

**Vehicle Research and Test Center
Curb Trip Rollover
of a 2007 Ford Expedition
TRC Inc. Test Number 100203**

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**Final Report
February - March 2010**

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Notice

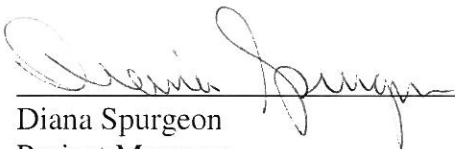
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TRC TEST NUMBER: 100203

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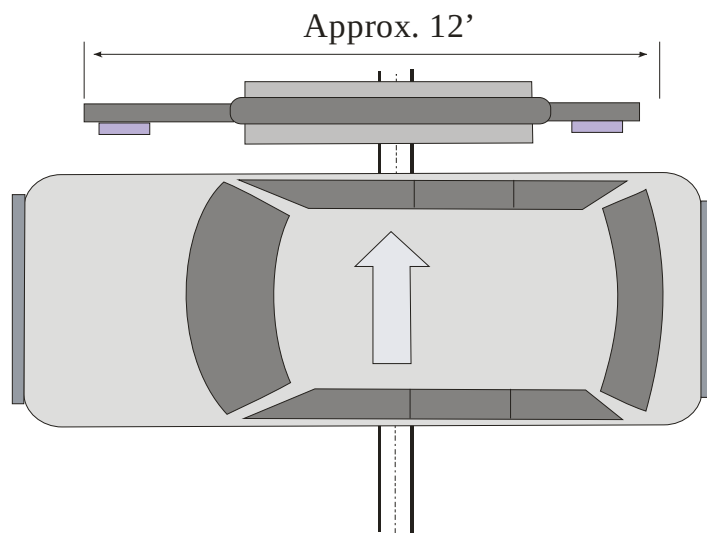
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SECTION 1

PURPOSE AND TEST PROCEDURE

This curb trip rollover crash test was conducted to investigate the dynamics of belted occupants during rollover crashes. This test was conducted with a modified 2007 Ford Expedition moving at 33.2 km/h (20.7 mph), releasing the vehicle with its roll axis perpendicular to the direction of the curb trip fixture. The vehicle was modified by replacing the rear seat with a modified front seat to simulate similar characteristics in both seating positions. The center console was also removed. The test vehicle contained three (3) instrumented Part 572E dummies. The OEM belts and buckles were replaced in all positions. The driver, right front passenger, and left rear passenger positions were equipped with a non pretension 3-PT belt system¹. The curtain air bags were fired manually at 100ms into the event. The test vehicle was towed laterally on its tires on soap and released two feet prior to impact with the curb. The leading tires impacted steel plates backed by aluminum honeycomb blocks to reduce contact forces and help prevent rim and axle damage during the tripping phase of the test. The steel plates were adjusted laterally to line up with the vehicle wheels. The honeycomb blocks were 16" wide by 6" tall by 9" thick with 180 psi crush strength. The height of the impacting plates was 7" above ground. The crushing of the honeycomb was constrained by two 2' diameter rods per honeycomb block that were welded to the back side of the impacting plates and that slid through steel tubes. The rods kept the impacting plates vertical and the honeycomb crushing uniformly. It was conducted for the National Highway Traffic Safety Administration's (NHTSA) Vehicle Research and Test Center (VRTC) by the Transportation Research Center Inc. (TRC Inc.).



¹ Belt Systems were provided by TRW Automotive.

SECTION 2

SUMMARY OF TEST RESULTS

A 2007 Ford Expedition, containing three (3) instrumented Part 572E test dummies was released at 33.2 km/h (20.7 mph). The vehicle was towed in the lateral direction on a soap-covered runway. After release, the vehicle impacted the curb fixture, and made one-half (1/2) rotation coming to rest on the roof. The curb trip rollover test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on February 3, 2010. Pre- and post-test photographs of the test vehicle and the dummies are included in Appendix A.

Three (3) restrained Part 572E Hybrid III 50th percentile adult male anthropomorphic test devices (ATD) were placed in the driver, right front, and left rear designated seating positions relative to the placement procedures specified in Appendix F of Laboratory Procedure TP208-14. The dummies were instrumented with head, chest, and pelvis triaxial accelerometers, upper and lower six-axis neck load cells, and a chest deflection potentiometer. The ATDs in position (1) and (4) were also instrumented with triaxial head rotational rate gyroscopes. The ATD in position three was instrumented with six (6) additional head accelerometers to complete a 9-array head configuration. All dummies were restrained by 3-point seat belts. All dummy instrumentation is detailed in this report. Seventy-eight (78) dummy channels of acceleration, force, moment, roll rate, and displacement data were collected for this test. A total of one-hundred-seventy-eight (178) channels of data were recorded.

The rollover test was documented by one (1) real-time camera¹ and thirteen (13) high-speed digital cameras. Camera locations and other pertinent camera information are included in this report.

Appendix A contains pre- & post-test photography. Appendix B contains the vehicle dummy response data traces. A summary of the front impact dummy configuration and verification test data can be found in Appendix C.

¹ The real-time camera did not produce an image.

TEST RESULTS SUMMARY

	Left Front ATD(#001)	Right Front ATD(#110)	Left Rear ATD(#043)
HIC15 CFC 1000	28	226	34
HIC36 CFC 1000	61	230	76
Chest Clip 3 ms (g) CFC 180	12.4	28.6	10.5
Chest Deflection (mm) CFC 600	-0.7	-3.4	-2.0
Neck Injury (NIJ) (ms) CFC 600			
NTE	0.19	0.12	0.26
NTF	0.08	0.04	0.05
NCE	0.08	0.80	0.00
NCF	0.12	0.14	0.05
Neck Tension (N) CFC1000	896.9	601.0	942.5
Neck Compression (N) CFC1000	-562.4	-3066.8	-260.2

	2007 Ford Expedition
Vehicle Test Weight	2932.4 kg ¹
Left Side - Maximum Crush	85 mm
Right Side - Maximum Crush	101 mm
Roof - Maximum Crush	85 mm
Impact Speed	33.2 km/h

NOTE: All vehicle and dummy measurements included in this report were achieved by using the coordinate measurement machine unless otherwise noted.

¹ The vehicle test weight is heavier for the curb trip test mode because of adding the structure to tow the vehicle laterally.

TEST NOTES:

The test vehicles post-test resting position appeared to create an offset in data and a non-return to zero in all Z-axis data channels and in several of the X- and Y-axis data channels.

The left rear passenger dummy's pelvis Z-axis acceleration data channel recorded question data spikes and data offsets throughout the event.

The vehicle center of gravity pitch and yaw rate gyroscopes exceeded their full scale value at approximately 25 milliseconds. The data appears valid.

The vehicle rear deck roll, pitch, and yaw rate gyroscopes exceeded their full scale value at approximately 744, 93, and 77 milliseconds, respectively. The data appears valid.

The vehicle right upper A-pillar Z-axis acceleration data channel exceeded the full scale value at approximately 85 milliseconds. No valid data recorded

The vehicle left upper C-pillar Z-axis acceleration data channel exceeded the full scale value at 117 milliseconds and recorded questionable data thereafter.

The front passenger lap belt force data channel exceeded the full scale value at approximately 135 milliseconds, and recorded multiple data spikes throughout the event.

The left rear passenger lap belt force data channel exceeded the full scale value at approximately 200 milliseconds, and recorded multiple data spikes throughout the event.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

TEST VEHICLE INFORMATION AND OPTIONS

Make	Ford	Driv. & Front Pass. Front Airbag	Yes
Model Year	2007	Driv. & Front Pass. Side Airbag	Yes
Model	Expedition XLT	Driv. & Front Pass. Head Airbag	No
Body Style	4-door SUV	Driv. & Front Pass. Curtain Airbag	Yes
		Driv. & Front Pass. Knee Airbag	No
VIN	1FMFU15537LA49965	Rear Pass. Front Airbag	No
Color	Red	Rear Pass. Side Airbag	No
Delivery Date	01/14/10	Rear Pass. Head Airbag	No
Odometer Reading	45,841	Rear Pass. Curtain Airbag	Yes
Dealer	---	Rear Pass. Knee Airbag	No
Transmission	Automatic	Load Limiters	---
Final Drive	Rear wheel drive	Anti-lock Brakes	Yes
Number of Cylinders	V8	All-Wheel Drive	No
Engine Displacement (L)	5.4	Pretensioners	---
Engine Placement	Longitudinal	Air Conditioning	Yes
Roof Rack	Yes / Removed	Tilt Wheel	Yes
Sunroof / T-Top	No	Power Seats	Yes
Tinted Glass	Yes	Power Windows	Yes
Traction Control	Yes	Power Steering	Yes
Power Brakes	Yes	AM/FM CD	Yes
Front Disc	Yes	Automatic Door Locks	Yes
Rear Disc	Yes	Other	N/A
Does owner's manual provide instructions to turn off automatic door locks?			Yes

DATA FROM CERTIFICATION LABEL

Manufactured by	Ford Motor Co.	GVWR (kg)	3357
Date of Manufacture	02/07	GAWR Front (kg)	1497
		GAWR Rear (kg)	1928

TEST VEHICLE SEAT TYPE AND CAPACITY

Measured Parameter	Front	Mid ³	Rear ³	Total
Type of Seats	Bucket	Split Bench	Split Bench	
Designated Seating Capacity (DSC)	2	3	3	8
Type of Seat Back	Manual Adjustable	Manual Adjustable	Manual Adjustable	
(A) Capacity Wt. (VCW) (kg)				742
(B) DSC x 68.08 kg				545
(A-B) Cargo Wt. (RCLW) (kg)				197

¹ Not Recorded

² Owner's manual not available at the time the report was prepared, information unknown.

³ The original seats were removed. A bucket seat was installed in the second row for this test.

⁴ The airbag curtains were fired manually.

DATA SHEET NO. 1 (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2007 Ford ExpeditionTest Program: Improved Restraints in RolloversTest Date: 02/03/10**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) ¹			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	642.6	637.0		676.0	776.0	
Right	kg	612.2	662.4		668.0	812.4	
Ratio	%	33.2	50.9		45.8	54.2	
Totals	kg	1254.8	1299.4	2554.2	1344.0	1588.4	2932.4

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value ¹
(A) Total Delivered Weight (UVW)	kg	2254.2
(B) Weight of 2 P572M ATDs	kg	165.2
(C) Rated Cargo/Luggage Weight (RCLW)	kg	136.0
(A+B+C) Vehicle Target Weight (TVTW)	kg	2855.4

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	900 ²	897 ²	897 ²	899 ²	--- ³
As Tested	mm	910	909	866	871	1636
Fully Loaded	mm	--- ³	--- ³	--- ³	--- ³	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	3020
Total Vehicle Length at Left Side	mm	--- ³
Total Vehicle Length at Centerline	mm	5208
Total Vehicle Length at Right Side	mm	--- ³
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	liters	98.4

Vehicle parts removed to make Target Vehicle Test Weight: Spare tire

¹ UVW and Target Test Weight was based on values recorded using a 5-passenger (DSC) vehicle as tested on December 3, 2008.² Matched test conducted October 22, 2009.³ Measurement not requested.

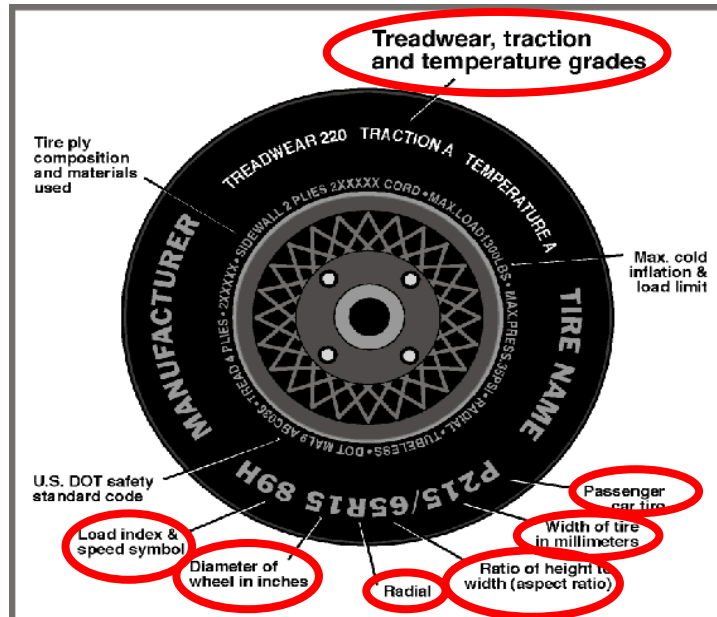
DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	240	240
Recommended Tire Size	P265/70R17	P265/70R17
Tire Size on Vehicle	P265/70R17	P265/70R17
Tire Manufacturer	Continental	Continental
Tire Name	Contitrac SUV	Contitrac SUV
Load Index & Speed Symbol	113S	113S
Tread wear	520	520
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 2

SEATS AND SEAT BELTS DATA

Test Vehicle: 2007 Ford Expedition
 Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

DUMMY RIDING POSITION

Driver: Total Number of detents:

Power seat; 220 mm of travel

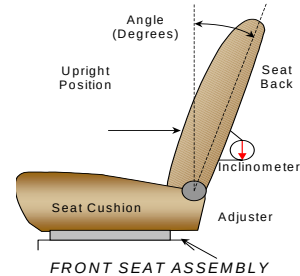
Passenger: Total Number of detents: 23

Left Rear Passenger: Total Number of detents: 23

Driver seat back angle: 13.3

Passenger seat back angle: 11.2°

Left rear seat back angle: 13.7°



The rear seat was replaced with a modified front seat to replicate the front occupant seat.

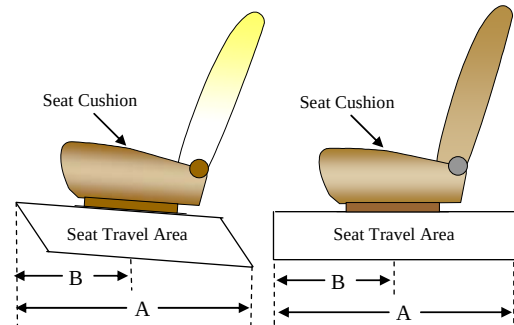
SEAT FORE/AFT POSITIONS

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	220	Mid
Fr Pass	215	Mid
Rear Seat	215	17 of 22

Seat position number one is the full forward position.



SEAT BELT UPPER ANCHORAGE

	Total No. of Positions	Placed in Position No.
Driver Seat	5	3
Fr Pass	5	3
Rear Seat	Fixed	Fixed

Position number one is the uppermost adjustment position.

Note: Vertical height adjusted to match head to roof measurement with left rear dummy.

DATA SHEET NO. 2 (CONTINUED)

SEATS AND SEAT BELTS DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

SEAT BELT CONFIGURATION

	Type	Configuration
Driver	3-PT: non pretension	C
Left Rear Passenger	3-PT: non pretension	C
Right Front Passenger	3-PT: non pretension	C

DATA SHEET NO. 3

POST-TEST OBSERVATIONS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front Seat Driver	Right Front Passenger	Rear Seat Passenger
Dummy Type / Serial No.	Hybrid III 50 th / 001	Hybrid III 50 th / 110	Hybrid III 50 th / 043
Head Contact	Headliner	Curtain airbag, side header, b-pillar, door frame, door glass, headliner	Side header
Upper Torso Contact	No visible contact	No visible contact	No visible contact
Lower Torso Contact	No visible contact	No visible contact	No visible contact
Left Knee Contact	No visible contact	No visible contact	No visible contact
Right Knee Contact	No visible contact	No visible contact	No visible contact

POST-TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Unlocked
Left Side Door Opening	Closed and latched	Closed and latched
Right Side Door Opening	Closed and latched	Closed and 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 the vehicle
Sill Separation	Did not separate from the vehicle
Windshield Damage	Cracked and separated from vehicle at upper left and right A-Pillar
Window Damage	Left side front and rear glass broke out. Rear hatch glass broke out. Right side front glass broke out.
Other Notable Effects	Right side front and rear wheel assemblies were damaged during the event

DATA SHEET NO. 3 (CONTINUED)**POST TEST OBSERVATIONS**Test Vehicle: 2007 Ford ExpeditionTest Program: Improved Restraints in RolloversTest Date: 02/03/10**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Left Front (Driver) Occupant Location 01		Right Front (Passenger) Occupant Location 03	
	Installed	Operation	Installed	Operation
Front Airbag	Yes	No	Yes	No
Side Airbag	Yes	No	Yes	No
Head Airbag	No	N/A	No	N/A
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	No	N/A	No	N/A
Seat Belt Load Limiter	Unknown	Unknown	Unknown	Unknown

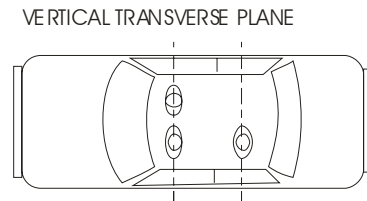
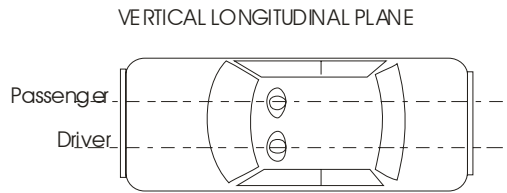
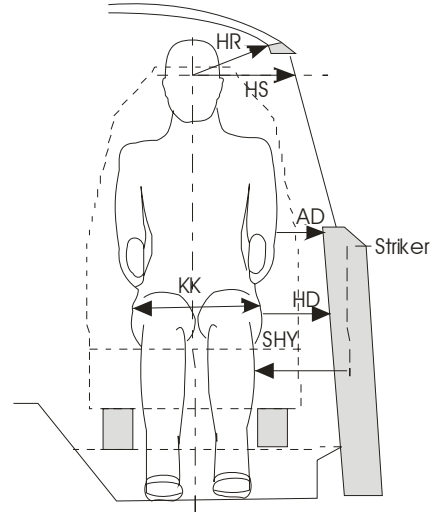
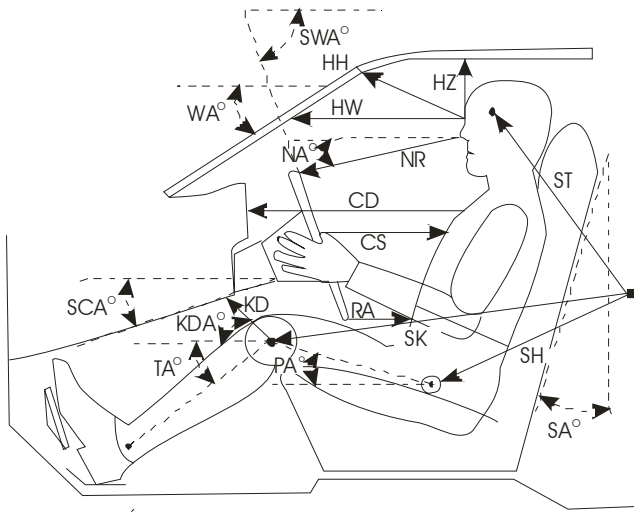
Restraint Type	Left Rear (Passenger) Occupant Location 04	
	Installed	Operation
Front Airbag	No	N/A
Side Airbag	No	N/A
Head Airbag	No	N/A
Curtain Airbag	Yes	Yes
Seat Belt Pretensioner	No	N/A
Seat Belt Load Limiter	Unknown	Unknown

NOTE: The left and right side curtain airbags were deployed at 100 milliseconds using TRC Inc.'s airbag firing system.

DATA SHEET NO. 4 **DUMMY MEASUREMENTS**

Test Vehicle: 2007 Ford Expedition
 Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10



DATA SHEET NO. 4 (CONTINUED)

DUMMY MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

FRONT SEAT OCCUPANTS

Code	Measurement Description	Driver (# 001)		Passenger (# 110)	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		31.1		29.8
SWA°	Steering Wheel Angle		---2		
SCA°	Steering Column Angle		---2		
SA°	Seat Back Angle (on headrest post)		14.0		12.4
HZ	Head to Roof (Z Direction)	251		228	
HH	Head to Header	435		448	
HW	Head to Windshield	711		704	
HR	Head to Side Header (Y Direction)	241		226	
NR	Nose to Rim	---2	---2		
CD	Chest to Dash	---1		---1	
CS	Steering Wheel to Chest	---2			
RA	Rim to Abdomen	---2			
KDL	Left Knee to Dash	183	13.2	161	
KDR	Right Knee to Dash	187		175	10.2
PA°	Pelvic Angle		23.1		25.0
TA°	Tibia Angle		48.8		53.1
KK	Knee to Knee (Y Direction)	293		260	
ST	Striker to Head	640	-80.8	659	-83.9
SK	Striker to Knee	602	-7.6	600	-9.5
SH	Striker to H-Point	226	9.8	207	3.0
SHY	Striker to H-Point (Y Direction)	171		182	
HS	Head to Side Window (Y Direction)	340		316	
HD	H-Point to Door (Y Direction)	80		89	
AD	Arm to Door (Y Direction)	133		145	

The seat back angle (SA°) is measured relative to vertical; all other angles are measured relative to horizontal.

A negative angle indicates the measurement point was above the striker.

¹ Measurement is not available.

² Measurement is not available, steering column was removed pre-test.

DATA SHEET NO. 4 (CONTINUED)**DUMMY MEASUREMENTS**Test Vehicle: 2007 Ford ExpeditionTest Program: Improved Restraints in RolloversTest Date: 02/03/10**LEFT REAR SEAT OCCUPANT**

Code	Measurement Description	Left Rear Passenger (#043)	
		Length (mm)	Angle(°)
WA°	Windshield Angle	109.2	
SWA°	Steering Wheel Angle		
SCA°	Steering Column Angle		
SA°	Seat Back Angle (on headrest post)		13.7
HZ	Head to Roof (Z Direction)	289	
HH	Head to Header	561	
HW	Head to Windshield		
HR	Head to Side Header (Y Direction)	266	
NR	Nose to Rim		
CD	Chest to Dash	544	
CS	Steering Wheel to Chest		
RA	Rim to Abdomen		
KDL	Left Knee to Dash (Seatback)	237	1.2
KDR	Right Knee to Dash (Seatback)	239	
PA°	Pelvic Angle		23.0
TA°	Tibia Angle		51.1
KK	Knee to Knee (Y Direction)	256	
ST	Striker to Head	543	-73.7
SK	Striker to Knee	675	1.2
SH	Striker to H-Point	319	26.3
SHY	Striker to H-Point (Y Direction)	205	
HS	Head to Side Window (Y Direction)	356	
HD	H-Point to Door (Y Direction)	113	
AD	Arm to Door (Y Direction)	153	

A negative angle indicates the measurement point was above the striker.

DATA SHEET NO. 5

OCCUPANT INSTRUMENTATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

LEFT FRONT

Location		Unit	Positive Direction Max. Time (ms)		Negative Direction Max. Time (ms)	
Head Acceleration	X	g	2.8	962.5	-4.1	1171.2
	Y	g	4.3	1170.3	-9.1	177.4
	Z	g	20.8	123.4	-6.1	56.3
	R	g	21.2	123.4		
Head Rate Gyro	X	°/s	479.3	262.3	-1809.2	125.1
	Y	°/s	503.3	1049.8	-562.8	934.0
	Z	°/s	249.6	270.8	-382.2	154.1
Upper Neck Force	X	N	96.5	964.8	-125.6	125.7
	Y	N	168.5	81.4	-369.8	178.0
	Z	N	896.9	127.4	-562.4	2375.3
Upper Neck Moment	X	Nm	17.2	2635.0	-19.7	163.0
	Y	Nm	9.0	2650.1	-12.8	169.6
	Z	Nm	3.6	445.4	-7.4	189.1
Chest Acceleration	X	g	1.8	906.5	-3.6	160.9
	Y	g	2.2	1754.7	-12.2	100.7
	Z	g	8.4	825.3	-6.9	60.6
	R	g	12.4	105.0		
Chest Displacement	X	mm	2.3	215.0	-0.7	121.2
Lower Neck Force	X	N	216.9	958.4	-111.5	68.6
	Y	N	637.8	825.2	-484.4	142.1
	Z	N	1029.0	123.4	-452.9	2374.5
Lower Neck Moment	X	Nm	43.6	84.2	-105.2	175.4
	Y	Nm	34.7	2382.4	-70.1	133.4
	Z	Nm	20.2	825.3	-11.5	141.6
Pelvis Acceleration	X	g	3.8	49.1	-3.8	147.6
	Y	g	4.4	164.9	-14.9	97.0
	Z	g	7.8	813.4	-6.9	59.0
	R	g	15.0	97.0		

Positive Direction

Longitudinal: Forward
Lateral: Rightward
Vertical: Downward

Negative Direction

Longitudinal: Rearward
Lateral: Leftward
Vertical: Upward

DATA SHEET NO. 5 (CONTINUED)
OCCUPANT INSTRUMENTATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

RIGHT FRONT

Location		Unit	Positive Direction Max.	Time (ms)	Negative Direction Max.	Time (ms)
Head Acceleration	X	g	37.0	114.7	-21.7	107.0
	Y	g	13.2	106.2	-69.3	114.0
	Z	g	51.0	106.2	-9.2	121.0
	R	g	73.1	115.0		
Head Front Acceleration	Y	g	6.0	325.5	-34.4	119.0
	Z	g	33.7	106.2	-6.7	218.5
Head Top Acceleration	X	g	66.9	115.2	-32.4	107.5
	Y	g	13.4	105.7	-82.7	114.5
Head Side Acceleration	X	g	71.8	115.8	-116.6	107.4
	Z	g	51.4	106.2	-22.8	120.5
Upper Neck Force	X	N	129.2	117.0	-557.3	132.8
	Y	N	453.7	757.0	-1313.5	118.2
	Z	N	601.0	105.4	-3066.8	113.7
Upper Neck Moment	X	Nm	168.5	118.2	-20.6	210.7
	Y	Nm	21.5	197.3	-68.3	131.0
	Z	Nm	13.6	116.1	-28.0	132.8
Lower Neck Force	X	N	349.7	112.3	-136.3	128.6
	Y	N	533.1	106.2	-1099.4	117.0
	Z	N	609.9	103.0	-2430.4	113.1
Lower Neck Moment	X	Nm	59.8	776.4	-89.4	147.4
	Y	Nm	119.8	113.9	-42.9	105.0
	Z	Nm	25.2	105.0	-50.3	117.0
Chest Acceleration	X	g	2.1	113.6	-5.5	108.9
	Y	g	2.5	236.5	-27.4	114.6
	Z	g	14.6	109.3	-4.6	352.2
	R	g	29.2	111.4		
Chest Displacement	X	mm	3.0	155.0	-3.4	1229.3
Pelvis Acceleration	X	g	1.8	201.7	-5.9	119.2
	Y	g	2.6	226.2	-17.3	78.7
	Z	g	6.3	111.9	-3.5	218.3
	R	g	17.8	78.7		

Positive Direction

Longitudinal: Forward

Lateral: Rightward

Vertical: Downward

Negative Direction

Longitudinal: Rearward

Lateral: Leftward

Vertical: Upward

DATA SHEET NO. 5 (CONTINUED)
OCCUPANT INSTRUMENTATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

LEFT REAR

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
Head Acceleration	X	g	2.1	957.2	-2.4	367.8
	Y	g	4.2	86.1	-8.7	195.4
	Z	g	22.3	135.3	-5.6	62.7
	R	g	22.9	149.5		
Head Rate Gyro	X	°/s	479.5	258.5	-1502.7	149.1
	Y	°/s	433.7	210.4	-740.9	146.6
	Z	°/s	208.8	298.2	-251.3	152.4
Upper Neck Force	X	N	62.2	937.9	-103.0	158.1
	Y	N	152.9	84.6	-322.0	192.2
	Z	N	942.5	149.6	-260.2	53.9
Upper Neck Moment	X	Nm	12.3	92.9	-19.7	160.9
	Y	Nm	7.1	87.3	-19.2	171.6
	Z	Nm	2.4	85.1	-6.3	221.3
Chest Acceleration	X	g	2.2	887.1	-4.4	160.4
	Y	g	1.1	481.0	-9.4	102.6
	Z	g	10.5	825.8	-5.8	65.9
	R	g	10.6	821.4		
Chest Displacement	X	mm	1.1	156.6	-2.0	232.4
Lower Neck Force	X	N	1193.6	86.9	-2872.8	172.6
	Y	N	889.2	68.5	-2400.1	141.8
	Z	N	766.4	227.9	-2978.4	145.9
Lower Neck Moment	X	Nm	13.0	158.0	-5.6	69.5
	Y	Nm	5.0	97.0	-24.6	154.3
	Z	Nm	7.7	135.0	-2.5	64.2
Pelvis Acceleration ¹	X	g	4.4	49.4	-4.3	151.6
	Y	g	4.1	156.6	-12.9	94.1
	Z	g	22.0	143.7	-101.3	102.4
	R	g	102.0	102.4		

Positive Direction

Longitudinal: Forward

Lateral: Rightward

Vertical: Downward

Negative Direction

Longitudinal: Rearward

Lateral: Leftward

Vertical: Upward

¹ See Test Notes.

DATA SHEET NO. 6

VEHICLE STRUCTURAL MEASUREMENTS^{1, 2}

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

STRUCTURAL MEASUREMENTS

	Elements	Pre-Test
1	Total Length	5208
2	Total Width	2007
3	Bumper Top Height	499
4	Bumper Bottom Height	424
5	Longitudinal Member Top Height	524
6	Longitudinal Member Bottom Height	444
7	Distance Between Longitudinal Members	845
7'	Longitudinal Member Width	100
8	Engine Top Height	995
9	Engine Bottom Height	295
10	Engine and Gearbox Width	750
11	Front Bumper - Engine Distance	650
12	Front Shock Absorber Fixing Height	825
13	Bonnet Leading Edge Height	1124
14	Front Shock Absorber Fixing Width	920
15	Front Bumper - Front Axle Distance	960
16	Front Axle - A Pillar Distance	675
17	A Pillar - B Pillar Distance	1065
18	B Pillar - Rear Axle Distance	1280
19	B Pillar - C Pillar Distance	995
20	Roof Sill Bottom Height	1646
21	Roof Sill Top Height	1785
22	Floor Sill Bottom Height	483
23	Floor Sill Top Height	536

All distance measurements are in millimeters and measured using a measuring tape.

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

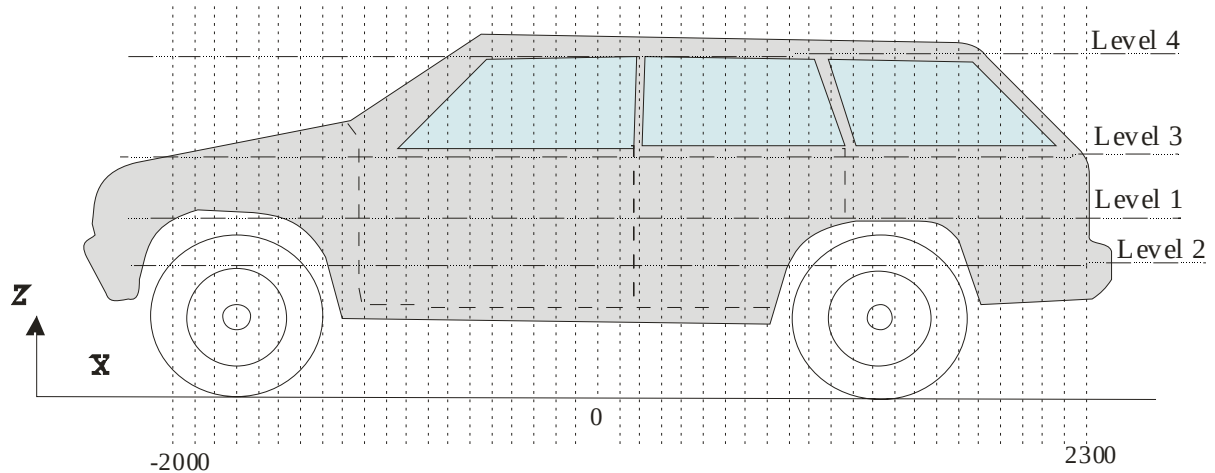
² The vertical measurements from the ground are adjusted based on the test vehicle's pre-test attitude measurements.

DATA SHEET NO. 7
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10



Left Side View
All measurements are in millimeters

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

Measurements along the vertical 0 mm line shown above.

Horizontal measurement spacing is approximately 100 millimeters.

Level	Measurement Description	Height Above Ground (mm)
4	Window Top	1780
3	Window Sill	1140
2	Occupant H-Point	830
1	Mid Door	920

Levels 1 through 4 measurements were achieved using a tape measure.

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

LEFT SIDE CRUSH

	Pre-Test				Post-Test				Difference			
	1	2	3	4	1	2	3	4	1	2	3	4
-2000			-839				-816				-23	
-1900			-859				-840				-19	
-1800			-874				-855				-19	
-1700			-885				-866				-19	
-1600			-894				-875				-19	
-1500	-974		-901		-947		-883		-27		-18	
-1400	-976		-907		-947		-888		-29		-19	
-1300	-975		-912		-942		-893		-33		-19	
-1200	-967	-977	-916		-942	-950	-898		-25	-27	-18	
-1100	-960	-972	-920		-937	-948	-904		-23	-24	-16	
-1000	-960	-963	-923		-940	-942	-908	0	-20	-21	-15	
-900	-961	-963	-925	-881	-944	-945	-912	-871	-17	-18	-13	-10
-800	-965	-967	-930	-850	-948	-951	-908	-843	-17	-16	-22	-7
-700	-968	-970	-934	-822	-945	-955	-899	-814	-23	-15	-35	-8
-600	-972	-973	-937	-794	-936	-956	-885	-775	-36	-17	-52	-19
-500	-974	-976	-941	-763	-947	-957	-879	-714	-27	-19	-62	-49
-400	-977	-978	-944	-726	-953	-954	-885	-654	-24	-24	-59	-72
-300	-979	-980	-947	-695	-957	-955	-893	-610	-22	-25	-54	-85
-200	-981	-982	-950	-681	-959	-957	-901	-600	-22	-25	-49	-81
-100	-982	-983	-953	-678	-960	-957	-908	-604	-22	-26	-45	-74
0	-984	-984	-955	-677	-961	-958	-914	-612	-23	-26	-41	-65
100	-985	-986	-957	-676	-961	-959	-923	-620	-24	-27	-34	-56
200	-986	-986	-958	-677	-958	-957	-932	-632	-28	-29	-26	-45
300	-986	-985	-960	-678	-953	-955	-923	-617	-33	-30	-37	-61
400	-986	-984	-960	-679	-955	-956	-925	-621	-31	-28	-35	-58
500	-986	-984	-961	-680	-956	-957	-927	-625	-30	-27	-34	-55
600	-985	-984	-962	-681	-957	-959	-928	-629	-28	-25	-34	-52
700	-985	-984	-962	-683	-958	-960	-930	-632	-27	-24	-32	-51
800	-984	-983	-962	-683	-959	-960	-931	-635	-25	-23	-31	-48
900	-984	-983	-962	-684	-960	-961	-931	-638	-24	-22	-31	-46
1000	-983	-982	-962	-685	-961	-961	-931	-641	-22	-21	-31	-44
1100	-983	-988	-962	-687	-961	-968	-929	-645	-22	-20	-33	-42
1200	-990	-994	-960	-687	-968	-969	-929	-649	-22	-25	-31	-38
1300	-997		-959	-687	-965		-932	-652	-32		-27	-35
1400	-998		-959	-687	-962		-932	-654	-36		-27	-33
1500	-997		-958	-686	-960		-932	-656	-37		-26	-30
1600	-995		-957	-685	-960		-931	-657	-35		-26	-28
1700	-991		-955	-684	-958		-931	-658	-33		-24	-26
1800	-983		-953	-684	-950		-931	-660	-33		-22	-24
1900	-972		-951	-683	-951		-930	-661	-21		-21	-22
2000			-948	-681			-929	-661			-19	-20
2100			-946	-677			-929	-660			-17	-17
2200			-943	-674			-928	-661			-15	-13
2300			-940				-927				-13	

DATA SHEET NO. 7 (CONTINUED)

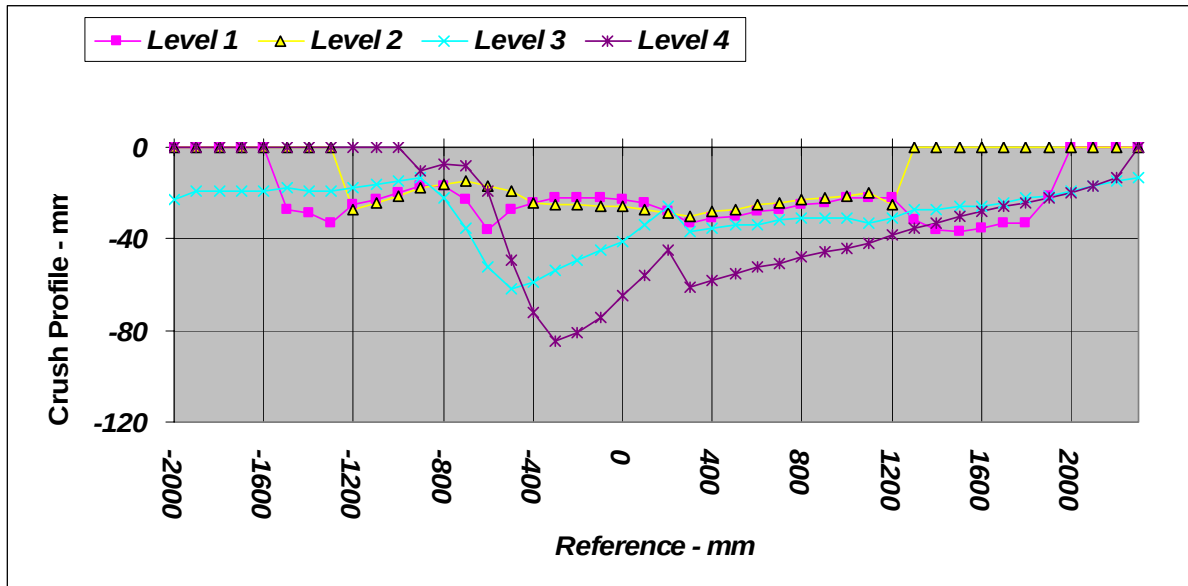
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

LEFT SIDE CRUSH



The side vehicle crush measurements and plot reported are lateral.

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

RIGHT SIDE CRUSH

	Pre-Test				Post-Test				Difference			
	1	2	3	4	1	2	3	4	1	2	3	4
-2000			855				866				-11	
-1900			874				886				-12	
-1800			888				899				-11	
-1700			898				909				-11	
-1600			907				917				-10	
-1500	981		914		994		924		-13		-10	
-1400	983		919		996		929		-13		-10	
-1300	982		924		995		933		-13		-9	
-1200	975	983	928		987	998	936		-12	-15	-8	
-1100	968	979	932		979	993	940		-11	-14	-8	
-1000	968	971	935		980	984	943		-12	-13	-8	
-900	971	972	938	894	981	984	945	900	-10	-12	-7	-6
-800	974	975	942	864	988	991	948	869	-14	-16	-6	-5
-700	977	978	945	839	993	996	957	845	-16	-18	-12	-6
-600	980	981	948	809	997	1000	963	812	-17	-19	-15	-3
-500	983	983	951	781	1002	1005	968	801	-19	-22	-17	-20
-400	985	985	954	747	1007	1009	973	809	-22	-24	-19	-62
-300	987	987	956	713	1011	1013	977	812	-24	-26	-21	-99
-200	989	988	958	695	1015	1017	982	796	-26	-29	-24	-101
-100	989	990	961	691	1018	1020	987	776	-29	-30	-26	-85
0	990	990	962	689	1022	1023	991	759	-32	-33	-29	-70
100	992	991	964	689	1025	1026	995	742	-33	-35	-31	-53
200	992	991	965	689	1028	1029	998	728	-36	-38	-33	-39
300	992	991	966	688	1017	1014	993	718	-25	-23	-27	-30
400	992	991	967	688	1018	1015	995	701	-26	-24	-28	-13
500	993	991	968	689	1019	1016	997	679	-26	-25	-29	10
600	992	991	969	690	1020	1017	998	678	-28	-26	-29	12
700	992	991	970	690	1021	1018	999	693	-29	-27	-29	-3
800	992	991	970	691	1021	1018	1000	705	-29	-27	-30	-14
900	992	990	970	692	1021	1019	1000	716	-29	-29	-30	-24
1000	991	990	970	695	1021	1019	1001	726	-30	-29	-31	-31
1100	991	997	970	696	1022	1027	1002	717	-31	-30	-32	-21
1200	999	999	969	696	1030	1022	1002	719	-31	-23	-33	-23
1300	1005		966	696	1027		991	719	-22		-25	-23
1400	1005		966	696	1027		981	718	-22		-15	-22
1500	1003		965	696	1026		982	716	-23		-17	-20
1600	1001		963	695	1023		981	713	-22		-18	-18
1700	998		960	693	1018		979	709	-20		-19	-16
1800	989		958	692	1009		977	704	-20		-19	-12
1900	978		955	691	997		974	697	-19		-19	-6
2000			953	690			971	694			-18	-4
2100			950	687			968	688			-18	-1
2200			947	684			964	683			-17	1
2300			944				960				-16	

DATA SHEET NO. 7 (CONTINUED)

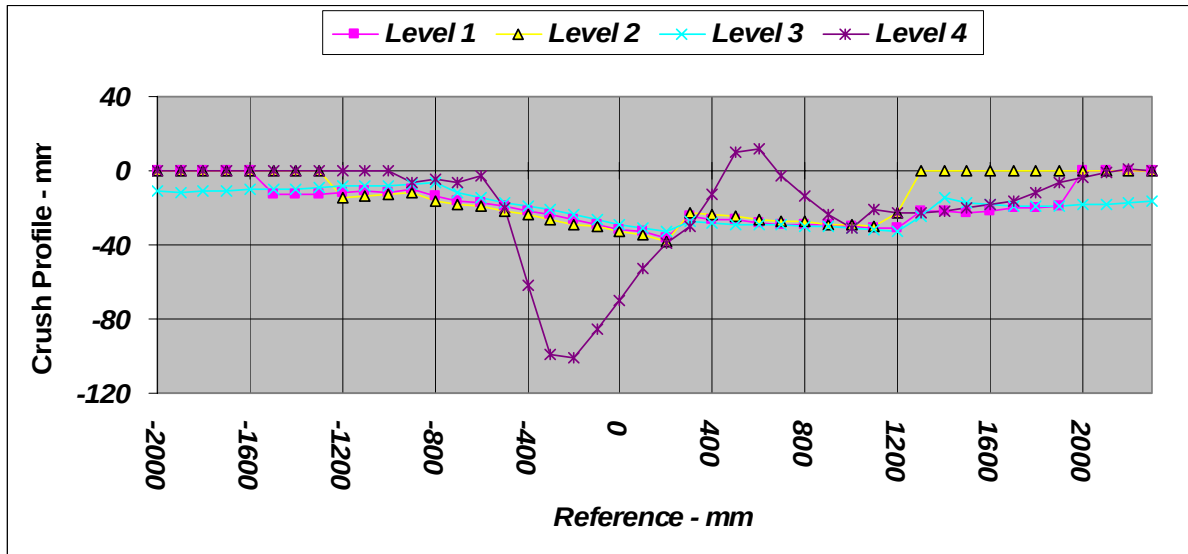
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

RIGHT SIDE CRUSH



The side vehicle crush measurements and plot reported are lateral.

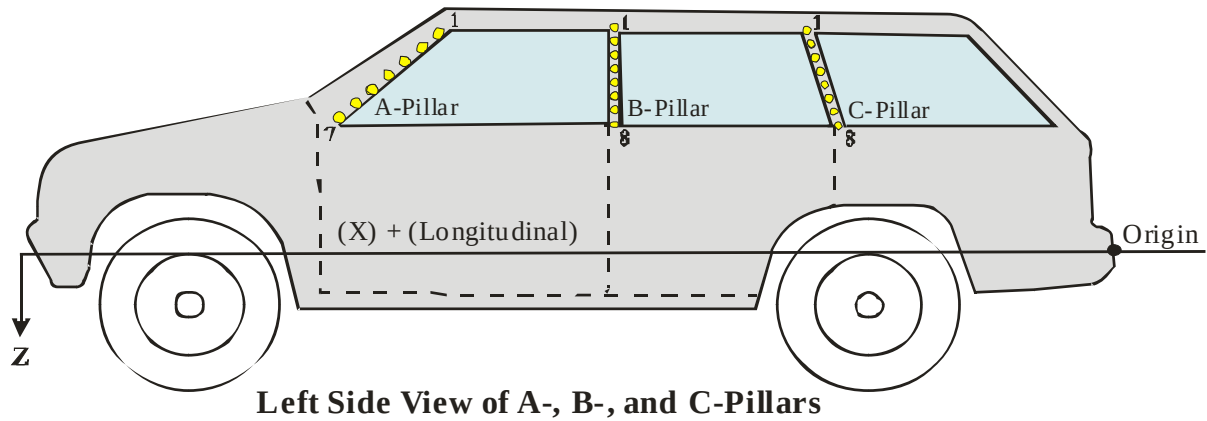
DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10



Vertical measurement spacing is approximately 100 millimeters.

Points 1 through 7 on the A-Pillar are the same as measurements -900 through -300 on Level 1 of left and right side crush.

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

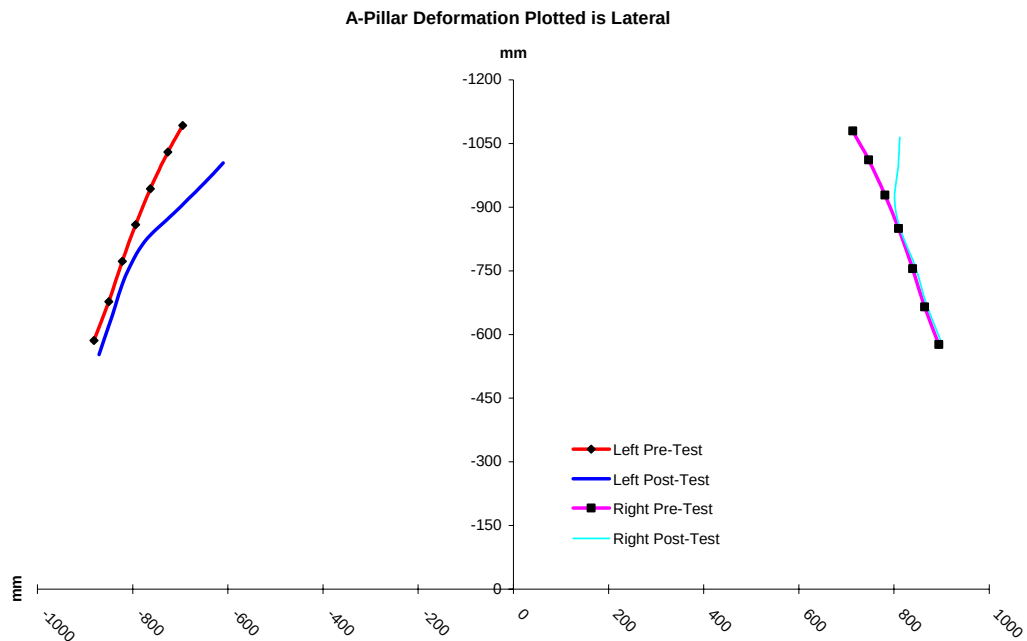
Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

A-PILLAR MEASUREMENTS

Index	Pre-Test			Post-Test			Difference		
Left A-Pillar	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
(1)	3626	-881	-586	3638	-871	-552	-12	-10	-33
(2)	3525	-850	-677	3537	-843	-645	-12	-7	-32
(3)	3424	-822	-772	3435	-814	-739	-11	-8	-33
(4)	3328	-794	-859	3337	-775	-818	-9	-19	-40
(5)	3230	-763	-943	3238	-714	-885	-8	-49	-58
(6)	3124	-726	-1030	3131	-654	-952	-7	-72	-78
(7)	3021	-695	-1093	3026	-610	-1005	-6	-85	-88
Right A-Pillar									
(1)	3631	894	-576	3630	900	-581	1	-6	5
(2)	3532	864	-665	3531	869	-668	1	-5	4
(3)	3437	839	-755	3434	845	-758	2	-6	3
(4)	3332	809	-850	3329	812	-852	3	-3	2
(5)	3242	781	-928	3236	801	-920	5	-20	-8
(6)	3140	747	-1012	3127	809	-999	14	-62	-13
(7)	3041	713	-1080	3021	812	-1065	20	-99	-15



DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

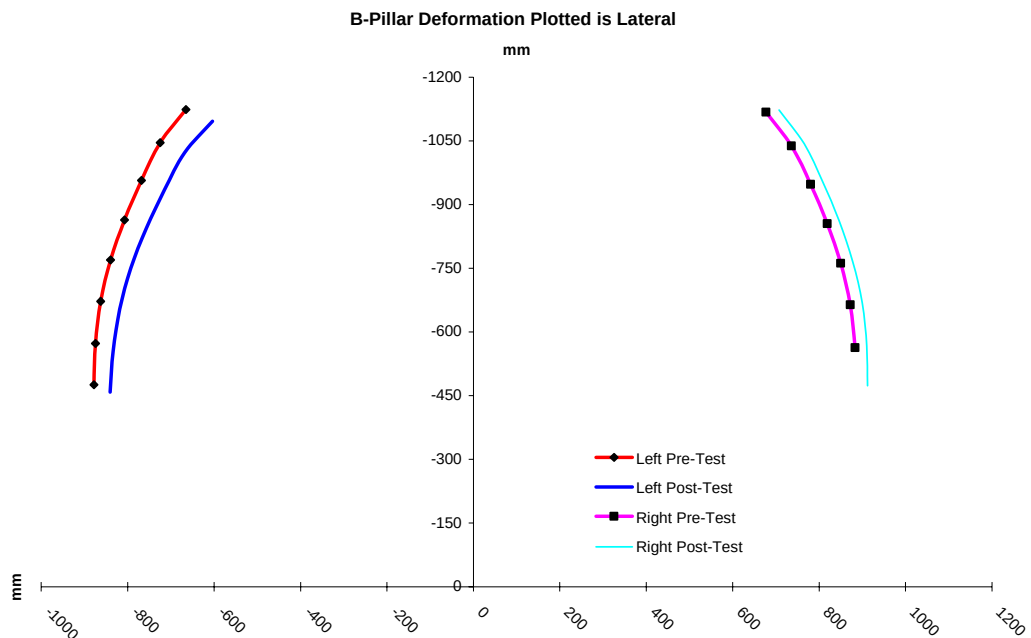
Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

B-PILLAR MEASUREMENTS

Index	Pre-Test			Post-Test			Difference		
Left B-Pillar	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
(1)	2472	-665	-1124	2485	-603	-1096	-13	-62	-27
(2)	2478	-724	-1046	2489	-668	-1022	-12	-56	-24
(3)	2483	-768	-957	2494	-715	-935	-11	-54	-22
(4)	2487	-807	-864	2497	-757	-844	-11	-51	-20
(5)	2494	-840	-770	2505	-793	-750	-11	-47	-19
(6)	2496	-863	-672	2505	-819	-654	-10	-44	-19
(7)	2499	-874	-573	2508	-834	-555	-9	-41	-18
(8)	2504	-878	-476	2513	-840	-458	-9	-37	-18
Right B-Pillar									
(1)	2477	677	-1117	2466	707	-1123	11	-30	5
(2)	2478	736	-1038	2468	765	-1043	10	-29	5
(3)	2483	780	-947	2474	808	-954	8	-28	7
(4)	2487	819	-855	2479	846	-862	8	-28	7
(5)	2492	850	-762	2483	878	-766	9	-28	4
(6)	2499	872	-664	2491	900	-668	9	-27	4
(7)	2501	883	-563	2493	910	-567	8	-27	4
(8)	2504	885	-470	2497	912	-473	6	-27	3



DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

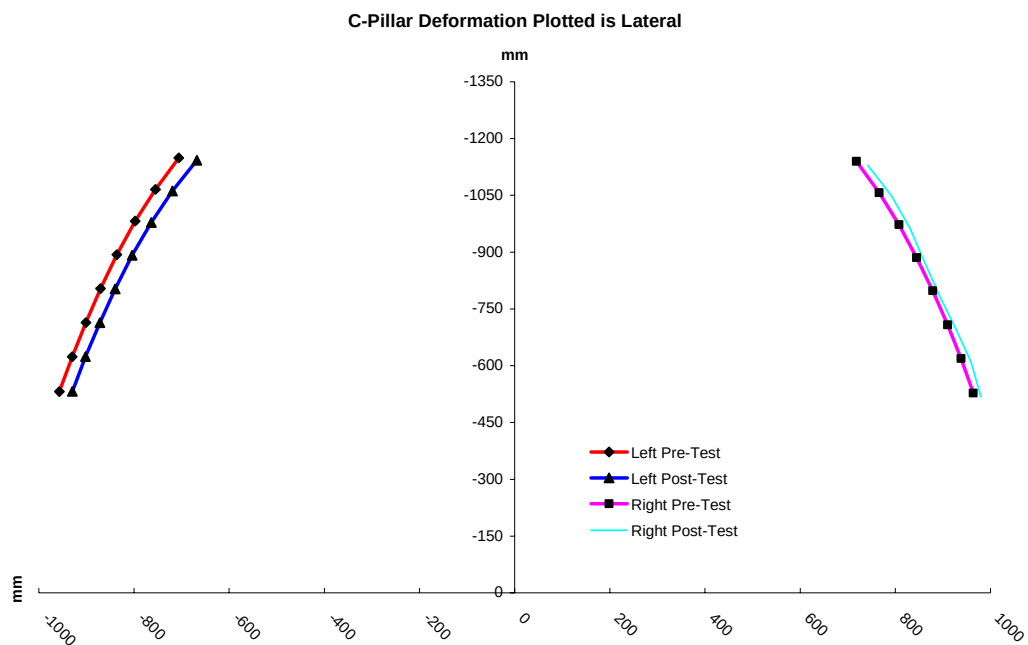
Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

C-PILLAR MEASUREMENTS

Index	Pre-Test			Post-Test			Difference		
Left C-Pillar	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
(1)	1564	-706	-1149	1584	-668	-1143	-20	-38	-6
(2)	1534	-755	-1066	1553	-719	-1062	-19	-36	-4
(3)	1503	-797	-982	1522	-764	-979	-19	-34	-3
(4)	1470	-836	-894	1489	-804	-892	-18	-32	-2
(5)	1439	-870	-804	1456	-840	-803	-17	-31	-1
(6)	1409	-901	-714	1425	-872	-714	-17	-29	0
(7)	1379	-930	-624	1395	-902	-624	-16	-28	1
(8)	1349	-957	-532	1364	-929	-532	-15	-27	1
Right C-Pillar									
(1)	1570	719	-1140	1566	742	-1129	4	-24	-10
(2)	1534	766	-1057	1531	792	-1050	4	-26	-8
(3)	1499	808	-973	1495	830	-964	4	-23	-9
(4)	1464	845	-886	1460	861	-875	5	-16	-11
(5)	1431	879	-798	1425	892	-787	5	-14	-12
(6)	1398	910	-708	1391	927	-698	7	-17	-10
(7)	1364	938	-619	1357	959	-610	8	-21	-9
(8)	1329	964	-528	1322	980	-518	7	-16	-10



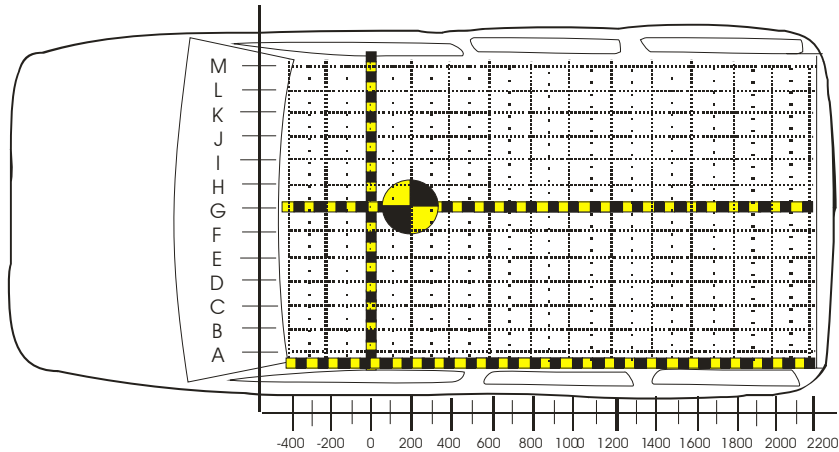
DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10



ROOF EXTERIOR CRUSH LEFT (ROWS A – D)

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
-400	-591	-484	-386	-287	-506	-406	-309	-209	-85	-78	-77	-78
-300	-591	-487	-386	-286	-507	-410	-311	-212	-84	-77	-75	-74
-200	-591	-488	-386	-286	-508	-413	-314	-214	-83	-75	-72	-72
-100	-591	-489	-386	-285	-512	-417	-318	-217	-79	-72	-68	-68
0	-592	-487	-387	-285	-516	-419	-322	-222	-76	-68	-65	-63
100	-593	-484	-384	-284	-516	-420	-322	-224	-77	-64	-62	-60
200	-593	-485	-385	-285	-525	-426	-326	-228	-68	-59	-59	-57
300	-593	-485	-384	-284	-529	-431	-331	-232	-64	-54	-53	-52
400	-593	-486	-384	-284	-535	-435	-334	-234	-58	-51	-50	-50
500	-593	-486	-385	-285	-537	-437	-338	-237	-56	-49	-47	-48
600	-592	-488	-387	-285	-541	-441	-341	-240	-51	-47	-46	-45
700	-592	-488	-387	-286	-545	-442	-345	-244	-47	-46	-42	-42
800	-591	-488	-387	-286	-546	-445	-346	-246	-45	-43	-41	-40
900	-591	-487	-387	-286	-547	-447	-348	-248	-44	-40	-39	-38
1000	-592	-490	-389	-287	-551	-452	-352	-251	-41	-38	-37	-36
1100	-592	-487	-387	-287	-552	-450	-350	-250	-40	-37	-37	-37
1200	-593	-488	-387	-286	-556	-453	-353	-252	-37	-35	-34	-34
1300	-592	-484	-385	-285	-558	-452	-352	-253	-34	-32	-33	-32
1400	-592	-488	-387	-286	-560	-457	-357	-257	-32	-31	-30	-29
1500	-593	-493	-393	-286	-563	-464	-364	-258	-30	-29	-29	-28
1600	-593	-487	-386	-286	-566	-459	-359	-260	-27	-28	-27	-26
1700	-594	-488	-387	-287	-567	-462	-362	-262	-27	-26	-25	-25
1800	-593	-486	-387	-287	-567	-463	-364	-264	-26	-23	-23	-23
1900	-593	-489	-389	-288	-572	-468	-368	-267	-21	-21	-21	-21
2000	-594	-489	-389	-289	-574	-470	-370	-269	-20	-19	-19	-20
2100	-594	-491	-392	-292	-577	-474	-375	-275	-17	-17	-17	-17
2200	-591	-494		-290	-575	-478		-275	-16	-16		-15

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

ROOF EXTERIOR CRUSH CENTER (ROWS E – I)

	Pre-Test					Post-Test					Difference				
	E	F	G	H	I	E	F	G	H	I	E	F	G	H	I
-400	-184	-85	10	115	216	-109	-10	85	188	288	-75	-75	-75	-73	-72
-300	-185	-85	13	115	214	-112	-13	85	185	282	-73	-72	-72	-70	-68
-200	-185	-88	14	112	213	-114	-17	83	179	280	-71	-71	-69	-67	-67
-100	-183	-87	15	109	215	-116	-20	81	174	279	-67	-67	-66	-65	-64
0	-186	-89	15	112	217	-123	-25	79	172	275	-63	-64	-64	-60	-58
100	-183	-88	15	111	213	-124	-28	74	168	270	-59	-60	-59	-57	-57
200	-184	-86	15	110	211	-128	-31	72	165	266	-56	-55	-57	-55	-55
300	-184	-85	15	111	212	-133	-33	68	162	263	-51	-52	-53	-51	-51
400	-184	-88	15	109	210	-134	-38	64	157	258	-50	-50	-49	-48	-48
500	-184	-88	14	107	213	-138	-41	61	154	259	-46	-47	-47	-47	-46
600	-186	-88	14	110	214	-141	-43	58	155	258	-45	-45	-44	-45	-44
700	-187	-88	13	108	212	-144	-45	56	150	254	-43	-43	-43	-42	-42
800	-186	-89	13	109	215	-146	-49	53	149	254	-40	-40	-40	-40	-39
900	-186	-90	12	107	208	-147	-50	51	144	246	-39	-40	-39	-37	-38
1000	-189	-90	11	107	210	-152	-53	49	144	246	-37	-37	-38	-37	-36
1100	-187	-88	10	105	212	-151	-53	46	141	245	-36	-35	-36	-36	-33
1200	-188	-88	10	105	211	-154	-54	44	139	242	-34	-34	-34	-34	-31
1300	-185	-89	9	106	209	-153	-56	41	136	240	-32	-33	-32	-30	-31
1400	-187	-86	9	108	210	-157	-55	39	137	239	-30	-31	-30	-29	-29
1500	-192	-89	9	105	209	-164	-60	37	133	237	-28	-29	-28	-28	-28
1600	-185	-88	8	103	206	-159	-61	34	129	232	-26	-27	-26	-26	-26
1700	-186	-89	7	106	209	-162	-63	32	130	232	-24	-26	-25	-24	-23
1800	-186	-88	6	107	206	-164	-65	30	129	229	-22	-23	-24	-22	-23
1900	-189	-89	5	108	205	-167	-67	27	128	225	-22	-22	-22	-20	-20
2000	-189	-89	4	105	203	-169	-69	24	123	222	-20	-20	-20	-18	-19
2100	-191	-91	2	102	203	-175	-72	20	120	219	-16	-19	-18	-18	-16
2200	-184	-85	10	103	204	-177	-77	18	119	221	-15	-17	-17	-16	-17

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

ROOF EXTERIOR CRUSH RIGHT (ROWS J – M)

	Pre-Test				Post-Test				Difference			
	J	K	L	M	J	K	L	M	J	K	L	M
-400	316	416	516	610	388	487	587	679	-72	-71	-71	-69
-300	313	416	517	606	381	482	580	668	-68	-66	-63	-62
-200	314	414	514	605	376	476	568	665	-62	-62	-54	-60
-100	315	416	516	602	376	474	569	658	-61	-58	-53	-56
0	316	418	518	604	373	473	571	658	-57	-55	-53	-54
100	315	412	513	604	371	466	565	654	-56	-54	-52	-50
200	311	411	510	605	366	461	562	647	-55	-50	-52	-42
300	311	411	509	604	362	461	562	636	-51	-50	-53	-32
400	312	409	510	604	360	458	557	625	-48	-49	-47	-21
500	313	410	511	604	359	455	553	612	-46	-45	-42	-8
600	313	414	514	605	358	455	551	613	-45	-41	-37	-8
700	311	413	511	604	354	454	549	623	-43	-41	-38	-19
800	313	414	514	605	353	455	550	627	-40	-41	-36	-22
900	311	409	509	604	349	447	544	629	-38	-38	-35	-25
1000	311	410	510	604	348	445	543	630	-37	-35	-33	-26
1100	312	412	511	605	346	445	544	632	-34	-33	-33	-27
1200	312	411	511	605	345	444	541	630	-33	-33	-30	-25
1300	310	408	509	605	341	440	536	629	-31	-32	-27	-24
1400	311	410	509	604	340	438	537	627	-29	-28	-28	-23
1500	311	408	508	604	337	434	535	625	-26	-26	-27	-21
1600	312	405	506	604	337	431	529	623	-25	-26	-23	-19
1700	311	407	508	603	335	431	529	619	-24	-24	-21	-16
1800	310	406	506	603	332	428	526	617	-22	-22	-20	-14
1900	310	403	503	602	331	425	521	613	-21	-22	-18	-11
2000	309	401	502	602	328	422	519	614	-19	-21	-17	-12
2100	302	401	502	604	320	419	518	614	-18	-18	-16	-10
2200	309		504	602	325		518	612	-16		-14	-10

DATA SHEET NO. 7 (CONTINUED)

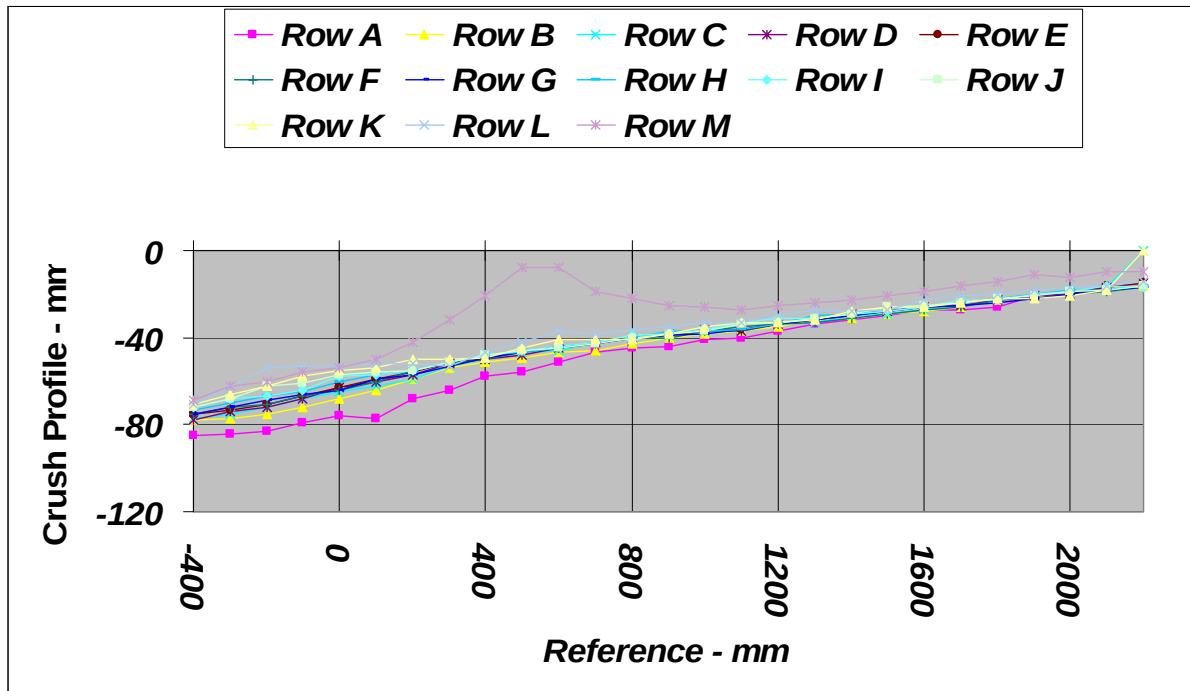
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

ROOF CRUSH



The roof crush measurements and plot reported are vertical.

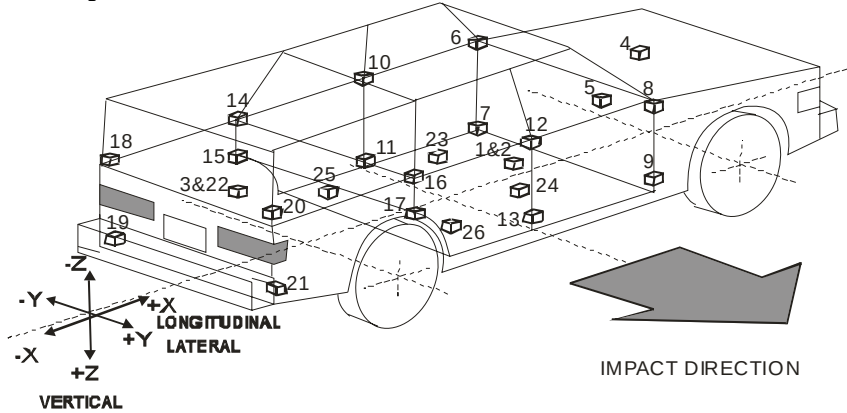
DATA SHEET NO. 8

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Vehicle Center of Gravity	2584	-3	-
2	Vehicle Center of Gravity ROLL	2584	50	-
3	Rear Deck (cargo area) ROLL	380	0	-
4	Top of Engine	4381	160	-
5	Bottom of Engine	4041	90	-
6	Left A-Pillar Upper	3074	-620	-
7	Left A-Pillar Lower	3575	-820	-
8	Right A-Pillar Upper	3074	620	-
9	Right A-Pillar Lower	3575	820	-
10	Left B-Pillar Upper	2464	-657	-
11	Left B-Pillar Lower	2494	-835	-
12	Right B-Pillar Upper	2462	657	-
13	Right B-Pillar Lower	2494	835	-
14	Left C-Pillar Upper	1654	-672	-
15	Left C-Pillar Lower	1780	-800	-
16	Right C-Pillar Upper	1664	672	-
17	Right C-Pillar Lower	1785	800	-
18	Left D-Pillar Upper	519	610	-
19	Left D-Pillar Lower	334	735	-
20	Right D-Pillar Upper	503	-610	-
21	Right D-Pillar Lower	314	-735	-
22	Vehicle Rear Deck	410	0	-
23	LF Seat Position (on floor)	2824	-420	-
24	RF Seat Position (on floor)	2824	420	-
25	LR Seat Position (on floor)	1864	-440	-
26	RR Seat Position (on floor)	1895	440	-

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

Location		Unit	Positive Direction Max. Time (ms)		Negative Direction Max. Time (ms)	
(1) Vehicle Center of Gravity Acceleration	X	g	4.4	87.0	-8.6	32.1
	Y	g	1.5	191.8	-20.3	30.3
	Z	g	18.6	37.4	-14.1	29.8
	R	g	24.4	29.9		
(2) Vehicle Center of Gravity Gyro ¹	X	°/s	622.4	30.2	-813.0	30.8
	Y	°/s	786.9	1130.1	-1599.2	31.2
	Z	°/s	1291.5	28.9	-860.7	1130.1
(3) Rear Deck Gyro ¹ (cargo area)	X	°/s	997.2	732.2	-1205.6	744.9
	Y	°/s	1359.9	93.4	-1181.9	751.4
	Z	°/s	1609.7	989.0	-1487.9	78.7
(4) Top of Engine	X	g	4.2	21.0	-2.2	27.5
	Y	g	2.1	1241.8	-17.5	20.8
	Z	g	10.6	79.4	-3.8	1241.6
	R	g	18.6	79.0		
(5) Bottom of Engine	X	g	5.0	16.3	-1.9	88.6
	Y	g	4.0	159.1	-25.8	16.5
	Z	g	4.3	1140.6	-9.1	81.8
	R	g	26.9	16.5		
(6) Left A-Pillar Upper	X	g	223.7	160.4	-104.4	1335.2
	Y	g	31.5	1108.6	-27.6	109.1
	Z	g	25.5	1104.0	-6.7	27.1
	R	g	223.7	160.4		
(7) Left A-Pillar Lower	X	g	4.2	740.8	-3.5	18.6
	Y	g	4.6	117.9	-19.4	81.8
	Z	g	9.2	1120.5	-12.7	35.1
	R	g	21.4	32.3		
(8) Right A-Pillar Upper ¹	X	g	16.0	103.2	-4.7	772.2
	Y	g	3.9	1279.0	-12.1	85.1
	Z	g	2128.4	89.3	-71.8	80.8
	R	g	2128.5	89.3		
(9) Right A-Pillar Lower	X	g	3.8	78.4	-2.4	125.9
	Y	g	3.4	737.1	-21.4	72.6
	Z	g	7.8	47.8	-7.0	105.0
	R	g	21.8	72.6		

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
(10) Left B-Pillar Upper	X	g	4.6	734.1	-7.5	1104.1
	Y	g	13.1	1147.4	-12.4	94.1
	Z	g	20.6	104.6	-19.1	1124.3
	R	g	22.1	104.6		
(11) Left B-Pillar Lower	X	g	5.0	740.8	-3.8	23.0
	Y	g	3.1	117.4	-22.1	29.4
	Z	g	8.0	1117.5	-13.9	29.1
	R	g	26.2	29.4		
(12) Right B-Pillar Upper	X	g	34.7	103.7	-5.7	108.8
	Y	g	9.3	727.6	-27.5	723.3
	Z	g	6.7	39.8	-34.6	103.0
	R	g	48.7	103.4		
(13) Right B-Pillar Lower	X	g	2.9	53.6	-11.6	85.8
	Y	g	4.4	143.6	-20.6	31.2
	Z	g	12.6	39.4	-8.6	116.0
	R	g	21.1	31.1		
(14) Left C-Pillar Upper ¹	X	g	6.7	734.2	-26.4	103.8
	Y	g	61.0	105.4	-13.0	97.8
	Z	g	2089.1	119.9	-292.9	247.4
	R	g	2089.1	119.9		
(15) Left C-Pillar Lower	X	g	6.0	38.8	-2.6	125.6
	Y	g	4.2	172.6	-13.6	48.0
	Z	g	7.7	756.2	-23.9	25.9
	R	g	25.7	25.8		
(16) Right C-Pillar Upper	X	g	3.5	720.9	-14.9	103.4
	Y	g	7.2	107.4	-90.8	102.8
	Z	g	10.1	22.2	-13.1	119.0
	R	g	92.0	102.8		
(17) Right C-Pillar Lower	X	g	4.9	59.4	-5.8	38.6
	Y	g	3.6	170.8	-18.7	28.7
	Z	g	12.1	20.6	-7.6	115.7
	R	g	21.4	28.5		
(18) Left D-Pillar Upper	X	g	6.0	40.8	-4.7	106.8
	Y	g	6.5	55.3	-25.4	734.2
	Z	g	16.9	734.2	-15.1	768.8
	R	g	30.6	734.2		

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
(19) Left D-Pillar Lower	X	g	6.6	54.4	-5.8	47.0
	Y	g	2.0	164.8	-10.6	31.8
	Z	g	18.9	746.6	-16.2	33.4
	R	g	19.4	33.0		
(20) Right D-Pillar Upper	X	g	4.0	71.9	-17.1	739.3
	Y	g	2.2	751.5	-39.6	733.7
	Z	g	46.0	745.0	-11.2	41.8
	R	g	46.1	745.0		
(21) Right D-Pillar Lower	X	g	4.0	61.2	-5.0	37.0
	Y	g	1.4	1294.6	-21.4	744.6
	Z	g	22.3	734.3	-37.2	744.5
	R	g	42.8	744.5		
(22) Vehicle Rear Deck	X	g	1.7	739.2	-3.0	80.6
	Y	g	3.8	751.8	-12.7	79.4
	Z	g	9.3	755.3	-8.5	59.5
	R	g	15.7	79.5		
(23) LF Seat Position (on floor)	X	g	4.0	741.1	-2.3	97.4
	Y	g	2.1	191.4	-18.4	29.0
	Z	g	6.4	752.5	-14.6	18.2
	R	g	18.7	29.0		
(24) RF Seat Position (on floor)	X	g	2.4	54.1	-3.5	30.3
	Y	g	1.4	1472.2	-20.2	30.2
	Z	g	14.7	17.9	-11.8	12.1
	R	g	21.6	30.8		
(25) LR Seat Position (on floor)	X	g	3.5	742.4	-5.9	29.0
	Y	g	1.8	152.3	-18.1	28.4
	Z	g	7.5	758.6	-14.7	21.6
	R	g	19.3	28.9		
(26) RR Seat Position (on floor)	X	g	4.7	56.2	-3.7	35.0
	Y	g	3.6	741.4	-17.3	28.5
	Z	g	17.1	39.8	-10.1	114.2
	R	g	20.1	39.8		

Reference: X: + Forward from rear bumper

Y: + Rightward from vehicle centerline

Z: + Downward from ground level

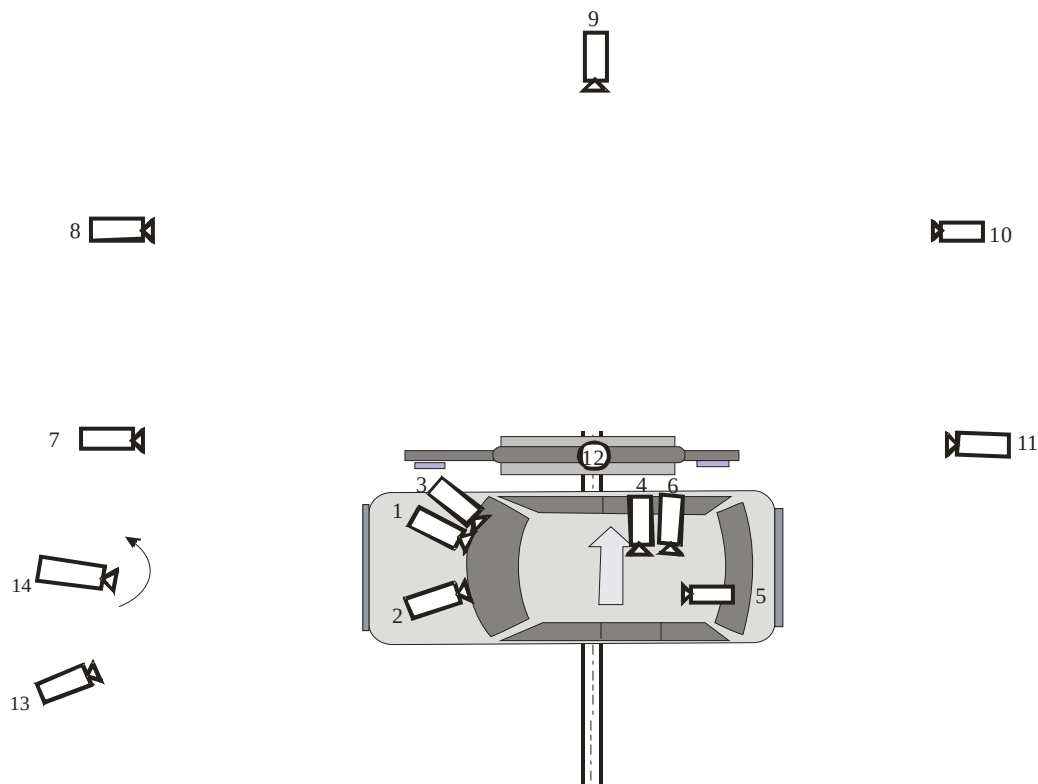
For acceleration data sign convention see Report Sign Convention in Appendix D.

¹ See Test Notes.

DATA SHEET NO. 9 **HIGH-SPEED CAMERA DATA**

Test Vehicle: 2007 Ford Expedition
 Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10



No.	Camera View	Camera Type	Lens (mm)	Speed (fps)	Trigger Delay (ms)
1	Driver Overall - Onboard	VRTC – 1	4.8	500	0
2	Passenger Overall - Onboard	VRTC – 2	5.5	500	0
3	Driver Pelvis Area - Onboard	VRTC – 3	4.8	500	0
4	Rear Passenger Waste Up	Redlake – LE	8.5	500	0
5	Rear Passenger Overall	Redlake – LE	8.5	500	0
6	Rear Passenger Head	Redlake – LE	4.8	500	0
7	Vehicle Left Side Launch	Redlake – LE	4.8	500	0
8	Vehicle Left Side Later in Event ¹	Redlake – LE	--- ¹	500	0
9	Downstream Wide	Redlake – LE	25	500	0
10	Vehicle Right Side Later in Event ¹	Redlake – LE	--- ¹	500	0
11	Vehicle Right Side Launch	Redlake – LE	12.5	500	0
12	Overhead wide	Redlake – LE	8.5	500	0
13	Upstream Oblique Wide	Visario G2	12.5	500	0
14	Real-time Panning ²	Canon	zoom	24	

¹ Vehicle did not enter this view, lens size was not recorded.

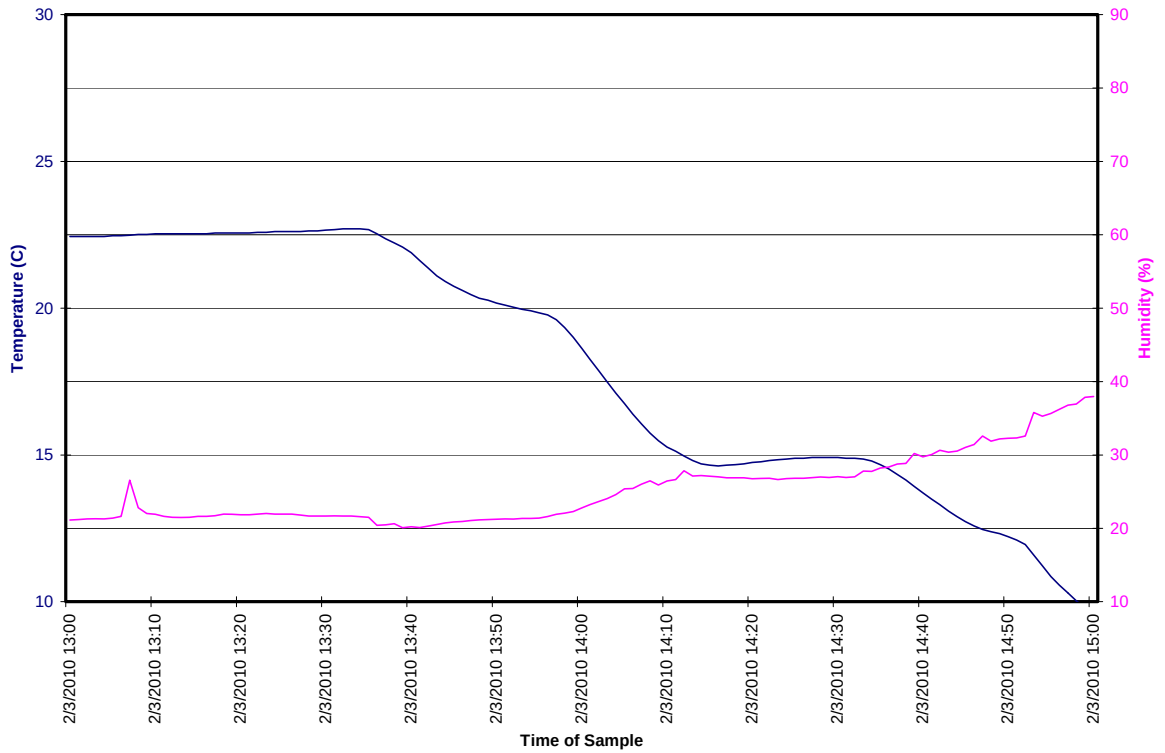
² Failed to record an image.

DATA SHEET NO. 10
DUMMY / VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2007 Ford Expedition
Test Program: Improved Restraints in Rollovers

Test Date: 02/03/10

2007 Ford Expedition Curb Trip Rollover 100203; Test Time 15:00



APPENDIX A
PHOTOGRAPHS

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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 Rear View



Figure A-12 Post-Test Right Rear View



Figure A-13 Pre-Test Right Side View



Figure A-14 Post-Test Right Side View



Figure A-15 Pre-Test Right Front View



Figure A-16 Post-Test Right Front View



Figure A-17 Pre-Test Front Underbody View

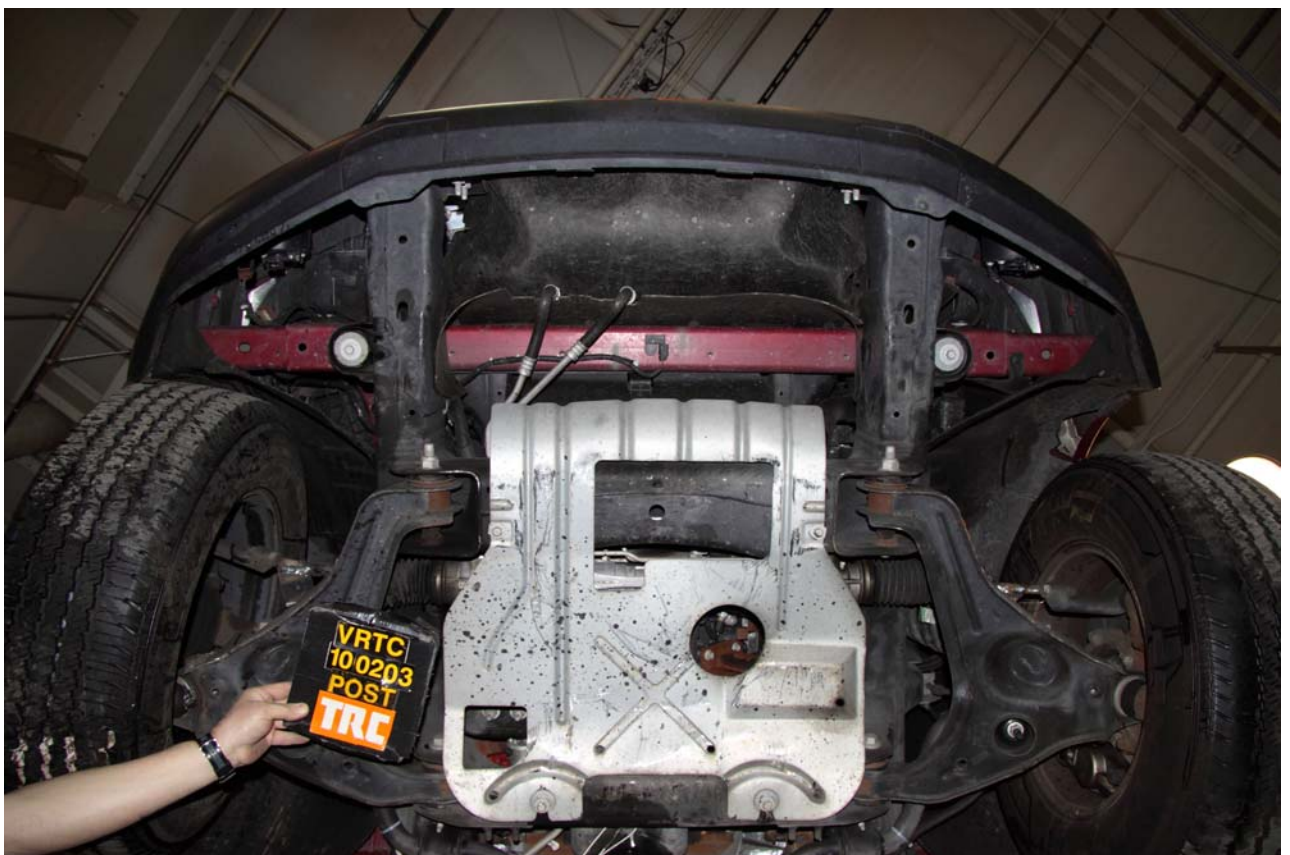


Figure A-18 Post-Test Front Underbody View

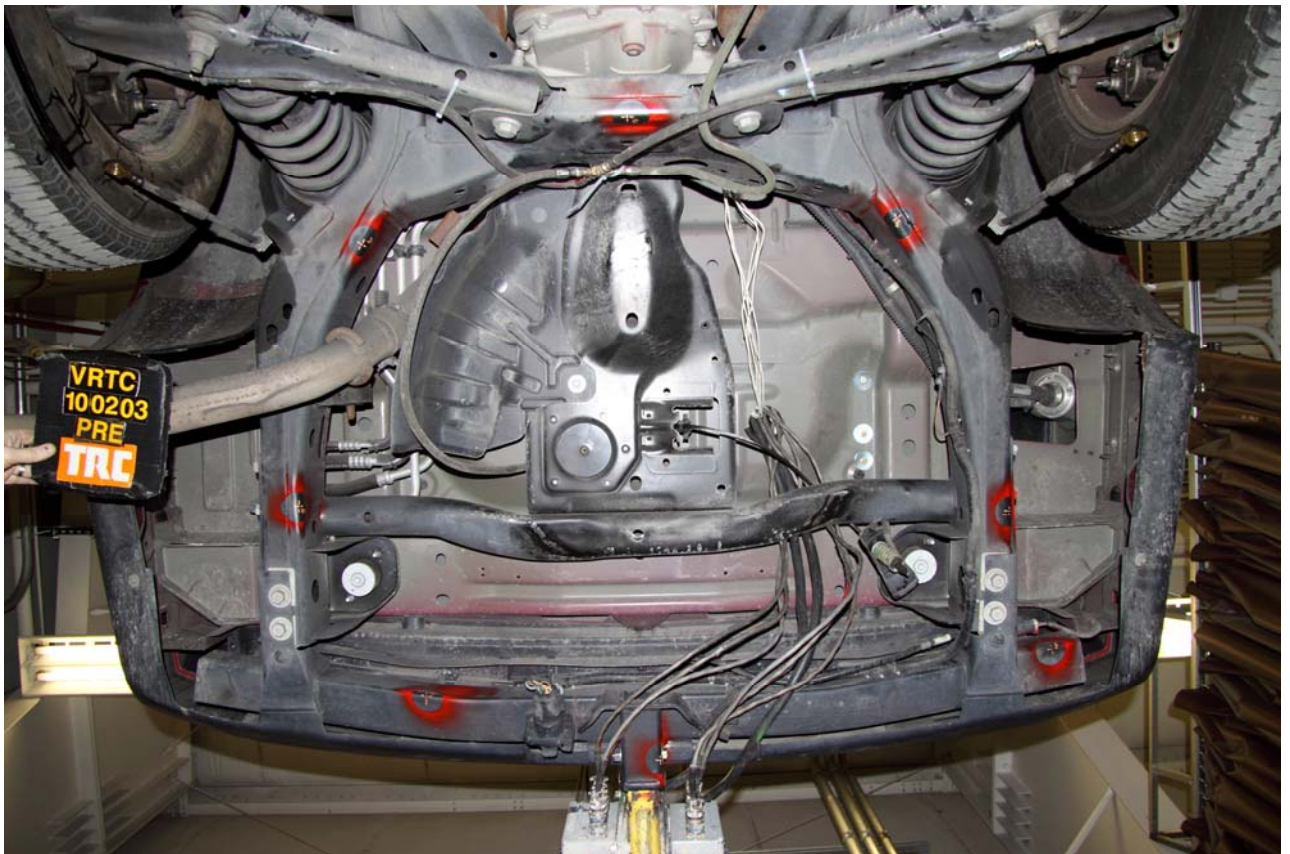


Figure A-19 Pre-Test Rear Underbody View

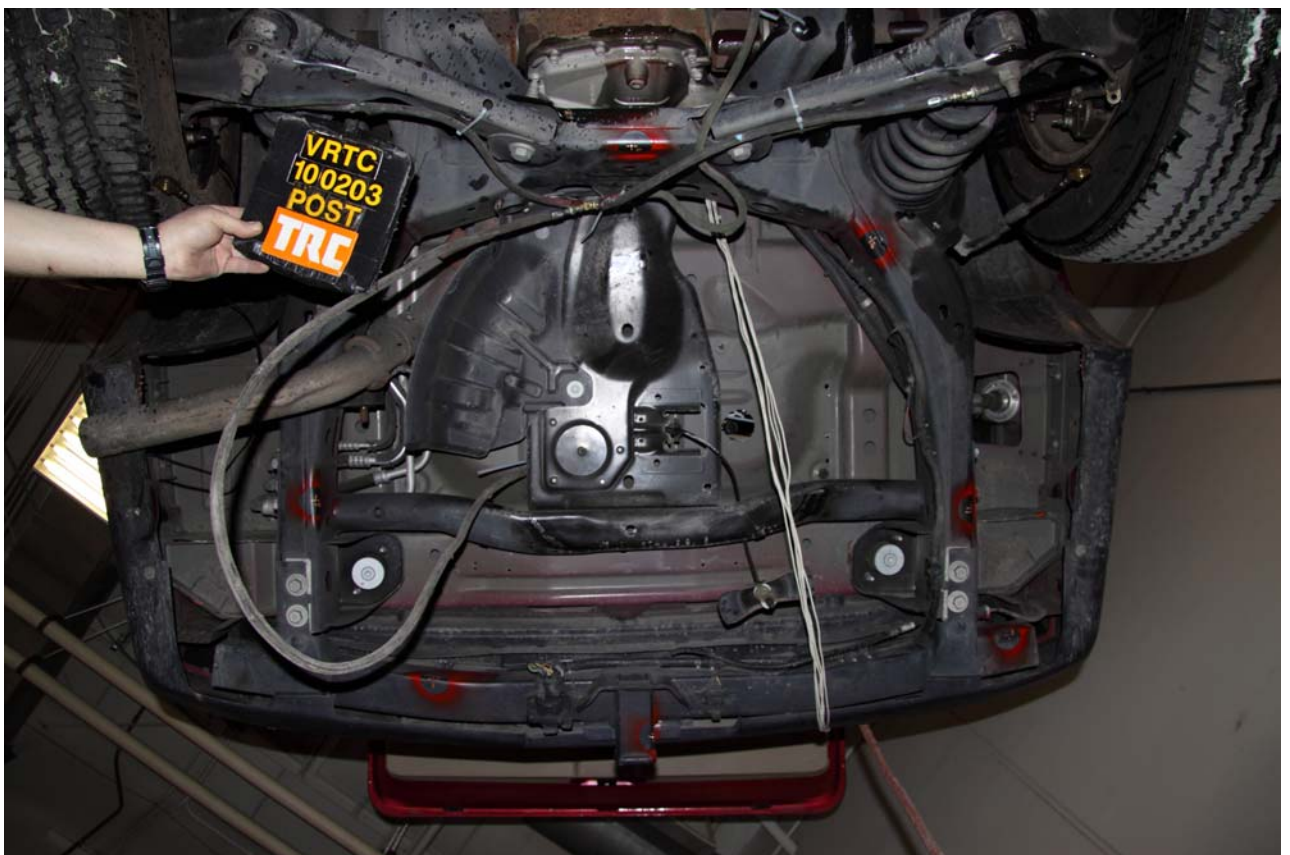


Figure A-20 Post-Test Rear Underbody View



Figure A-21 Pre-Test Windshield View



Figure A-22 Post-Test Windshield View



Figure A-23 Pre-Test Windshield View – Driver Dummy



Figure A-24 Post-Test Windshield View – Driver Dummy



Figure A-25 Pre-Test Driver Dummy - View 1



Figure A-26 Post-Test Driver Dummy - View 1



Figure A-27 Pre-Test Driver Dummy - View 2



Figure A-28 Post-Test Driver Dummy - View 2



Figure A-29 Pre-Test Driver Dummy - View 3

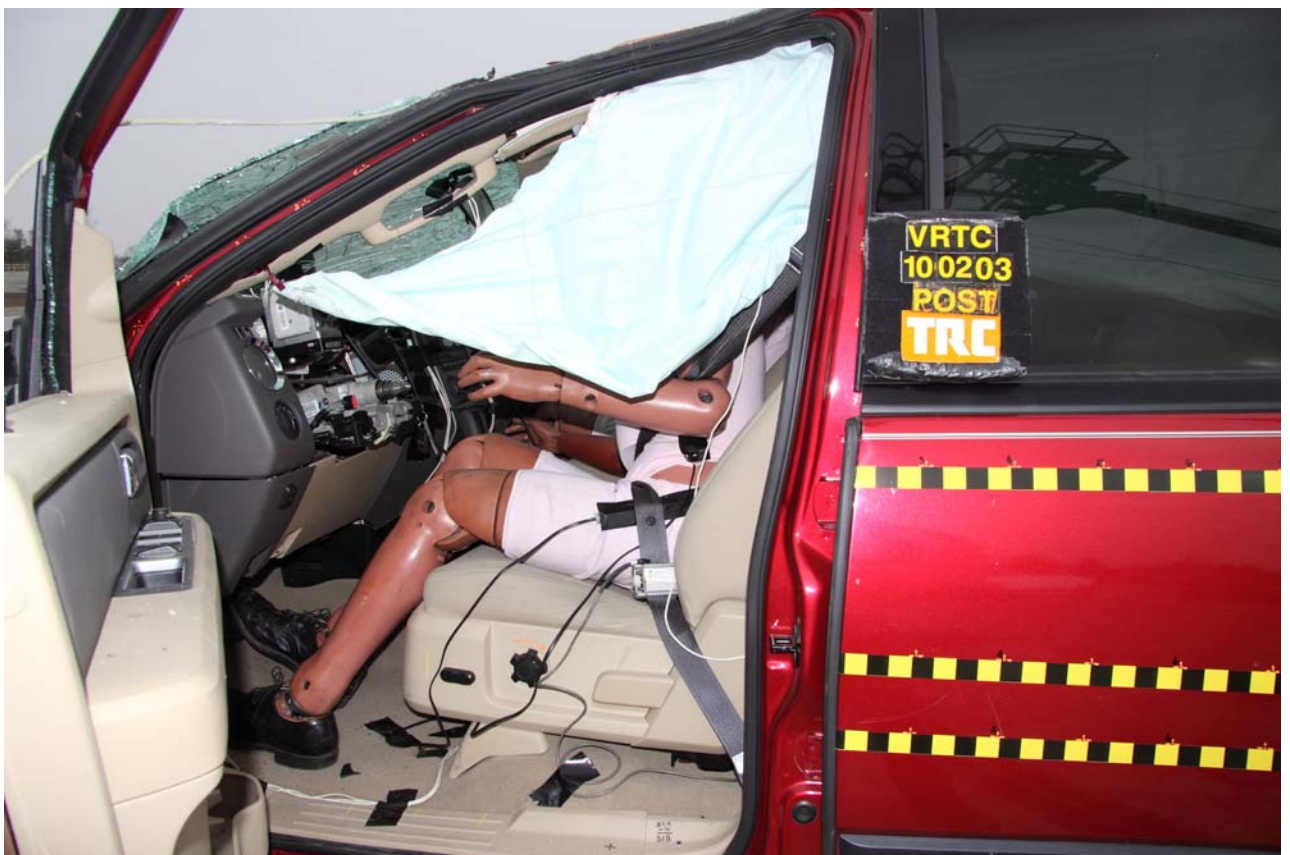


Figure A-30 Post-Test Driver Dummy - View 3



Figure A-31 Pre-Test Driver Dummy - View 4



Figure A-32 Post-Test Driver Dummy - View 4



Figure A-33 Pre-Test Windshield View – Right Front Passenger



Figure A-34 Post-Test Windshield View – Right Front Passenger



Figure A-35 Pre-Test Right Front Passenger Dummy - View 1



Figure A-36 Post-Test Right Front Passenger Dummy - View 1



Figure A-37 Pre-Test Right Front Passenger Dummy - View 2



Figure A-38 Post-Test Right Front Passenger Dummy - View 2



Figure A-39 Pre-Test Right Front Passenger Dummy - View 3



Figure A-40 Post-Test Right Front Passenger Dummy - View 3



Figure A-41 Pre-Test Right Front Passenger Dummy - View 4



Figure A-42 Pre-Test Right Front Passenger Dummy - View 5



Figure A-43 Pre-Test Left Rear Passenger Dummy - View 1



Figure A-44 Pre-Test Left Rear Passenger Dummy - View 2



Figure A-45 Pre-Test Left Rear Passenger Dummy - View 3

Intentionally Left Blank



Figure A-46 Pre-Test Left Rear Passenger Dummy - View 4



Figure A-47 Post-Test Left Rear Passenger Dummy - View 4



Figure A-48 Vehicle Certification Label View



Figure A-49 Vehicle Tire Pressure Label View



Figure A-50 Post-Test Driver Dummy Overall



Figure A-51 Post-Test Driver Dummy Contact - View 1



Figure A-52 Post-Test Right Front Passenger Dummy Overall



Figure A-53 Post-Test Right Front Passenger Dummy Contact View



Figure A-54 Post-Test Left Rear Passenger Dummy Overall



Figure A-55 Post-Test Left Rear Passenger Dummy Contact View



Figure A-56 Pre-Test Test Area - View 1



Figure A-57 Post-Test Test Area - View 1



Figure A-58 Pre-Test Test Area - View 2

Intentionally Left Blank



Figure A-59 Pre-Test Test Area - View 3



Figure A-60 Post-Test Test Area - View 3



Figure A-61 Post-Test Vehicle Resting Position – Front



Figure A-62 Post-Test Vehicle Resting Position – Left Side



Figure A-63 Post-Test Vehicle Resting Position - Rear



Figure A-64 Post-Test Vehicle Resting Position – Right Side

APPENDIX B
DATA PLOTS



Curb Trip Rollover 2007 Ford Expedition

Driver Head X-Axis Acceleration

Date: 02/03/2010

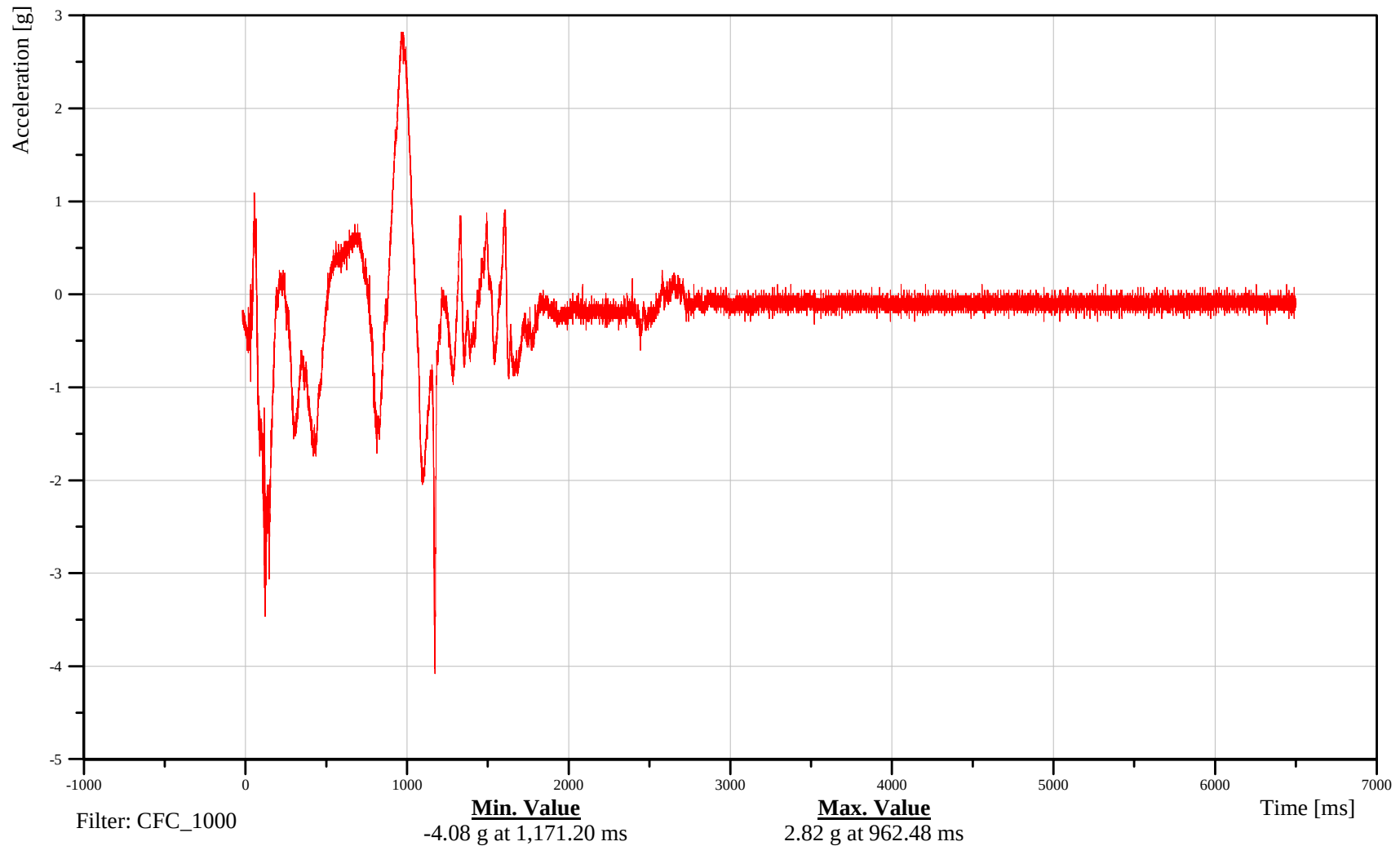
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Customer: VRTC

11HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-2

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Head Y-Axis Acceleration

Date: 02/03/2010

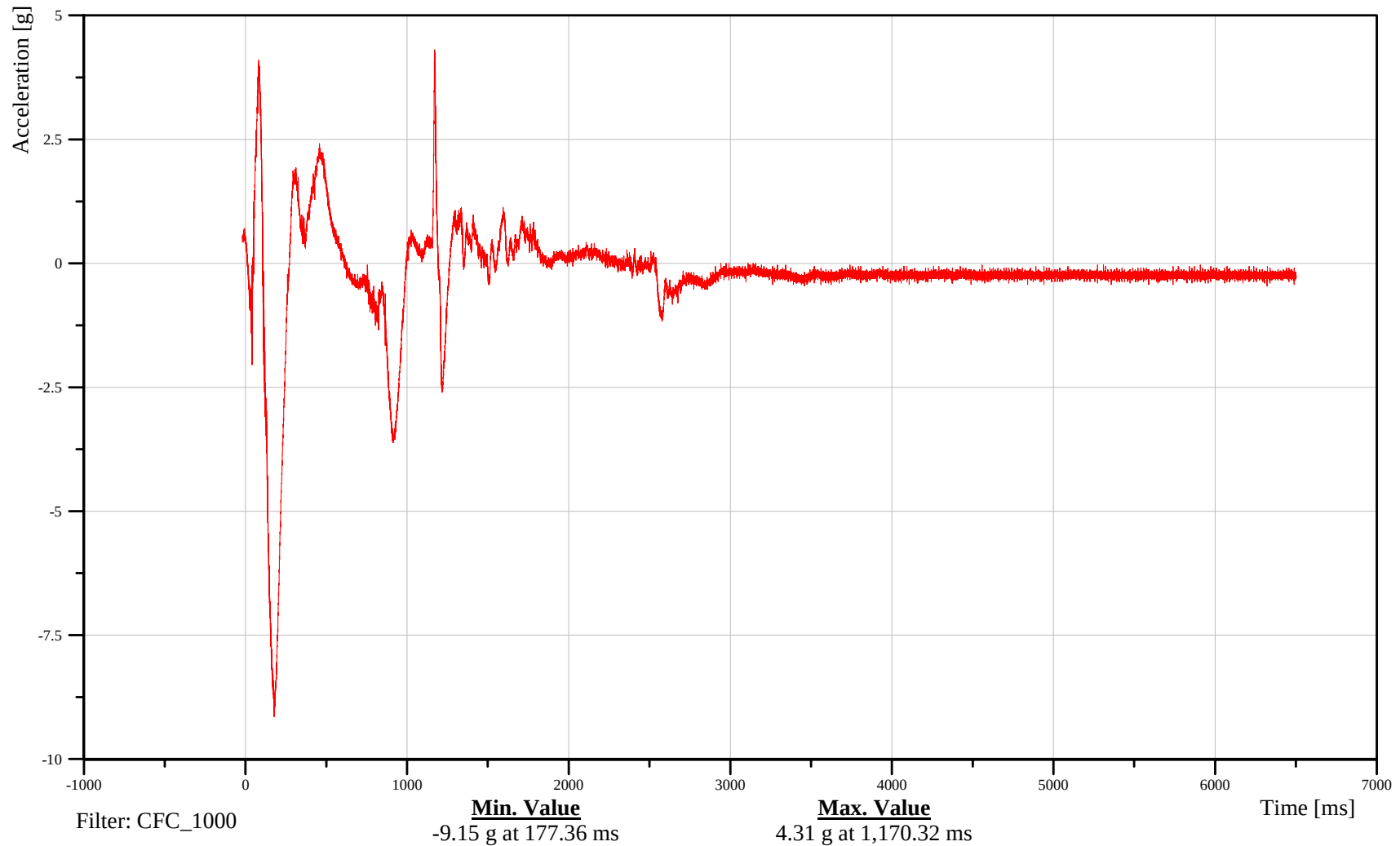
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TRC Inc. Test Lab: CTF

Test Number: 100203



B-3

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Head Z-Axis Acceleration

Date: 02/03/2010

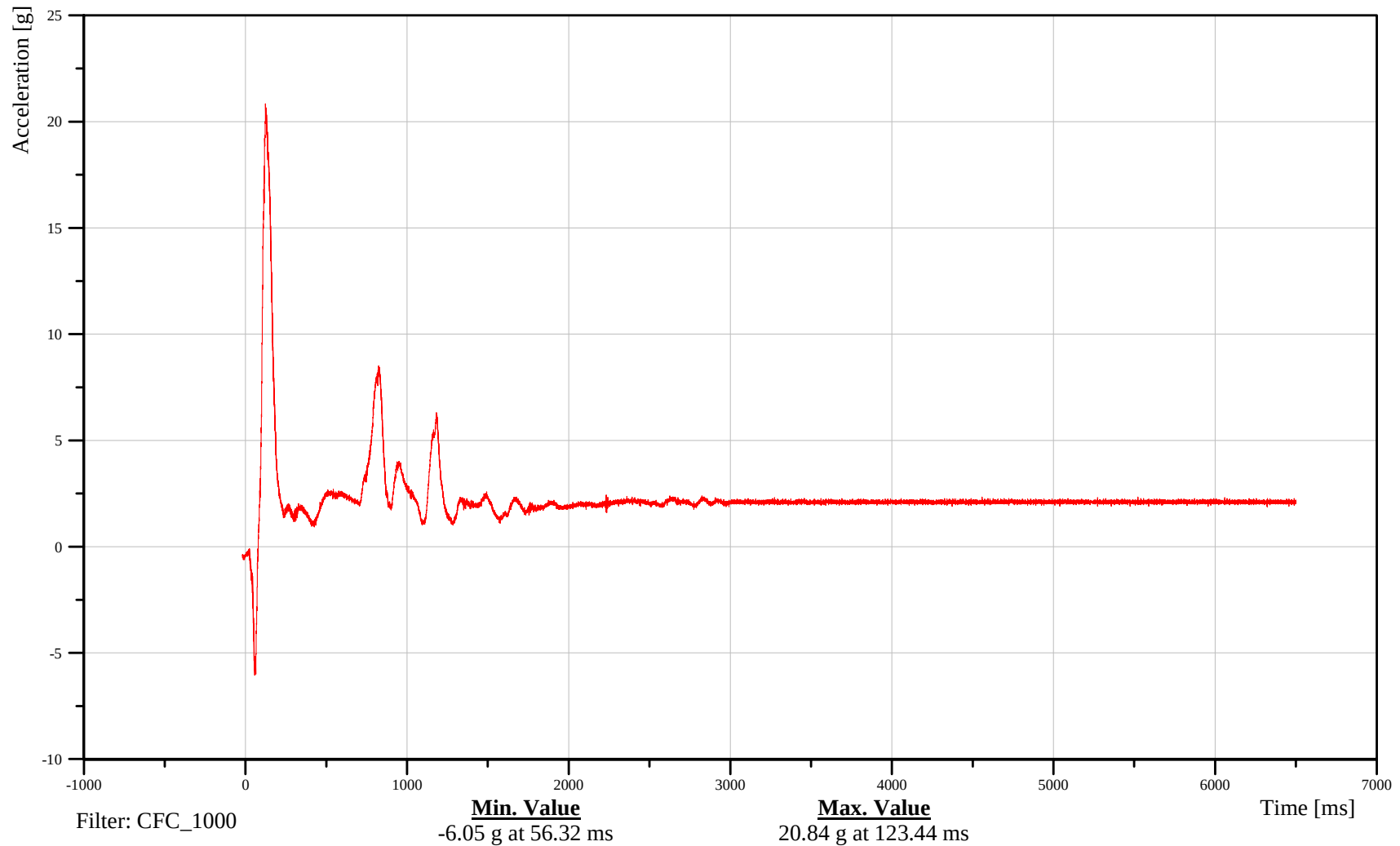
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-4

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Head Resultant Acceleration

Date: 02/03/2010

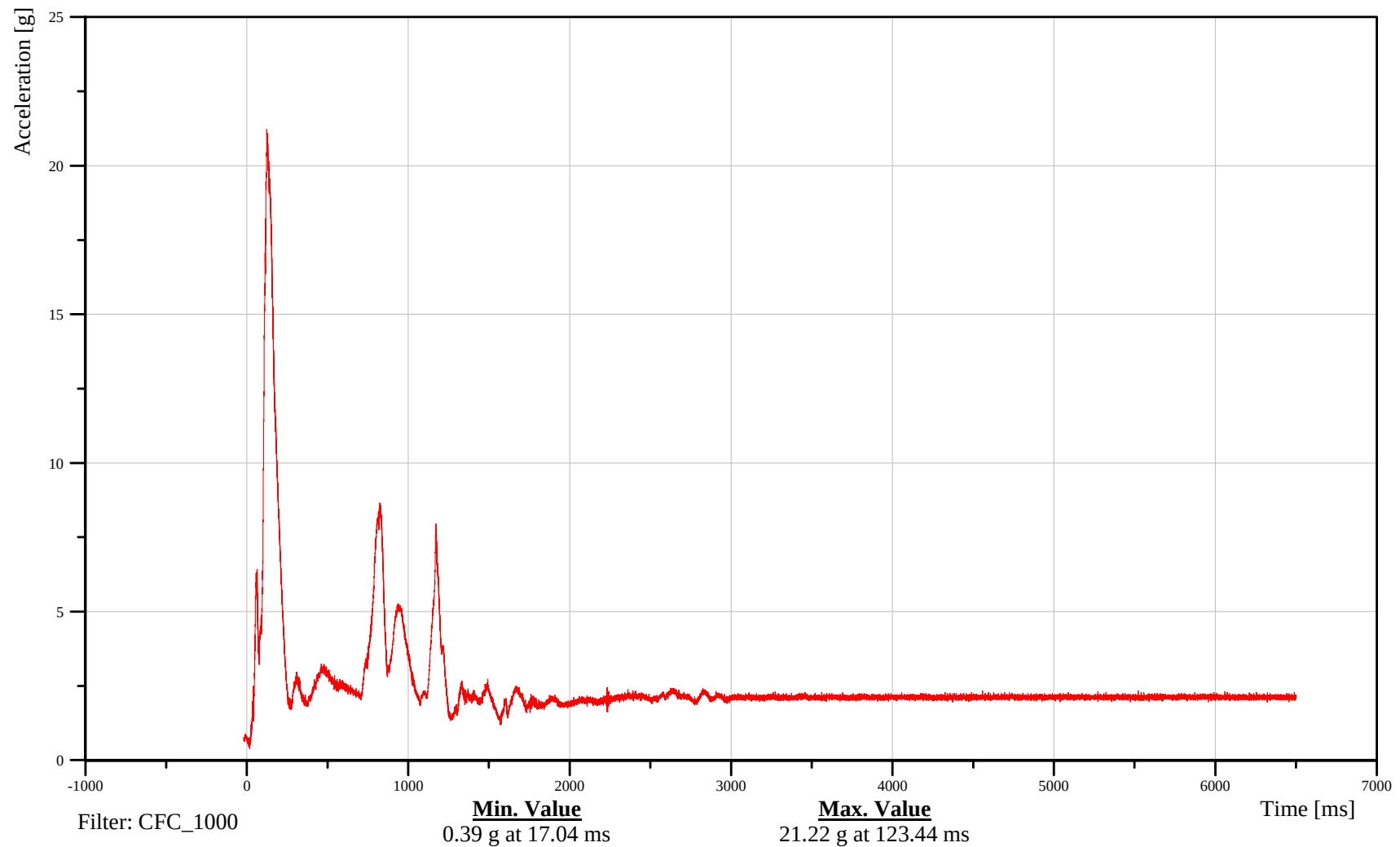
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-5

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Head (DTS ARS) Rate Gyro X

Date: 02/03/2010

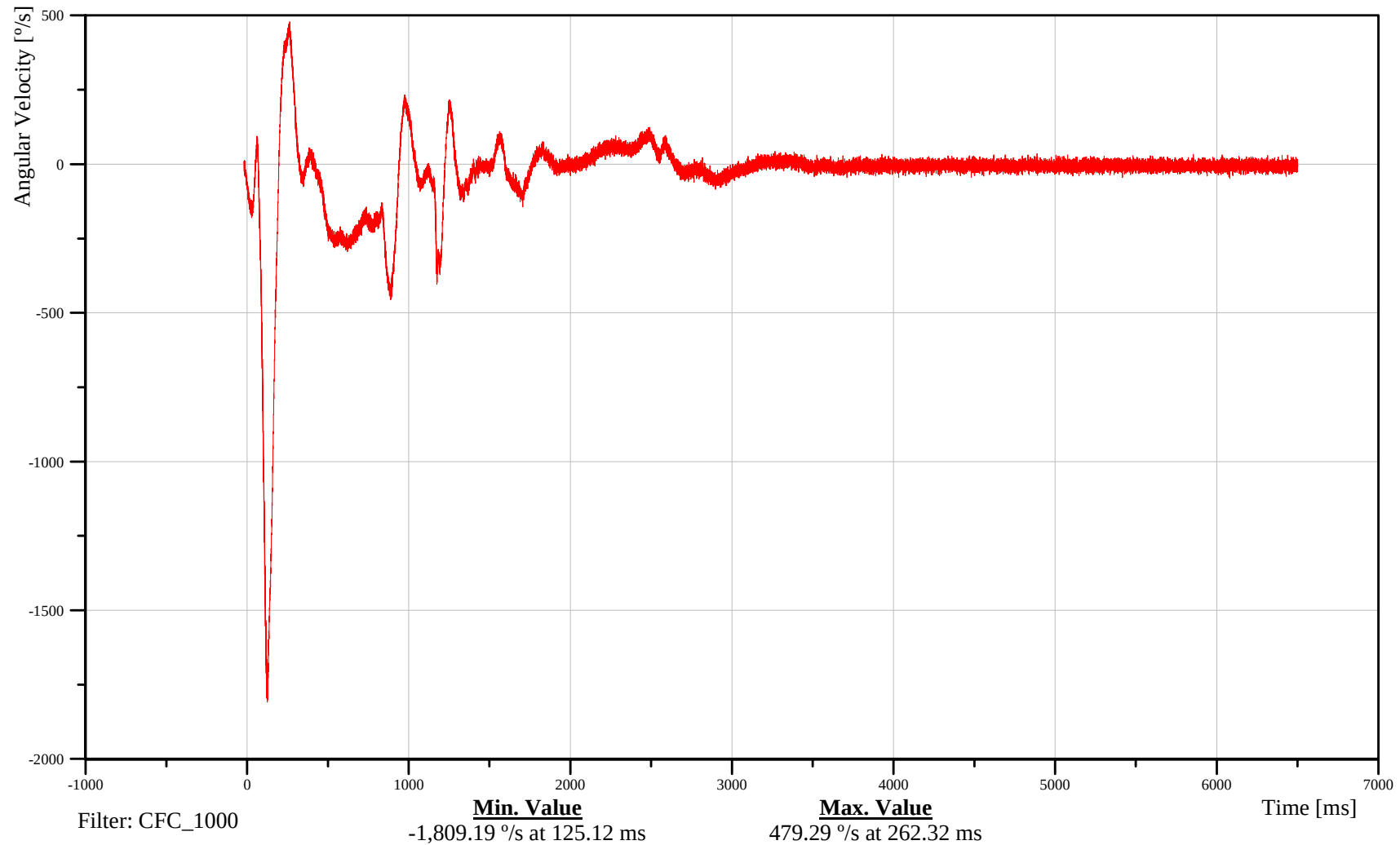
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TRC Inc. Test Lab: CTF

Test Number: 100203



B-6

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Head (DTS ARS) Rate Gyro Y

Date: 02/03/2010

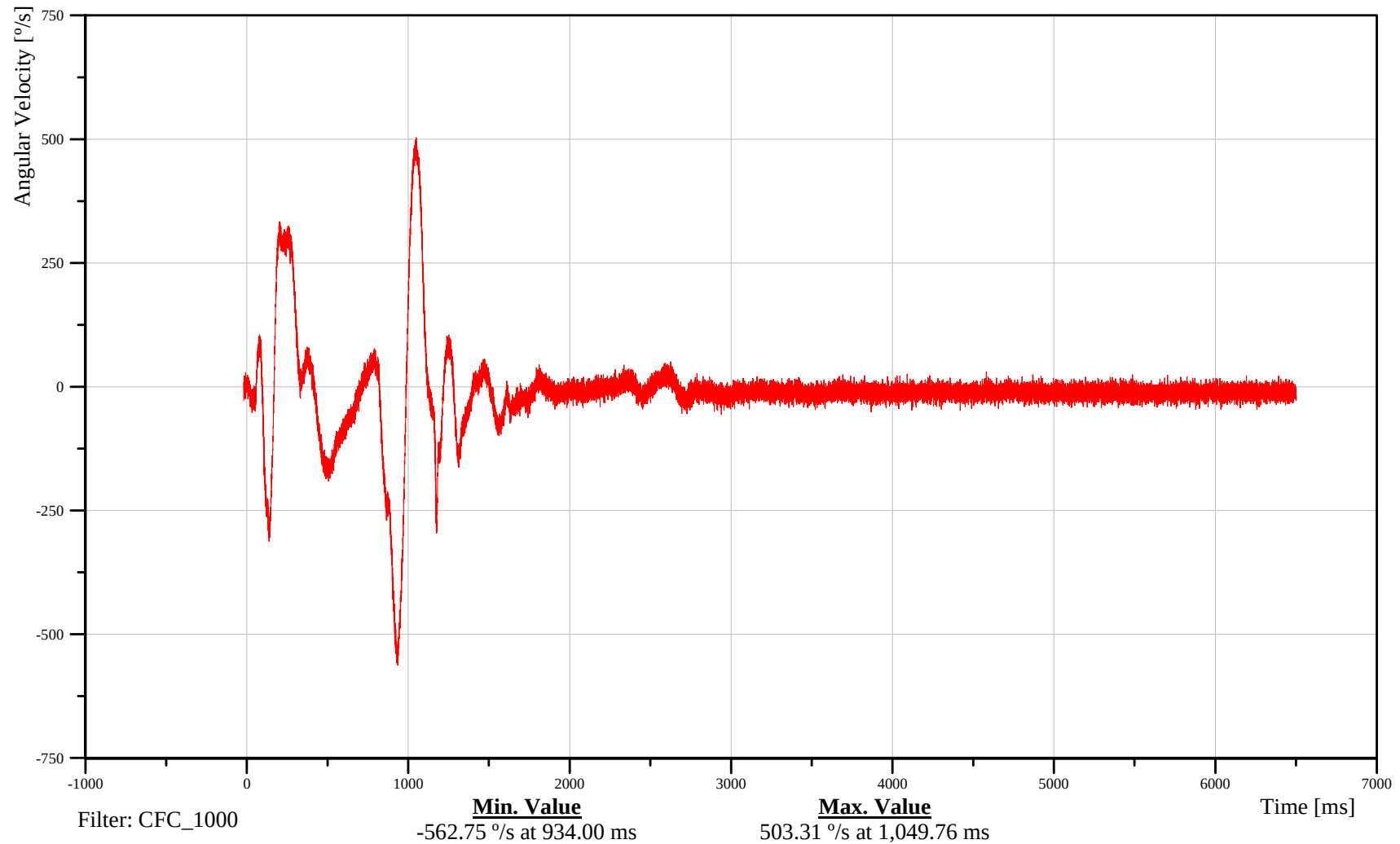
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-7

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Head (DTS ARS) Rate Gyro Z

Date: 02/03/2010

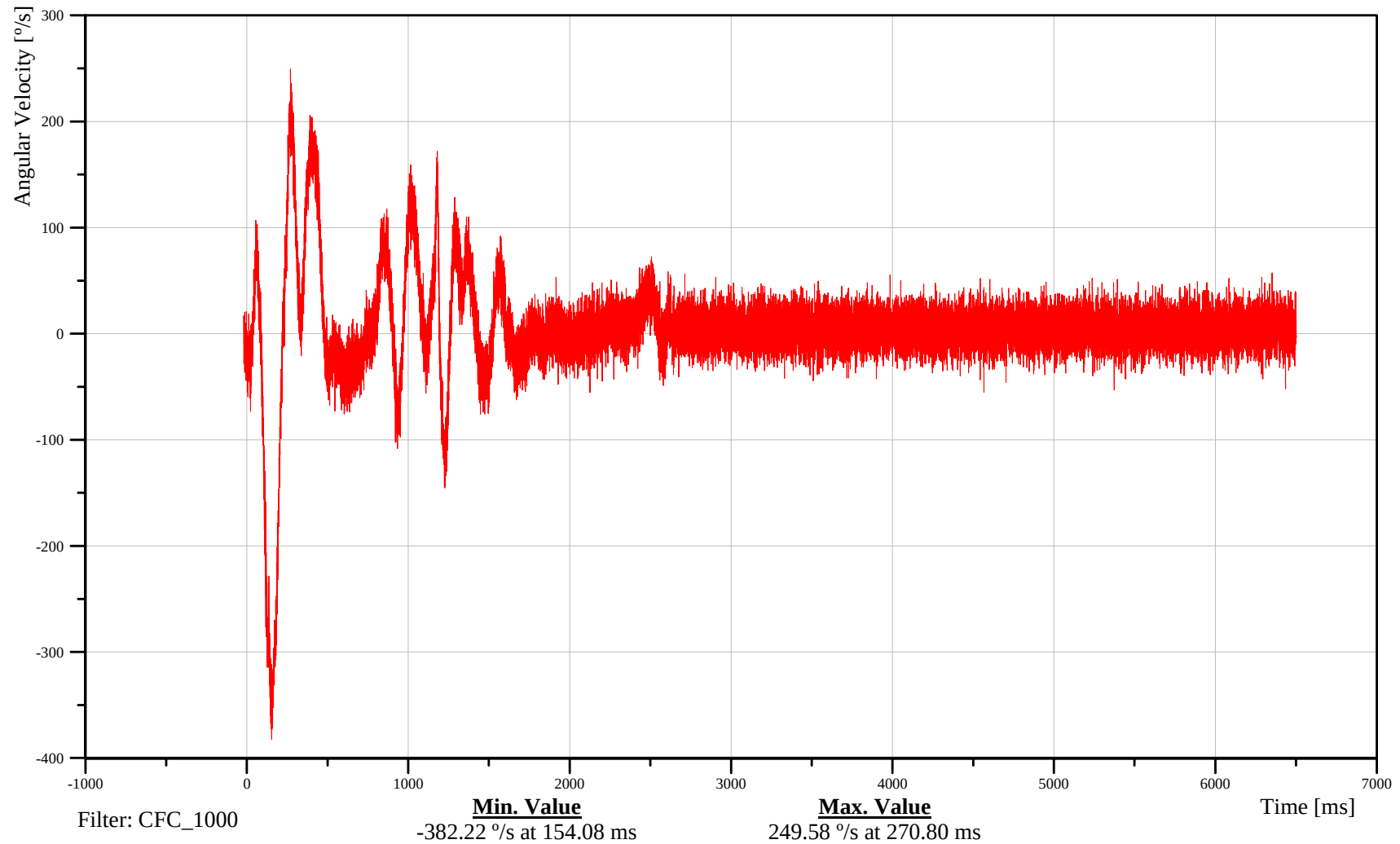
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-8

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck X-Axis Force

Date: 02/03/2010

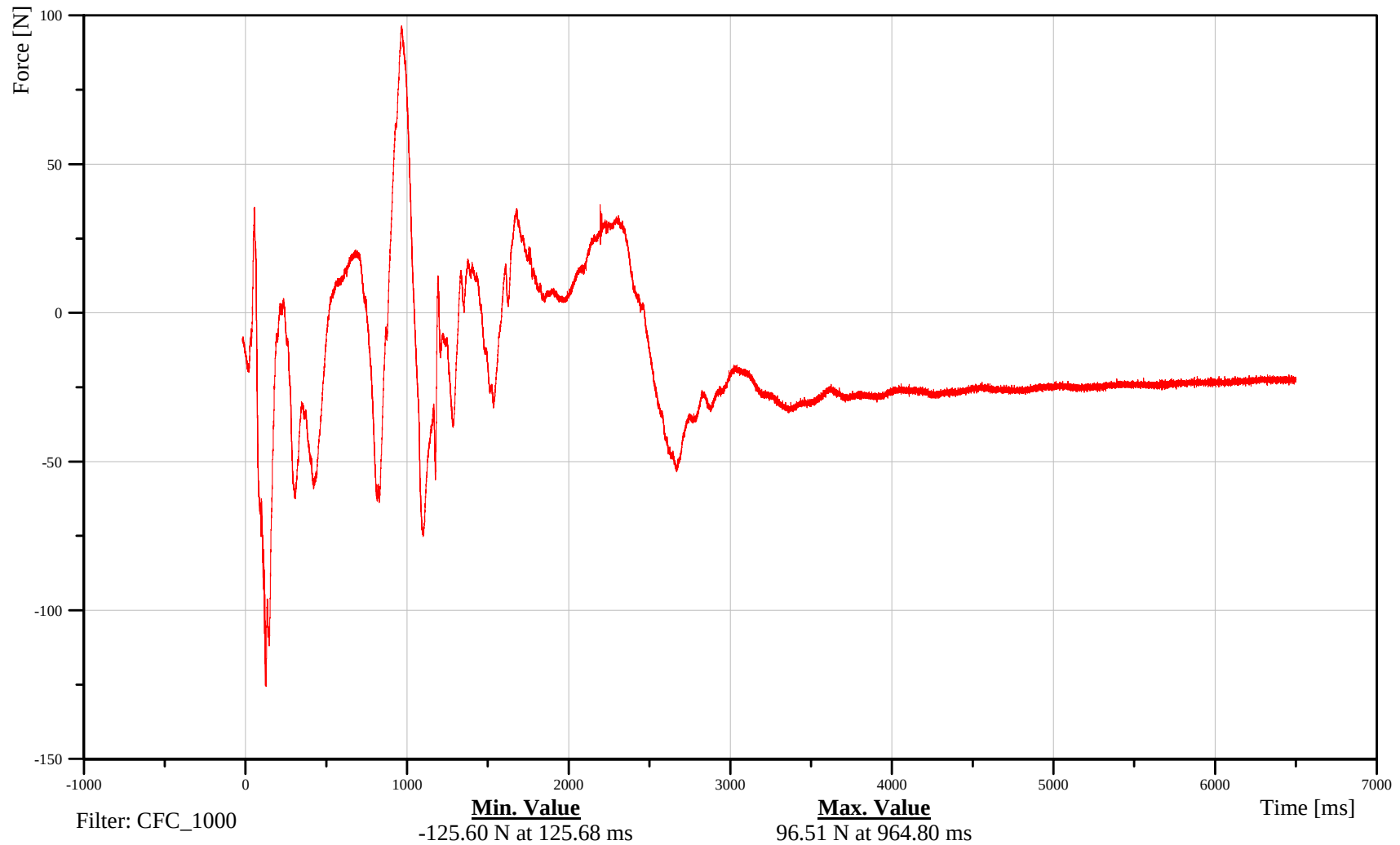
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Customer: VRTC

11NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-9

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Y-Axis Force

Date: 02/03/2010

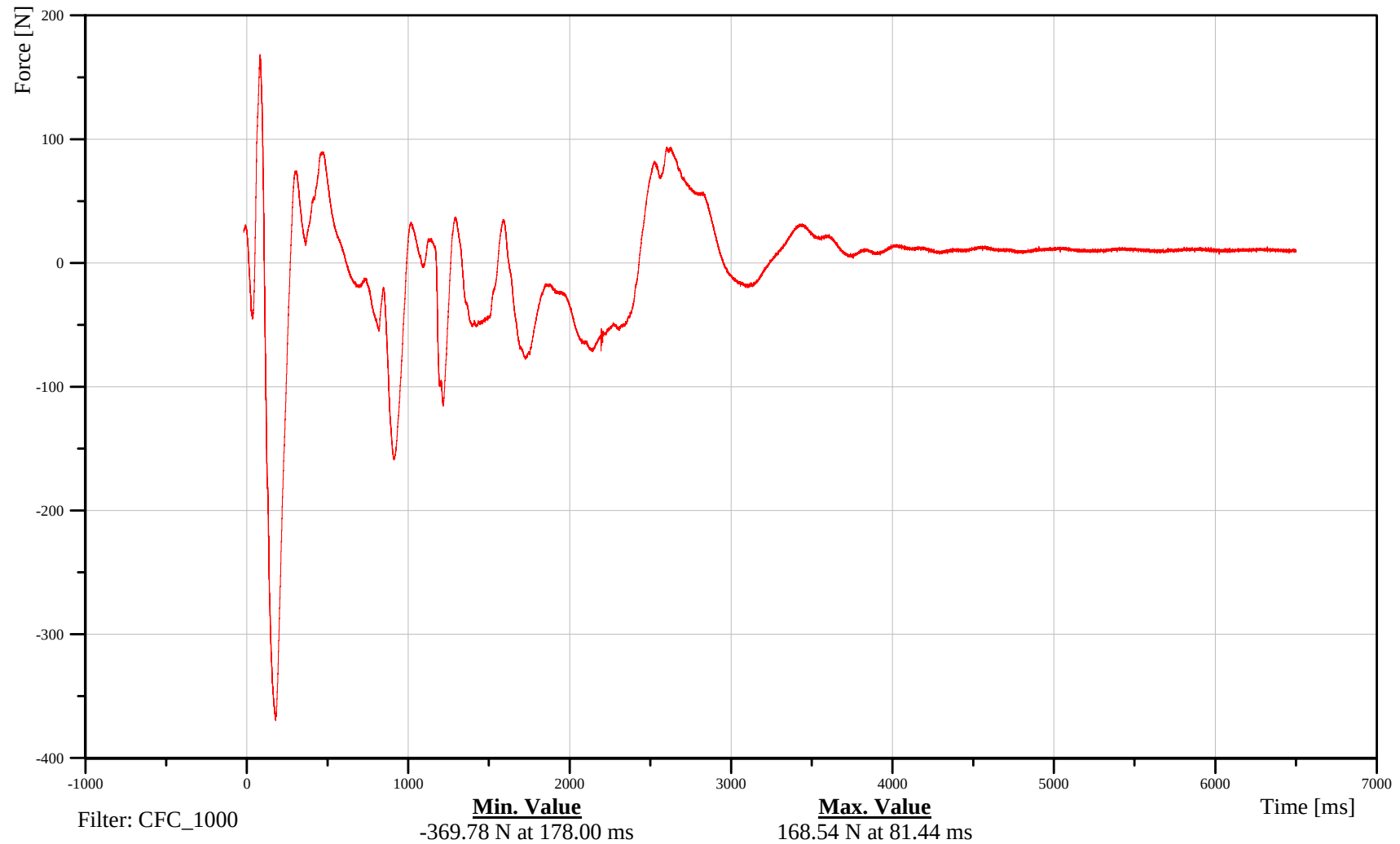
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-10

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Z-Axis Force

Date: 02/03/2010

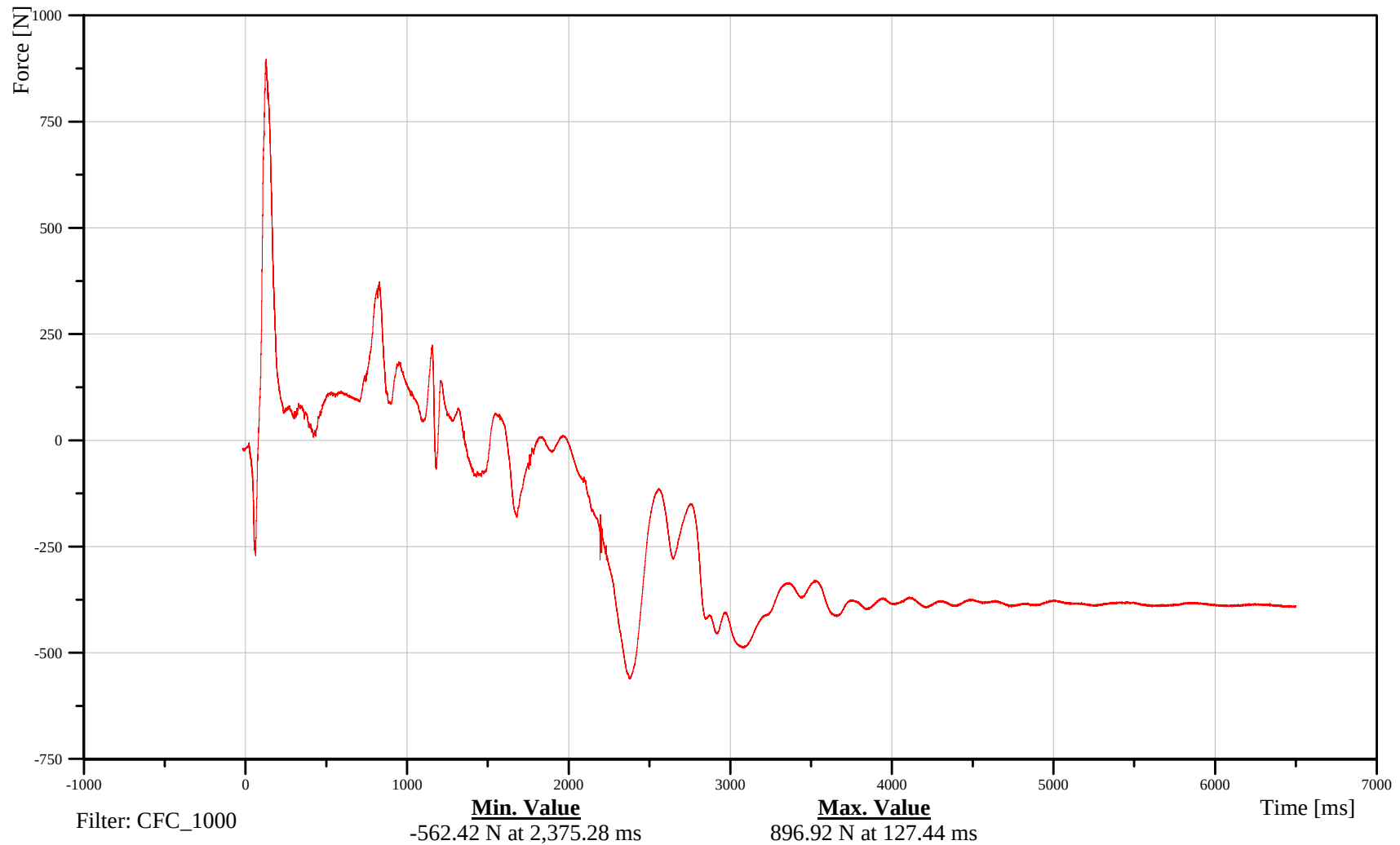
Time: 15:17

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-11

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Moment About X Axis

Date: 02/03/2010

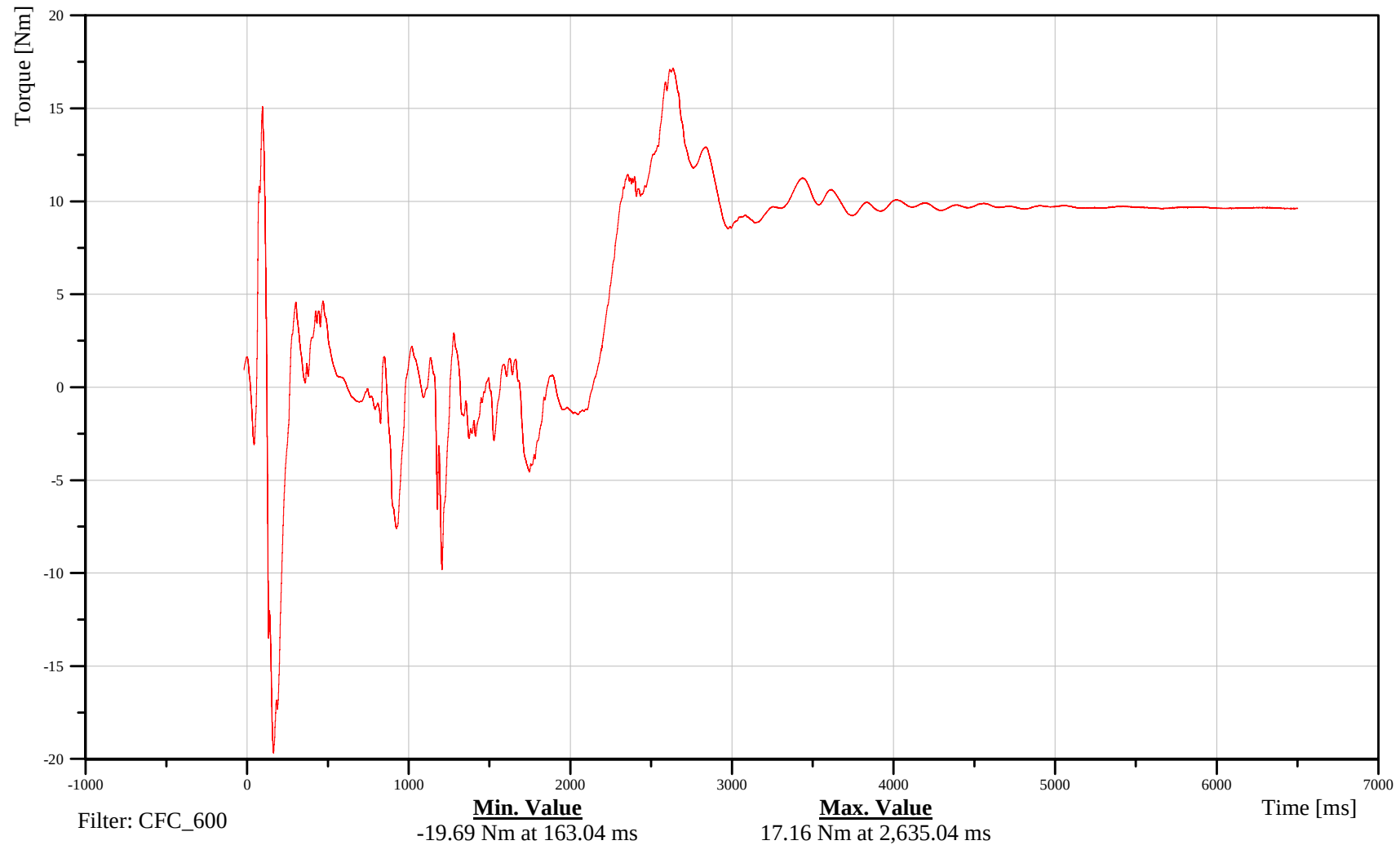
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-12

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Moment About Y Axis

Date: 02/03/2010

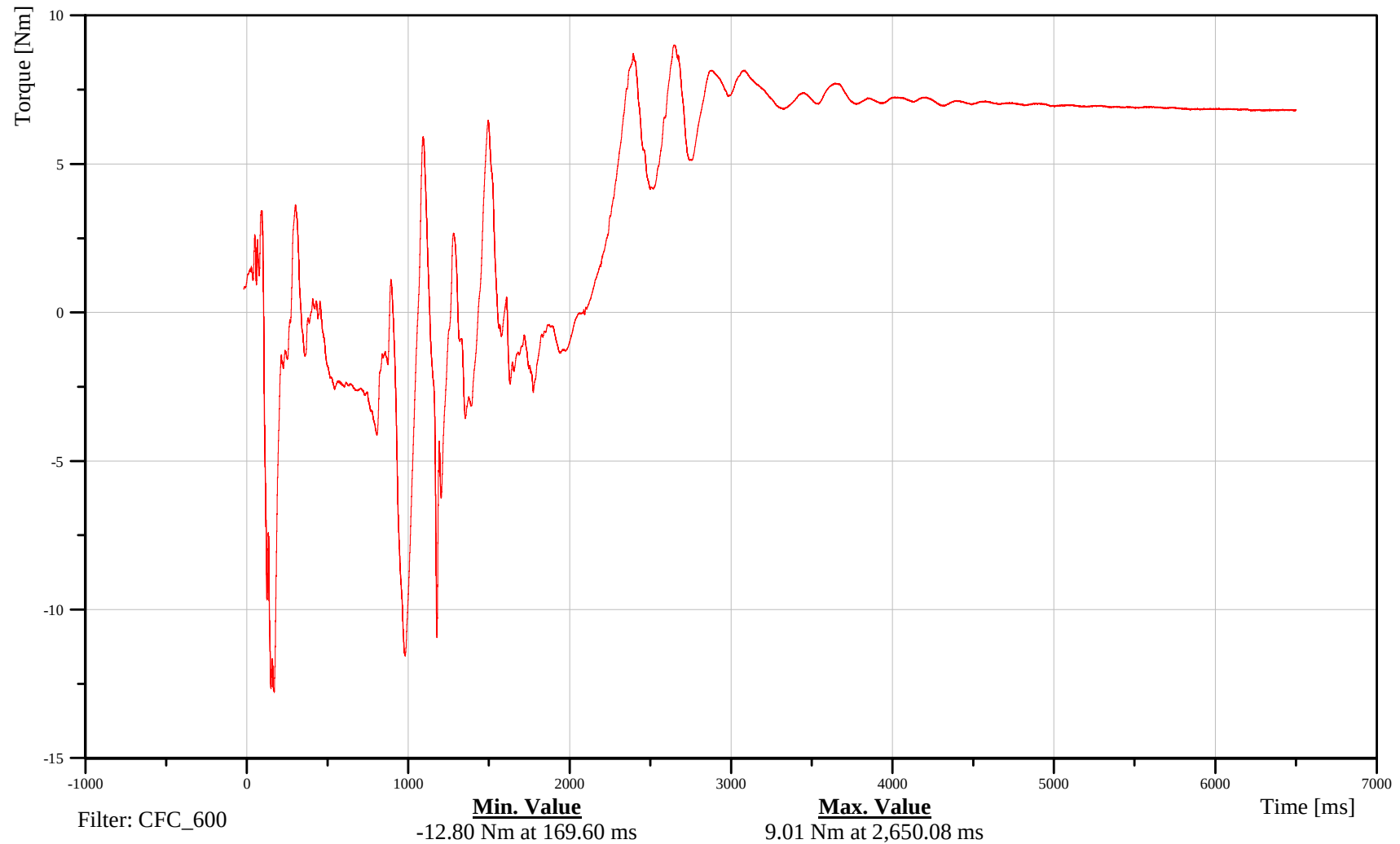
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-13

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Moment About Z Axis

Date: 02/03/2010

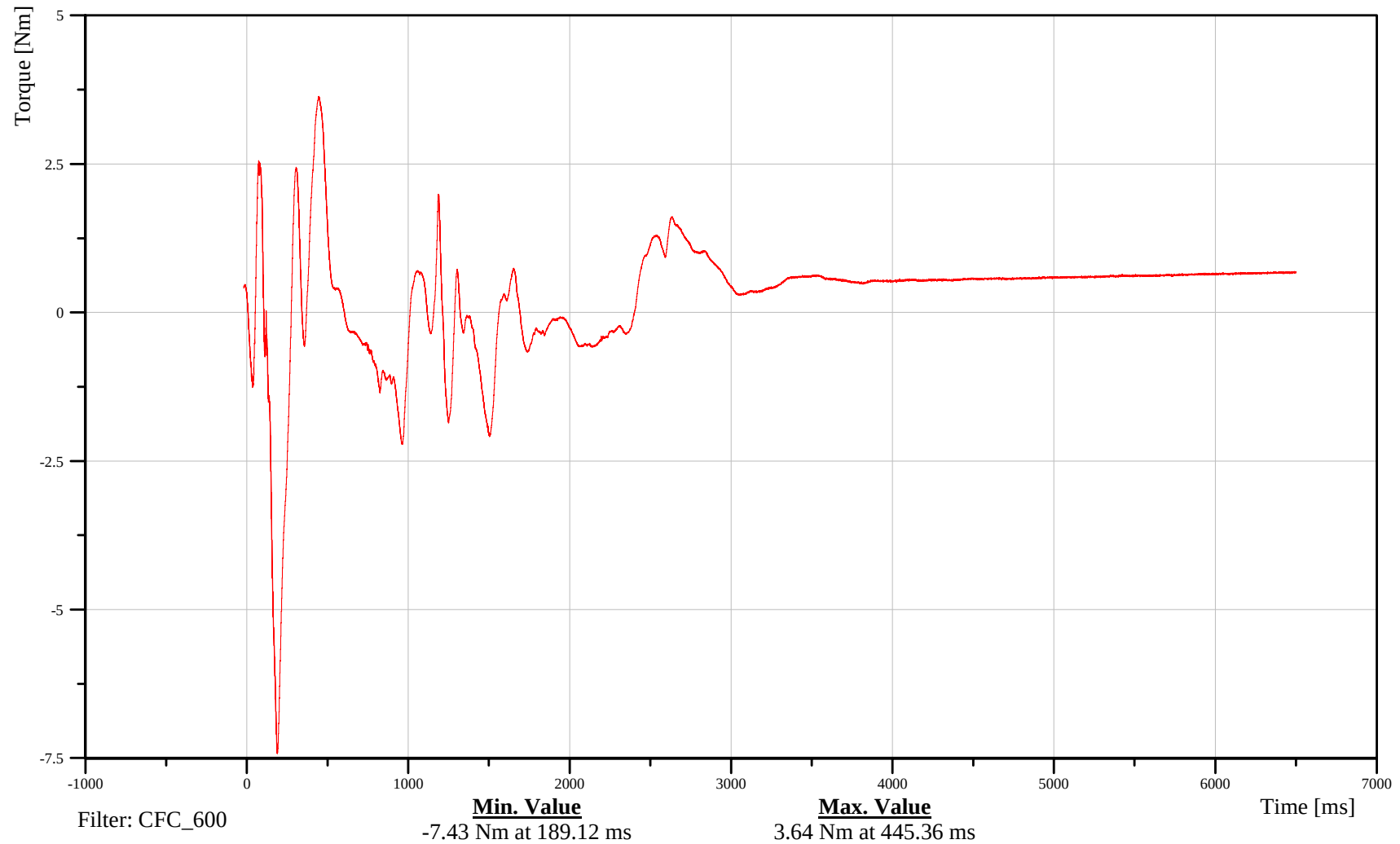
Time: 15:17

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-14

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Chest X-Axis Acceleration

Date: 02/03/2010

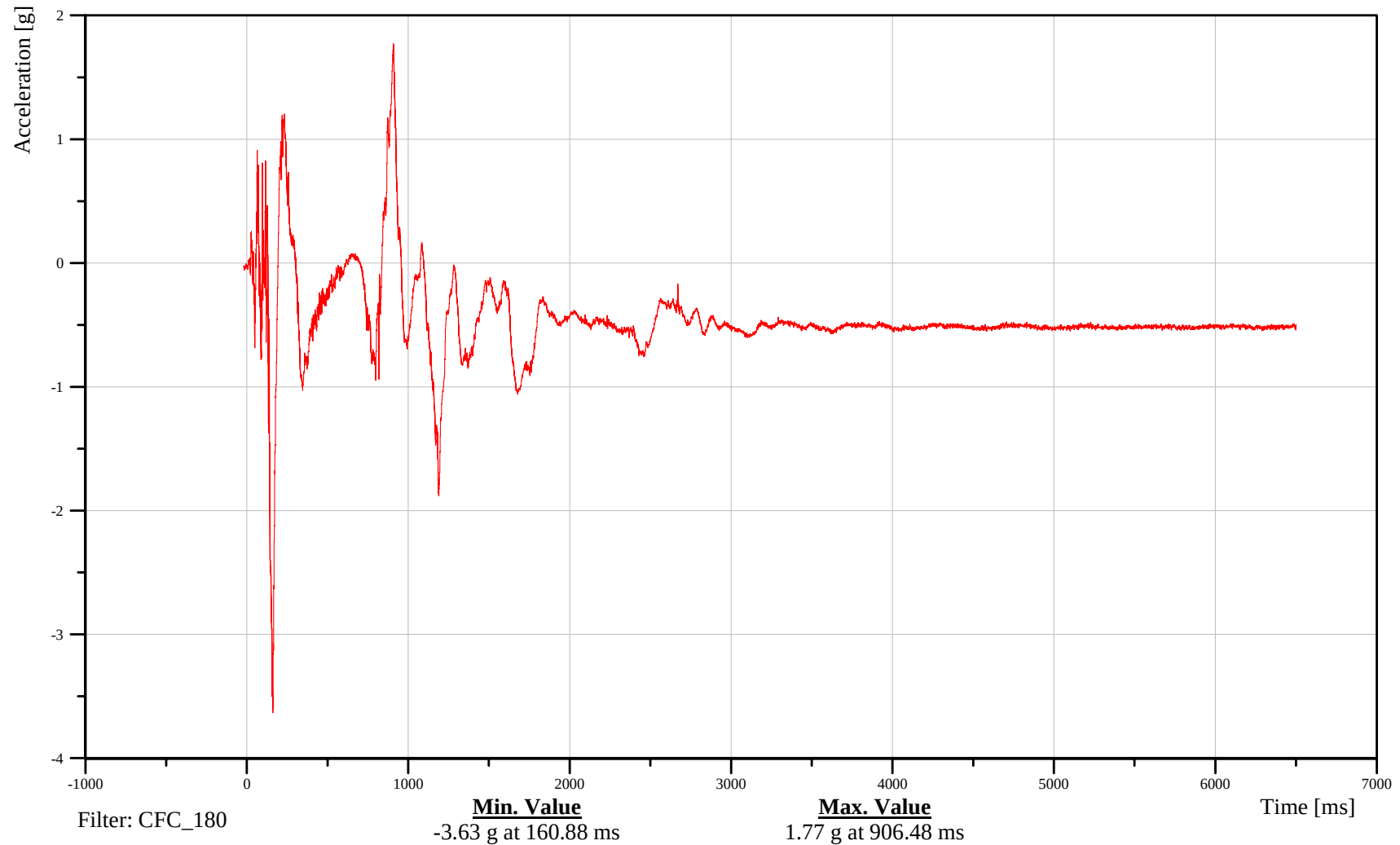
Time: 15:17

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-15

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Chest Y-Axis Acceleration

Date: 02/03/2010

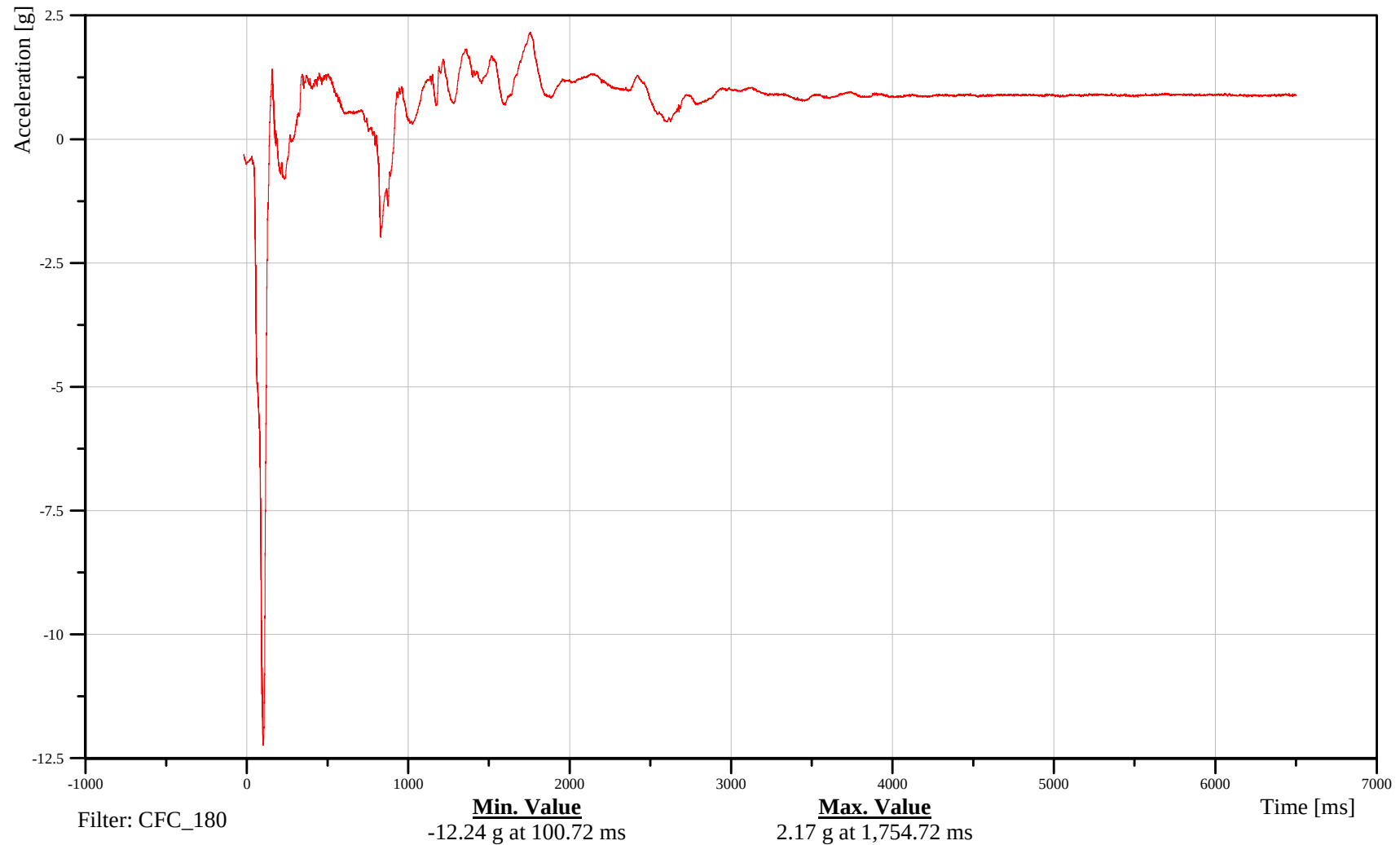
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-16

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Chest Z-Axis Acceleration

Date: 02/03/2010

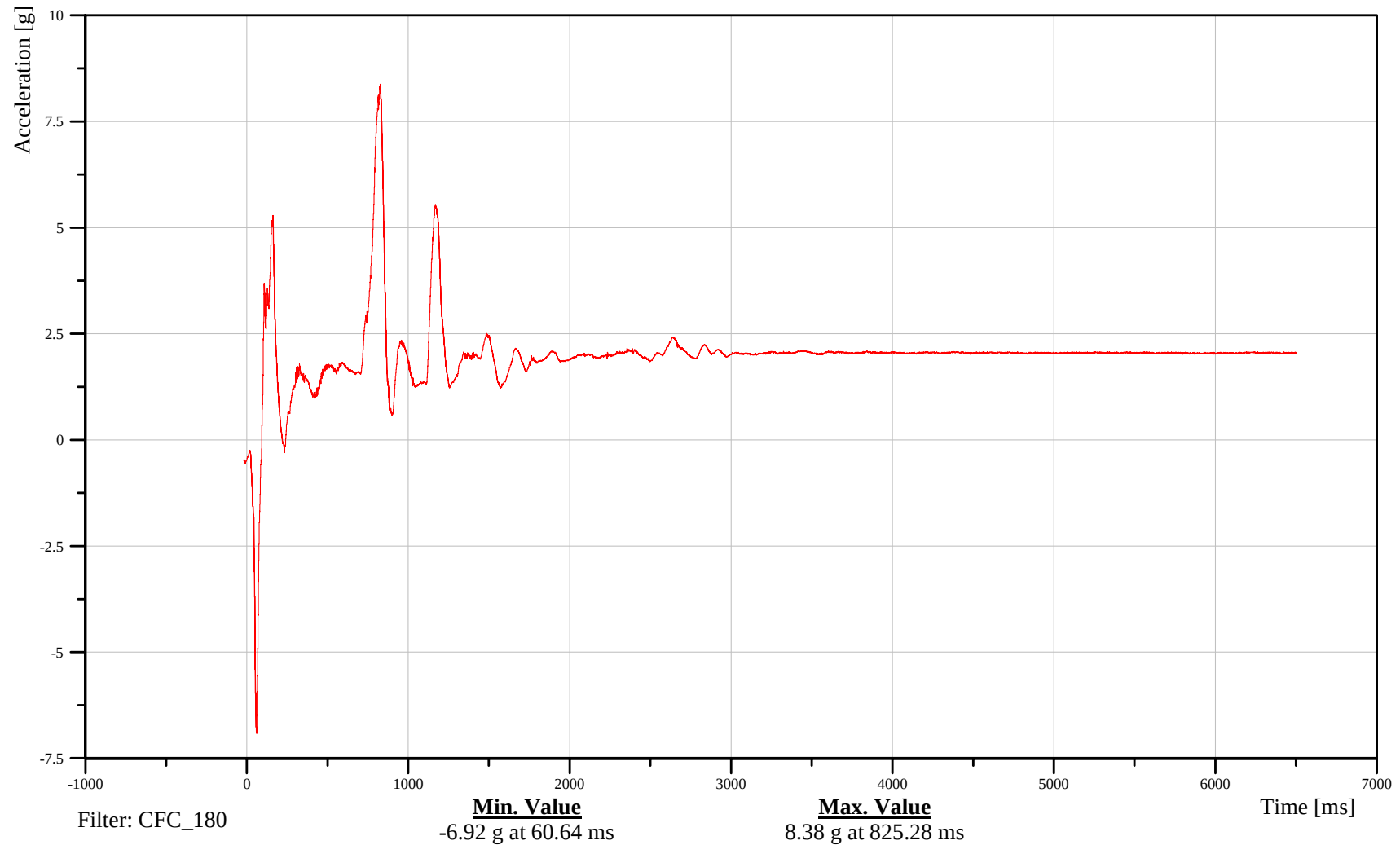
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-17

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Chest Resultant Acceleration

Date: 02/03/2010

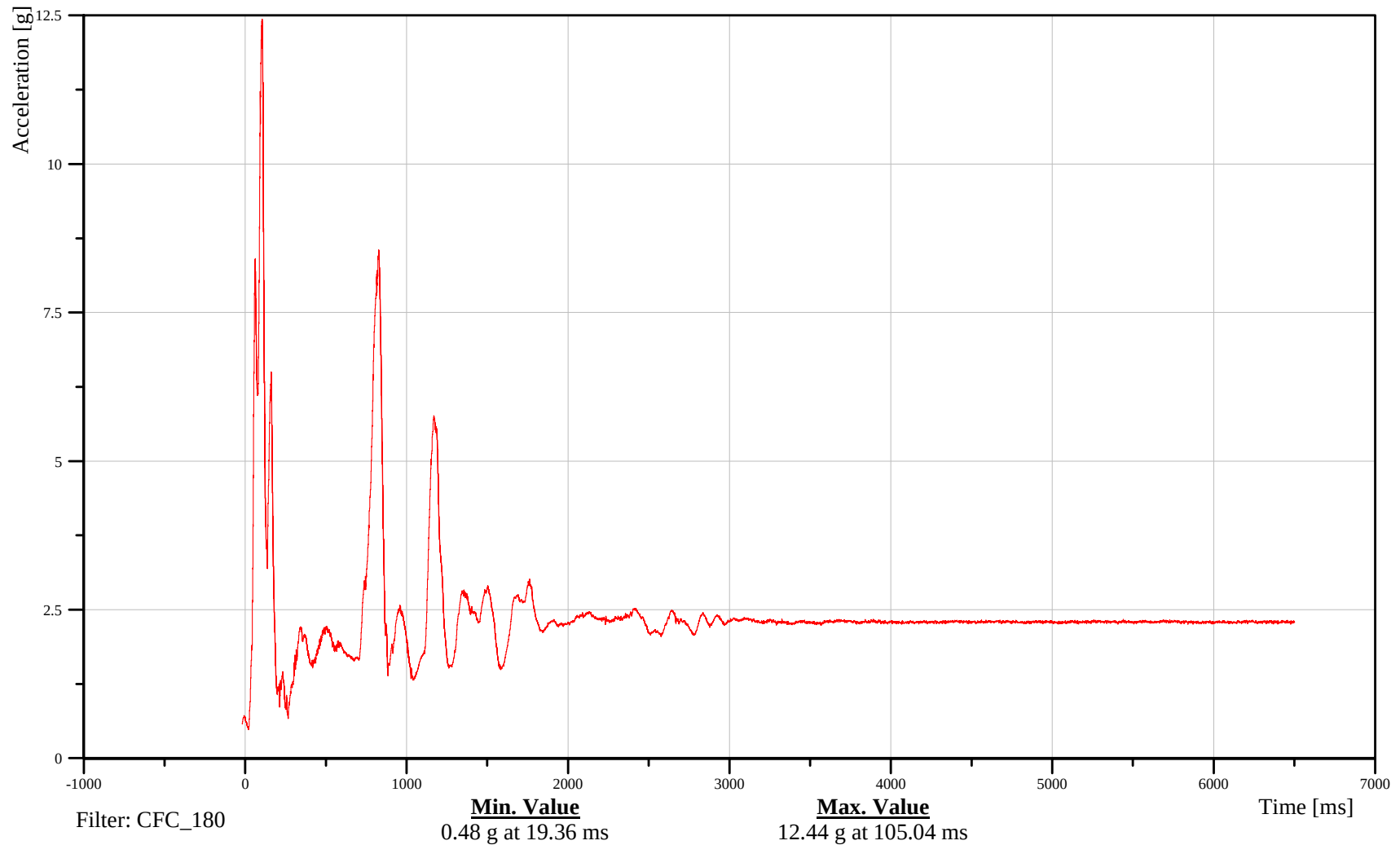
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TRC Inc. Test Lab: CTF

Test Number: 100203



B-18

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Chest X-Axis Displacement

Date: 02/03/2010

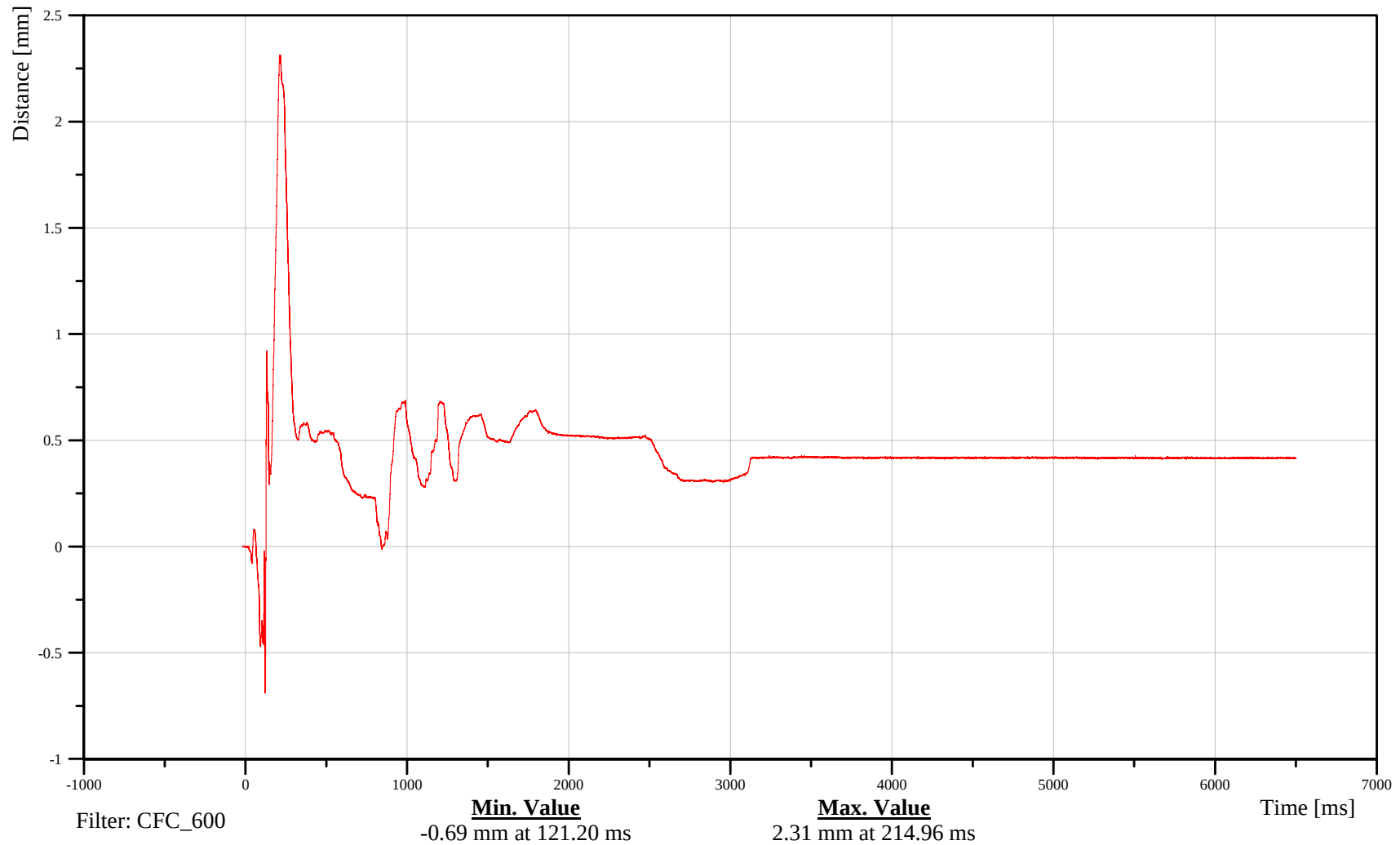
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-19

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck X-Axis Force

Date: 02/03/2010

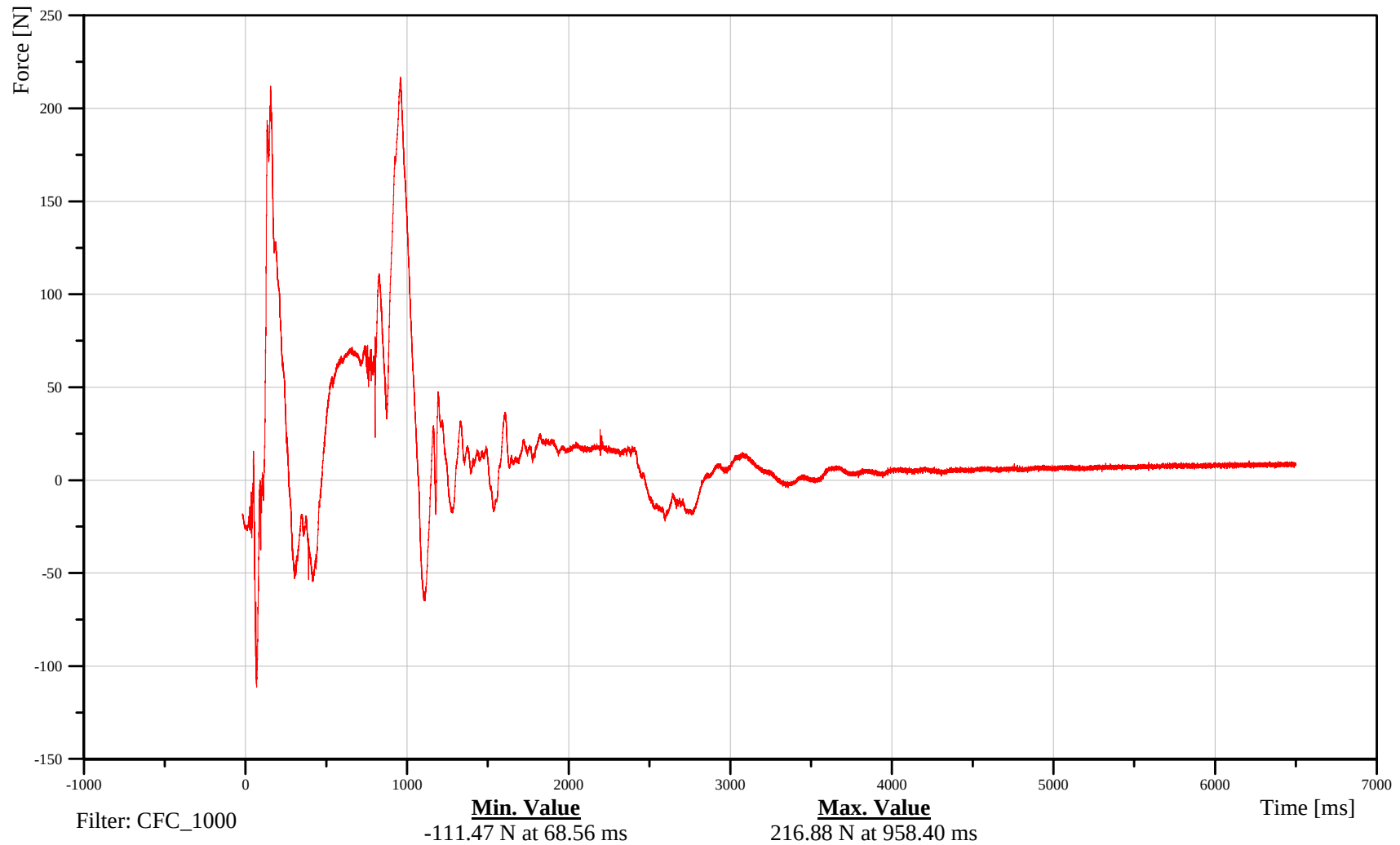
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-20

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Y-Axis Force

Date: 02/03/2010

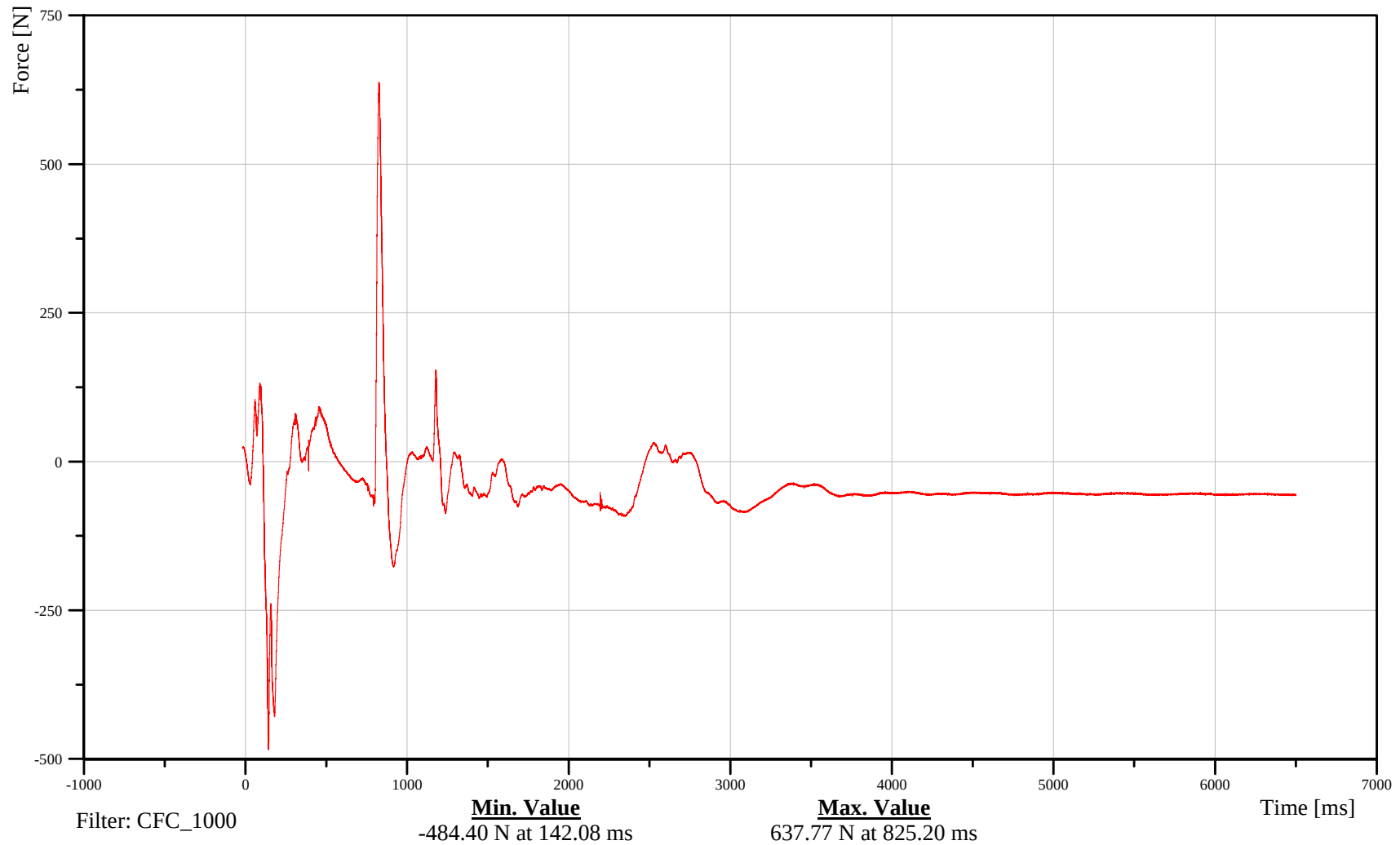
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-21

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Z-Axis Force

Date: 02/03/2010

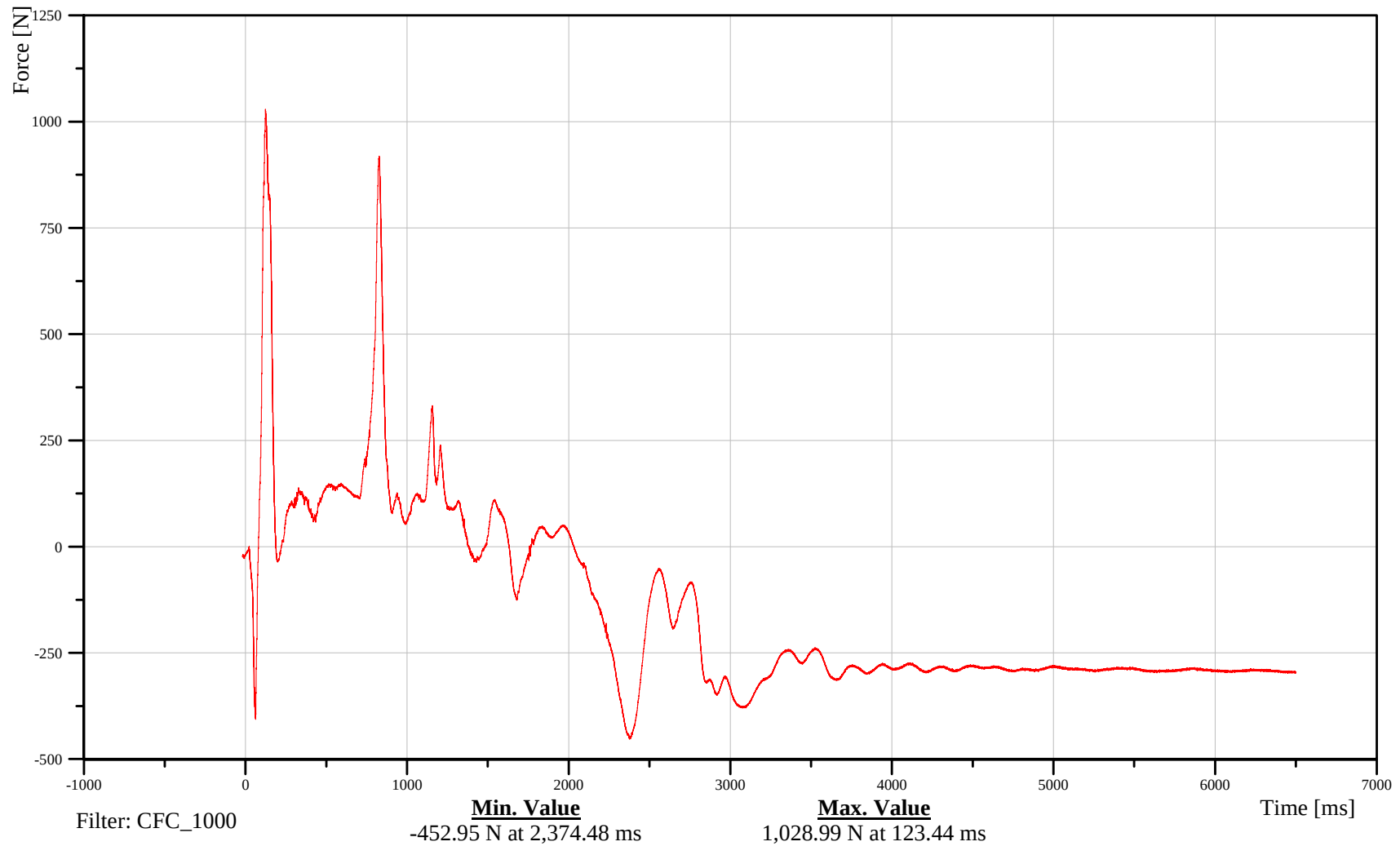
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-22

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Moment About X Axis

Date: 02/03/2010

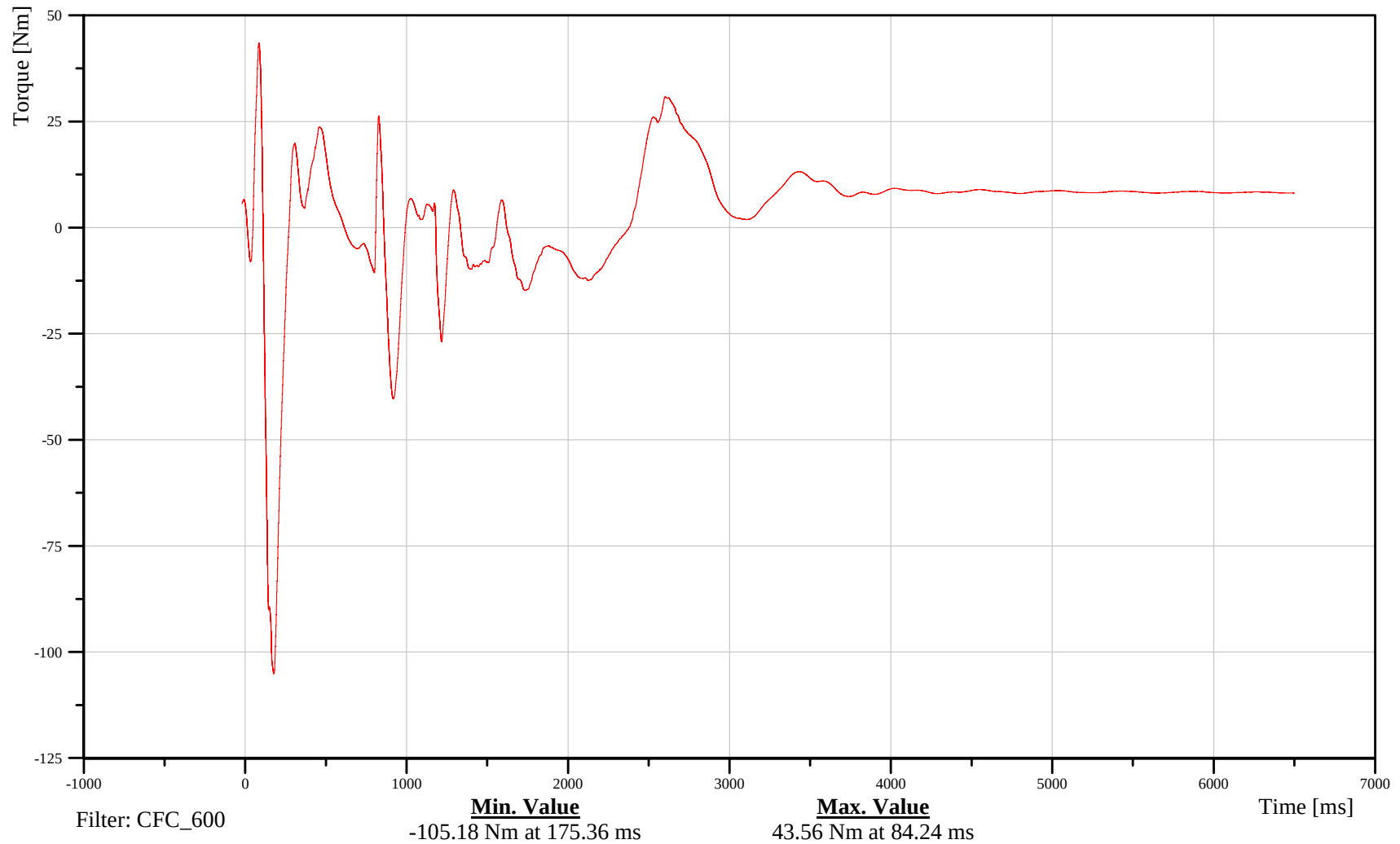
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-23

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Moment About Y Axis

Date: 02/03/2010

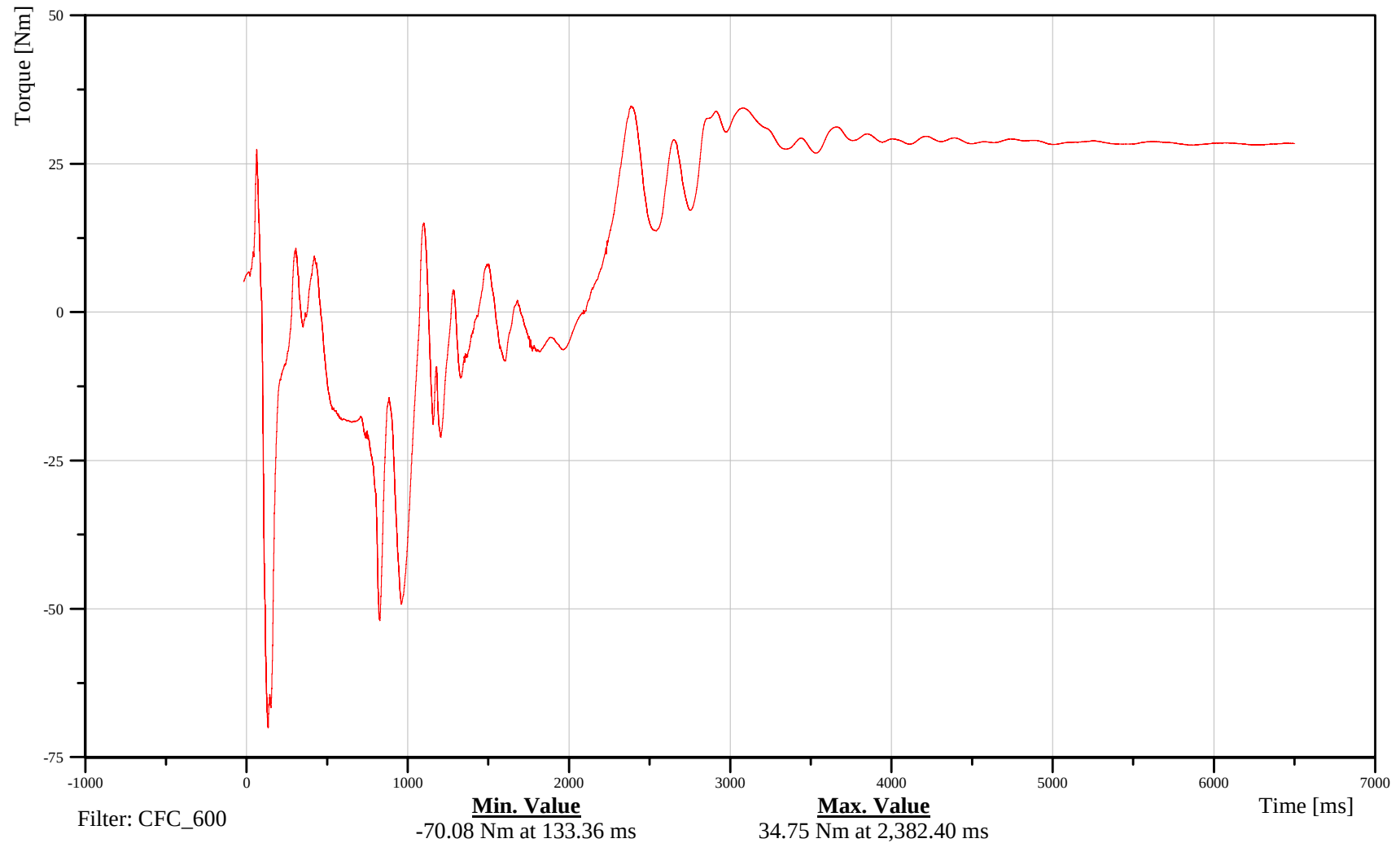
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-24

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Moment About Z Axis

Date: 02/03/2010

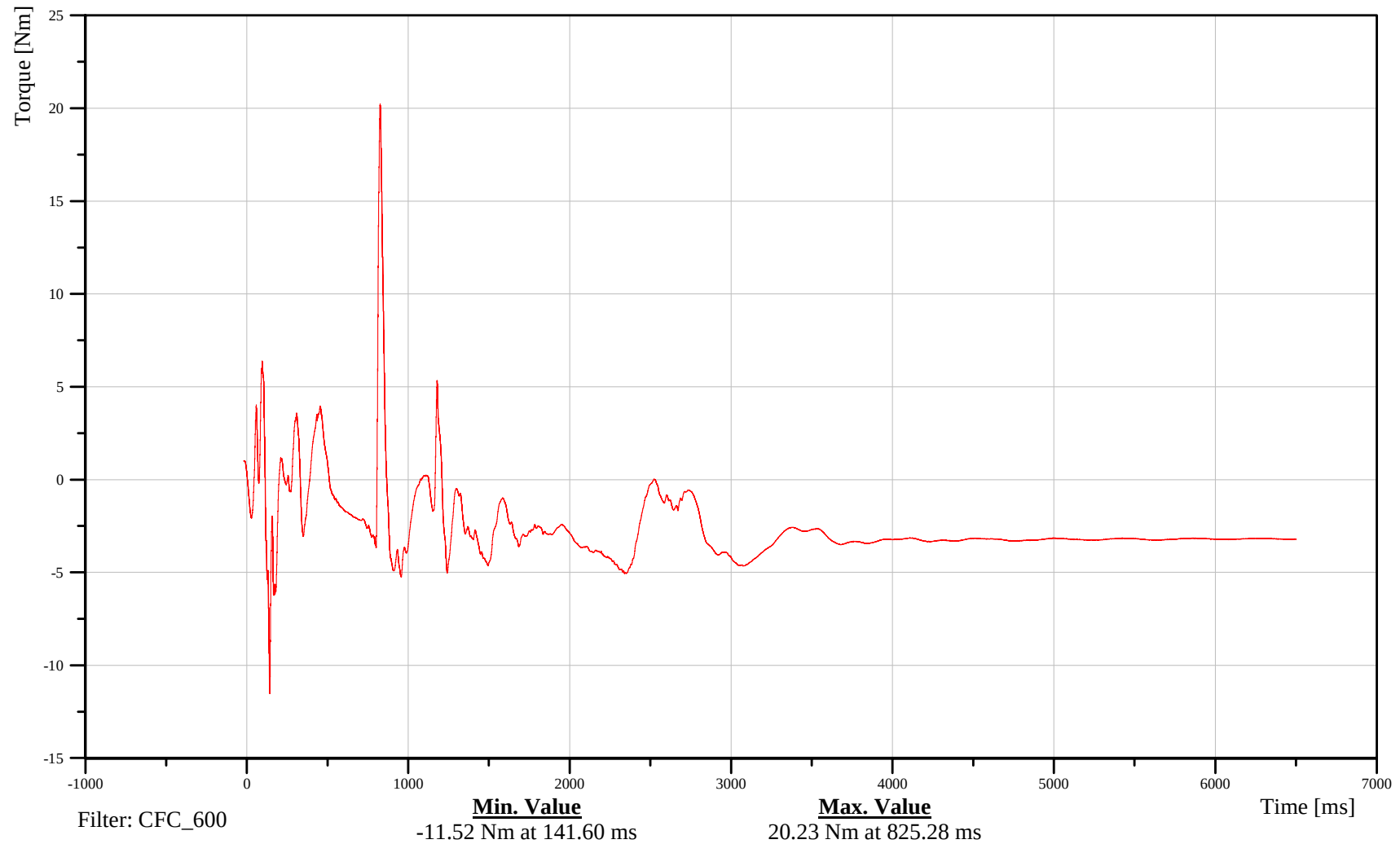
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-25

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis X-Axis Acceleration

Date: 02/03/2010

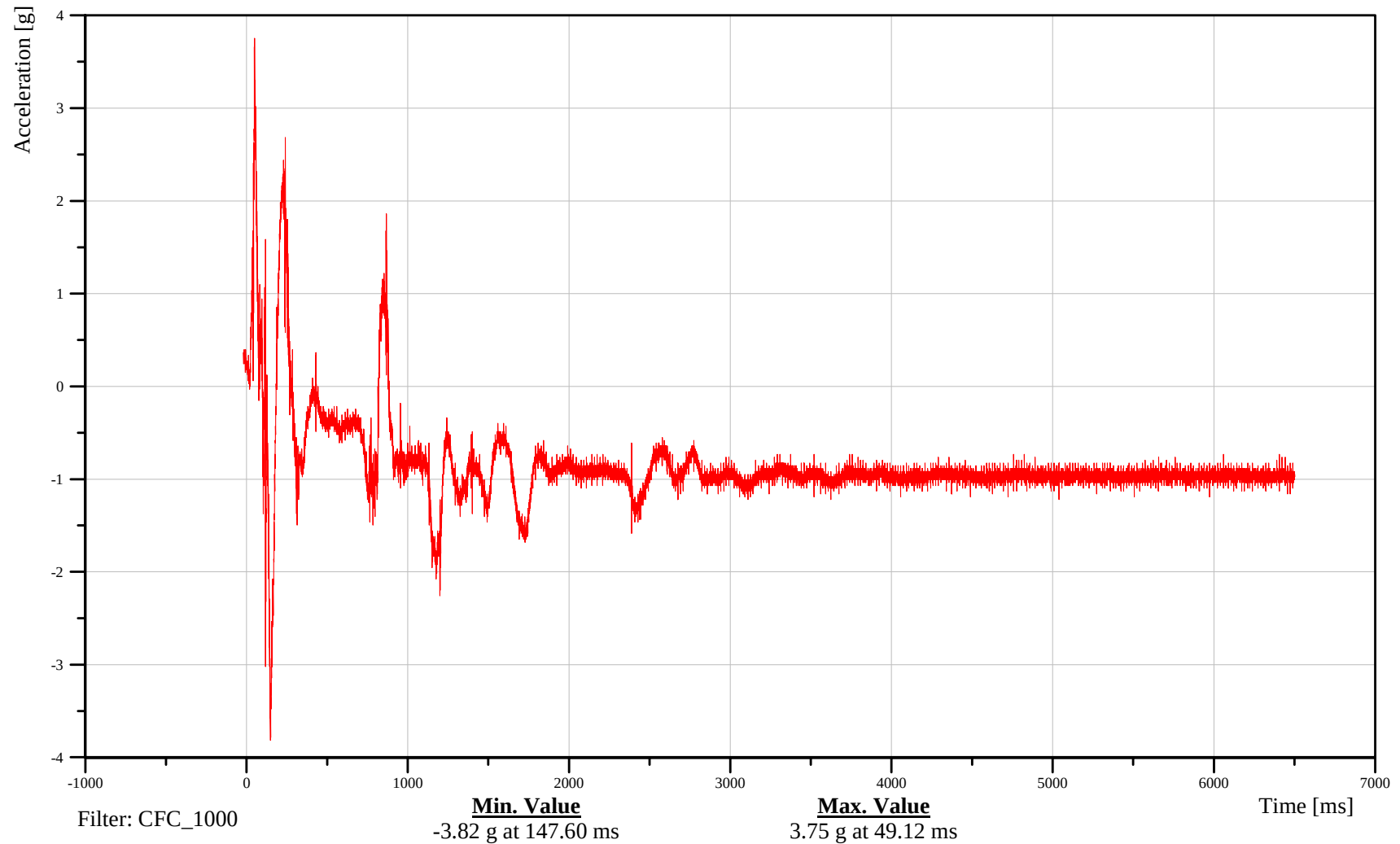
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203





Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Y-Axis Acceleration

Date: 02/03/2010

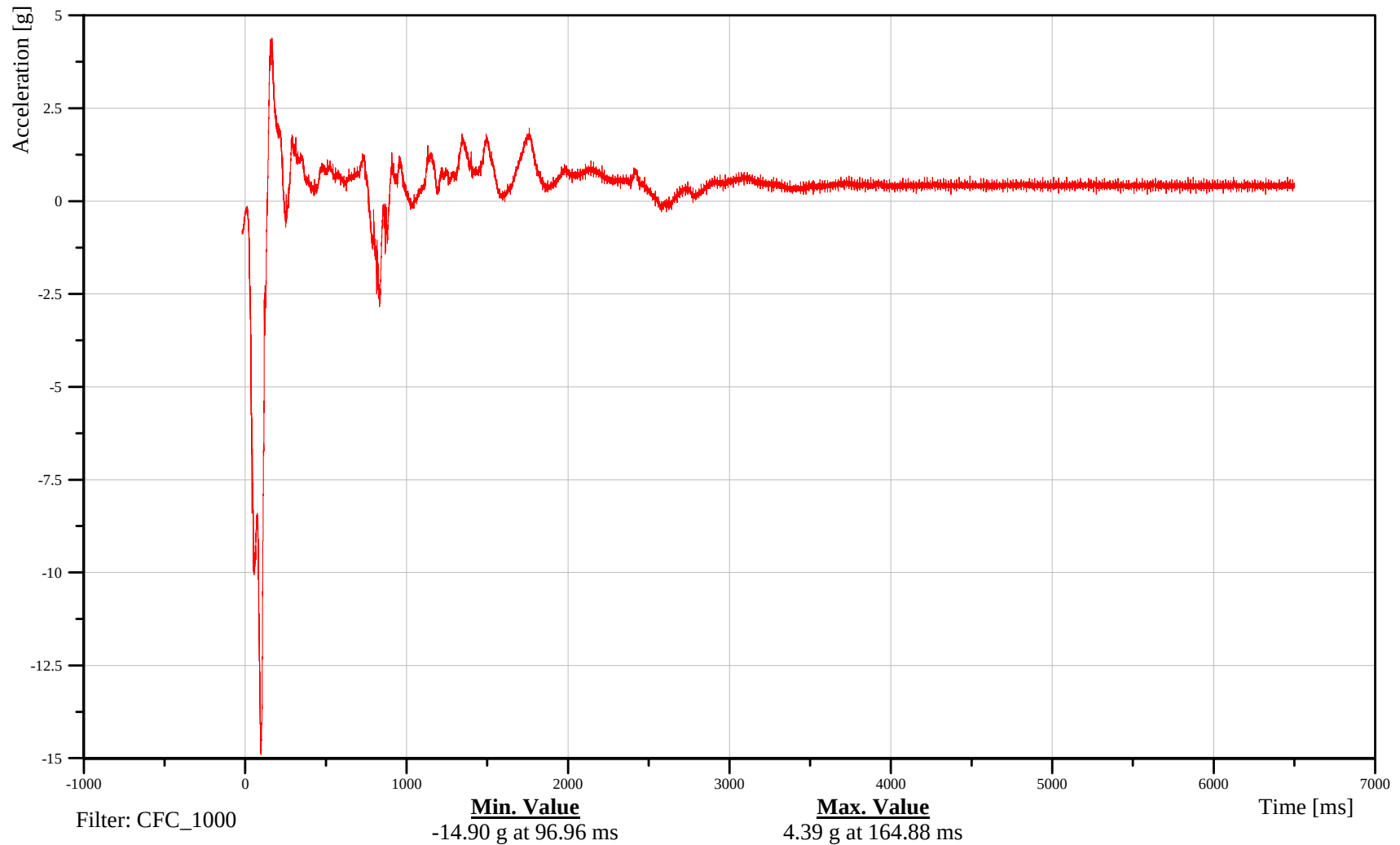
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-27

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Z-Axis Acceleration

Date: 02/03/2010

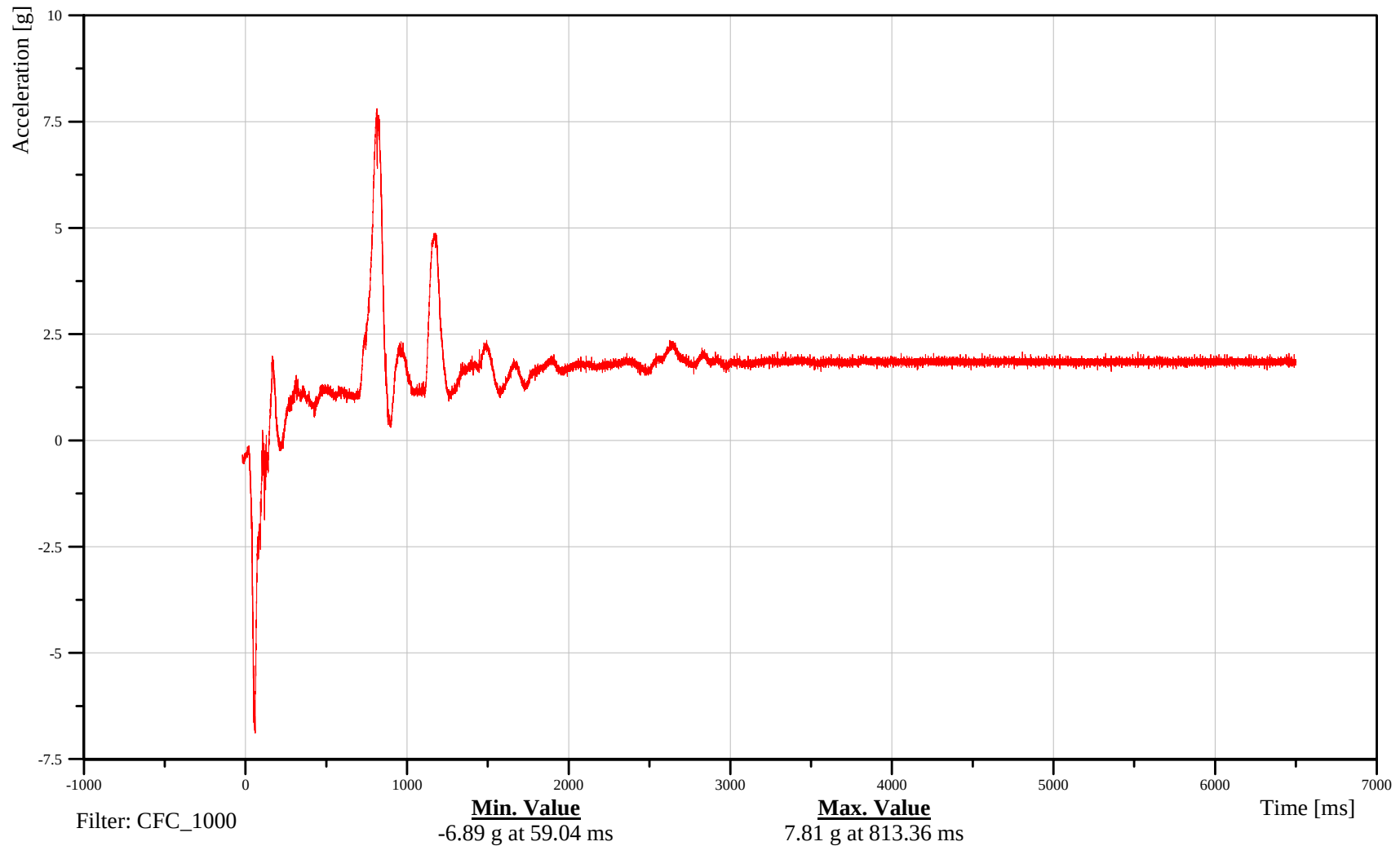
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-28

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Resultant Acceleration

Date: 02/03/2010

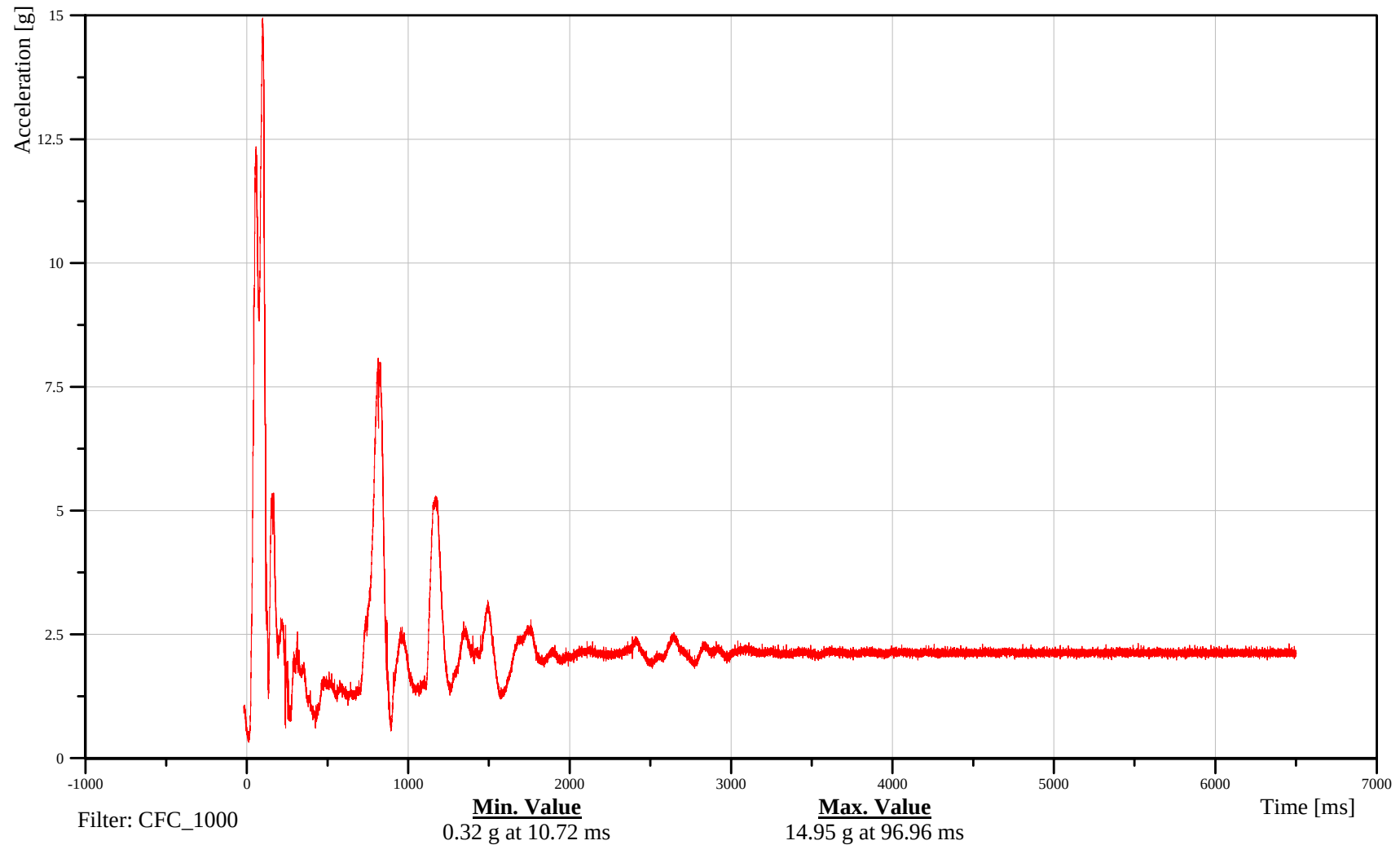
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-29

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head X-Axis Acceleration

Date: 02/03/2010

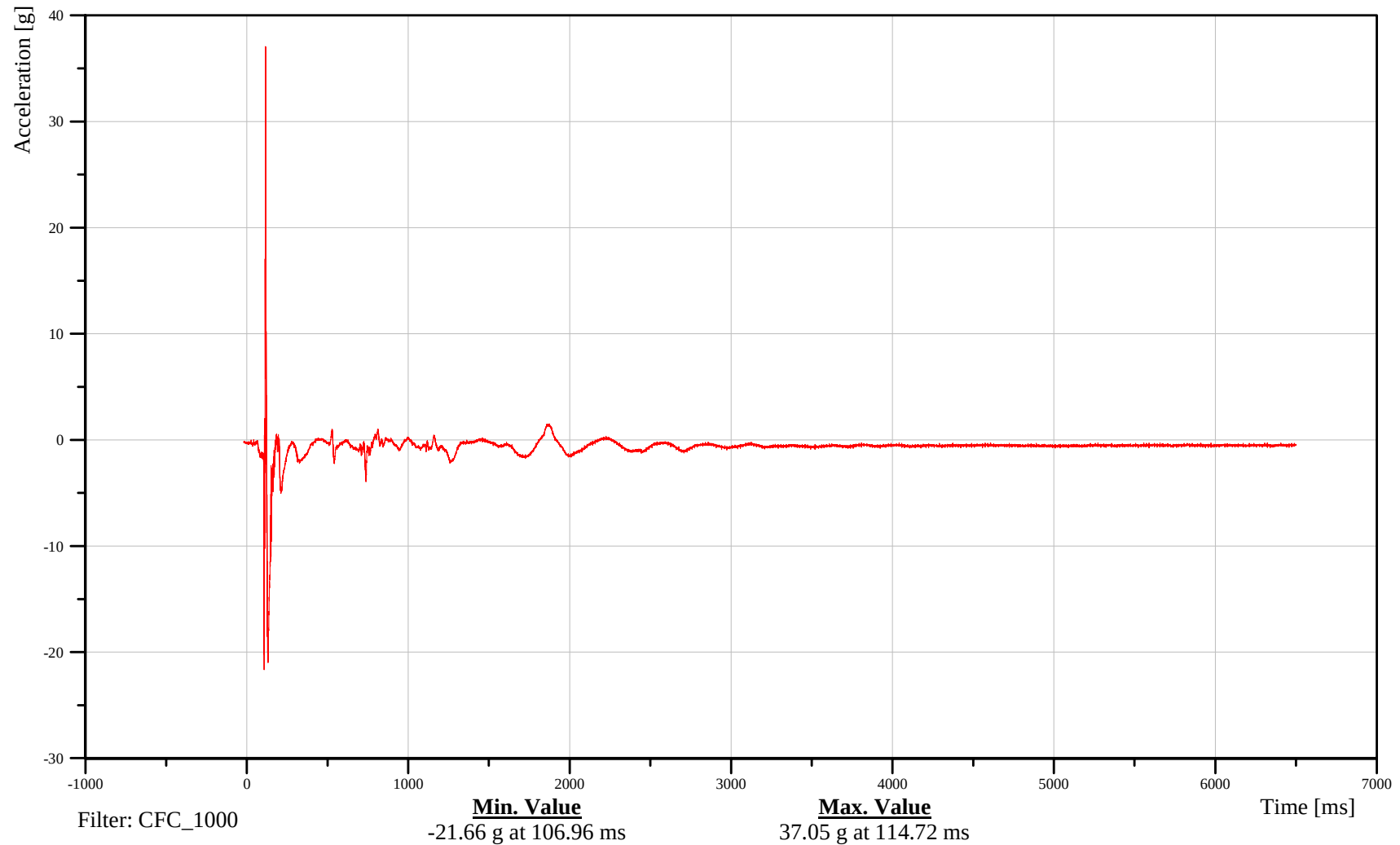
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-30

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head Y-Axis Acceleration

Date: 02/03/2010

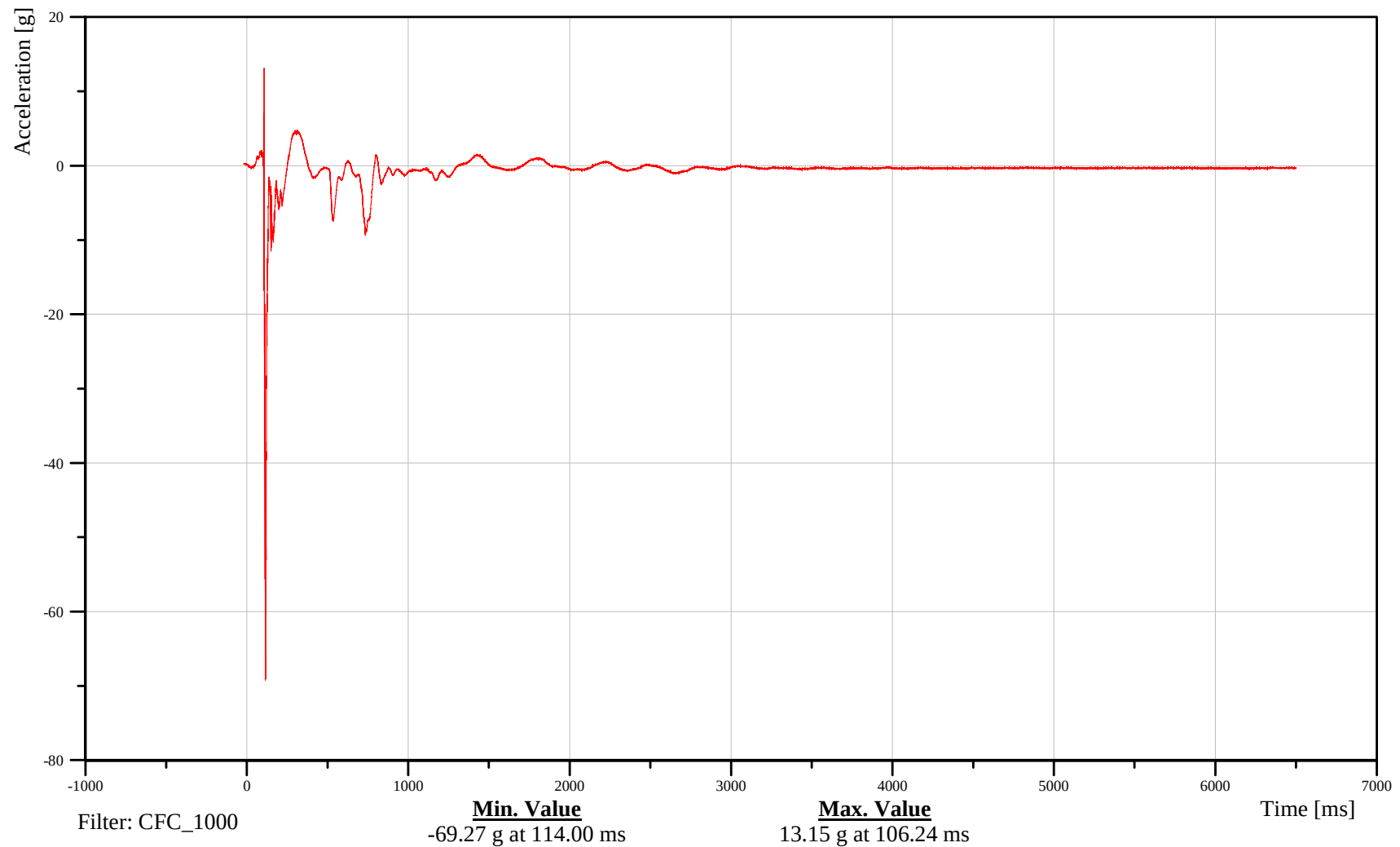
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-31

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head Z-Axis Acceleration

Date: 02/03/2010

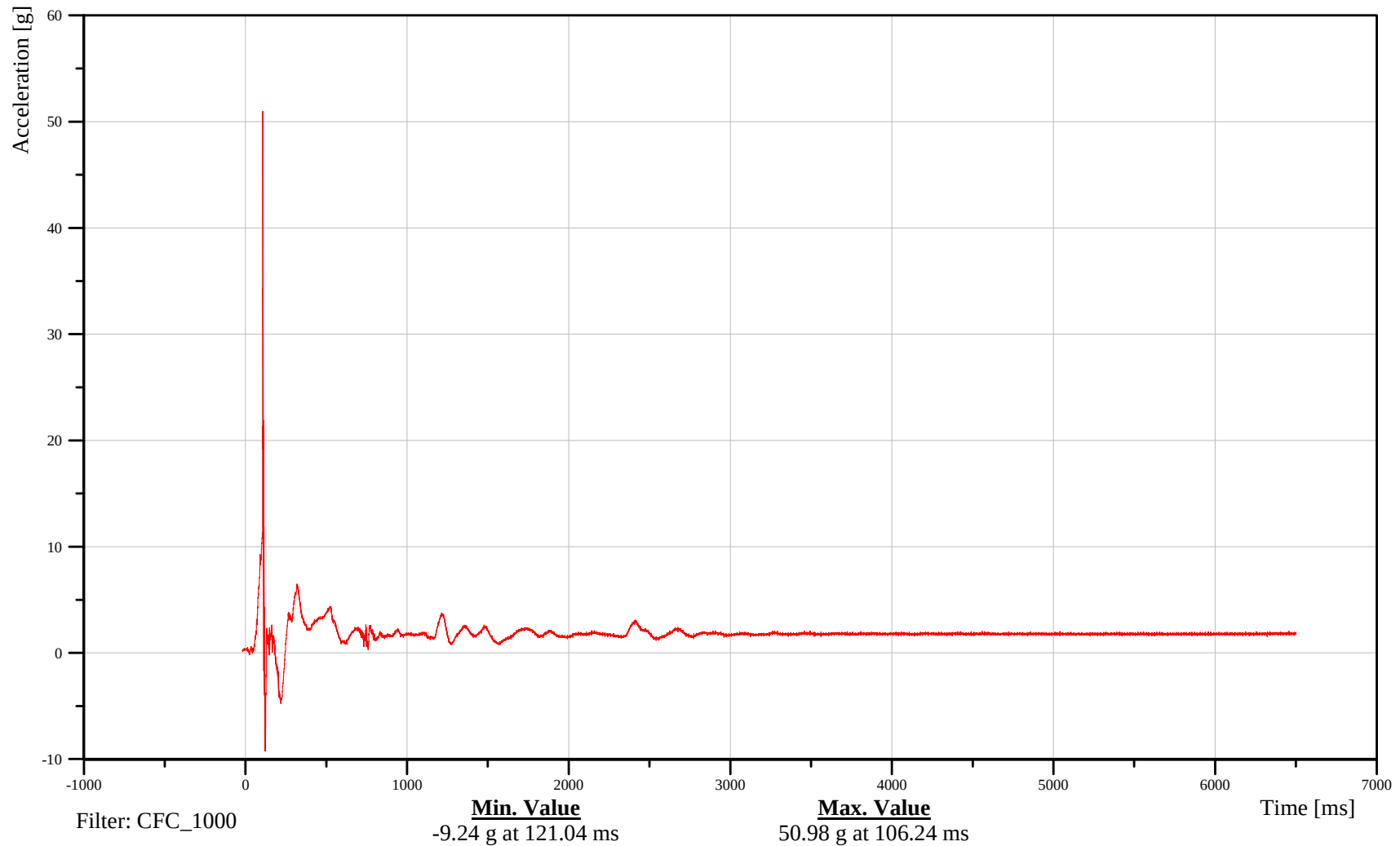
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Customer: VRTC

13HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-32

100203



Curb Trip Rollover 2007 Ford Expedition

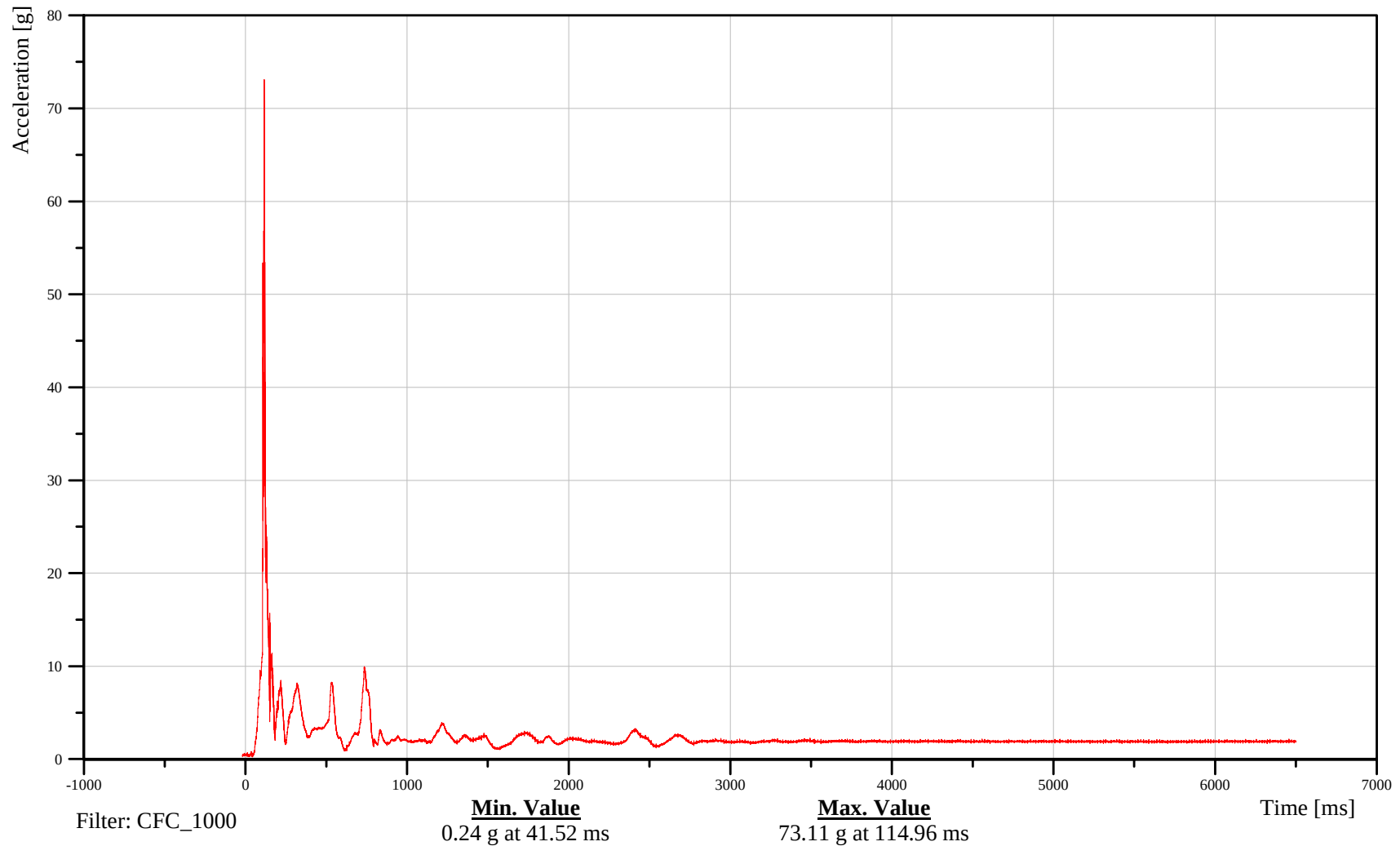
Right Front Passenger Head Resultant Acceleration

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13HEADCG00H3ACRA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-33

100203



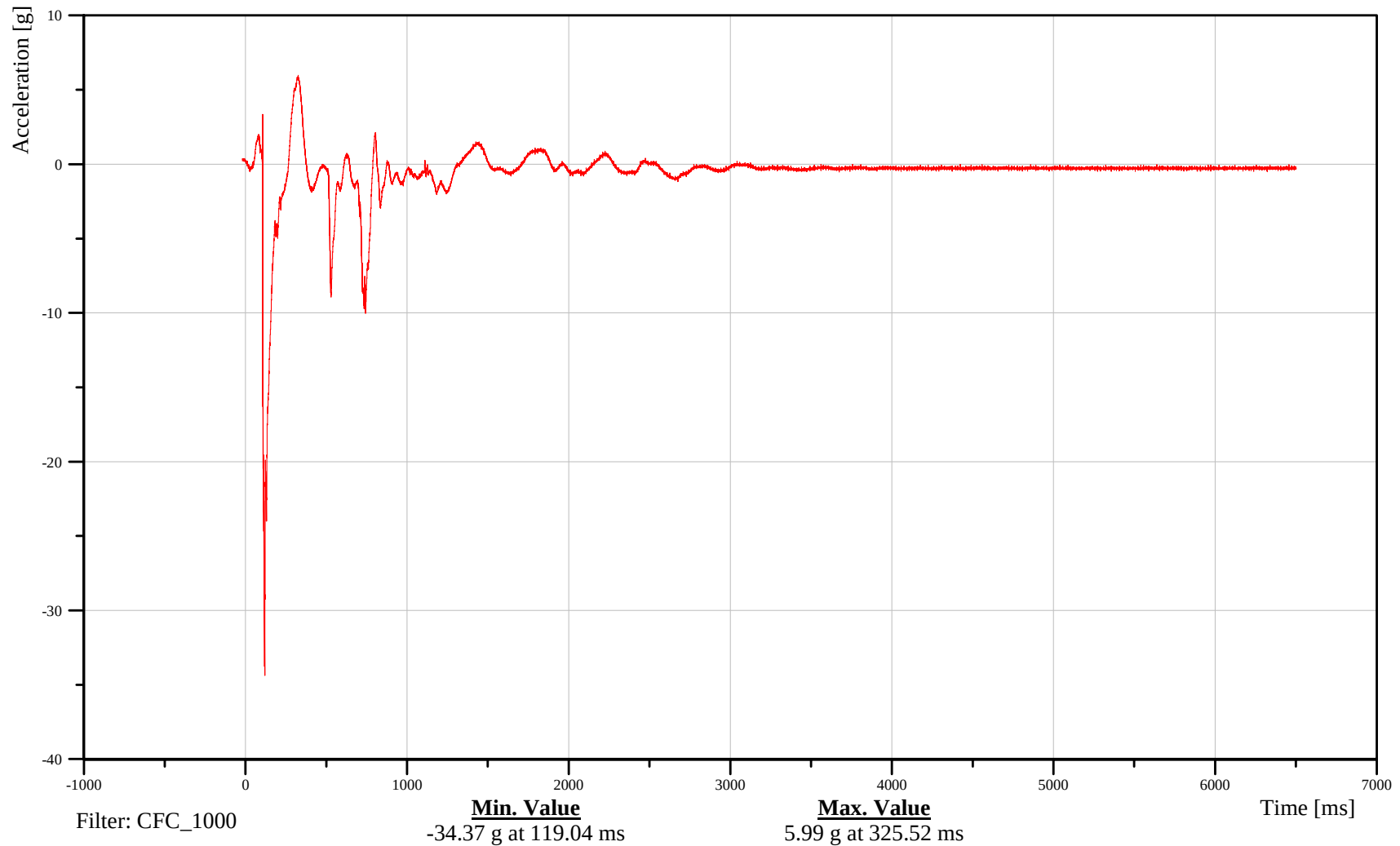
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Front Y-Axis Acceleration

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13HEADFR00H3ACYA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-34

100203



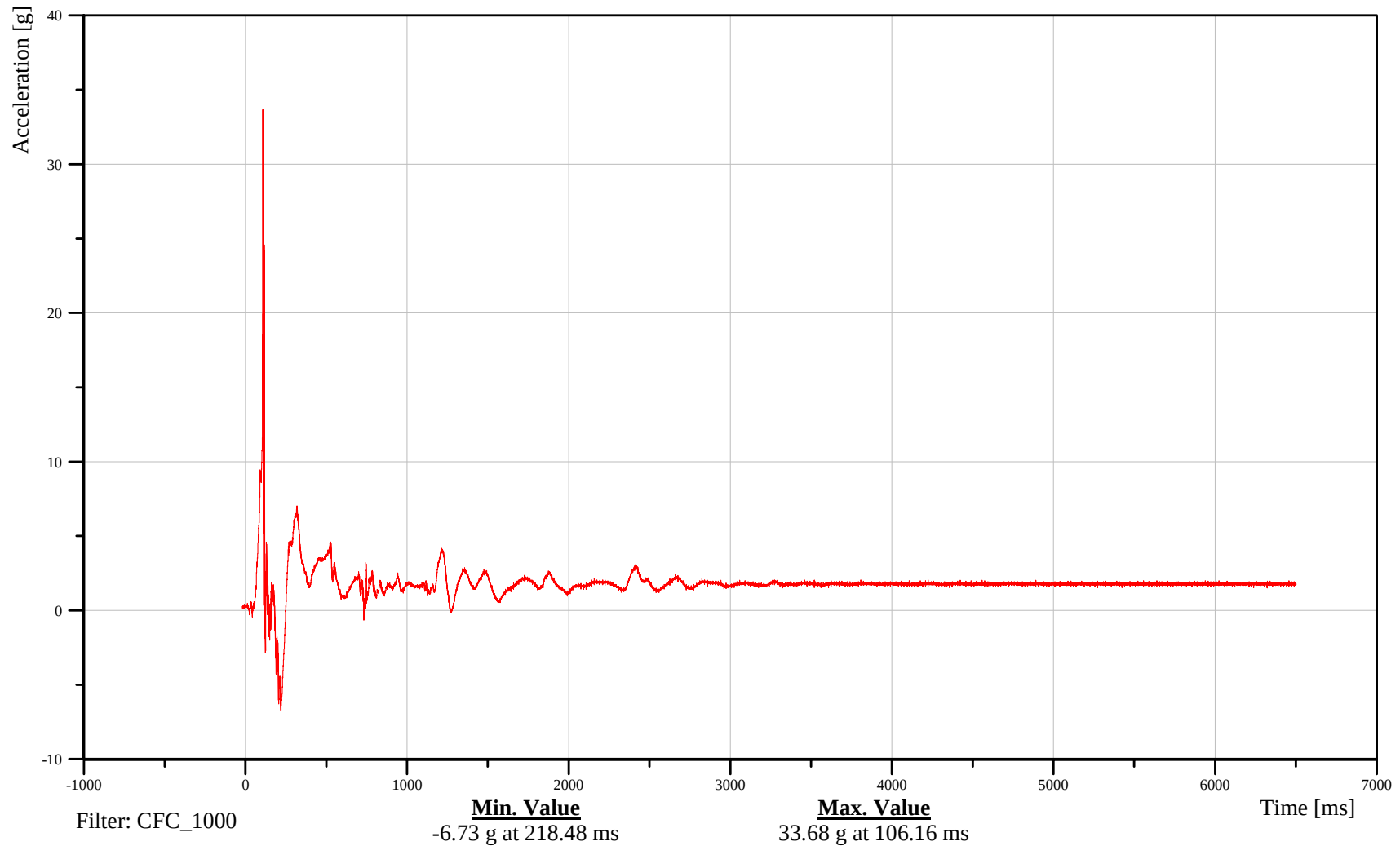
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Front Z-Axis Acceleration

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13HEADFR00H3ACZA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-35

100203



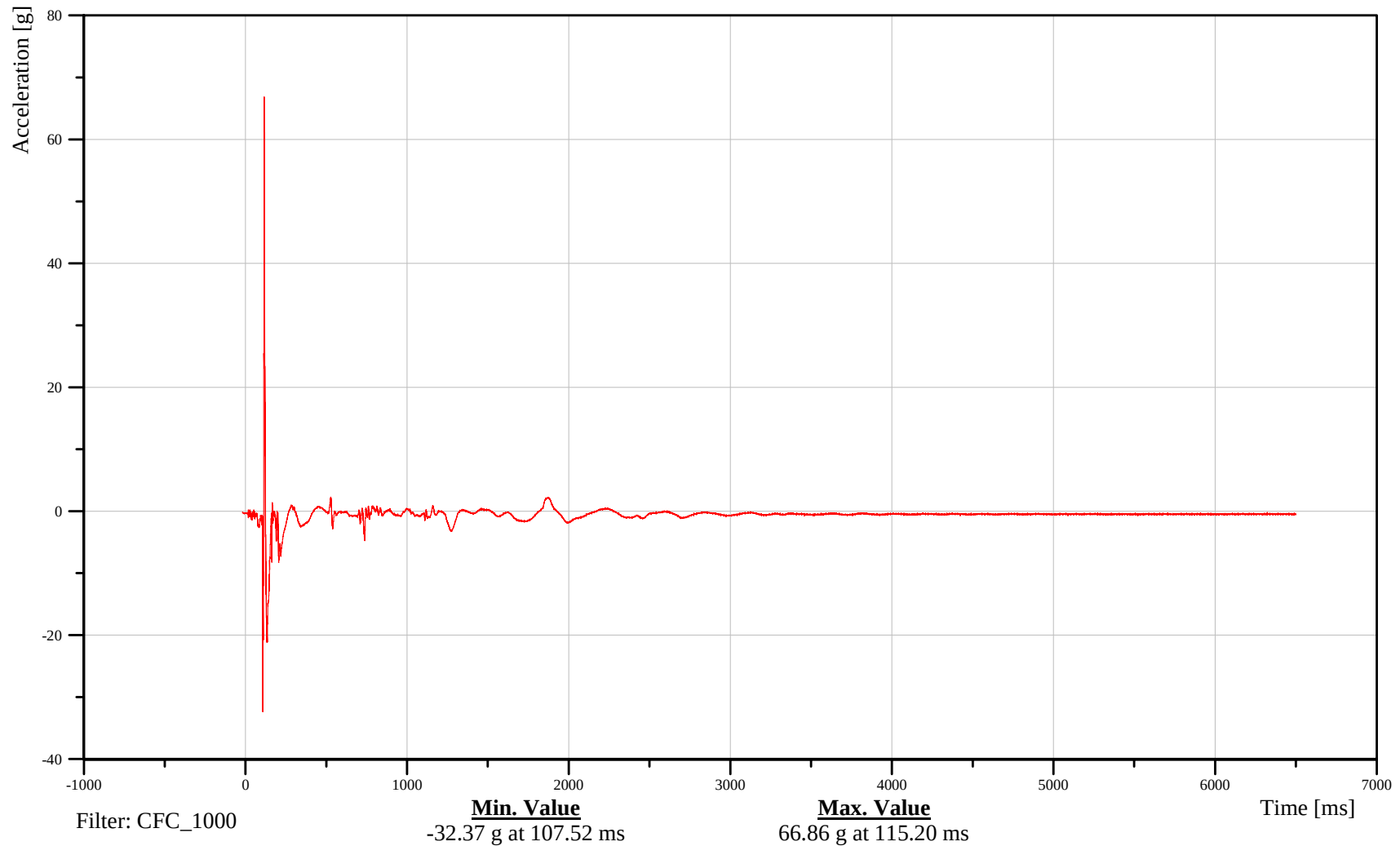
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Top X-Axis Acceleration

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13HEADUP00H3ACXA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-36

100203



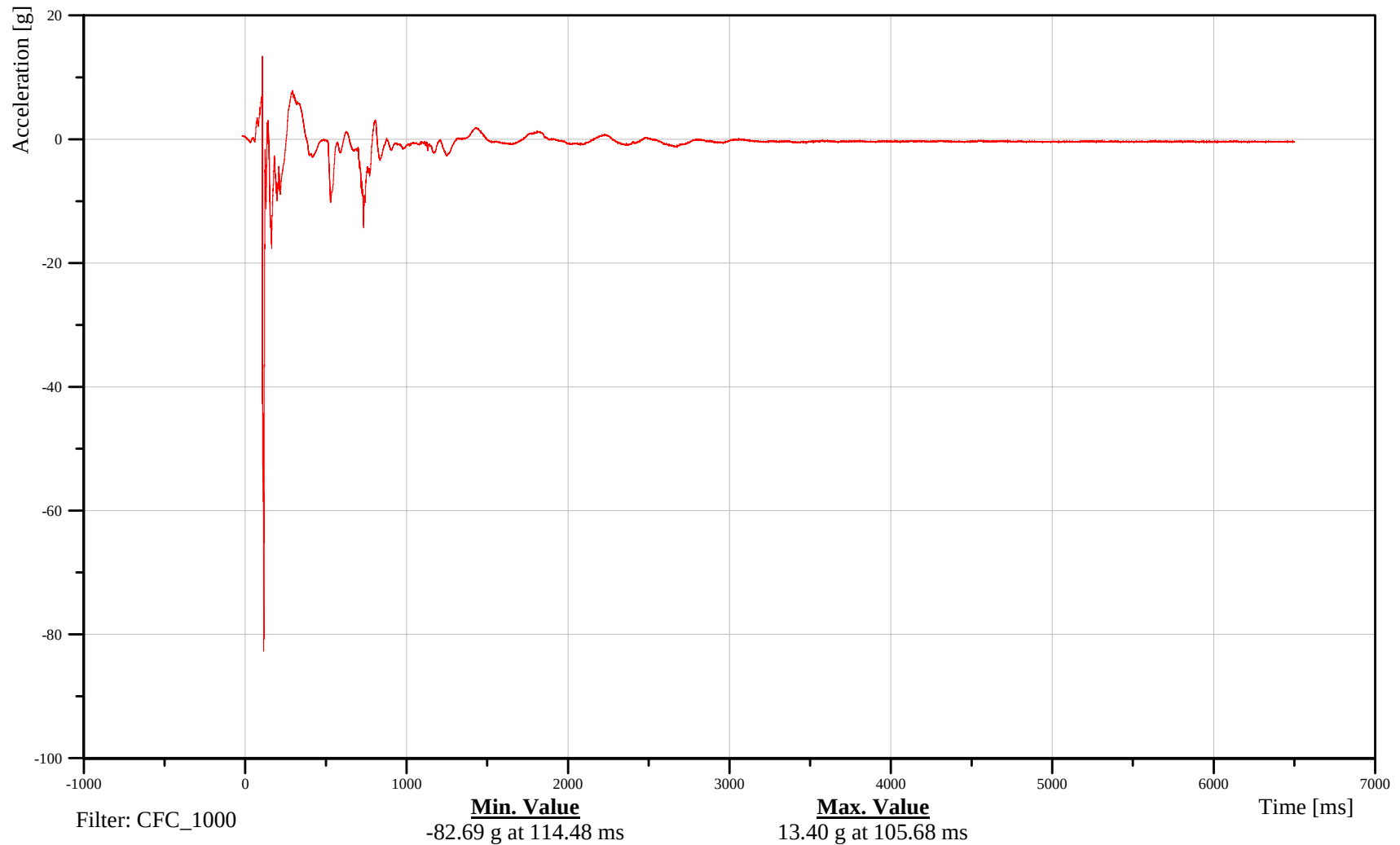
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Top Y-Axis Acceleration

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Time: 15:17

Customer: VRTC

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TRC Inc. Test Lab: CTF
Test Number: 100203



B-37

100203



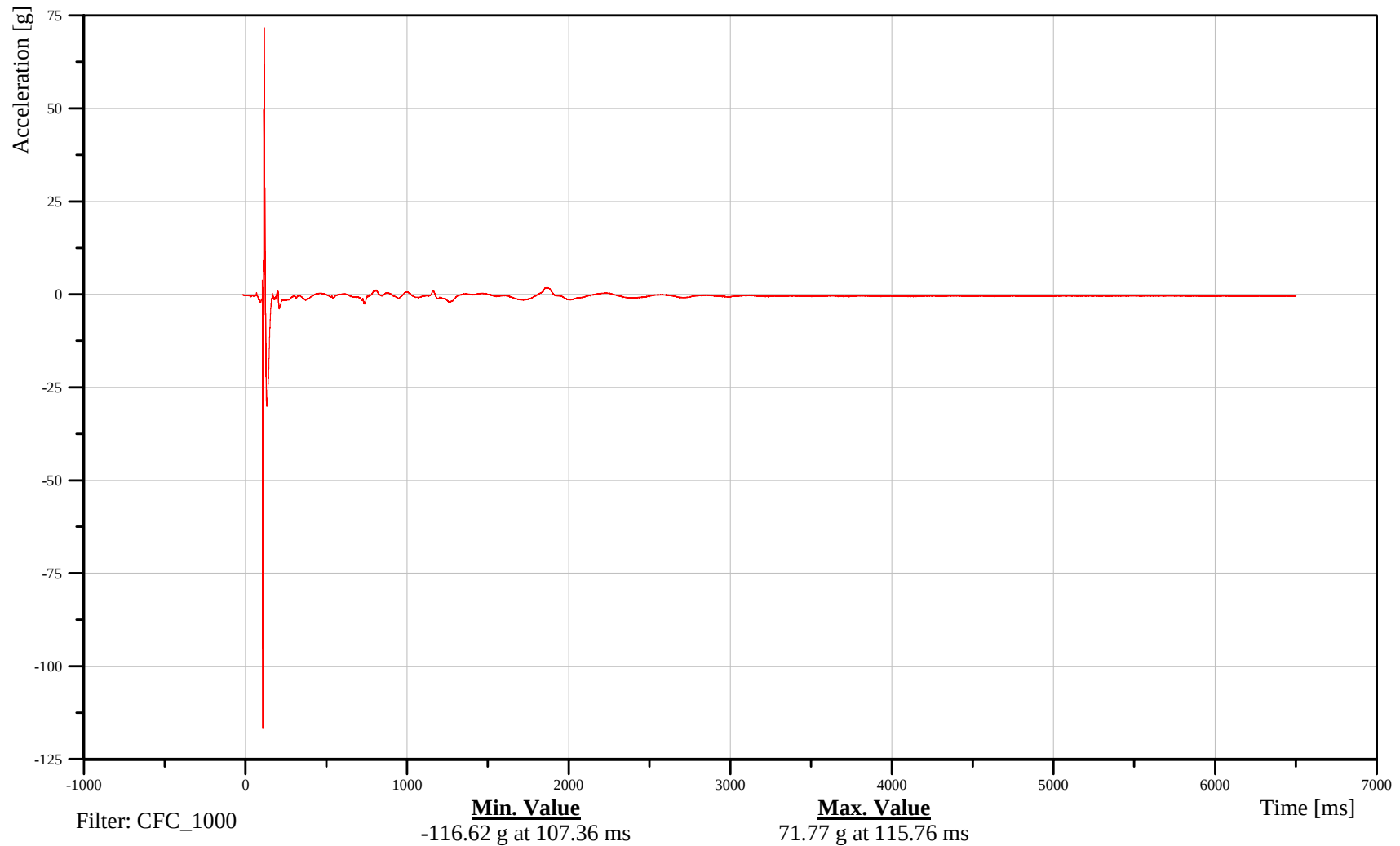
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Left X-Axis Acceleration

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Time: 15:17

Customer: VRTC

13HEADLE00H3ACXA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-38

100203



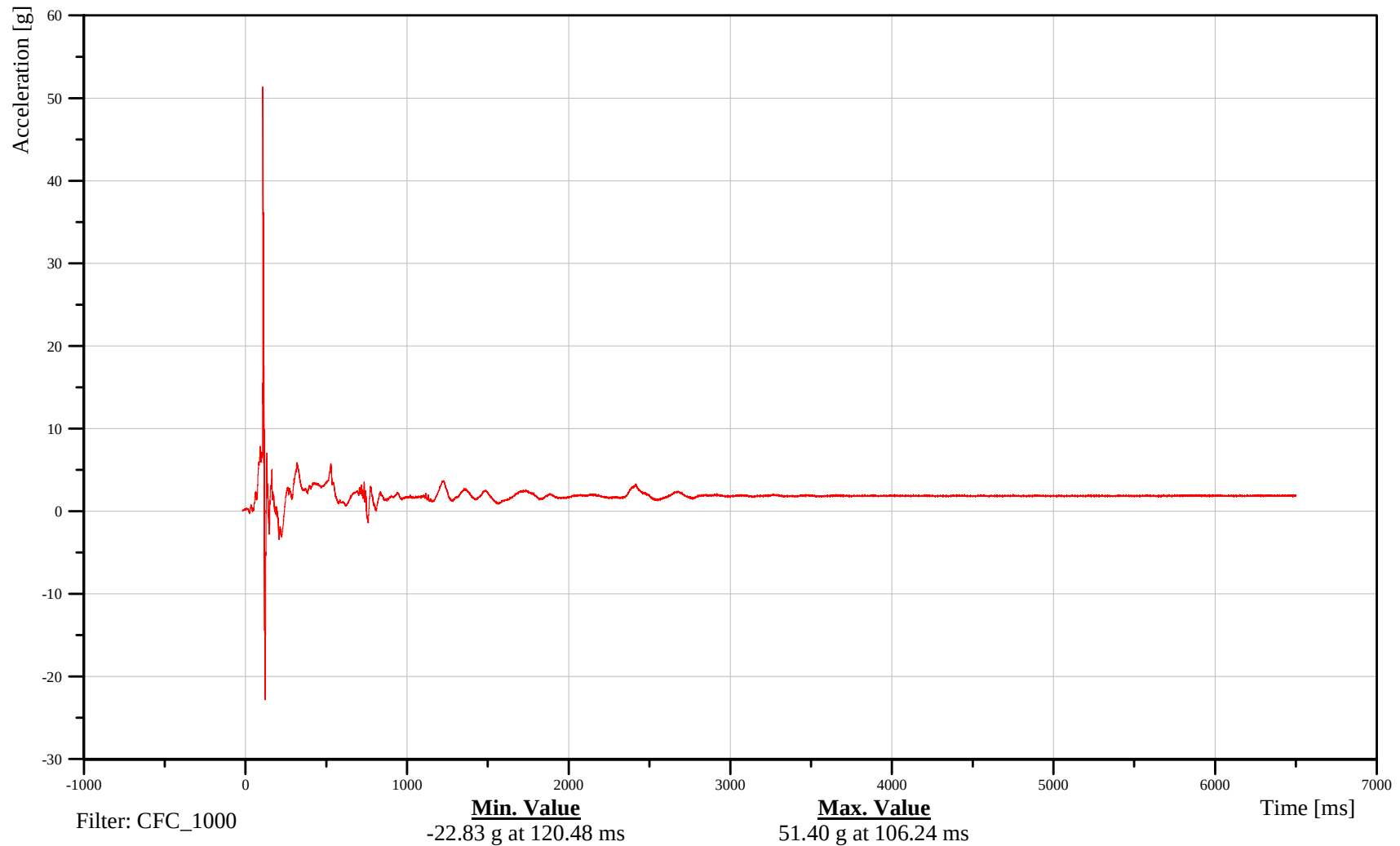
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Left Z-Axis Acceleration

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13HEADLE00H3ACZA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-39

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Upper Neck X-Axis Force

Date: 02/03/2010

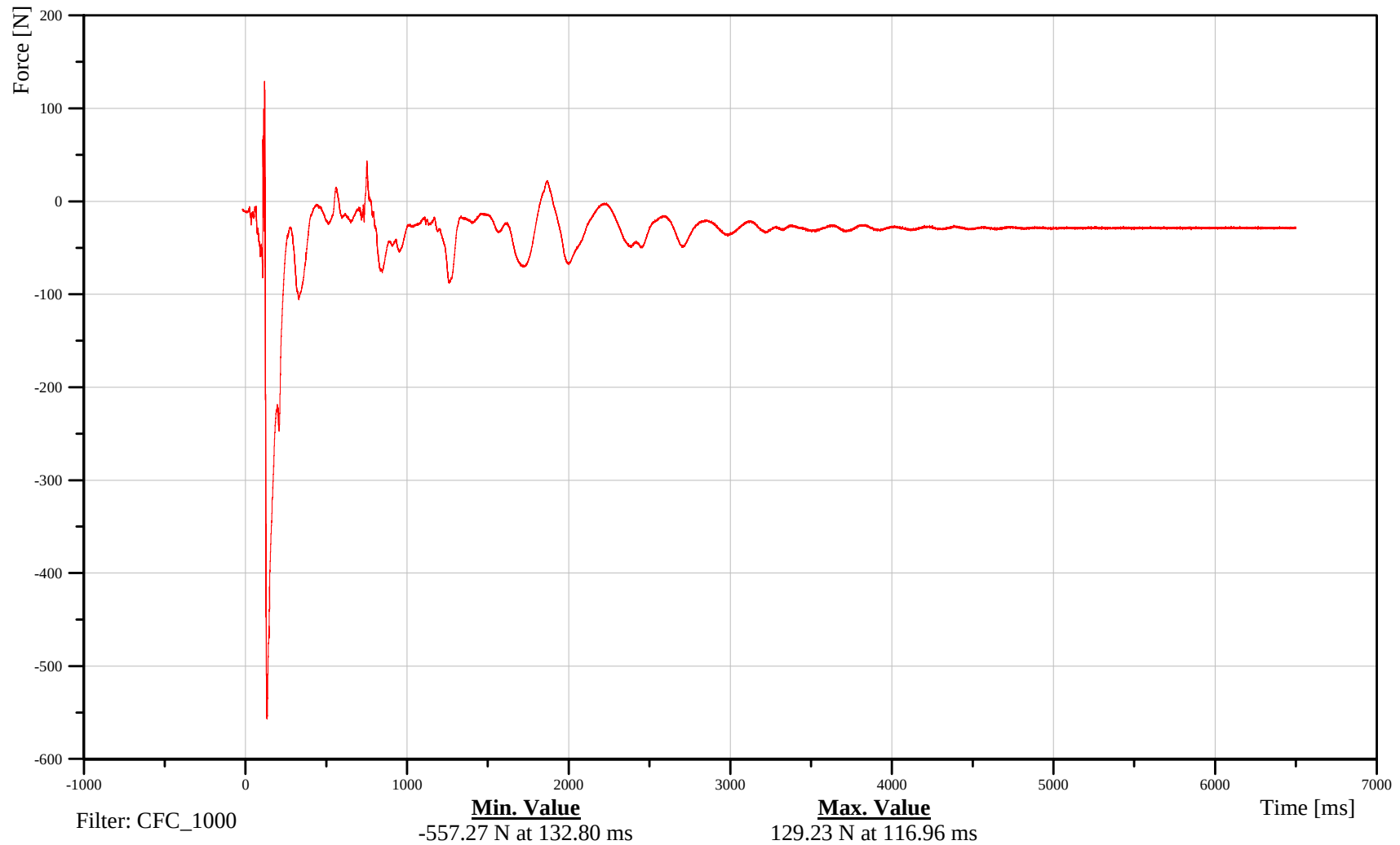
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100203



B-40

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Upper Neck Y-Axis Force

Date: 02/03/2010

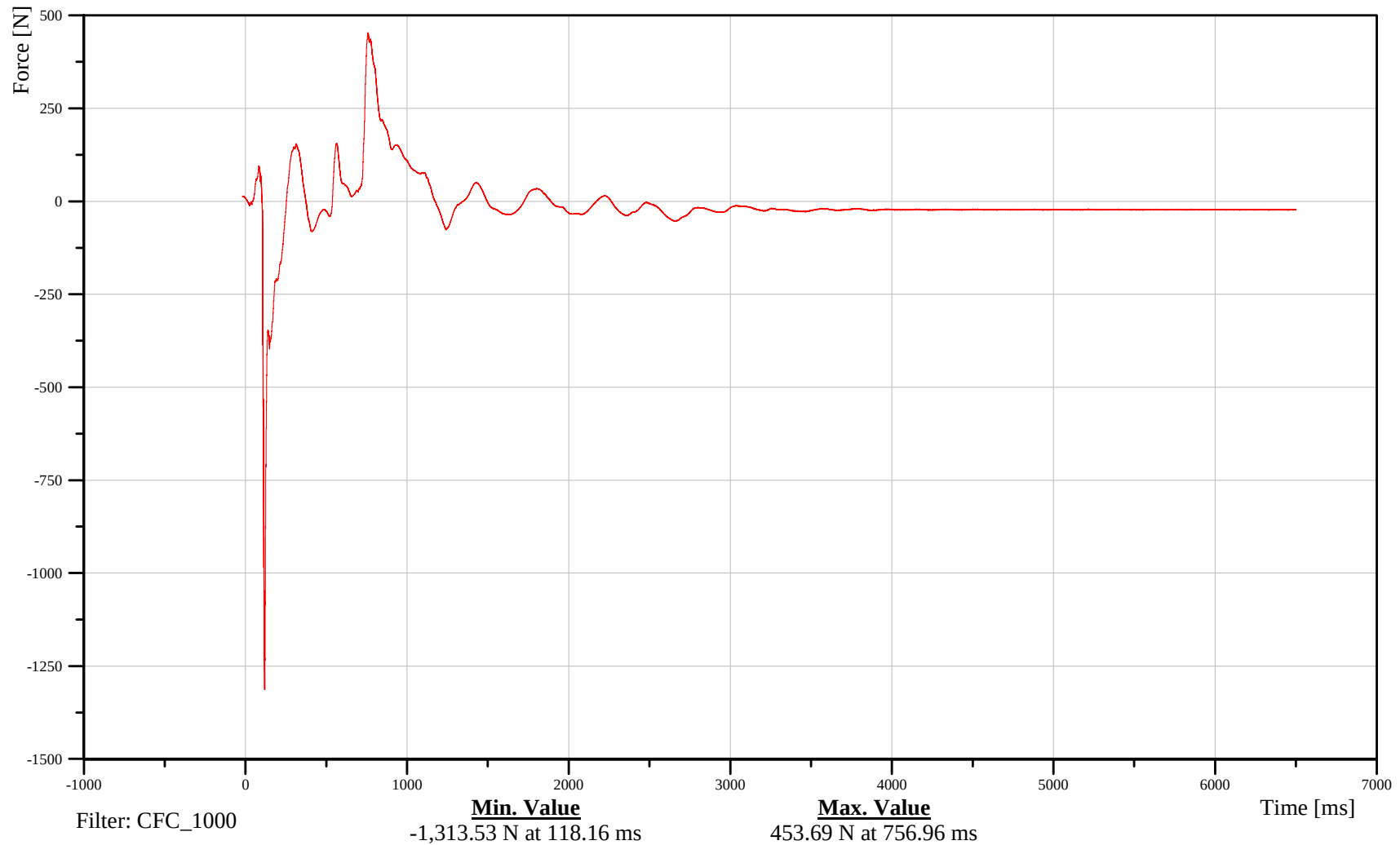
Time: 15:17

Customer: VRTC

13NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-41

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Upper Neck Z-Axis Force

Date: 02/03/2010

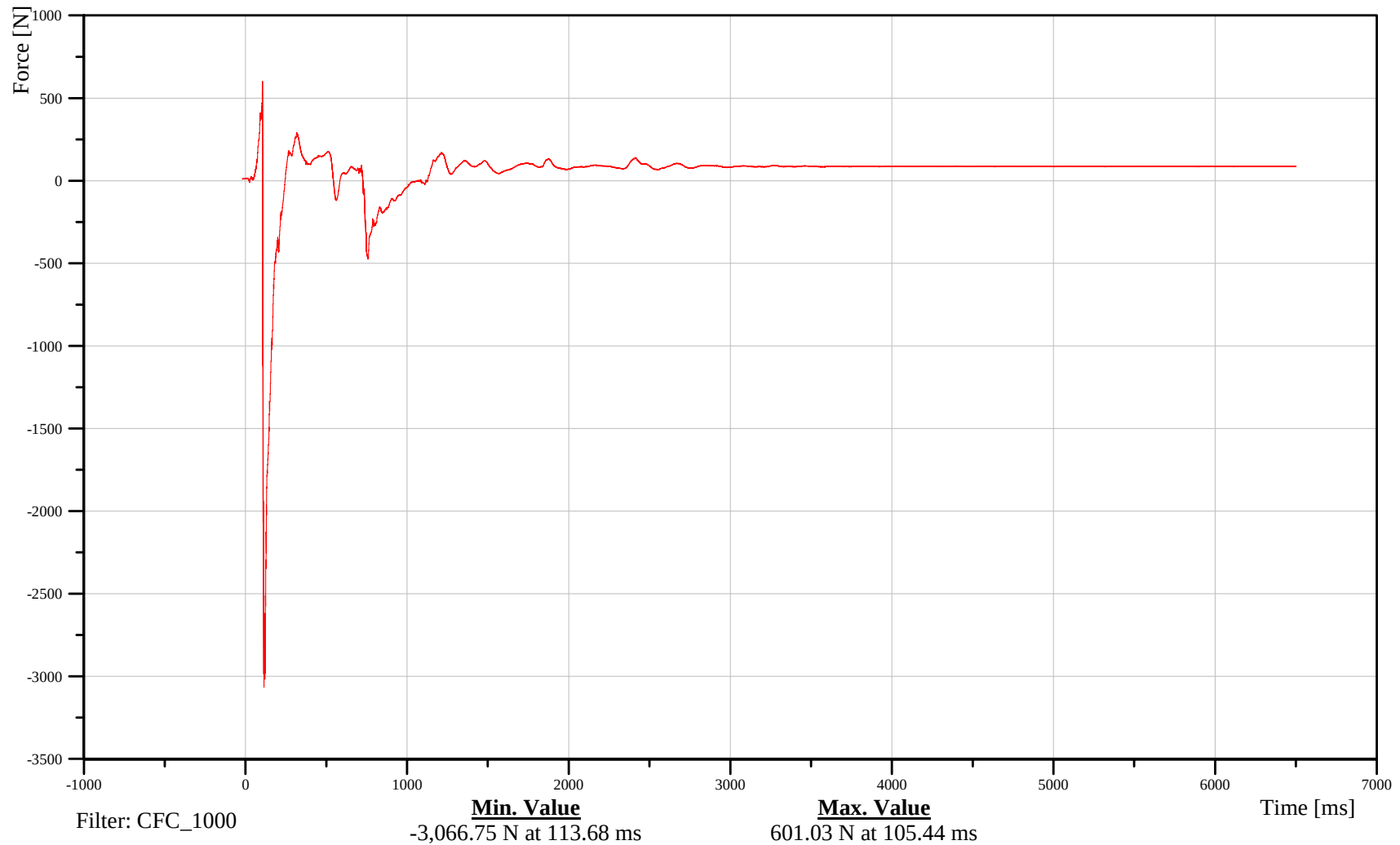
Time: 15:17

Customer: VRTC

13NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-42

100203



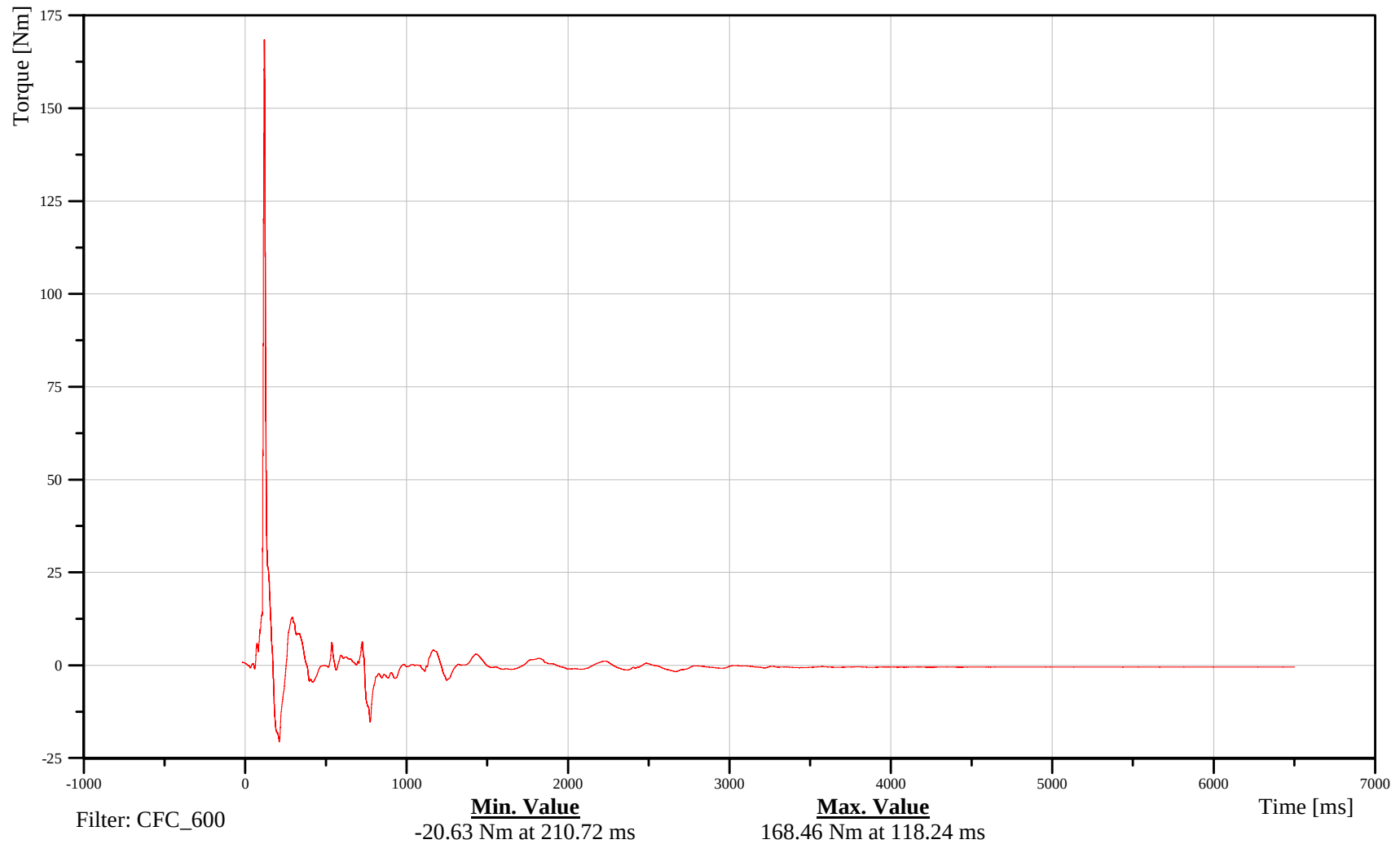
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Upper Neck Moment About X Axis

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13NECKUP00H3MOXB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-43

100203



Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Upper Neck Moment About Y Axis

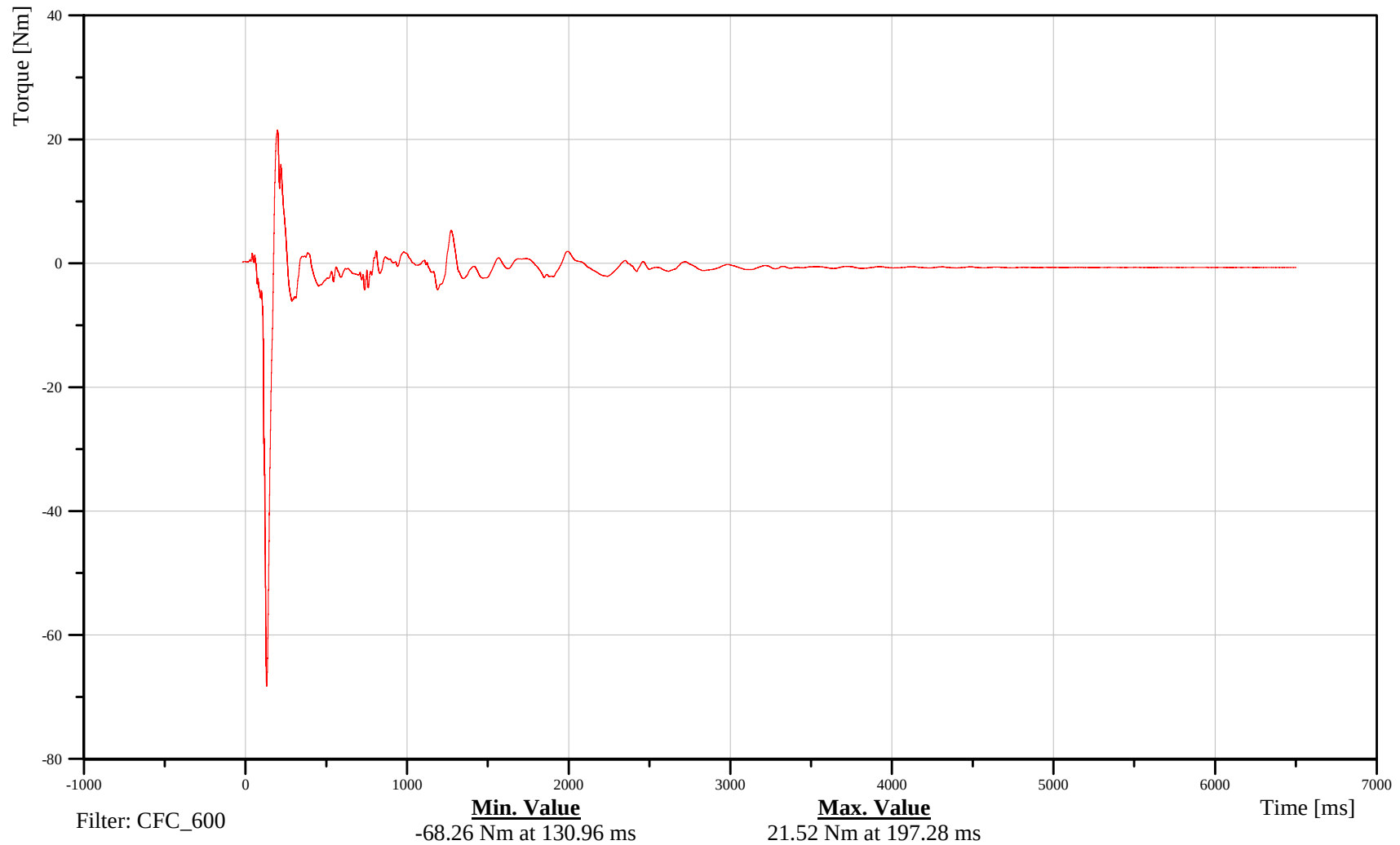
Date: 02/03/2010
Time: 15:17

Customer: VRTC

13NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-44

100203



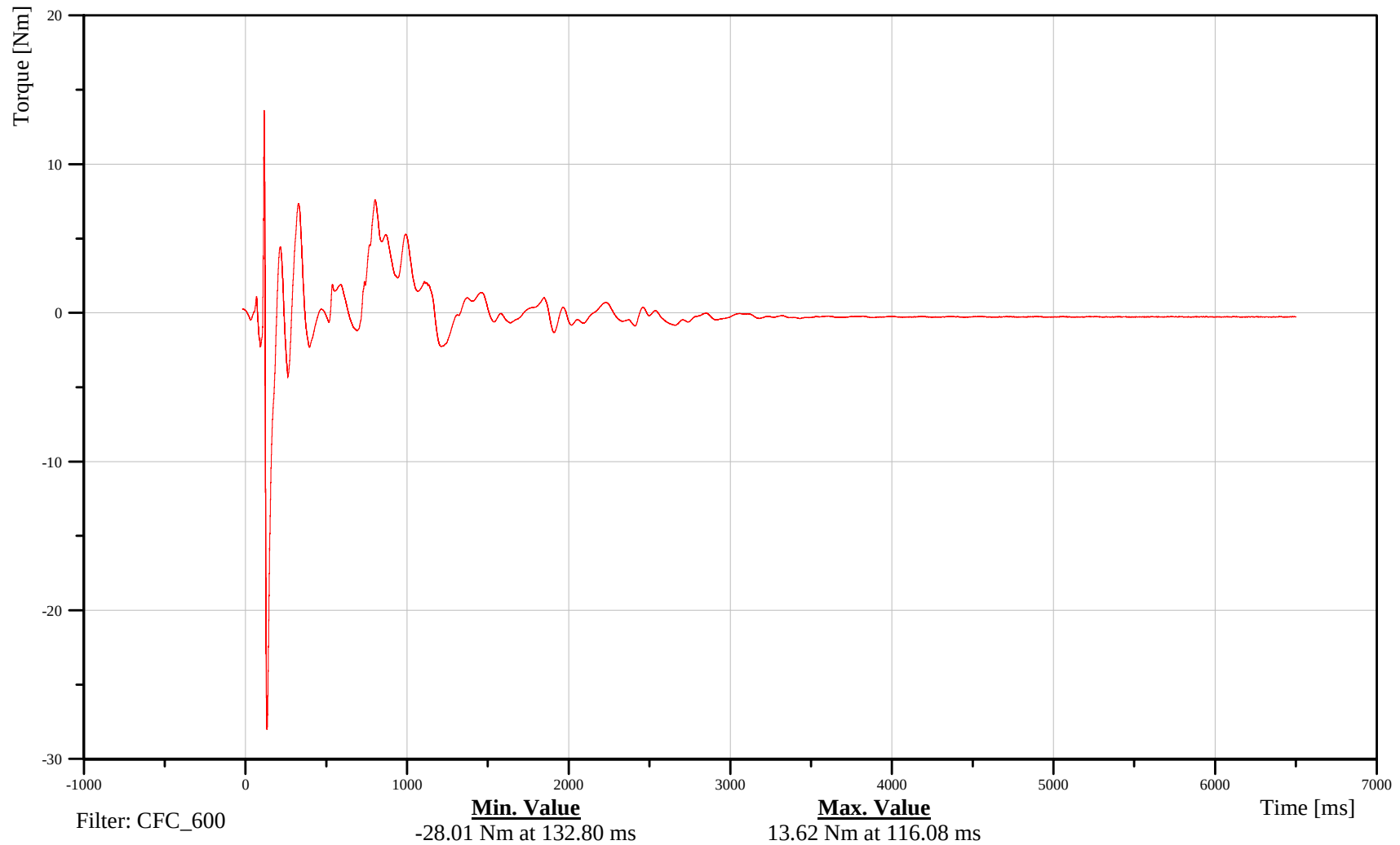
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Upper Neck Moment About Z Axis

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13NECKUP00H3MOZB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-45

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Lower Neck X-Axis Force

Date: 02/03/2010

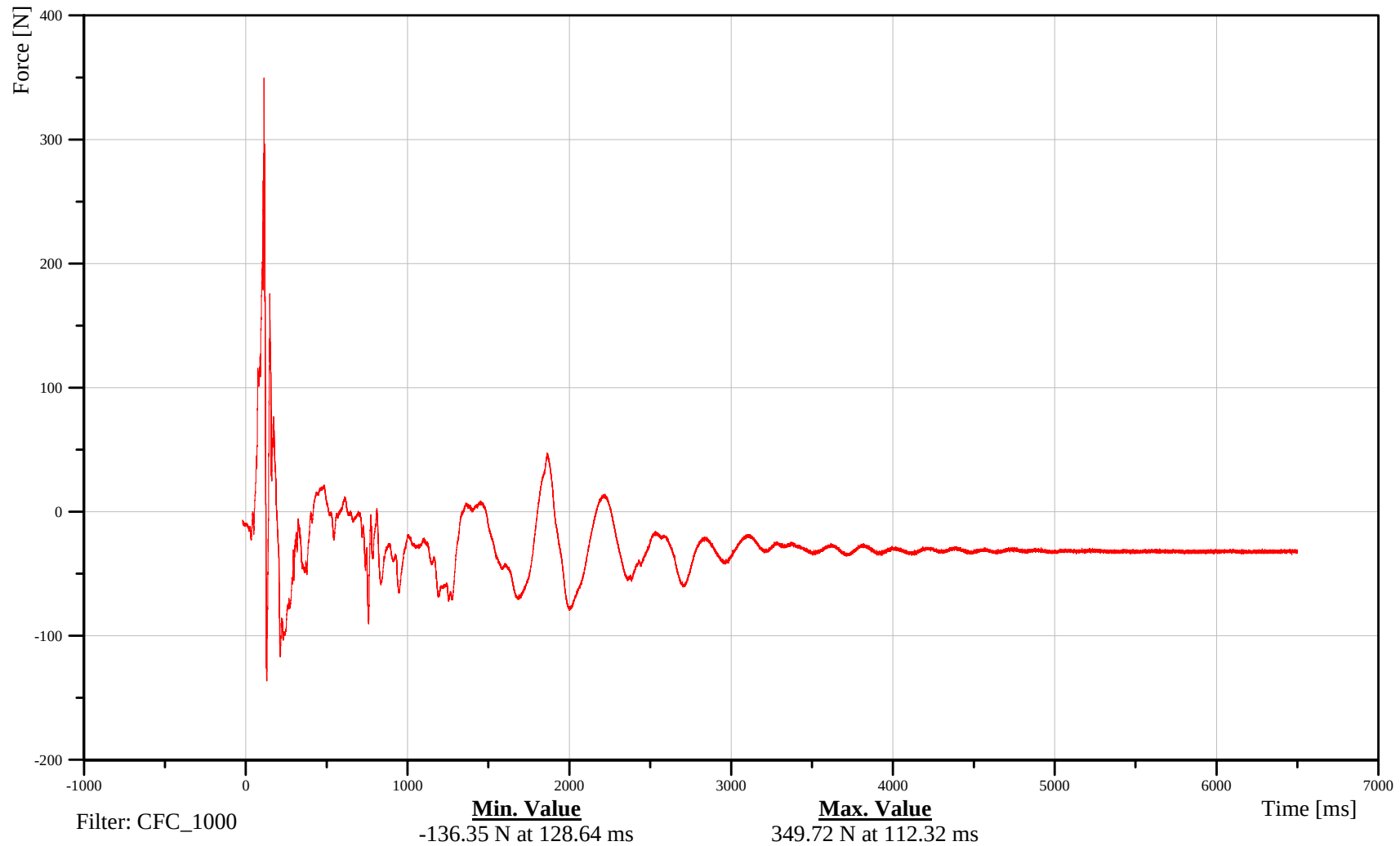
Time: 15:17

Customer: VRTC

13NECKLO00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-46

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Lower Neck Y-Axis Force

Date: 02/03/2010

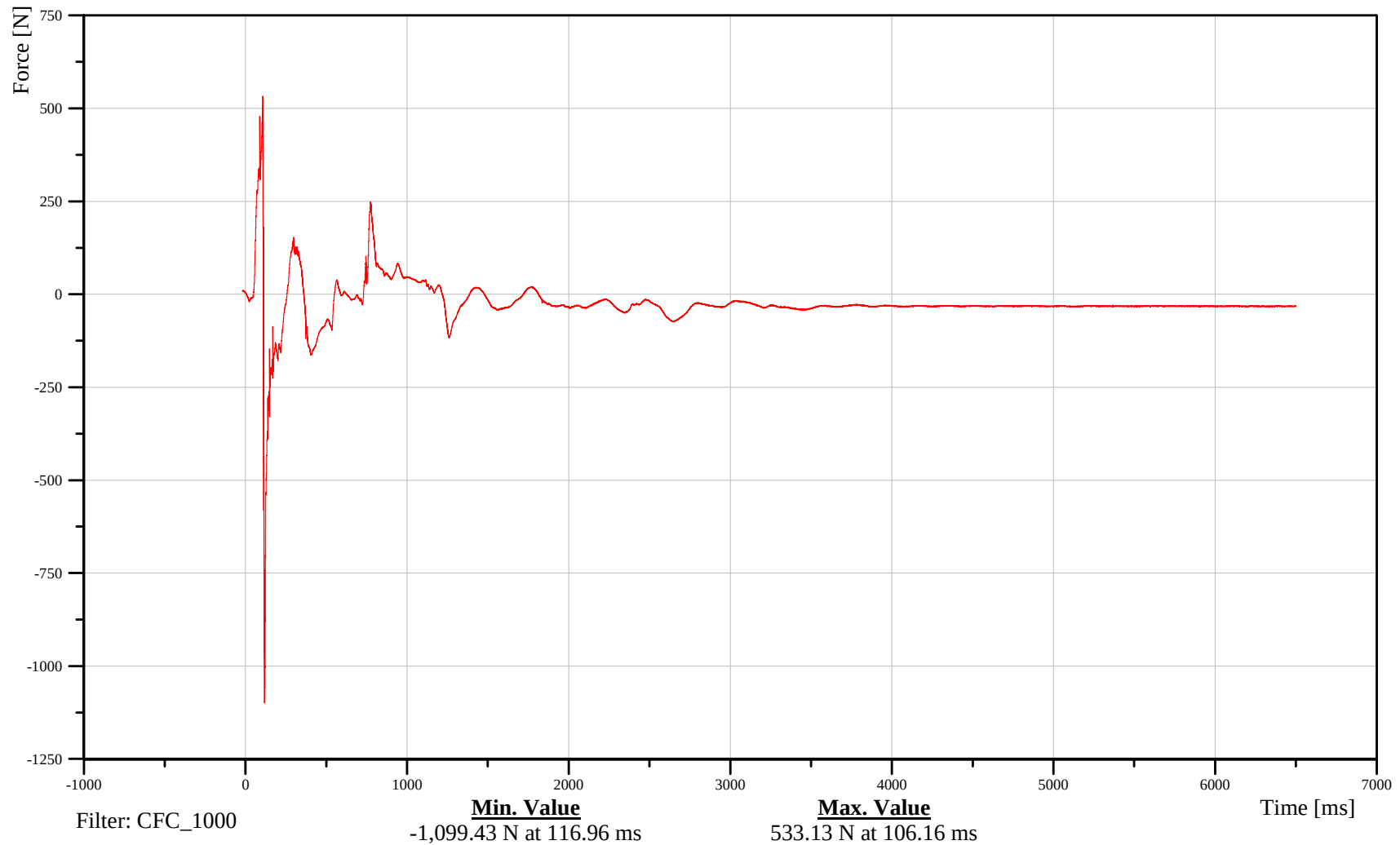
Time: 15:17

Customer: VRTC

13NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-47

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Lower Neck Z-Axis Force

Date: 02/03/2010

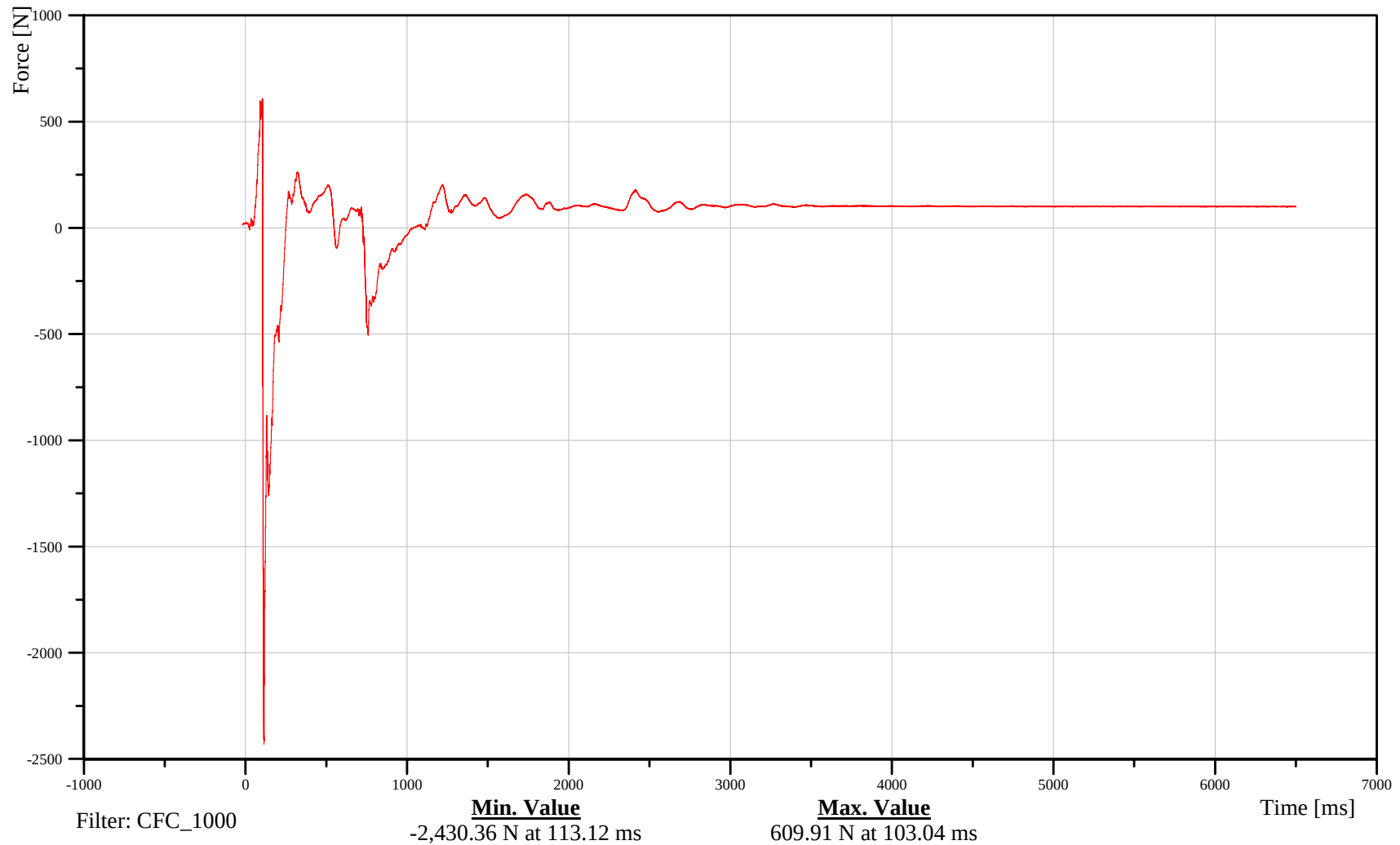
Time: 15:17

Customer: VRTC

13NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-48

100203



Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Lower Neck Moment About X Axis

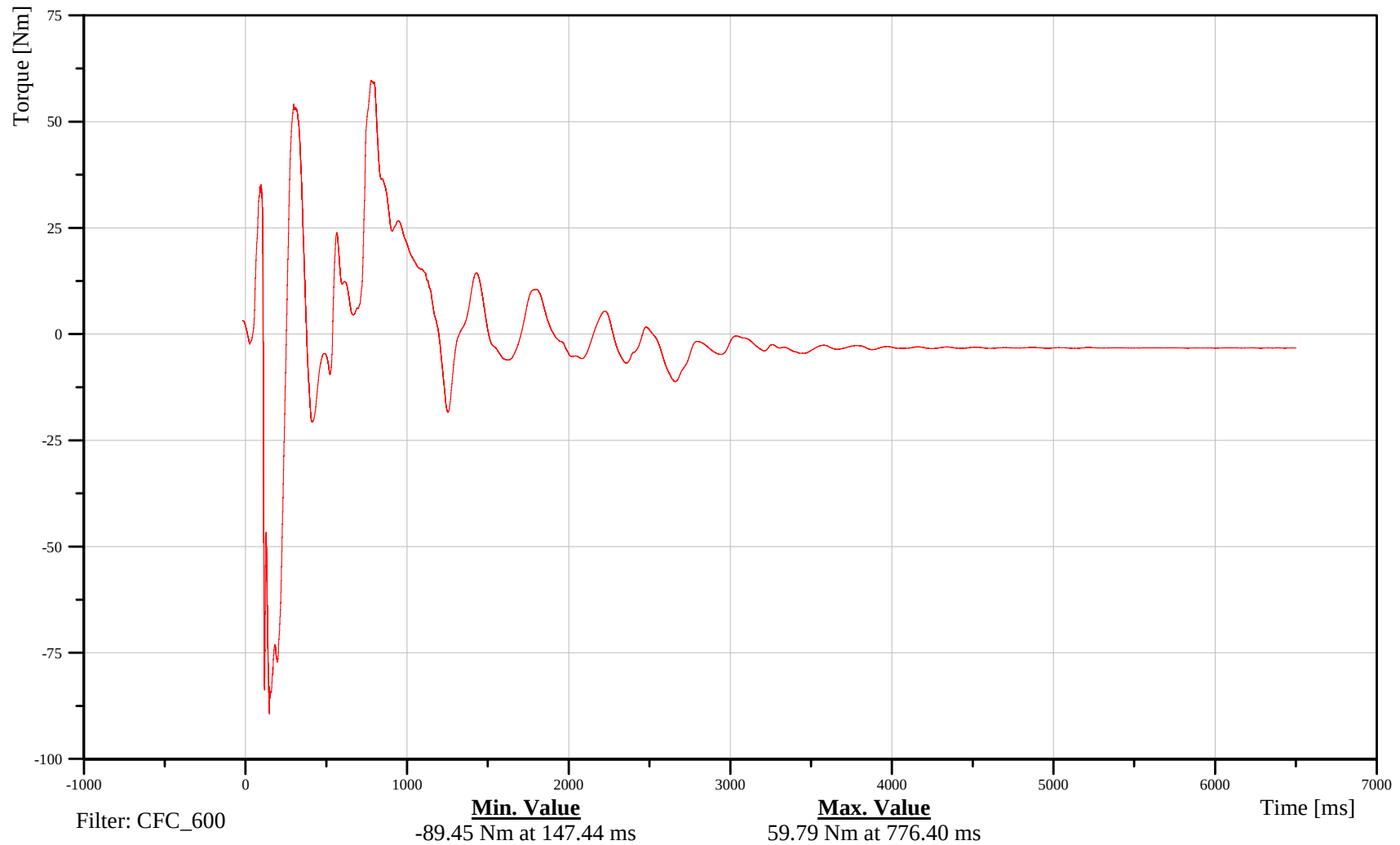
Date: 02/03/2010
Time: 15:17

Customer: VRTC

13NECKLO00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-49

100203



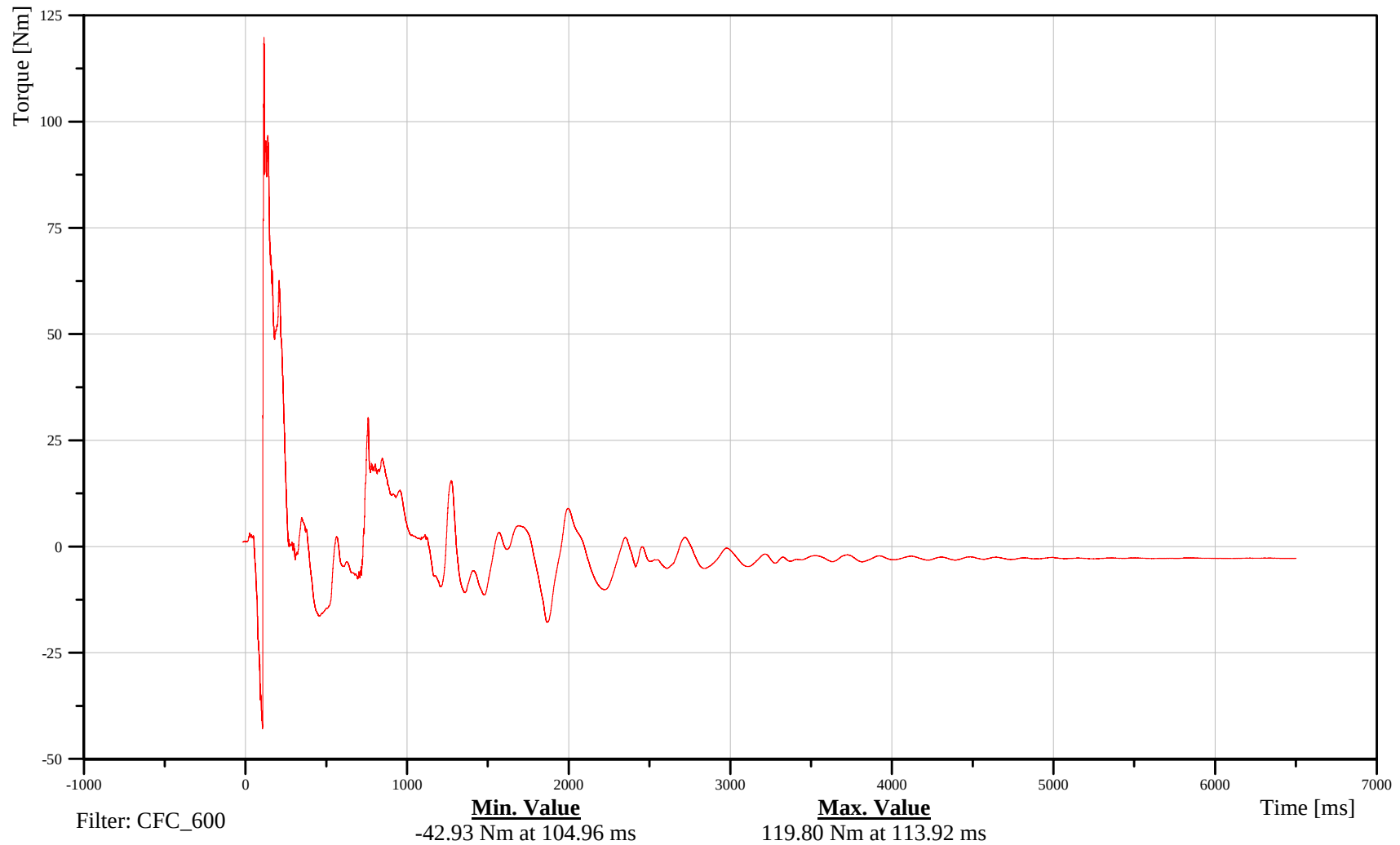
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Lower Neck Moment About Y Axis

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13NECKLO00H3MOYB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-50

100203



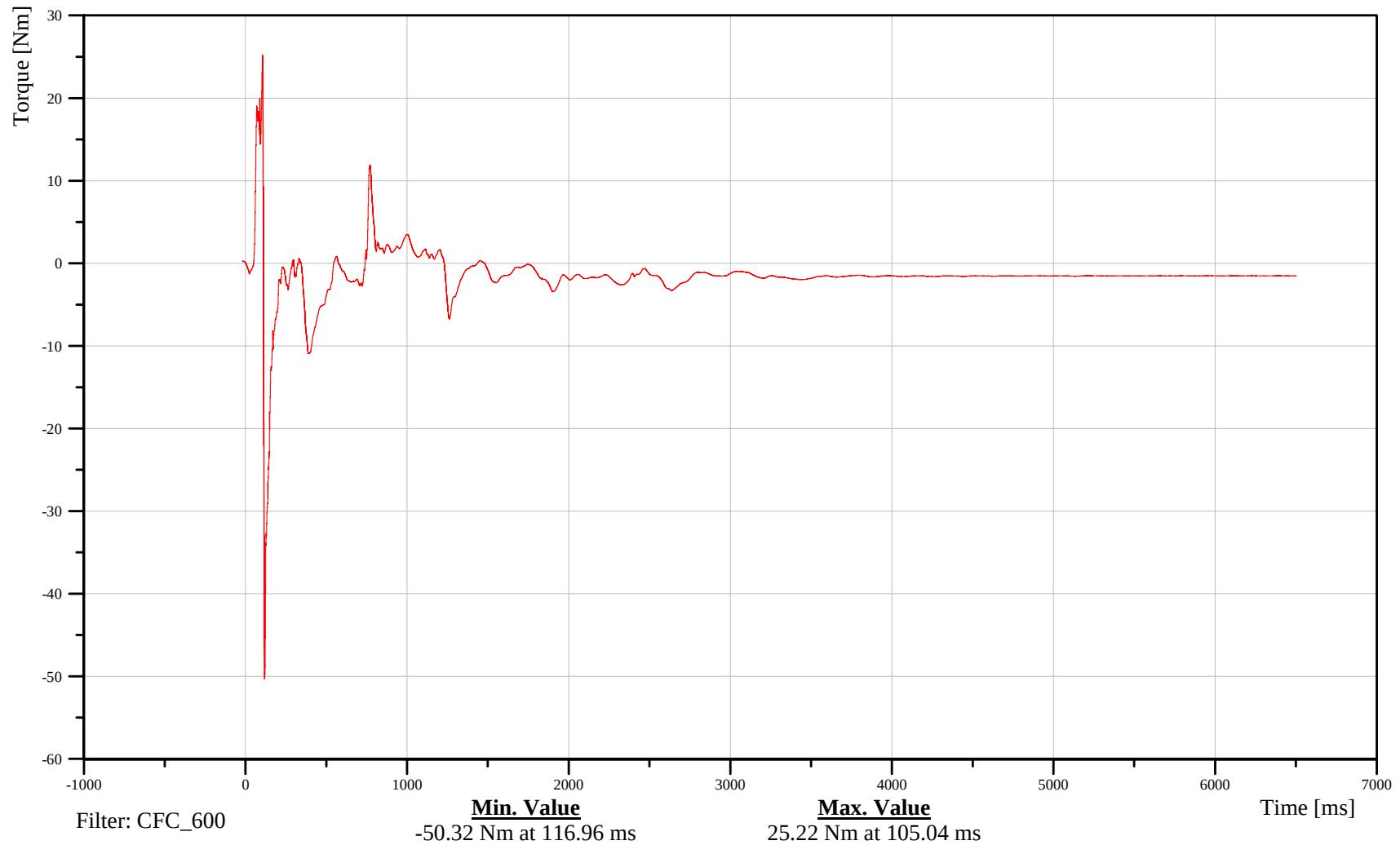
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Lower Neck Moment About Z Axis

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13NECKLO00H3MOZB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-51

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Chest X-Axis Acceleration

Date: 02/03/2010

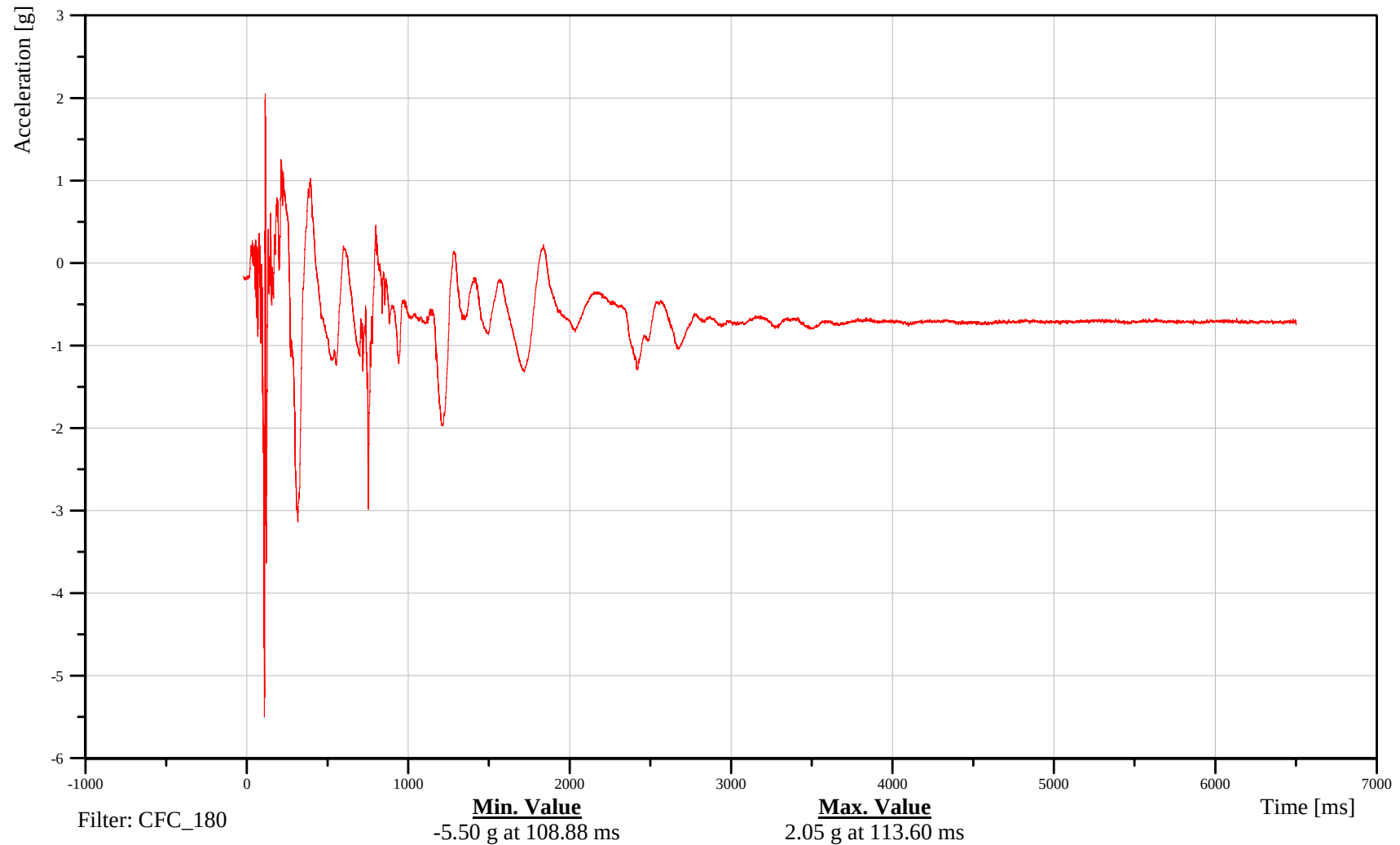
Time: 15:17

Customer: VRTC

13CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100203



B-52

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Chest Y-Axis Acceleration

Date: 02/03/2010

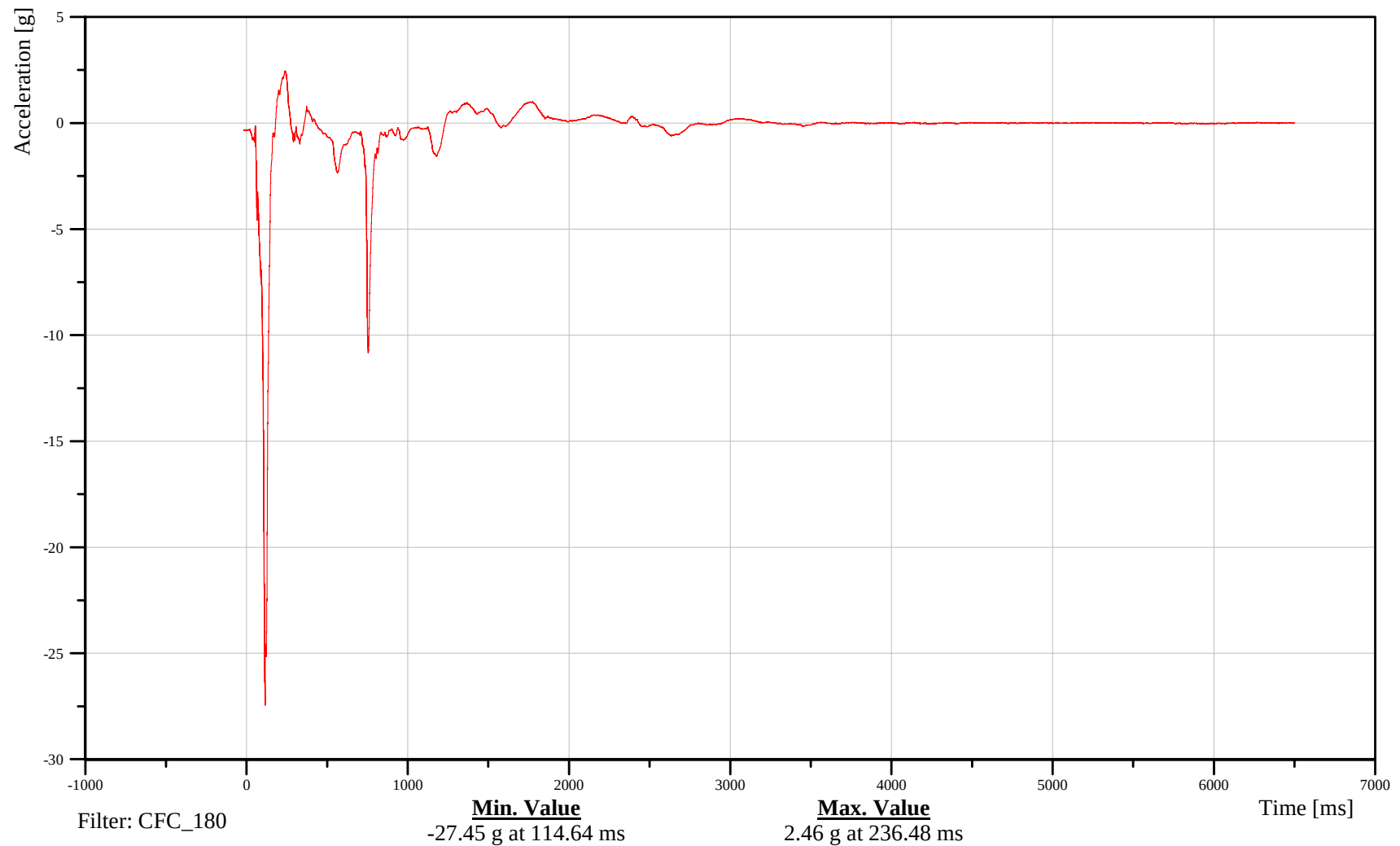
Time: 15:17

Customer: VRTC

13CHSTCG00H3ACYC

TRC Inc. Test Lab: CTF

Test Number: 100203



B-53

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Chest Z-Axis Acceleration

Date: 02/03/2010

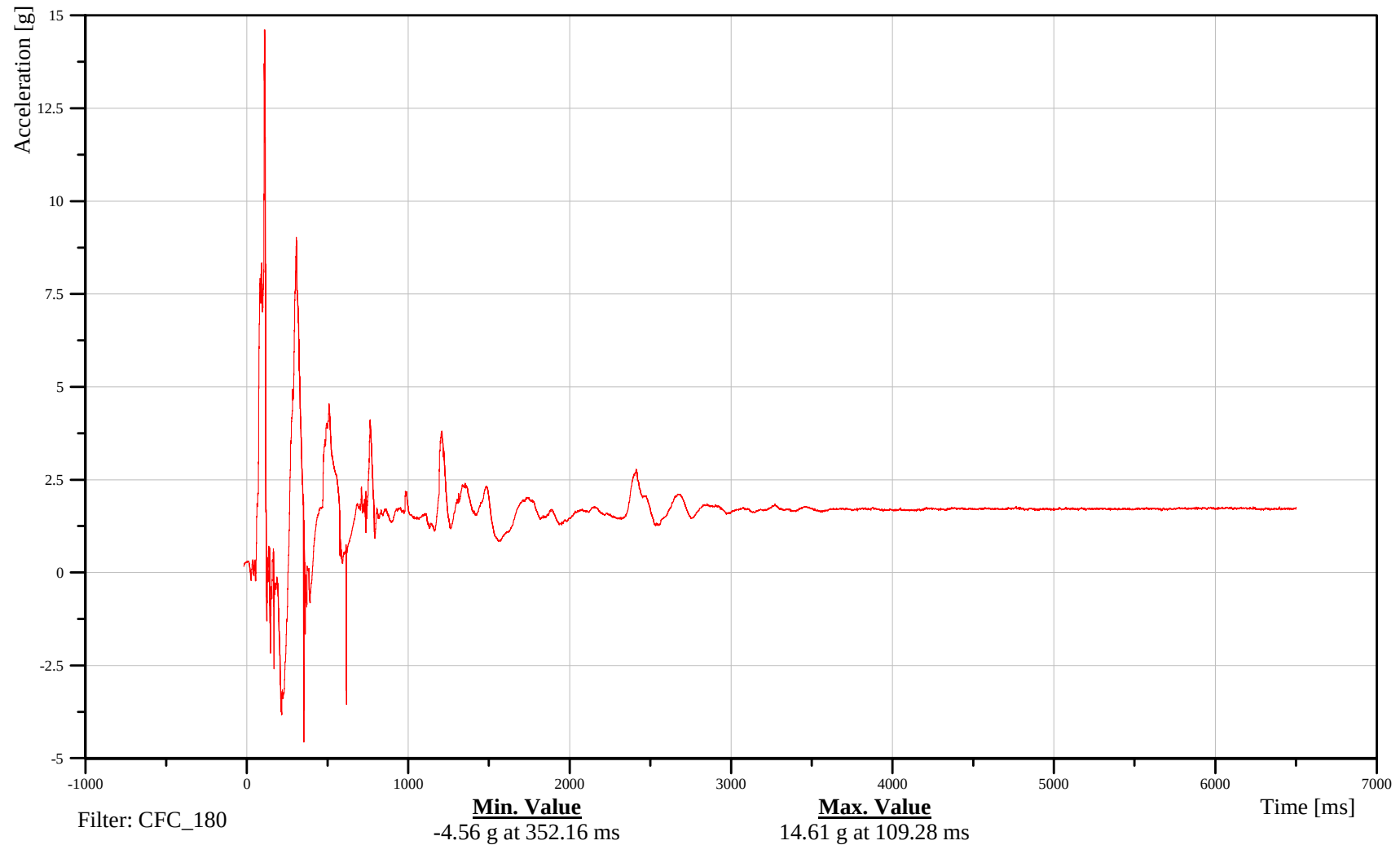
Time: 15:17

Customer: VRTC

13CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100203



B-54

100203



Curb Trip Rollover 2007 Ford Expedition

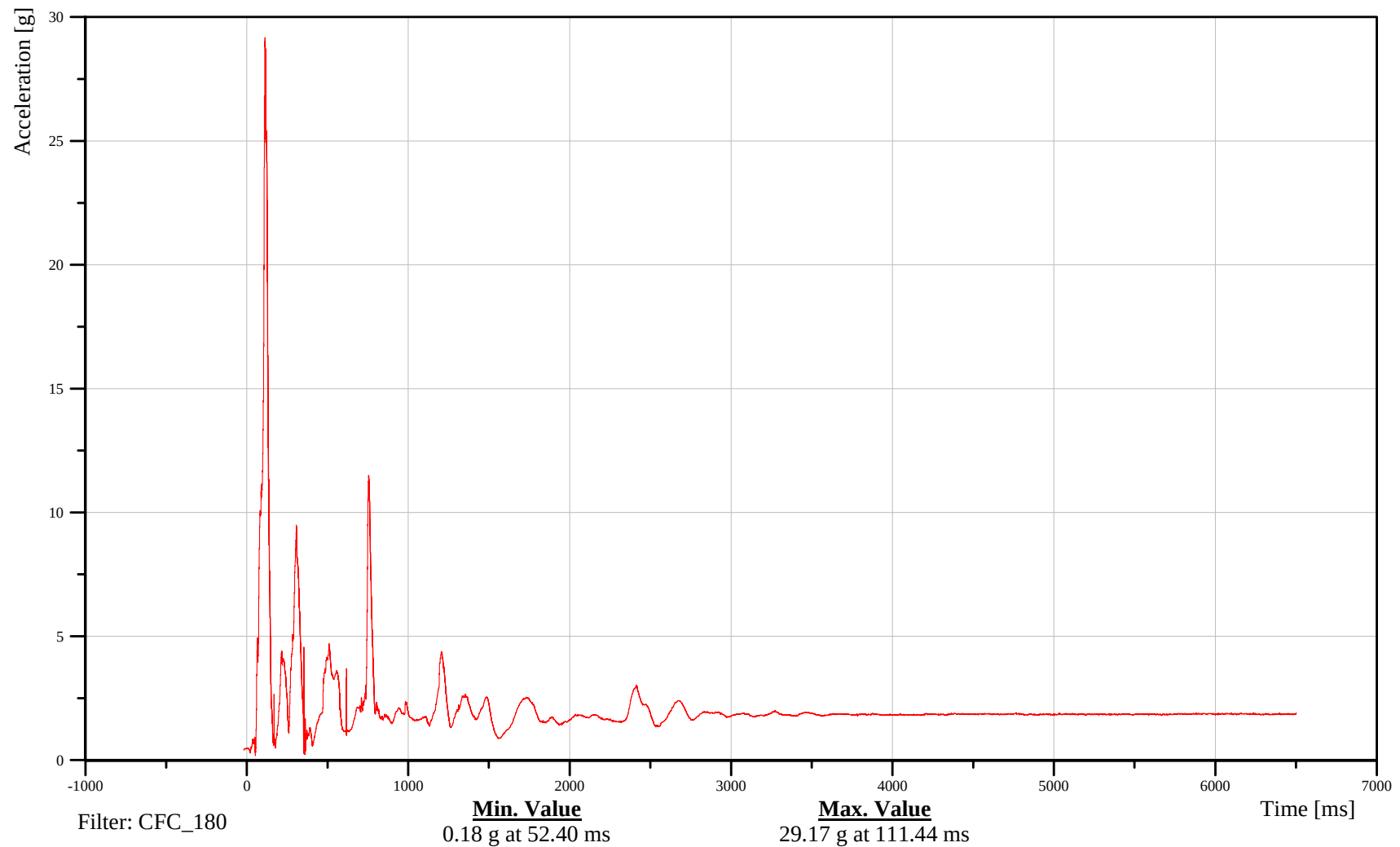
Right Front Passenger Chest Resultant Acceleration

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13CHSTCG00H3ACRC

TRC Inc. Test Lab: CTF
Test Number: 100203



B-55

100203



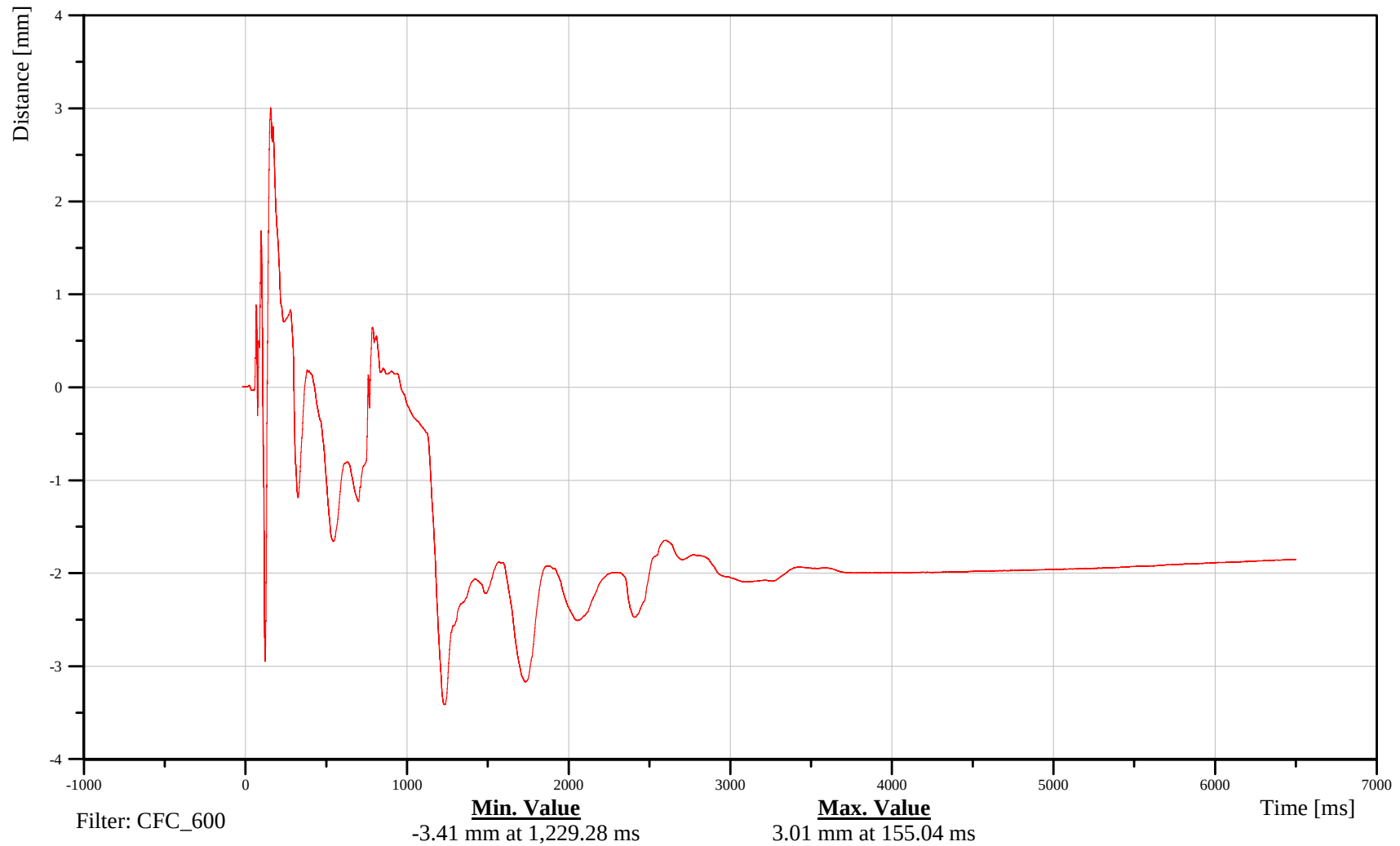
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Chest X-Axis Displacement

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13CHST0000H3DSXB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-56

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis X-Axis Acceleration

Date: 02/03/2010

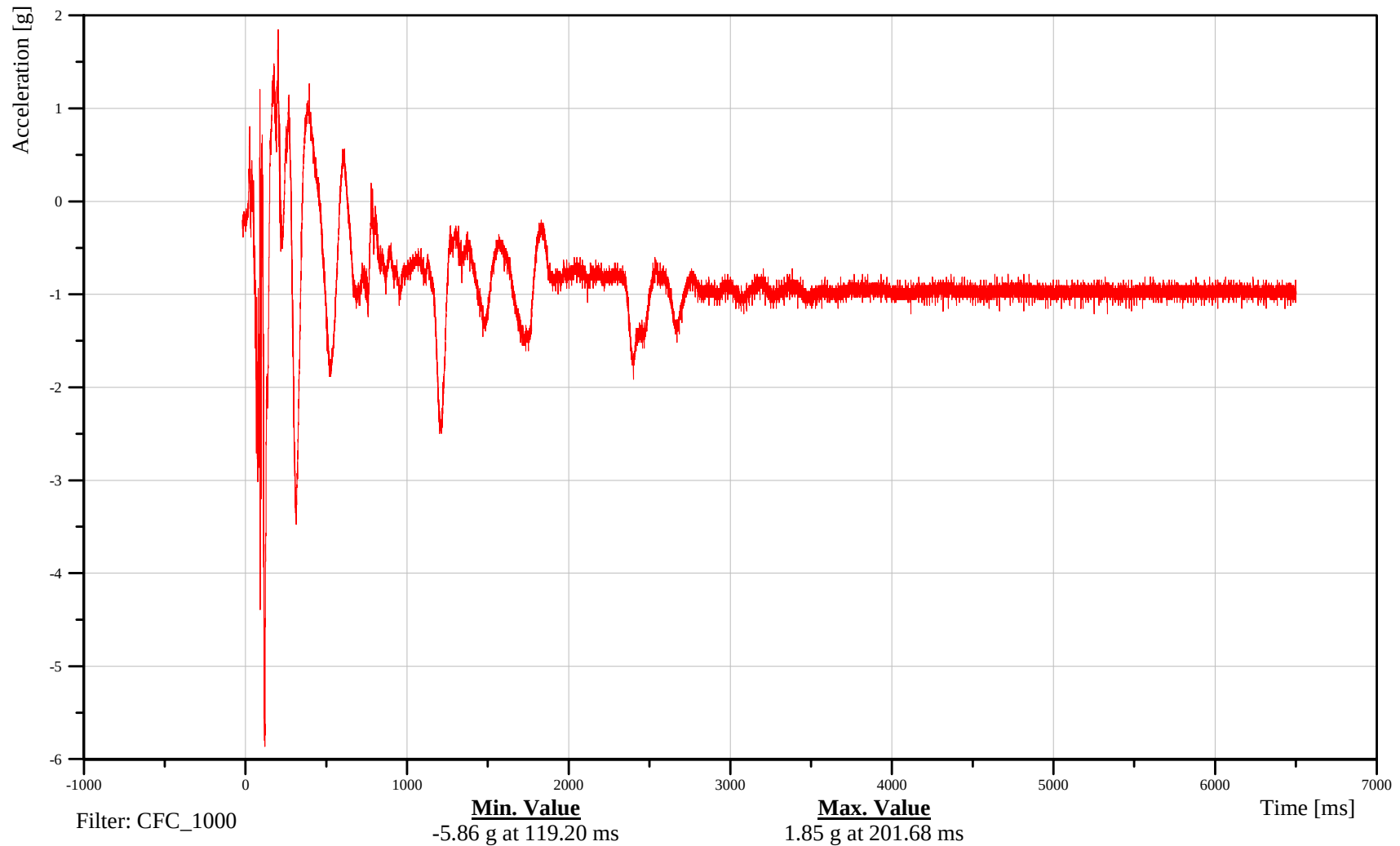
Time: 15:17

Customer: VRTC

13PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-57

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis Y-Axis Acceleration

Date: 02/03/2010

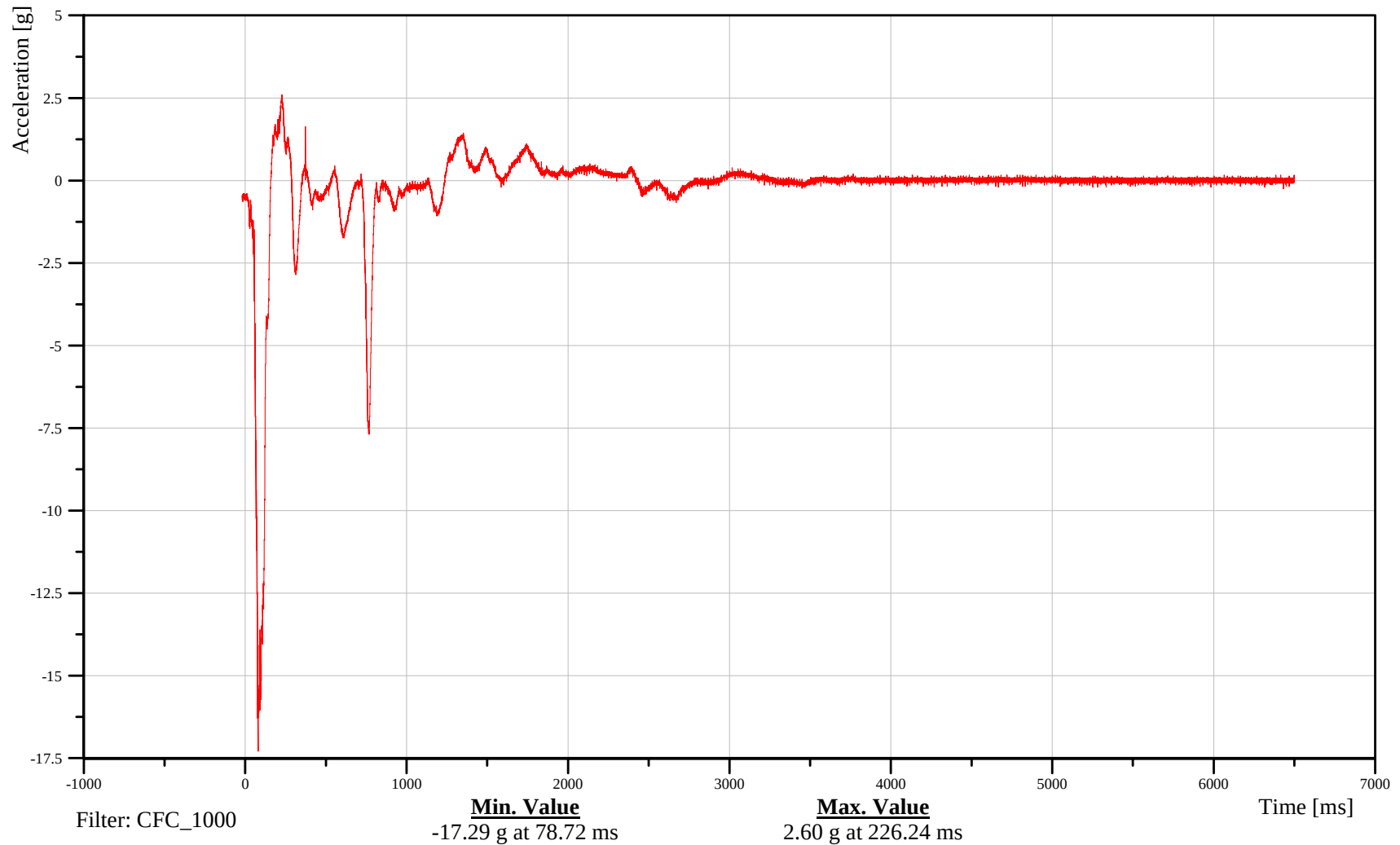
Time: 15:17

Customer: VRTC

13PELVCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-58

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis Z-Axis Acceleration

Date: 02/03/2010

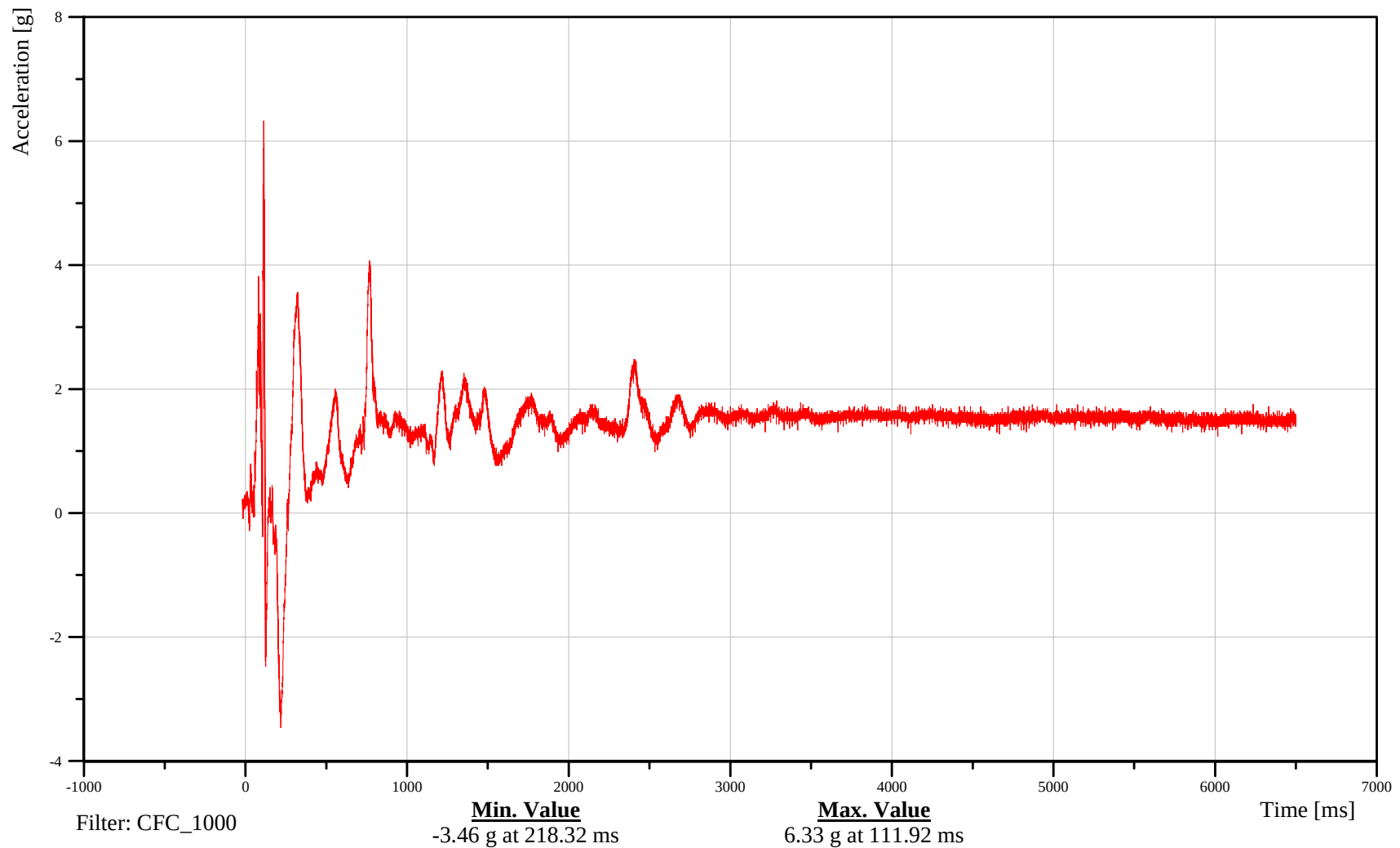
Time: 15:17

Customer: VRTC

13PELVCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-59

100203



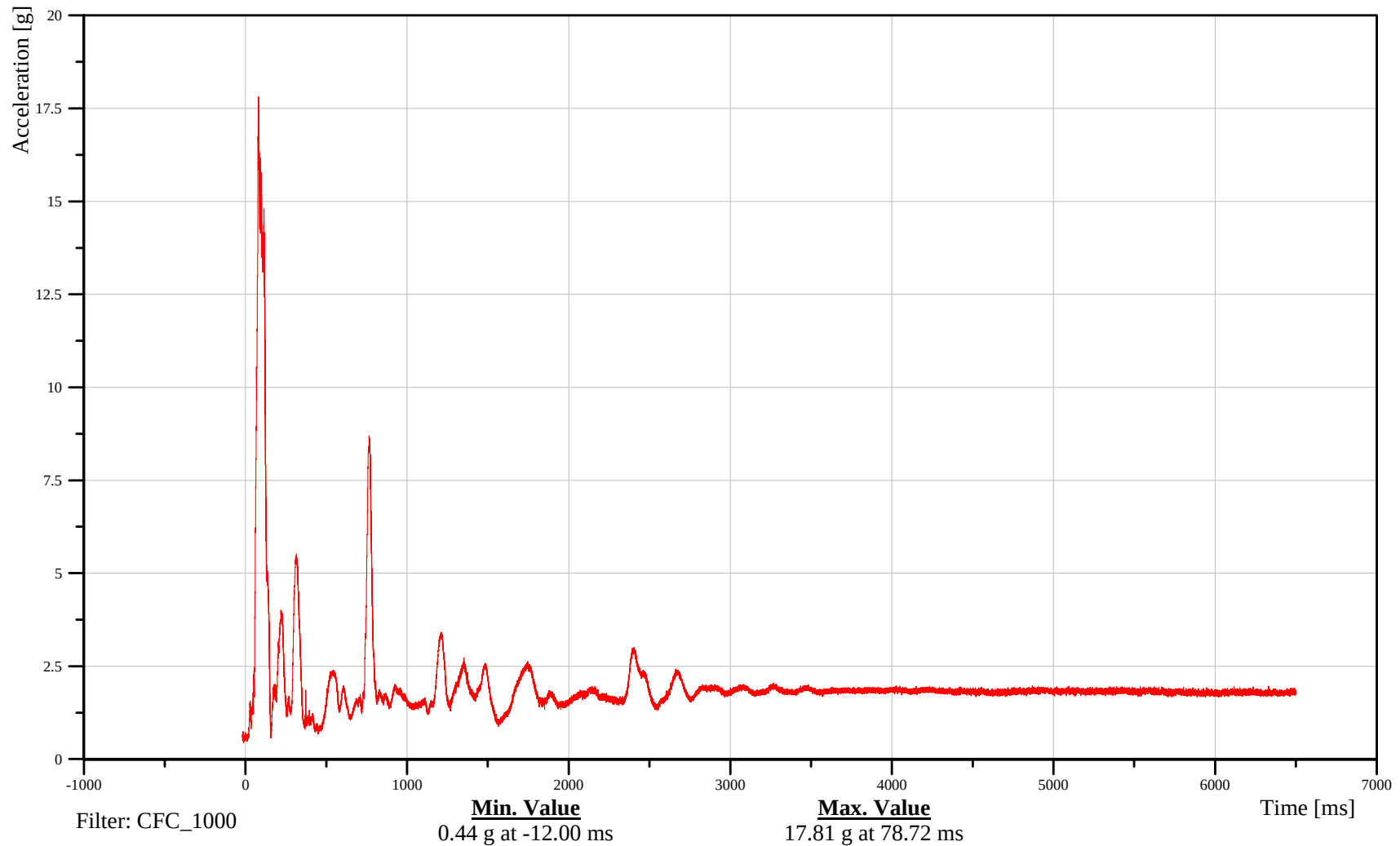
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Pelvis Resultant Acceleration

Date: 02/03/2010
Time: 15:17

Customer: VRTC

13PELVCG00H3ACRA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-60

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head X-Axis Acceleration

Date: 02/03/2010

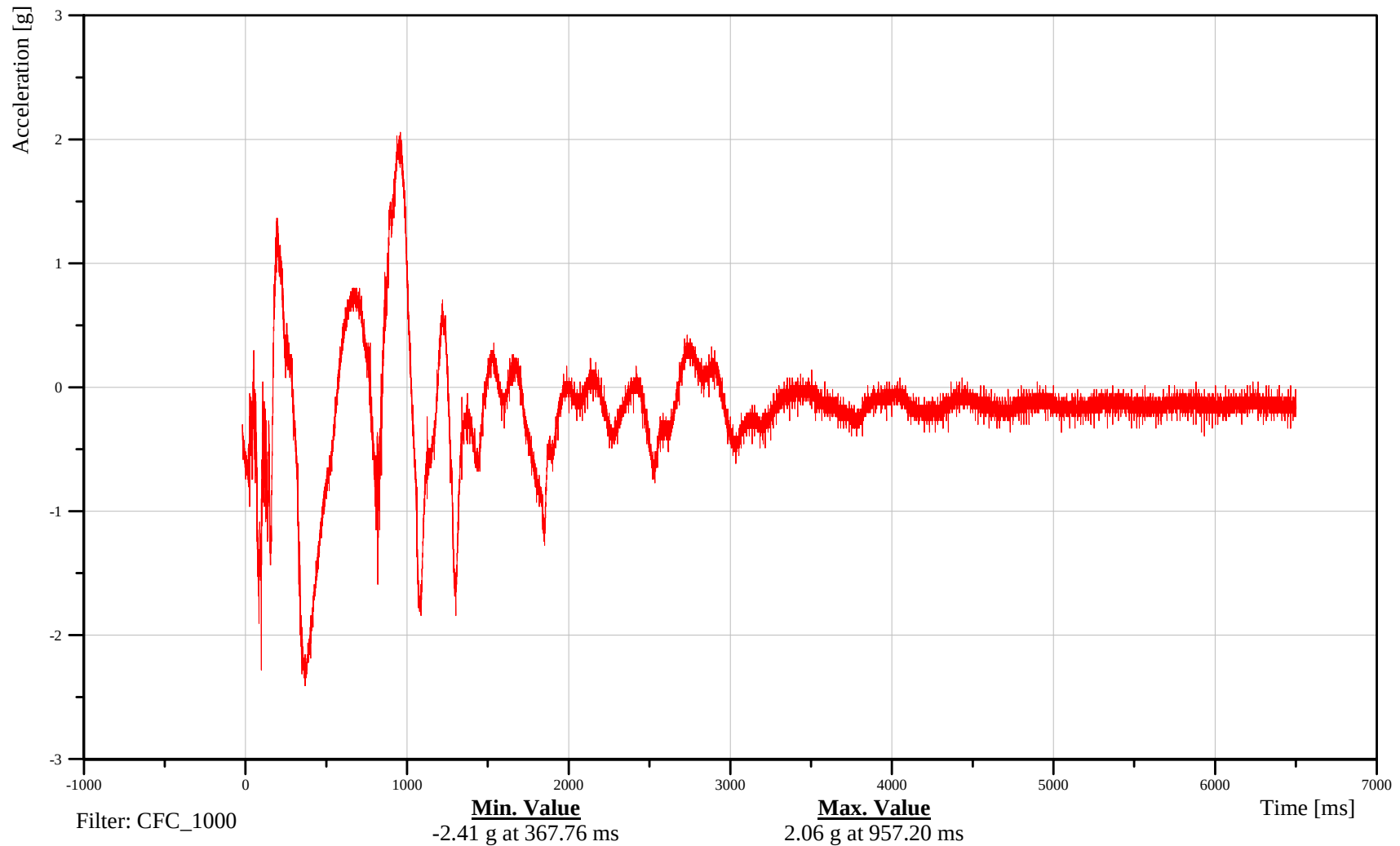
Time: 15:17

Customer: VRTC

14HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-61

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Y-Axis Acceleration

Date: 02/03/2010

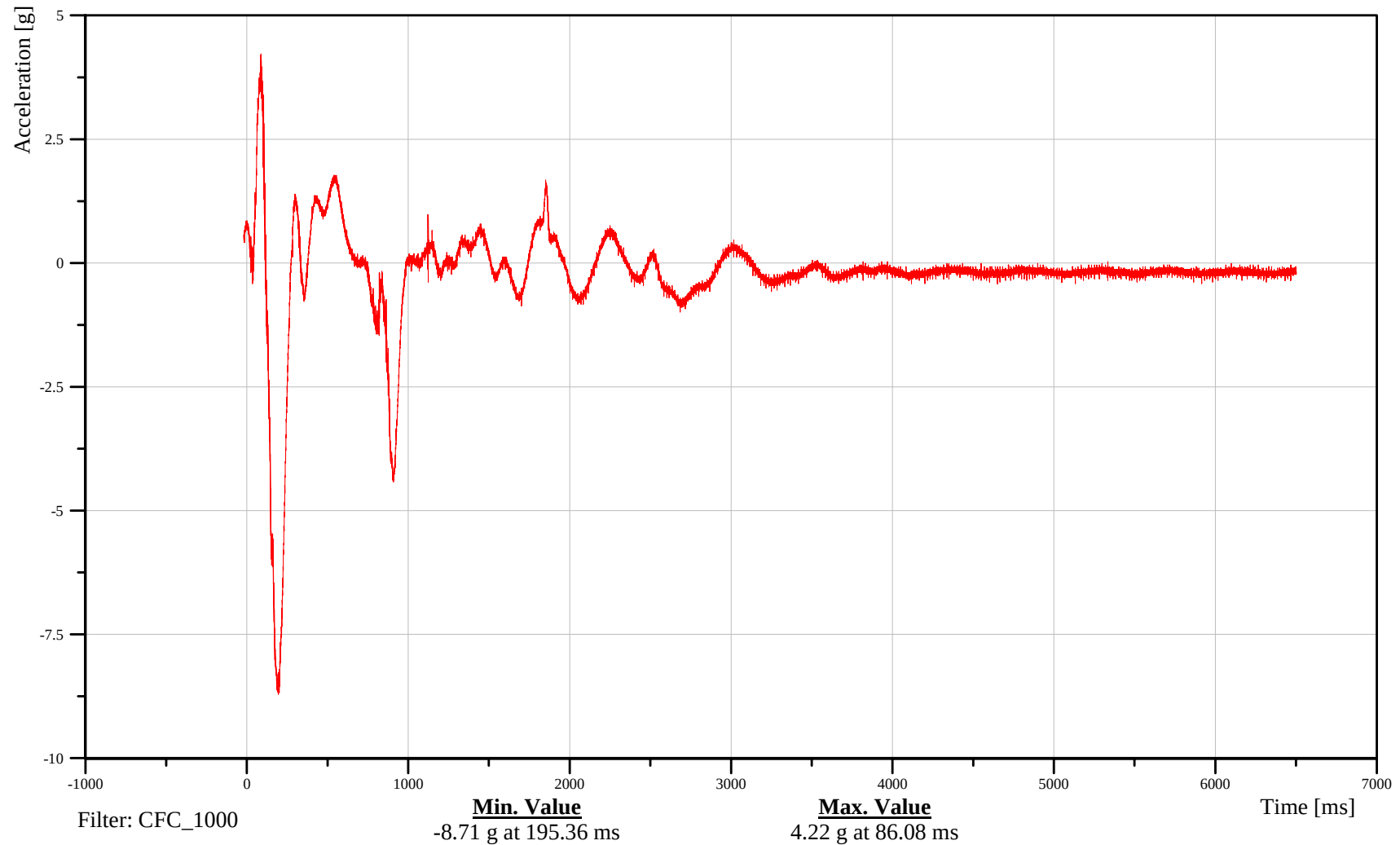
Time: 15:17

Customer: VRTC

14HEADCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-62

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Z-Axis Acceleration

Date: 02/03/2010

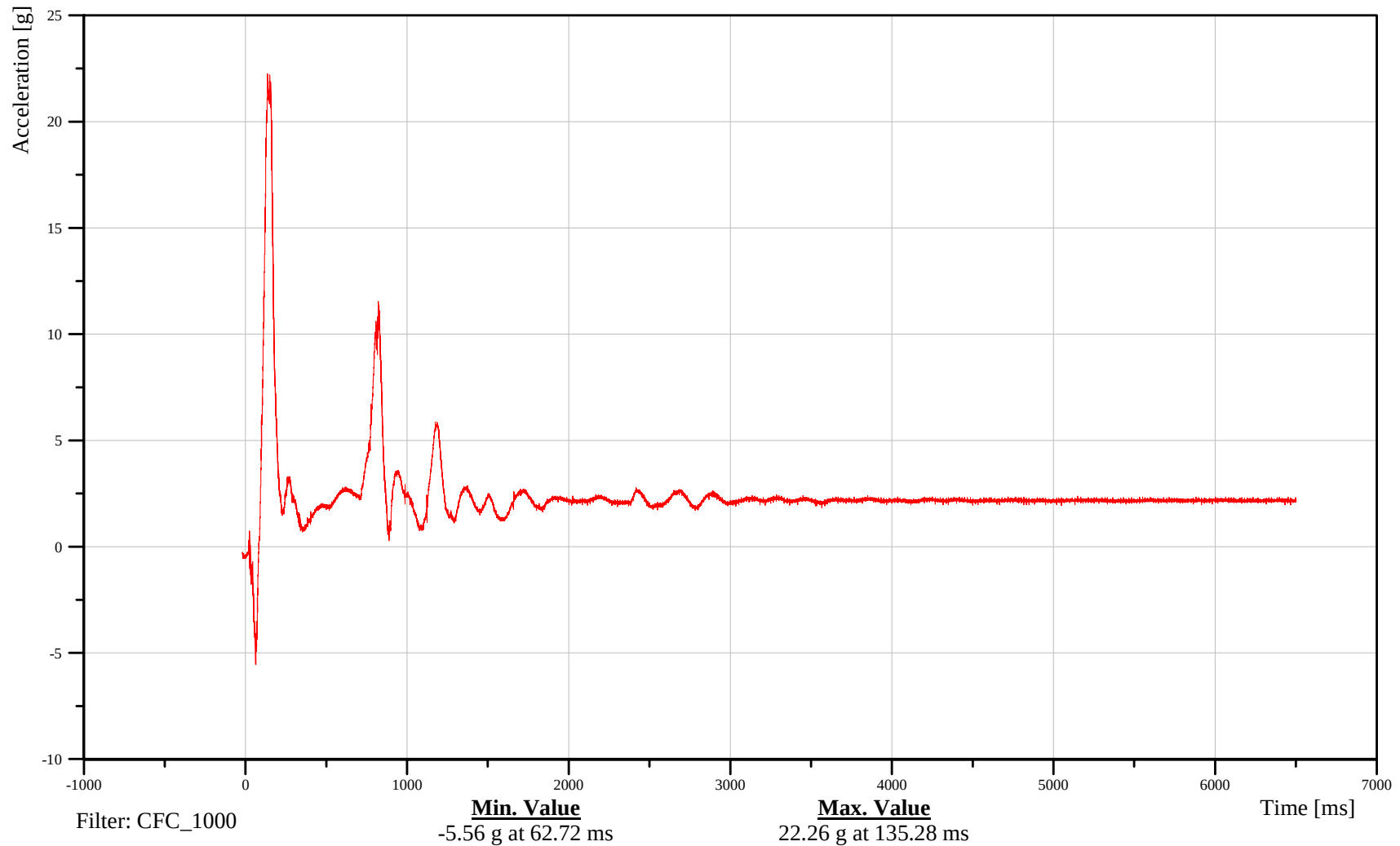
Time: 15:17

Customer: VRTC

14HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-63

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Resultant Acceleration

Date: 02/03/2010

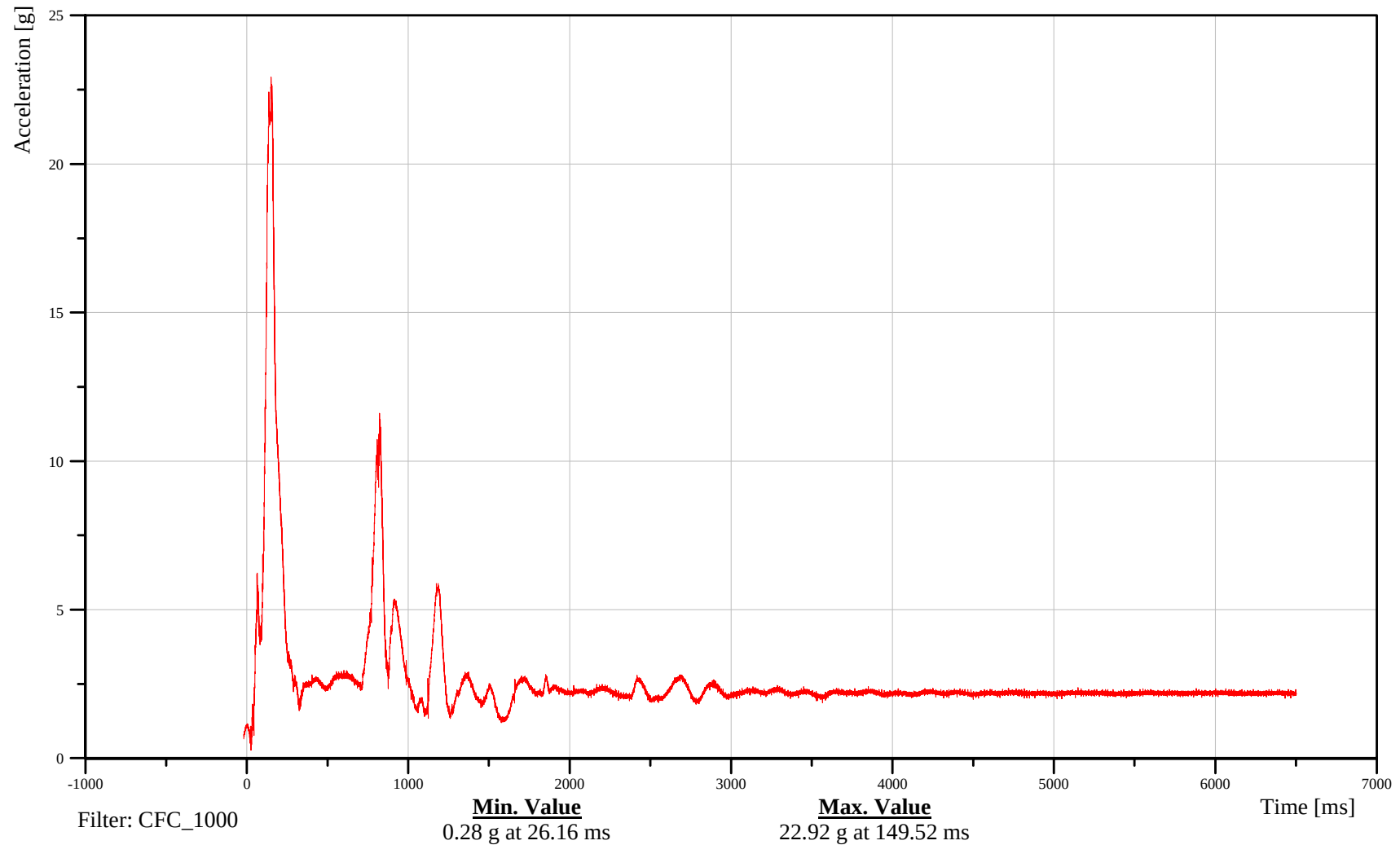
Time: 15:17

Customer: VRTC

14HEADCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-64

100203



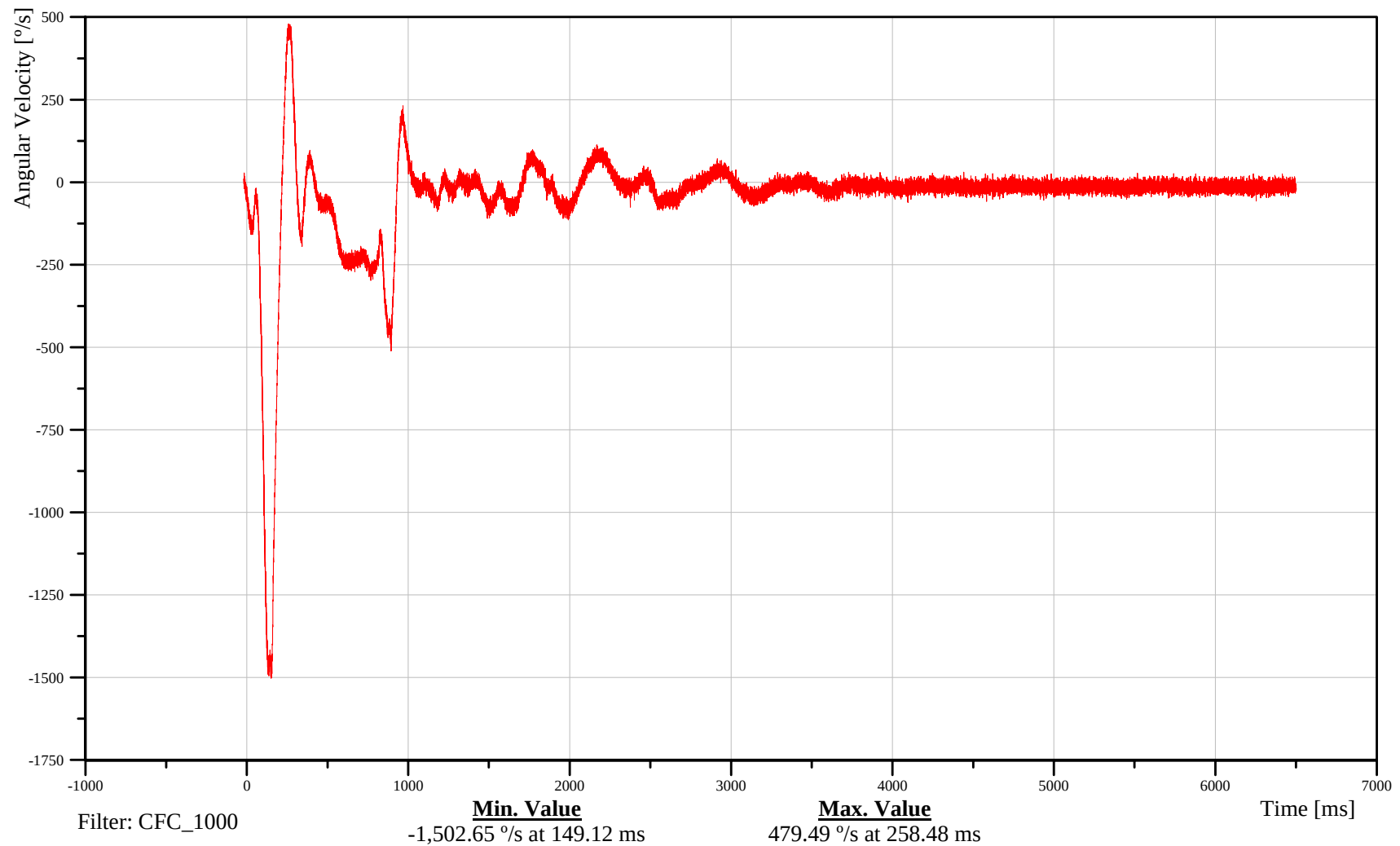
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Head (DTS ARS) Rate Gyro X

Date: 02/03/2010
Time: 15:17

Customer: VRTC

14HEADCG00H3AVXA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-65

100203



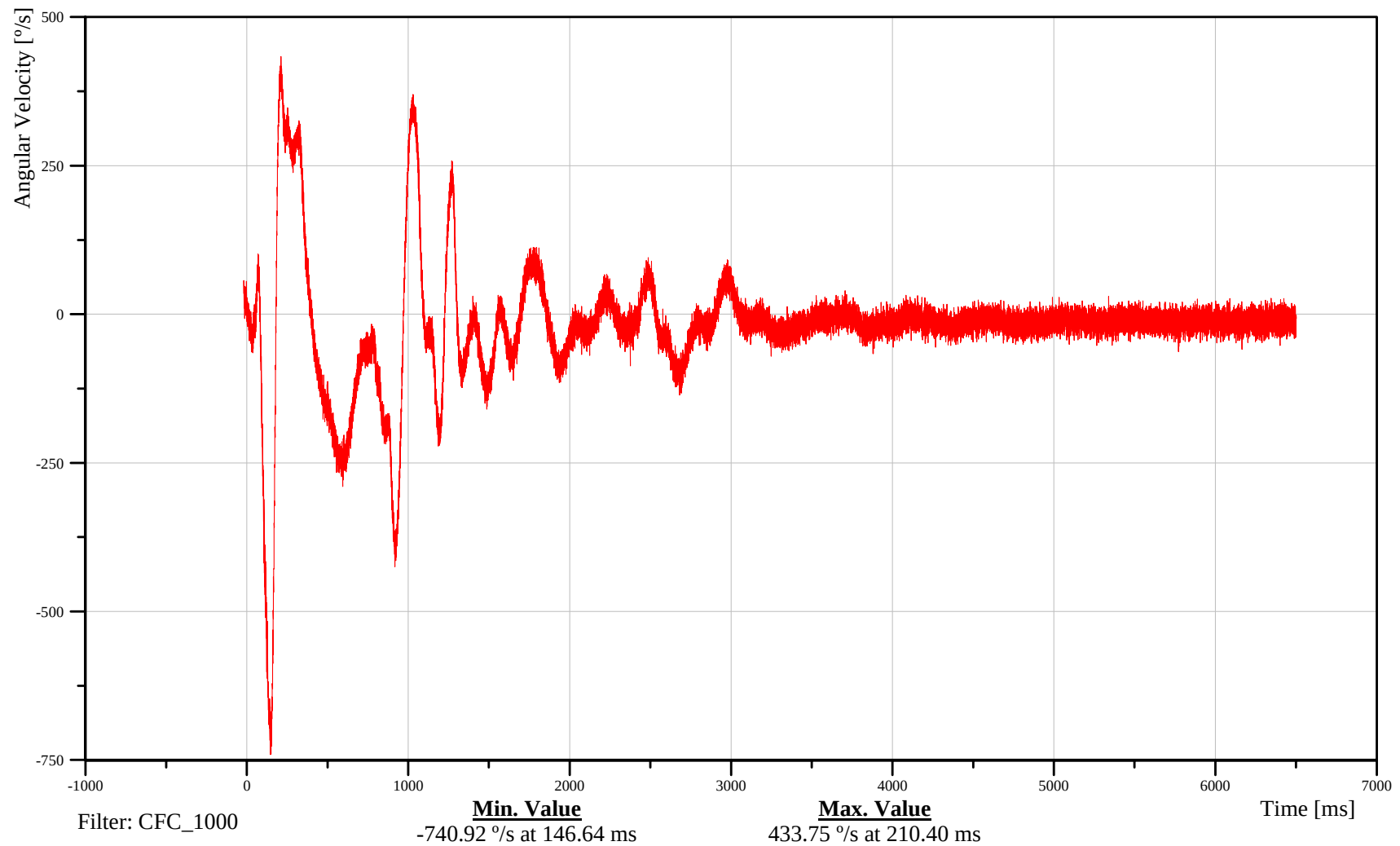
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Head (DTS ARS) Rate Gyro Y

Date: 02/03/2010
Time: 15:17

Customer: VRTC

14HEADCG00H3AVYA

TRC Inc. Test Lab: CTF
Test Number: 100203



B-66

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head (DTS ARS) Rate Gyro Z

Date: 02/03/2010

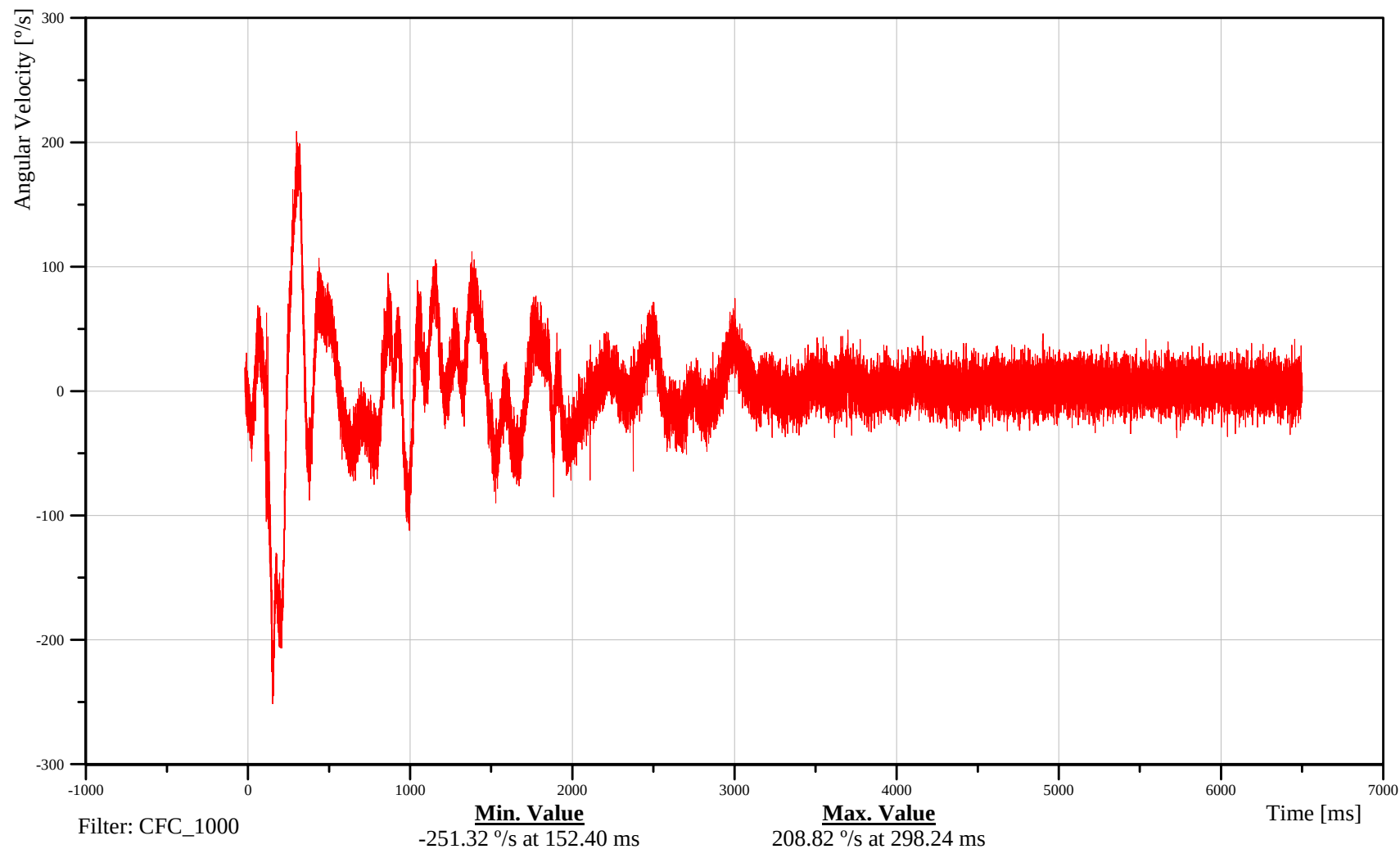
Time: 15:17

Customer: VRTC

14HEADCG00H3AVZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-67

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Upper Neck X-Axis Force

Date: 02/03/2010

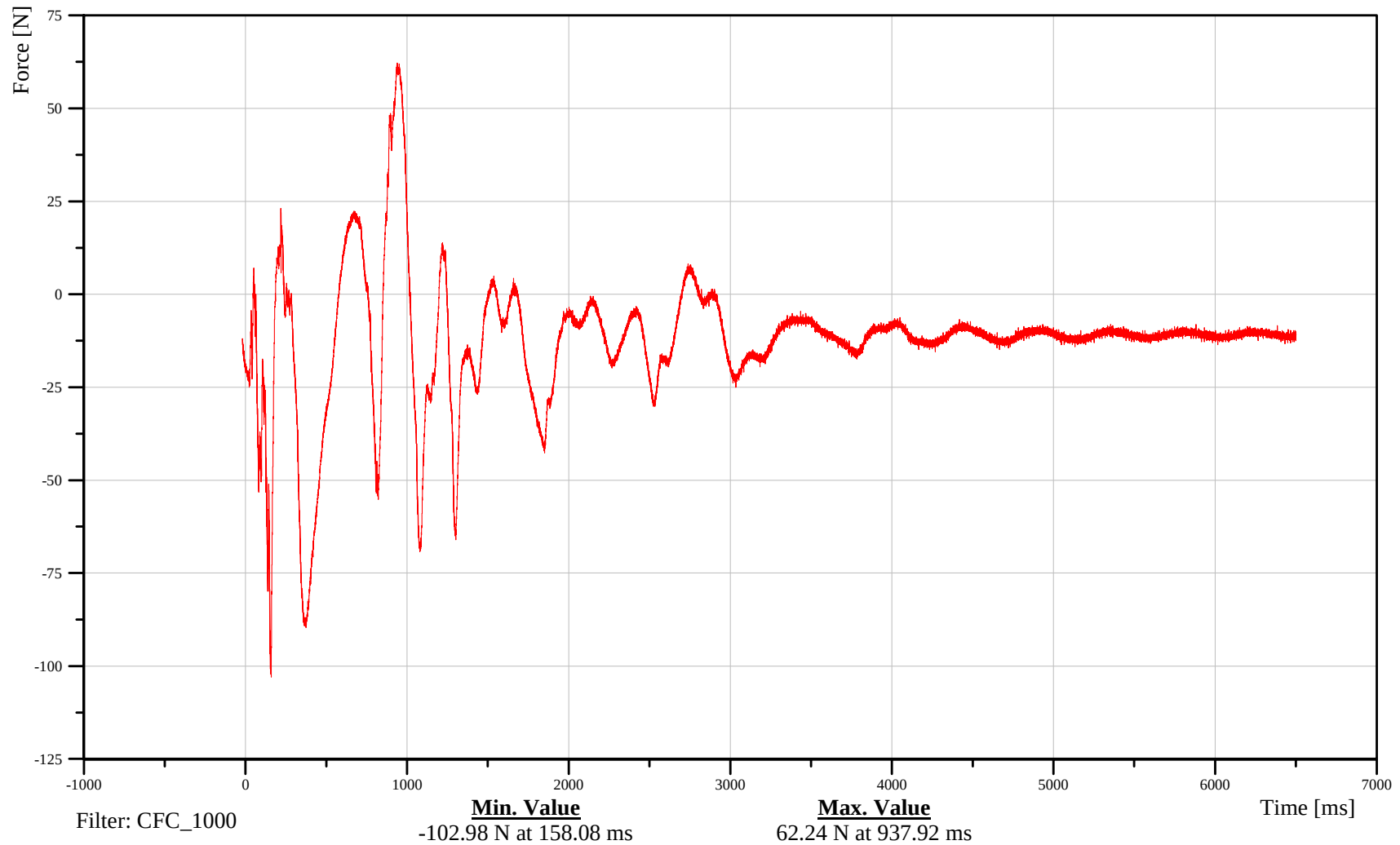
Time: 15:17

Customer: VRTC

14NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-68

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Upper Neck Y-Axis Force

Date: 02/03/2010

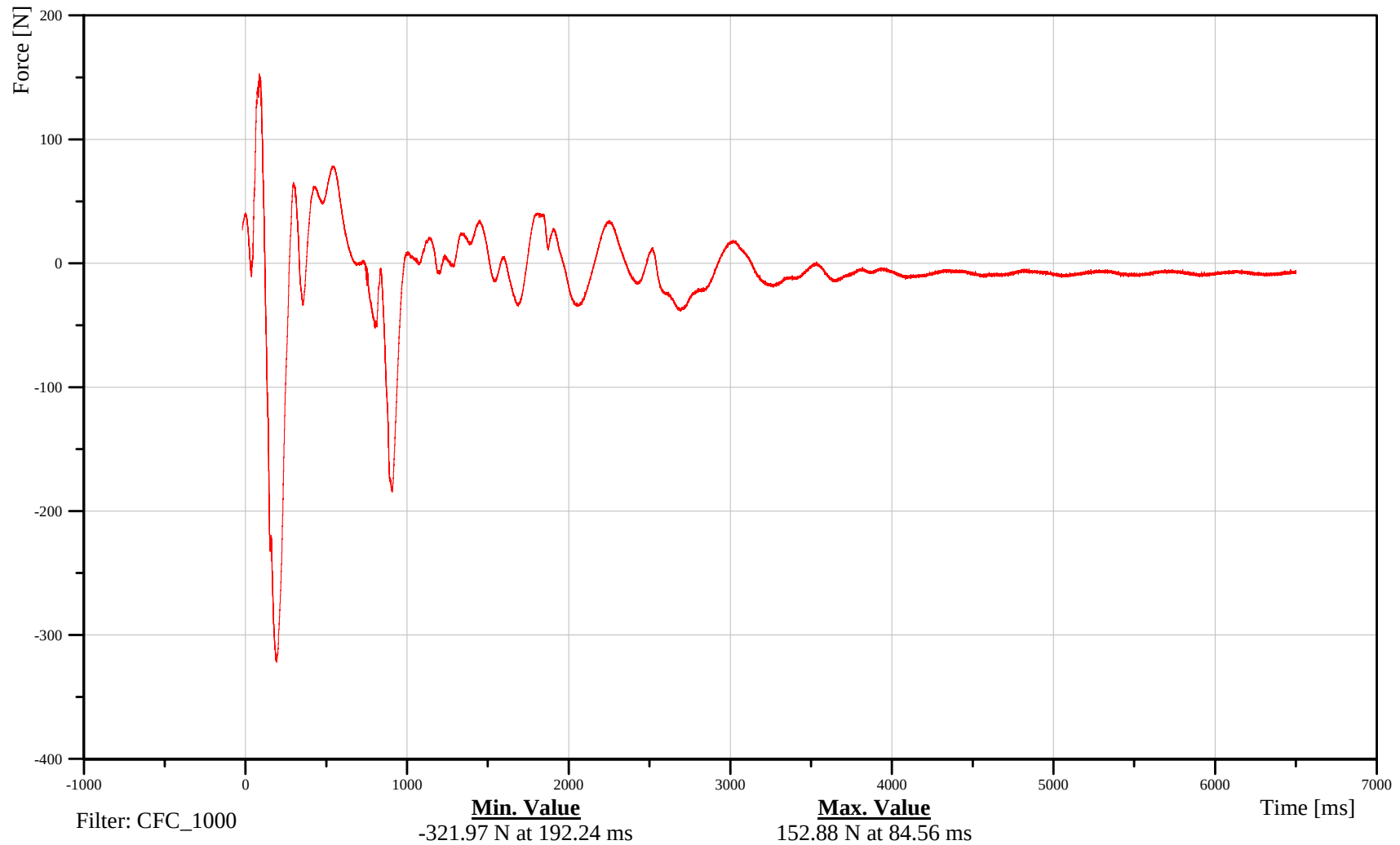
Time: 15:17

Customer: VRTC

14NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-69

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Upper Neck Z-Axis Force

Date: 02/03/2010

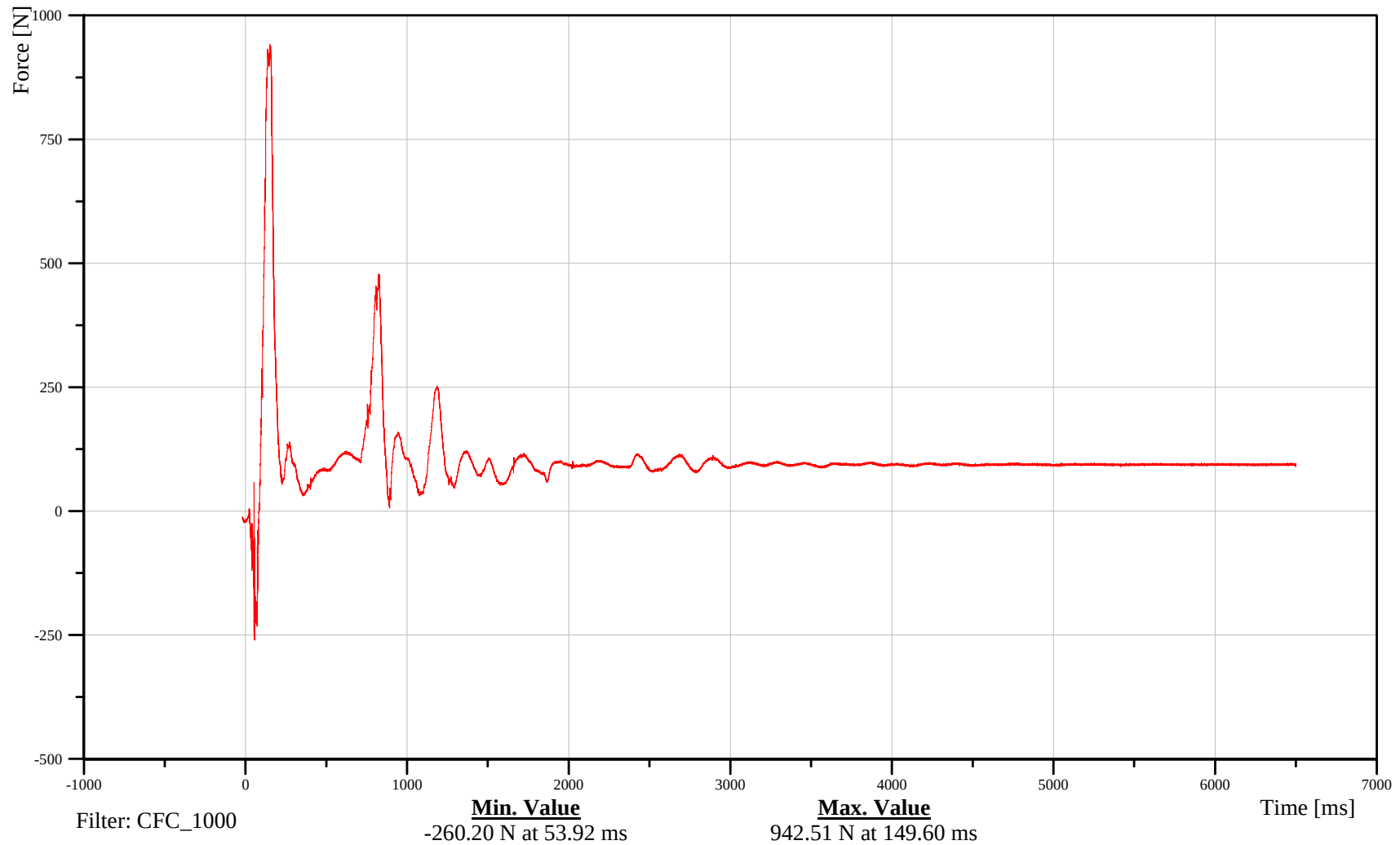
Time: 15:17

Customer: VRTC

14NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-70

100203



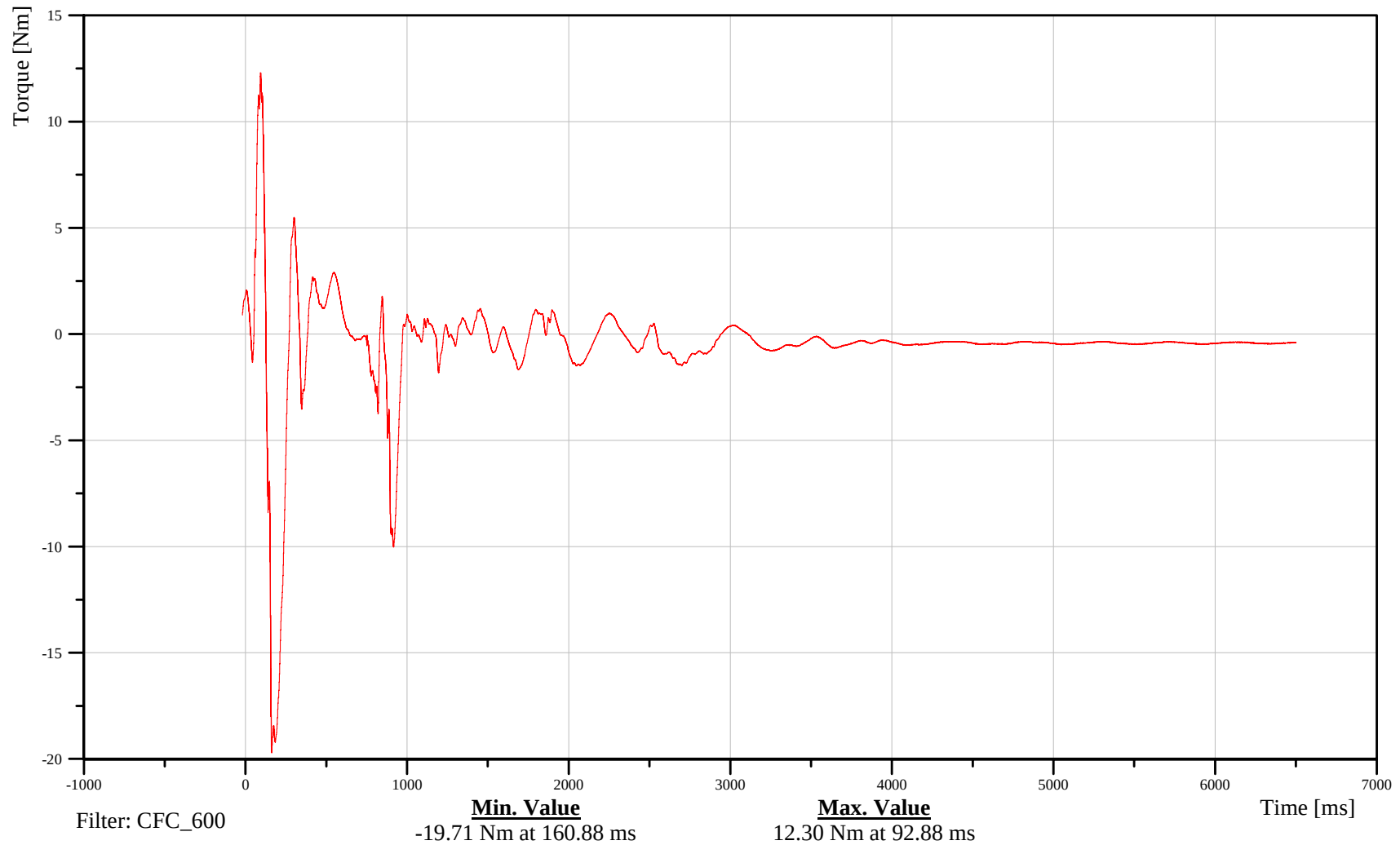
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Upper Neck Moment About X Axis

Date: 02/03/2010
Time: 15:17

Customer: VRTC

14NECKUP00H3MOXB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-71

100203



Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Upper Neck Moment About Y Axis

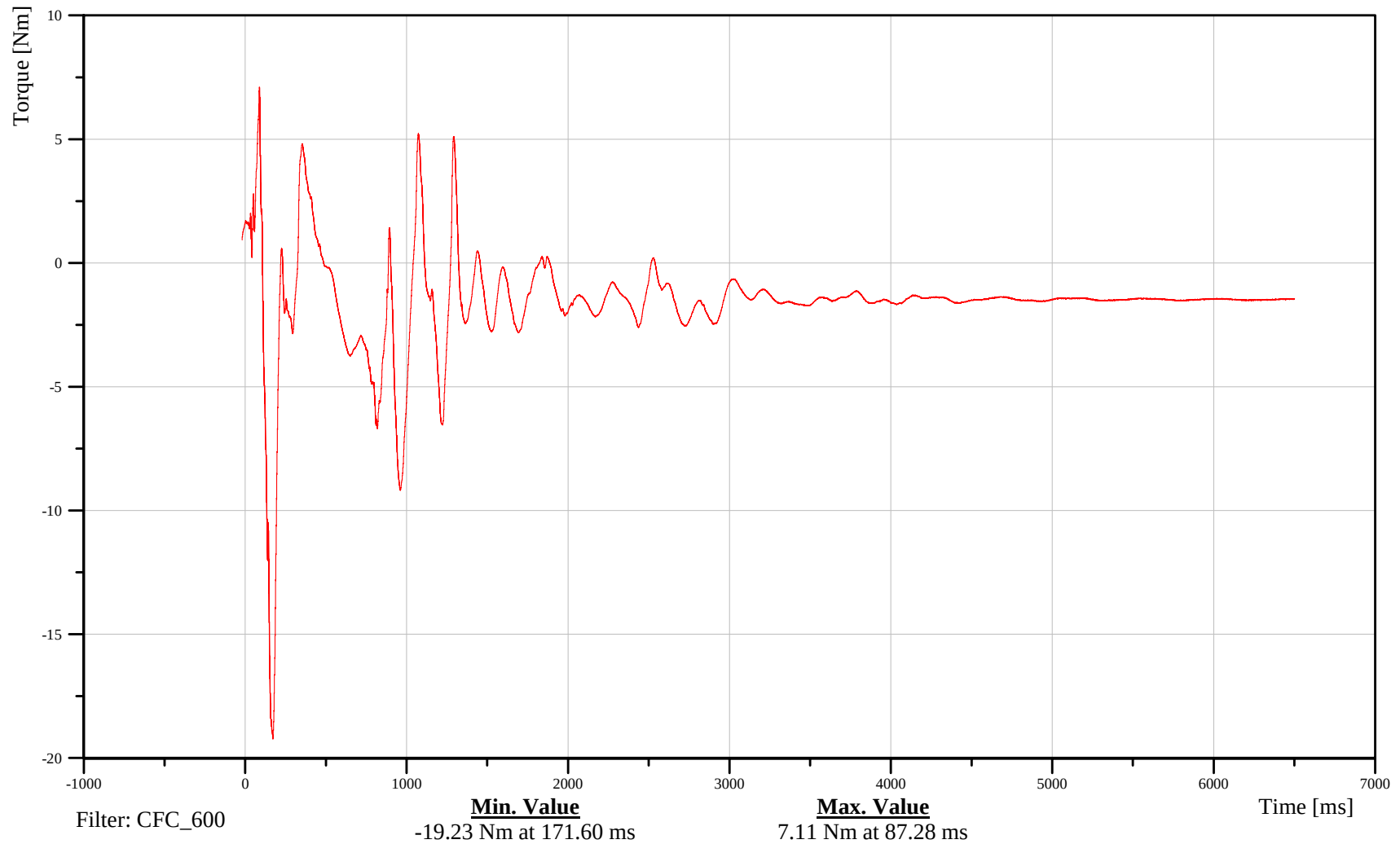
Date: 02/03/2010
Time: 15:17

Customer: VRTC

14NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-72

100203



Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Upper Neck Moment About Z Axis

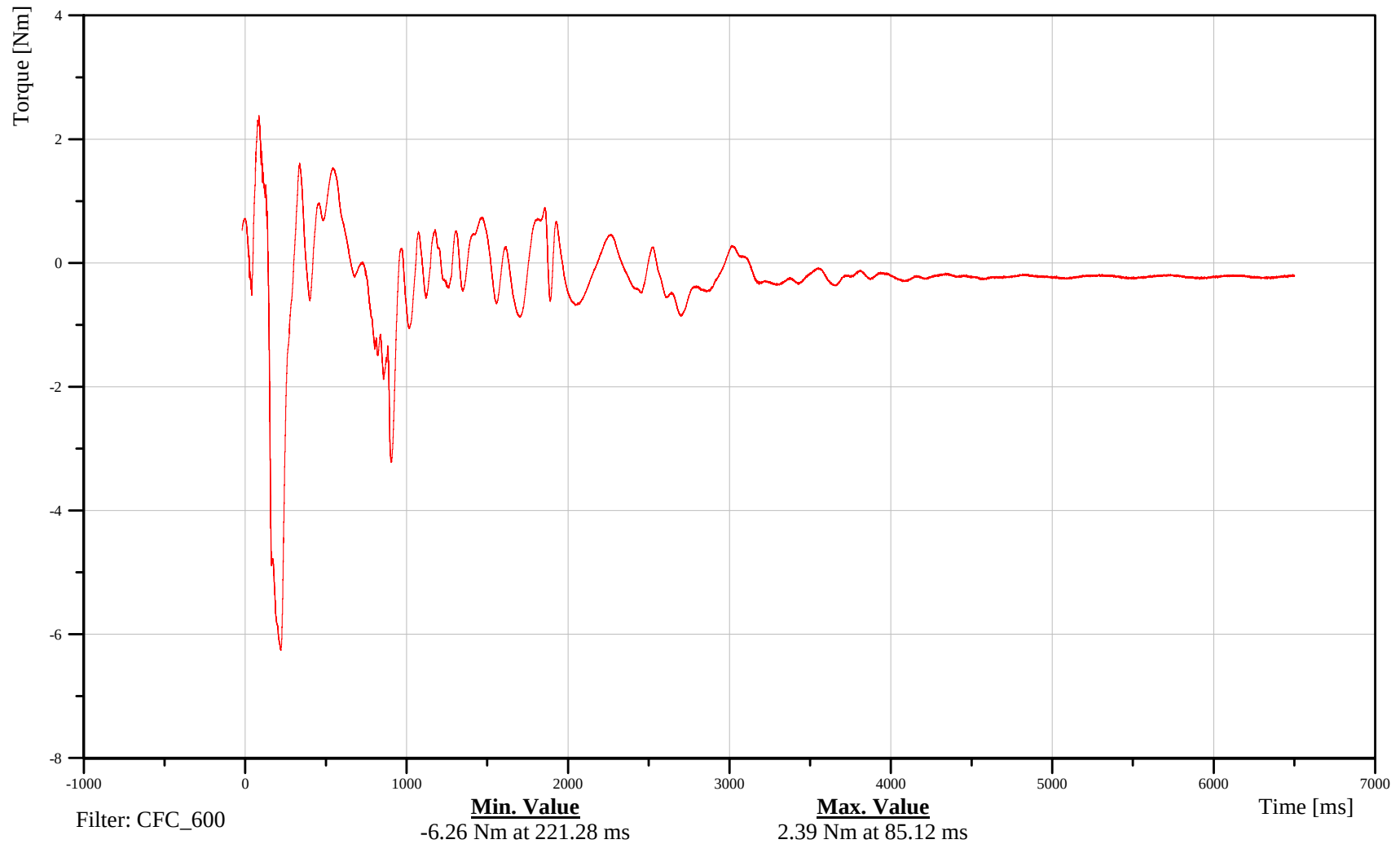
Date: 02/03/2010
Time: 15:17

Customer: VRTC

14NECKUP00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-73

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest X-Axis Acceleration

Date: 02/03/2010

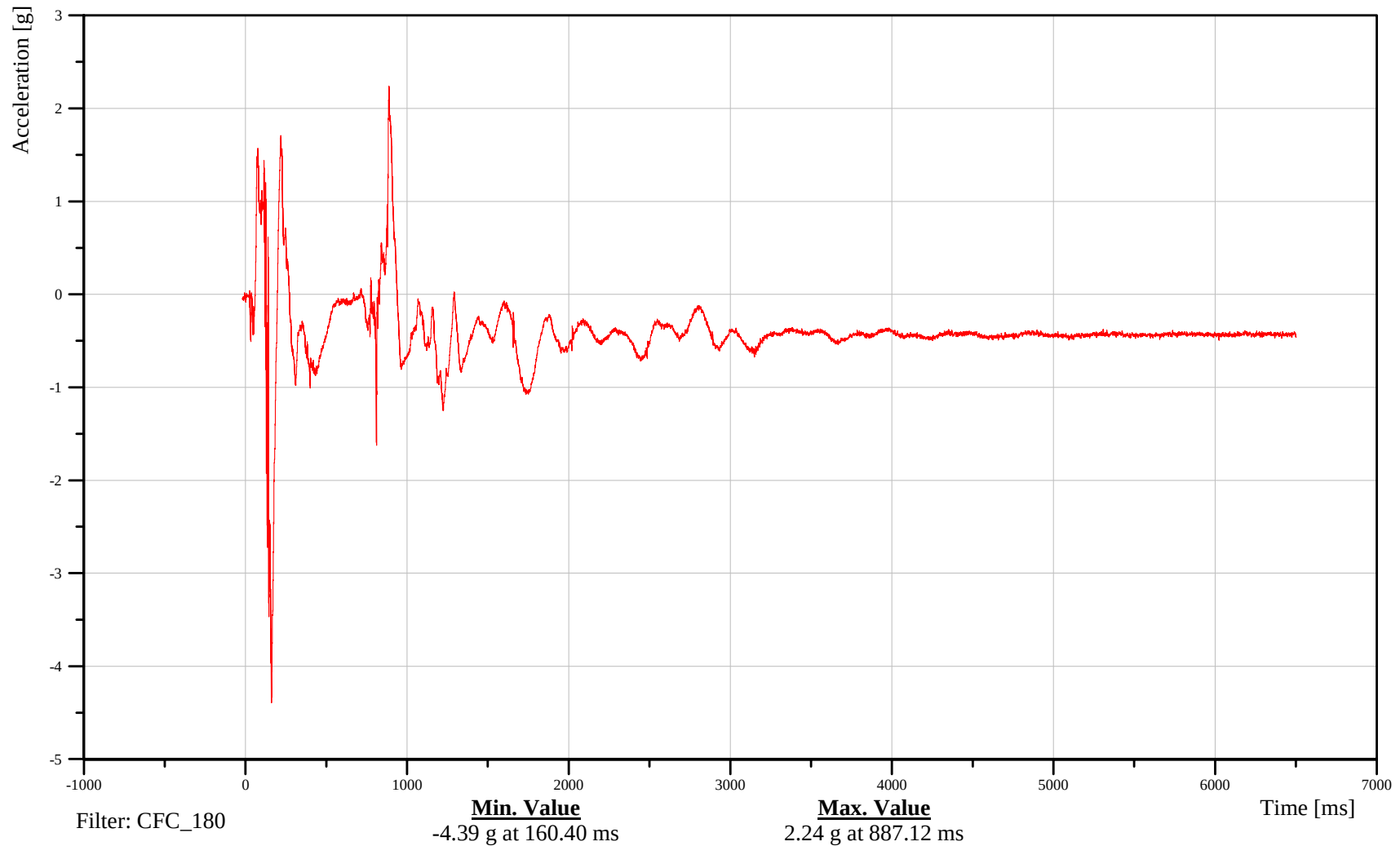
Time: 15:17

Customer: VRTC

14CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100203



B-74

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest Y-Axis Acceleration

Date: 02/03/2010

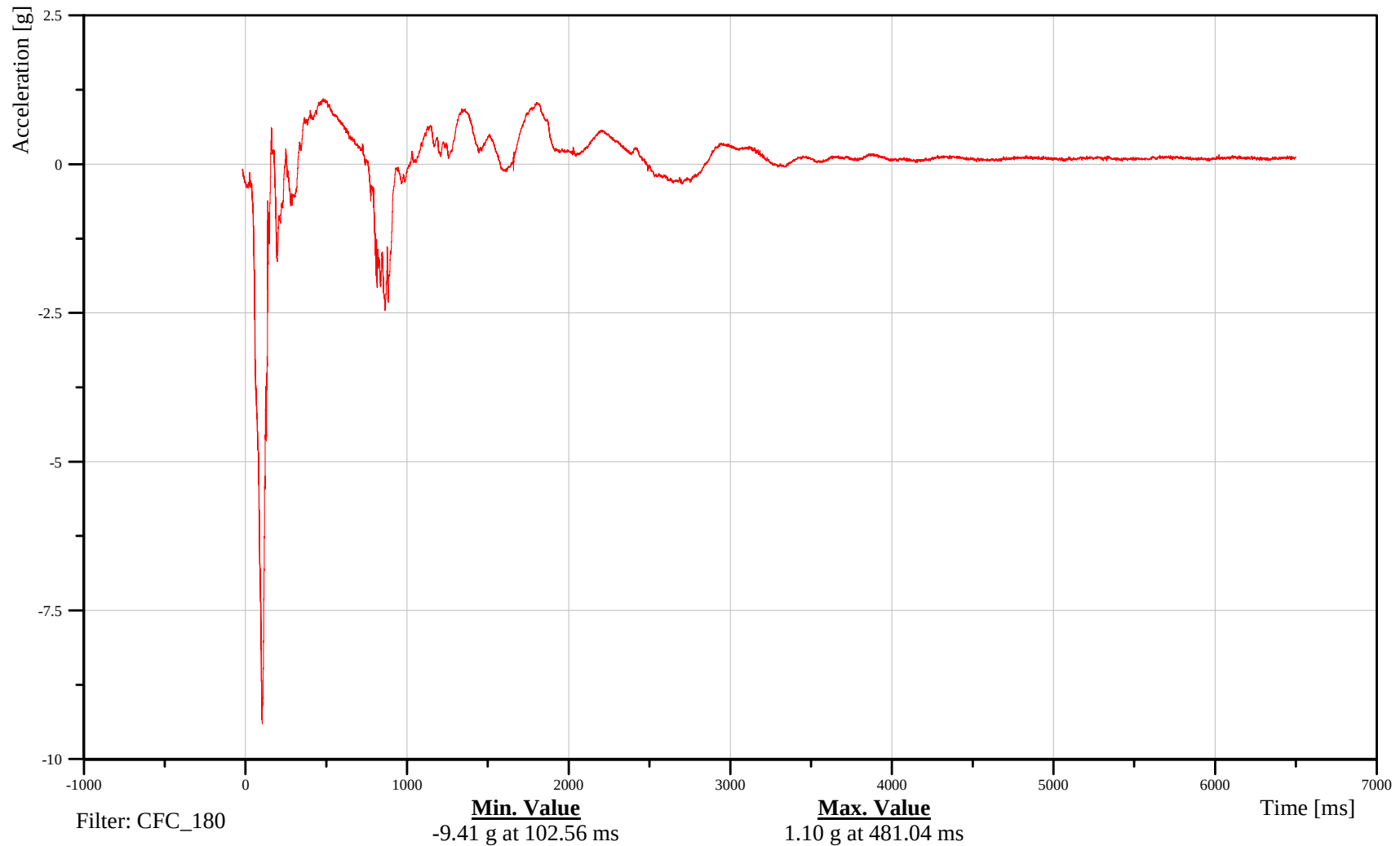
Time: 15:17

Customer: VRTC

14CHSTCG00H3ACYC

TRC Inc. Test Lab: CTF

Test Number: 100203



B-75

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest Z-Axis Acceleration

Date: 02/03/2010

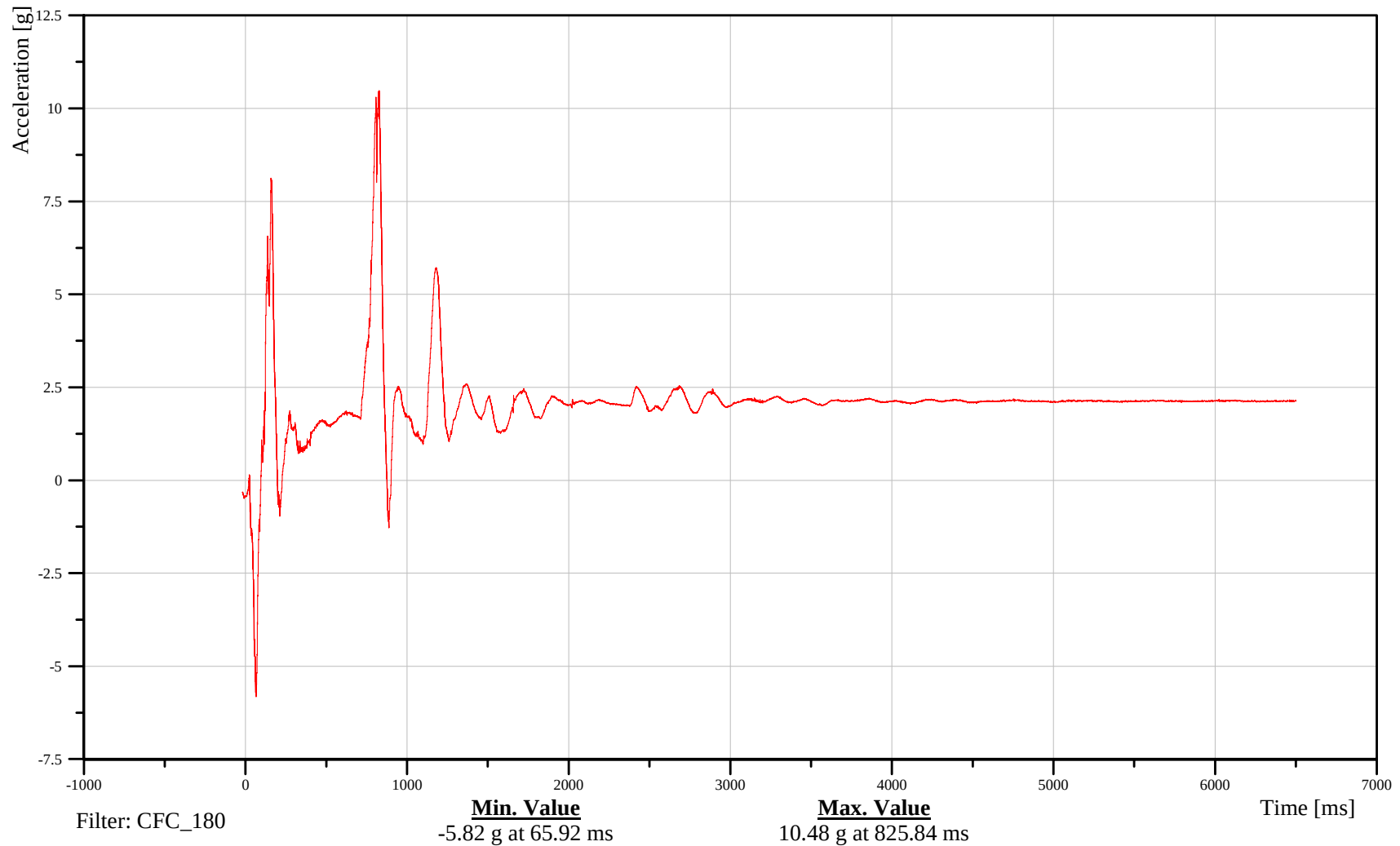
Time: 15:17

Customer: VRTC

14CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100203



B-76

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest Resultant Acceleration

Date: 02/03/2010

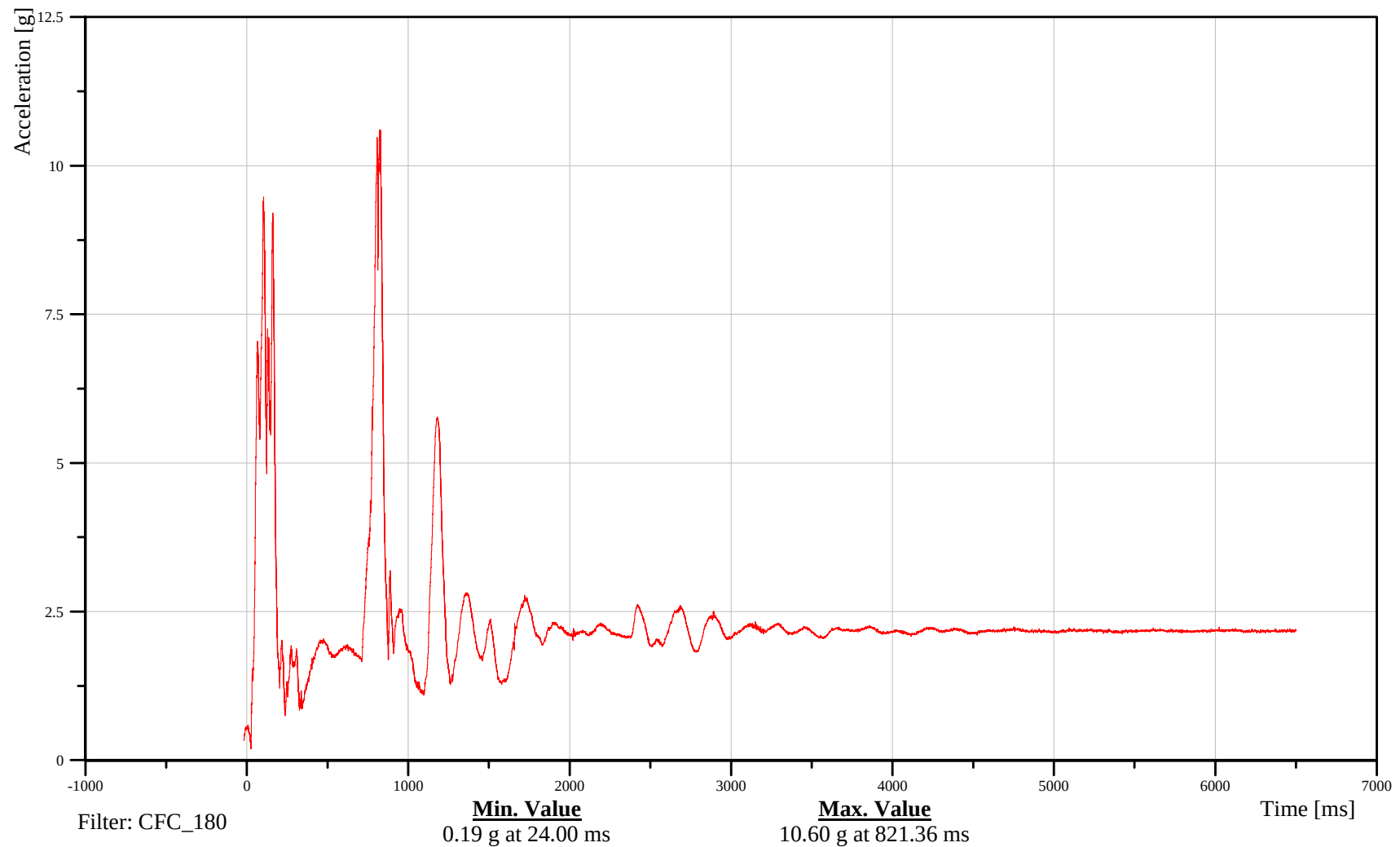
Time: 15:17

Customer: VRTC

14CHSTCG00H3ACRC

TRC Inc. Test Lab: CTF

Test Number: 100203



B-77

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest X-Axis Displacement

Date: 02/03/2010

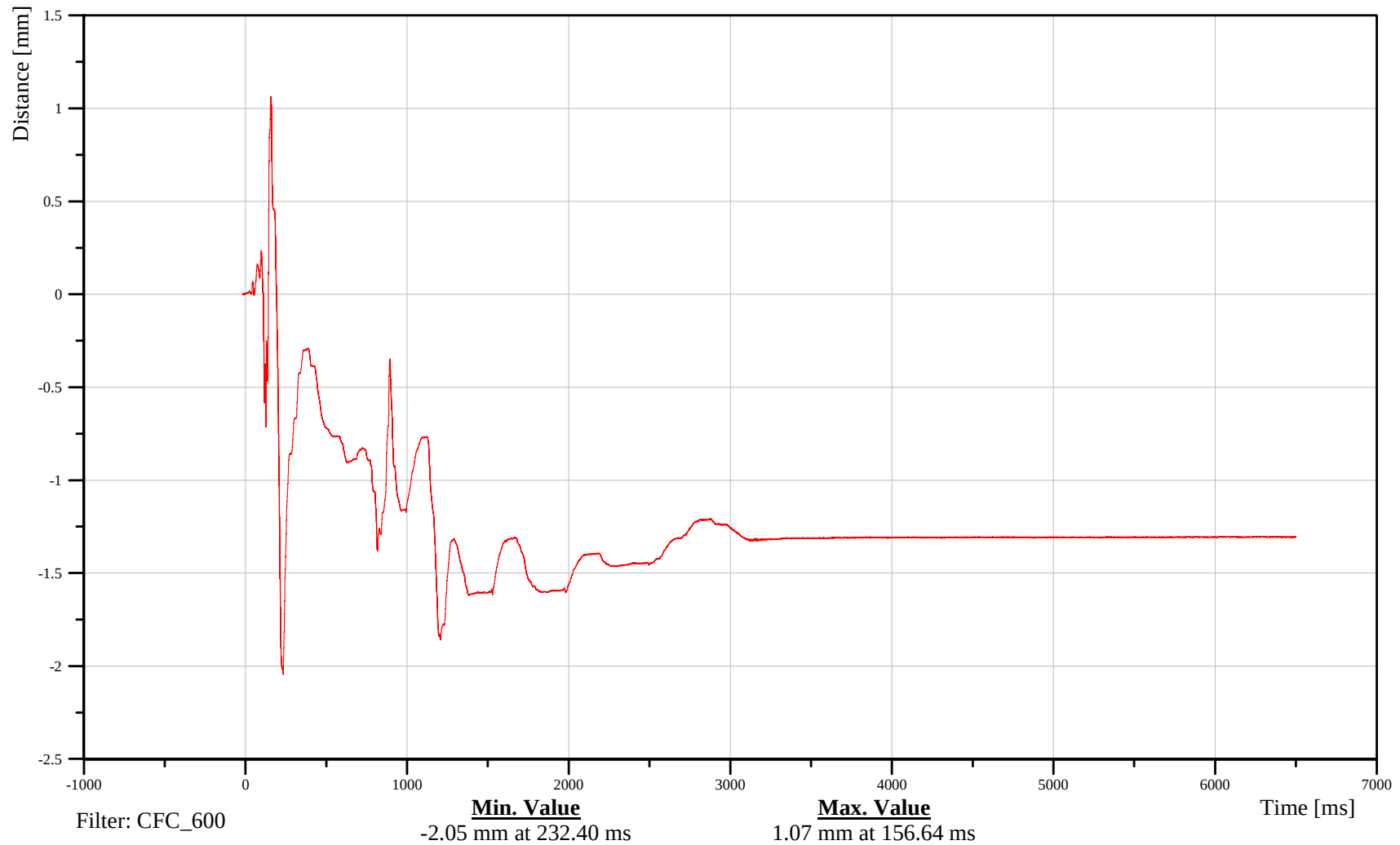
Time: 15:17

Customer: VRTC

14CHST0000H3DSXB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-78

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis X-Axis Acceleration

Date: 02/03/2010

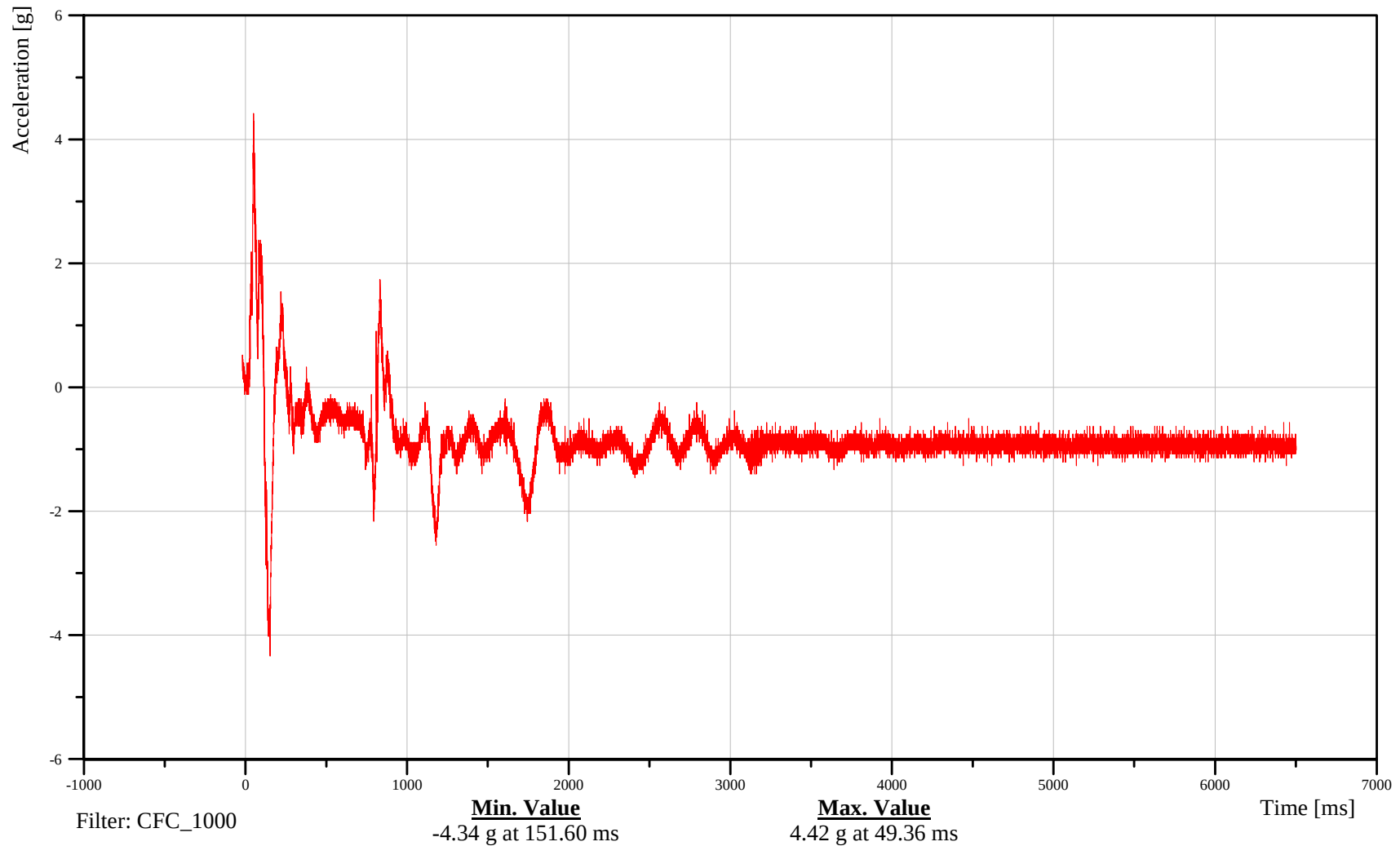
Time: 15:17

Customer: VRTC

14PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-79

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Y-Axis Acceleration

Date: 02/03/2010

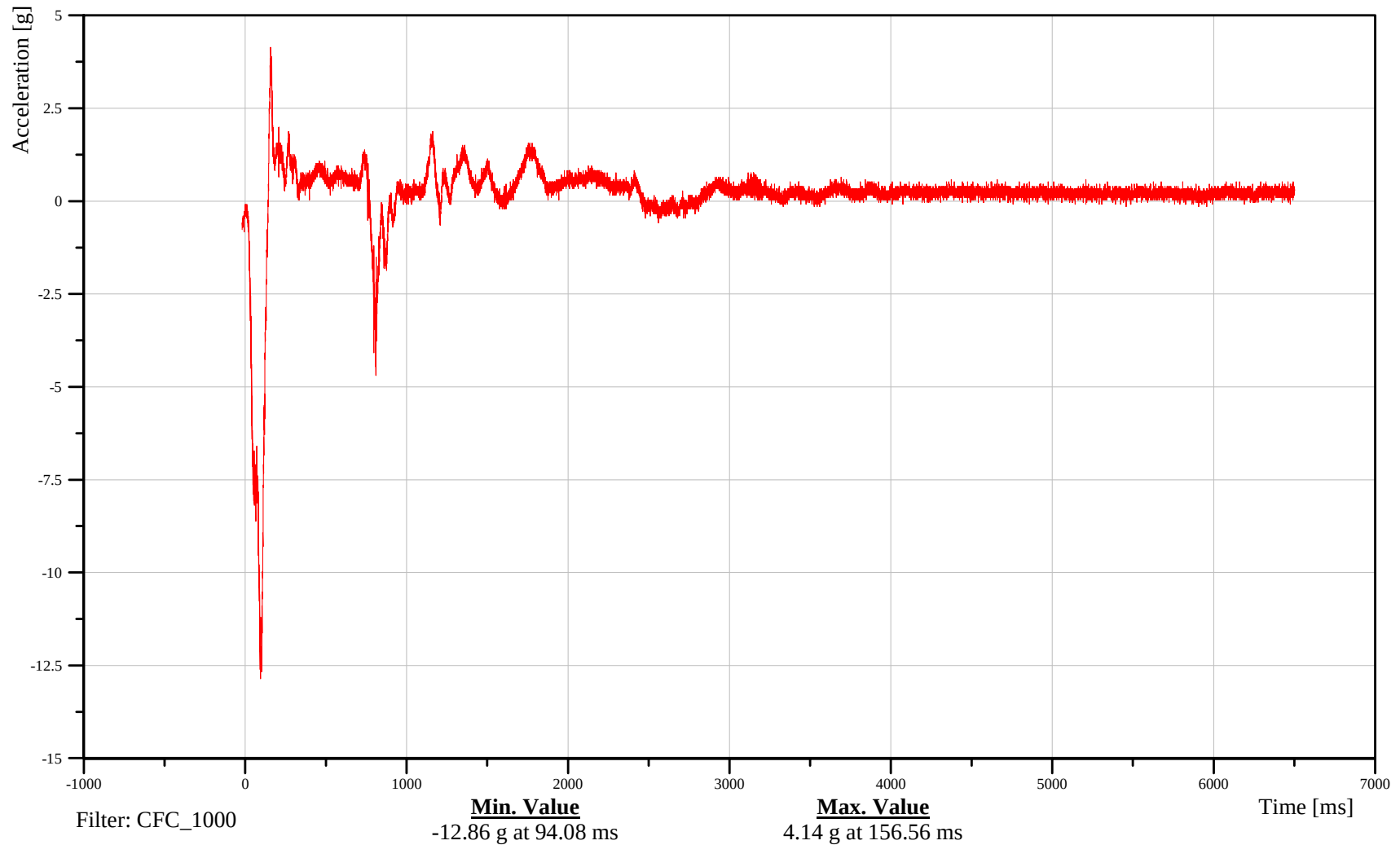
Time: 15:17

Customer: VRTC

14PELVCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-80

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Z-Axis Acceleration

Date: 02/03/2010

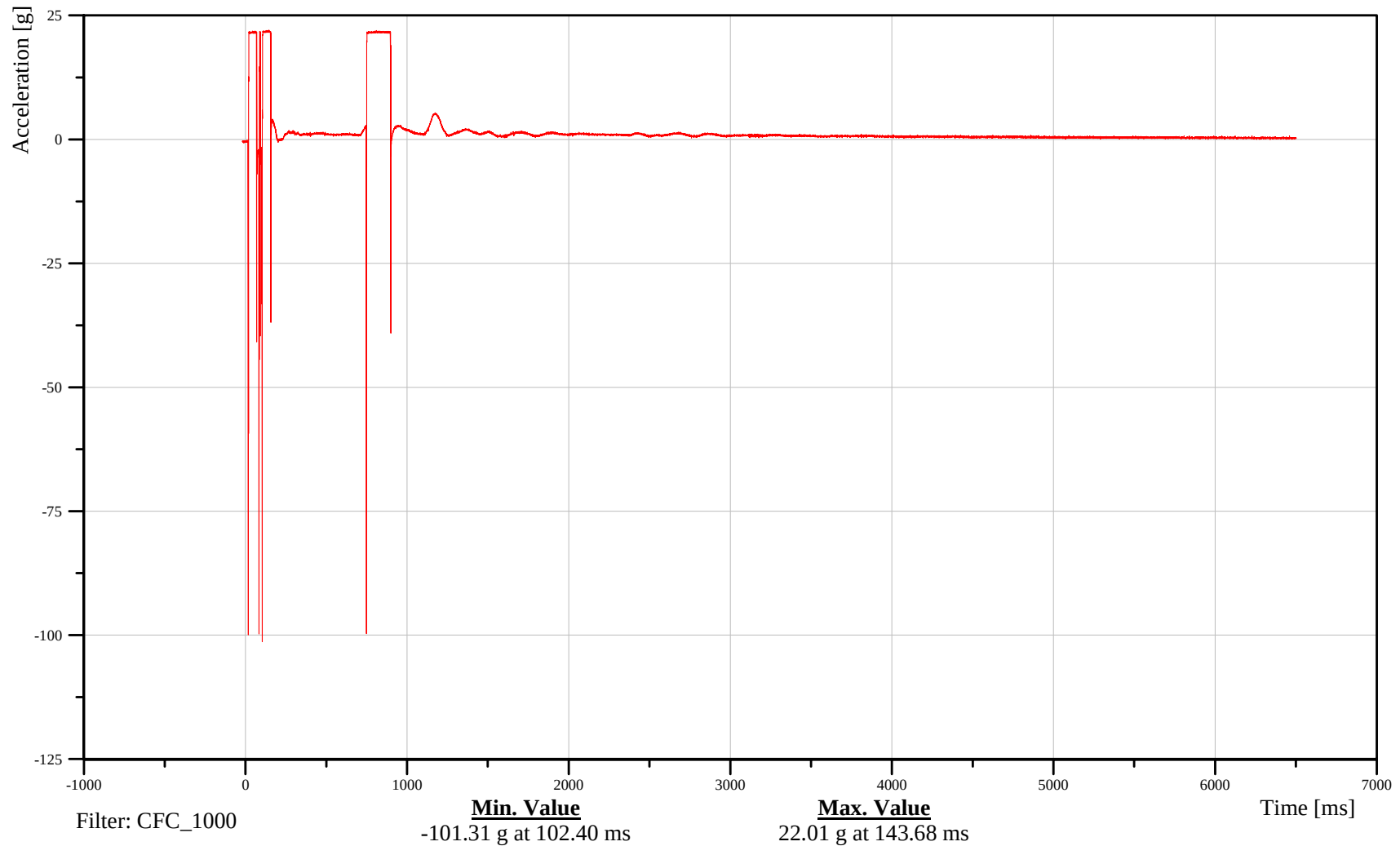
Time: 15:17

Customer: VRTC

14PELVCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-81

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Resultant Acceleration

Date: 02/03/2010

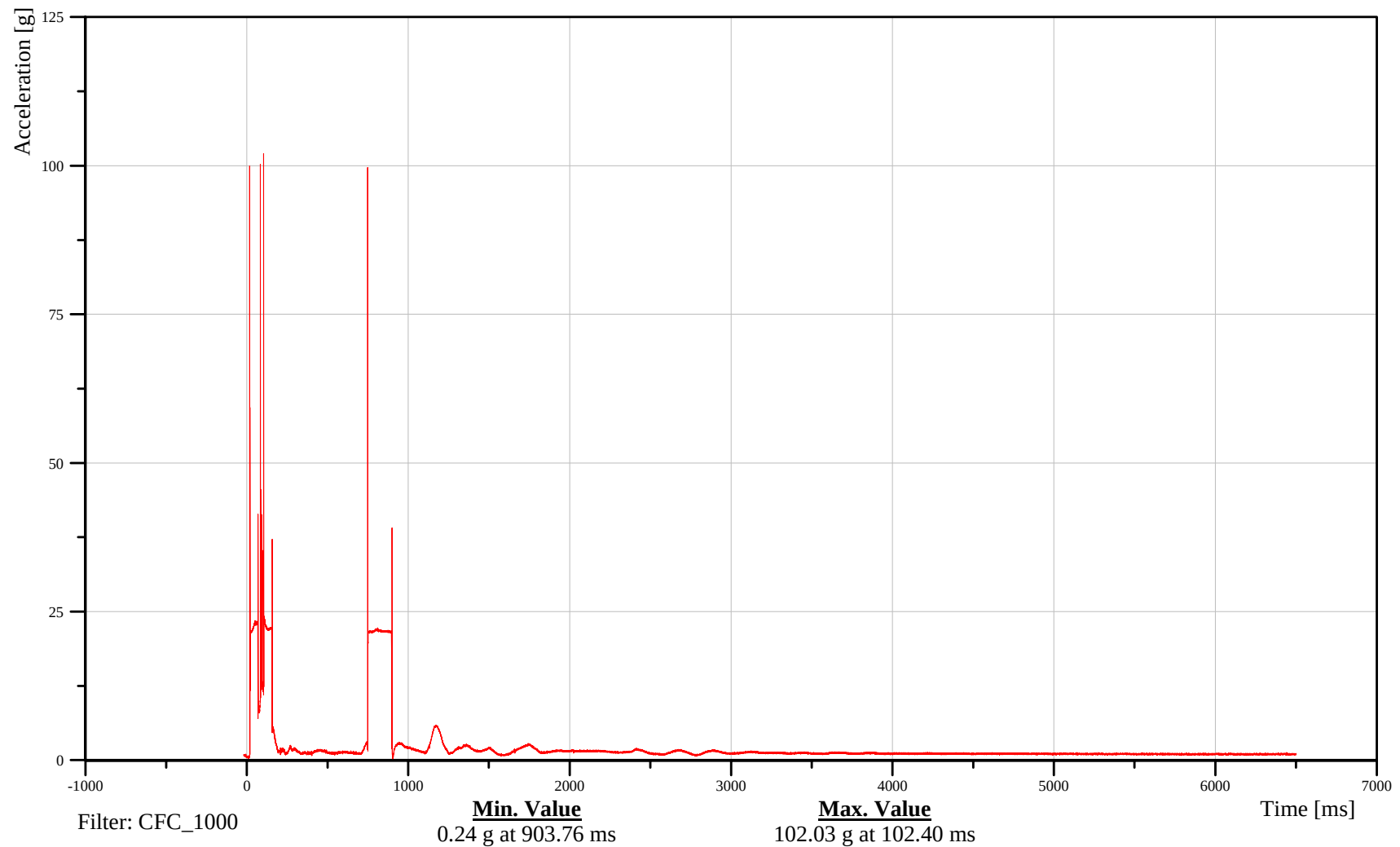
Time: 15:17

Customer: VRTC

14PELVCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-82

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Lower Neck X-Axis Force

Date: 02/03/2010

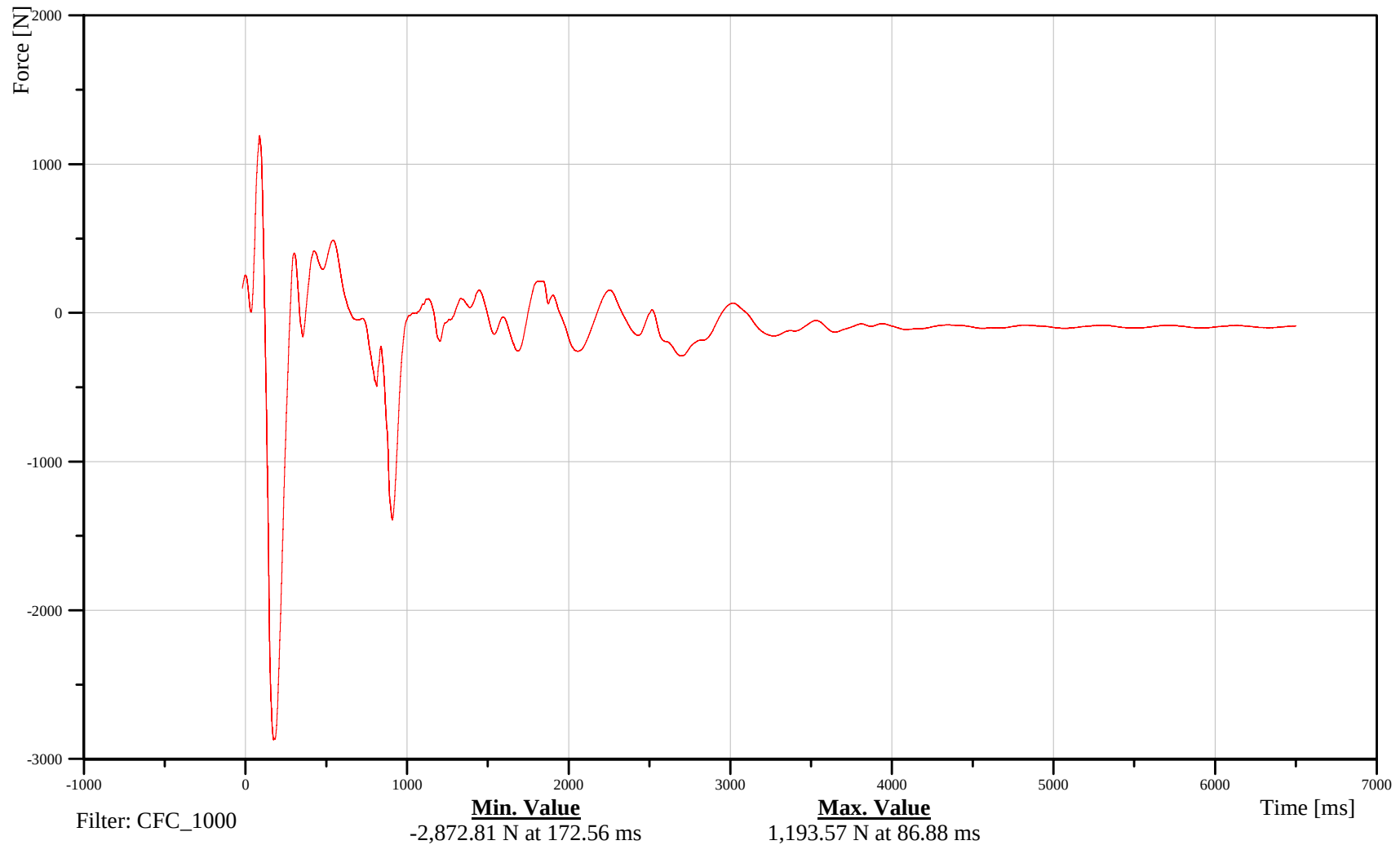
Time: 15:17

Customer: VRTC

14NECKLO00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-83

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Lower Neck Y-Axis Force

Date: 02/03/2010

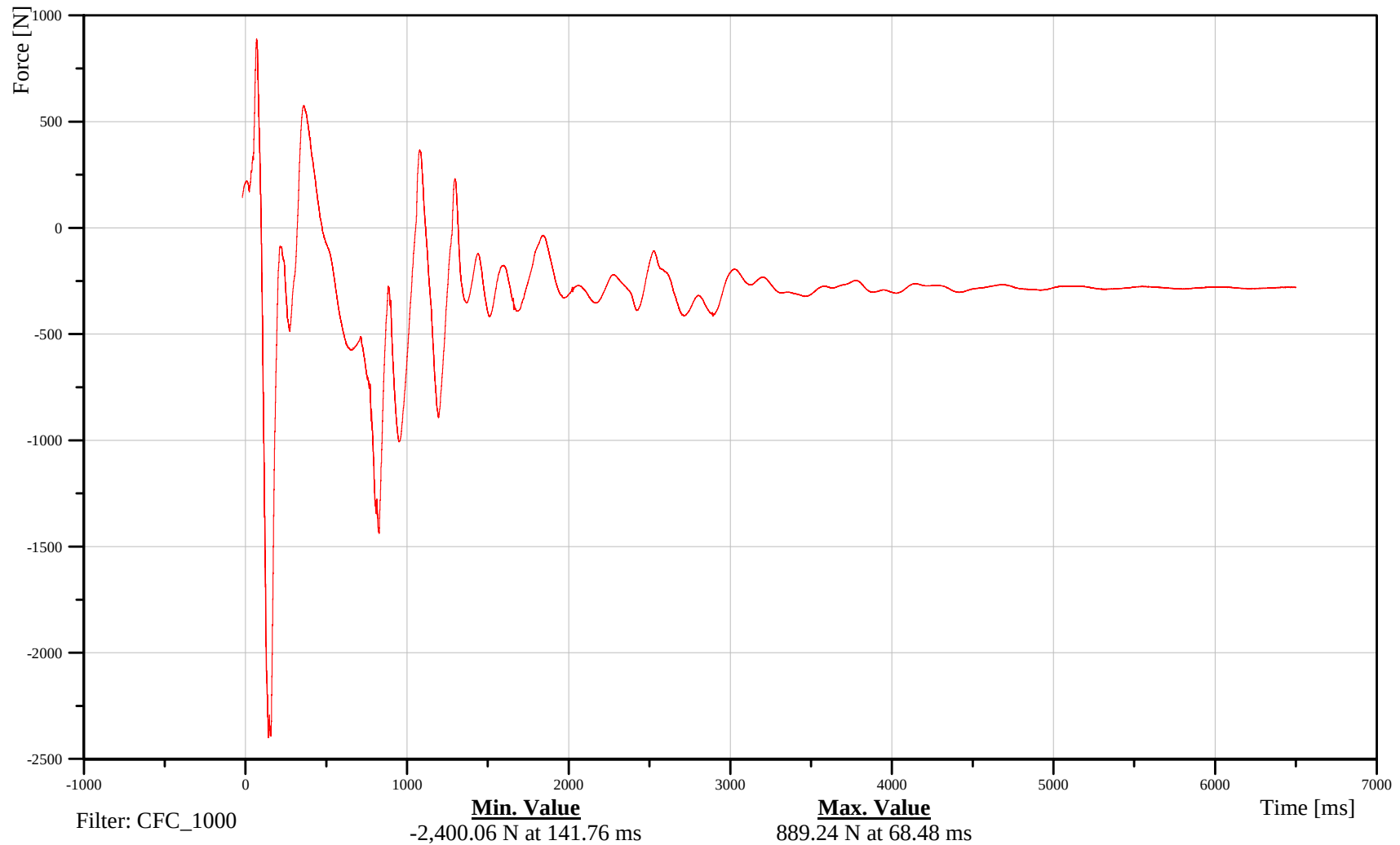
Time: 15:17

Customer: VRTC

14NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-84

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Lower Neck Z-Axis Force

Date: 02/03/2010

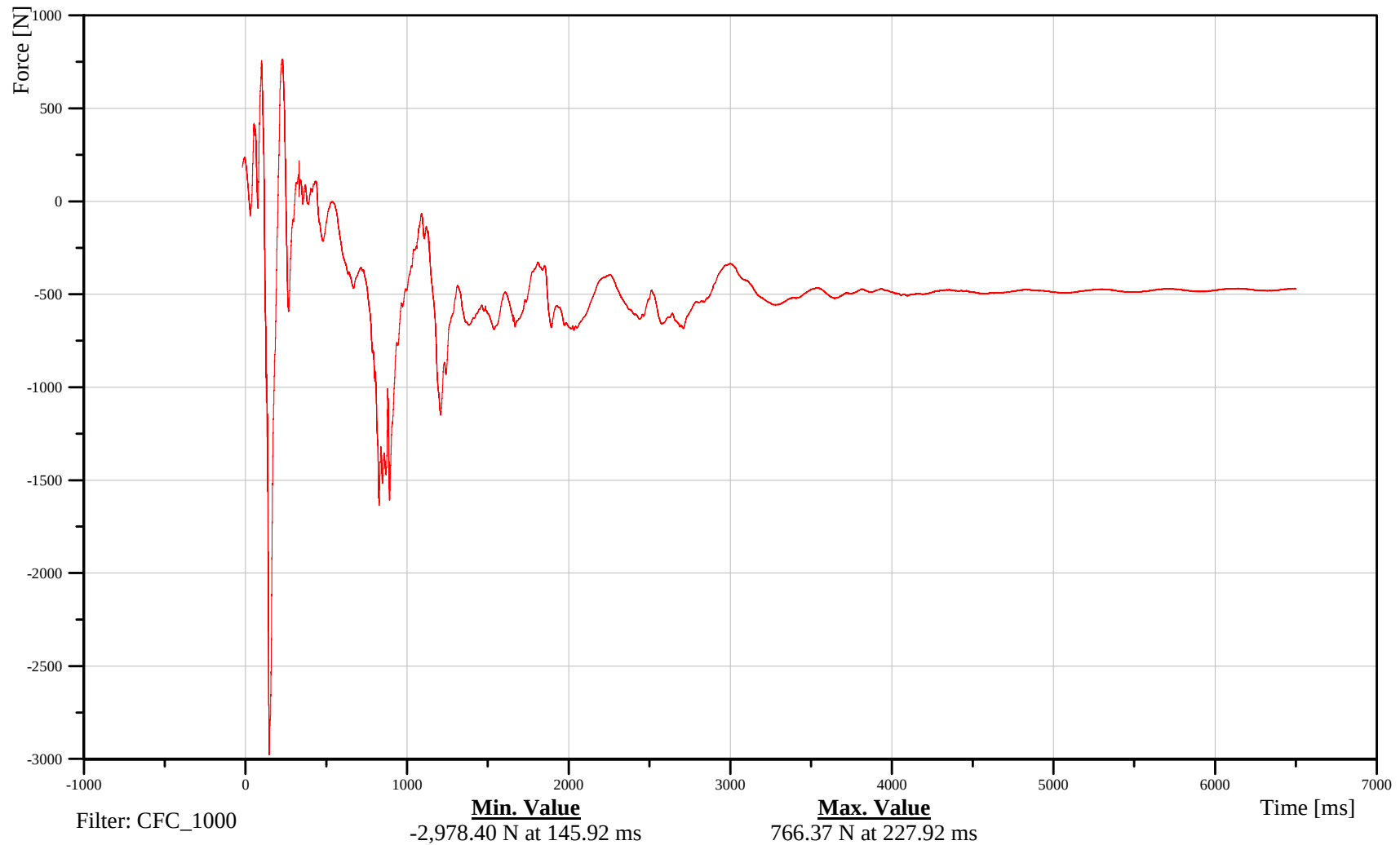
Time: 15:17

Customer: VRTC

14NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100203



B-85

100203



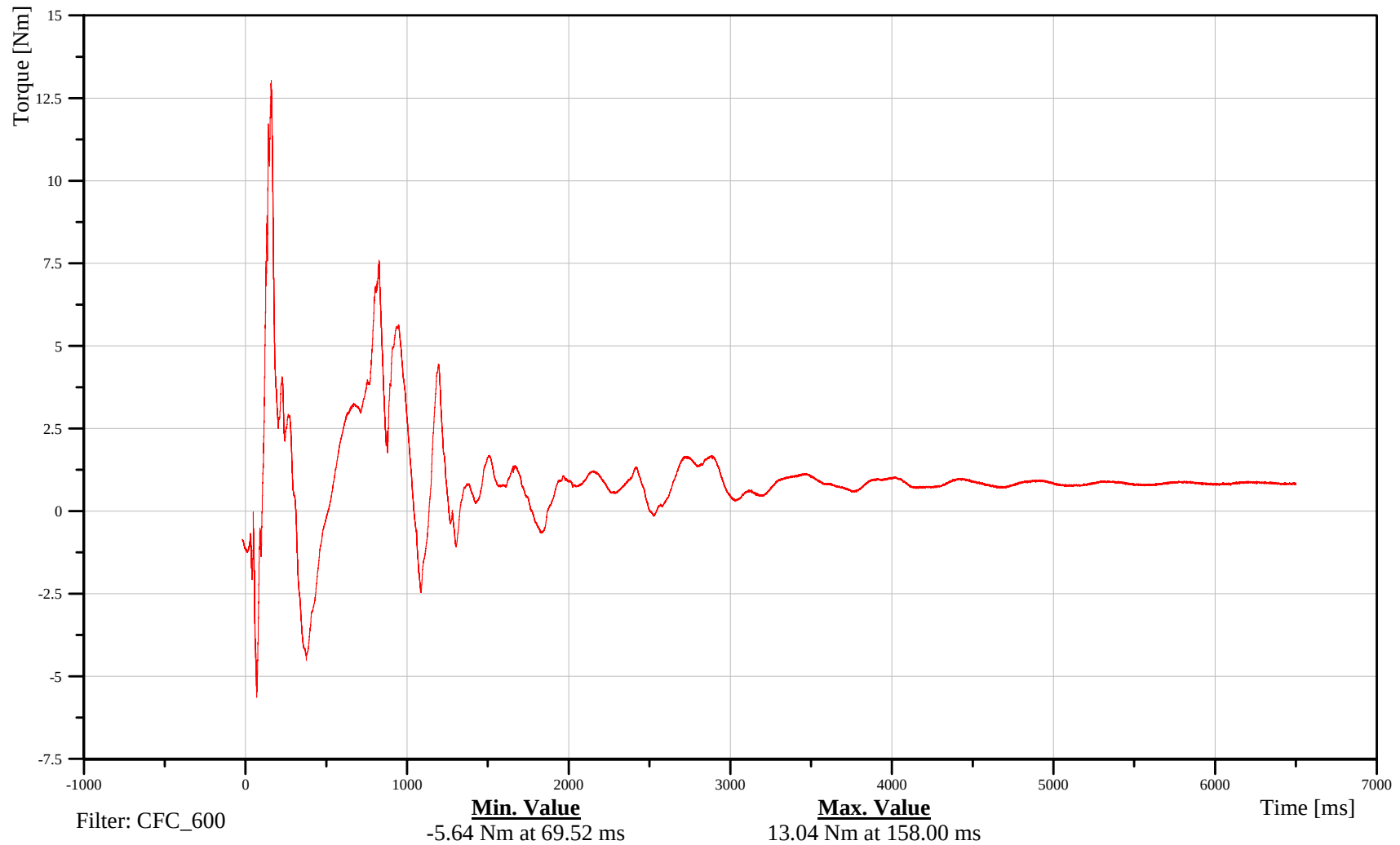
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Lower Neck Moment About X Axis

Date: 02/03/2010
Time: 15:17

Customer: VRTC

14NECKLO00H3MOXB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-86

100203



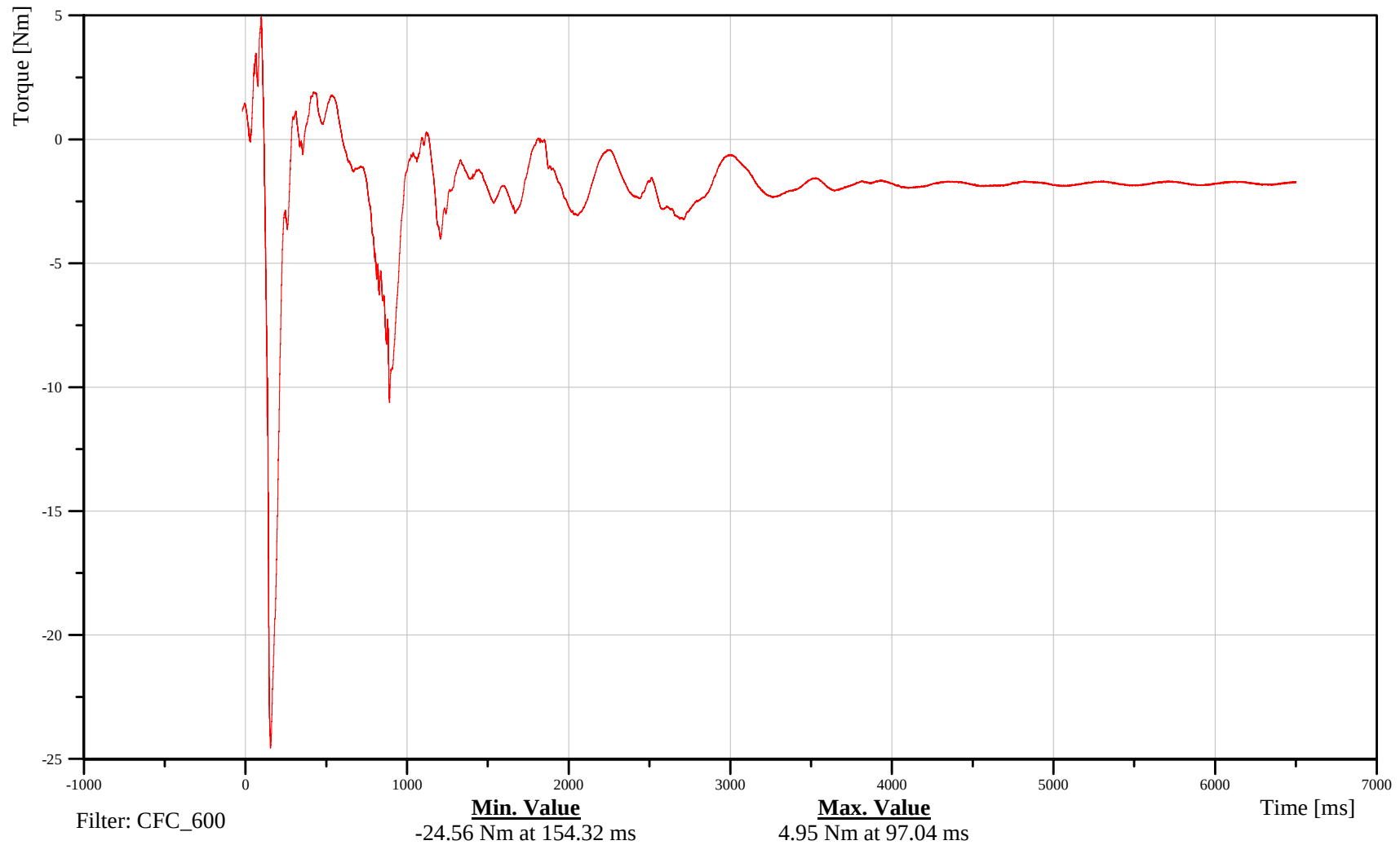
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Lower Neck Moment About Y Axis

Date: 02/03/2010
Time: 15:17

Customer: VRTC

14NECKLO00H3MOYB

TRC Inc. Test Lab: CTF
Test Number: 100203



B-87

100203



Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Lower Neck Moment About Z Axis

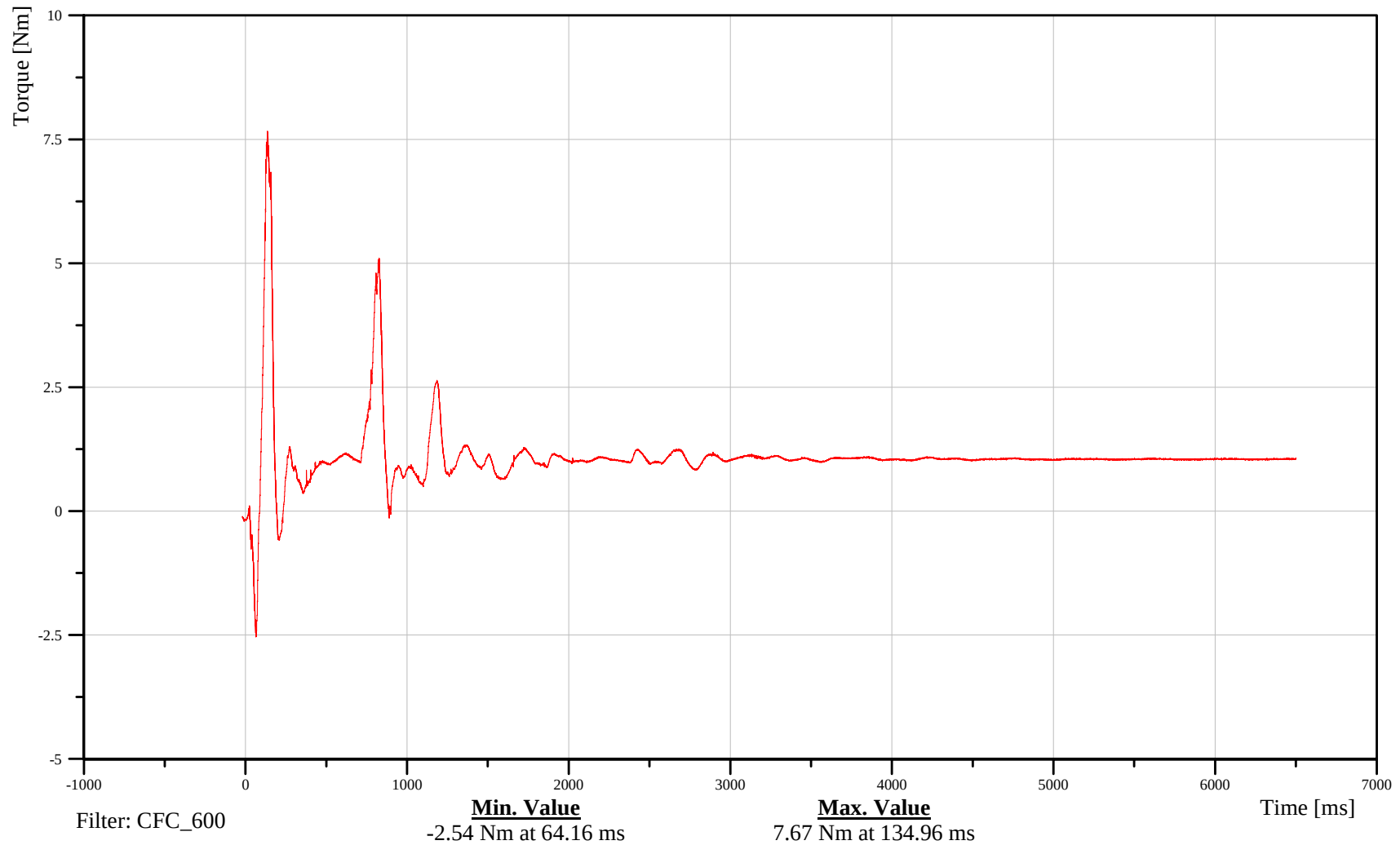
Date: 02/03/2010
Time: 15:17

Customer: VRTC

14NECKLO00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-88

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity X-Axis Acceleration

Date: 02/03/2010

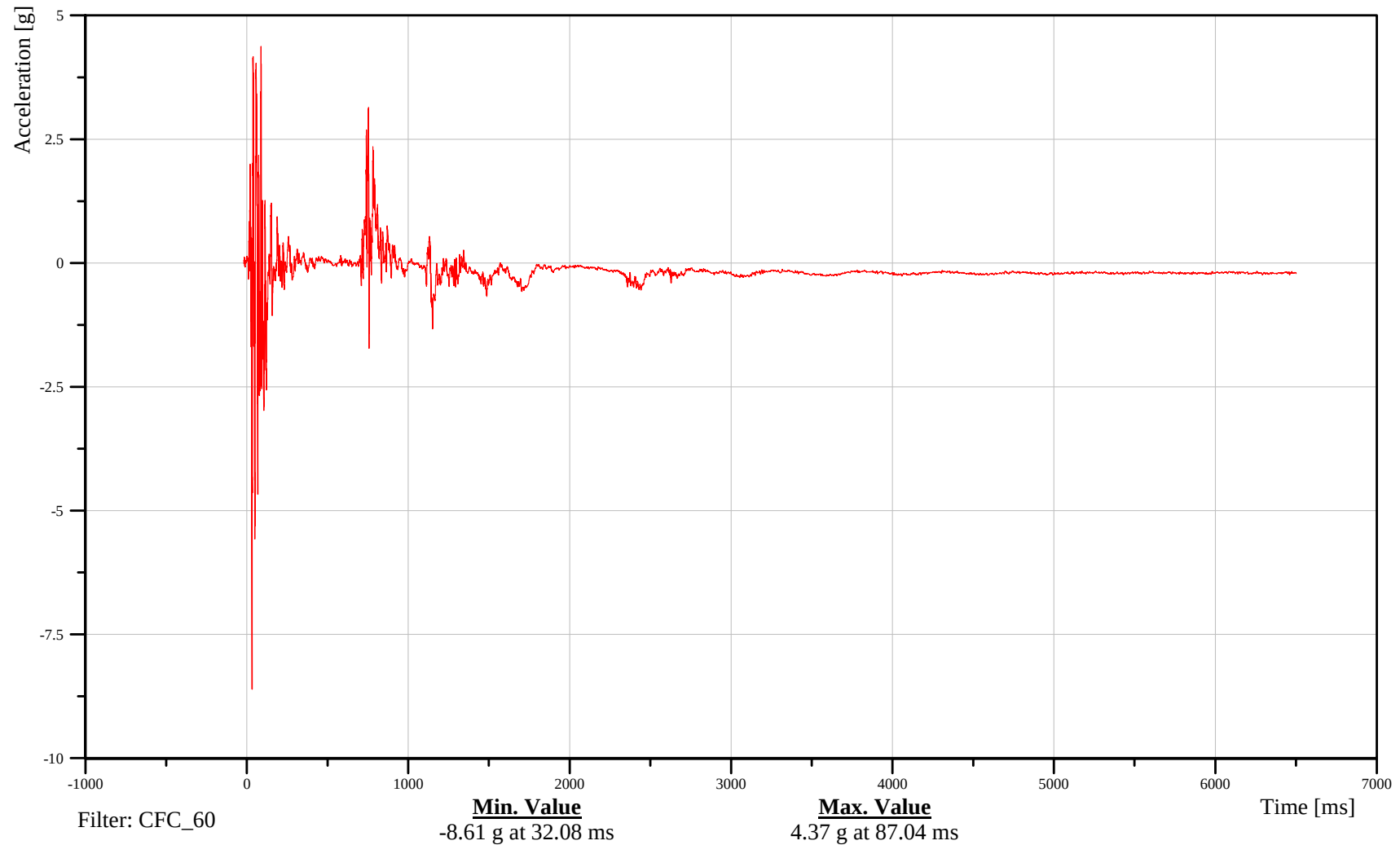
Time: 15:17

Customer: VRTC

10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-89

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity Y-Axis Acceleration

Date: 02/03/2010

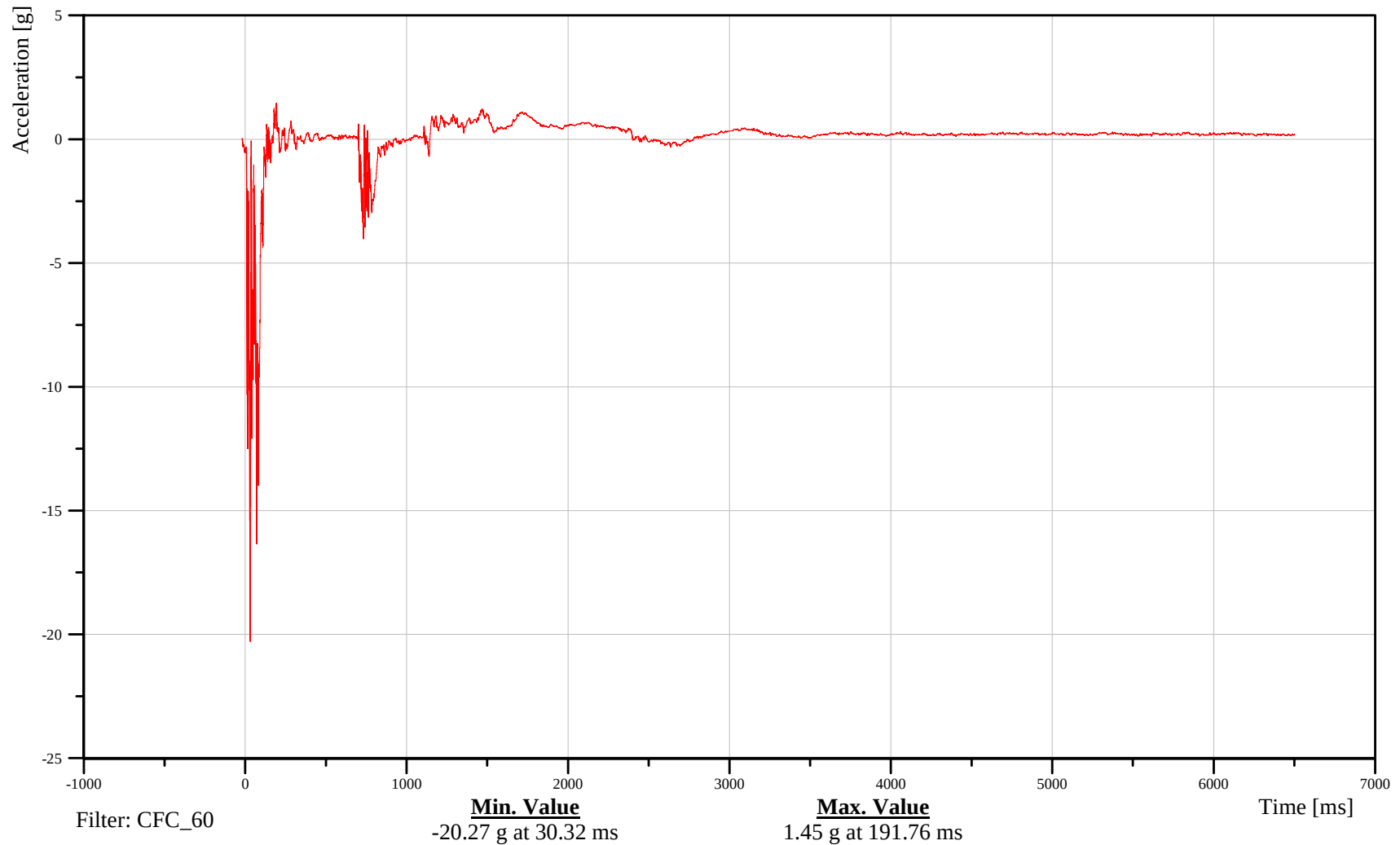
Time: 15:17

Customer: VRTC

10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-90

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity Z-Axis Acceleration

Date: 02/03/2010

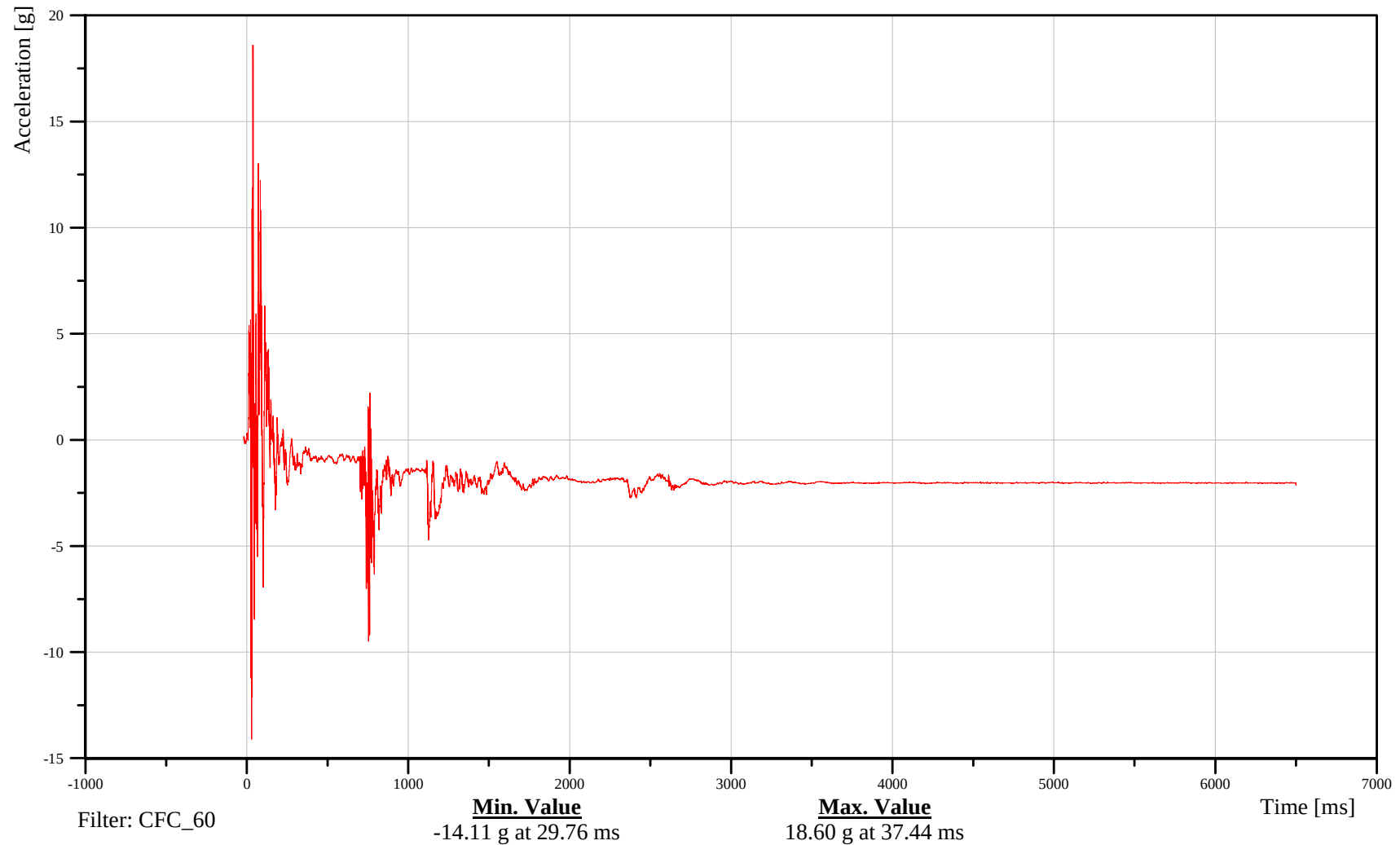
Time: 15:17

Customer: VRTC

10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-91

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity Resultant Acceleration

Date: 02/03/2010

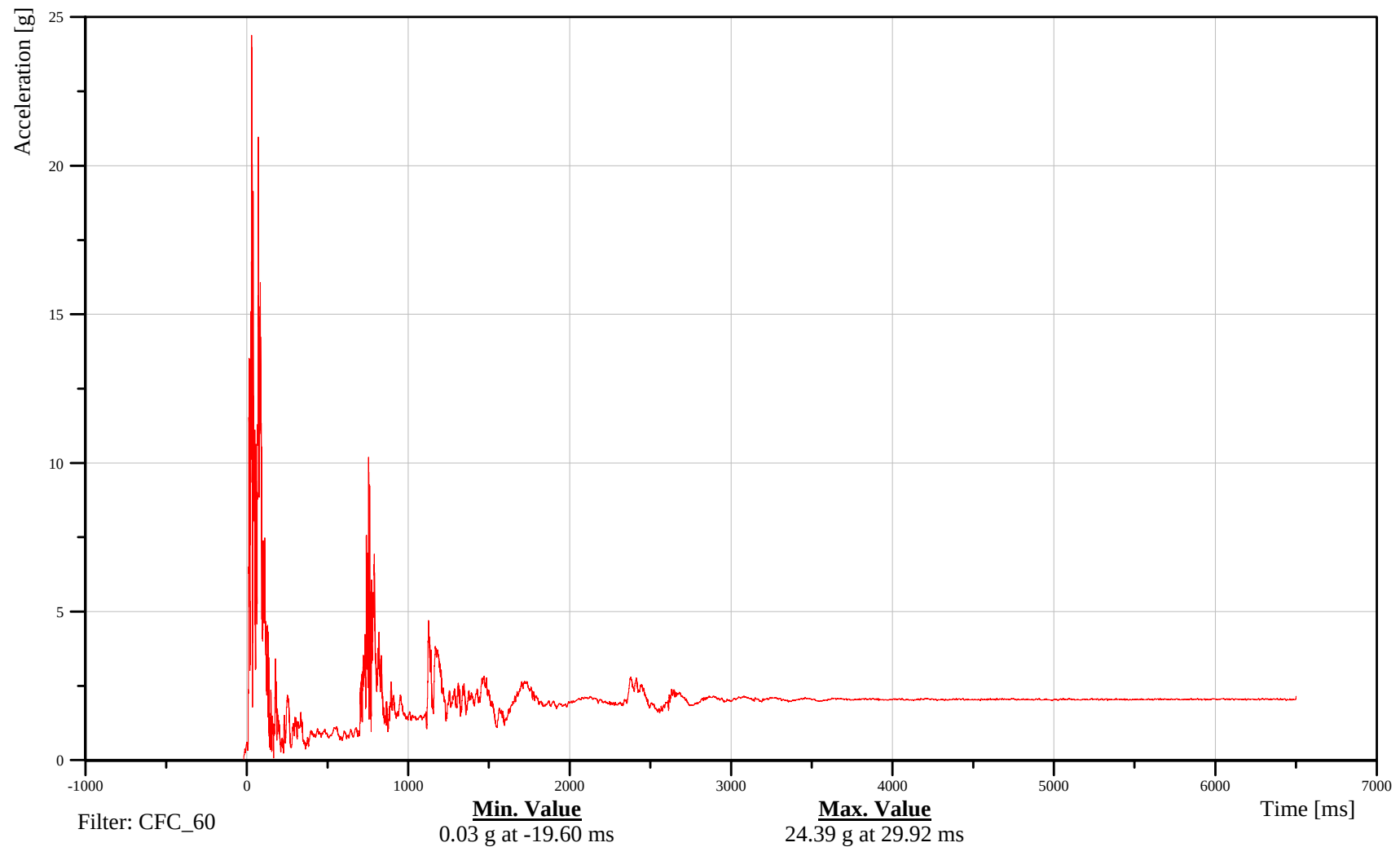
Time: 15:17

Customer: VRTC

10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-92

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Vehicle Roll Rate

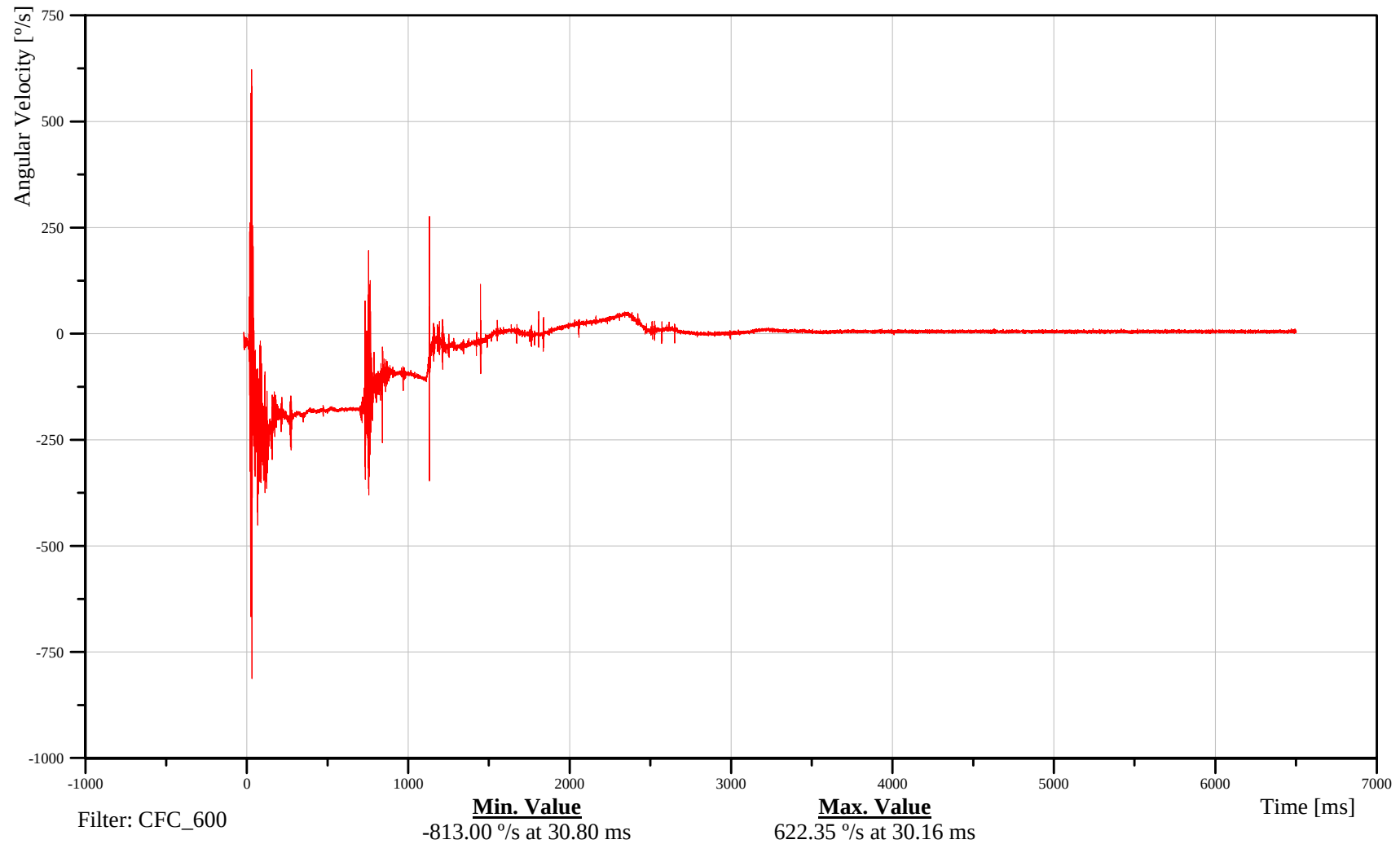
Time: 15:17

Customer: VRTC

10VEHCCG0000AVXB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-93

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Pitch Rate

Date: 02/03/2010

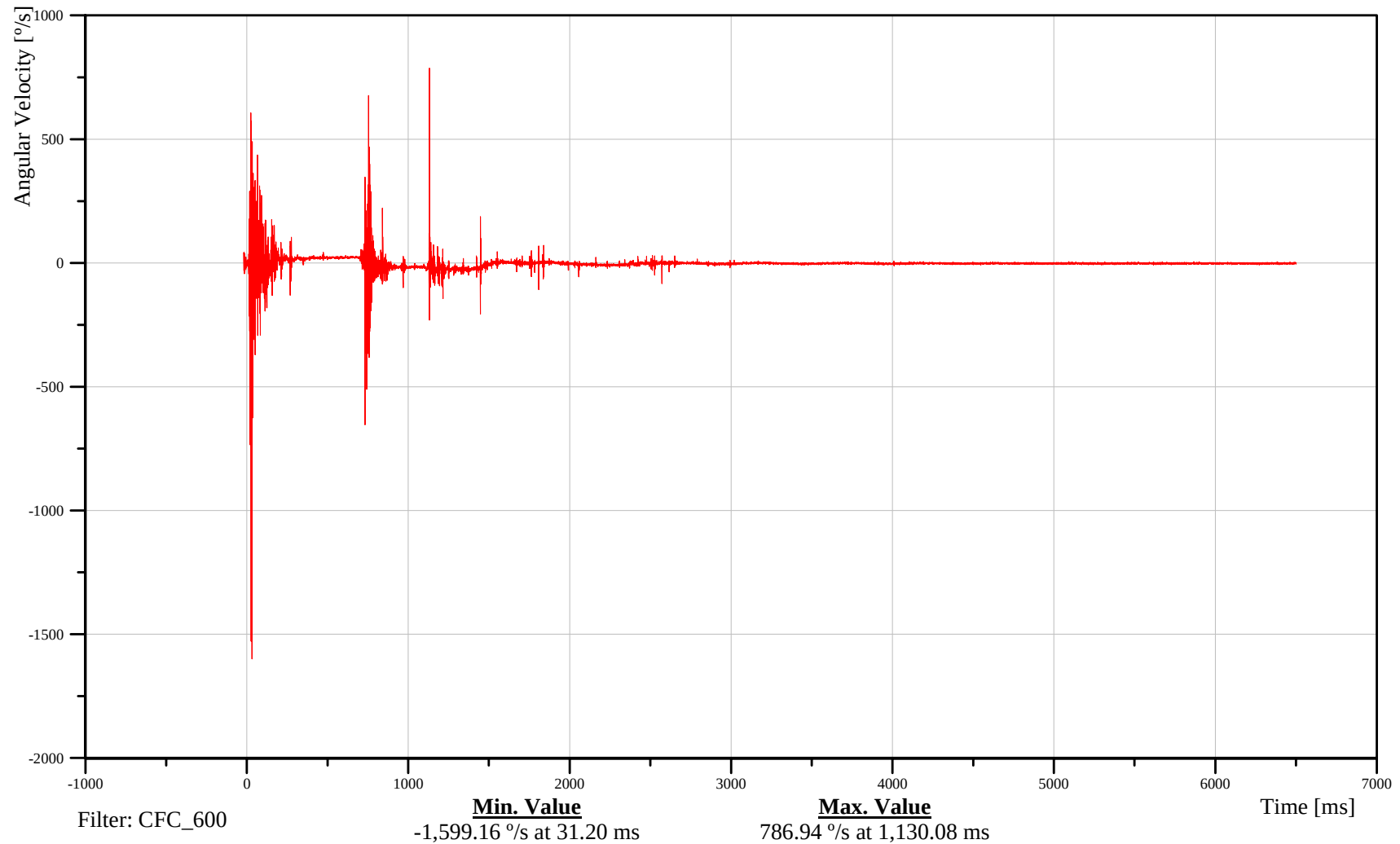
Time: 15:17

Customer: VRTC

10VEHCCG0000AVYB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-94

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Yaw Rate

Date: 02/03/2010

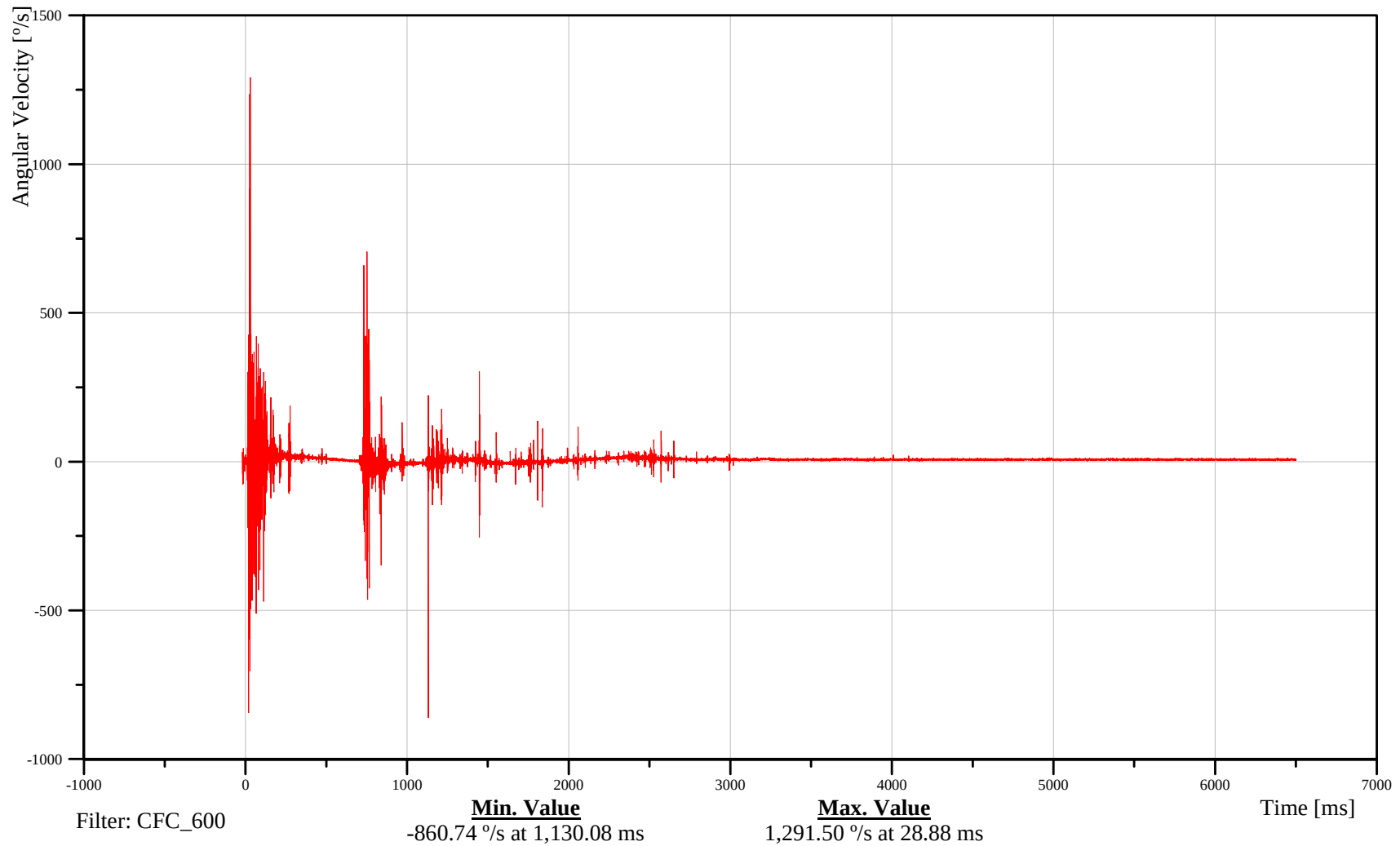
Time: 15:17

Customer: VRTC

10VEHCCG0000AVZB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-95

100203



Curb Trip Rollover 2007 Ford Expedition

Rear Deck Roll Rate Redundant

Date: 02/03/2010

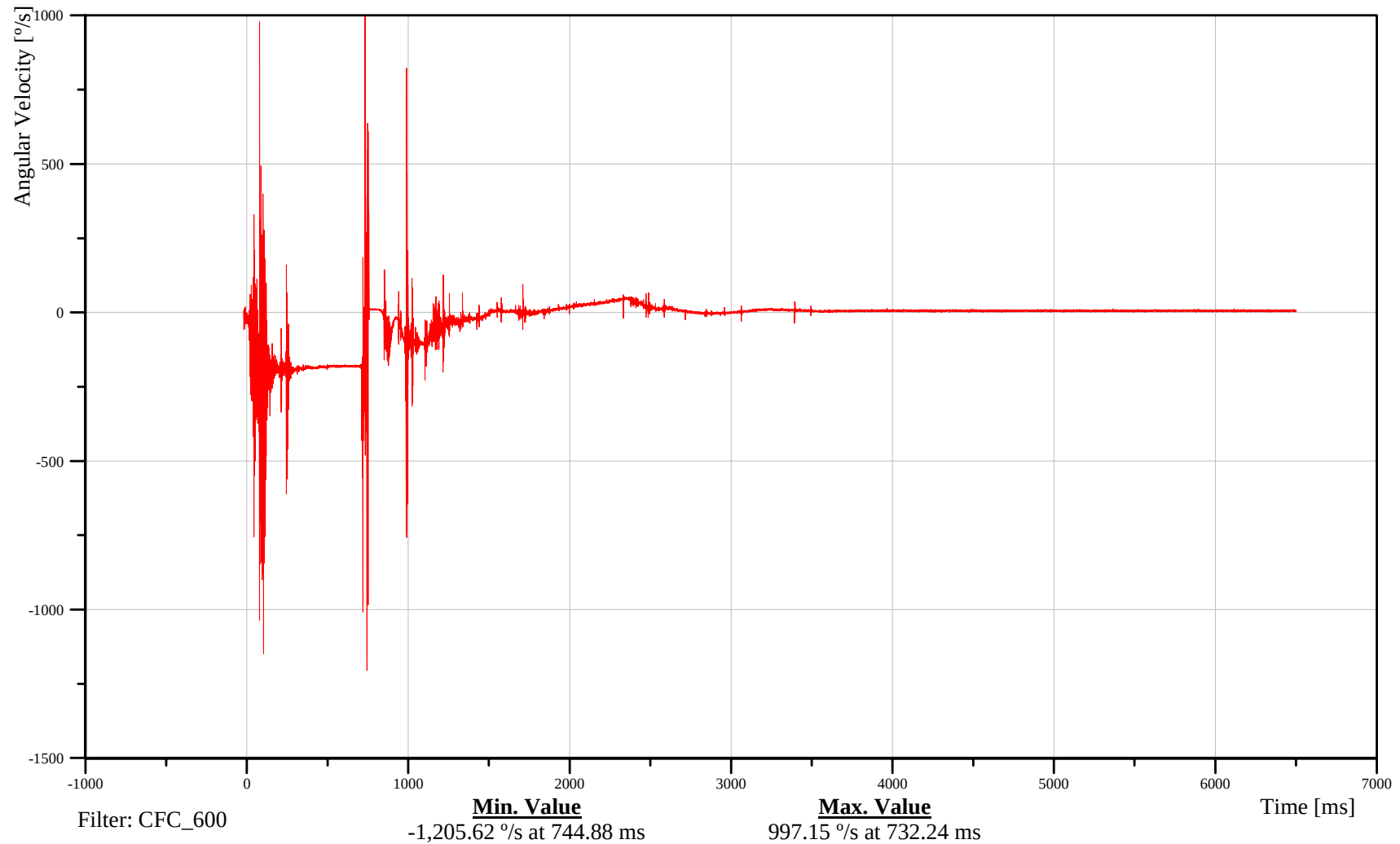
Time: 15:17

Customer: VRTC

10VEHCREDK00AVXB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-96

100203



Curb Trip Rollover 2007 Ford Expedition

Rear Deck Pitch Rate Redundant

Date: 02/03/2010

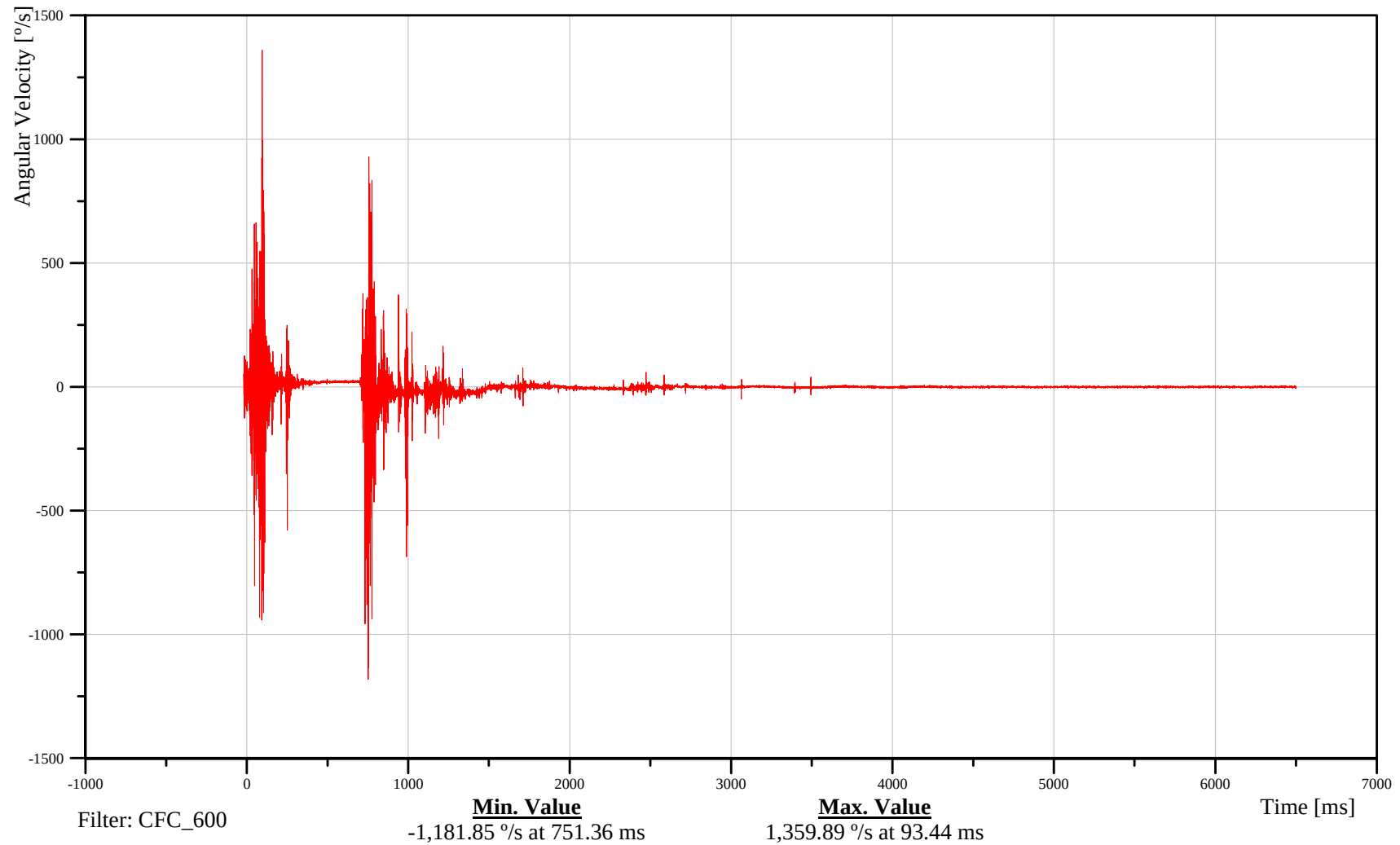
Time: 15:17

Customer: VRTC

10VEHCREDK00AVYB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-97

100203



Curb Trip Rollover 2007 Ford Expedition

Rear Deck Yaw Rate Redundant

Date: 02/03/2010

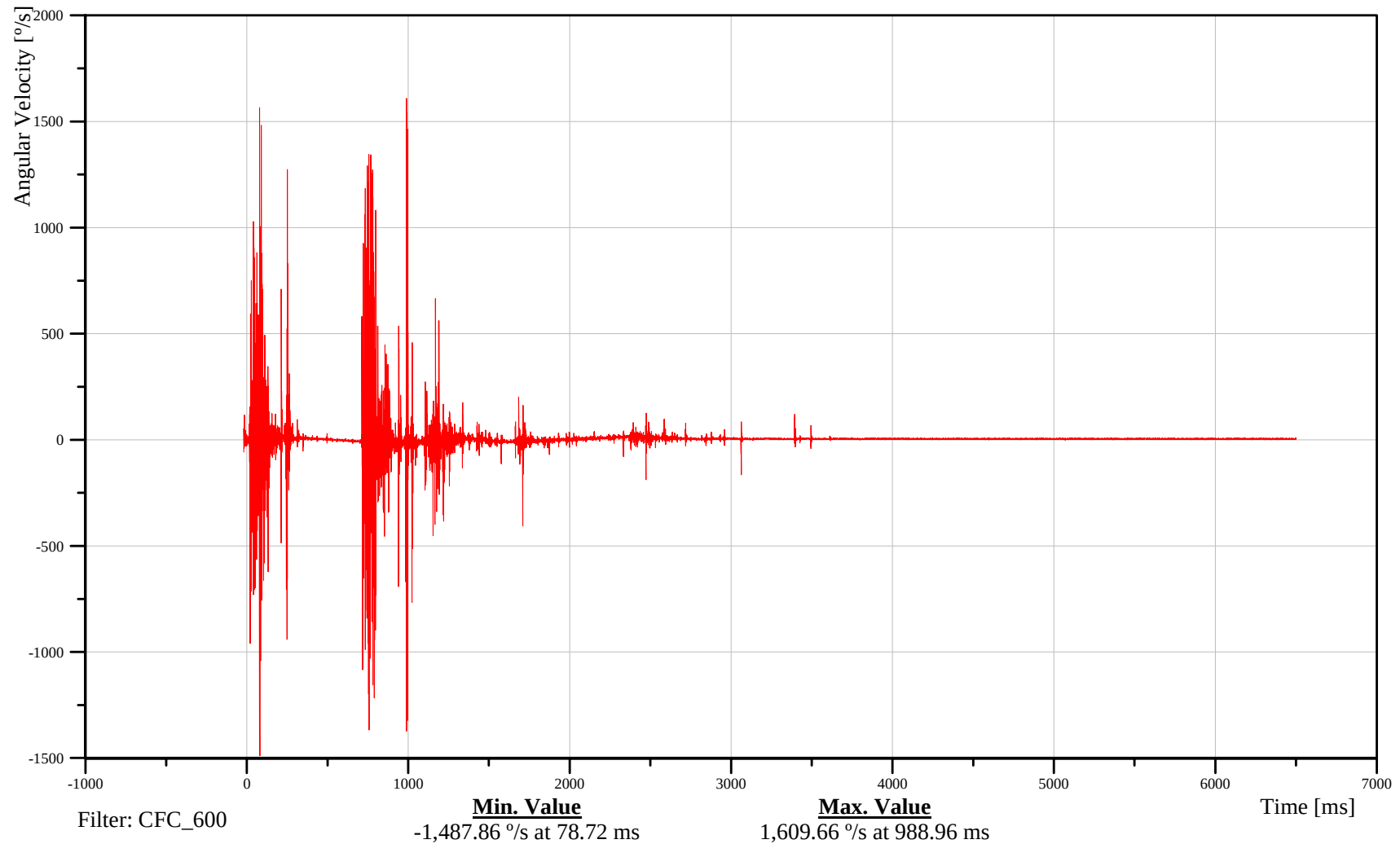
Time: 15:17

Customer: VRTC

10VEHCREDK00AVZB

TRC Inc. Test Lab: CTF

Test Number: 100203



B-98

100203



Curb Trip Rollover 2007 Ford Expedition

Top of Engine X-Axis Acceleration

Date: 02/03/2010

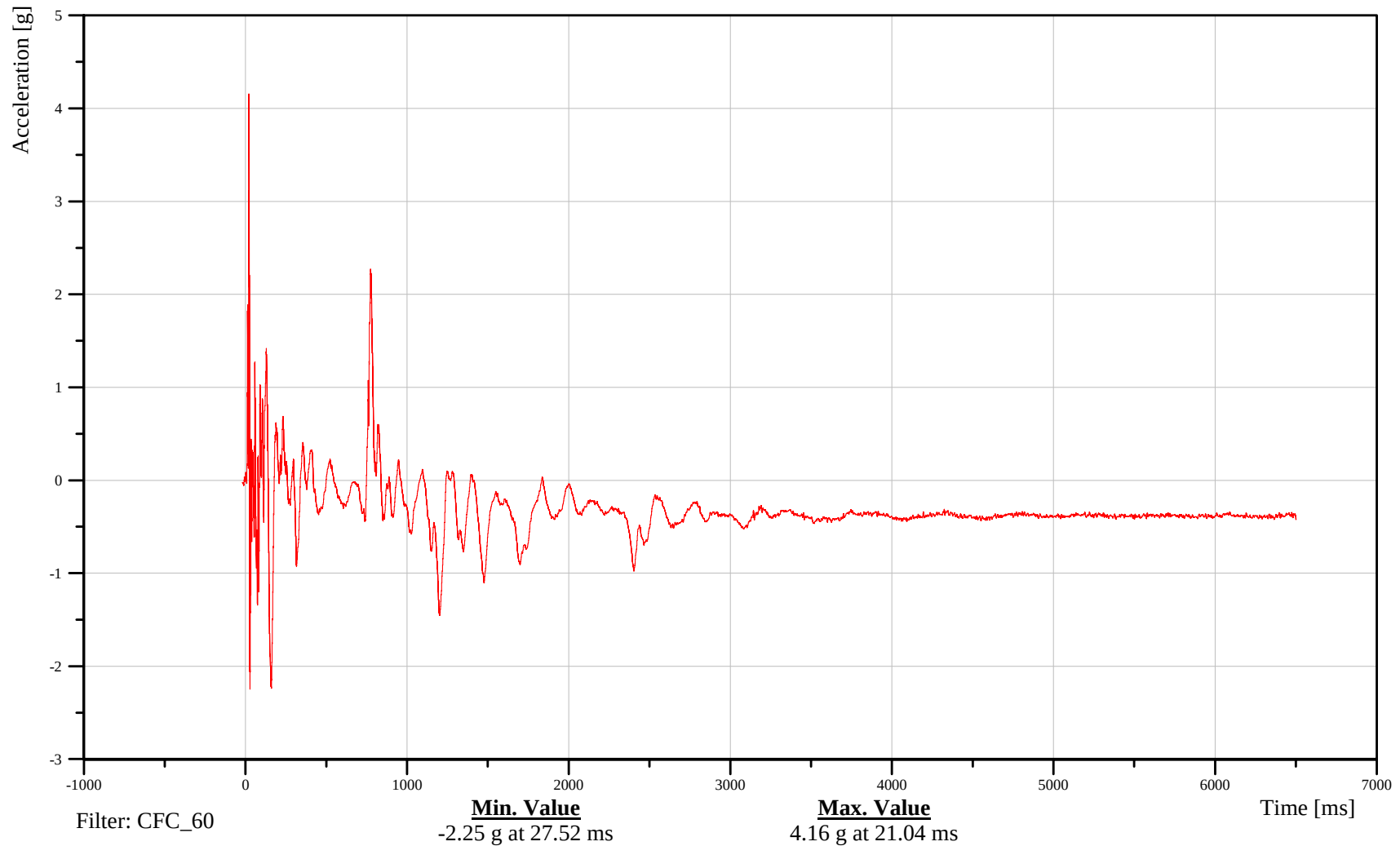
Time: 15:17

Customer: VRTC

10ENGNTTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-99

100203



Curb Trip Rollover 2007 Ford Expedition

Top of Engine Y-Axis Acceleration

Date: 02/03/2010

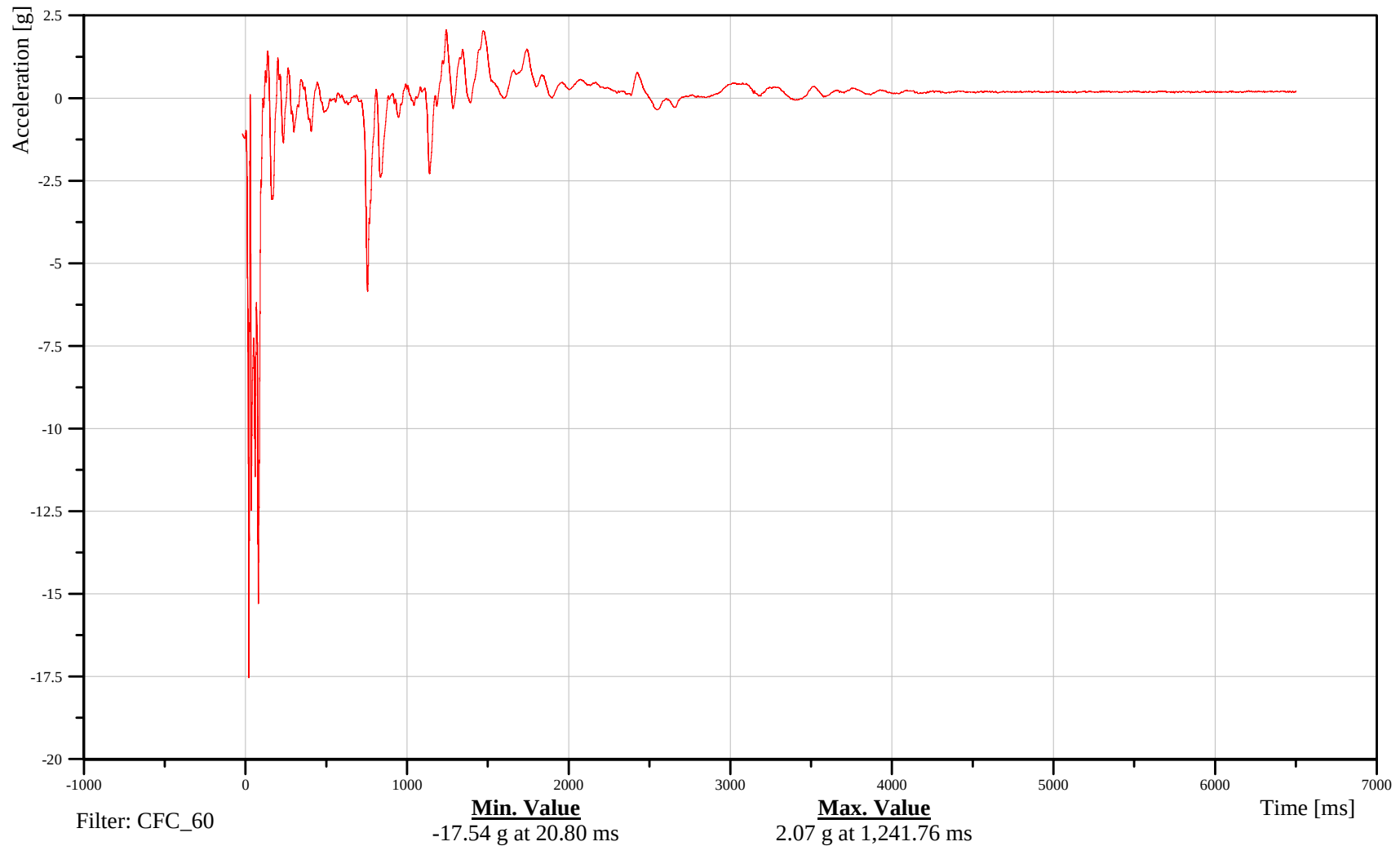
Time: 15:17

Customer: VRTC

10ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-100

100203



Curb Trip Rollover 2007 Ford Expedition

Top of Engine Z-Axis Acceleration

Date: 02/03/2010

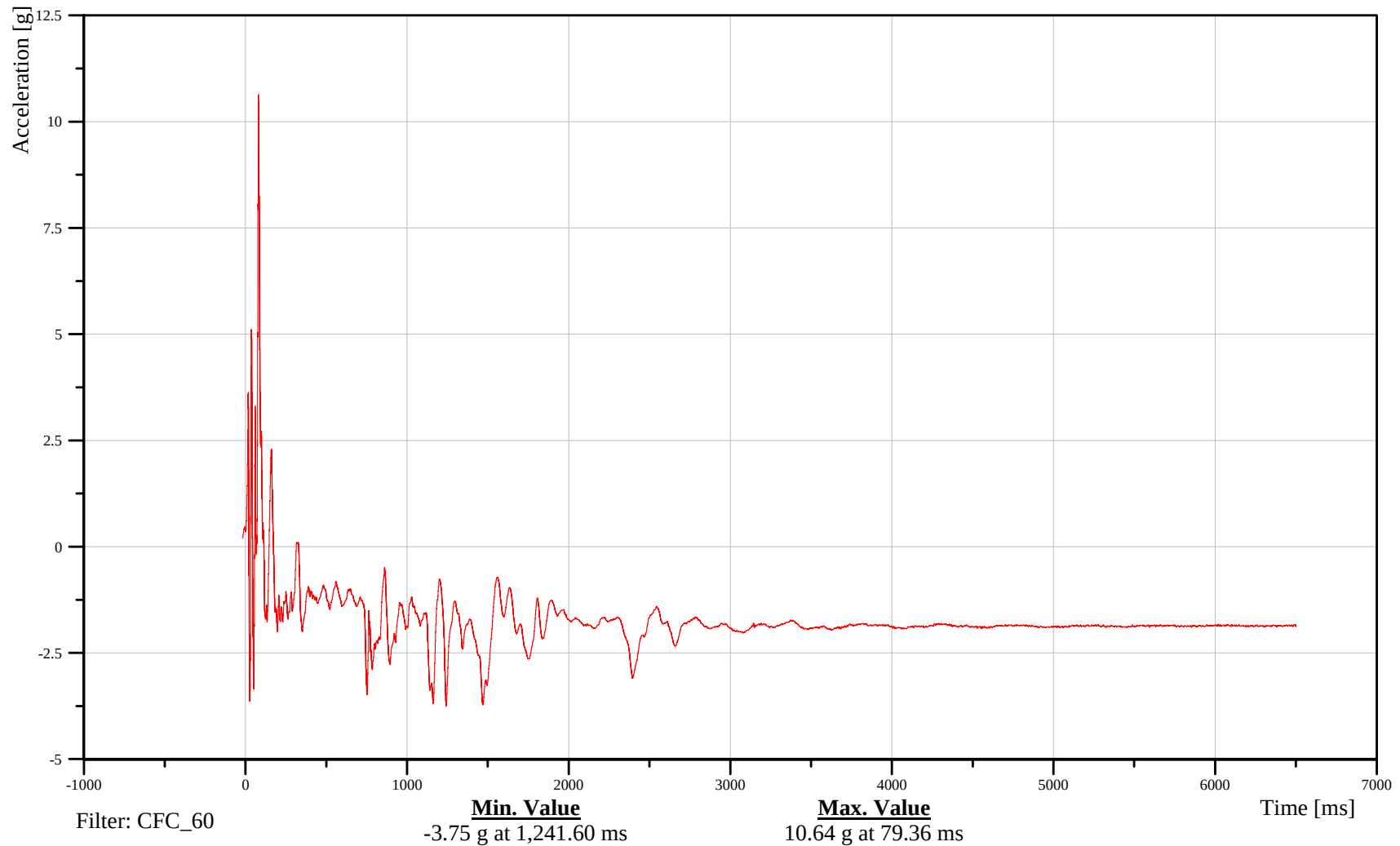
Time: 15:17

Customer: VRTC

10ENGNTTP0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-101

100203



Curb Trip Rollover 2007 Ford Expedition

Top of Engine Resultant Acceleration

Date: 02/03/2010

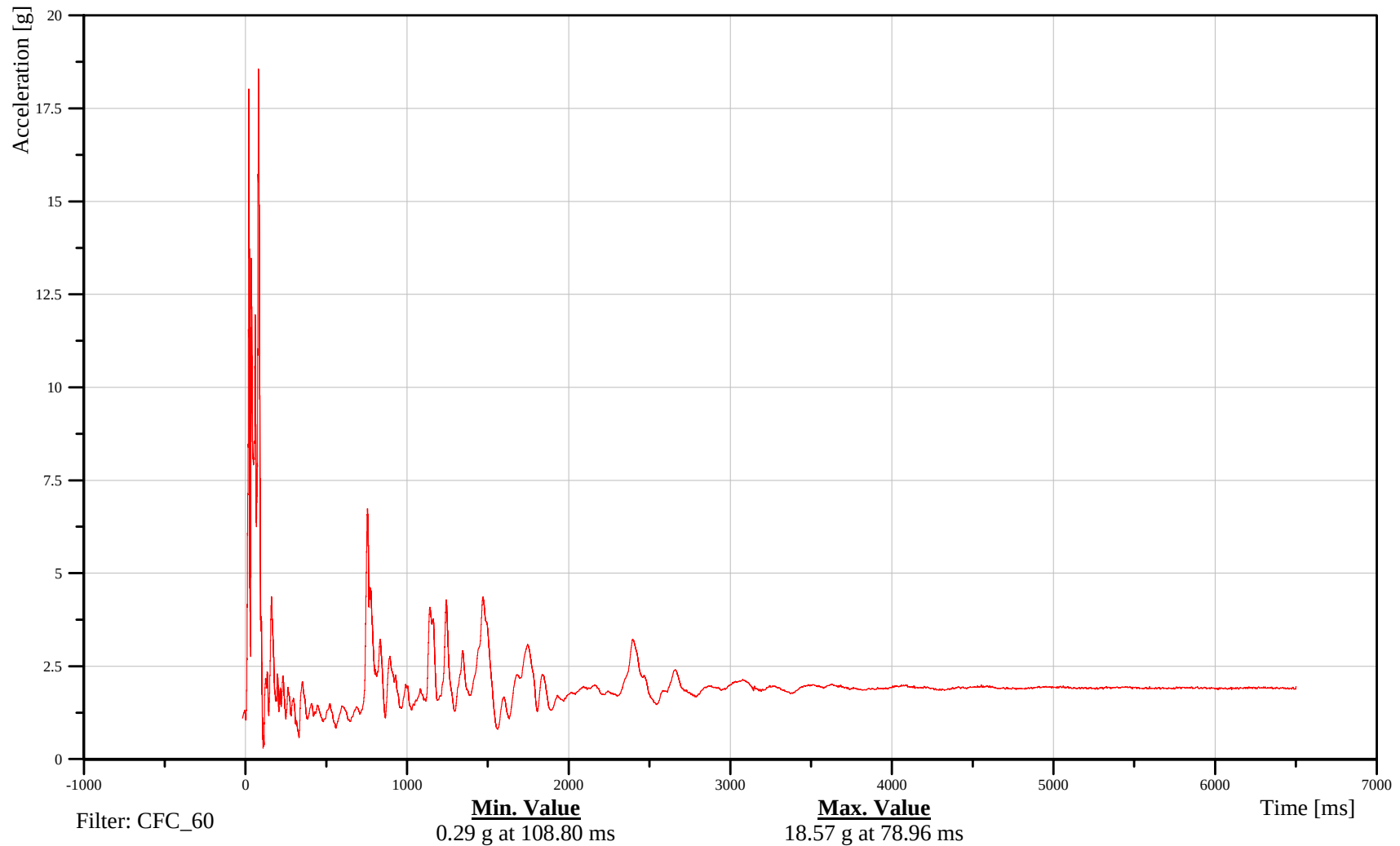
Time: 15:17

Customer: VRTC

10ENGNTTP0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-102

100203



Curb Trip Rollover 2007 Ford Expedition

Bottom of Engine X-Axis Acceleration

Date: 02/03/2010

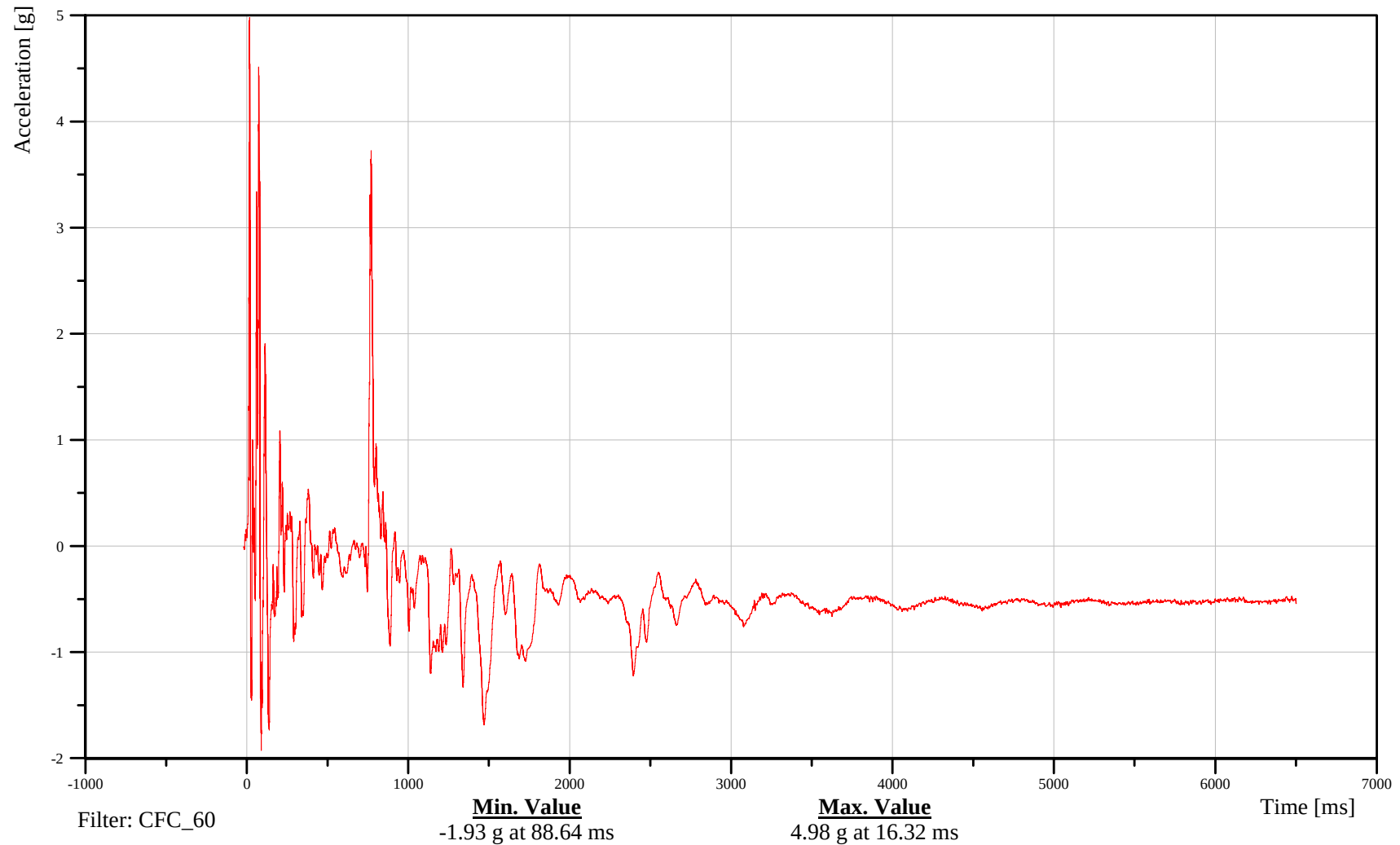
Time: 15:17

Customer: VRTC

10ENGNB00000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-103

100203



Curb Trip Rollover 2007 Ford Expedition

Bottom of Engine Y-Axis Acceleration

Date: 02/03/2010

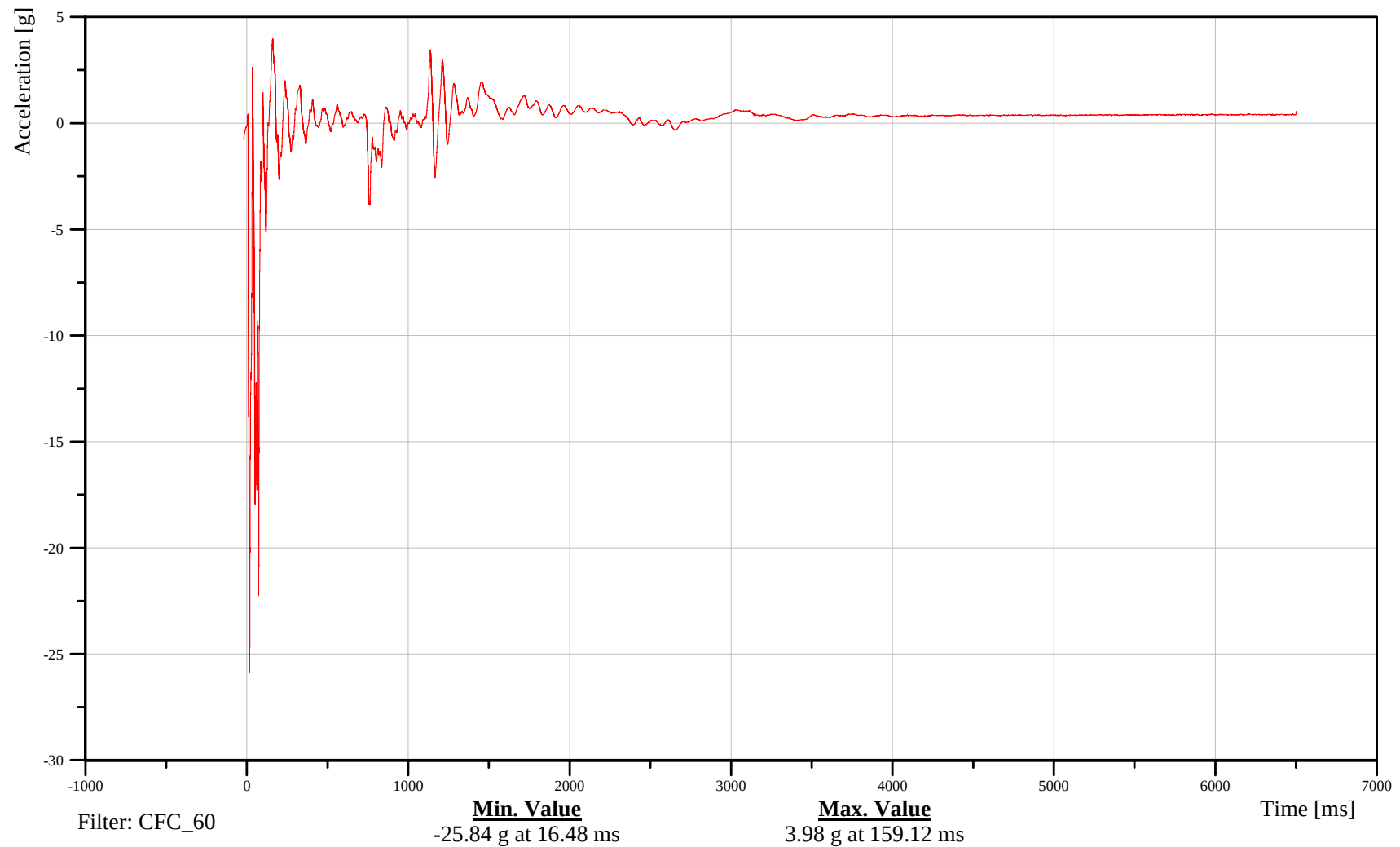
Time: 15:17

Customer: VRTC

10ENG NBO00000AC YD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-104

100203



Curb Trip Rollover 2007 Ford Expedition

Bottom of Engine Z-Axis Acceleration

Date: 02/03/2010

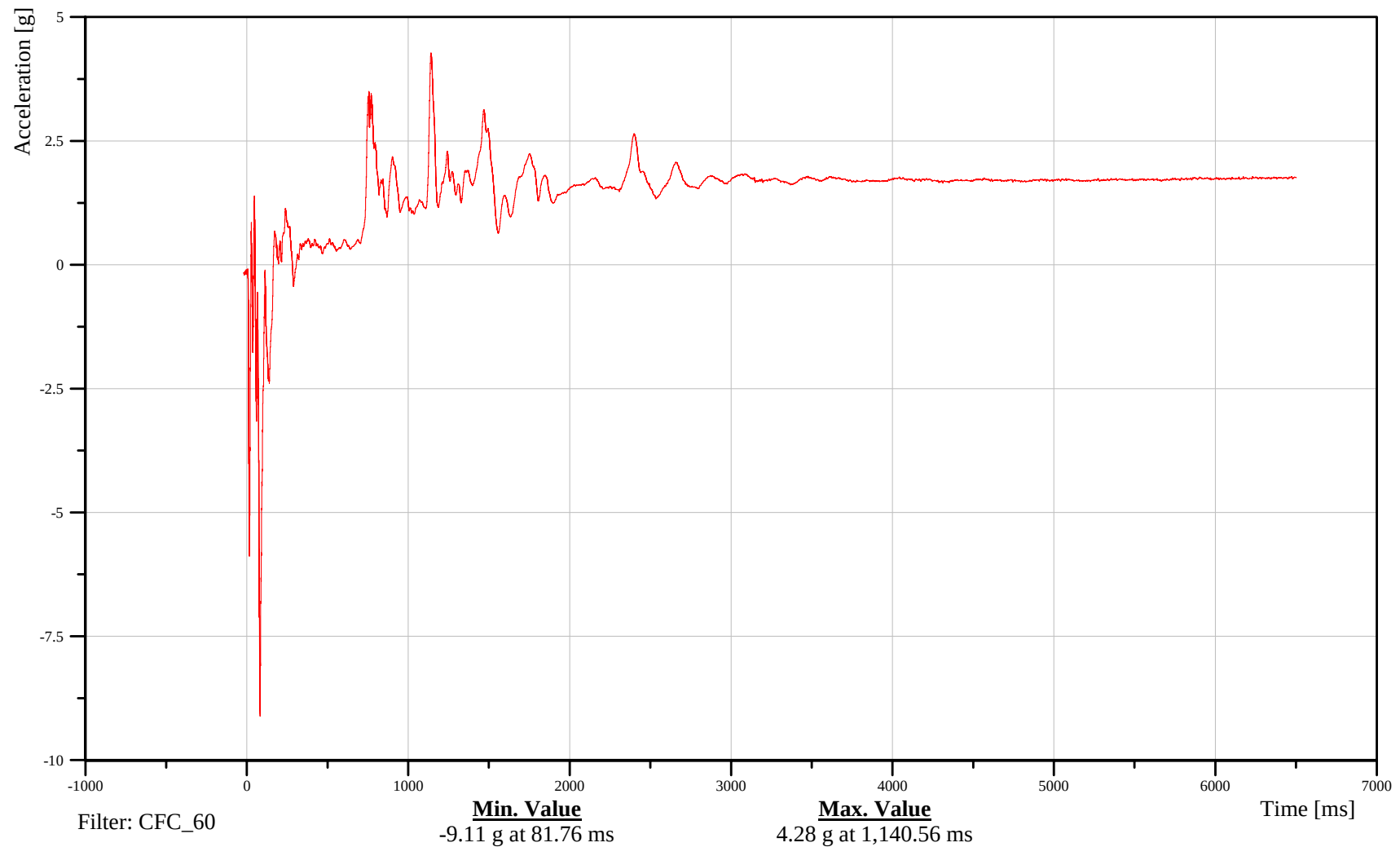
Time: 15:17

Customer: VRTC

10ENG NBO0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-105

100203



Curb Trip Rollover 2007 Ford Expedition

Bottom of Engine Resultant Acceleration

Date: 02/03/2010

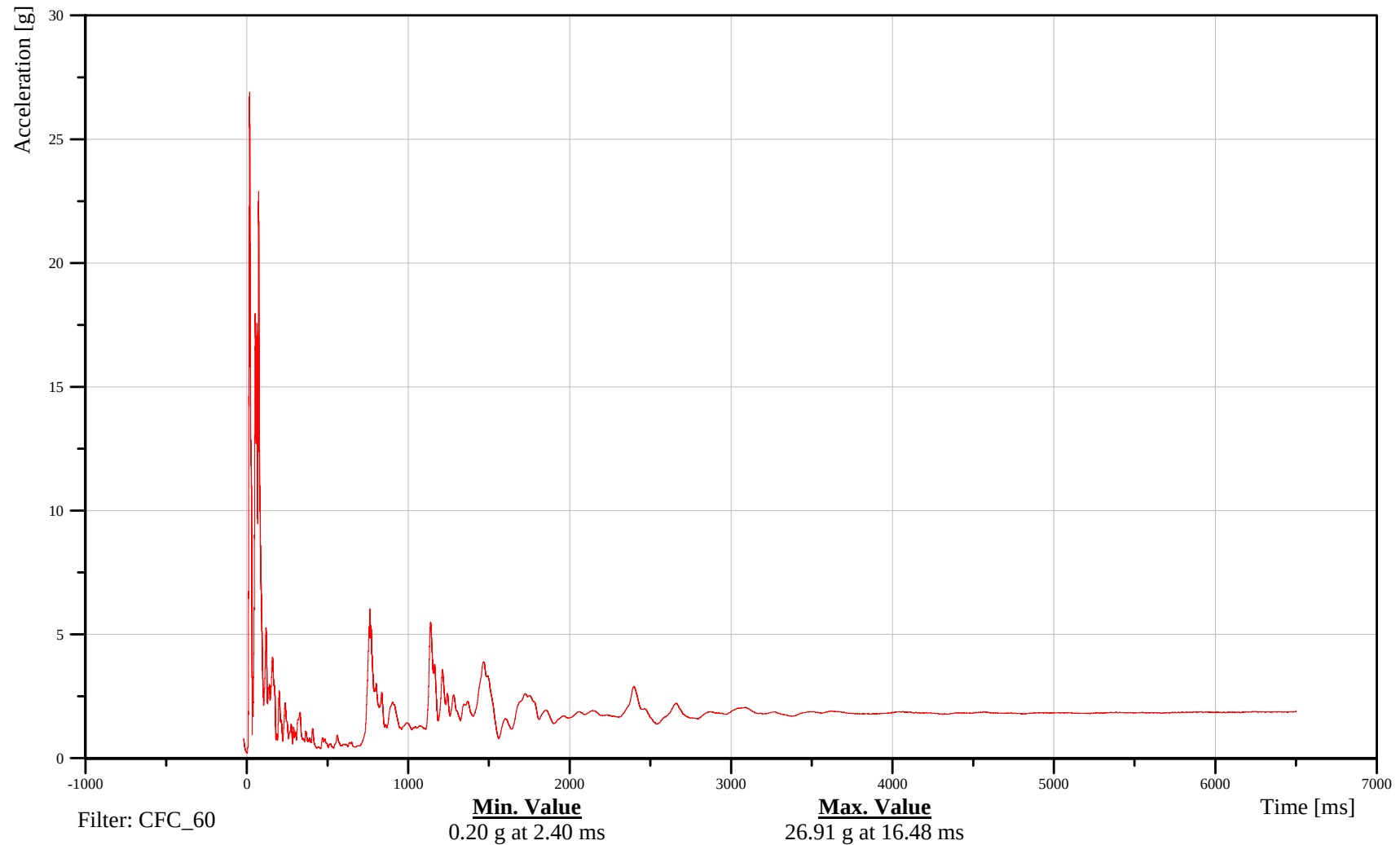
Time: 15:17

Customer: VRTC

10ENG NBO0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-106

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

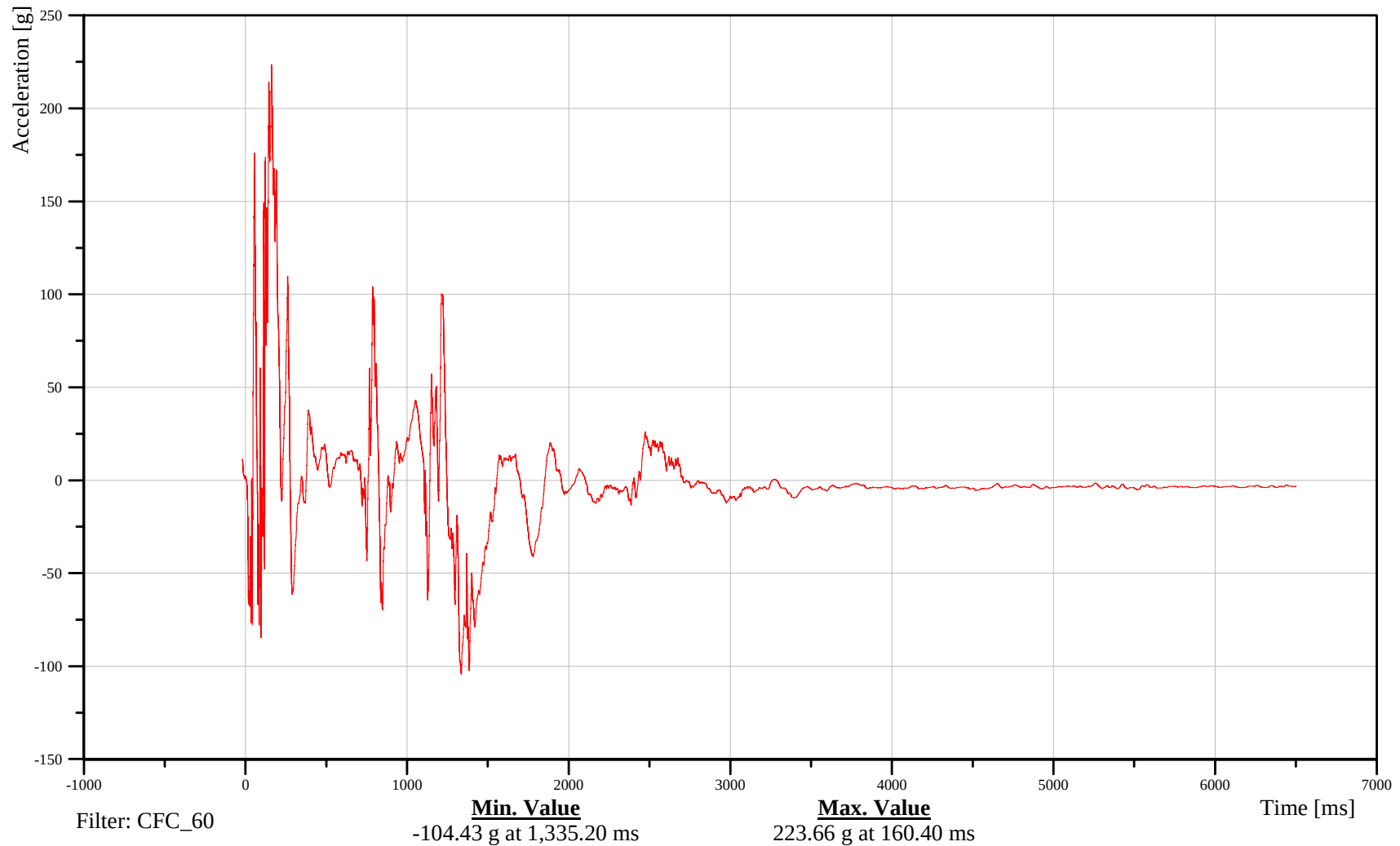
Time: 15:17

Customer: VRTC

10APILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-107

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper Y-Axis Acceleration

Date: 02/03/2010

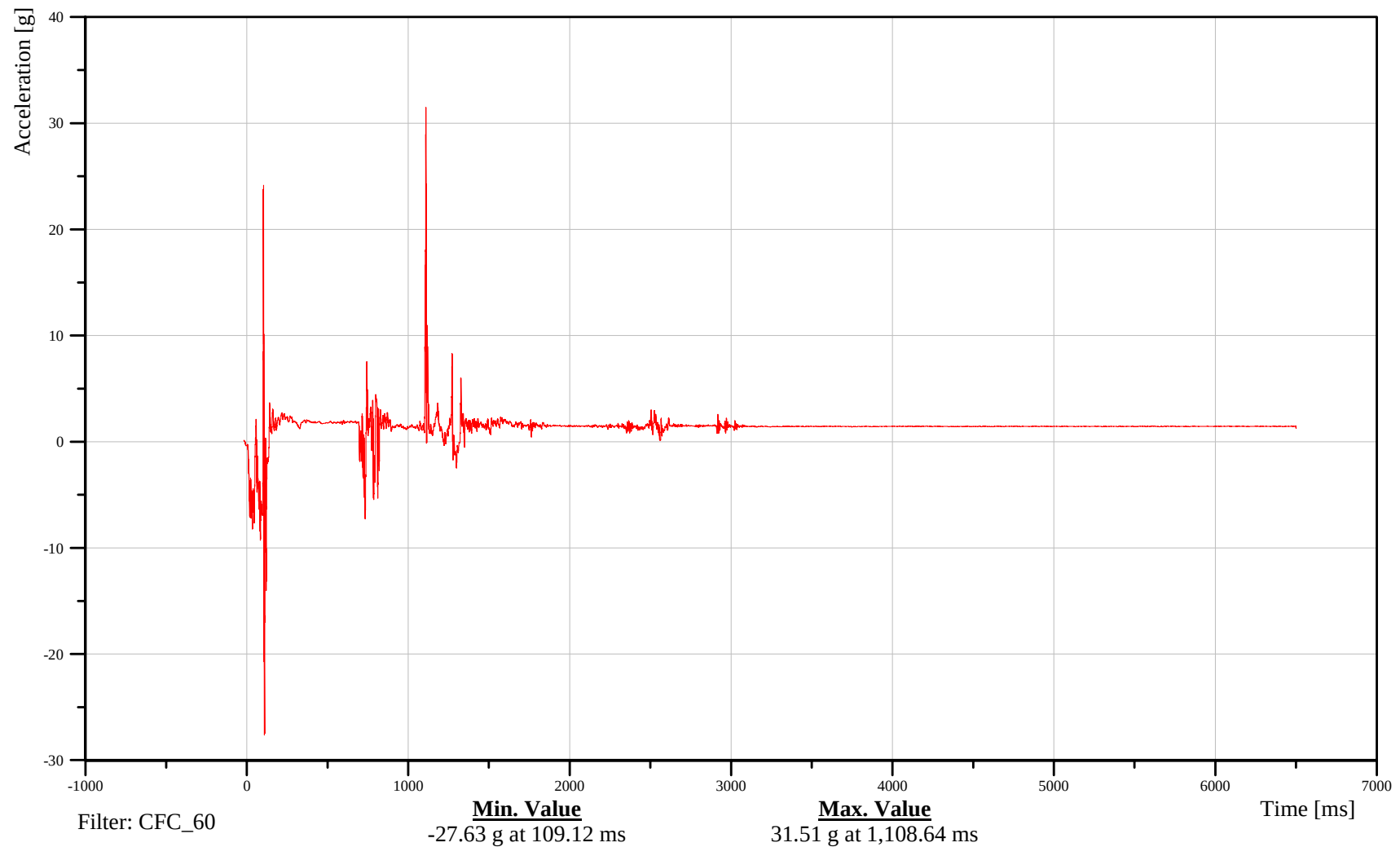
Time: 15:17

Customer: VRTC

10APILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-108

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper Z-Axis Acceleration

Date: 02/03/2010

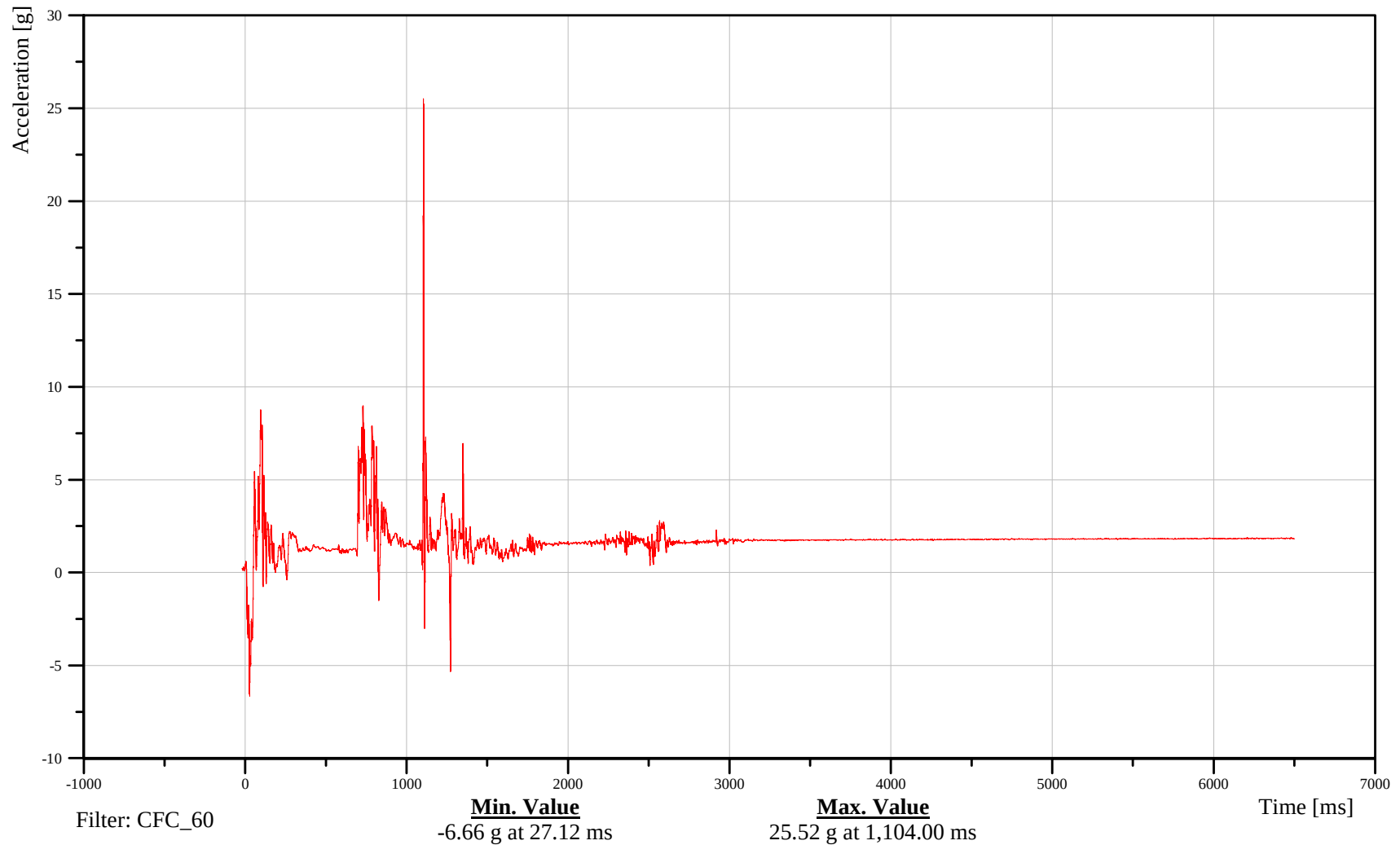
Time: 15:17

Customer: VRTC

10APILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-109

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper Resultant Acceleration

Date: 02/03/2010

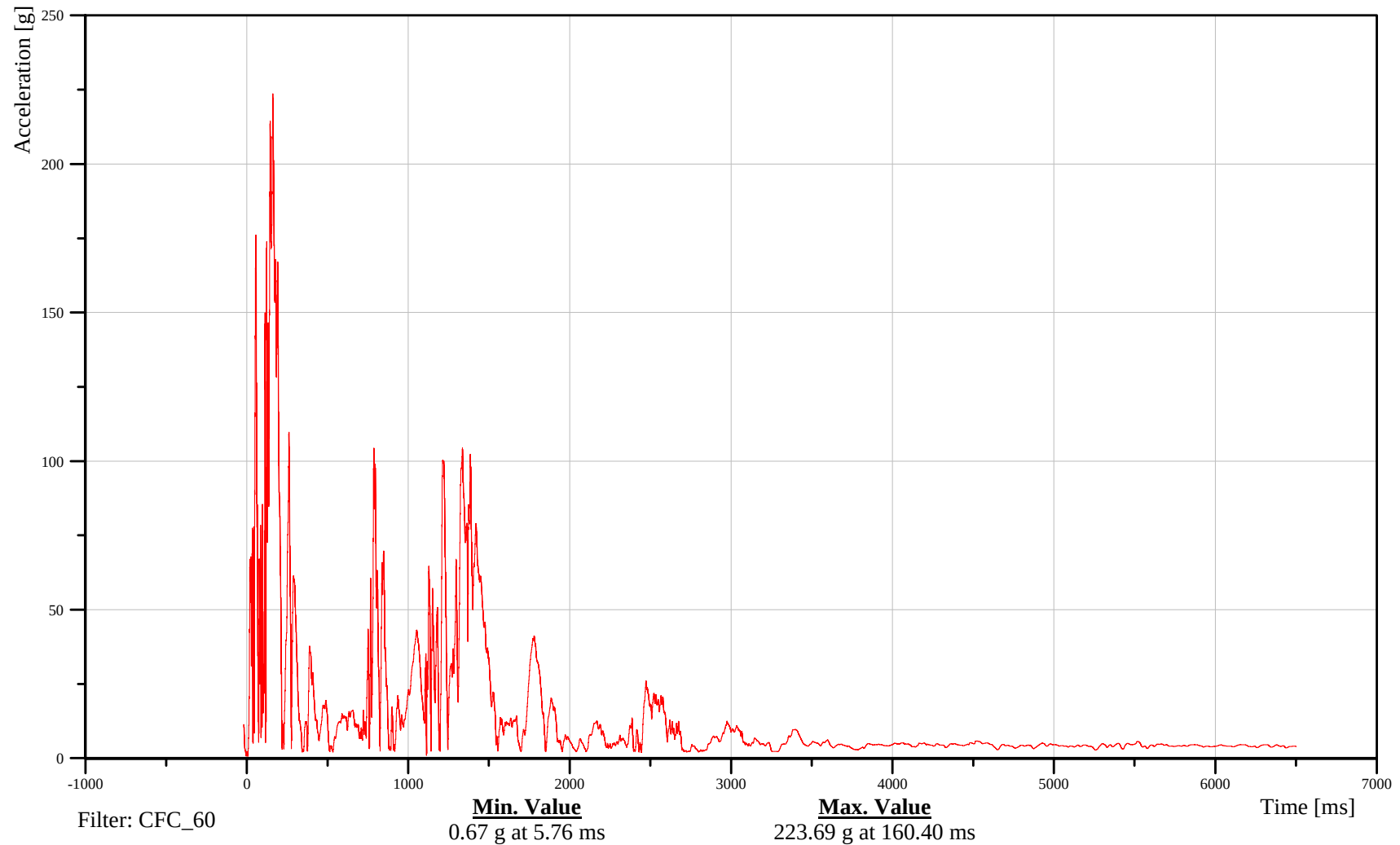
Time: 15:17

Customer: VRTC

10APILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-110

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

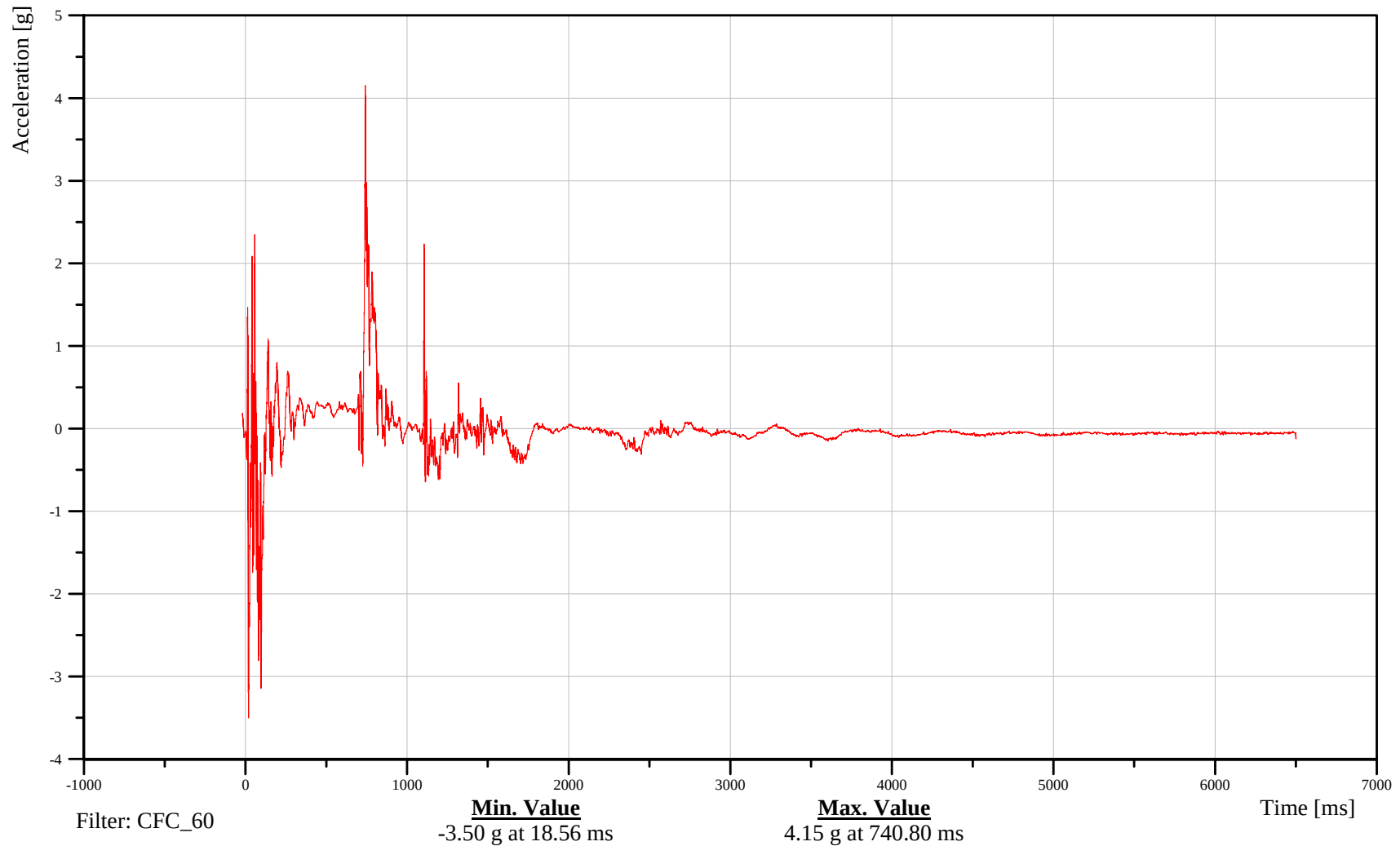
Time: 15:17

Customer: VRTC

10APILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-111

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower Y-Axis Acceleration

Date: 02/03/2010

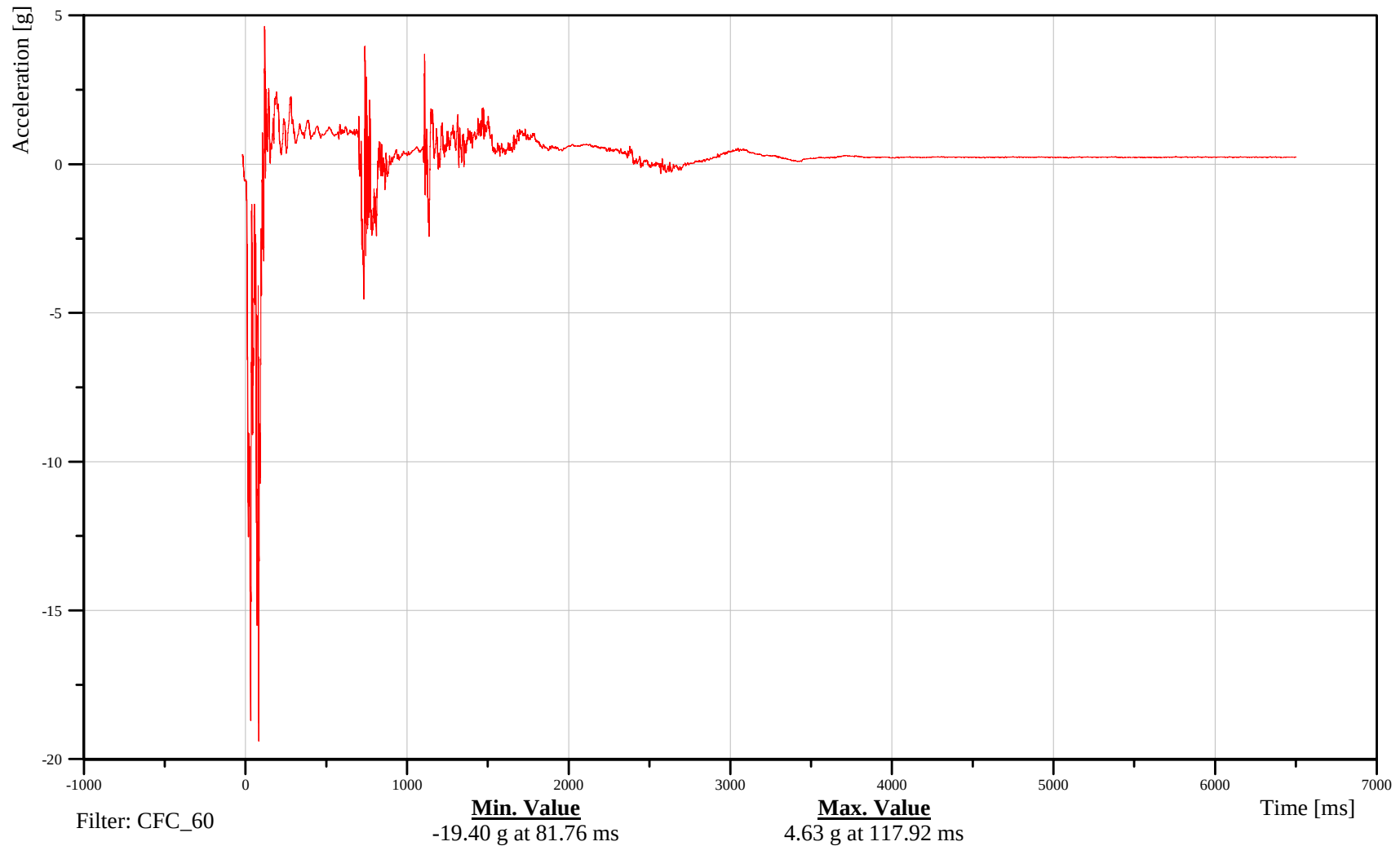
Time: 15:17

Customer: VRTC

10APILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-112

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

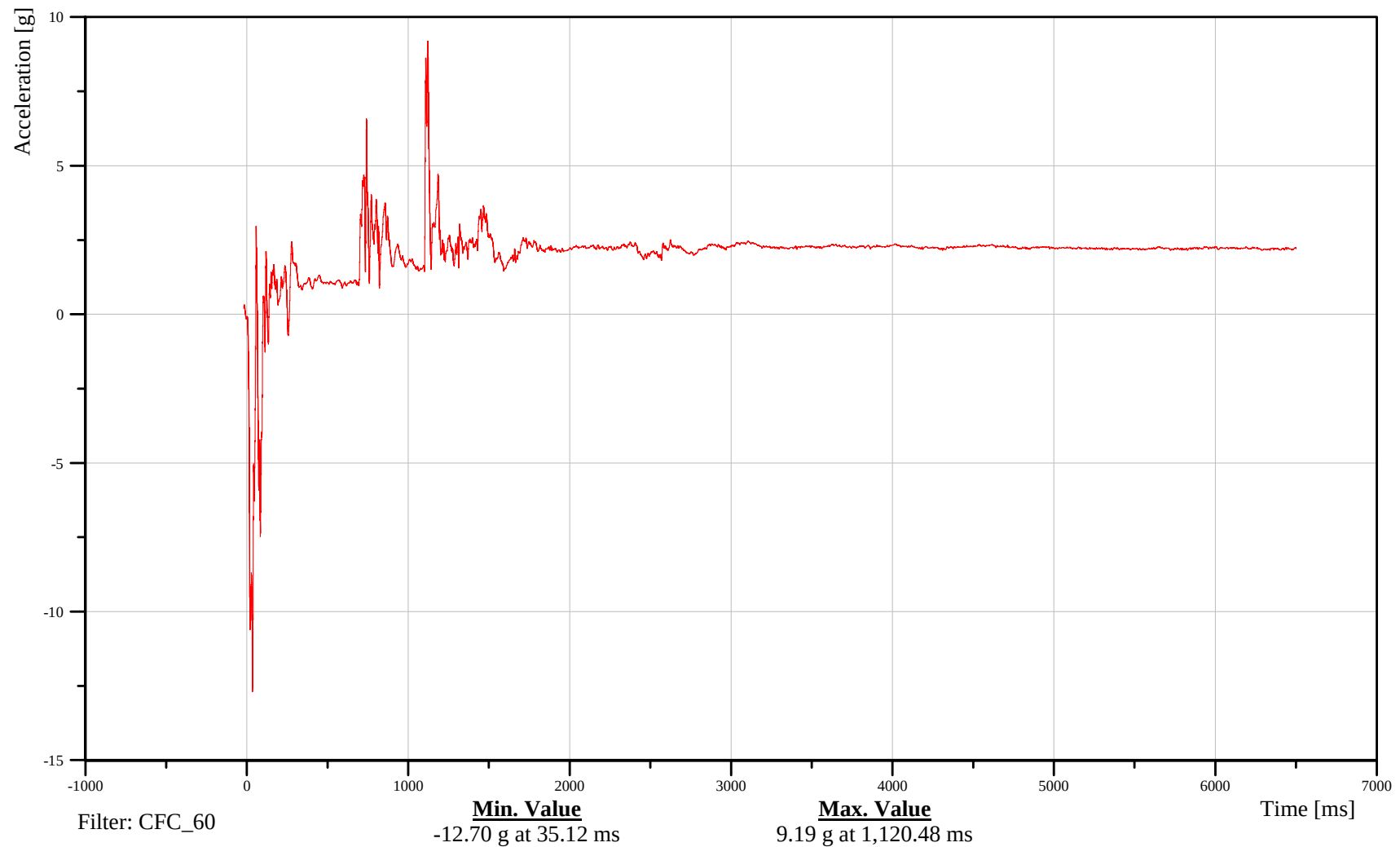
Time: 15:17

Customer: VRTC

10APILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-113

100203



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower Resultant Acceleration

Date: 02/03/2010

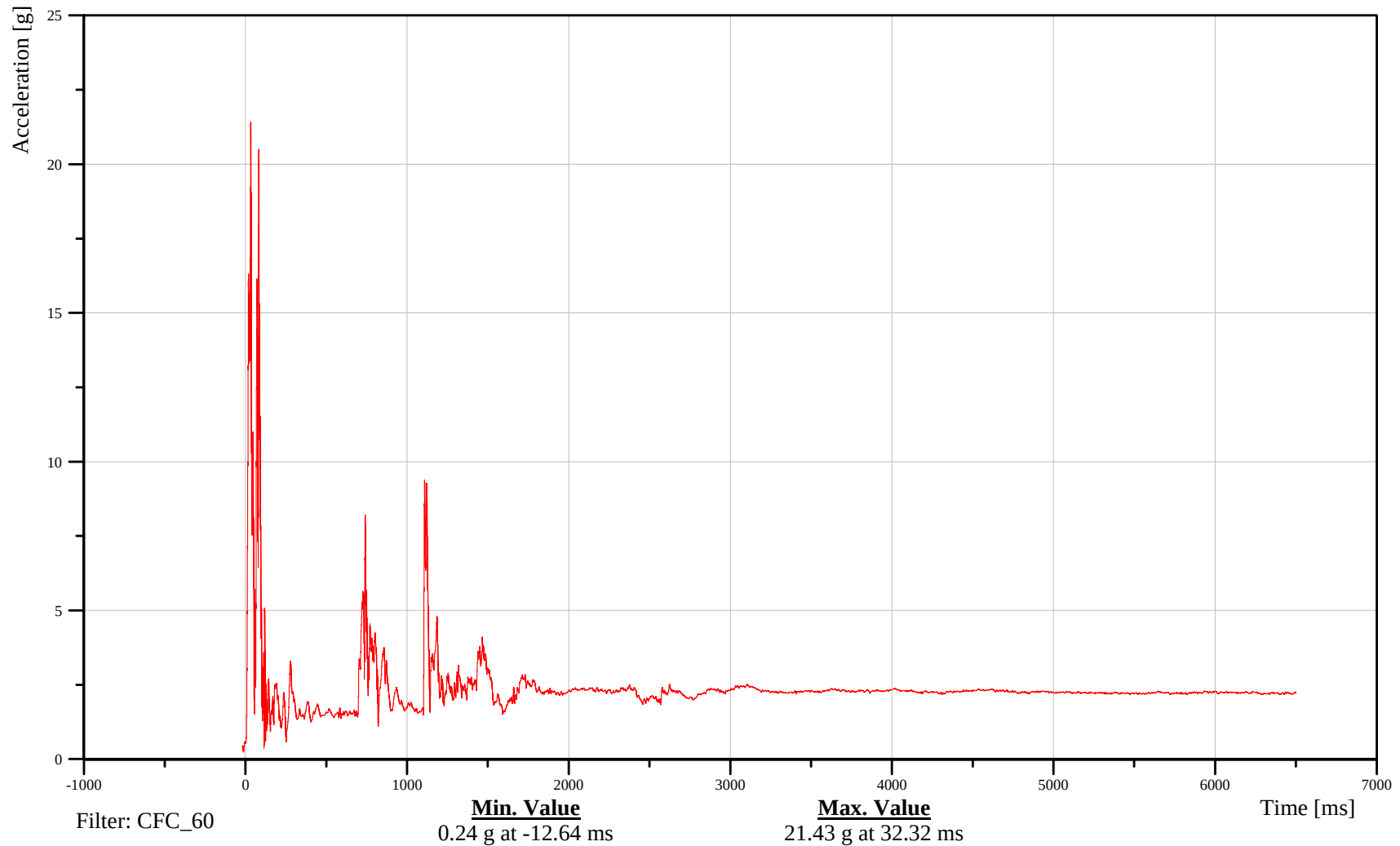
Time: 15:17

Customer: VRTC

10APILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-114

100203



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

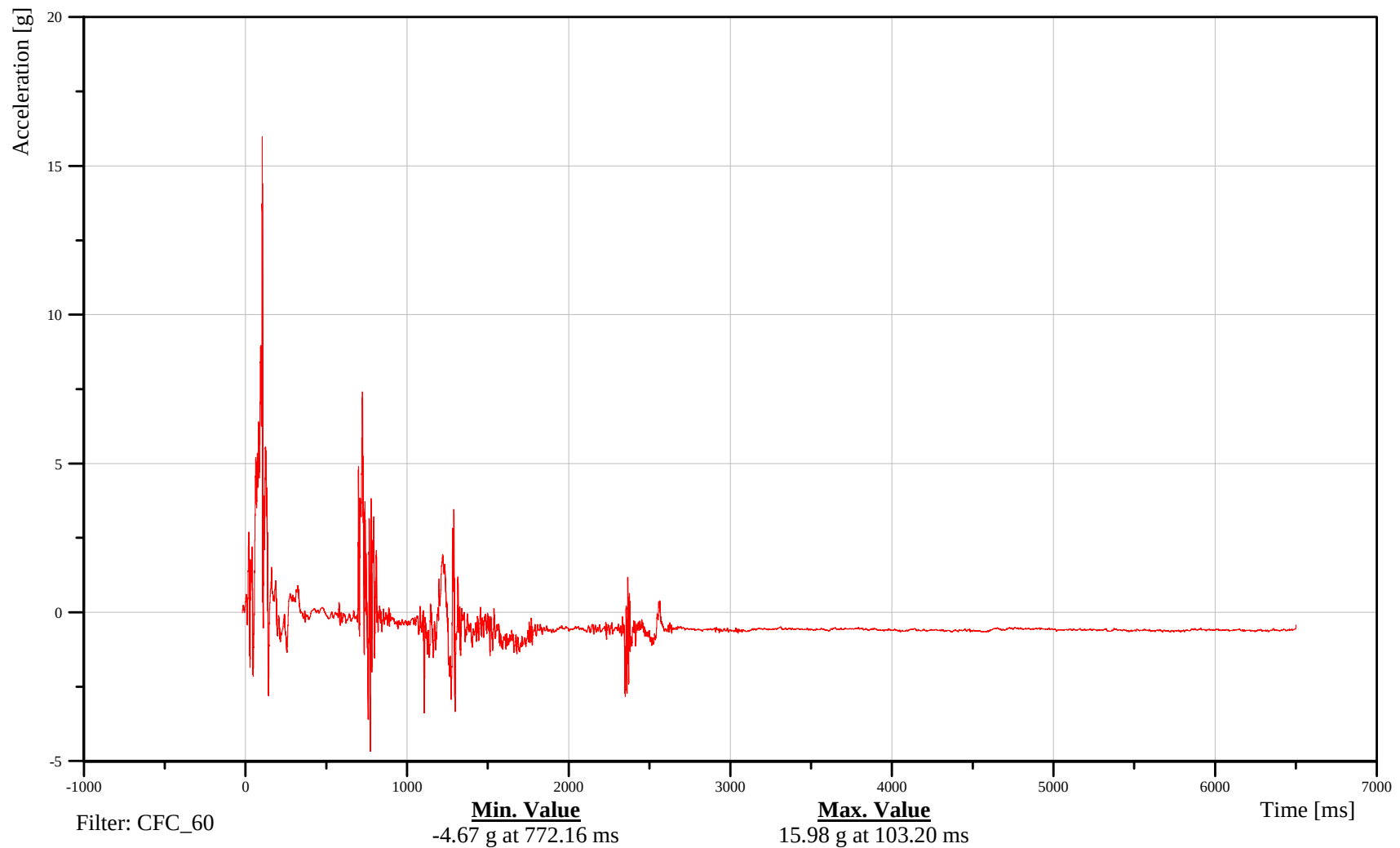
Time: 15:17

Customer: VRTC

10APILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-115

100203



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Upper Y-Axis Acceleration

Date: 02/03/2010

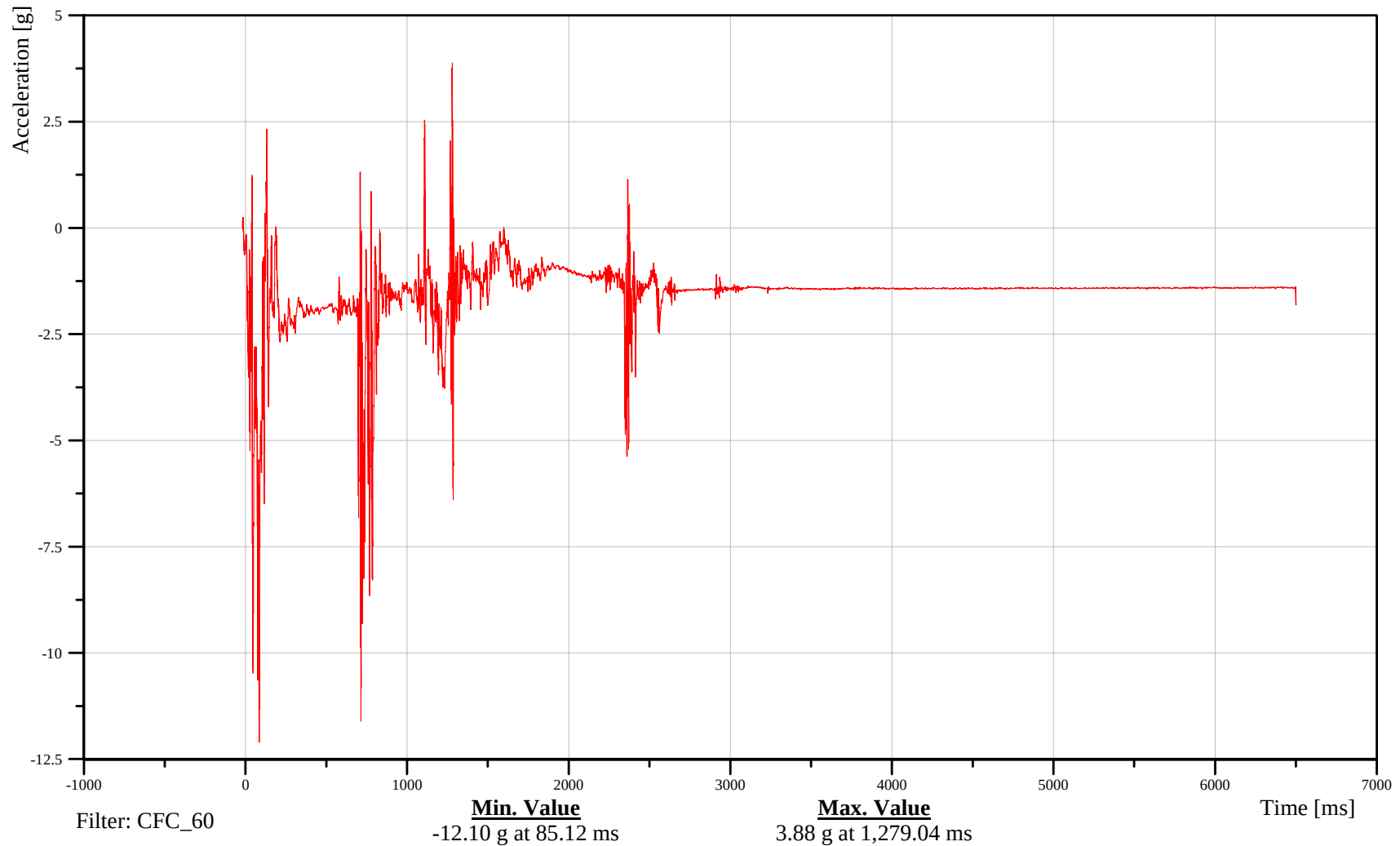
Time: 15:17

Customer: VRTC

10APILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-116

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right A-Pillar Upper Z-Axis Acceleration

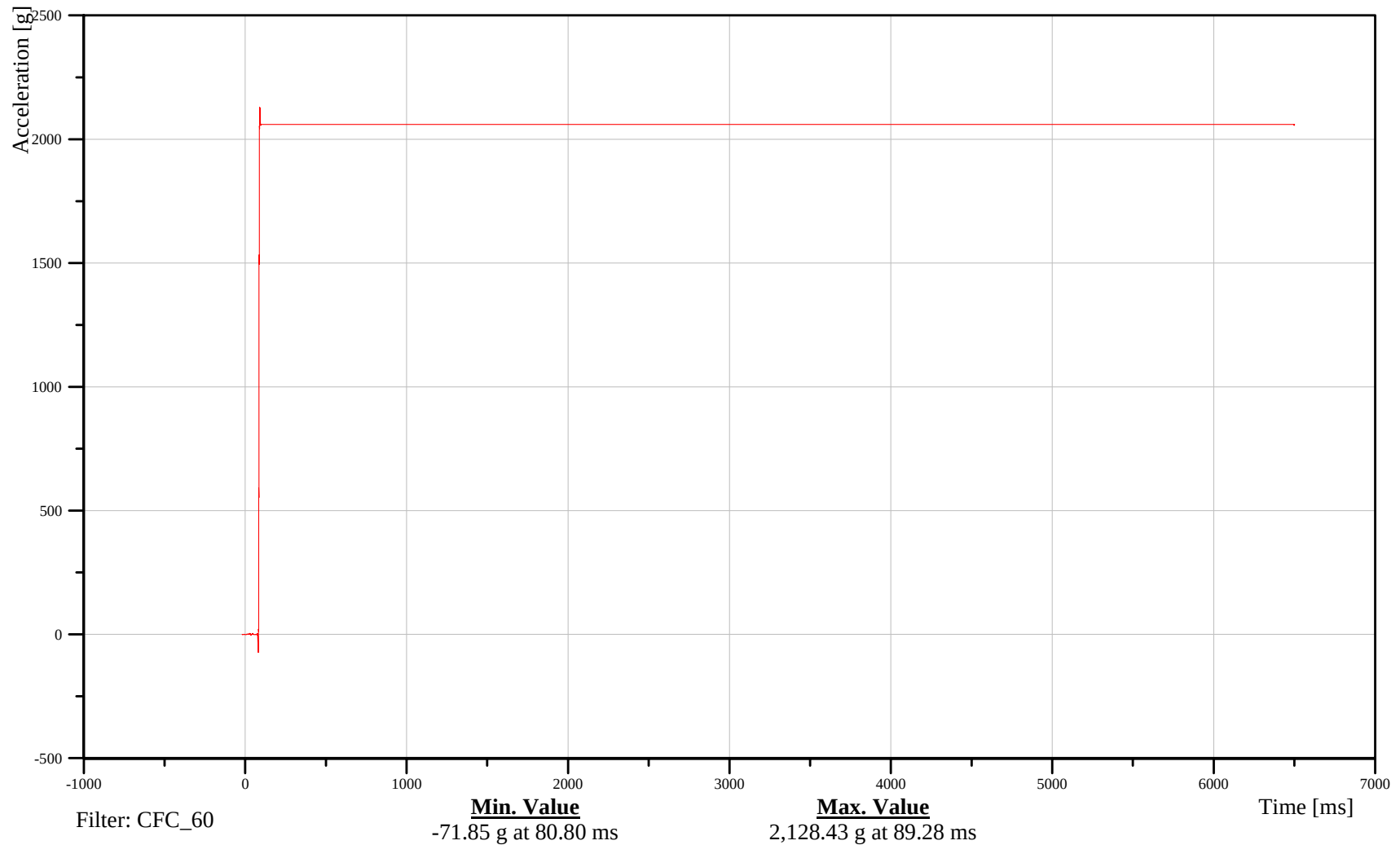
Time: 15:17

Customer: VRTC

10APILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-117

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right A-Pillar Upper Resultant Acceleration

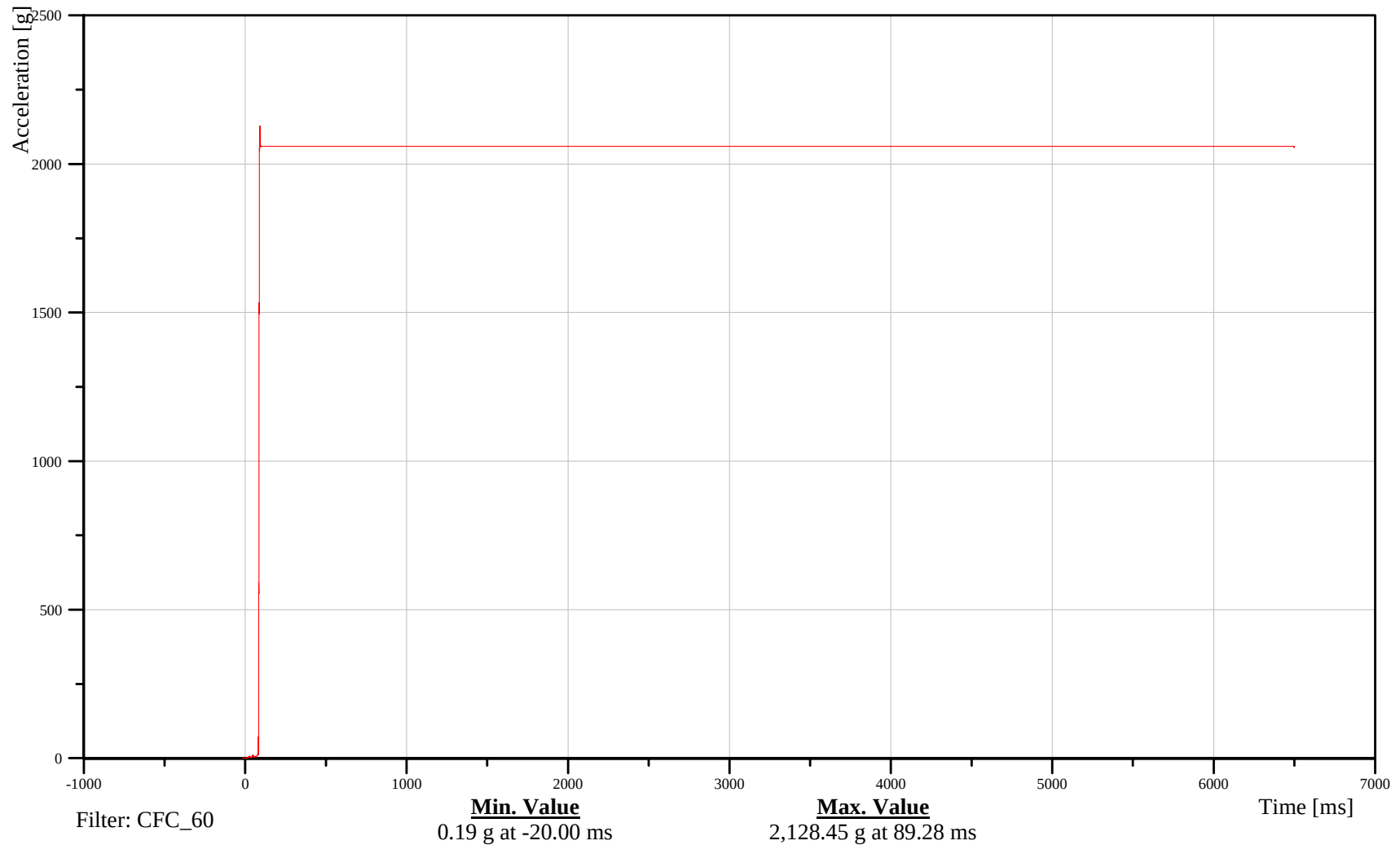
Time: 15:17

Customer: VRTC

10APILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-118

100203



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

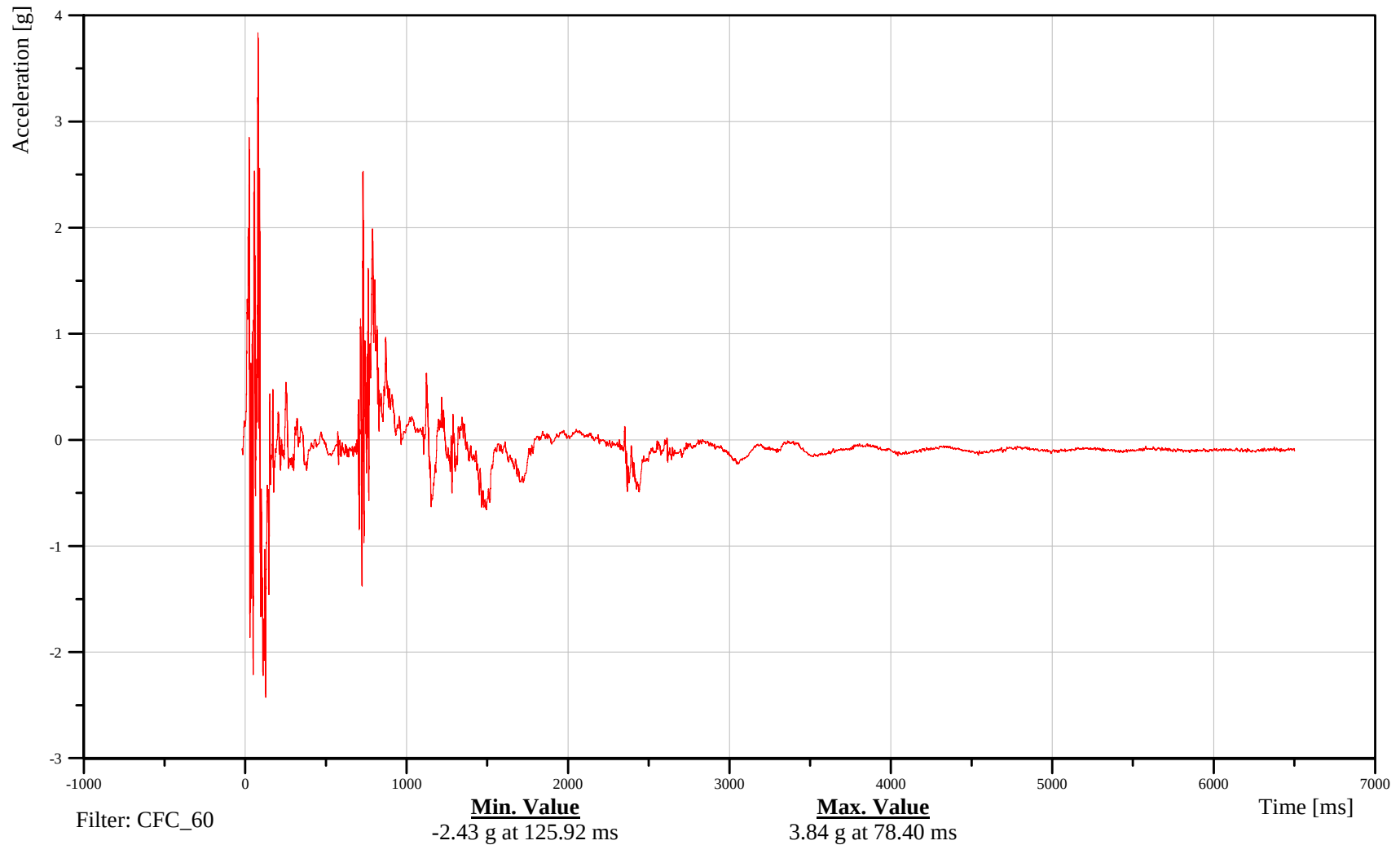
Time: 15:17

Customer: VRTC

10APILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-119

100203



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Lower Y-Axis Acceleration

Date: 02/03/2010

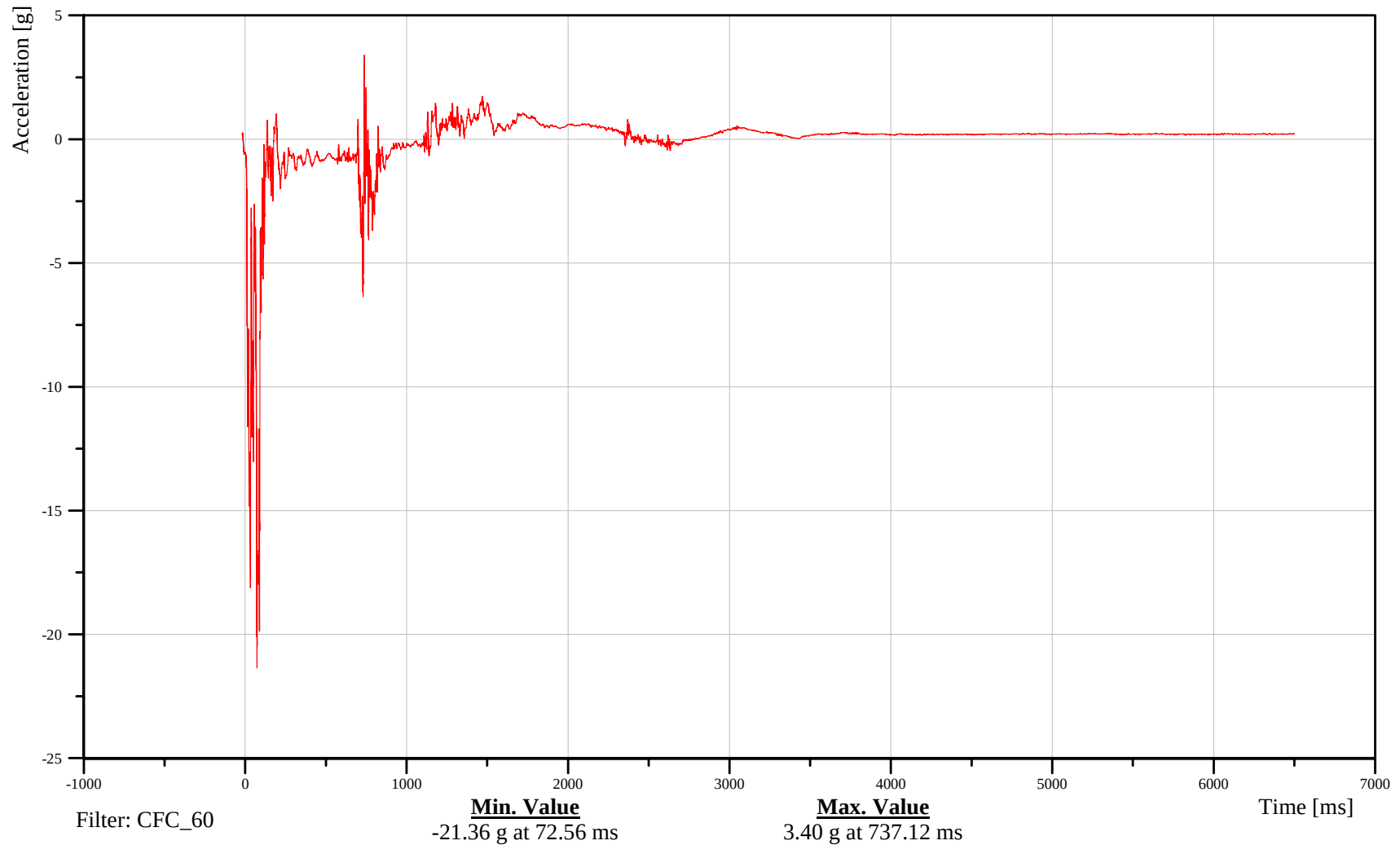
Time: 15:17

Customer: VRTC

10APILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-120

100203



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

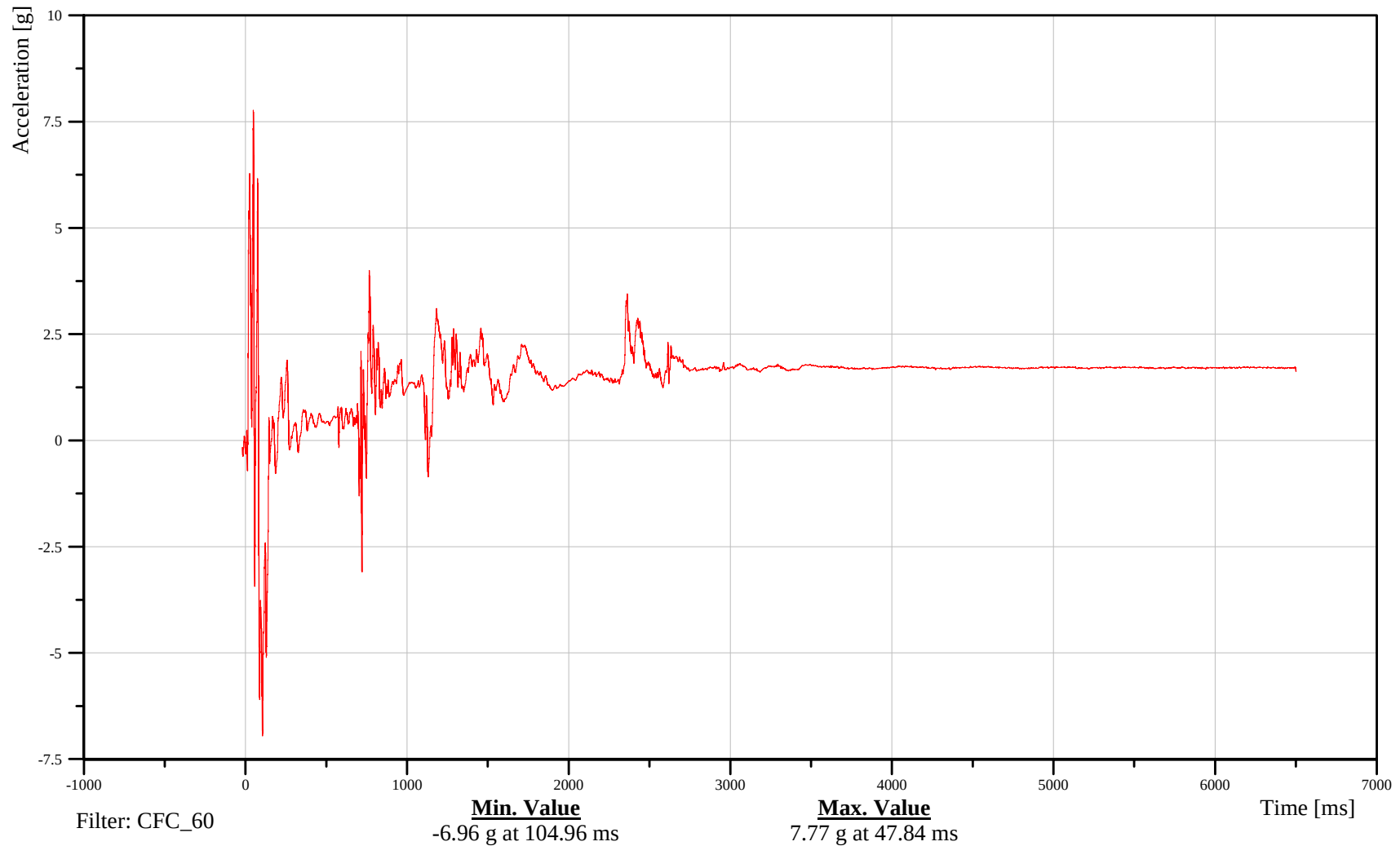
Time: 15:17

Customer: VRTC

10APILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-121

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right A-Pillar Lower Resultant Acceleration

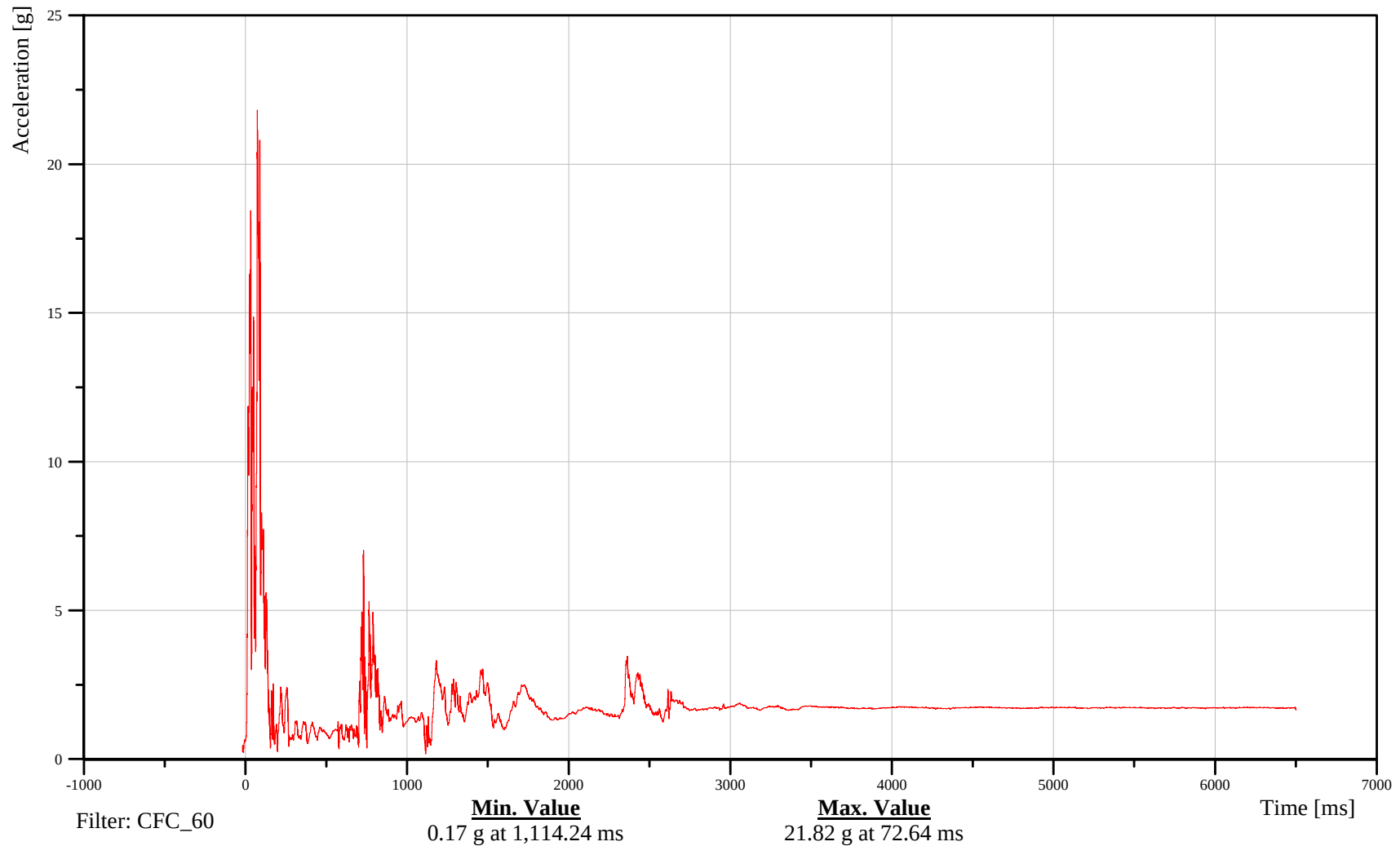
Time: 15:17

Customer: VRTC

10APILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-122

100203



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

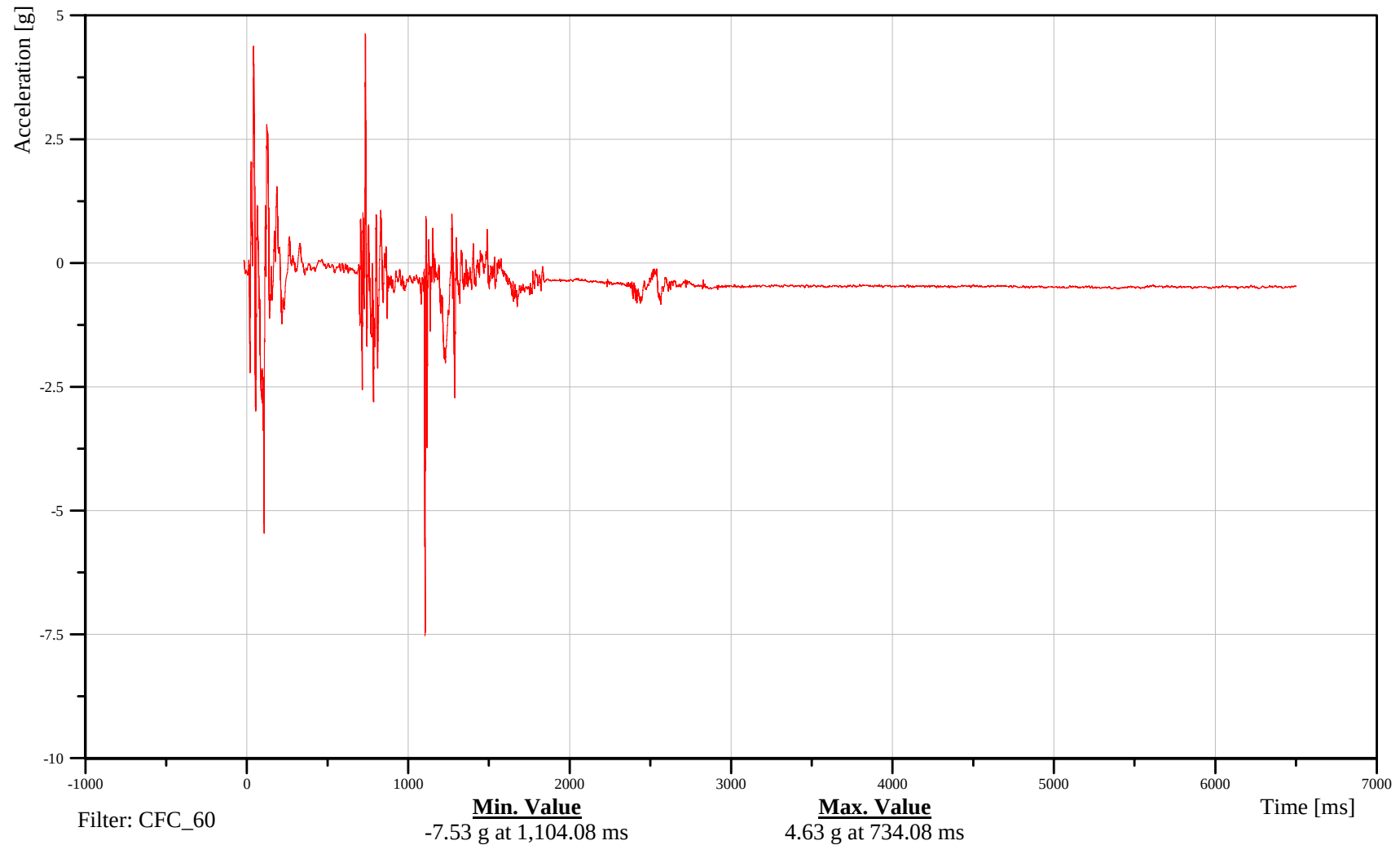
Time: 15:17

Customer: VRTC

10BPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-123

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Left B-Pillar Upper Y-Axis Acceleration

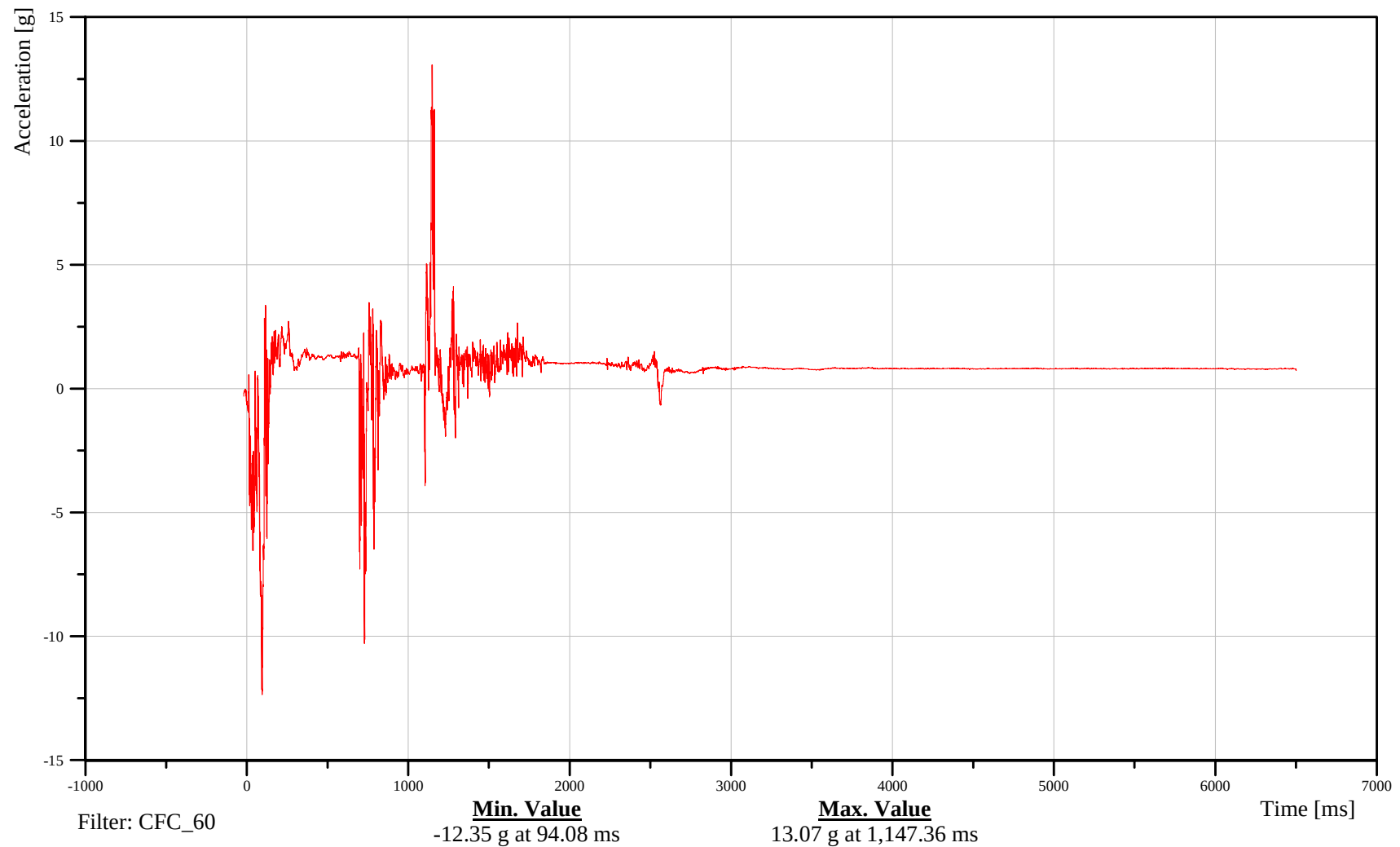
Time: 15:17

Customer: VRTC

10BPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-124

100203



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Upper Z-Axis Acceleration

Date: 02/03/2010

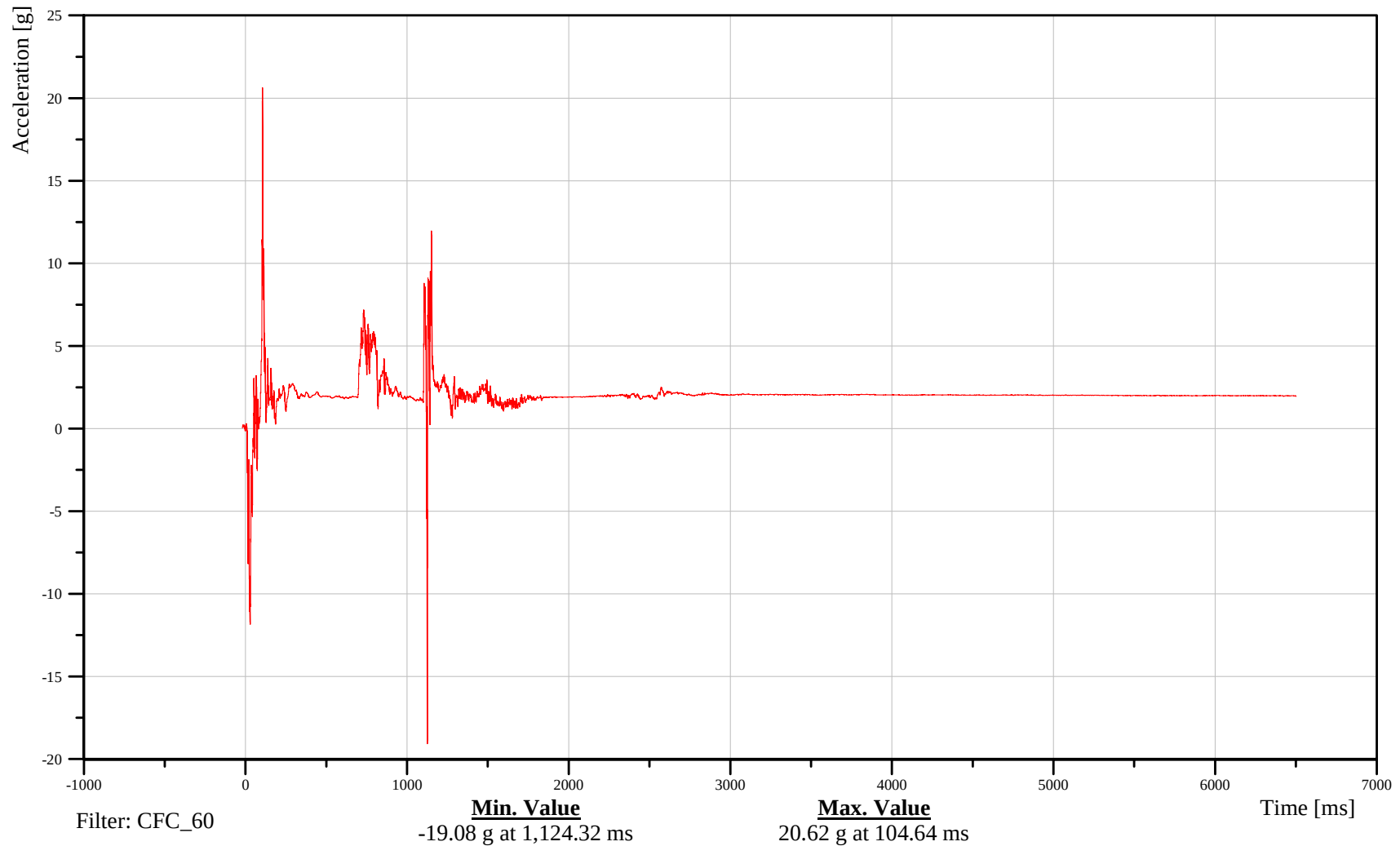
Time: 15:17

Customer: VRTC

10BPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-125

100203



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Upper Resultant Acceleration

Date: 02/03/2010

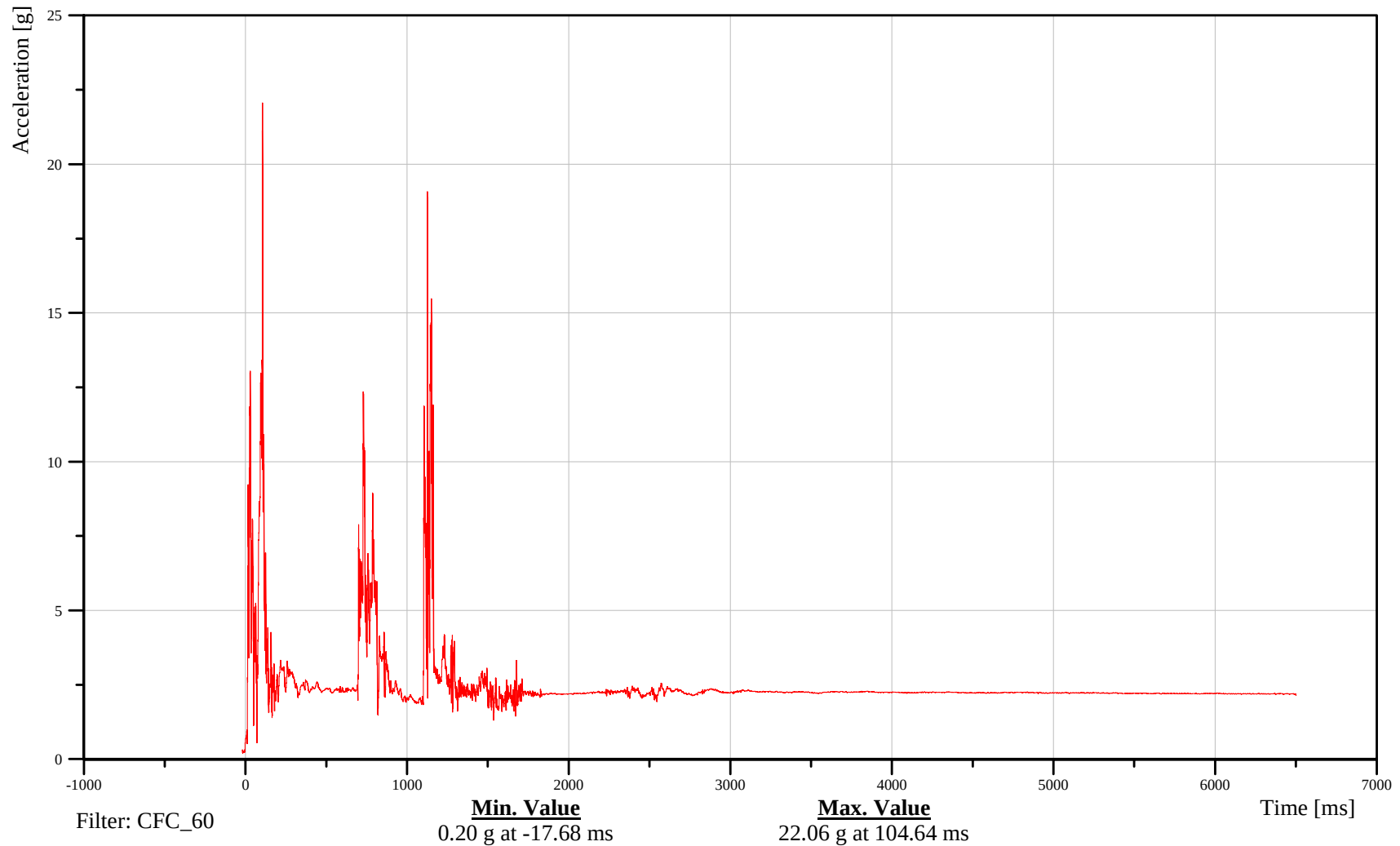
Time: 15:17

Customer: VRTC

10BPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-126

100203



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

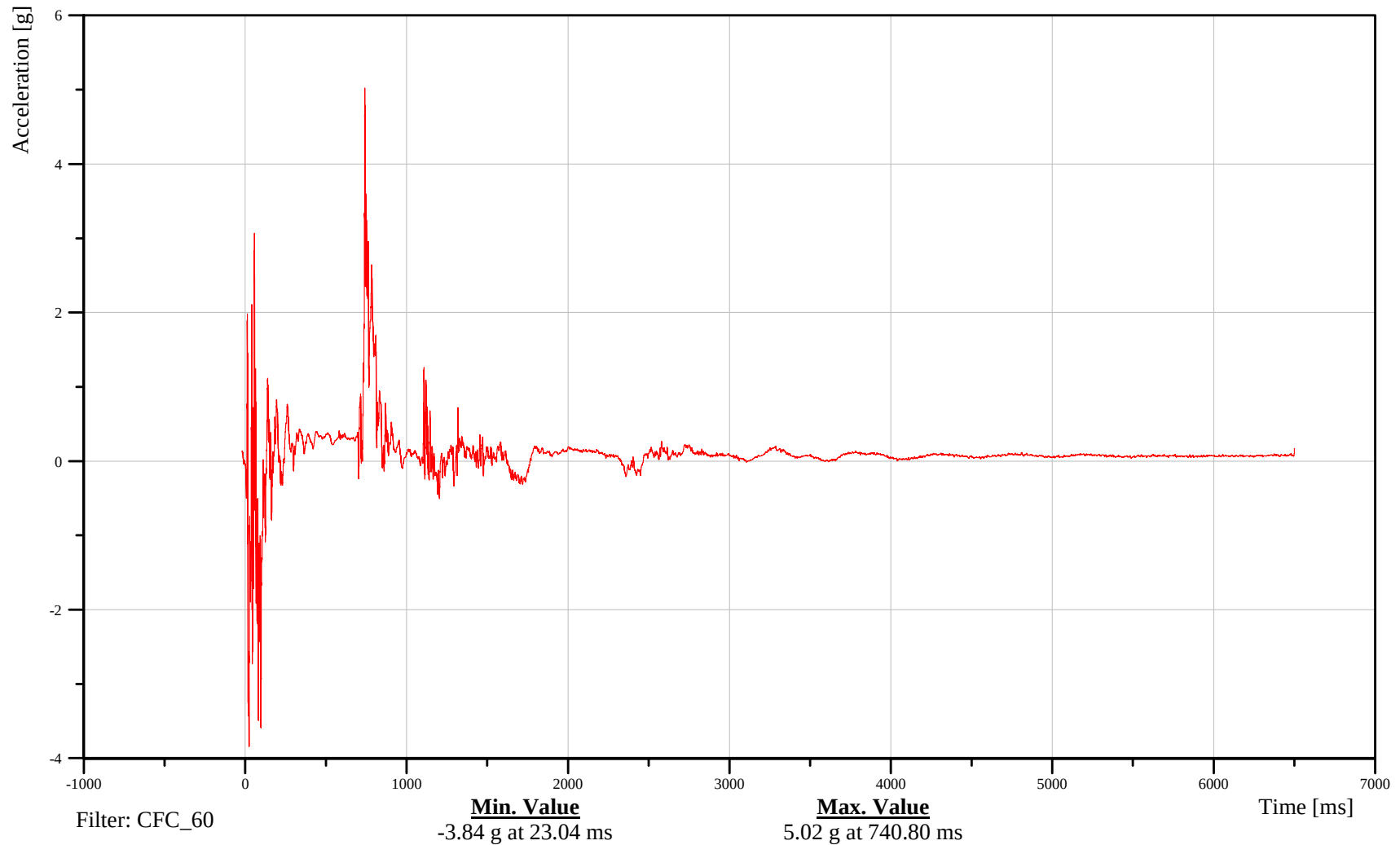
Time: 15:17

Customer: VRTC

10BPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-127

100203



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower Y-Axis Acceleration

Date: 02/03/2010

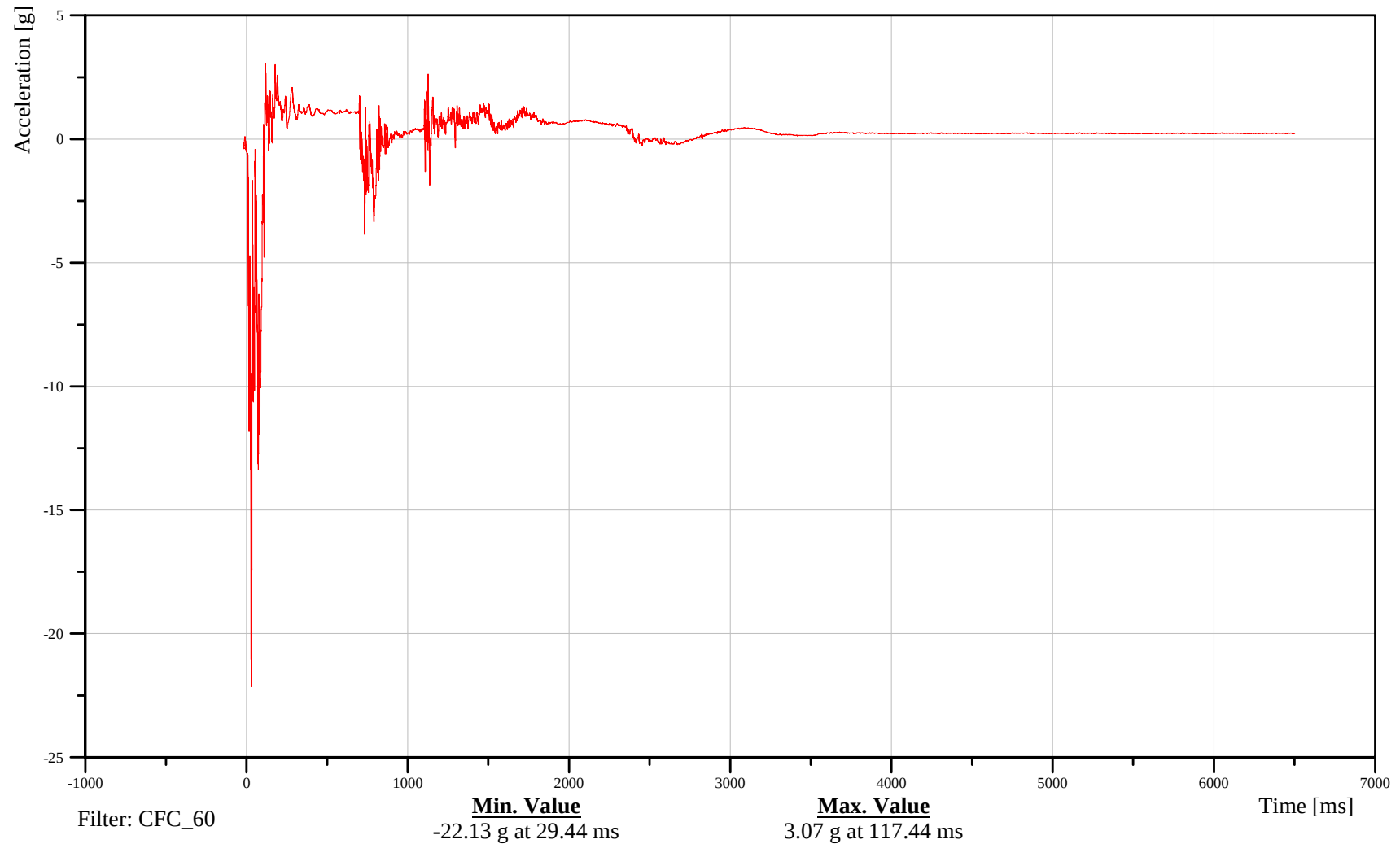
Time: 15:17

Customer: VRTC

10BPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-128

100203



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

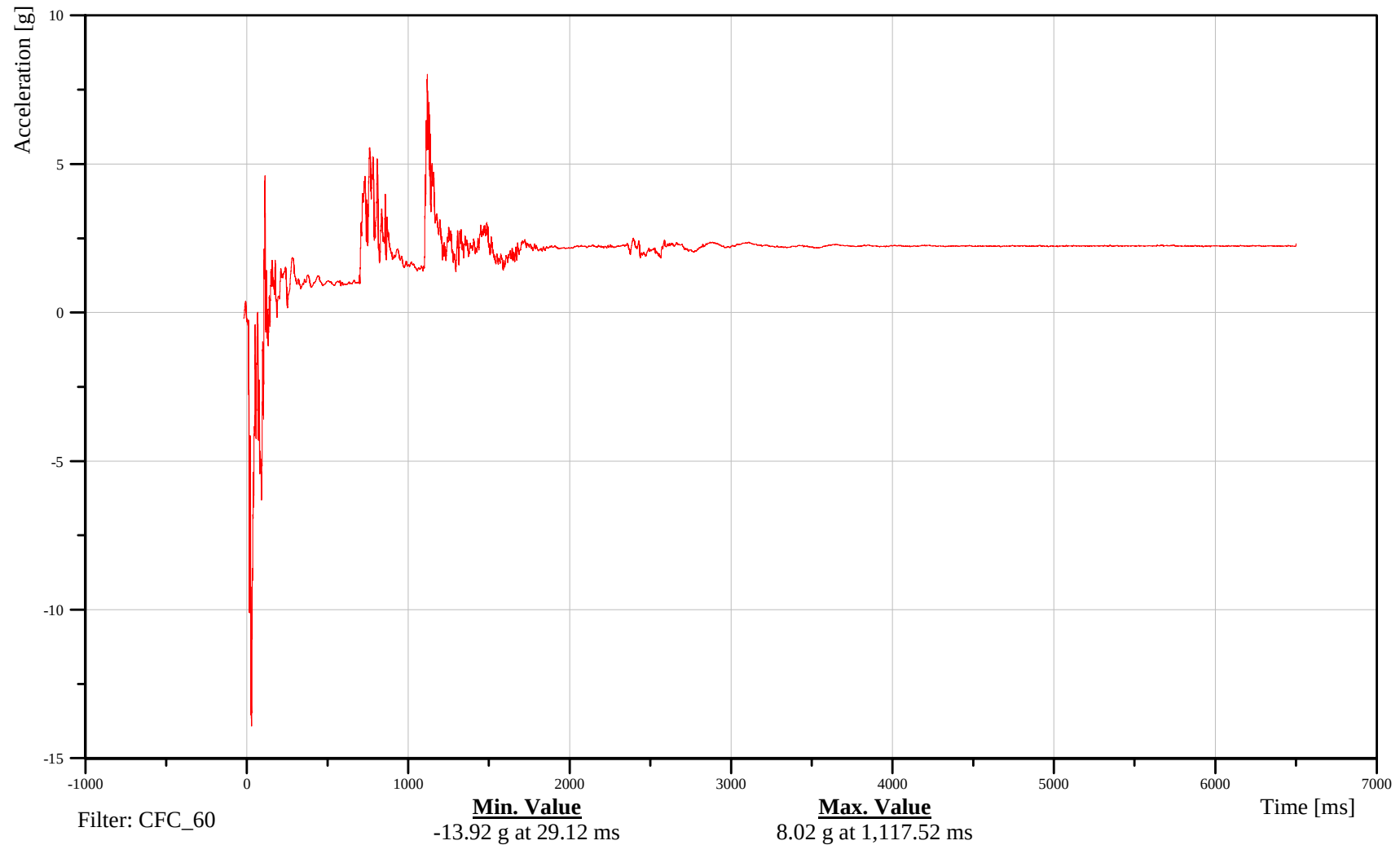
Time: 15:17

Customer: VRTC

10BPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-129

100203



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower Resultant Acceleration

Date: 02/03/2010

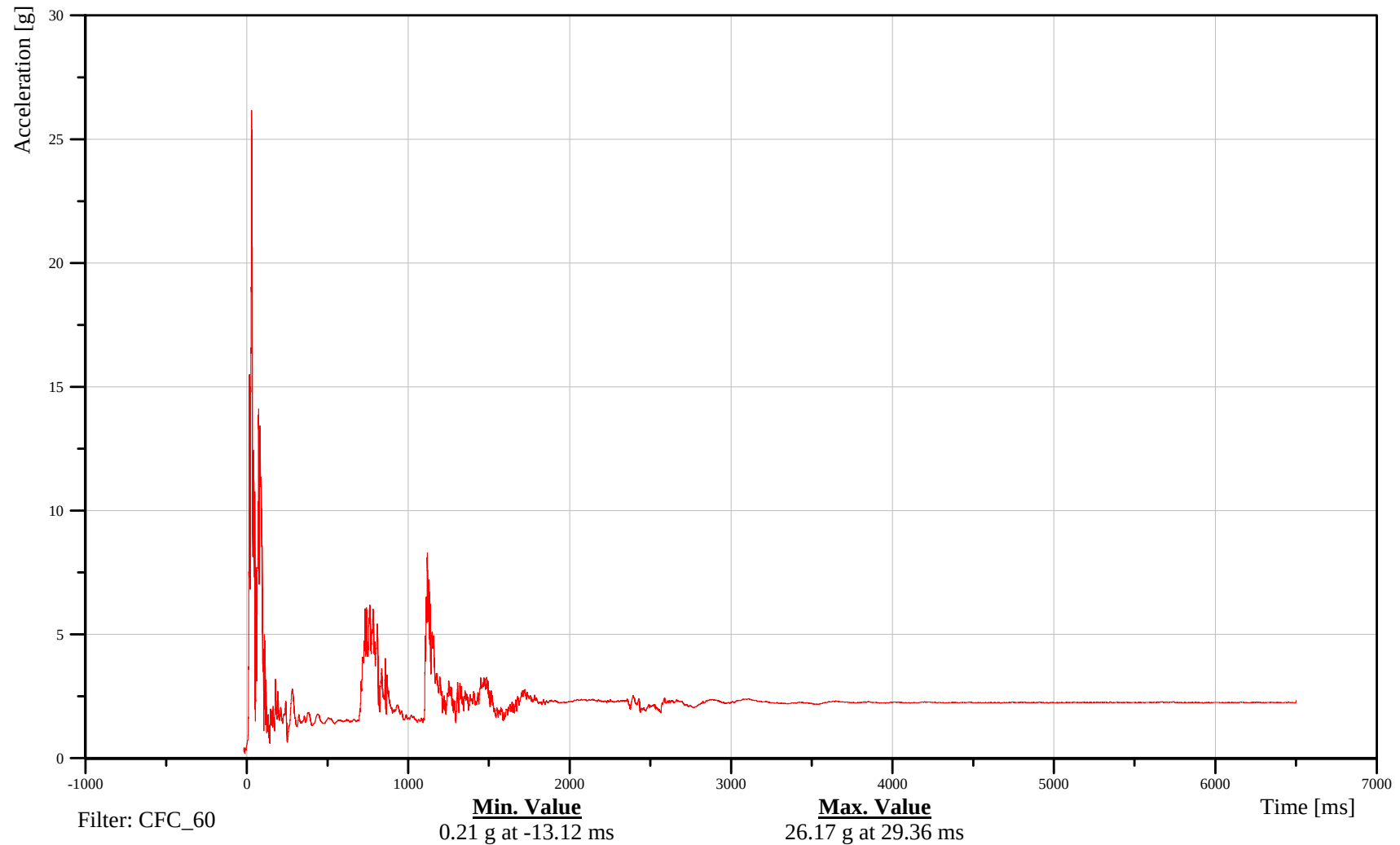
Time: 15:17

Customer: VRTC

10BPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-130

100203



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

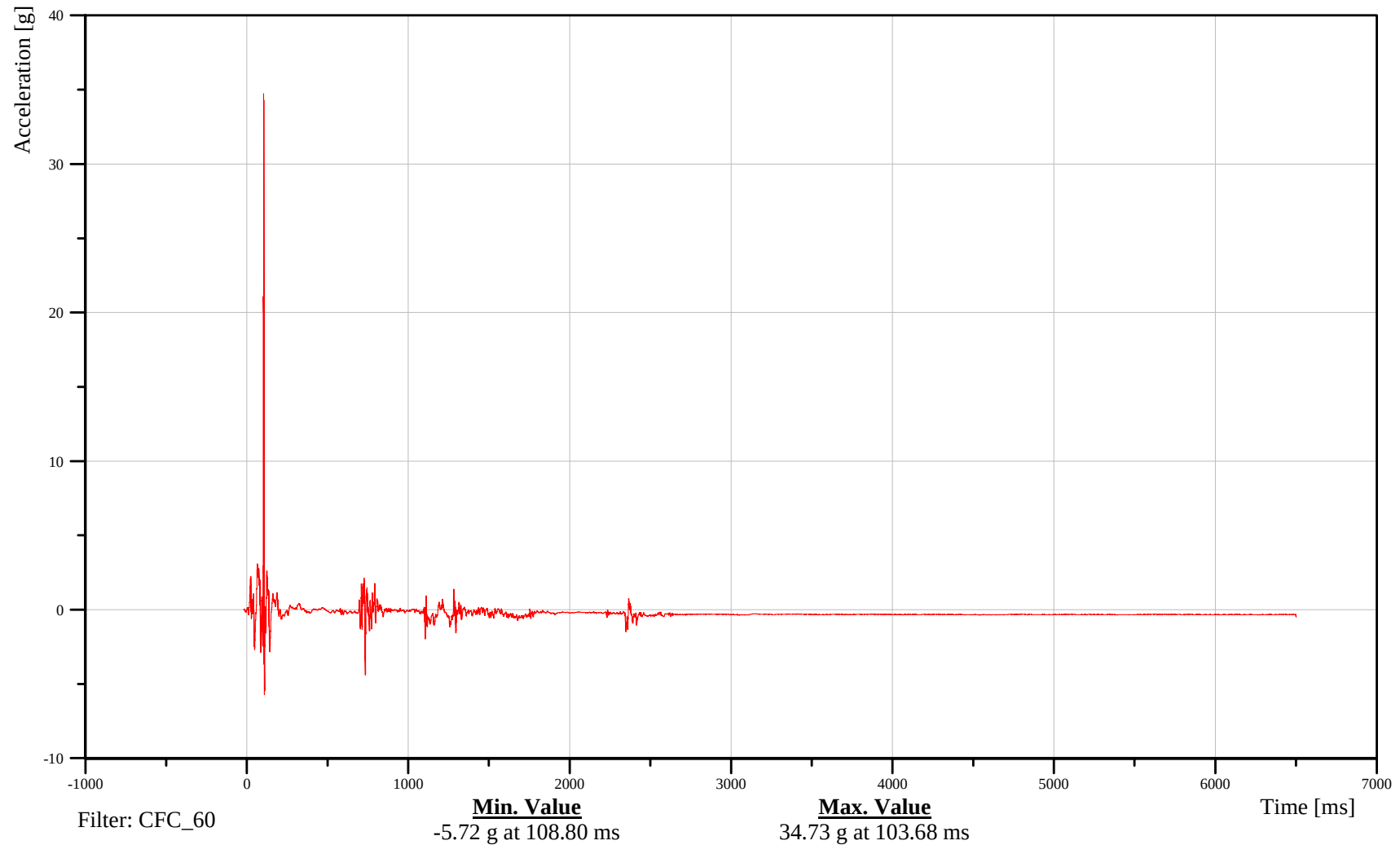
Time: 15:17

Customer: VRTC

10BPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-131

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right B-Pillar Upper Y-Axis Acceleration

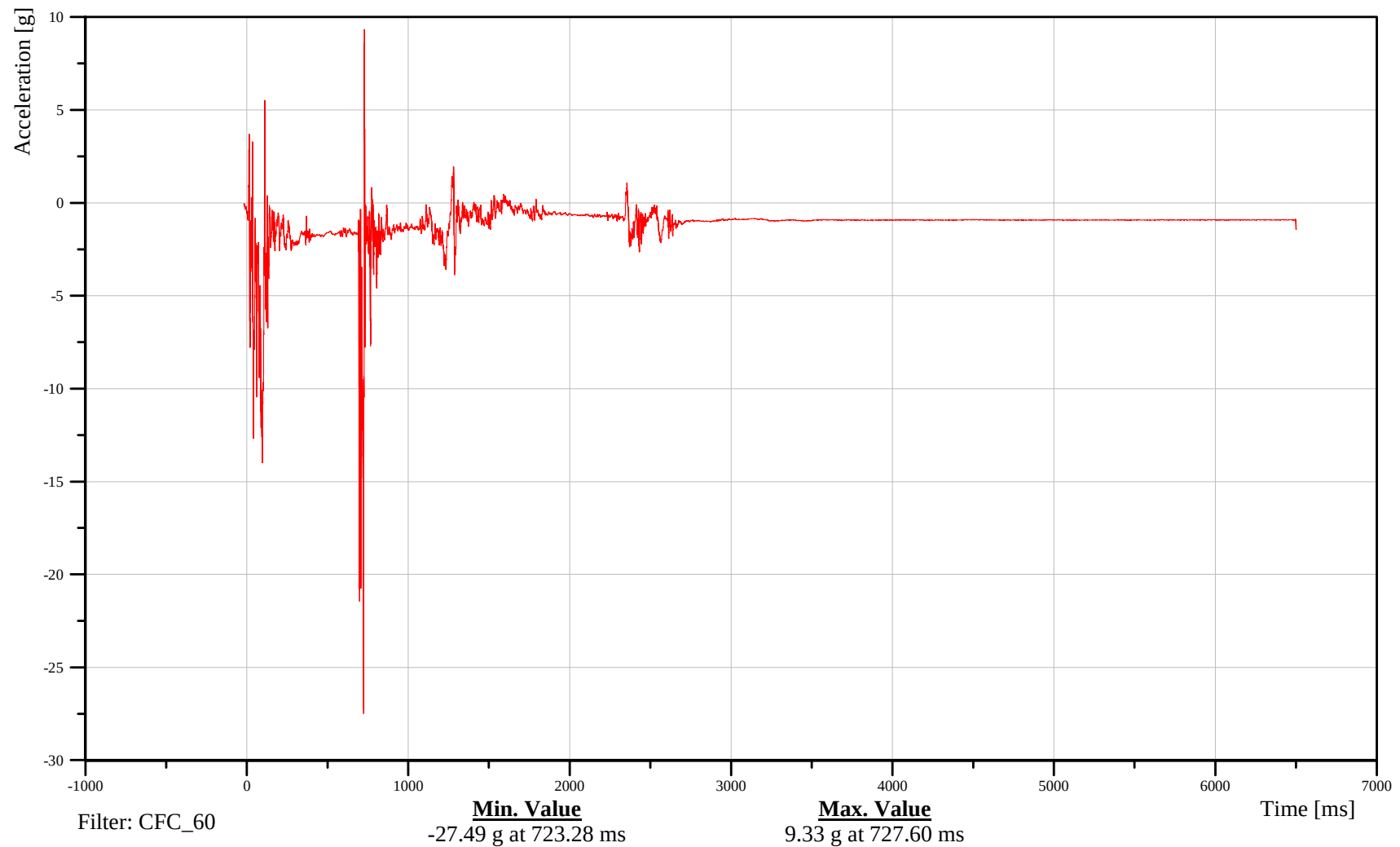
Time: 15:17

Customer: VRTC

10BPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-132

100203



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Upper Z-Axis Acceleration

Date: 02/03/2010

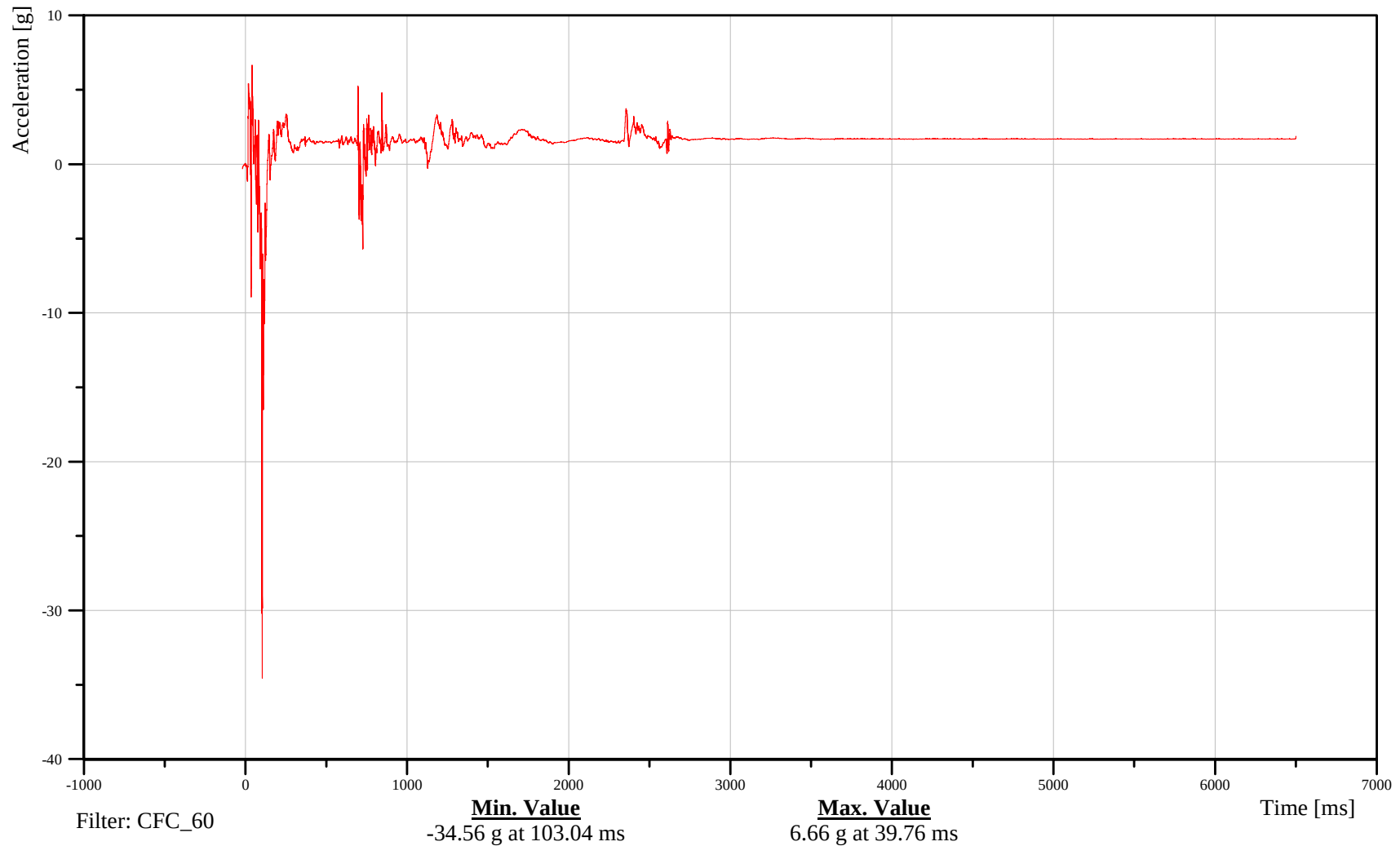
Time: 15:17

Customer: VRTC

10BPILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-133

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right B-Pillar Upper Resultant Acceleration

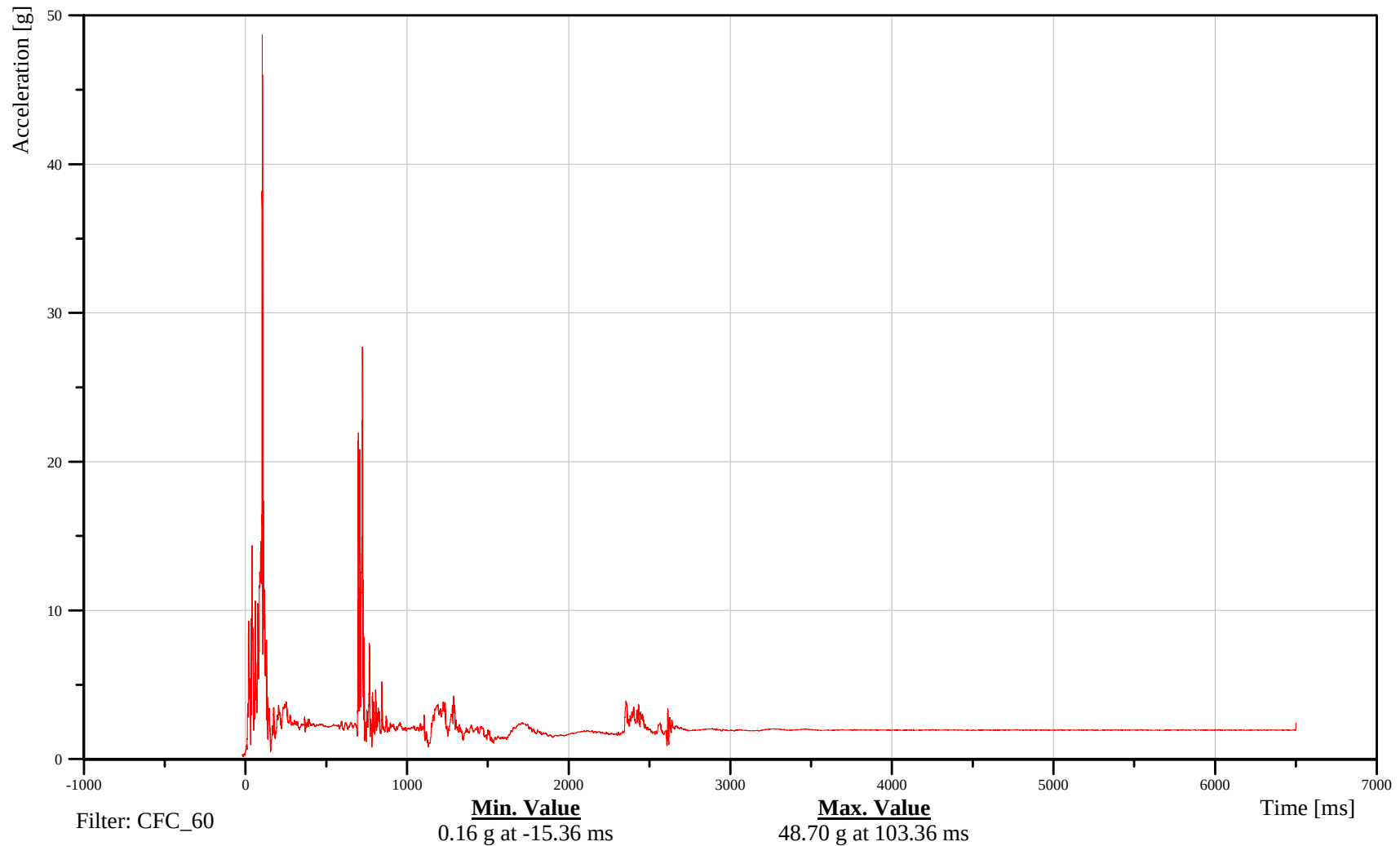
Time: 15:17

Customer: VRTC

10BPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-134

100203



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

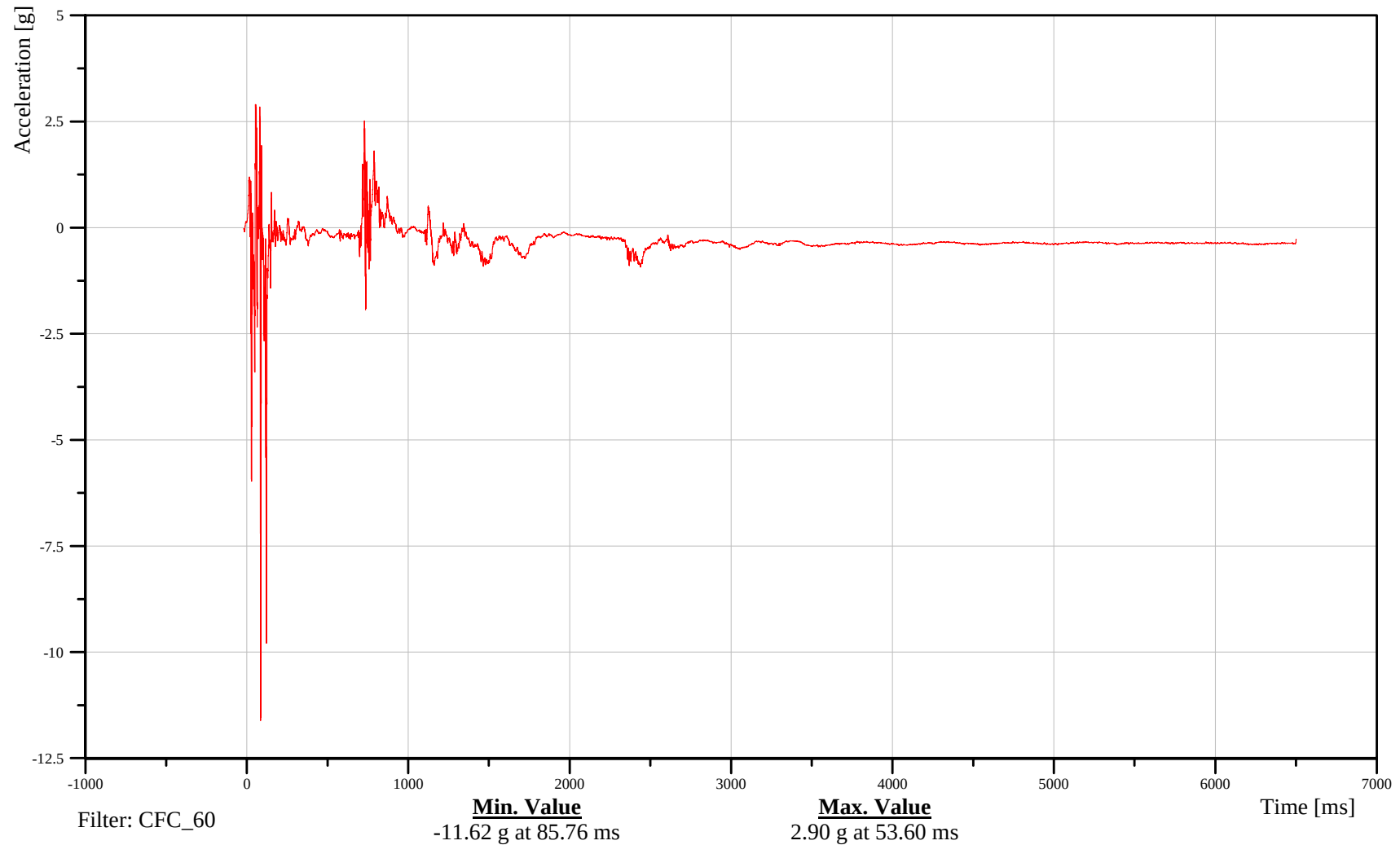
Time: 15:17

Customer: VRTC

10BPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-135

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right B-Pillar Lower Y-Axis Acceleration

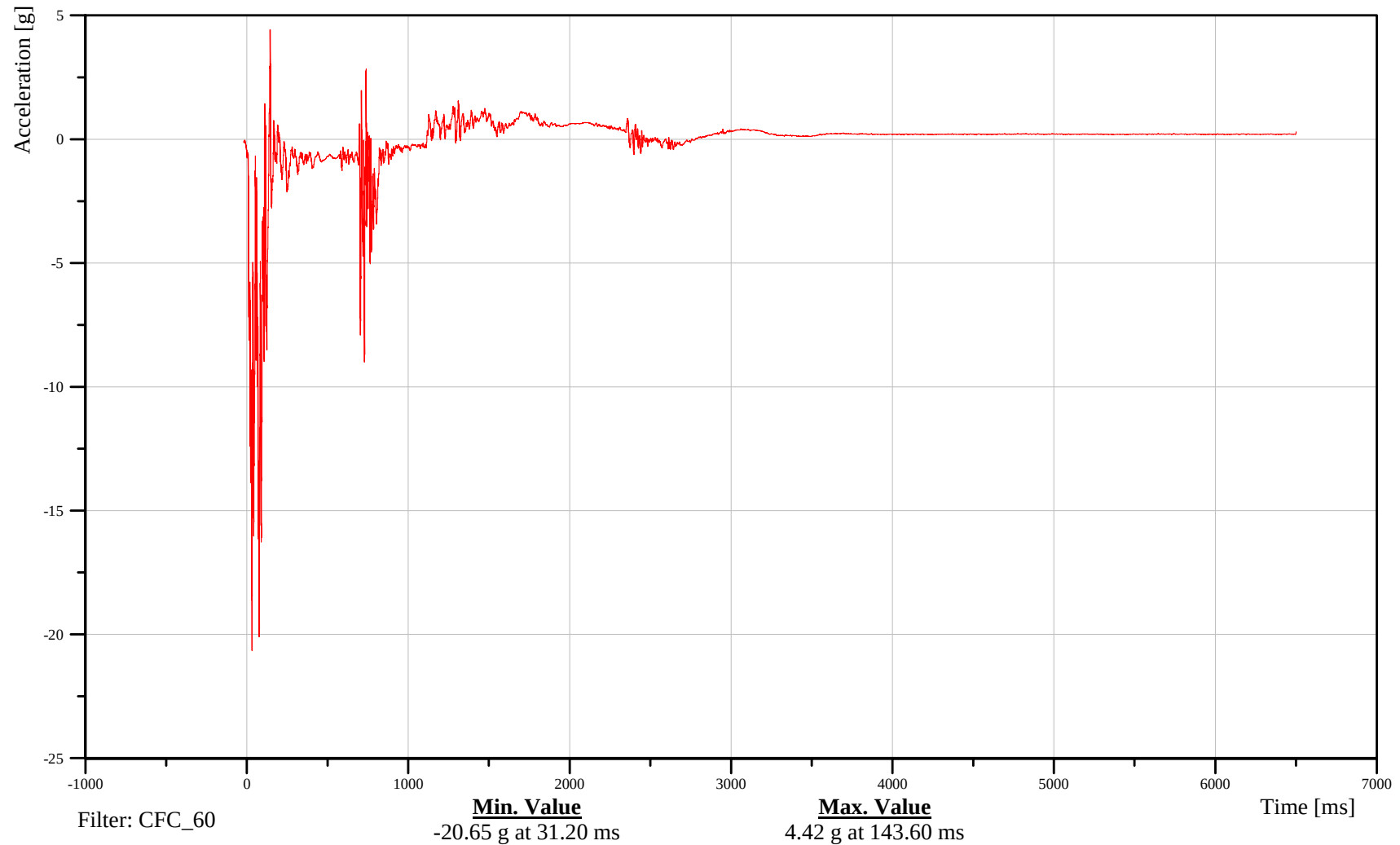
Time: 15:17

Customer: VRTC

10BPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-136

100203



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

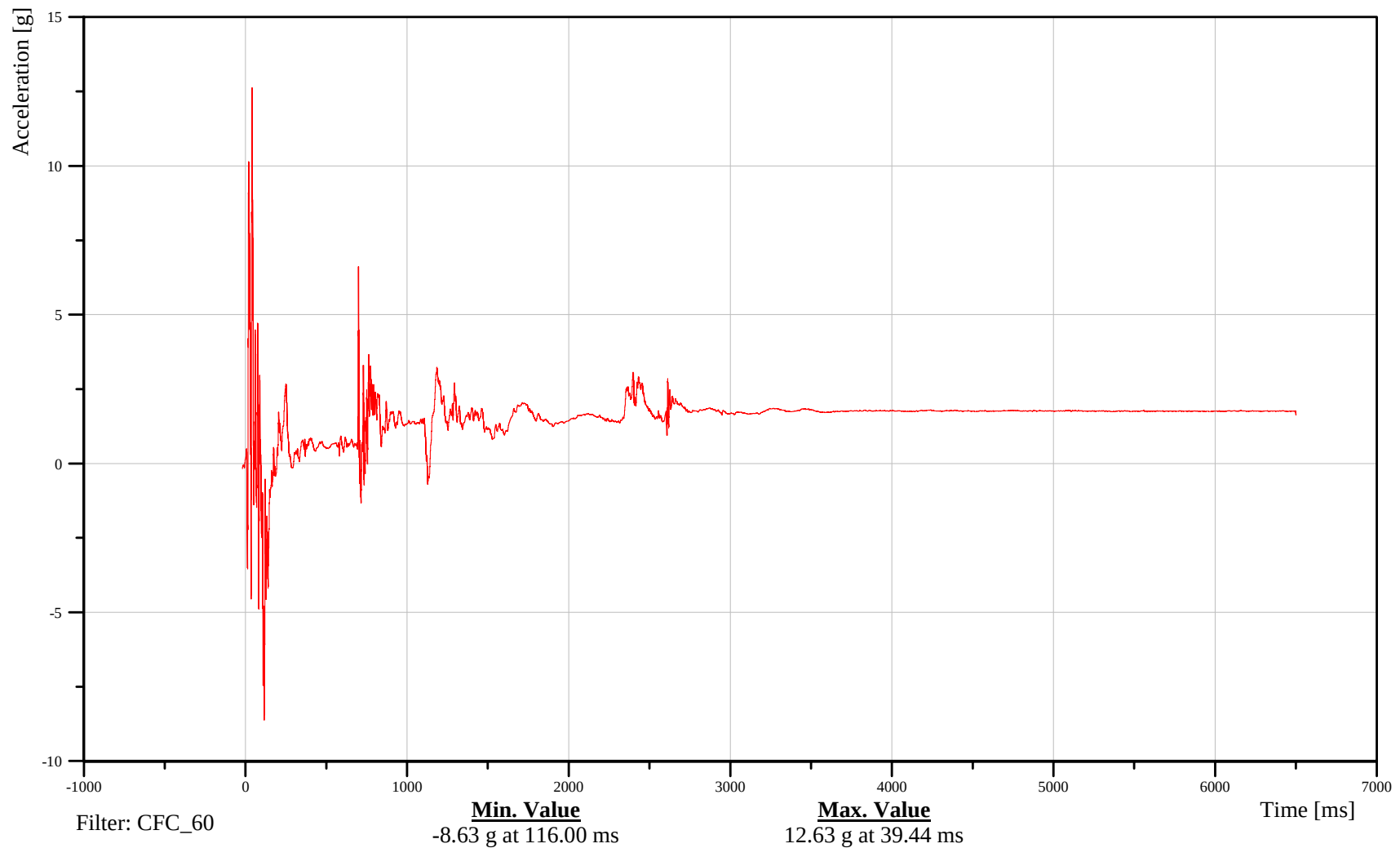
Time: 15:17

Customer: VRTC

10BPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-137

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right B-Pillar Lower Resultant Acceleration

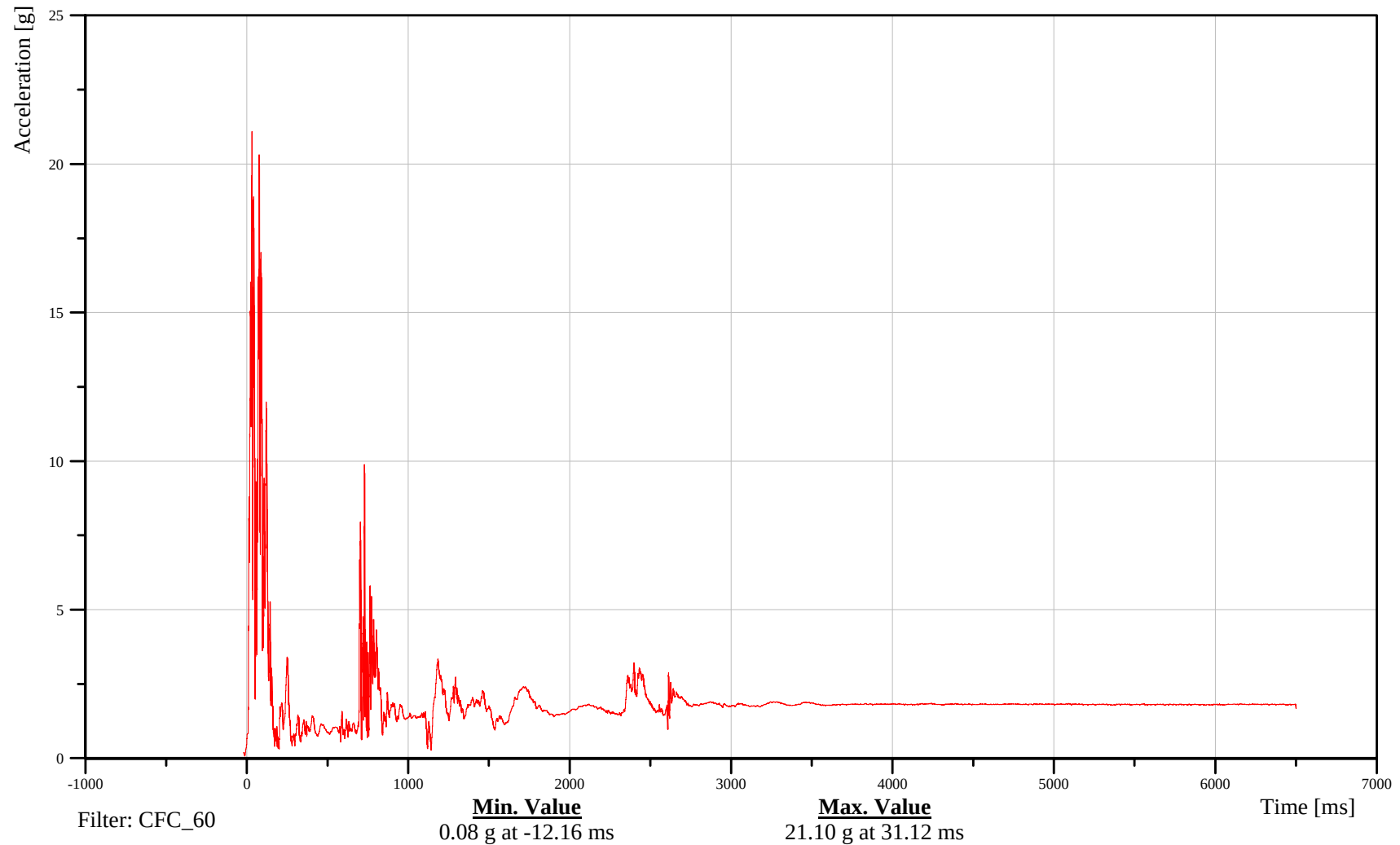
Time: 15:17

Customer: VRTC

10BPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-138

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

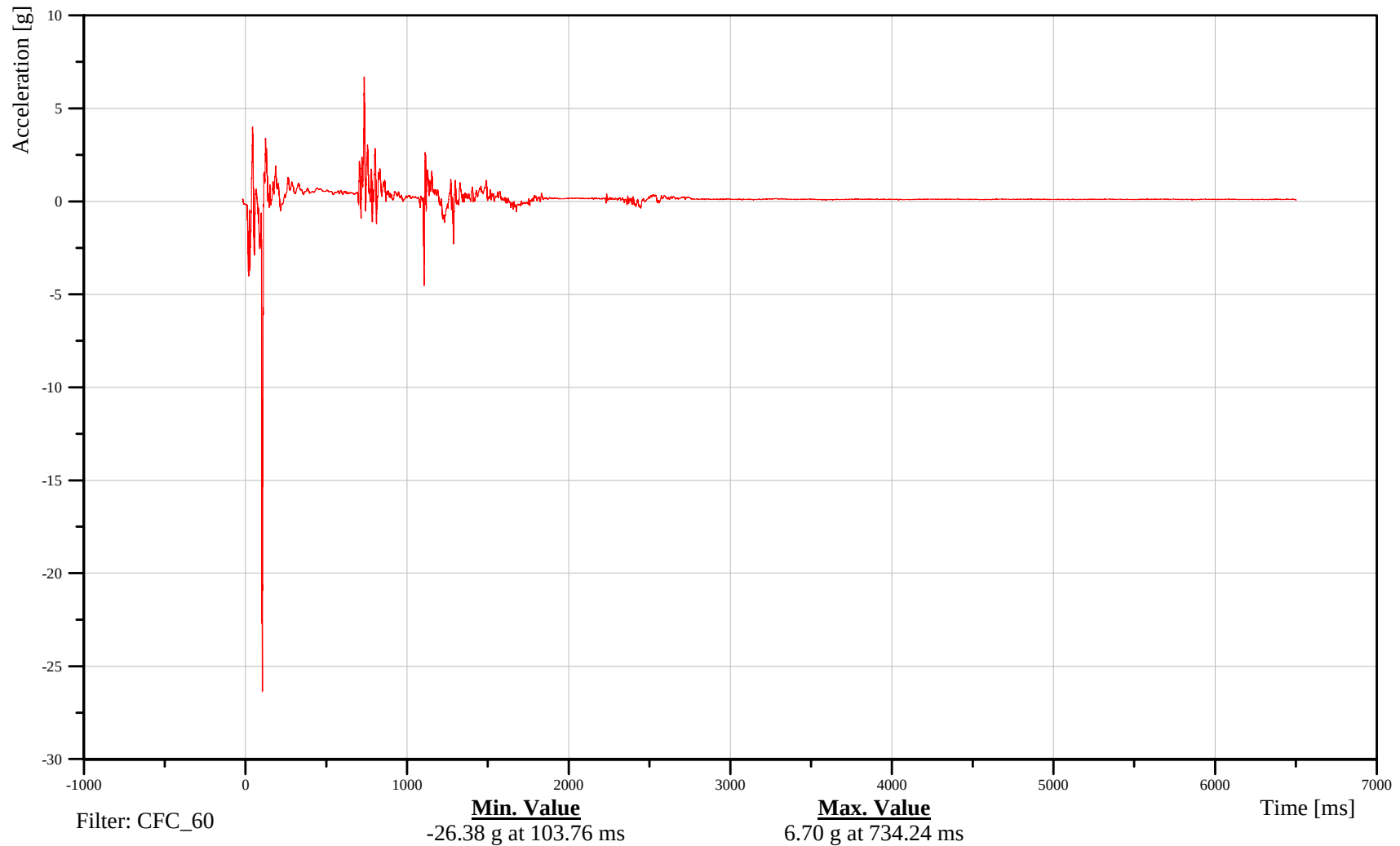
Time: 15:17

Customer: VRTC

10CPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-139

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper Y-Axis Acceleration

Date: 02/03/2010

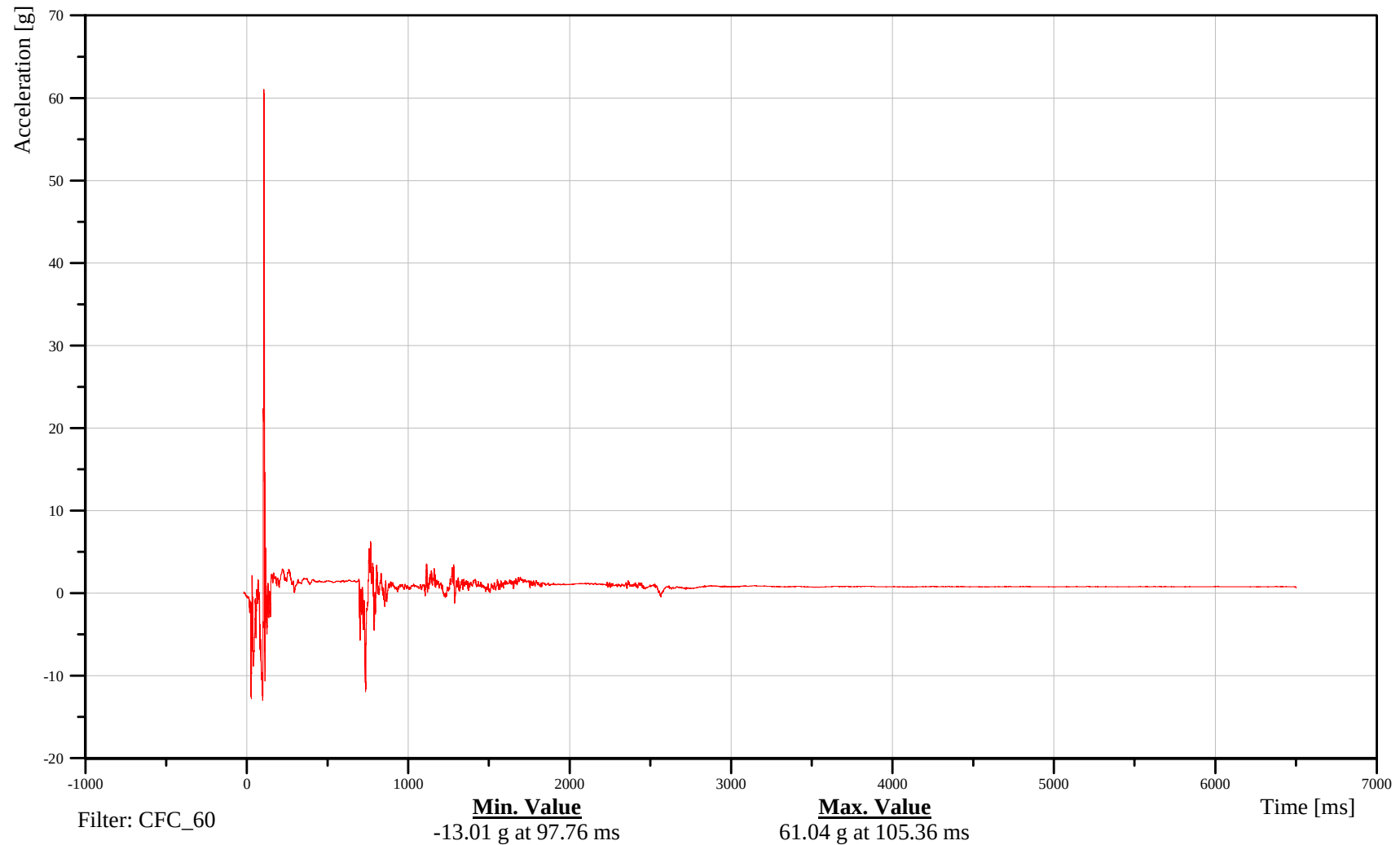
Time: 15:17

Customer: VRTC

10CPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-140

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper Z-Axis Acceleration

Date: 02/03/2010

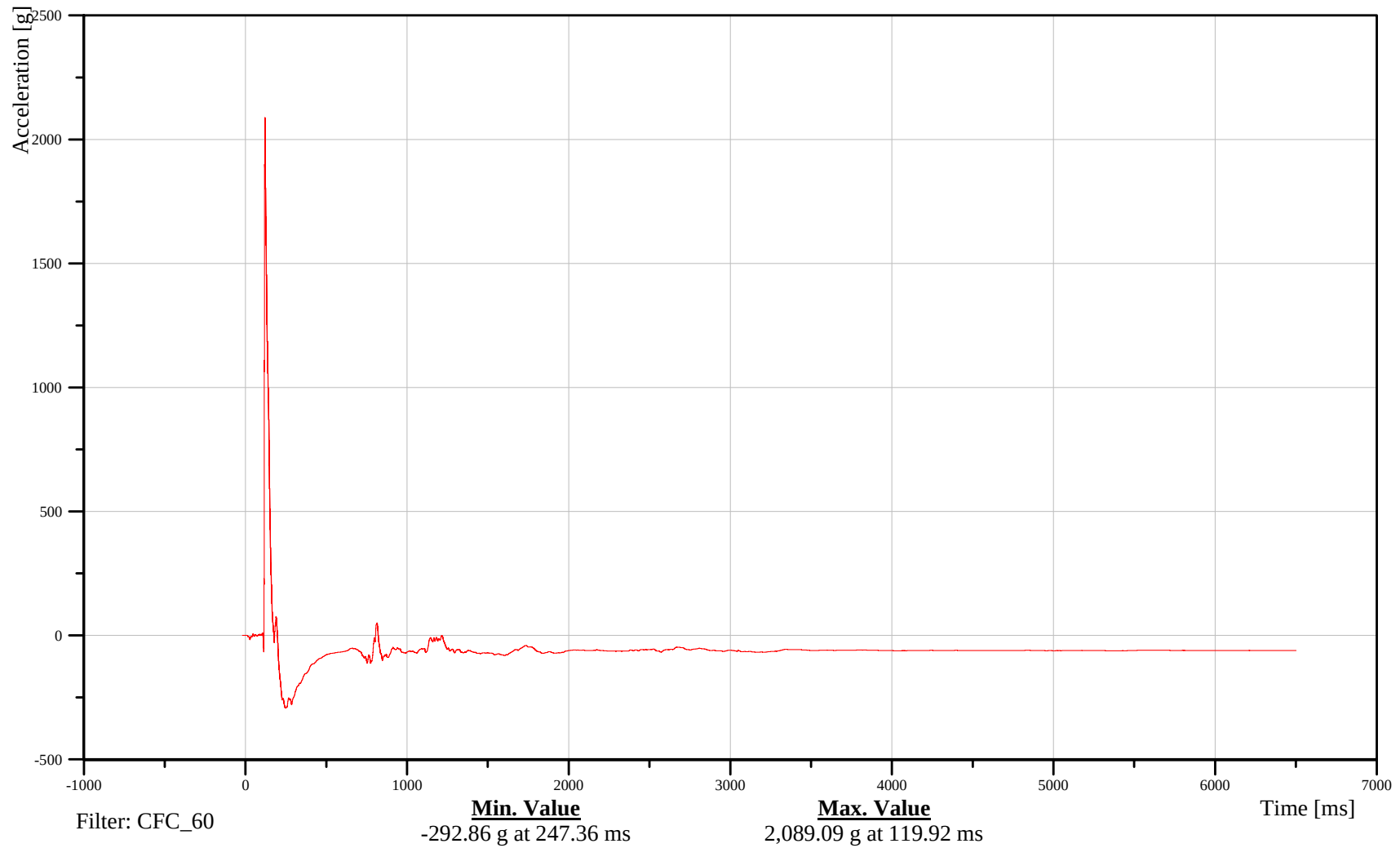
Time: 15:17

Customer: VRTC

10CPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-141

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper Resultant Acceleration

Date: 02/03/2010

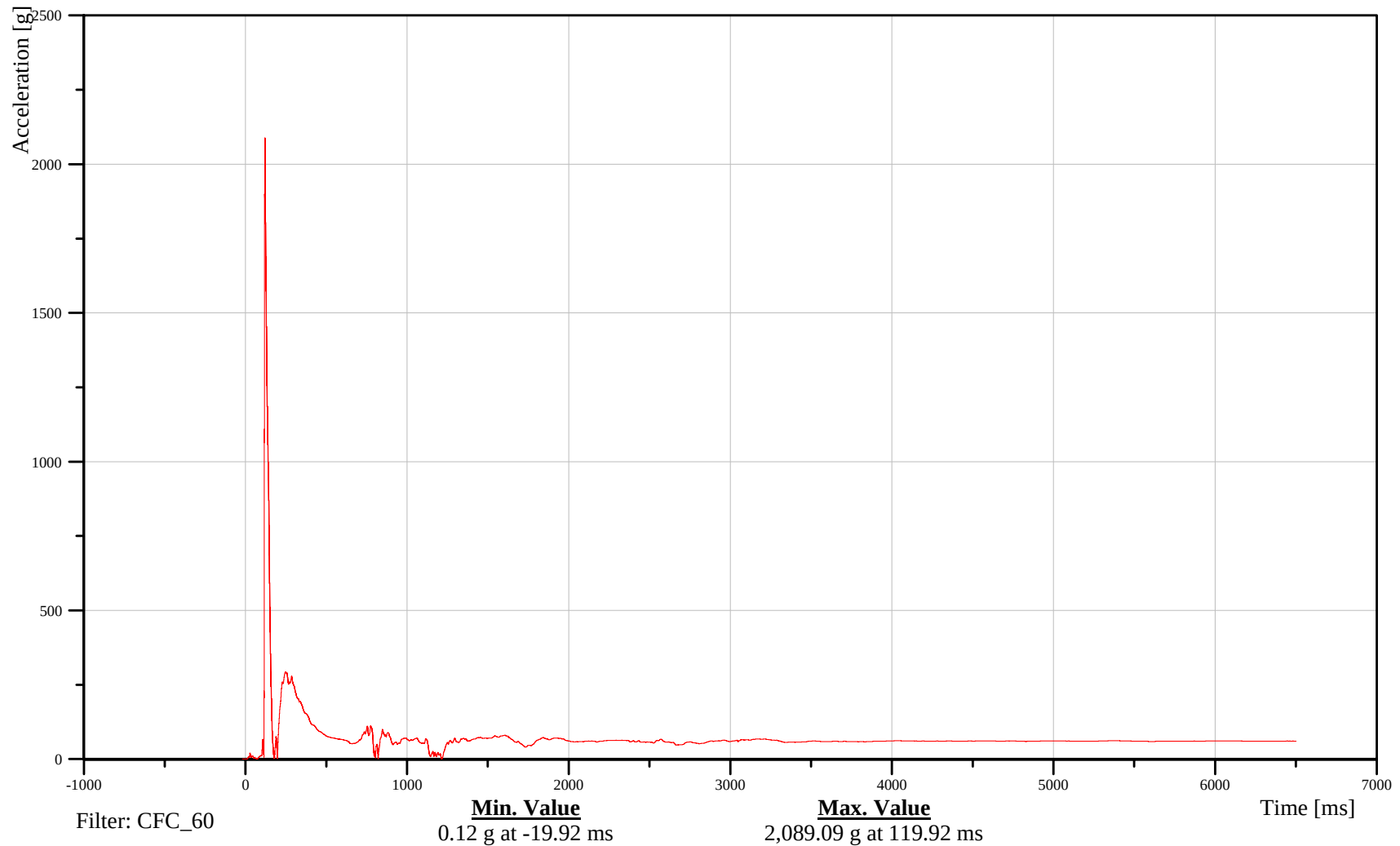
Time: 15:17

Customer: VRTC

10CPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-142

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

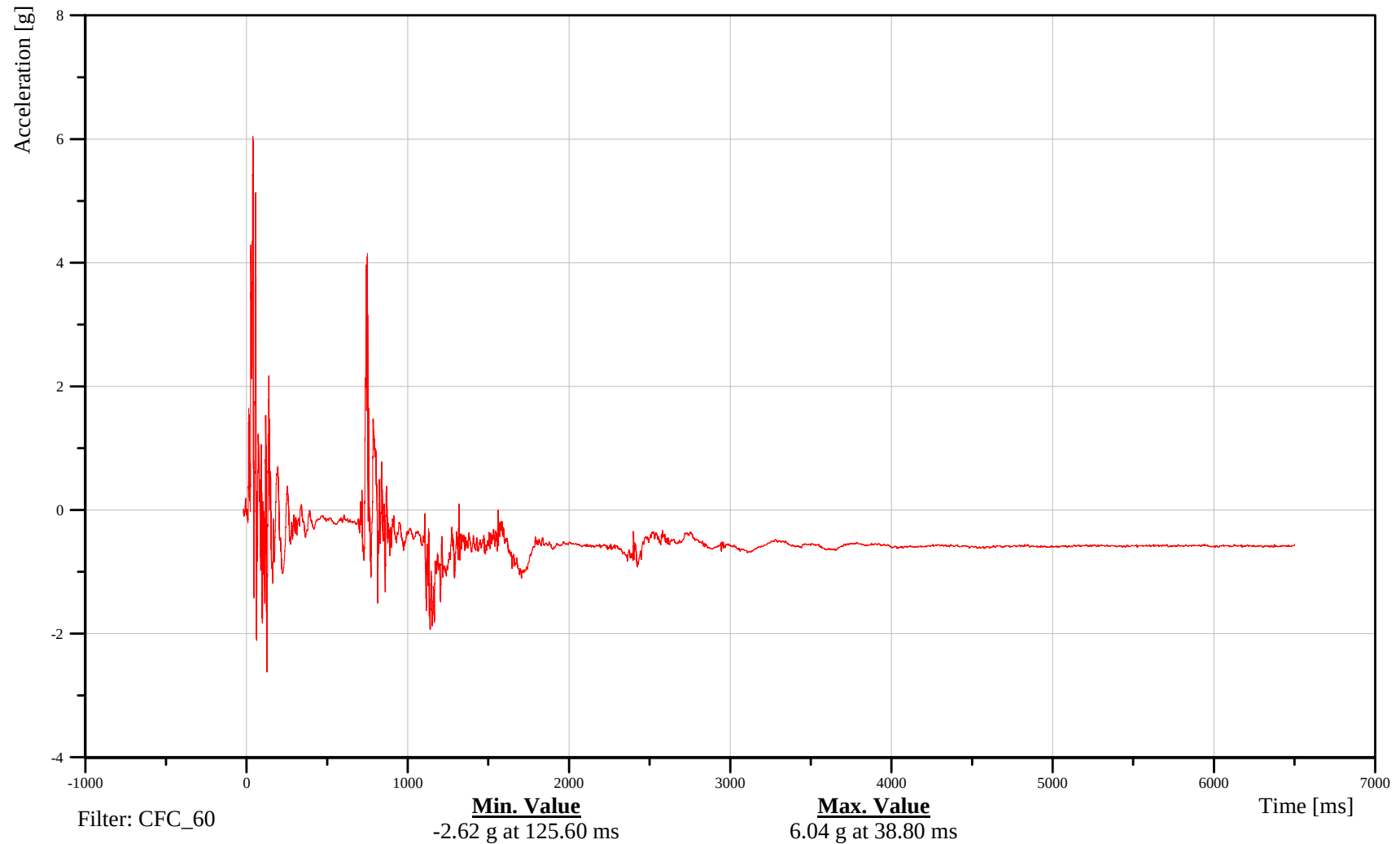
Time: 15:17

Customer: VRTC

10CPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-143

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower Y-Axis Acceleration

Date: 02/03/2010

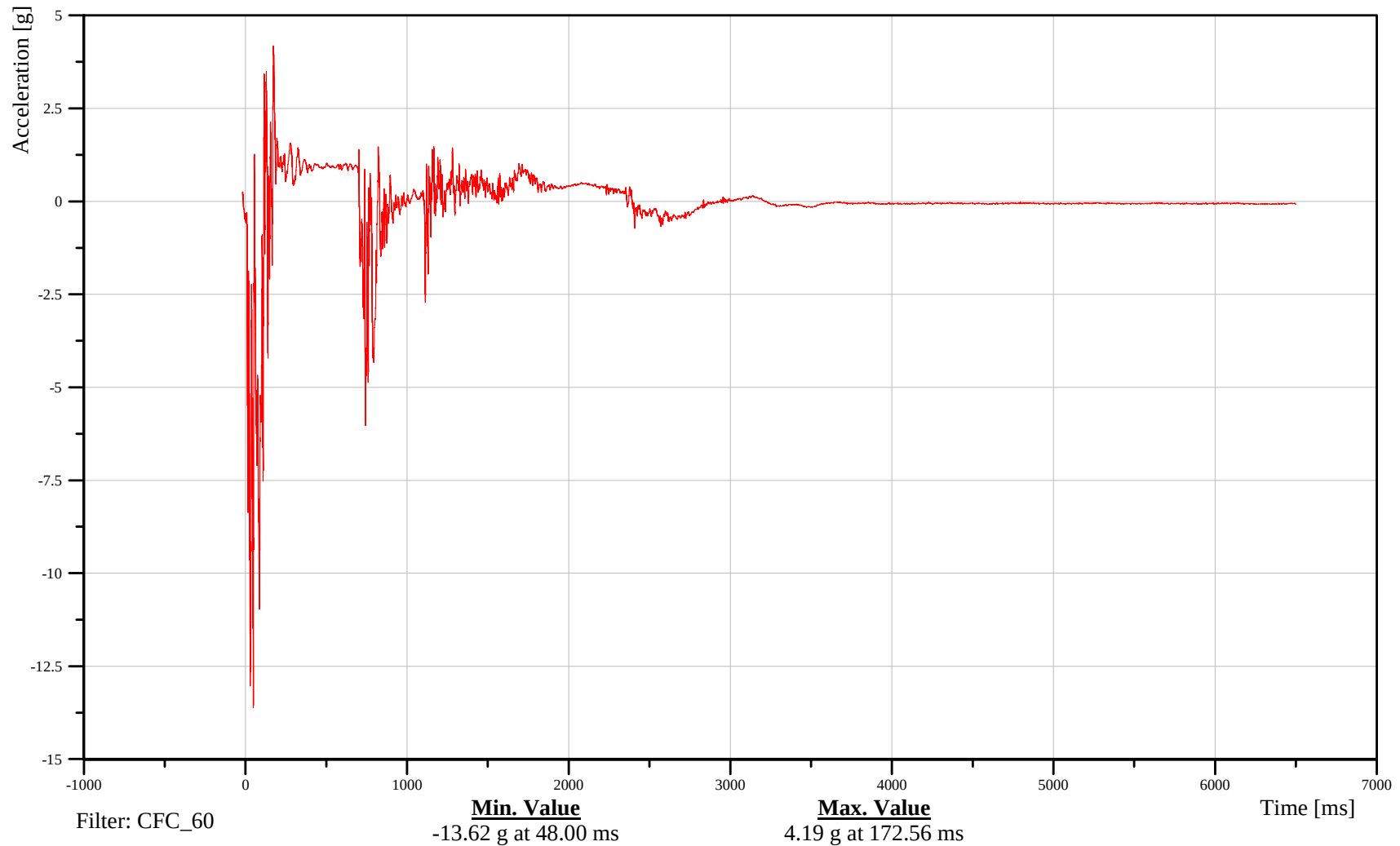
Time: 15:17

Customer: VRTC

10CPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-144

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

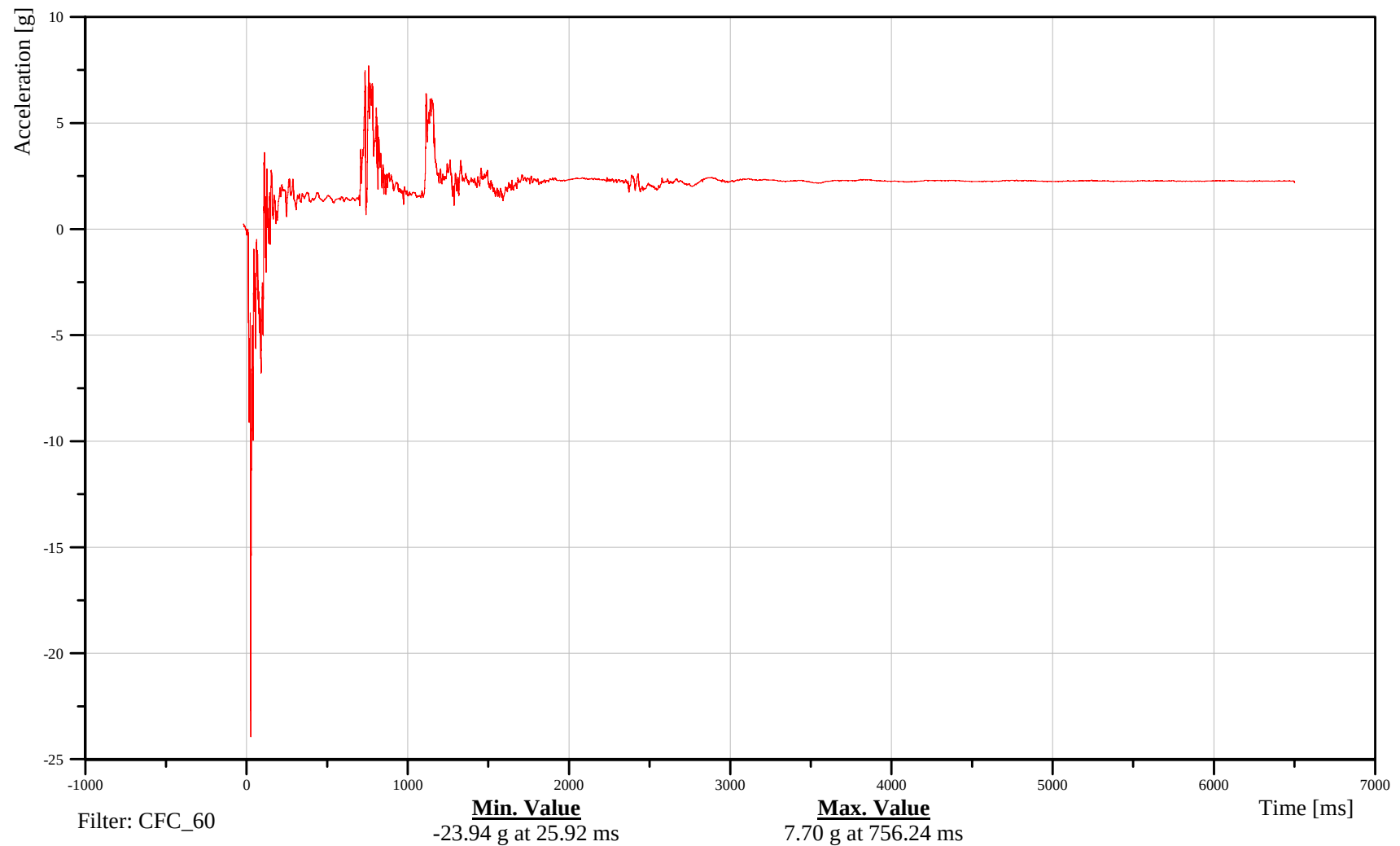
Time: 15:17

Customer: VRTC

10CPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-145

100203



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower Resultant Acceleration

Date: 02/03/2010

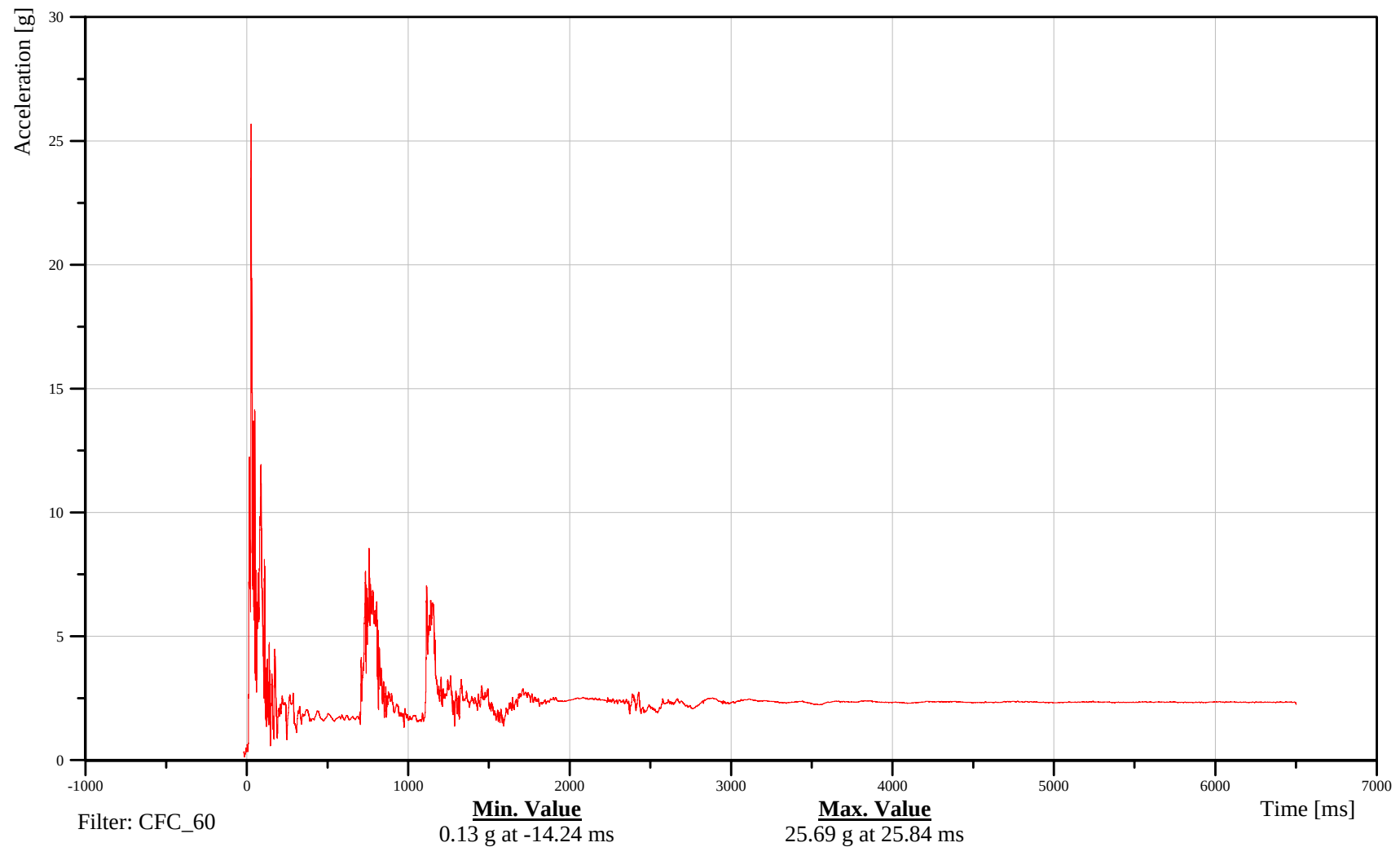
Time: 15:17

Customer: VRTC

10CPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-146

100203



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

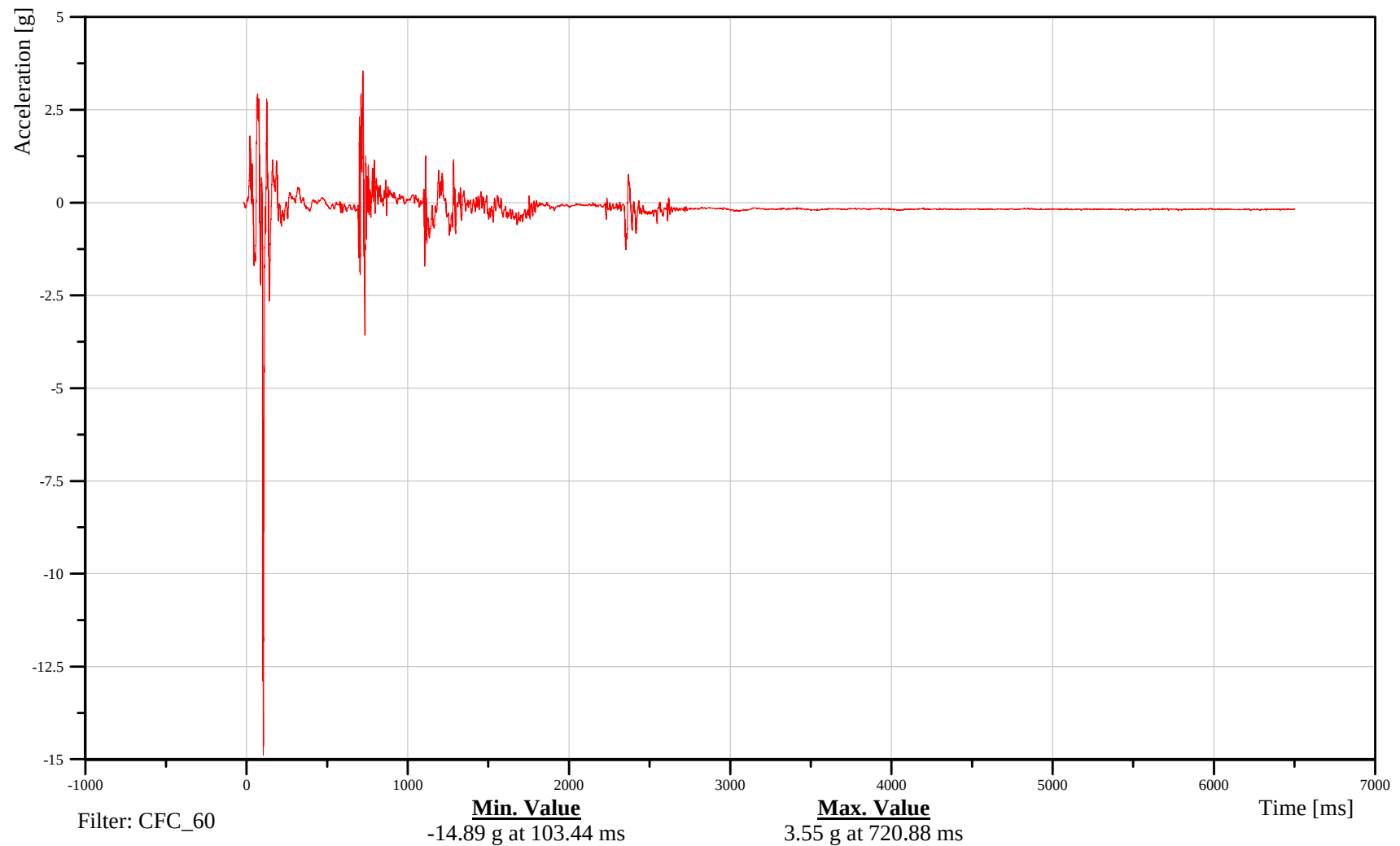
Time: 15:17

Customer: VRTC

10CPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-147

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right C-Pillar Upper Y-Axis Acceleration

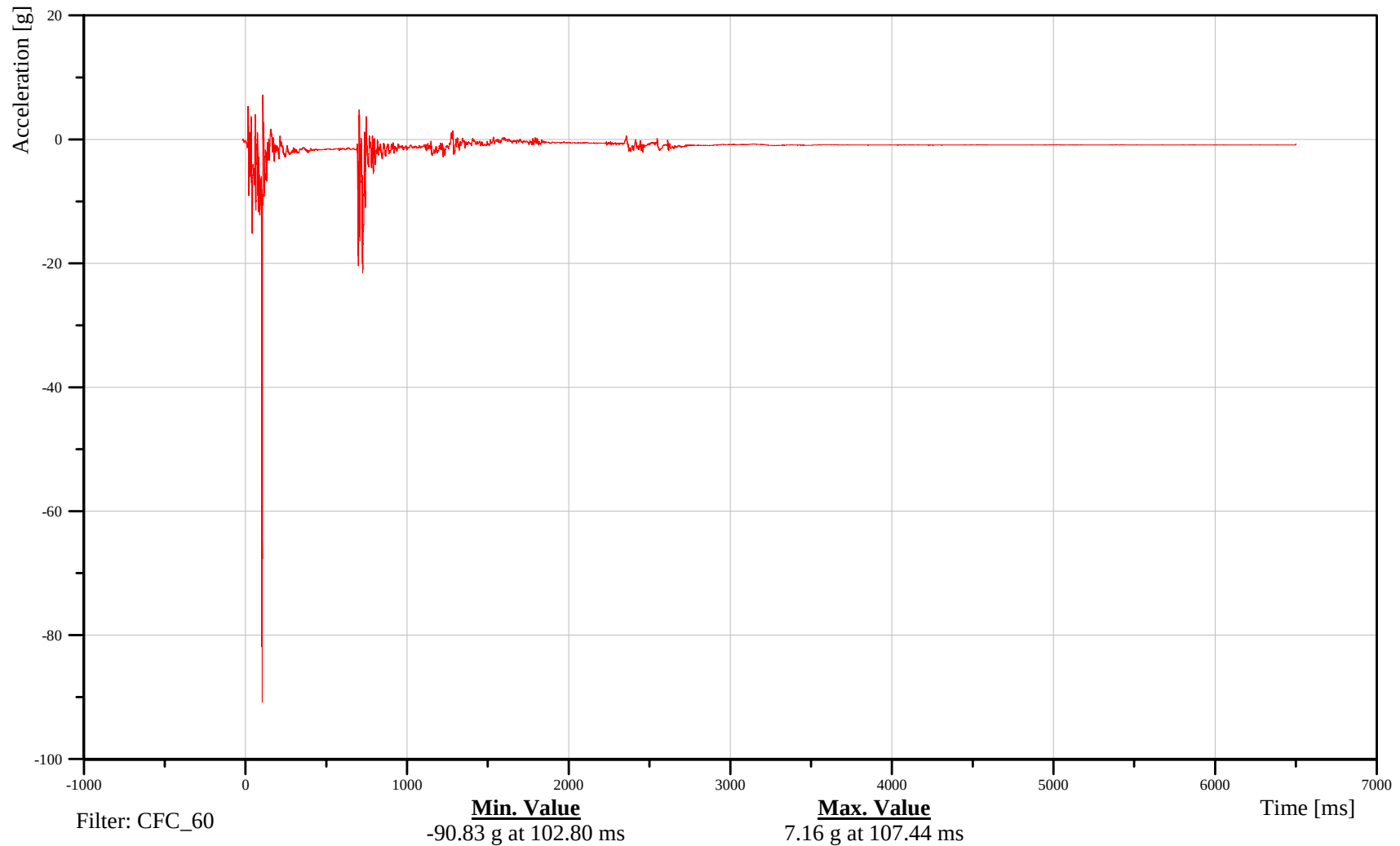
Time: 15:17

Customer: VRTC

10CPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-148

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right C-Pillar Upper Z-Axis Acceleration

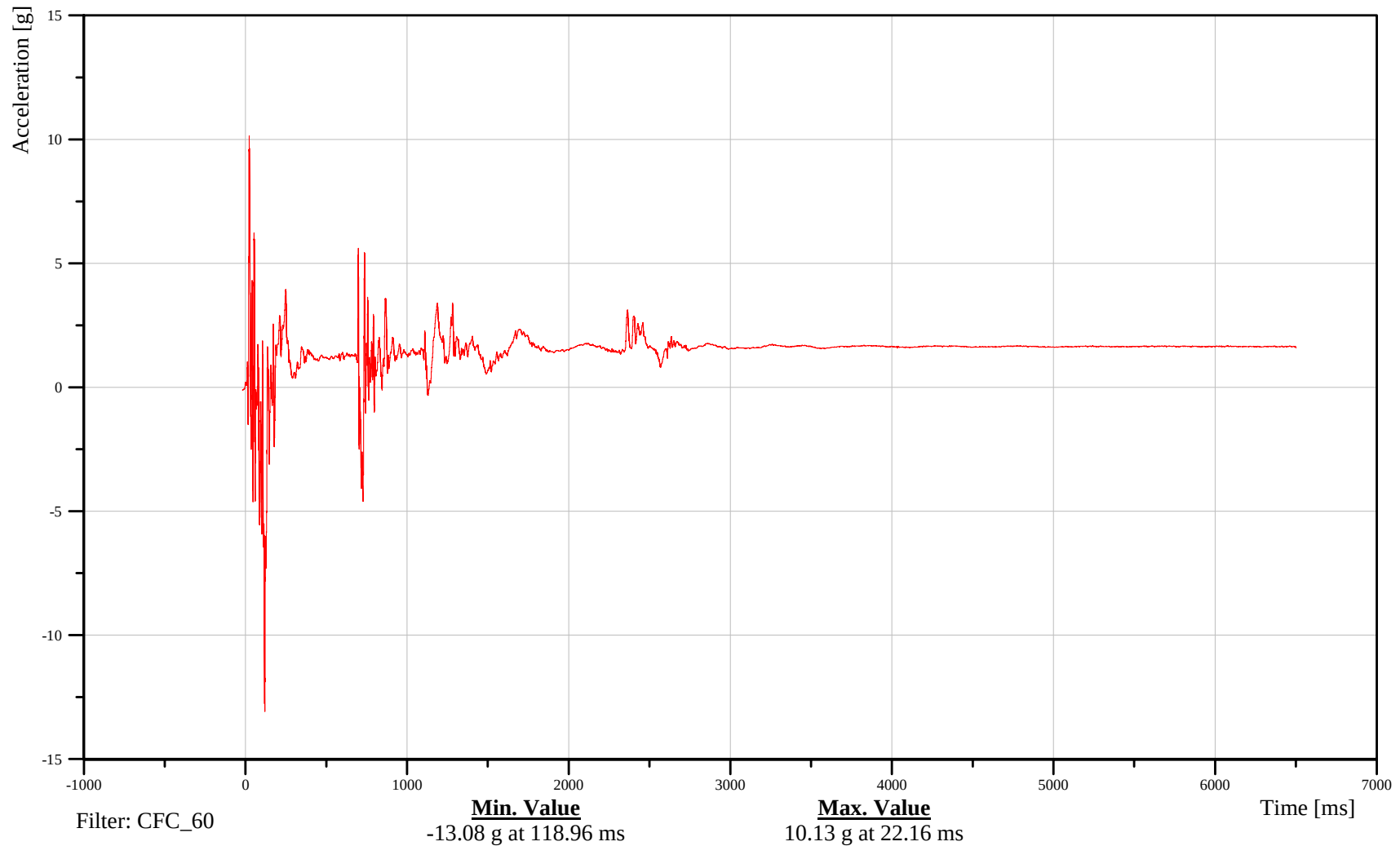
Time: 15:17

Customer: VRTC

10CPILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-149

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right C-Pillar Upper Resultant Acceleration

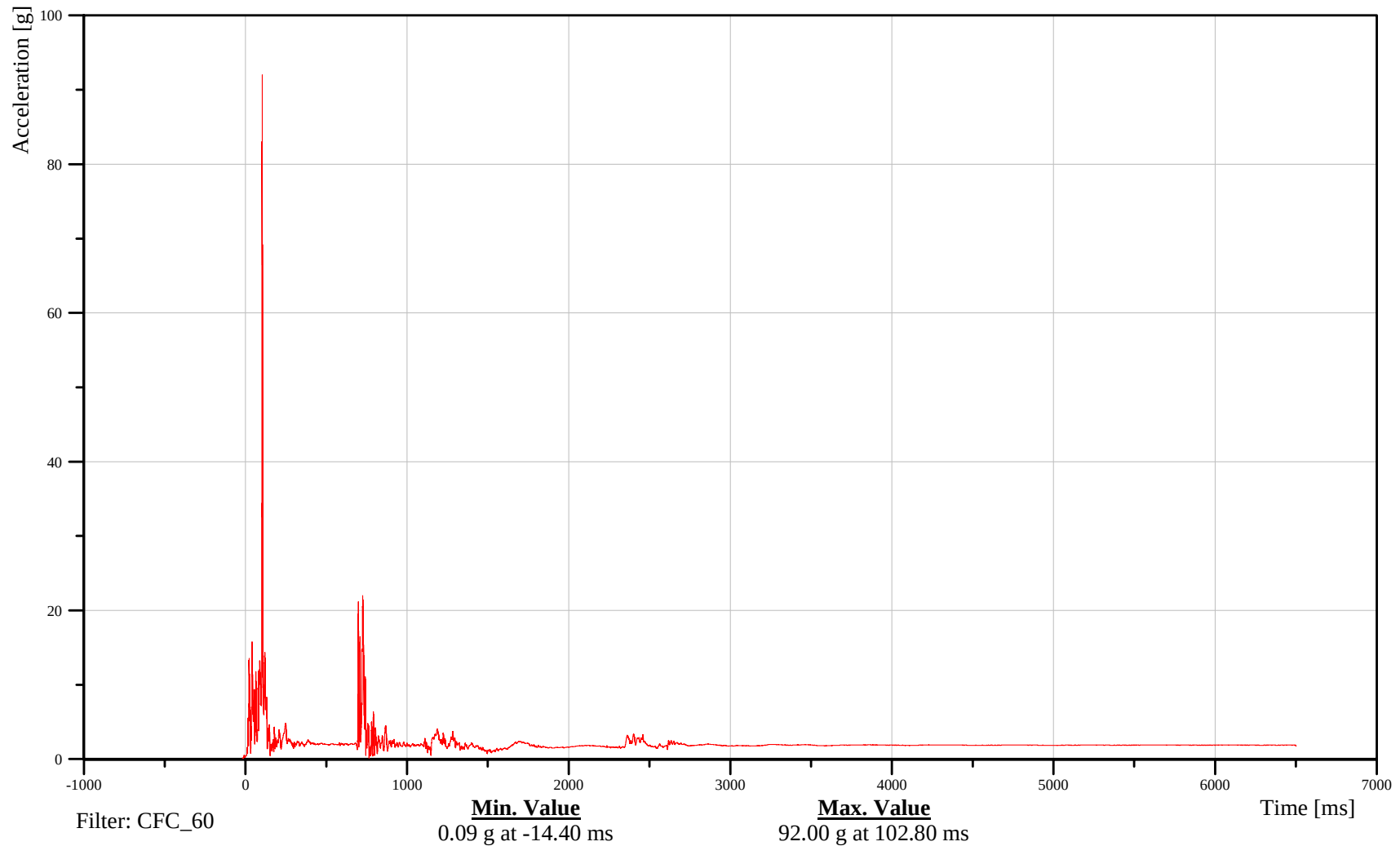
Time: 15:17

Customer: VRTC

10CPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-150

100203



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

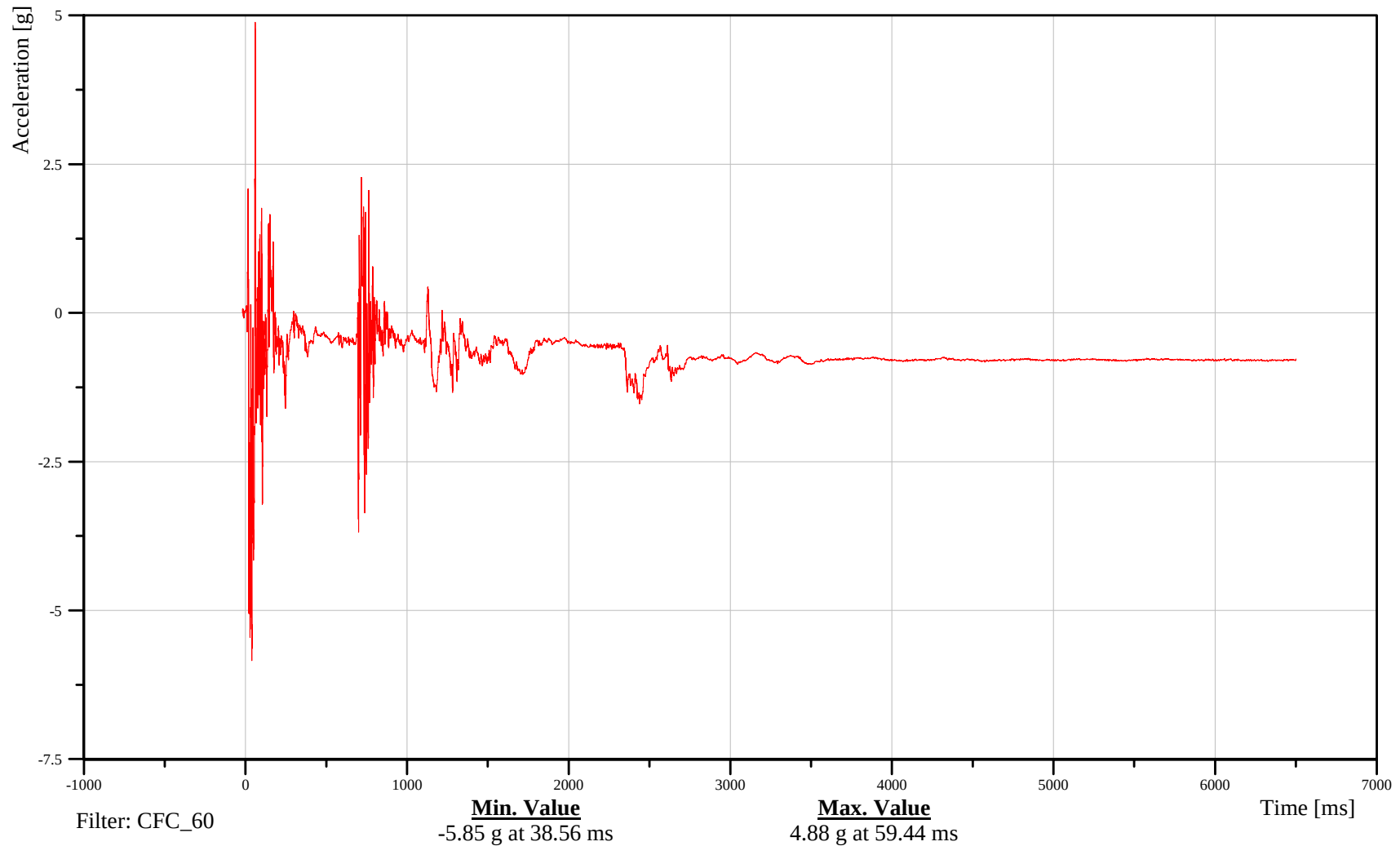
Time: 15:17

Customer: VRTC

10CPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-151

100203



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower Y-Axis Acceleration

Date: 02/03/2010

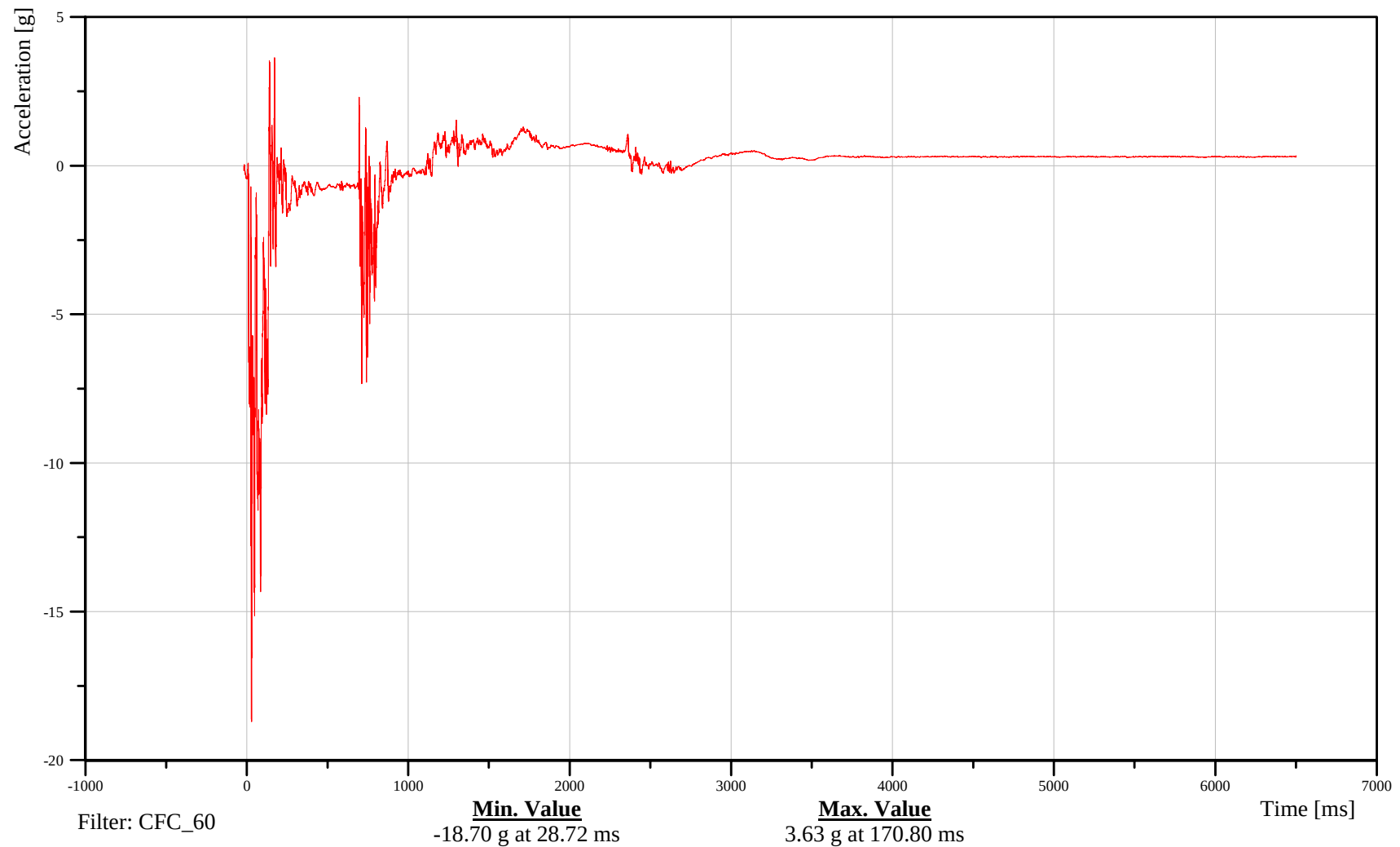
Time: 15:17

Customer: VRTC

10CPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-152

100203



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

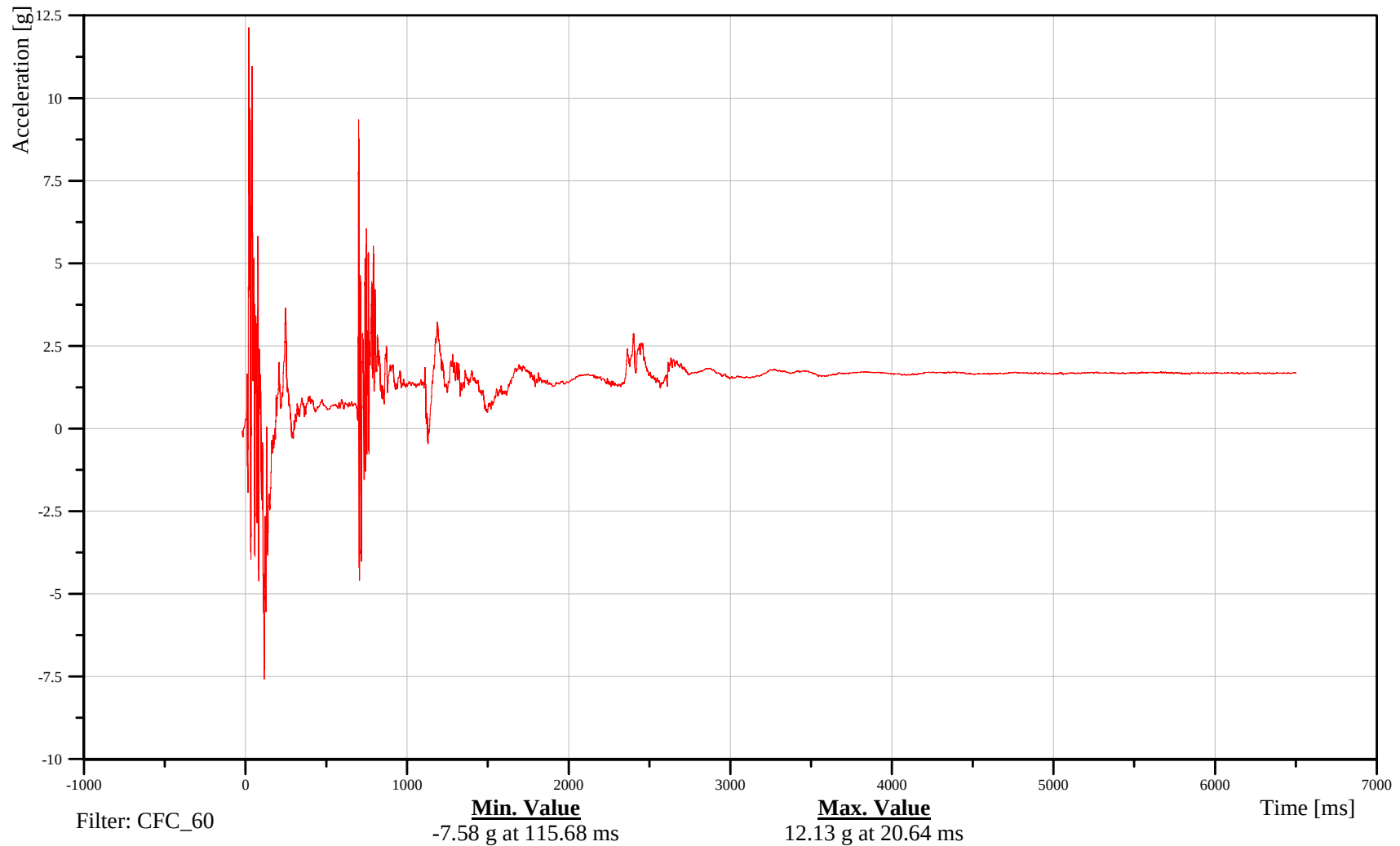
Time: 15:17

Customer: VRTC

10CPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-153

100203



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower Resultant Acceleration

Date: 02/03/2010

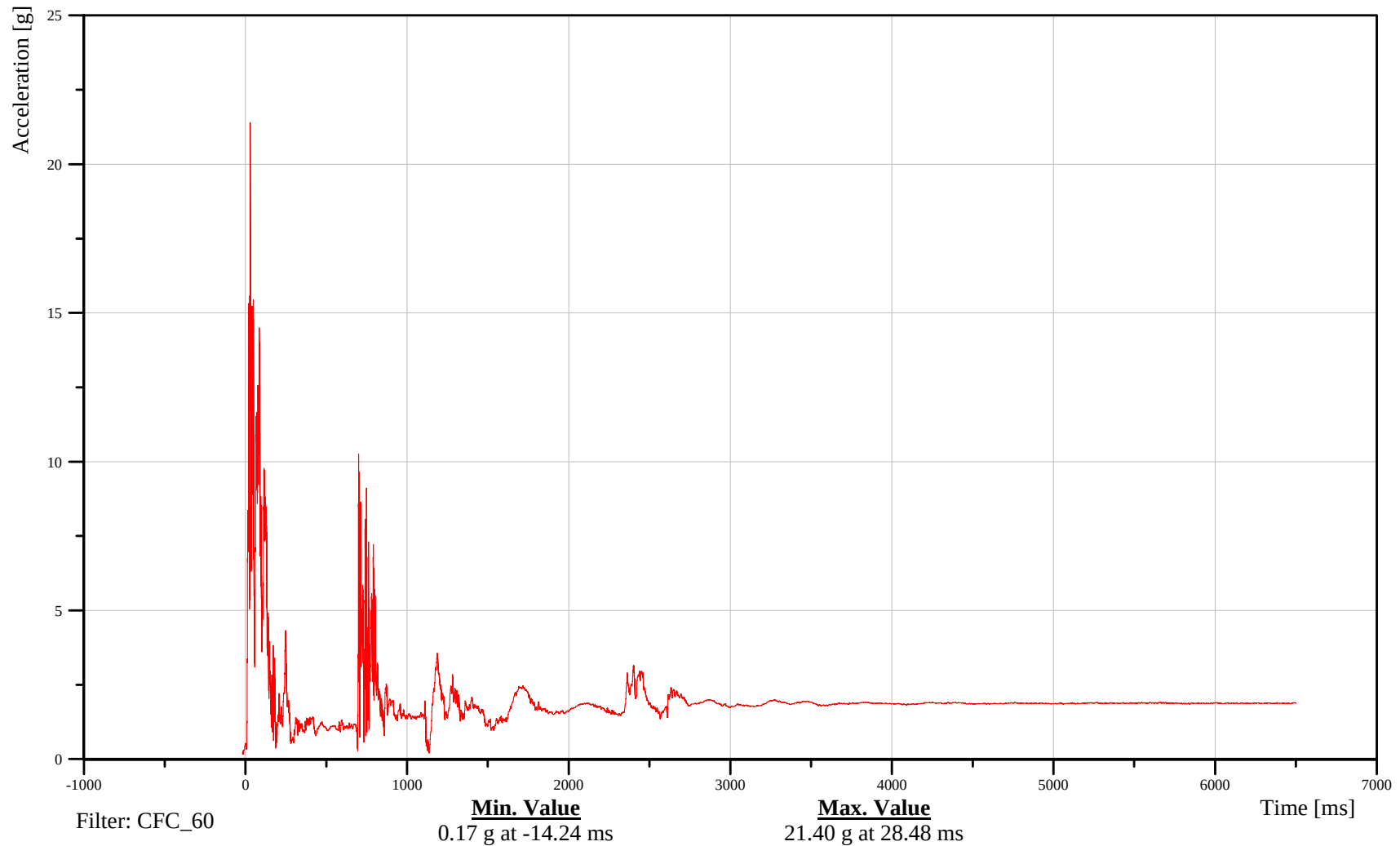
Time: 15:17

Customer: VRTC

10CPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-154

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

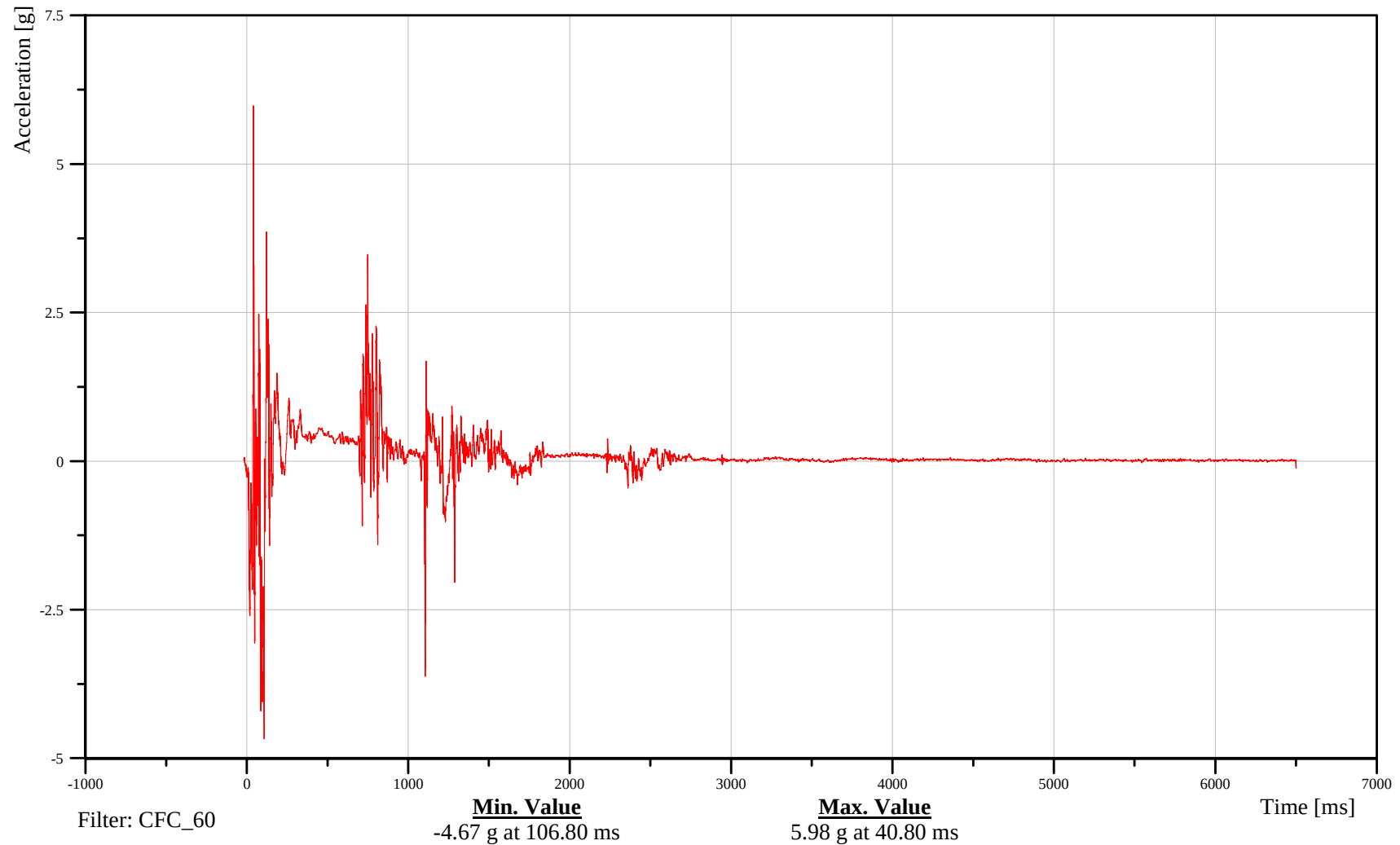
Time: 15:17

Customer: VRTC

10DPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-155

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper Y-Axis Acceleration

Date: 02/03/2010

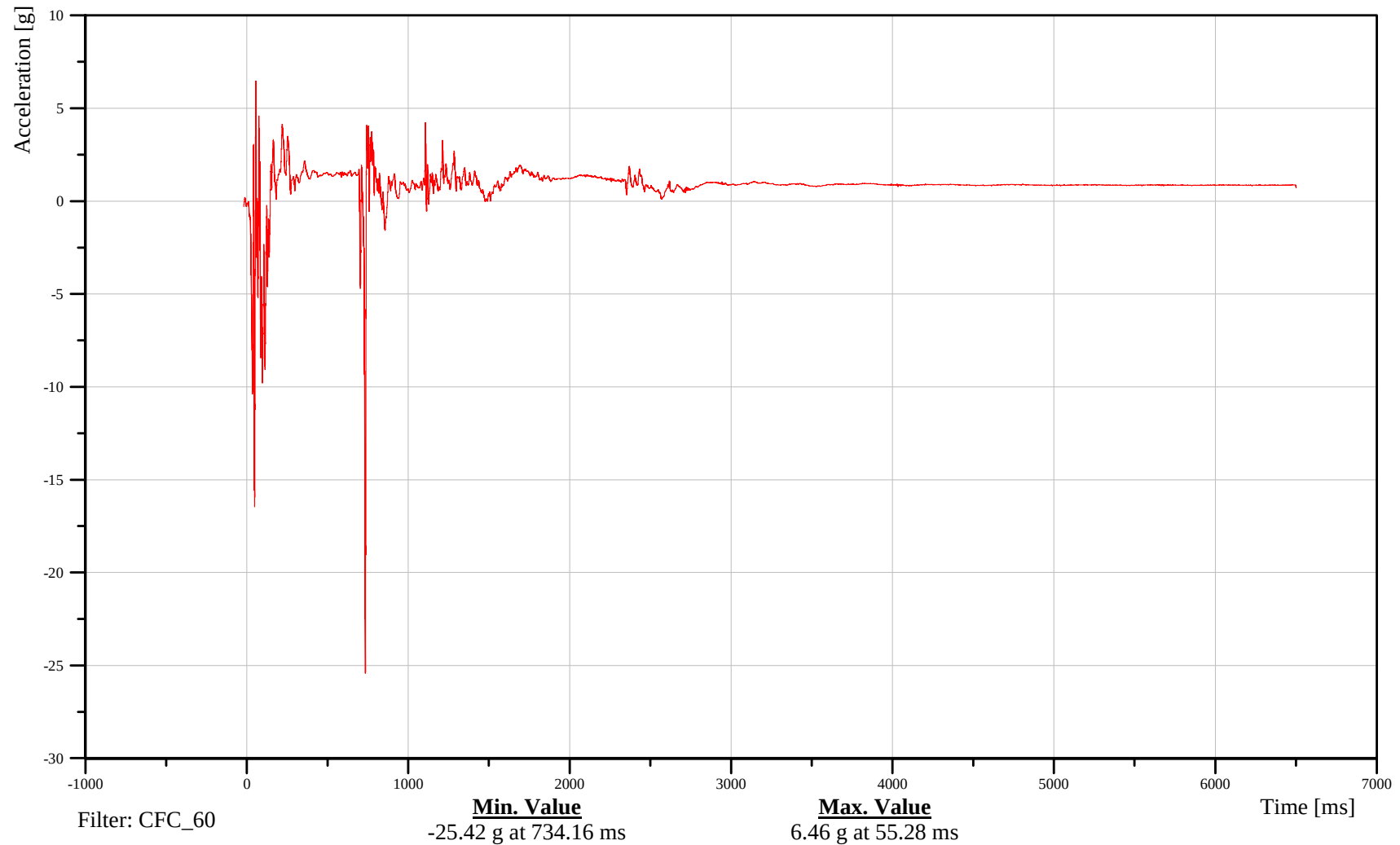
Time: 15:17

Customer: VRTC

10DPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-156

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper Z-Axis Acceleration

Date: 02/03/2010

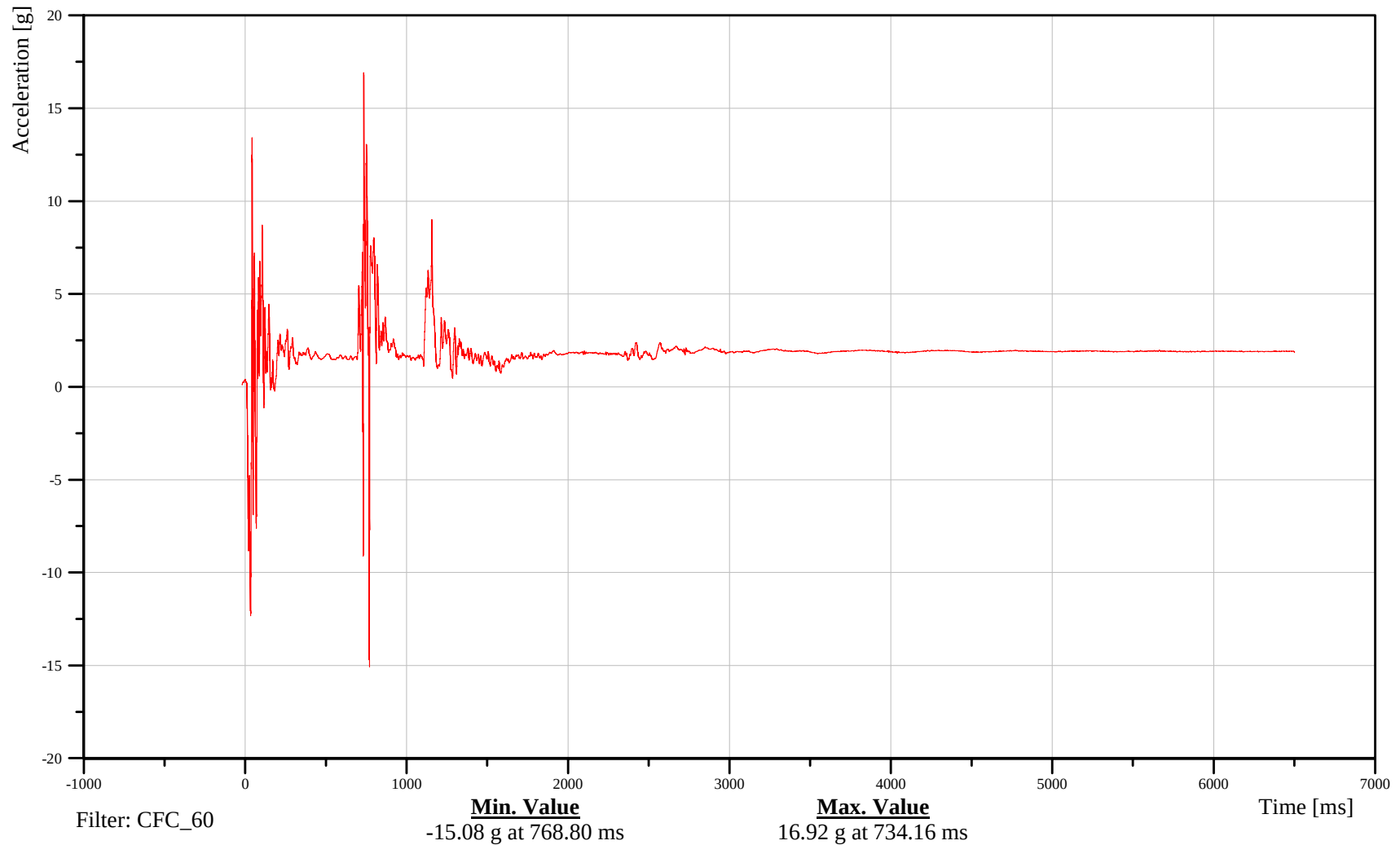
Time: 15:17

Customer: VRTC

10DPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-157

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper Resultant Acceleration

Date: 02/03/2010

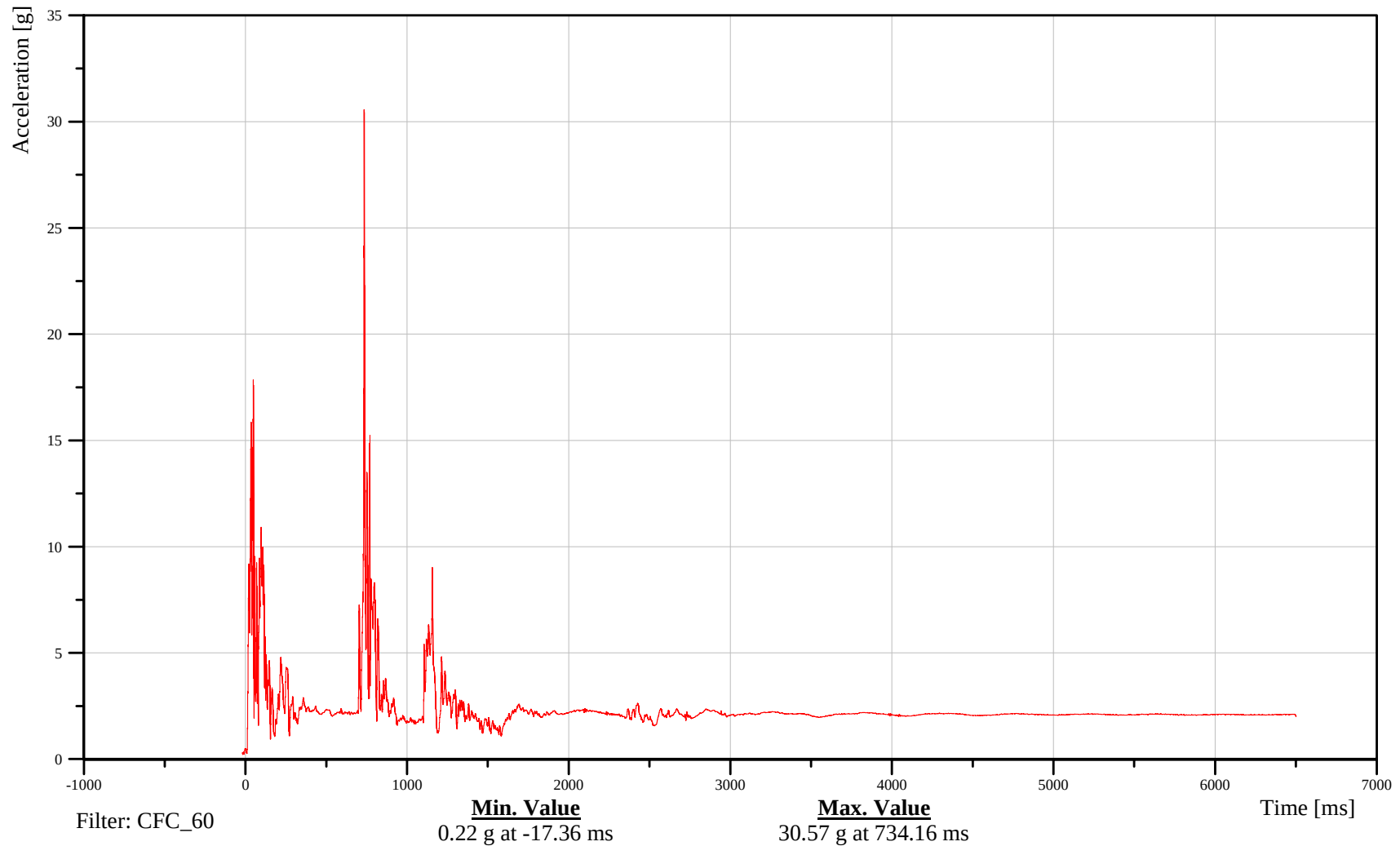
Time: 15:17

Customer: VRTC

10DPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-158

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

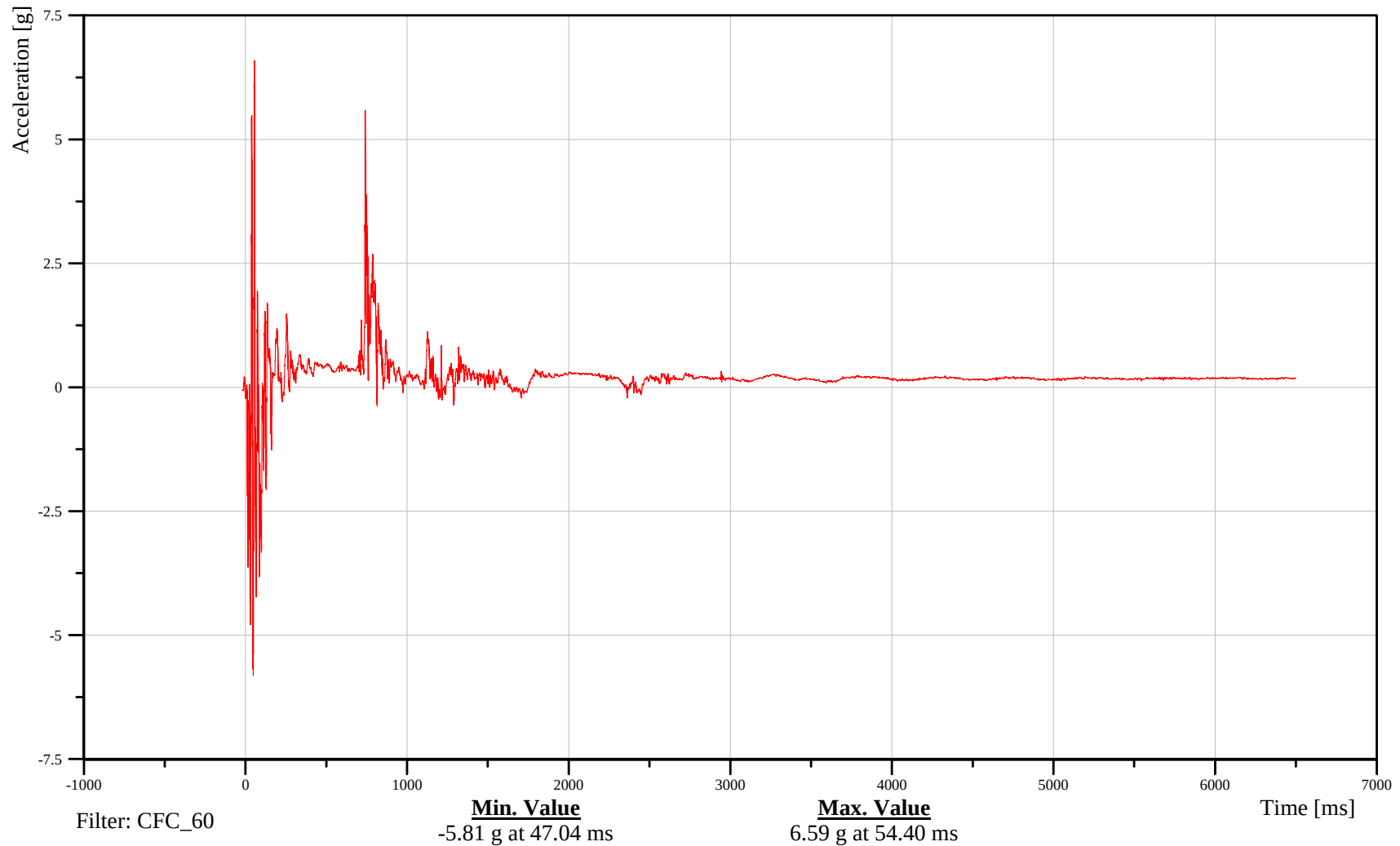
Time: 15:17

Customer: VRTC

10DPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-159

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower Y-Axis Acceleration

Date: 02/03/2010

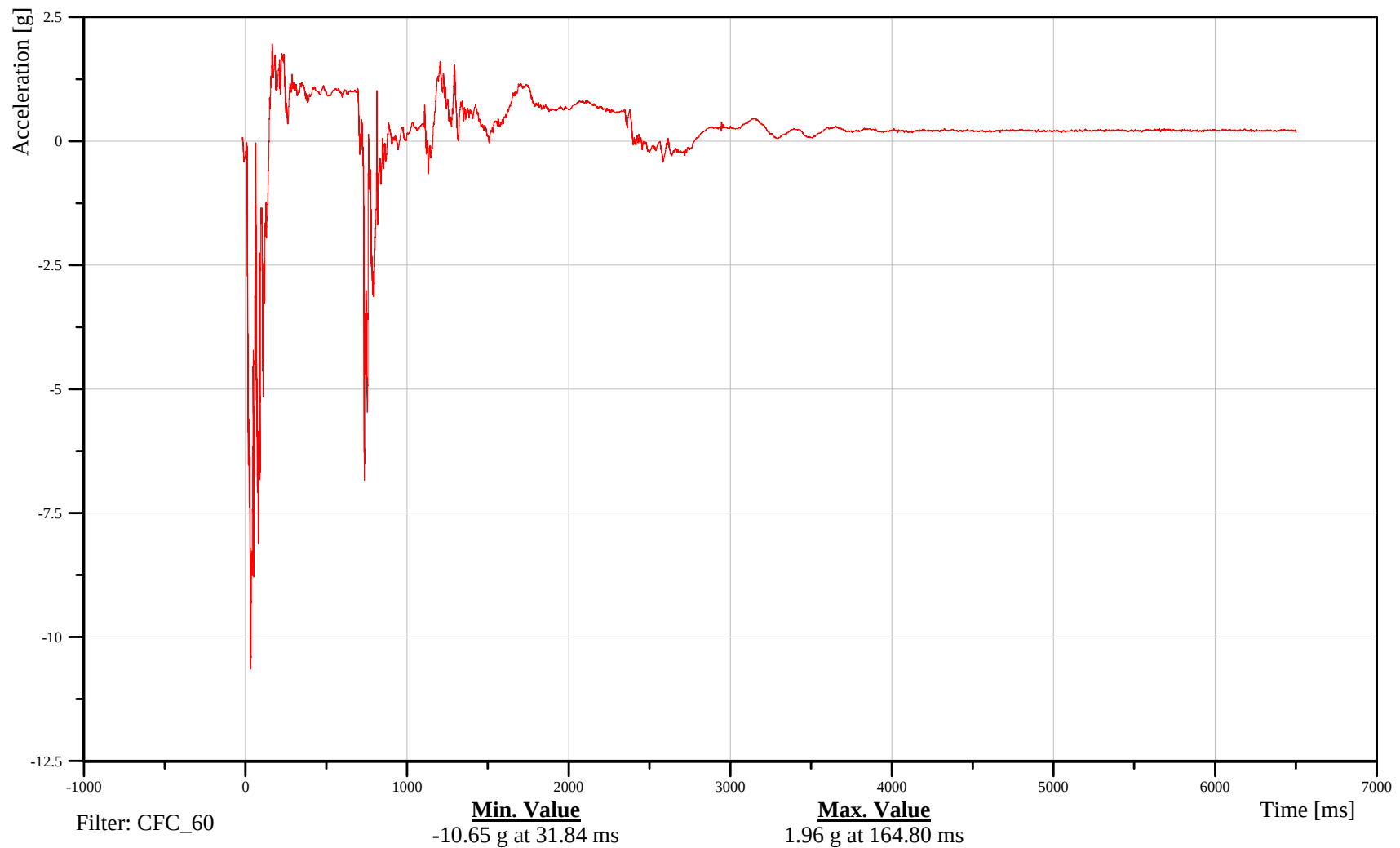
Time: 15:17

Customer: VRTC

10DPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-160

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

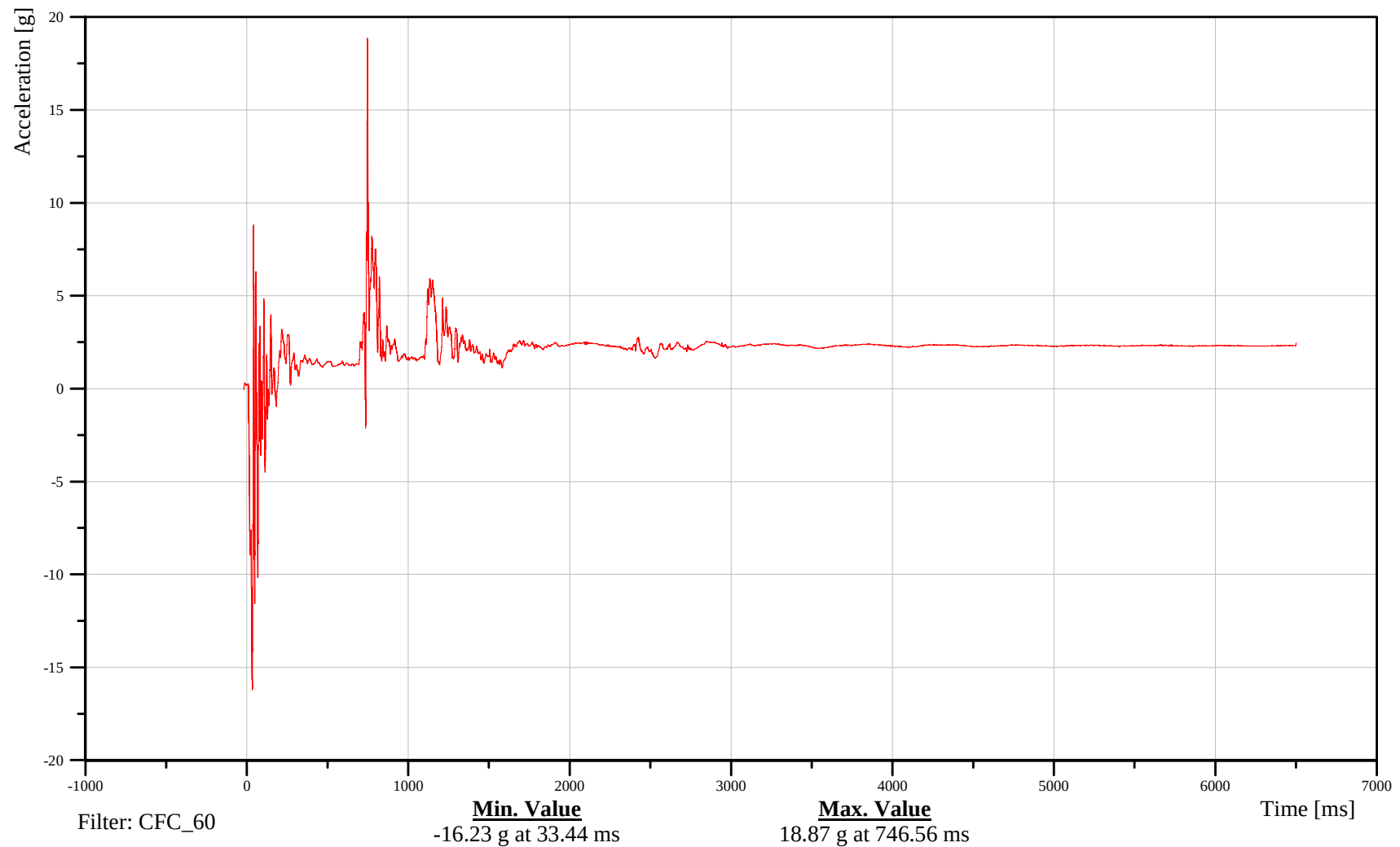
Time: 15:17

Customer: VRTC

10DPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-161

100203



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower Resultant Acceleration

Date: 02/03/2010

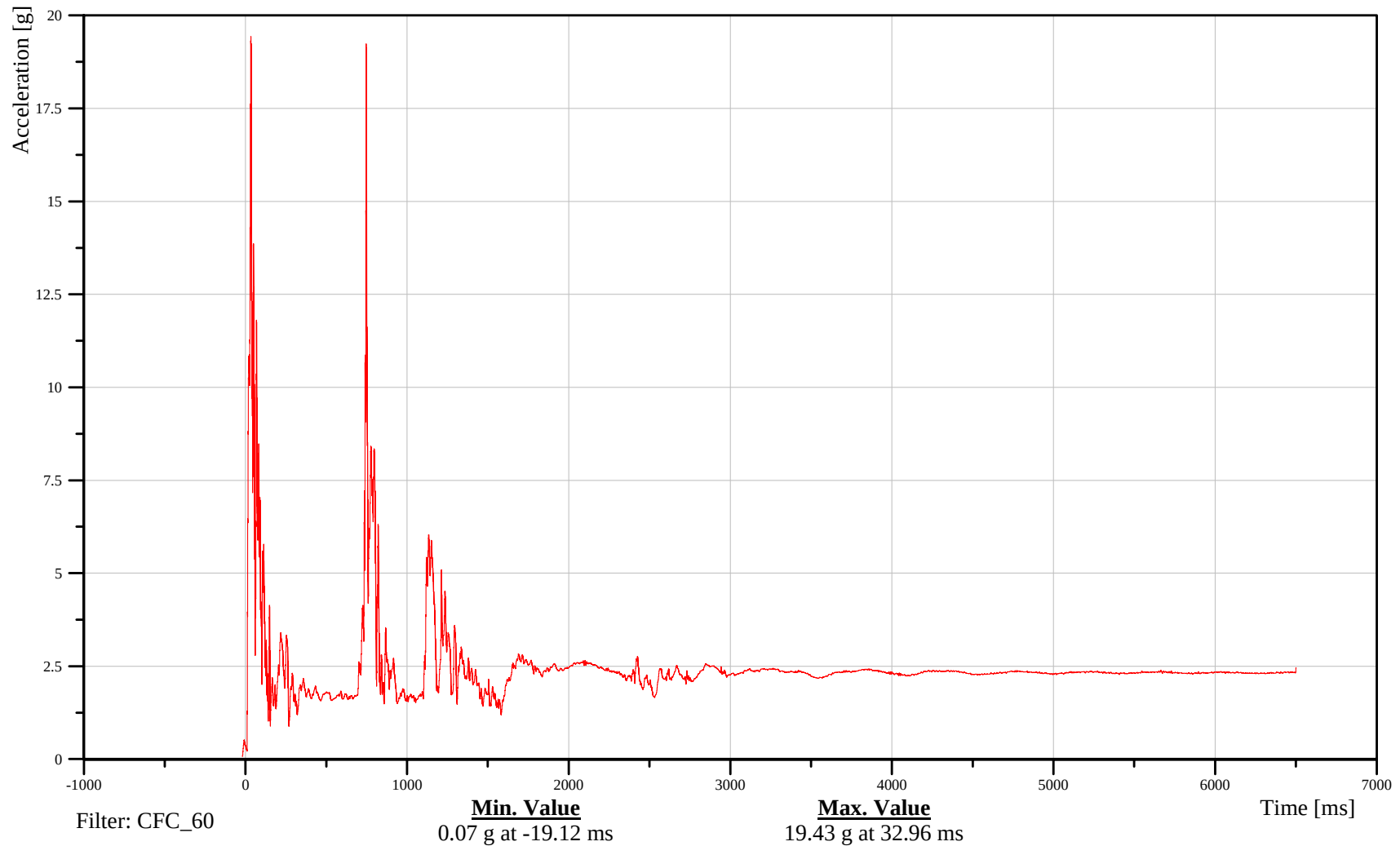
Time: 15:17

Customer: VRTC

10DPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-162

100203



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Upper X-Axis Acceleration

Date: 02/03/2010

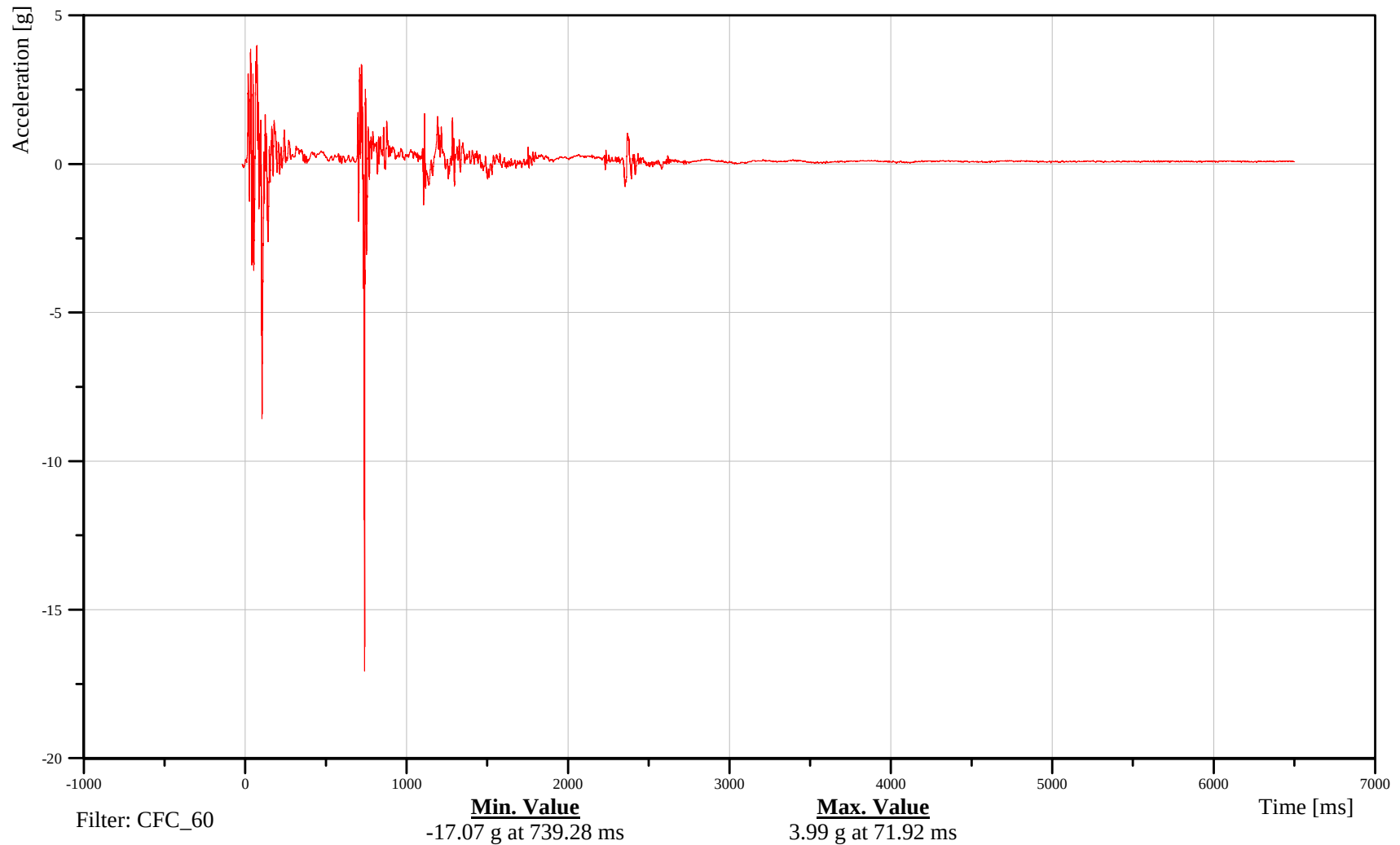
Time: 15:17

Customer: VRTC

10DPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-163

100203



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Upper Y-Axis Acceleration

Date: 02/03/2010

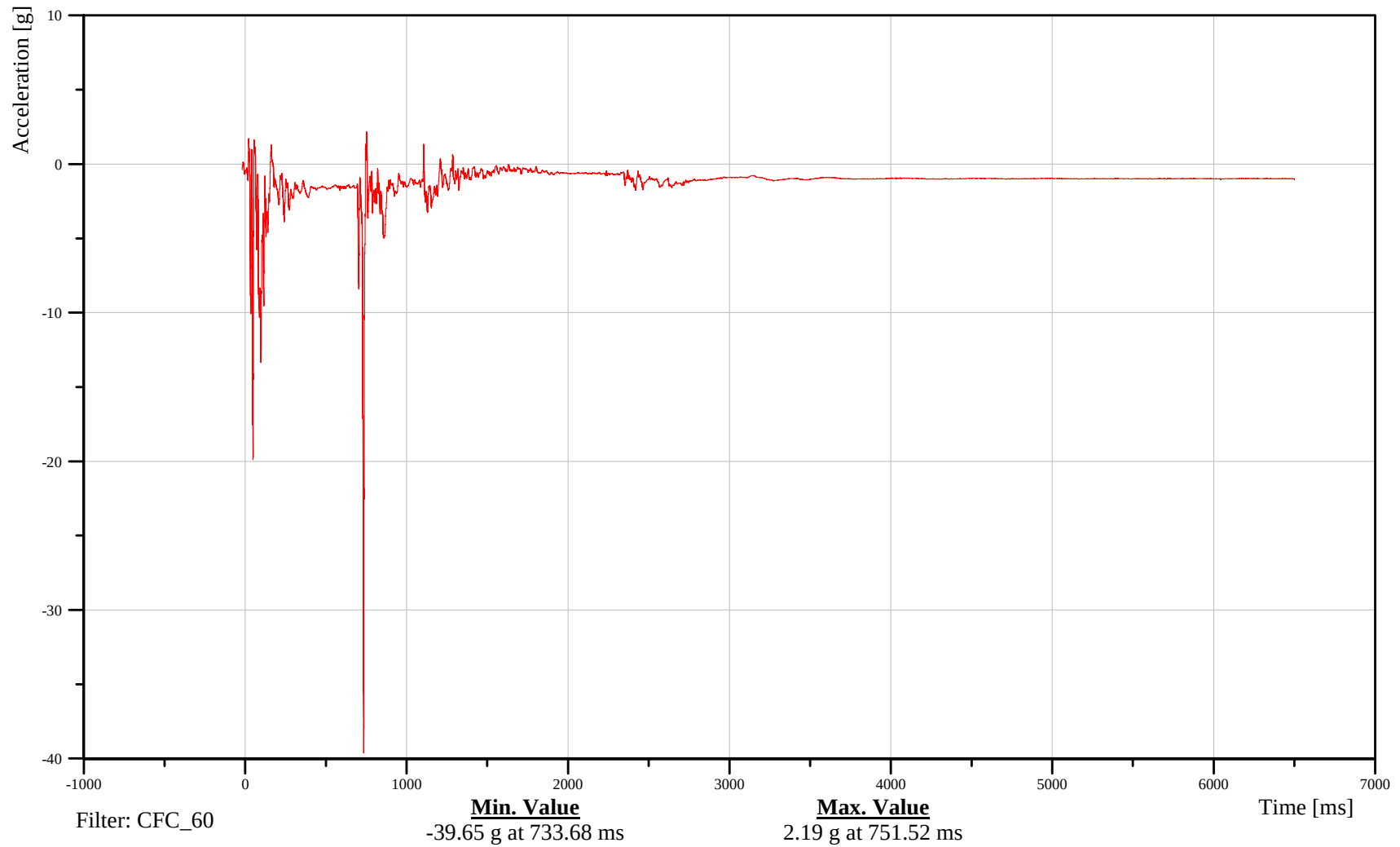
Time: 15:17

Customer: VRTC

10DPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-164

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right D-Pillar Upper Z-Axis Acceleration

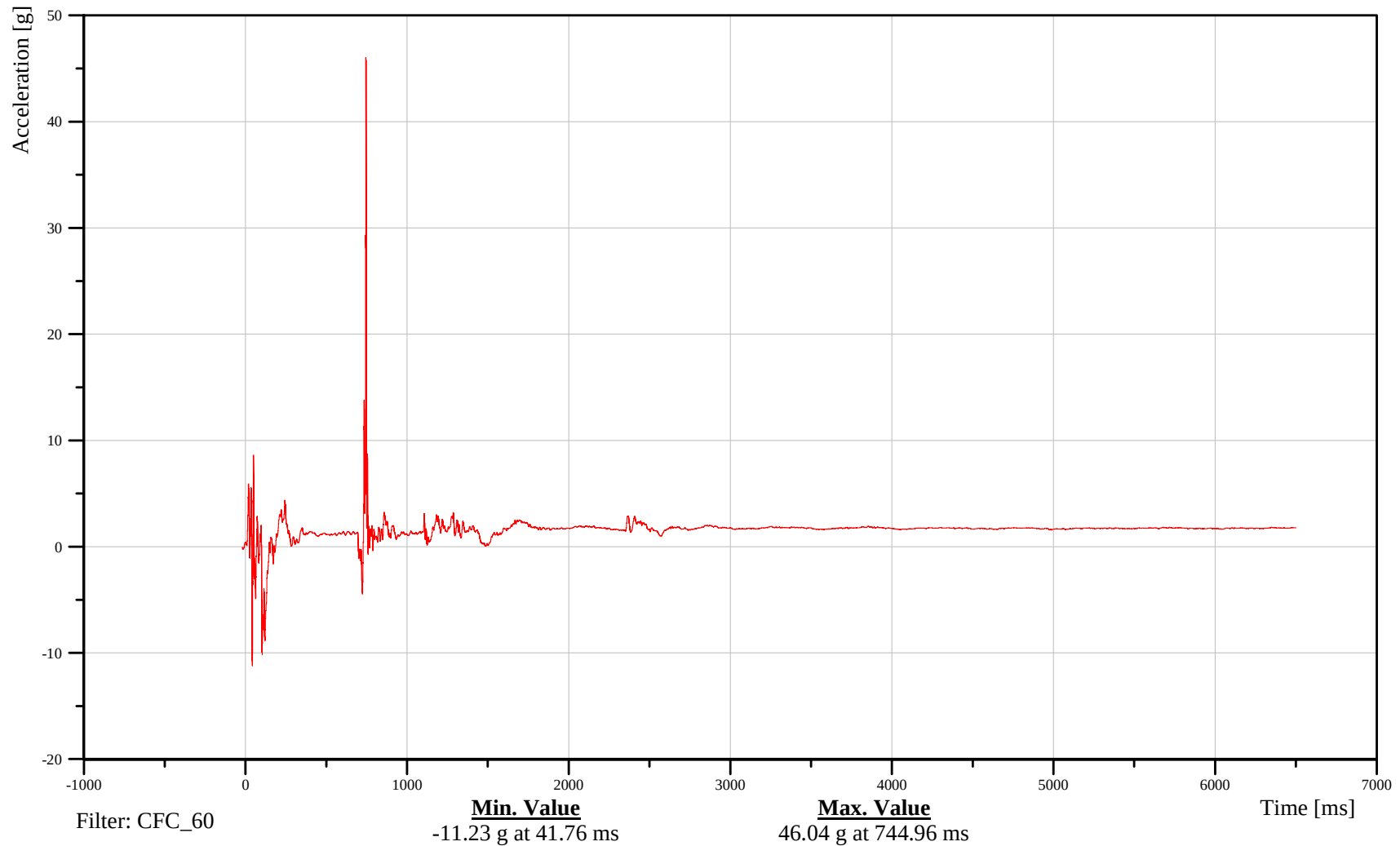
Time: 15:17

Customer: VRTC

10DPILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-165

100203



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Upper Resultant Acceleration

Date: 02/03/2010

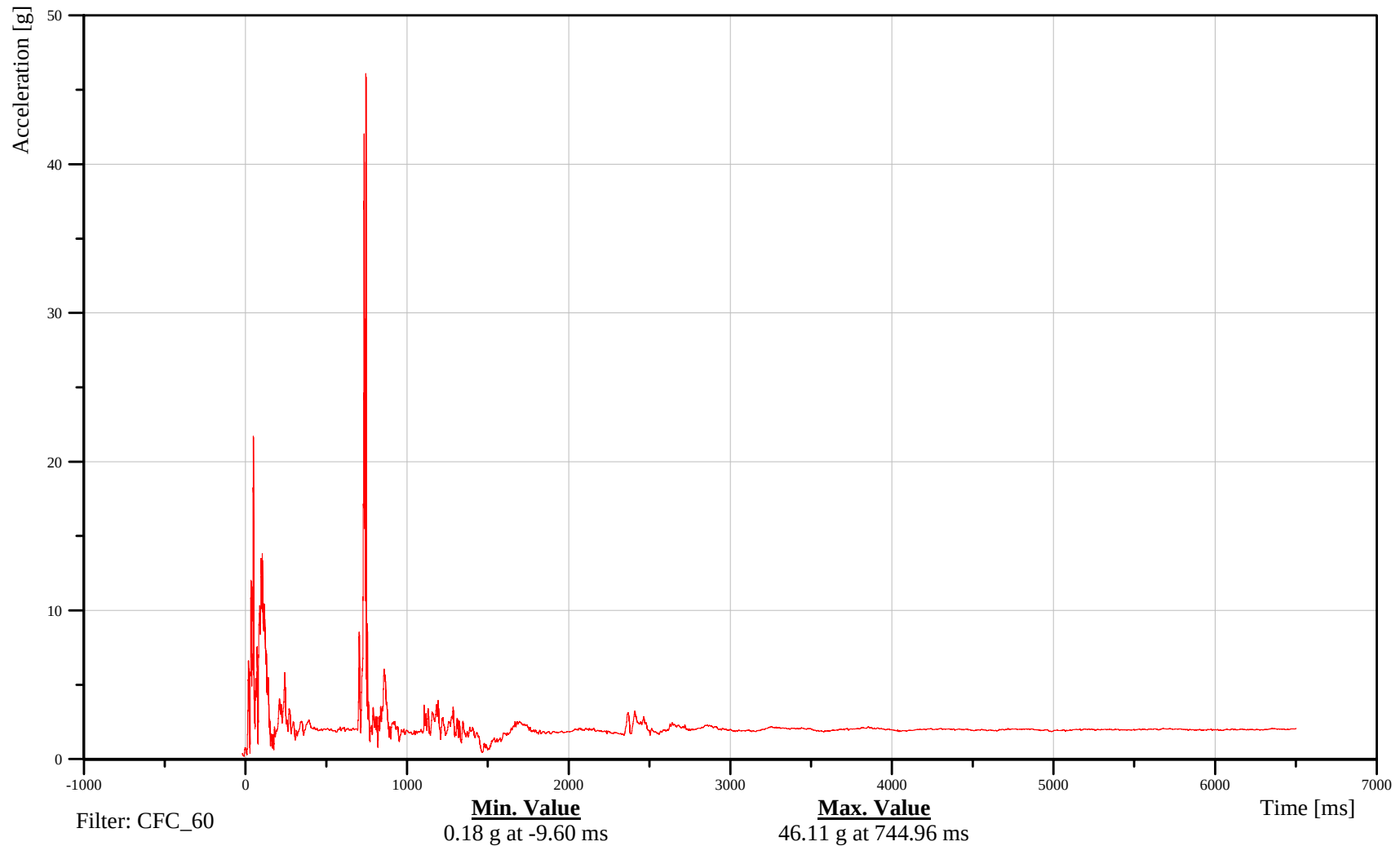
Time: 15:17

Customer: VRTC

10DPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-166

100203



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Lower X-Axis Acceleration

Date: 02/03/2010

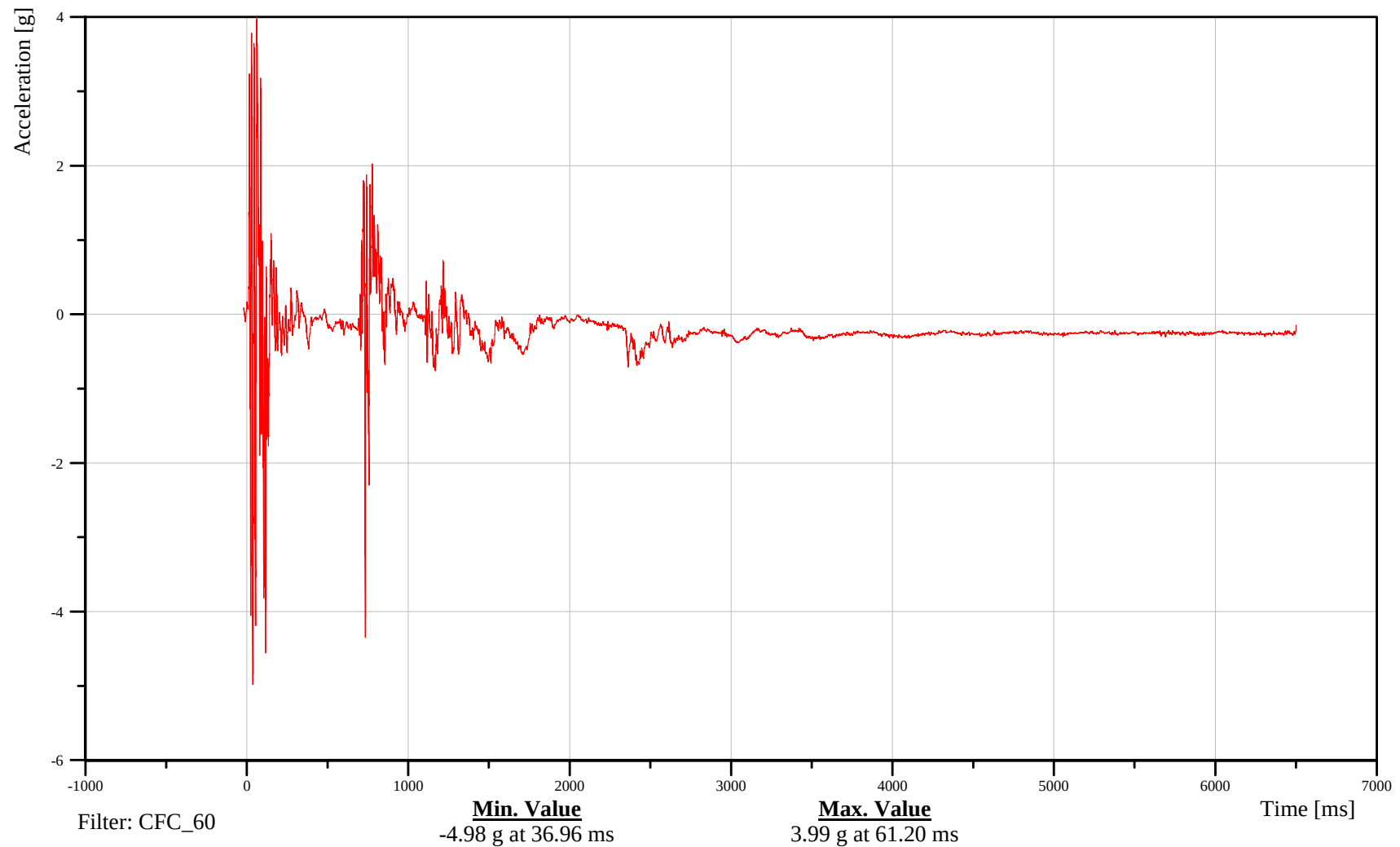
Time: 15:17

Customer: VRTC

10DPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-167

100203



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Lower Y-Axis Acceleration

Date: 02/03/2010

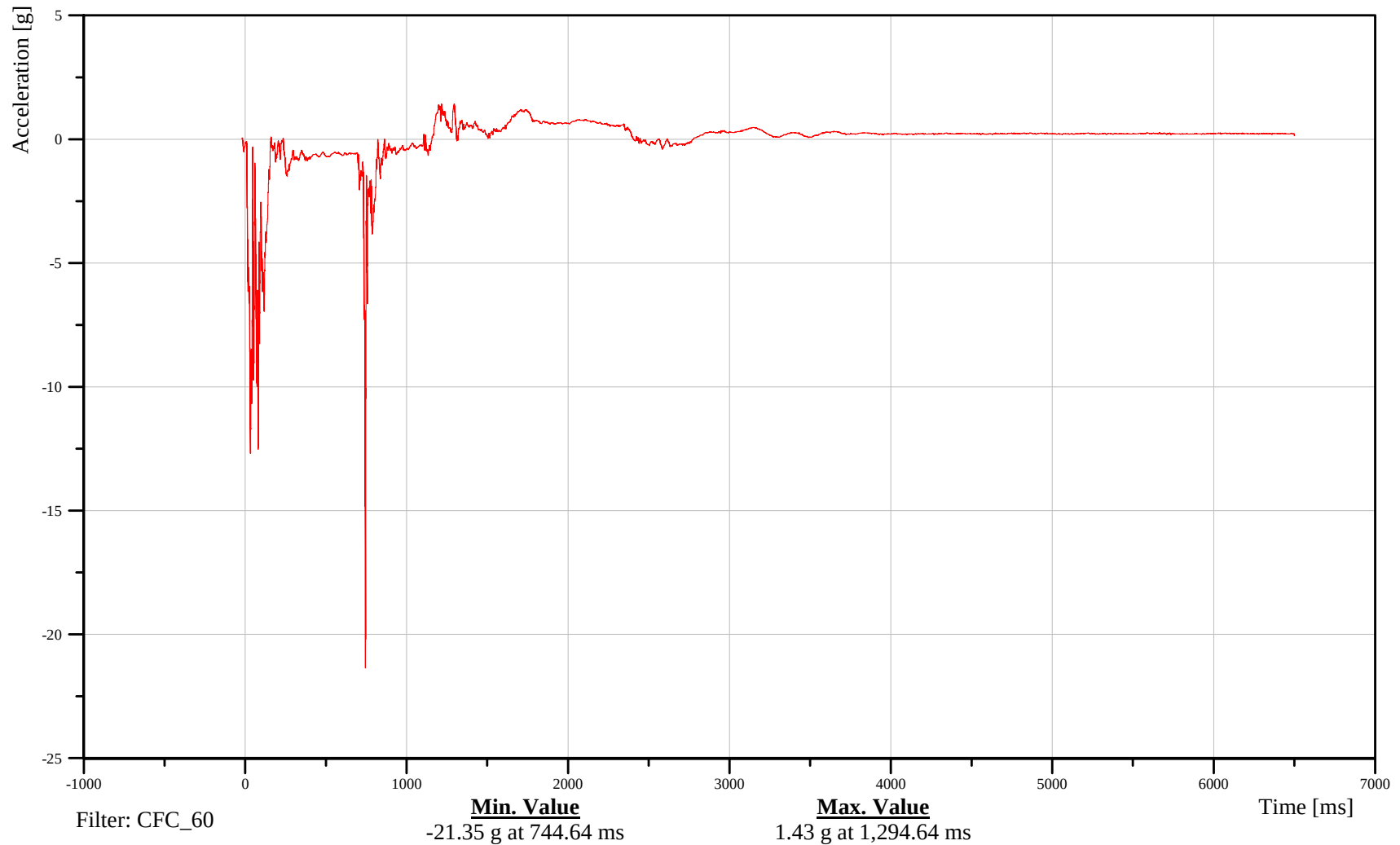
Time: 15:17

Customer: VRTC

10DPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-168

100203



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Lower Z-Axis Acceleration

Date: 02/03/2010

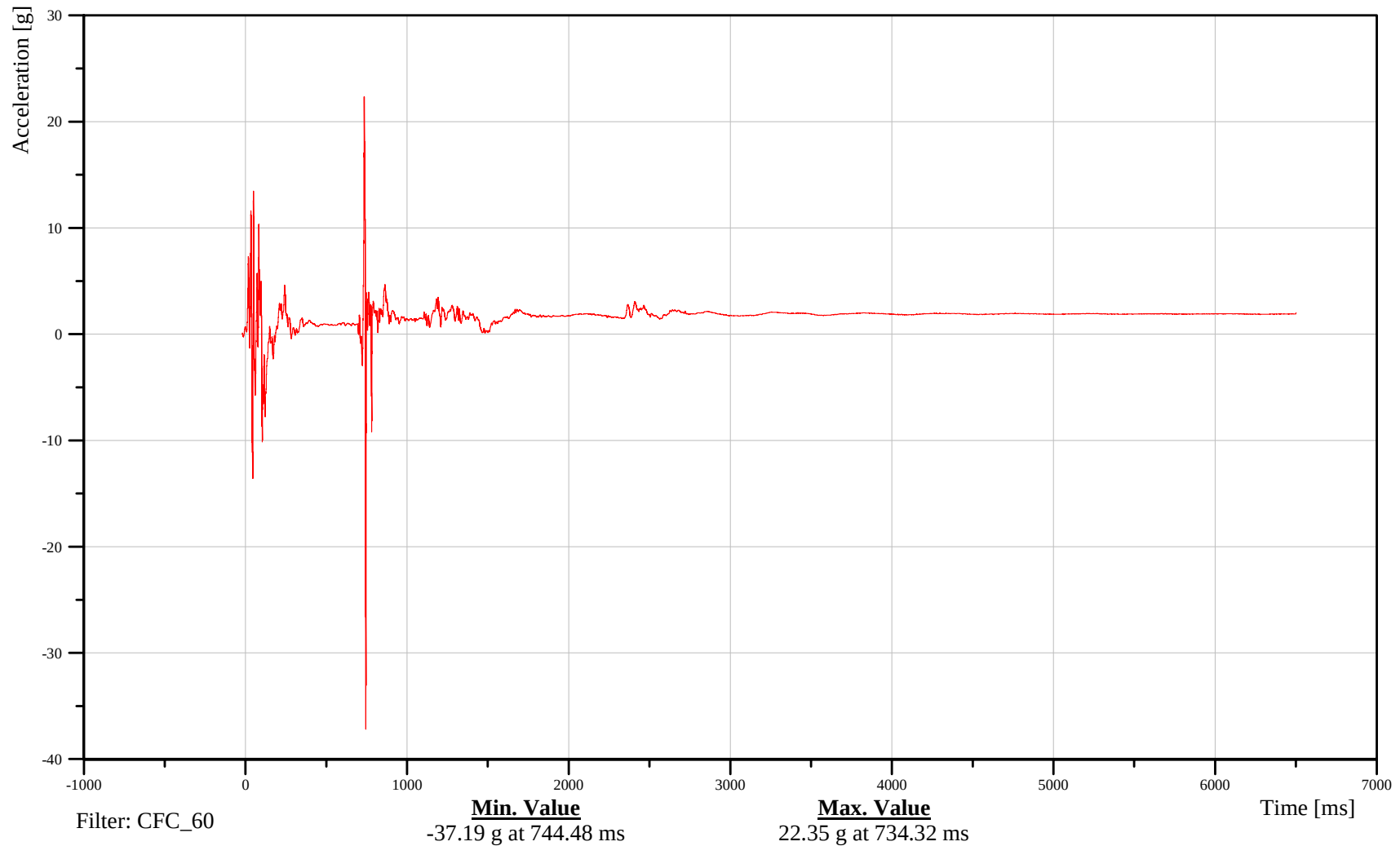
Time: 15:17

Customer: VRTC

10DPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-169

100203



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Lower Resultant Acceleration

Date: 02/03/2010

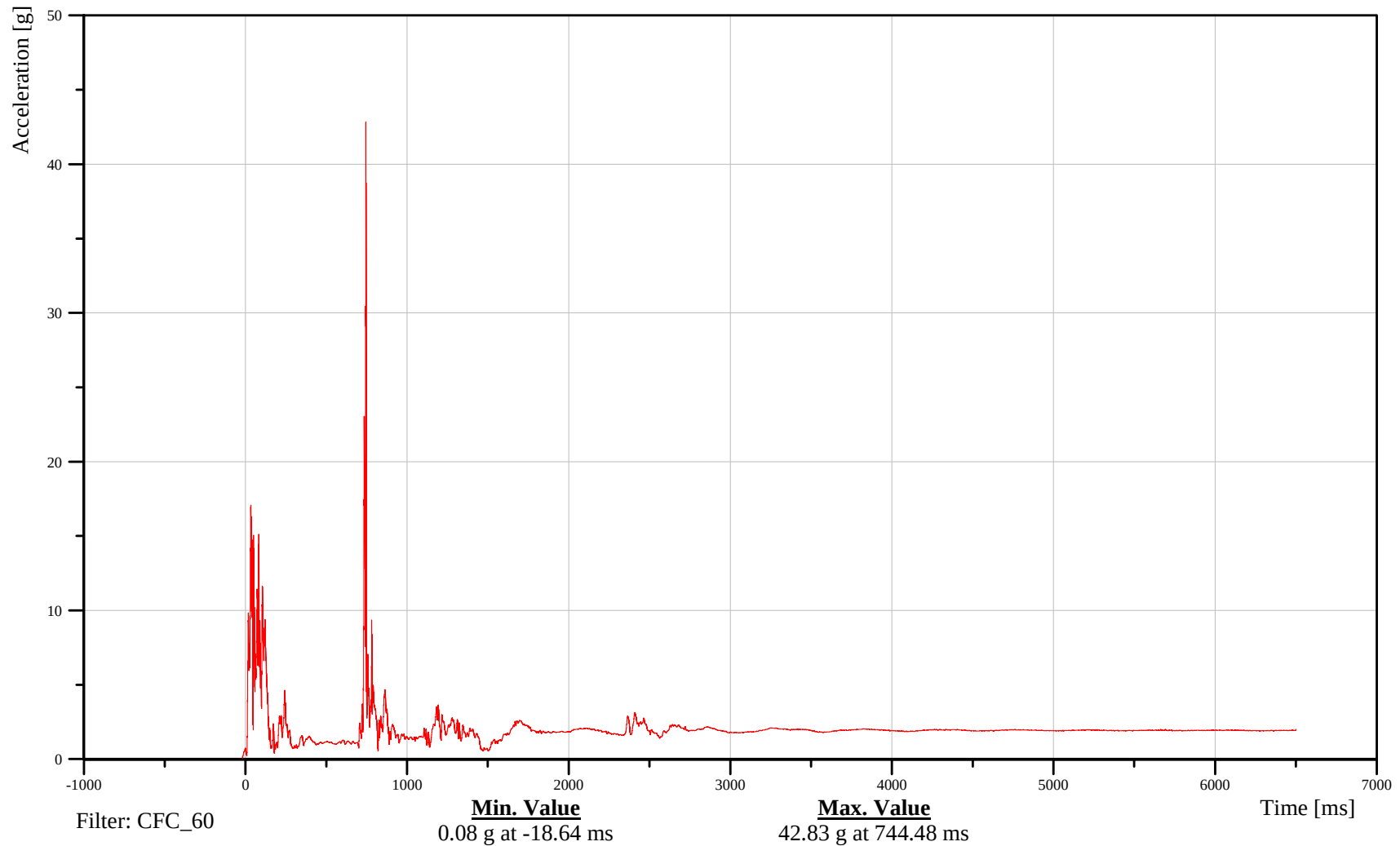
Time: 15:17

Customer: VRTC

10DPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-170

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck X-Axis Acceleration

Date: 02/03/2010

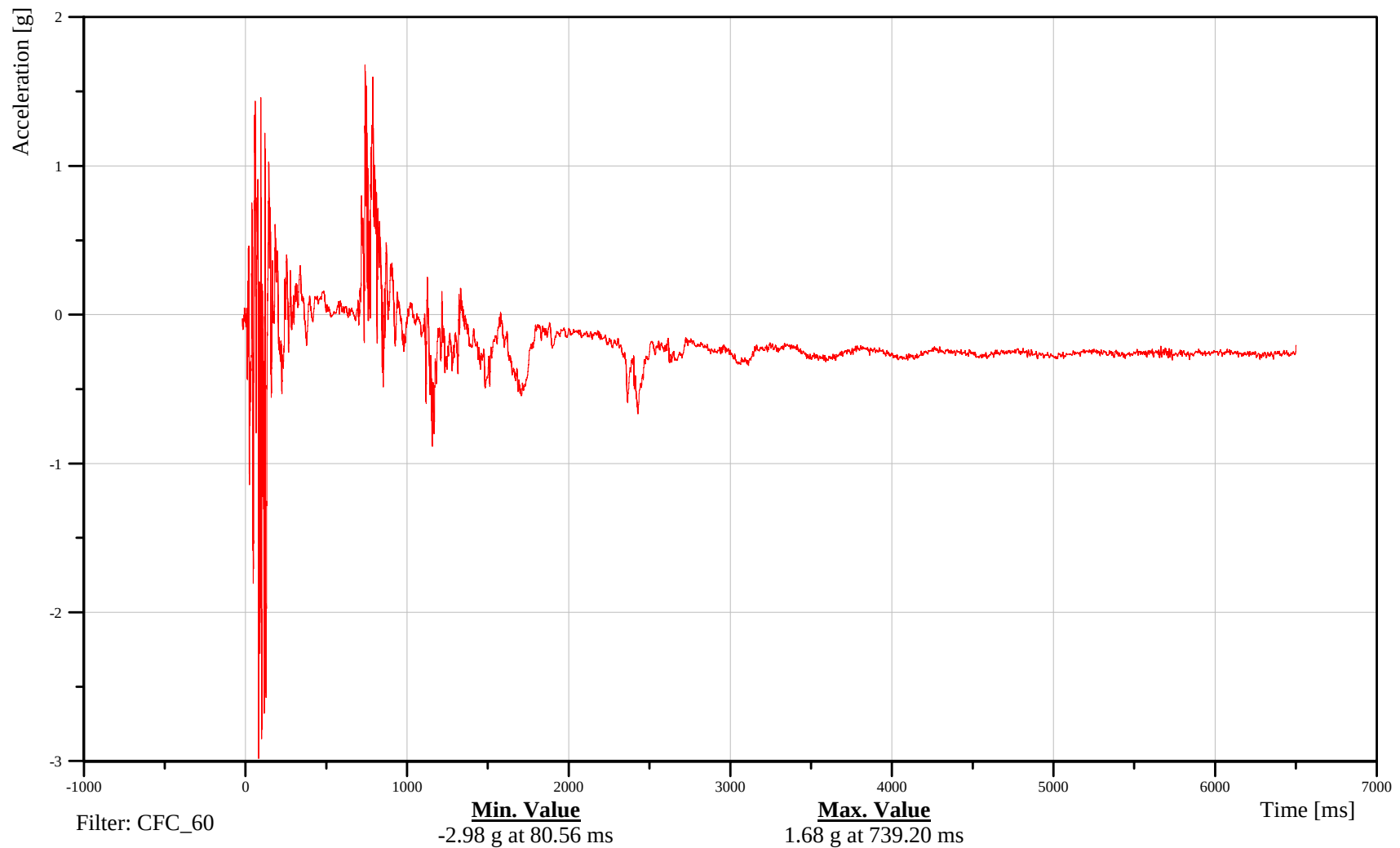
Time: 15:17

Customer: VRTC

102RDK000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-171

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck Y-Axis Acceleration

Date: 02/03/2010

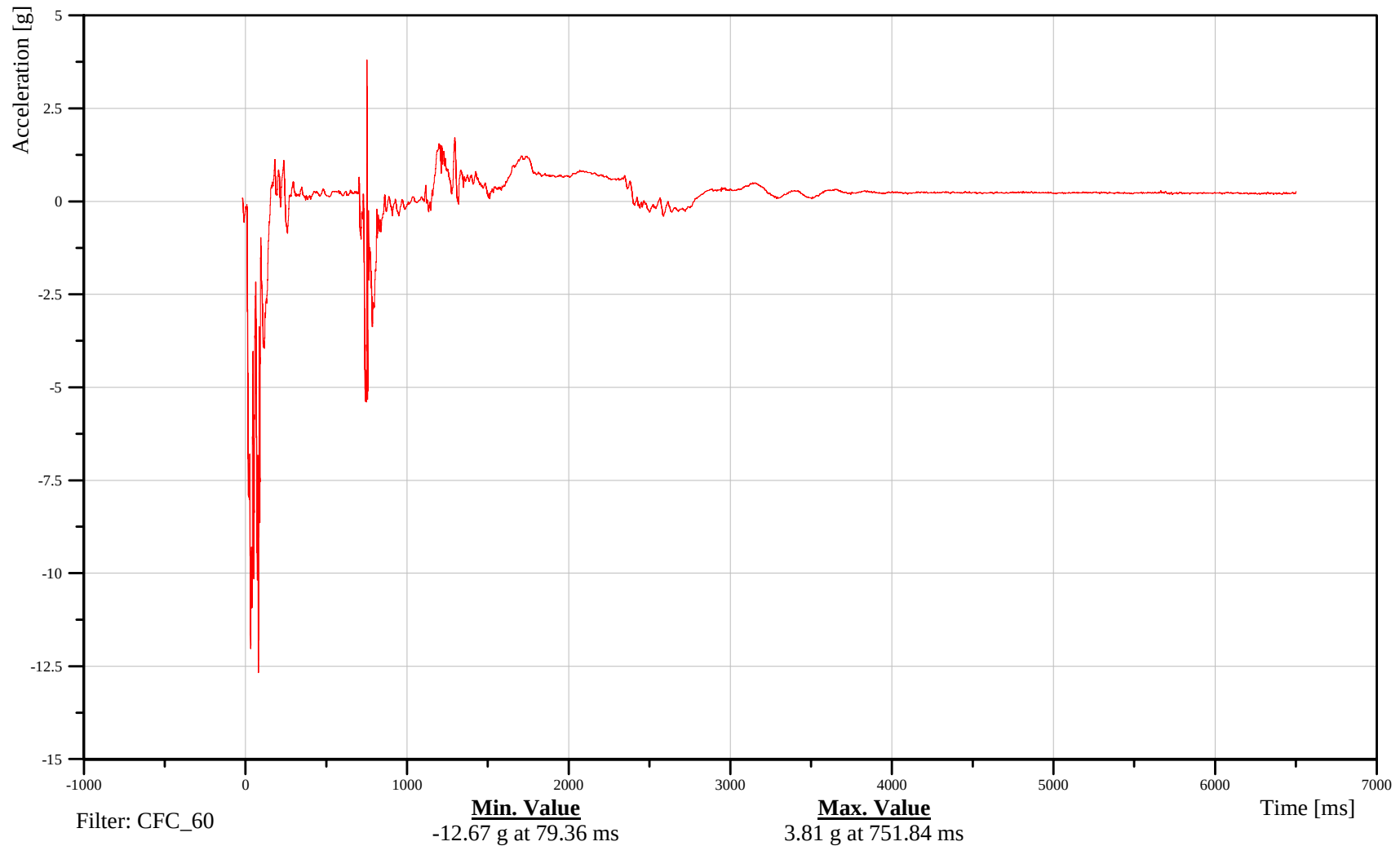
Time: 15:17

Customer: VRTC

102RDK000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-172

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck Z-Axis Acceleration

Date: 02/03/2010

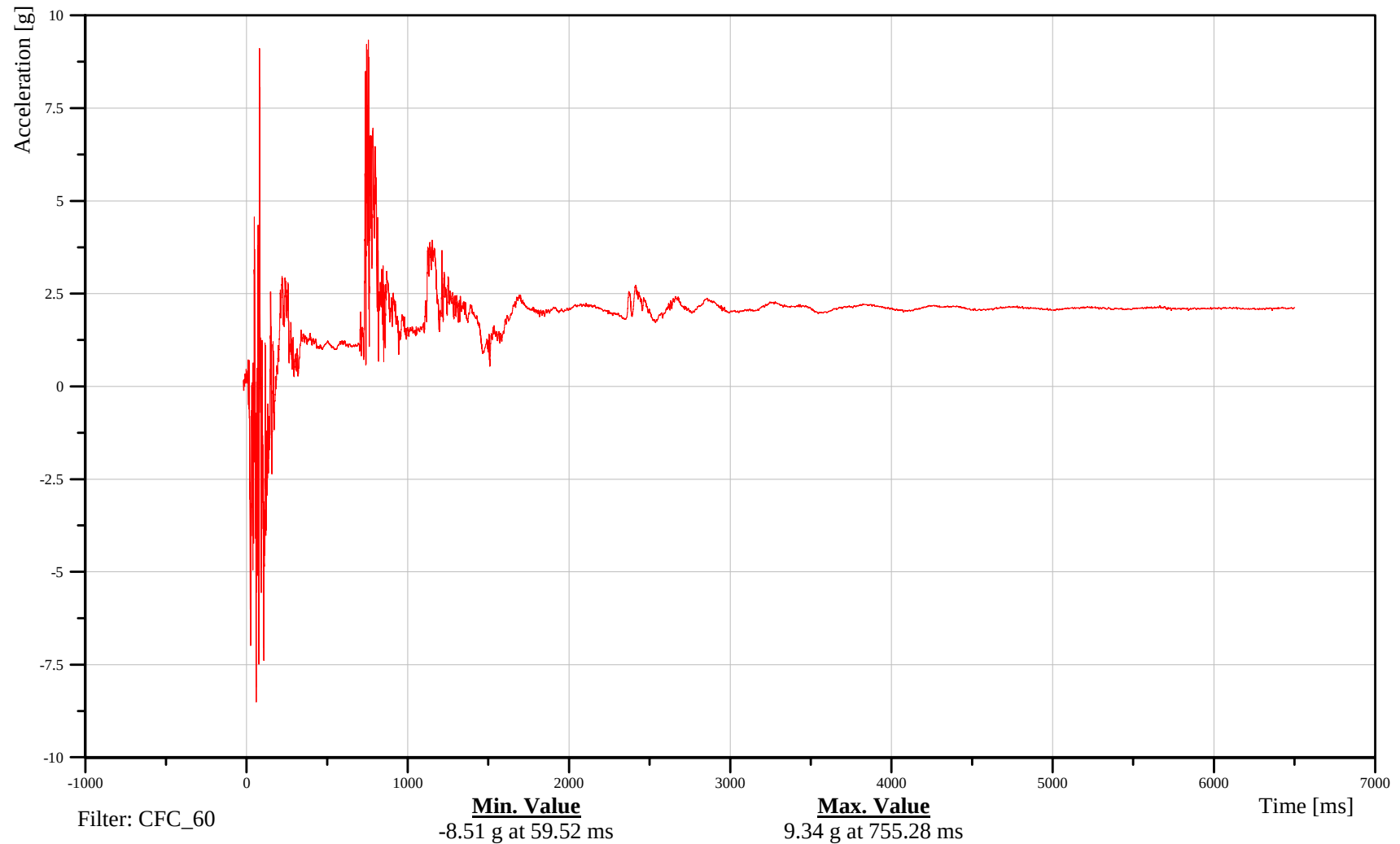
Time: 15:17

Customer: VRTC

102RDK000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-173

100203



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck Resultant Acceleration

Date: 02/03/2010

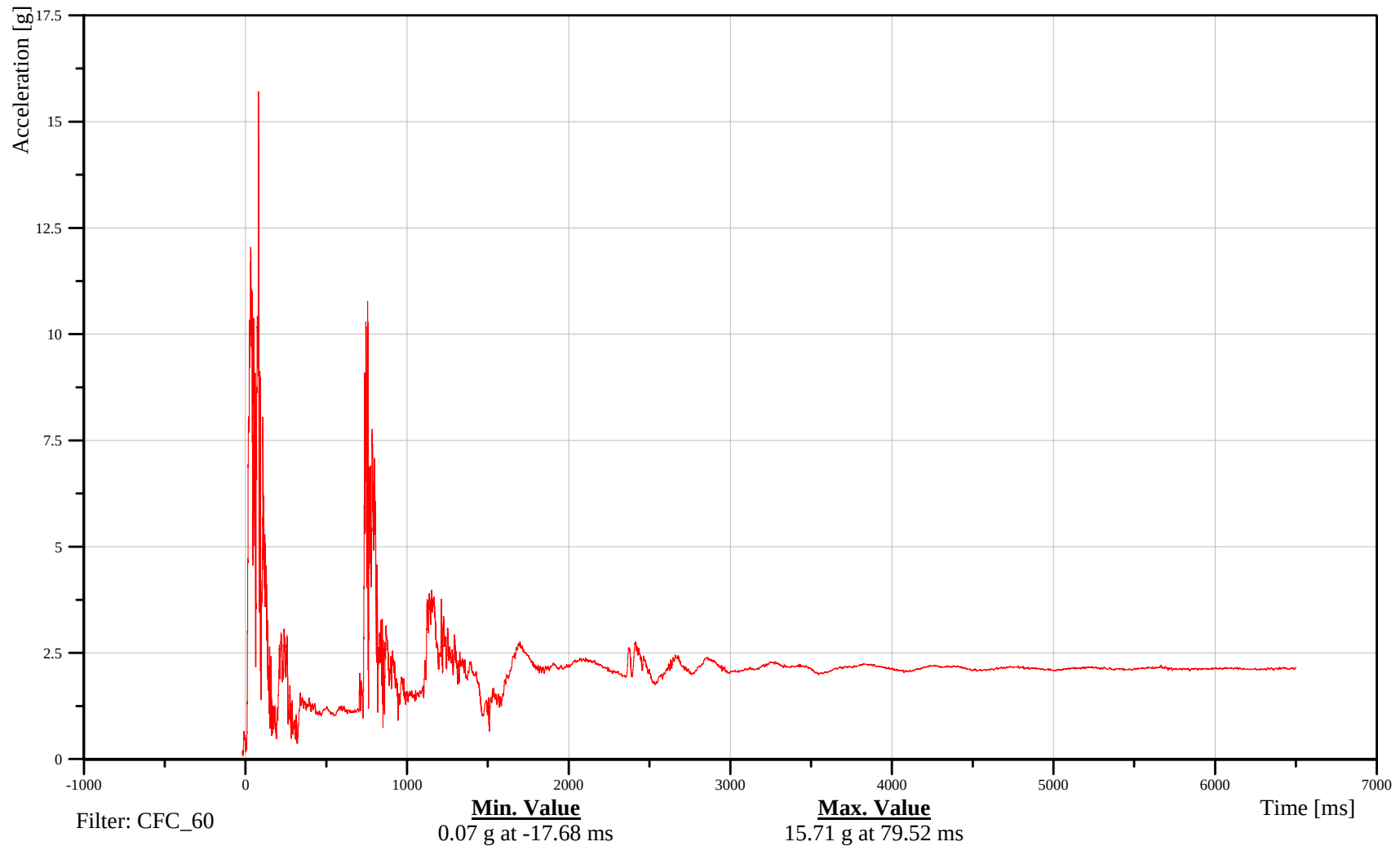
Time: 15:17

Customer: VRTC

102RDK000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-174

100203



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) X-Axis Acceleration

Date: 02/03/2010

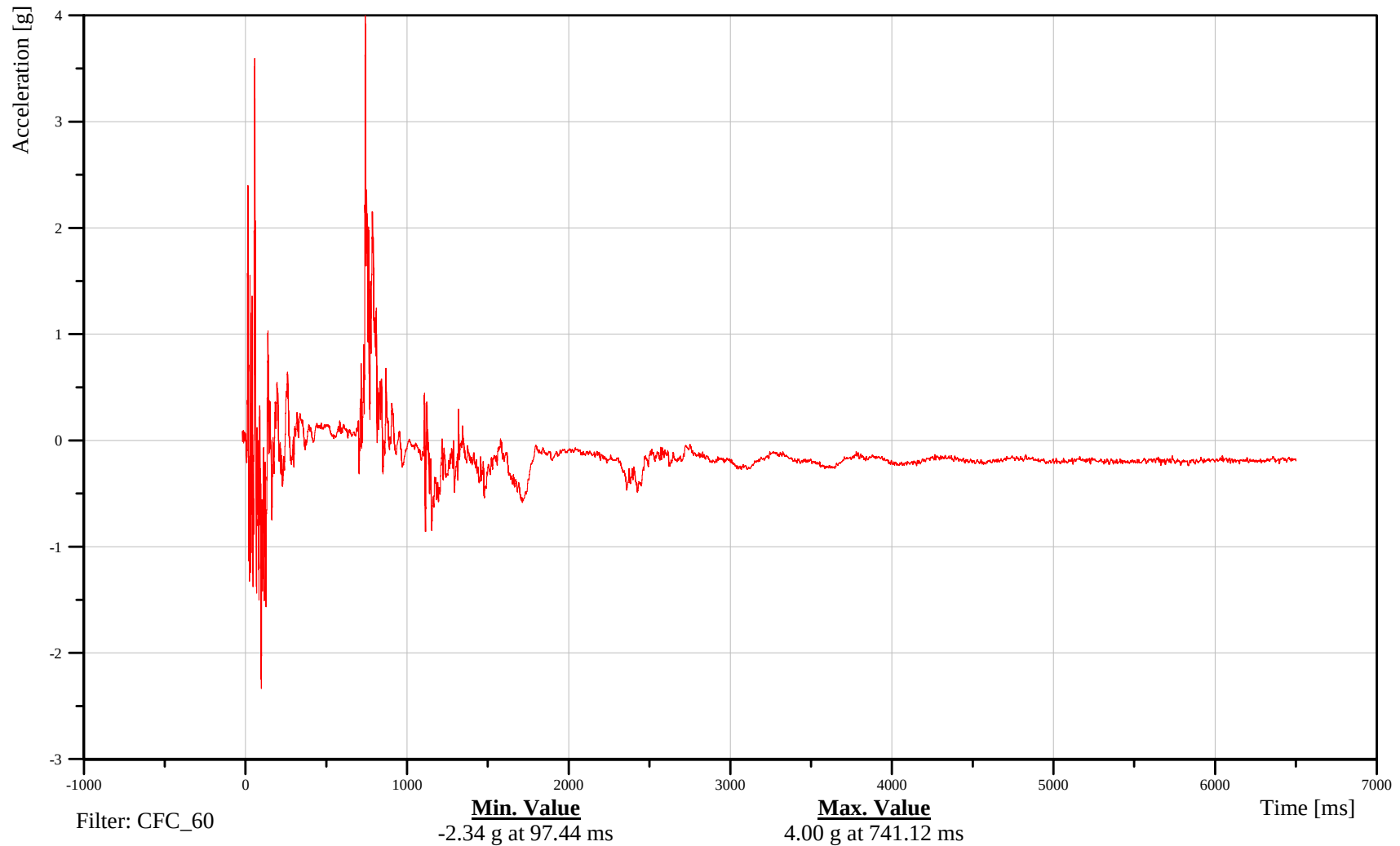
Time: 15:17

Customer: VRTC

11SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-175

100203



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) Y-Axis Acceleration

Date: 02/03/2010

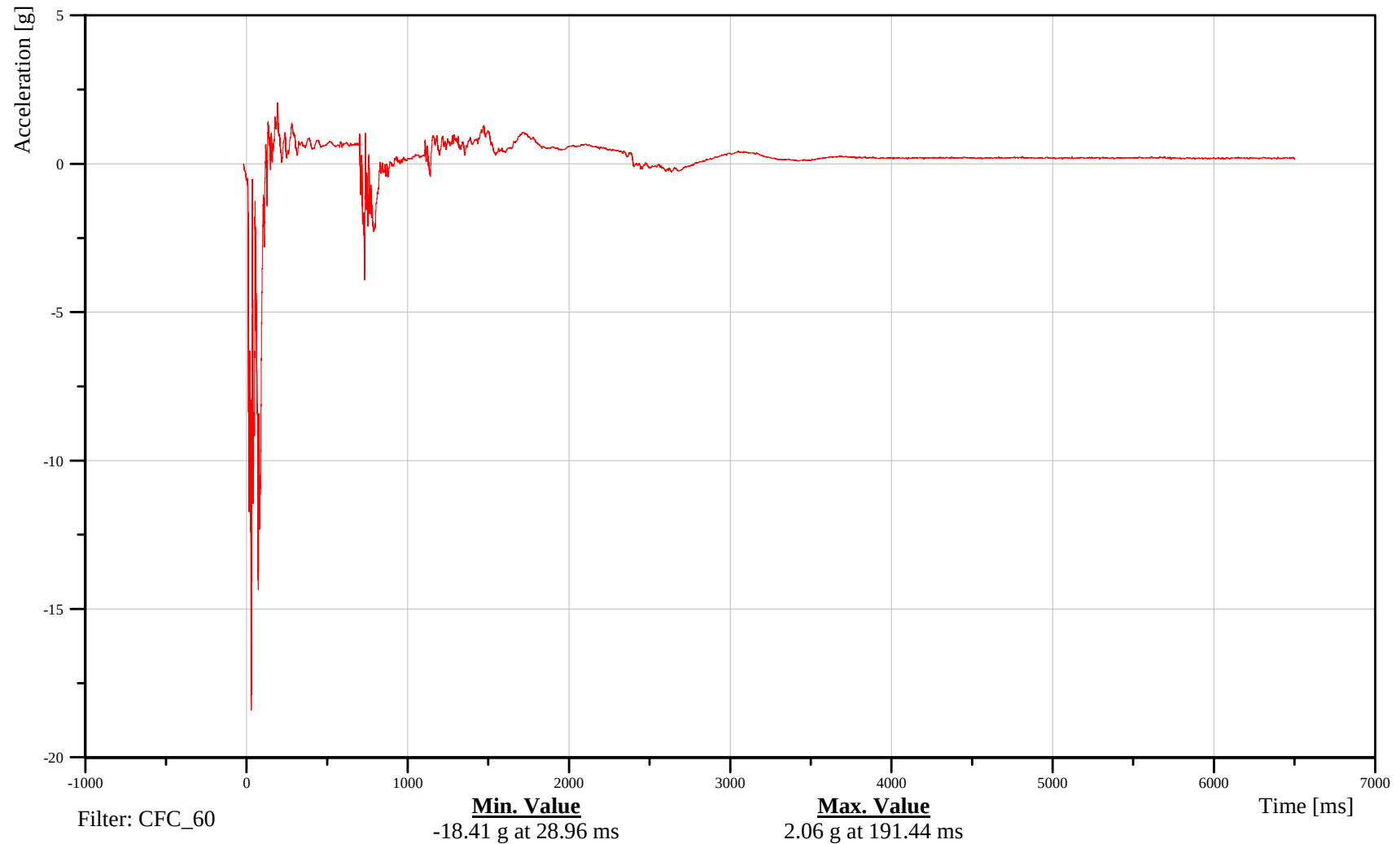
Time: 15:17

Customer: VRTC

11SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-176

100203



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) Z-Axis Acceleration

Date: 02/03/2010

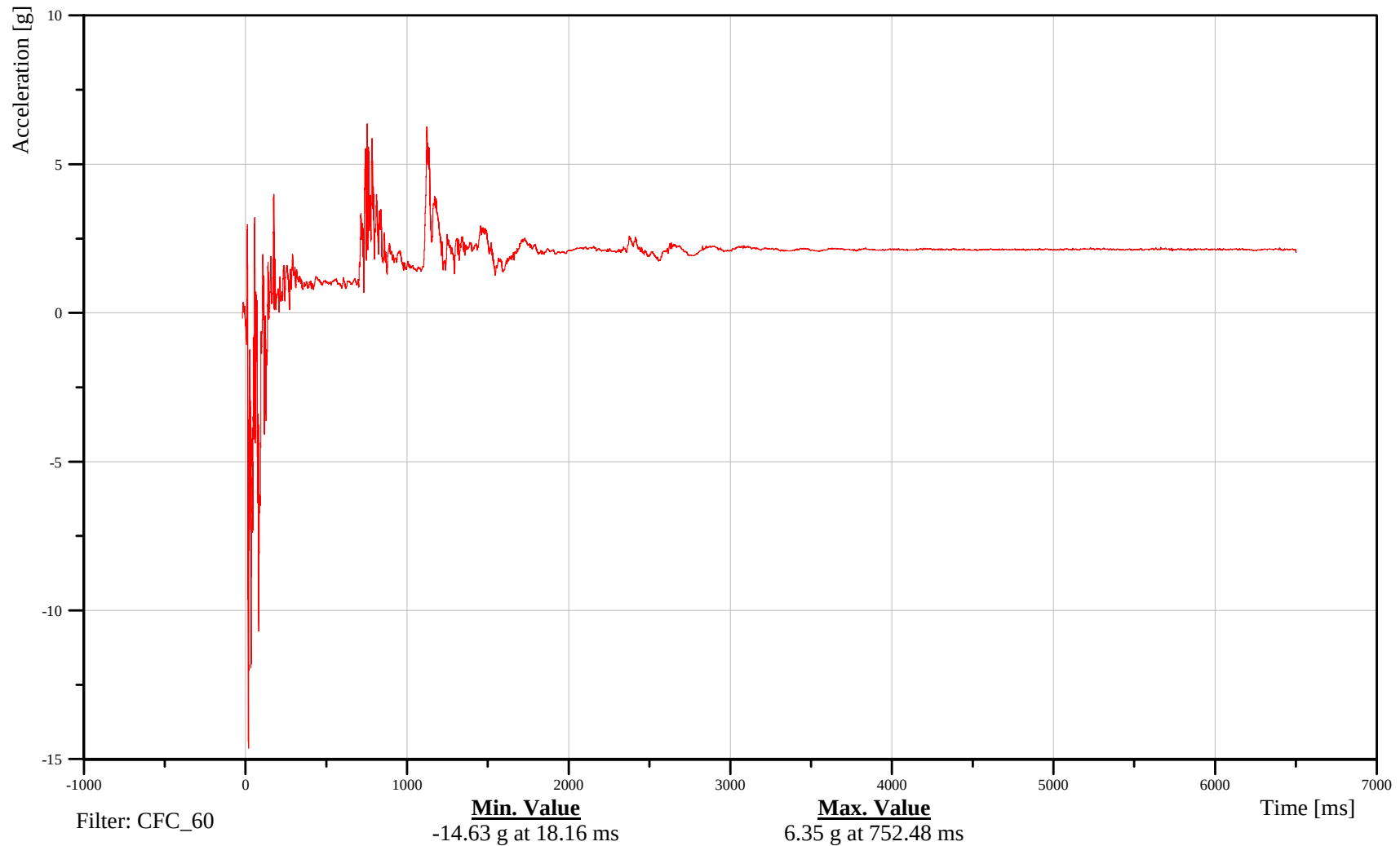
Time: 15:17

Customer: VRTC

11SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-177

100203



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) Resultant Acceleration

Date: 02/03/2010

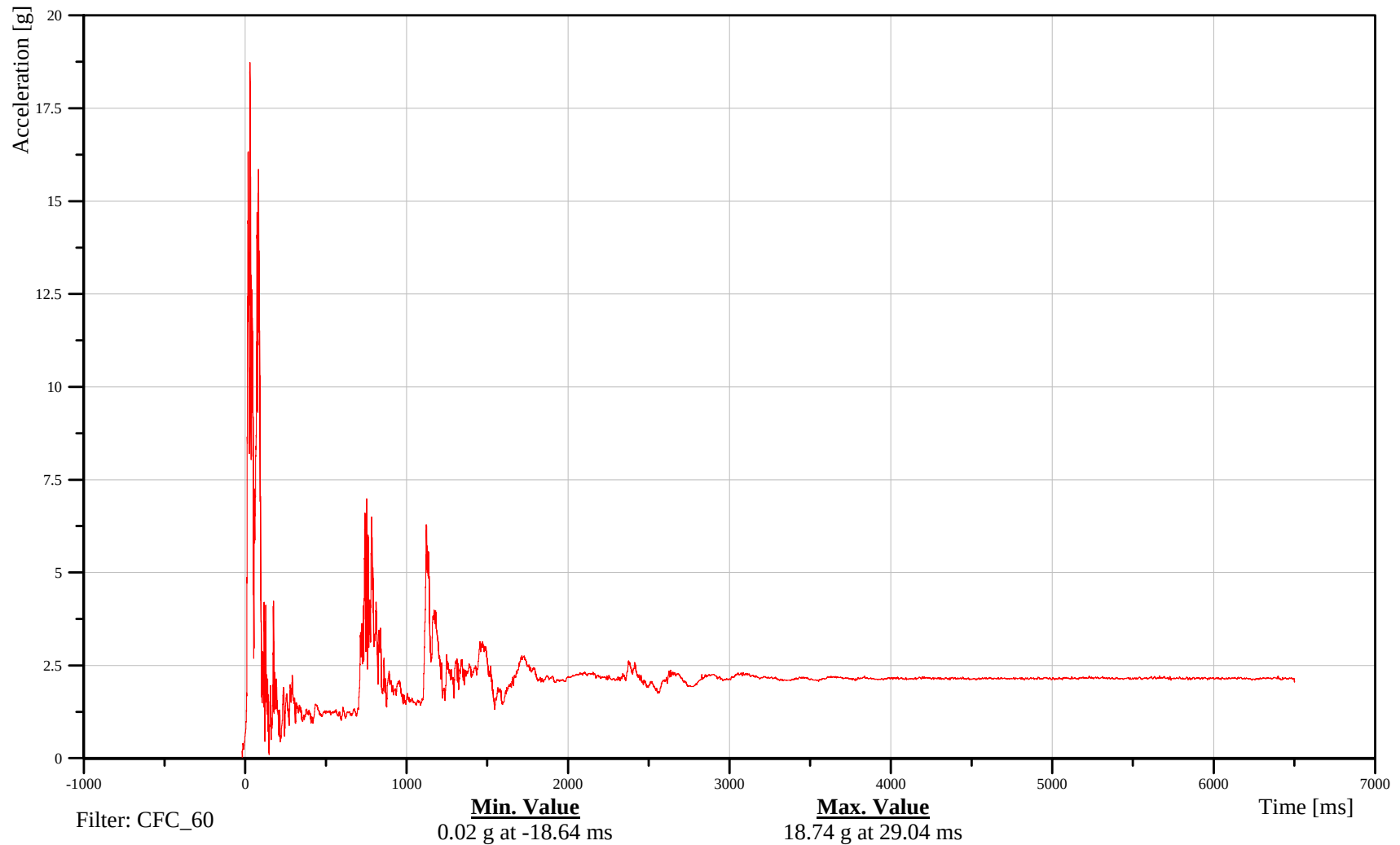
Time: 15:17

Customer: VRTC

11SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-178

100203



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) X-Axis Acceleration

Date: 02/03/2010

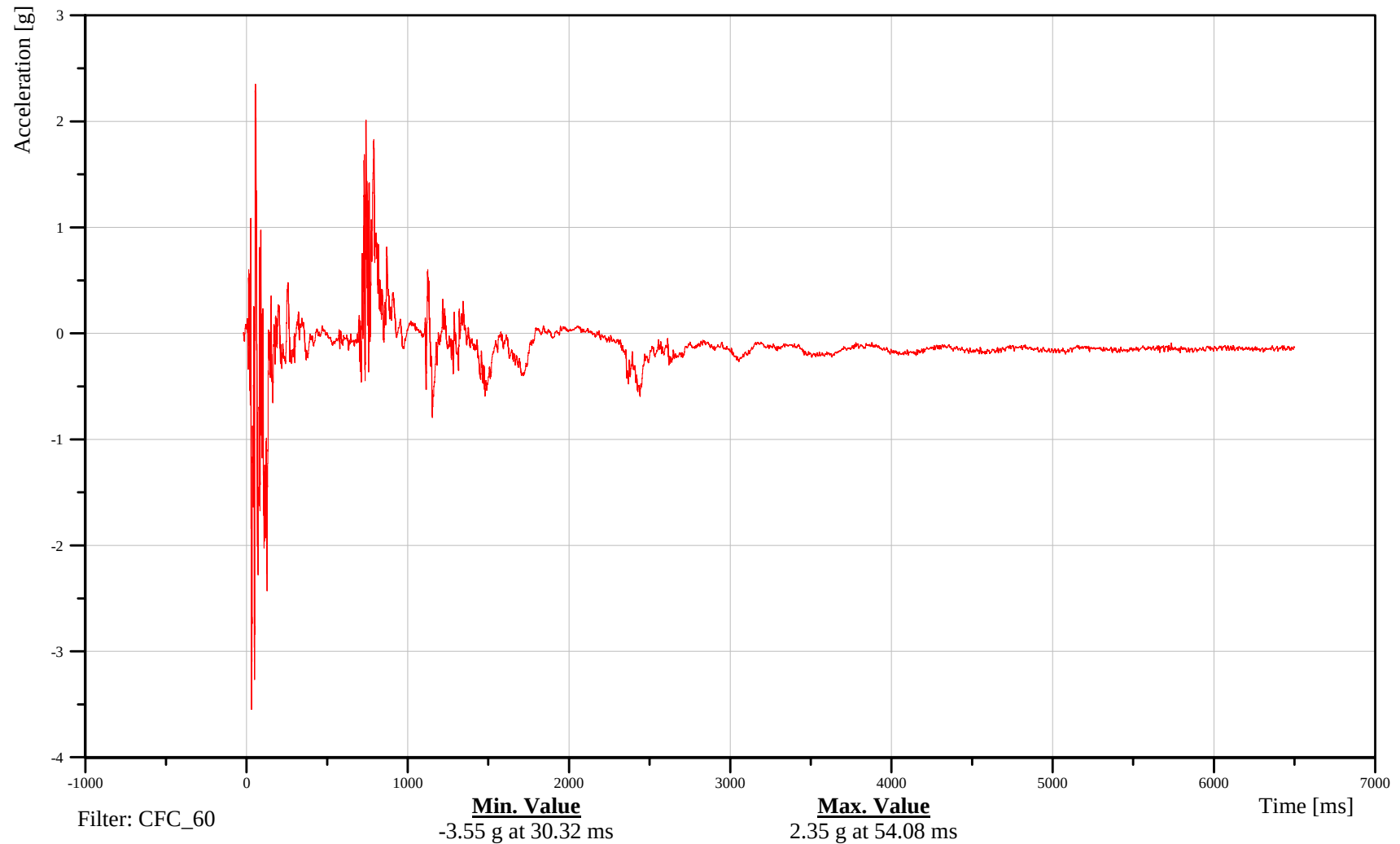
Time: 15:17

Customer: VRTC

13SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-179

100203



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) Y-Axis Acceleration

Date: 02/03/2010

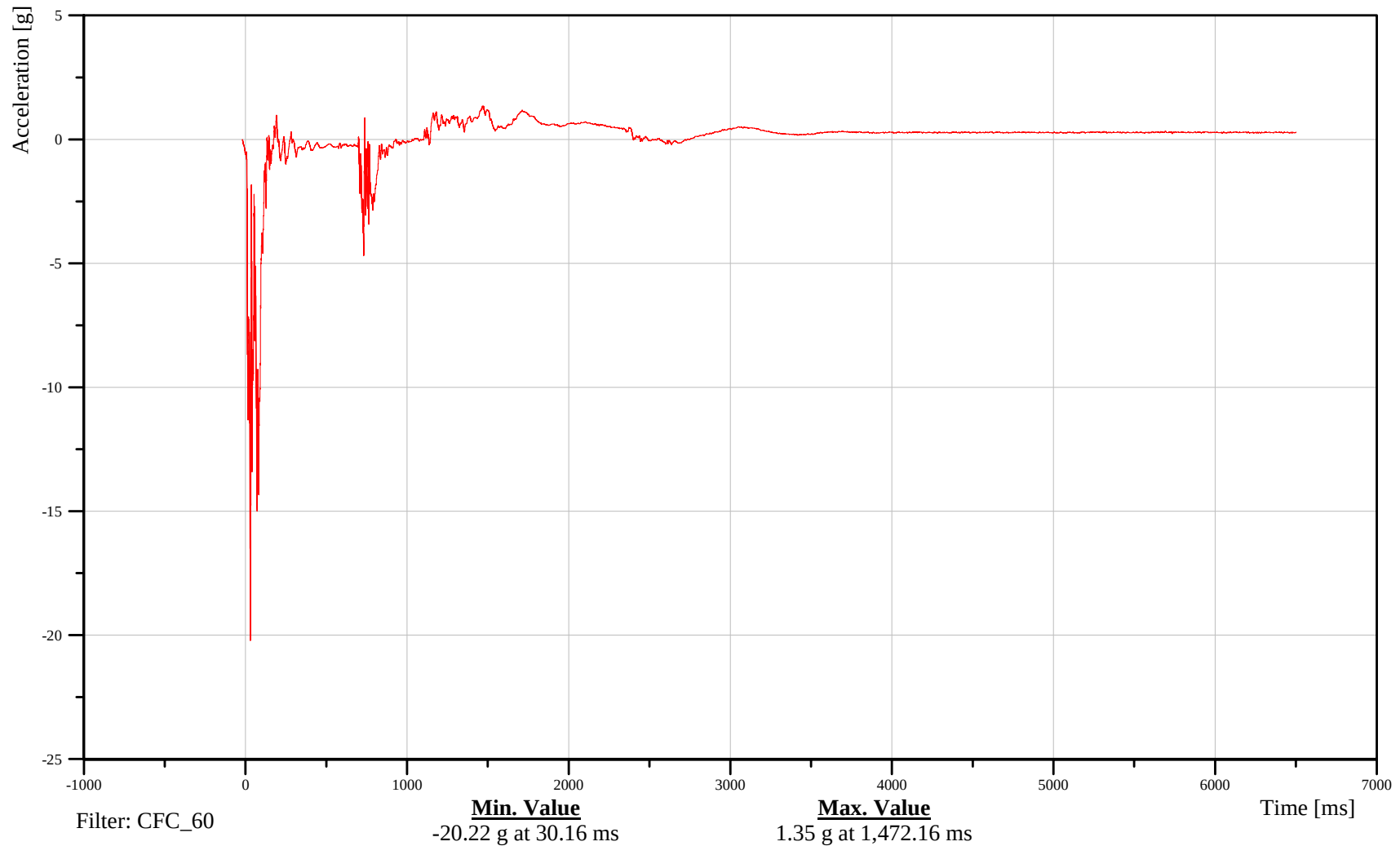
Time: 15:17

Customer: VRTC

13SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-180

100203



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) Z-Axis Acceleration

Date: 02/03/2010

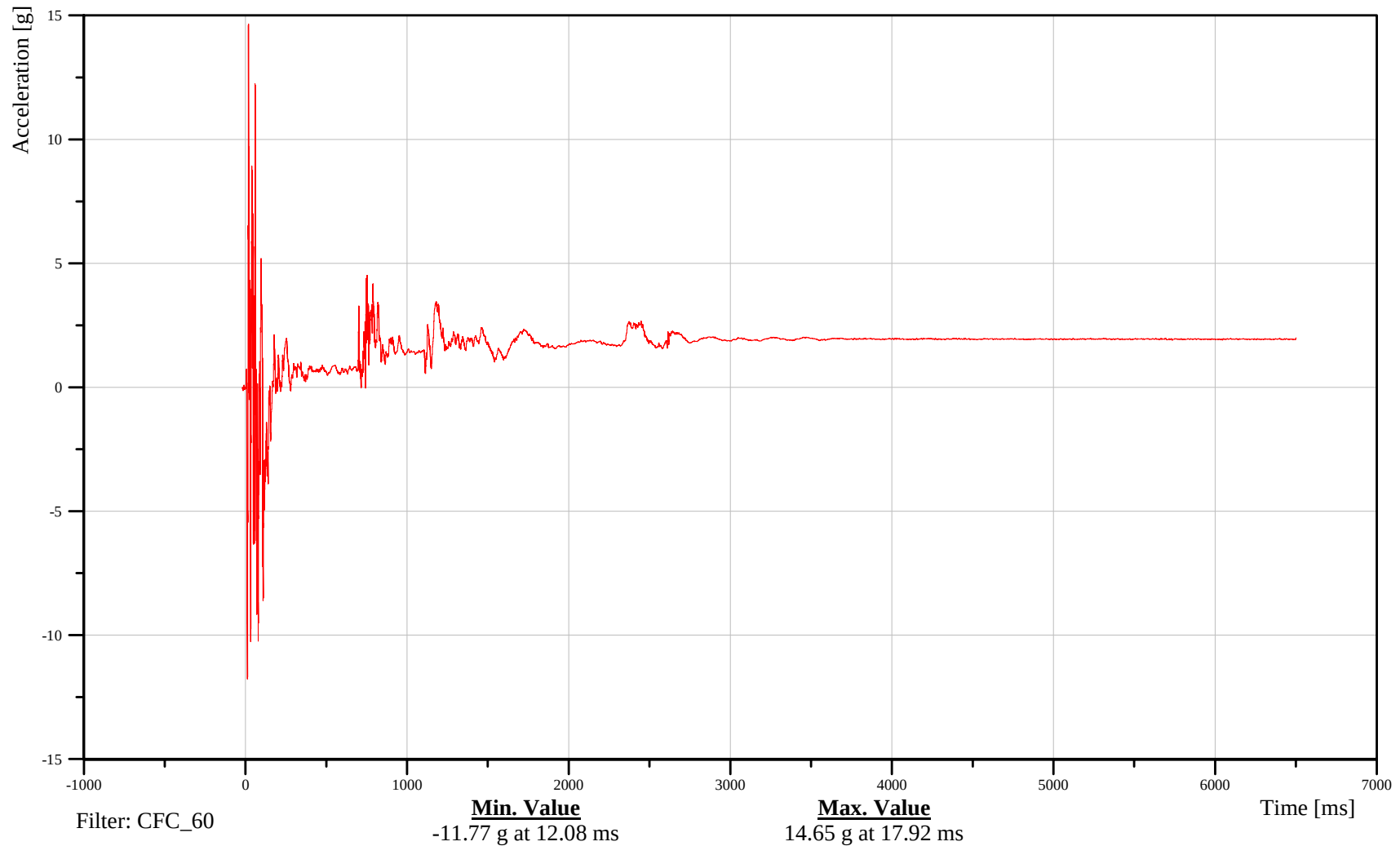
Time: 15:17

Customer: VRTC

13SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-181

100203



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) Resultant Acceleration

Date: 02/03/2010

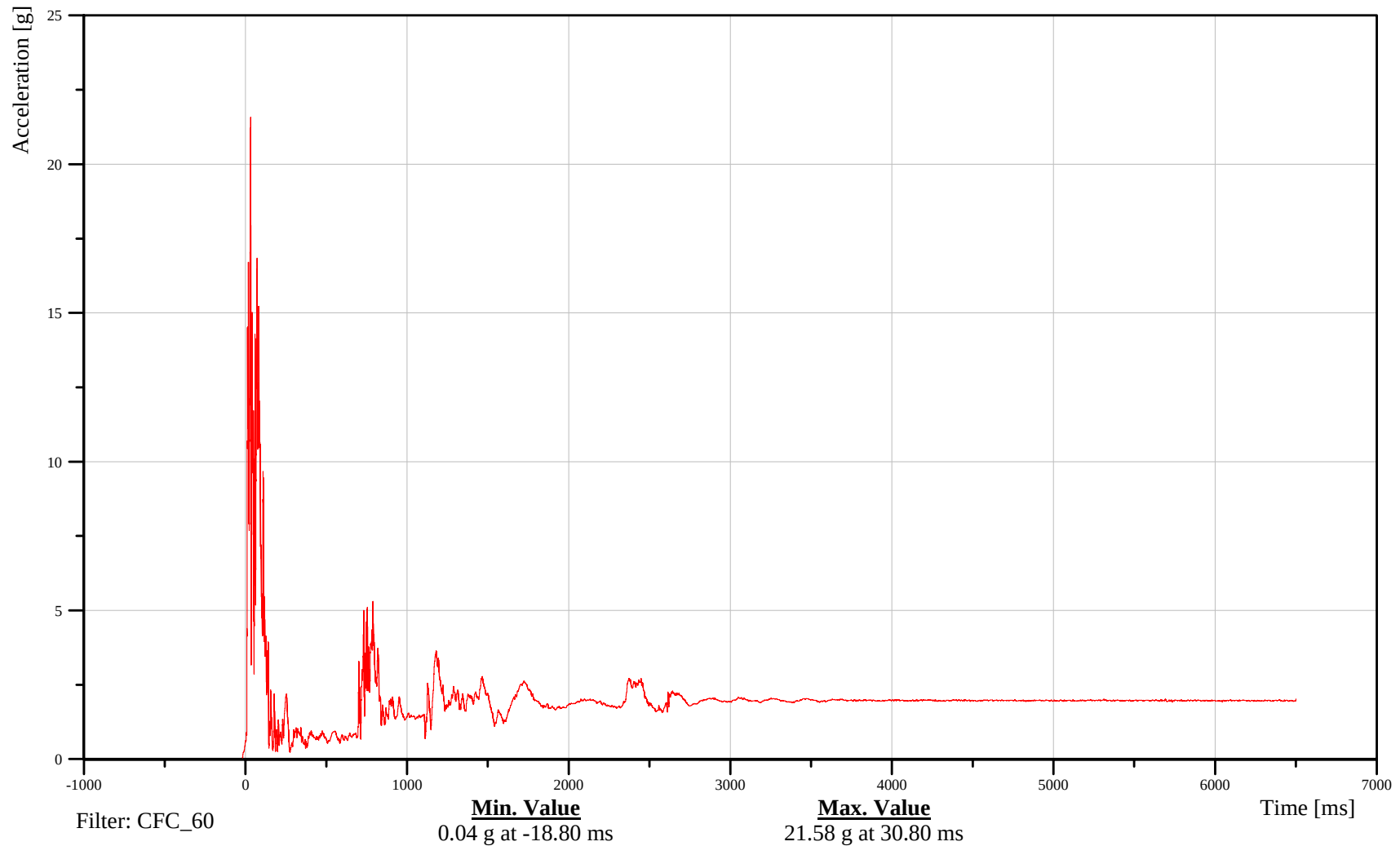
Time: 15:17

Customer: VRTC

13SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-182

100203



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) X-Axis Acceleration

Date: 02/03/2010

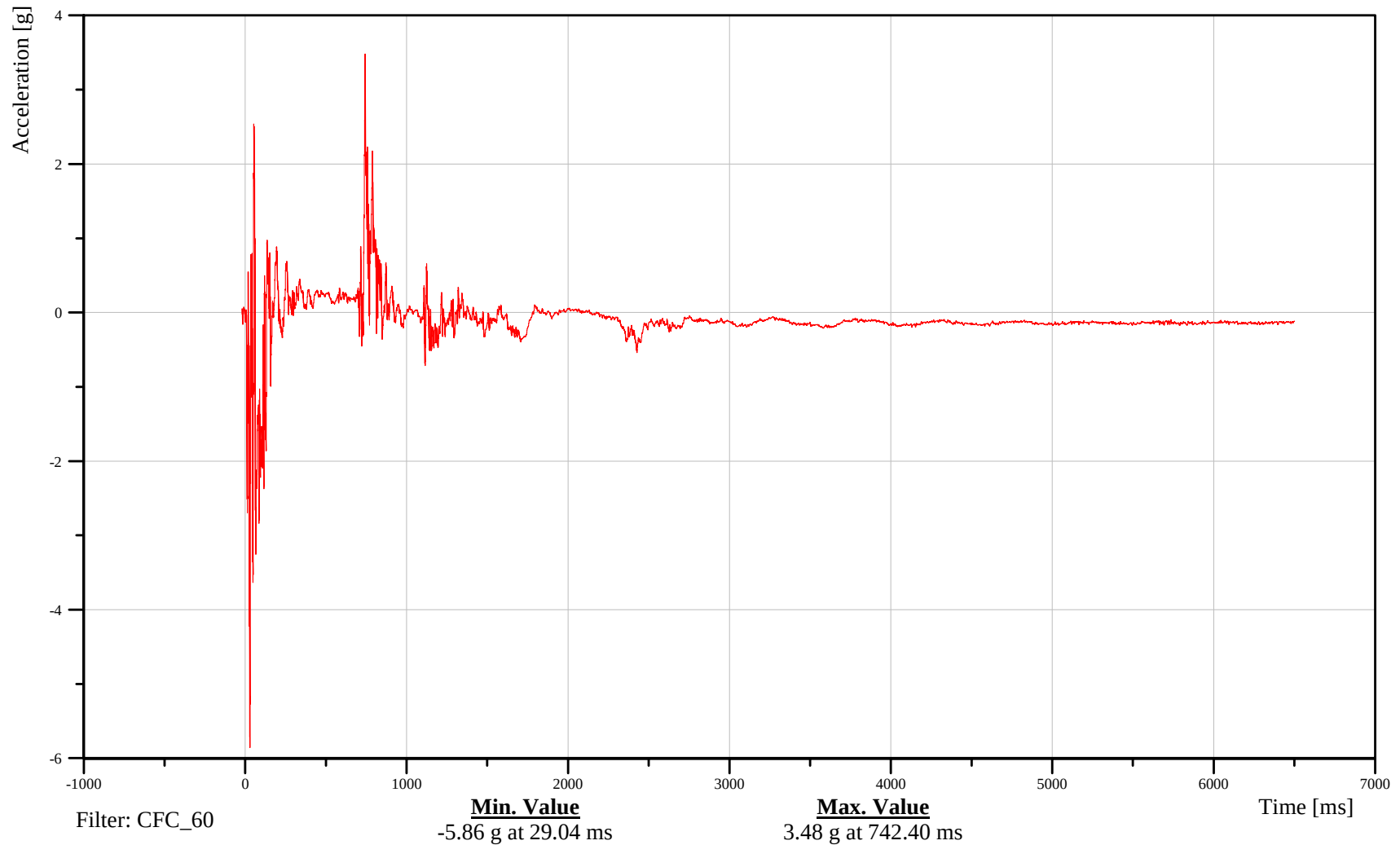
Time: 15:17

Customer: VRTC

14SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-183

100203



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) Y-Axis Acceleration

Date: 02/03/2010

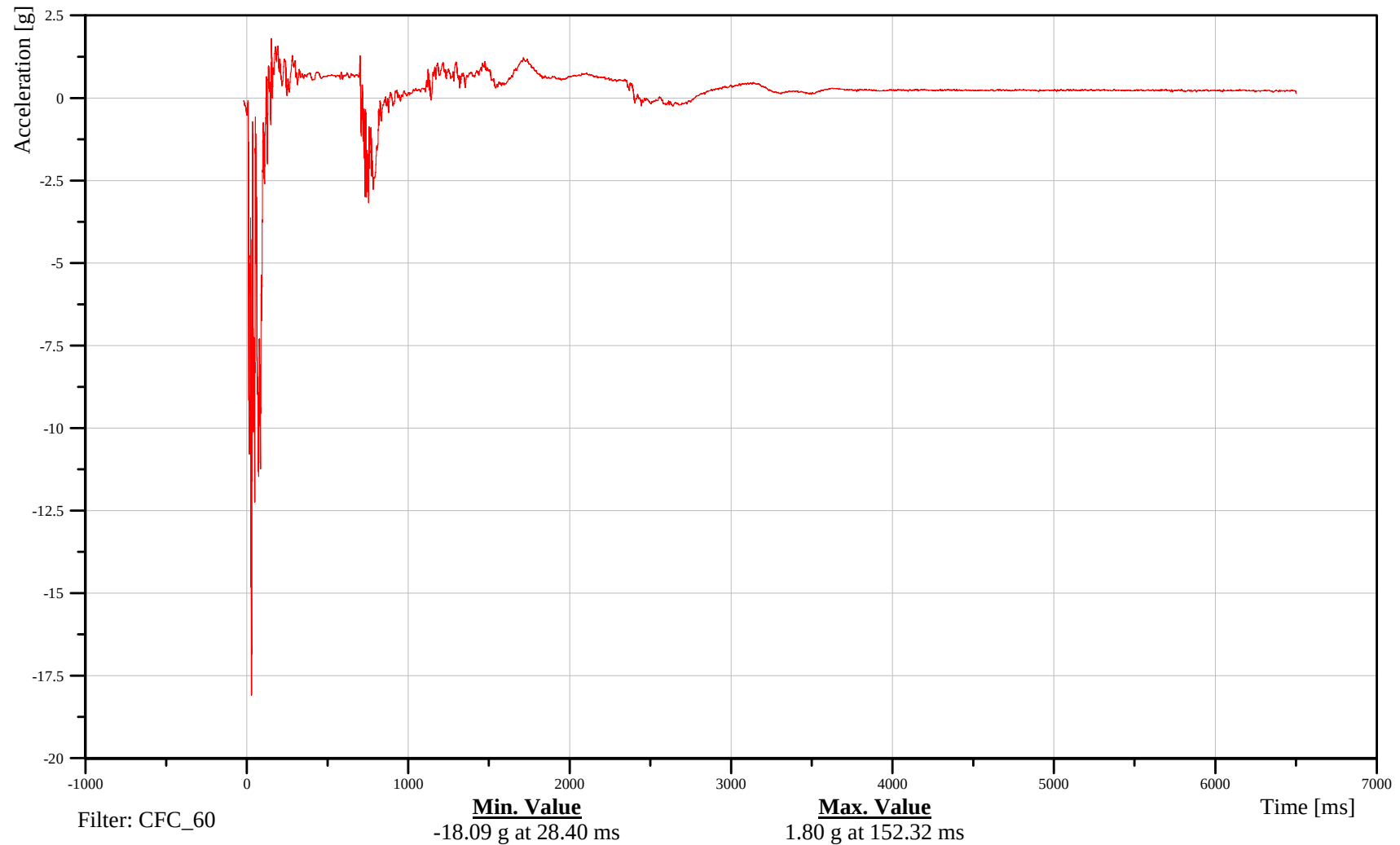
Time: 15:17

Customer: VRTC

14SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-184

100203



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) Z-Axis Acceleration

Date: 02/03/2010

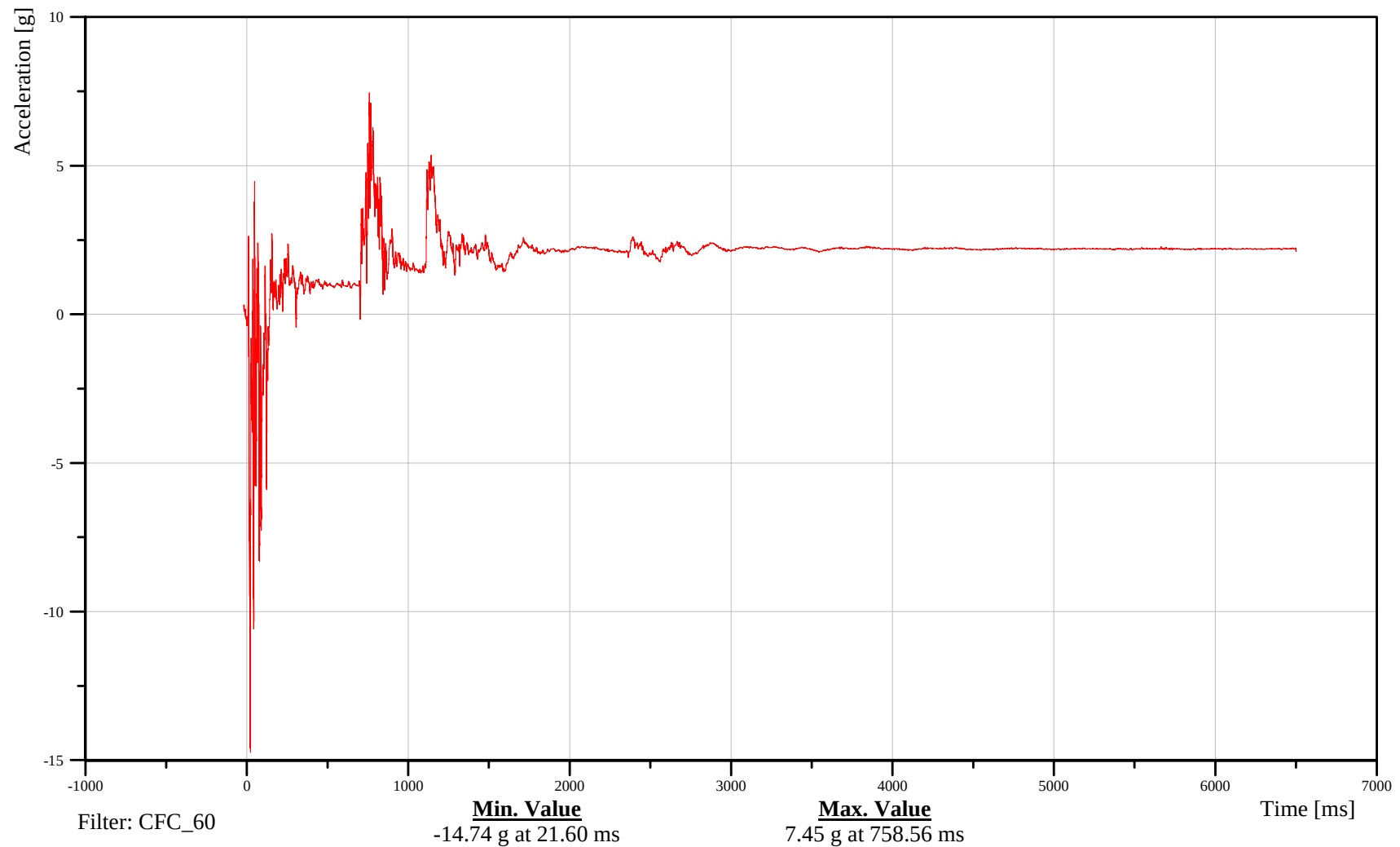
Time: 15:17

Customer: VRTC

14SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-185

100203



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) Resultant Acceleration

Date: 02/03/2010

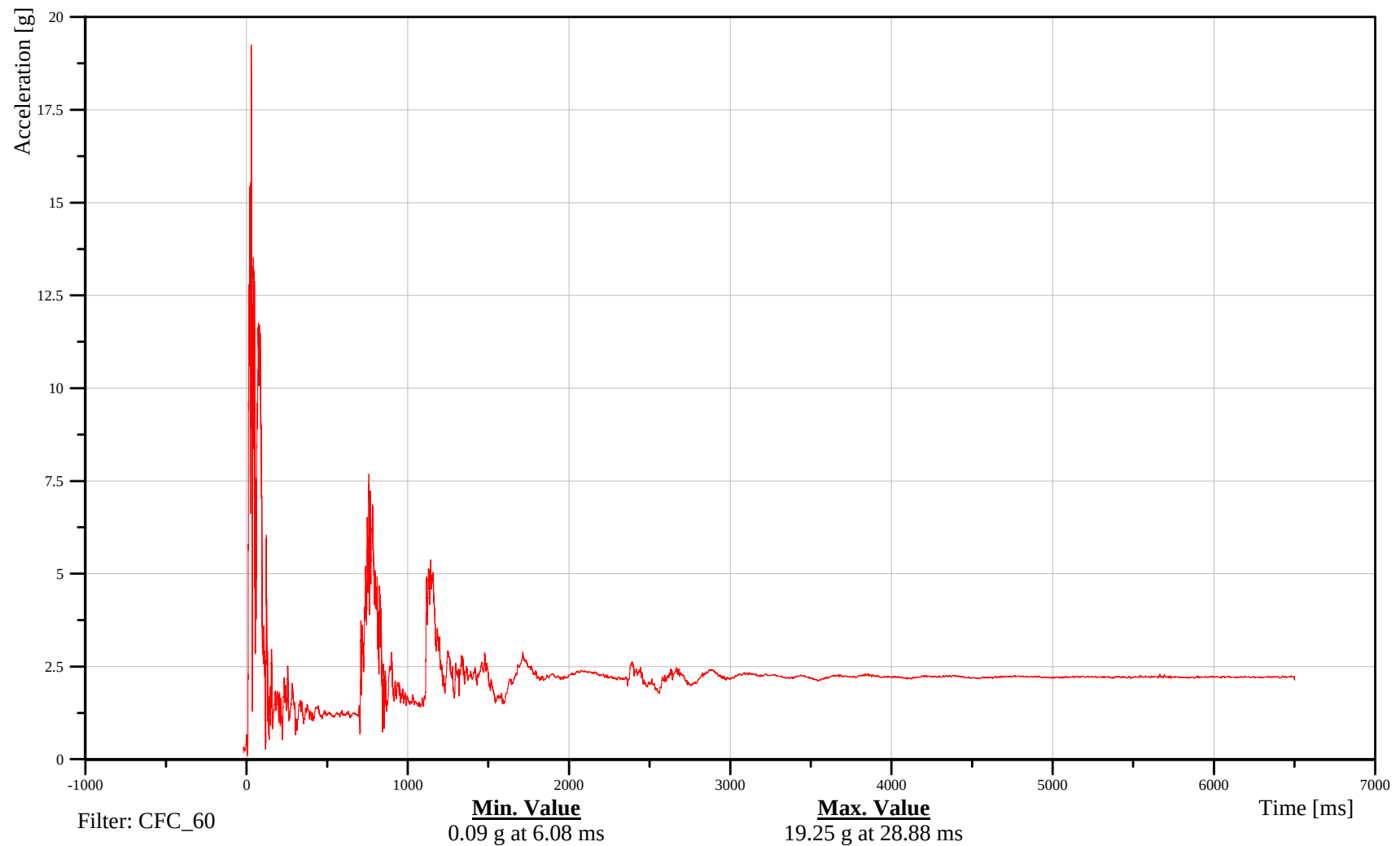
Time: 15:17

Customer: VRTC

14SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-186

100203



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) X-Axis Acceleration

Date: 02/03/2010

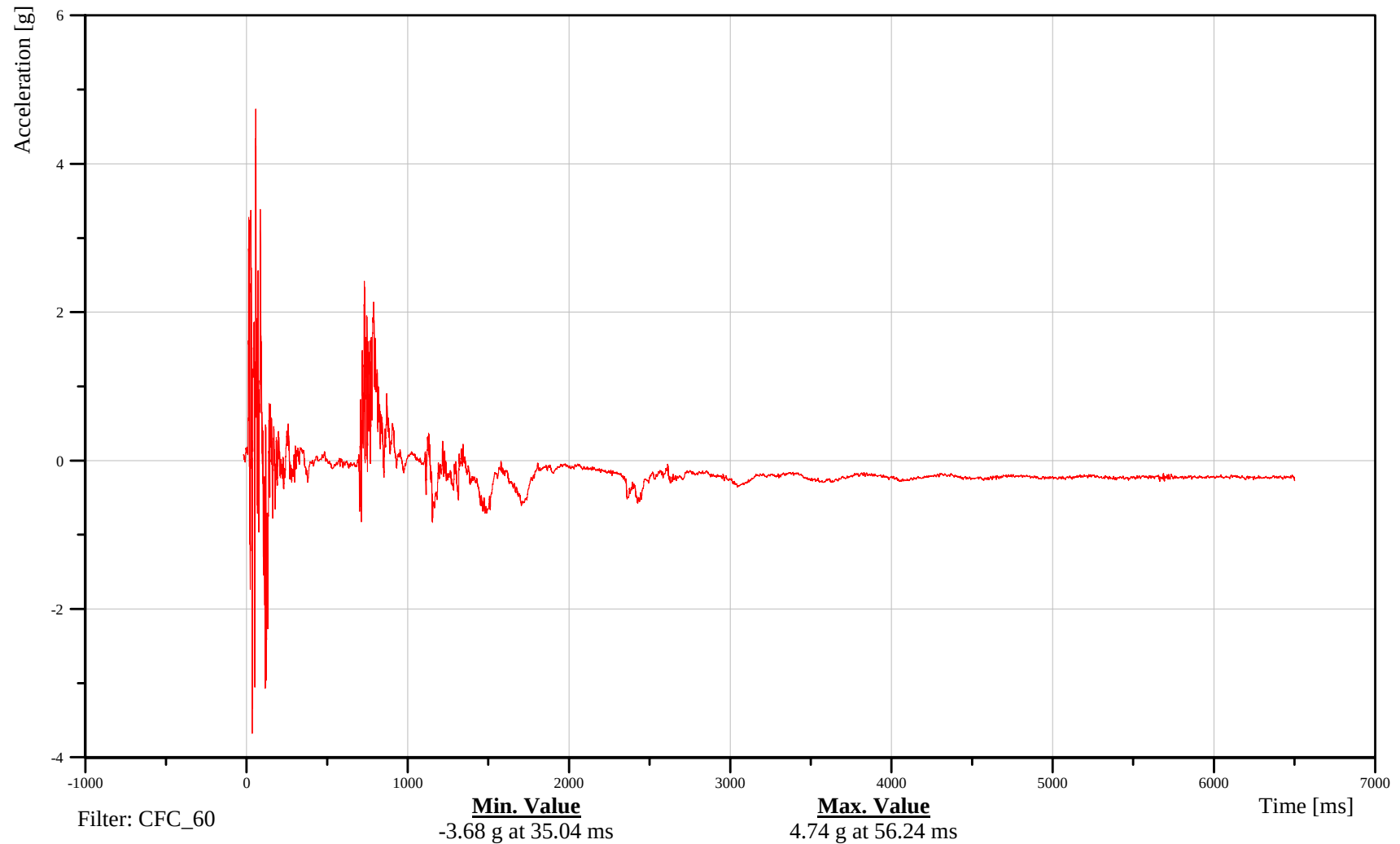
Time: 15:17

Customer: VRTC

16SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-187

100203



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) Y-Axis Acceleration

Date: 02/03/2010

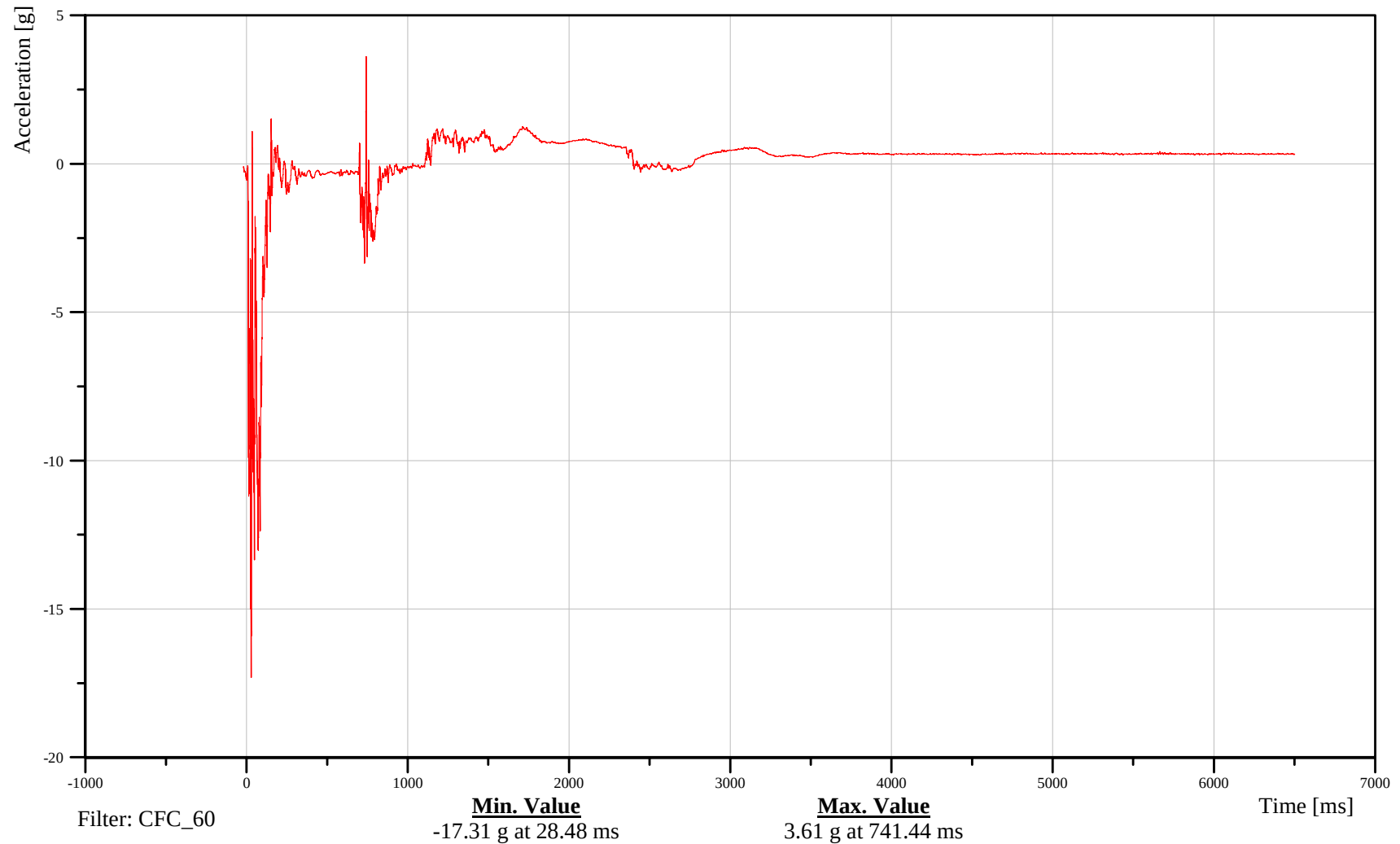
Time: 15:17

Customer: VRTC

16SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-188

100203



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) Z-Axis Acceleration

Date: 02/03/2010

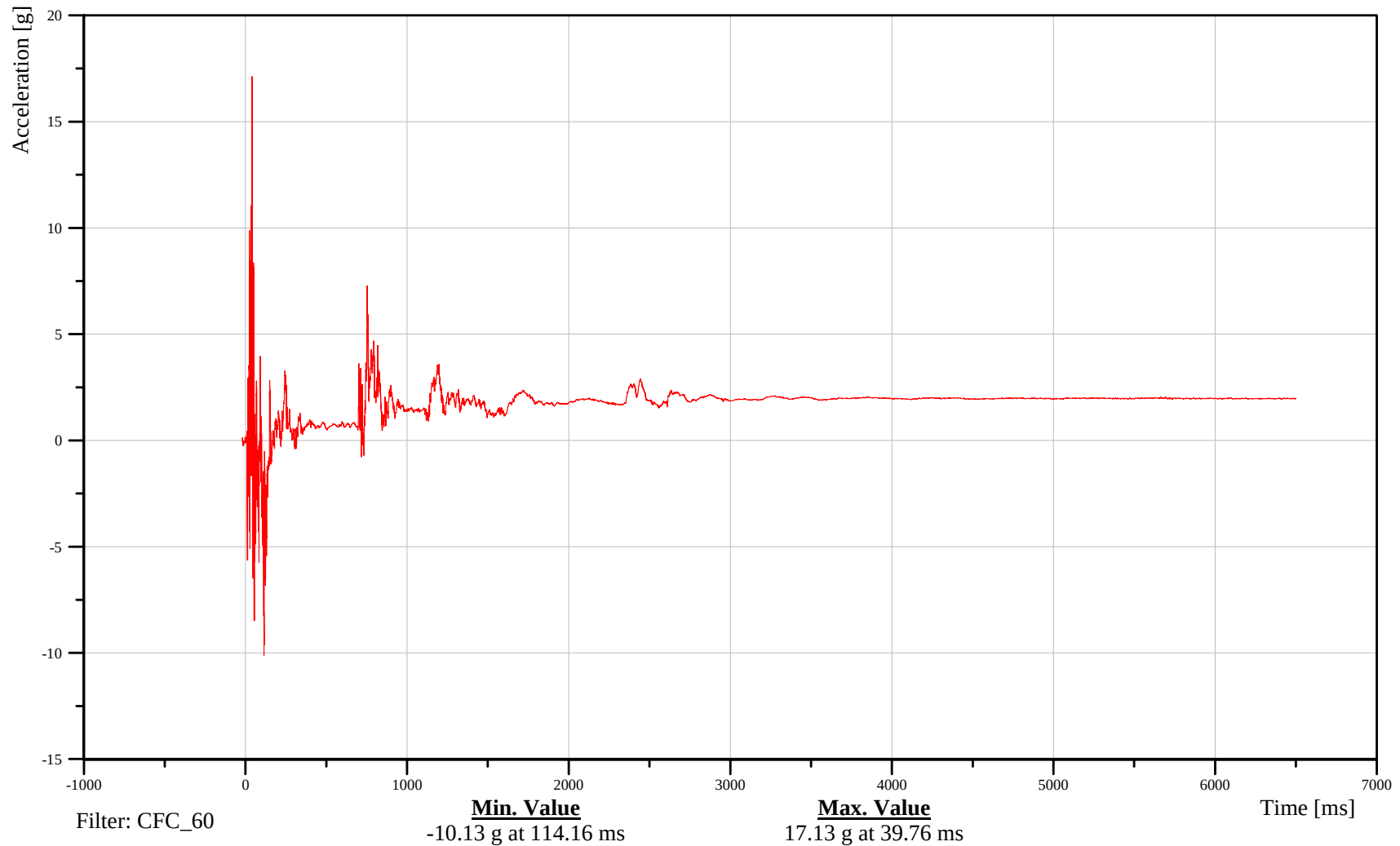
Time: 15:17

Customer: VRTC

16SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-189

100203



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) Resultant Acceleration

Date: 02/03/2010

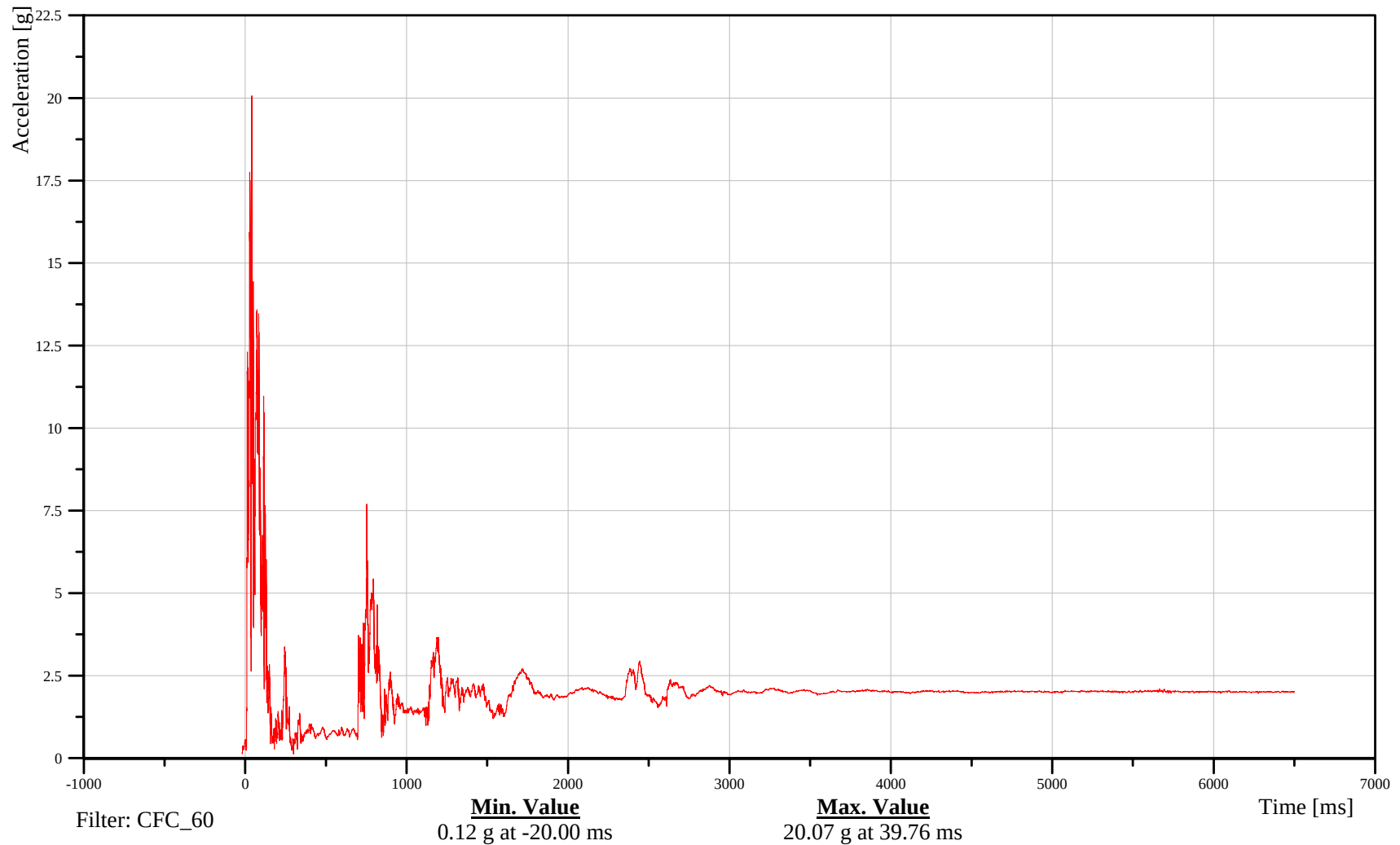
Time: 15:17

Customer: VRTC

16SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100203



B-190

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Lap Belt Force

Date: 02/03/2010

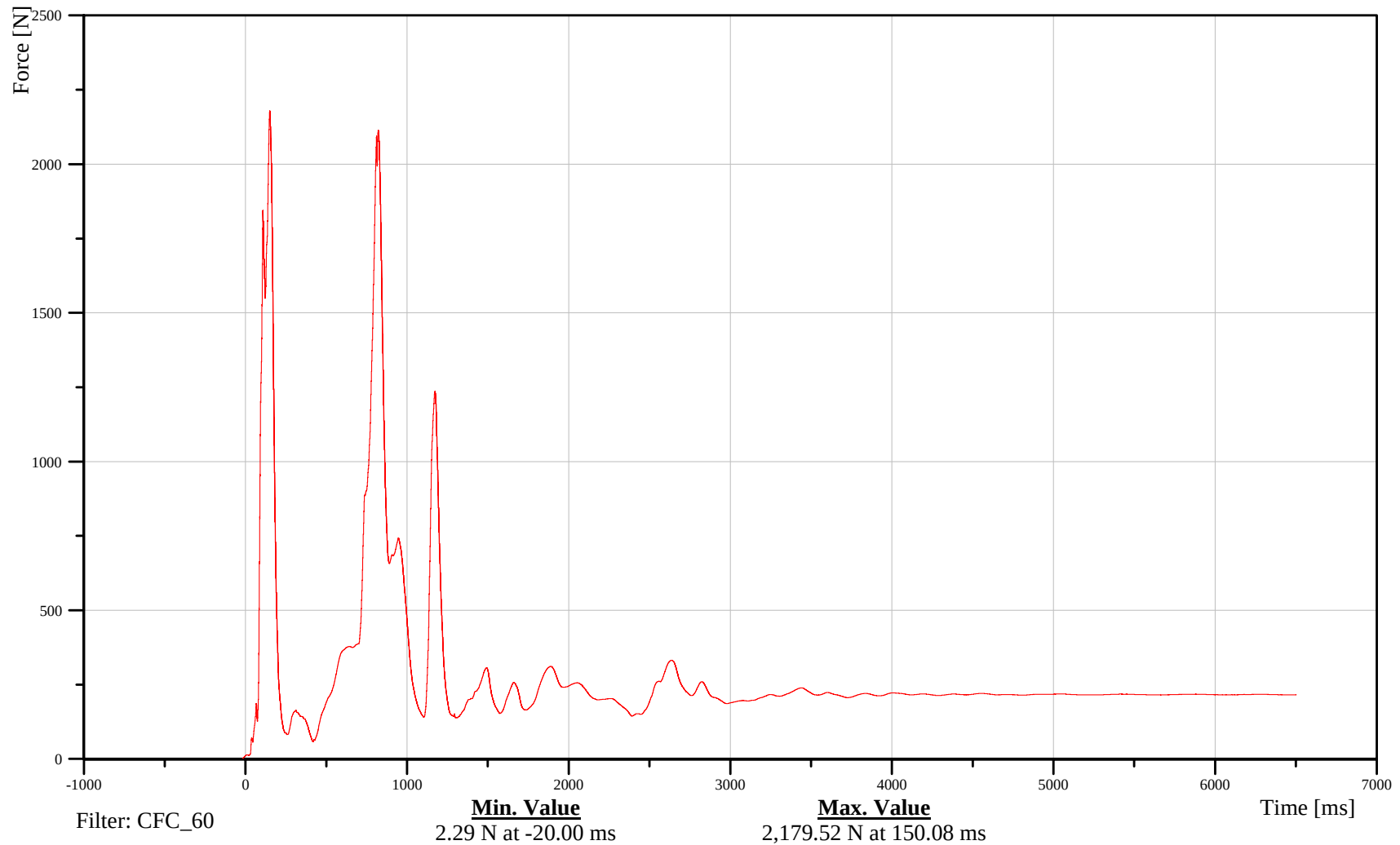
Time: 15:17

Customer: VRTC

11SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 100203



B-191

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Shoulder Belt Force

Date: 02/03/2010

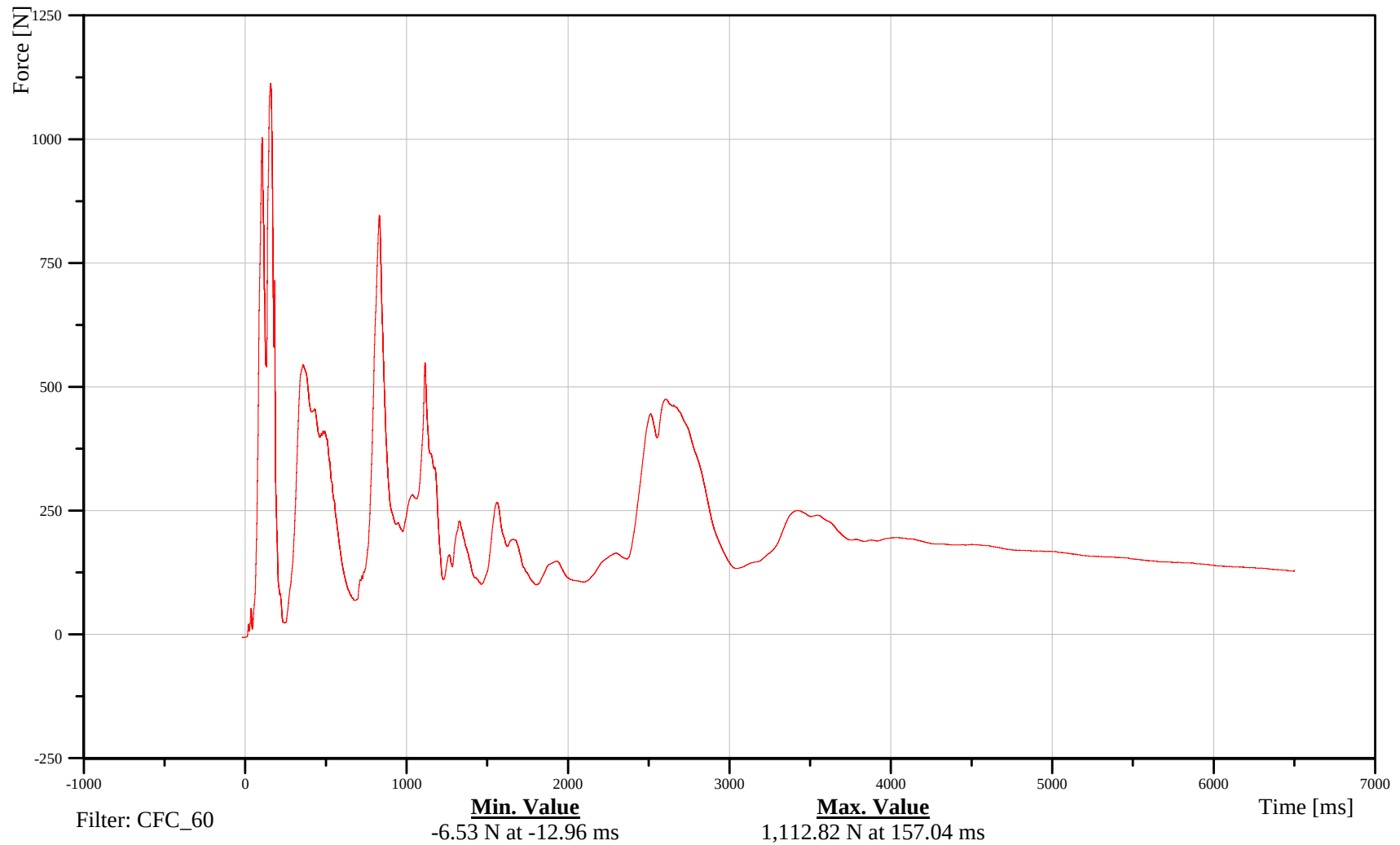
Time: 15:17

Customer: VRTC

11SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 100203



B-192

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right Front Passenger Lap Belt Force

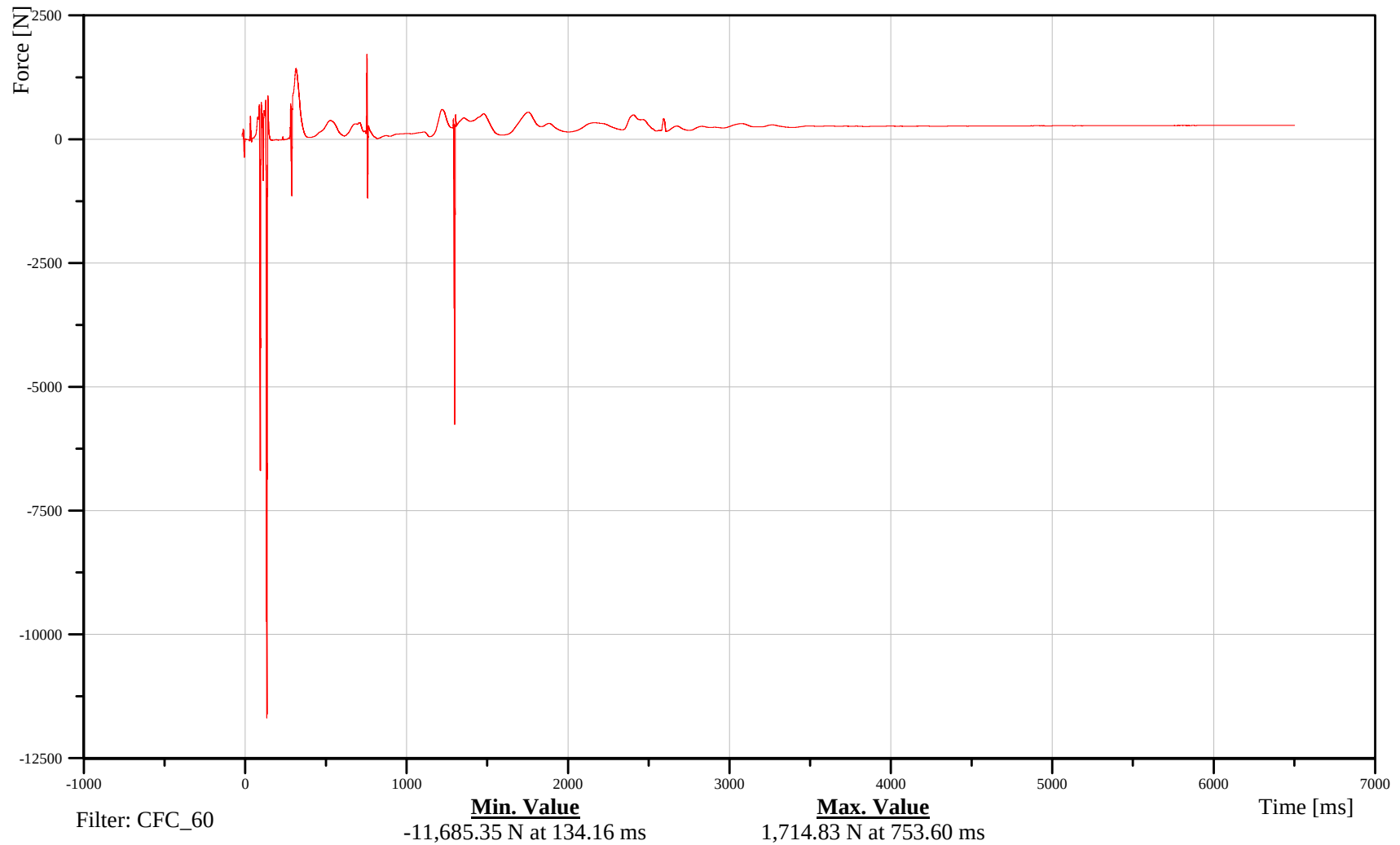
Time: 15:17

Customer: VRTC

13SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 100203



B-193

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Right Front Passenger Shoulder Belt Force

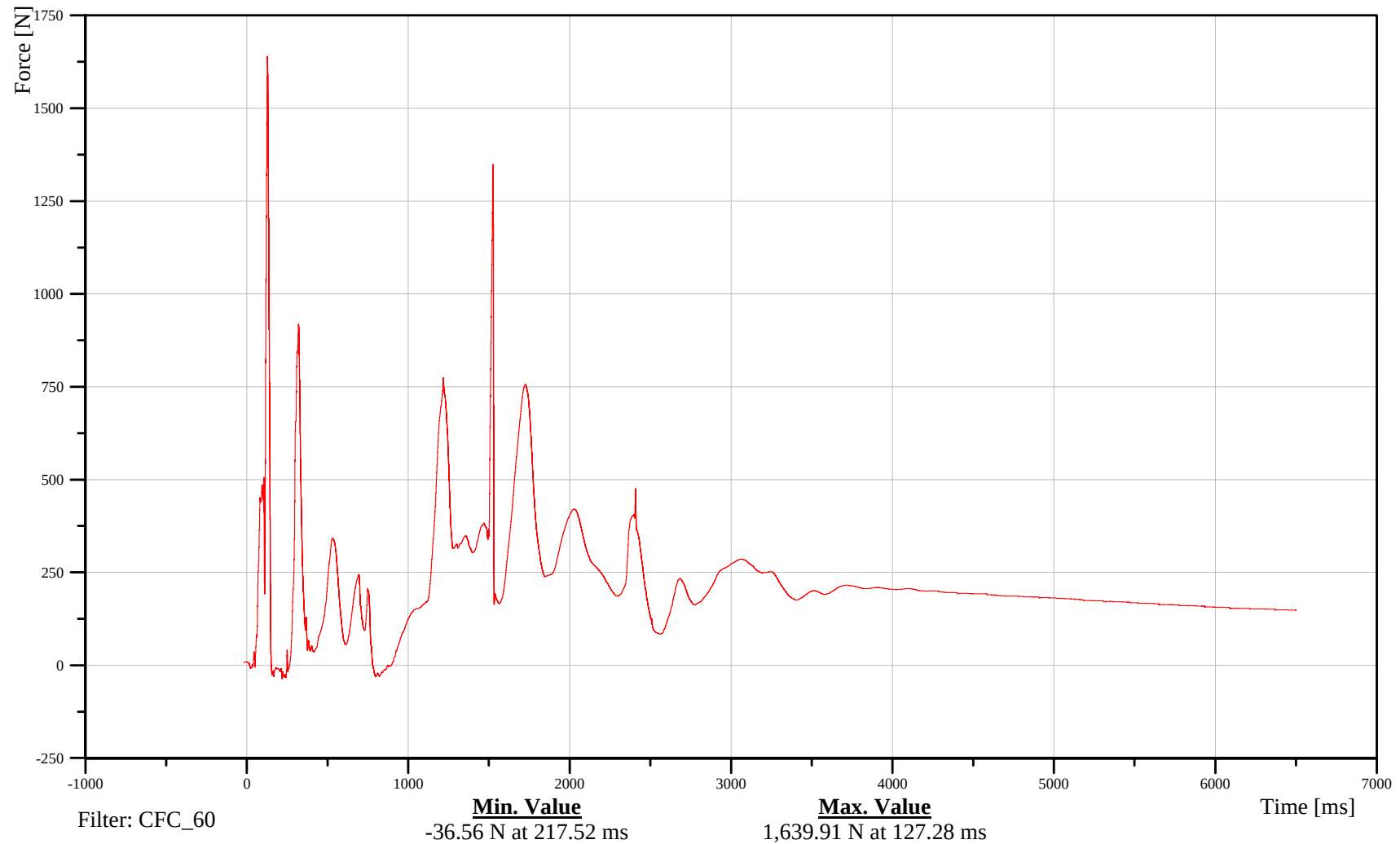
Time: 15:17

Customer: VRTC

13SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 100203



B-194

100203



Curb Trip Rollover 2007 Ford Expedition

Date: 02/03/2010

Left Rear Passenger Lap Belt Force

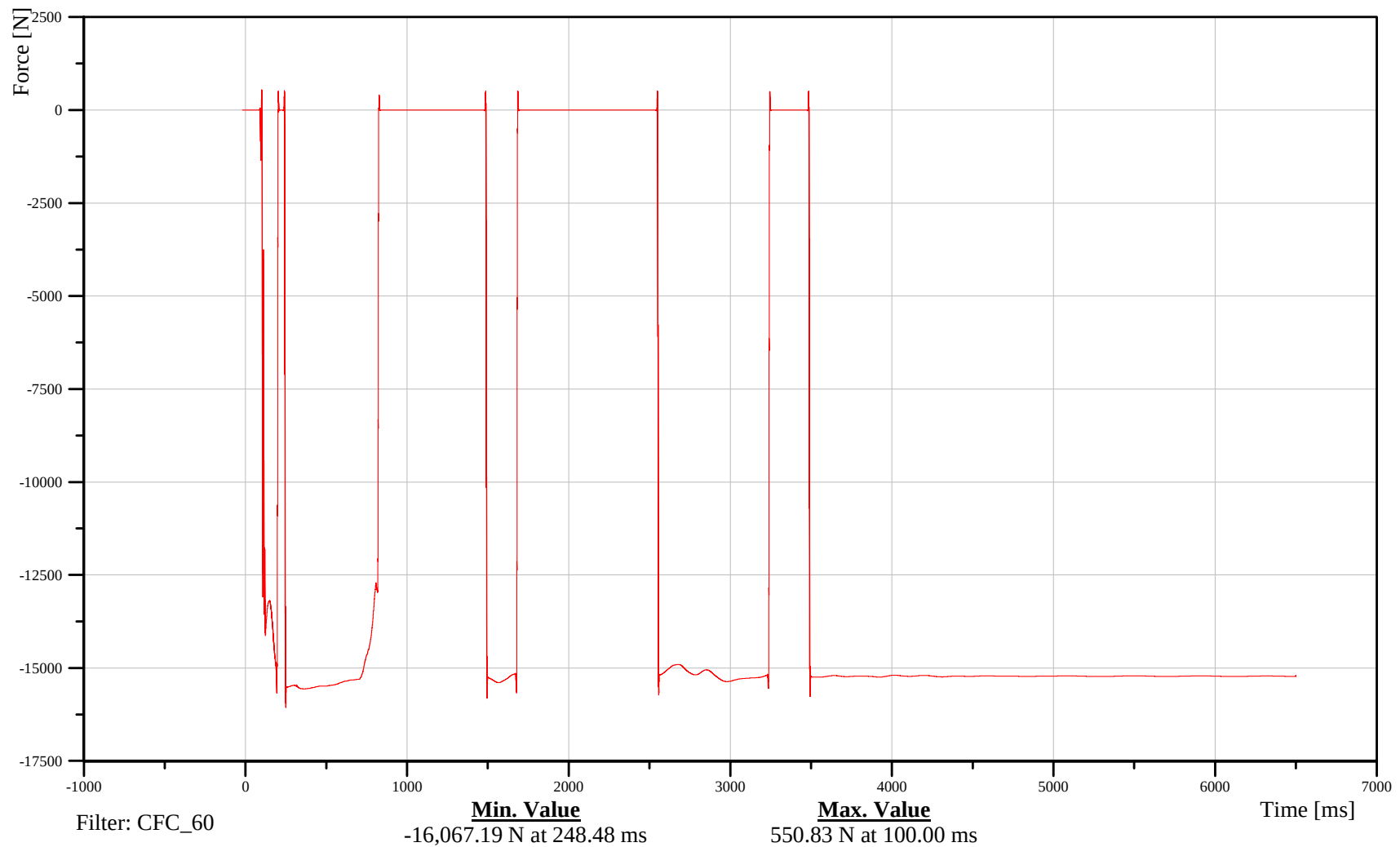
Time: 15:17

Customer: VRTC

14SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 100203



B-195

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Shoulder Belt Force

Date: 02/03/2010

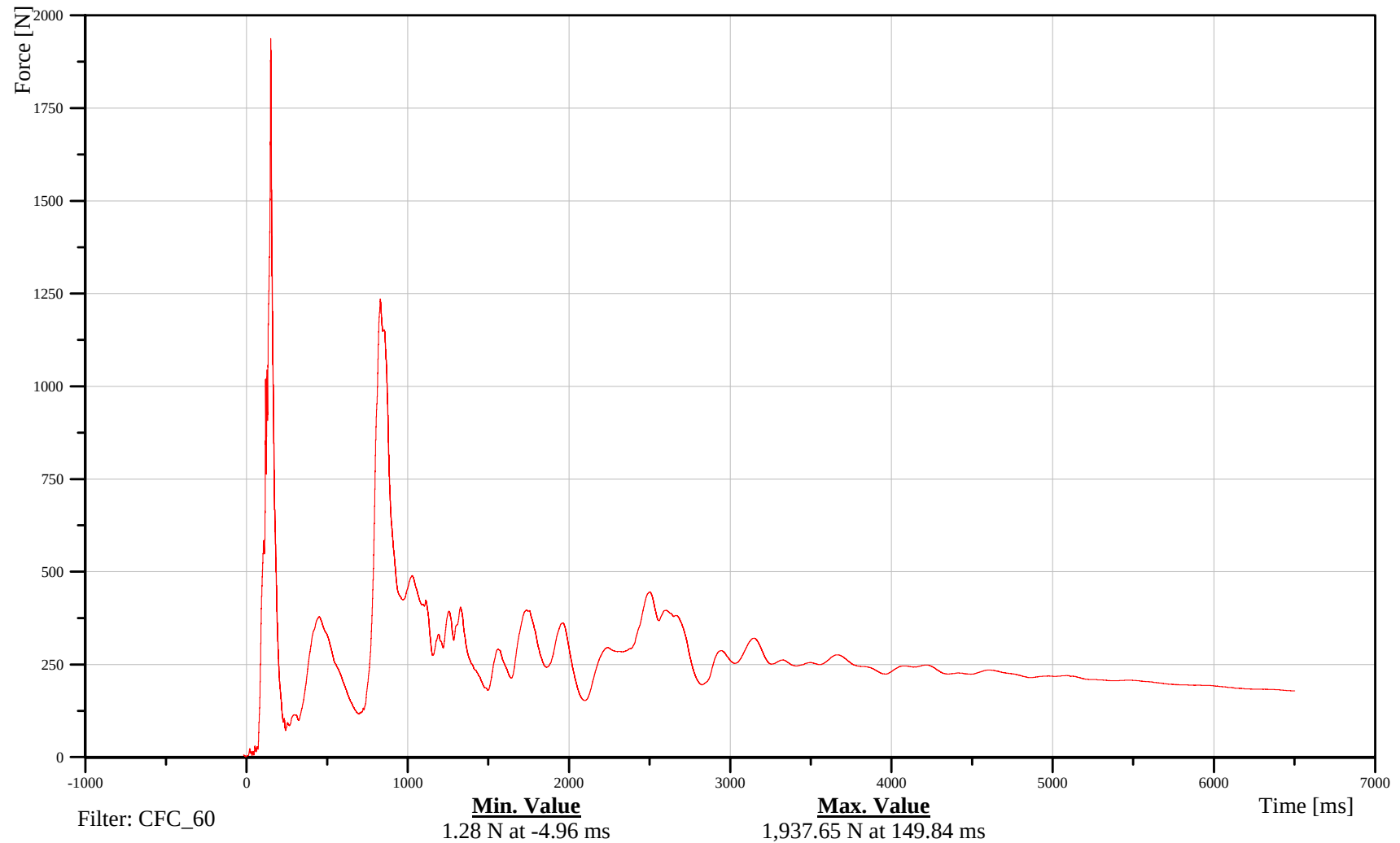
Time: 15:17

Customer: VRTC

14SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 100203



B-196

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Seat Belt Spool Potentiometer

Date: 02/03/2010

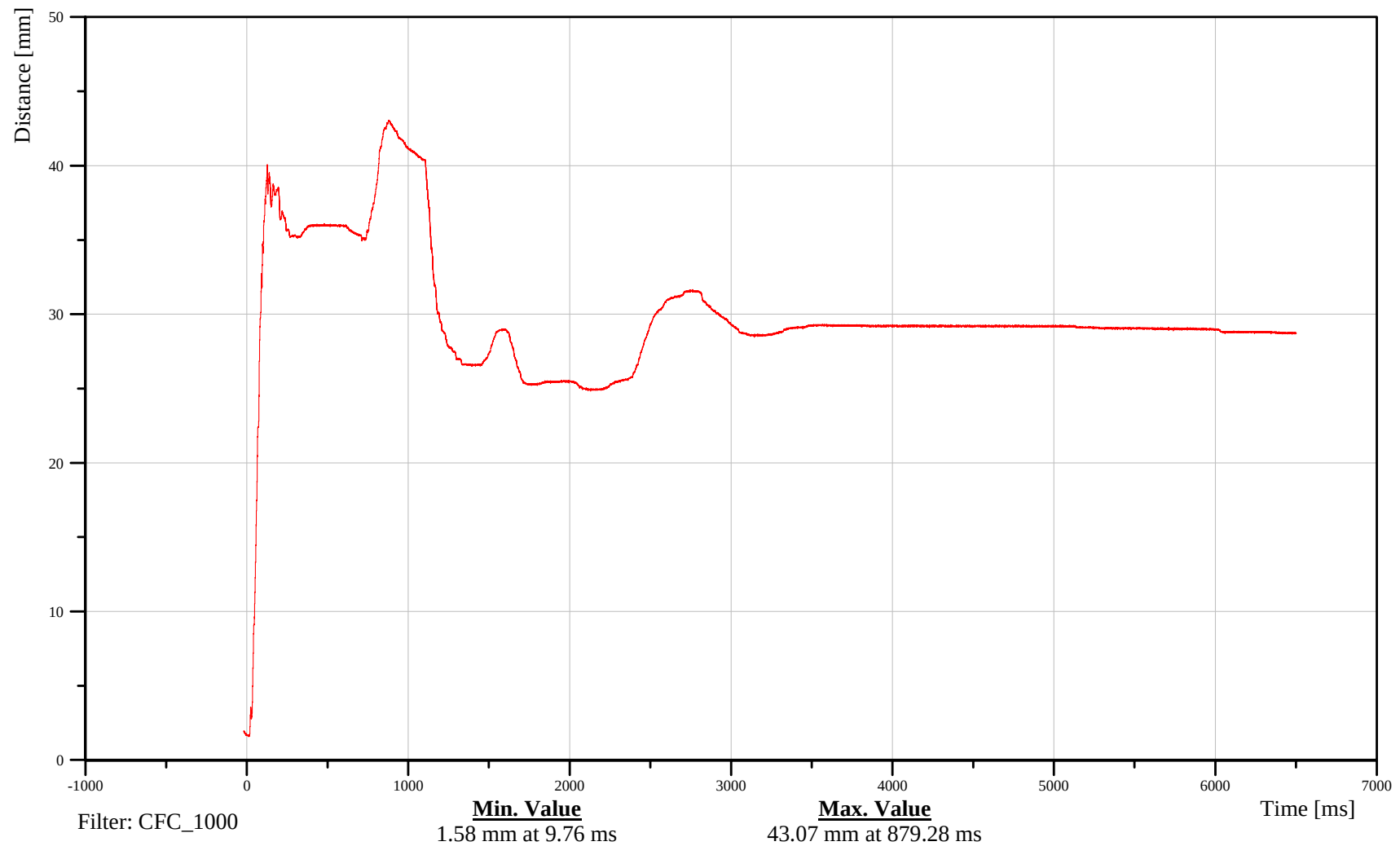
Time: 15:17

Customer: VRTC

11SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100203



B-197

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Belt Spool Potentiometer

Date: 02/03/2010

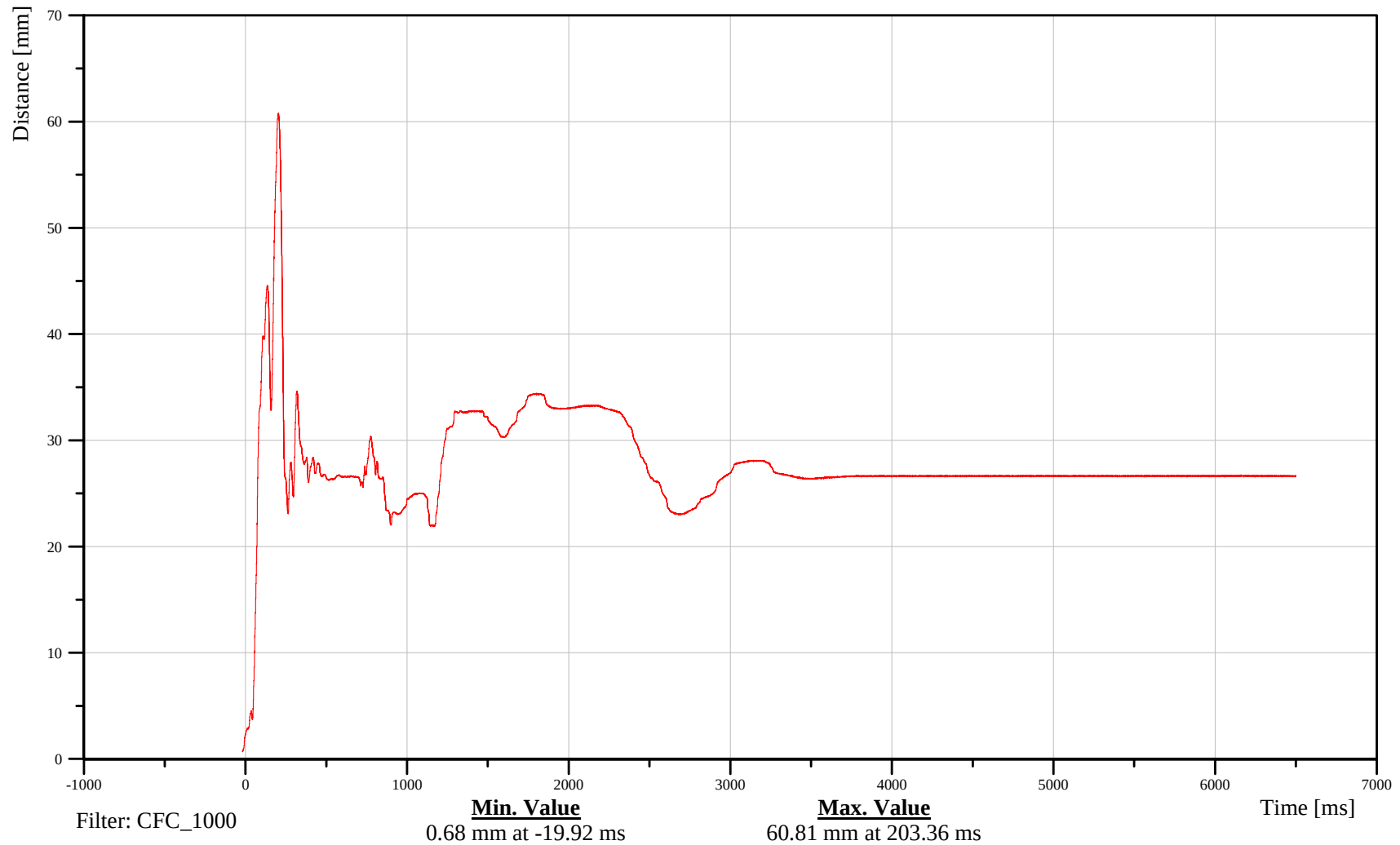
Time: 15:17

Customer: VRTC

13SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100203



B-198

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Belt Spool Potentiometer

Date: 02/03/2010

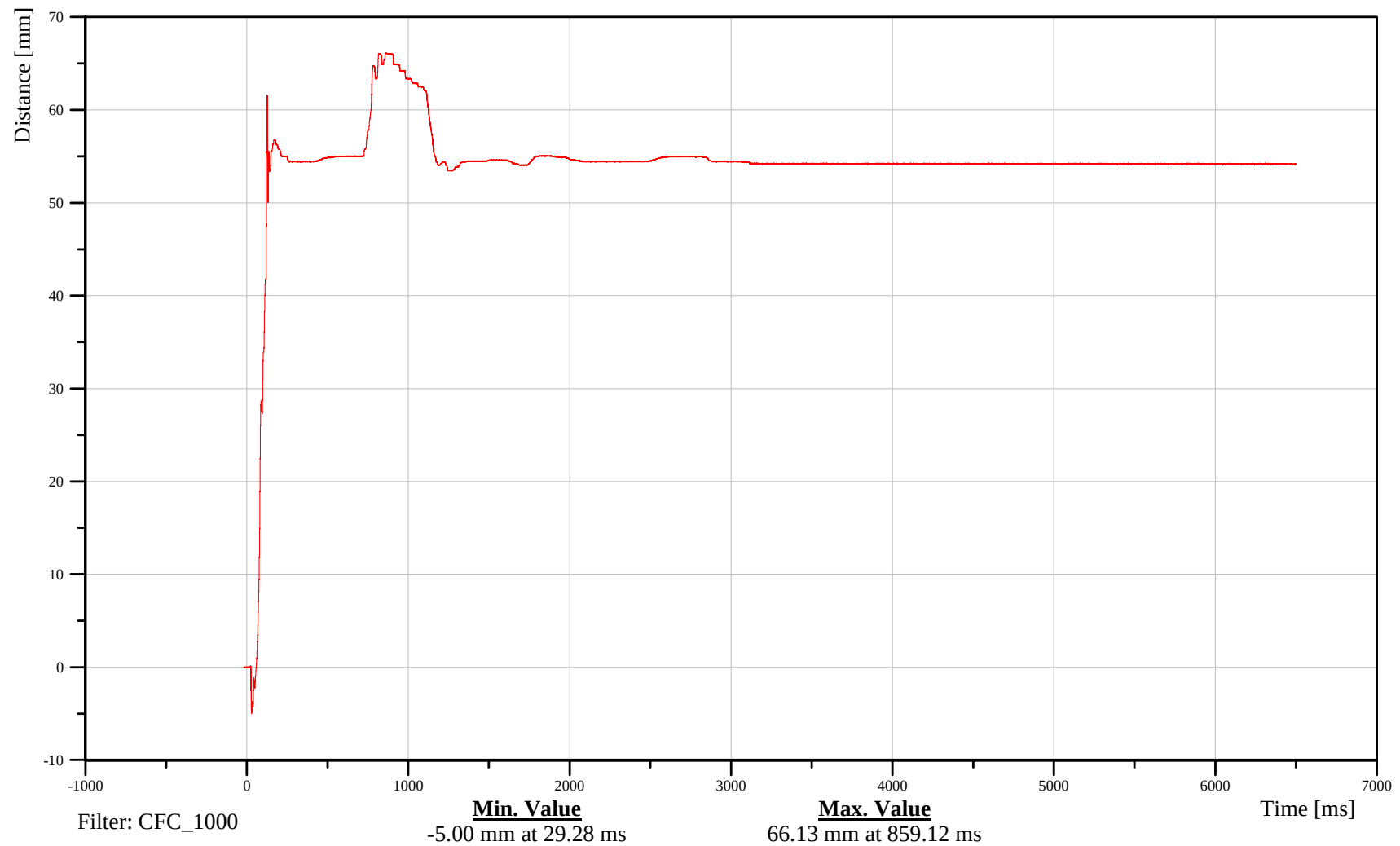
Time: 15:17

Customer: VRTC

14SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100203



B-199

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Head Contact

Date: 02/03/2010

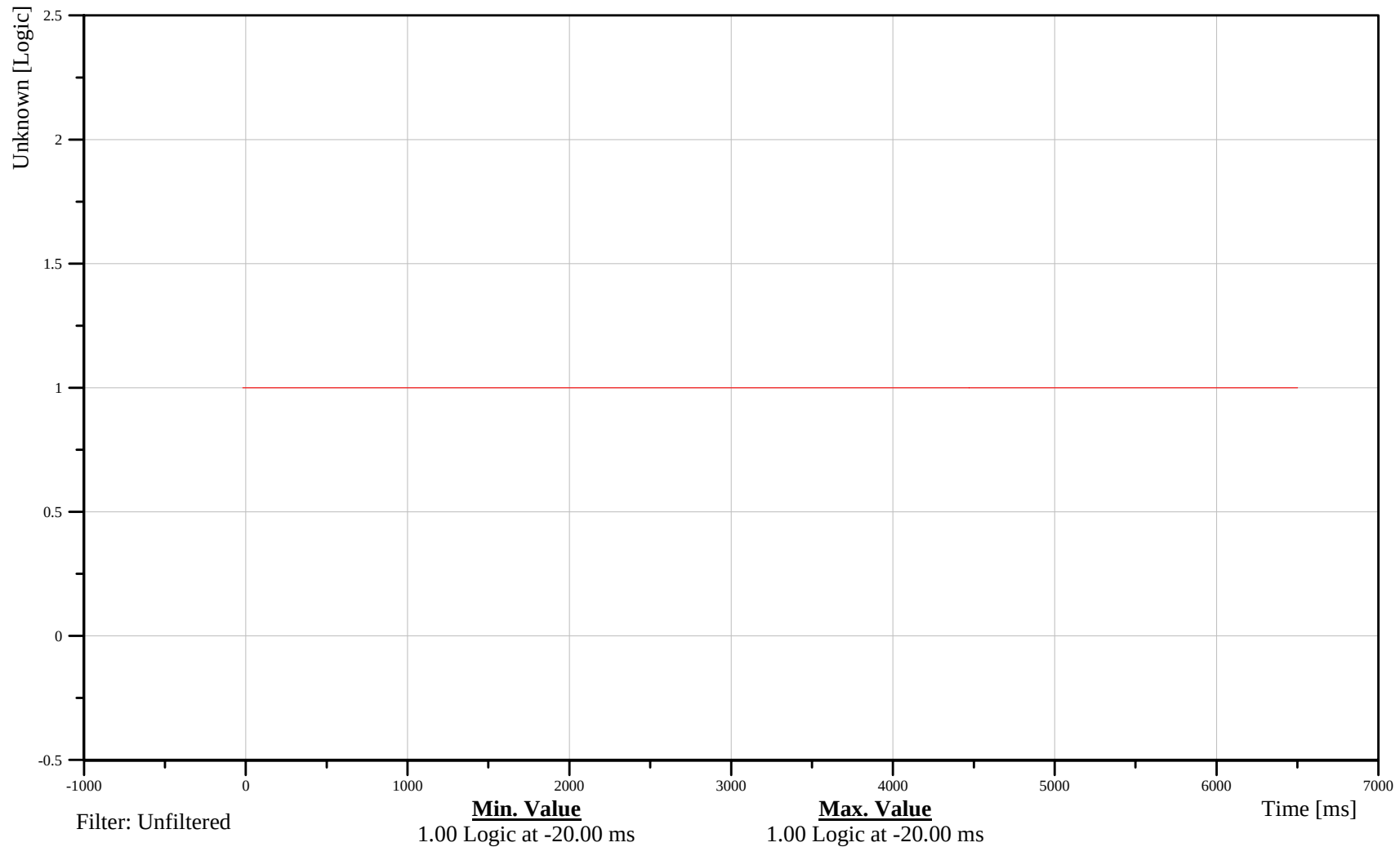
Time: 15:17

Customer: VRTC

11CONT000023EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-200

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Thorax Contact

Date: 02/03/2010

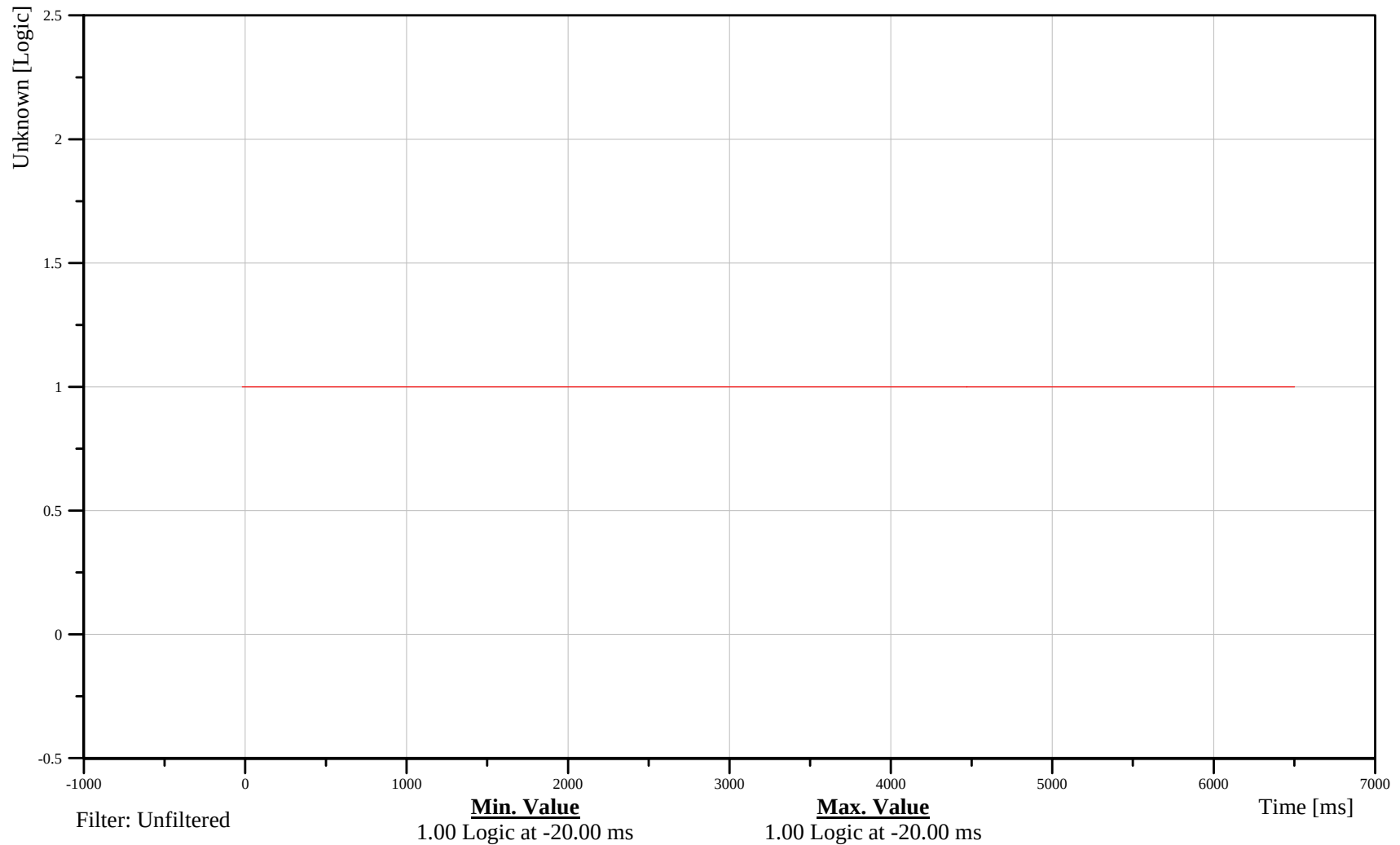
Time: 15:17

Customer: VRTC

11CONT000024EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-201

100203



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Contact

Date: 02/03/2010

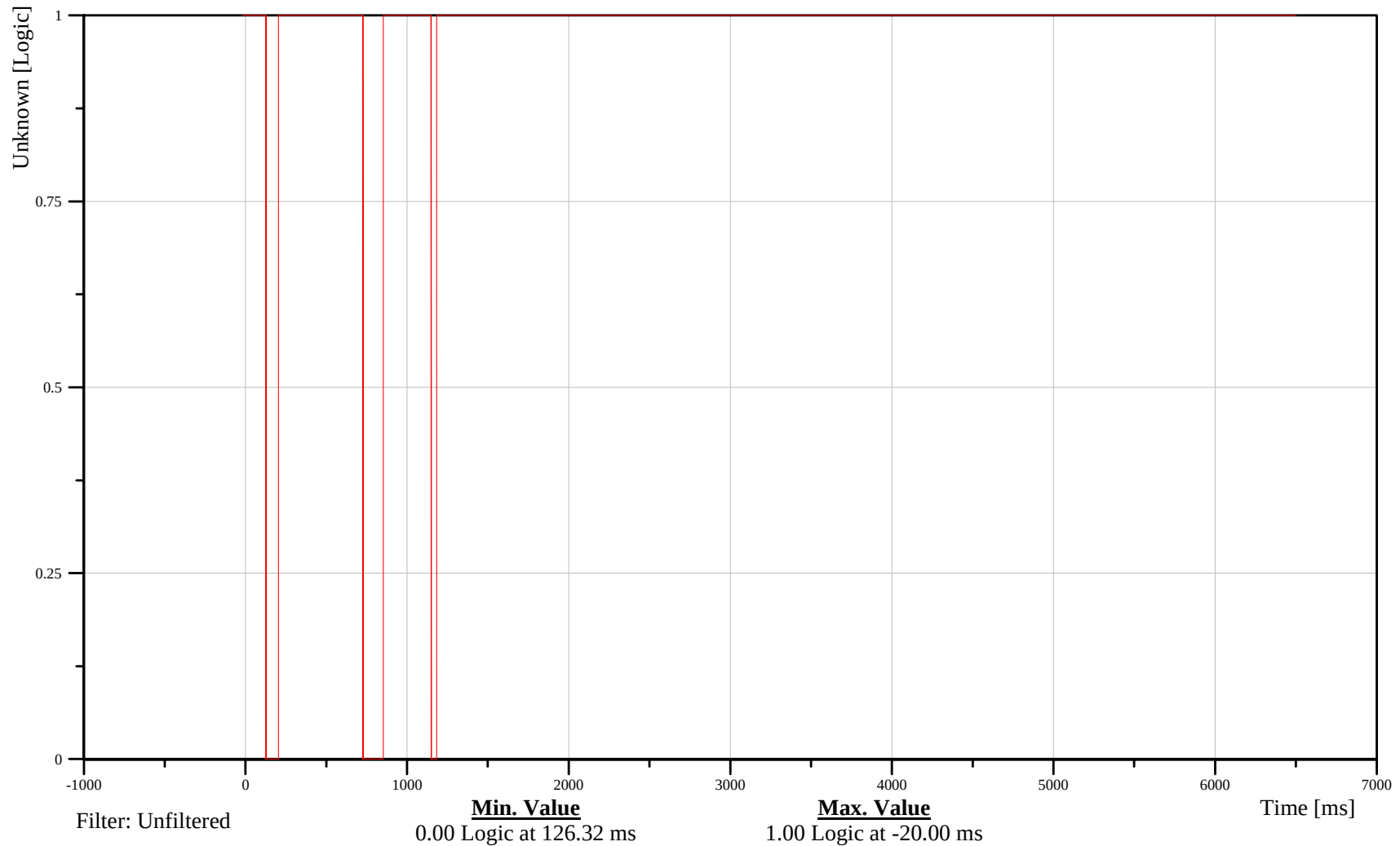
Time: 15:17

Customer: VRTC

11CONT000025EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-202

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head Contact Switch

Date: 02/03/2010

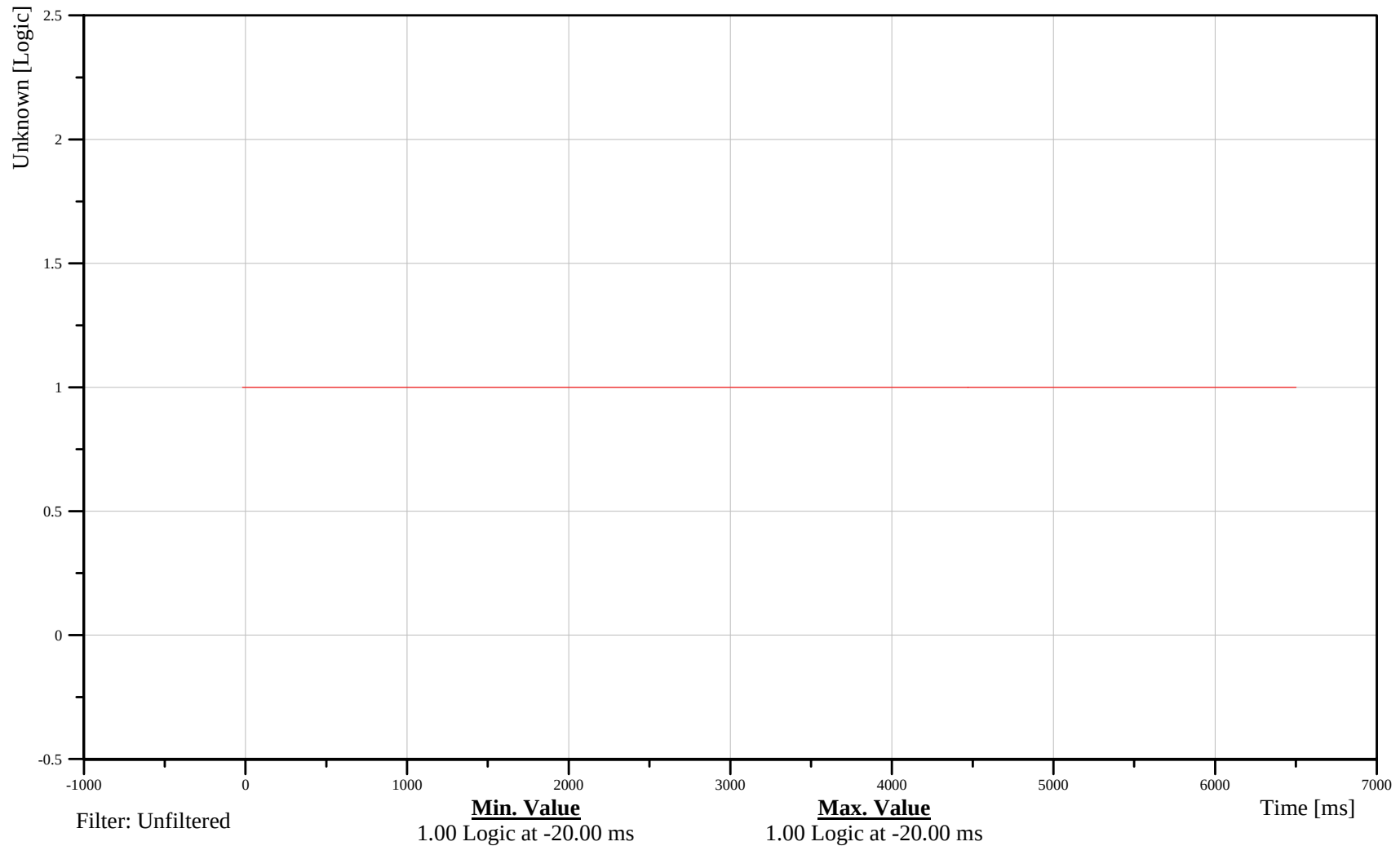
Time: 15:17

Customer: VRTC

13CONT000026EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-203

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Thorax Contact Switch

Date: 02/03/2010

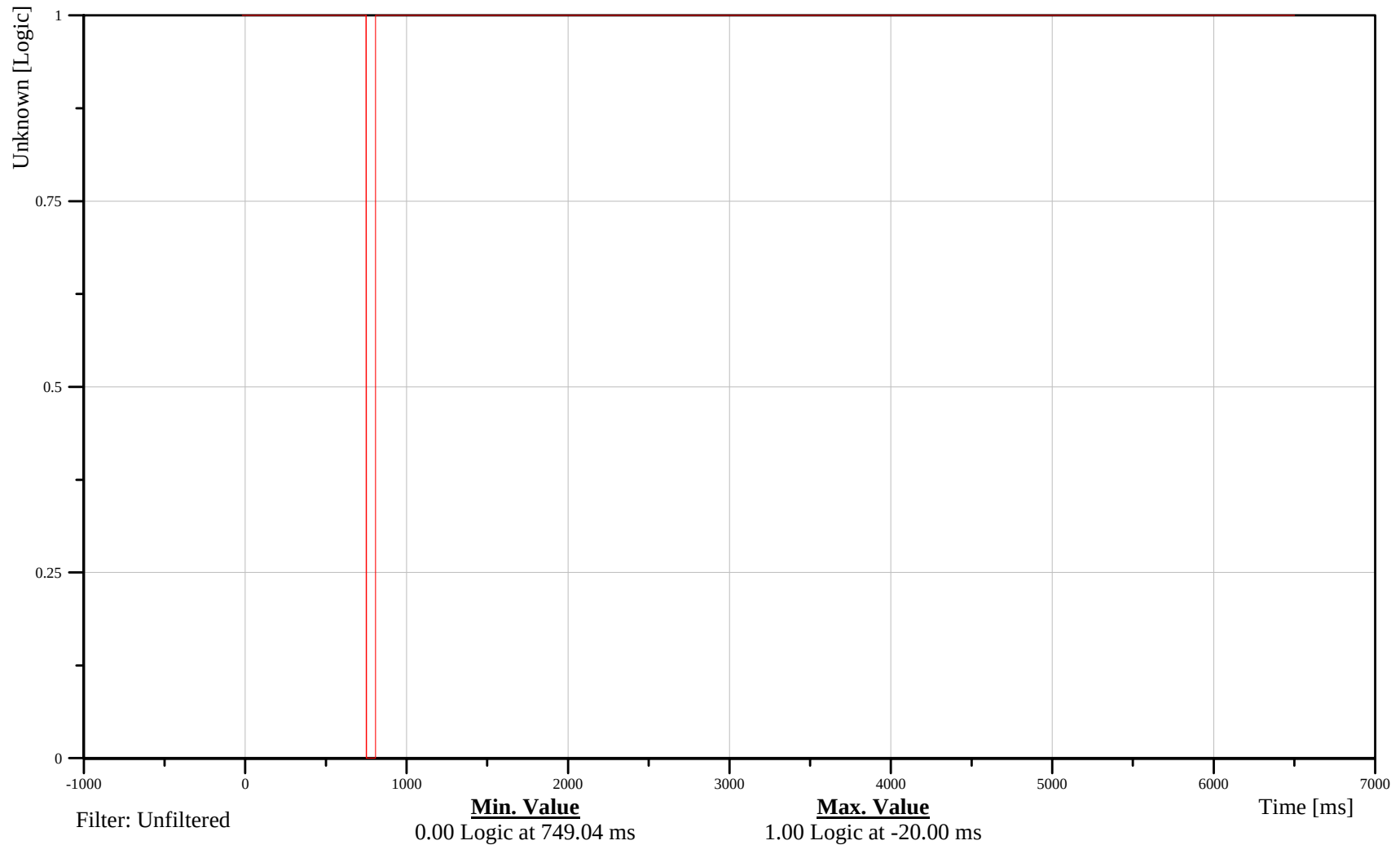
Time: 15:17

Customer: VRTC

13CONT000027EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-204

100203



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis Contact Switch

Date: 02/03/2010

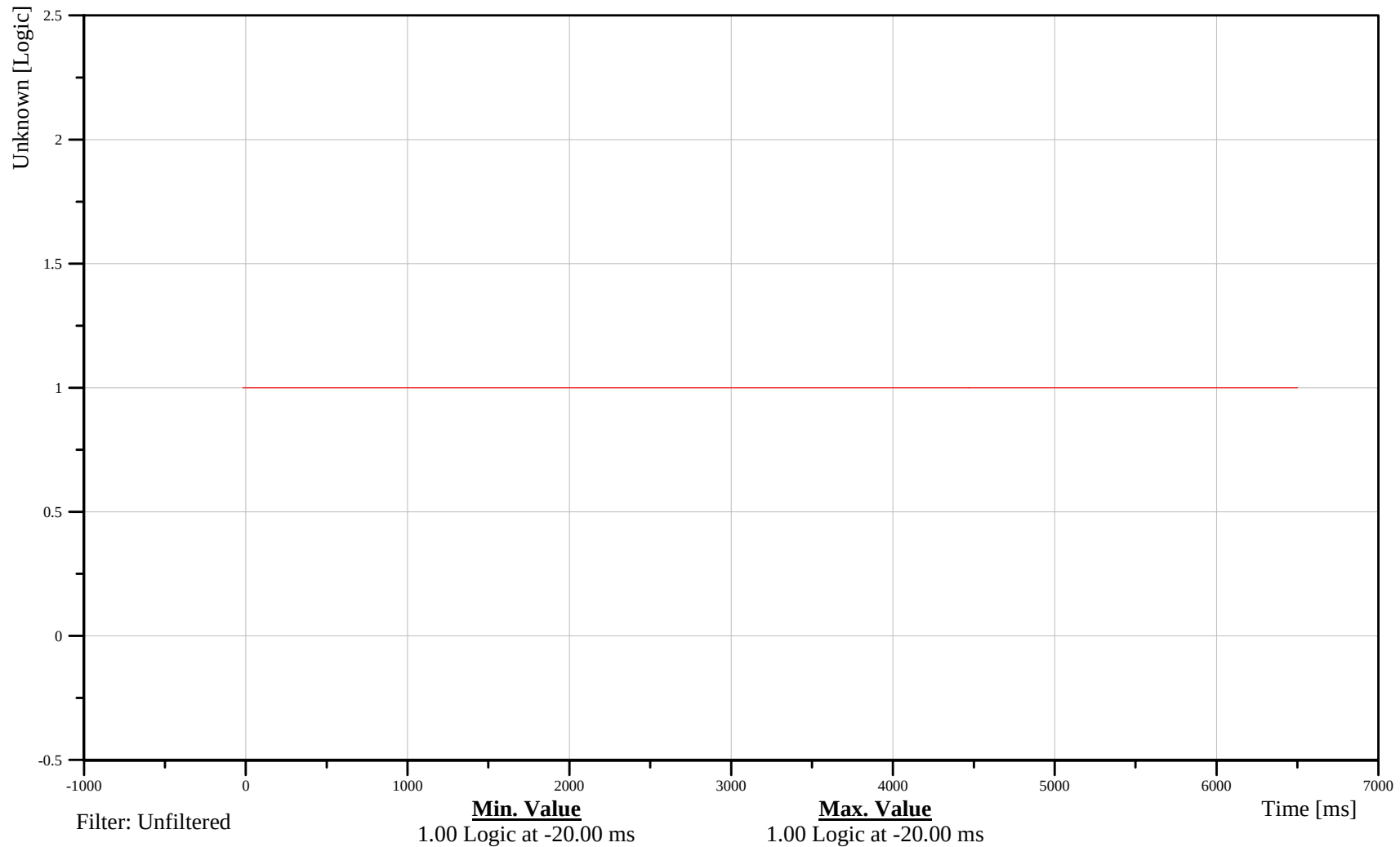
Time: 15:17

Customer: VRTC

13CONT000028EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-205

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Contact

Date: 02/03/2010

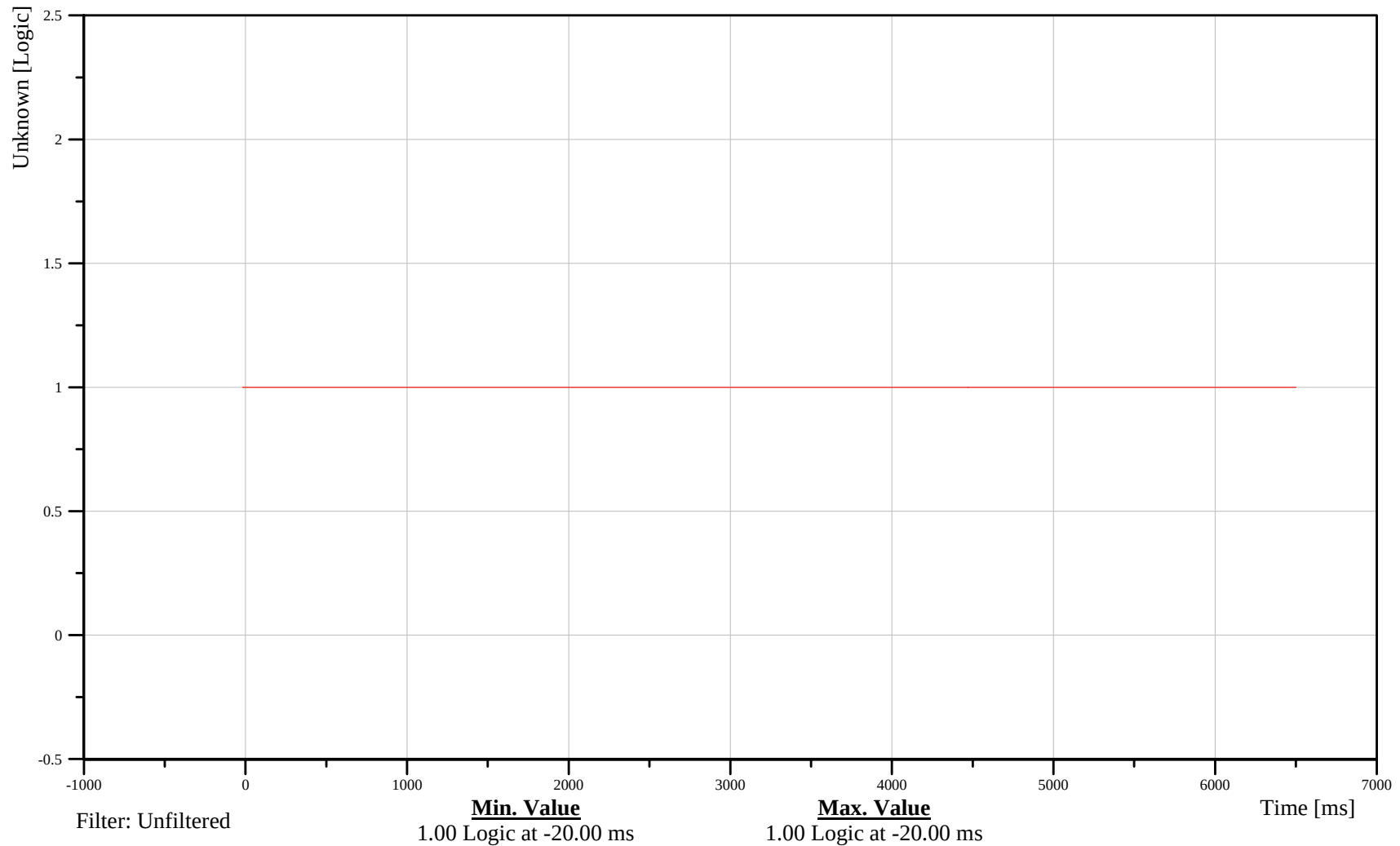
Time: 15:17

Customer: VRTC

14CONT000029EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-206

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Thorax Contact

Date: 02/03/2010

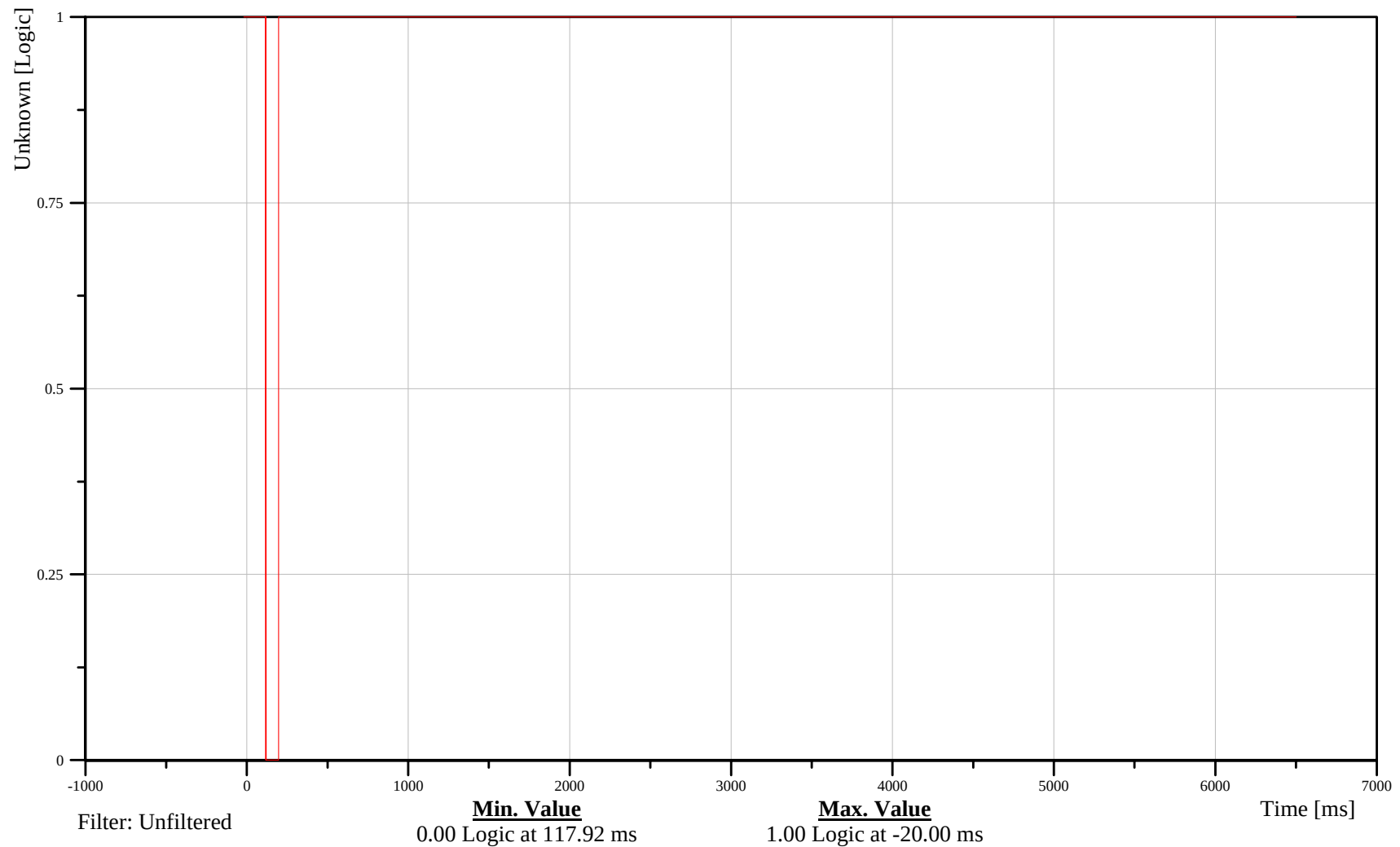
Time: 15:17

Customer: VRTC

14CONT000030EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-207

100203



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Contact

Date: 02/03/2010

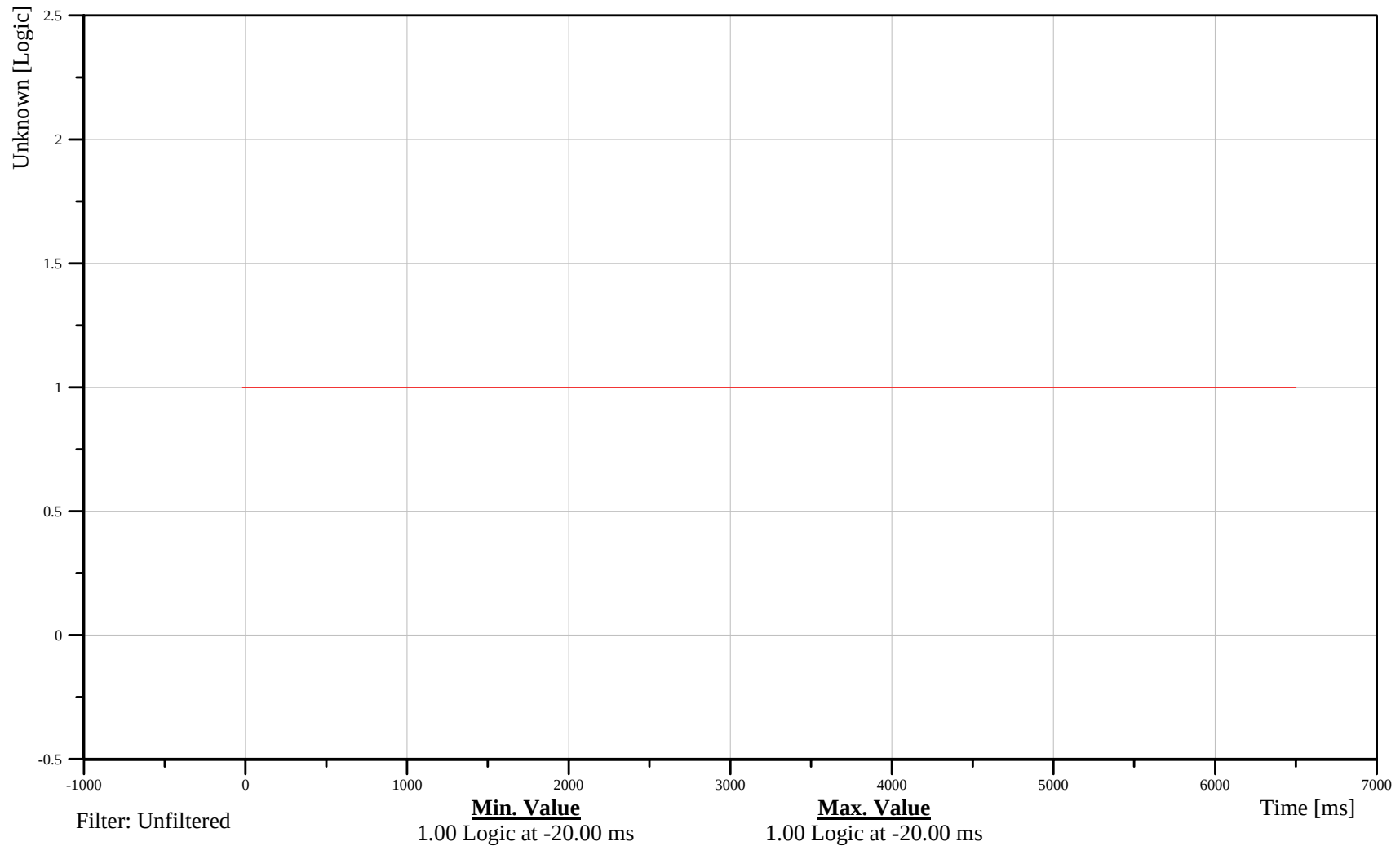
Time: 15:17

Customer: VRTC

14CONT000031EV00

TRC Inc. Test Lab: CTF

Test Number: 100203



B-208

100203



Curb Trip Rollover 2007 Ford Expedition

Left Side Curtain Airbag Voltage

Date: 02/03/2010

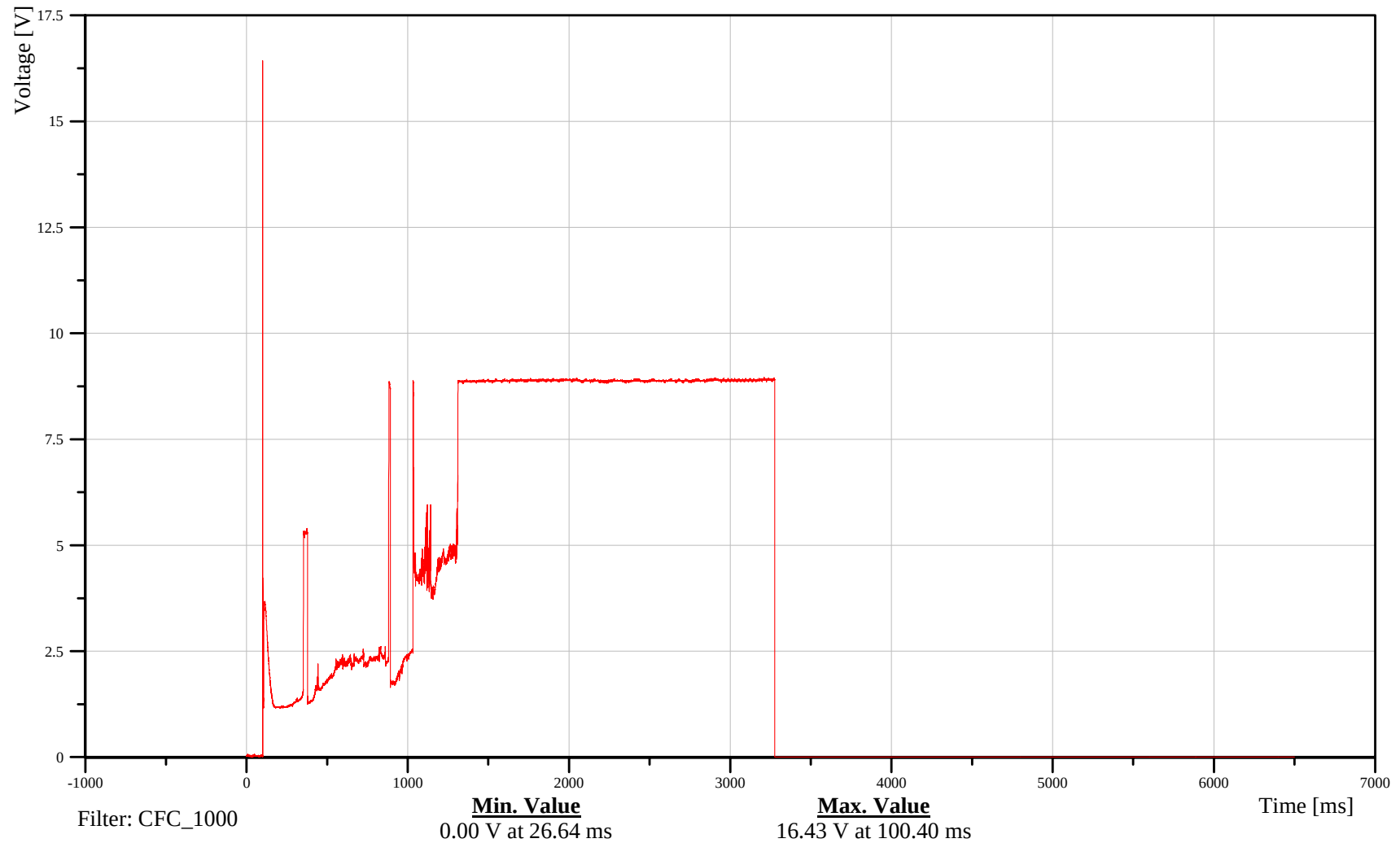
Time: 15:17

Customer: VRTC

11AIRB000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100203



B-209

100203



Curb Trip Rollover 2007 Ford Expedition

Right Side Curtain Airbag Voltage

Date: 02/03/2010

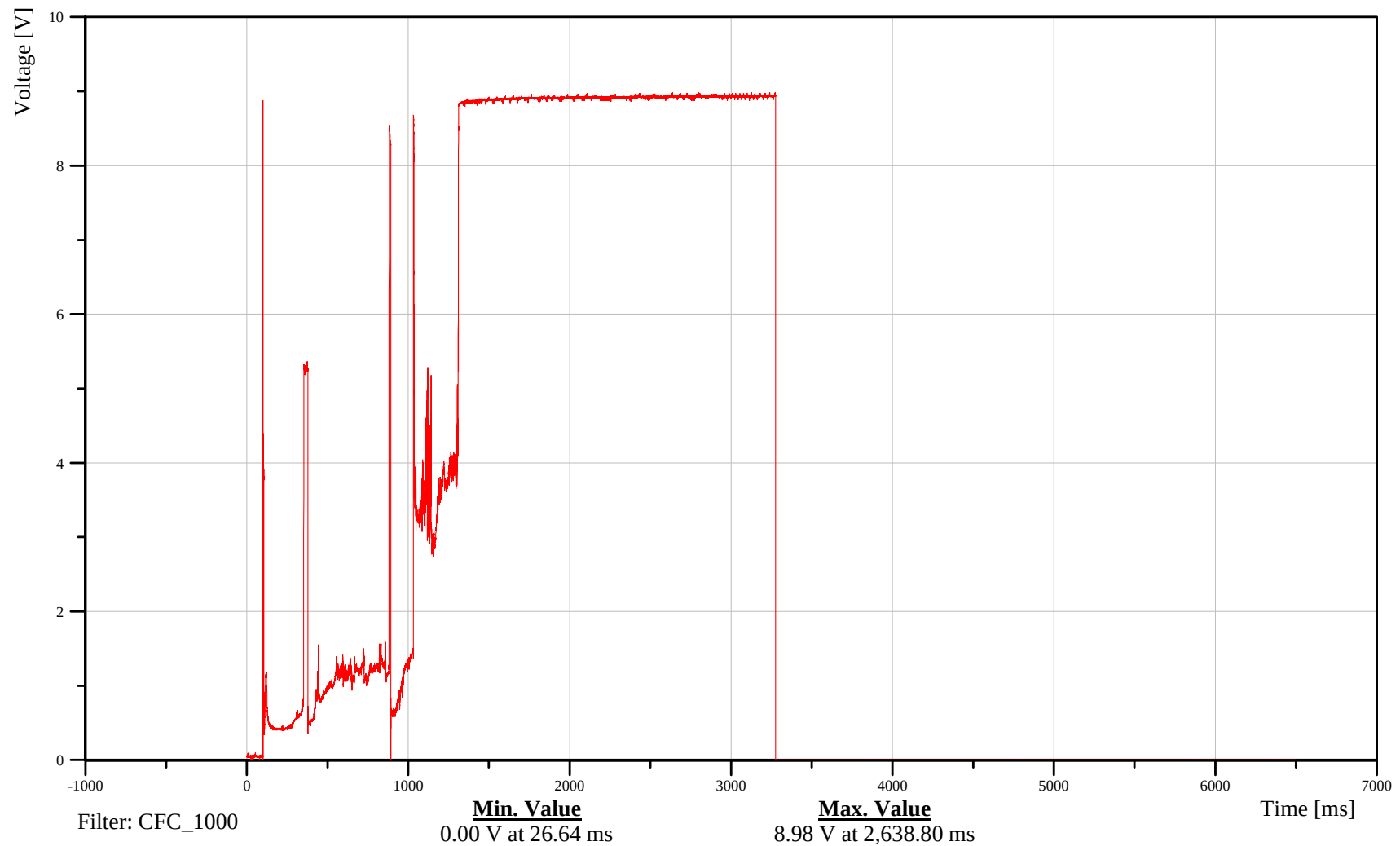
Time: 15:17

Customer: VRTC

13AIRB000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100203



B-210

100203



Curb Trip Rollover 2007 Ford Expedition

Left Side Curtain Airbag Current

Date: 02/03/2010

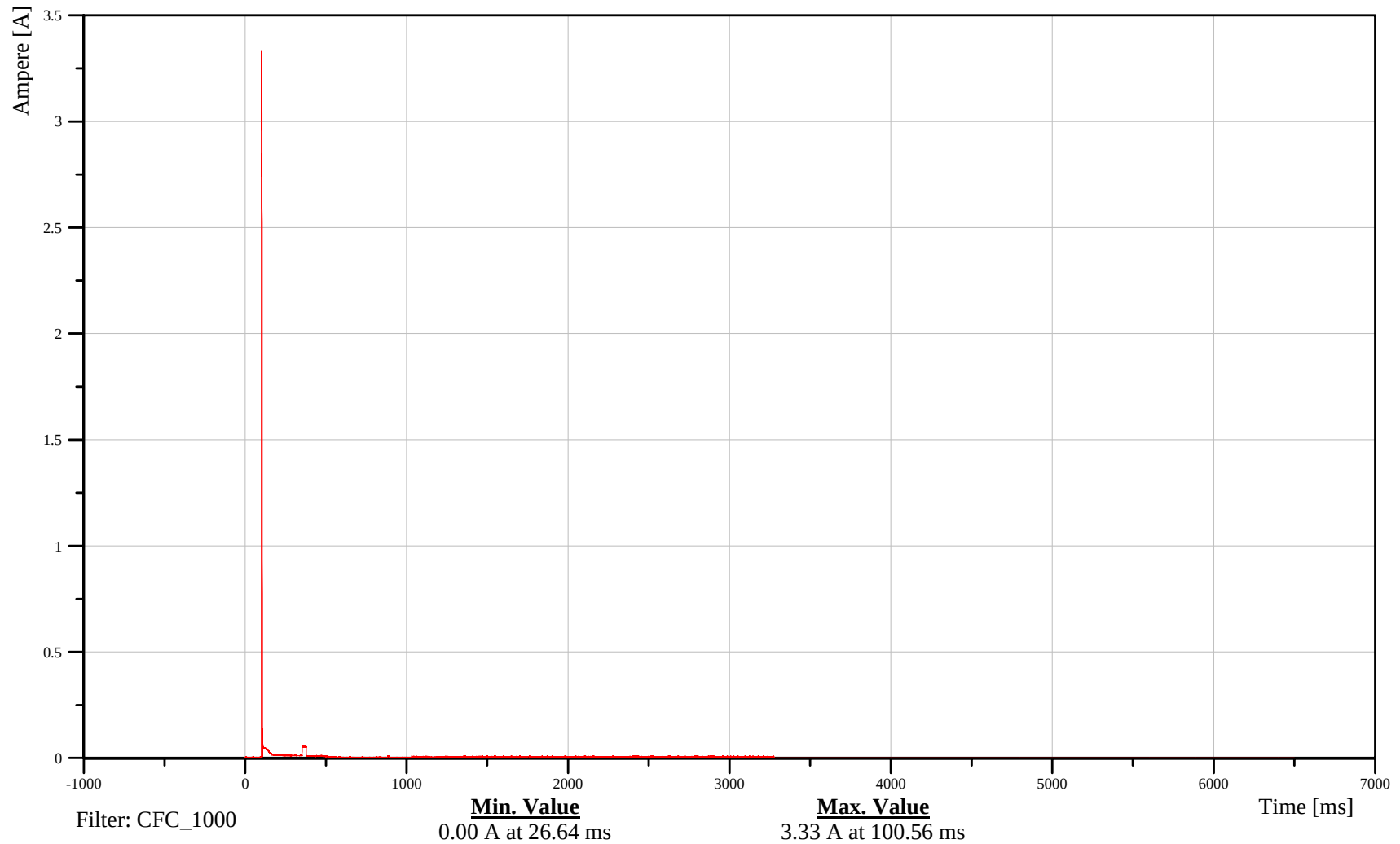
Time: 15:17

Customer: VRTC

11AIRB000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100203



B-211

100203



Curb Trip Rollover 2007 Ford Expedition

Right Side Curtain Airbag Current

Date: 02/03/2010

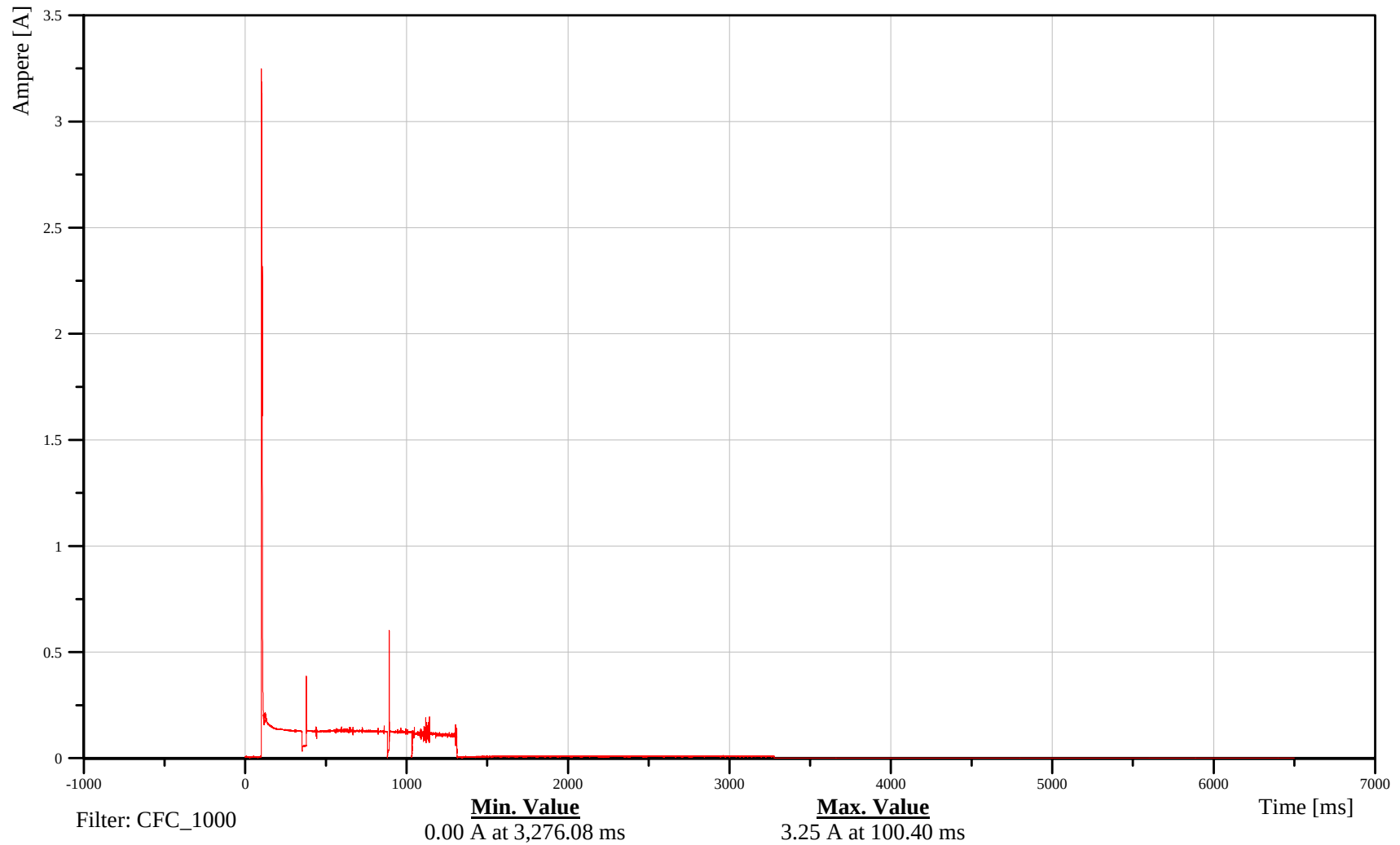
Time: 15:17

Customer: VRTC

13AIRB000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100203



B-212

100203

APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Calibration Test Results

Pre-Test

Driver Dummy S/N: 001

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 001 Certification No. 13-1

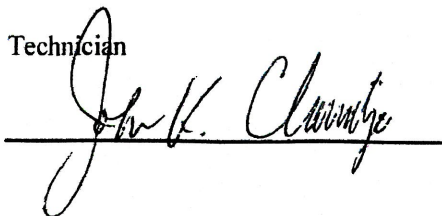
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	260.6 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	4.1 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

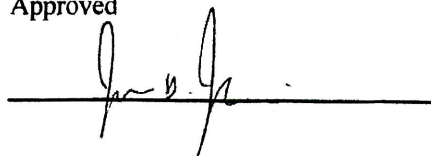
Test meets specifications.

Comments:

Technician



Approved



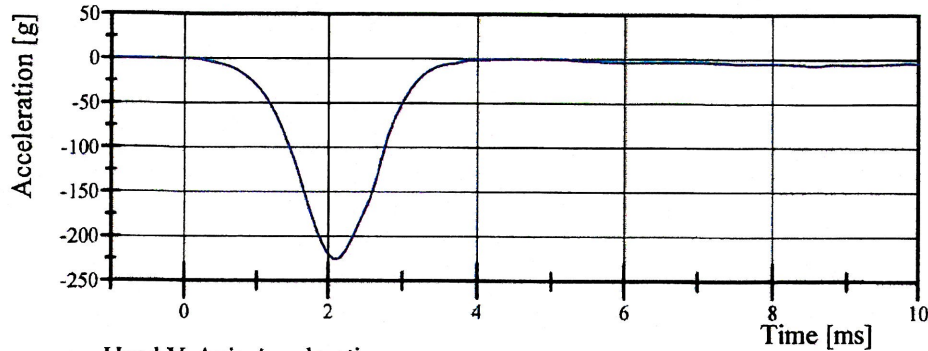
Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 001 Certification No. 13-1

Test Date: 1/25/2010

Head X-Axis Acceleration

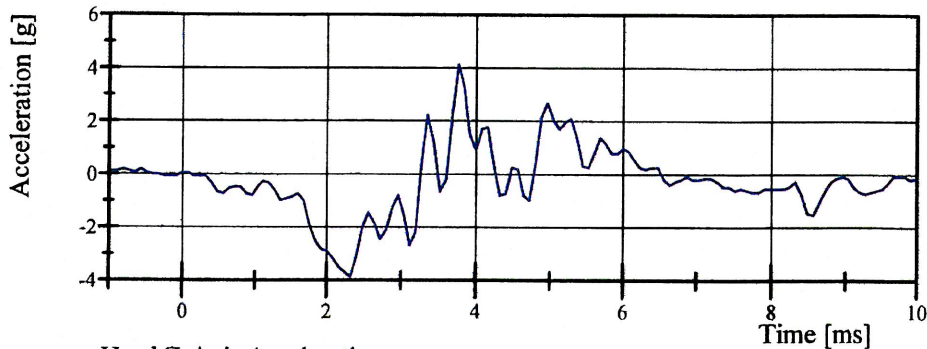


Filter Class: CFC_1000

Max: 0.4 g at 4.9 ms

Min: -226.0 g at 2.1 ms

Head Y-Axis Acceleration

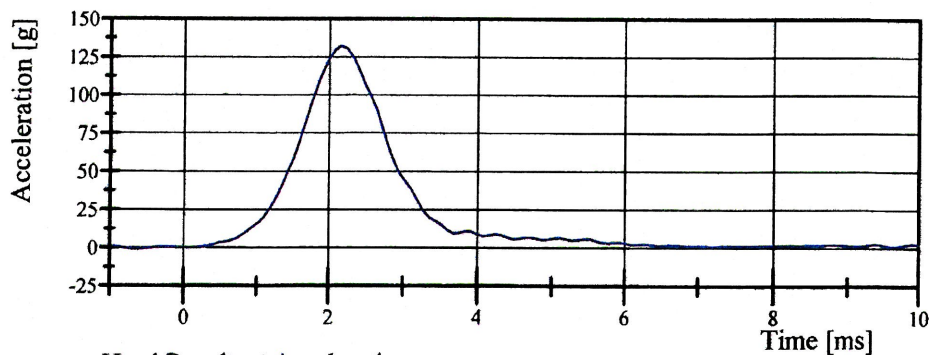


Filter Class: CFC_1000

Max: 4.1 g at 3.8 ms

Min: -3.9 g at 2.3 ms

Head Z-Axis Acceleration

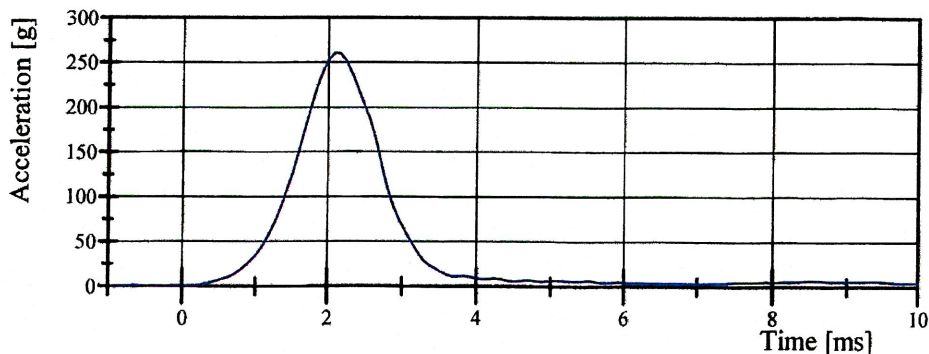


Filter Class: CFC_1000

Max: 132.4 g at 2.2 ms

Min: -0.9 g at -0.6 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 260.6 g at 2.1 ms

Min: 0.1 g at 0.0 ms

Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 001 Certification No. 13-1

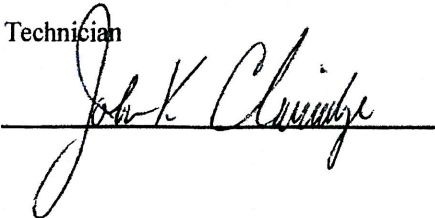
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.942 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	41.4 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-25.14 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-20.78 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-13.66 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-13.66 g	Yes
Total Head D-Plane Rotation Peak	(-64) - (-78) °	-72.7 °	Yes
Time of Peak	57 - 64 ms	60.5 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	120.8 ms	Yes
Total Neck Occipital Condyles Moment Peak	88 - 108 N·m	95.5 N·m	Yes
Time of Peak	47 - 58 ms	53.5 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	100.0 ms	Yes

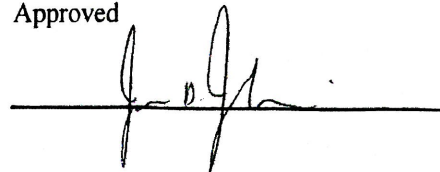
Test meets specifications.

Comments:

Technician



Approved



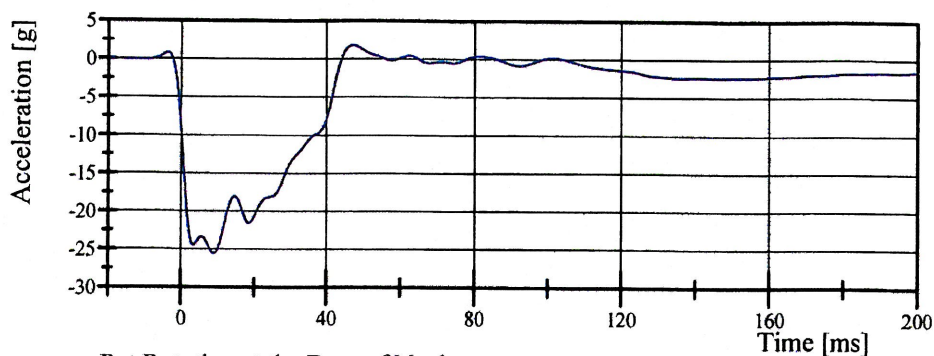
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 001 Certification No. 13-1

Test Date: 1/25/2010

Pendulum Acceleration

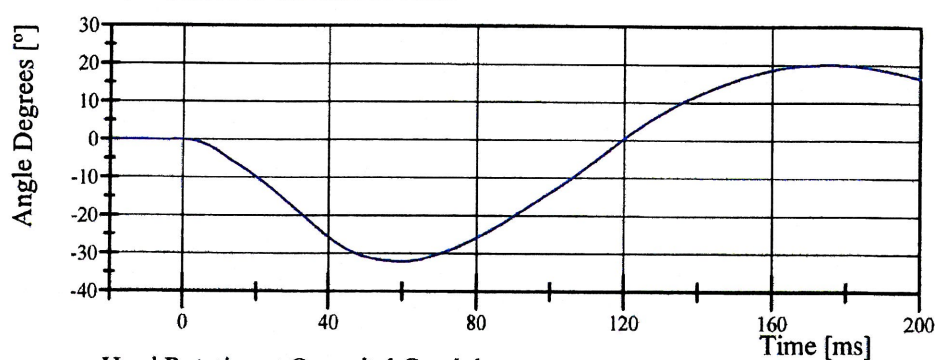


Filter Class: CFC_60

Max: 1.9 g at 47.0 ms

Min: -25.5 g at 9.1 ms

Pot Rotation at the Base of Neck

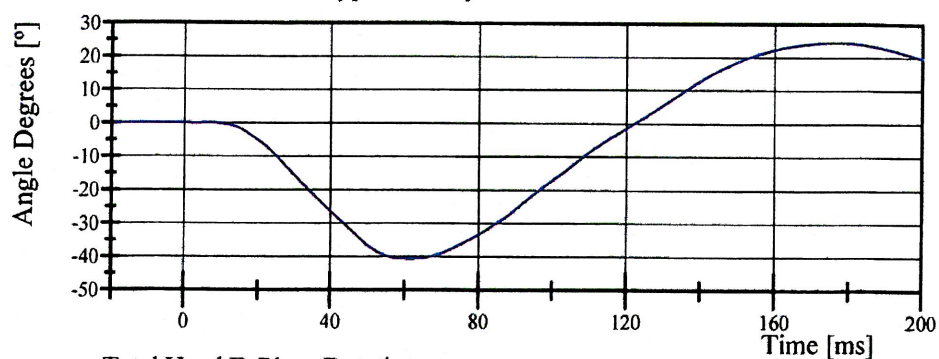


Filter Class: CFC_60

Max: 20.1 ° at 175.7 ms

Min: -32.1 ° at 59.9 ms

Head Rotation at Occypital Condyles

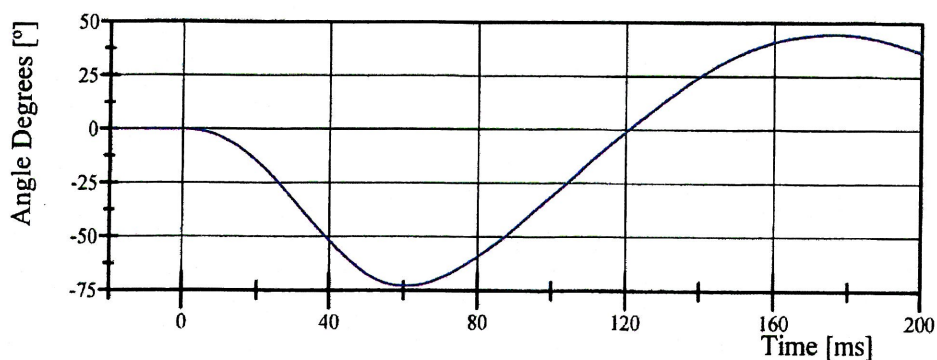


Filter Class: CFC_60

Max: 24.5 ° at 176.7 ms

Min: -40.6 ° at 61.6 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 44.6 ° at 176.3 ms

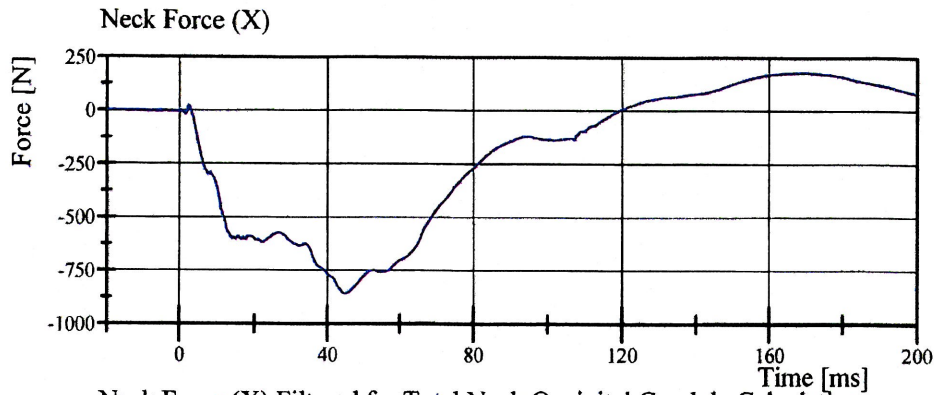
Min: -72.7 ° at 60.5 ms

Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 001 Certification No. 13-1

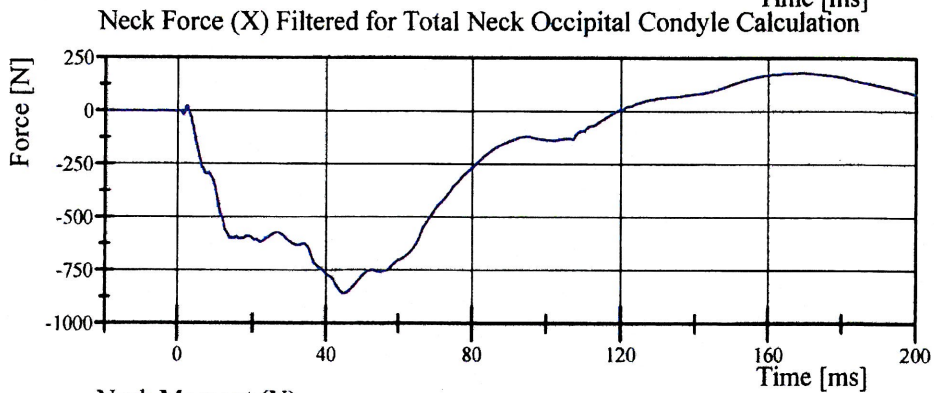
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 183.1 N at 168.4 ms

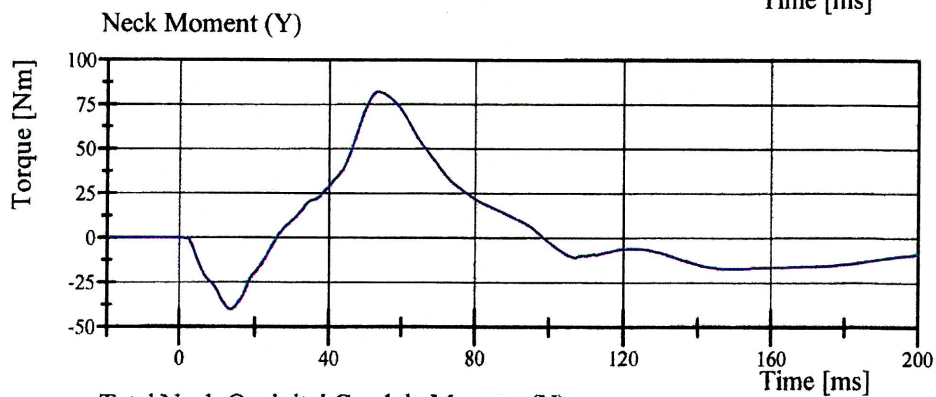
Min: -858.6 N at 44.8 ms



Filter Class: CFC_600

Max: 183.0 N at 168.6 ms

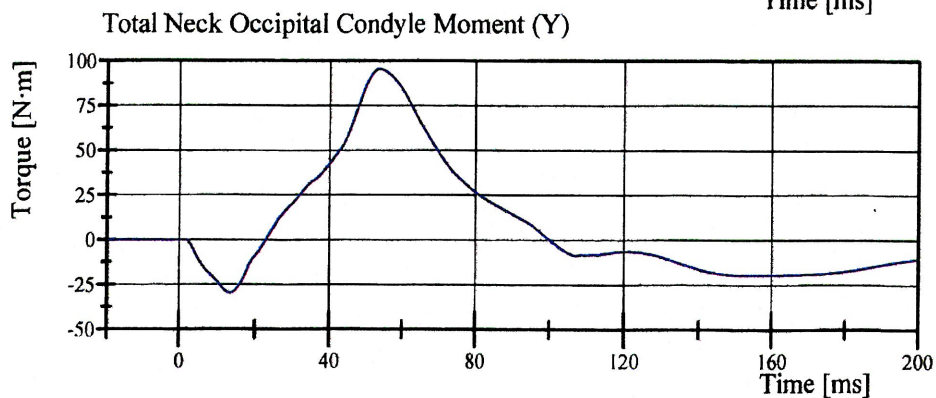
Min: -858.6 N at 45.0 ms



Filter Class: CFC_600

Max: 82.2 Nm at 53.4 ms

Min: -40.0 Nm at 13.8 ms



Filter Class: CFC_600

Max: 95.5 N·m at 53.5 ms

Min: -29.7 N·m at 13.4 ms

Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 001 Certification No. 13-1

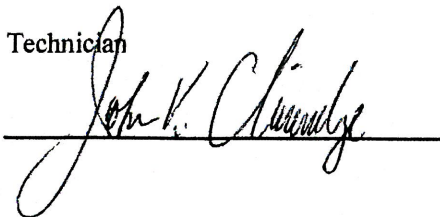
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-6.016 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	40.6 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.42 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	17.57 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	15.36 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	15.36 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	90.9 °	Yes
Time of Peak	72 - 82 ms	76.7 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	153.7 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-53) - (-80) N·m	-69.3 N·m	Yes
Time of Peak	65 - 79 ms	70.6 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	142.1 ms	Yes

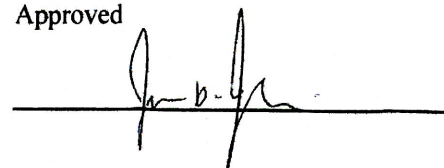
Test meets specifications.

Comments:

Technician



Approved



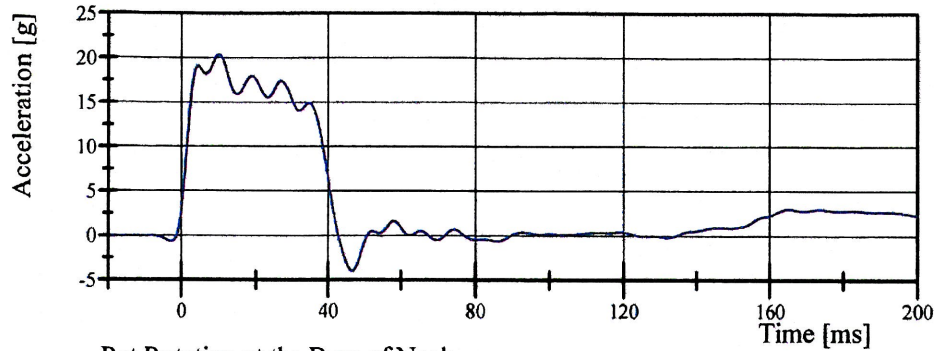
Transportation Research Center Inc.

Neck Extension

HIH 50th Serial No. 001 Certification No. 13-1

Test Date: 1/25/2010

Pendulum Acceleration

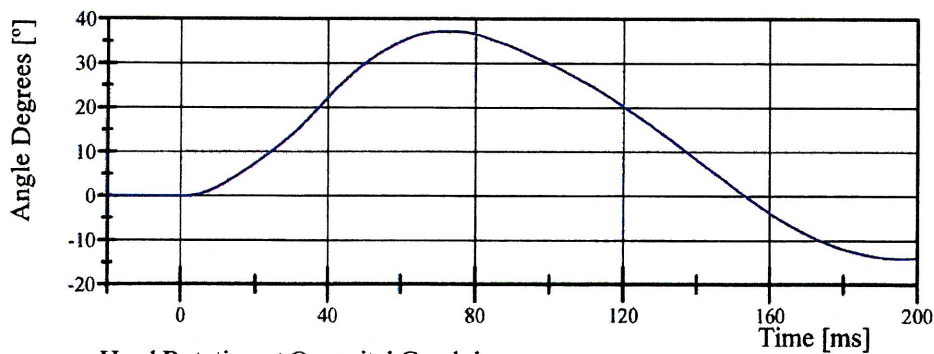


Filter Class: CFC_60

Max: 20.4 g at 10.1 ms

Min: -4.0 g at 46.6 ms

Pot Rotation at the Base of Neck

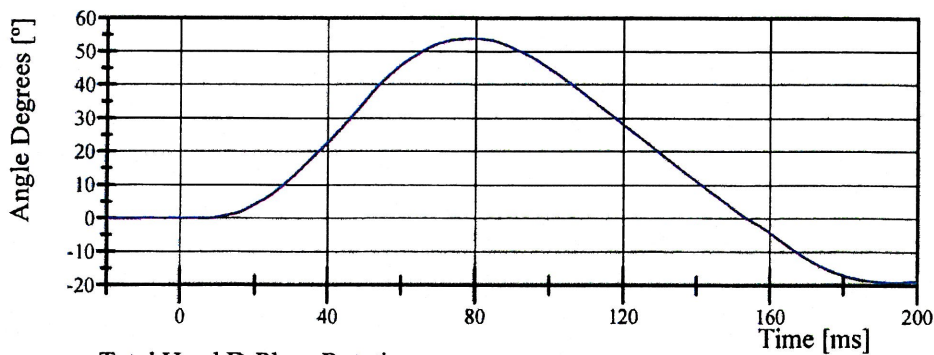


Filter Class: CFC_60

Max: 37.2 ° at 72.6 ms

Min: -14.0 ° at 195.8 ms

Head Rotation at Occypital Condyles

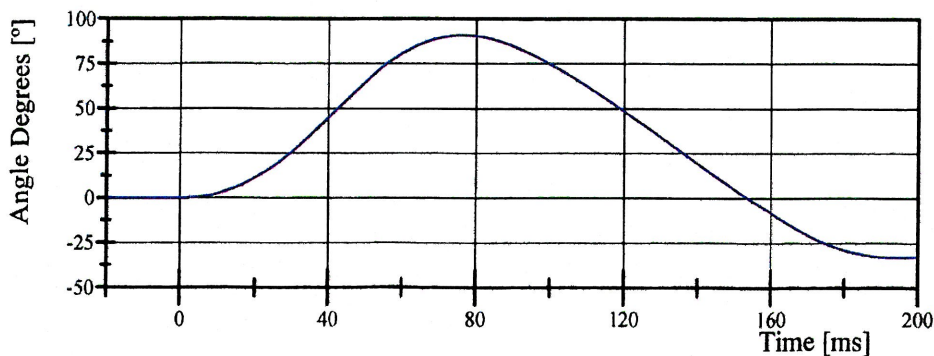


Filter Class: CFC_60

Max: 53.9 ° at 79.4 ms

Min: -19.0 ° at 193.8 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 90.9 ° at 76.7 ms

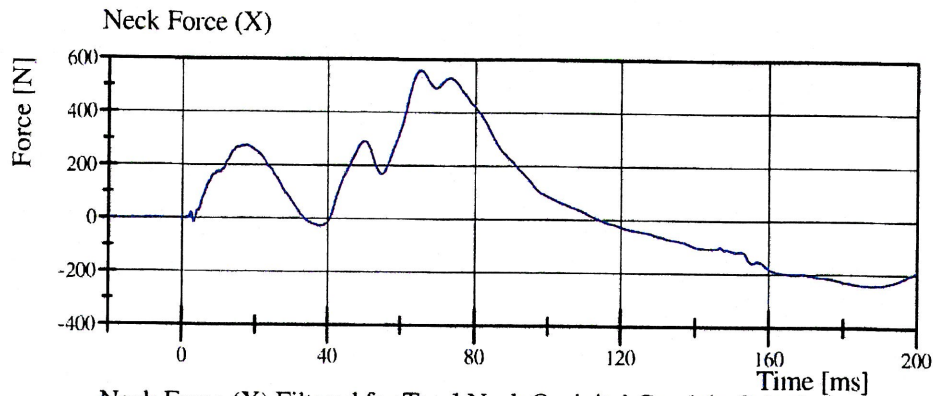
Min: -33.0 ° at 194.8 ms

Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 001 Certification No. 13-1

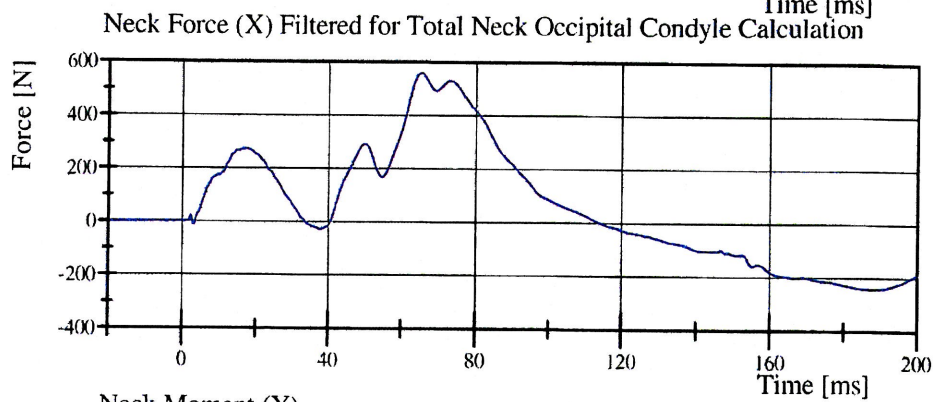
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 559.6 N at 65.5 ms

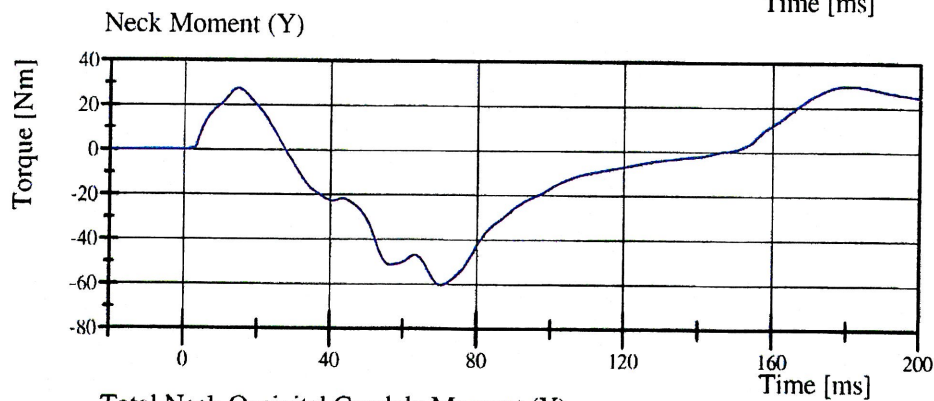
Min: -242.8 N at 187.7 ms



Filter Class: CFC_600

Max: 559.5 N at 65.6 ms

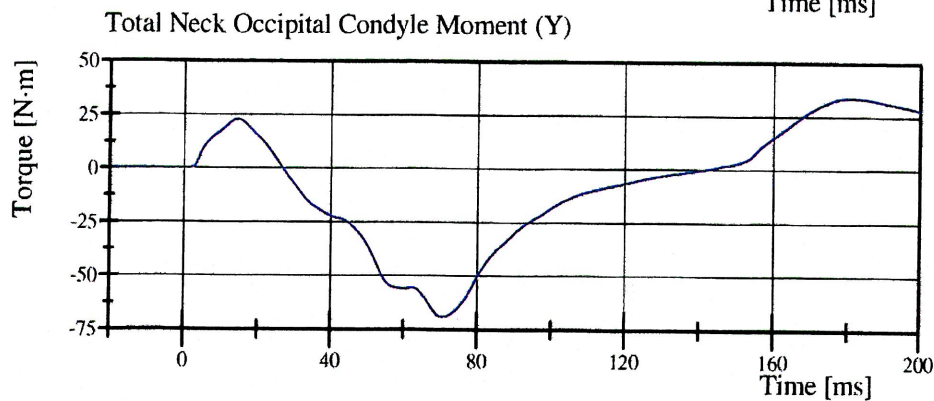
Min: -242.4 N at 187.6 ms



Filter Class: CFC_600

Max: 29.5 Nm at 179.9 ms

Min: -60.5 Nm at 70.4 ms



Filter Class: CFC_600

Max: 33.6 N·m at 181.5 ms

Min: -69.3 N·m at 70.6 ms

Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 001 Certification No. 13-1

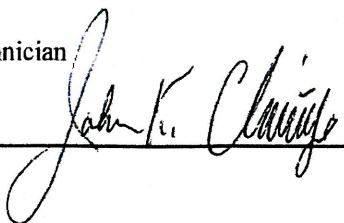
Test Date: 1/26/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.654 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,738.6 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-66.87 mm	Yes
Internal Hysteresis	65 - 85 %	73.3 %	Yes

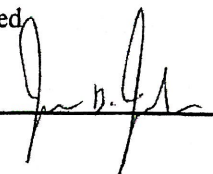
Test meets specifications.

Comments:

Technician



Approved



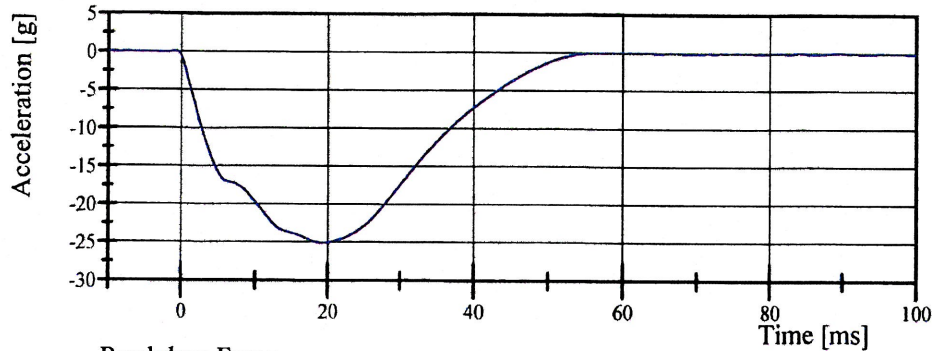
Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 001 Certification No. 13-1

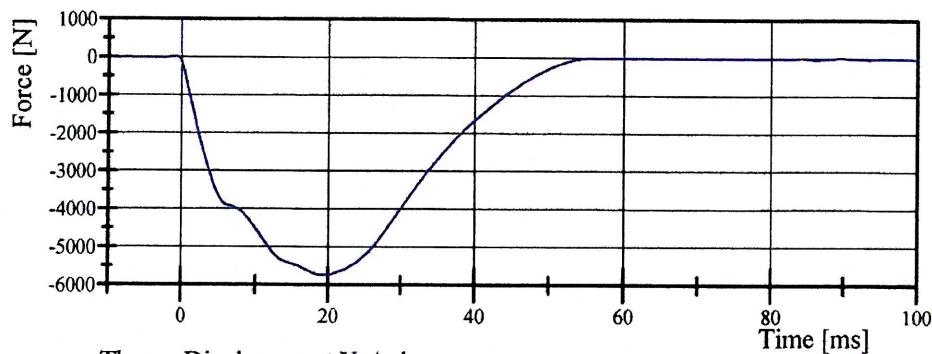
Test Date: 1/26/2010

Pendulum Acceleration



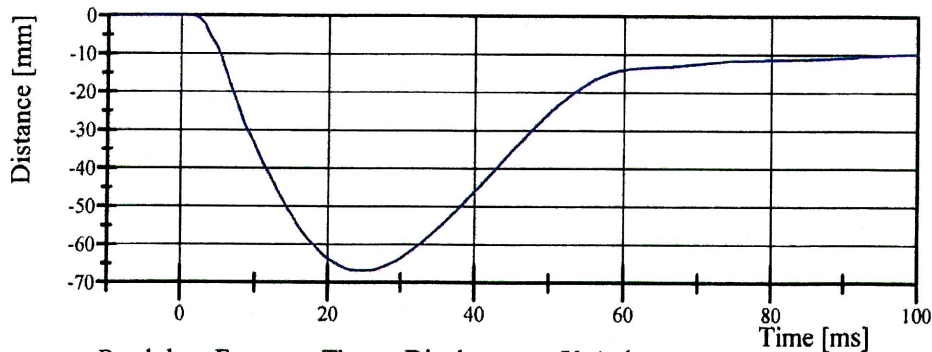
Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -25.0 g at 19.7 ms

Pendulum Force



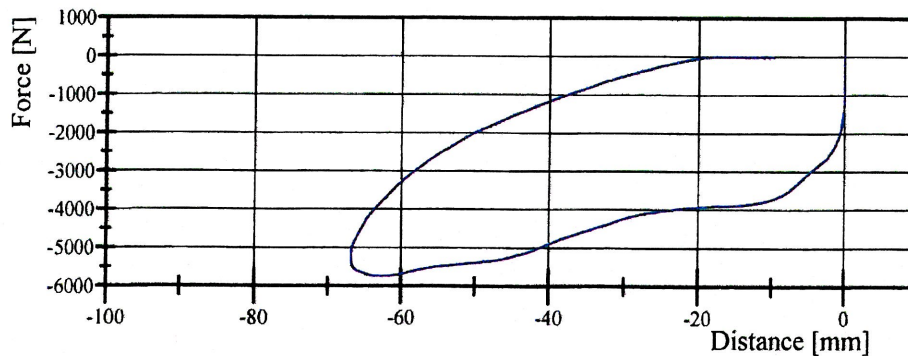
Filter Class: CFC_180
Max: 28.4 N at -0.8 ms
Min: -5,738.6 N at 19.7 ms

Thorax Displacement X-Axis



Filter Class: CFC_600
Max: 0.0 mm at -2.2 ms
Min: -66.9 mm at 25.4 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180
Max: 28.4 N at 0.0 mm
Min: -5,738.6 N at -63.3 mm

Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 001L

Date: 01/22/2010

Test Number: 001C13

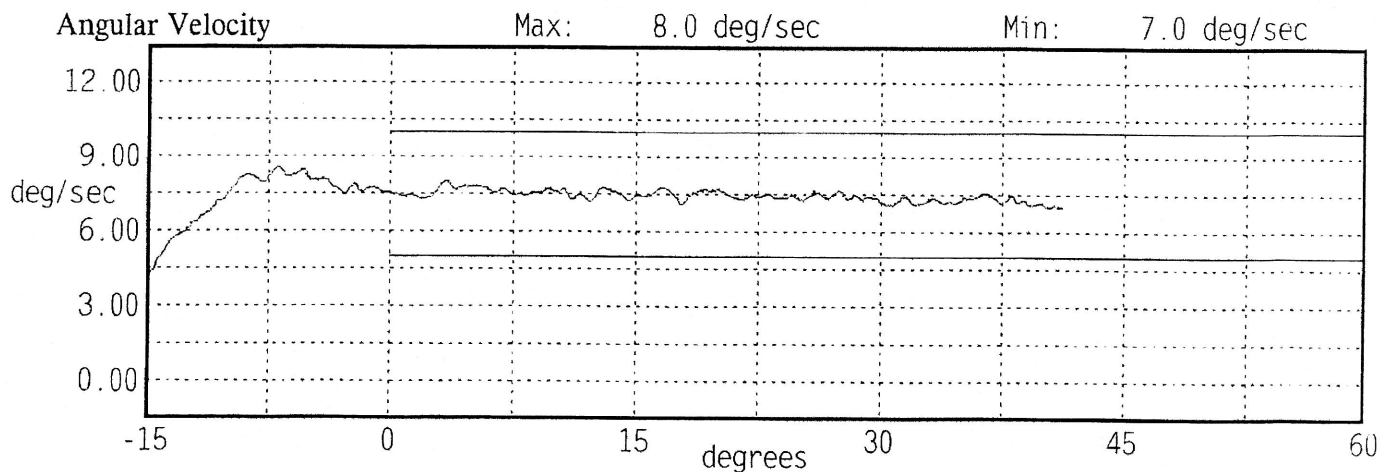
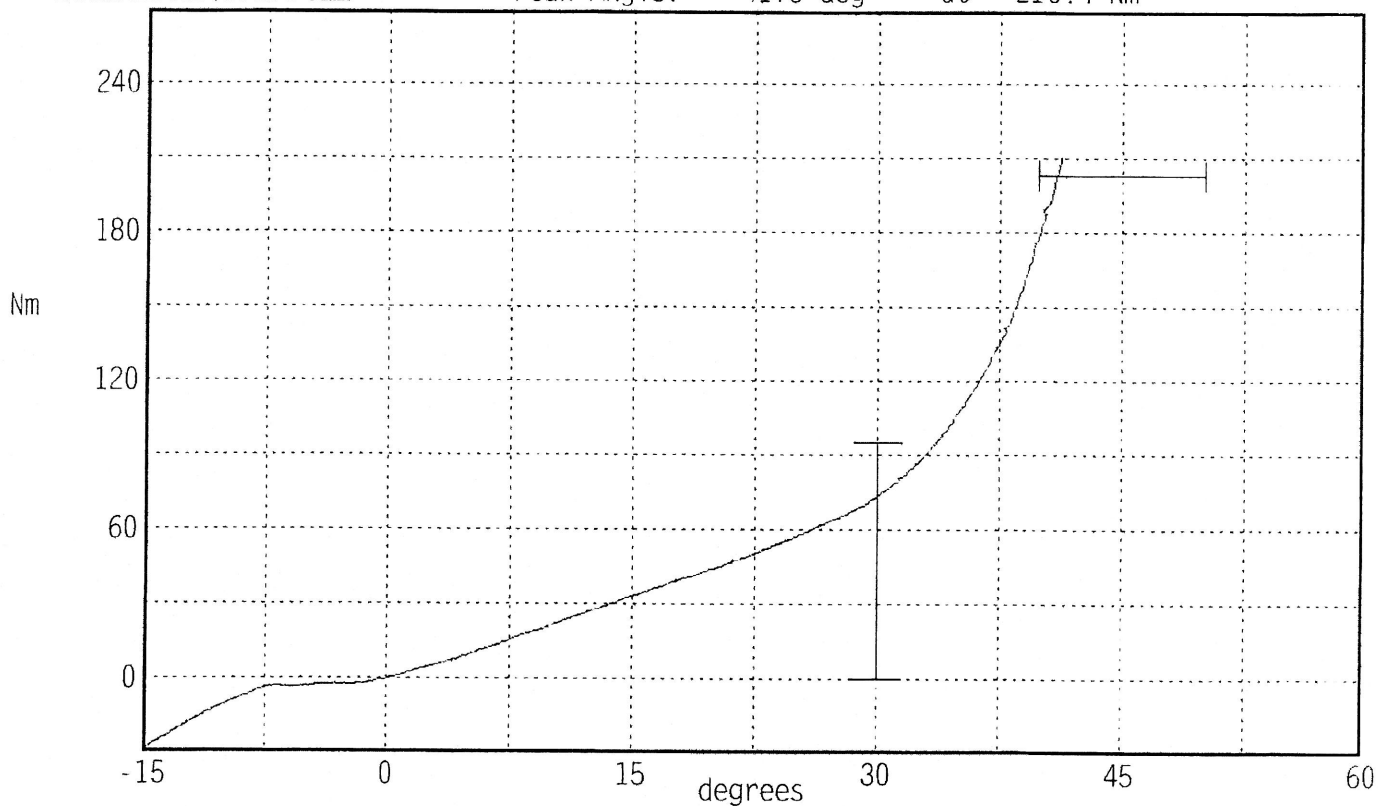
Time: 10:49

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.6 °C Pass
Humidity	10 - 70	35 % Pass
Moment at 30 deg	<= 94.9	74.0 Nm Pass
Angle at 203 Nm	40.0 - 50.0	41.1 deg Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec Pass

Moment About H-Point

Peak Moment: 210.4 Nm at 41.3 deg
Peak Angle: 41.3 deg at 210.4 Nm



Transportation Research Center Inc

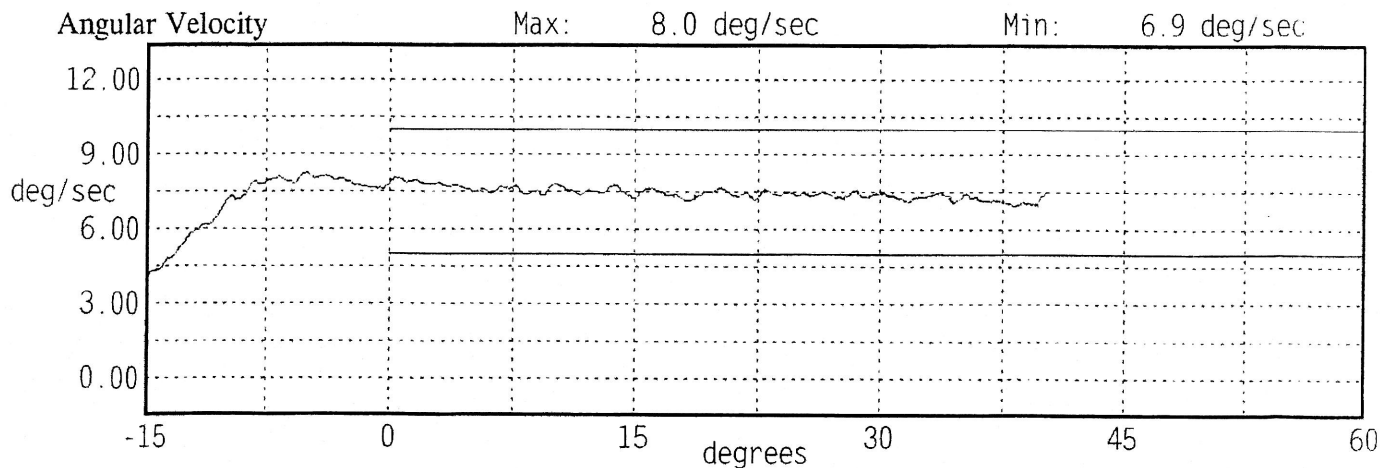
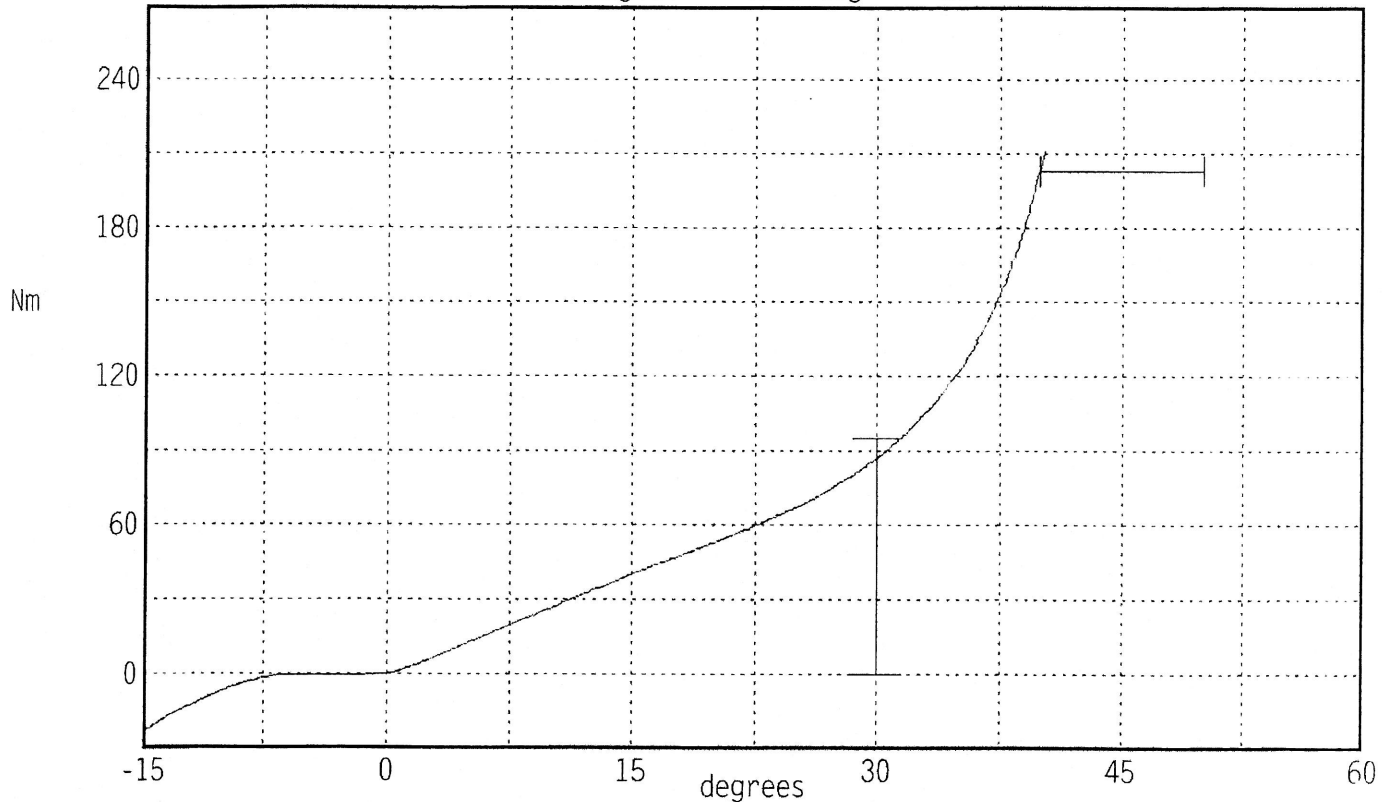
Hybrid III Hip Range of Motion

Serial Number: 001R
Test Number: 001C13
Comments:

Date: 01/22/2010
Time: 13:58

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	21.7 °C	Pass
Humidity	10 - 70	36 %	Pass
Moment at 30 deg	<= 94.9	87.6 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	40.1 deg	Pass
Average Velocity	5.0 - 10.0	7.4 deg/sec	Pass

Moment About H-Point
Peak Moment: 210.8 Nm at 40.3 deg
Peak Angle: 40.3 deg at 210.8 Nm



Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 50th Serial No. 001 Certification No. 13-2

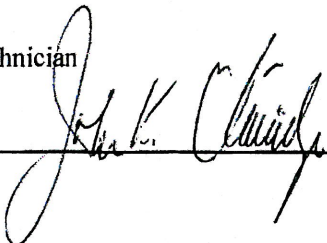
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.109 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,043.20 N	Yes

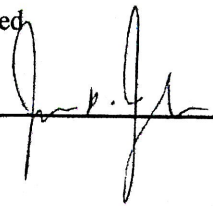
Test meets specifications.

Comments:

Technician



Approved

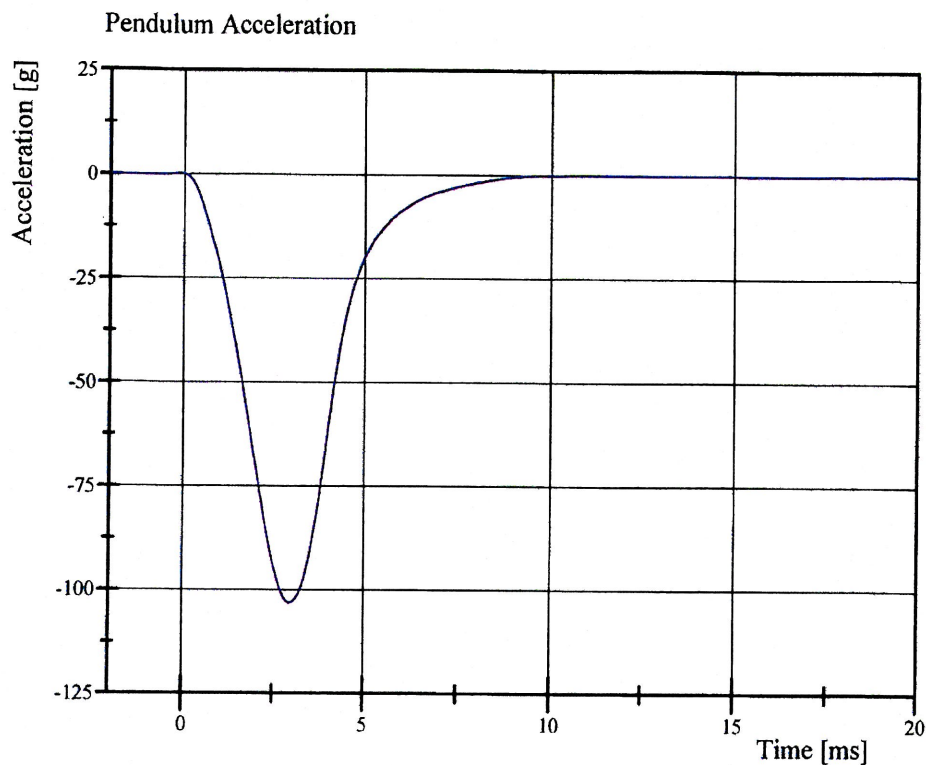


Transportation Research Center Inc.

Left Knee Femur Response Test

HIII 50th Serial No. 001 Certification No. 13-2

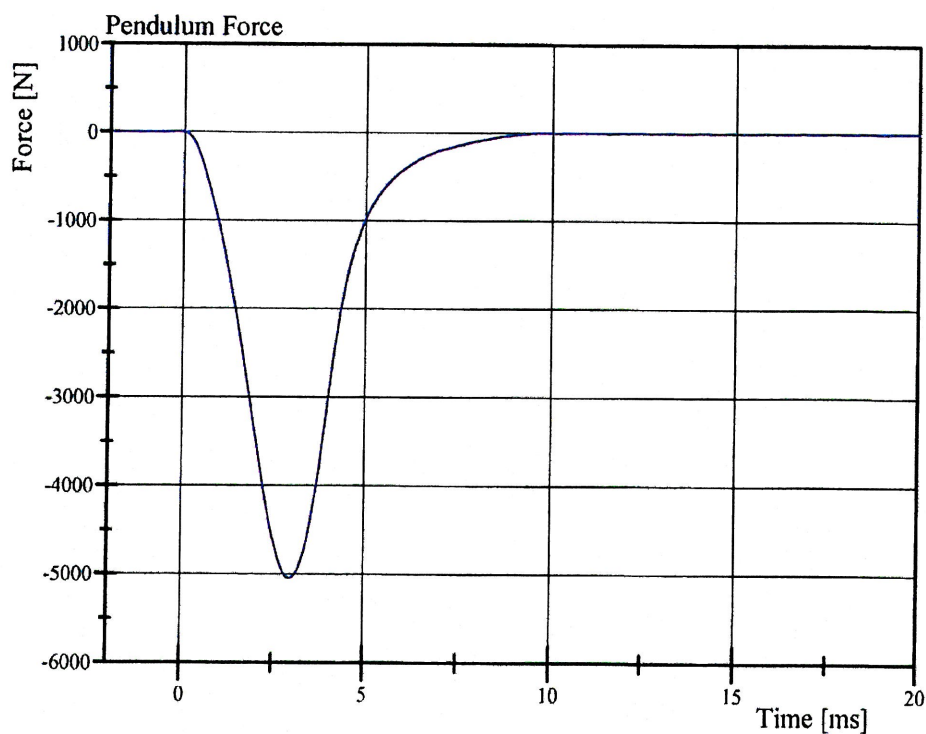
Test Date: 1/25/2010



Filter Class: CFC_600

Max: 0.2 g at -0.1 ms

Min: -103.1 g at 3.0 ms



Filter Class: CFC_600

Max: 7.6 N at -0.1 ms

Min: -5,043.2 N at 3.0 ms

Transportation Research Center Inc.

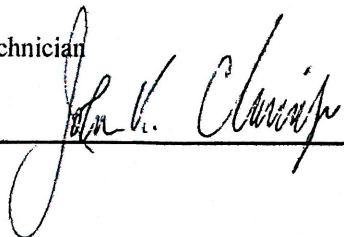
Right Knee Femur Response Test
HIII 50th Serial No. 001 Certification No. 13-1
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.112 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,527.67 N	Yes

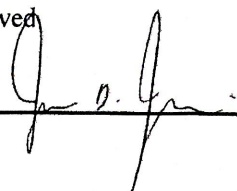
Test meets specifications.

Comments:

Technician



Approved

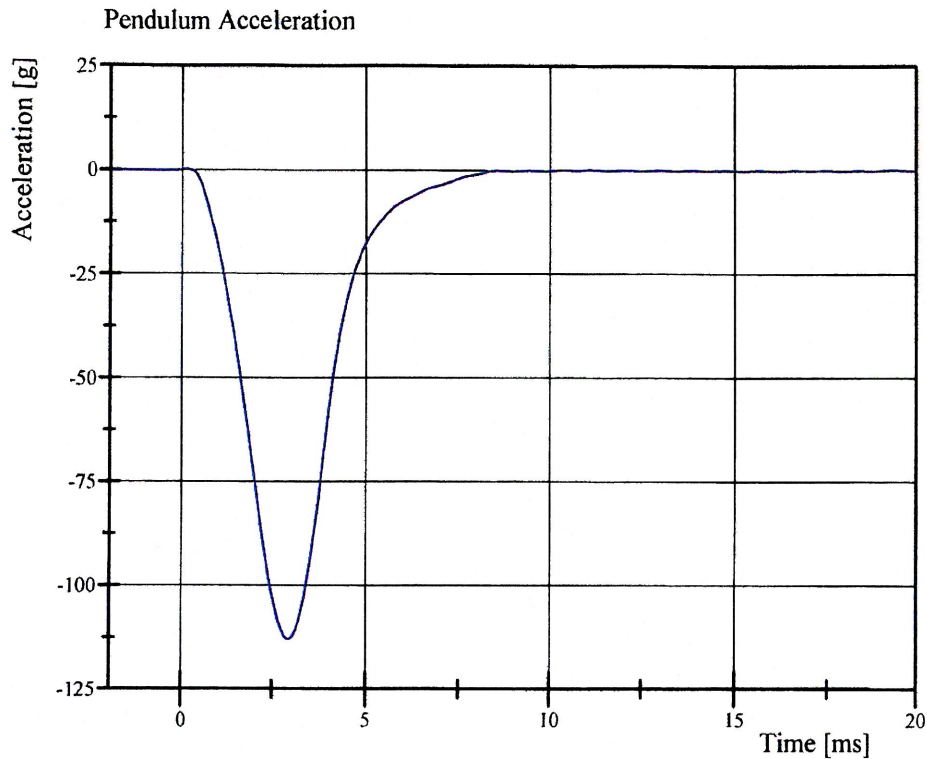


Transportation Research Center Inc.

Right Knee Femur Response Test

HIH 50th Serial No. 001 Certification No. 13-1

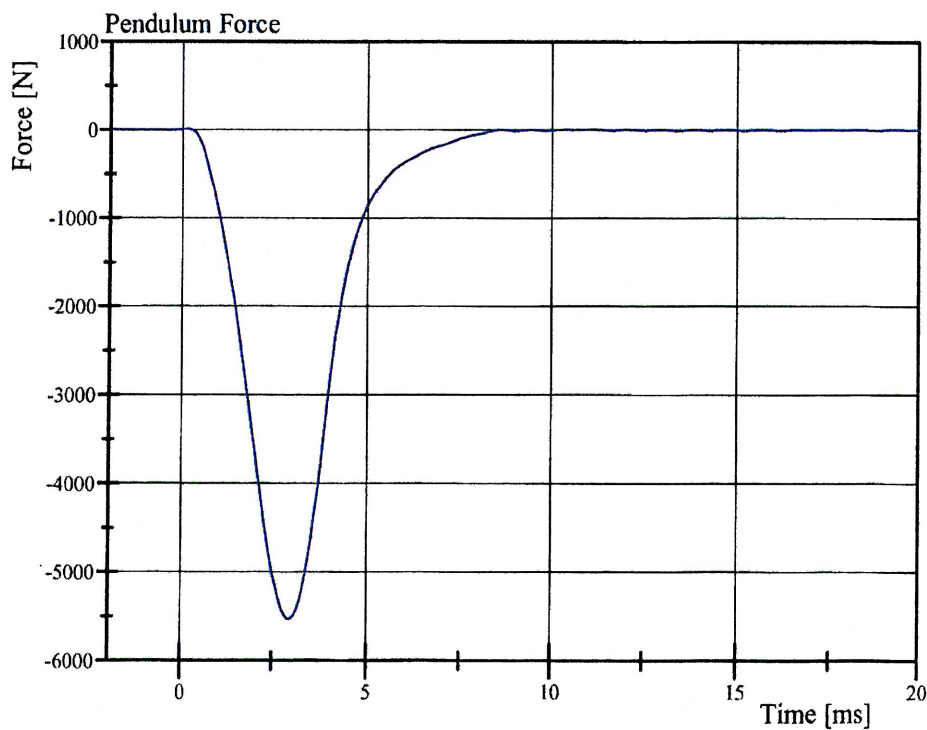
Test Date: 1/25/2010



Filter Class: CFC_600

Max: 0.2 g at 0.2 ms

Min: -113.0 g at 3.0 ms



Filter Class: CFC_600

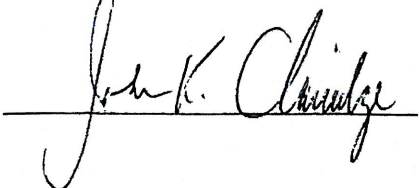
Max: 10.7 N at 0.2 ms

Min: -5,527.7 N at 3.0 ms

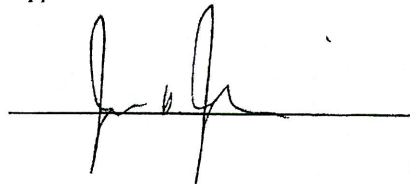
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 001 Calibration No. 13

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	885	Yes
B	Shoulder Pivot Height	505.5 - 520.7	516	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 154.9	153	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	298	Yes
H	Skull Cap To Backline	40.6 - 45.7	44	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	340	Yes
J	Elbow Rest Height	190.5 - 210.8	202	Yes
K	Buttock Knee Length	579.1 - 604.5	597	Yes
L	Popliteal Height	429.3 - 454.7	438	Yes
M	Knee Pivot Height	485.1 - 500.4	496	Yes
N	Buttock Popliteal Length	452.1 - 477.5	467	Yes
O	Chest Depth	213.4 - 228.6	218	Yes
P	Foot Length	251.5 - 266.7	260	Yes
V	Shoulder Breadth	421.6 - 436.9	427	Yes
W	Foot Breadth	91.4 - 106.7	99	Yes
Y	Chest Circumference	970.3 - 1000.8	994	Yes
Z	Waist Circumference	835.7 - 866.1	858	Yes
AA	Location For Chest Circumference	429.3 - 434.3	430	Yes
BB	Location For Waist Circumference	226.1 - 231.1	229	Yes

Technician



Approved



Calibration Test Results

Pre-Test

Right Front Passenger Dummy S/N: 110

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 110 Certification No. 33-1

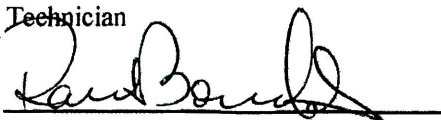
Test Date: 1/22/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	36 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	248.1 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	4.8 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

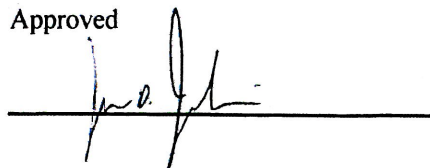
Test meets specifications.

Comments:

Technician



Approved



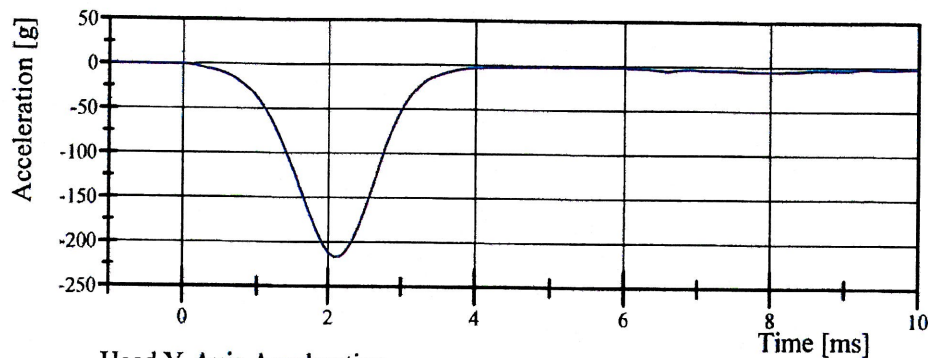
Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 110 Certification No. 33-1

Test Date: 1/22/2010

Head X-Axis Acceleration

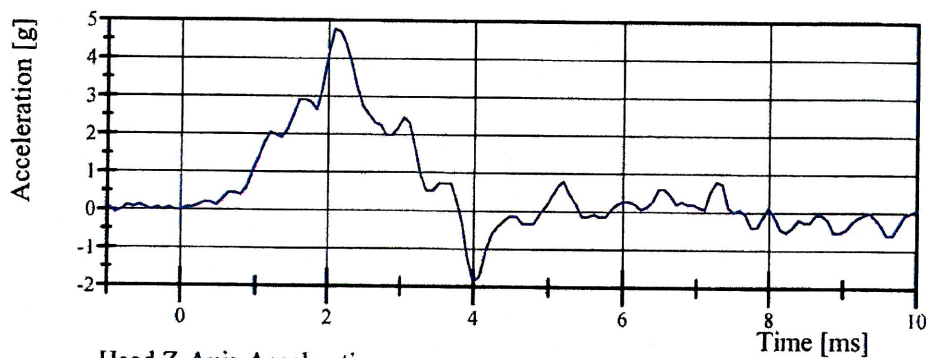


Filter Class: CFC_1000

Max: 0.1 g at -0.4 ms

Min: -216.8 g at 2.1 ms

Head Y-Axis Acceleration

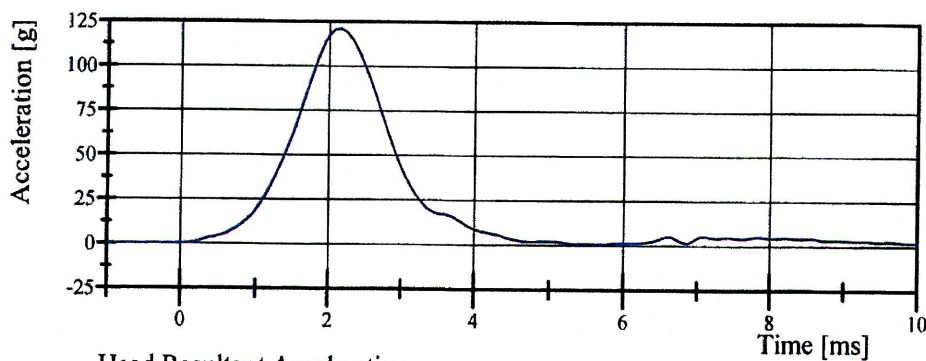


Filter Class: CFC_1000

Max: 4.8 g at 2.1 ms

Min: -1.9 g at 4.0 ms

Head Z-Axis Acceleration

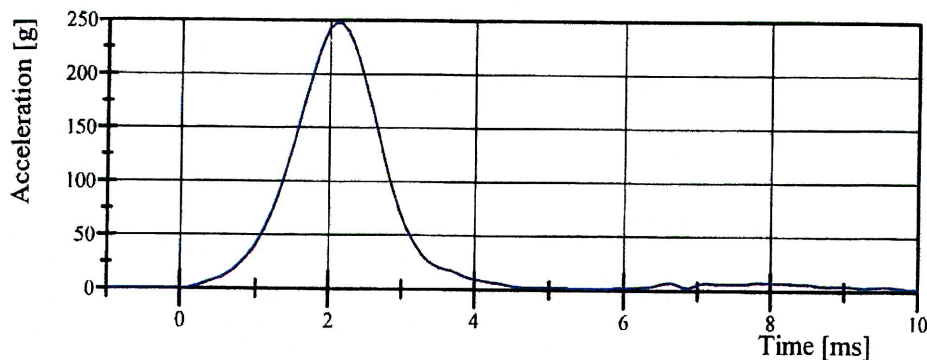


Filter Class: CFC_1000

Max: 121.1 g at 2.2 ms

Min: -0.0 g at -1.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 248.1 g at 2.1 ms

Min: 0.0 g at -0.8 ms

Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 110 Certification No. 33-1

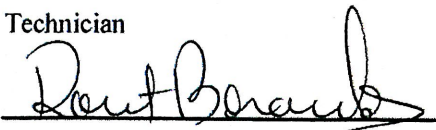
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.968 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.7 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-25.98 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-22.43 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-16.40 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-16.41 g	Yes
Total Head D-Plane Rotation Peak	(-64) - (-78) °	-74.5 °	Yes
Time of Peak	57 - 64 ms	61.1 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	122.3 ms	Yes
Total Neck Occipital Condyles Moment Peak	88 - 108 N·m	98.2 N·m	Yes
Time of Peak	47 - 58 ms	50.8 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	101.7 ms	Yes

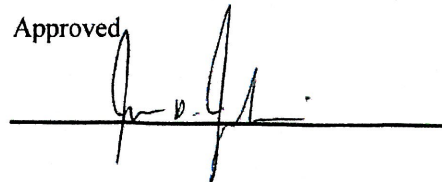
Test meets specifications.

Comments:

Technician



Approved



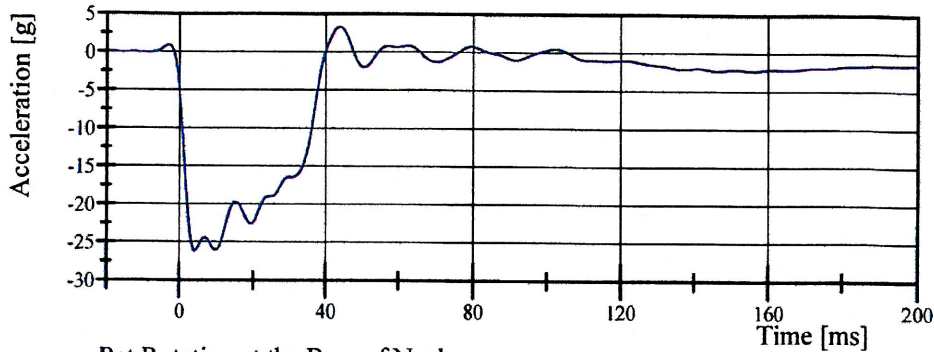
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 110 Certification No. 33-1

Test Date: 1/25/2010

Pendulum Acceleration

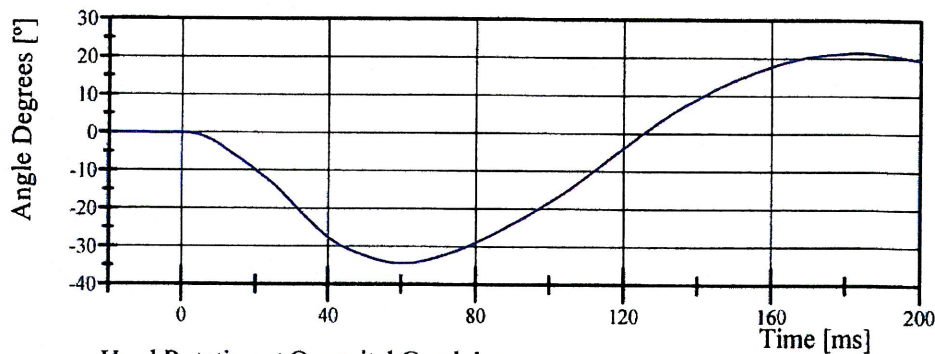


Filter Class: CFC_60

Max: 3.4 g at 43.9 ms

Min: -26.1 g at 4.1 ms

Pot Rotation at the Base of Neck

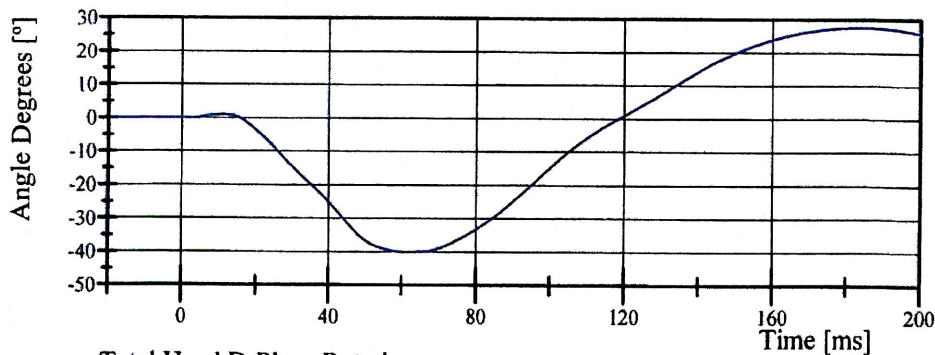


Filter Class: CFC_60

Max: 21.5 ° at 183.5 ms

Min: -34.4 ° at 60.3 ms

Head Rotation at Occypital Condyles

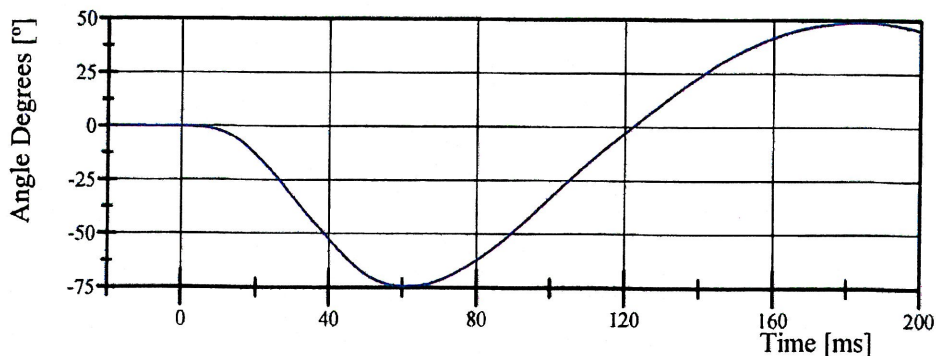


Filter Class: CFC_60

Max: 27.6 ° at 184.8 ms

Min: -40.1 ° at 61.6 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 49.1 ° at 183.9 ms

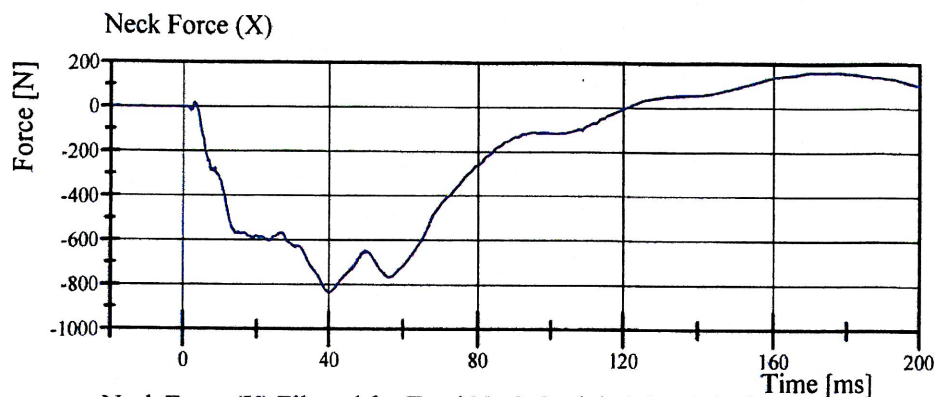
Min: -74.5 ° at 61.1 ms

Transportation Research Center Inc.

Neck Flexion

HIH 50th Serial No. 110 Certification No. 33-1

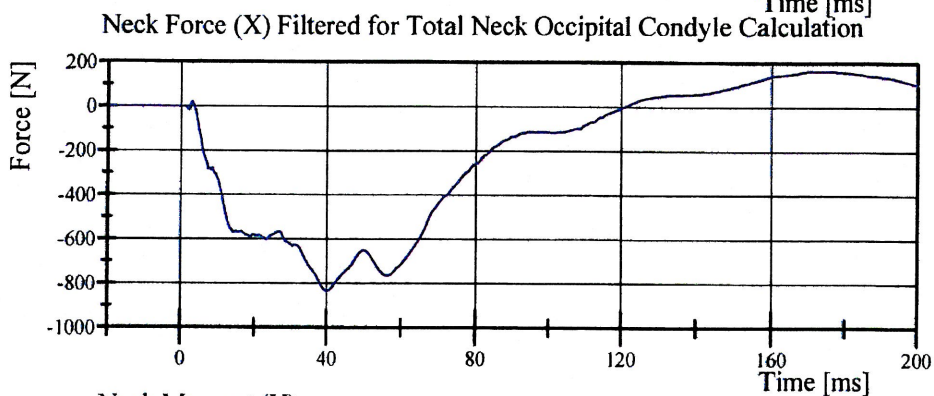
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 164.2 N at 170.7 ms

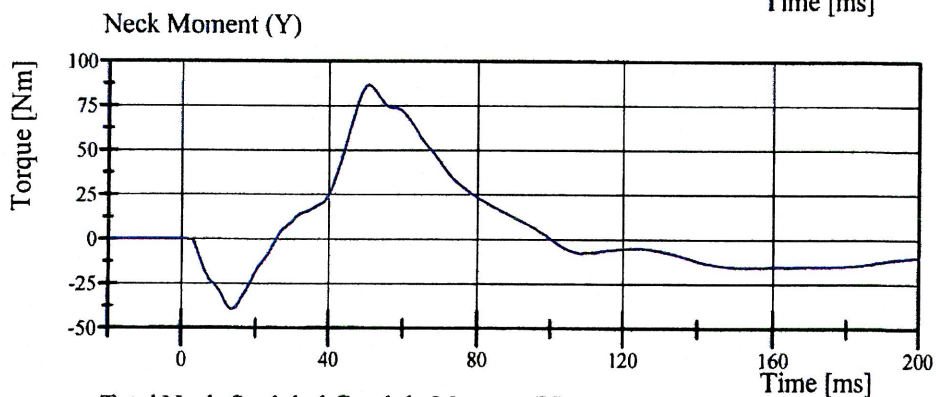
Min: -834.1 N at 40.2 ms



Filter Class: CFC_600

Max: 164.1 N at 170.9 ms

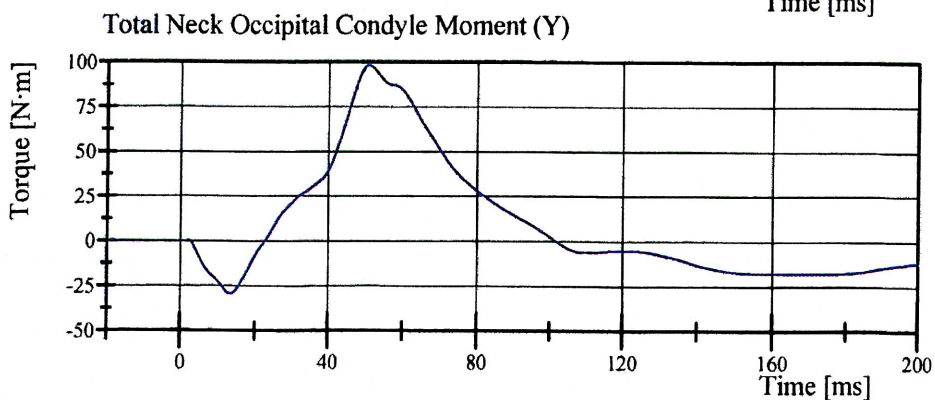
Min: -833.7 N at 40.0 ms



Filter Class: CFC_600

Max: 86.6 Nm at 50.7 ms

Min: -39.3 Nm at 13.6 ms



Filter Class: CFC_600

Max: 98.2 N·m at 50.8 ms

Min: -29.5 N·m at 13.5 ms

Neck Extension
HIII 50th Serial No. 110 Certification No. 33-1
Test Date: 1/25/2010

Test meets specifications.

Technician

Approved

Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

01.26.2010 07:29:47 1885



100203

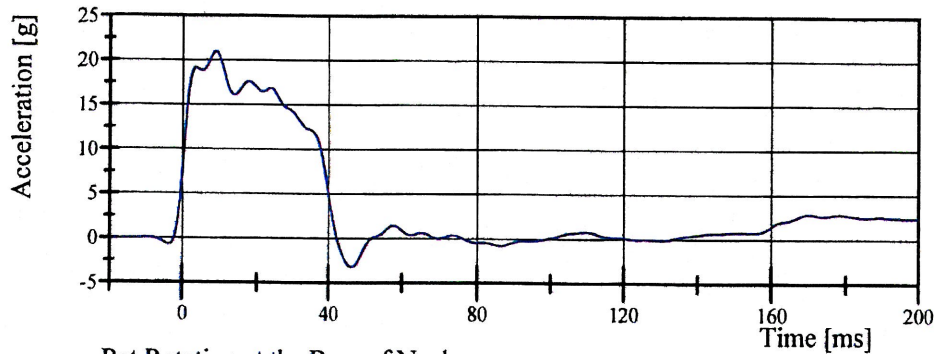
Transportation Research Center Inc.

Neck Extension

HIH 50th Serial No. 110 Certification No. 33-1

Test Date: 1/25/2010

Pendulum Acceleration

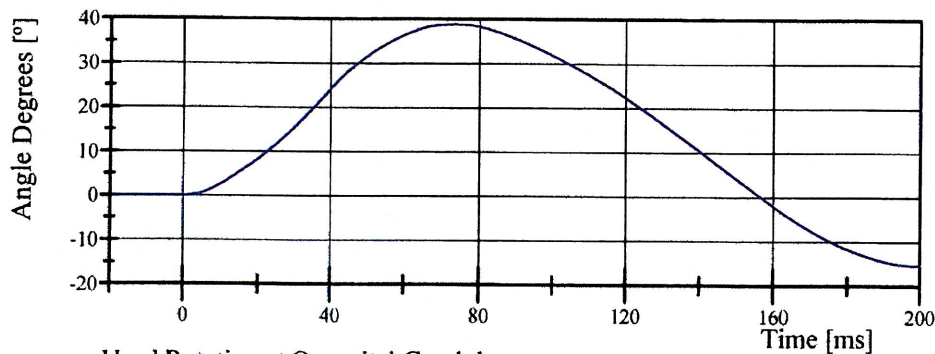


Filter Class: CFC_60

Max: 21.0 g at 8.9 ms

Min: -3.2 g at 46.5 ms

Pot Rotation at the Base of Neck

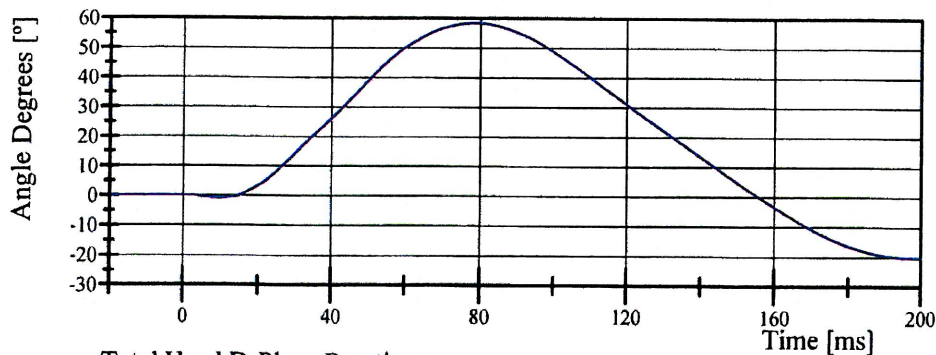


Filter Class: CFC_60

Max: 38.9 ° at 73.6 ms

Min: -15.4 ° at 200.0 ms

Head Rotation at Occypital Condyles

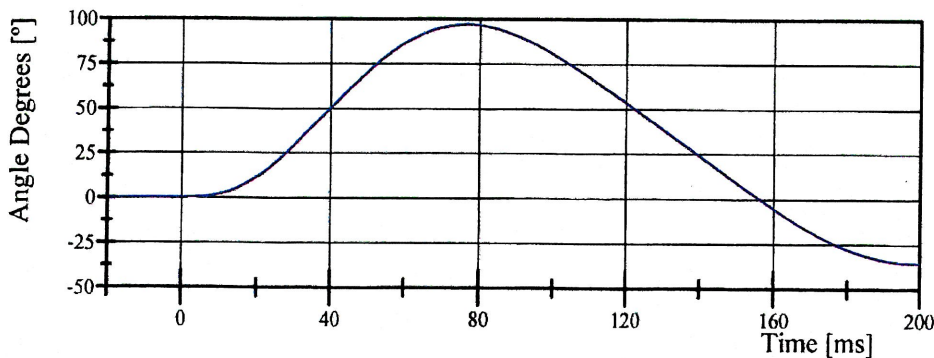


Filter Class: CFC_60

Max: 58.4 ° at 78.9 ms

Min: -20.2 ° at 198.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 97.1 ° at 77.0 ms

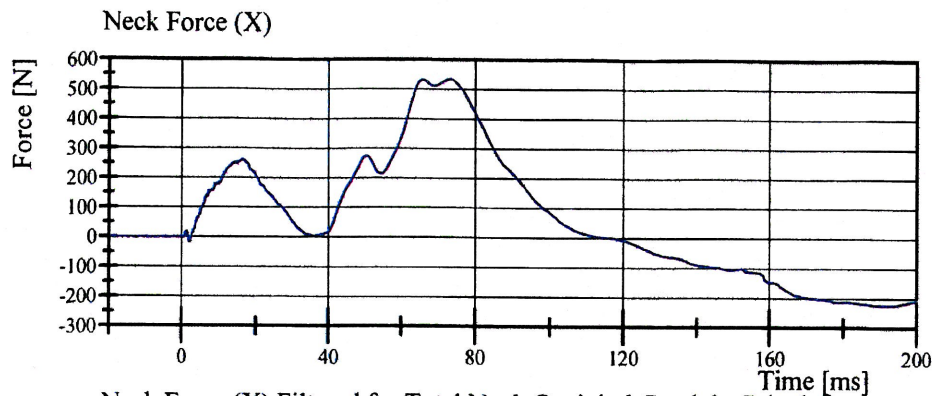
Min: -35.6 ° at 199.8 ms

Transportation Research Center Inc.

Neck Extension

HIH 50th Serial No. 110 Certification No. 33-1

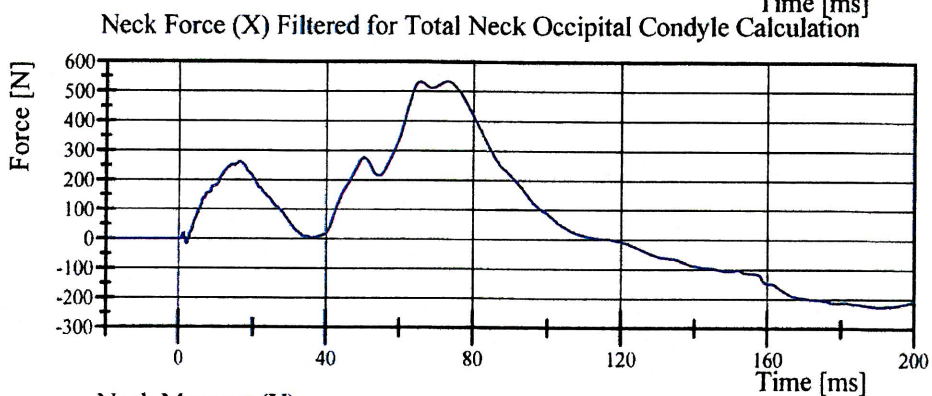
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 535.4 N at 73.2 ms

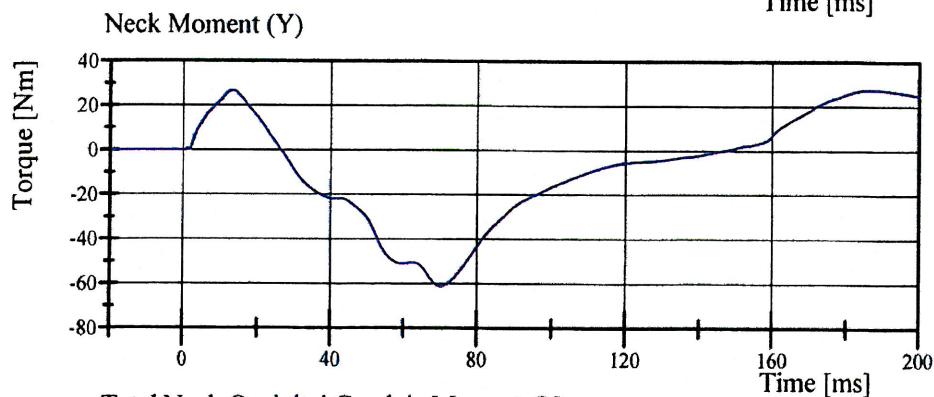
Min: -225.1 N at 191.9 ms



Filter Class: CFC_600

Max: 535.0 N at 73.1 ms

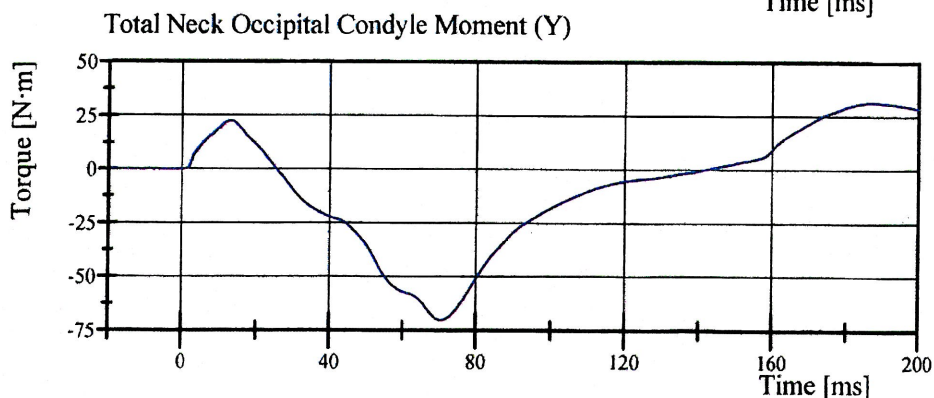
Min: -224.6 N at 191.7 ms



Filter Class: CFC_600

Max: 27.6 Nm at 187.3 ms

Min: -61.1 Nm at 70.4 ms



Filter Class: CFC_600

Max: 31.5 N·m at 188.2 ms

Min: -70.3 N·m at 70.5 ms

Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 110 Certification No. 33-7

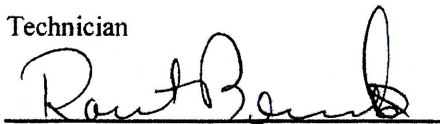
Test Date: 1/27/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	29 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.713 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,704.6 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-69.74 mm	Yes
Internal Hysteresis	65 - 85 %	75.2 %	Yes

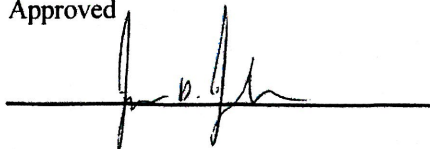
Test meets specifications.

Comments:

Technician



Approved



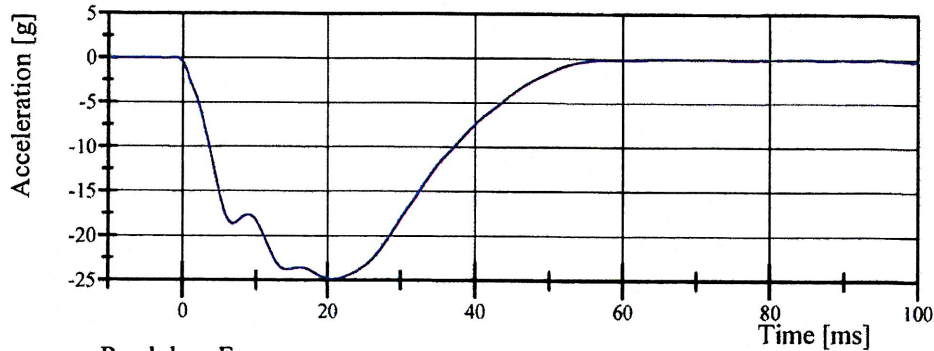
Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 110 Certification No. 33-7

Test Date: 1/27/2010

Pendulum Acceleration

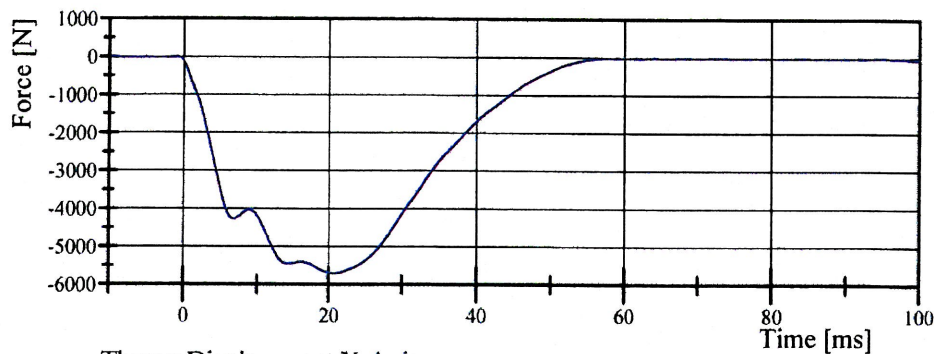


Filter Class: CFC_180

Max: 0.0 g at -1.0 ms

Min: -24.9 g at 20.7 ms

Pendulum Force

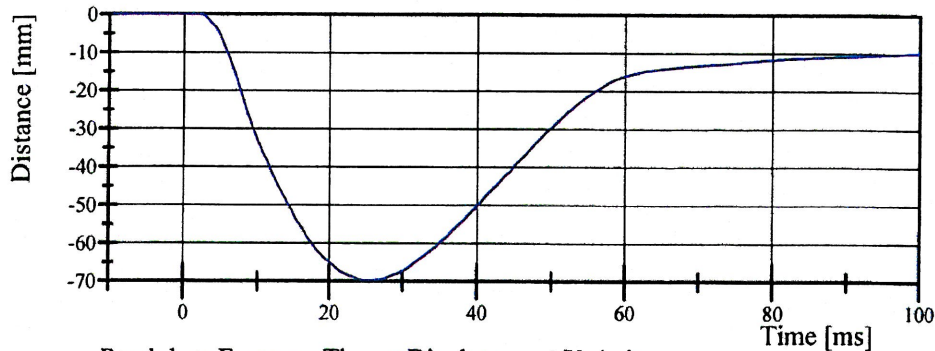


Filter Class: CFC_180

Max: 11.3 N at -1.0 ms

Min: -5,704.6 N at 20.7 ms

Thorax Displacement X-Axis

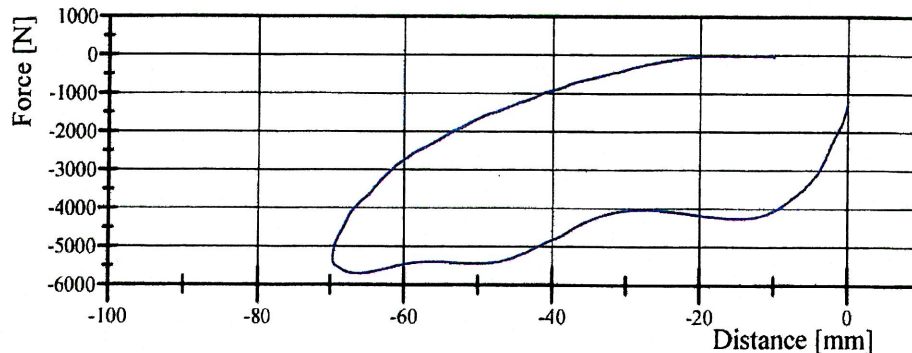


Filter Class: CFC_600

Max: 0.0 mm at -1.4 ms

Min: -69.7 mm at 25.2 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180

Max: 11.3 N at -0.0 mm

Min: -5,704.6 N at -66.1 mm

Transportation Research Center Inc

Hybrid III Hip Range of Motion

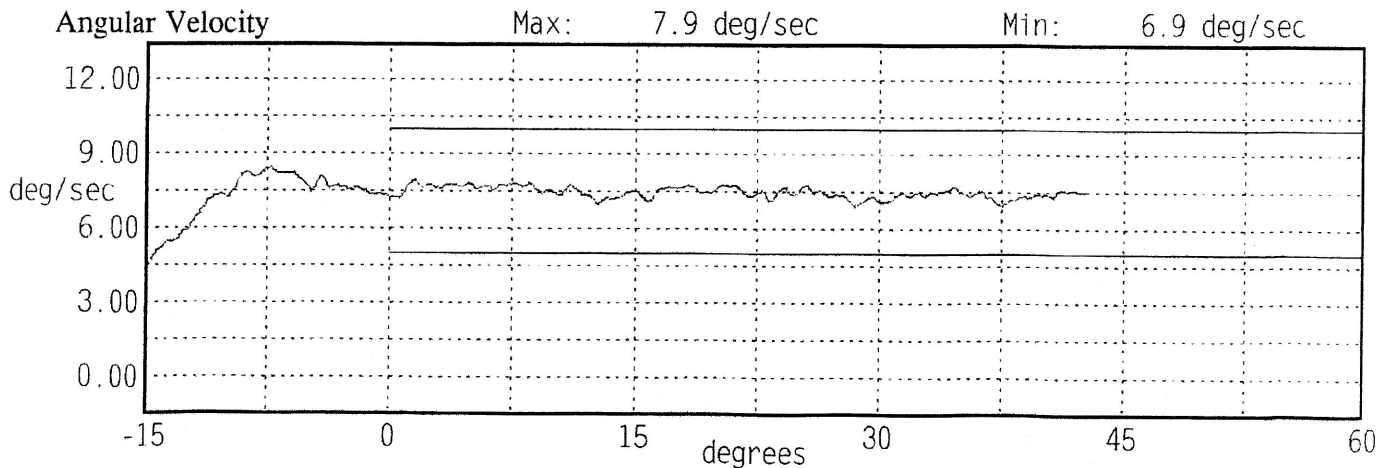
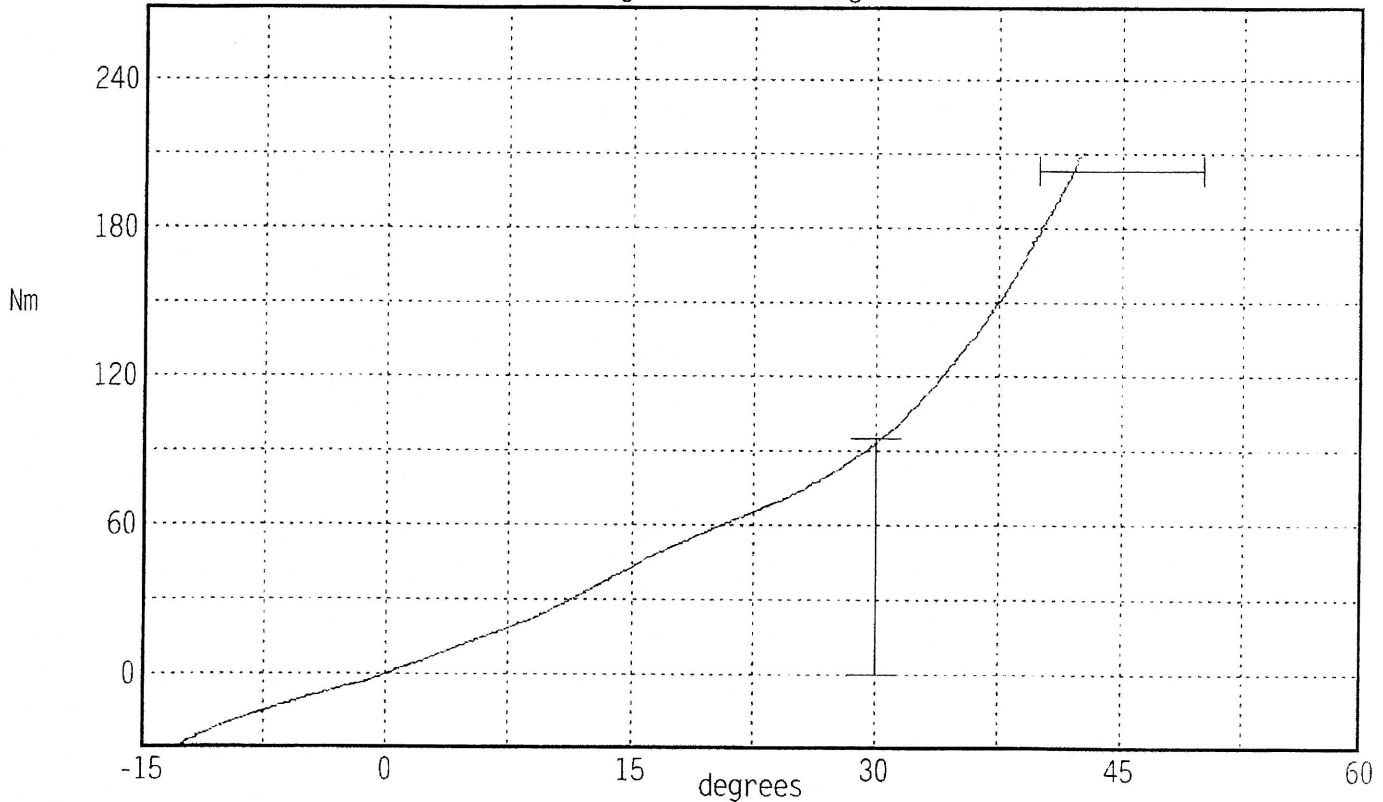
Serial Number: 110L
Test Number: 110C33

Date: 01/25/2010
Time: 09:20

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	18.9 - 25.6	22.1 °C	Pass
Humidity	10 - 70	32 %	Pass
Moment at 30 deg	<= 94.9	93.2 Nm	Pass
Angle at 203 Nm	40.0 - 50.0	42.0 deg	Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec	Pass

Moment About H-Point
Peak Moment: 210.7 Nm at 42.6 deg
Peak Angle: 42.6 deg at 210.7 Nm



Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 110R

Date: 01/25/2010

Test Number: 110C33

Time: 10:02

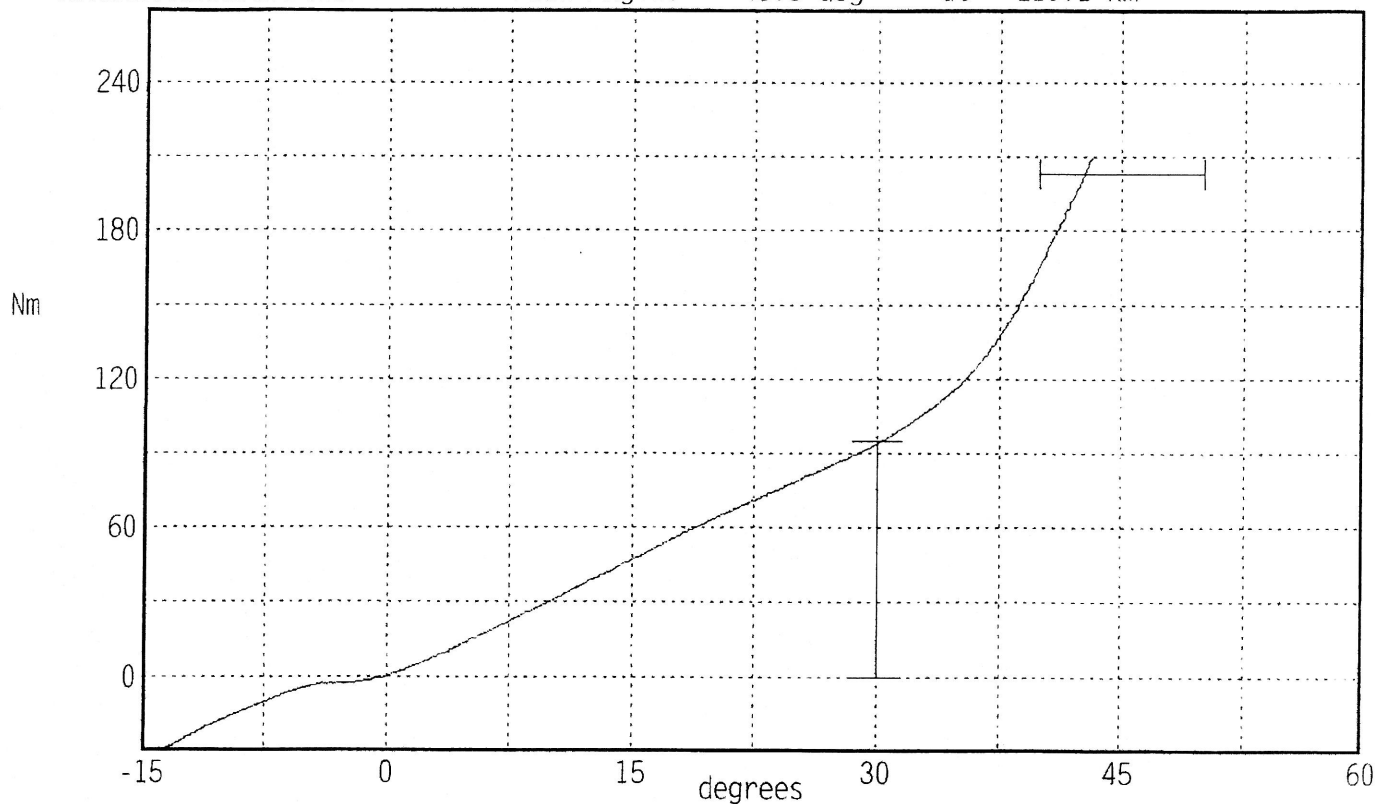
Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.9 °C Pass
Humidity	10 - 70	33 % Pass
Moment at 30 deg	<= 94.9	94.2 Nm Pass
Angle at 203 Nm	40.0 - 50.0	42.8 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Peak Moment: 210.1 Nm at 43.3 deg

Peak Angle: 43.3 deg at 210.1 Nm

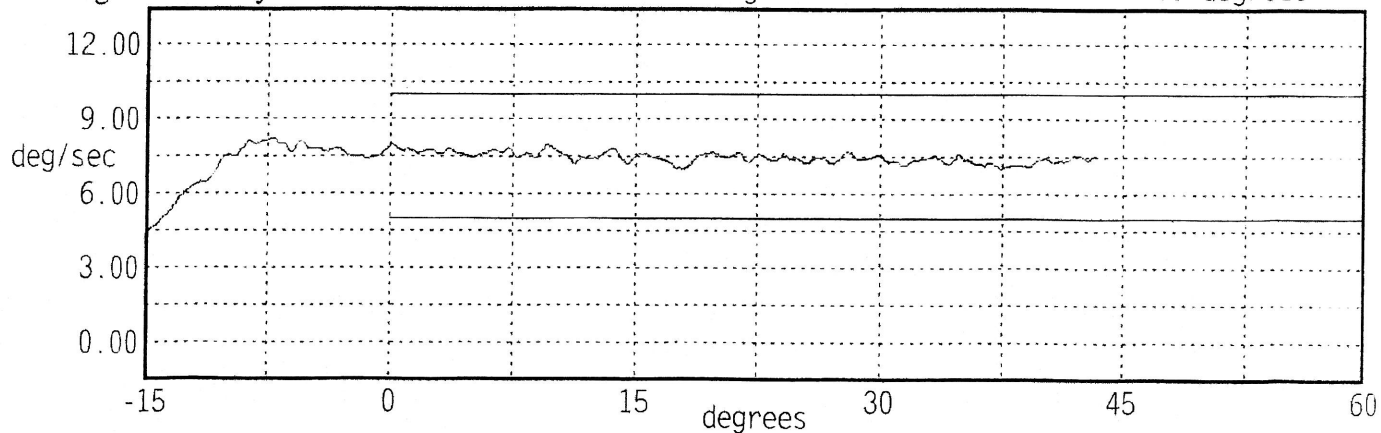
Moment About H-Point



Angular Velocity

Max: 8.0 deg/sec

Min: 7.0 deg/sec



Transportation Research Center Inc.

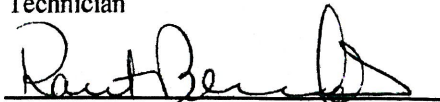
Left Knee Femur Response Test
HIII 50th Serial No. 110 Certification No. 33-1
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.110 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,604.03 N	Yes

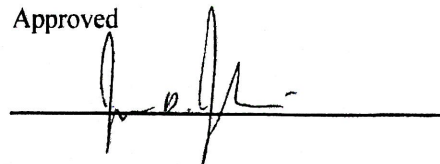
Test meets specifications.

Comments:

Technician

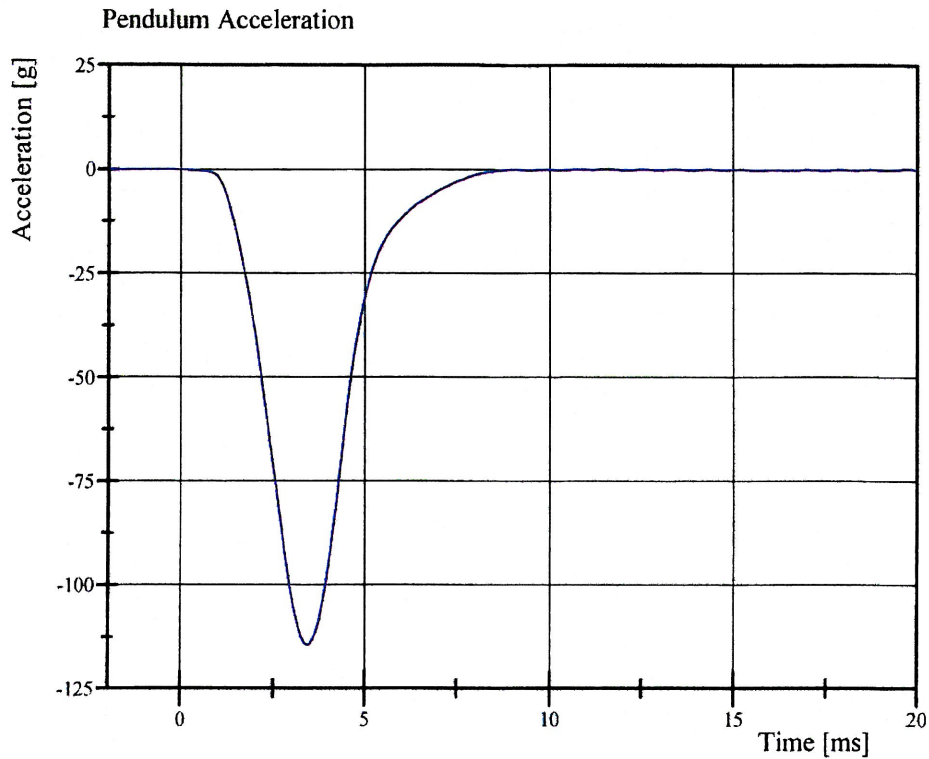


Approved

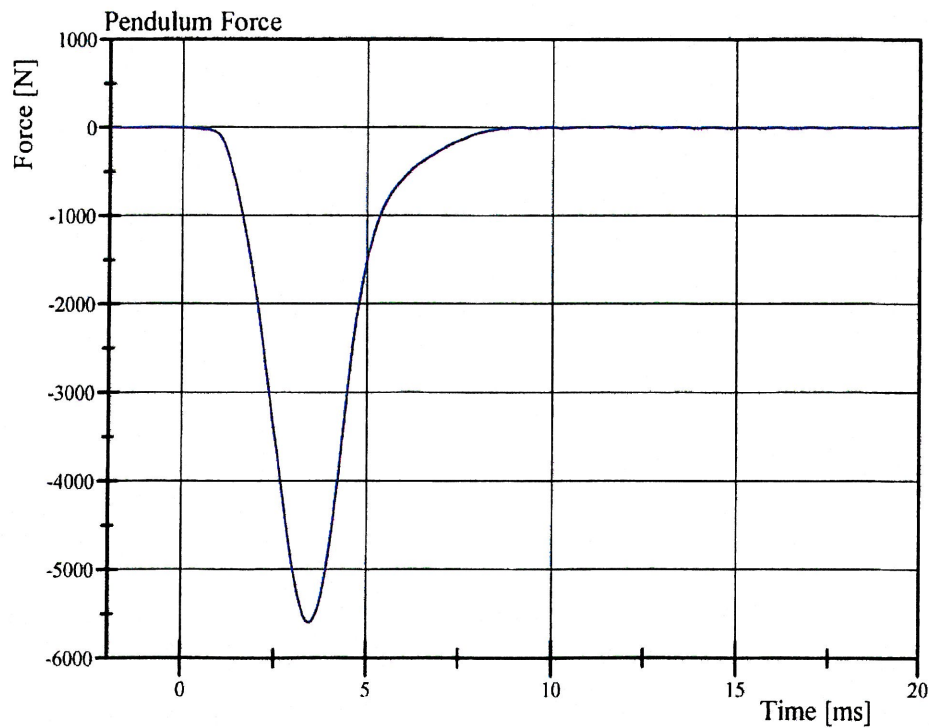


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 110 Certification No. 33-1
Test Date: 1/25/2010



Filter Class: CFC_600
Max: 0.2 g at 11.6 ms
Min: -114.5 g at 3.4 ms



Filter Class: CFC_600
Max: 8.8 N at 11.6 ms
Min: -5,604.0 N at 3.4 ms

Transportation Research Center Inc.

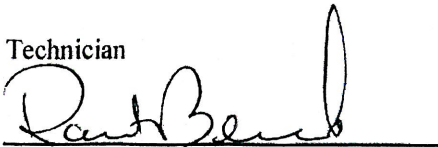
Right Knee Femur Response Test
HIII 50th Serial No. 110 Certification No. 33-2
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.106 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,235.24 N	Yes

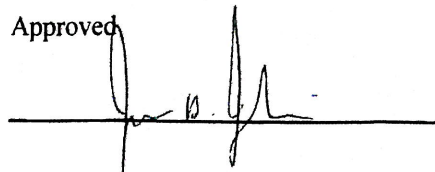
Test meets specifications.

Comments:

Technician

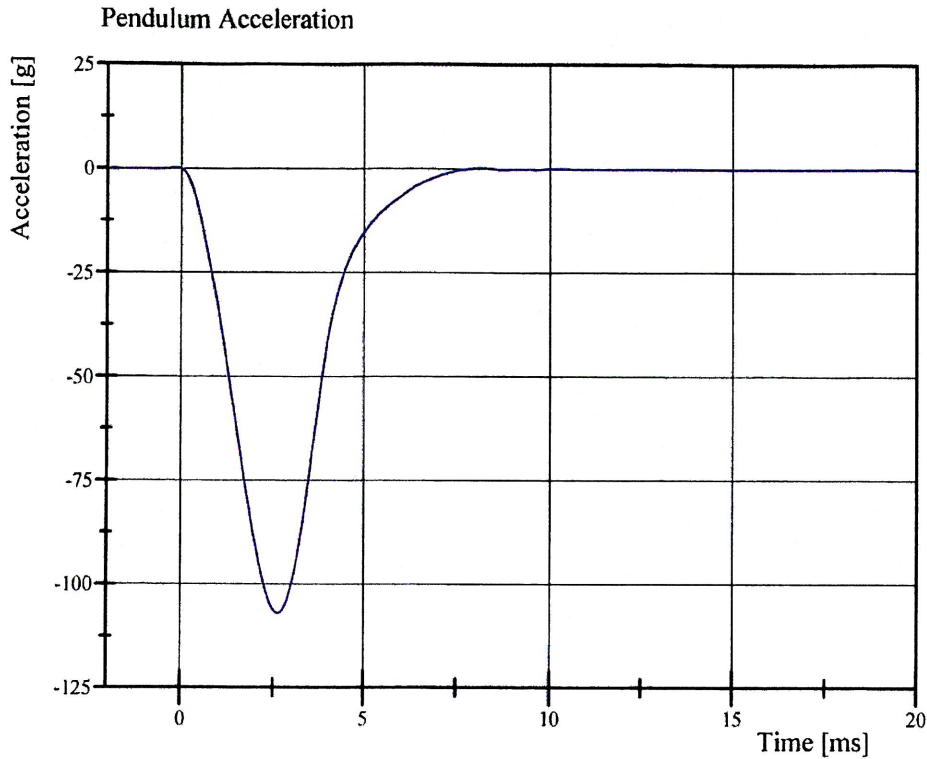


Approved

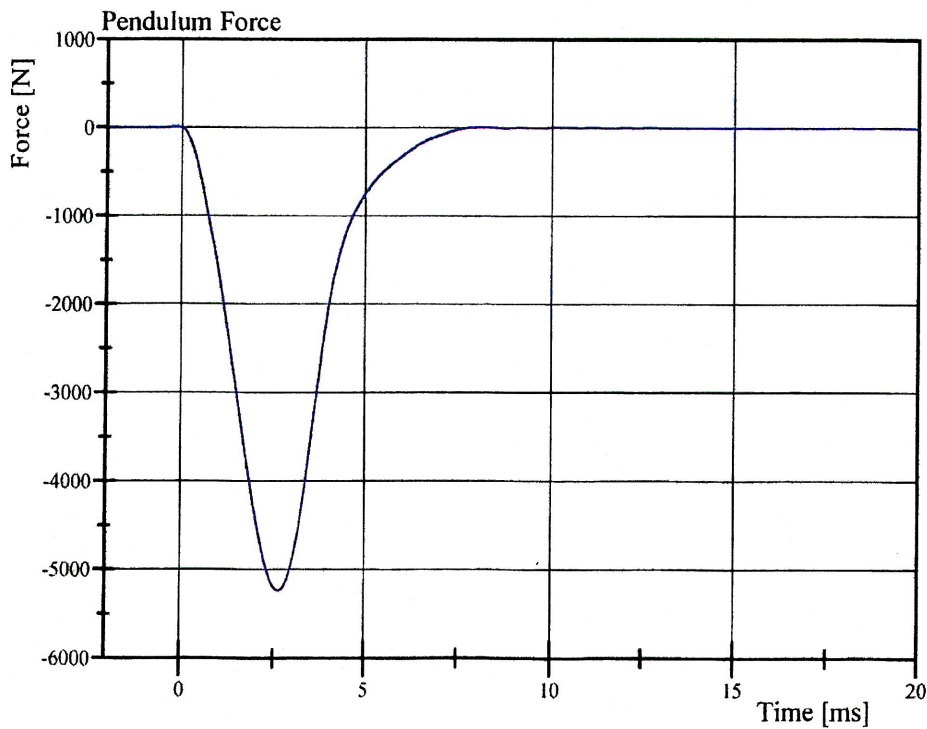


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 110 Certification No. 33-2
Test Date: 1/25/2010



Filter Class: CFC_600
Max: 0.2 g at -0.2 ms
Min: -107.0 g at 2.6 ms

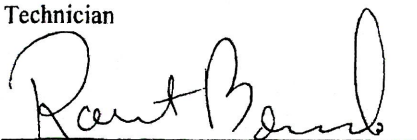


Filter Class: CFC_600
Max: 11.9 N at -0.2 ms
Min: -5,235.2 N at 2.6 ms

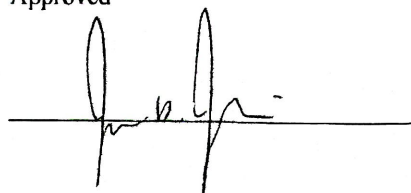
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 110 Calibration No. 33

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	887	Yes
B	Shoulder Pivot Height	505.5 - 520.7	513	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	92	Yes
F	Thigh Clearance	139.7 - 154.9	153	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	293	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	204	Yes
K	Buttock Knee Length	579.1 - 604.5	600	Yes
L	Popliteal Height	429.3 - 454.7	443	Yes
M	Knee Pivot Height	485.1 - 500.4	496	Yes
N	Buttock Popliteal Length	452.1 - 477.5	473	Yes
O	Chest Depth	213.4 - 228.6	227	Yes
P	Foot Length	251.5 - 266.7	260	Yes
V	Shoulder Breadth	421.6 - 436.9	434	Yes
W	Foot Breadth	91.4 - 106.7	100	Yes
Y	Chest Circumference	970.3 - 1000.8	999	Yes
Z	Waist Circumference	835.7 - 866.1	863	Yes
AA	Location For Chest Circumference	429.3 - 434.3	430	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Technician



Approved



Calibration Test Results

Pre-Test

Left Rear Passenger Dummy S/N: 043

Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 043 Certification No. 9-2

Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	238.0 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	-3.5 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

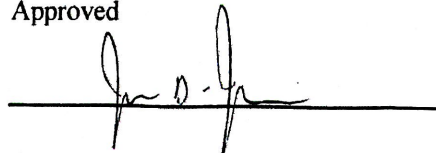
Test meets specifications.

Comments:

Technician



Approved



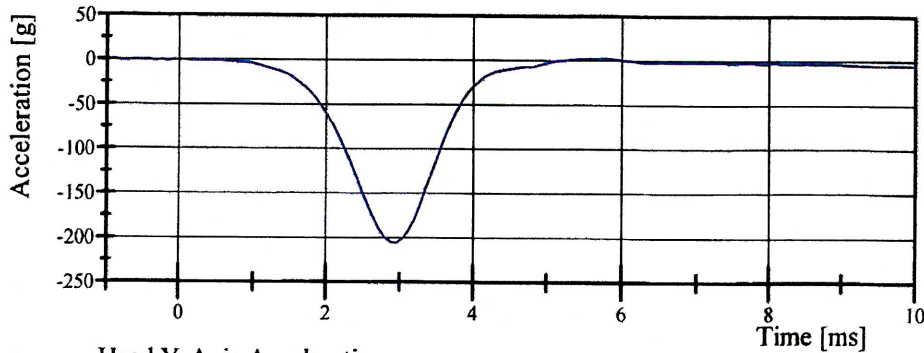
Transportation Research Center Inc.

Front Head Drop

HIII 50th Serial No. 043 Certification No. 9-2

Test Date: 1/25/2010

Head X-Axis Acceleration

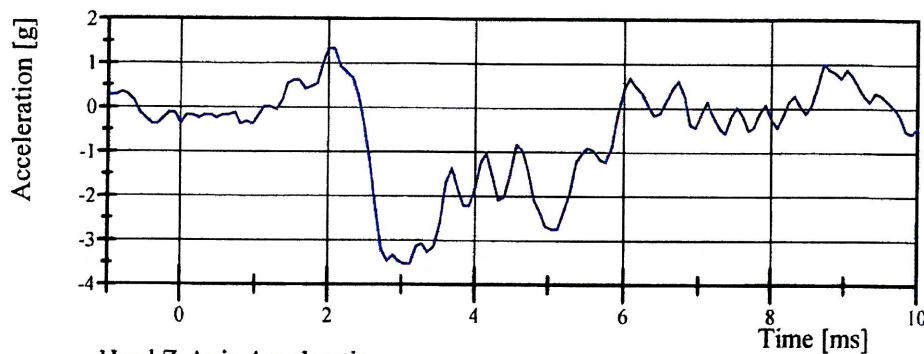


Filter Class: CFC_1000

Max: 3.1 g at 5.8 ms

Min: -205.7 g at 3.0 ms

Head Y-Axis Acceleration

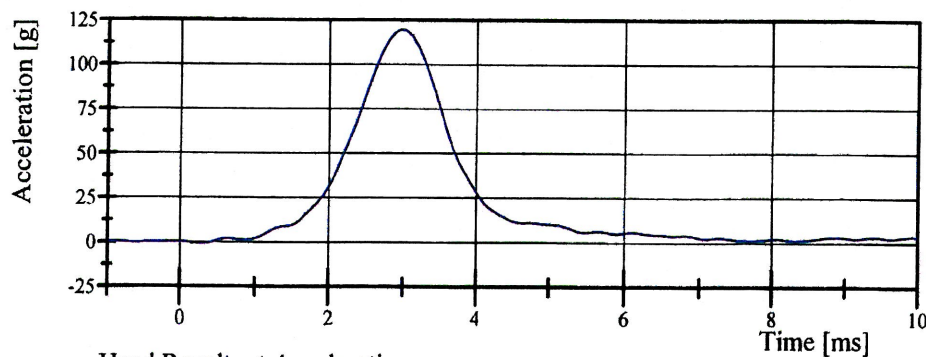


Filter Class: CFC_1000

Max: 1.3 g at 2.0 ms

Min: -3.5 g at 3.0 ms

Head Z-Axis Acceleration

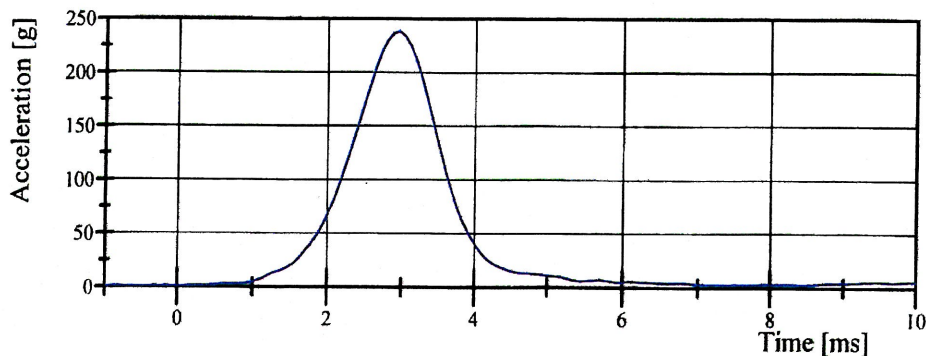


Filter Class: CFC_1000

Max: 119.8 g at 3.0 ms

Min: -1.0 g at 0.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 238.0 g at 3.0 ms

Min: 0.6 g at -0.5 ms

Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 043 Certification No. 9-1

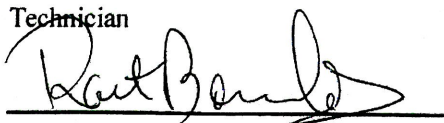
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	6.89 - 7.13 m/s	6.956 m/s	Yes
Pendulum Acceleration Decay Crossing -5g	34 - 42 ms	37.0 ms	Yes
Pendulum Acceleration at 10ms	(-22.5) - (-27.5) g	-25.78 g	Yes
Pendulum Acceleration at 20ms	(-17.6) - (-22.6) g	-22.42 g	Yes
Pendulum Acceleration at 30ms	(-12.5) - (-18.5) g	-16.49 g	Yes
Pendulum Acceleration > 30ms	>= (-29.0) g	-16.49 g	Yes
Total Head D-Plane Rotation Peak	(-64) - (-78) °	-69.7 °	Yes
Time of Peak	57 - 64 ms	59.5 ms	Yes
Total Head D-Plane Rotation Decay to 0°	113 - 128 ms	123.0 ms	Yes
Total Neck Occipital Condyles Moment Peak	88 - 108 N·m	97.3 N·m	Yes
Time of Peak	47 - 58 ms	50.2 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	97 - 107 ms	97.0 ms	Yes

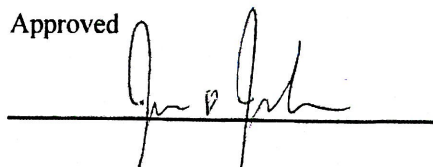
Test meets specifications.

Comments:

Technician



Approved



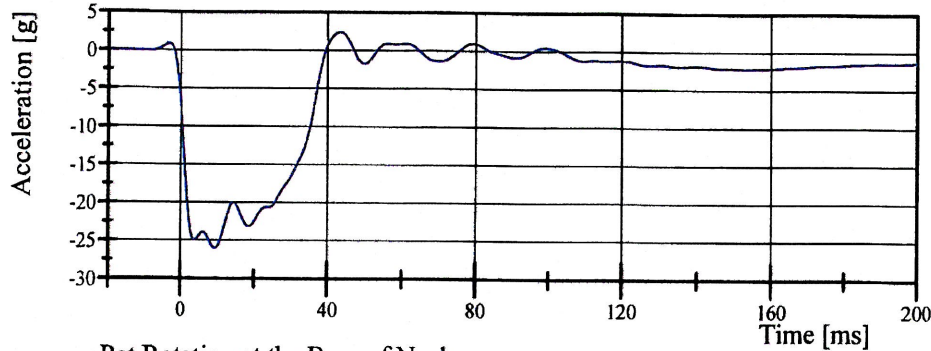
Transportation Research Center Inc.

Neck Flexion

HIII 50th Serial No. 043 Certification No. 9-1

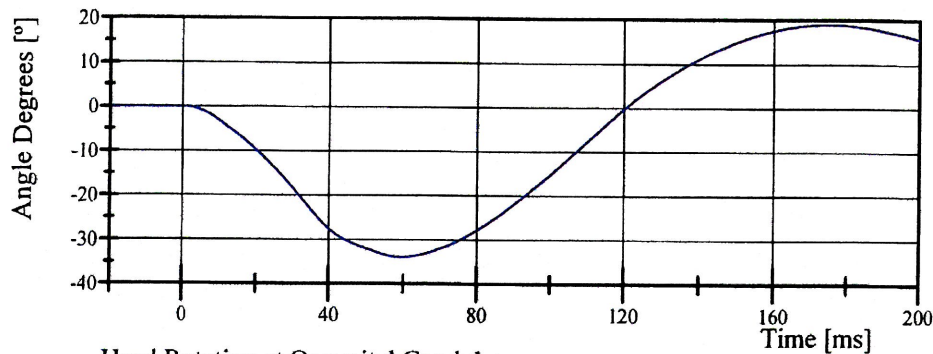
Test Date: 1/25/2010

Pendulum Acceleration



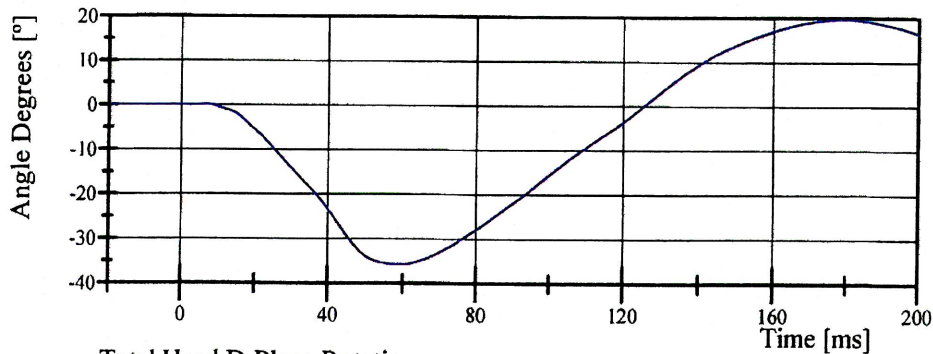
Filter Class: CFC_60
Max: 2.4 g at 43.3 ms
Min: -26.0 g at 9.4 ms

Pot Rotation at the Base of Neck



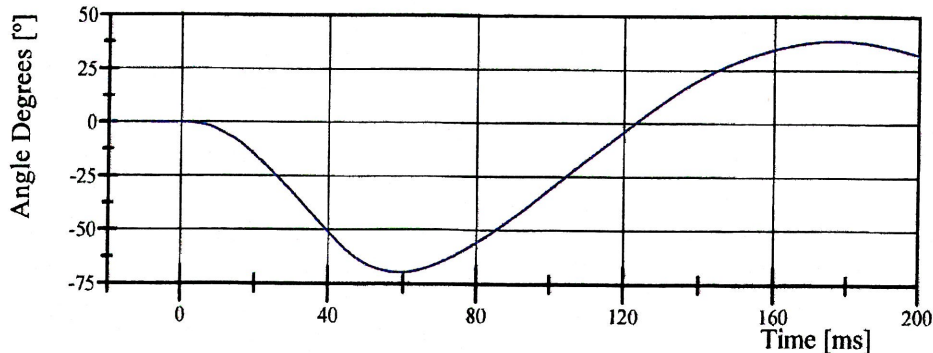
Filter Class: CFC_60
Max: 19.0 ° at 175.2 ms
Min: -33.9 ° at 59.6 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 19.6 ° at 179.4 ms
Min: -35.8 ° at 59.5 ms

Total Head D-Plane Rotation



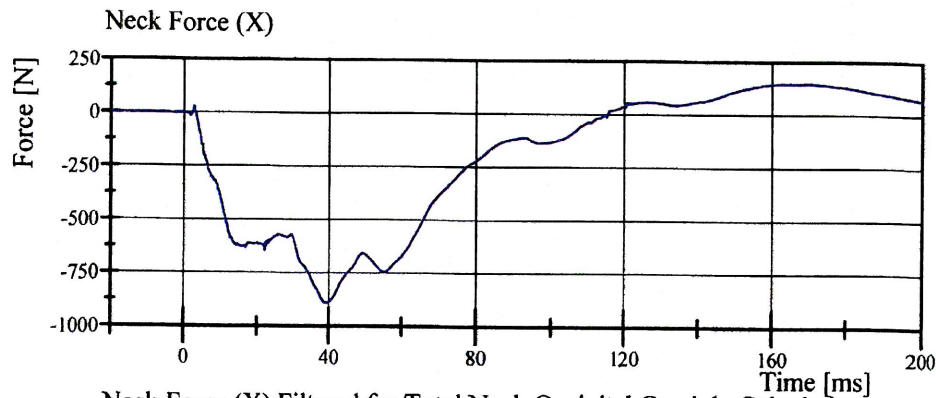
Filter Class: CFC_60
Max: 38.6 ° at 177.4 ms
Min: -69.7 ° at 59.5 ms

Transportation Research Center Inc.

Neck Flexion

HIH 50th Serial No. 043 Certification No. 9-1

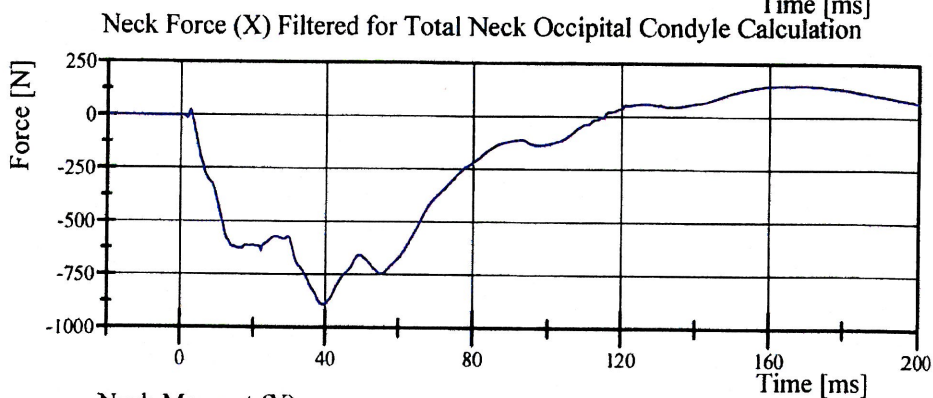
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 150.1 N at 169.5 ms

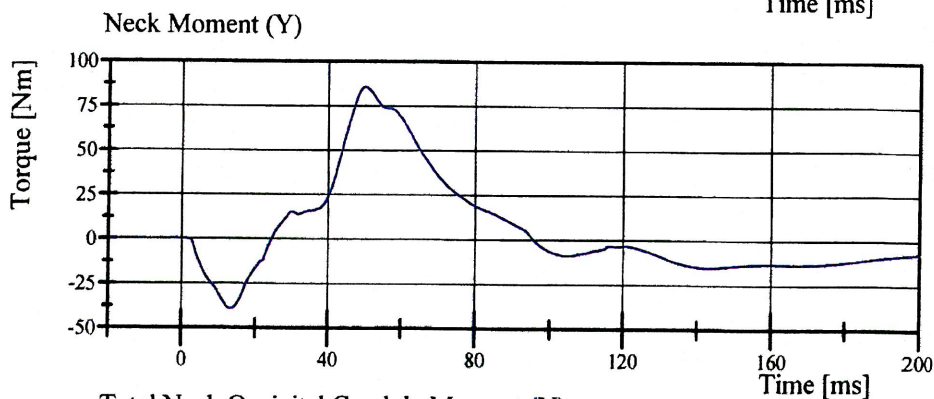
Min: -892.1 N at 39.3 ms



Filter Class: CFC_600

Max: 149.5 N at 169.5 ms

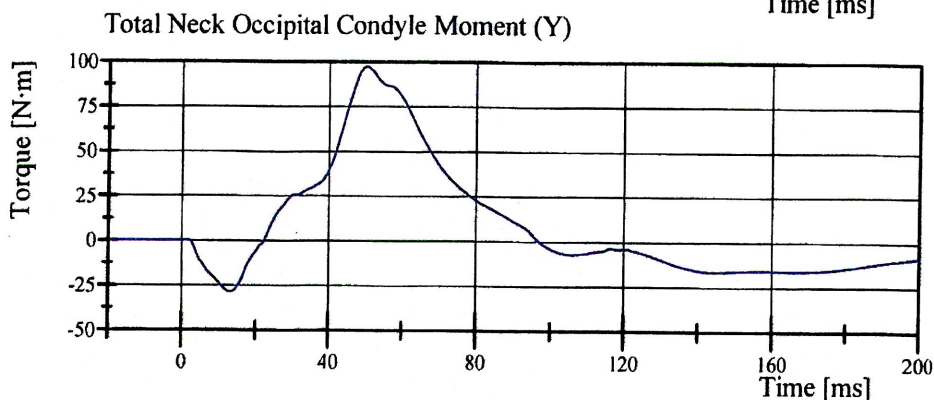
Min: -891.4 N at 39.3 ms



Filter Class: CFC_600

Max: 85.5 Nm at 50.1 ms

Min: -39.3 Nm at 13.5 ms



Filter Class: CFC_600

Max: 97.3 N·m at 50.2 ms

Min: -28.7 N·m at 12.8 ms

Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 043 Certification No. 9-2

Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.9 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.977 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	40.8 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.79 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	17.15 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	12.06 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	12.06 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	91.1 °	Yes
Time of Peak	72 - 82 ms	76.2 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	156.7 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-53) - (-80) N·m	-66.1 N·m	Yes
Time of Peak	65 - 79 ms	70.7 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	142.1 ms	Yes

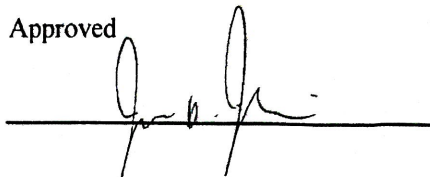
Test meets specifications.

Comments:

Technician



Approved



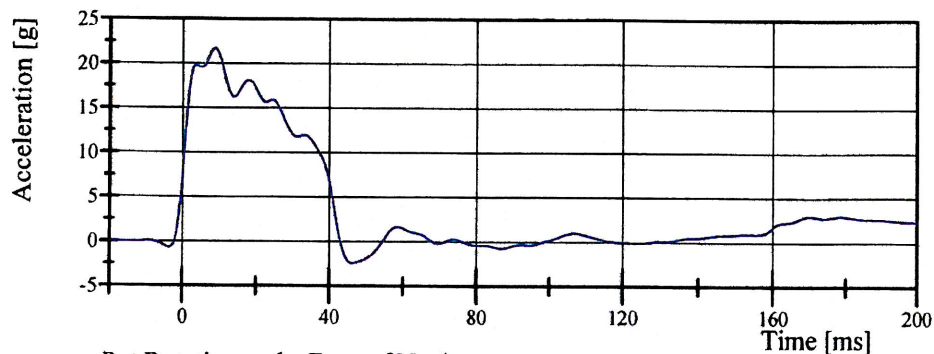
Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 043 Certification No. 9-2

Test Date: 1/25/2010

Pendulum Acceleration

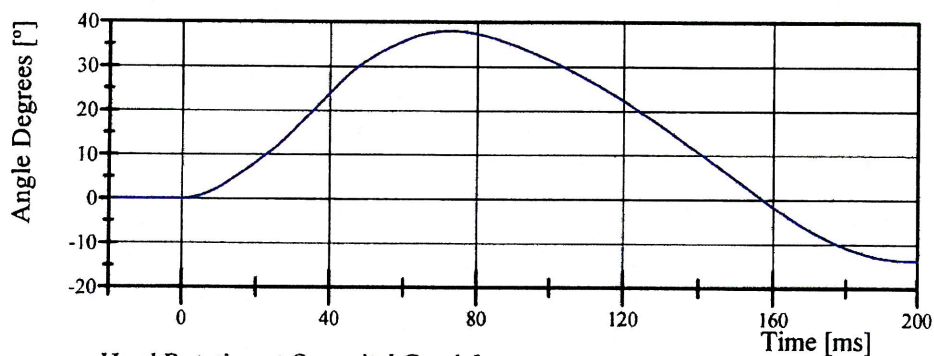


Filter Class: CFC_60

Max: 21.7 g at 8.6 ms

Min: -2.4 g at 46.5 ms

Pot Rotation at the Base of Neck

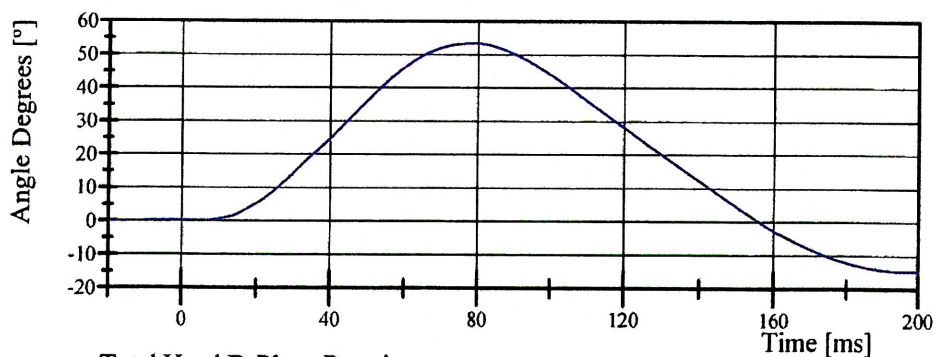


Filter Class: CFC_60

Max: 38.0 ° at 72.8 ms

Min: -13.7 ° at 198.6 ms

Head Rotation at Occypital Condyles

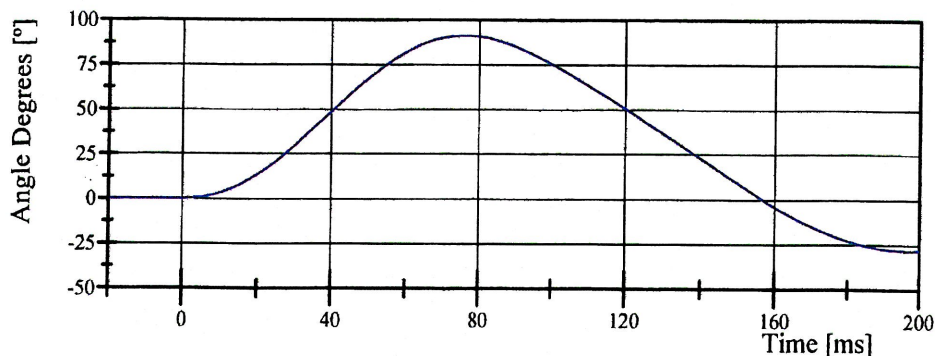


Filter Class: CFC_60

Max: 53.4 ° at 79.0 ms

Min: -14.7 ° at 196.8 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 91.1 ° at 76.2 ms

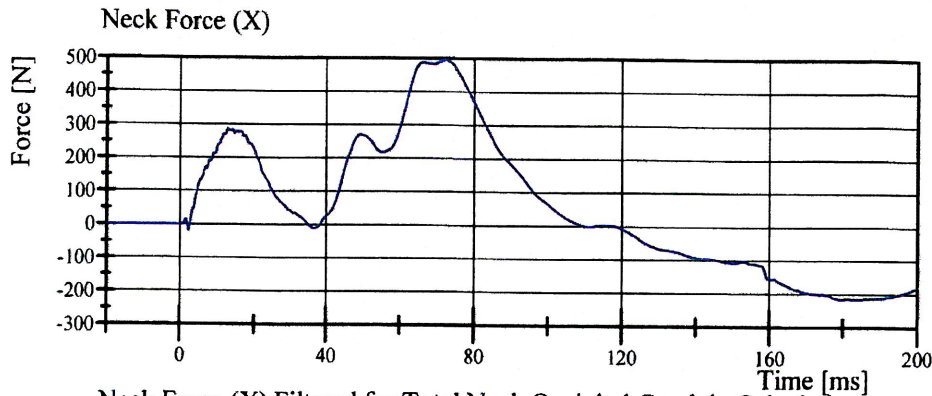
Min: -28.4 ° at 197.6 ms

Transportation Research Center Inc.

Neck Extension

HIII 50th Serial No. 043 Certification No. 9-2

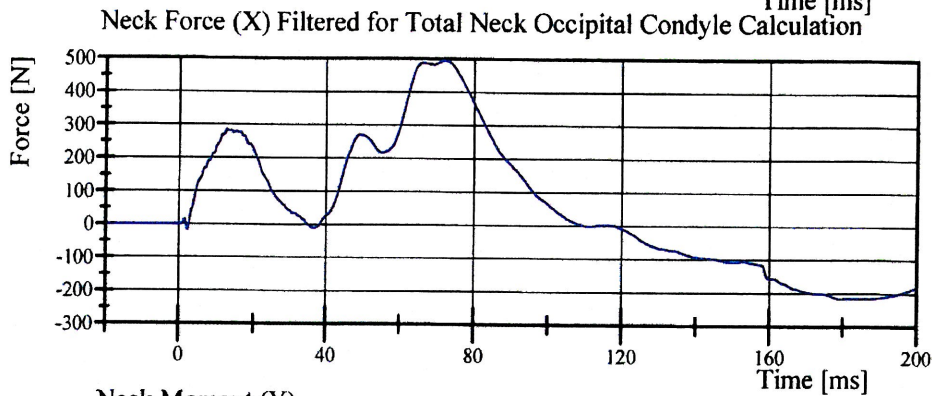
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 496.0 N at 72.1 ms

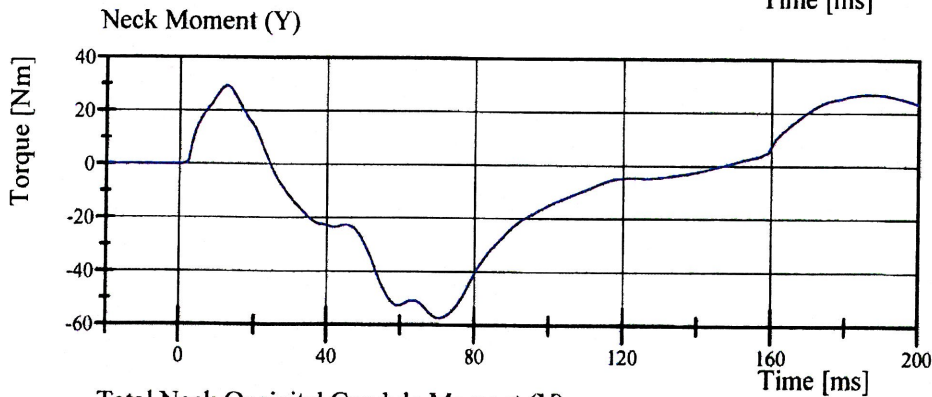
Min: -216.6 N at 179.4 ms



Filter Class: CFC_600

Max: 495.8 N at 72.2 ms

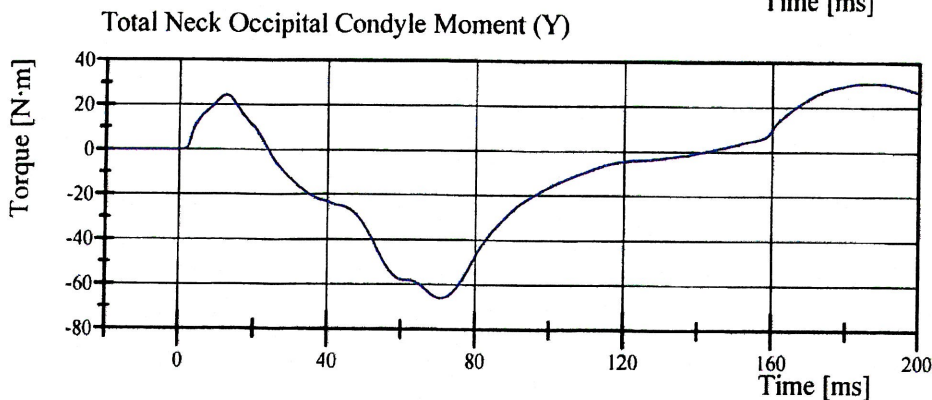
Min: -216.1 N at 179.4 ms



Filter Class: CFC_600

Max: 29.3 Nm at 12.8 ms

Min: -57.4 Nm at 70.6 ms



Filter Class: CFC_600

Max: 30.9 N·m at 187.3 ms

Min: -66.1 N·m at 70.7 ms

Transportation Research Center Inc.

Front Thorax

HIII 50th Serial No. 043 Certification No. 9-1

Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.8 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Probe Velocity	6.59 - 6.83 m/s	6.654 m/s	Yes
Probe Force Peak	(-5,160) - (-5,893) N	-5,651.6 N	Yes
Maximum Chest Compression	(-63.5) - (-72.6) mm	-69.98 mm	Yes
Internal Hysteresis	65 - 85 %	73.2 %	Yes

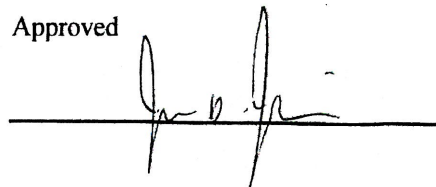
Test meets specifications.

Comments:

Technician



Approved



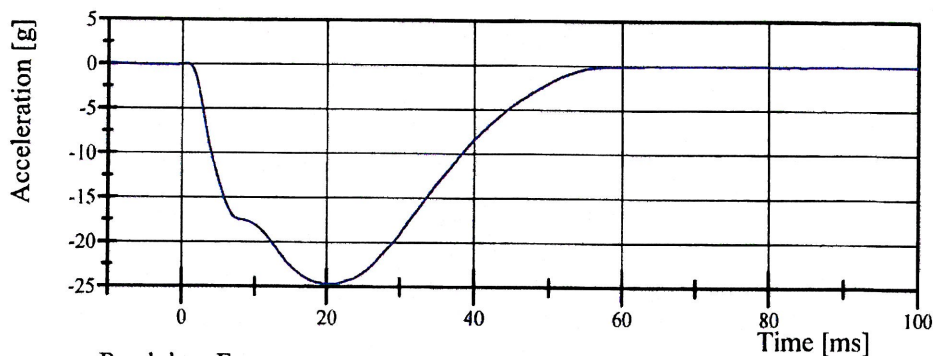
Transportation Research Center Inc.

Front Thorax

III 50th Serial No. 043 Certification No. 9-1

Test Date: 1/25/2010

Pendulum Acceleration

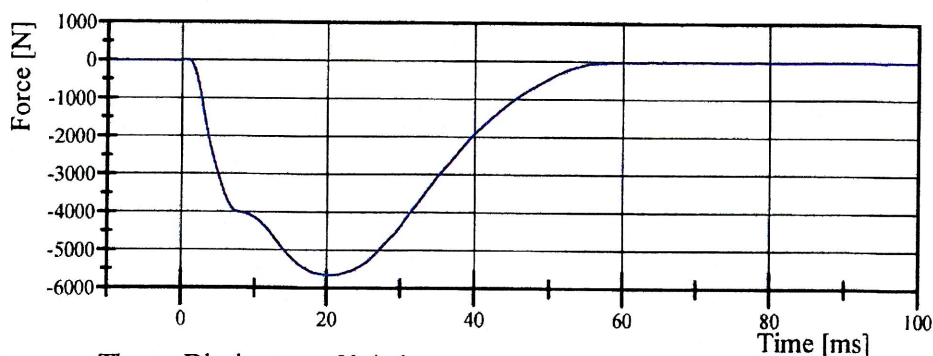


Filter Class: CFC_180

Max: 0.1 g at 0.6 ms

Min: -24.7 g at 20.3 ms

Pendulum Force

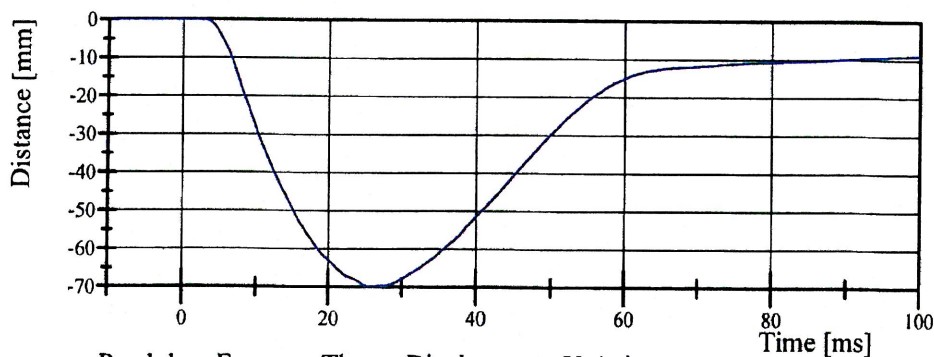


Filter Class: CFC_180

Max: 19.8 N at 0.6 ms

Min: -5,651.6 N at 20.3 ms

Thorax Displacement X-Axis

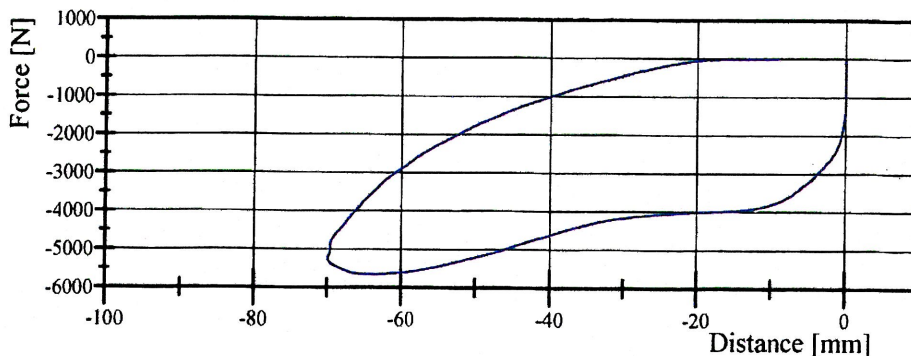


Filter Class: CFC_600

Max: 0.0 mm at -1.7 ms

Min: -70.0 mm at 25.8 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180

Max: 19.8 N at 0.0 mm

Min: -5,651.6 N at -63.6 mm

Transportation Research Center Inc

Hybrid III Hip Range of Motion

Serial Number: 043L

Date: 01/25/2010

Test Number: 043C09

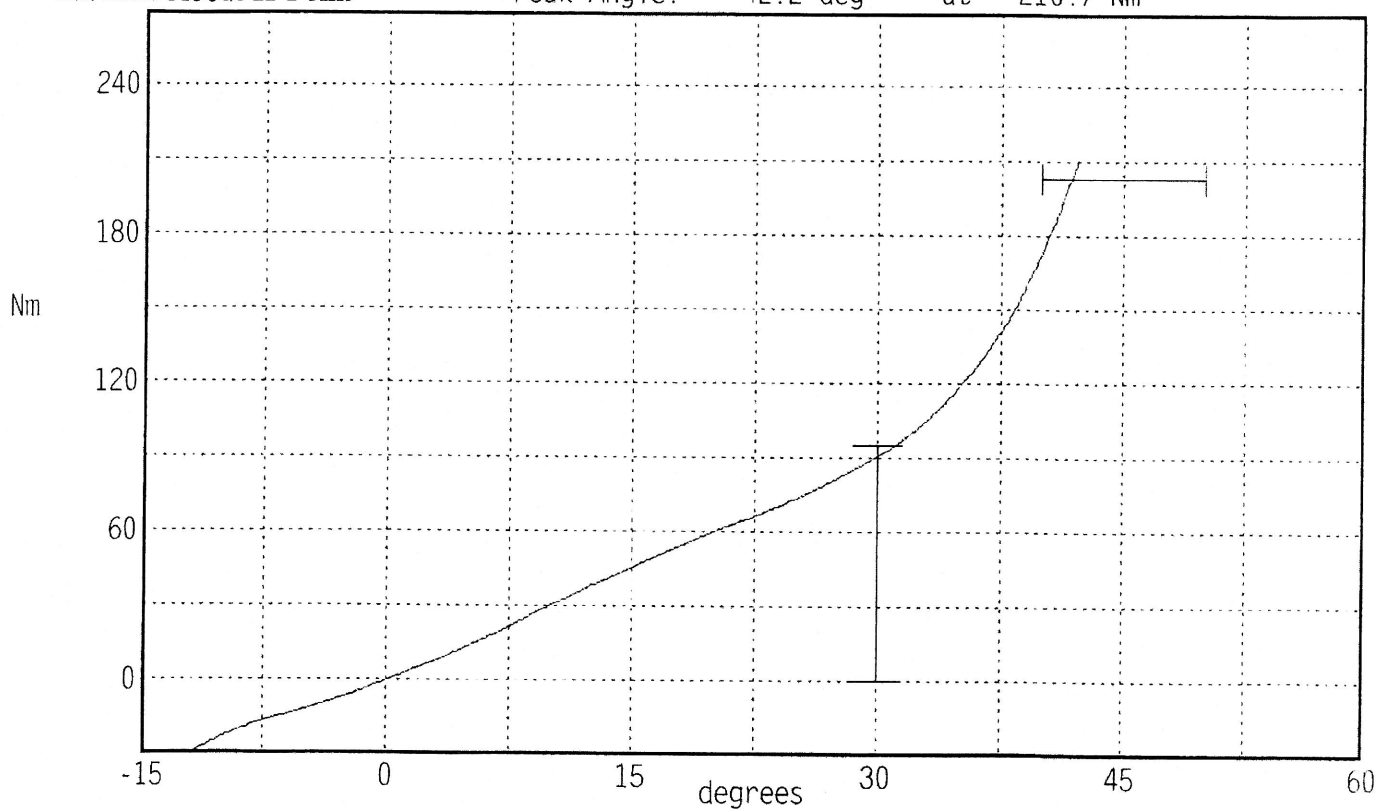
Time: 07:35

Comments:

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.7 °C Pass
Humidity	10 - 70	35 % Pass
Moment at 30 deg	<= 94.9	91.0 Nm Pass
Angle at 203 Nm	40.0 - 50.0	41.8 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Moment About H-Point

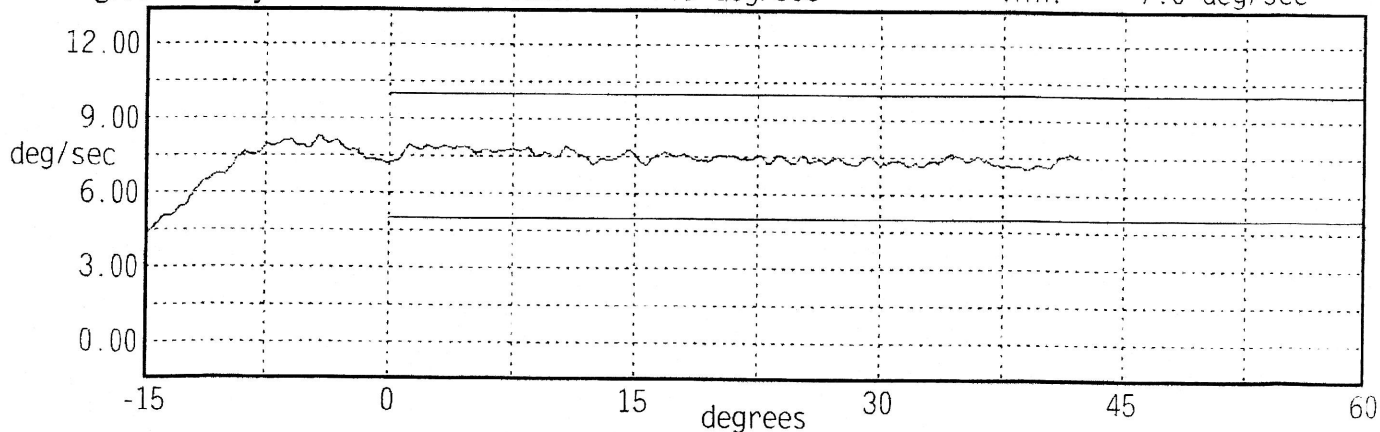
Peak Moment: 210.7 Nm at 42.2 deg
Peak Angle: 42.2 deg at 210.7 Nm



Angular Velocity

Max: 7.9 deg/sec

Min: 7.0 deg/sec



Transportation Research Center Inc

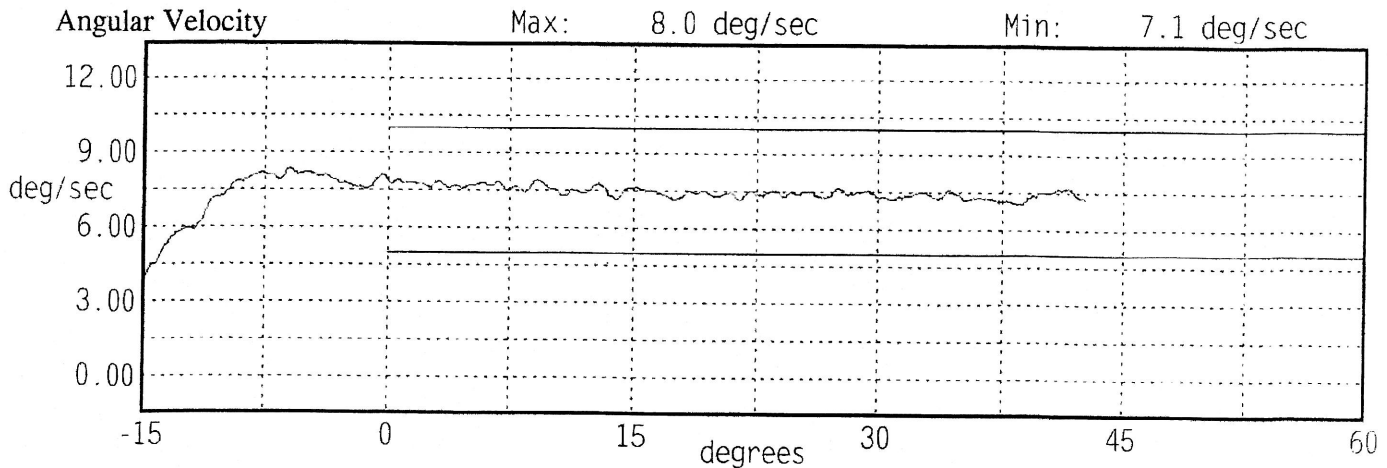
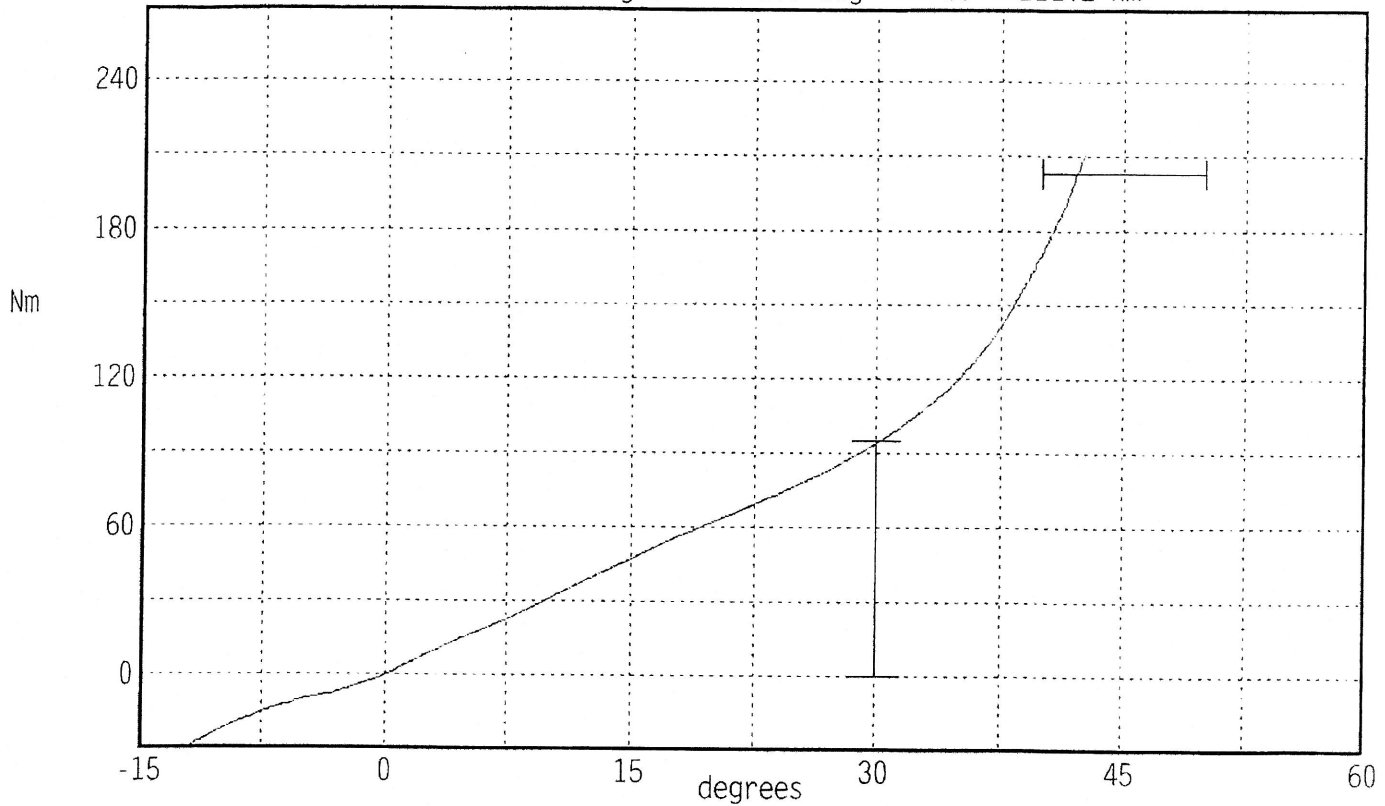
Hybrid III Hip Range of Motion

Serial Number: 043R
Test Number: 043C09
Comments:

Date: 01/25/2010
Time: 08:19

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	18.9 - 25.6	21.7 °C Pass
Humidity	10 - 70	33 % Pass
Moment at 30 deg	<= 94.9	94.1 Nm Pass
Angle at 203 Nm	40.0 - 50.0	42.1 deg Pass
Average Velocity	5.0 - 10.0	7.5 deg/sec Pass

Moment About H-Point
Peak Moment: 211.2 Nm at 42.6 deg
Peak Angle: 42.6 deg at 211.2 Nm



Transportation Research Center Inc.

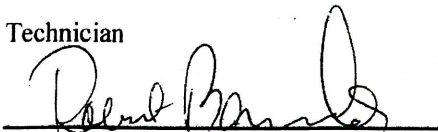
Left Knee Femur Response Test
HIII 50th Serial No. 043 Certification No. 9-1
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.0 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.130 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,441.37 N	Yes

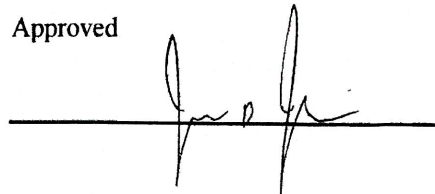
Test meets specifications.

Comments:

Technician

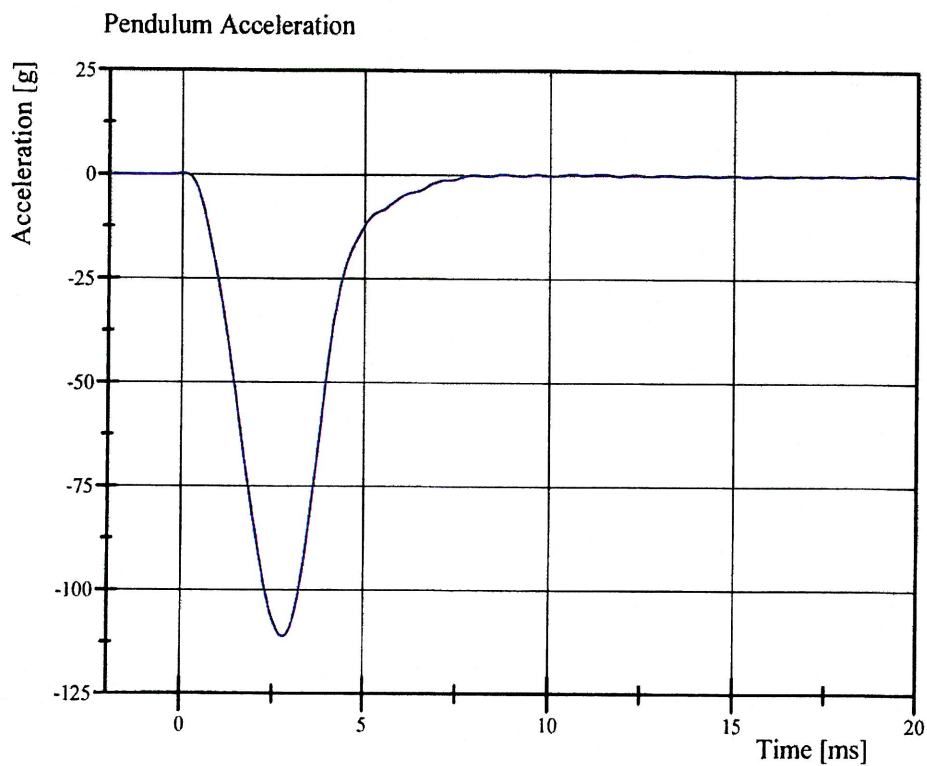


Approved

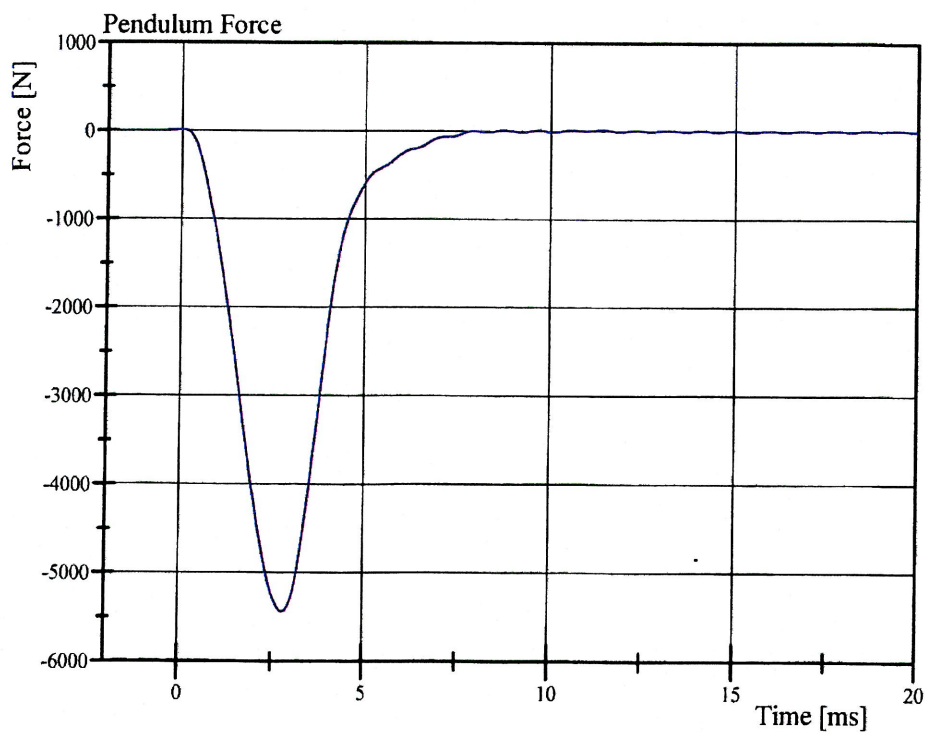


Transportation Research Center Inc.

Left Knee Femur Response Test
HIII 50th Serial No. 043 Certification No. 9-1
Test Date: 1/25/2010



Filter Class: CFC_600
Max: 0.3 g at 11.4 ms
Min: -111.2 g at 2.8 ms



Filter Class: CFC_600
Max: 14.0 N at 11.4 ms
Min: -5,441.4 N at 2.8 ms

Transportation Research Center Inc.

Right Knee Femur Response Test

HIII 50th Serial No. 043 Certification No. 9-1

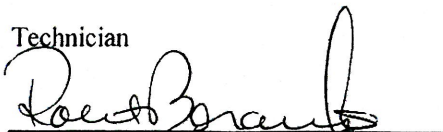
Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	18.9 - 25.5 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Probe Velocity	2.08 - 2.13 m/s	2.118 m/s	Yes
Peak Femur Force	(-4,715.2) - (-5,782.6) N	-5,514.91 N	Yes

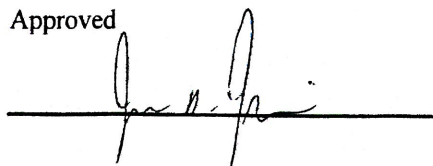
Test meets specifications.

Comments:

Technician

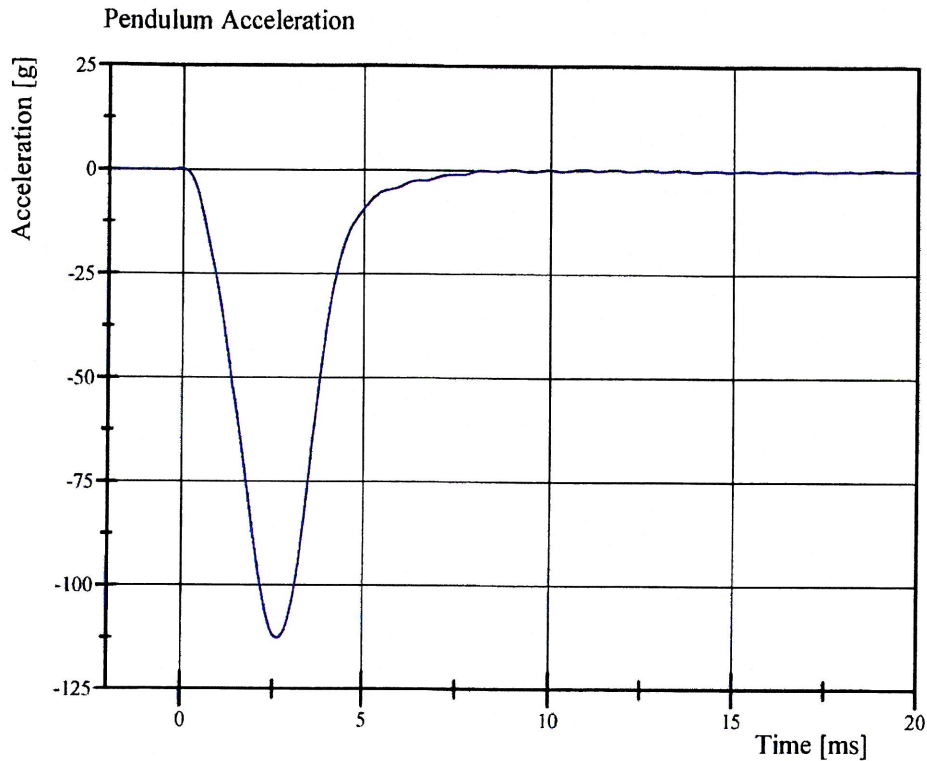


Approved

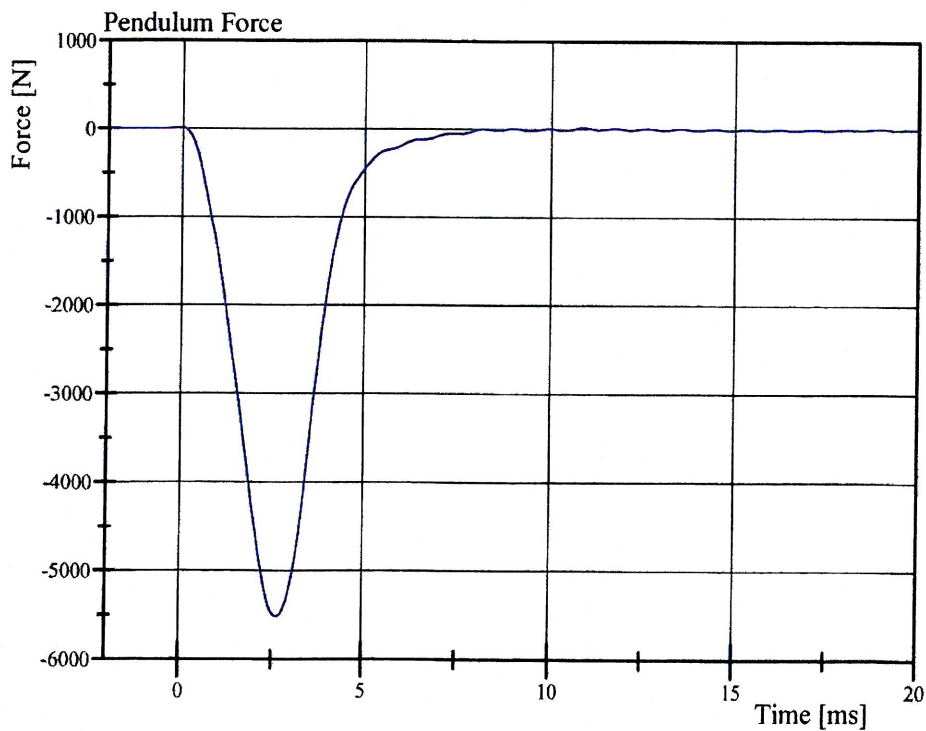


Transportation Research Center Inc.

Right Knee Femur Response Test
HIII 50th Serial No. 043 Certification No. 9-1
Test Date: 1/25/2010



Filter Class: CFC_600
Max: 0.4 g at 10.9 ms
Min: -112.7 g at 2.6 ms

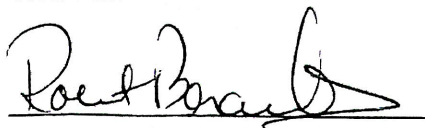


Filter Class: CFC_600
Max: 19.1 N at 10.9 ms
Min: -5,514.9 N at 2.6 ms

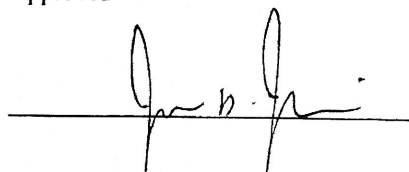
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 043 Calibration No. 9

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Total Sitting Height	878.8 - 889.0	886	Yes
B	Shoulder Pivot Height	505.5 - 520.7	515	Yes
C	H-Point Height	83.8 - 88.9	87	Yes
D	H-Point From Seatback	134.6 - 139.7	138	Yes
E	Shoulder Pivot From Backline	83.8 - 94.0	93	Yes
F	Thigh Clearance	139.7 - 154.9	153	Yes
G	Back Of Elbow To Wrist Pivot	289.6 - 304.8	292	Yes
H	Skull Cap To Backline	40.6 - 45.7	45	Yes
I	Shoulder-Elbow Length	330.2 - 345.4	337	Yes
J	Elbow Rest Height	190.5 - 210.8	200	Yes
K	Buttock Knee Length	579.1 - 604.5	598	Yes
L	Popliteal Height	429.3 - 454.7	443	Yes
M	Knee Pivot Height	485.1 - 500.4	495	Yes
N	Buttock Popliteal Length	452.1 - 477.5	473	Yes
O	Chest Depth	213.4 - 228.6	221	Yes
P	Foot Length	251.5 - 266.7	260	Yes
V	Shoulder Breadth	421.6 - 436.9	430	Yes
W	Foot Breadth	91.4 - 106.7	100	Yes
Y	Chest Circumference	970.3 - 1000.8	999	Yes
Z	Waist Circumference	835.7 - 866.1	864	Yes
AA	Location For Chest Circumference	429.3 - 434.3	430	Yes
BB	Location For Waist Circumference	226.1 - 231.1	230	Yes

Technician



Approved



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 100203

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
1	Trig D1	10ZERO000000VO0A	EVENT		1 Logic	Bipolar	
2	P52086	11PELVCG00H3ACZA	Pelvis Accel Z	1000	g	-Bipolar	1-001 VRTC H3 50th.022
3	P51954	11HEADCG00H3ACXA	Head Accel X	1000	g	-Bipolar	1-001 VRTC H3 50th.001
4	P58726	11HEADCG00H3ACYA	Head Accel Y	1000	g	-Bipolar	1-001 VRTC H3 50th.002
5	P51266	11HEADCG00H3ACZA	Head Accel Z	1000	g	-Bipolar	1-001 VRTC H3 50th.003
6	ARS-12K-ARS1082	11HEADCG00H3AVXA	Head (DTS ARS) Rate Gyro X	12000	%s	Bipolar	1-001 HIII 50th VRTC.031
7	ARS-12K-ARS2630	11HEADCG00H3AVYA	Head(DTS ARS) Rate Gyro Y	12000	%s	Bipolar	1-001 HIII 50th VRTC.032
8	ARS-12K-ARS1034	11HEADCG00H3AVZA	Head (DTS ARS) Rate Gyro Z	12000	%s	Bipolar	1-001 HIII 50th VRTC.033
9	IF-205-261-FX	11NECKUP00H3FOXA	Neck Force X	8896	N	-Bipolar	1-001 VRTC H3 50th.007
10	IF-205-261-FY	11NECKUP00H3FOYA	Neck Force Y	8896	N	Bipolar	1-001 VRTC H3 50th.008
11	IF-205-261-FZ	11NECKUP00H3FOZA	Neck Force Z	13344	N	Bipolar	1-001 VRTC H3 50th.009
12	IF-205-261-MX	11NECKUP00H3MOXA	Neck Moment X	282.5	Nm	-Bipolar	1-001 VRTC H3 50th.010
13	IF-205-261-MY	11NECKUP00H3MOYA	Neck Moment Y	282.5	Nm	Bipolar	1-001 VRTC H3 50th.011
14	IF-205-261-MZ	11NECKUP00H3MOZA	Neck Moment Z	282.5	Nm	Bipolar	1-001 VRTC H3 50th.012
15	P52081	11CHSTCG00H3ACXA	Chest Accel X	1000	g	Bipolar	1-001 VRTC H3 50th.013
16	02I02I05-F11	11CHSTCG00H3ACYA	Chest Accel Y	1000	g	-Bipolar	1-001 VRTC H3 50th.014
17	P58771	11CHSTCG00H3ACZA	Chest Accel Z	1000	g	-Bipolar	1-001 VRTC H3 50th.015
18	81422-84394-43	11CHST0000H3DSXA	Chest Deflection X CST001	84	mm	Bipolar	1-001 HIII 50th VRTC.019
19	1794A-249-FX	11NECKLO00H3FOXA	Lower Neck Force X	8896	N	-Bipolar	1-001 VRTC H3 50th.025
20	1794A-249-FY	11NECKLO00H3FOYA	Lower Neck Force Y	8896	N	Bipolar	1-001 VRTC H3 50th.026
21	1794A-249-FZ	11NECKLO00H3FOZA	Lower Neck Force Z	13345	N	Bipolar	1-001 VRTC H3 50th.027
22	1794A-249-MX	11NECKLO00H3MOXA	Lower Neck Moment X	282.5	Nm	-Bipolar	1-001 VRTC H3 50th.028
23	1794A-249-MY	11NECKLO00H3MOYA	Lower Neck Moment Y	282.5	Nm	Bipolar	1-001 VRTC H3 50th.029
24	1794A-249-MZ	11NECKLO00H3MOZA	Lower Neck Moment Z	282.5	Nm	Bipolar	1-001 VRTC H3 50th.030
25	P58870	11PELVCG00H3ACXA	Pelvis Accel X	1000	g	-Bipolar	1-001 VRTC H3 50th.020
26	P52071	11PELVCG00H3ACYA	Pelvis Accel Y	1000	g	-Bipolar	1-001 VRTC H3 50th.021
27	05G20-L12	13HEADCG00H3ACXA	Head Accel X	1000	g	Bipolar	3-110 HIII 50th FTSS.001
28	02A18-N15	13HEADCG00H3ACYA	Head Accel Y	1000	g	-Bipolar	3-110 HIII 50th FTSS.002
29	02I02I05-F09	13HEADCG00H3ACZA	Head Accel Z	1000	g	-Bipolar	3-110 HIII 50th FTSS.003
30	P51712	13HEADFR00H3ACYA	Head (FT) Accel Y	1000	g	-Bipolar	3-110 HIII 50th FTSS.004
31	P51717	13HEADFR00H3ACZA	Head (FT) Accel Z	1000	g	-Bipolar	3-110 HIII 50th FTSS.005
32	P50099	13HEADUP00H3ACXA	Head (TP) Accel X	1000	g	Bipolar	3-110 HIII 50th FTSS.006
33	B02A25-N01	13HEADUP00H3ACYA	Head (TP) Accel Y	1000	g	-Bipolar	3-110 HIII 50th FTSS.007
34	02A18-N01	13HEADLE00H3ACXA	Head (LT) Accel X	1000	g	Bipolar	3-110 HIII 50th FTSS.008
35	03F03J01-R11	13HEADLE00H3ACZA	Head (LT) Accel Z	1000	g	-Bipolar	3-110 HIII 50th FTSS.009
36	1716A-1597-FX	13NECKUP00H3FOXA	Neck Force X	8896.4	N	-Bipolar	3-110 HIII 50th FTSS.010

Channel Report Test Number 100203

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
37	1716A-1597-FY	13NECKUP00H3FOYA	Neck Force Y	8896.4	N	Bipolar	3-110 HIII 50th FTSS.011
38	1716A-1597-FZ	13NECKUP00H3FOZA	Neck Force Z	13344.6	N	Bipolar	3-110 HIII 50th FTSS.012
39	1716A-1597-MX	13NECKUP00H3MOXA	Neck Moment X	282.4	Nm	-Bipolar	3-110 HIII 50th FTSS.013
40	1716A-1597-MY	13NECKUP00H3MOYA	Neck Moment Y	282.4	Nm	Bipolar	3-110 HIII 50th FTSS.014
41	1716A-1597-MZ	13NECKUP00H3MOZA	Neck Moment Z	282.4	Nm	Bipolar	3-110 HIII 50th FTSS.015
42	1794A-0216-FX	13NECKLO00H3FOXA	Neck Lower Force X	13345	N	-Bipolar	3-110 HIII 50th FTSS.016
43	1794A-0216-FY	13NECKLO00H3FOYA	Neck Lower Force Y	13344.6	N	Bipolar	3-110 HIII 50th FTSS.017
44	1794A-0216-FZ	13NECKLO00H3FOZA	Neck Lower Force Z	13344.6	N	Bipolar	3-110 HIII 50th FTSS.018
45	1794A-0216-MX	13NECKLO00H3MOXA	Neck Lower Moment X	452	Nm	-Bipolar	3-110 HIII 50th FTSS.019
46	1794A-0216-MY	13NECKLO00H3MOYA	Neck Lower Moment Y	452	Nm	Bipolar	3-110 HIII 50th FTSS.020
47	1794A-0216-MZ	13NECKLO00H3MOZA	Neck Lower Moment Z	452	Nm	Bipolar	3-110 HIII 50th FTSS.021
48	99H12-F24	13CHSTCG00H3ACXA	Chest Accel X	1000	g	Bipolar	3-110 HIII 50th FTSS.022
49	02I02I05-F04	13CHSTCG00H3ACYA	Chest Accel Y	1000	g	-Bipolar	3-110 HIII 50th FTSS.023
50	03D03C27-N07	13CHSTCG00H3ACZA	Chest Accel Z	1000	g	-Bipolar	3-110 HIII 50th FTSS.024
51	14CB1-2897-9528	13CHST0000H3DSXA	Chest Deflection X (CST110)	75	mm	Bipolar	3-110 HIII 50th FTSS.028
52	P52008	13PELVCG00H3ACXA	Pelvis Accel X	1000	g	-Bipolar	3-110 HIII 50th FTSS.029
53	04J04I20-Z24	13PELVCG00H3ACYA	Pelvis Accel Y	1000	g	-Bipolar	3-110 HIII 50th FTSS.030
54	98H13-F19	13PELVCG00H3ACZA	Pelvis Accel Z	1000	g	-Bipolar	3-110 HIII 50th FTSS.031
55	P52023	14HEADCG00H3ACXA	Head Accel X	1000	g	-Bipolar	4-043 HIII 50th VRTC.001
56	P52013	14HEADCG00H3ACYA	Head Accel Y	1000	g	-Bipolar	4-043 HIII 50th VRTC.002
57	P52083	14HEADCG00H3ACZA	Head Accel Z	1000	g	-Bipolar	4-043 HIII 50th VRTC.003
58	ARS-12K-ARS2240	14HEADCG00H3AVXA	Head (DTS ARS) Rate Gyro X	12000	%s	Bipolar	4-043 HIII 50th VRTC.025
59	ARS-12K-ARS2238	14HEADCG00H3AVYA	Head (DTS ARS) Rate Gyro Y	12000	%s	Bipolar	4-043 HIII 50th VRTC.026
60	ARS-12K-ARS0253	14HEADCG00H3AVZA	Head (DTS ARS) Rate Gyro Z	12000	%s	Bipolar	4-043 HIII 50th VRTC.027
61	1716A-798-FX	14NECKUP00H3FOXA	Upper Neck Force X	8896	N	-Bipolar	4-043 HIII 50th VRTC.004
62	1716A-798-FY	14NECKUP00H3FOYA	Upper Neck Force Y	8896	N	Bipolar	4-043 HIII 50th VRTC.005
63	1716A-798-FZ	14NECKUP00H3FOZA	Upper Neck Force Z	13344	N	Bipolar	4-043 HIII 50th VRTC.006
64	1716A-798-MX	14NECKUP00H3MOXA	Upper Neck Moment X	282	Nm	-Bipolar	4-043 HIII 50th VRTC.007
65	1716A-798-MY	14NECKUP00H3MOYA	Upper Neck Moment Y	282	Nm	Bipolar	4-043 HIII 50th VRTC.008
66	1716A-798-MZ	14NECKUP00H3MOZA	Upper Neck Moment Z	282	Nm	Bipolar	4-043 HIII 50th VRTC.009
67	P16899	14CHSTCG00H3ACXA	Chest Accel X	1000	g	Bipolar	4-043 HIII 50th VRTC.010
68	P16517	14CHSTCG00H3ACYA	Chest Accel Y	1000	g	-Bipolar	4-043 HIII 50th VRTC.011
69	P51702	14CHSTCG00H3ACZA	Chest Accel Z	1000	g	-Bipolar	4-043 HIII 50th VRTC.012
70	84892-A-CST043	14CHST0000H3DSXA	Chest Deflection X	84	mm	-Bipolar	4-043 HIII 50th VRTC.013
71	1794A-250-FX	14NECKLO00H3FOXA	Lower Neck Force X	8896	N	-Bipolar	4-043 HIII 50th VRTC.016
72	1794A-250-FY	14NECKLO00H3FOYA	Lower Neck Force Y	8896	N	Bipolar	4-043 HIII 50th VRTC.017

Channel Report Test Number 100203

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
73	1794A-250-FZ	14NECKLO00H3FOZA	Lower Neck Force Z	13345	N	Bipolar	4-043 HIII 50th VRTC.018
74	1794A-250-MX	14NECKLO00H3MOXA	Lower Neck Moment X	282	Nm	-Bipolar	4-043 HIII 50th VRTC.019
75	1794A-250-MY	14NECKLO00H3MOYA	Lower Neck Moment Y	282	Nm	Bipolar	4-043 HIII 50th VRTC.020
76	1794A-250-MZ	14NECKLO00H3MOZA	Lower Neck Moment Z	282	Nm	Bipolar	4-043 HIII 50th VRTC.021
77	P52108	14PELVCG00H3ACXA	Pelvis Accel X	2000	g	-Bipolar	4-043 HIII 50th VRTC.022
78	P51710	14PELVCG00H3ACYA	Pelvis Accel Y	2000	g	-Bipolar	4-043 HIII 50th VRTC.023
79	P16225	14PELVCG00H3ACZA	Pelvis Accel Z	2000	g	-Bipolar	4-043 HIII 50th VRTC.024
80	P63129	10VEHCCG0000ACXA	Vehicle Center of Gravity X-axis A	2000	g	Bipolar	
81	P61736	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-axis A	2000	g	-Bipolar	
82	P63193	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-axis A	2000	g	Bipolar	
83	ARS-1500-ARS0665	10VEHCCG0000AVXA	Vehicle Center of Gravity ROLL R	1500	%s	Bipolar	
84	ARS-1500-ARS0737	10VEHCCG0000AVYA	Vehicle Center of Gravity PITCH I	1500	%s	-Bipolar	
85	ARS-1500-ARS0732	10VEHCCG0000AVZA	Vehicle Center of Gravity YAW R/	1500	%s	Bipolar	
86	ARS-1500-ARS1091	10VEHCREDK00AVXA	Rear Deck (cargo area) ROLL RA	1500	%s	Bipolar	
87	ARS-1500-ARS1055	10VEHCREDK00AVYA	Rear Deck (cargo area) PITCH R.	1500	%s	-Bipolar	
88	ARS-1500-ARS0738	10VEHCREDK00AVZA	Rear Deck (cargo area) YAW RA	1500	%s	-Bipolar	
89	P61424	10ENGNTPO000ACXA	Top of Engine X-axis AccelTop of	2000	g	Bipolar	
90	P61282	10ENGNTPO000ACYA	Top of Engine Y-axis Accel	2000	g	-Bipolar	
91	P63134	10ENGNTPO000ACZA	Top of Engine Z-axis Accel	2000	g	Bipolar	
92	P49042	10ENGNBO0000ACXA	Bottom of Engine X-axis Accel	2000	g	Bipolar	
93	P63169	10ENGNBO0000ACYA	Bottom of Engine Y-axis Accel	2000	g	-Bipolar	
94	P48116	10ENGNBO0000ACZA	Left Bottom of Engine Z-axis Accel	2000	g	Bipolar	
95	P61325	10APILUPLE00ACXA	Left A-Pillar Upper X-Axis Acceler	2000	g	Bipolar	
96	P61735	10APILUPLE00ACYA	Left A-Pillar Upper Y-Axis Acceler	2000	g	Bipolar	
97	P62627	10APILUPLE00ACZA	Left A-Pillar Upper Z-Axis Acceler	2000	g	-Bipolar	
98	P62574	10APILLOLE00ACXA	Left A-Pillar Lower X-Axis Acceler	2000	g	Bipolar	
99	P61537	10APILLOLE00ACYA	Left A-Pillar Lower Y-Axis Acceler	2000	g	Bipolar	
100	P63138	10APILLOLE00ACZA	Left A-Pillar Lower Z-Axis Acceler	2000	g	-Bipolar	
101	P63137	10APILUPRI00ACXA	Right A-Pillar Upper X-Axis Accel	2000	g	Bipolar	
102	P61269	10APILUPRI00ACYA	Right A-Pillar Upper Y-Axis Accel	2000	g	-Bipolar	
103	P62225	10APILUPRI00ACZA	Right A-Pillar Upper Z-Axis Accel	2000	g	-Bipolar	
104	P61752	10APILLORI00ACXA	Right A-Pillar Lower X-Axis Accel	2000	g	Bipolar	
105	P62550	10APILLORI00ACYA	Right A-Pillar Lower Y-Axis Accel	2000	g	-Bipolar	
106	P62202	10APILLORI00ACZA	Right A-Pillar Lower Z-Axis Accel	2000	g	-Bipolar	
107	P57790	10BPILUPLE00ACXA	Left B-Pillar Upper X-Axis Acceler	2000	g	Bipolar	
108	P34212	10BPILUPLE00ACYA	Left B-Pillar Upper Y-Axis Acceler	2000	g	Bipolar	

Channel Report Test Number 100203

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
109	P61453	10BPILUPLE00ACZA	Left B-Pillar Upper Z-Axis Acceler	2000	g	-Bipolar	
110	P57185	10BPILLOLE00ACXA	Left B-Pillar Lower X-Axis Acceler	2000	g	Bipolar	
111	P58023	10BPILLOLE00ACYA	Left B-Pillar Lower Y-Axis Acceler	2000	g	Bipolar	
112	P58024	10BPILLOLE00ACZA	Left B-Pillar Lower Z-Axis Acceler	2000	g	-Bipolar	
113	P62197	10BPILUPRI00ACXA	Right B-Pillar Upper X-Axis Acceler	2000	g	Bipolar	
114	P63123	10BPILUPRI00ACYA	Right B-Pillar Upper Y-Axis Acceler	2000	g	-Bipolar	
115	P61296	10BPILUPRI00ACZA	Right B-Pillar Upper Z-Axis Acceler	2000	g	-Bipolar	
116	P58576	10BPILLORI00ACXA	Right B-Pillar Lower X-Axis Acceler	2000	g	Bipolar	
117	P62232	10BPILLORI00ACYA	Right B-Pillar Lower Y-Axis Acceler	2000	g	-Bipolar	
118	P62233	10BPILLORI00ACZA	Right B-Pillar Lower Z-Axis Acceler	2000	g	-Bipolar	
119	P63168	10CPILUPLE00ACXA	Left C-Pillar Upper X-Axis Acceler	2000	g	Bipolar	
120	P57784	10CPILUPLE00ACYA	Left C-Pillar Upper Y-Axis Acceler	2000	g	Bipolar	
121	P61434	10CPILUPLE00ACZA	Left C-Pillar Upper Z-Axis Acceler	2000	g	-Bipolar	
122	P61361	10CPILLOLE00ACXA	Left C-Pillar Lower X-Axis Acceler	2000	g	Bipolar	
123	P61746	10CPILLOLE00ACYA	Left C-Pillar Lower Y-Axis Acceler	2000	g	Bipolar	
124	P61774	10CPILLOLE00ACZA	Left C-Pillar Lower Z-Axis Acceler	2000	g	-Bipolar	
125	P61733	10CPILUPRI00ACXA	Right C-Pillar Upper X-Axis Acceler	2000	g	Bipolar	
126	P61732	10CPILUPRI00ACYA	Right C-Pillar Upper Y-Axis Acceler	2000	g	-Bipolar	
127	P61754	10CPILUPRI00ACZA	Right C-Pillar Upper Z-Axis Acceler	2000	g	-Bipolar	
128	P62208	10CPILLORI00ACXA	Right C-Pillar Lower X-Axis Acceler	2000	g	Bipolar	
129	P46517	10CPILLORI00ACYA	Right C-Pillar Lower Y-Axis Acceler	2000	g	-Bipolar	
130	P63135	10CPILLORI00ACZA	Right C-Pillar Lower Z-Axis Acceler	2000	g	-Bipolar	
131	P63136	10DPILUPLE00ACXA	Left D-Pillar Upper X-Axis Acceler	2000	g	Bipolar	
132	P58552	10DPILUPLE00ACYA	Left D-Pillar Upper Y-Axis Acceler	2000	g	Bipolar	
133	P63173	10DPILUPLE00ACZA	Left D-Pillar Upper Z-Axis Acceler	2000	g	-Bipolar	
134	P63195	10DPILLOLE00ACXA	Left D-Pillar Lower X-Axis Acceler	2000	g	Bipolar	
135	P63200	10DPILLOLE00ACYA	Left D-Pillar Lower Y-Axis Acceler	2000	g	Bipolar	
136	P63180	10DPILLOLE00ACZA	Left D-Pillar Lower Z-Axis Acceler	2000	g	-Bipolar	
137	P62834	10DPILUPRI00ACXA	Right D-Pillar Upper X-Axis Acceler	2000	g	Bipolar	
138	P63085	10DPILUPRI00ACYA	Right D-Pillar Upper Y-Axis Acceler	2000	g	-Bipolar	
139	P64864	10DPILUPRI00ACZA	Right D-Pillar Upper Z-Axis Acceler	2000	g	-Bipolar	
140	P61314	10DPILLORI00ACXA	Right D-Pillar Lower X-Axis Acceler	2000	g	Bipolar	
141	P46509	10DPILLORI00ACYA	Right D-Pillar Lower Y-Axis Acceler	2000	g	-Bipolar	
142	P62628	10DPILLORI00ACZA	Right D-Pillar Lower Z-Axis Acceler	2000	g	-Bipolar	
143	P64868	102RDK000000ACXA	Vehicle Rear Deck X-axis Acceler	2000	g	-Bipolar	
144	P63198	102RDK000000ACYA	Vehicle Rear Deck Y-axis Acceler	2000	g	-Bipolar	

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Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
145	P63192	102RDK000000ACZA	Vehicle Rear Deck Z-axis Acceler	2000	g	-Bipolar	
146	P61310	11SEAT000000ACXA	LF Seat Position (on floor) X-axis	2000	g	Bipolar	
147	P62632	11SEAT000000ACYA	LF Seat Position (on floor) Y-axis	2000	g	-Bipolar	
148	P61388	11SEAT000000ACZA	LF Seat Position (on floor) Z-axis	2000	g	-Bipolar	
149	P61405	13SEAT000000ACXA	RF Seat Position (on floor) X-axis	2000	g	Bipolar	
150	P63131	13SEAT000000ACYA	RF Seat Position (on floor) Y-axis	2000	g	-Bipolar	
151	P64806	13SEAT000000ACZA	RF Seat Position (on floor) Z-axis	2000	g	-Bipolar	
152	P62213	14SEAT000000ACXA	LR Seat Position (on floor) X-axis	2000	g	Bipolar	
153	P45012	14SEAT000000ACYA	LR Seat Position (on floor) Y-axis	2000	g	-Bipolar	
154	P61394	14SEAT000000ACZA	LR Seat Position (on floor) Z-axis	2000	g	-Bipolar	
155	P57207	16SEAT000000ACXA	RR Seat Position (on floor) X-axis	2000	g	Bipolar	
156	P57876	16SEAT000000ACYA	RR Seat Position (on floor) Y-axis	2000	g	-Bipolar	
157	P61536	16SEAT000000ACZA	RR Seat Position (on floor) Z-axis	2000	g	-Bipolar	
158	3419T-828	11SEBE0000B5FO0A	Driver Lap Belt Force	15568	N	Bipolar	
159	X08012	11SEBE0000B3FO0A	Driver Shoulder Belt Force	15568	N	Bipolar	
160	3419-829	13SEBE0000B5FO0A	Front Pass. Lap Belt Force	15568	N	Bipolar	
161	X08010	13SEBE0000B3FO0A	Front Pass. Shldr. Belt Force	15568	N	Bipolar	
162	3419-830	14SEBE0000B5FO0A	Left Rear Pass. Lap Belt Force	15568	N	Bipolar	
163	X08013	14SEBE0000B3FO0A	Left Rear Pass. Shldr. Belt Force	15568	N	Bipolar	
164	G1805342B	11SEBE0000B5DS0A	Driver Seat Belt Spool Potentiome	750	mm	Bipolar	
165	K1506282A	13SEBE0000B5DS0A	Right Front Belt Spool Potentiome	750	mm	Bipolar	
166	B1801244B	14SEBE0000B5DS0A	Left Rear Passenger Belt Spool P	750	mm	Bipolar	
167	Bit.00	11CONT000023EV00	DRIV. Head Contact Switch	1	Logic	Bipolar	
168	Bit.01	11CONT000024EV00	DRIV. Thorax Contact Switch	1	Logic	Bipolar	
169	Bit.02	11CONT000025EV00	DRIV. Pelvis Contact Switch	1	Logic	Bipolar	
170	Bit.03	13CONT000026EV00	Pass. Head Contact Switch	1	Logic	Bipolar	
171	Bit.05	13CONT000027EV00	Pass. Thorax Contact Switch	1	Logic	Bipolar	
172	Bit.06	13CONT000028EV00	Pass. Pelvis Contact Switch	1	Logic	Bipolar	
173	Bit.07	14CONT000029EV00	Left Rear Pass. Head Contact Sw	1	Logic	Bipolar	
174	Bit.08	14CONT000030EV00	Left Rear Pass. Thorax Contact S	1	Logic	Bipolar	
175	Bit.09	14CONT000031EV00	Left Rear Pass. Pelvis Contact Sv	1	Logic	Bipolar	
176	ABT squib volts	11AIRB000000VO0A	Left Side Curtain Airbag Voltage	50	V	Bipolar	
177	ABT squib volts	13AIRB000000VO0A	Right Side Curtain Airbag Voltage	50	V	Bipolar	
	ABT squib amps	11AIRB000000CU0A	Left Side Curtain Airbag Current	5	A	Bipolar	
	ABT squib amps	13AIRB000000CU0A	Right Side Curtain Airbag Current	5	A	Bipolar	

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Chan	ISO mnemonic	Channel Title	Filter	Flip	Zero	Full Scale
1	11HEADCG00H3ACXA	Driver Head X-Axis Acceleration	1000	+	yes	1000
2	11HEADCG00H3ACYA	Driver Head Y-Axis Acceleration	1000	+	yes	1000
3	11HEADCG00H3ACZA	Driver Head Z-Axis Acceleration	1000	+	yes	1000
3A	11HEADCG00H3ACRA	Driver Head Resultant Acceleration	1000			
4	11HEADCG00H3AVXA	Driver Head (DTS ARS) Rate Gyro X	1000	+	yes	12000
5	11HEADCG00H3AVYA	Driver Head (DTS ARS) Rate Gyro Y	1000	+	yes	12000
6	11HEADCG00H3AVZA	Driver Head (DTS ARS) Rate Gyro Z	1000	+	yes	12000
7	11NECKUP00H3FOXA	Driver Upper Neck X-Axis Force	1000	+	yes	8896
8	11NECKUP00H3FOYA	Driver Upper Neck Y-Axis Force	1000	+	yes	8896
9	11NECKUP00H3FOZA	Driver Upper Neck Z-Axis Force	1000	+	yes	13344
10	11NECKUP00H3MOXA	Driver Upper Neck Moment About X Axis	600	+	yes	282.5
11	11NECKUP00H3MOYA	Driver Upper Neck Moment About Y Axis	600	+	yes	282.5
12	11NECKUP00H3MOZA	Driver Upper Neck Moment About Z Axis	600	+	yes	282.5
13	11CHSTCG00H3ACXA	Driver Chest X-Axis Acceleration	180	+	yes	1000
14	11CHSTCG00H3ACYA	Driver Chest Y-Axis Acceleration	180	+	yes	1000
15	11CHSTCG00H3ACZA	Driver Chest Z-Axis Acceleration	180	+	yes	1000
15A	11CHSTCG00H3ACRA	Driver Chest Resultant Acceleration	180			
16	11CHST0000H3DSXA	Driver Chest X-Axis Displacement	600	+	yes	84
17	11NECKLO00H3FOXA	Driver Lower Neck X-Axis Force	1000	+	yes	8896
18	11NECKLO00H3FOYA	Driver Lower Neck Y-Axis Force	1000	+	yes	8896
19	11NECKLO00H3FOZA	Driver Lower Neck Z-Axis Force	1000	+	yes	13345
20	11NECKLO00H3MOXA	Driver Lower Neck Moment About X Axis	600	+	yes	282.5
21	11NECKLO00H3MOYA	Driver Lower Neck Moment About Y Axis	600	+	yes	282.5
22	11NECKLO00H3MOZA	Driver Lower Neck Moment About Z Axis	600	+	yes	282.5
23	11PELVCG00H3ACXA	Driver Pelvis X-Axis Acceleration	1000	+	yes	1000
24	11PELVCG00H3ACYA	Driver Pelvis Y-Axis Acceleration	1000	+	yes	1000
25	11PELVCG00H3ACZA	Driver Pelvis Z-Axis Acceleration	1000	+	yes	1000
25A	11PELVCG00H3ACRA	Driver Pelvis Resultant Acceleration	1000			
26	13HEADCG00H3ACXA	Right Front Passenger Head X-Axis Acceleration	1000	+	yes	1000
27	13HEADCG00H3ACYA	Right Front Passenger Head Y-Axis Acceleration	1000	+	yes	1000
28	13HEADCG00H3ACZA	Right Front Passenger Head Z-Axis Acceleration	1000	+	yes	1000
28A	13HEADCG00H3ACRA	Right Front Passenger Head Resultant Acceleration	1000			
29	13HEADFR00H3ACYA	Right Front Passenger Head Front Y-Axis Acceleration	1000	+	yes	1000
30	13HEADFR00H3ACZA	Right Front Passenger Head Front Z-Axis Acceleration	1000	+	yes	1000
31	13HEADUP00H3ACXA	Right Front Passenger Head Top X-Axis Acceleration	1000	+	yes	1000
32	13HEADUP00H3ACYA	Right Front Passenger Head Top Y-Axis Acceleration	1000	+	yes	1000
33	13HEADLE00H3ACXA	Right Front Passenger Head Left X-Axis Acceleration	1000	+	yes	1000
34	13HEADLE00H3ACZA	Right Front Passenger Head Left Z-Axis Acceleration	1000	+	yes	1000
35	13NECKUP00H3FOXA	Right Front Passenger Upper Neck X-Axis Force	1000	+	yes	8896.4

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Chan	ISO mnemonic	Channel Title	Filter	Flip	Zero	Full Scale
36	13NECKUP00H3FOYA	Right Front Passenger Upper Neck Y-Axis Force	1000	+	yes	8896.4
37	13NECKUP00H3FOZA	Right Front Passenger Upper Neck Z-Axis Force	1000	+	yes	13344.6
38	13NECKUP00H3MOXA	Right Front Passenger Upper Neck Moment About X Axis	600	+	yes	282.4
39	13NECKUP00H3MOYA	Right Front Passenger Upper Neck Moment About Y Axis	600	+	yes	282.4
40	13NECKUP00H3MOZA	Right Front Passenger Upper Neck Moment About Z Axis	600	+	yes	282.4
41	13NECKLO00H3FOXA	Right Front Passenger Lower Neck X-Axis Force	1000	+	yes	13345
42	13NECKLO00H3FOYA	Right Front Passenger Lower Neck Y-Axis Force	1000	+	yes	13344.6
43	13NECKLO00H3FOZA	Right Front Passenger Lower Neck Z-Axis Force	1000	+	yes	13344.6
44	13NECKLO00H3MOXA	Right Front Passenger Lower Neck Moment About X Axis	600	+	yes	452
45	13NECKLO00H3MOYA	Right Front Passenger Lower Neck Moment About Y Axis	600	+	yes	452
46	13NECKLO00H3MOZA	Right Front Passenger Lower Neck Moment About Z Axis	600	+	yes	452
47	13CHSTCG00H3ACXA	Right Front Passenger Chest X-Axis Acceleration	180	+	yes	1000
48	13CHSTCG00H3ACYA	Right Front Passenger Chest Y-Axis Acceleration	180	+	yes	1000
49	13CHSTCG00H3ACZA	Right Front Passenger Chest Z-Axis Acceleration	180	+	yes	1000
49A	13CHSTCG00H3ACRA	Right Front Passenger Chest Resultant Acceleration	180			
50	13CHST0000H3DSXA	Right Front Passenger Chest X-Axis Displacement	600	+	yes	75
51	13PELVCG00H3ACXA	Right Front Passenger Pelvis X-Axis Acceleration	1000	+	yes	1000
52	13PELVCG00H3ACYA	Right Front Passenger Pelvis Y-Axis Acceleration	1000	+	yes	1000
53	13PELVCG00H3ACZA	Right Front Passenger Pelvis Z-Axis Acceleration	1000	+	yes	1000
53A	13PELVCG00H3ACRA	Right Front Passenger Pelvis Resultant Acceleration	1000			
54	14HEADCG00H3ACXA	Left Rear Passenger Head X-Axis Acceleration	1000	+	yes	1000
55	14HEADCG00H3ACYA	Left Rear Passenger Head Y-Axis Acceleration	1000	+	yes	1000
56	14HEADCG00H3ACZA	Left Rear Passenger Head Z-Axis Acceleration	1000	+	yes	1000
56A	14HEADCG00H3ACRA	Left Rear Passenger Head Resultant Acceleration	1000			
57	14HEADCG00H3AVXA	Left Rear Passenger Head (DTS ARS) Rate Gyro X	1000	+	yes	12000
58	14HEADCG00H3AVYA	Left Rear Passenger Head (DTS ARS) Rate Gyro Y	1000	+	yes	12000
59	14HEADCG00H3AVZA	Left Rear Passenger Head (DTS ARS) Rate Gyro Z	1000	+	yes	12000
60	14NECKUP00H3FOXA	Left Rear Passenger Upper Neck X-Axis Force	1000	+	yes	8896
61	14NECKUP00H3FOYA	Left Rear Passenger Upper Neck Y-Axis Force	1000	+	yes	8896
62	14NECKUP00H3FOZA	Left Rear Passenger Upper Neck Z-Axis Force	1000	+	yes	13344
63	14NECKUP00H3MOXA	Left Rear Passenger Upper Neck Moment About X Axis	600	+	yes	282
64	14NECKUP00H3MOYA	Left Rear Passenger Upper Neck Moment About Y Axis	600	+	yes	282
65	14NECKUP00H3MOZA	Left Rear Passenger Upper Neck Moment About Z Axis	600	+	yes	282
66	14CHSTCG00H3ACXA	Left Rear Passenger Chest X-Axis Acceleration	180	+	yes	1000
67	14CHSTCG00H3ACYA	Left Rear Passenger Chest Y-Axis Acceleration	180	+	yes	1000
68	14CHSTCG00H3ACZA	Left Rear Passenger Chest Z-Axis Acceleration	180	+	yes	1000
68A	14CHSTCG00H3ACRA	Left Rear Passenger Chest Resultant Acceleration	180			
69	14CHST0000H3DSXA	Left Rear Passenger Chest X-Axis Displacement	600	+	yes	84

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Chan	ISO mnemonic	Channel Title	Filter	Flip	Zero	Full Scale
70	14PELVCG00H3ACXA	Left Rear Passenger Pelvis X-Axis Acceleration	1000	+	yes	2000
71	14PELVCG00H3ACYA	Left Rear Passenger Pelvis Y-Axis Acceleration	1000	+	yes	2000
72	14PELVCG00H3ACZA	Left Rear Passenger Pelvis Z-Axis Acceleration	1000	+	yes	2000
72A	14PELVCG00H3ACRA	Left Rear Passenger Pelvis Resultant Acceleration	1000			
73	14NECKLO00H3FOXA	Left Rear Passenger Lower Neck X-Axis Force	1000	+	yes	8896
74	14NECKLO00H3FOYA	Left Rear Passenger Lower Neck Y-Axis Force	1000	+	yes	8896
75	14NECKLO00H3FOZA	Left Rear Passenger Lower Neck Z-Axis Force	1000	+	yes	13345
76	14NECKLO00H3MOXA	Left Rear Passenger Lower Neck Moment About X Axis	600	+	yes	282
77	14NECKLO00H3MOYA	Left Rear Passenger Lower Neck Moment About Y Axis	600	+	yes	282
78	14NECKLO00H3MOZA	Left Rear Passenger Lower Neck Moment About Z Axis	600	+	yes	282
79	10VEHCCG0000ACXA	Vehicle Center of Gravity X-Axis Acceleration	60	+	yes	2000
80	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-Axis Acceleration	60	+	yes	2000
81	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-Axis Acceleration	60	+	yes	2000
81A	10VEHCCG0000ACRA	Vehicle Center of Gravity Resultant Acceleration	60			
82	10VEHCCG0000AVXA	Vehicle Roll Rate	600	+	yes	1500
83	10VEHCCG0000AVYA	Vehicle Pitch Rate	600	+	yes	1500
84	10VEHCCG0000AVZA	Vehicle Yaw Rate	600	+	yes	1500
85	10VEHCREDK00AVXA	Rear Deck Roll Rate Redundant	600	+	yes	1500
86	10VEHCREDK00AVYA	Rear Deck Pitch Rate Redundant	600	+	yes	1500
87	10VEHCREDK00AVZA	Rear Deck Yaw Rate Redundant	600	+	yes	1500
88	10ENGNTF0000ACXA	Top of Engine X-Axis Acceleration	60	+	yes	2000
89	10ENGNTF0000ACYA	Top of Engine Y-Axis Acceleration	60	+	yes	2000
90	10ENGNTF0000ACZA	Top of Engine Z-Axis Acceleration	60	+	yes	2000
90A	10ENGNTF0000ACRA	Top of Engine Resultant Acceleration	60			
91	10ENGNB0000ACXA	Bottom of Engine X-Axis Acceleration	60	+	yes	2000
92	10ENGNB0000ACYA	Bottom of Engine Y-Axis Acceleration	60	+	yes	2000
93	10ENGNB0000ACZA	Bottom of Engine Z-Axis Acceleration	60	+	yes	2000
93A	10ENGNB0000ACRA	Bottom of Engine Resultant Acceleration	60			
94	10APILUPLE00ACXA	Left A-Pillar Upper X-Axis Acceleration	60	+	yes	2000
95	10APILUPLE00ACYA	Left A-Pillar Upper Y-Axis Acceleration	60	+	yes	2000
96	10APILUPLE00ACZA	Left A-Pillar Upper Z-Axis Acceleration	60	+	yes	2000
96A	10APILUPLE00ACRA	Left A-Pillar Upper Resultant Acceleration	60			
97	10APILLOLE00ACXA	Left A-Pillar Lower X-Axis Acceleration	60	+	yes	2000
98	10APILLOLE00ACYA	Left A-Pillar Lower Y-Axis Acceleration	60	+	yes	2000
99	10APILLOLE00ACZA	Left A-Pillar Lower Z-Axis Acceleration	60	+	yes	2000
99A	10APILLOLE00ACRA	Left A-Pillar Lower Resultant Acceleration	60			
100	10APILUPRI00ACXA	Right A-Pillar Upper X-Axis Acceleration	60	+	yes	2000
101	10APILUPRI00ACYA	Right A-Pillar Upper Y-Axis Acceleration	60	+	yes	2000
102	10APILUPRI00ACZA	Right A-Pillar Upper Z-Axis Acceleration	60	+	yes	2000

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Channel	ISO mnemonic	Channel Title	Filter	Flip	Zero	Full Scale
102A	10APILUPRI00ACRA	Right A-Pillar Upper Resultant Acceleration	60			
103	10APILLORI00ACXA	Right A-Pillar Lower X-Axis Acceleration	60 +	yes		2000
104	10APILLORI00ACYA	Right A-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
105	10APILLORI00ACZA	Right A-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
105A	10APILLORI00ACRA	Right A-Pillar Lower Resultant Acceleration	60			
106	10BPILUPLE00ACXA	Left B-Pillar Upper X-Axis Acceleration	60 +	yes		2000
107	10BPILUPLE00ACYA	Left B-Pillar Upper Y-Axis Acceleration	60 +	yes		2000
108	10BPILUPLE00ACZA	Left B-Pillar Upper Z-Axis Acceleration	60 +	yes		2000
108A	10BPILUPLE00ACRA	Left B-Pillar Upper Resultant Acceleration	60			
109	10BPILLOLE00ACXA	Left B-Pillar Lower X-Axis Acceleration	60 +	yes		2000
110	10BPILLOLE00ACYA	Left B-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
111	10BPILLOLE00ACZA	Left B-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
111A	10BPILLOLE00ACRA	Left B-Pillar Lower Resultant Acceleration	60			
112	10BPILUPRI00ACXA	Right B-Pillar Upper X-Axis Acceleration	60 +	yes		2000
113	10BPILUPRI00ACYA	Right B-Pillar Upper Y-Axis Acceleration	60 +	yes		2000
114	10BPILUPRI00ACZA	Right B-Pillar Upper Z-Axis Acceleration	60 +	yes		2000
114A	10BPILUPRI00ACRA	Right B-Pillar Upper Resultant Acceleration	60			
115	10BPILLORI00ACXA	Right B-Pillar Lower X-Axis Acceleration	60 +	yes		2000
116	10BPILLORI00ACYA	Right B-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
117	10BPILLORI00ACZA	Right B-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
117A	10BPILLORI00ACRA	Right B-Pillar Lower Resultant Acceleration	60			
118	10CPILUPLE00ACXA	Left C-Pillar Upper X-Axis Acceleration	60 +	yes		2000
119	10CPILUPLE00ACYA	Left C-Pillar Upper Y-Axis Acceleration	60 +	yes		2000
120	10CPILUPLE00ACZA	Left C-Pillar Upper Z-Axis Acceleration	60 +	yes		2000
120A	10CPILUPLE00ACRA	Left C-Pillar Upper Resultant Acceleration	60			
121	10CPILLOLE00ACXA	Left C-Pillar Lower X-Axis Acceleration	60 +	yes		2000
122	10CPILLOLE00ACYA	Left C-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
123	10CPILLOLE00ACZA	Left C-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
123A	10CPILLOLE00ACRA	Left C-Pillar Lower Resultant Acceleration	60			
124	10CPILUPRI00ACXA	Right C-Pillar Upper X-Axis Acceleration	60 +	yes		2000
125	10CPILUPRI00ACYA	Right C-Pillar Upper Y-Axis Acceleration	60 +	yes		2000
126	10CPILUPRI00ACZA	Right C-Pillar Upper Z-Axis Acceleration	60 +	yes		2000
126A	10CPILUPRI00ACRA	Right C-Pillar Upper Resultant Acceleration	60			
127	10CPILLORI00ACXA	Right C-Pillar Lower X-Axis Acceleration	60 +	yes		2000
128	10CPILLORI00ACYA	Right C-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
129	10CPILLORI00ACZA	Right C-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
129A	10CPILLORI00ACRA	Right C-Pillar Lower Resultant Acceleration	60			
130	10DPILUPLE00ACXA	Left D-Pillar Upper X-Axis Acceleration	60 +	yes		2000
131	10DPILUPLE00ACYA	Left D-Pillar Upper Y-Axis Acceleration	60 +	yes		2000

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Chan	ISO mnemonic	Channel Title	Filter	Flip	Zero	Full Scale
132	10DPILUPLE00ACZA	Left D-Pillar Upper Z-Axis Acceleration	60	+	yes	2000
132A	10DPILUPLE00ACRA	Left D-Pillar Upper Resultant Acceleration	60			
133	10DPILLOLE00ACXA	Left D-Pillar Lower X-Axis Acceleration	60	+	yes	2000
134	10DPILLOLE00ACYA	Left D-Pillar Lower Y-Axis Acceleration	60	+	yes	2000
135	10DPILLOLE00ACZA	Left D-Pillar Lower Z-Axis Acceleration	60	+	yes	2000
135A	10DPILLOLE00ACRA	Left D-Pillar Lower Resultant Acceleration	60			
136	10DPILUPRI00ACXA	Right D-Pillar Upper X-Axis Acceleration	60	+	yes	2000
137	10DPILUPRI00ACYA	Right D-Pillar Upper Y-Axis Acceleration	60	+	yes	2000
138	10DPILUPRI00ACZA	Right D-Pillar Upper Z-Axis Acceleration	60	+	yes	2000
138A	10DPILUPRI00ACRA	Right D-Pillar Upper Resultant Acceleration	60			
139	10DPILLORI00ACXA	Right D-Pillar Lower X-Axis Acceleration	60	+	yes	2000
140	10DPILLORI00ACYA	Right D-Pillar Lower Y-Axis Acceleration	60	+	yes	2000
141	10DPILLORI00ACZA	Right D-Pillar Lower Z-Axis Acceleration	60	+	yes	2000
141A	10DPILLORI00ACRA	Right D-Pillar Lower Resultant Acceleration	60			
142	102RDK000000ACXA	Vehicle Rear Deck X-Axis Acceleration	60	+	yes	2000
143	102RDK000000ACYA	Vehicle Rear Deck Y-Axis Acceleration	60	+	yes	2000
144	102RDK000000ACZA	Vehicle Rear Deck Z-Axis Acceleration	60	+	yes	2000
144A	102RDK000000ACRA	Vehicle Rear Deck Resultant Acceleration	60			
145	11SEAT000000ACXA	LF Seat Position (on floor) X-Axis Acceleration	60	+	yes	2000
146	11SEAT000000ACYA	LF Seat Position (on floor) Y-Axis Acceleration	60	+	yes	2000
147	11SEAT000000ACZA	LF Seat Position (on floor) Z-Axis Acceleration	60	+	yes	2000
147A	11SEAT000000ACRA	LF Seat Position (on floor) Resultant Acceleration	60			
148	13SEAT000000ACXA	RF Seat Position (on floor) X-Axis Acceleration	60	+	yes	2000
149	13SEAT000000ACYA	RF Seat Position (on floor) Y-Axis Acceleration	60	+	yes	2000
150	13SEAT000000ACZA	RF Seat Position (on floor) Z-Axis Acceleration	60	+	yes	2000
150A	13SEAT000000ACRA	RF Seat Position (on floor) Resultant Acceleration	60			
151	14SEAT000000ACXA	LR Seat Position (on floor) X-Axis Acceleration	60	+	yes	2000
152	14SEAT000000ACYA	LR Seat Position (on floor) Y-Axis Acceleration	60	+	yes	2000
153	14SEAT000000ACZA	LR Seat Position (on floor) Z-Axis Acceleration	60	+	yes	2000
153A	14SEAT000000ACRA	LR Seat Position (on floor) Resultant Acceleration	60			
154	16SEAT000000ACXA	RR Seat Position (on floor) X-Axis Acceleration	60	+	yes	2000
155	16SEAT000000ACYA	RR Seat Position (on floor) Y-Axis Acceleration	60	+	yes	2000
156	16SEAT000000ACZA	RR Seat Position (on floor) Z-Axis Acceleration	60	+	yes	2000
156A	16SEAT000000ACRA	RR Seat Position (on floor) Resultant Acceleration	60			
157	11SEBE0000B5FO0A	Driver Lap Belt Force	60	+	yes	15568
158	11SEBE0000B3FO0A	Driver Shoulder Belt Force	60	+	yes	15568
159	13SEBE0000B5FO0A	Right Front Passenger Lap Belt Force	60	+	yes	15568
160	13SEBE0000B3FO0A	Right Front Passenger Shoulder Belt Force	60	+	yes	15568

Command File Test Number 100203

Chan	ISO mnemonic	Channel Title	Filter	Flip	Zero	Full Scale
161	14SEBE0000B5FO0A	Left Rear Passenger Lap Belt Force	60	+	yes	15568
162	14SEBE0000B3FO0A	Left Rear Passenger Shoulder Belt Force	60	+	yes	15568
163	11SEBE0000B5DS0A	Driver Seat Belt Spool Potentiometer	1000	+	yes	750
164	13SEBE0000B5DS0A	Right Front Passenger Belt Spool Potentiometer	1000	+	yes	750
165	14SEBE0000B5DS0A	Left Rear Passenger Belt Spool Potentiometer	1000	+	yes	750
166	11CONT000023EV00	Driver Head Contact	0	+	no	1
167	11CONT000024EV00	Driver Thorax Contact	0	+	no	1
168	11CONT000025EV00	Driver Pelvis Contact	0	+	no	1
169	13CONT000026EV00	Right Front Passenger Head Contact Switch	0	+	no	1
170	13CONT000027EV00	Right Front Passenger Thorax Contact Switch	0	+	no	1
171	13CONT000028EV00	Right Front Passenger Pelvis Contact Switch	0	+	no	1
172	14CONT000029EV00	Left Rear Passenger Head Contact	0	+	no	1
173	14CONT000030EV00	Left Rear Passenger Thorax Contact	0	+	no	1
174	14CONT000031EV00	Left Rear Passenger Pelvis Contact	0	+	no	1
175	11AIRB000000VO0A	Left Side Curtain Airbag Voltage	1000	+	no	50
176	13AIRB000000VO0A	Right Side Curtain Airbag Voltage	1000	+	no	50
177	11AIRB000000CU0A	Left Side Curtain Airbag Current	1000	+	no	5
178	13AIRB000000CU0A	Right Side Curtain Airbag Current	1000	+	no	5

APPENDIX E
INSIA Report on Structural Measurements



STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY

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March, 1999

REPORT DOCUMENTATION PAGE	
Title:	<i>STRUCTURAL SURVEY OF CARS. MEASUREMENT METHODOLOGY OF THE MAIN RESISTANT ELEMENTS IN THE CAR BODY</i>
Author(s):	Aparicio Izquierdo, Francisco Páez Ayuso, Francisco Javier
Performing Organisation name and address:	INSIA – University Institute for Automobile Research Carretera de Valencia, Km. 7 – Campus Sur de la Universidad Politécnica de Madrid 28031 – Madrid – Spain
Supplementary notes:	Under contract to: THE EUROPEAN COMMUNITY Project: “Improvement of Crash Compatibility between Cars” Contract N°: RO – 97 – SC.1064
Abstract:	The main aim of this working package -<i>Structural Survey of Cars</i>- is the reduction of incompatibilities, both structural and geometric, between passenger vehicles and their potential collision partners. The understanding of these incompatibilities needs a previous step for the knowledge of the existing car fleet. Firstly, it is necessary to select the main resistant elements in the car body. These elements have to be chosen from the point of view of the sort of collision that we want to study, that is to say, frontal and side impacts. Detailed measurements have been taken from exterior and interior elements, spread to a total number of 74 models selected from the main vehicle manufacturers at Spain. All of them are being sold this year. Using the information available from the previous measurements in vehicles, the geometric characteristics of the main resistant elements involved in the geometric compatibility between cars will be defined. This report shows the methodology followed to get these measurements.
Subject terms:	Crash compatibility, geometric compatibility, resistant elements, measure methodology
Date:	March, 1999

1.- METHODOLOGY.

Detailed measurements have been taken from exterior and interior elements. Using the information available from the previous measurements in vehicles, the geometric characteristics of the main resistant elements involved in the geometric compatibility between cars have been defined. These elements are presented in the following figures, and have been divided in two main groups according to the vehicle zones studied in this project.

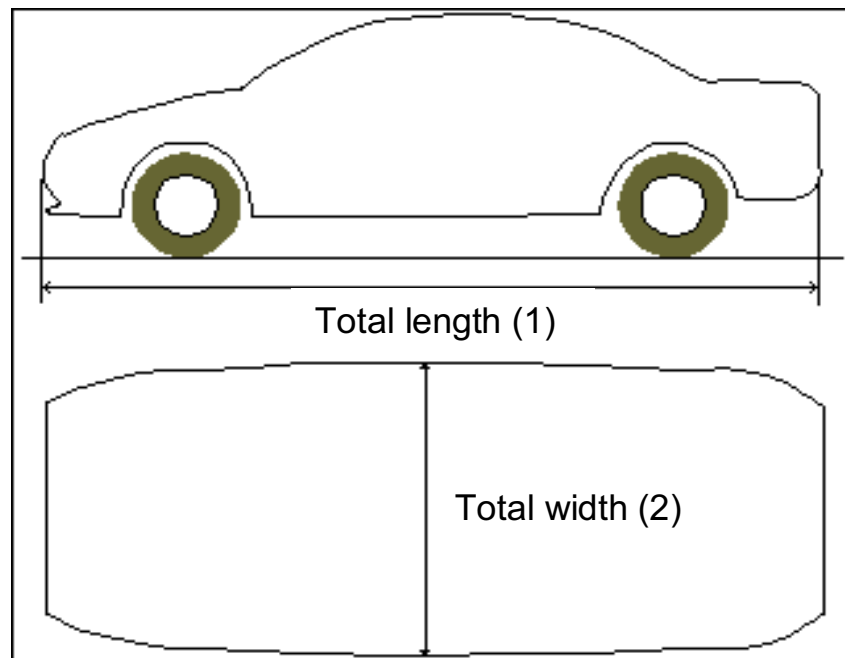


Figure 1.- Definition of the main resistant elements. General dimensions.

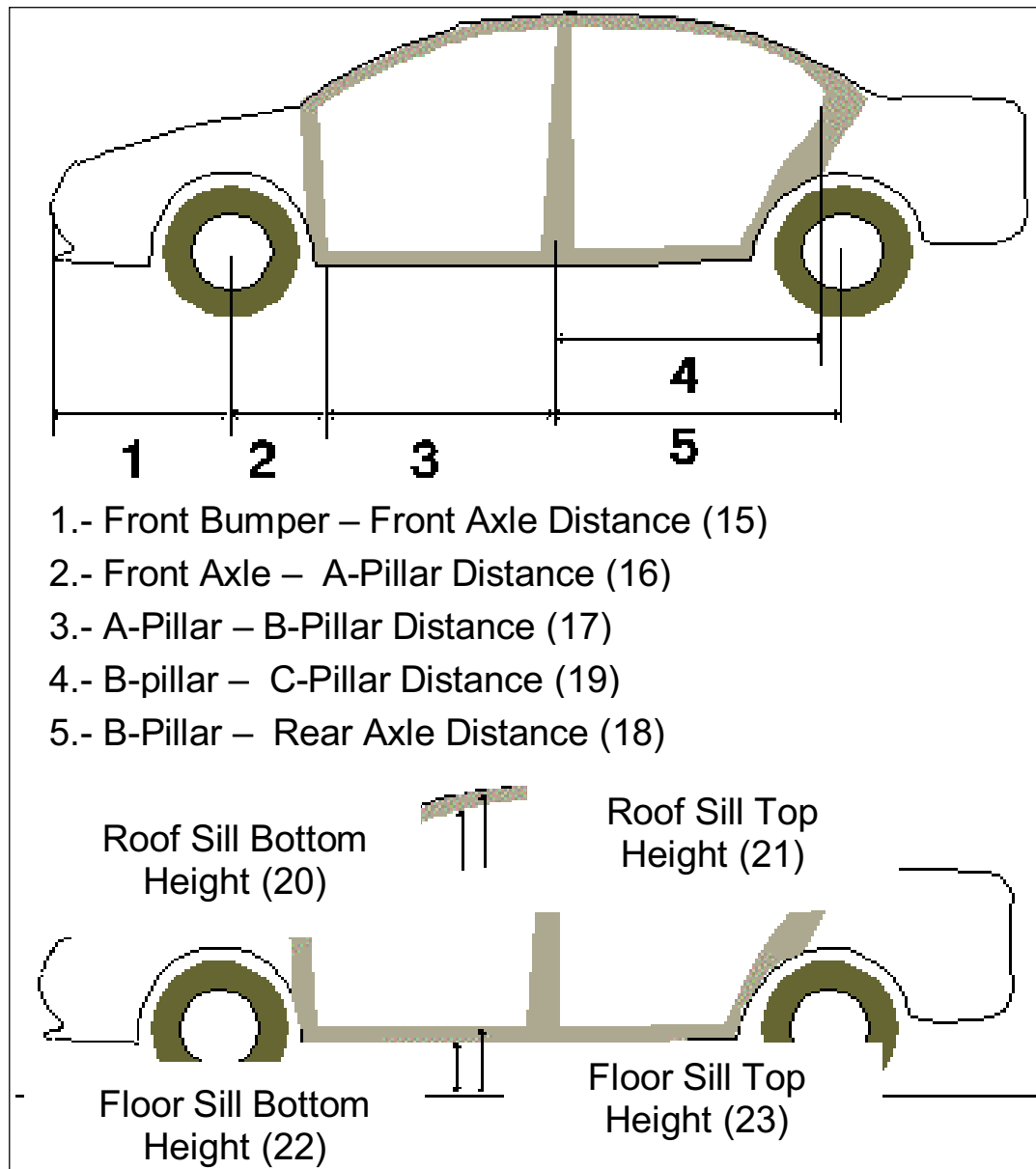


Figure 2.- Definition of the main resistant elements. Side elements.

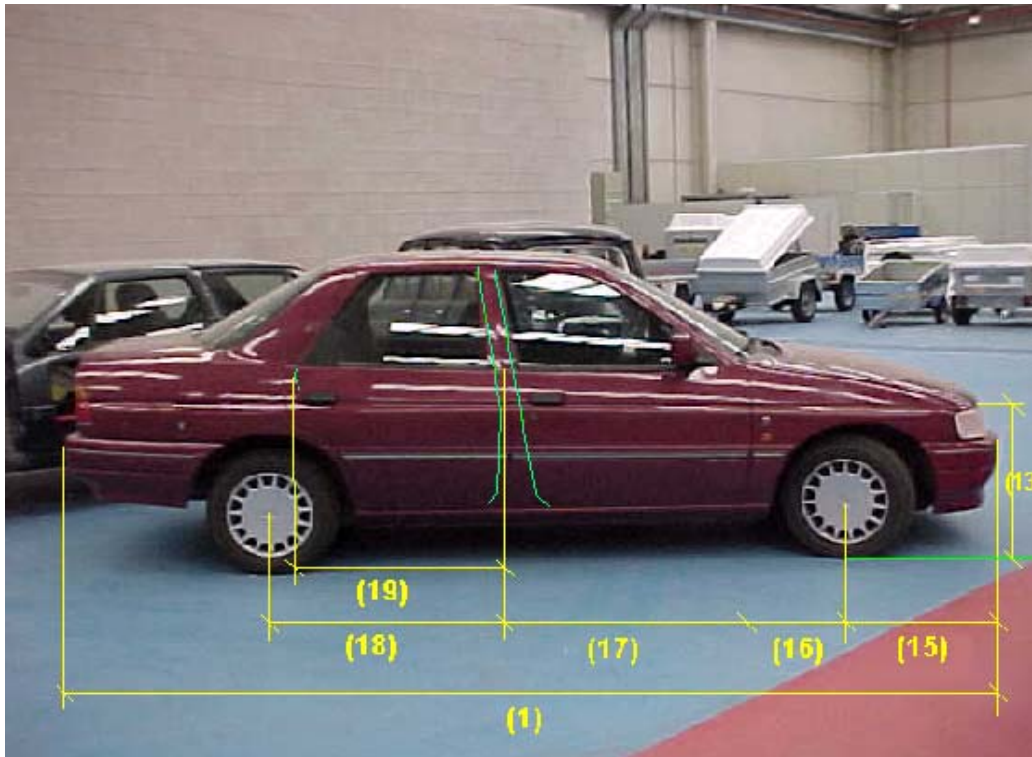


Figure 3.-
Measurements of
the side resistant
elements (outer).

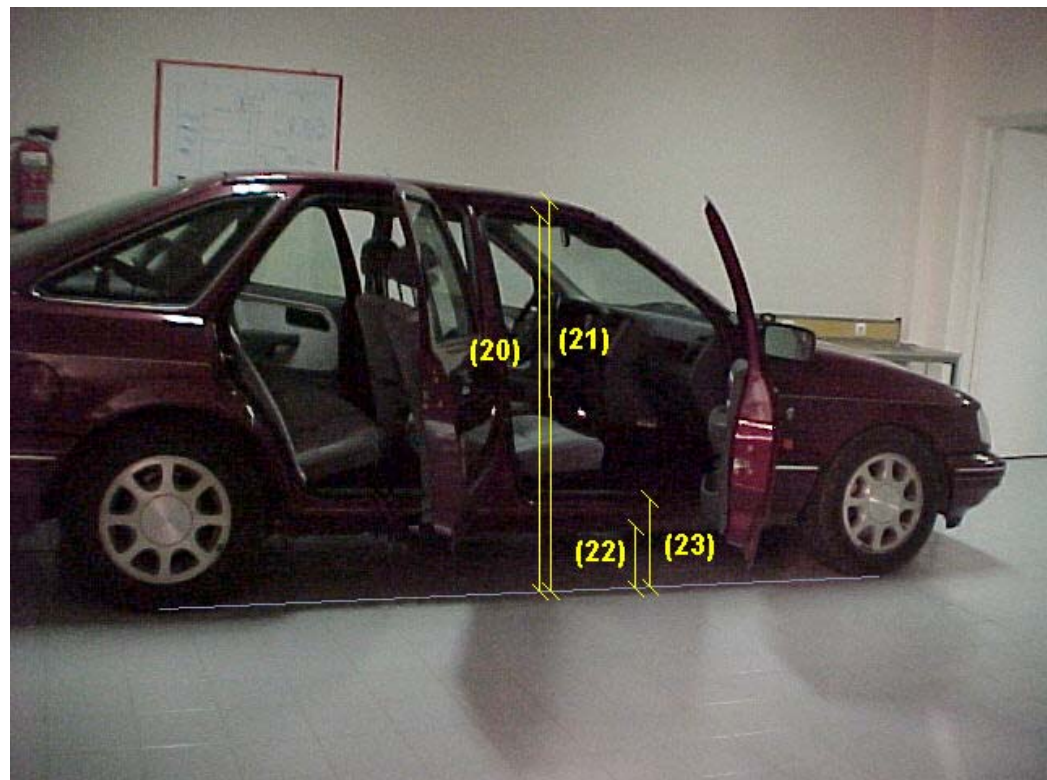


Figure 4.- Measurements
of the side resistant
elements (inner).

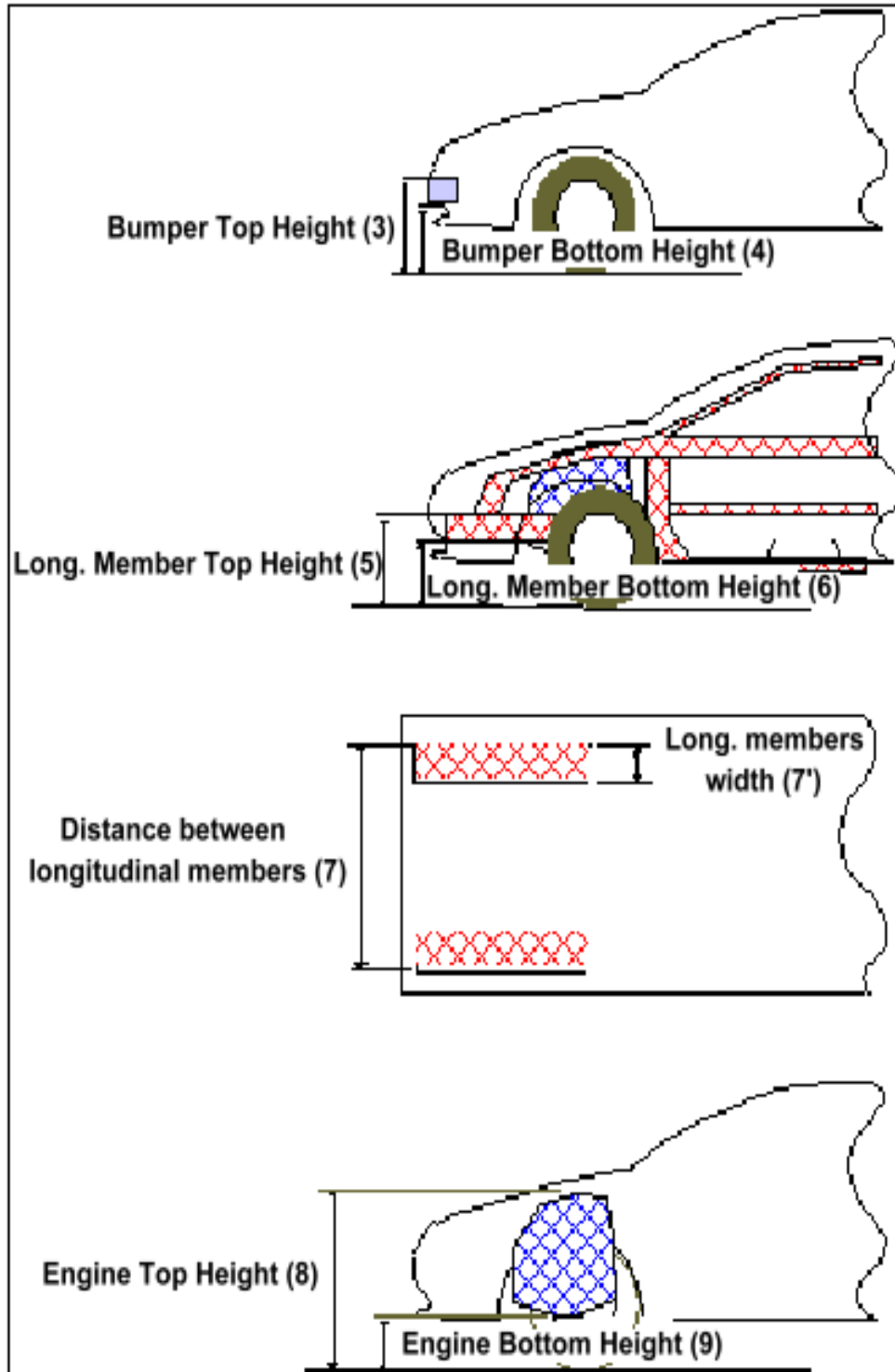


Figure 5.- Definition of the main resistant elements. Front elements.

Figure 6.-
Measurements of the
main resistant elements.
Front elements 1.

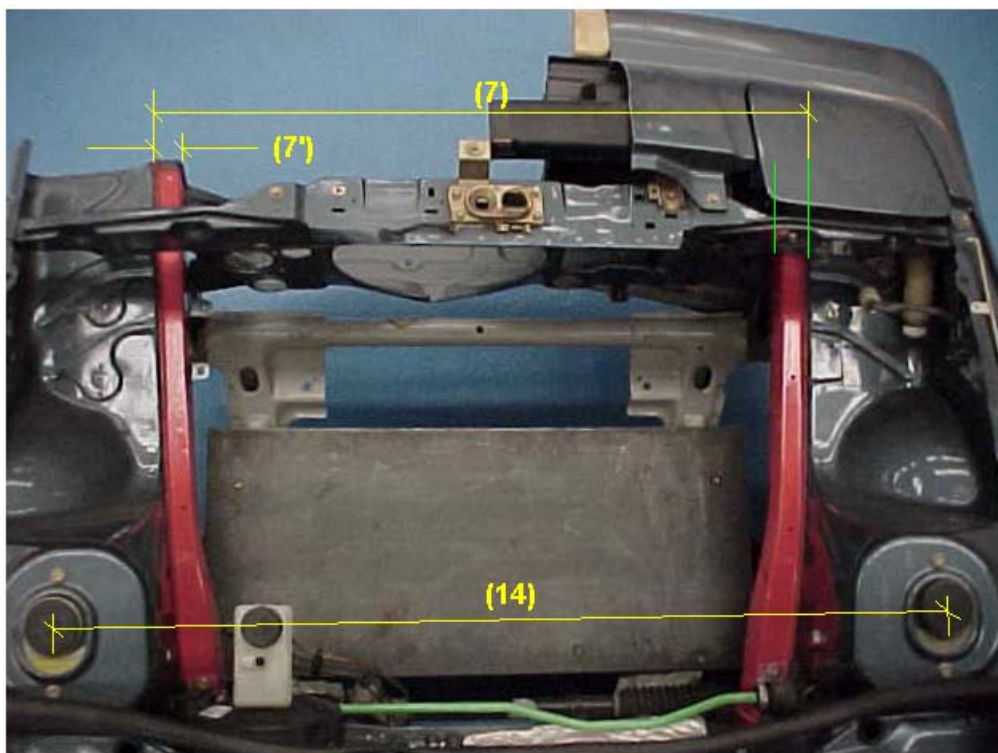
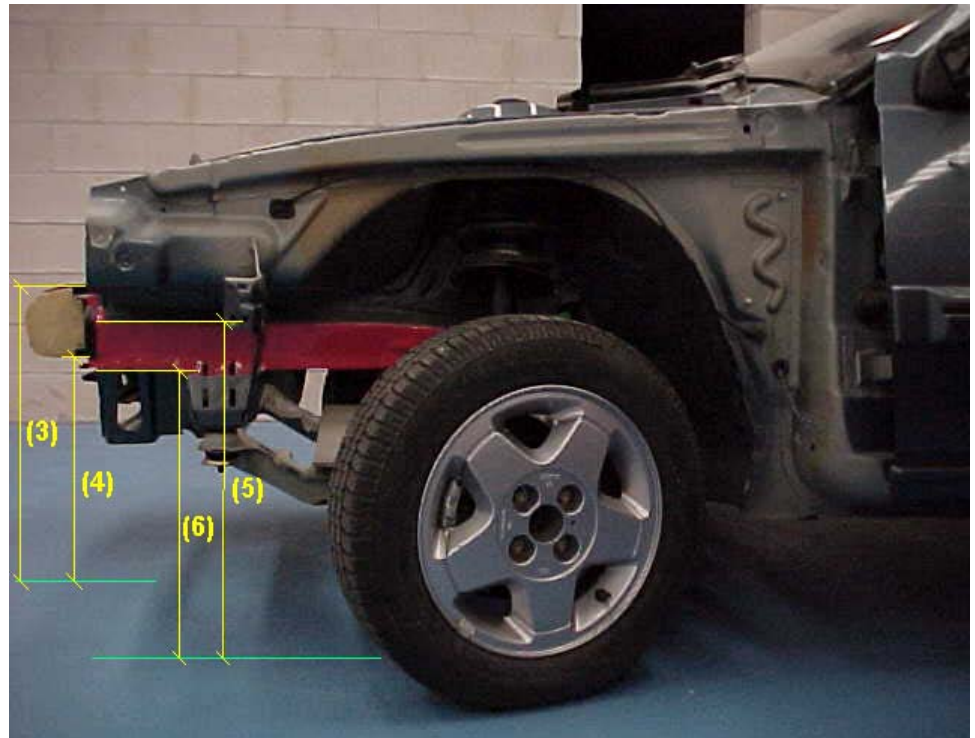


Figure 7.-
Measurements
of the main
resistant
elements. Front
elements 2.

Figure 8.-
Measurements of
the main resistant
elements. Front
elements 3.

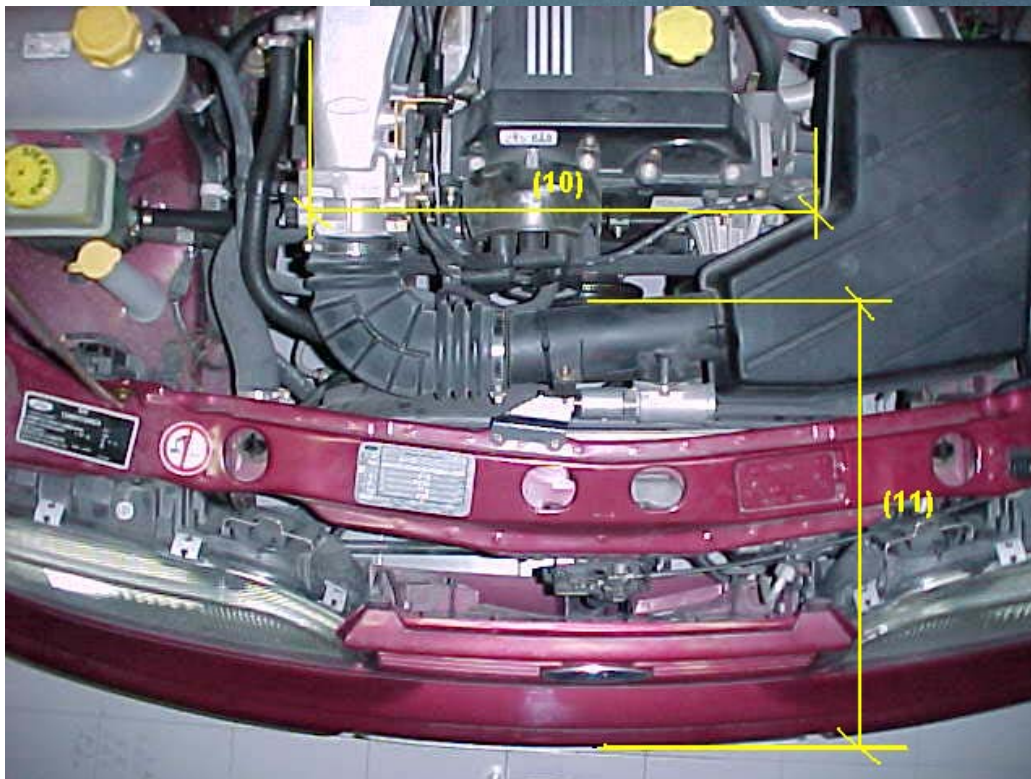
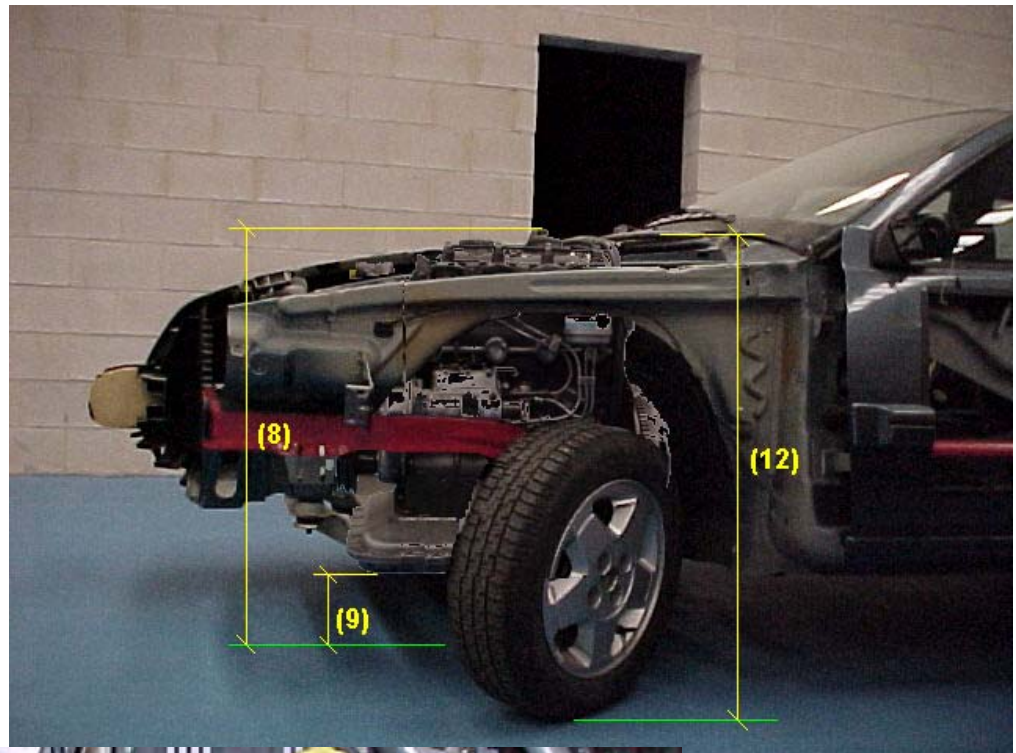


Figure 9.-
Definition of
the main
resistant
elements. Front
elements
(Longitudinal
engine).



The procedure considered to measure these elements is described as follows, where it is indicated the location of these ones in the Excel Sheet (SURVEY.XLS) into brackets:

FRONT ELEMENTS

- **Total Length –(1)- (Side & Front Sheets - C column):** distance between the point in the front bumper further on and the point in the rear bumper further back.
- **Weight (Side & Front Sheets - D column):** mass, including an average driver weight (70 kg), and the fuel tank mass (at half-capacity).
- **Total Width –(2)- (Side & Front Sheets - E column):** distance between the outer side points in a transverse plane of the vehicle (middle plane between the front and rear axles).
- **Bumper bottom height –(4)- (Front Sheet G column):** distance between the ground and the lowest point on the front bumper, being a resistant member (aerodynamic elements under the front bumper are not considered).
- **Bumper top height –(3)- (Front Sheet H column):** distance between the ground and the highest point on the front bumper, being a resistant member (aerodynamic elements are not considered).
- **Longitudinal member top height –(5)- (Front Sheet I column):** distance between the ground and the highest point on the longitudinal members, measured approximately in the front bumper-longitudinal member joint (when accessible).
- **Longitudinal member bottom height –(6)- (Front Sheet J column):** distance between the ground and the lowest point on the longitudinal members, measured approximately in the front bumper-longitudinal member joint.
- **Distance between longitudinal members (Front Sheet K column):** transverse distance between extreme points in longitudinal members, measured approximately in the front bumper-longitudinal member joint.

Depending on the accessibility of these members, the extreme points are the inner points (I) or the outer points (O).

- **Longitudinal member width -7'- (Front Sheet L column):** width of one of the longitudinal members, measured approximately in the front bumper-longitudinal member joint.

- **Engine top height (8) (Front Sheet N column):** distance between the ground and the highest point on the engine that can be a resistant member in case of accident (usually, the highest point on the head, or the highest point of the inlet or exhaust manifolds).
- **Engine bottom height (9) (Front Sheet M column):** distance between the ground and the lowest point on the engine (usually, the lowest point on the crankcase).
- **Engine and Gearbox width (10) (Front Sheet O & P columns):**
 - *Transverse configuration engine:* distance between extreme points in the gearbox-cylinder block unit or others resistant members attached to the cylinder block unit, i.e. fan belts (from a front point of view).
 - *Longitudinal configuration engine:* distance between extreme points in the cylinder block unit (from a front point of view).
- **Front bumper - Engine distance (11) (Front Sheet Q column):** distance between the point in the front bumper further on and the point in the engine further on that is a resistant element, i.e. the further on point of the exhaust manifold placed in the front of the engine.
- **Front shock absorber fixing width (14) (Front Sheet R column):** transverse distance between the front shock absorber - body car joints.
- **Front shock absorber fixing height (12) (Front Sheet S column):** distance between the ground and the front shock absorber-body car joint.
- **Bonnet leading edge height (Front Sheet T column):** distance between the ground and the bonnet edge further on.

SIDE ELEMENTS

- **Front bumper - Front axle distance (15) (Side Sheet G column):** distance between the point in the front bumper further on and the middle point in the front tyre-road contact patch.
- **Front axle - A Pillar distance (16) (Side Sheet H column):** distance between the middle point in the front tyre-road contact patch and the point in the A-pillar further back.
- **A Pillar - B Pillar distance (17) (Side Sheet I column):** distance between the point in the A-pillar further back and the middle point in the B-pillar.
- **B Pillar - C Pillar distance (19) (Side Sheet J column):** distance between the middle point in the B-pillar and the point in the C-pillar further back (only 4/5-door vehicles).
- **B Pillar - Rear axle distance (18) (Side Sheet K column):** distance between the middle point in the B-pillar and the middle point in the rear tyre-road contact patch.
- **Roof sill bottom height (20) (Side Sheet L column):** distance between the ground and the lowest point on the roof sill, measured in the front door middle point.
- **Roof sill top height (21) (Side Sheet M column):** distance between the ground and the highest point on the roof sill (usually located in the sill-roof joint), measured in the front door middle point.
- **Floor sill bottom height (22) (Side Sheet N column):** distance between the ground and the lowest point on the floor sill, measured in the front door middle point.
- **Floor sill top height (23) (Side Sheet O column):** distance between the ground and the highest point on the floor sill, measured in the front door middle point.

NOTE

- N/A: dimension not available.