

**Vehicle Research and Test Center
Curb Trip Rollover
of a 2007 Ford Expedition
TRC Inc. Test Number 100413**

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Notice

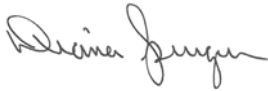
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TRC TEST NUMBER: 100413

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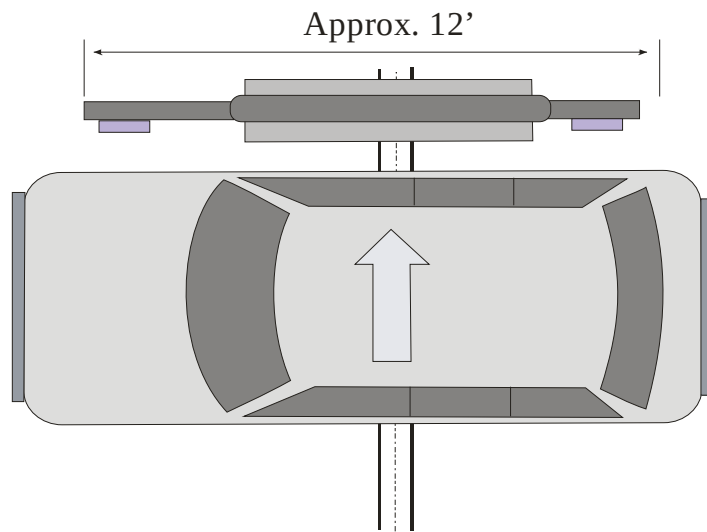
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SECTION 1

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 33.1 km/h (20.6 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, left rear passenger were equipped with motorized and buckle pretensioner, and right front passenger position was equipped with a retractor and buckle pretension 3-PT belt system¹. The curtain air bags and pretensioners 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 33.1 km/h (20.6 mph). The vehicle was towed in the lateral direction on a soap-covered runway. After release, the vehicle impacted the curb fixture, and made a three-quarter (3/4) rotation coming to rest on the driver's side. The curb trip rollover test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on April 13, 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, rotation, and displacement data were collected for this test. A total of one-hundred-eighty-six (186) channels of data were recorded.

The rollover test was documented by one (1) real-time camera 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.

TEST RESULTS SUMMARY

	Left Front ATD(#001)	Right Front ATD(#110)	Left Rear ATD(#043)
HIC15 CFC 1000	24	350	17
HIC36 CFC 1000	42	357	37
Chest Clip 3 ms (g) CFC 180	13.1	36.3	10.3
Chest Deflection (mm) CFC 600	-3.0	-4.1	-1.5
Neck Injury (NIJ) (ms) CFC 600			
NTE	0.21	0.35	0.20
NTF	0.04	0.16	0.03
NCE	0.08	0.40	0.00
NCF	0.03	0.25	0.03
Neck Tension (N) CFC1000	784.6	1350.0	712.3
Neck Compression (N) CFC1000	-214.6	-2135.9	-171.9

	2007 Ford Expedition
Vehicle Test Weight	2933.0 kg ¹
Left Side - Maximum Crush	49 mm
Right Side - Maximum Crush	52 mm
Roof - Maximum Crush	76 mm
Impact Speed	33.1 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 vehicle's 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 vehicle's CG Pitch Rate Y-axis rotational gyroscope, 10VEHCCG0000AVYA, exceeded its full scale value at approximately 24 milliseconds, and the data appears valid.

The vehicle's Rear Deck Roll, Pitch, and Yaw Rate Redundant X-, Y-, and Z-axis rotational gyroscopes, 10VEHCREDK00AVXA, AVYA, AVZA, exceeded the full scale value at approximately 103 milliseconds, and the data appears valid.

The Left Rear Passenger Belt Spool Potentiometer, 14SEBE0000B5DS0A, failed to record any useable data.

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: 04/13/10

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	1FMFU15507LA69848	Rear Pass. Front Airbag	No
Color	Silver	Rear Pass. Side Airbag	No
Delivery Date	01/26/10	Rear Pass. Head Airbag	No
Odometer Reading	30,941	Rear Pass. Curtain Airbag	Yes
Dealer	Provided by VRTC	Rear Pass. Knee Airbag	No
Transmission	Automatic	Load Limiters	Yes ¹
Final Drive	Rear wheel drive	Anti-lock Brakes	Yes
Number of Cylinders	V8	All-Wheel Drive	No
Engine Displacement (L)	5.4	Pretensioners	Yes ¹
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	03/07	GAWR Front (kg)	1497
		GAWR Rear (kg)	1928

TEST VEHICLE SEAT TYPE AND CAPACITY

Measured Parameter	Front	Mid ²	Rear ²	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)				746
(B) DSC x 68.08 kg				545
(A-B) Cargo Wt. (RCLW) (kg)				201

Note: The side airbags and pretensioners were fired manually.

¹ The original pretensioners and load limiters were removed and replaced with belt systems provided by TRW Automotive.

² The original seats were removed. A bucket seat was installed in the second row for this test.

DATA SHEET NO. 1 (CONTINUED)**GENERAL TEST AND VEHICLE PARAMETER DATA**Test Vehicle: 2007 Ford ExpeditionTest Program: Improved Restraints in RolloversTest Date: 04/13/10**TEST VEHICLE WEIGHTS**

	Units	As Delivered (UVW) ¹			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	642.6	637.0		666.0	792.2	
Right	kg	612.2	662.4		682.0	792.8	
Ratio	%	33.2	50.9		46.0	54.0	
Totals	kg	1254.8	1299.4	2554.2	1348.0	1585.0	2933.0

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)
Pre-Test	mm	920	913	872	864	1632
Post-Test	mm	970	835	854	714	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	3020
Total Vehicle Length at Left Side	mm	4885
Total Vehicle Length at Centerline	mm	5208
Total Vehicle Length at Right Side	mm	4885
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	Not recorded
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.

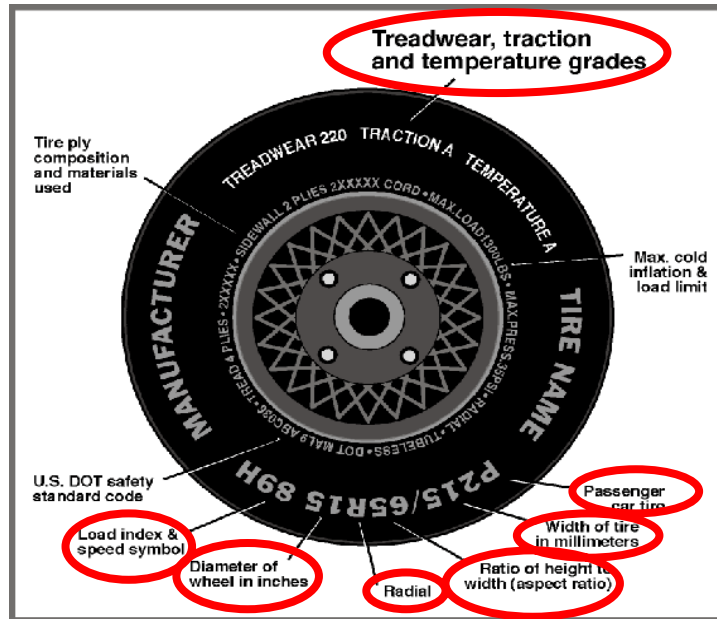
DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10



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 TR	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: 04/13/10

DUMMY RIDING POSITION

Driver: Total Number of detents:

Power seat; 240 mm of travel

Passenger: Total Number of detents: 22

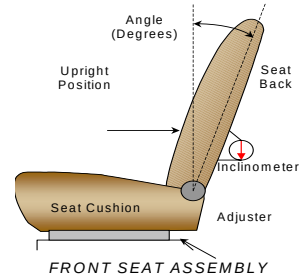
Left Rear Passenger: Total Number of detents: 22

Driver seat back angle: 11.5°

Passenger seat back angle: 11.8°

Left rear seat back angle: 9.3°

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



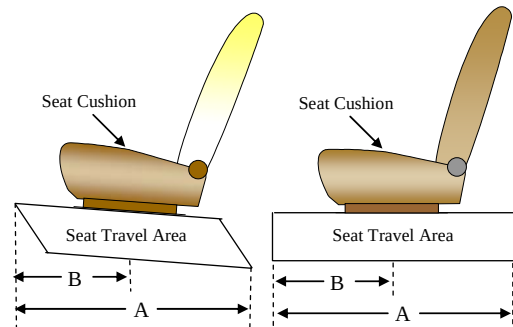
SEAT FORE/AFT POSITIONS

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	240	Mid
Fr Pass	215	12 of 22
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: 04/13/10

SEAT BELT CONFIGURATION

	Type	Configuration
Driver	3-PT: motorized retractor ¹ and buckle pretension ²	I
Left Rear Passenger	3-PT: motorized retractor ¹ and buckle pretension ²	I
Right Front Passenger	3-PT: retractor and buckle pretension ²	G

¹ Motorized retractor activated at launch of test.

² Pretensioners manually fired at 100 milliseconds.

DATA SHEET NO. 3

POST-TEST OBSERVATIONS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

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	Side header and roof	Right side door glass, outboard side of curtain airbag, and B-pillar	Airbag, Side header, and roof
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	Door panel
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	Completely shattered and separated from the vehicle on the upper right side
Window Damage	Left side front and rear glass broke out. Right side front glass broke out.
Other Notable Effects	None

DATA SHEET NO. 3 (CONTINUED)**POST TEST OBSERVATIONS**Test Vehicle: 2007 Ford ExpeditionTest Program: Improved Restraints in RolloversTest Date: 04/13/10**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	Yes	Yes	Yes	Yes

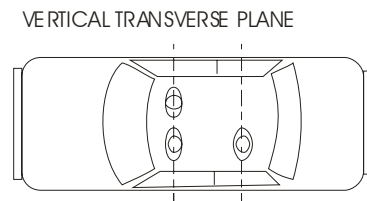
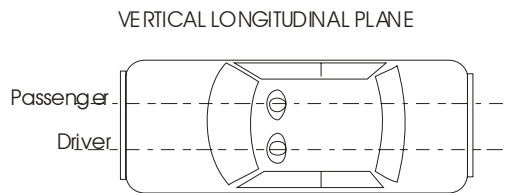
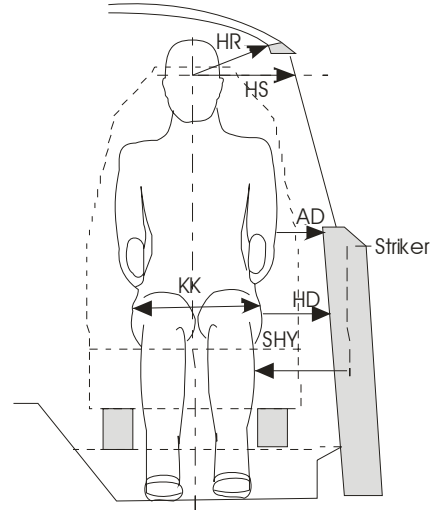
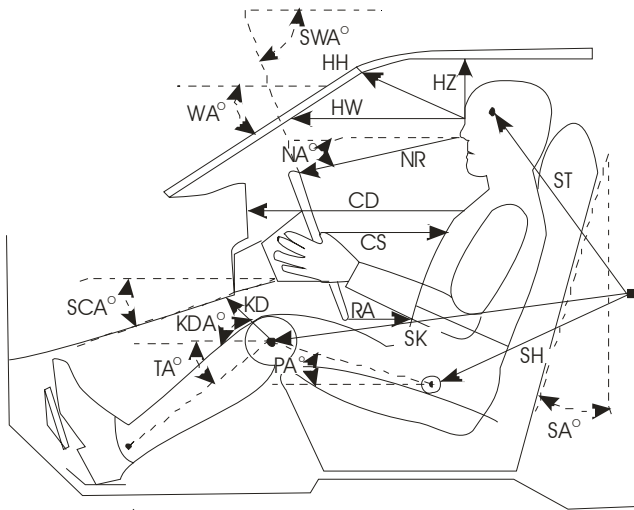
Restraint Type	Left Rear (Passenger) Occupant Location 04	
	Installed	Operation
Front Airbag	No	N/A
Side Airbag	No	N/A
Head Airbag	No	N/A
Curtain Airbag	Yes	Yes
Seat Belt Pretensioner	Yes	Yes

NOTE: The left and right side curtain airbags and all pretensioners 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: 04/13/10



DATA SHEET NO. 4 (CONTINUED)

DUMMY MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

FRONT SEAT OCCUPANTS

Code	Measurement Description	Driver (# 001)		Passenger (# 110)	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		30.7		30.2
SWA°	Steering Wheel Angle		--- ²		
SCA°	Steering Column Angle		--- ²		
SA°	Seat Back Angle (on headrest post)		10.9		10.7
HZ	Head to Roof (Z Direction)	252		219	
HH	Head to Header	425		425	
HW	Head to Windshield	707		668	
HR	Head to Side Header (Y Direction)	255		222	
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	184	10.4	186	20.5
KDR	Right Knee to Dash	184	15.8	182	9.8
PA°	Pelvic Angle		24.2		22.4
TA°	Tibia Angle		50.8		54.3
KK	Knee to Knee (Y Direction)	278		237	
ST	Striker to Head	638	-79.9	678	-81.9
SK	Striker to Knee	605	-8.2	597	-9.7
SH	Striker to H-Point	226	9.2	205	-1.3
SHY	Striker to H-Point (Y Direction)	176		165	
HS	Head to Side Window (Y Direction)	371		340	
HD	H-Point to Door (Y Direction)	81		71	
AD	Arm to Door (Y Direction)	145		135	

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: 04/13/10**LEFT REAR SEAT OCCUPANT**

Code	Measurement Description	Left Rear Passenger (#043)	
		Length (mm)	Angle(°)
WA°	Windshield Angle	114.5	
SWA°	Steering Wheel Angle		
SCA°	Steering Column Angle		
SA°	Seat Back Angle (on headrest post)		8.1
HZ	Head to Roof (Z Direction)	249	
HH	Head to Header	614	
HW	Head to Windshield	589	
HR	Head to Side Header (Y Direction)	234	
NR	Nose to Rim		
CD	Chest to Dash	565	
CS	Steering Wheel to Chest		
RA	Rim to Abdomen		
KDL	Left Knee to Dash (Seatback)	214	1.4
KDR	Right Knee to Dash (Seatback)	223	
PA°	Pelvic Angle		26.4
TA°	Tibia Angle		54.3
KK	Knee to Knee (Y Direction)	267	
ST	Striker to Head	540	-71.8
SK	Striker to Knee	691	0.1
SH	Striker to H-Point	339	25.3
SHY	Striker to H-Point (Y Direction)	228	
HS	Head to Side Window (Y Direction)	340	
HD	H-Point to Door (Y Direction)	135	
AD	Arm to Door (Y Direction)	161	

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: 04/13/10

LEFT FRONT

Location		Unit	Positive Direction Max. Time (ms)		Negative Direction Max. Time (ms)	
Head Acceleration	X	g	1.1	1132.9	-4.4	125.3
	Y	g	10.2	975.4	-10.5	162.3
	Z	g	19.3	117.9	-4.7	60.6
	R	g	20.6	117.9		
Head Rate Gyro	X	°/s	610.9	234.1	-1668.7	128.0
	Y	°/s	340.1	267.8	-286.6	117.0
	Z	°/s	293.3	284.4	-498.7	127.6
Upper Neck Force	X	N	34.7	974.1	-166.5	122.0
	Y	N	144.8	393.7	-433.3	161.5
	Z	N	784.6	129.5	-214.6	60.8
Upper Neck Moment	X	Nm	12.7	94.9	-24.0	978.8
	Y	Nm	5.5	1082.7	-16.9	123.8
	Z	Nm	3.0	1983.8	-9.0	166.2
Chest Acceleration	X	g	0.9	122.2	-4.0	115.2
	Y	g	3.1	3230.2	-12.9	102.0
	Z	g	6.8	973.4	-5.1	60.2
	R	g	13.8	105.7		
Chest Displacement	X	mm	0.1	45.6	-3.0	130.8
Lower Neck Force	X	N	111.2	140.5	-111.5	300.5
	Y	N	138.1	1102.6	-505.3	155.8
	Z	N	870.8	119.3	-297.4	61.3
Lower Neck Moment	X	Nm	36.6	395.1	-125.3	162.2
	Y	Nm	21.3	298.2	-54.0	129.9
	Z	Nm	4.4	1101.6	-10.7	143.5
Pelvis Acceleration	X	g	4.1	55.0	-6.0	104.3
	Y	g	3.4	247.8	-16.8	103.3
	Z	g	6.0	962.2	-5.1	59.3
	R	g	17.5	103.3		

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: 04/13/10

RIGHT FRONT

Location		Unit	Positive Direction Max.	Time (ms)	Negative Direction Max.	Time (ms)
Head Acceleration	X	g	106.6	112.4	-51.0	118.5
	Y	g	45.1	107.1	-91.5	118.5
	Z	g	56.5	118.2	-38.6	691.8
	R	g	126.4	112.4		
Head Front Acceleration	Y	g	44.7	112.9	-123.4	118.6
	Z	g	62.6	111.8	-24.0	692.2
Head Top Acceleration	X	g	135.2	112.2	-97.7	691.8
	Y	g	48.3	109.2	-196.5	118.6
Head Side Acceleration	X	g	246.4	112.2	-70.6	119.0
	Z	g	118.0	118.4	-32.3	691.8
Upper Neck Force	X	N	100.8	108.1	-758.0	112.6
	Y	N	409.9	114.2	-639.0	122.9
	Z	N	1350.0	117.0	-2135.9	739.1
Upper Neck Moment	X	Nm	44.9	123.0	-26.6	115.5
	Y	Nm	29.2	140.7	-37.7	124.1
	Z	Nm	3.6	110.2	-24.5	133.4
Lower Neck Force	X	N	833.1	108.2	-376.0	122.7
	Y	N	571.3	108.0	-951.9	122.9
	Z	N	1252.4	111.6	-2063.2	739.8
Lower Neck Moment	X	Nm	36.0	96.9	-114.7	123.0
	Y	Nm	148.3	833.3	-98.1	111.7
	Z	Nm	30.5	108.1	-43.5	123.0
Chest Acceleration	X	g	6.1	112.2	-9.6	107.8
	Y	g	2.9	3213.8	-39.7	115.6
	Z	g	13.7	119.4	-3.9	695.7
	R	g	39.7	115.6		
Chest Displacement	X	mm	2.3	100.1	-4.1	129.4
Pelvis Acceleration	X	g	3.3	84.8	-9.7	122.4
	Y	g	2.4	3199.2	-16.1	125.8
	Z	g	10.5	120.3	-3.9	111.2
	R	g	19.6	125.2		

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: 04/13/10

LEFT REAR

Location		Unit	Positive Direction Max.	Time (ms)	Negative Direction Max.	Time (ms)
Head Acceleration	X	g	1.3	647.5	-2.6	2023.8
	Y	g	7.9	2029.0	-6.8	188.6
	Z	g	16.8	143.9	-3.7	59.8
	R	g	17.4	143.9		
Head Rate Gyro	X	°/s	390.8	270.9	-1414.2	139.8
	Y	°/s	542.4	231.8	-520.4	137.9
	Z	°/s	188.4	307.0	-371.4	213.0
Upper Neck Force	X	N	34.2	643.3	-90.0	303.5
	Y	N	124.4	83.6	-254.8	193.3
	Z	N	712.3	145.7	-171.9	60.8
Upper Neck Moment	X	Nm	11.7	88.6	-16.2	989.8
	Y	Nm	6.1	296.7	-15.5	162.9
	Z	Nm	3.2	2035.0	-5.0	211.8
Chest Acceleration	X	g	2.2	112.7	-3.1	154.0
	Y	g	3.1	3249.4	-11.4	105.0
	Z	g	6.3	978.0	-4.5	61.1
	R	g	11.9	105.0		
Chest Displacement	X	mm	0.9	108.2	-1.5	136.7
Lower Neck Force	X	N	939.6	82.1	-2338.1	186.2
	Y	N	639.9	302.4	-2023.1	145.6
	Z	N	554.4	106.2	-2162.0	161.8
Lower Neck Moment	X	Nm	11.0	145.0	-4.4	302.2
	Y	Nm	4.0	74.9	-20.1	161.9
	Z	Nm	5.6	140.4	-1.7	61.9
Pelvis Acceleration	X	g	4.4	52.1	-6.0	104.3
	Y	g	2.7	3216.2	-20.3	103.5
	Z	g	6.1	976.3	-6.4	103.6
	R	g	21.9	103.5		

Positive Direction

Longitudinal: Forward

Lateral: Rightward

Vertical: Downward

Negative Direction

Longitudinal: Rearward

Lateral: Leftward

Vertical: Upward

DATA SHEET NO. 6

VEHICLE STRUCTURAL MEASUREMENTS^{1, 2}

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

STRUCTURAL MEASUREMENTS

	Elements	Pre-Test
1	Total Length	5208
2	Total Width	2007
3	Bumper Top Height	569
4	Bumper Bottom Height	432
5	Longitudinal Member Top Height	559
6	Longitudinal Member Bottom Height	439
7	Distance Between Longitudinal Members	967
7'	Longitudinal Member Width	110
8	Engine Top Height	1192
9	Engine Bottom Height	292
10	Engine and Gearbox Width	700
11	Front Bumper - Engine Distance	785
12	Front Shock Absorber Fixing Height	649
13	Bonnet Leading Edge Height	1117
14	Front Shock Absorber Fixing Width	930
15	Front Bumper - Front Axle Distance	960
16	Front Axle - A Pillar Distance	670
17	A Pillar - B Pillar Distance	1075
18	B Pillar - Rear Axle Distance	1278
19	B Pillar - C Pillar Distance	1000
20	Roof Sill Bottom Height	1721
21	Roof Sill Top Height	1792
22	Floor Sill Bottom Height	501
23	Floor Sill Top Height	550

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.

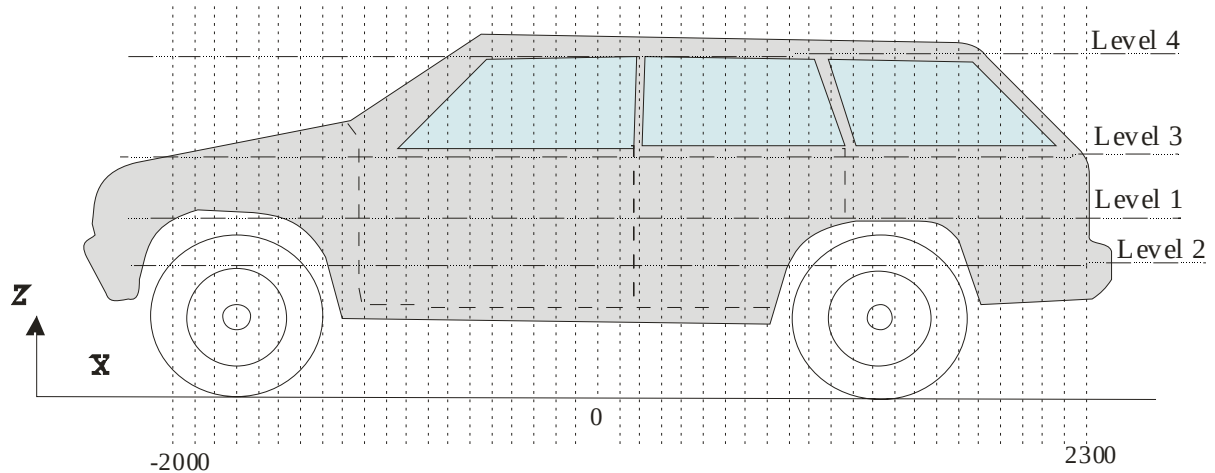
² The vertical measurements from the ground are adjusted based on the test vehicle's pre-test attitude measurements.

DATA SHEET NO. 7
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10



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: 04/13/10

LEFT SIDE CRUSH

	Pre-Test				Post-Test				Difference			
	1	2	3	4	1	2	3	4	1	2	3	4
-2000			-809				-858				49	
-1900			-833				-881				48	
-1800			-852				-898				46	
-1700			-866				-911				45	
-1600			-877				-920				43	
-1500	-977		-885		-1005		-927		28		42	
-1400	-979		-892		-1003		-933		24		41	
-1300	-977		-898		-1004		-937		27		39	
-1200	-969	-979	-903		-996	-1007	-941		27	28	38	
-1100	-961	-973	-908		-989	-1001	-945		28	28	37	
-1000	-963	-966	-912	0	-991	-994	-948		28	28	36	
-900	-965	-967	-915	-887	-993	-993	-950	-923	28	26	35	36
-800	-969	-970	-920	-854	-998	-995	-927	-884	29	25	7	30
-700	-972	-973	-925	-829	-1000	-1002	-908	-852	28	29	-17	23
-600	-975	-976	-929	-801	-1002	-1004	-913	-815	27	28	-16	14
-500	-978	-978	-933	-767	-1003	-1004	-924	-769	25	26	-9	2
-400	-980	-980	-937	-736	-1004	-1004	-933	-732	24	24	-4	-4
-300	-982	-982	-941	-701	-1004	-1005	-942	-692	22	23	1	-9
-200	-984	-984	-944	-686	-1005	-1006	-947	-677	21	22	3	-9
-100	-985	-985	-947	-681	-1005	-1007	-954	-676	20	22	7	-5
0	-986	-986	-950	-678	-1005	-1007	-960	-677	19	21	10	-1
100	-987	-987	-953	-678	-1006	-1006	-967	-681	19	19	14	3
200	-988	-987	-955	-679	-1004	-1004	-973	-687	16	17	18	8
300	-988	-987	-956	-679	-1002	-1001	-973	-677	14	14	17	-2
400	-988	-987	-958	-680	-1002	-1002	-974	-678	14	15	16	-2
500	-988	-987	-959	-681	-1002	-1002	-974	-680	14	15	15	-1
600	-988	-987	-961	-681	-1001	-1001	-974	-680	13	14	13	-1
700	-988	-987	-962	-682	-1000	-1000	-974	-681	12	13	12	-1
800	-987	-986	-963	-683	-999	-1000	-973	-683	12	14	10	0
900	-987	-986	-963	-683	-999	-998	-972	-685	12	12	9	2
1000	-986	-985	-963	-685	-998	-997	-970	-687	12	12	7	2
1100	-986	-991	-963	-687	-998	-1000	-962	-679	12	9	-1	-8
1200	-992	-997	-962	-687	-1000	-993	-960	-684	8	-4	-2	-3
1300	-999		-961	-686	-988		-962	-686	-11		1	0
1400	-1001		-962	-687	-983		-962	-685	-18		0	-2
1500	-1000		-960	-686	-982		-961	-685	-18		1	-1
1600	-997		-959	-685	-979		-959	-684	-18		0	-1
1700	-993		-957	-685	-979		-957	-683	-14		0	-2
1800	-985		-955	-684	-973		-955	-683	-12		0	-1
1900	-973		-953	-684	-974		-953	-682	1		0	-2
2000			-951	-683			-950	-679			-1	-4
2100			-948	-681			-948	-679			0	-2
2200			-945	-679			-945	-678			0	-1
2300			-943				-942				-1	

DATA SHEET NO. 7 (CONTINUED)

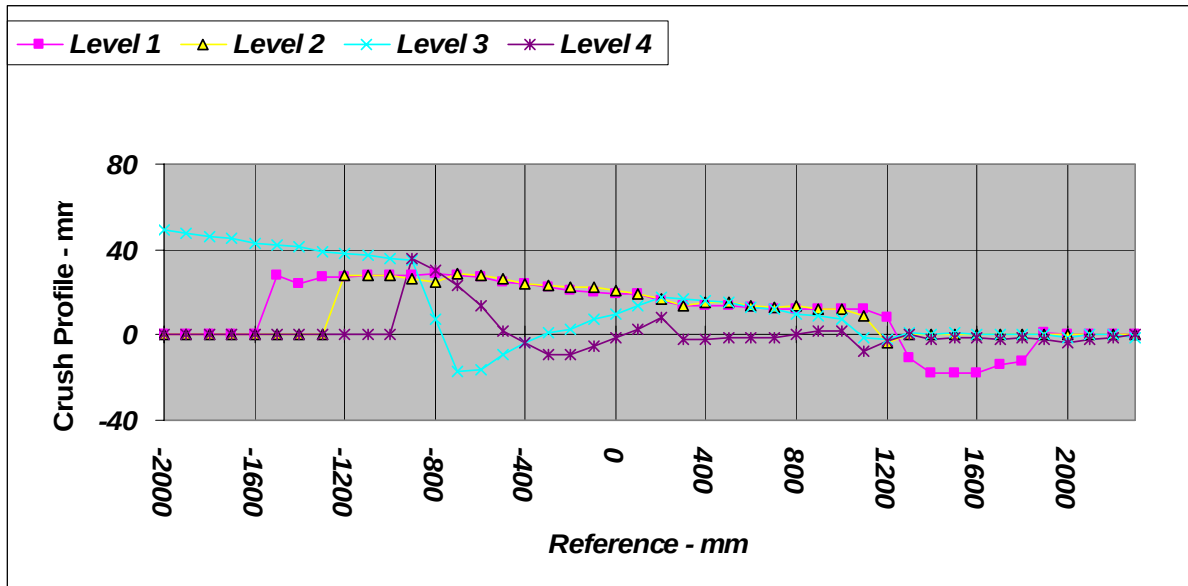
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

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: 04/13/10

RIGHT SIDE CRUSH

	Pre-Test				Post-Test				Difference			
	1	2	3	4	1	2	3	4	1	2	3	4
-2000			823				875				-52	
-1900			844				894				-50	
-1800			859				907				-48	
-1700			870				917				-47	
-1600			879				924				-45	
-1500	970		886		1019		929		-49		-43	
-1400	973		892		1020		934		-47		-42	
-1300	971		898		1016		937		-45		-39	
-1200	963	974	903		1007	1020	941		-44	-46	-38	
-1100	957	968	907		999	1012	944		-42	-44	-37	
-1000	959	962	911		999	1004	946		-40	-42	-35	
-900	962	963	914	883	1003	1005	951	935	-41	-42	-37	-52
-800	965	967	918	853	1006	1008	956	902	-41	-41	-38	-49
-700	969	970	923	826	1009	1011	961	872	-40	-41	-38	-46
-600	972	973	927	798	1012	1014	965	831	-40	-41	-38	-33
-500	974	975	930	762	1014	1016	968	756	-40	-41	-38	6
-400	977	978	934	732	1016	1017	971	691	-39	-39	-37	41
-300	979	980	938	700	1018	1019	975	674	-39	-39	-37	26
-200	981	981	941	689	1019	1020	978	669	-38	-39	-37	20
-100	982	983	944	684	1020	1021	980	672	-38	-38	-36	12
0	984	984	947	683	1021	1022	983	677	-37	-38	-36	6
100	985	984	950	682	1022	1022	985	693	-37	-38	-35	-11
200	986	985	953	681	1023	1022	986	714	-37	-37	-33	-33
300	986	985	954	681	1014	1012	978	725	-28	-27	-24	-44
400	986	985	956	683	1014	1012	980	725	-28	-27	-24	-42
500	987	986	959	684	1014	1012	982	727	-27	-26	-23	-43
600	987	986	960	685	1013	1012	984	727	-26	-26	-24	-42
700	987	986	961	687	1013	1011	984	727	-26	-25	-23	-40
800	987	986	962	688	1012	1010	985	727	-25	-24	-23	-39
900	987	985	963	689	1011	1009	985	727	-24	-24	-22	-38
1000	986	984	964	690	1010	1008	985	728	-24	-24	-21	-38
1100	987	991	964	691	1010	1014	984	719	-23	-23	-20	-28
1200	994	997	963	691	1017	1009	983	717	-23	-12	-20	-26
1300	1002		963	691	1018		977	714	-16		-14	-23
1400	1002		963	691	1015		965	711	-13		-2	-20
1500	1001		962	691	1009		964	708	-8		-2	-17
1600	998		961	690	1005		962	705	-7		-1	-15
1700	994		959	690	997		959	702	-3		0	-12
1800	985		957	689	984		955	698	1		2	-9
1900	974		955	689	969		955	695	5		0	-6
2000			953	688			951	691			2	-3
2100			950	686			946	687			4	-1
2200			947	683			941	681			6	2
2300			944				937				7	

DATA SHEET NO. 7 (CONTINUED)

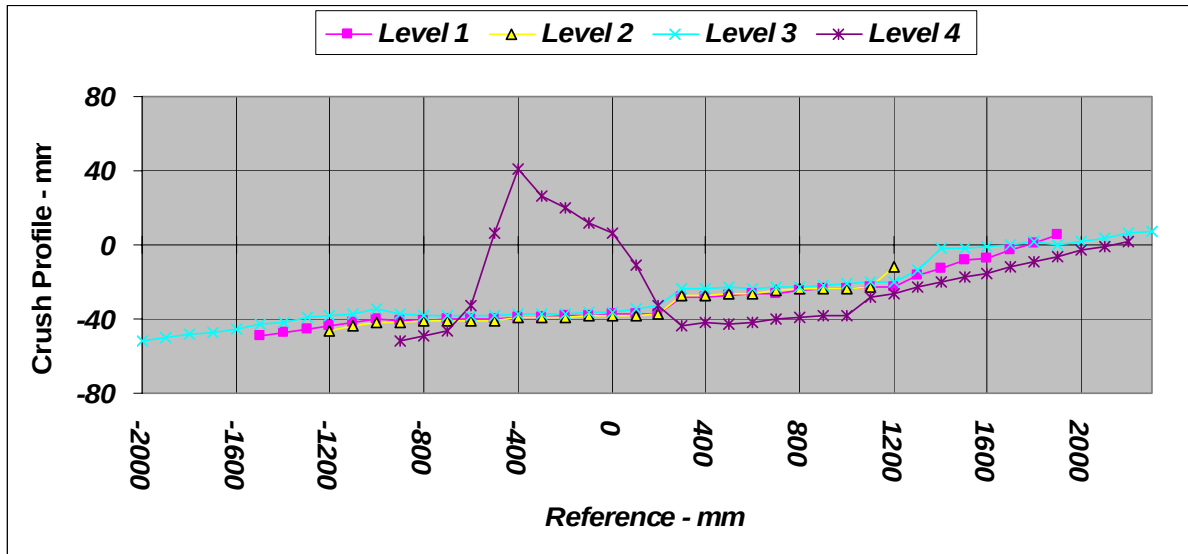
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

RIGHT SIDE CRUSH



The side vehicle crush measurements and plot reported are lateral.

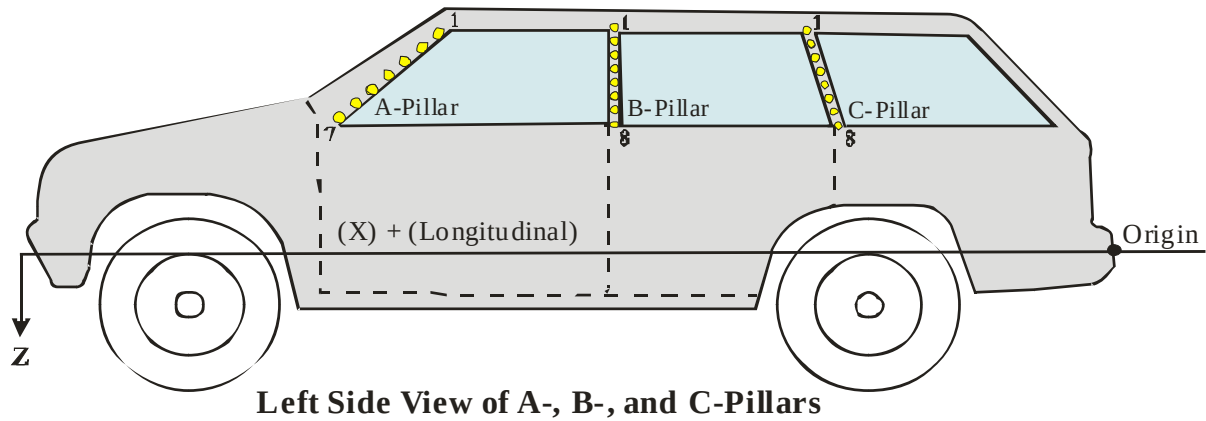
DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10



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

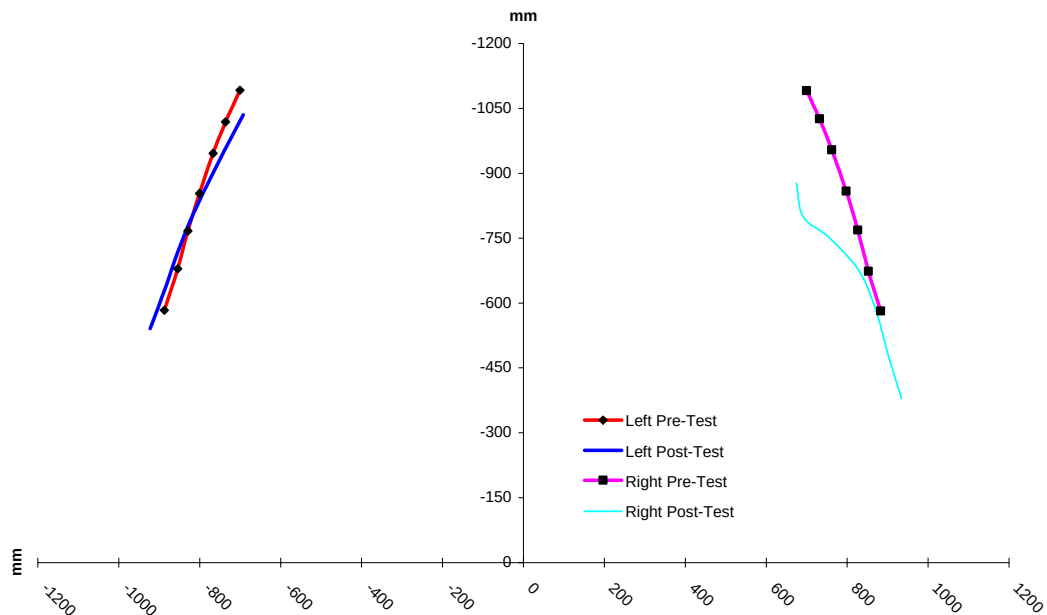
Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

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)	3628	-887	-583	3616	-923	-541	12	35	-43
(2)	3524	-854	-679	3513	-884	-637	11	29	-43
(3)	3430	-829	-767	3419	-852	-723	11	23	-44
(4)	3337	-801	-853	3327	-815	-807	9	15	-47
(5)	3230	-767	-946	3222	-769	-895	8	3	-51
(6)	3143	-736	-1019	3136	-732	-964	7	-4	-54
(7)	3032	-701	-1092	3026	-692	-1035	6	-9	-57
Right A-Pillar									
(1)	3622	883	-582	3624	935	-379	-2	-52	-202
(2)	3523	853	-673	3533	902	-478	-10	-50	-196
(3)	3421	826	-769	3439	872	-580	-18	-46	-189
(4)	3322	798	-859	3345	831	-673	-23	-33	-187
(5)	3214	762	-954	3244	756	-751	-30	5	-203
(6)	3124	732	-1026	3158	691	-799	-35	40	-227
(7)	3013	700	-1091	3058	674	-878	-45	26	-213

A-Pillar Deformation Plotted is Lateral



DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

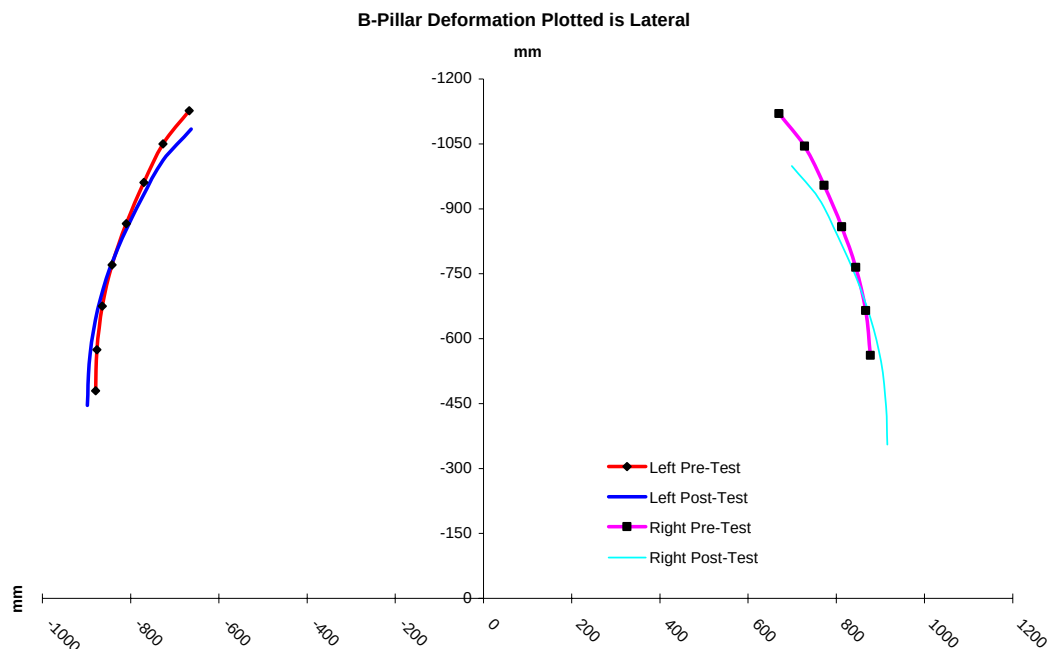
Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

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	-667	-1127	2472	-662	-1084	0	-5	-43
(2)	2471	-727	-1050	2472	-727	-1012	0	0	-38
(3)	2478	-770	-961	2478	-775	-925	0	5	-36
(4)	2486	-810	-866	2484	-819	-832	2	9	-33
(5)	2489	-842	-770	2486	-855	-739	3	13	-32
(6)	2493	-865	-675	2489	-880	-643	3	16	-33
(7)	2493	-877	-575	2488	-894	-541	5	17	-33
(8)	2500	-880	-480	2495	-898	-446	5	19	-34
Right B-Pillar									
(1)	2475	670	-1120	2519	699	-999	-45	-29	-121
(2)	2477	728	-1045	2514	759	-925	-37	-31	-120
(3)	2483	772	-954	2513	804	-835	-31	-32	-119
(4)	2488	812	-859	2511	845	-740	-23	-33	-119
(5)	2490	844	-765	2506	878	-646	-16	-34	-119
(6)	2496	867	-665	2505	901	-547	-9	-35	-118
(7)	2500	877	-562	2501	913	-444	-2	-35	-118
(8)	2503	880	-474	2498	916	-355	4	-36	-119



DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

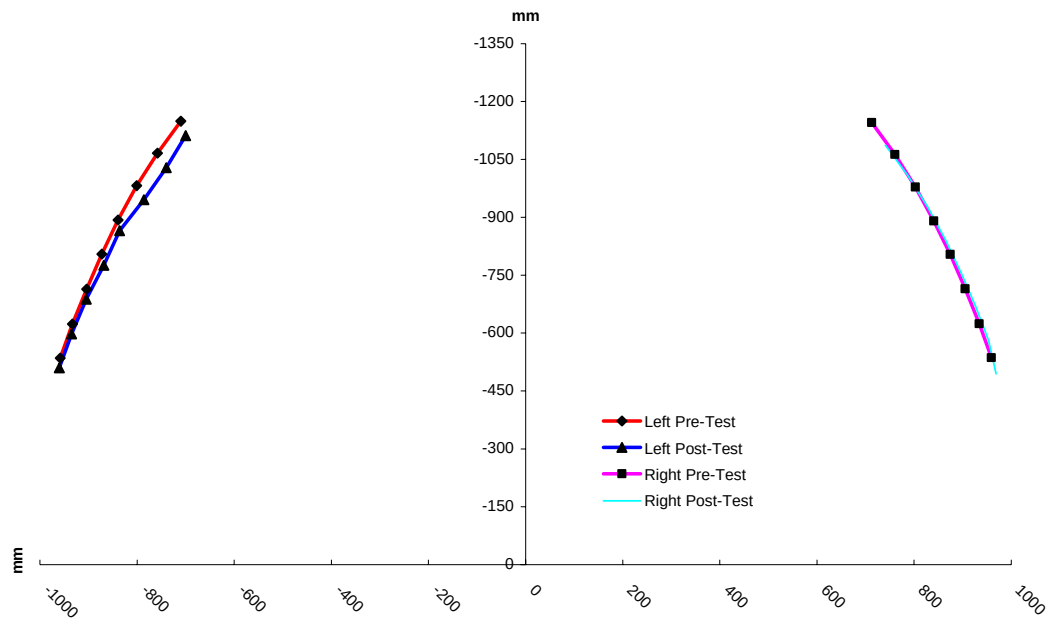
Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

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)	1568	-710	-1149	1570	-700	-1112	-1	-10	-37
(2)	1537	-758	-1066	1536	-740	-1028	2	-19	-38
(3)	1505	-801	-982	1501	-786	-946	4	-15	-36
(4)	1472	-839	-893	1469	-836	-865	4	-3	-27
(5)	1440	-873	-804	1435	-869	-776	5	-4	-28
(6)	1408	-904	-714	1402	-905	-688	6	1	-26
(7)	1375	-933	-623	1368	-935	-598	7	2	-26
(8)	1345	-958	-535	1336	-960	-510	9	2	-25
Right C-Pillar									
(1)	1571	713	-1146	1619	741	-1087	-49	-28	-59
(2)	1537	761	-1063	1580	788	-1007	-42	-27	-56
(3)	1504	803	-979	1539	829	-925	-35	-26	-54
(4)	1470	841	-891	1499	865	-841	-28	-24	-50
(5)	1437	874	-804	1458	897	-756	-21	-23	-48
(6)	1404	905	-715	1417	927	-669	-14	-22	-46
(7)	1370	934	-624	1377	953	-581	-7	-19	-44
(8)	1335	959	-537	1335	969	-494	0	-10	-42

C-Pillar Deformation Plotted is Lateral



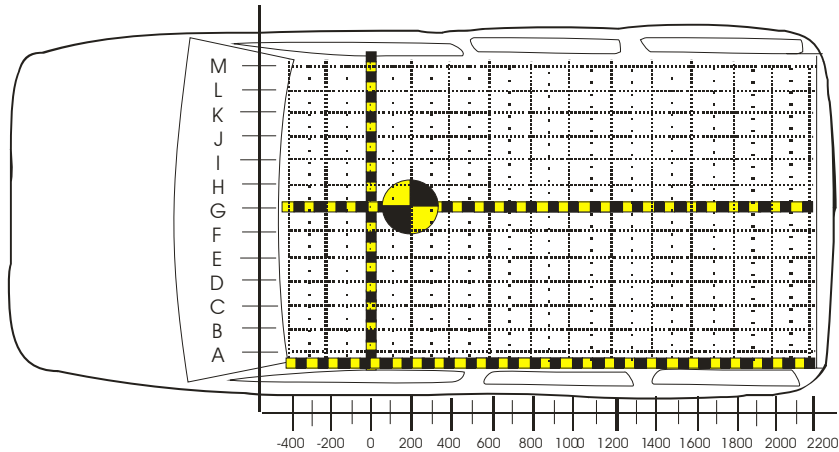
DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10



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	-598	-496	-396	-300	-580	-479	-381	-285	-18	-17	-15	-15
-300	-599	-500	-400	-301	-579	-485	-388	-287	-20	-15	-12	-14
-200	-600	-499	-400	-300	-583	-484	-388	-287	-17	-15	-12	-13
-100	-599	-501	-400	-302	-586	-486	-389	-290	-13	-15	-11	-12
0	-600	-500	-398	-302	-591	-485	-387	-292	-9	-15	-11	-10
100	-598	-497	-398	-302	-591	-484	-387	-292	-7	-13	-11	-10
200	-599	-499	-399	-302	-593	-488	-388	-293	-6	-11	-11	-9
300	-599	-498	-398	-299	-593	-489	-388	-292	-6	-9	-10	-7
400	-598	-497	-398	-301	-594	-487	-390	-295	-4	-10	-8	-6
500	-598	-497	-397	-301	-593	-489	-390	-295	-5	-8	-7	-6
600	-597	-498	-396	-301	-593	-488	-390	-295	-4	-10	-6	-6
700	-597	-498	-398	-300	-593	-490	-392	-295	-4	-8	-6	-5
800	-596	-497	-397	-301	-594	-491	-391	-297	-2	-6	-6	-4
900	-597	-496	-397	-300	-594	-490	-392	-297	-3	-6	-5	-3
1000	-597	-497	-397	-300	-594	-491	-392	-297	-3	-6	-5	-3
1100	-597	-496	-396	-299	-593	-491	-392	-297	-4	-5	-4	-2
1200	-597	-498	-398	-299	-595	-493	-395	-297	-2	-5	-3	-2
1300	-596	-497	-396	-299	-594	-494	-394	-298	-2	-3	-2	-1
1400	-597	-497	-397	-296	-595	-496	-396	-297	-2	-1	-1	1
1500	-598	-498	-395	-299	-597	-498	-396	-300	-1	0	1	1
1600	-598	-498	-396	-299	-596	-497	-397	-301	-2	-1	1	2
1700	-597	-497	-394	-299	-596	-496	-397	-300	-1	-1	3	1
1800	-597	-496	-395	-298	-597	-495	-397	-300	0	-1	2	2
1900	-598	-497	-395	-298	-598	-498	-398	-300	0	1	3	2
2000	-598	-498	-395	-298	-598	-498	-398	-301	0	0	3	3
2100	-599	-497	-396	-300	-599	-499	-399	-303	0	2	3	3
2200	-598	-495		-298	-599	-495		-299	1	0		1

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

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	-198	-98	-2	97	198	-183	-82	12	127	226	-15	-16	-14	-30	-28
-300	-201	-100	-3	100	201	-188	-88	7	126	227	-13	-12	-10	-26	-26
-200	-201	-99	-1	101	201	-189	-88	8	124	223	-12	-11	-9	-23	-22
-100	-201	-100	0	100	201	-190	-90	7	121	222	-11	-10	-7	-21	-21
0	-198	-98	1	100	200	-189	-89	7	119	219	-9	-9	-6	-19	-19
100	-197	-96	2	99	200	-189	-88	6	115	217	-8	-8	-4	-16	-17
200	-198	-97	1	99	200	-191	-90	7	114	214	-7	-7	-6	-15	-14
300	-197	-94	2	99	201	-190	-93	3	110	207	-7	-1	-1	-11	-6
400	-198	-96	3	101	201	-196	-94	3	111	209	-2	-2	0	-10	-8
500	-197	-97	3	100	201	-194	-95	3	110	209	-3	-2	0	-10	-8
600	-197	-95	4	102	203	-193	-93	4	112	211	-4	-2	0	-10	-8
700	-197	-95	4	103	202	-194	-94	4	111	211	-3	-1	0	-8	-9
800	-196	-95	4	101	203	-193	-93	4	109	211	-3	-2	0	-8	-8
900	-195	-92	4	103	204	-193	-92	3	110	212	-2	0	1	-7	-8
1000	-197	-94	4	102	203	-195	-94	4	108	209	-2	0	0	-6	-6
1100	-194	-95	4	102	204	-194	-95	3	107	209	0	0	1	-5	-5
1200	-195	-95	4	103	205	-195	-96	2	109	209	0	1	2	-6	-4
1300	-195	-93	4	103	205	-195	-93	2	108	209	0	0	2	-5	-4
1400	-195	-95	4	102	204	-196	-96	1	106	207	1	1	3	-4	-3
1500	-196	-94	4	103	202	-197	-95	2	106	205	1	1	2	-3	-3
1600	-196	-93	4	103	204	-197	-96	2	106	206	1	3	2	-3	-2
1700	-194	-94	5	101	203	-196	-97	2	103	205	2	3	3	-2	-2
1800	-194	-92	5	102	203	-197	-93	2	104	205	3	1	3	-2	-2
1900	-195	-93	5	103	203	-197	-97	3	103	204	2	4	2	0	-1
2000	-195	-94	6	102	203	-198	-96	3	103	204	3	2	3	-1	-1
2100	-195	-95	5	102	202	-199	-96	2	102	201	4	1	3	0	1
2200	-196	-96	5	104	202	-200	-99	2	103	201	4	3	3	1	1

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

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	300	400	497	599	326	428	487	523	-26	-28	10	76
-300	301	402	501	601	324	426	498	525	-23	-24	3	76
-200	303	401	503	601	325	410	503	539	-22	-9	0	62
-100	305	401	504	599	322	407	500	551	-17	-6	4	48
0	305	401	503	600	322	410	497	564	-17	-9	6	36
100	306	400	501	600	322	411	493	578	-16	-11	8	22
200	302	401	501	600	315	412	501	584	-13	-11	0	16
300	301	400	500	600	309	406	503	589	-8	-6	-3	11
400	305	402	503	599	311	406	506	591	-6	-4	-3	8
500	306	401	501	599	312	405	500	595	-6	-4	1	4
600	306	403	503	599	311	408	500	596	-5	-5	3	3
700	306	403	503	599	311	407	500	599	-5	-4	3	0
800	306	403	503	600	311	407	503	601	-5	-4	0	-1
900	306	404	505	601	311	408	505	602	-5	-4	0	-1
1000	306	403	502	600	311	408	504	604	-5	-5	-2	-4
1100	306	403	504	602	311	407	506	606	-5	-4	-2	-4
1200	307	404	504	604	312	409	507	608	-5	-5	-3	-4
1300	308	404	505	604	312	408	508	607	-4	-4	-3	-3
1400	305	403	503	604	310	408	507	606	-5	-5	-4	-2
1500	308	401	502	603	310	405	505	606	-2	-4	-3	-3
1600	307	403	502	603	309	405	505	606	-2	-2	-3	-3
1700	307	403	503	603	309	406	505	606	-2	-3	-2	-3
1800	307	403	504	603	309	406	505	605	-2	-3	-1	-2
1900	307	404	503	603	308	406	504	605	-1	-2	-1	-2
2000	307	403	504	605	307	404	504	605	0	-1	0	0
2100	302	402	502	603	301	402	501	603	1	0	1	0
2200	305		501	599	304		501	598	1		0	1

DATA SHEET NO. 7 (CONTINUED)

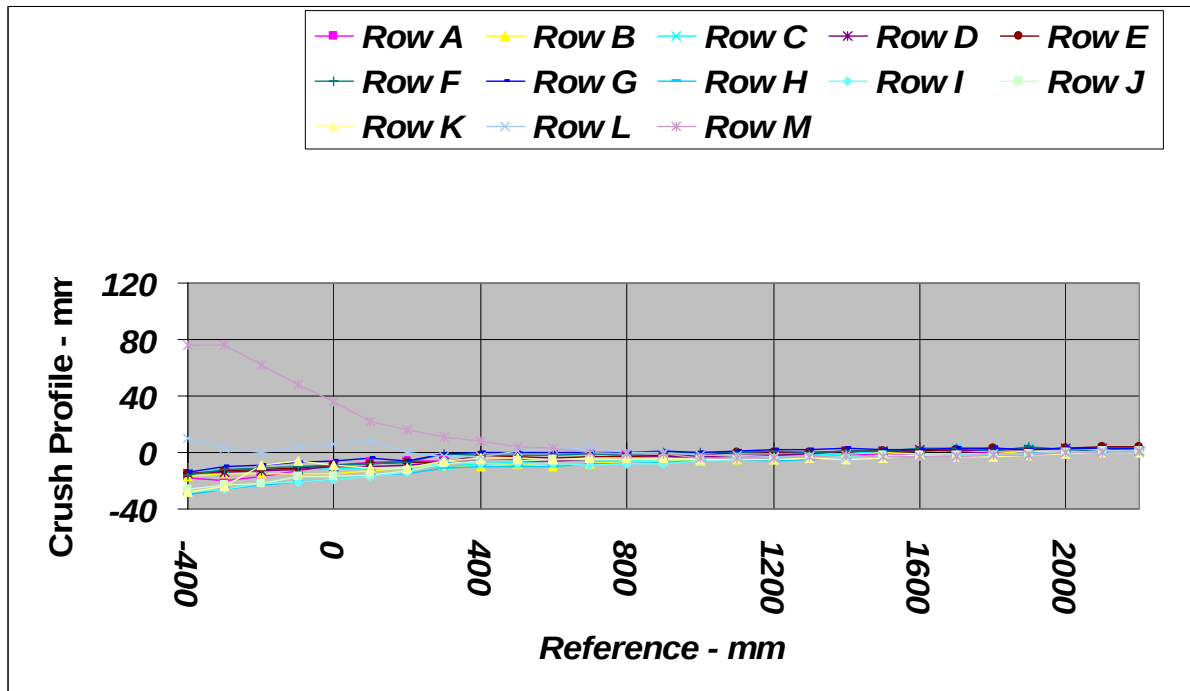
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

ROOF CRUSH



The roof crush measurements and plot reported are vertical.

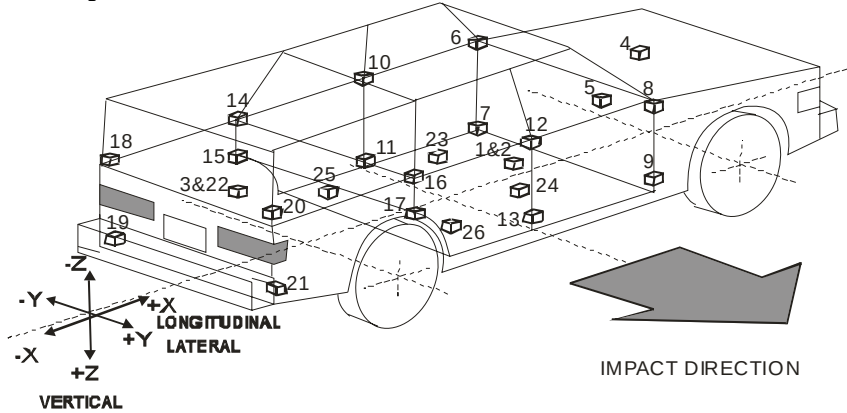
DATA SHEET NO. 8

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Vehicle Center of Gravity	2910	50	-650
2	Vehicle Center of Gravity ROLL	2910	10	-650
3	Rear Deck (cargo area) ROLL	740	0	-800
4	Top of Engine	4720	178	-926
5	Bottom of Engine	4370	0	-295
6	Left A-Pillar Upper	3350	-537	-1737
7	Left A-Pillar Lower	3910	-810	-588
8	Right A-Pillar Upper	3365	537	-1737
9	Right A-Pillar Lower	3890	810	-568
10	Left B-Pillar Upper	2810	-625	-1733
11	Left B-Pillar Lower	2810	-837	-584
12	Right B-Pillar Upper	2820	625	-1713
13	Right B-Pillar Lower	2785	837	-550
14	Left C-Pillar Upper	2000	-672	-1673
15	Left C-Pillar Lower	2180	-842	-575
16	Right C-Pillar Upper	2000	672	-1670
17	Right C-Pillar Lower	2185	842	-565
18	Left D-Pillar Upper	805	-630	-1577
19	Left D-Pillar Lower	655	-725	-924
20	Right D-Pillar Upper	820	630	-1575
21	Right D-Pillar Lower	650	725	-941
22	Vehicle Rear Deck	705	0	-800
23	LF Seat Position (on floor)	3150	-450	-603
24	RF Seat Position (on floor)	3158	470	-590
25	LR Seat Position (on floor)	2190	-387	-680
26	RR Seat Position (on floor)	2230	436	-570

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

Location		Unit	Positive Direction Max.	Time (ms)	Negative Direction Max.	Time (ms)
(1) Vehicle Center of Gravity Acceleration	X	g	6.4	20.2	-3.9	99.9
	Y	g	3.0	2387.8	-21.4	29.4
	Z	g	10.8	106.6	-10.8	75.4
	R	g	21.8	29.3		
(2) Vehicle Center of Gravity Gyro ¹	X	°/s	513.6	31.1	-794.8	724.2
	Y	°/s	1264.8	22.2	-1423.1	24.2
	Z	°/s	269.0	66.3	-513.5	22.6
(3) Rear Deck Gyro ¹ (cargo area)	X	°/s	1251.4	107.2	-1474.1	106.3
	Y	°/s	1379.8	103.2	-1314.6	105.0
	Z	°/s	1058.2	104.0	-1128.9	103.0
(4) Top of Engine	X	g	2.5	26.4	-3.6	107.2
	Y	g	3.0	3201.9	-15.7	70.2
	Z	g	5.2	133.8	-9.2	90.9
	R	g	15.9	70.2		
(5) Bottom of Engine	X	g	5.2	16.5	-1.9	116.0
	Y	g	3.8	946.6	-22.9	16.4
	Z	g	5.9	947.8	-5.8	92.3
	R	g	24.1	16.4		
(6) Left A-Pillar Upper	X	g	8.5	1038.6	-4.7	1047.0
	Y	g	15.5	103.0	-12.8	706.0
	Z	g	26.0	919.3	-8.4	33.8
	R	g	28.0	919.2		
(7) Left A-Pillar Lower	X	g	2.9	29.4	-2.6	93.7
	Y	g	4.3	920.7	-18.4	30.3
	Z	g	13.2	922.3	-11.2	25.3
	R	g	20.5	30.4		
(8) Right A-Pillar Upper	X	g	23.6	770.6	-4.6	723.4
	Y	g	12.7	1191.8	-28.6	706.7
	Z	g	21.6	1049.1	-8.9	79.3
	R	g	28.9	706.8		
(9) Right A-Pillar Lower	X	g	4.2	21.0	-2.9	98.0
	Y	g	2.9	2378.5	-17.1	91.0
	Z	g	8.3	33.5	-6.8	84.2
	R	g	18.0	31.6		

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
(10) Left B-Pillar Upper	X	g	7.3	102.9	-3.5	913.2
	Y	g	11.0	917.0	-12.5	116.7
	Z	g	26.7	914.4	-9.5	29.0
	R	g	27.0	914.1		
(11) Left B-Pillar Lower	X	g	2.3	927.9	-3.9	75.0
	Y	g	6.0	933.0	-19.1	29.6
	Z	g	13.2	915.0	-12.2	29.8
	R	g	22.6	29.7		
(12) Right B-Pillar Upper	X	g	3.6	702.6	-14.6	954.6
	Y	g	9.7	752.4	-23.8	953.9
	Z	g	70.3	102.6	-10.3	77.5
	R	g	71.2	102.6		
(13) Right B-Pillar Lower	X	g	4.8	71.2	-3.8	85.7
	Y	g	3.0	2387.2	-22.4	29.9
	Z	g	12.8	27.4	-5.5	73.5
	R	g	24.0	29.4		
(14) Left C-Pillar Upper	X	g	54.6	104.4	-5.3	915.2
	Y	g	16.9	935.5	-107.2	106.0
	Z	g	29.4	918.5	-16.9	120.1
	R	g	114.4	105.8		
(15) Left C-Pillar Lower	X	g	2.4	927.0	-3.4	75.2
	Y	g	5.2	3120.9	-17.3	29.0
	Z	g	11.3	922.3	-12.7	20.8
	R	g	21.4	29.0		
(16) Right C-Pillar Upper	X	g	4.3	25.2	-3.8	113.1
	Y	g	6.1	17.7	-20.4	109.2
	Z	g	7.3	811.0	-9.7	102.5
	R	g	20.5	109.2		
(17) Right C-Pillar Lower	X	g	5.7	70.9	-3.7	85.6
	Y	g	5.0	2385.6	-15.9	29.5
	Z	g	12.3	25.7	-8.9	72.2
	R	g	17.4	26.7		
(18) Left D-Pillar Upper	X	g	3.6	26.4	-4.9	920.2
	Y	g	4.3	1961.7	-11.9	97.0
	Z	g	15.3	923.5	-12.3	35.7
	R	g	15.4	923.5		

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
(19) Left D-Pillar Lower	X	g	5.2	25.0	-4.7	919.7
	Y	g	3.2	2380.3	-9.4	109.7
	Z	g	13.8	923.7	-14.7	35.0
	R	g	16.4	34.3		
(20) Right D-Pillar Upper	X	g	4.3	33.7	-4.3	112.2
	Y	g	2.8	1961.0	-15.2	101.7
	Z	g	8.5	35.7	-9.5	81.9
	R	g	15.7	113.8		
(21) Right D-Pillar Lower	X	g	3.5	66.8	-5.6	112.8
	Y	g	2.9	2381.2	-11.2	63.9
	Z	g	11.1	35.0	-10.5	81.9
	R	g	14.2	34.2		
(22) Vehicle Rear Deck	X	g	2.8	66.1	-2.3	57.4
	Y	g	3.3	2380.6	-10.4	87.8
	Z	g	7.4	926.7	-17.5	106.2
	R	g	18.3	106.2		
(23) LF Seat Position (on floor)	X	g	2.3	43.0	-4.0	93.8
	Y	g	3.4	2387.4	-18.7	29.3
	Z	g	8.9	929.8	-10.1	23.6
	R	g	18.9	29.4		
(24) RF Seat Position (on floor)	X	g	4.6	71.4	-3.4	86.8
	Y	g	3.3	2388.2	-19.4	29.6
	Z	g	14.1	19.0	-8.3	14.0
	R	g	19.4	29.7		
(25) LR Seat Position (on floor)	X	g	3.2	43.0	-3.4	98.3
	Y	g	3.9	2386.2	-17.0	29.4
	Z	g	7.8	923.6	-9.7	22.4
	R	g	17.9	29.8		
(26) RR Seat Position (on floor)	X	g	4.0	78.8	-4.3	64.4
	Y	g	39.3	1165.1	-17.4	29.5
	Z	g	10.8	38.1	-11.0	74.0
	R	g	39.4	1165.1		

Reference: X: + Forward from rear bumper

Y: + Rightward from vehicle centerline

Z: + Downward from ground level

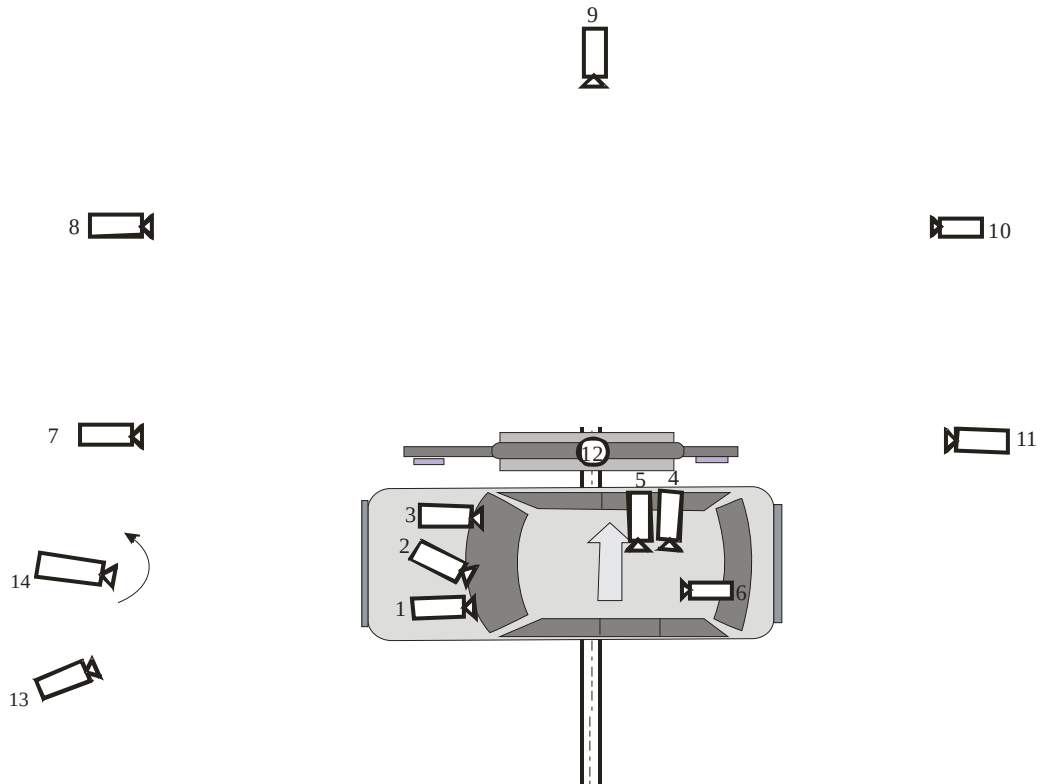
For acceleration data sign convention see Report Sign Convention in Appendix D.

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: 04/13/10



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	8.5	500	0
3	Driver Pelvis Area - Onboard	VRTC – 3	6	500	0
4	Rear Passenger Waste Up	Redlake – LE	8.5	500	0
5	Rear Passenger Overall	Redlake – LE	4.8	500	0
6	Rear Passenger Head	Redlake – LE	6	500	0
7	Vehicle Left Side Launch	Redlake – LE	6.5	500	0
8	Vehicle Left Side Later in Event	Visario G2	12.0	500	0
9	Downstream Wide	Visario G1	25	500	0
10	Vehicle Right Side Later in Event	Redlake – LE	12.5	500	0
11	Vehicle Right Side Launch	Redlake – LE	12.5	500	0
12	Overhead wide	Redlake – LE	6.5	500	0
13	Upstream Oblique Wide	Visario G2	12.5	500	0
14	Real-time Panning	Canon	zoom	24	

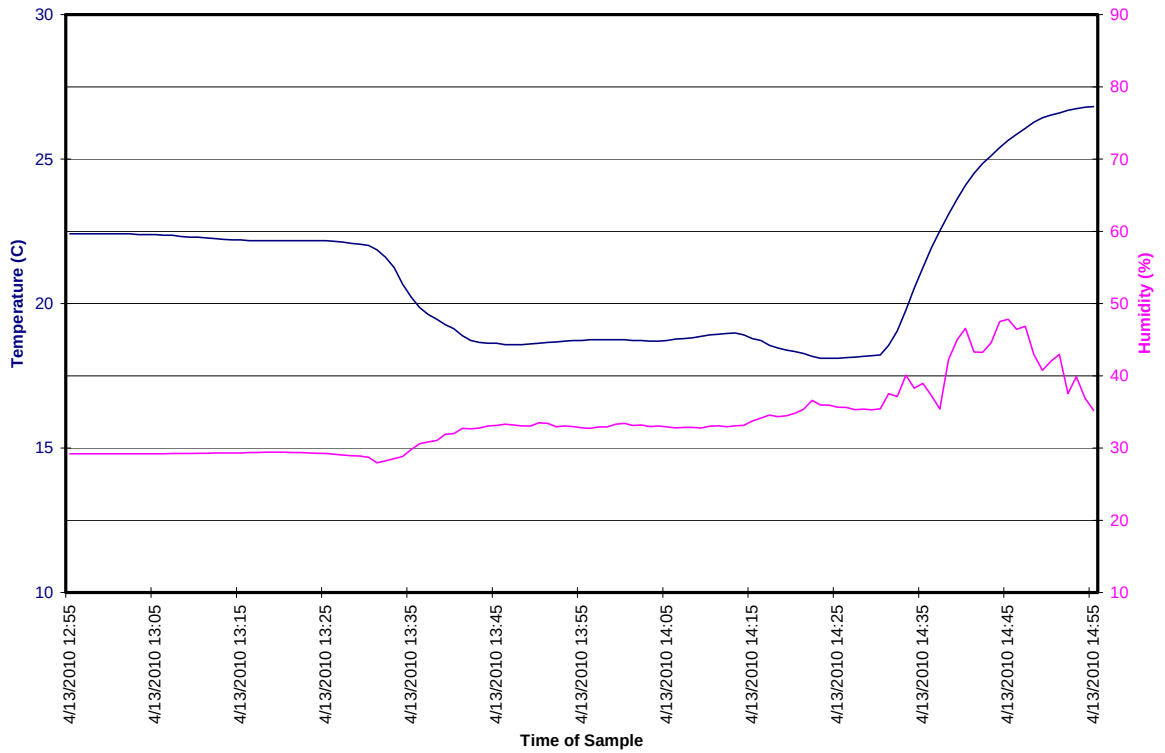
DATA SHEET NO. 10
DUMMY / VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/13/10

2007 Ford Expedition Curb Trip Rollover 100413; Test Time 14:55



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

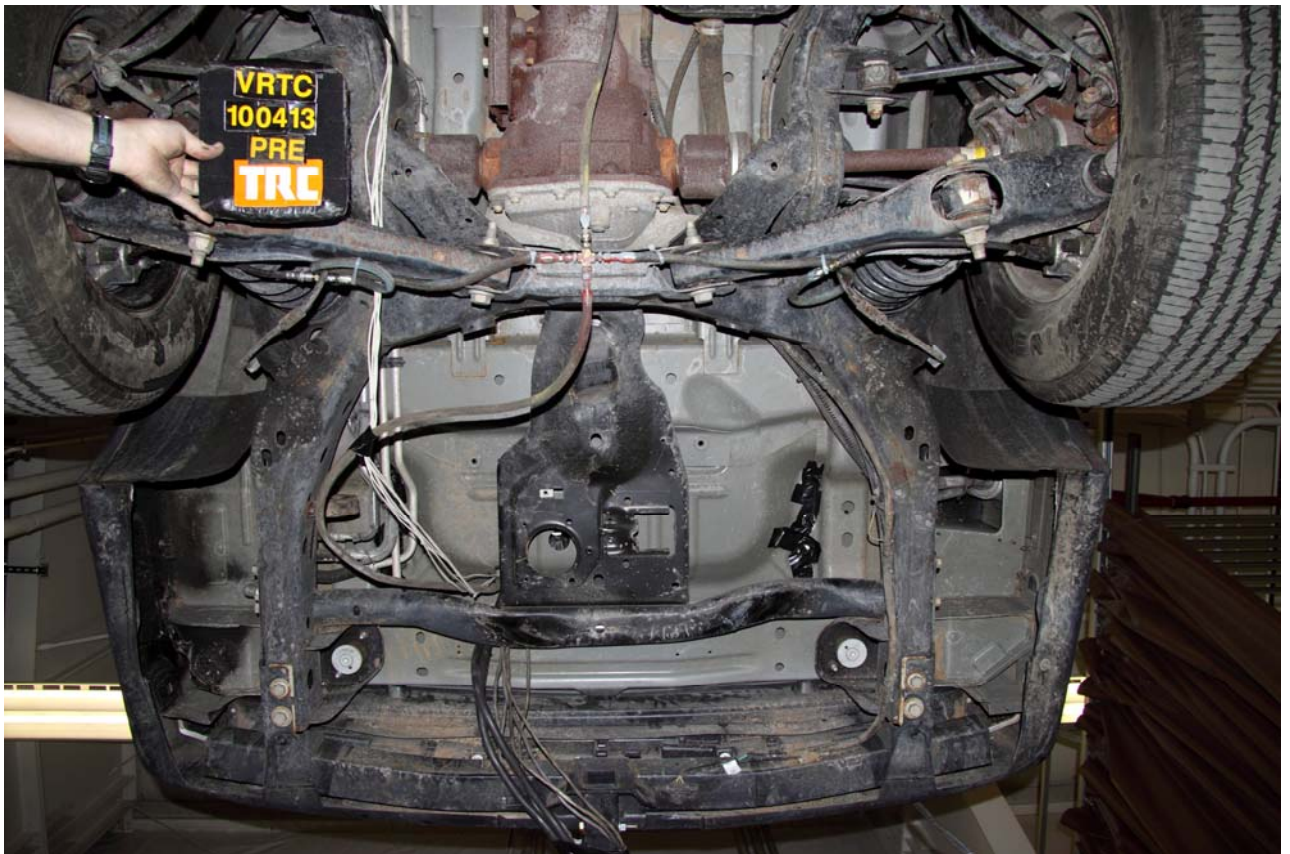


Figure A-19 Pre-Test Rear Underbody View

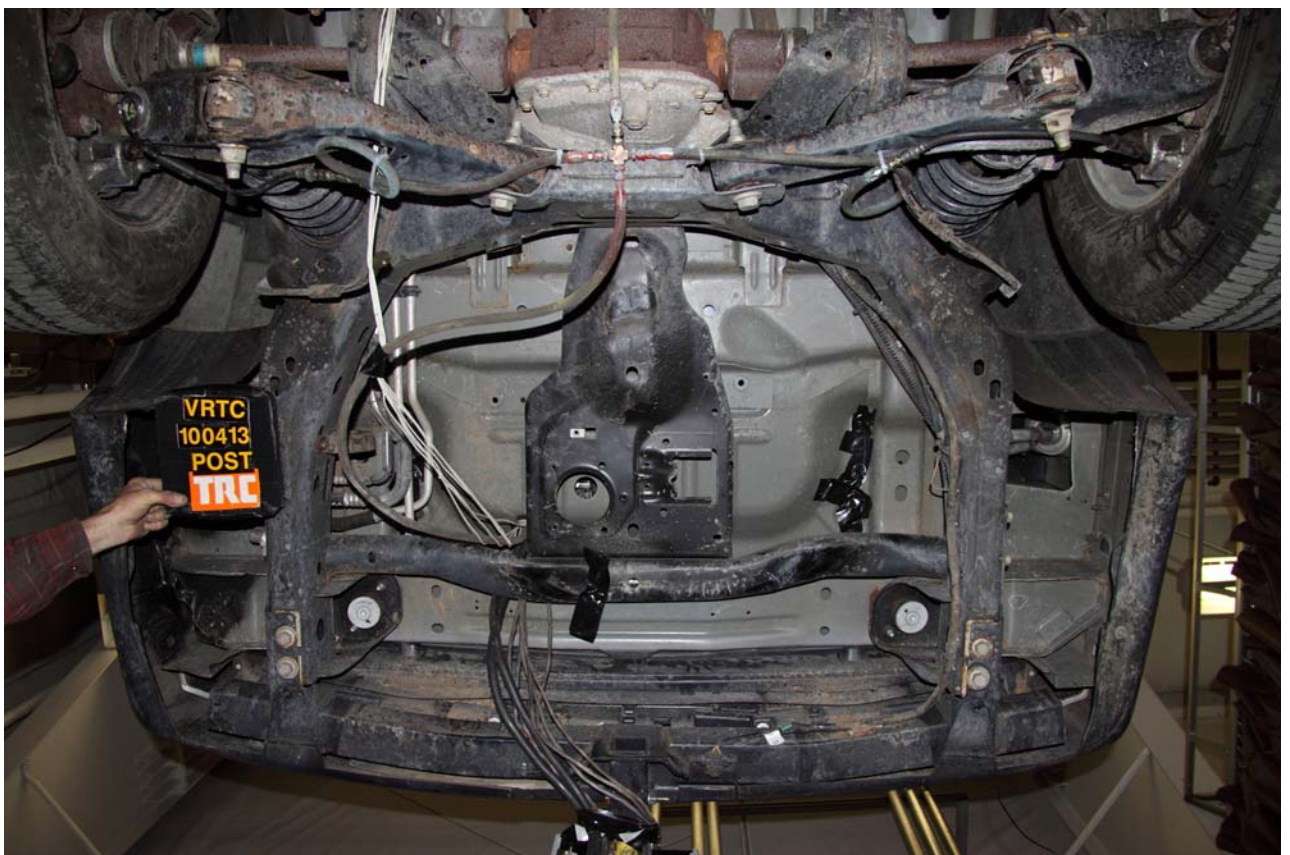


Figure A-20 Post-Test Rear Underbody View



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 Post-Test Right Front Passenger Dummy - View 4



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



Figure A-44 Post-Test Left Rear Passenger Dummy - View 1



Figure A-45 Pre-Test Left Rear Passenger Dummy - View 2



Figure A-46 Post-Test Left Rear Passenger Dummy - View 2



Figure A-47 Pre-Test Left Rear Passenger Dummy - View 3



Figure A-48 Post-Test Left Rear Passenger Dummy - View 3



Figure A-49 Pre-Test Left Rear Passenger Dummy - View 4



Figure A-50 Post-Test Left Rear Passenger Dummy - View 4



Figure A-51 Post-Test Driver Dummy Contact View

Intentionally Left Blank



Figure A-52 Post-Test Right Front Passenger Dummy Contact – View 1



Figure A-53 Post-Test Right Front Passenger Dummy Contact – View 2



Figure A-54 Post-Test Left Rear Passenger Dummy Contact – View 1



Figure A-55 Post-Test Left Rear Passenger Dummy Contact – View 2



Figure A-56 Post-Test Left Rear Passenger Dummy Contact – View 3



Figure A-57 Pre-Test Test Area View



Figure A-58 Post-Test Vehicle Resting Position – Front



Figure A-59 Post-Test Vehicle Resting Position – Left Side



Figure A-60 Post-Test Vehicle Resting Position - Rear



Figure A-61 Post-Test Vehicle Resting Position – Right Side



Figure A-62 Vehicle Certification Label

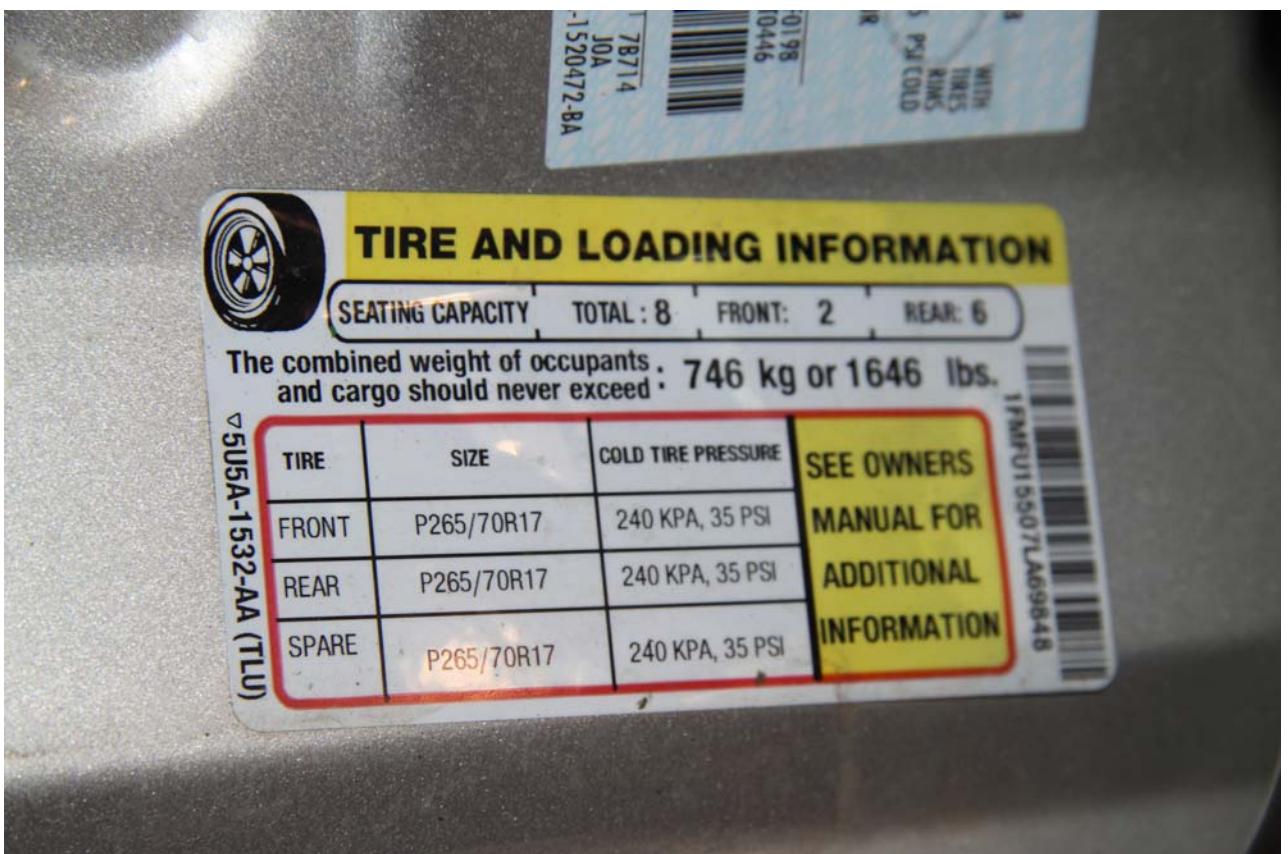


Figure A-63 Tire and Loading Information Label

APPENDIX B
DATA PLOTS



Curb Trip Rollover 2007 Ford Expedition

Driver Head X-Axis Acceleration

Date: 04/13/2010

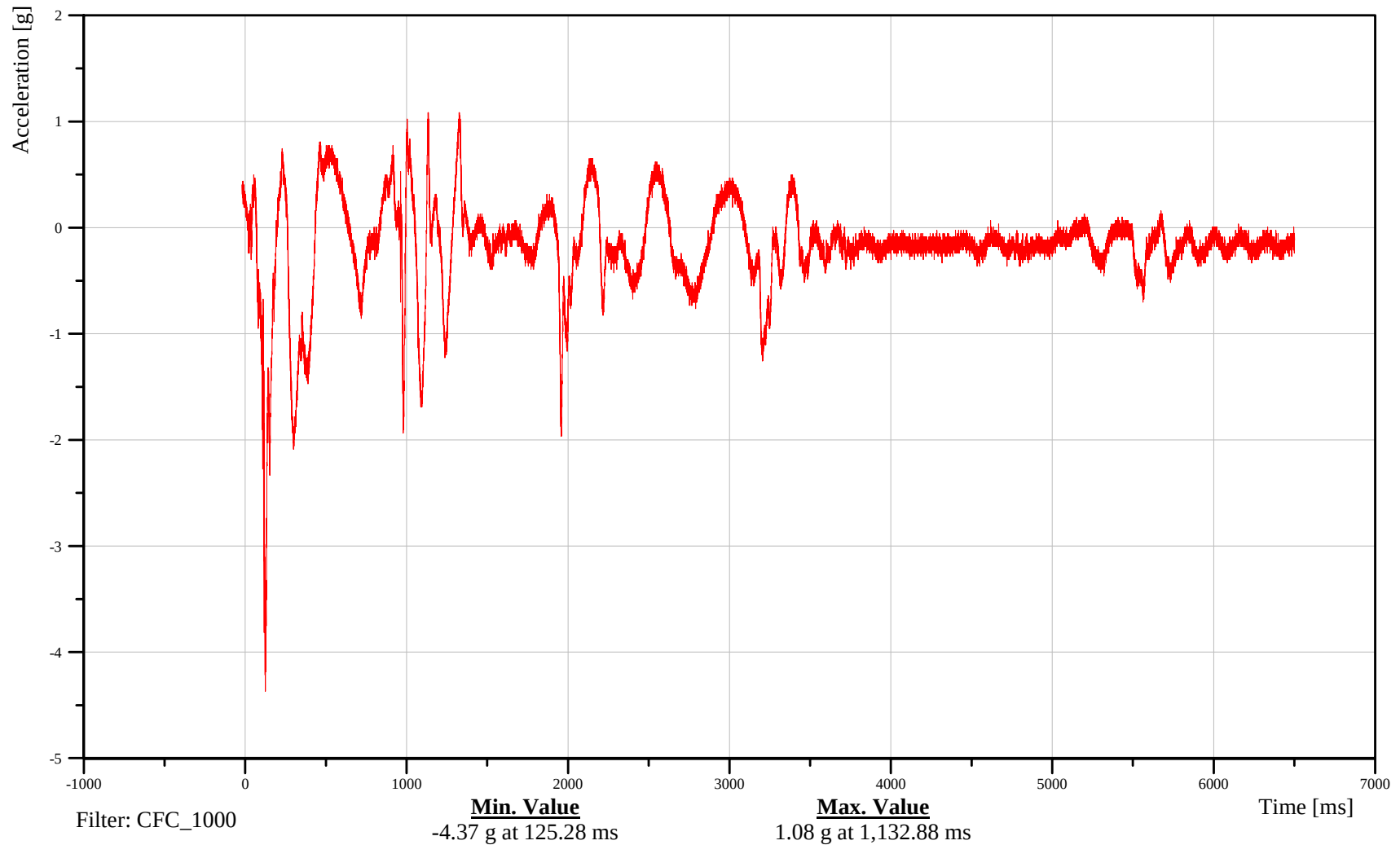
Time: 15:07

Customer: VRTC

11HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-2

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Head Y-Axis Acceleration

Date: 04/13/2010

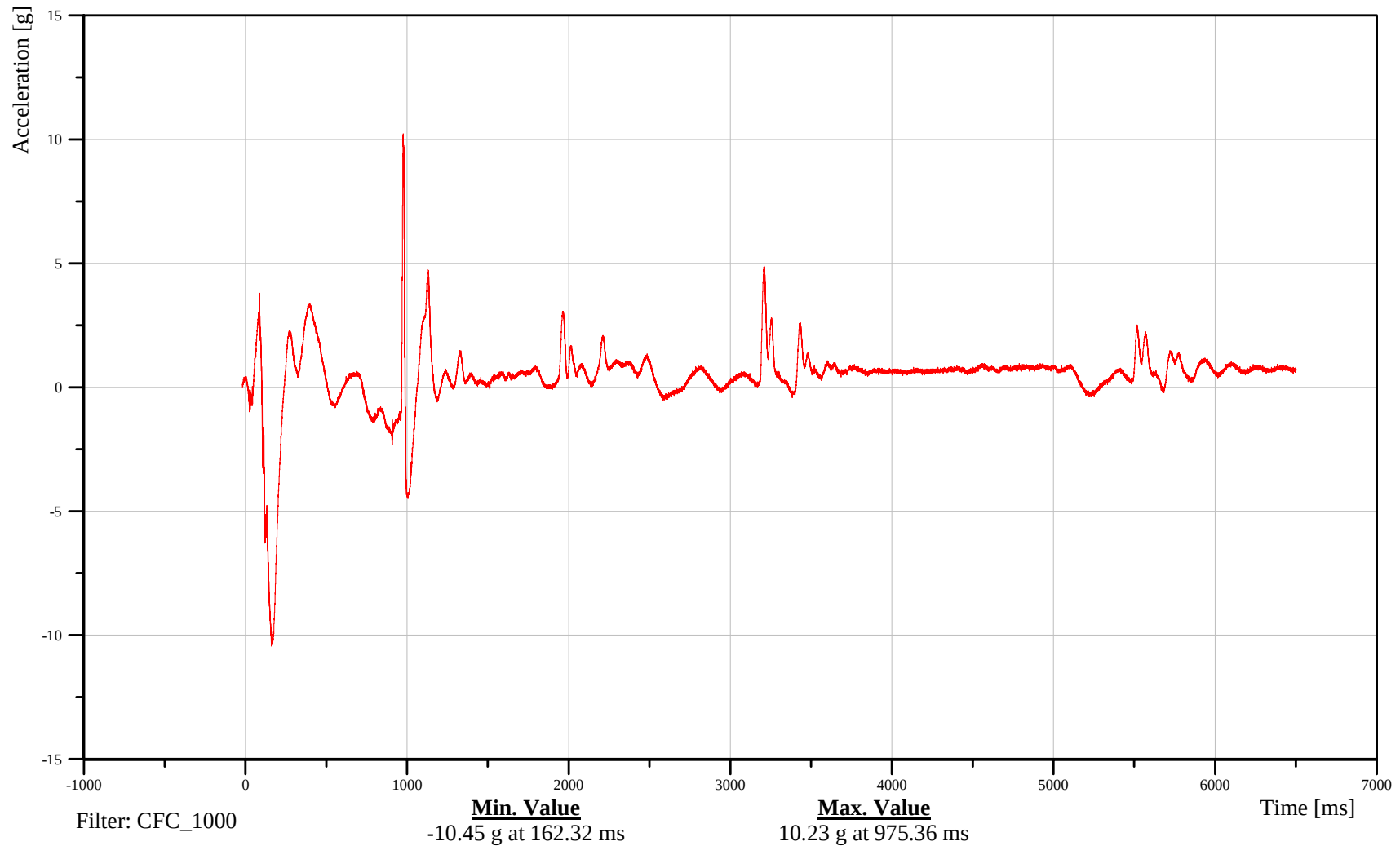
Time: 15:07

Customer: VRTC

11HEADCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-3

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Head Z-Axis Acceleration

Date: 04/13/2010

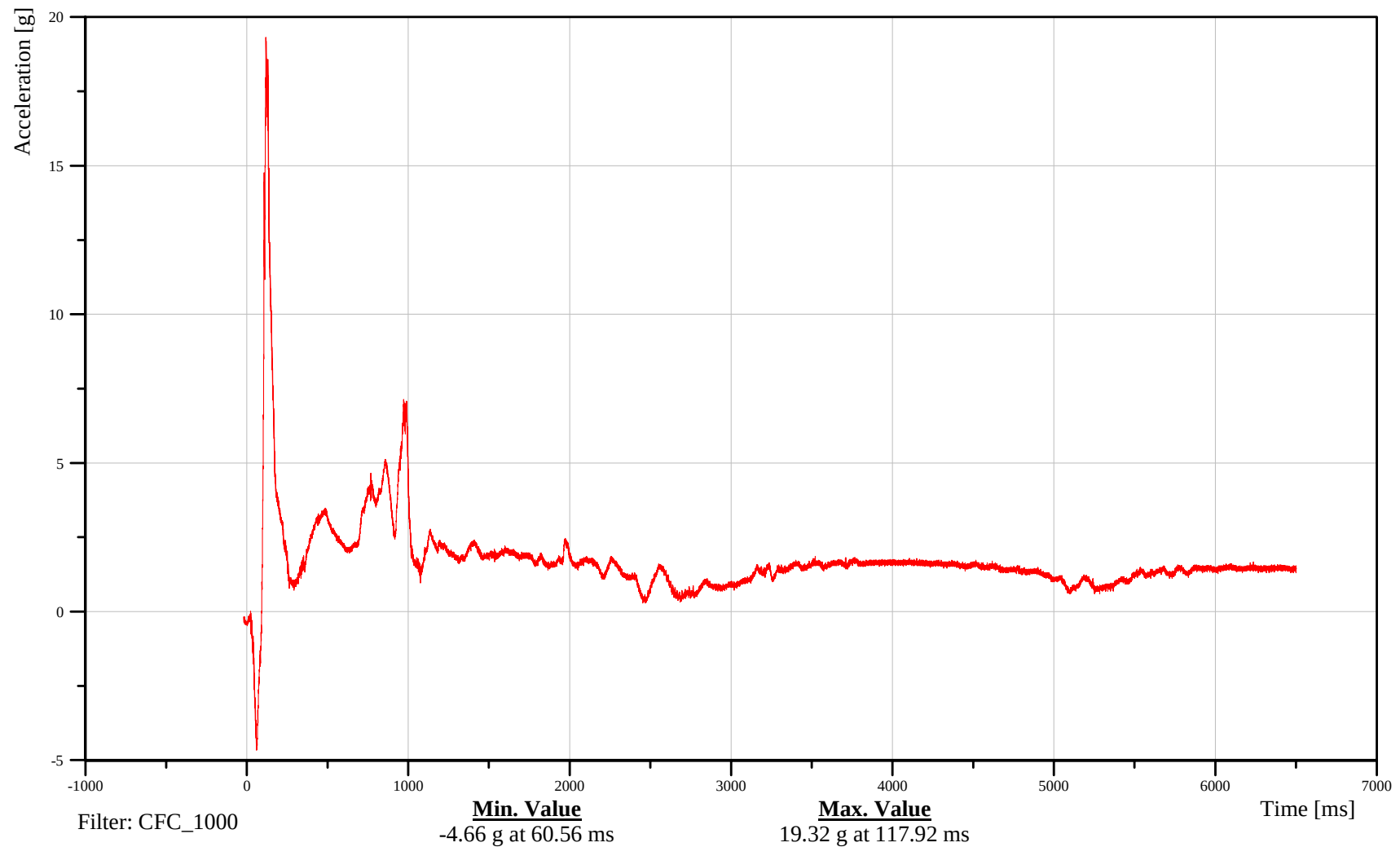
Time: 15:07

Customer: VRTC

11HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-4

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Head Resultant Acceleration

Date: 04/13/2010

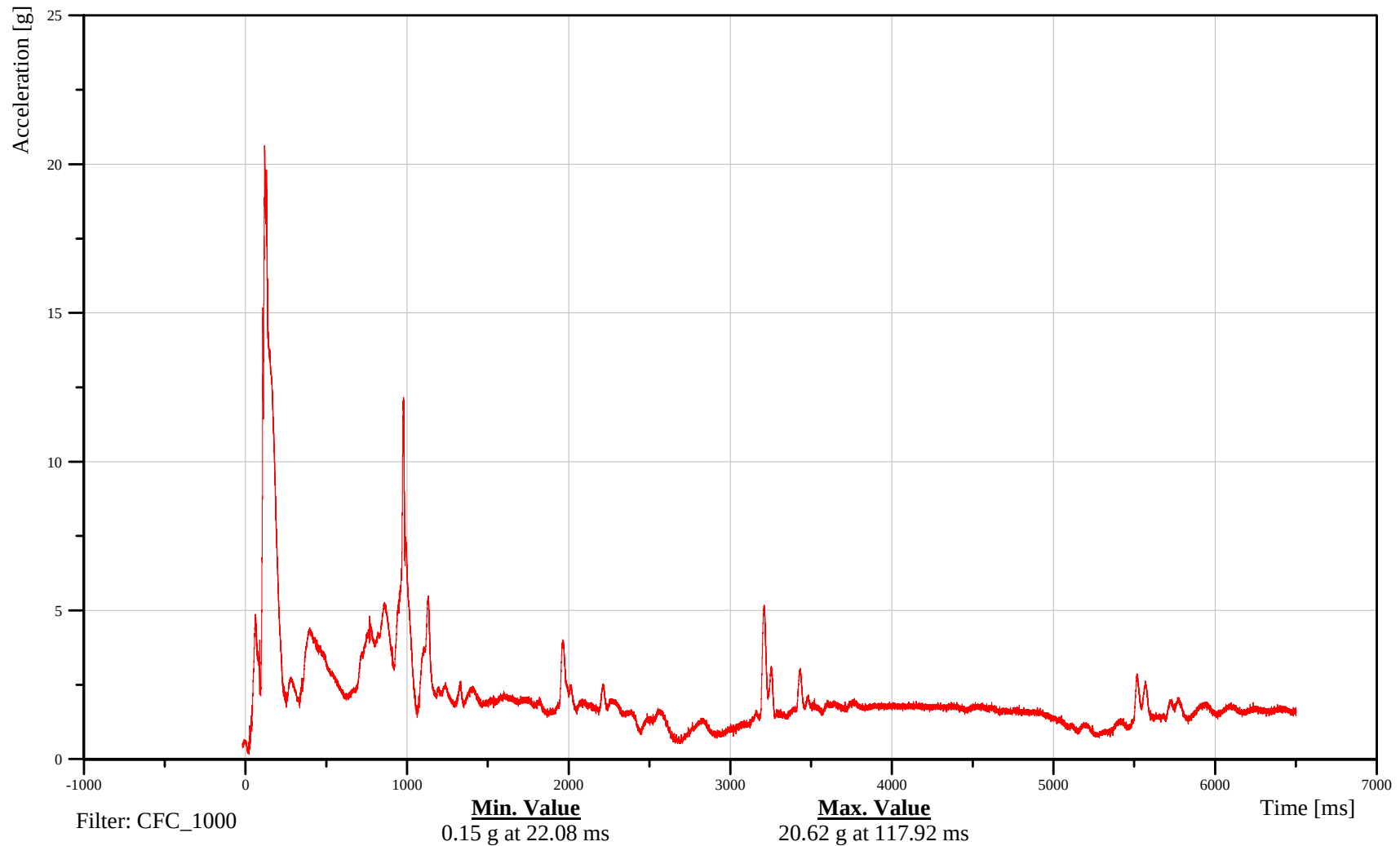
Time: 15:07

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-5

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Head (DTS ARS) Rate Gyro X

Date: 04/13/2010

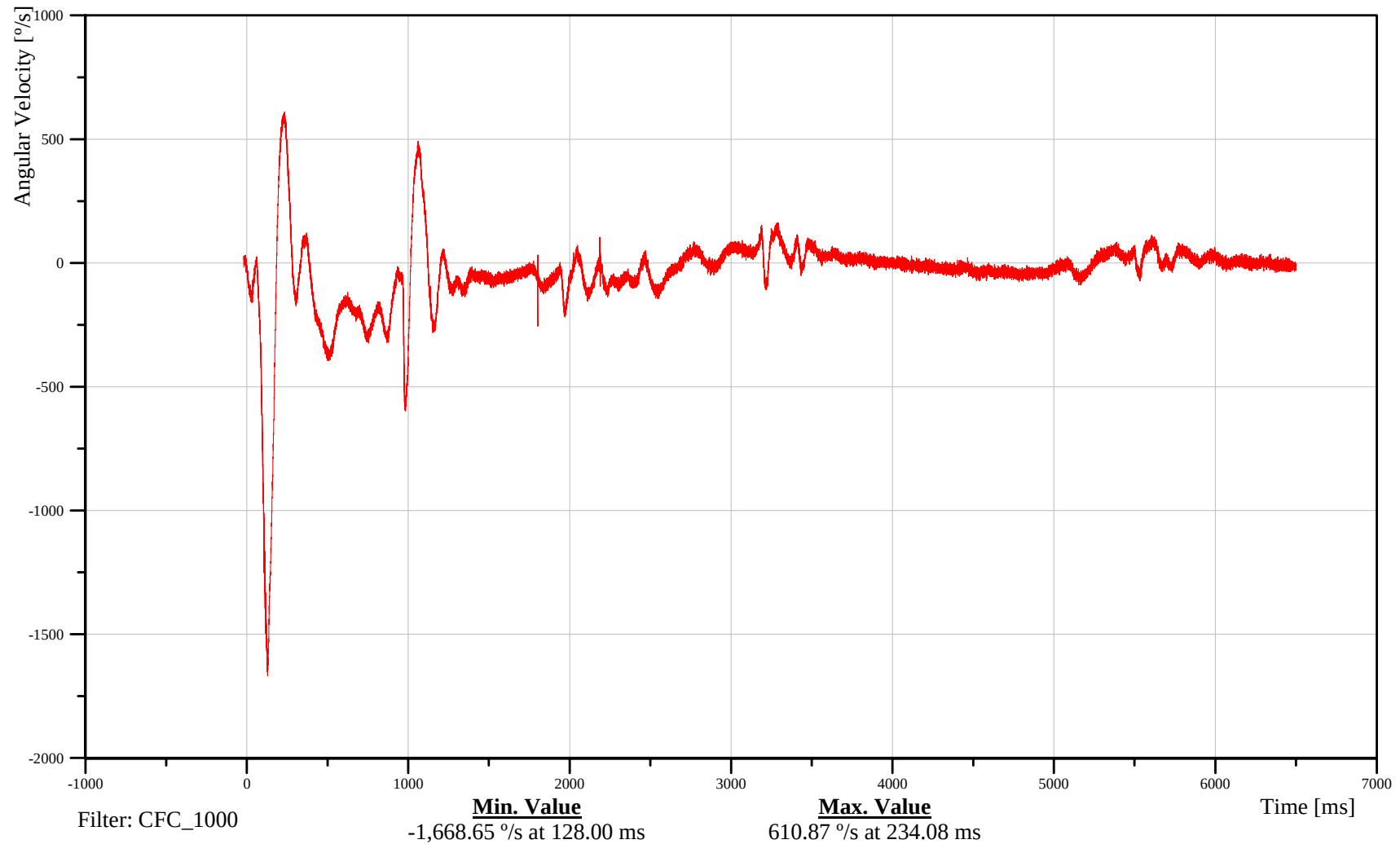
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-6

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Head (DTS ARS) Rate Gyro Y

Date: 04/13/2010

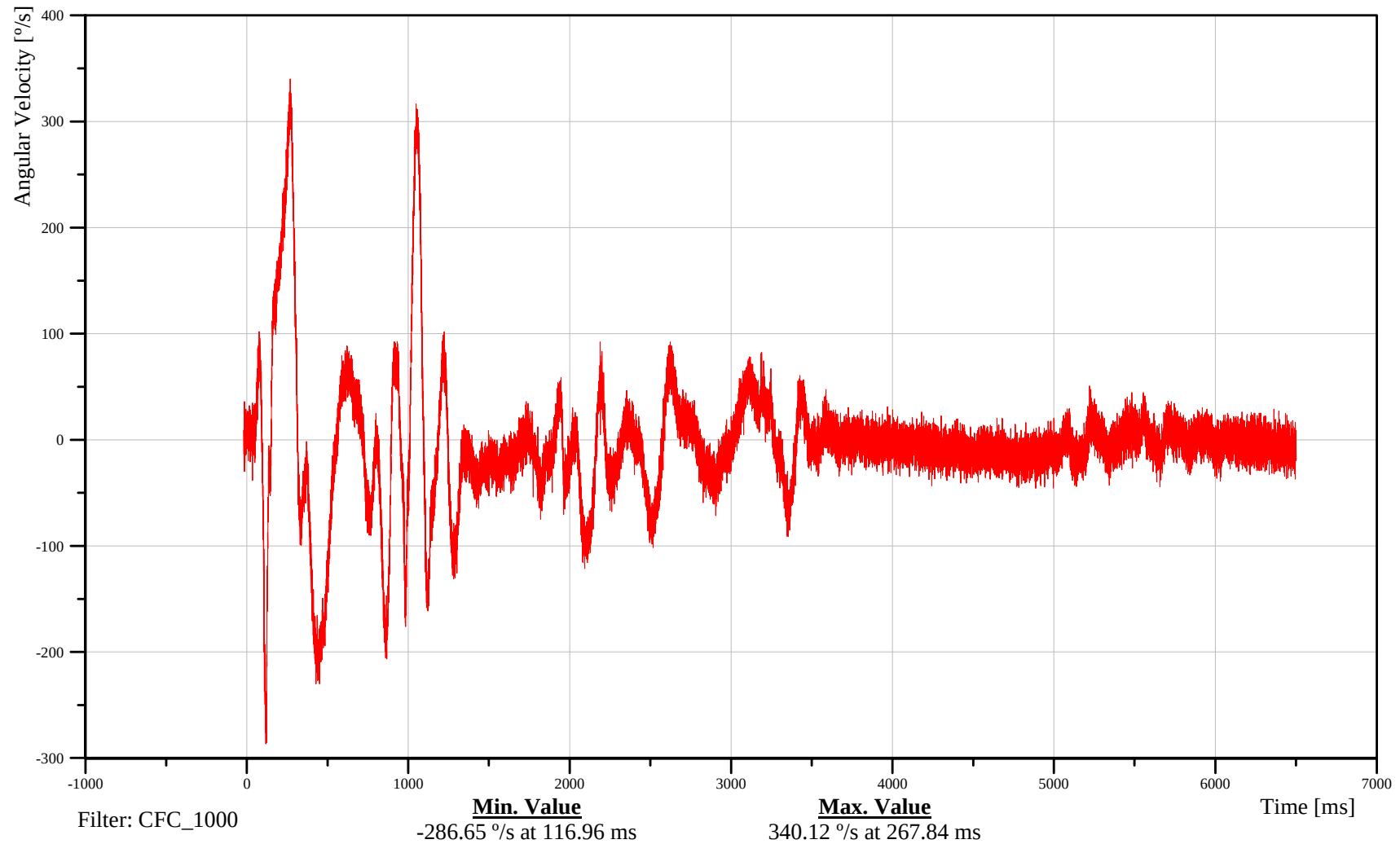
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-7

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Head (DTS ARS) Rate Gyro Z

Date: 04/13/2010

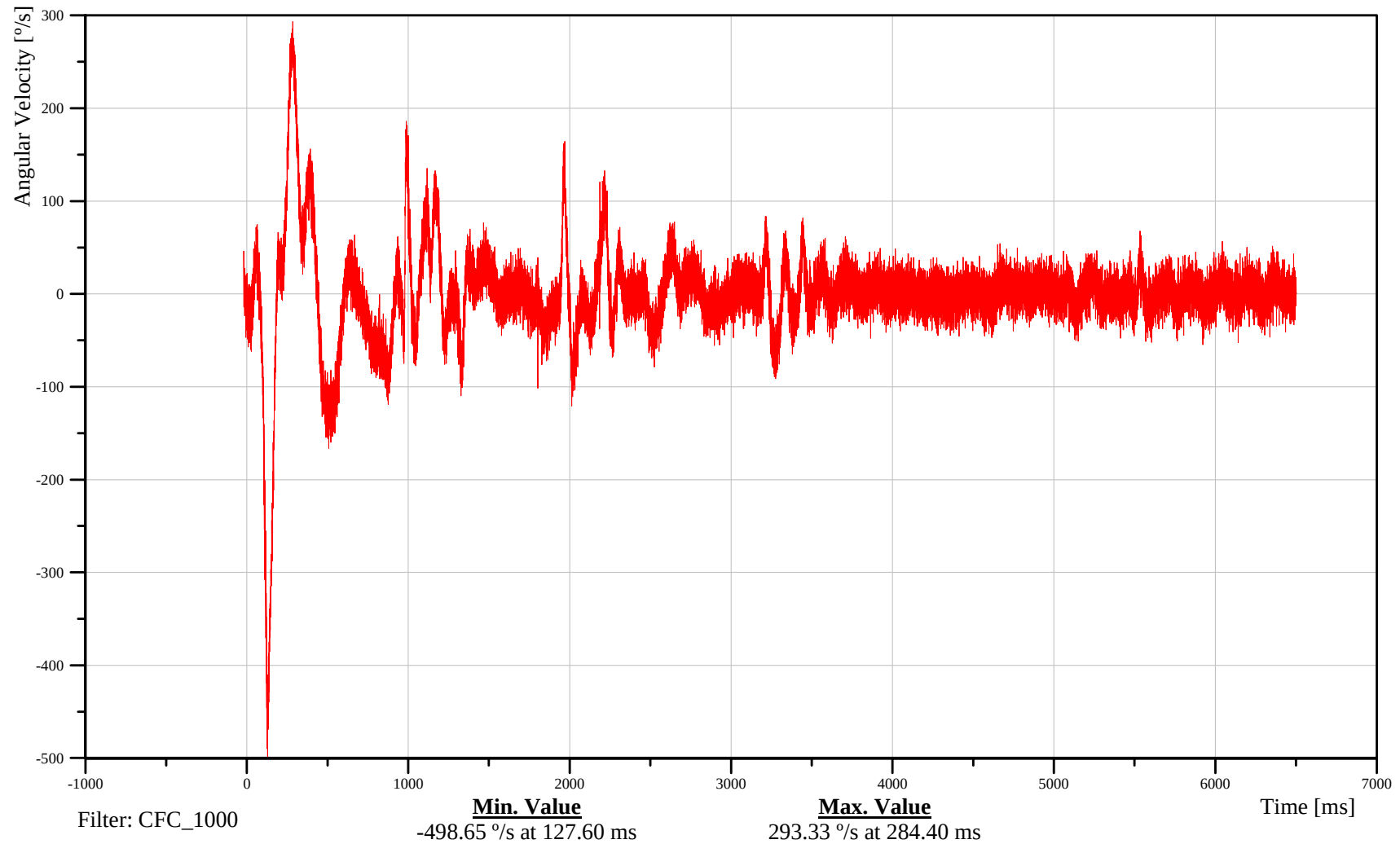
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Customer: VRTC

11HEADCG00H3AVZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-8

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck X-Axis Force

Date: 04/13/2010

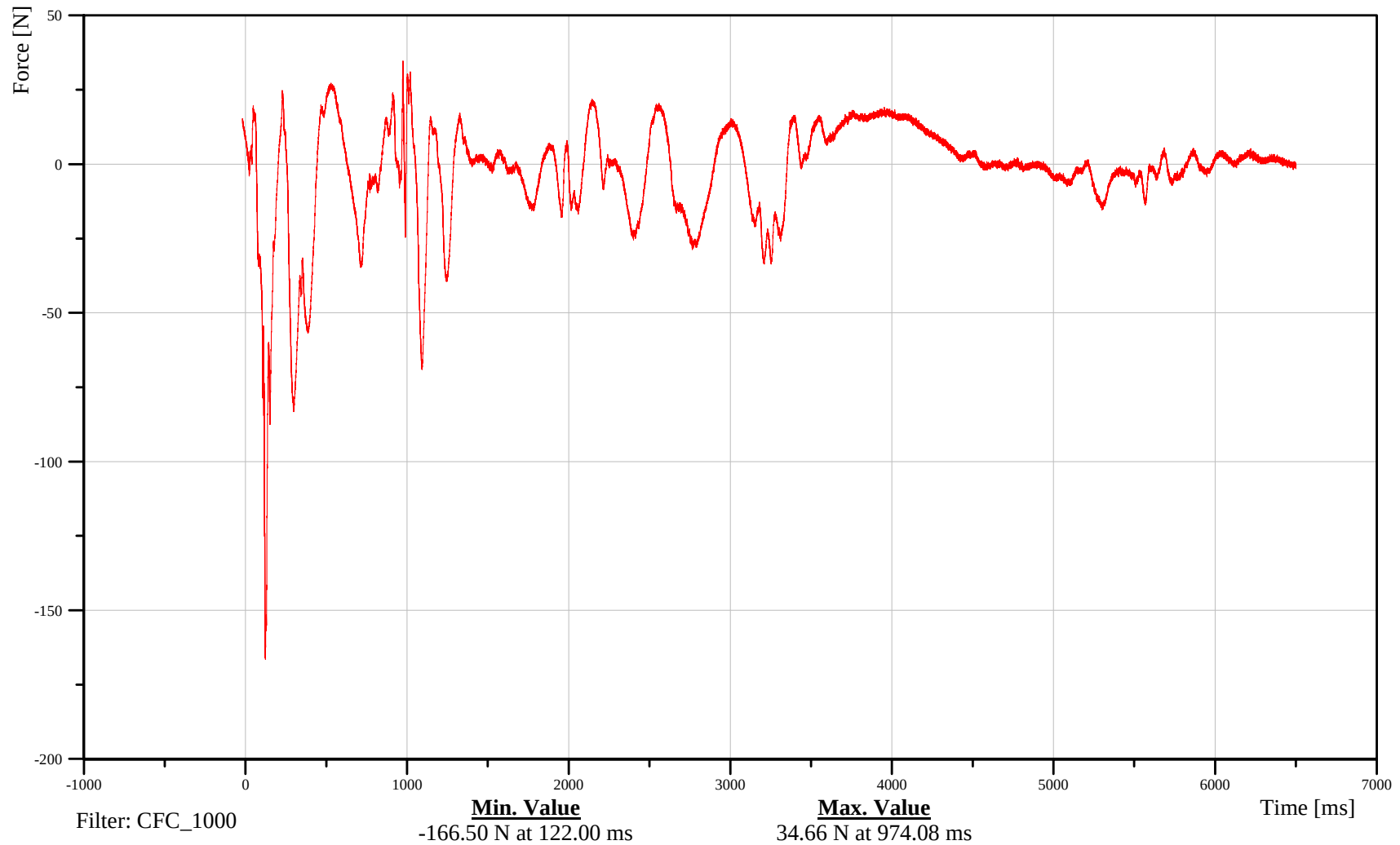
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Customer: VRTC

11NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-9

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Y-Axis Force

Date: 04/13/2010

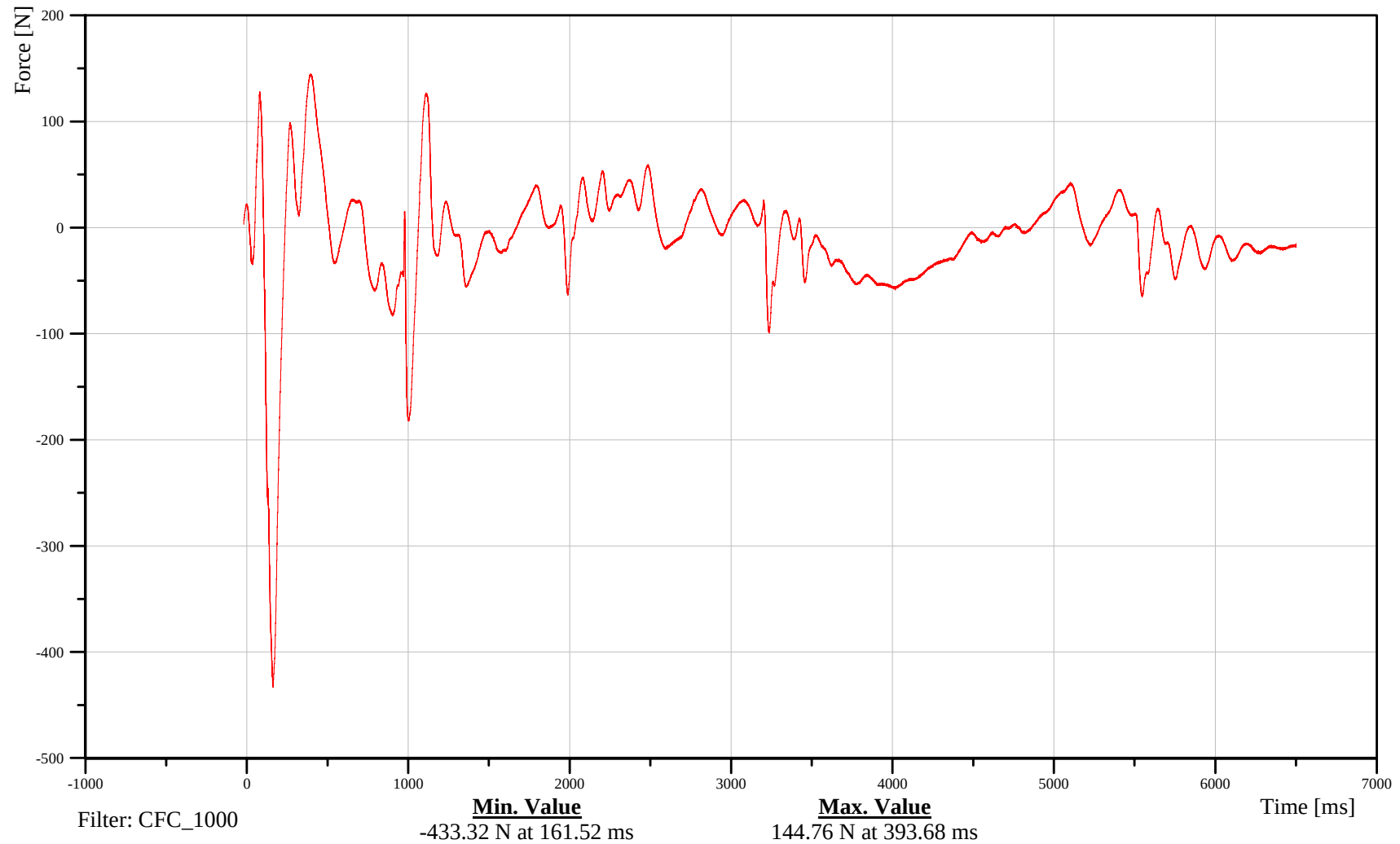
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Customer: VRTC

11NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-10

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Z-Axis Force

Date: 04/13/2010

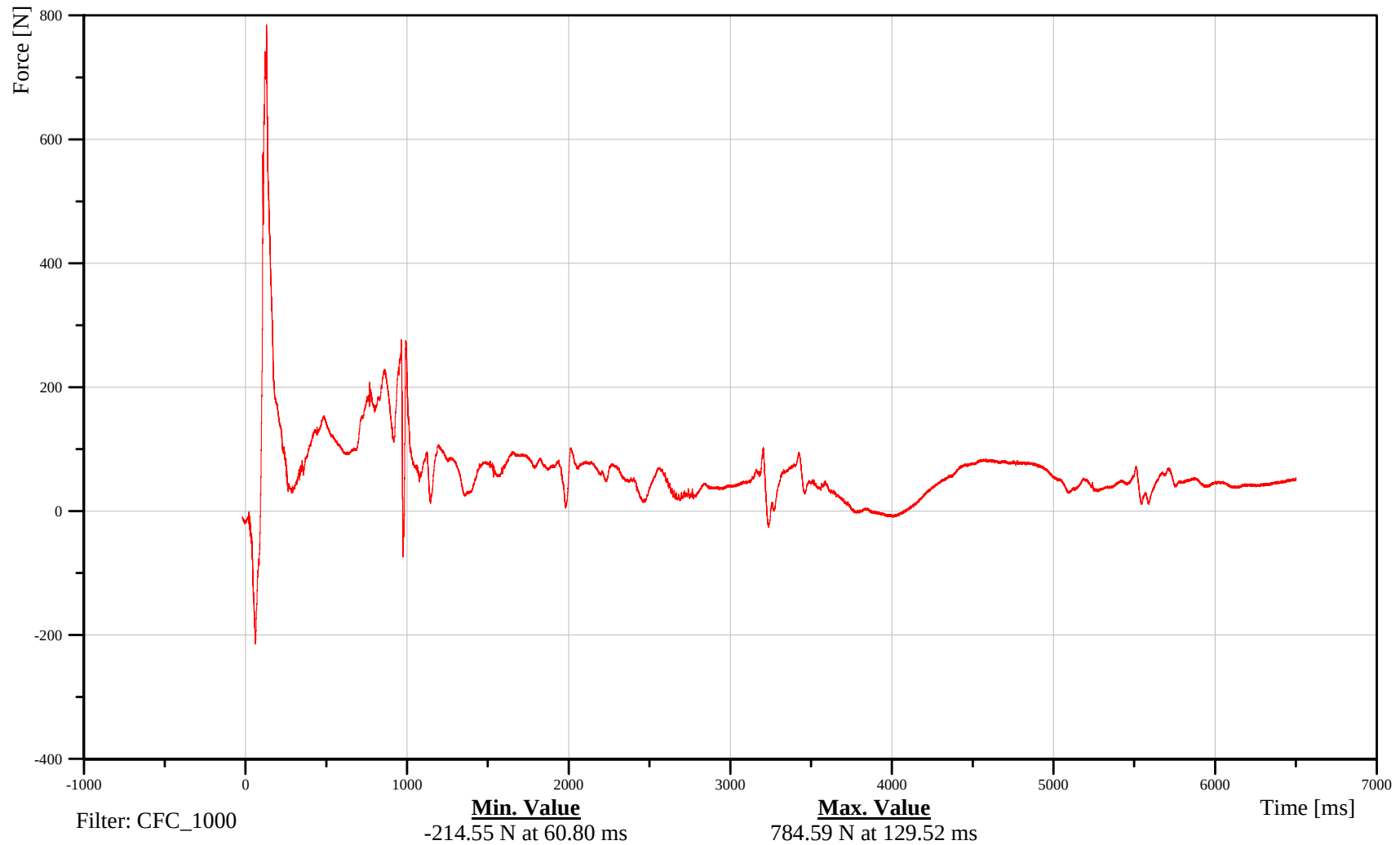
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Customer: VRTC

11NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-11

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Moment About X Axis

Date: 04/13/2010

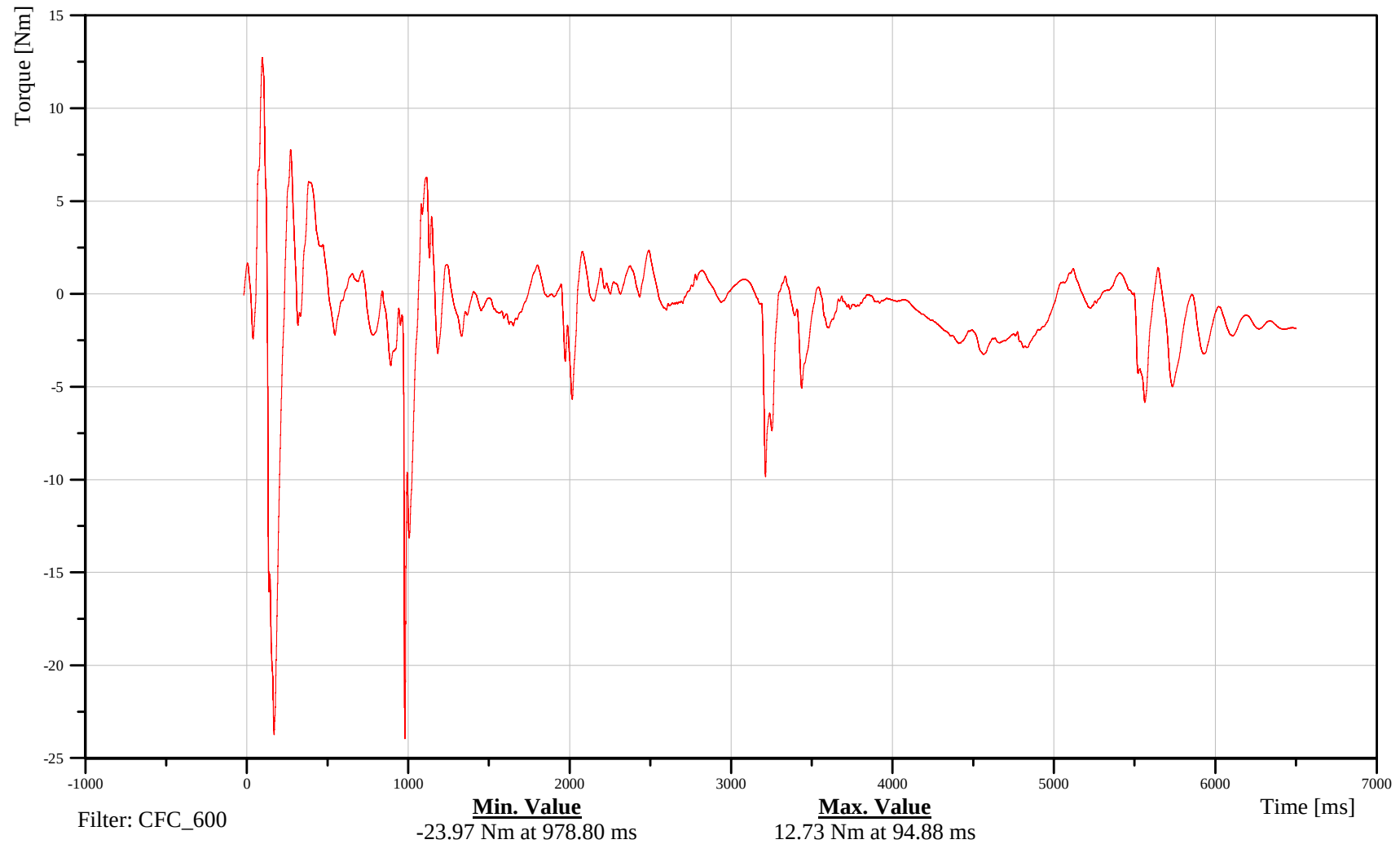
Time: 15:07

Customer: VRTC

11NECKUP00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-12

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Moment About Y Axis

Date: 04/13/2010

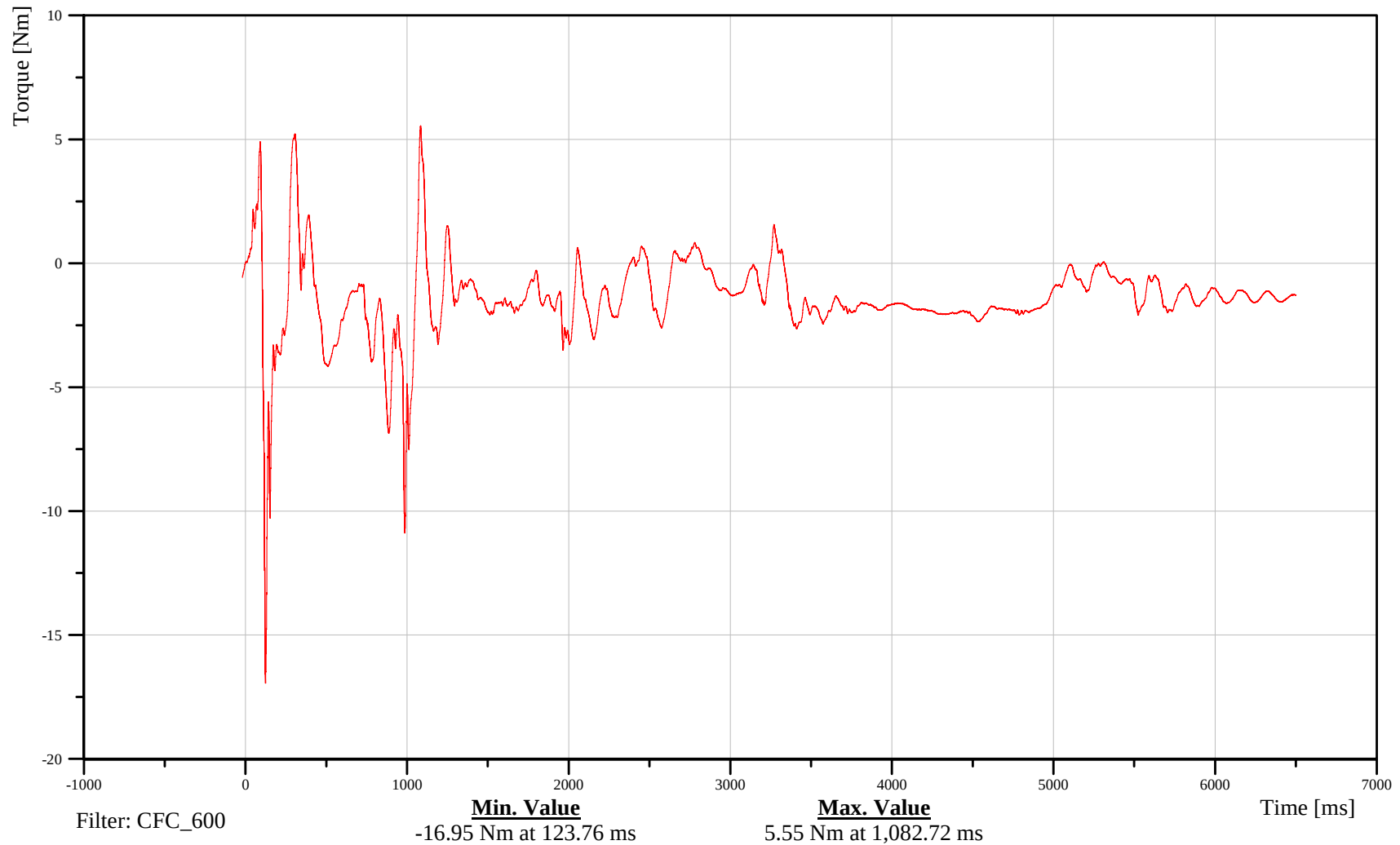
Time: 15:07

Customer: VRTC

11NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-13

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Upper Neck Moment About Z Axis

Date: 04/13/2010

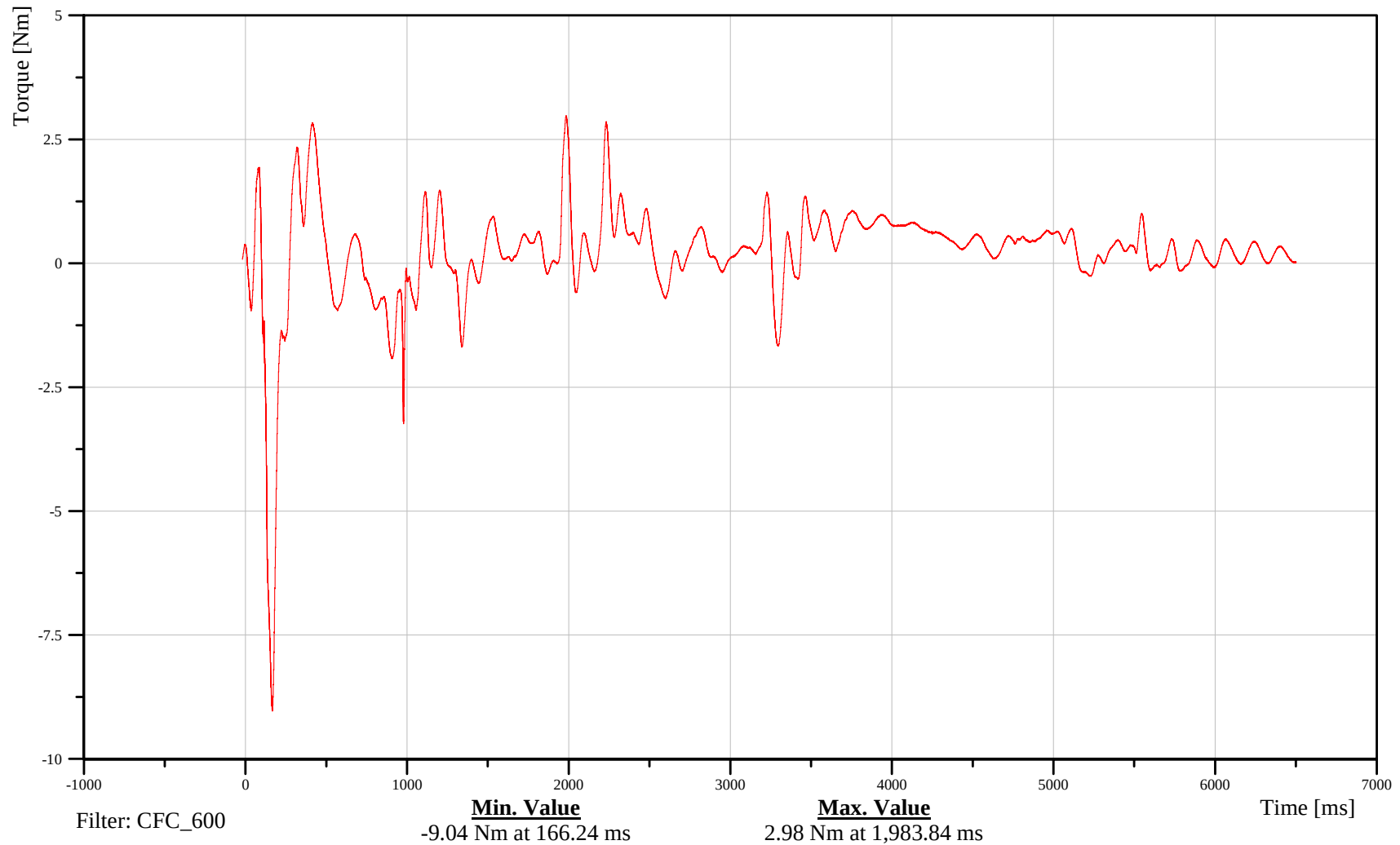
Time: 15:07

Customer: VRTC

11NECKUP00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-14

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Chest X-Axis Acceleration

Date: 04/13/2010

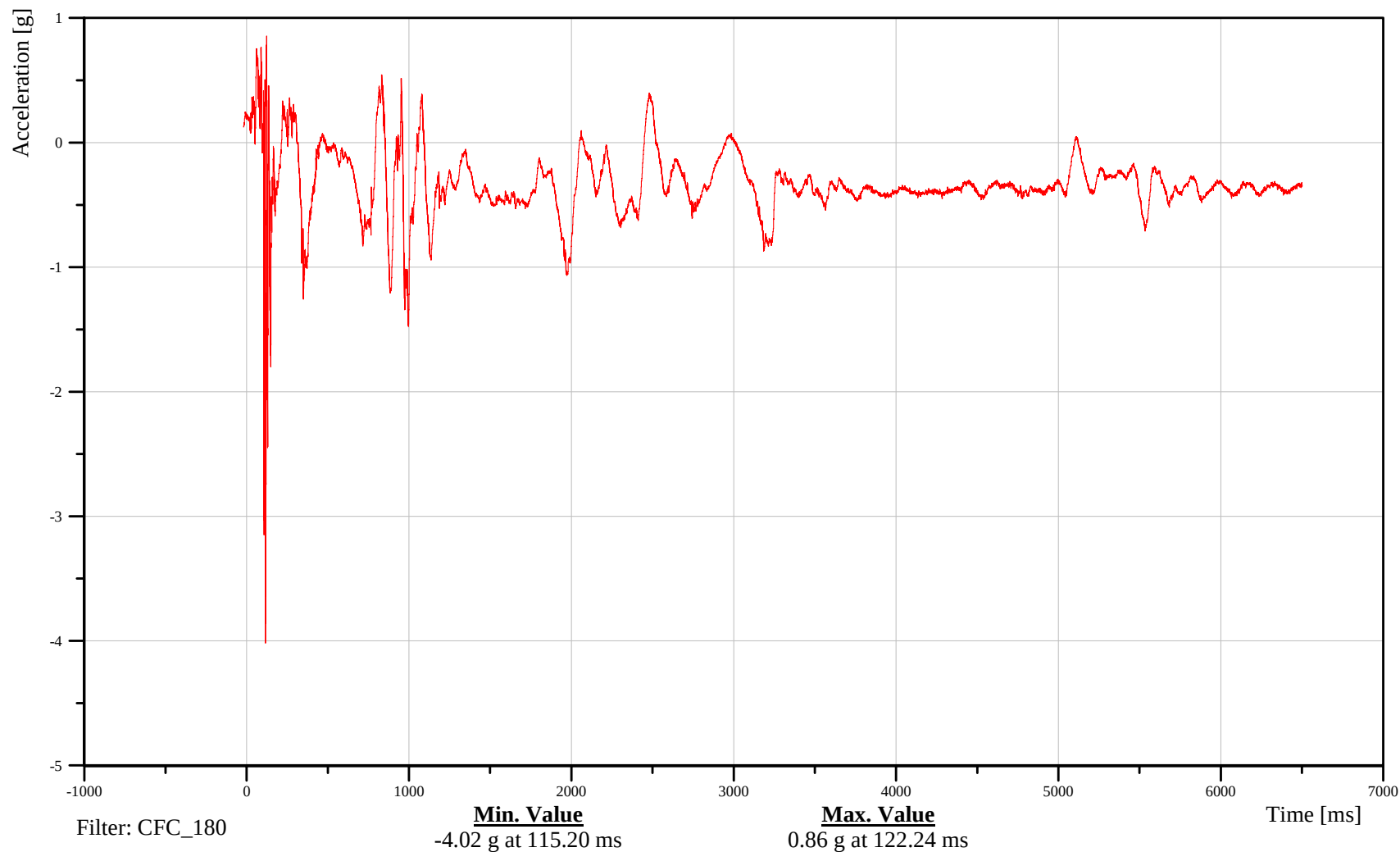
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Customer: VRTC

11CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-15

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Chest Y-Axis Acceleration

Date: 04/13/2010

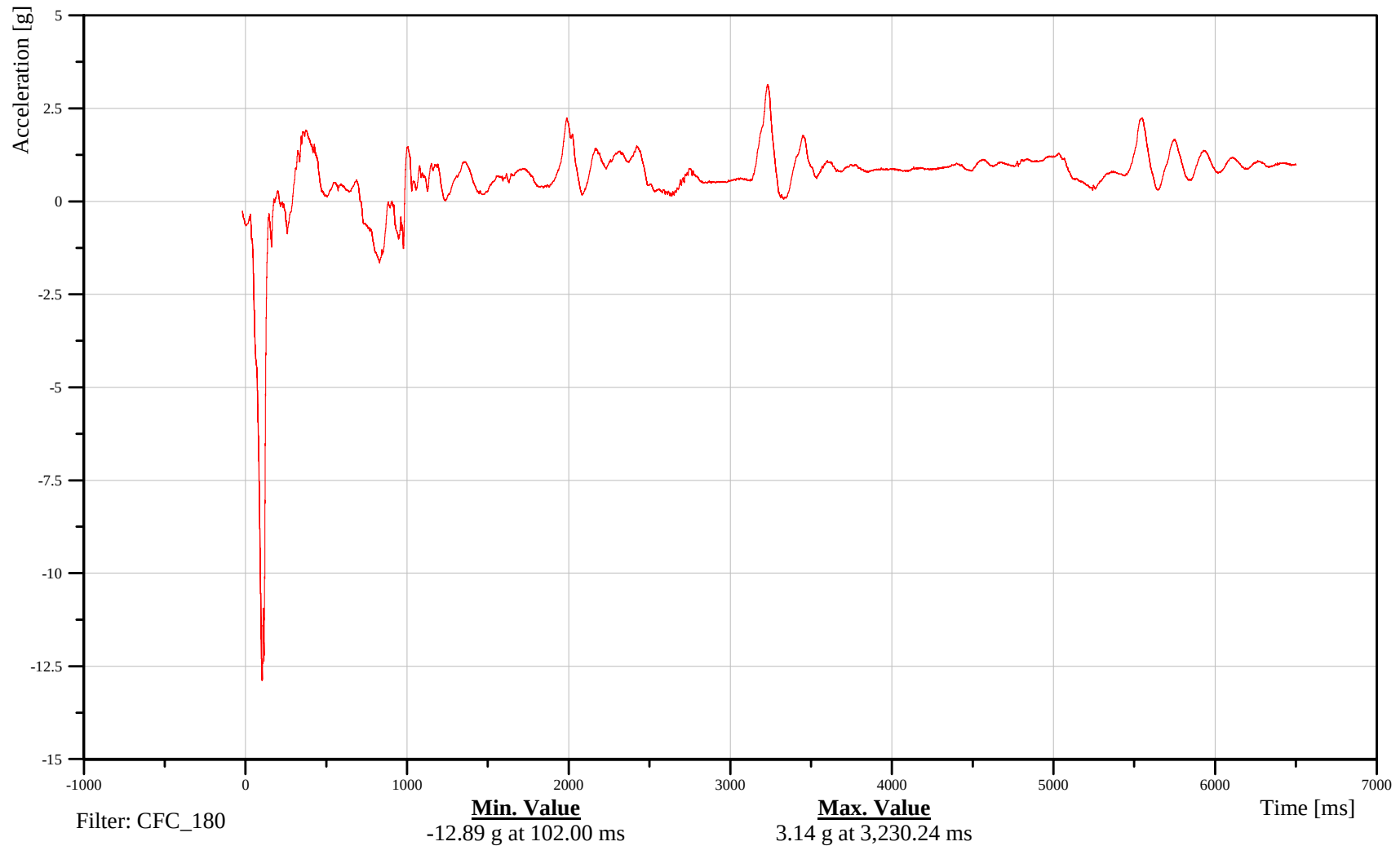
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-16

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Chest Z-Axis Acceleration

Date: 04/13/2010

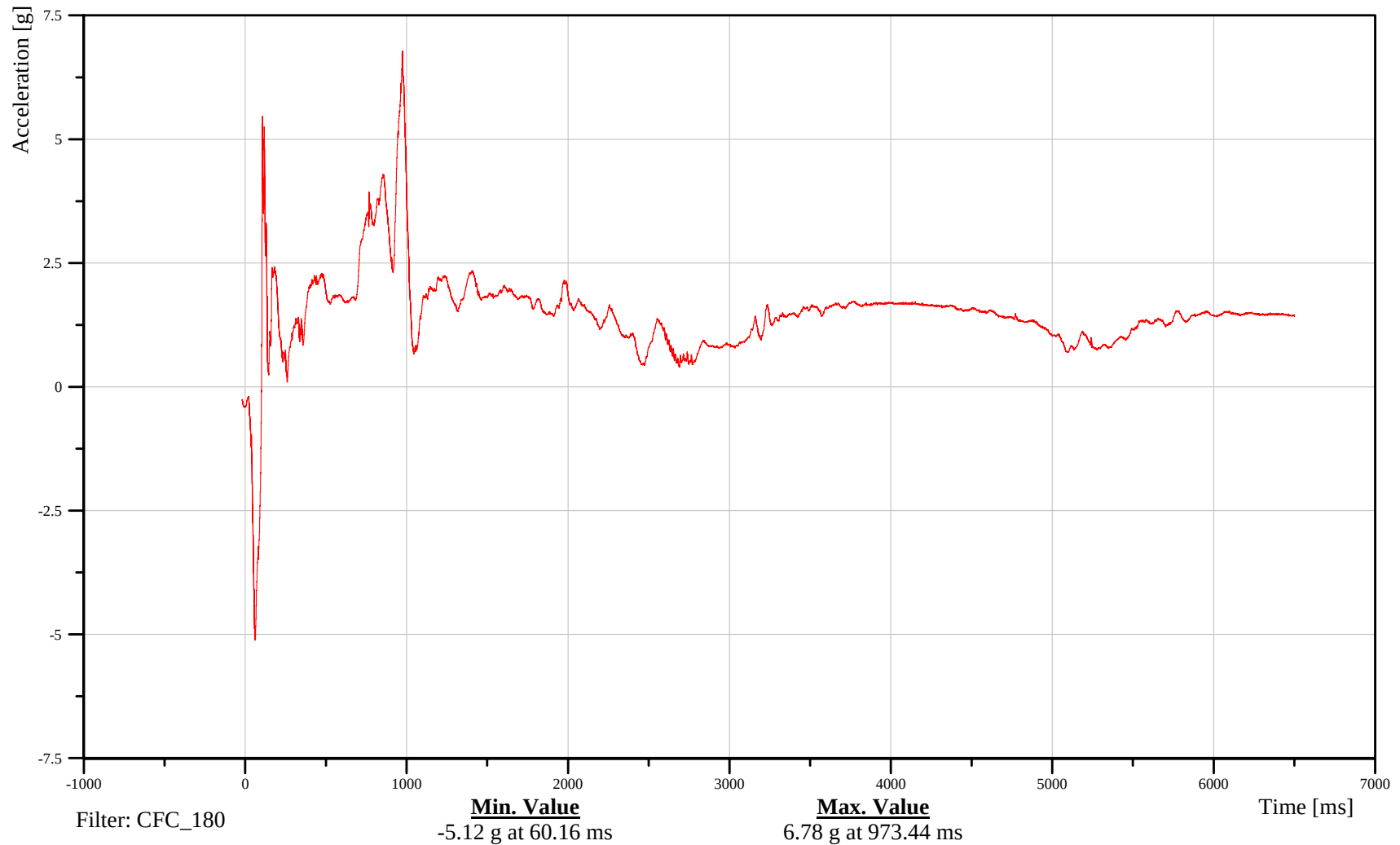
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Customer: VRTC

11CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-17

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Chest Resultant Acceleration

Date: 04/13/2010

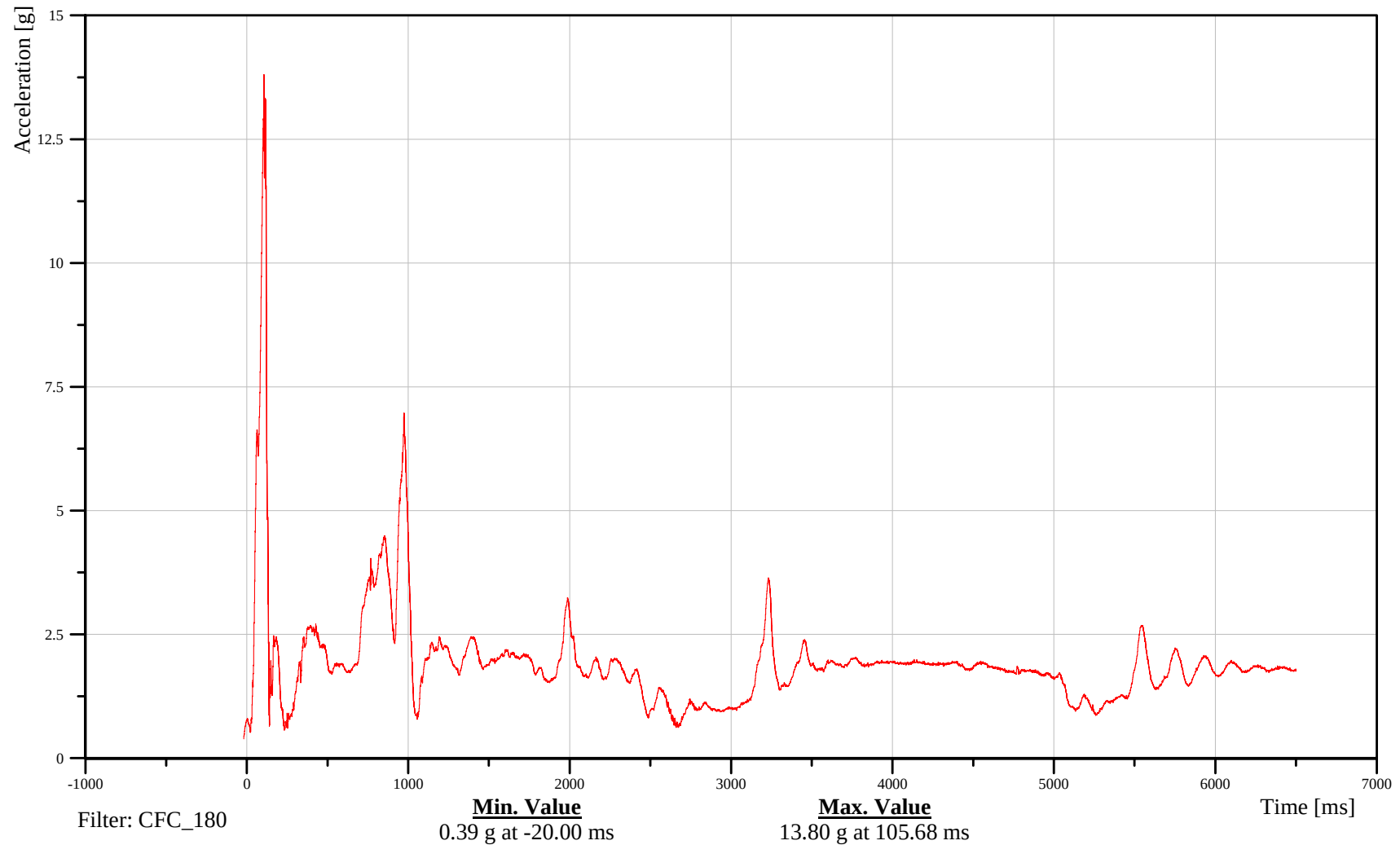
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-18

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Chest X-Axis Displacement

Date: 04/13/2010

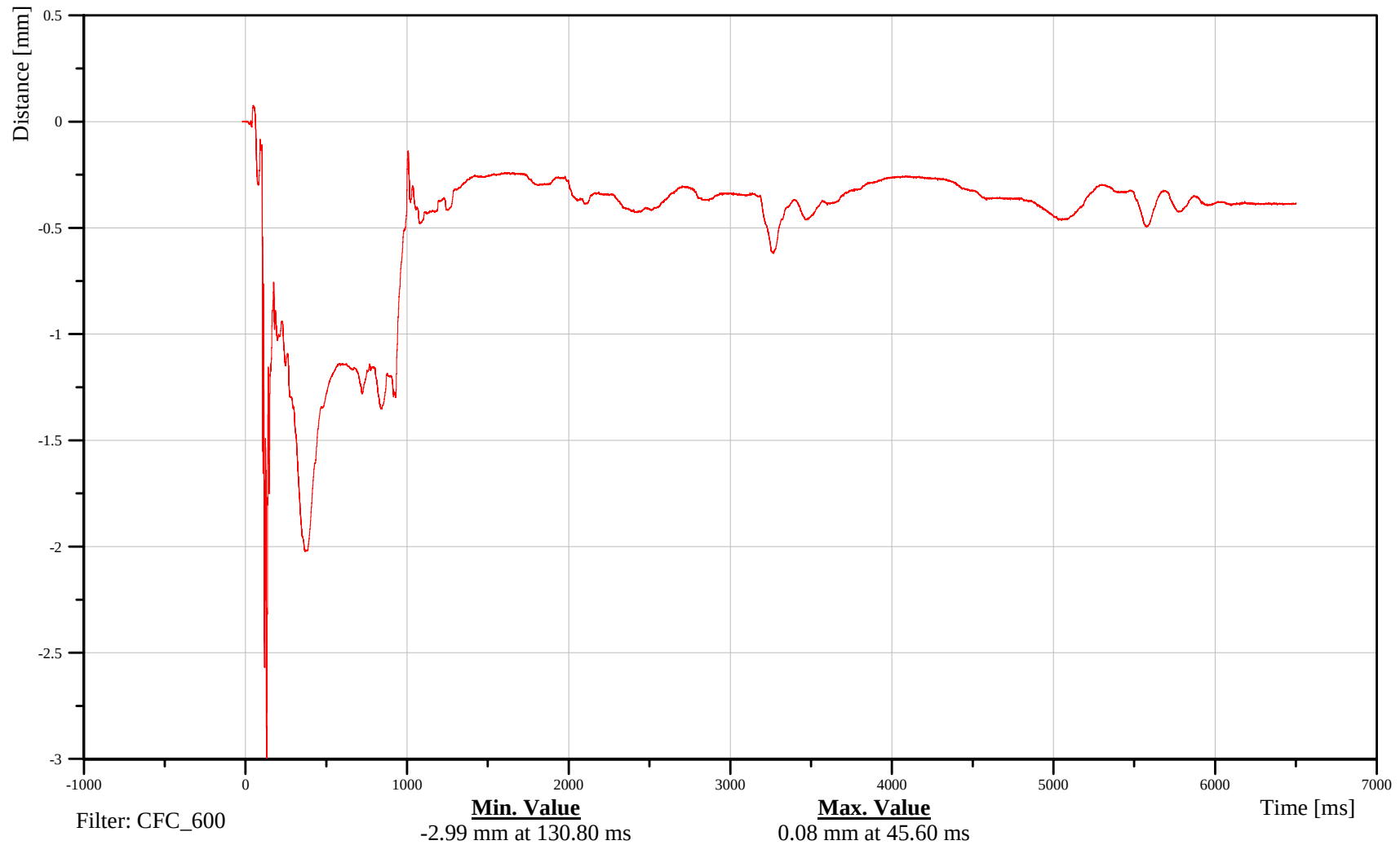
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413





Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck X-Axis Force

Date: 04/13/2010

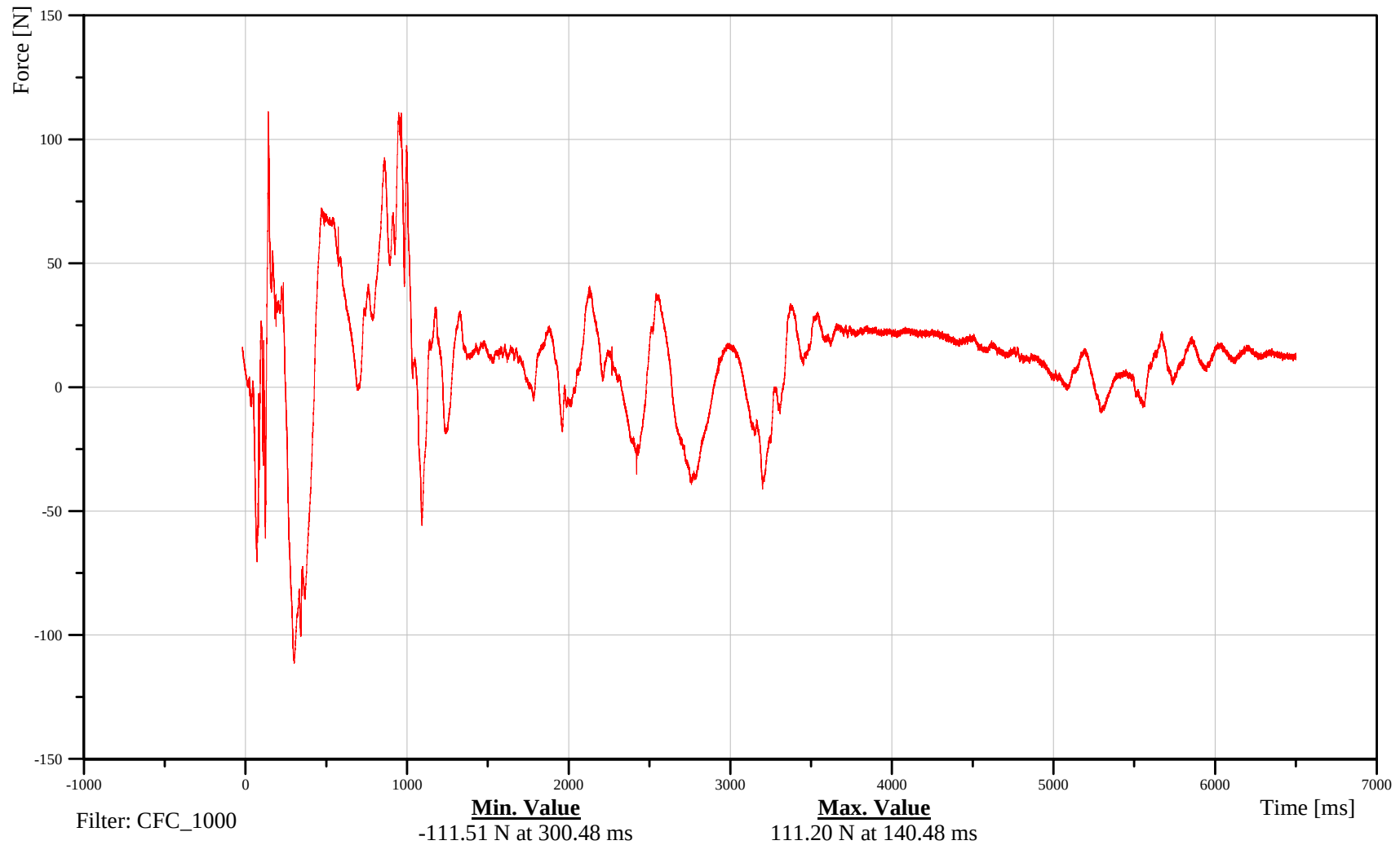
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-20

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Y-Axis Force

Date: 04/13/2010

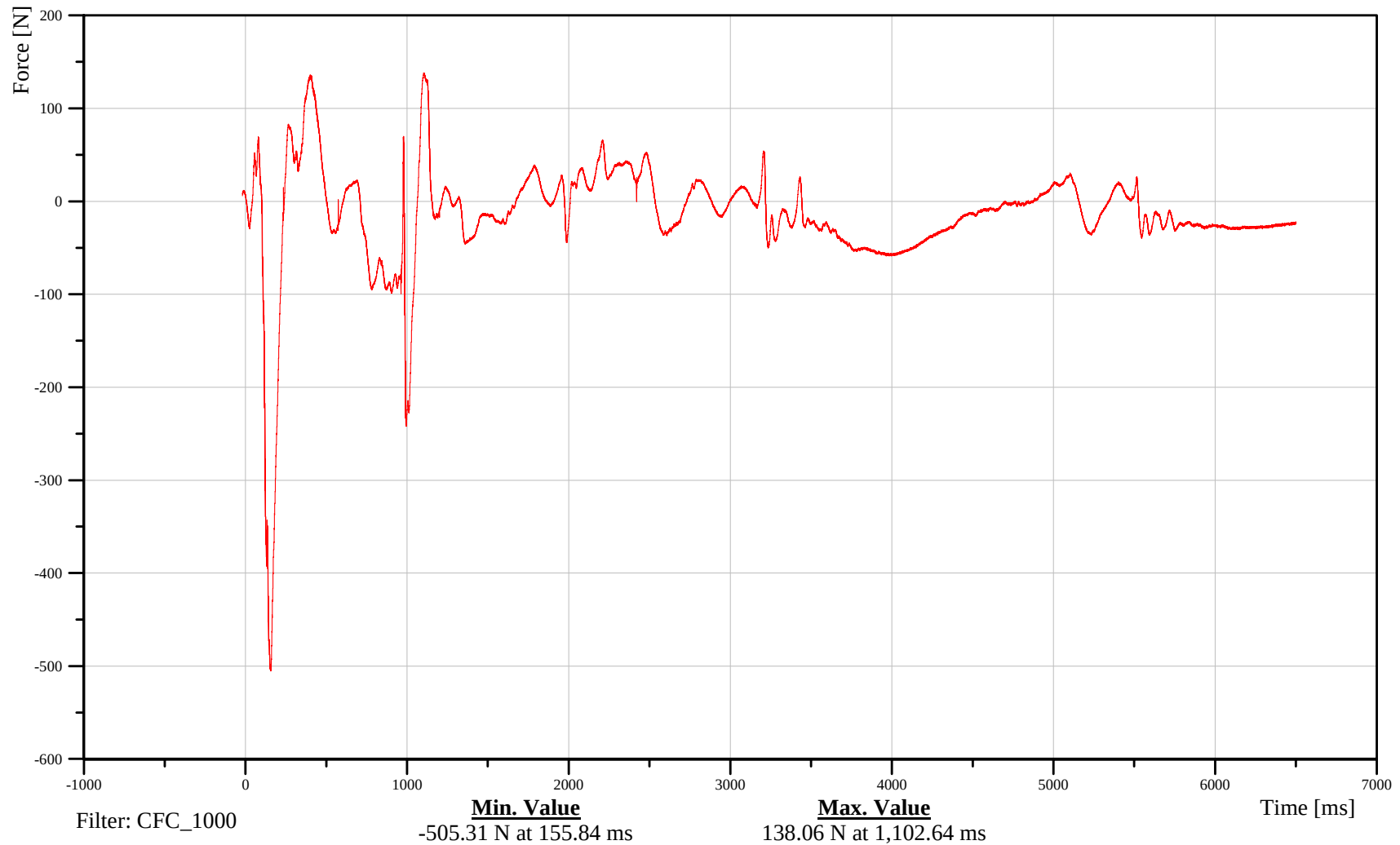
Time: 15:07

Customer: VRTC

11NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-21

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Z-Axis Force

Date: 04/13/2010

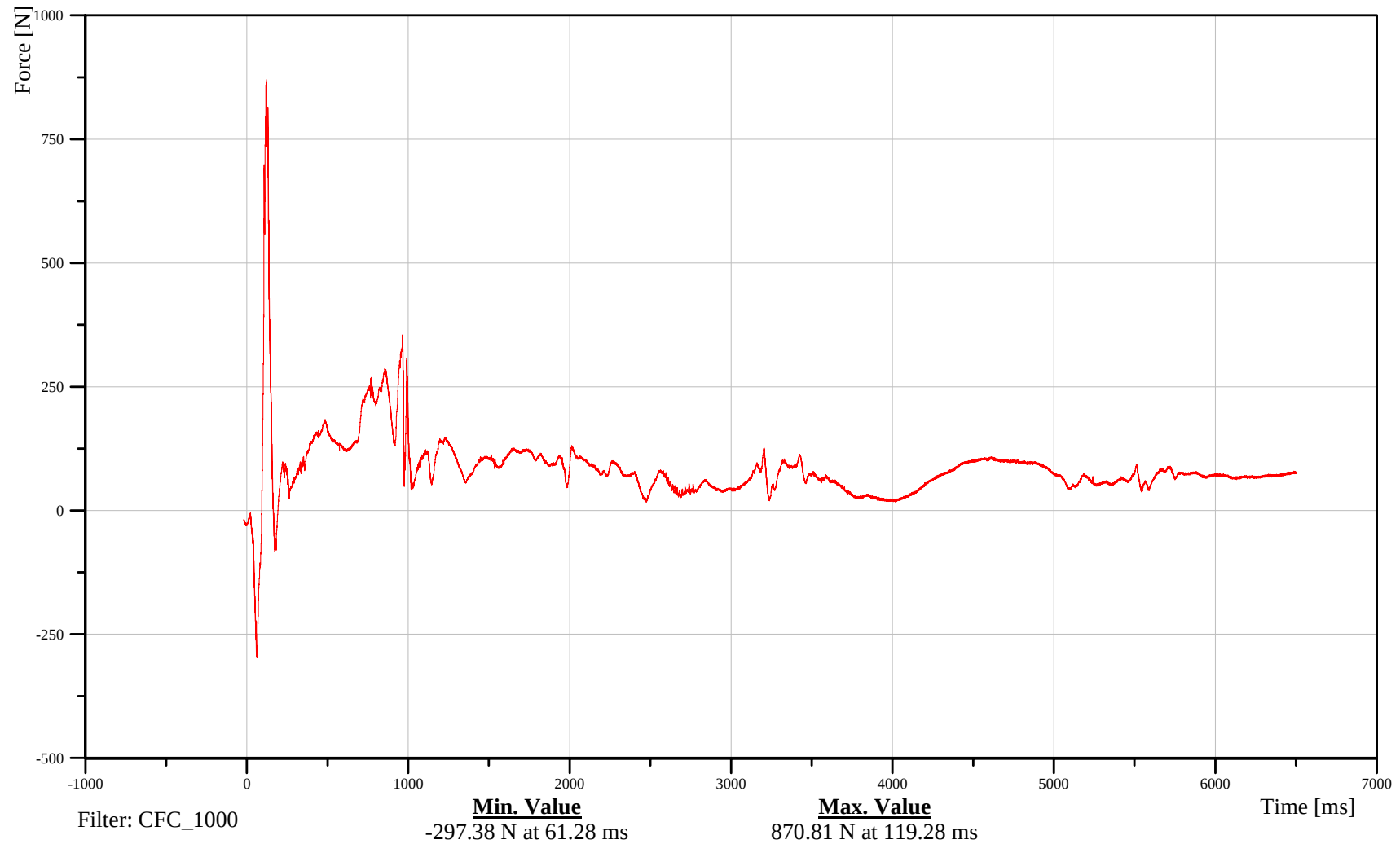
Time: 15:07

Customer: VRTC

11NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-22

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Moment About X Axis

Date: 04/13/2010

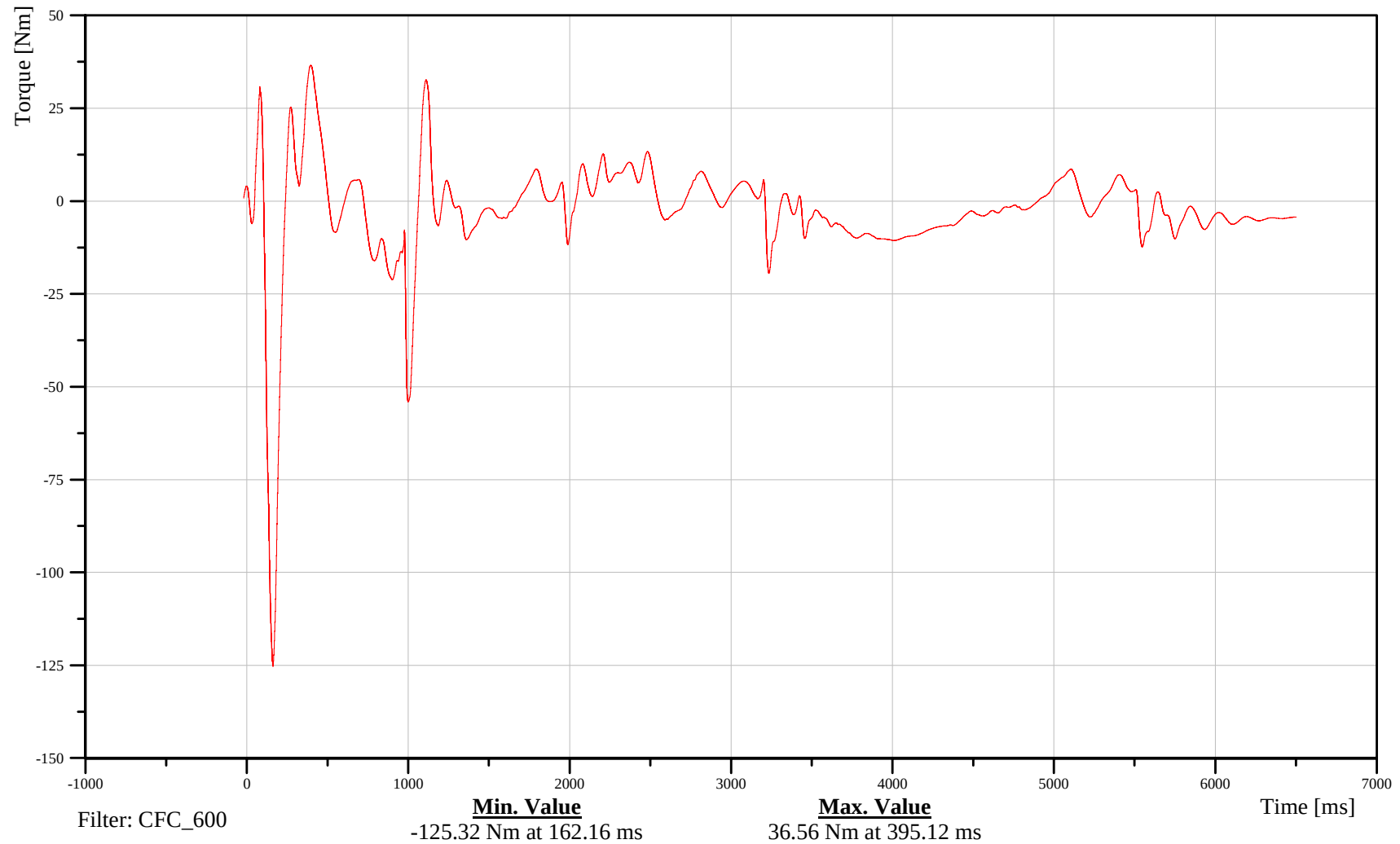
Time: 15:07

Customer: VRTC

11NECKLO00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-23

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Moment About Y Axis

Date: 04/13/2010

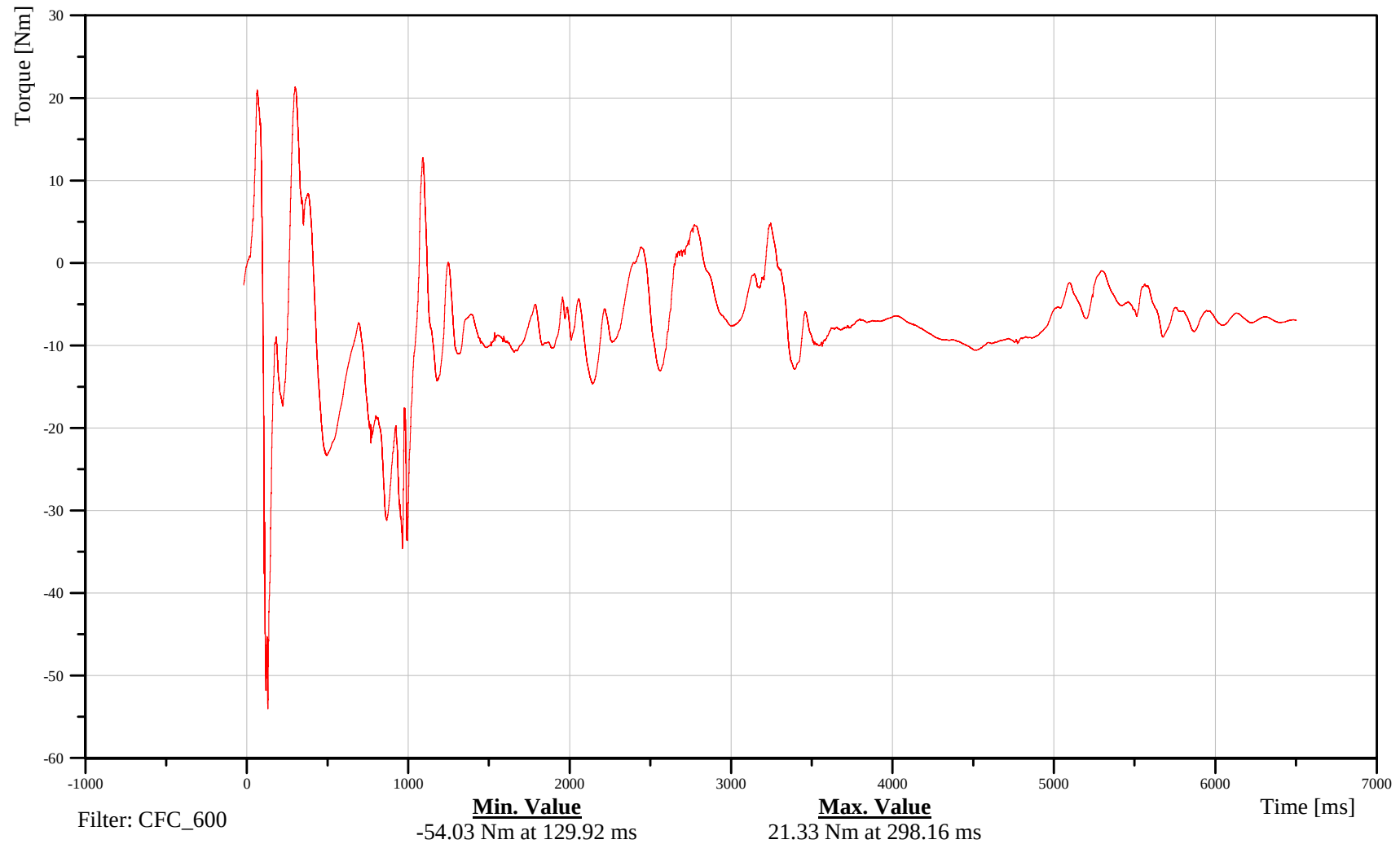
Time: 15:07

Customer: VRTC

11NECKLO00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-24

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Lower Neck Moment About Z Axis

Date: 04/13/2010

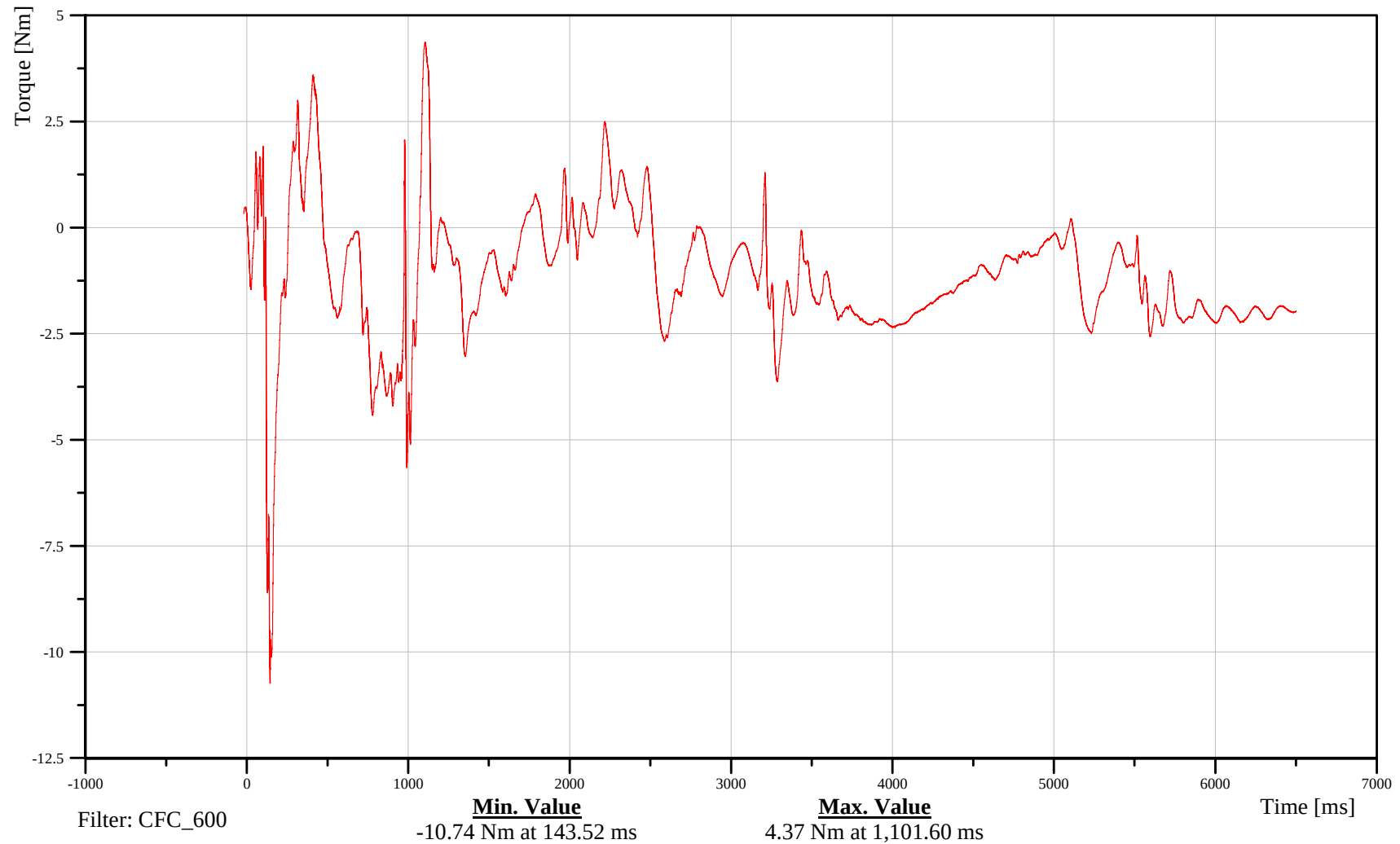
Time: 15:07

Customer: VRTC

11NECKLO00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-25

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis X-Axis Acceleration

Date: 04/13/2010

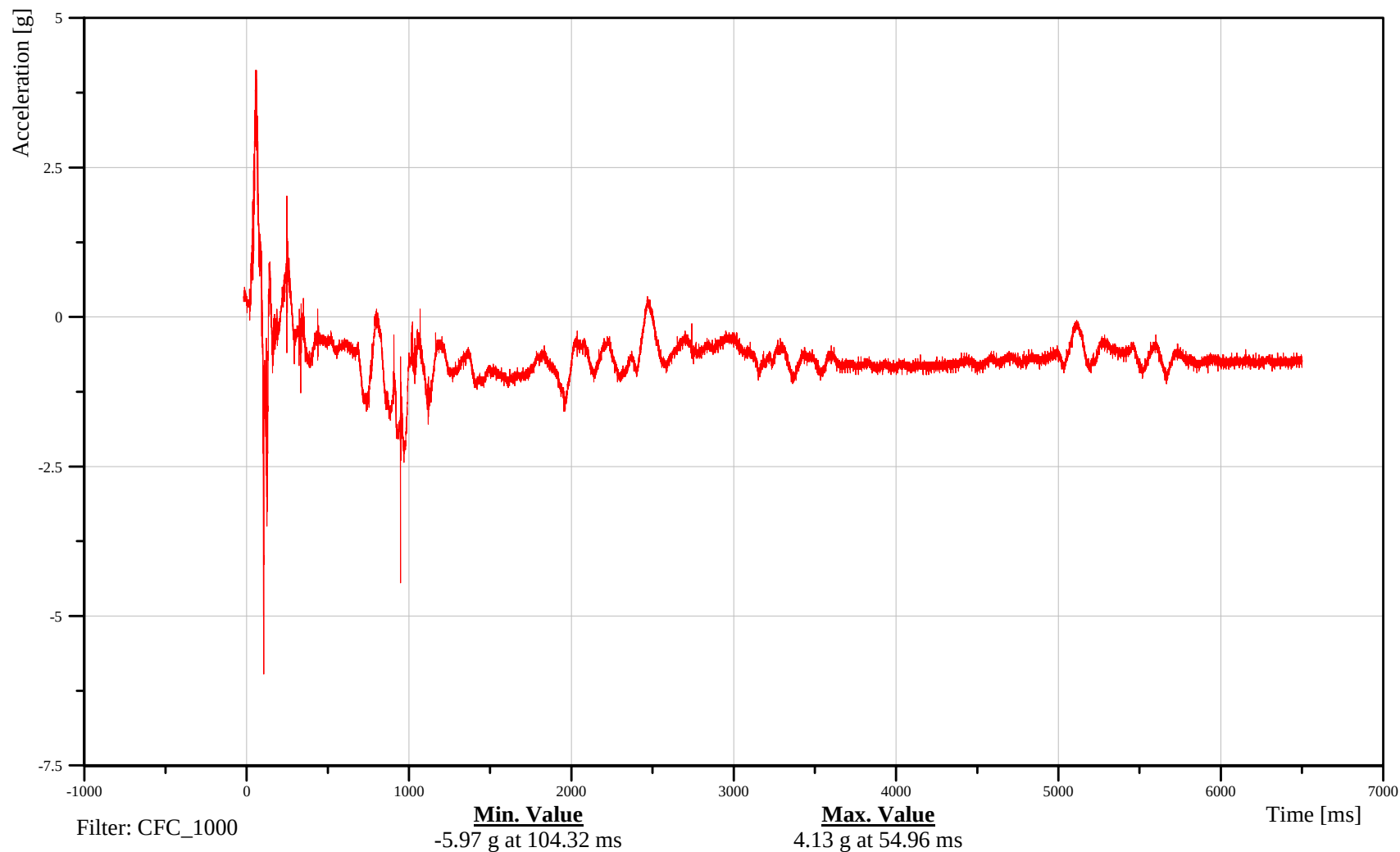
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Customer: VRTC

11PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-26

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Y-Axis Acceleration

Date: 04/13/2010

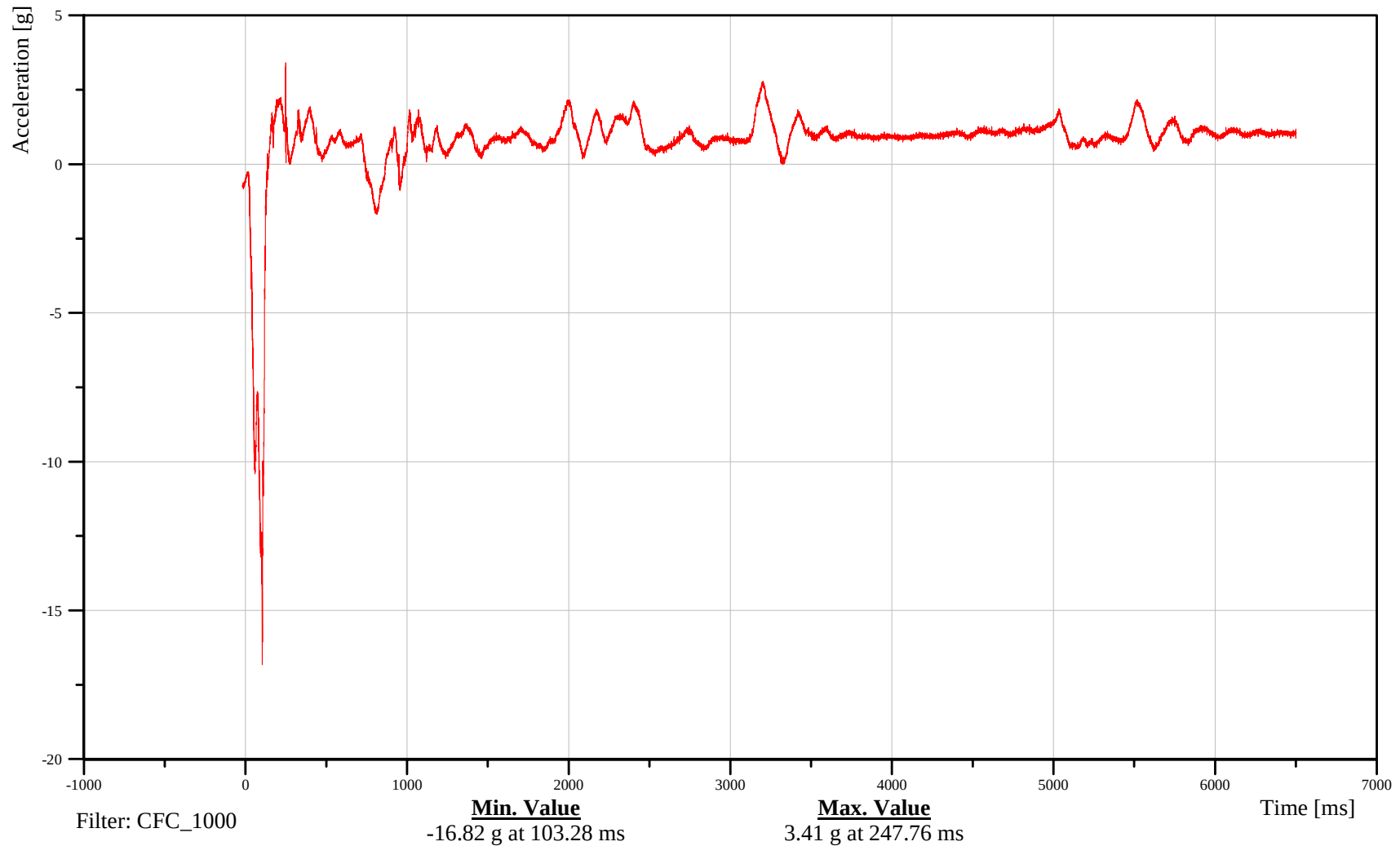
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-27

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Z-Axis Acceleration

Date: 04/13/2010

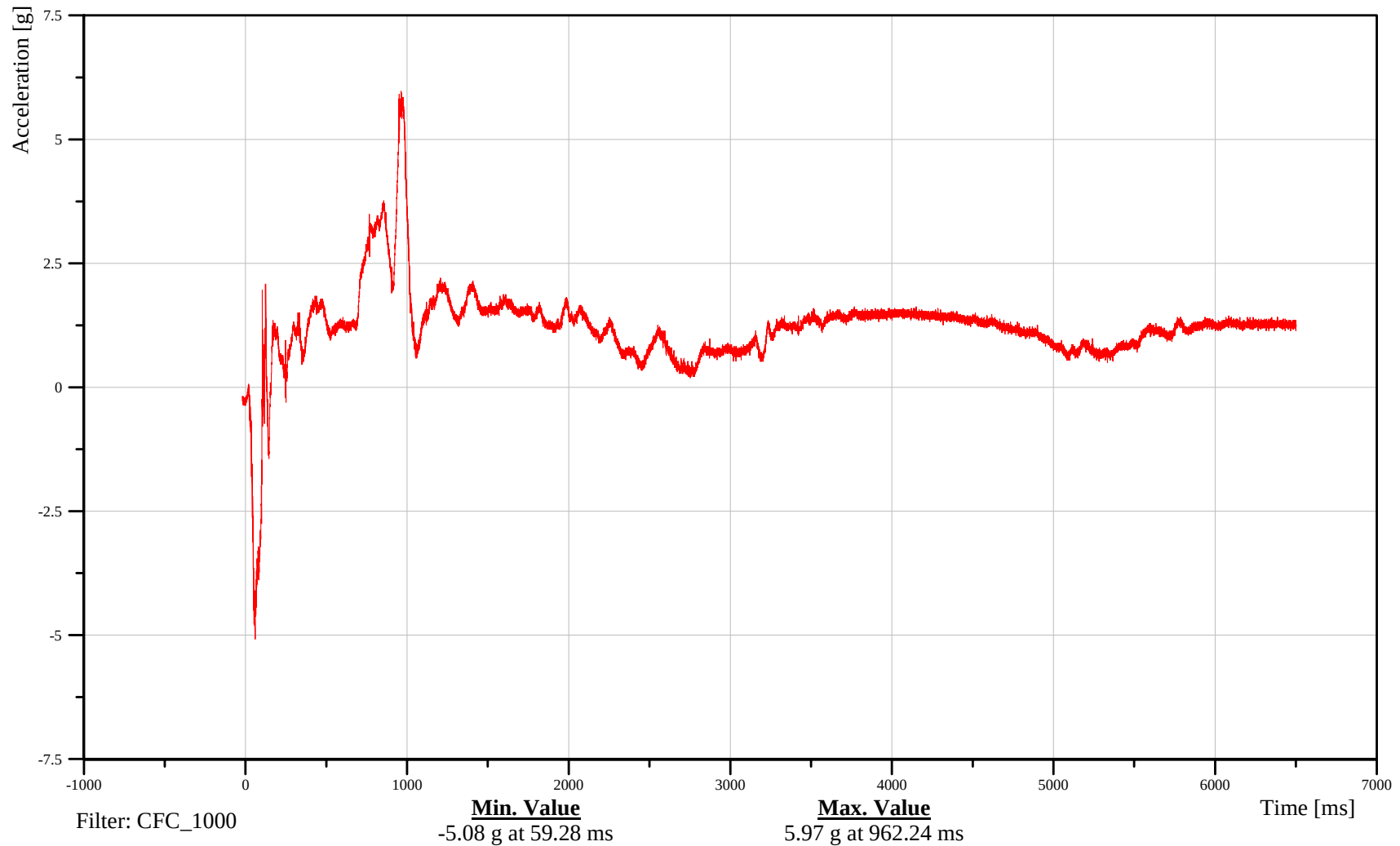
Time: 15:07

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 100413



B-28

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Resultant Acceleration

Date: 04/13/2010

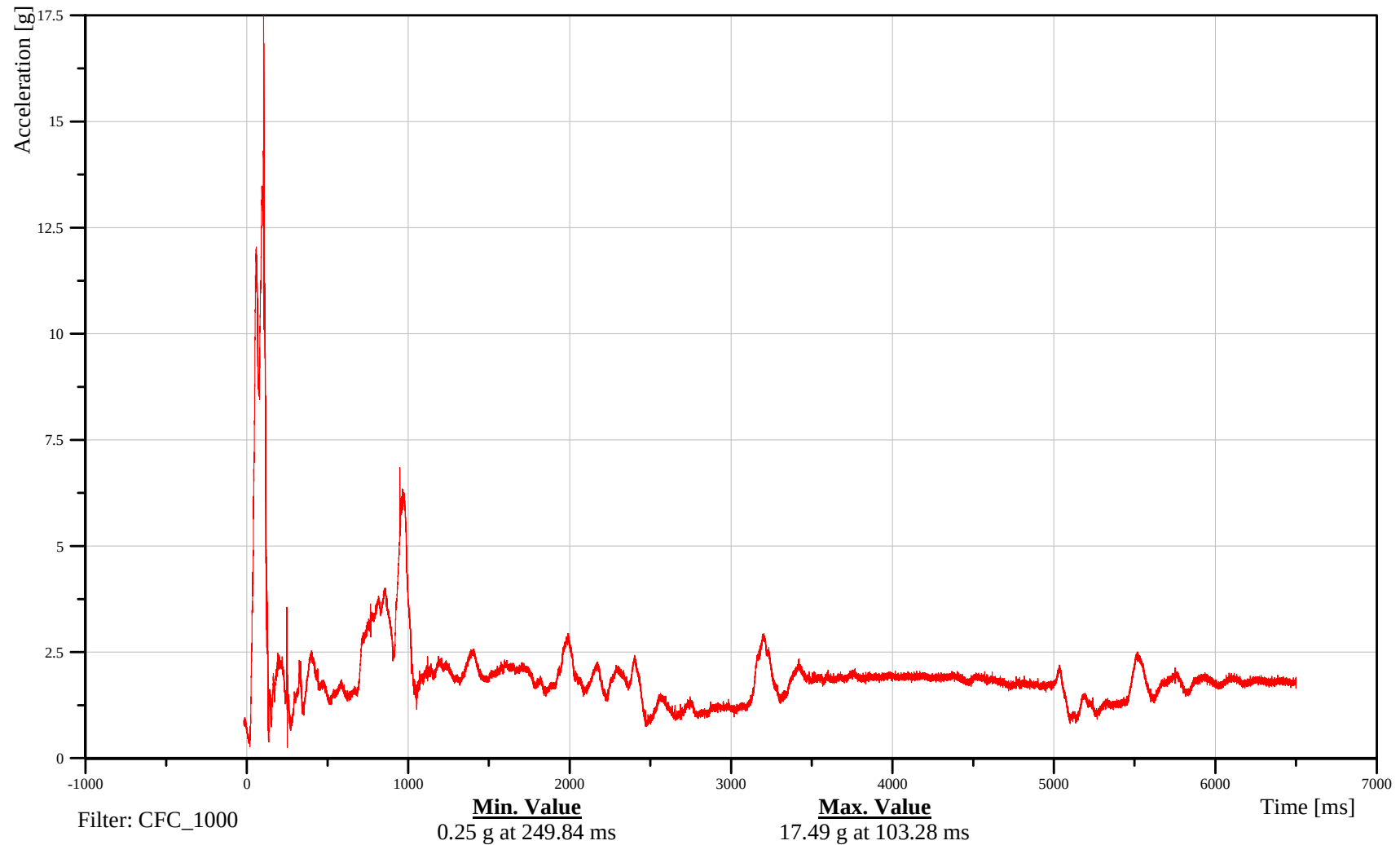
Time: 15:07

Customer: VRTC

11PELVCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100413





Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head X-Axis Acceleration

Date: 04/13/2010

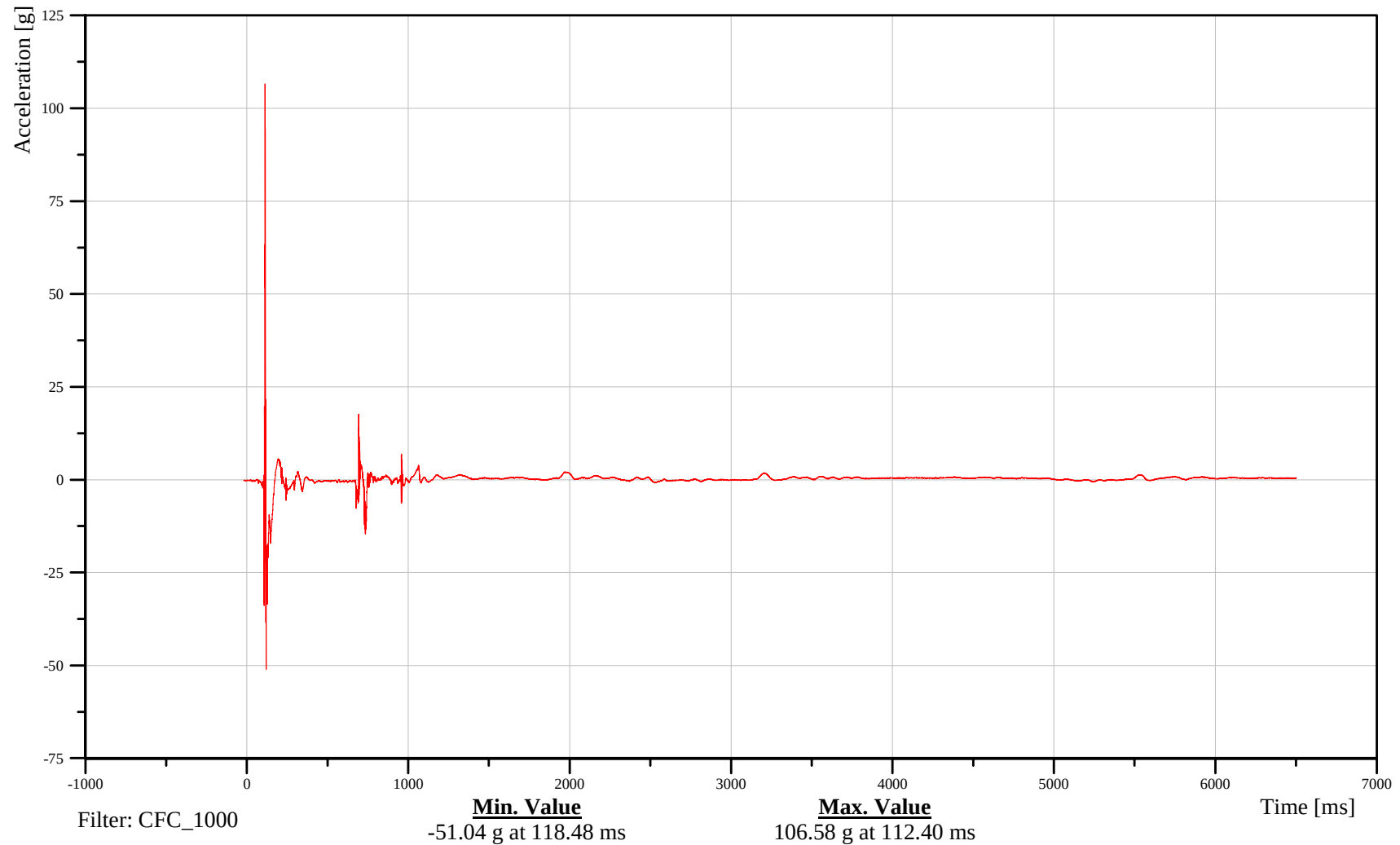
Time: 15:07

Customer: VRTC

13HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-30

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head Y-Axis Acceleration

Date: 04/13/2010

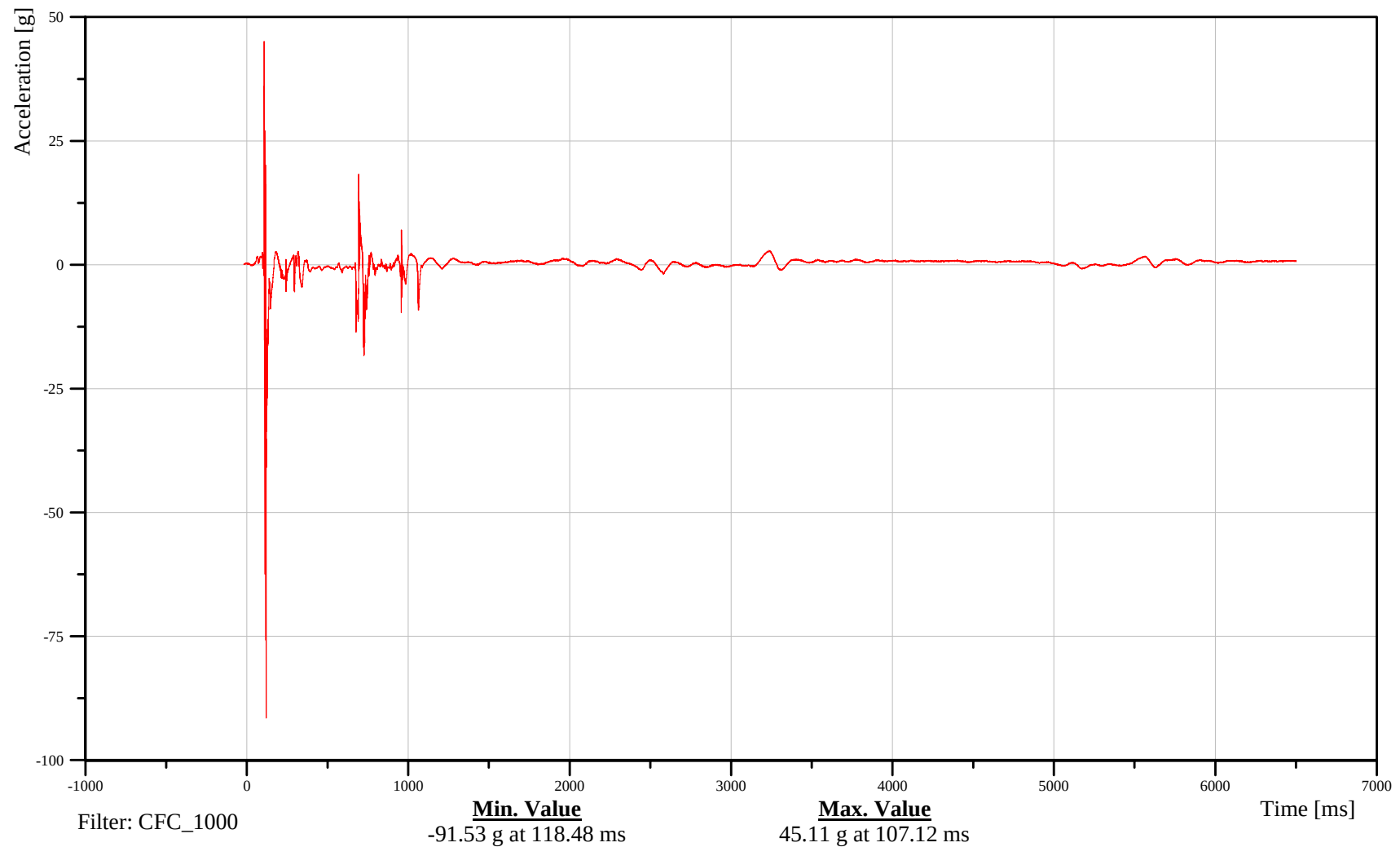
Time: 15:07

Customer: VRTC

13HEADCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-31

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head Z-Axis Acceleration

Date: 04/13/2010

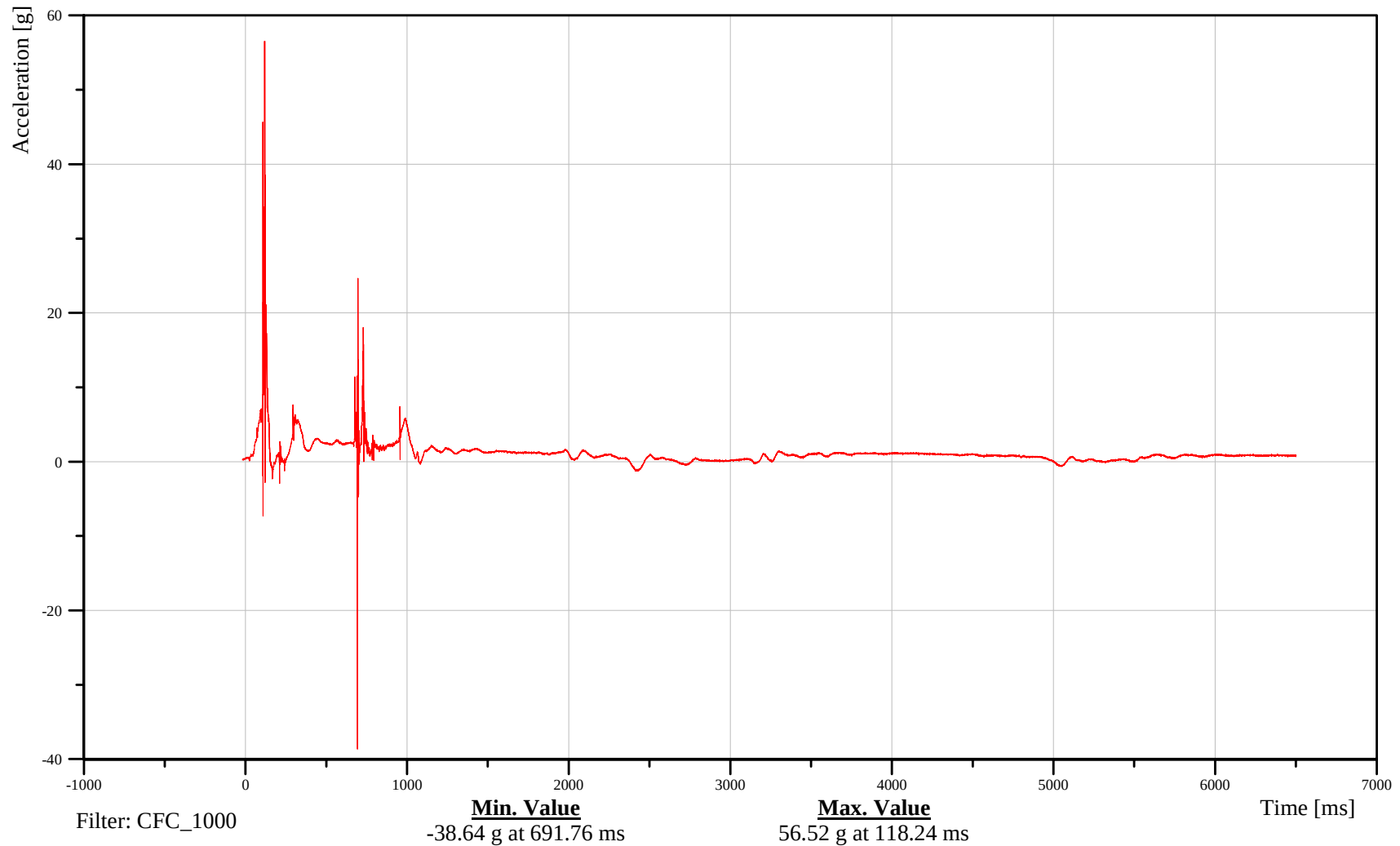
Time: 15:07

Customer: VRTC

13HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-32

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head Resultant Acceleration

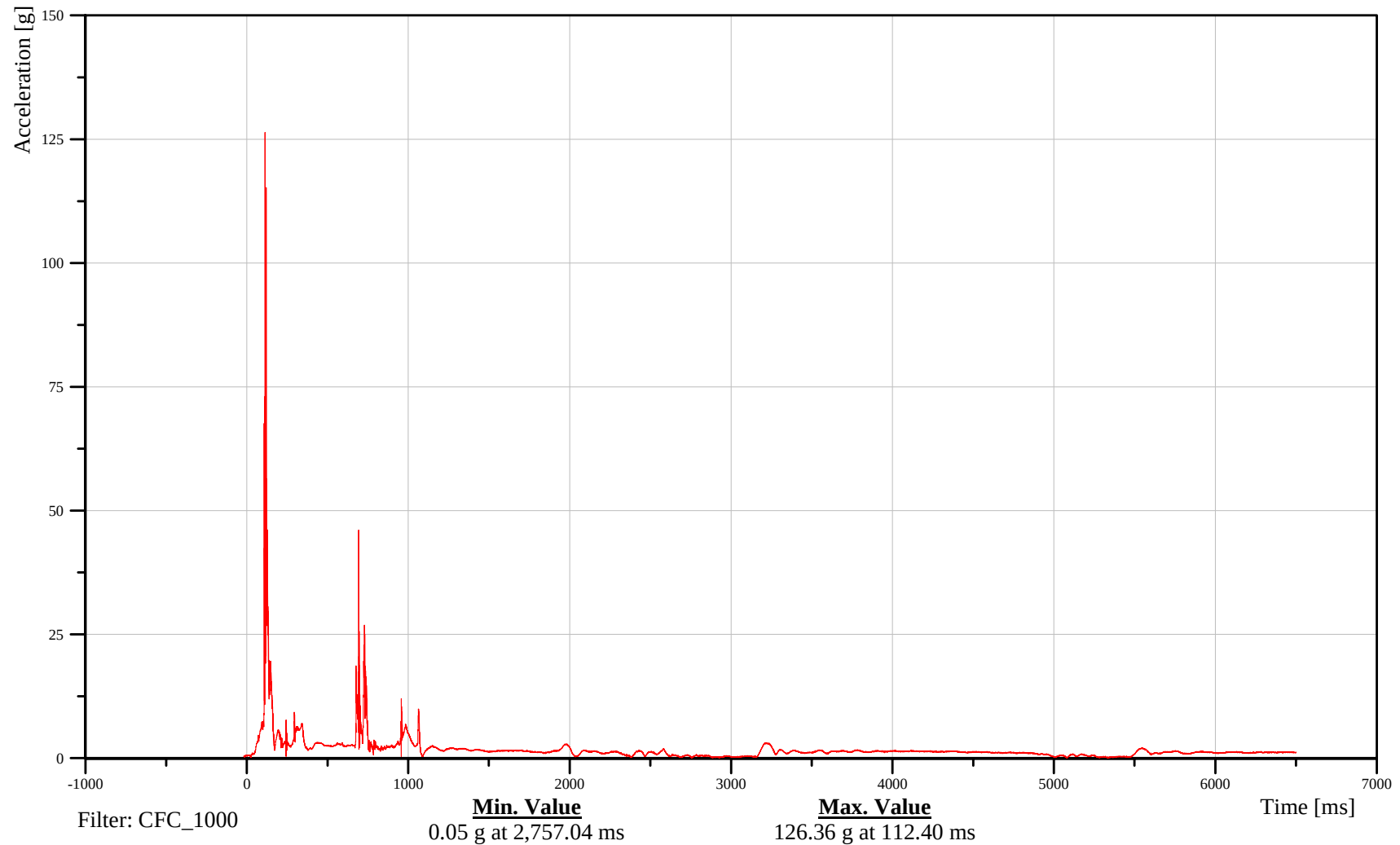
Date: 04/13/2010
Time: 15:07

Customer: VRTC

13HEADCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-33

100413



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

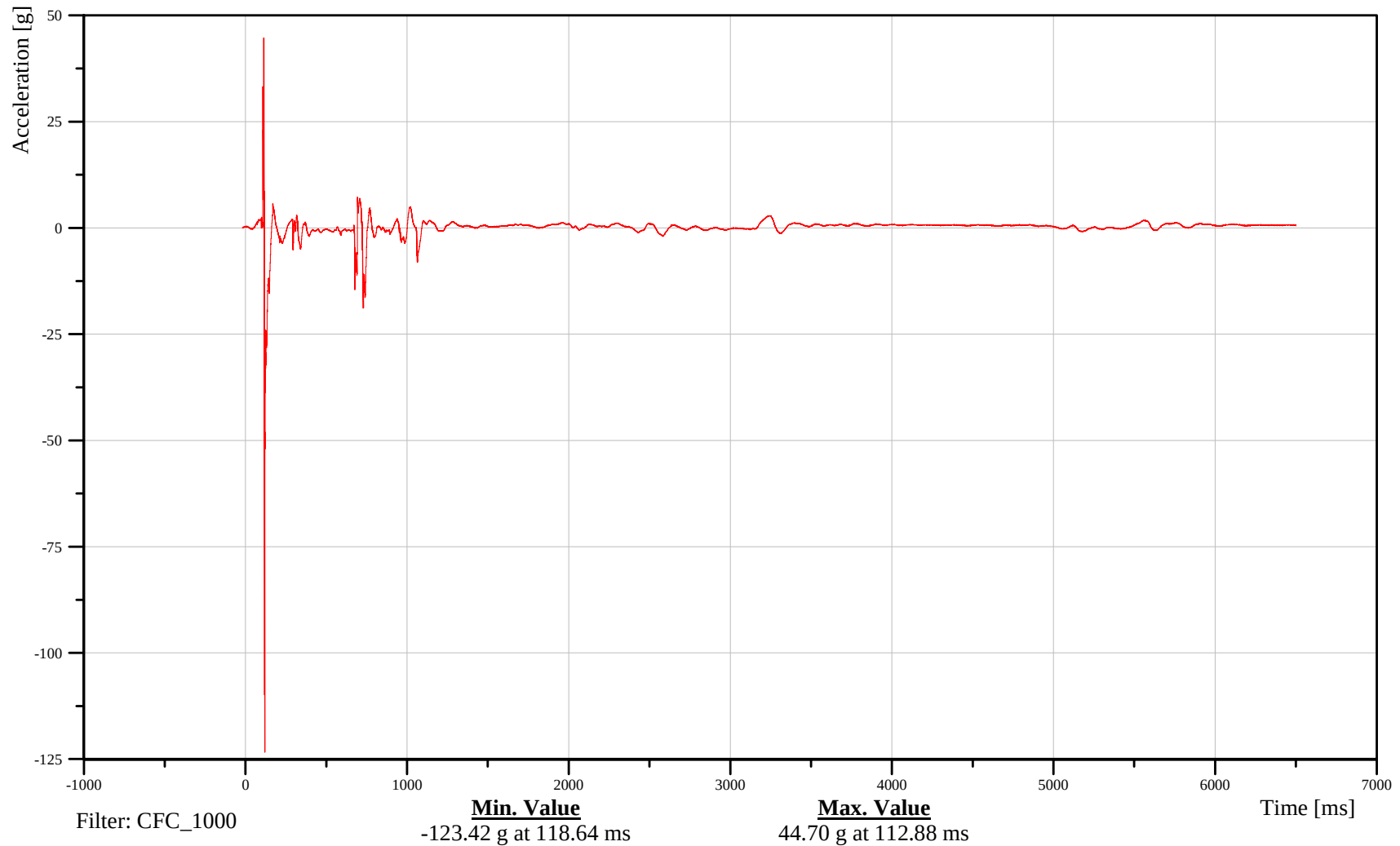
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Time: 15:07

Customer: VRTC

13HEADFR00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-34

100413



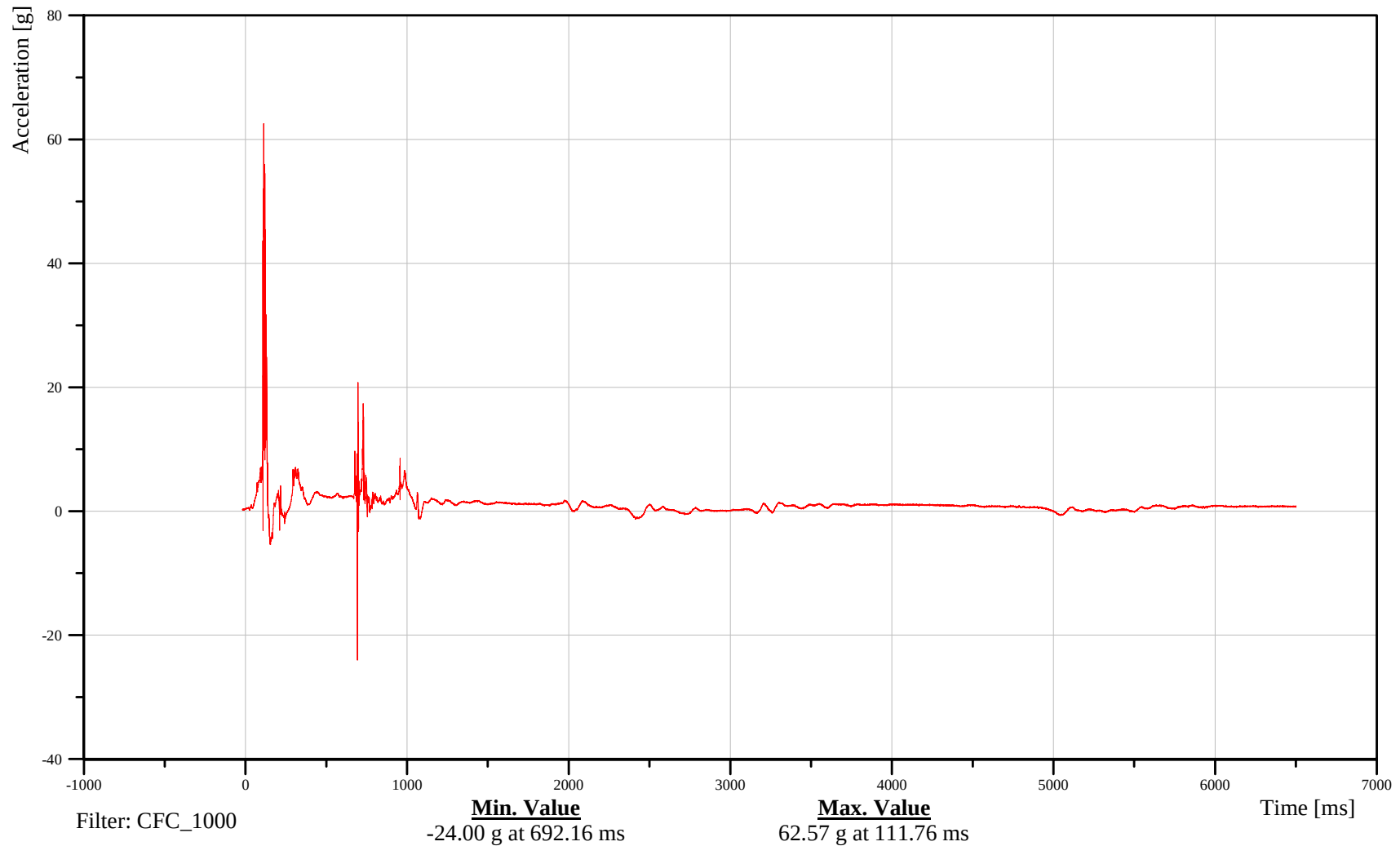
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Front Z-Axis Acceleration

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13HEADFR00H3ACZA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-35

100413



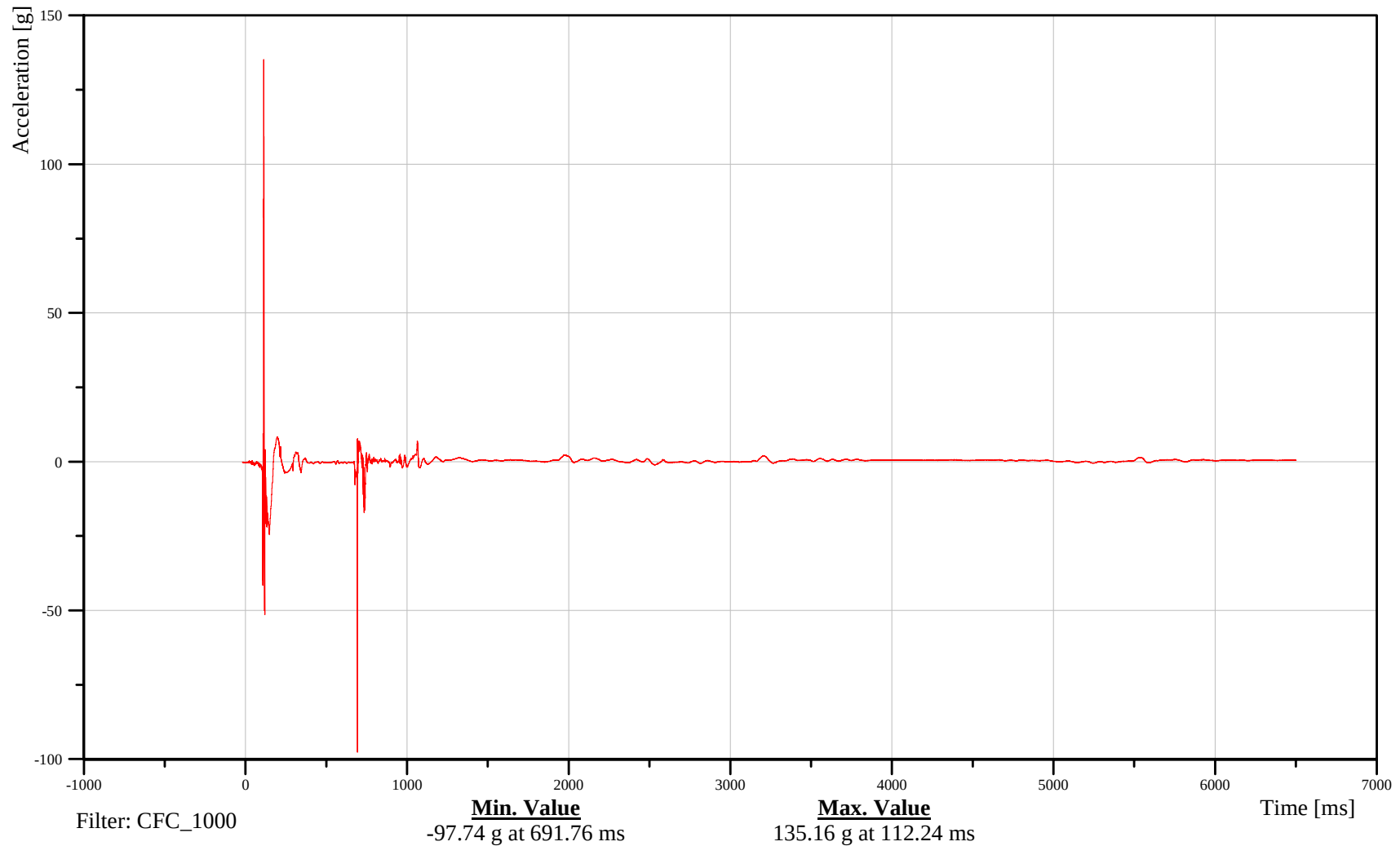
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Top X-Axis Acceleration

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13HEADUP00H3ACXA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-36

100413



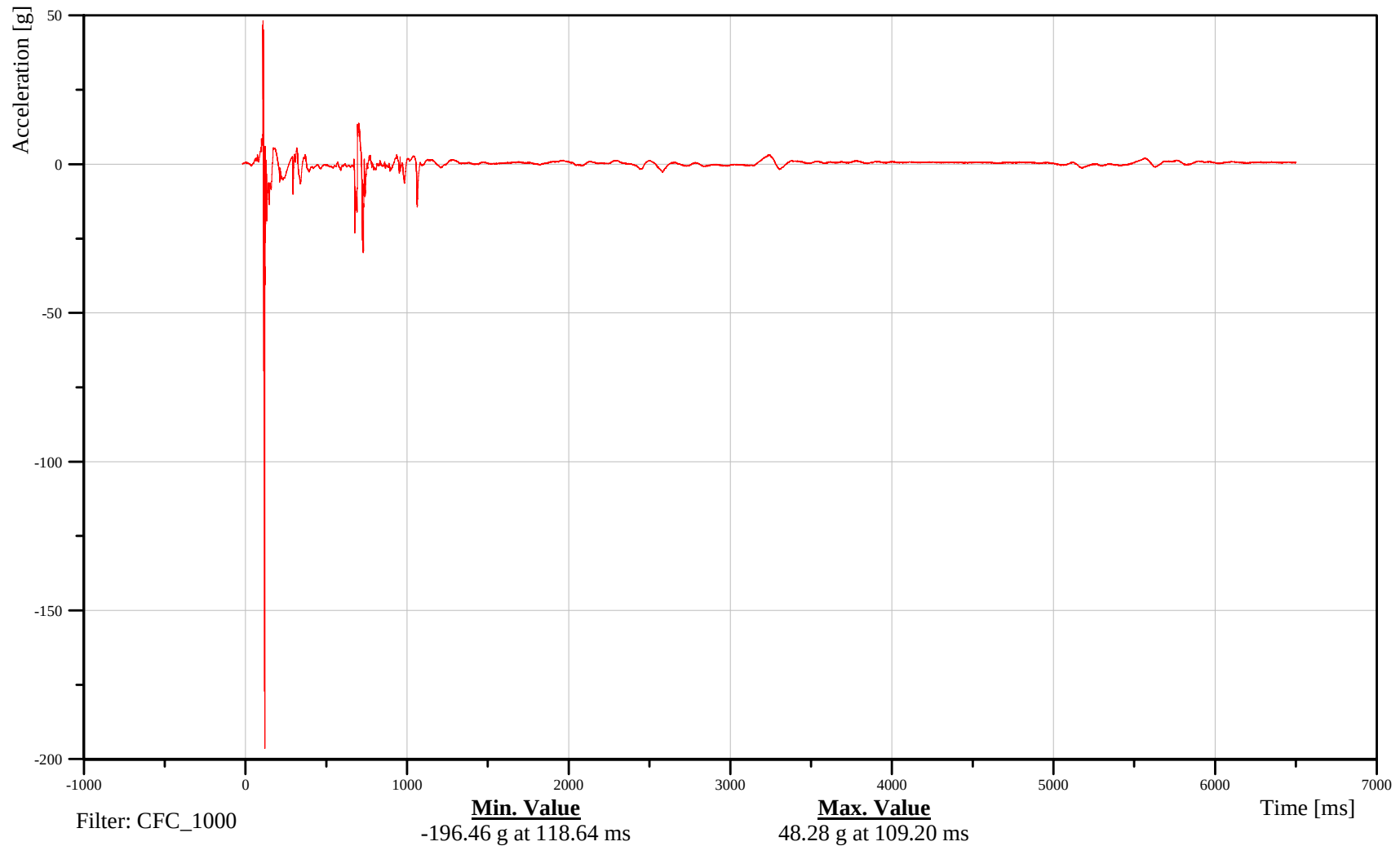
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Top Y-Axis Acceleration

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13HEADUP00H3ACYA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-37

100413



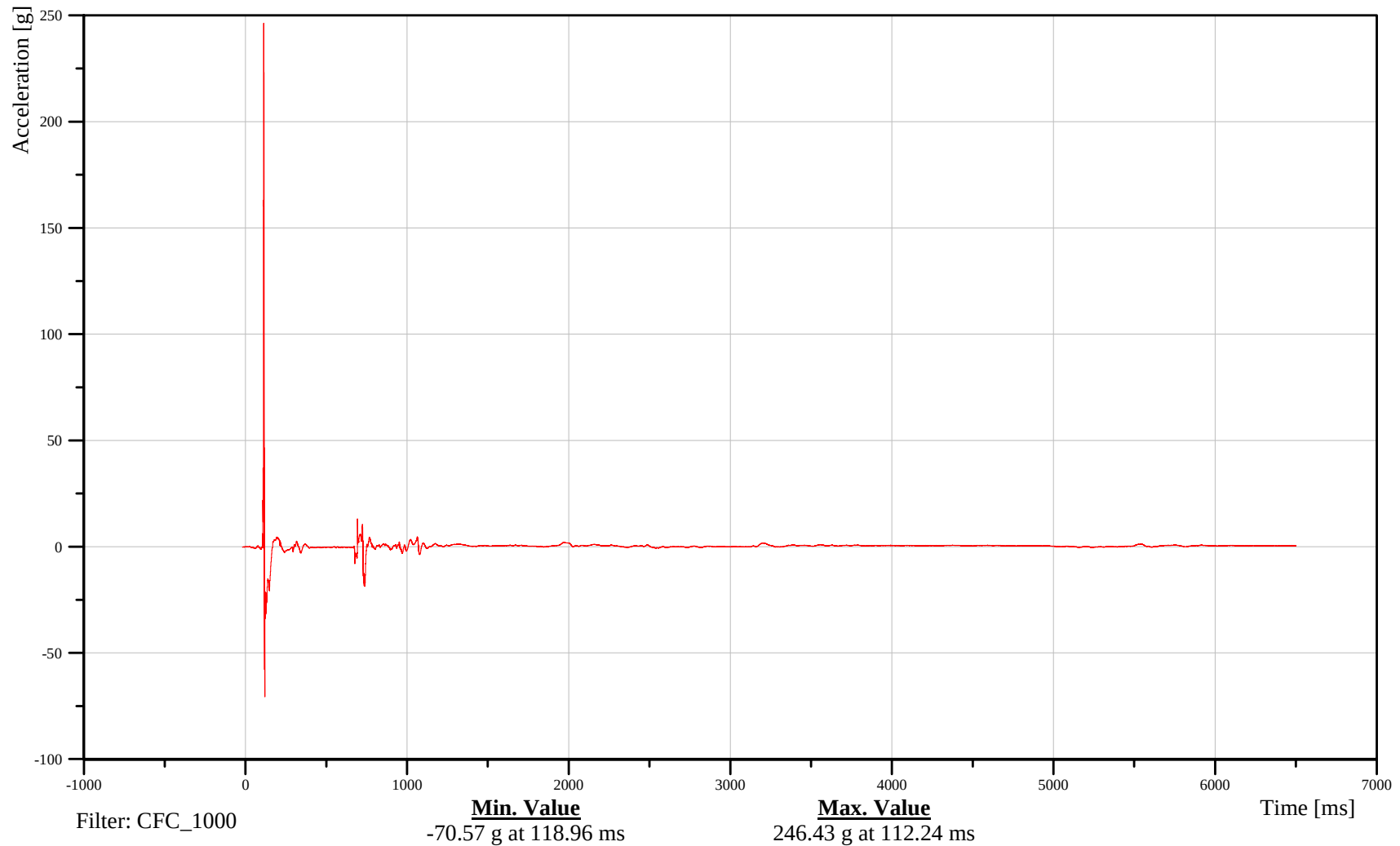
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Left X-Axis Acceleration

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13HEADLE00H3ACXA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-38

100413



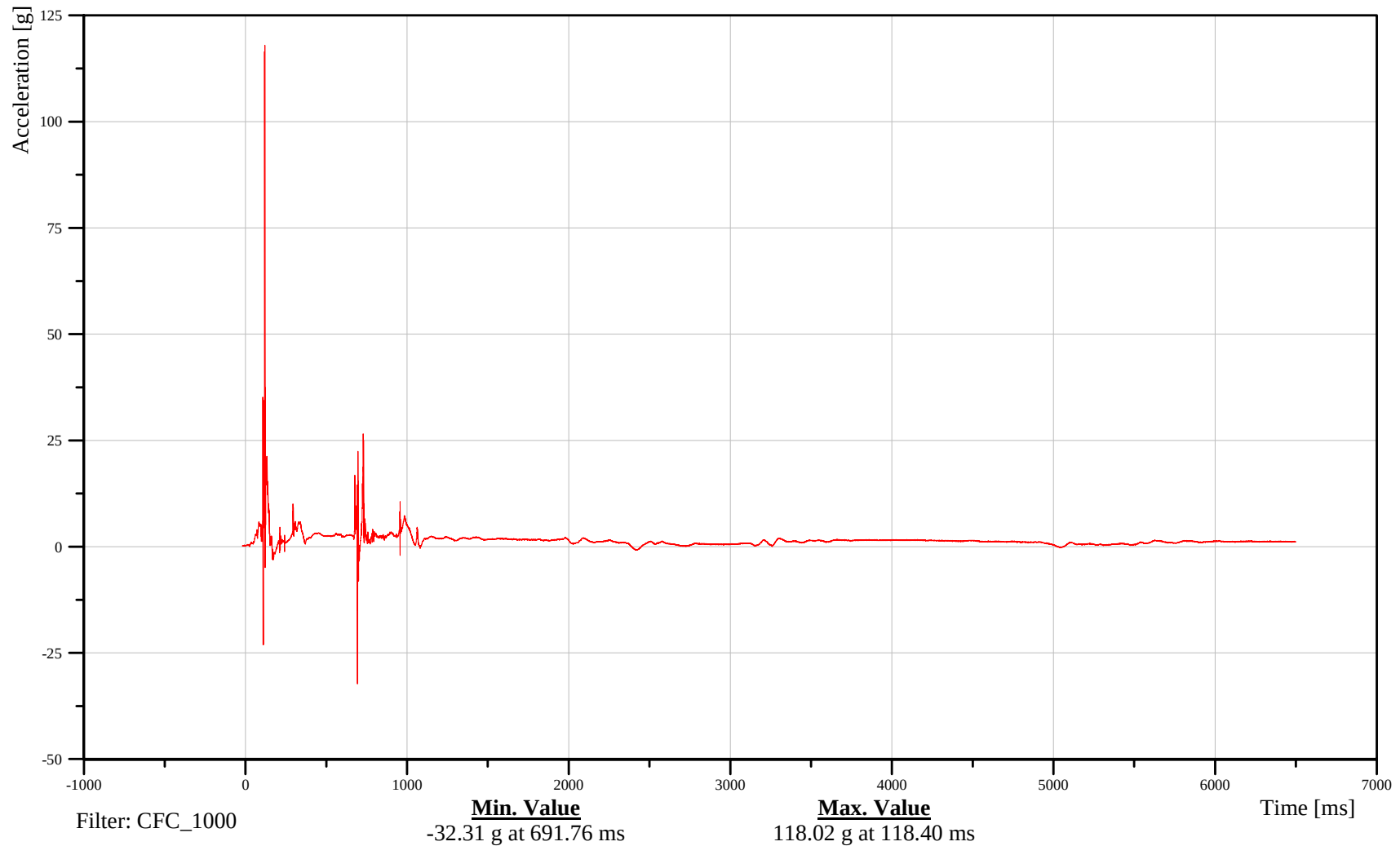
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Head Left Z-Axis Acceleration

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13HEADLE00H3ACZA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-39

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Upper Neck X-Axis Force

Date: 04/13/2010

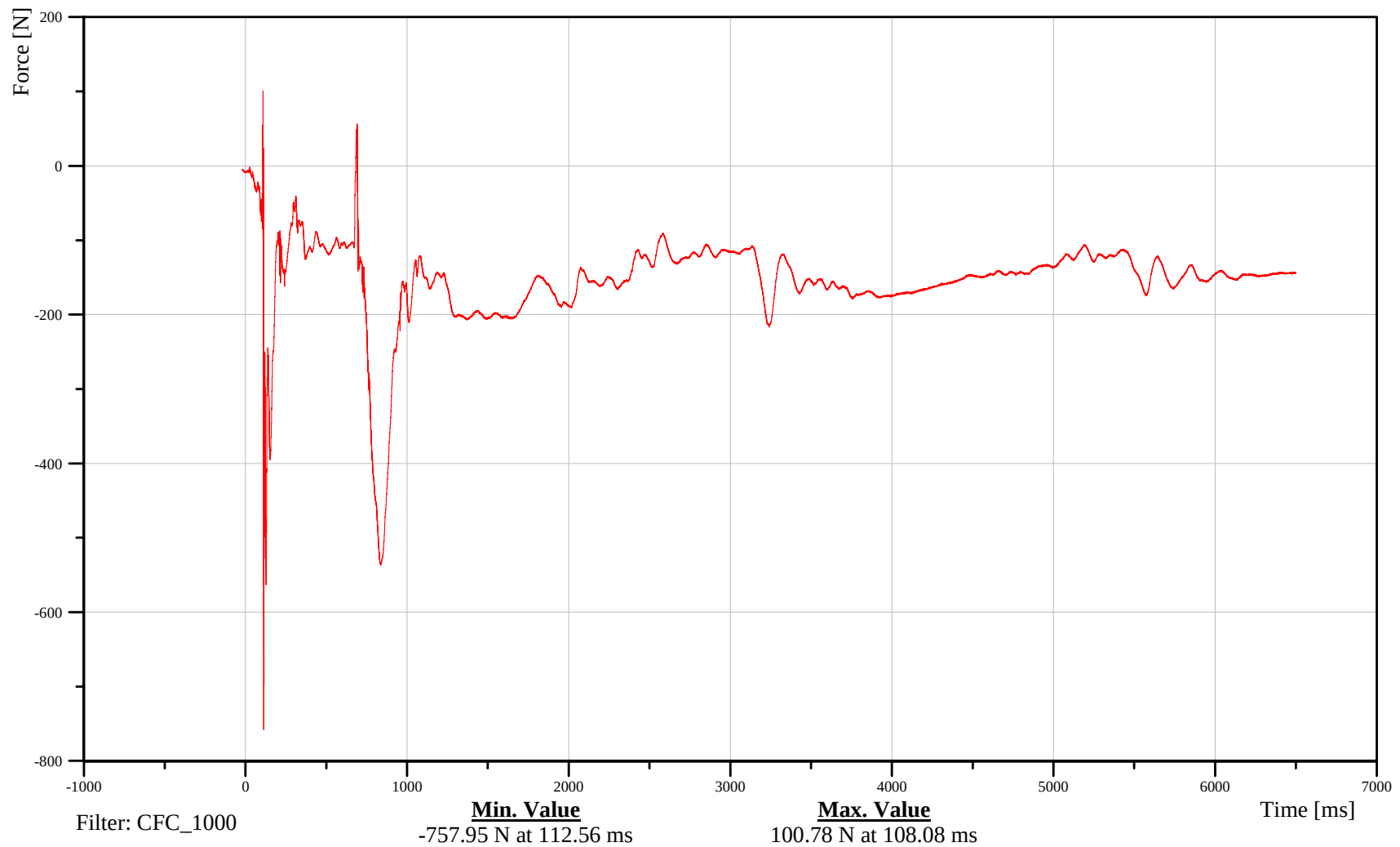
Time: 15:07

Customer: VRTC

13NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-40

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Upper Neck Y-Axis Force

Date: 04/13/2010

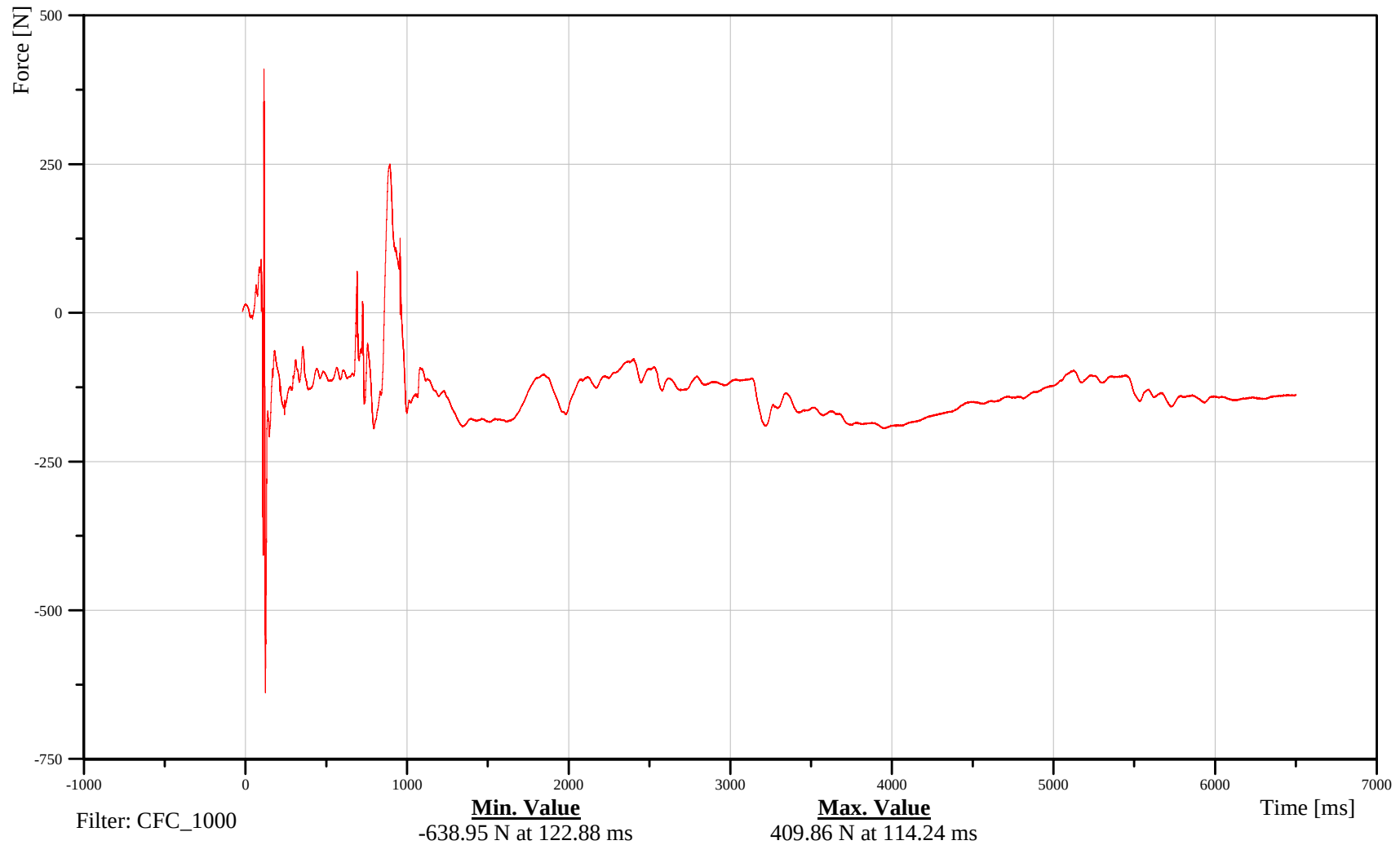
Time: 15:07

Customer: VRTC

13NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-41

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Upper Neck Z-Axis Force

Date: 04/13/2010

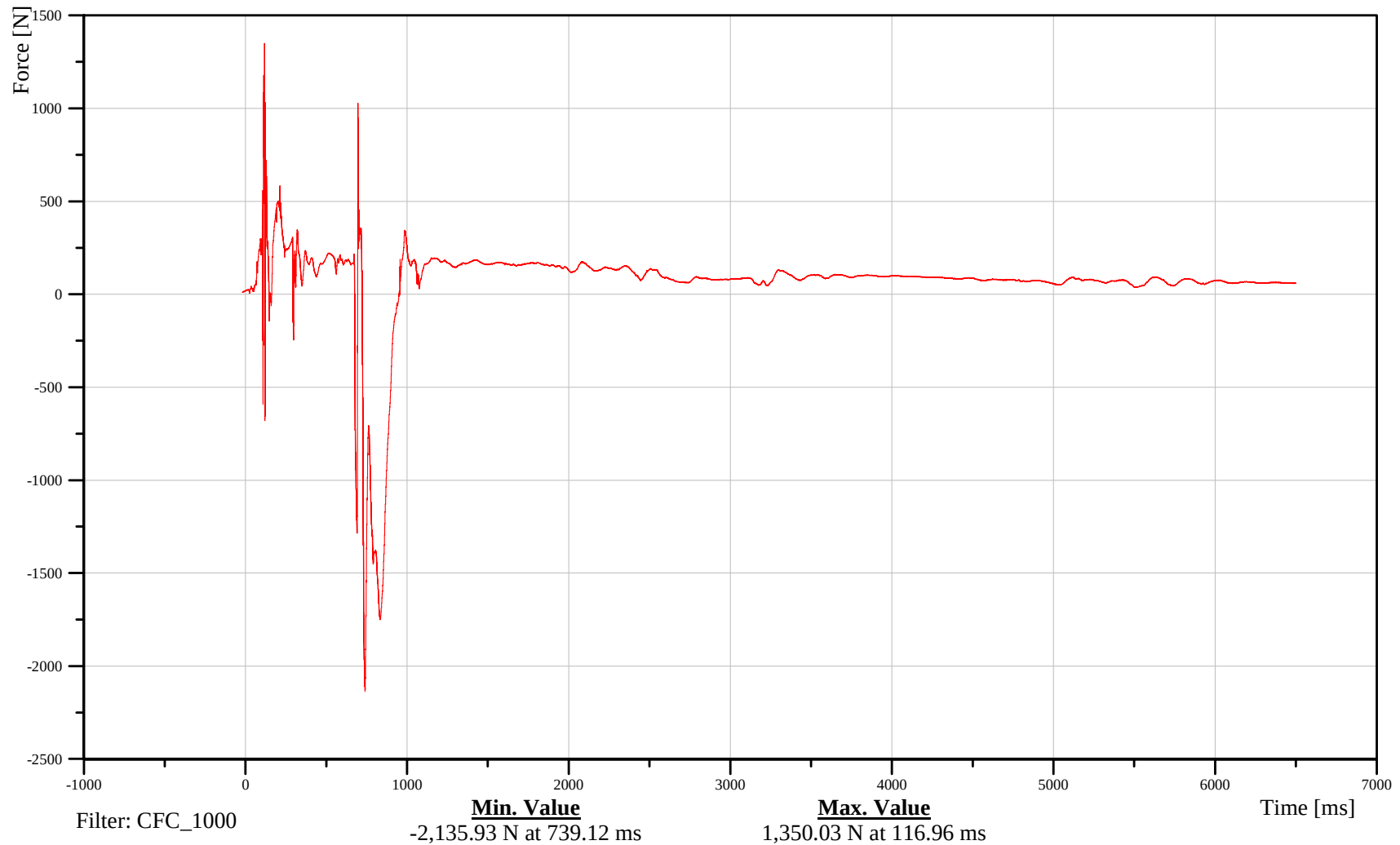
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Customer: VRTC

13NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-42

100413



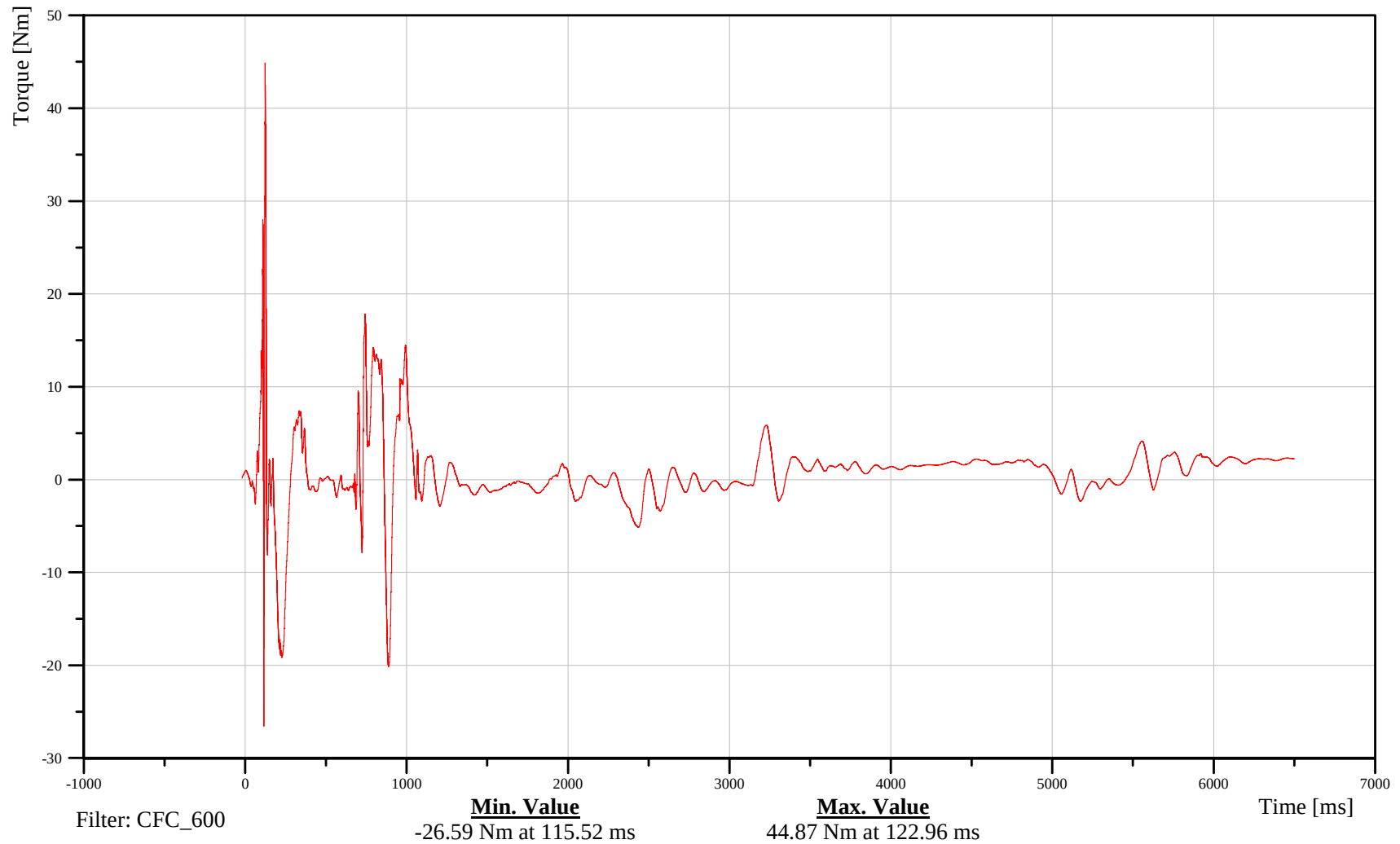
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Upper Neck Moment About X Axis

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13NECKUP00H3MOXB

TRC Inc. Test Lab: CTF
Test Number: 100413



B-43

100413



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

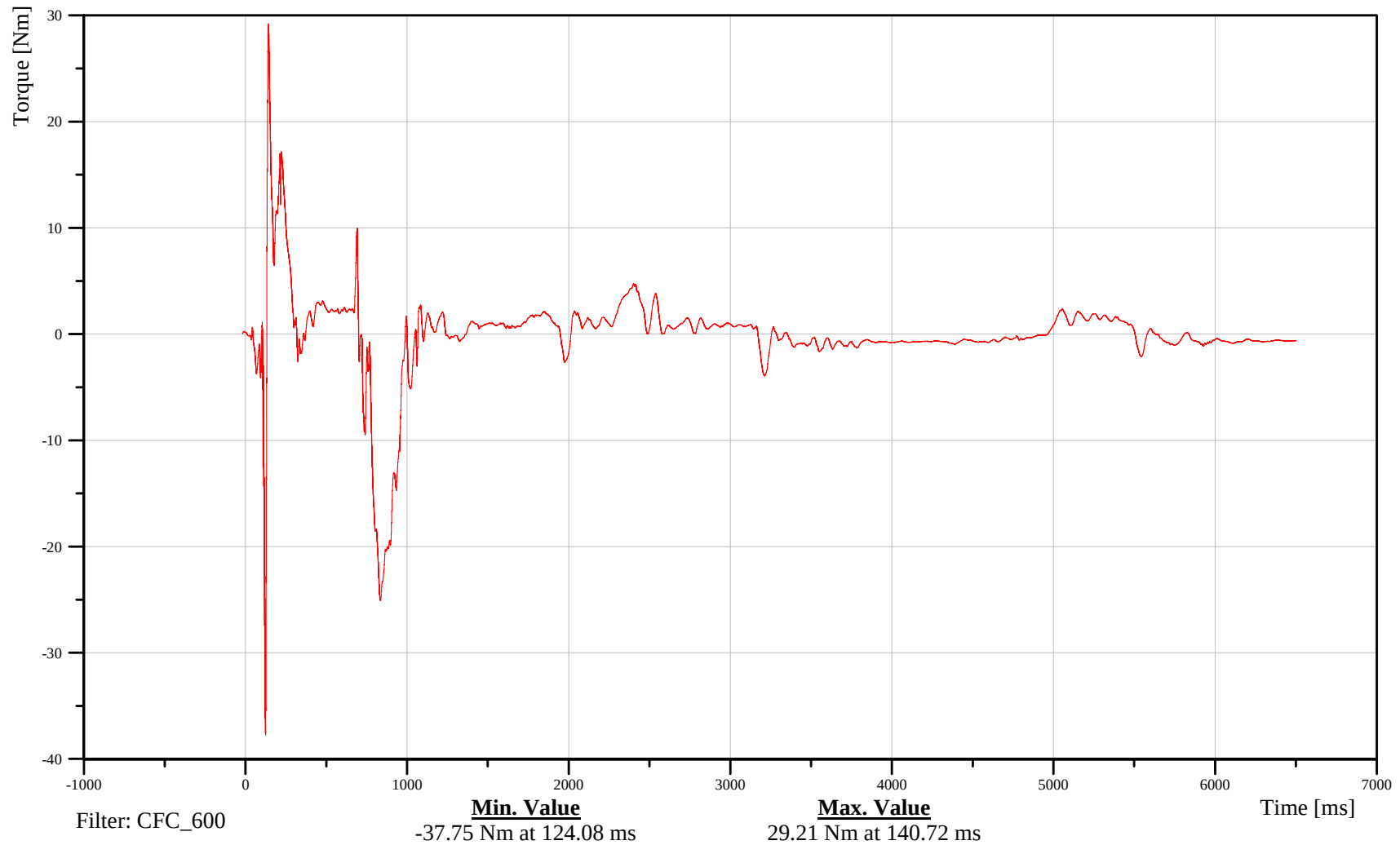
Date: 04/13/2010
Time: 15:07

Customer: VRTC

13NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-44

100413



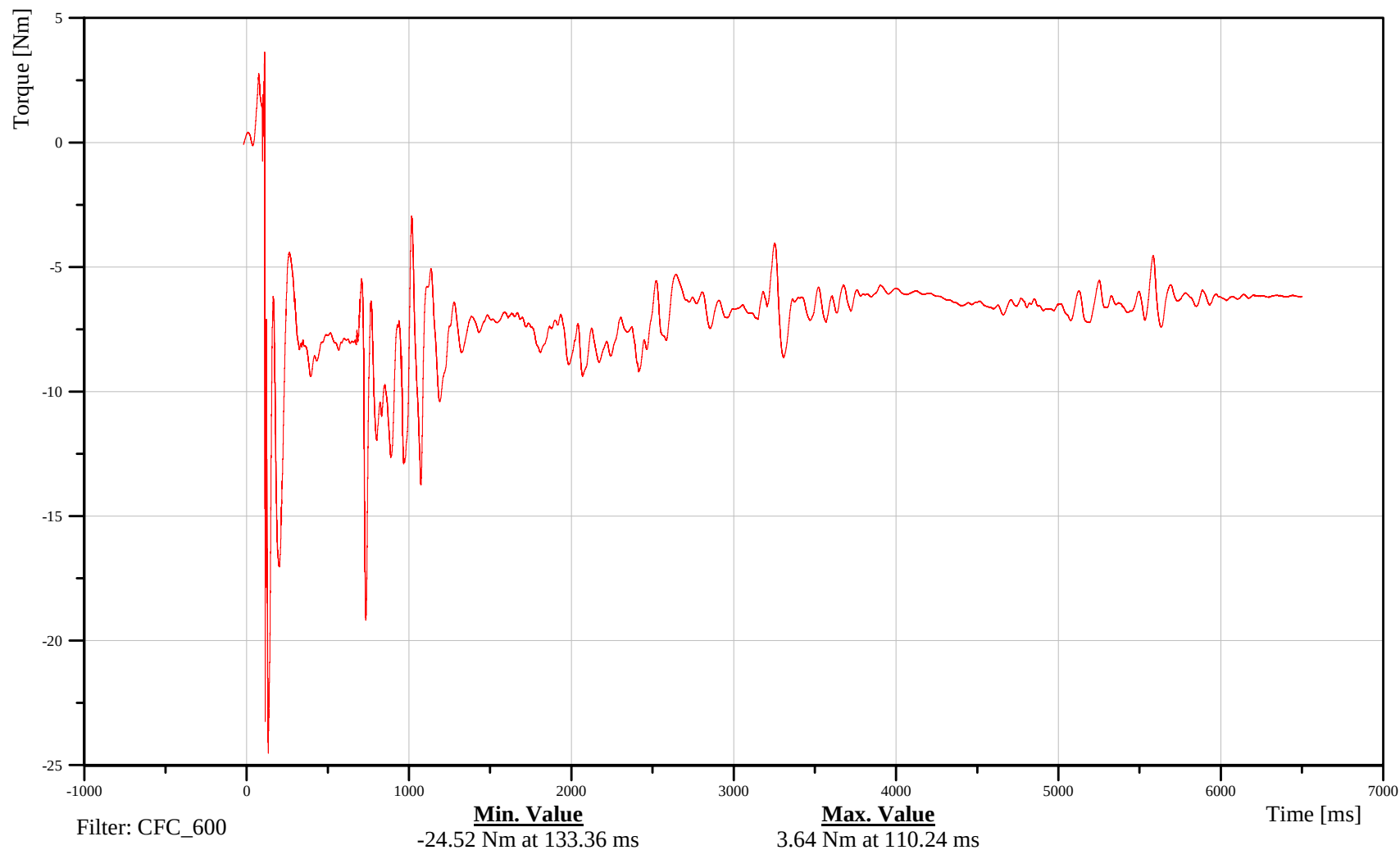
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Upper Neck Moment About Z Axis

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13NECKUP00H3MOZB

TRC Inc. Test Lab: CTF
Test Number: 100413



B-45

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Lower Neck X-Axis Force

Date: 04/13/2010

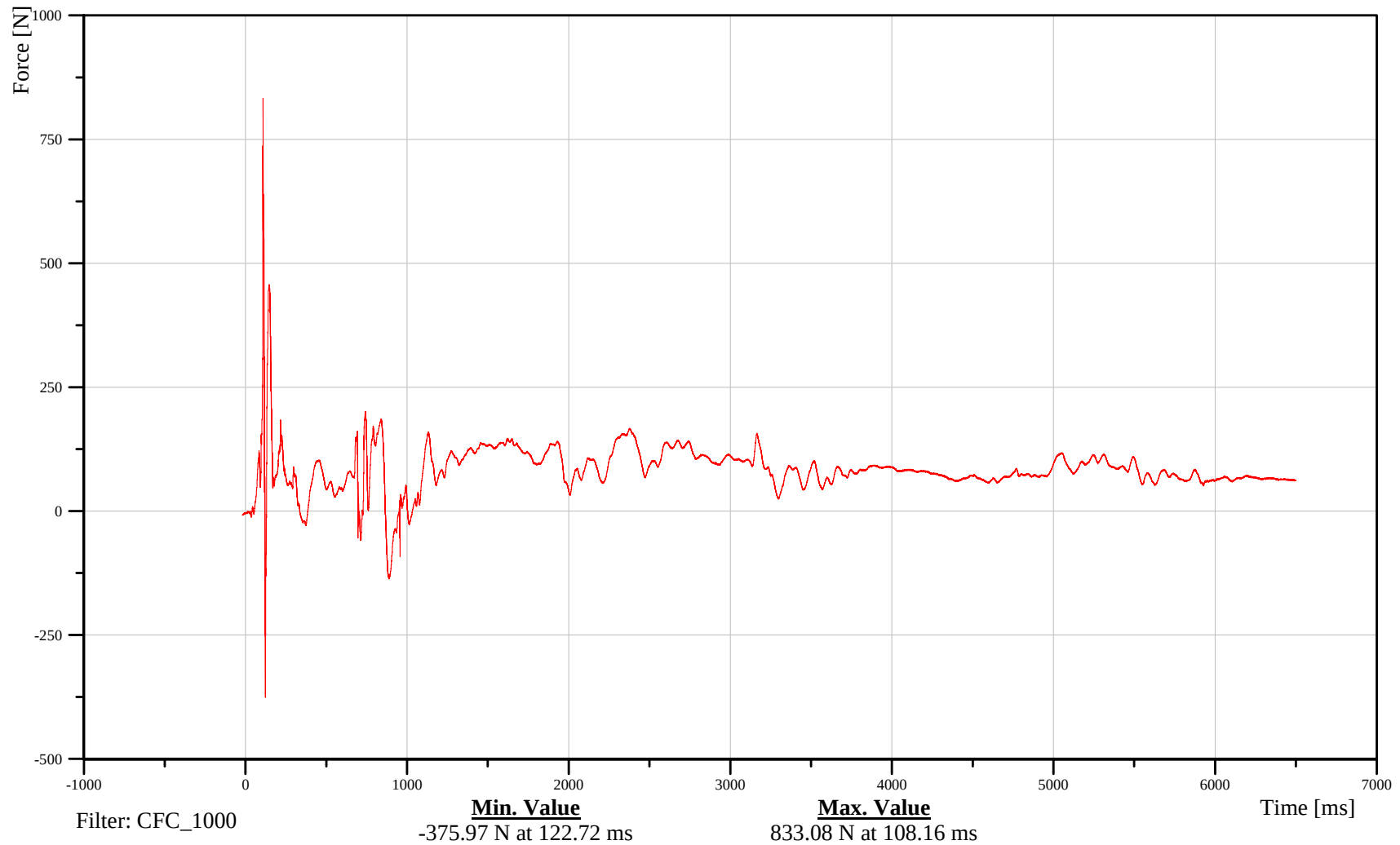
Time: 15:07

Customer: VRTC

13NECKLO00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-46

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Lower Neck Y-Axis Force

Date: 04/13/2010

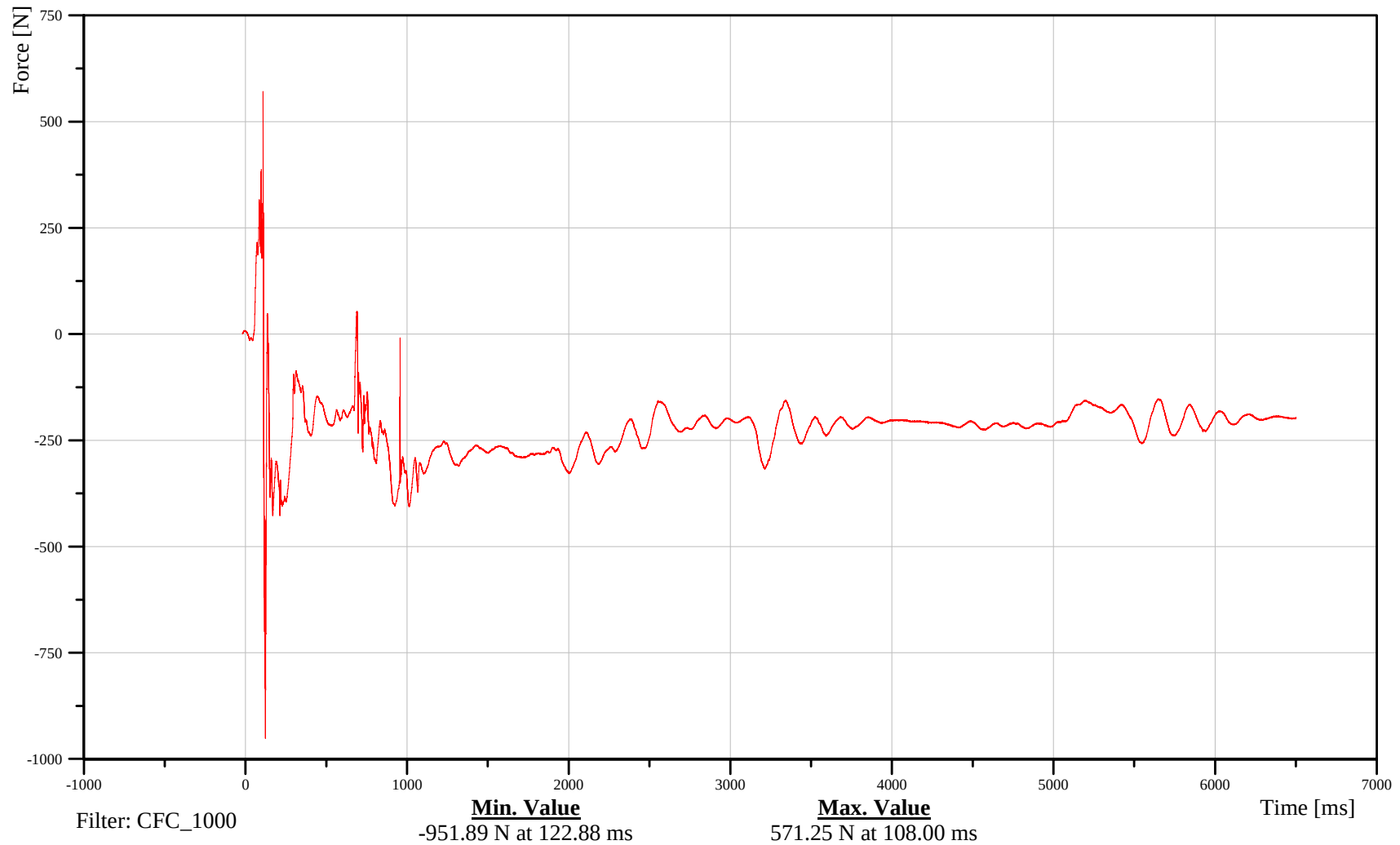
Time: 15:07

Customer: VRTC

13NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-47

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Lower Neck Z-Axis Force

Date: 04/13/2010

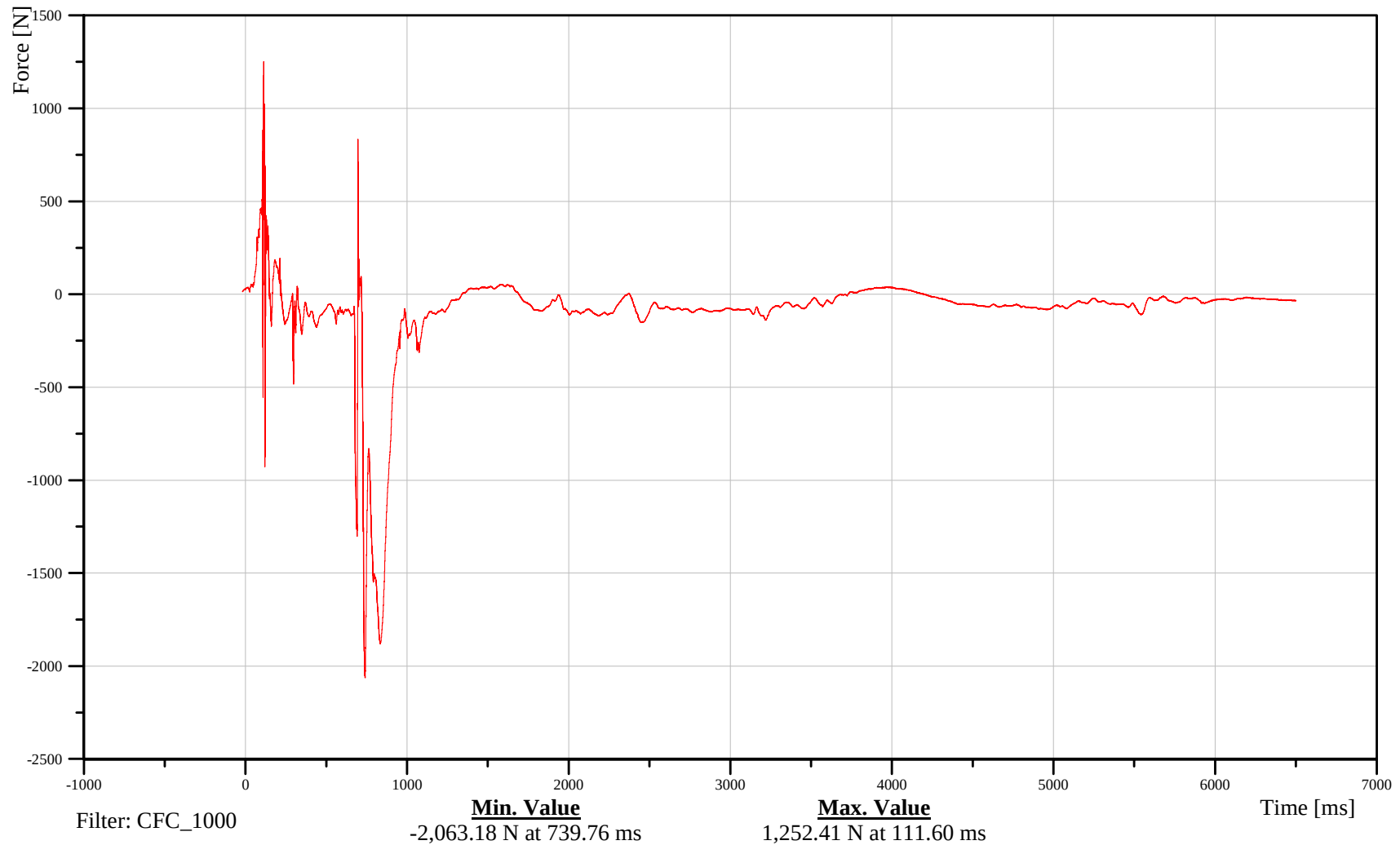
Time: 15:07

Customer: VRTC

13NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-48

100413



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

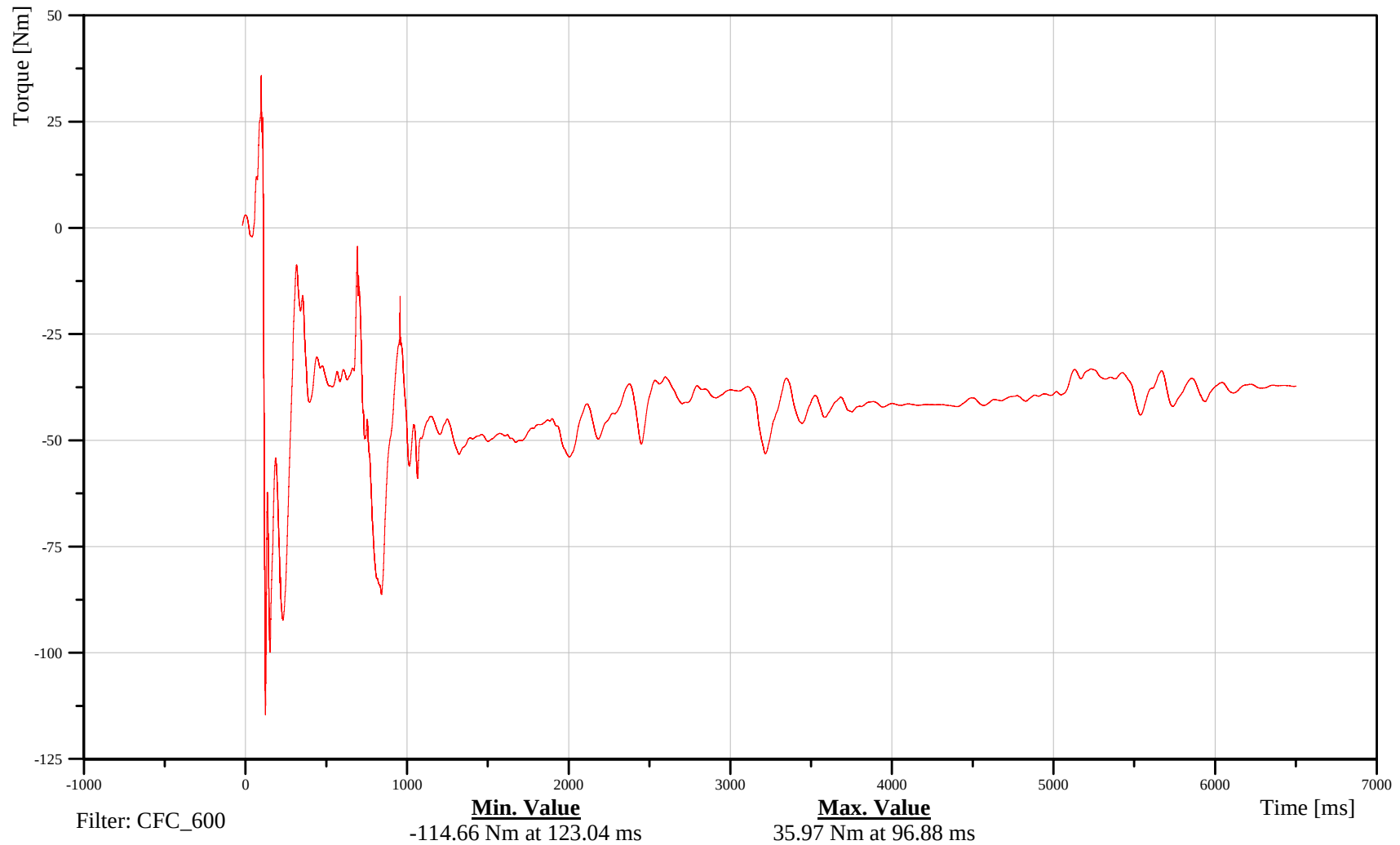
Date: 04/13/2010
Time: 15:07

Customer: VRTC

13NECKLO00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-49

100413



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

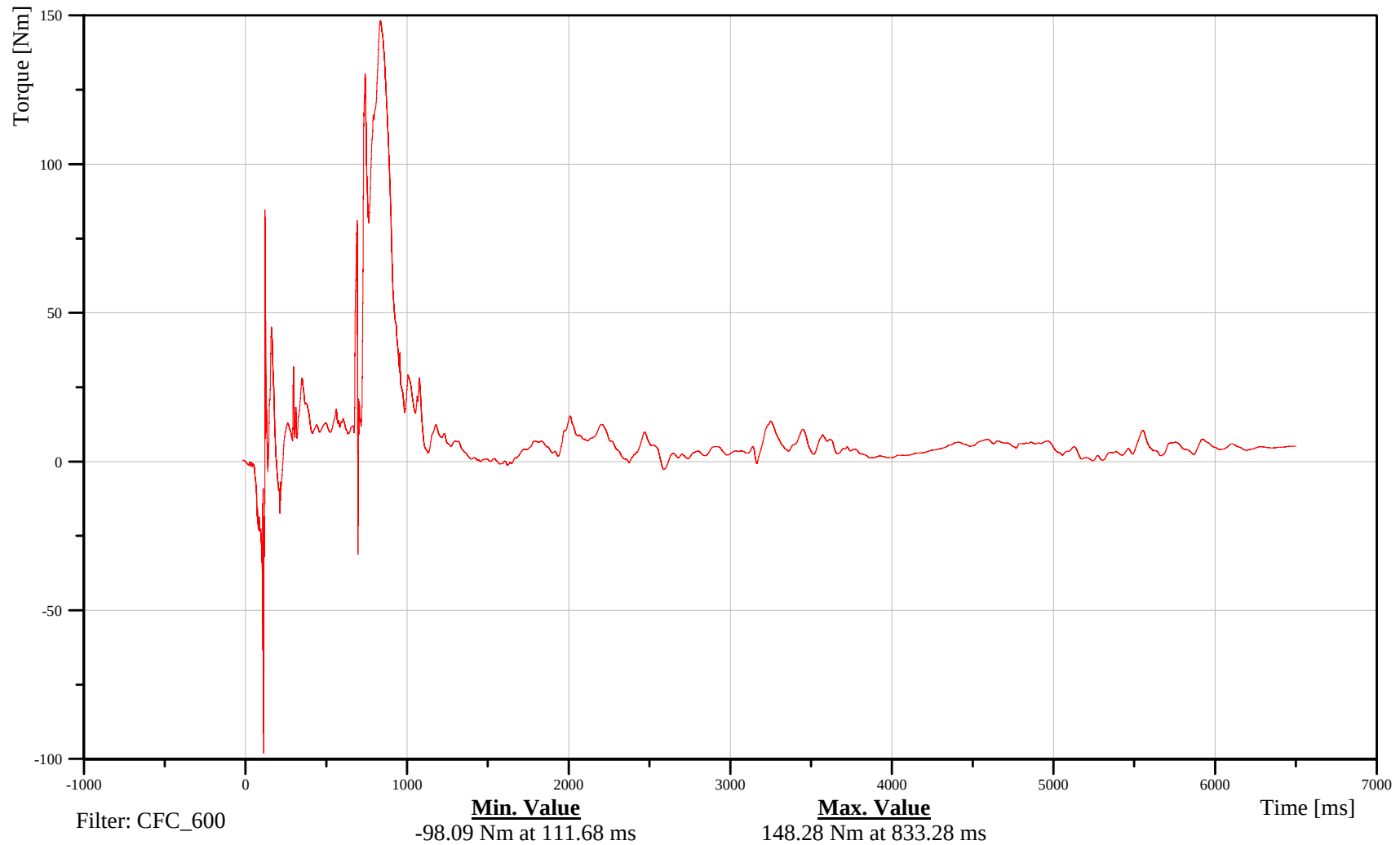
Date: 04/13/2010
Time: 15:07

Customer: VRTC

13NECKLO00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-50

100413



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

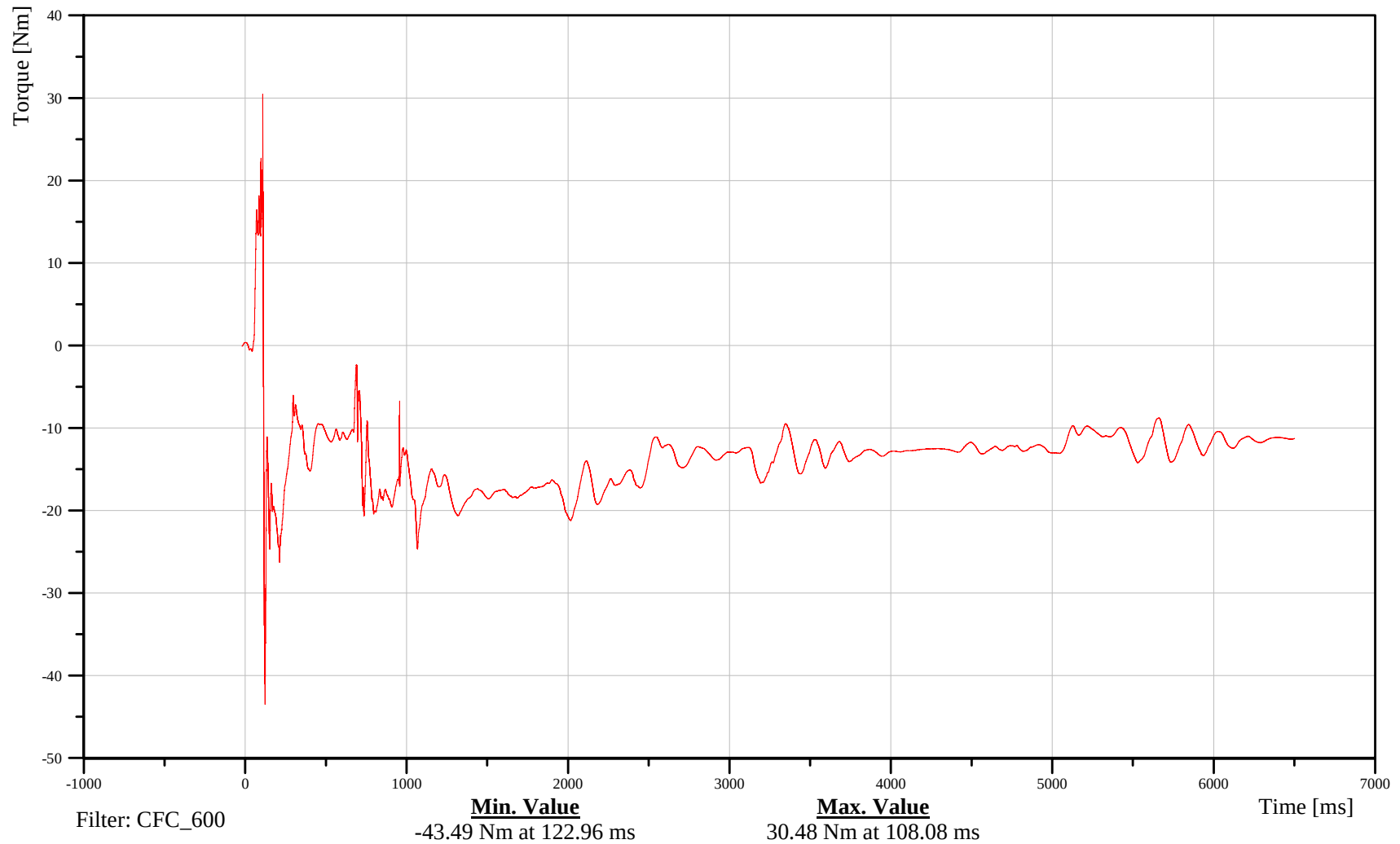
Date: 04/13/2010
Time: 15:07

Customer: VRTC

13NECKLO00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-51

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Chest X-Axis Acceleration

Date: 04/13/2010

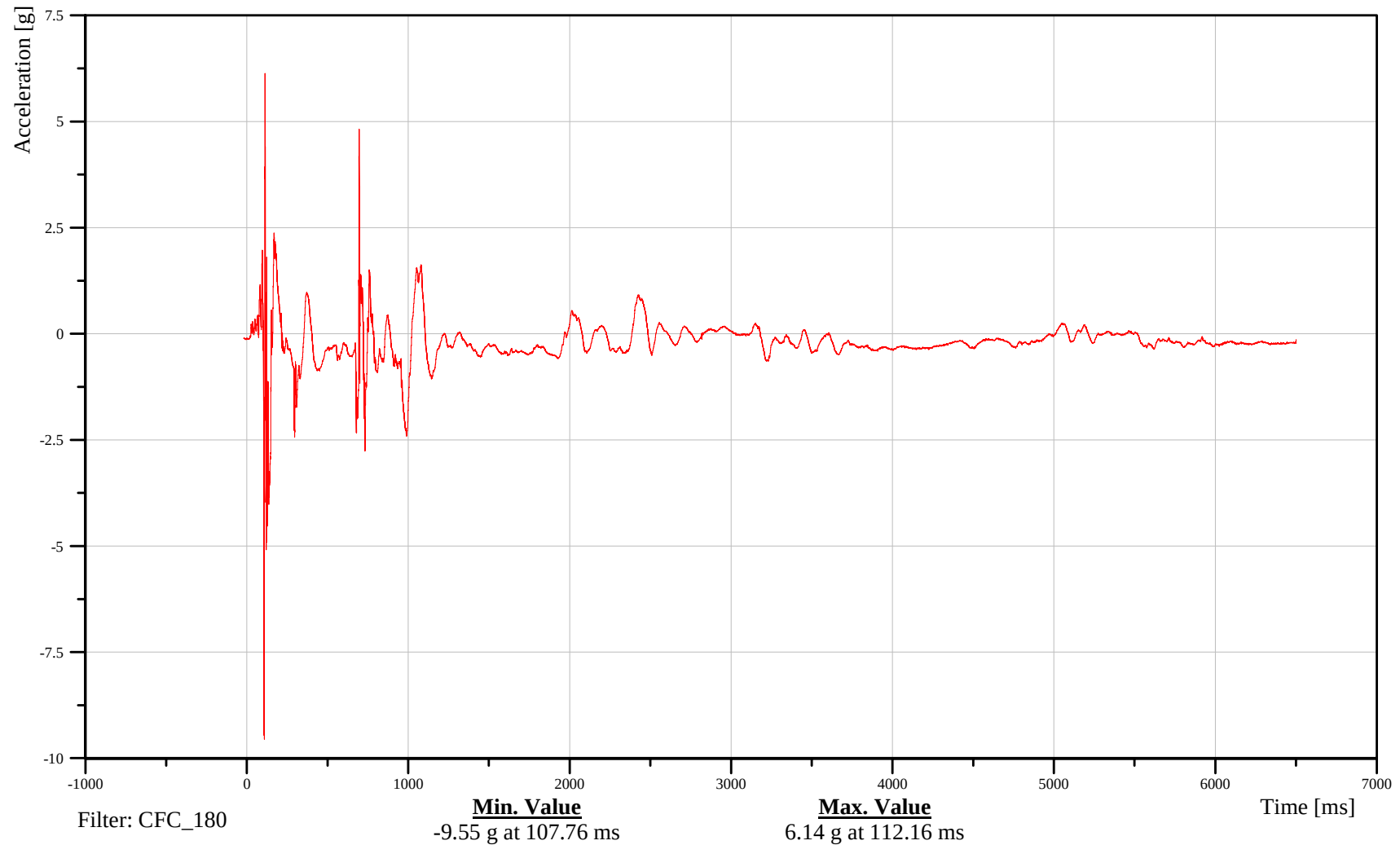
Time: 15:07

Customer: VRTC

13CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-52

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Chest Y-Axis Acceleration

Date: 04/13/2010

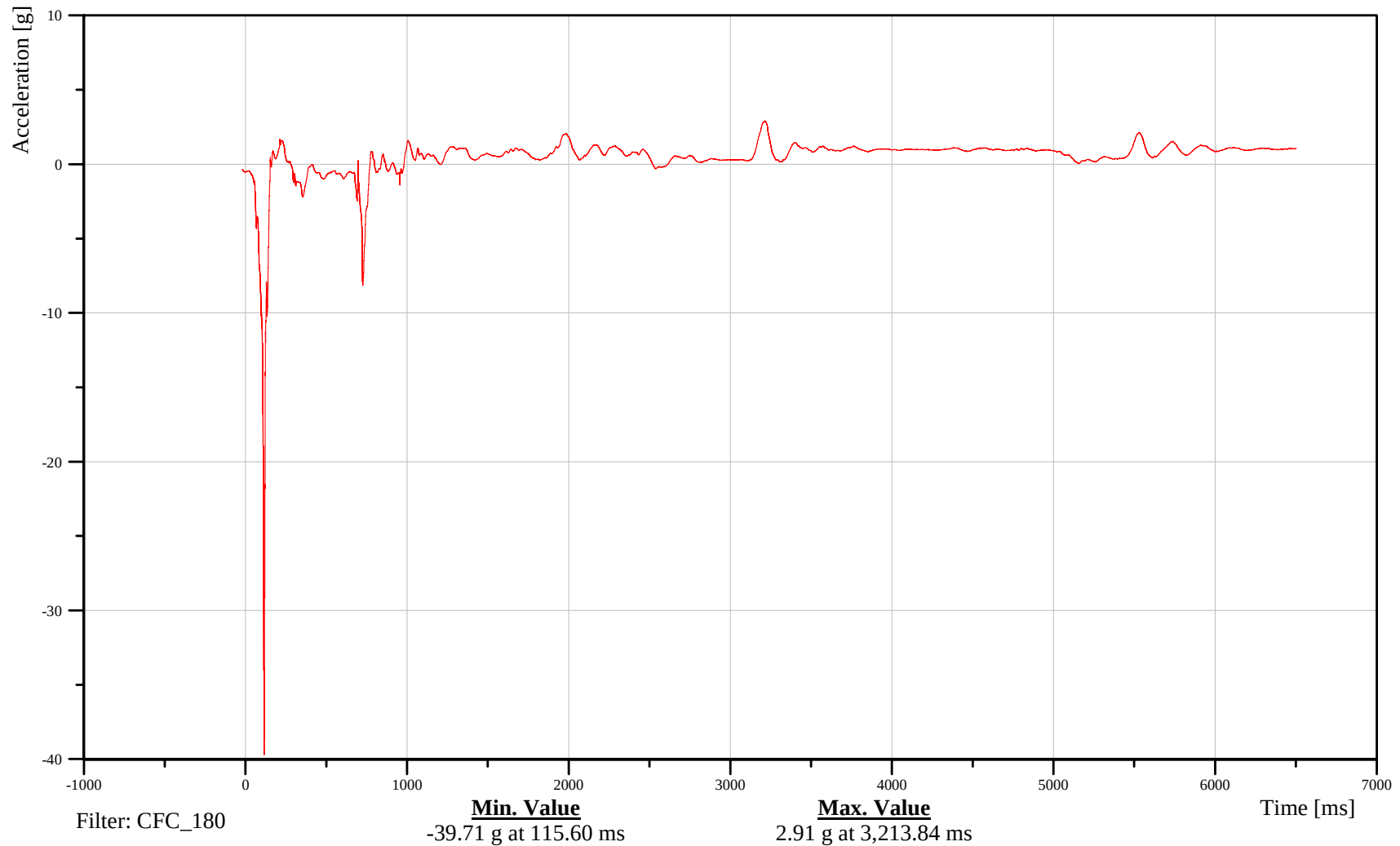
Time: 15:07

Customer: VRTC

13CHSTCG00H3ACYC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-53

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Chest Z-Axis Acceleration

Date: 04/13/2010

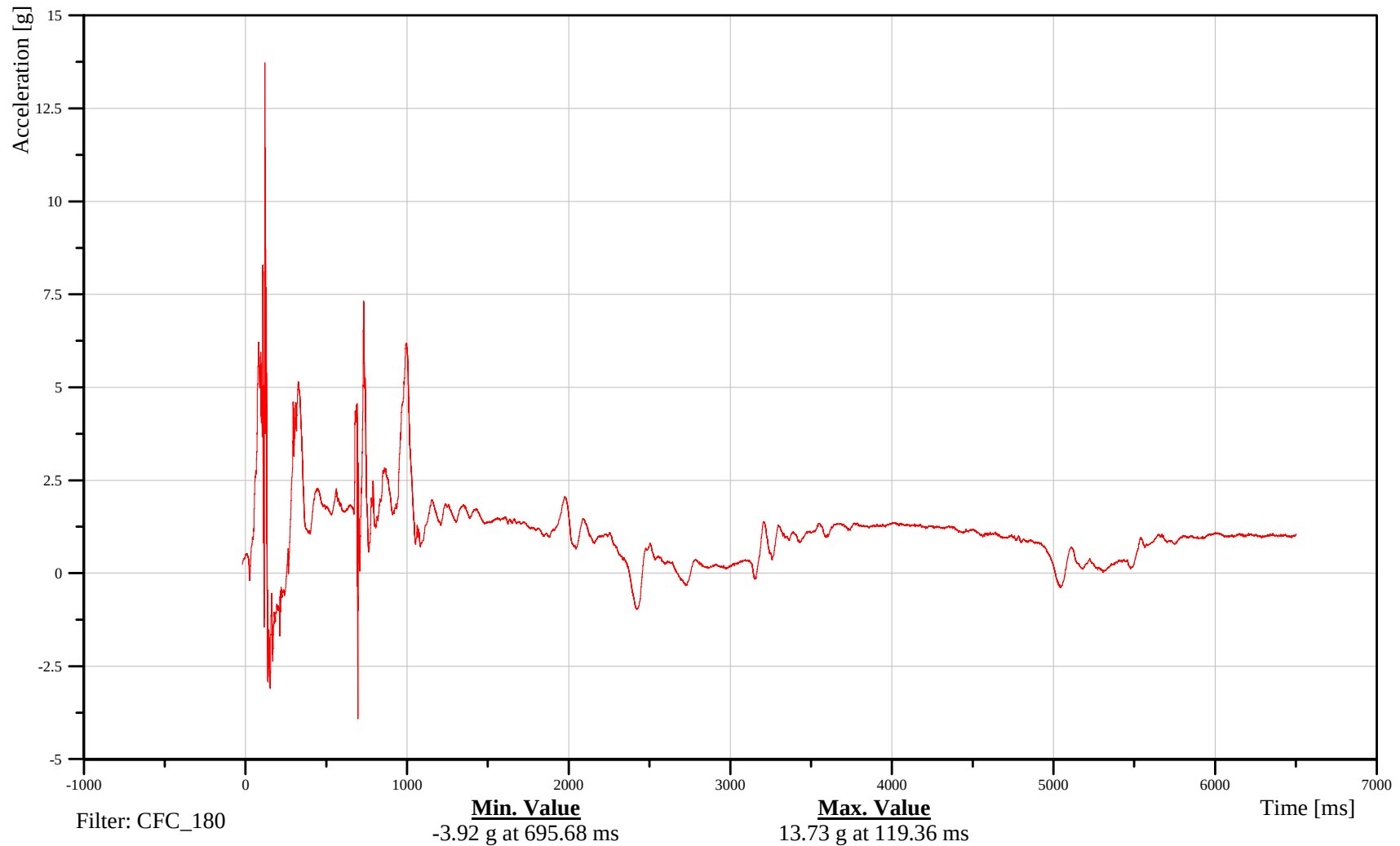
Time: 15:07

Customer: VRTC

13CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-54

100413



Curb Trip Rollover 2007 Ford Expedition

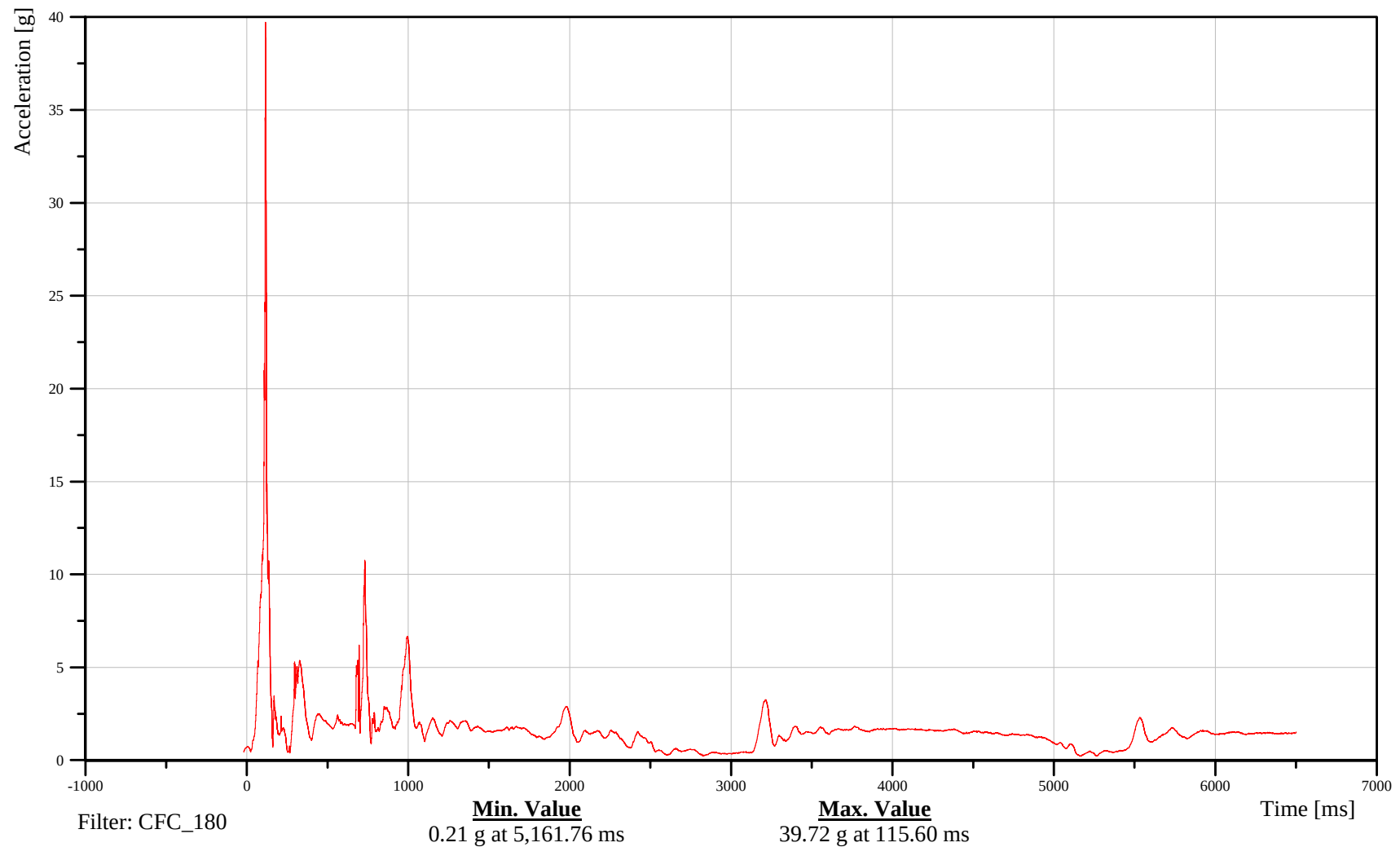
Right Front Passenger Chest Resultant Acceleration

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13CHSTCG00H3ACRC

TRC Inc. Test Lab: CTF
Test Number: 100413



B-55

100413



Curb Trip Rollover 2007 Ford Expedition

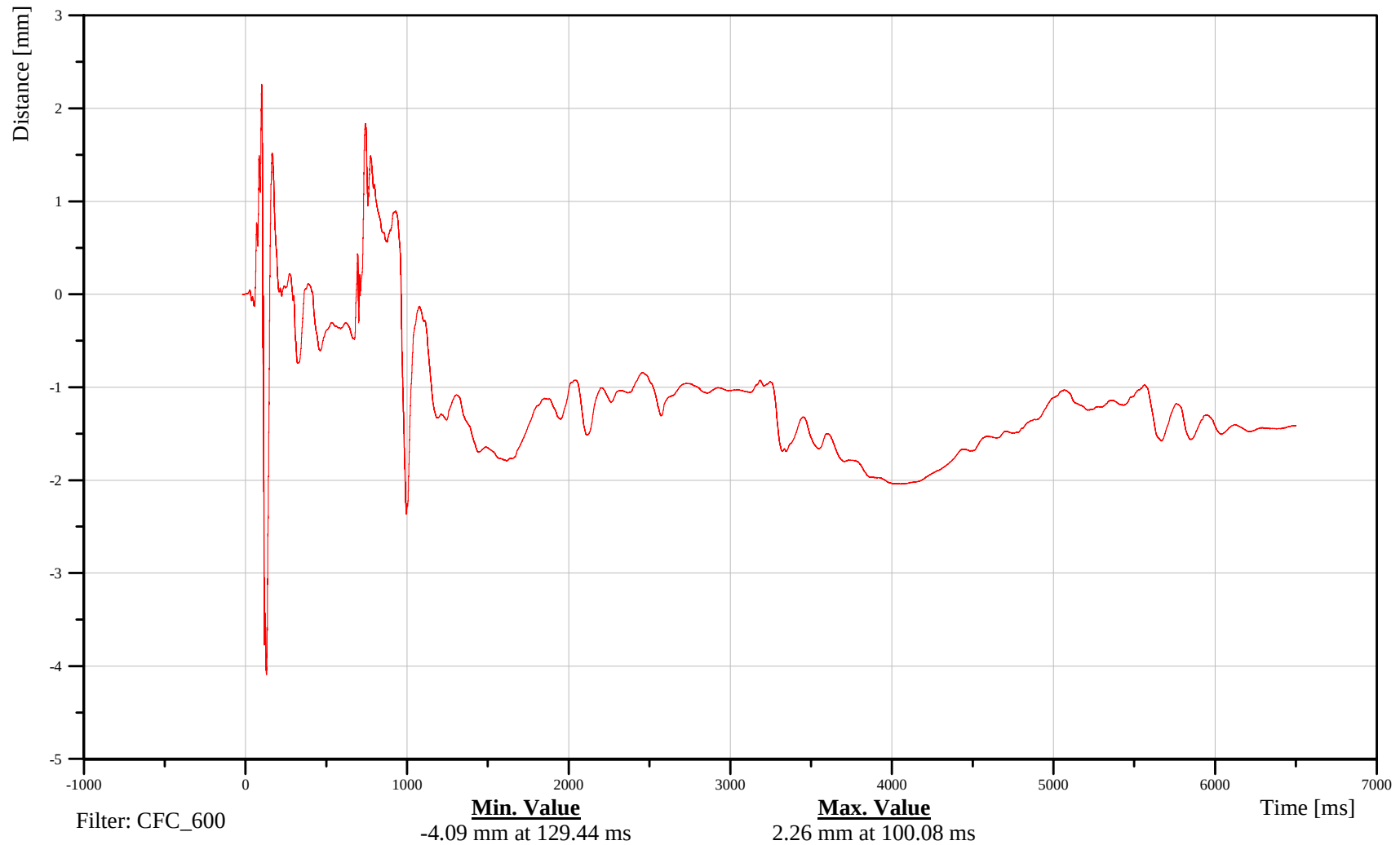
Right Front Passenger Chest X-Axis Displacement

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13CHST0000H3DSXB

TRC Inc. Test Lab: CTF
Test Number: 100413



B-56

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis X-Axis Acceleration

Date: 04/13/2010

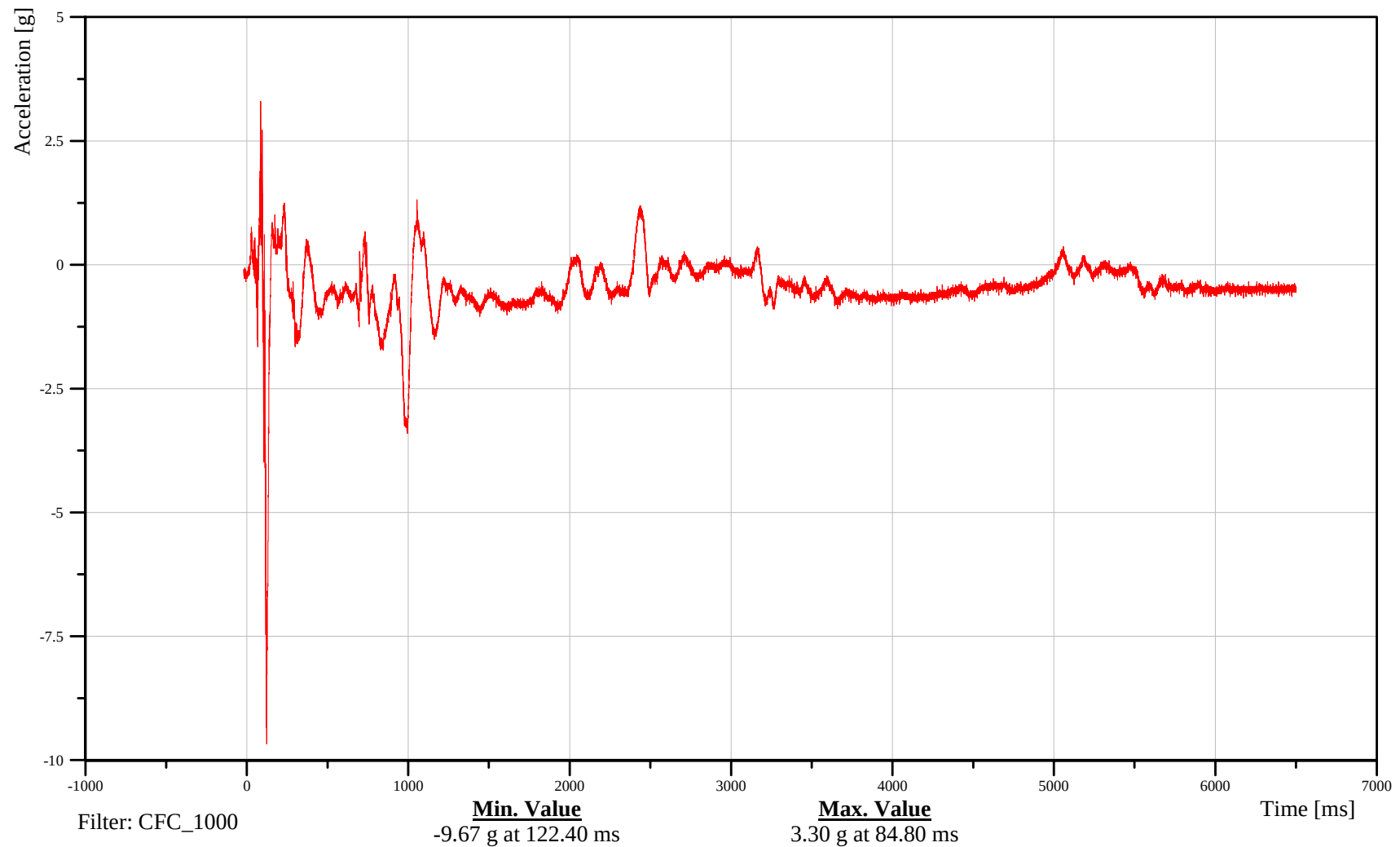
Time: 15:07

Customer: VRTC

13PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-57

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis Y-Axis Acceleration

Date: 04/13/2010

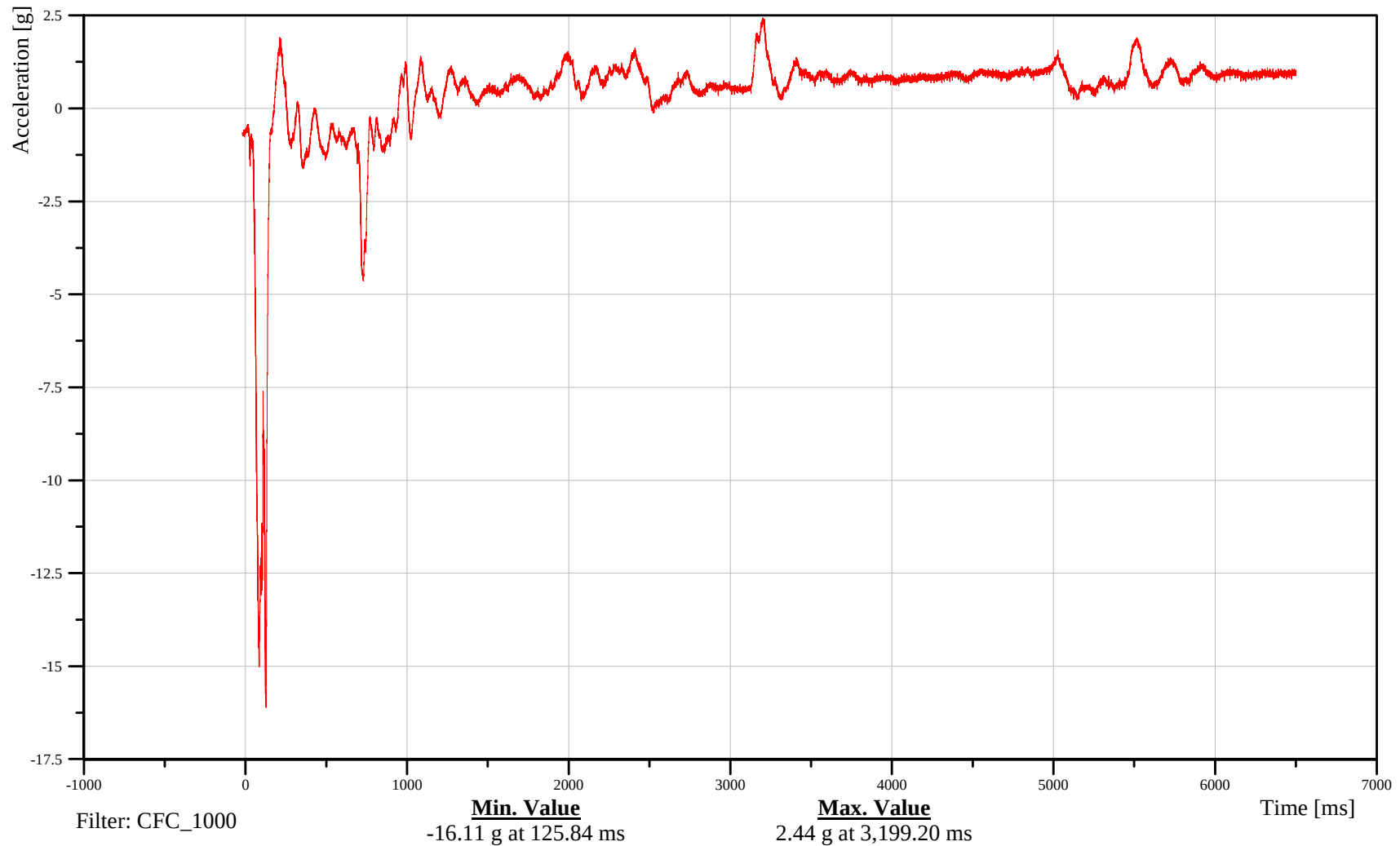
Time: 15:07

Customer: VRTC

13PELVCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-58

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis Z-Axis Acceleration

Date: 04/13/2010

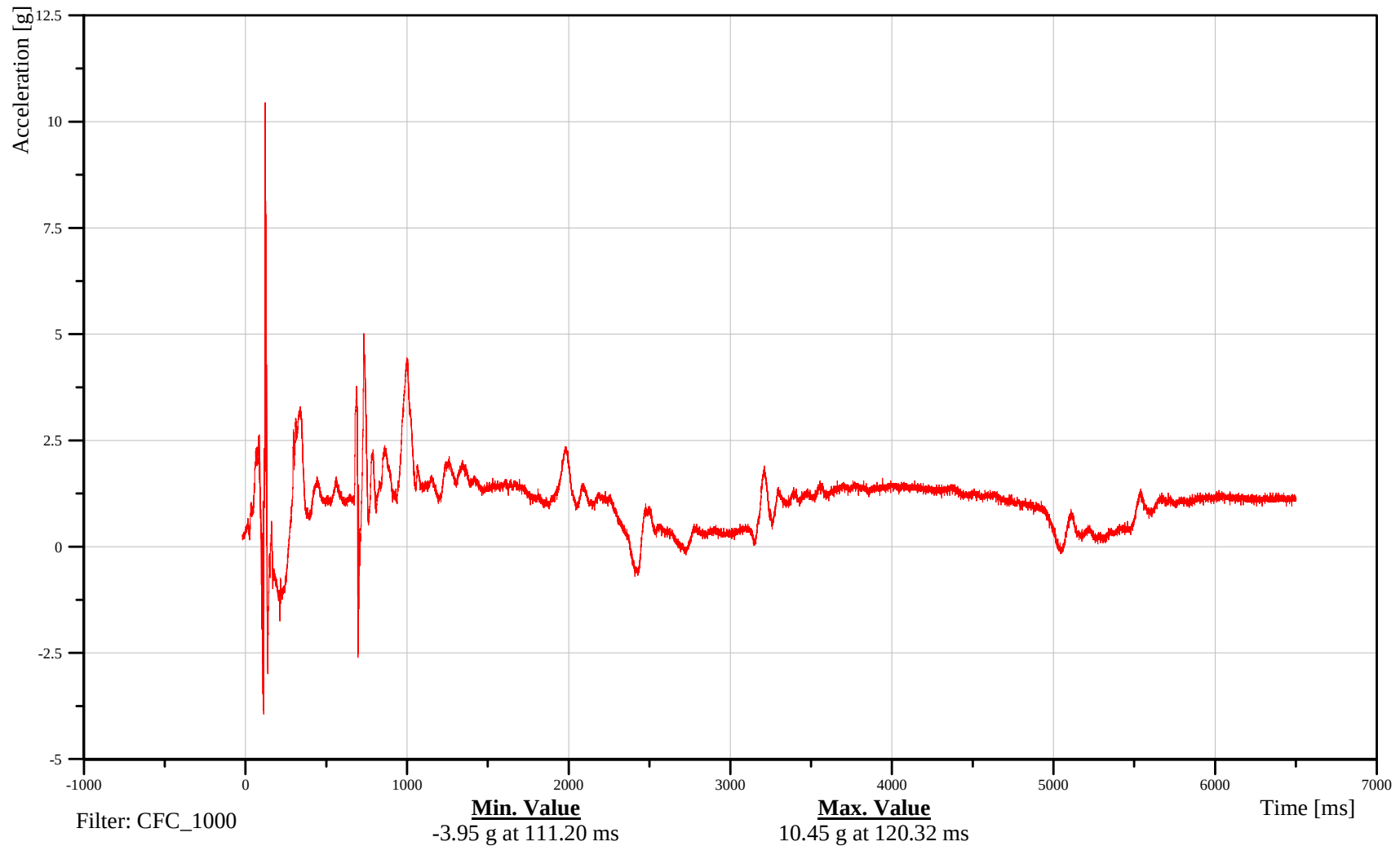
Time: 15:07

Customer: VRTC

13PELVCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-59

100413



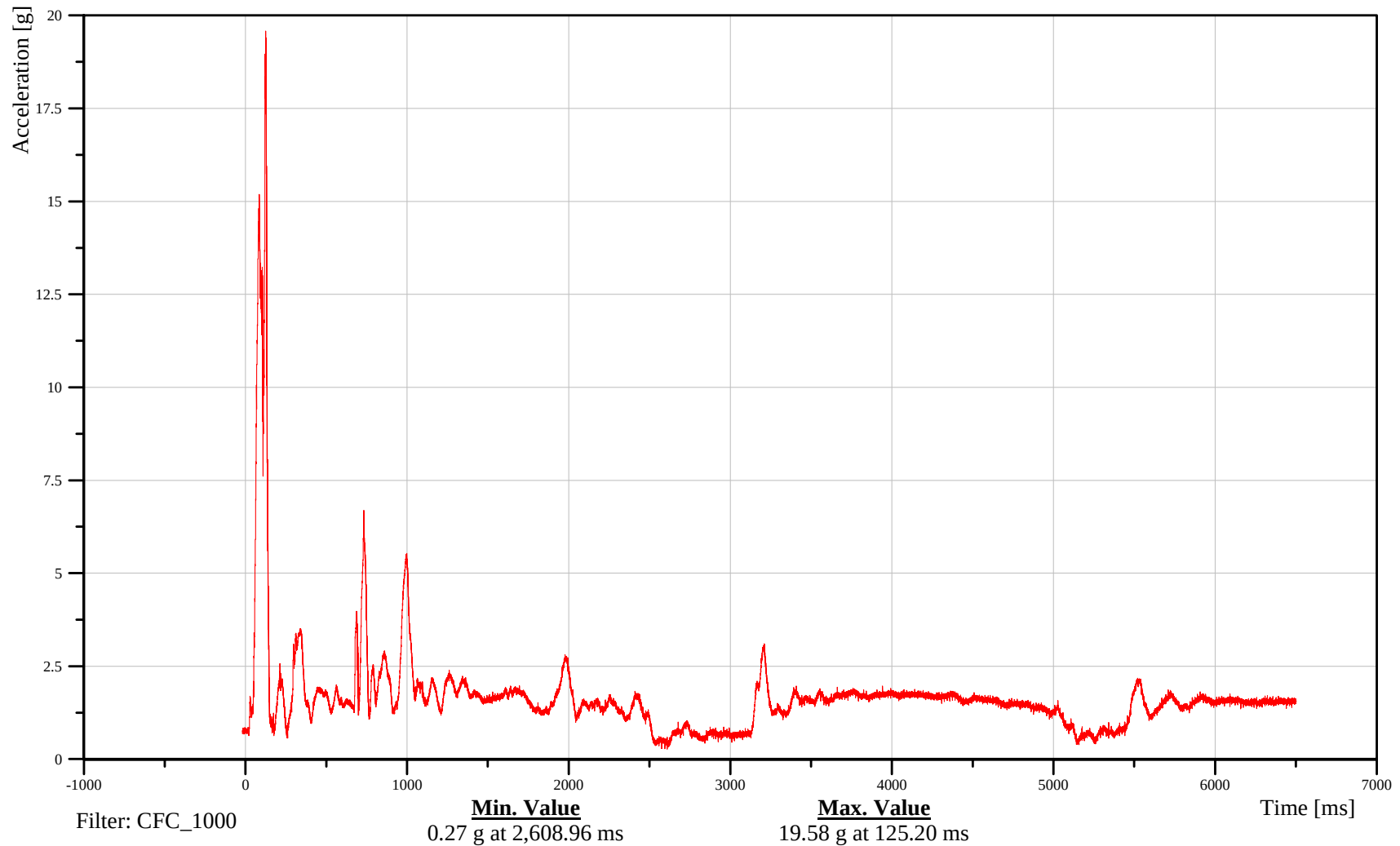
Curb Trip Rollover 2007 Ford Expedition
Right Front Passenger Pelvis Resultant Acceleration

Date: 04/13/2010
Time: 15:07

Customer: VRTC

13PELVCG00H3ACRA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-60

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head X-Axis Acceleration

Date: 04/13/2010

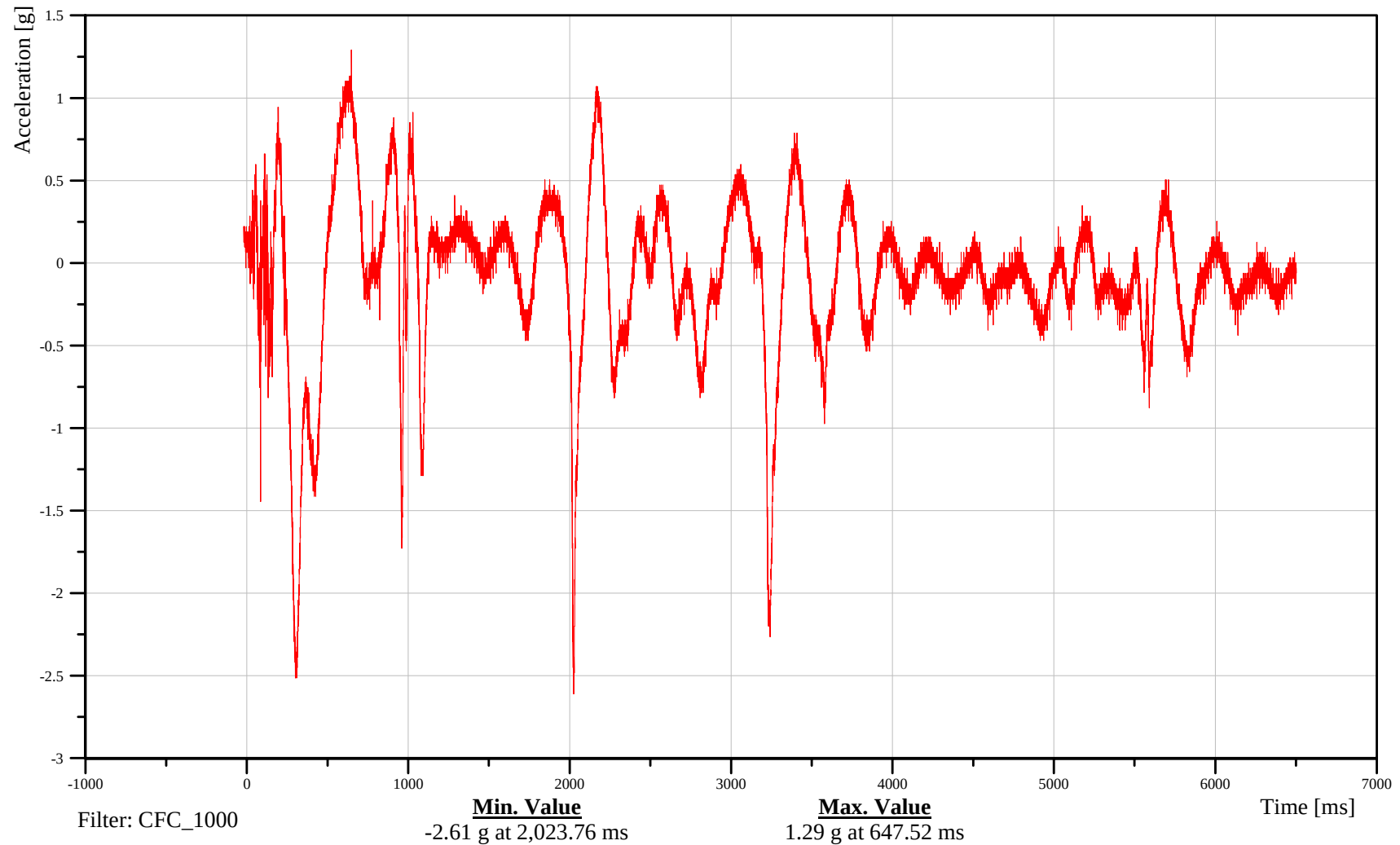
Time: 15:07

Customer: VRTC

14HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-61

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Y-Axis Acceleration

Date: 04/13/2010

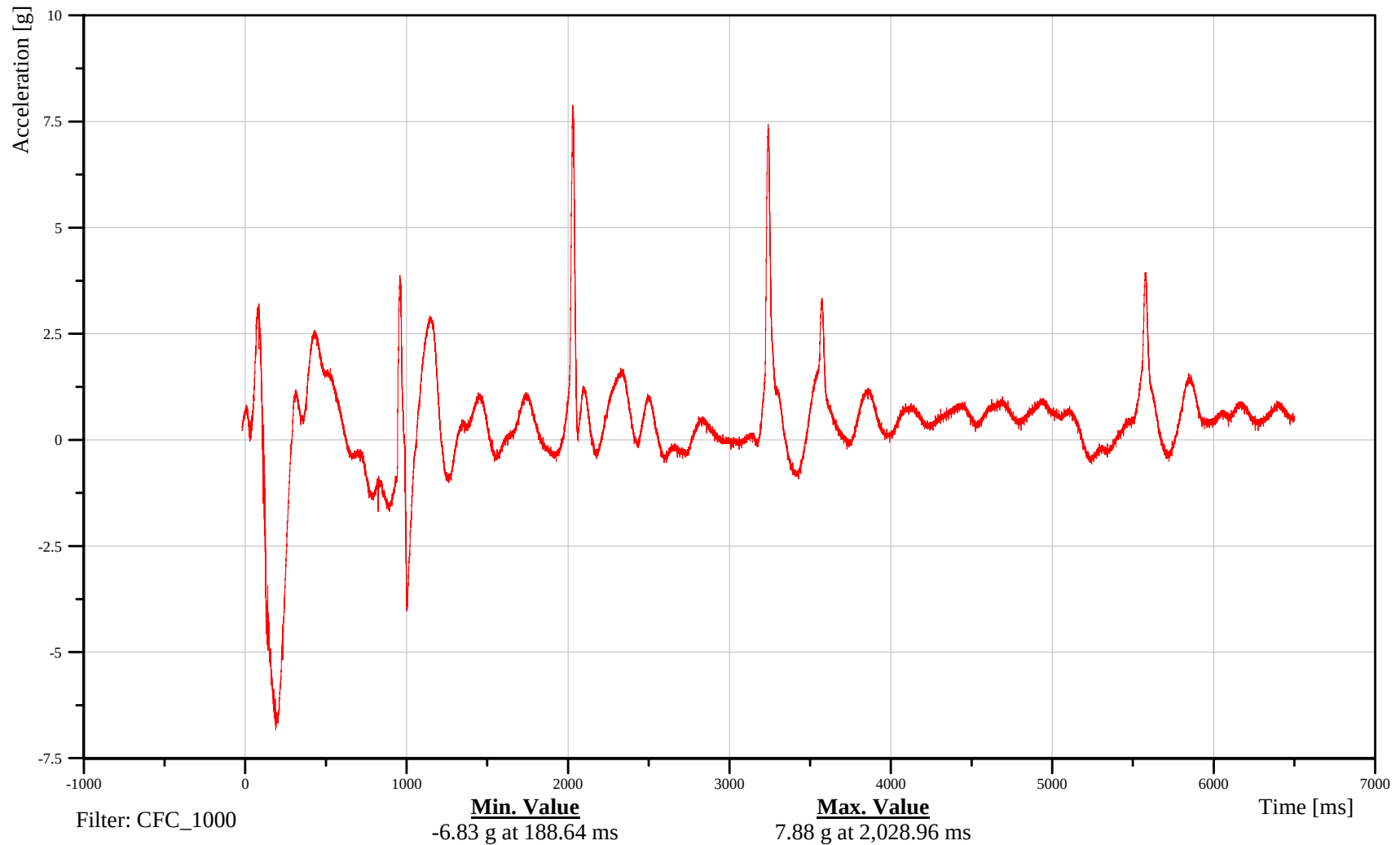
Time: 15:07

Customer: VRTC

14HEADCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-62

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Z-Axis Acceleration

Date: 04/13/2010

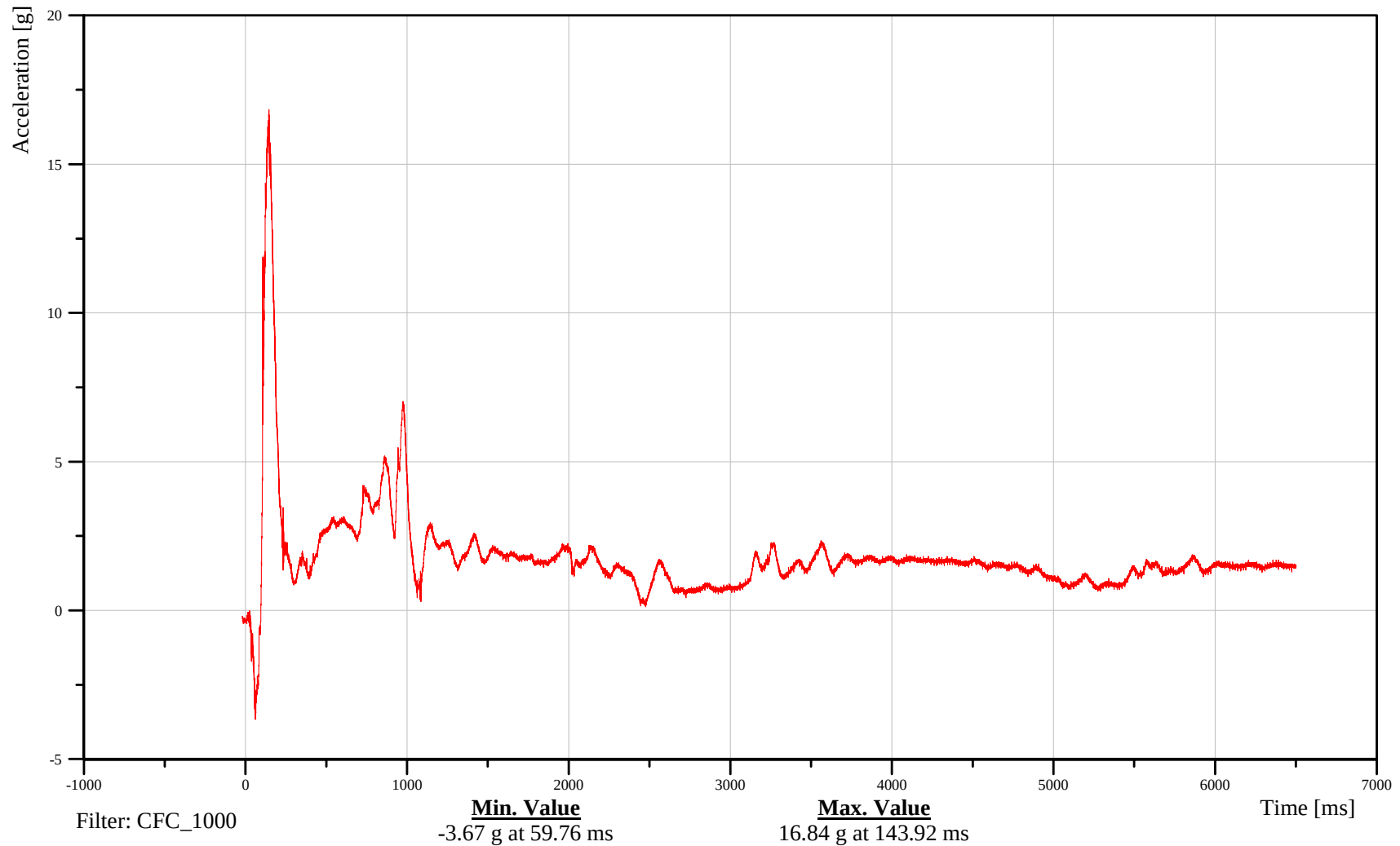
Time: 15:07

Customer: VRTC

14HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-63

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Resultant Acceleration

Date: 04/13/2010

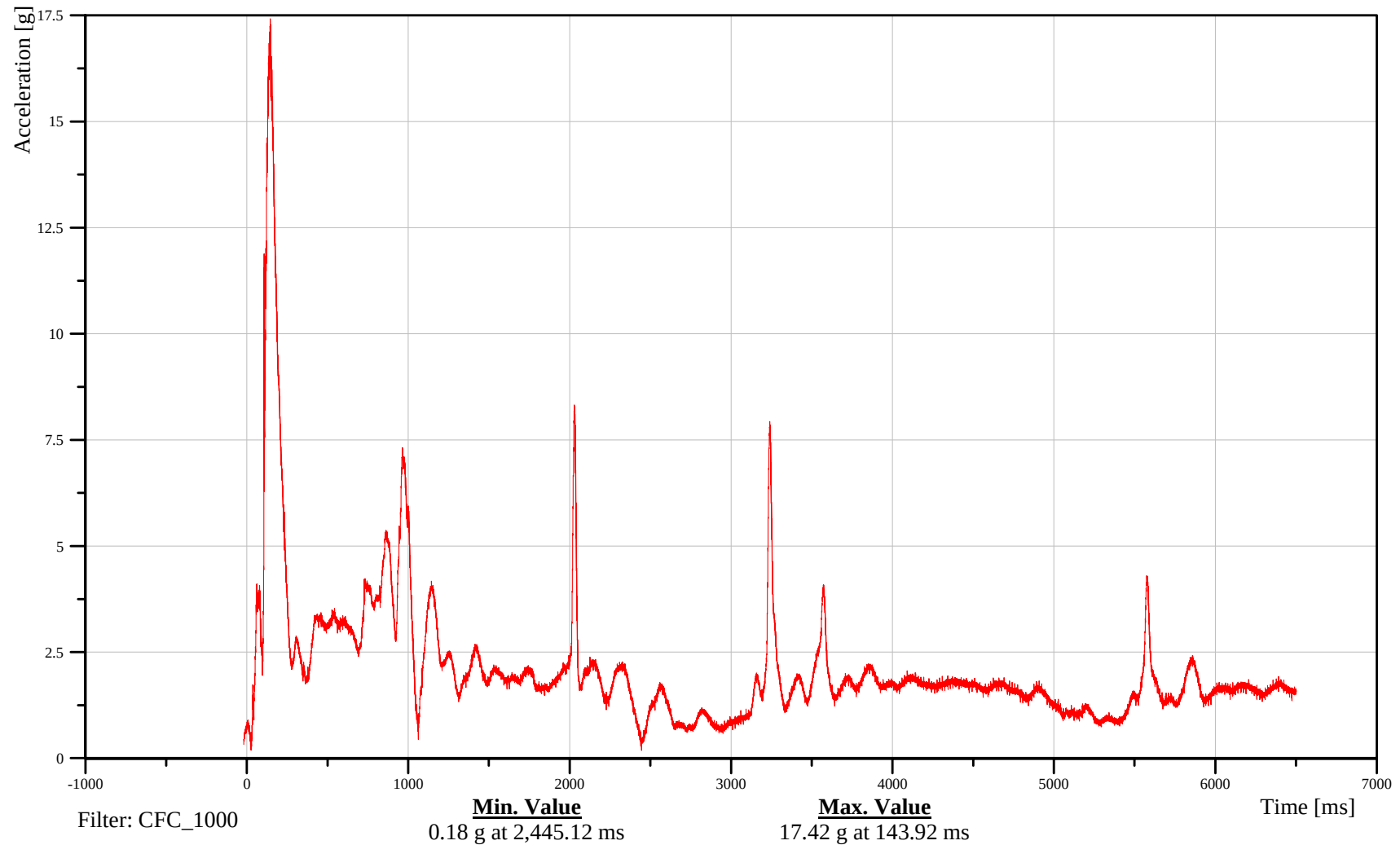
Time: 15:07

Customer: VRTC

14HEADCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-64

100413



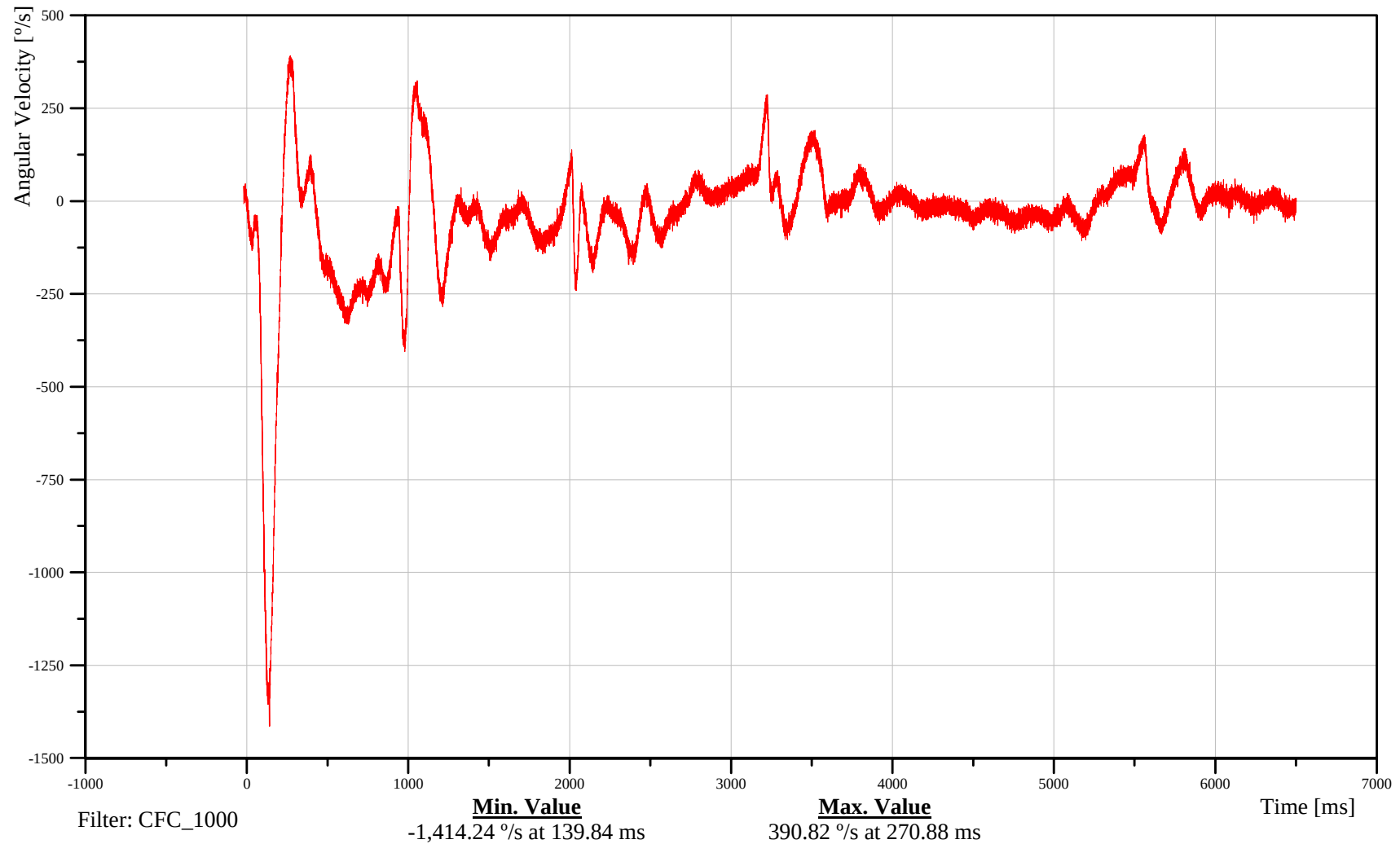
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Head (DTS ARS) Rate Gyro X

Date: 04/13/2010
Time: 15:07

Customer: VRTC

14HEADCG00H3AVXA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-65

100413



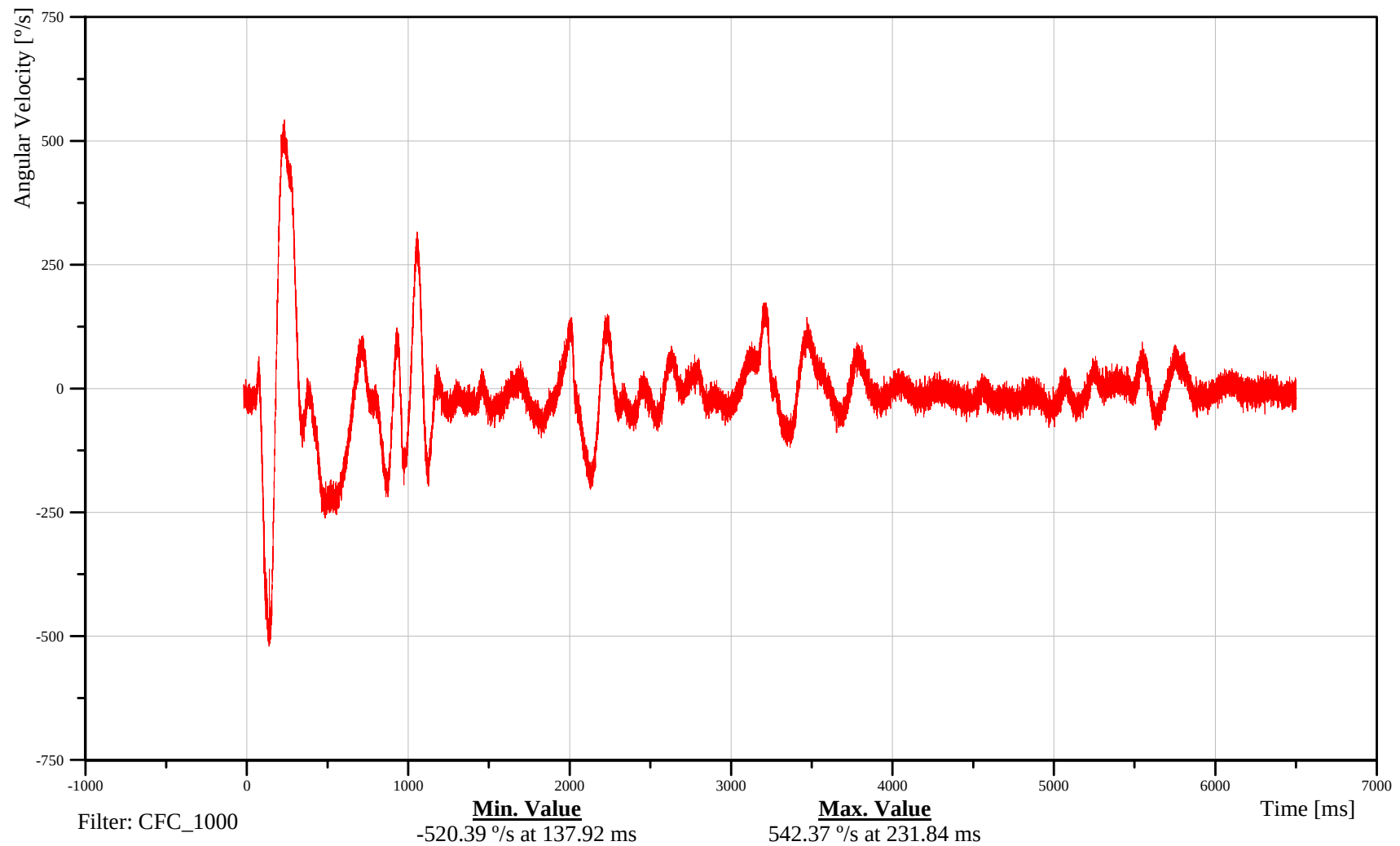
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Head (DTS ARS) Rate Gyro Y

Date: 04/13/2010
Time: 15:07

Customer: VRTC

14HEADCG00H3AVYA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-66

100413



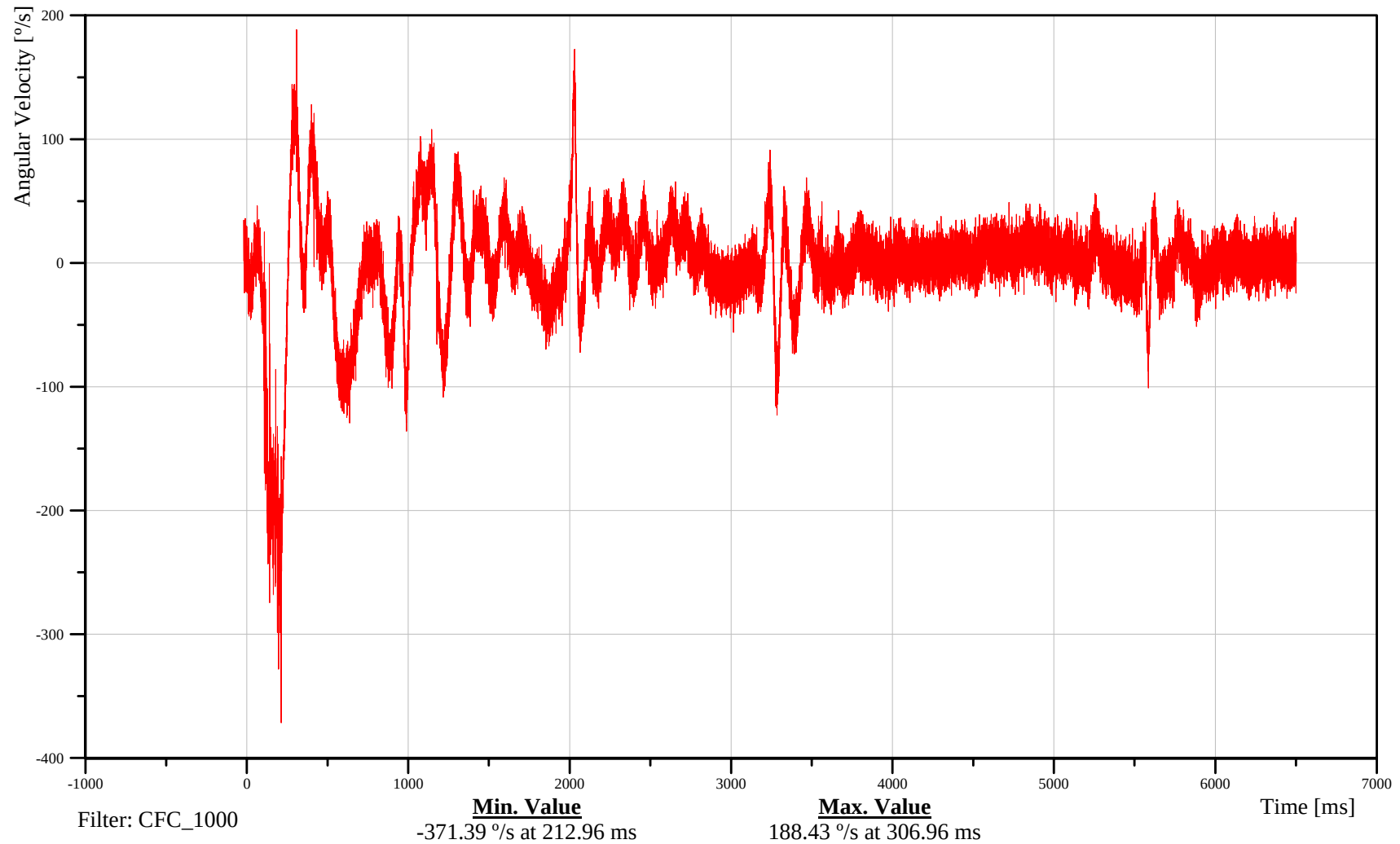
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Head (DTS ARS) Rate Gyro Z

Date: 04/13/2010
Time: 15:07

Customer: VRTC

14HEADCG00H3AVZA

TRC Inc. Test Lab: CTF
Test Number: 100413



B-67

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Upper Neck X-Axis Force

Date: 04/13/2010

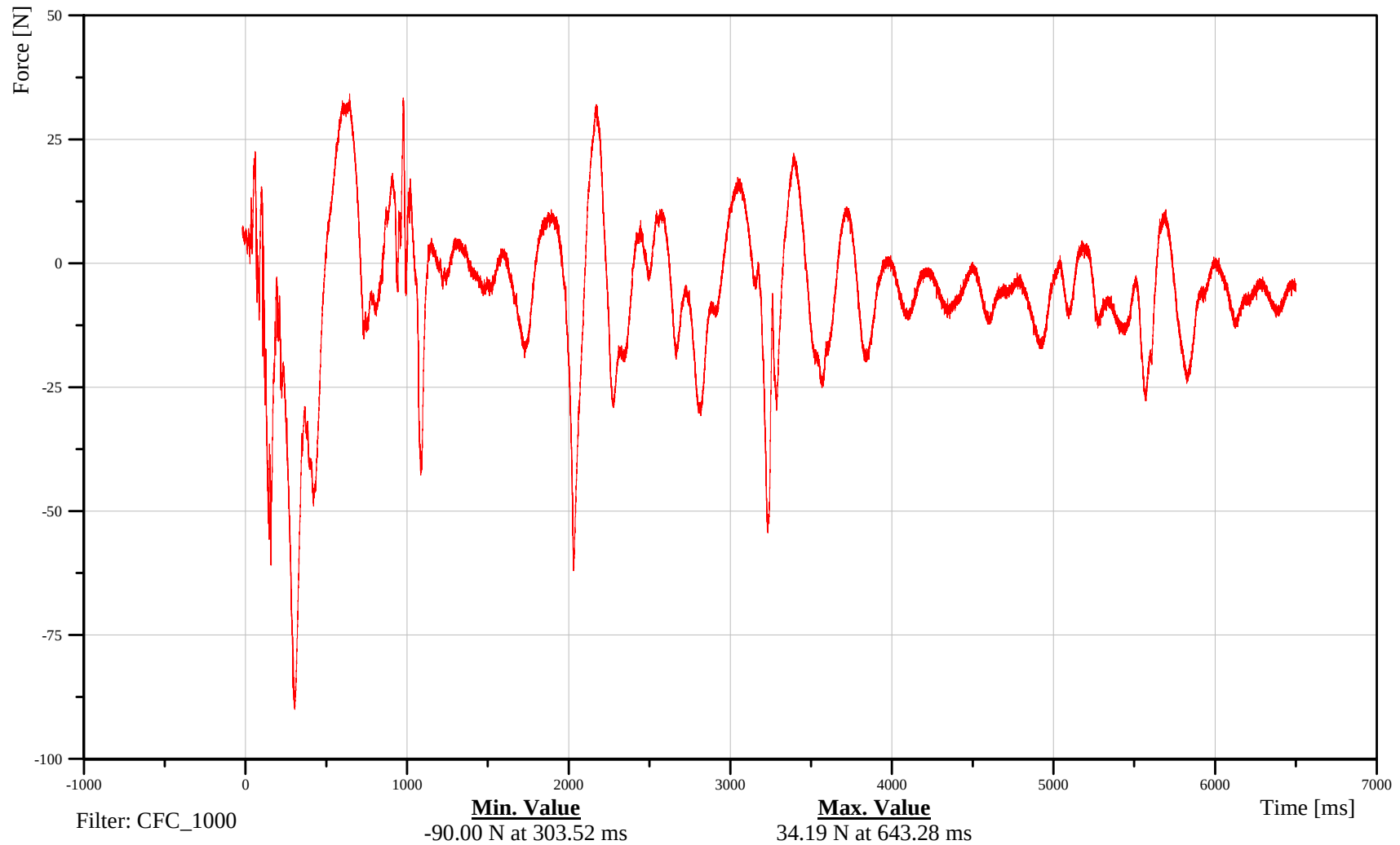
Time: 15:07

Customer: VRTC

14NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-68

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Upper Neck Y-Axis Force

Date: 04/13/2010

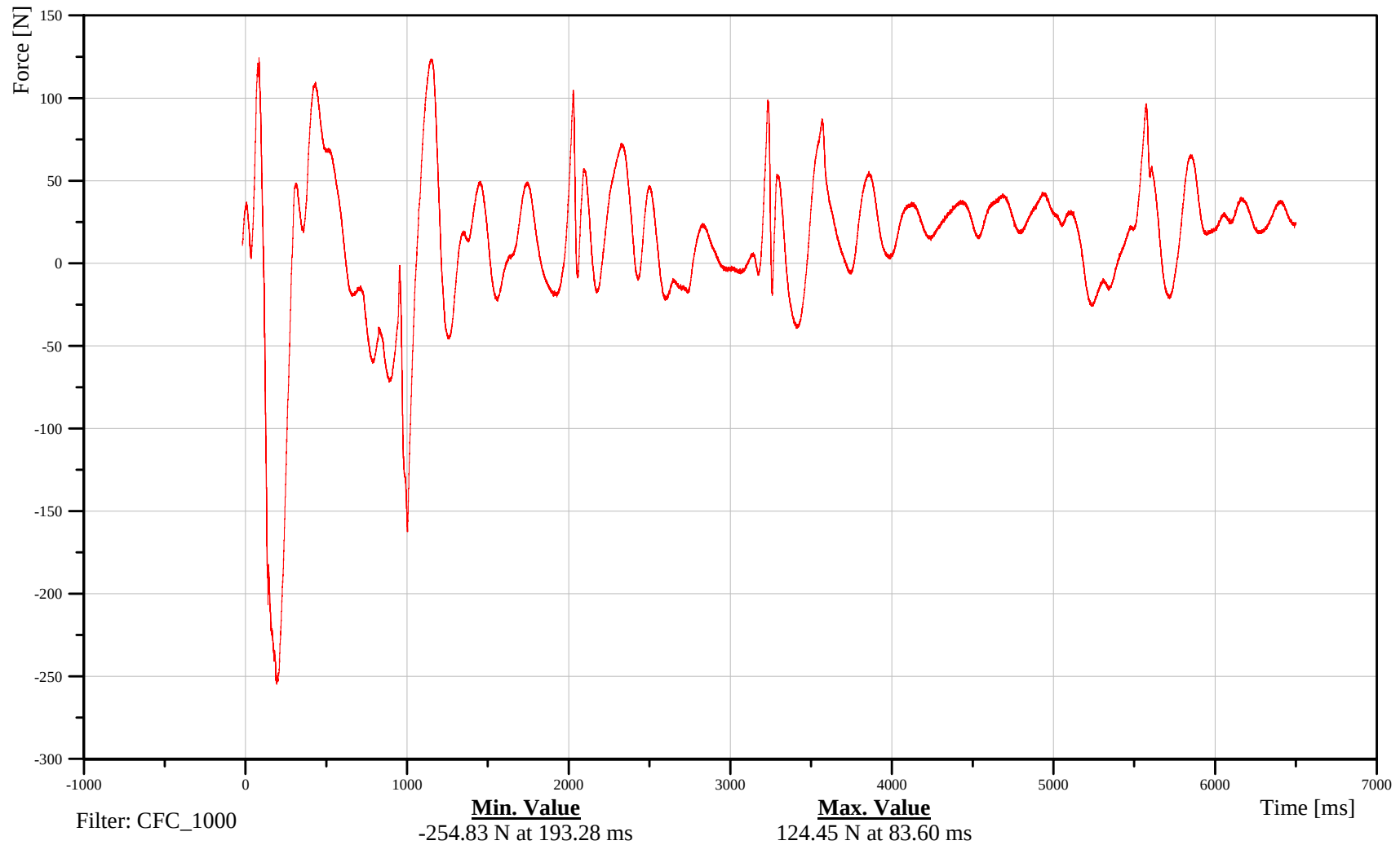
Time: 15:07

Customer: VRTC

14NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-69

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Upper Neck Z-Axis Force

Date: 04/13/2010

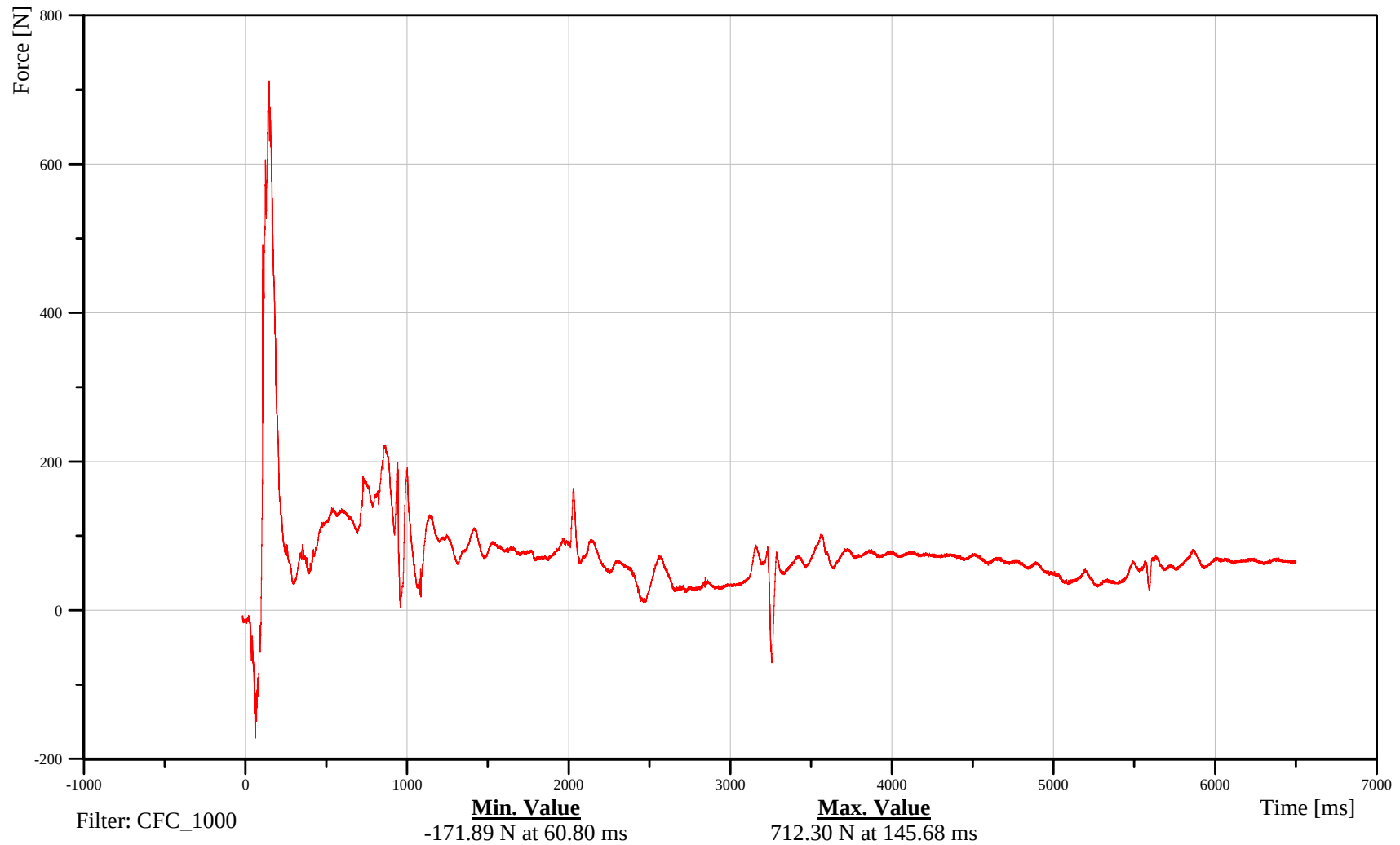
Time: 15:07

Customer: VRTC

14NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-70

100413



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

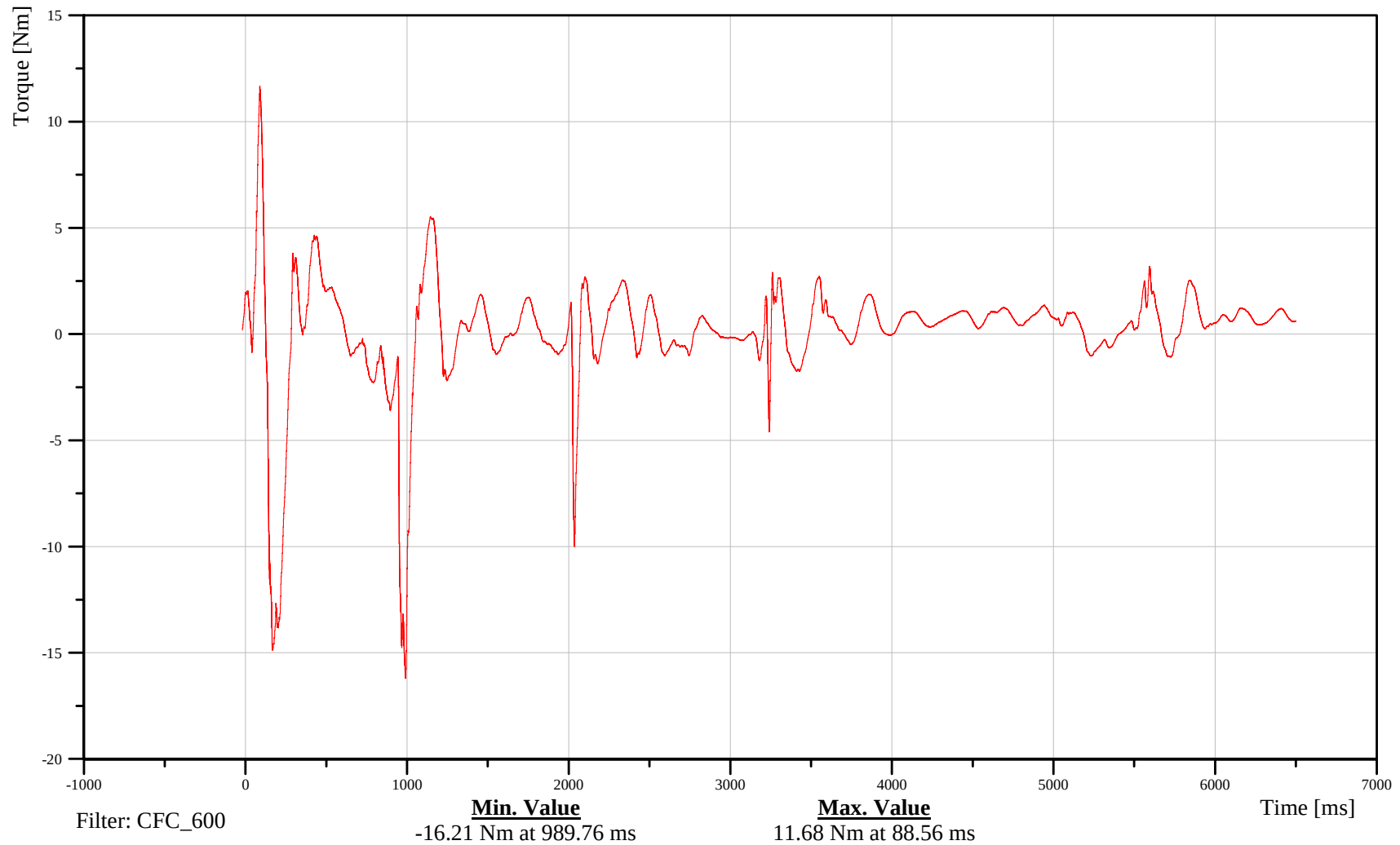
Date: 04/13/2010
Time: 15:07

Customer: VRTC

14NECKUP00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-71

100413



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

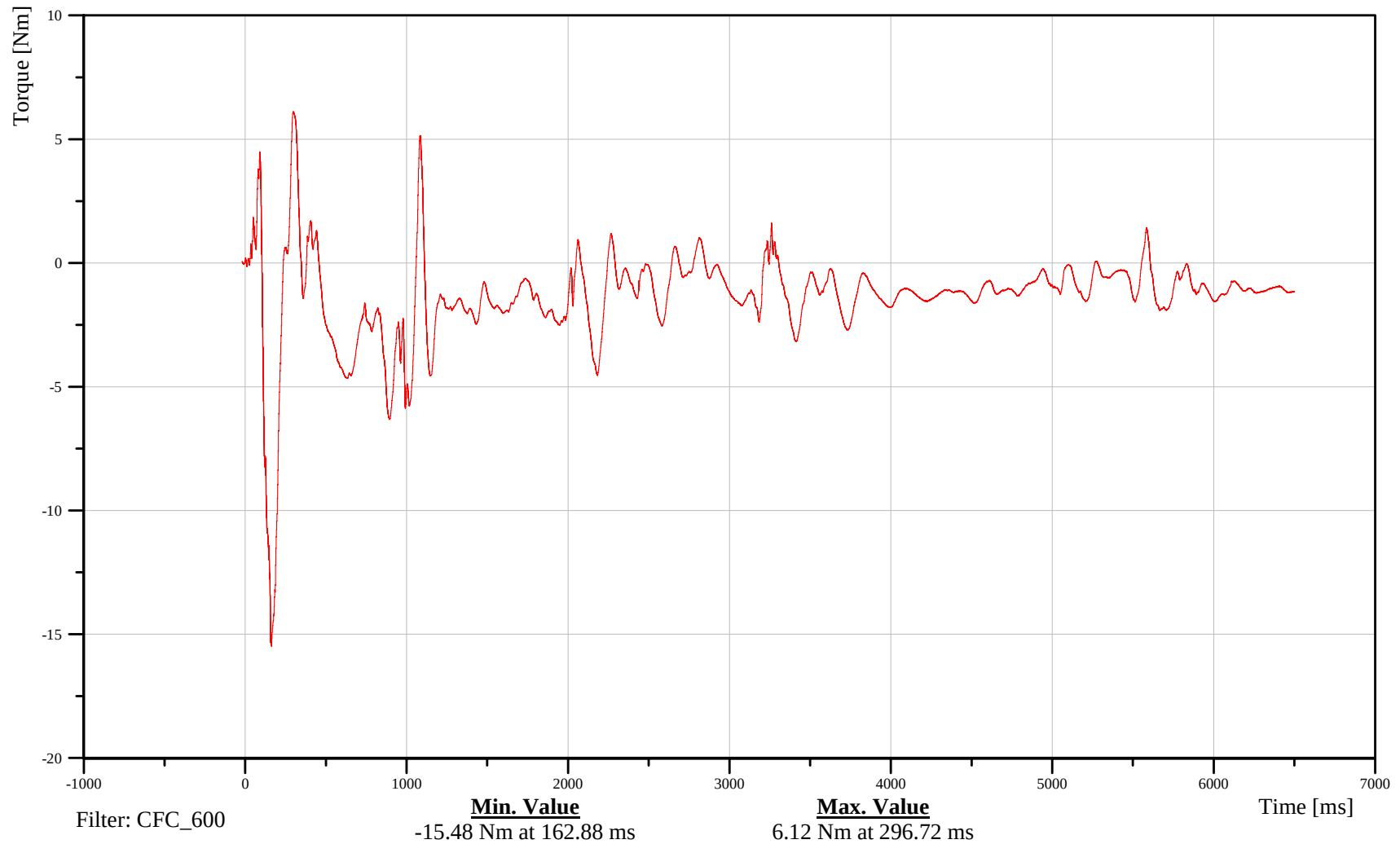
Date: 04/13/2010
Time: 15:07

Customer: VRTC

14NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-72

100413



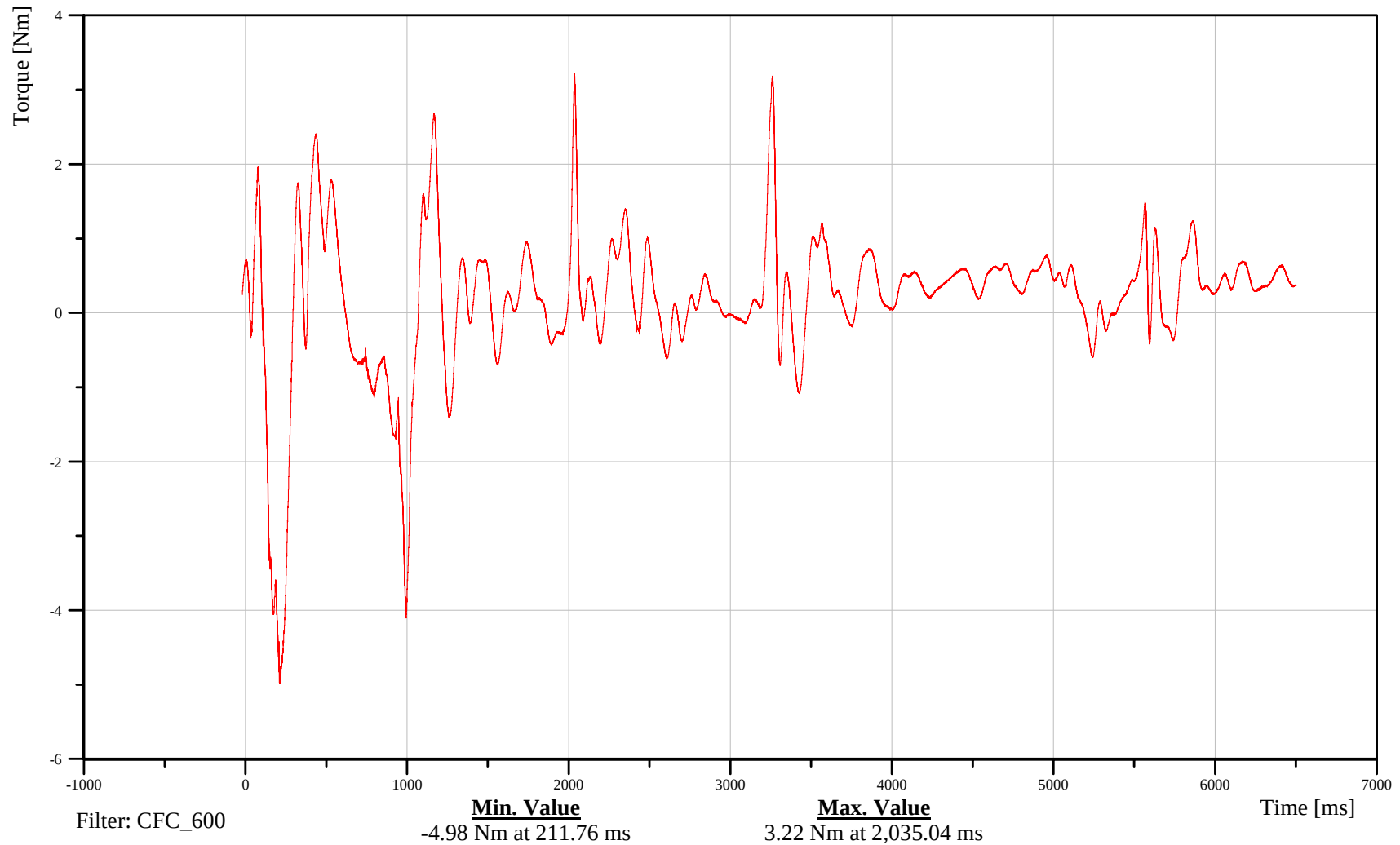
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Upper Neck Moment About Z Axis

Date: 04/13/2010
Time: 15:07

Customer: VRTC

14NECKUP00H3MOZB

TRC Inc. Test Lab: CTF
Test Number: 100413



B-73

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest X-Axis Acceleration

Date: 04/13/2010

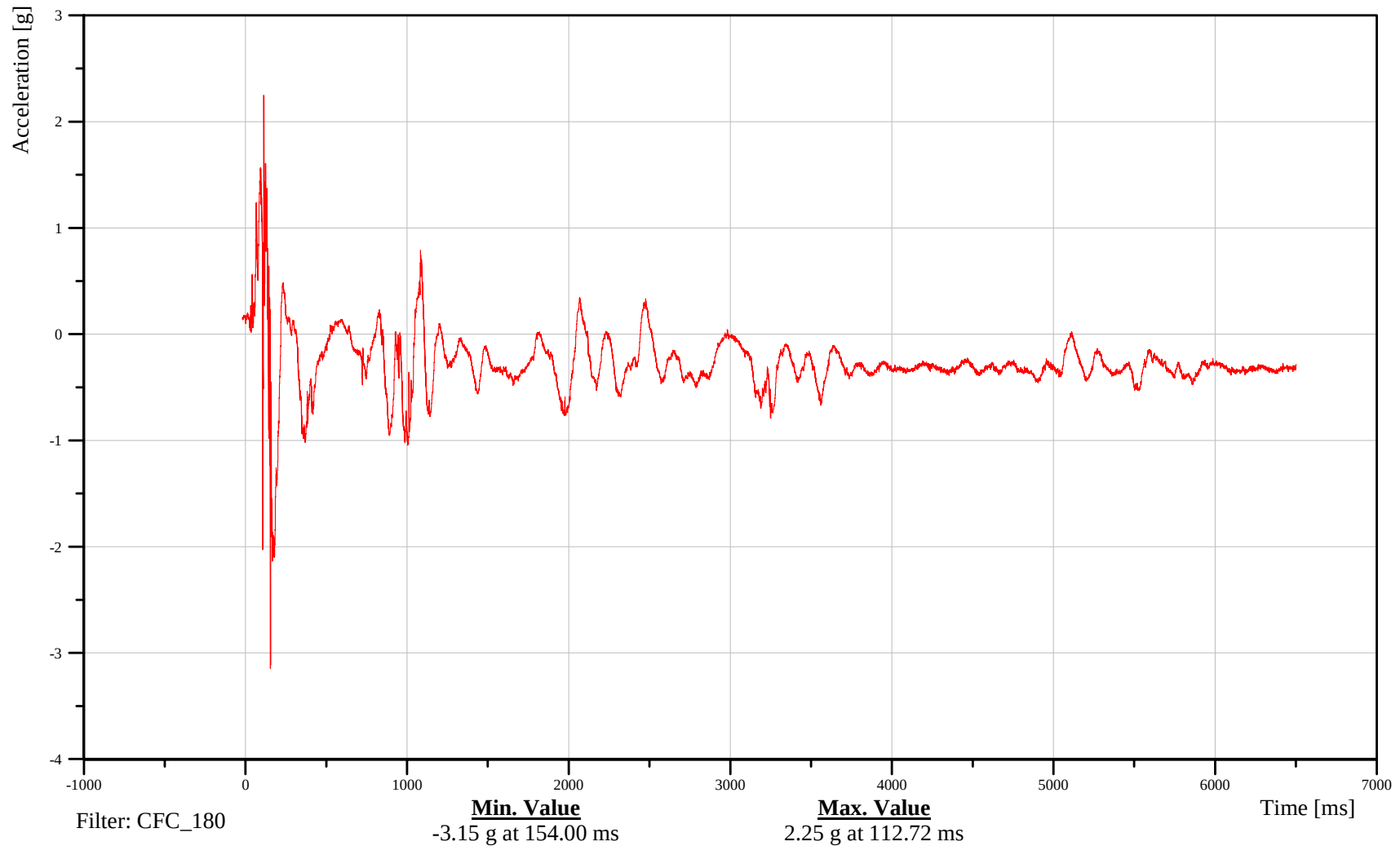
Time: 15:07

Customer: VRTC

14CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-74

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest Y-Axis Acceleration

Date: 04/13/2010

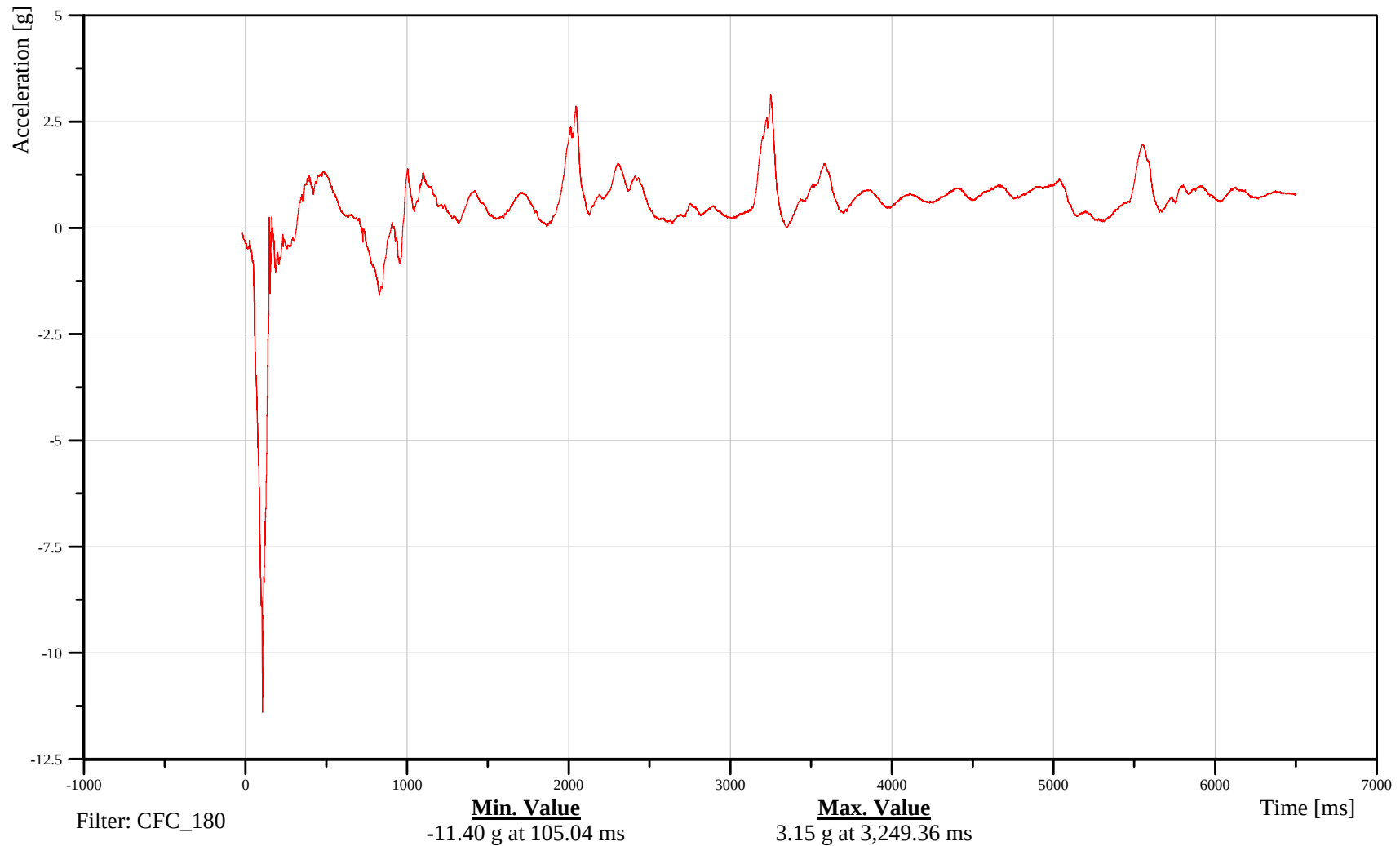
Time: 15:07

Customer: VRTC

14CHSTCG00H3ACYC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-75

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest Z-Axis Acceleration

Date: 04/13/2010

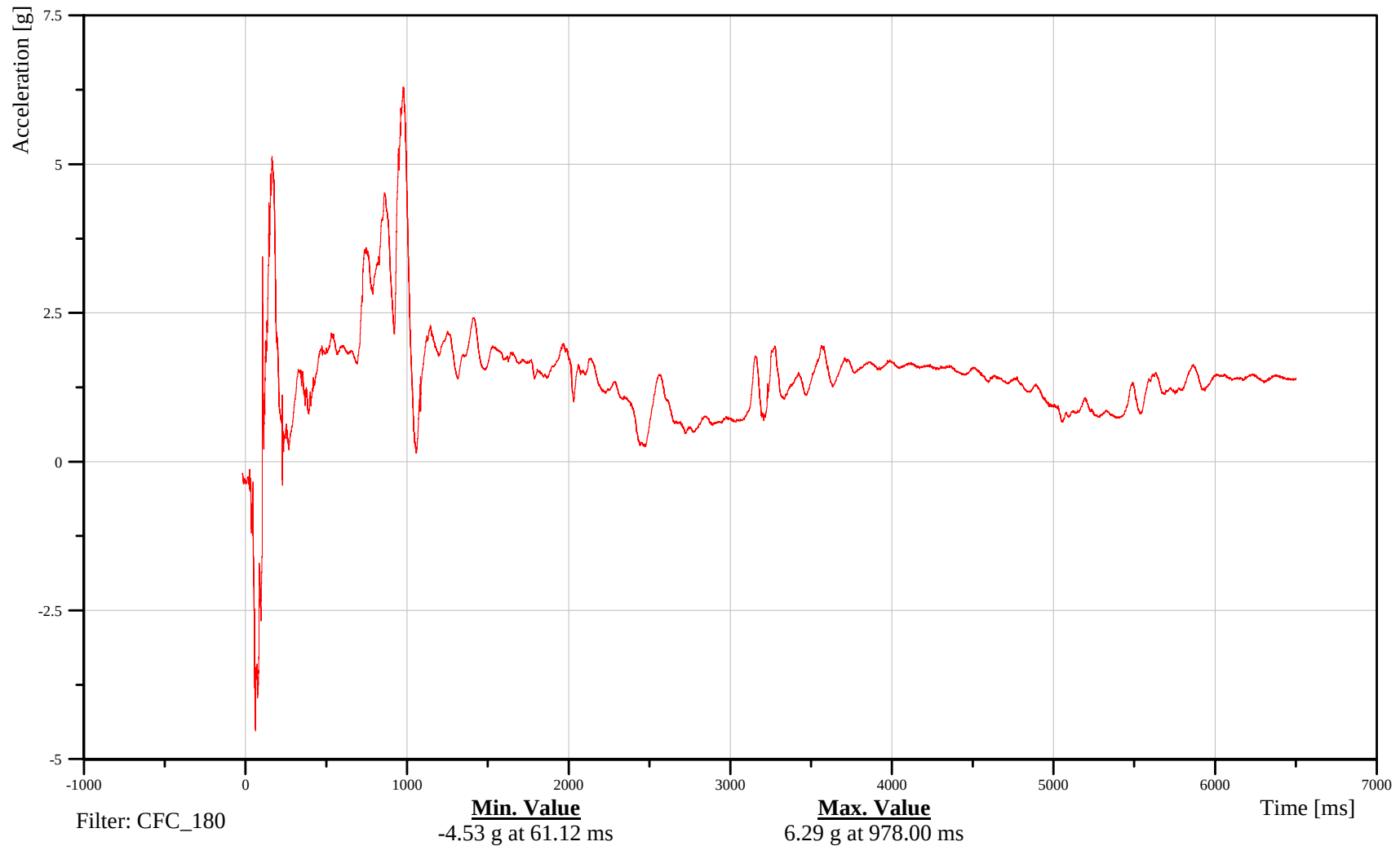
Time: 15:07

Customer: VRTC

14CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-76

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest Resultant Acceleration

Date: 04/13/2010

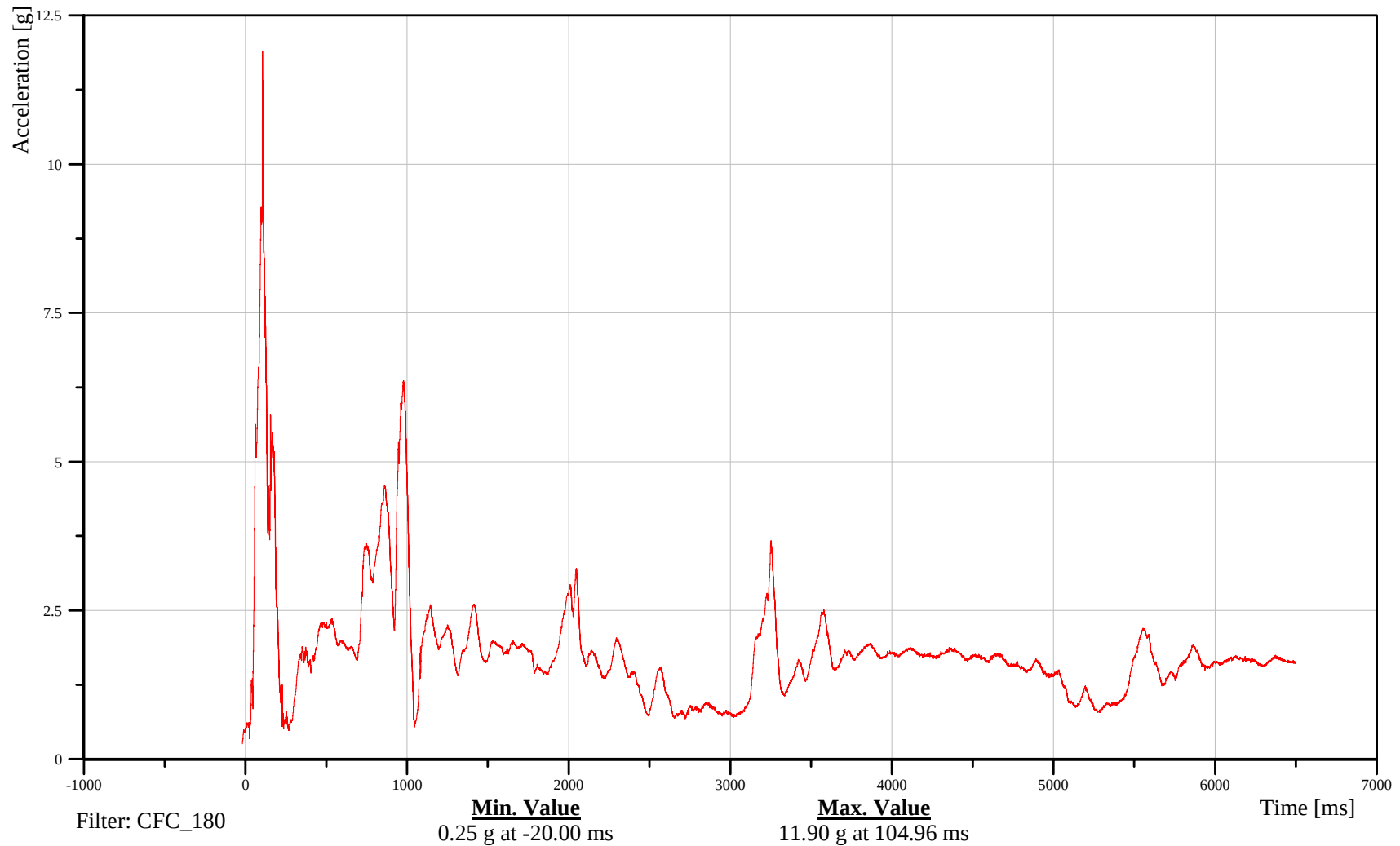
Time: 15:07

Customer: VRTC

14CHSTCG00H3ACRC

TRC Inc. Test Lab: CTF

Test Number: 100413



B-77

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Chest X-Axis Displacement

Date: 04/13/2010

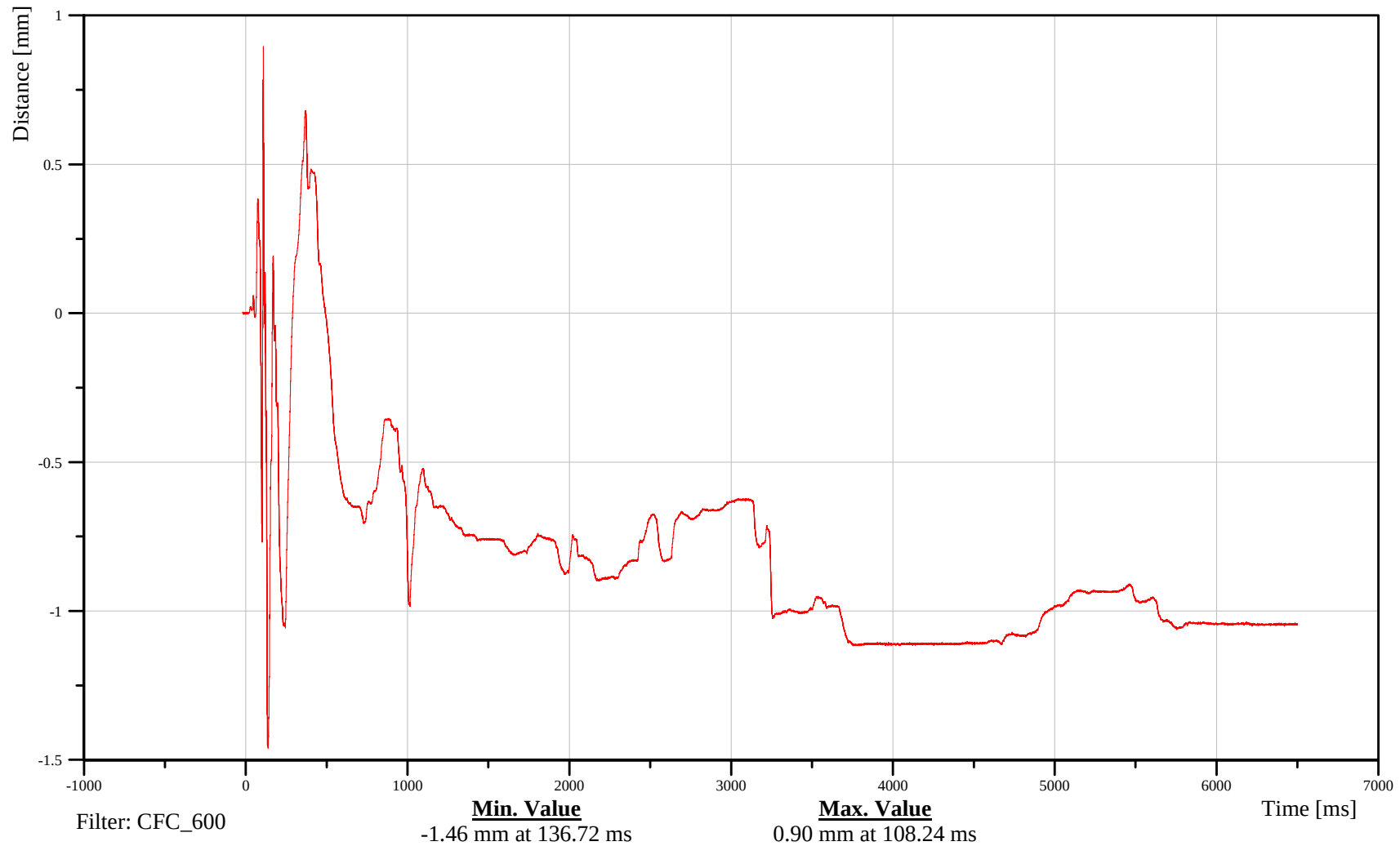
Time: 15:07

Customer: VRTC

14CHST0000H3DSXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-78

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis X-Axis Acceleration

Date: 04/13/2010

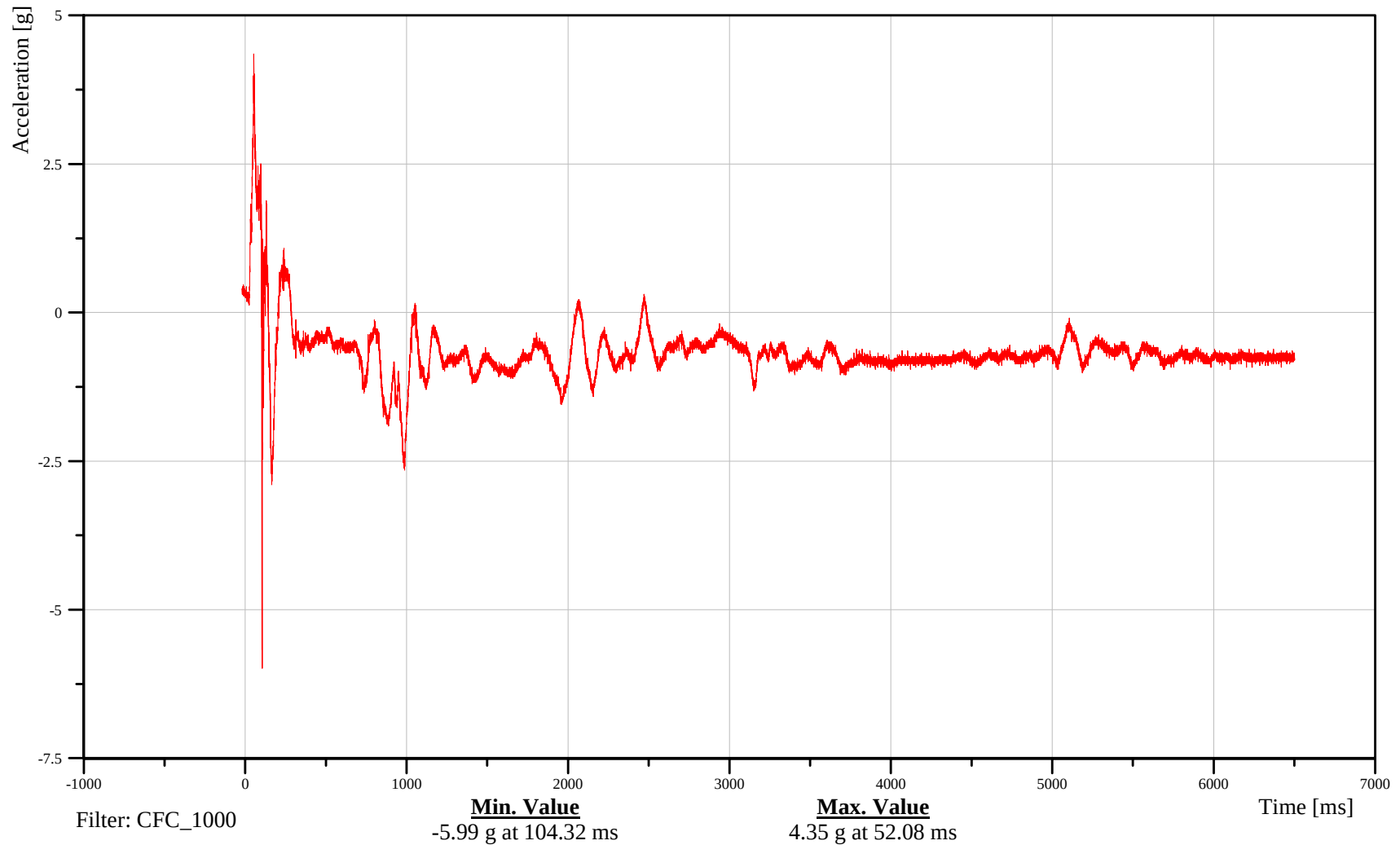
Time: 15:07

Customer: VRTC

14PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-79

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Y-Axis Acceleration

Date: 04/13/2010

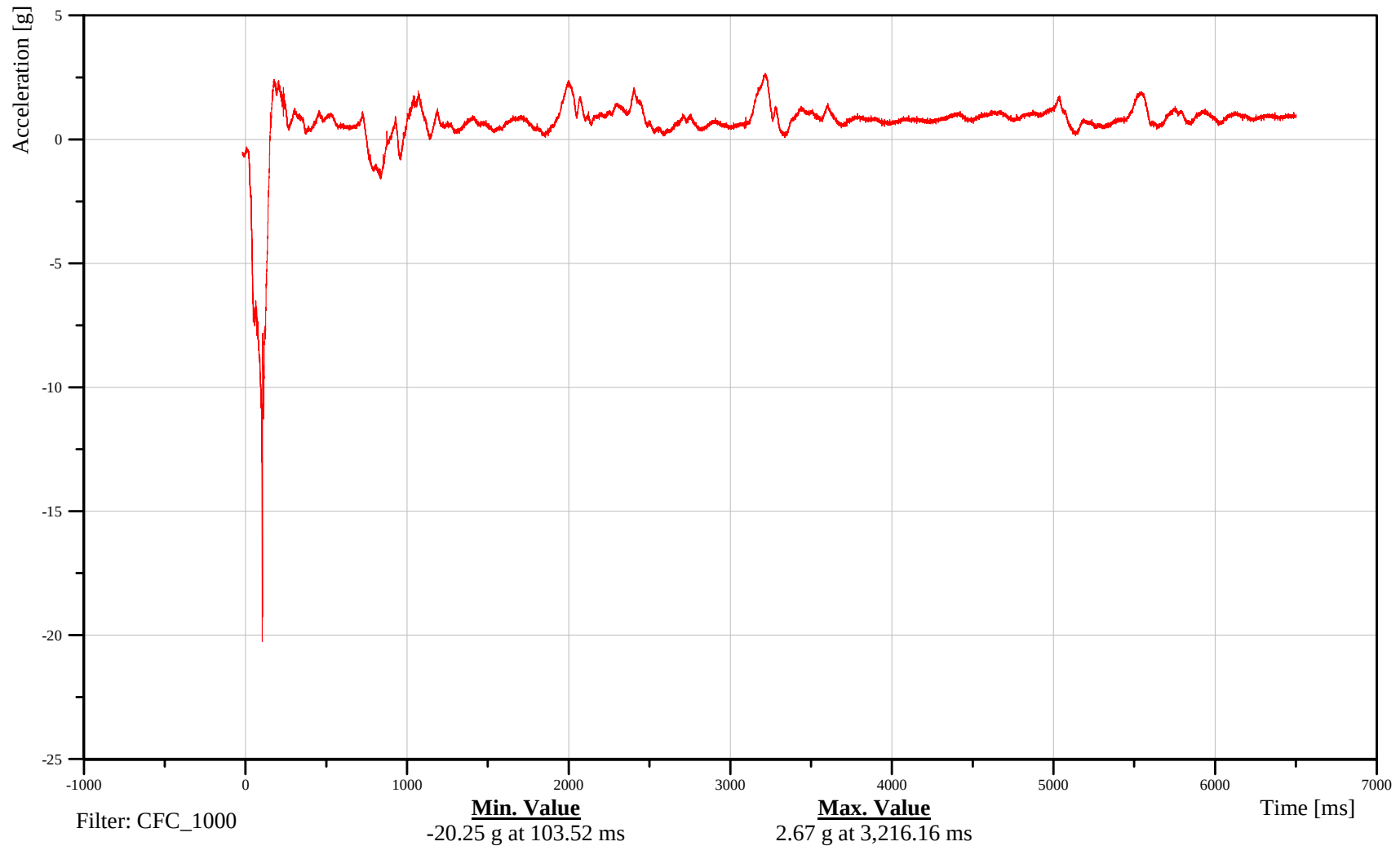
Time: 15:07

Customer: VRTC

14PELVCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-80

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Z-Axis Acceleration

Date: 04/13/2010

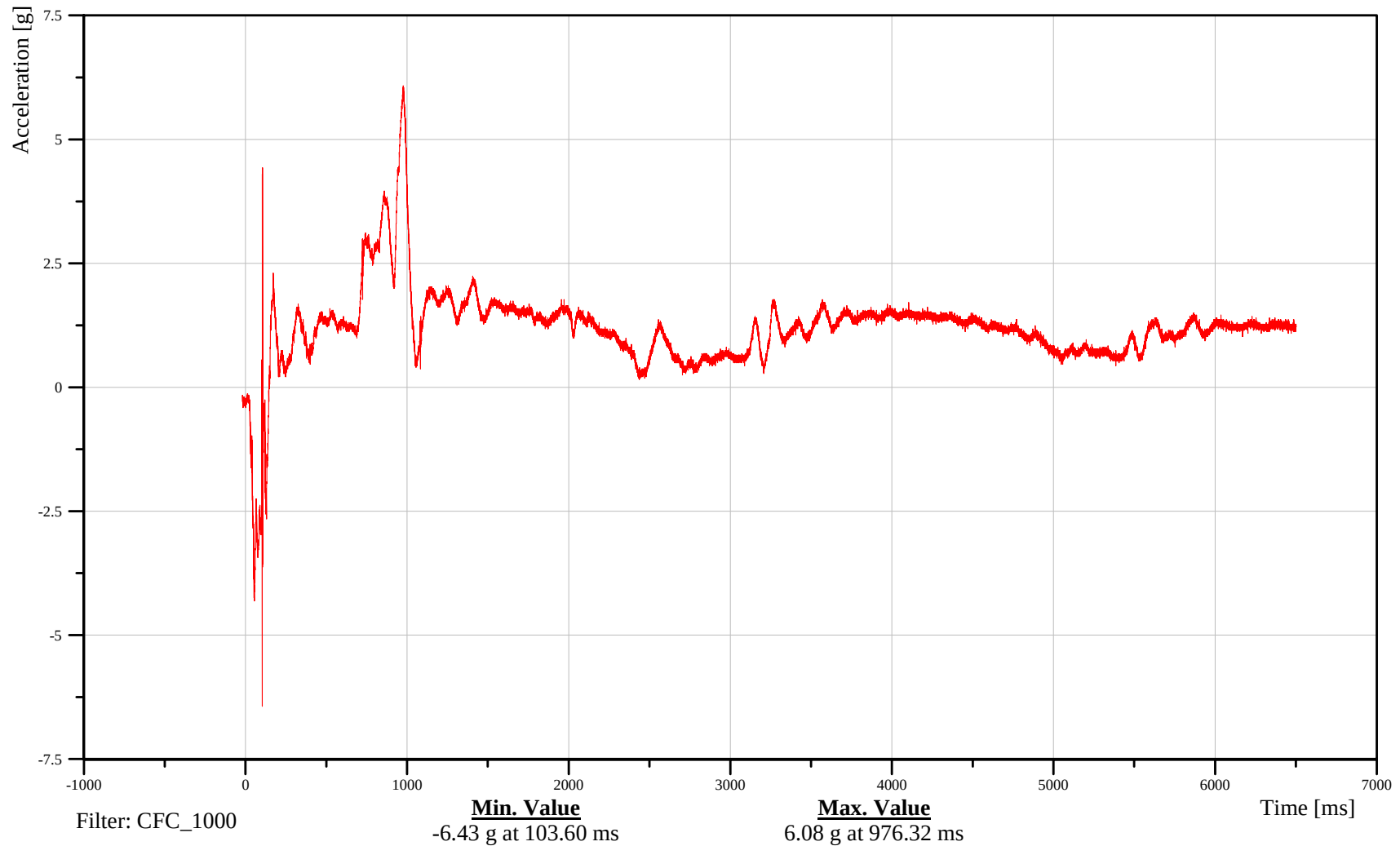
Time: 15:07

Customer: VRTC

14PELVCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-81

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Resultant Acceleration

Date: 04/13/2010

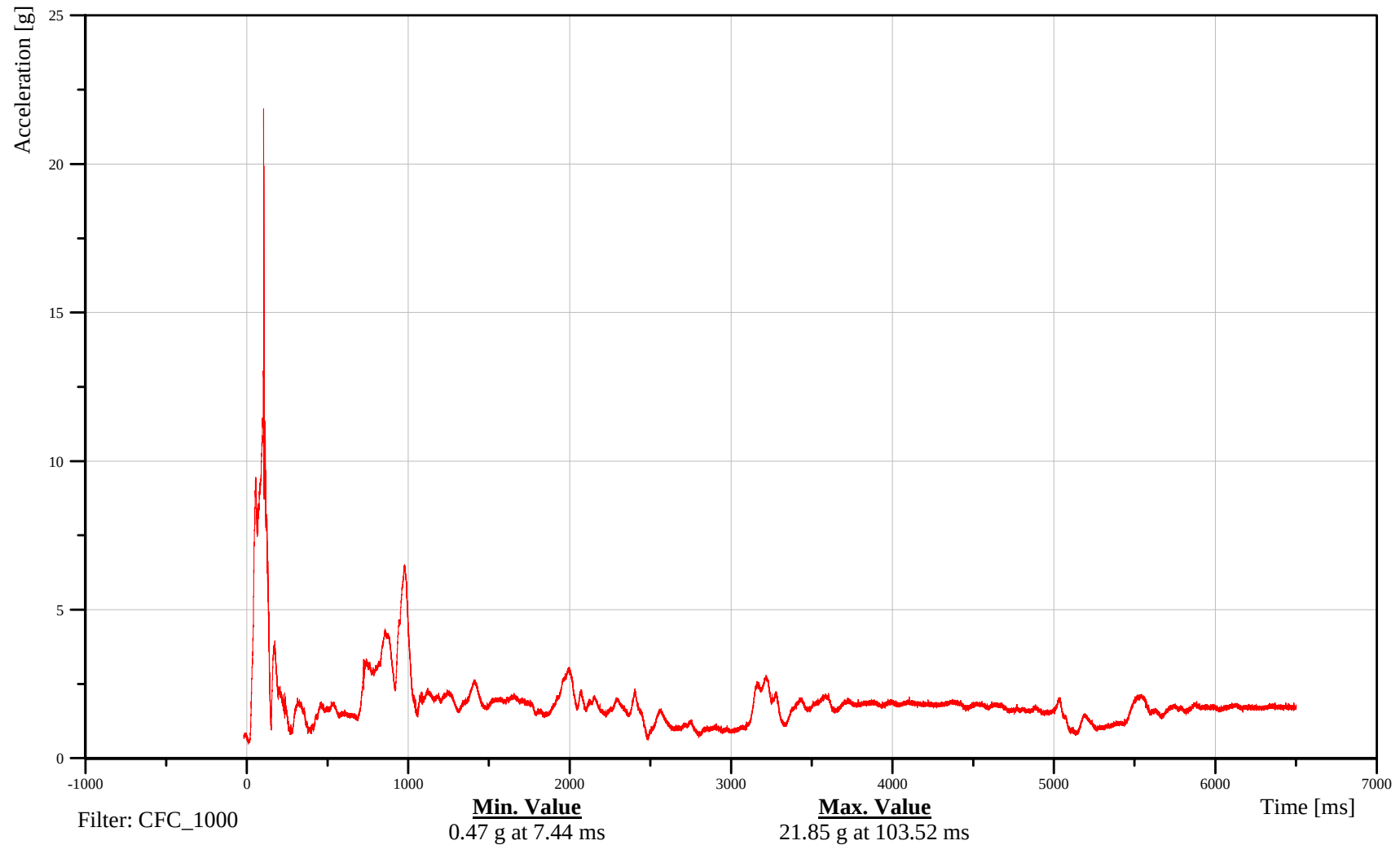
Time: 15:07

Customer: VRTC

14PELVCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-82

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Lower Neck X-Axis Force

Date: 04/13/2010

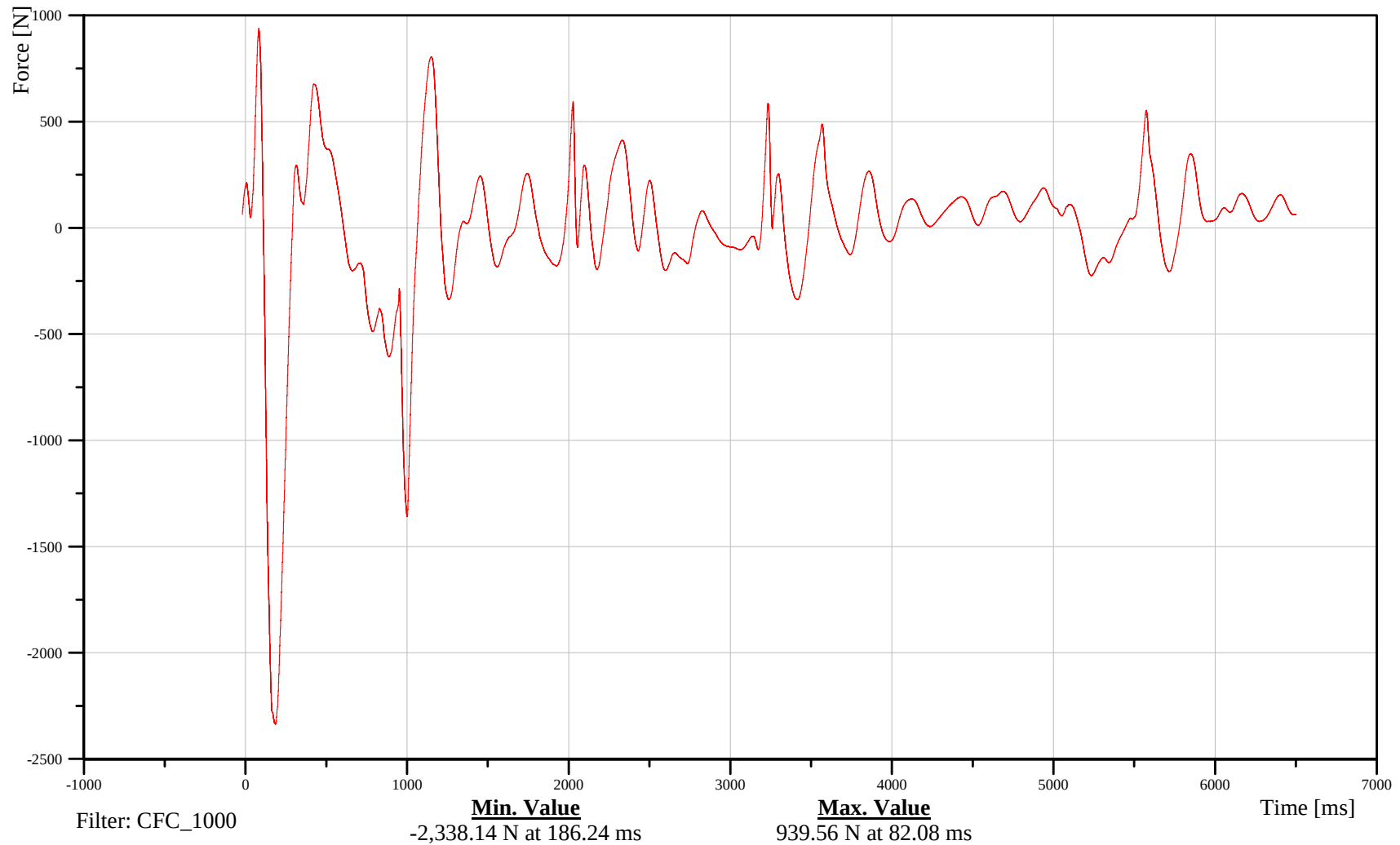
Time: 15:07

Customer: VRTC

14NECKLO00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-83

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Lower Neck Y-Axis Force

Date: 04/13/2010

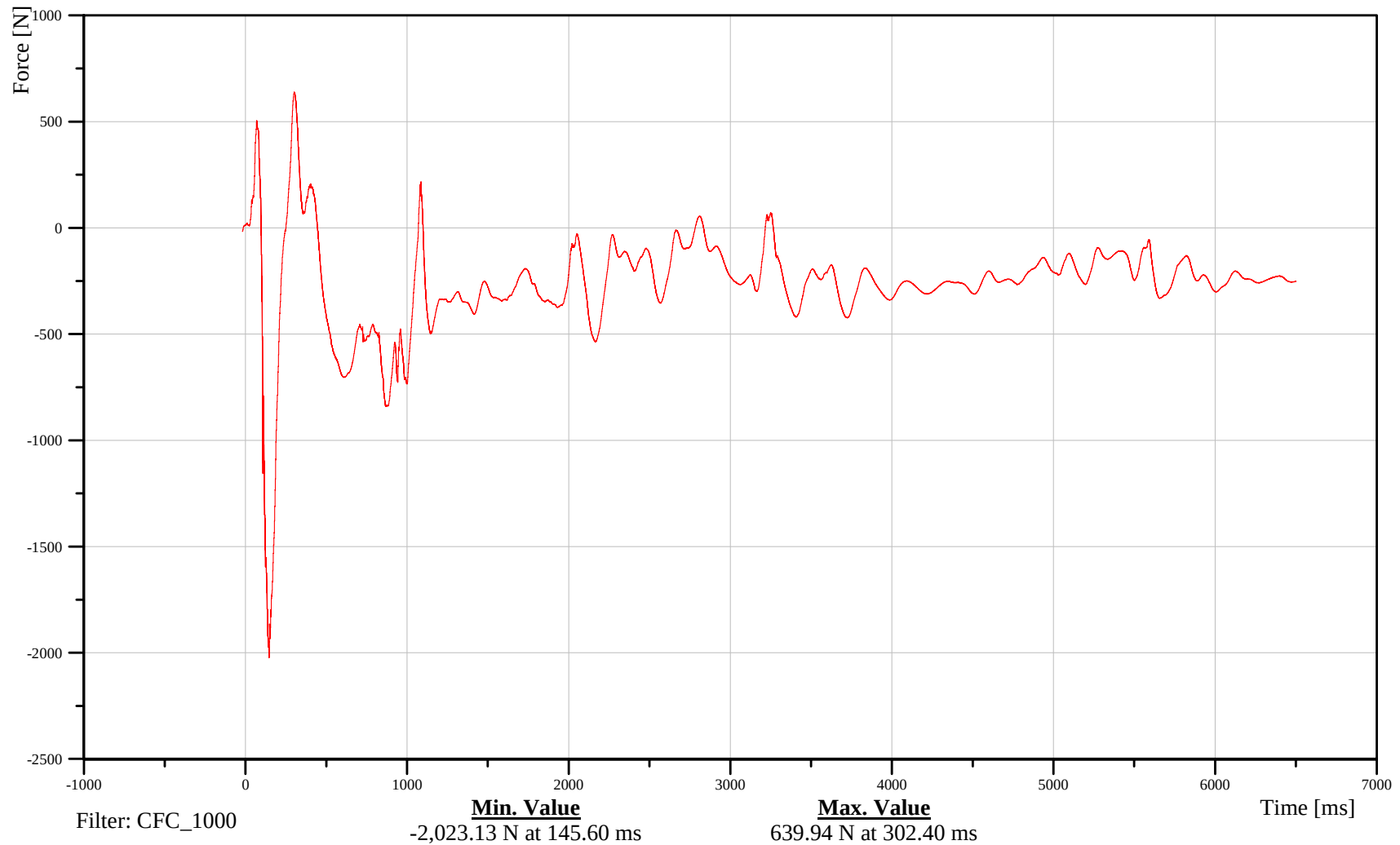
Time: 15:07

Customer: VRTC

14NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-84

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Lower Neck Z-Axis Force

Date: 04/13/2010

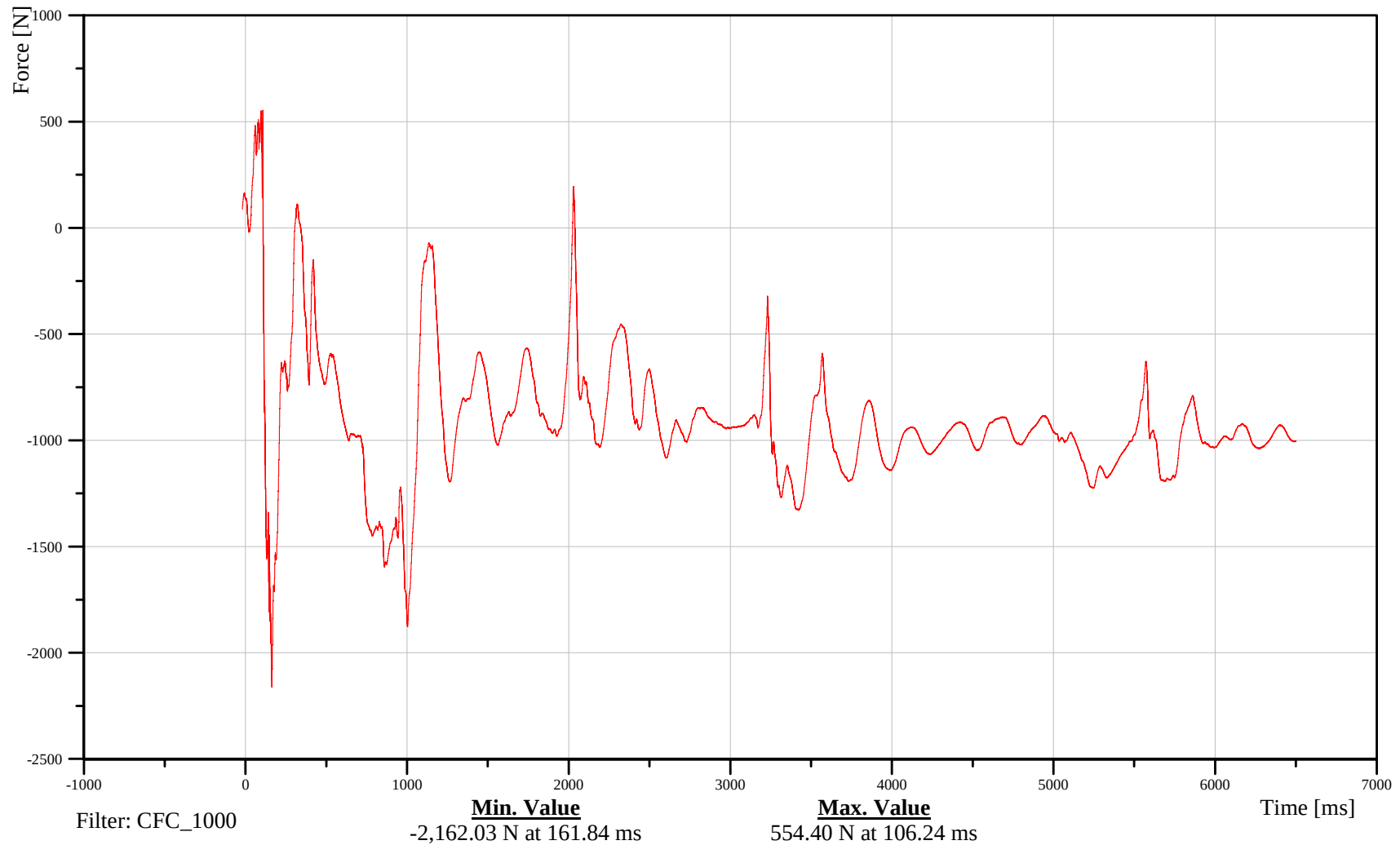
Time: 15:07

Customer: VRTC

14NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100413



B-85

100413



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

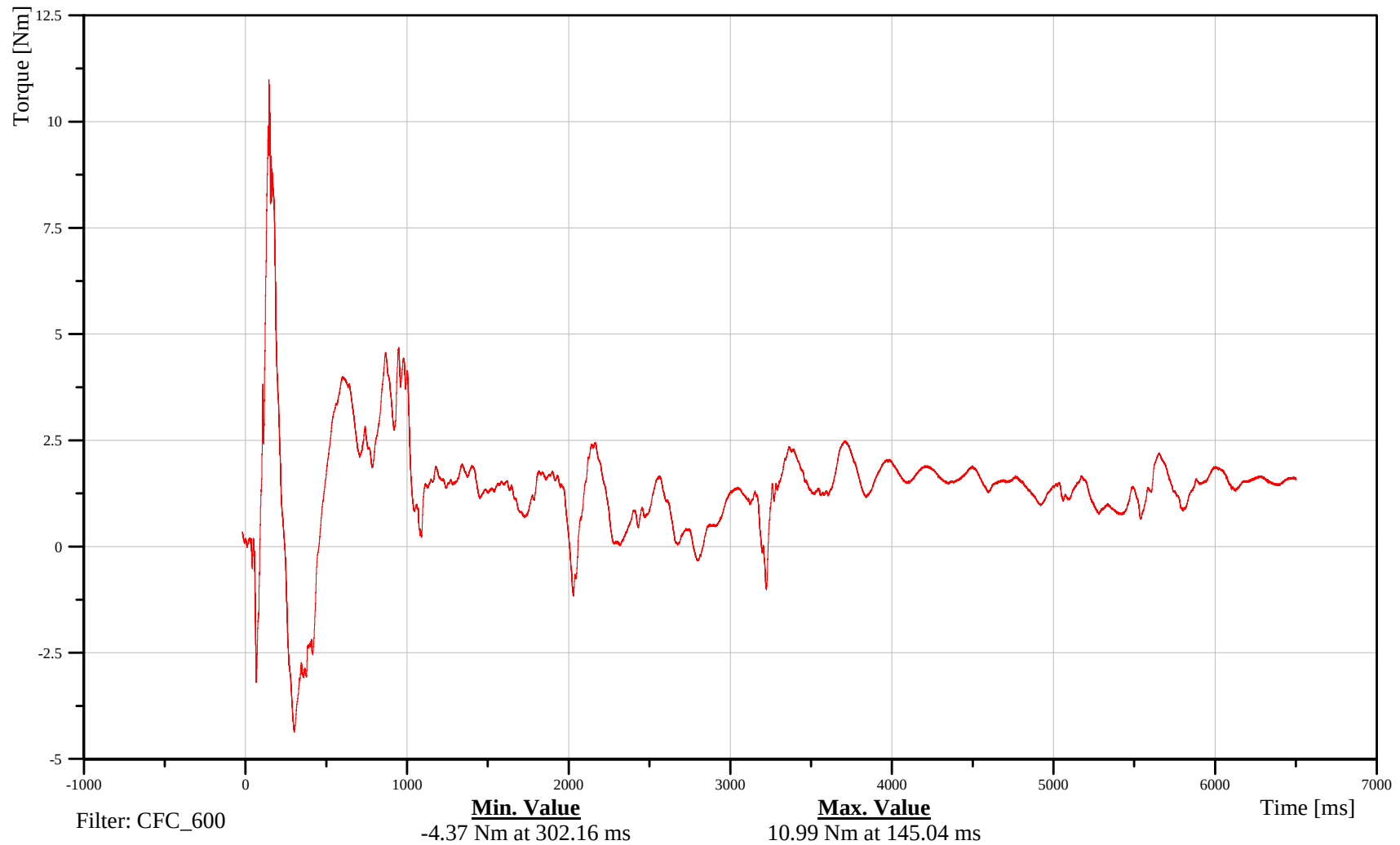
Date: 04/13/2010
Time: 15:07

Customer: VRTC

14NECKLO00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-86

100413



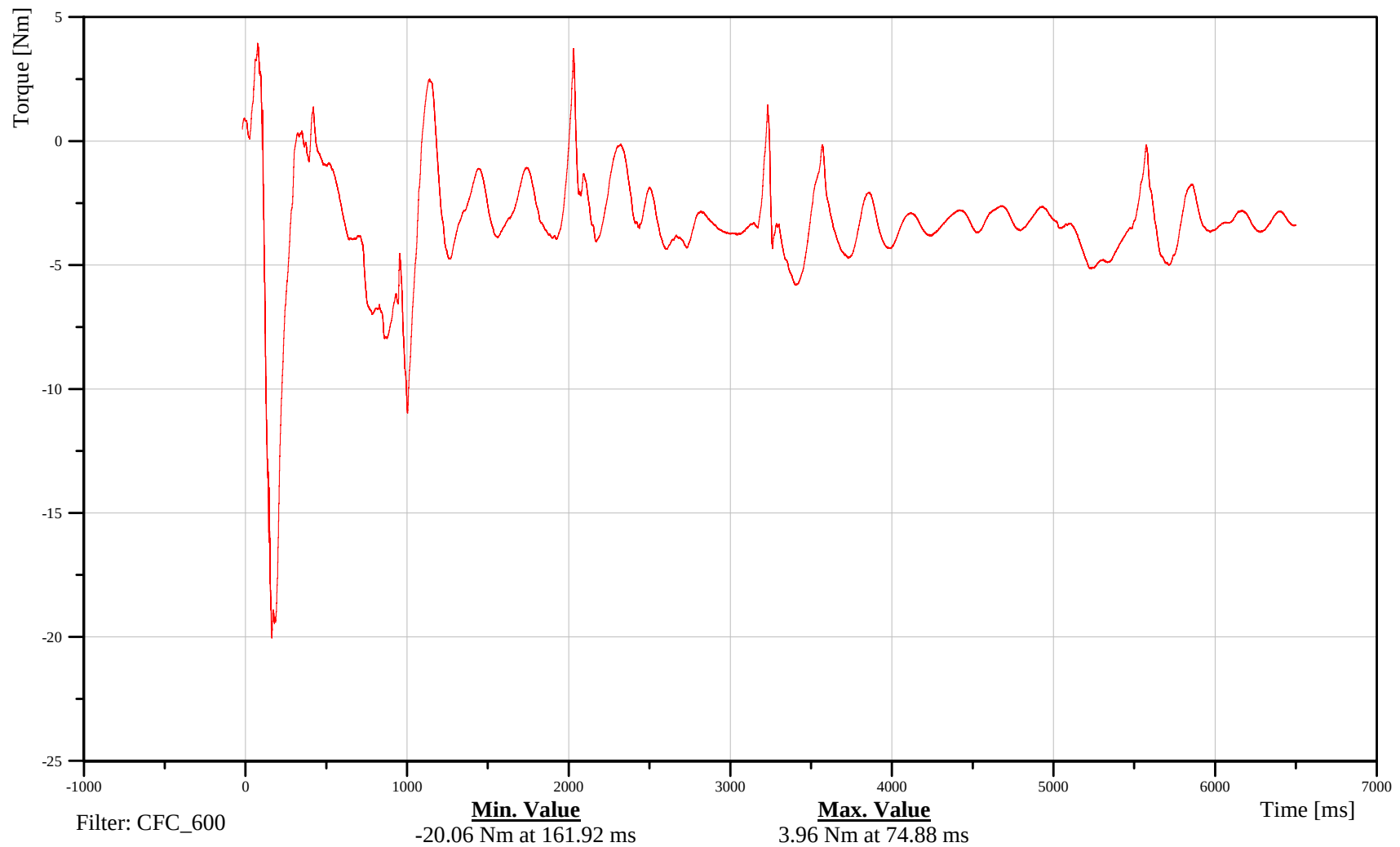
Curb Trip Rollover 2007 Ford Expedition
Left Rear Passenger Lower Neck Moment About Y Axis

Date: 04/13/2010
Time: 15:07

Customer: VRTC

14NECKLO00H3MOYB

TRC Inc. Test Lab: CTF
Test Number: 100413



B-87

100413



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

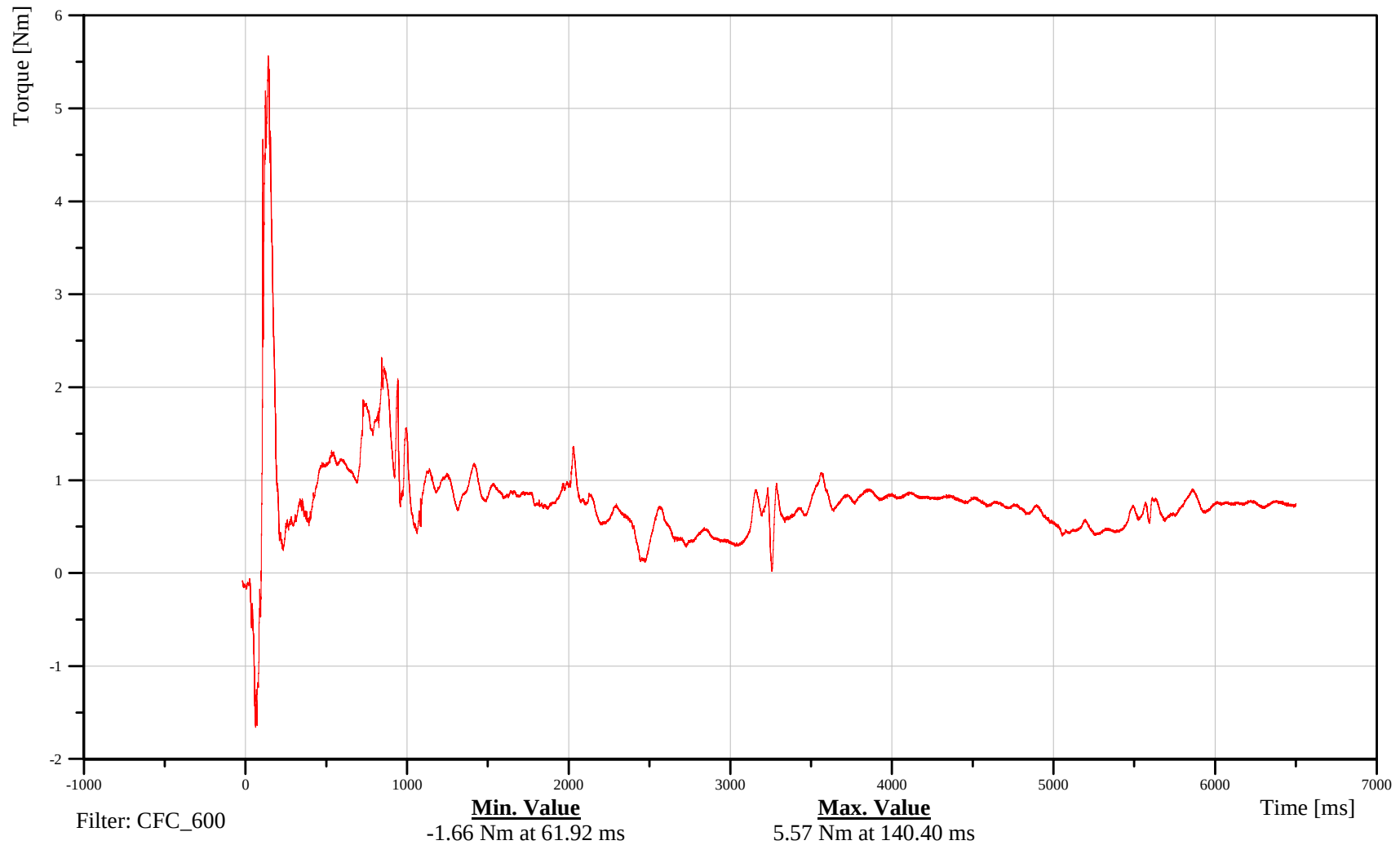
Date: 04/13/2010
Time: 15:07

Customer: VRTC

14NECKLO00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-88

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity X-Axis Acceleration

Date: 04/13/2010

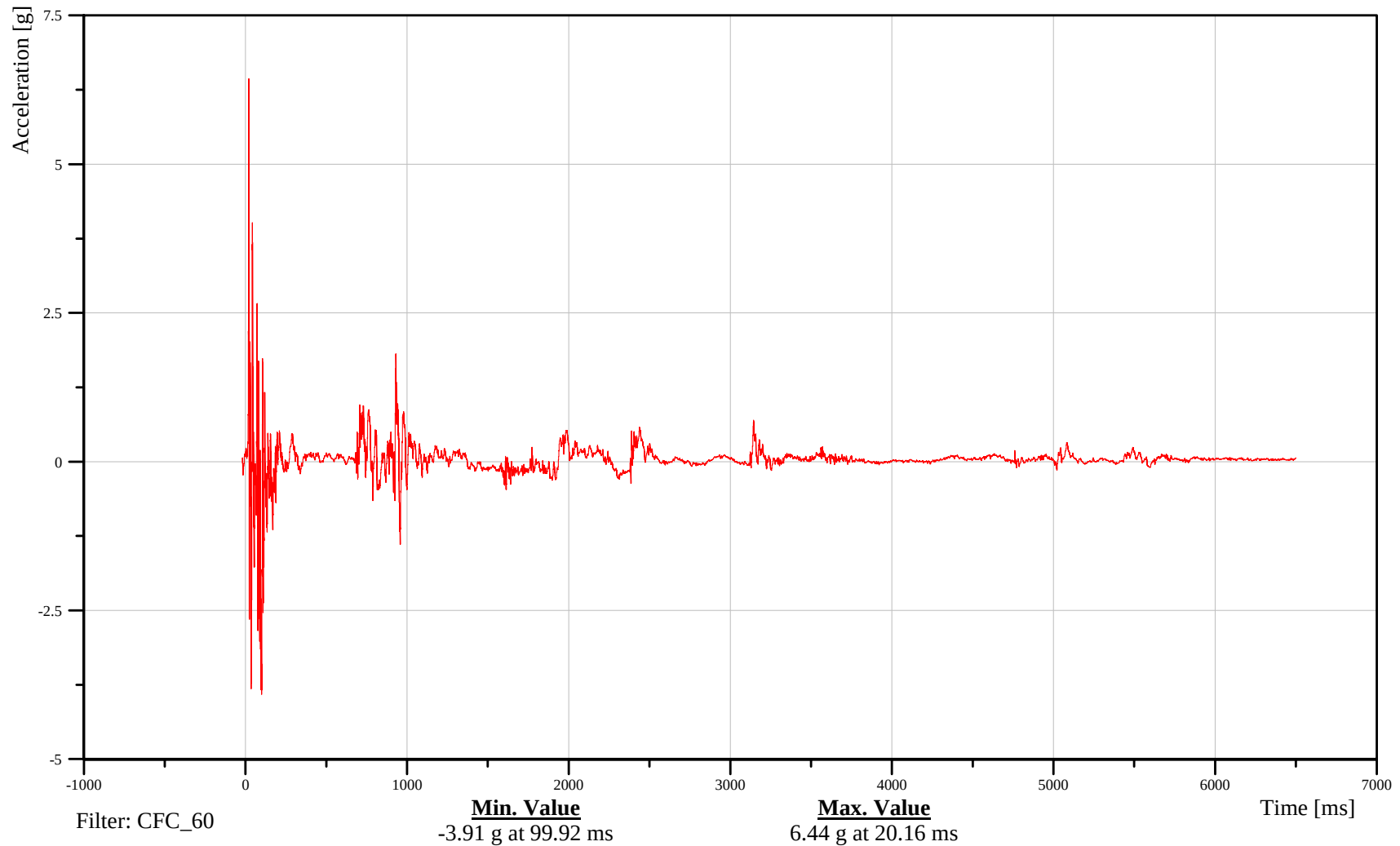
Time: 15:07

Customer: VRTC

10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-89

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity Y-Axis Acceleration

Date: 04/13/2010

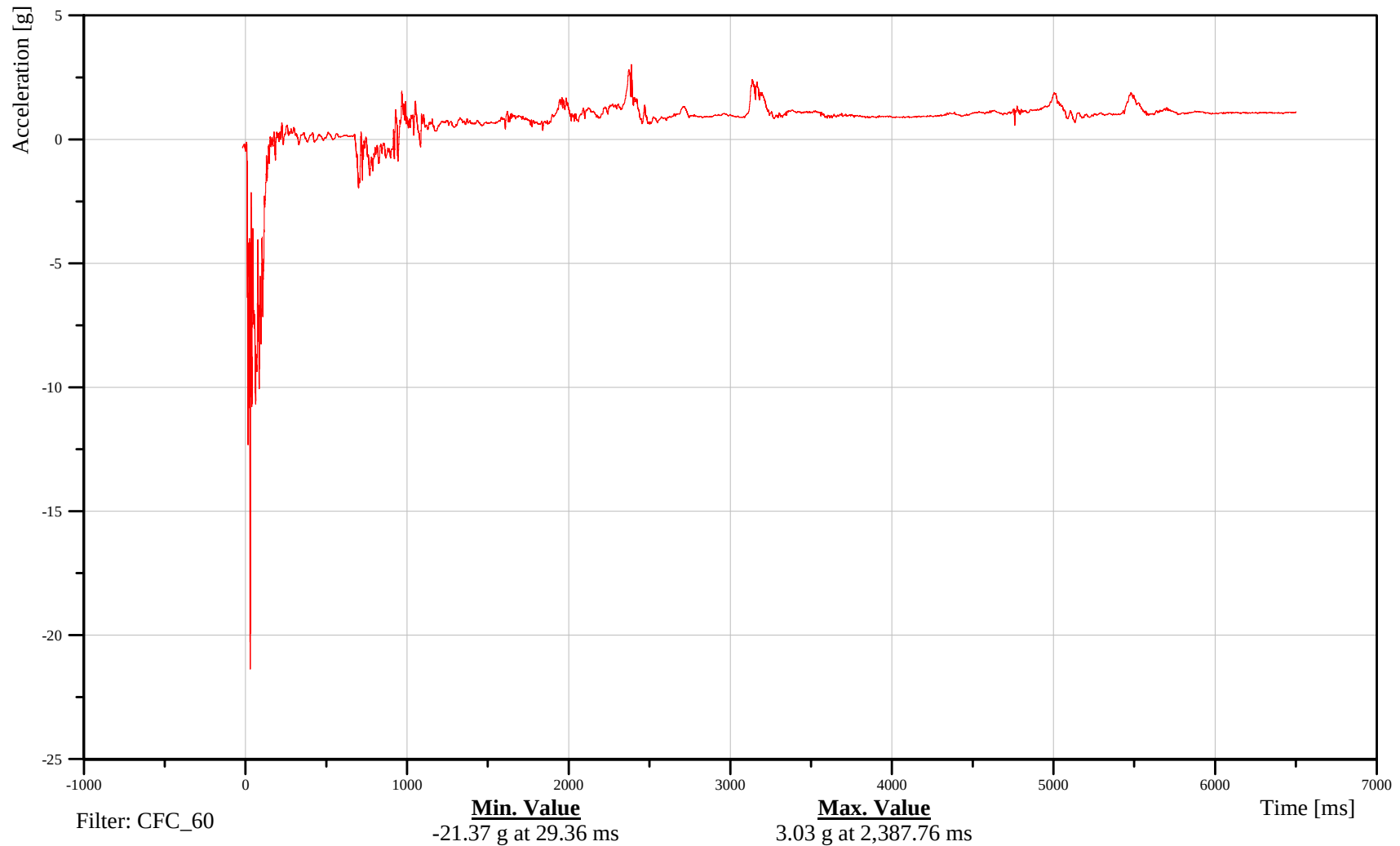
Time: 15:07

Customer: VRTC

10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-90

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity Z-Axis Acceleration

Date: 04/13/2010

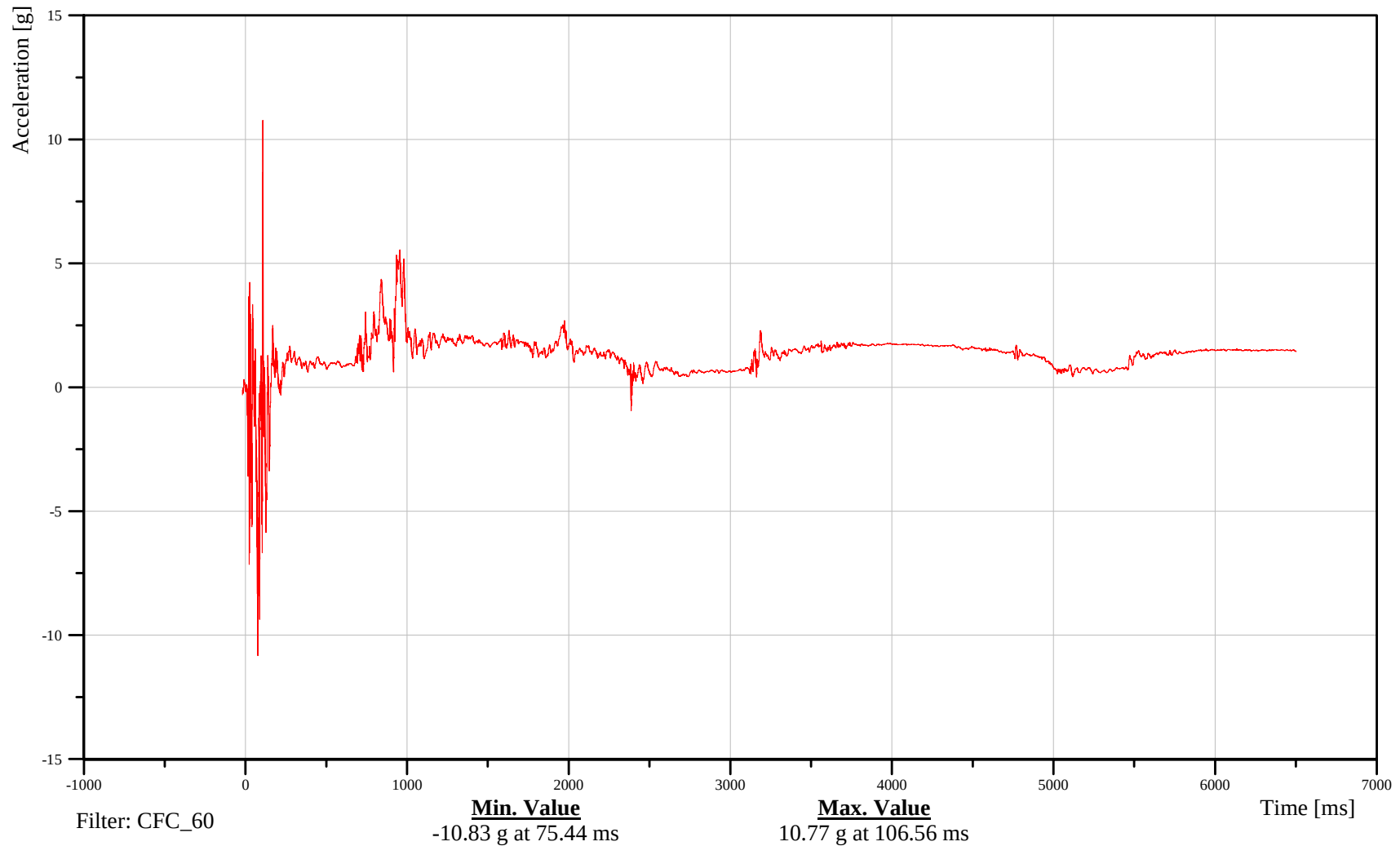
Time: 15:07

Customer: VRTC

10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-91

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Center of Gravity Resultant Acceleration

Date: 04/13/2010

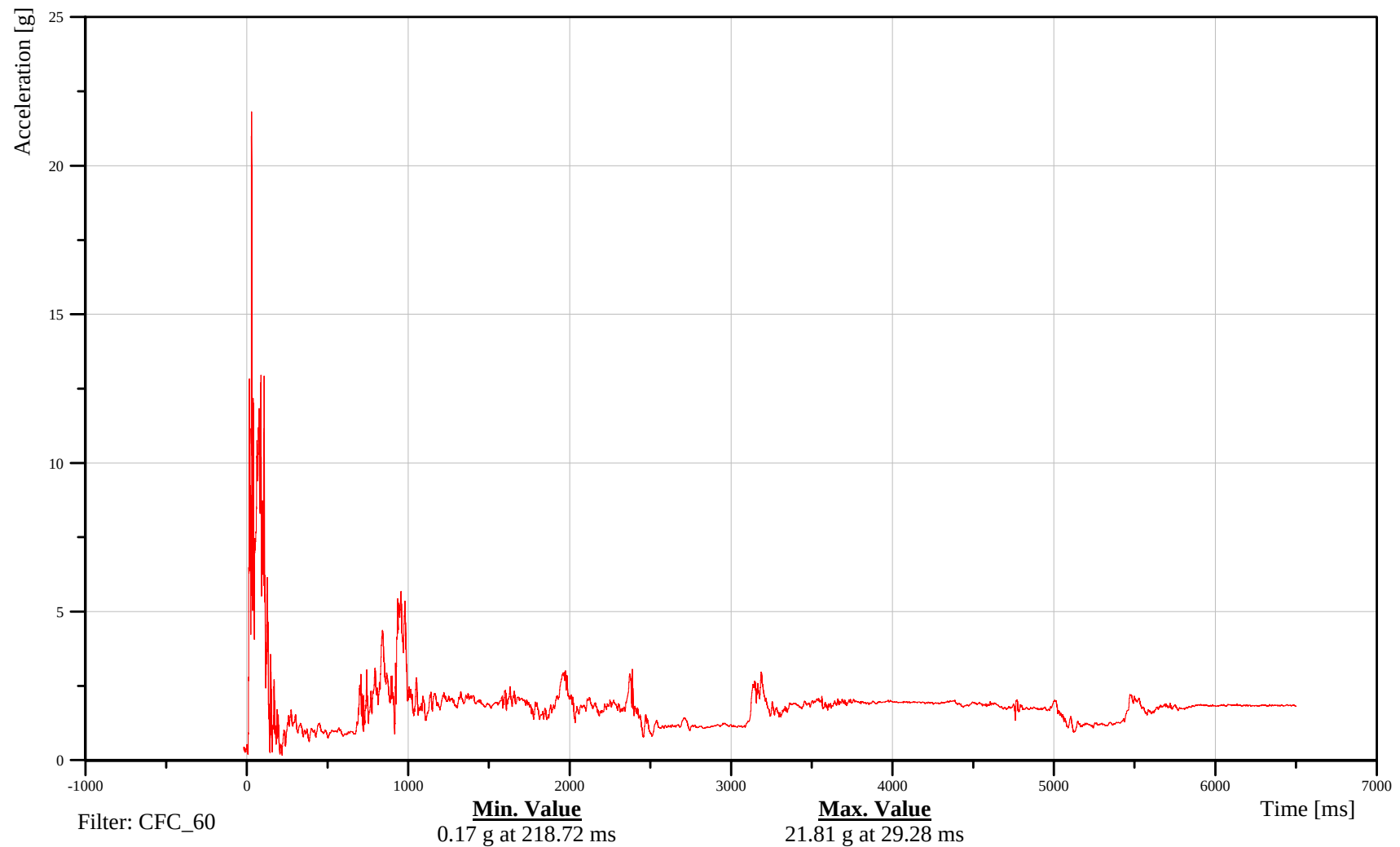
Time: 15:07

Customer: VRTC

10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-92

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Roll Rate

Date: 04/13/2010

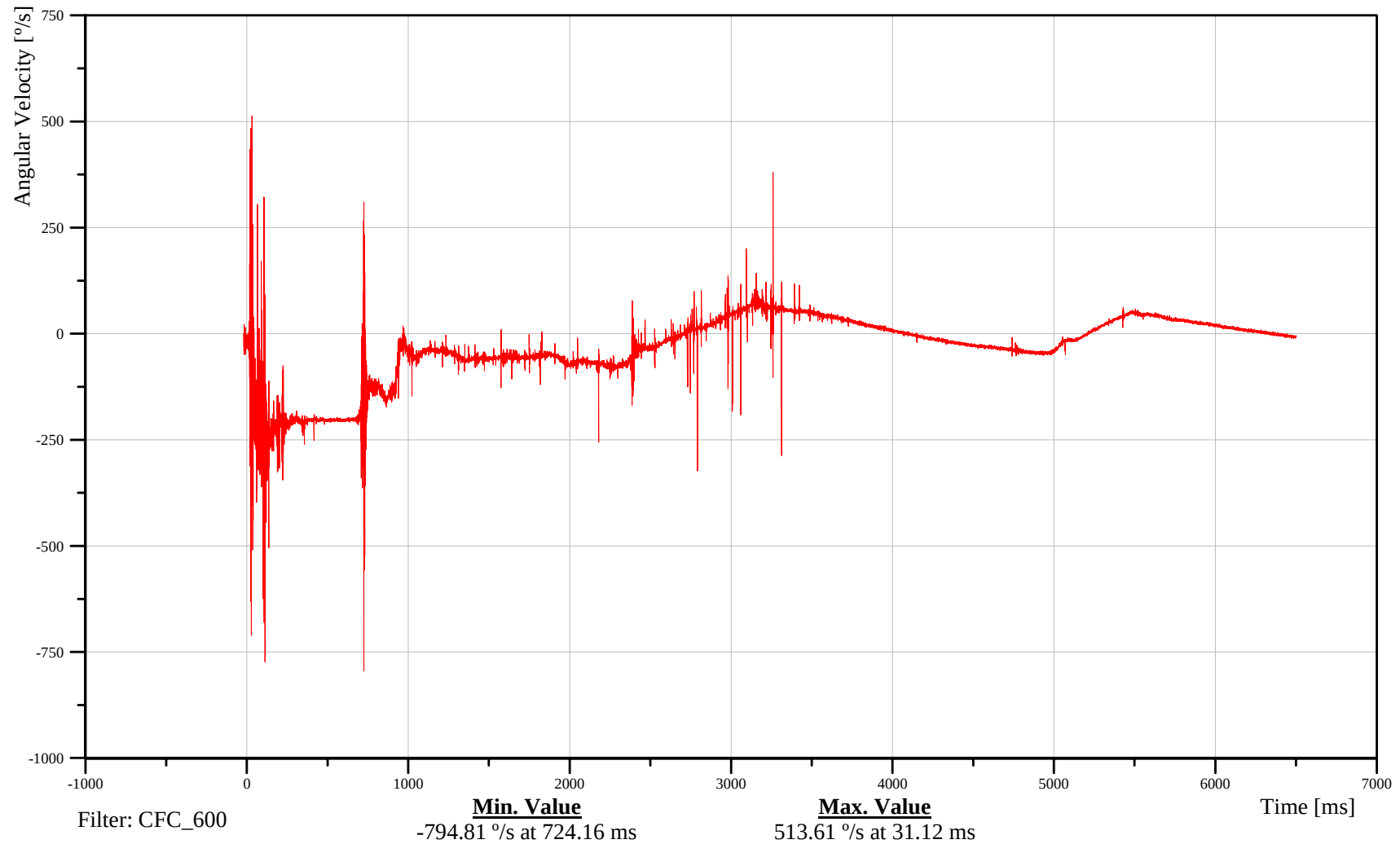
Time: 15:07

Customer: VRTC

10VEHCCG0000AVXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-93

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Pitch Rate

Date: 04/13/2010

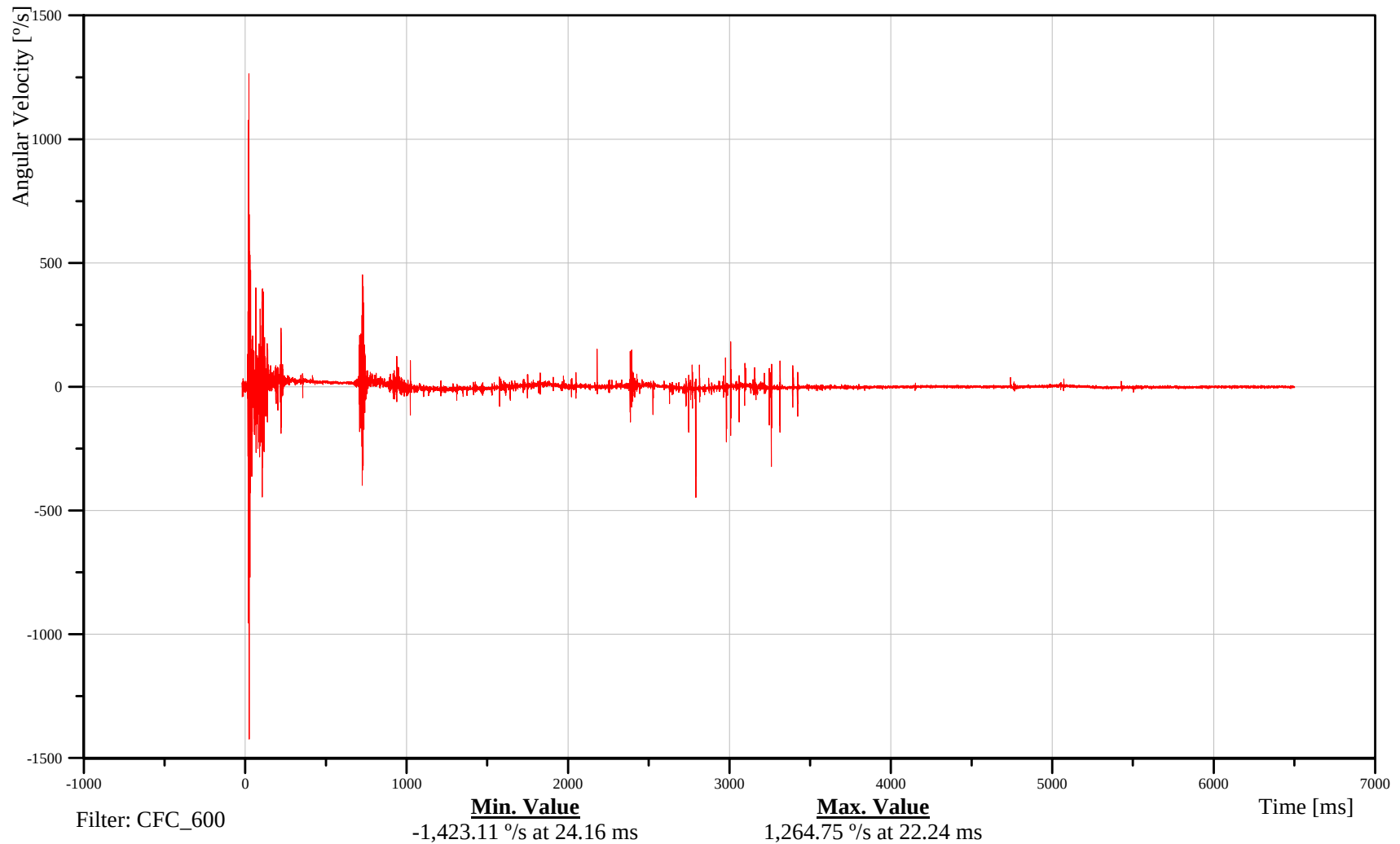
Time: 15:07

Customer: VRTC

10VEHCCG0000AVYB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-94

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Yaw Rate

Date: 04/13/2010

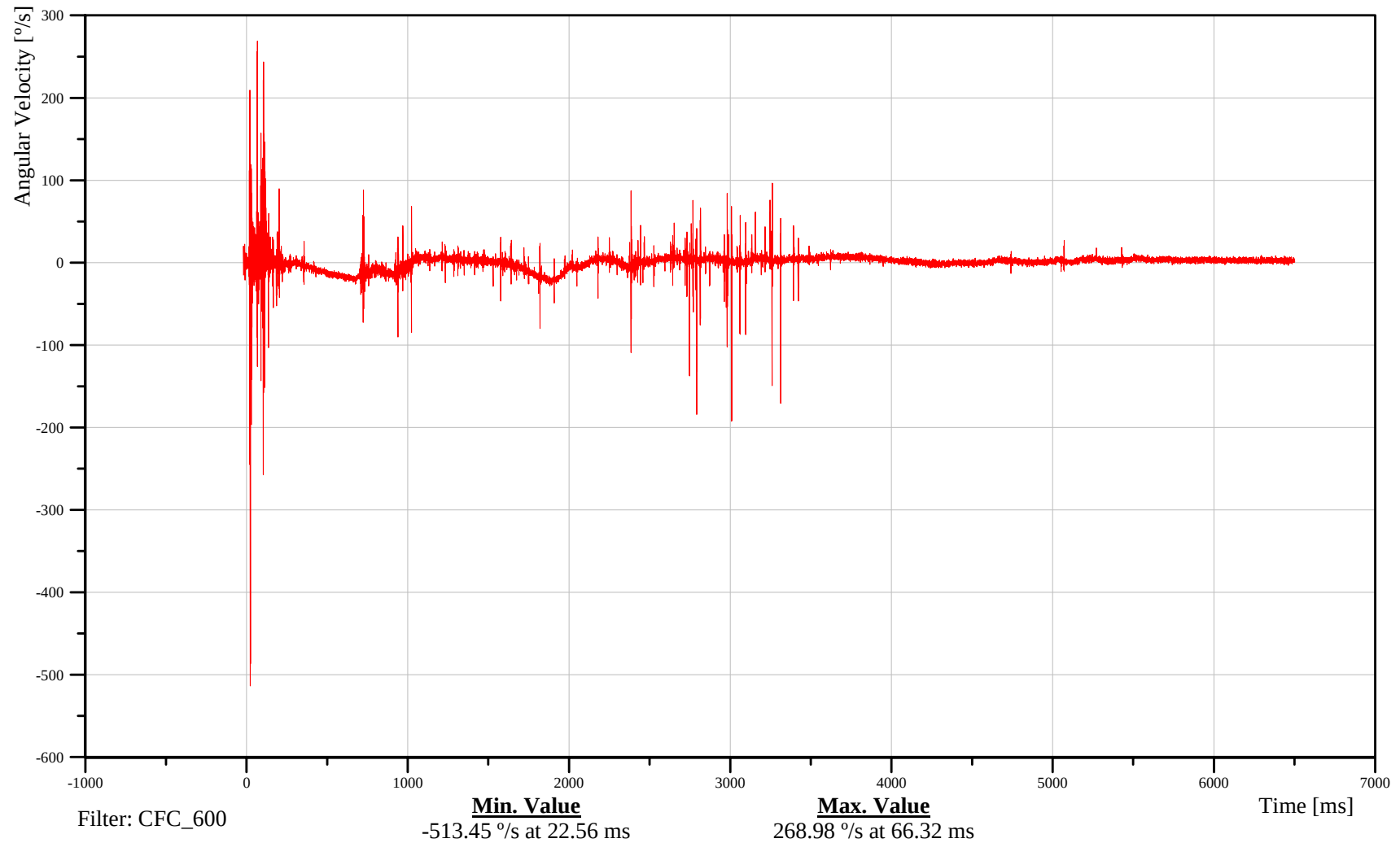
Time: 15:07

Customer: VRTC

10VEHCCG0000AVZB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-95

100413



Curb Trip Rollover 2007 Ford Expedition

Rear Deck Roll Rate Redundant

Date: 04/13/2010

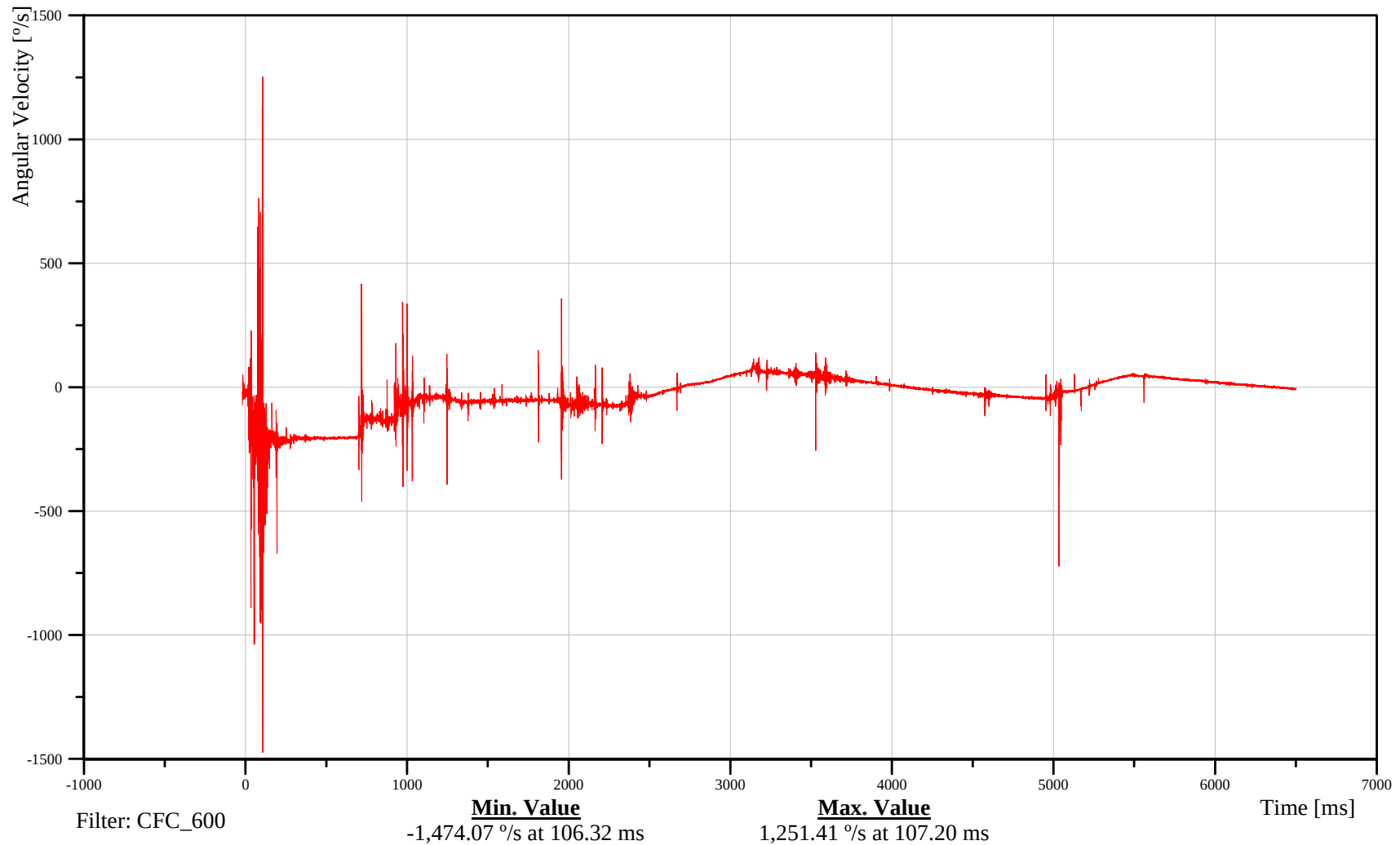
Time: 15:07

Customer: VRTC

10VEHCREDK00AVXB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-96

100413



Curb Trip Rollover 2007 Ford Expedition

Rear Deck Pitch Rate Redundant

Date: 04/13/2010

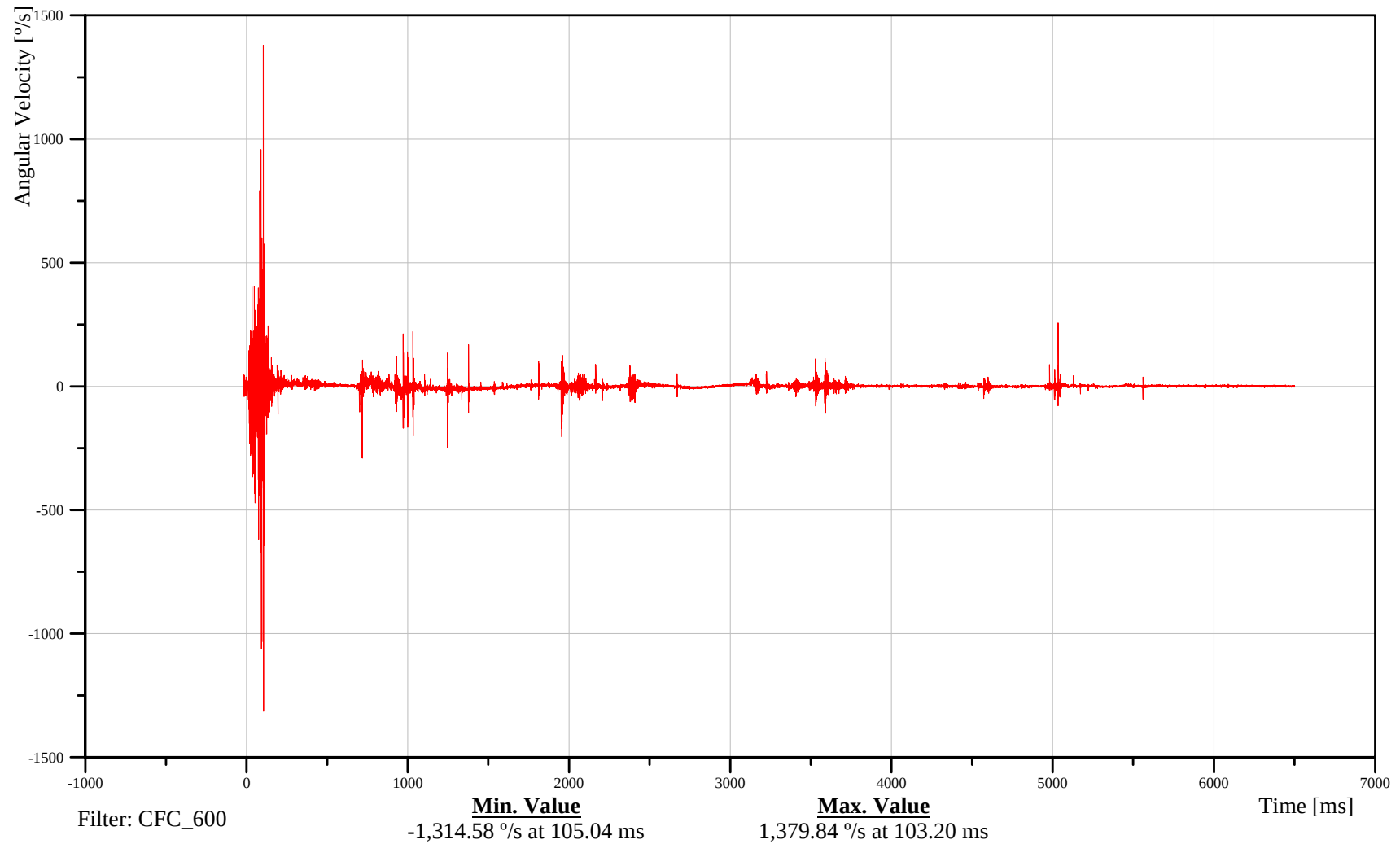
Time: 15:07

Customer: VRTC

10VEHCREDK00AVYB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-97

100413



Curb Trip Rollover 2007 Ford Expedition

Rear Deck Yaw Rate Redundant

Date: 04/13/2010

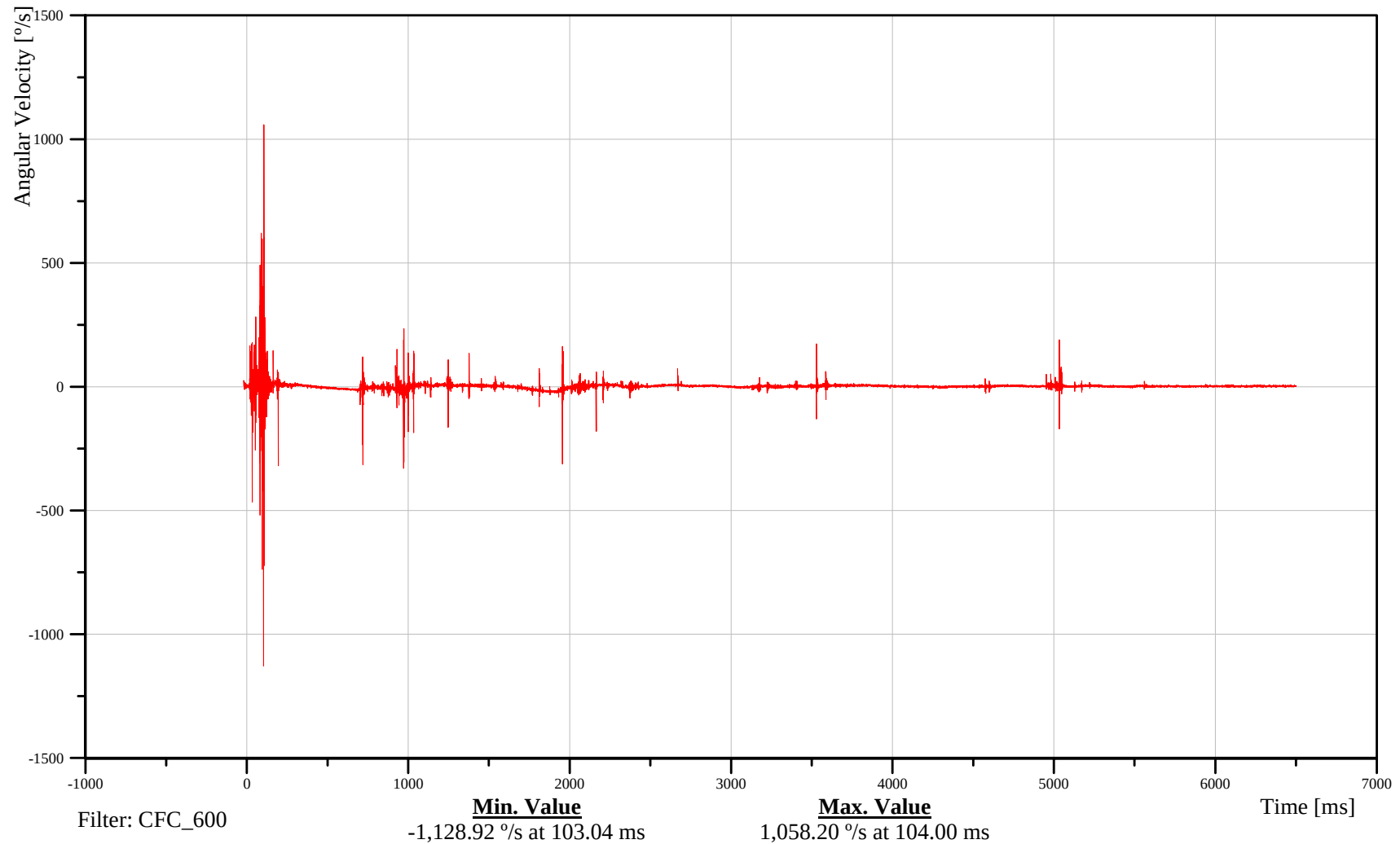
Time: 15:07

Customer: VRTC

10VEHCREDK00AVZB

TRC Inc. Test Lab: CTF

Test Number: 100413



B-98

100413



Curb Trip Rollover 2007 Ford Expedition

Top of Engine X-Axis Acceleration

Date: 04/13/2010

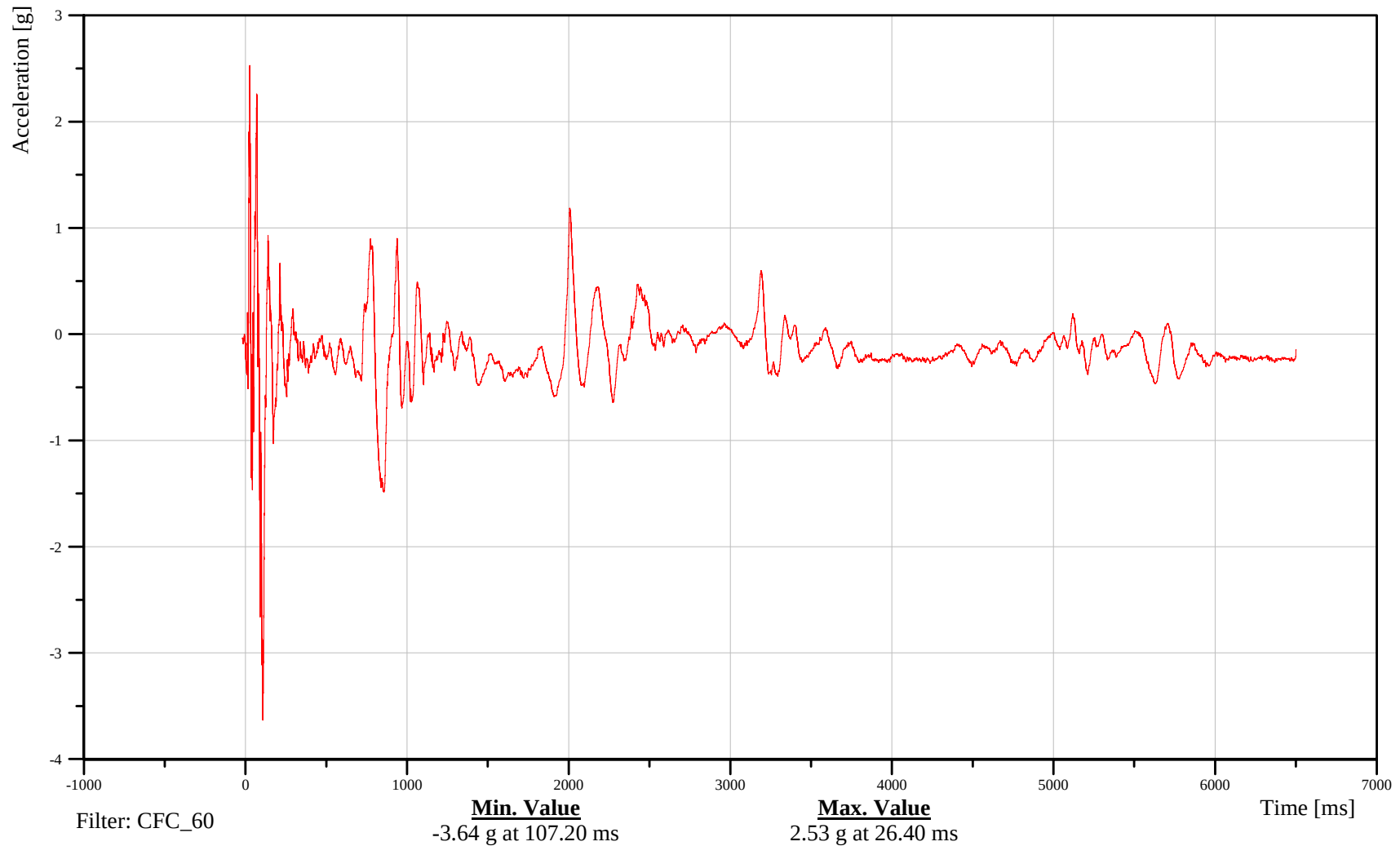
Time: 15:07

Customer: VRTC

10ENGNT0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-99

100413



Curb Trip Rollover 2007 Ford Expedition

Top of Engine Y-Axis Acceleration

Date: 04/13/2010

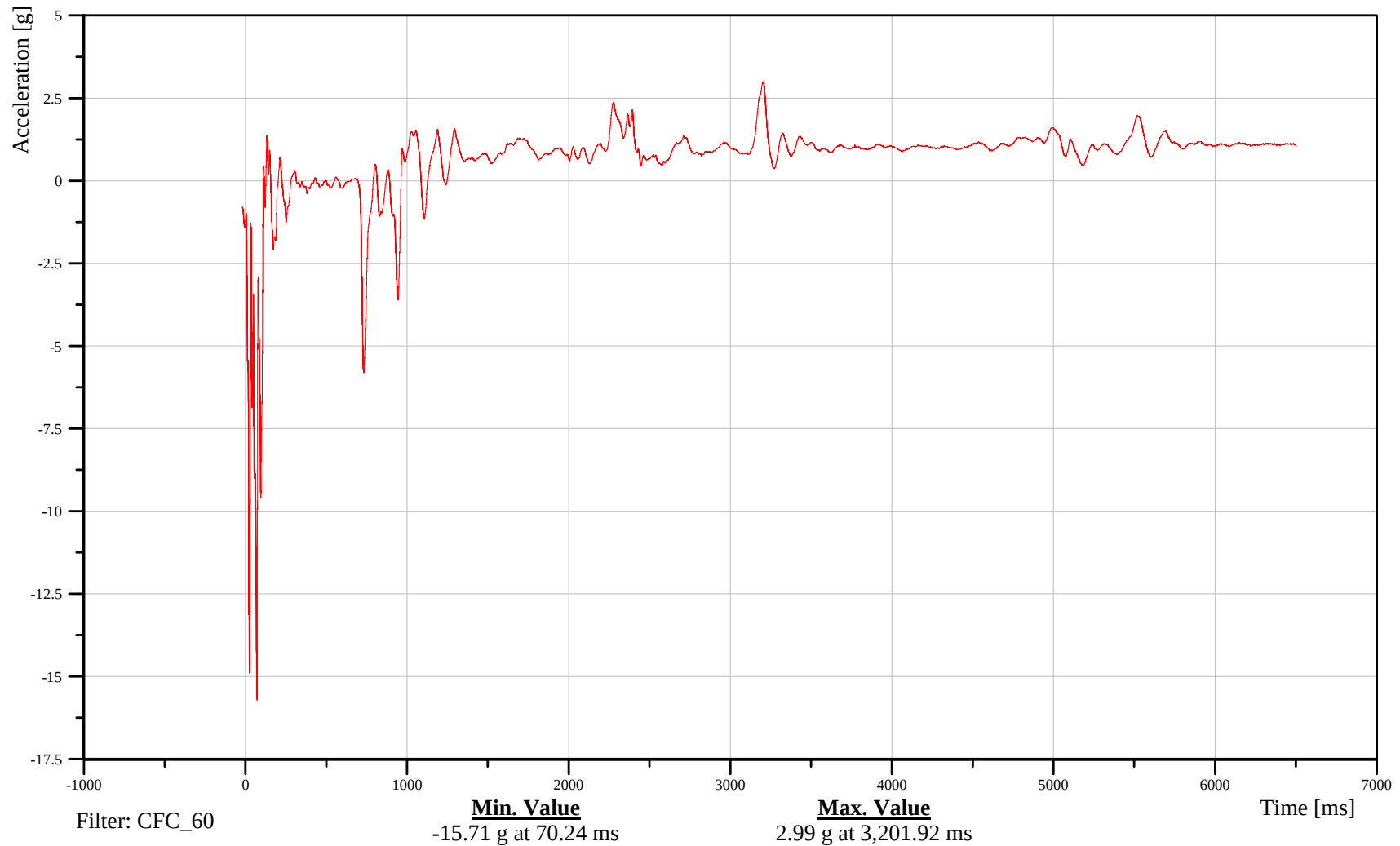
Time: 15:07

Customer: VRTC

10ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-100

100413



Curb Trip Rollover 2007 Ford Expedition

Top of Engine Z-Axis Acceleration

Date: 04/13/2010

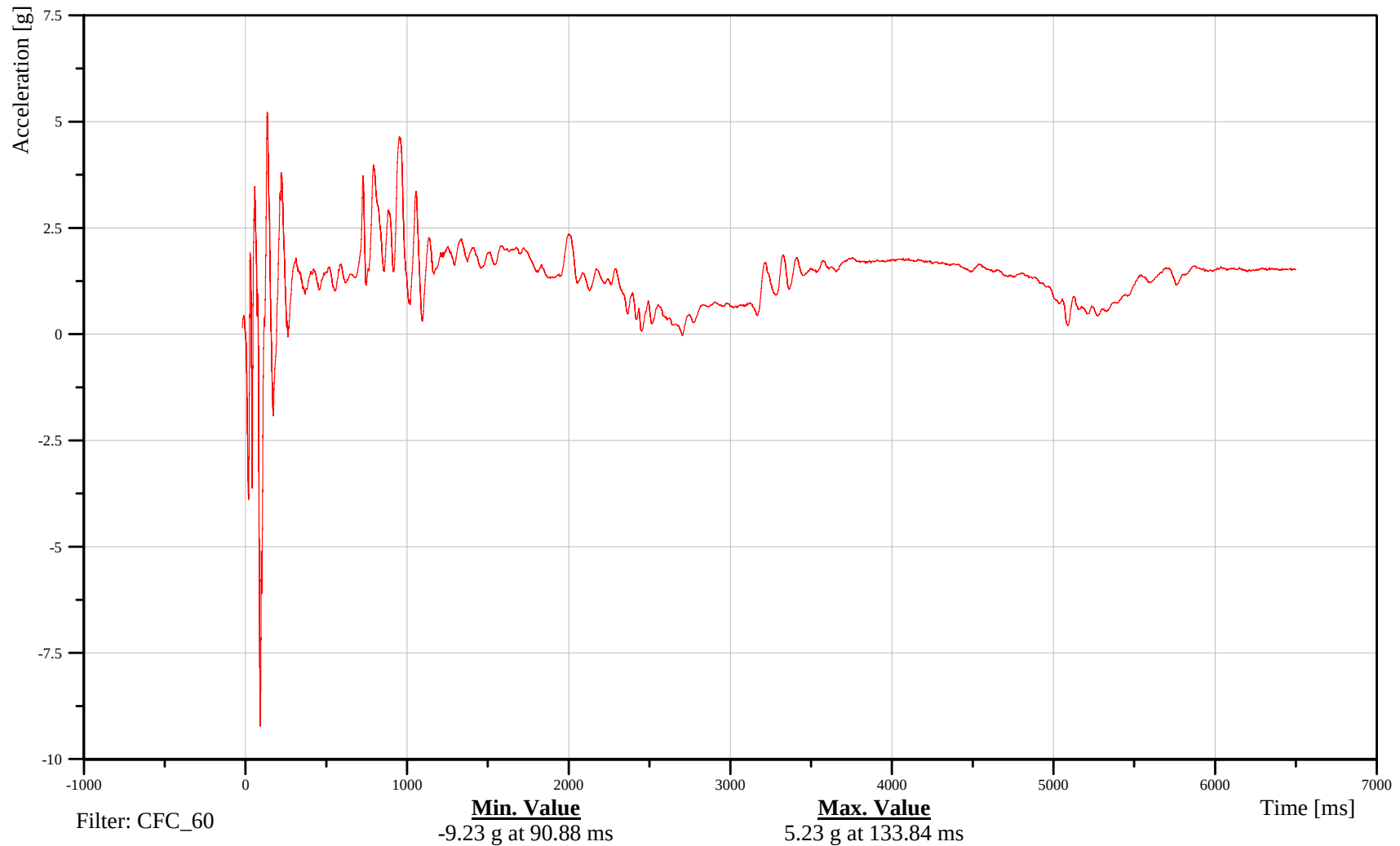
Time: 15:07

Customer: VRTC

10ENGNTTP0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-101

100413



Curb Trip Rollover 2007 Ford Expedition

Top of Engine Resultant Acceleration

Date: 04/13/2010

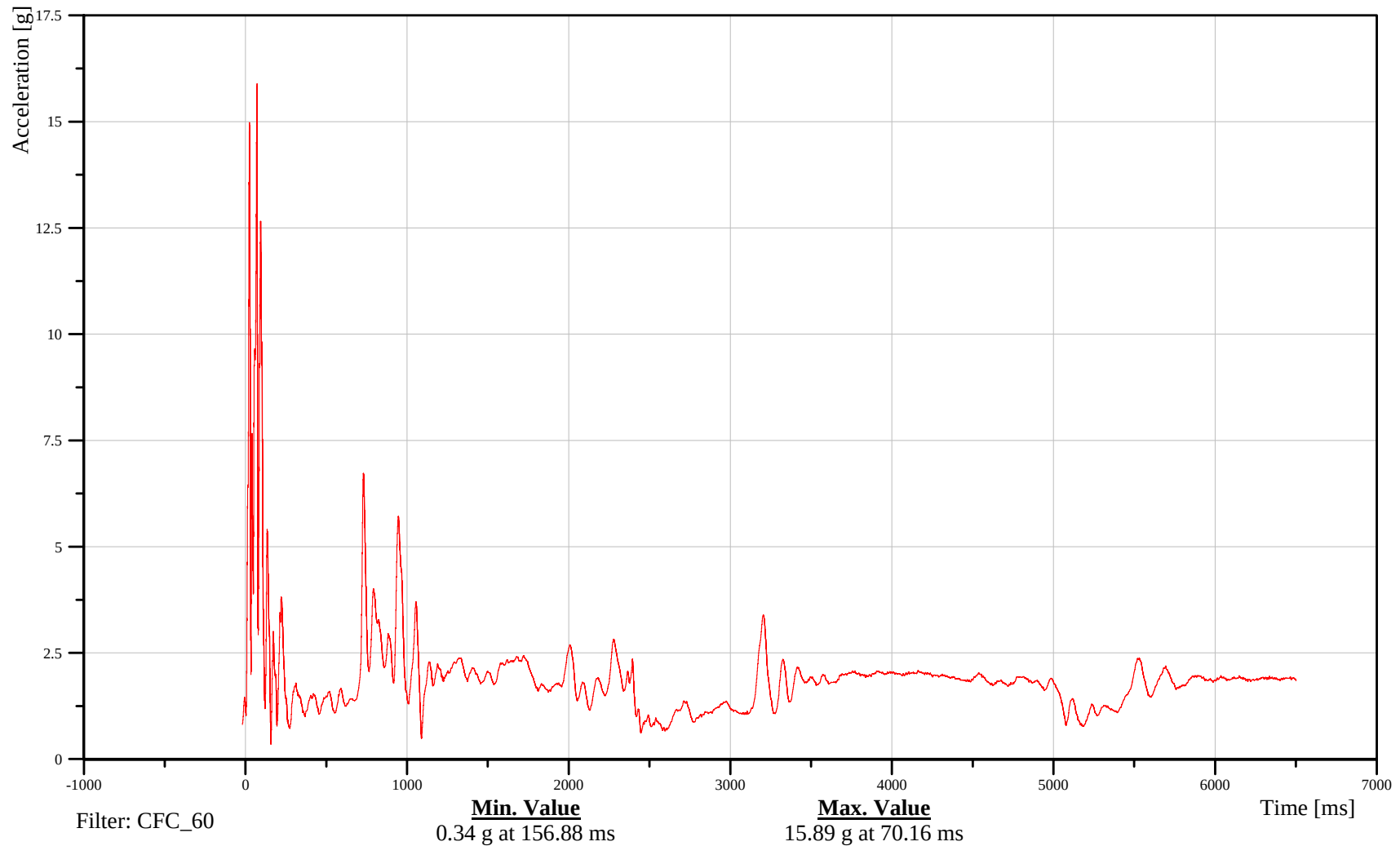
Time: 15:07

Customer: VRTC

10ENGNTTP0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-102

100413



Curb Trip Rollover 2007 Ford Expedition

Bottom of Engine X-Axis Acceleration

Date: 04/13/2010

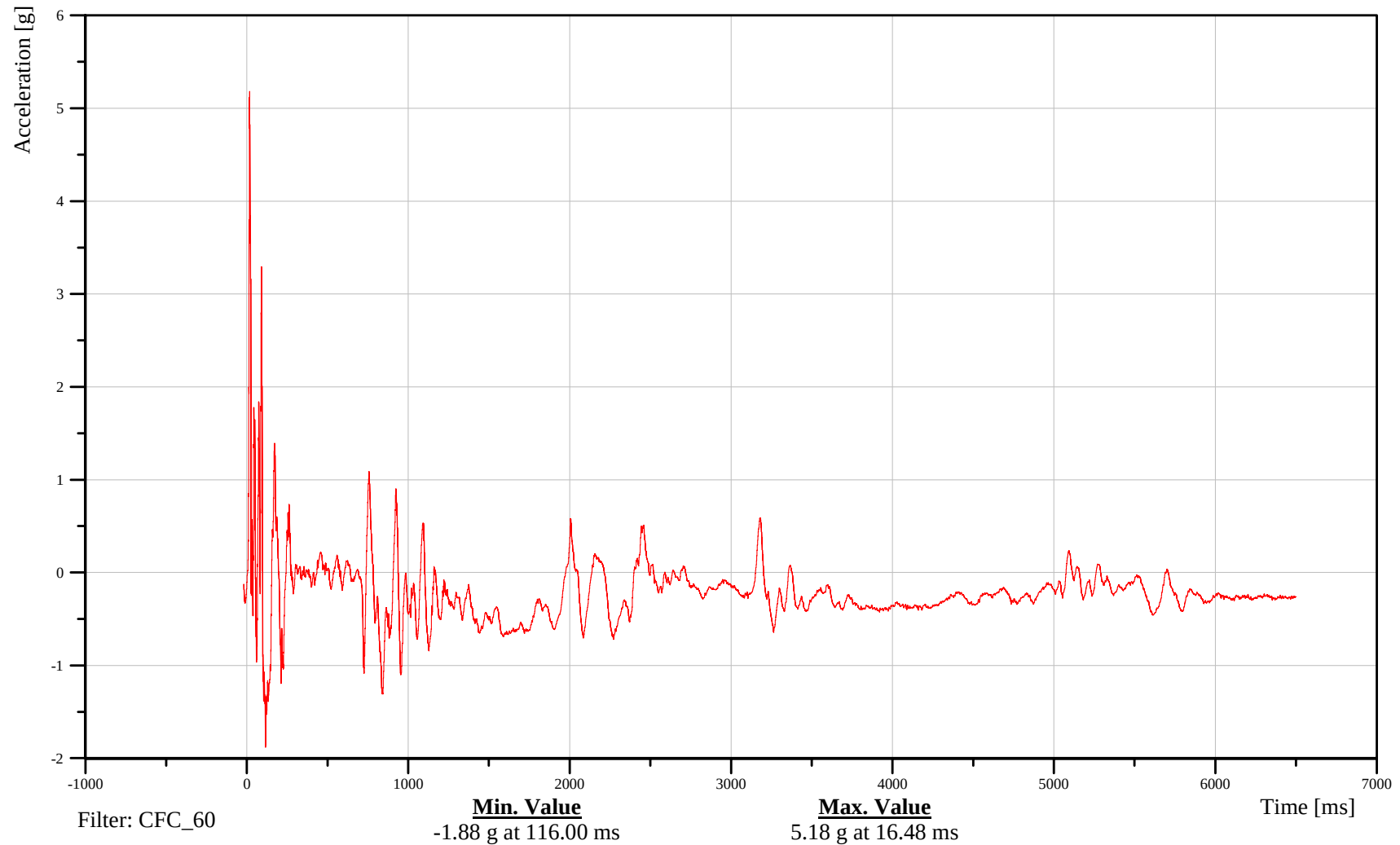
Time: 15:07

Customer: VRTC

10ENGNBO0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-103

100413



Curb Trip Rollover 2007 Ford Expedition

Bottom of Engine Y-Axis Acceleration

Date: 04/13/2010

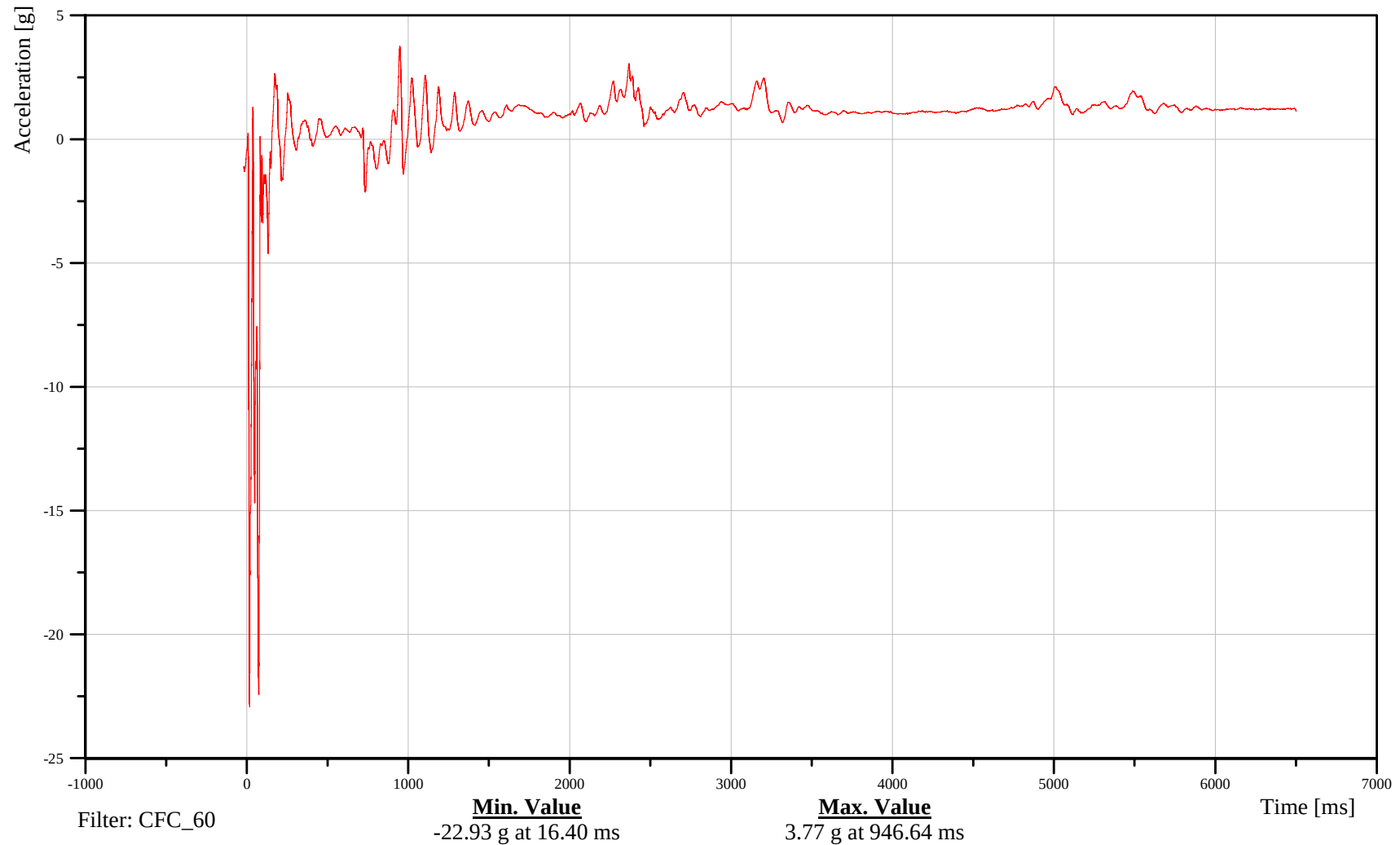
Time: 15:07

Customer: VRTC

10ENGNB00000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-104

100413



Curb Trip Rollover 2007 Ford Expedition

Bottom of Engine Z-Axis Acceleration

Date: 04/13/2010

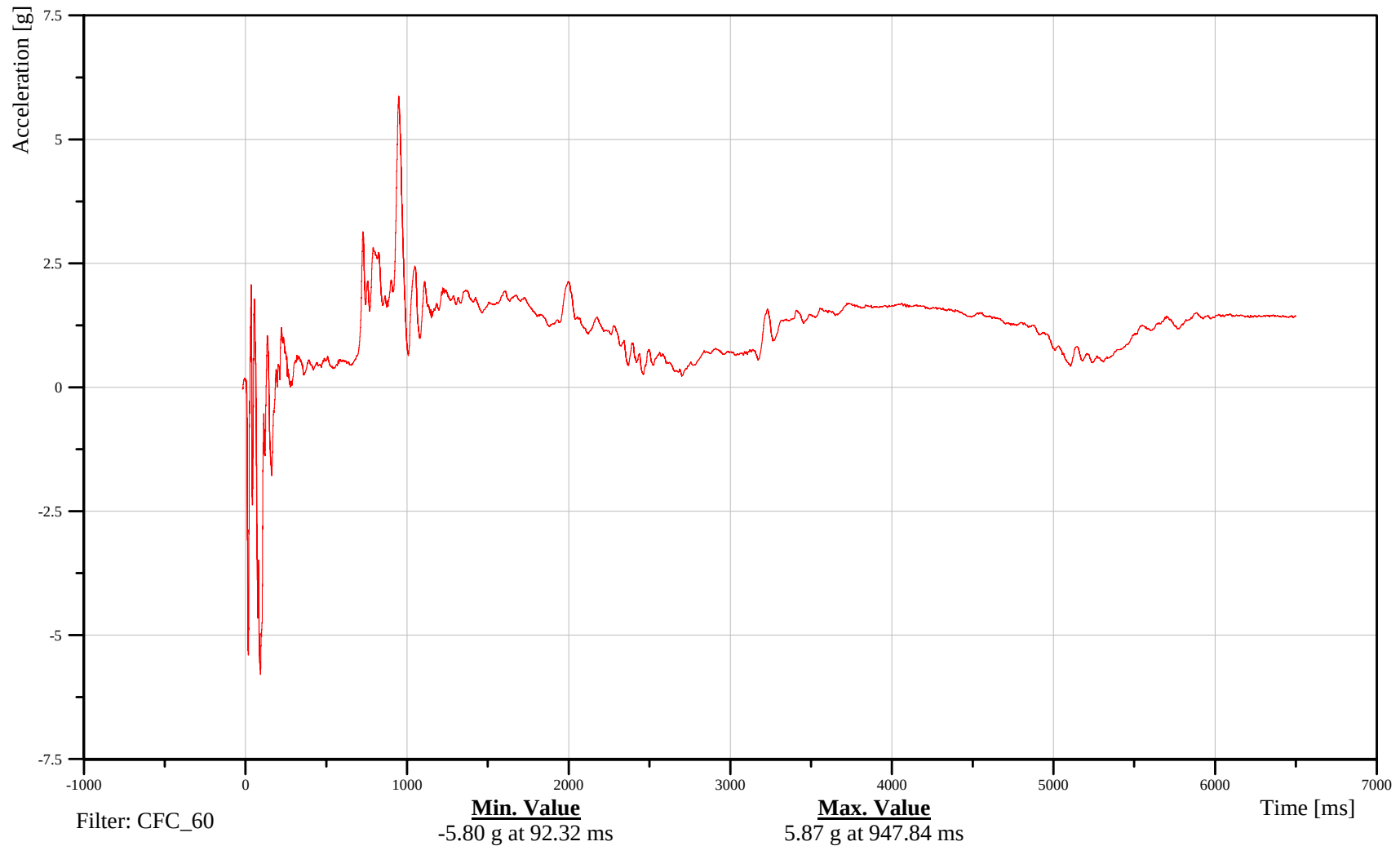
Time: 15:07

Customer: VRTC

10ENG NBO0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-105

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Bottom of Engine Resultant Acceleration

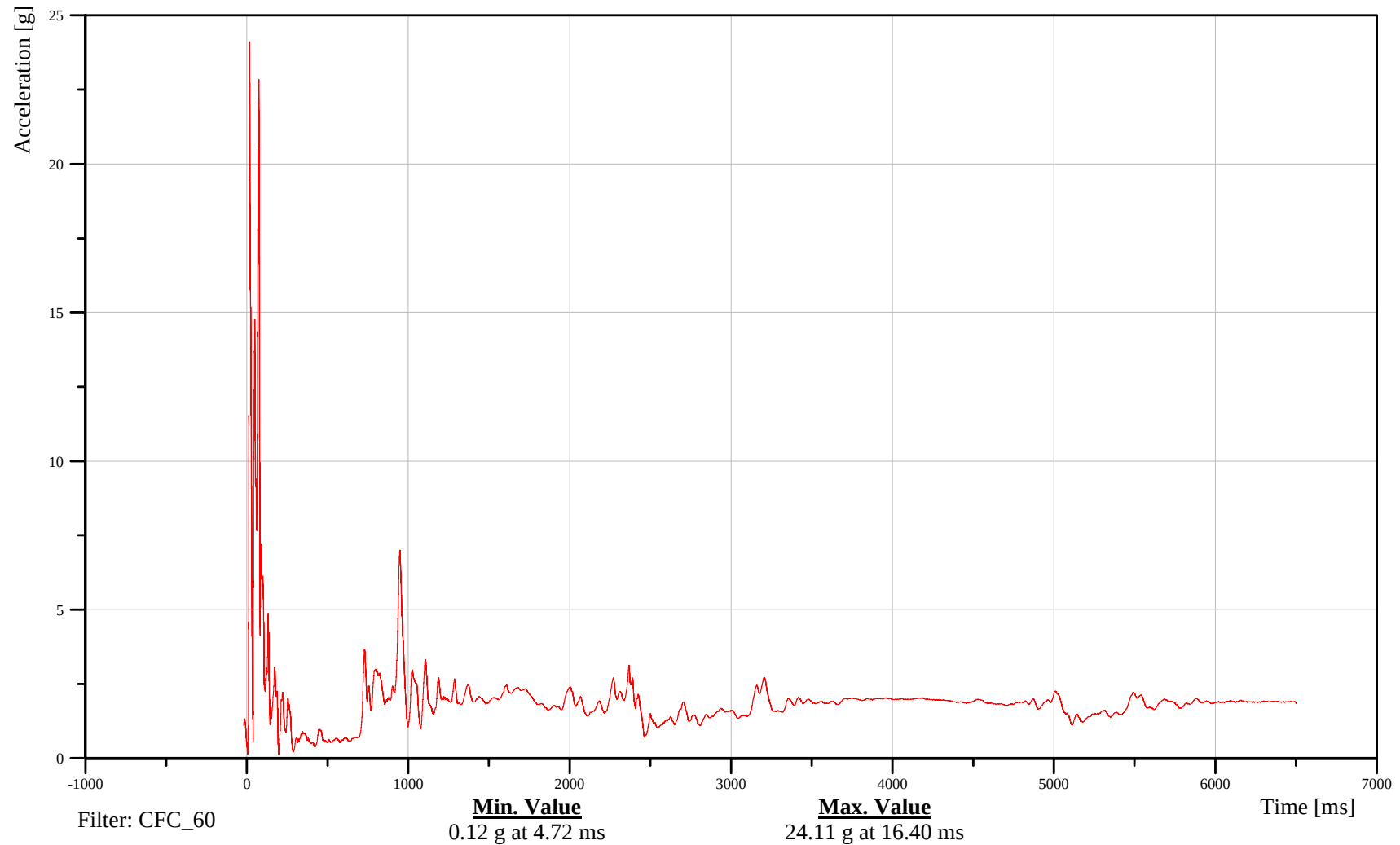
Time: 15:07

Customer: VRTC

10ENG NBO0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-106

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

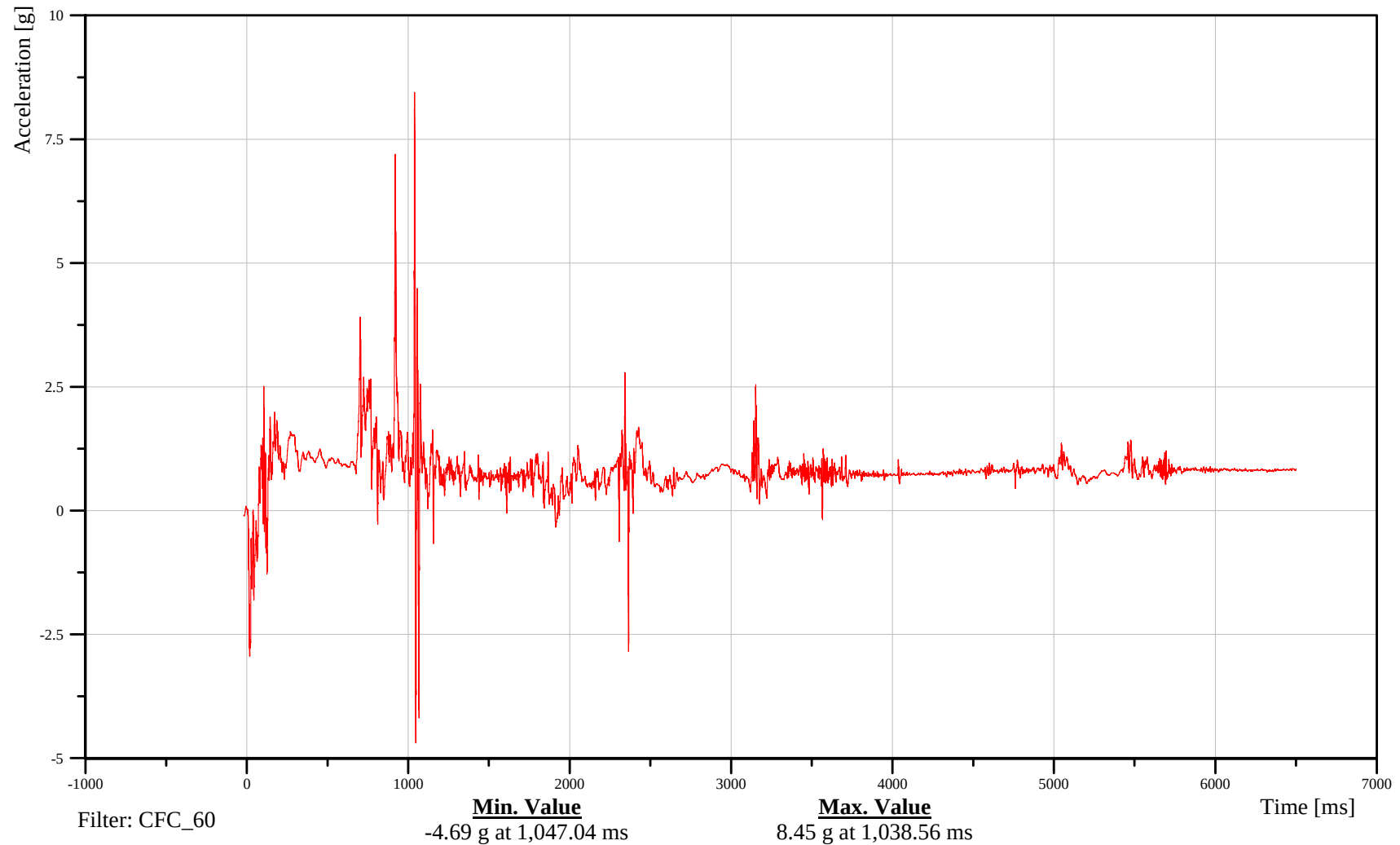
Time: 15:07

Customer: VRTC

10APILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-107

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

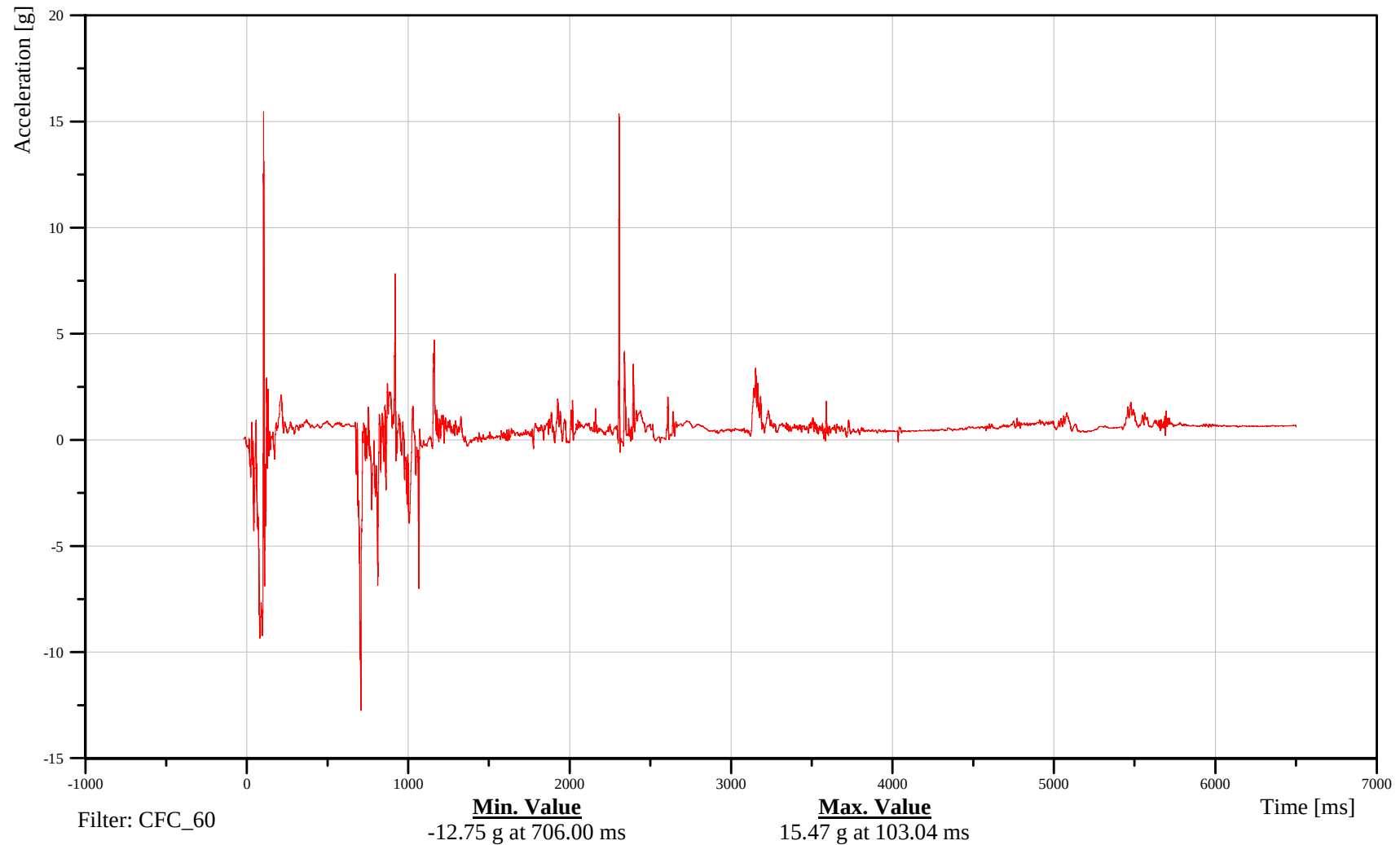
Time: 15:07

Customer: VRTC

10APILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-108

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper Z-Axis Acceleration

Date: 04/13/2010

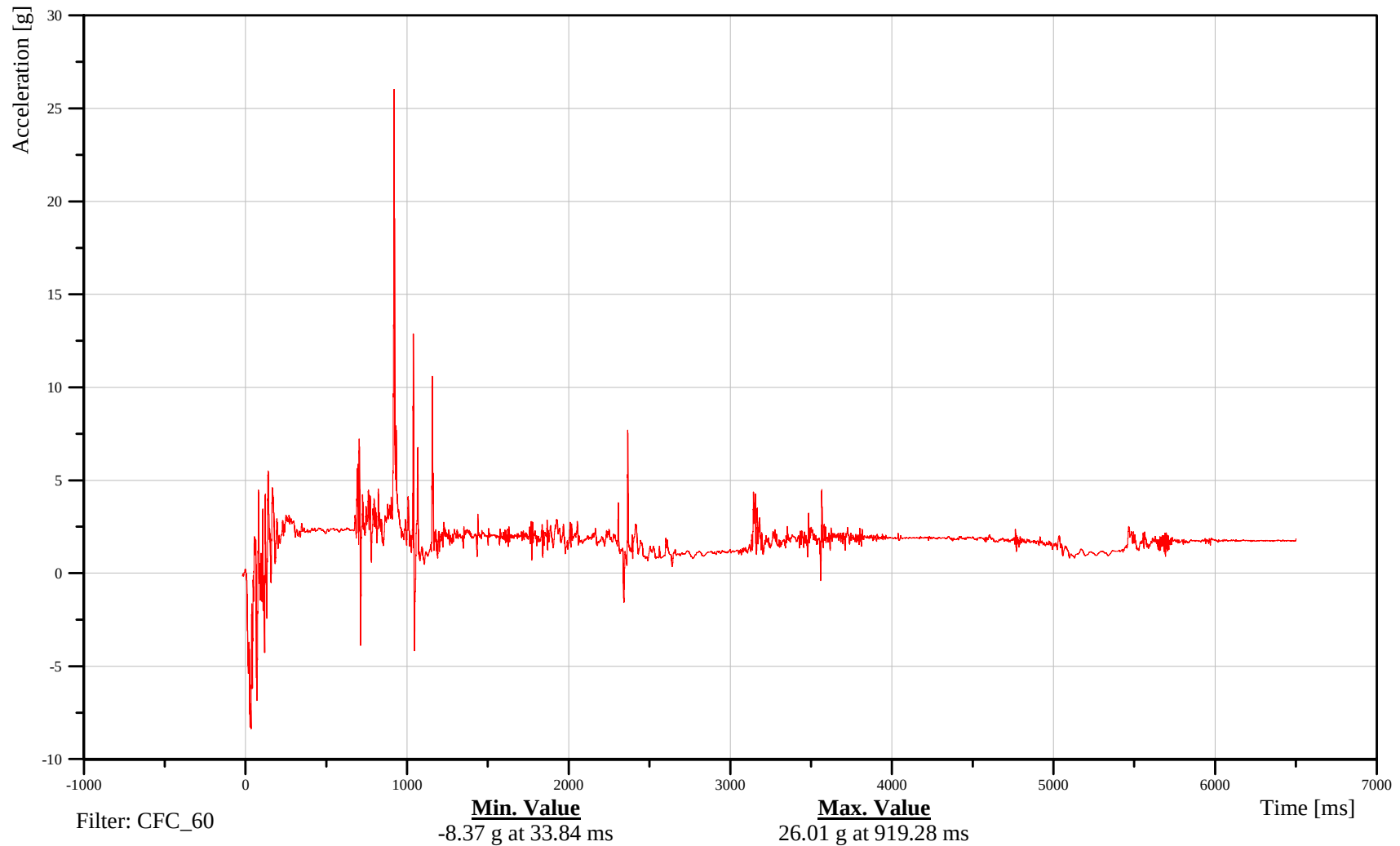
Time: 15:07

Customer: VRTC

10APILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-109

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Upper Resultant Acceleration

Date: 04/13/2010

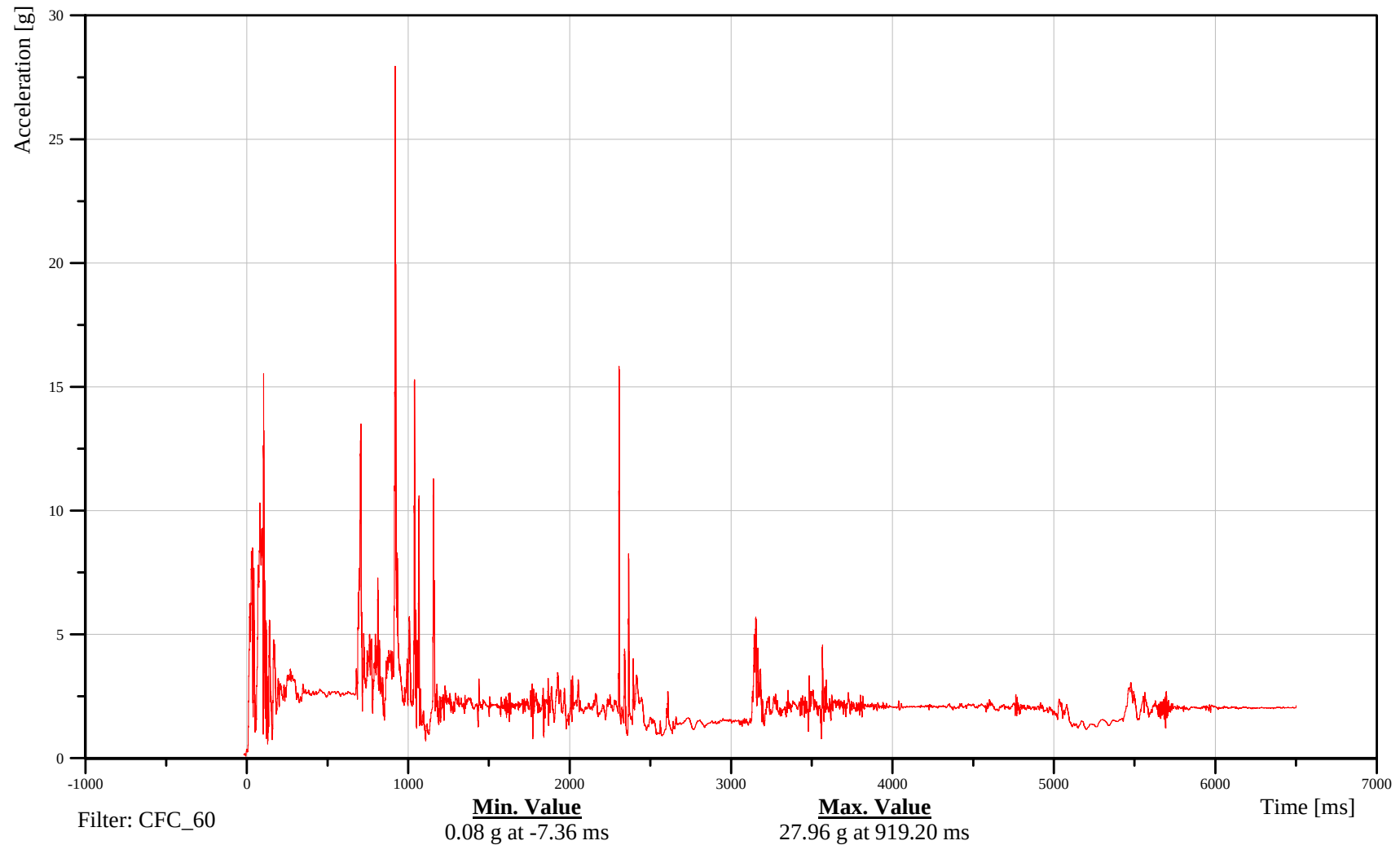
Time: 15:07

Customer: VRTC

10APILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-110

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower X-Axis Acceleration

Date: 04/13/2010

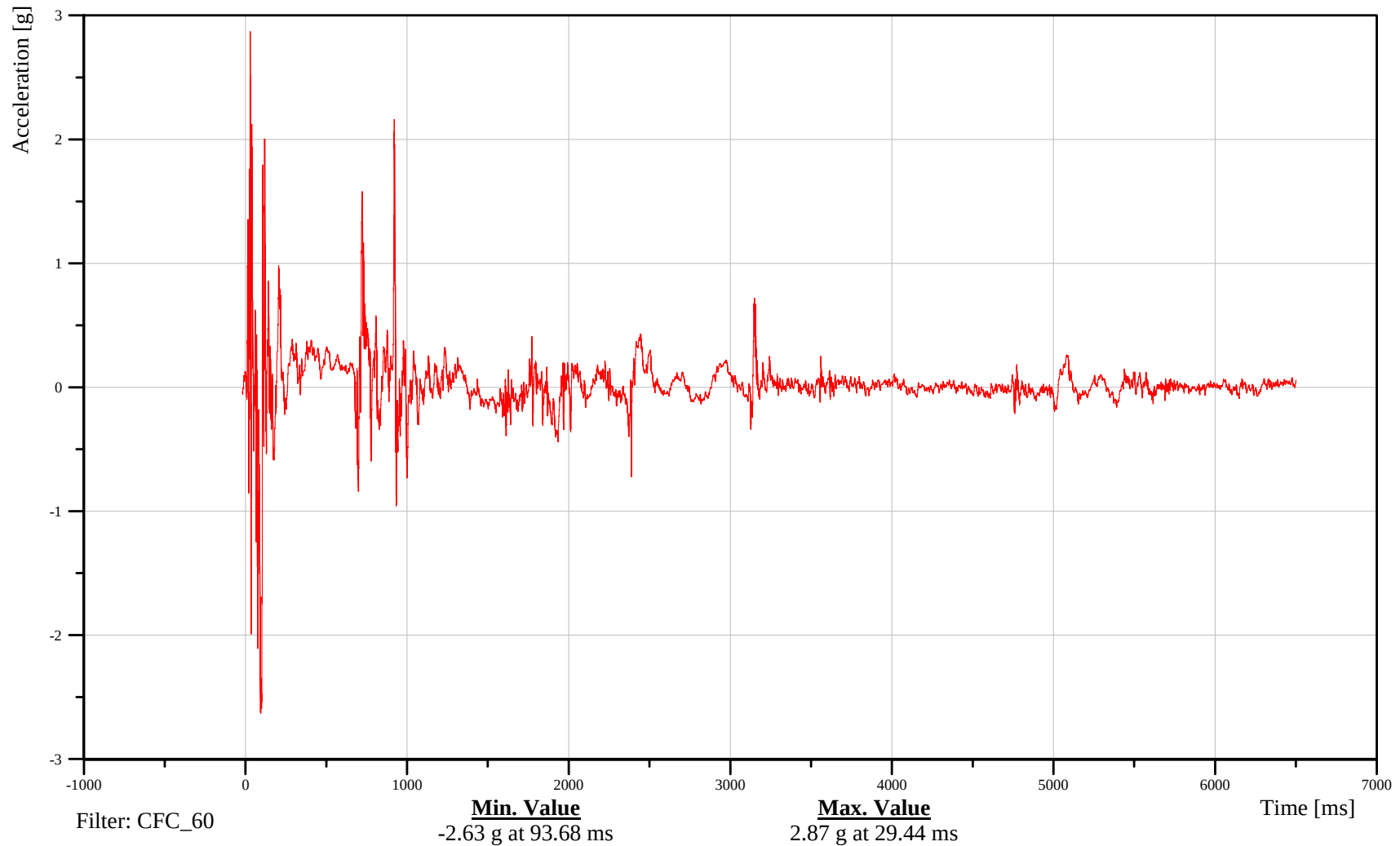
Time: 15:07

Customer: VRTC

10APILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-111

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

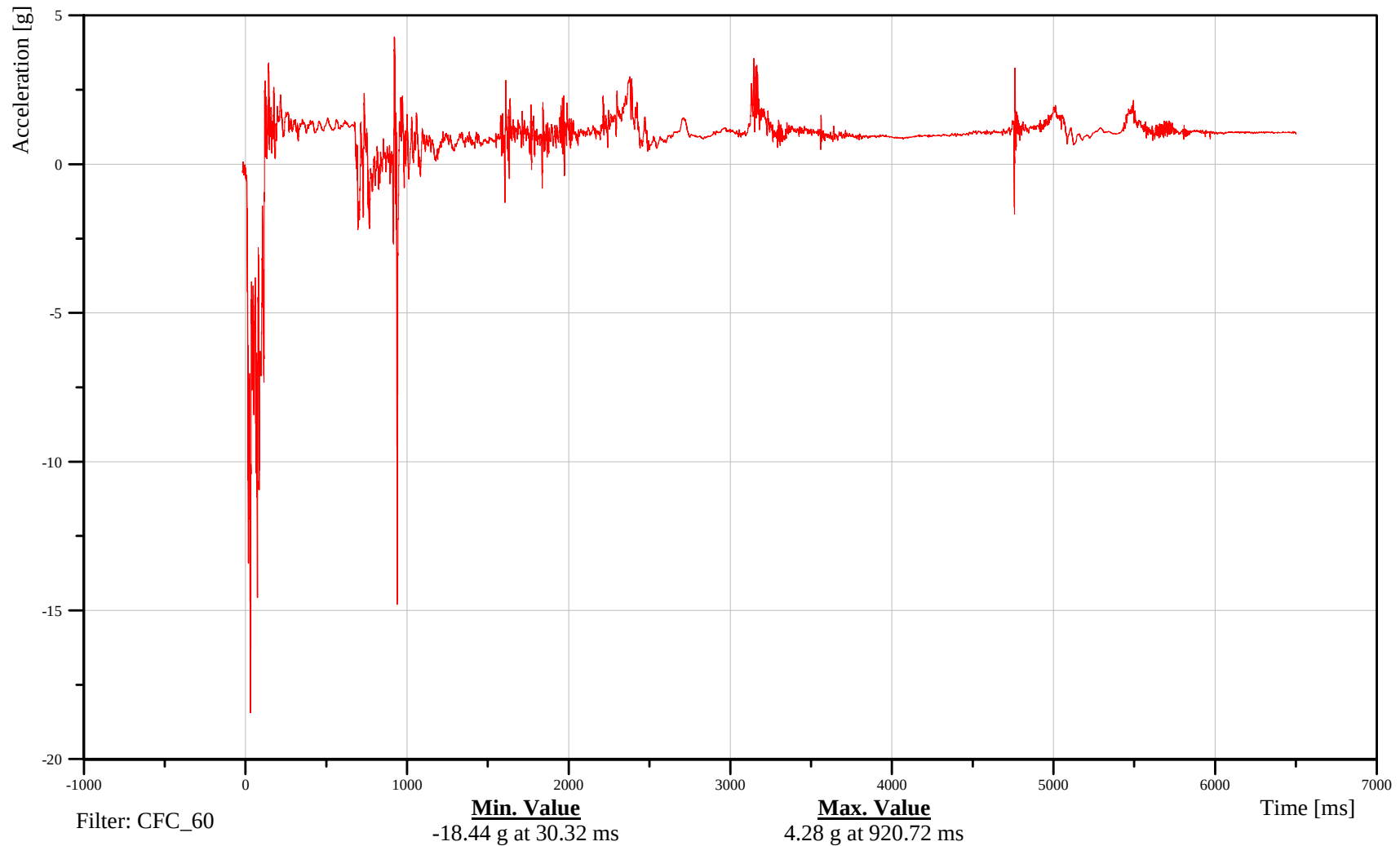
Time: 15:07

Customer: VRTC

10APILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-112

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

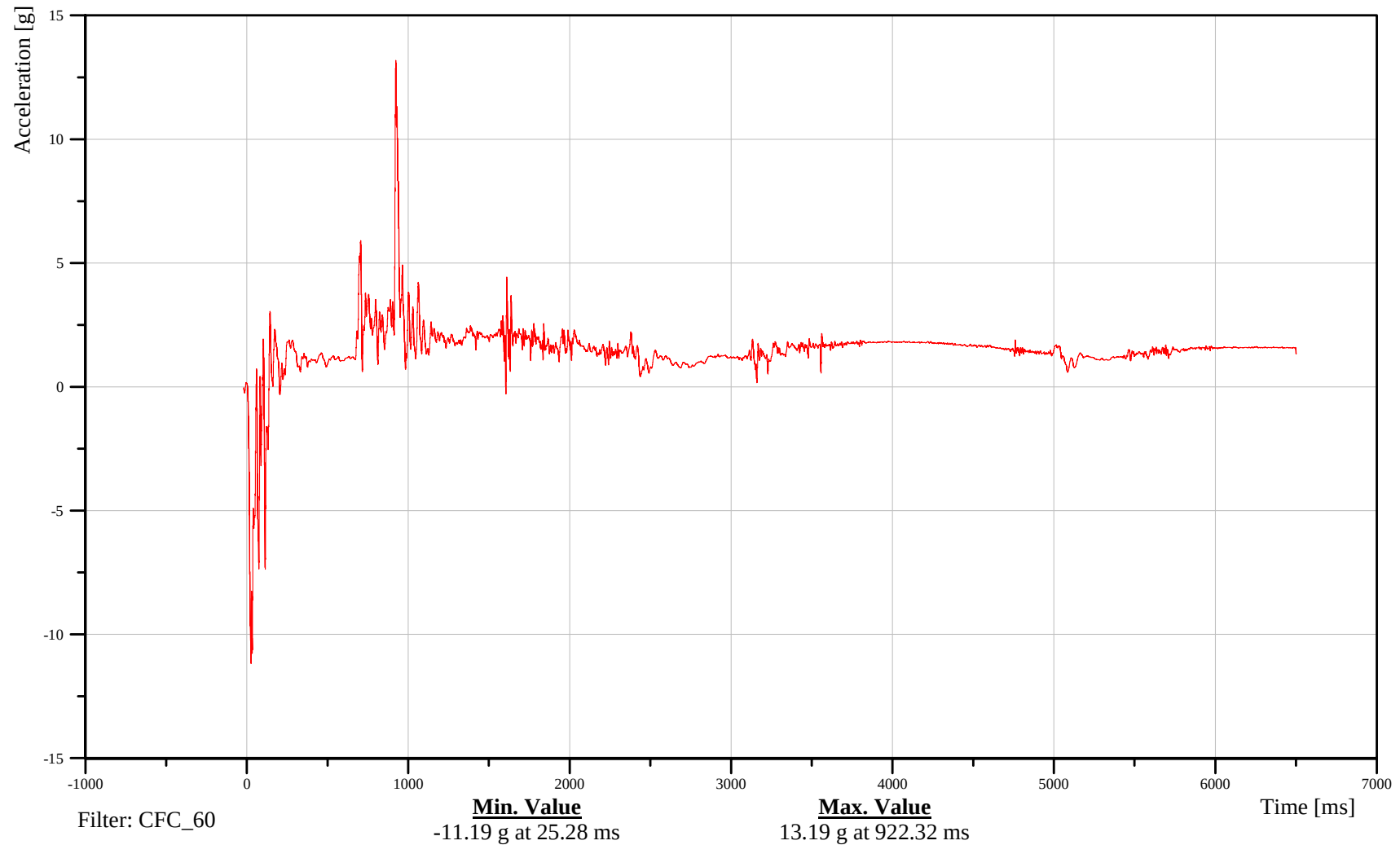
Time: 15:07

Customer: VRTC

10APILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-113

100413



Curb Trip Rollover 2007 Ford Expedition

Left A-Pillar Lower Resultant Acceleration

Date: 04/13/2010

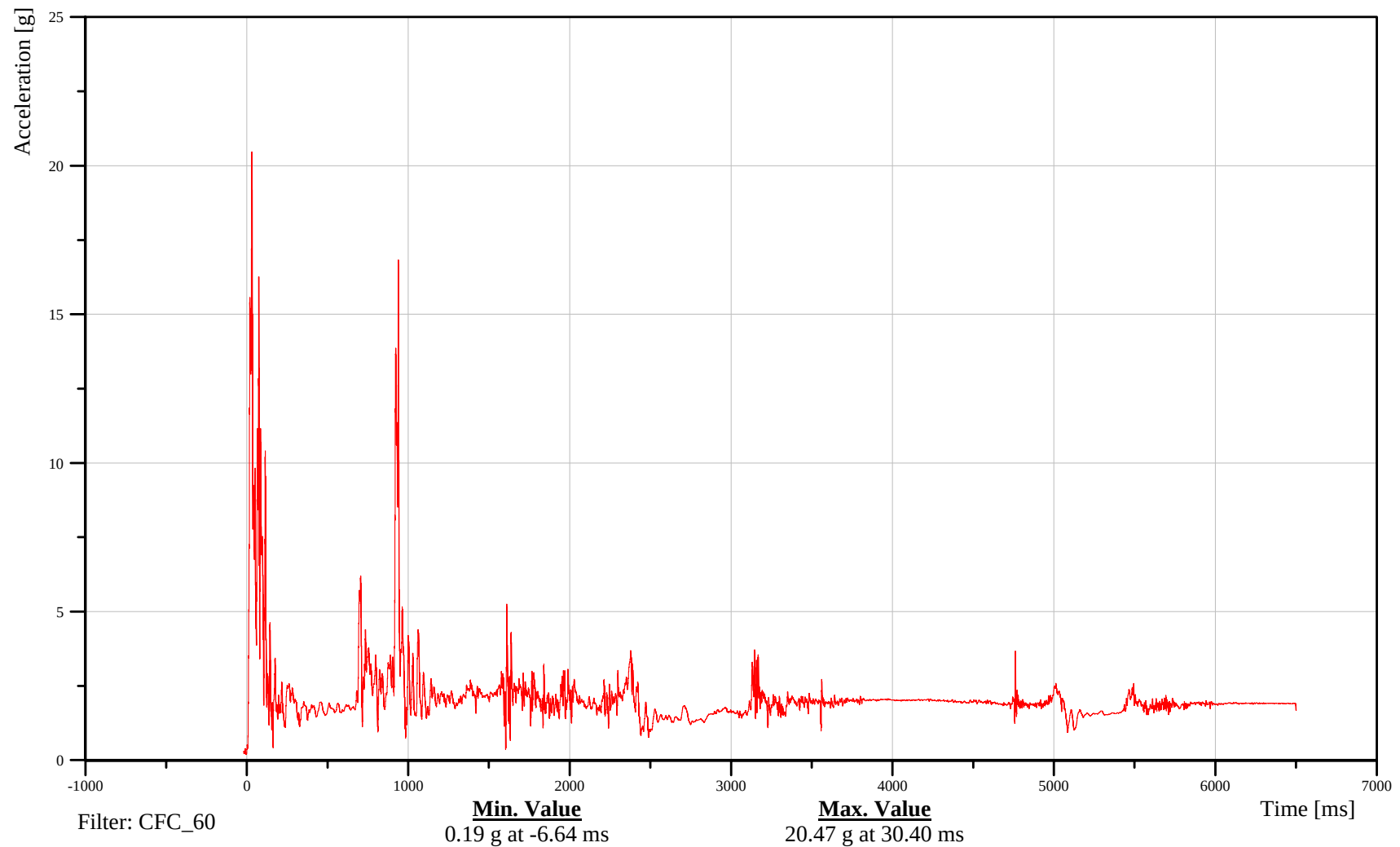
Time: 15:07

Customer: VRTC

10APILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-114

100413



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

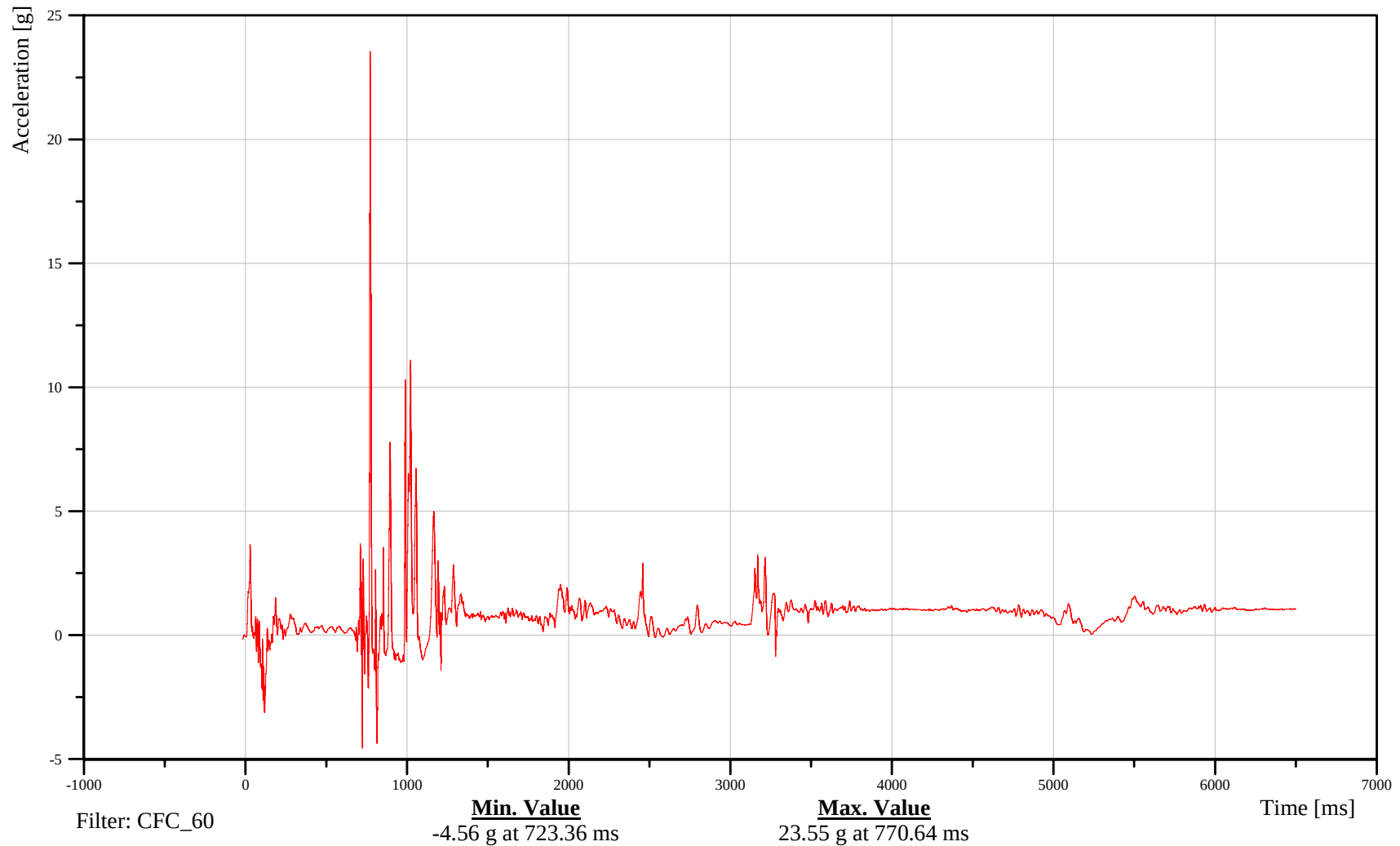
Time: 15:07

Customer: VRTC

10APILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-115

100413



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

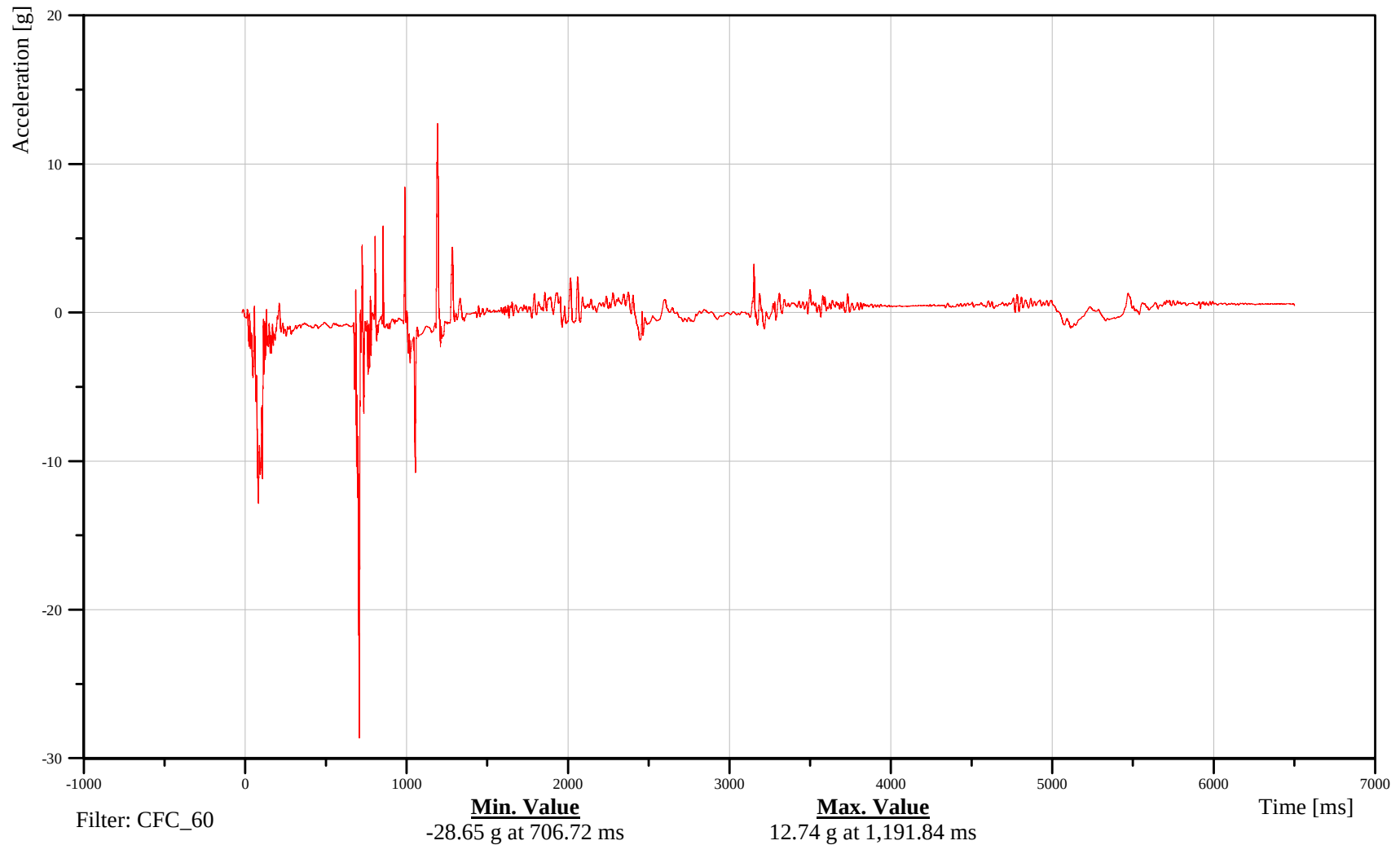
Time: 15:07

Customer: VRTC

10APILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-116

100413



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Upper Z-Axis Acceleration

Date: 04/13/2010

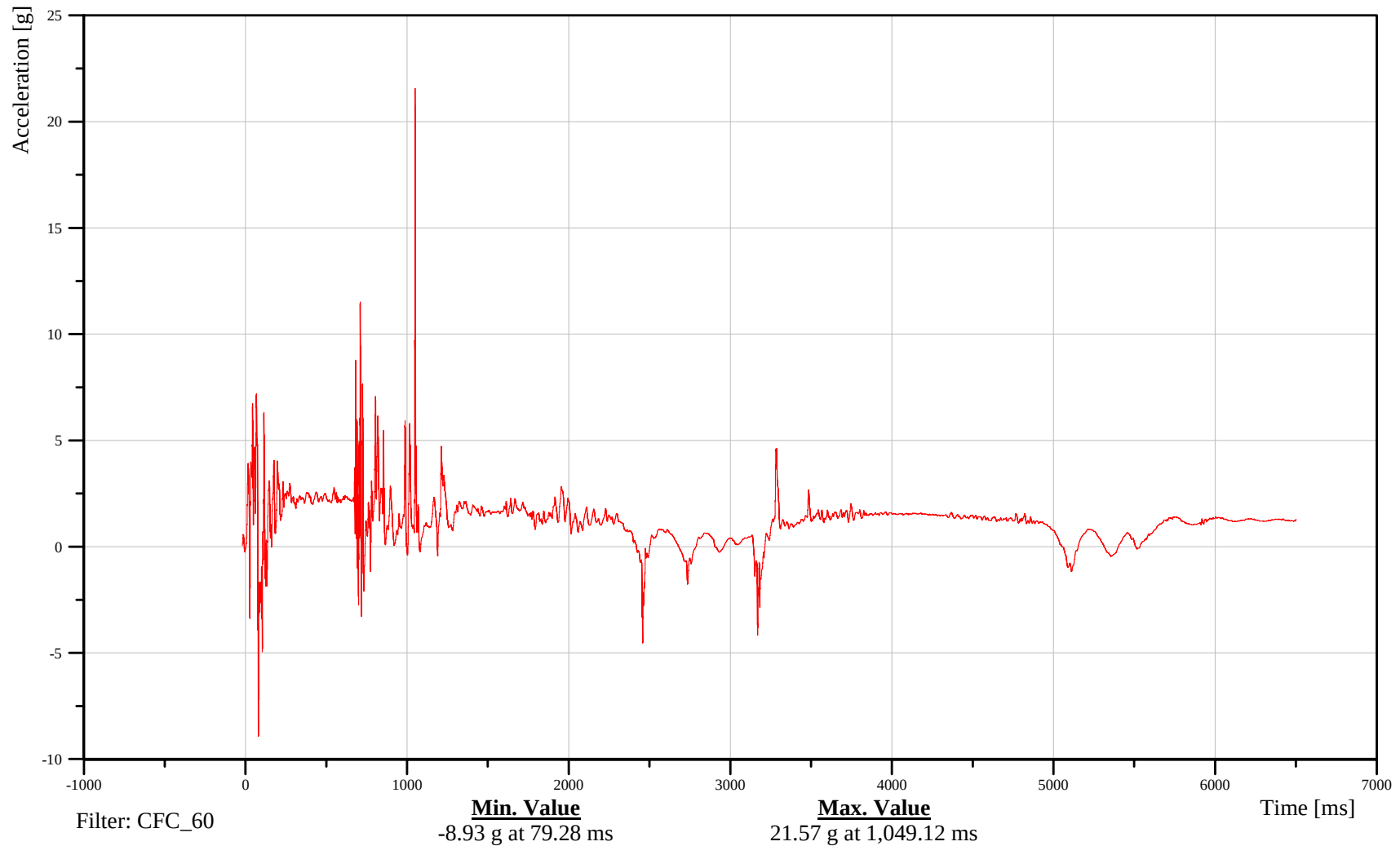
Time: 15:07

Customer: VRTC

10APILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-117

100413



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Upper Resultant Acceleration

Date: 04/13/2010

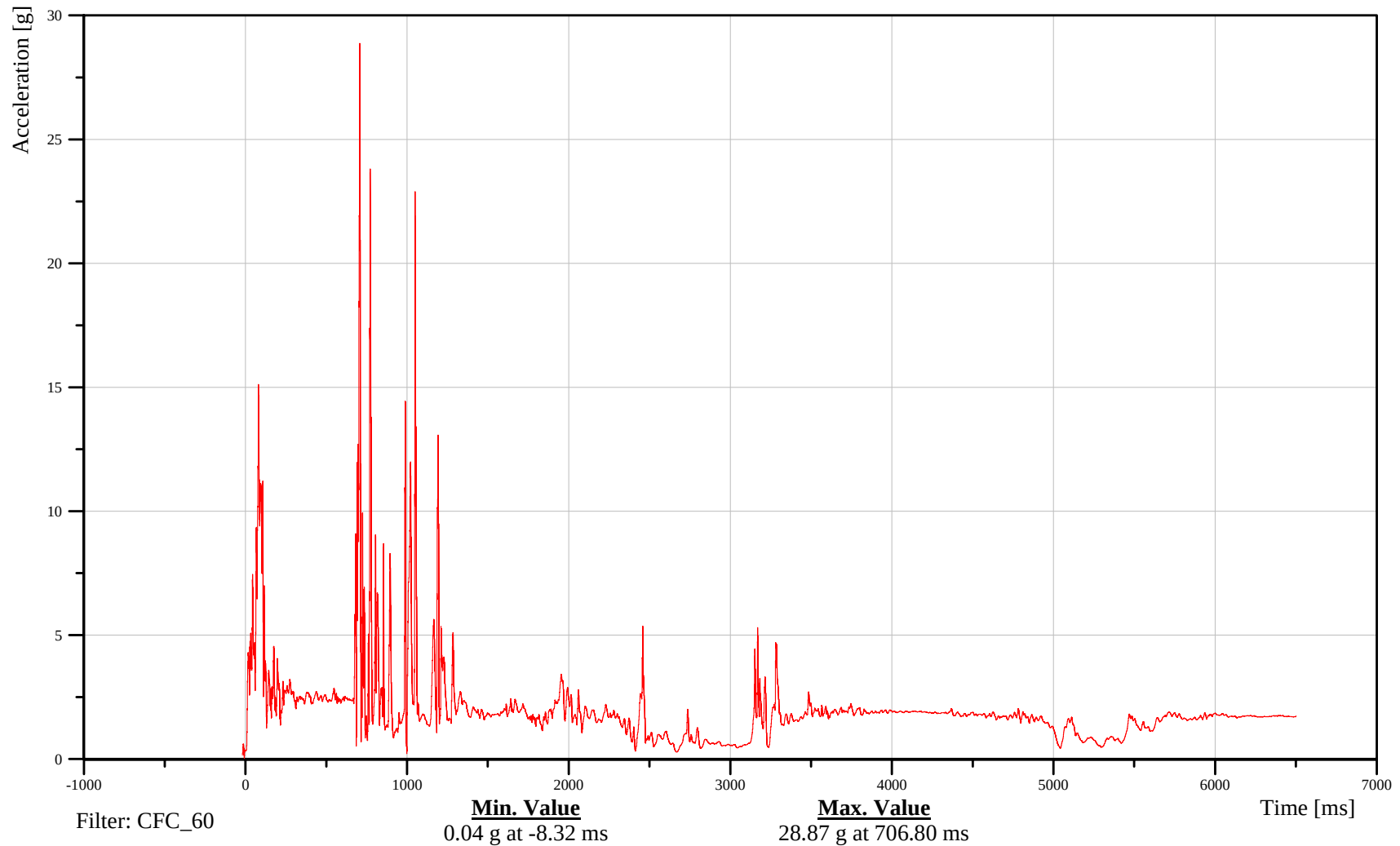
Time: 15:07

Customer: VRTC

10APILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-118

100413



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Lower X-Axis Acceleration

Date: 04/13/2010

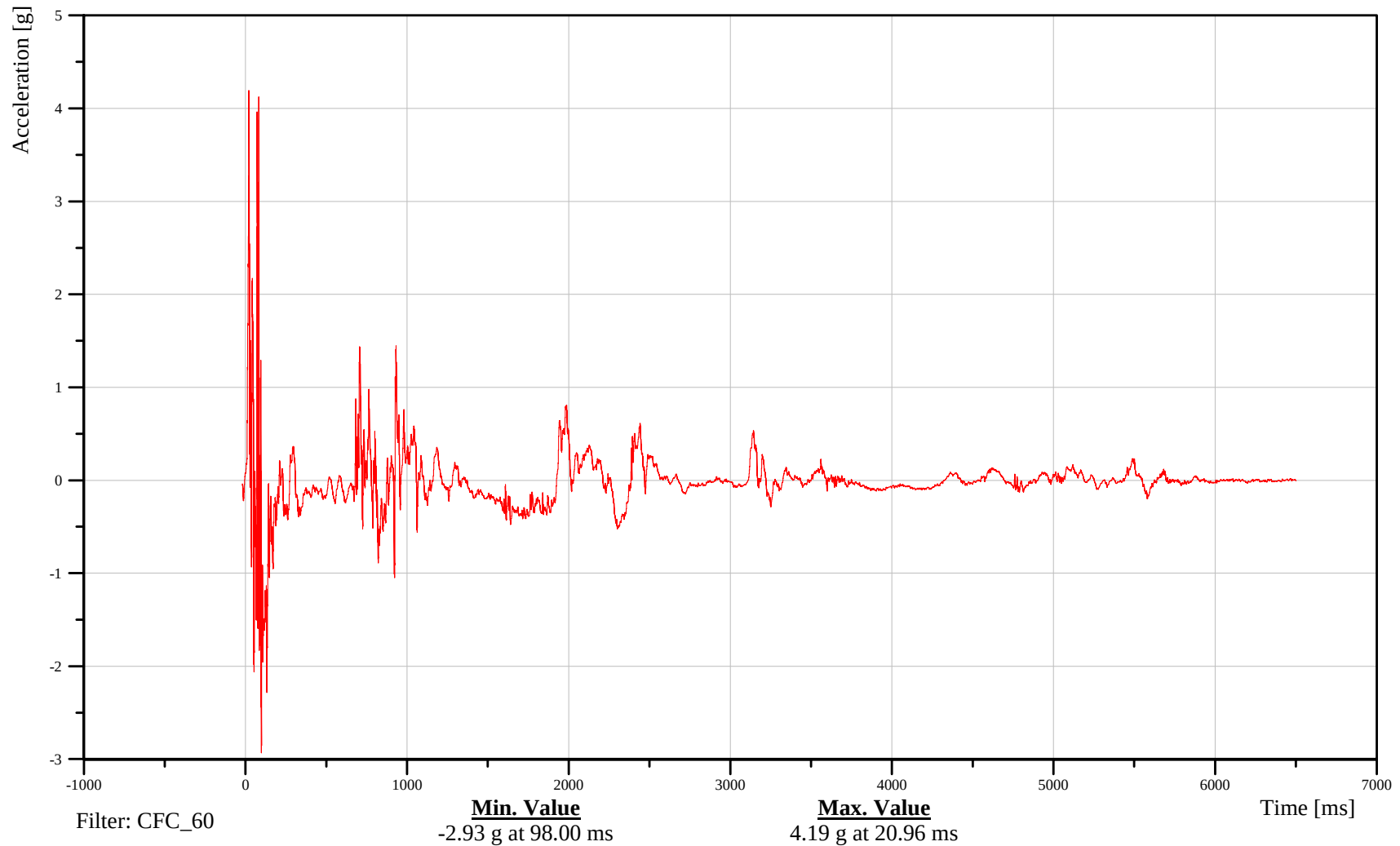
Time: 15:07

Customer: VRTC

10APILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-119

100413



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

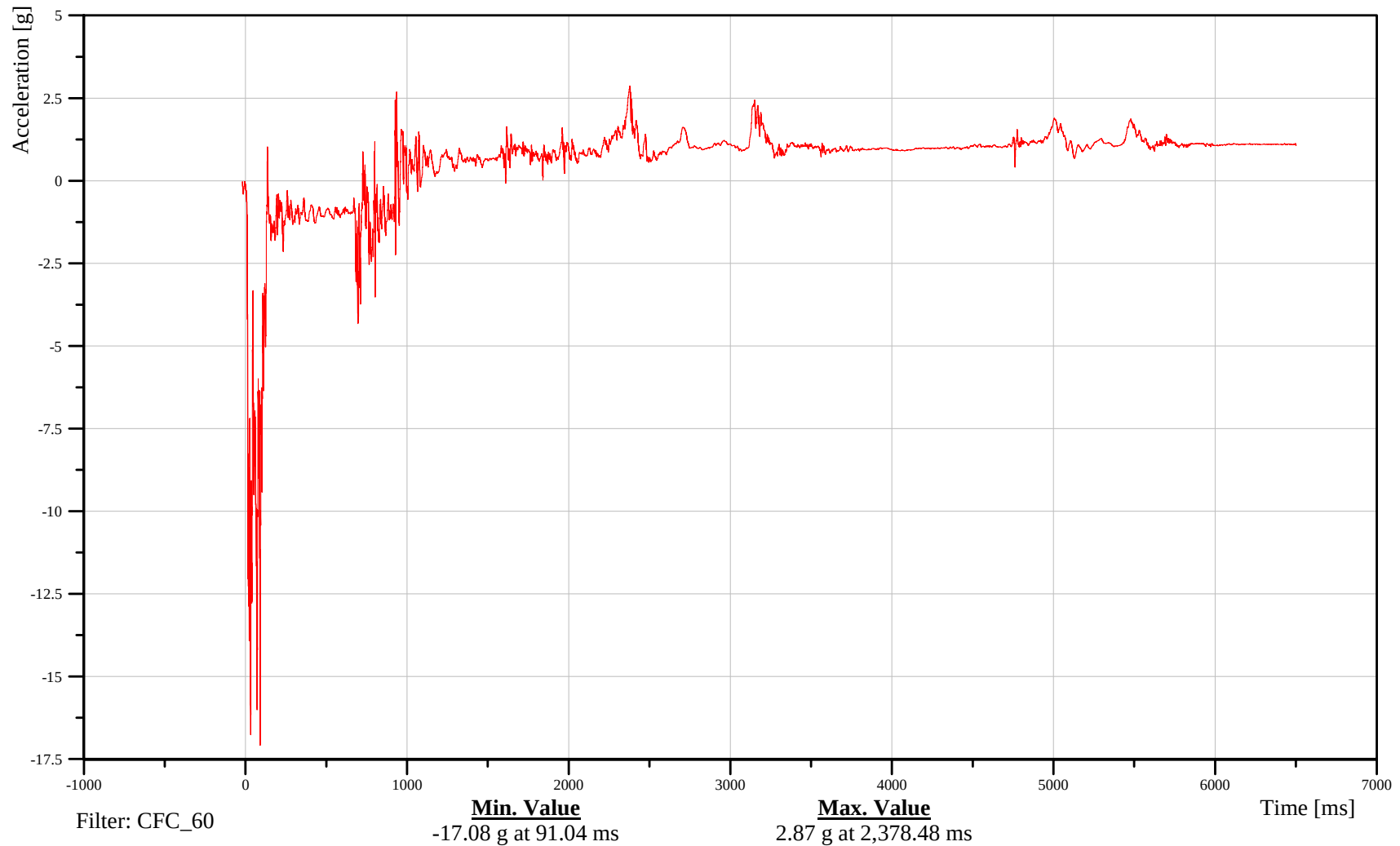
Time: 15:07

Customer: VRTC

10APILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-120

100413



Curb Trip Rollover 2007 Ford Expedition

Right A-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

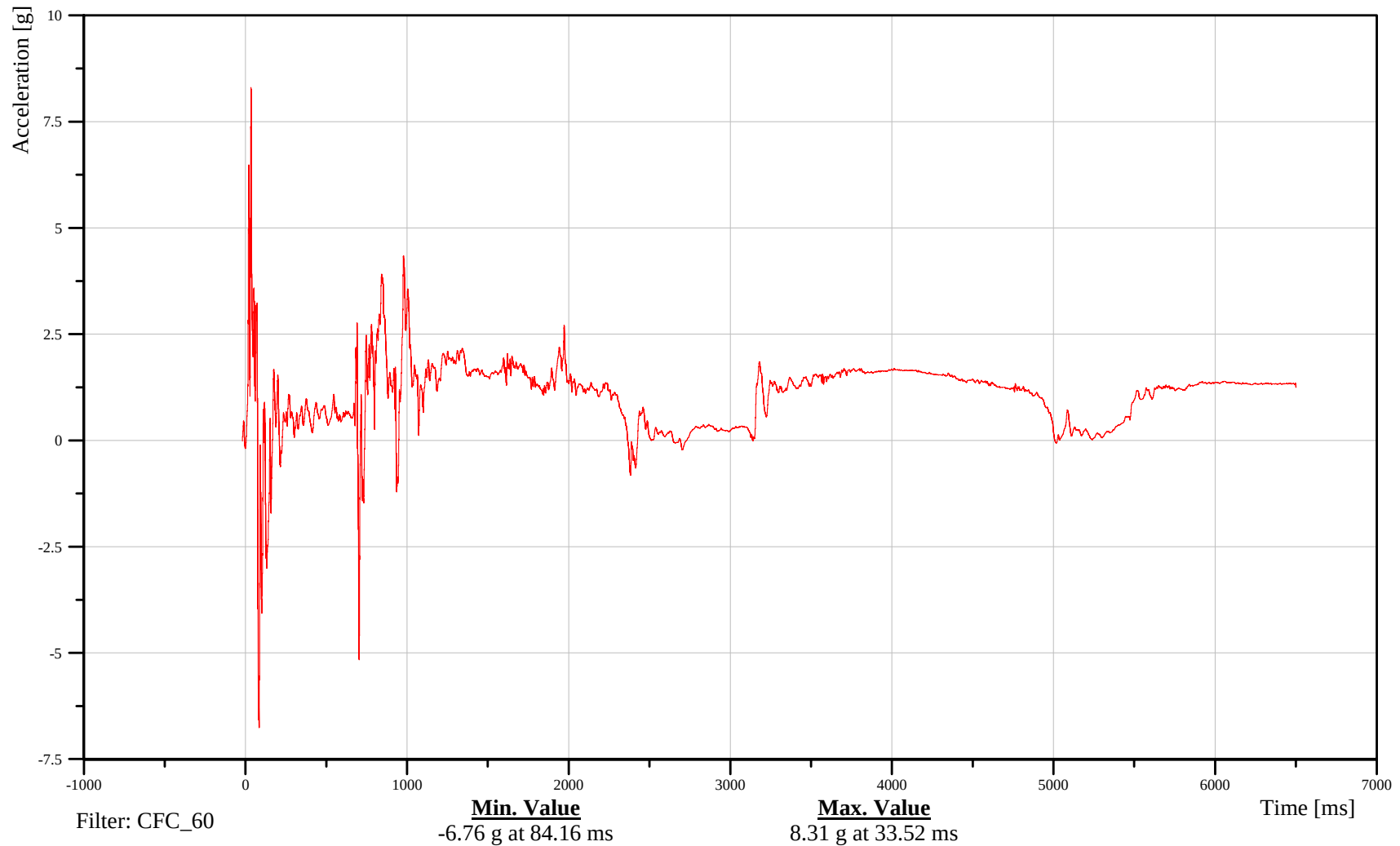
Time: 15:07

Customer: VRTC

10APILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-121

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right A-Pillar Lower Resultant Acceleration

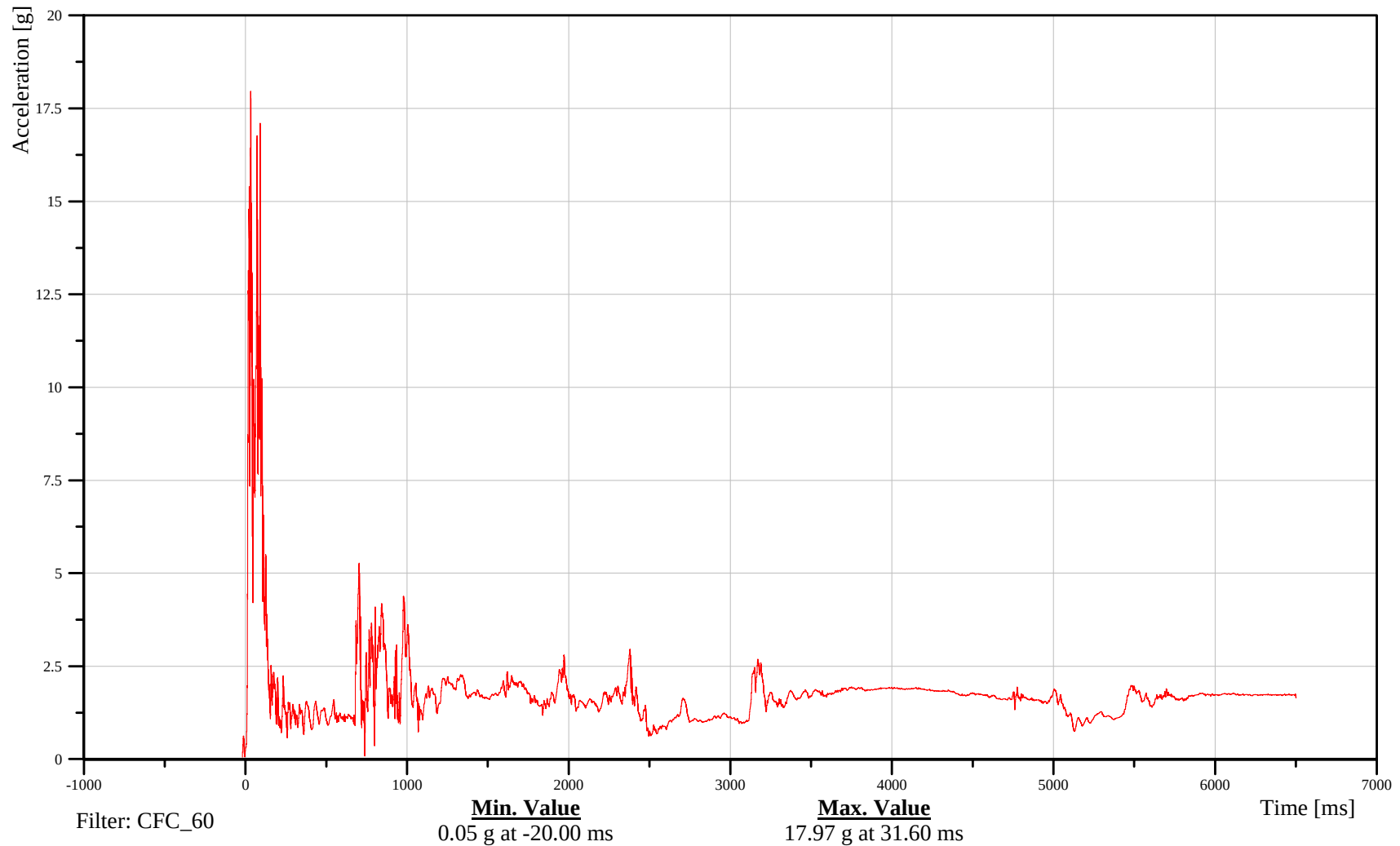
Time: 15:07

Customer: VRTC

10APILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-122

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

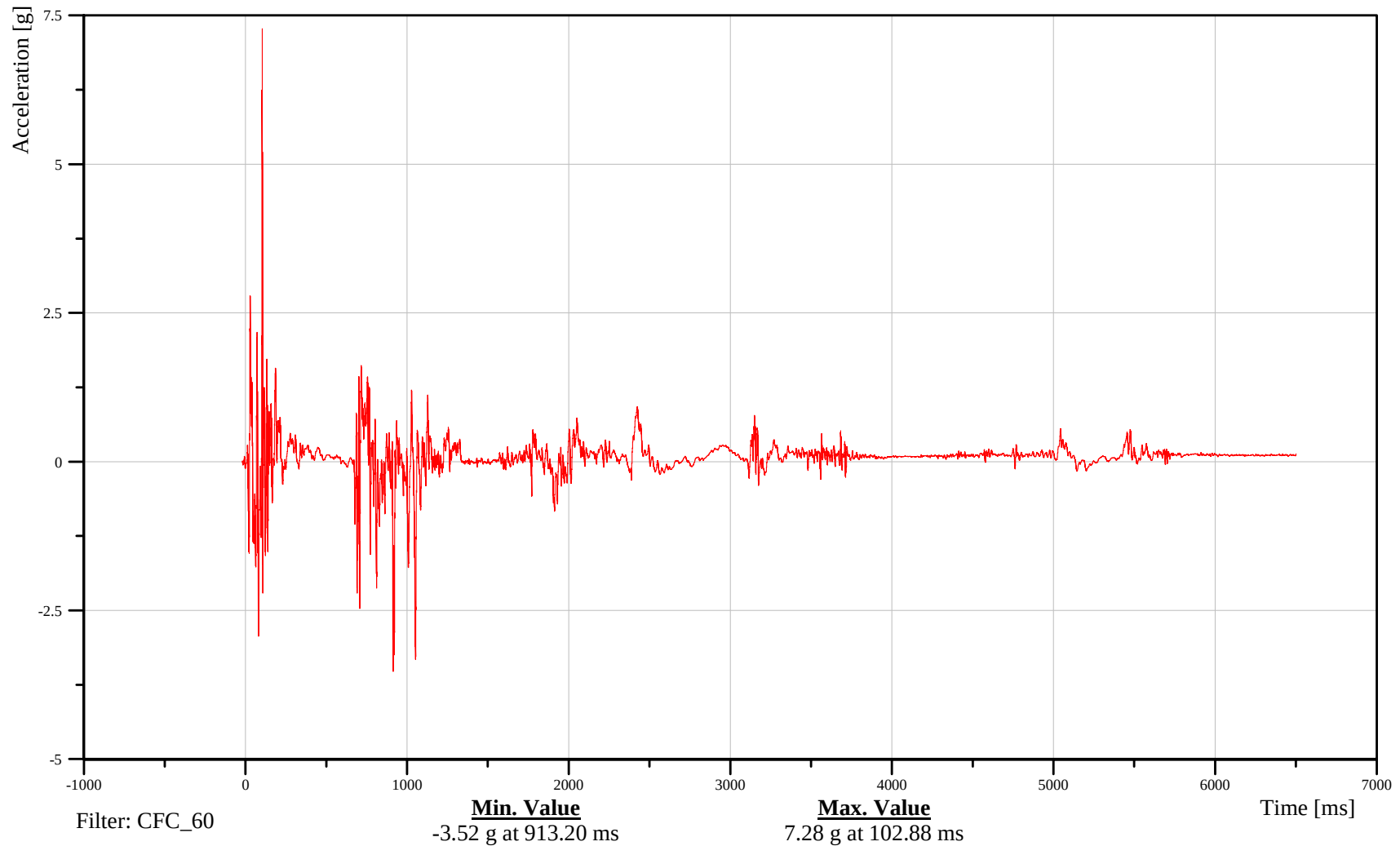
Time: 15:07

Customer: VRTC

10BPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-123

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

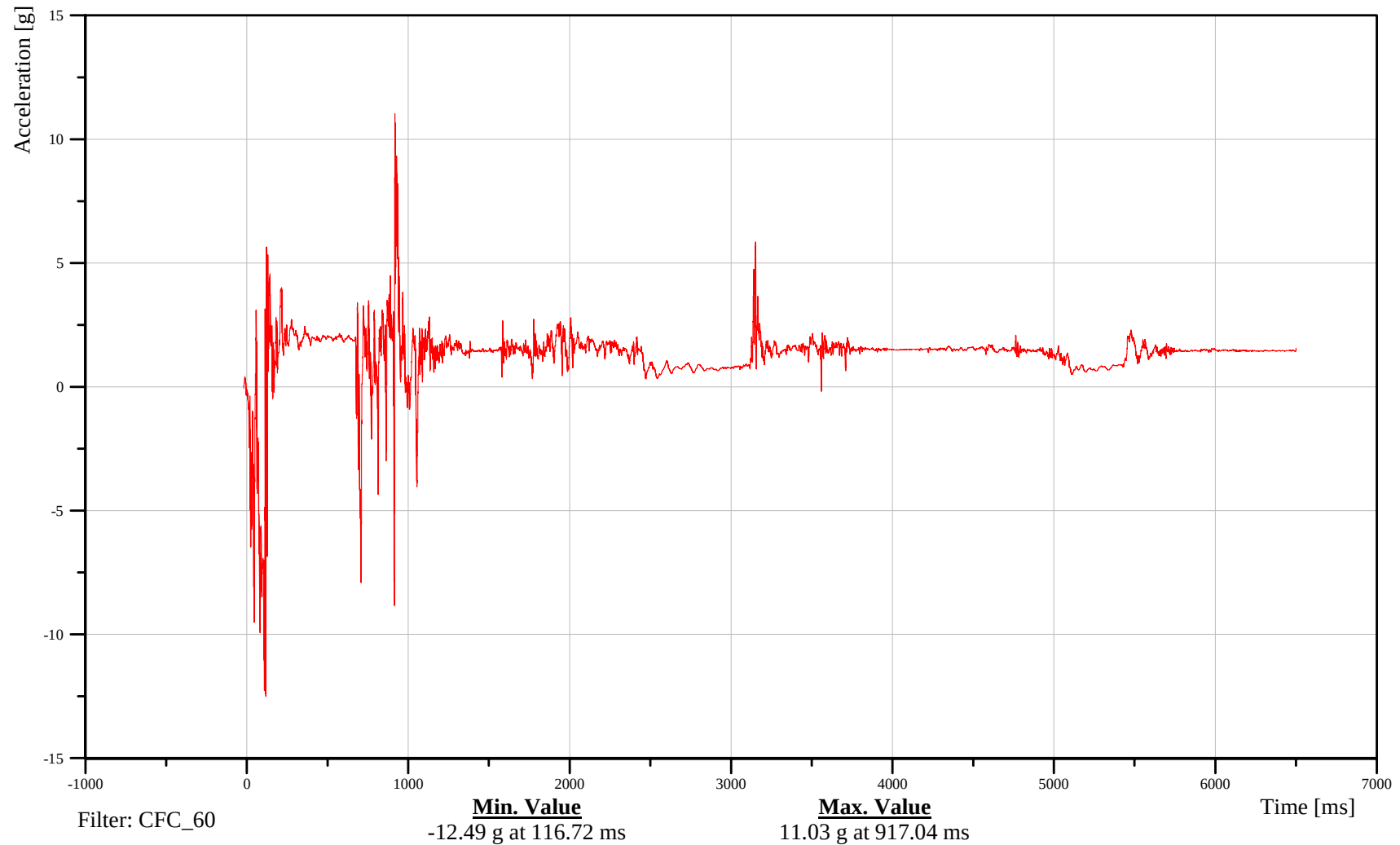
Time: 15:07

Customer: VRTC

10BPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-124

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Upper Z-Axis Acceleration

Date: 04/13/2010

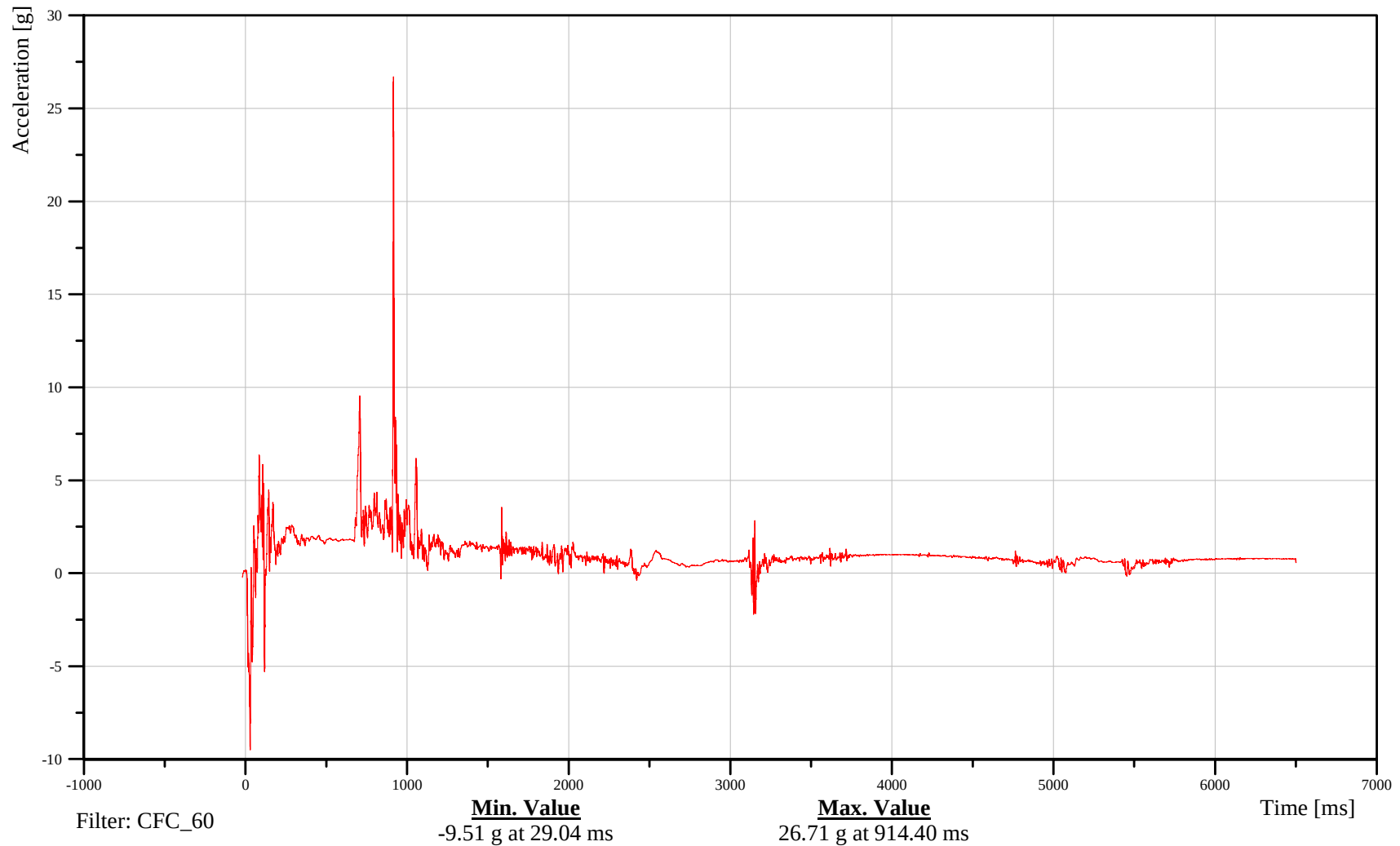
Time: 15:07

Customer: VRTC

10BPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-125

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Upper Resultant Acceleration

Date: 04/13/2010

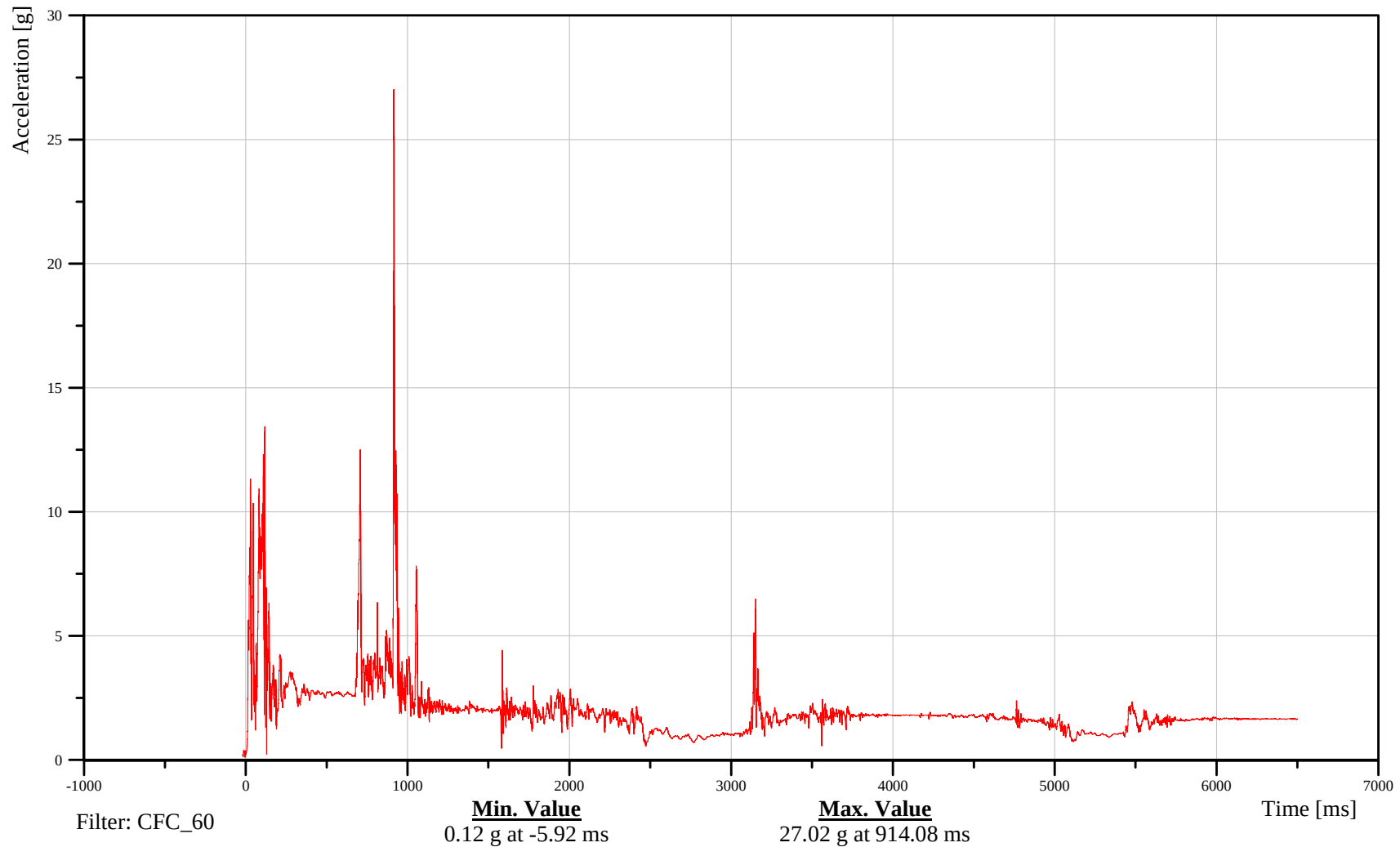
Time: 15:07

Customer: VRTC

10BPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-126

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower X-Axis Acceleration

Date: 04/13/2010

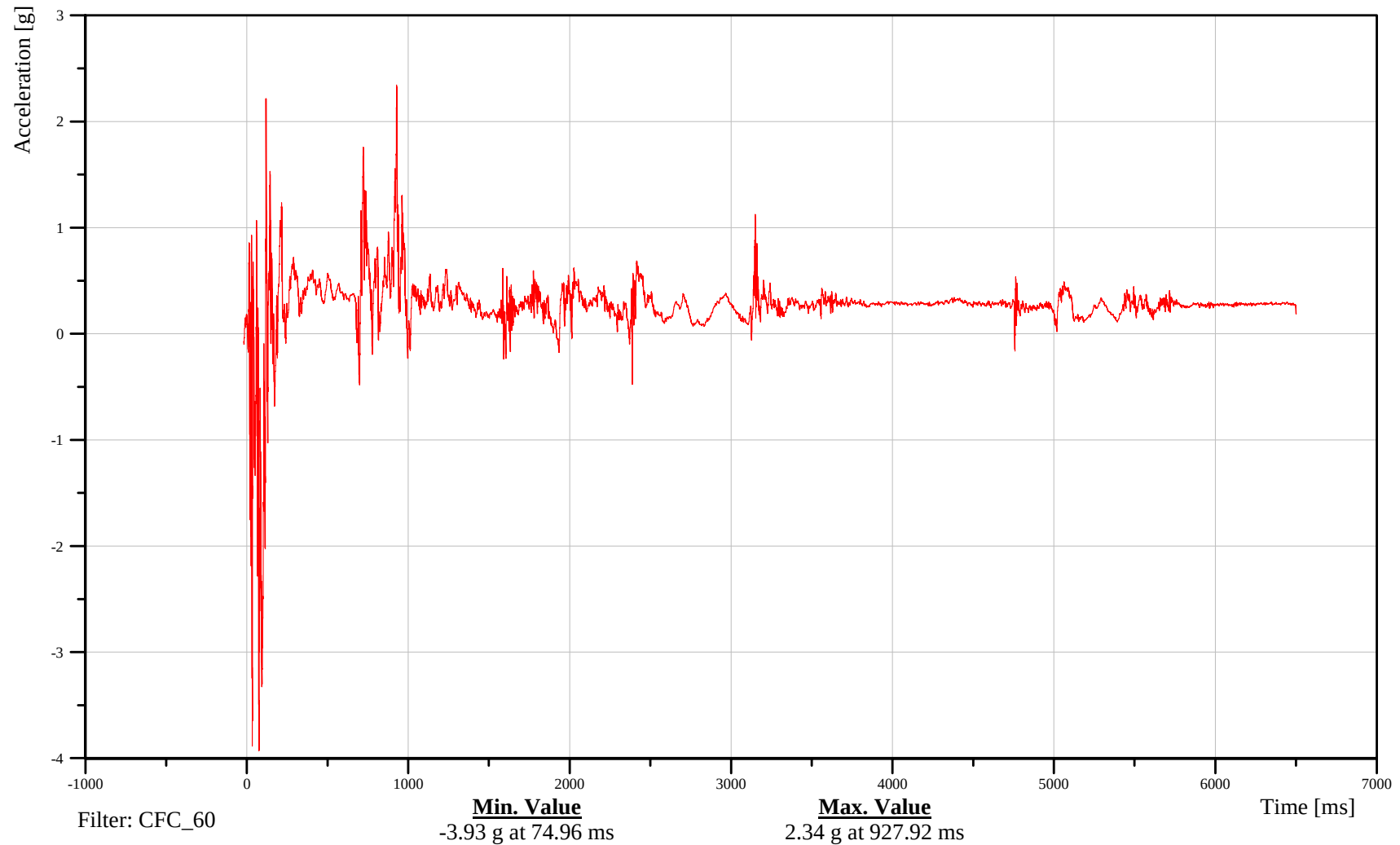
Time: 15:07

Customer: VRTC

10BPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-127

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

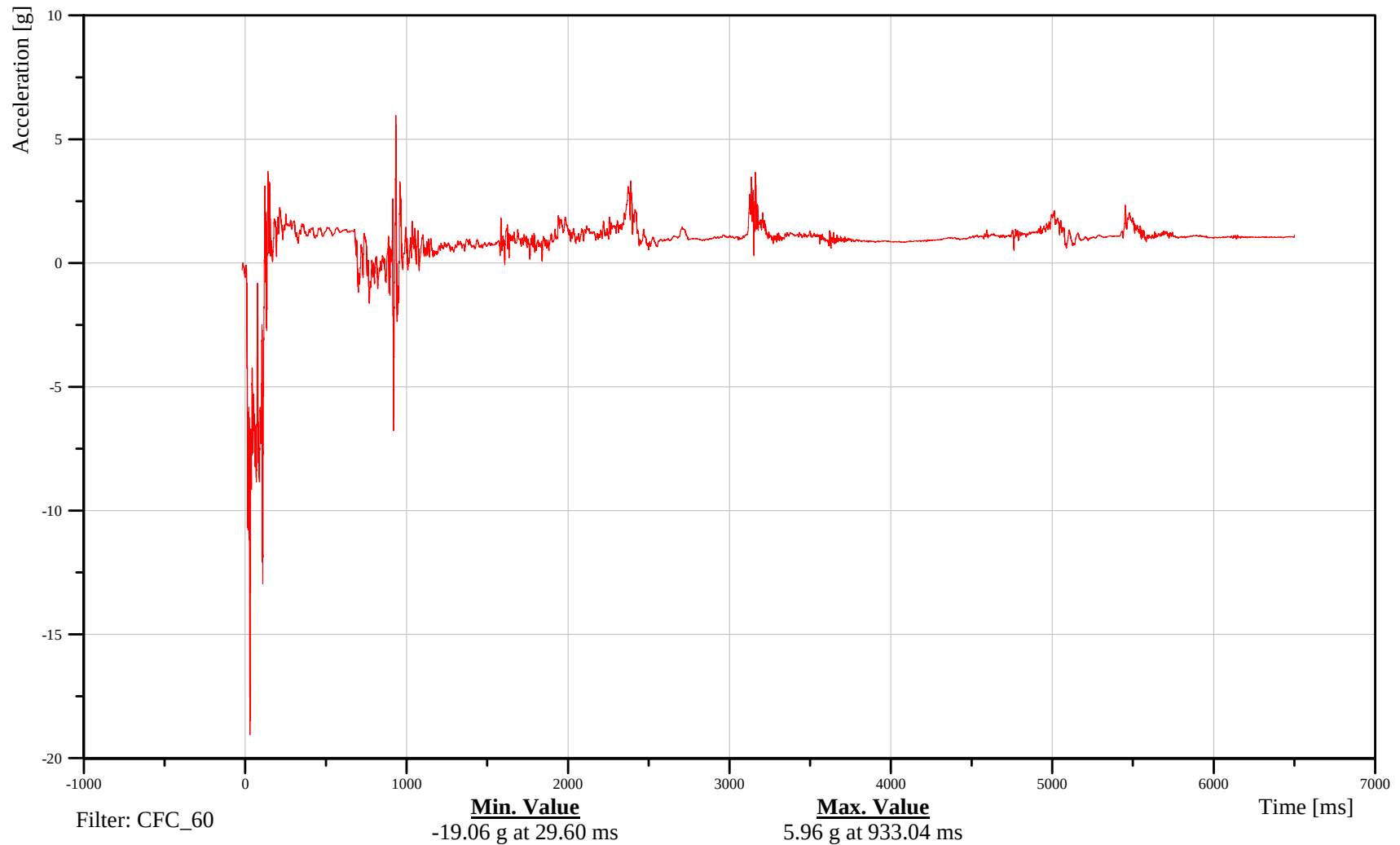
Time: 15:07

Customer: VRTC

10BPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-128

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

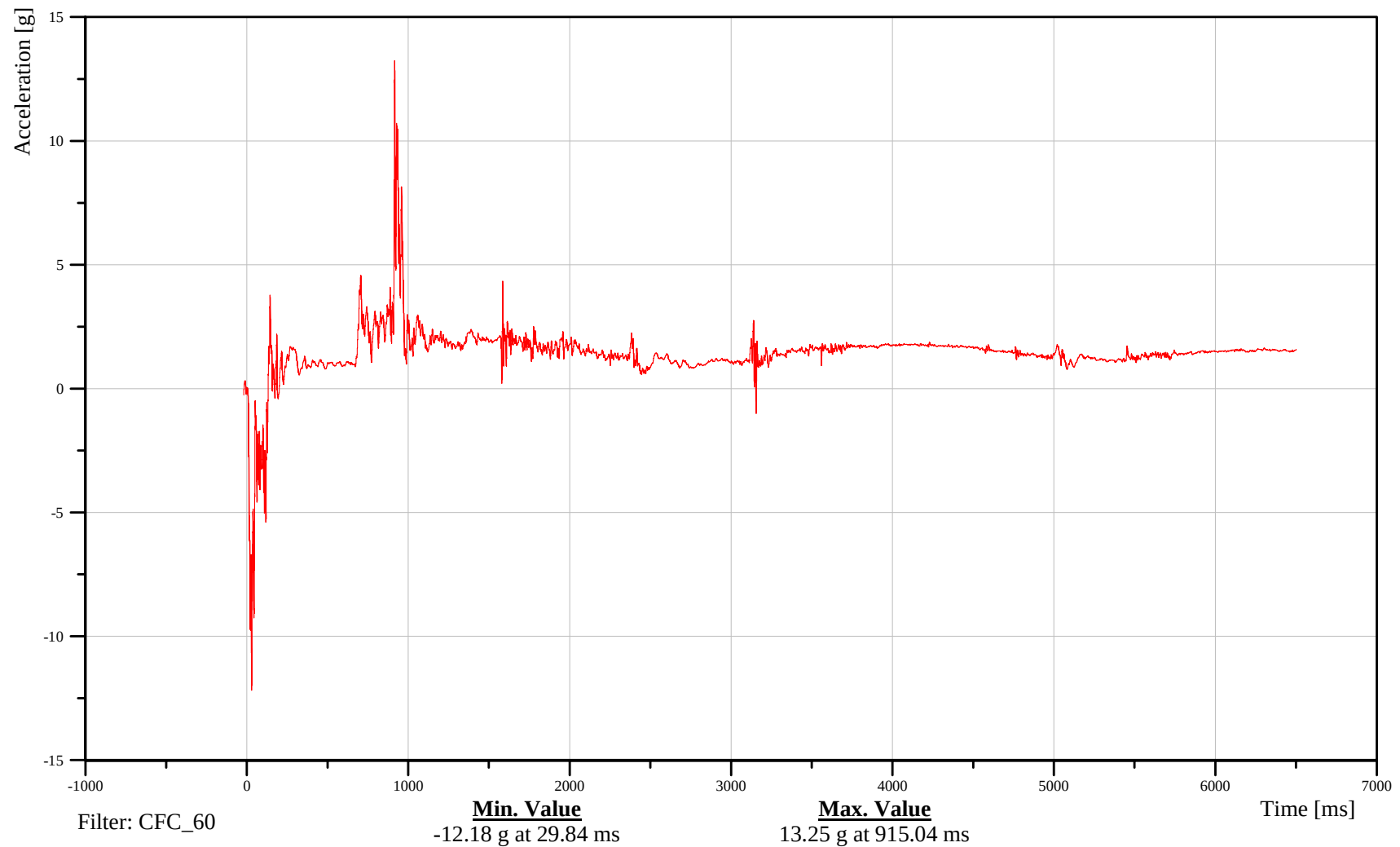
Time: 15:07

Customer: VRTC

10BPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-129

100413



Curb Trip Rollover 2007 Ford Expedition

Left B-Pillar Lower Resultant Acceleration

Date: 04/13/2010

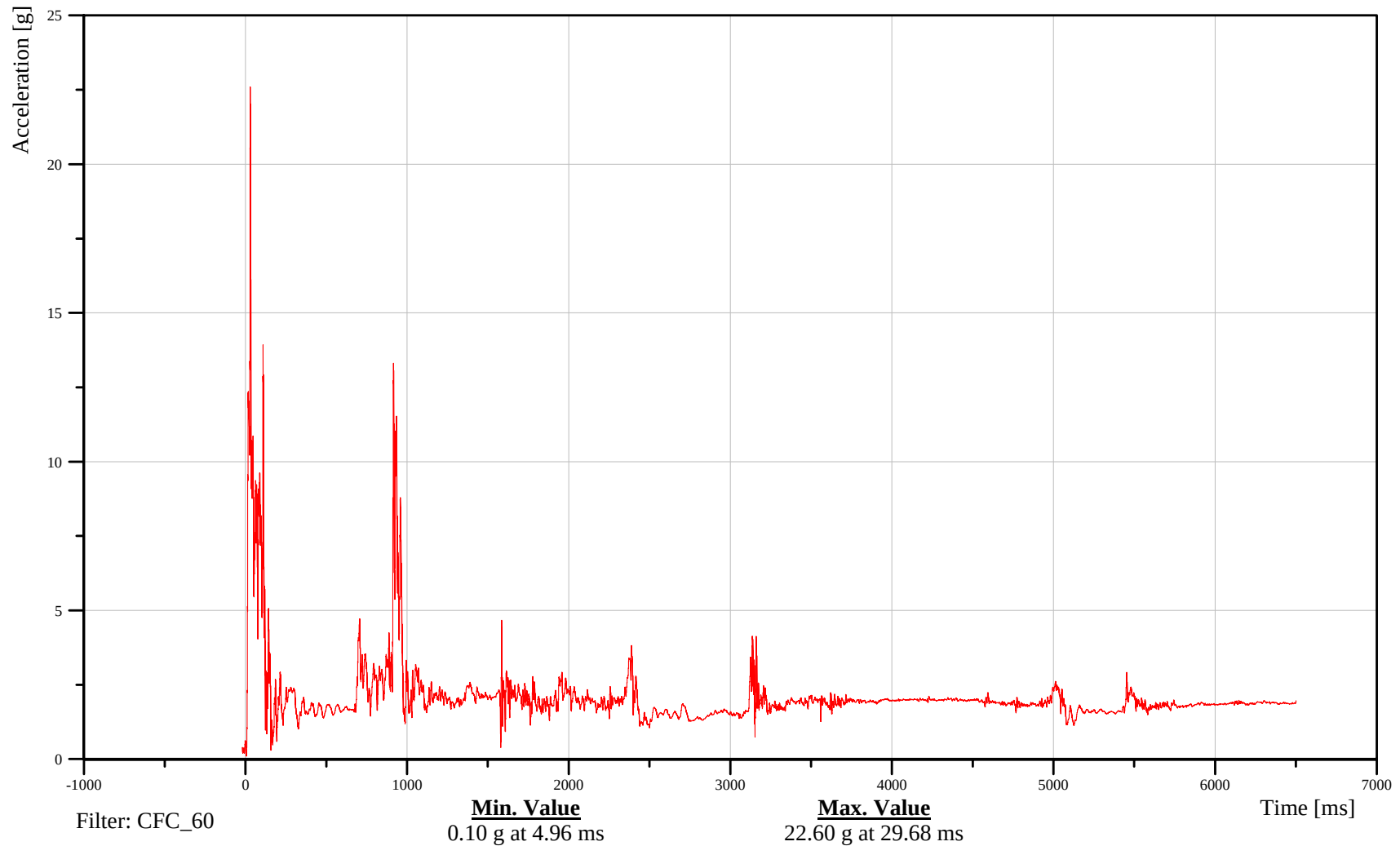
Time: 15:07

Customer: VRTC

10BPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-130

100413



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

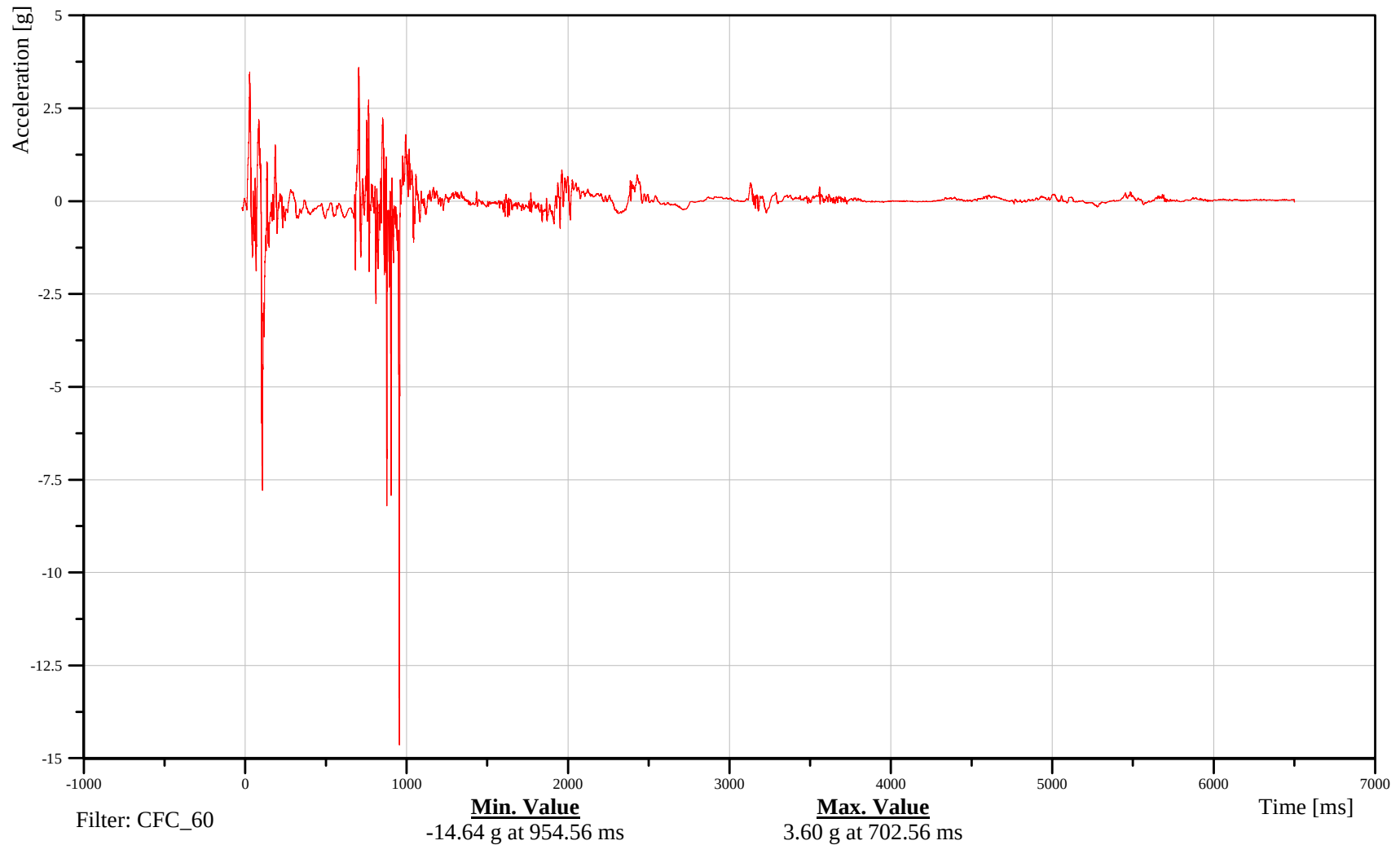
Time: 15:07

Customer: VRTC

10BPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-131

100413



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

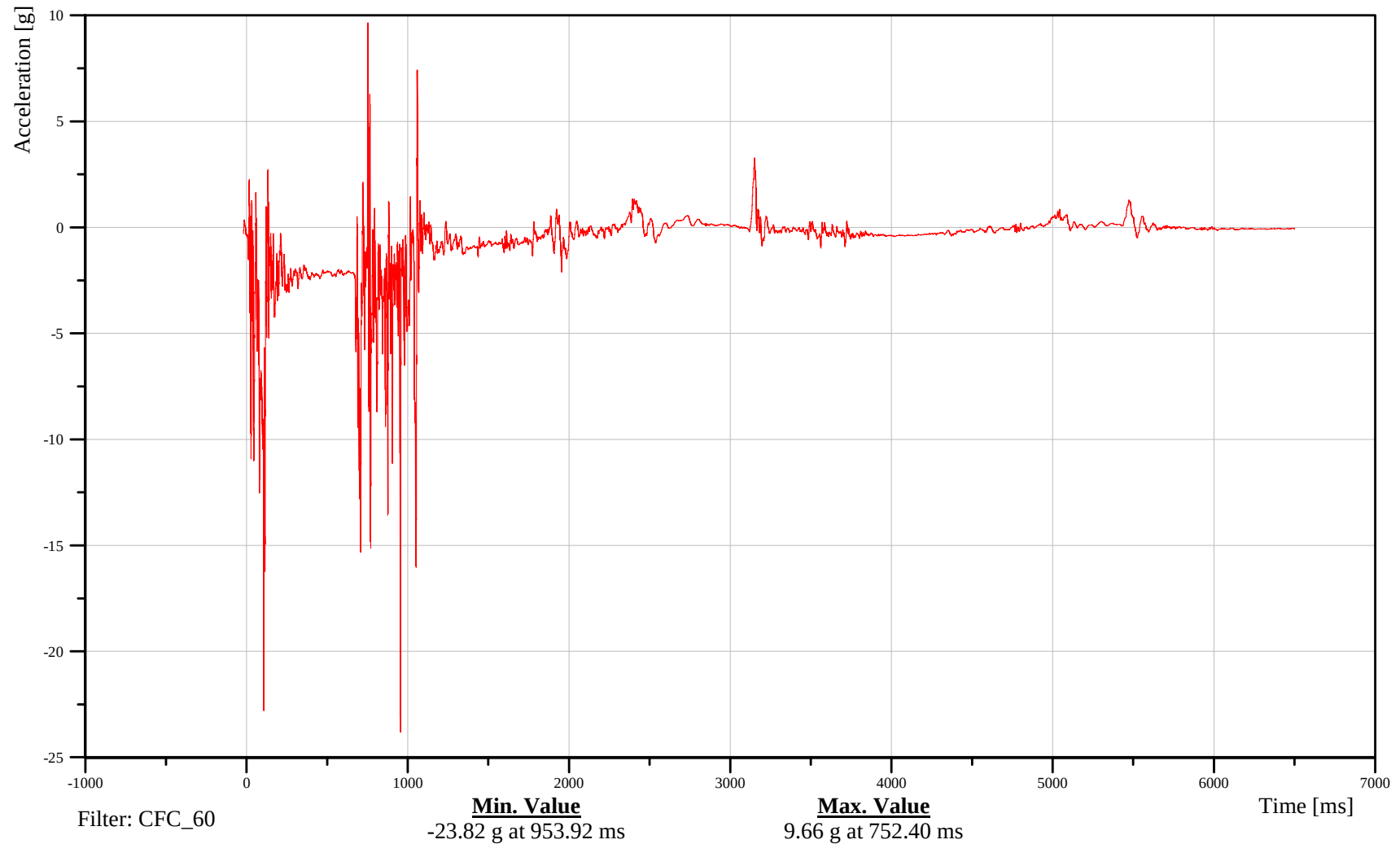
Time: 15:07

Customer: VRTC

10BPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-132

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right B-Pillar Upper Z-Axis Acceleration

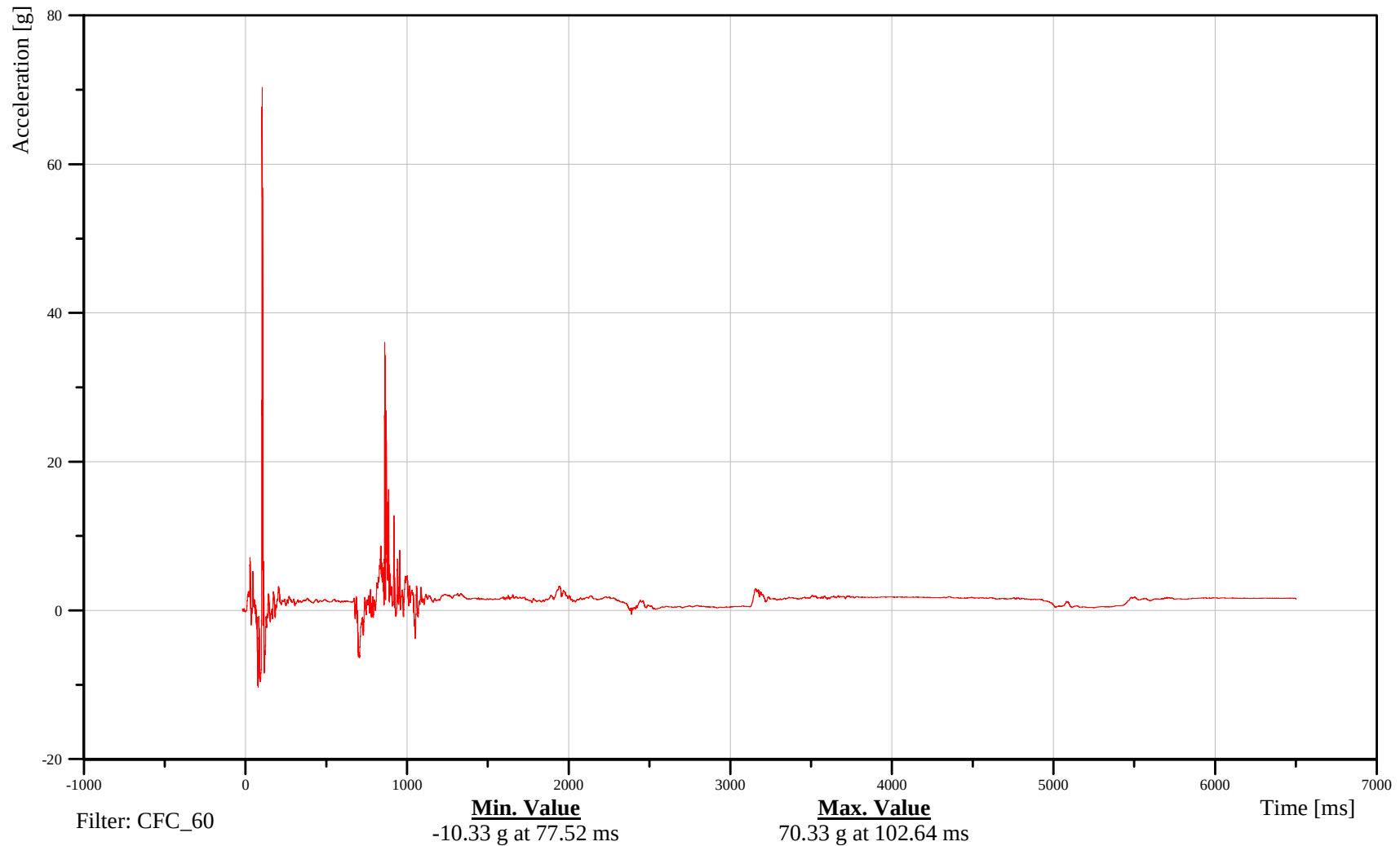
Time: 15:07

Customer: VRTC

10BPILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-133

100413



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Upper Resultant Acceleration

Date: 04/13/2010

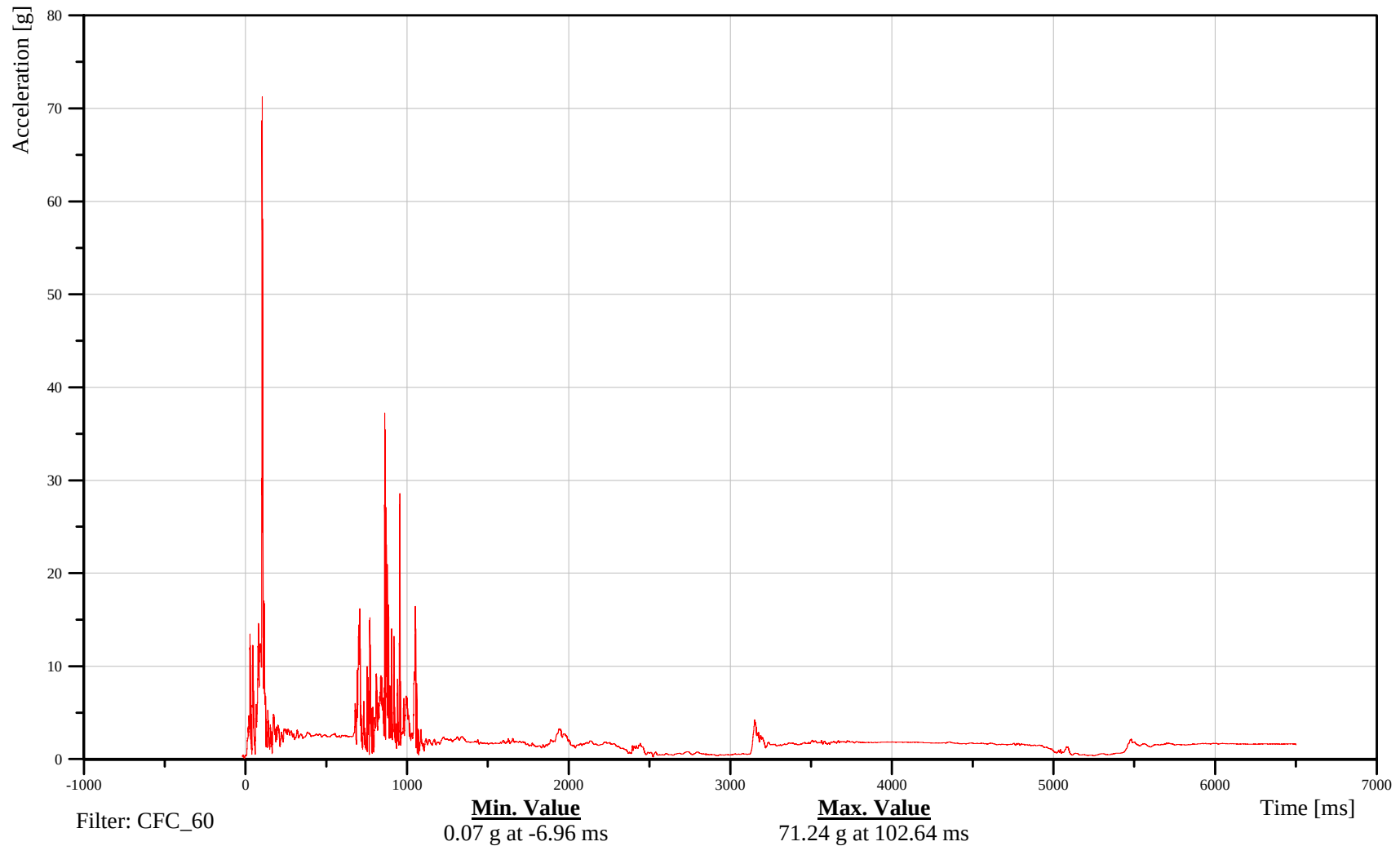
Time: 15:07

Customer: VRTC

10BPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-134

100413



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Lower X-Axis Acceleration

Date: 04/13/2010

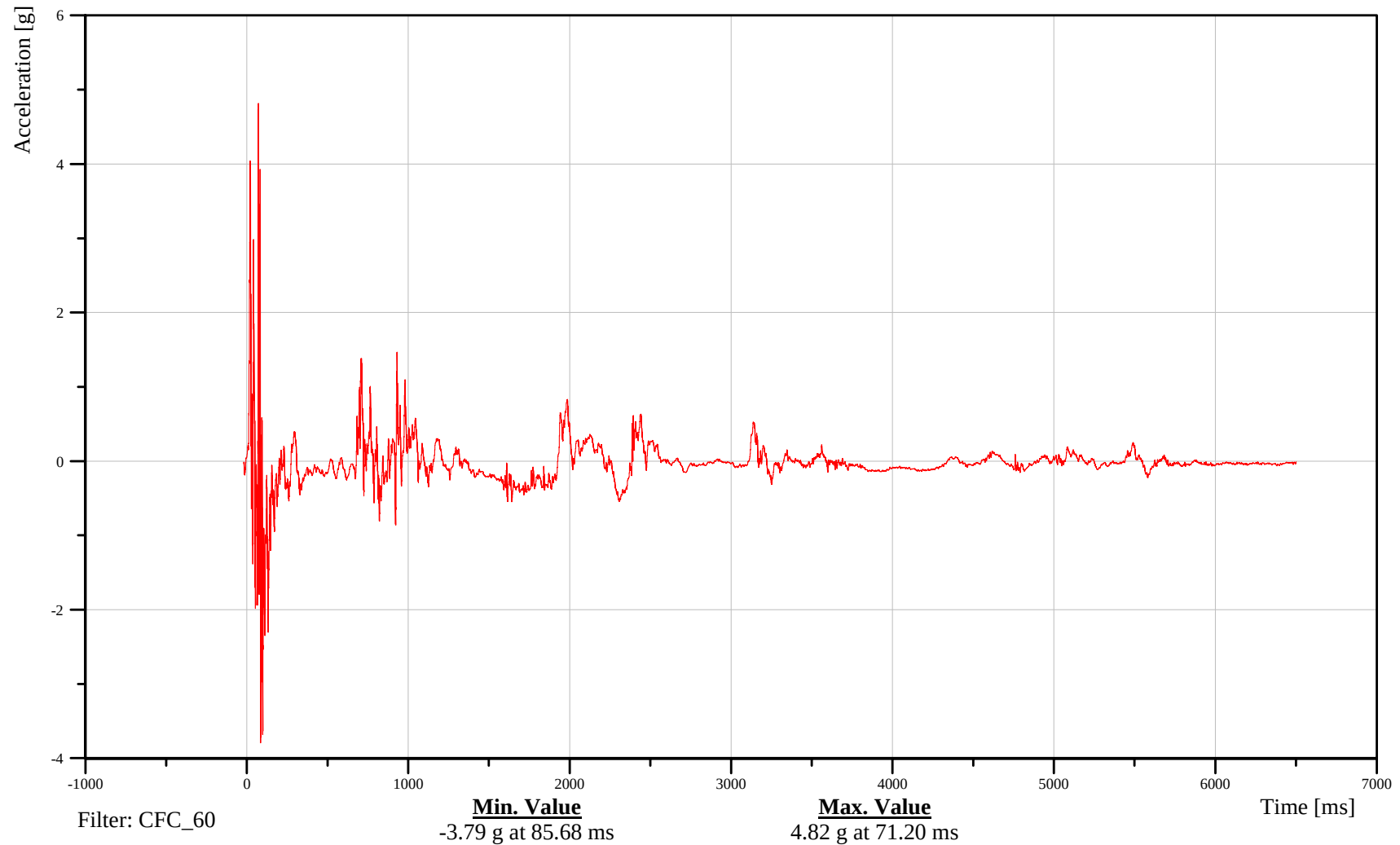
Time: 15:07

Customer: VRTC

10BPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-135

100413



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

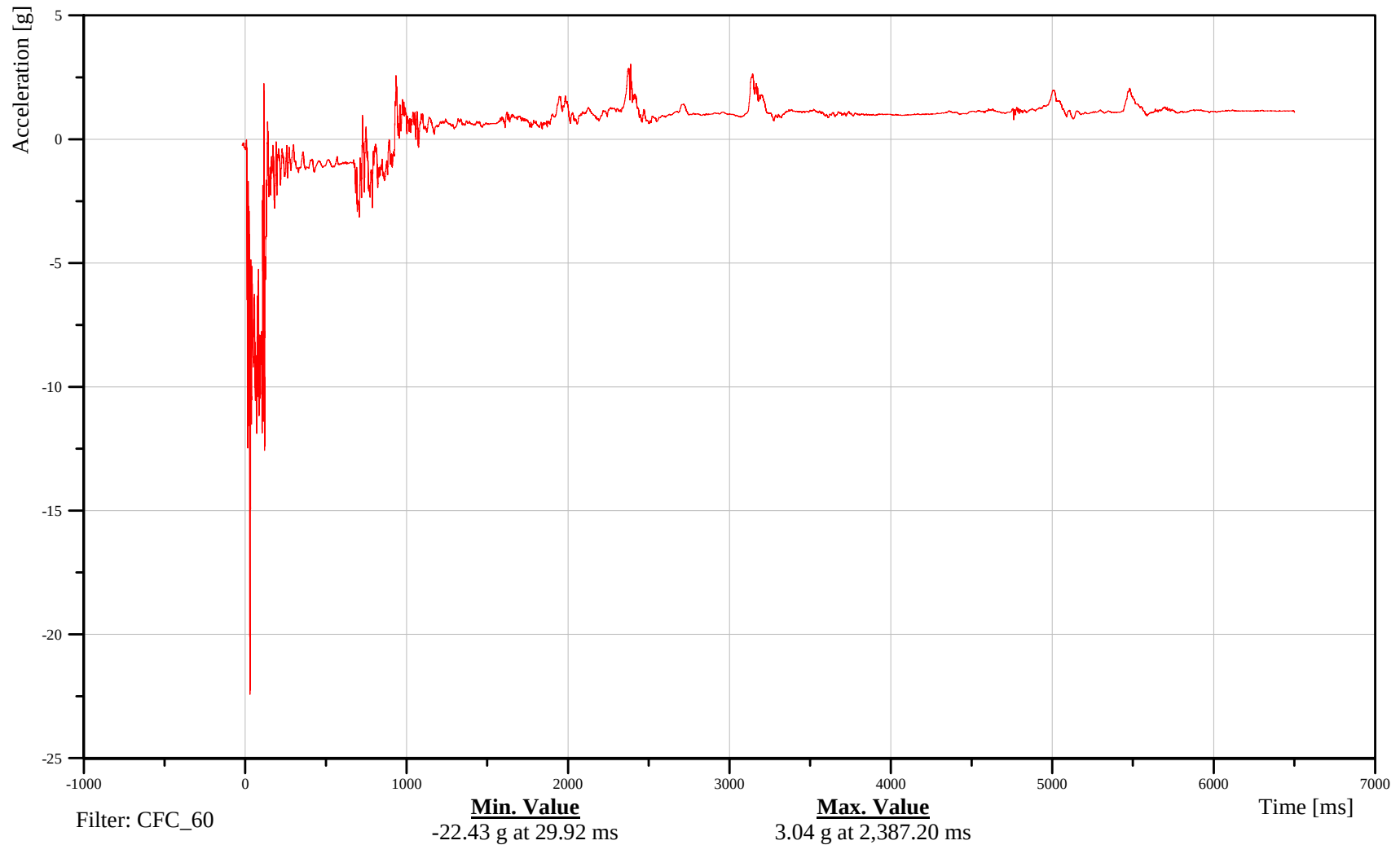
Time: 15:07

Customer: VRTC

10BPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-136

100413



Curb Trip Rollover 2007 Ford Expedition

Right B-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

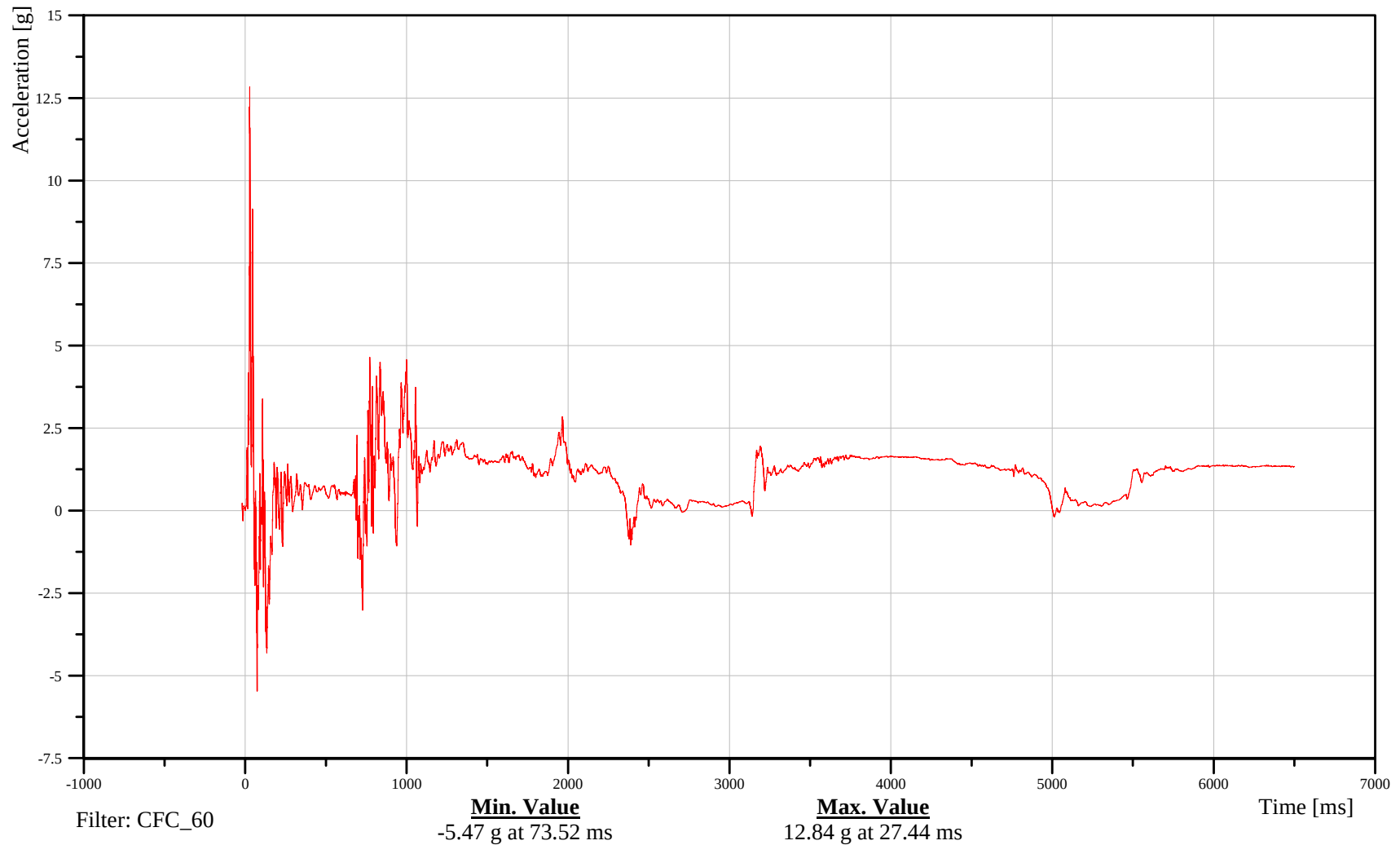
Time: 15:07

Customer: VRTC

10BPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-137

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right B-Pillar Lower Resultant Acceleration

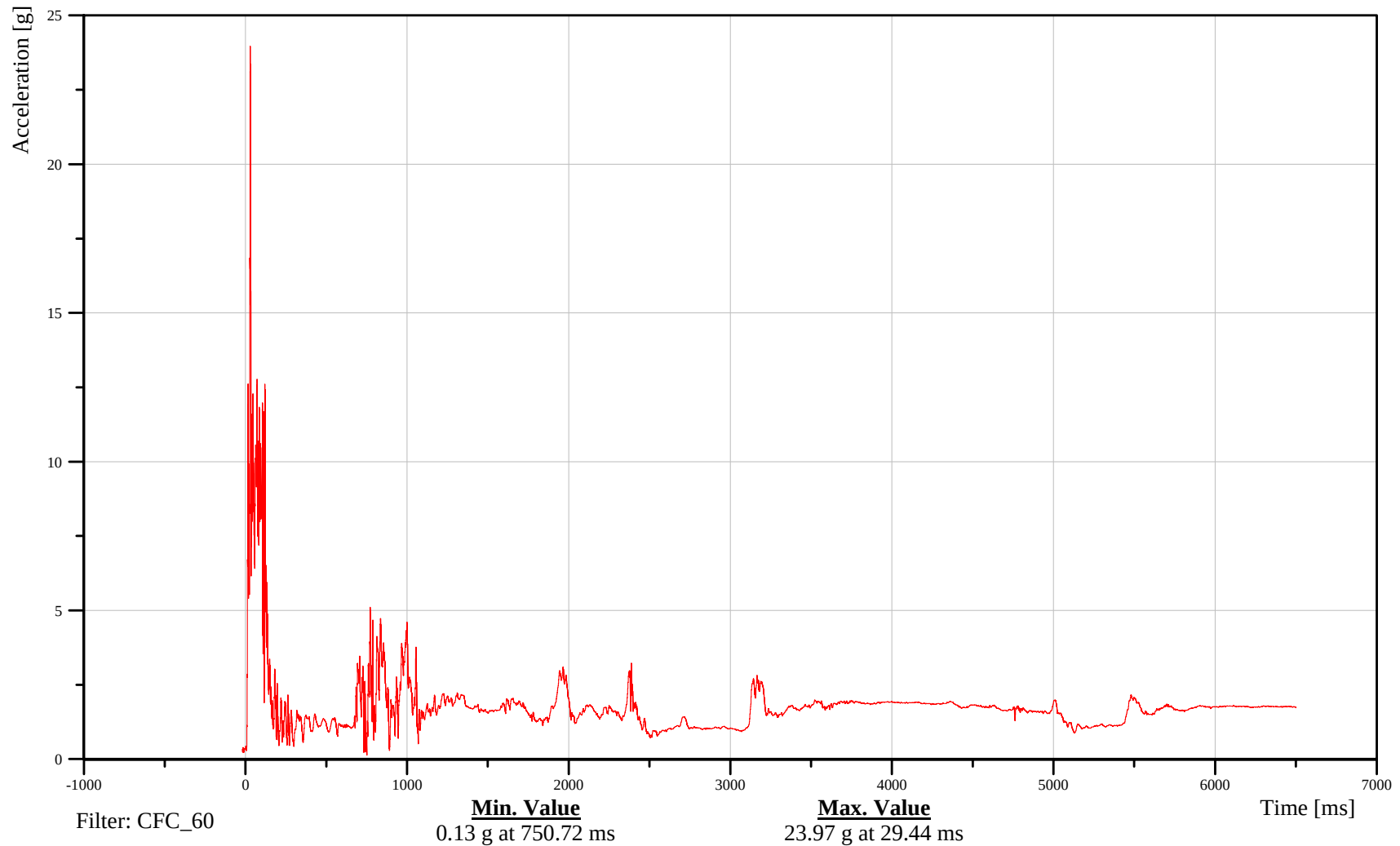
Time: 15:07

Customer: VRTC

10BPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-138

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

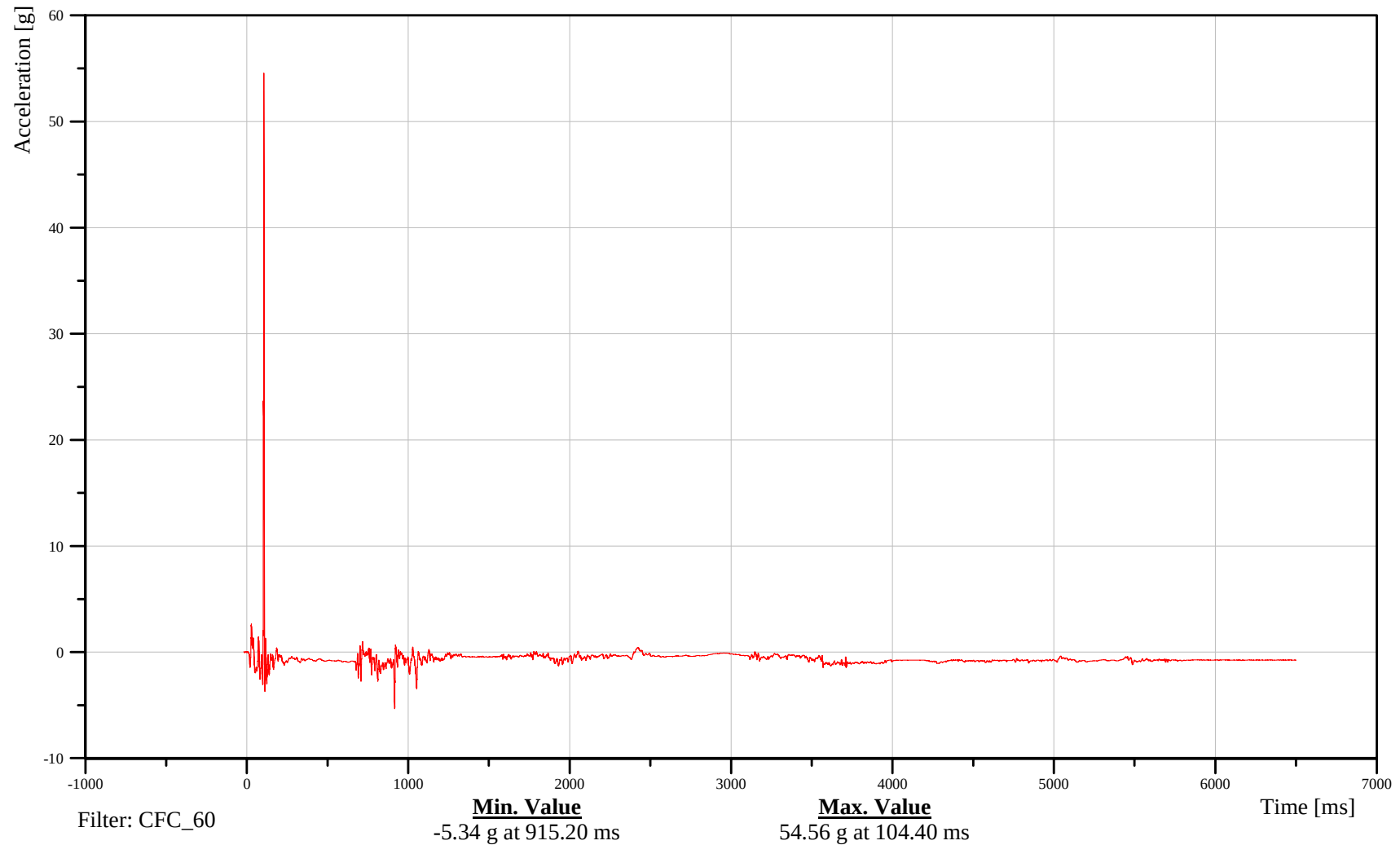
Time: 15:07

Customer: VRTC

10CPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-139

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

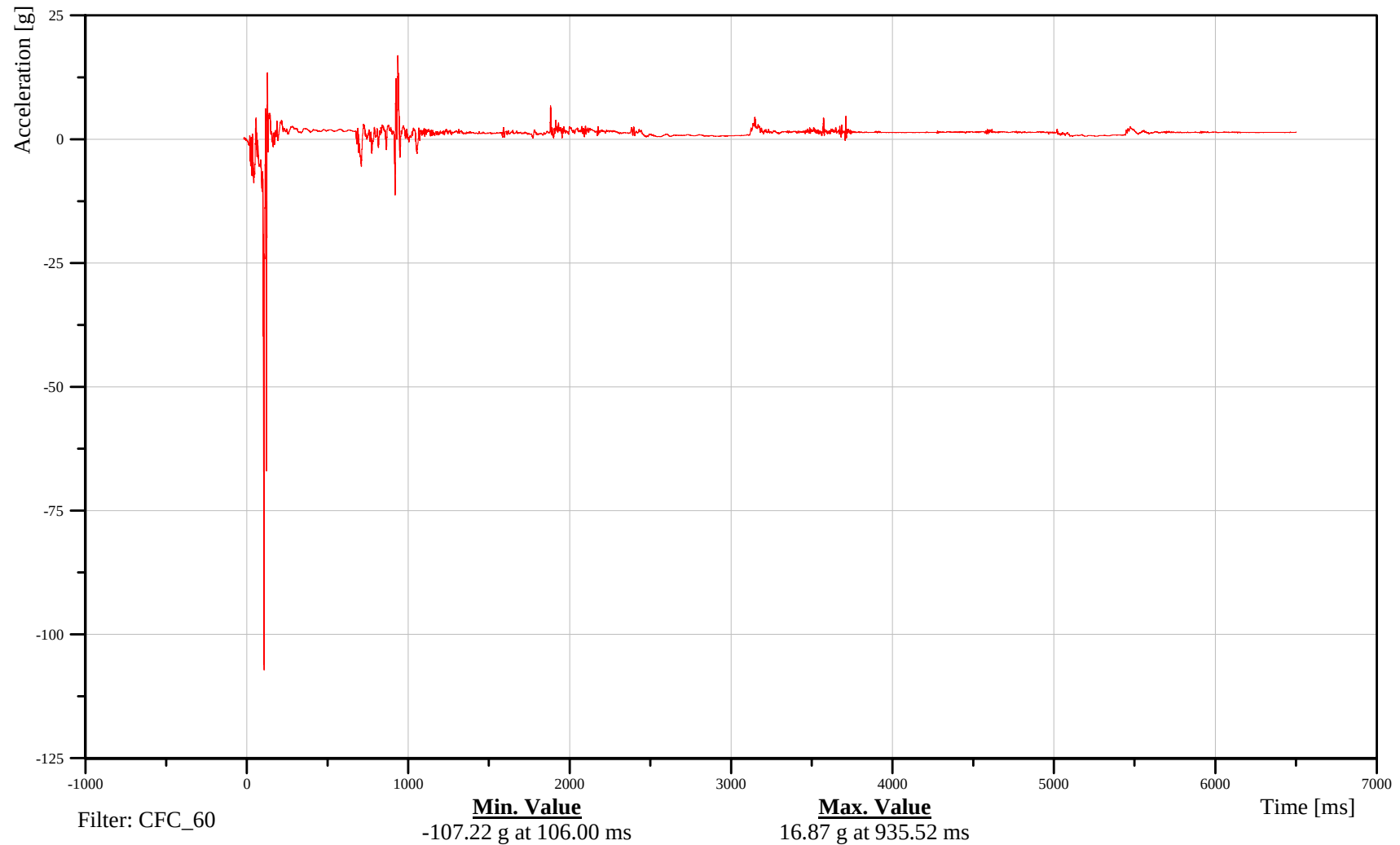
Time: 15:07

Customer: VRTC

10CPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-140

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper Z-Axis Acceleration

Date: 04/13/2010

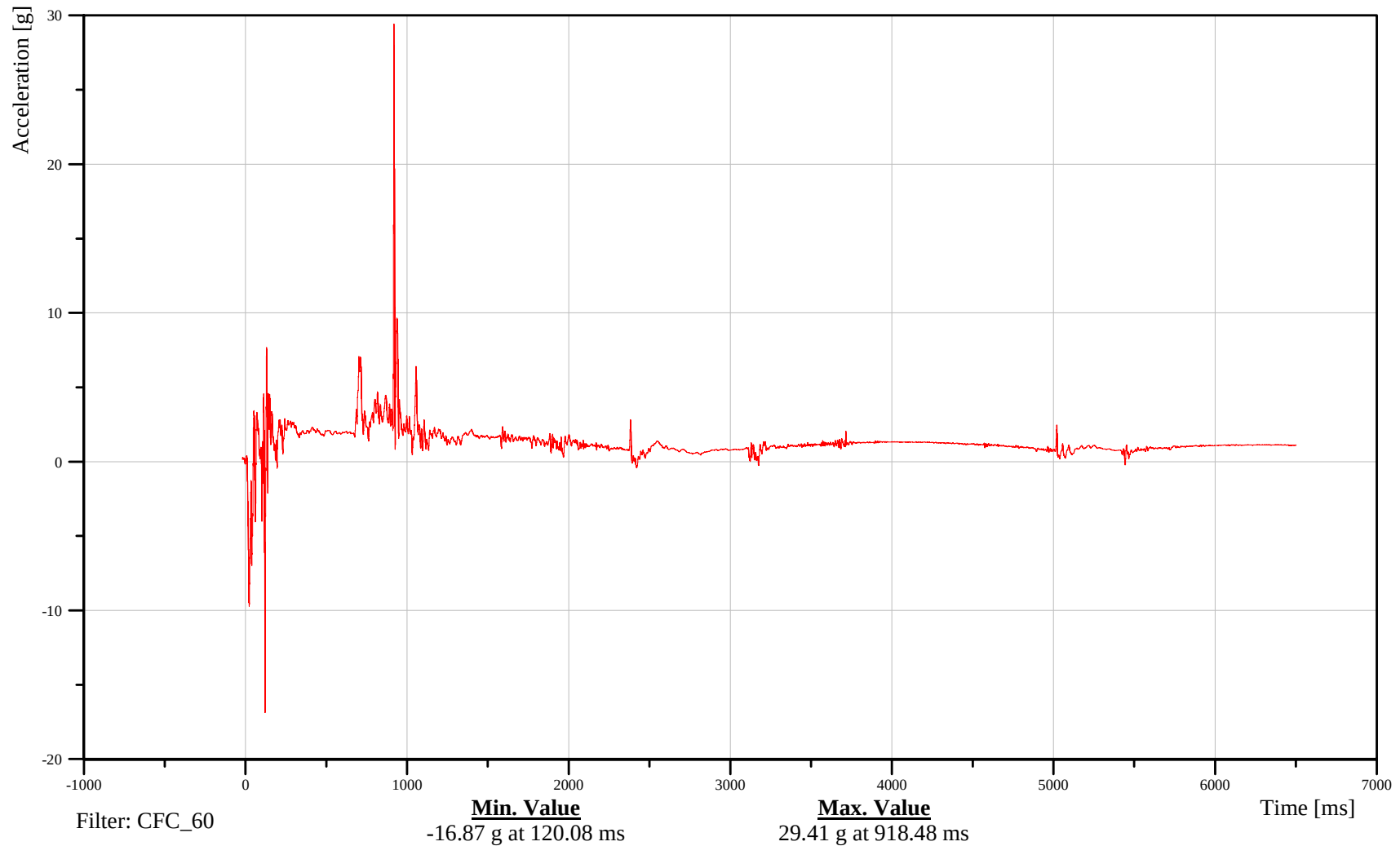
Time: 15:07

Customer: VRTC

10CPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-141

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Upper Resultant Acceleration

Date: 04/13/2010

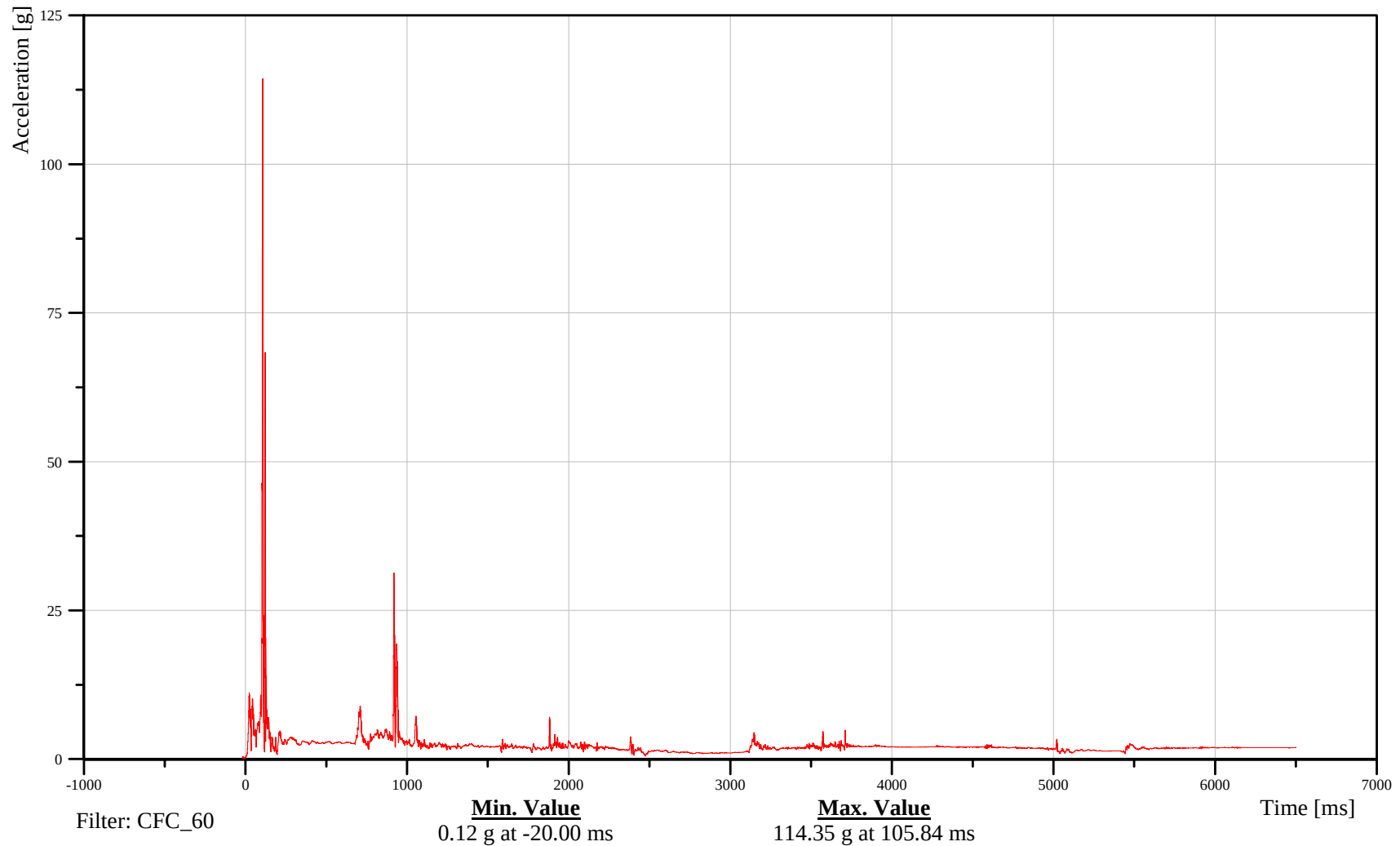
Time: 15:07

Customer: VRTC

10CPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-142

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower X-Axis Acceleration

Date: 04/13/2010

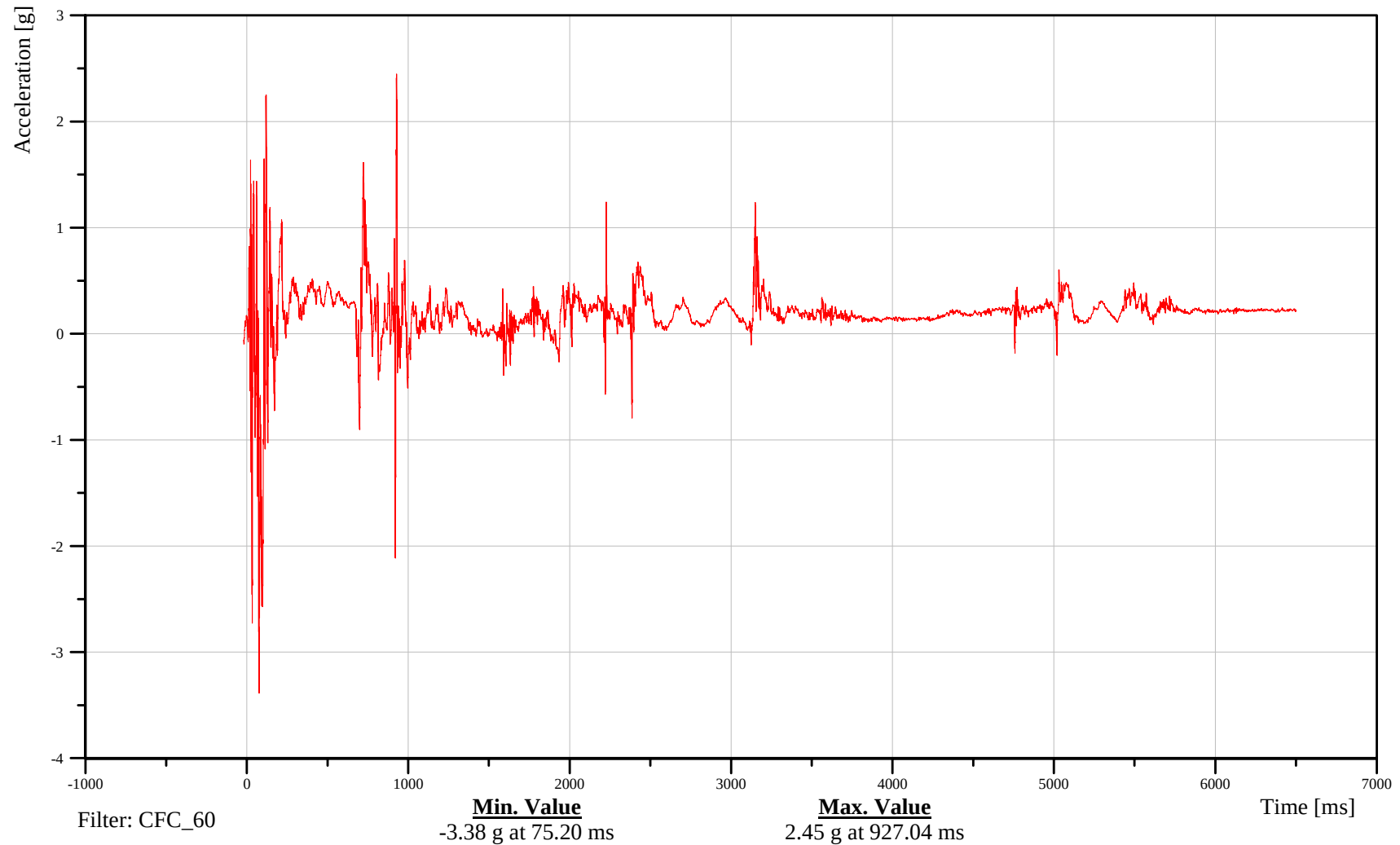
Time: 15:07

Customer: VRTC

10CPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-143

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

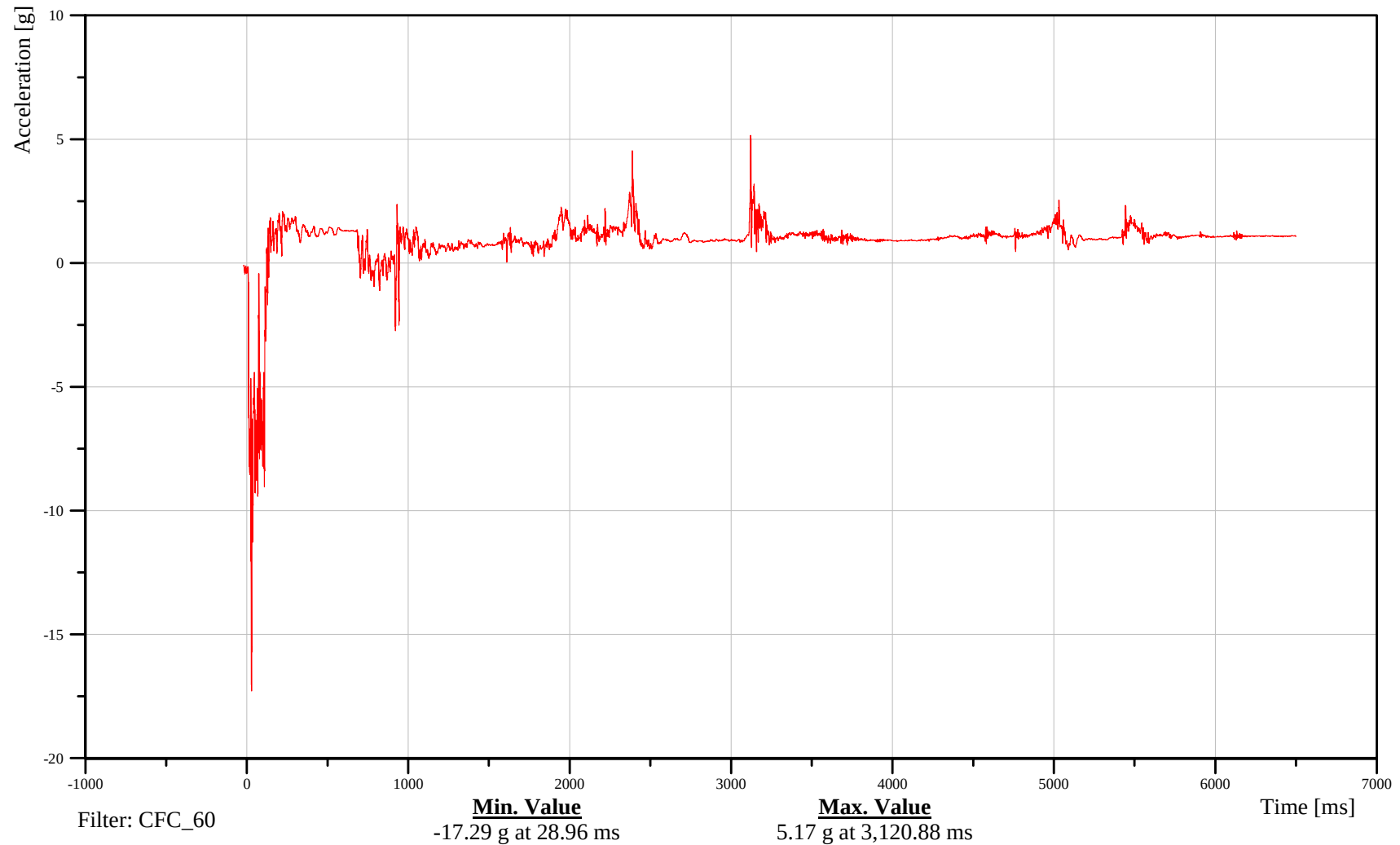
Time: 15:07

Customer: VRTC

10CPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-144

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

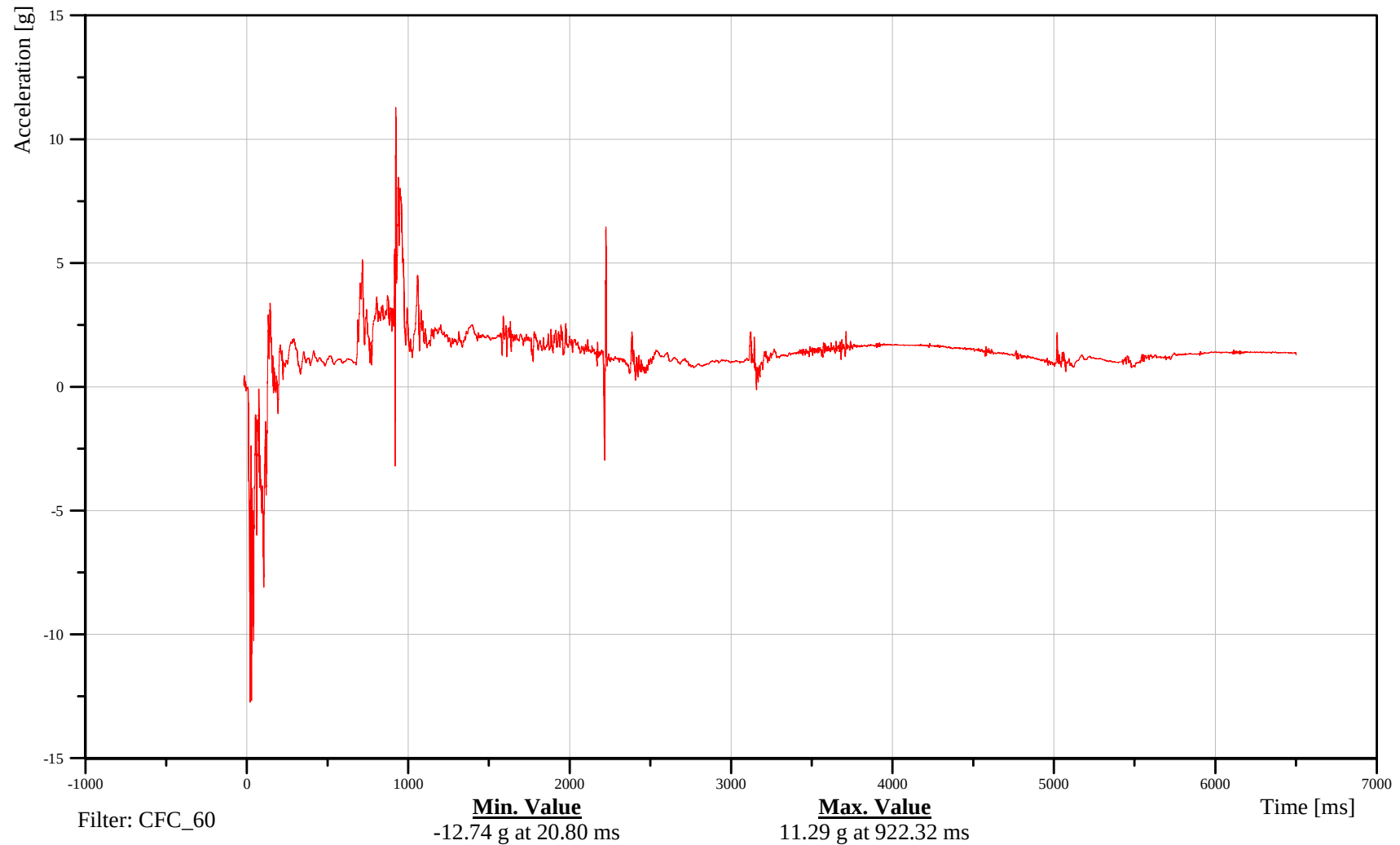
Time: 15:07

Customer: VRTC

10CPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-145

100413



Curb Trip Rollover 2007 Ford Expedition

Left C-Pillar Lower Resultant Acceleration

Date: 04/13/2010

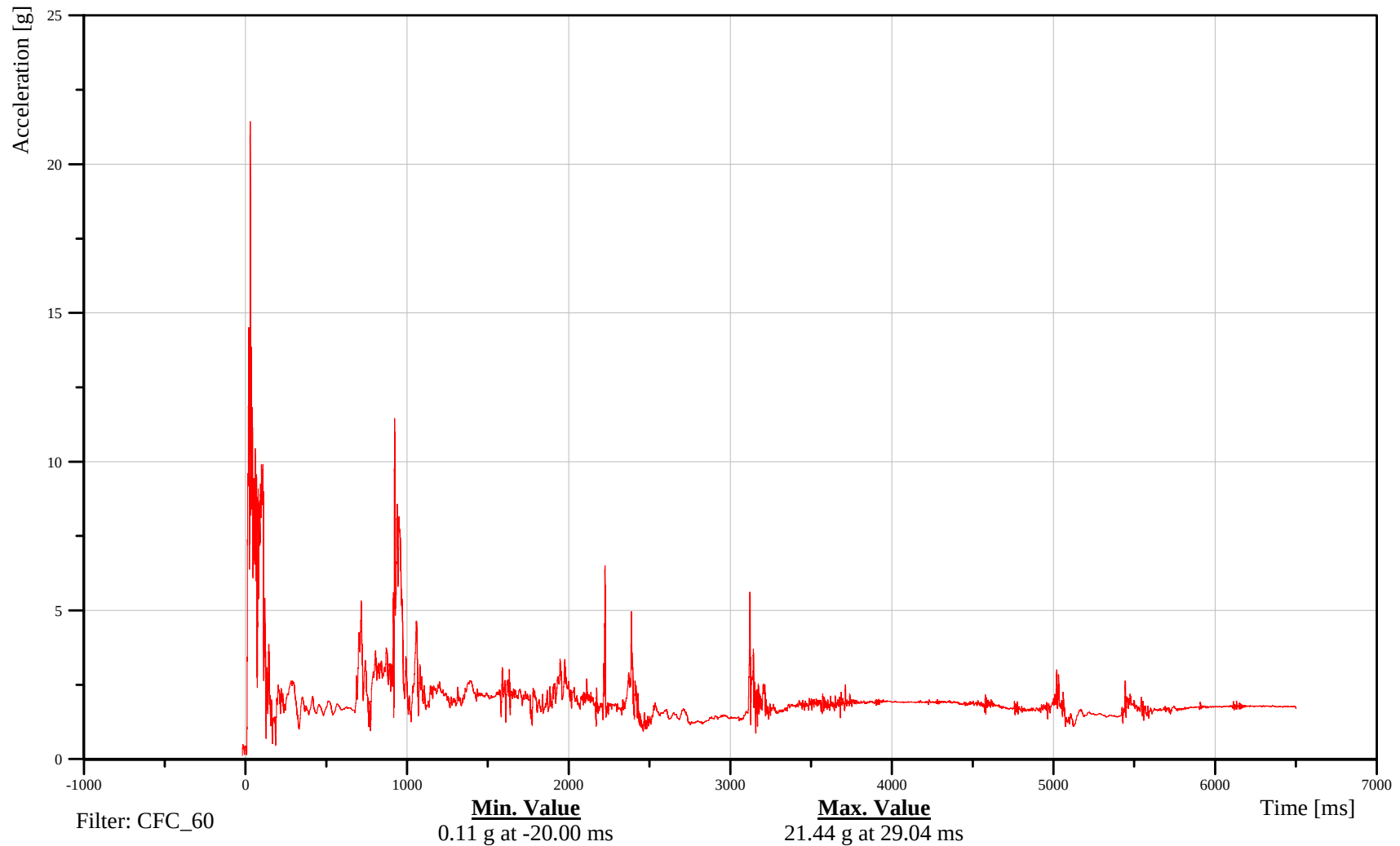
Time: 15:07

Customer: VRTC

10CPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-146

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

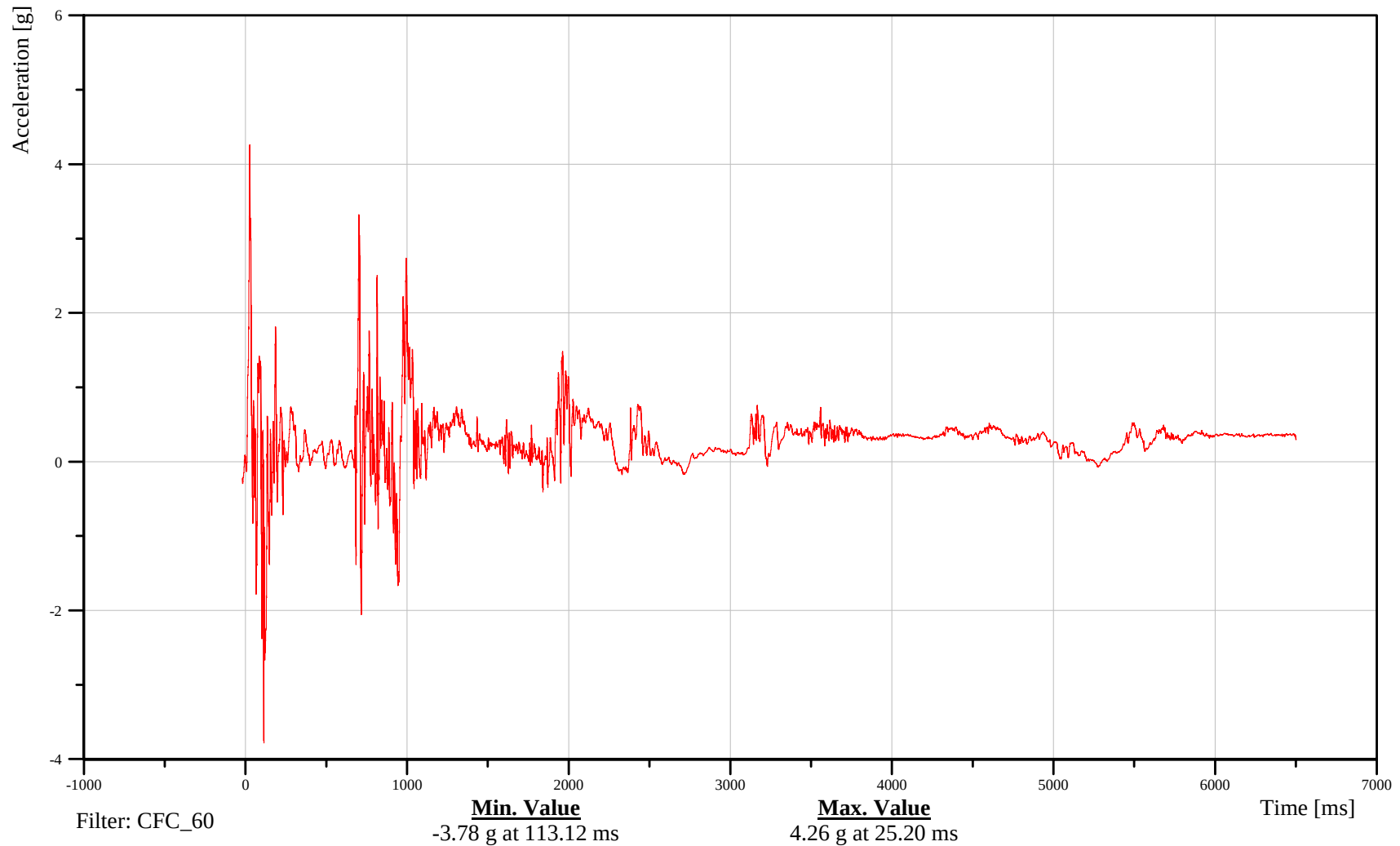
Time: 15:07

Customer: VRTC

10CPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-147

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

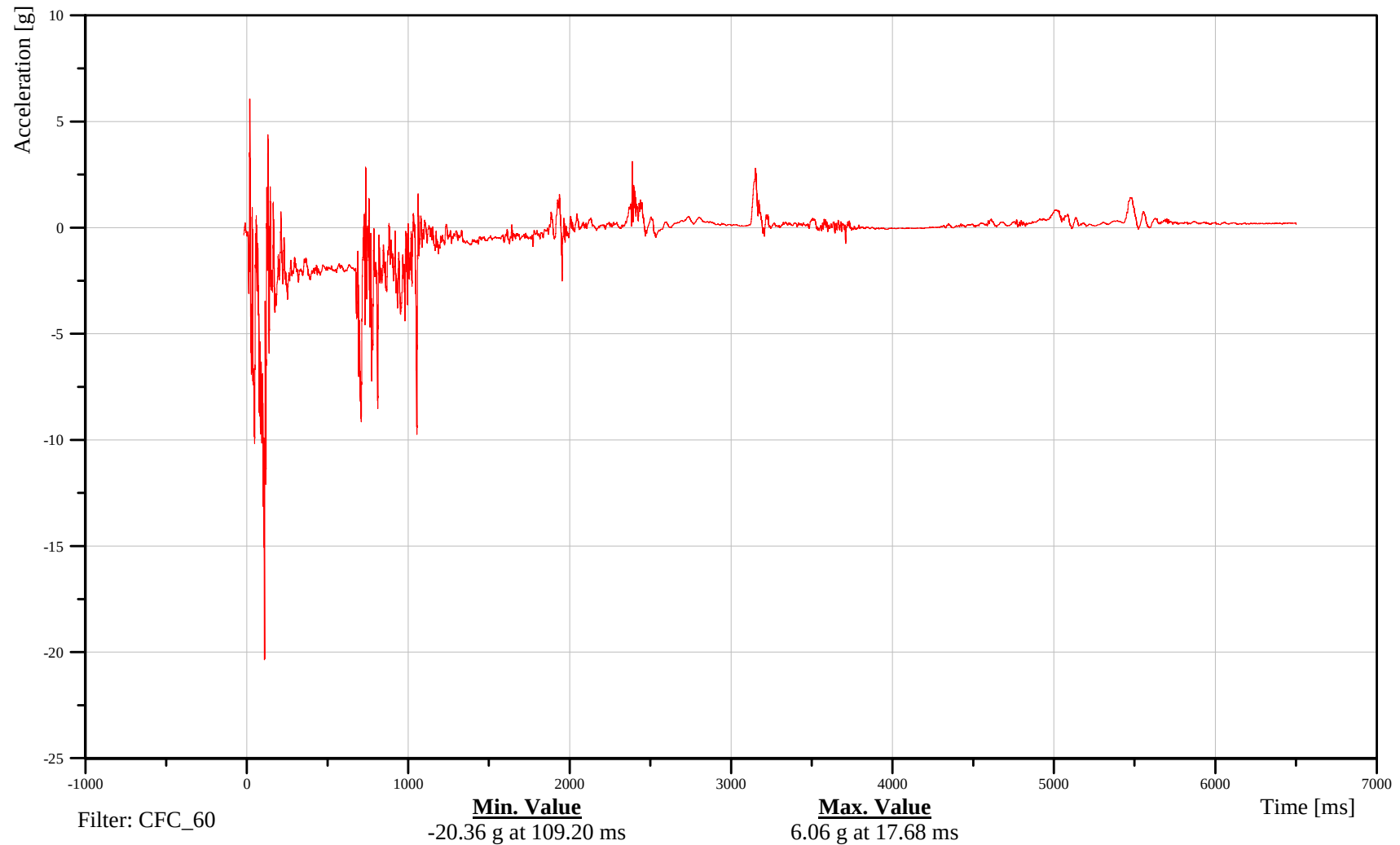
Time: 15:07

Customer: VRTC

10CPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-148

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Upper Z-Axis Acceleration

Date: 04/13/2010

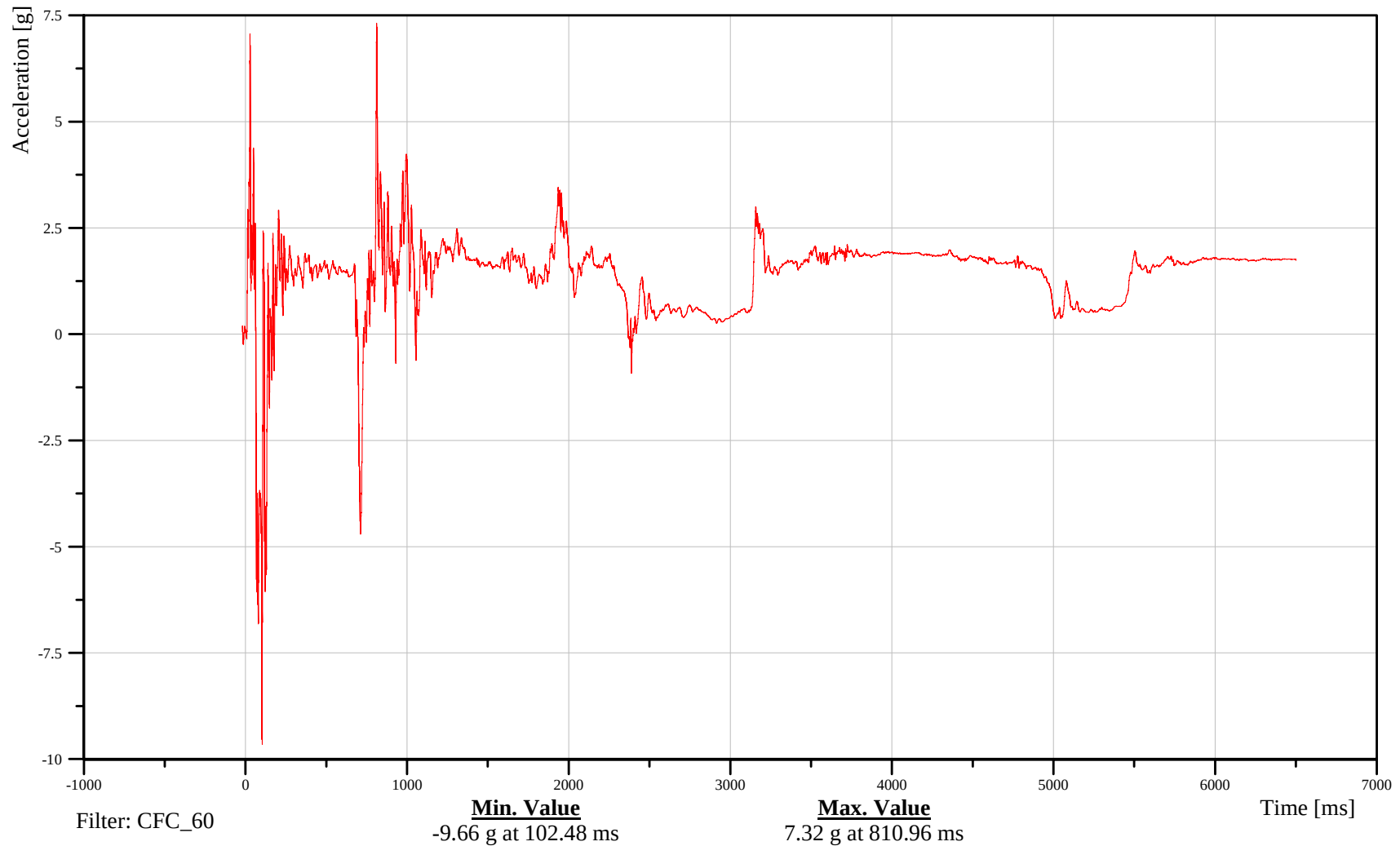
Time: 15:07

Customer: VRTC

10CPILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-149

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Upper Resultant Acceleration

Date: 04/13/2010

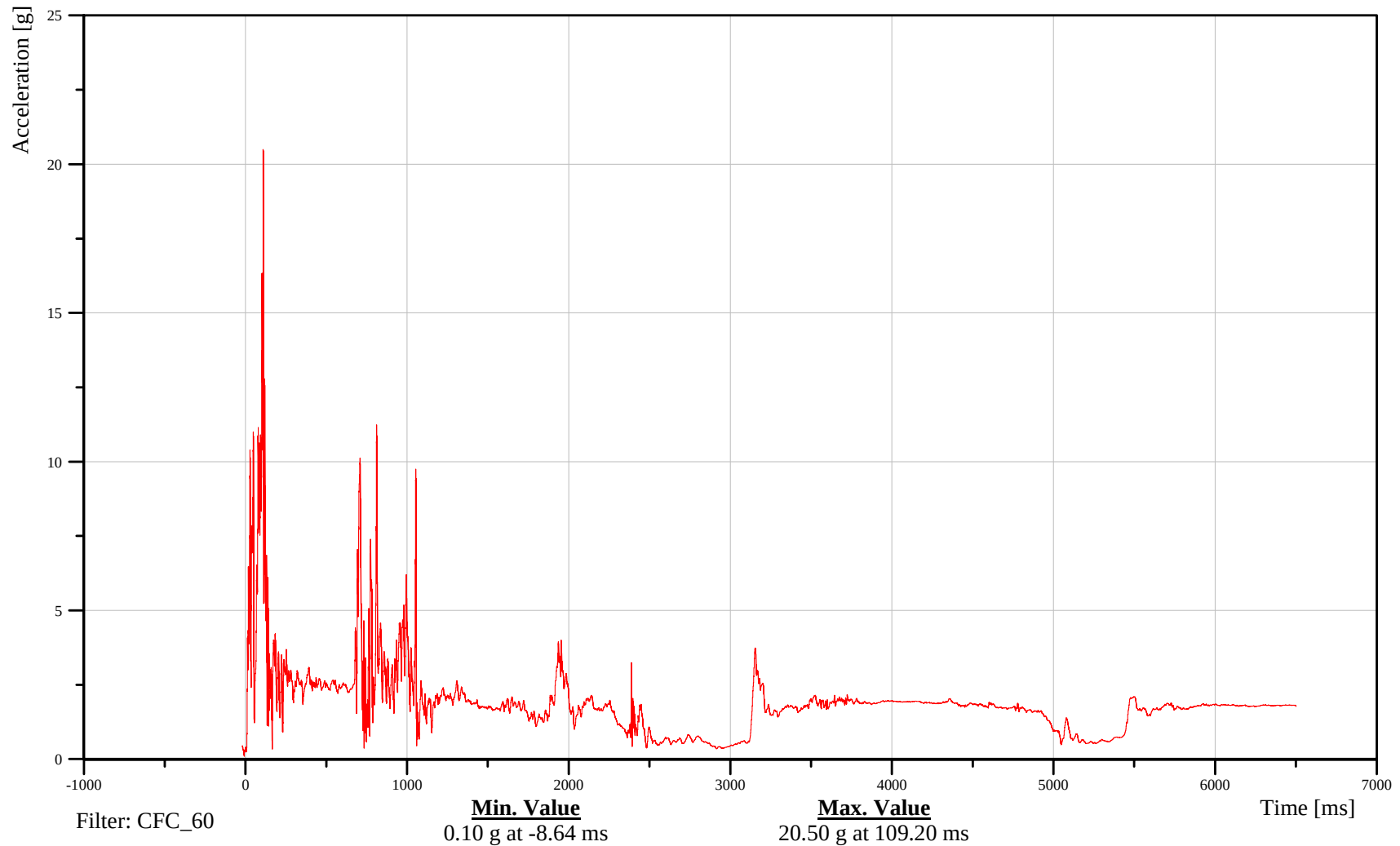
Time: 15:07

Customer: VRTC

10CPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-150

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower X-Axis Acceleration

Date: 04/13/2010

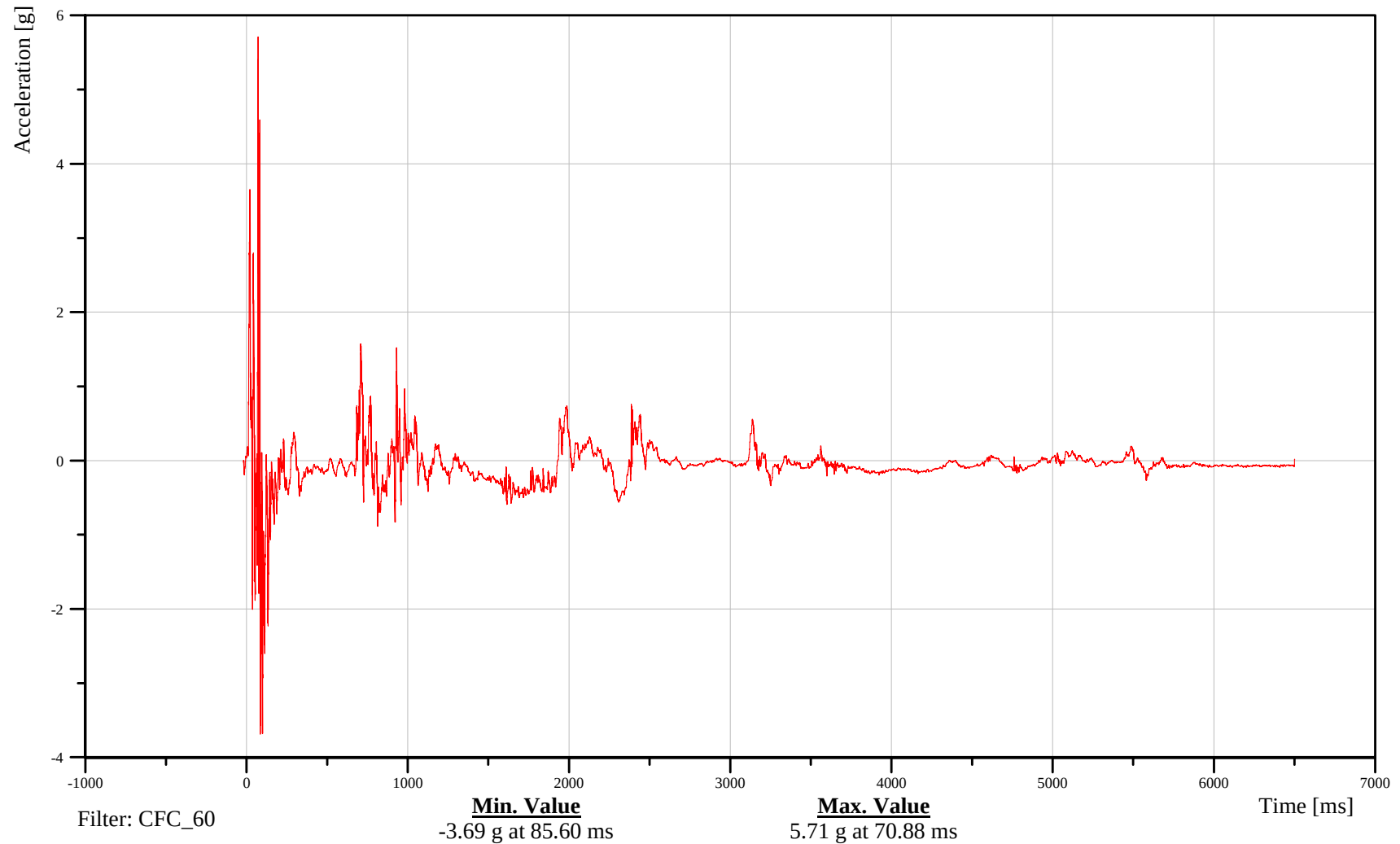
Time: 15:07

Customer: VRTC

10CPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-151

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

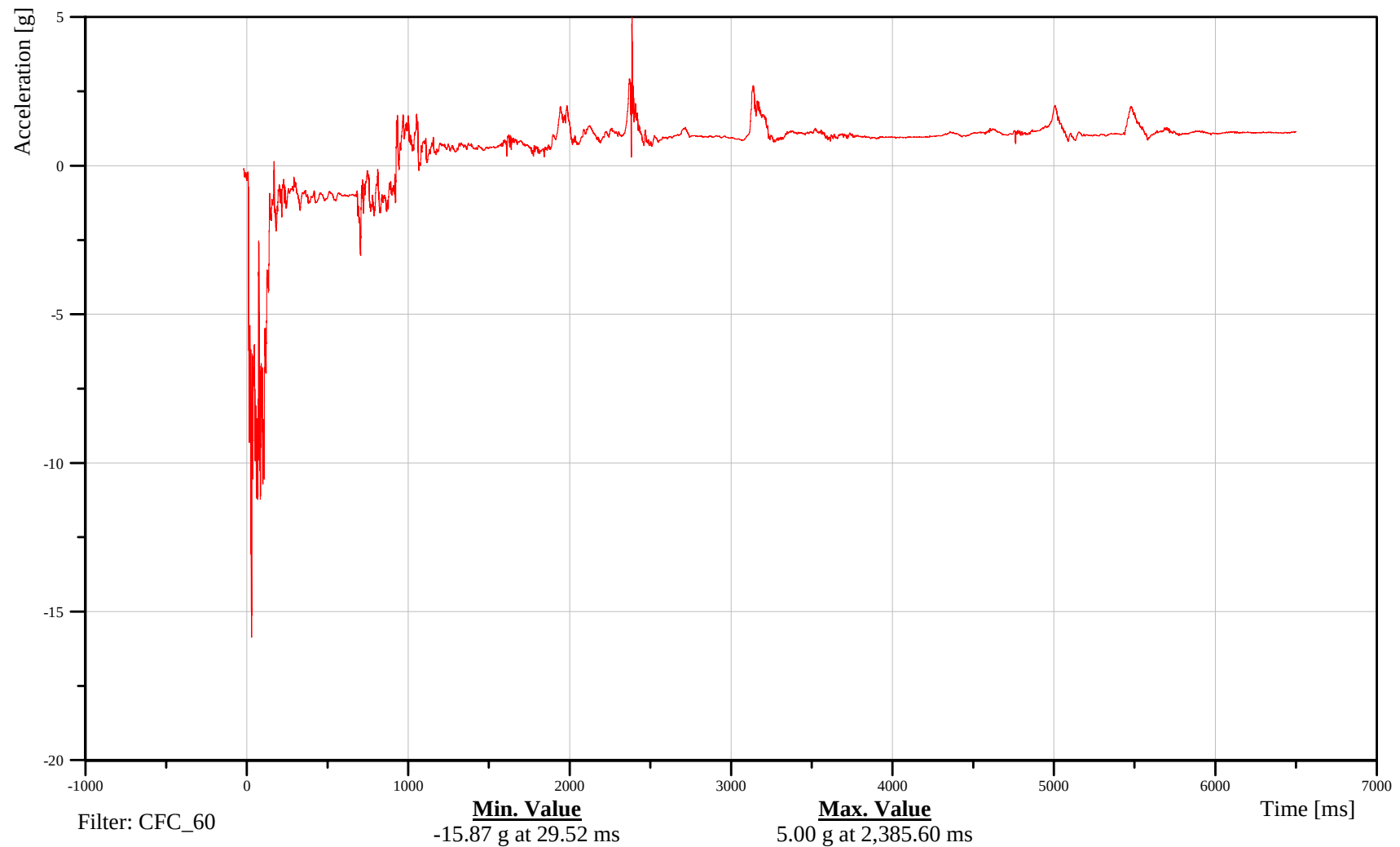
Time: 15:07

Customer: VRTC

10CPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-152

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

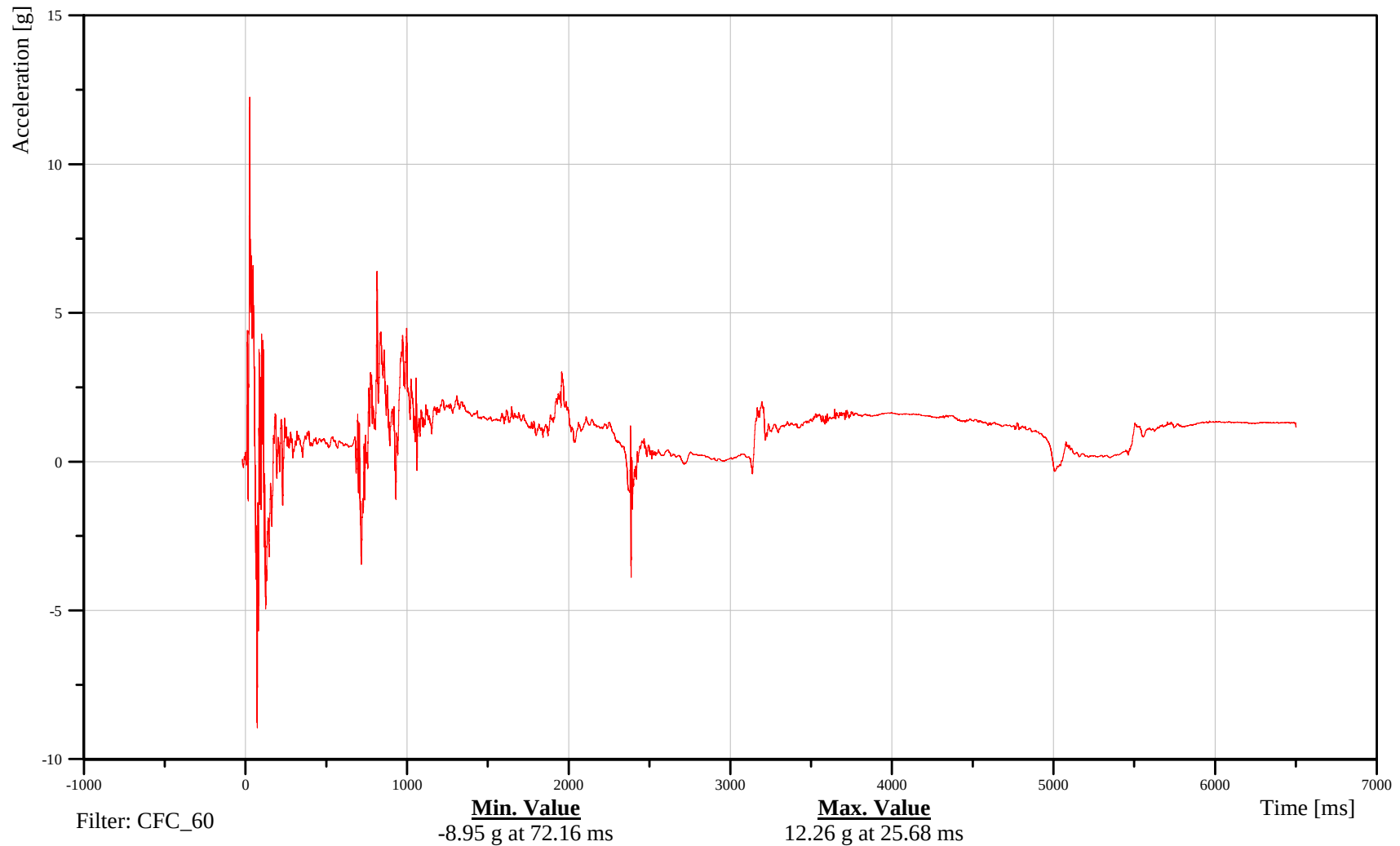
Time: 15:07

Customer: VRTC

10CPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-153

100413



Curb Trip Rollover 2007 Ford Expedition

Right C-Pillar Lower Resultant Acceleration

Date: 04/13/2010

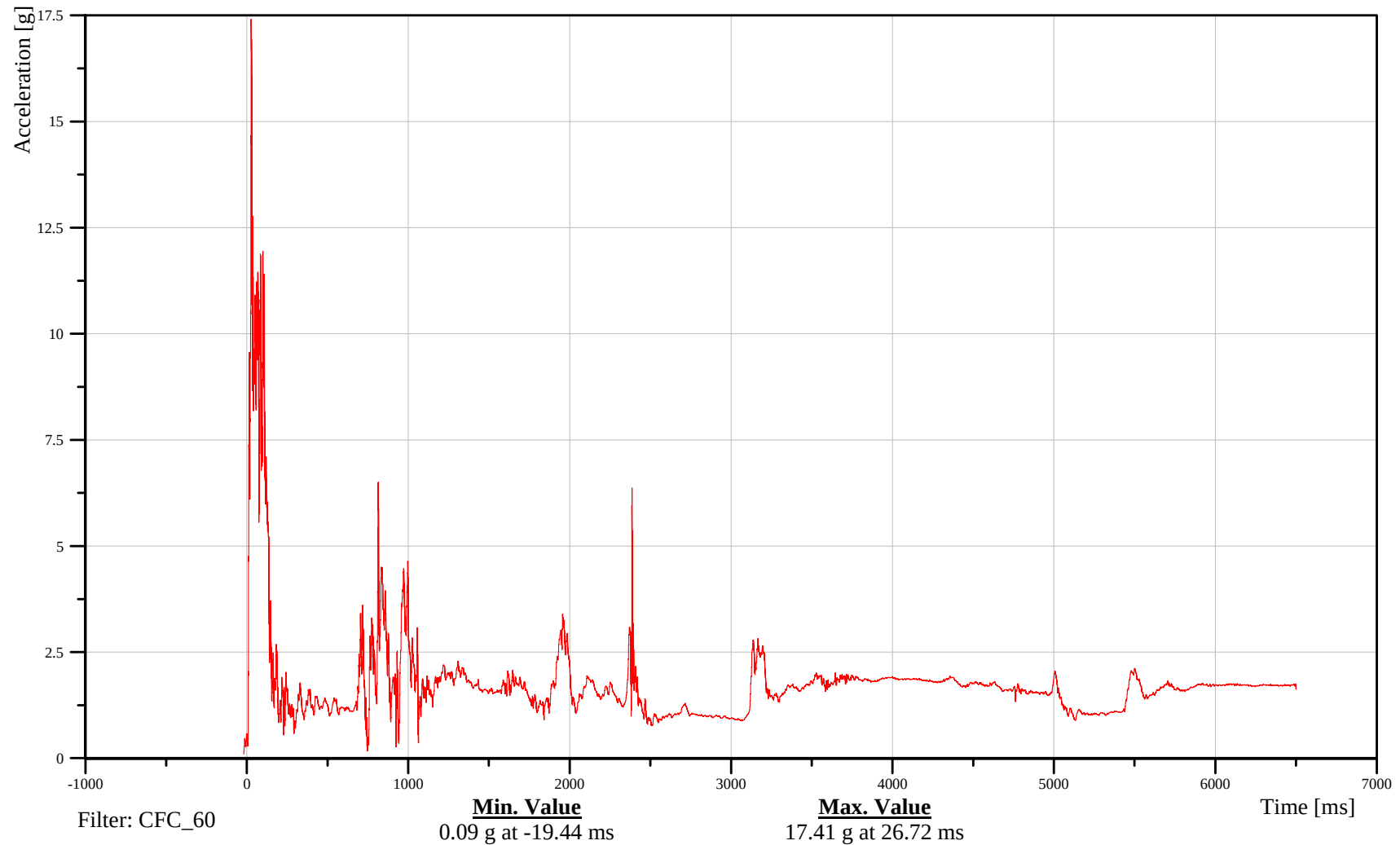
Time: 15:07

Customer: VRTC

10CPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-154

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

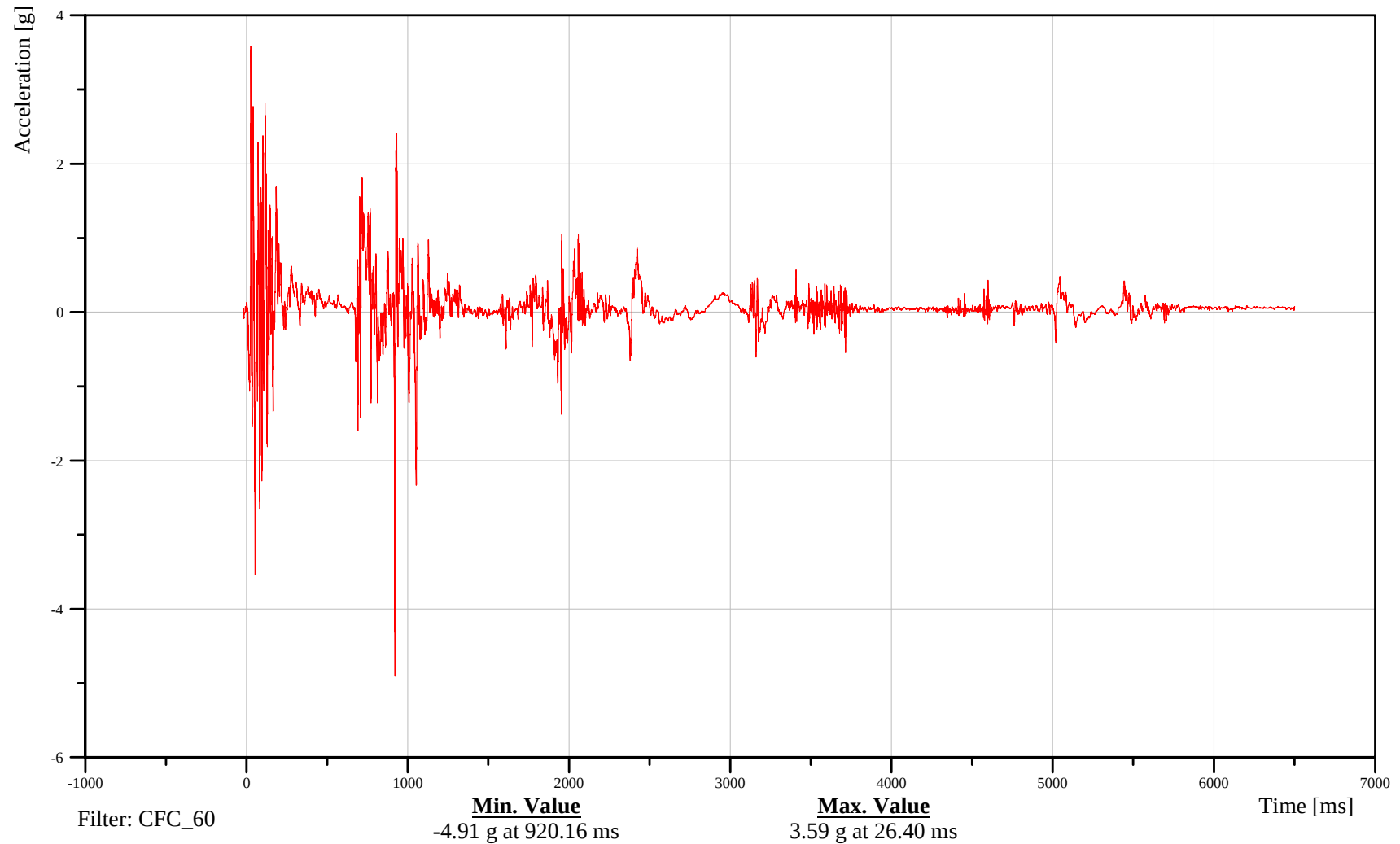
Time: 15:07

Customer: VRTC

10DPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-155

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

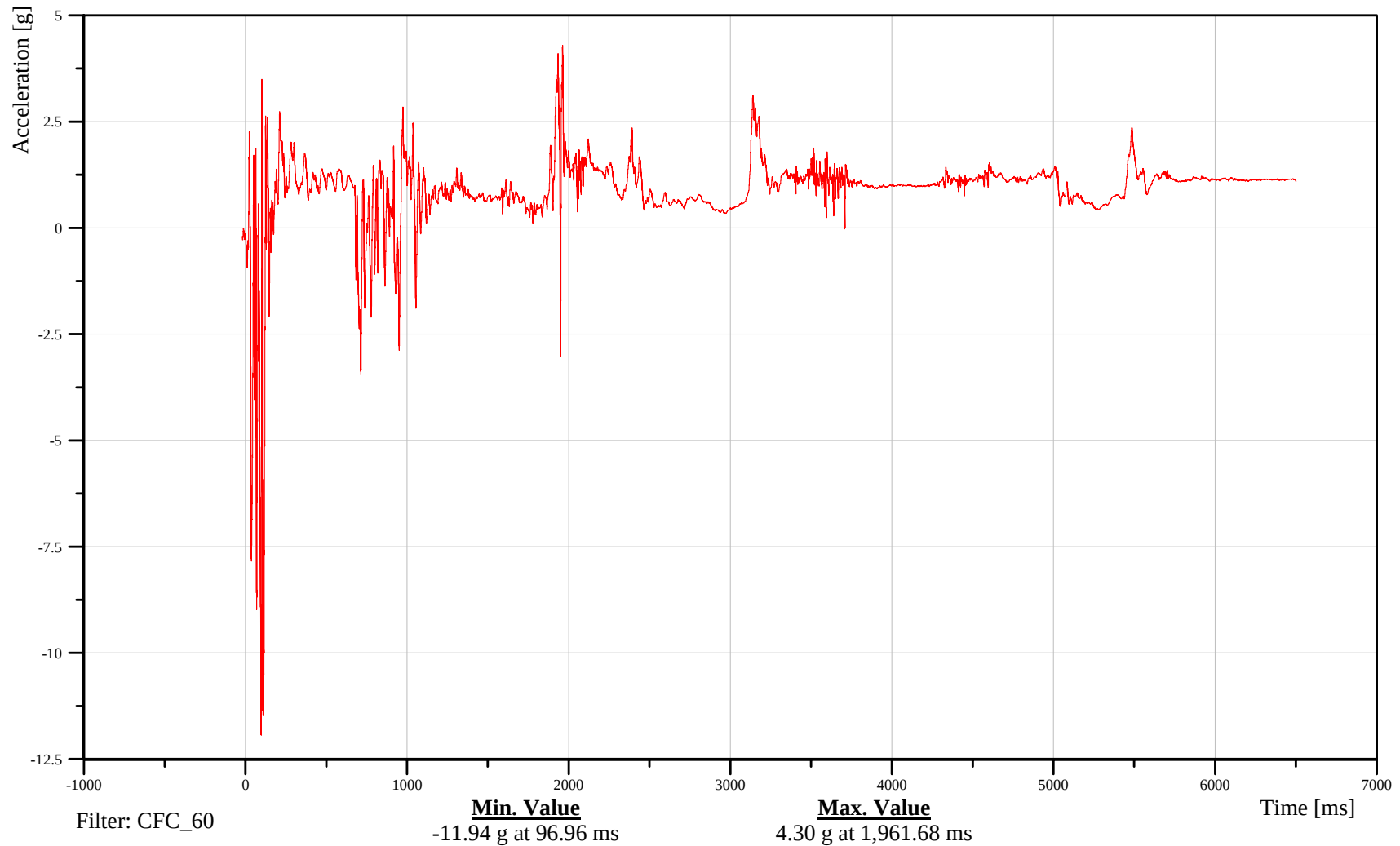
Time: 15:07

Customer: VRTC

10DPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-156

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper Z-Axis Acceleration

Date: 04/13/2010

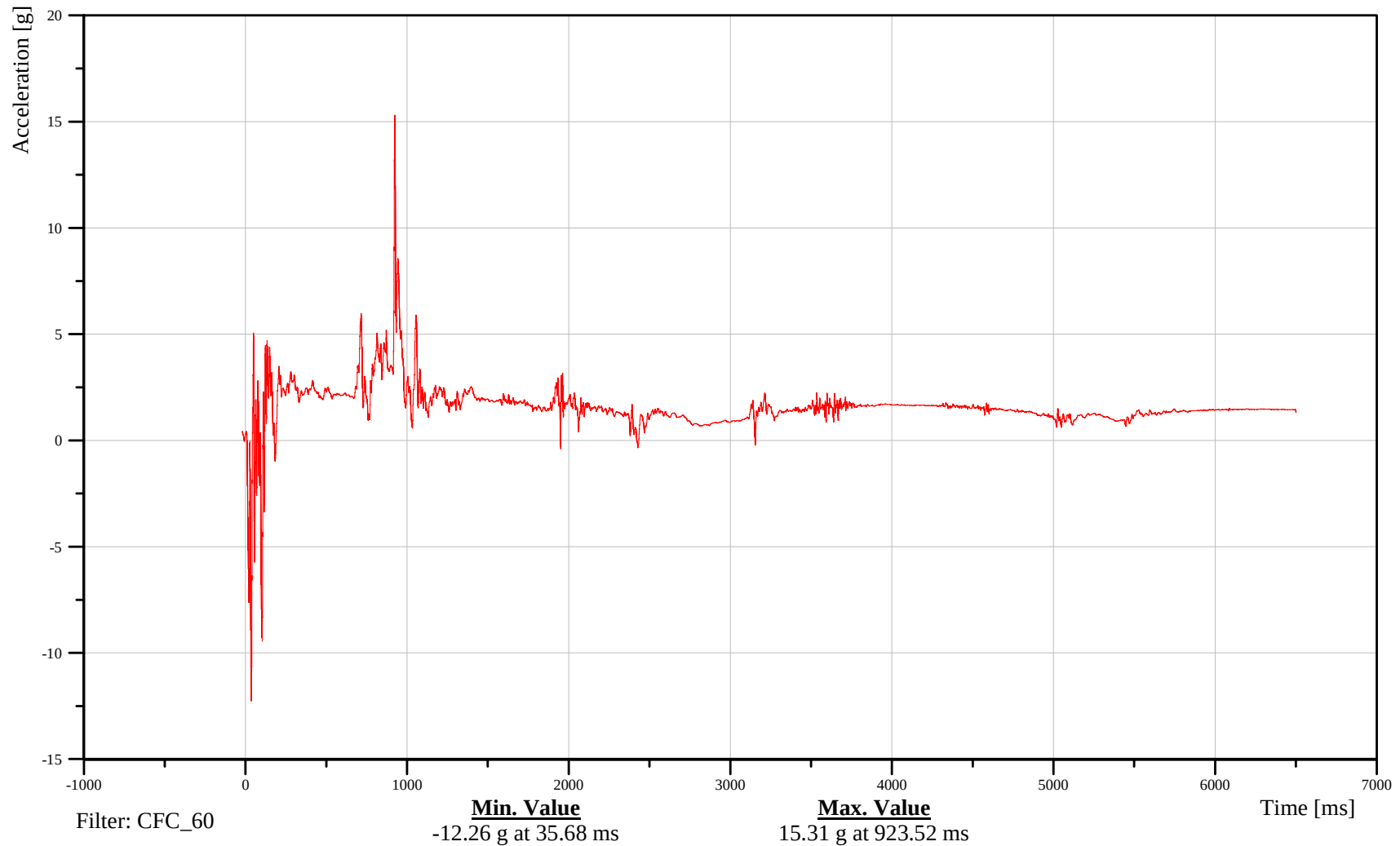
Time: 15:07

Customer: VRTC

10DPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-157

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Upper Resultant Acceleration

Date: 04/13/2010

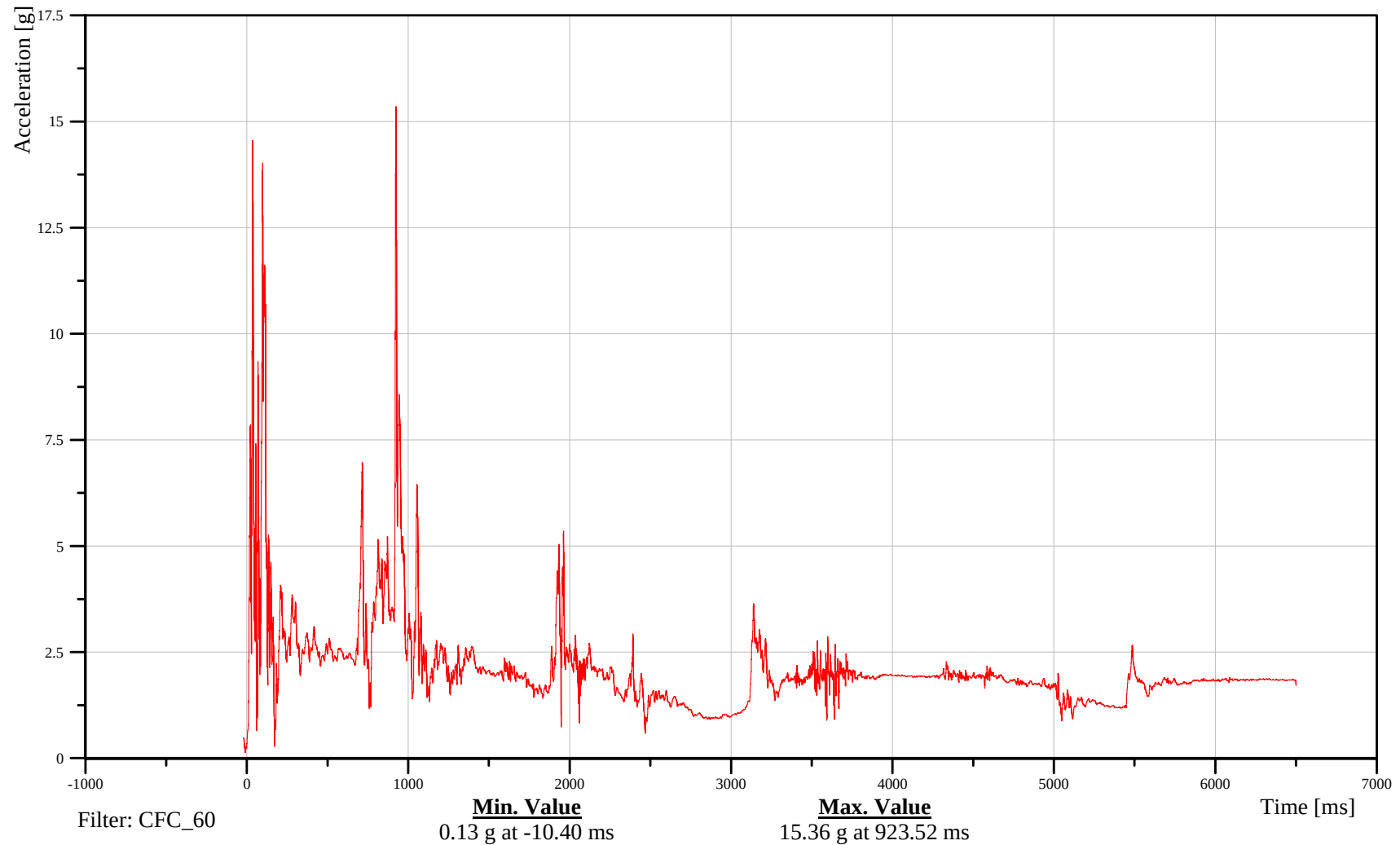
Time: 15:07

Customer: VRTC

10DPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-158

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower X-Axis Acceleration

Date: 04/13/2010

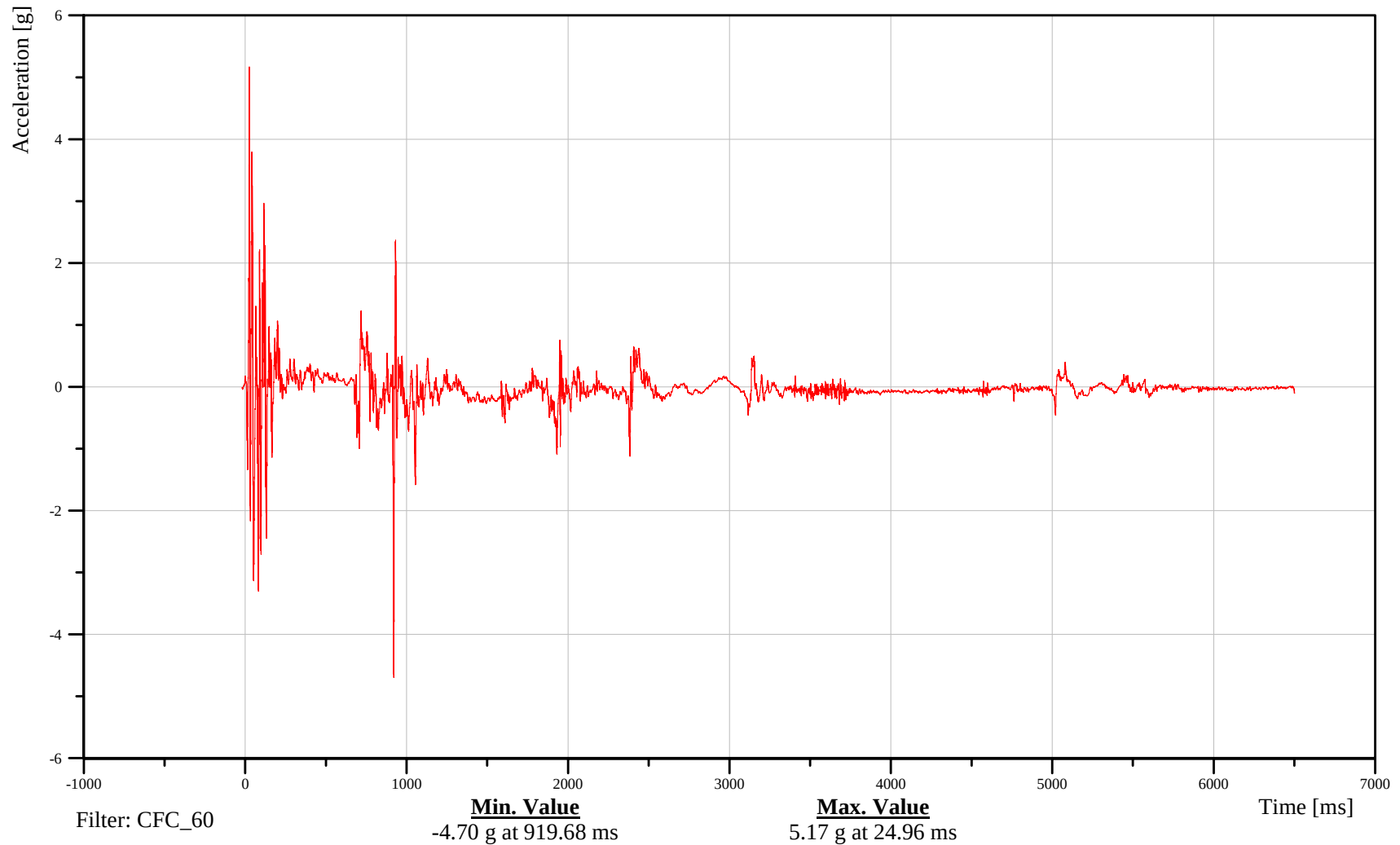
Time: 15:07

Customer: VRTC

10DPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-159

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

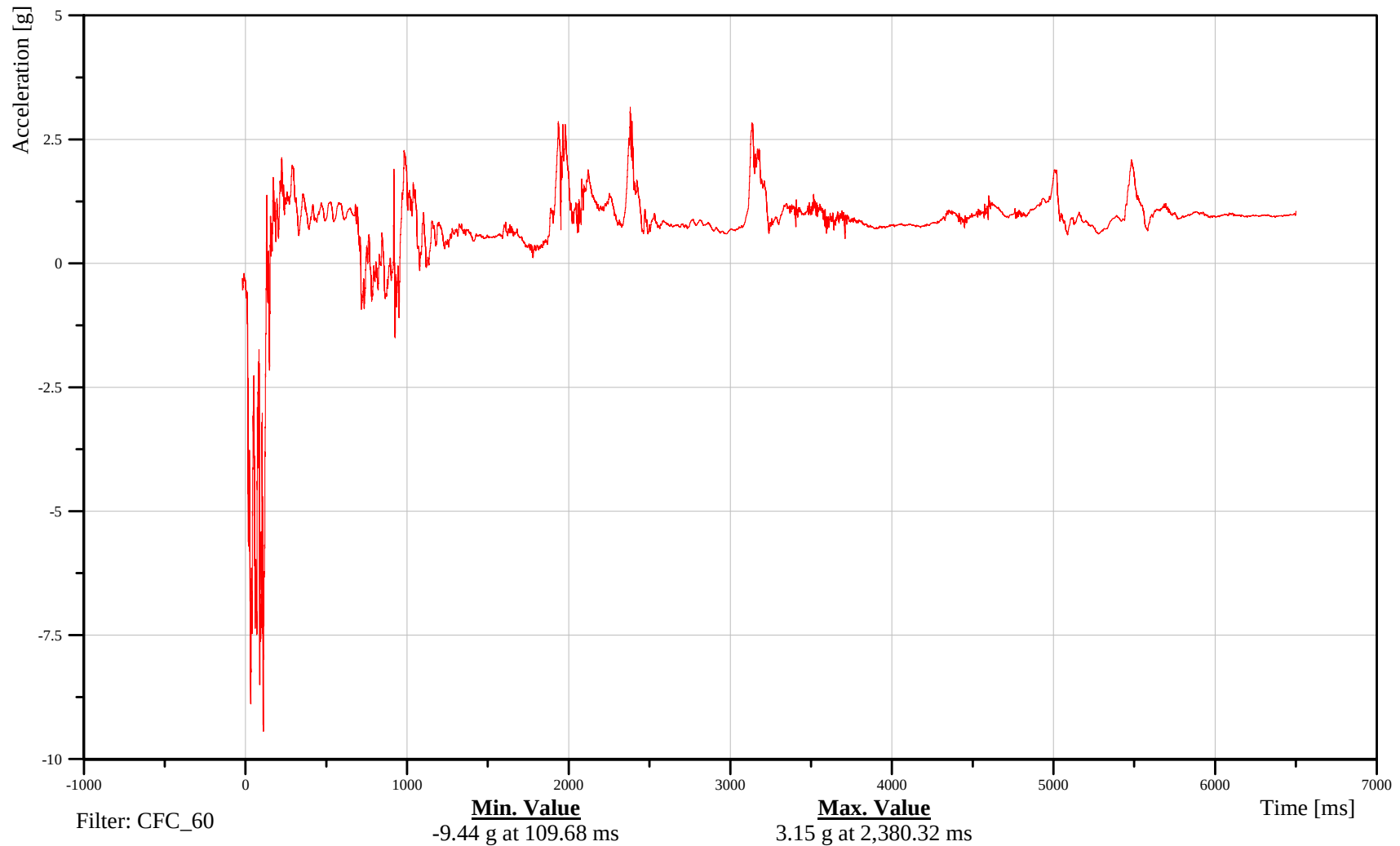
Time: 15:07

Customer: VRTC

10DPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-160

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

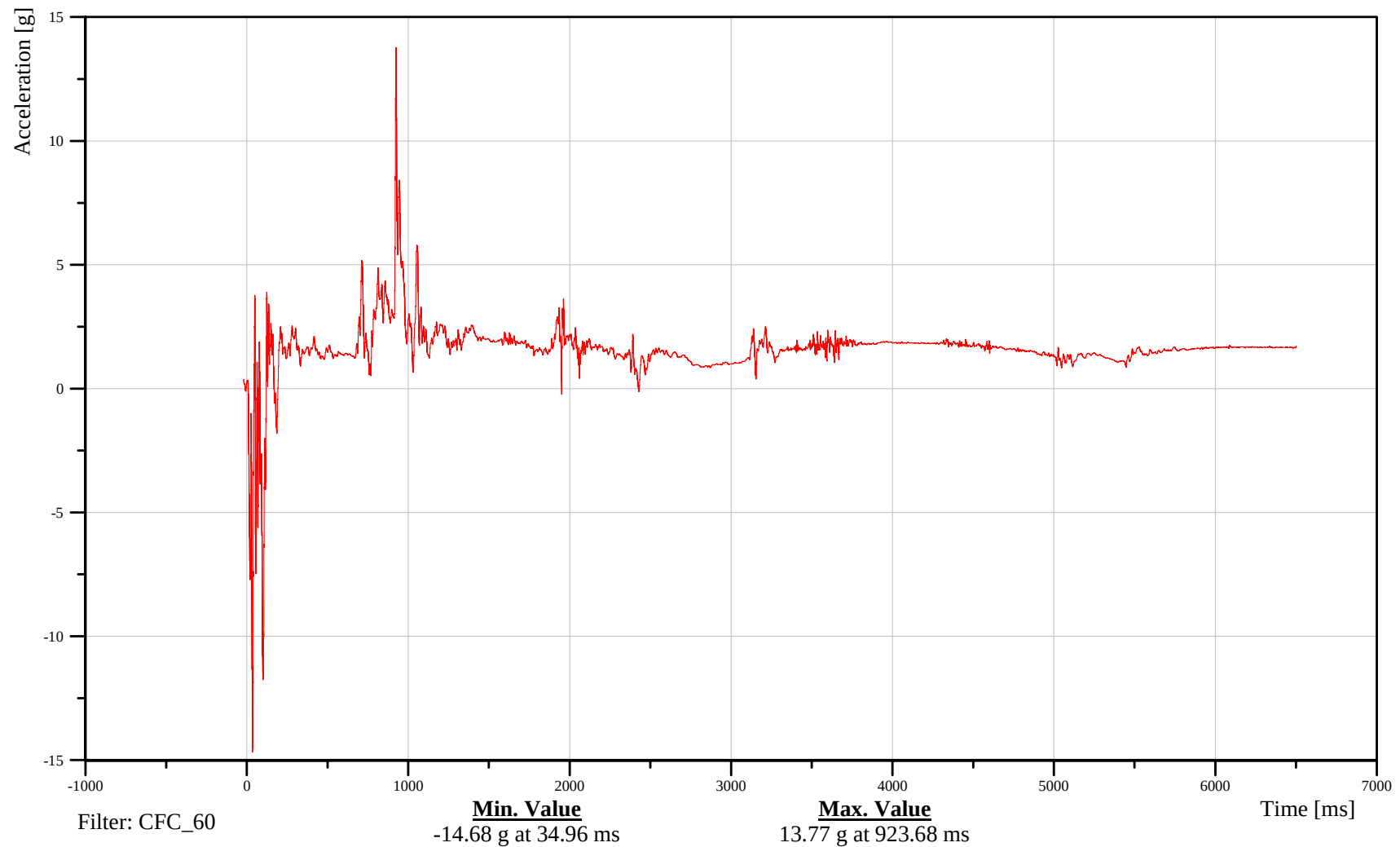
Time: 15:07

Customer: VRTC

10DPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-161

100413



Curb Trip Rollover 2007 Ford Expedition

Left D-Pillar Lower Resultant Acceleration

Date: 04/13/2010

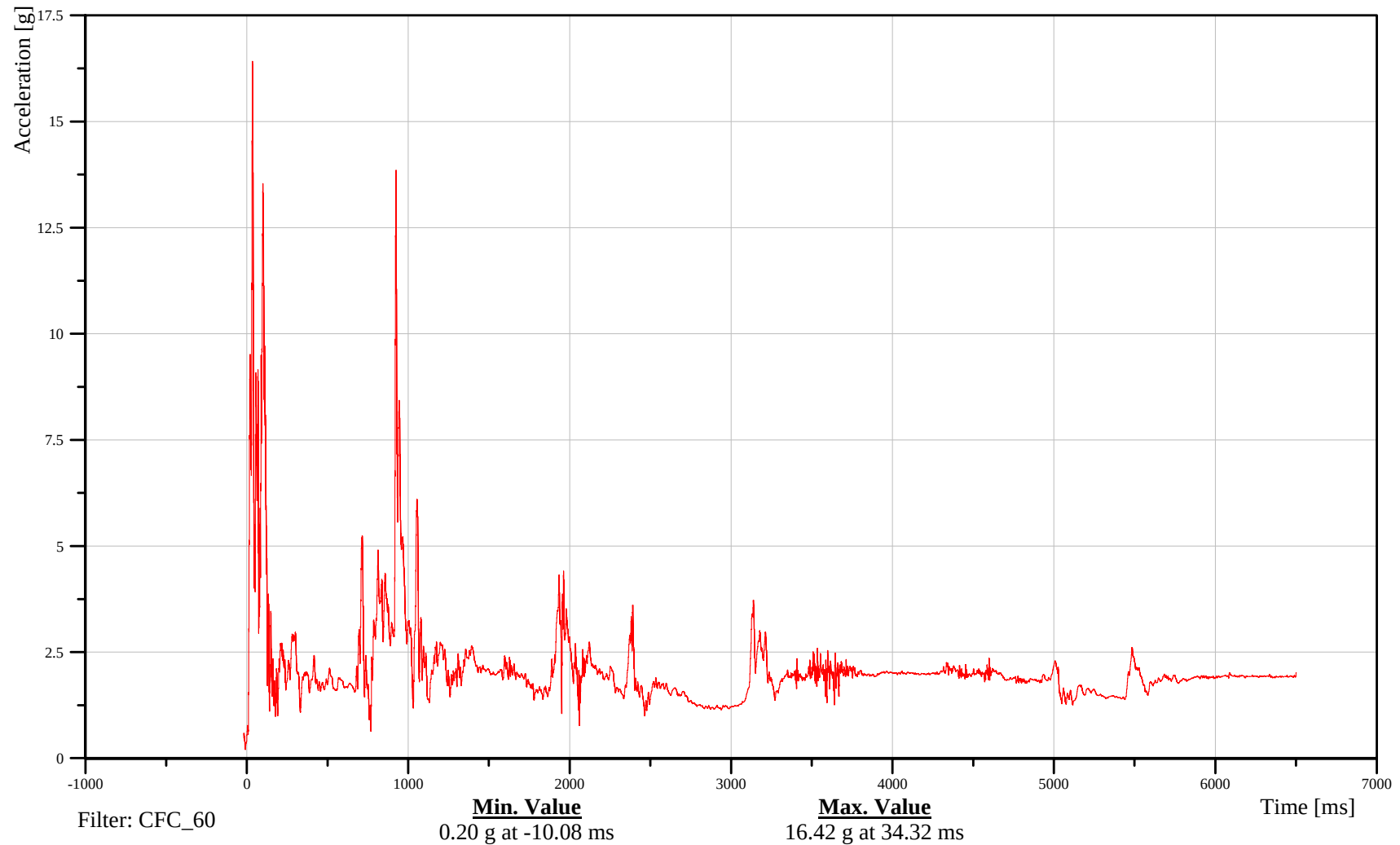
Time: 15:07

Customer: VRTC

10DPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-162

100413



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Upper X-Axis Acceleration

Date: 04/13/2010

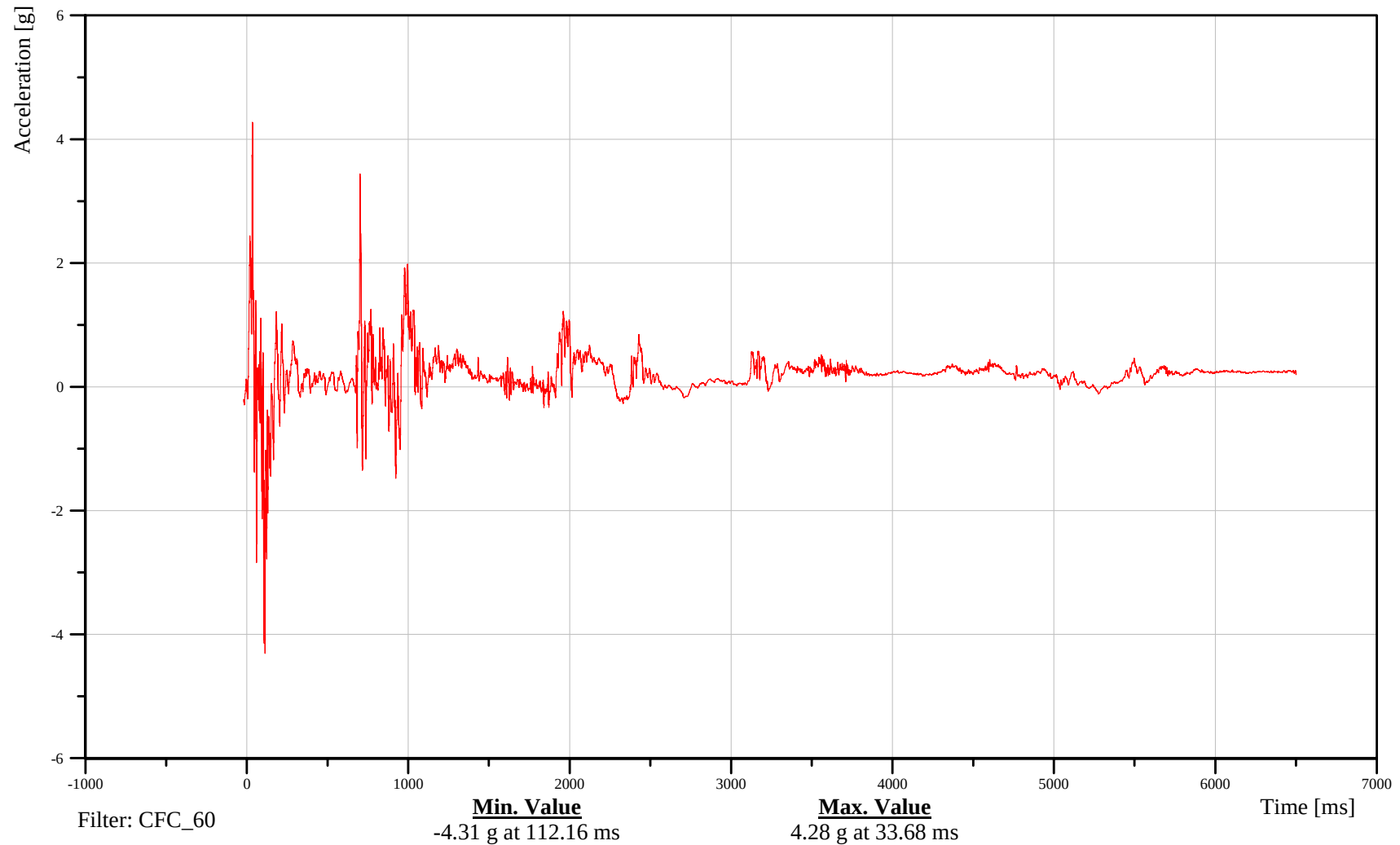
Time: 15:07

Customer: VRTC

10DPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-163

100413



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Upper Y-Axis Acceleration

Date: 04/13/2010

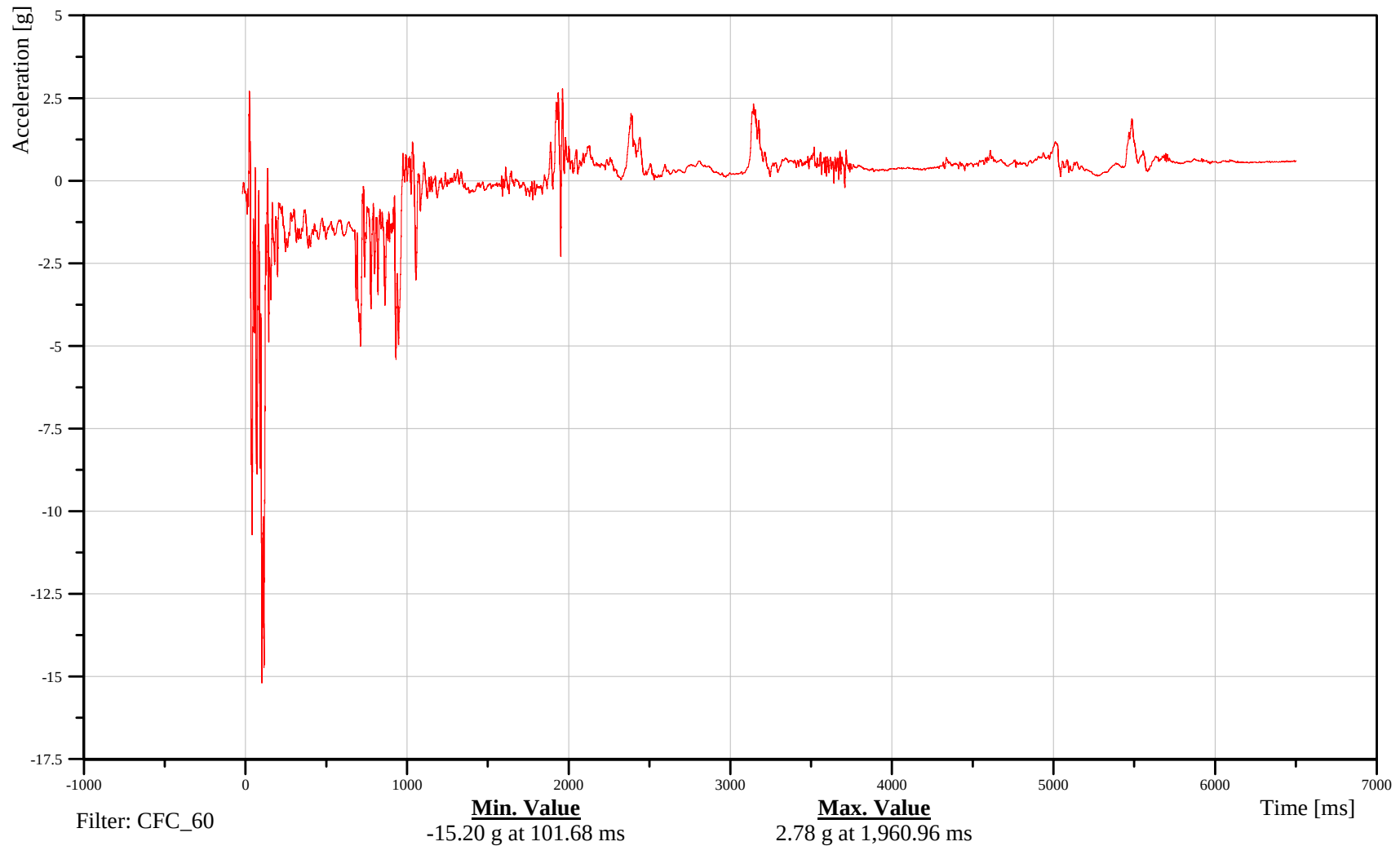
Time: 15:07

Customer: VRTC

10DPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-164

100413



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Upper Z-Axis Acceleration

Date: 04/13/2010

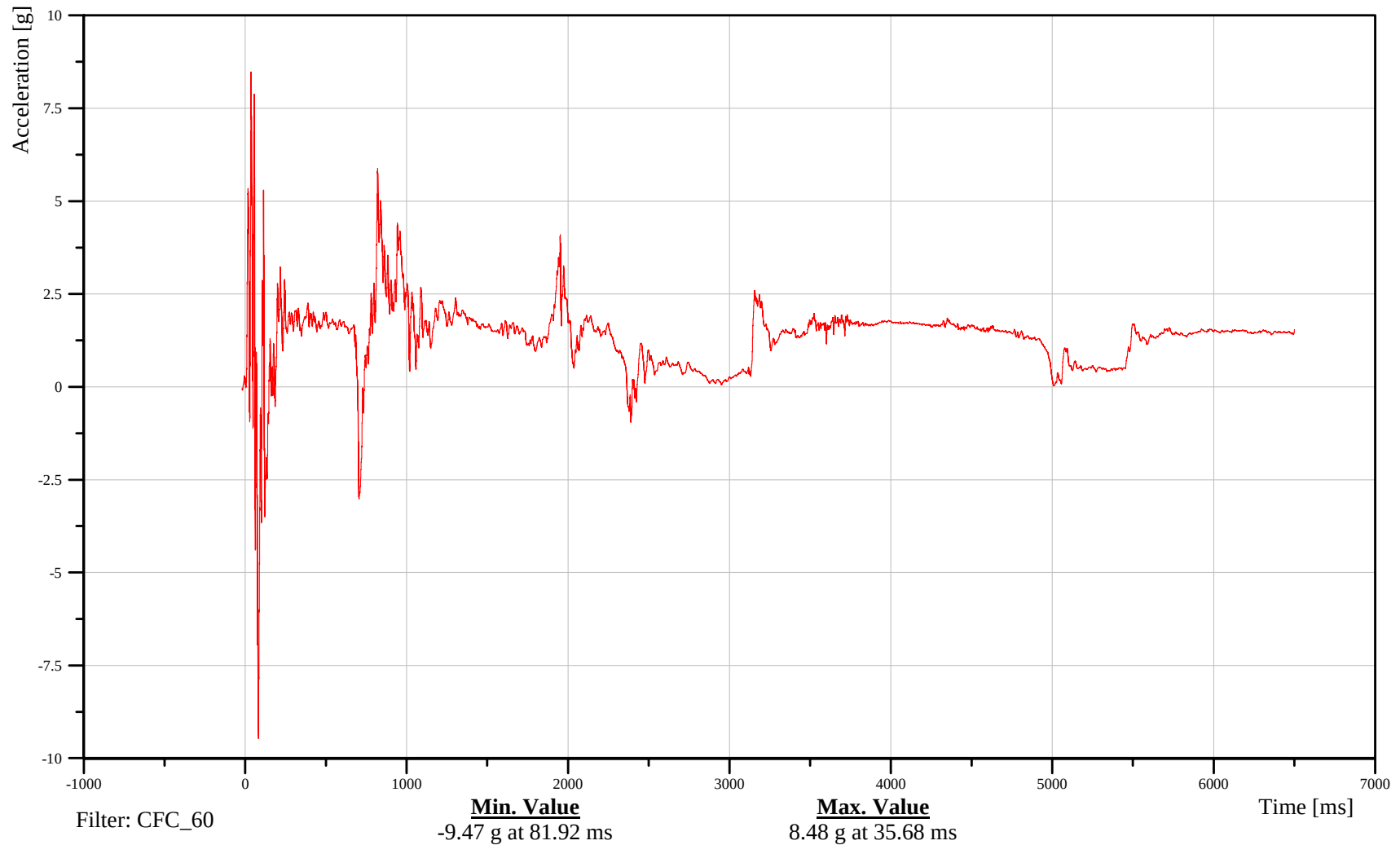
Time: 15:07

Customer: VRTC

10DPILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-165

100413



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Upper Resultant Acceleration

Date: 04/13/2010

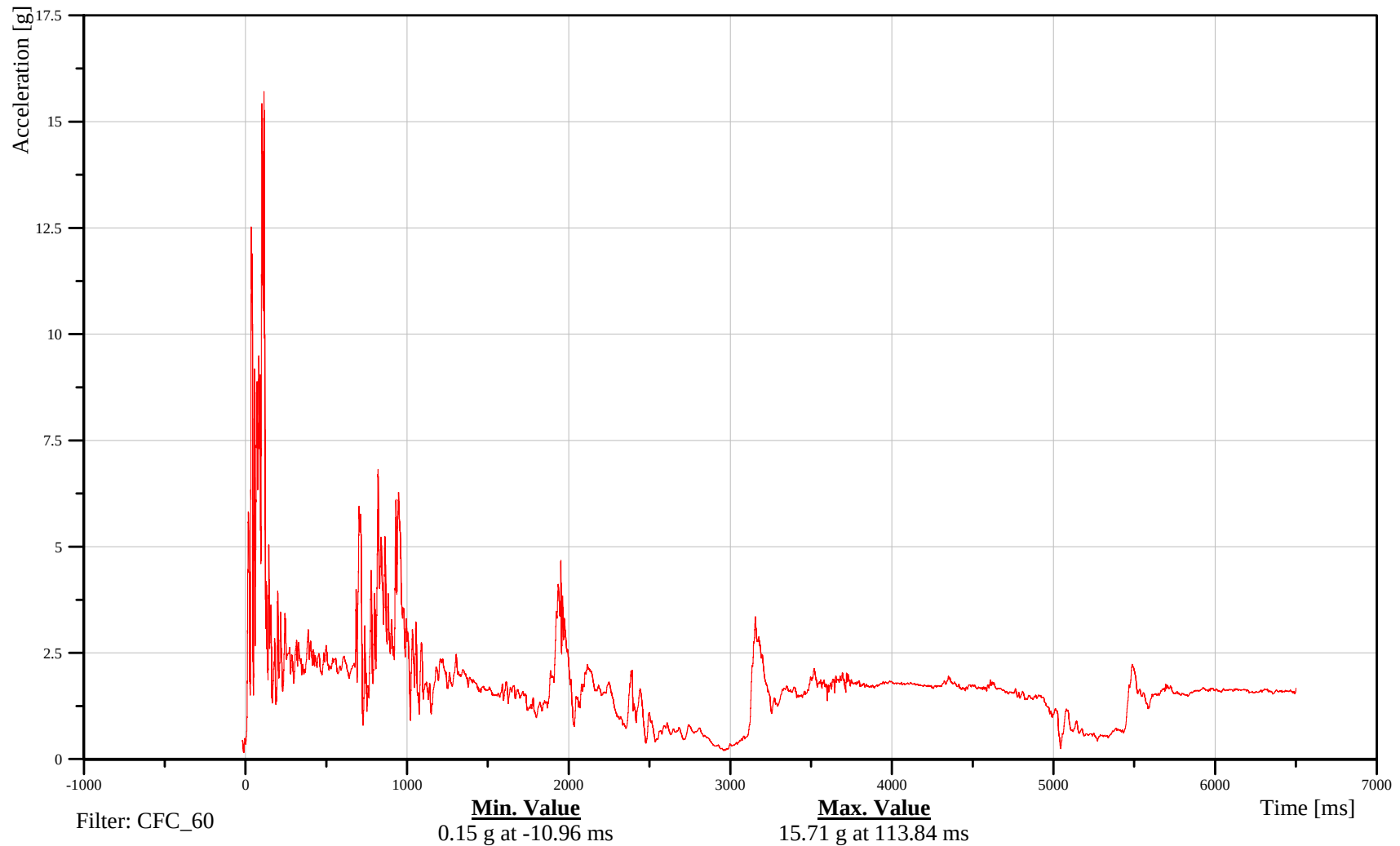
Time: 15:07

Customer: VRTC

10DPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-166

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right D-Pillar Lower X-Axis Acceleration

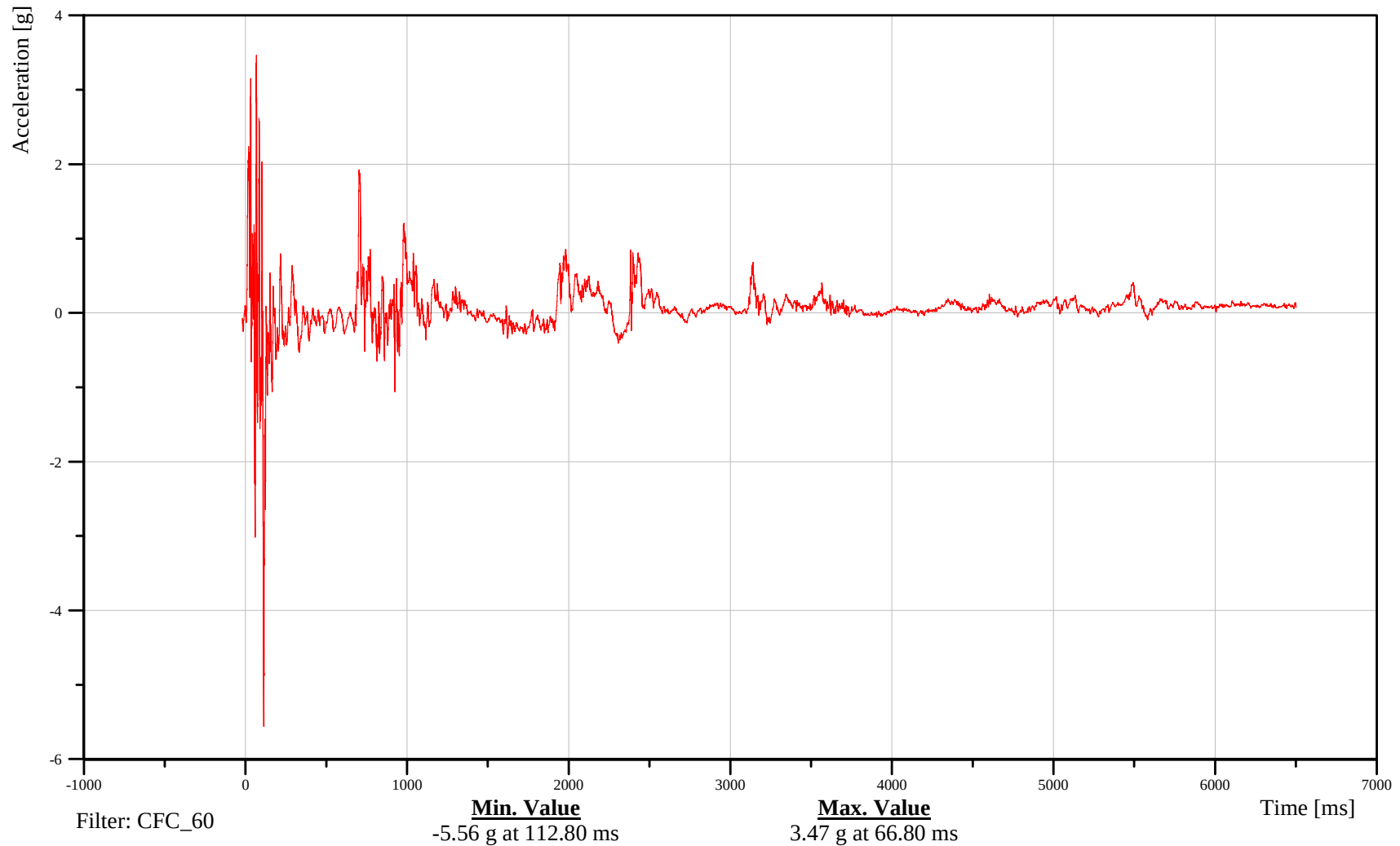
Time: 15:07

Customer: VRTC

10DPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-167

100413



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Lower Y-Axis Acceleration

Date: 04/13/2010

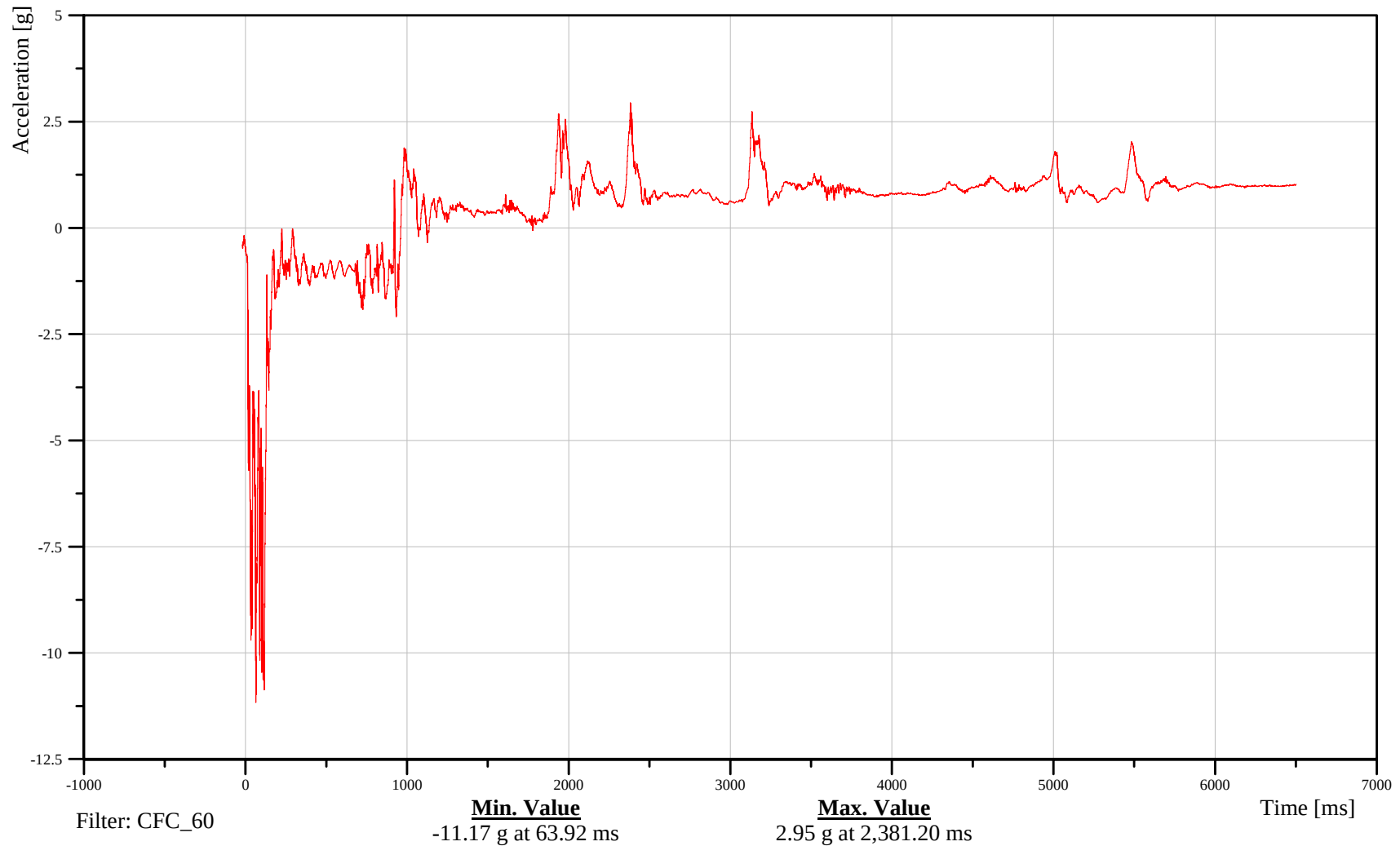
Time: 15:07

Customer: VRTC

10DPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-168

100413



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Lower Z-Axis Acceleration

Date: 04/13/2010

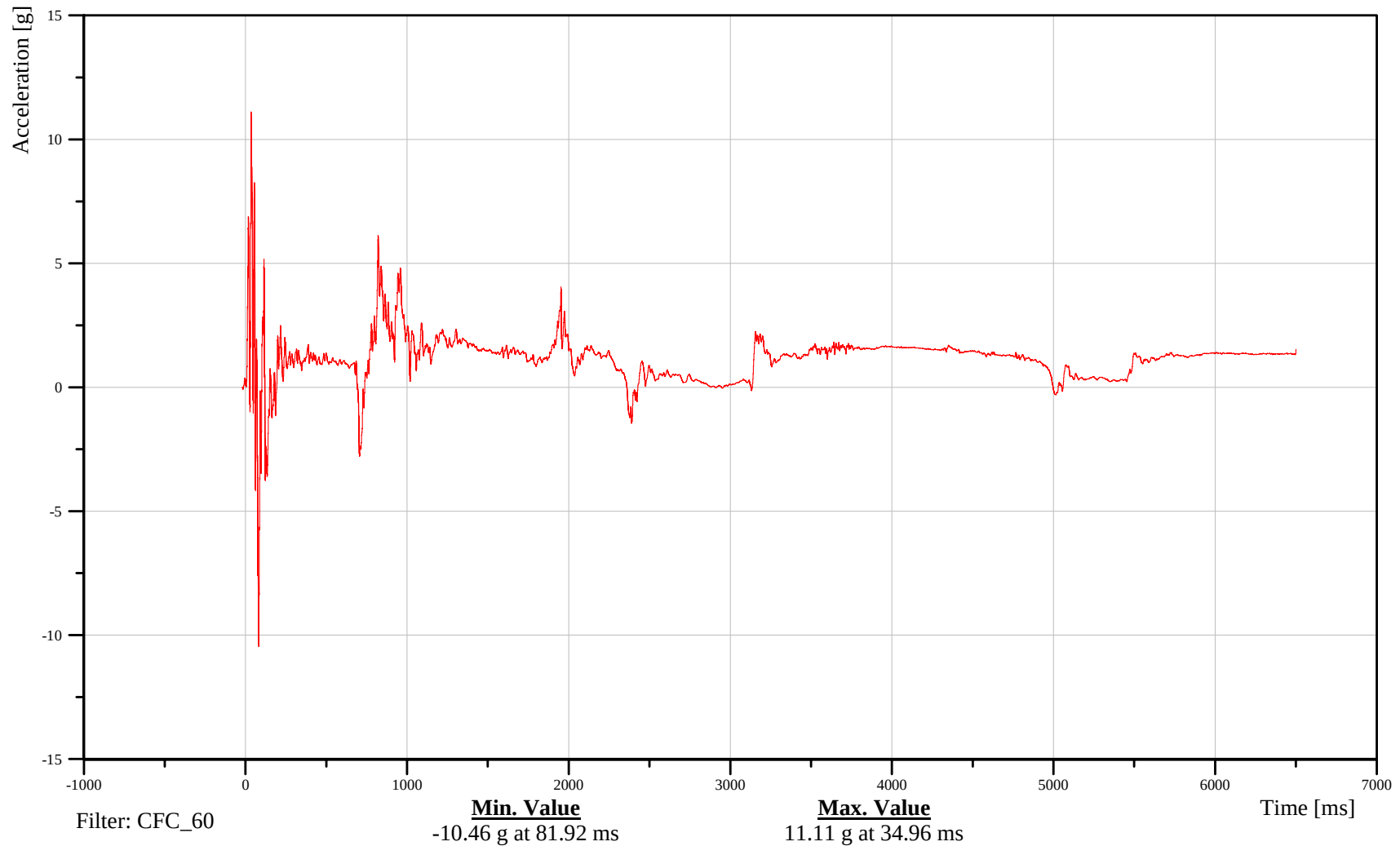
Time: 15:07

Customer: VRTC

10DPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-169

100413



Curb Trip Rollover 2007 Ford Expedition

Right D-Pillar Lower Resultant Acceleration

Date: 04/13/2010

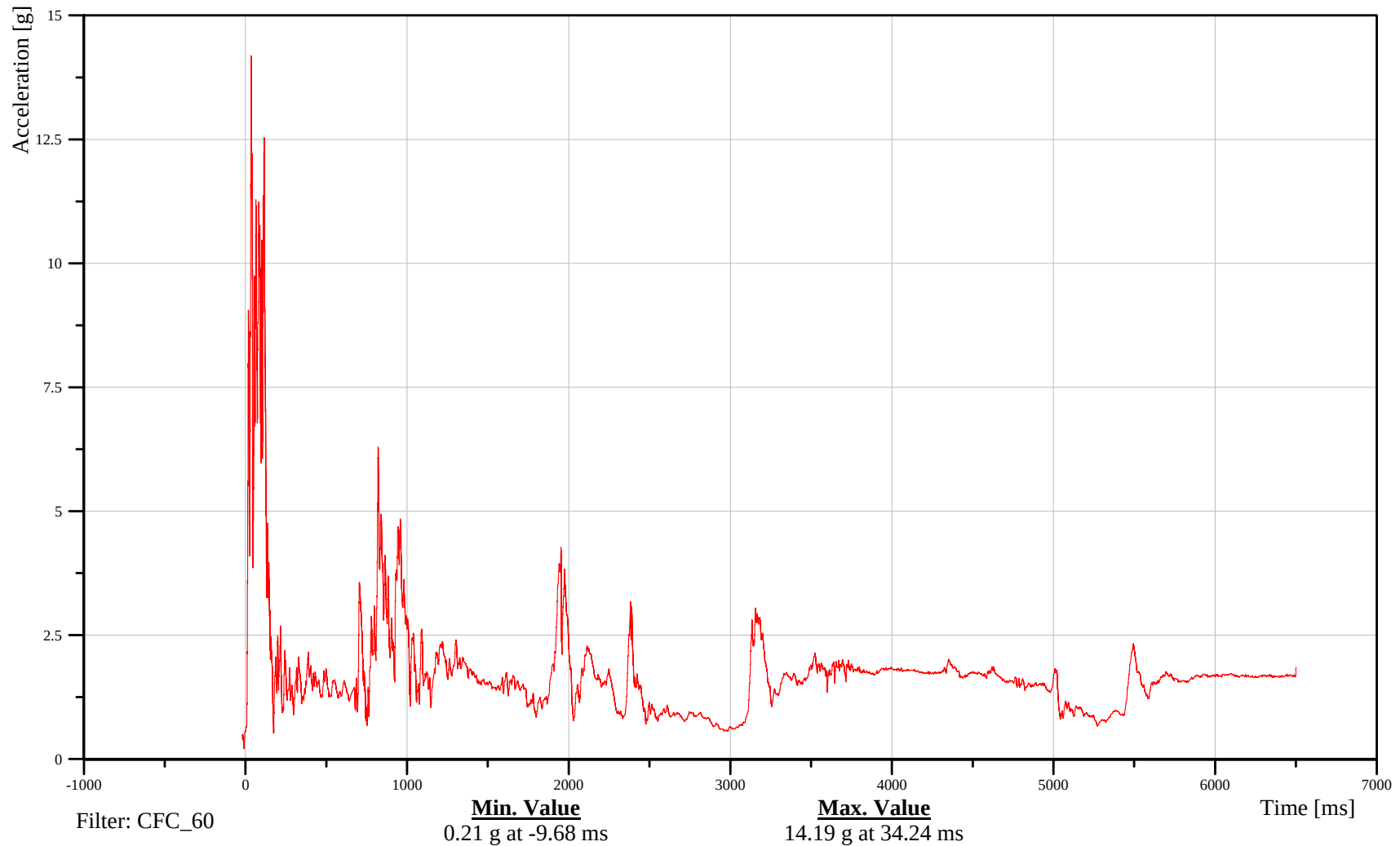
Time: 15:07

Customer: VRTC

10DPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-170

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck X-Axis Acceleration

Date: 04/13/2010

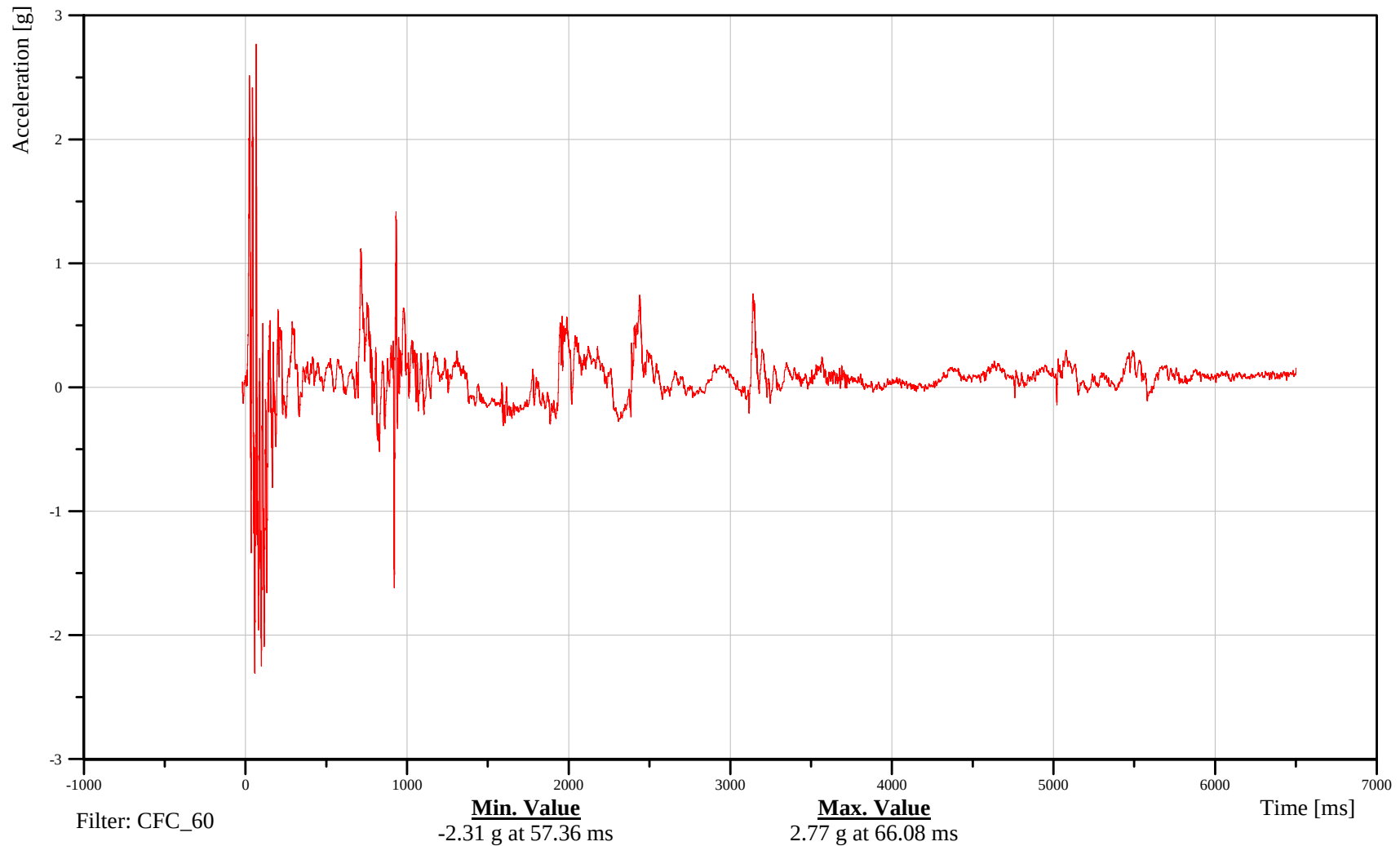
Time: 15:07

Customer: VRTC

102RDK000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-171

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck Y-Axis Acceleration

Date: 04/13/2010

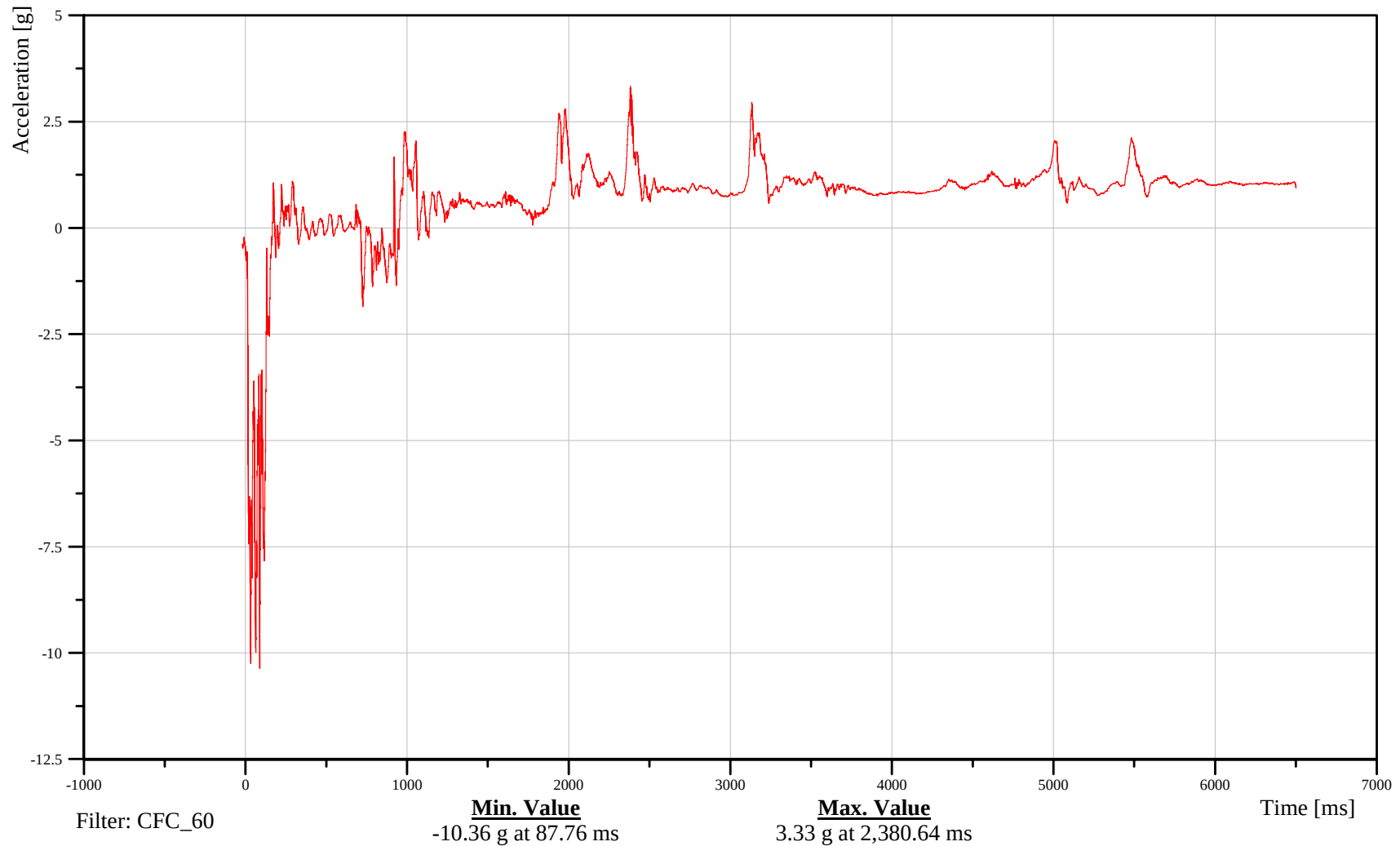
Time: 15:07

Customer: VRTC

102RDK000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-172

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck Z-Axis Acceleration

Date: 04/13/2010

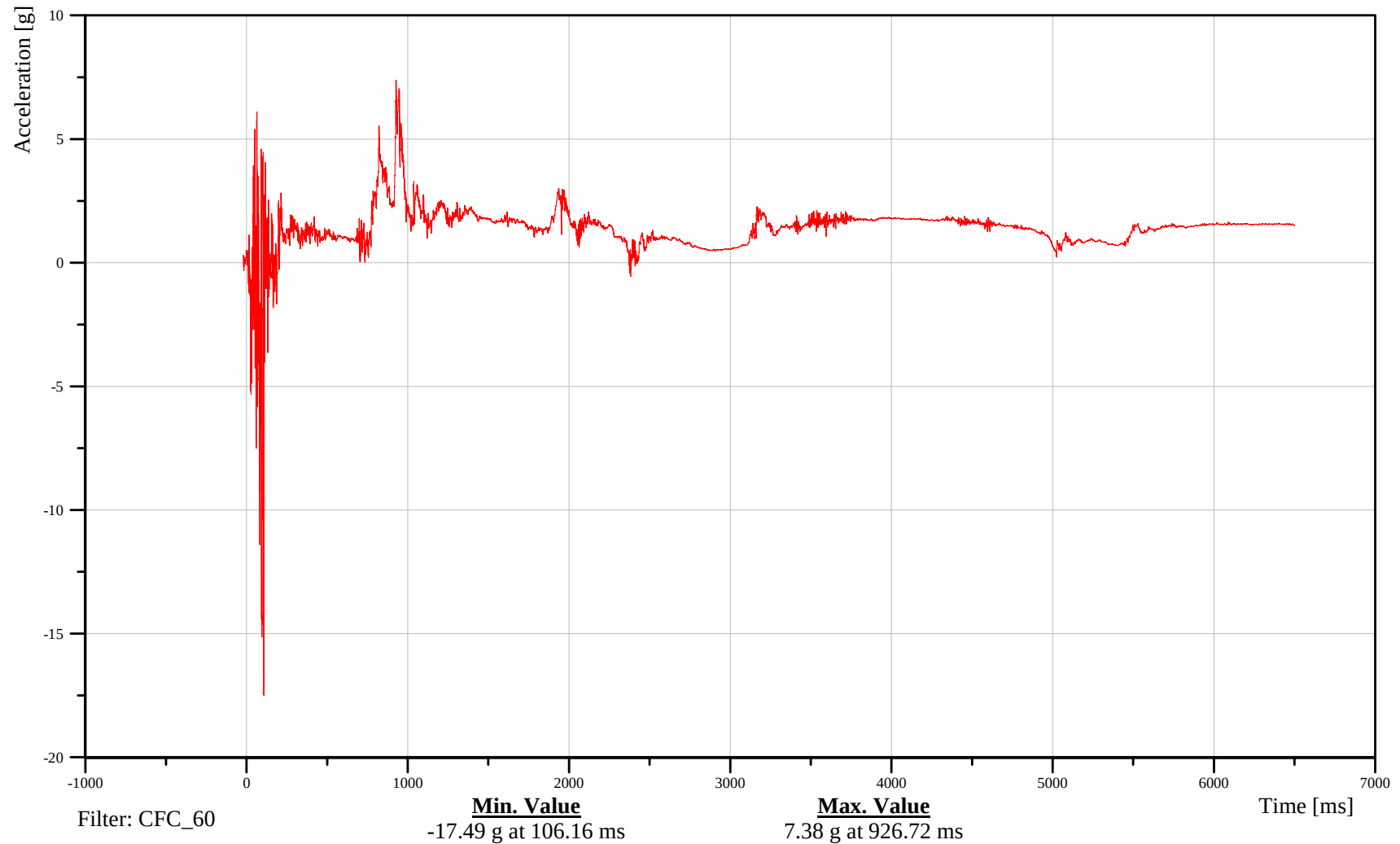
Time: 15:07

Customer: VRTC

102RDK000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-173

100413



Curb Trip Rollover 2007 Ford Expedition

Vehicle Rear Deck Resultant Acceleration

Date: 04/13/2010

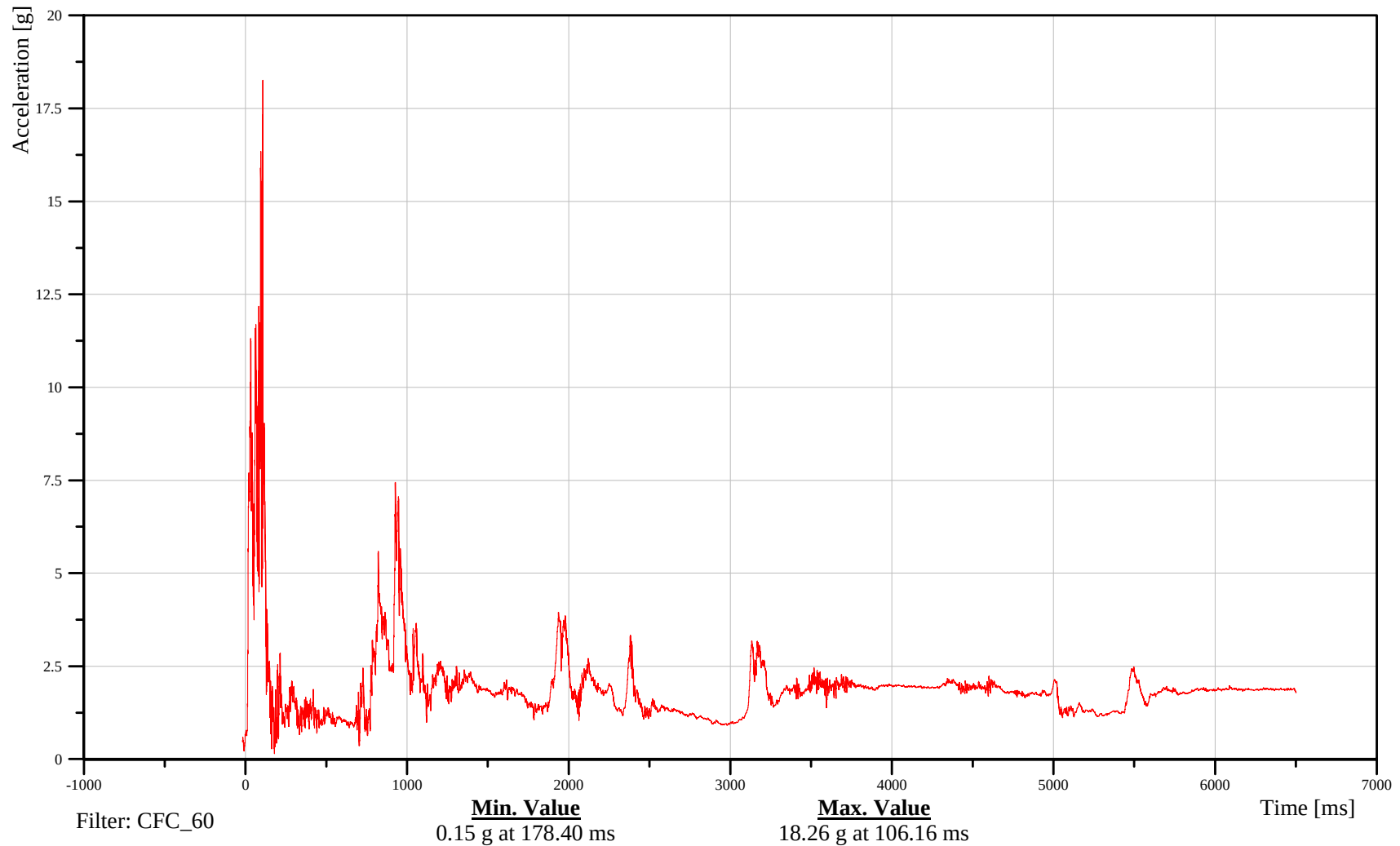
Time: 15:07

Customer: VRTC

102RDK000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-174

100413



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) X-Axis Acceleration

Date: 04/13/2010

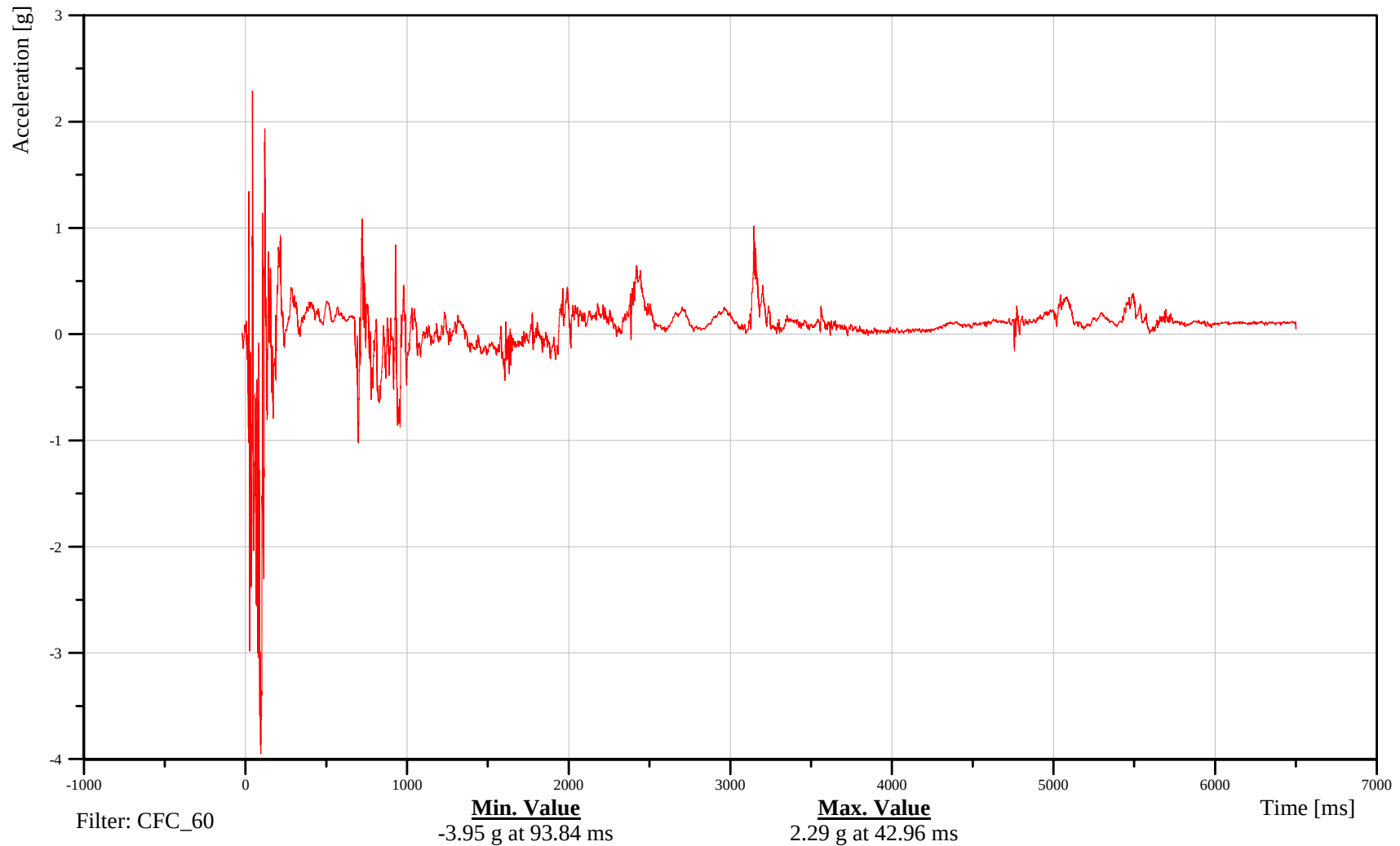
Time: 15:07

Customer: VRTC

11SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-175

100413



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) Y-Axis Acceleration

Date: 04/13/2010

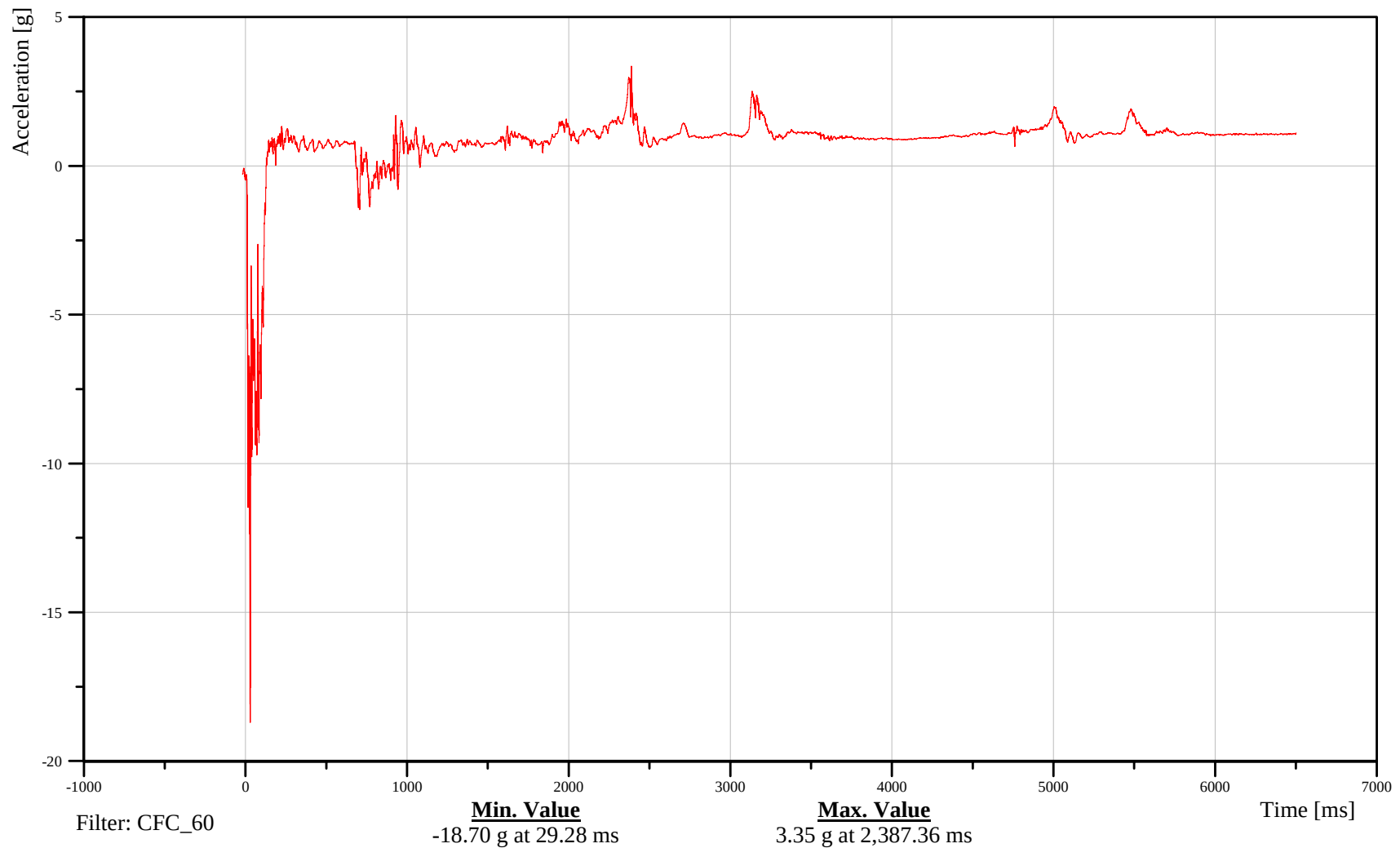
Time: 15:07

Customer: VRTC

11SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-176

100413



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) Z-Axis Acceleration

Date: 04/13/2010

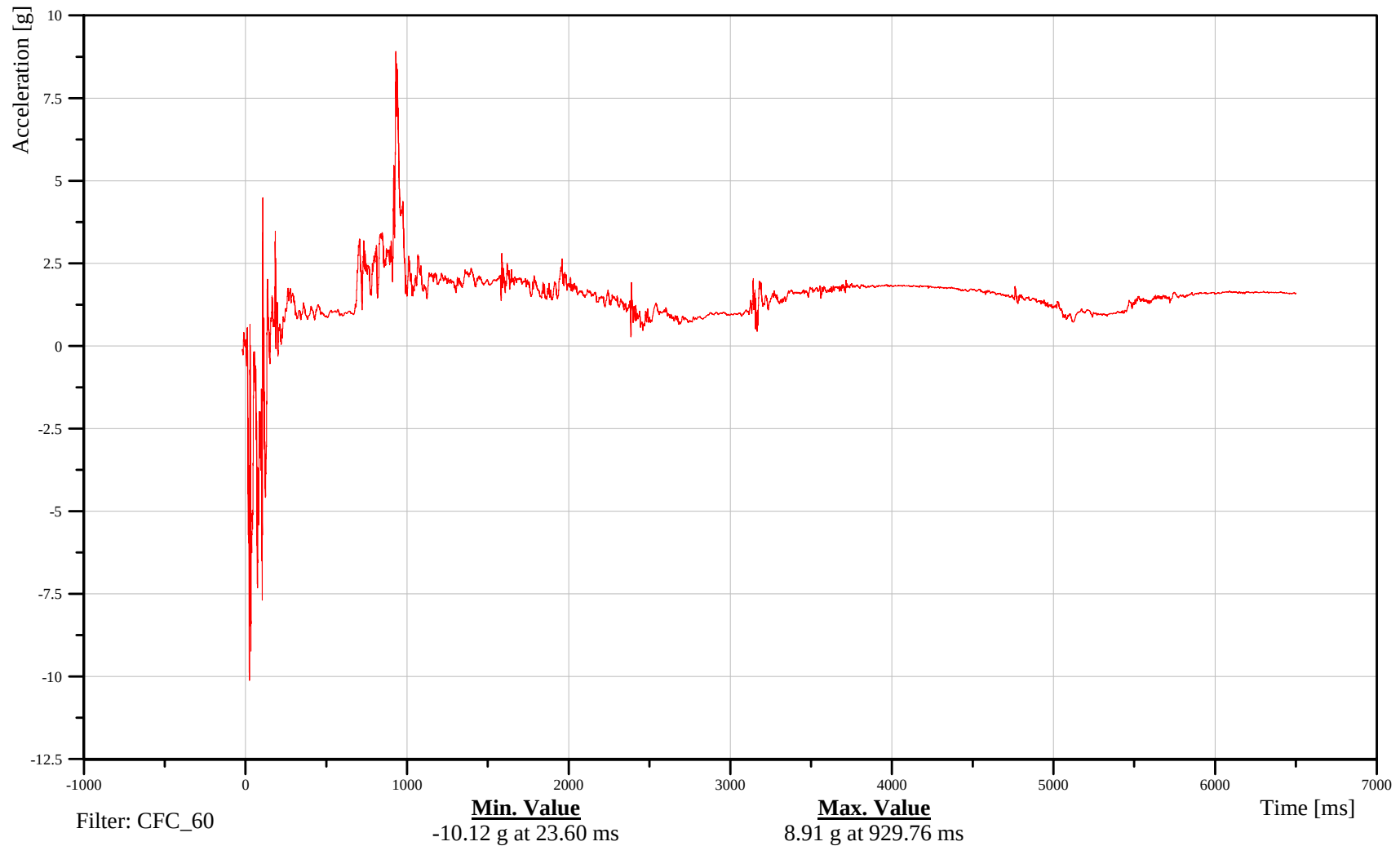
Time: 15:07

Customer: VRTC

11SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-177

100413



Curb Trip Rollover 2007 Ford Expedition

LF Seat Position (on floor) Resultant Acceleration

Date: 04/13/2010

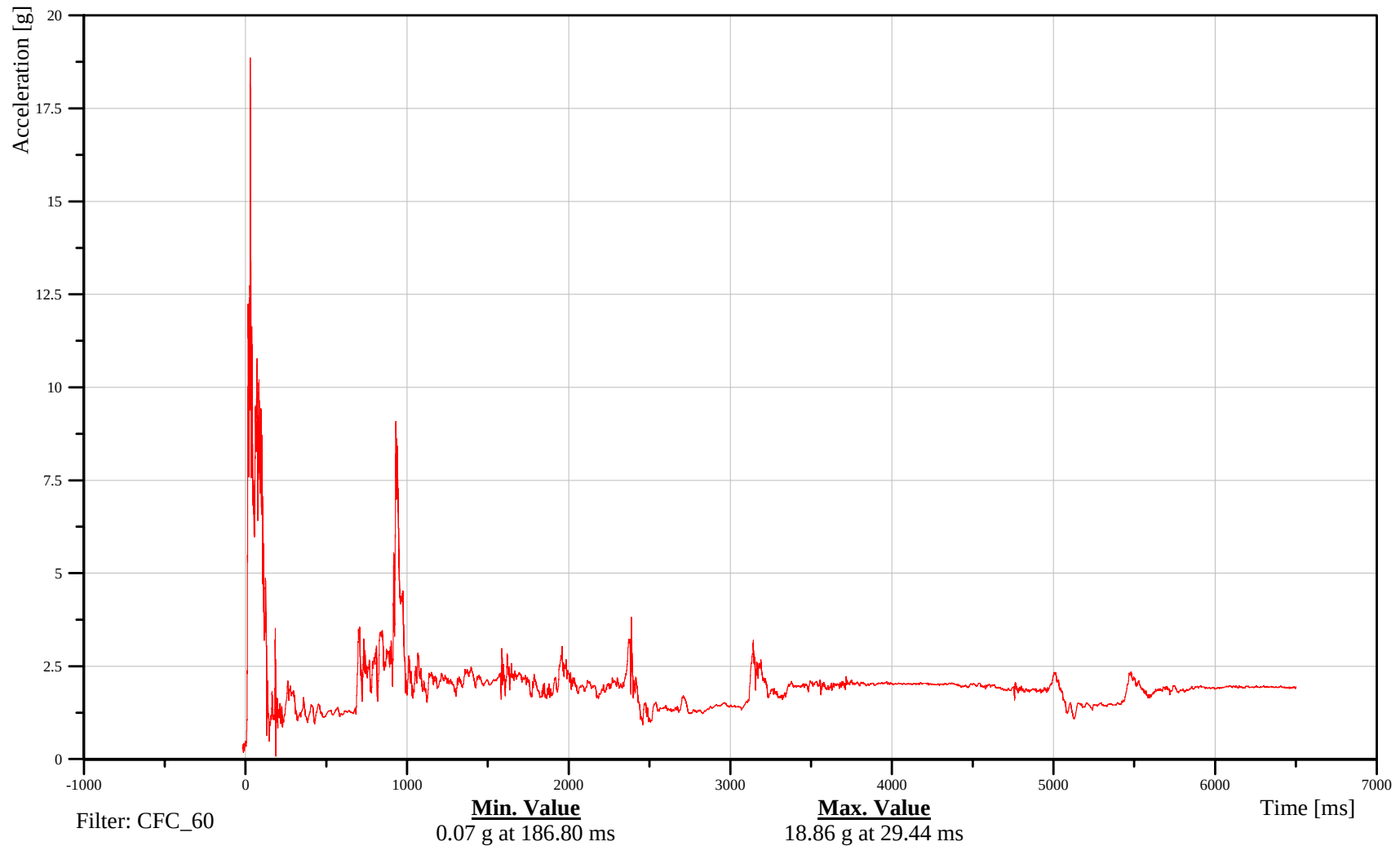
Time: 15:07

Customer: VRTC

11SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-178

100413



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) X-Axis Acceleration

Date: 04/13/2010

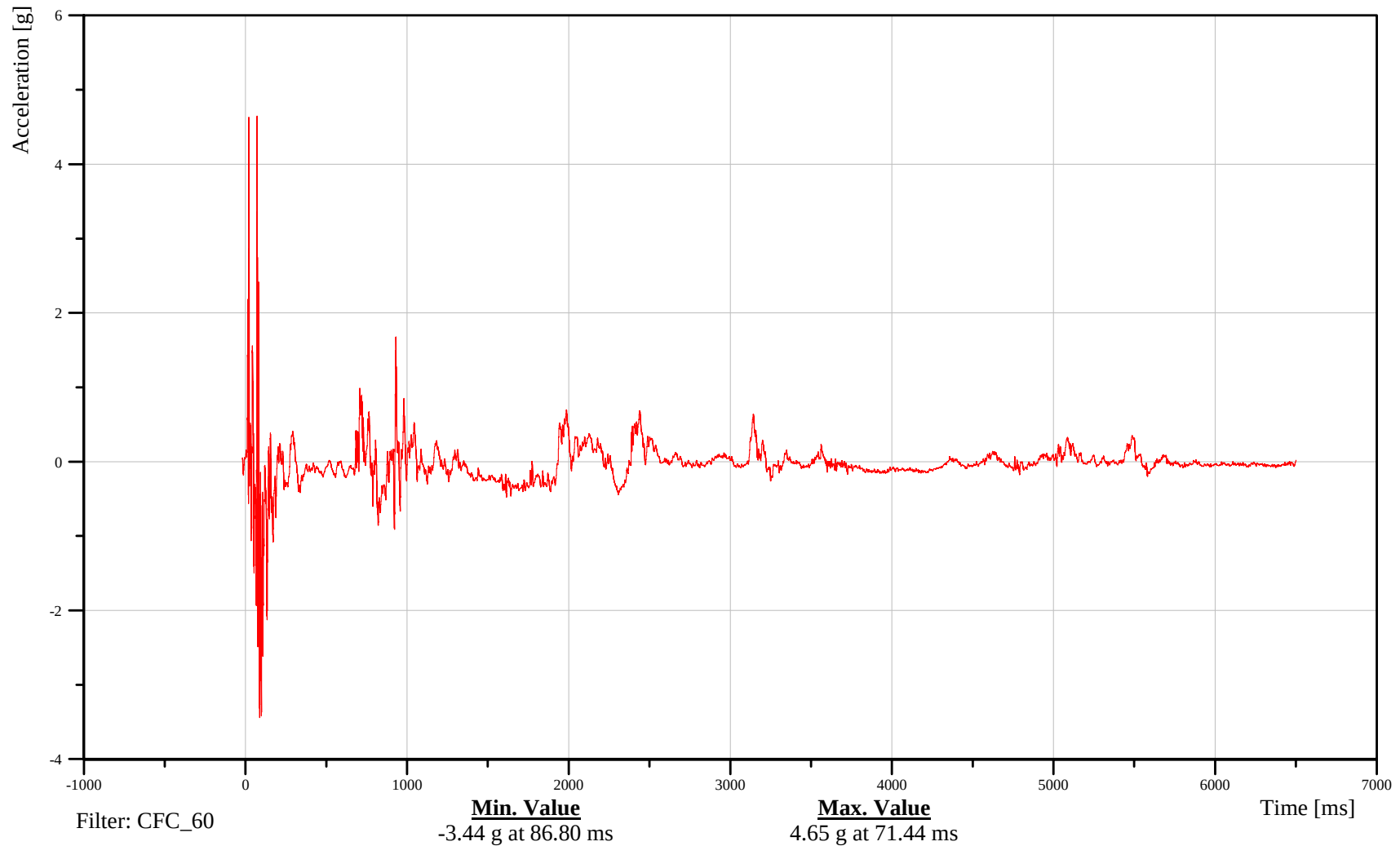
Time: 15:07

Customer: VRTC

13SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-179

100413



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) Y-Axis Acceleration

Date: 04/13/2010

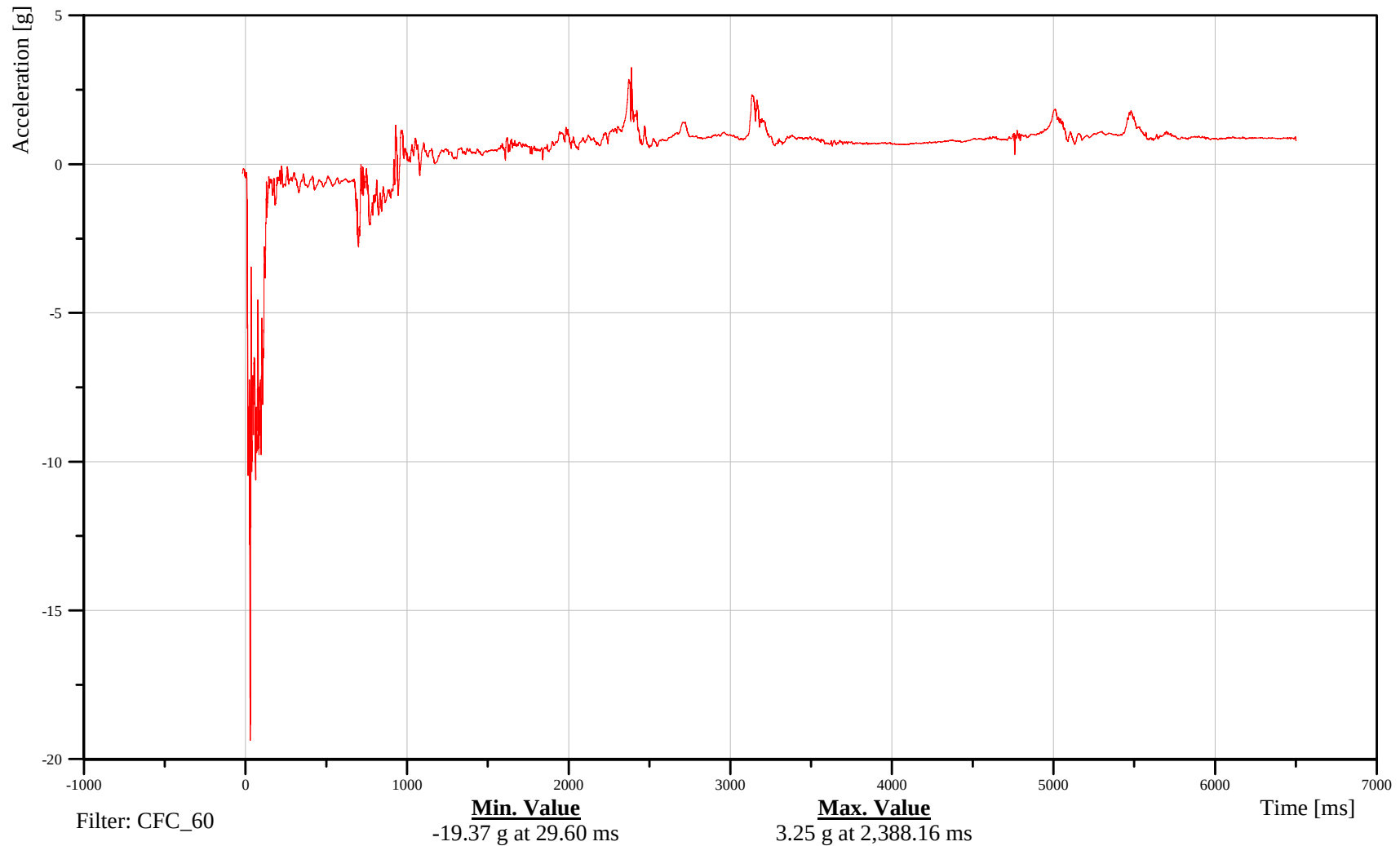
Time: 15:07

Customer: VRTC

13SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-180

100413



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) Z-Axis Acceleration

Date: 04/13/2010

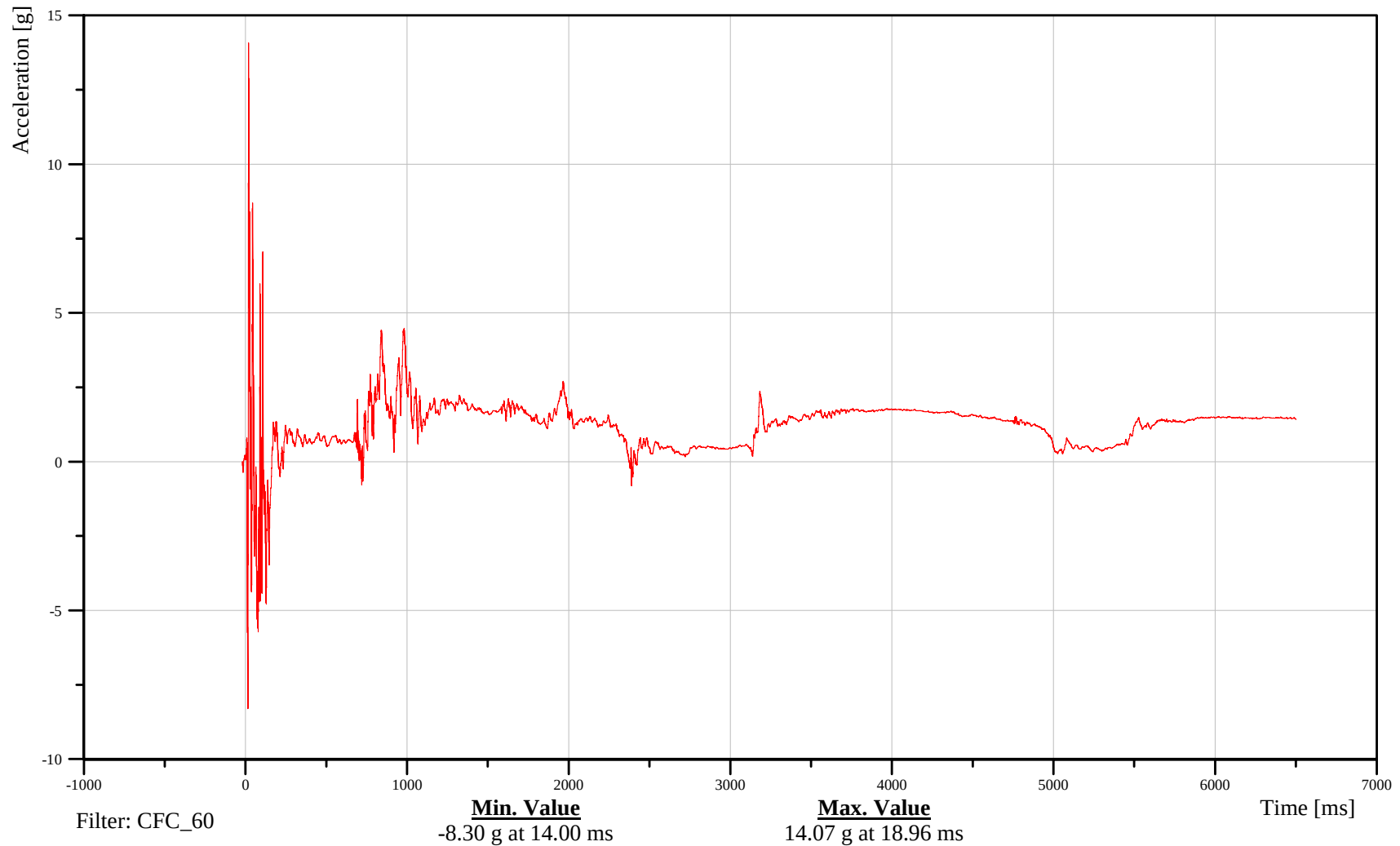
Time: 15:07

Customer: VRTC

13SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-181

100413



Curb Trip Rollover 2007 Ford Expedition

RF Seat Position (on floor) Resultant Acceleration

Date: 04/13/2010

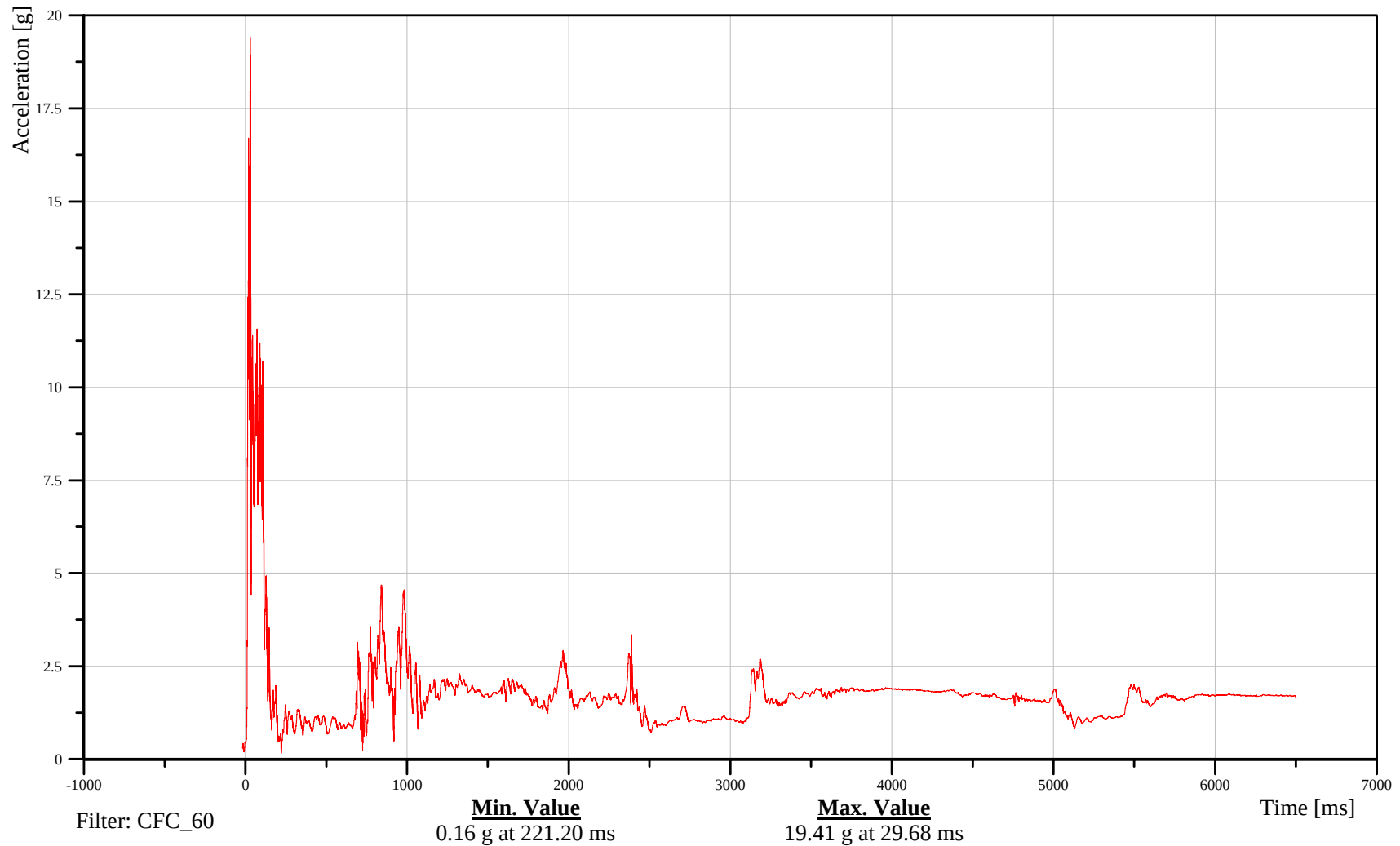
Time: 15:07

Customer: VRTC

13SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-182

100413



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) X-Axis Acceleration

Date: 04/13/2010

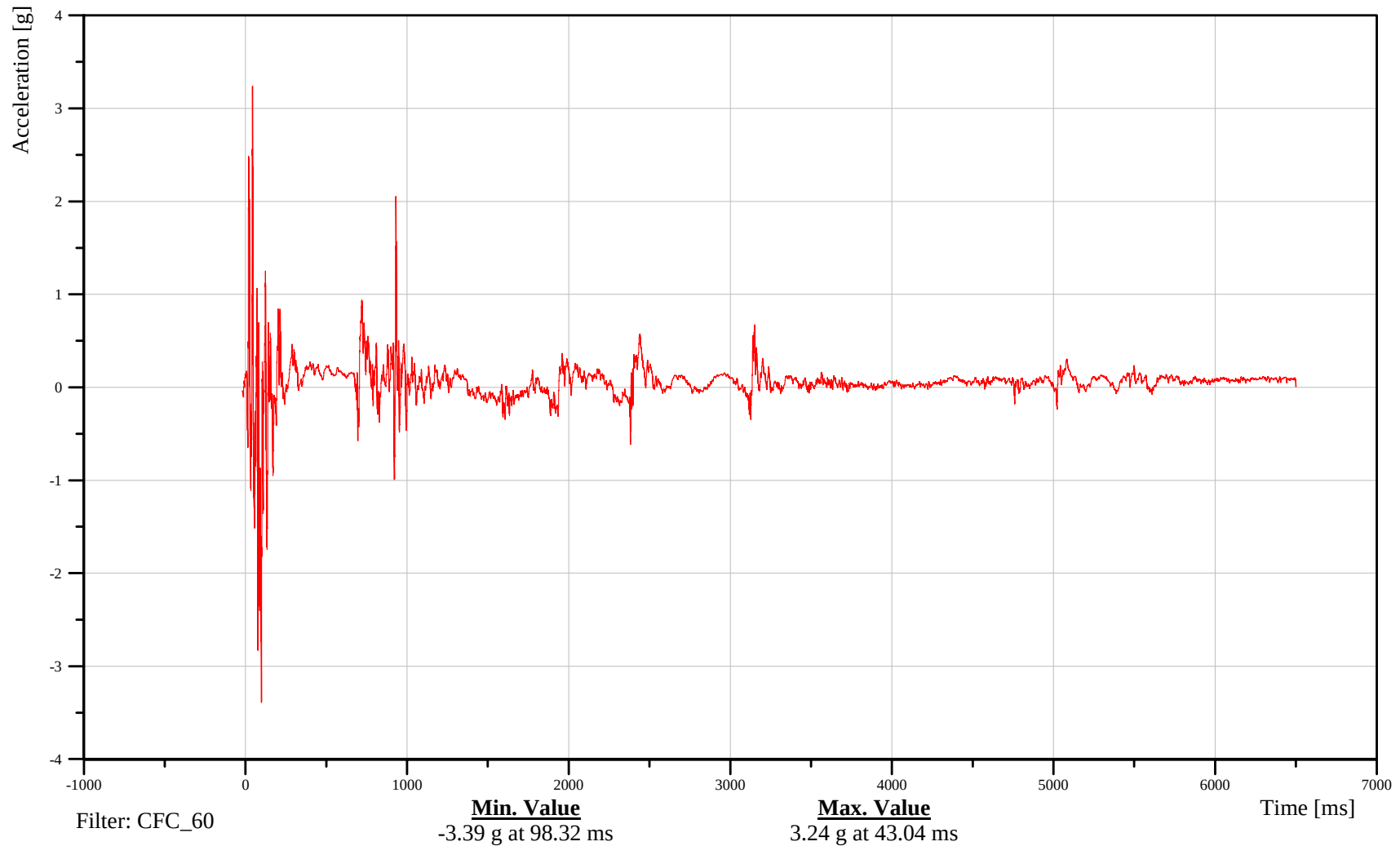
Time: 15:07

Customer: VRTC

14SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-183

100413



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) Y-Axis Acceleration

Date: 04/13/2010

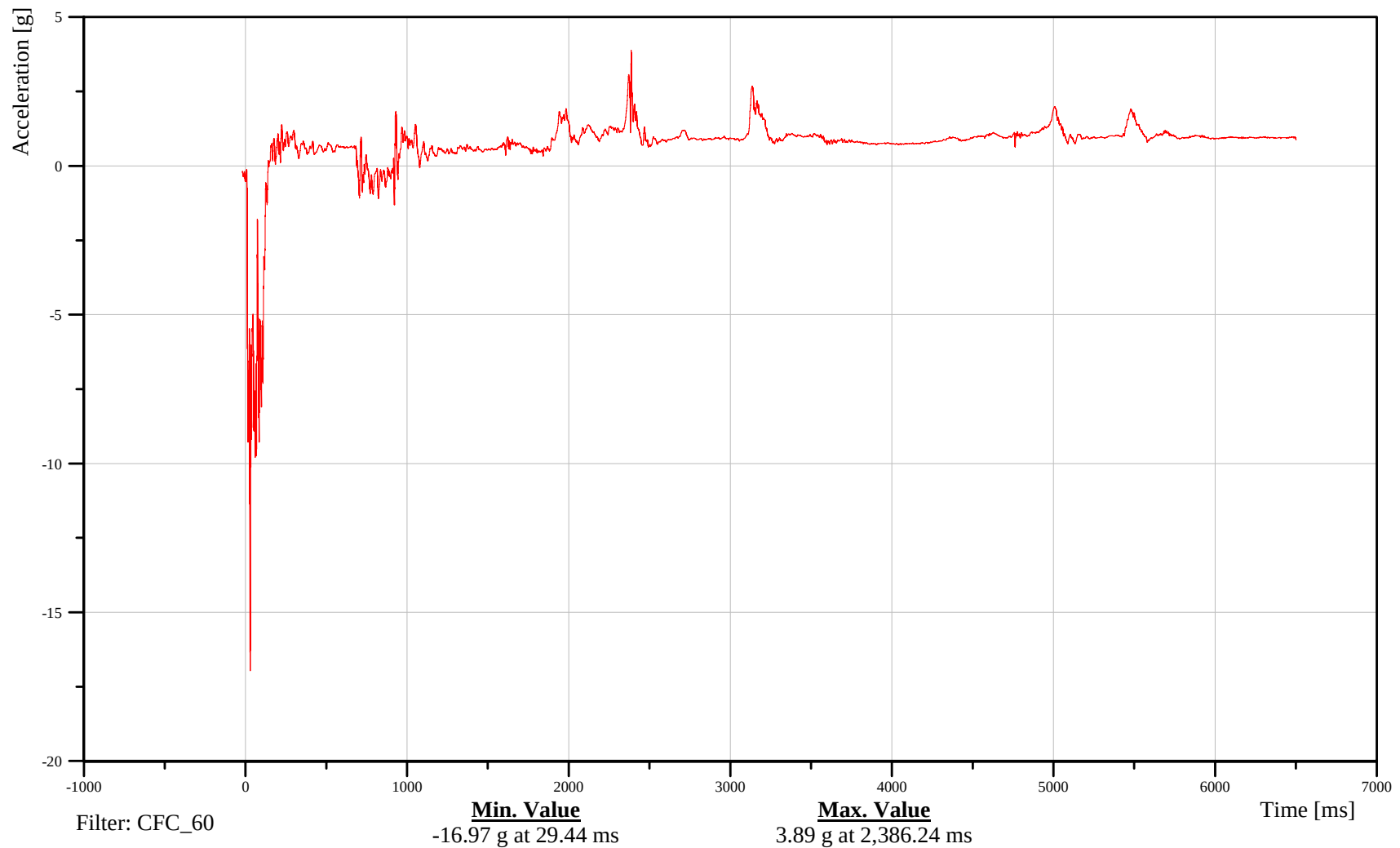
Time: 15:07

Customer: VRTC

14SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-184

100413



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) Z-Axis Acceleration

Date: 04/13/2010

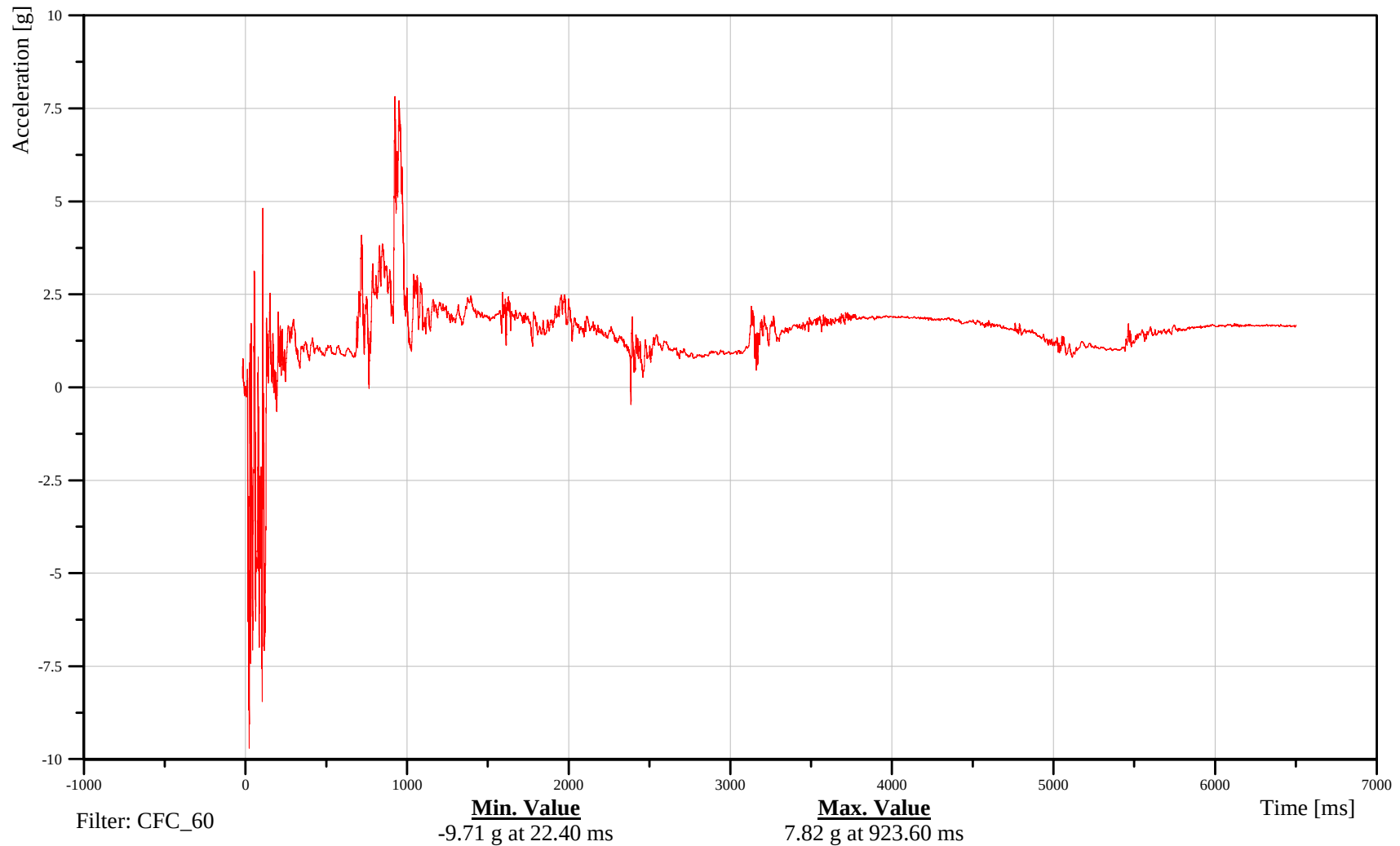
Time: 15:07

Customer: VRTC

14SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-185

100413



Curb Trip Rollover 2007 Ford Expedition

LR Seat Position (on floor) Resultant Acceleration

Date: 04/13/2010

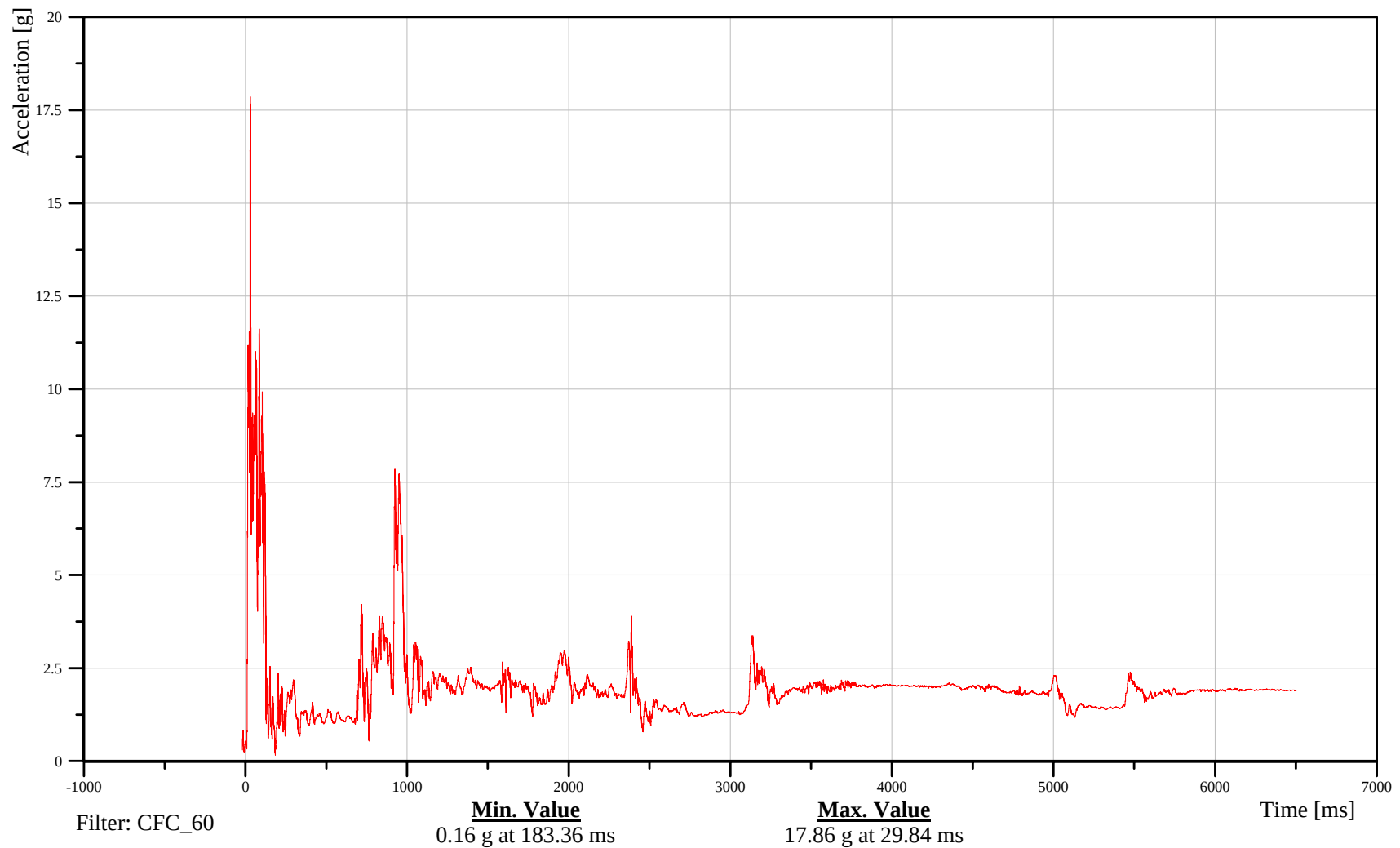
Time: 15:07

Customer: VRTC

14SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-186

100413



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) X-Axis Acceleration

Date: 04/13/2010

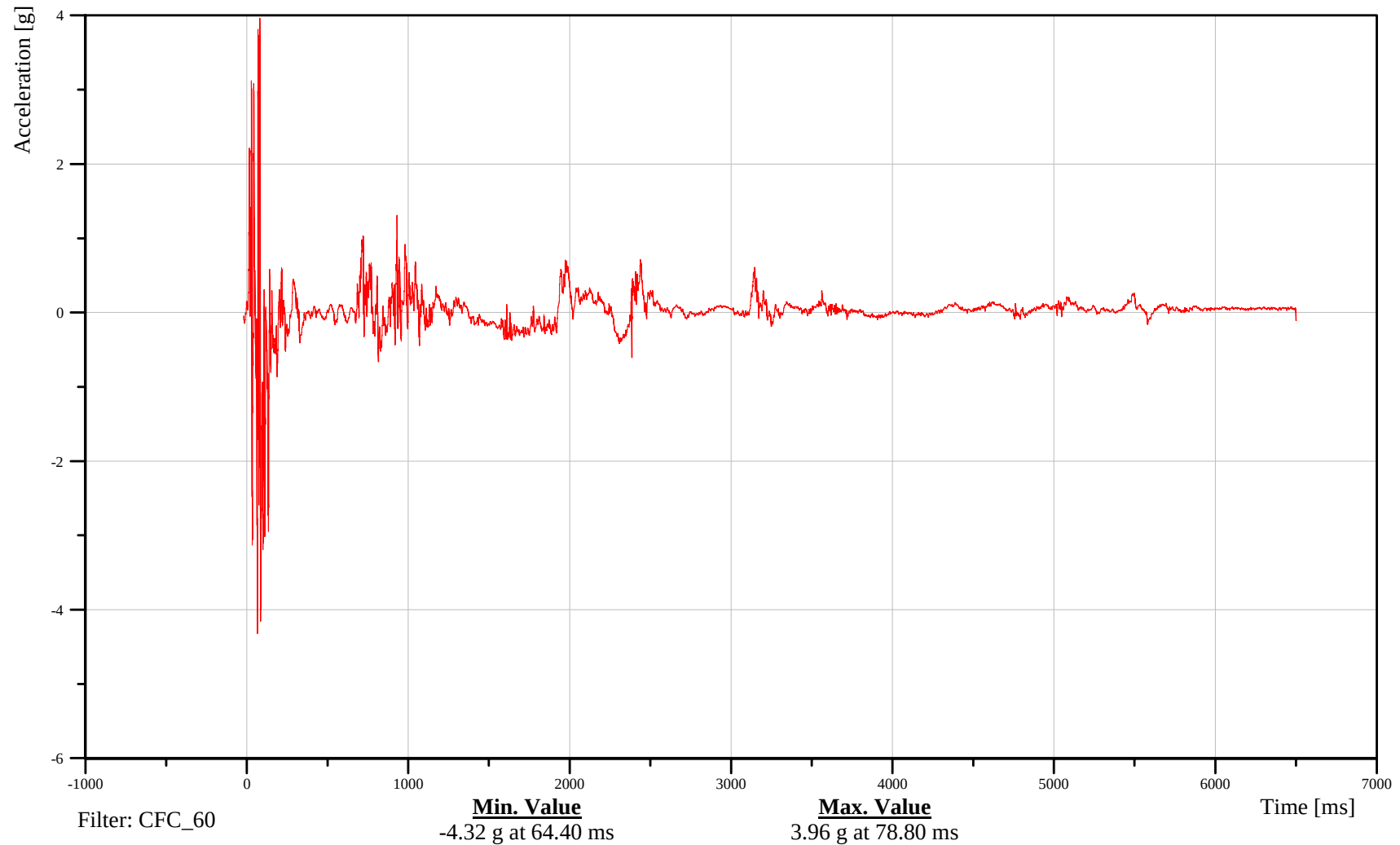
Time: 15:07

Customer: VRTC

16SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-187

100413



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) Y-Axis Acceleration

Date: 04/13/2010

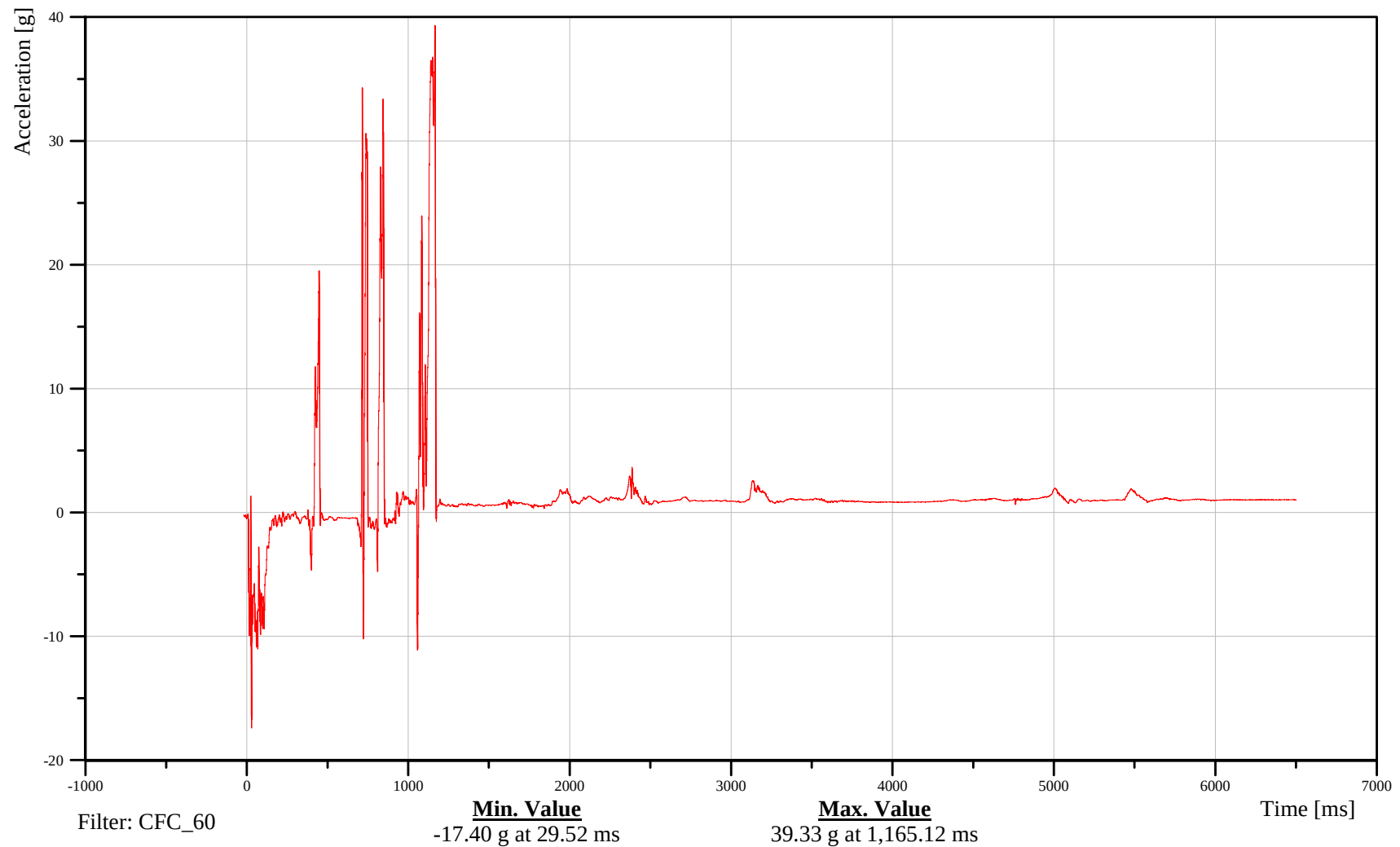
Time: 15:07

Customer: VRTC

16SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-188

100413



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) Z-Axis Acceleration

Date: 04/13/2010

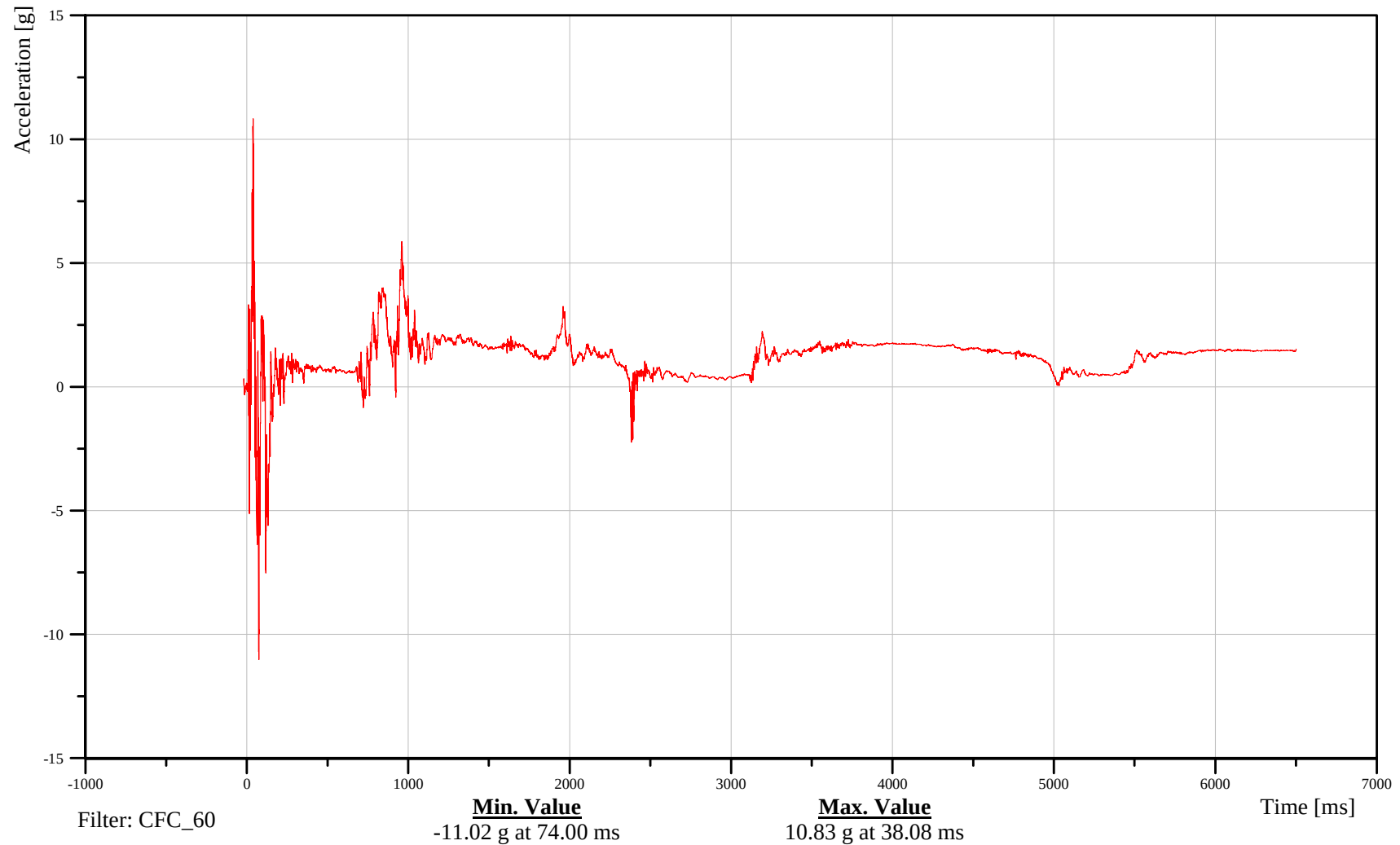
Time: 15:07

Customer: VRTC

16SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-189

100413



Curb Trip Rollover 2007 Ford Expedition

RR Seat Position (on floor) Resultant Acceleration

Date: 04/13/2010

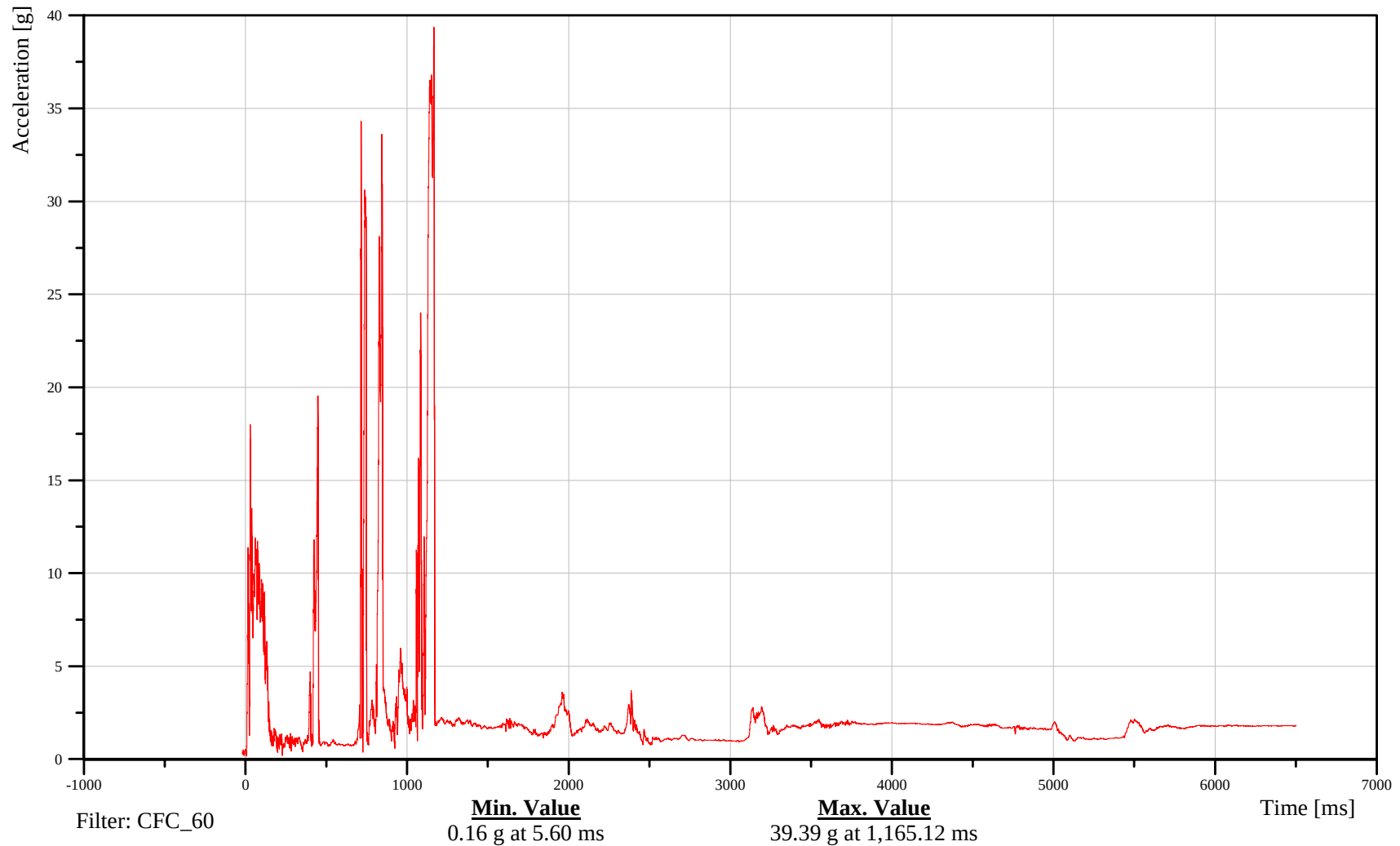
Time: 15:07

Customer: VRTC

16SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100413



B-190

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Lap Belt Force

Date: 04/13/2010

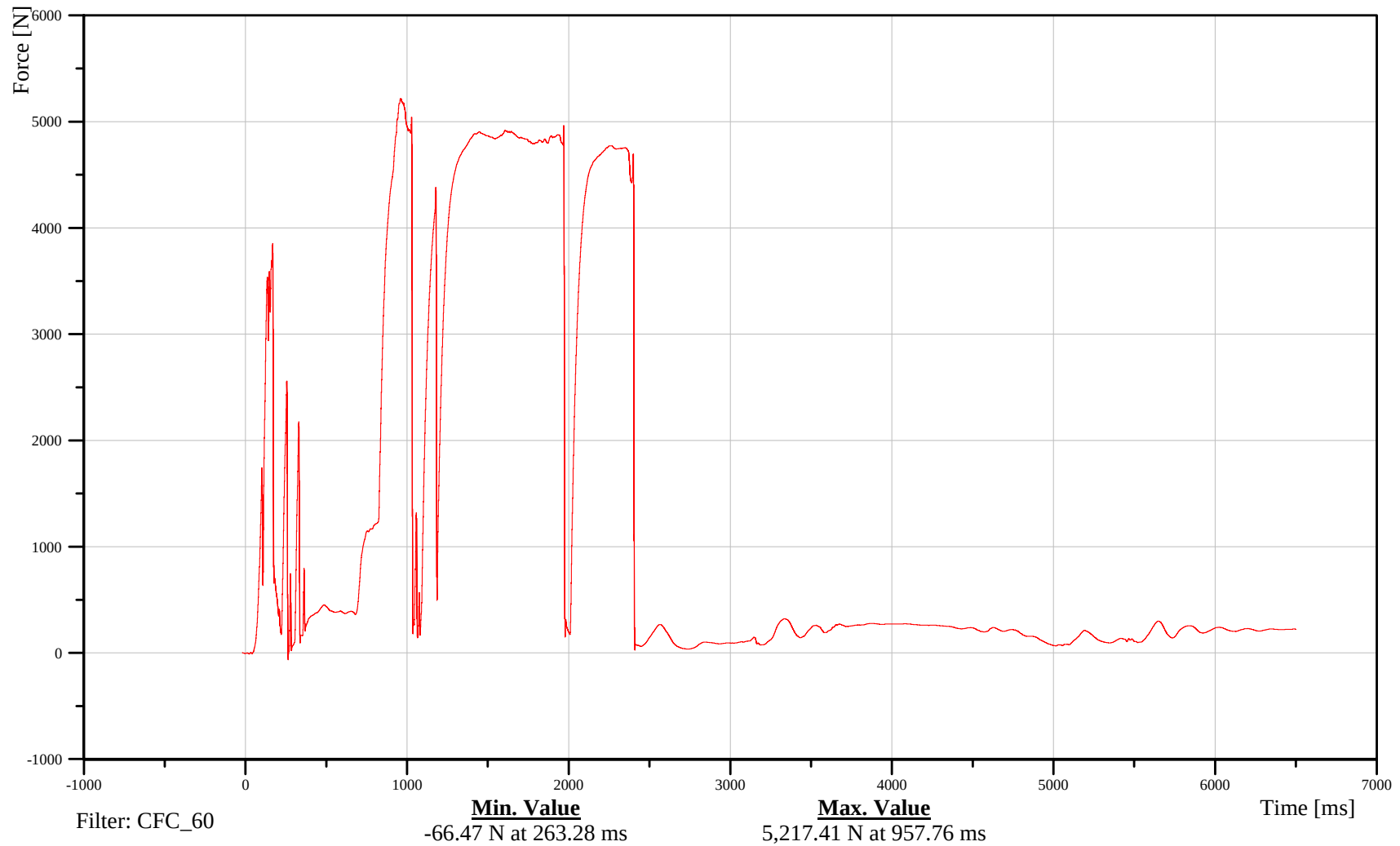
Time: 15:07

Customer: VRTC

11SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 100413



B-191

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Shoulder Belt Force

Date: 04/13/2010

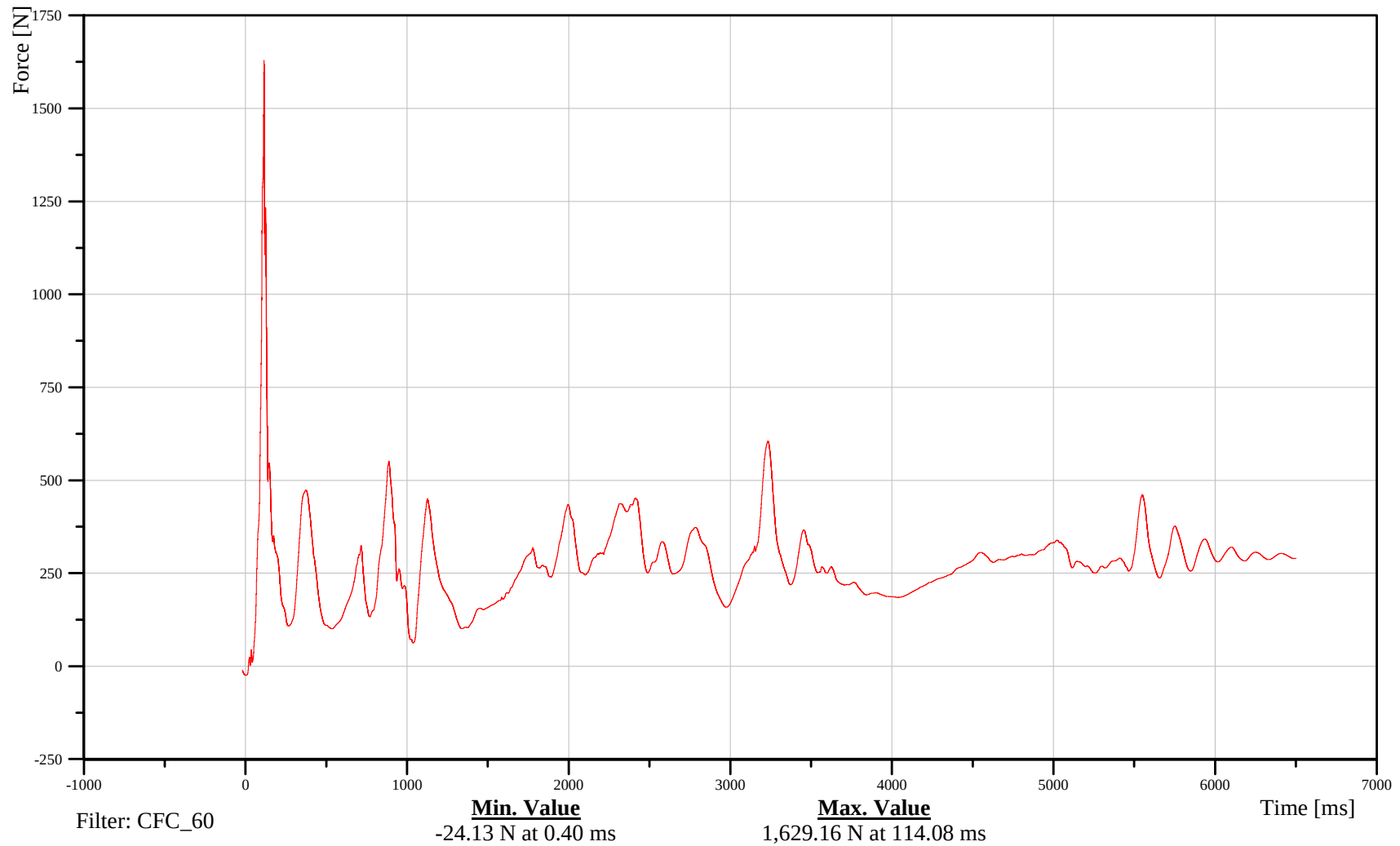
Time: 15:07

Customer: VRTC

11SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 100413



B-192

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Lap Belt Force

Date: 04/13/2010

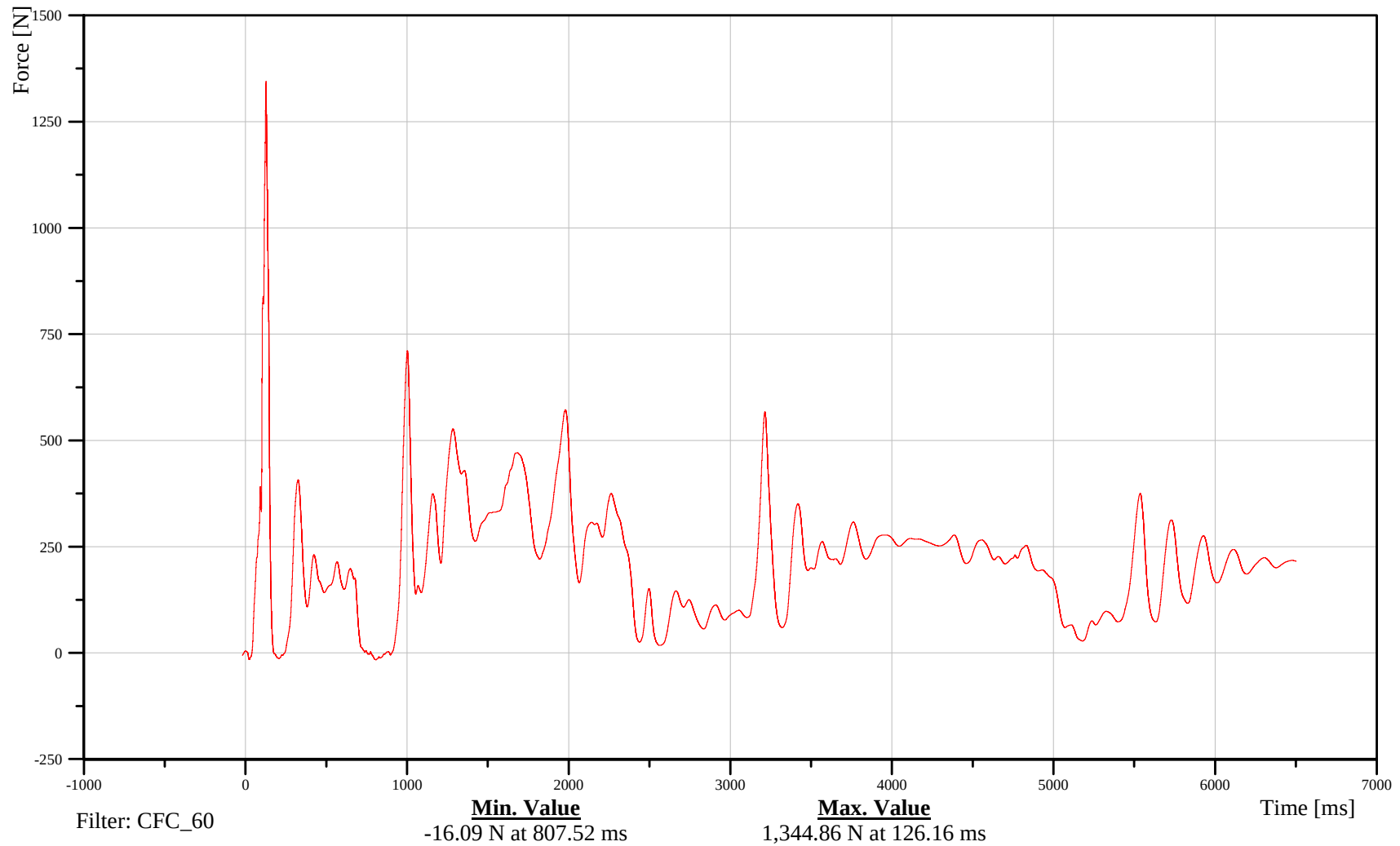
Time: 15:07

Customer: VRTC

13SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 100413



B-193

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Shoulder Belt Force

Date: 04/13/2010

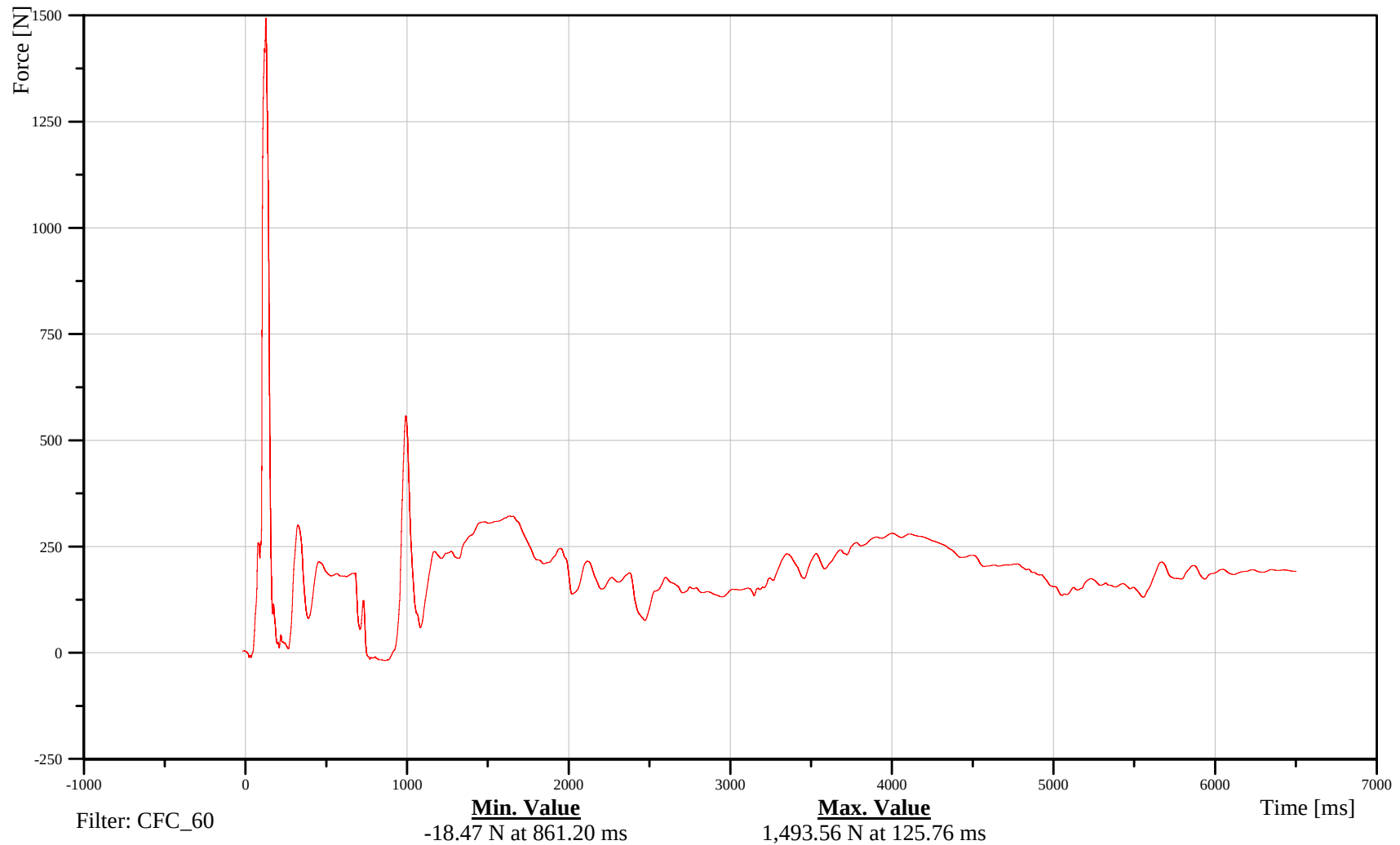
Time: 15:07

Customer: VRTC

13SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 100413



B-194

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Lap Belt Force

Date: 04/13/2010

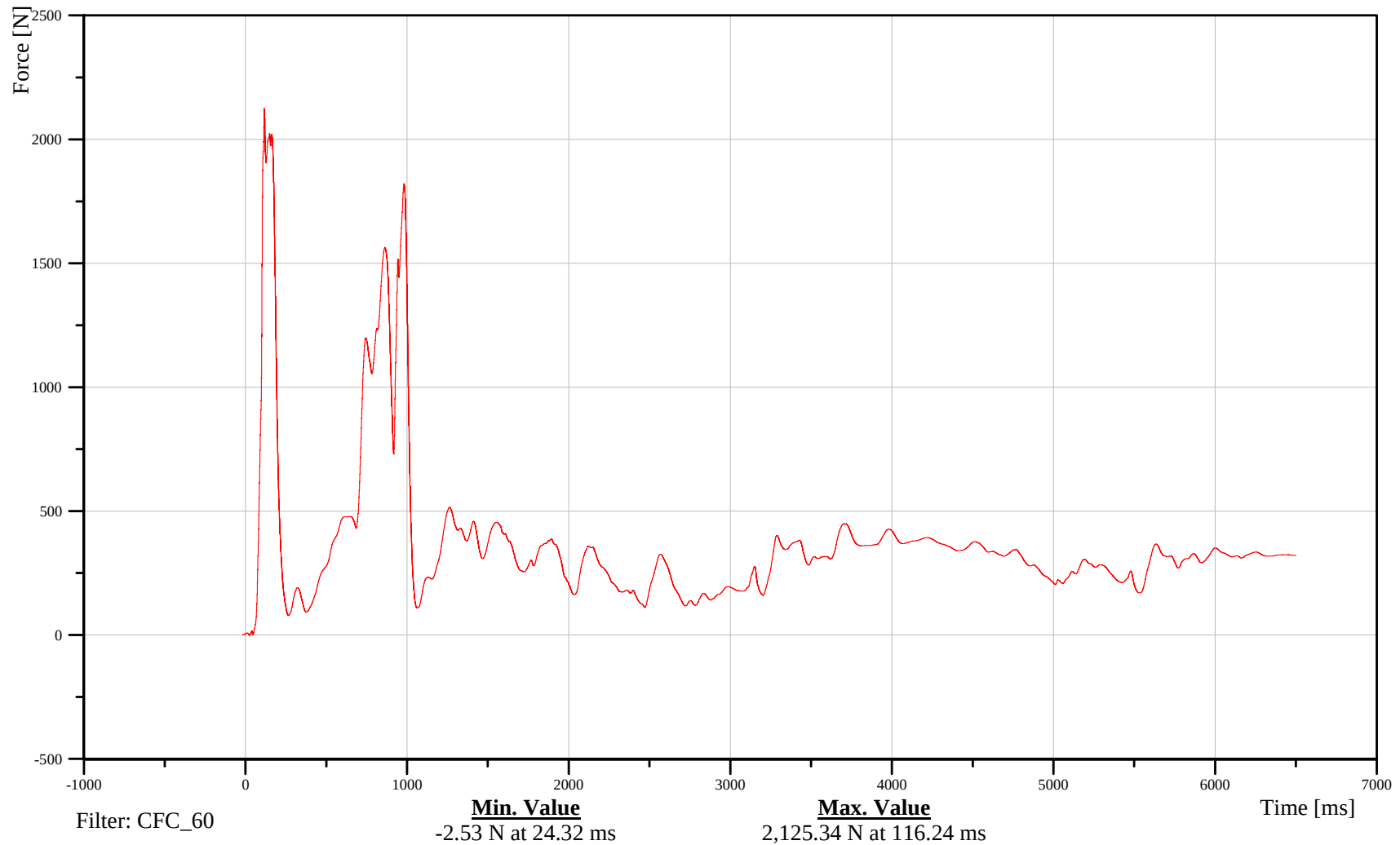
Time: 15:07

Customer: VRTC

14SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 100413



B-195

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Shoulder Belt Force

Date: 04/13/2010

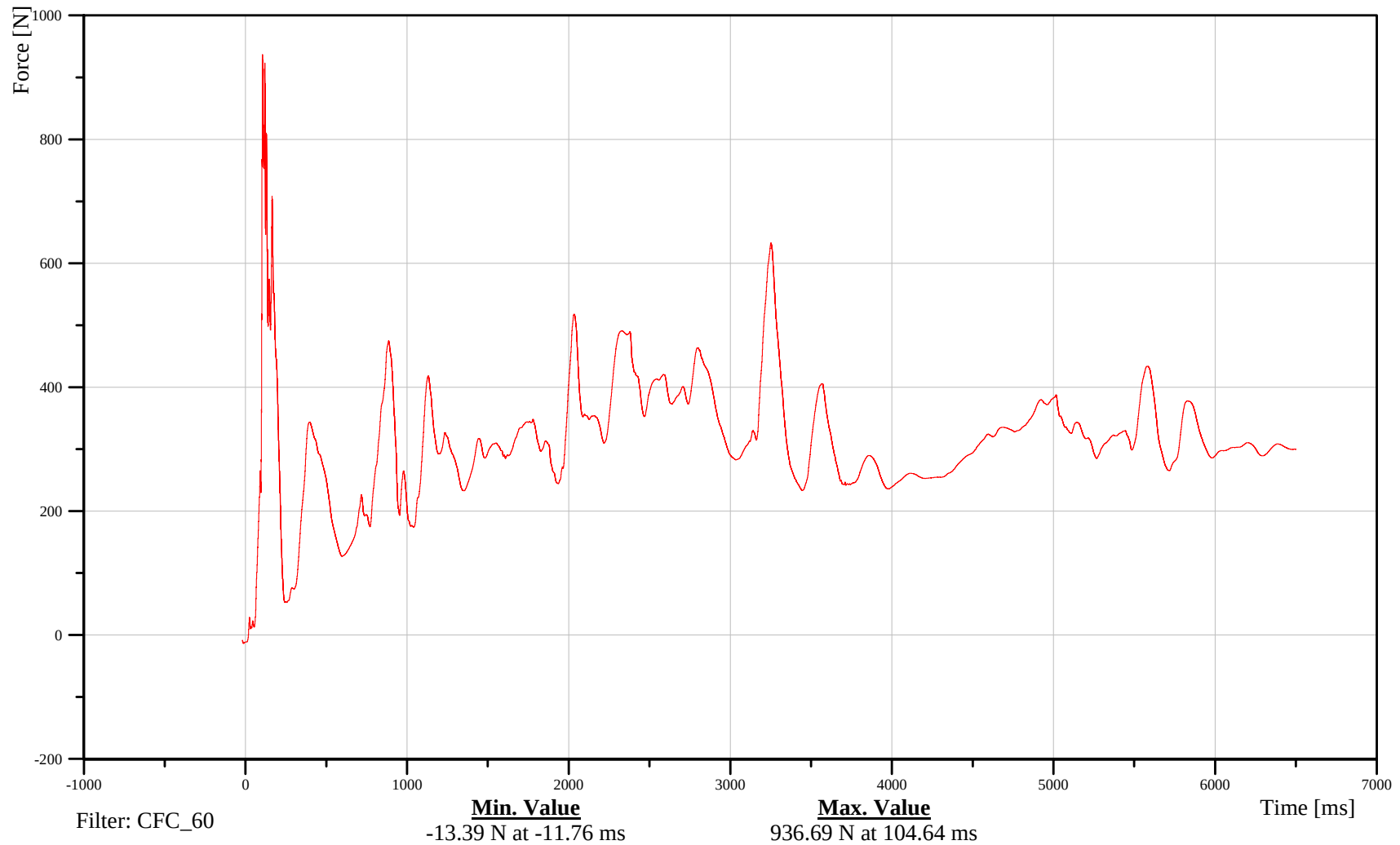
Time: 15:07

Customer: VRTC

14SEBE0000B3FO0D

TRC Inc. Test Lab: CTF

Test Number: 100413



B-196

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Seat Belt Spool Potentiometer

Date: 04/13/2010

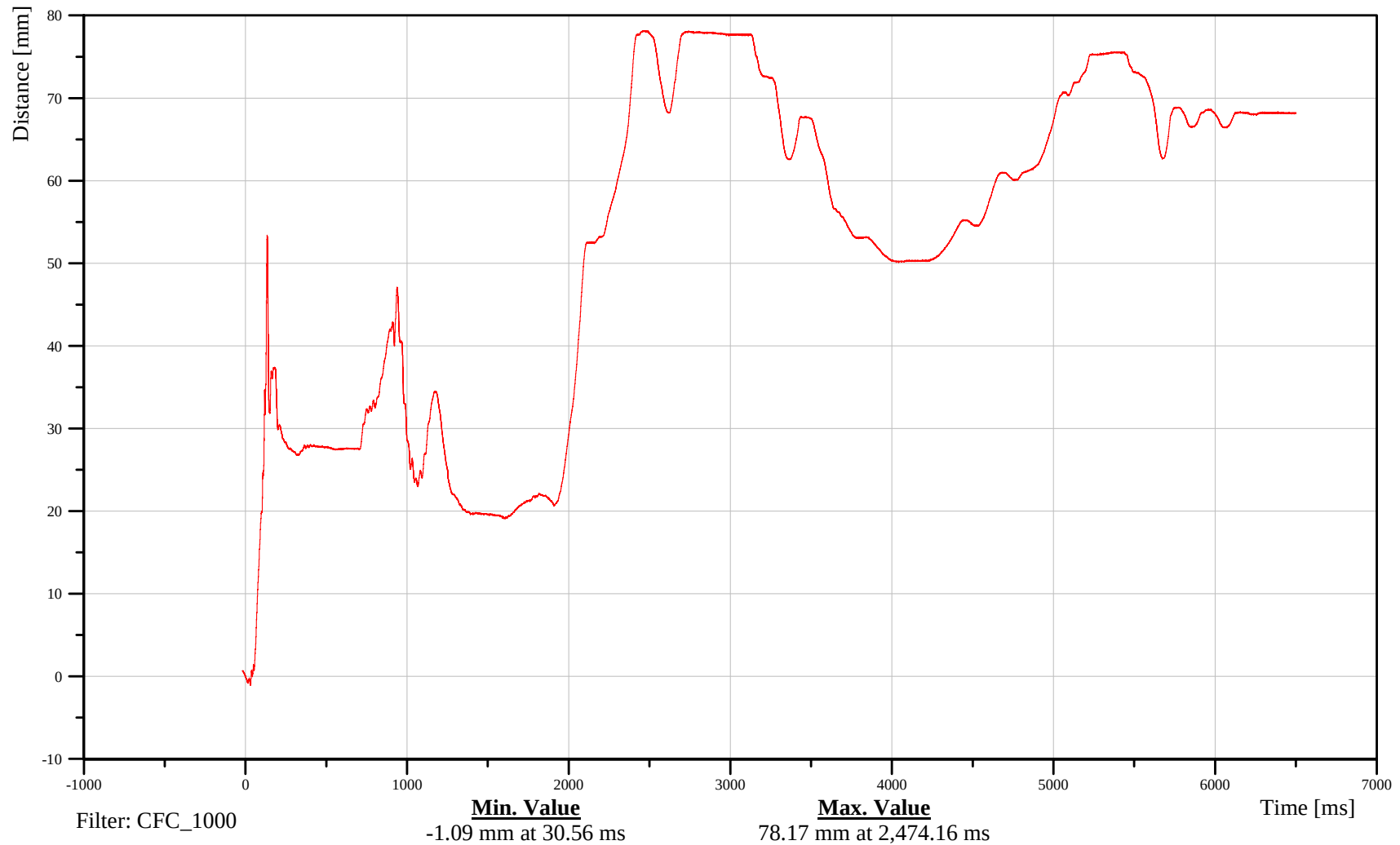
Time: 15:07

Customer: VRTC

11SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-197

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Belt Spool Potentiometer

Date: 04/13/2010

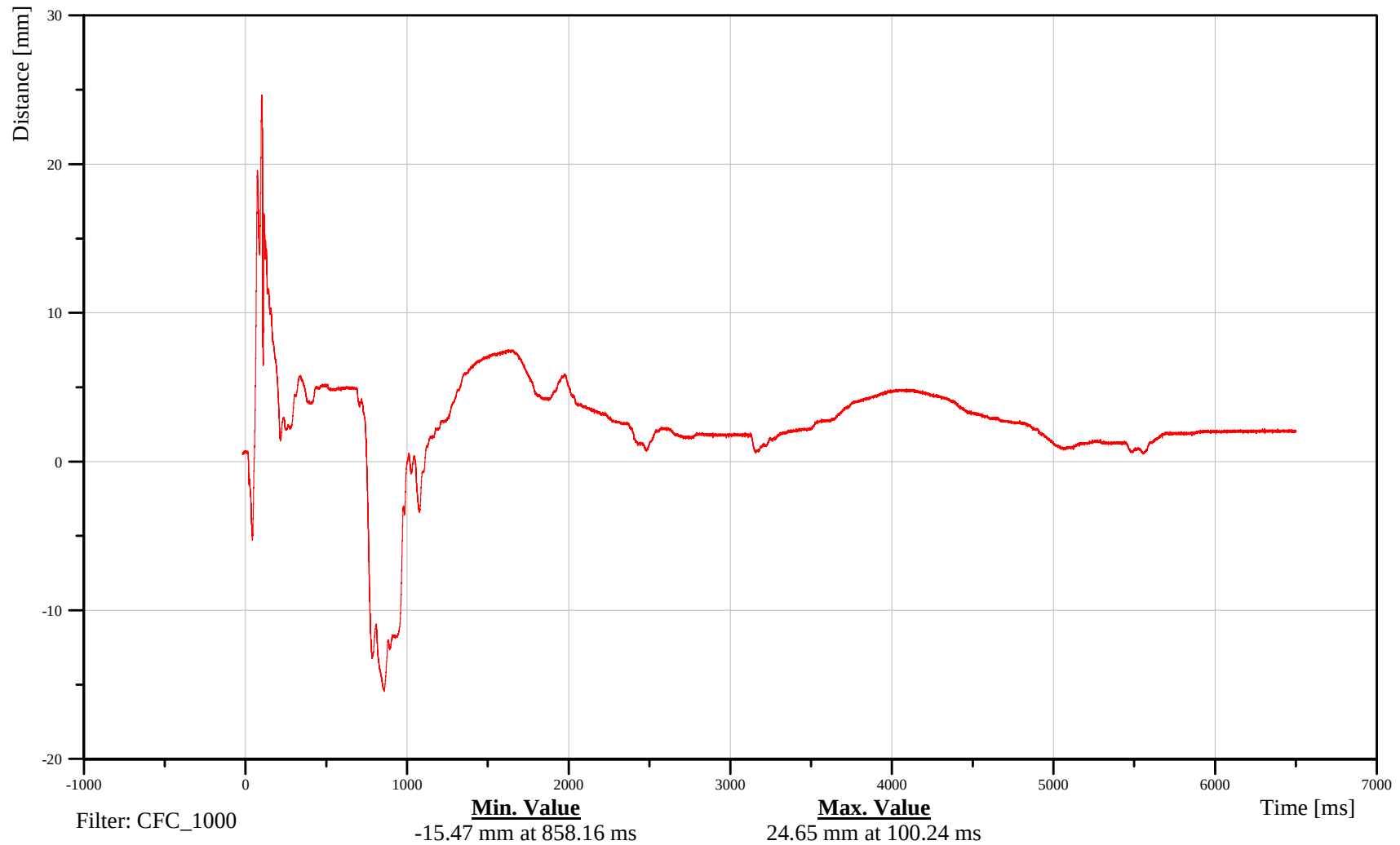
Time: 15:07

Customer: VRTC

13SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-198

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Belt Spool Potentiometer

Date: 04/13/2010

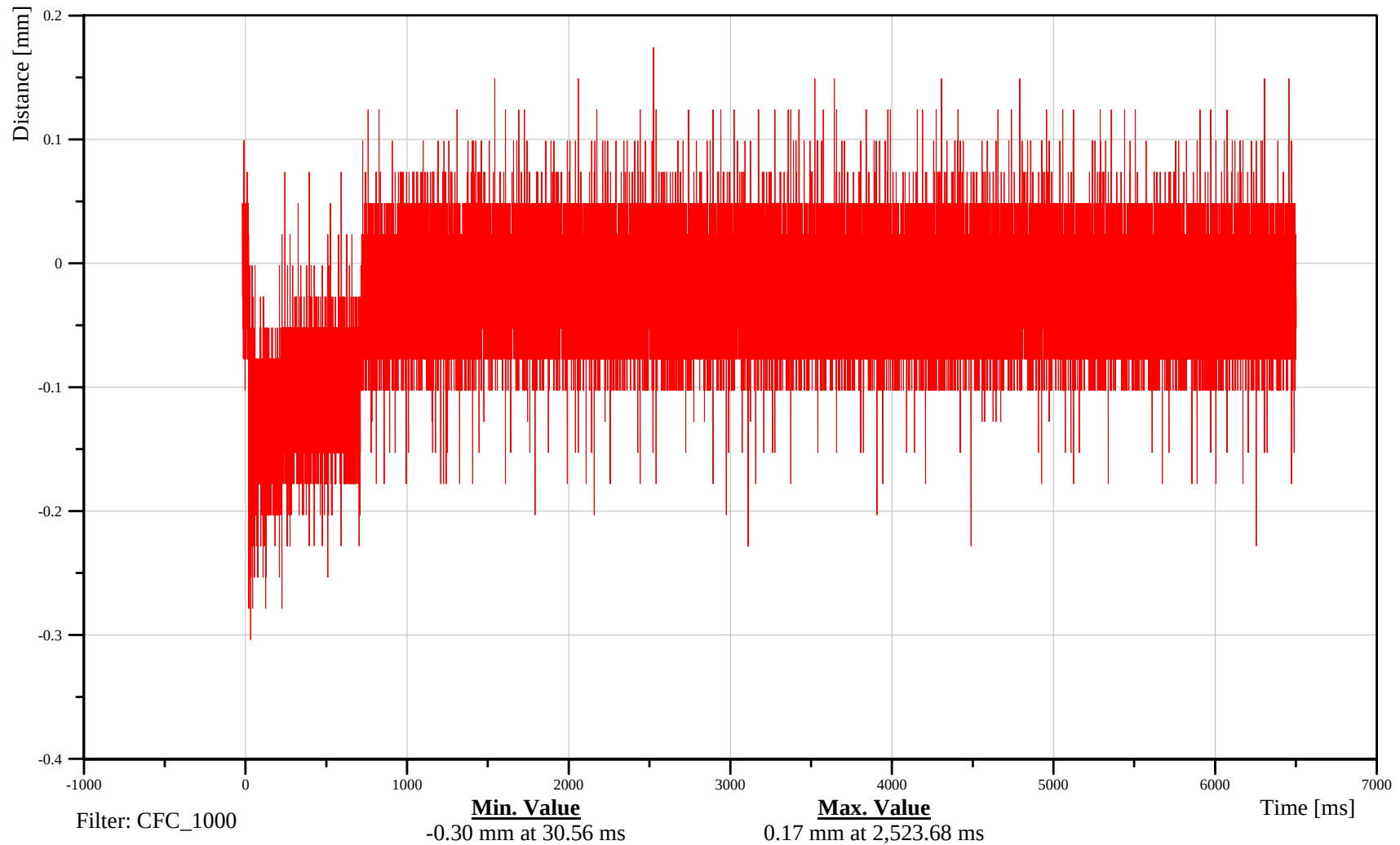
Time: 15:07

Customer: VRTC

14SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-199

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Time: 15:07

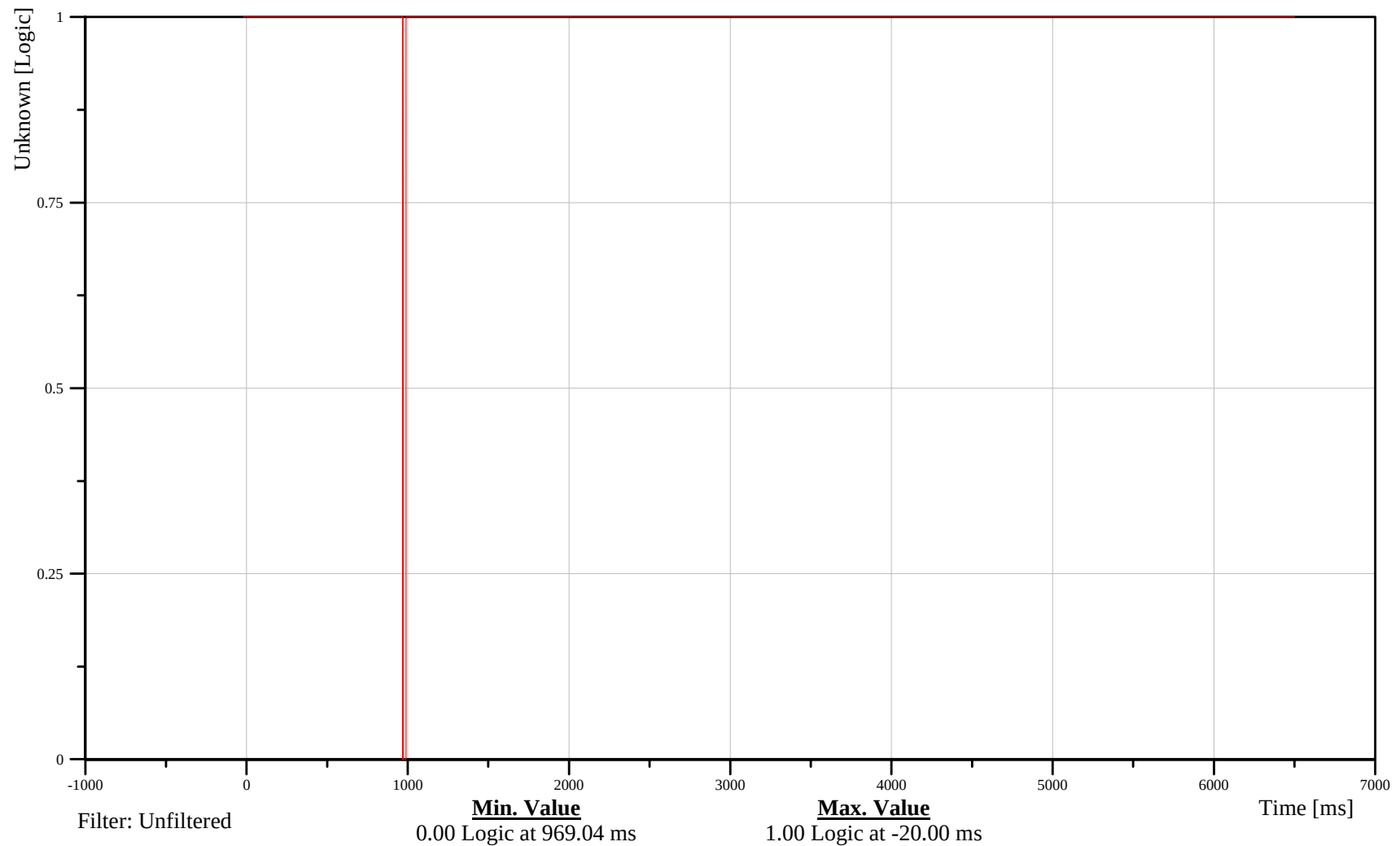
Driver Head Contact

Customer: VRTC

11CONT000023EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-200

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Thorax Contact

Date: 04/13/2010

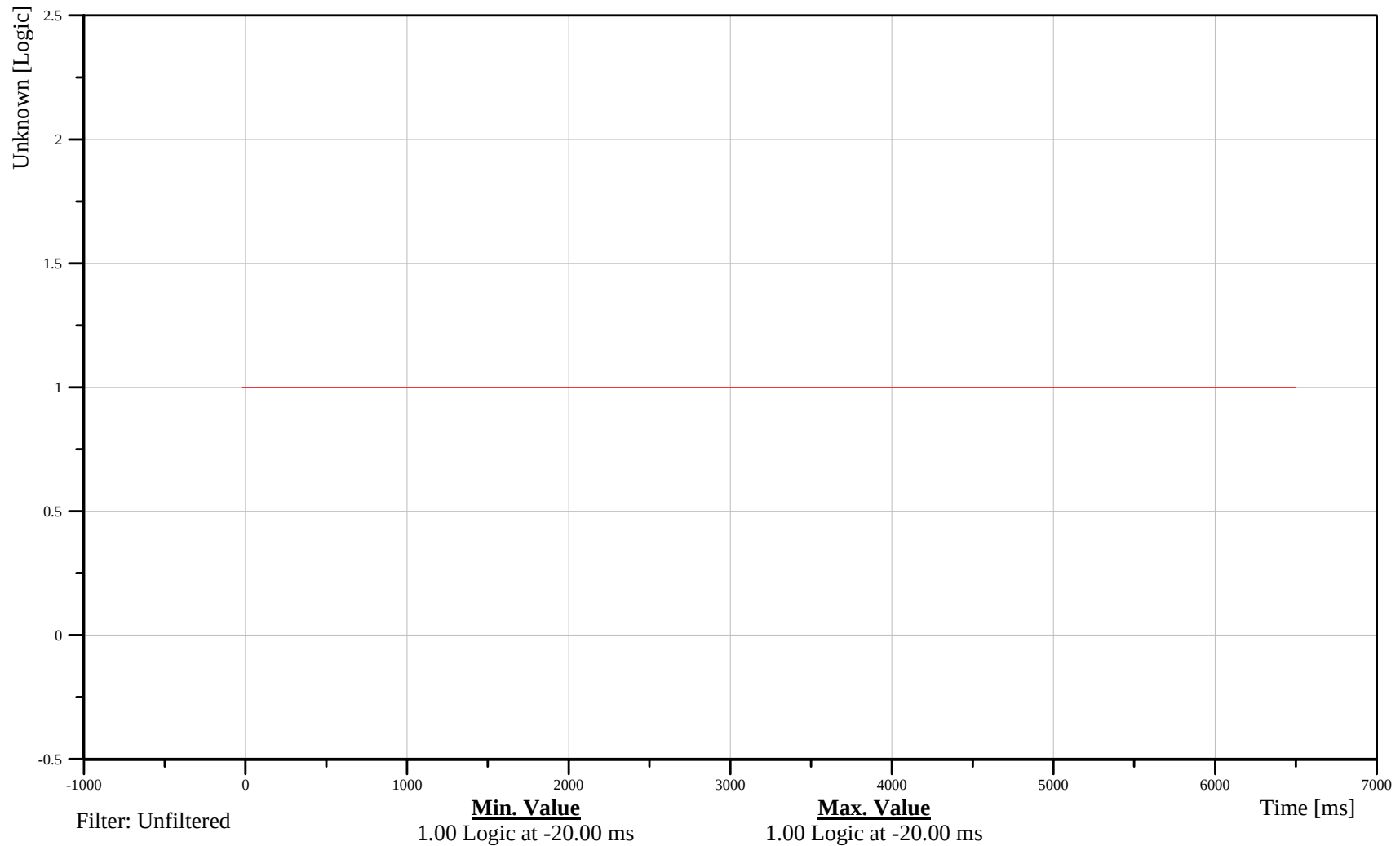
Time: 15:07

Customer: VRTC

11CONT000024EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-201

100413



Curb Trip Rollover 2007 Ford Expedition

Driver Pelvis Contact

Date: 04/13/2010

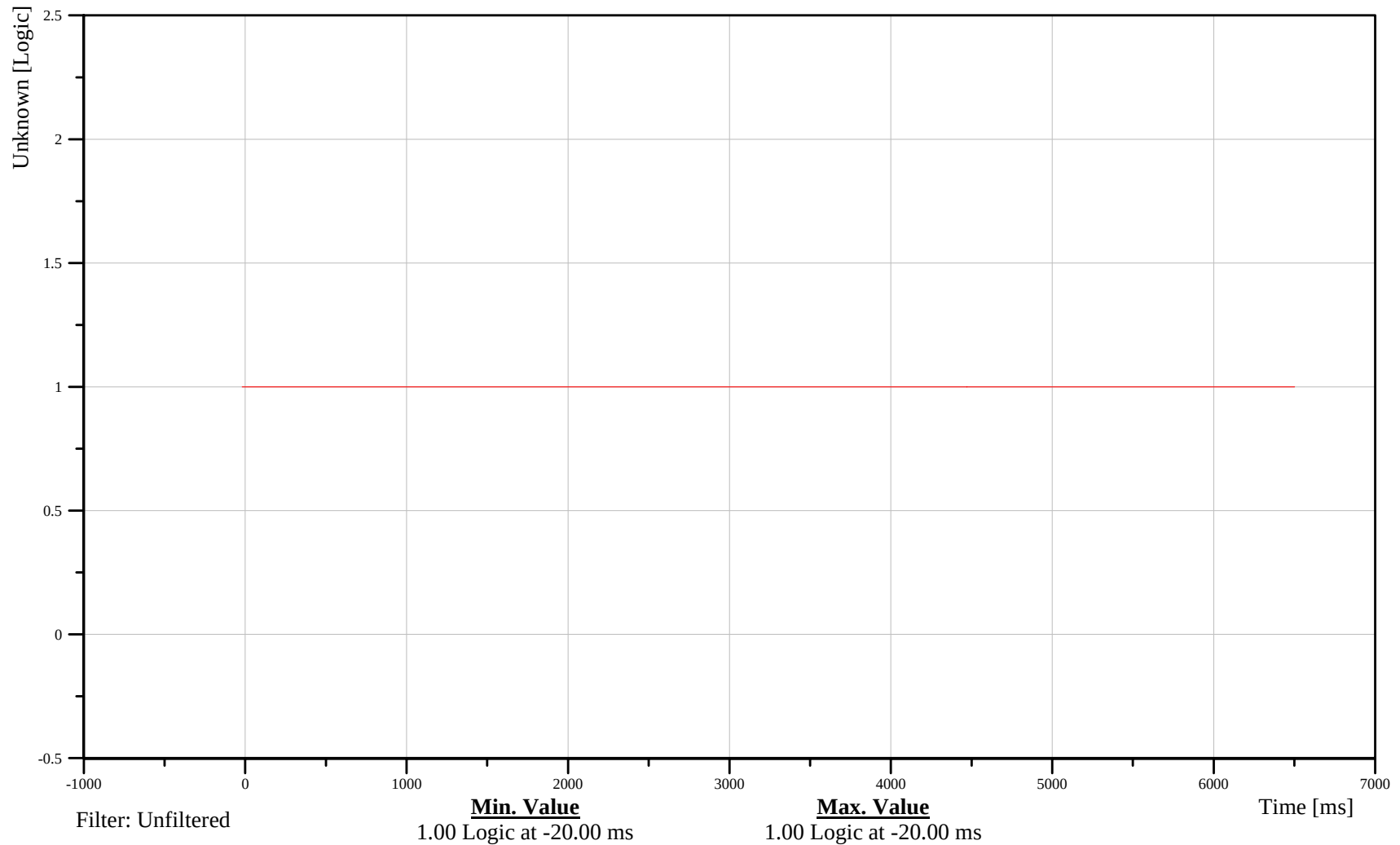
Time: 15:07

Customer: VRTC

11CONT000025EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-202

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Head Contact Switch

Date: 04/13/2010

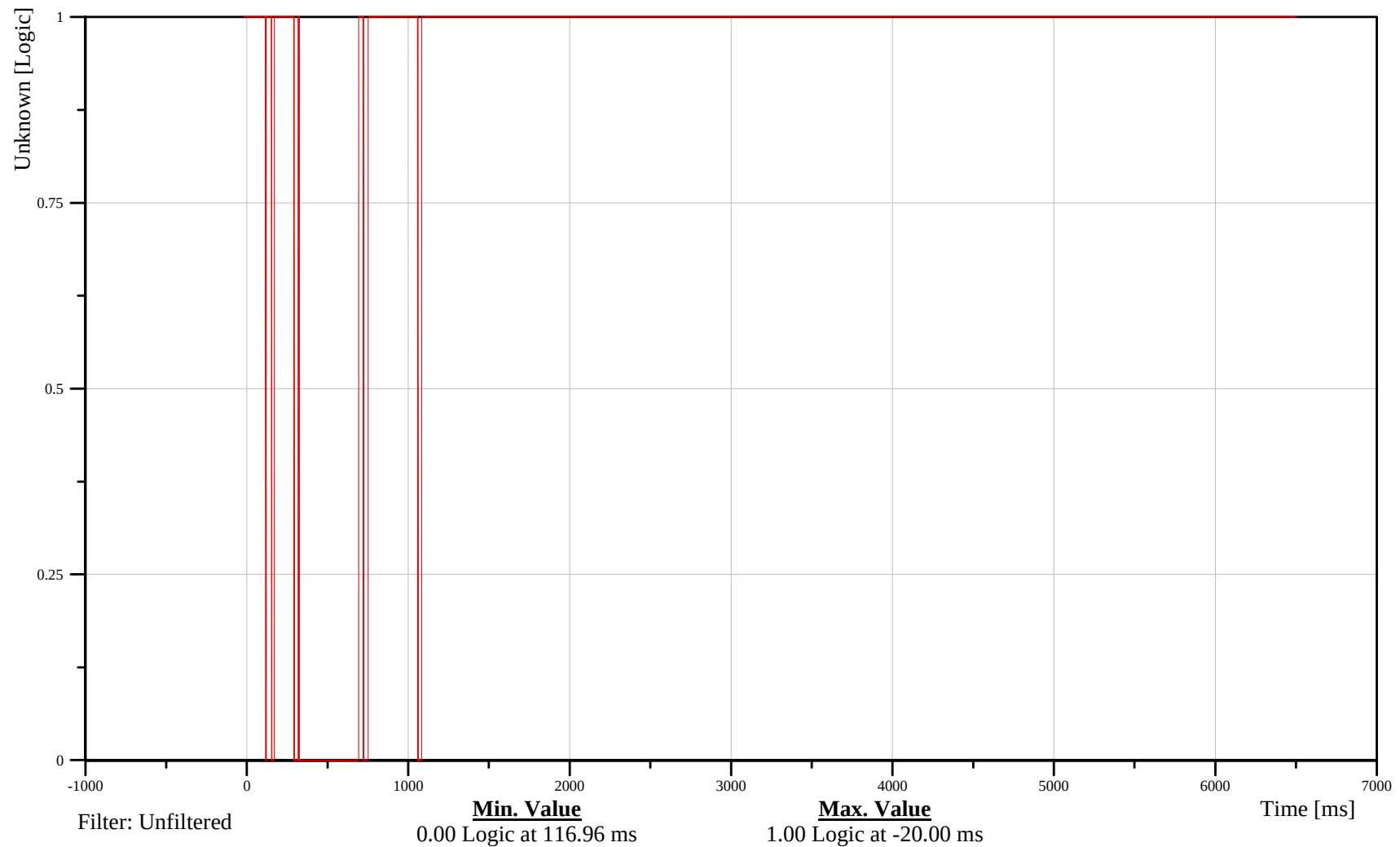
Time: 15:07

Customer: VRTC

13CONT000026EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-203

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Thorax Contact Switch

Date: 04/13/2010

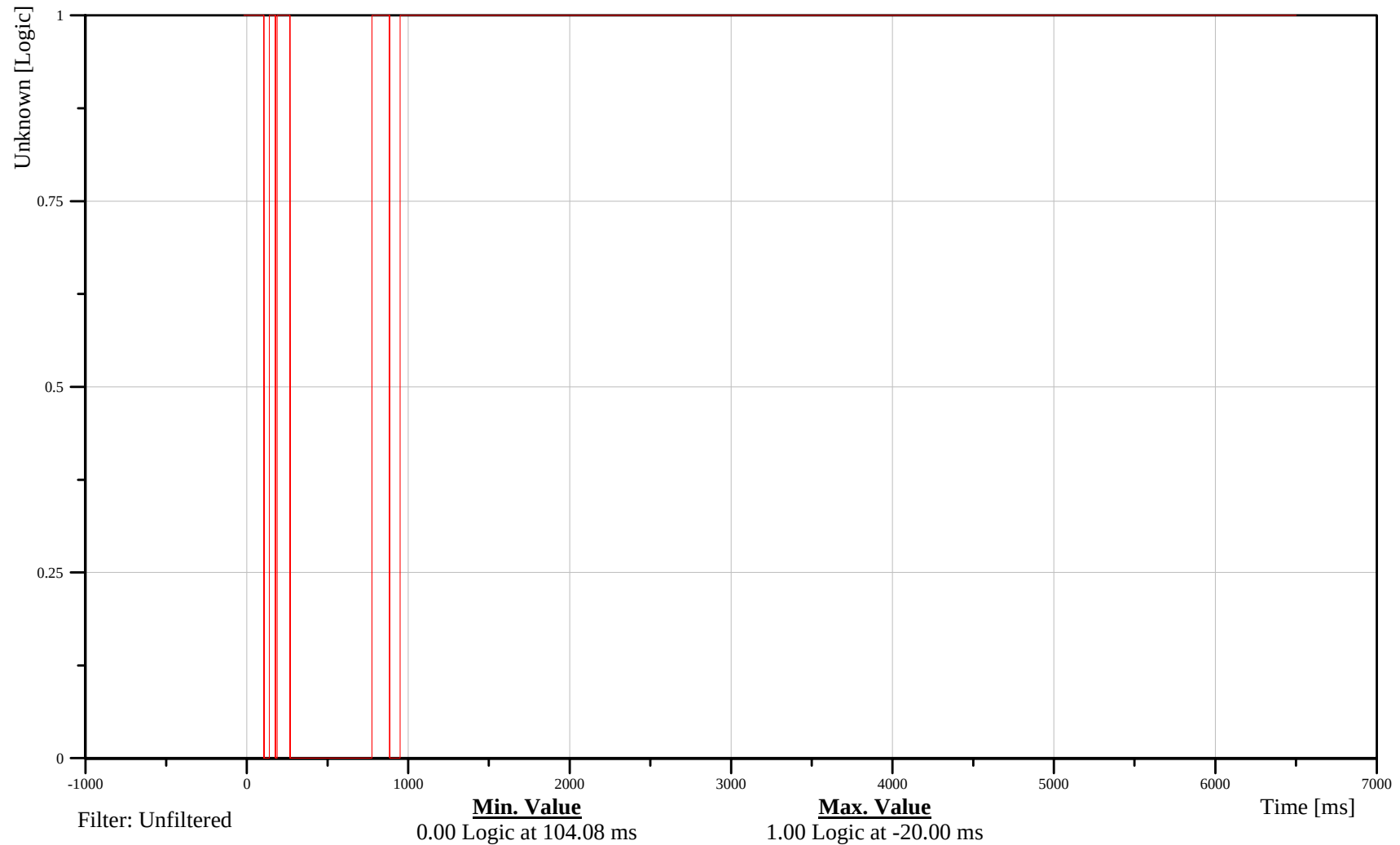
Time: 15:07

Customer: VRTC

13CONT000027EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-204

100413



Curb Trip Rollover 2007 Ford Expedition

Right Front Passenger Pelvis Contact Switch

Date: 04/13/2010

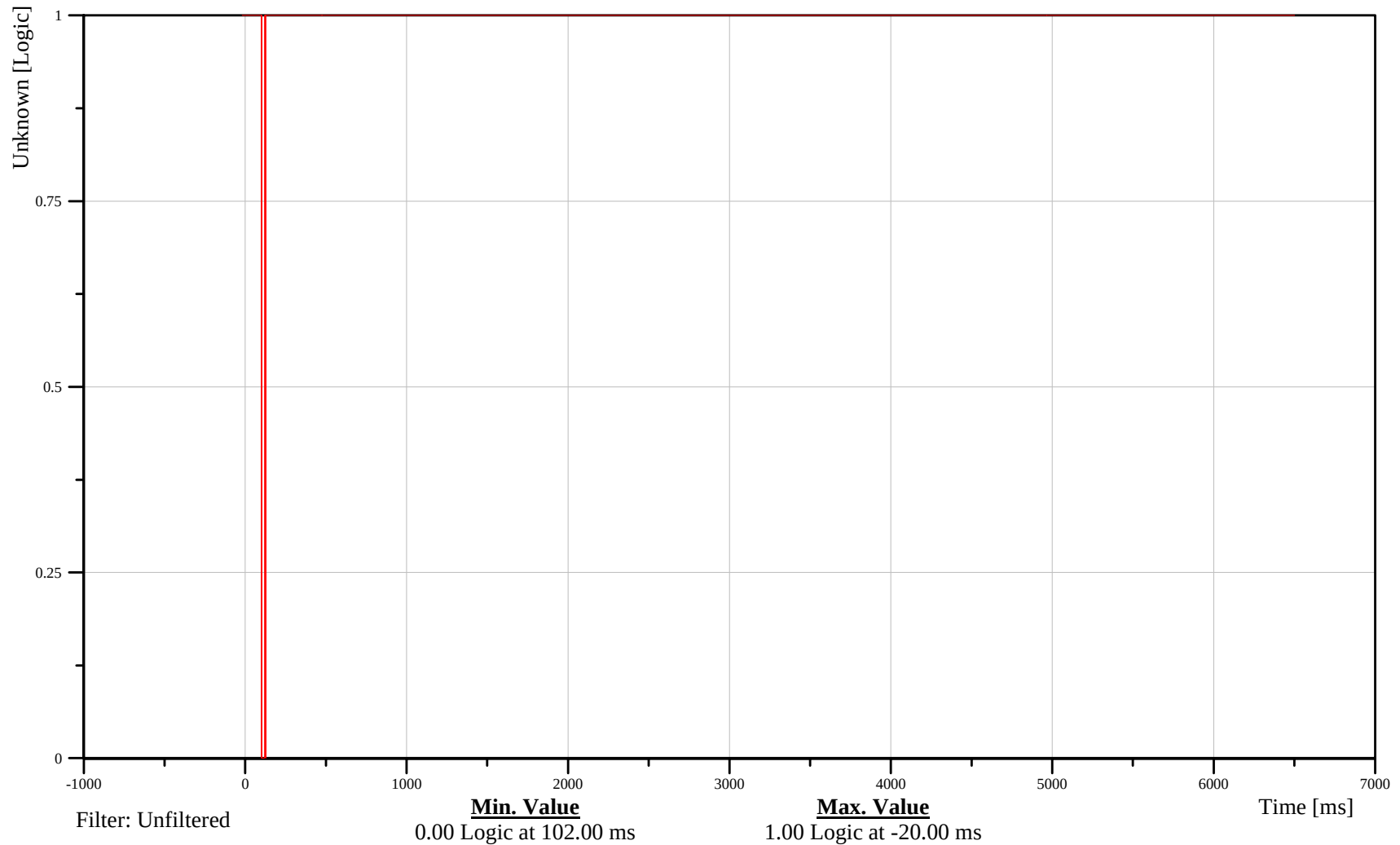
Time: 15:07

Customer: VRTC

13CONT000028EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-205

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Head Contact

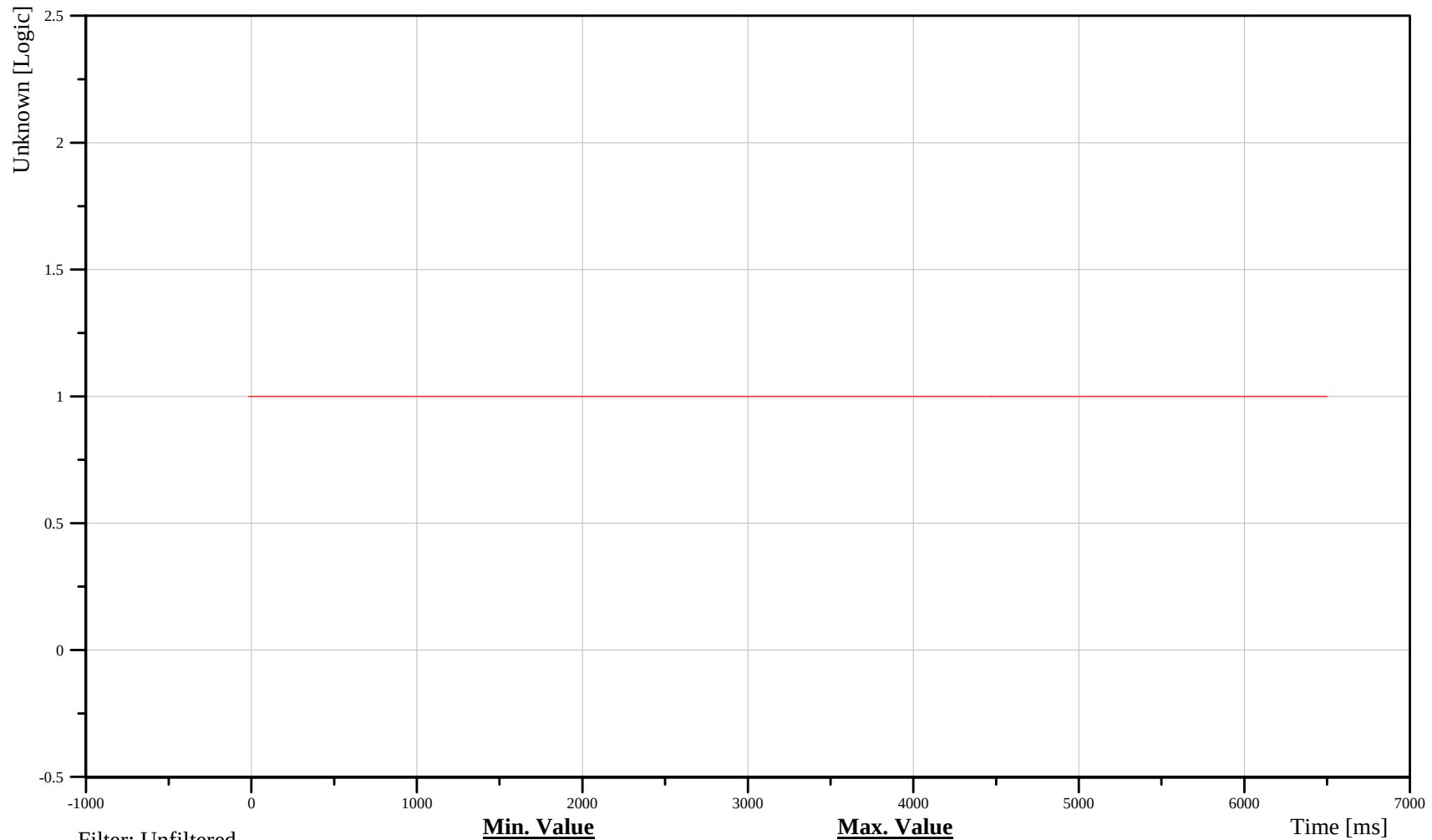
Date: 04/13/2010
Time: 15:07

Customer: VRTC

14CONT000029EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-206

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Thorax Contact

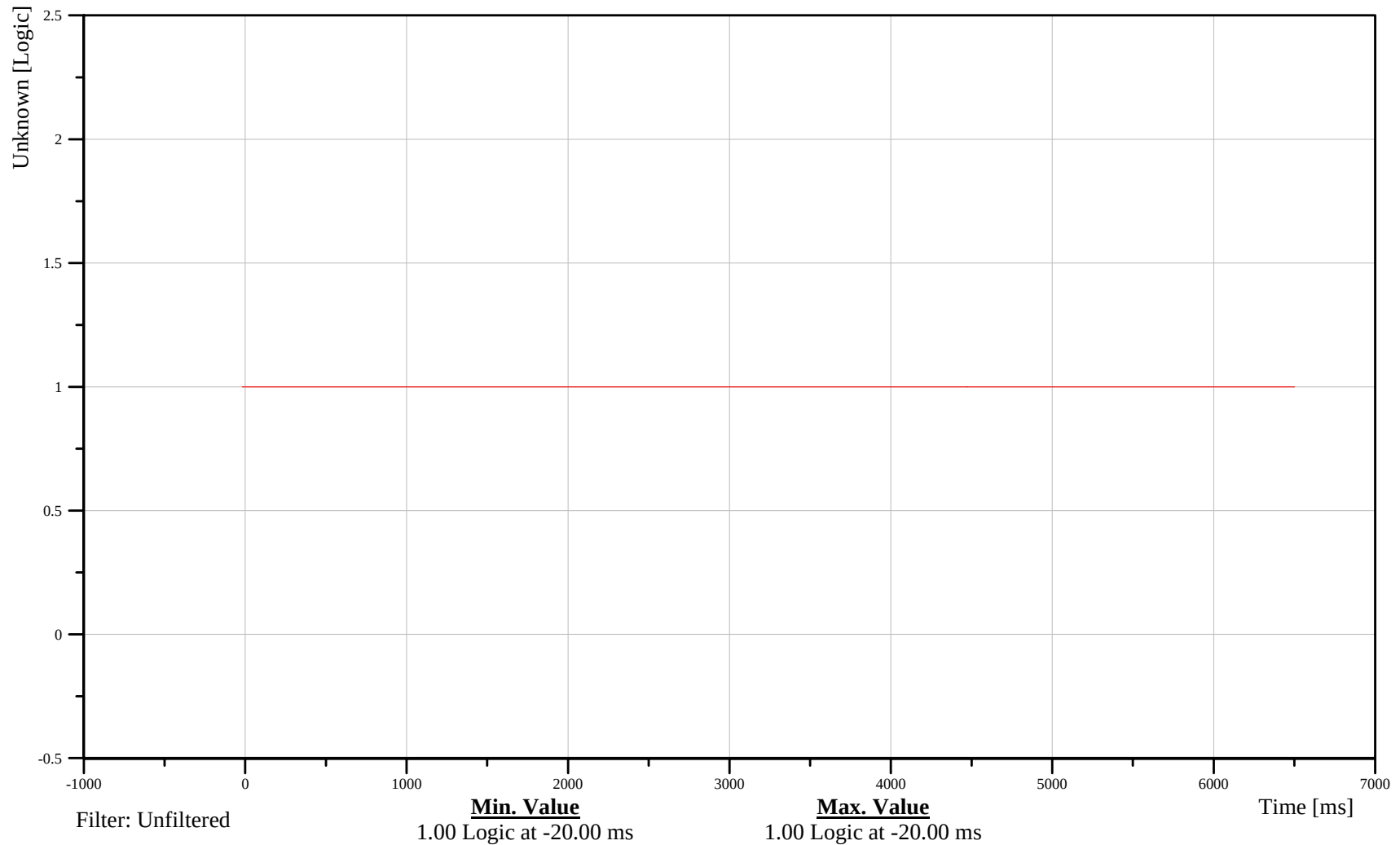
Date: 04/13/2010
Time: 15:07

Customer: VRTC

14CONT000030EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-207

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Passenger Pelvis Contact

Date: 04/13/2010

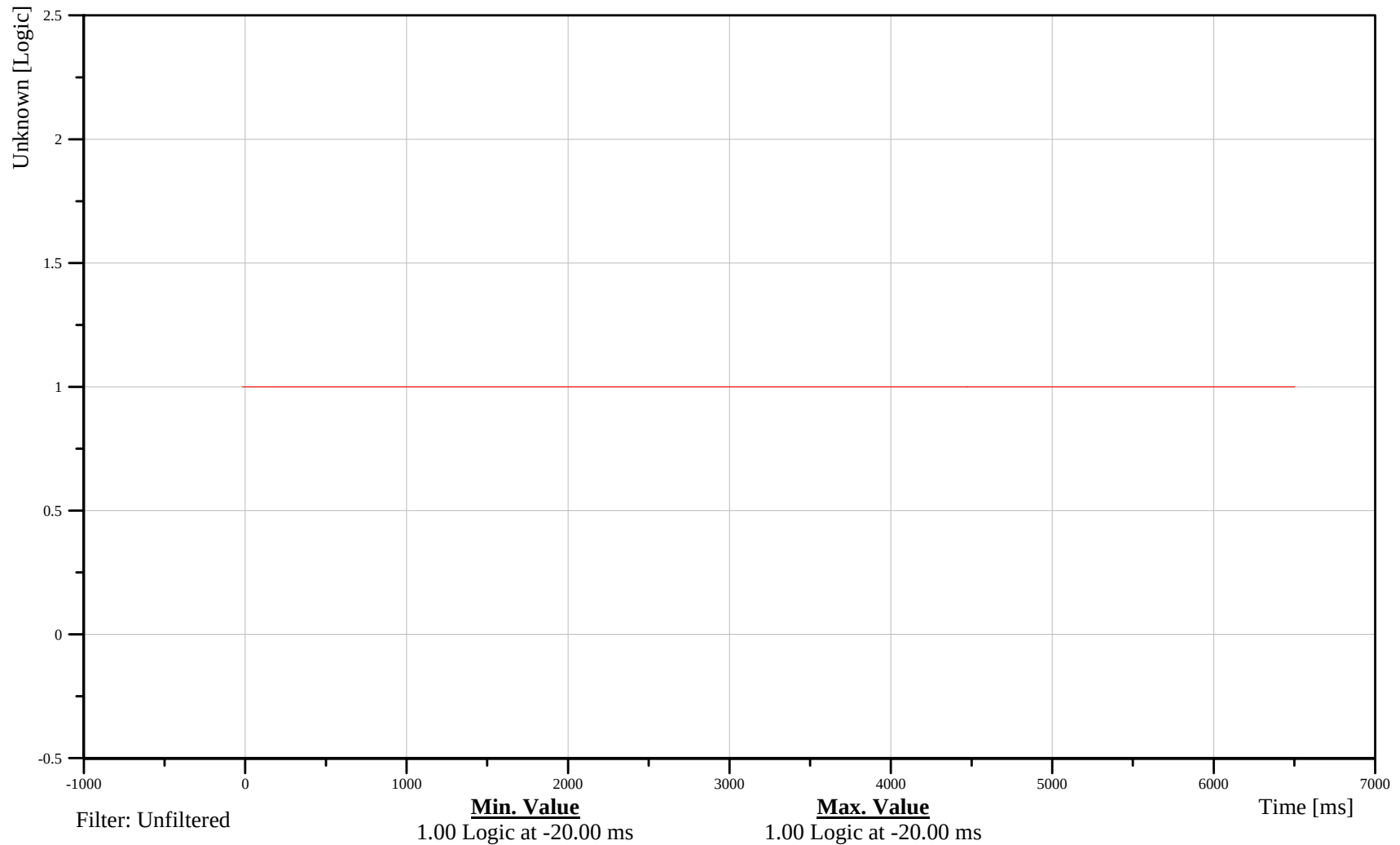
Time: 15:07

Customer: VRTC

14CONT000031EV00

TRC Inc. Test Lab: CTF

Test Number: 100413



B-208

100413



Curb Trip Rollover 2007 Ford Expedition

Left Side Curtain Airbag Voltage

Date: 04/13/2010

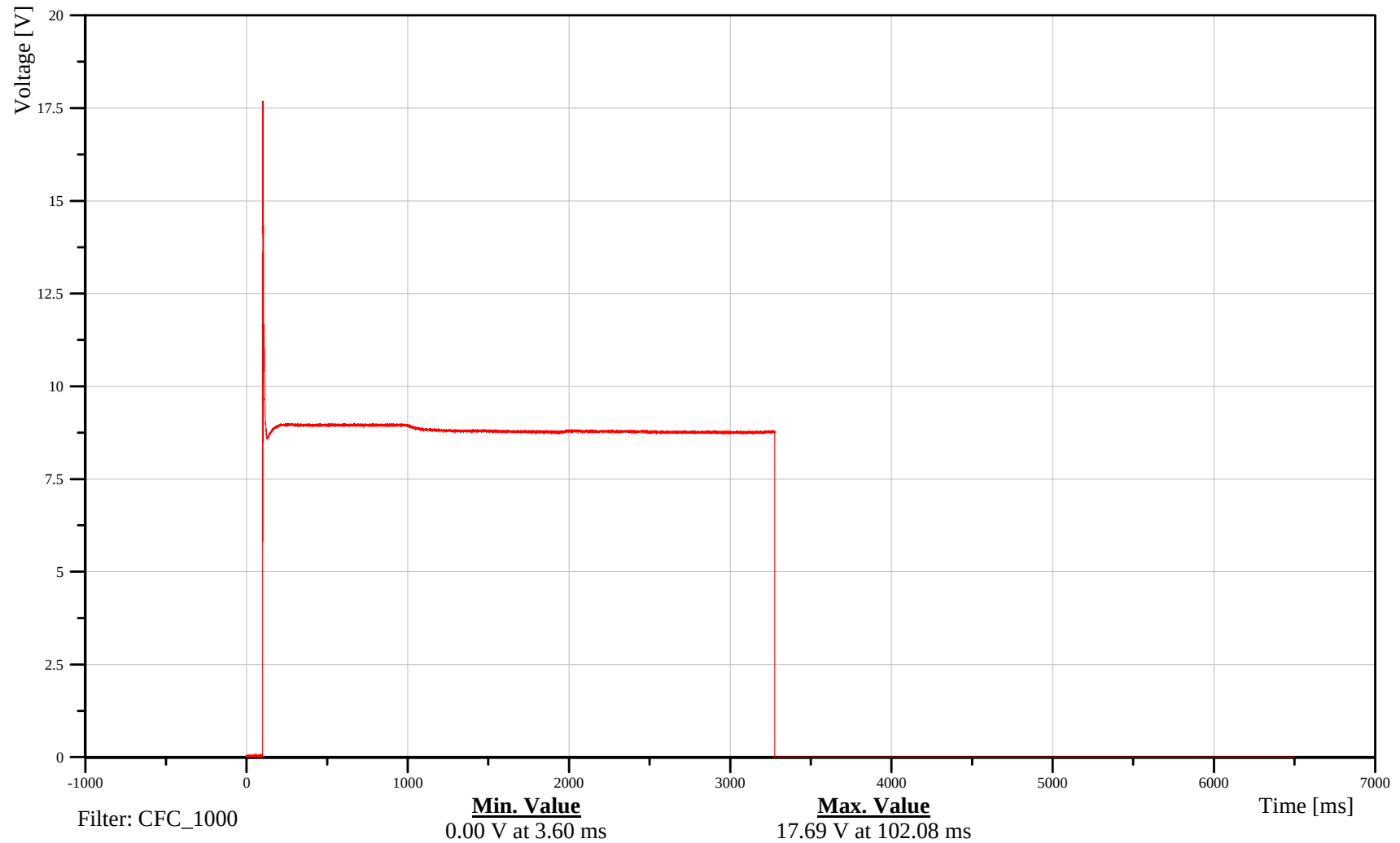
Time: 15:07

Customer: VRTC

11AIRB000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-209

100413



Curb Trip Rollover 2007 Ford Expedition

Right Side Curtain Airbag Voltage

Date: 04/13/2010

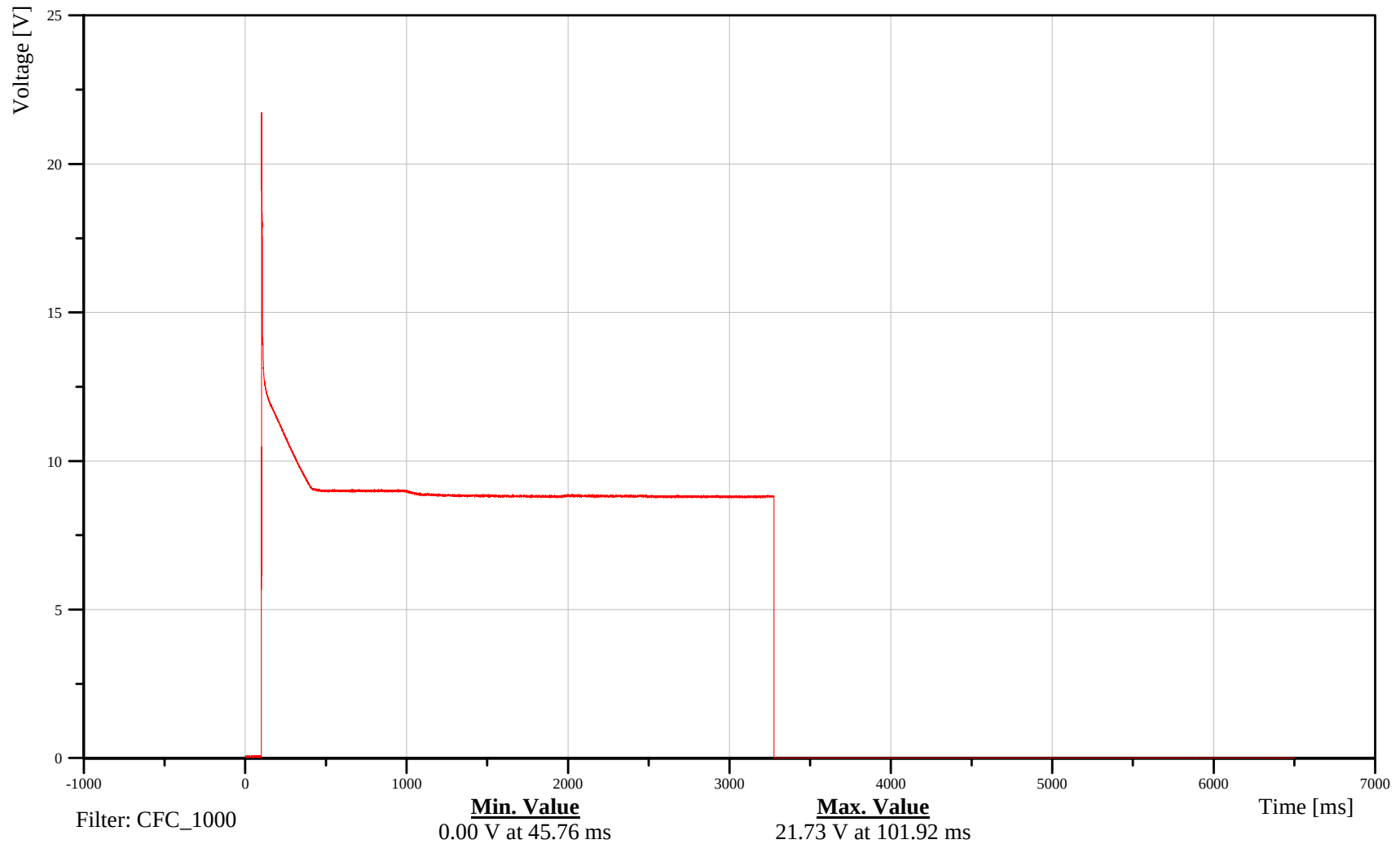
Time: 15:07

Customer: VRTC

13AIRB000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-210

100413



Curb Trip Rollover 2007 Ford Expedition

Left Front Buckle Pretensioner Voltage

Date: 04/13/2010

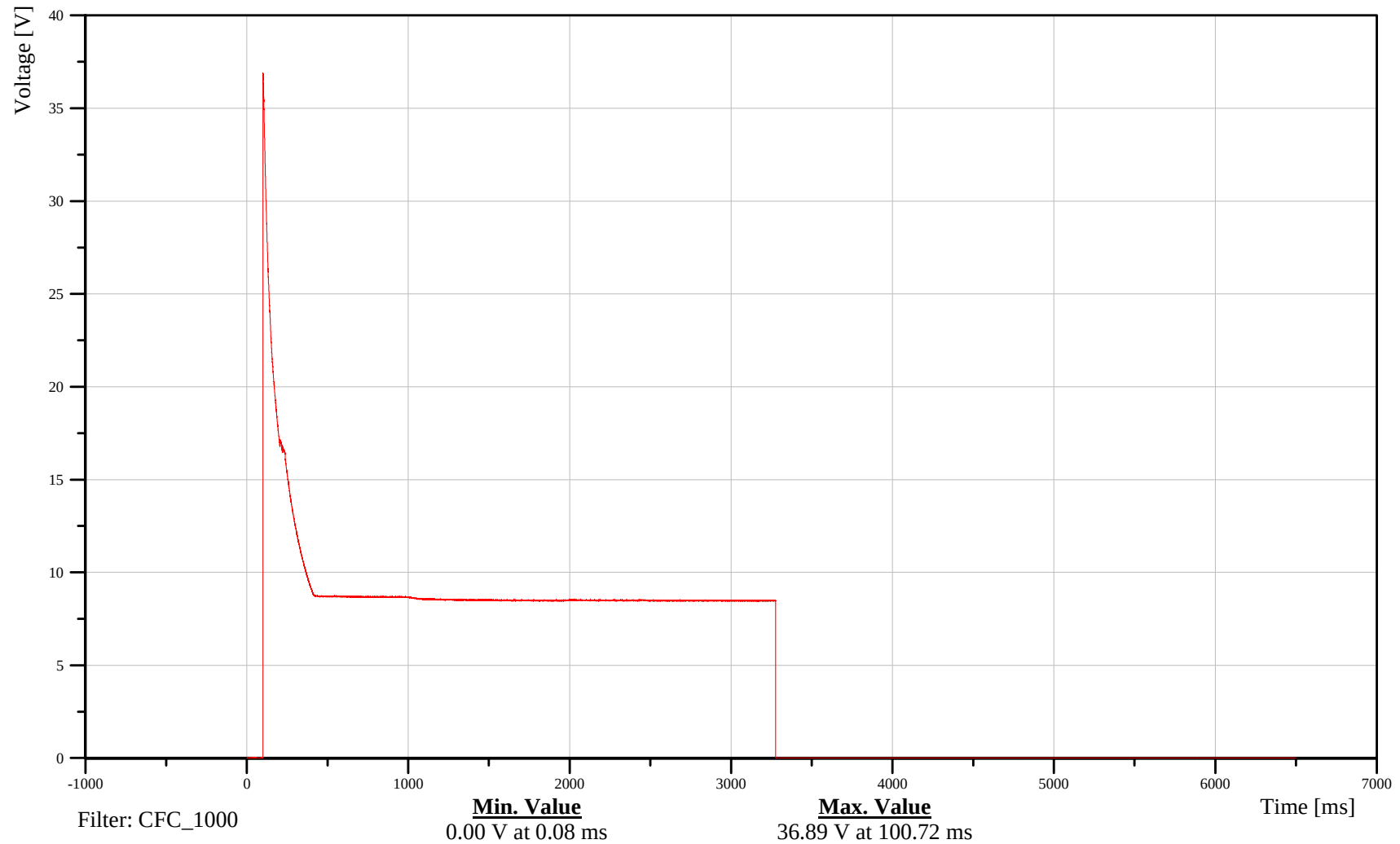
Time: 15:07

Customer: VRTC

11PRET000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-211

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right Front Buckle Pretensioner Voltage

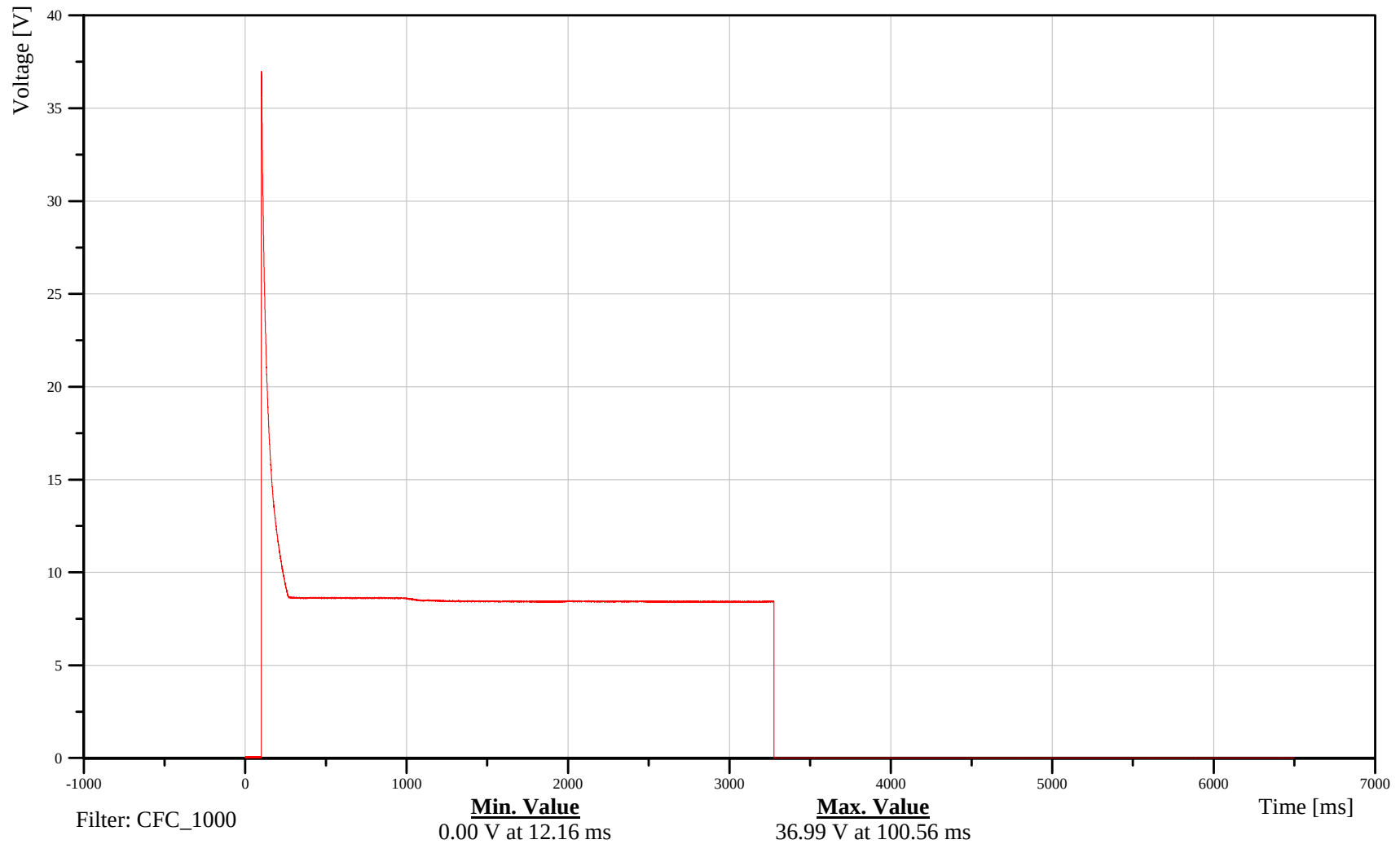
Time: 15:07

Customer: VRTC

13PRET000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-212

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Buckle Pretensioner Voltage

Date: 04/13/2010

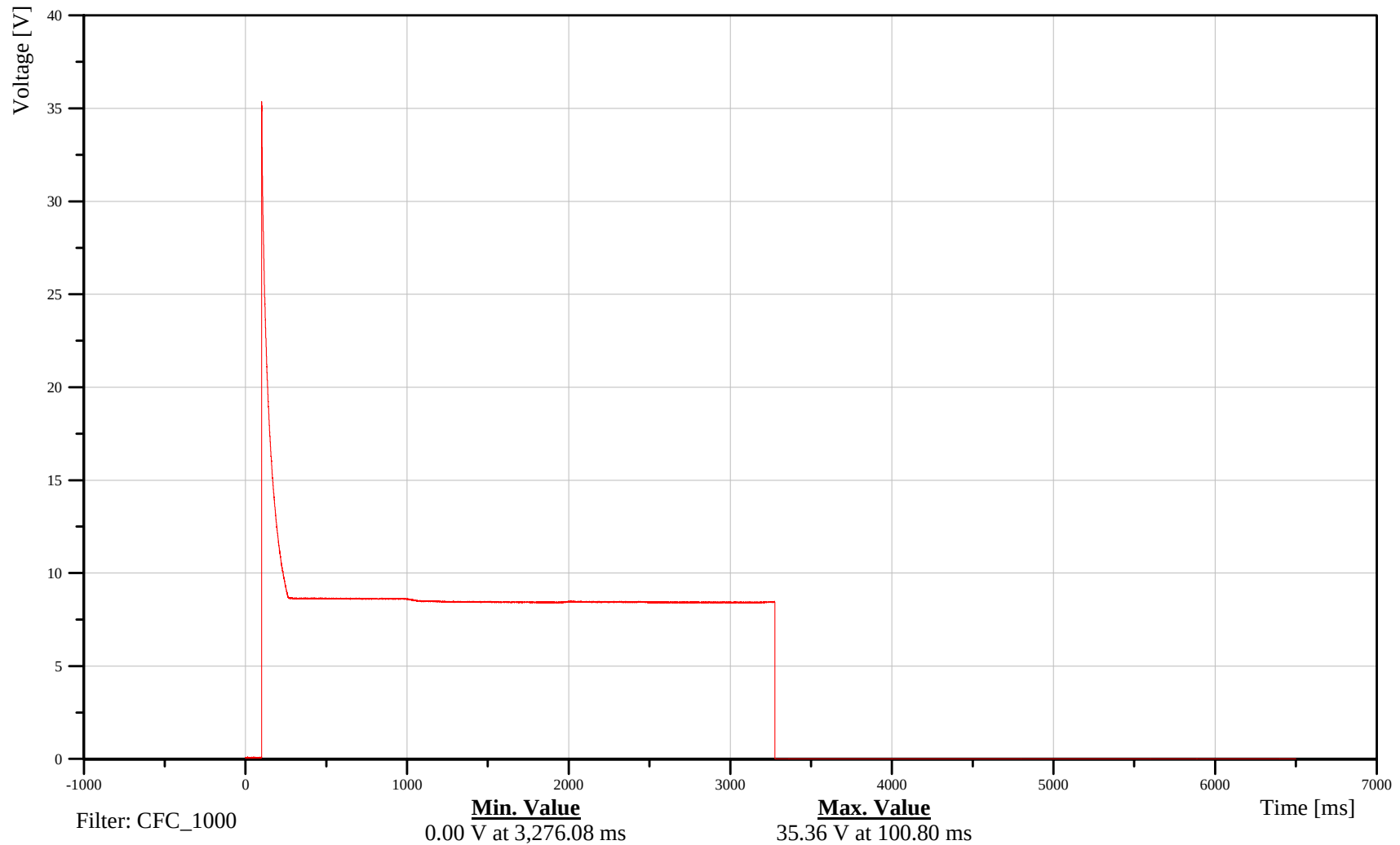
Time: 15:07

Customer: VRTC

14PRET000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-213

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right Front Passenger Retractor Voltage

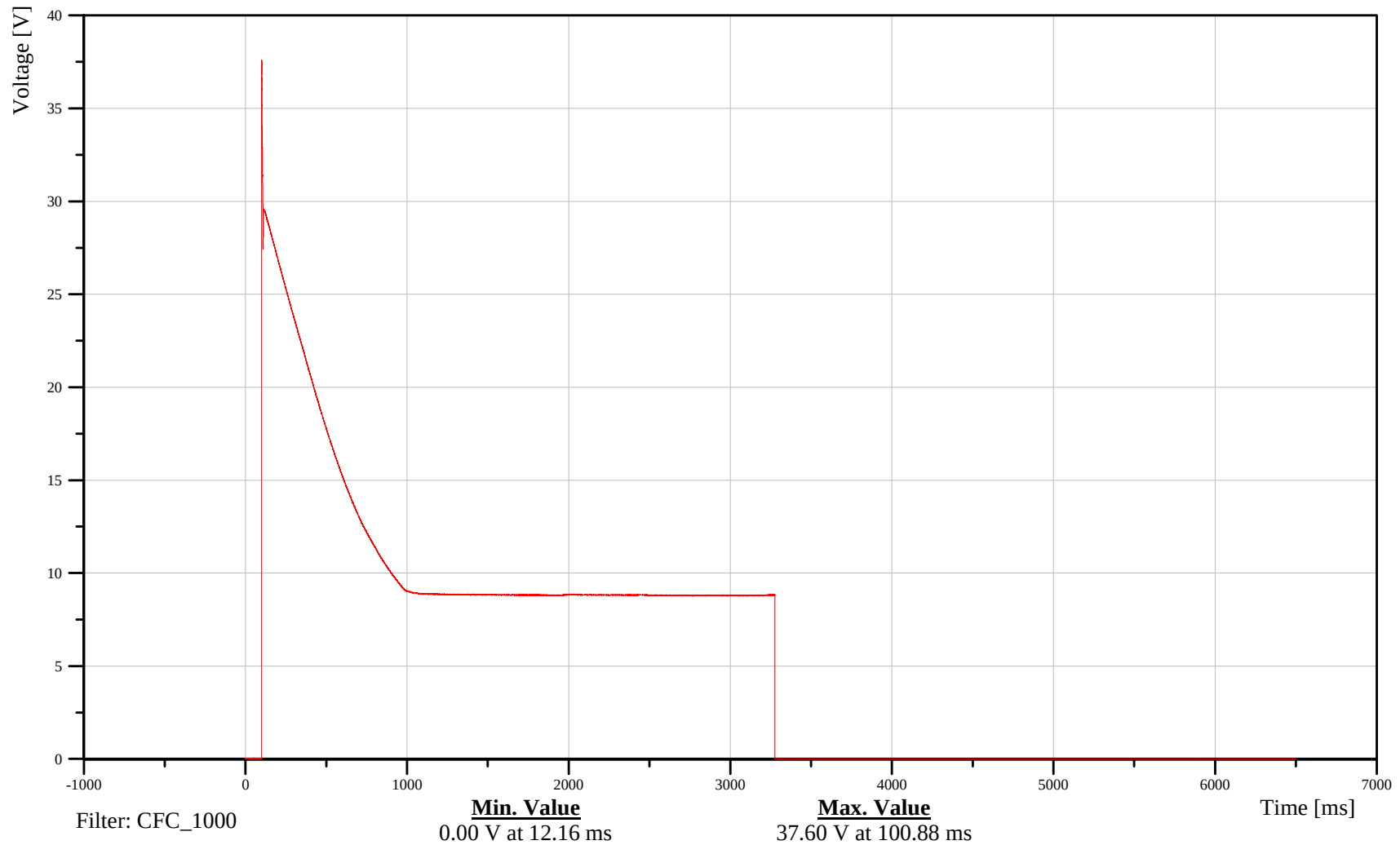
Time: 15:07

Customer: VRTC

13RETR000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-214

100413



Curb Trip Rollover 2007 Ford Expedition

Left Side Curtain Airbag Current

Date: 04/13/2010

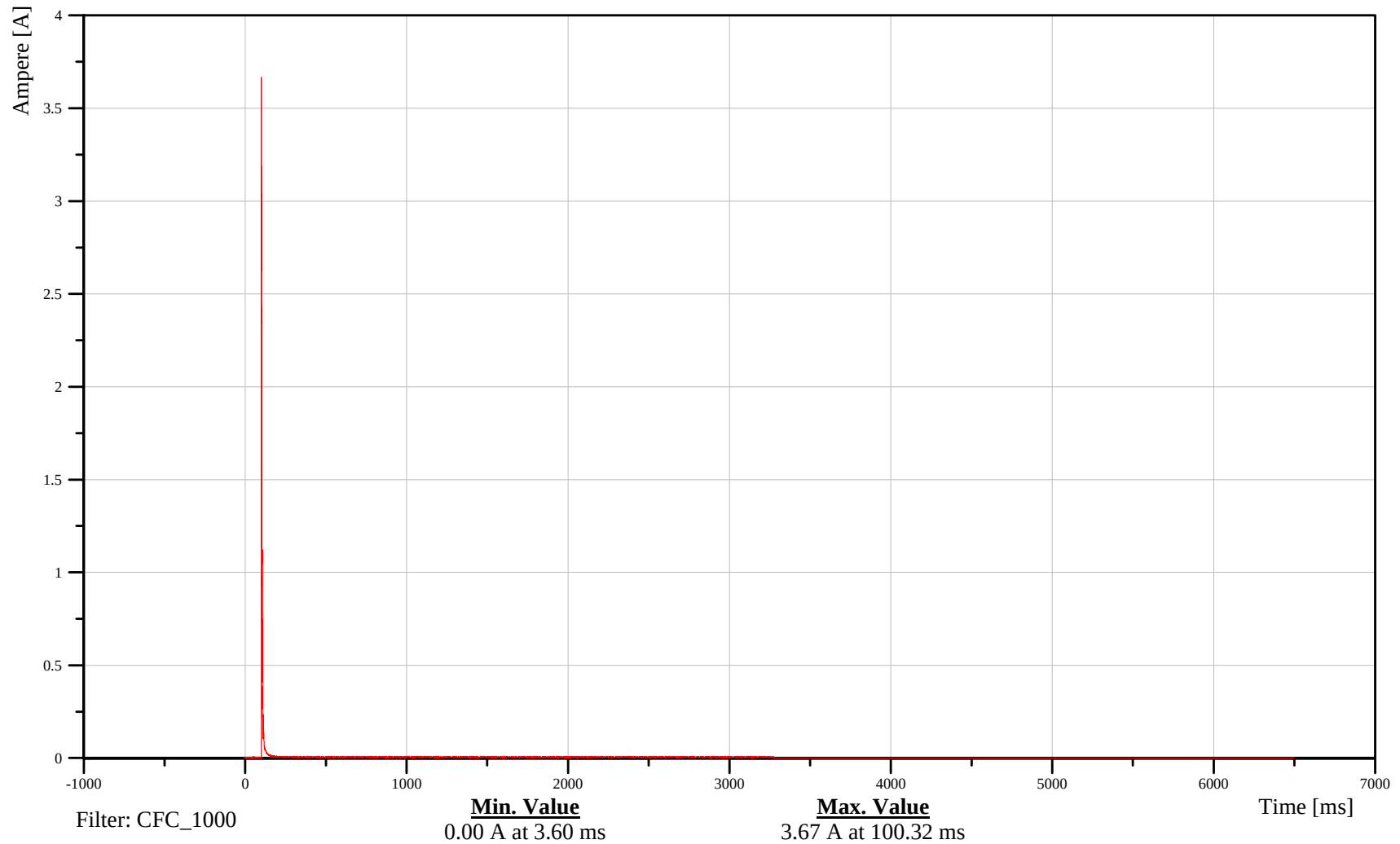
Time: 15:07

Customer: VRTC

11AIRB000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-215

100413



Curb Trip Rollover 2007 Ford Expedition

Right Side Curtain Airbag Current

Date: 04/13/2010

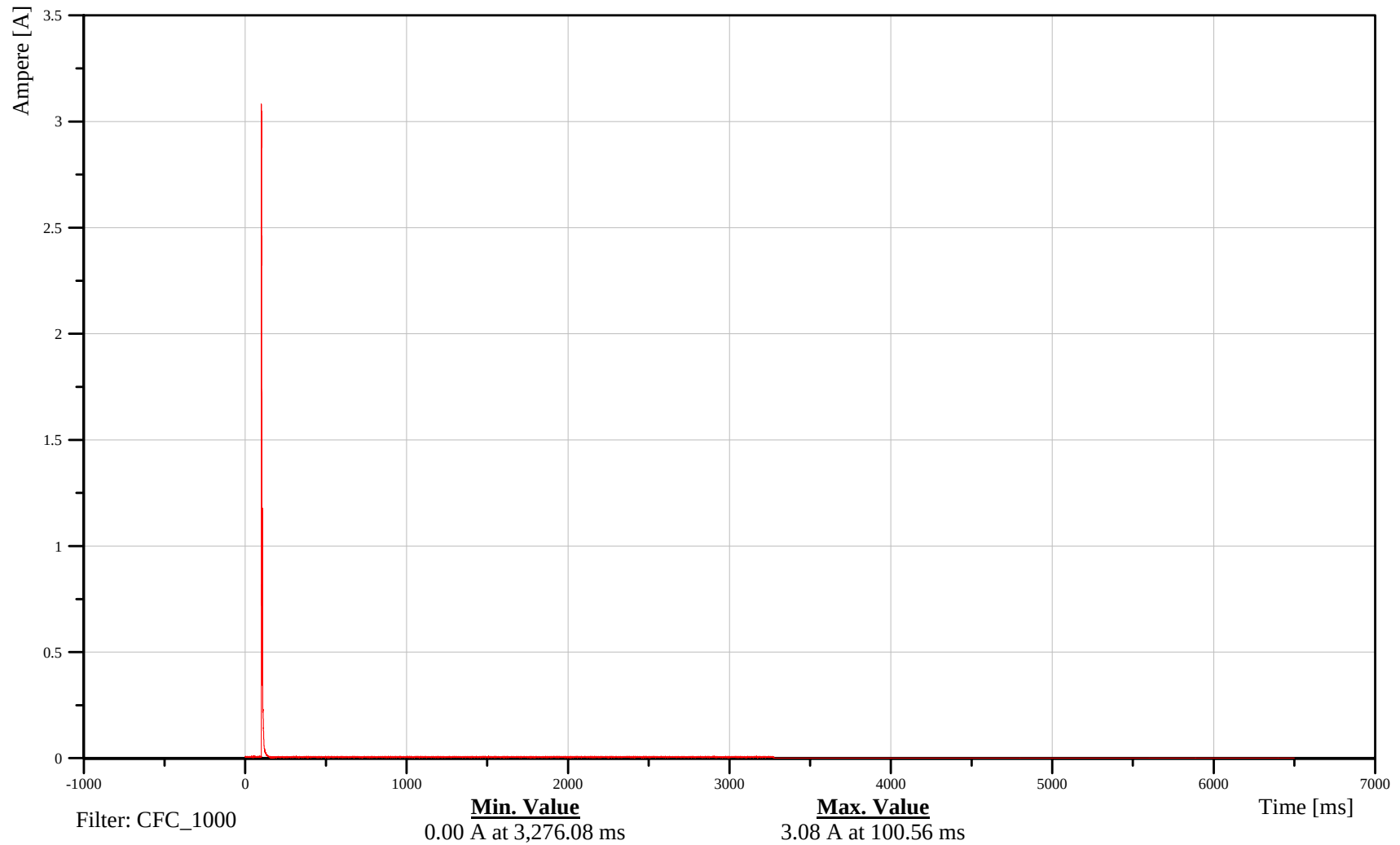
Time: 15:07

Customer: VRTC

13AIRB000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-216

100413



Curb Trip Rollover 2007 Ford Expedition

Left Front Buckle Pretensioner Current

Date: 04/13/2010

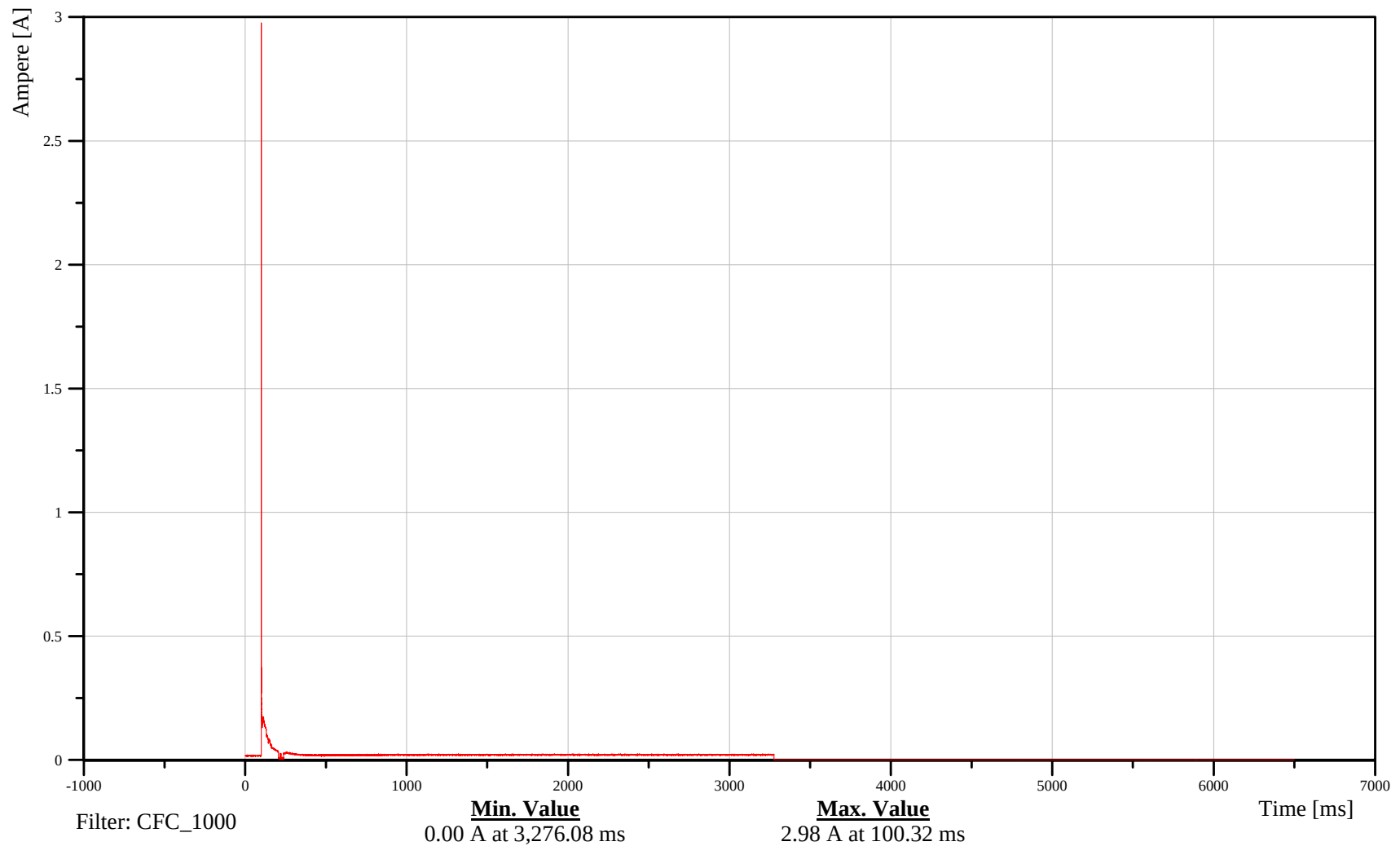
Time: 15:07

Customer: VRTC

11PRET000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-217

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right Front Buckle Pretensioner Current

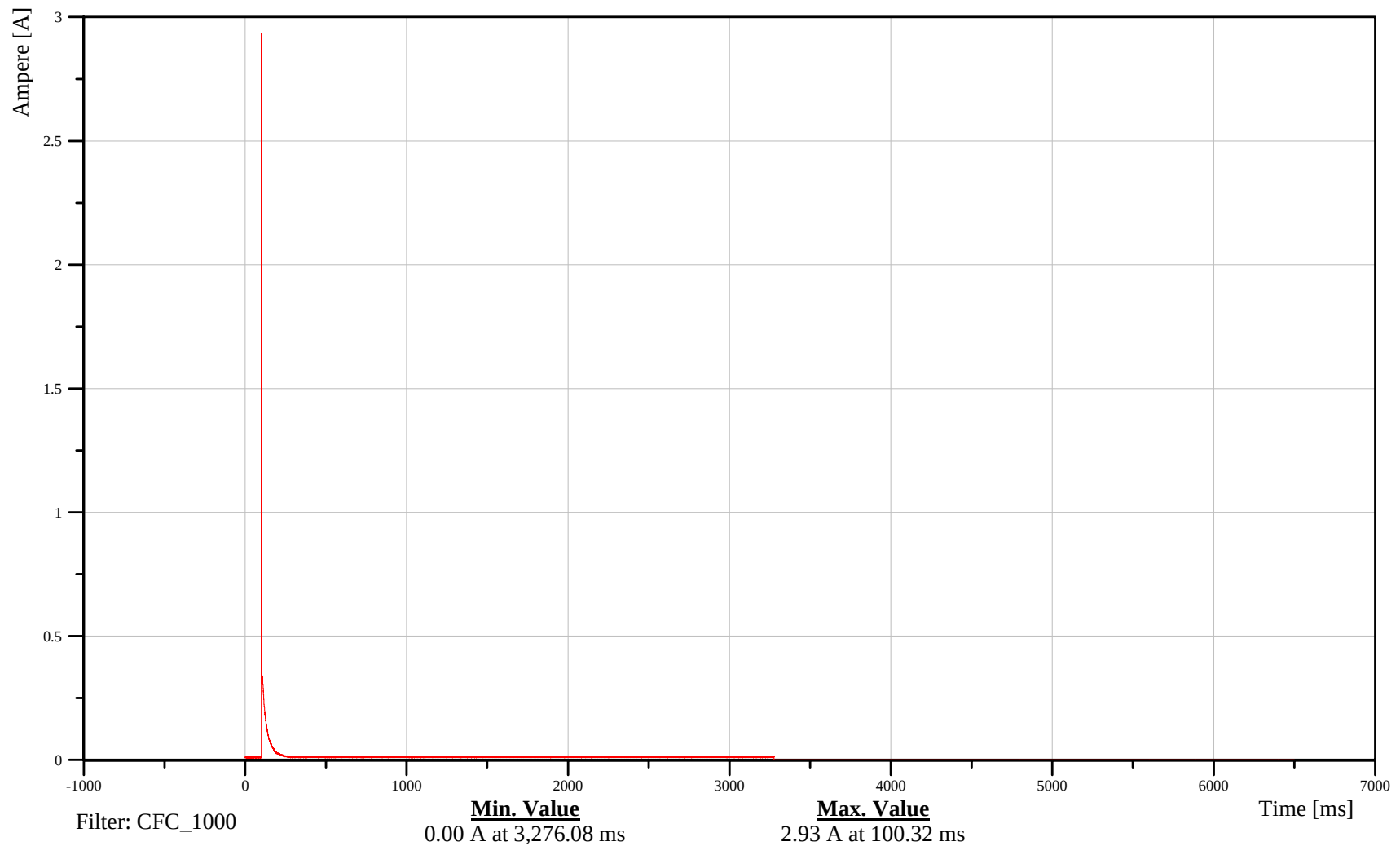
Time: 15:07

Customer: VRTC

13PRET000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-218

100413



Curb Trip Rollover 2007 Ford Expedition

Left Rear Buckle Pretensioner Current

Date: 04/13/2010

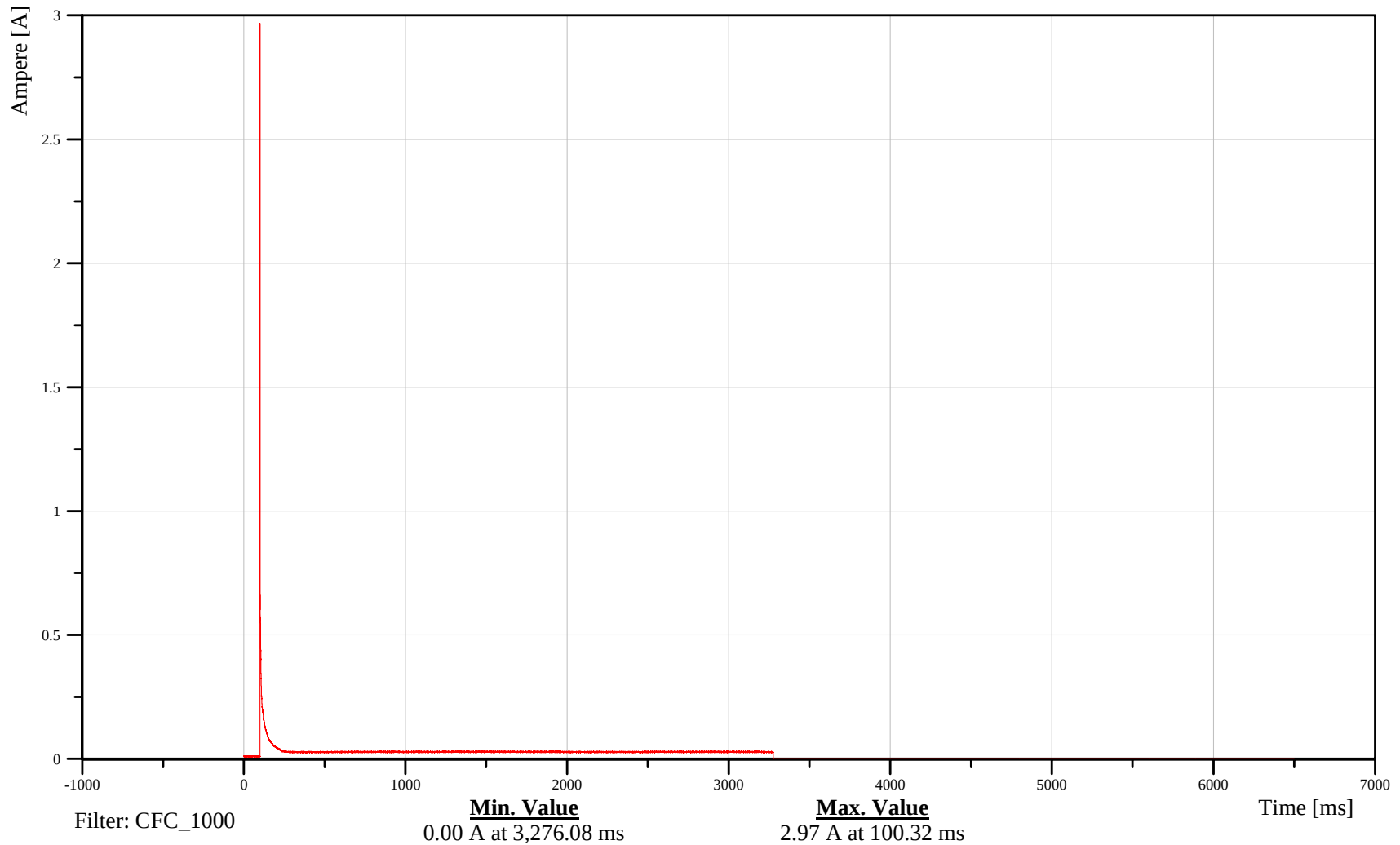
Time: 15:07

Customer: VRTC

14PRET000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-219

100413



Curb Trip Rollover 2007 Ford Expedition

Date: 04/13/2010

Right Front Passenger Retractor Current

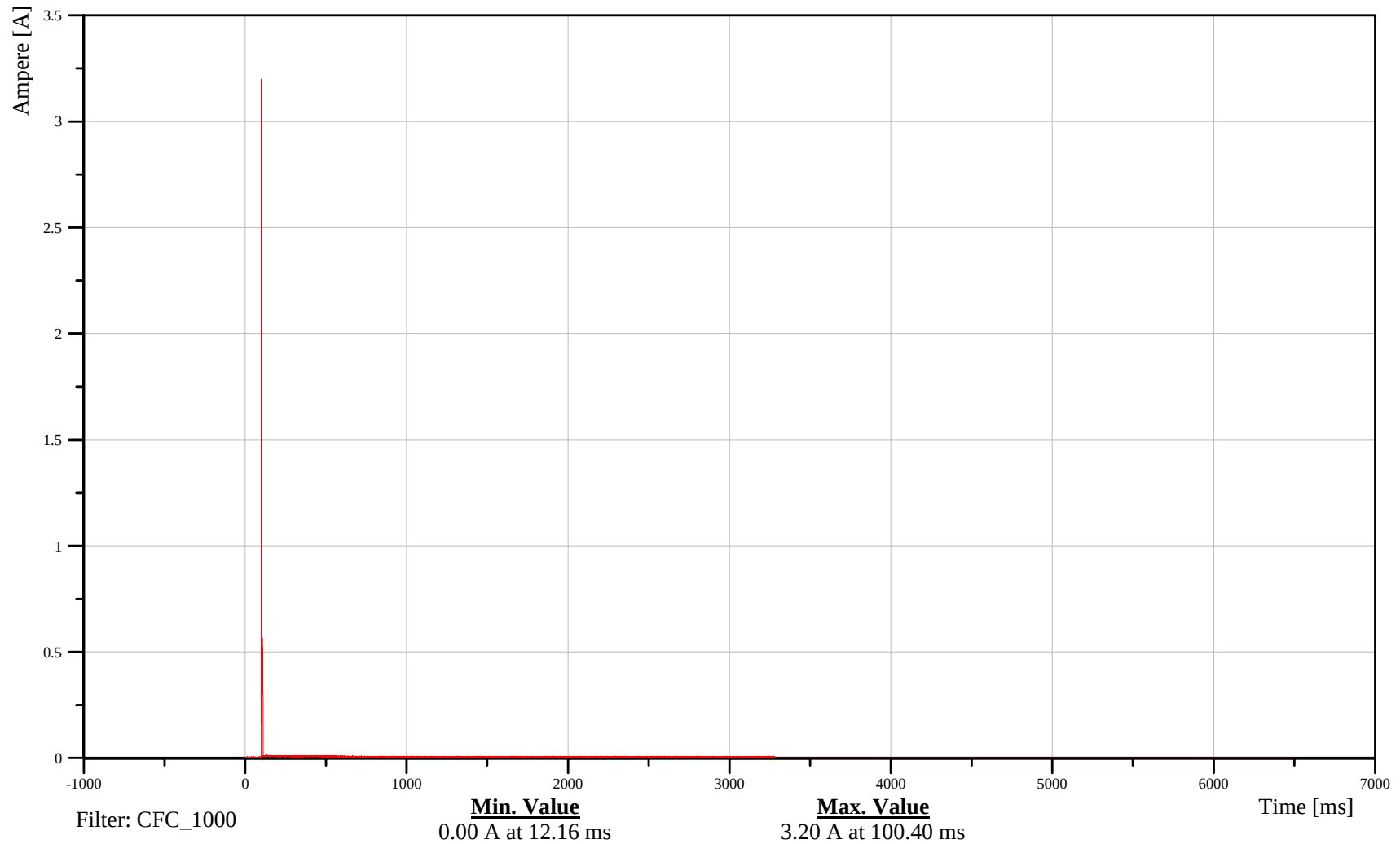
Time: 15:07

Customer: VRTC

13RETR000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100413



B-220

100413

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

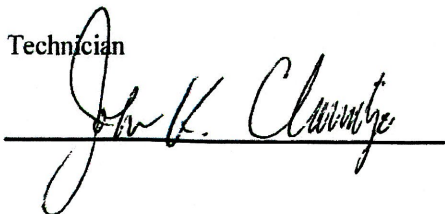
Test Date: 1/25/2010

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

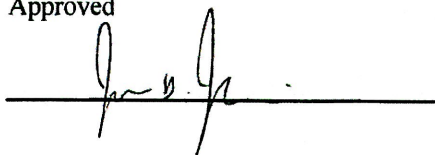
Test meets specifications.

Comments:

Technician



Approved

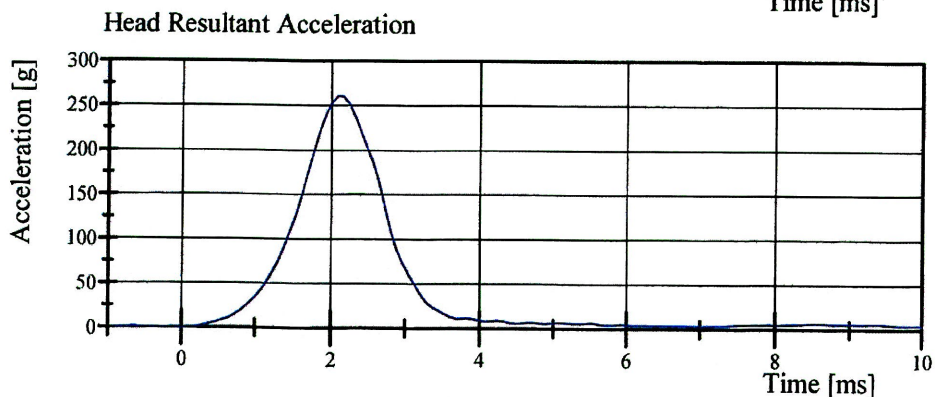
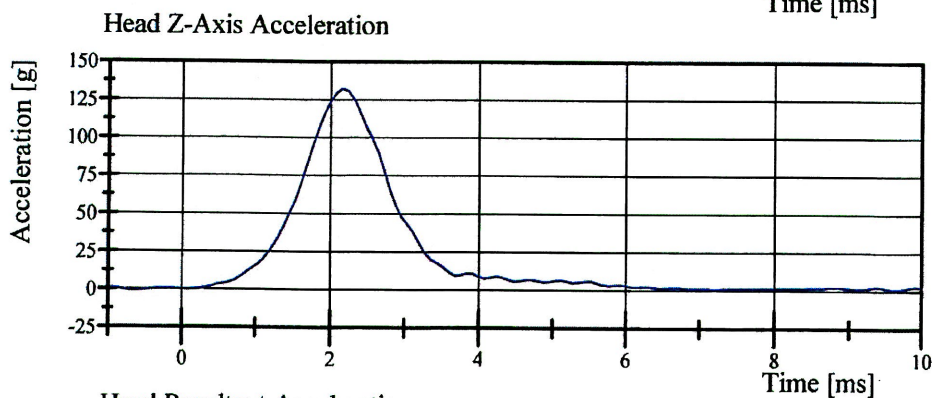
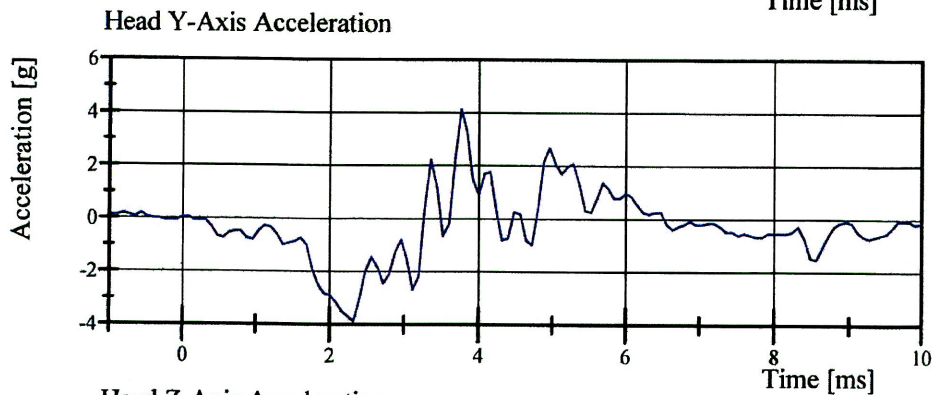
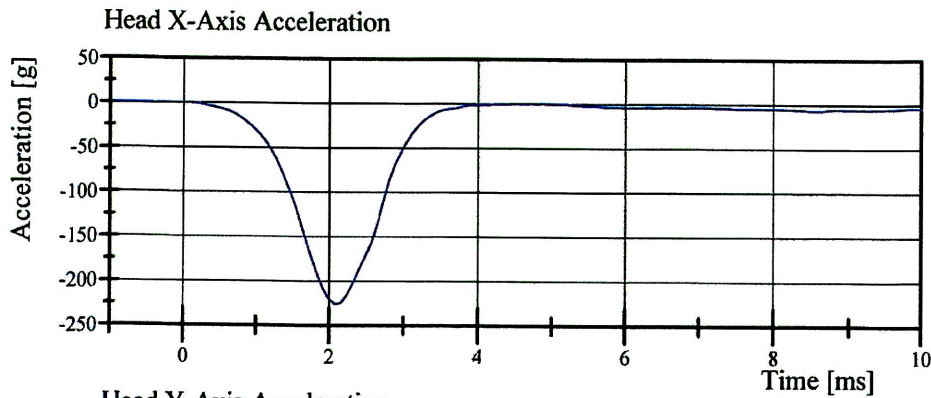


Transportation Research Center Inc.

Front Head Drop

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

Test Date: 1/25/2010



Transportation Research Center Inc.

Neck Flexion

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

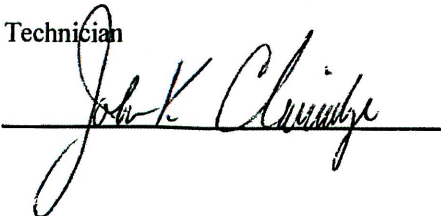
Test Date: 1/25/2010

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	$\geq$ (-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

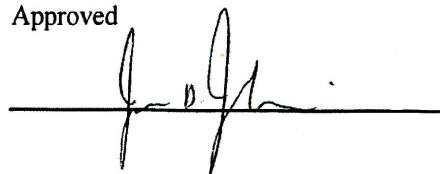
Test meets specifications.

Comments:

Technician



Approved

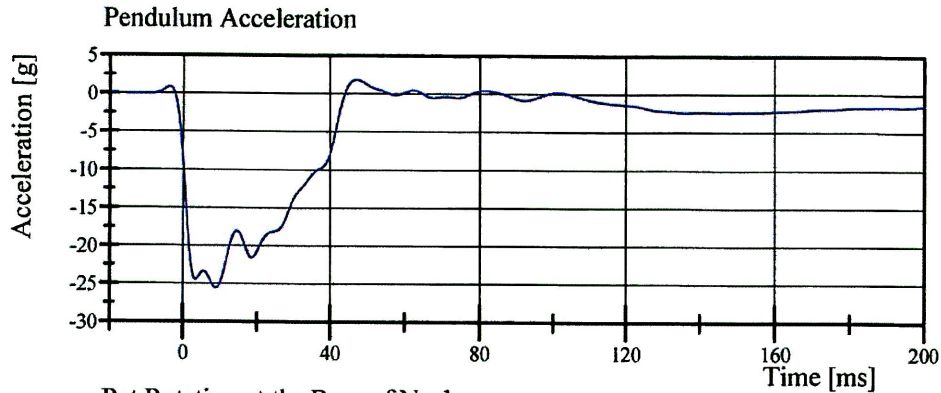


Transportation Research Center Inc.

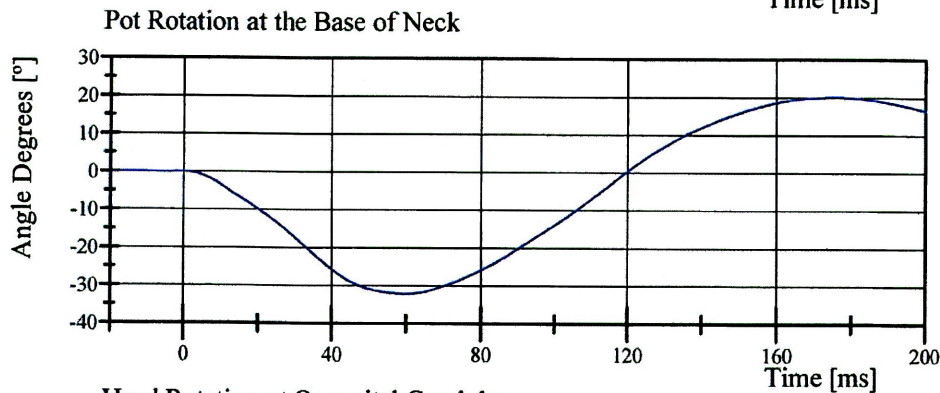
Neck Flexion

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

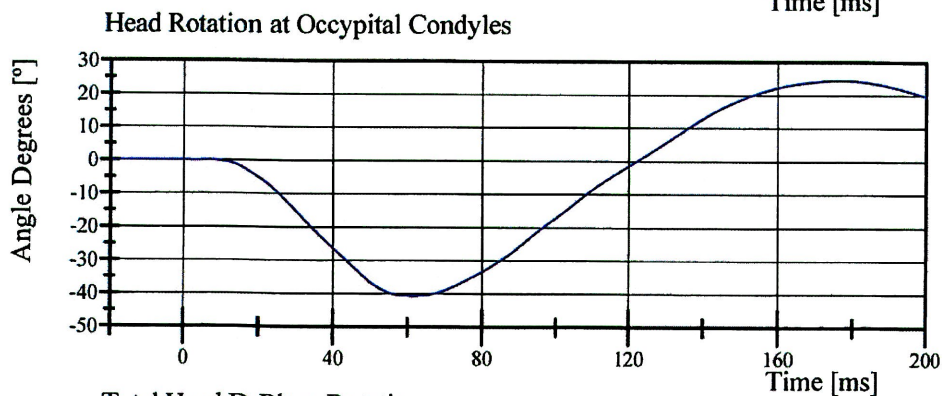
Test Date: 1/25/2010



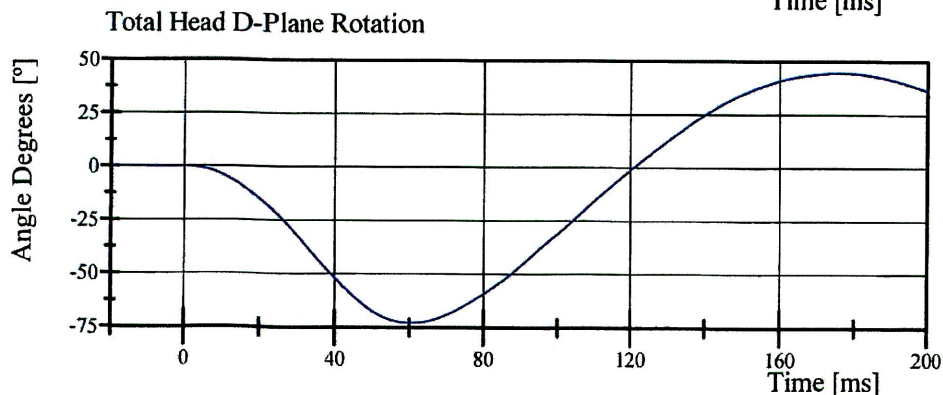
Filter Class: CFC_60
Max: 1.9 g at 47.0 ms
Min: -25.5 g at 9.1 ms



Filter Class: CFC_60
Max: 20.1 ° at 175.7 ms
Min: -32.1 ° at 59.9 ms



Filter Class: CFC_60
Max: 24.5 ° at 176.7 ms
Min: -40.6 ° at 61.6 ms



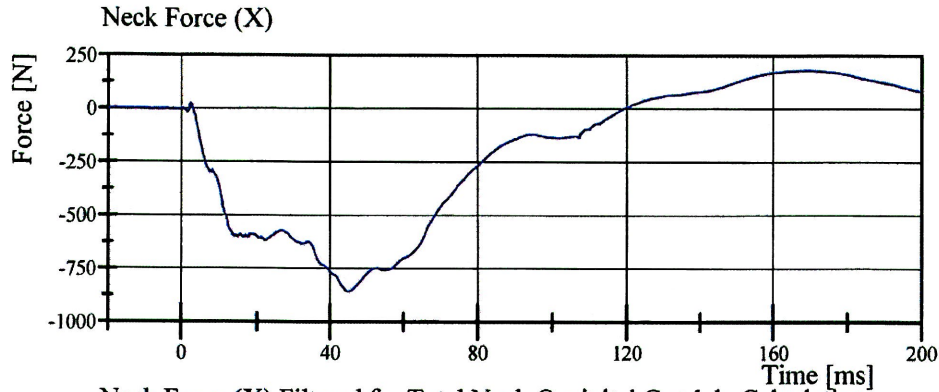
Filter Class: CFC_60
Max: 44.6 ° at 176.3 ms
Min: -72.7 ° at 60.5 ms

Transportation Research Center Inc.

Neck Flexion

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

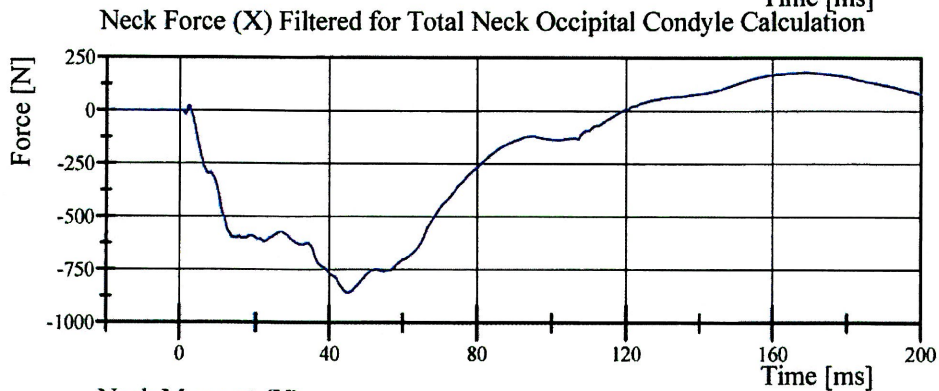
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 183.1 N at 168.4 ms

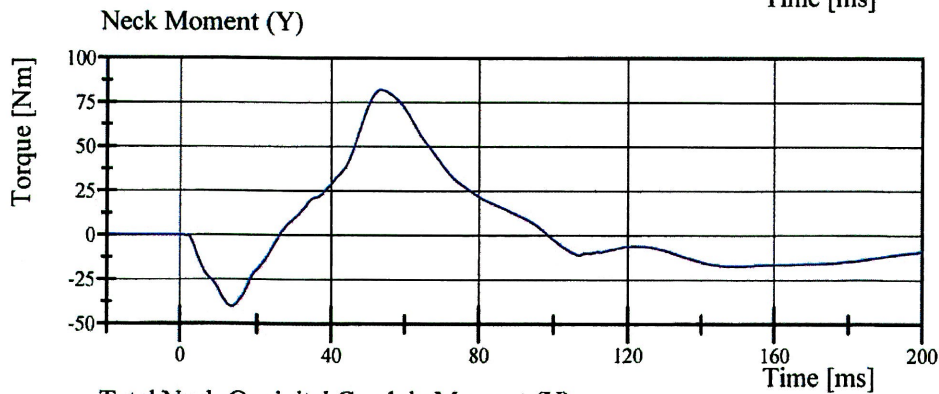
Min: -858.6 N at 44.8 ms



Filter Class: CFC_600

Max: 183.0 N at 168.6 ms

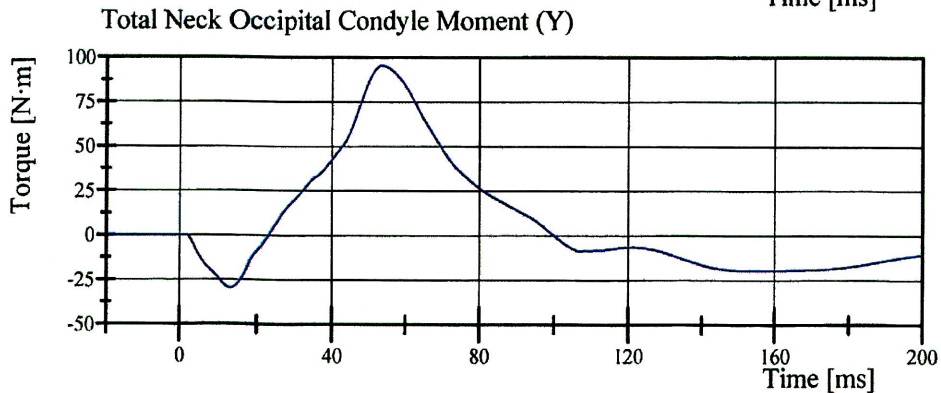
Min: -858.6 N at 45.0 ms



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

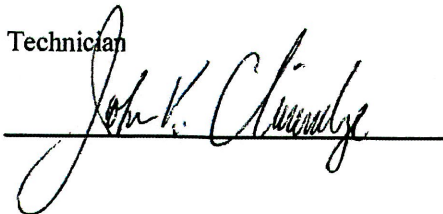
HIII 50th Serial No. 001 Certification No. 13-1

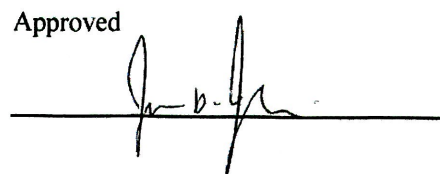
Test Date: 1/25/2010

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


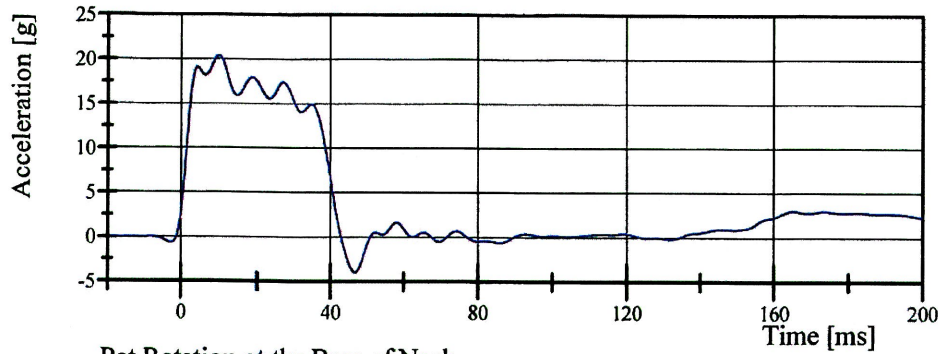
Transportation Research Center Inc.

Neck Extension

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

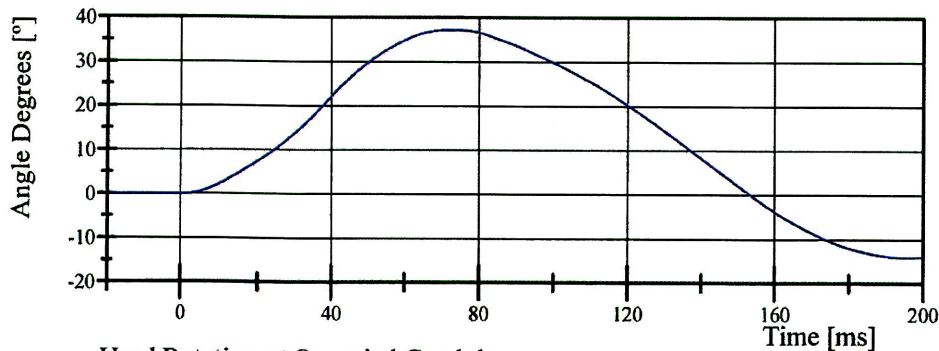
Test Date: 1/25/2010

Pendulum Acceleration



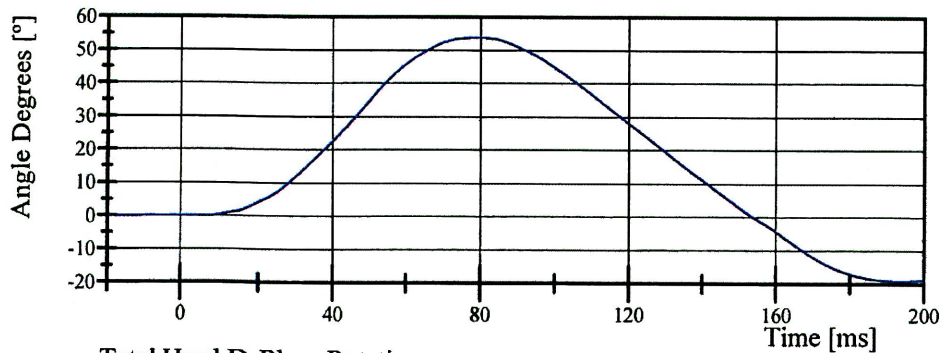
Filter Class: CFC_60
Max: 20.4 g at 10.1 ms
Min: -4.0 g at 46.6 ms

Pot Rotation at the Base of Neck



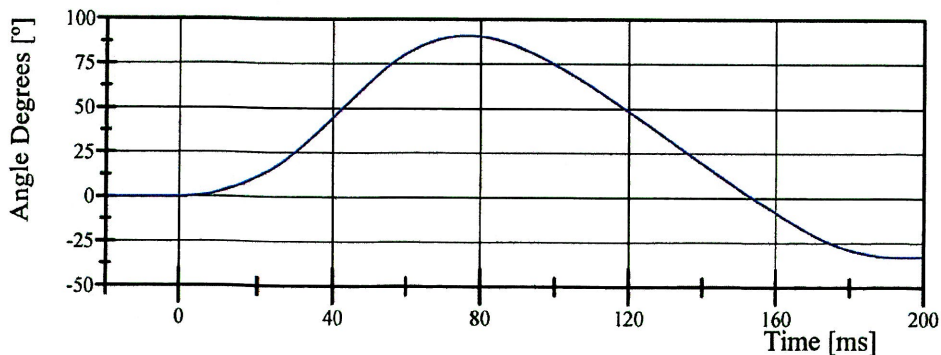
Filter Class: CFC_60
Max: 37.2 ° at 72.6 ms
Min: -14.0 ° at 195.8 ms

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



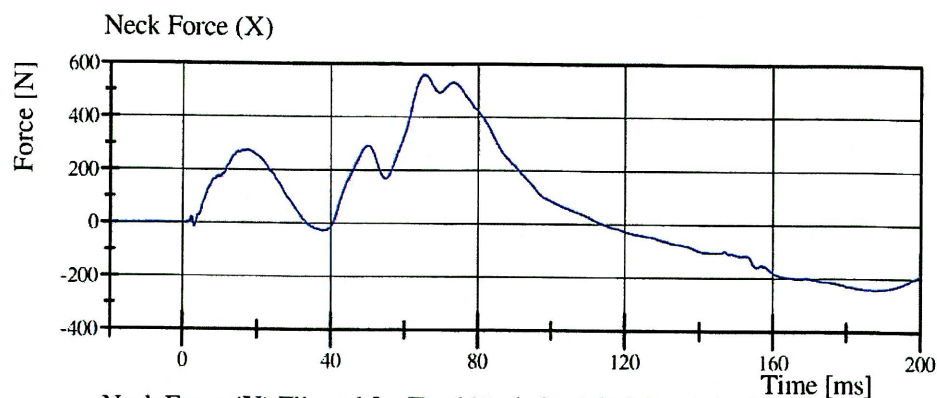
Filter Class: CFC_60
Max: 90.9 ° at 76.7 ms
Min: -33.0 ° at 194.8 ms

Transportation Research Center Inc.

Neck Extension

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

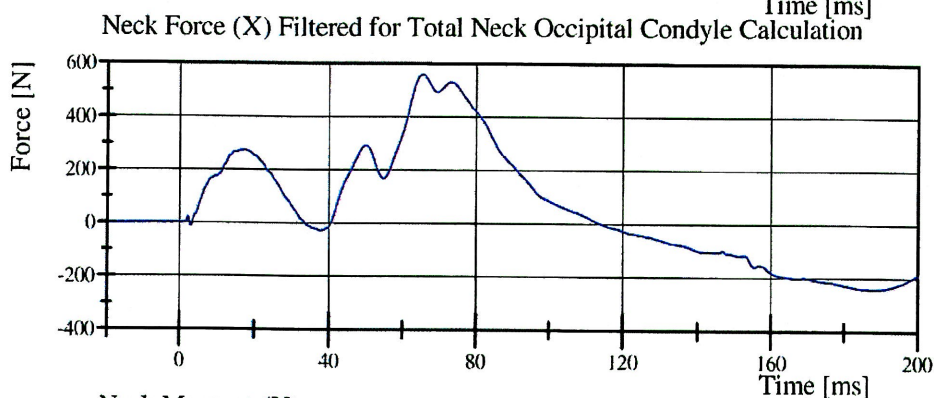
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 559.6 N at 65.5 ms

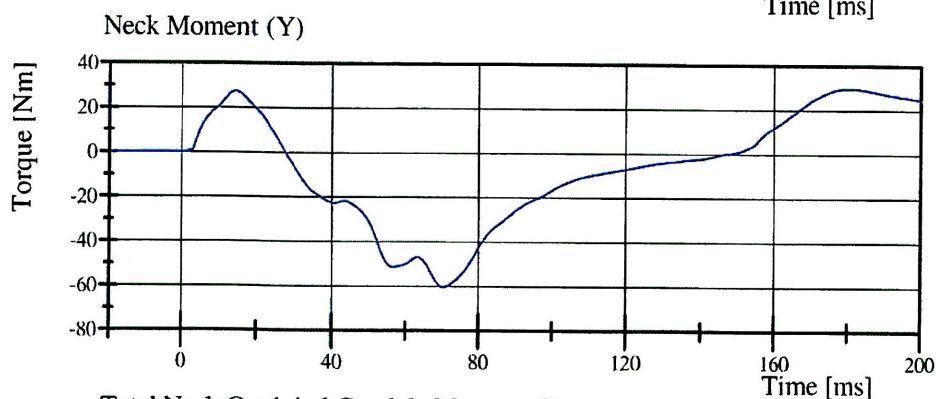
Min: -242.8 N at 187.7 ms



Filter Class: CFC_600

Max: 559.5 N at 65.6 ms

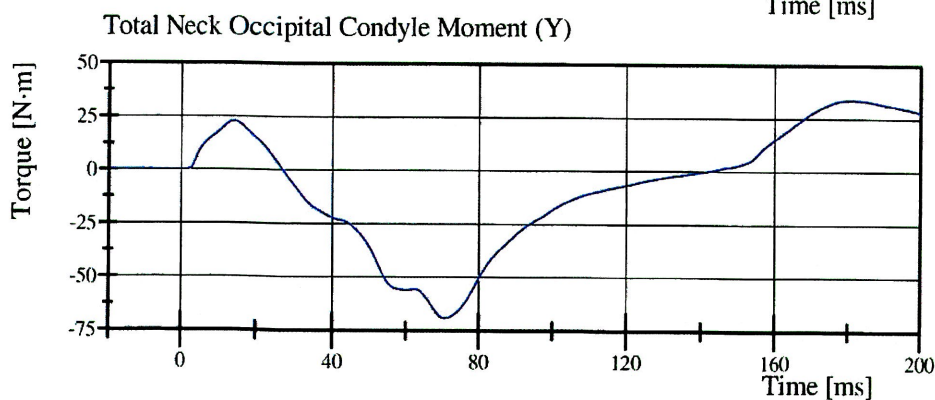
Min: -242.4 N at 187.6 ms



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

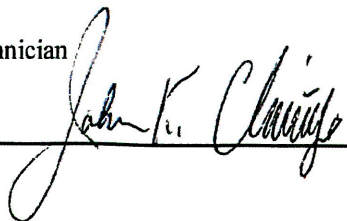
Test Date: 1/26/2010

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

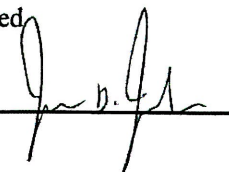
Test meets specifications.

Comments:

Technician



Approved



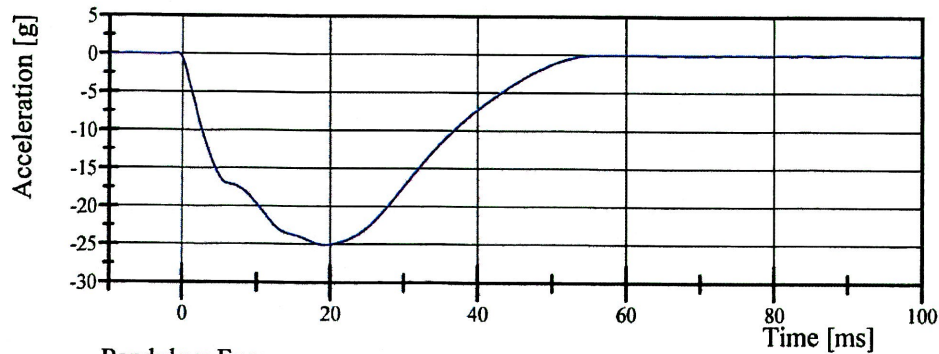
Transportation Research Center Inc.

Front Thorax

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

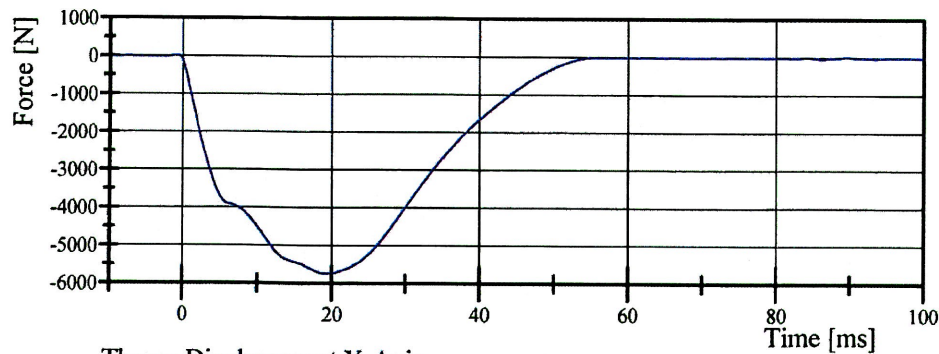
Test Date: 1/26/2010

Pendulum Acceleration



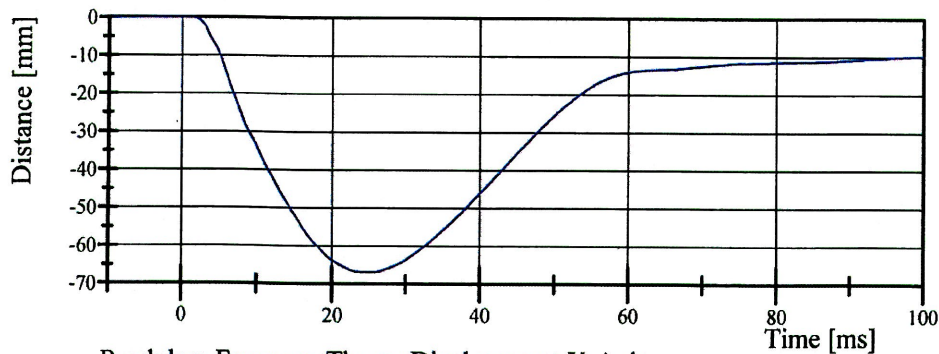
Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -25.0 g at 19.7 ms

Pendulum Force



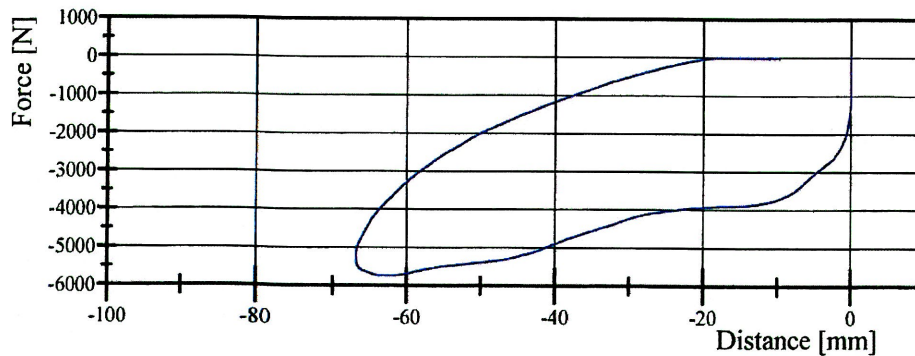
Filter Class: CFC_180
Max: 28.4 N at -0.8 ms
Min: -5,738.6 N at 19.7 ms

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

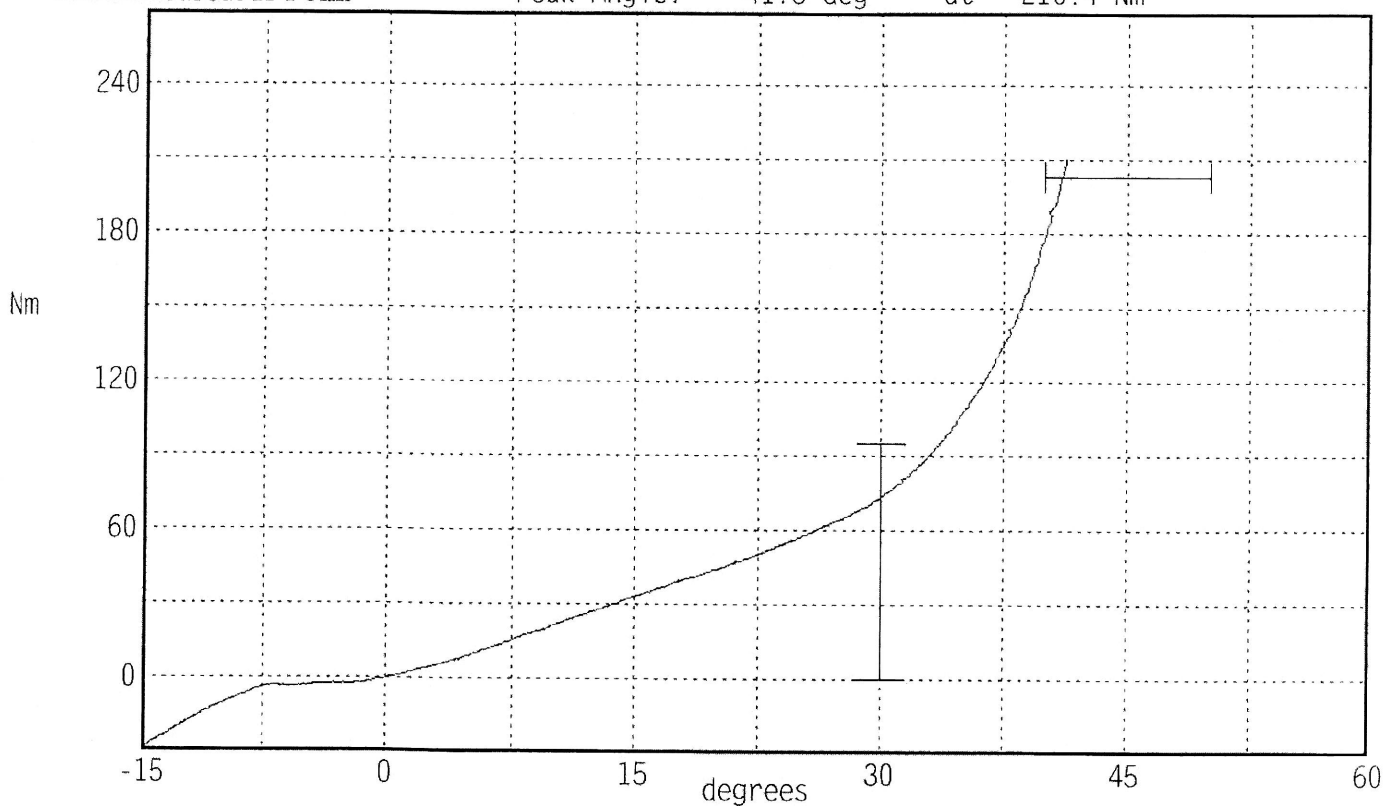
Time: 10:49

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

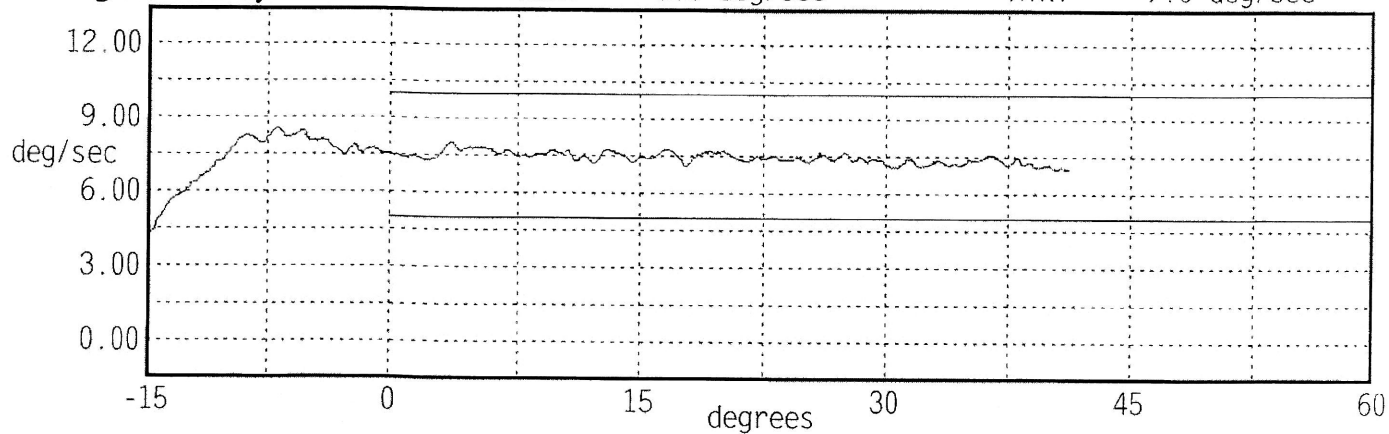
Moment About H-Point

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



Angular Velocity

Max: 8.0 deg/sec Min: 7.0 deg/sec



Transportation Research Center Inc

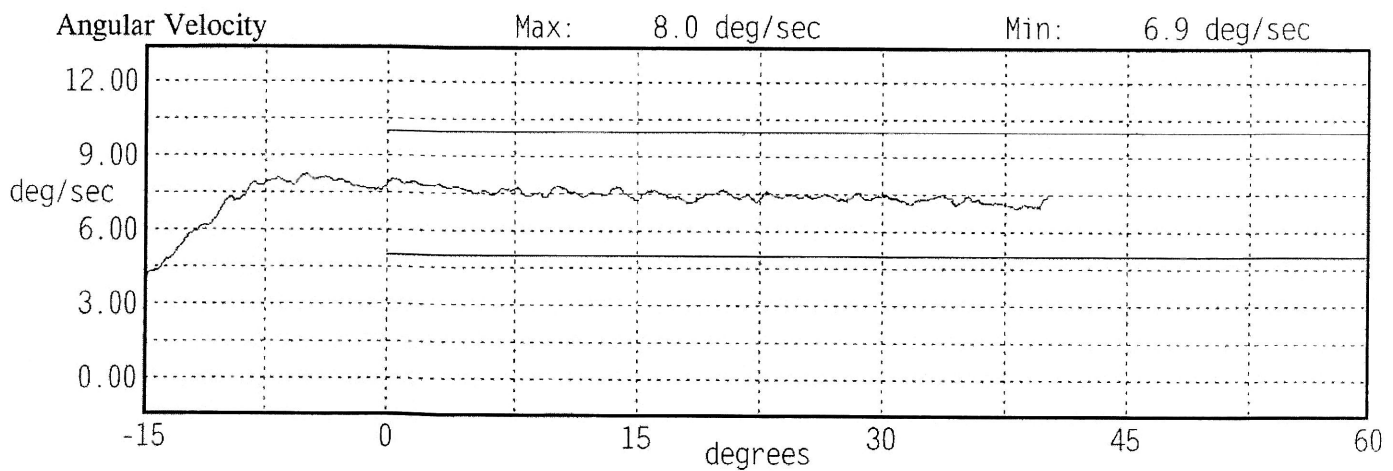
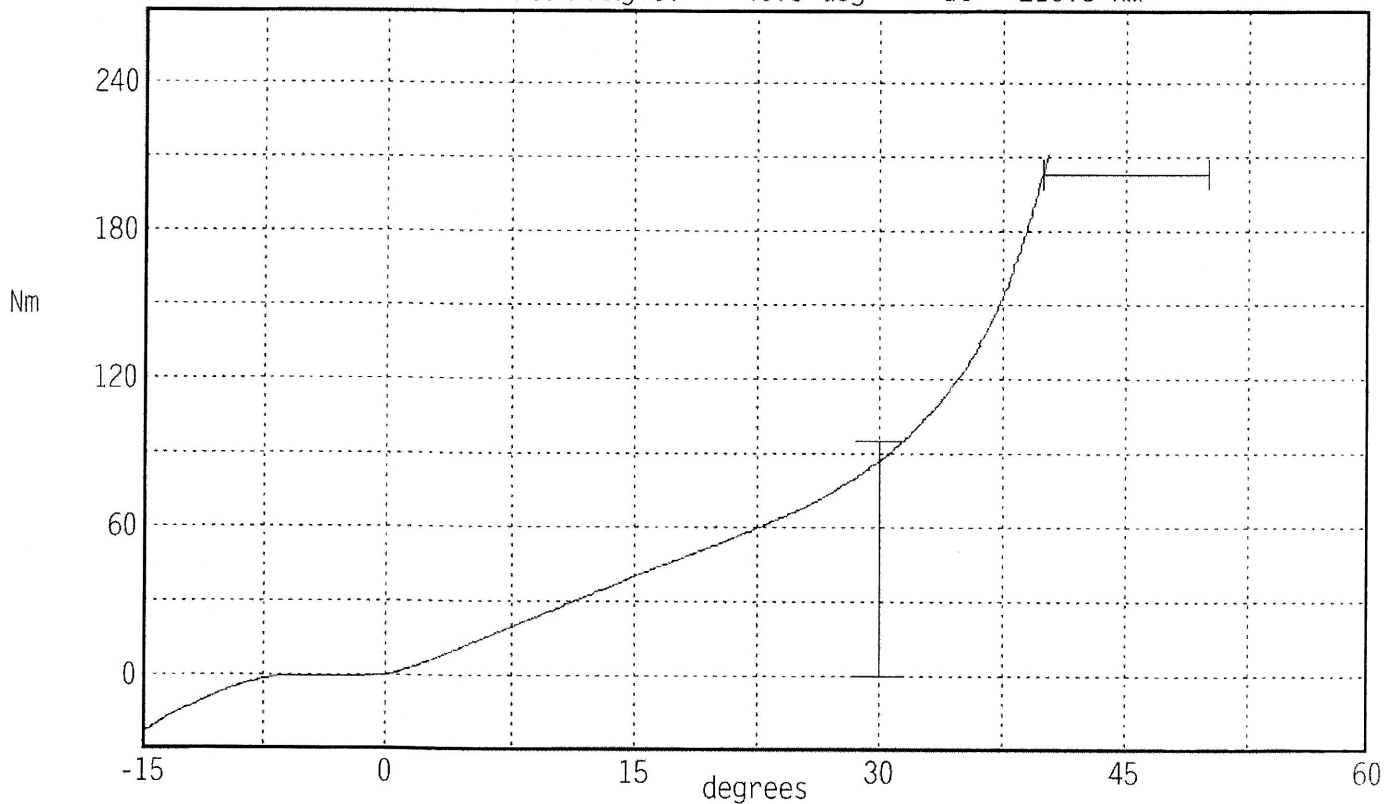
Hybrid III Hip Range of Motion

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.

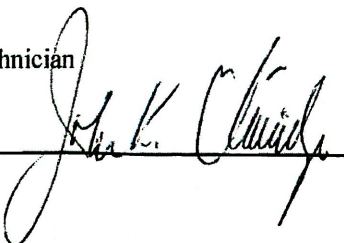
Left Knee Femur Response Test
HIII 50th Serial No. 001 Certification No. 13-2
Test Date: 1/25/2010

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

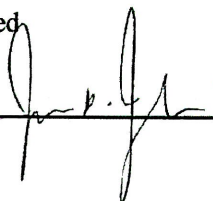
Test meets specifications.

Comments:

Technician

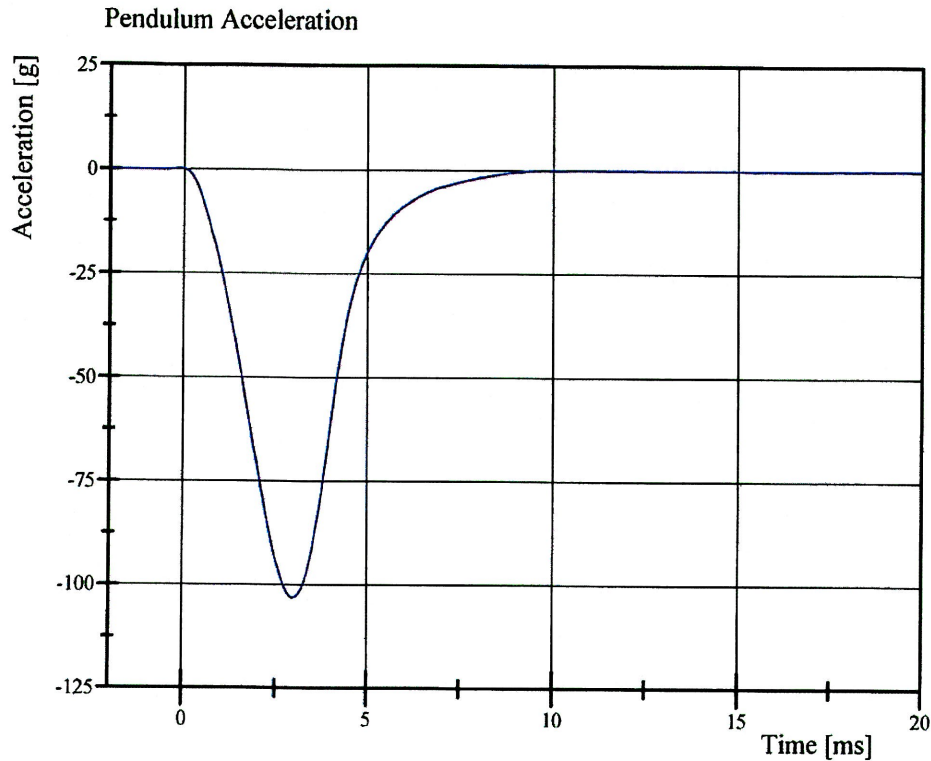


Approved

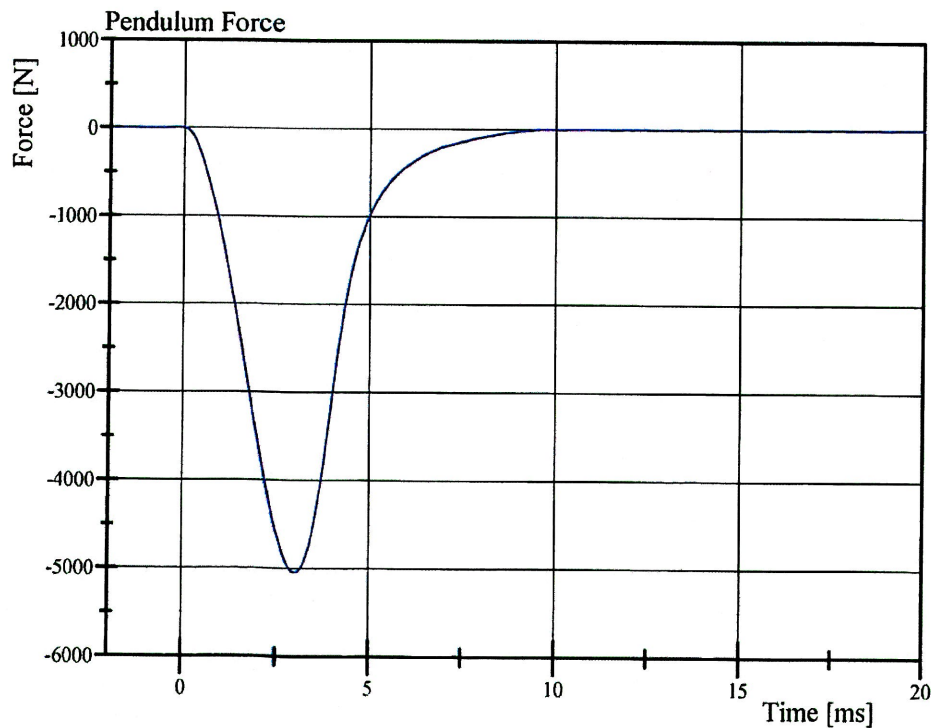


Transportation Research Center Inc.

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

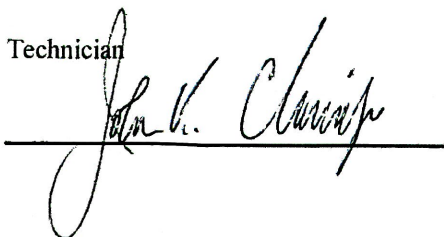
Test Date: 1/25/2010

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

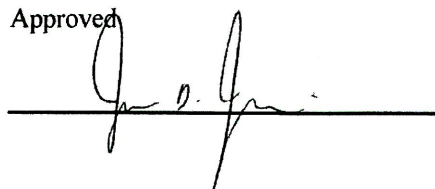
Test meets specifications.

Comments:

Technician



Approved



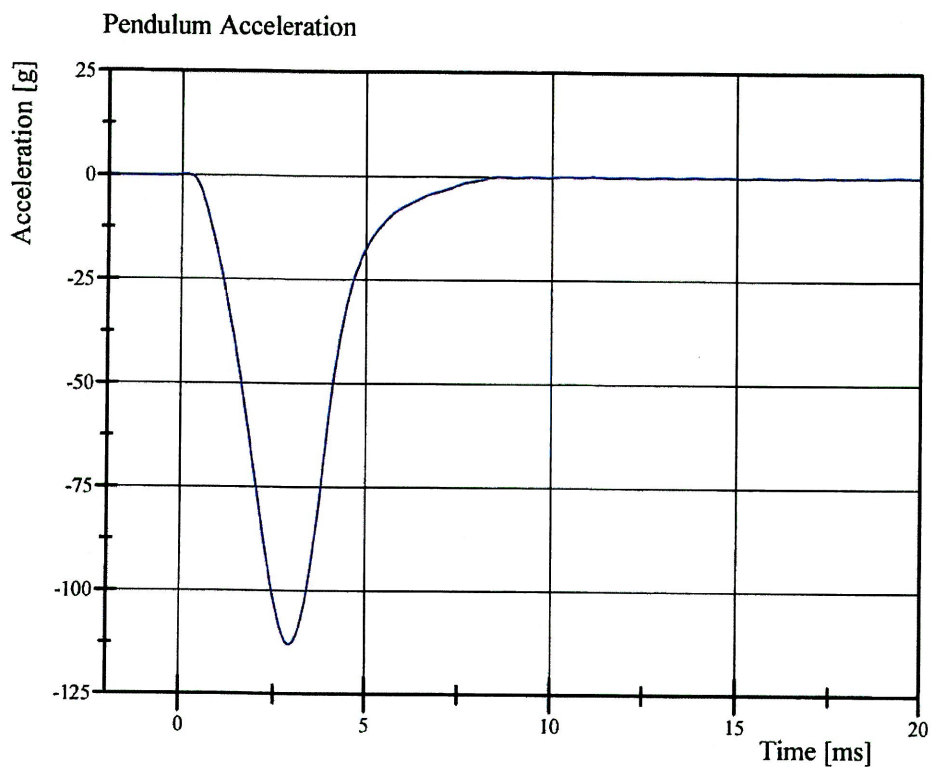
Specification Source: CFR49 Part 572 Subpart E
with Polarity in accordance with J211

01.25.2010 11:10:51 1758



Transportation Research Center Inc.

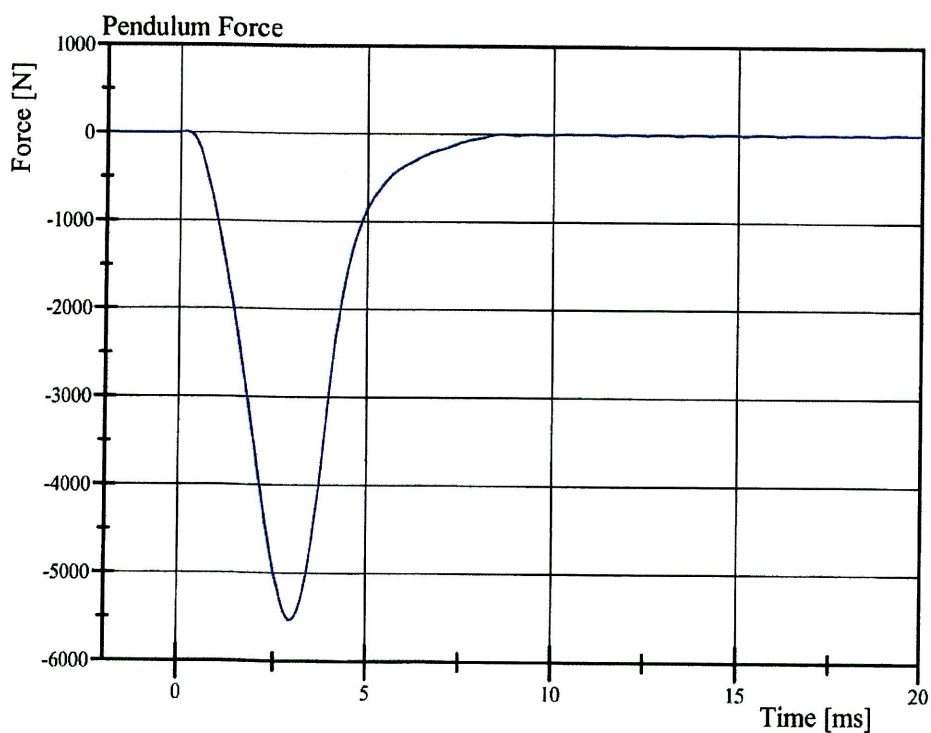
Right Knee Femur Response Test
HIII 50th Serial No. 001 Certification No. 13-1
Test Date: 1/25/2010



Filter Class: CFC_600

Max: 0.2 g at 0.2 ms

Min: -113.0 g at 3.0 ms



Filter Class: CFC_600

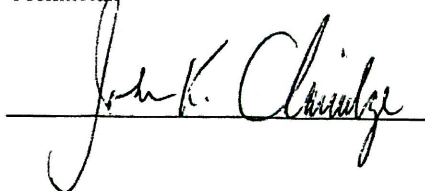
Max: 10.7 N at 0.2 ms

Min: -5,527.7 N at 3.0 ms

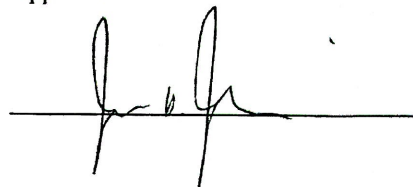
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 001 Calibration No. 13

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

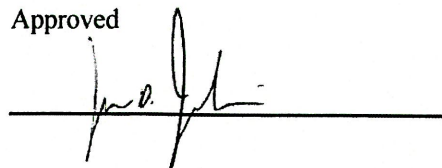
Test meets specifications.

Comments:

Technician



Approved



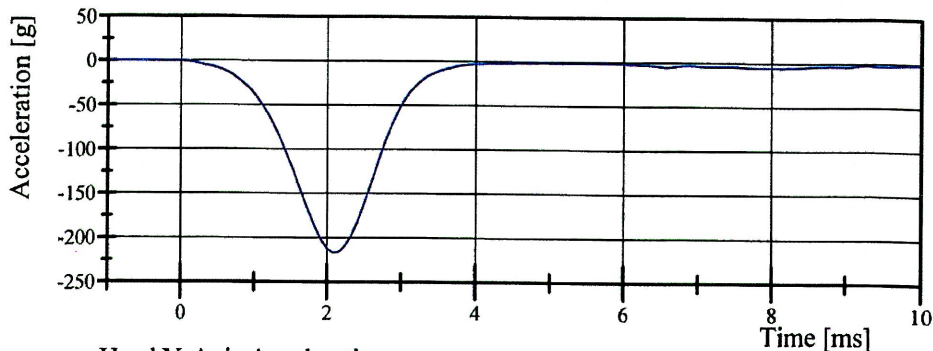
Transportation Research Center Inc.

Front Head Drop

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

Test Date: 1/22/2010

Head X-Axis Acceleration

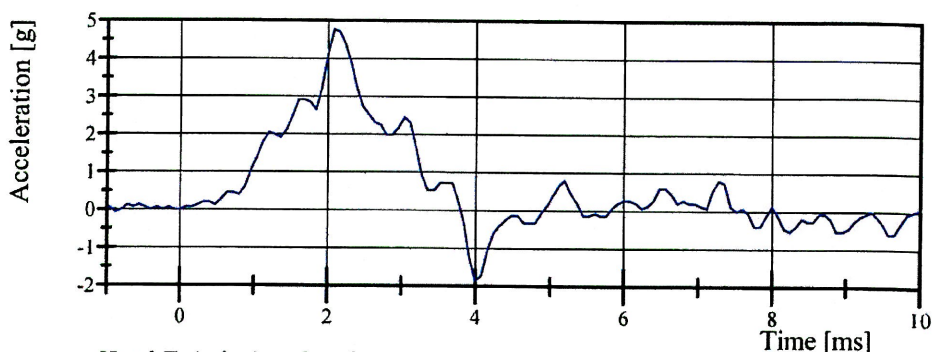


Filter Class: CFC_1000

Max: 0.1 g at -0.4 ms

Min: -216.8 g at 2.1 ms

Head Y-Axis Acceleration

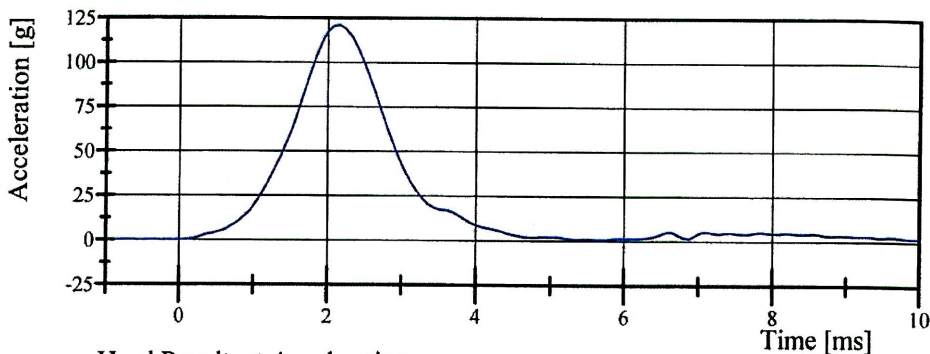


Filter Class: CFC_1000

Max: 4.8 g at 2.1 ms

Min: -1.9 g at 4.0 ms

Head Z-Axis Acceleration

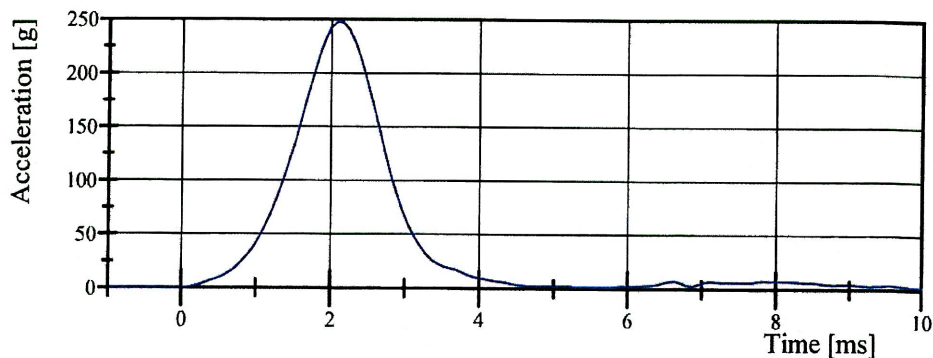


Filter Class: CFC_1000

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

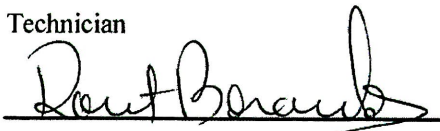
Test Date: 1/25/2010

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

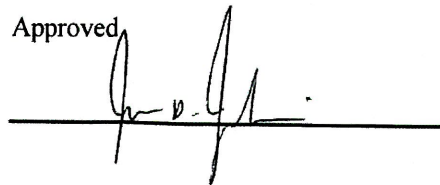
Test meets specifications.

Comments:

Technician



Approved



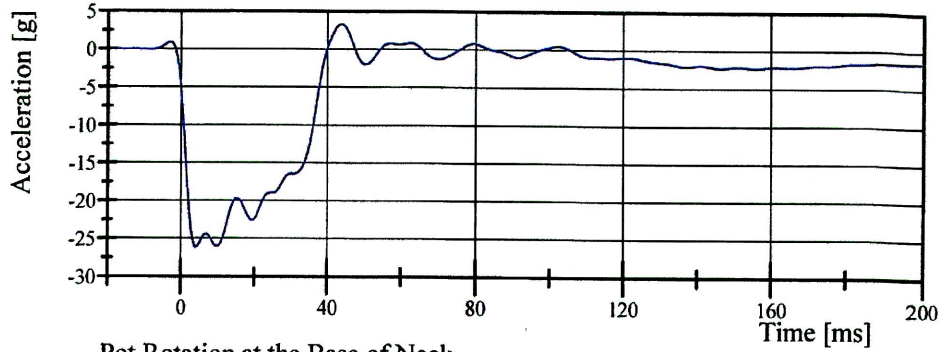
Transportation Research Center Inc.

Neck Flexion

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

Test Date: 1/25/2010

Pendulum Acceleration

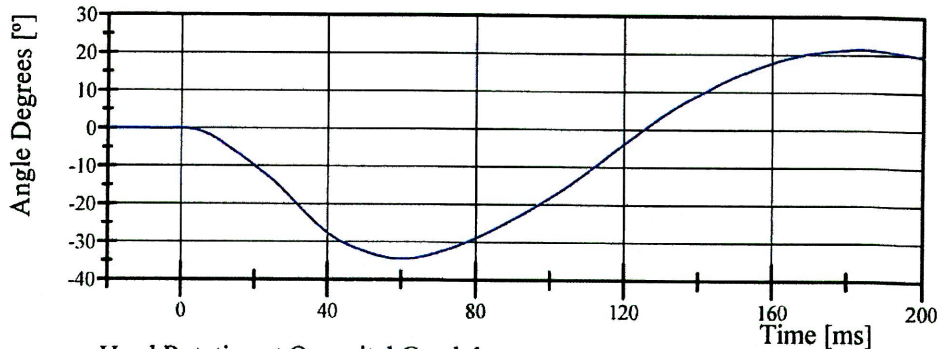


Filter Class: CFC_60

Max: 3.4 g at 43.9 ms

Min: -26.1 g at 4.1 ms

Pot Rotation at the Base of Neck

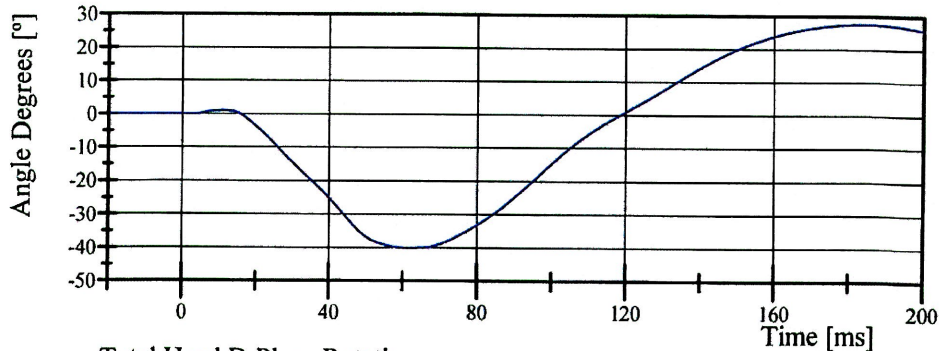


Filter Class: CFC_60

Max: 21.5 ° at 183.5 ms

Min: -34.4 ° at 60.3 ms

Head Rotation at Occypital Condyles

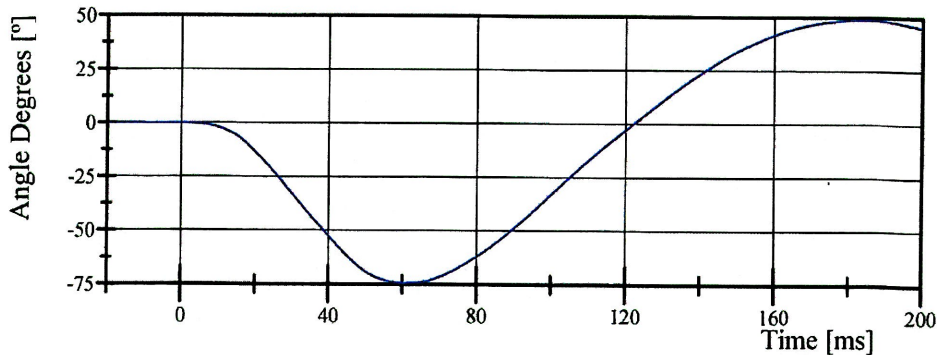


Filter Class: CFC_60

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

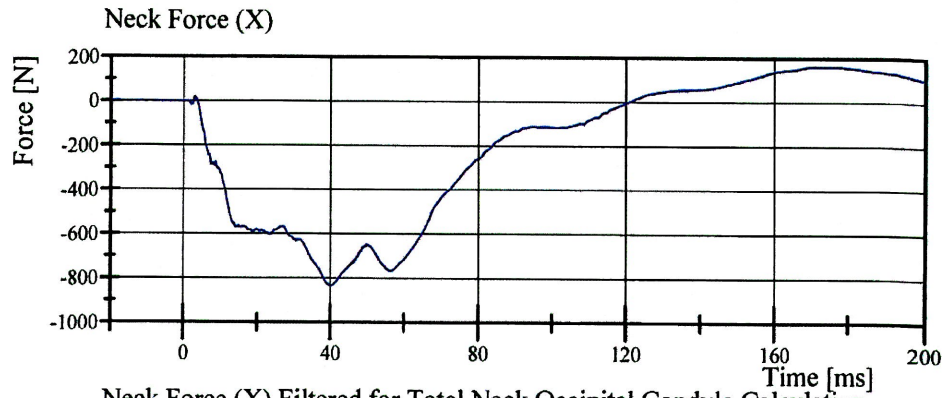
Min: -74.5 ° at 61.1 ms

Transportation Research Center Inc.

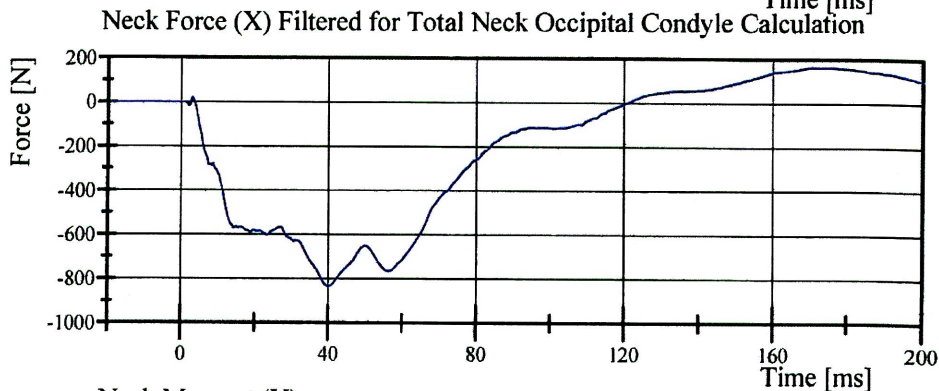
Neck Flexion

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

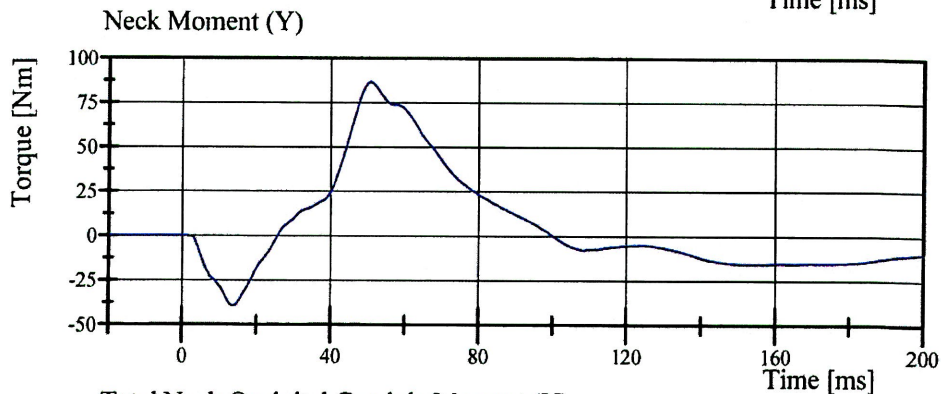
Test Date: 1/25/2010



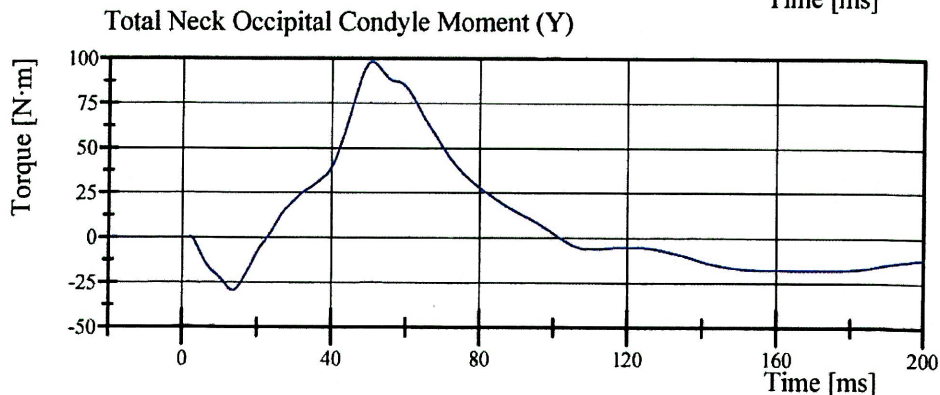
Filter Class: CFC_1000
Max: 164.2 N at 170.7 ms
Min: -834.1 N at 40.2 ms



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

Transportation Research Center Inc.

Neck Extension

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	22.1 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.986 m/s	Yes
Pendulum Acceleration Decay			
Crossing 5g	38 - 46 ms	40.0 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.36 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.99 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.34 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.34 g	Yes
Total Head D-Plane Rotation			
Peak	81 - 106 °	97.1 °	Yes
Time of Peak	72 - 82 ms	77.0 ms	Yes
Total Head D-Plane Rotation			
Decay to 0°	147 - 174 ms	156.3 ms	Yes
Total Neck Occipital Condyles Moment			
Peak	(-53) - (-80) N·m	-70.3 N·m	Yes
Time of Peak	65 - 79 ms	70.5 ms	Yes
Total Neck Occipital Condyles Moment			
Decay to 0 N·m	120 - 148 ms	141.8 ms	Yes

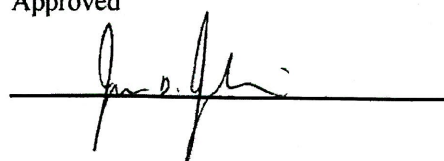
Test meets specifications.

Comments:

Technician



Approved



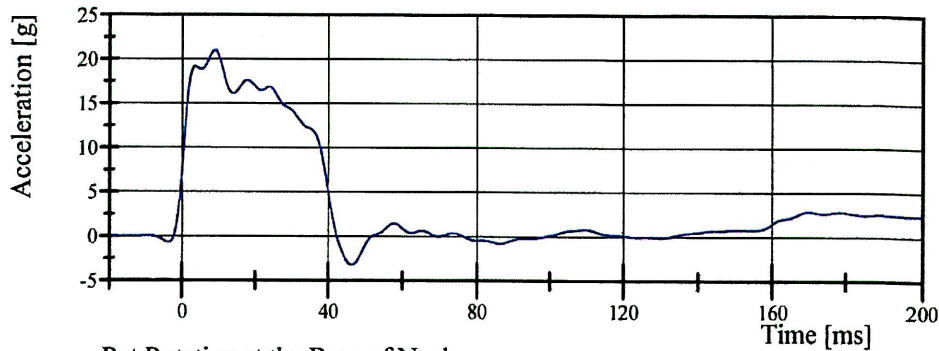
Transportation Research Center Inc.

Neck Extension

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

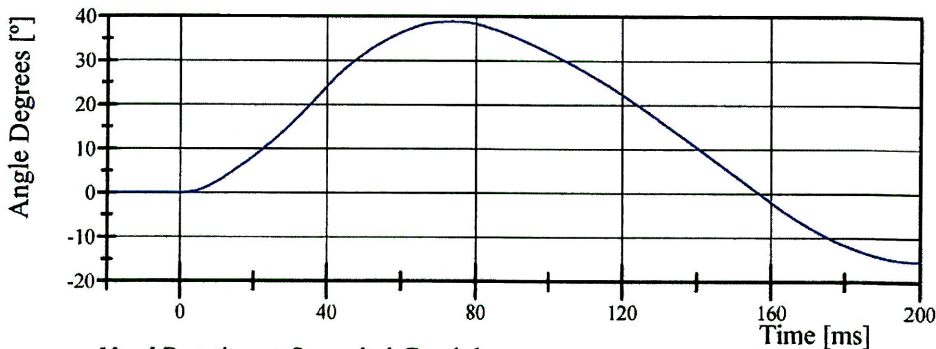
Test Date: 1/25/2010

Pendulum Acceleration



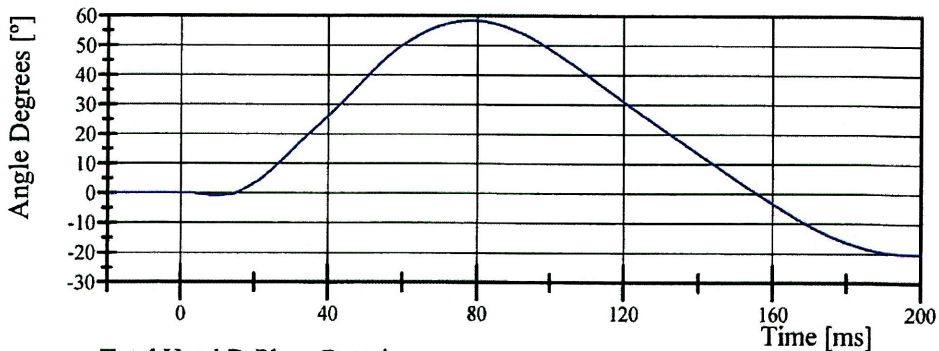
Filter Class: CFC_60
Max: 21.0 g at 8.9 ms
Min: -3.2 g at 46.5 ms

Pot Rotation at the Base of Neck



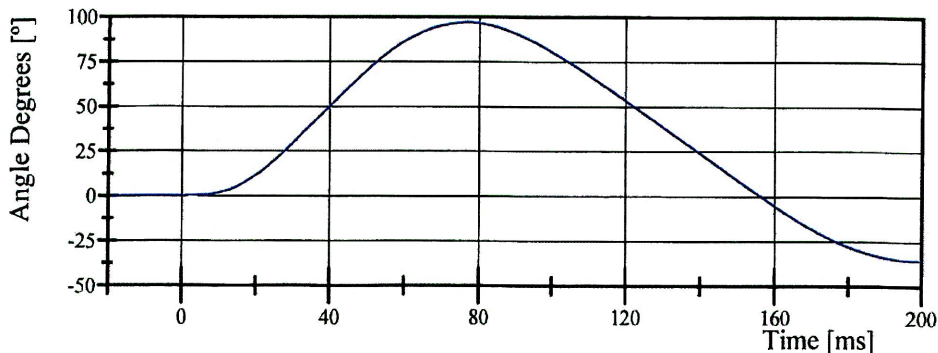
Filter Class: CFC_60
Max: 38.9 ° at 73.6 ms
Min: -15.4 ° at 200.0 ms

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



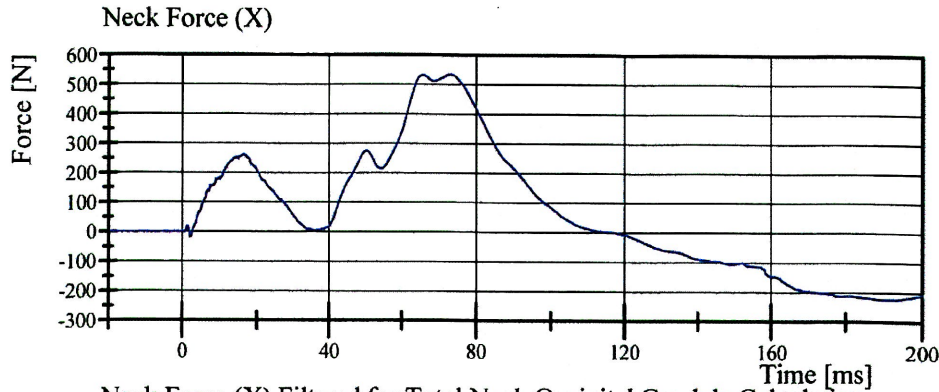
Filter Class: CFC_60
Max: 97.1 ° at 77.0 ms
Min: -35.6 ° at 199.8 ms

Transportation Research Center Inc.

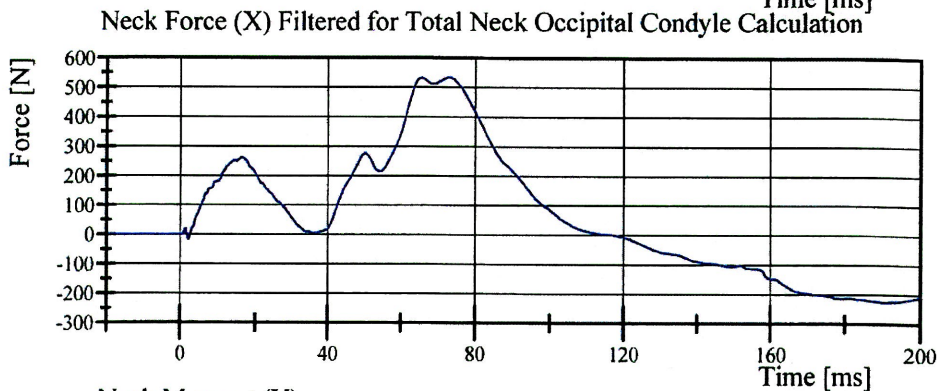
Neck Extension

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

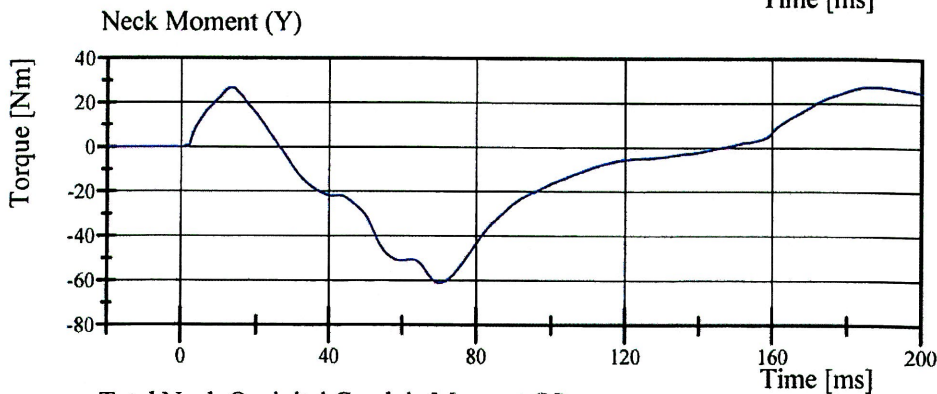
Test Date: 1/25/2010



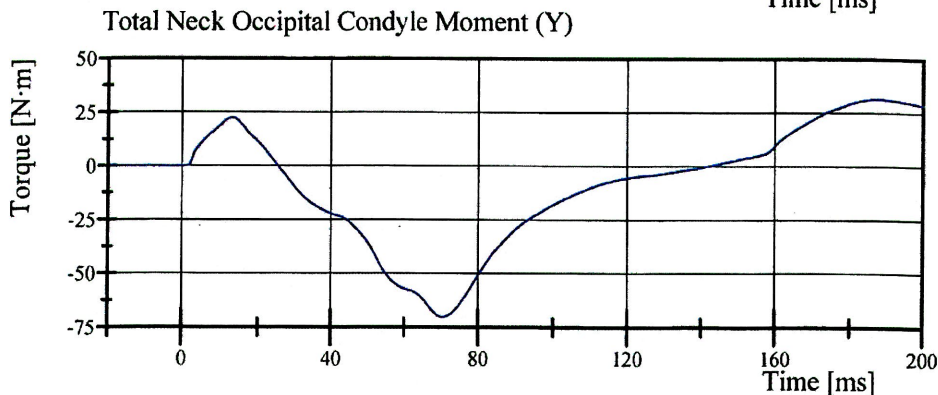
Filter Class: CFC_1000
Max: 535.4 N at 73.2 ms
Min: -225.1 N at 191.9 ms



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

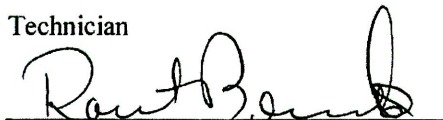
Test Date: 1/27/2010

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

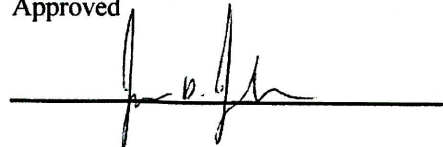
Test meets specifications.

Comments:

Technician



Approved



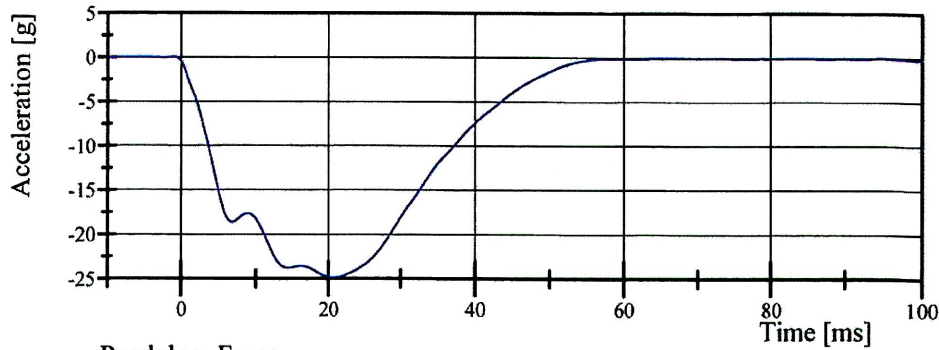
Transportation Research Center Inc.

Front Thorax

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

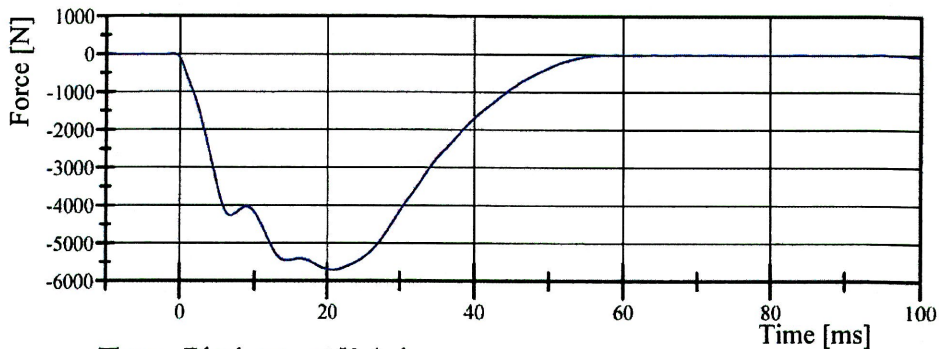
Test Date: 1/27/2010

Pendulum Acceleration



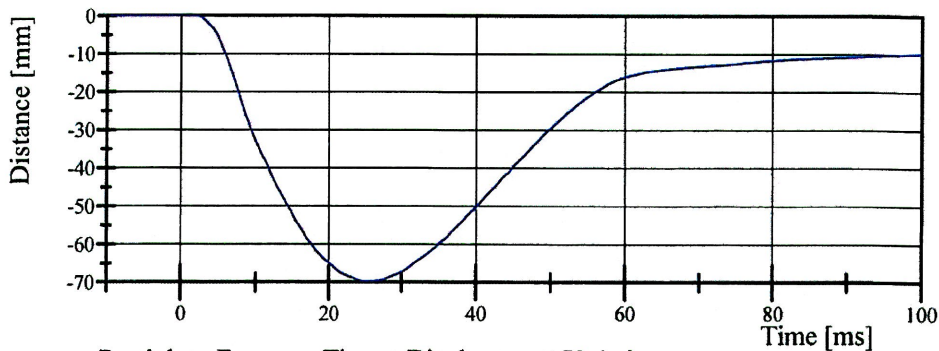
Filter Class: CFC_180
Max: 0.0 g at -1.0 ms
Min: -24.9 g at 20.7 ms

Pendulum Force



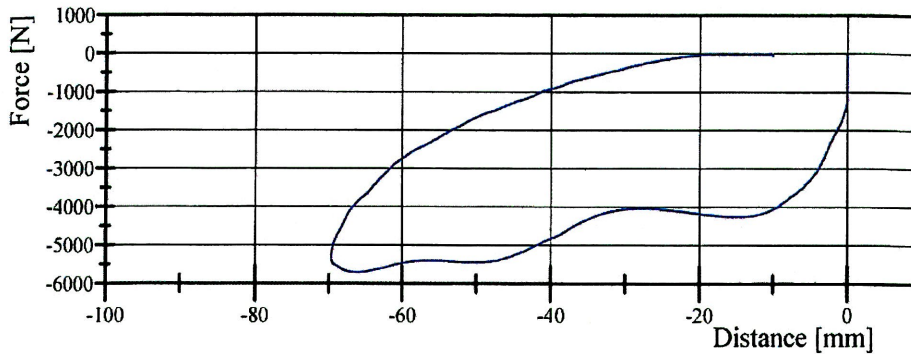
Filter Class: CFC_180
Max: 11.3 N at -1.0 ms
Min: -5,704.6 N at 20.7 ms

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

Date: 01/25/2010

Test Number: 110C33

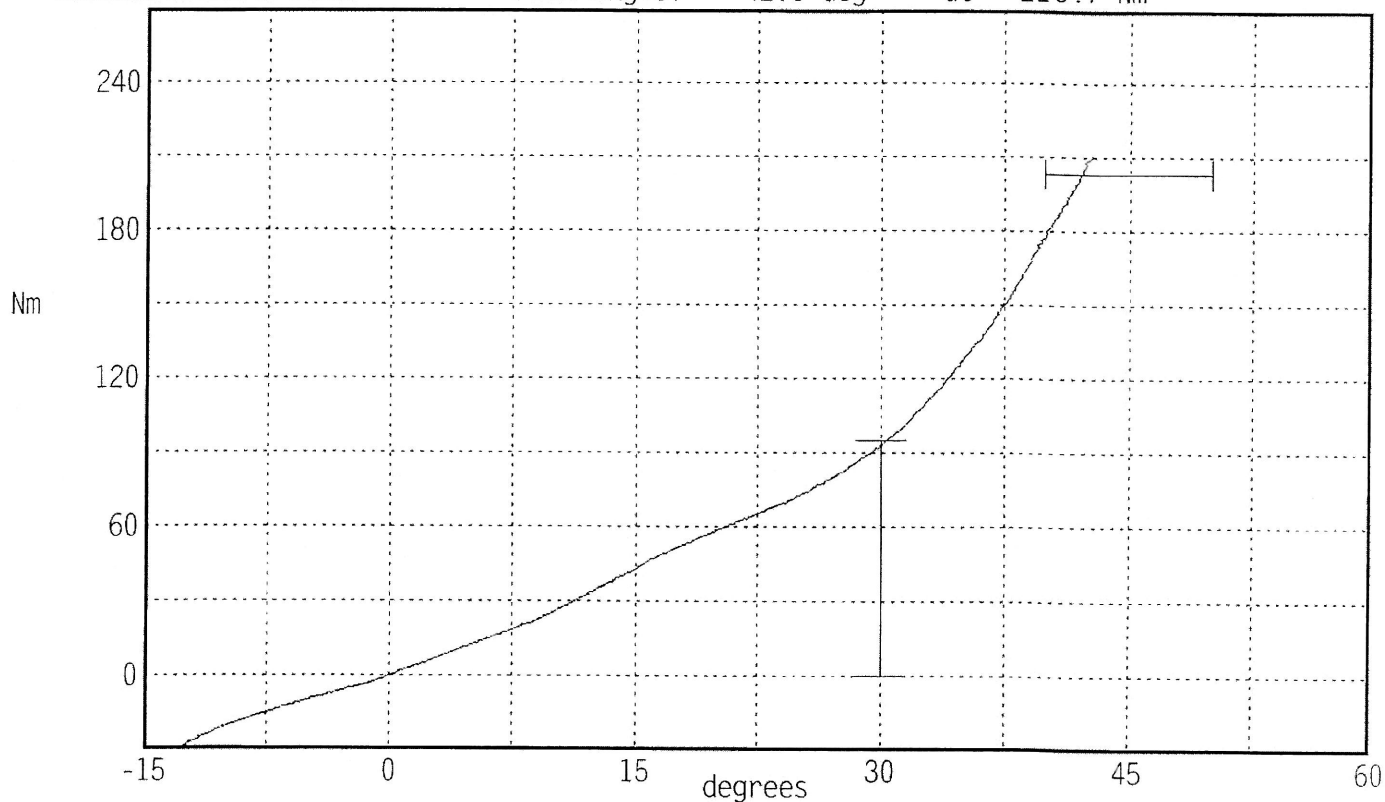
Time: 09:20

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

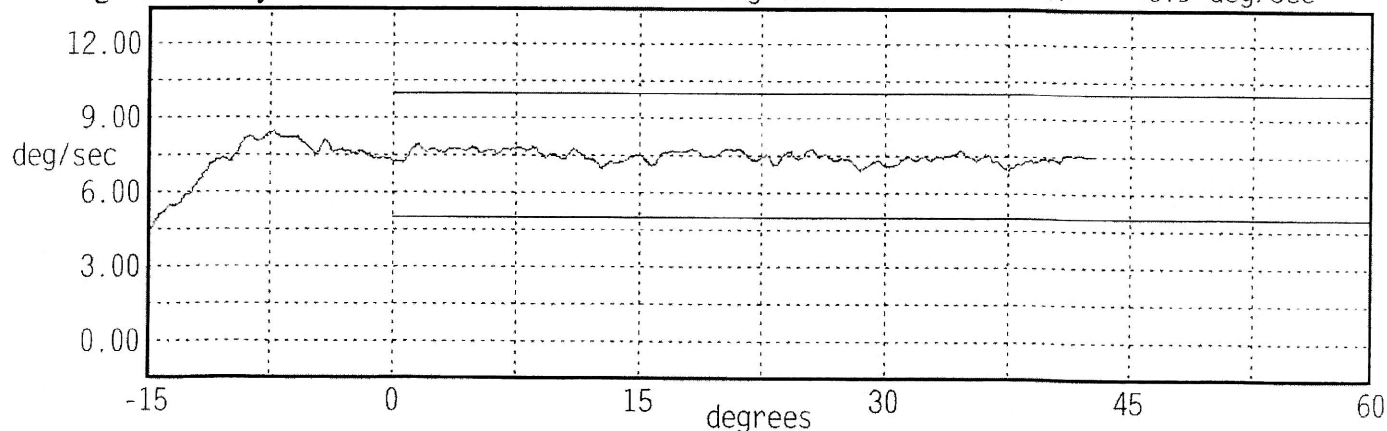
Moment About H-Point

Peak Moment: 210.7 Nm at 42.6 deg
Peak Angle: 42.6 deg at 210.7 Nm



Angular Velocity

Max: 7.9 deg/sec Min: 6.9 deg/sec



Transportation Research Center Inc

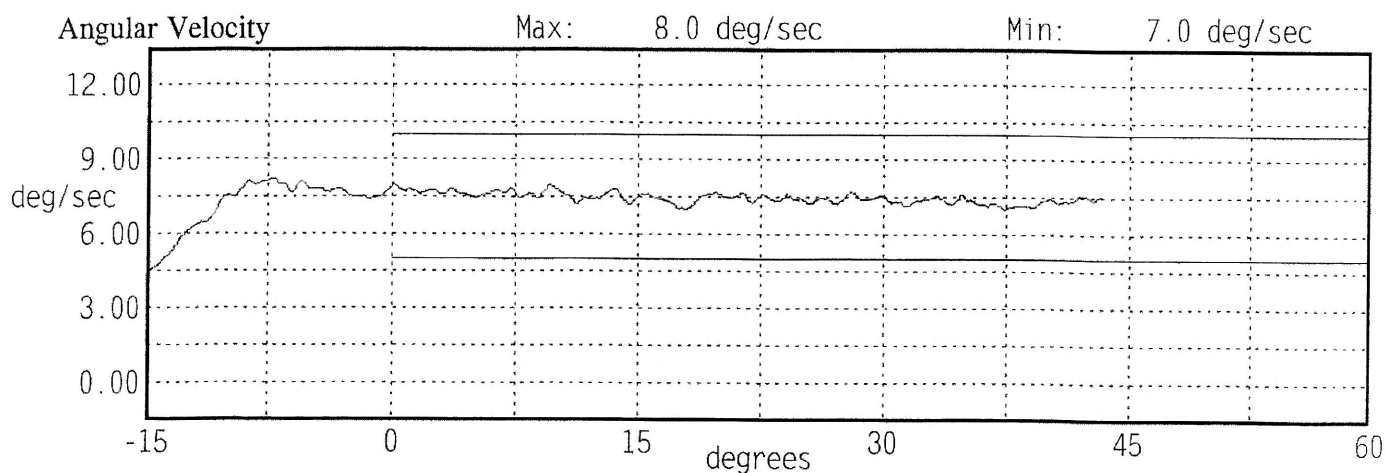
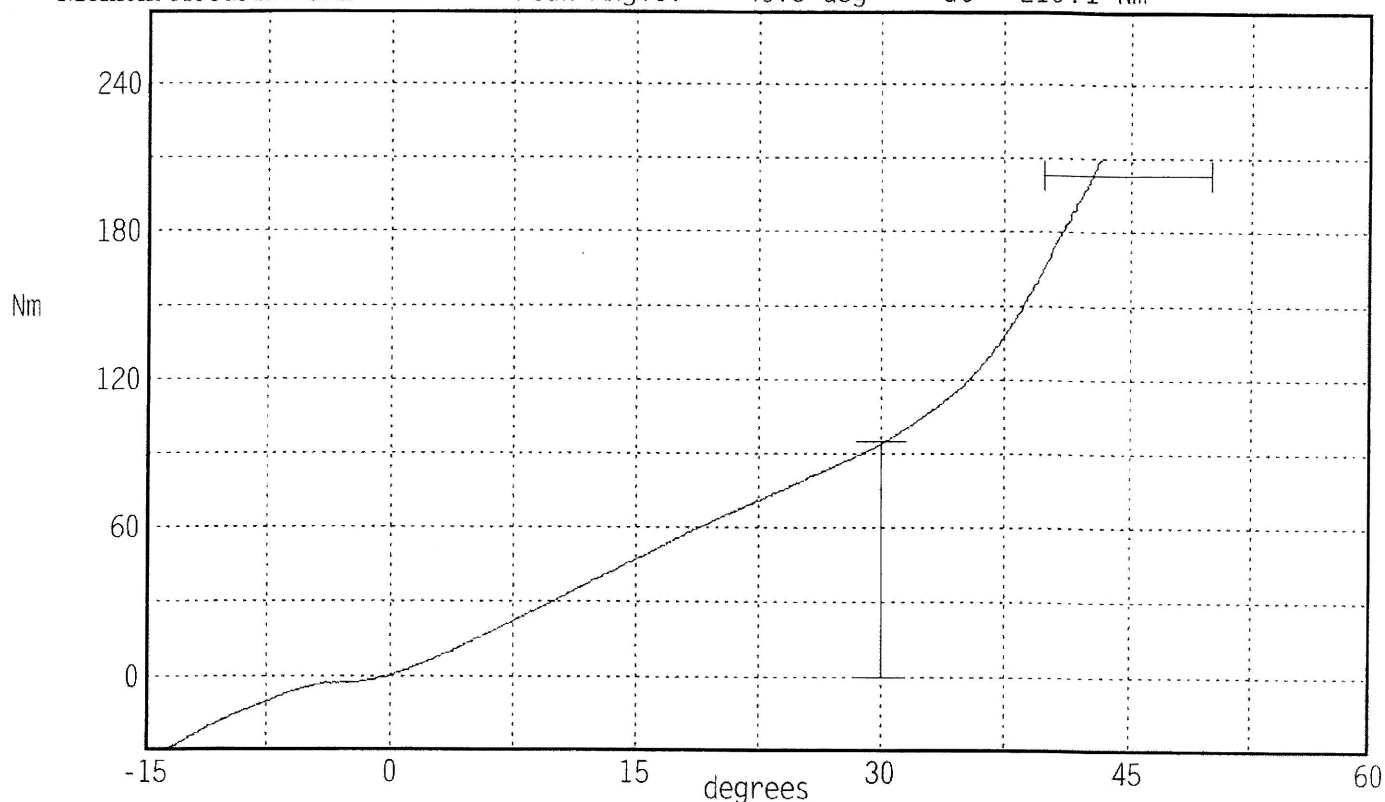
Hybrid III Hip Range of Motion

Serial Number: 110R
Test Number: 110C33
Comments:

Date: 01/25/2010
Time: 10:02

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

Moment About H-Point
Peak Moment: 210.1 Nm at 43.3 deg
Peak Angle: 43.3 deg at 210.1 Nm



Transportation Research Center Inc.

Left Knee Femur Response Test

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

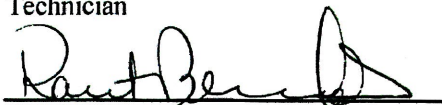
Test Date: 1/25/2010

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

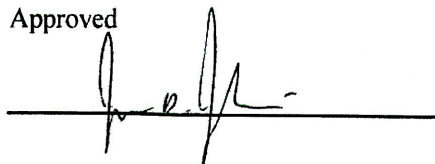
Test meets specifications.

Comments:

Technician



Approved

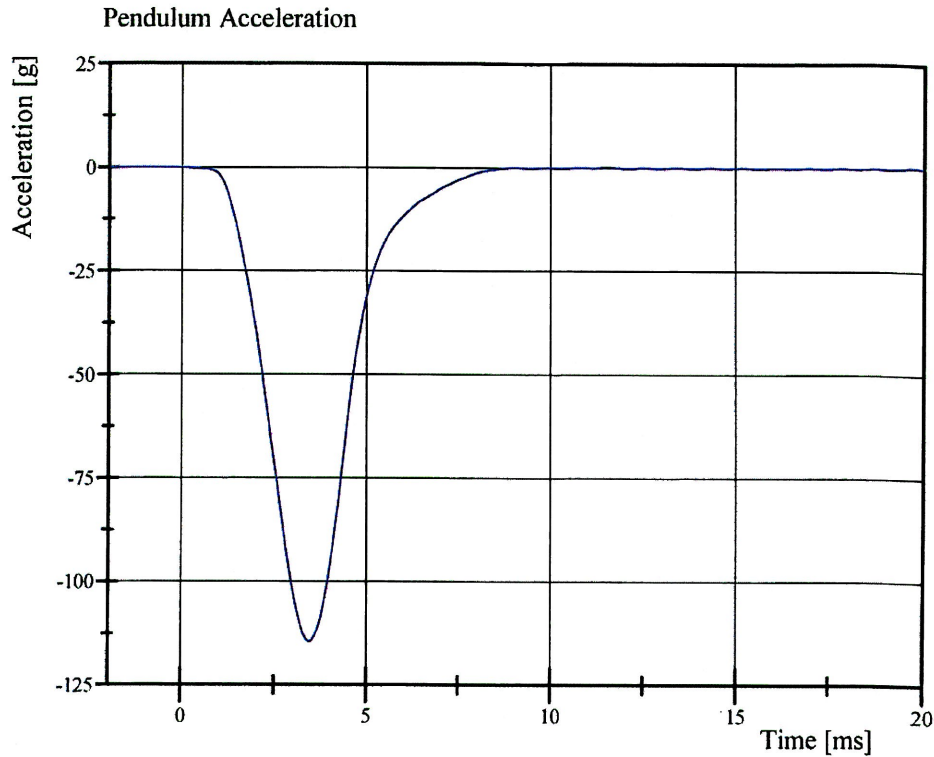


Transportation Research Center Inc.

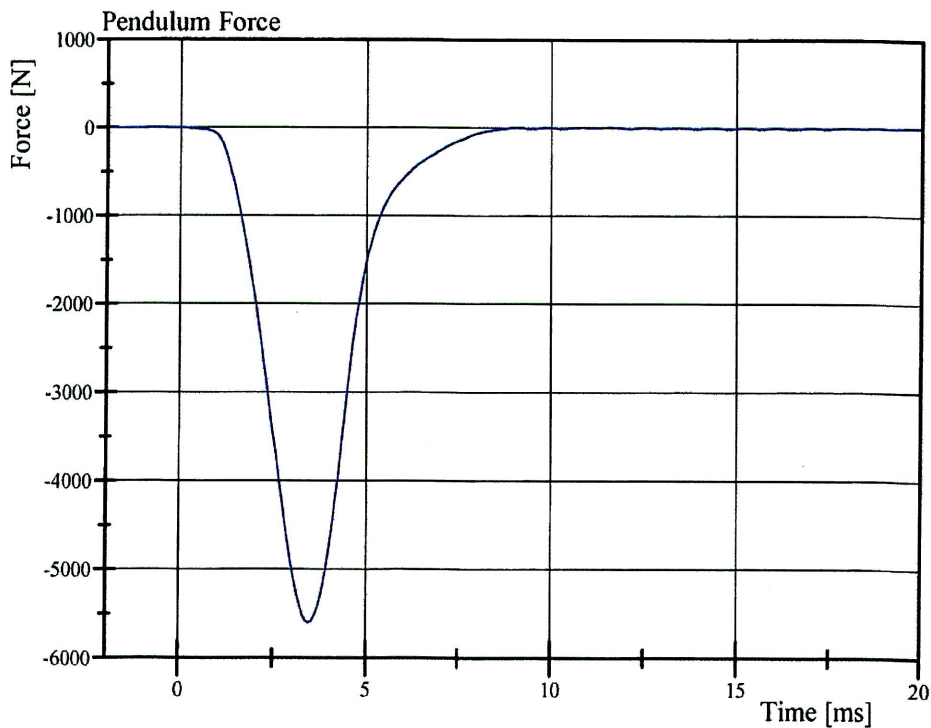
Left Knee Femur Response Test

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

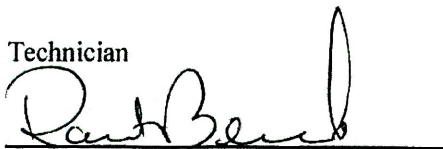
Test Date: 1/25/2010

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

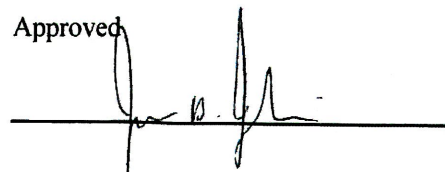
Test meets specifications.

Comments:

Technician

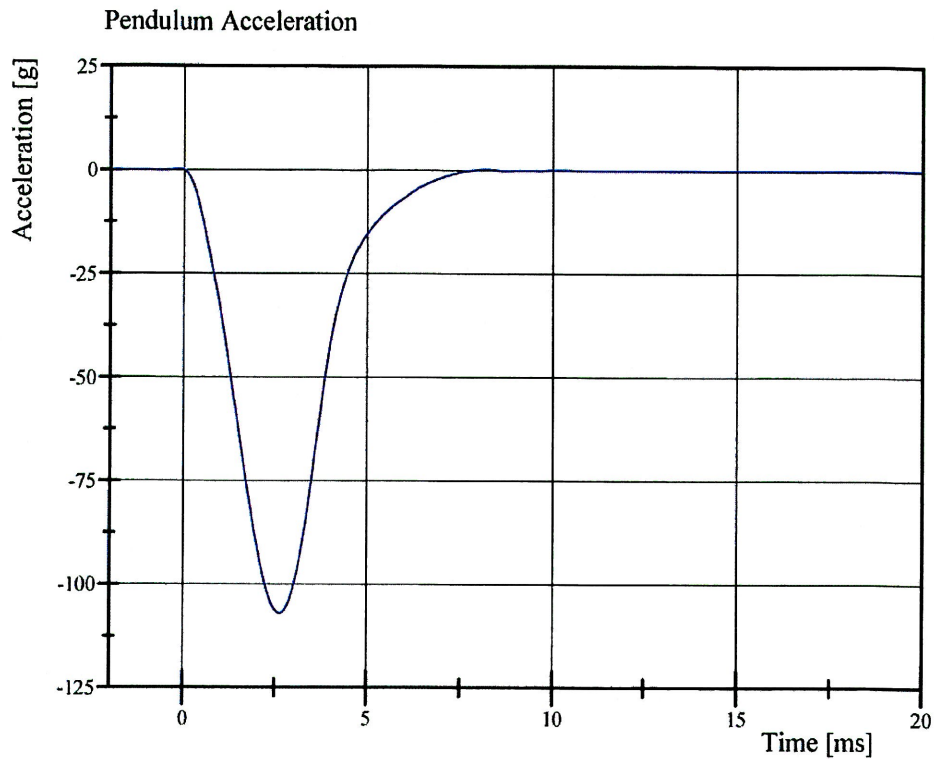


Approved

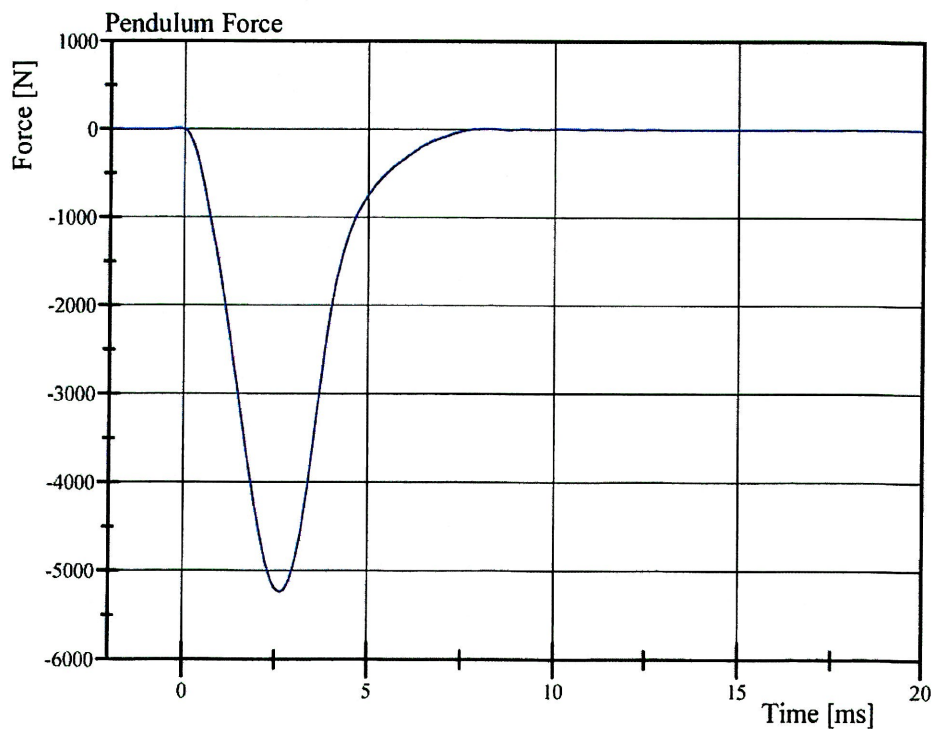


Transportation Research Center Inc.

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

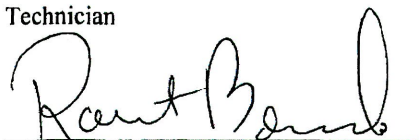


Filter Class: CFC_600
Max: 11.9 N at -0.2 ms
Min: -5,235.2 N at 2.6 ms

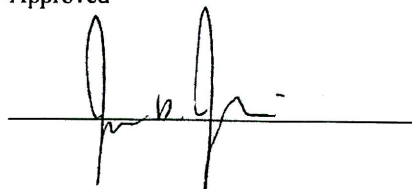
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 110 Calibration No. 33

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

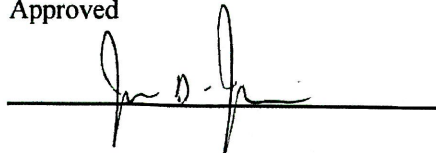
Test meets specifications.

Comments:

Technician



Approved

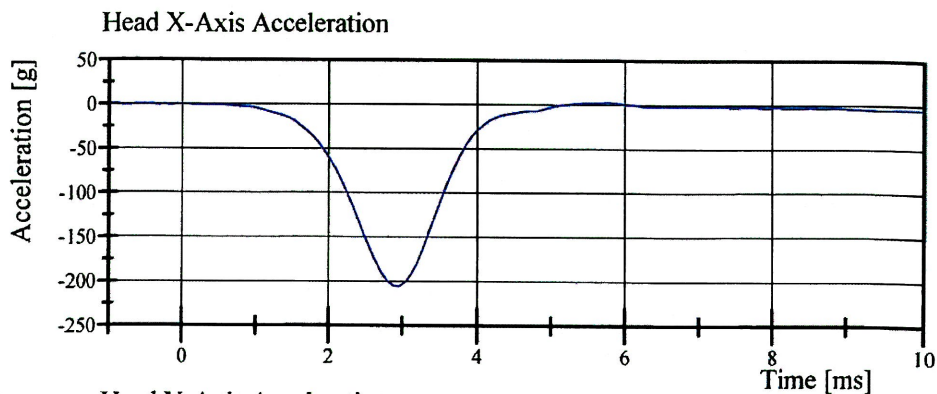


Transportation Research Center Inc.

Front Head Drop

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

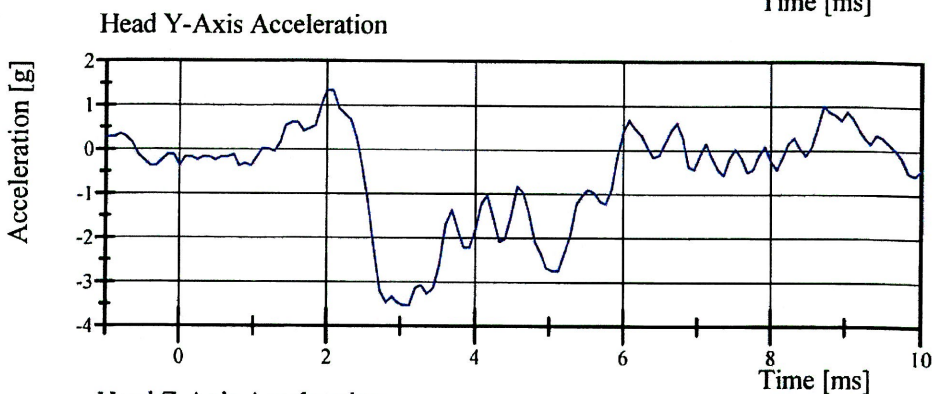
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 3.1 g at 5.8 ms

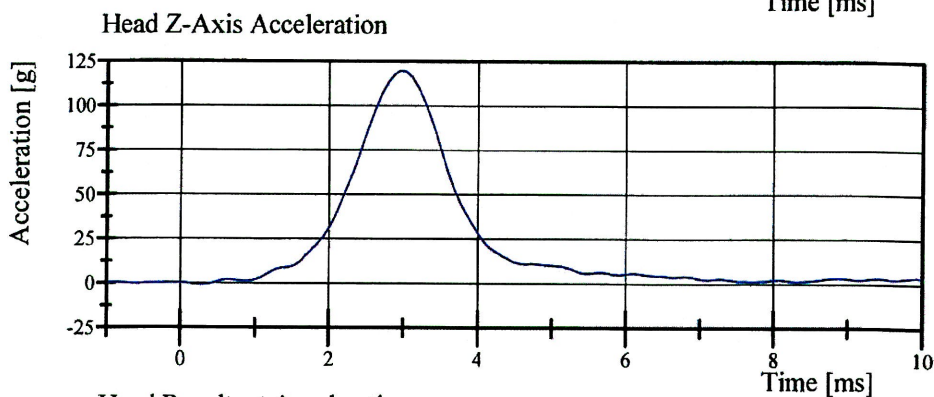
Min: -205.7 g at 3.0 ms



Filter Class: CFC_1000

Max: 1.3 g at 2.0 ms

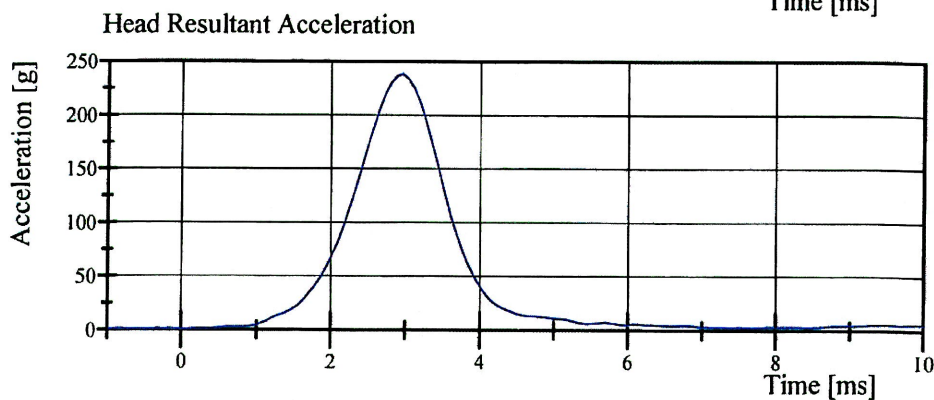
Min: -3.5 g at 3.0 ms



Filter Class: CFC_1000

Max: 119.8 g at 3.0 ms

Min: -1.0 g at 0.2 ms



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

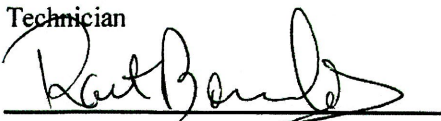
Test Date: 1/25/2010

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

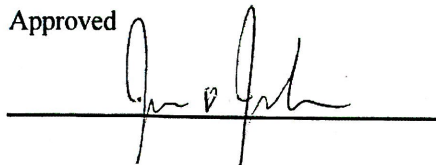
Test meets specifications.

Comments:

Technician



Approved

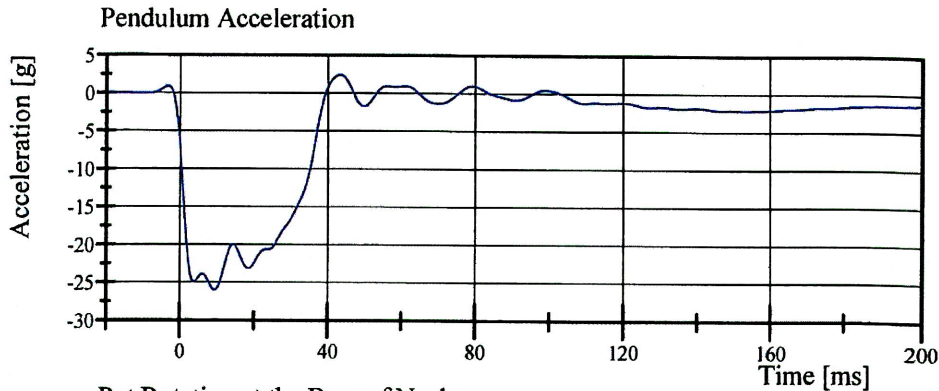


Transportation Research Center Inc.

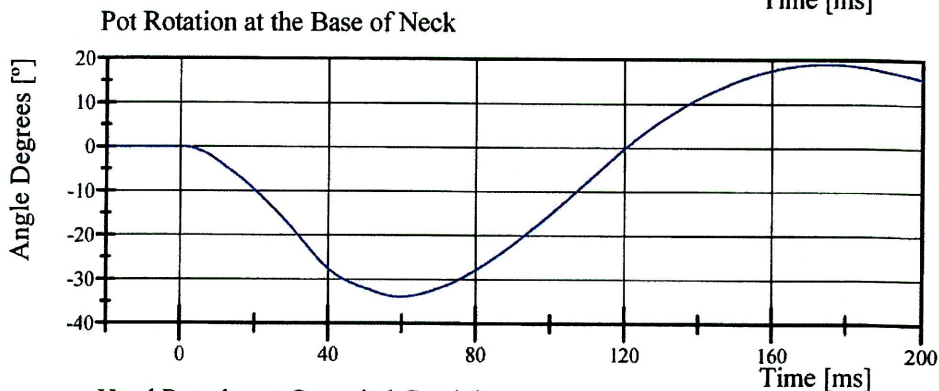
Neck Flexion

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

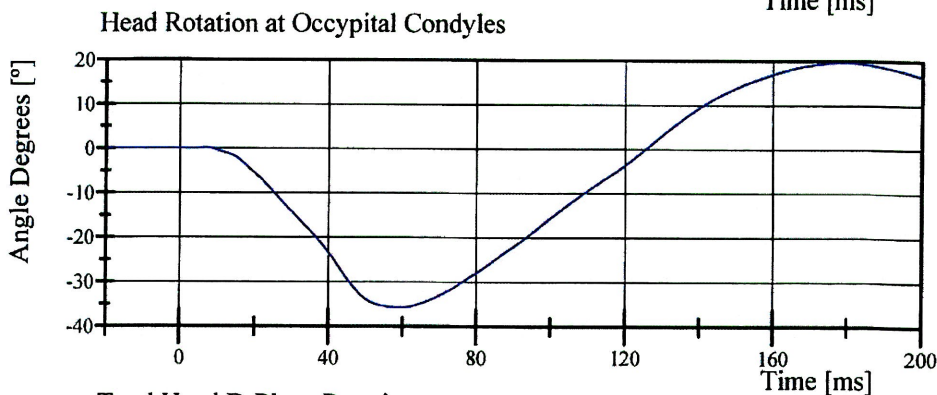
Test Date: 1/25/2010



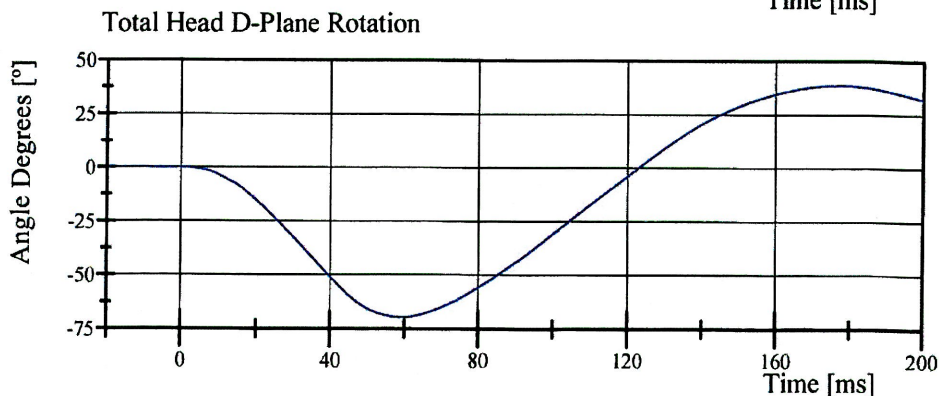
Filter Class: CFC_60
Max: 2.4 g at 43.3 ms
Min: -26.0 g at 9.4 ms



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



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



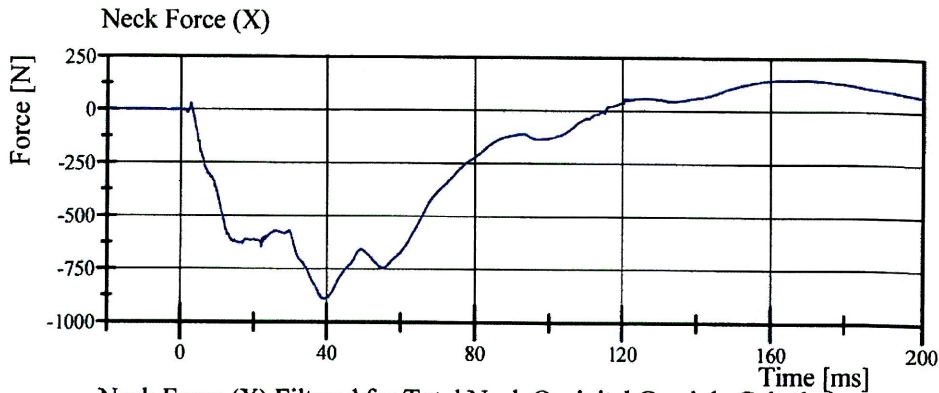
Filter Class: CFC_60
Max: 38.6 ° at 177.4 ms
Min: -69.7 ° at 59.5 ms

Transportation Research Center Inc.

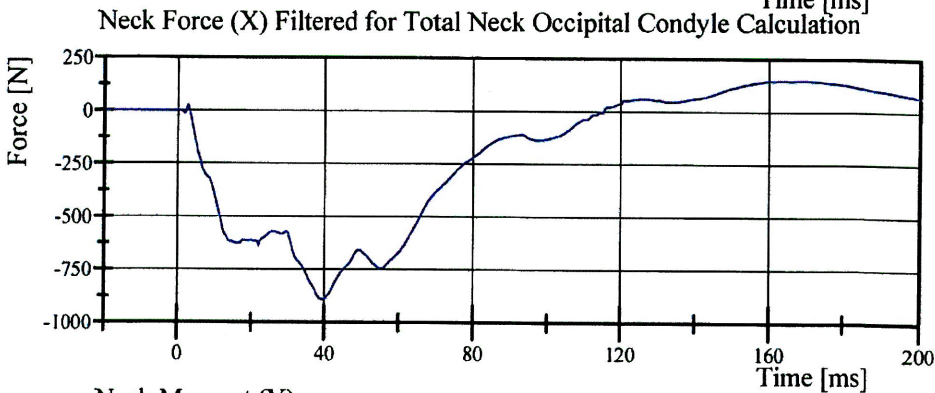
Neck Flexion

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

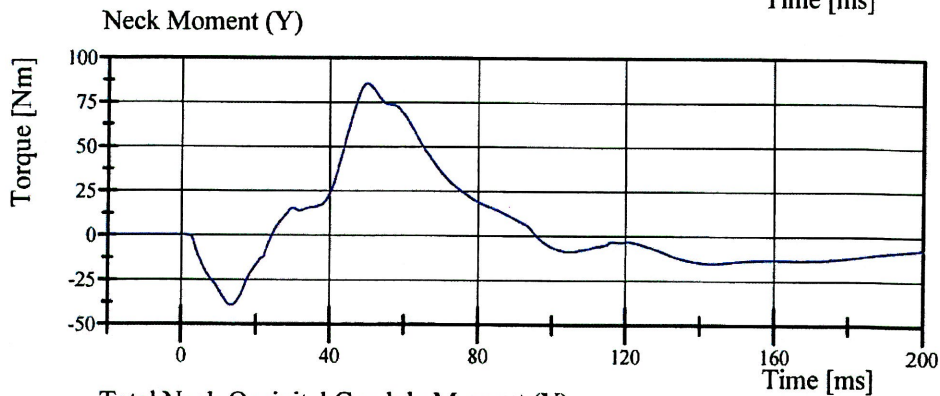
Test Date: 1/25/2010



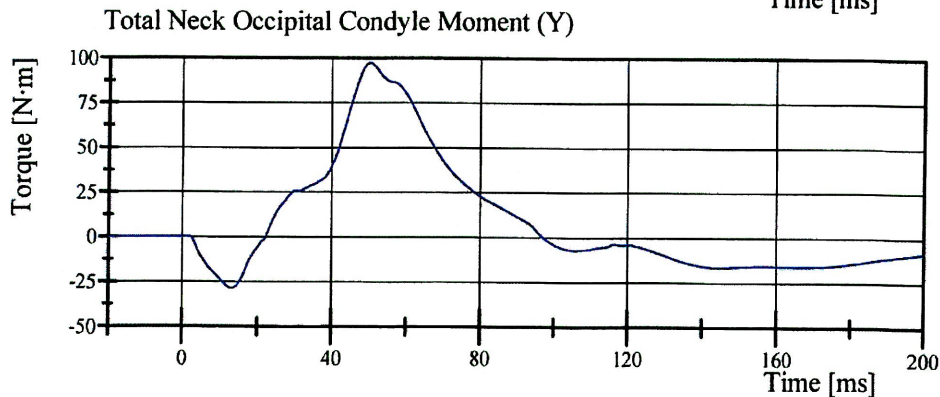
Filter Class: CFC_1000
Max: 150.1 N at 169.5 ms
Min: -892.1 N at 39.3 ms



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

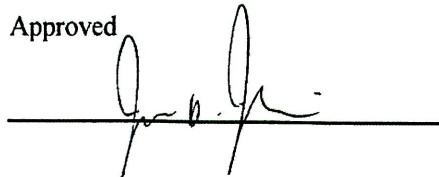
Test meets specifications.

Comments:

Technician



Approved

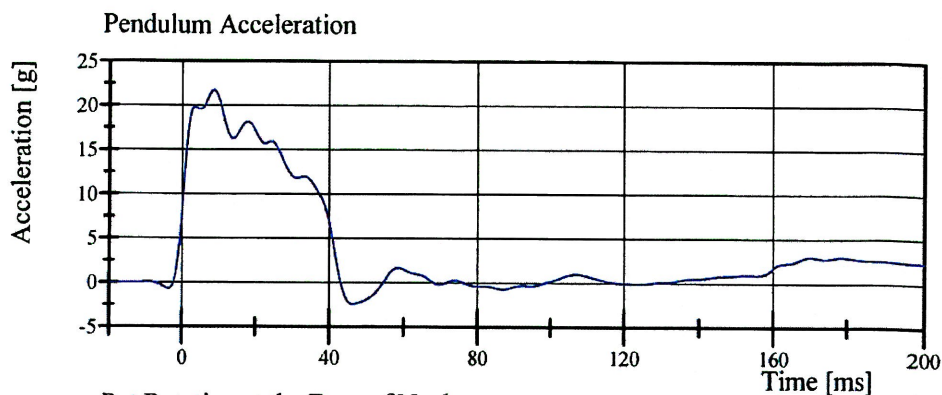


Transportation Research Center Inc.

Neck Extension

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

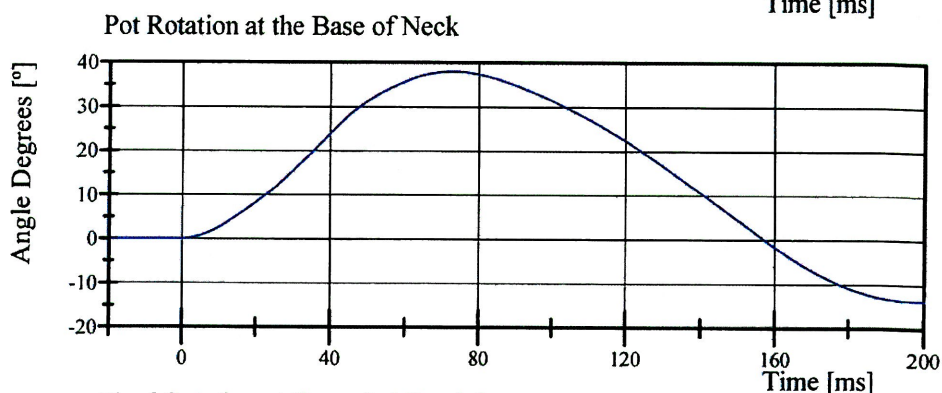
Test Date: 1/25/2010



Filter Class: CFC_60

Max: 21.7 g at 8.6 ms

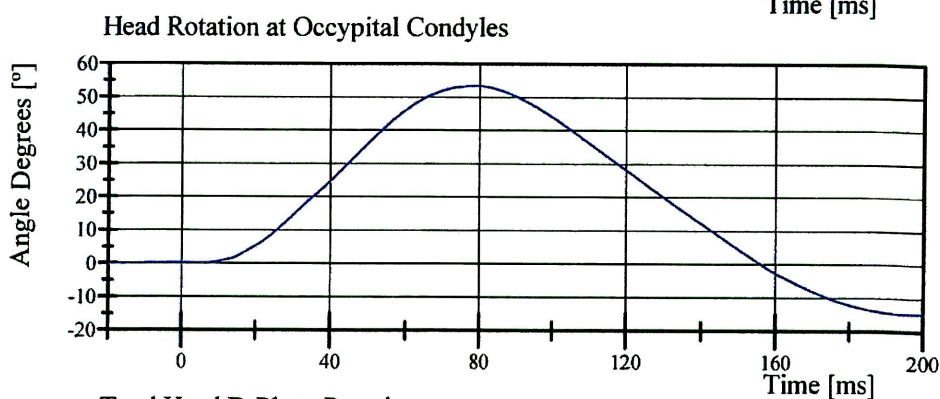
Min: -2.4 g at 46.5 ms



Filter Class: CFC_60

Max: 38.0 ° at 72.8 ms

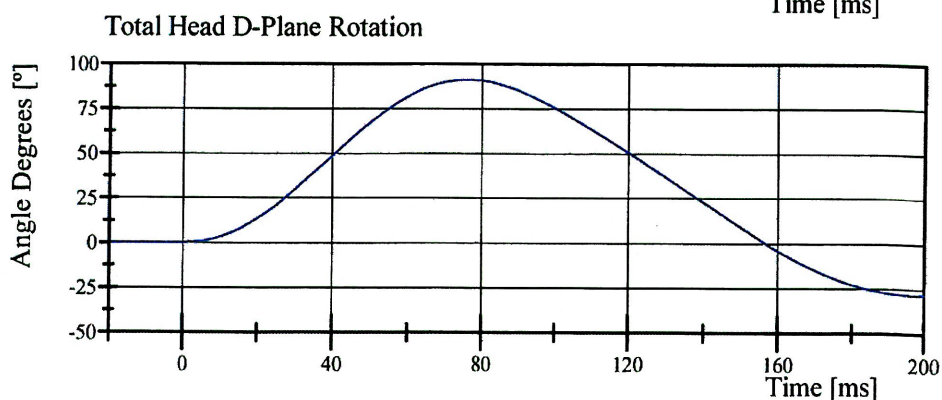
Min: -13.7 ° at 198.6 ms



Filter Class: CFC_60

Max: 53.4 ° at 79.0 ms

Min: -14.7 ° at 196.8 ms



Filter Class: CFC_60

Max: 91.1 ° at 76.2 ms

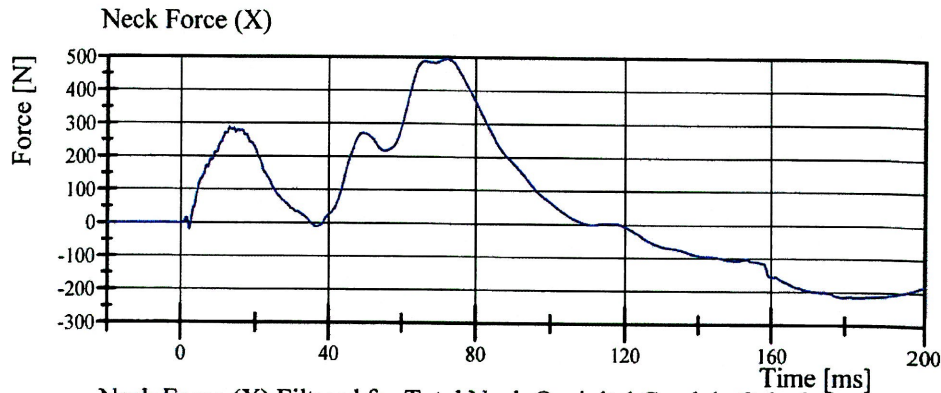
Min: -28.4 ° at 197.6 ms

Transportation Research Center Inc.

Neck Extension

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

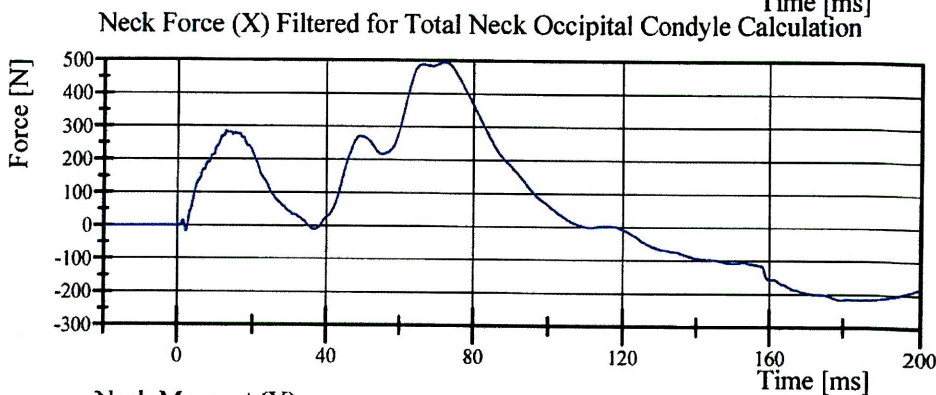
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 496.0 N at 72.1 ms

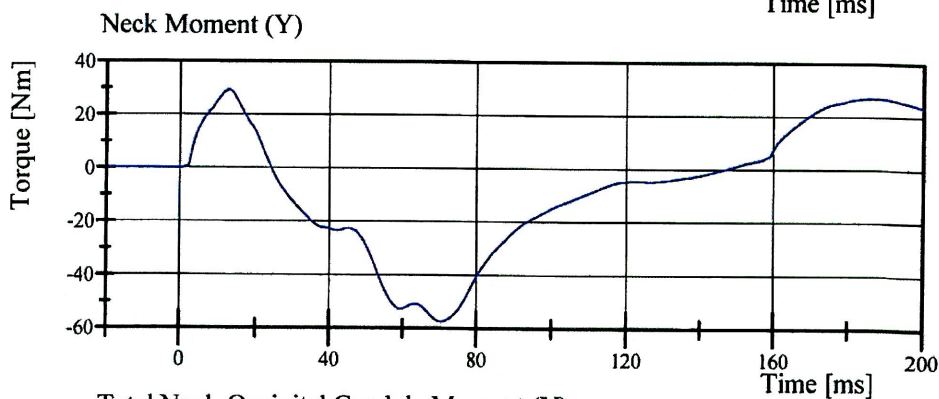
Min: -216.6 N at 179.4 ms



Filter Class: CFC_600

Max: 495.8 N at 72.2 ms

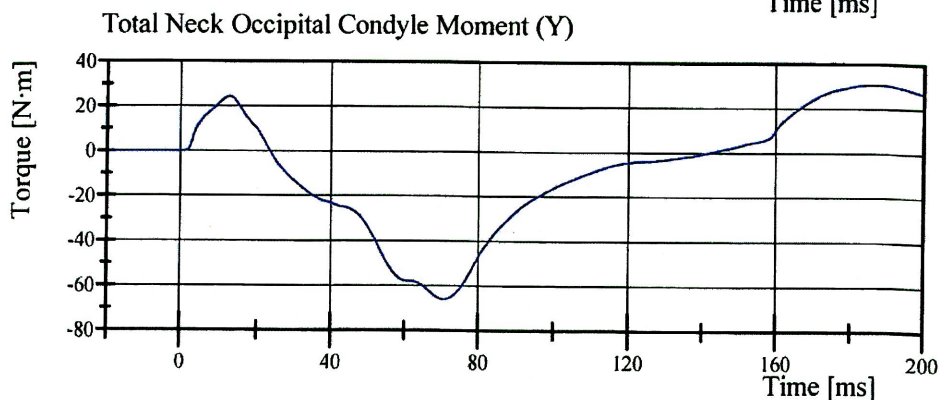
Min: -216.1 N at 179.4 ms



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

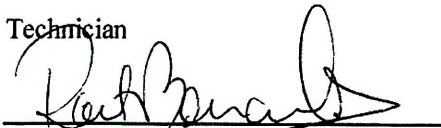
Test Date: 1/25/2010

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

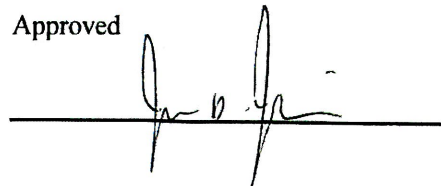
Test meets specifications.

Comments:

Technician



Approved

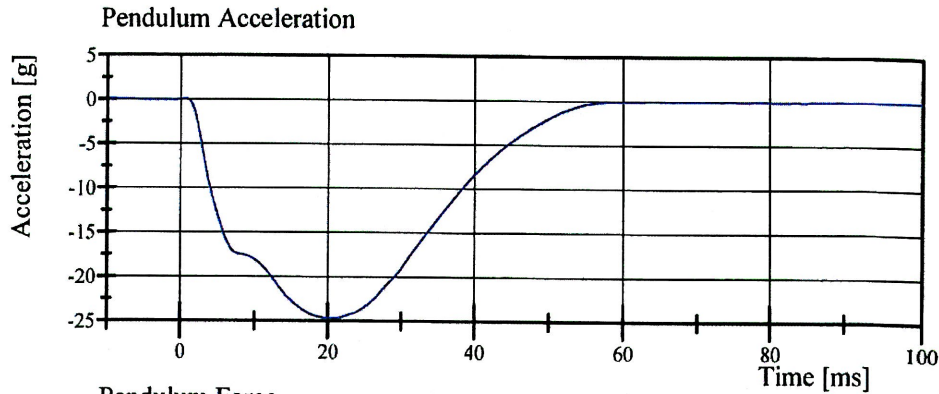


Transportation Research Center Inc.

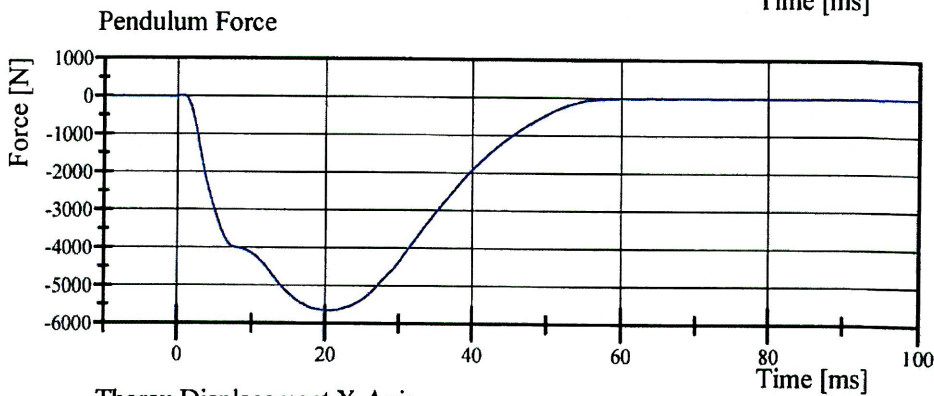
Front Thorax

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

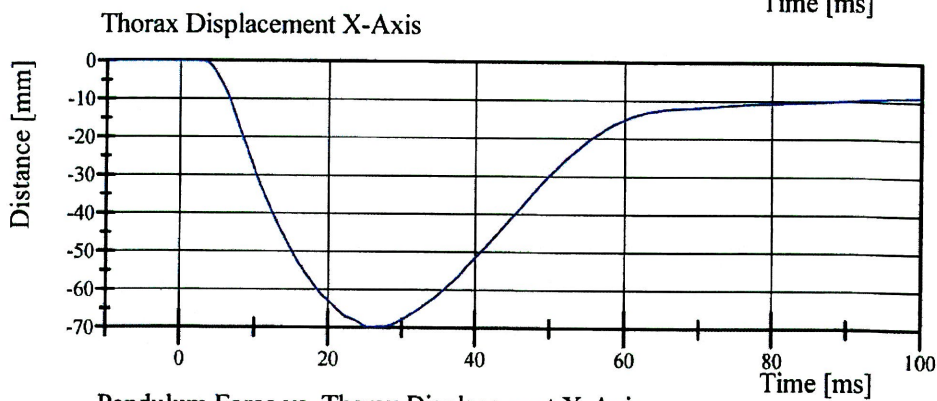
Test Date: 1/25/2010



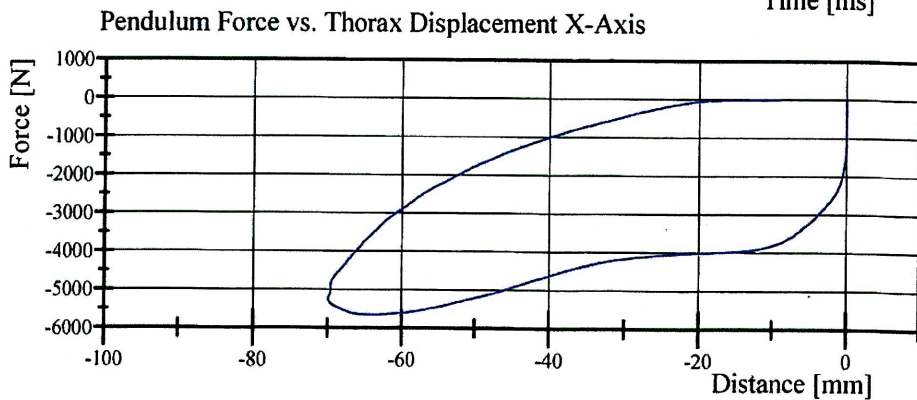
Filter Class: CFC_180
Max: 0.1 g at 0.6 ms
Min: -24.7 g at 20.3 ms



Filter Class: CFC_180
Max: 19.8 N at 0.6 ms
Min: -5,651.6 N at 20.3 ms



Filter Class: CFC_600
Max: 0.0 mm at -1.7 ms
Min: -70.0 mm at 25.8 ms



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

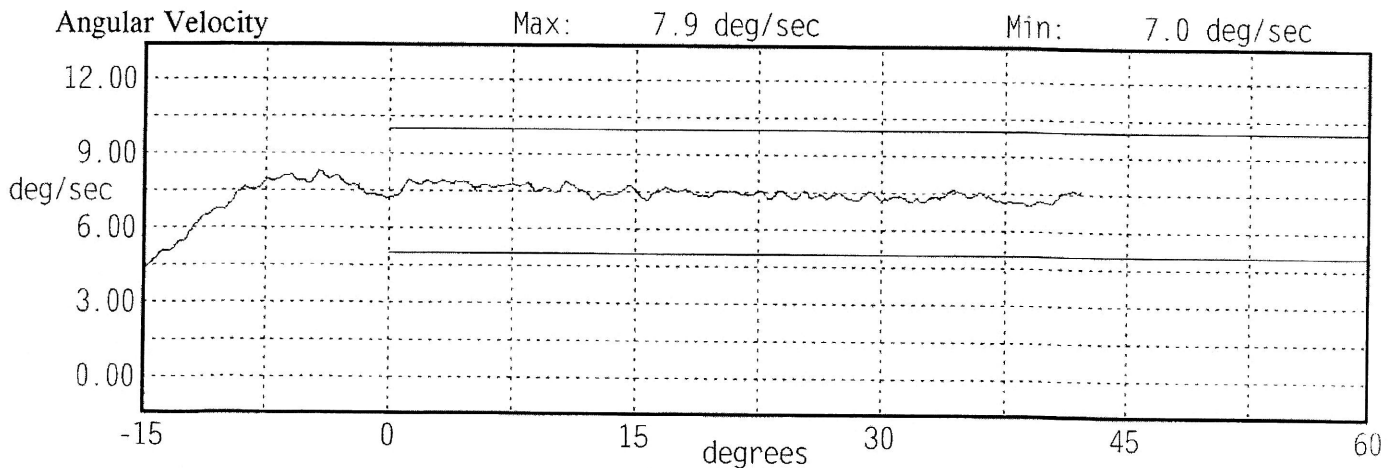
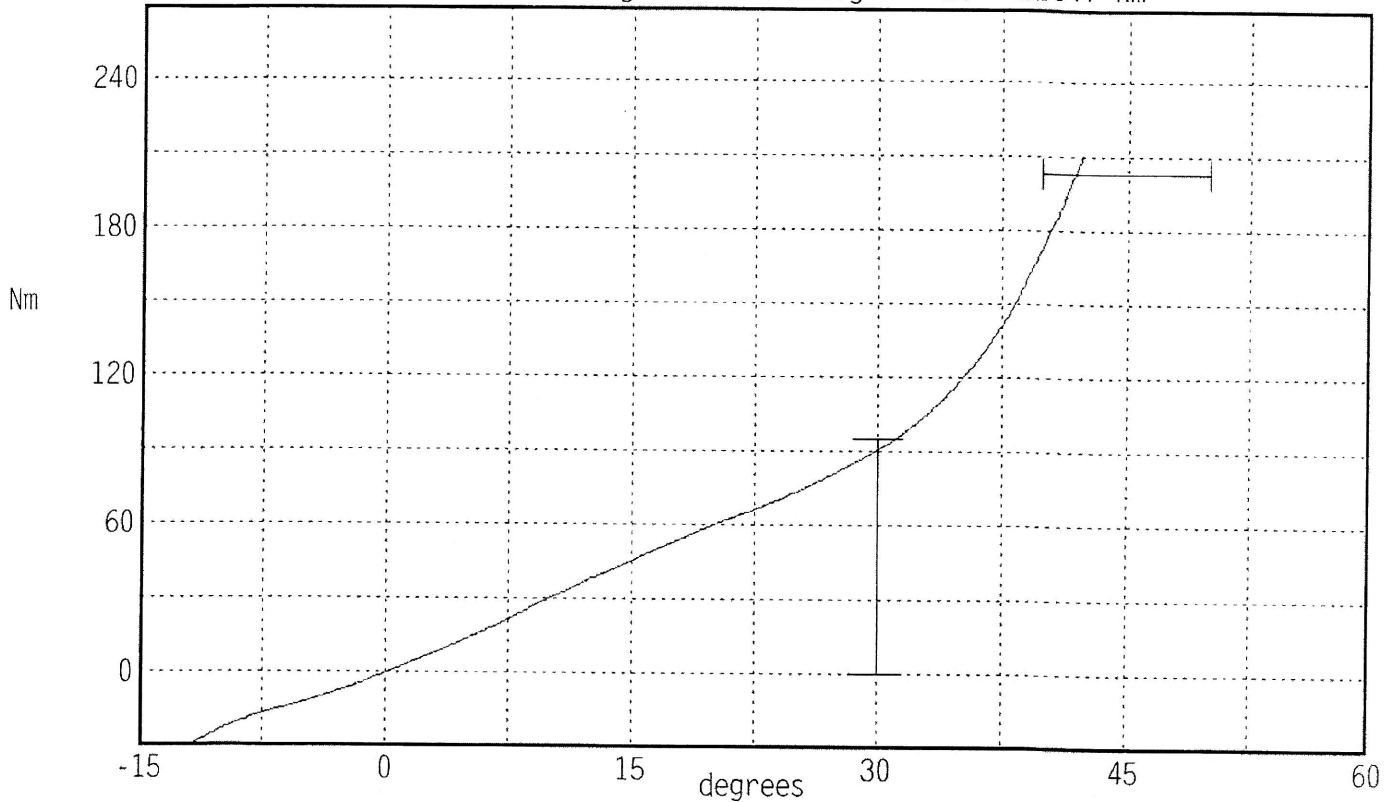
Hybrid III Hip Range of Motion

Serial Number: 043L
Test Number: 043C09
Comments:

Date: 01/25/2010
Time: 07:35

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



Transportation Research Center Inc

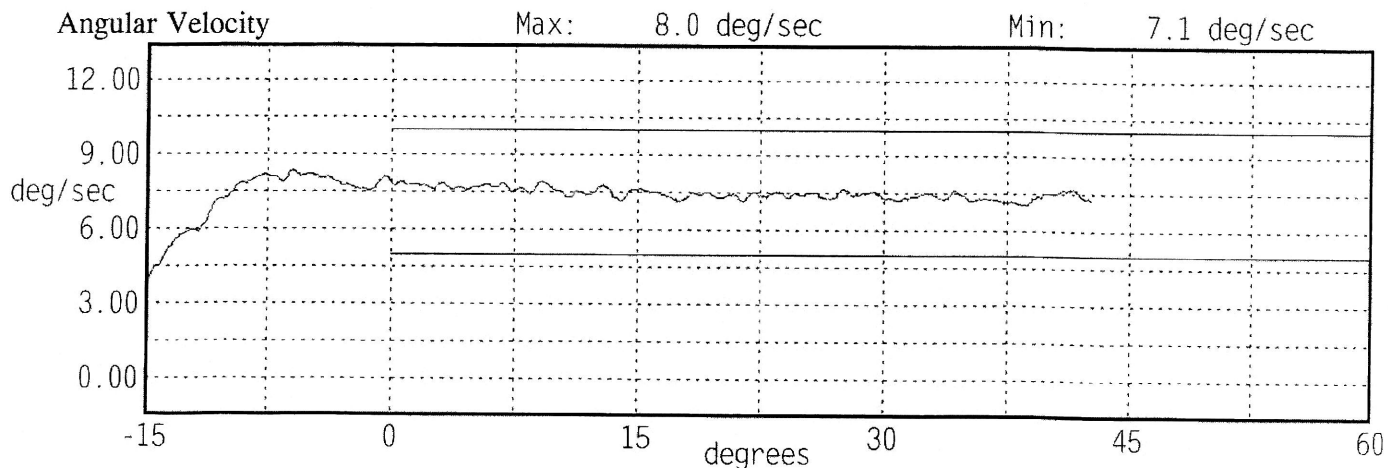
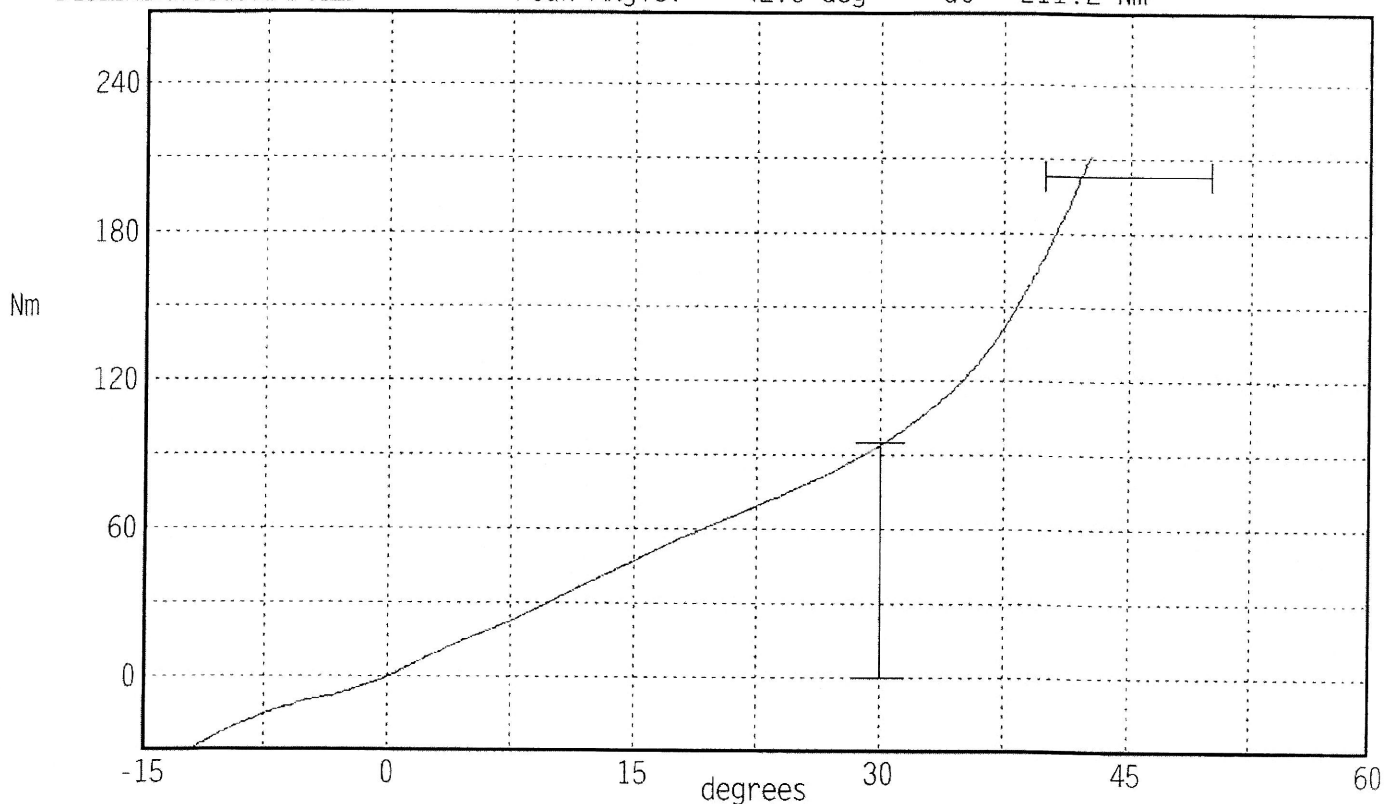
Hybrid III Hip Range of Motion

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.

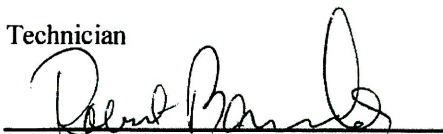
Left Knee Femur Response Test
HIII 50th Serial No. 043 Certification No. 9-1
Test Date: 1/25/2010

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

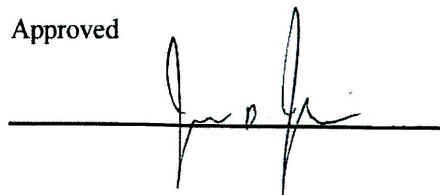
Test meets specifications.

Comments:

Technician

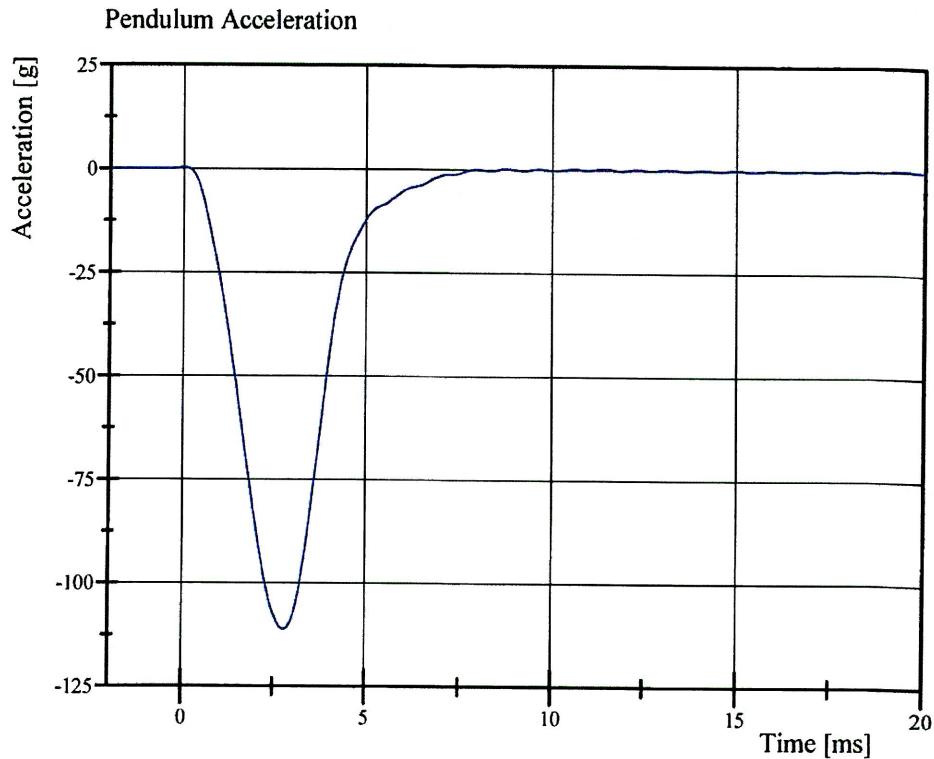


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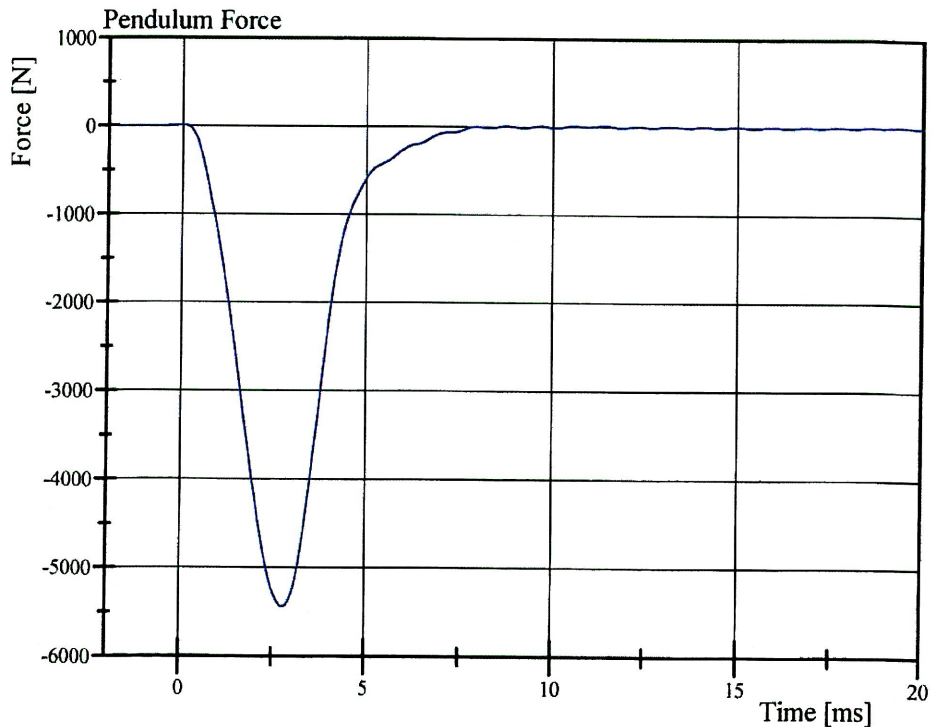


Transportation Research Center Inc.

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

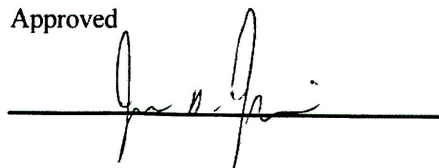
Test meets specifications.

Comments:

Technician

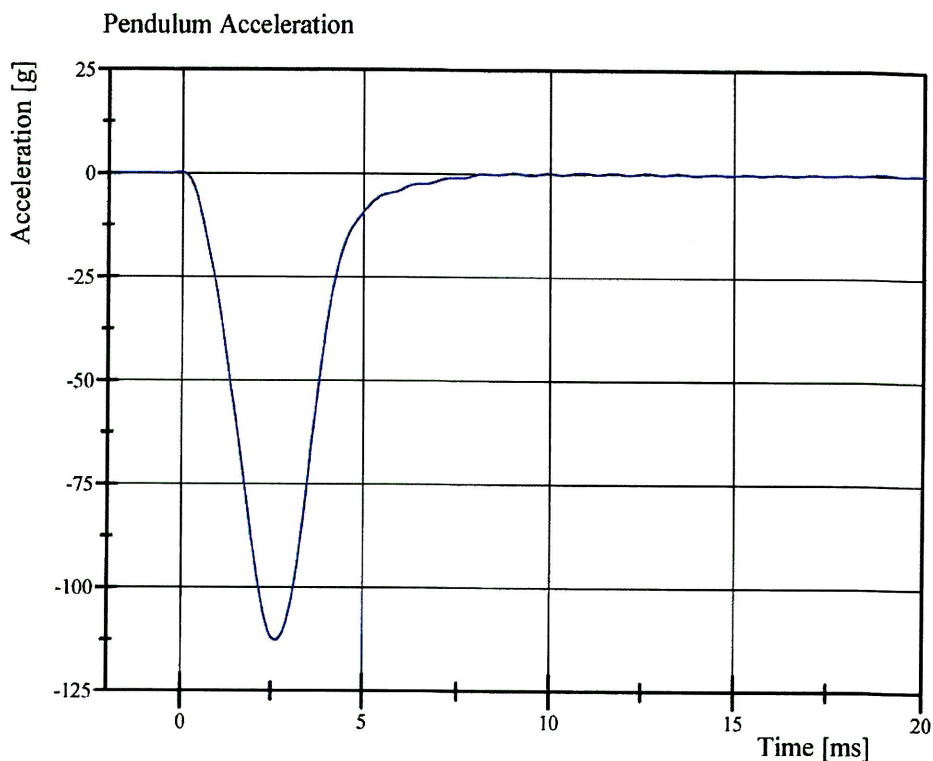


Approved

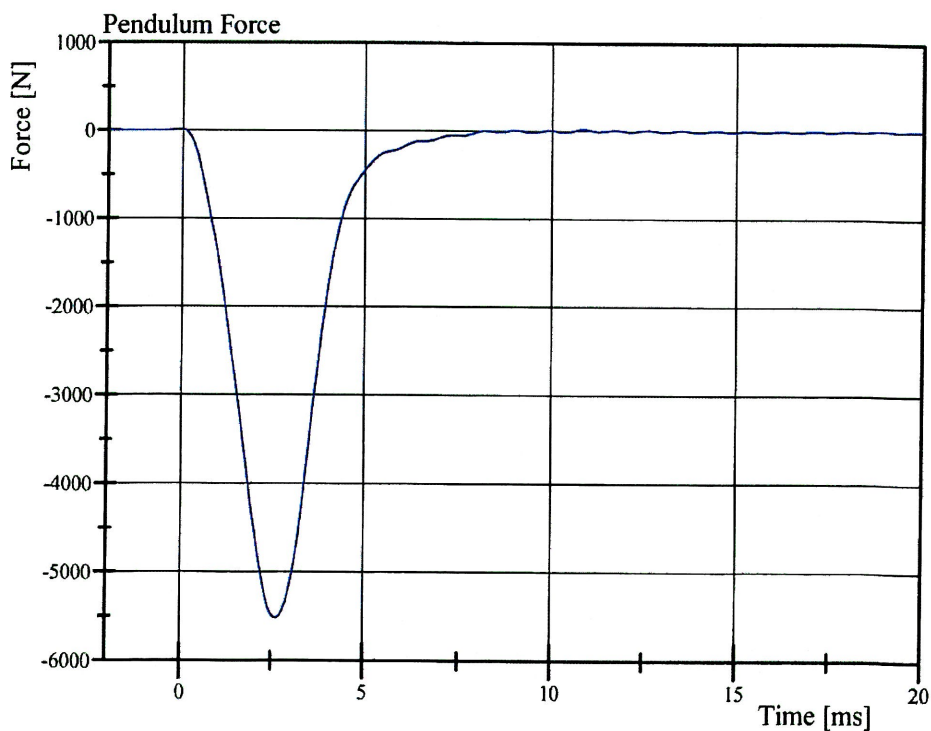


Transportation Research Center Inc.

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

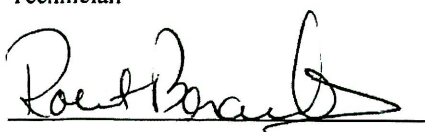


Filter Class: CFC_600
Max: 19.1 N at 10.9 ms
Min: -5,514.9 N at 2.6 ms

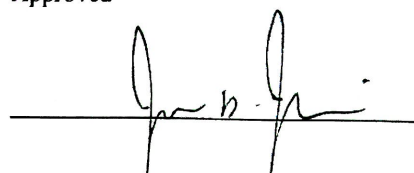
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 043 Calibration No. 9

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 100413

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

Channel Report Test Number 100413

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
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
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

Channel Report Test Number 100413

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
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
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	1000	g	-Bipolar	4-043 HIII 50th VRTC.022
78	P51710	14PELVCG00H3ACYA	Pelvis Accel Y	1000	g	-Bipolar	4-043 HIII 50th VRTC.023
79	P16225	14PELVCG00H3ACZA	Pelvis Accel Z	1000	g	-Bipolar	4-043 HIII 50th VRTC.024
80	P58576	10VEHCCG0000ACXA	Vehicle Center of Gravity X-axis Accel	2000	g	Bipolar	
81	P62232	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-axis Accel	2000	g	-Bipolar	
82	P61732	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-axis Accel	2000	g	-Bipolar	
83	P63179	10ENGNT0000ACXA	Top of Engine X-axis Accel	2000	g	Bipolar	
84	P63117	10ENGNT0000ACYA	Top of Engine Y-axis Accel	2000	g	-Bipolar	
85	P64869	10ENGNT0000ACZA	Top of Engine Z-axis Accel	2000	g	-Bipolar	
86	P63123	10ENGNBO0000ACXA	Bottom of Engine X-axis Accel	2000	g	Bipolar	
87	P62197	10ENGNBO0000ACYA	Bottom of Engine Y-axis Accel	2000	g	-Bipolar	
88	P61319	10ENGNBO0000ACZA	Bottom of Engine Z-axis Accel	2000	g	Bipolar	
89	P62617	10APILUPLE00ACXA	Left A-Pillar Upper X-Axis Acceleratic	2000	g	-Bipolar	
90	P62620	10APILUPLE00ACYA	Left A-Pillar Upper Y-Axis Acceleratic	2000	g	-Bipolar	
91	P61765	10APILUPLE00ACZA	Left A-Pillar Upper Z-Axis Acceleratic	2000	g	Bipolar	
92	P64912	10APILLOLE00ACXA	Left A-Pillar Lower X-Axis Acceleratic	2000	g	-Bipolar	
93	P63135	10APILLOLE00ACYA	Left A-Pillar Lower Y-Axis Acceleratic	2000	g	Bipolar	
94	P62833	10APILLOLE00ACZA	Left A-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
95	P63270	10APILUPRI00ACXA	Right A-Pillar Upper X-Axis Accelerat	2000	g	-Bipolar	
96	P64875	10APILUPRI00ACYA	Right A-Pillar Upper Y-Axis Accelerat	2000	g	Bipolar	

Channel Report Test Number 100413

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
97	P63191	10APILUPRI00ACZA	Right A-Pillar Upper Z-Axis Accelerat	2000	g	Bipolar	
98	P63201	10APILLORI00ACXA	Right A-Pillar Lower X-Axis Accelerat	2000	g	Bipolar	
99	P64881	10APILLORI00ACYA	Right A-Pillar Lower Y-Axis Accelerat	2000	g	-Bipolar	
100	P62797	10APILLORI00ACZA	Right A-Pillar Lower Z-Axis Accelerat	2000	g	-Bipolar	
101	P62628	10BPILUPLE00ACXA	Left B-Pillar Upper X-Axis Acceleratic	2000	g	Bipolar	
102	P61314	10BPILUPLE00ACYA	Left B-Pillar Upper Y-Axis Acceleratic	2000	g	Bipolar	
103	P46509	10BPILUPLE00ACZA	Left B-Pillar Upper Z-Axis Acceleratic	2000	g	-Bipolar	
104	P64893	10BPILLOLE00ACXA	Left B-Pillar Lower X-Axis Acceleratic	2000	g	Bipolar	
105	P64902	10BPILLOLE00ACYA	Left B-Pillar Lower Y-Axis Acceleratic	2000	g	Bipolar	
106	P64906	10BPILLOLE00ACZA	Left B-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
107	P61754	10BPILUPRI00ACXA	Right B-Pillar Upper X-Axis Accelerat	2000	g	Bipolar	
108	P34212	10BPILUPRI00ACYA	Right B-Pillar Upper Y-Axis Accelerat	2000	g	-Bipolar	
109	P57790	10BPILUPRI00ACZA	Right B-Pillar Upper Z-Axis Accelerat	2000	g	-Bipolar	
110	P63193	10BPILLORI00ACXA	Right B-Pillar Lower X-Axis Accelerat	2000	g	Bipolar	
111	P63196	10BPILLORI00ACYA	Right B-Pillar Lower Y-Axis Accelerat	2000	g	-Bipolar	
112	P57160	10BPILLORI00ACZA	Right B-Pillar Lower Z-Axis Accelerat	2000	g	-Bipolar	
113	P47331	10CPILUPLE00ACXA	Left C-Pillar Upper X-Axis Acceleratic	2000	g	Bipolar	
114	P47536	10CPILUPLE00ACYA	Left C-Pillar Upper Y-Axis Acceleratic	2000	g	Bipolar	
115	P64874	10CPILUPLE00ACZA	Left C-Pillar Upper Z-Axis Acceleratic	2000	g	-Bipolar	
116	P45659	10CPILLOLE00ACXA	Left C-Pillar Lower X-Axis Acceleratic	2000	g	Bipolar	
117	P63158	10CPILLOLE00ACYA	Left C-Pillar Lower Y-Axis Acceleratic	2000	g	Bipolar	
118	P61712	10CPILLOLE00ACZA	Left C-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
119	P64877	10CPILUPRI00ACXA	Right C-Pillar Upper X-Axis Accelerat	2000	g	Bipolar	
120	P64885	10CPILUPRI00ACYA	Right C-Pillar Upper Y-Axis Accelerat	2000	g	-Bipolar	
121	P63177	10CPILUPRI00ACZA	Right C-Pillar Upper Z-Axis Accelerat	2000	g	-Bipolar	
122	P57876	10CPILLORI00ACXA	Right C-Pillar Lower X-Axis Accelerat	2000	g	Bipolar	
123	P62215	10CPILLORI00ACYA	Right C-Pillar Lower Y-Axis Accelerat	2000	g	-Bipolar	
124	P57207	10CPILLORI00ACZA	Right C-Pillar Lower Z-Axis Accelerat	2000	g	-Bipolar	
125	P63134	10DPILUPLE00ACXA	Left D-Pillar Upper X-Axis Acceleratic	2000	g	Bipolar	
126	P62564	10DPILUPLE00ACYA	Left D-Pillar Upper Y-Axis Acceleratic	2000	g	Bipolar	
127	P64888	10DPILUPLE00ACZA	Left D-Pillar Upper Z-Axis Acceleratic	2000	g	-Bipolar	
128	P62555	10DPILLOLE00ACXA	Left D-Pillar Lower X-Axis Acceleratic	2000	g	Bipolar	

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Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
129	P57185	10DPILLOLE00ACYA	Left D-Pillar Lower Y-Axis Acceleratic	2000	g	Bipolar	
130	P58024	10DPILLOLE00ACZA	Left D-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
131	P49042	10DPILUPRI00ACXA	Right D-Pillar Upper X-Axis Accelerat	2000	g	Bipolar	
132	P63085	10DPILUPRI00ACYA	Right D-Pillar Upper Y-Axis Accelerat	2000	g	-Bipolar	
133	P64864	10DPILUPRI00ACZA	Right D-Pillar Upper Z-Axis Accelerat	2000	g	-Bipolar	
134	P64880	10DPILLORI00ACXA	Right D-Pillar Lower X-Axis Accelerat	2000	g	Bipolar	
135	P48116	10DPILLORI00ACYA	Right D-Pillar Lower Y-Axis Accelerat	2000	g	-Bipolar	
136	P61270	10DPILLORI00ACZA	Right D-Pillar Lower Z-Axis Accelerat	2000	g	-Bipolar	
137	P61400	102RDK000000ACXA	Vehicle Rear Deck X-Axis Acceleratic	2000	g	Bipolar	
138	P64865	102RDK000000ACYA	Vehicle Rear Deck Y-Axis Acceleratic	2000	g	-Bipolar	
139	P63194	102RDK000000ACZA	Vehicle Rear Deck Z-Axis Acceleratic	2000	g	-Bipolar	
140	P62550	11SEAT000000ACXA	LF Seat Position (on floor) X-Axis Ac	2000	g	Bipolar	
141	P63180	11SEAT000000ACYA	LF Seat Position (on floor)Y-Axis Acc	2000	g	-Bipolar	
142	P63195	11SEAT000000ACZA	LF Seat Position (on floor) Z-Axis Ac	2000	g	-Bipolar	
143	P61388	13SEAT000000ACXA	RF Seat Position (on floor) X-Axis Ac	2000	g	Bipolar	
144	P62632	13SEAT000000ACYA	RF Seat Position (on floor) Y-Axis Ac	2000	g	Bipolar	
145	P63173	13SEAT000000ACZA	RF Seat Position (on floor) Z-Axis Ac	2000	g	-Bipolar	
146	P63199	14SEAT000000ACXA	LR Seat Position (on floor) X-Axis Ac	2000	g	Bipolar	
147	P62574	14SEAT000000ACYA	LR Seat Position (on floor) Y-Axis Ac	2000	g	Bipolar	
148	P63192	14SEAT000000ACZA	LR Seat Position (on floor) Z-Axis Ac	2000	g	-Bipolar	
149	P64868	16SEAT000000ACXA	RR Seat Position (on floor) X-Axis Ac	2000	g	Bipolar	
150	P63178	16SEAT000000ACYA	RR Seat Position (on floor) Y-Axis Ac	2000	g	Bipolar	
151	P63198	16SEAT000000ACZA	RR Seat Position (on floor) Z-Axis Ac	2000	g	-Bipolar	
152	ARS-1500-ARS1055	10VEHCCG0000AVXA	Vehicle CG Roll Rate	1500	%/s	Bipolar	
153	ARS-1500-ARS0737	10VEHCCG0000AVYA	Vehicle CG Pitch Rate	1500	%/s	-Bipolar	
154	ARS-1500-ARS0665	10VEHCCG0000AVZA	Vehicle CG Yaw Rate	1500	%/s	-Bipolar	
155	ARS-1500-ARS1091	10VEHCREDK00AVXA	Rear Deck Roll Rate Redundant	1500	%/s	Bipolar	
156	ARS-1500-ARS2609	10VEHCREDK00AVYA	Rear Deck Pitch Rate Redundant	1500	%/s	-Bipolar	
157	ARS-1500-ARS0738	10VEHCREDK00AVZA	Rear Deck Yaw Rate Redundant	1500	%/s	-Bipolar	
158	B2001121B	11SEBE0000B5DS0A	Driver Seat Belt Spool Potentiometer	750	mm	Bipolar	
159	B2001122B	13SEBE0000B5DS0A	Right Front Belt Spool Potentiometer	750	mm	Bipolar	
160	B2001120B	14SEBE0000B5DS0A	Left Rear Passenger Belt Spool Pote	750	mm	Bipolar	

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Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
161	3255-388	11SEBE0000B5FO0A	Driver Lap Belt Force	13344	N	Bipolar	
162	3255-392	11SEBE0000B3FO0A	Driver Shoulder Belt Force	13344	N	Bipolar	
163	3255-393	13SEBE0000B5FO0A	Front Pass. Lap Belt Force	13344	N	Bipolar	
164	3255-386	13SEBE0000B3FO0A	Front Pass. Shldr. Belt Force	13344	N	Bipolar	
165	3255-387	14SEBE0000B5FO0A	Left Rear Pass. Lap Belt Force	13344	N	Bipolar	
166	3255-390	14SEBE0000B3FO0A	Left Rear Pass. Shldr. Belt Force	13344	N	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 Switch	1	Logic	Bipolar	
174	Bit.08	14CONT000030EV00	Left Rear Pass. Thorax Contact Switch	1	Logic	Bipolar	
175	Bit.09	14CONT000031EV00	Left Rear Pass. Pelvis Contact Switch	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	
178	ABT squib volts	11PRET000000VO0A	Left Front Buckle Pretensioner Voltage	50	V	Bipolar	
179	ABT squib volts	13PRET000000VO0A	Right Front Buckle Pretensioner Voltage	50	V	Bipolar	
180	ABT squib volts	14PRET000000VO0A	Left Rear Buckle Pretensioner Voltage	50	V	Bipolar	
181	ABT squib volts	13RETR000000VO0A	Right Front Passenger Retractor Voltage	50	V	Bipolar	
182	ABT squib amps	11AIRB000000CU0A	Left Side Curtain Airbag Current	5	A	Bipolar	
183	ABT squib amps	13AIRB000000CU0A	Right Side Curtain Airbag Current	5	A	Bipolar	
184	ABT squib amps	11PRET000000CU0A	Left Front Buckle Pretensioner Current	5	A	Bipolar	
185	ABT squib amps	13PRET000000CU0A	Right Front Buckle Pretensioner Current	5	A	Bipolar	
186	ABT squib amps	14PRET000000CU0A	Left Rear Buckle Pretensioner Current	5	A	Bipolar	
187	ABT squib amps	13RETR000000CU0A	Right Front Passenger Retractor Current	5	A	Bipolar	

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Channel	ISO mnemonic	Channel Title	Filter Class	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			

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Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
	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
	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

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Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
	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
	70 14PELVCG00H3ACXA	Left Rear Passenger Pelvis X-Axis Acceleration	1000	+	yes	1000
	71 14PELVCG00H3ACYA	Left Rear Passenger Pelvis Y-Axis Acceleration	1000	+	yes	1000
	72 14PELVCG00H3ACZA	Left Rear Passenger Pelvis Z-Axis Acceleration	1000	+	yes	1000
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

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Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
	87 10VEHCREDK00AVZA	Rear Deck Yaw Rate Redundant	600	+	yes	1500
	88 10ENGNTPO000ACXA	Top of Engine X-Axis Acceleration	60	+	yes	2000
	89 10ENGNTPO000ACYA	Top of Engine Y-Axis Acceleration	60	+	yes	2000
	90 10ENGNTPO000ACZA	Top of Engine Z-Axis Acceleration	60	+	yes	2000
90A	10ENGNTPO000ACRA	Top of Engine Resultant Acceleration	60			
	91 10ENGNBO0000ACXA	Bottom of Engine X-Axis Acceleration	60	+	yes	2000
	92 10ENGNBO0000ACYA	Bottom of Engine Y-Axis Acceleration	60	+	yes	2000
	93 10ENGNBO0000ACZA	Bottom of Engine Z-Axis Acceleration	60	+	yes	2000
93A	10ENGNBO0000ACRA	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
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

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Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
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
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

Command File Test Number 100413

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
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	13344
158	11SEBE0000B3FO0A	Driver Shoulder Belt Force	60	+	yes	13344
159	13SEBE0000B5FO0A	Right Front Passenger Lap Belt Force	60	+	yes	13344

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Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
160	13SEBE0000B3FO0A	Right Front Passenger Shoulder Belt Force	60	+	yes	13344
161	14SEBE0000B5FO0A	Left Rear Passenger Lap Belt Force	60	+	yes	13344
162	14SEBE0000B3FO0A	Left Rear Passenger Shoulder Belt Force	60	+	yes	13344
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	11PRET000000VO0A	Left Front Buckle Pretensioner Voltage	1000	+	no	50
178	13PRET000000VO0A	Right Front Buckle Pretensioner Voltage	1000	+	no	50
179	14PRET000000VO0A	Left Rear Buckle Pretensioner Voltage	1000	+	no	50
180	13RETR000000VO0A	Right Front Passenger Retractor Voltage	1000	+	no	50
181	11AIRB000000CU0A	Left Side Curtain Airbag Current	1000	+	no	5
182	13AIRB000000CU0A	Right Side Curtain Airbag Current	1000	+	no	5
183	11PRET000000CU0A	Left Front Buckle Pretensioner Current	1000	+	no	5
184	13PRET000000CU0A	Right Front Buckle Pretensioner Current	1000	+	no	5
185	14PRET000000CU0A	Left Rear Buckle Pretensioner Current	1000	+	no	5
186	13RETR000000CU0A	Right Front Passenger Retractor Current	1000	+	no	5

APPENDIX E
INSIA Report on Structural Measurements



UPM



INSIA

Compatibility Project
EEVC - WG15

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:**

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

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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 -*Structural Survey of Cars*- 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.

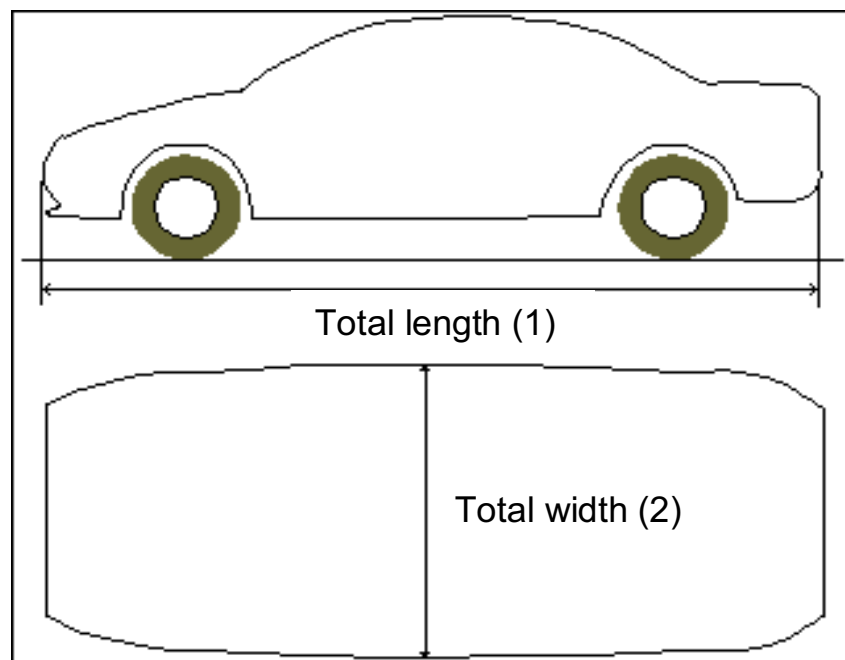


Figure 1.- Definition of the main resistant elements. General dimensions.

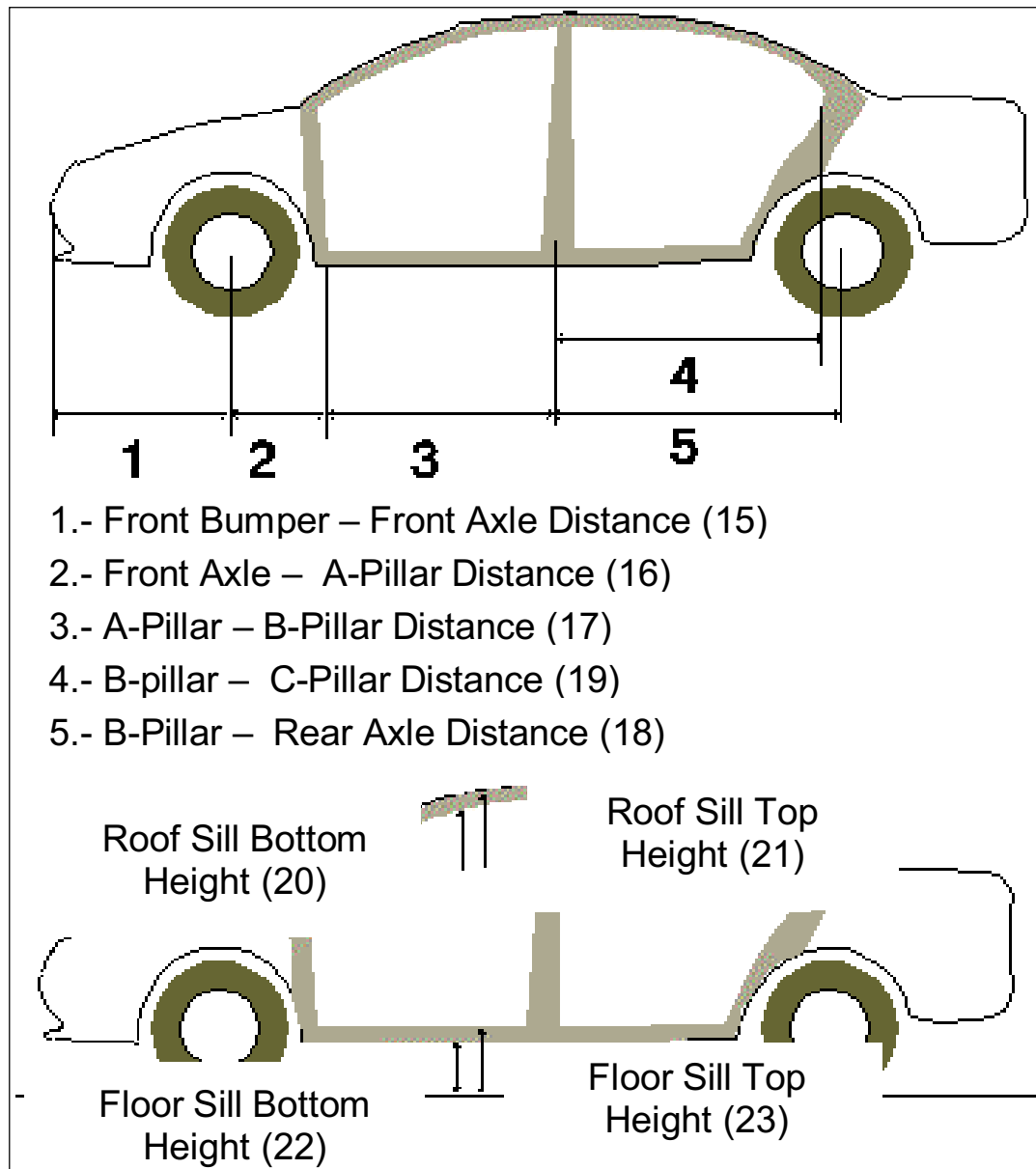


Figure 2.- Definition of the main resistant elements. Side elements.

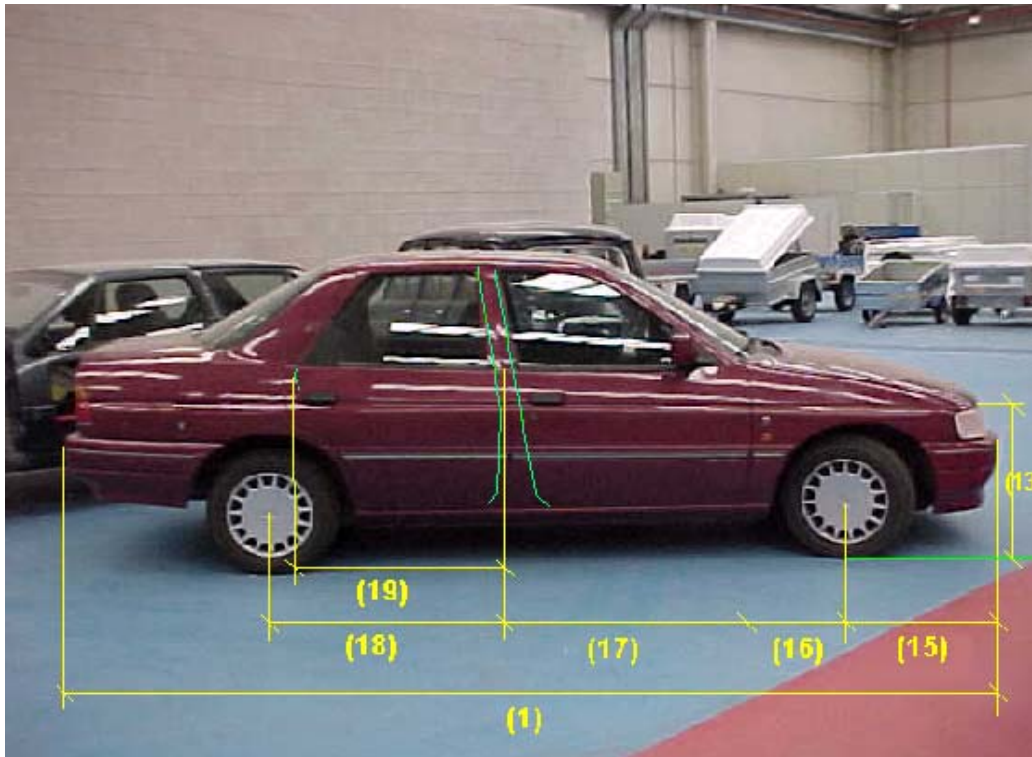


Figure 3.-
Measurements of
the side resistant
elements (outer).

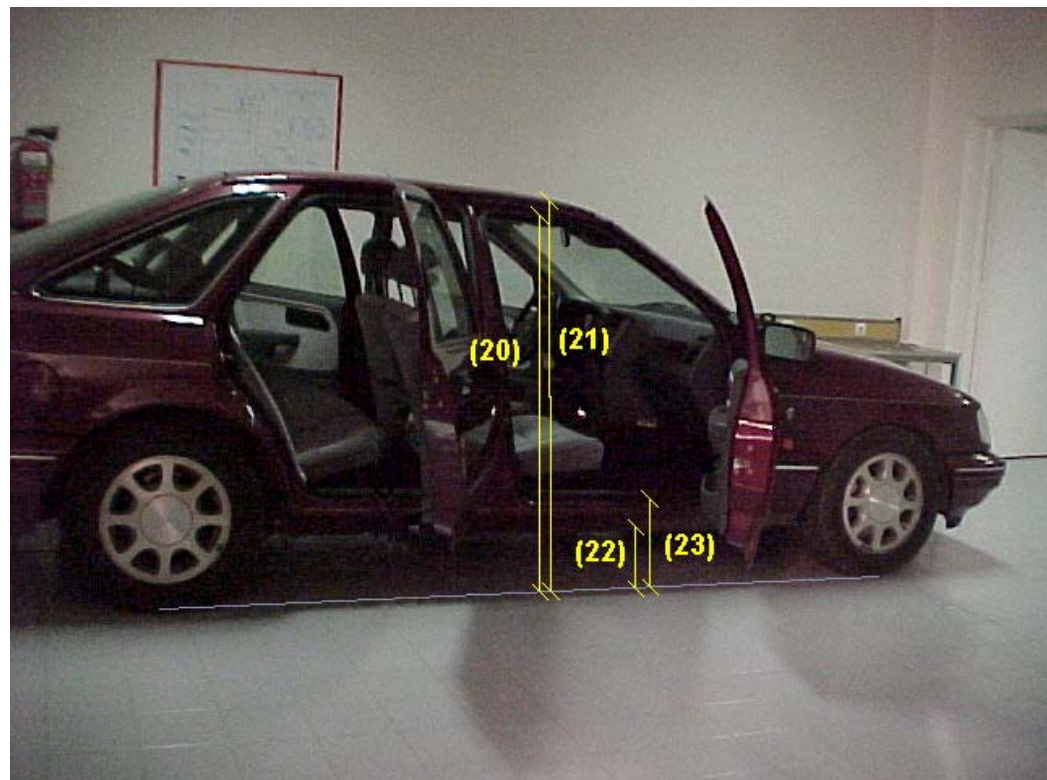


Figure 4.- Measurements
of the side resistant
elements (inner).

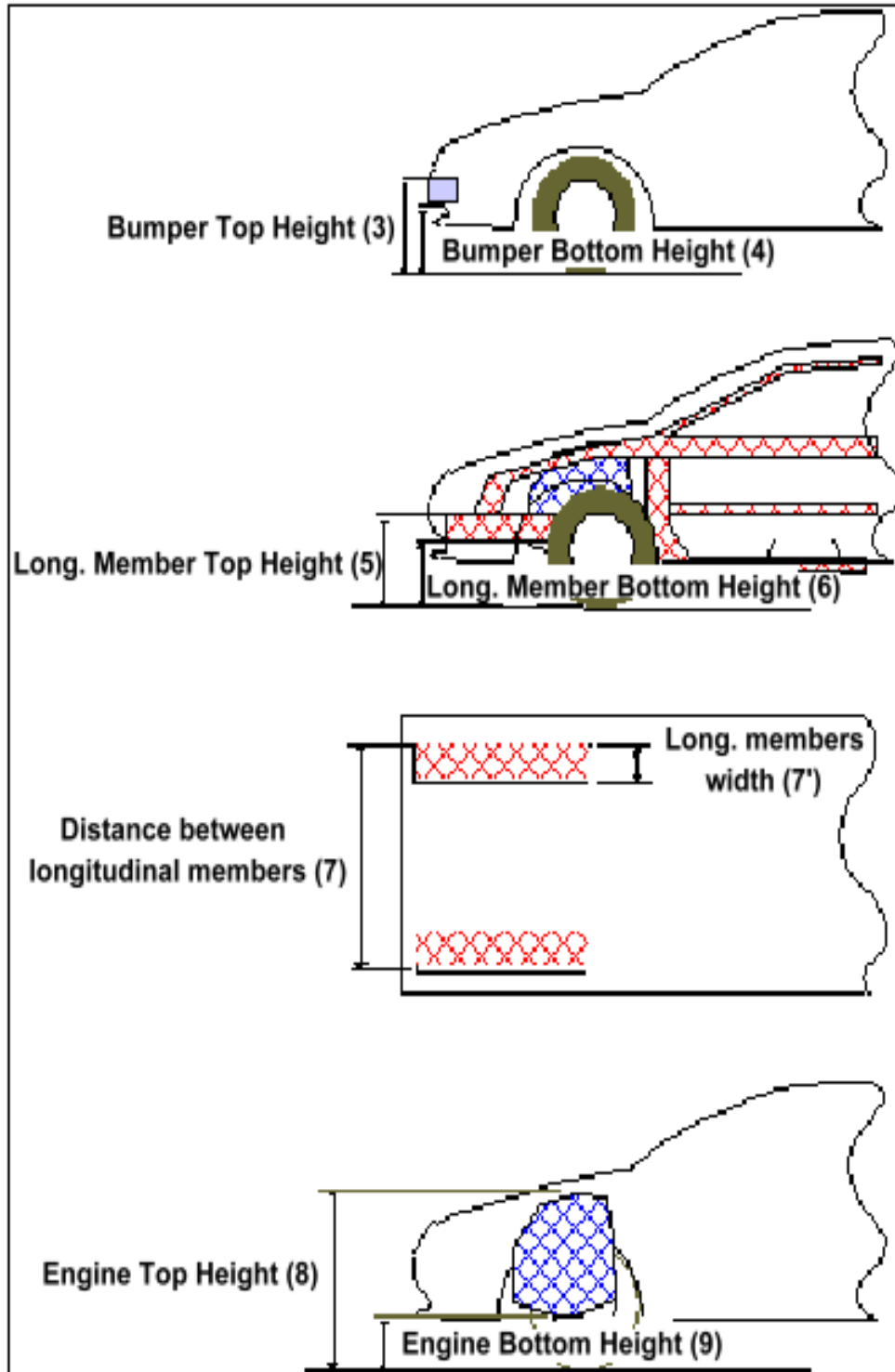


Figure 5.- Definition of the main resistant elements. Front elements.

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

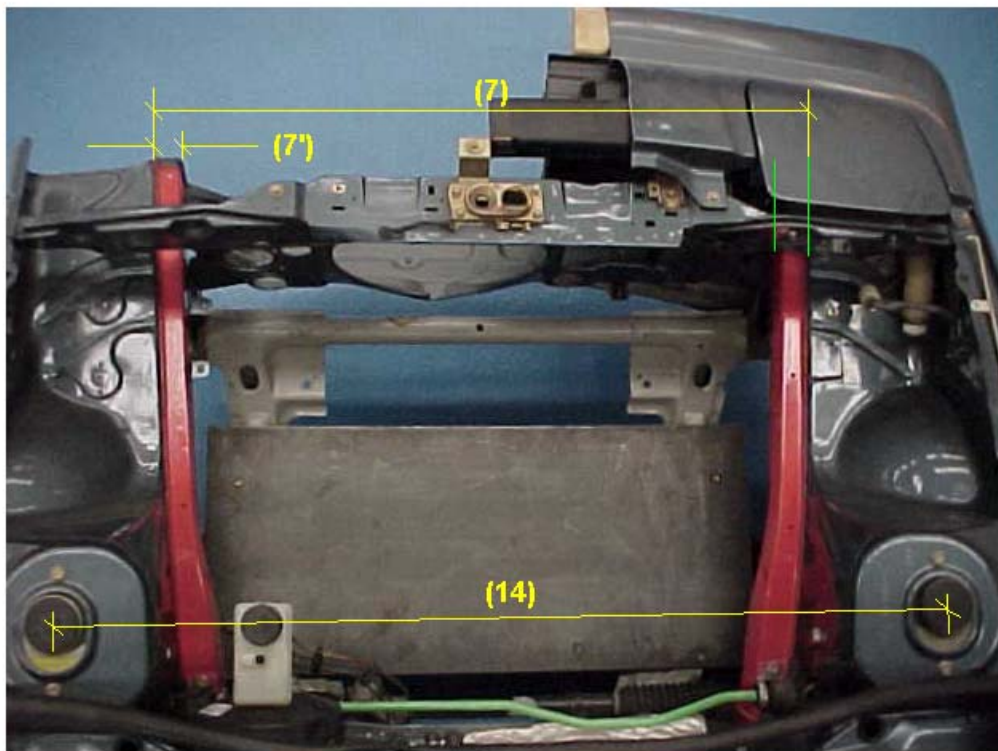
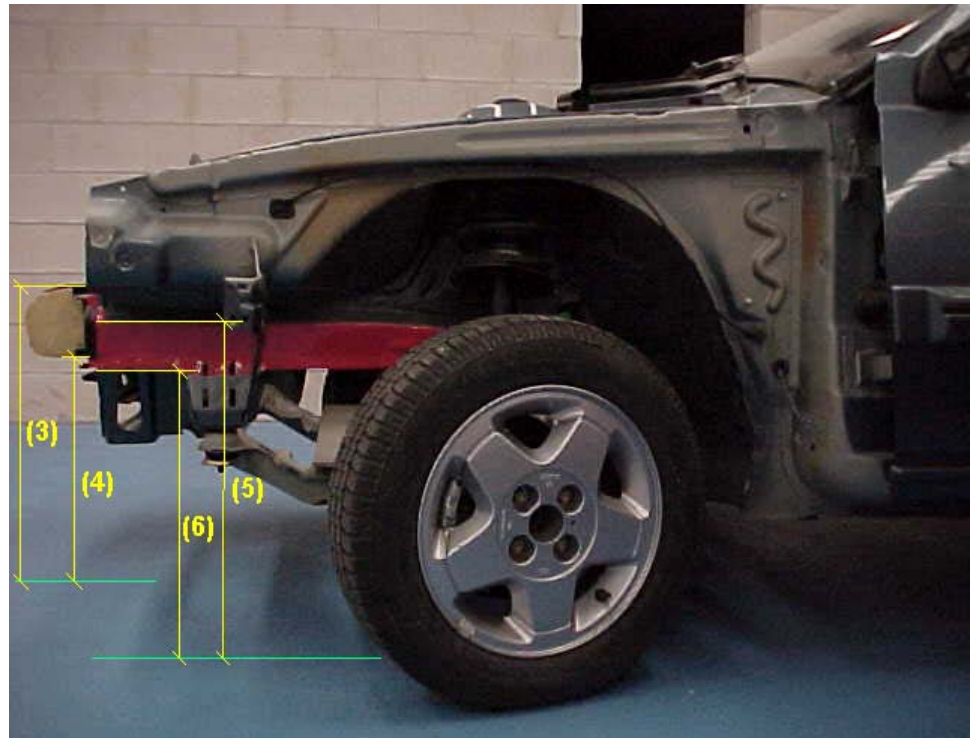


Figure 7.-
Measurements
of the main
resistant
elements. Front
elements 2.

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

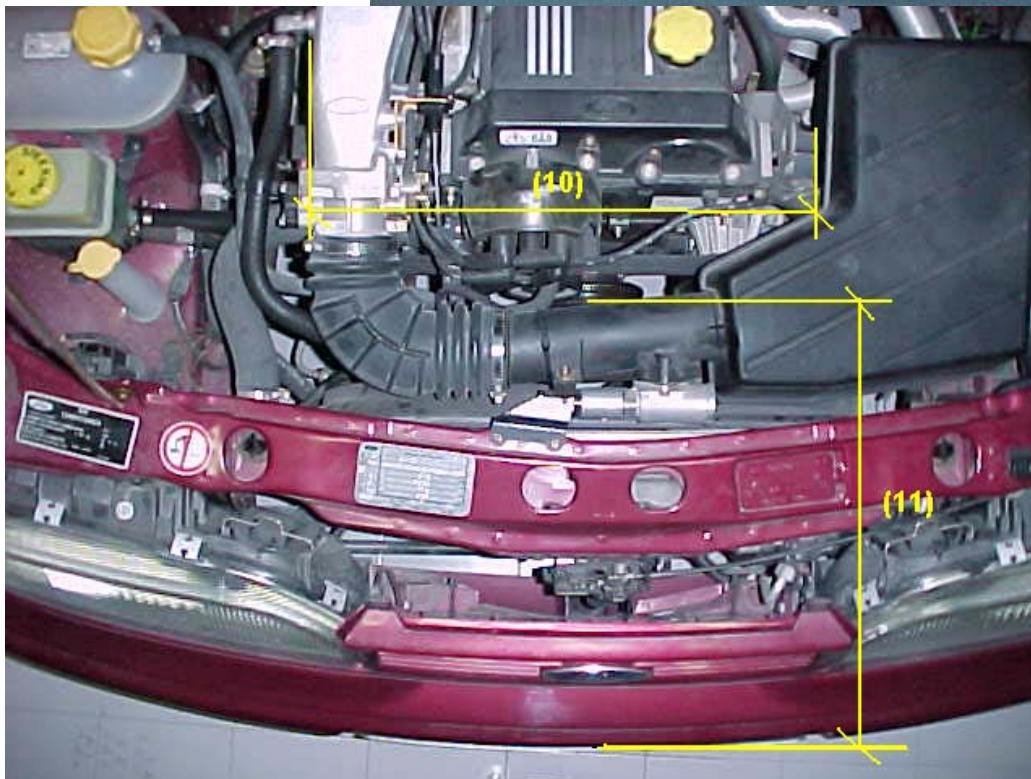
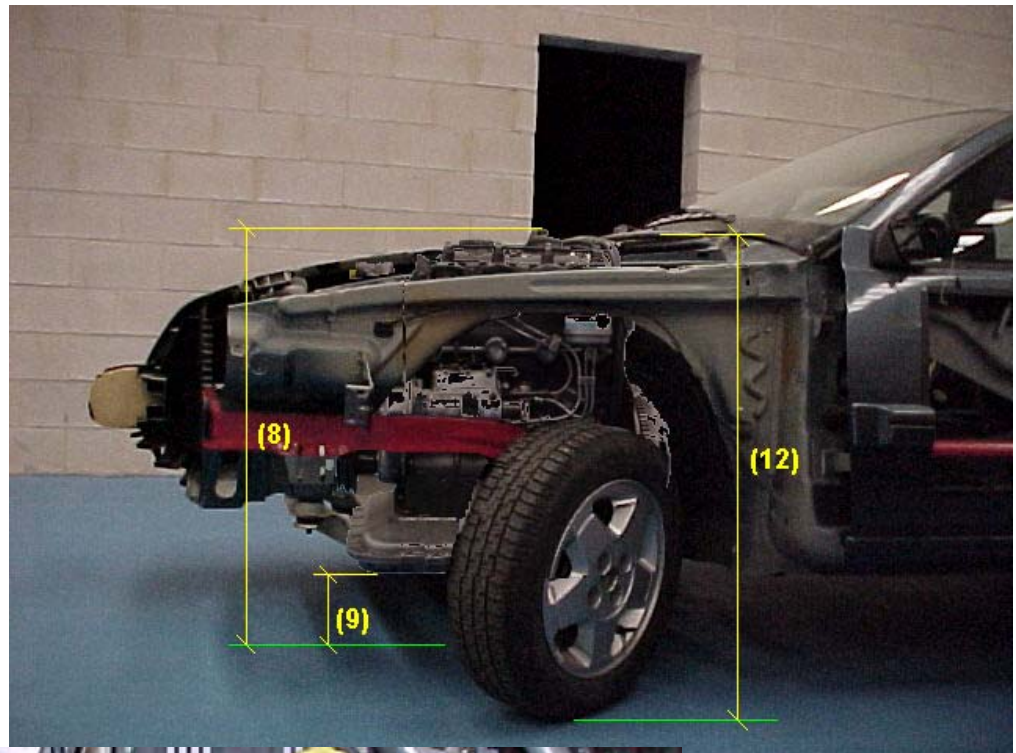


Figure 9.-
Definition of
the main
resistant
elements. Front
elements
(Longitudinal
engine).



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.