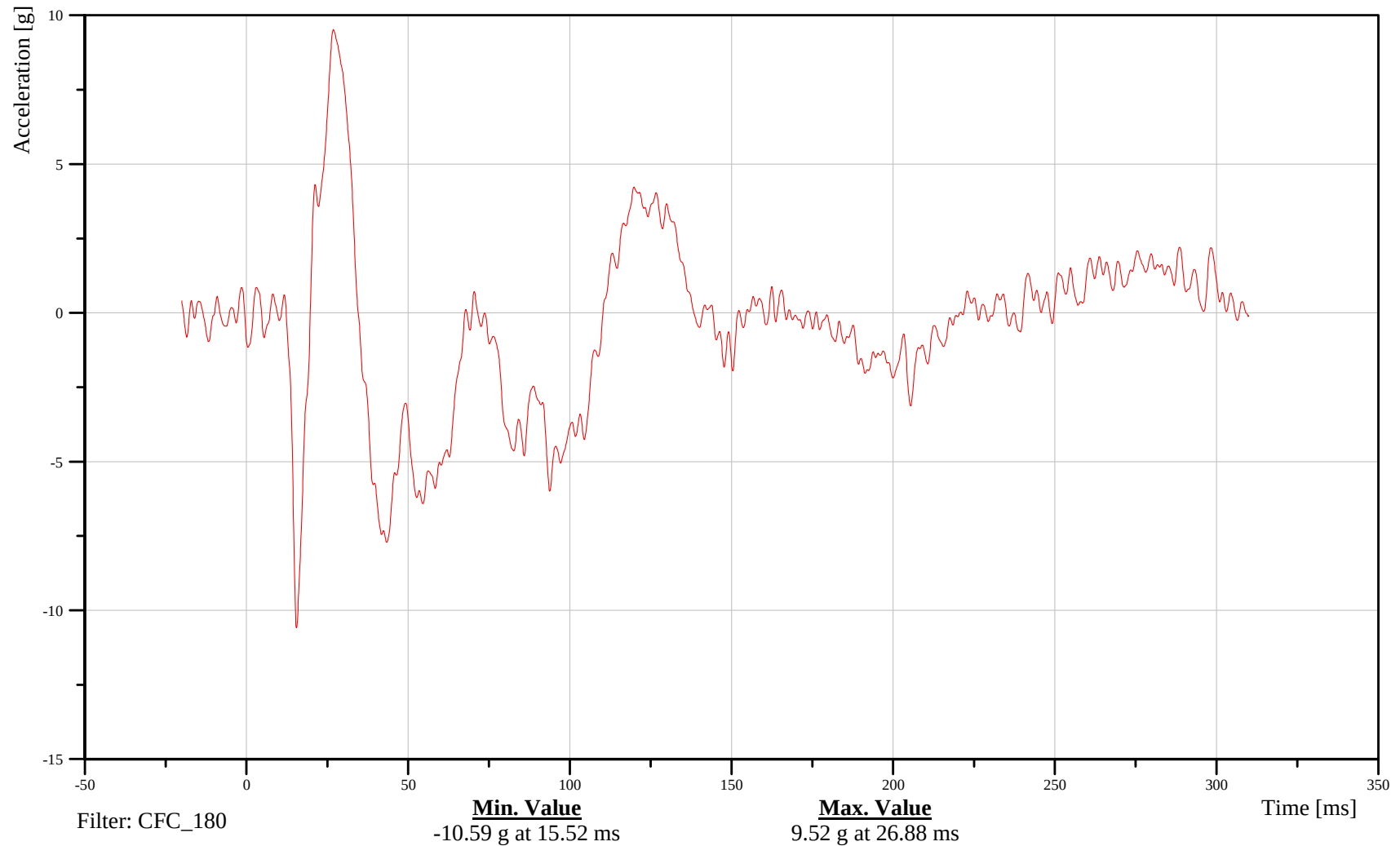
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0100WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-102

080729



World SID Evaluation
Driver T1 Y-Axis Acceleration

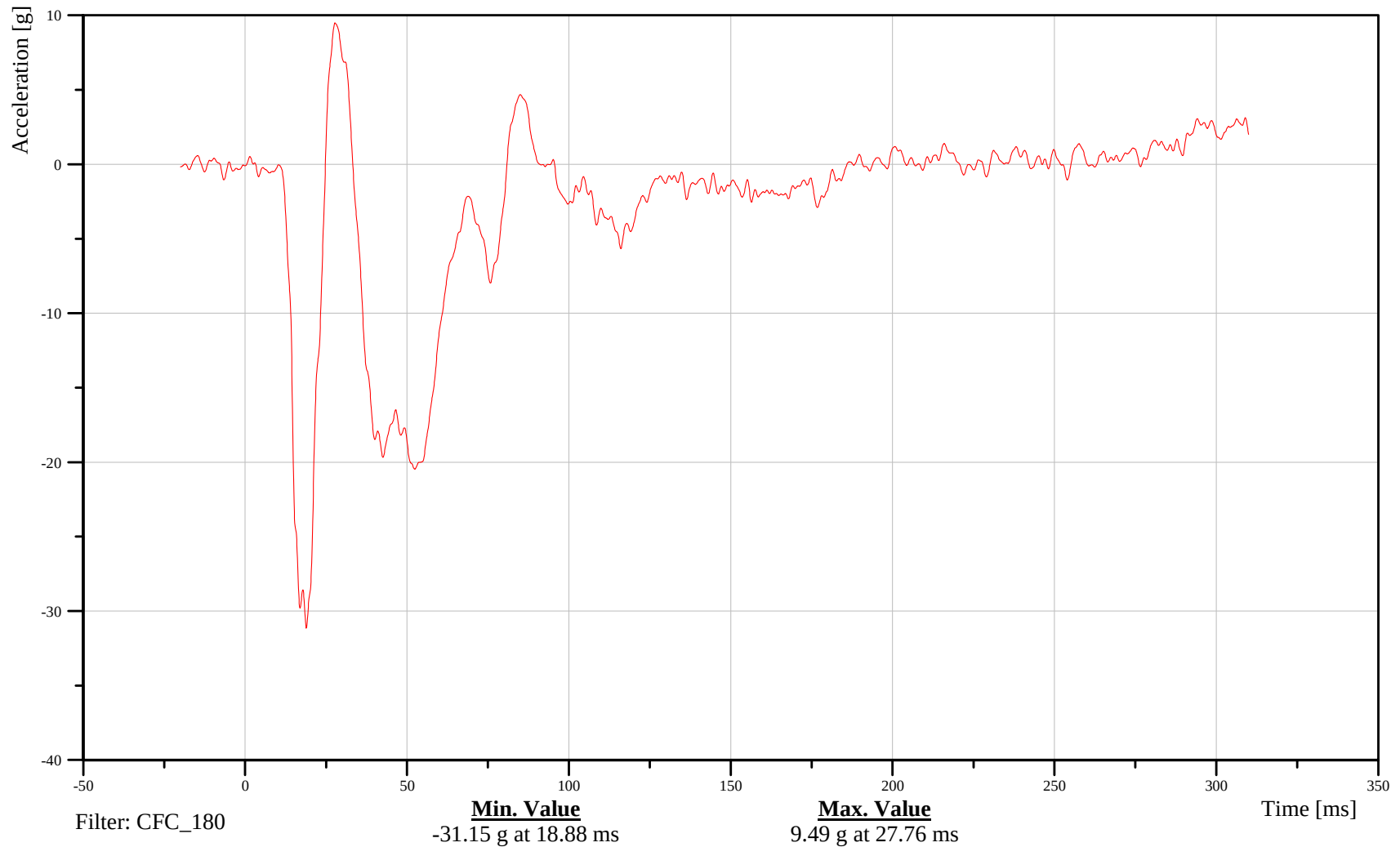
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0100WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-103

080729



World SID Evaluation

Driver T1 Z-Axis Acceleration

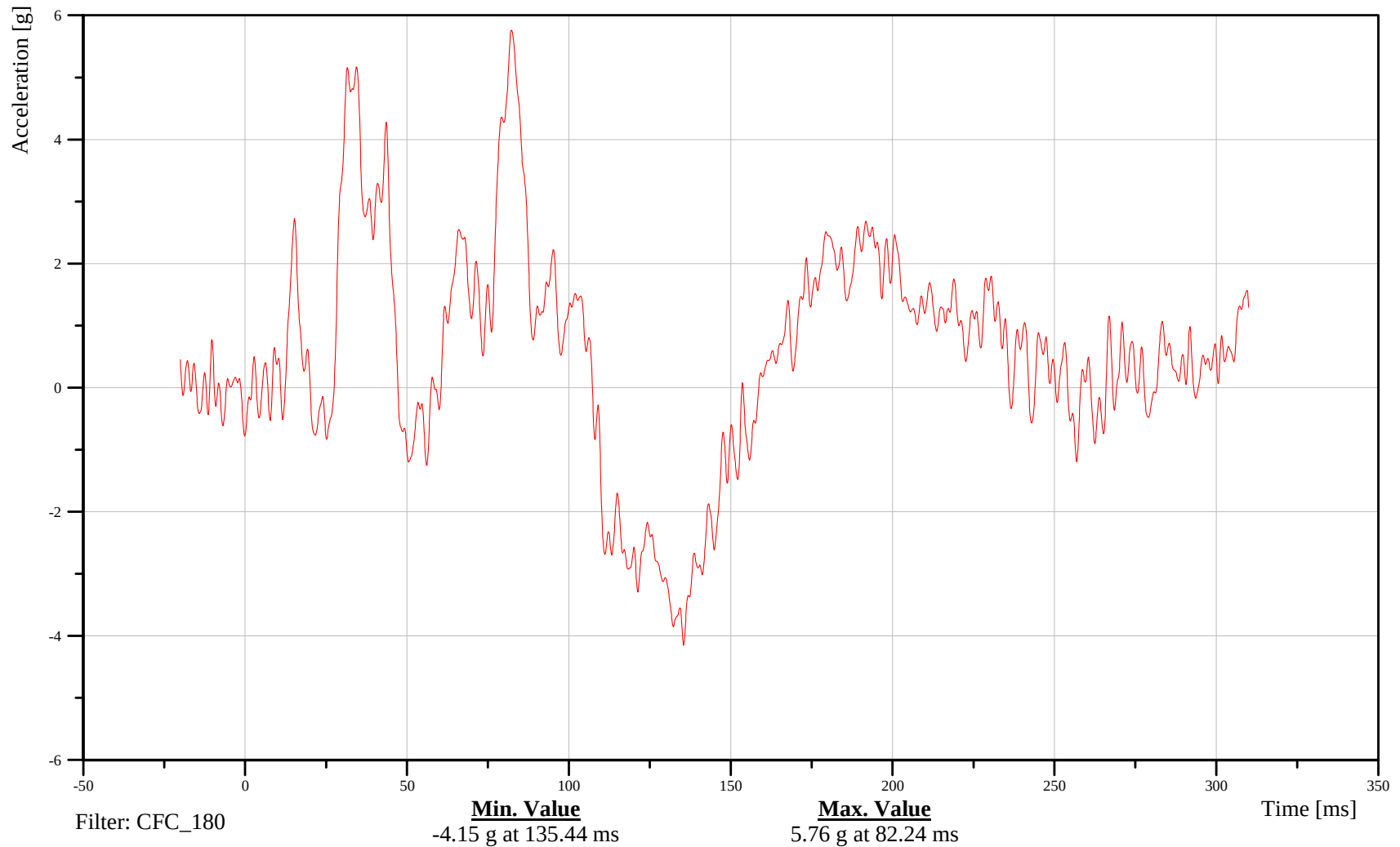
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0100WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-104

080729



World SID Evaluation

Driver T1 Resultant Acceleration

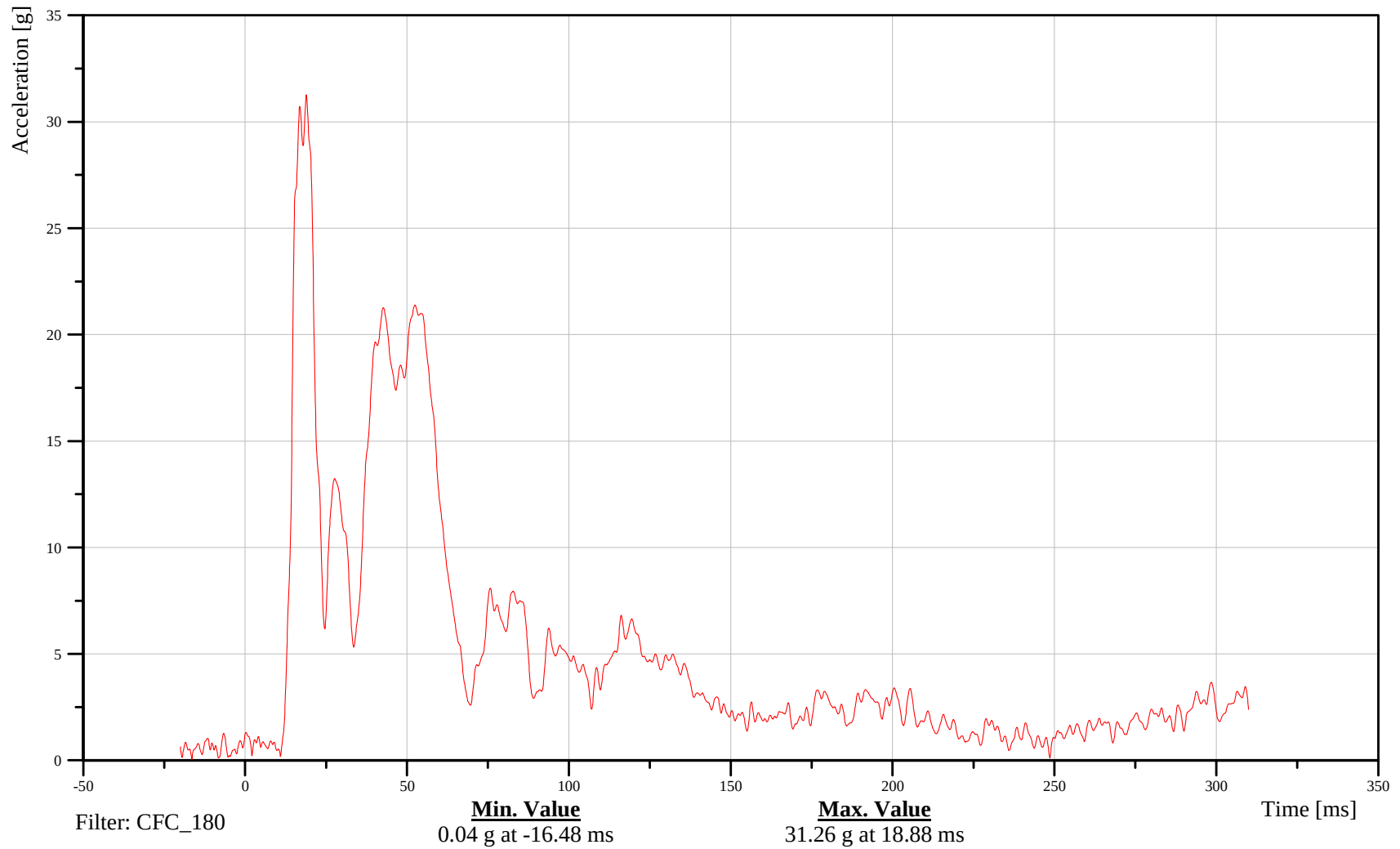
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0100WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-105

080729



World SID Evaluation

Driver T4 X-Axis Acceleration

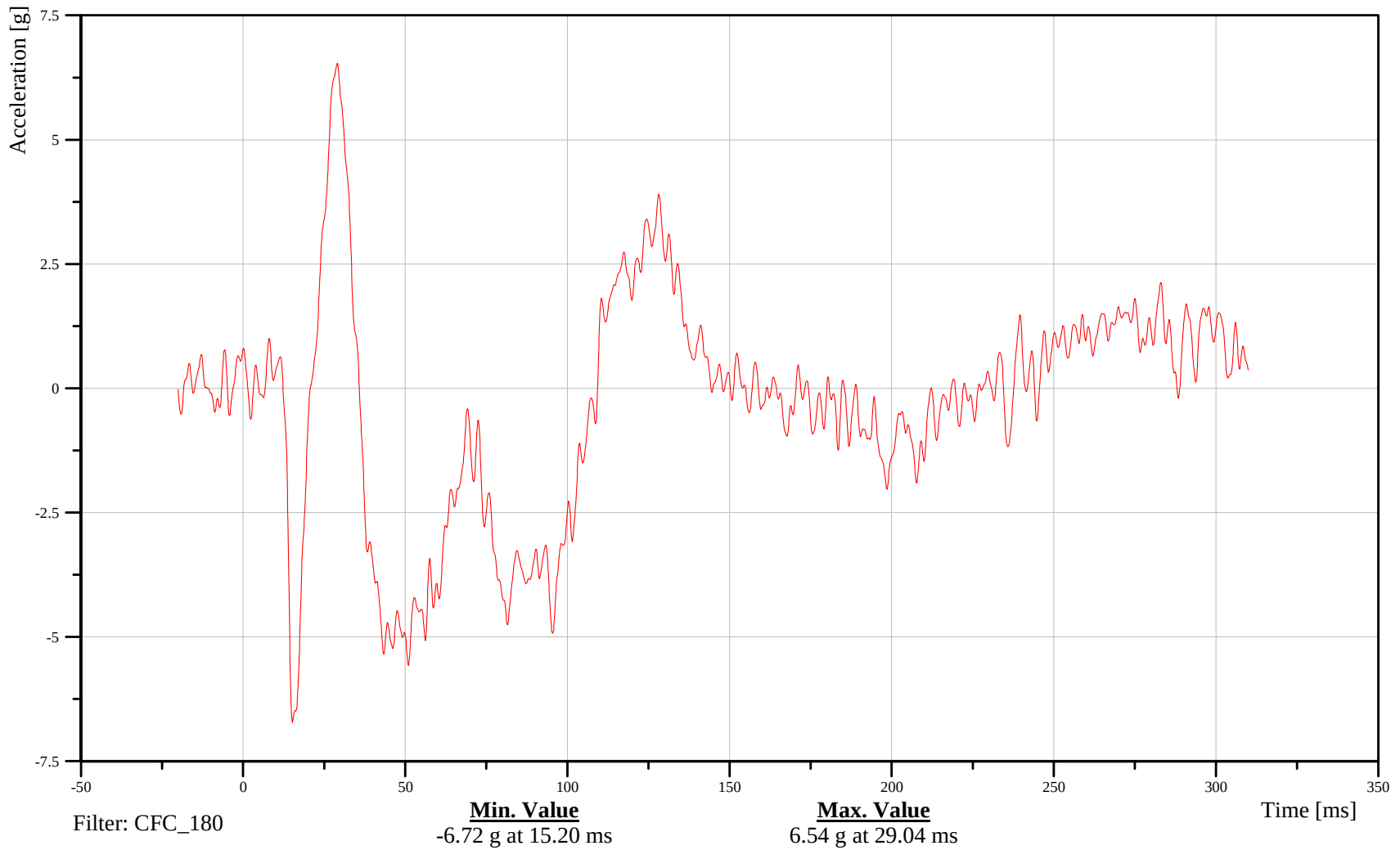
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0400WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-106

080729



World SID Evaluation
Driver T4 Y-Axis Acceleration

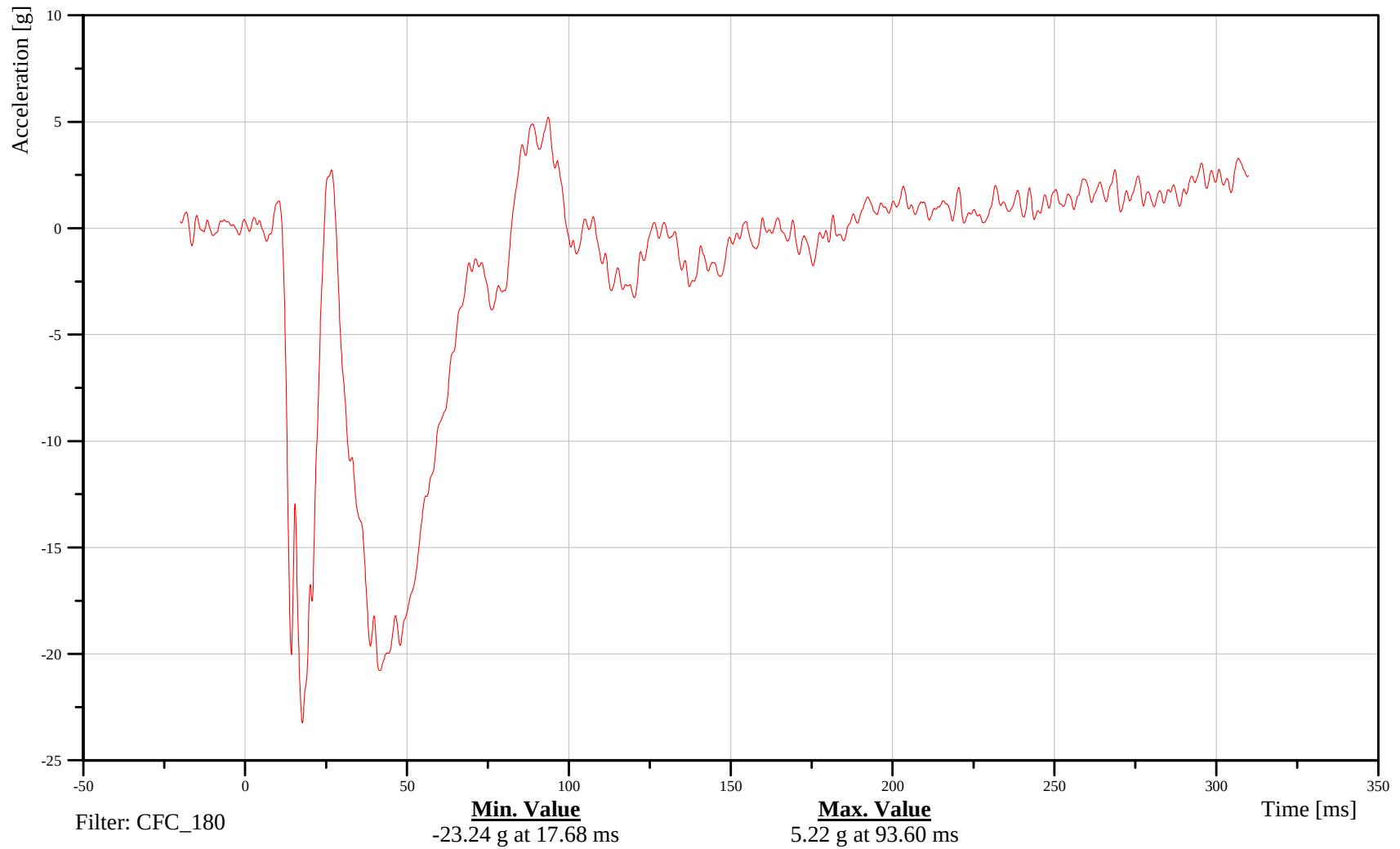
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0400WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-107

080729



World SID Evaluation

Driver T4 Z-Axis Acceleration

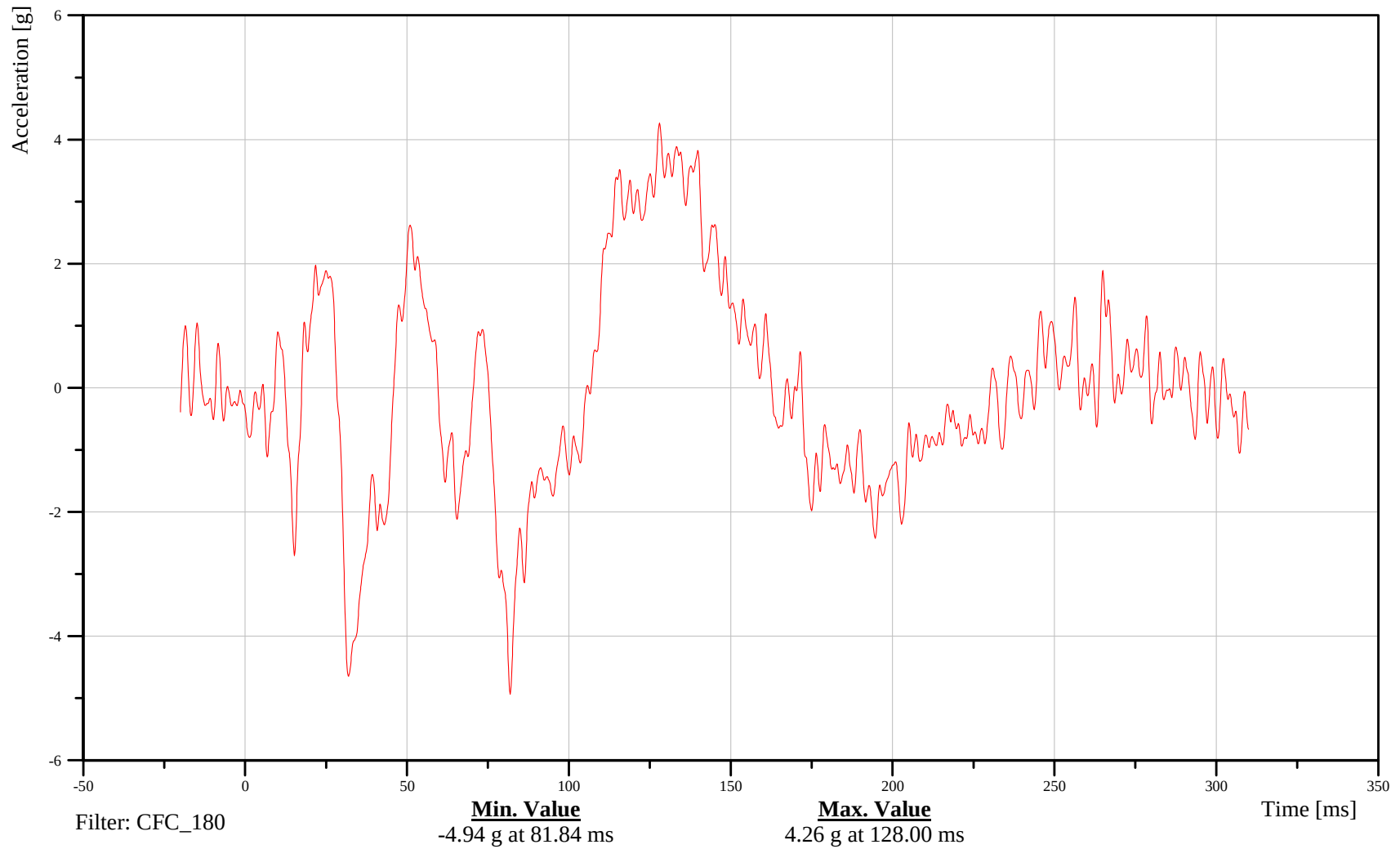
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0400WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-108

080729



World SID Evaluation

Driver T4 Resultant Acceleration

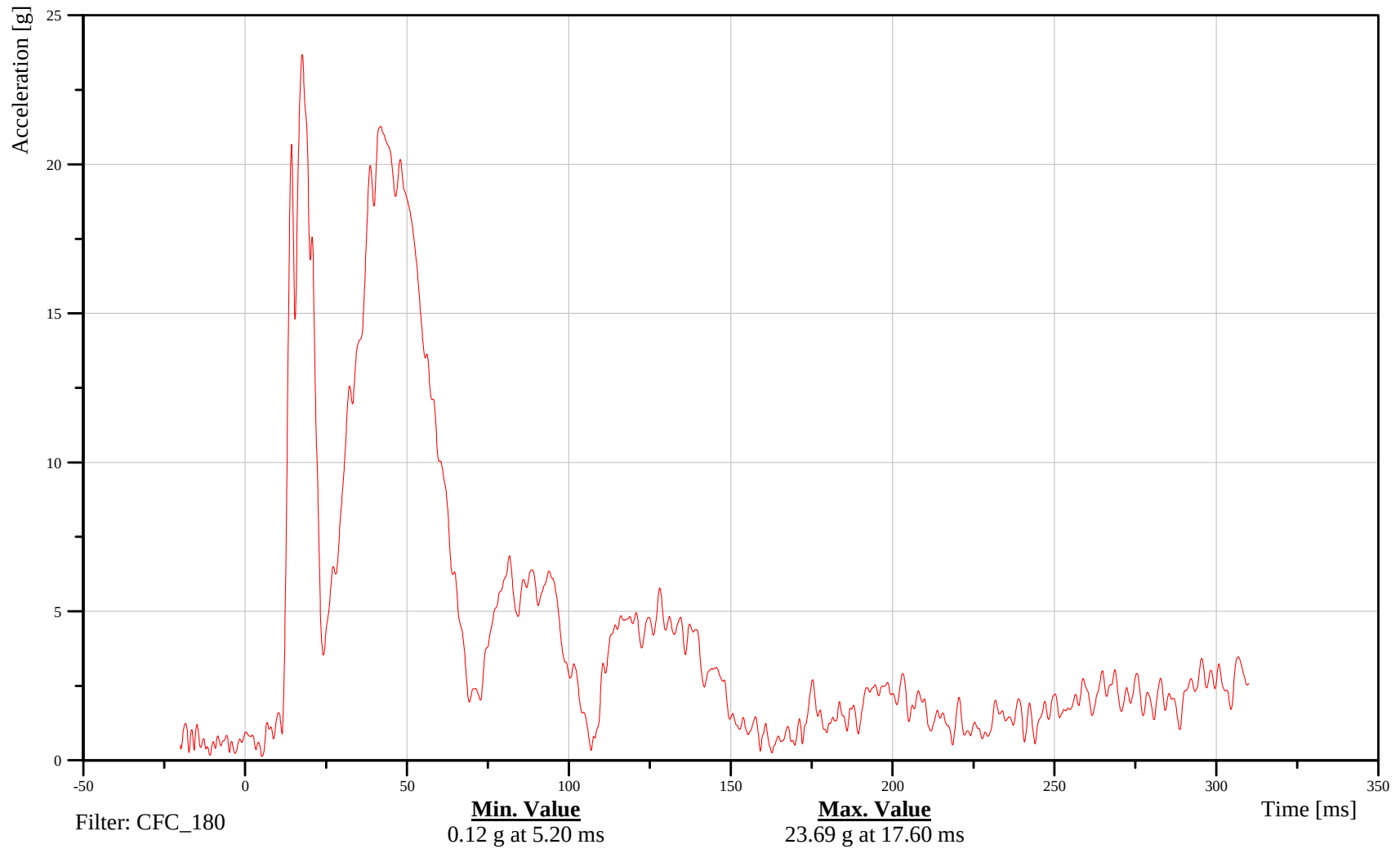
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP0400WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-109

080729



World SID Evaluation

Driver T12 X-Axis Acceleration

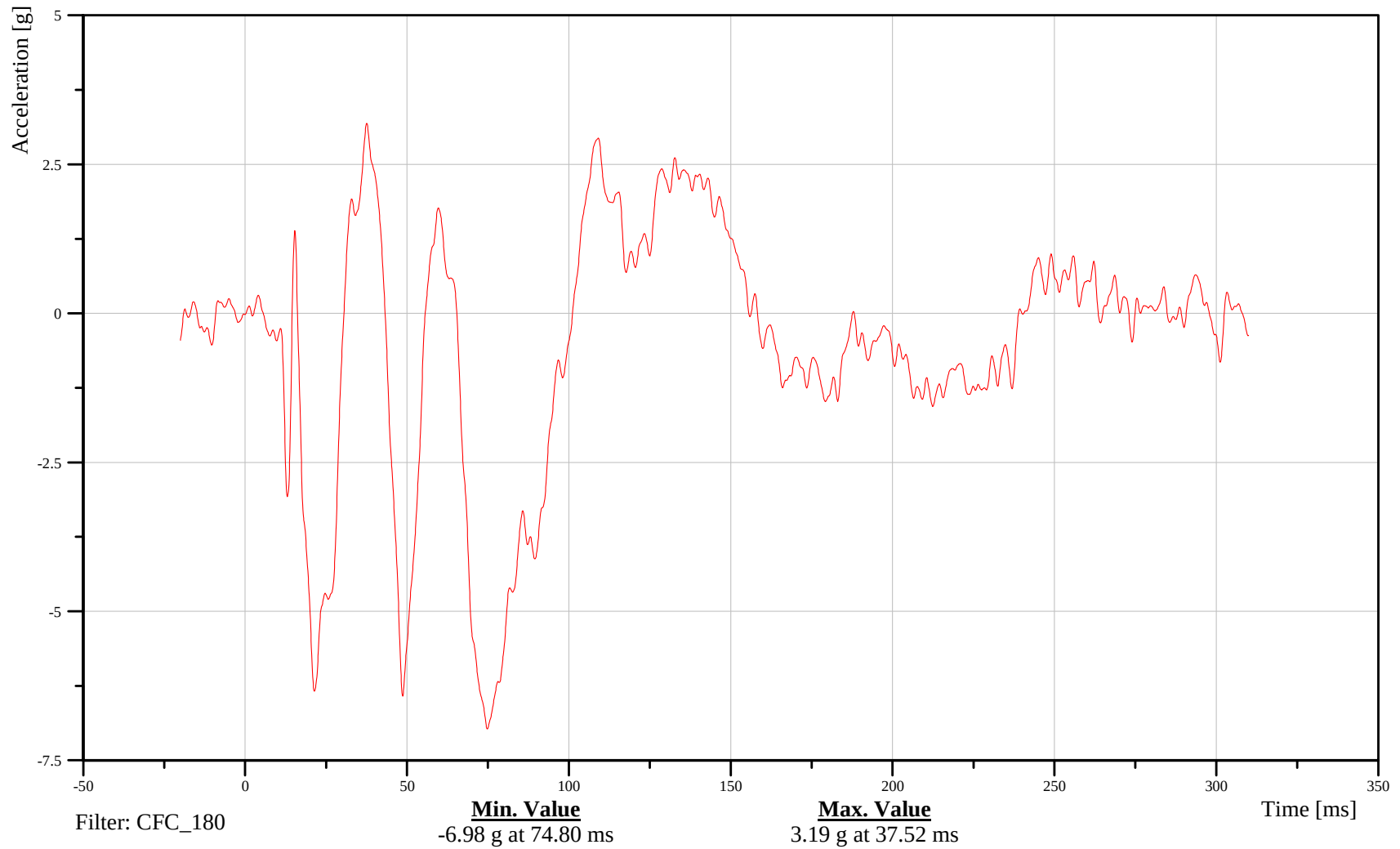
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP1200WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-110

080729



World SID Evaluation
Driver T12 Y-Axis Acceleration

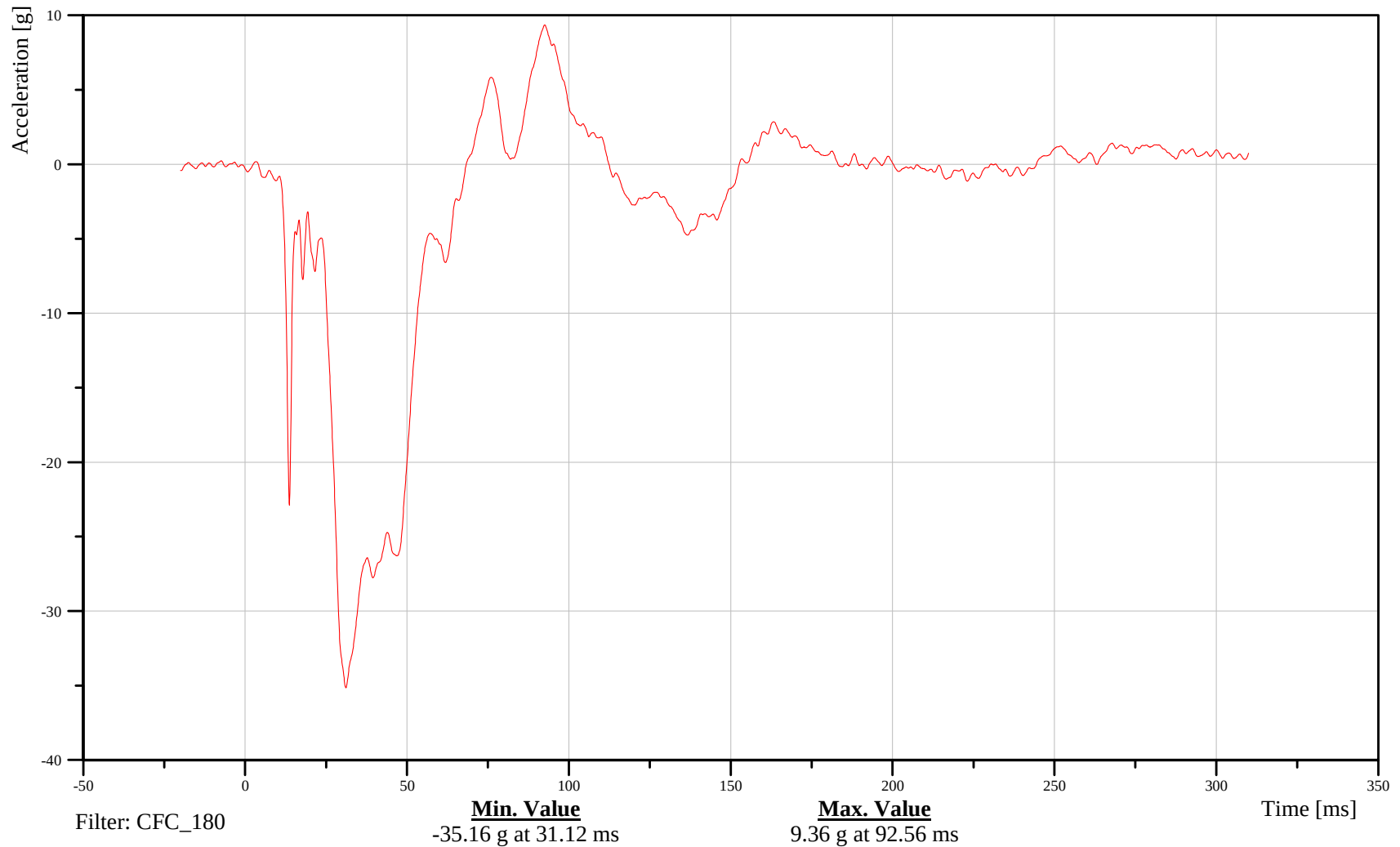
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP1200WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-111

080729



World SID Evaluation

Driver T12 Z-Axis Acceleration

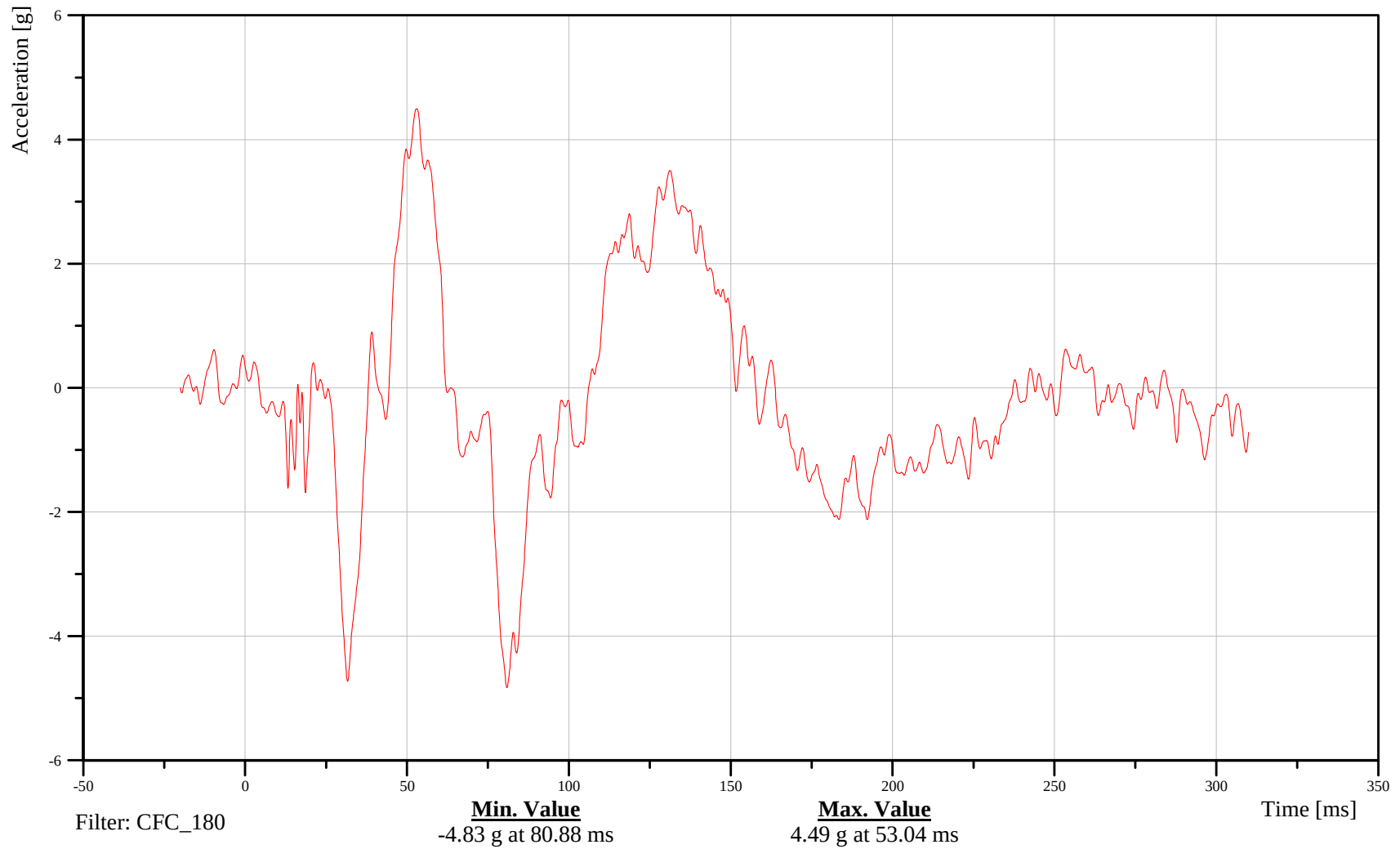
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP1200WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-112

080729



World SID Evaluation

Driver T12 Resultant Acceleration

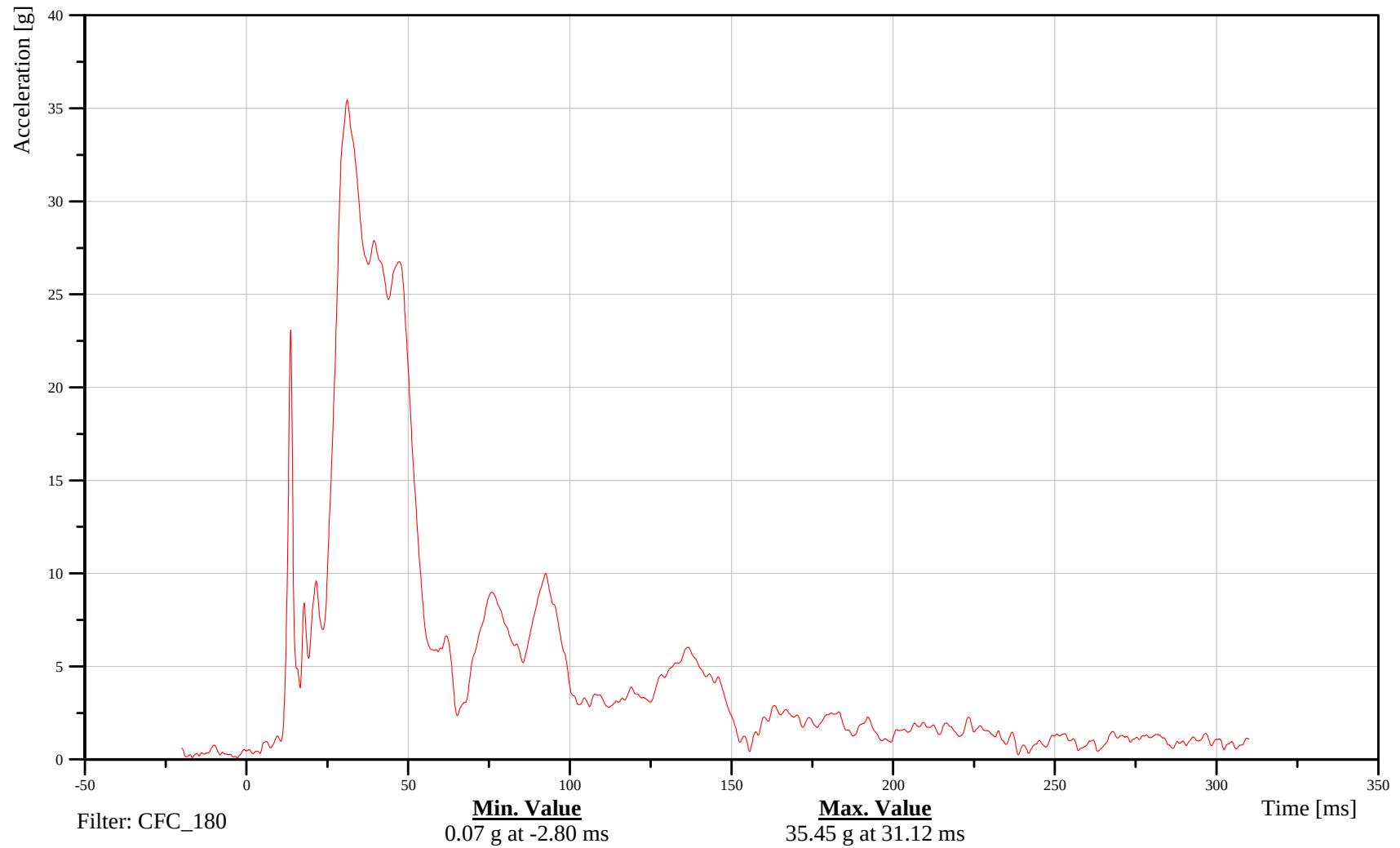
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11THSP1200WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-113

080729



World SID Evaluation
Driver Thorax Rib 1 Y-Axis Displacement

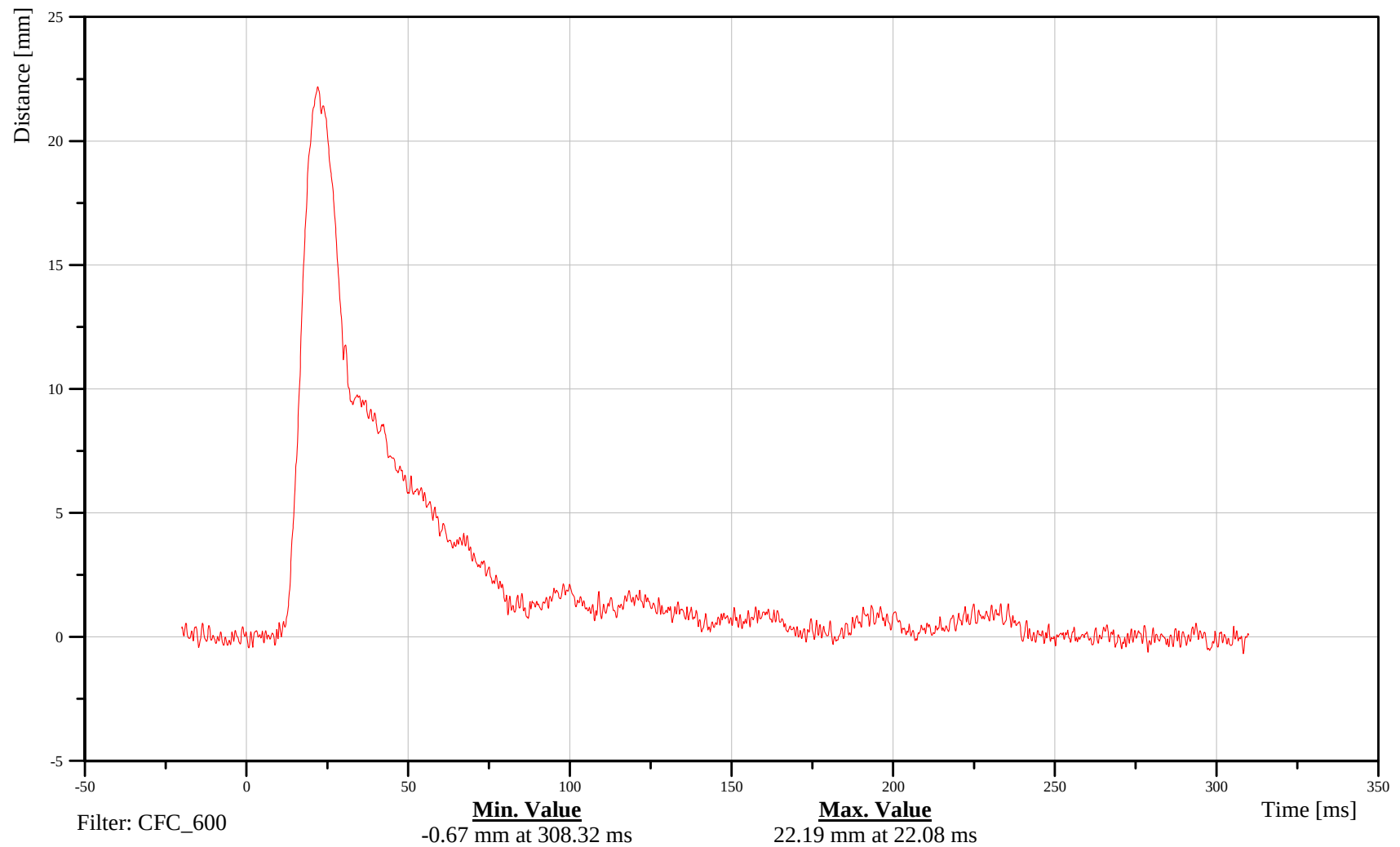
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-114

080729



World SID Evaluation
Driver Thorax Rib 1 X-Axis Acceleration

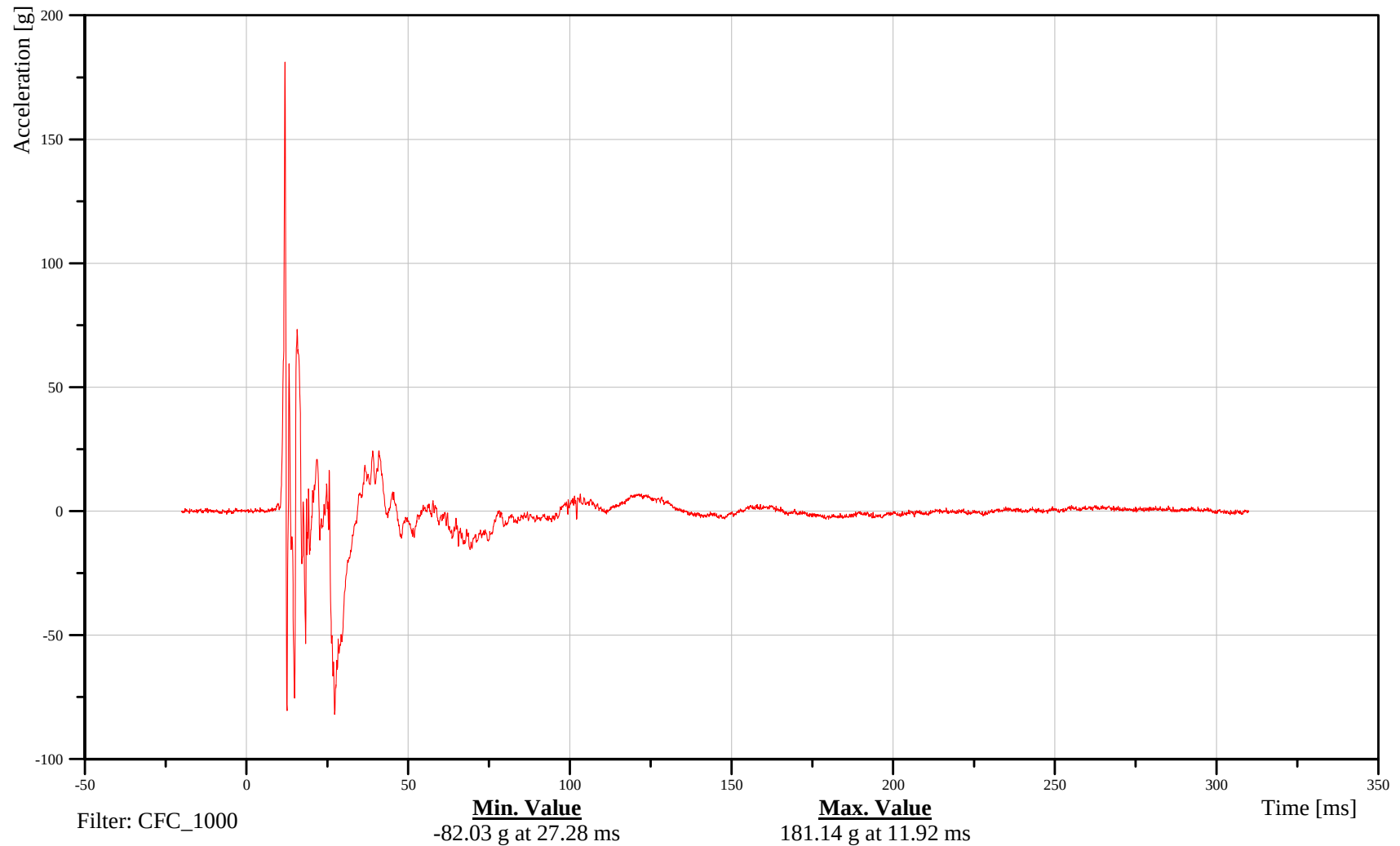
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-115

080729



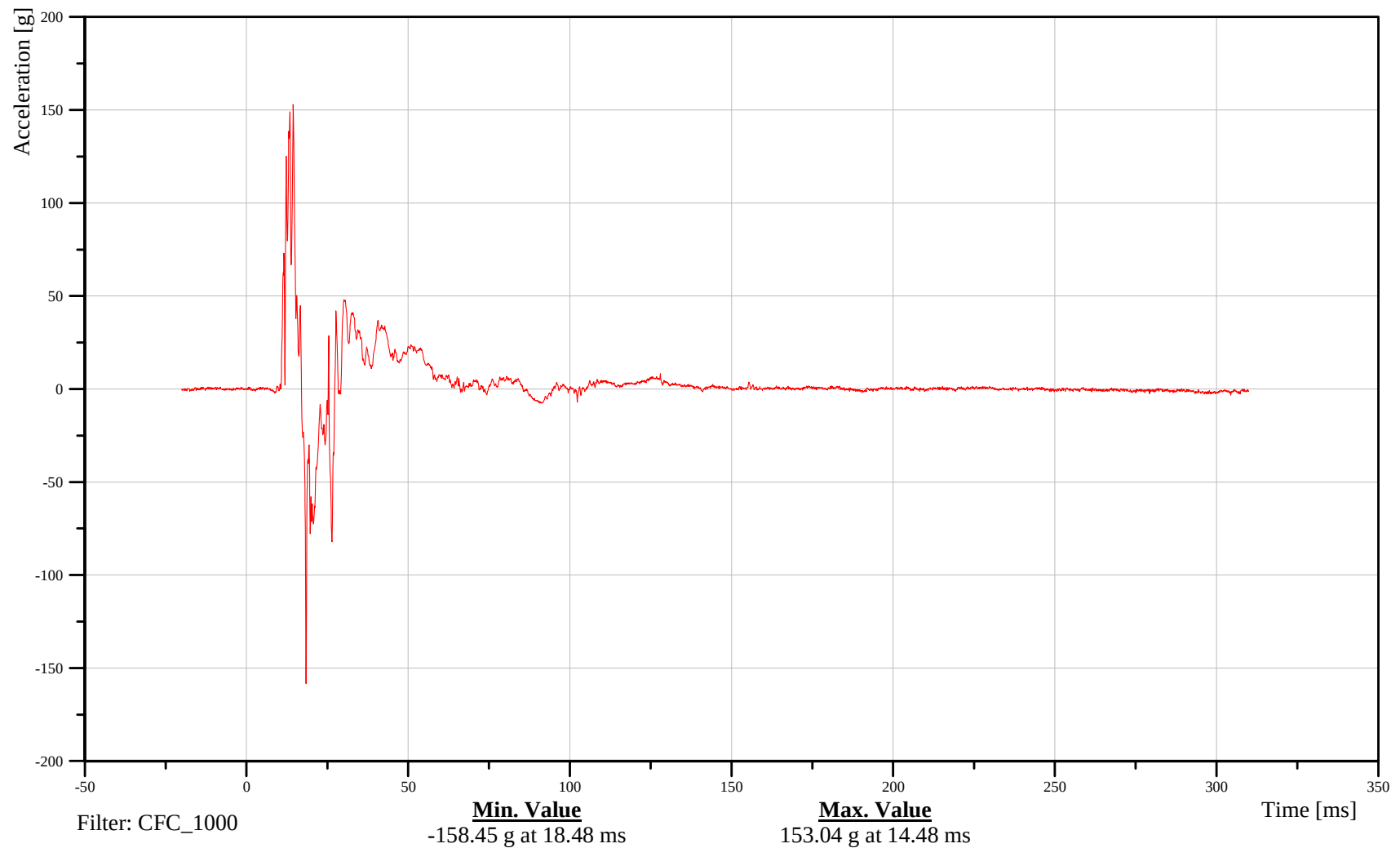
World SID Evaluation
Driver Thorax Rib 1 Y-Axis Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE01WSACYA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-116

080729



World SID Evaluation
Driver Thorax Rib 1 Z-Axis Acceleration

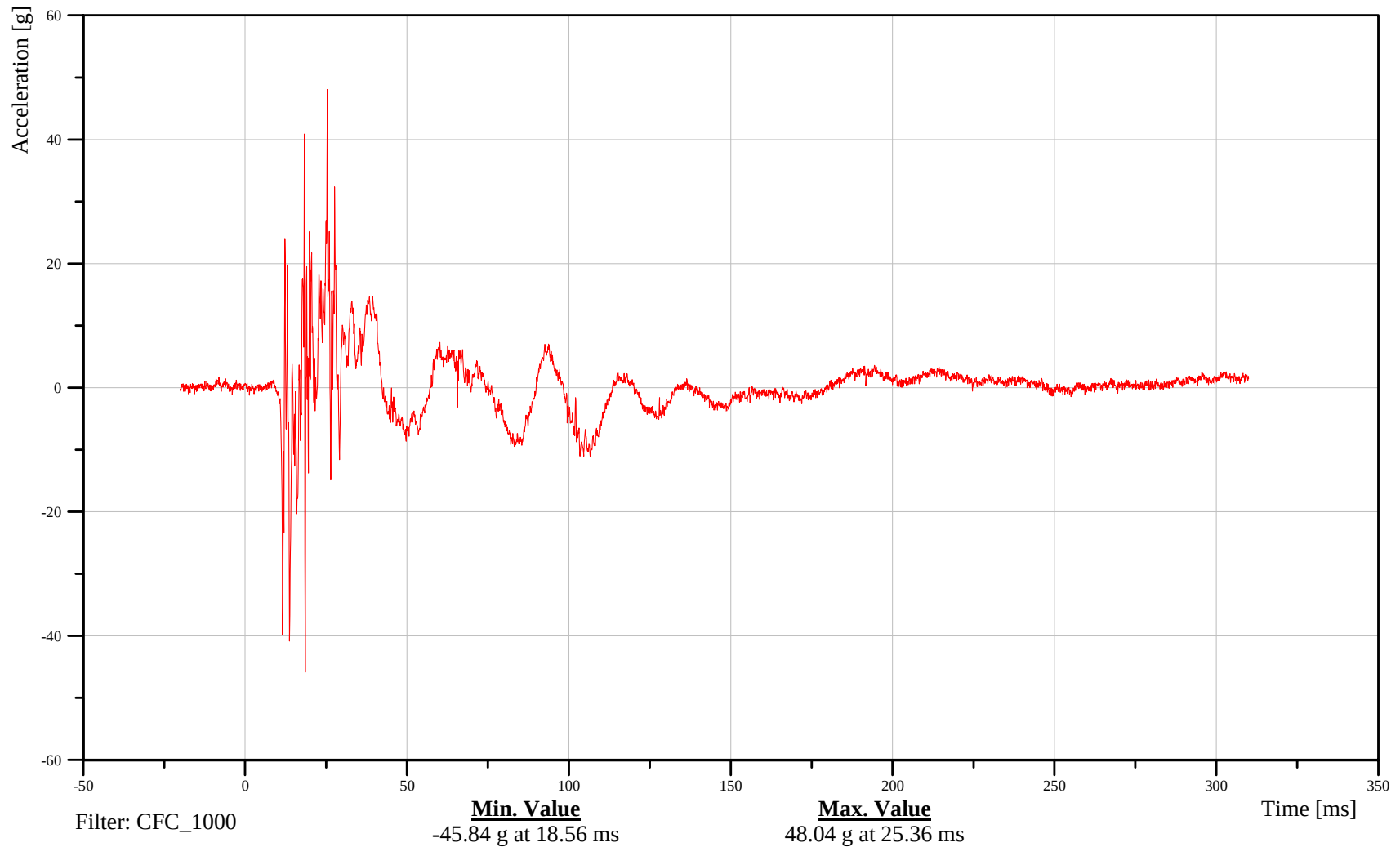
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-117

080729



World SID Evaluation

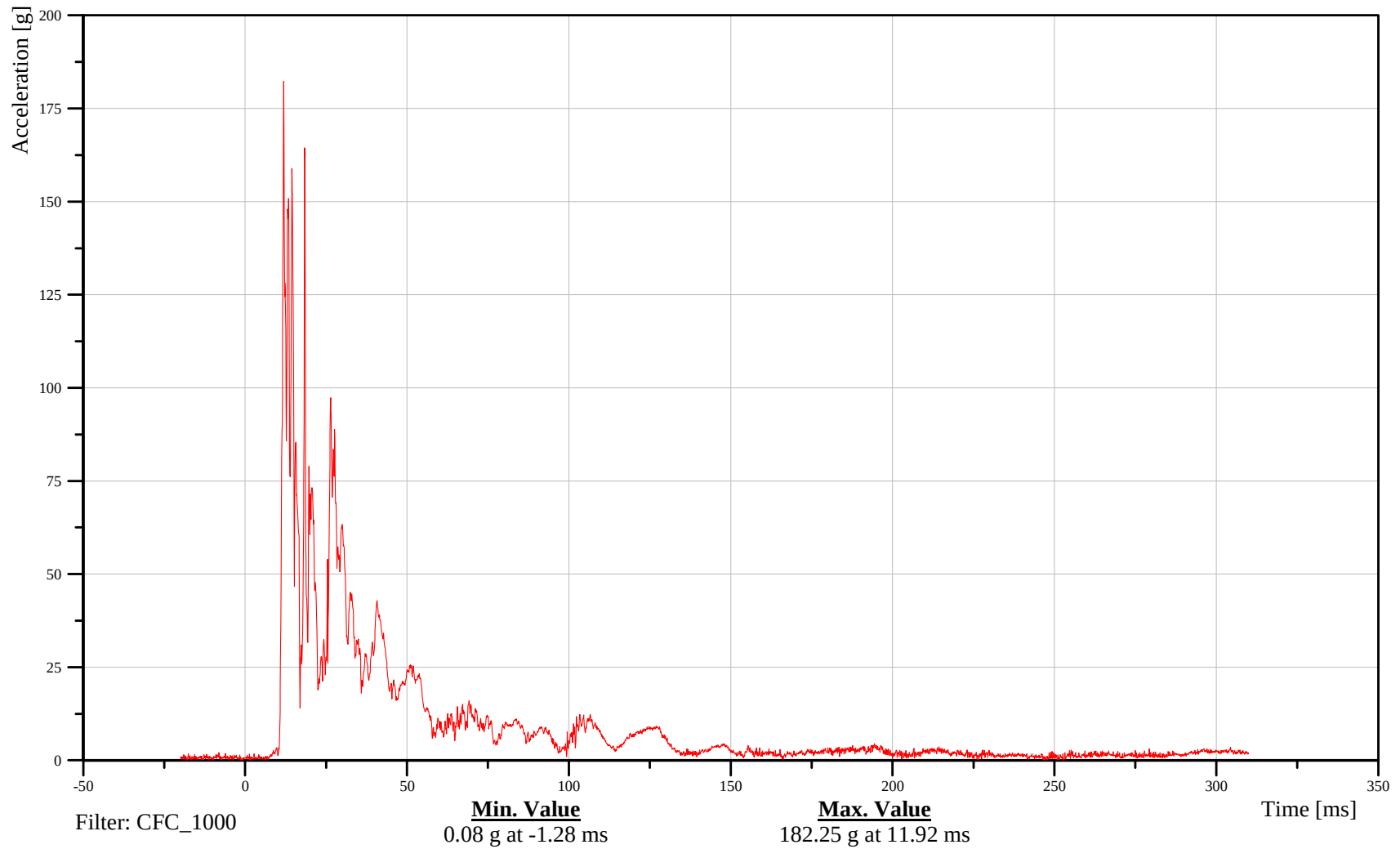
Driver Thorax Rib 1 Resultant Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE01WSACRA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-118

080729



World SID Evaluation
Driver Thorax Rib 2 Y-Axis Displacement

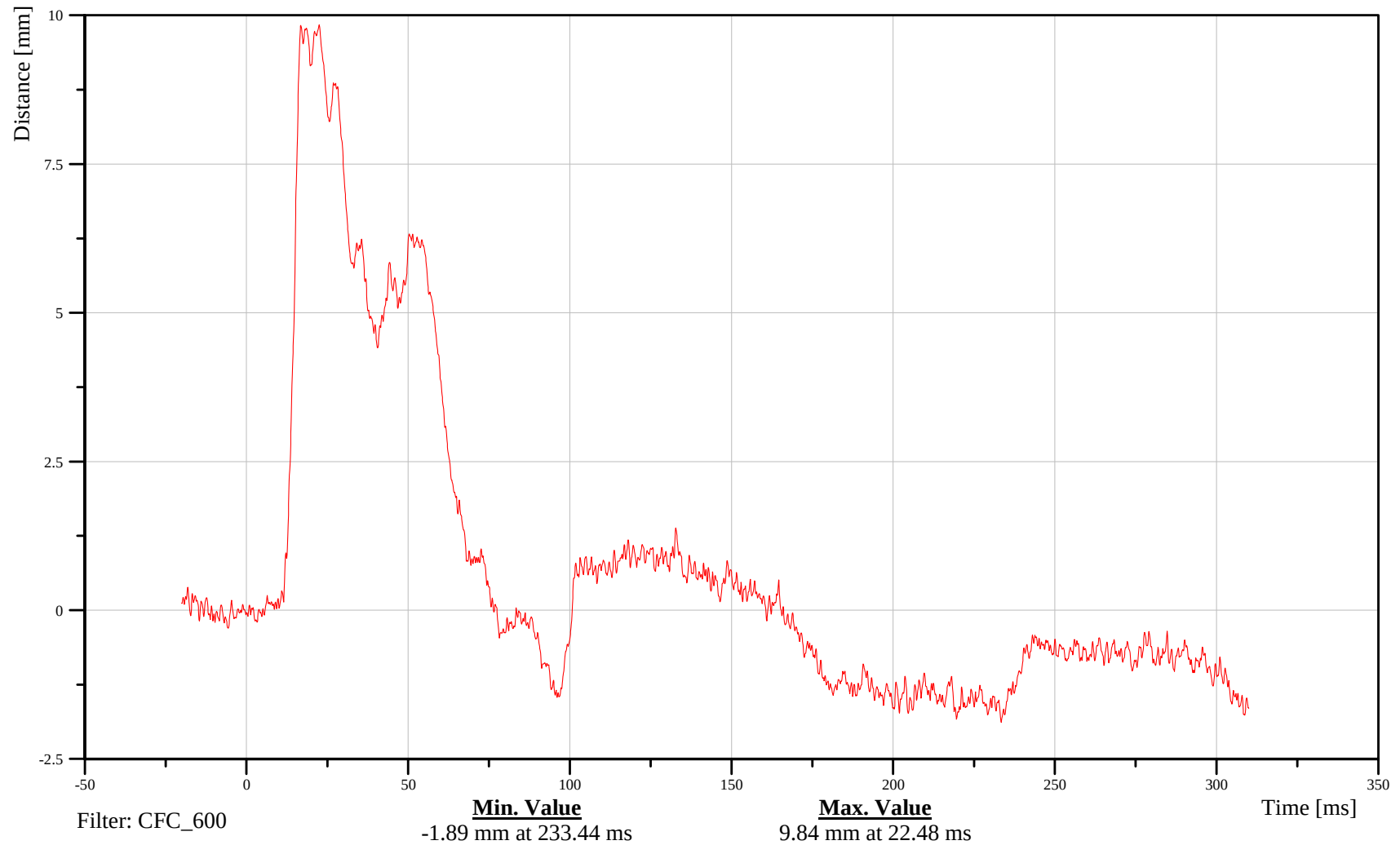
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-119

080729



World SID Evaluation
Driver Thorax Rib 2 X-Axis Acceleration

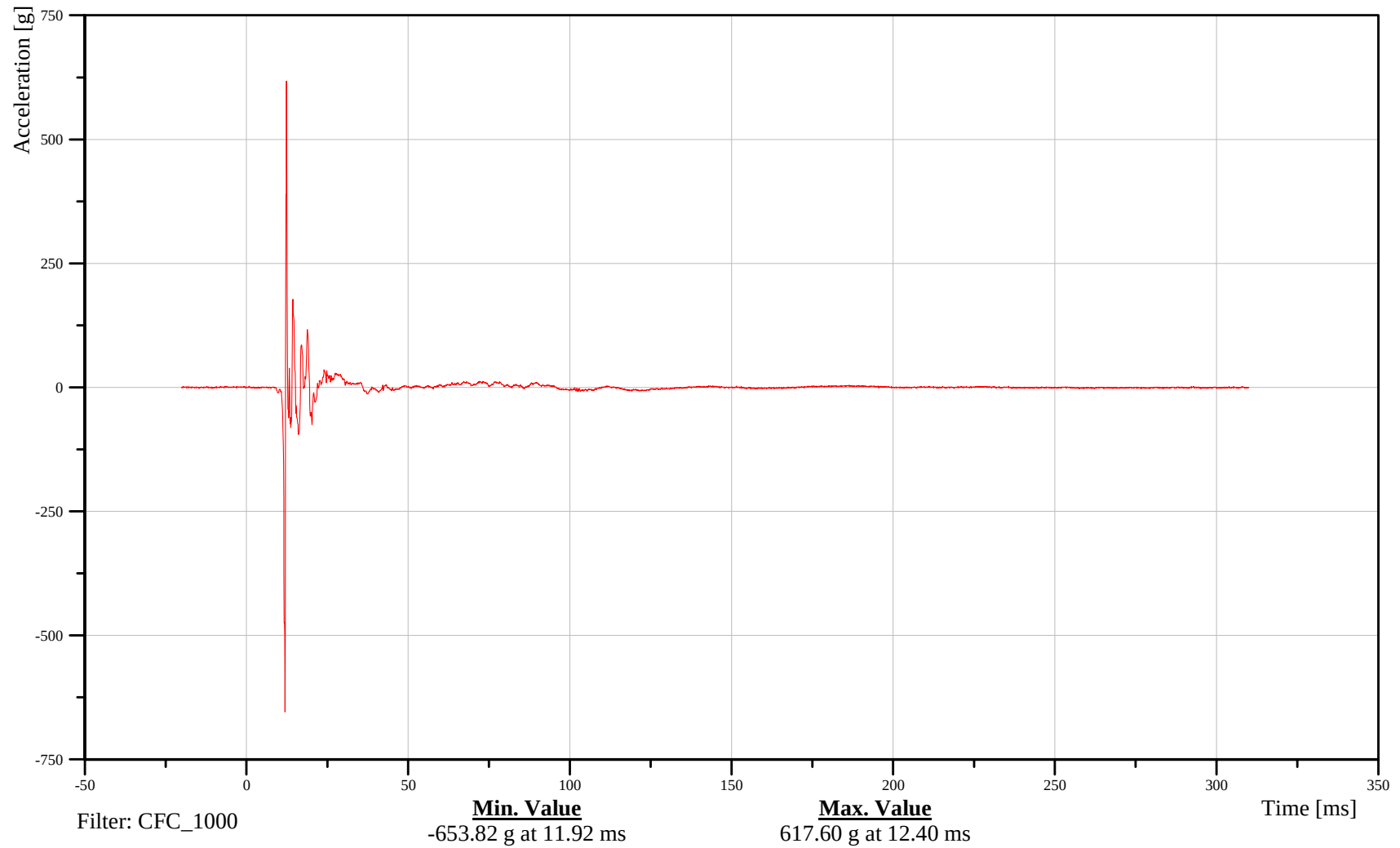
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-120

080729



World SID Evaluation
Driver Thorax Rib 2 Y-Axis Acceleration

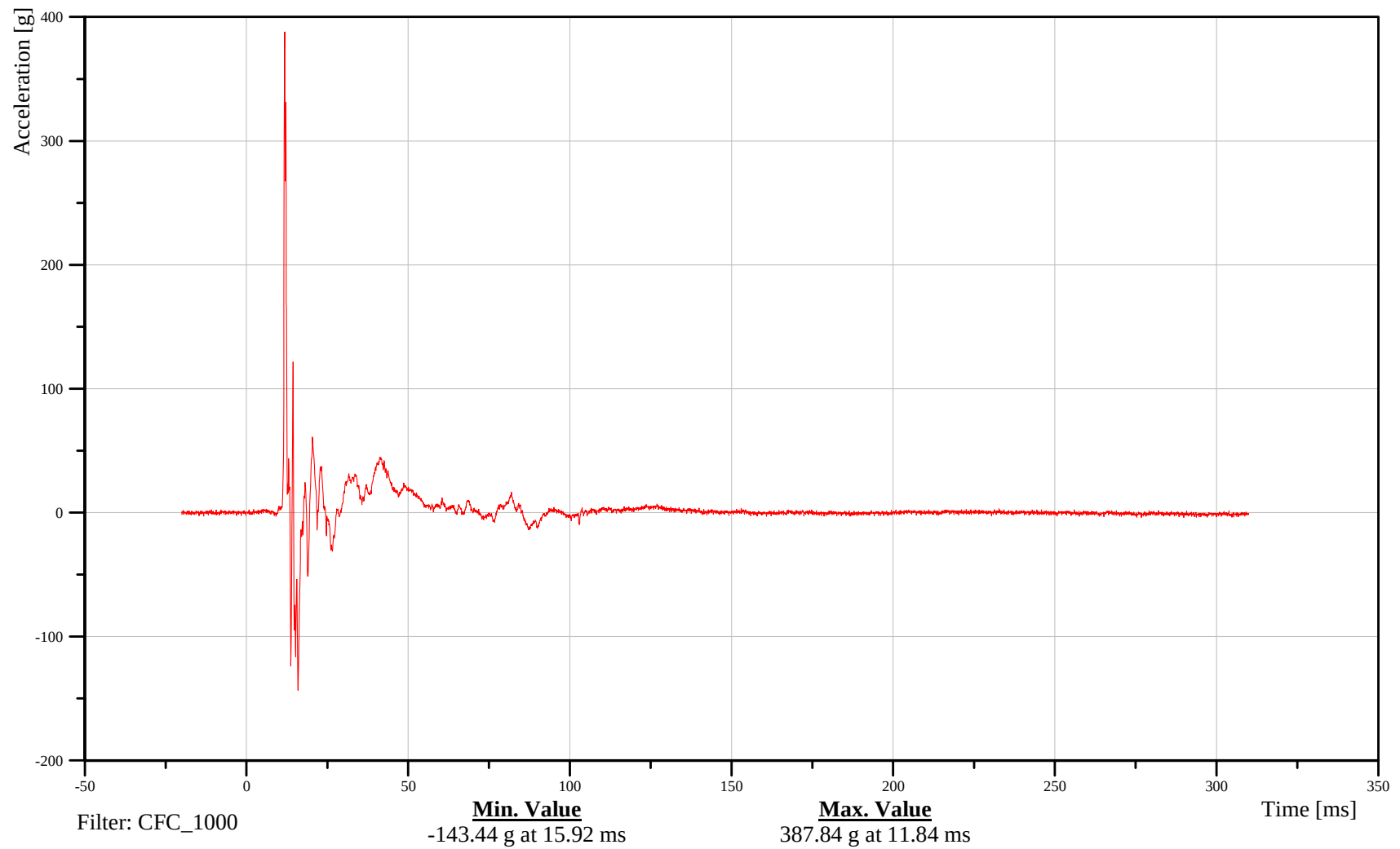
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-121

080729



World SID Evaluation
Driver Thorax Rib 2 Z-Axis Acceleration

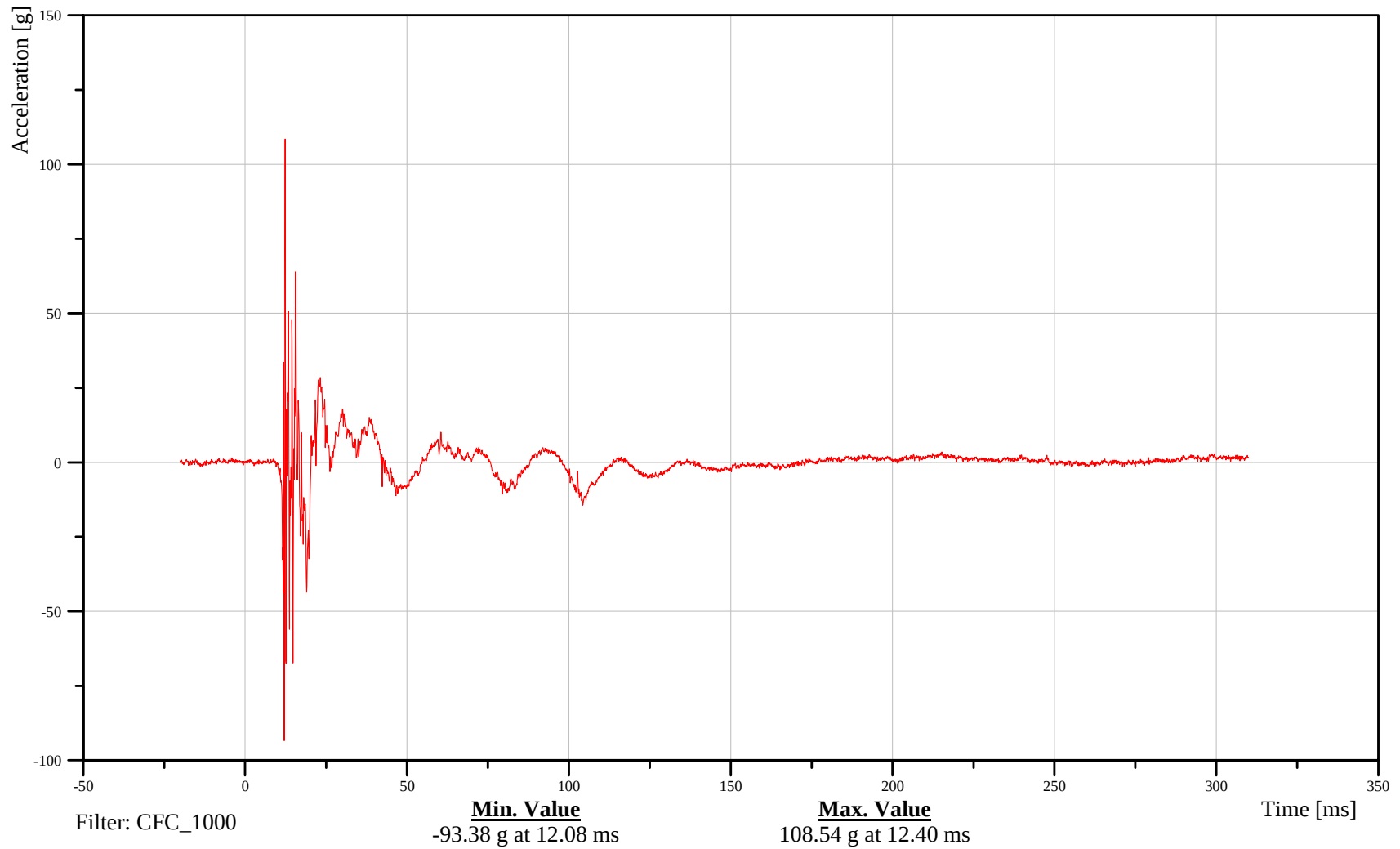
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-122

080729



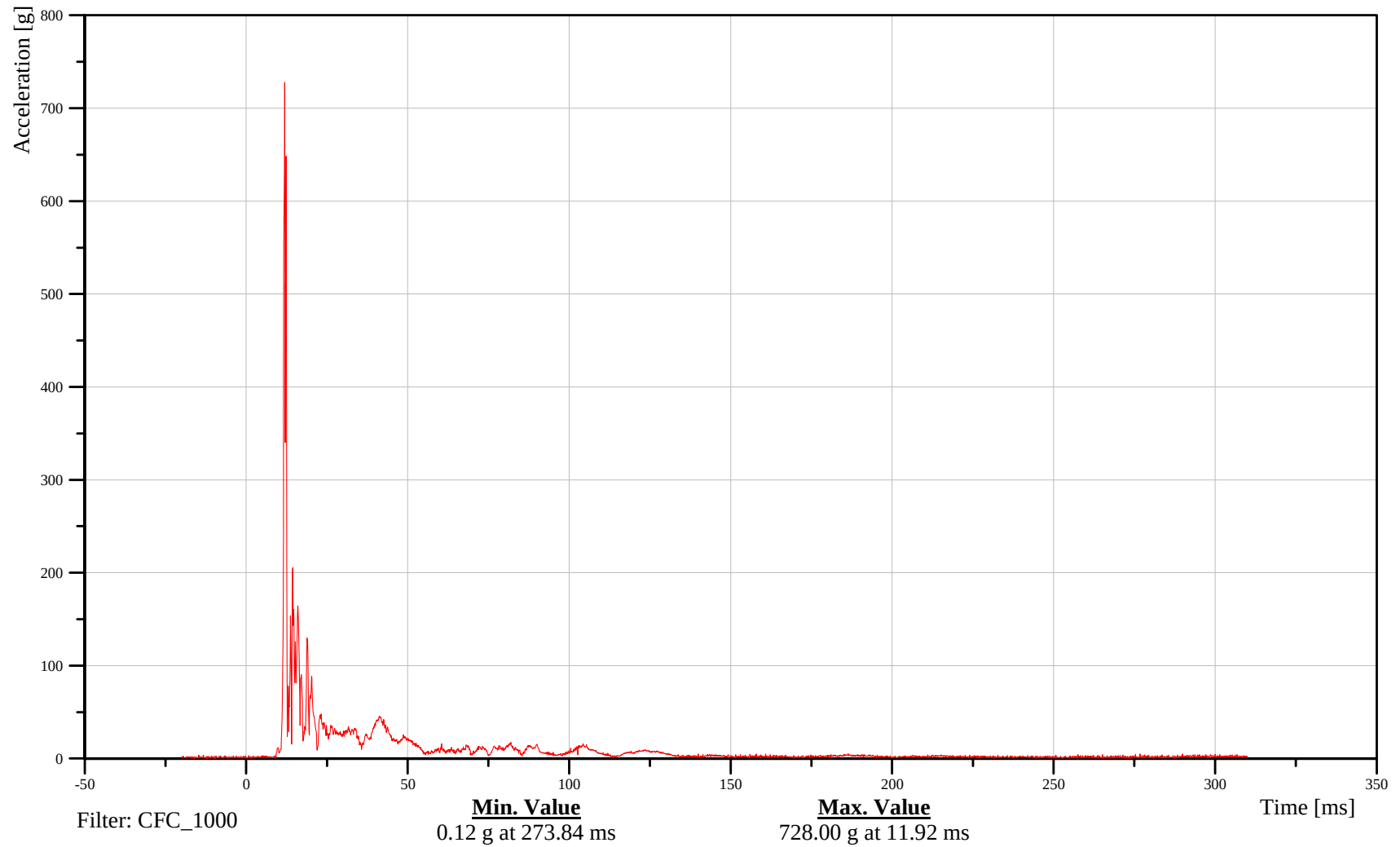
World SID Evaluation
Driver Thorax Rib 2 Resultant Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE02WSACRA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-123

080729



World SID Evaluation
Driver Thorax Rib 3 Y-Axis Displacement

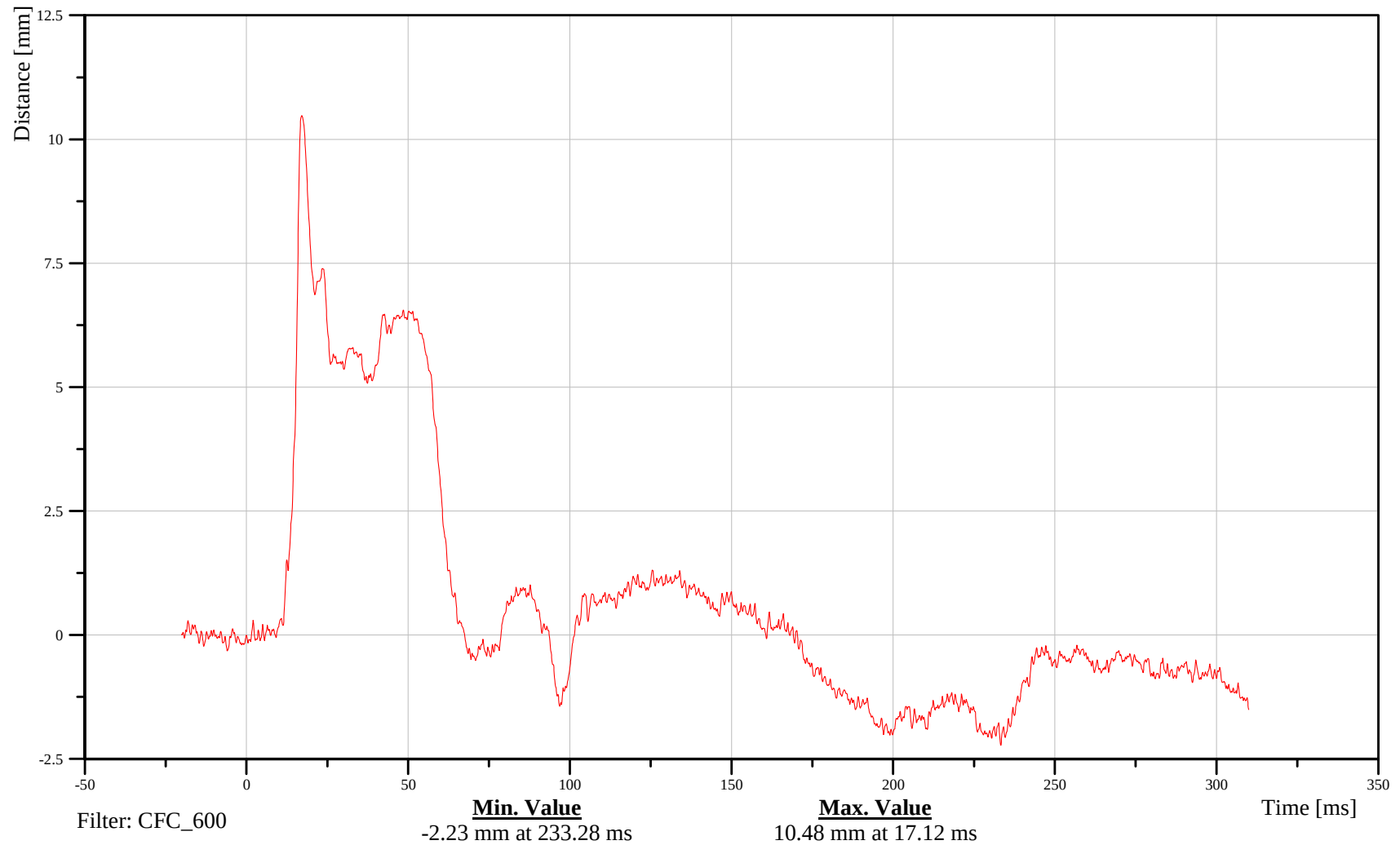
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE03WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-124

080729



World SID Evaluation
Driver Thorax Rib 3 X-Axis Acceleration

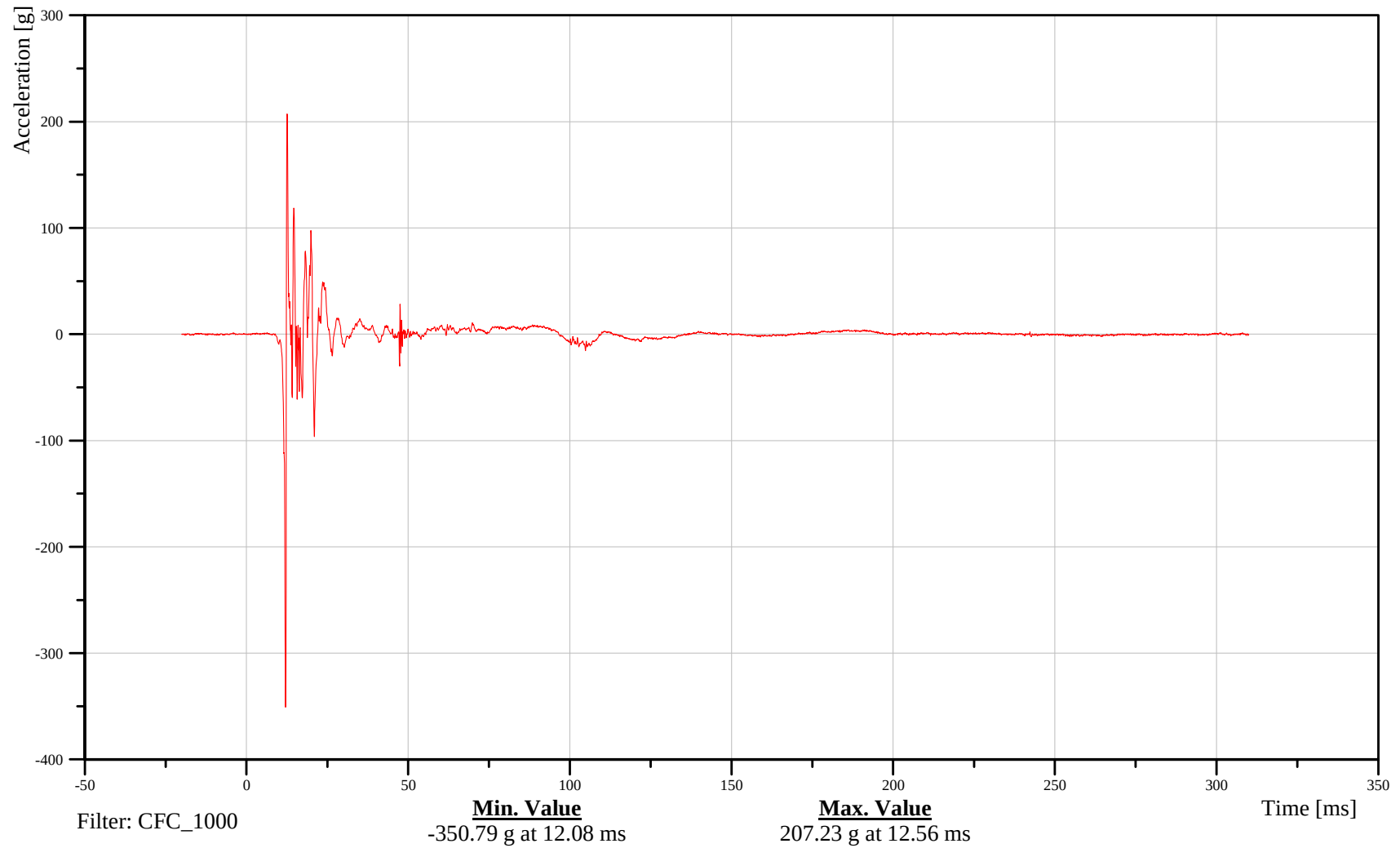
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE03WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-125

080729



World SID Evaluation
Driver Thorax Rib 3 Y-Axis Acceleration

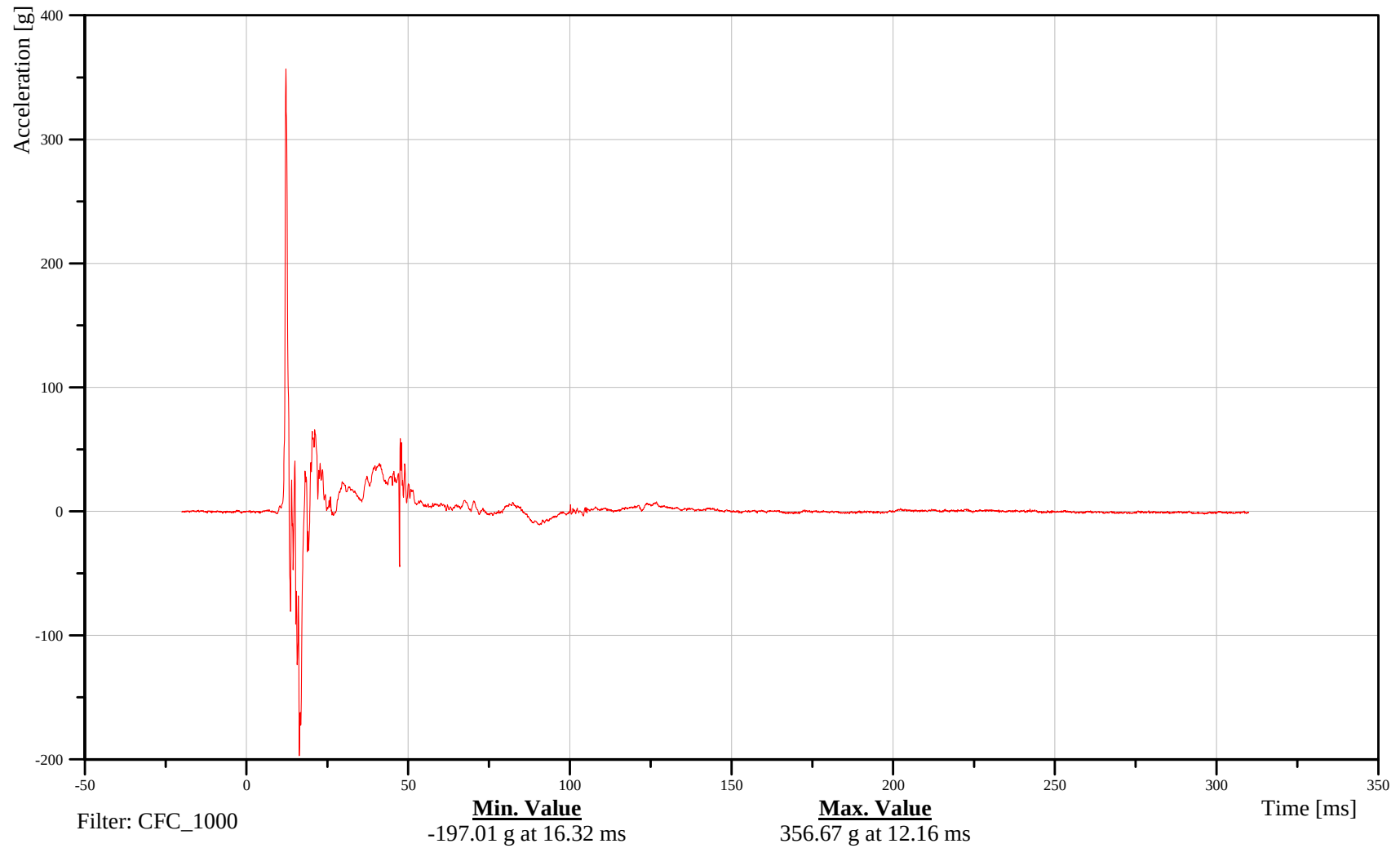
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE03WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-126

080729



World SID Evaluation
Driver Thorax Rib 3 Z-Axis Acceleration

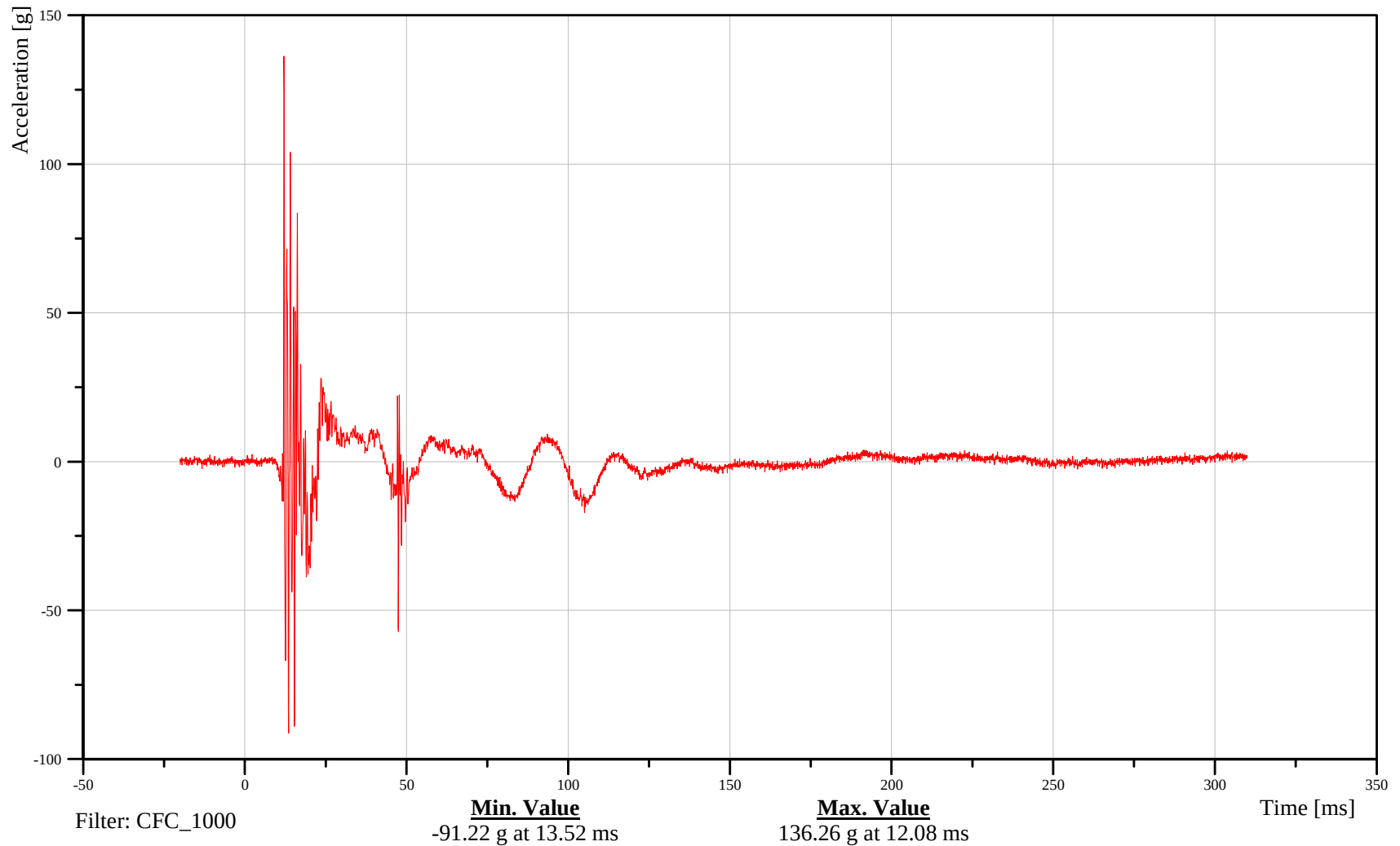
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE03WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-127

080729



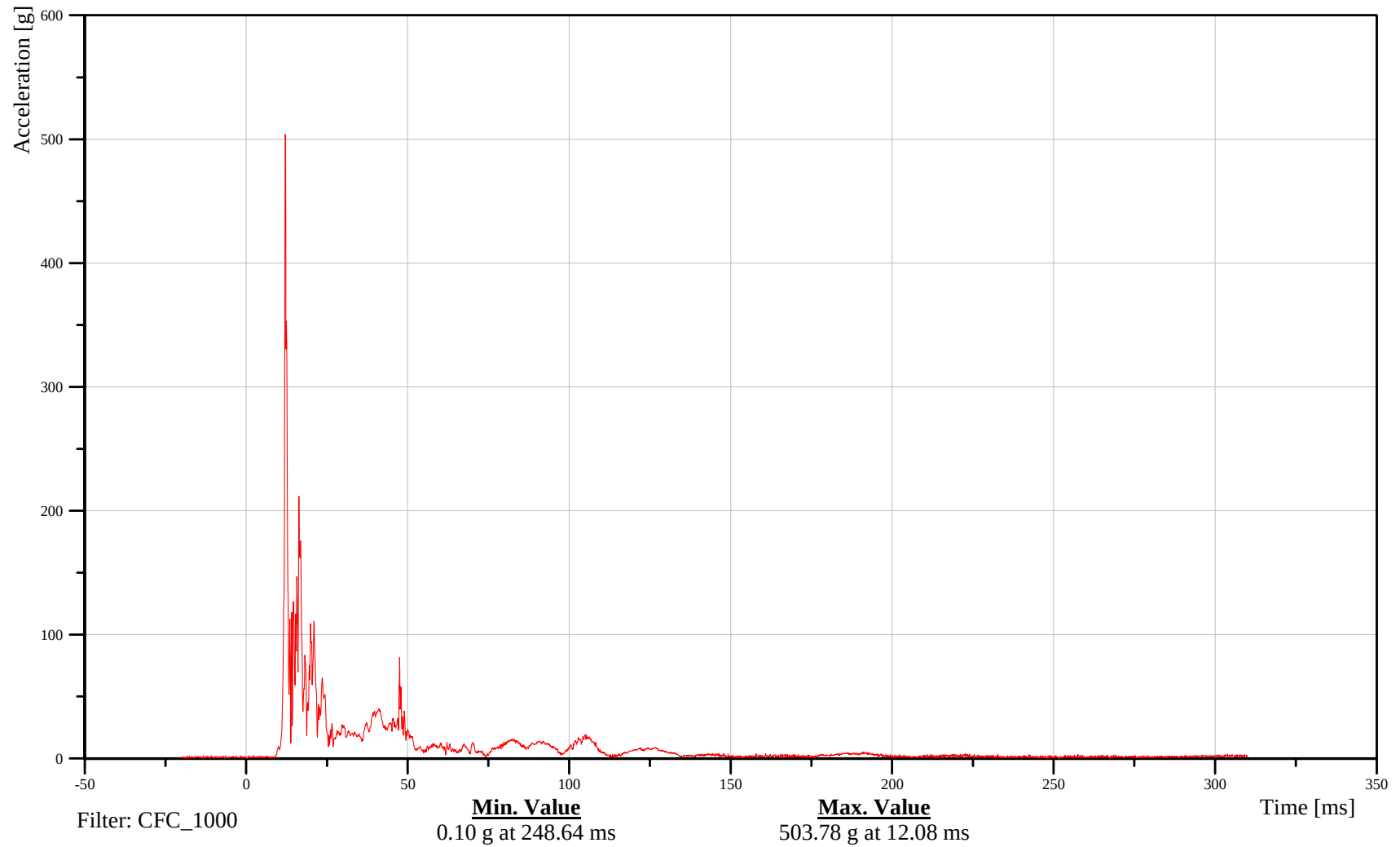
World SID Evaluation
Driver Thorax Rib 3 Resultant Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

11TRRILE03WSACRA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-128

080729



World SID Evaluation

Driver Abdominal Rib 1 Y-Axis Displacement

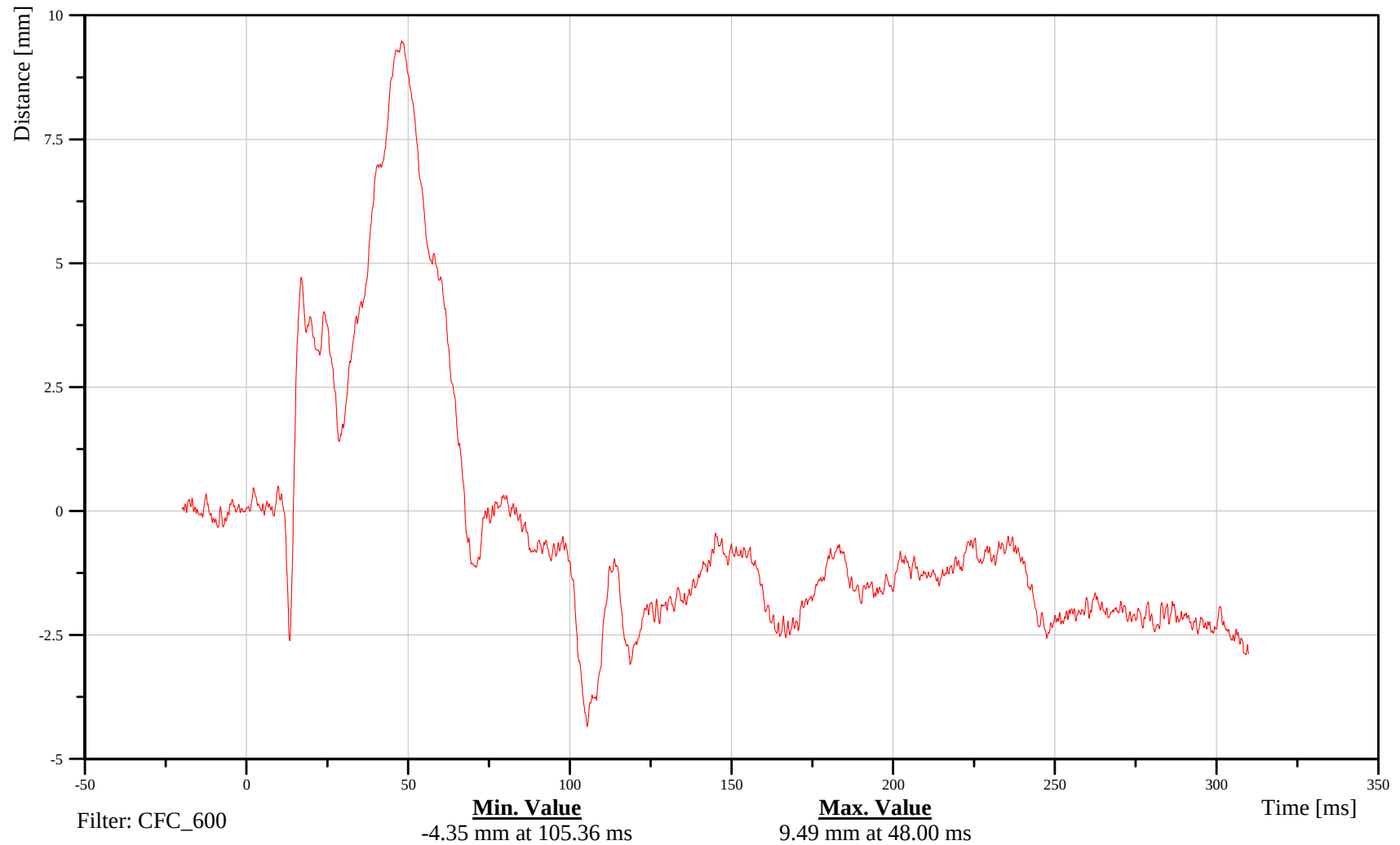
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-129

080729



World SID Evaluation
Driver Abdominal Rib 1 X-Axis Acceleration

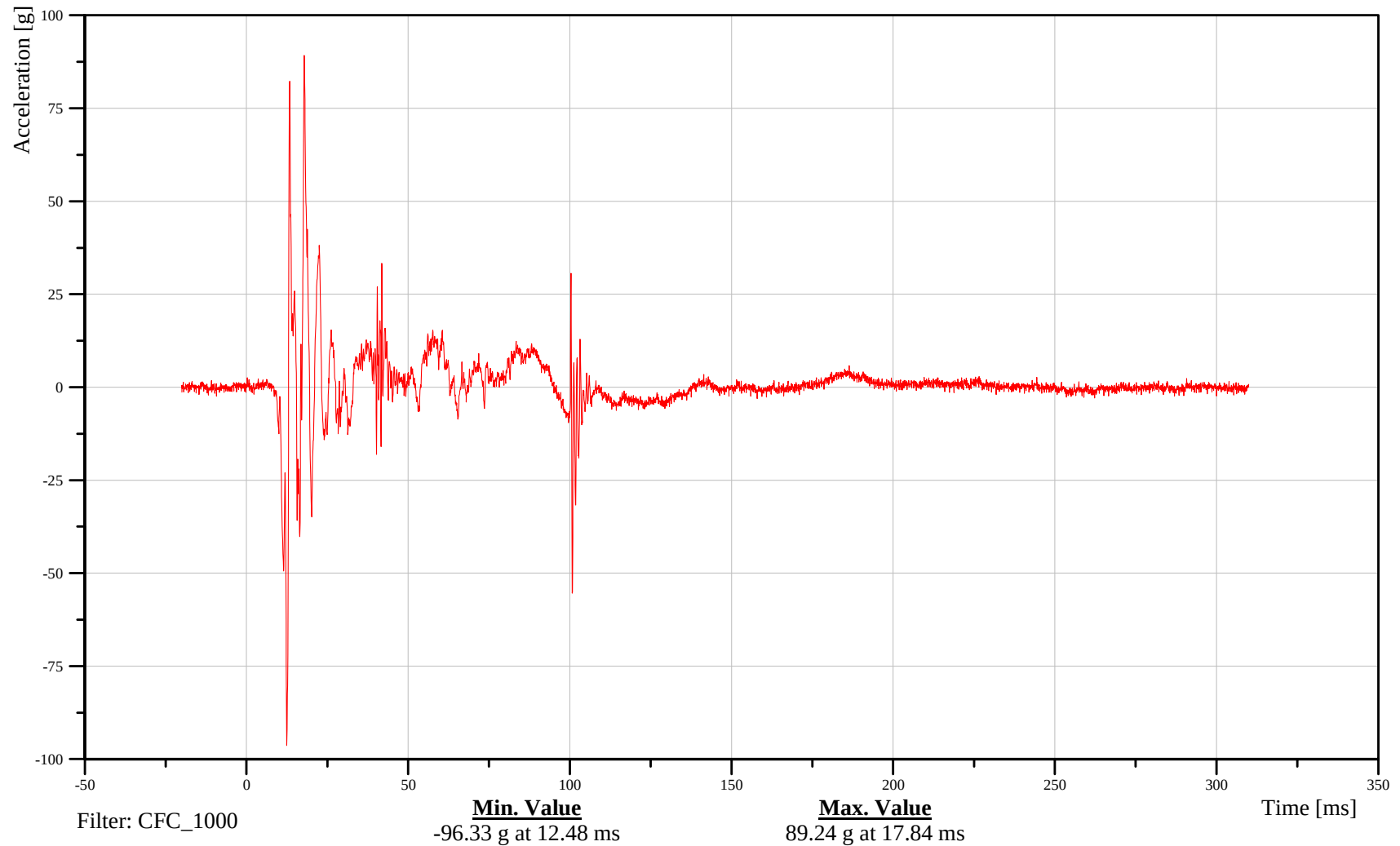
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-130

080729



World SID Evaluation
Driver Abdominal Rib 1 Y-Axis Acceleration

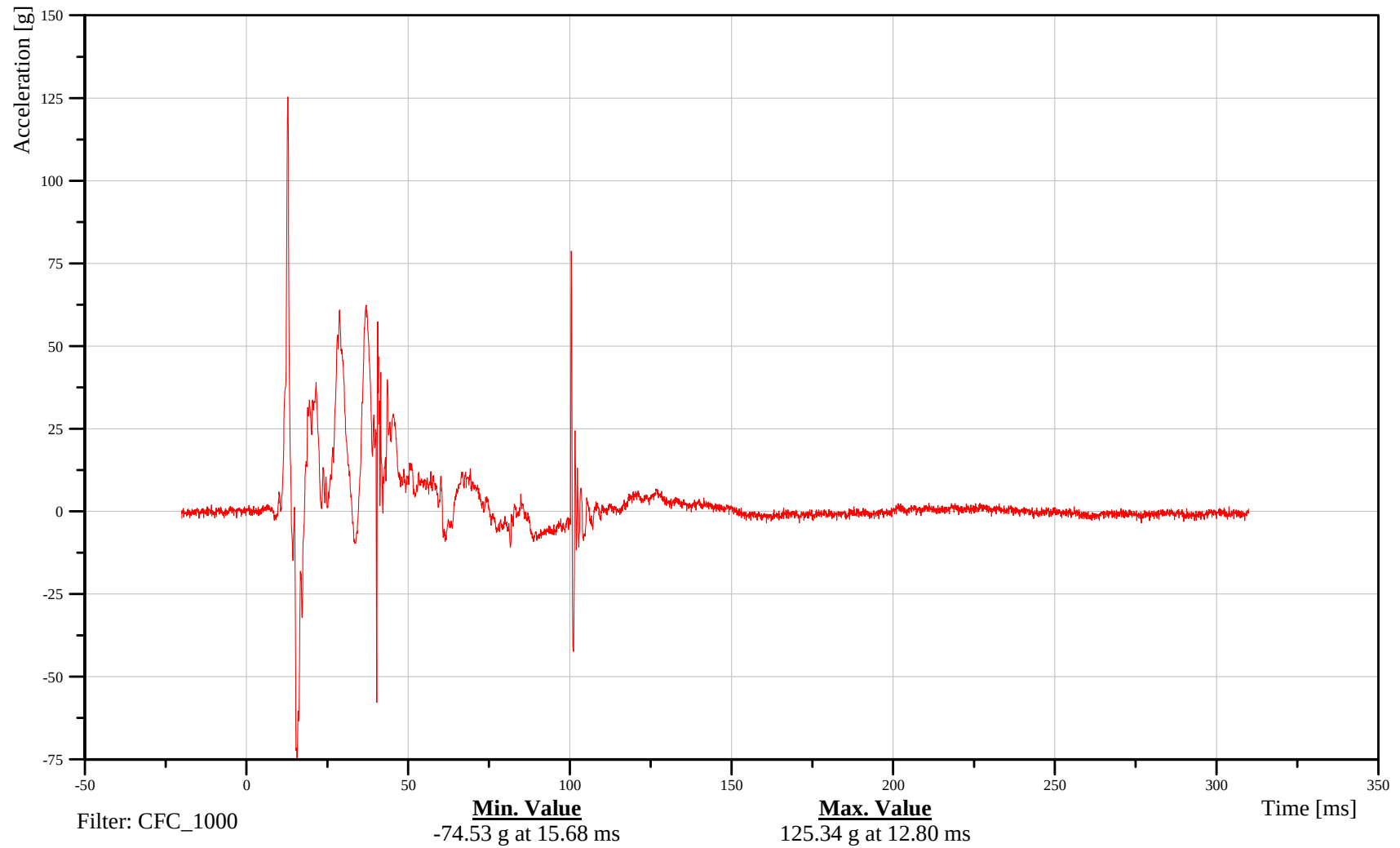
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-131

080729



World SID Evaluation
Driver Abdominal Rib 1 Z-Axis Acceleration

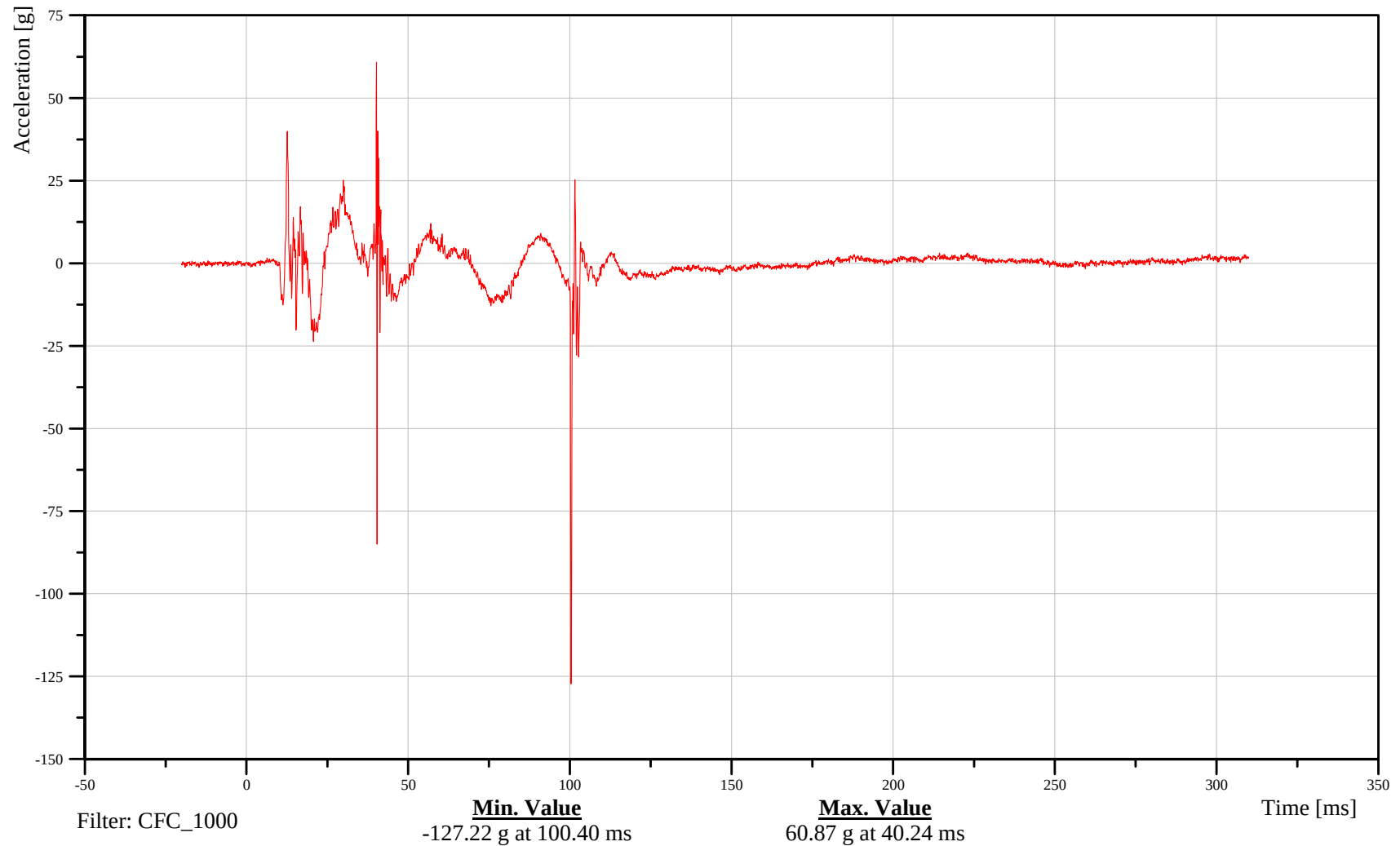
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-132

080729



World SID Evaluation
Driver Abdominal Rib 1 Resultant Acceleration

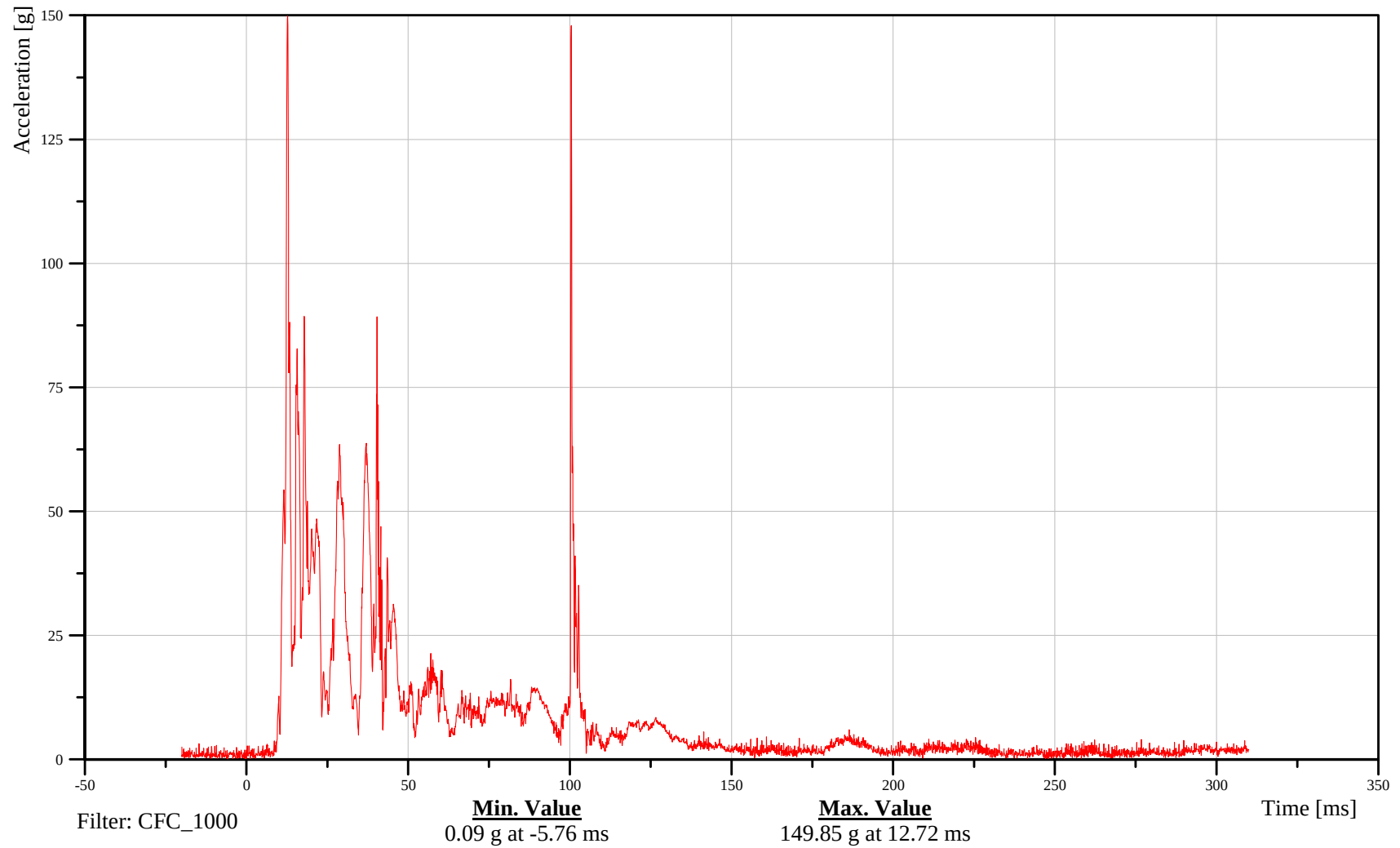
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-133

080729



World SID Evaluation

Driver Abdominal Rib 2 Y-Axis Displacement

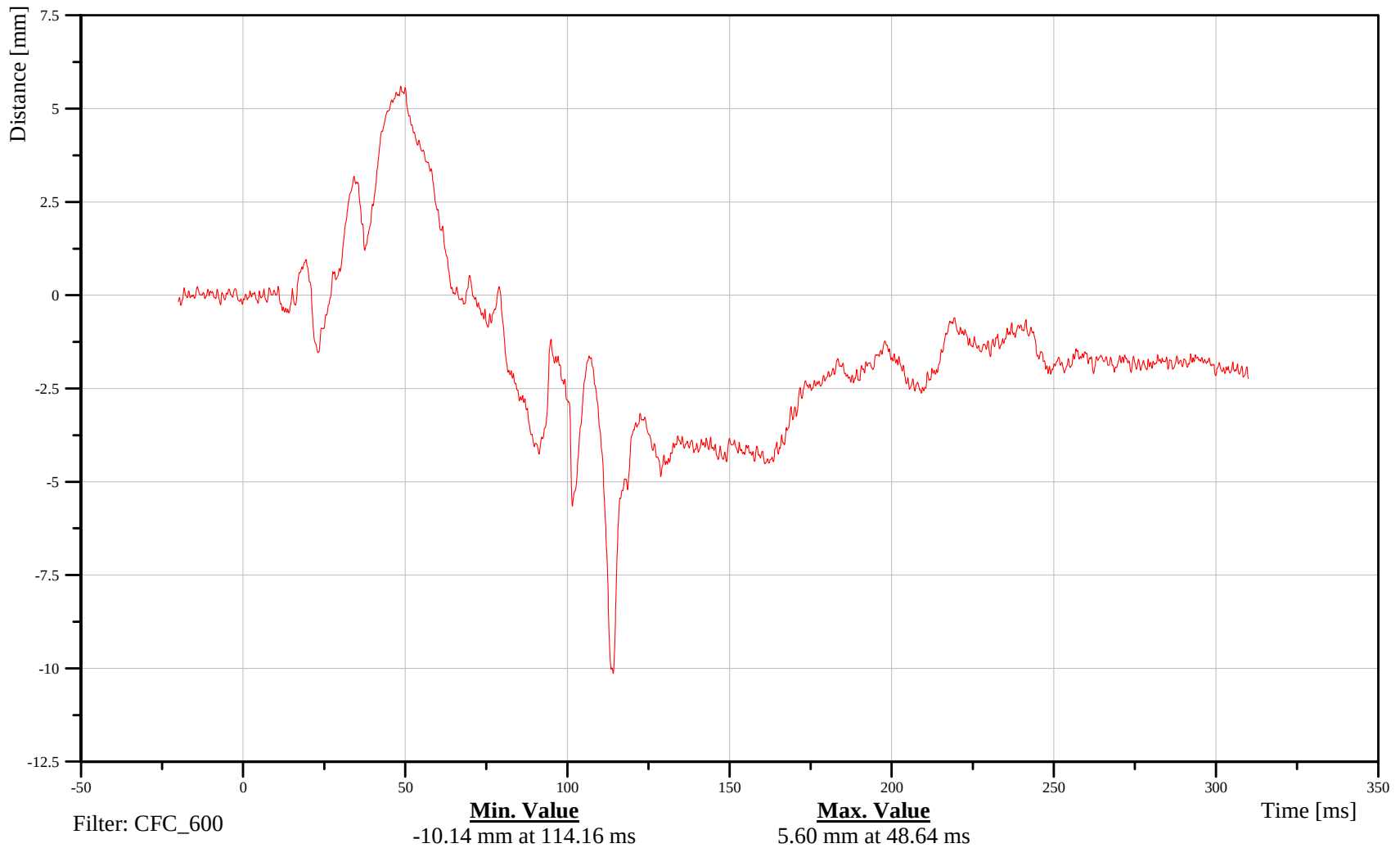
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-134

080729



World SID Evaluation
Driver Abdominal Rib 2 X-Axis Acceleration

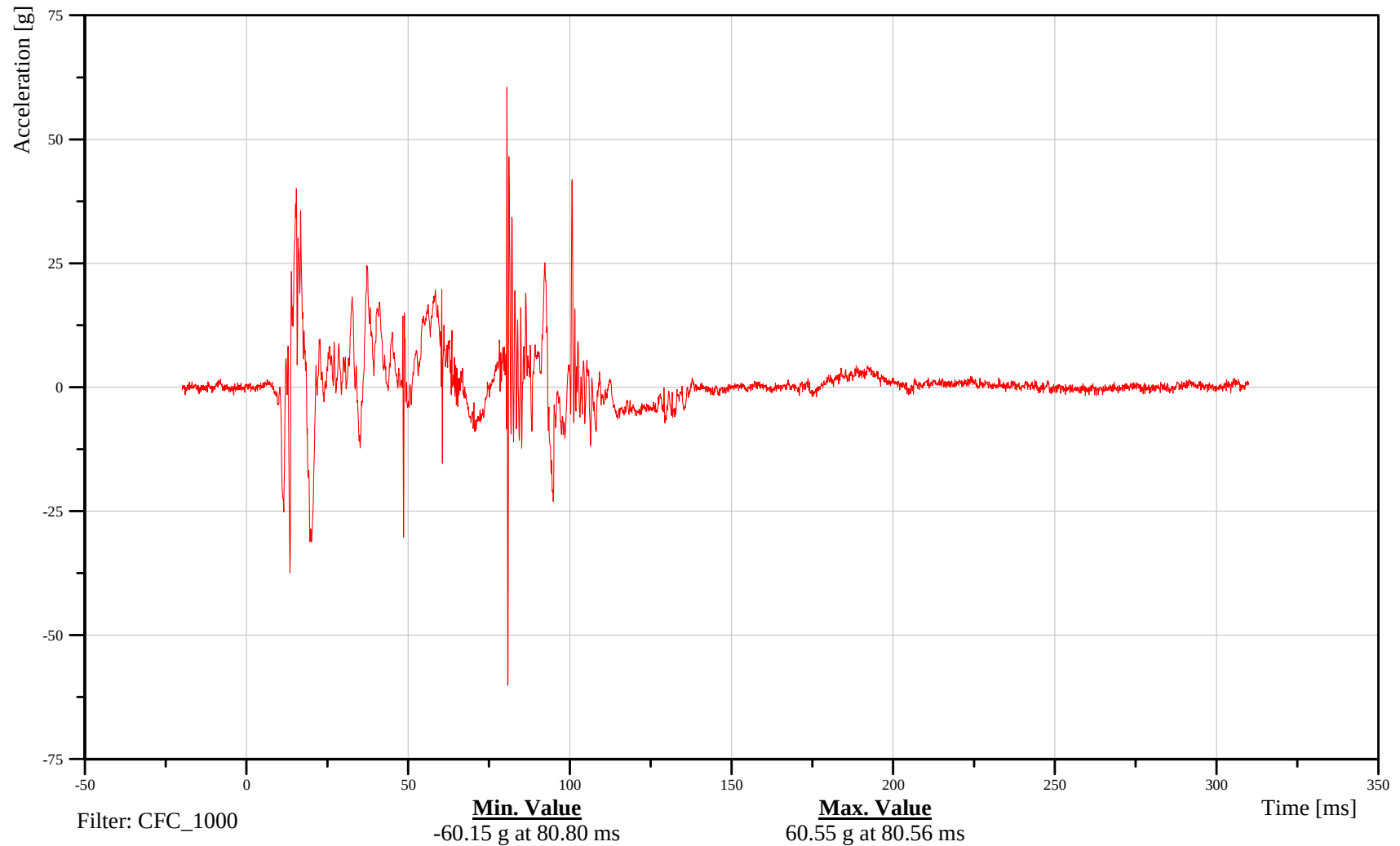
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-135

080729



World SID Evaluation
Driver Abdominal Rib 2 Y-Axis Acceleration

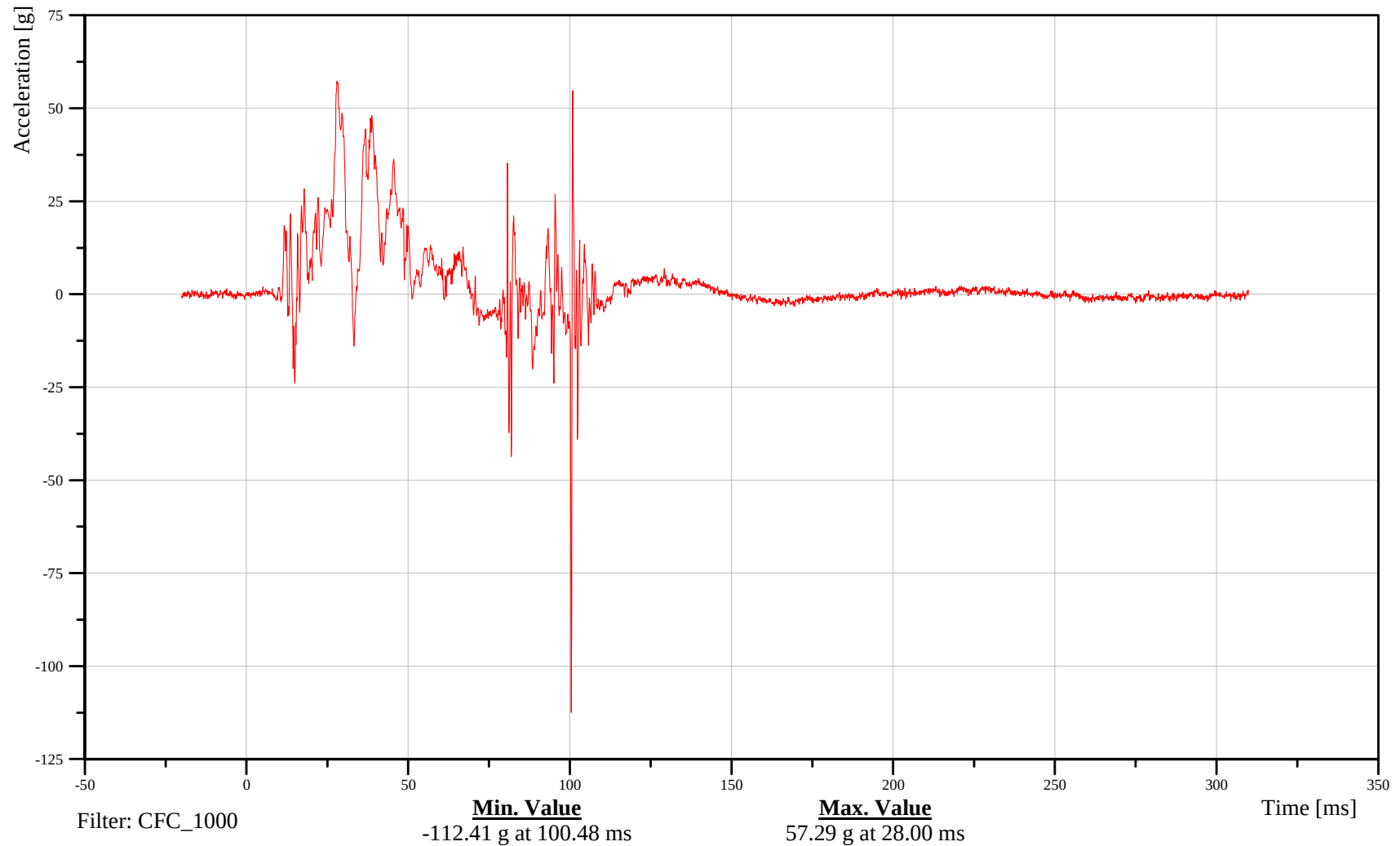
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-136

080729



World SID Evaluation
Driver Abdominal Rib 2 Z-Axis Acceleration

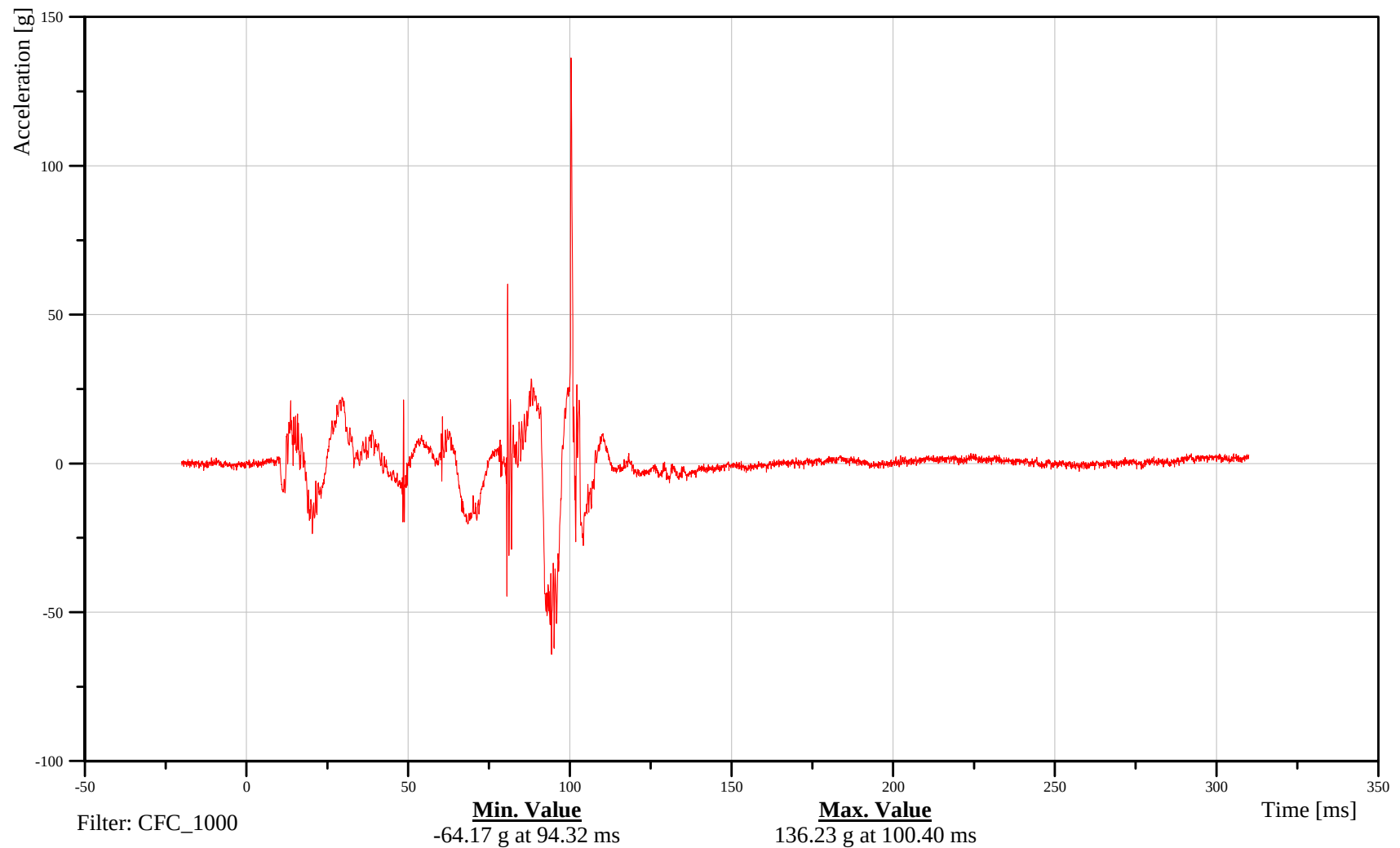
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-137

080729



World SID Evaluation

Driver Abdominal Rib 2 Resultant Acceleration

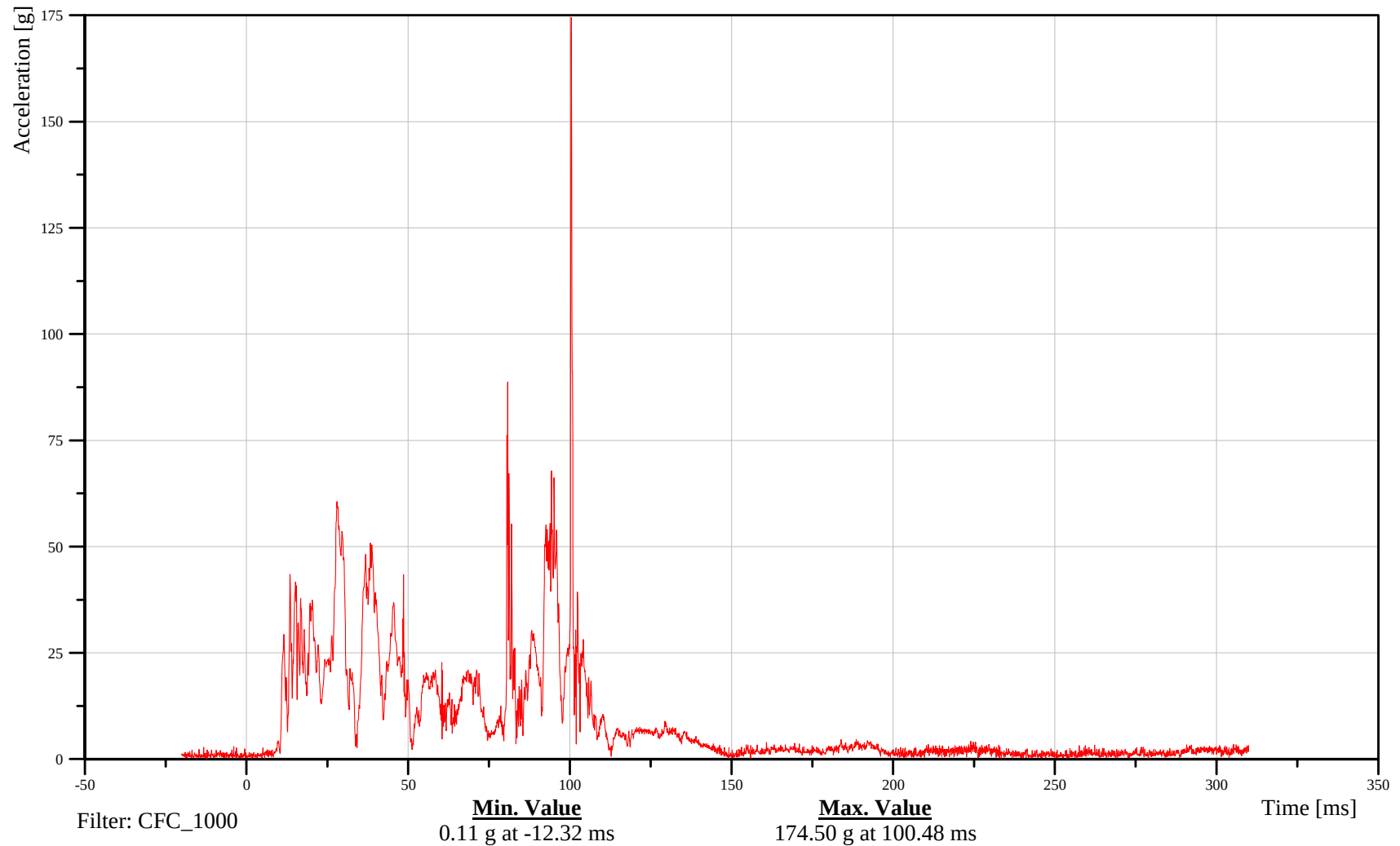
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11ABRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-138

080729



World SID Evaluation

Driver Lumbar X-Axis Force

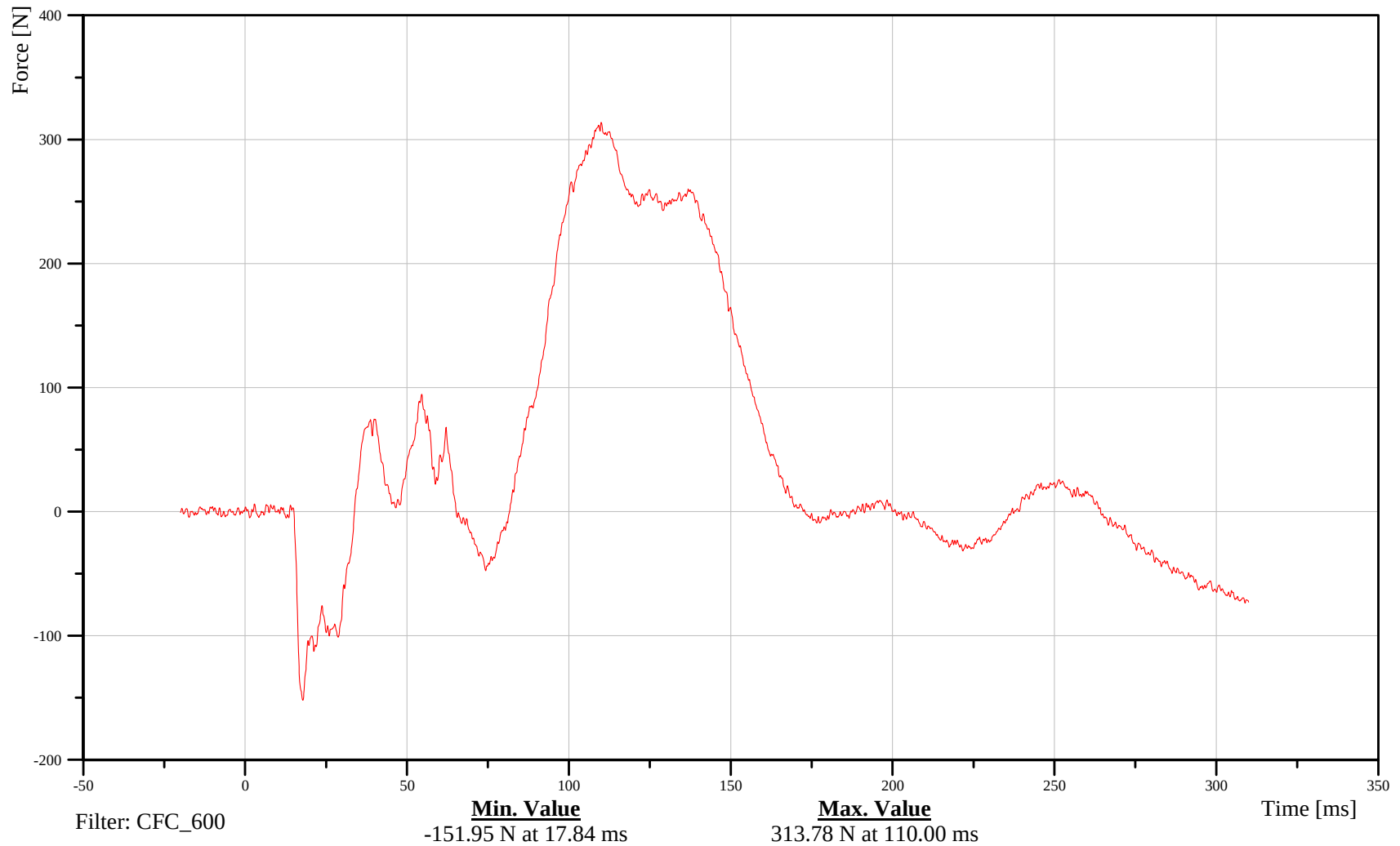
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11LUSP0000WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-139

080729



World SID Evaluation

Driver Lumbar Y-Axis Force

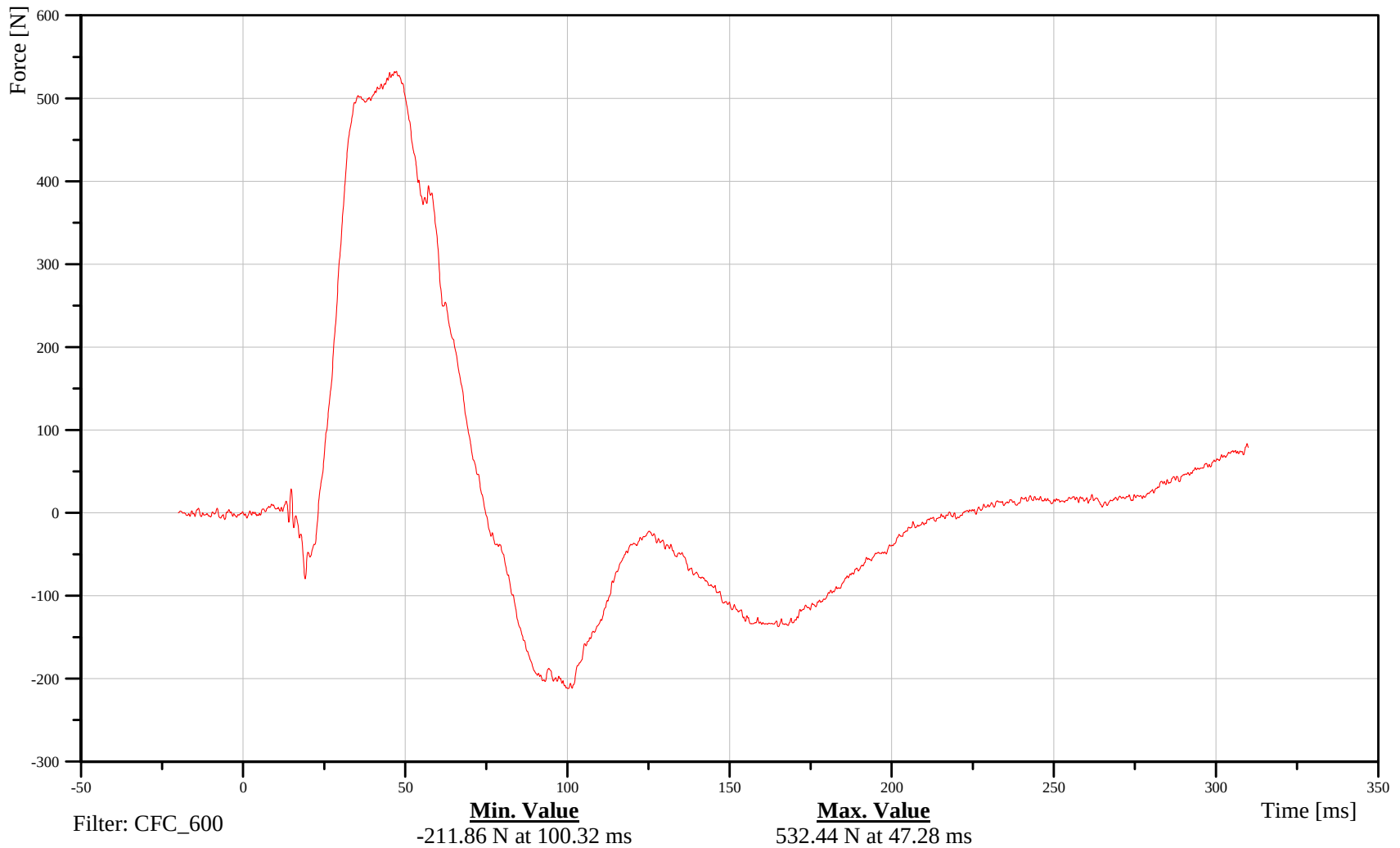
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11LUSP0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-140

080729



World SID Evaluation Driver Lumbar Z-Axis Force

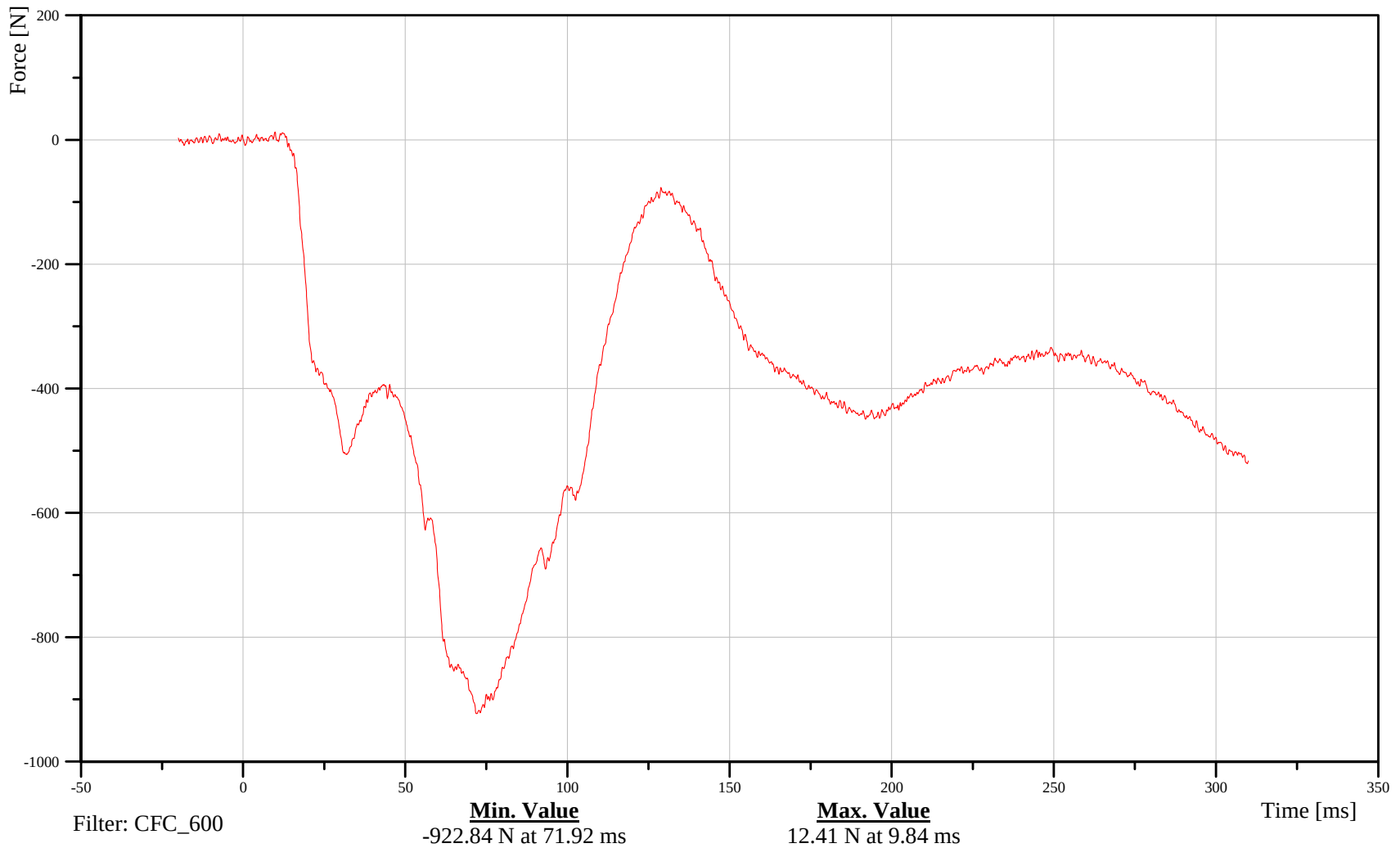
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11LUSP0000WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-141

080729



World SID Evaluation

Driver Lumbar Moment About X Axis

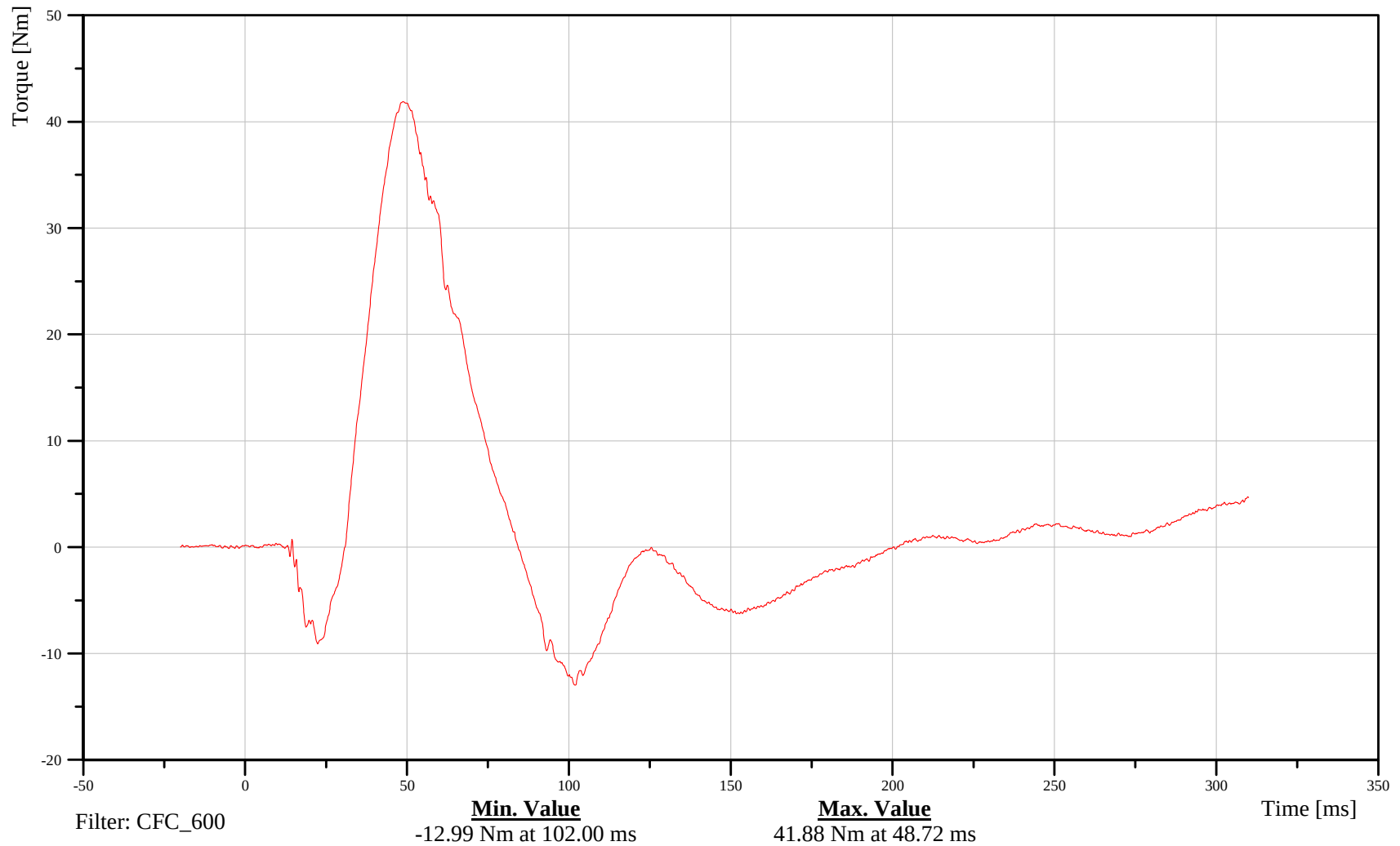
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11LUSP0000WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-142

080729



World SID Evaluation

Driver Lumbar Moment About Y Axis

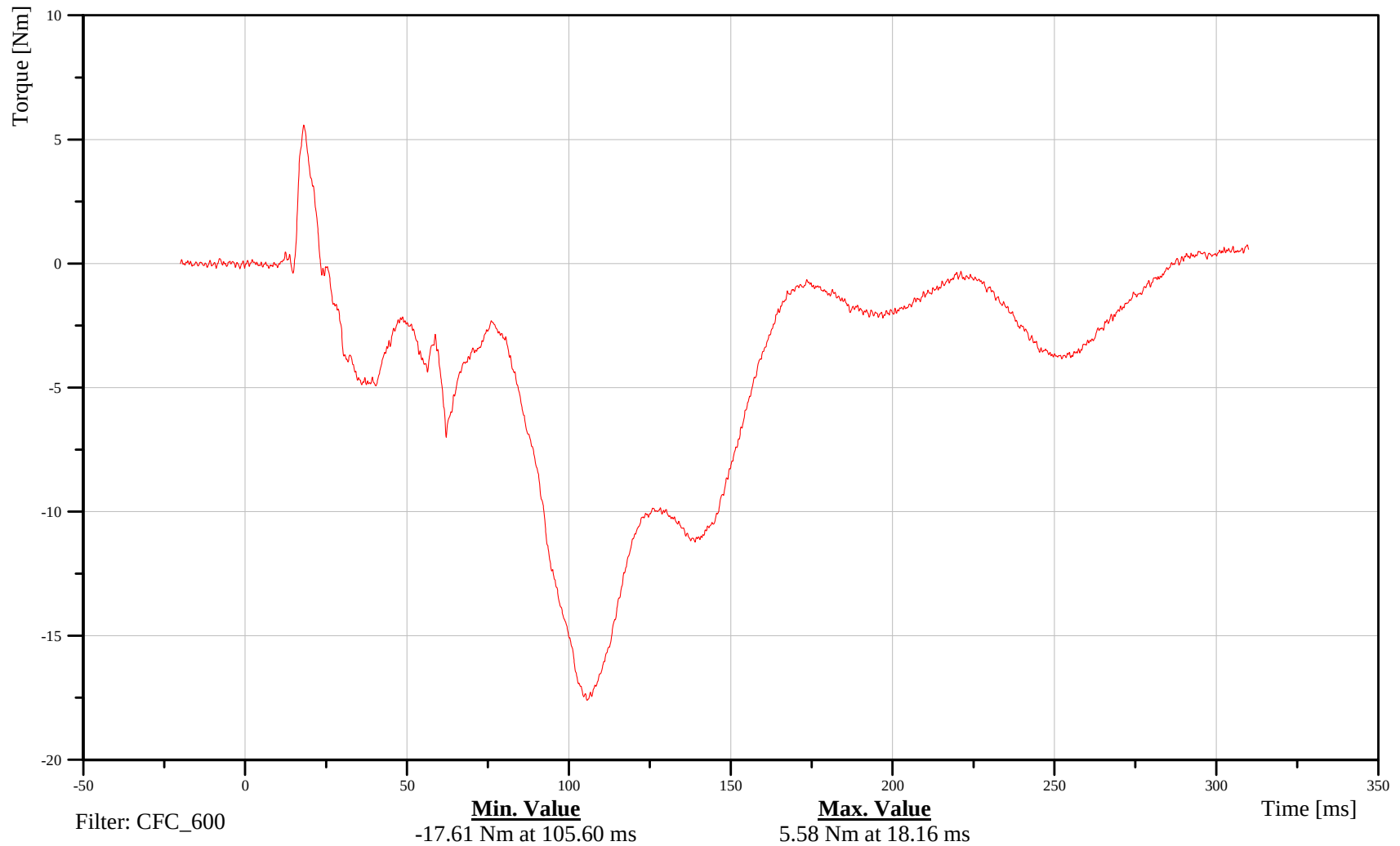
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11LUSP0000WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-143

080729



World SID Evaluation

Driver Lumbar Moment About Z Axis

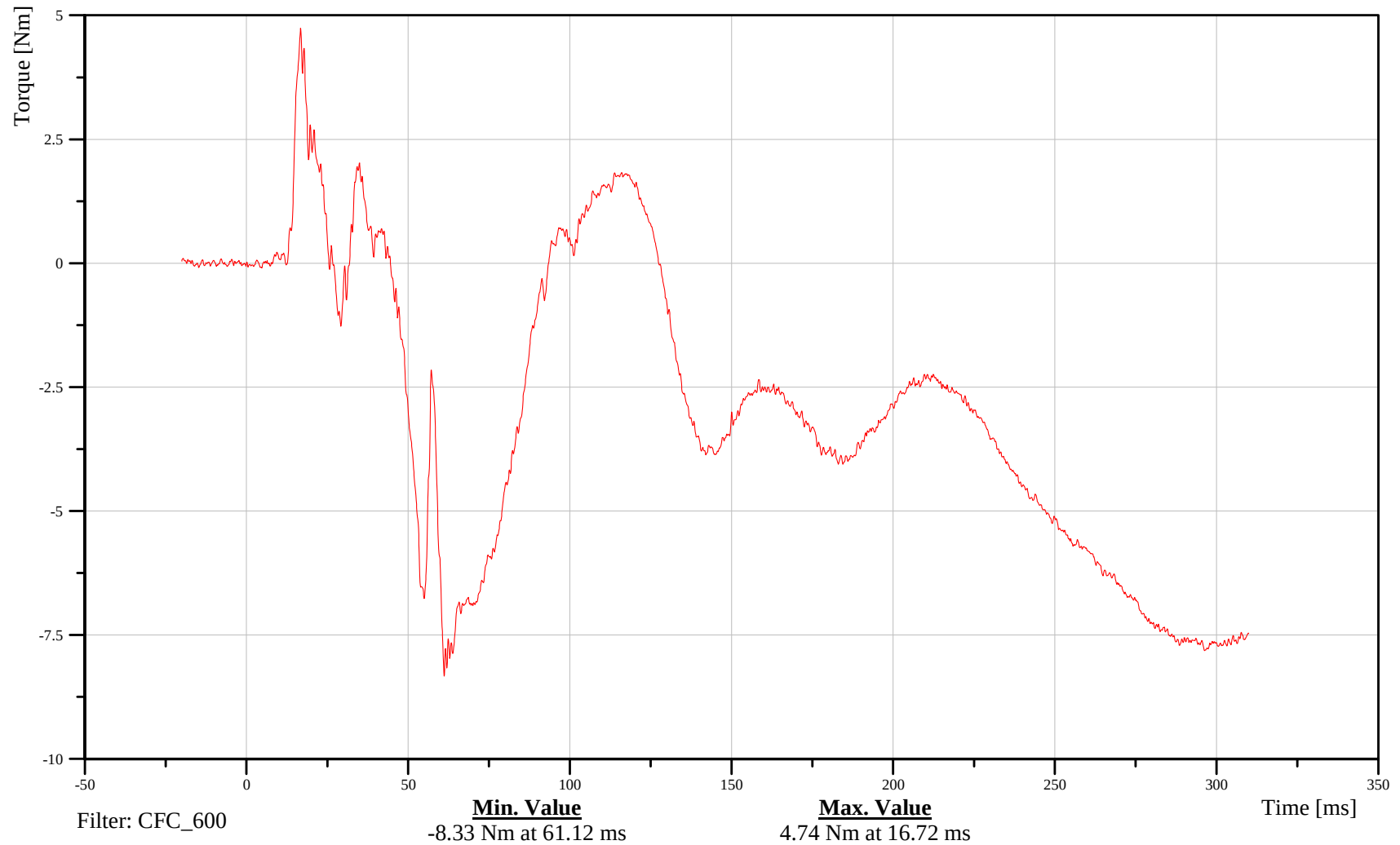
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11LUSP0000WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-144

080729



World SID Evaluation
Driver Pelvis X-Axis Acceleration

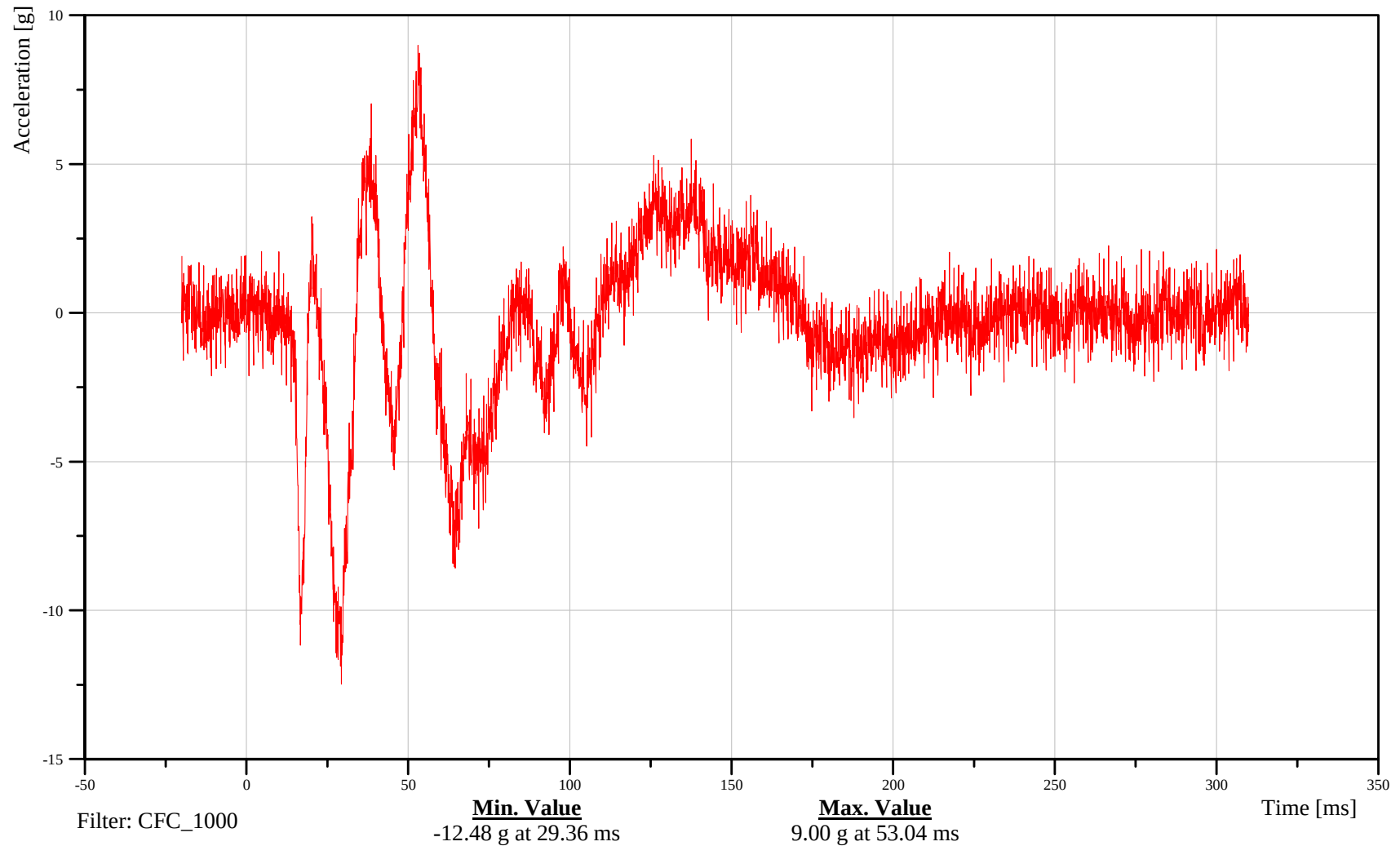
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11PELVCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-145

080729



World SID Evaluation
Driver Pelvis Y-Axis Acceleration

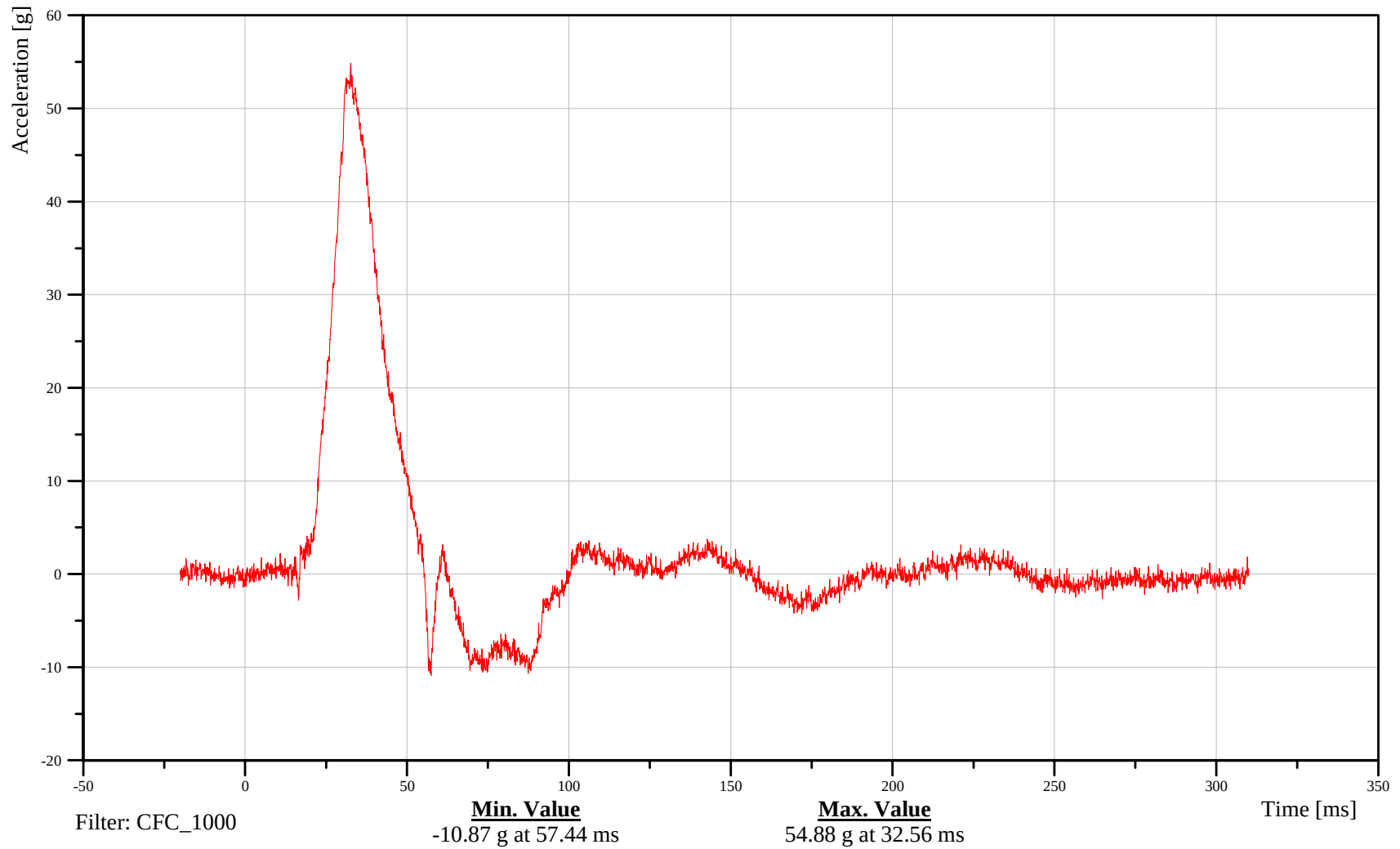
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11PELVCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-146

080729



World SID Evaluation

Driver Pelvis Z-Axis Acceleration

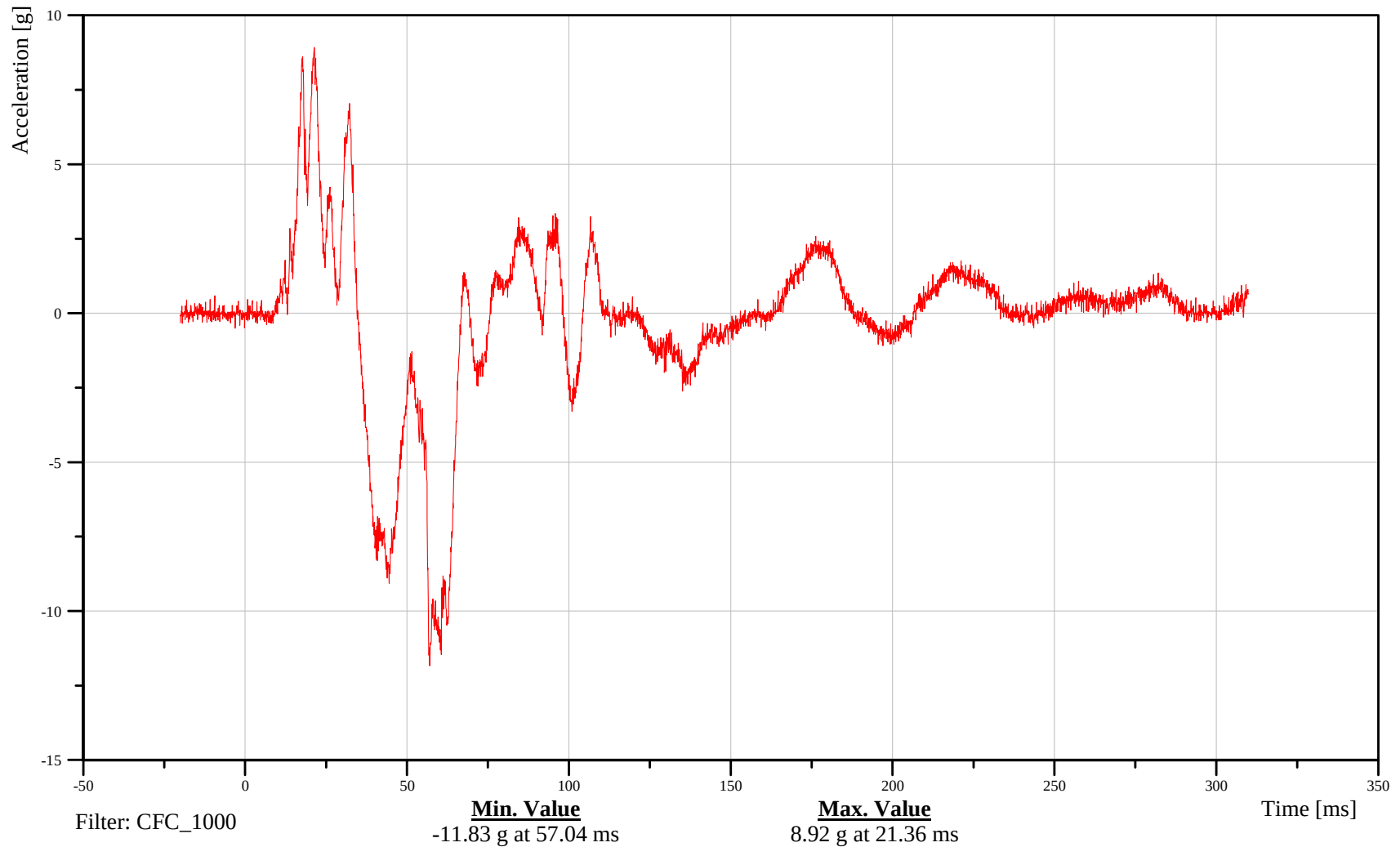
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11PELVCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-147

080729



World SID Evaluation
Driver Pelvis Resultant Acceleration

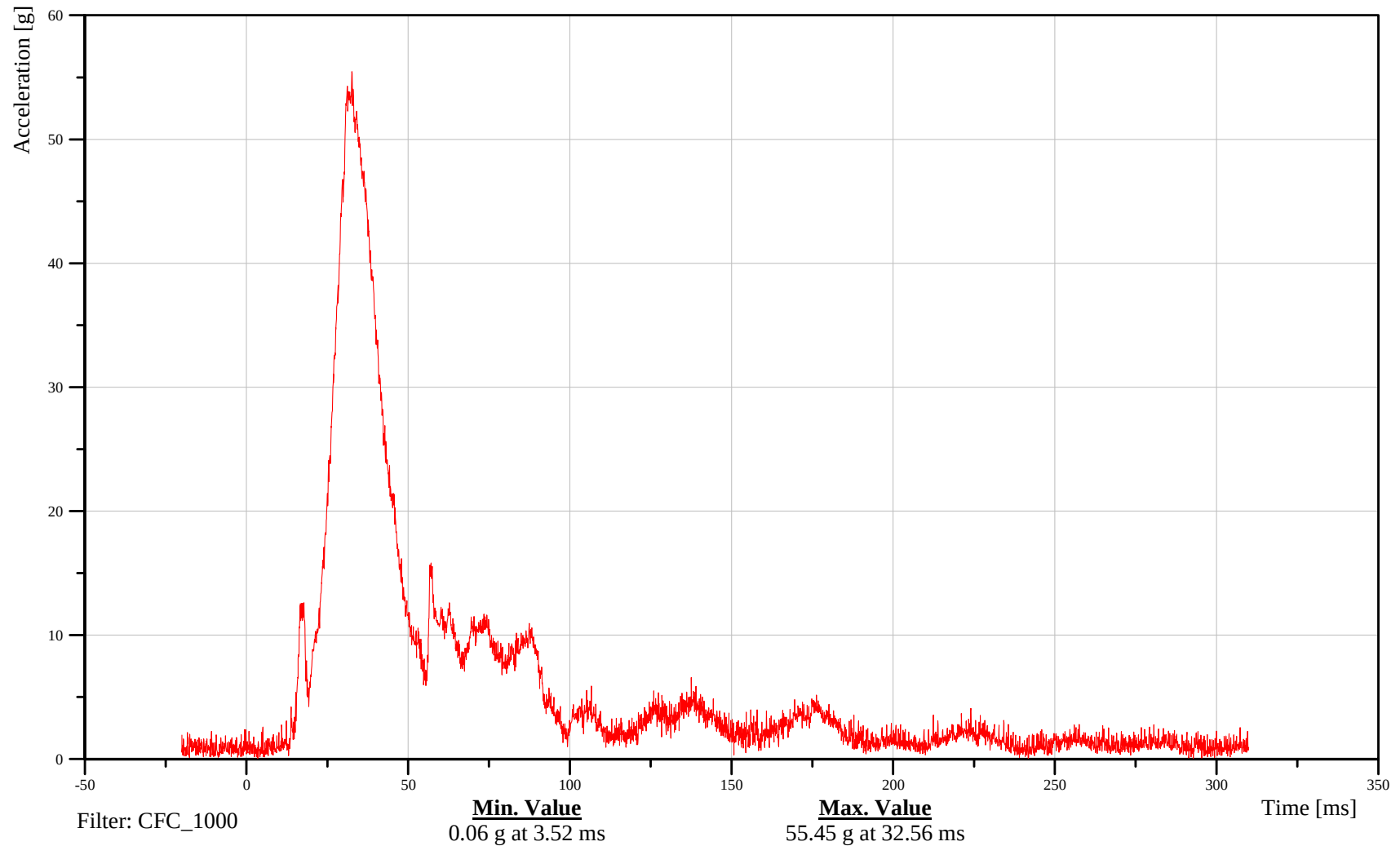
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11PELVCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-148

080729



World SID Evaluation

Driver Pubic Y-Axis Force

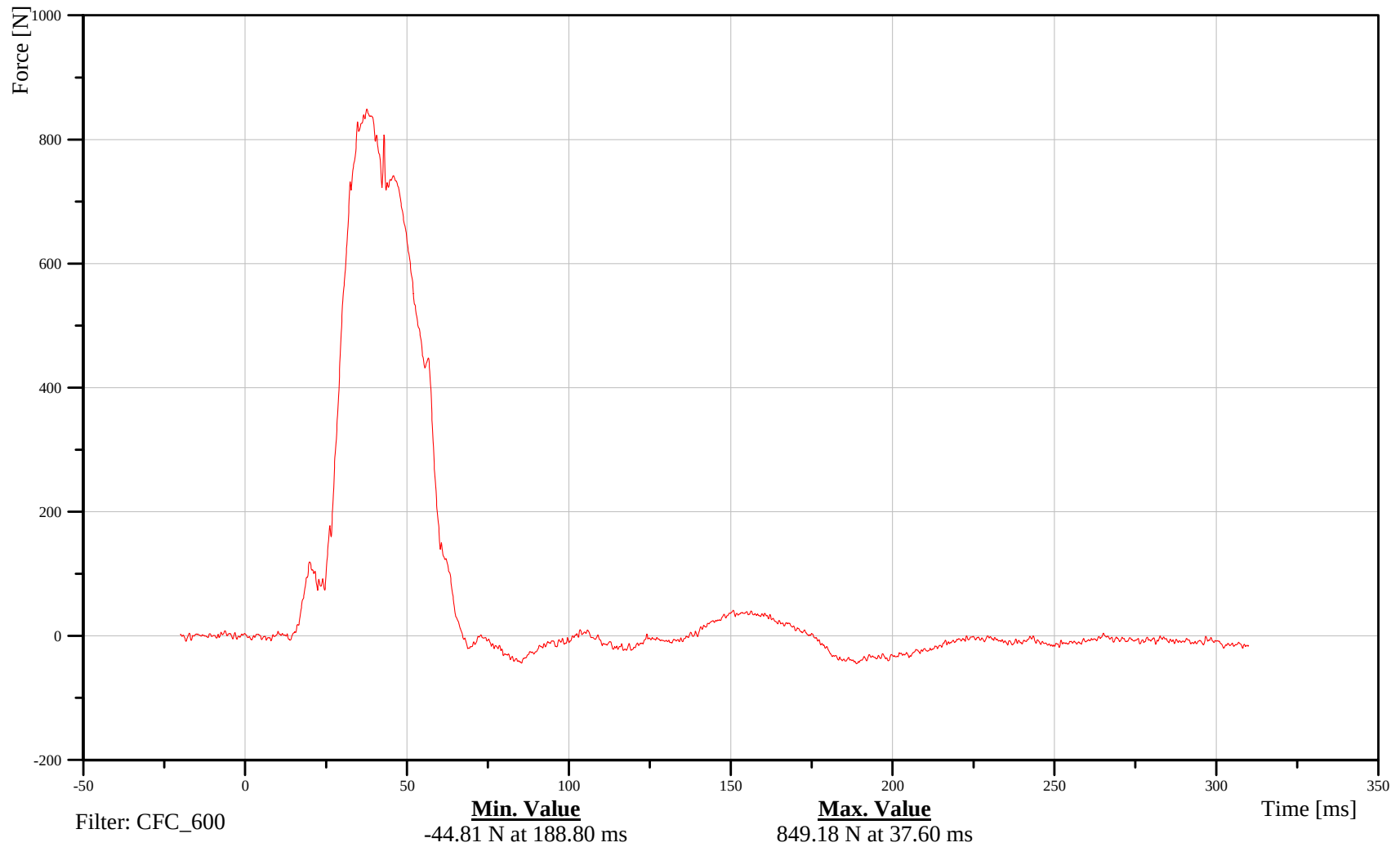
Date: 07/29/2008
Time: 14:50

Customer: VRTC

11PUBC0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-149

080729



World SID Evaluation

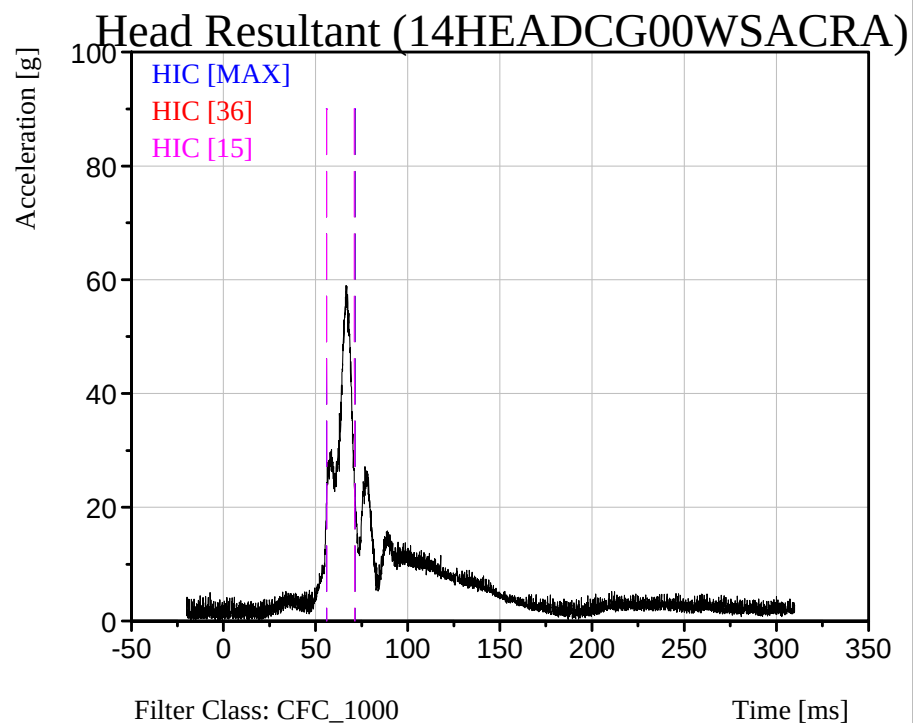
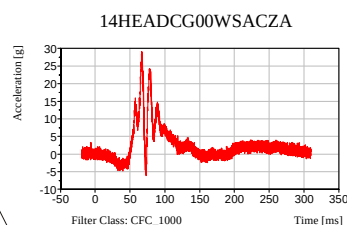
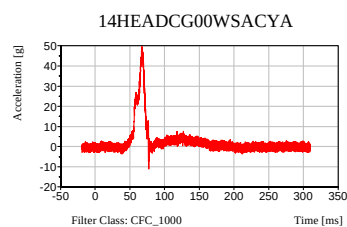
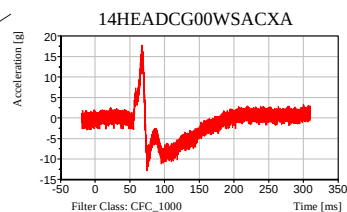
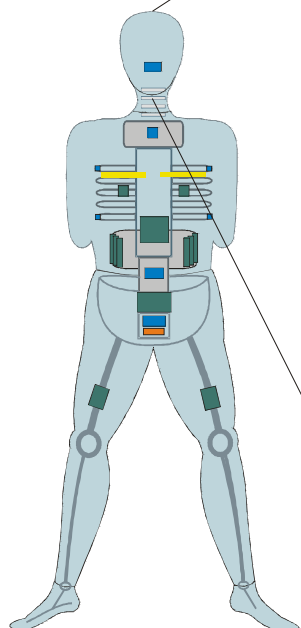
Head Injury Criterion (HIC)

Date: 07/29/2008
Time: 14:50

Customer: VRTC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



	<u>T1</u> (Begin)	<u>T2</u> (End)	<u>Avg. g T1 to T2</u>
HIC [Max.] = 121.98	56.00 ms	71.44 ms	36.15 g
HIC [36] = 121.98	56.00 ms	71.44 ms	36.15 g
HIC [15] = 121.72	56.08 ms	71.12 ms	36.51 g

Dummy:
Seating Position:
Left Rear Passenger

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

B-150

080729



World SID Evaluation
Passenger Head X-Axis Acceleration

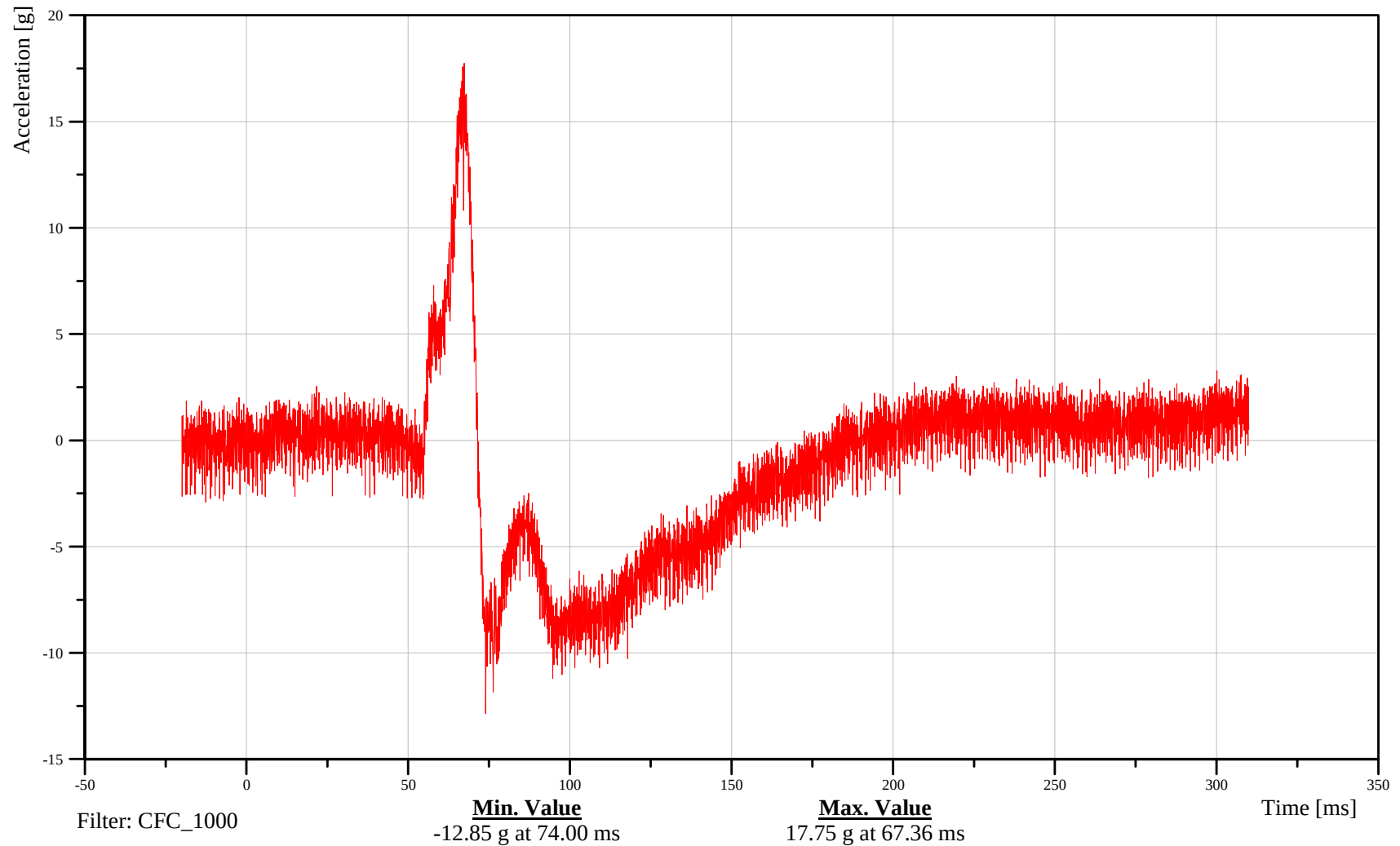
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14HEADC00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-151

080729



World SID Evaluation
Passenger Head Y-Axis Acceleration

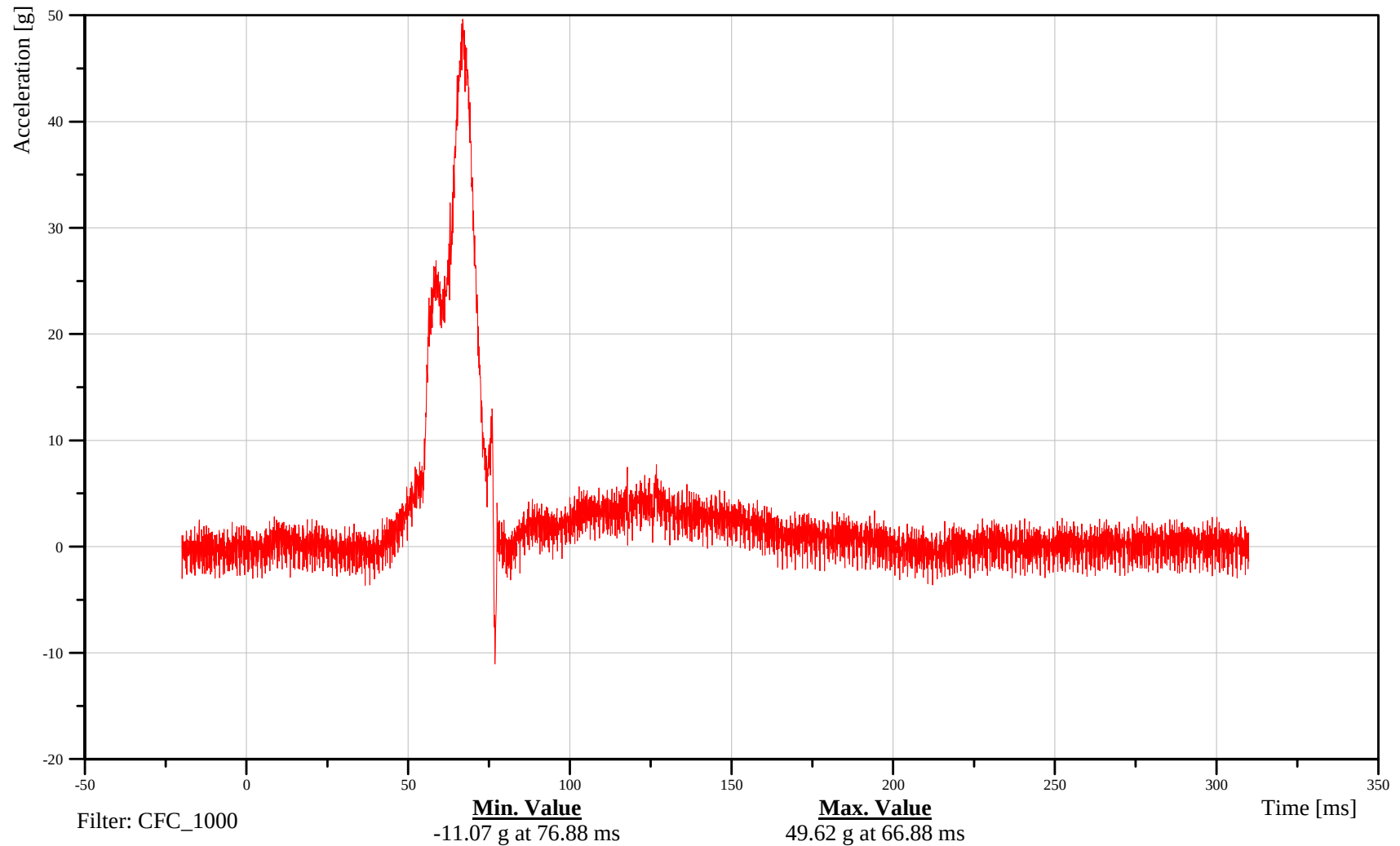
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14HEADC00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-152

080729



World SID Evaluation
Passenger Head Z-Axis Acceleration

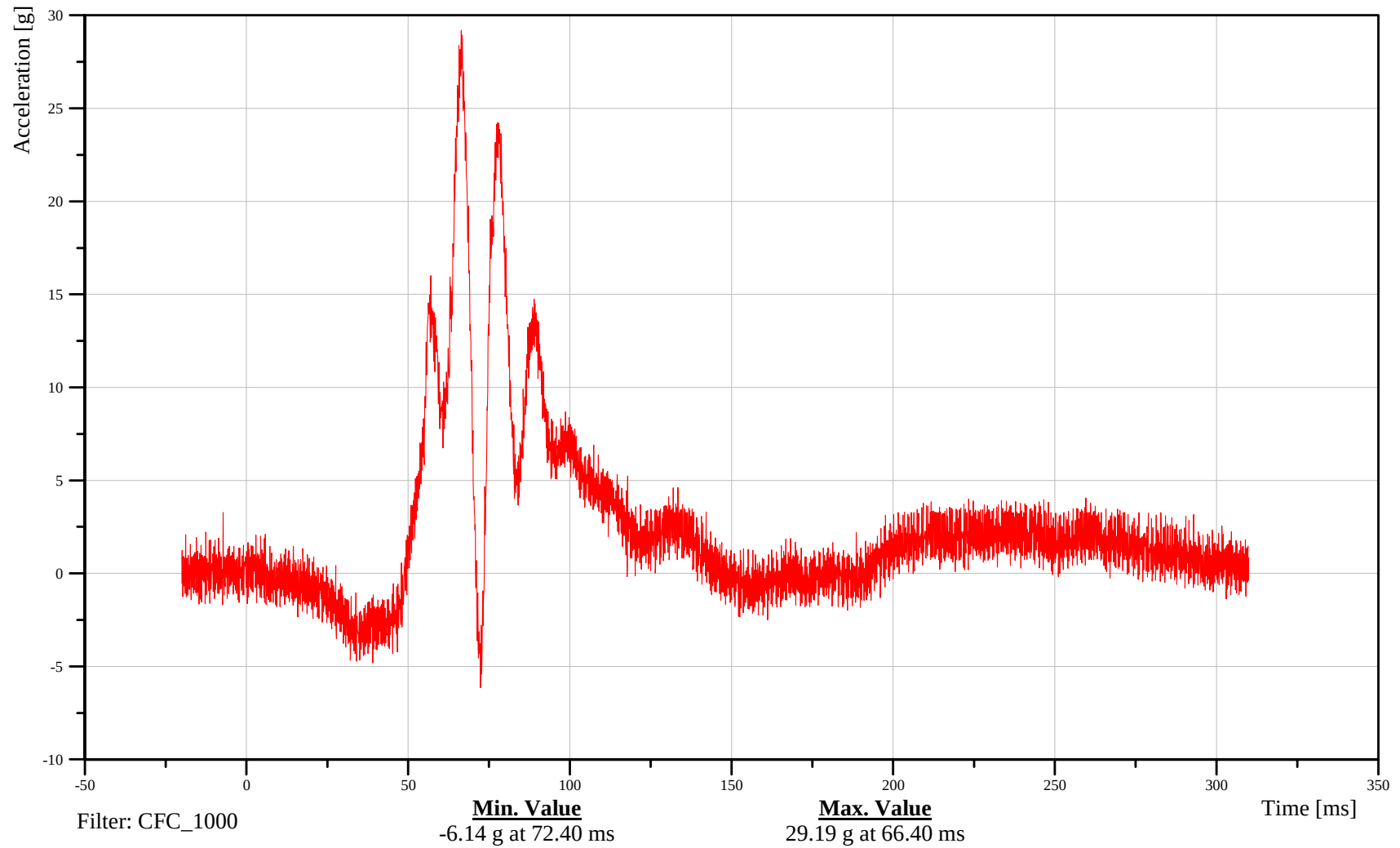
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14HEADCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-153

080729



World SID Evaluation
Passenger Head Resultant Acceleration

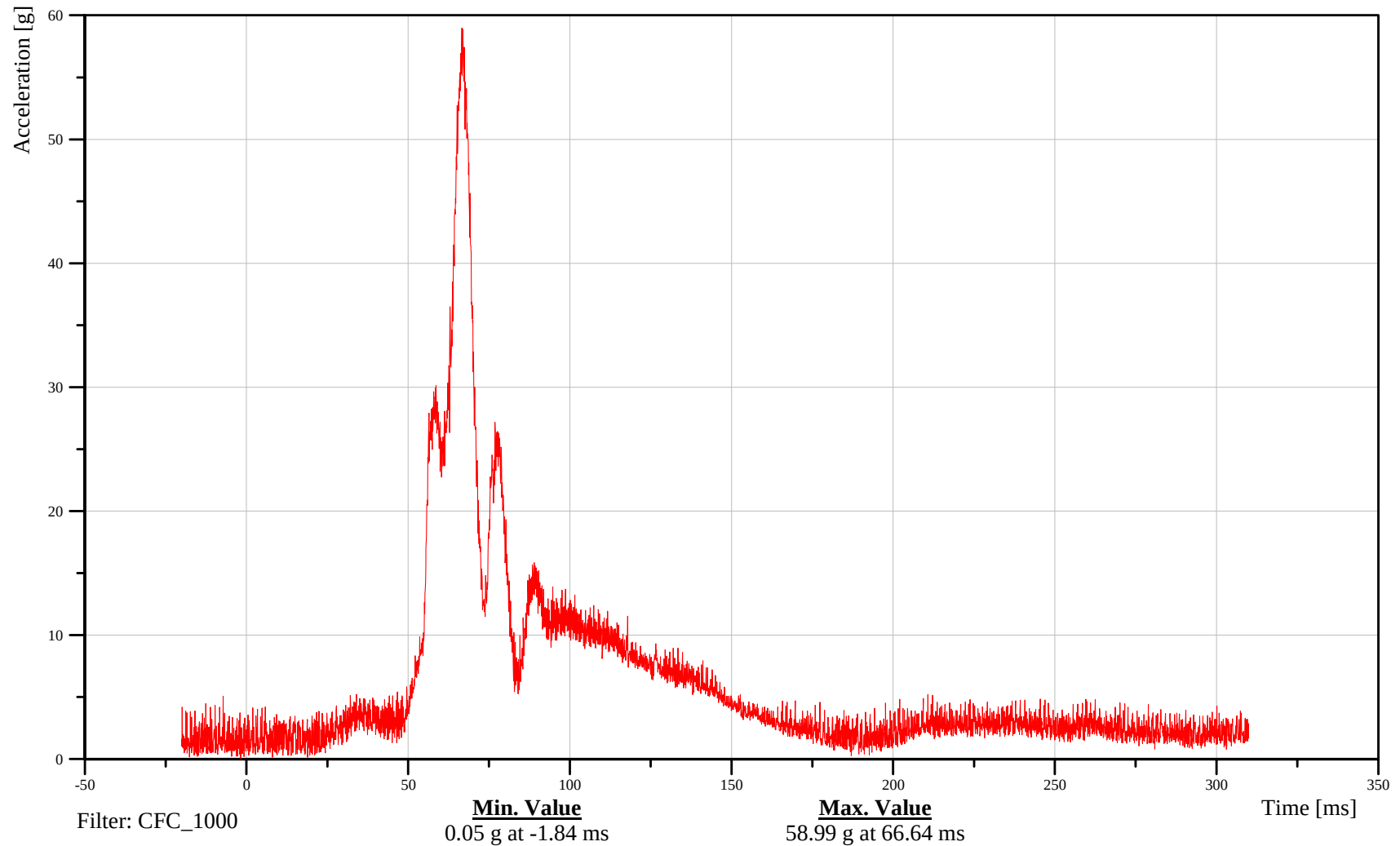
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14HEADCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-154

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

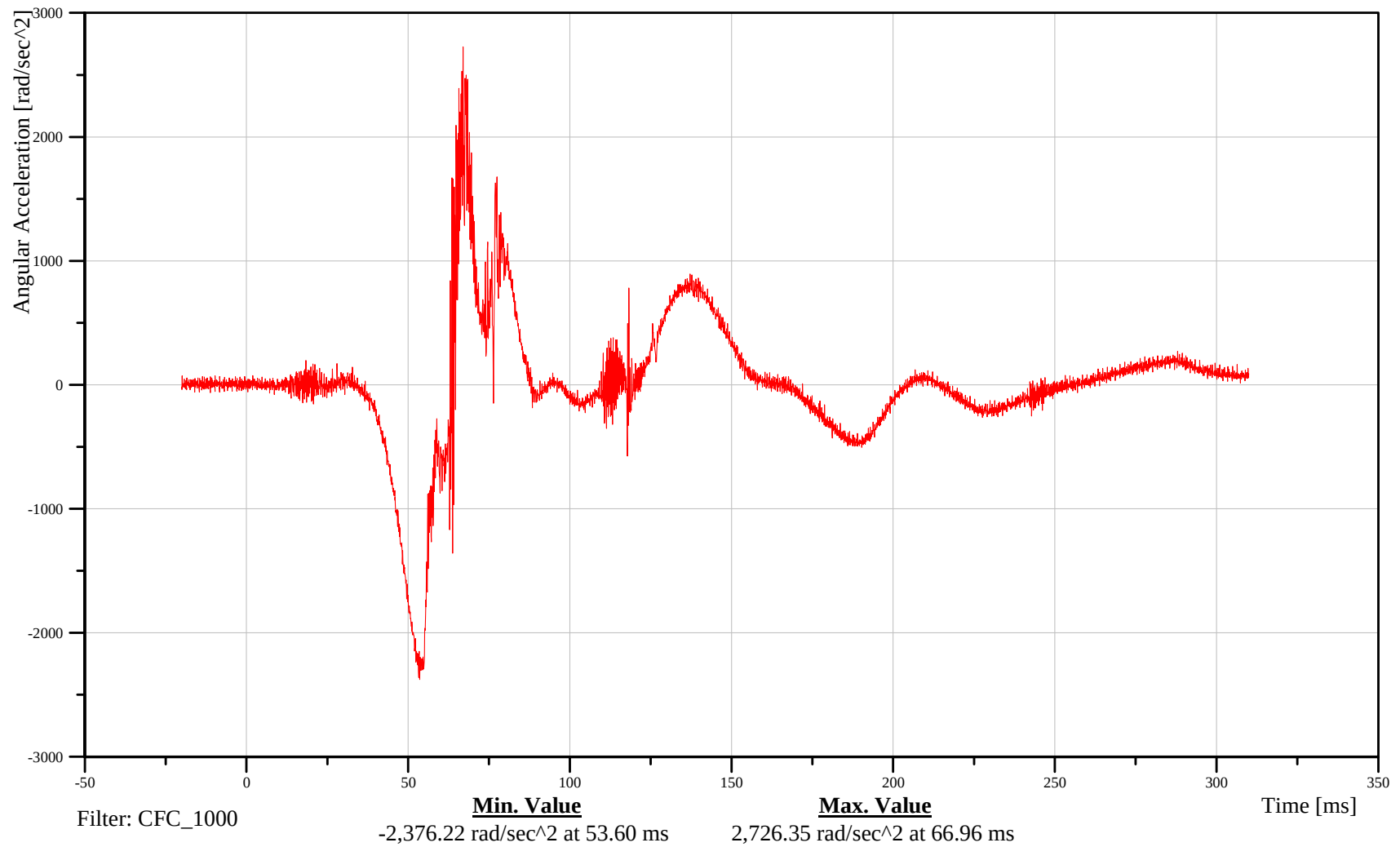
Passenger Head X-Axis Angular Displacement

Customer: VRTC

14HEADCG00WSANXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-155

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

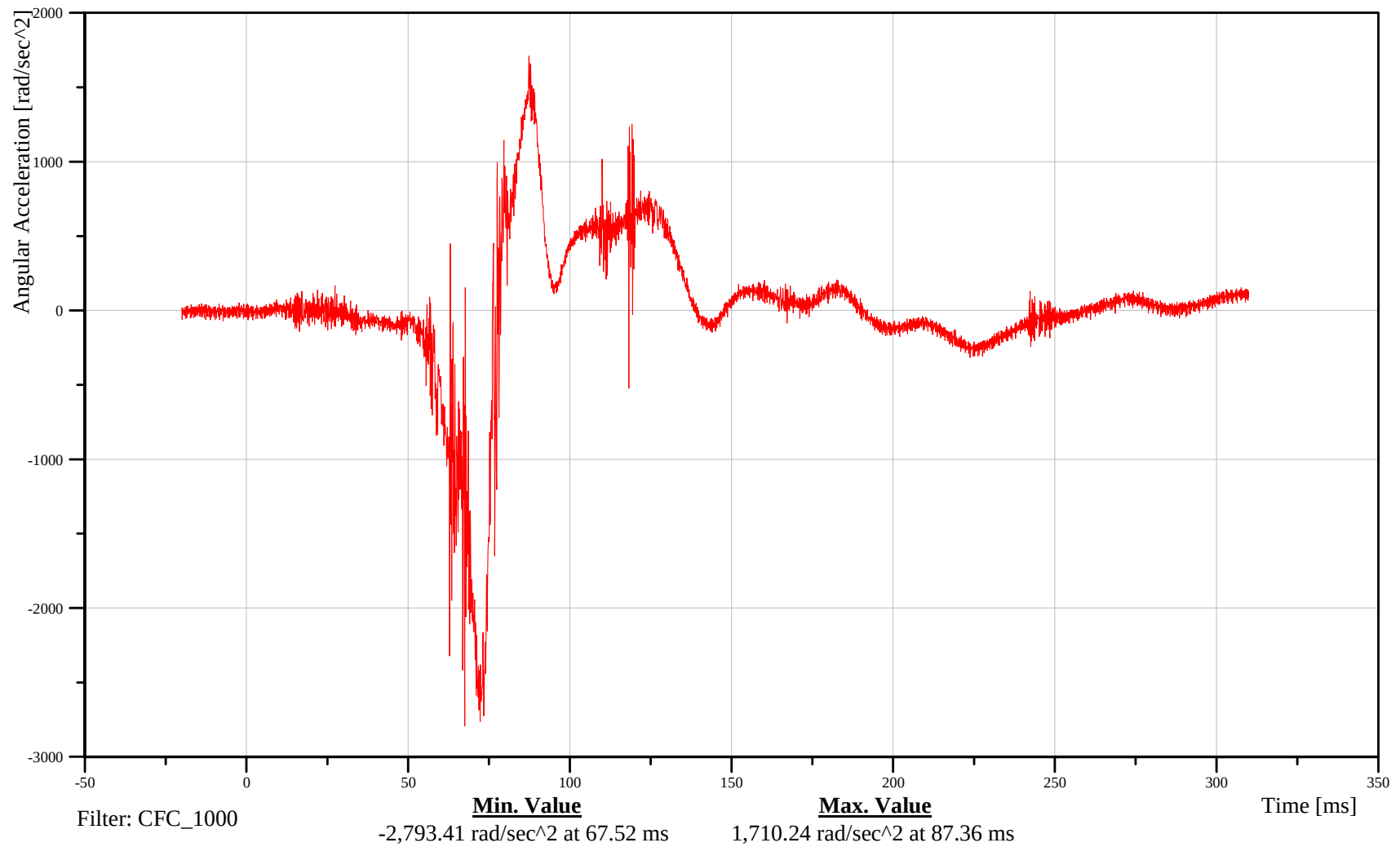
Passenger Head Y-Axis Angular Displacement

Customer: VRTC

14HEADCG00WSANYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-156

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

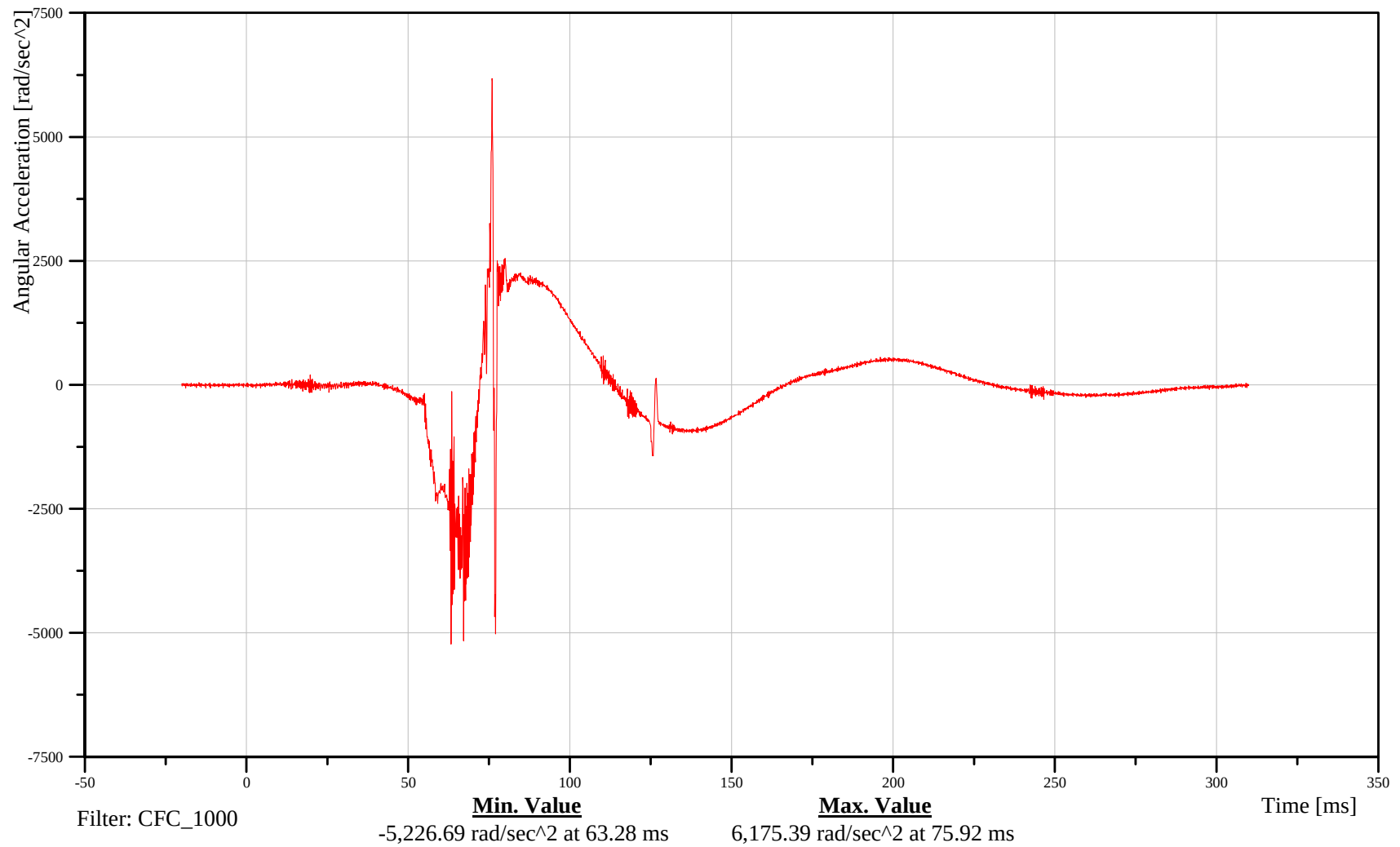
Passenger Head Z-Axis Angular Displacement

Customer: VRTC

14HEADCG00WSANZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-157

080729



World SID Evaluation
Passenger Upper Neck X-Axis Force

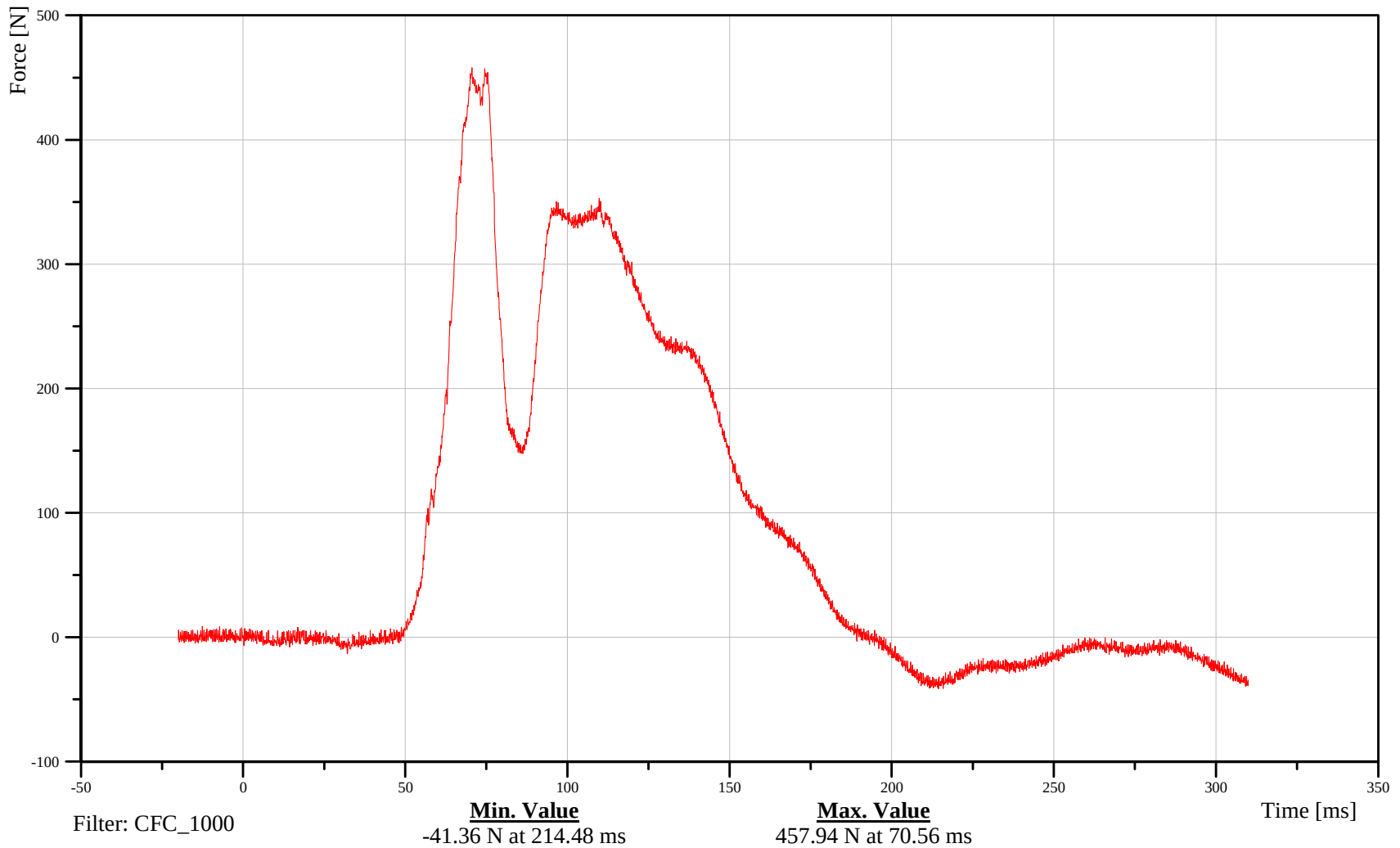
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14NECKUP00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-158

080729



World SID Evaluation
Passenger Upper Neck Y-Axis Force

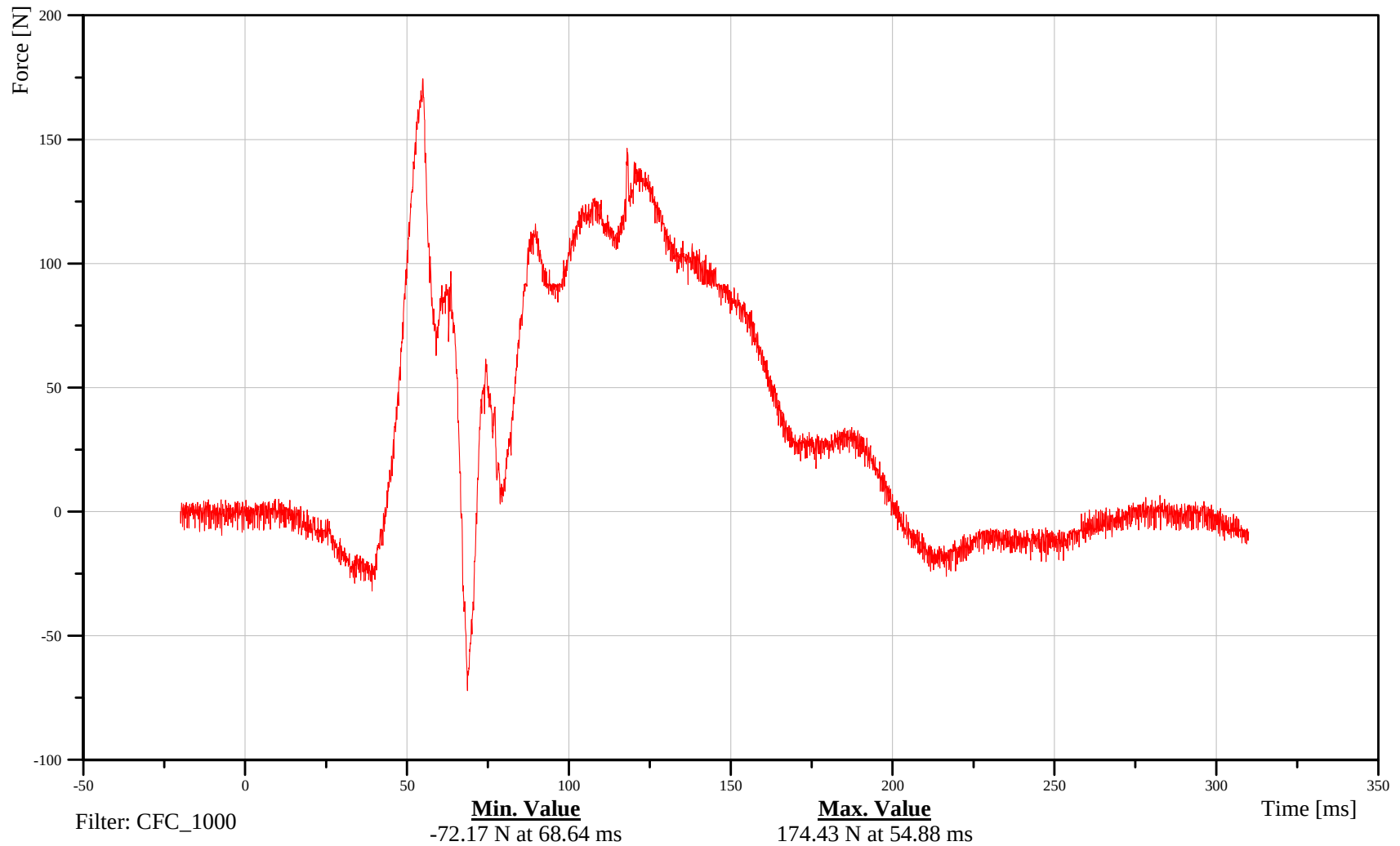
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14NECKUP00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-159

080729



World SID Evaluation
Passenger Upper Neck Z-Axis Force

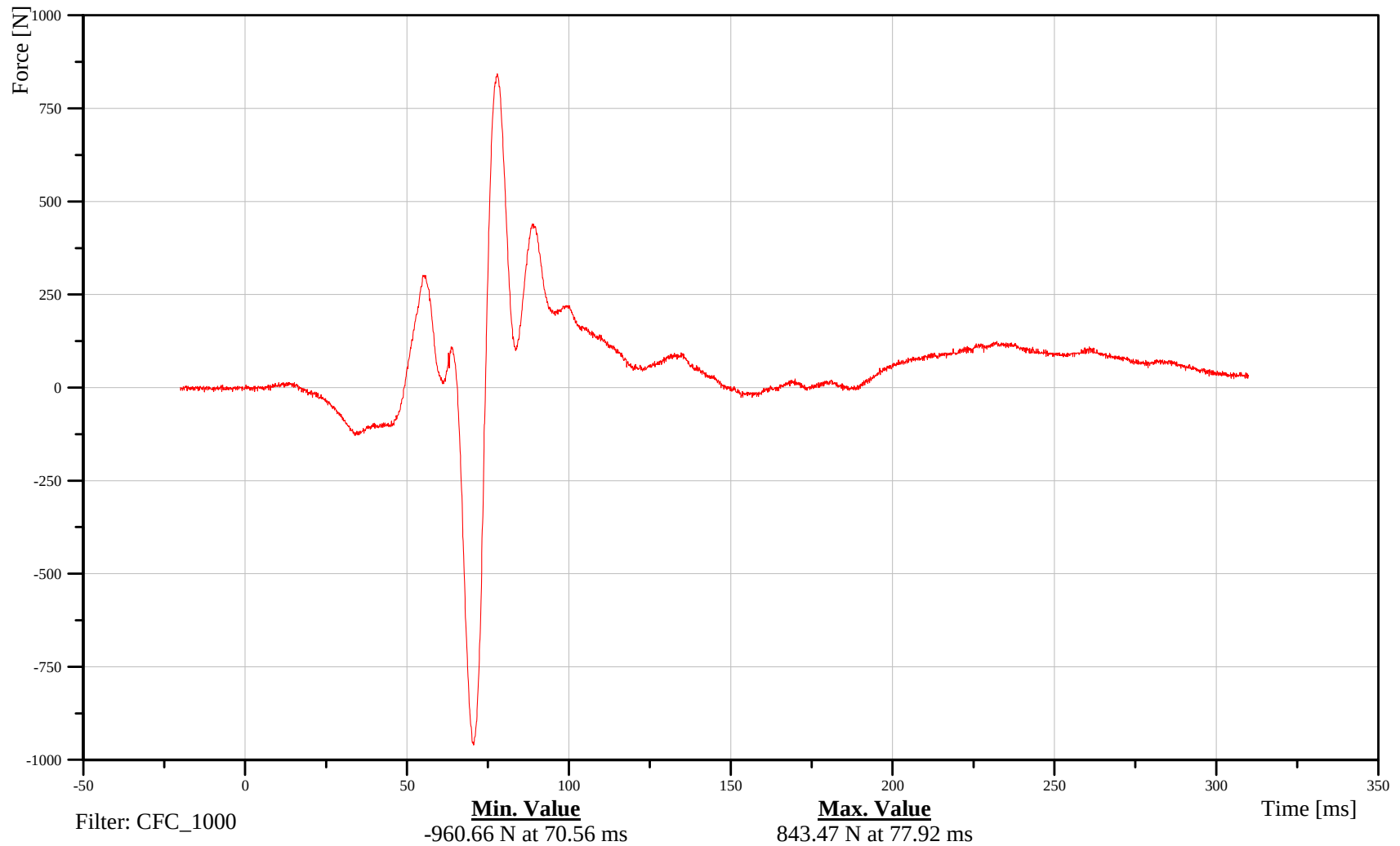
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14NECKUP00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-160

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

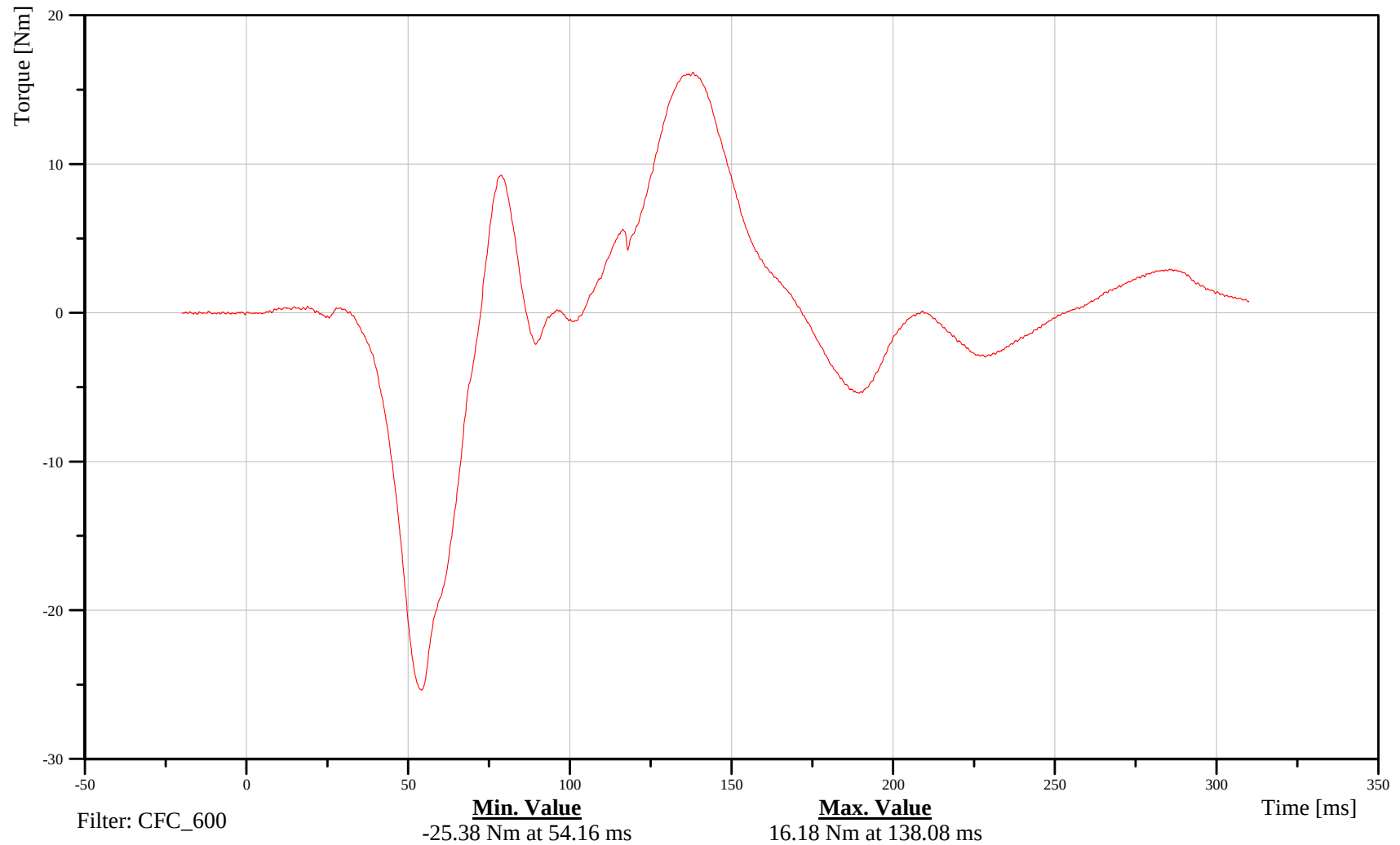
Passenger Upper Neck Moment About X Axis

Customer: VRTC

14NECKUP00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-161

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

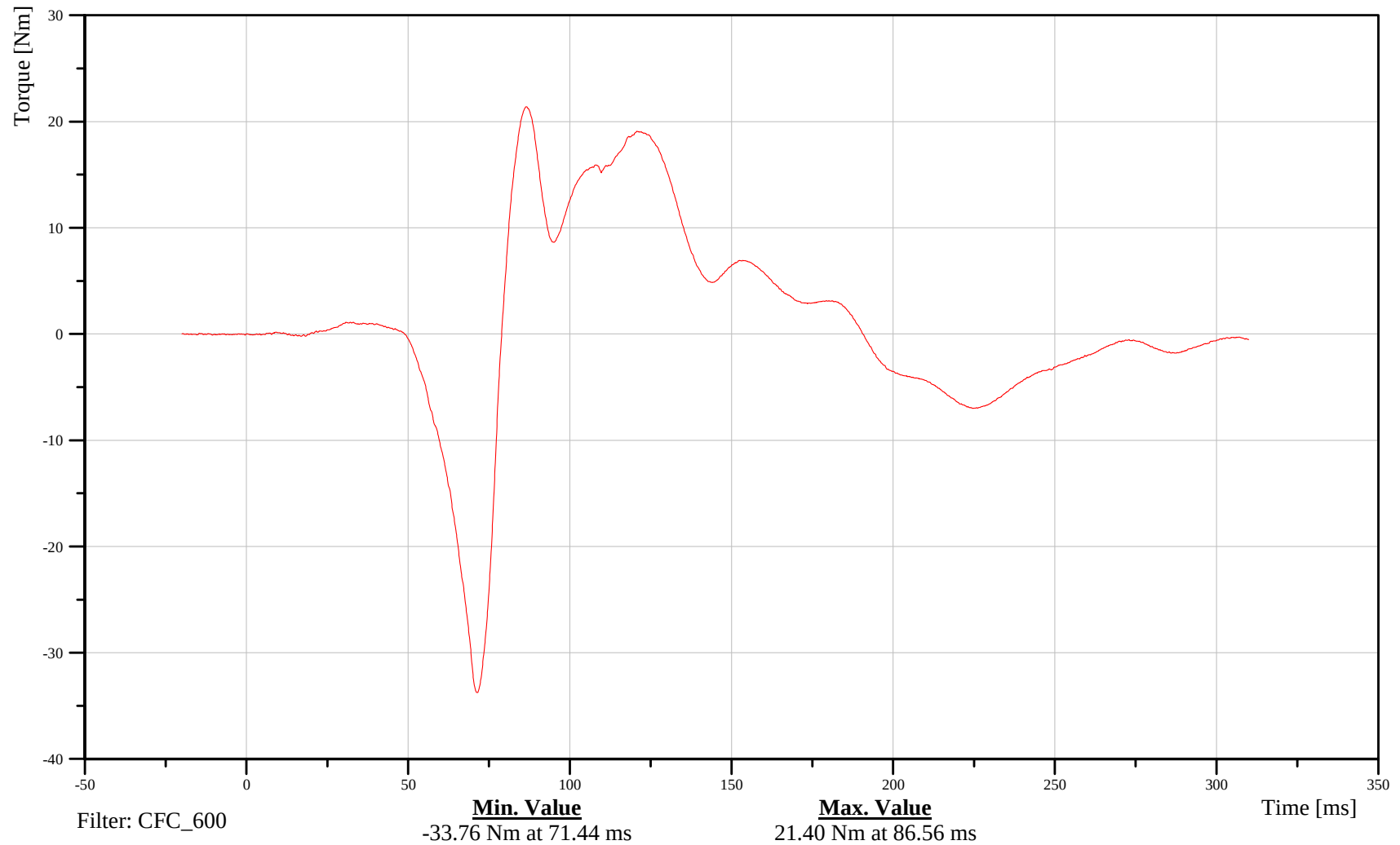
Passenger Upper Neck Moment About Y Axis

Customer: VRTC

14NECKUP00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-162

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

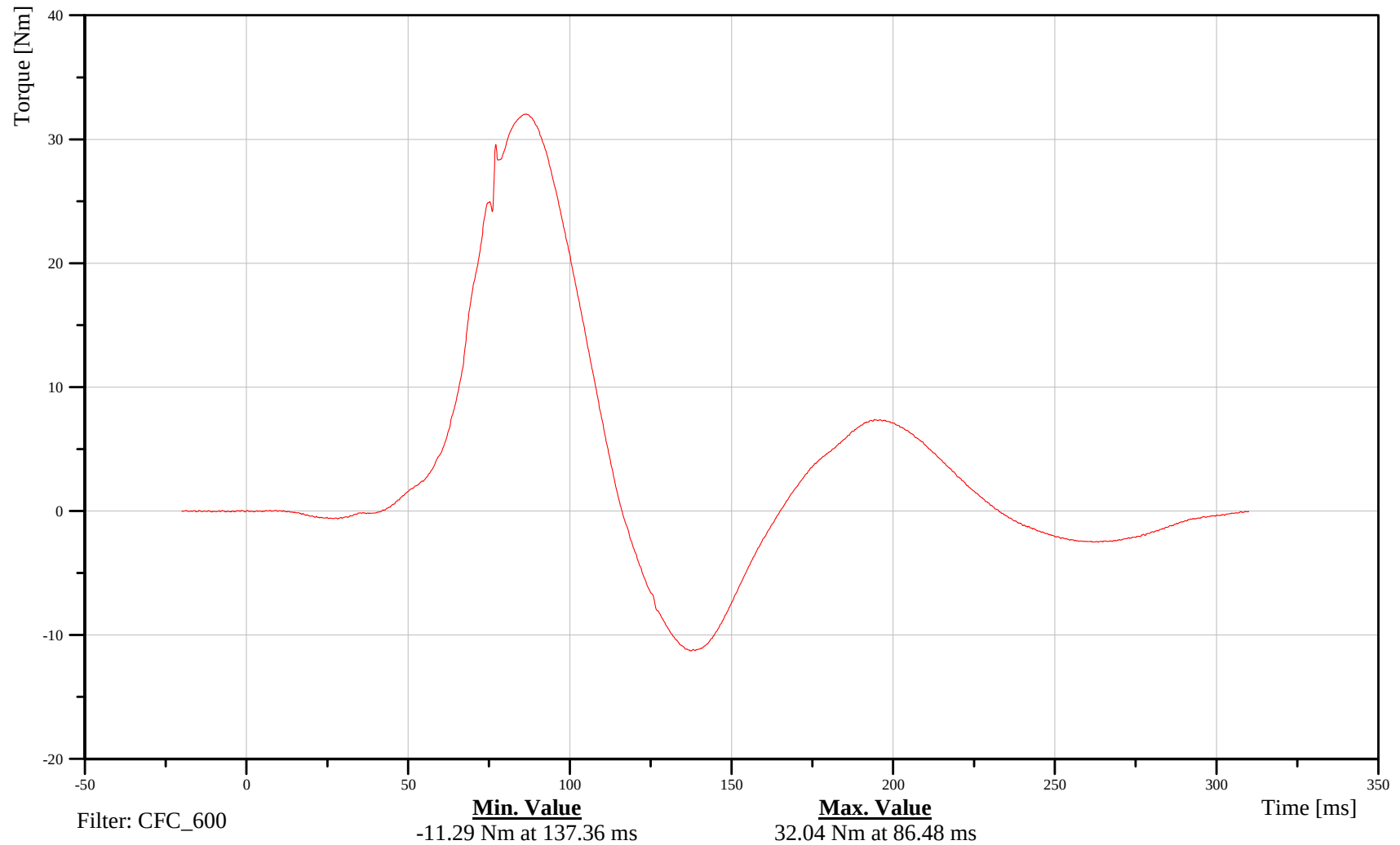
Passenger Upper Neck Moment About Z Axis

Customer: VRTC

14NECKUP00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-163

080729



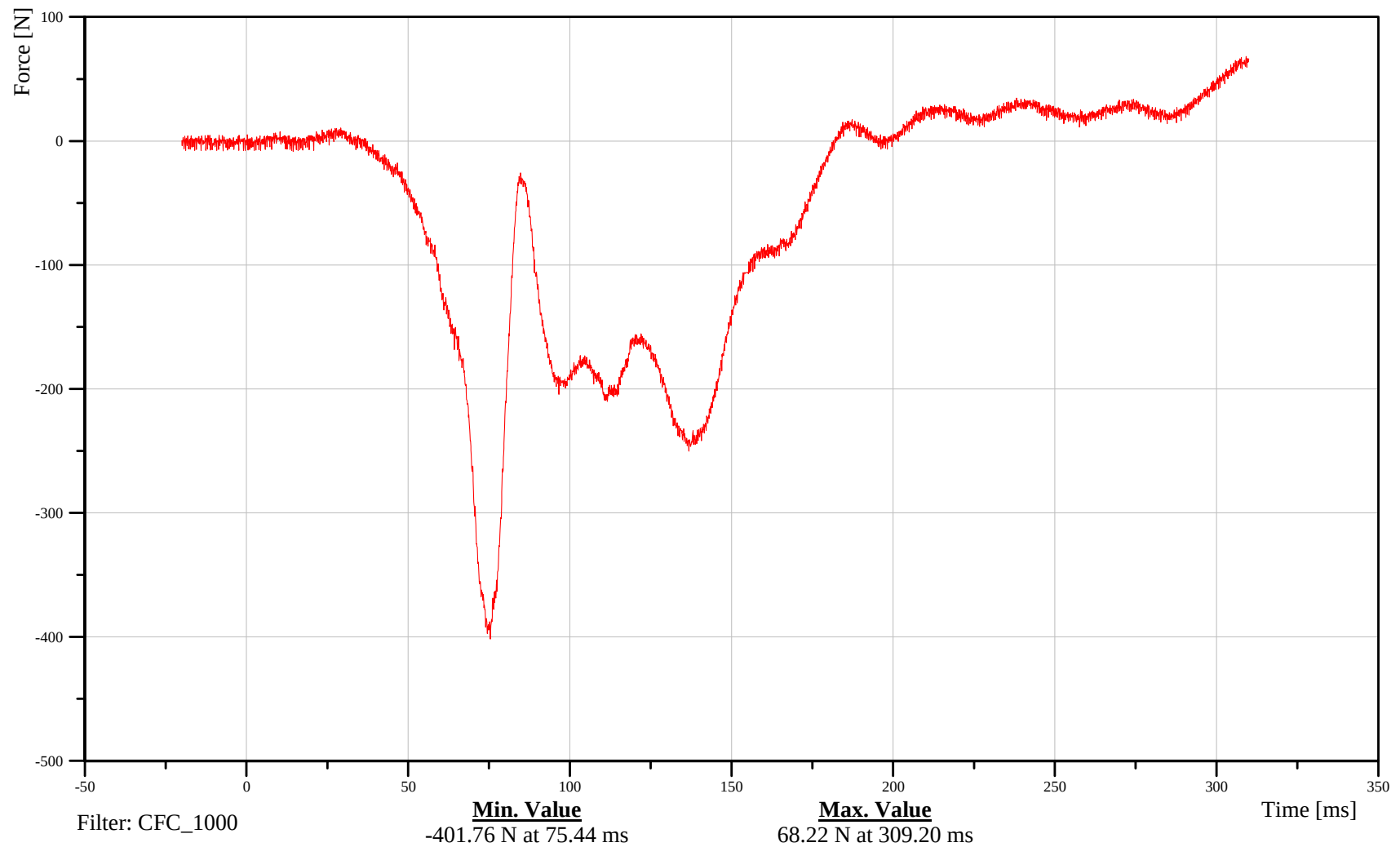
World SID Evaluation
Passenger Lower Neck X-Axis Force

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14NECKLO00WSFOXA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-164

080729



World SID Evaluation
Passenger Lower Neck Y-Axis Force

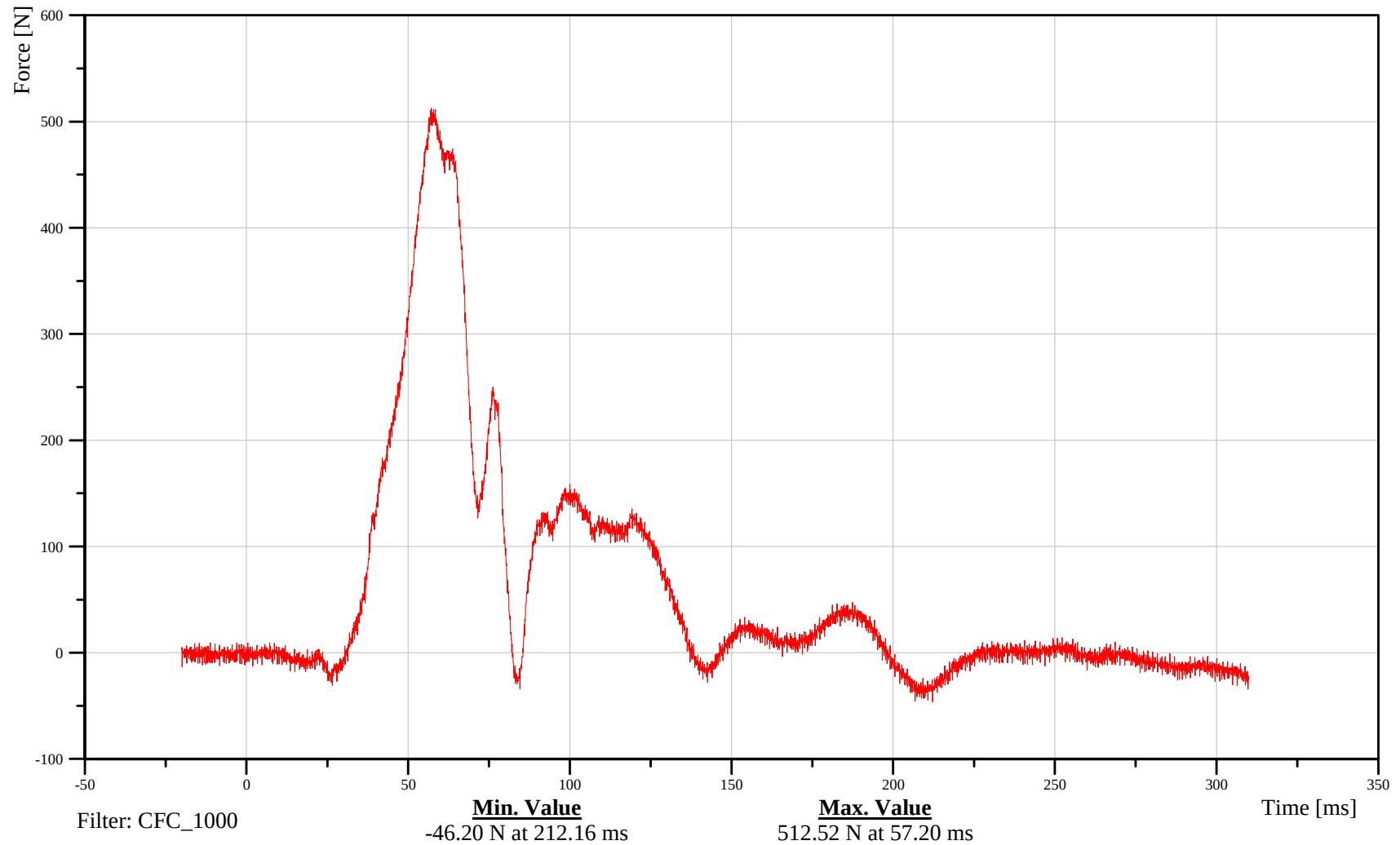
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14NECKLO00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-165

080729



World SID Evaluation
Passenger Lower Neck Z-Axis Force

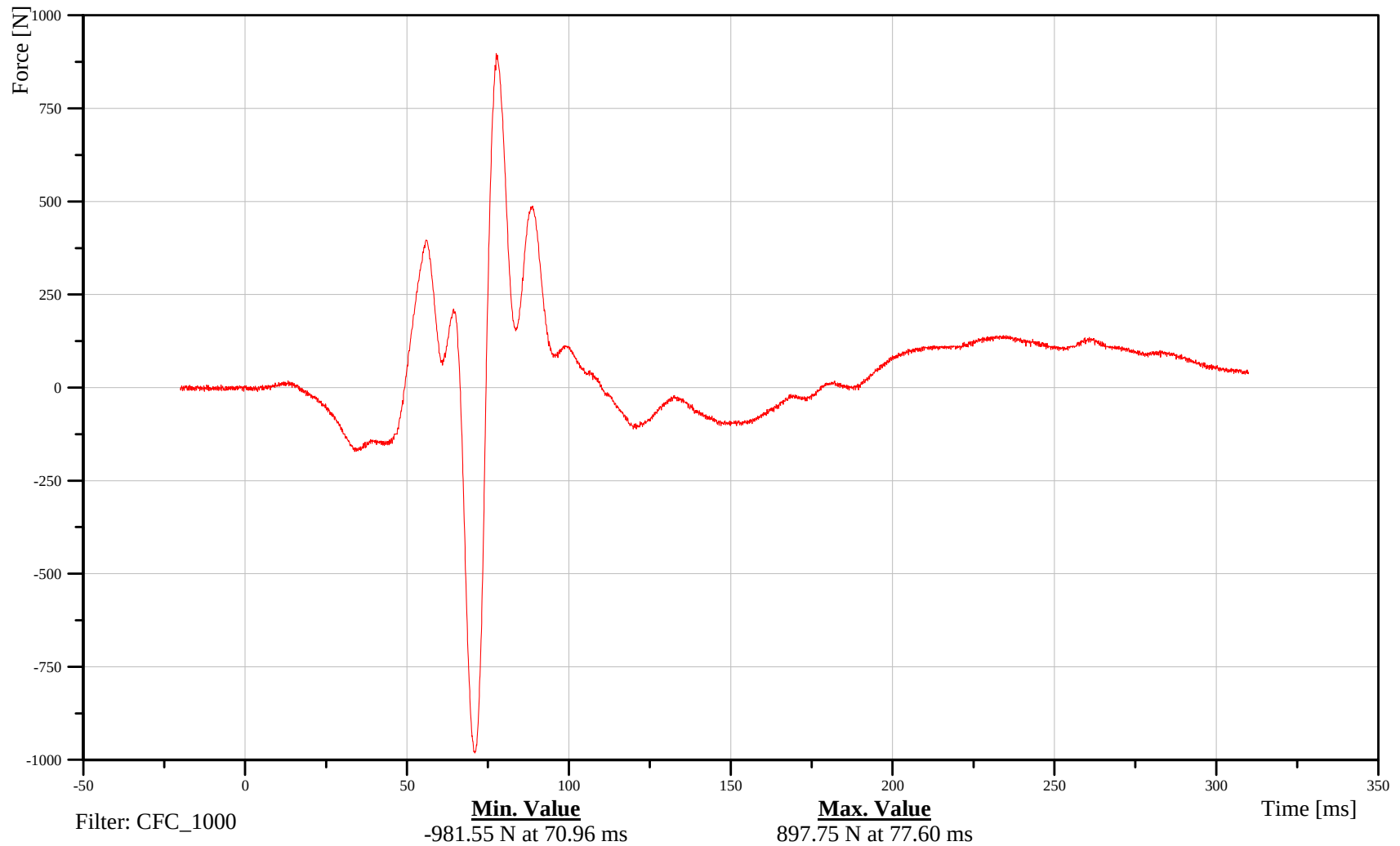
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14NECKLO00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-166

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

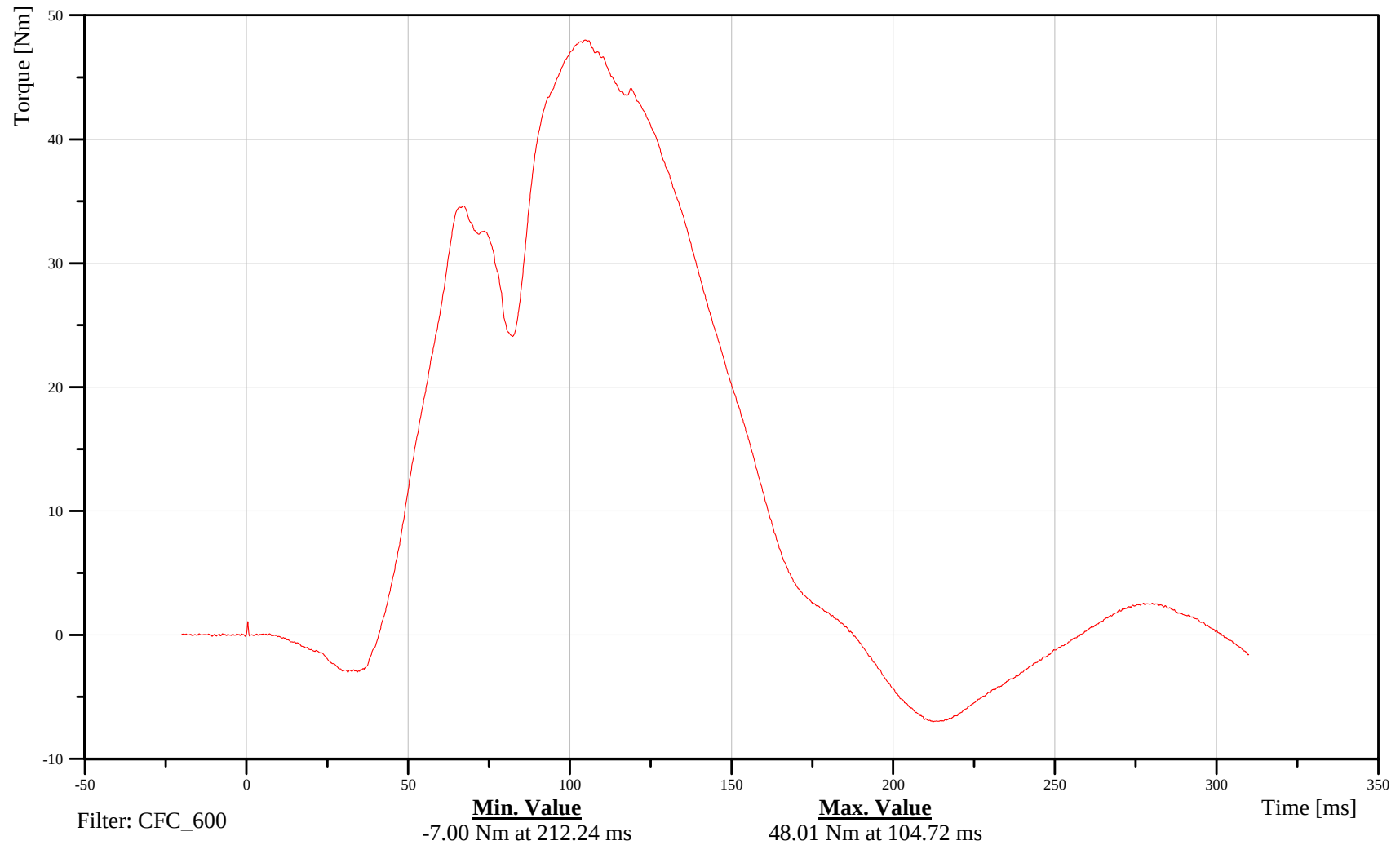
Passenger Lower Neck Moment About X Axis

Customer: VRTC

14NECKLO00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-167

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

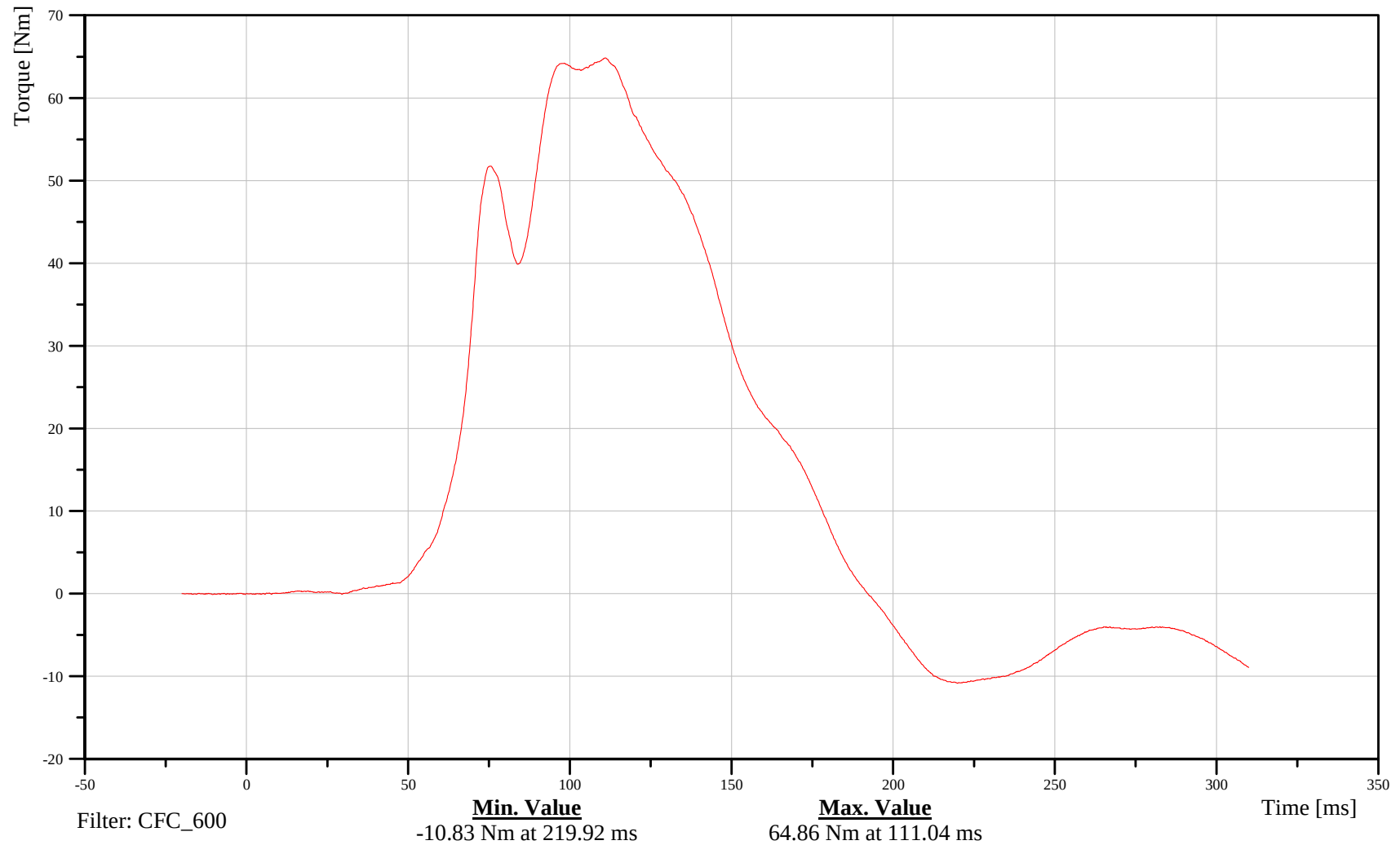
Passenger Lower Neck Moment About Y Axis

Customer: VRTC

14NECKLO00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-168

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

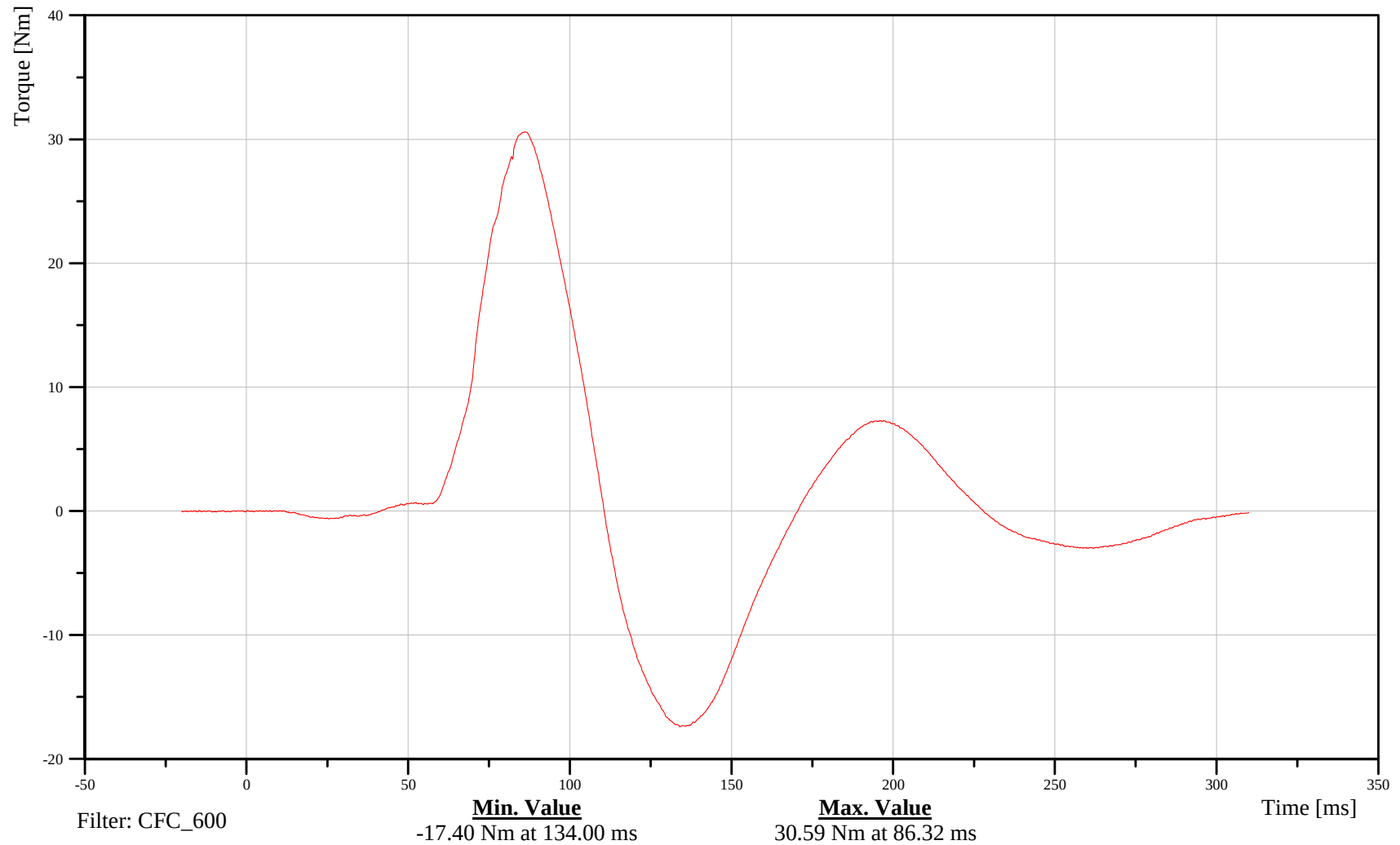
Passenger Lower Neck Moment About Z Axis

Customer: VRTC

14NECKLO00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-169

080729



World SID Evaluation

Passenger Shoulder X-Axis Force

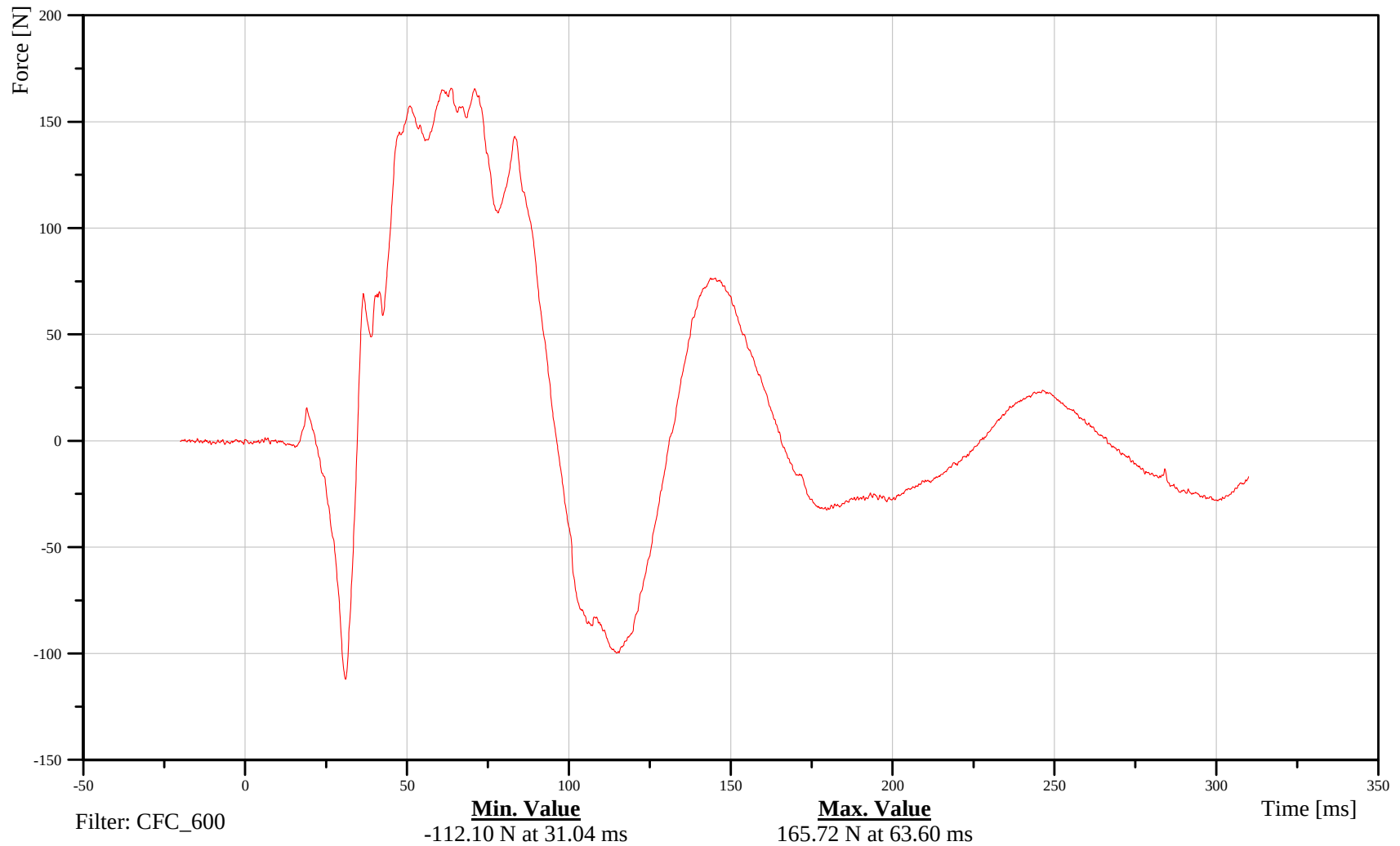
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-170

080729



World SID Evaluation
Passenger Shoulder Y-Axis Force

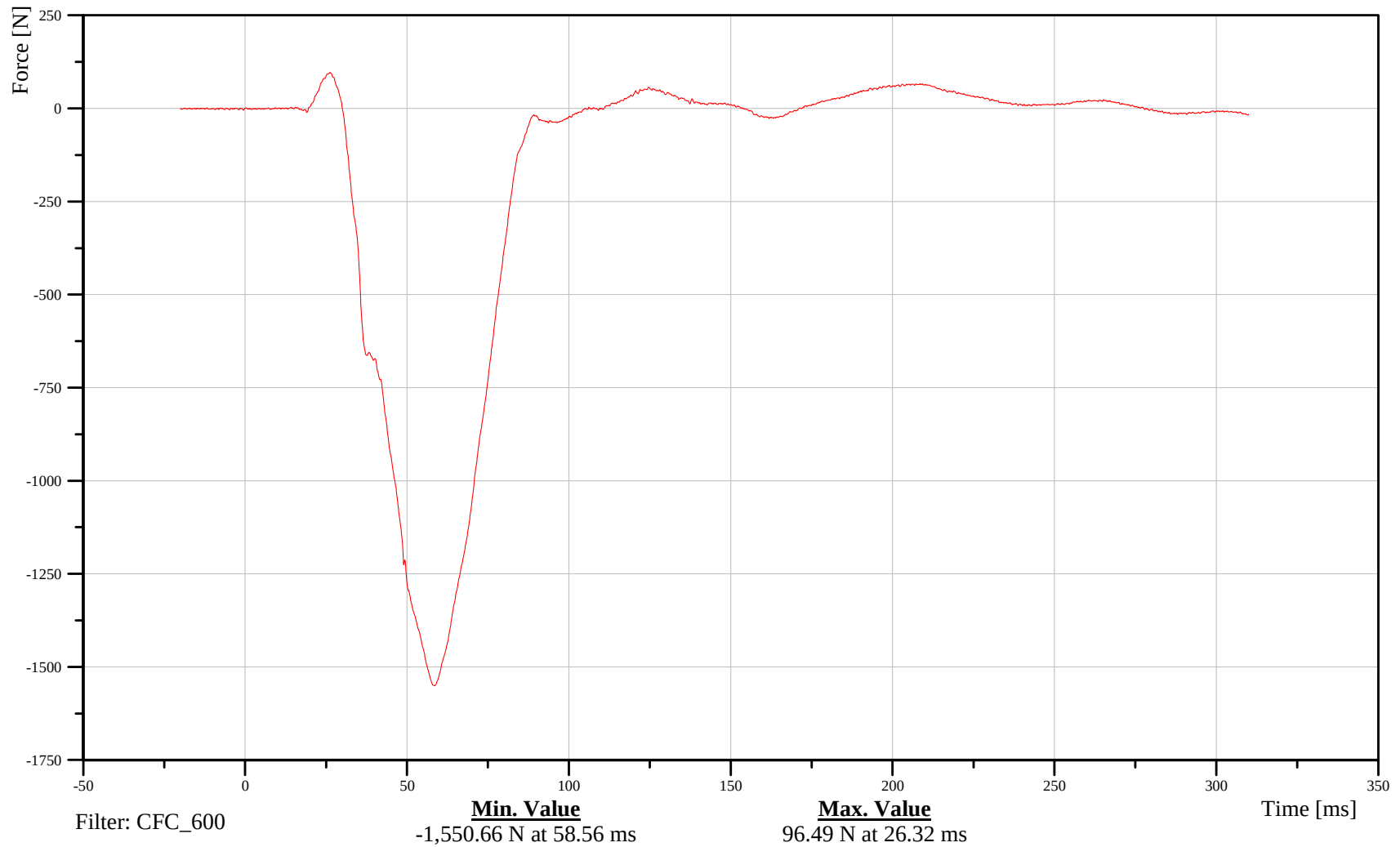
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-171

080729



World SID Evaluation
Passenger Shoulder Z-Axis Force

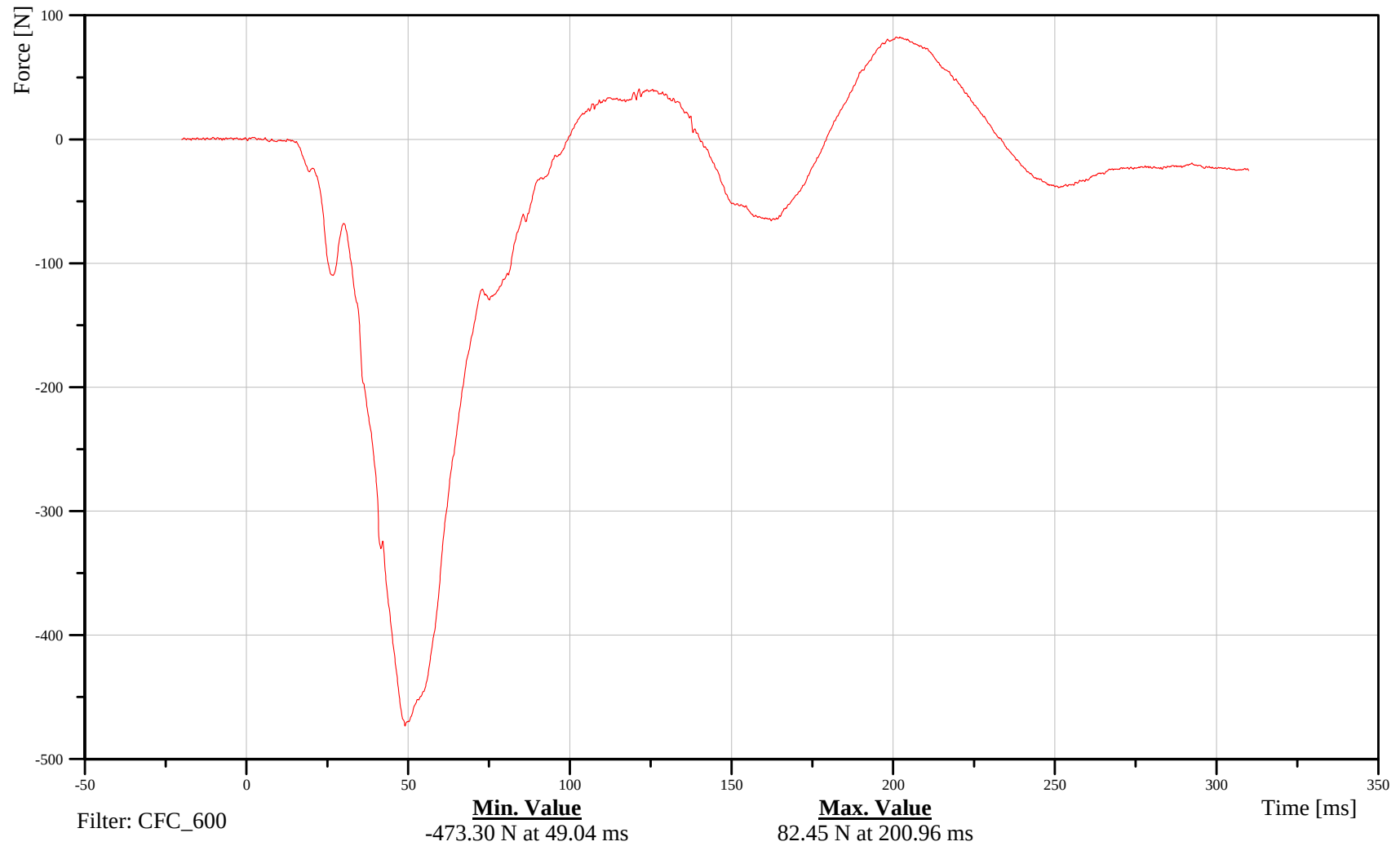
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-172

080729



World SID Evaluation

Passenger Shoulder Y-Axis Displacement

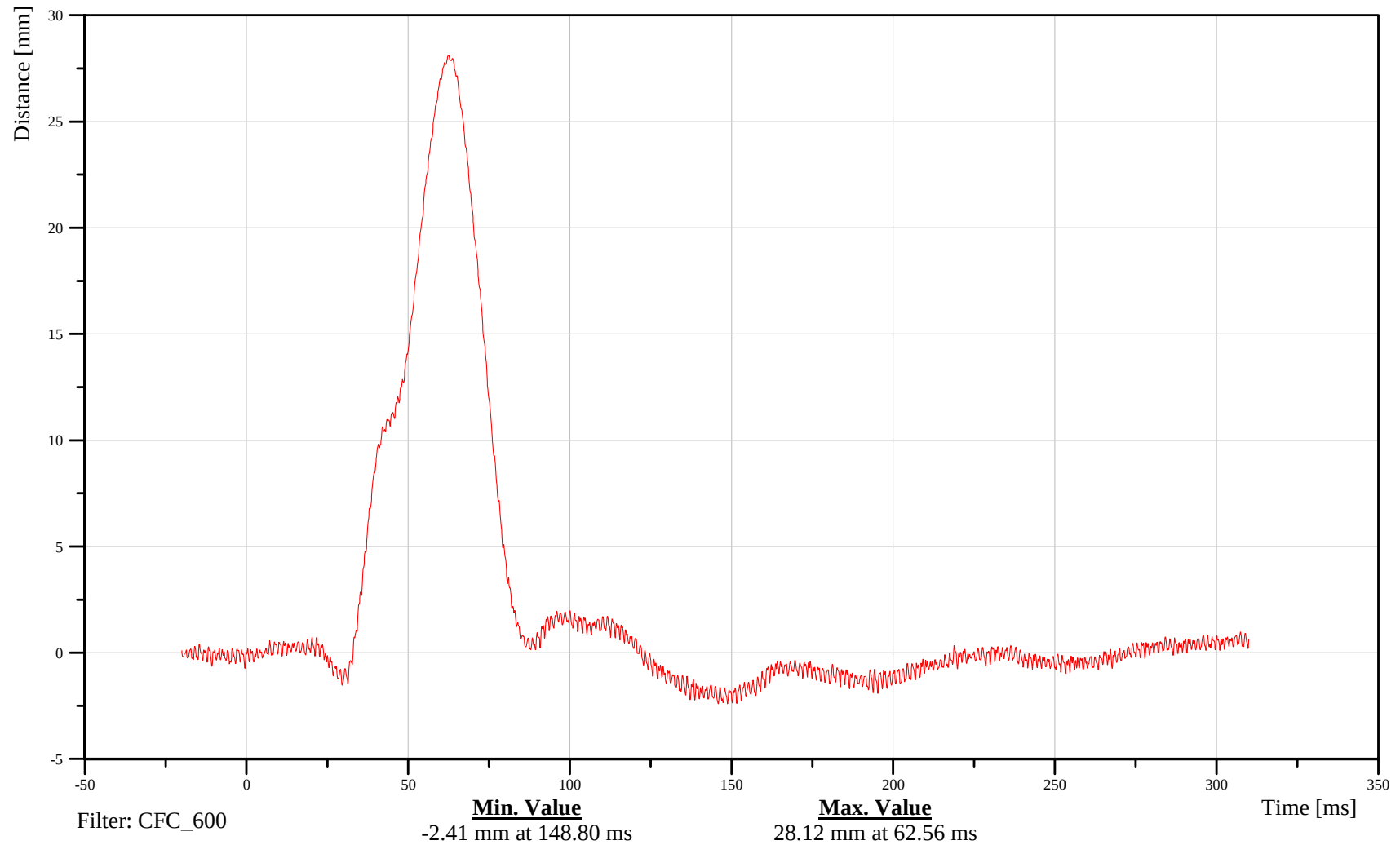
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-173

080729



World SID Evaluation
Passenger Shoulder X-Axis Acceleration

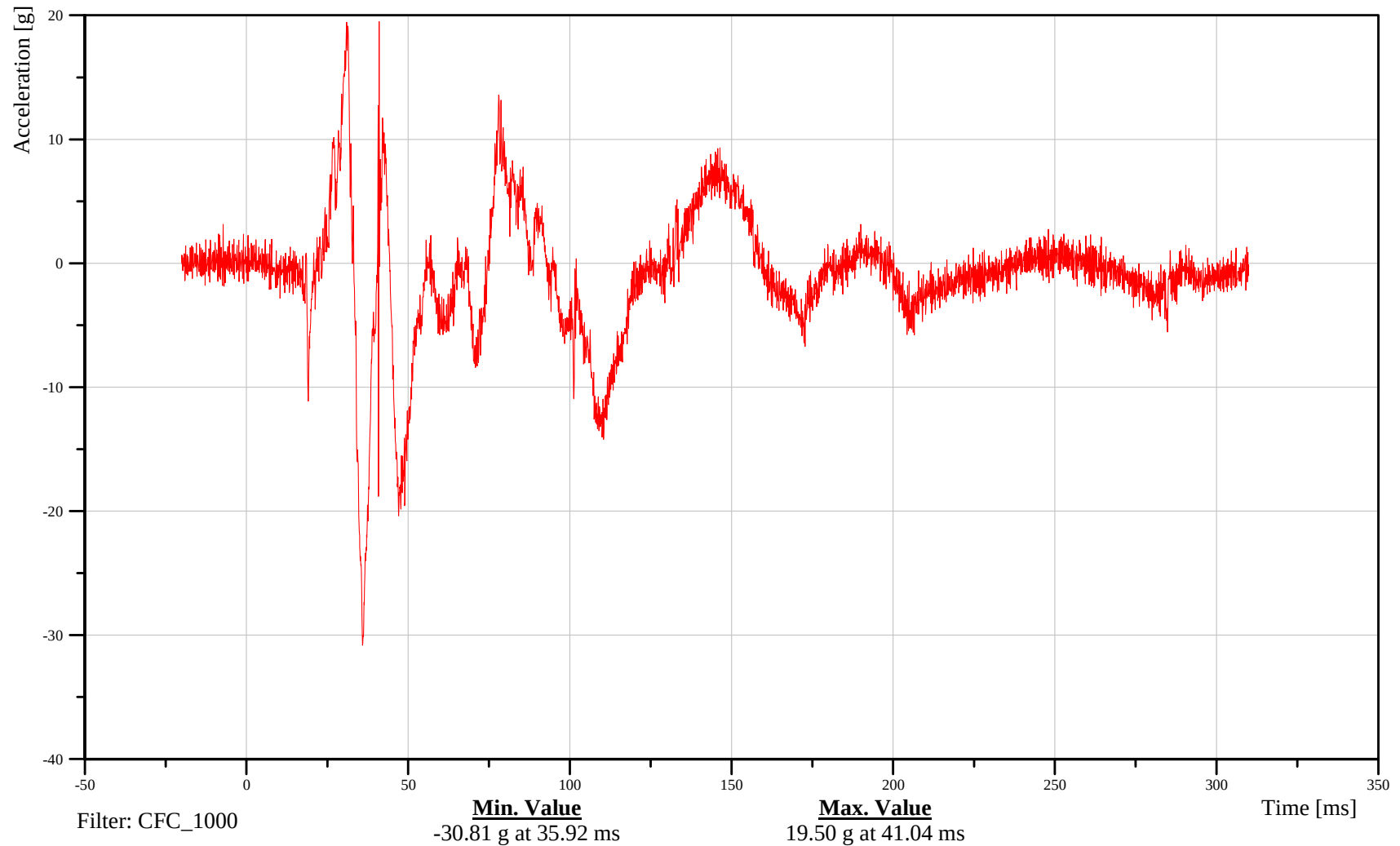
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-174

080729



World SID Evaluation
Passenger Shoulder Y-Axis Acceleration

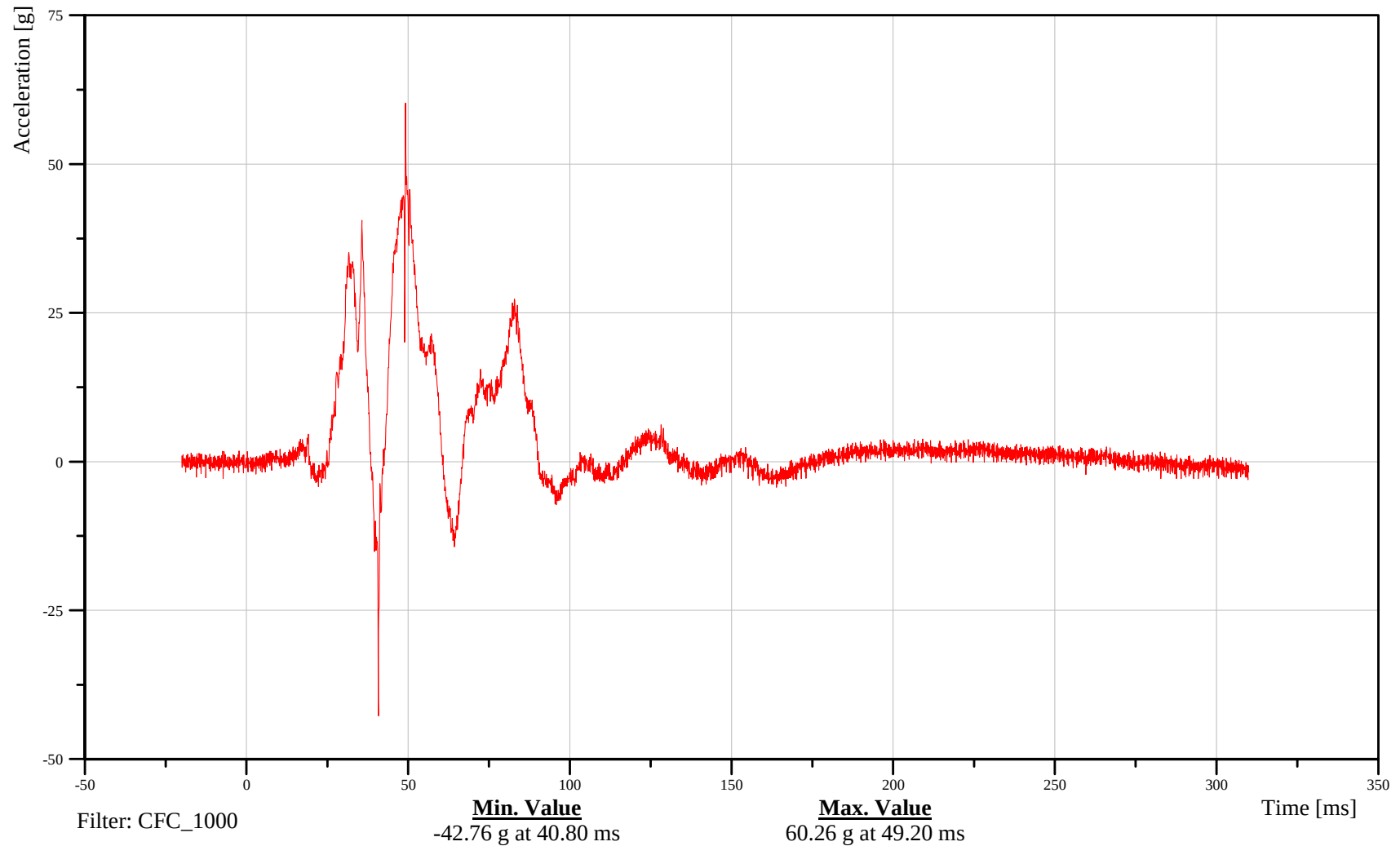
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-175

080729



World SID Evaluation
Passenger Shoulder Z-Axis Acceleration

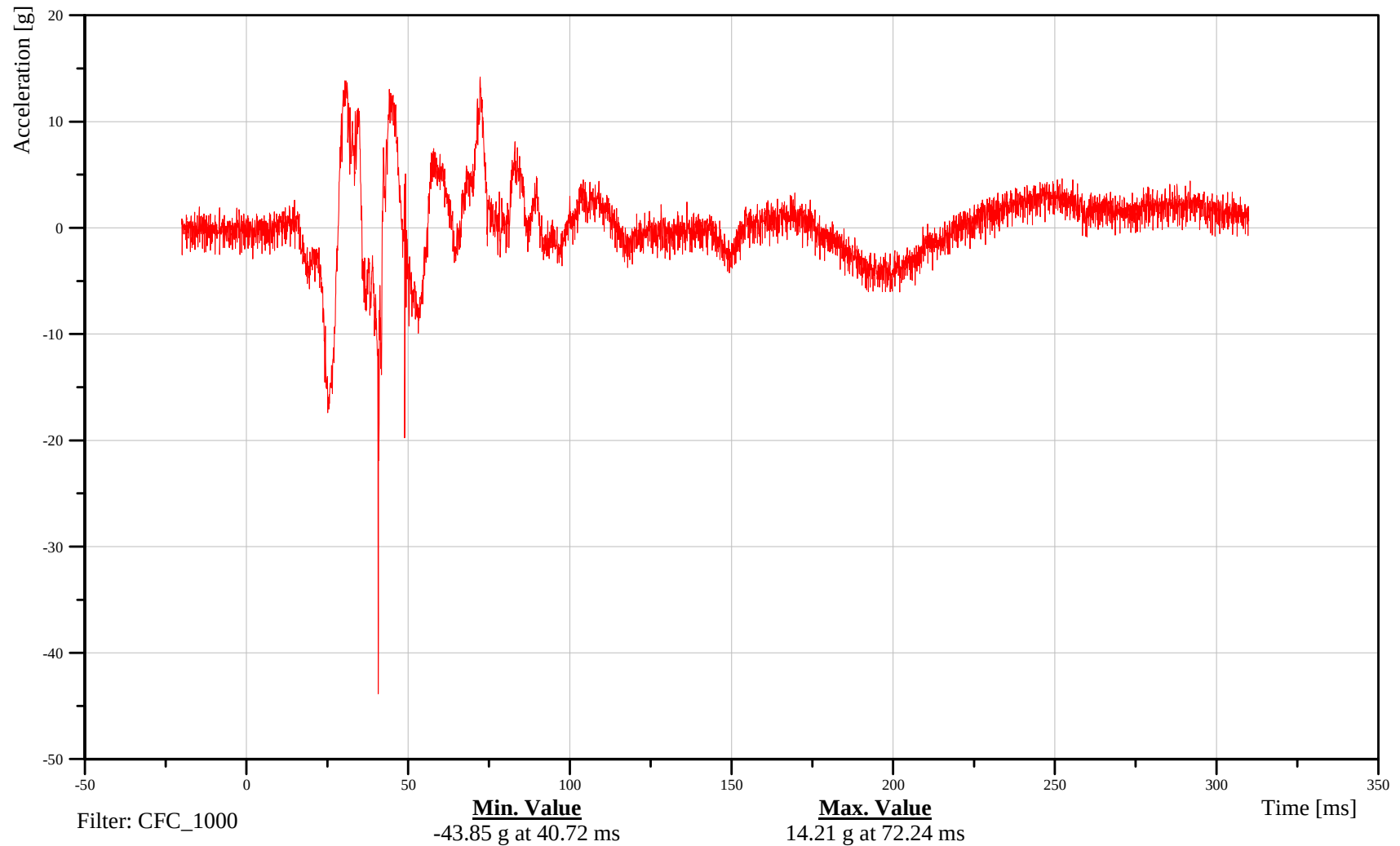
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-176

080729



World SID Evaluation

Passenger Shoulder Resultant Acceleration

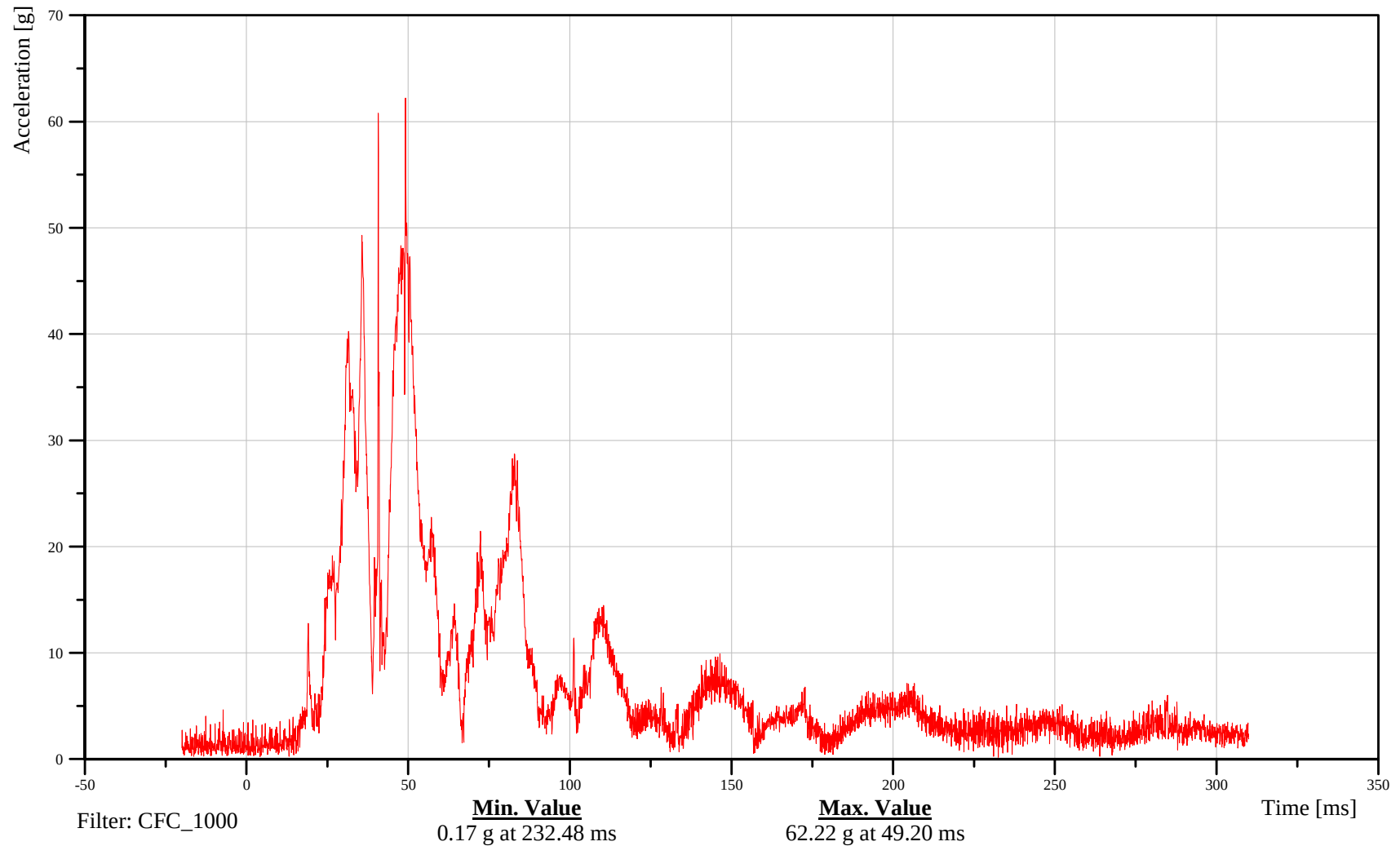
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14SHLDLE00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-177

080729



World SID Evaluation
Passenger T1 X-Axis Acceleration

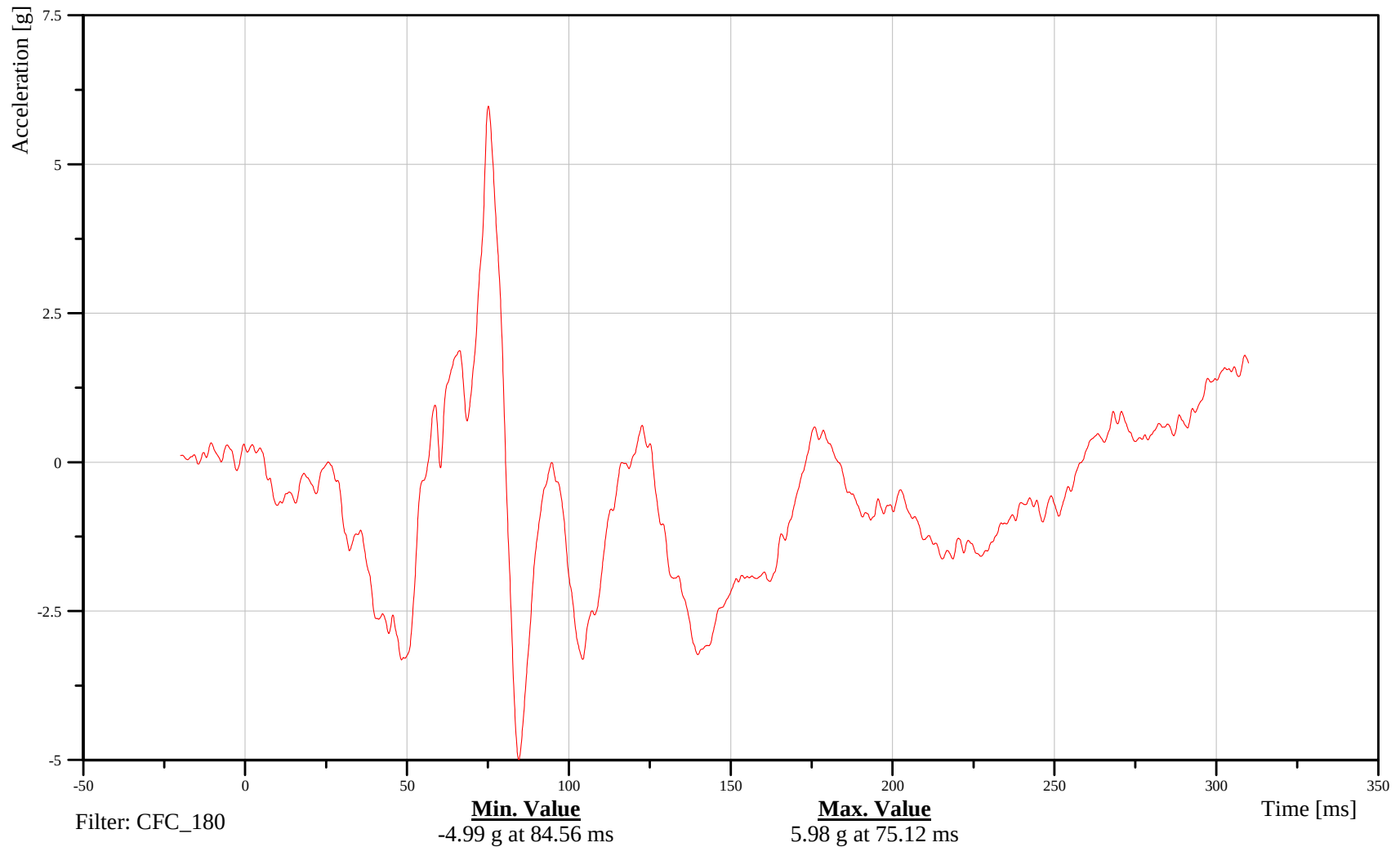
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0100WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-178

080729



World SID Evaluation
Passenger T1 Y-Axis Acceleration

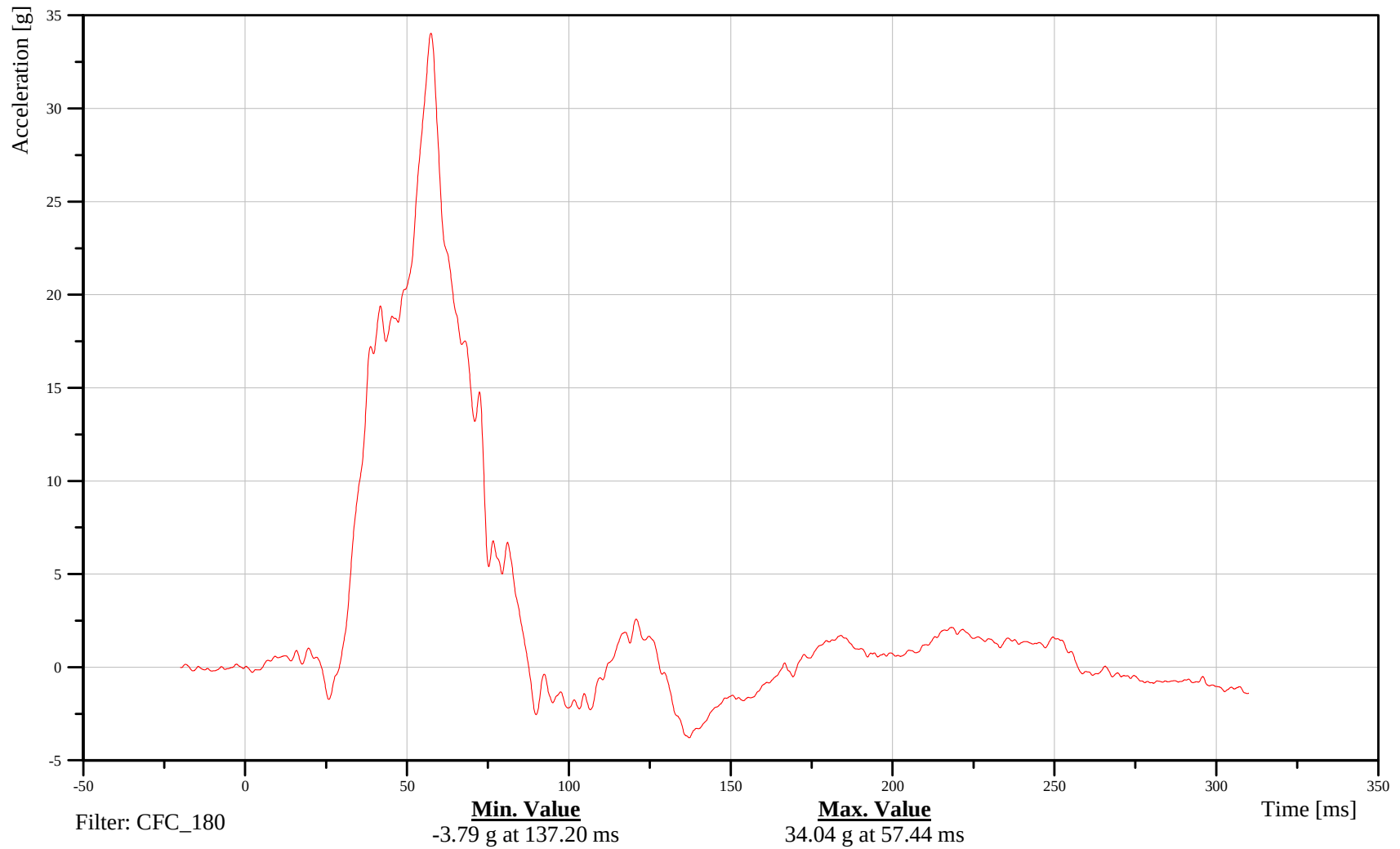
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0100WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-179

080729



World SID Evaluation

Passenger T1 Z-Axis Acceleration

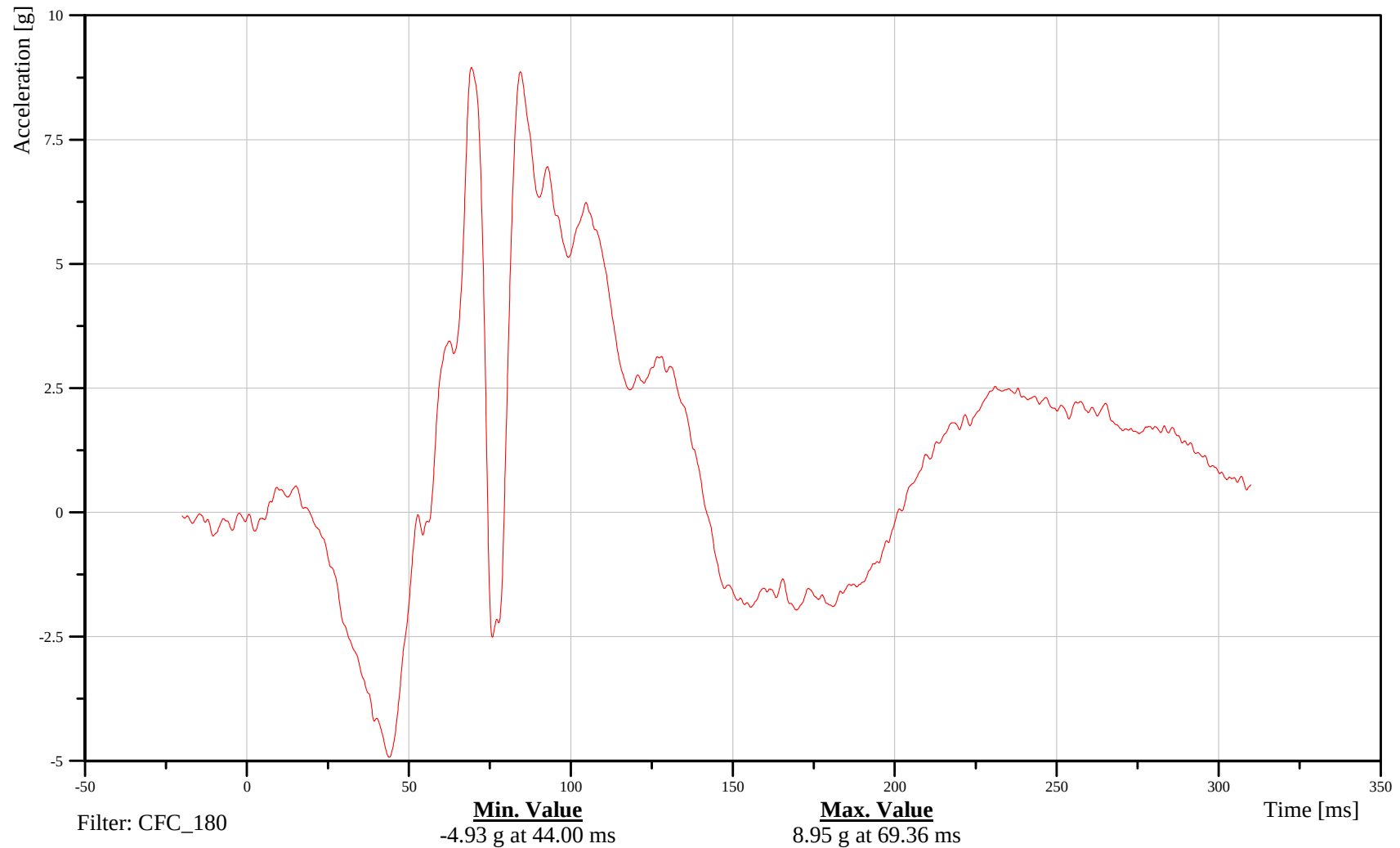
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0100WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-180

080729



World SID Evaluation
Passenger T1 Resultant Acceleration

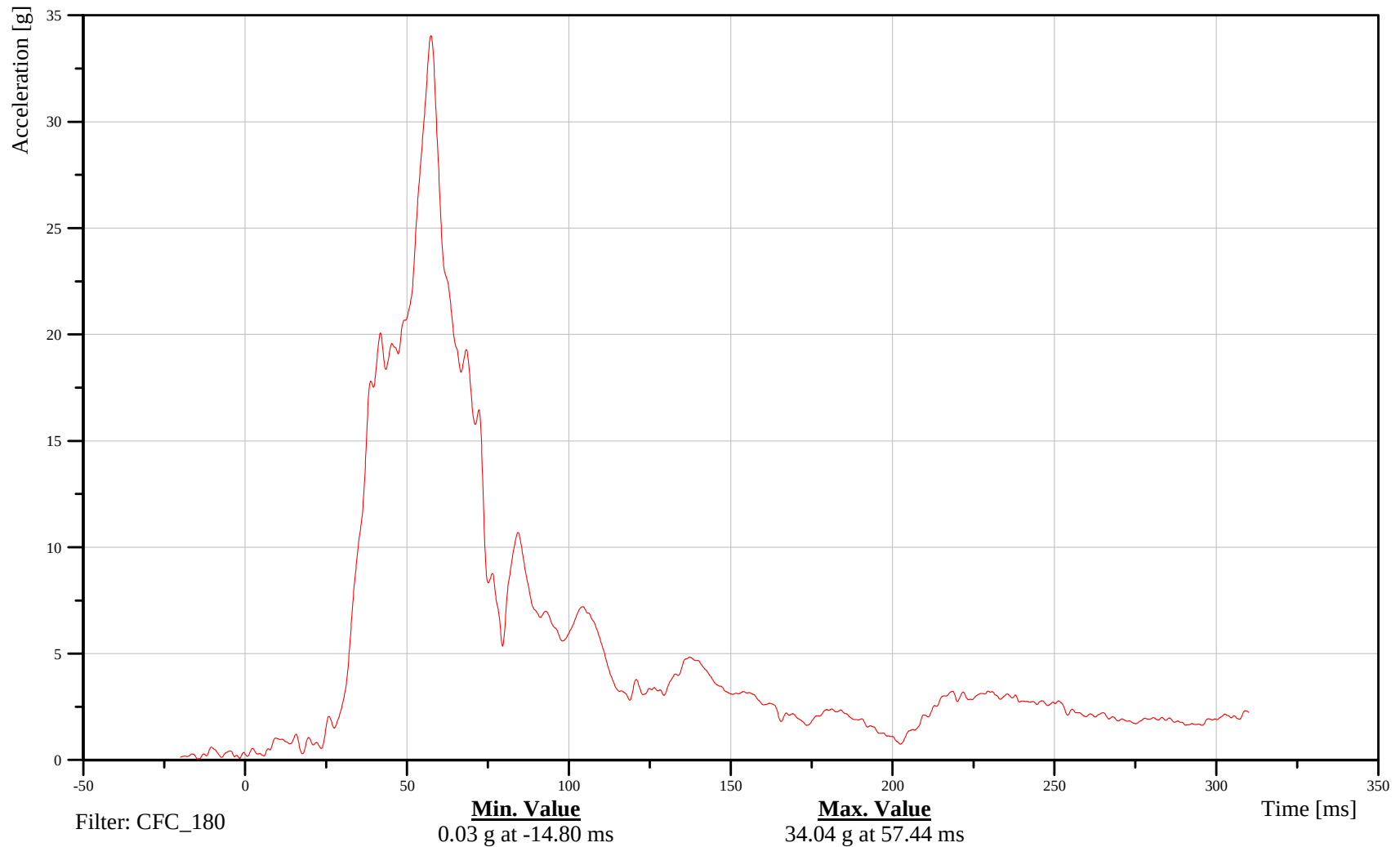
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0100WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-181

080729



World SID Evaluation
Passenger T4 X-Axis Acceleration

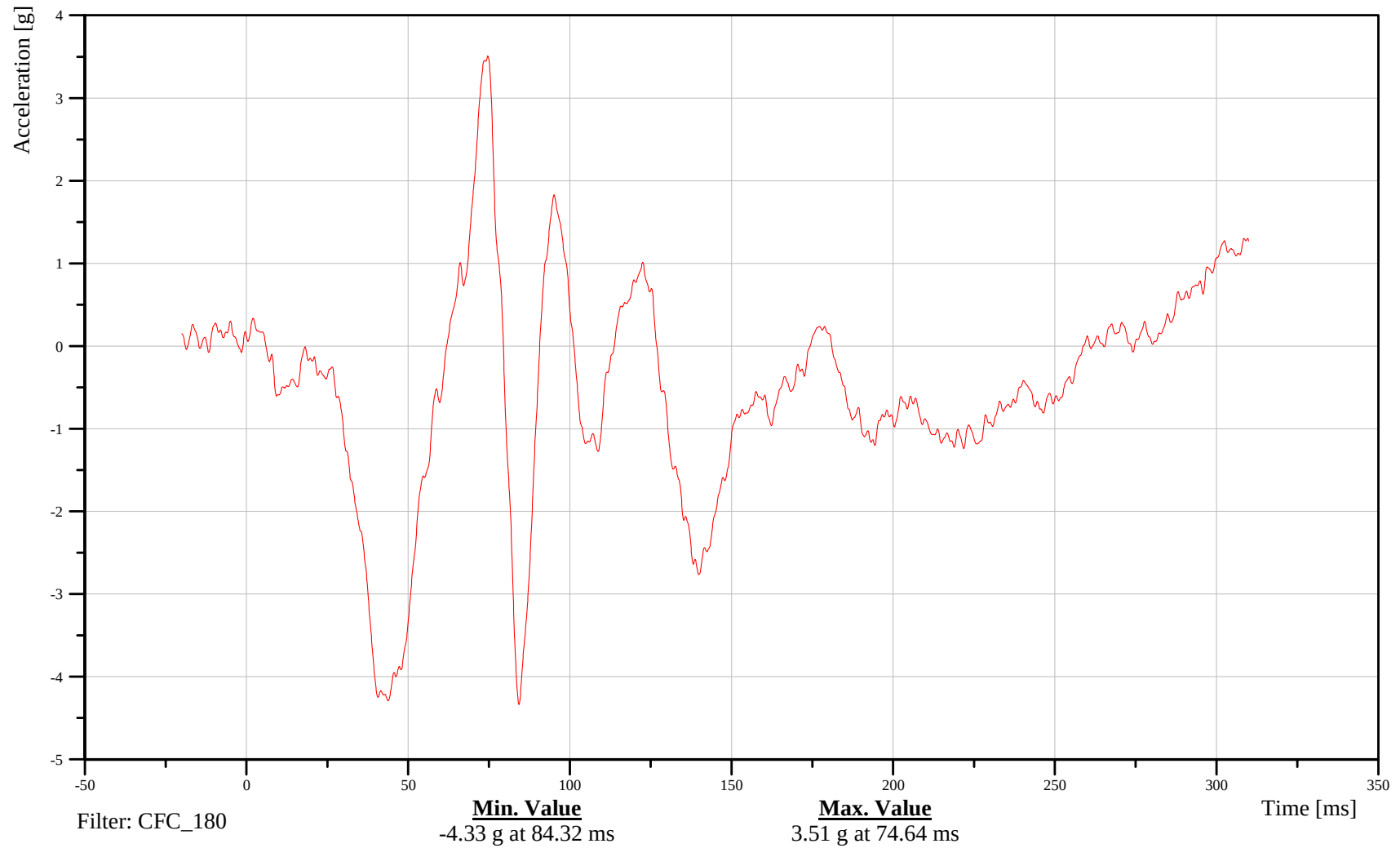
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0400WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-182

080729



World SID Evaluation
Passenger T4 Y-Axis Acceleration

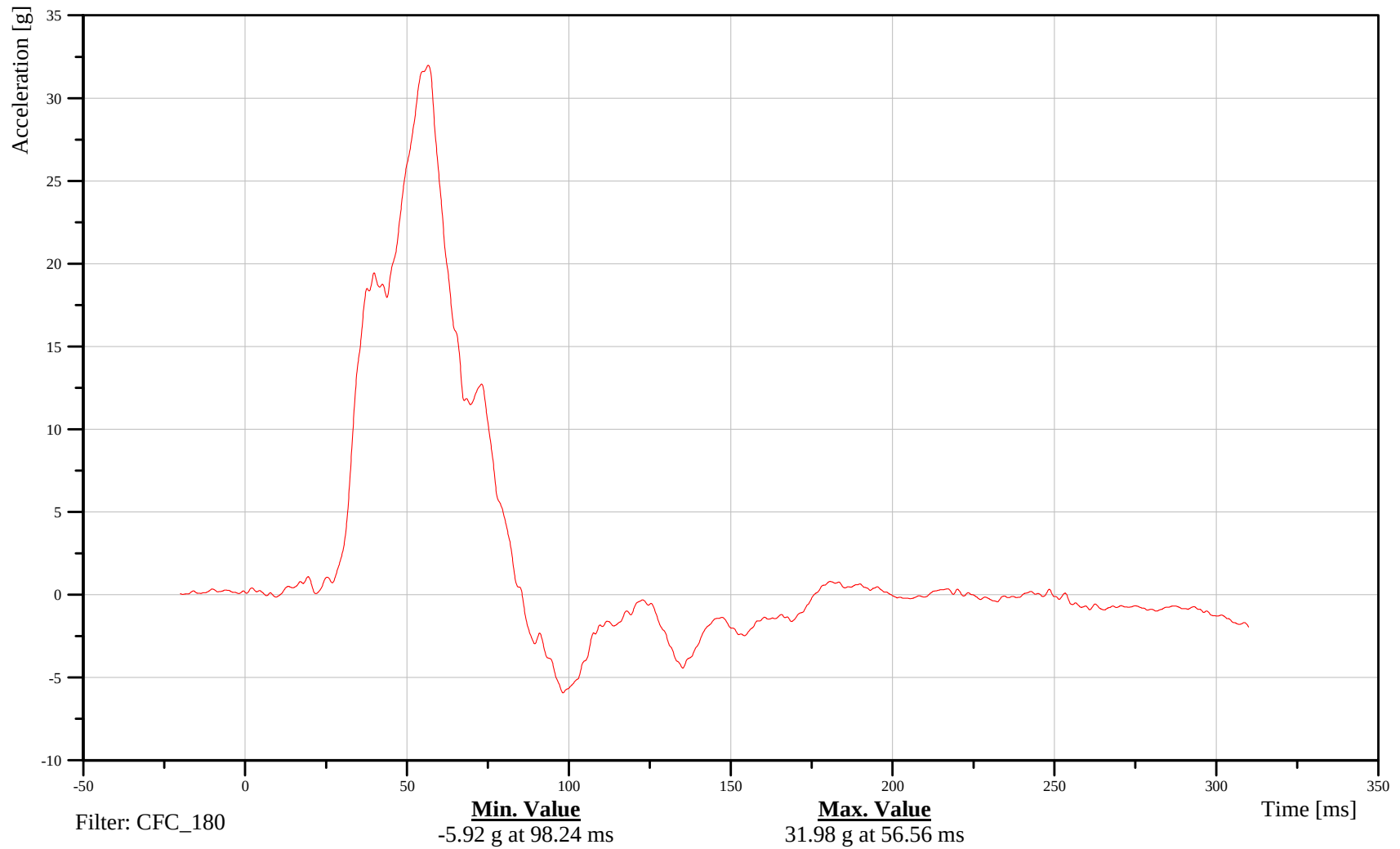
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0400WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-183

080729



World SID Evaluation
Passenger T4 Z-Axis Acceleration

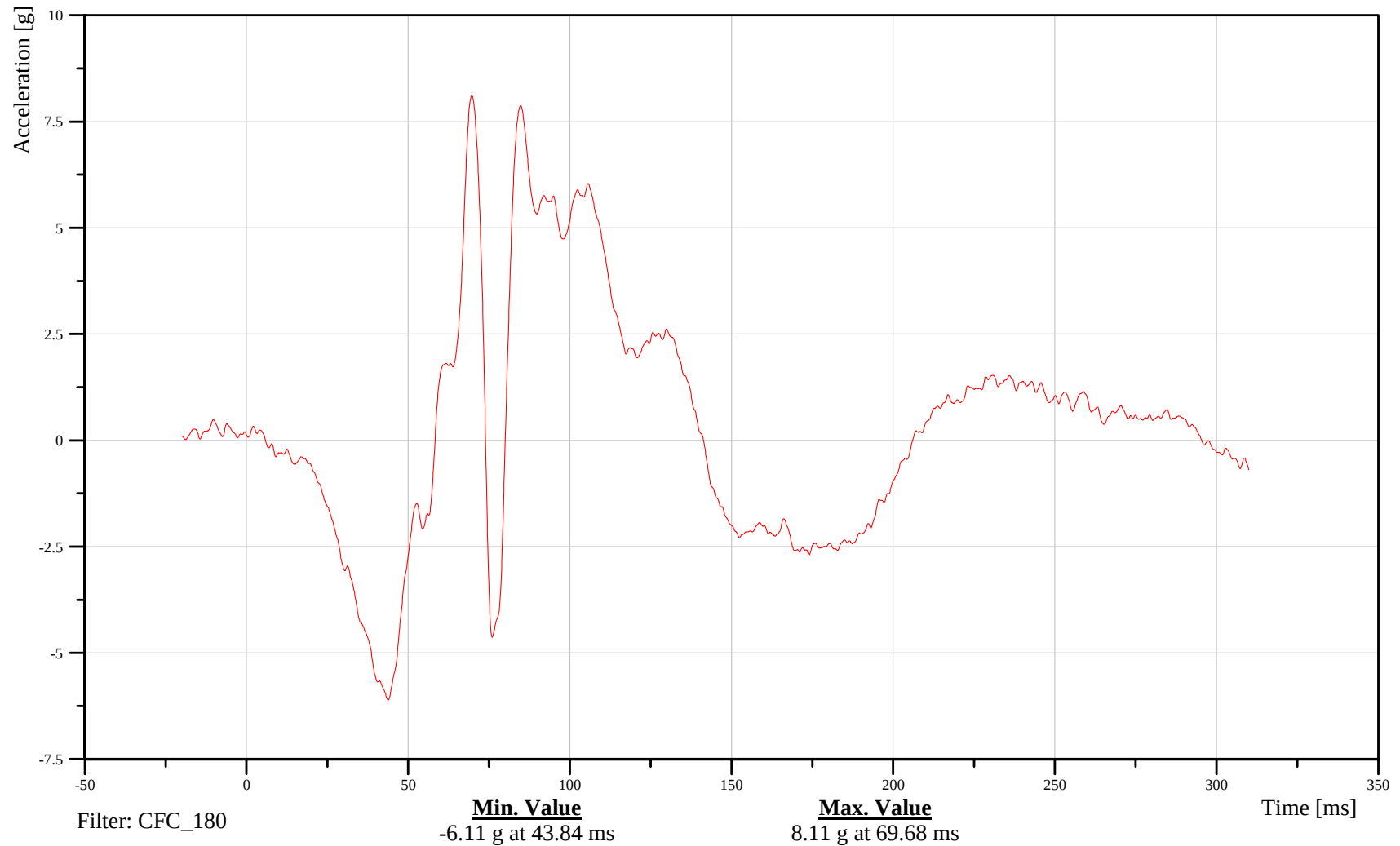
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0400WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-184

080729



World SID Evaluation
Passenger T4 Resultant Acceleration

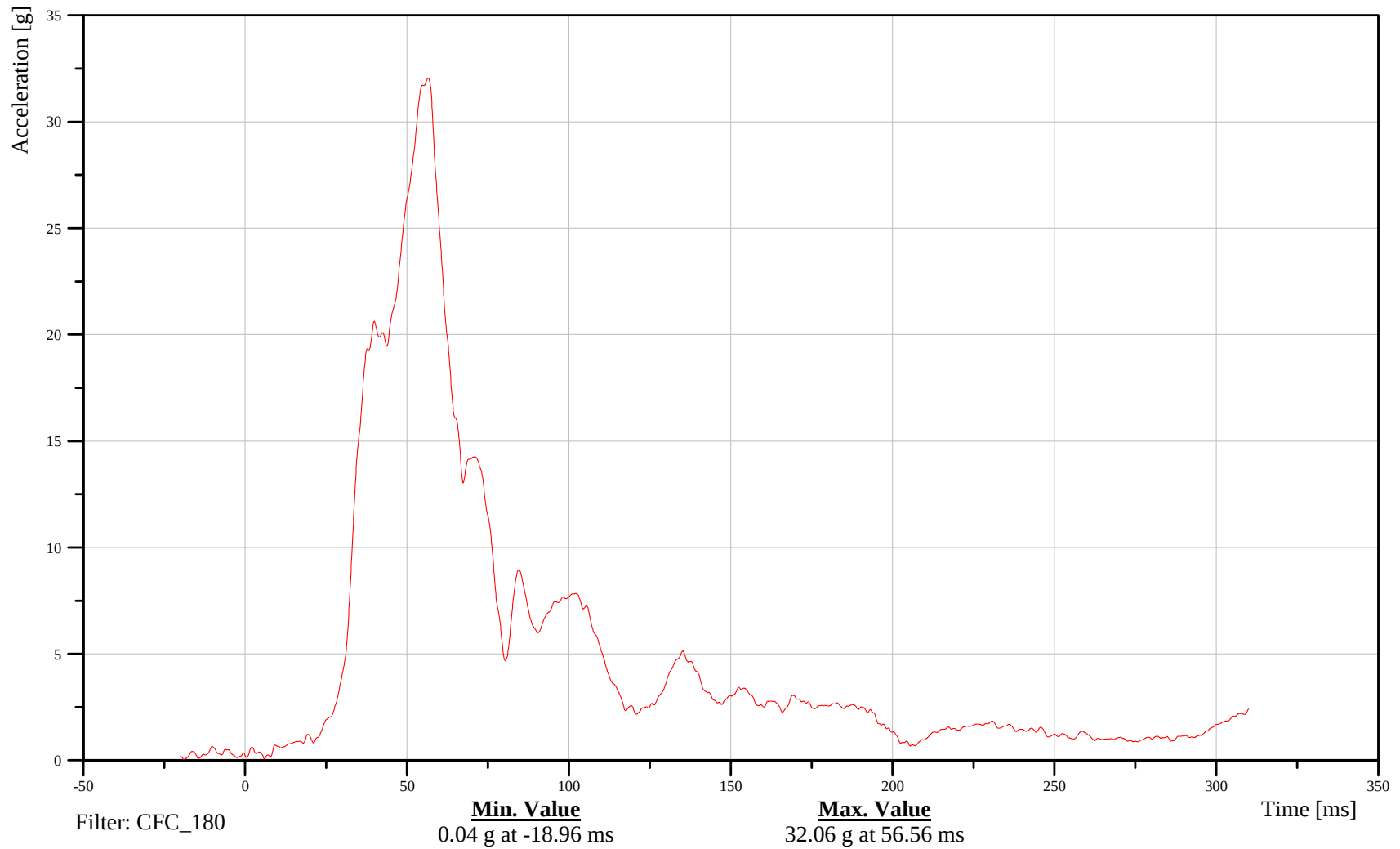
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP0400WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-185

080729



World SID Evaluation
Passenger T12 X-Axis Acceleration

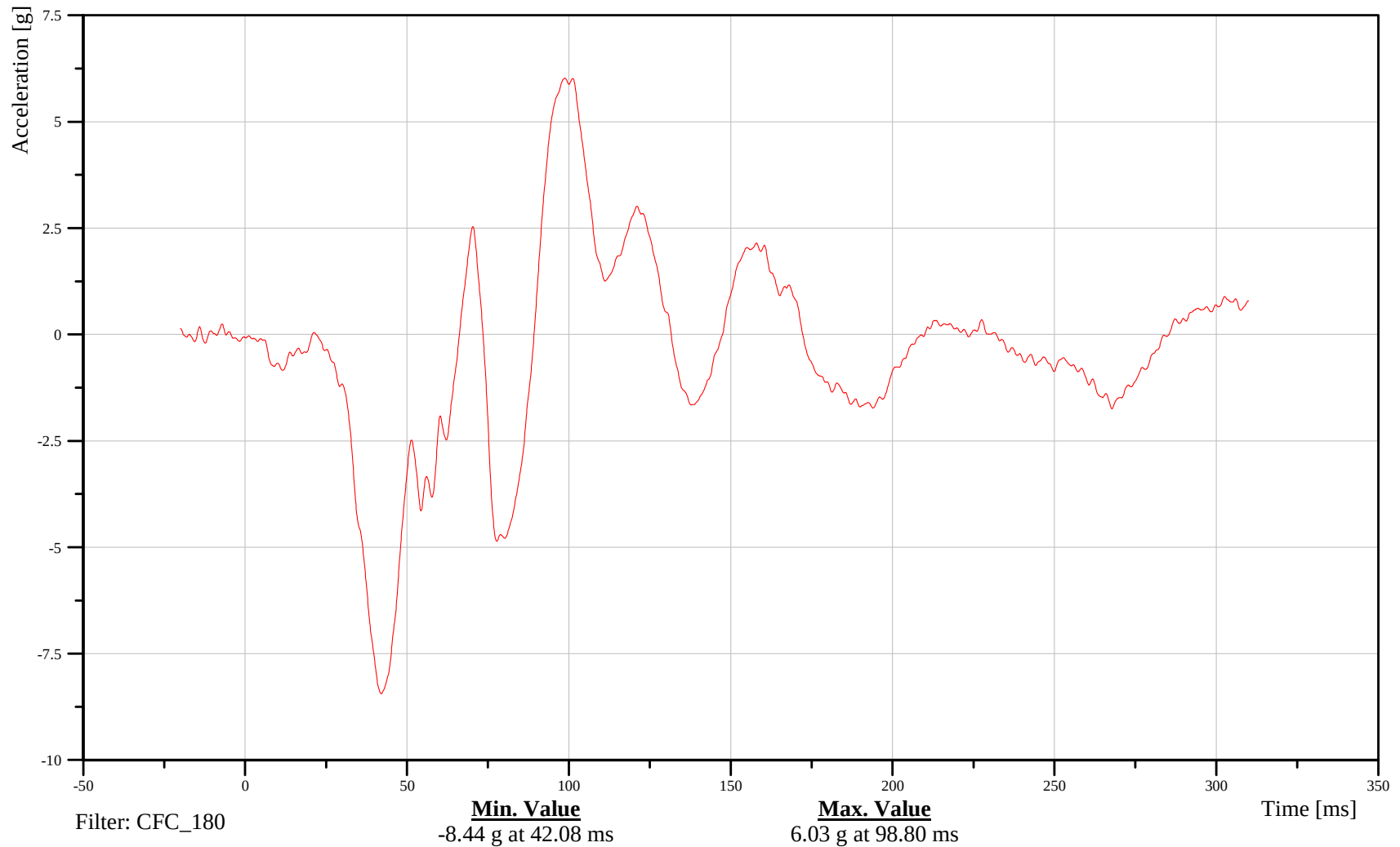
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP1200WSACXC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-186

080729



World SID Evaluation
Passenger T12 Y-Axis Acceleration

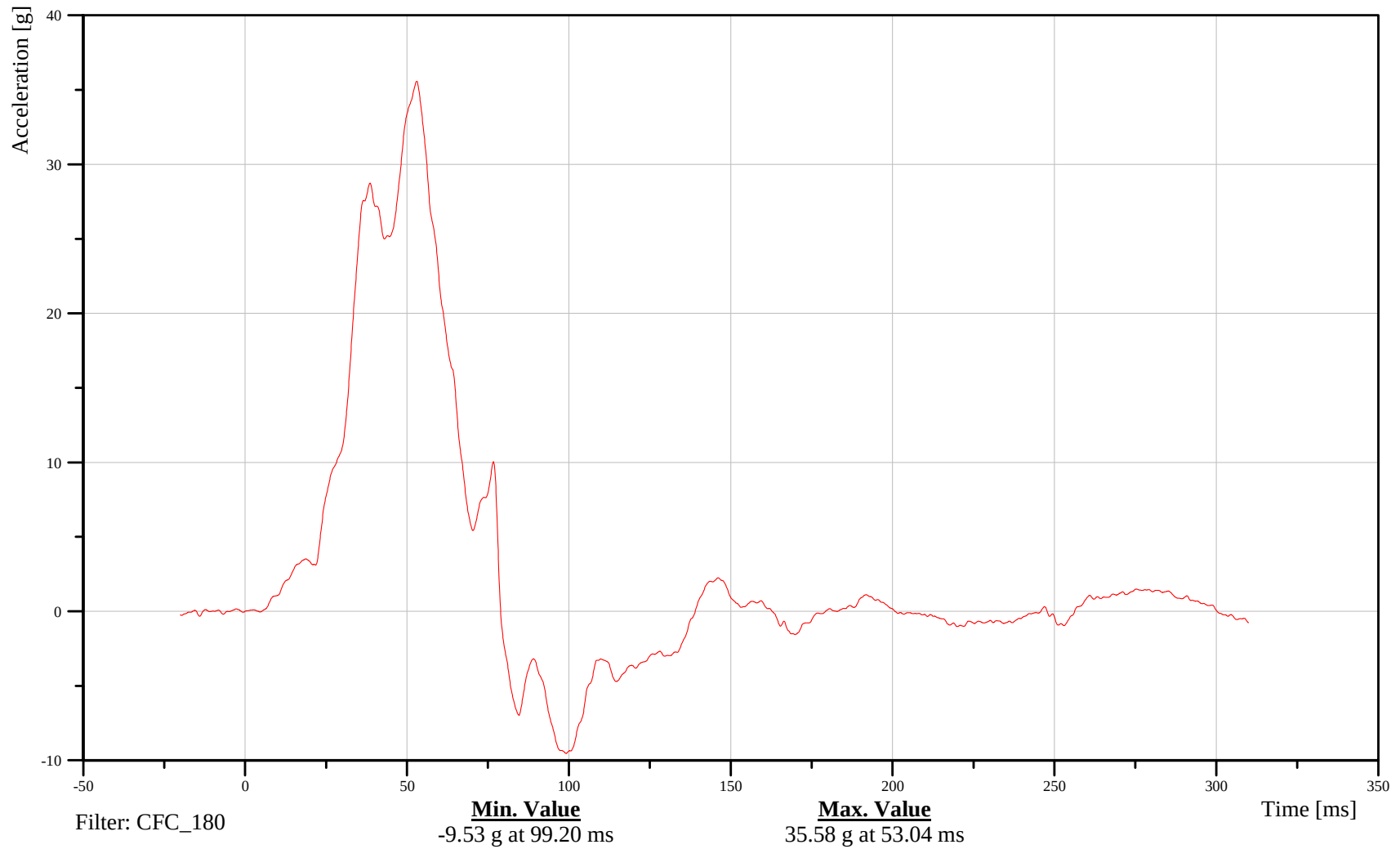
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP1200WSACYC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-187

080729



World SID Evaluation
Passenger T12 Z-Axis Acceleration

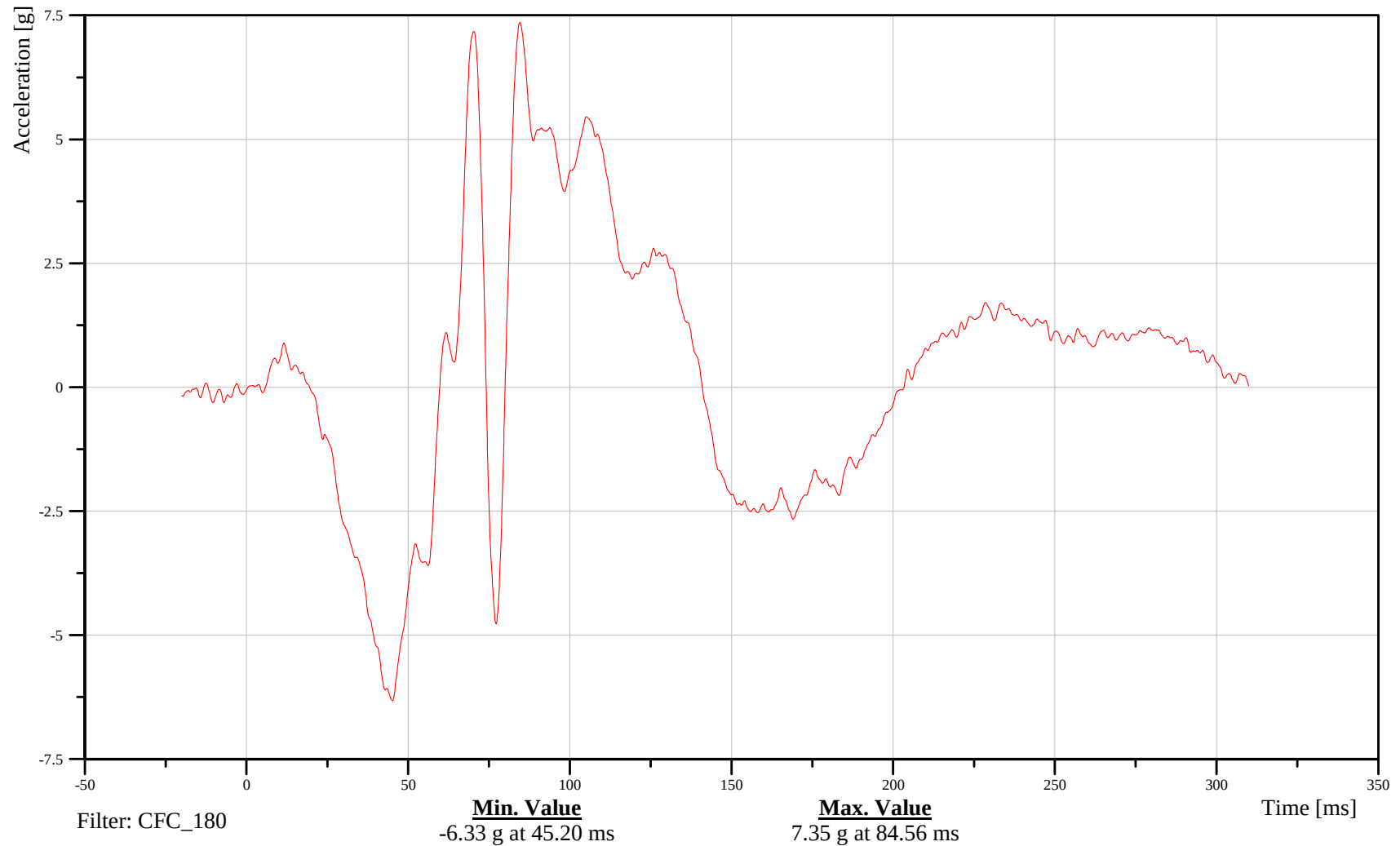
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14THSP1200WSACZC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-188

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

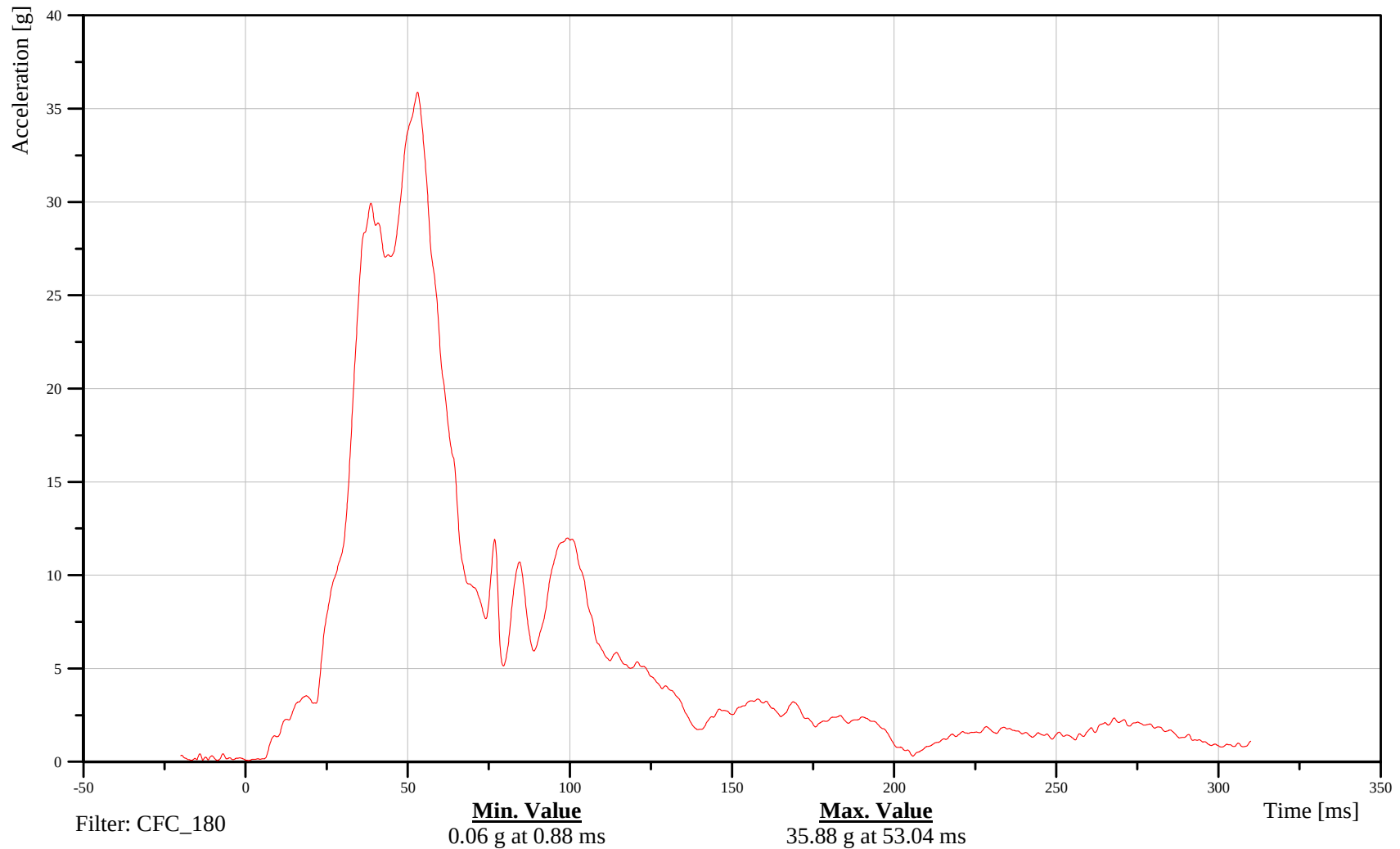
Passenger T12 Resultant Acceleration

Customer: VRTC

14THSP1200WSACRC

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-189

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

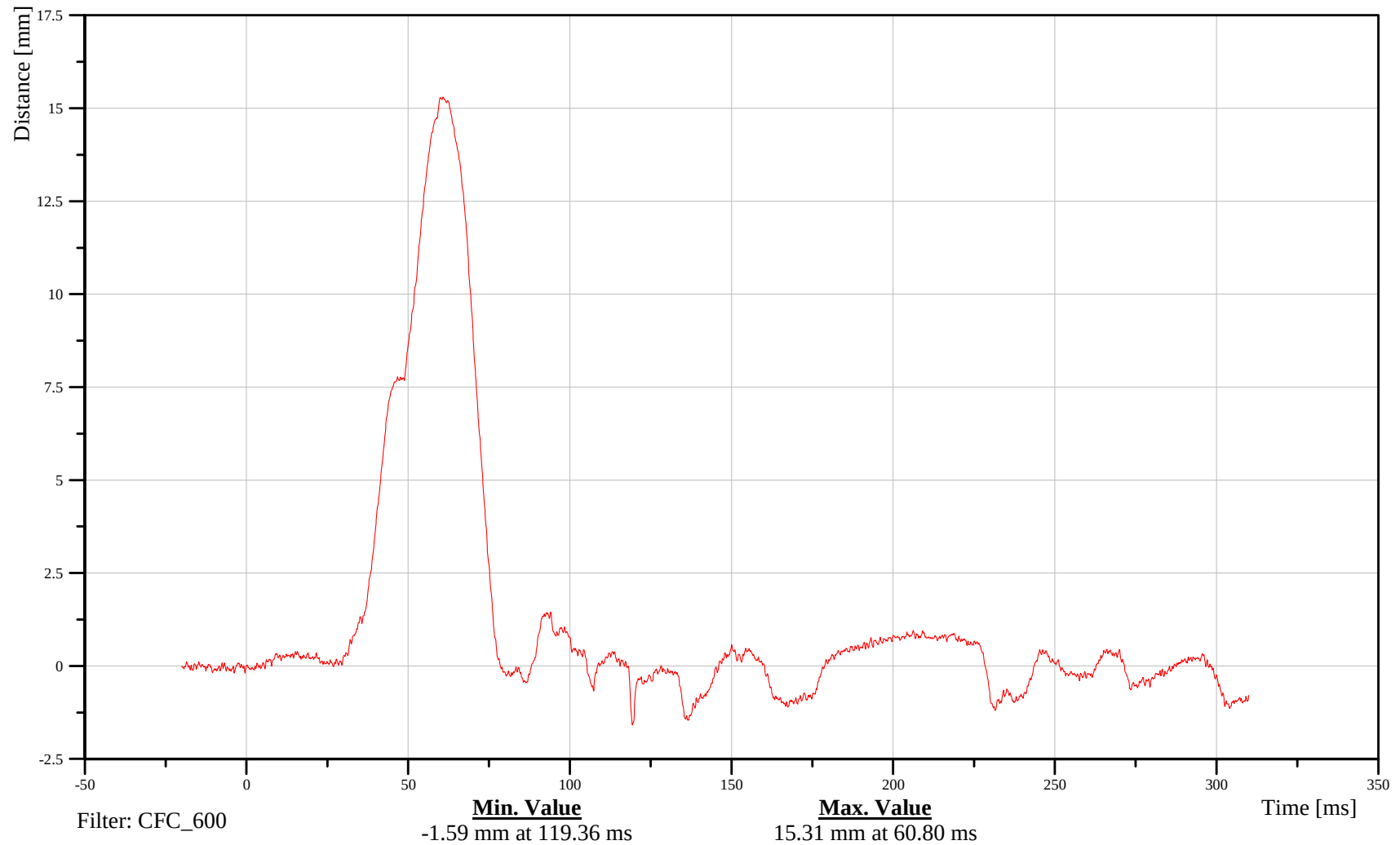
Passenger Thorax Rib 1 Y-Axis Displacement

Customer: VRTC

14TRRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-190

080729



World SID Evaluation
Passenger Thorax Rib 1 X-Axis Acceleration

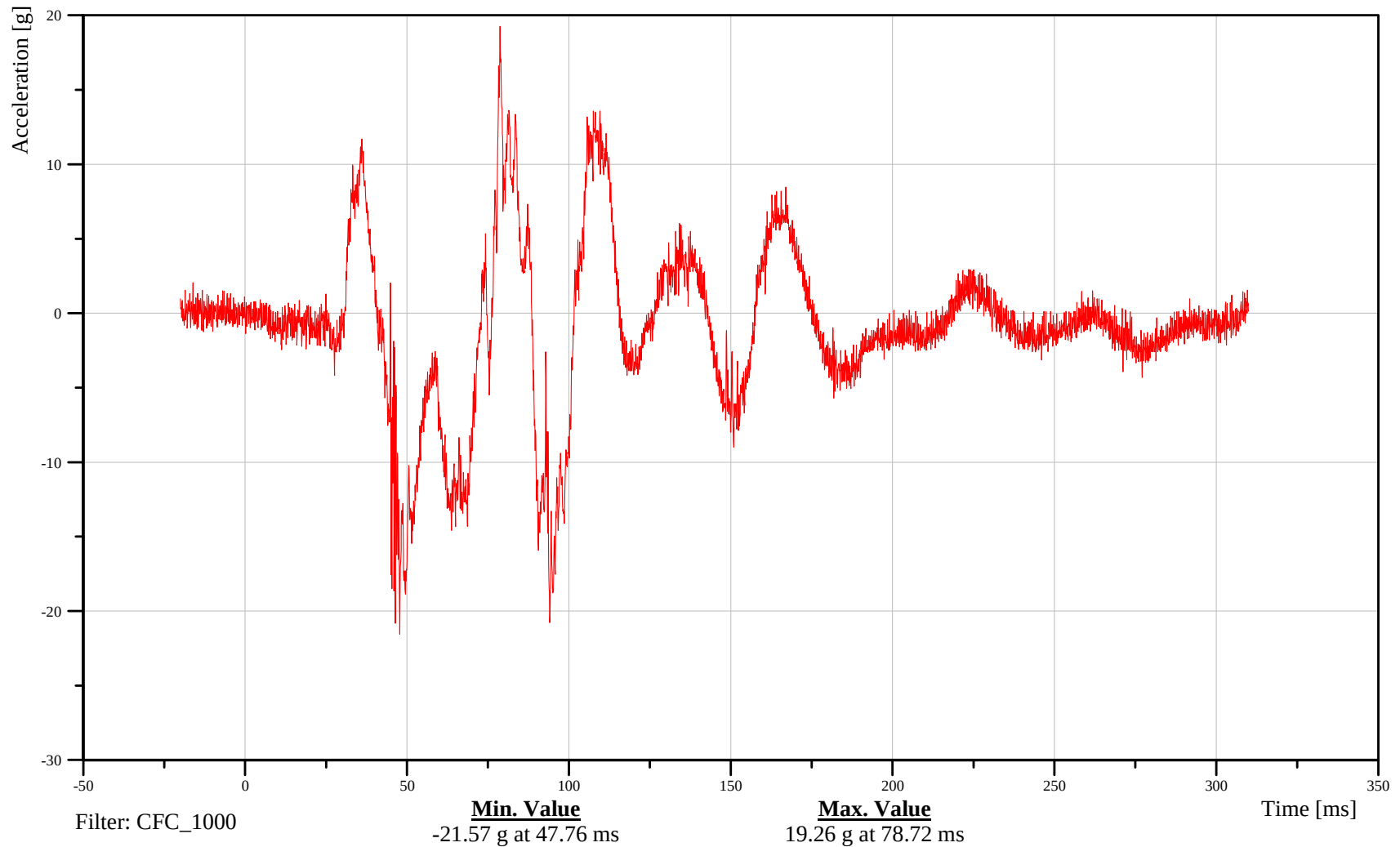
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-191

080729



World SID Evaluation
Passenger Thorax Rib 1 Y-Axis Acceleration

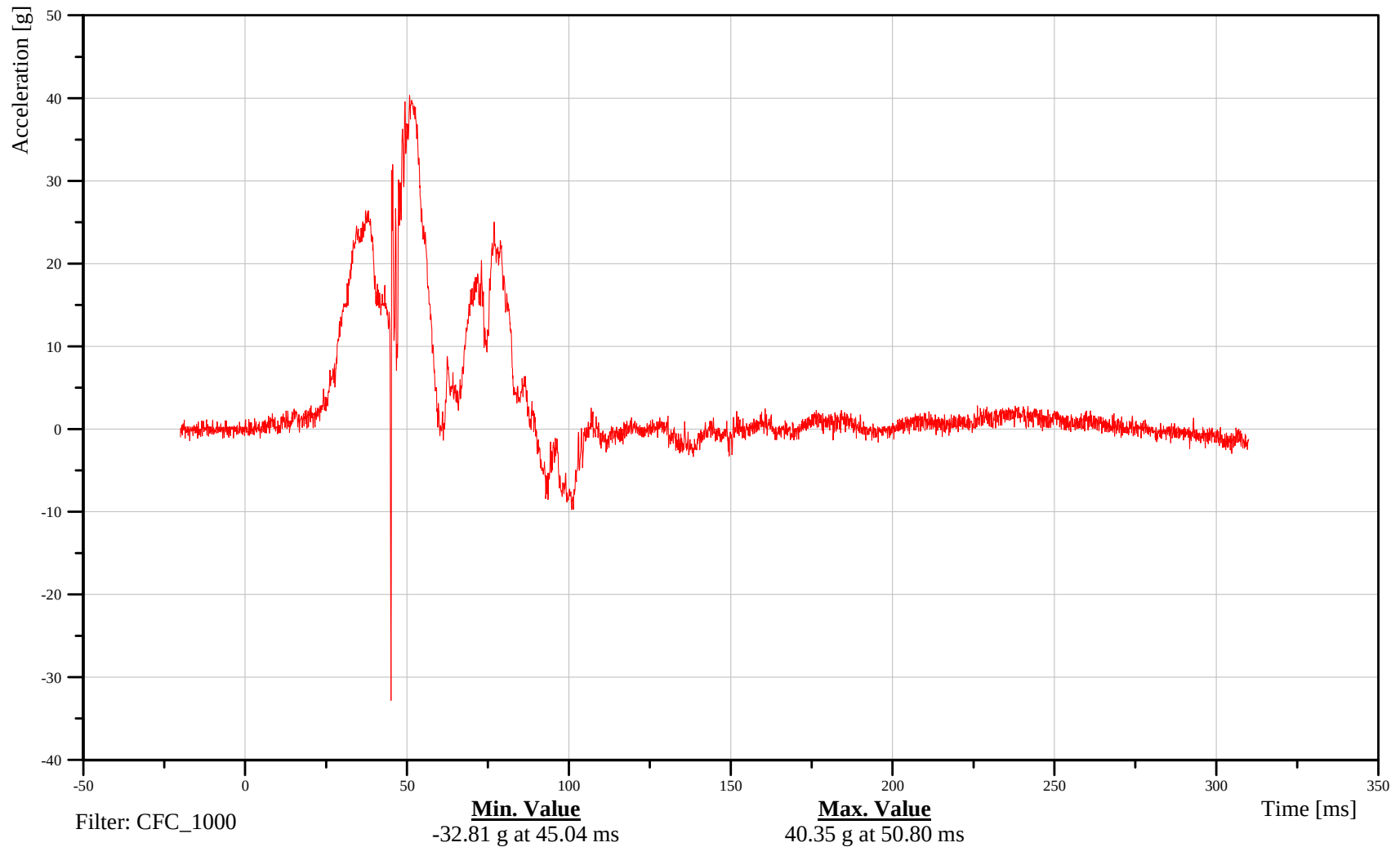
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-192

080729



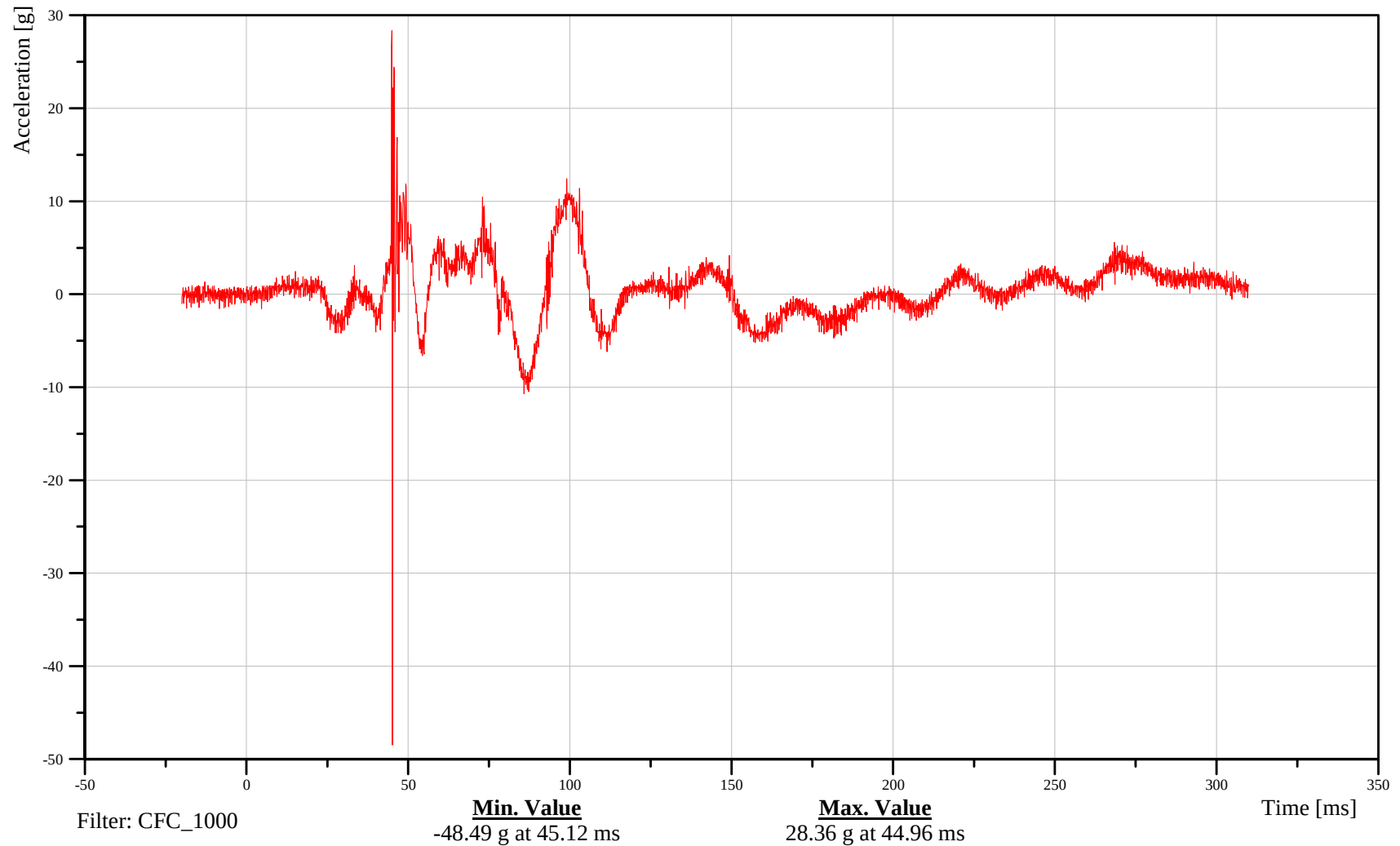
World SID Evaluation
Passenger Thorax Rib 1 Z-Axis Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE01WSACZA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-193

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

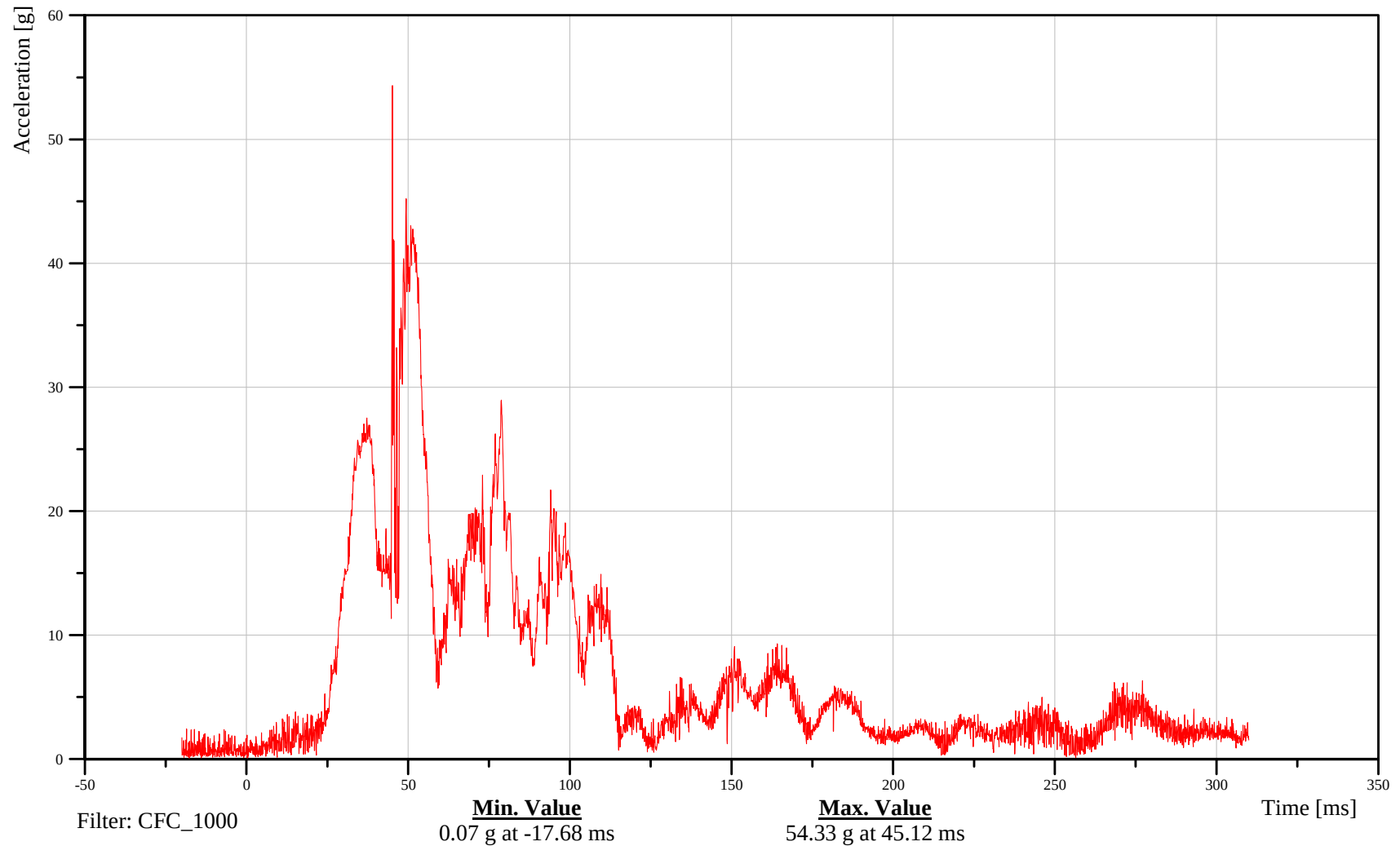
Passenger Thorax Rib 1 Resultant Acceleration

Customer: VRTC

14TRRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-194

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

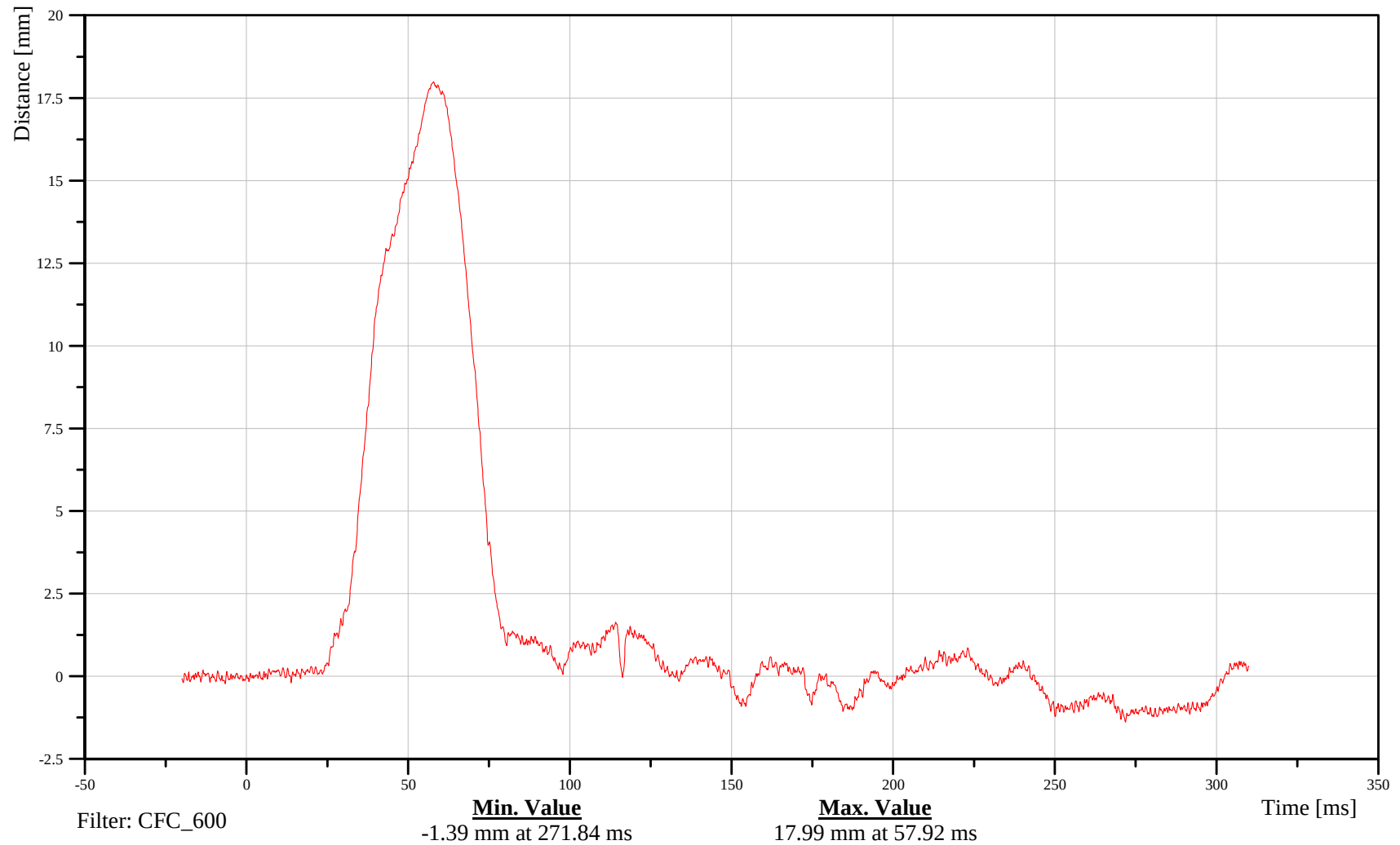
Passenger Thorax Rib 2 Y-Axis Displacement

Customer: VRTC

14TRRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-195

080729



World SID Evaluation
Passenger Thorax Rib 2 X-Axis Acceleration

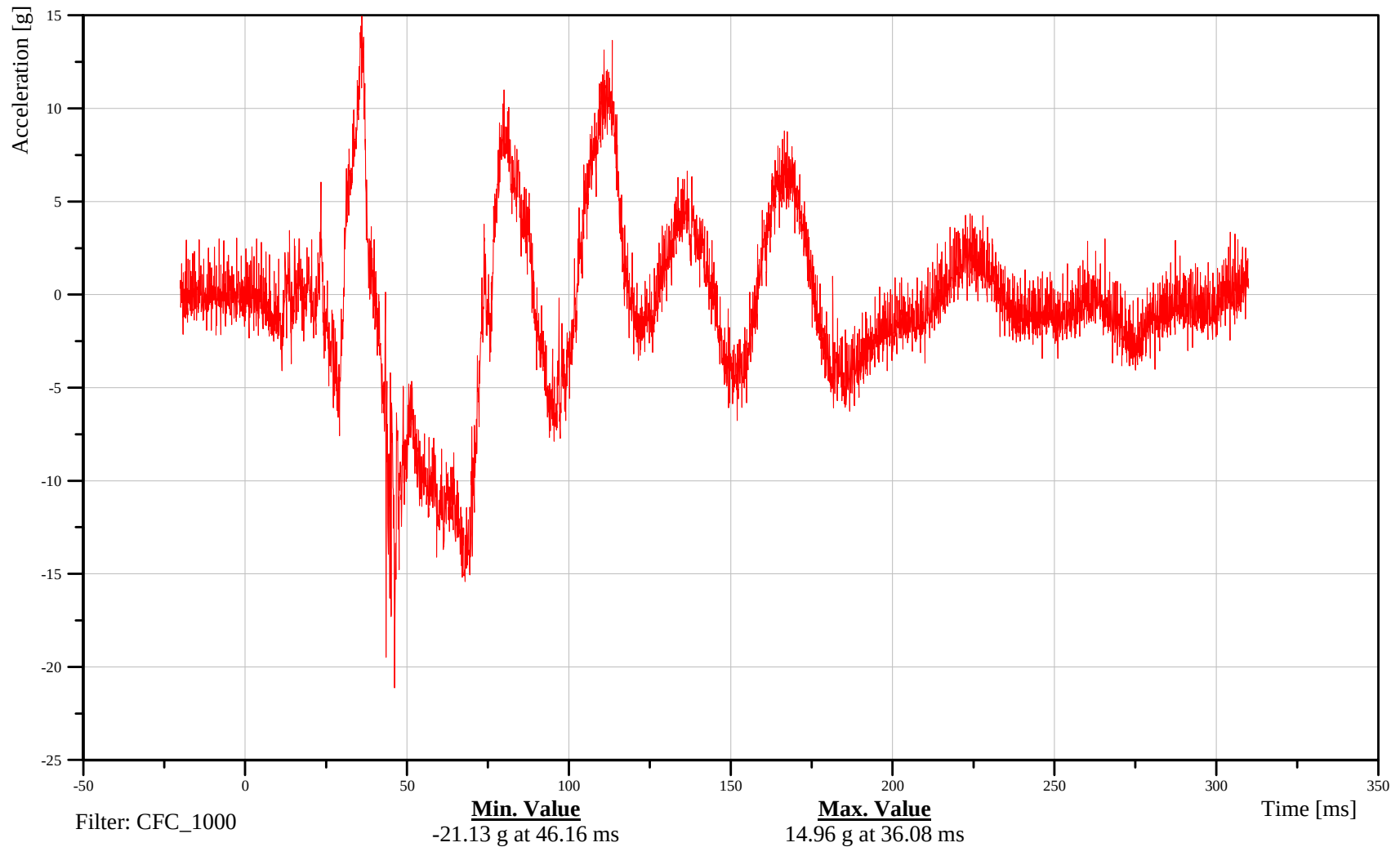
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-196

080729



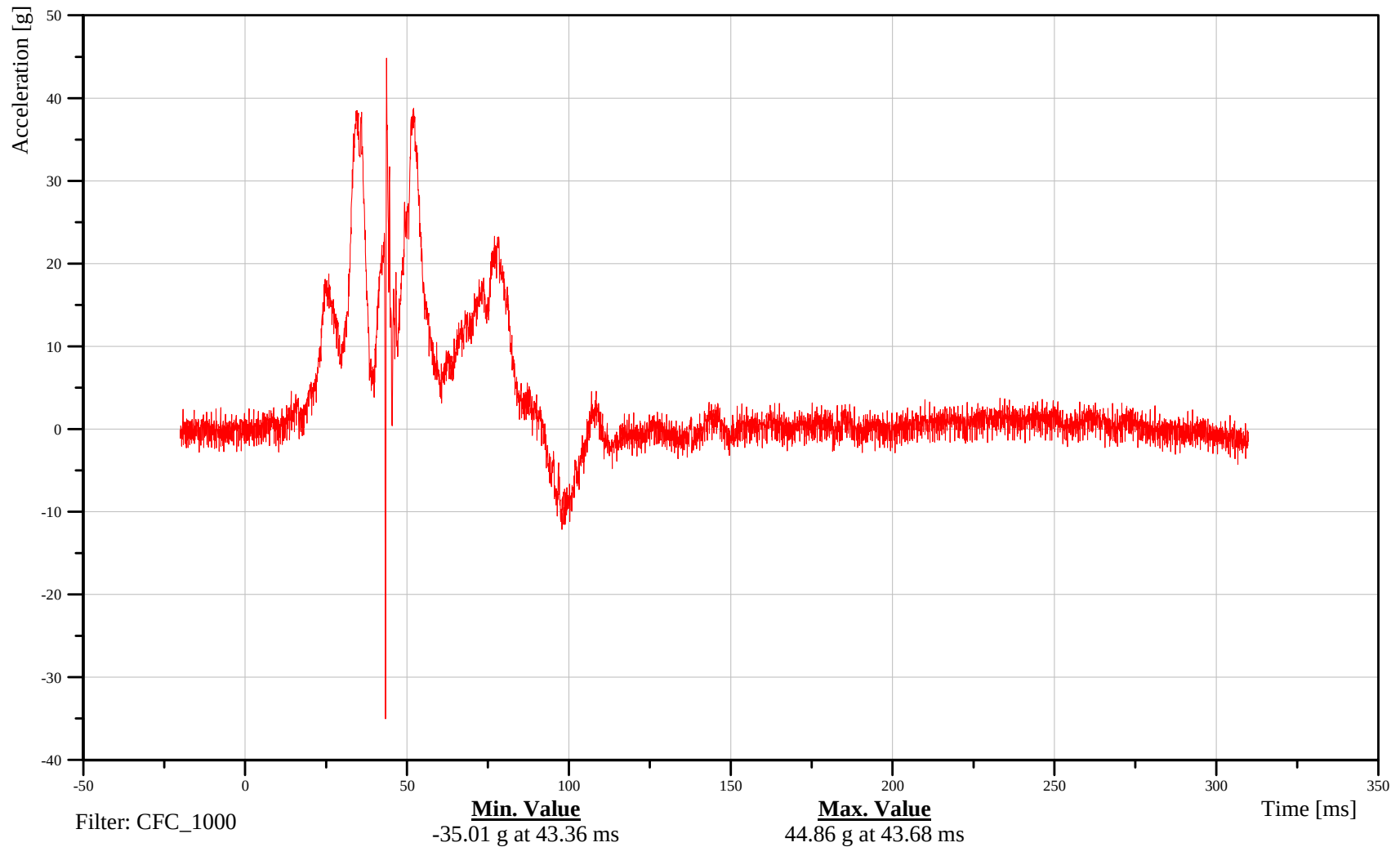
World SID Evaluation
Passenger Thorax Rib 2 Y-Axis Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE02WSACYA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-197

080729



World SID Evaluation
Passenger Thorax Rib 2 Z-Axis Acceleration

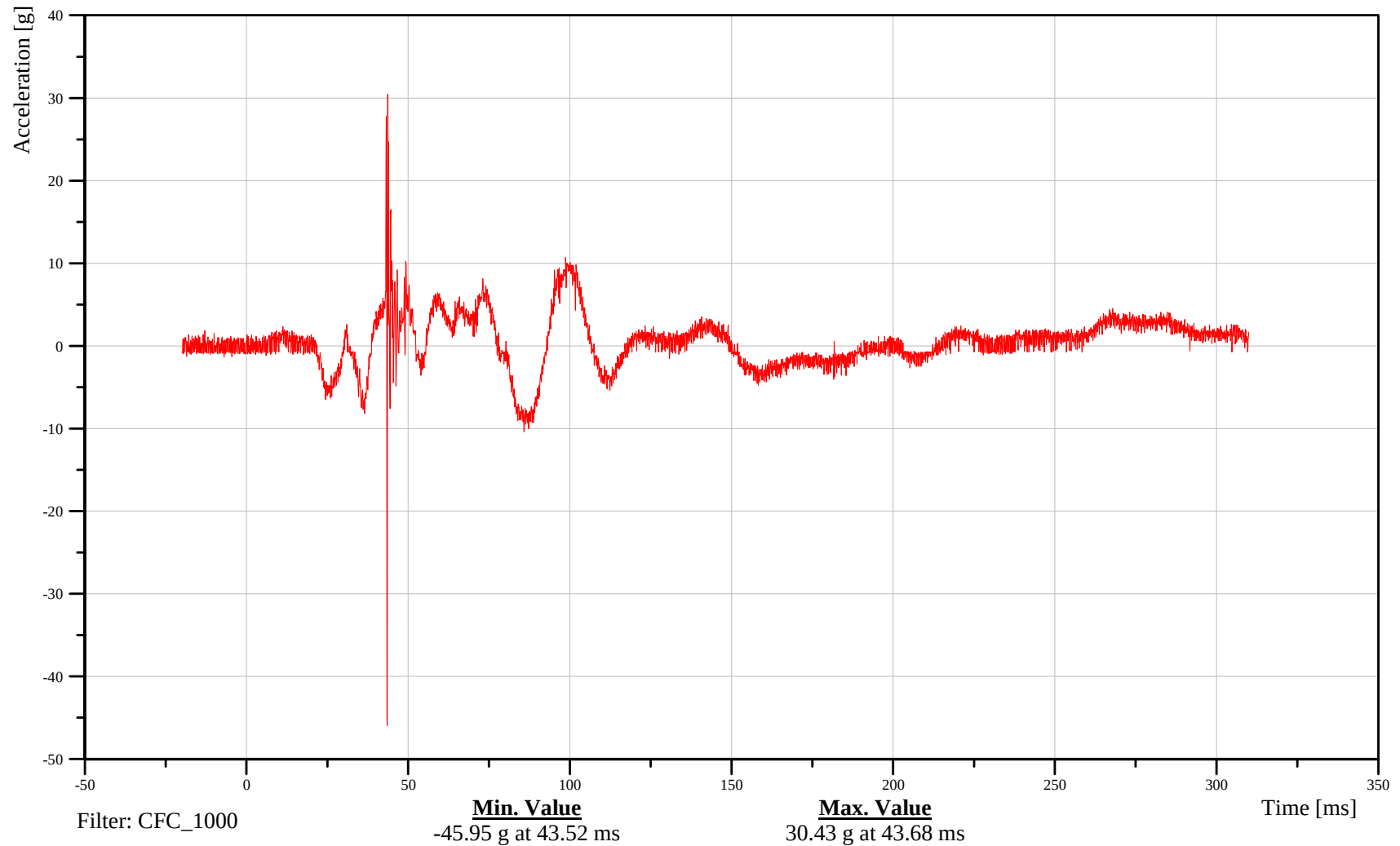
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-198

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

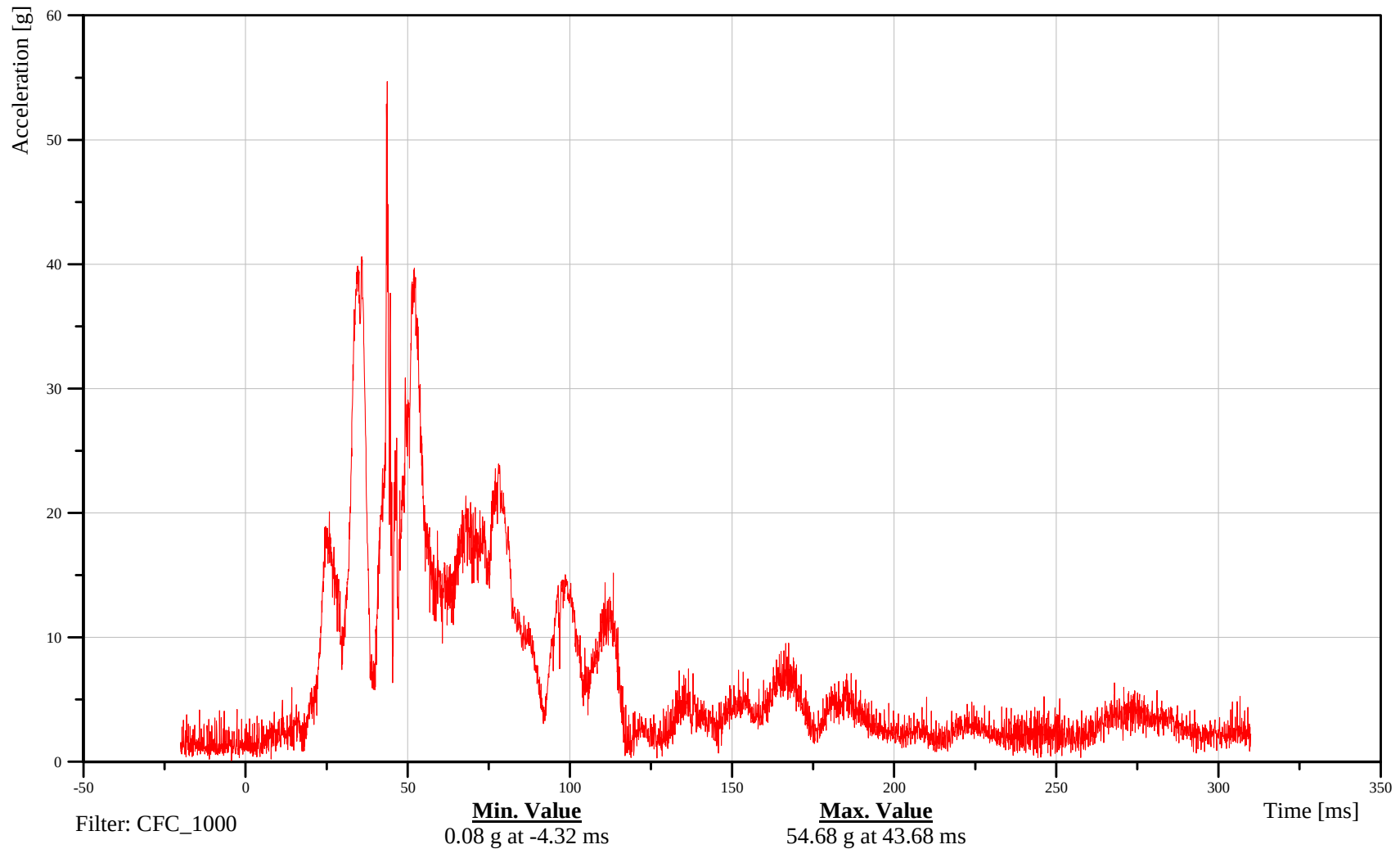
Passenger Thorax Rib 2 Resultant Acceleration

Customer: VRTC

14TRRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-199

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

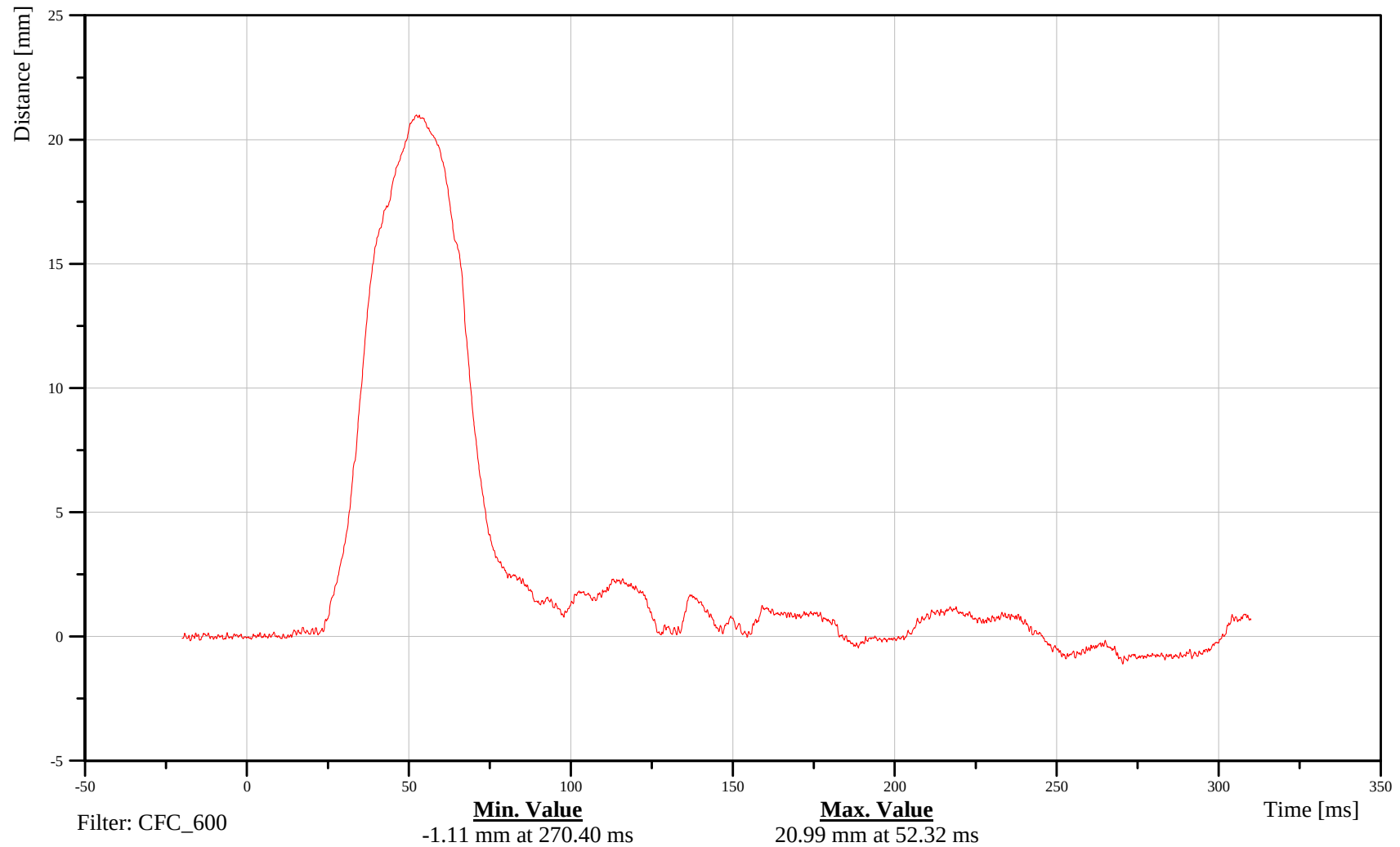
Passenger Thorax Rib 3 Y-Axis Displacement

Customer: VRTC

14TRRILE03WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-200

080729



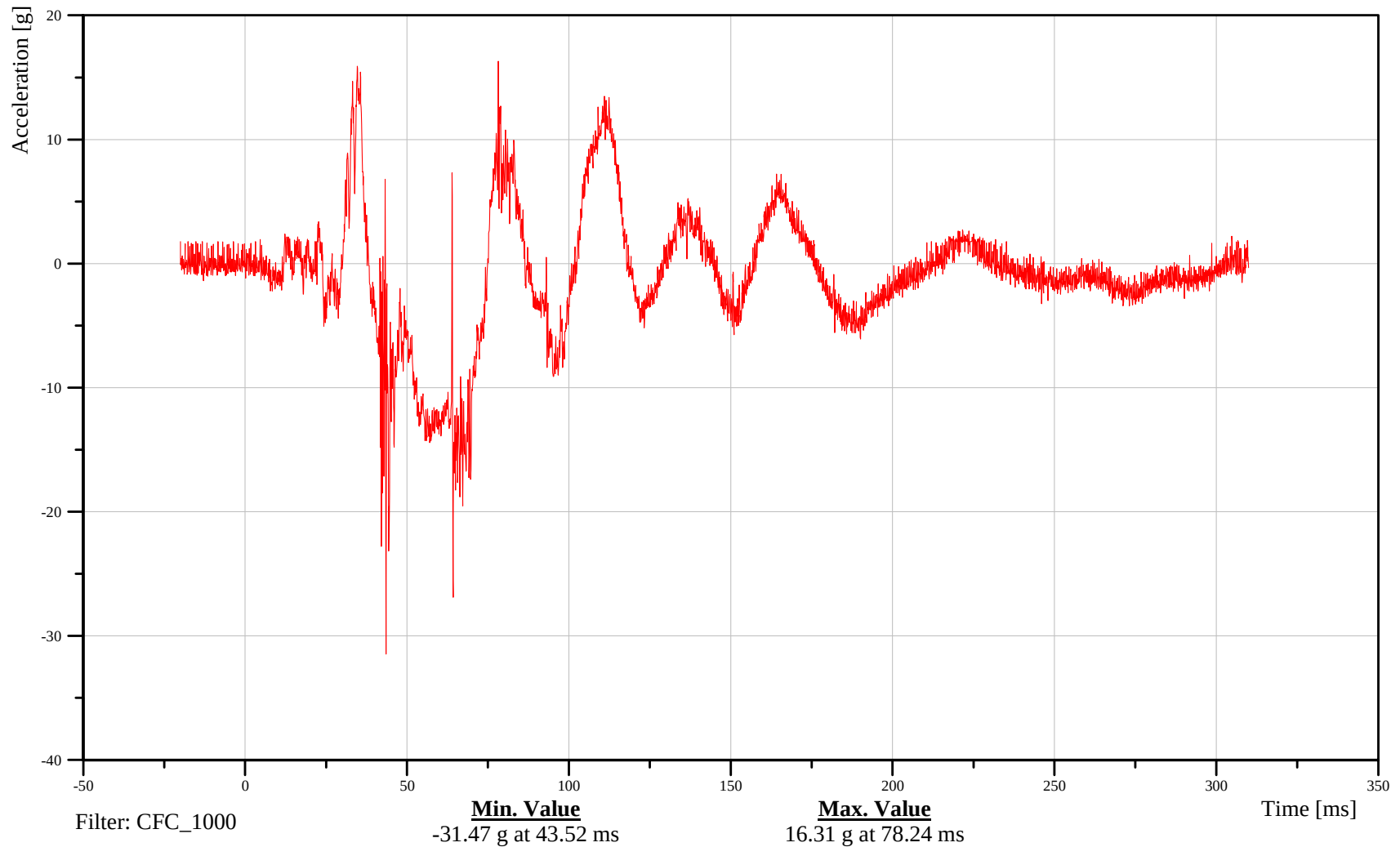
World SID Evaluation
Passenger Thorax Rib 3 X-Axis Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE03WSACXA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-201

080729



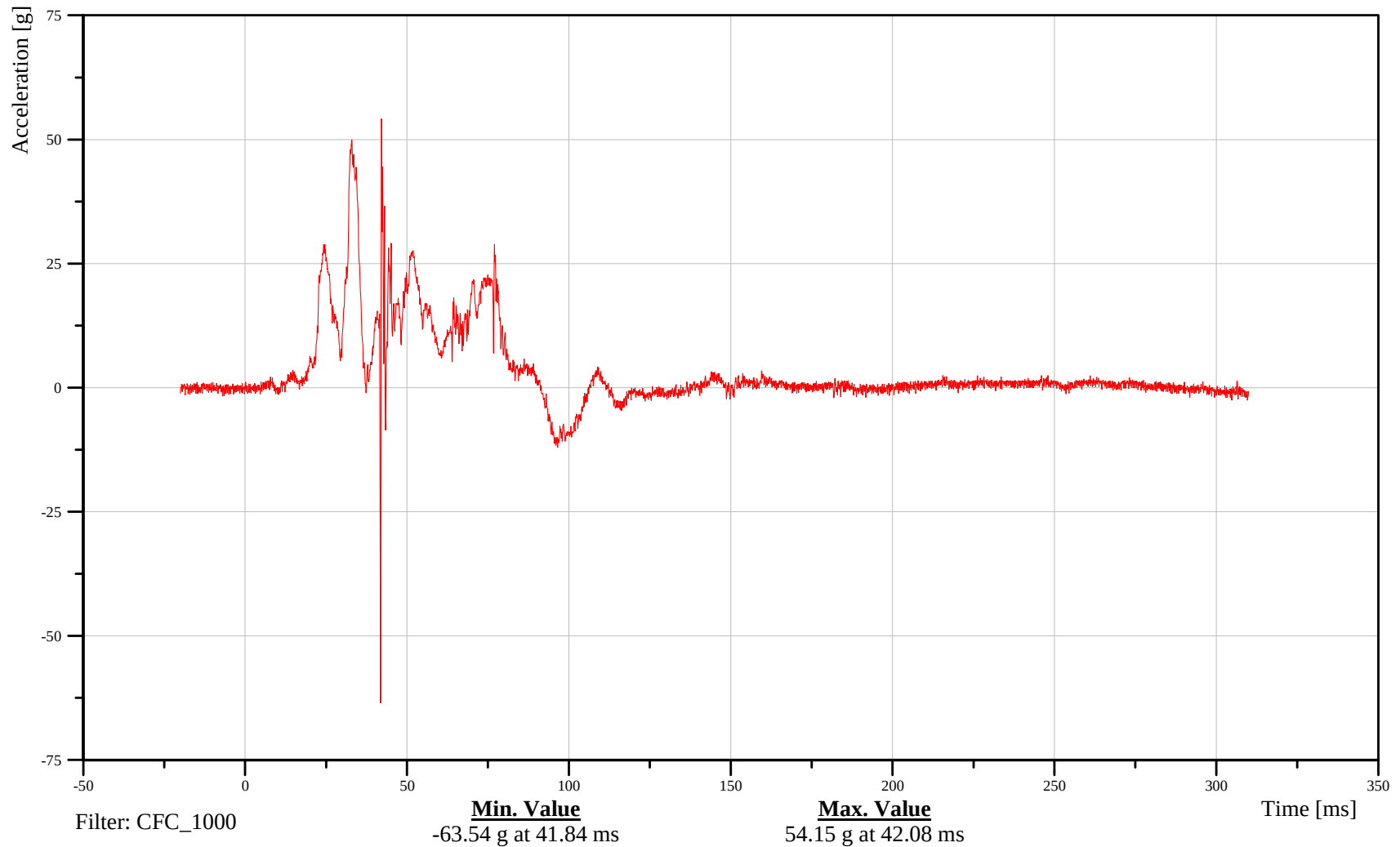
World SID Evaluation
Passenger Thorax Rib 3 Y-Axis Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE03WSACYA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-202

080729



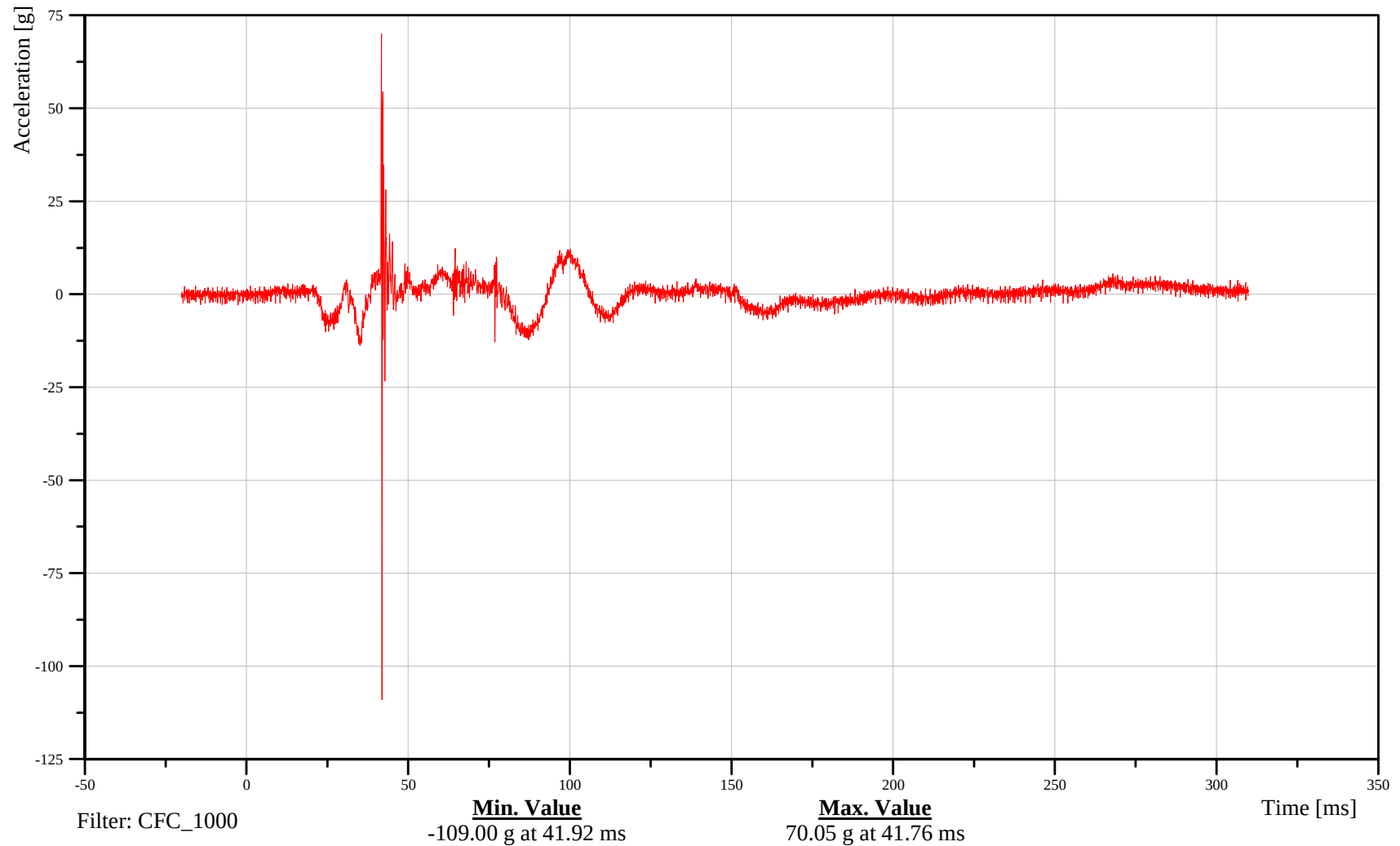
World SID Evaluation
Passenger Thorax Rib 3 Z-Axis Acceleration

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14TRRILE03WSACZA

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-203

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

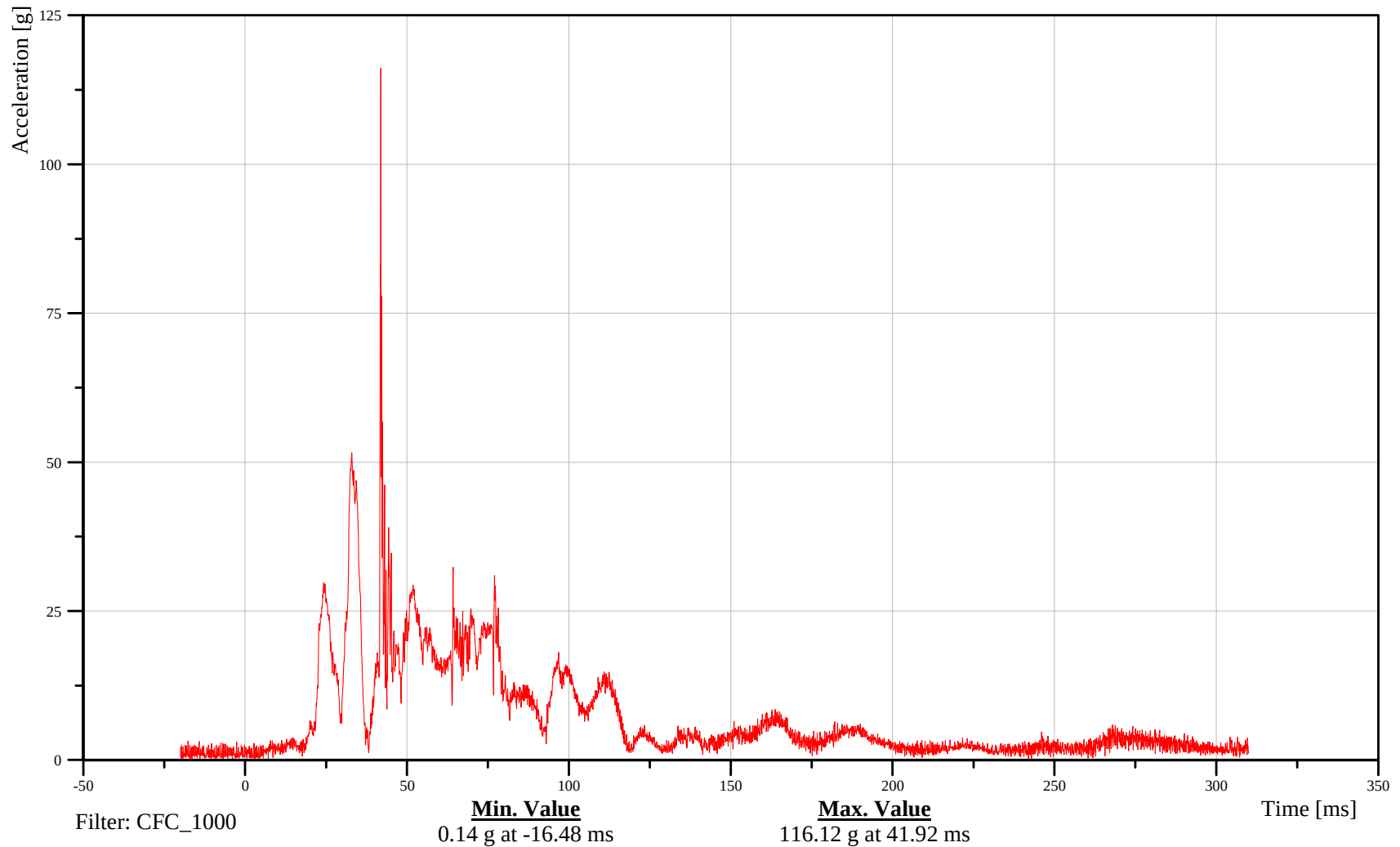
Passenger Thorax Rib 3 Resultant Acceleration

Customer: VRTC

14TRRILE03WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-204

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

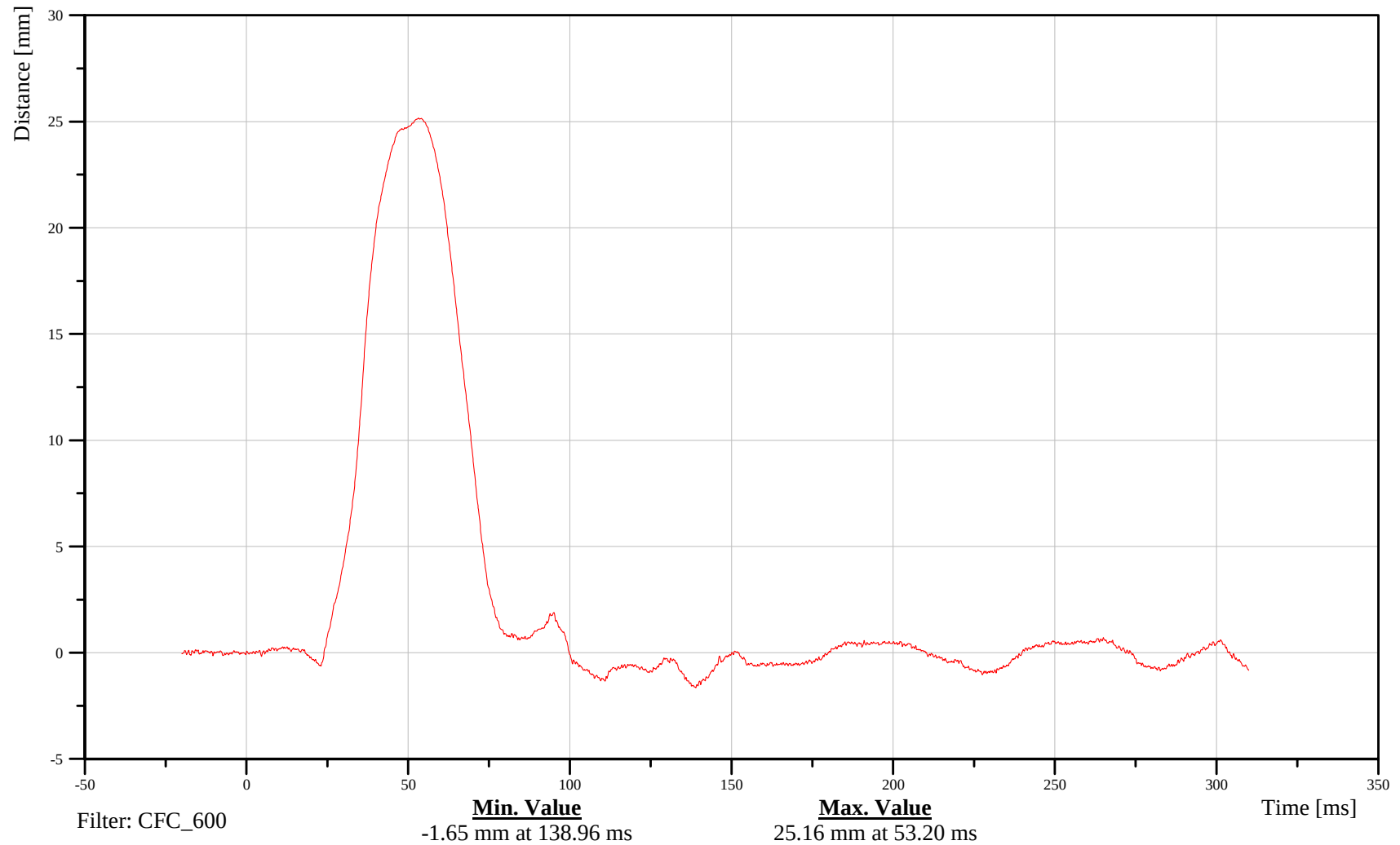
Passenger Abdominal Rib 1 Y-Axis Displacement

Customer: VRTC

14ABRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-205

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

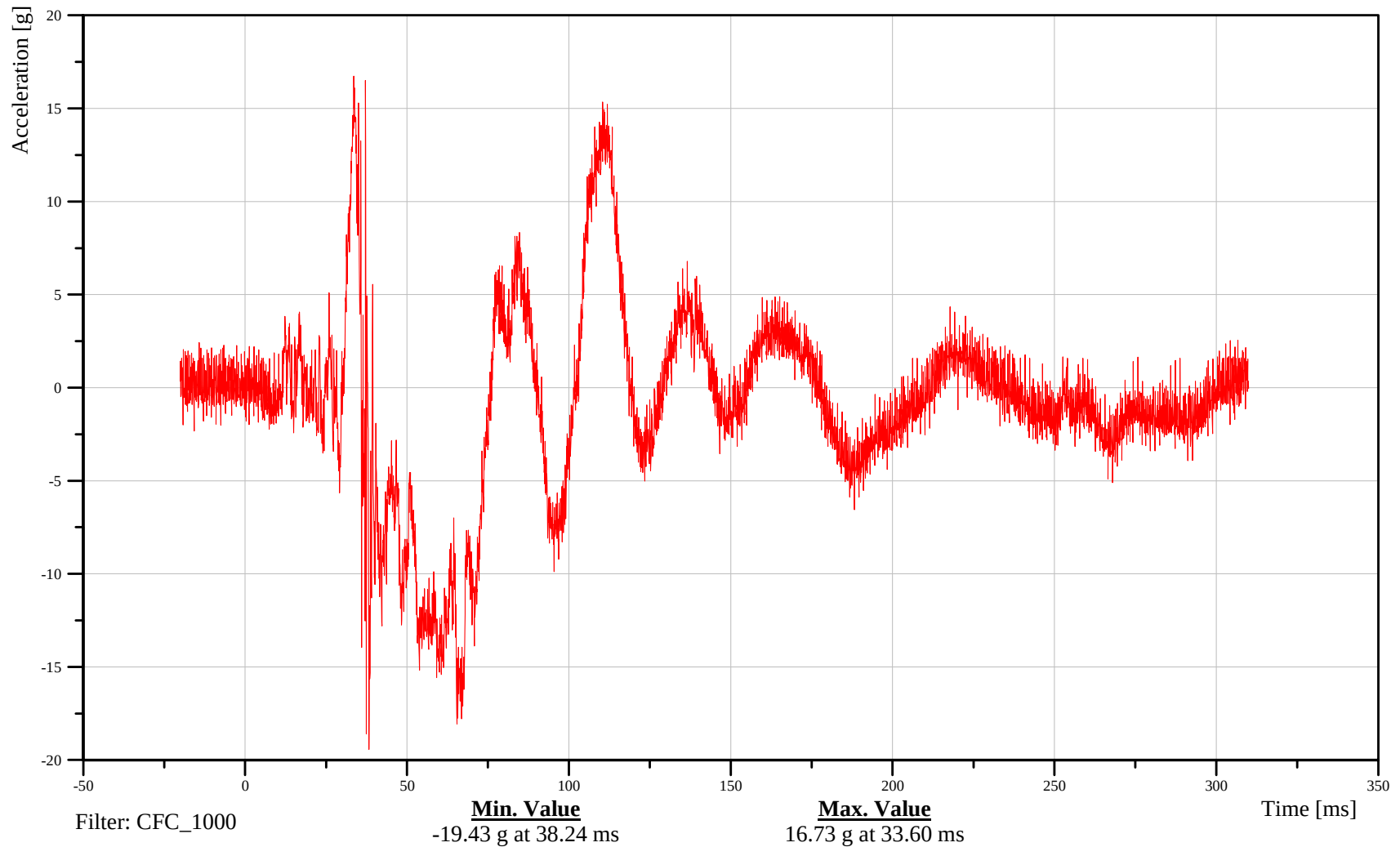
Passenger Abdominal Rib 1 X-Axis Acceleration

Customer: VRTC

14ABRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-206

080729



World SID Evaluation

Passenger Abdominal Rib 1 Y-Axis Acceleration

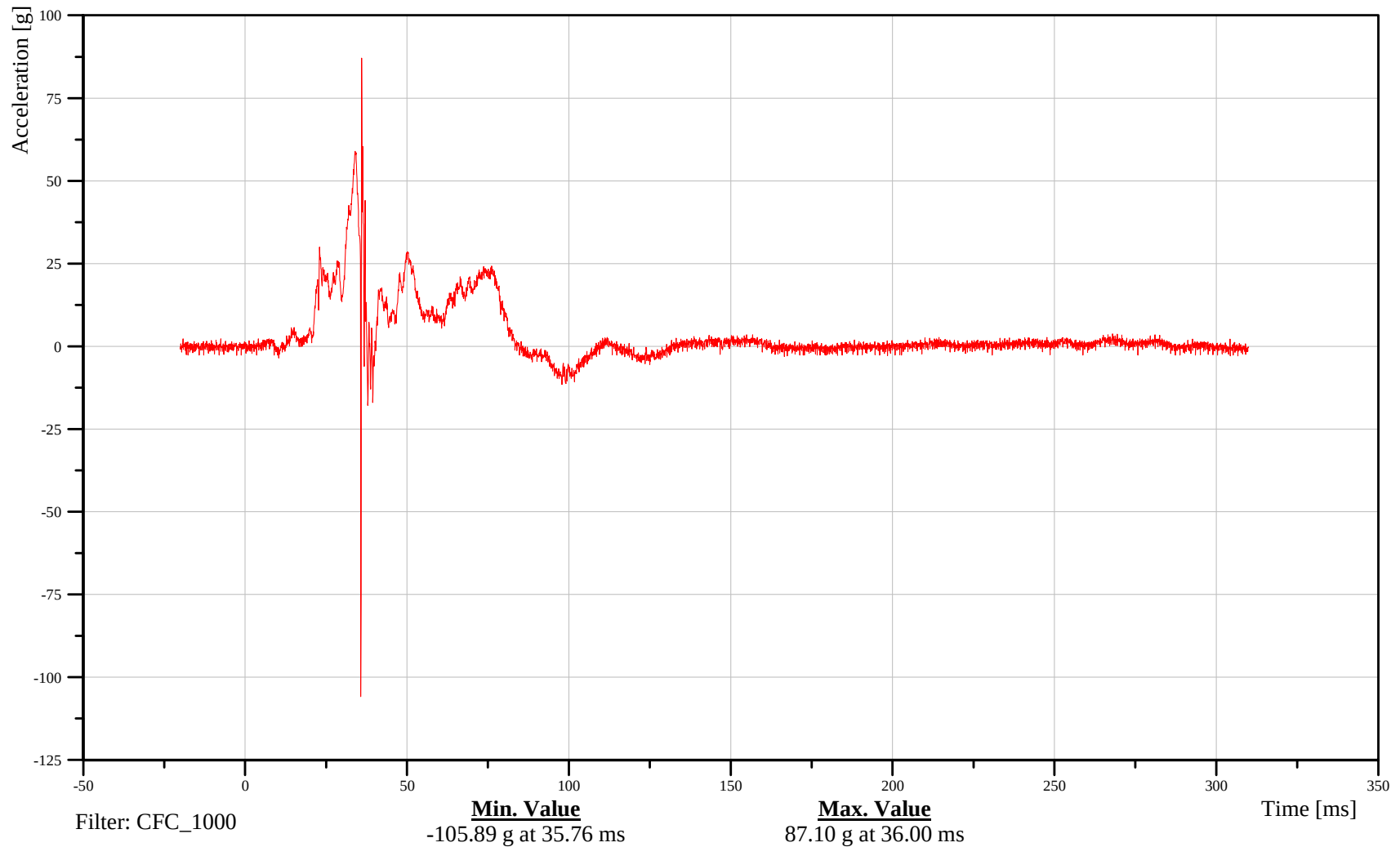
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14ABRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-207

080729



World SID Evaluation

Passenger Abdominal Rib 1 Z-Axis Acceleration

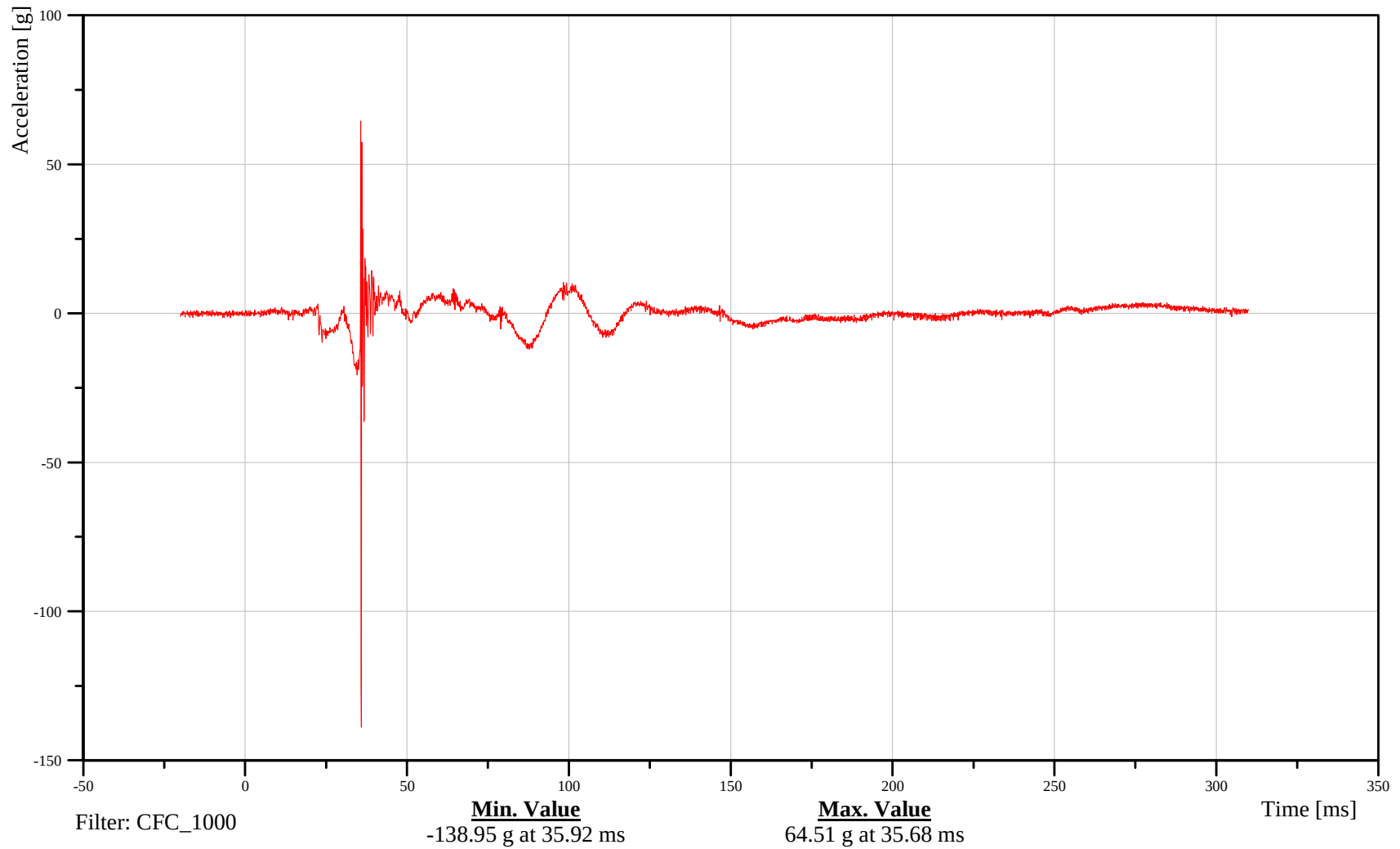
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14ABRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-208

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

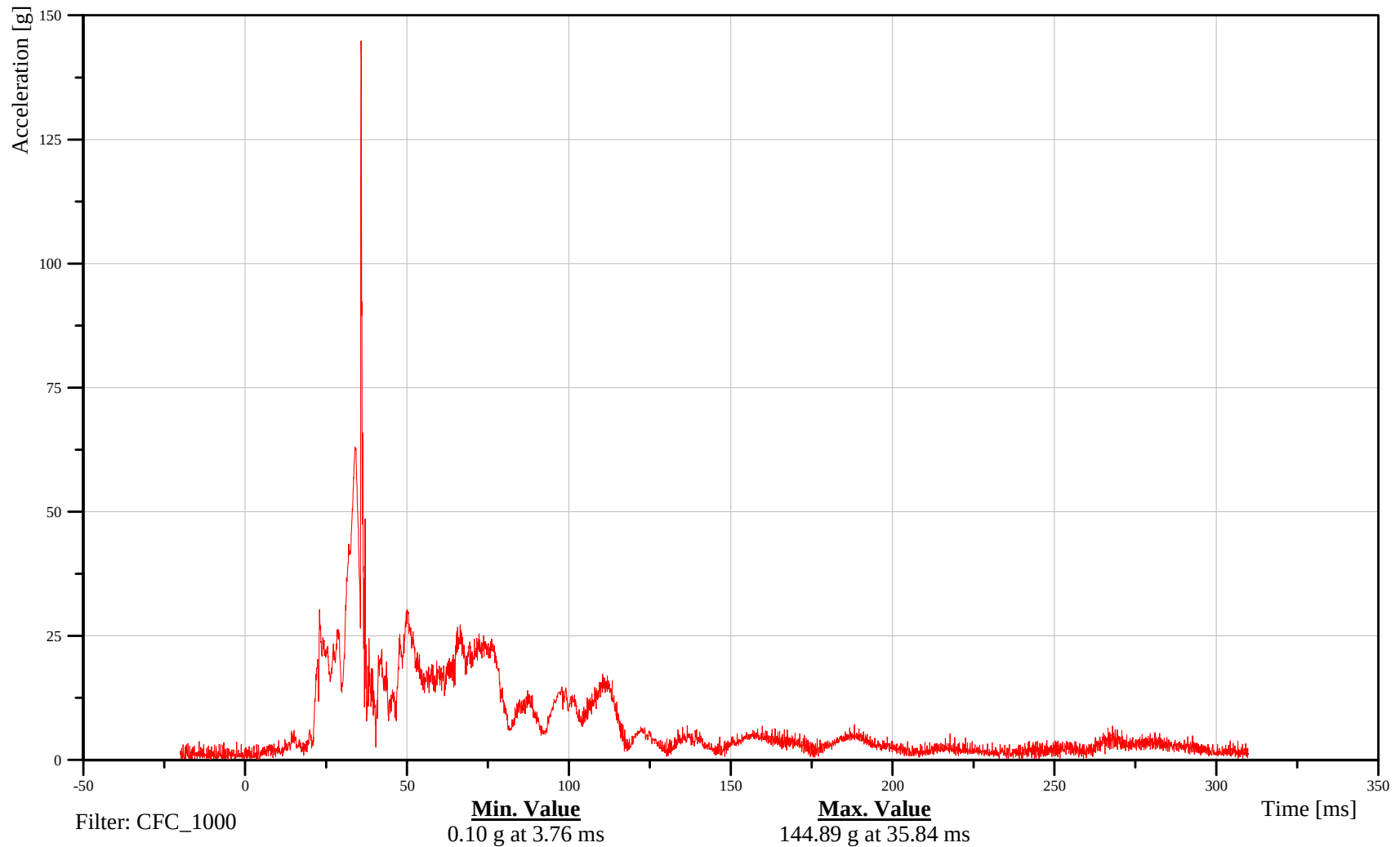
Passenger Abdominal Rib 1 Resultant Acceleration

Customer: VRTC

14ABRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-209

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

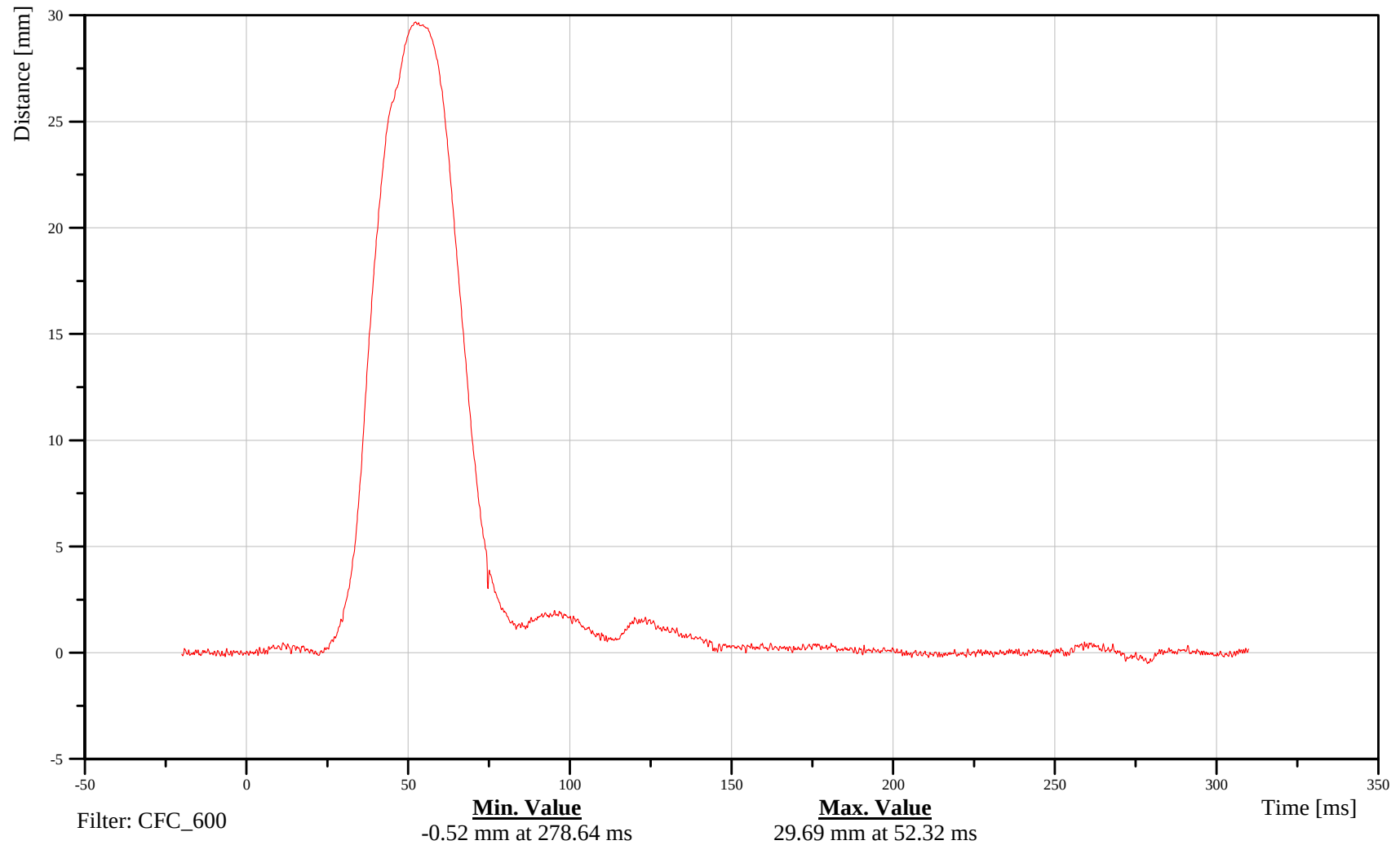
Passenger Abdominal Rib 2 Y-Axis Displacement

Customer: VRTC

14ABRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-210

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

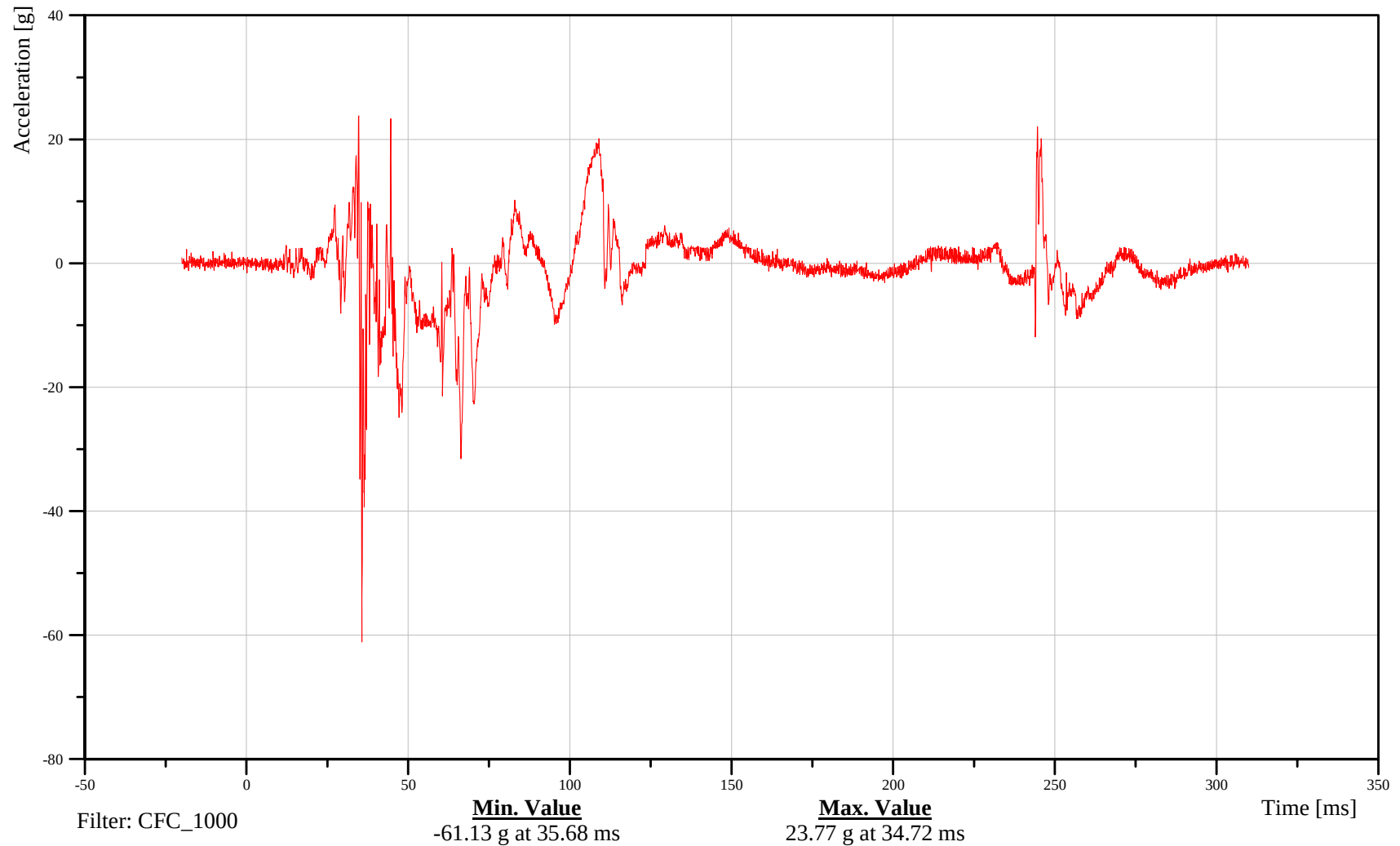
Passenger Abdominal Rib 2 X-Axis Acceleration

Customer: VRTC

14ABRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-211

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

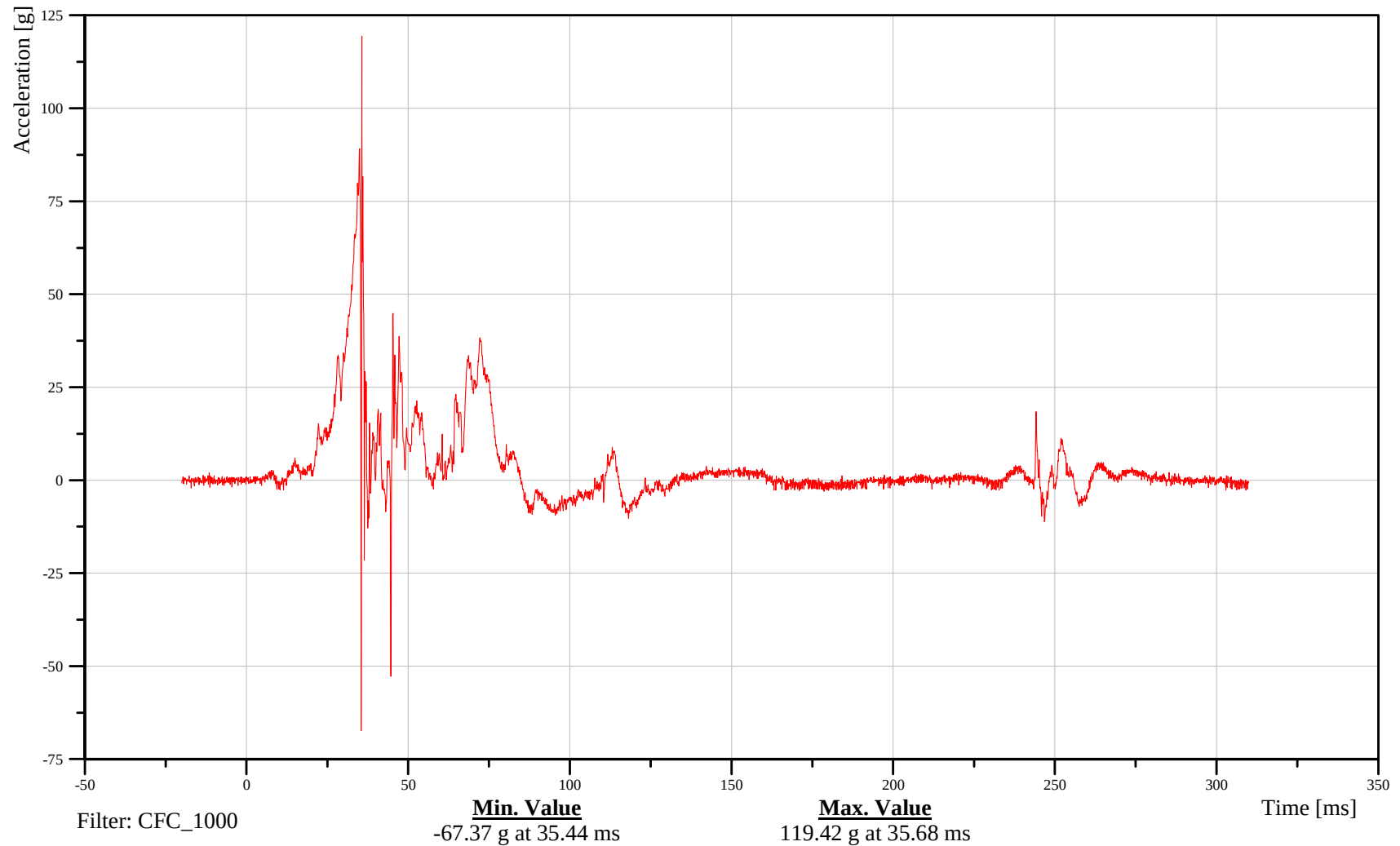
Passenger Abdominal Rib 2 Y-Axis Acceleration

Customer: VRTC

14ABRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-212

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

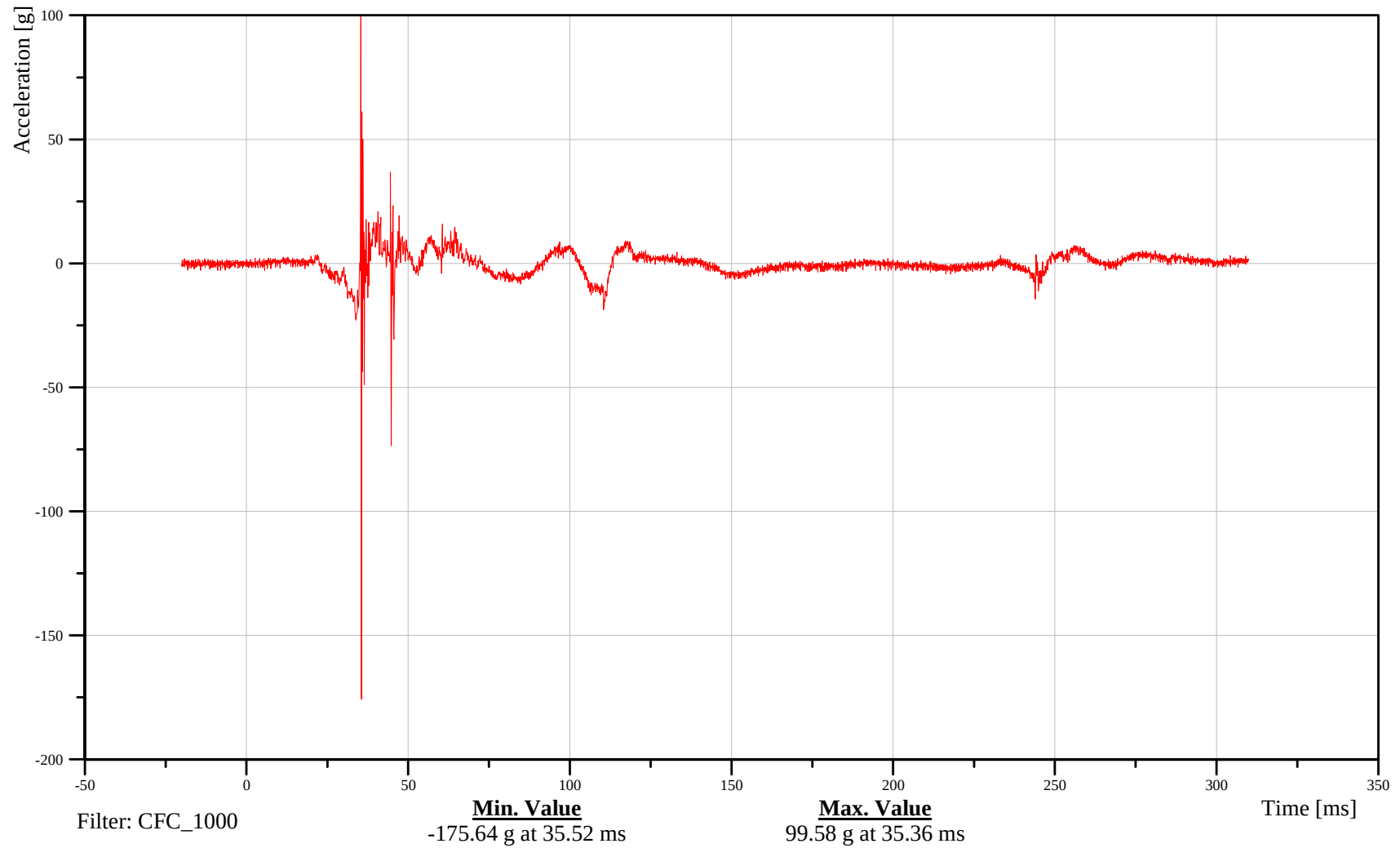
Passenger Abdominal Rib 2 Z-Axis Acceleration

Customer: VRTC

14ABRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-213

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

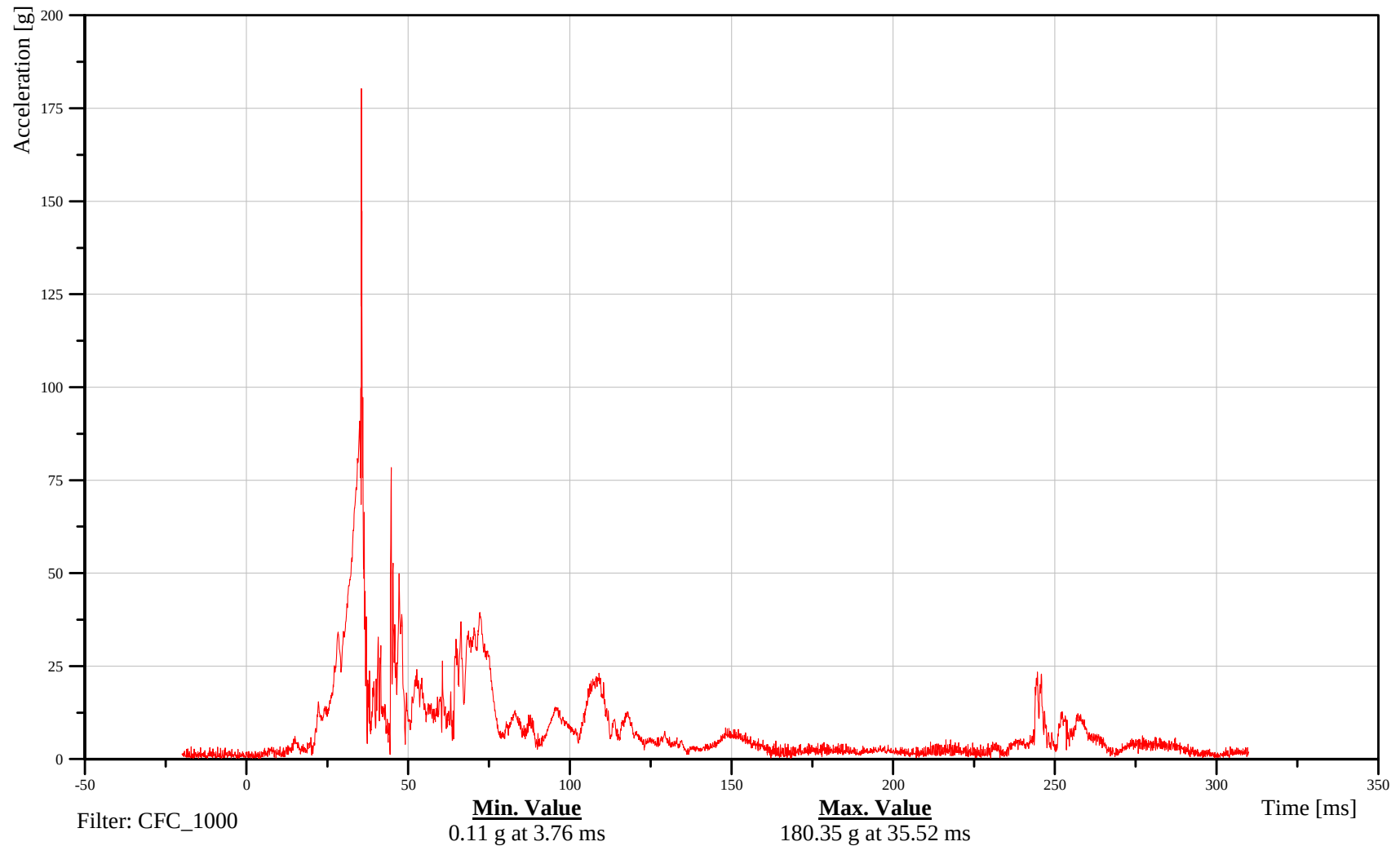
Passenger Abdominal Rib 2 Resultant Acceleration

Customer: VRTC

14ABRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-214

080729



World SID Evaluation
Passenger Lumbar X-Axis Force

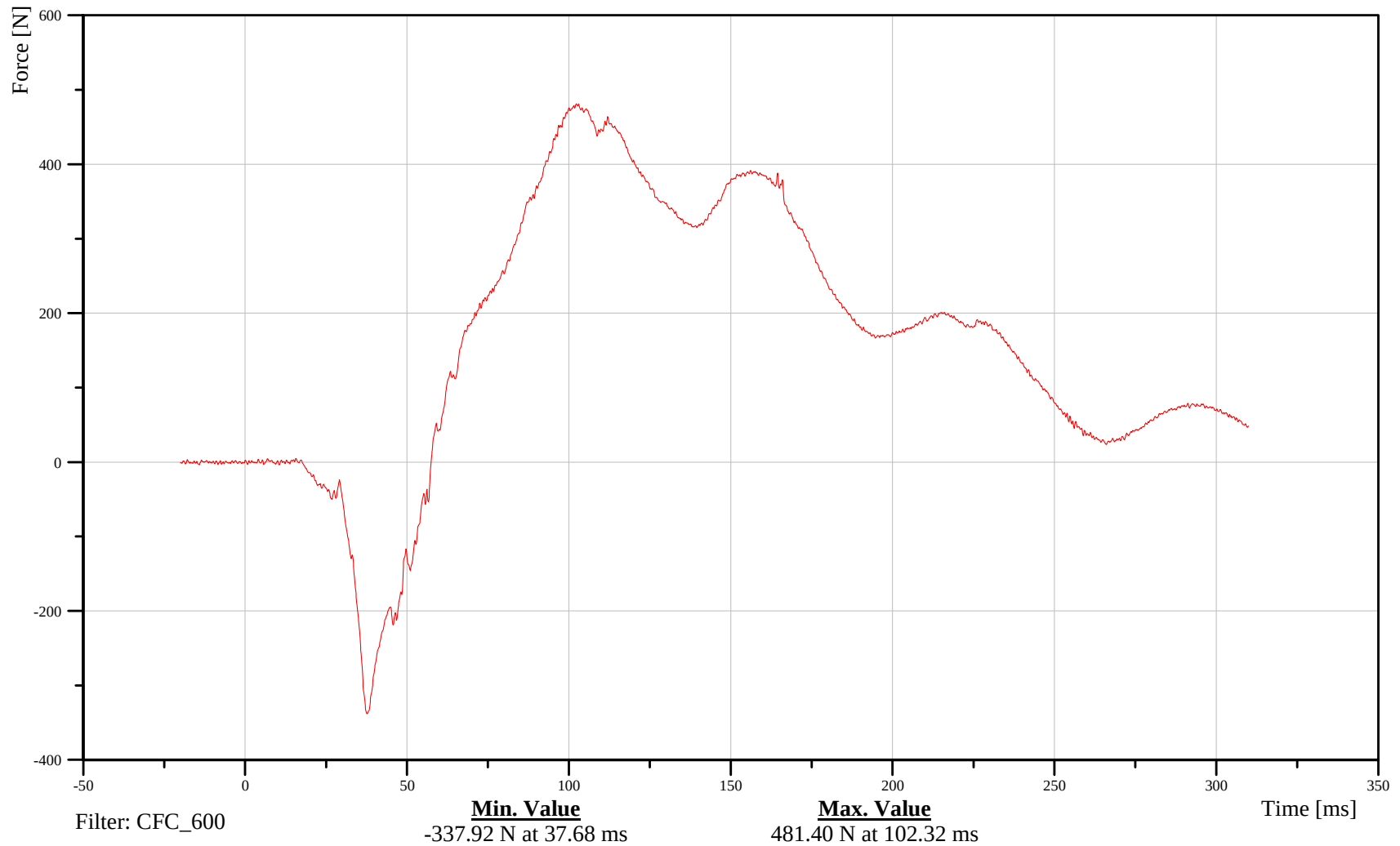
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14LUSP0000WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-215

080729



World SID Evaluation

Passenger Lumbar Y-Axis Force

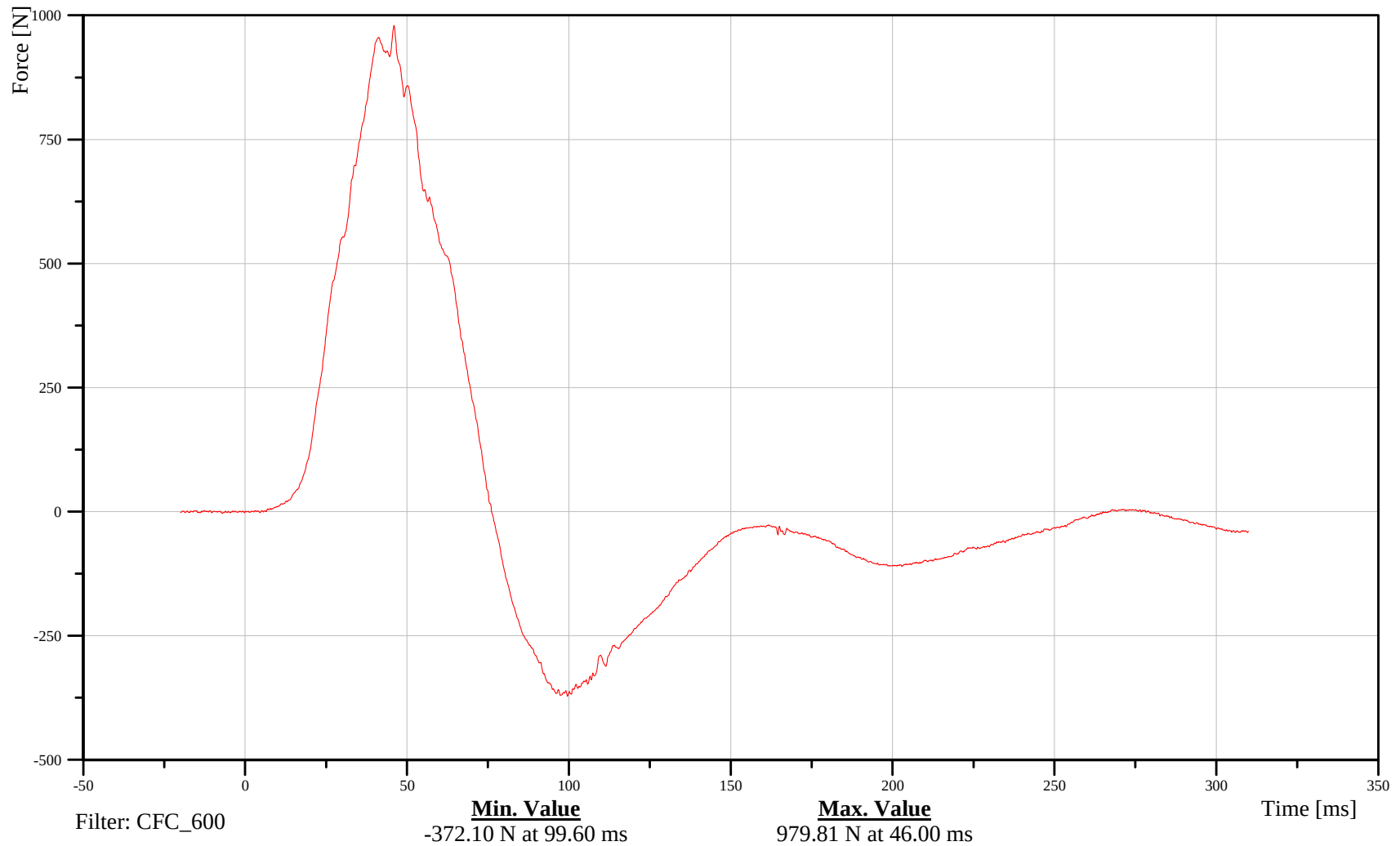
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14LUSP0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-216

080729



World SID Evaluation
Passenger Lumbar Z-Axis Force

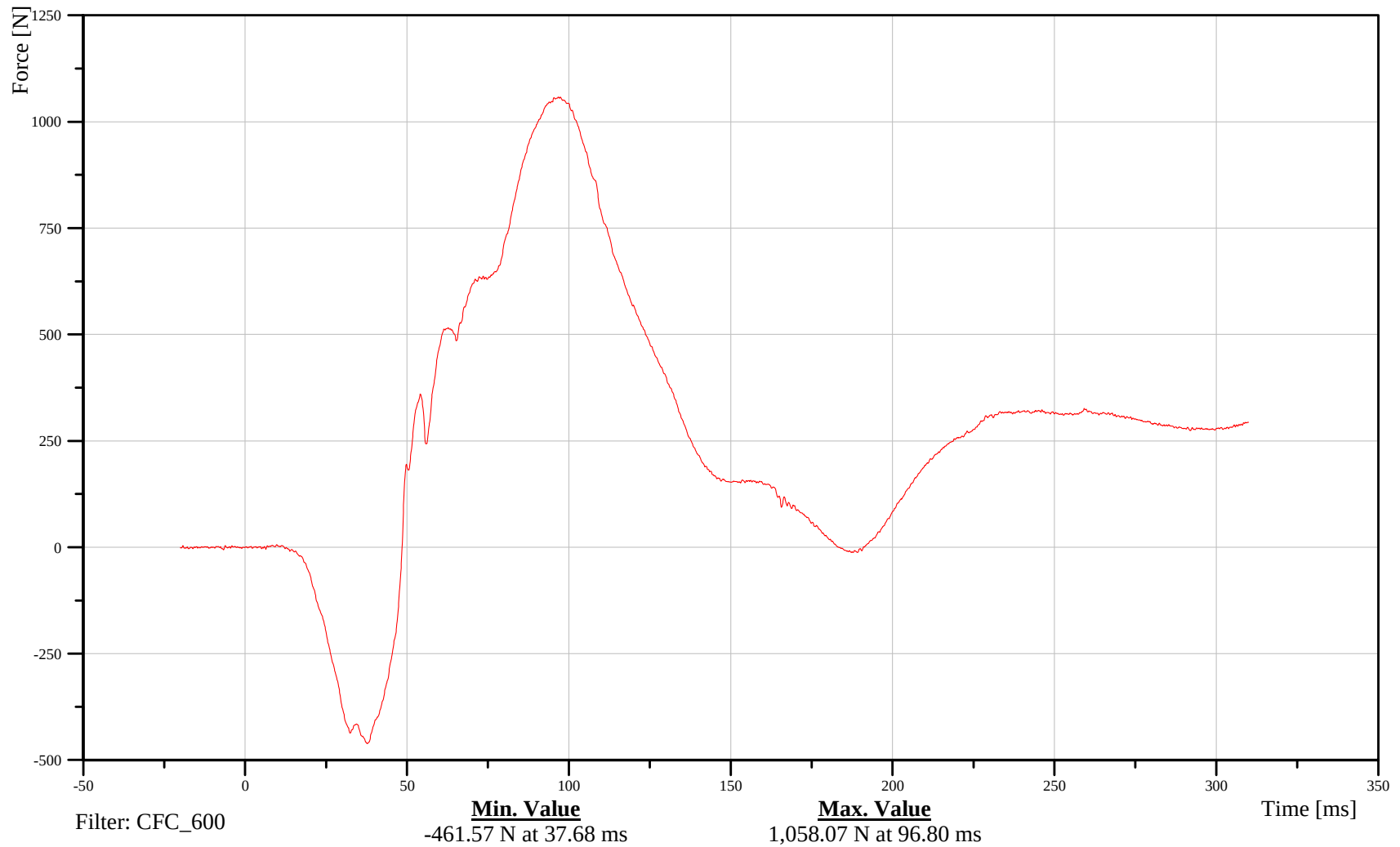
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14LUSP0000WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-217

080729



World SID Evaluation

Passenger Lumbar Moment About X Axis

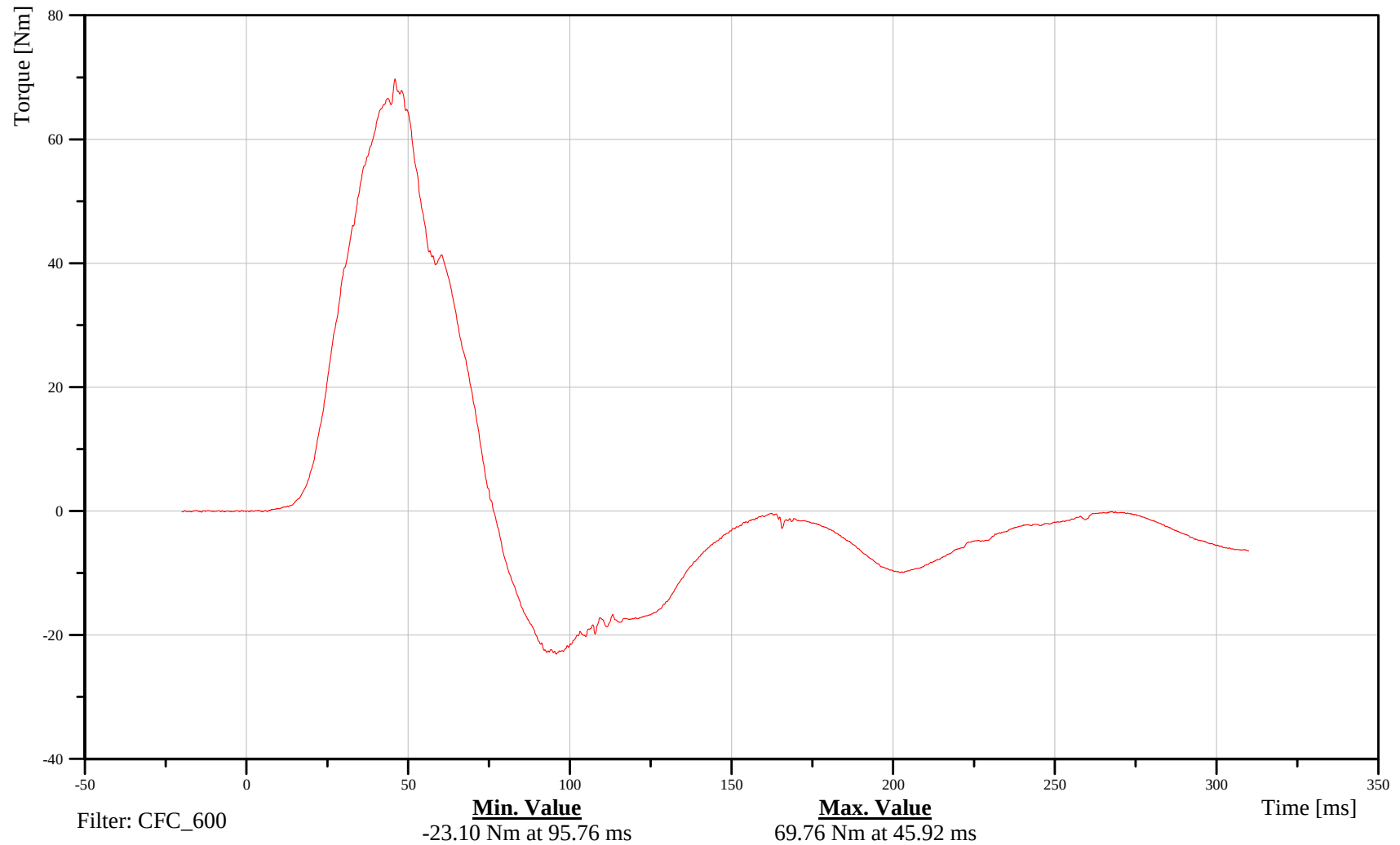
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14LUSP0000WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-218

080729



World SID Evaluation

Date: 07/29/2008
Time: 14:50

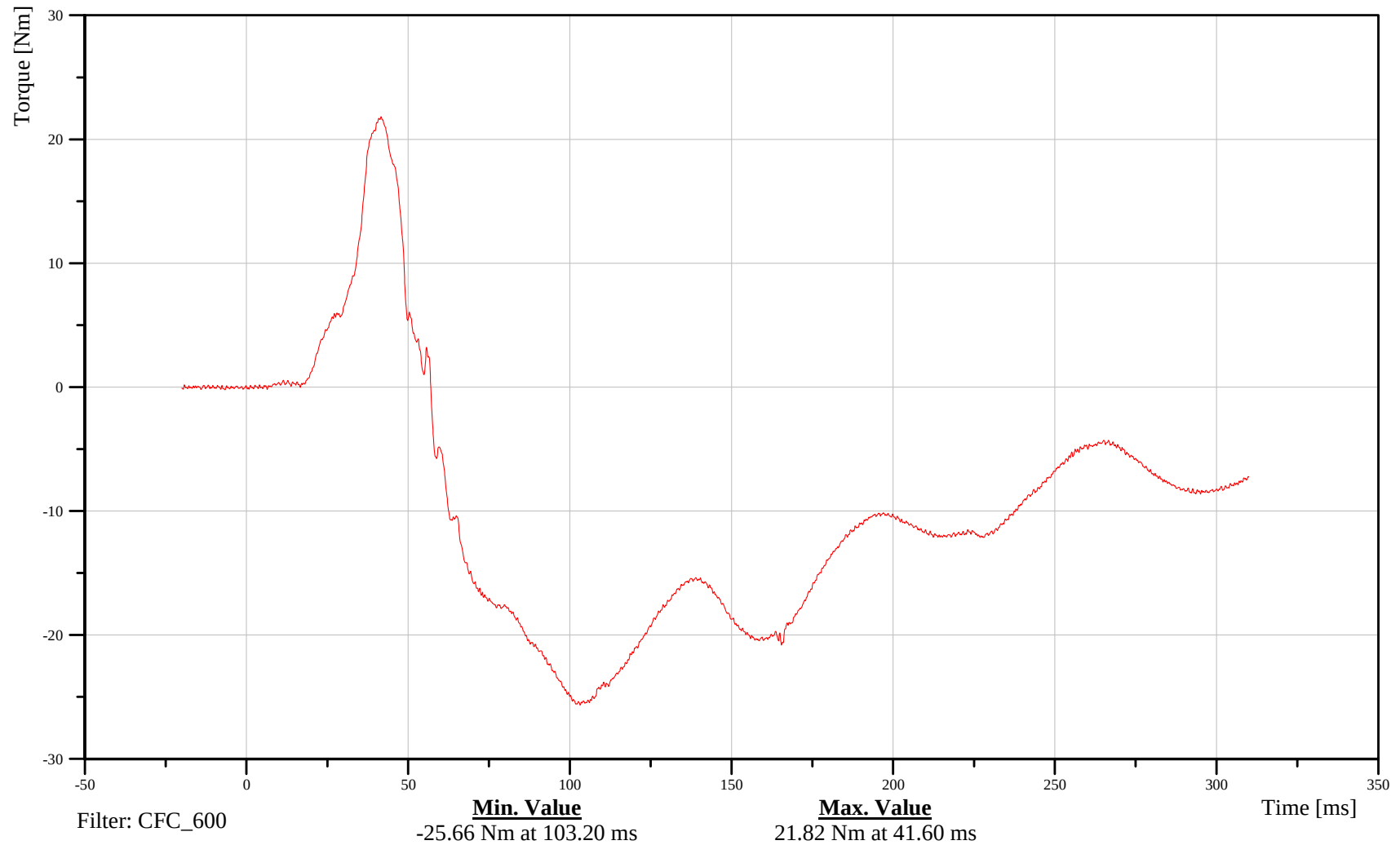
Passenger Lumbar Moment About Y Axis

Customer: VRTC

14LUSP0000WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-219

080729



World SID Evaluation
Passenger Lumbar Moment About Z Axis

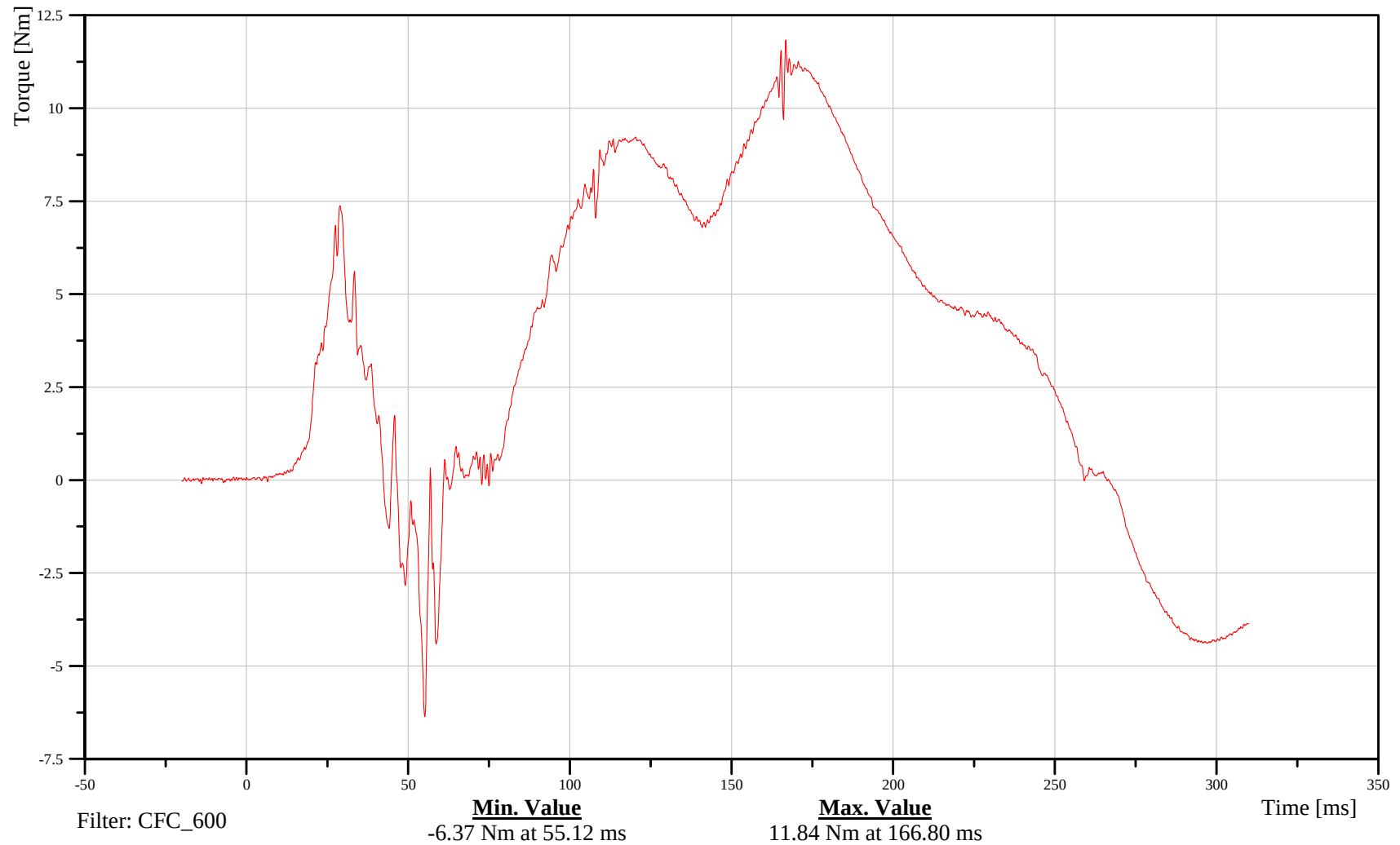
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14LUSP0000WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-220

080729



World SID Evaluation
Passenger Pelvis X-Axis Acceleration

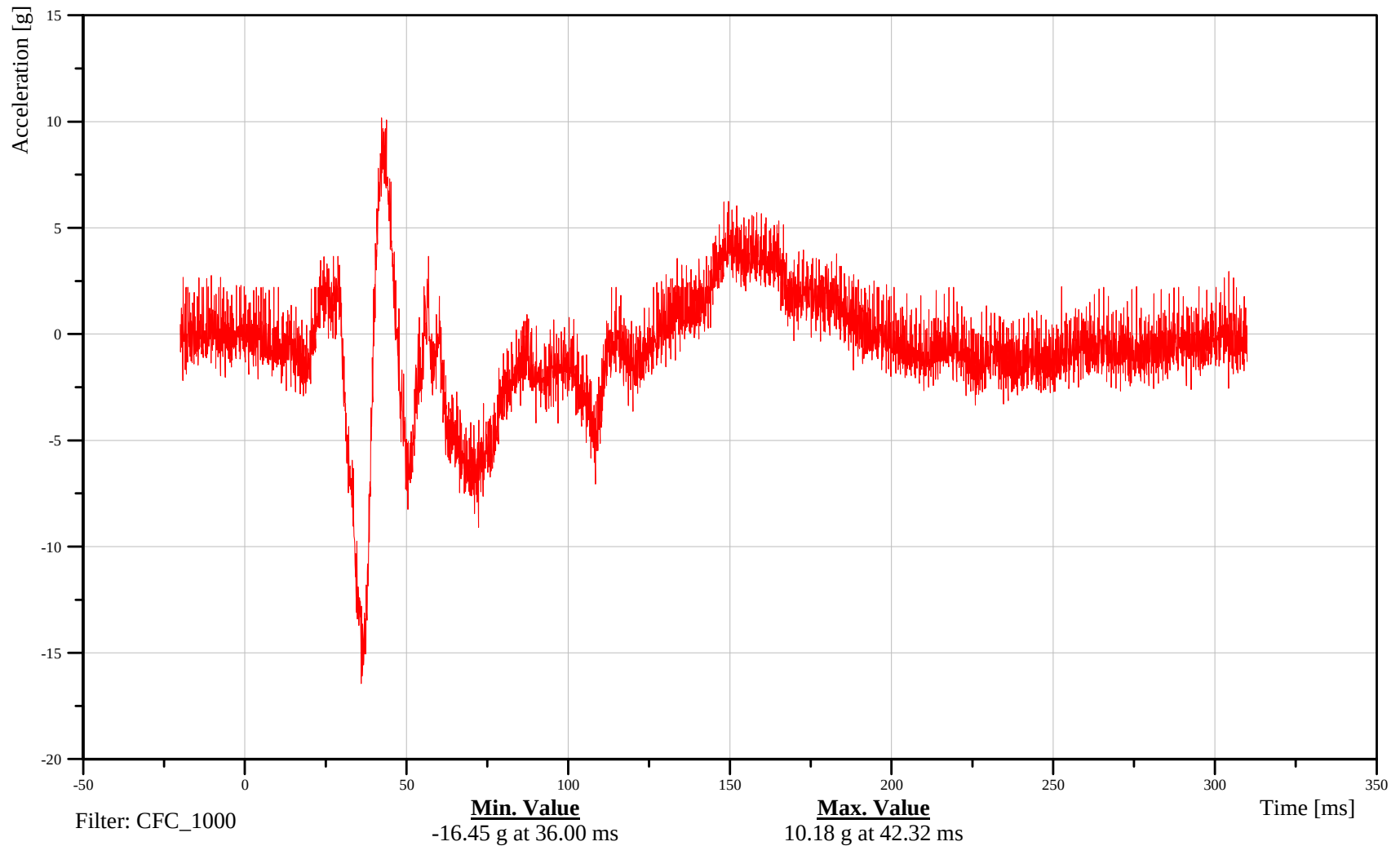
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14PELVCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-221

080729



World SID Evaluation
Passenger Pelvis Y-Axis Acceleration

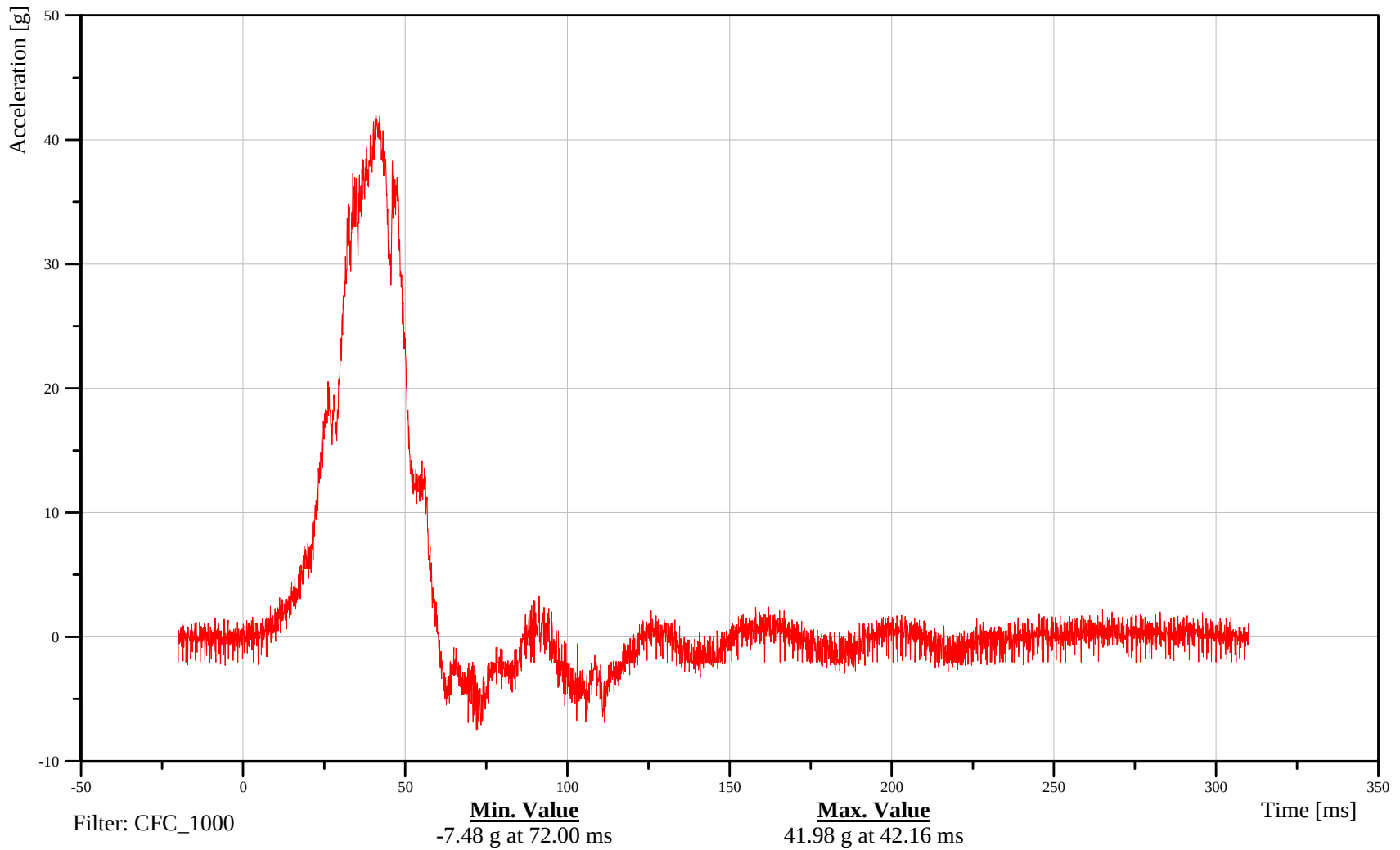
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14PELVCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-222

080729



World SID Evaluation
Passenger Pelvis Z-Axis Acceleration

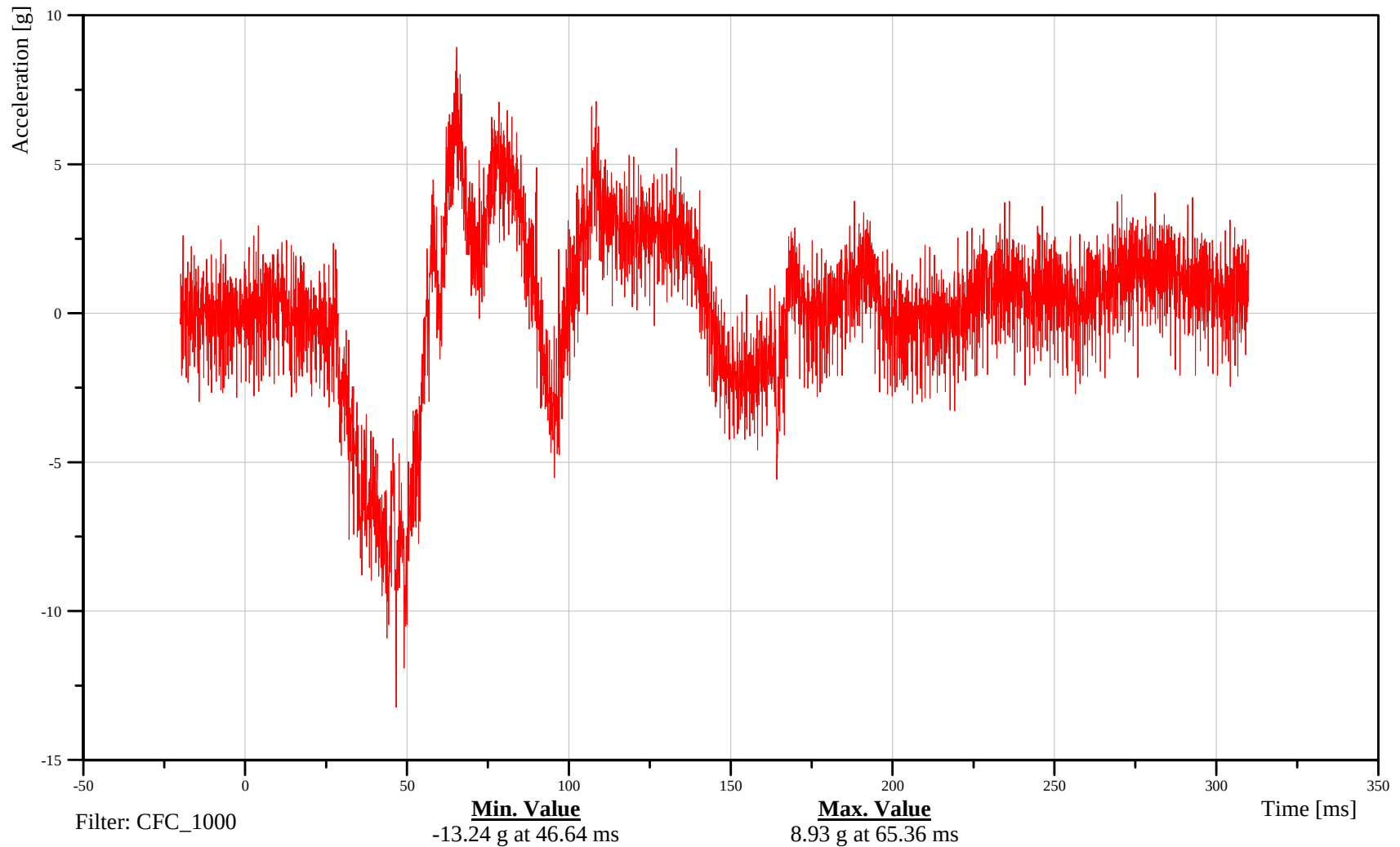
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14PELVCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-223

080729



World SID Evaluation

Passenger Pelvis Resultant Acceleration

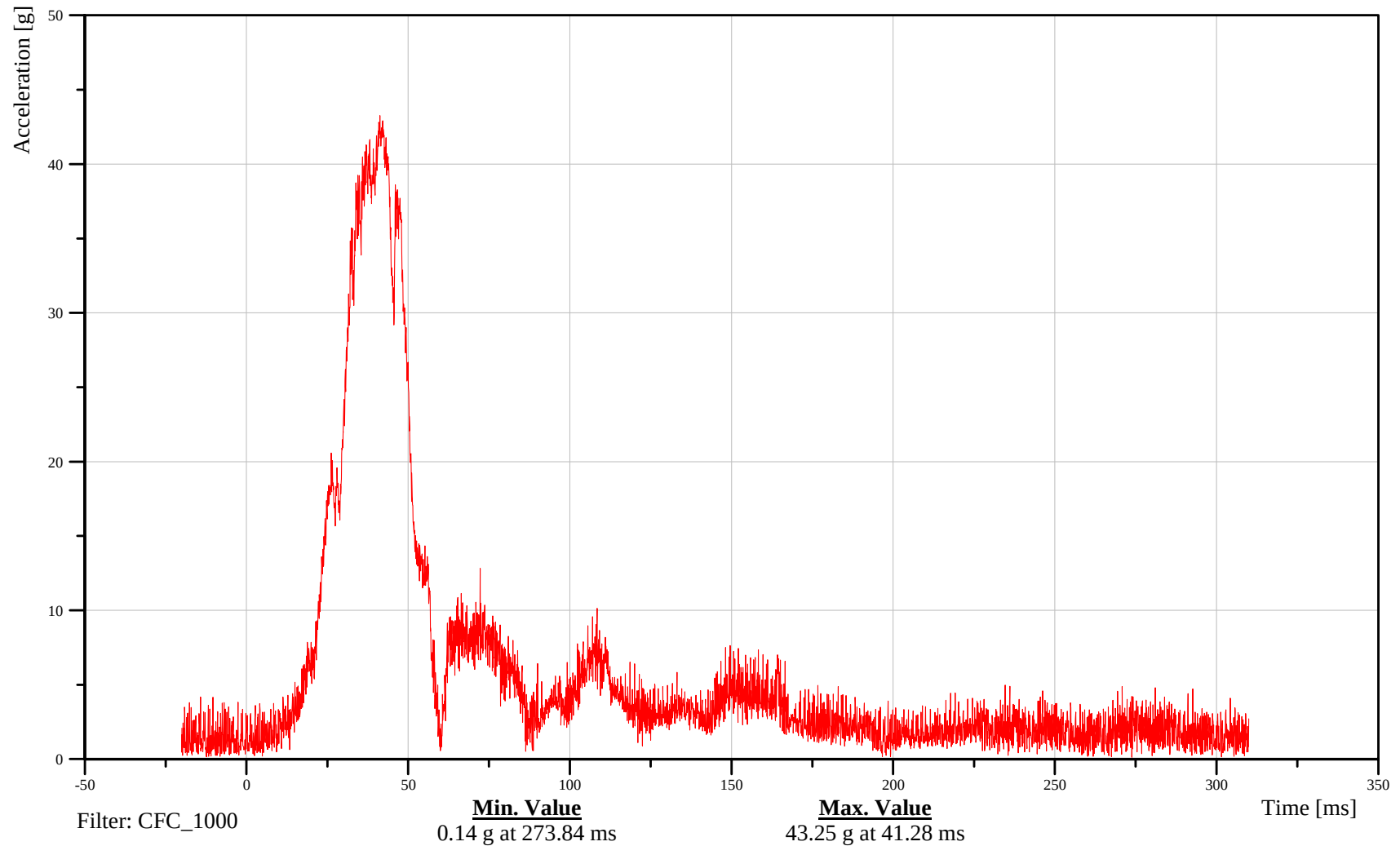
Date: 07/29/2008
Time: 14:50

Customer: VRTC

14PELVCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 080729-1



B-224

080729



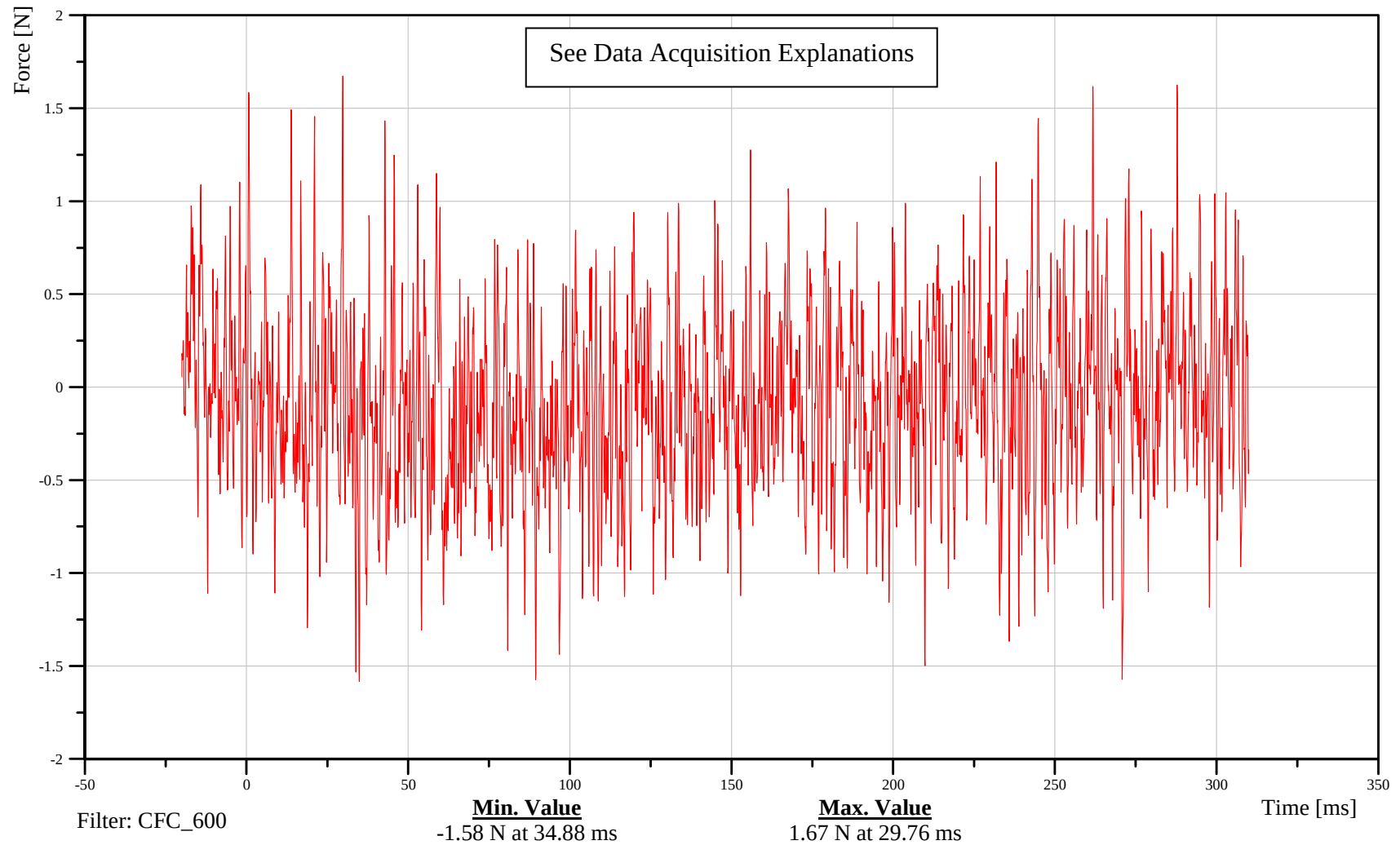
World SID Evaluation
Passenger Pubic Y-Axis Force

Date: 07/29/2008
Time: 14:50

Customer: VRTC

14PUBC0000WSFOYB

TRC Inc. Test Lab: CTF
Test Number: 080729-1



B-225

080729

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. 1-1

Test Date: 7/16/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	245.6 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-14.2 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



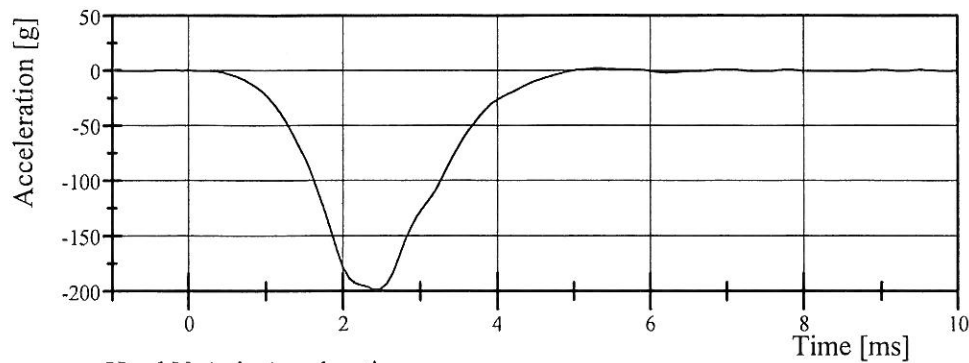
Transportation Research Center Inc.

Front Head Drop

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

Test Date: 7/16/2008

Head X-Axis Acceleration

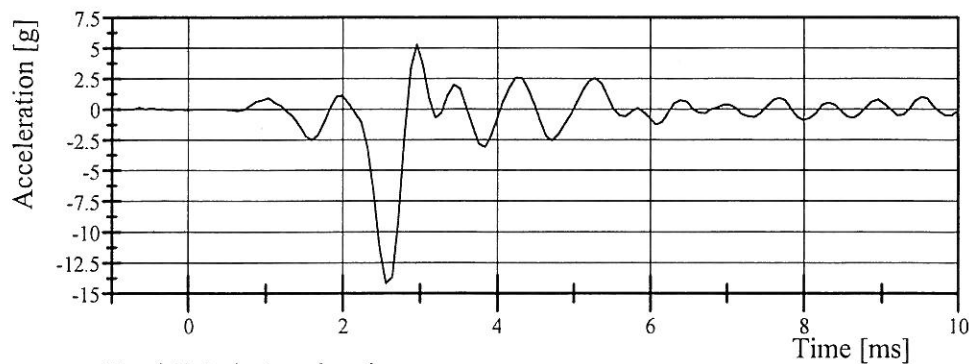


Filter Class: CFC_1000

Max: 2.0 g at 5.4 ms

Min: -198.5 g at 2.4 ms

Head Y-Axis Acceleration

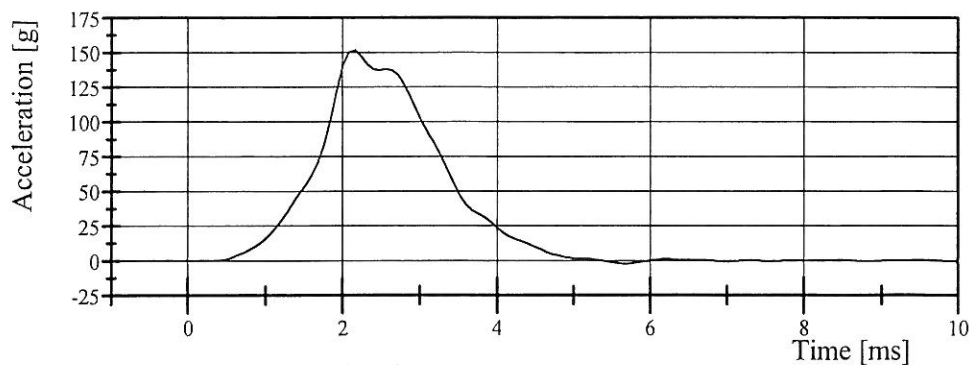


Filter Class: CFC_1000

Max: 5.3 g at 3.0 ms

Min: -14.2 g at 2.6 ms

Head Z-Axis Acceleration

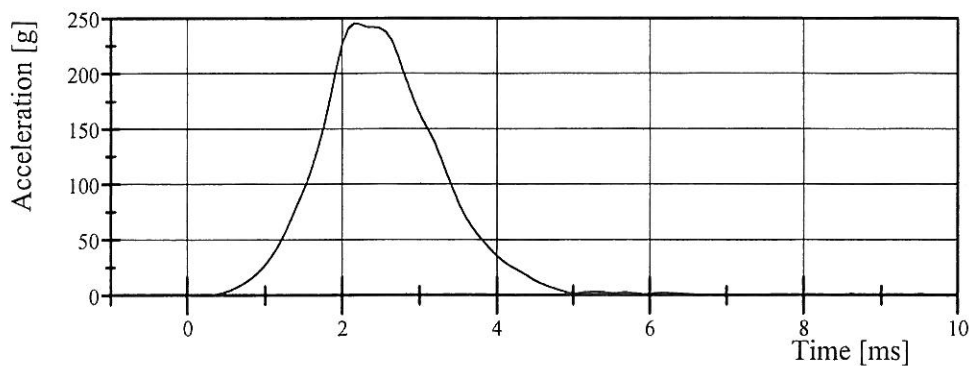


Filter Class: CFC_1000

Max: 151.8 g at 2.2 ms

Min: -2.3 g at 5.7 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 245.6 g at 2.2 ms

Min: 0.0 g at -0.9 ms

Transportation Research Center Inc.

Left Lateral Head Drop

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

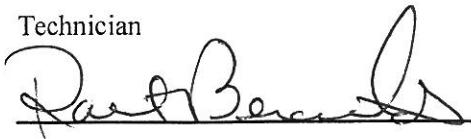
Test Date: 7/16/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	114.0 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



Approved

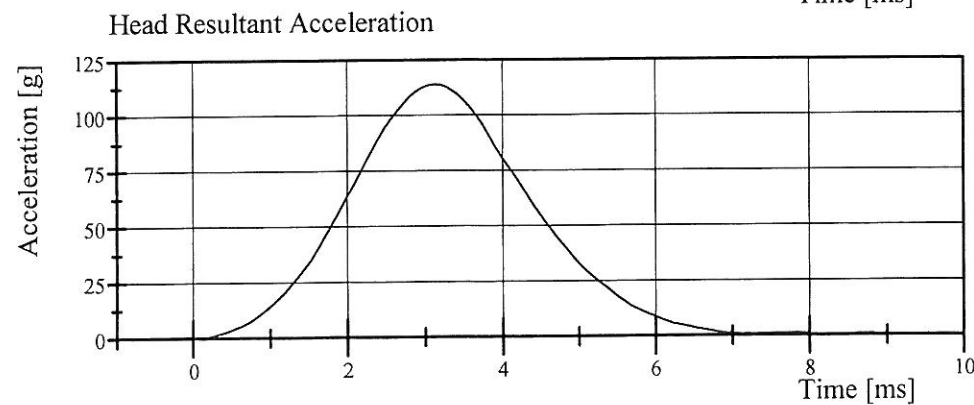
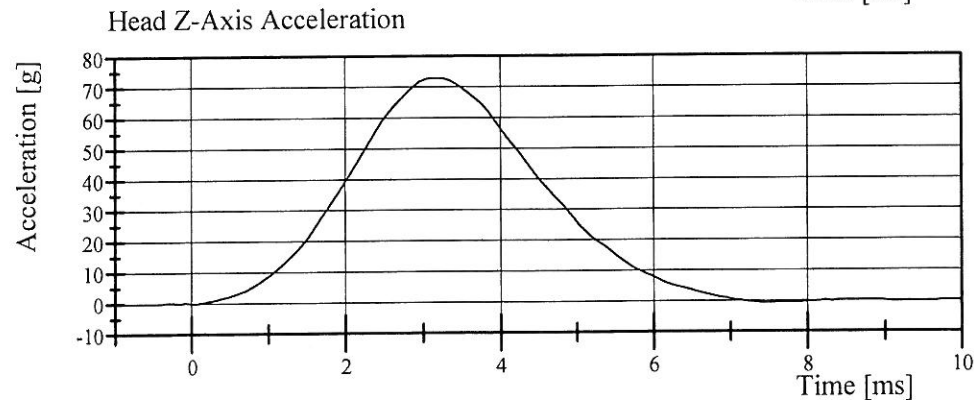
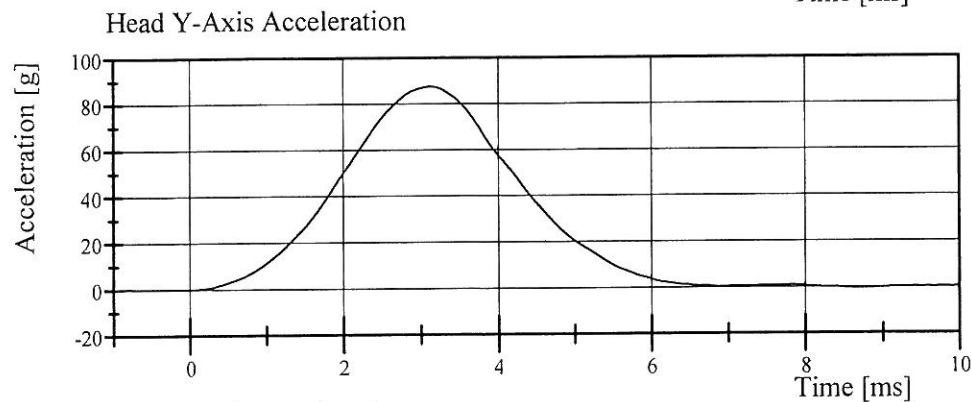
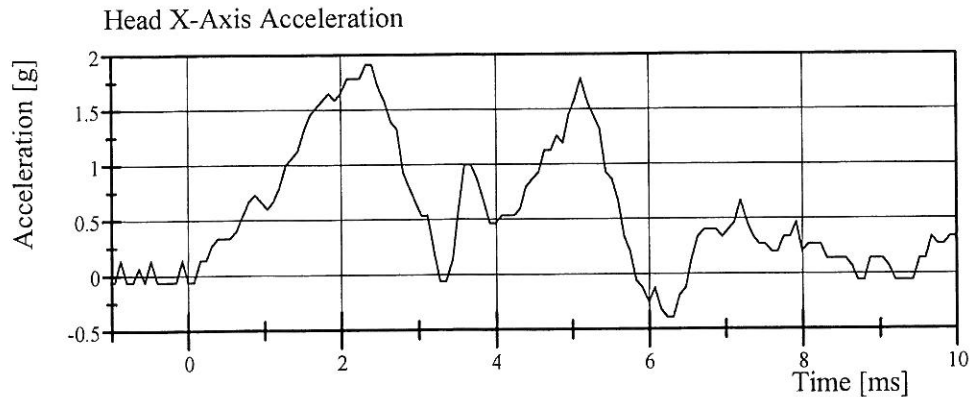


Transportation Research Center Inc.

Left Lateral Head Drop

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

Test Date: 7/16/2008



Transportation Research Center Inc.

Right Lateral Head Drop

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

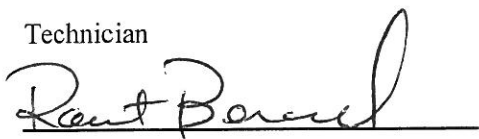
Test Date: 7/16/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	55 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	117.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-4.2 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



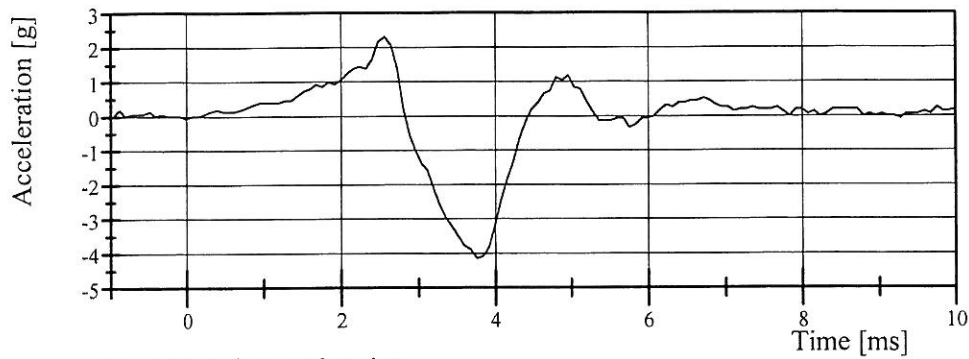
Transportation Research Center Inc.

Right Lateral Head Drop

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

Test Date: 7/16/2008

Head X-Axis Acceleration

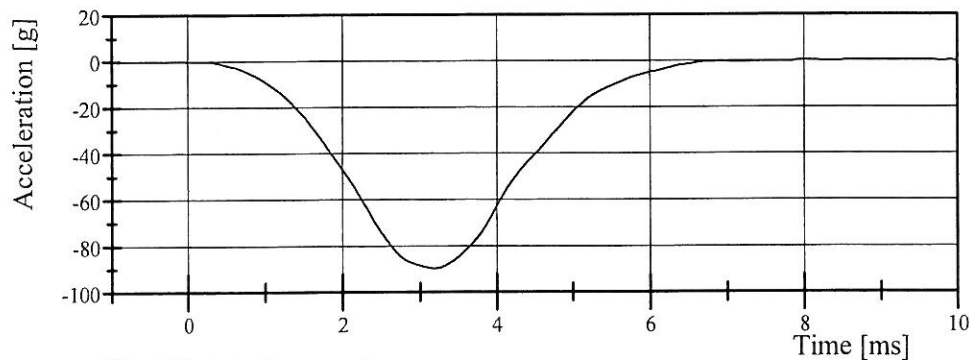


Filter Class: CFC_1000

Max: 2.3 g at 2.6 ms

Min: -4.2 g at 3.8 ms

Head Y-Axis Acceleration

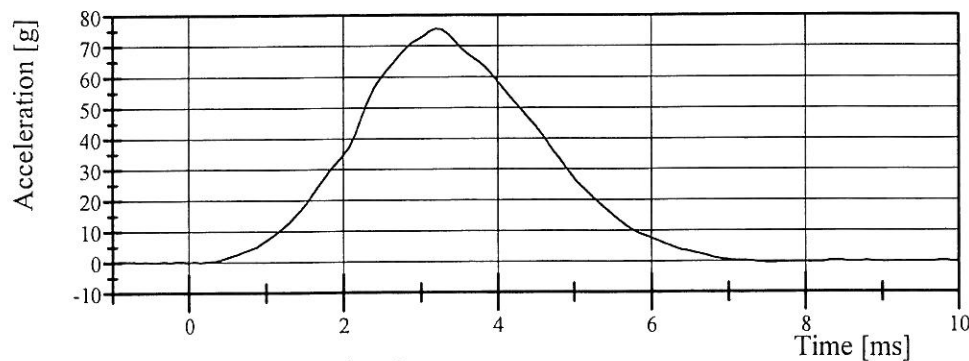


Filter Class: CFC_1000

Max: 0.4 g at 9.2 ms

Min: -89.7 g at 3.2 ms

Head Z-Axis Acceleration

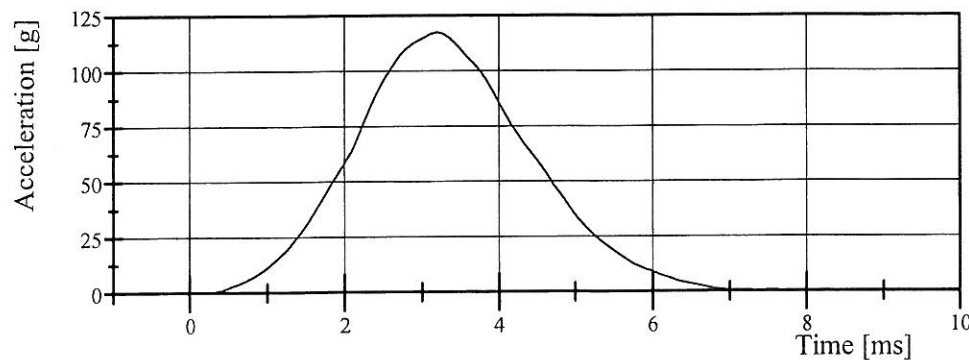


Filter Class: CFC_1000

Max: 75.7 g at 3.2 ms

Min: -0.5 g at 7.5 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 117.4 g at 3.2 ms

Min: 0.0 g at -1.0 ms

Transportation Research Center Inc.

Left Lateral Neck

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

Test Date: 7/28/2008

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	0.956 m/s	Yes
Change at 8 ms	1.6 - 2.16 m/s	2.037 m/s	Yes
Change at 12 ms	2.43 - 3.29 m/s	3.252 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-53.4 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	62.1 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) °	-34.8 °	Yes
Time of Peak	56 - 68 ms	56.5 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-30) - (-37) °	-31.4 °	Yes
Time of Peak	56 - 68 ms	56.8 ms	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bely

Approved

Ron Stenver

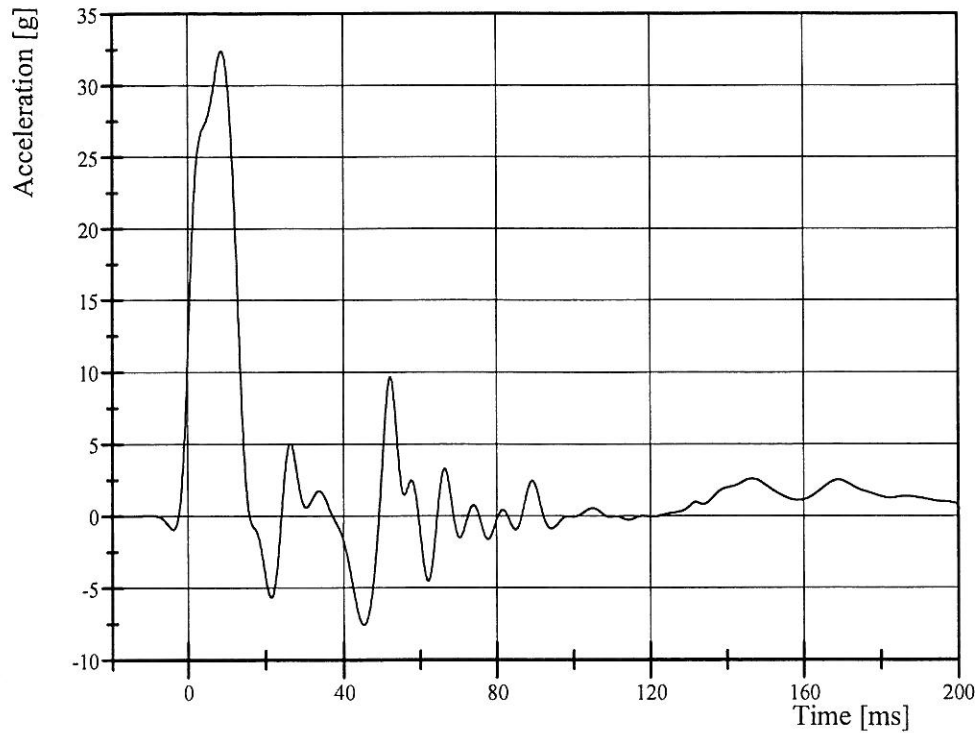
Transportation Research Center Inc.

Left Lateral Neck

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

Test Date: 7/28/2008

Pendulum Acceleration

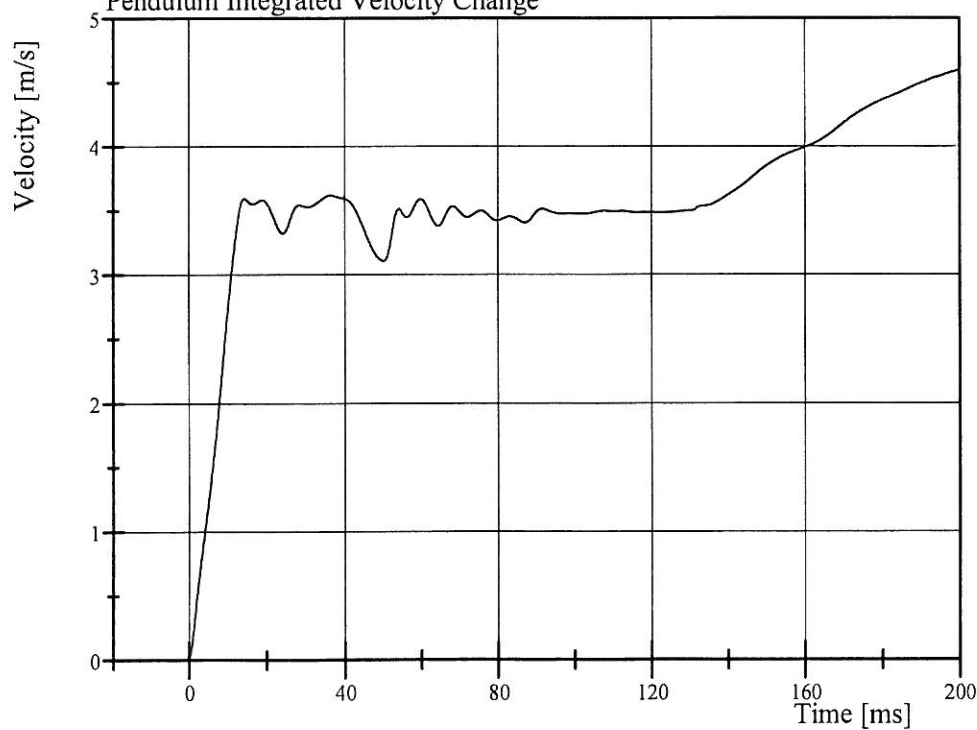


Filter Class: CFC_60

Max: 32.4 g at 8.9 ms

Min: -7.6 g at 45.4 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

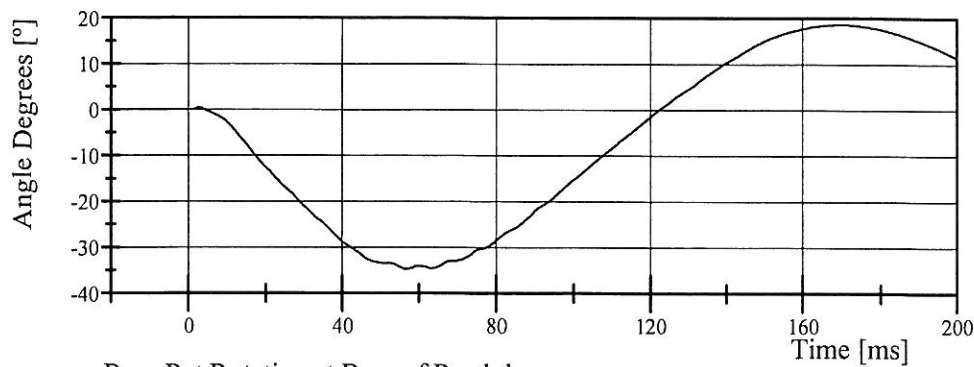
Transportation Research Center Inc.

Left Lateral Neck

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

Test Date: 7/28/2008

Forward Pot Rotation at Base of Pendulum

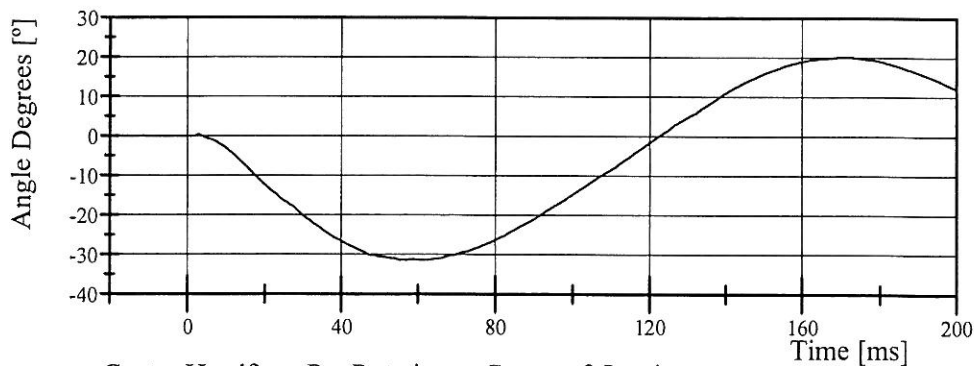


Filter Class: CFC_1000

Max: 18.7 ° at 169.3 ms

Min: -34.8 ° at 56.5 ms

Rear Pot Rotation at Base of Pendulum

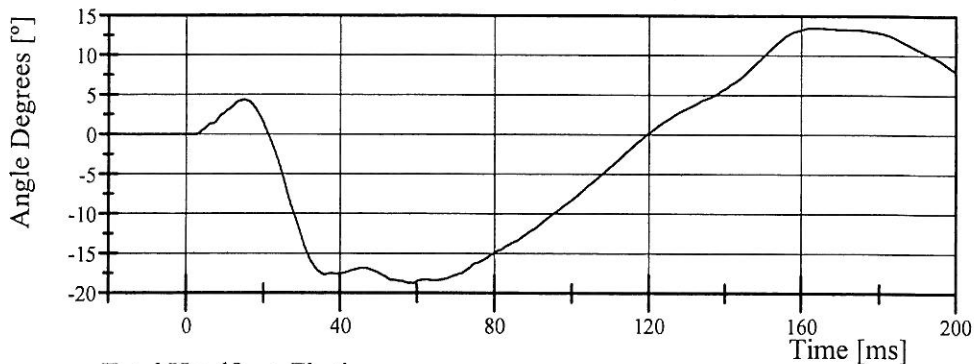


Filter Class: CFC_1000

Max: 20.2 ° at 170.1 ms

Min: -31.4 ° at 56.8 ms

Center Headform Pot Rotation at Center of Gravity

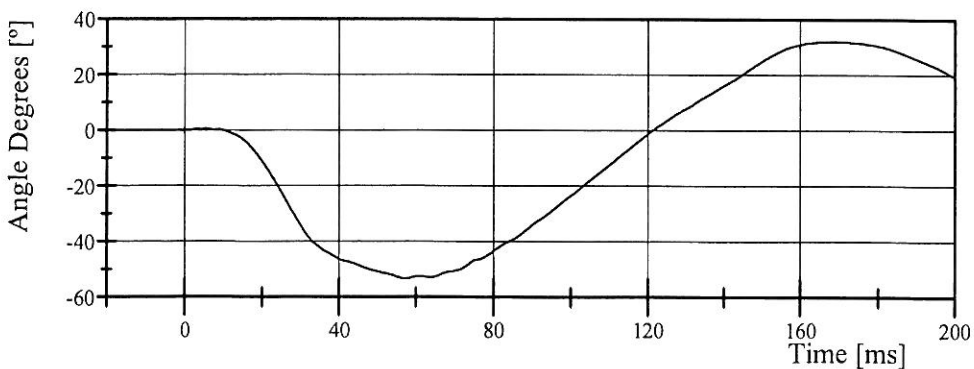


Filter Class: CFC_1000

Max: 13.5 ° at 164.2 ms

Min: -18.8 ° at 59.0 ms

Total Headform Flexion



Filter Class: CFC_1000

Max: 32.0 ° at 168.3 ms

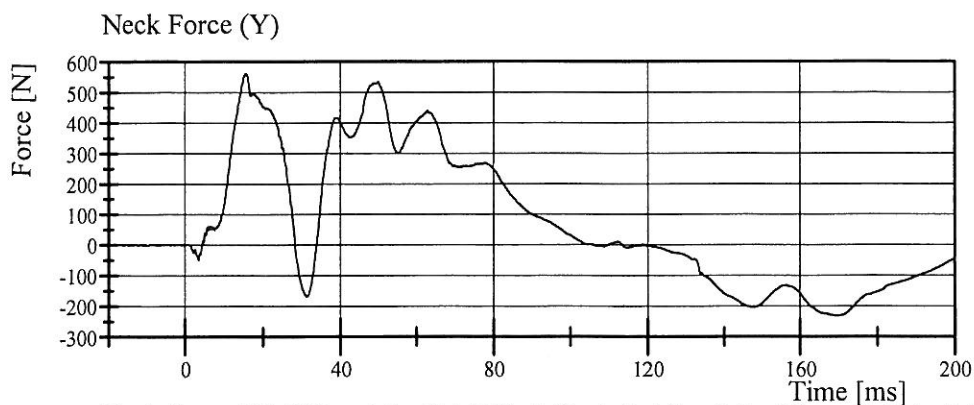
Min: -53.4 ° at 57.3 ms

Transportation Research Center Inc.

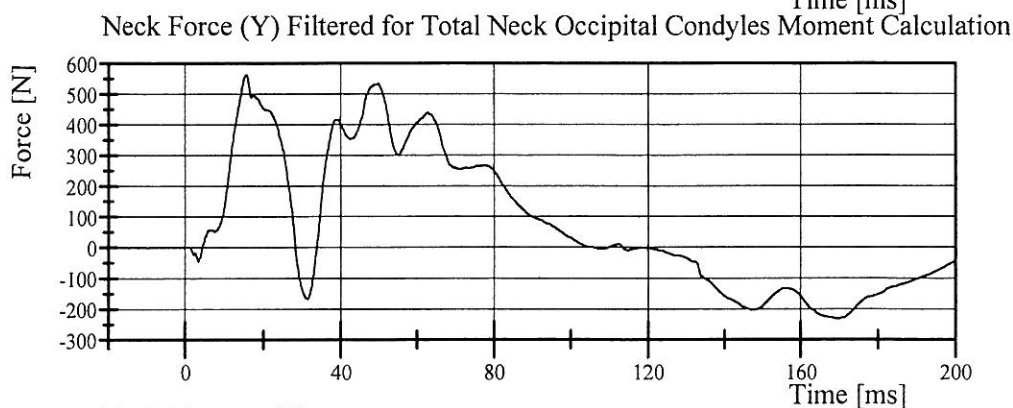
Left Lateral Neck

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

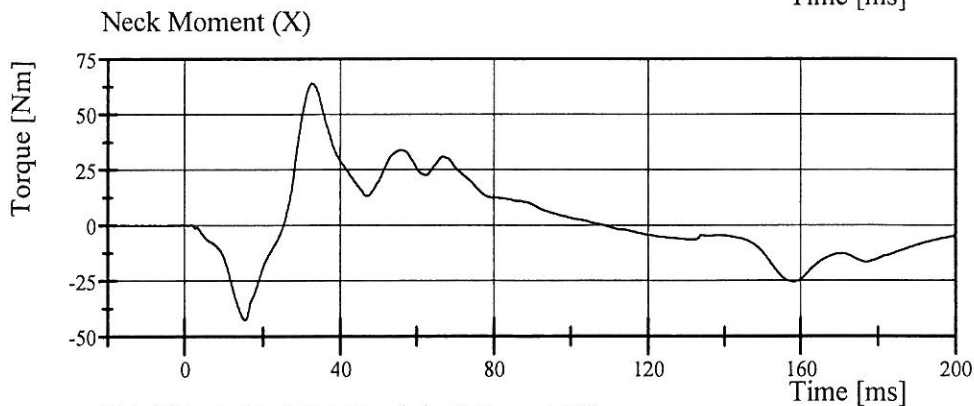
Test Date: 7/28/2008



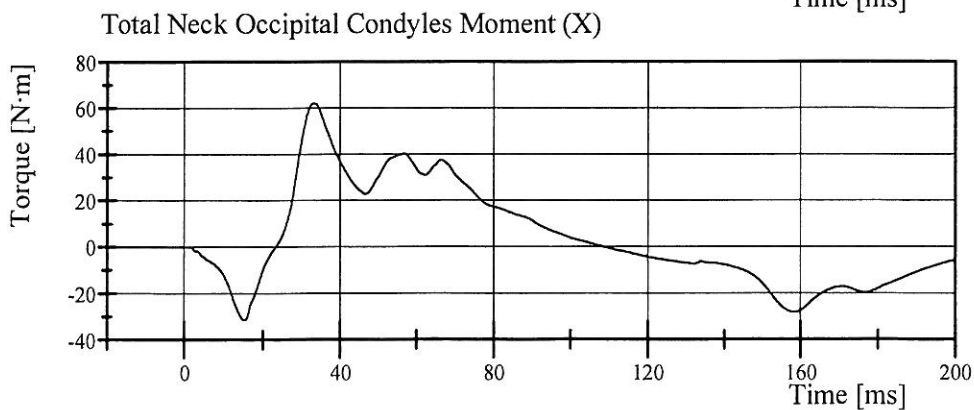
Filter Class: CFC_1000
Max: 562.3 N at 15.7 ms
Min: -231.4 N at 169.4 ms



Filter Class: CFC_600
Max: 562.0 N at 15.7 ms
Min: -231.2 N at 169.4 ms



Filter Class: CFC_600
Max: 63.9 Nm at 32.6 ms
Min: -42.5 Nm at 15.4 ms



Filter Class: CFC_600
Max: 62.1 N·m at 33.2 ms
Min: -31.6 N·m at 15.3 ms

Transportation Research Center Inc.

Left Lateral Shoulder

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

Test Date: 7/24/2009

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	50 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.27 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-3,032.7 N	Yes
Shoulder Displacement	35 - 44 mm	38.4 mm	Yes

Test meets specifications.

Comments:

Technician

Raul Boravides

Approved

Ken Storer



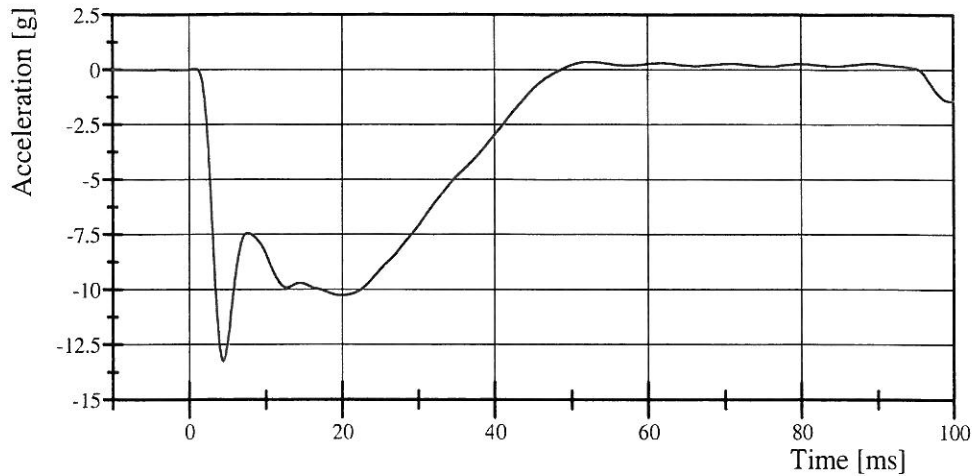
Transportation Research Center Inc.

Left Lateral Shoulder

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

Test Date: 7/24/2009

Impactor Acceleration

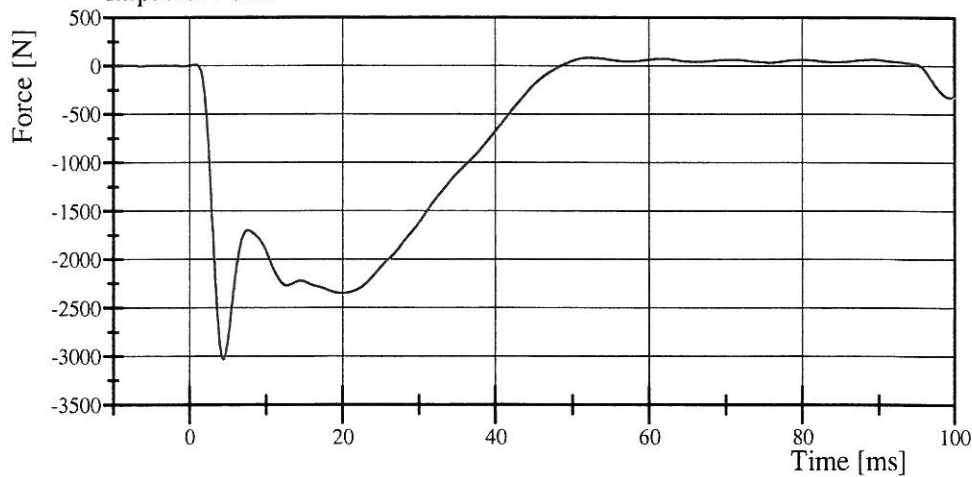


Filter Class: CFC_180

Max: 0.4 g at 52.2 ms

Min: -13.2 g at 4.5 ms

Impactor Force

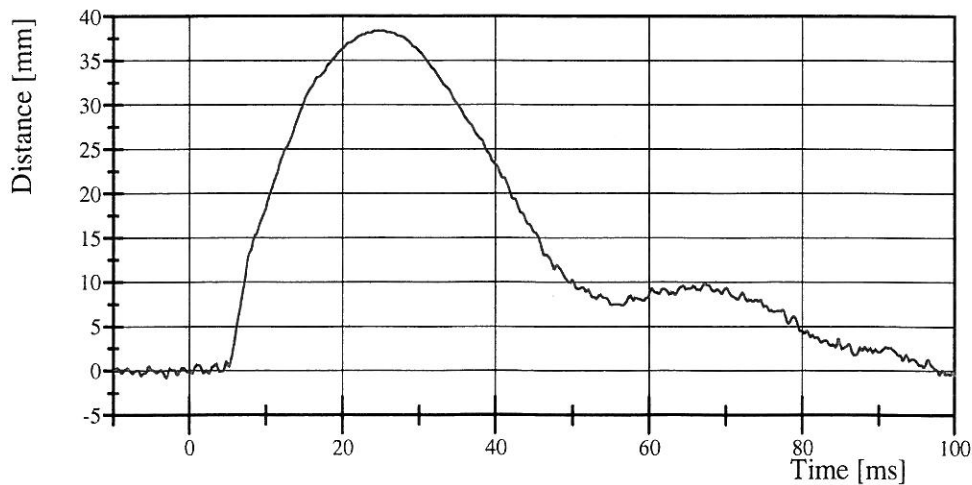


Filter Class: CFC_180

Max: 81.1 N at 52.2 ms

Min: -3,032.7 N at 4.5 ms

Shoulder Displacement



Filter Class: CFC_600

Max: 38.4 mm at 25.4 ms

Min: -0.8 mm at -3.1 ms

Transportation Research Center Inc.

Left Lateral Thorax with Arm

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

Test Date: 7/25/2008

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	6.71 m/s	Yes
Impactor Force	(-4,700) - (-6,400) N	-5,283.7 N	Yes
Upper Thorax Rib Displacement	35 - 47 mm	42.2 mm	Yes
Center Thorax Rib Displacement	42 - 57 mm	50.2 mm	Yes
Lower Thorax Rib Displacement	40 - 54 mm	44.7 mm	Yes
Upper Spine Lateral Acceleration	24 - 33 g	27.3 g	Yes
Lower Spine Lateral Acceleration	20 - 28 g	22.2 g	Yes

Test meets specifications.

Comments:

Technician

Roland Bravender

Approved

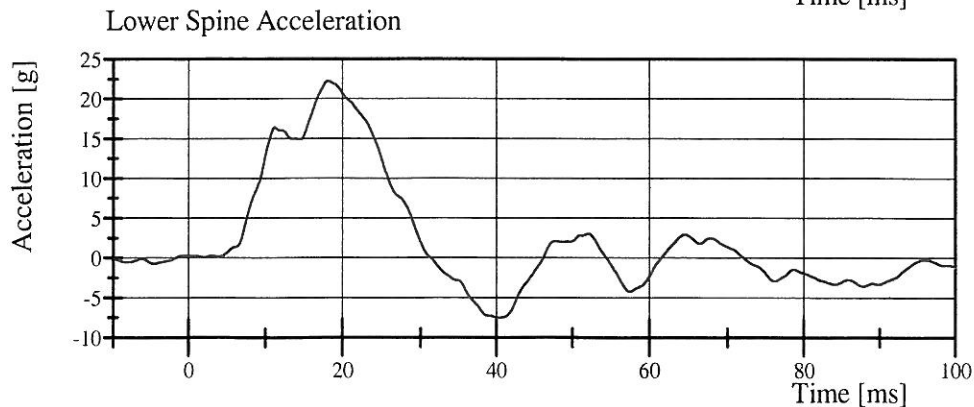
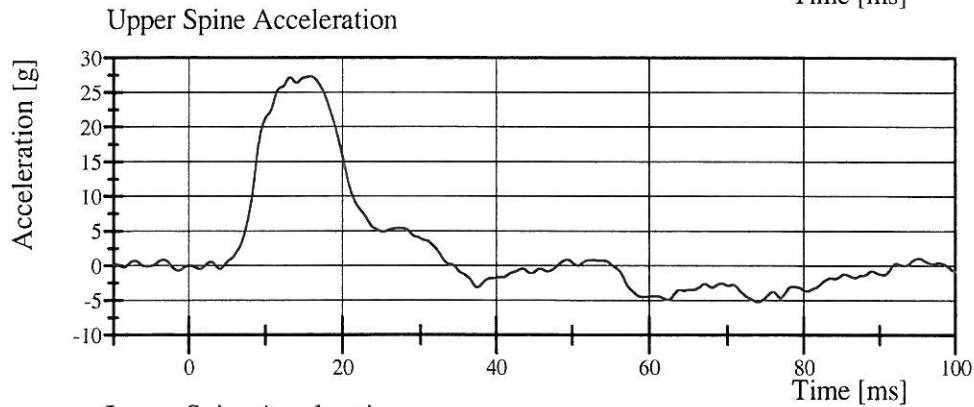
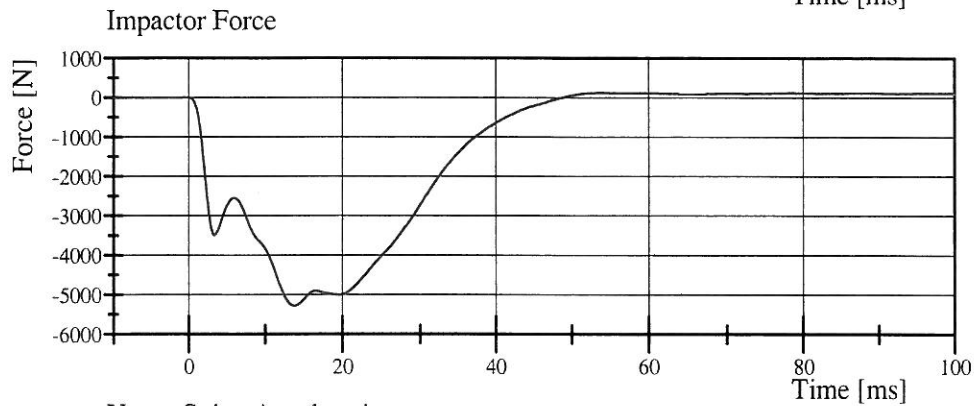
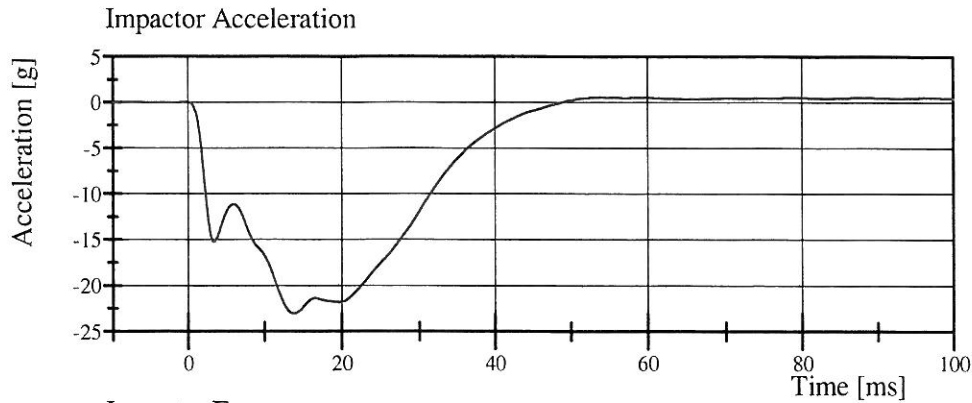
Pam Stone

Transportation Research Center Inc.

Left Lateral Thorax with Arm

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

Test Date: 7/25/2008



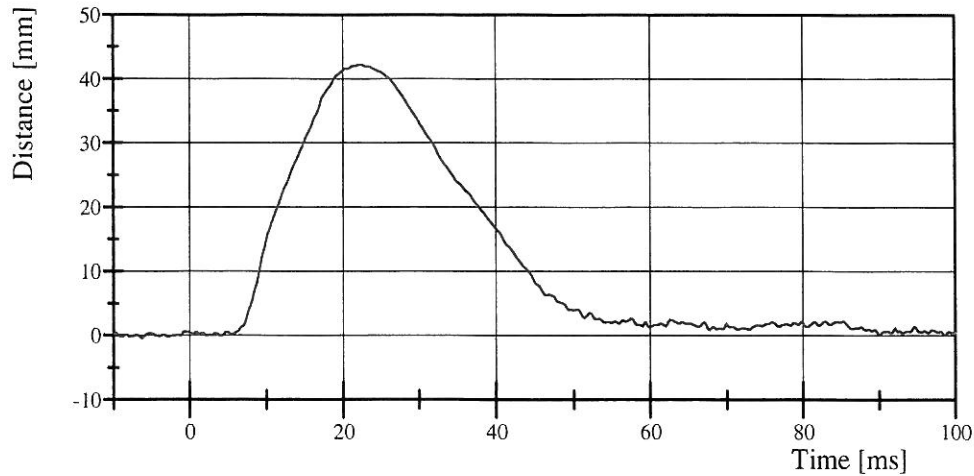
Transportation Research Center Inc.

Left Lateral Thorax with Arm

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

Test Date: 7/25/2008

Upper Thorax Rib Displacement

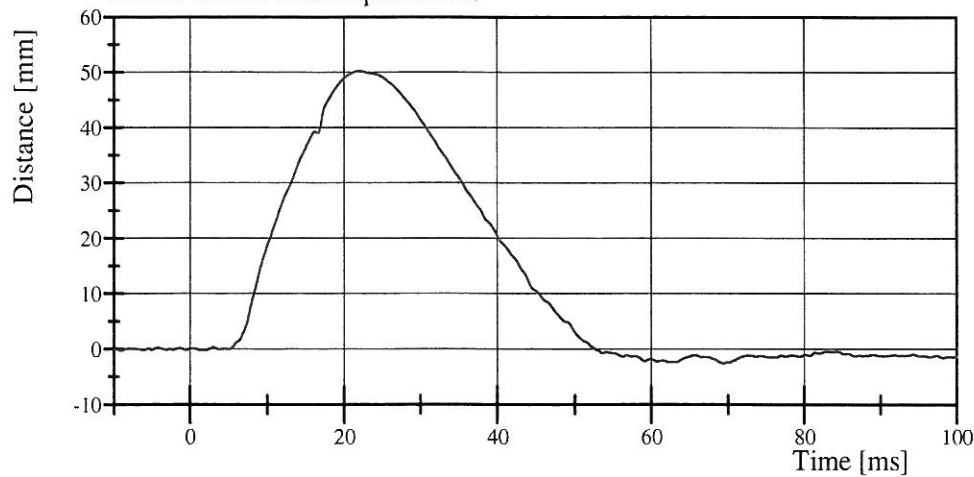


Filter Class: CFC_600

Max: 42.2 mm at 22.4 ms

Min: -0.5 mm at -6.2 ms

Center Thorax Rib Displacement

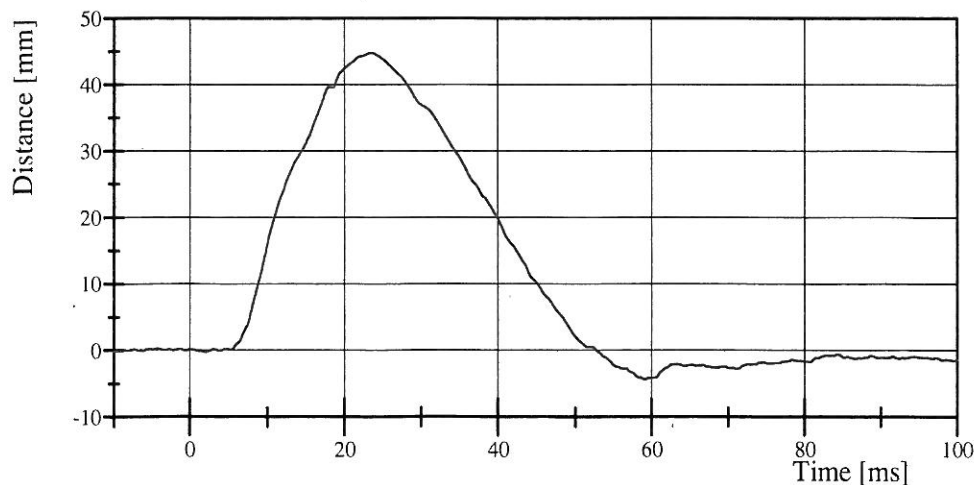


Filter Class: CFC_600

Max: 50.2 mm at 22.0 ms

Min: -2.7 mm at 69.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600

Max: 44.7 mm at 23.6 ms

Min: -4.4 mm at 59.1 ms

Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID ISO 15830-2 Serial No. 014 Certification No. 1-7

Test Date: 7/28/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.389 m/s	Yes
Impactor Force	(-3,200) - (-3,900) N	-3,504.4 N	Yes
Upper Thorax Rib Displacement	34 - 43 mm	39.9 mm	Yes
Center Thorax Rib Displacement	34 - 43 mm	44.3 mm	No
Lower Thorax Rib Displacement	34 - 43 mm	42.5 mm	Yes
Upper Spine Lateral Acceleration	12 - 17 g	14.2 g	Yes
Lower Spine Lateral Acceleration	15 - 21 g	14.2 g	No

Test does not meet specifications.

Comments:

Technician

Raoul Bonavides

Approved

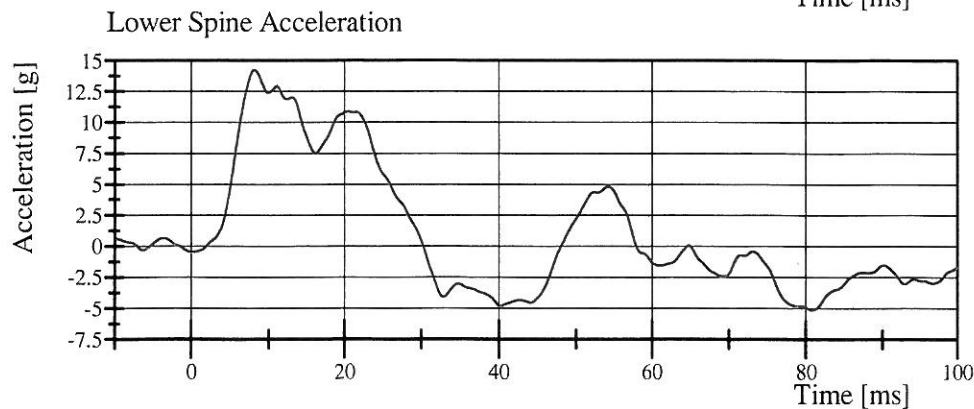
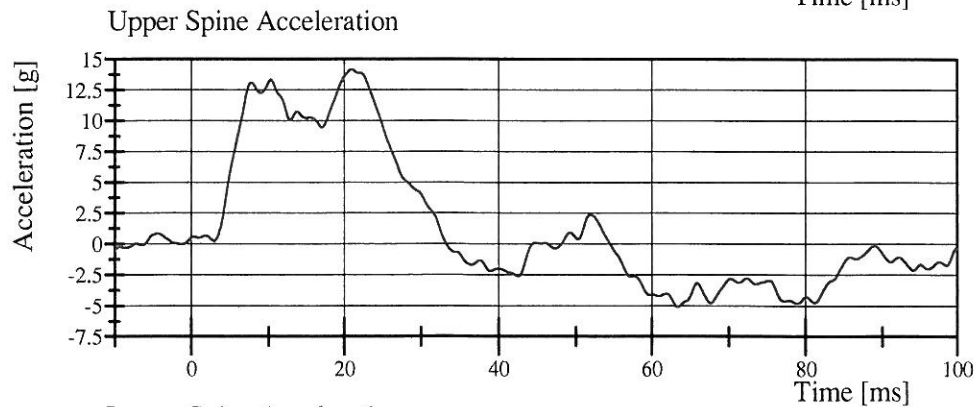
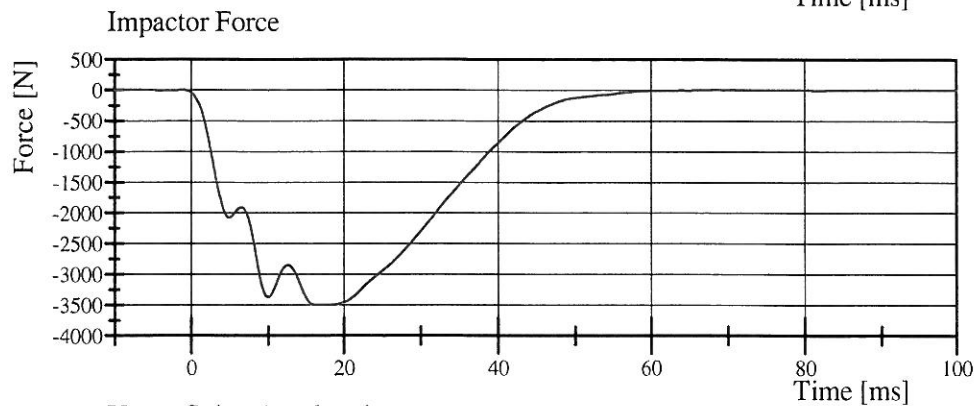
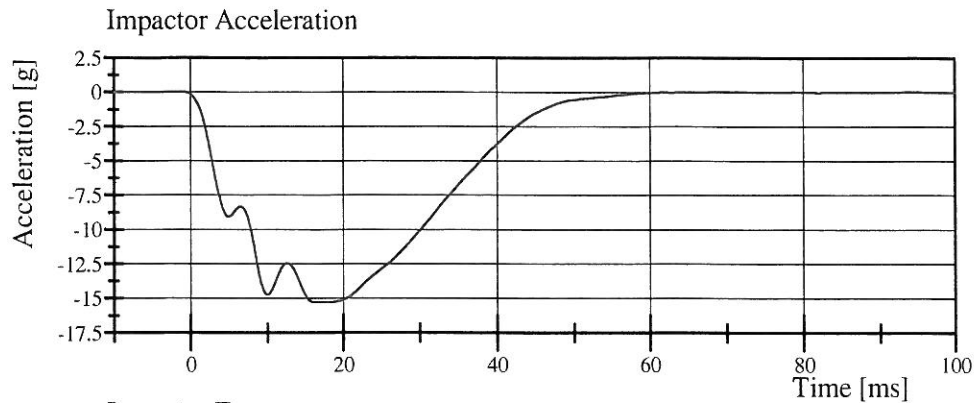
Don Stone

Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID ISO 15830-2 Serial No. 014 Certification No. 1-7

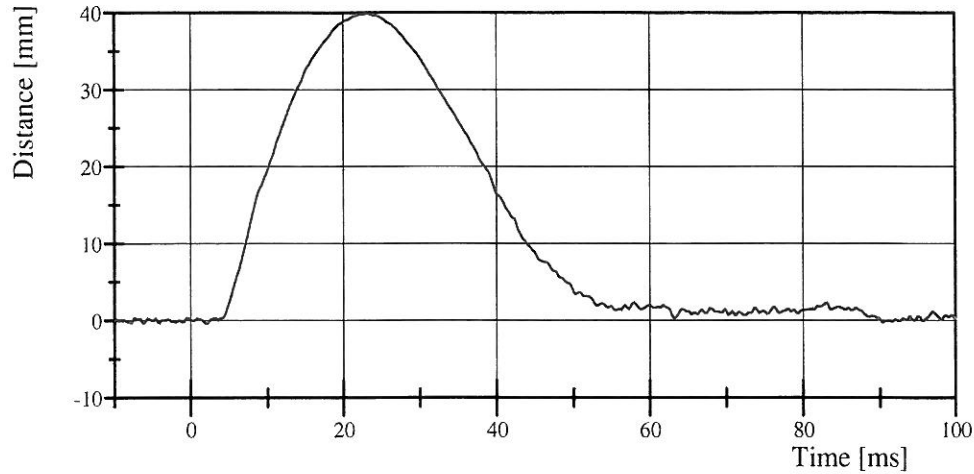
Test Date: 7/28/2008



Transportation Research Center Inc.

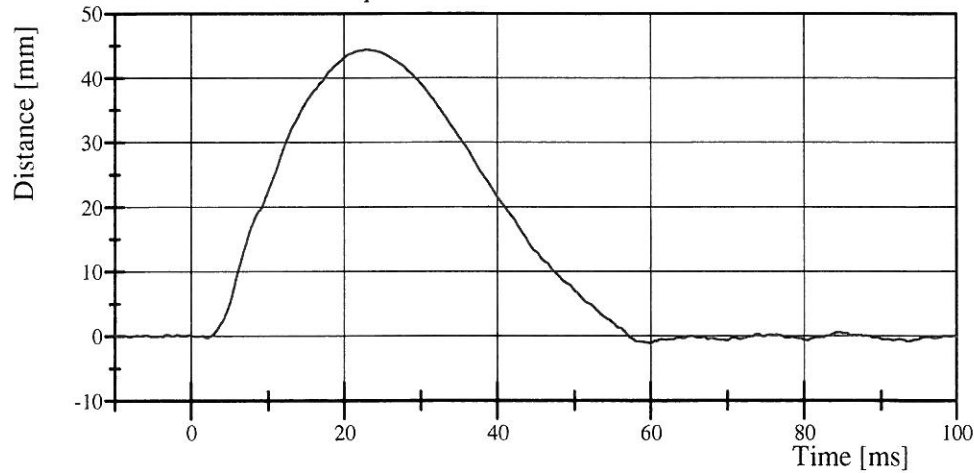
Left Lateral Thorax without Arm
WorldSID ISO 15830-2 Serial No. 014 Certification No. 1-7
Test Date: 7/28/2008

Upper Thorax Rib Displacement



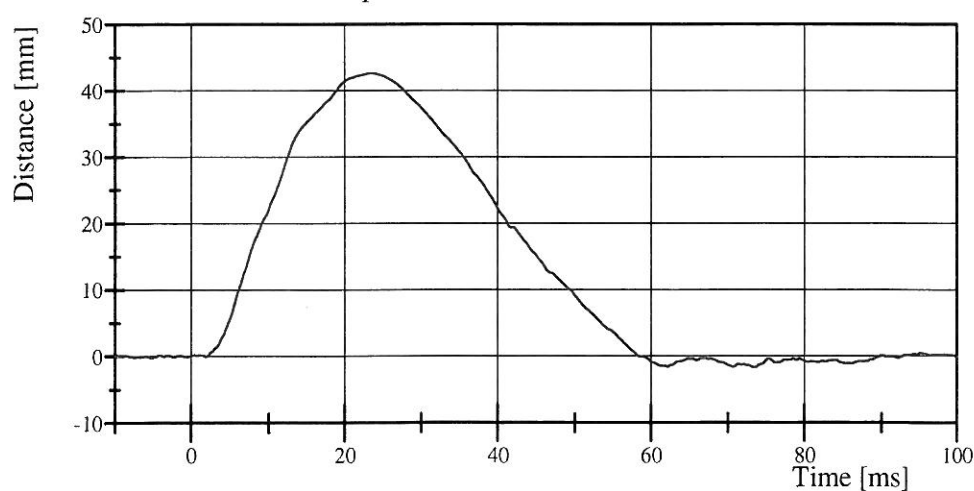
Filter Class: CFC_600
Max: 39.9 mm at 23.3 ms
Min: -0.4 mm at 2.1 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 44.3 mm at 22.9 ms
Min: -1.2 mm at 60.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 42.5 mm at 23.4 ms
Min: -1.7 mm at 73.5 ms

Transportation Research Center Inc.

Left Lateral Abdomen

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

Test Date: 7/25/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.39 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-3,097.8 N	Yes
Upper Abdominal Rib Displacement	33 - 41 mm	35.8 mm	Yes
Lower Abdominal Rib Displacement	31 - 39 mm	33.9 mm	Yes
Lower Spine Lateral Acceleration	15 - 20 g	17.0 g	Yes

Test meets specifications.

Comments:

Technician

Raul Barrios

Approved

Ken Stover

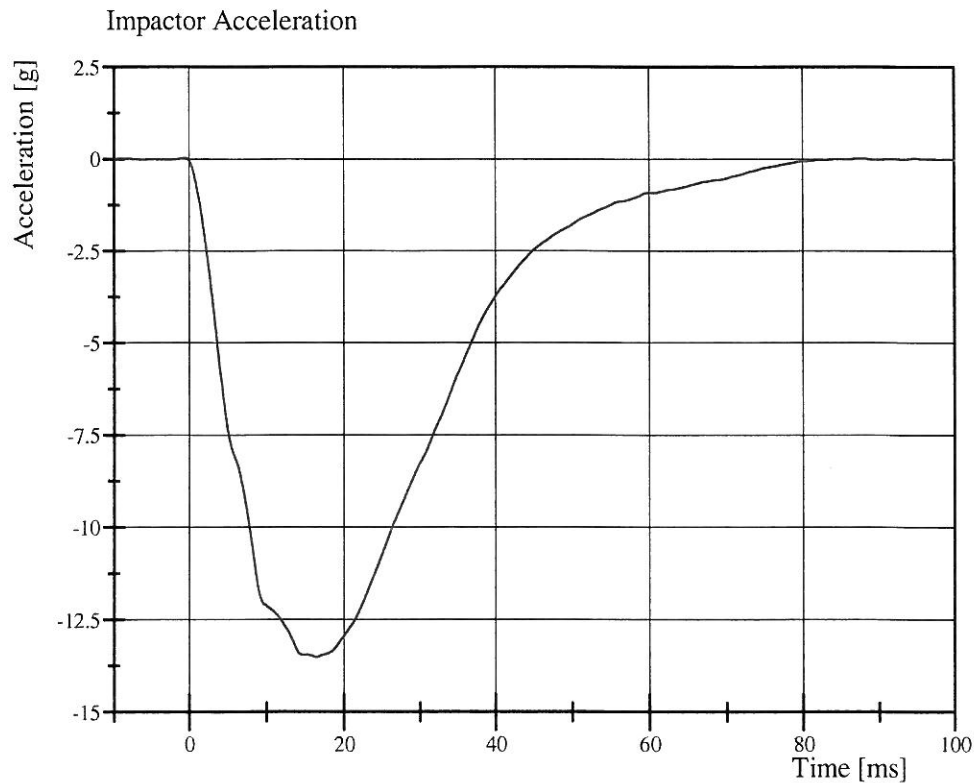


Transportation Research Center Inc.

Left Lateral Abdomen

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

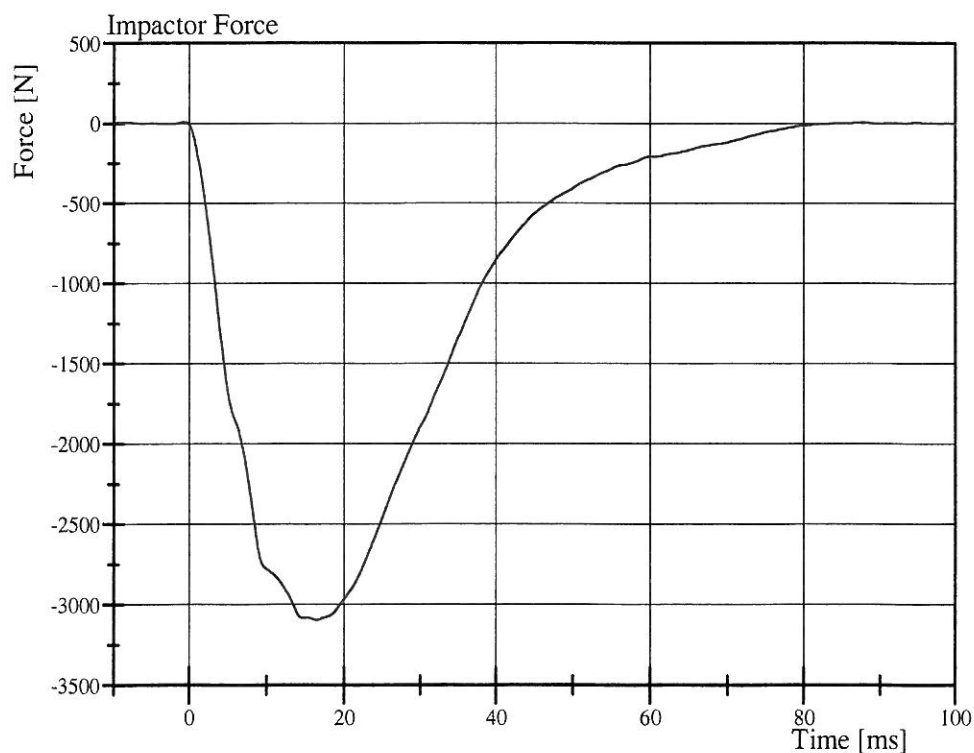
Test Date: 7/25/2008



Filter Class: CFC_180

Max: 0.0 g at -0.6 ms

Min: -13.5 g at 16.5 ms



Filter Class: CFC_180

Max: 6.7 N at -0.6 ms

Min: -3,097.8 N at 16.5 ms

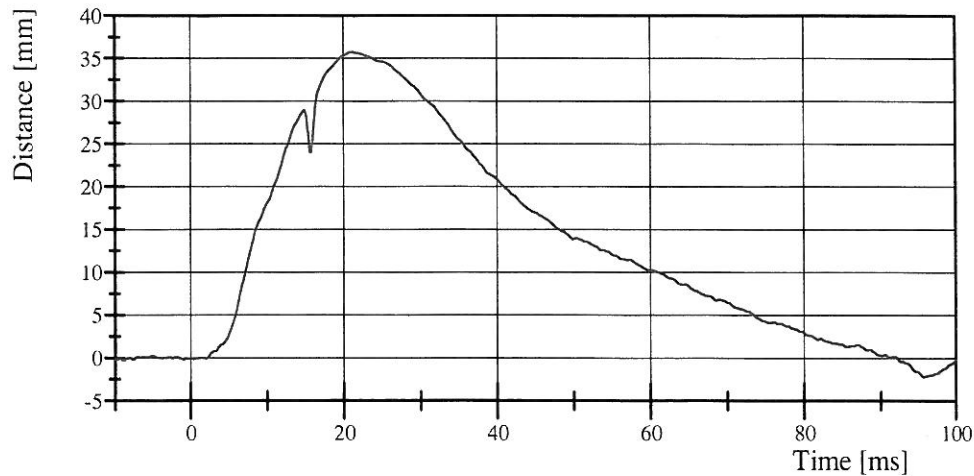
Transportation Research Center Inc.

Left Lateral Abdomen

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

Test Date: 7/25/2008

Upper Abdominal Rib Displacement

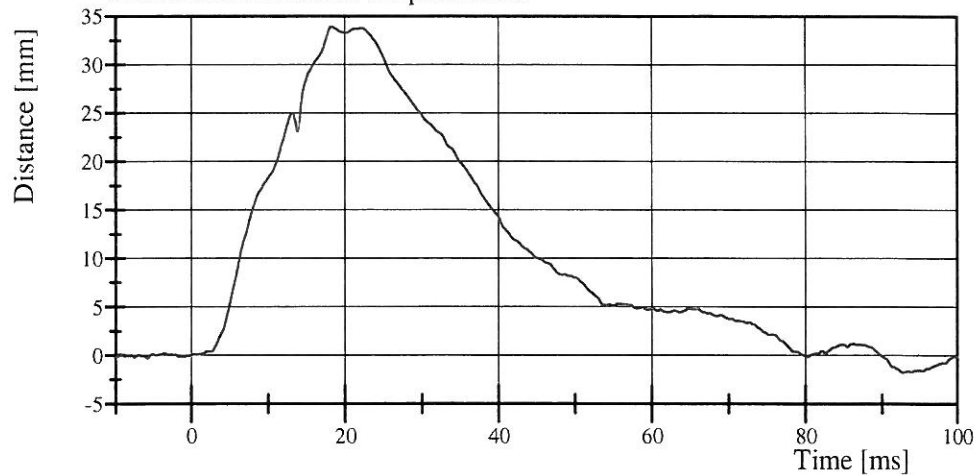


Filter Class: CFC_600

Max: 35.8 mm at 21.1 ms

Min: -2.2 mm at 95.8 ms

Lower Abdominal Rib Displacement

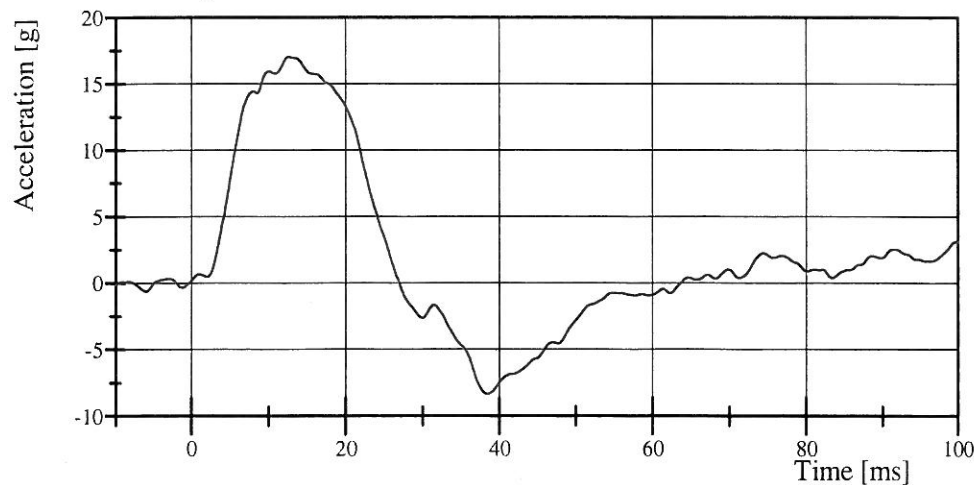


Filter Class: CFC_600

Max: 33.9 mm at 18.3 ms

Min: -1.8 mm at 92.9 ms

Lower Spine Acceleration (Y)



Filter Class: CFC_180

Max: 17.0 g at 12.7 ms

Min: -8.3 g at 38.4 ms

Transportation Research Center Inc.

Left Lateral Pelvis

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

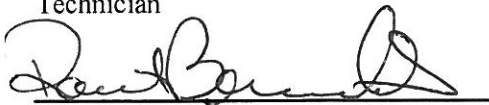
Test Date: 7/28/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.68 m/s	Yes
Impactor Force	(-6,300) - (-7,800) N	-7,654.6 N	Yes
Pelvis Lateral Acceleration	41 - 51 g	45.3 g	Yes
Lower Spine Lateral Acceleration	10 - 14 g	13.0 g	Yes

Test meets specifications.

Comments:

Technician



Approved

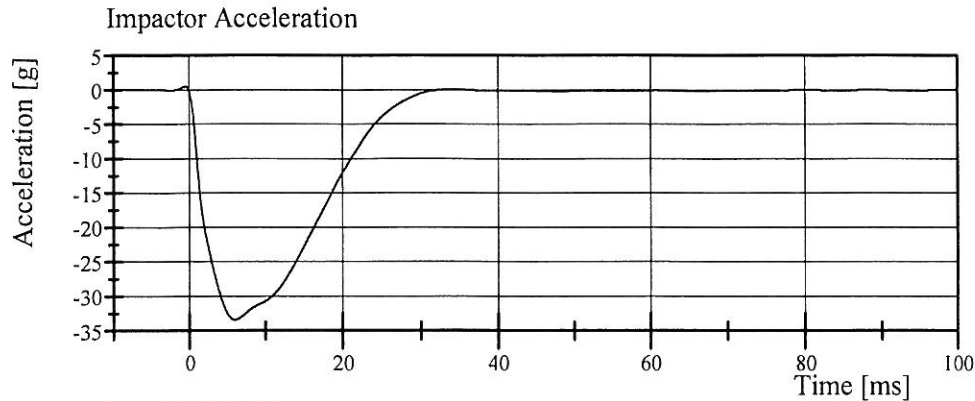


Transportation Research Center Inc.

Left Lateral Pelvis

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

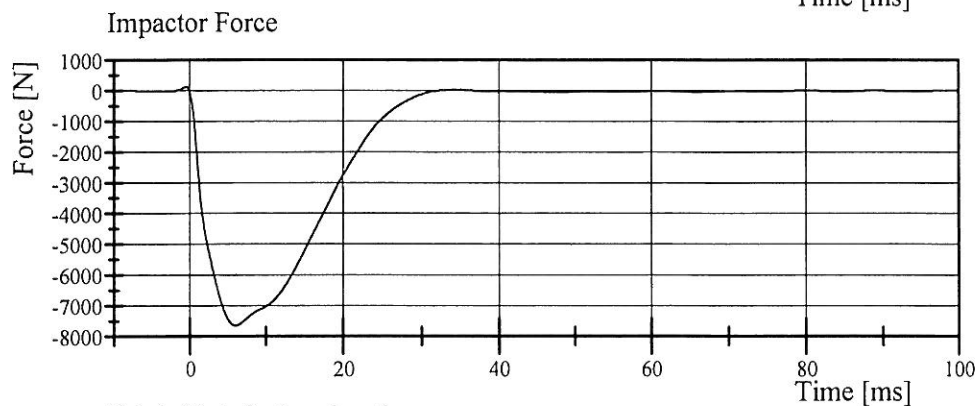
Test Date: 7/28/2008



Filter Class: CFC_180

Max: 0.5 g at -0.5 ms

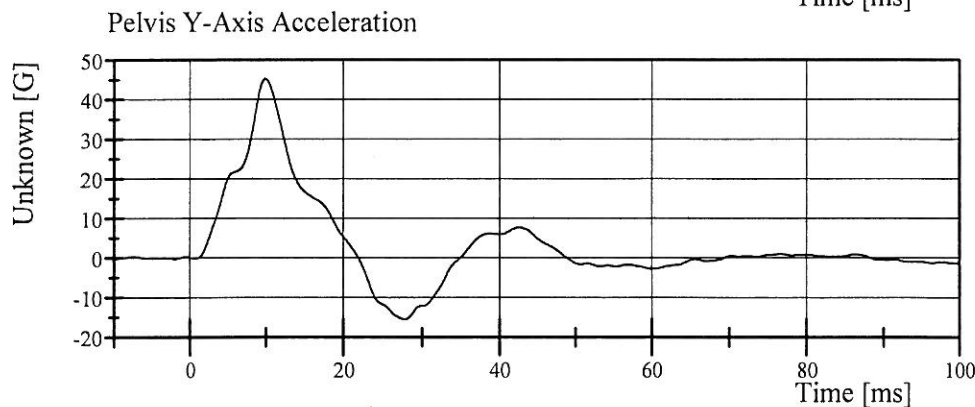
Min: -33.4 g at 6.1 ms



Filter Class: CFC_180

Max: 122.7 N at -0.5 ms

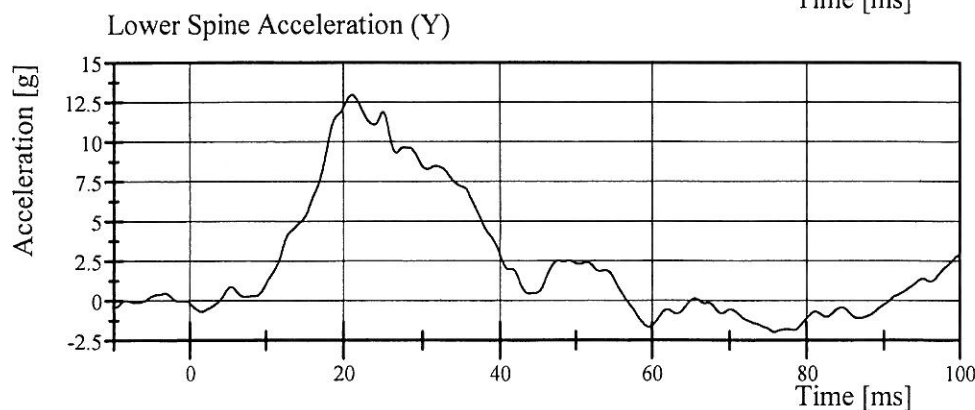
Min: -7,654.6 N at 6.1 ms



Filter Class: CFC_180

Max: 45.3 G at 9.9 ms

Min: -15.5 G at 27.8 ms



Filter Class: CFC_180

Max: 13.0 g at 21.1 ms

Min: -2.0 g at 75.8 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. 4-1

Test Date: 7/15/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	54 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	245.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	7.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician



Approved



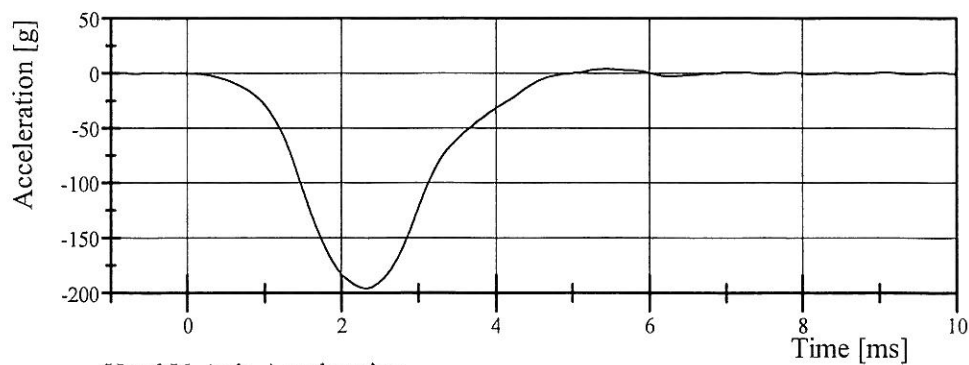
Transportation Research Center Inc.

Front Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

Test Date: 7/15/2008

Head X-Axis Acceleration

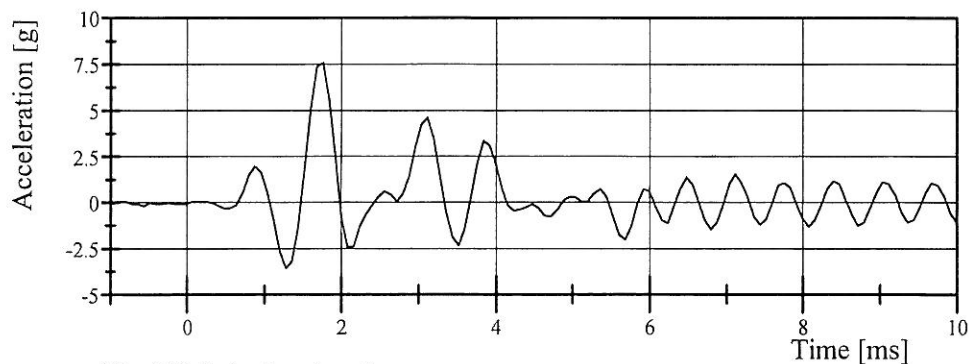


Filter Class: CFC_1000

Max: 4.1 g at 5.4 ms

Min: -196.1 g at 2.3 ms

Head Y-Axis Acceleration

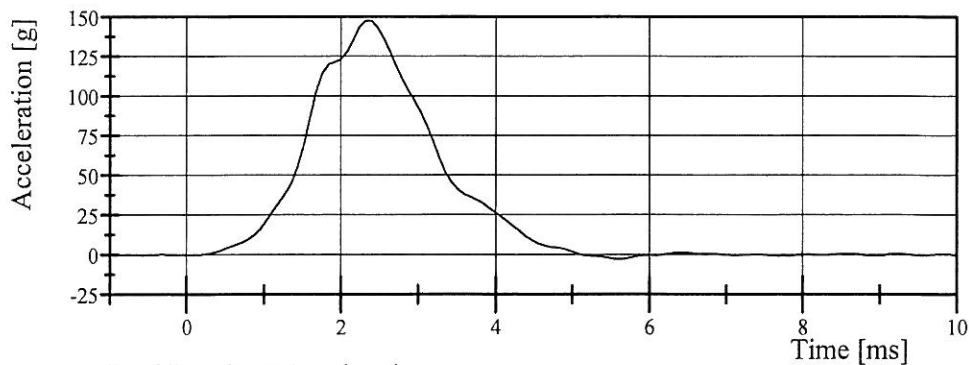


Filter Class: CFC_1000

Max: 7.6 g at 1.8 ms

Min: -3.6 g at 1.3 ms

Head Z-Axis Acceleration

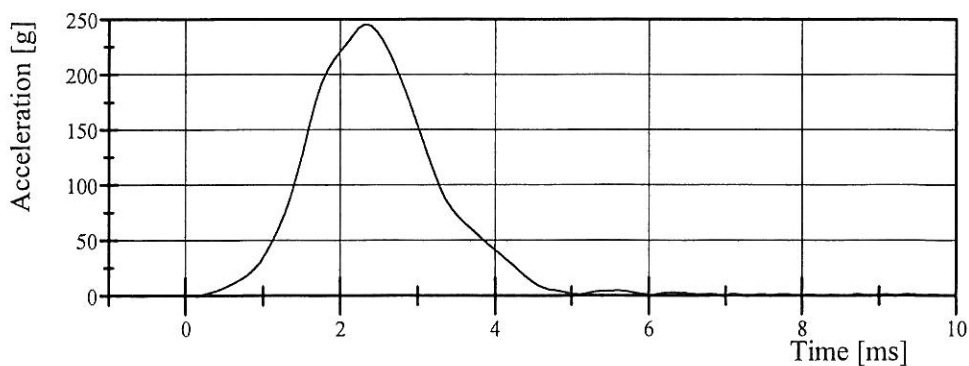


Filter Class: CFC_1000

Max: 147.7 g at 2.3 ms

Min: -2.8 g at 5.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 245.5 g at 2.3 ms

Min: 0.1 g at -1.0 ms

Transportation Research Center Inc.

Left Lateral Head Drop

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

Test Date: 7/16/2008

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	109.0 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

Ron Stoner

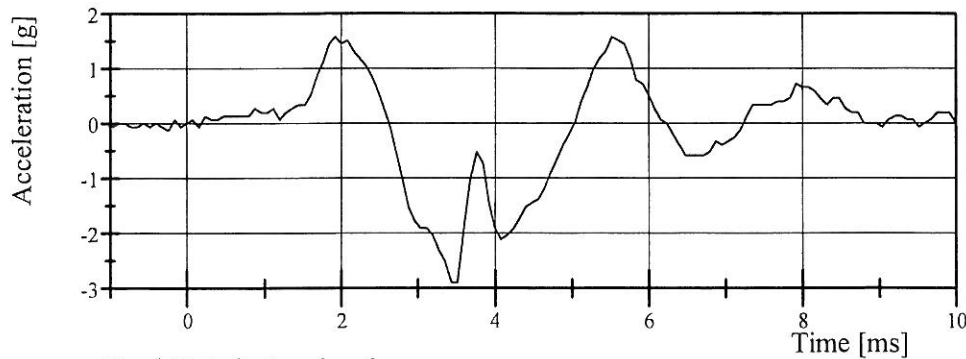
Transportation Research Center Inc.

Left Lateral Head Drop

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

Test Date: 7/16/2008

Head X-Axis Acceleration

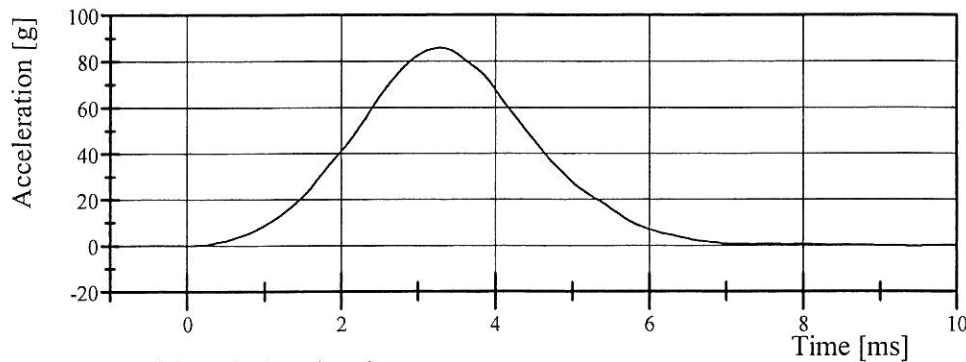


Filter Class: CFC_1000

Max: 1.6 g at 1.9 ms

Min: -2.9 g at 3.4 ms

Head Y-Axis Acceleration

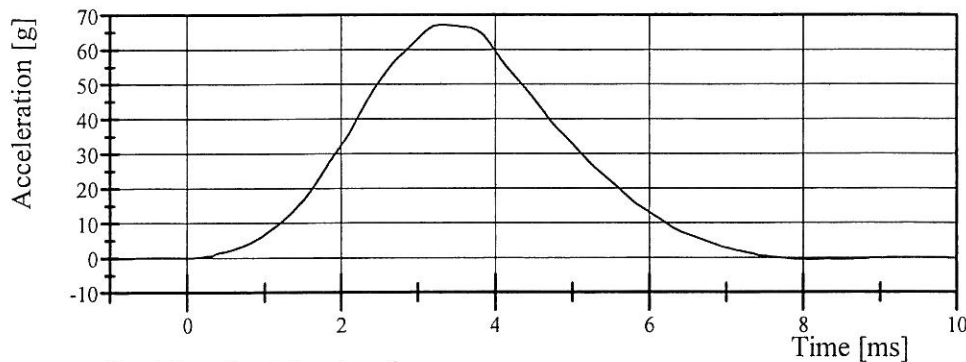


Filter Class: CFC_1000

Max: 85.8 g at 3.3 ms

Min: -0.2 g at 9.4 ms

Head Z-Axis Acceleration

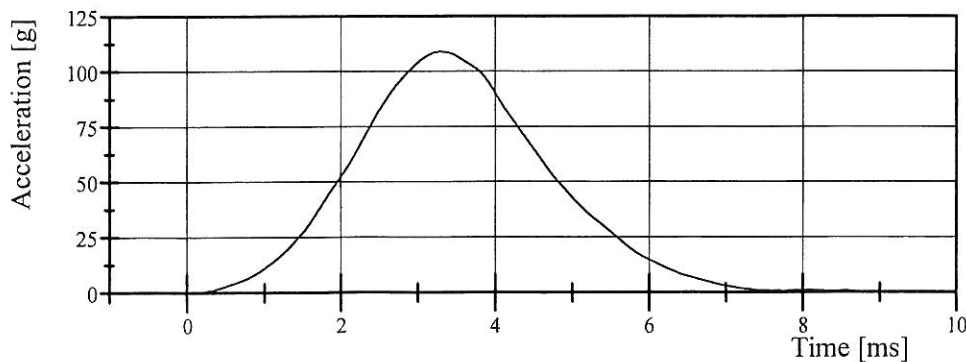


Filter Class: CFC_1000

Max: 67.2 g at 3.3 ms

Min: -0.5 g at 8.1 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 109.0 g at 3.3 ms

Min: 0.0 g at -0.6 ms

Transportation Research Center Inc.

Right Lateral Head Drop

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

Test Date: 7/16/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	112.8 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.1 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Technician

Charles W. Bell

Approved

Ron Stoner

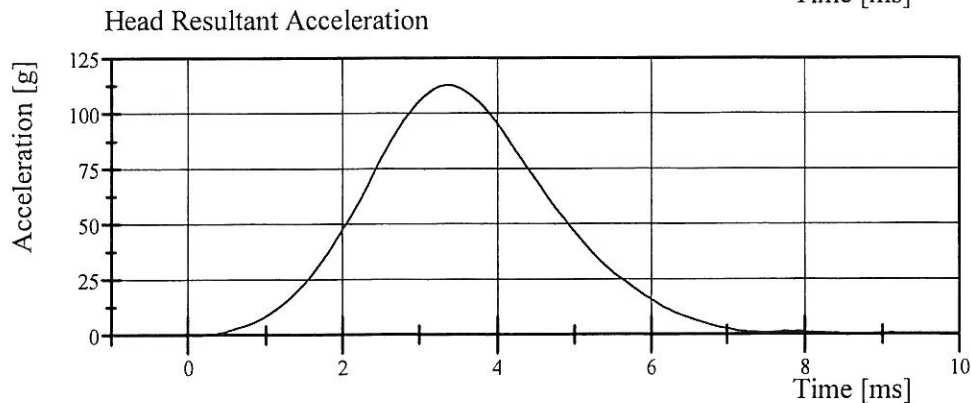
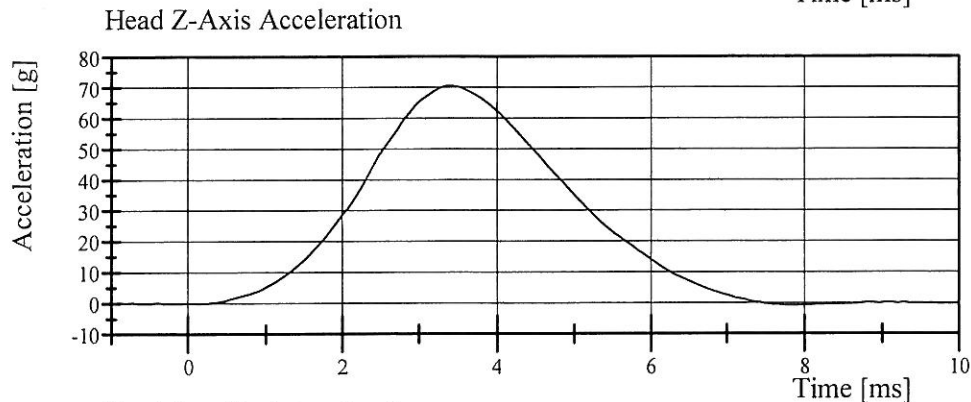
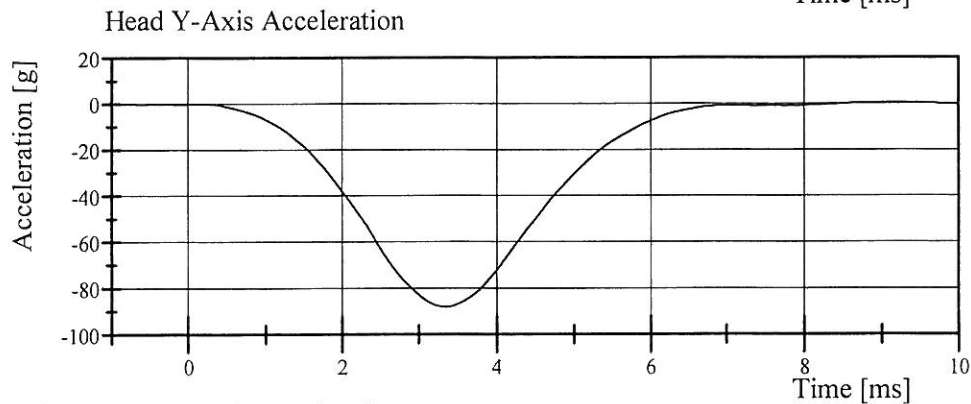
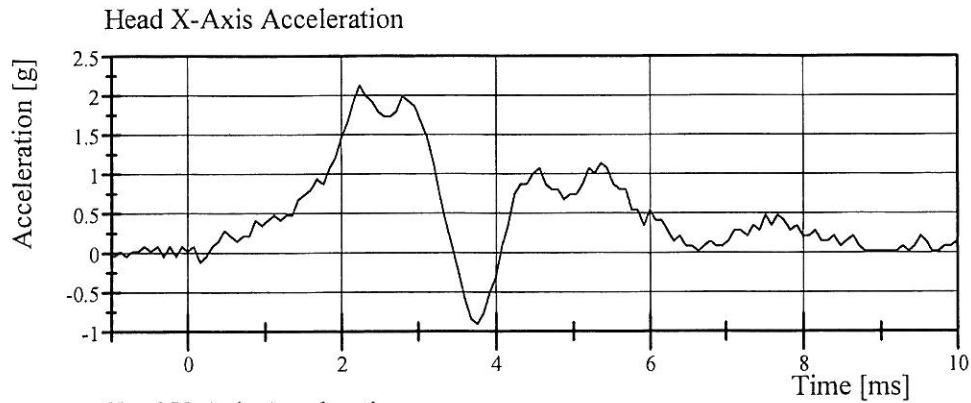


Transportation Research Center Inc.

Right Lateral Head Drop

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

Test Date: 7/16/2008



Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

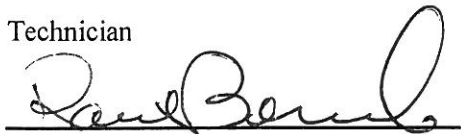
Test Date: 7/28/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	52 %	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	0.946 m/s	Yes
Change at 8 ms	1.6 - 2.16 m/s	1.984 m/s	Yes
Change at 12 ms	2.43 - 3.29 m/s	3.134 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-55.2 deg	Yes
Headform Flexion Decay			
- from Peak to Zero Degrees	58 - 72 ms	65.6 ms	Yes
Total Neck Occipital Condyles Moment	55 - 68 N·m	59.9 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) °	-35.6 °	Yes
Time of Peak	56 - 68 ms	58.2 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-30) - (-37) °	-32.4 °	Yes
Time of Peak	56 - 68 ms	62.1 ms	Yes

Test meets specifications.

Comments:

Technician



Approved

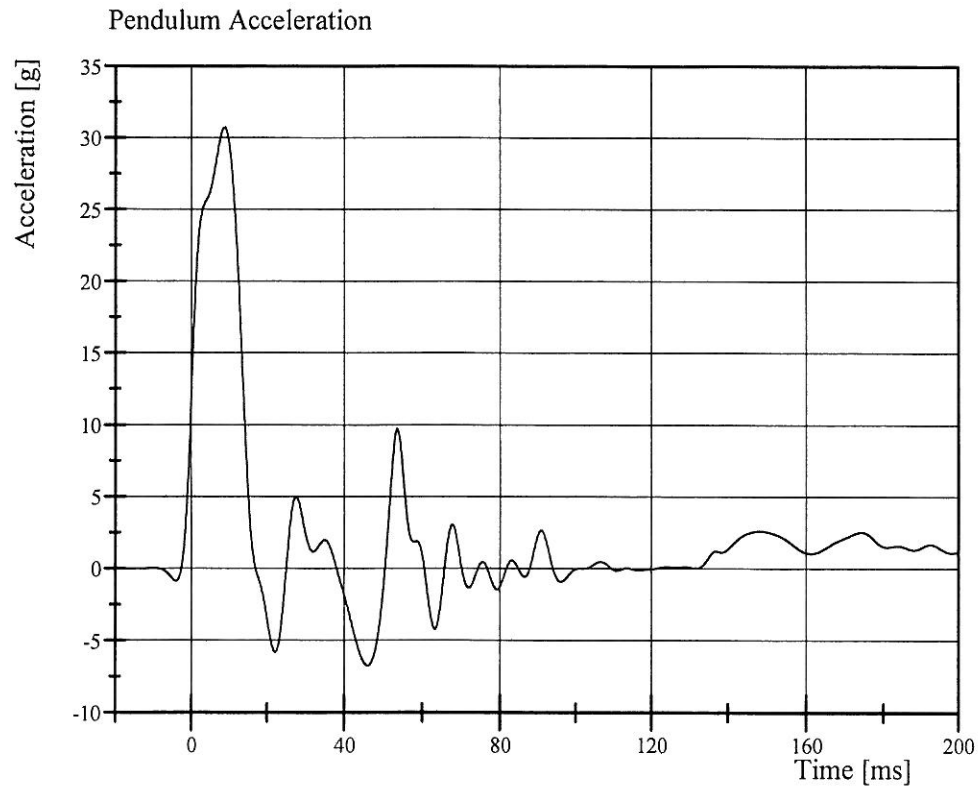


Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

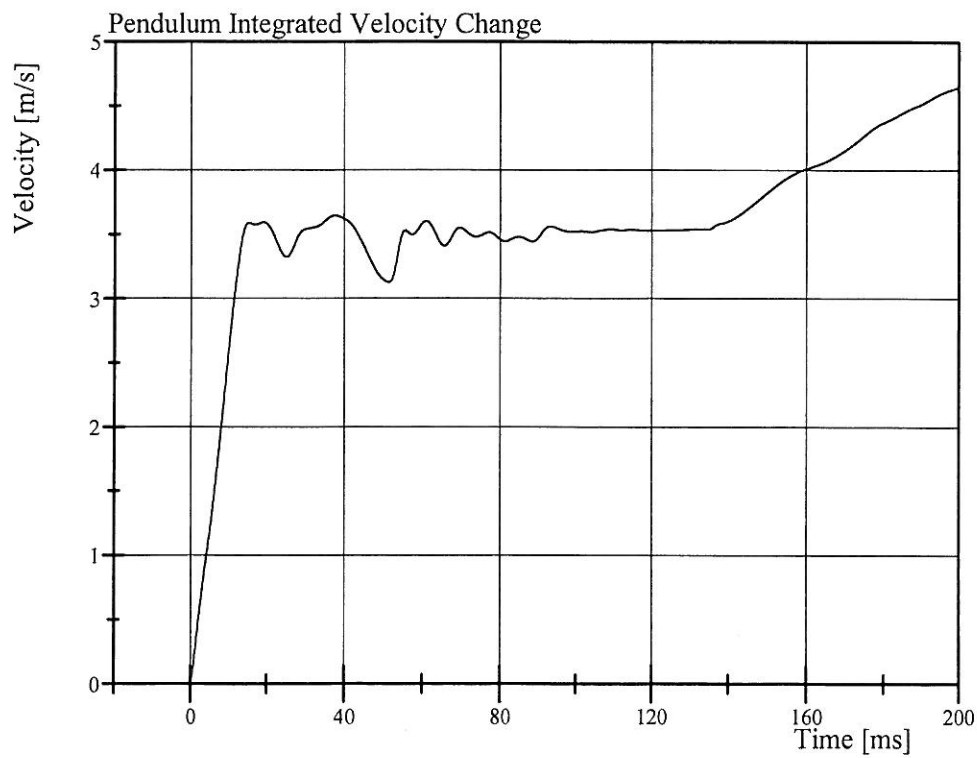
Test Date: 7/28/2008



Filter Class: CFC_60

Max: 30.7 g at 8.8 ms

Min: -6.8 g at 46.2 ms



Filter Class: CFC_180

Max: 4.6 m/s at 200.0 ms

Min: 0.0 m/s at 0.0 ms

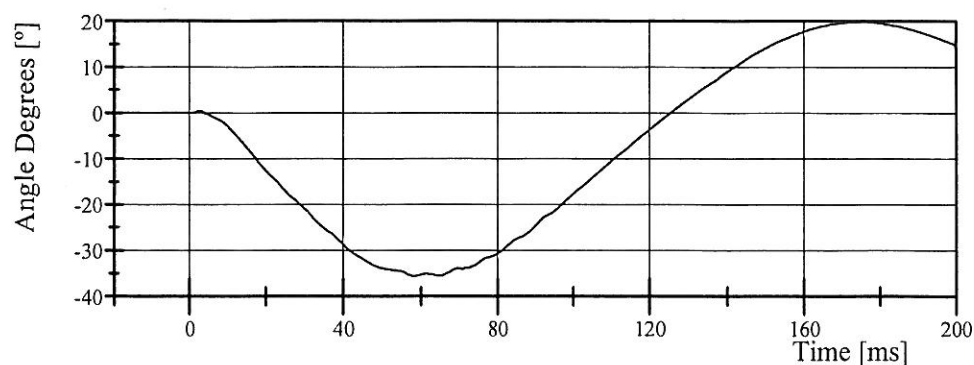
Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

Test Date: 7/28/2008

Forward Pot Rotation at Base of Pendulum

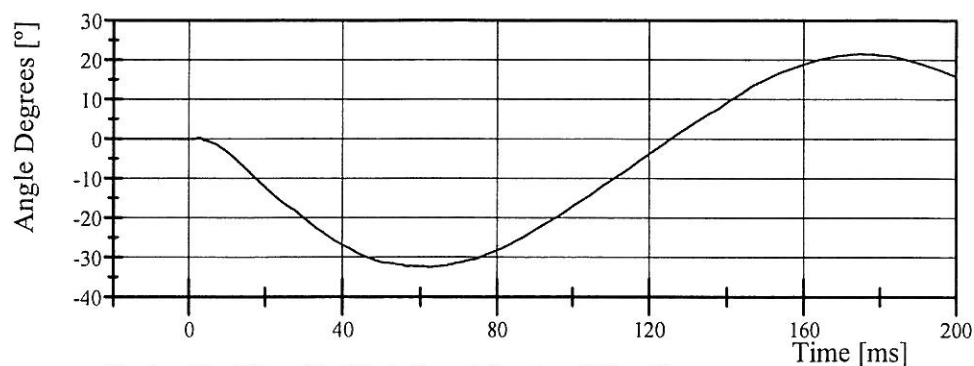


Filter Class: CFC_1000

Max: 19.9 ° at 176.7 ms

Min: -35.6 ° at 58.2 ms

Rear Pot Rotation at Base of Pendulum

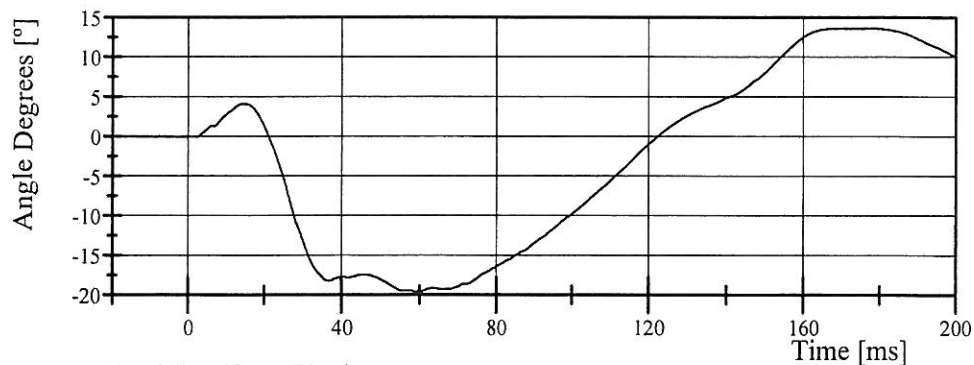


Filter Class: CFC_1000

Max: 21.5 ° at 175.4 ms

Min: -32.4 ° at 62.1 ms

Center Headform Pot Rotation at Center of Gravity

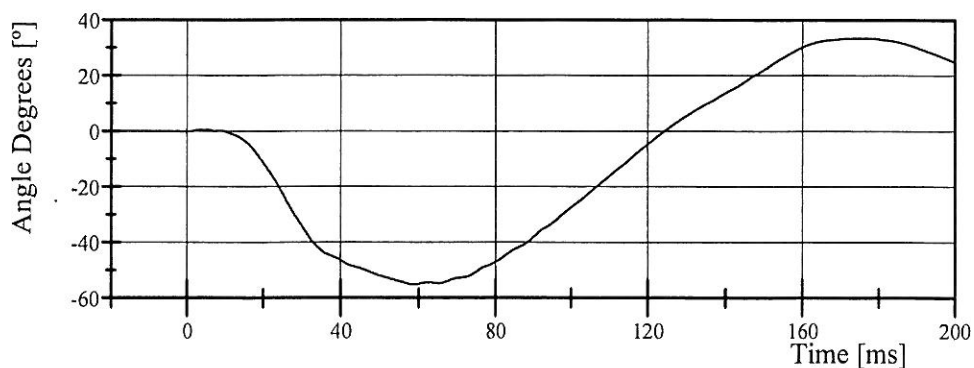


Filter Class: CFC_1000

Max: 13.6 ° at 178.1 ms

Min: -19.7 ° at 60.1 ms

Total Headform Flexion



Filter Class: CFC_1000

Max: 33.5 ° at 176.8 ms

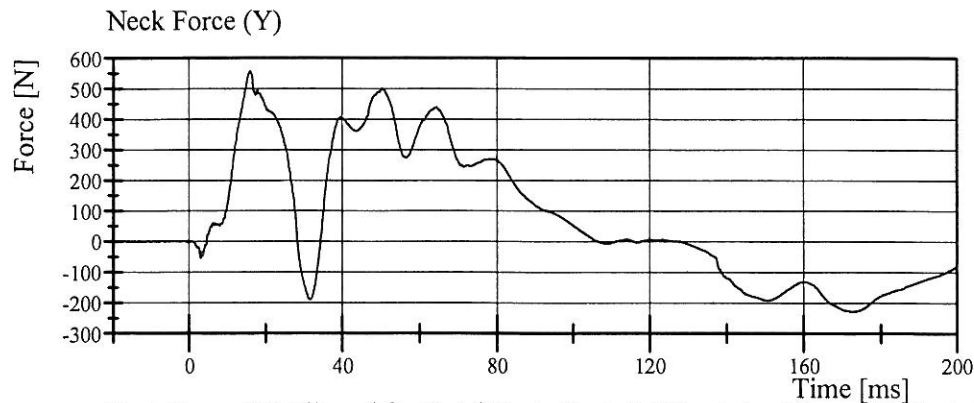
Min: -55.2 ° at 58.7 ms

Transportation Research Center Inc.

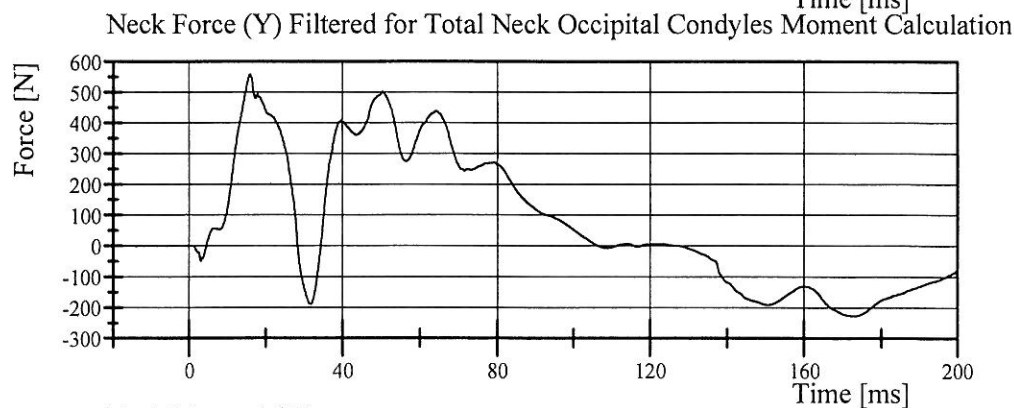
Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

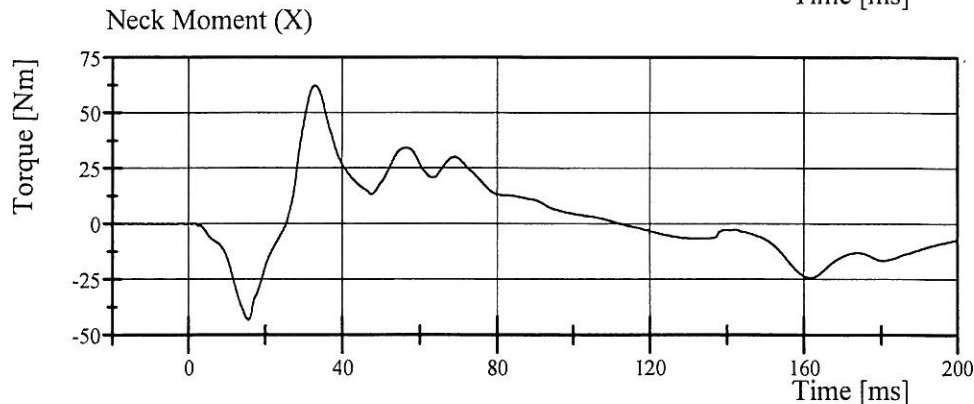
Test Date: 7/28/2008



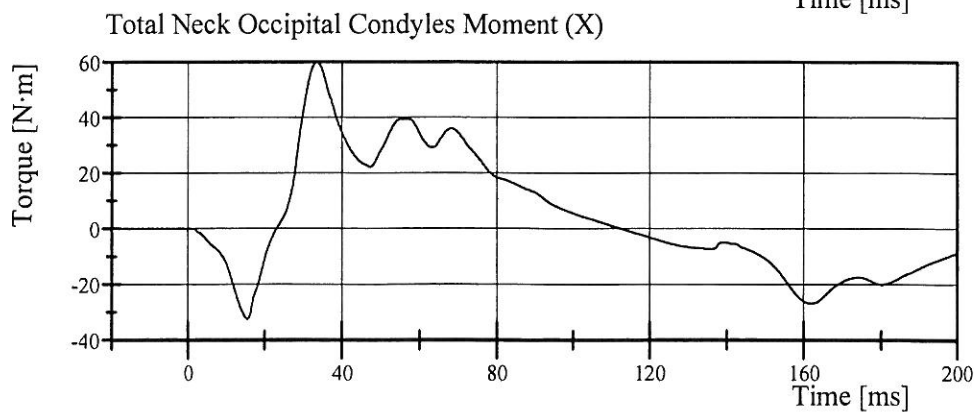
Filter Class: CFC_1000
Max: 556.8 N at 16.0 ms
Min: -227.7 N at 173.0 ms



Filter Class: CFC_600
Max: 556.7 N at 16.0 ms
Min: -227.3 N at 172.9 ms



Filter Class: CFC_600
Max: 62.2 Nm at 33.0 ms
Min: -43.1 Nm at 15.7 ms



Filter Class: CFC_600
Max: 59.9 N·m at 33.5 ms
Min: -32.3 N·m at 15.6 ms

Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-3

Test Date: 7/28/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.38 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-2,767.2 N	Yes
Shoulder Displacement	35 - 44 mm	36.8 mm	Yes

Test meets specifications.

Comments:

Technician



Approved



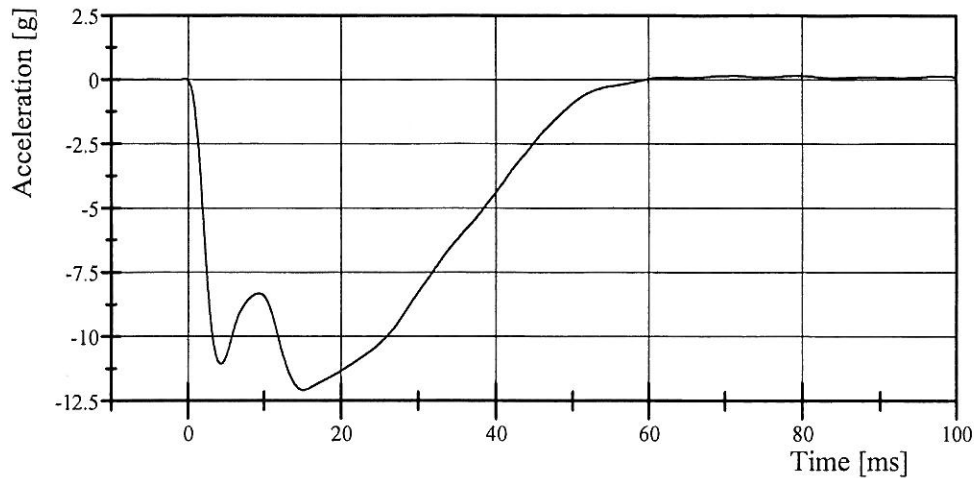
Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-3

Test Date: 7/28/2008

Impactor Acceleration

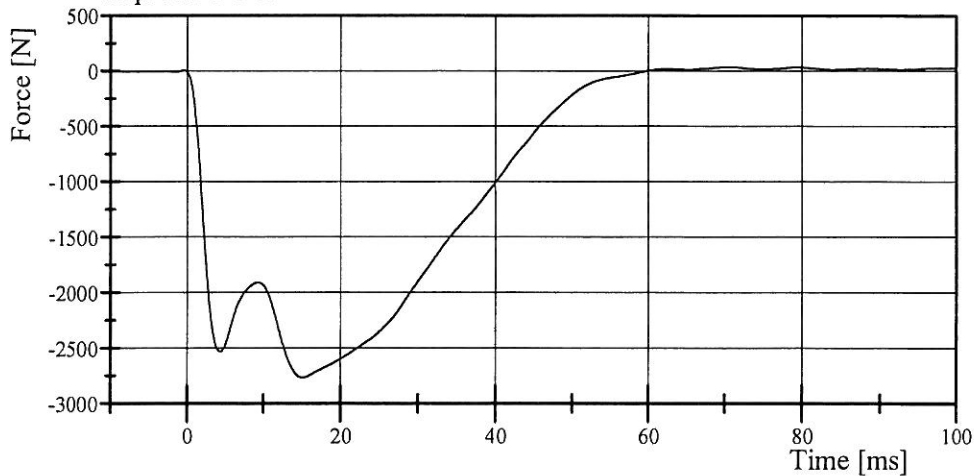


Filter Class: CFC_180

Max: 0.1 g at 71.3 ms

Min: -12.1 g at 15.2 ms

Impactor Force

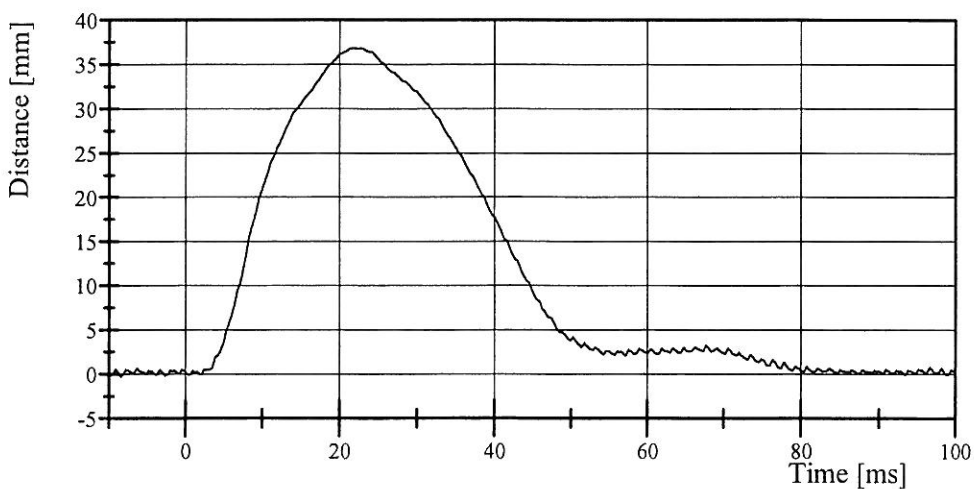


Filter Class: CFC_180

Max: 33.6 N at 71.3 ms

Min: -2,767.2 N at 15.2 ms

Shoulder Displacement



Filter Class: CFC_600

Max: 36.8 mm at 22.1 ms

Min: -0.3 mm at -8.4 ms

Transportation Research Center Inc.

Left Lateral Thorax with Arm

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

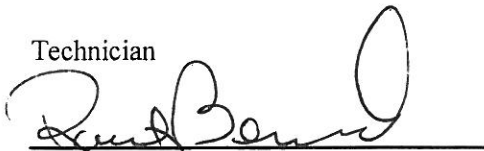
Test Date: 7/28/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.74 m/s	Yes
Impactor Force	(-4,700) - (-6,400) N	-5,518.1 N	Yes
Upper Thorax Rib Displacement	35 - 47 mm	36.2 mm	Yes
Center Thorax Rib Displacement	42 - 57 mm	46.0 mm	Yes
Lower Thorax Rib Displacement	40 - 54 mm	40.1 mm	Yes
Upper Spine Lateral Acceleration	24 - 33 g	30.7 g	Yes
Lower Spine Lateral Acceleration	20 - 28 g	24.3 g	Yes

Test meets specifications.

Comments:

Technician



Approved

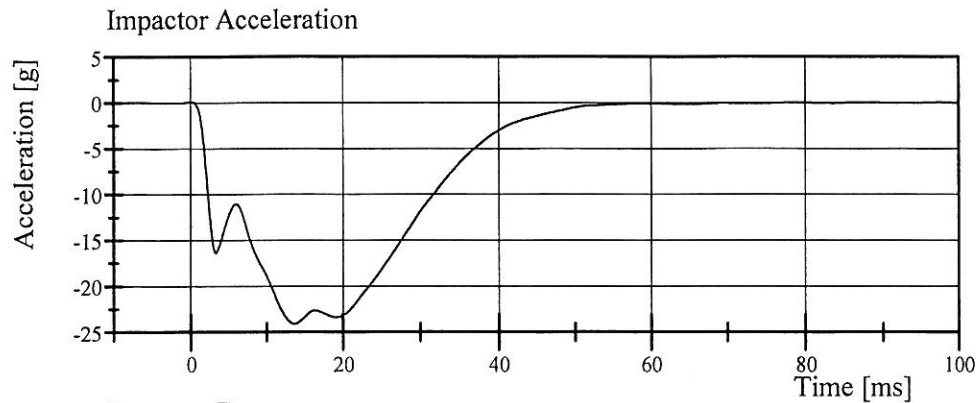


Transportation Research Center Inc.

Left Lateral Thorax with Arm

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

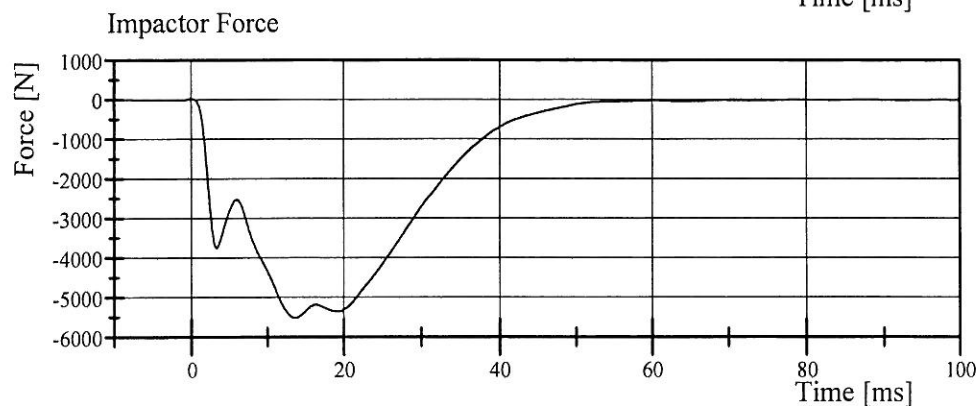
Test Date: 7/28/2008



Filter Class: CFC_180

Max: 0.1 g at 0.2 ms

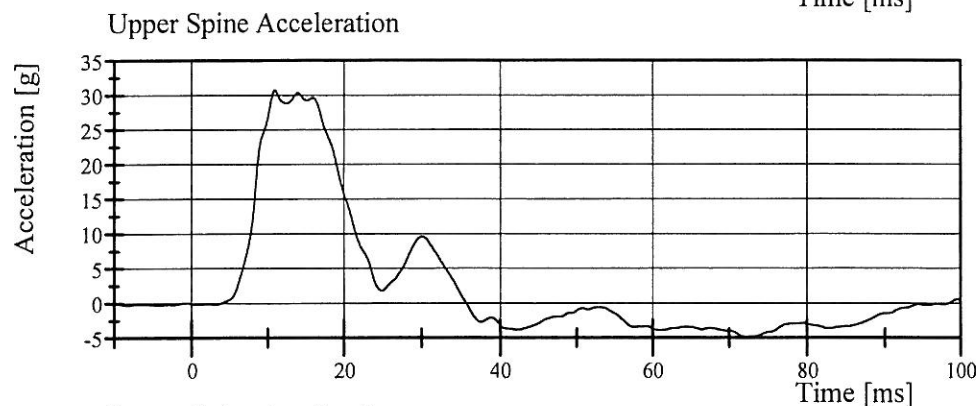
Min: -24.1 g at 13.7 ms



Filter Class: CFC_180

Max: 22.7 N at 0.2 ms

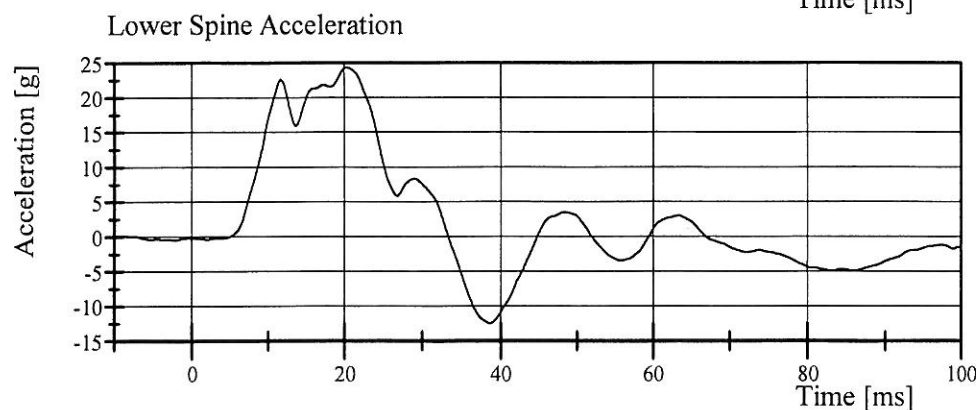
Min: -5,518.1 N at 13.7 ms



Filter Class: CFC_180

Max: 30.7 g at 11.0 ms

Min: -4.8 g at 72.2 ms



Filter Class: CFC_180

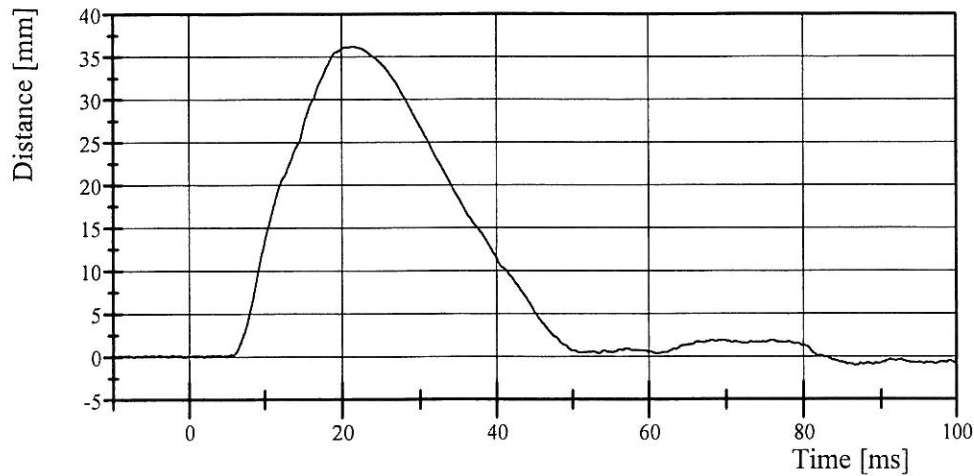
Max: 24.3 g at 20.3 ms

Min: -12.5 g at 38.7 ms

Transportation Research Center Inc.

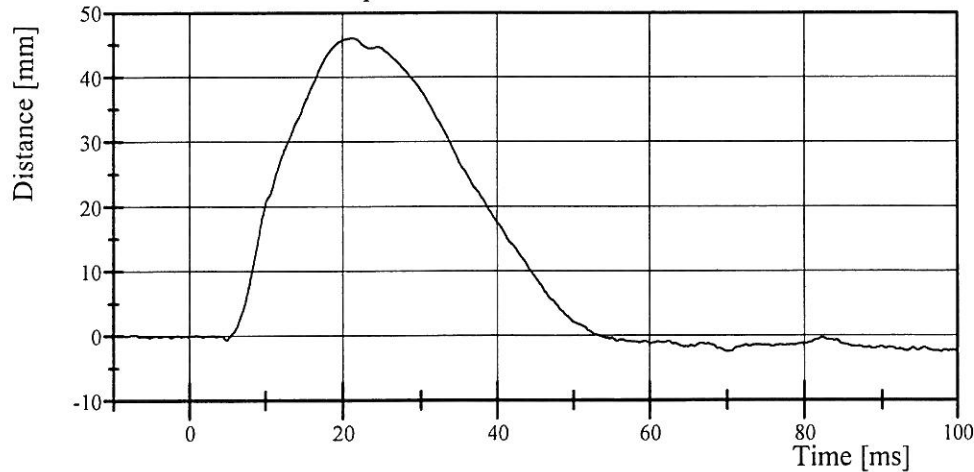
Left Lateral Thorax with Arm
WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-2
Test Date: 7/28/2008

Upper Thorax Rib Displacement



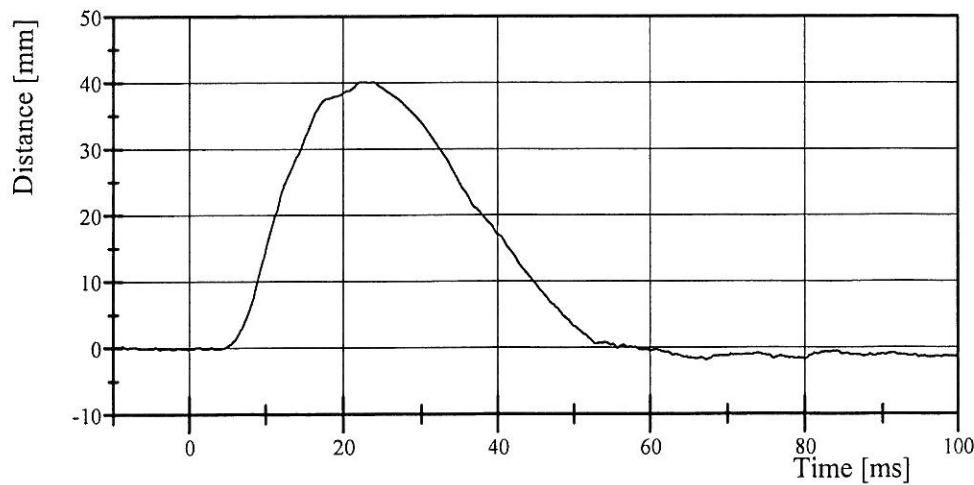
Filter Class: CFC_600
Max: 36.2 mm at 21.5 ms
Min: -1.0 mm at 86.7 ms

Center Thorax Rib Displacement



Filter Class: CFC_600
Max: 46.0 mm at 21.2 ms
Min: -2.5 mm at 97.9 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600
Max: 40.1 mm at 23.9 ms
Min: -1.8 mm at 67.3 ms

Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

Test Date: 7/28/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.5 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.34 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-2,802.4 N	Yes
Upper Abdominal Rib Displacement	33 - 41 mm	35.9 mm	Yes
Lower Abdominal Rib Displacement	31 - 39 mm	33.9 mm	Yes
Lower Spine Lateral Acceleration	15 - 20 g	15.9 g	Yes

Test meets specifications.

Comments:

Technician



Approved

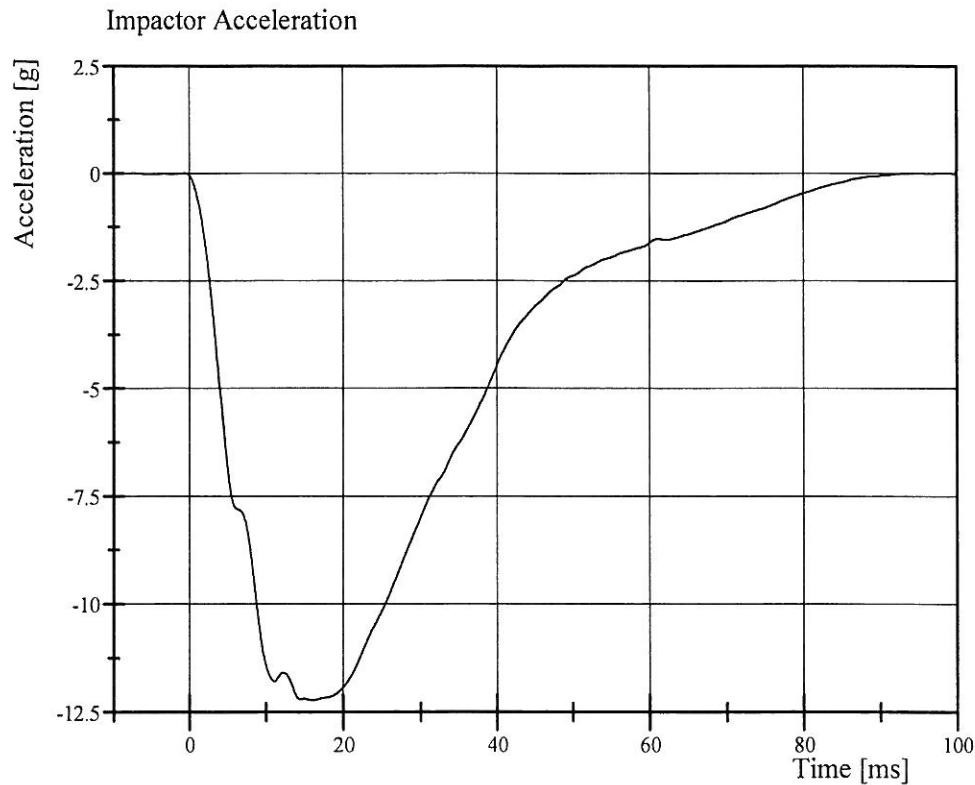


Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

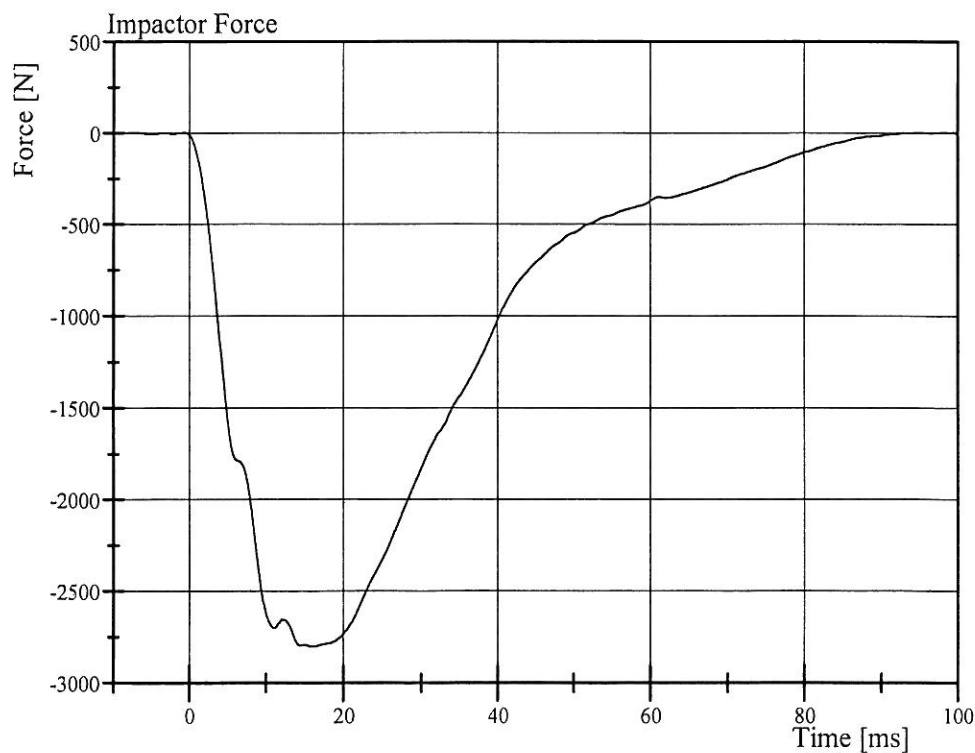
Test Date: 7/28/2008



Filter Class: CFC_180

Max: 0.0 g at 98.2 ms

Min: -12.2 g at 16.2 ms



Filter Class: CFC_180

Max: 2.7 N at 98.2 ms

Min: -2,802.4 N at 16.2 ms

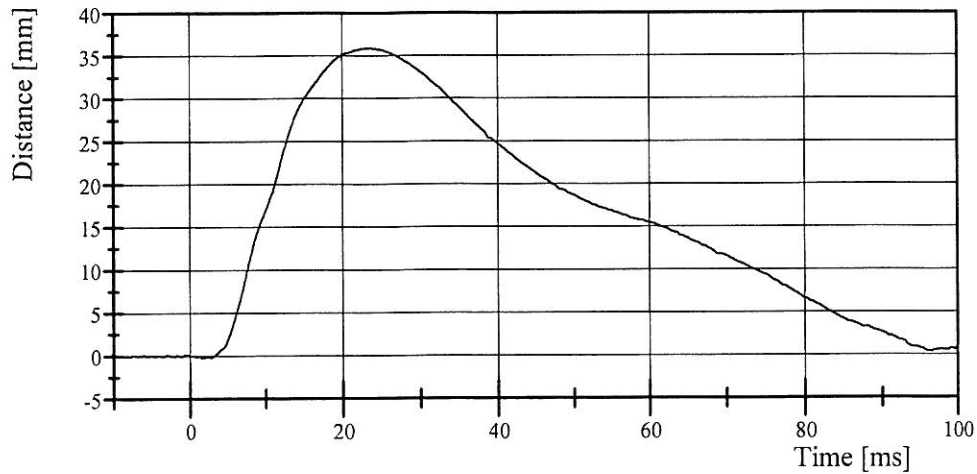
Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

Test Date: 7/28/2008

Upper Abdominal Rib Displacement

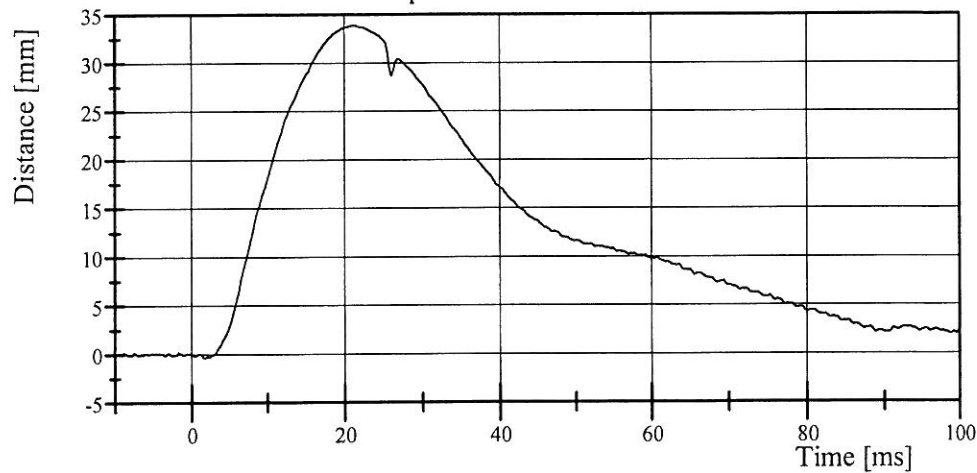


Filter Class: CFC_600

Max: 35.9 mm at 23.5 ms

Min: -0.2 mm at 2.9 ms

Lower Abdominal Rib Displacement

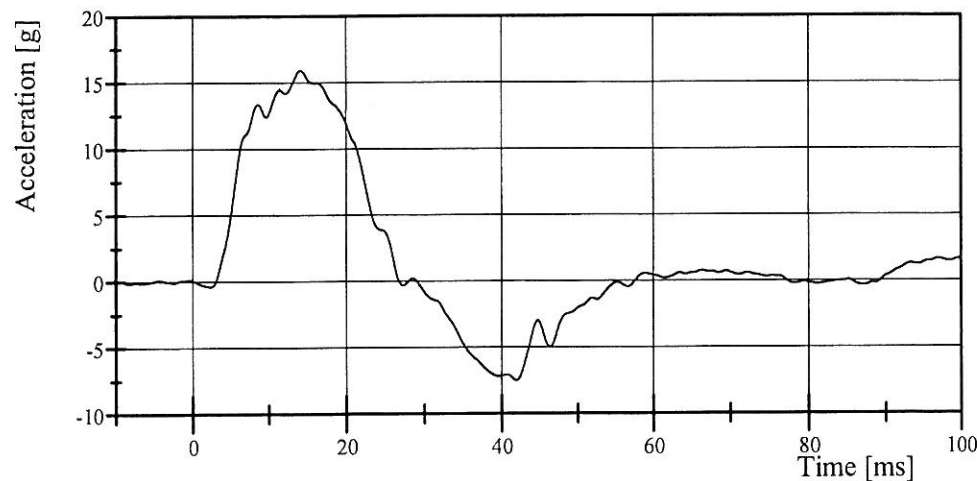


Filter Class: CFC_600

Max: 33.9 mm at 21.1 ms

Min: -0.4 mm at 1.8 ms

Lower Spine Acceleration (Y)



Filter Class: CFC_180

Max: 15.9 g at 14.2 ms

Min: -7.5 g at 42.0 ms

Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

Test Date: 7/28/2008

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.69 m/s	Yes
Impactor Force	(-6,300) - (-7,800) N	-7,148.3 N	Yes
Pelvis Lateral Acceleration	41 - 51 g	45.7 g	Yes
Lower Spine Lateral Acceleration	10 - 14 g	12.2 g	Yes

Test meets specifications.

Comments:

Technician

Raul Borcila

Approved

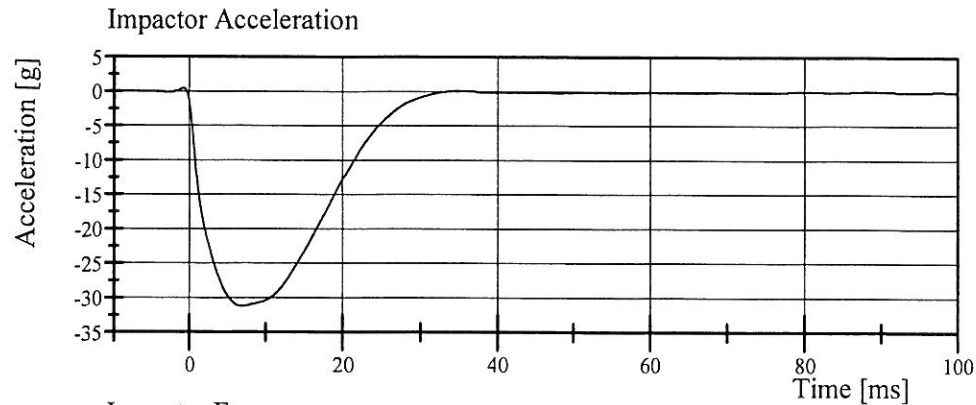
Ron Stoner

Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 016 Certification No. 4-1

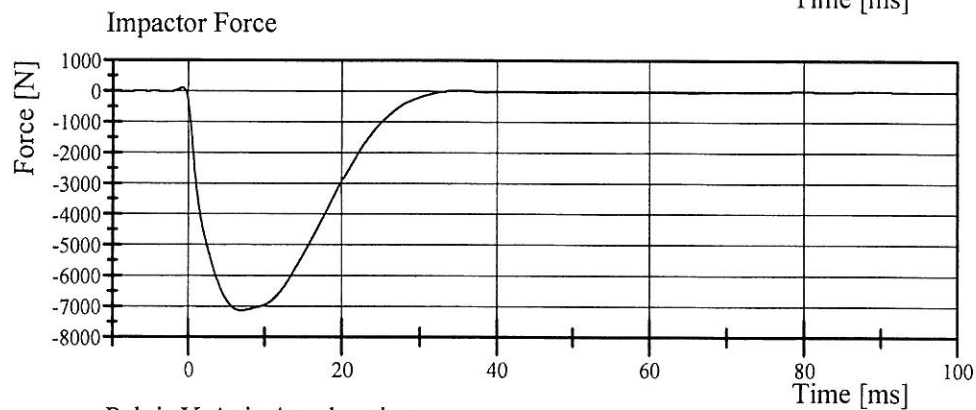
Test Date: 7/28/2008



Filter Class: CFC_180

Max: 0.5 g at -0.8 ms

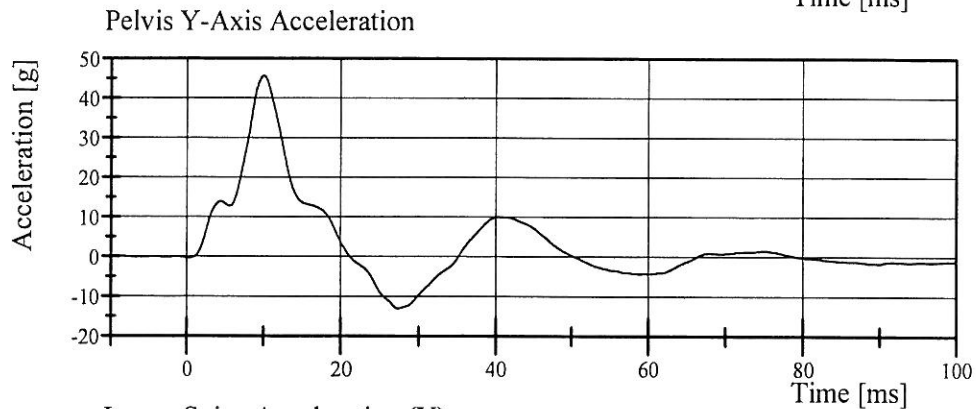
Min: -31.2 g at 7.0 ms



Filter Class: CFC_180

Max: 111.1 N at -0.8 ms

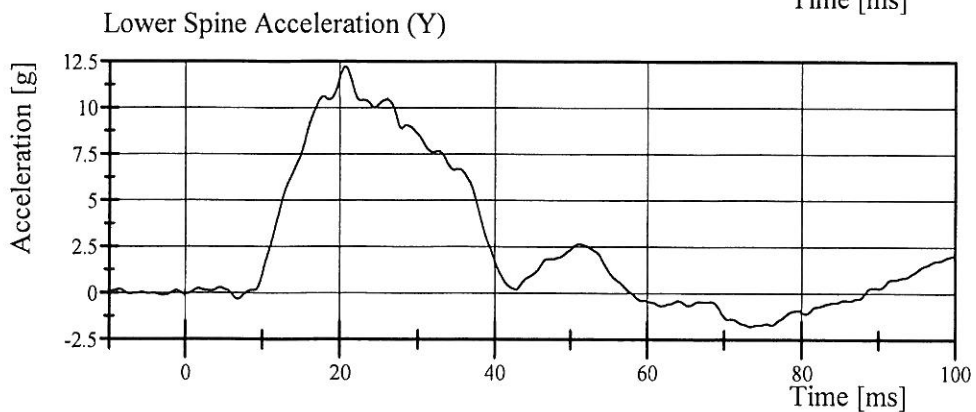
Min: -7,148.3 N at 7.0 ms



Filter Class: CFC_180

Max: 45.7 g at 10.1 ms

Min: -13.0 g at 27.4 ms



Filter Class: CFC_180

Max: 12.2 g at 20.7 ms

Min: -1.8 g at 73.4 ms

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 080729

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity
1	Trig D1	10ZERO000000VO0A	EVENT		1 Logic	Bipolar
2	P58571	16SILBFR0000ACXA	RIGHT SIDE SILL AT FRONT SEAT (X)	400	g	Bipolar
3	P58576	16SILBFR0000ACYA	RIGHT SIDE SILL AT FRONT SEAT (Y)	1000	g	-Bipolar
4	P58540	16SILBFR0000ACZA	RIGHT SIDE SILL AT FRONT SEAT (Z)	400	g	-Bipolar
5	P57876	16SILBRE0000ACXA	RIGHT SIDE SILL AT REAR SEAT (X)	400	g	Bipolar
6	P61262	16SILBRE0000ACYA	RIGHT SIDE SILL AT REAR SEAT (Y)	1000	g	-Bipolar
7	P61372	16SILBRE0000ACZA	RIGHT SIDE SILL AT REAR SEAT (Z)	400	g	-Bipolar
8	P47556	18FORA000000ACXA	REAR FLOORPAN ABOVE AXLE (X)	1000	g	Bipolar
9	P56948	18FORA000000ACYA	REAR FLOORPAN ABOVE AXLE (Y)	1000	g	-Bipolar
10	P61398	18FORA000000ACZA	REAR FLOORPAN ABOVE AXLE (Z)	1000	g	-Bipolar
11	P58554	14SILBFR0000ACYA	LEFT SIDE SILL AT FRONT SEAT (Y)	1000	g	Bipolar
12	P58579	14SILBRE0000ACYA	LEFT SIDE SILL AT REAR SEAT (Y)	1000	g	Bipolar
13	P58539	16VEHCRE0000ACYA	RIGHT REAR OCCUPANT COMPARTMENT (Y)	1500	g	Bipolar
14	P56926	11APILLO0000ACYA	LEFT LOWER A-POST (Y)	1500	g	-Bipolar
15	P44280	11APILUP0000ACYA	LEFT UPPER A-POST (Y)	1500	g	-Bipolar
16	P61373	14BPILLO0000ACYA	LEFT LOWER B-POST (Y)	1500	g	-Bipolar
17	P61381	14BPILUP0000ACYA	LEFT UPPER B-POST (Y)	1500	g	-Bipolar
18	P57937	11SETRFR0000ACYA	LEFT FRONT SEAT TRACK (Y)	1500	g	Bipolar
19	P58609	14SETRRE0000ACYA	LEFT REAR SEAT TRACK (Y)	1500	g	Bipolar
20	P61286	10VEHCCG0000ACXA	VEHICLE CENTER OF GRAVITY (X)	1000	g	Bipolar
21	P61321	10VEHCCG0000ACYA	VEHICLE CENTER OF GRAVITY (Y)	1000	g	-Bipolar
22	P61341	10VEHCCG0000ACZA	VEHICLE CENTER OF GRAVITY (Z)	1000	g	-Bipolar
23	P57930	10ENGNTTP0000ACXA	Top of Engine X-axis Accel	2000	g	-Bipolar
24	P57191	10ENGNTTP0000ACYA	Top of Engine Y-axis Accel	2000	g	-Bipolar
25	P57851	102FIRCX0000ACXA	Center of Firewall X-axis Accel	2000	g	Bipolar
26	P59117	102FIRCX0000ACYA	Center of Firewall Y-axis Accel	2000	g	-Bipolar
27	P57941	10ROOFRI2100ACXA	Right Roof Rail in line with Impact X-Axis Accel	2000	g	-Bipolar
28	P54518	10ROOFRI2100ACYA	Right Roof Rail in line with Impact Y-Axis Accel	2000	g	-Bipolar
29	P61301	11DOORMI0000ACYA	FRONT DOOR CENTERLINE (#6)	2000	g	Bipolar
30	P58612	11DOORMIRE00ACYA	FRONT DOOR MID REAR (#8)	2000	g	Bipolar
31	P57789	11DOORUPMI00ACYA	FRONT DOOR UPPER CENTER (#9)	2000	g	Bipolar
32	P57787	14DOORMIRE00ACYA	REAR DOOR MID REAR (#10)	2000	g	Bipolar
33	P61300	14DOORUPMI00ACYA	REAR DOOR UPPER CENTER (#11)	2000	g	Bipolar
34	ABFire1	10AIRBLE2200EV0A	Driver Side airbag (IP 1003)	5	V	Bipolar
35	ABFire3	11PRET000000EV0A	ELR P/T DRIV (IP 1006)	5	V	Bipolar
36	ABFire4	11PRETIN0000EV0A	Driver Inner Buckle Pre-tensioner(IP 200)	5	V	Bipolar
37	Bit.01	11HEAD000000VO0A	01 DUMMY HEAD CONTACT SWITCH		1 Logic	Bipolar

Channel Report Test Number 080729

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity
38	Bit.02	11SHLD000000VO0A	01 DUMMY SHOULDER CONTACT SWITCH	1	Logic	Bipolar
39	Bit.03	11TORS000000VO0A	01 DUMMY TORSO CONTACT SWITCH	1	Logic	Bipolar
40	Bit.04	11LEGLE000000VO0A	01 DUMMY LEFT LEG CONTACT SWITCH	1	Logic	Bipolar
41	Bit.05	14HEAD000000VO0A	02 DUMMY HEAD CONTACT SWITCH	1	Logic	Bipolar
42	Bit.06	14SHLD000000VO0A	02 DUMMY SHOULDER CONTACT SWITCH	1	Logic	Bipolar
43	Bit.07	14TORS000000VO0A	02 DUMMY TORSO CONTACT SWITCH	1	Logic	Bipolar
44	Bit.08	14LEGLE000000VO0A	02 DUMMY LEG CONTACT SWITCH	1	Logic	Bipolar
45	P33336	M0FRAMLE0000ACXA	MDB Left X	1000	g	Bipolar
46	P44313	M0FRAMRI0000ACXA	MDB RIGHT X	1000	g	Bipolar
47	P57332	M0FRAMTP0000ACXA	MDB TOP X	1000	g	Bipolar
48	P61265	M0FRAMLERE00ACXA	MDB Left Rear X	1000	g	Bipolar
49	p61323	M0FRAMLERE00ACYA	MDB Left Rear Y	1000	g	-Bipolar
50	P61315	M0MBARCG0000ACXA	MDB Center of Gravity X	1000	g	-Bipolar
51	P58608	M0MBARCG0000ACYA	MDB Center of Gravity Y	1000	g	-Bipolar
52	P61266	M0MBARCG0000ACZA	MDB Center of Gravity Z	1000	g	-Bipolar
53	Bit.06	M1CONT000000VO00	MDB LEFT CONTACT SWITCH	1	Logic	Bipolar
54	Bit.05	M3CONT000000VO00	MDB RIGHT CONTACT SWITCH	1	Logic	Bipolar

Command File Test Number 080729

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			

Command File Test Number 080729

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
22	10ENGNT0000ACXA	Top of Engine X-Axis Acceleration	60	+	yes	2000
23	10ENGNT0000ACYA	Top of Engine Y-Axis Acceleration	60	+	yes	2000
24	102FIRCX0000ACXA	Center Firewall X-Axis Acceleration	60	+	yes	2000
25	102FIRCX0000ACYA	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	11DOORMI0000ACYA	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	10AIRBLE2200EV0A	Driver Side Airbag	1000	+	no	5
34	11PRET000000EV0A	Driver ELR Pretensioner	1000	+	no	5
35	11PRETIN0000EV0A	Driver Inner Buckle Pretensioner	1000	+	no	5
36	11HEAD000000VO0A	Driver Head Contact Switch	1000	+	no	1
37	11SHLD000000VO0A	Driver Shoulder Contact Switch	1000	+	no	1
38	11TORS000000VO0A	Driver Torso Contact Switch	1000	+	no	1
39	11LEGLE000000VO0A	Driver Leg Contact Switch	1000	+	no	1
40	14HEAD000000VO0A	Passenger Head Contact Switch	1000	+	no	1
41	14SHLD000000VO0A	Passenger Shoulder Contact Switch	1000	+	no	1
42	14TORS000000VO0A	Passenger Torso Contact Switch	1000	+	no	1
43	14LEGLE000000VO0A	Passenger Leg Contact Switch	1000	+	no	1
44	M0FRAMLE0000ACXA	MDB Left Frame X-Axis Acceleration	60	+	yes	1000
45	M0FRAMRI0000ACXA	MDB Right Frame X-Axis Acceleration	60	+	yes	1000
46	M0FRAMTP0000ACXA	MDB Top Frame X-Axis Acceleration	60	+	yes	1000
47	M0FRAMLERE00ACXA	MDB Left Rear X-Axis Acceleration	60	+	yes	1000
48	M0FRAMLERE00ACYA	MDB Left Rear Y-Axis Acceleration	60	+	yes	0
49	M0MBARCG0000ACXA	MDB Center of Gravity X-Axis Acceleration	60	+	yes	1000
49A	M0MBARCG0000VEXA	MDB Center of Gravity X-Axis Velocity	180			
50	M0MBARCG0000ACYA	MDB Center of Gravity Y-Axis Acceleration	60	+	yes	1000
50A	M0MBARCG0000VEYA	MDB Center of Gravity Y-Axis Velocity	180			
51	M0MBARCG0000ACZA	MDB Center of Gravity Z-Axis Acceleration	60	+	yes	1000
51A	M0MBARCG0000ACRA	MDB Center of Gravity Resultant Acceleration	60			
52	M1CONT000000VO00	MDB Left Contact Switch	0	+	no	1
53	M3CONT000000VO00	MDB Right Contact Switch	0	+	no	1
54	11HEADCG00WSACXA	Driver Head X-Axis Acceleration	1000	+	yes	2000
55	11HEADCG00WSACYA	Driver Head Y-Axis Acceleration	1000	+	yes	2000

Command File Test Number 080729

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
56	11HEADCG00WSACZA	Driver Head Z-Axis Acceleration	1000	+	yes	2000
56A	11HEADCG00WSACRA	Driver Head Resultant Acceleration	1000			
57	11HEADCG00WSANXA	Driver Head X-Axis Angular Displacement	1000	+	yes	50000
58	11HEADCG00WSANYA	Driver Head Y-Axis Angular Displacement	1000	+	yes	50000
59	11HEADCG00WSANZA	Driver Head Z-Axis Angular Displacement	1000	+	yes	50000
60	11NECKUP00WSFOXA	Driver Upper Neck X-Axis Force	1000	+	yes	10000
61	11NECKUP00WSFOYA	Driver Upper Neck Y-Axis Force	1000	+	yes	10000
62	11NECKUP00WSFOZA	Driver Upper Neck Z-Axis Force	1000	+	yes	12000
63	11NECKUP00WSMOXA	Driver Upper Neck Moment About X Axis	600	+	yes	300
64	11NECKUP00WSMOYA	Driver Upper Neck Moment About Y Axis	600	+	yes	300
65	11NECKUP00WSMOZA	Driver Upper Neck Moment About Z Axis	600	+	yes	200
66	11NECKLO00WSFOXA	Driver Lower Neck X-Axis Force	1000	+	yes	10000
67	11NECKLO00WSFOYA	Driver Lower Neck Y-Axis Force	1000	+	yes	10000
68	11NECKLO00WSFOZA	Driver Lower Neck Z-Axis Force	1000	+	yes	12000
69	11NECKLO00WSMOXA	Driver Lower Neck Moment About X Axis	600	+	yes	300
70	11NECKLO00WSMOYA	Driver Lower Neck Moment About Y Axis	600	+	yes	300
71	11NECKLO00WSMOZA	Driver Lower Neck Moment About Z Axis	600	+	yes	200
72	11SHLDLE00WSFOXA	Driver Shoulder X-Axis Force	600	+	yes	5000
73	11SHLDLE00WSFOYA	Driver Shoulder Y-Axis Force	600	+	yes	10000
74	11SHLDLE00WSFOZA	Driver Shoulder Z-Axis Force	600	+	yes	5000
75	11SHLDLE00WSDSYA	Driver Shoulder Y-Axis Displacement	600	+	yes	90
76	11SHLDLE00WSACXA	Driver Shoulder X-Axis Acceleration	1000	+	yes	2000
77	11SHLDLE00WSACYA	Driver Shoulder Y-Axis Acceleration	1000	+	yes	2000
78	11SHLDLE00WSACZA	Driver Shoulder Z-Axis Acceleration	1000	+	yes	2000
78A	11SHLDLE00WSACRA	Driver Shoulder Resultant Acceleration	1000			
79	11THSP0100WSACXA	Driver T1 X-Axis Acceleration	180	+	yes	2000
80	11THSP0100WSACYA	Driver T1 Y-Axis Acceleration	180	+	yes	2000
81	11THSP0100WSACZA	Driver T1 Z-Axis Acceleration	180	+	yes	2000
81A	11THSP0100WSACRA	Driver T1 Resultant Acceleration	180			
82	11THSP0400WSACXA	Driver T4 X-Axis Acceleration	180	+	yes	2000
83	11THSP0400WSACYA	Driver T4 Y-Axis Acceleration	180	+	yes	2000
84	11THSP0400WSACZA	Driver T4 Z-Axis Acceleration	180	+	yes	2000
84A	11THSP0400WSACRA	Driver T4 Resultant Acceleration	180			
85	11THSP1200WSACXA	Driver T12 X-Axis Acceleration	180	+	yes	2000
86	11THSP1200WSACYA	Driver T12 Y-Axis Acceleration	180	+	yes	2000
87	11THSP1200WSACZA	Driver T12 Z-Axis Acceleration	180	+	yes	2000
87A	11THSP1200WSACRA	Driver T12 Resultant Acceleration	180			

Command File Test Number 080729

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
88	11TRRILE01WSDSYA	Driver Thorax Rib 1 Y-Axis Displacement	600	+	yes	90
89	11TRRILE01WSACXA	Driver Thorax Rib 1 X-Axis Acceleration	1000	+	yes	2000
90	11TRRILE01WSACYA	Driver Thorax Rib 1 Y-Axis Acceleration	1000	+	yes	2000
91	11TRRILE01WSACZA	Driver Thorax Rib 1 Z-Axis Acceleration	1000	+	yes	2000
91A	11TRRILE01WSACRA	Driver Thorax Rib 1 Resultant Acceleration	1000			
92	11TRRILE02WSDSYA	Driver Thorax Rib 2 Y-Axis Displacement	600	+	yes	90
93	11TRRILE02WSACXA	Driver Thorax Rib 2 X-Axis Acceleration	1000	+	yes	2000
94	11TRRILE02WSACYA	Driver Thorax Rib 2 Y-Axis Acceleration	1000	+	yes	2000
95	11TRRILE02WSACZA	Driver Thorax Rib 2 Z-Axis Acceleration	1000	+	yes	2000
95A	11TRRILE02WSACRA	Driver Thorax Rib 2 Resultant Acceleration	1000			
96	11TRRILE03WSDSYA	Driver Thorax Rib 3 Y-Axis Displacement	600	+	yes	90
97	11TRRILE03WSACXA	Driver Thorax Rib 3 X-Axis Acceleration	1000	+	yes	2000
98	11TRRILE03WSACYA	Driver Thorax Rib 3 Y-Axis Acceleration	1000	+	yes	2000
99	11TRRILE03WSACZA	Driver Thorax Rib 3 Z-Axis Acceleration	1000	+	yes	2000
99A	11TRRILE03WSACRA	Driver Thorax Rib 3 Resultant Acceleration	1000			
100	11ABRILE01WSDSYA	Driver Abdominal Rib 1 Y-Axis Displacement	600	+	yes	90
101	11ABRILE01WSACXA	Driver Abdominal Rib 1 X-Axis Acceleration	1000	+	yes	2000
102	11ABRILE01WSACYA	Driver Abdominal Rib 1 Y-Axis Acceleration	1000	+	yes	2000
103	11ABRILE01WSACZA	Driver Abdominal Rib 1 Z-Axis Acceleration	1000	+	yes	2000
103A	11ABRILE01WSACRA	Driver Abdominal Rib 1 Resultant Acceleration	1000			
104	11ABRILE02WSDSYA	Driver Abdominal Rib 2 Y-Axis Displacement	600	+	yes	90
105	11ABRILE02WSACXA	Driver Abdominal Rib 2 X-Axis Acceleration	1000	+	yes	2000
106	11ABRILE02WSACYA	Driver Abdominal Rib 2 Y-Axis Acceleration	1000	+	yes	2000
107	11ABRILE02WSACZA	Driver Abdominal Rib 2 Z-Axis Acceleration	1000	+	yes	2000
107A	11ABRILE02WSACRA	Driver Abdominal Rib 2 Resultant Acceleration	1000			
108	11LUSP0000WSFOXA	Driver Lumbar X-Axis Force	600	+	yes	10000
109	11LUSP0000WSFOYA	Driver Lumbar Y-Axis Force	600	+	yes	10000
110	11LUSP0000WSFOZA	Driver Lumbar Z-Axis Force	600	+	yes	12000
111	11LUSP0000WSMOXA	Driver Lumbar Moment About X Axis	600	+	yes	300
112	11LUSP0000WSMOYA	Driver Lumbar Moment About Y Axis	600	+	yes	300
113	11LUSP0000WSMOZA	Driver Lumbar Moment About Z Axis	600	+	yes	200
114	11PELVCG00WSACXA	Driver Pelvis X-Axis Acceleration	1000	+	yes	2000
115	11PELVCG00WSACYA	Driver Pelvis Y-Axis Acceleration	1000	+	yes	2000
116	11PELVCG00WSACZA	Driver Pelvis Z-Axis Acceleration	1000	+	yes	2000
116A	11PELVCG00WSACRA	Driver Pelvis Resultant Acceleration	1000			
117	11PUBC0000WSFOYA	Driver Pubic Y-Axis Force	600	+	yes	12000
118	14HEADCG00WSACXA	Passenger Head X-Axis Acceleration	1000	+	yes	2000

D-11

080729

Command File Test Number 080729

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
119	14HEADCG00WSACYA	Passenger Head Y-Axis Acceleration	1000	+	yes	2000
120	14HEADCG00WSACZA	Passenger Head Z-Axis Acceleration	1000	+	yes	2000
120A	14HEADCG00WSACRA	Passenger Head Resultant Acceleration	1000			
121	14HEADCG00WSANXA	Passenger Head X-Axis Angular Displacement	1000	+	yes	50000
122	14HEADCG00WSANYA	Passenger Head Y-Axis Angular Displacement	1000	+	yes	50000
123	14HEADCG00WSANZA	Passenger Head Z-Axis Angular Displacement	1000	+	yes	50000
124	14NECKUP00WSFOXA	Passenger Upper Neck X-Axis Force	1000	+	yes	10000
125	14NECKUP00WSFOYA	Passenger Upper Neck Y-Axis Force	1000	+	yes	10000
126	14NECKUP00WSFOZA	Passenger Upper Neck Z-Axis Force	1000	+	yes	12000
127	14NECKUP00WSMOXA	Passenger Upper Neck Moment About X Axis	600	+	yes	300
128	14NECKUP00WSMOYA	Passenger Upper Neck Moment About Y Axis	600	+	yes	300
129	14NECKUP00WSMOZA	Passenger Upper Neck Moment About Z Axis	600	+	yes	200
130	14NECKLO00WSFOXA	Passenger Lower Neck X-Axis Force	1000	+	yes	10000
131	14NECKLO00WSFOYA	Passenger Lower Neck Y-Axis Force	1000	+	yes	10000
132	14NECKLO00WSFOZA	Passenger Lower Neck Z-Axis Force	1000	+	yes	12000
133	14NECKLO00WSMOXA	Passenger Lower Neck Moment About X Axis	600	+	yes	300
134	14NECKLO00WSMOYA	Passenger Lower Neck Moment About Y Axis	600	+	yes	300
135	14NECKLO00WSMOZA	Passenger Lower Neck Moment About Z Axis	600	+	yes	200
136	14SHLDLE00WSFOXA	Passenger Shoulder X-Axis Force	600	+	yes	5000
137	14SHLDLE00WSFOYA	Passenger Shoulder Y-Axis Force	600	+	yes	10000
138	14SHLDLE00WSFOZA	Passenger Shoulder Z-Axis Force	600	+	yes	5000
139	14SHLDLE00WSDSYA	Passenger Shoulder Y-Axis Displacement	600	+	yes	90
140	14SHLDLE00WSACXA	Passenger Shoulder X-Axis Acceleration	1000	+	yes	2000
141	14SHLDLE00WSACYA	Passenger Shoulder Y-Axis Acceleration	1000	+	yes	2000
142	14SHLDLE00WSACZA	Passenger Shoulder Z-Axis Acceleration	1000	+	yes	2000
142A	14SHLDLE00WSACRA	Passenger Shoulder Resultant Acceleration	1000			
143	14THSP0100WSACXA	Passenger T1 X-Axis Acceleration	180	+	yes	2000
144	14THSP0100WSACYA	Passenger T1 Y-Axis Acceleration	180	+	yes	2000
145	14THSP0100WSACZA	Passenger T1 Z-Axis Acceleration	180	+	yes	2000
145A	14THSP0100WSACRA	Passenger T1 Resultant Acceleration	180			
146	14THSP0400WSACXA	Passenger T4 X-Axis Acceleration	180	+	yes	2000
147	14THSP0400WSACYA	Passenger T4 Y-Axis Acceleration	180	+	yes	2000
148	14THSP0400WSACZA	Passenger T4 Z-Axis Acceleration	180	+	yes	2000
148A	14THSP0400WSACRA	Passenger T4 Resultant Acceleration	180			
149	14THSP1200WSACXA	Passenger T12 X-Axis Acceleration	180	+	yes	2000
150	14THSP1200WSACYA	Passenger T12 Y-Axis Acceleration	180	+	yes	2000
151	14THSP1200WSACZA	Passenger T12 Z-Axis Acceleration	180	+	yes	2000

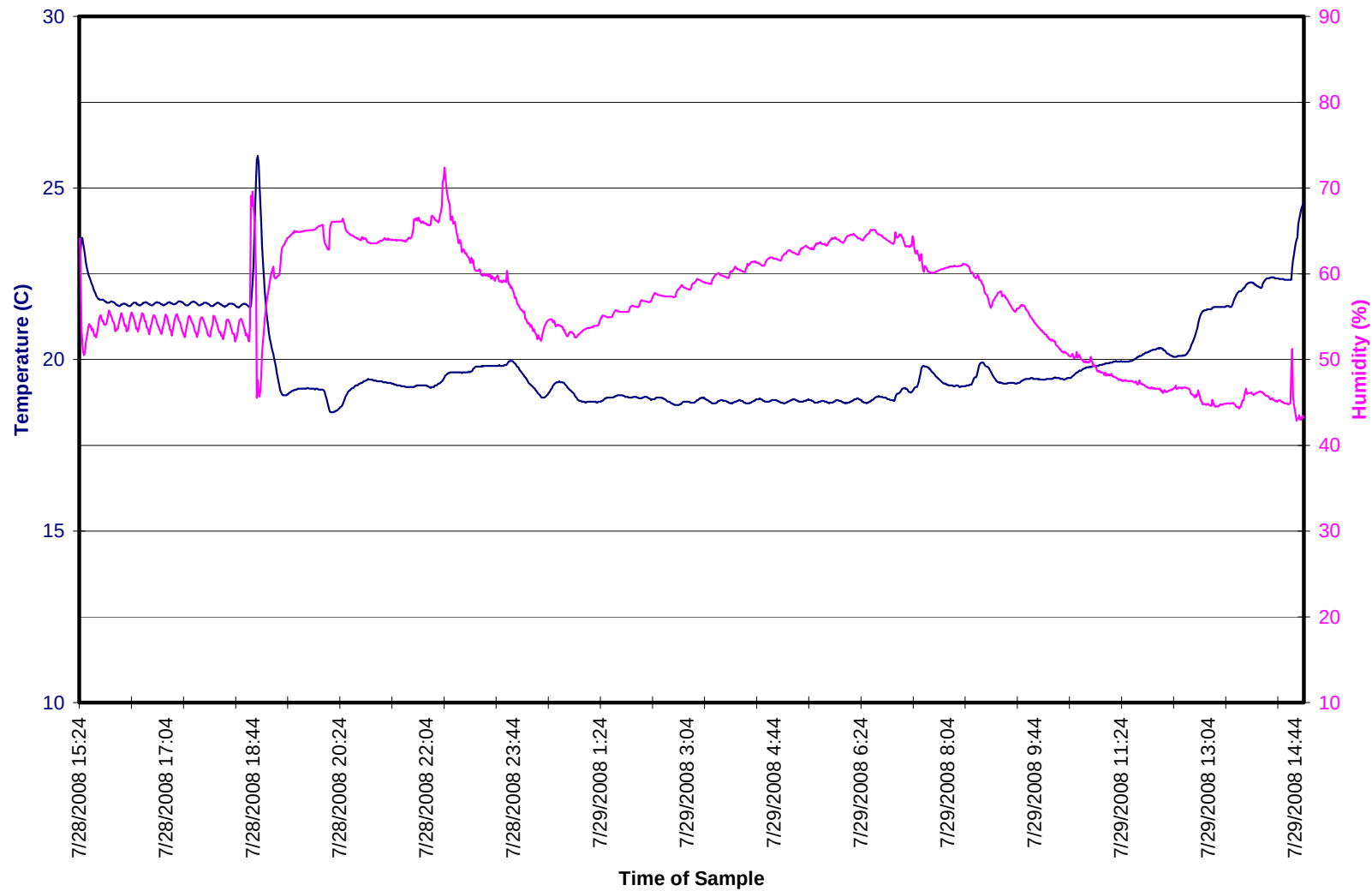
Command File Test Number 080729

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
151A	14THSP1200WSACRA	Passenger T12 Resultant Acceleration	180			
152	14TRRILE01WSDSYA	Passenger Thorax Rib 1 Y-Axis Displacement	600 +	yes	90	
153	14TRRILE01WSACXA	Passenger Thorax Rib 1 X-Axis Acceleration	1000 +	yes	2000	
154	14TRRILE01WSACYA	Passenger Thorax Rib 1 Y-Axis Acceleration	1000 +	yes	2000	
155	14TRRILE01WSACZA	Passenger Thorax Rib 1 Z-Axis Acceleration	1000 +	yes	2000	
155A	14TRRILE01WSACRA	Passenger Thorax Rib 1 Resultant Acceleration	1000			
156	14TRRILE02WSDSYA	Passenger Thorax Rib 2 Y-Axis Displacement	600 +	yes	90	
157	14TRRILE02WSACXA	Passenger Thorax Rib 2 X-Axis Acceleration	1000 +	yes	2000	
158	14TRRILE02WSACYA	Passenger Thorax Rib 2 Y-Axis Acceleration	1000 +	yes	2000	
159	14TRRILE02WSACZA	Passenger Thorax Rib 2 Z-Axis Acceleration	1000 +	yes	2000	
159A	14TRRILE02WSACRA	Passenger Thorax Rib 2 Resultant Acceleration	1000			
160	14TRRILE03WSDSYA	Passenger Thorax Rib 3 Y-Axis Displacement	600 +	yes	90	
161	14TRRILE03WSACXA	Passenger Thorax Rib 3 X-Axis Acceleration	1000 +	yes	2000	
162	14TRRILE03WSACYA	Passenger Thorax Rib 3 Y-Axis Acceleration	1000 +	yes	2000	
163	14TRRILE03WSACZA	Passenger Thorax Rib 3 Z-Axis Acceleration	1000 +	yes	2000	
163A	14TRRILE03WSACRA	Passenger Thorax Rib 3 Resultant Acceleration	1000			
164	14ABRILE01WSDSYA	Passenger Abdominal Rib 1 Y-Axis Displacement	600 +	yes	90	
165	14ABRILE01WSACXA	Passenger Abdominal Rib 1 X-Axis Acceleration	1000 +	yes	2000	
166	14ABRILE01WSACYA	Passenger Abdominal Rib 1 Y-Axis Acceleration	1000 +	yes	2000	
167	14ABRILE01WSACZA	Passenger Abdominal Rib 1 Z-Axis Acceleration	1000 +	yes	2000	
167A	14ABRILE01WSACRA	Passenger Abdominal Rib 1 Resultant Acceleration	1000			
168	14ABRILE02WSDSYA	Passenger Abdominal Rib 2 Y-Axis Displacement	600 +	yes	90	
169	14ABRILE02WSACXA	Passenger Abdominal Rib 2 X-Axis Acceleration	1000 +	yes	2000	
170	14ABRILE02WSACYA	Passenger Abdominal Rib 2 Y-Axis Acceleration	1000 +	yes	2000	
171	14ABRILE02WSACZA	Passenger Abdominal Rib 2 Z-Axis Acceleration	1000 +	yes	2000	
171A	14ABRILE02WSACRA	Passenger Abdominal Rib 2 Resultant Acceleration	1000			
172	14LUSP0000WSFOXA	Passenger Lumbar X-Axis Force	600 +	yes	10000	
173	14LUSP0000WSFOYA	Passenger Lumbar Y-Axis Force	600 +	yes	10000	
174	14LUSP0000WSFOZA	Passenger Lumbar Z-Axis Force	600 +	yes	12000	
175	14LUSP0000WSMOXA	Passenger Lumbar Moment About X Axis	600 +	yes	300	
176	14LUSP0000WSMOYA	Passenger Lumbar Moment About Y Axis	600 +	yes	300	
177	14LUSP0000WSMOZA	Passenger Lumbar Moment About Z Axis	600 +	yes	200	
178	14PELVCG00WSACXA	Passenger Pelvis X-Axis Acceleration	1000 +	yes	2000	
179	14PELVCG00WSACYA	Passenger Pelvis Y-Axis Acceleration	1000 +	yes	2000	
180	14PELVCG00WSACZA	Passenger Pelvis Z-Axis Acceleration	1000 +	yes	2000	
180A	14PELVCG00WSACRA	Passenger Pelvis Resultant Acceleration	1000			
181	14PUBC0000WSFOYA	Passenger Pubic Y-Axis Force	600 +	yes	12000	

D-14

080206

2005 SUBARU FORESTER LEFT SIDE FMVSS 214 MDB IMPACT AT 32 KPH



CERTIFICATE OF CONFORMITY

Serial No. **13387**

Certificate No. **37127**

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	47339-8	13071	N/A
2	46402-8	10975	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: 47339-8

GR No: 13071

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	44.155	44.901	44.884	PASS
Sample 2	43.133	43.440	43.061	PASS
Sample 3	43.445	43.620	43.661	PASS
Sample 4	43.256	43.305	42.665	PASS
Sample 5	43.456	43.575	42.977	PASS
Sample 6	44.378	43.857	44.104	PASS
Sample 7	43.344	42.219	41.908	FAIL
Sample 8	43.849	43.291	43.661	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

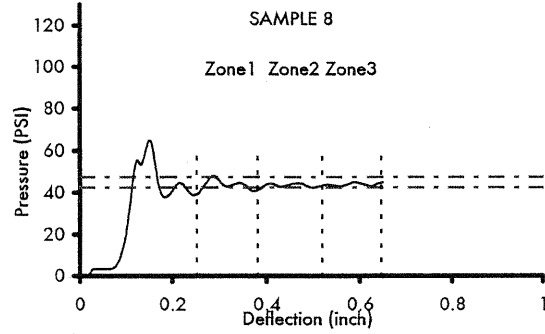
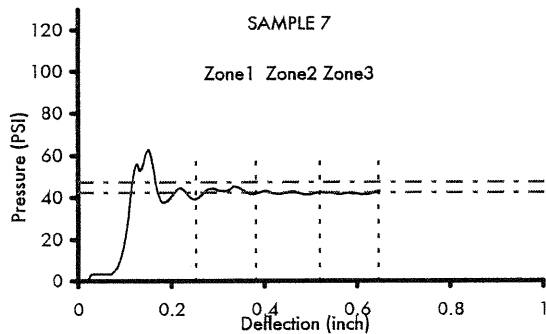
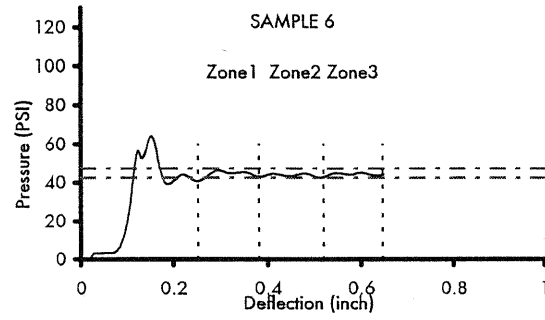
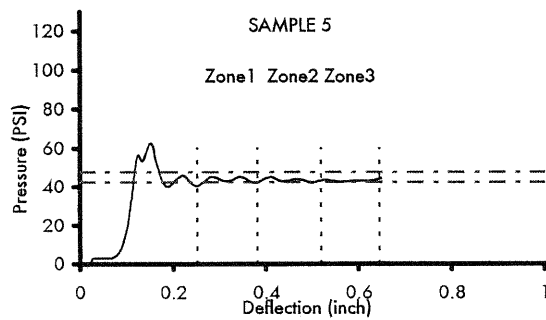
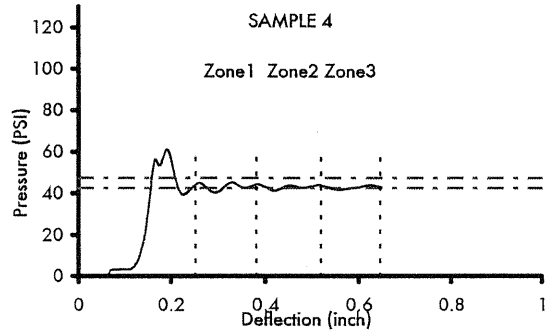
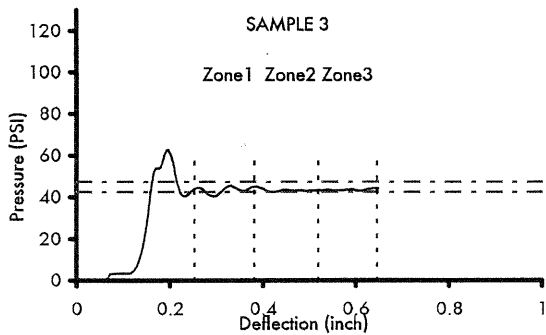
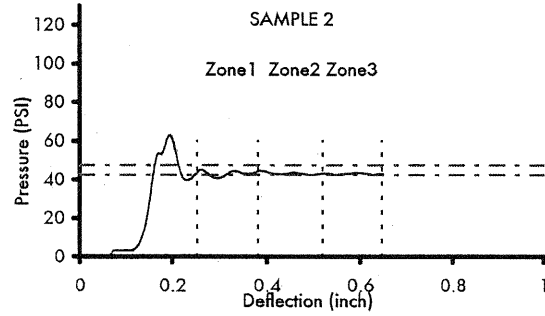
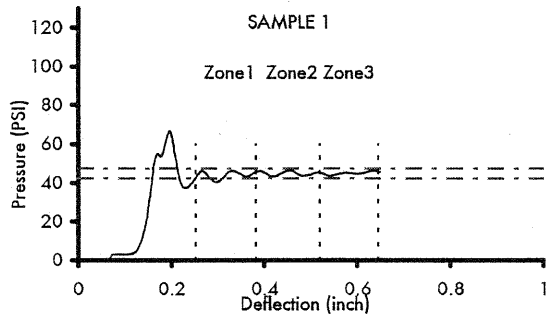
NHTSA / IIHS DEFORMABLE SIDE IMPACT BARRIER
MAIN BLOCK

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: 47339-8

GR No: 13071





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: 46402-8

GR No: 10975

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	235.24	237.00	233.54	PASS
Sample 2	240.14	240.13	238.52	PASS
Sample 3	247.65	245.33	245.46	PASS
Sample 4	246.97	244.29	243.57	PASS
Sample 5	233.99	232.45	234.88	PASS
Sample 6	250.30	248.04	249.65	PASS
Sample 7	248.03	248.32	247.08	PASS
Sample 8	243.77	242.24	239.36	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: 46402-8

GR No: 10975

