

**Vehicle Research and Test Center  
Oblique Side Pole Impact  
World SID  
2010 Ford F150  
TRC Inc. Test Number: 100211**

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**Final Report  
February - March 2010**

**Prepared For  
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**TRC TEST NUMBER: 100211**

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Section 1.0

Purpose and Test Procedure

## Purpose

This side impact test is part of FMVSS 214 Oblique Pole Side Impact Protection. It was conducted for the National Highway Traffic Safety Administration (NHTSA) and Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC Inc.). The purpose of this test was to refine the seating procedure for the 50<sup>th</sup> male WorldSID dummy and begin to evaluate the performance of the post-FMVSS 214 fleet with the new dummy. The test was conducted in accordance with the National Highway Traffic Safety Administration's Notice of Proposed Rulemaking (Docket No. NHTSA-2004-17694, May 17, 2004).

Section 2.0

Side Impact Test

## Summary of Side Impact Test

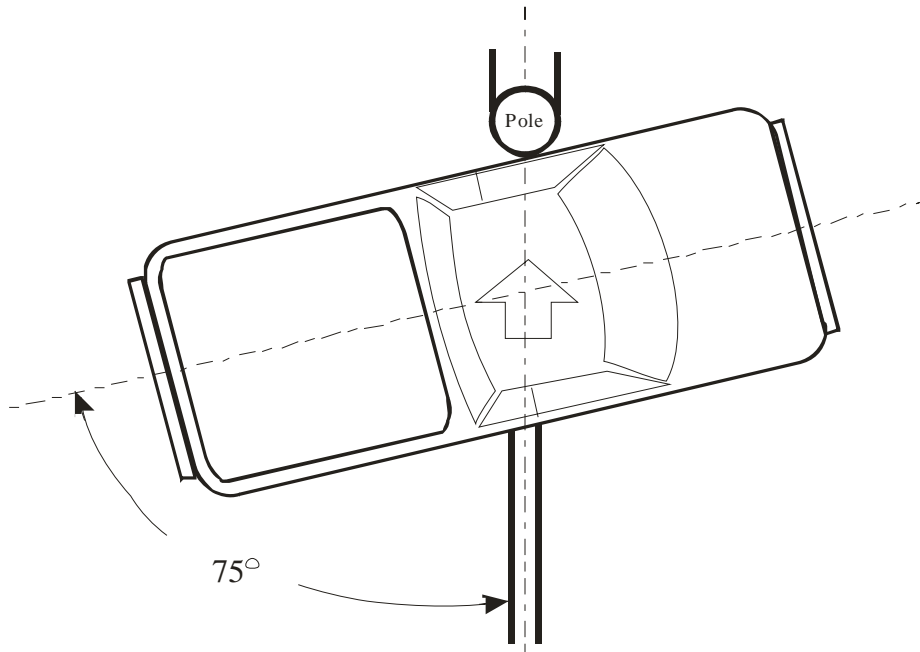
A 2010 Ford F150 impacted an oblique rigid pole barrier at an angle of 75° between the line of forward motion and the centerline of the vehicle, at a velocity of 31.2 km/h (19.4 mph). The pole was aligned with the dummy's head center of gravity. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on February 11, 2010. Pre-test and post-test photographs of the test vehicle, the rigid pole barrier, and the side impact dummy (World SID) are included in Appendix A.

One restrained Side Impact Dummy (World SID) was placed in the driver (Pos. #1) designated seating position according to the instructions specified in the World SID Seating Procedure Draft 1.0. The World SID was calibrated prior to this test. The side impact test was documented by one (1) real-time camera and eight (8) high-speed digital cameras. Camera locations and other pertinent camera information are included in this report.

The World SID instrumentation is detailed in Table 4. Eight-four (84) dummy channels of acceleration, force, moment, and displacement data were collected for this test.

A summary of the side impact dummy (World SID) configuration and verification test data can be found in Appendix C. A total of 119 channels of data were recorded. Appendix B contains the vehicle, barrier, and dummy response data traces.

### Test Results Summary



	Front World SID (#016)
HIC36 (g) CFC 1000	367
Upper Rib Deflection (mm) CFC 600	
Rib 1	41 mm
Rib 2	32 mm
Rib 3	25 mm
Lower Rib Deflection (mm) CFC 600	
Rib 1	30 mm
Rib 2	33 mm
Lower Spine Resultant (g) CFC 180	56.7 g
Pubic Symph. Force (N) CFC 600	1110 N

	2010 Ford F150
Vehicle Test Weight	2334.0 kg (5145.6 lbs)
Impact Point (Horizontal)-behind center of front axle	1470 mm
Maximum Crush	445 mm Level 2
Impact Speed	31.2 km/h

### Data Acquisition Explanations

The vehicle's center of gravity X-axis roll rate gyro data channel, 10VEHCCG0000AVXA, exceeded its full scale at 26.3 milliseconds after T-0. Data recorded after that time should be considered as questionable.

The vehicle's center of gravity Y- and Z-axis roll rate gyro data channels, 10VEHCCG0000AVYA and 10VEHCCG0000AVZA respectively, exceeded their full scale at 11.6 milliseconds after T-0. Data recorded after that time should be considered as questionable.

The vehicle's left side sill at rear seat Y-Axis acceleration data channel, 14SILBRE0000ACYA, exceeded its full scale at 18.6 milliseconds after T-0. Data recorded after that time should be considered as questionable.

The vehicle's left front seat track Y-Axis acceleration data channel, 11SETRFR0000ACYA, exceeded its full scale at 53.2 milliseconds after T-0. Data recorded after that time should be considered as questionable.

The WorldSID dummy does not have a nose so any seating measurements must be referenced to the Bridge of the Nose. TRC's FARO program uses the nose tip to compute some of the measurements. When asked to measure the nose tip, the bridge of nose point was used instead (in the spreadsheet, nosebridge1 and nosetip1 are the same point). The final dummy measurement page should reference only the bridge of nose.

Section 3

Summary of Test Results

Table 1 General Test Vehicle Parameter Data

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

**TEST VEHICLE INFORMATION**

Make	Ford
Model	F150
Body Style	Pick-up
VIN	1FTMF1CWXAKB03440
Color	Red
Odometer Reading	78
Transmission	Automatic
Final Drive	Rear-wheel drive
Number of Cylinders	8
Engine Displacement	4.6L
Engine Placement	V
Air Conditioning	Yes
Power Windows	No
Power Seats	No
Cruise Control	No
Tinted Glass	Yes
Keyless Entry	No

**TEST VEHICLE OPTIONS**

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

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Ford Motor Company
Date of Manufacture	10/09

GVWR (lb)/(kg)	6450 / 2926
GAWR Front (lb)/(kg)	3000 / 1361
GAWR Rear (lb)/(kg)	3500 / 1588

Measured Parameter	Front	Mid	Rear	Total
Type of Seats	Split Bench	None	None	
Number Of Occupants	3	0	0	3
Capacity Wt. (VCW) (kg)				1752.5

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

**TEST VEHICLE WEIGHTS**

	Units	As Delivered (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	609.6	464.4		654.0	530.0	
Right	kg	601.6	455.2		616.5	533.5	
Ratio	%	56.8	43.2		54.4	45.6	
Totals	kg	1211.2	919.6	2130.8	1270.5	1063.5	2334.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value
Total Delivered Weight	kg	2130.8
Weight of World SID ATD	kg	76.0
Rated Cargo/Luggage Weight (RCLW)	kg	136.0
Calculated Vehicle Target Weight (TVTW)	kg	2342.8

**TEST VEHICLE ATTITUDES AND CG**

	Units	LF	RF	LR	RR	CG(aft of front axle)
As Delivered	mm	907	905	970	972	1379
As Tested	mm	910	905	945	956	1456
Fully Loaded	mm	900	905	940	948	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	3195
Total Vehicle Length at Left Side	mm	5190
Total Vehicle Length at Centerline	mm	5412
Total Vehicle Length at Right Side	mm	5190
Weight of Ballast on Instrumentation Rack	kg	36.7
Amount of Stoddard Solvent in Fuel Tank	liters	91.6

**TEST VEHICLE VERTICAL IMPACT LINE DATA**

Measurement Description	Units	Value
Impact Reference Line From Front Axle	mm	1470
Impact Point	mm	1471
Impact Point Difference	mm	1 mm Right

Table 1 General Test Vehicle Parameter Data, Continued

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

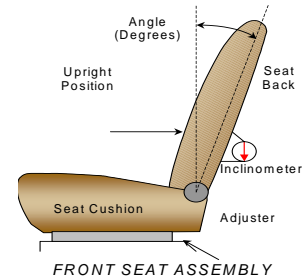
**WORLD SID RIDING POSITION**

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

Driver: Total Number of detents: N/A

Test detent (with the forward-most detent defined as 0): N/A

Driver seat back angle: The back was adjusted to 19.4° forward of vertical measured at the head restraint.

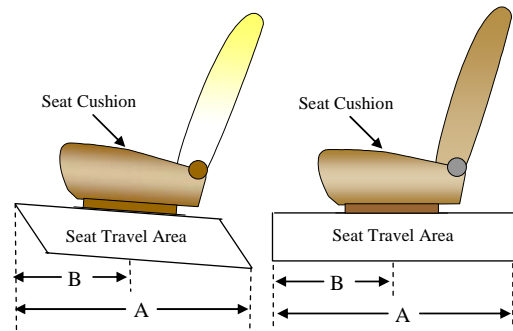


**SEAT FORE/AFT POSITIONS**

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.
<b>Driver Seat</b>	30 Notches	19 Notches
<b>Rear Seat</b>	Not applicable	Not applicable



**SEAT BELT UPPER ANCHORAGE**

	Total No. of Positions	Placed in Position No.
<b>Driver Seat</b>	4	2
<b>Rear Seat</b>	Not applicable	Not applicable

Position number one is the uppermost adjustment position.

Table 1 General Test Vehicle Parameter Data, Continued

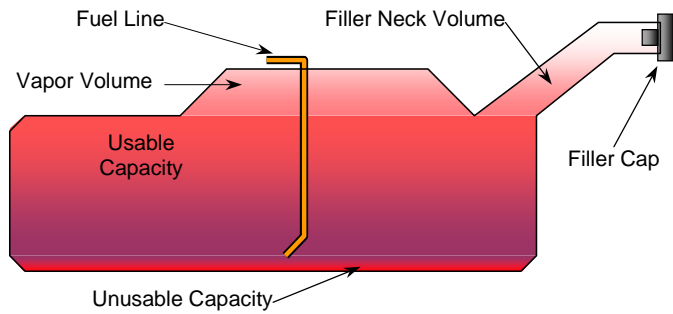
Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

**FUEL TANK CAPACITY**

	Liters
Usable Capacity of “Standard Tank”	98.4
Usable Capacity used for FMVSS 301	89.5 – 92.5
Actual Amount of Solvent used	91.6

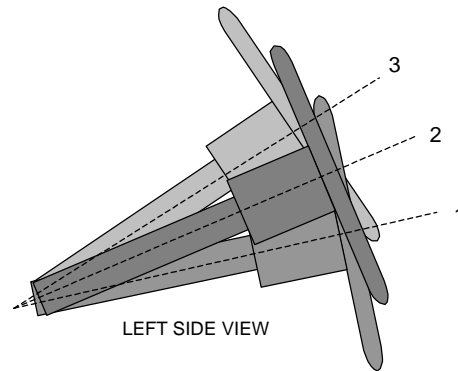
The test vehicle is equipped with an electric fuel pump. The fuel pump operates for approximately two seconds after the ignition is placed in the “ON” position, after which the fuel pump automatically shuts off. The fuel filler door is located on the left rear fender. The standard fuel tank occupies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



VEHICLE FUEL TANK ASSEMBLY

**STEERING COLUMN ADJUSTMENT**

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



STEERING COLUMN ASSEMBLY

**STEERING WHEEL/COLUMN POSITIONS**

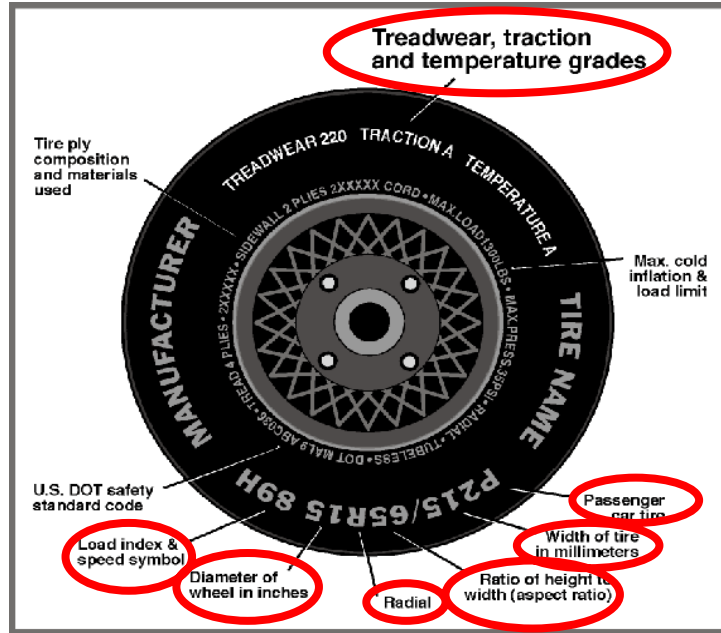
	Degrees	Fore/Aft Position, mm
Lowermost Position	N/A	N/A
Geometric Center Position <sup>1</sup>	N/A	N/A
Uppermost Position	N/A	N/A

<sup>1</sup> Steering column positioned in the 5<sup>th</sup> of 10 notches. Full up was notch 1, full down was notch 10.

Table 2 Test Vehicle Tire Information

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10



**DATA FROM TIRE PLACARD**

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	280	280
Cold / Test Pressure (kPa)	260	260
Recommended Tire Size	P235/70R17	P235/70R17
Tire Size on Vehicle	P235/70R17	P235/70R17
Tire Manufacturer	Hankook	Hankook
Tire Name	DynaPro AS	DynaPro AS
Radial	Yes	Yes
Wheel Diameter	17	17
Load Index & Speed Symbol	108S	108S
Treadwear	440	440
Traction Grade	B	B
Temperature Grade	A	A

Table 3 Post-Test Observations

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

**TEST DUMMY INFORMATION AND CONTACT POINTS**

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

**POST TEST DOOR OPENING AND SEAT TRACK INFORMATION**

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Not applicable
Left Side Door Opening	Closed and latched	Not applicable
Right Side Door Opening	Closed and latched	Not applicable
Seat Movement	None	Not applicable
Seat Back Failure	None	Not applicable

**POST TEST STRUCTURAL OBSERVATIONS**

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Did not separate from vehicle
Sill Separation	Did not separate from vehicle
Windshield Damage	Windshield cracked
Window Damage	Driver's side window shattered
Other Notable Effects	None

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Left Front (Driver) Occupant Location 01	
	Installed	Operation
Front Airbag	Yes	No
Torso Airbag	Yes	Yes
Head Airbag	No	Not applicable
Curtain Airbag	Yes	Yes
Seat Belt Pretensioner	Yes	No
Seat Belt Load Limiter	No	Not applicable

Section 4

Occupant and Vehicle Information

Table 4 World SID Instrumentation Data

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max. (g)	Time (ms)	Max. (g)	Time (ms)
Head Acceleration	X	10.0	134.7	-15.2	57.8
	Y	56.6	56.0	-9.8	140.9
	Z	18.4	110.9	-1.6	30.8
	R	59.4	56.0		
Head Angular Displacement	X	1850.1	84.2	-1261.2	47.8
	Y	802.6	100.6	-1415.6	143.3
	Z	1902.8	138.2	-1219.9	78.9
Upper Neck Force	X	371.1	134.9	-156.3	53.5
	Y	146.2	47.0	-325.1	149.3
	Z	704.0	111.5	-234.1	67.7
Upper Neck Moment	X	19.7	83.5	-27.5	152.0
	Y	11.0	76.0	-38.4	139.9
	Z	15.6	133.0	-16.7	85.2
Lower Neck Force	X	609.2	120.7	-383.6	53.8
	Y	738.6	49.4	-444.8	116.2
	Z	648.6	109.7	-232.9	148.2
Lower Neck Moment	X	46.9	48.8	-90.7	144.4
	Y	32.6	55.2	-112.8	128.3
	Z	5.5	282.2	-18.1	90.5
Shoulder Force	X	210.6	274.2	-332.7	16.6
	Y	177.5	120.1	-2079.8	46.1
	Z	426.8	43.3	-143.7	106.0
Shoulder Displacement	Y	37.6	52.3	-5.2	26.7
Shoulder Acceleration	X	122.0	16.1	-136.3	14.8
	Y	99.2	15.8	-122.2	14.2
	Z	157.8	16.0	-128.5	15.4
	R	218.3	16.0		

Table 4 World SID Instrumentation Data, Continued

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max. (g)	Time (ms)	Max. (g)	Time (ms)
T1 Acceleration	X	11.5	95.3	-12.8	16.7
	Y	41.2	52.7	-13.8	112.1
	Z	7.0	142.4	-4.8	42.6
	R	42.7	52.7		
T4 Acceleration	X	9.9	95.0	-10.4	52.2
	Y	45.6	50.5	-13.1	99.2
	Z	8.0	143.8	-5.1	44.0
	R	46.7	50.6		
T12 Acceleration	X	12.0	70.2	-11.3	114.3
	Y	55.5	47.9	-27.1	84.4
	Z	6.5	143.0	-7.2	93.6
	R	56.7	47.9		
Thorax Rib 1 Displacement	Y	41.2	54.0	-3.5	17.6
Thorax Rib 1 Acceleration	X	55.6	18.3	-58.8	35.8
	Y	94.2	43.2	-92.2	47.7
	Z	60.6	47.6	-92.4	47.8
	R	101.9	47.6		
Thorax Rib 2 Displacement	Y	32.4	54.1	-3.6	19.1
Thorax Rib 2 Acceleration	X	47.0	18.1	-53.2	35.7
	Y	77.1	43.6	-78.4	46.2
	Z	54.1	46.1	-80.9	46.3
	R	89.9	35.4		
Thorax Rib 3 Displacement	Y	25.2	52.2	-5.8	19.1
Thorax Rib 3 Acceleration	X	46.9	16.4	-29.2	24.0
	Y	98.0	44.8	-40.9	44.5
	Z	48.2	44.4	-60.6	44.6
	R	103.1	44.8		

Table 4 World SID Instrumentation Data, Continued

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max. (g)	Time (ms)	Max. (g)	Time (ms)
Abdominal Rib 1 Displacement	Y	30.5	52.0	-2.0	19.1
Abdominal Rib 1 Acceleration	X	57.9	16.2	-80.6	20.1
	Y	72.0	46.1	-40.3	22.7
	Z	31.8	45.6	-55.3	36.4
	R	93.0	20.1		
Abdominal Rib 2 Displacement	Y	33.3	50.3	-5.3	19.1
Abdominal Rib 2 Acceleration	X	68.4	16.2	-73.3	18.0
	Y	75.7	41.1	-60.2	21.4
	Z	27.0	40.6	-58.2	40.8
	R	97.9	18.0		
Lumbar Force	X	423.7	71.3	-641.8	117.9
	Y	1319.9	48.5	-194.7	95.0
	Z	1041.7	134.3	-152.1	42.6
Lumbar Moment	X	67.2	45.7	-27.1	96.0
	Y	27.0	118.0	-29.3	71.3
	Z	24.1	51.3	-4.7	135.3
Pelvis Acceleration	X	7.7	60.8	-10.0	120.9
	Y	43.6	47.0	-25.5	81.6
	Z	10.9	120.9	-7.2	96.6
	R	43.7	47.0		
Sacro-Iliac Left Force	X	790.2	119.1	-222.5	60.3
	Y	4.0	-13.0	-2439.5	47.5
	Z	344.8	43.9	-502.4	139.9
Sacro-Iliac Left Moment	X	13.0	144.6	-126.6	44.9
	Y	20.8	71.3	-24.3	119.8
	Z	44.8	119.1	-27.2	61.6

Table 4 World SID Instrumentation Data, Continued

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max.	Time	Max.	Time
		(g)	(ms)	(g)	(ms)
Sacro-Iliac Right Force	X	408.5	93.0	-305.0	37.2
	Y	2.1	-14.0	-1458.6	88.0
	Z	657.7	71.5	-85.8	29.0
Sacro-Iliac Right Moment	X	25.8	124.3	-26.6	38.5
	Y	14.7	116.4	-19.1	75.4
	Z	33.4	119.1	-10.6	62.8
Pubic Force	Y	1109.9	53.6	-4.4	12.8
Left Femur Force	X	800.6	121.0	-209.8	39.8
	Y	52.0	18.2	-1675.1	53.6
	Z	39.6	19.8	-2065.4	53.0
Left Knee Outboard Force	Y	195.3	17.6	-112.8	44.9
Left Knee Inboard Force	Y	19.1	20.5	-494.6	74.0
Right Mid Femur Force	X	101.3	28.8	-105.6	94.7
	Y	579.6	66.2	-221.4	41.2
	Z	1198.6	62.1	-294.4	119.8

Positive Direction

Longitudinal: Forward  
 Lateral: Rightward  
 Vertical: Downward

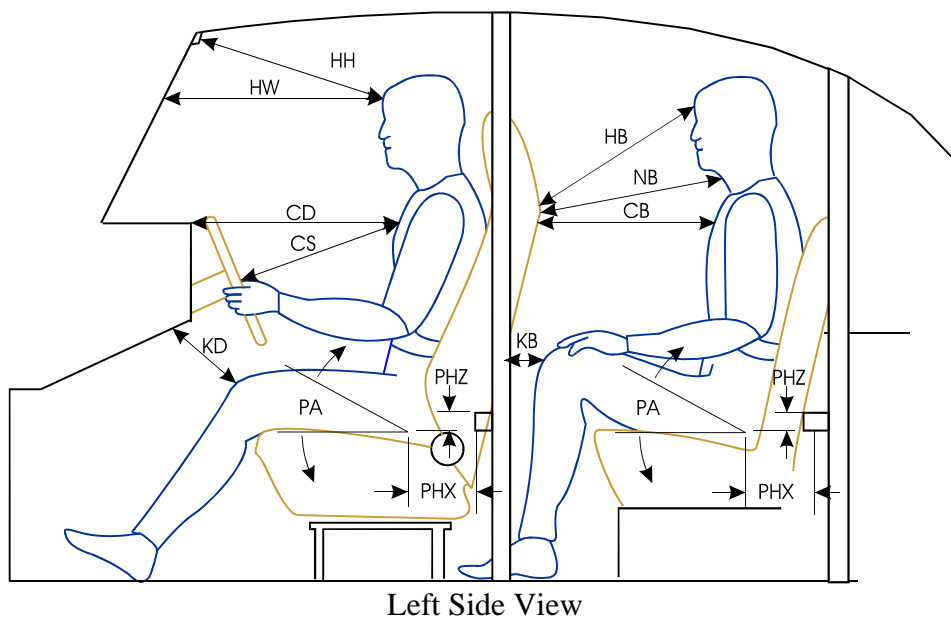
Negative Direction

Longitudinal: Rearward  
 Lateral: Leftward  
 Vertical: Upward

Figure 1 World SID Longitudinal Clearance Dimensions

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10



Note: All measurements are in millimeters with tolerance of  $\pm 0.1$  mm

Measurement	Driver World SID # 016
HH	499
HW	785
HZ	268
NR	525
CD	678
CS	445
KDL(KDA $^{\circ}$ )	114/(17.5 $^{\circ}$ )
KDR(KDA $^{\circ}$ )	118/(16.0 $^{\circ}$ )
PA $^{\circ}$	Not Available
PHX	374
PHZ	42

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

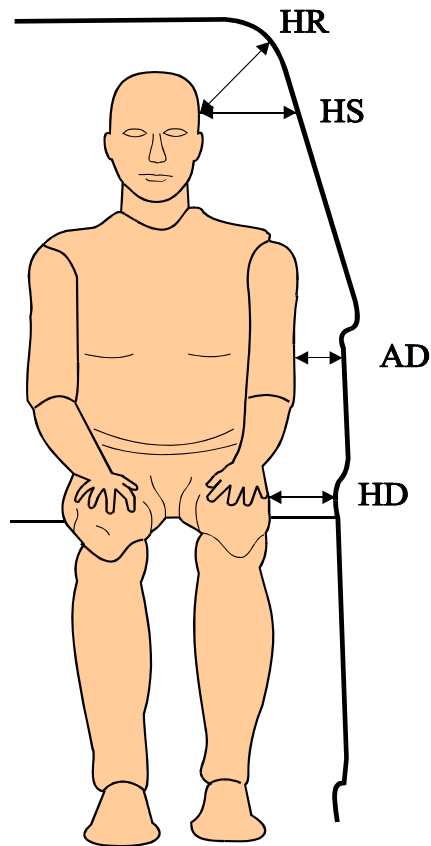
Location	Measurement
Head X-Angle	-1.5 $^{\circ}$
Head Y-Angle	0.1 $^{\circ}$
Pelvis X-Angle	-2.4 $^{\circ}$
Pelvis Y-Angle	1.3 $^{\circ}$

Note: Measurements recorded from WorldSID Digital Read-out Box

Figure 2 World SID Lateral Clearance Dimensions

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10



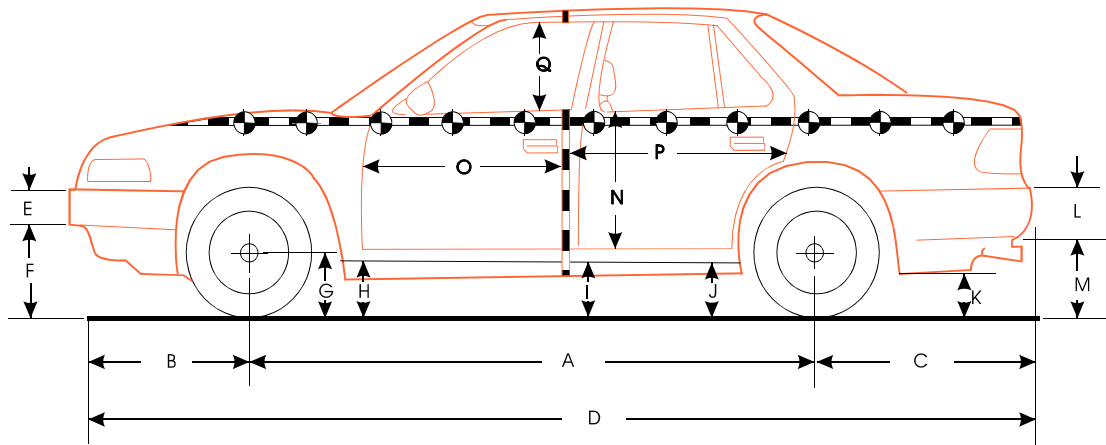
Note: All measurements are in millimeters with tolerance of  $\pm 0.1$  mm

Measurement	Driver World SID # 016
HR	246
HS	357
AD	Lower: 149      Upper: 229
HD	127

Figure 3 Vehicle Pre-Test And Post-Test Measurements

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10



Left Side View

Note: All dimensions are in millimeters with tolerance of  $\pm 0.1$  mm

	Pre-Test (as delivered)	Pre-Test (as tested)	Post-Test (as tested)	Change
A	3195	3195	3100	95
B	987	987	975	12
C	1230	1230	1270	-40
D	5412	5412	5345	67
E	231	231	231	0
F	391	384	431	-47
G	350	355	361	-6
G1	423	415	443	-28
H	429	425	461	-36
I	457	445	468	-23
J1	442	125	455	-330
J2	475	458	490	-32
K	520	492	563	-71
L	195	195	195	0
M	540	500	590	-90
N	N/A	N/A	N/A	N/A
O	835	835	831	4
P	N/A	N/A	N/A	N/A
Q	480	480	437	43
R	5190	5190	5200	-10
S	5190	5190	5070	120
T	1640	1640	1380	260

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

Table 5 Vehicle Structural Measurements<sup>1,2</sup>

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

	Elements	Pre-Test
1	Total Length	5412
2	Total Width	1970
3	Bumper Top Height	630
4	Bumper Bottom Height	373
5	Longitudinal Member Top Height	546
6	Longitudinal Member Bottom Height	383
7	Distance Between Longitudinal Members	960
7'	Longitudinal Member Width	100
8	Engine Top Height	955
9	Engine Bottom Height	268
10	Engine and Gearbox Width	700
11	Front Bumper - Engine Distance	790
12	Front Shock Absorber Fixing Height	825
13	Bonnet Leading Edge Height	1155
14	Front Shock Absorber Fixing Width	970
15	Front Bumper - Front Axle Distance	987
16	Front Axle - A Pillar Distance	650
17	A Pillar - B Pillar Distance	1214
18	B Pillar - Rear Axle Distance	1350
19	B Pillar - C Pillar Distance	N/A
20	Roof Sill Bottom Height	1790
21	Roof Sill Top Height	1722
22	Floor Sill Bottom Height	494
23	Floor Sill Top Height	550

All distance measurements are in millimeters.

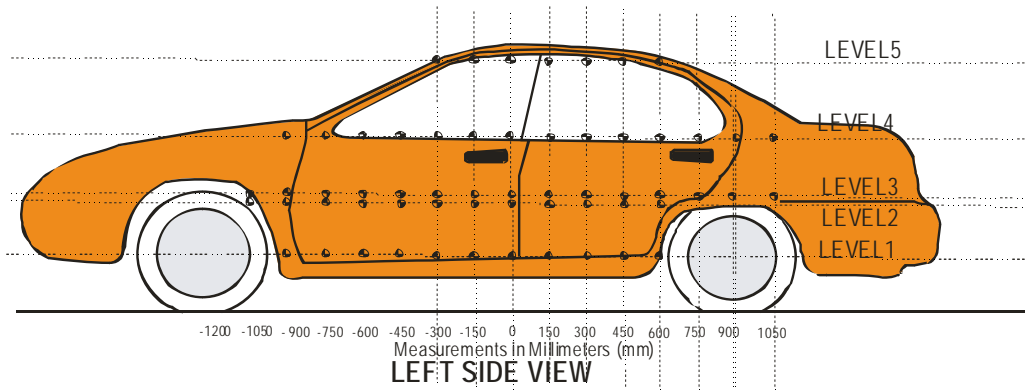
<sup>1</sup> Taken from INSIA report, “Structural Survey of Cars, Methodology of the Main Resistant Elements in the Car Body”, March 1999.

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

Figure 4 Vehicle Side Measurements

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10



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

Measurements vehicle forward of the impact line are negative.

All measurements below in mm.

Level	Measurement Description	Height Above Ground
5	Window Top	1815
4	Window Sill	1195
3	Mid Door	870
2	Occupant H-Point	910
1	Side Sill	480

Table 6 Vehicle Exterior Crush Profiles - All Levels

Vehicle: 2010 Ford F150

Location	Height		(mm) From Impact Point <sup>1</sup>															
			-1500	-1350	-1200	-1050	-900	-750	-600	-450	-300	-150	0	150	300	450	600	750
Level 1 Side Sill	480	Pre					938	941	945	948	951	953	955	957	959	959	956	954
		Post					914	868	809	750	687	616	523	551	687	820	816	926
		Crush					24	73	136	198	264	337	432	406	272	139	140	28
Level 2 H-Point	910	Pre		977	963	959	963	967	970	973	973	976	978	979	980	981	980	974
		Post		1007	977	954	917	852	789	711	621	621	533	557	691	771	836	948
		Crush		-30	-14	5	46	115	181	262	352	355	445	422	289	210	144	26
Level 3 Mid-Door	870	Pre			976	971	957	960	965	969	972	975	976	978	978	980	979	972
		Post			1003	982	951	914	849	787	710	618	532	555	688	767	834	946
		Crush			-27	-11	6	46	116	182	262	357	444	423	290	213	145	26
Level 4 Window Sill	1195	Pre	878	905	922	933	940	944	950	955	959	963	967	970	973	974	974	967
		Post	961	969	969	962	950	926	863	794	715	630	540	562	681	773	824	940
		Crush	-83	-64	-47	-29	-10	18	87	161	244	333	427	408	292	201	150	27
Level 5 Window Top	1815	Pre					906	871	828	781	737	714	704	703	702	702	678	
		Post					919	870	804	729	657	596	520	530	571	601	607	
		Crush					-13	1	24	52	80	118	184	173	131	101	71	

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

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

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

<sup>1</sup> The target impact point was 25mm rearward of the crush grid zero line.

Table 6 Vehicle Exterior Crush Profiles - All Levels, Continued

Vehicle: 2010 Ford F150

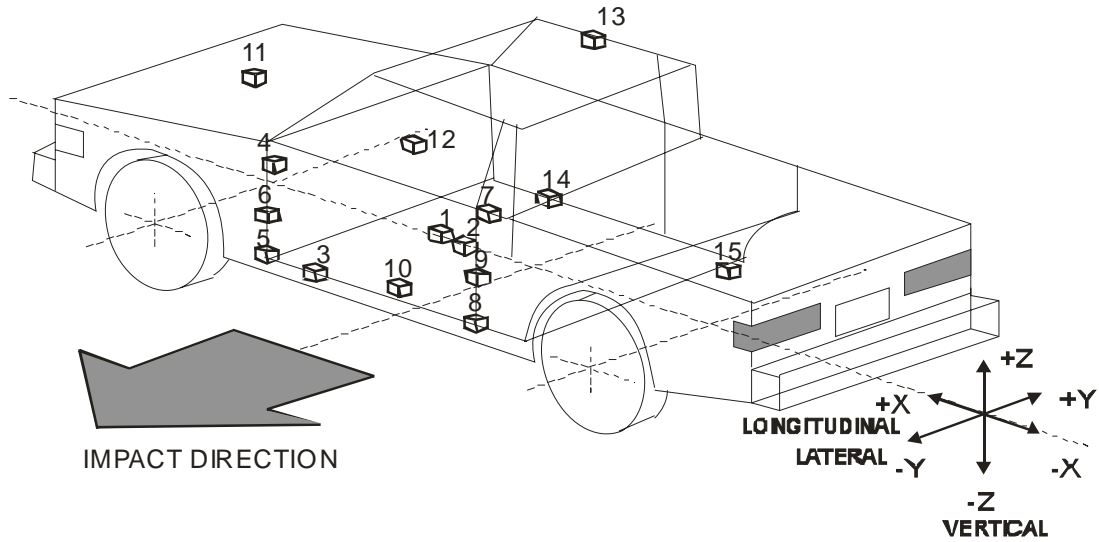
Location	Height	(mm) From Impact Point													
		900	1050	1200	1350	1500	1650	1800	1950	2100	2250	2400	2550	2700	
Level 1 Side Sill	480	Pre	956	956	957										
		Post	930	933	936										
		Crush	26	23	21										
Level 2 H-Point	910	Pre	975	975	975	996	1000								
		Post	953	957	961	984	991								
		Crush	22	18	14	12	9								
Level 3 Mid-Door	870	Pre	974	975	976	999									
		Post	952	956	961	986									
		Crush	22	19	15	13									
Level 4 Window Sill	1195	Pre	969	969	970	971	972	974	973	968	961	955	950	945	
		Post	945	949	952	956	960	963	965	962	958	955	952	949	
		Crush	24	20	18	15	12	11	8	6	3	0	-2	-4	
Level 5 Window Top	1815	Pre													
		Post													
		Crush													

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

Figure 5 Test Vehicle Accelerometer Locations and Data Summary

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10



- |  |  |
|--|--|
| 1-Vehicle Center of Gravity                        | 10-Left Side Front Seat Track at H-point |
| 2-Vehicle Center of Gravity Gyroscopes             | 11-Top of Engine                         |
| 3-Left Floor Sill Between A-Pillar and Impact Line | 12-Center Firewall                       |
| 4-Left Side Sill at A-Pillar                       | 13-Right Side Roof Rail                  |
| 5-Left Side Lower A-Pillar                         | 14-Right Side Floor Sill                 |
| 6-Left Side Middle A-Pillar                        | 15-Rear Deck Behind Rear Axle            |
| 7-Left Side Sill at Rear Seat                      |  |
| 8-Left Side Lower B-Pillar                         |  |
| 9-Left Side Middle B-Pillar                        |  |

Table 7 Test Vehicle Accelerometer Locations and Data Summary

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

	Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
		X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
1	Vehicle CG	2969	0	615				
	Longitudinal				2.4	56.6	-8.4	46.2
	Lateral				25.0	50.5	-1.6	280.5
	Vertical				26.5	44.1	-32.4	62.0
	Resultant				35.3	61.9		
2	Vehicle CG Gyroscopes <sup>1</sup>	2969	0	615				
	Longitudinal				466.4	33.5	-431.5	76.2
	Lateral				158.9	273.3	-536.7	14.0
	Vertical				175.5	271.1	-468.1	12.0
3	Left Side Sill Between A-Pillar and Impact Line <sup>1</sup>	3900	-700	551				
	Lateral				59.7	41.2	-7.1	49.3
4	Left Side Sill at A-Pillar	3860	-705	540				
	Lateral				40.5	41.7	-2.1	32.4
5	Left Side Lower A-Pillar	4308	-900	718				
	Lateral				22.5	13.6	-11.8	52.0
6	Left Side Middle A-Pillar	4325	-900	1045				
	Lateral				21.3	41.7	-1.5	2.4
7	Left Side Sill at Rear Seat	2873	-685	605				
	Lateral				122.4	18.1	-150.3	21.4
8	Left Side Lower B-Pillar	3145	-840	620				
	Lateral				57.2	12.3	-27.4	26.1
9	Left Side Middle B-Pillar	3130	-840	1038				
	Lateral				71.1	14.0	-42.8	22.7

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

Table 7 Test Vehicle Accelerometer Locations and Data Summary, Continued

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10

	Location	Coordinates (millimeters)			Positive Direction		Negative Direction	
		X	Y	Z	Max. (g)	Time (ms)	Max. (g)	Time (ms)
10	Left Side Front Seat Track at H-Point <sup>1</sup>	3388	-690	625				
	Lateral				92.9	33.0	-1556.6	57.4
11	Top of Engine	5112	130	1209				
	Longitudinal				1.1	157.2	-9.2	62.9
	Lateral				18.9	58.1	-3.5	35.3
12	Firewall	4922	0	958				
	Lateral				12.7	55.7	-1.4	5.2
13	Right Side Roof Rail	3385	690	1748				
	Lateral				15.0	36.6	-1.8	253.7
14	Right Side Sill	3510	750	535				
	Lateral				23.7	51.9	-5.4	42.6
15	Rear Deck Behind Rear Axle	828	0	791				
	Longitudinal				2.3	67.8	-6.0	54.8
	Lateral				15.9	79.3	-1.6	240.6

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

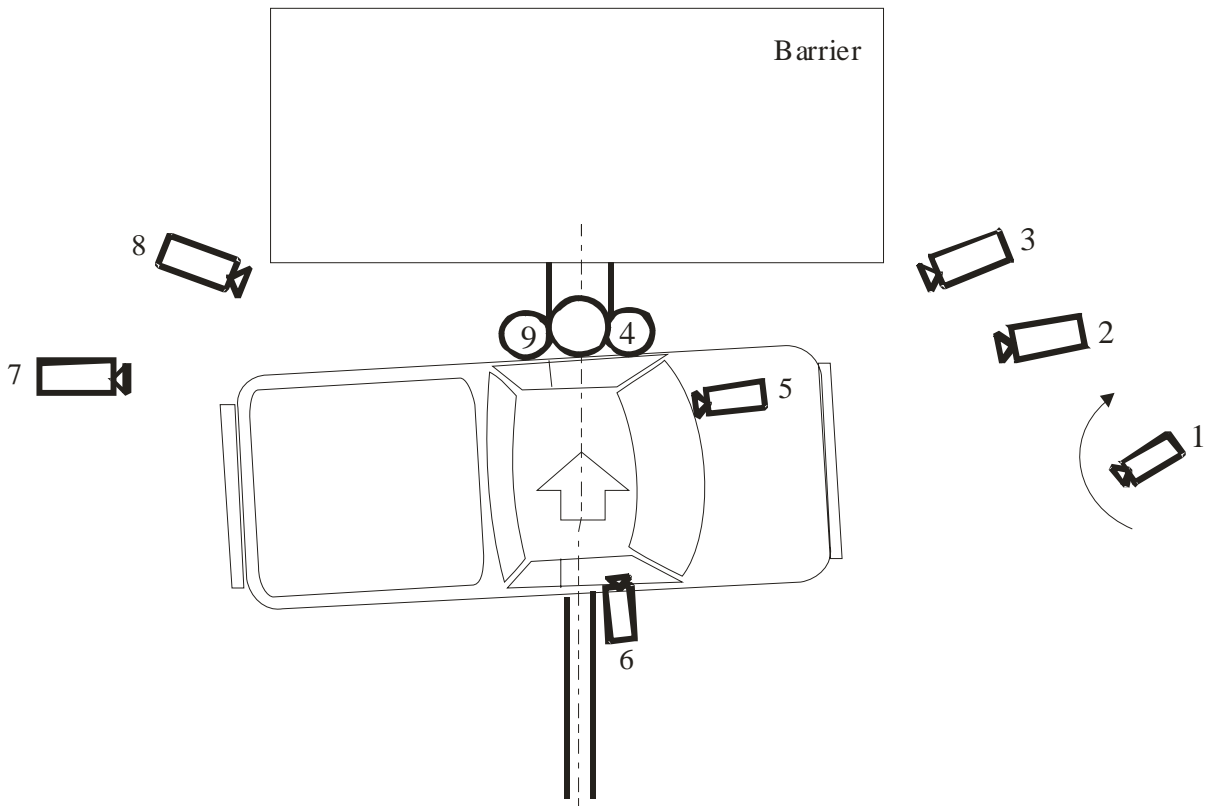
For acceleration data sign convention see Report Sign Convention in Appendix D.

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

Figure 7 High-Speed Camera Locations and Data Summary

Test Vehicle: 2010 Ford F150

Test Date: 02/11/10



No.	Camera View	Location (mm) <sup>1</sup>			Angle <sup>1</sup> (deg.)	Lens (mm)	Speed (fps)
		X	Y	Z			
1	Real-time					Zoom	1000
2	Front view					12.5	1000
3	Front oblique					25	1000
4	Overhead tight					25	1000
5	Onboard vehicle front					12.5	1000
6	Onboard right front door					12.5	1000
7	Rear view					12.5	1000
8	Rear oblique view					25	1000
9	Overhead wide view					12.5	1000

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

<sup>1</sup> Camera location and angle measurements were not recorded.

Appendix A

Photographs



**Figure A-1 Pre-Test Front View**



**Figure A-2 Post-Test Front View**



**Figure A-3 Pre-Test Left Front View**



**Figure A-4 Post-Test Left Front View**



**Figure A-5 Pre-Test Left Side View**



**Figure A-6 Post-Test Left Side View**



**Figure A-7 Pre-Test Left Side Close-up View**



**Figure A-8 Post-Test Left Side Close-up View**



**Figure A-9 Pre-Test Left Rear View**



**Figure A-10 Post-Test Left Rear View**



**Figure A-11 Pre-Test Rear View**



**Figure A-12 Post-Test Rear View**

**Photograph Not Taken**

**Figure A-13 Pre-Test Right Side View**



**Figure A-14 Post-Test Right Side View**



**Figure A-15 Pre-Test Front Impact Alignment View**



**Figure A-16 Post-Test Front Impact Alignment View**



**Figure A-17 Pre-Test Rear Impact Alignment View**



**Figure A-18 Post-Test Rear Impact Alignment View**



**Figure A-19 Pre-Test Primary Impact Point View**



**Figure A-20 Post-Test Primary Impact Point View**



Figure A-21 Pre-Test Fuel Filler Cap View



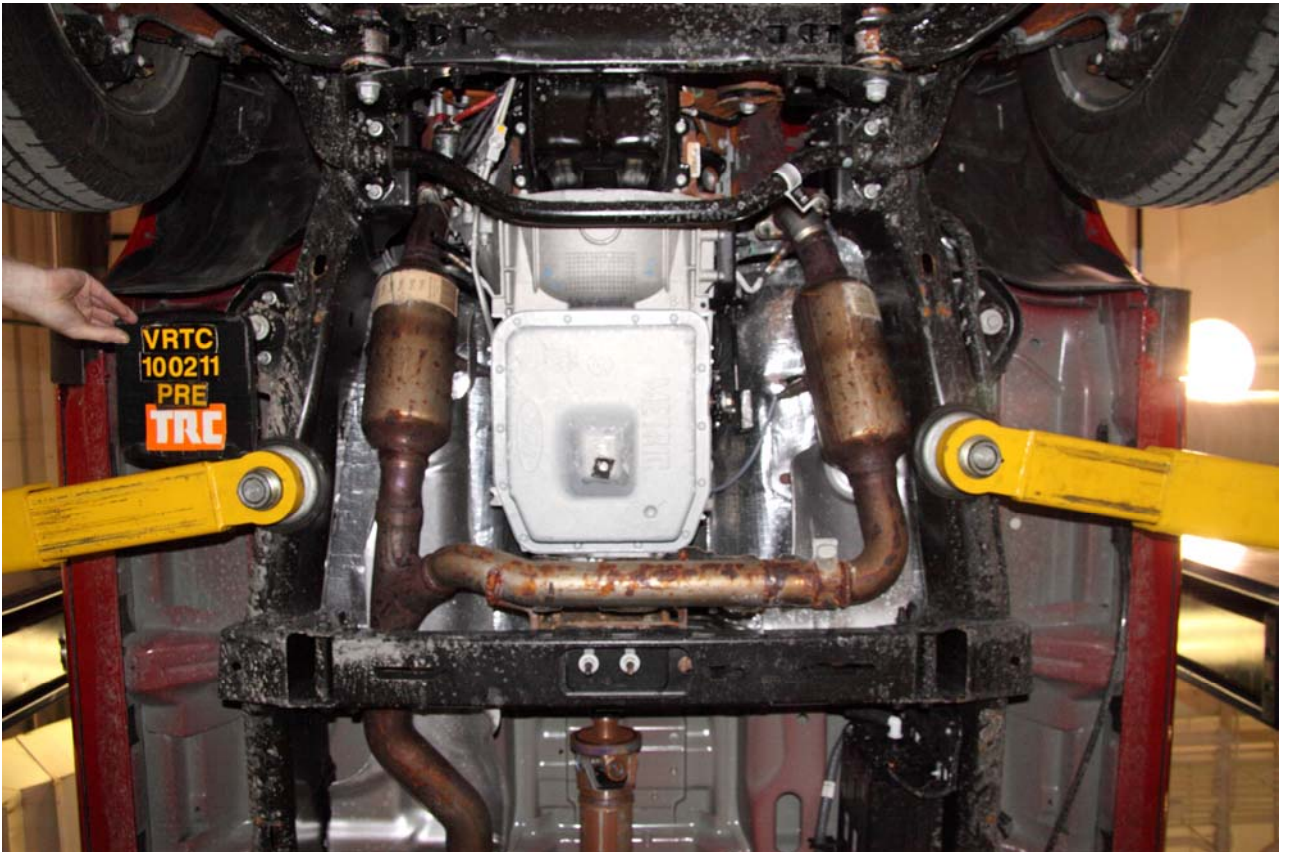
Figure A-22 Post-Test Fuel Filler Cap View



**Figure A-23 Pre-Test Front Underbody View**



**Figure A-24 Post-Test Front Underbody View**



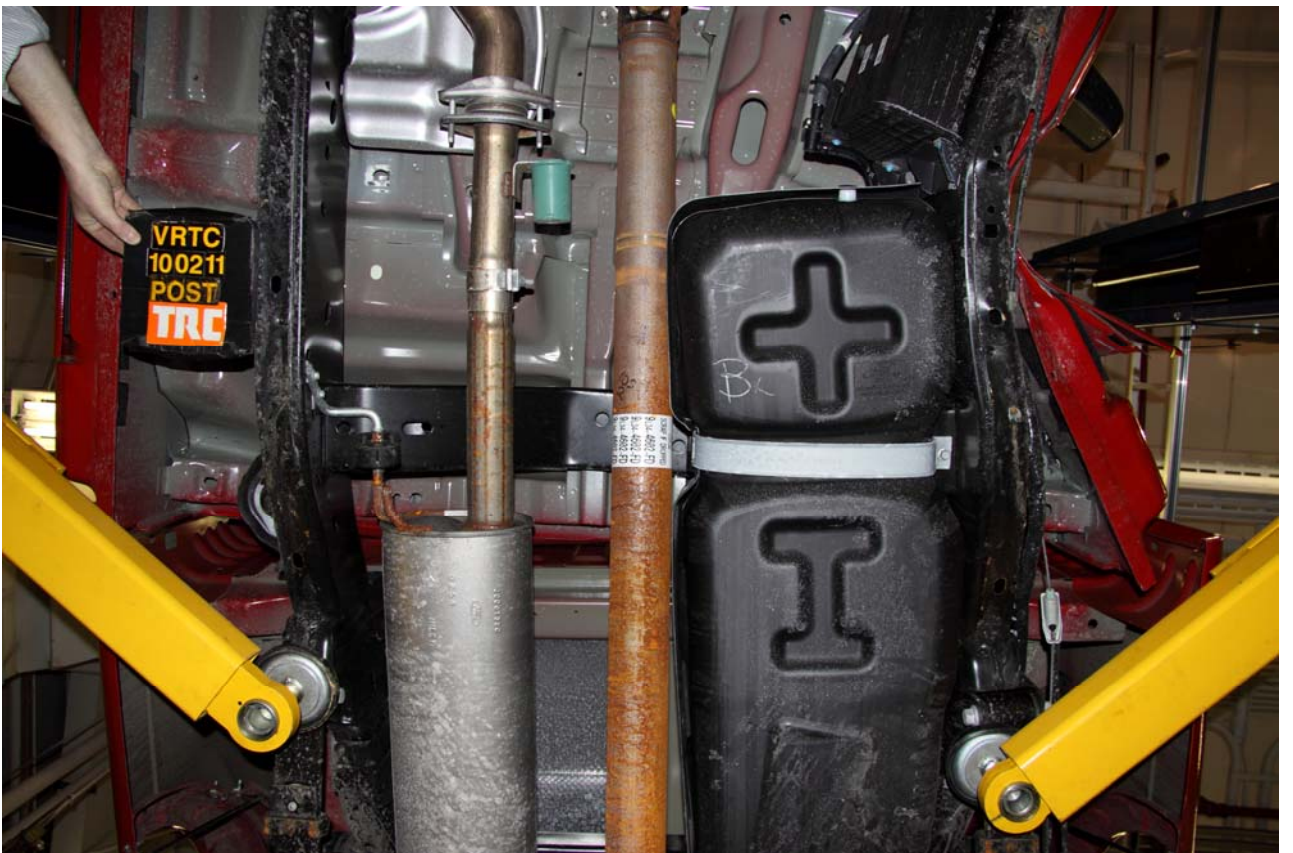
**Figure A-25 Pre-Test Mid Front Underbody View**



**Figure A-26 Post-Test Mid Front Underbody View**



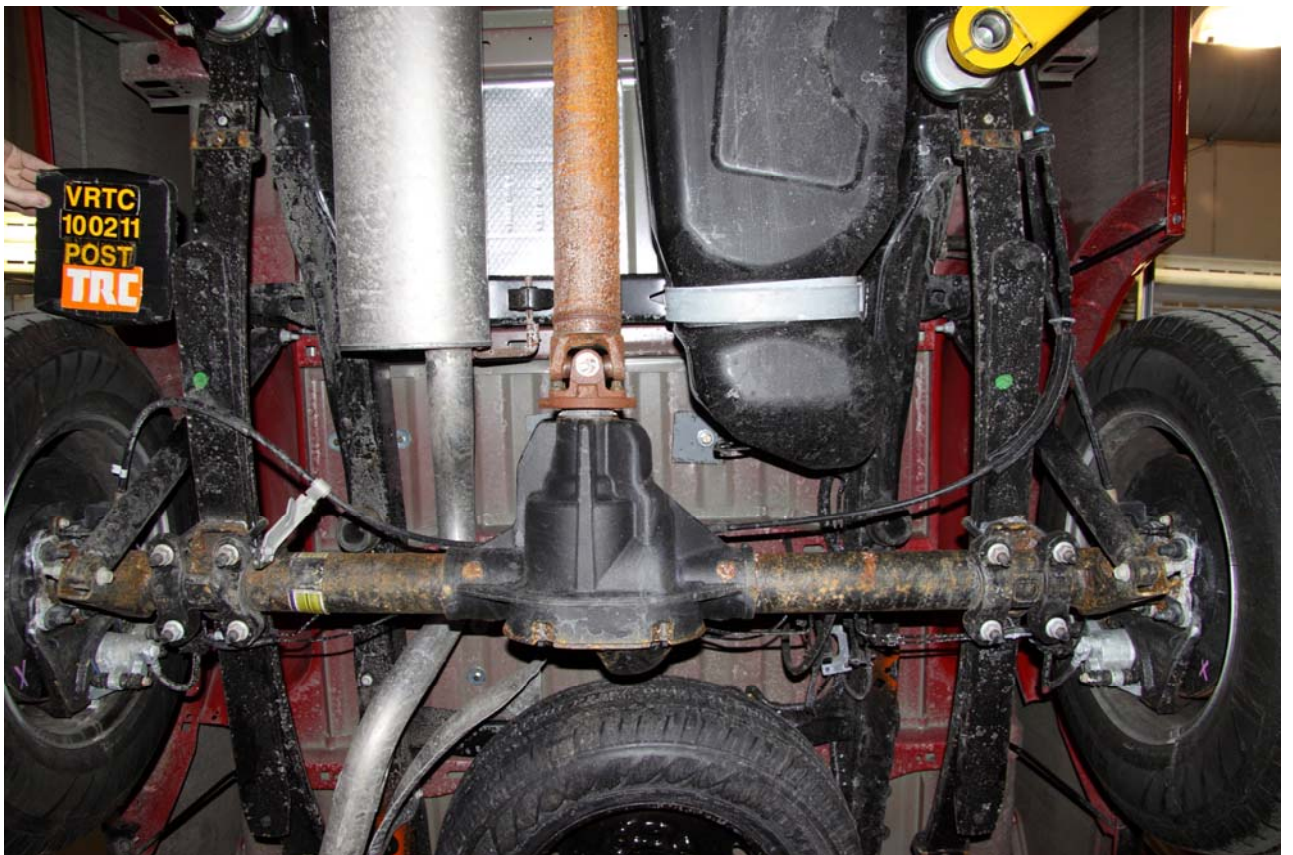
**Figure A-27 Pre-Test Mid Underbody View**



**Figure A-28 Post-Test Mid Underbody View**



**Figure A-29 Pre-Test Mid Rear Underbody View**



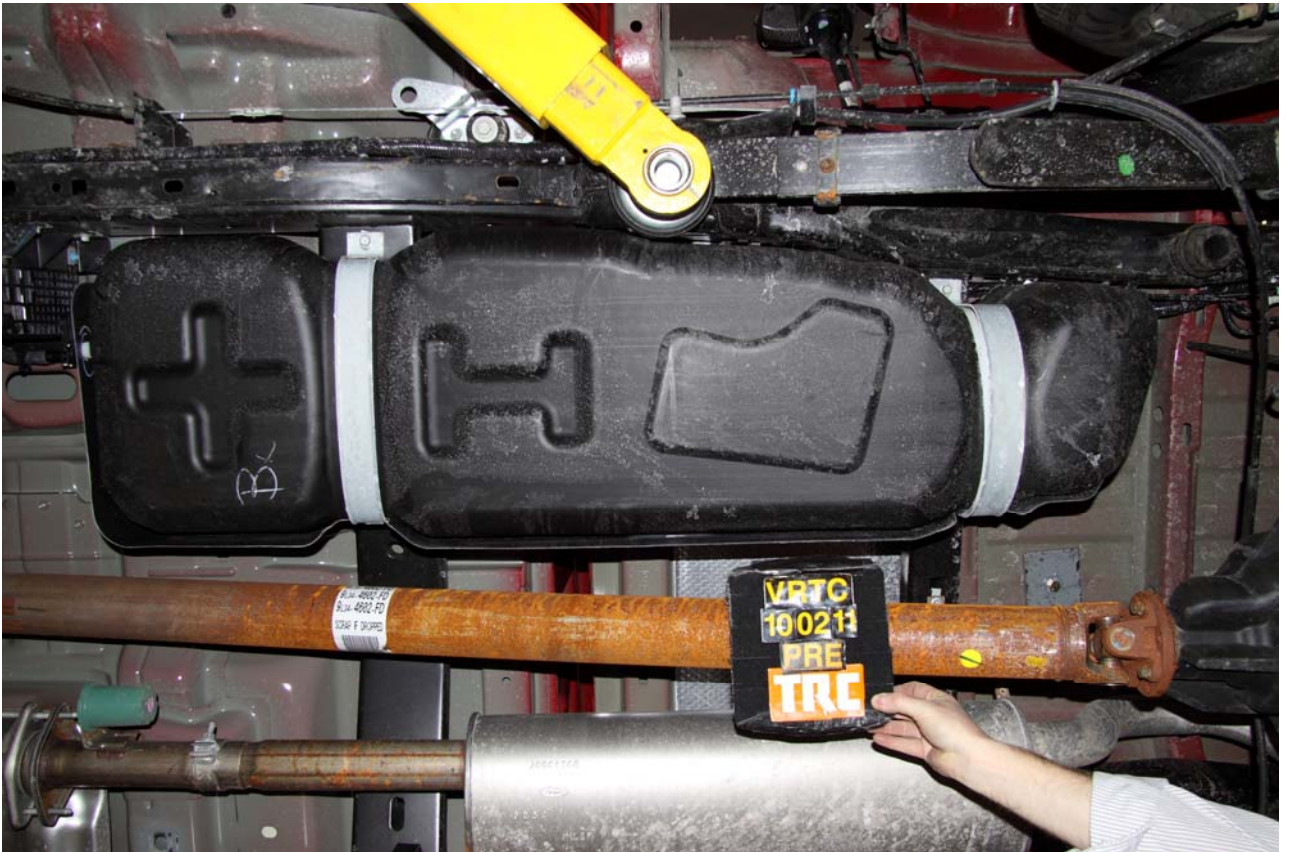
**Figure A-30 Post-Test Mid Rear Underbody View**



**Figure A-31 Pre-Test Rear Underbody View**



**Figure A-32 Post-Test Rear Underbody View**



**Figure A-33 Pre-Test Fuel Tank View**



**Figure A-34 Post-Test Fuel Tank View**



**Figure A-35 Pre-Test Fuel Filler Neck View**



**Figure A-36 Post-Test Fuel Filler Neck View**



**Figure A-37 Pre-Test Fuel Lines View**



**Figure A-38 Post-Test Fuel Lines View**



**Figure A-39 Pre-Test Driver Dummy - View 1**



**Figure A-40 Post-Test Driver Dummy - View 1**



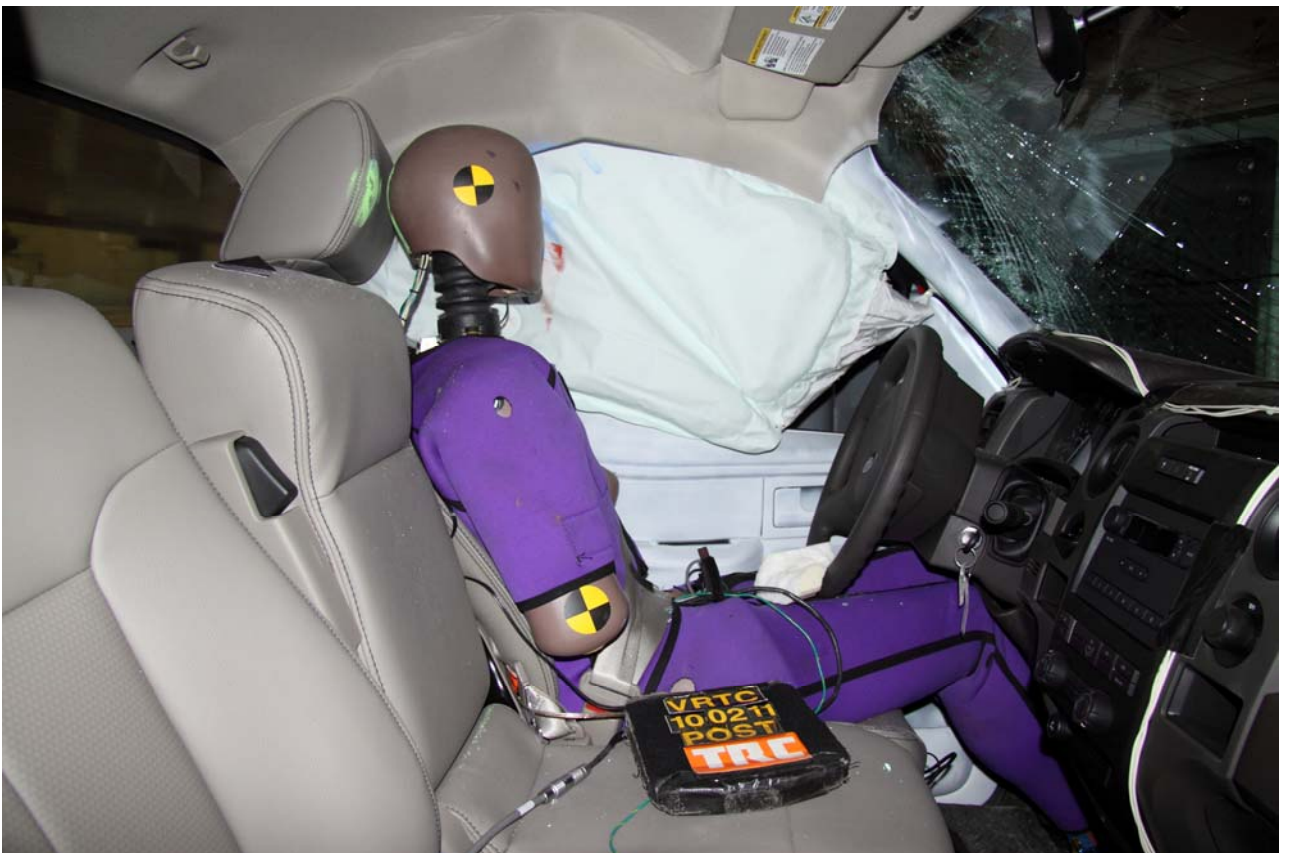
**Figure A-41 Pre-Test Driver Dummy - View 2**



**Figure A-42 Pre-Test Driver Dummy - View 3**



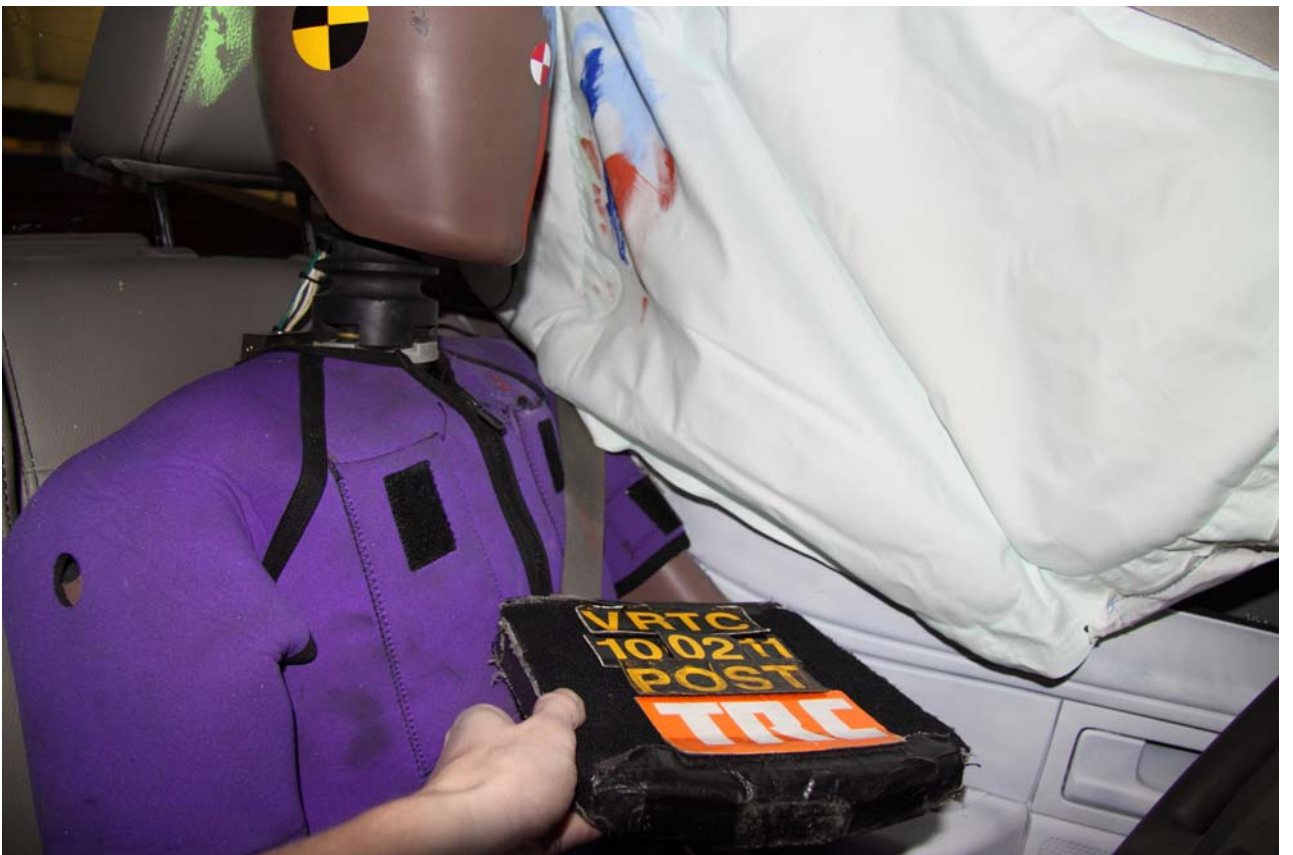
**Figure A-43 Pre-Test Driver Dummy - View 4**



**Figure A-44 Post-Test Driver Dummy - View 4**



**Figure A-45 Pre-Test Driver Dummy - View 5**



**Figure A-46 Post-Test Driver Dummy - View 5**



**Figure A-47 Pre-Test Driver Dummy - View 6**



**Figure A-48 Post-Test Driver Dummy - View 6**



**Figure A-49 Pre-Test Driver Door Panel View**



**Figure A-50 Post-Test Driver Door Panel View**



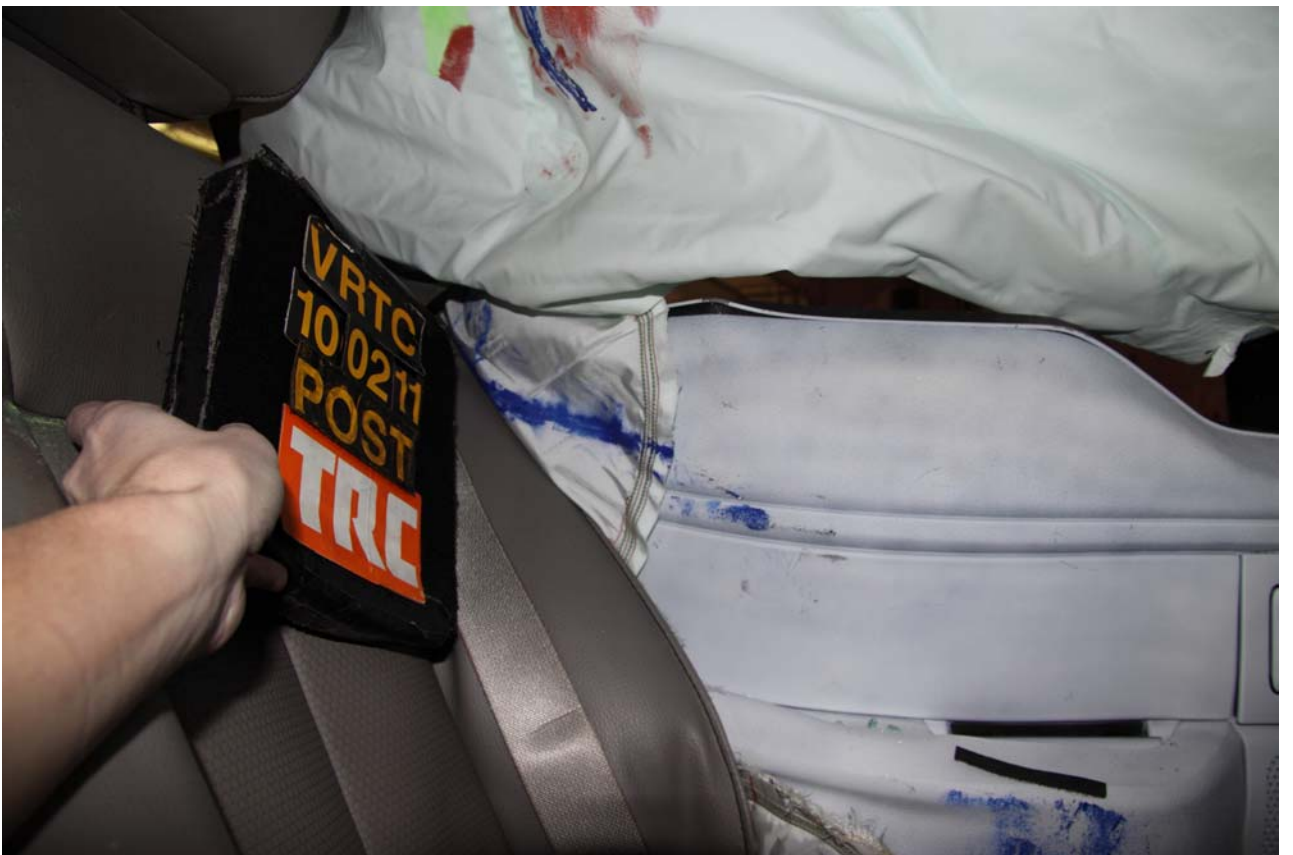
**Figure A-51 Post-Test Driver Dummy Overall View**



**Figure A-52 Post-Test Driver Dummy Contact - View 1**



**Figure A-53 Post-Test Driver Dummy Contact - View 2**



**Figure A-54 Post-Test Driver Dummy Contact - View 3**



**Figure A-55 Post-Test Driver Dummy Contact - View 4**



**Figure A-56 Vehicle Certification Label**

Appendix B

Data Plots



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

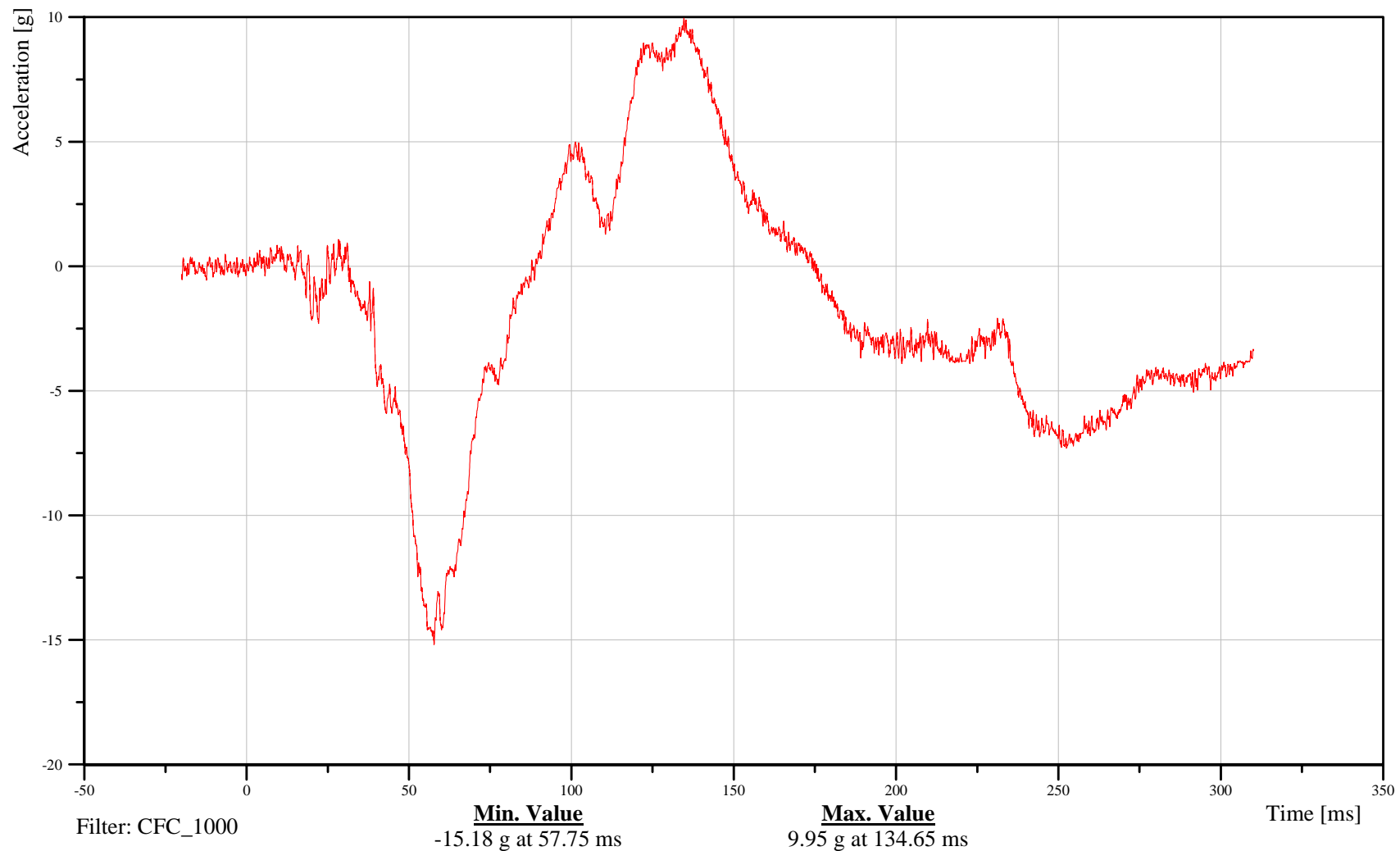
## Head X-Axis Acceleration

Customer: VRTC

# 11HEADCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-2

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

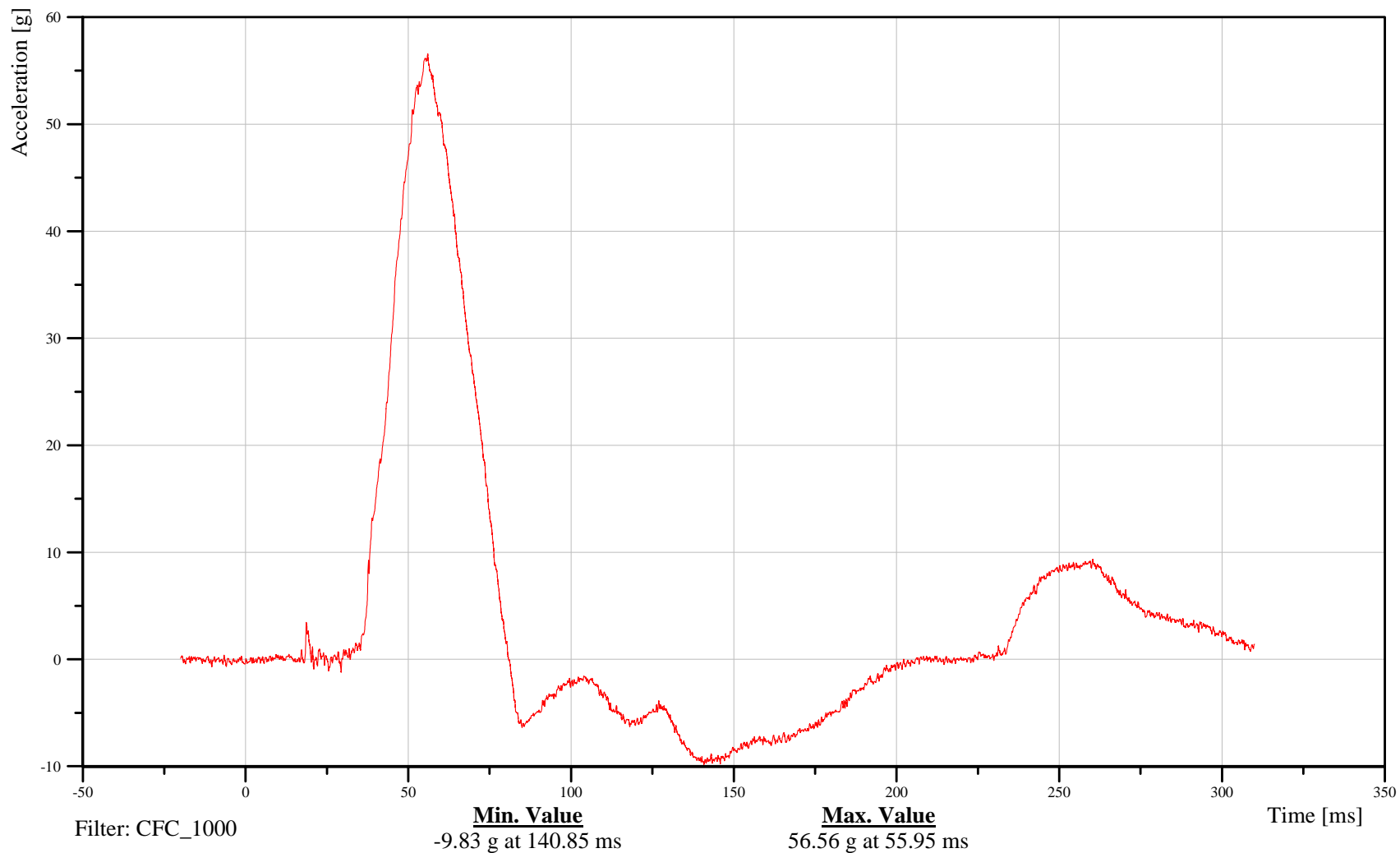
## Head Y-Axis Acceleration

Customer: VRTC

# 11HEADCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-3

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

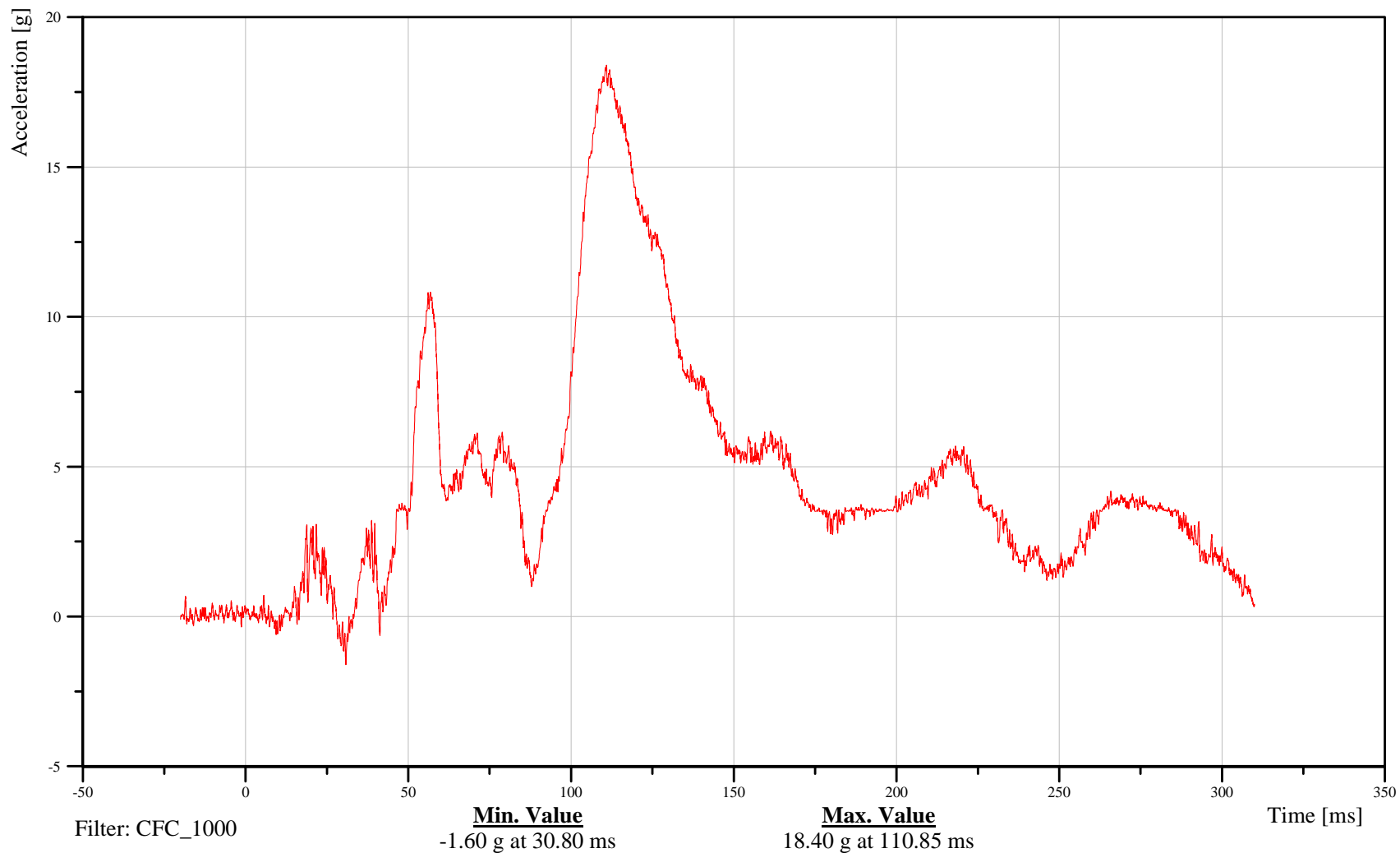
## Head Z-Axis Acceleration

Customer: VRTC

# 11HEADCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-4

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

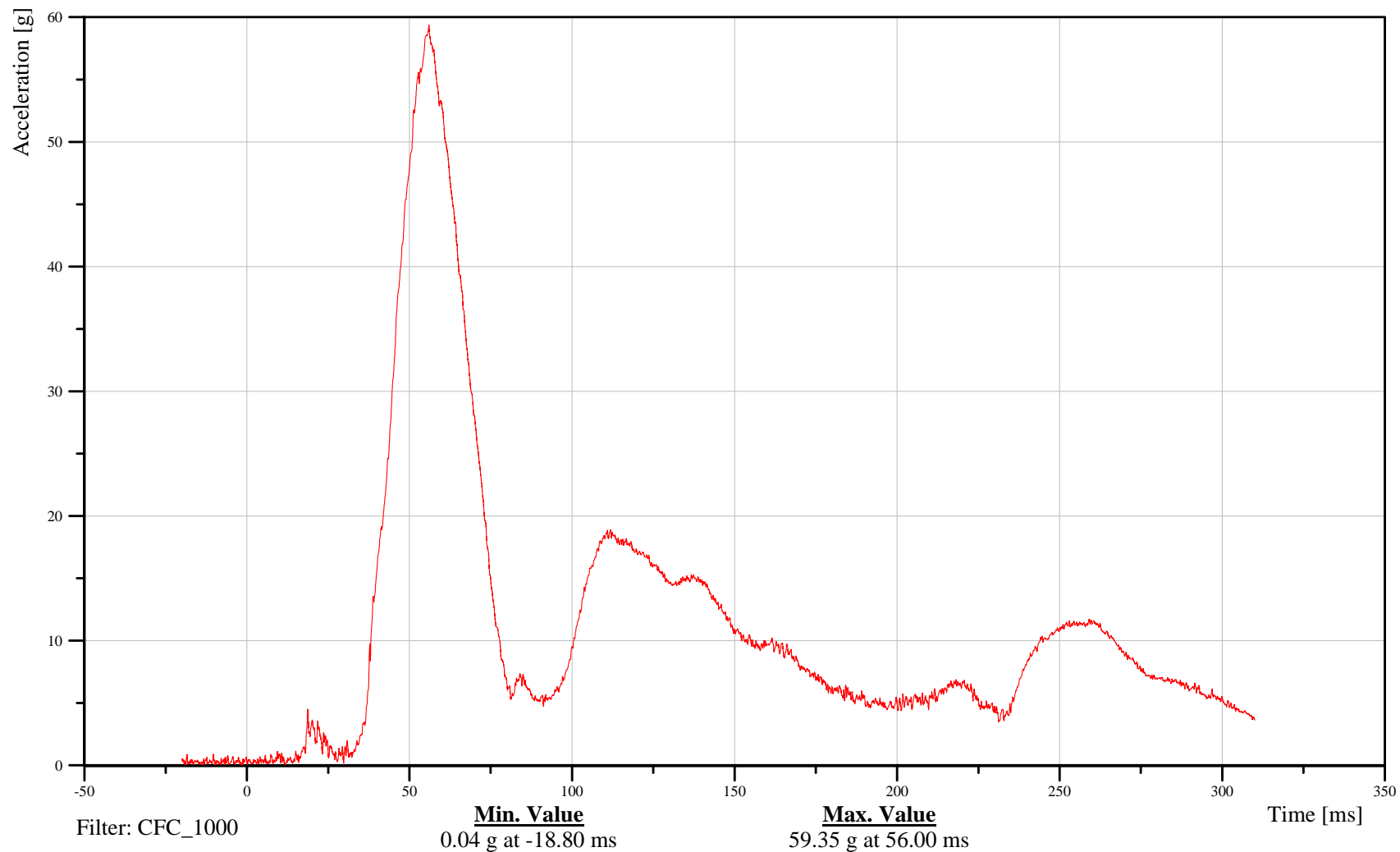
## Head Resultant Acceleration

Customer: VRTC

# 11HEADCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-5

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

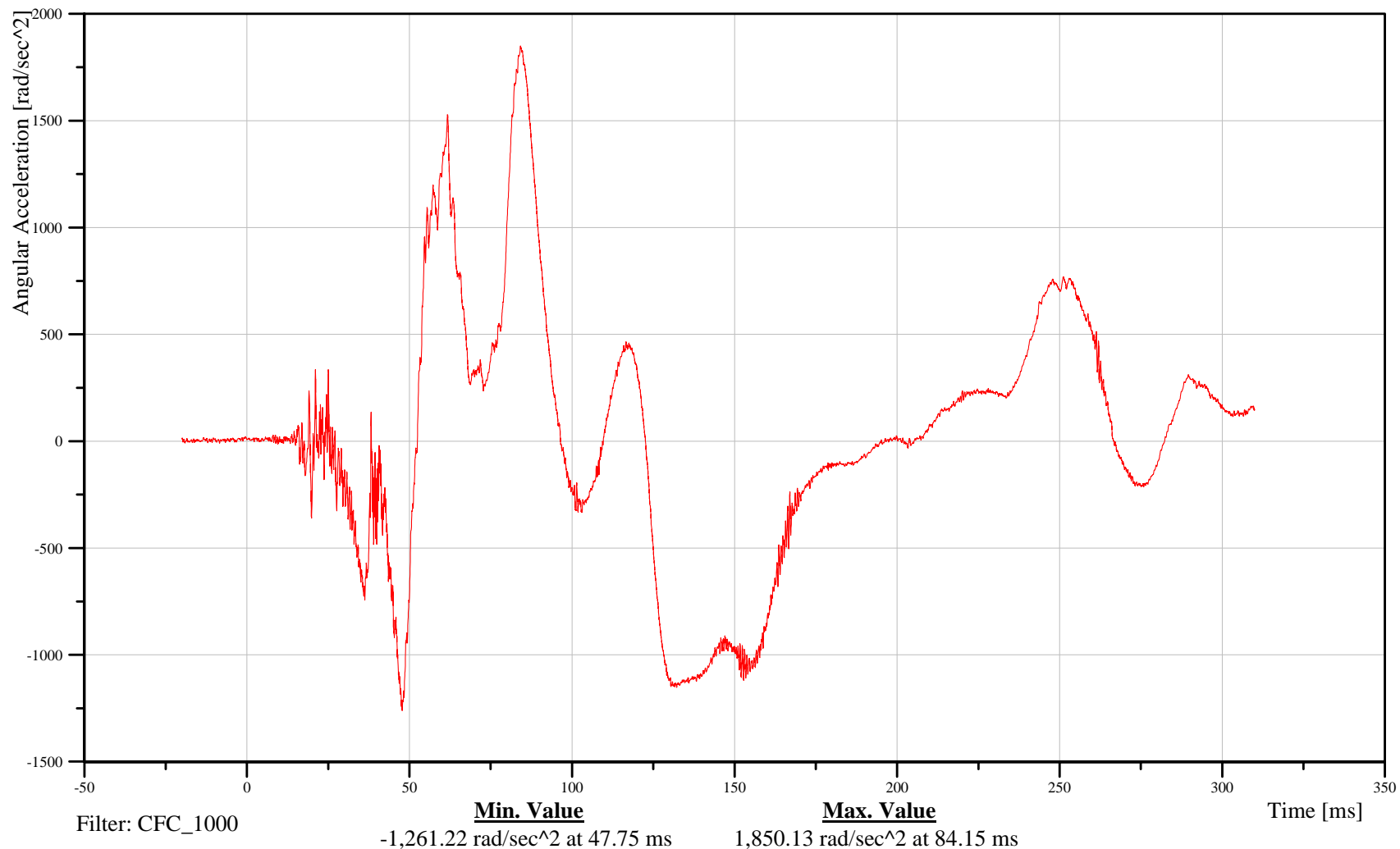
## Head X-Axis Angular Displacement

Customer: VRTC

# 11HEADCG00WSANXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-6

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

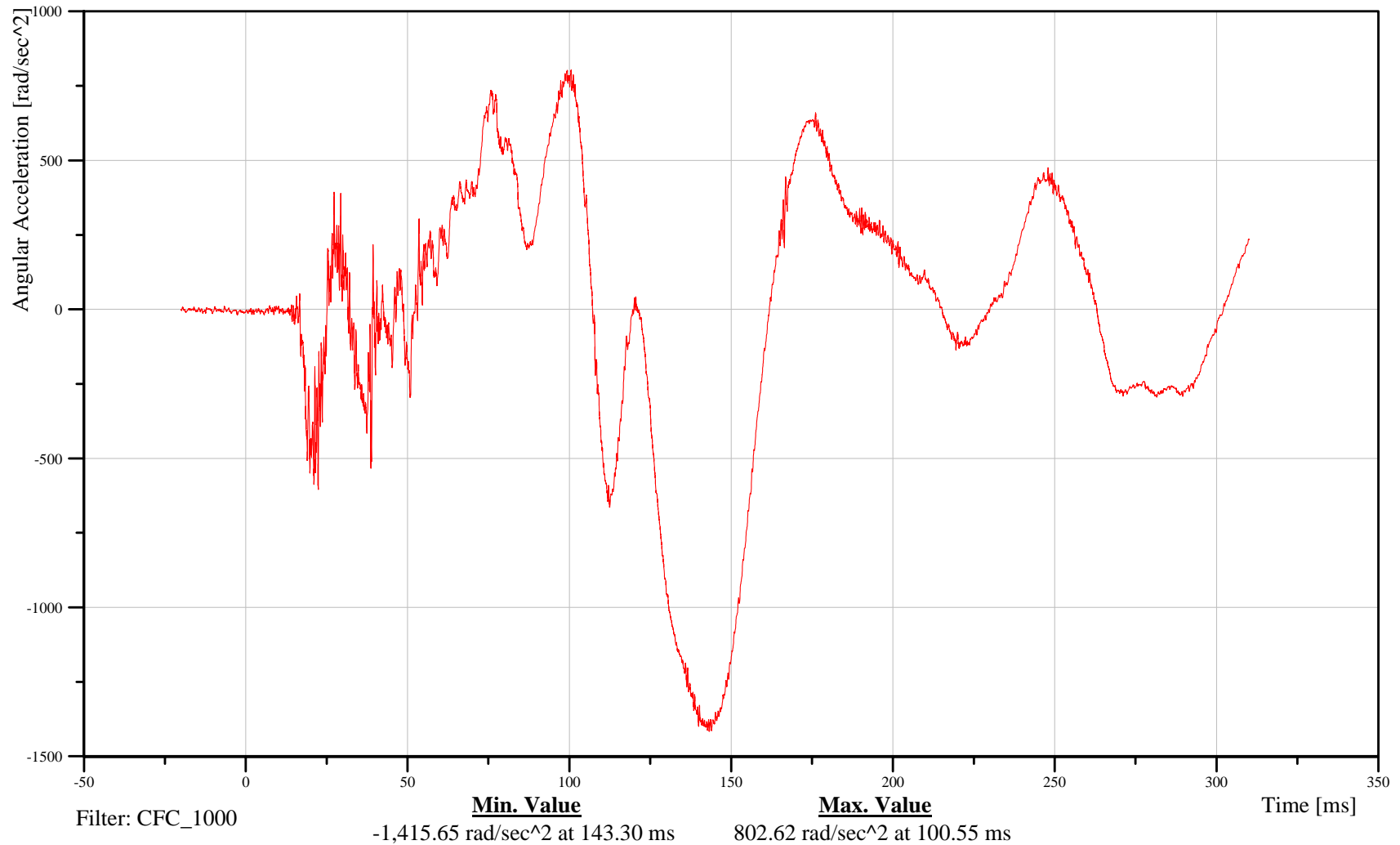
## Head Y-Axis Angular Displacement

Customer: VRTC

# 11HEADCG00WSANYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-7

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

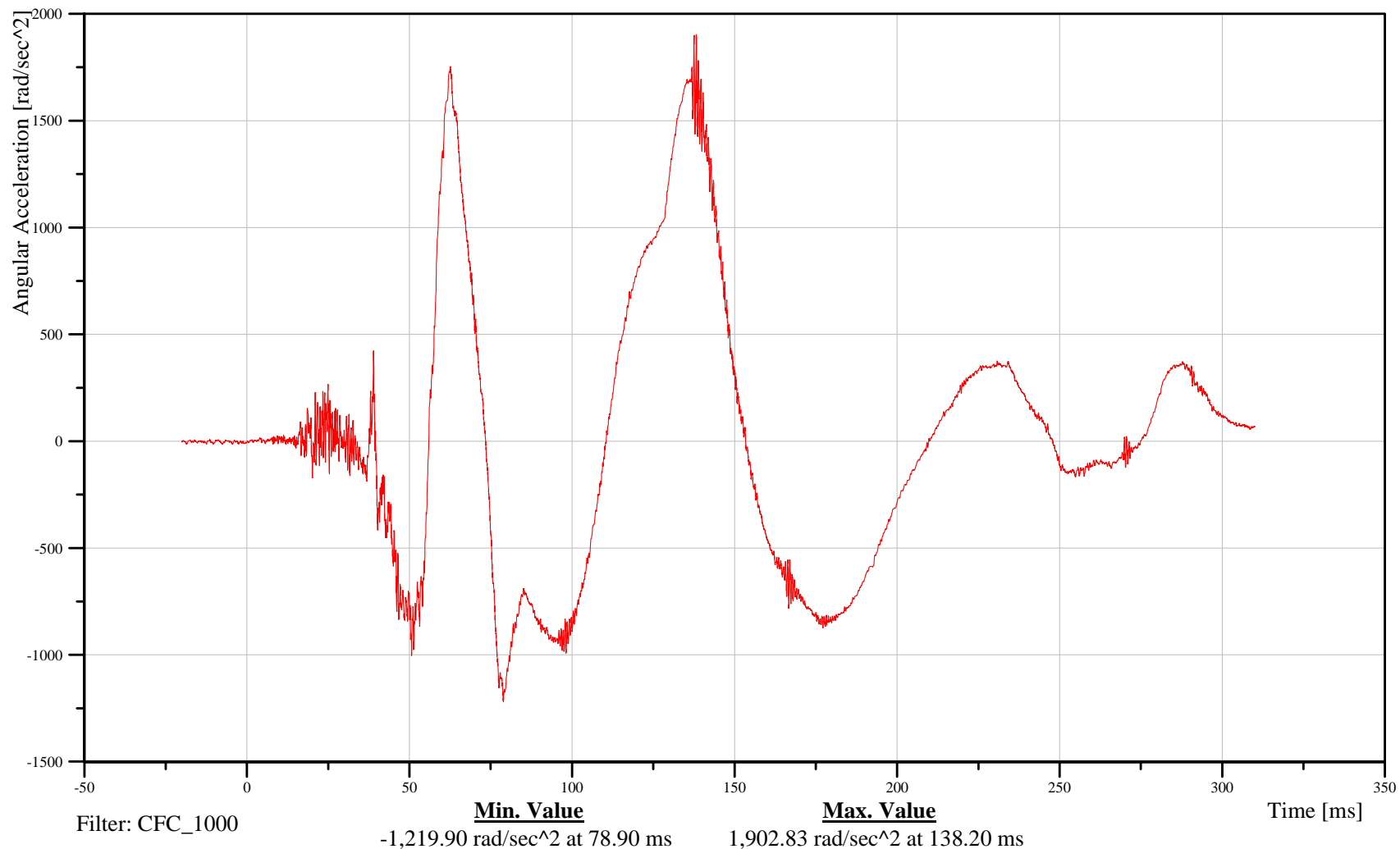
## Head Z-Axis Angular Displacement

Customer: VRTC

# 11HEADCG00WSANZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-8

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

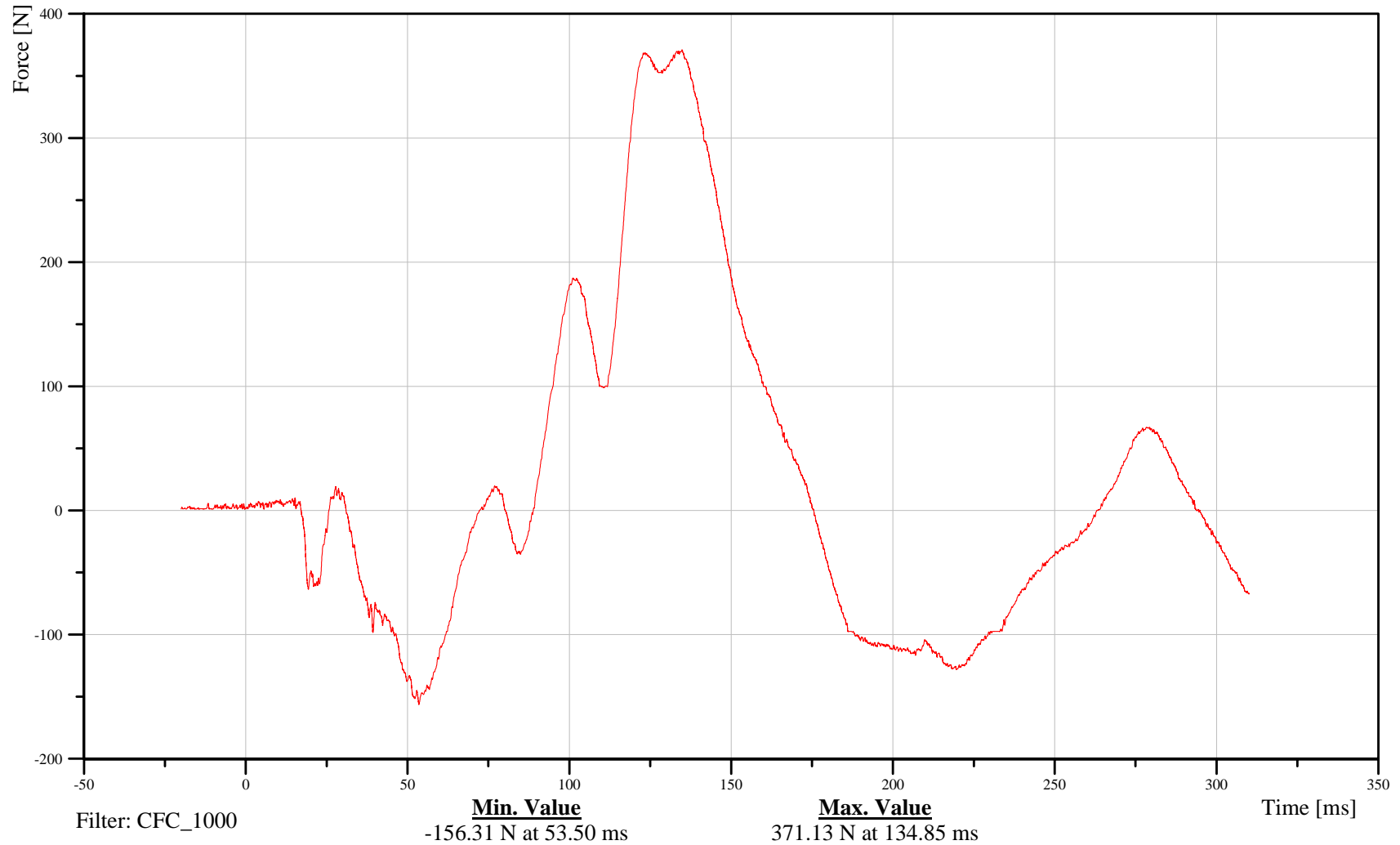
## Upper Neck X-Axis Force

Customer: VRTC

# 11NECKUP00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-9

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

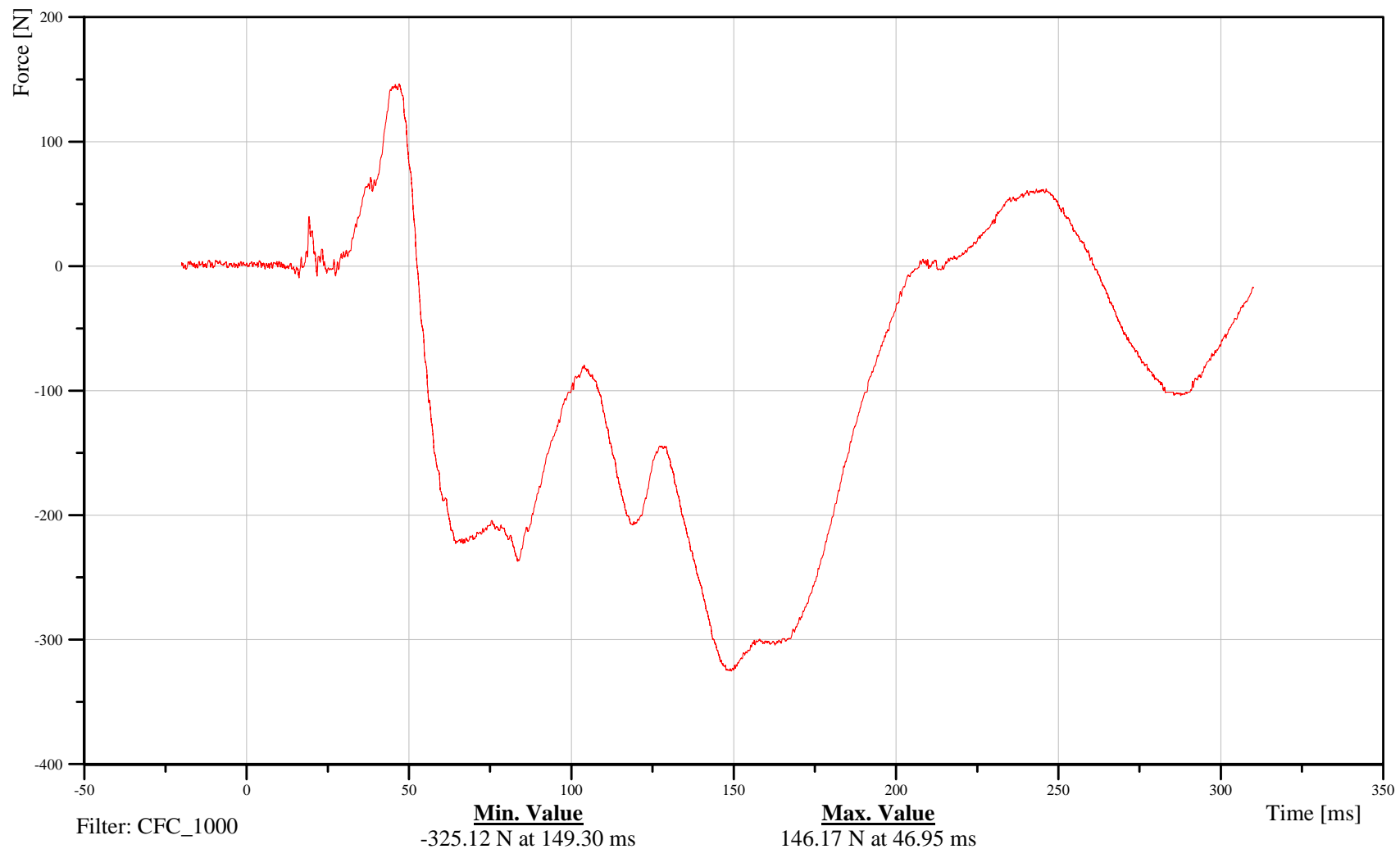
## Upper Neck Y-Axis Force

Customer: VRTC

# 11NECKUP00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-10

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

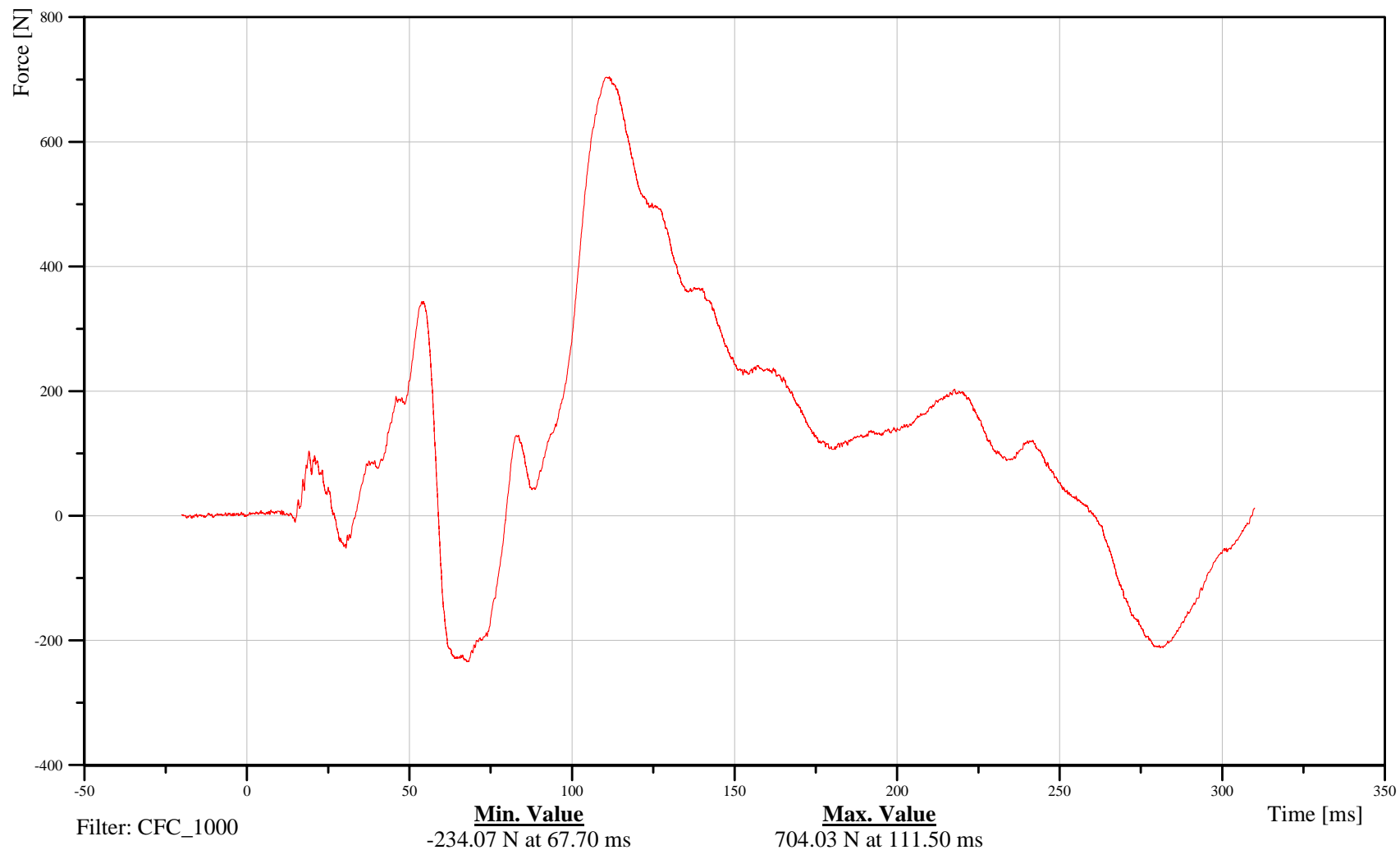
## Upper Neck Z-Axis Force

Customer: VRTC

# 11NECKUP00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-11

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

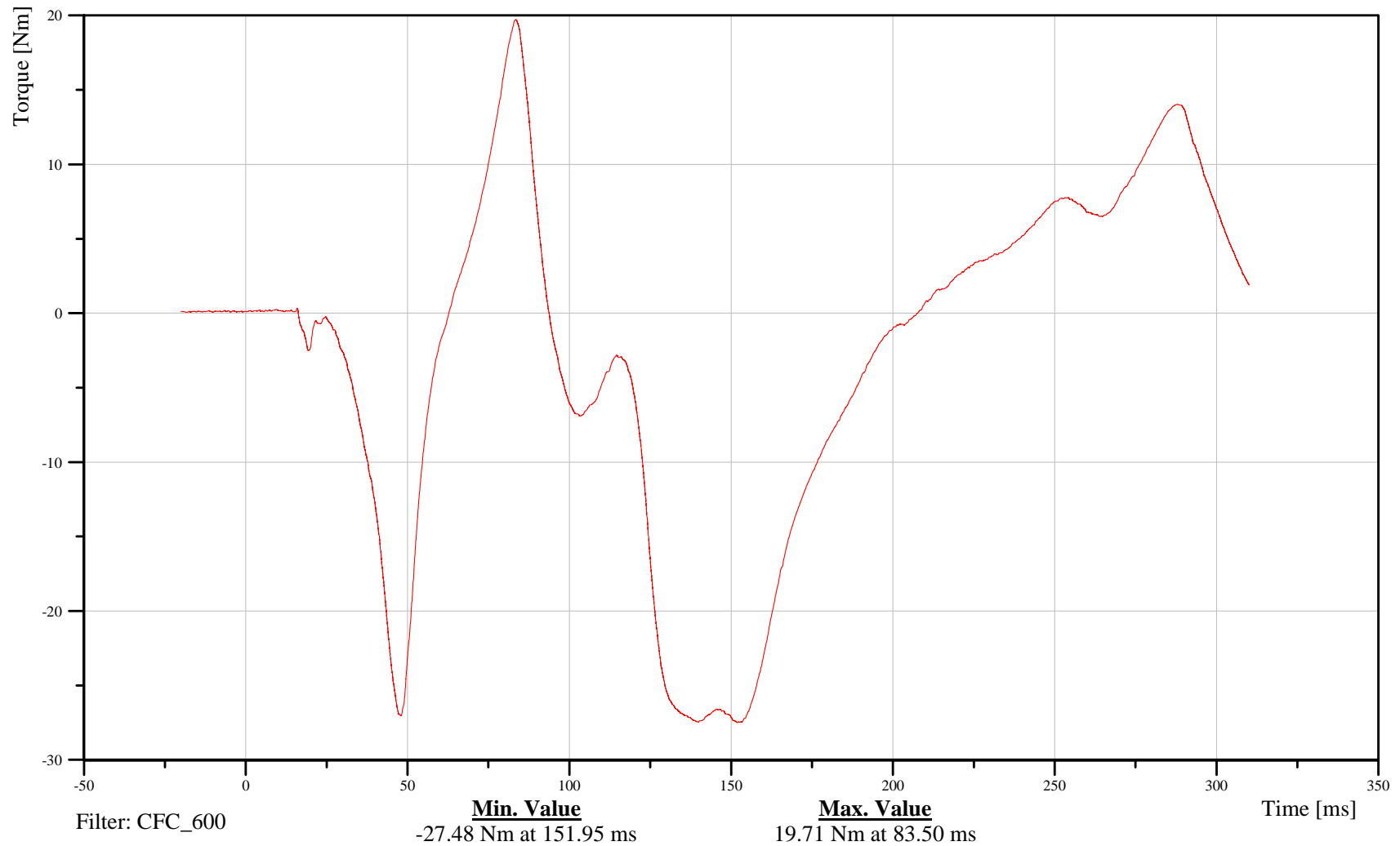
## Upper Neck Moment About X Axis

Customer: VRTC

### 11NECKUP00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-12

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

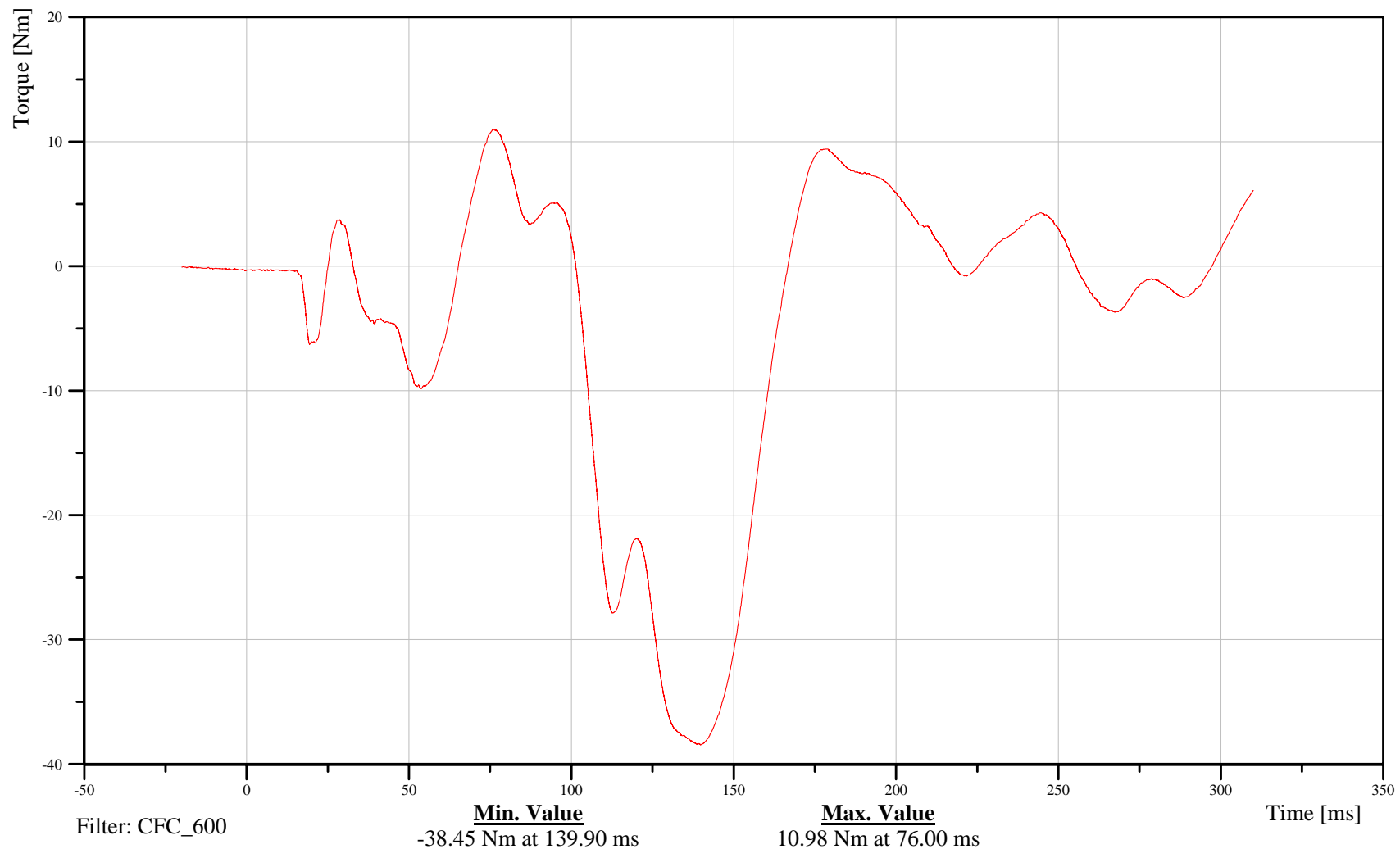
## Upper Neck Moment About Y Axis

Customer: VRTC

# 11NECKUP00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-13

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

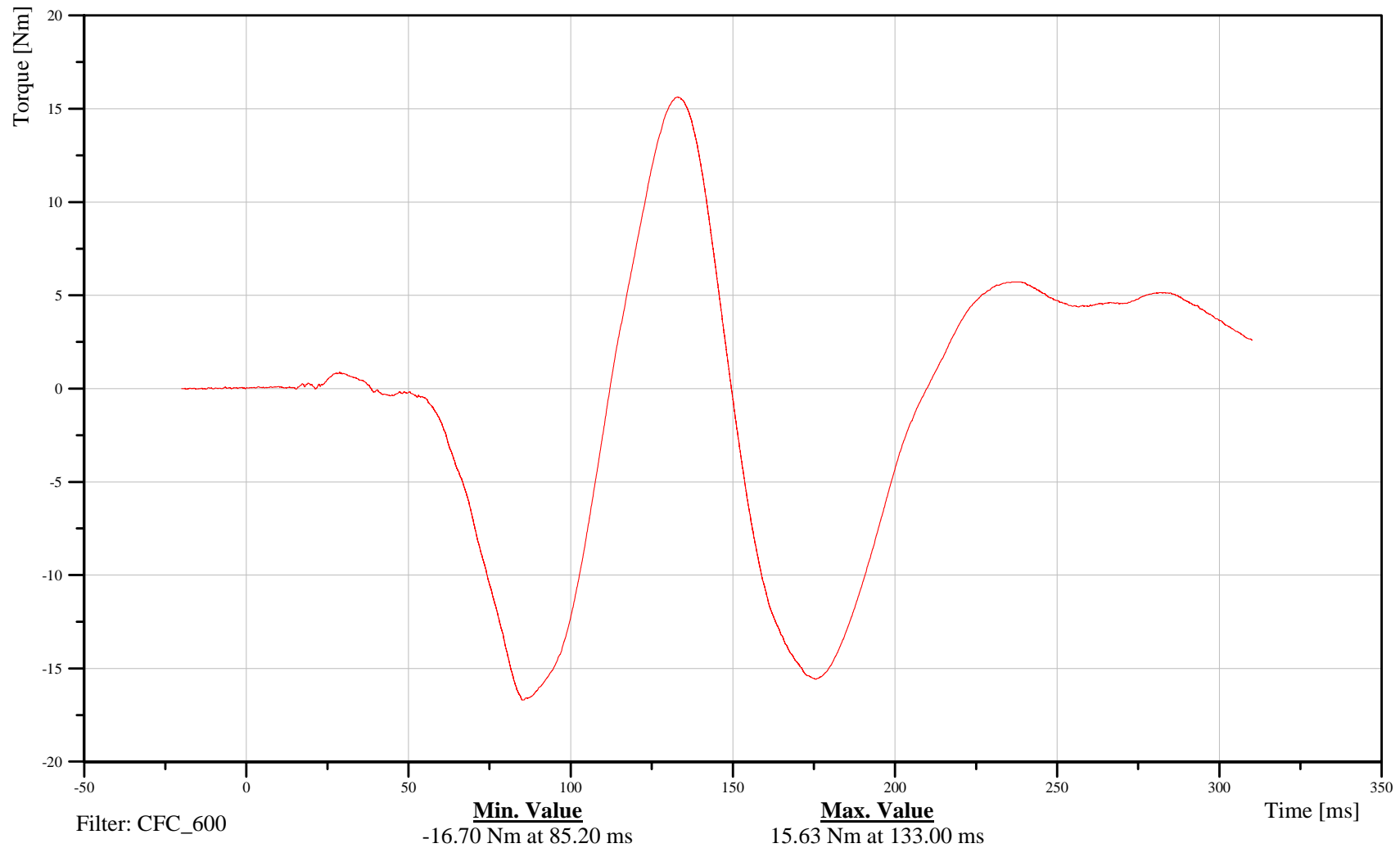
## Upper Neck Moment About Z Axis

Customer: VRTC

# 11NECKUP00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-14

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

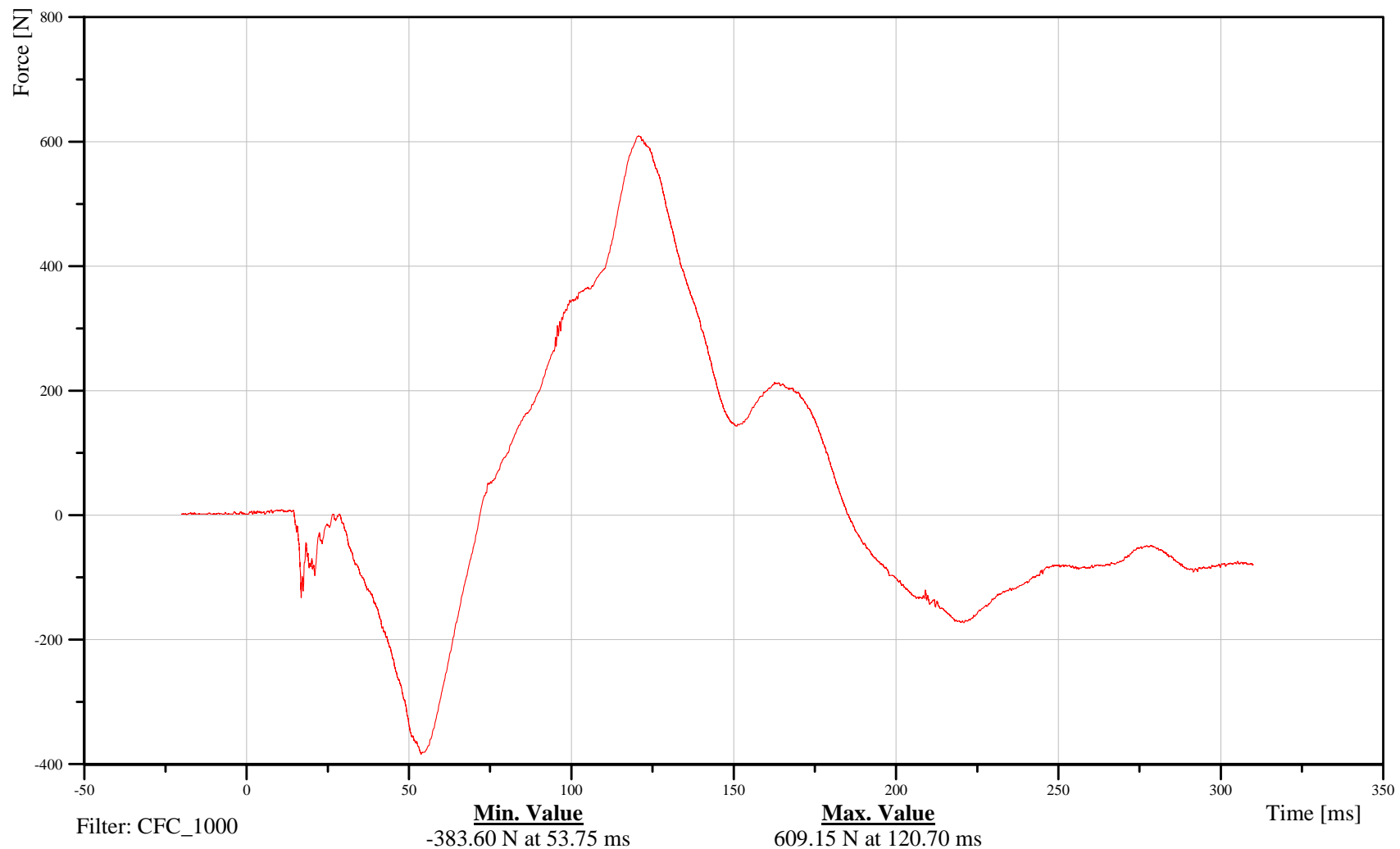
## Lower Neck X-Axis Force

Customer: VRTC

# 11NECKLO00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-15

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

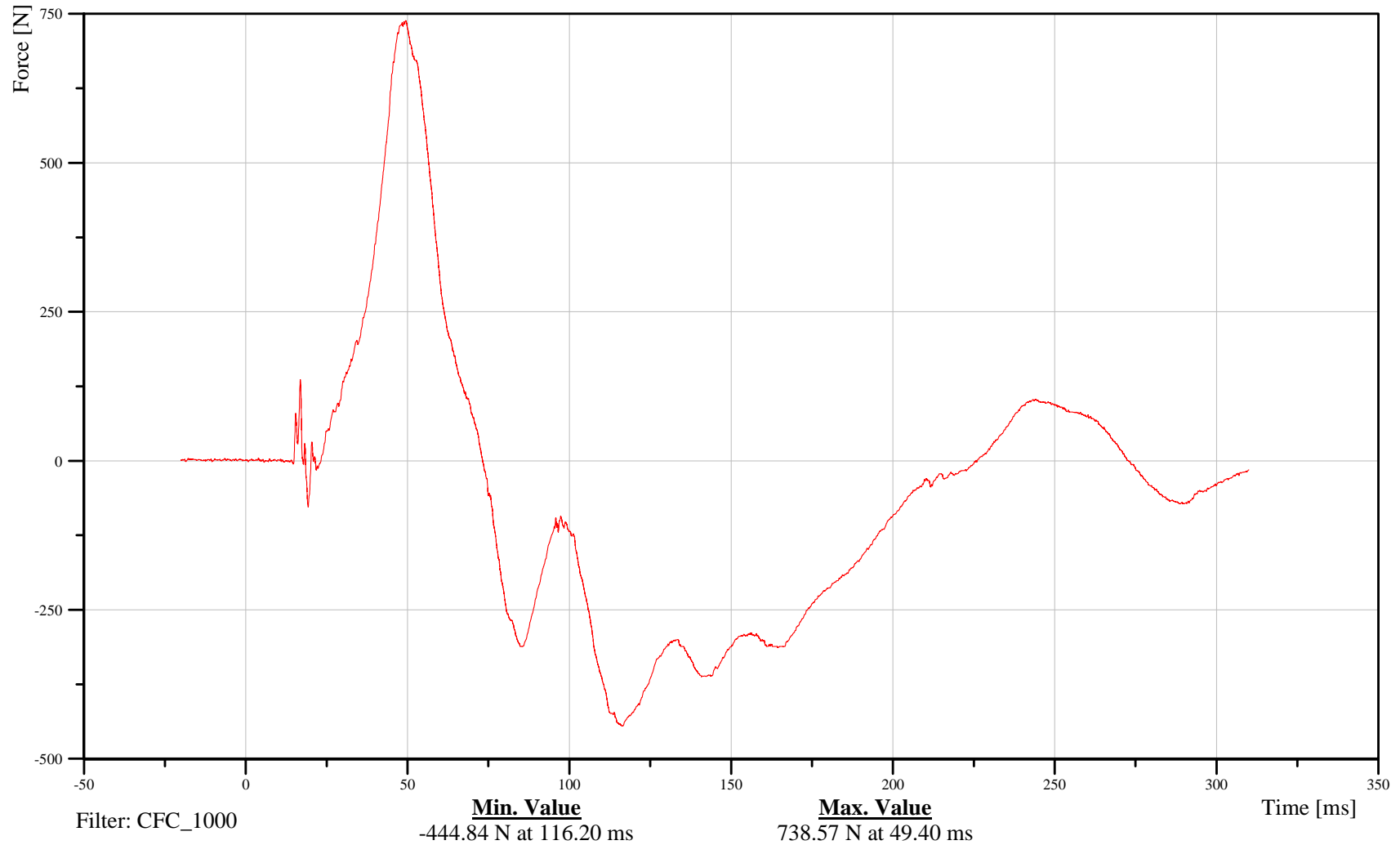
## Lower Neck Y-Axis Force

Customer: VRTC

# 11NECKLO00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-16

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

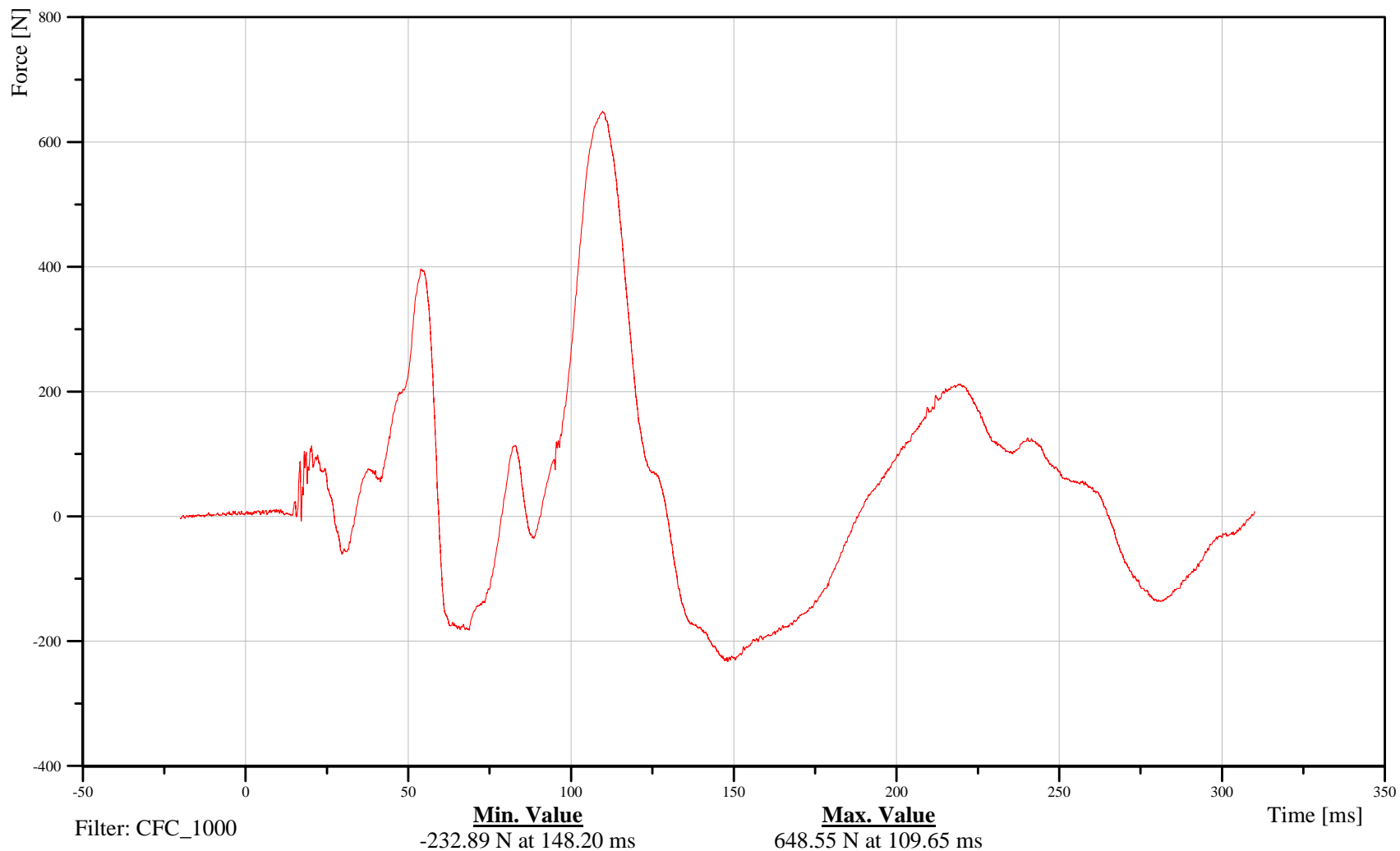
## Lower Neck Z-Axis Force

Customer: VRTC

# 11NECKLO00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-17

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

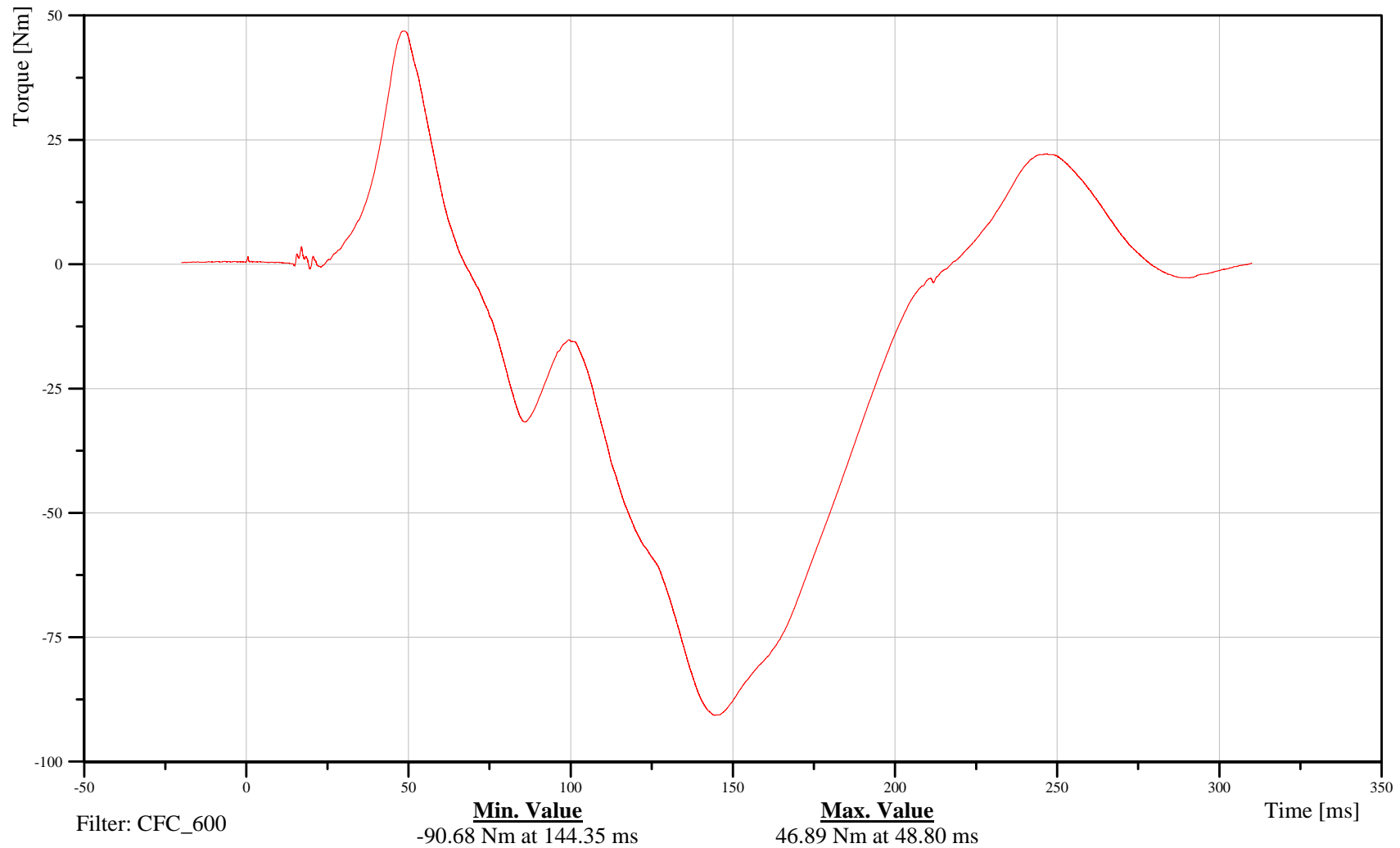
## Lower Neck Moment About X Axis

Customer: VRTC

# 11NECKLO00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-18

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

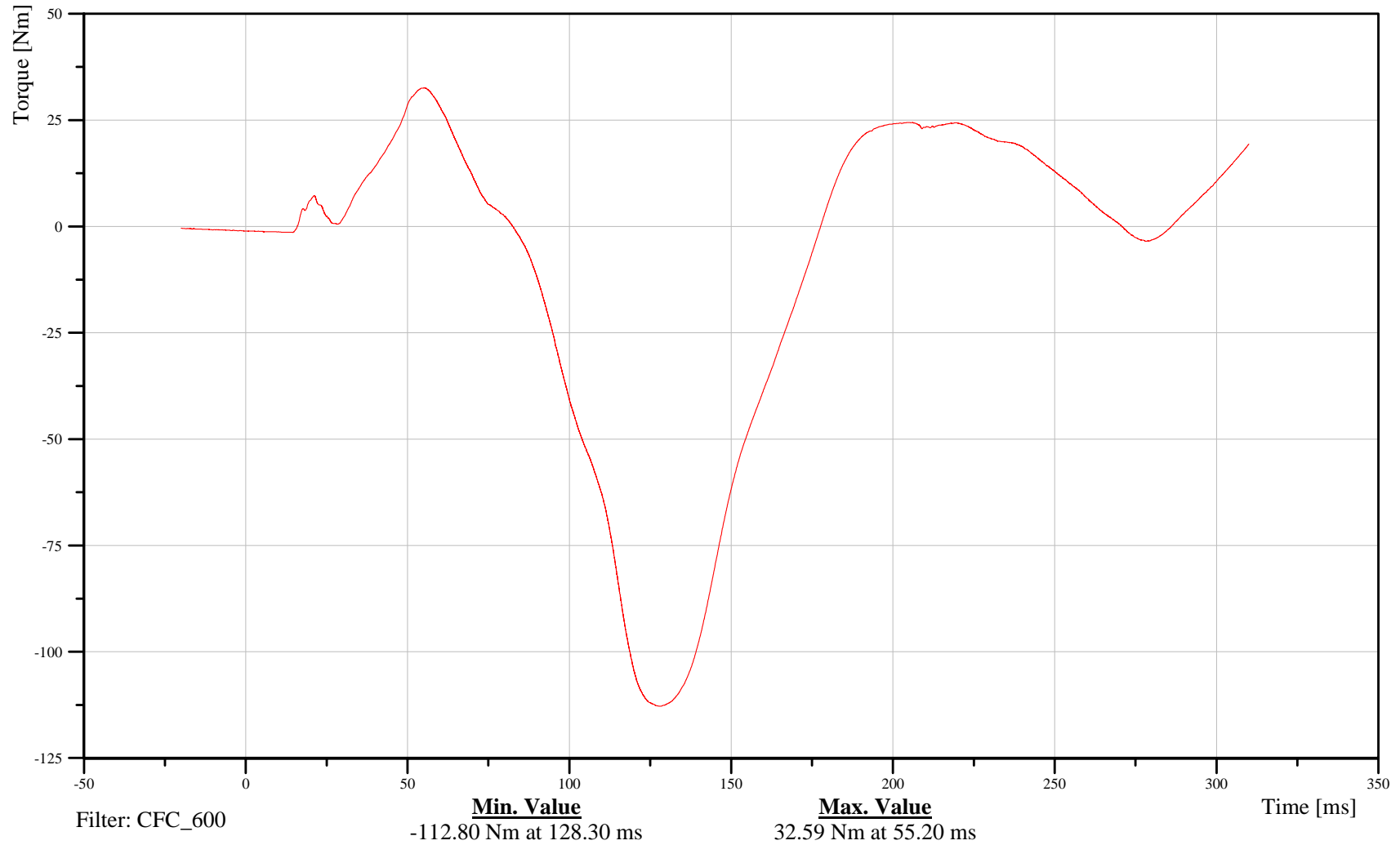
## Lower Neck Moment About Y Axis

Customer: VRTC

# 11NECKLO00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-19

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

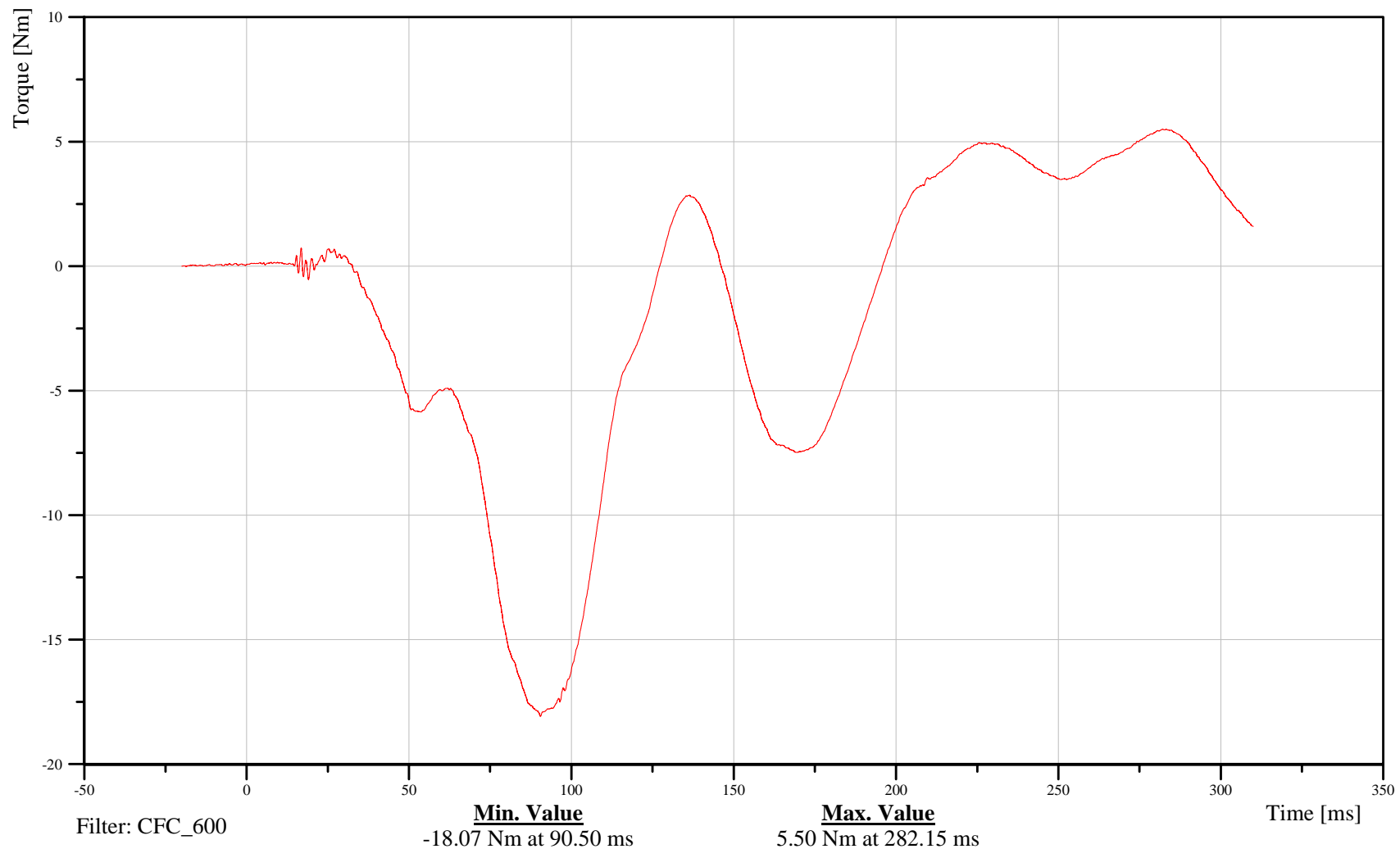
## Lower Neck Moment About Z Axis

Customer: VRTC

# 11NECKLO00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-20

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

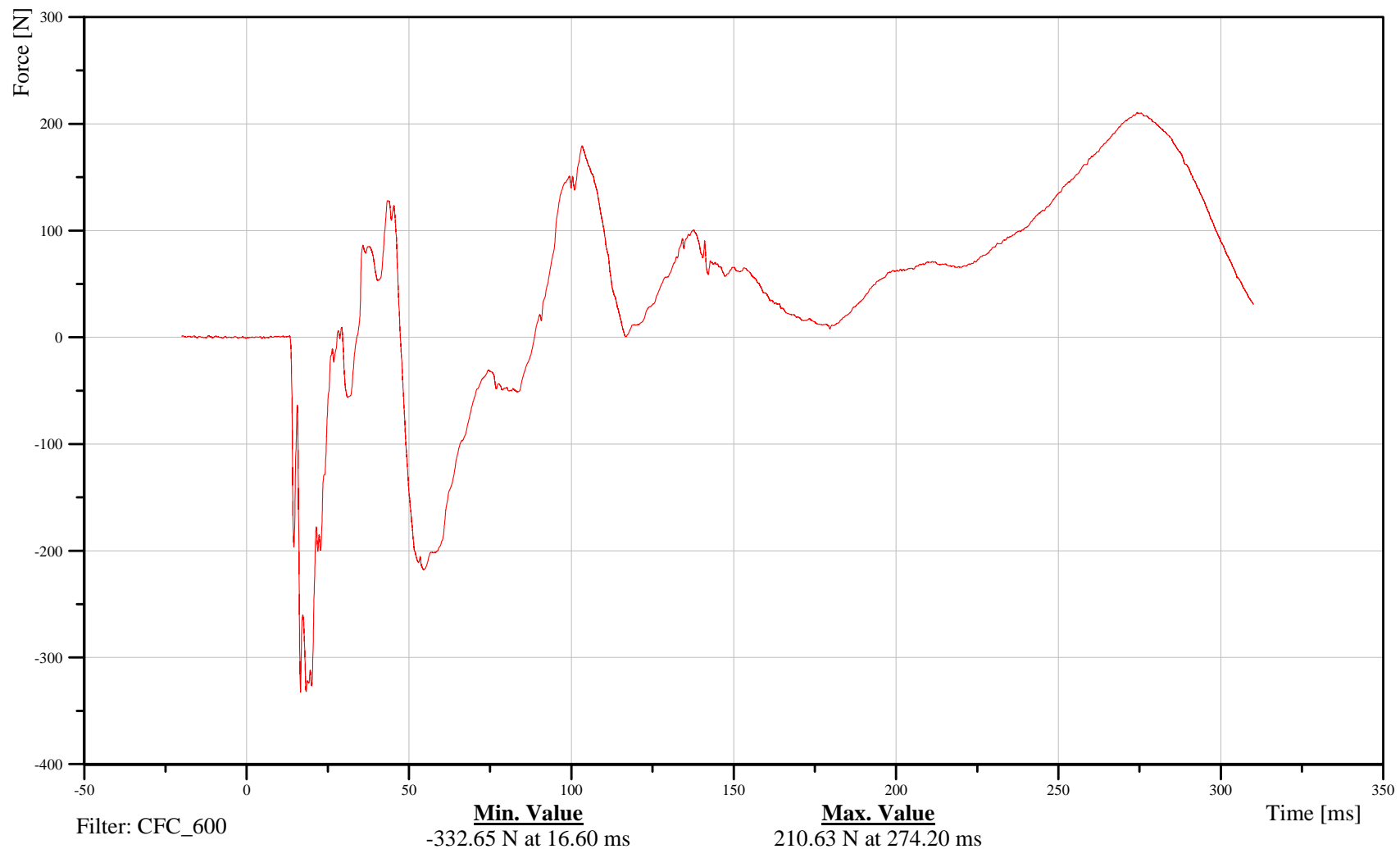
## Shoulder X-Axis Force

Customer: VRTC

# 11SHLDLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-21

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

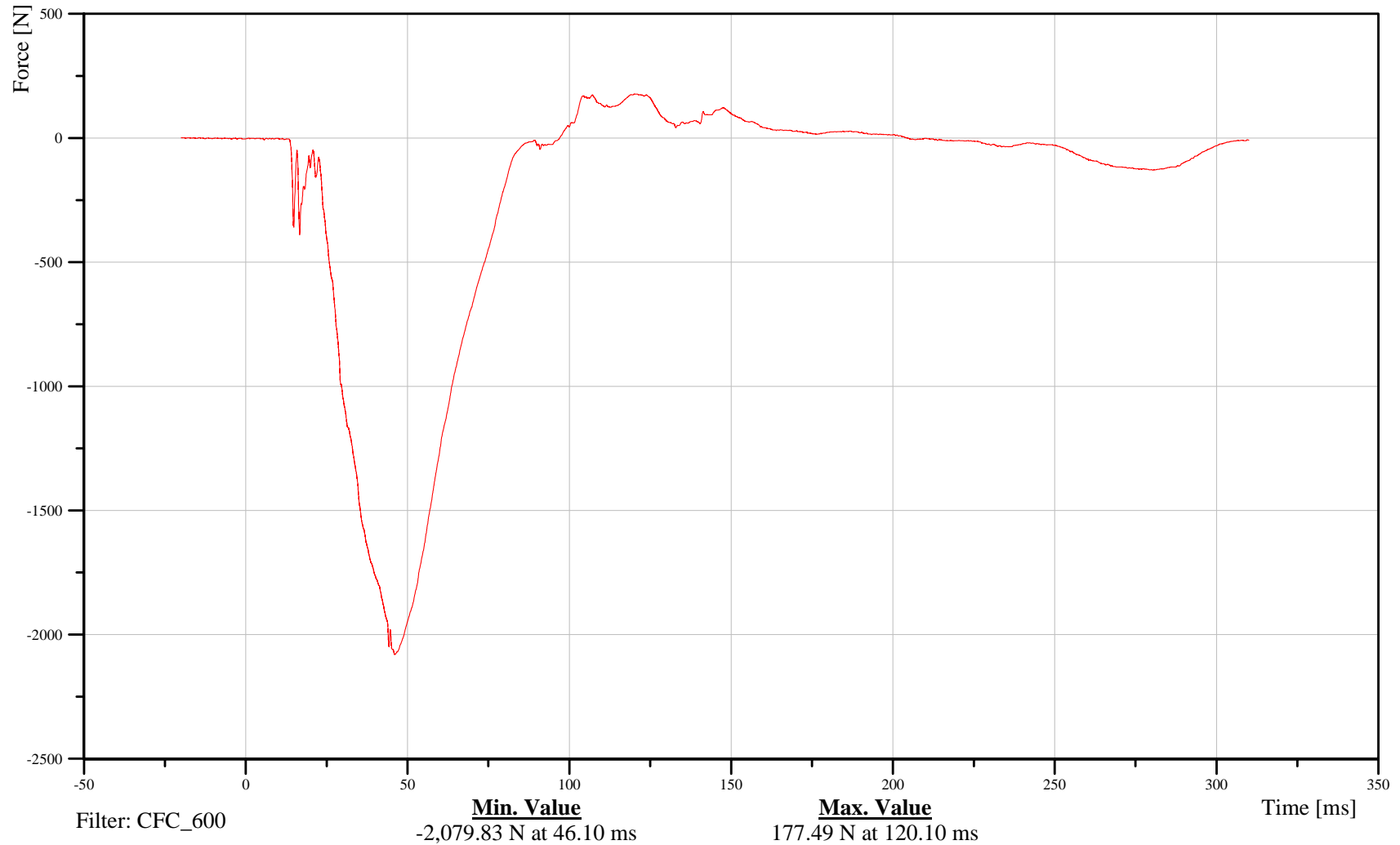
## Shoulder Y-Axis Force

Customer: VRTC

# 11SHLDLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-22

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

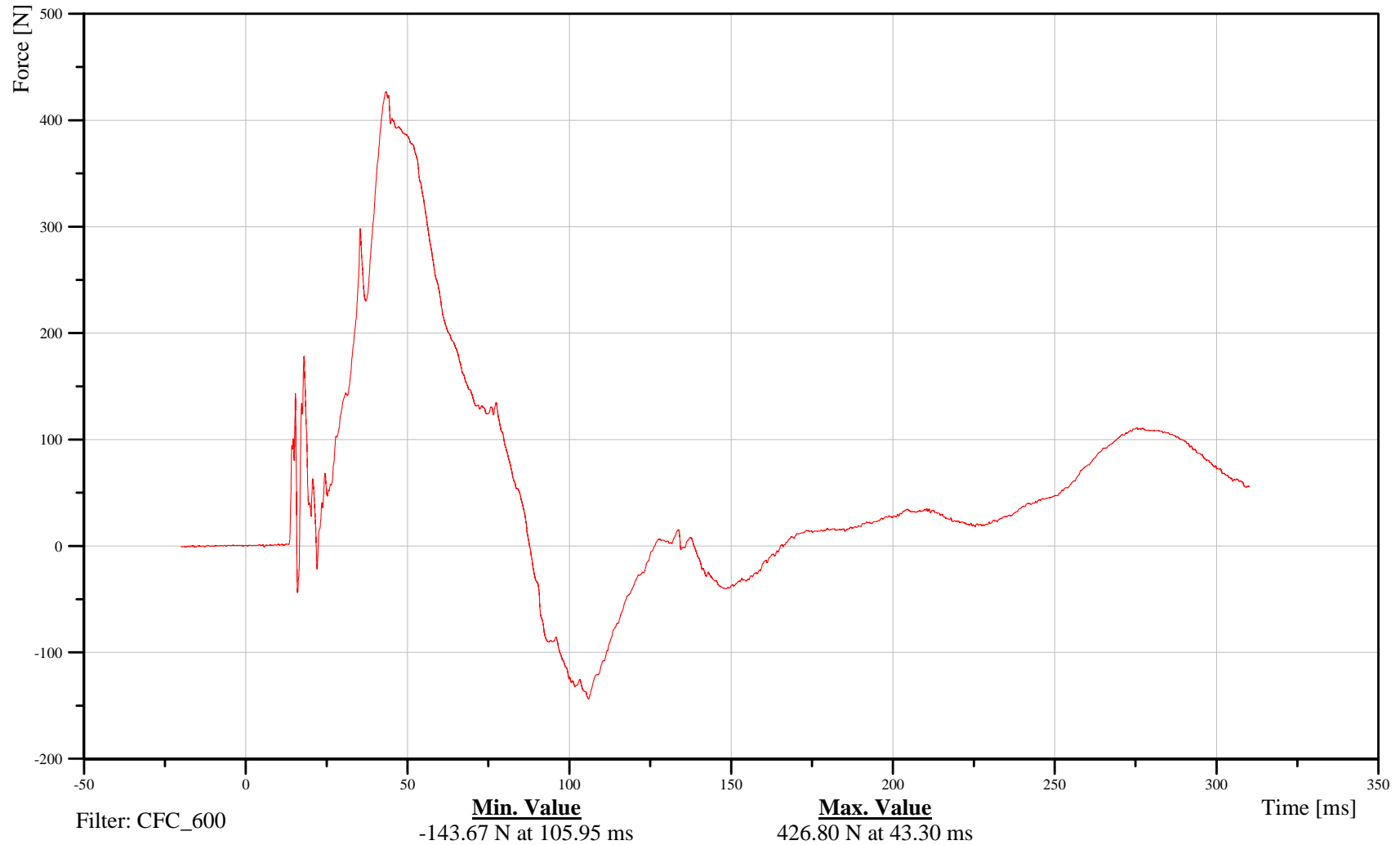
## Shoulder Z-Axis Force

Customer: VRTC

# 11SHLDLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-23

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

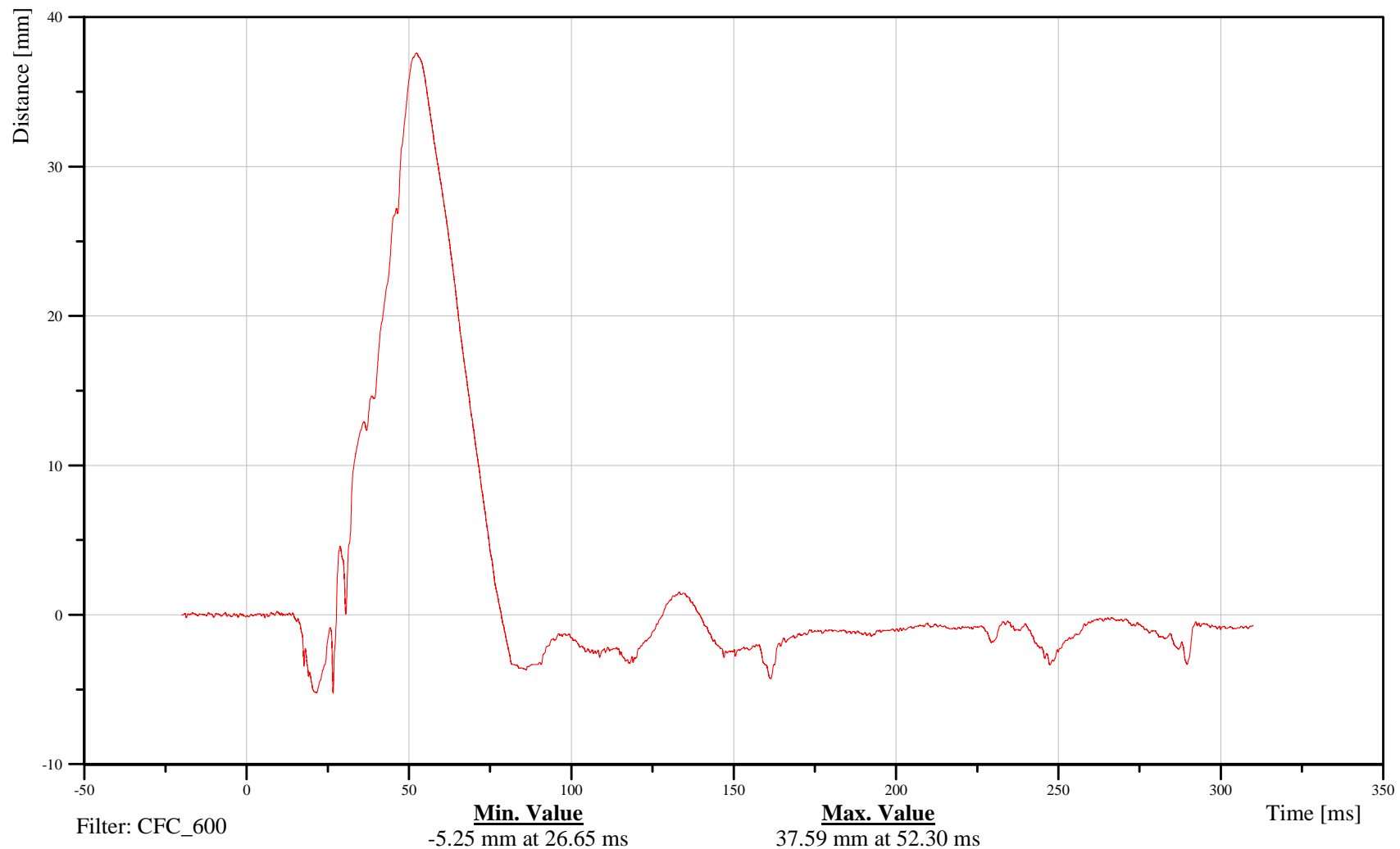
## Shoulder Y-Axis Displacement

Customer: VRTC

# 11SHLDLE00WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-24

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

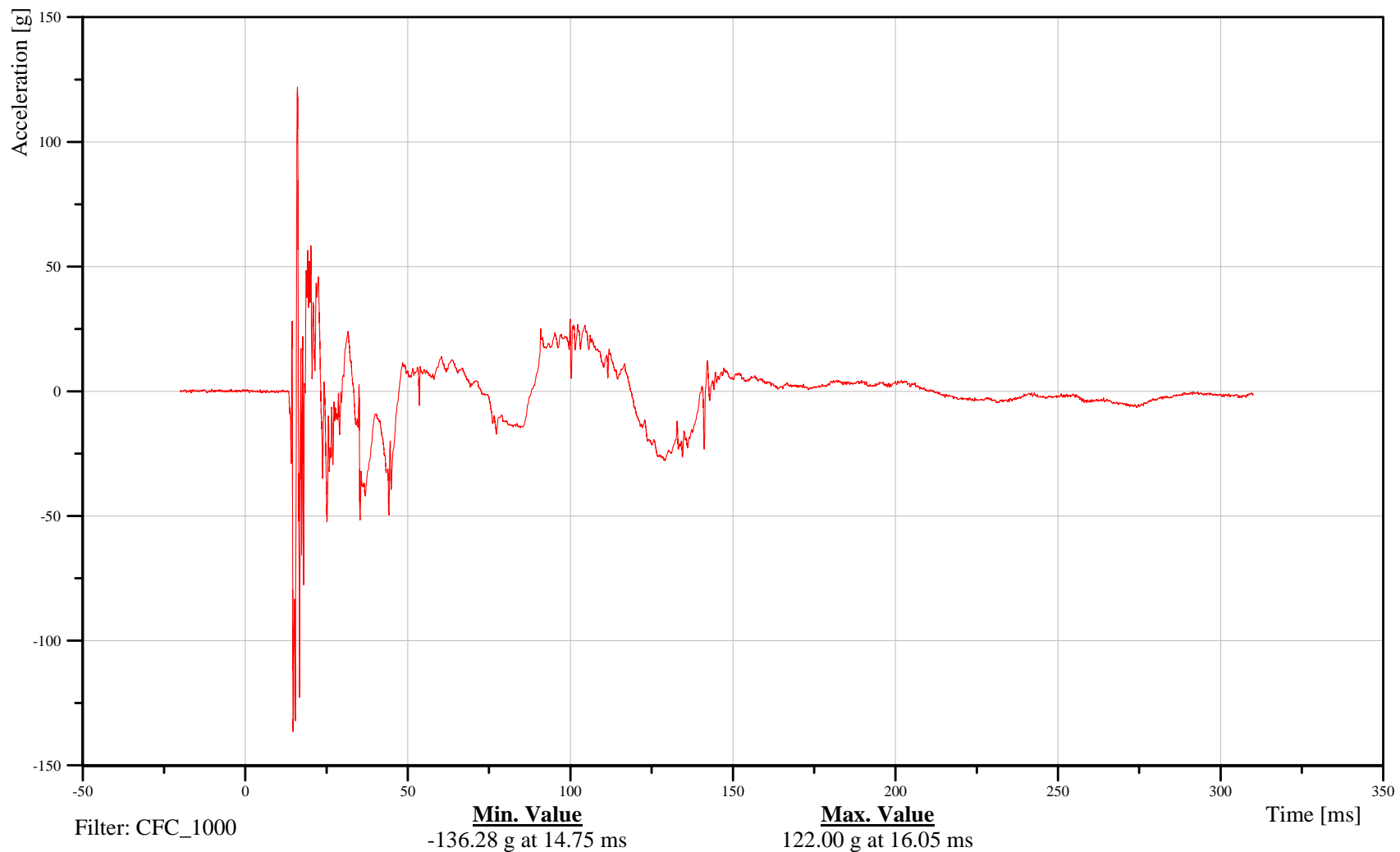
## Shoulder X-Axis Acceleration

Customer: VRTC

# 11SHLDLE00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-25

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

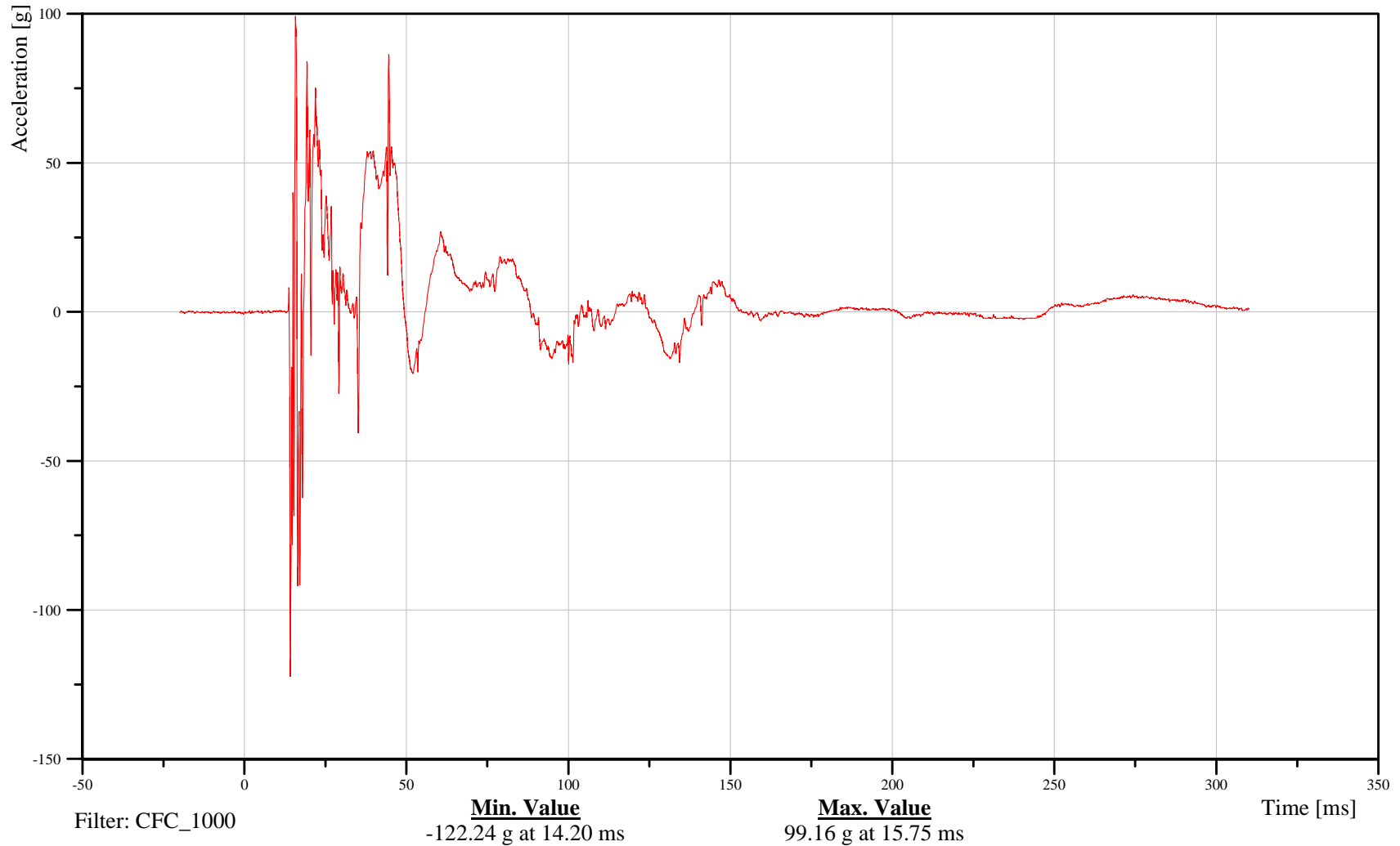
## Shoulder Y-Axis Acceleration

Customer: VRTC

# 11SHLDLE00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-26

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

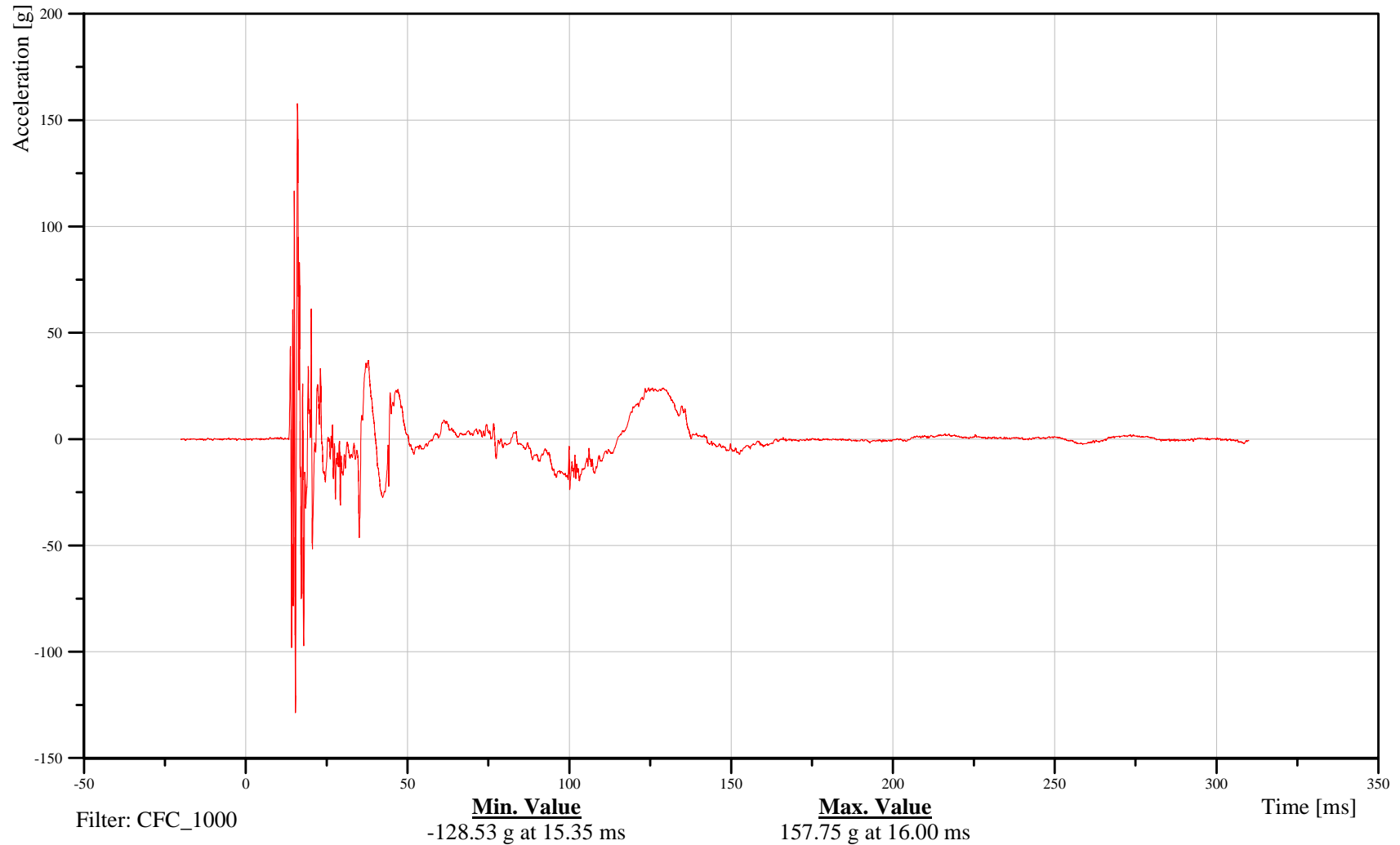
## Shoulder Z-Axis Acceleration

Customer: VRTC

# 11SHLDLE00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-27

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

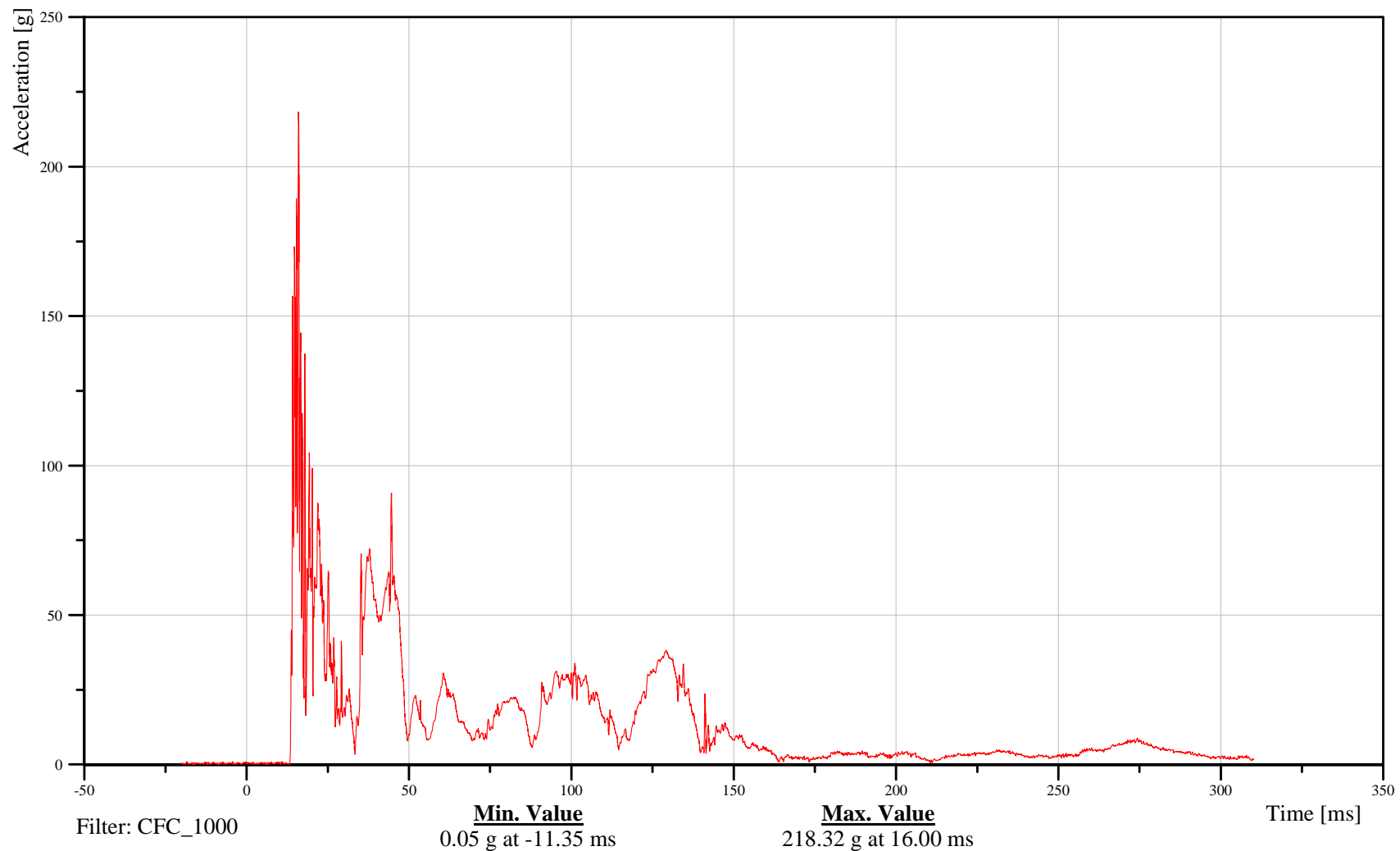
## Shoulder Resultant Acceleration

Customer: VRTC

# 11SHLDLE00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-28

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

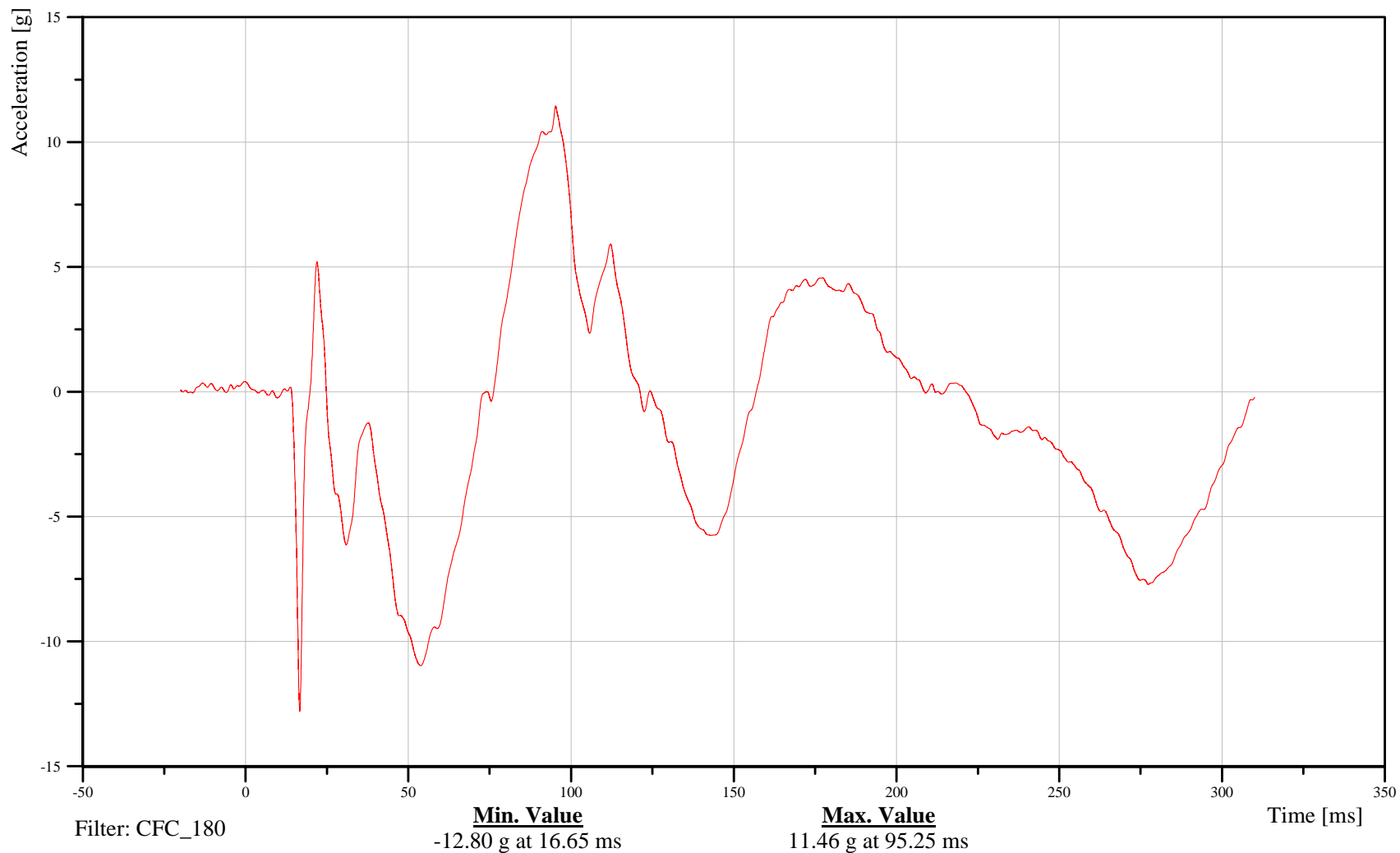
## T1 X-Axis Acceleration

Customer: VRTC

# 11THSP0100WSACXC

TRC Inc. Test Lab: CTF

Test Number: 100211



B-29

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

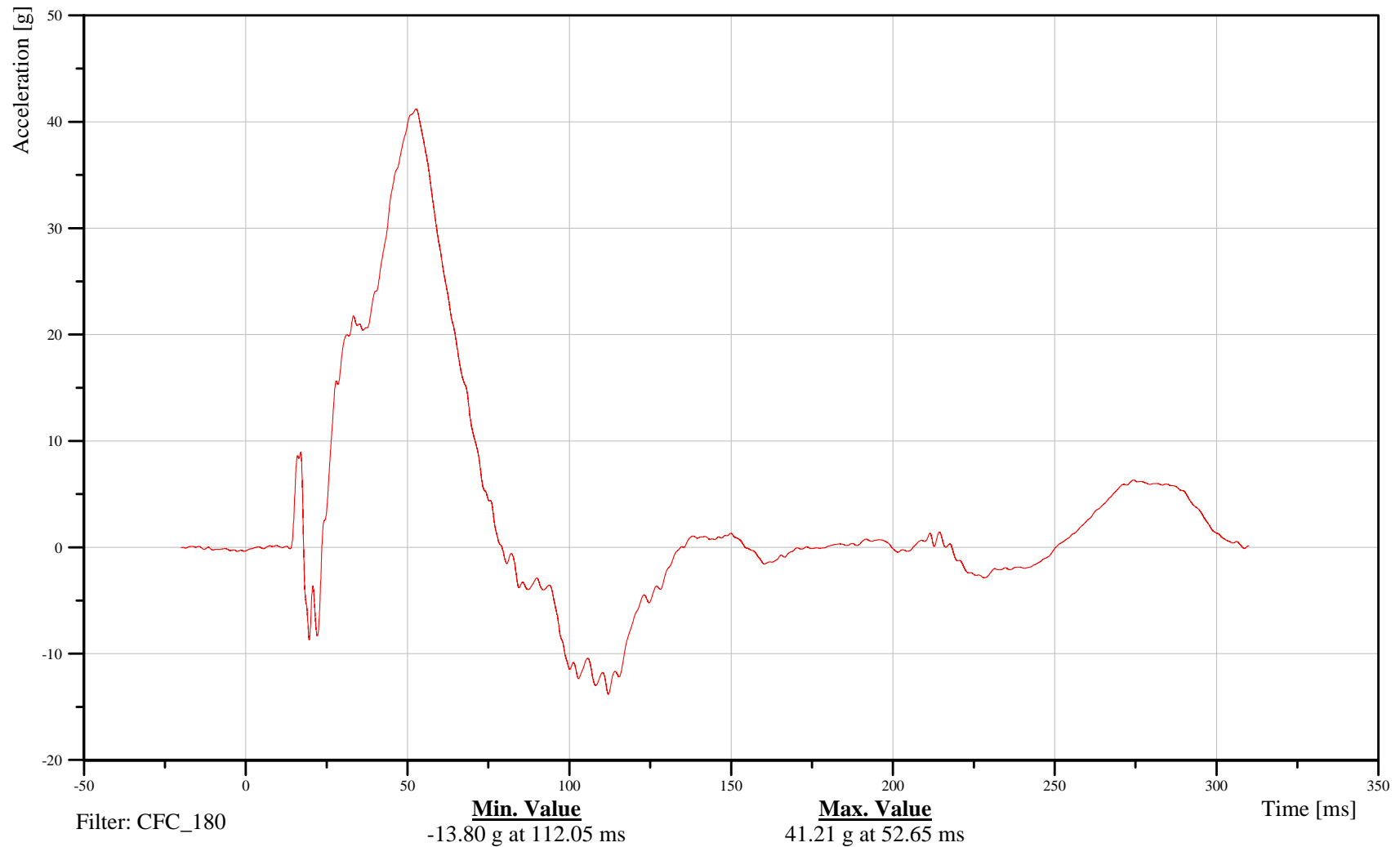
## T1 Y-Axis Acceleration

Customer: VRTC

# 11THSP0100WSACYC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

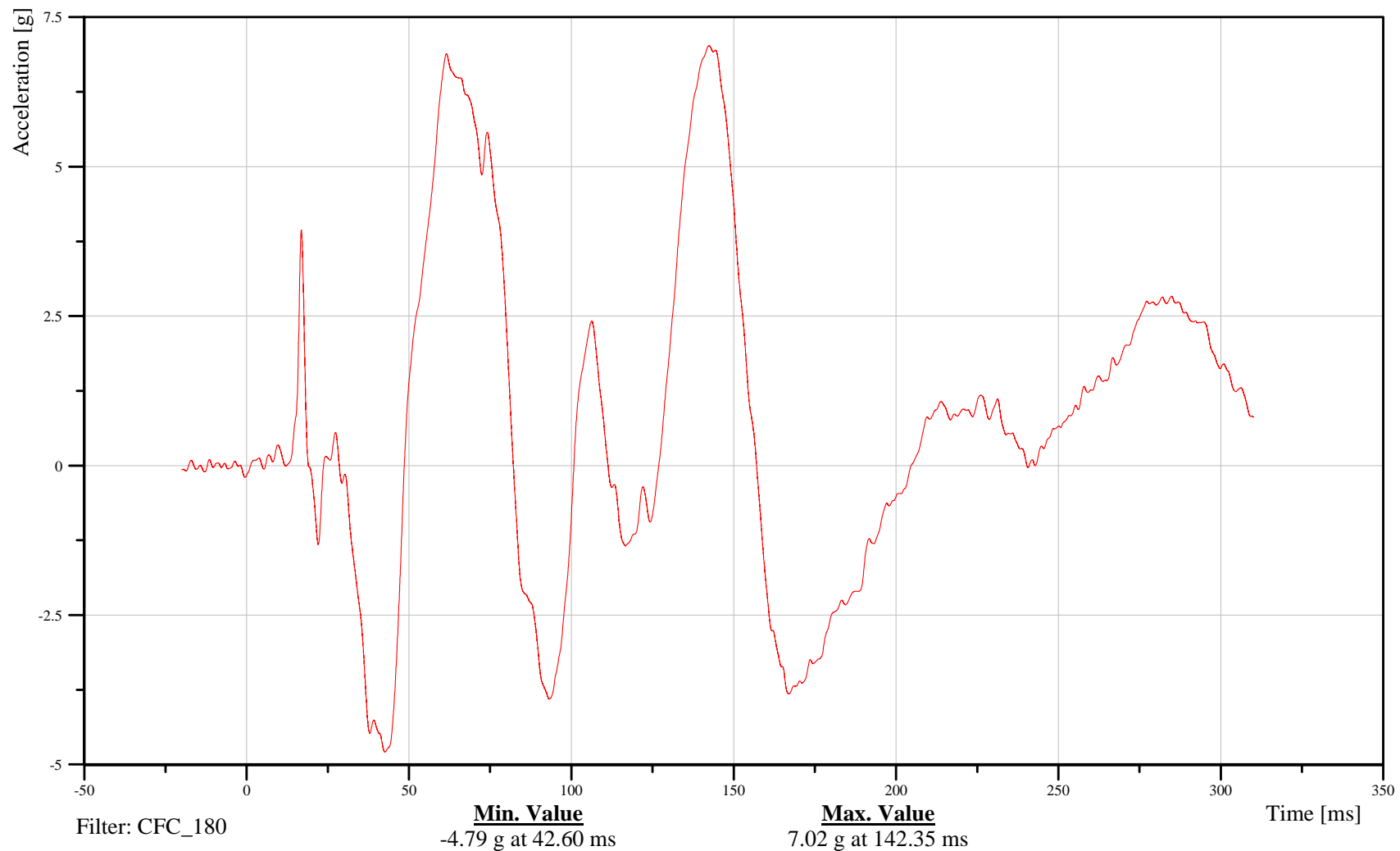
## T1 Z-Axis Acceleration

Customer: VRTC

# 11THSP0100WSACZC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

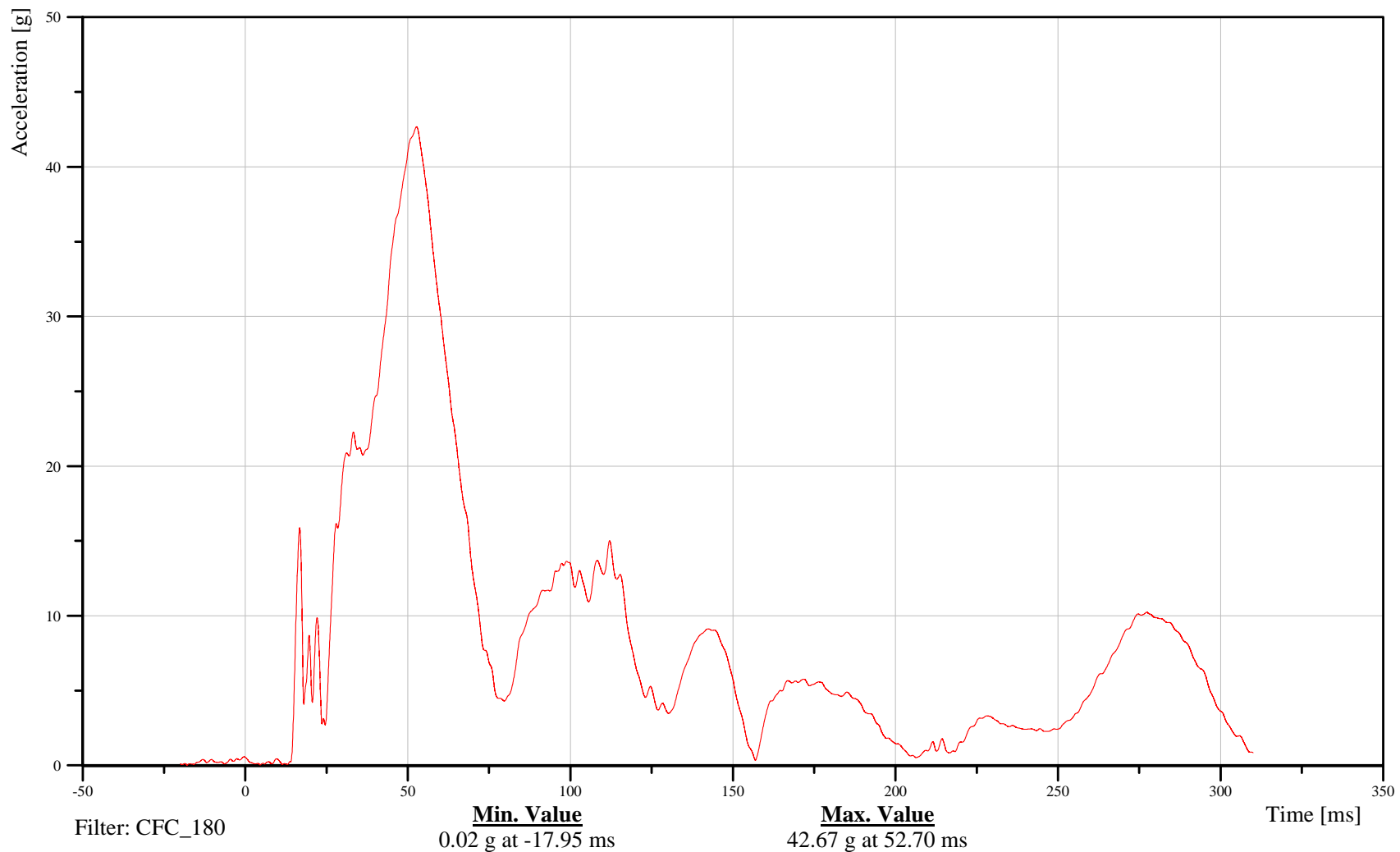
## T1 Resultant Acceleration

Customer: VRTC

# 11THSP0100WSACRC

TRC Inc. Test Lab: CTF

Test Number: 100211



B-32

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

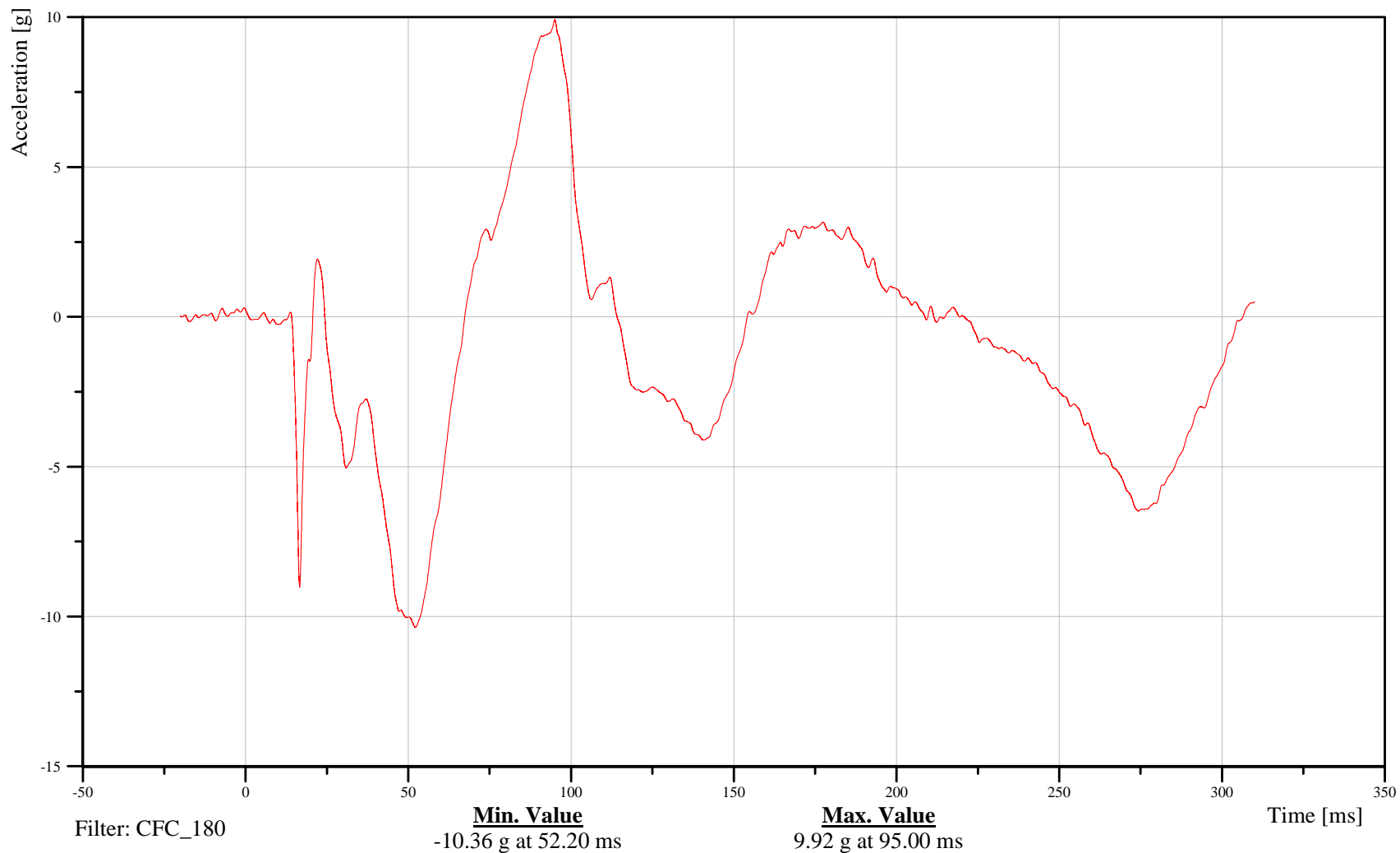
## T4 X-Axis Acceleration

Customer: VRTC

# 11THSP0400WSACXC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

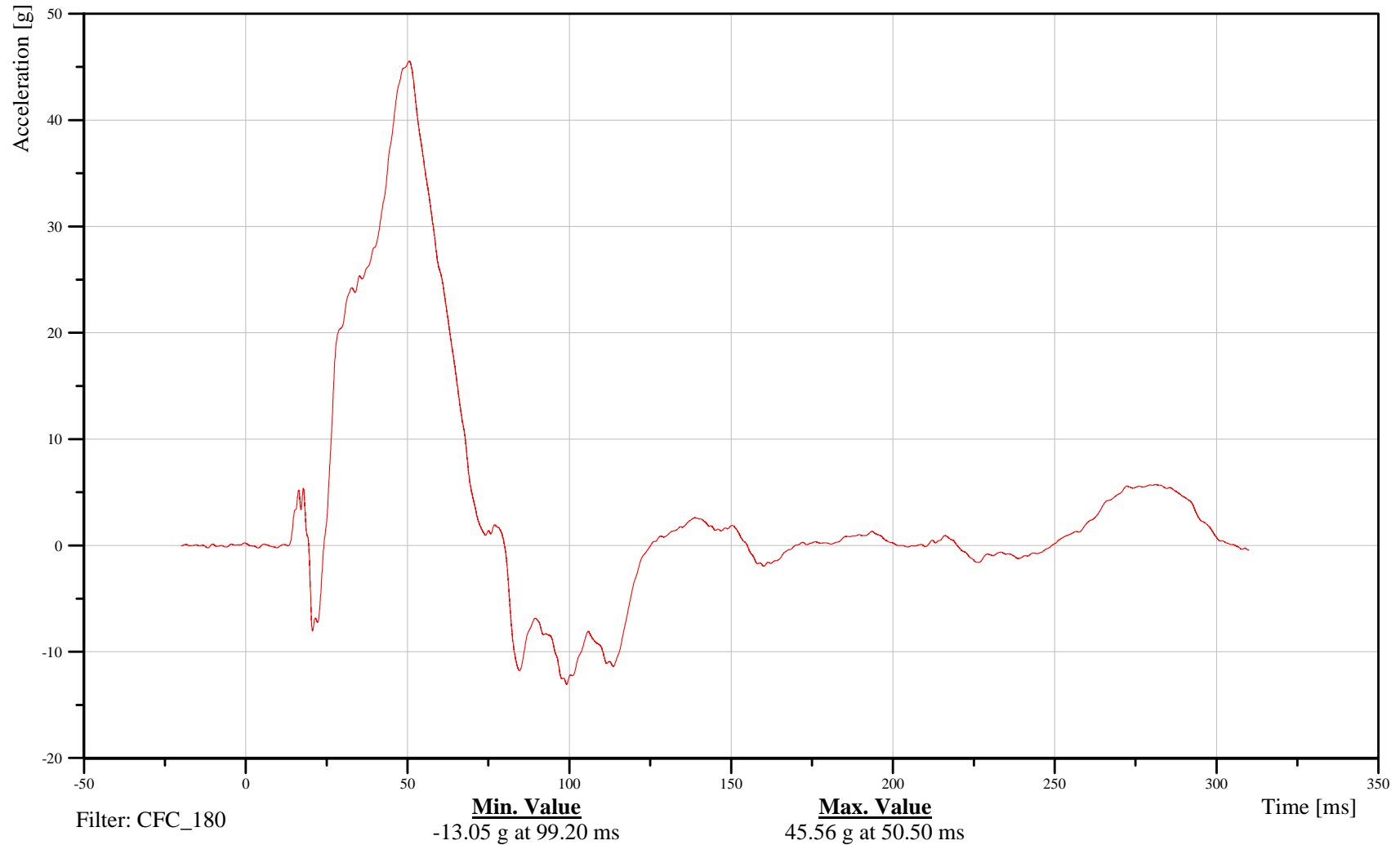
## T4 Y-Axis Acceleration

Customer: VRTC

# 11THSP0400WSACYC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

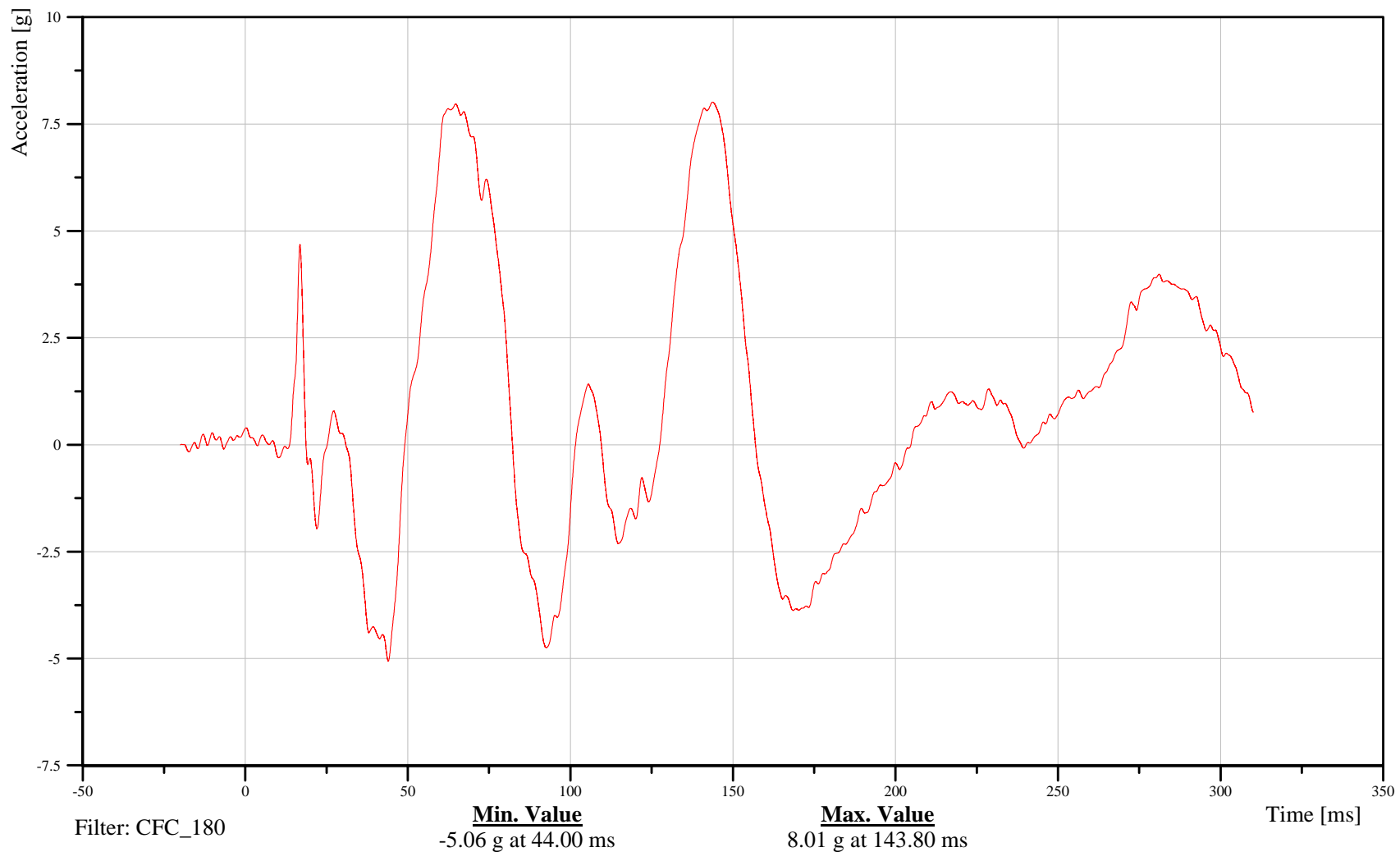
## T4 Z-Axis Acceleration

Customer: VRTC

# 11THSP0400WSACZC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

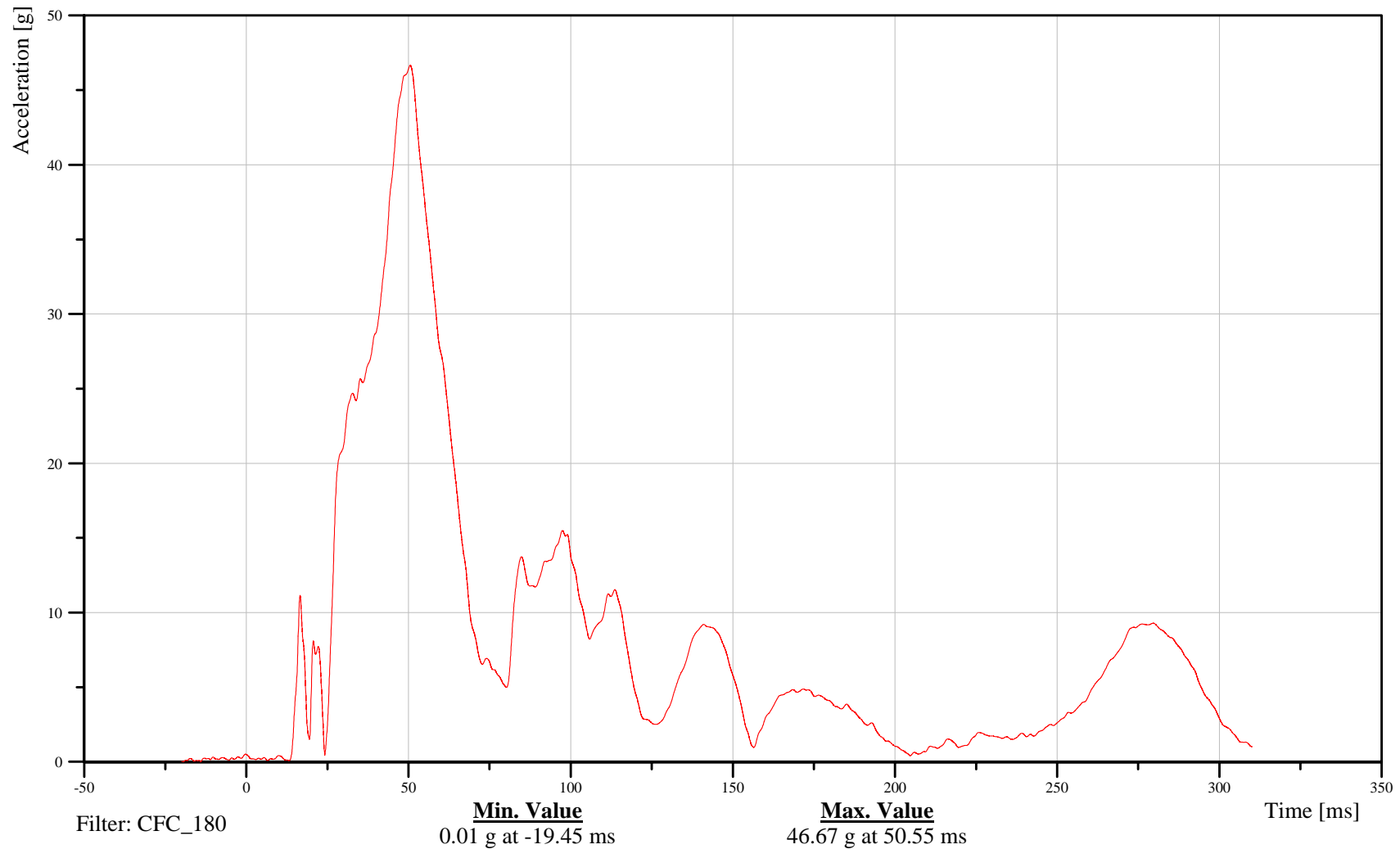
## T4 Resultant Acceleration

Customer: VRTC

# 11THSP0400WSACRC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

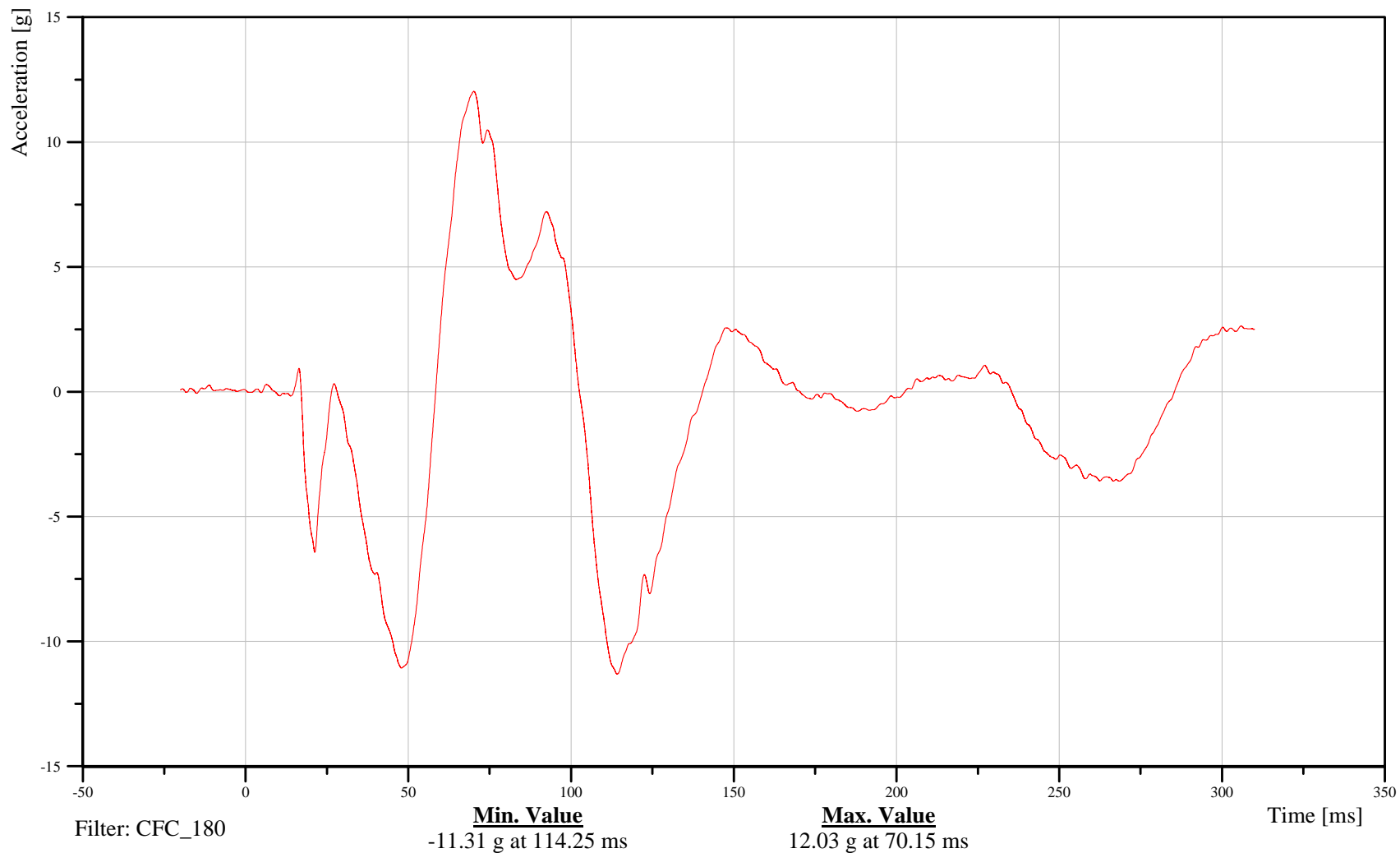
## T12 X-Axis Acceleration

Customer: VRTC

# 11THSP1200WSACXC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

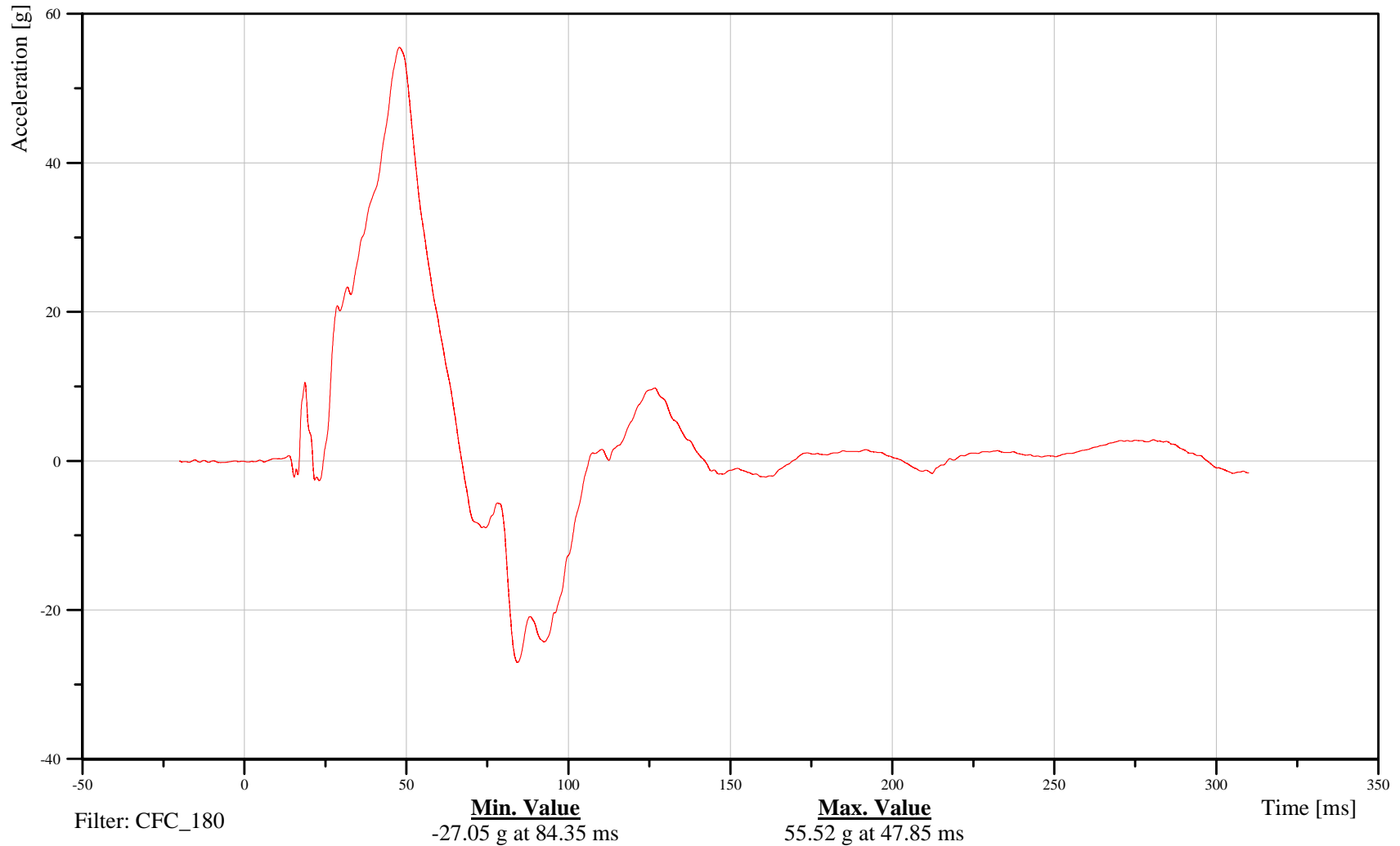
## T12 Y-Axis Acceleration

Customer: VRTC

# 11THSP1200WSACYC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

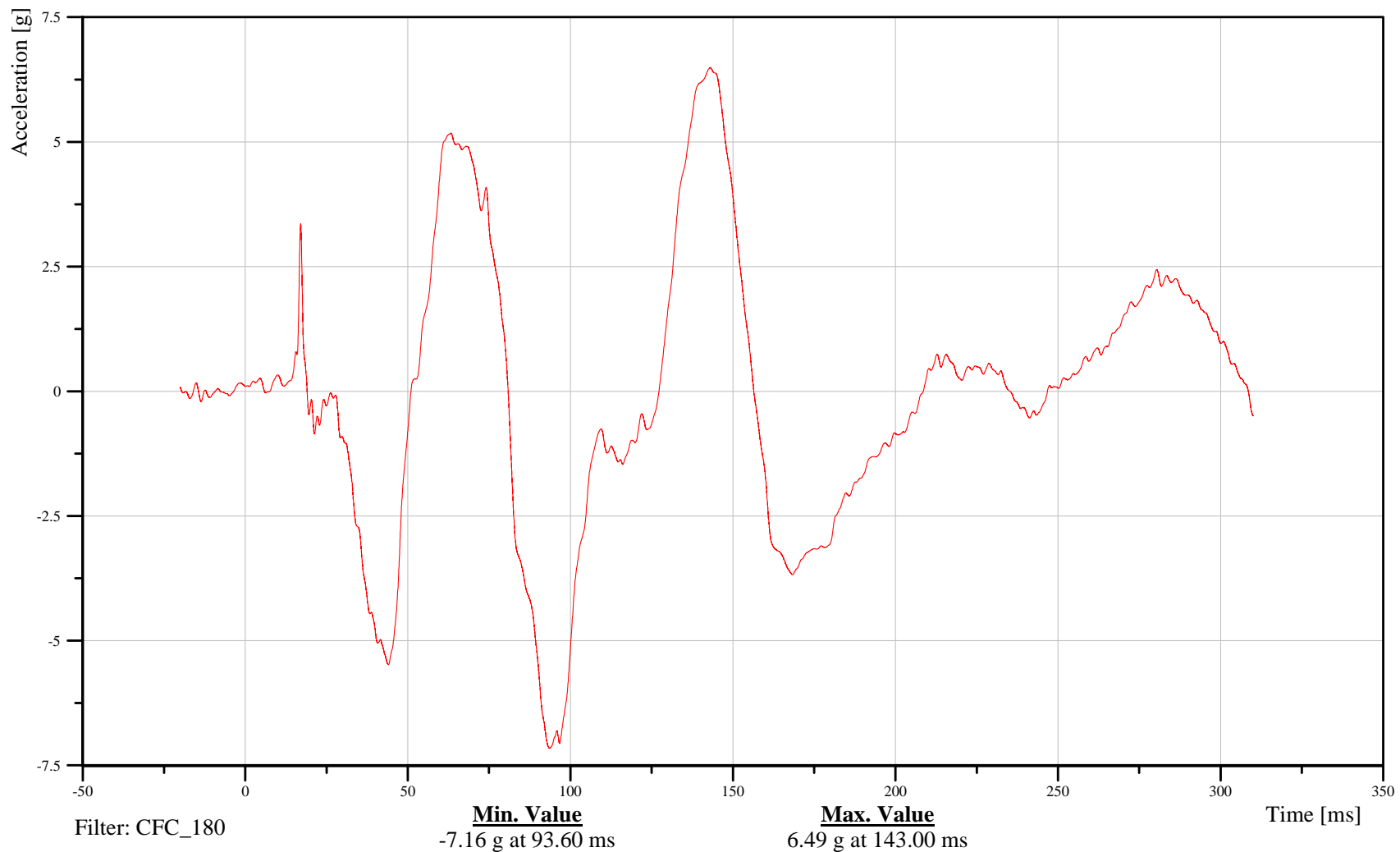
## T12 Z-Axis Acceleration

Customer: VRTC

# 11THSP1200WSACZC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

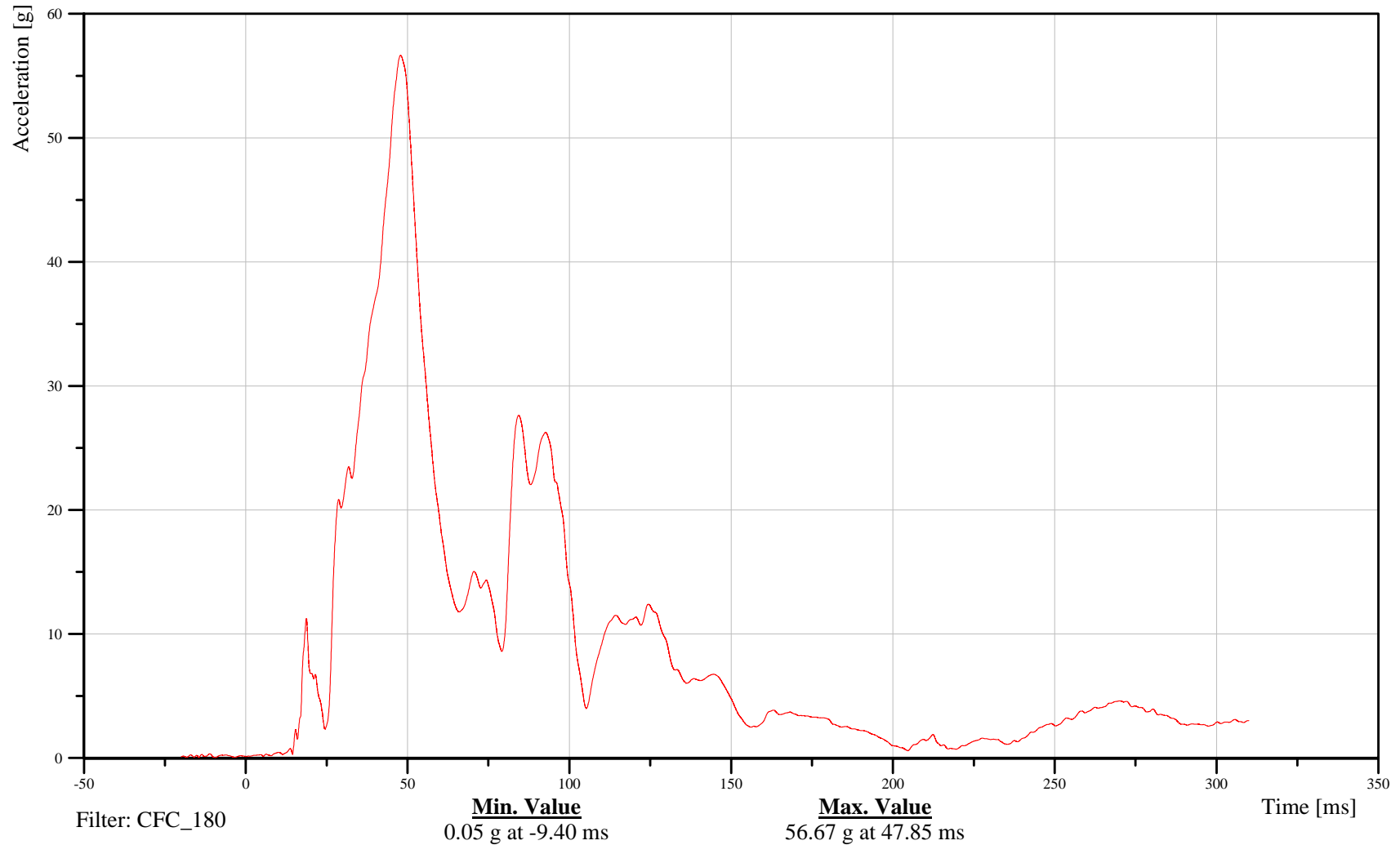
## T12 Resultant Acceleration

Customer: VRTC

# 11THSP1200WSACRC

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

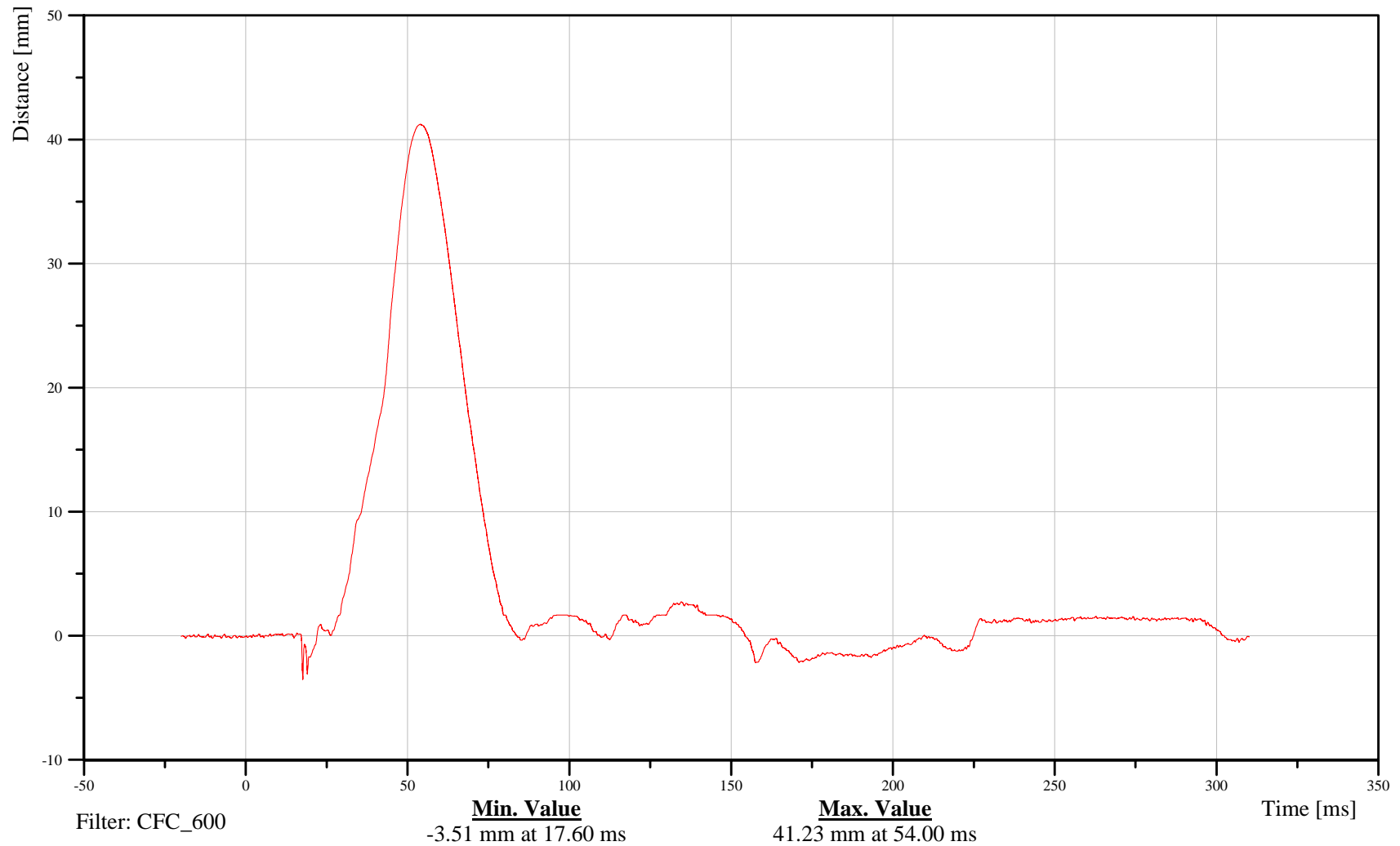
## Thorax Rib 1 Y-Axis Displacement

Customer: VRTC

# 11TRRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

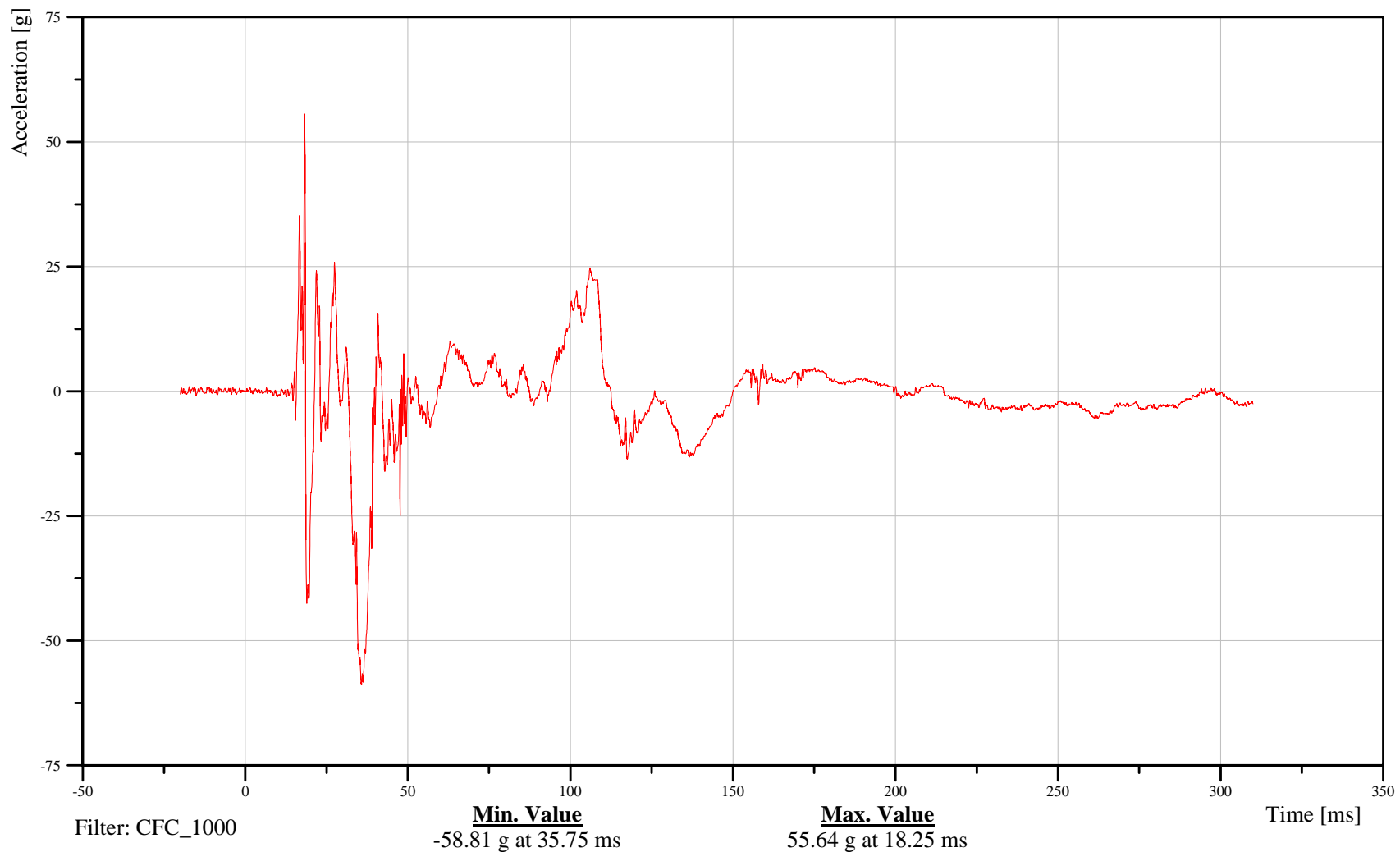
## Thorax Rib 1 X-Axis Acceleration

Customer: VRTC

# 11TRRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-42

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

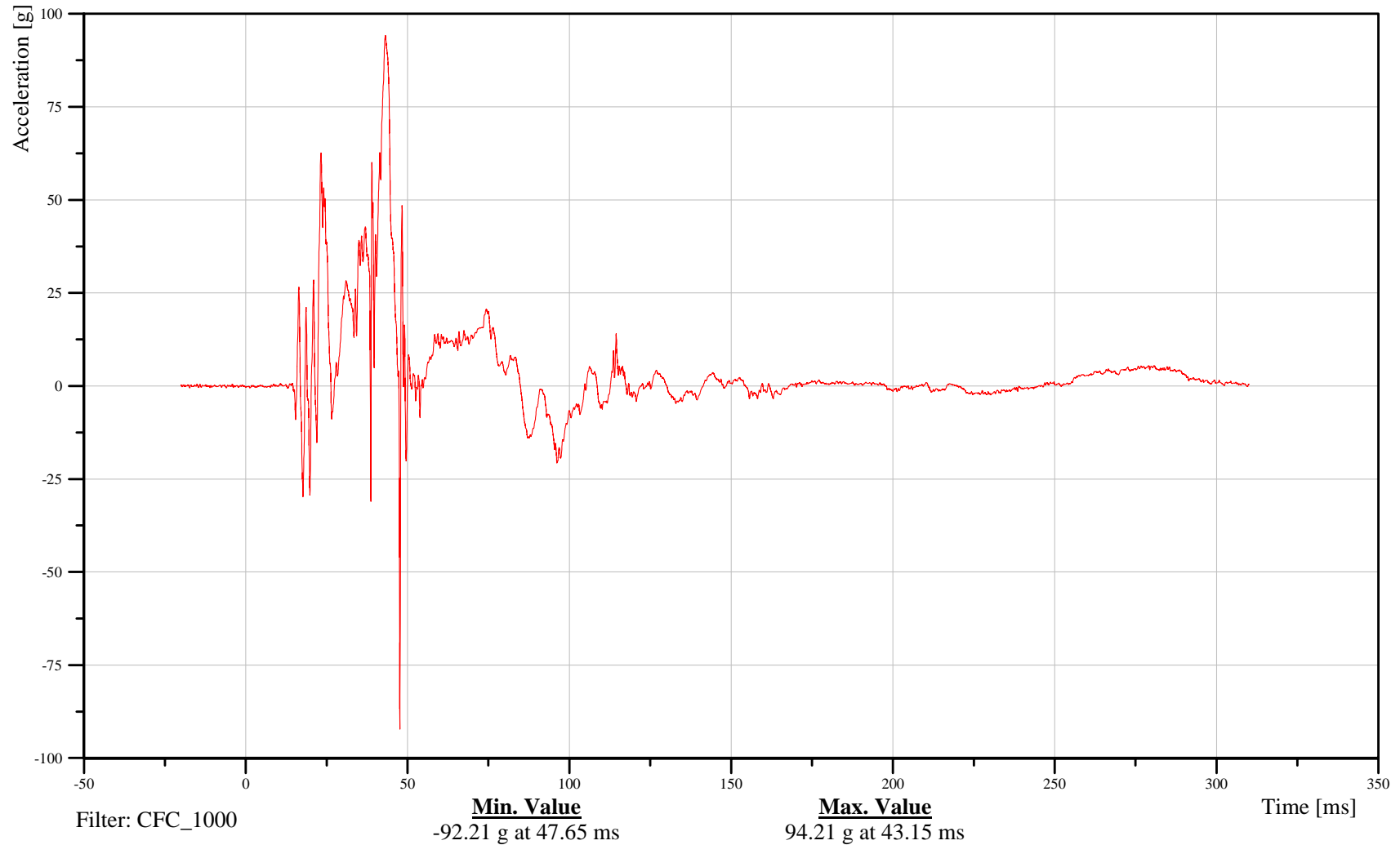
## Thorax Rib 1 Y-Axis Acceleration

Customer: VRTC

# 11TRRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

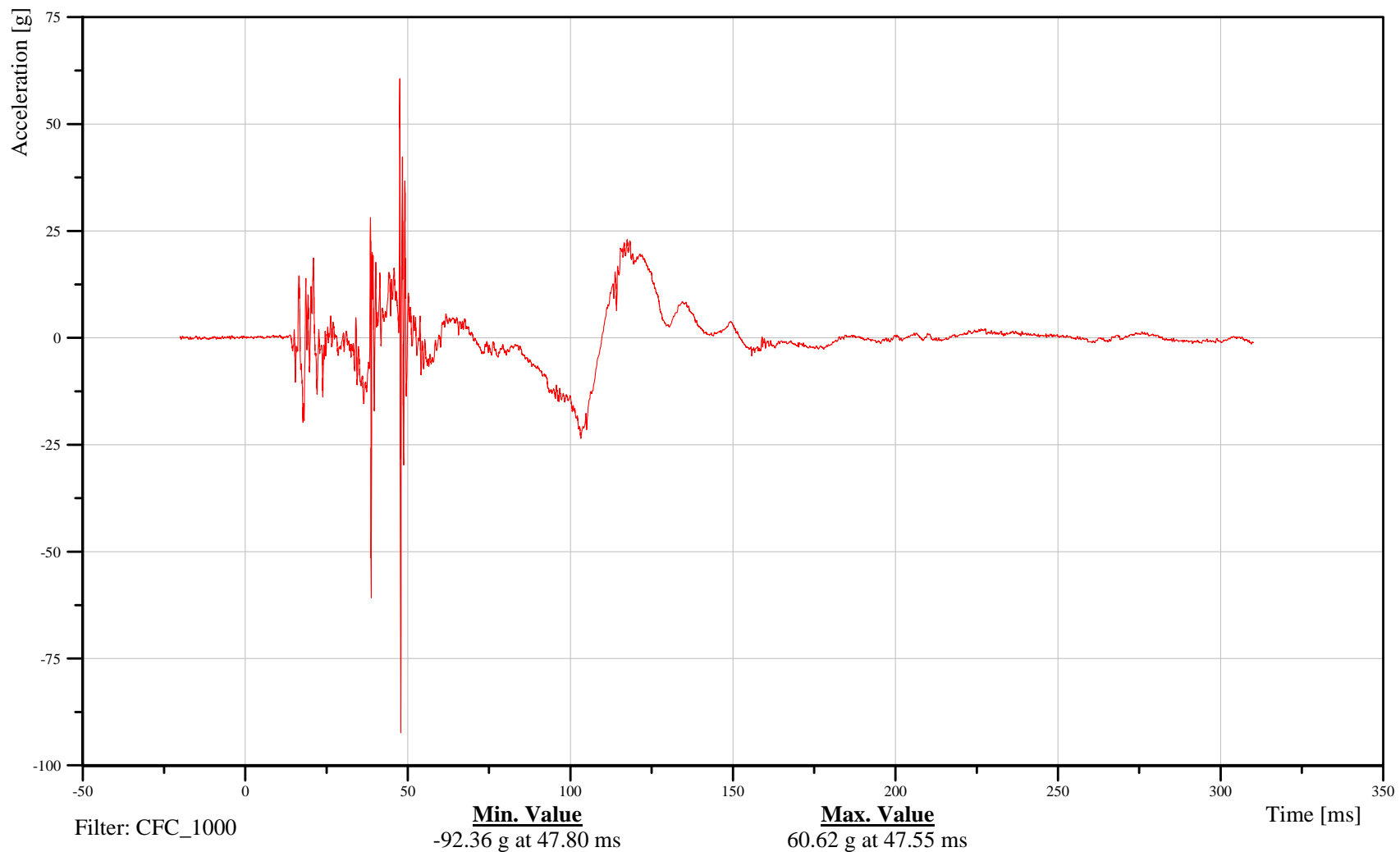
## Thorax Rib 1 Z-Axis Acceleration

Customer: VRTC

# 11TRRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-44

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

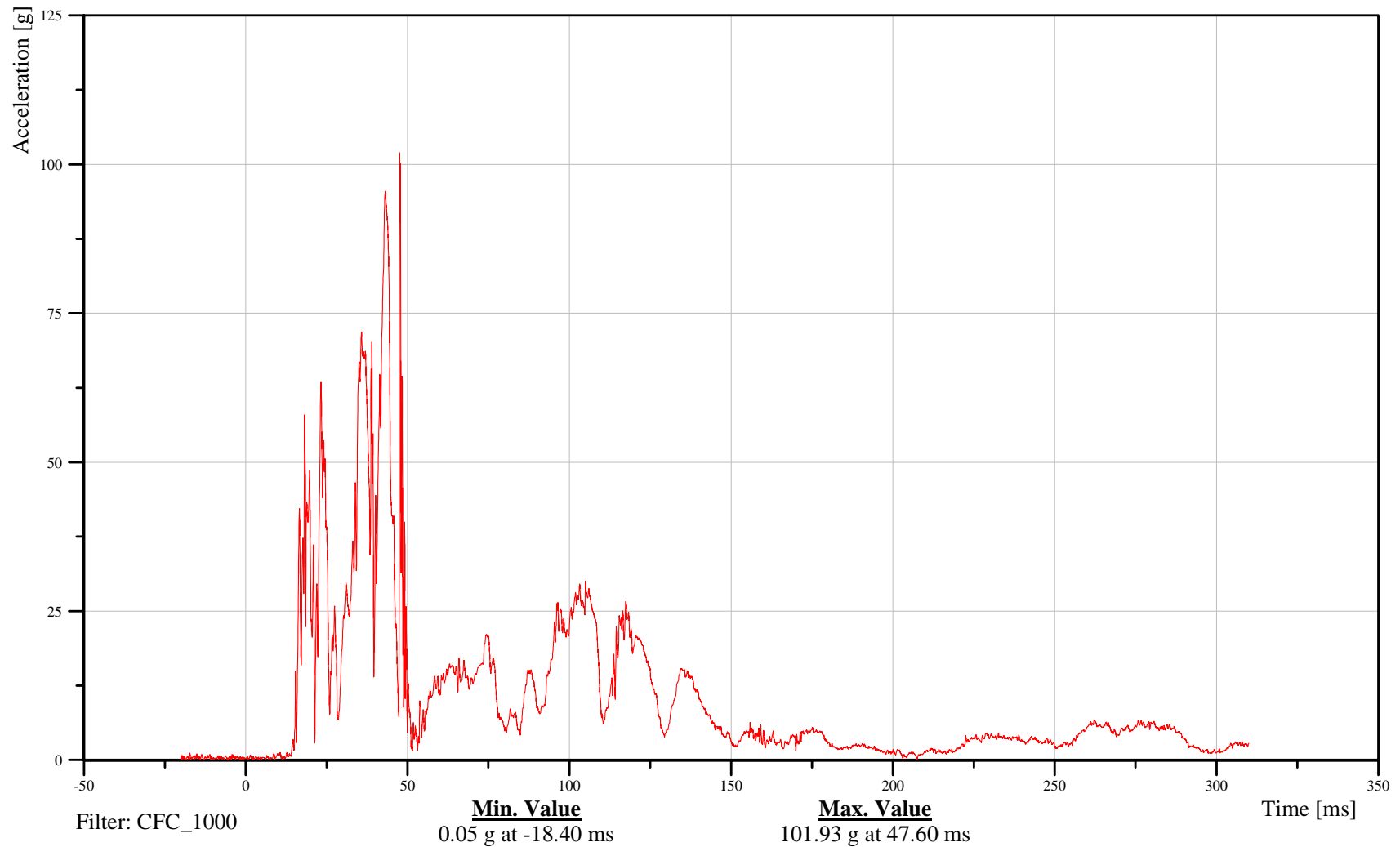
## Thorax Rib 1 Resultant Acceleration

Customer: VRTC

# 11TRRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-45

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

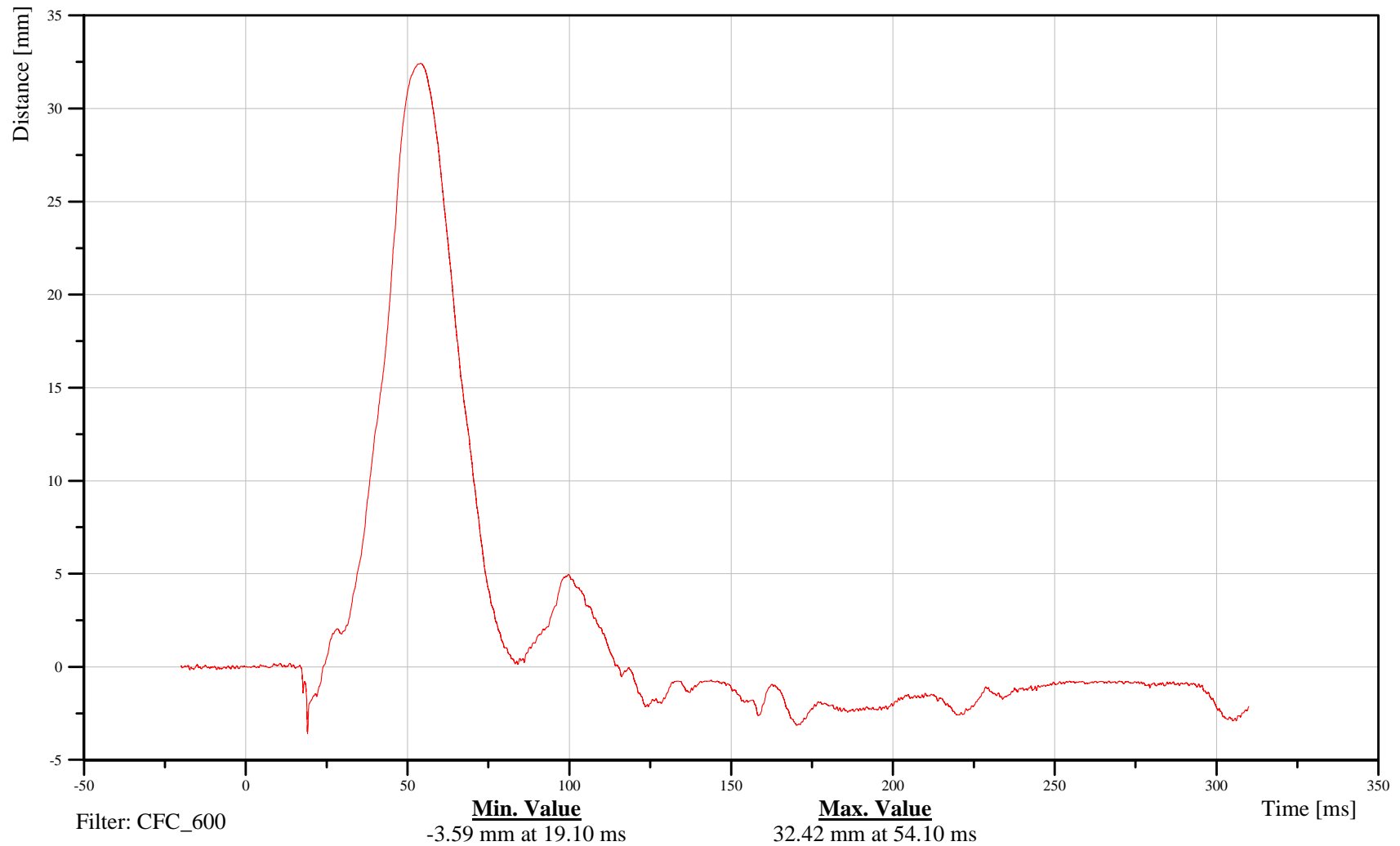
## Thorax Rib 2 Y-Axis Displacement

Customer: VRTC

# 11TRRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-46

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

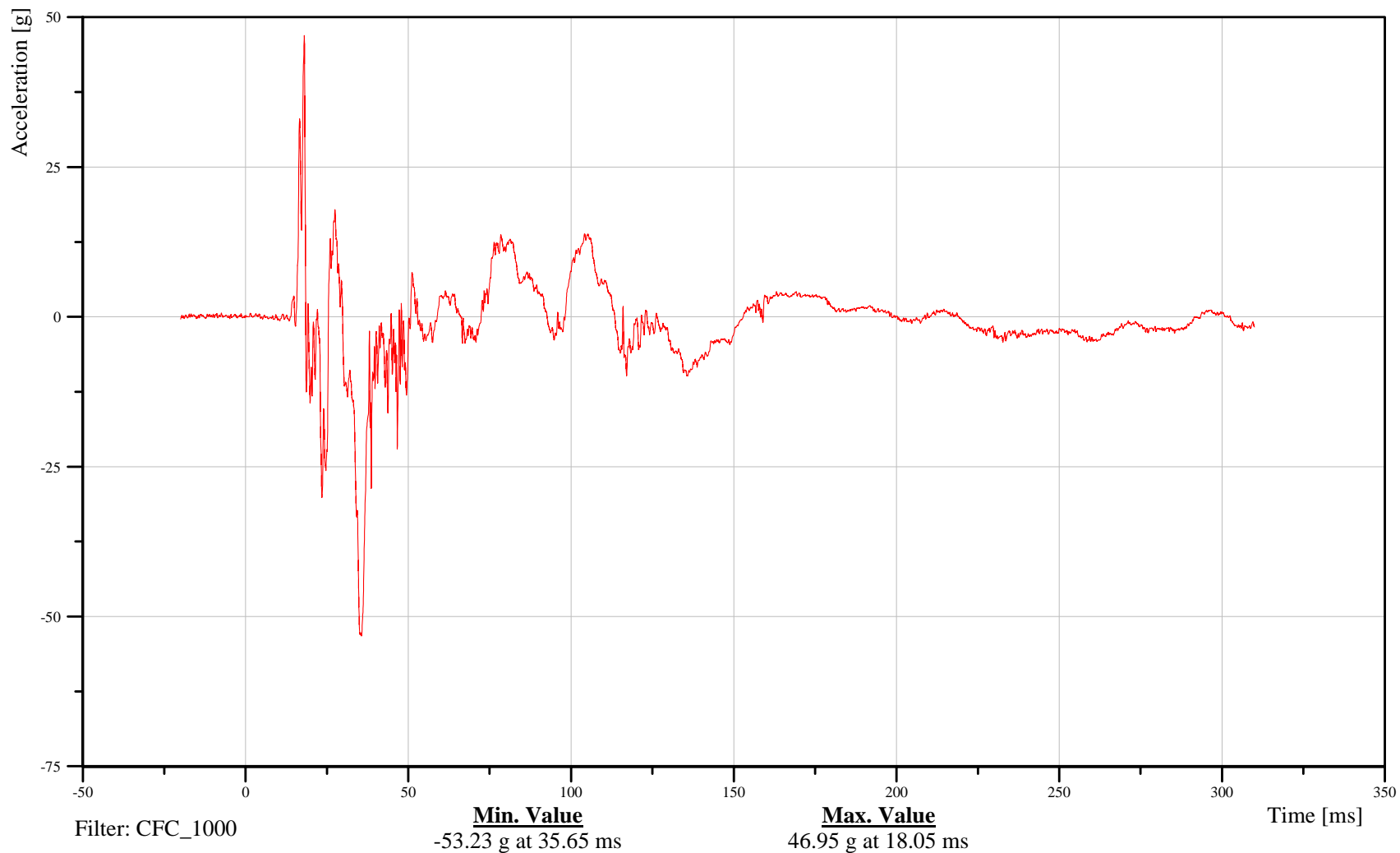
## Thorax Rib 2 X-Axis Acceleration

Customer: VRTC

# 11TRRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-47

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

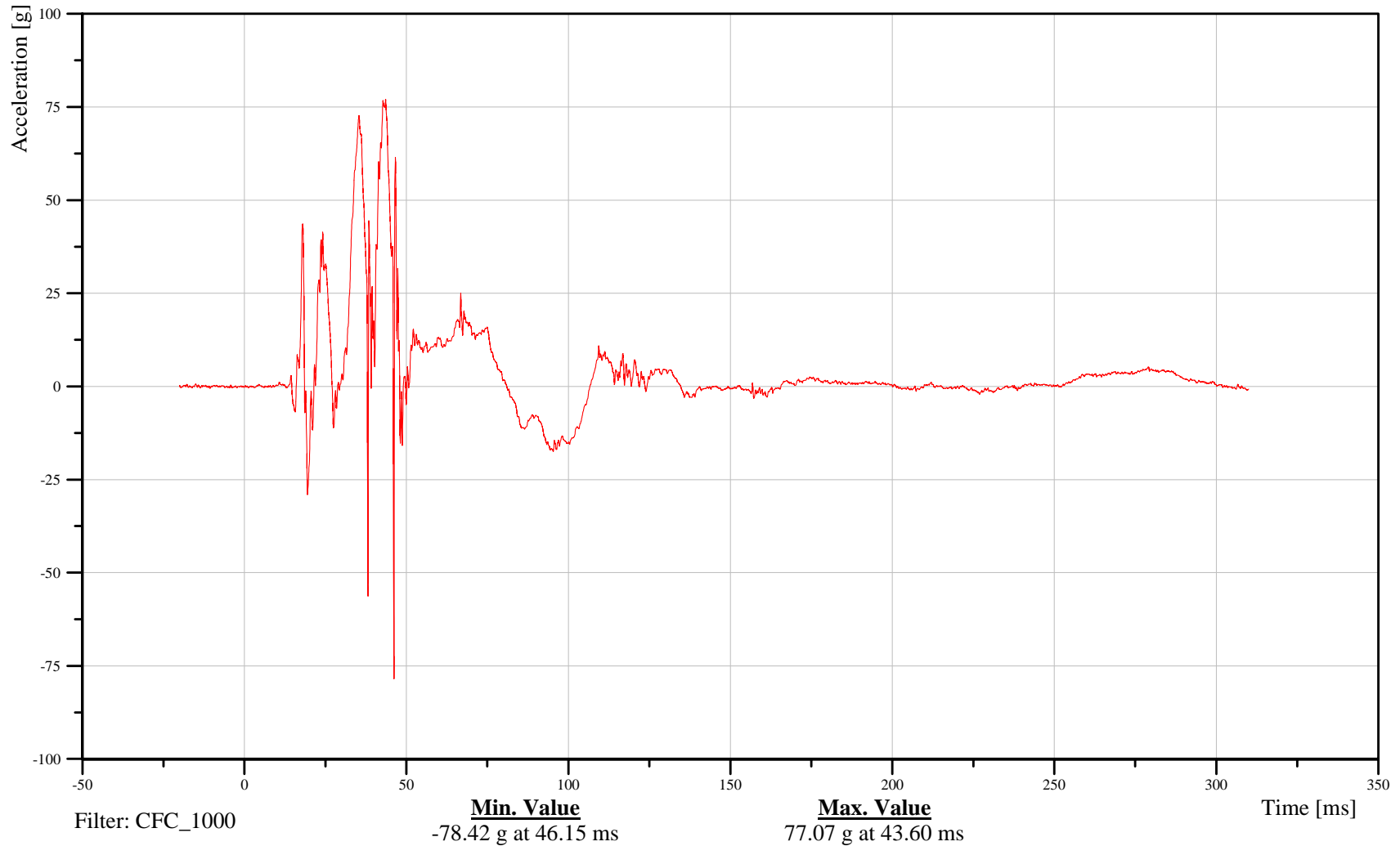
## Thorax Rib 2 Y-Axis Acceleration

Customer: VRTC

# 11TRRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

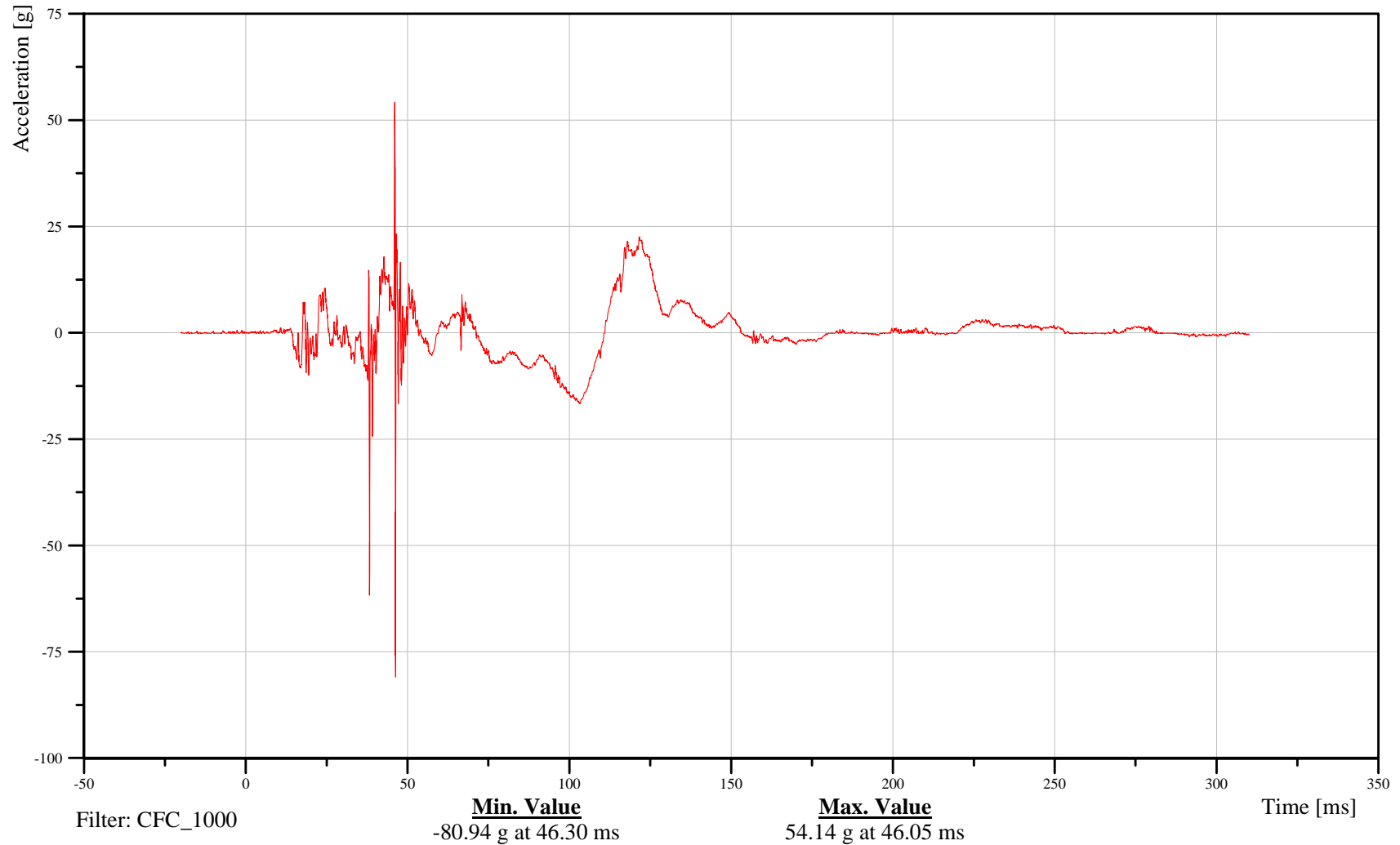
## Thorax Rib 2 Z-Axis Acceleration

Customer: VRTC

# 11TRRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-49

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

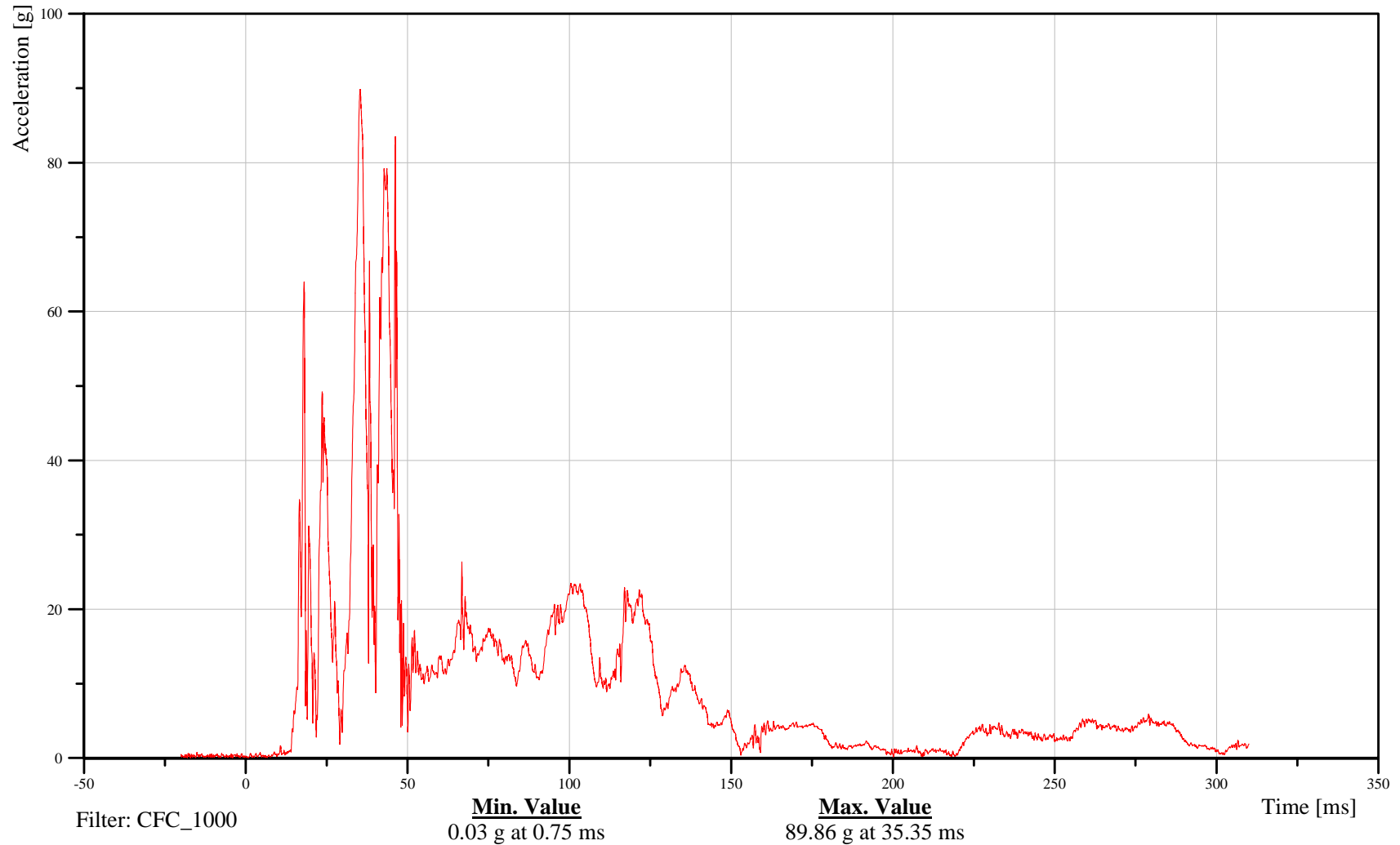
## Thorax Rib 2 Resultant Acceleration

Customer: VRTC

# 11TRRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-50

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

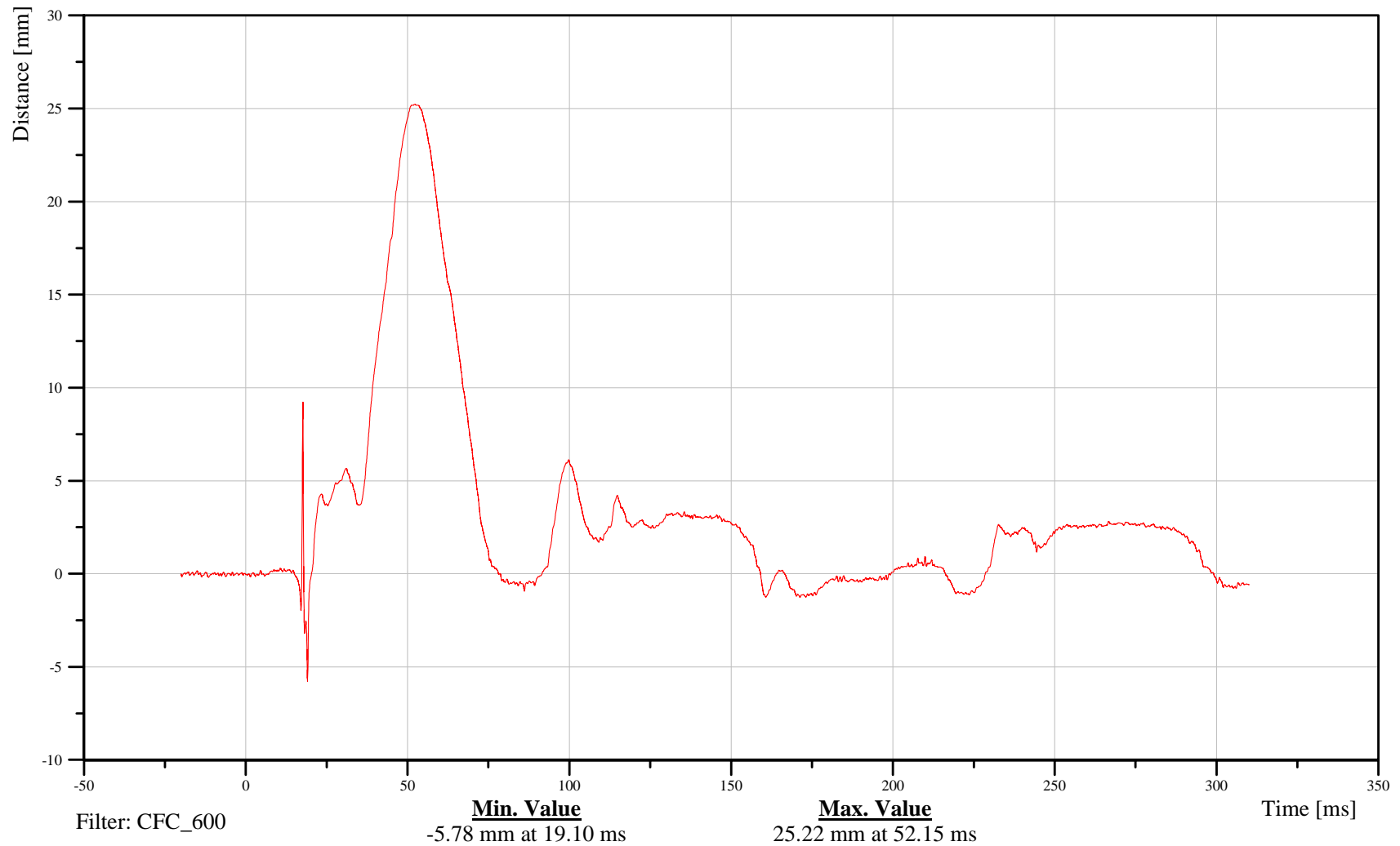
## Thorax Rib 3 Y-Axis Displacement

Customer: VRTC

# 11TRRILE03WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-51

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

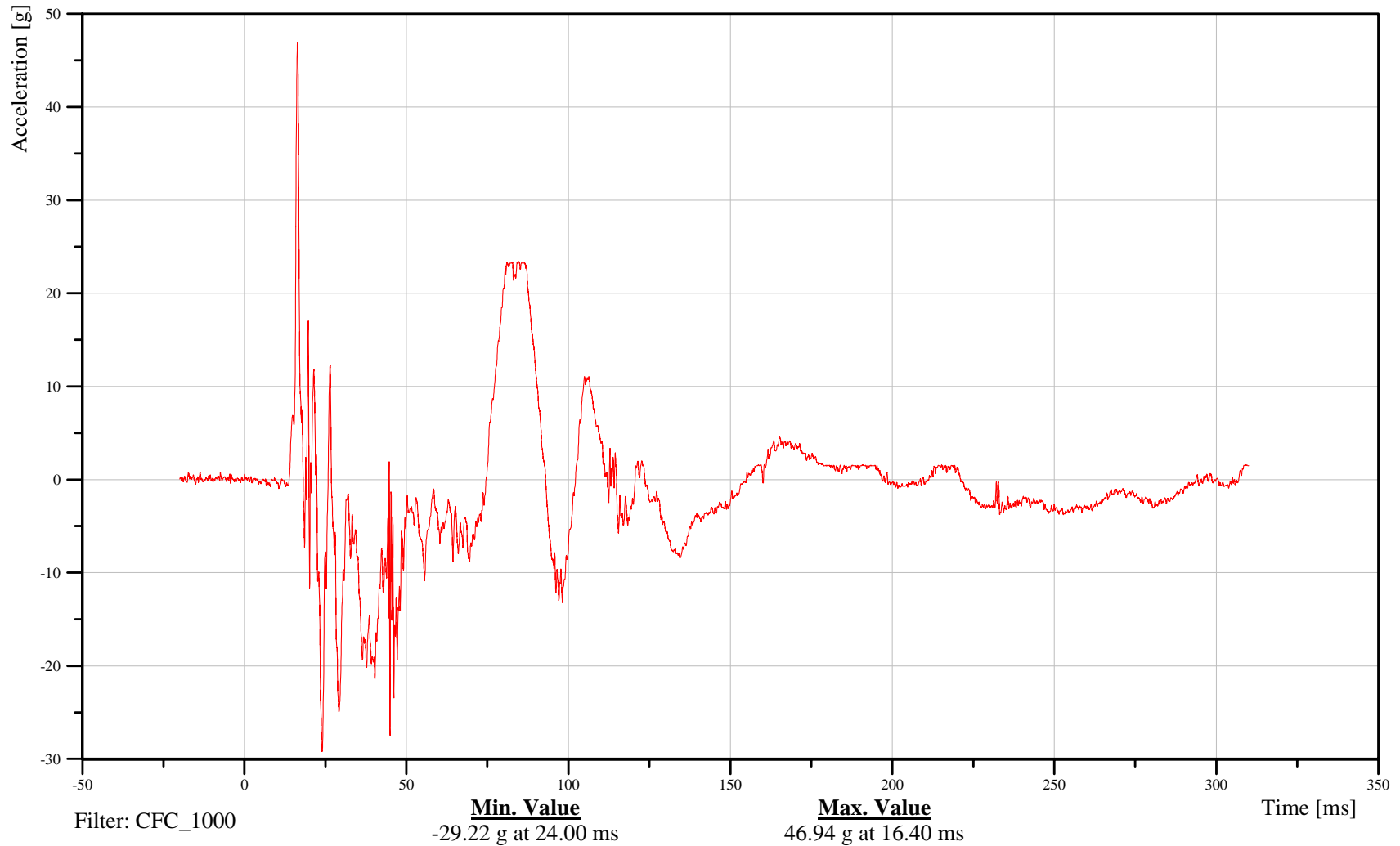
## Thorax Rib 3 X-Axis Acceleration

Customer: VRTC

# 11TRRILE03WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-52

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

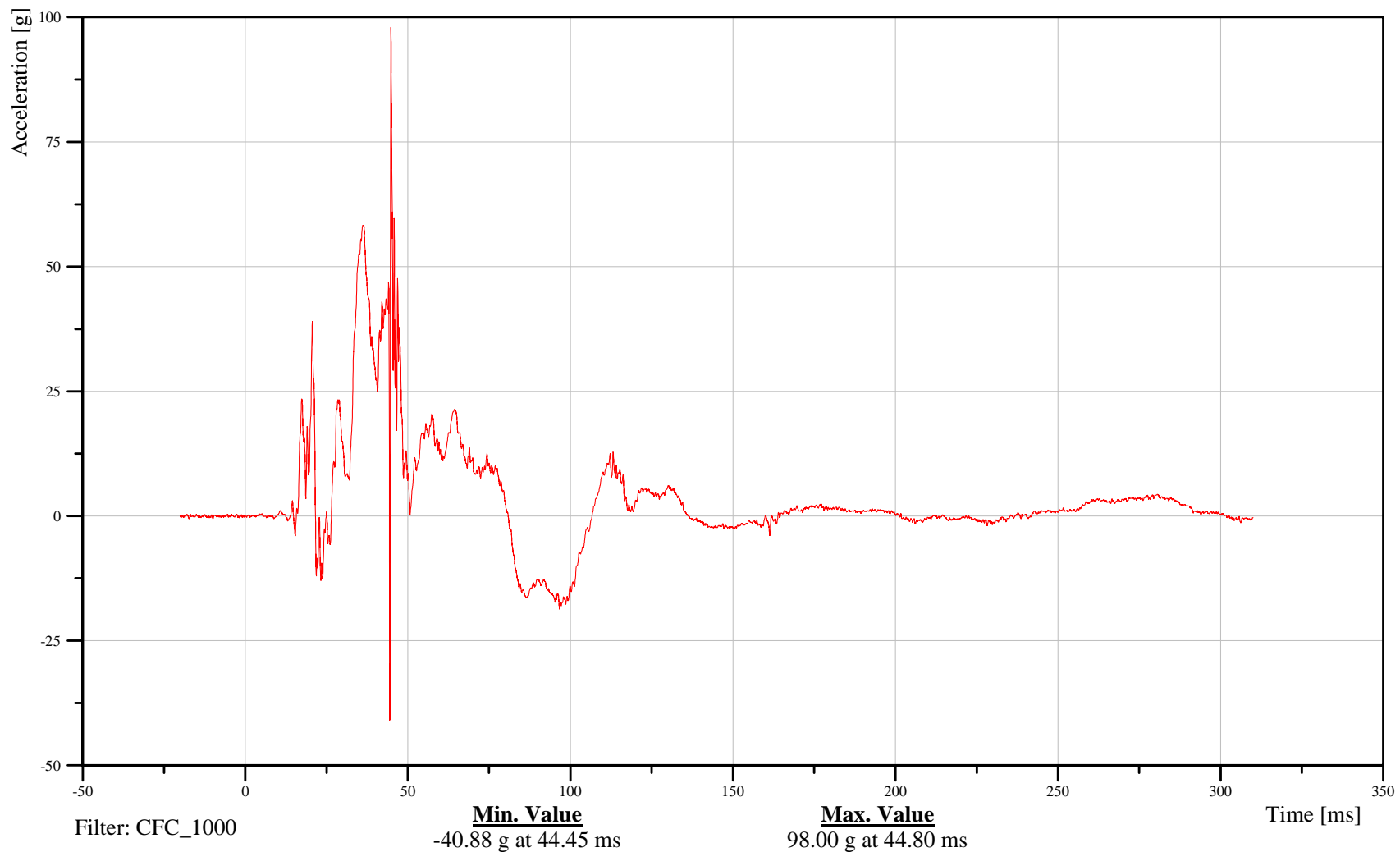
## Thorax Rib 3 Y-Axis Acceleration

Customer: VRTC

# 11TRRILE03WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-53

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

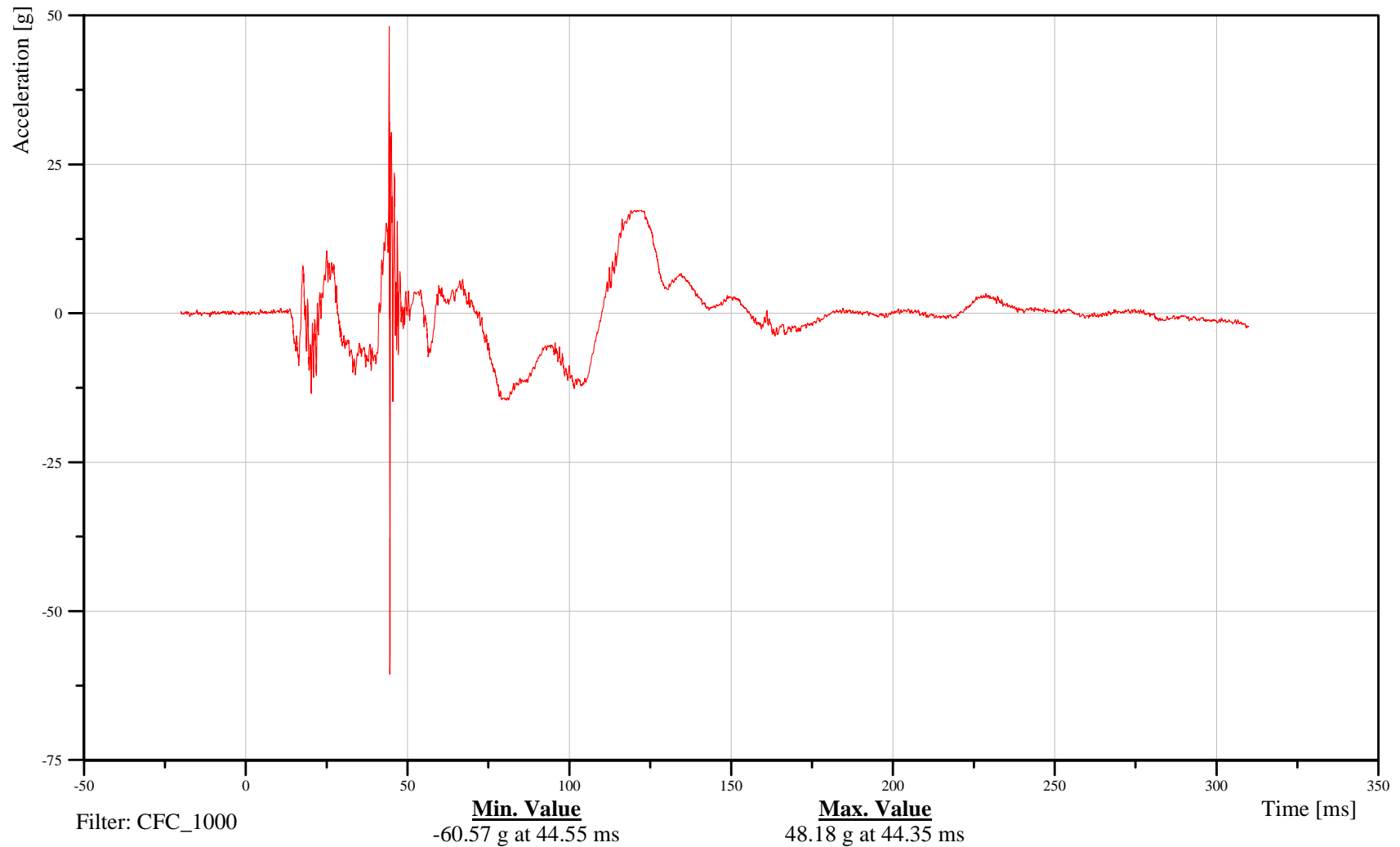
## Thorax Rib 3 Z-Axis Acceleration

Customer: VRTC

# 11TRRILE03WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-54

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

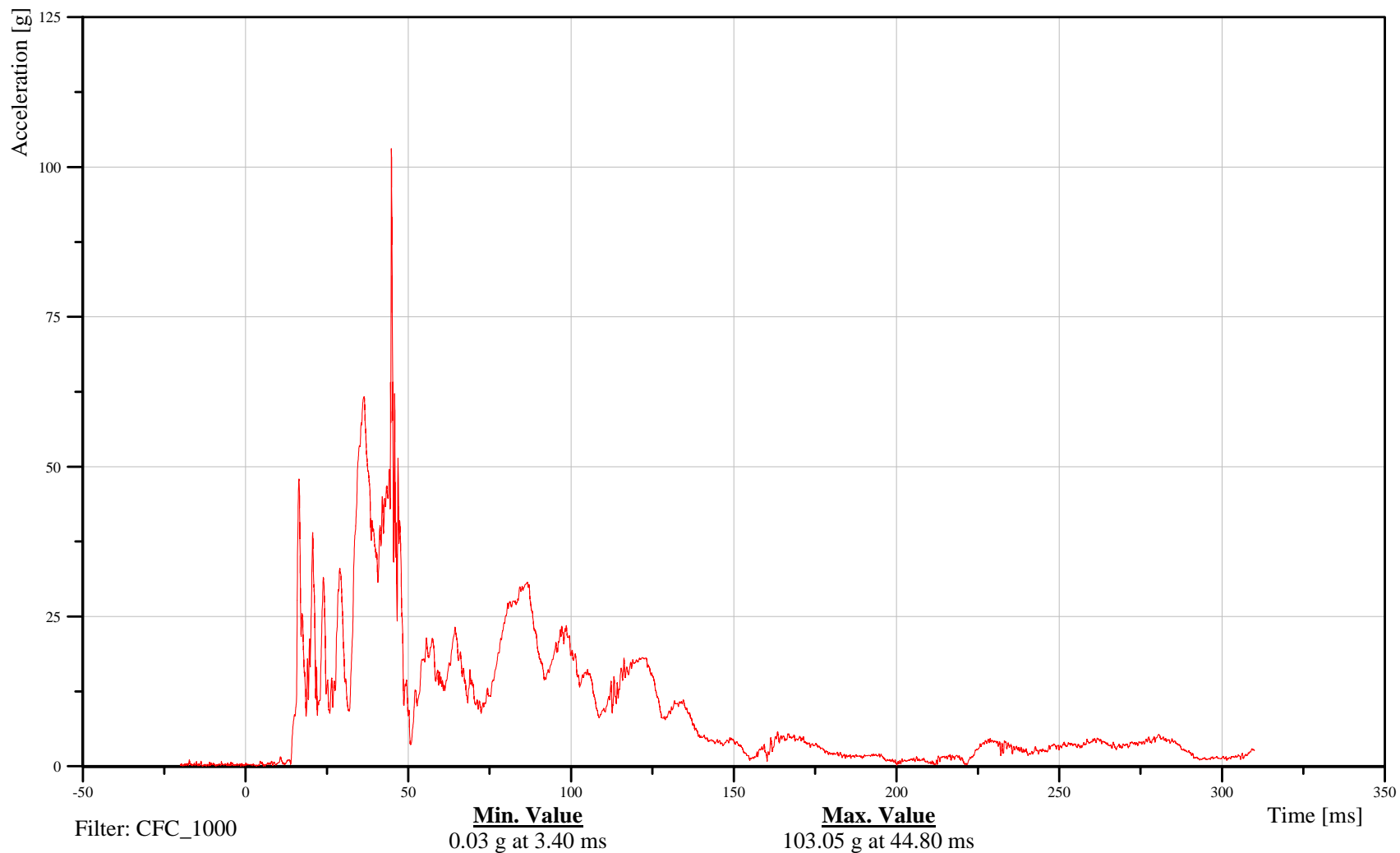
## Thorax Rib 3 Resultant Acceleration

Customer: VRTC

# 11TRRILE03WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-55

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

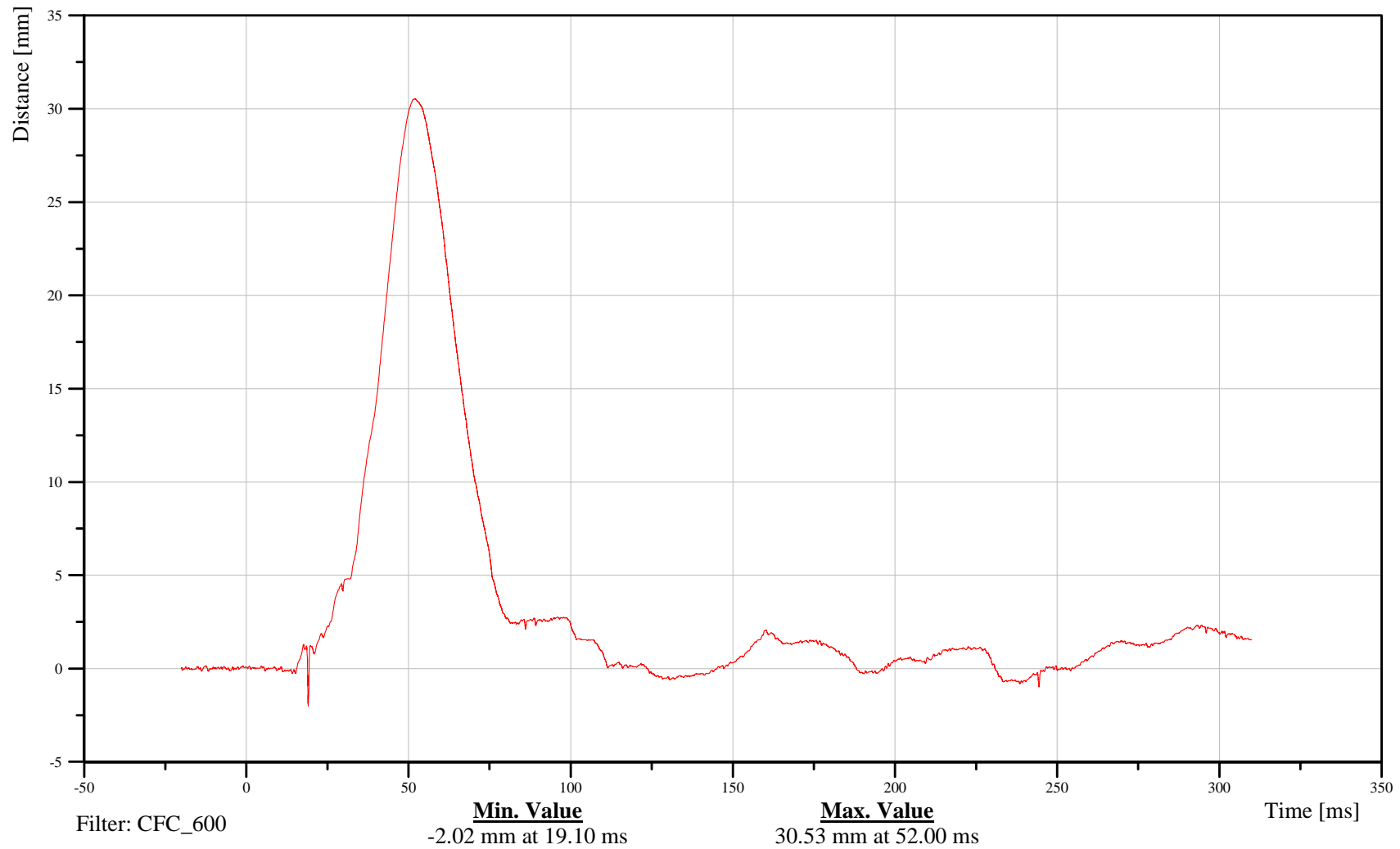
## Abdominal Rib 1 Y-Axis Displacement

Customer: VRTC

# 11ABRILE01WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-56

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

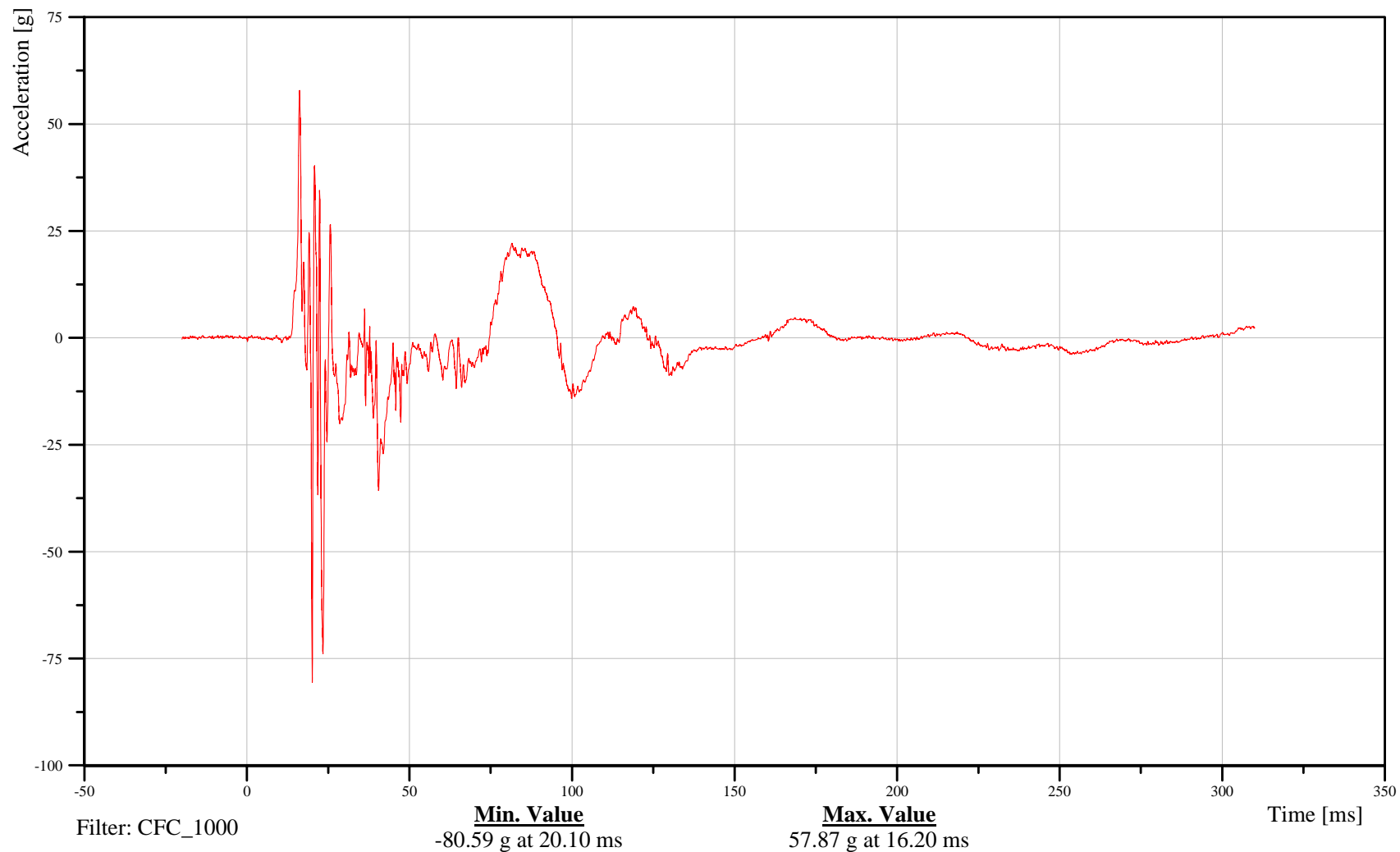
## Abdominal Rib 1 X-Axis Acceleration

Customer: VRTC

# 11ABRILE01WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-57

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

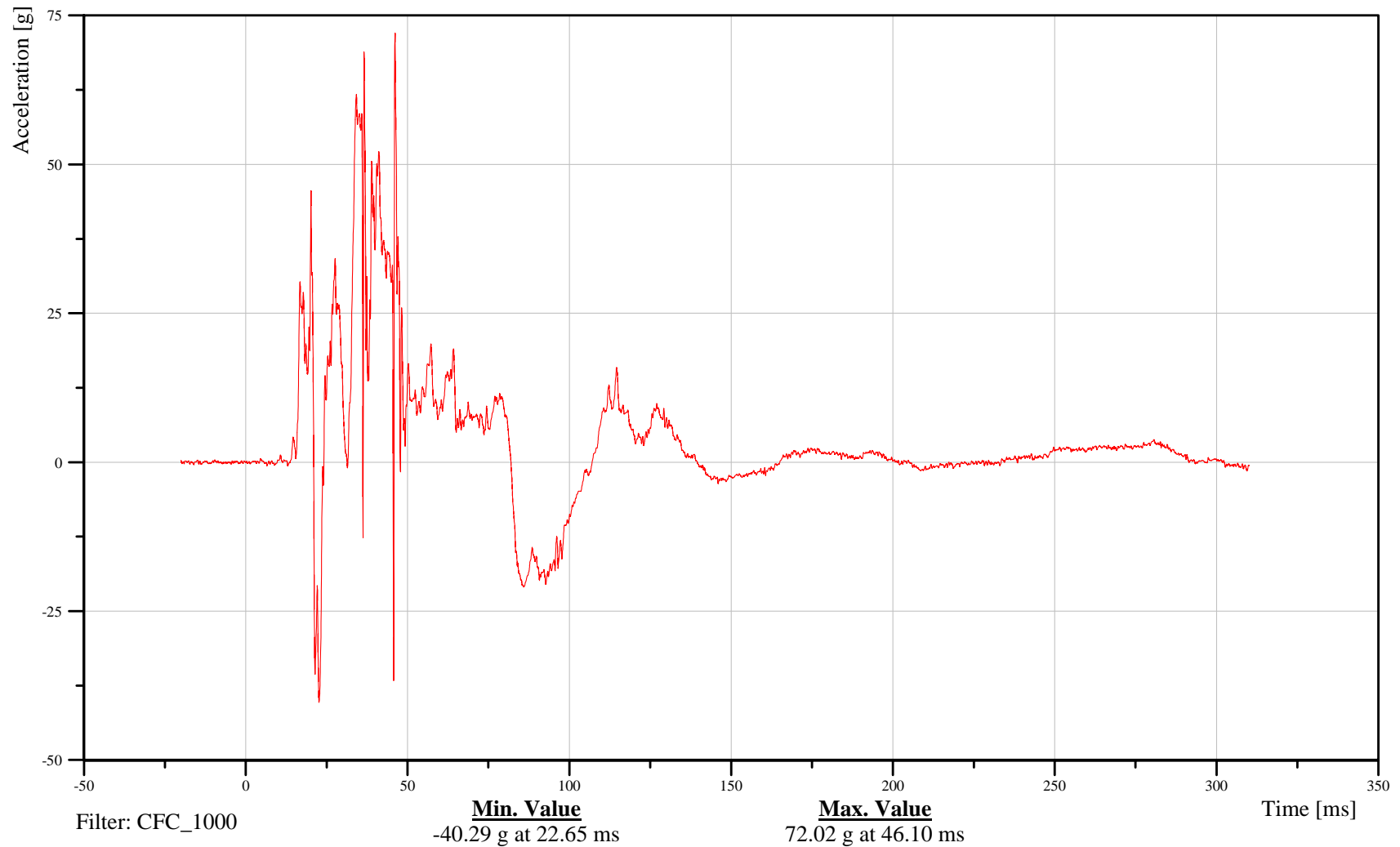
## Abdominal Rib 1 Y-Axis Acceleration

Customer: VRTC

# 11ABRILE01WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

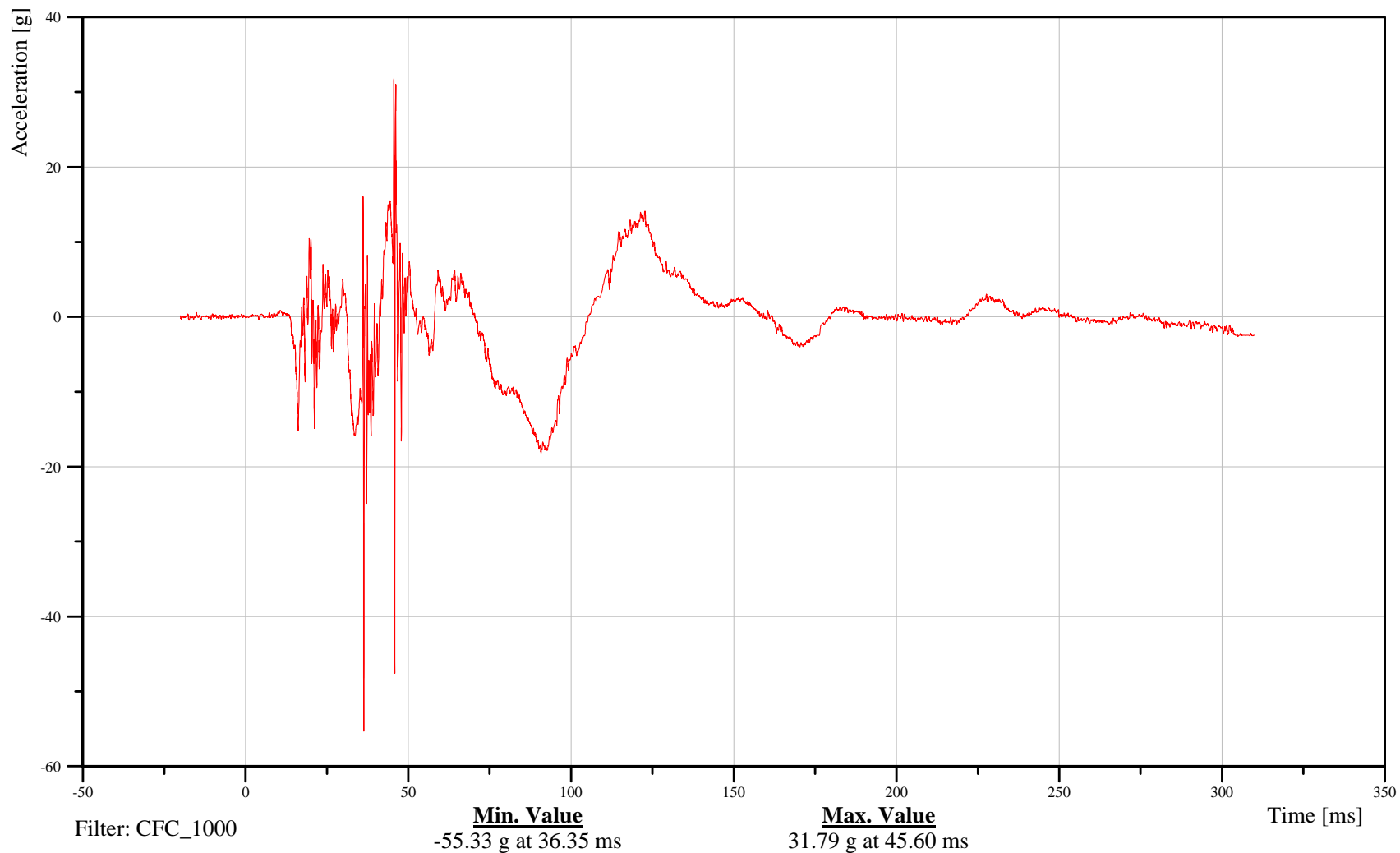
## Abdominal Rib 1 Z-Axis Acceleration

Customer: VRTC

# 11ABRILE01WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



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100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

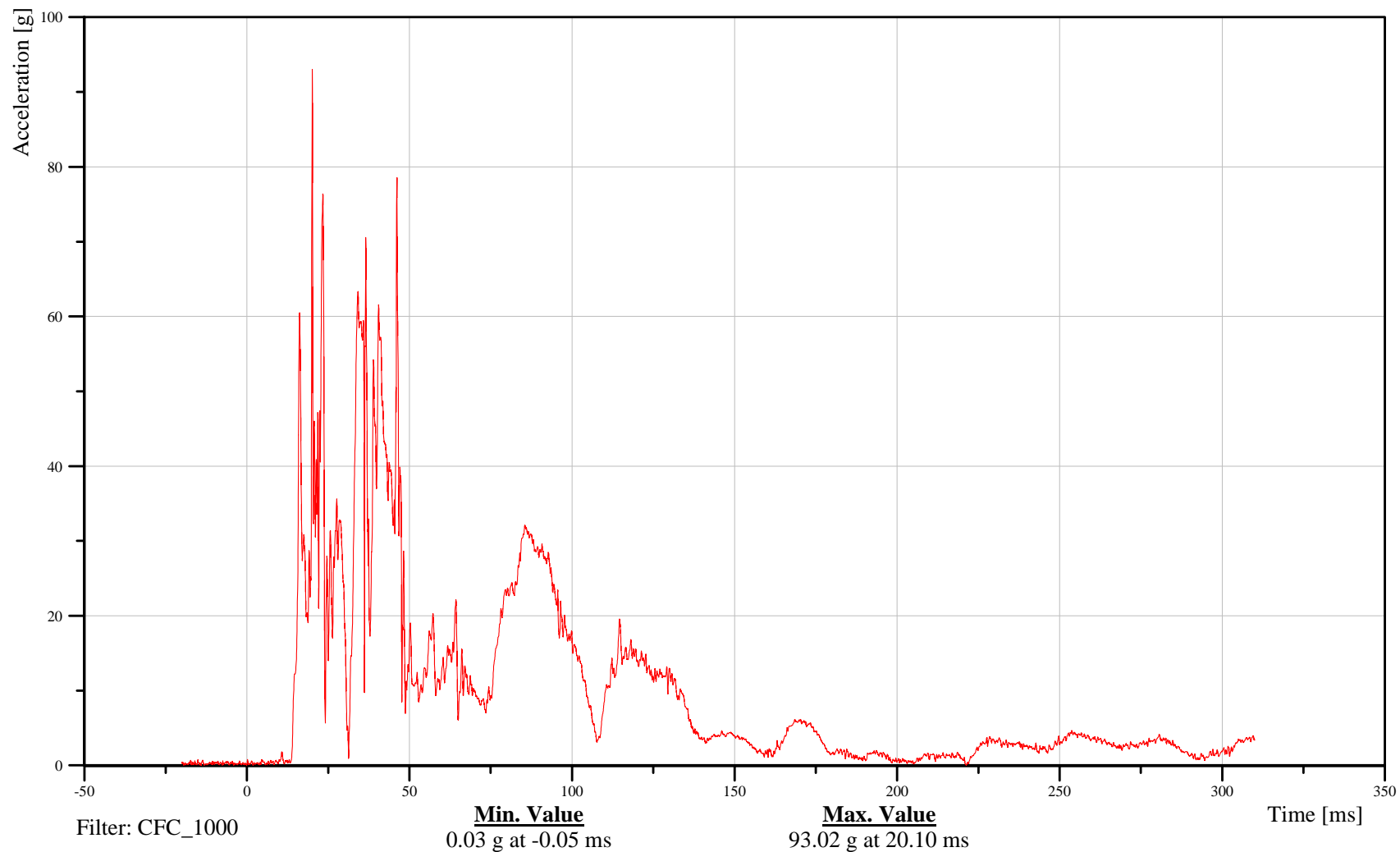
## Abdominal Rib 1 Resultant Acceleration

Customer: VRTC

# 11ABRILE01WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-60

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

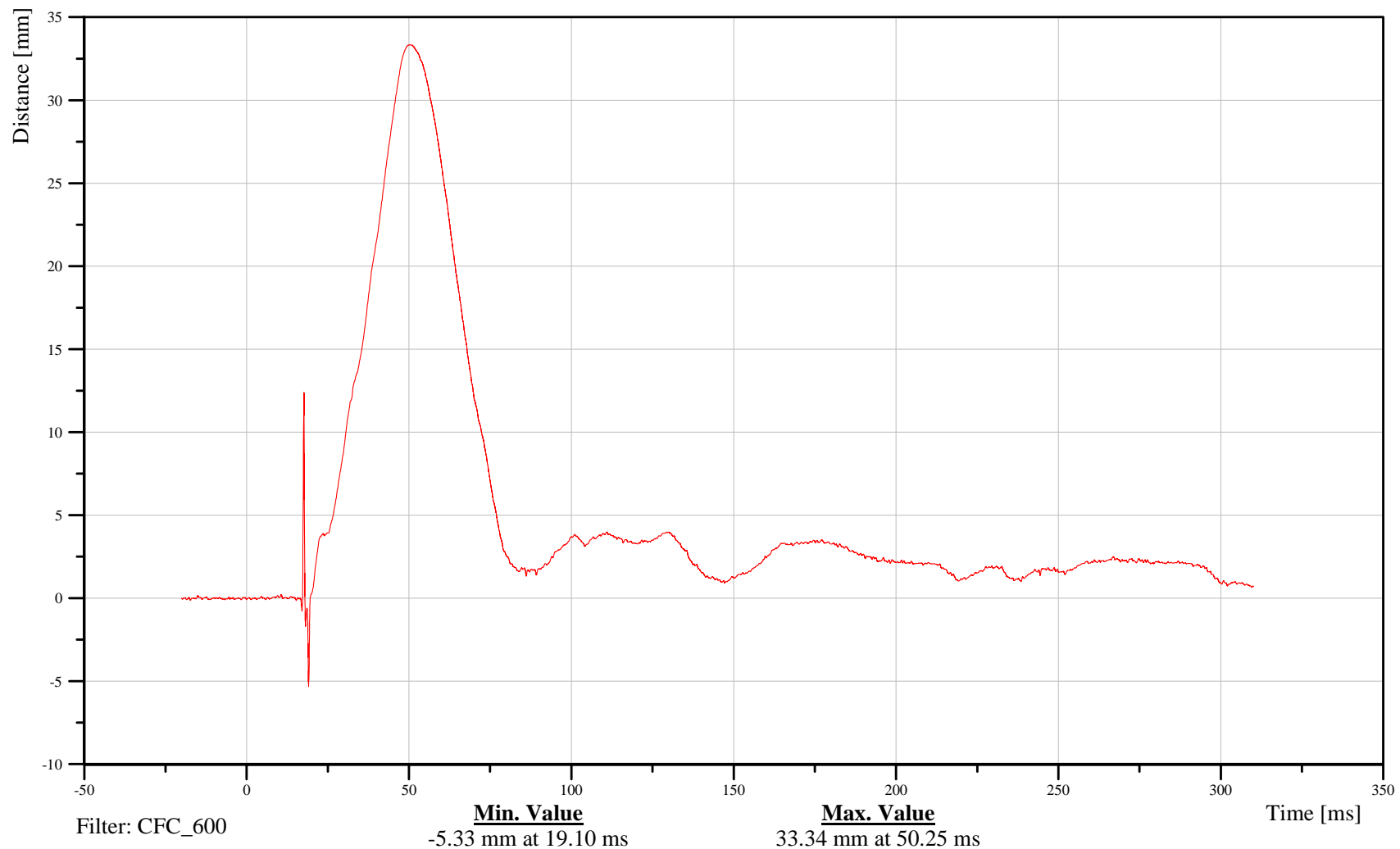
## Abdominal Rib 2 Y-Axis Displacement

Customer: VRTC

# 11ABRILE02WSDSYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-61

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

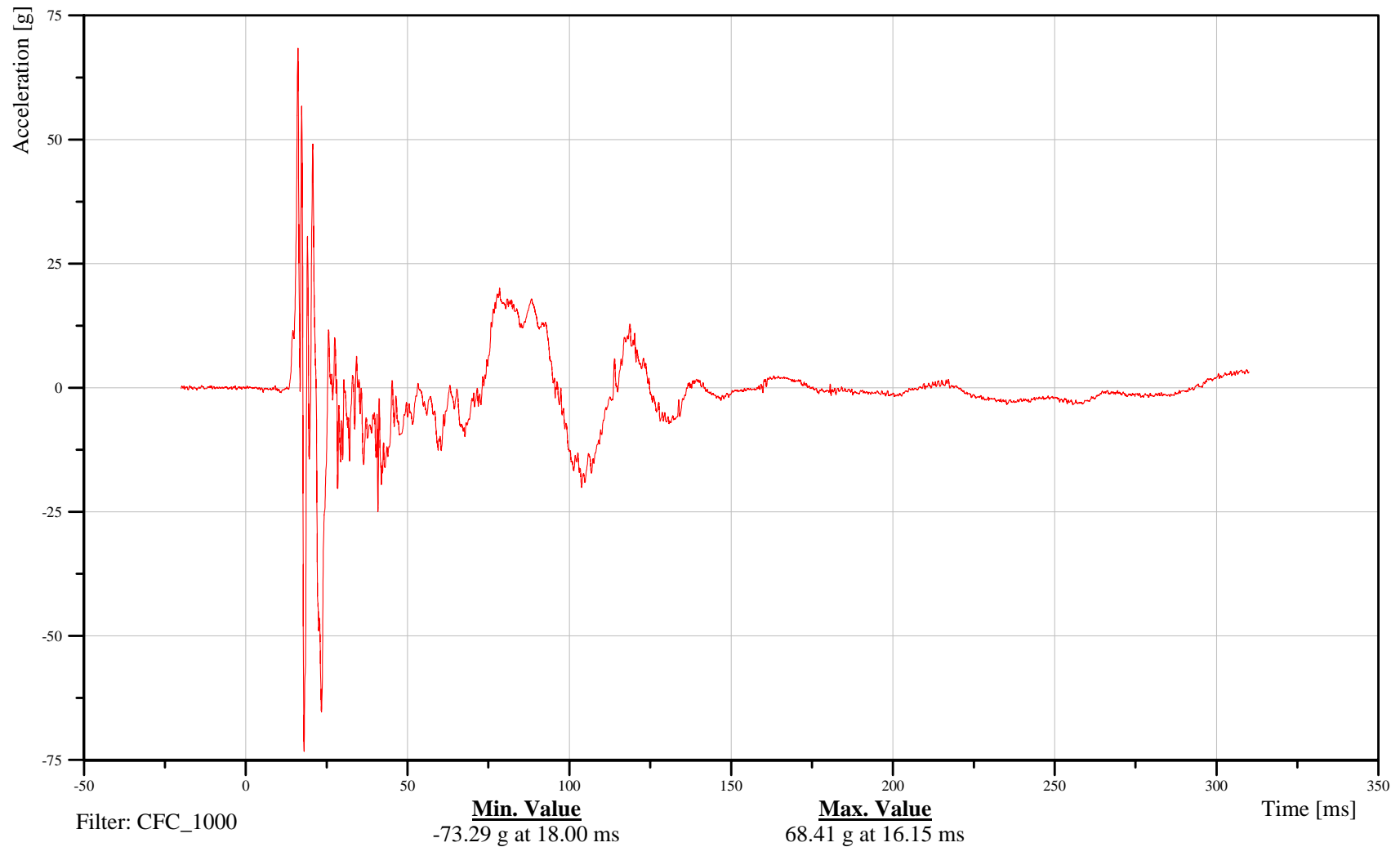
## Abdominal Rib 2 X-Axis Acceleration

Customer: VRTC

# 11ABRILE02WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-62

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

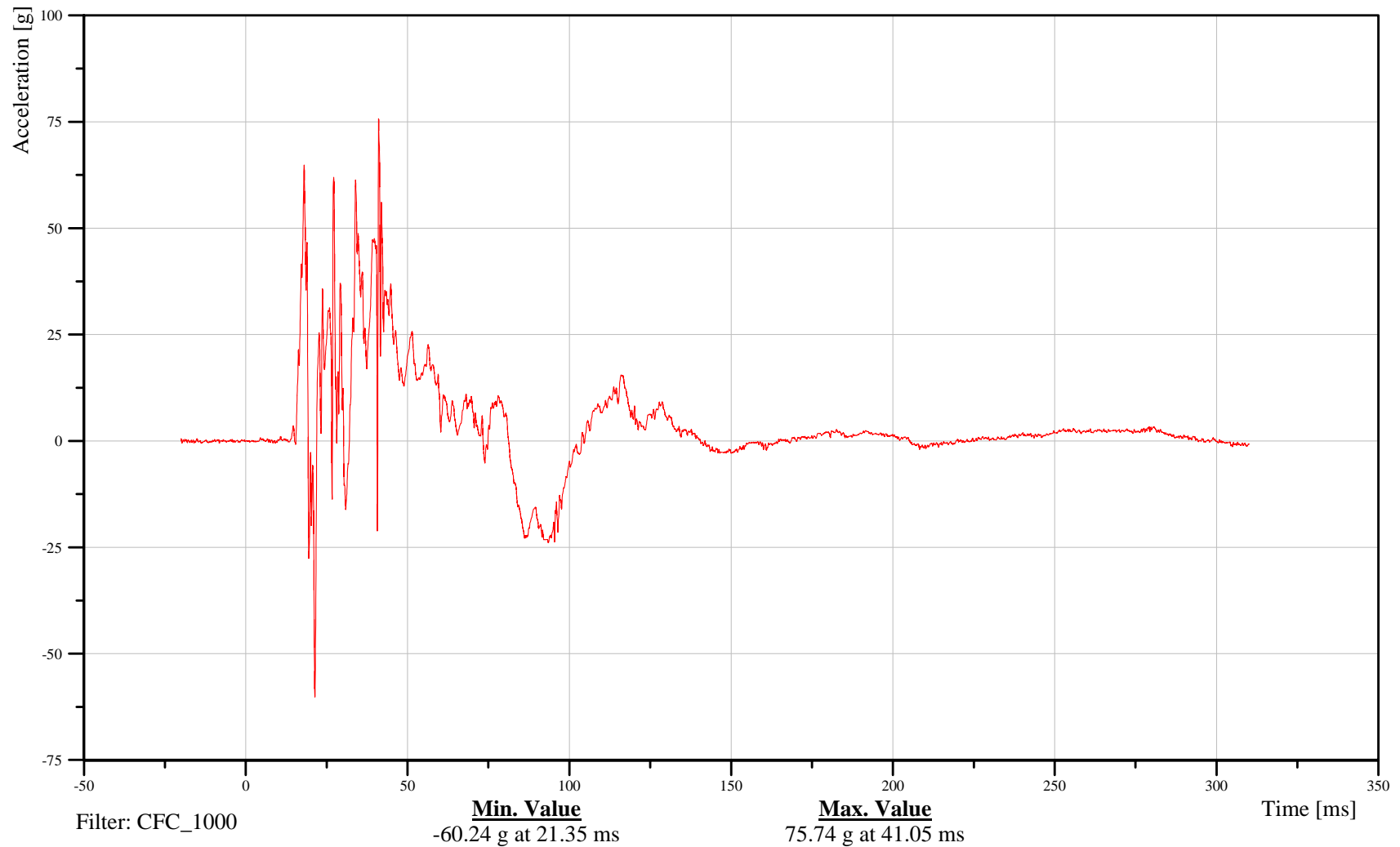
## Abdominal Rib 2 Y-Axis Acceleration

Customer: VRTC

# 11ABRILE02WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-63

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

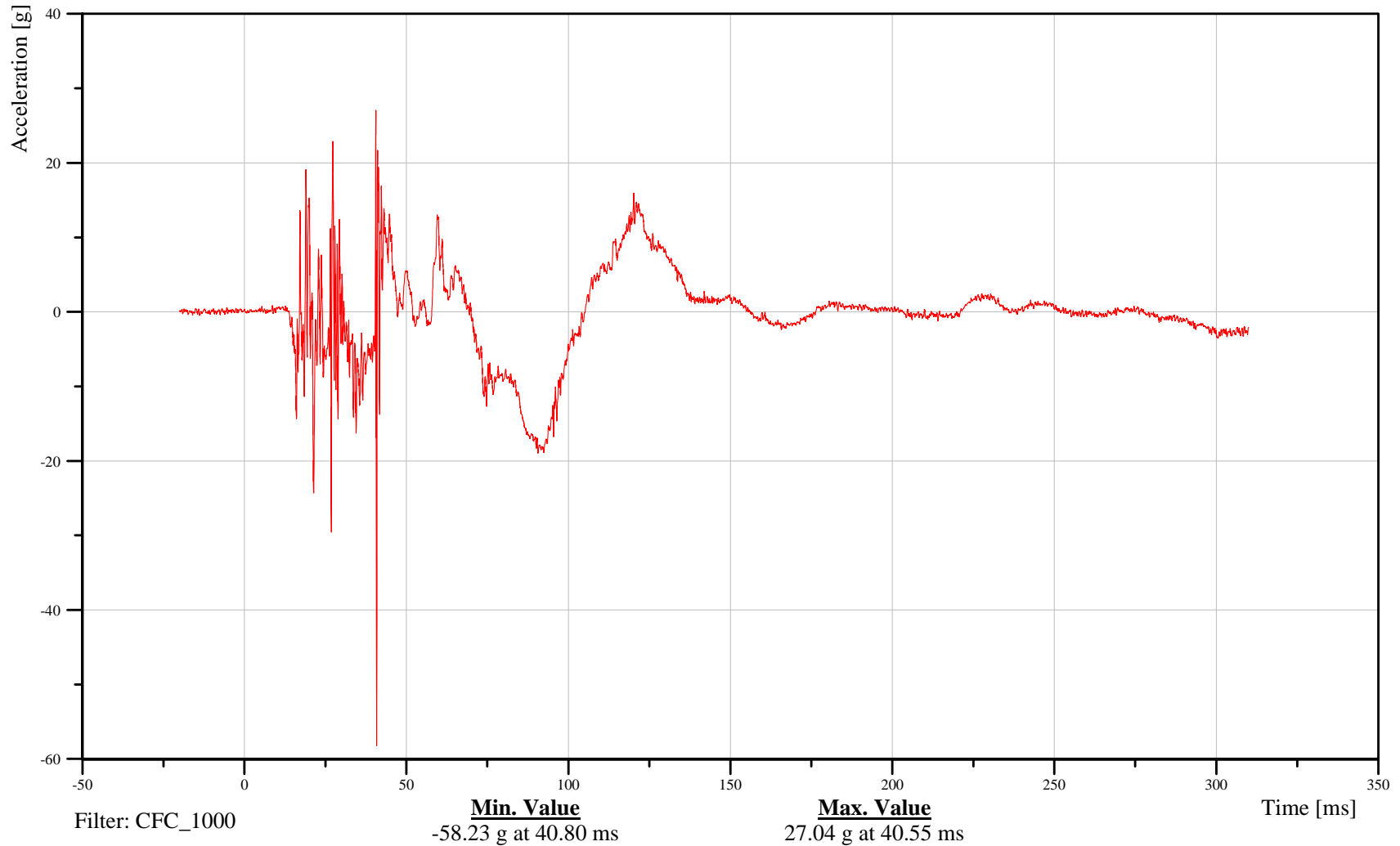
## Abdominal Rib 2 Z-Axis Acceleration

Customer: VRTC

# 11ABRILE02WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-64

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

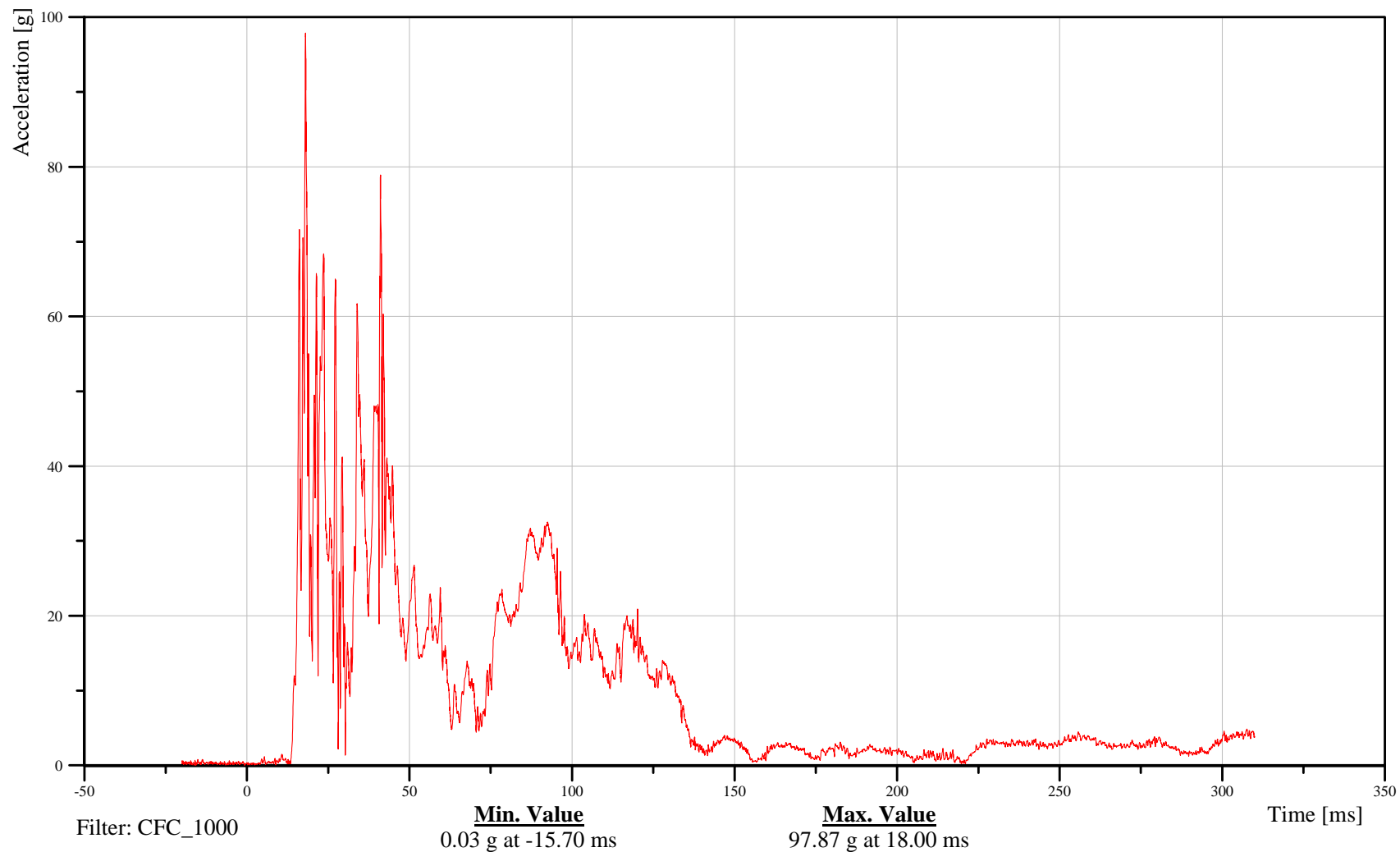
## Abdominal Rib 2 Resultant Acceleration

Customer: VRTC

# 11ABRILE02WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-65

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

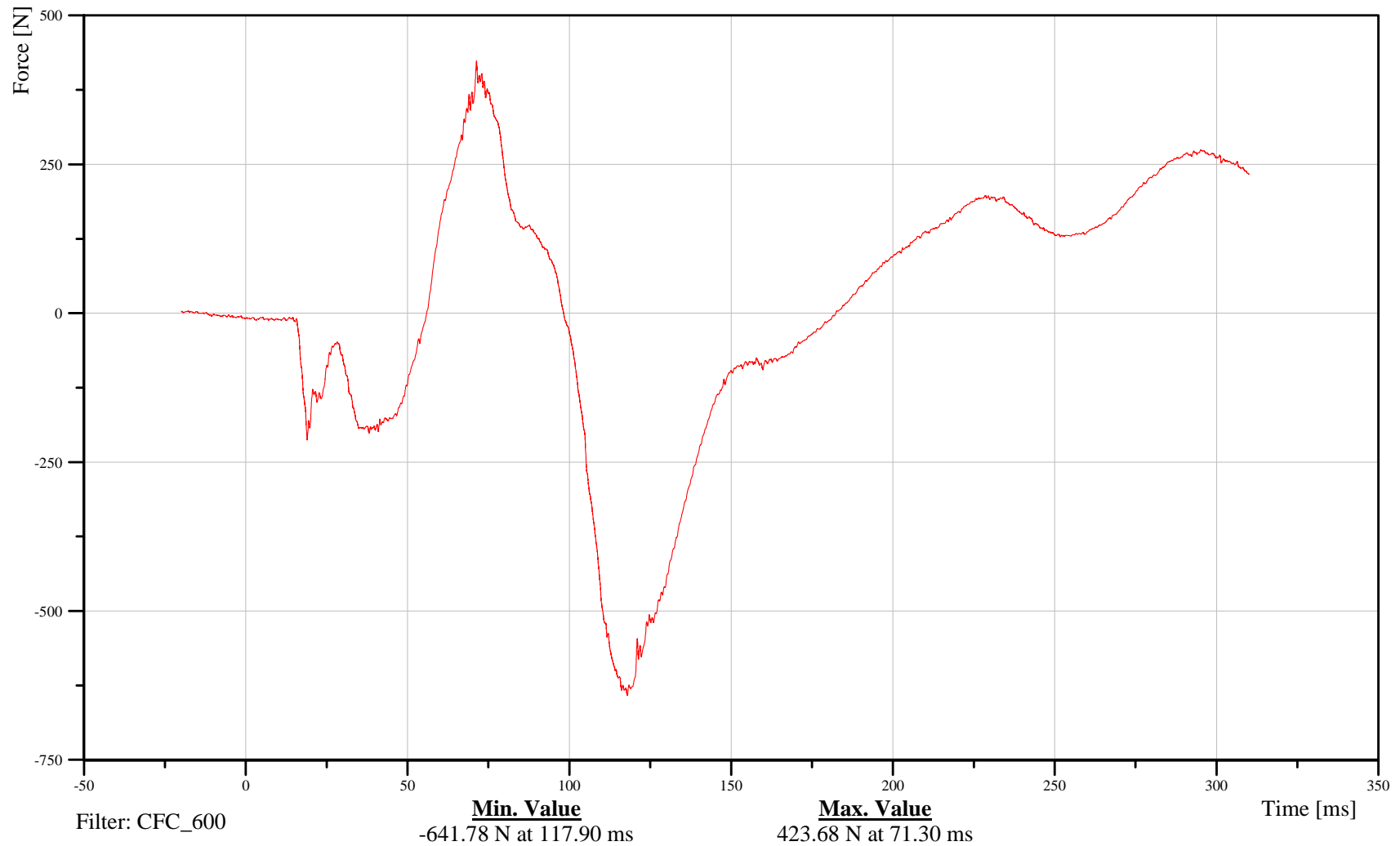
## Lumbar X-Axis Force

Customer: VRTC

# 11LUSP0000WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-66

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

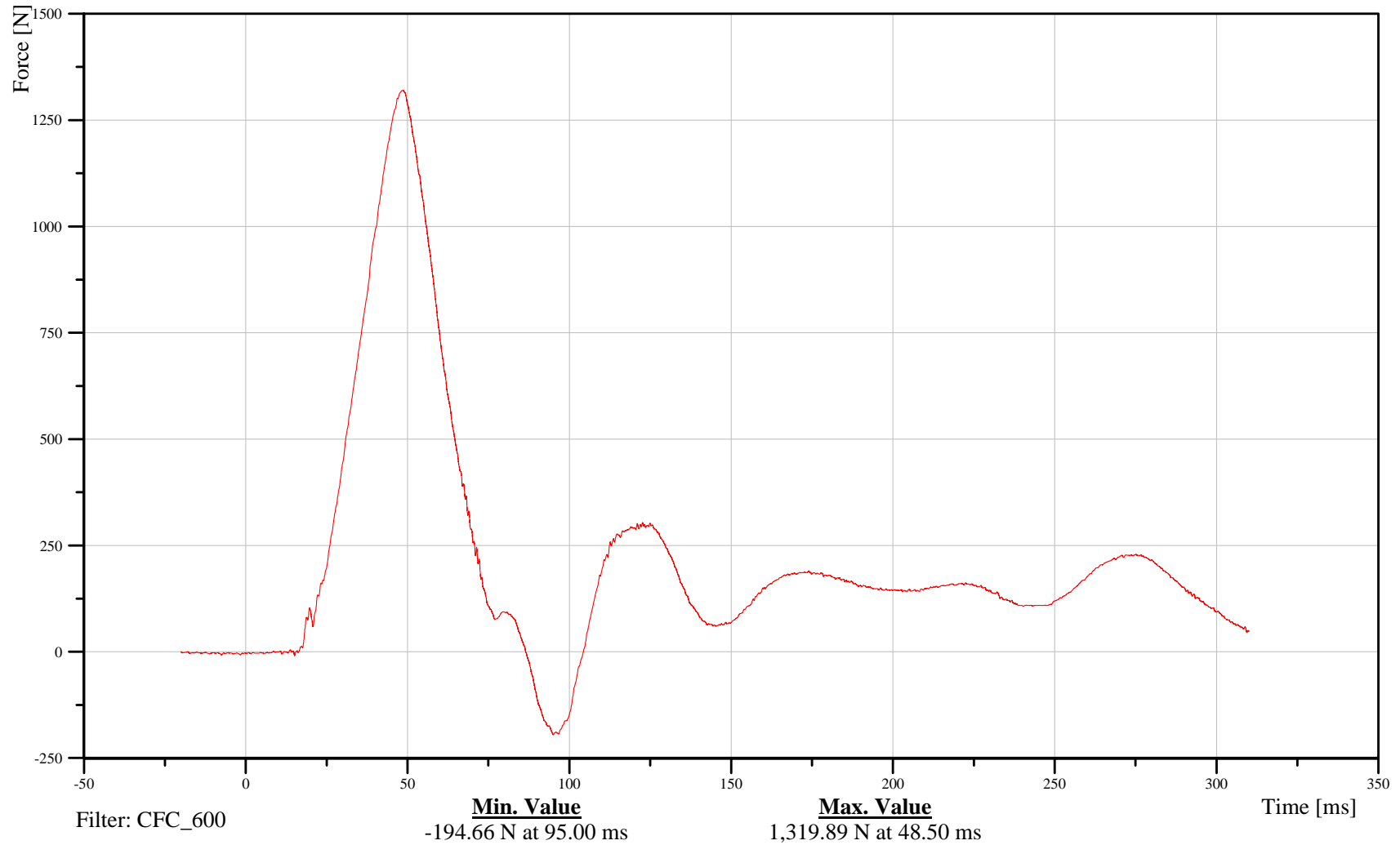
## Lumbar Y-Axis Force

Customer: VRTC

# 11LUSP0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-67

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

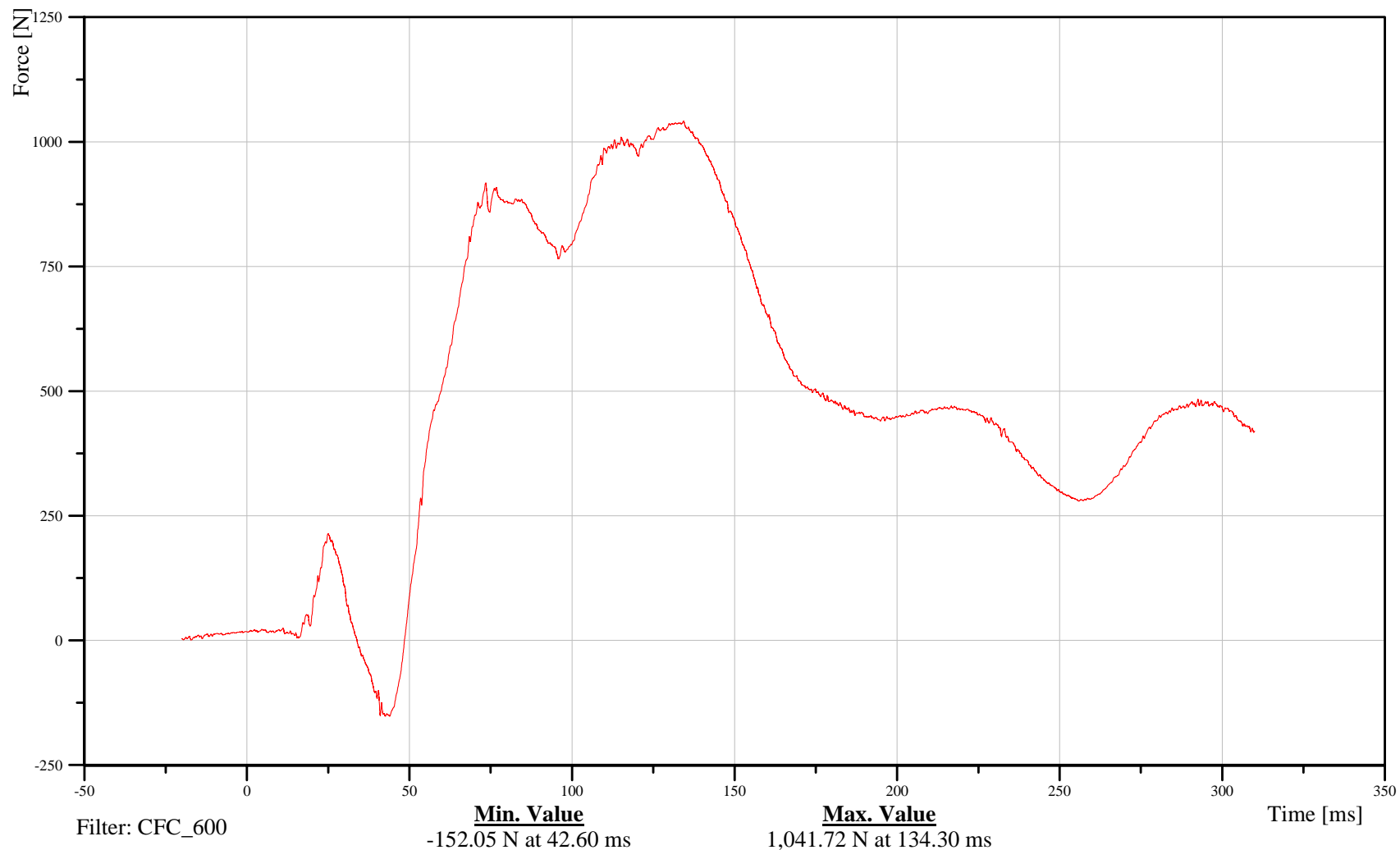
## Lumbar Z-Axis Force

Customer: VRTC

# 11LUSP0000WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-68

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

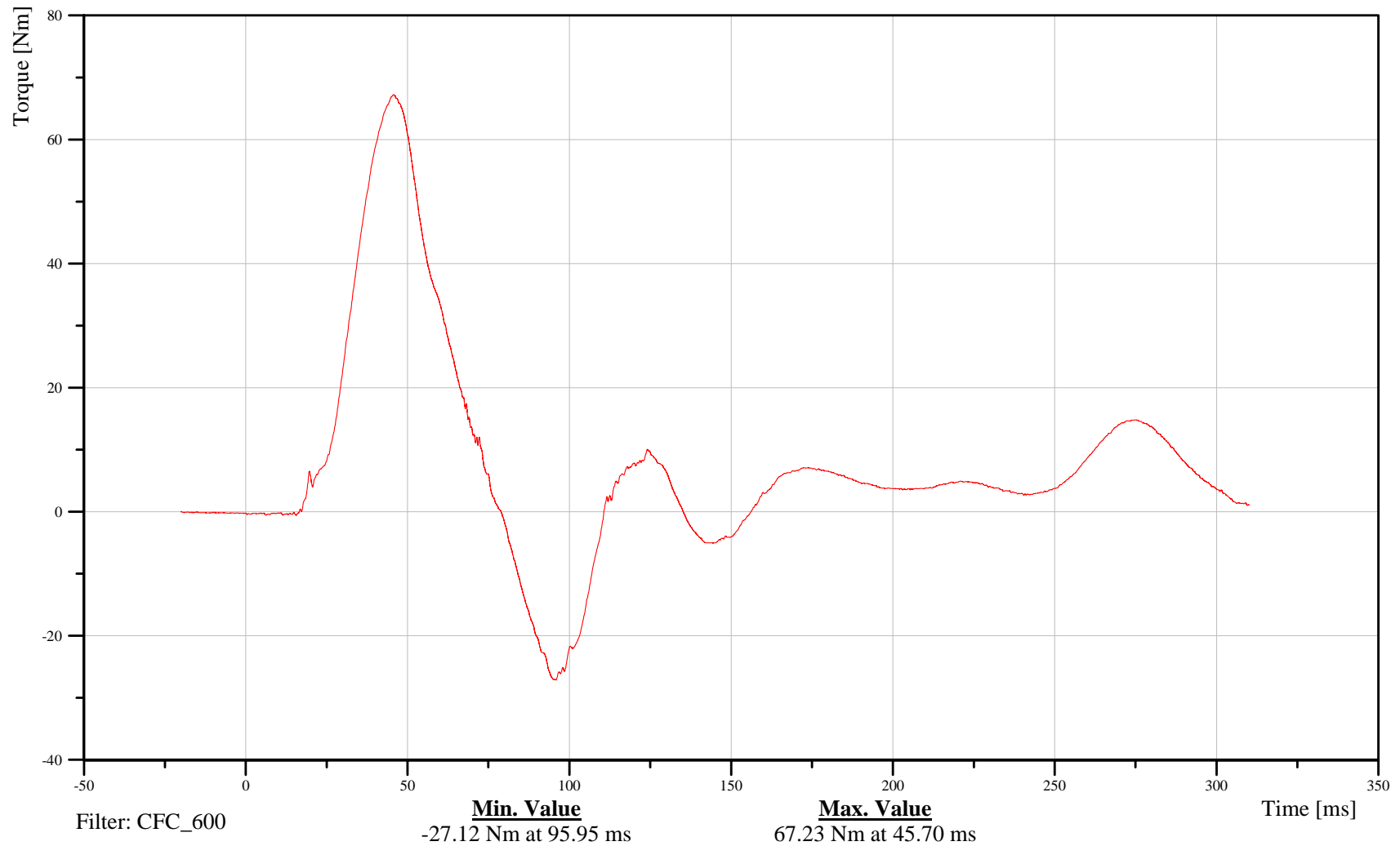
## Lumbar Moment About X Axis

Customer: VRTC

# 11LUSP0000WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-69

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

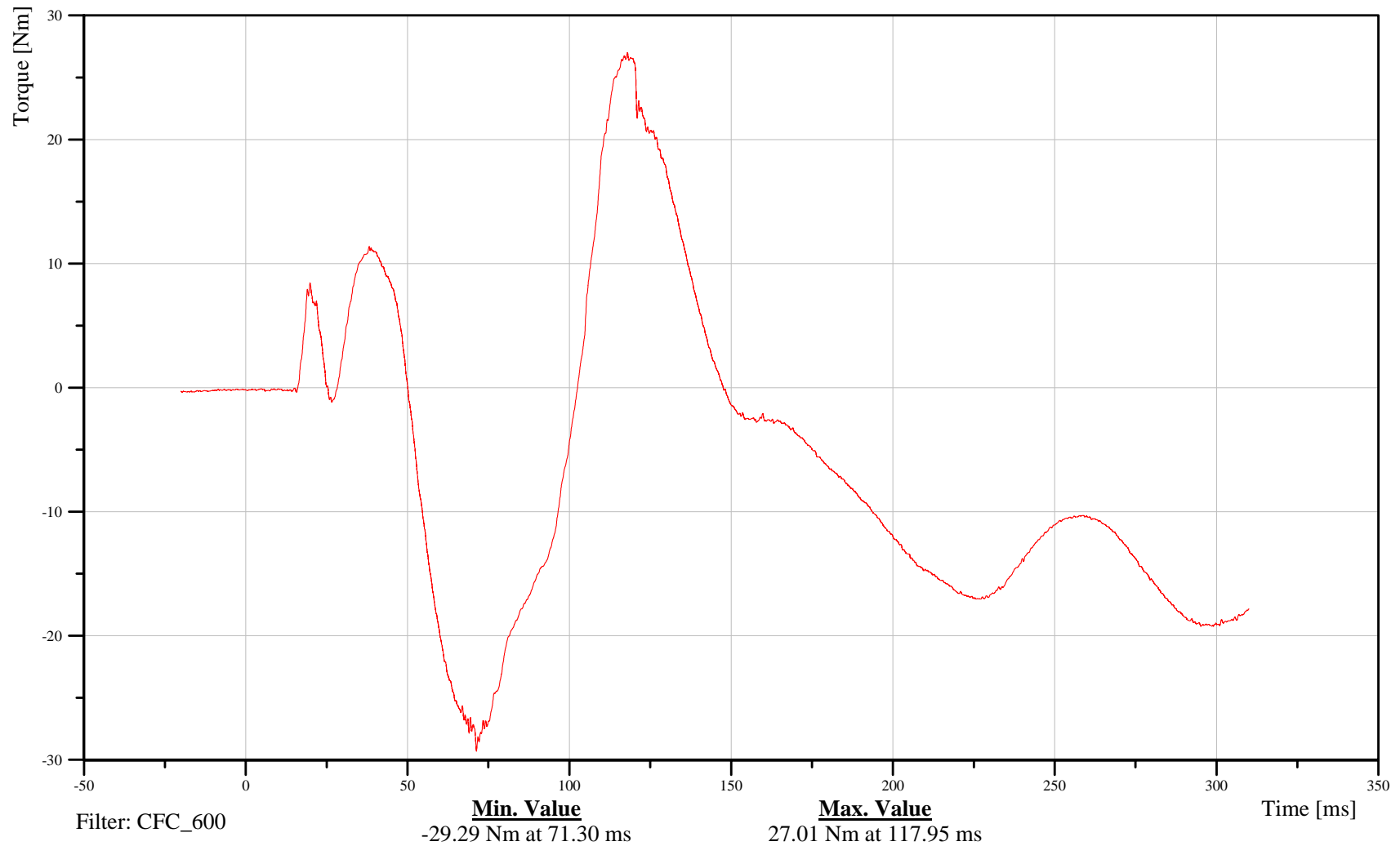
## Lumbar Moment About Y Axis

Customer: VRTC

# 11LUSP0000WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-70

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

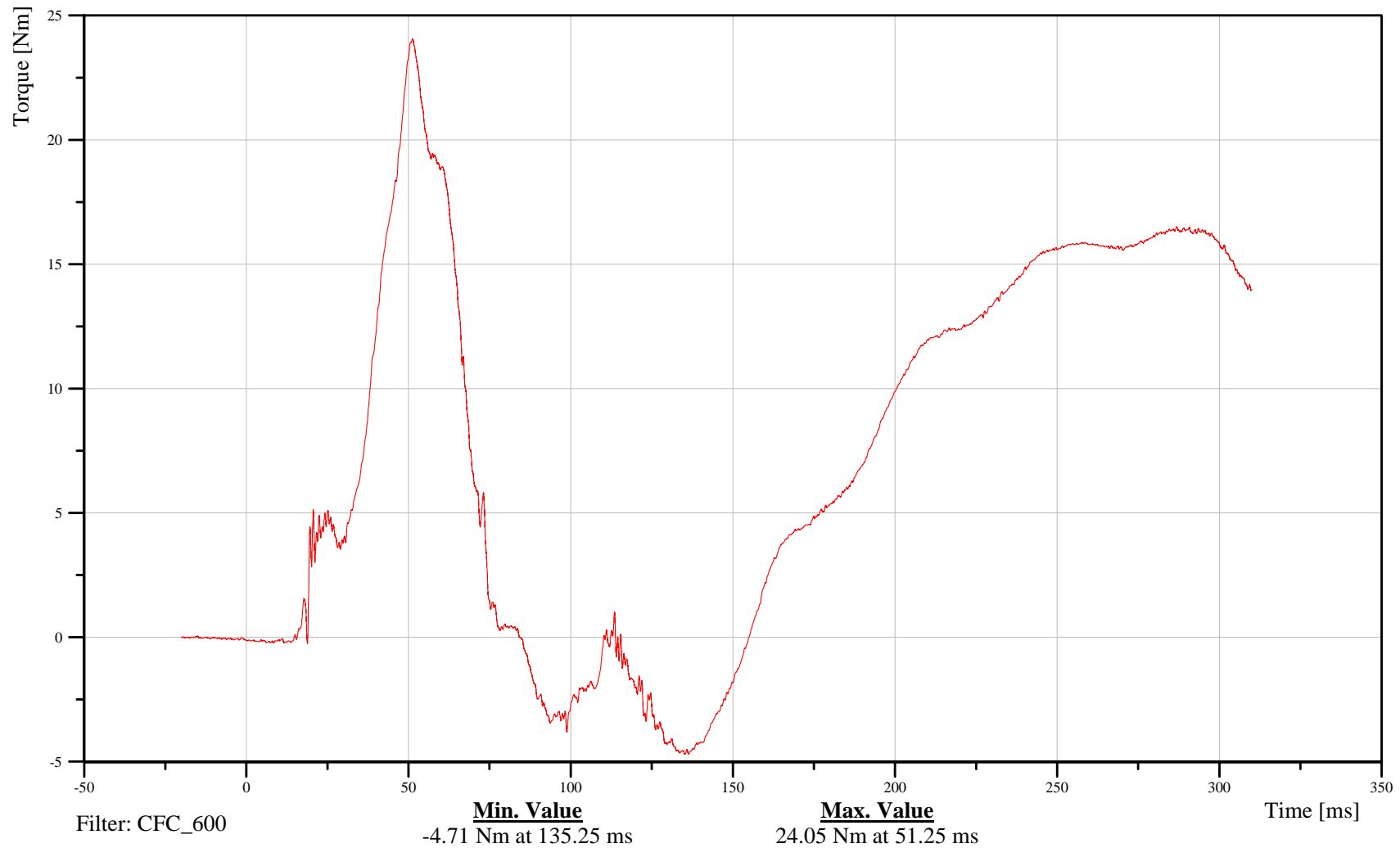
## Lumbar Moment About Z Axis

Customer: VRTC

# 11LUSP0000WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-71

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

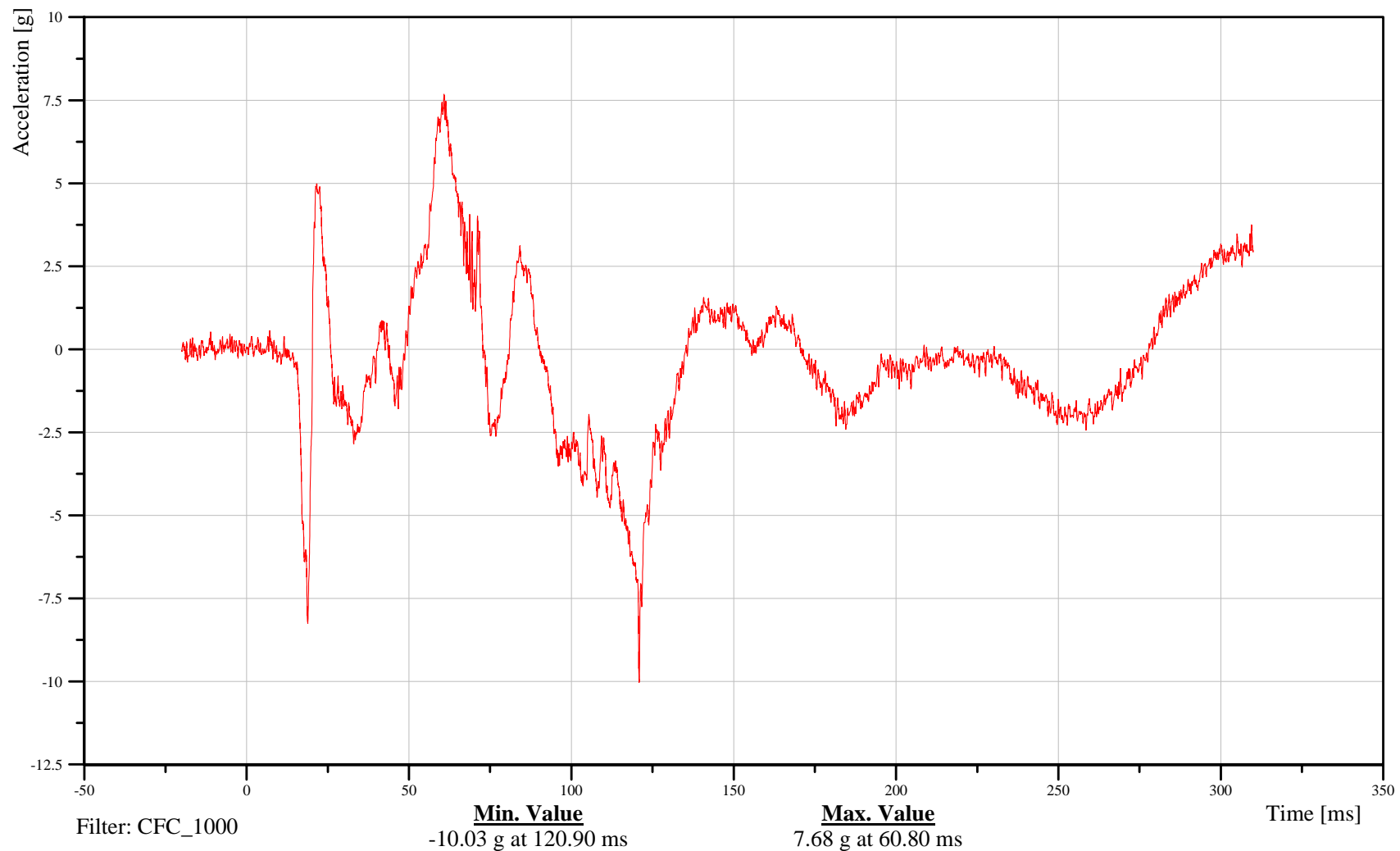
## Pelvis X-Axis Acceleration

Customer: VRTC

# 11PELVCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-72

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

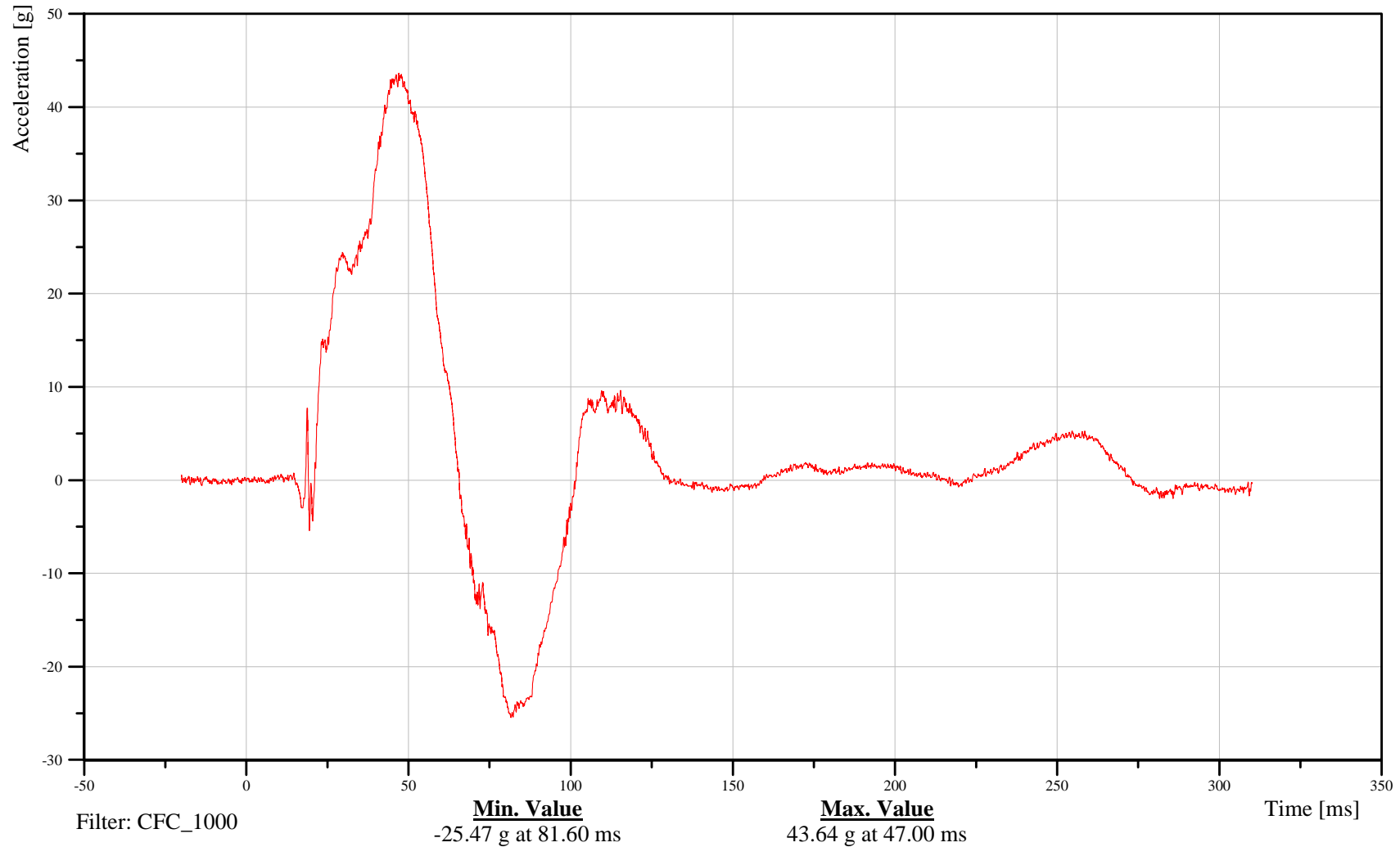
## Pelvis Y-Axis Acceleration

Customer: VRTC

# 11PELVCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-73

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

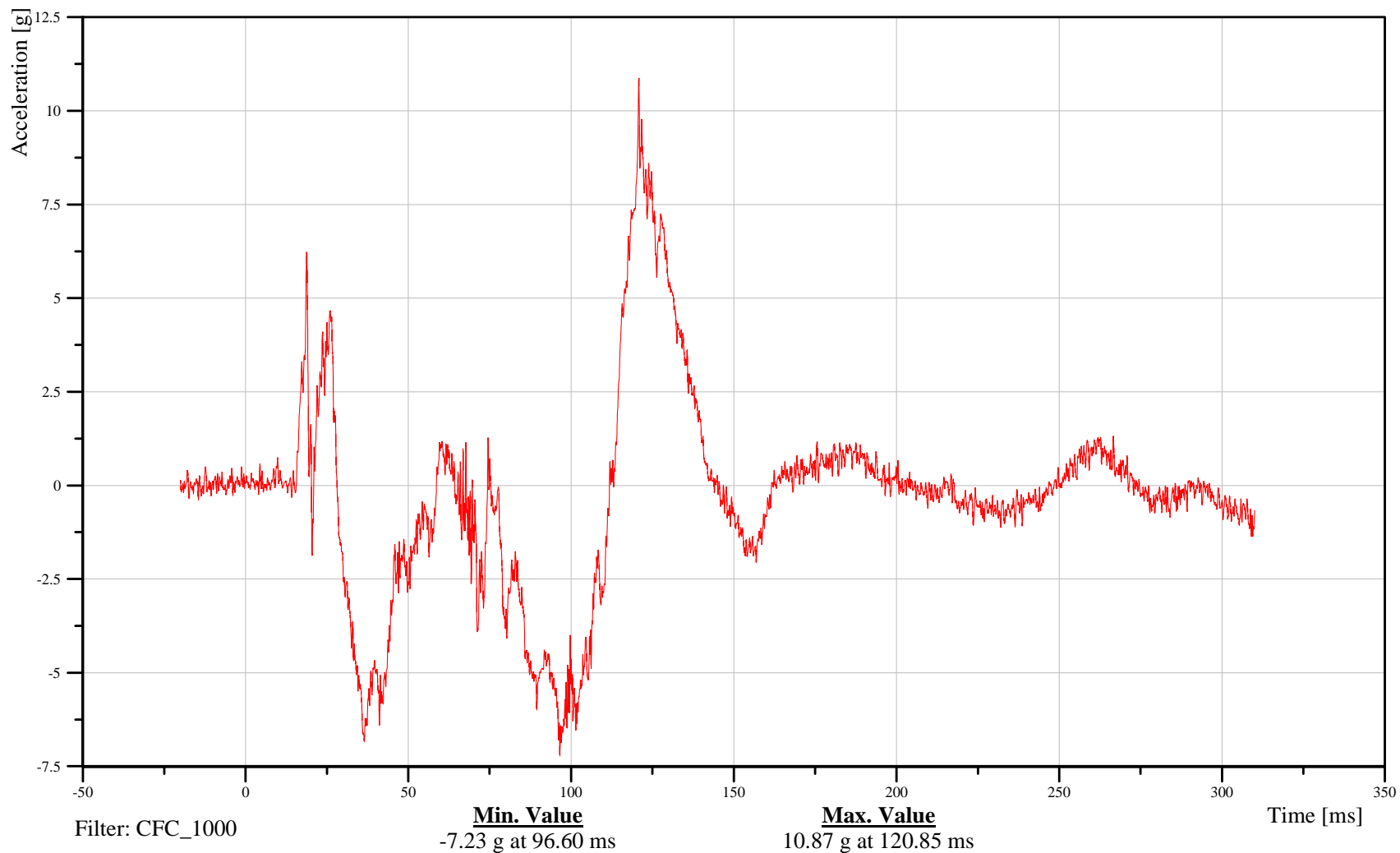
## Pelvis Z-Axis Acceleration

Customer: VRTC

# 11PELVCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-74

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

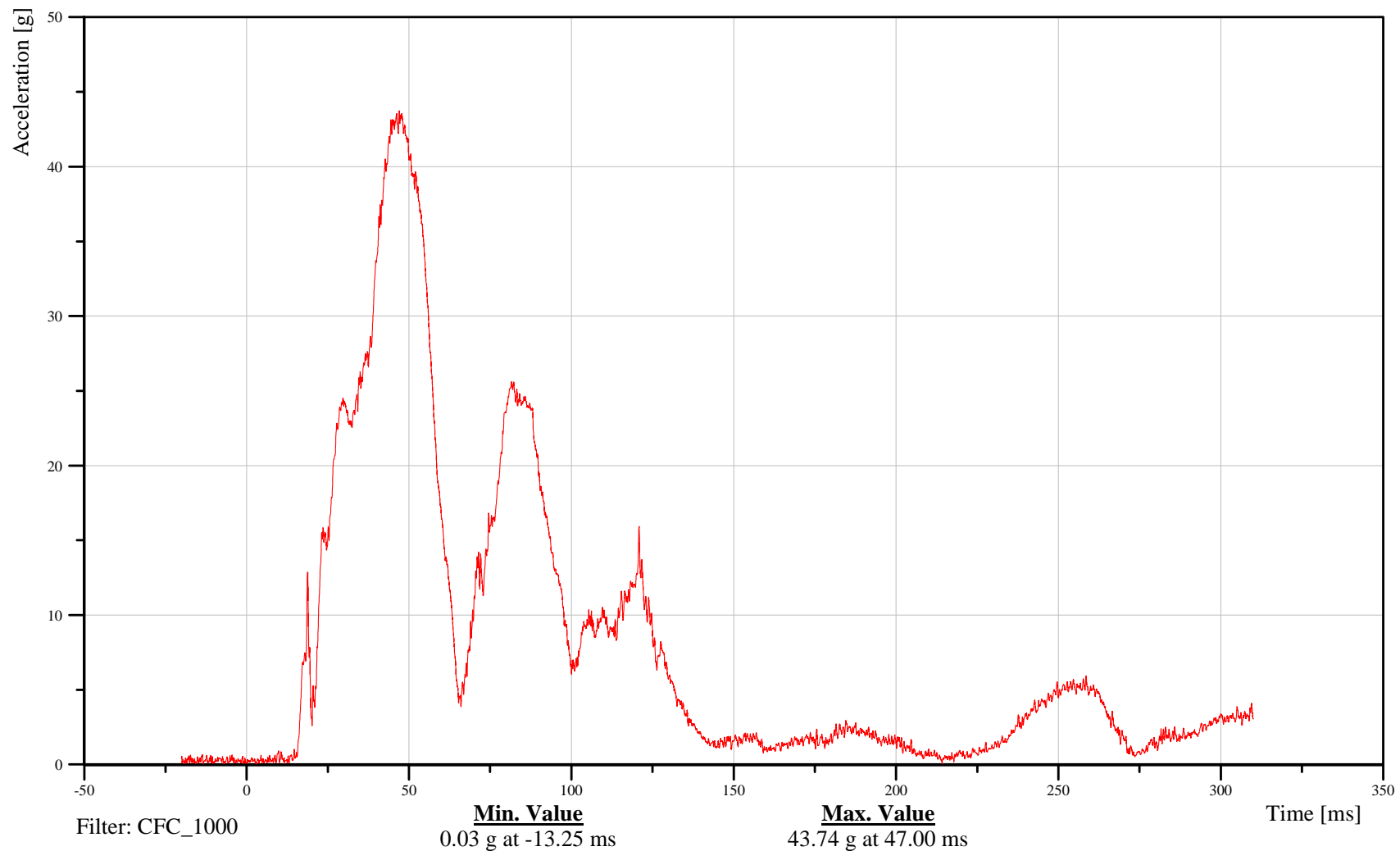
## Pelvis Resultant Acceleration

Customer: VRTC

# 11PELVCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-75

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

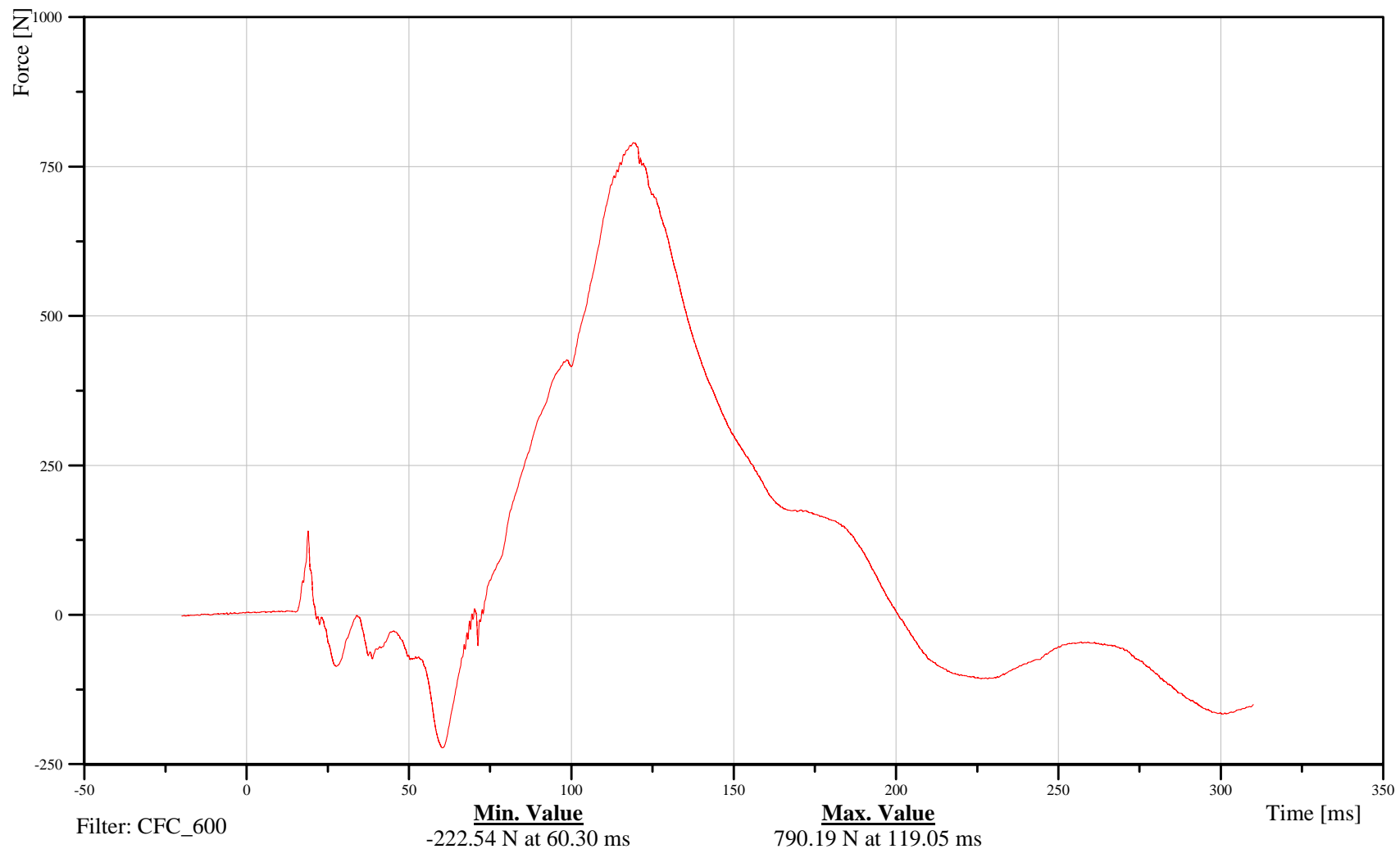
## Sacro-Iliac Left X-Axis Force

Customer: VRTC

# 11SACRLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-76

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

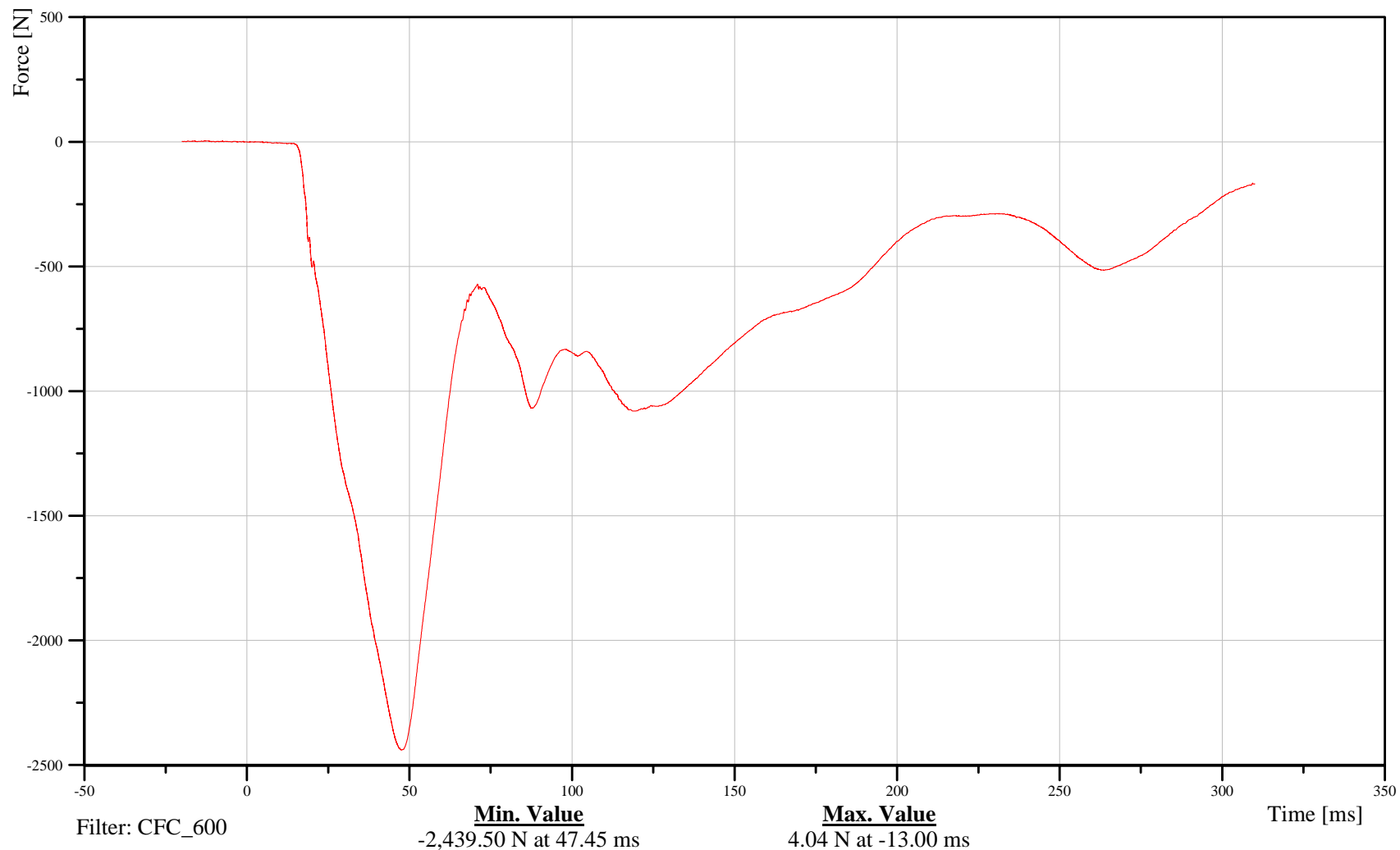
## Sacro-Iliac Left Y-Axis Force

Customer: VRTC

# 11SACRLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-77

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

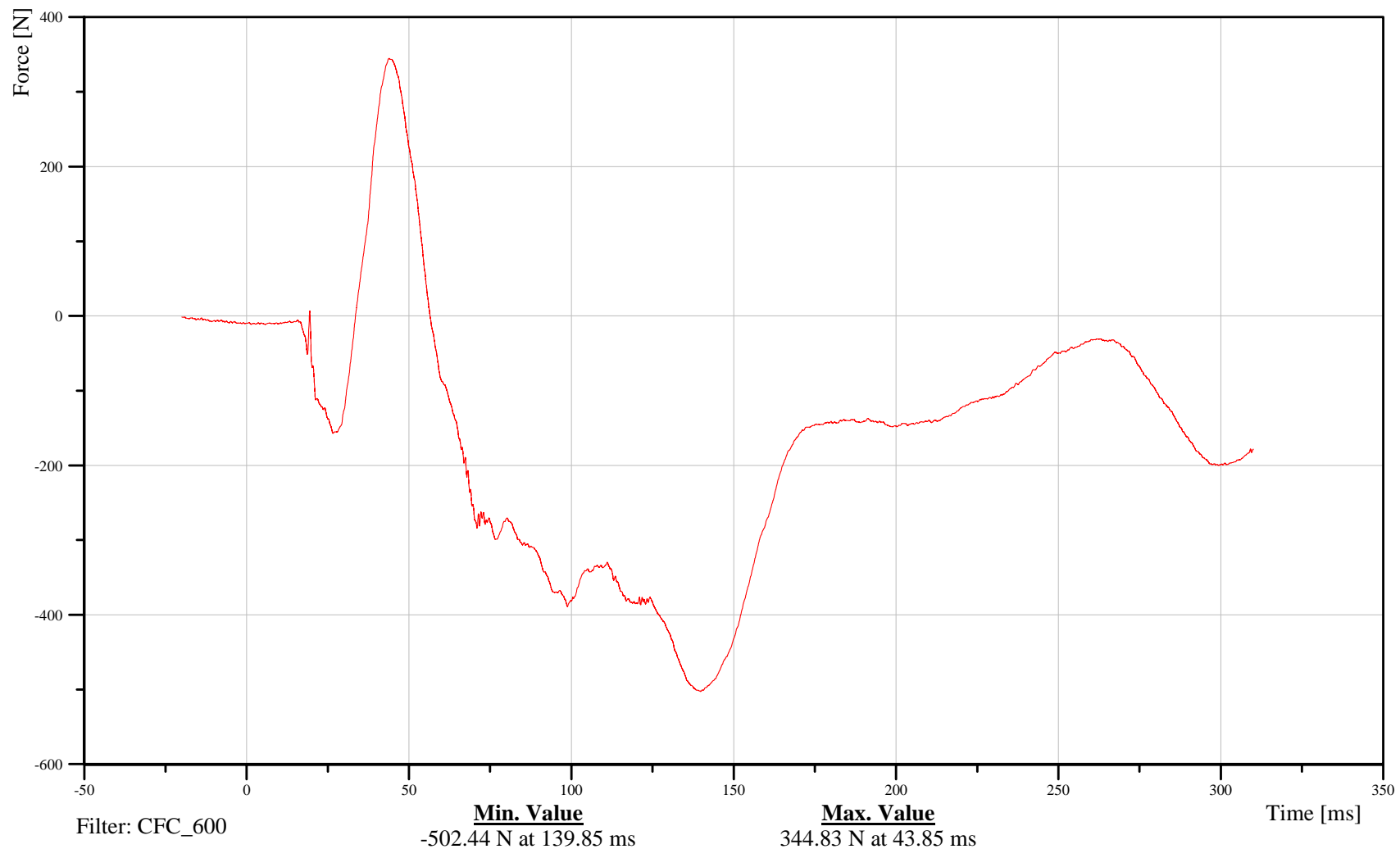
## Sacro-Iliac Left Z-Axis Force

Customer: VRTC

# 11SACRLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-78

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

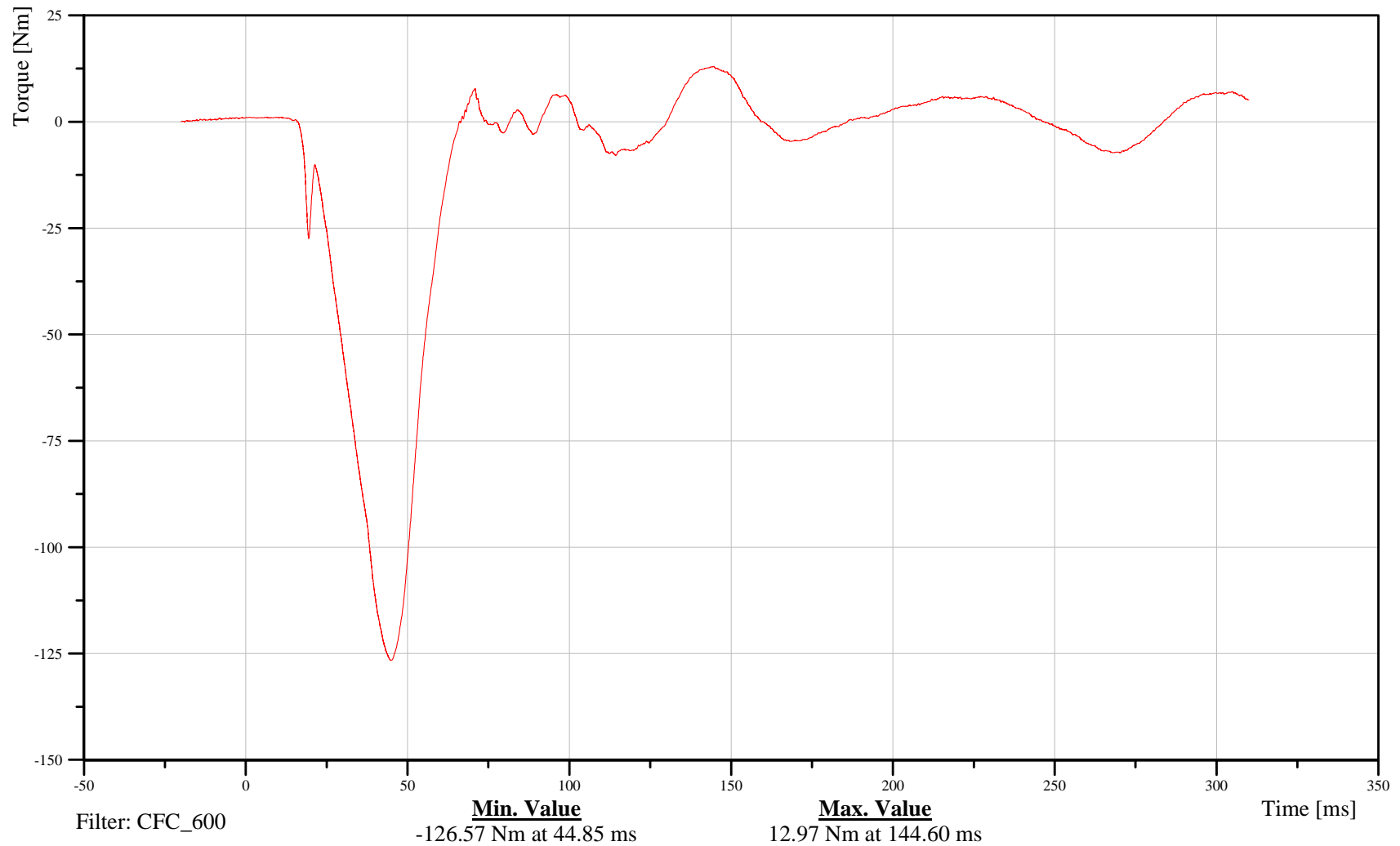
## Sacro-Iliac Left Moment About X Axis

Customer: VRTC

# 11SACRLE00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-79

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

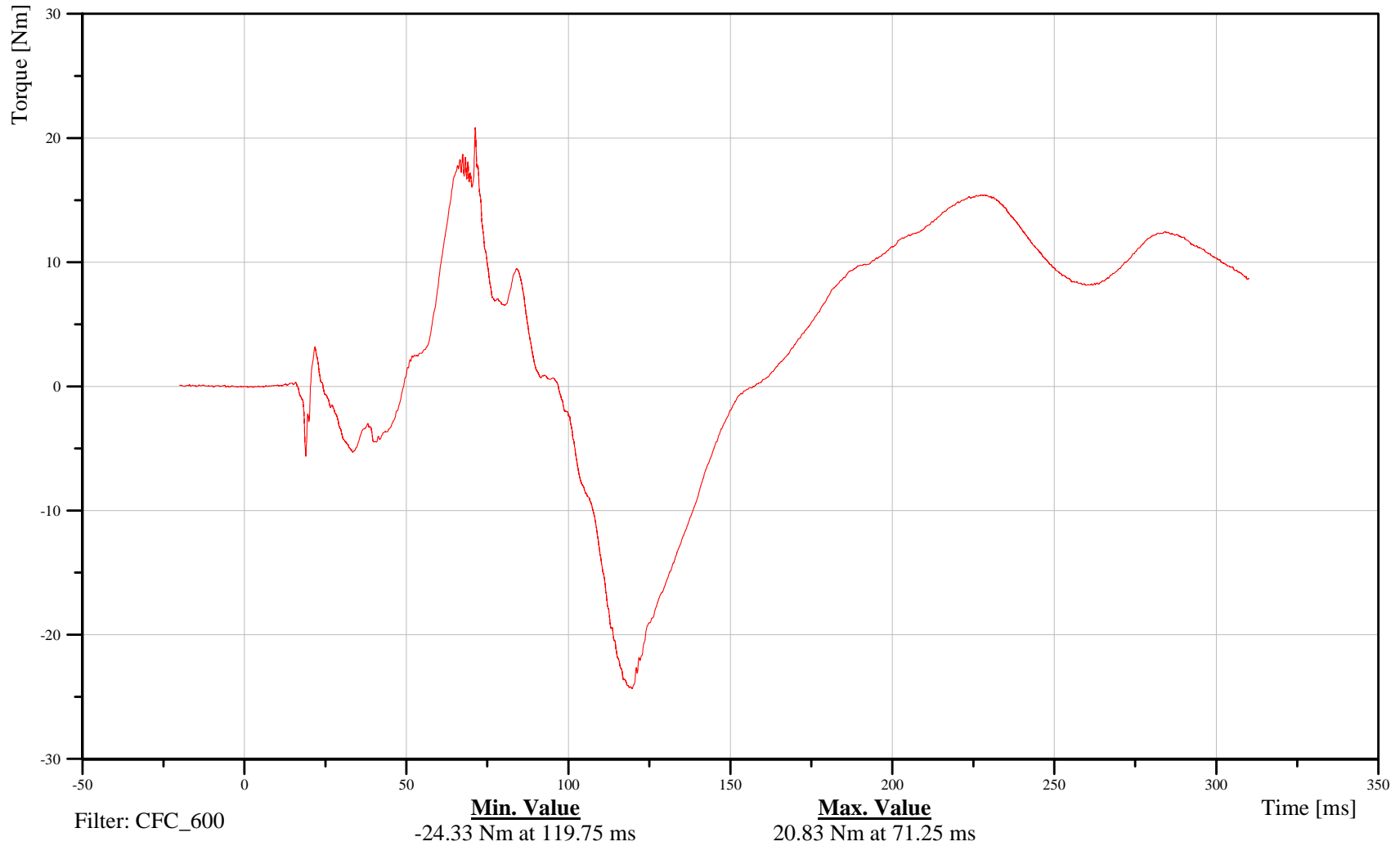
## Sacro-Iliac Left Moment About Y Axis

Customer: VRTC

# 11SACRLE00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-80

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

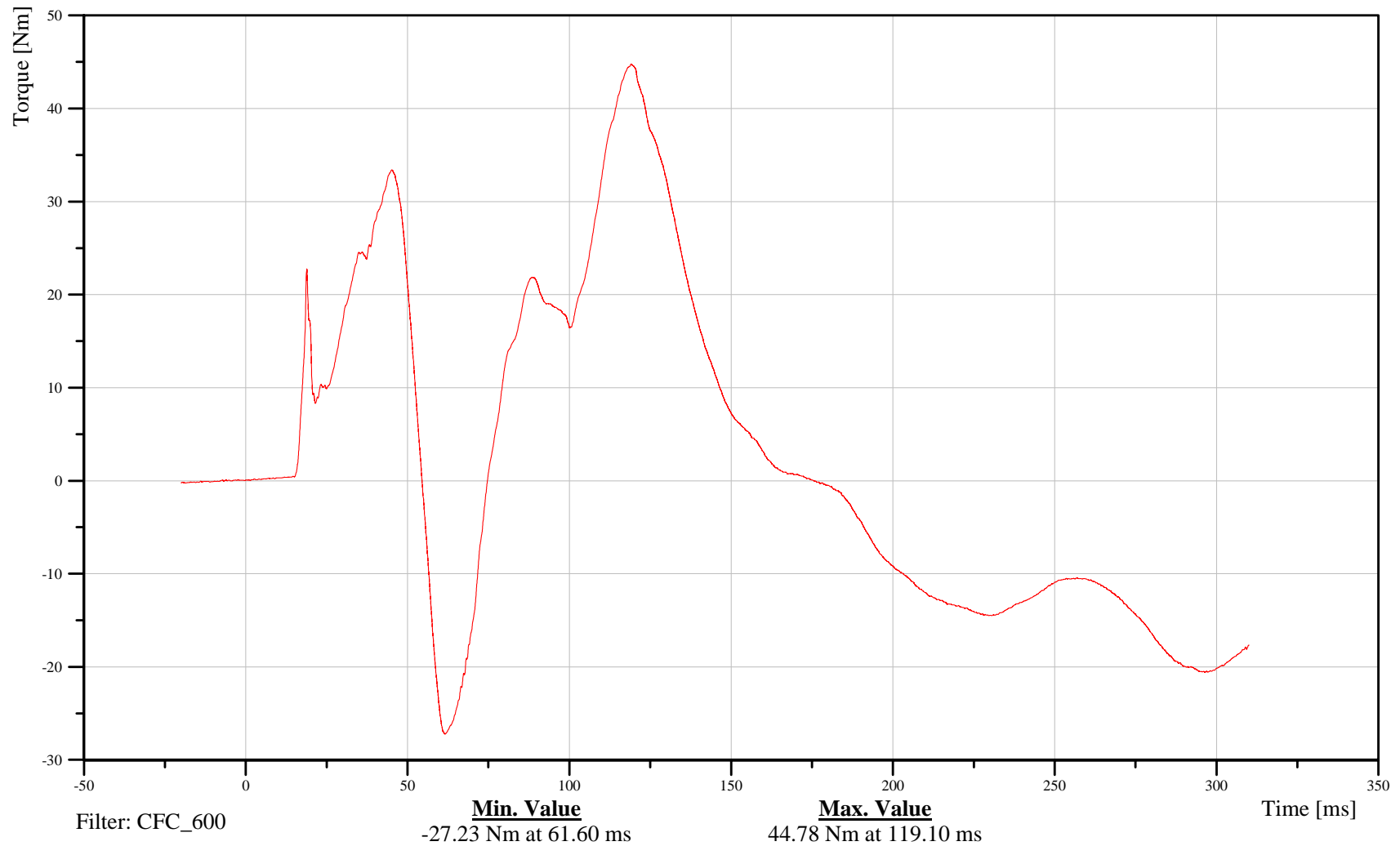
## Sacro-Iliac Left Moment About Z Axis

Customer: VRTC

# 11SACRLE00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-81

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

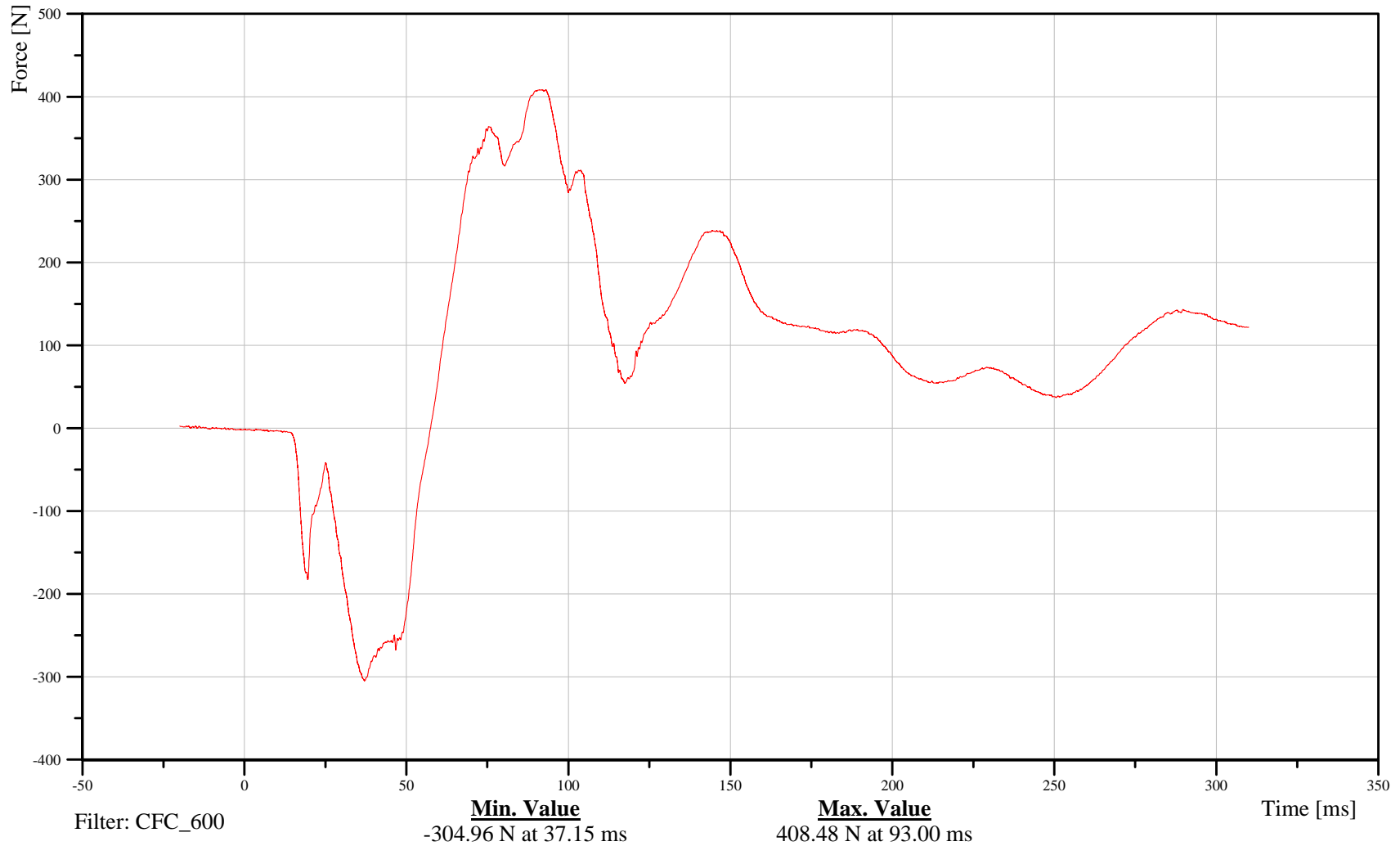
## Sacro-Iliac Right X-Axis Force

Customer: VRTC

# 11SACRRI00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-82

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

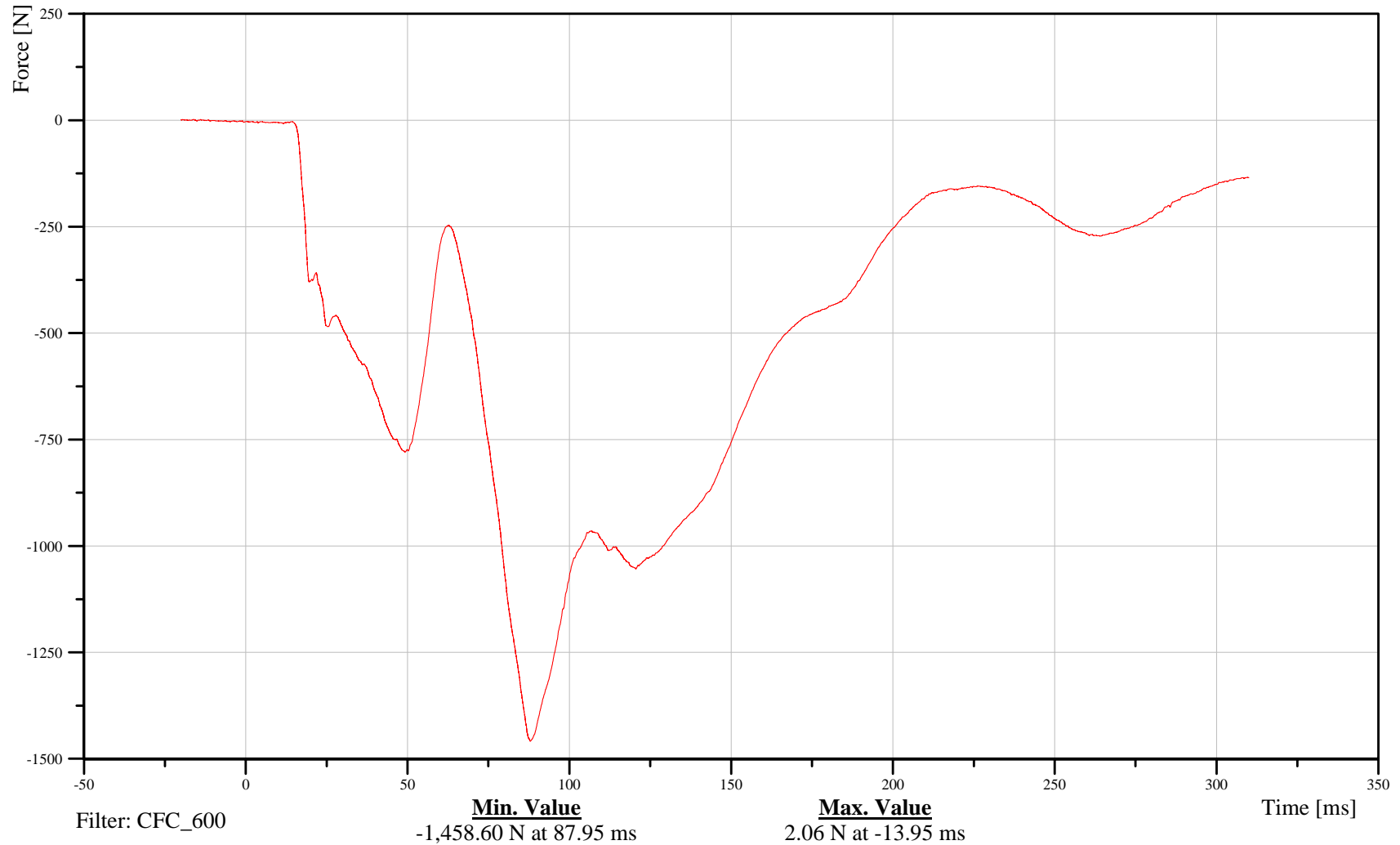
## Sacro-Iliac Right Y-Axis Force

Customer: VRTC

# 11SACRRI00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-83

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

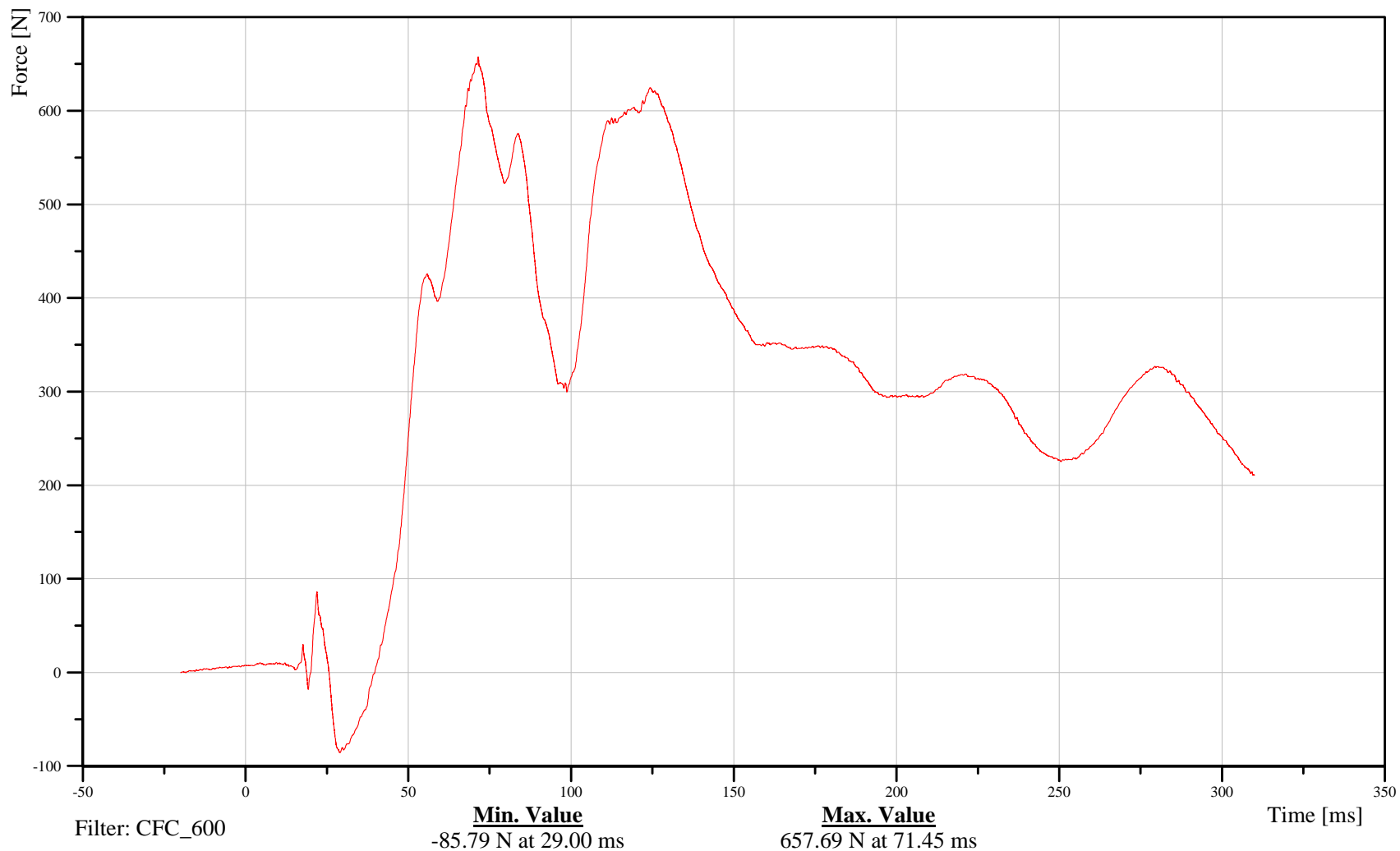
## Sacro-Iliac Right Z-Axis Force

Customer: VRTC

# 11SACRRI00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-84

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

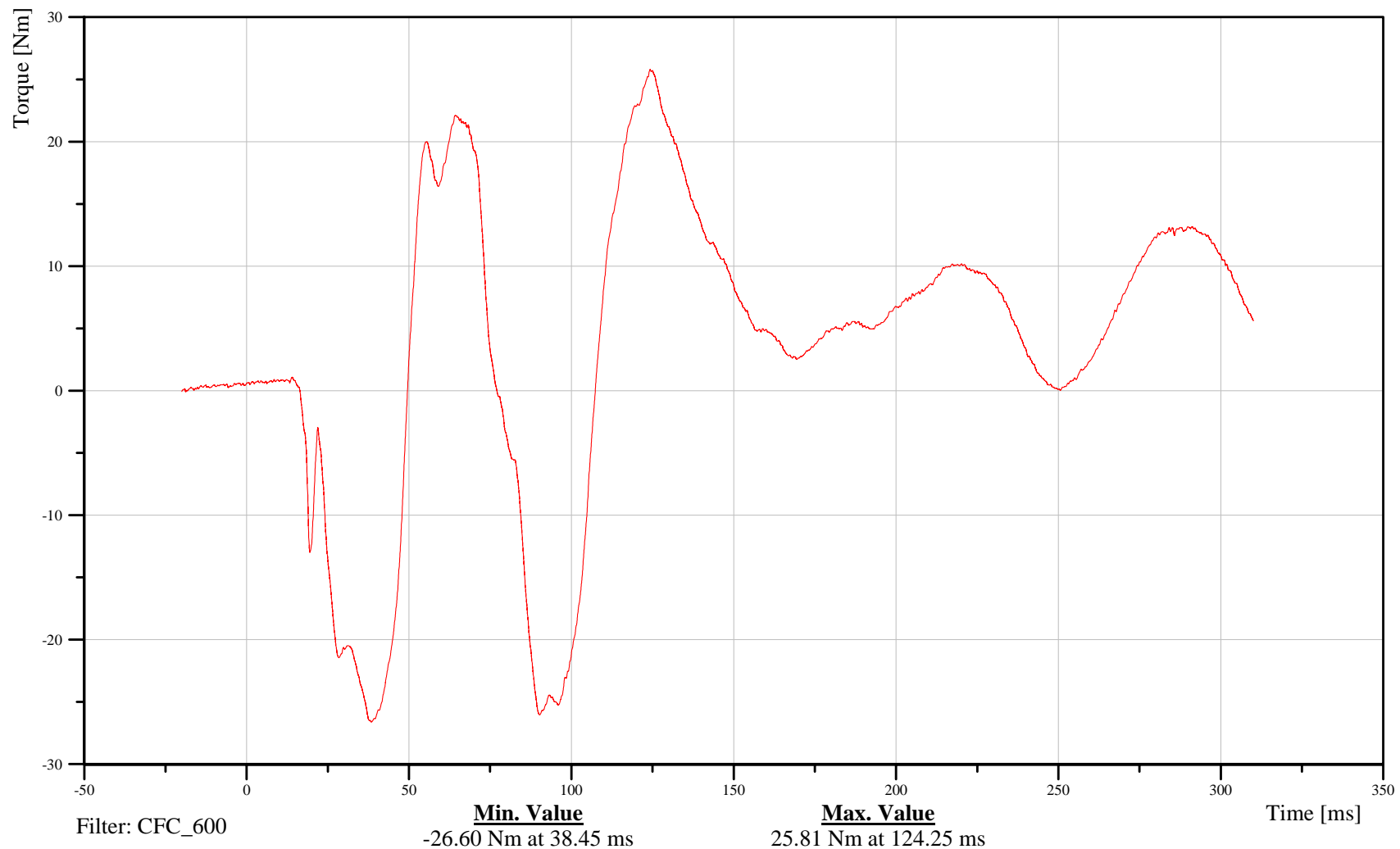
## Sacro-Iliac Right Moment About X Axis

Customer: VRTC

# 11SACRRI00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-85

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

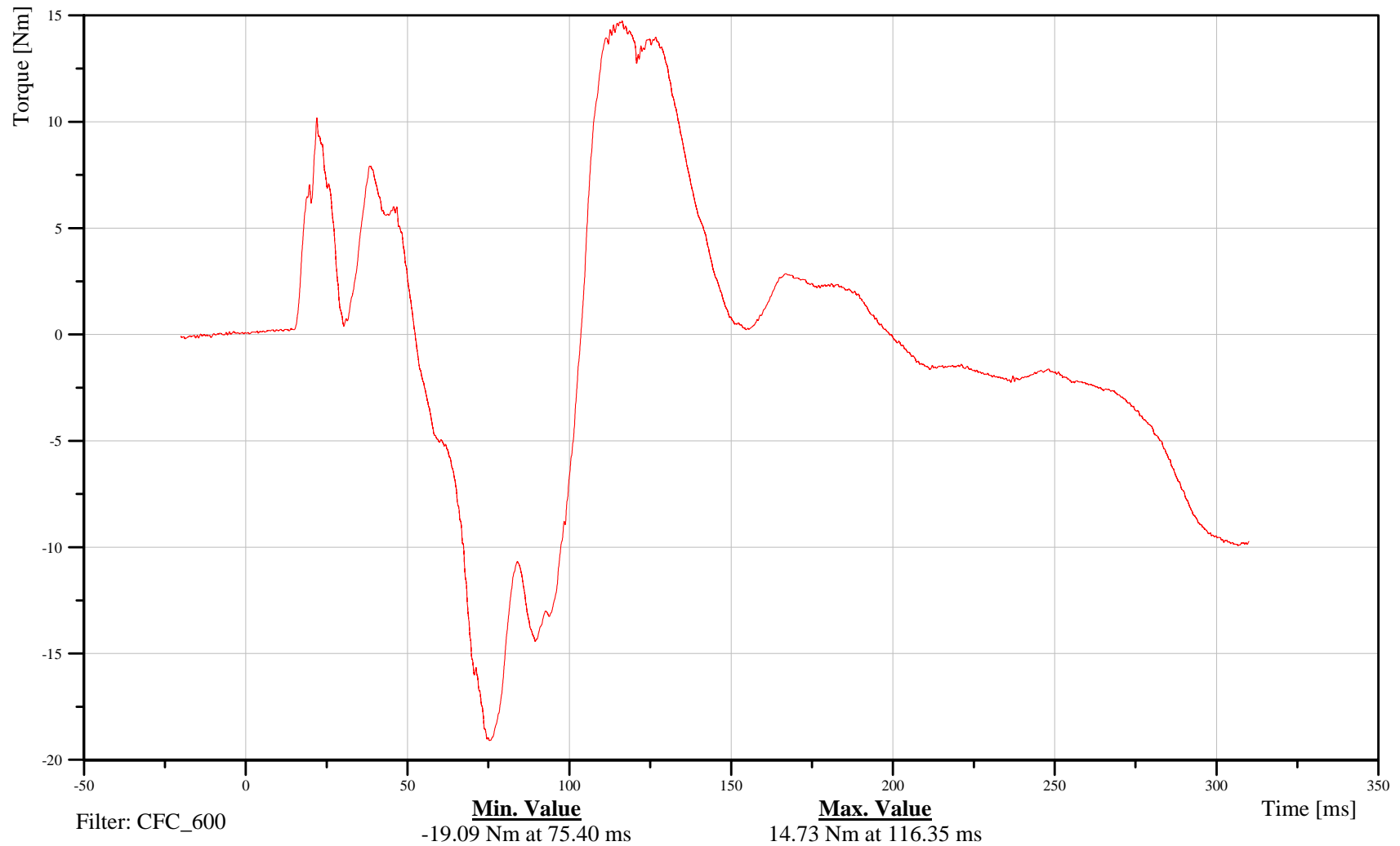
## Sacro-Iliac Right Moment About Y Axis

Customer: VRTC

# 11SACRRI00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-86

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

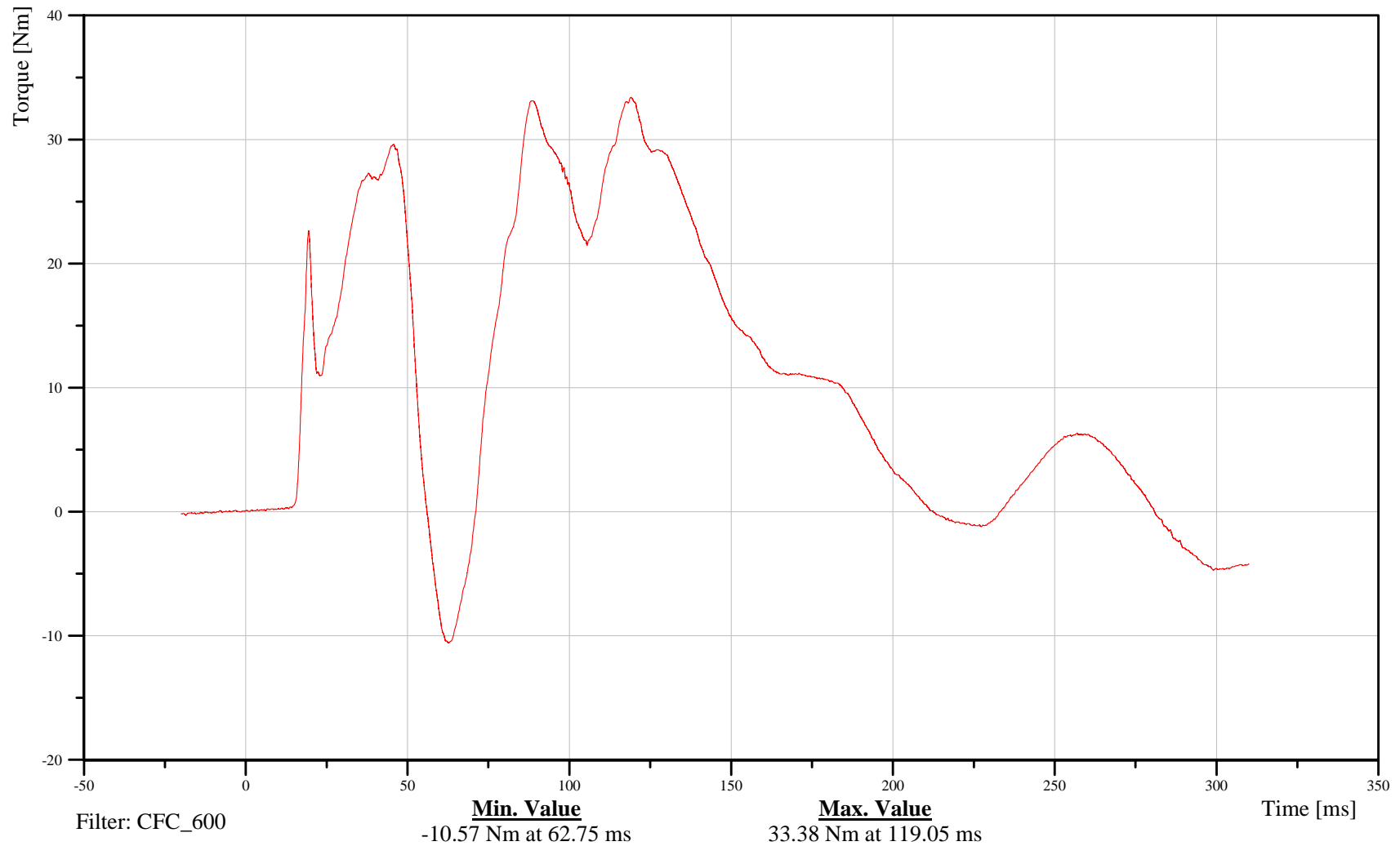
## Sacro-Iliac Right Moment About Z Axis

Customer: VRTC

# 11SACRRI00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-87

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

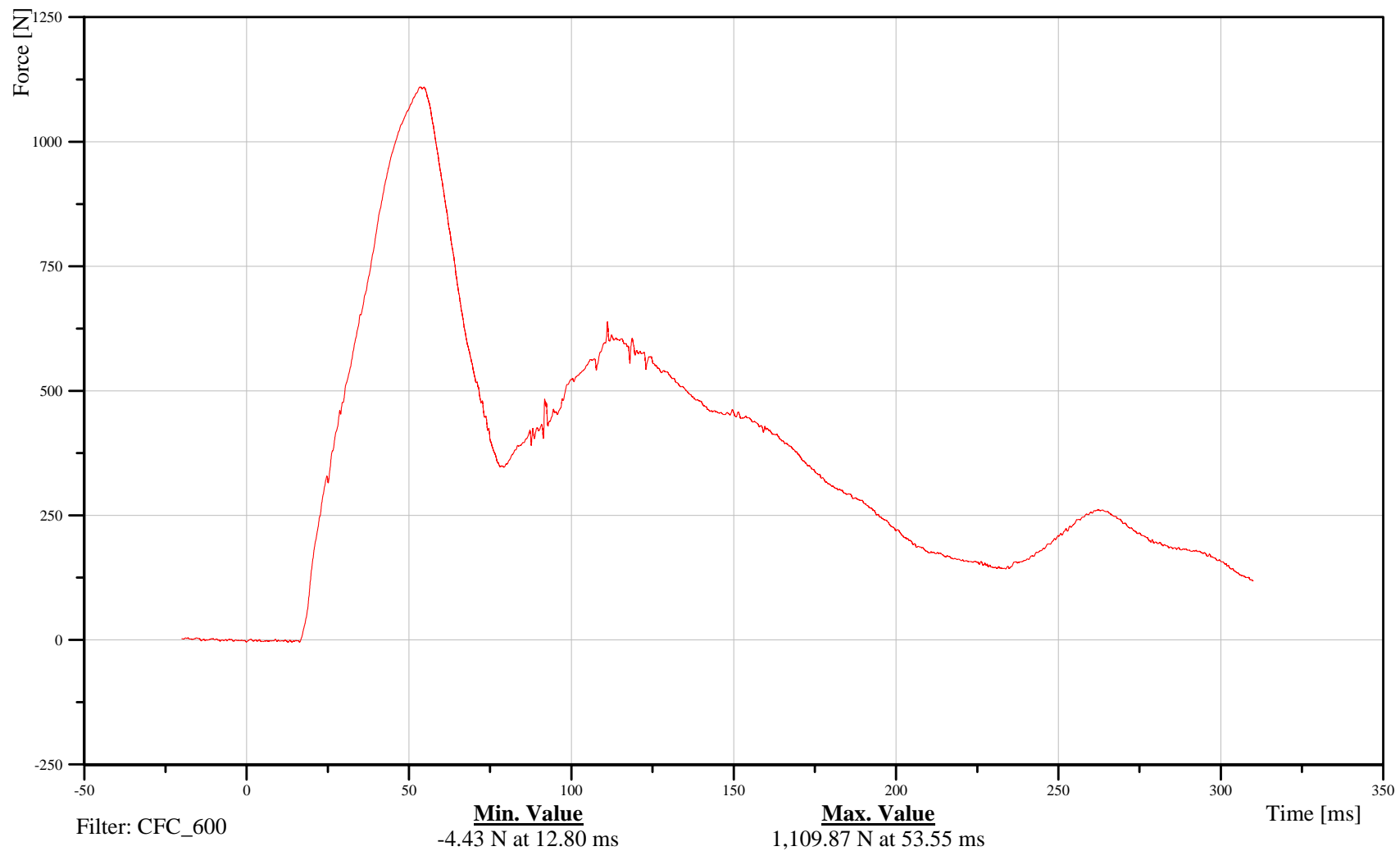
## Pubic Y-Axis Force

Customer: VRTC

# 11PUBC0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-88

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

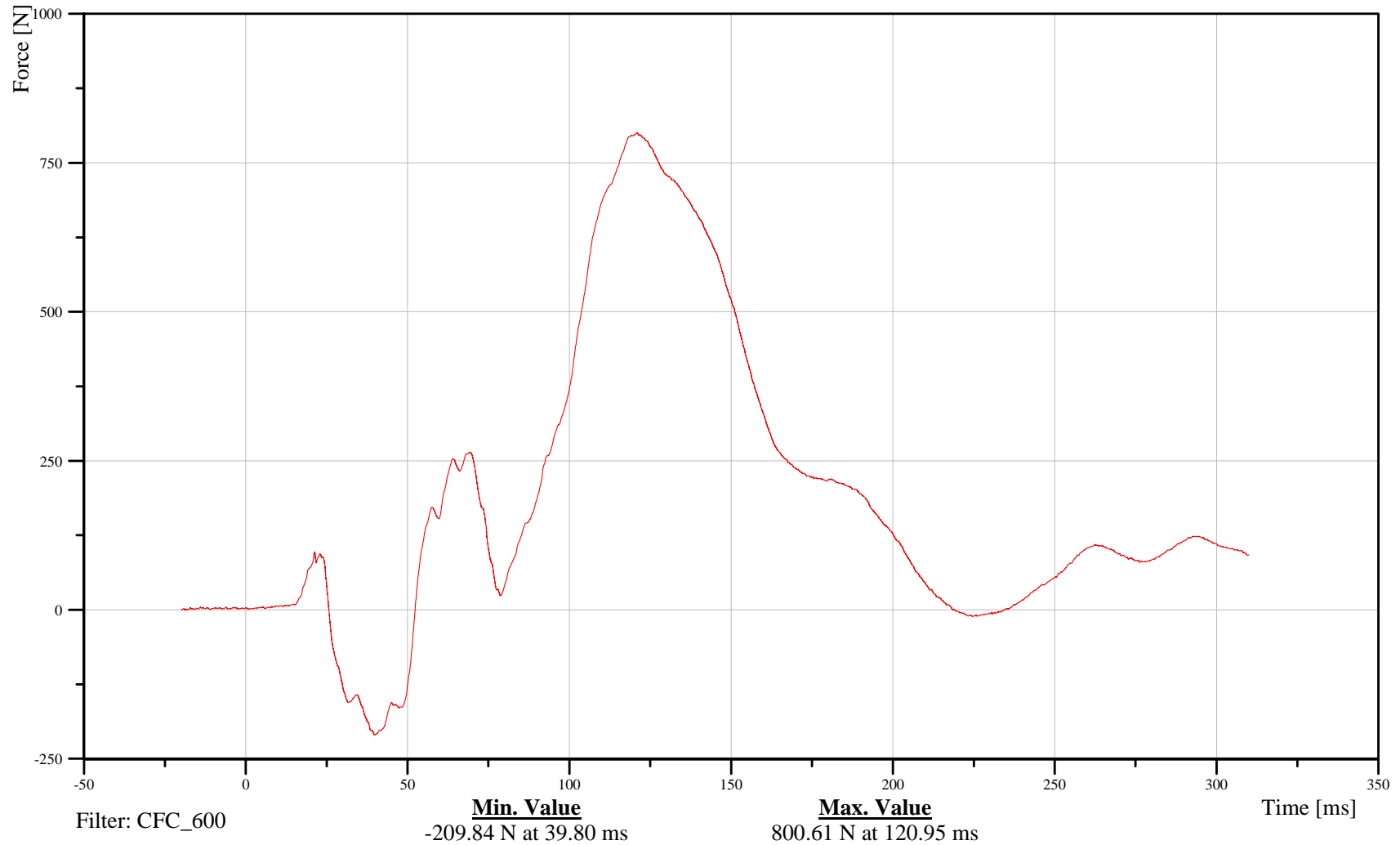
## Left Femur X-Axis Force

Customer: VRTC

# 11FEMRLL00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-89

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

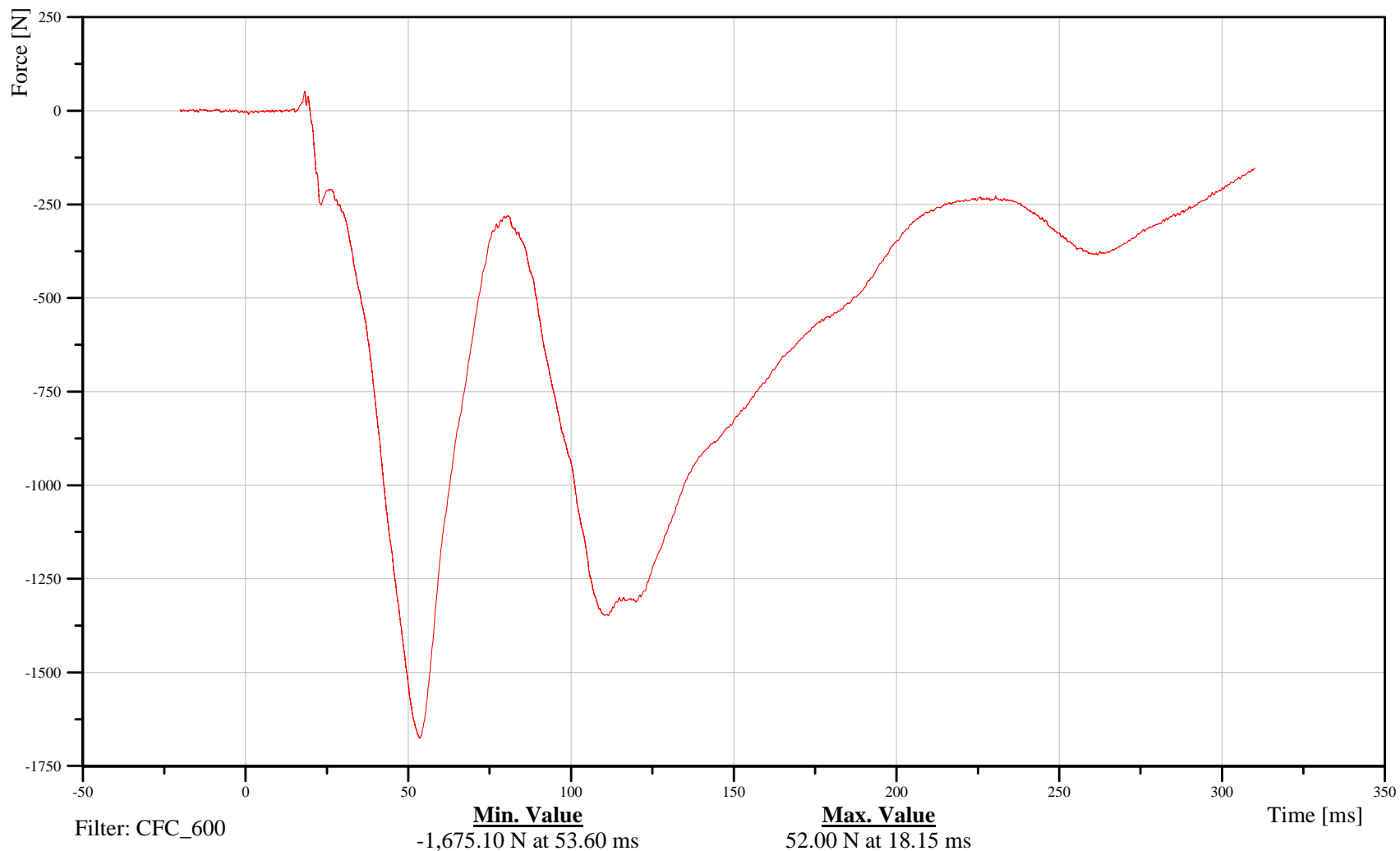
## Left Femur Y-Axis Force

Customer: VRTC

# 11FEMRLL00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-90

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

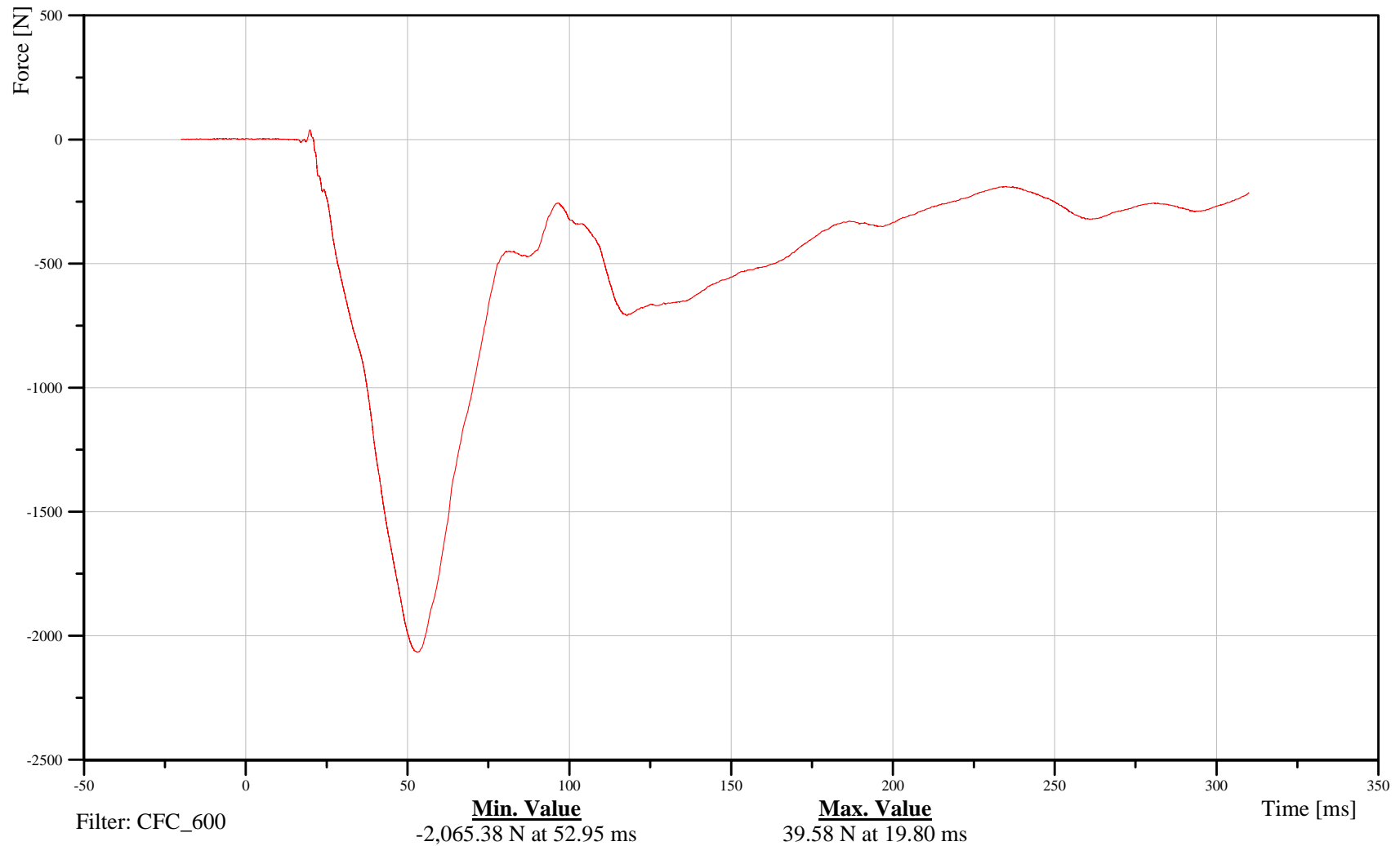
## Left Femur Z-Axis Force

Customer: VRTC

# 11FEMRLL00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-91

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

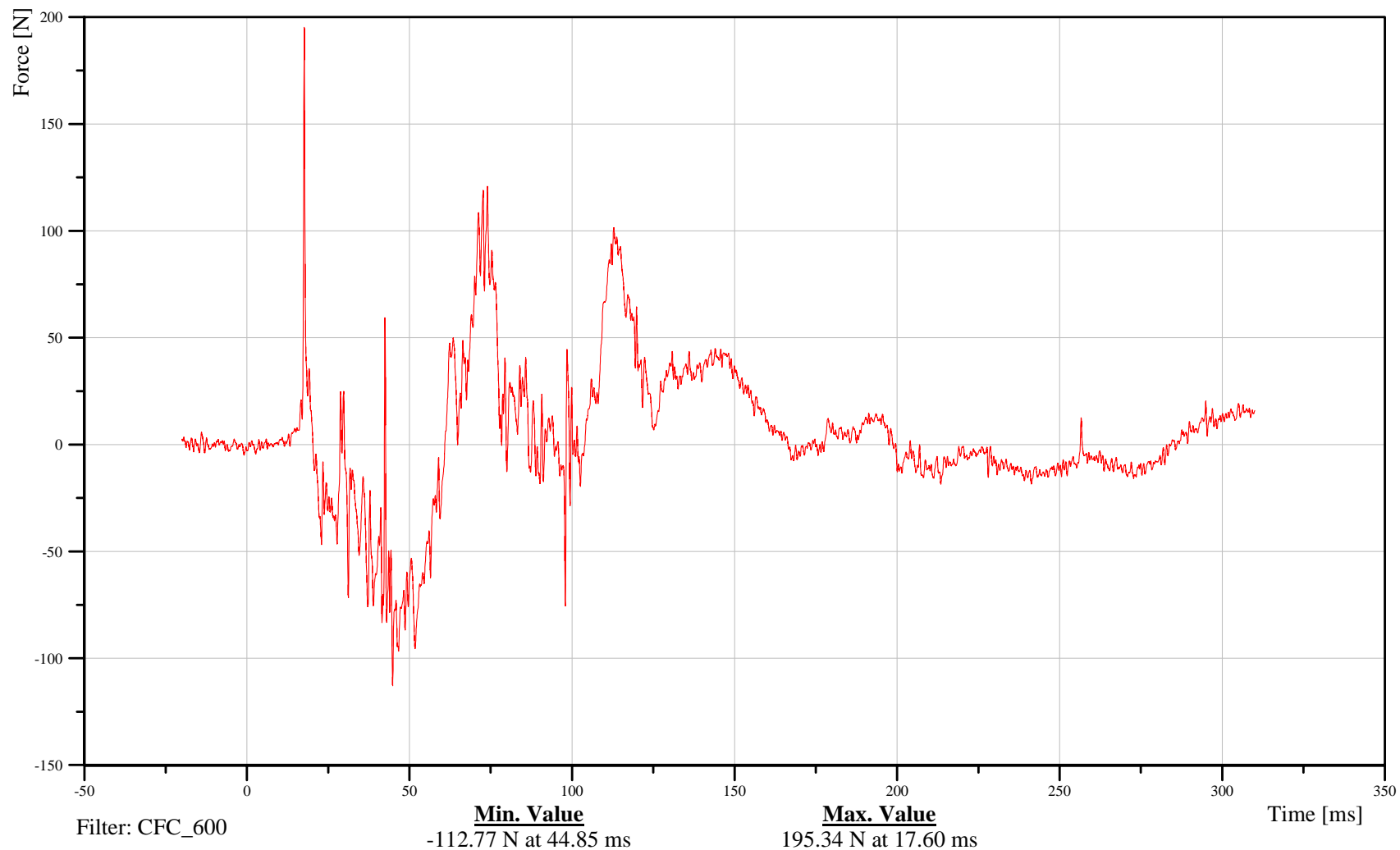
## Left Knee Outboard Y-Axis Force

Customer: VRTC

# 11KNEELEOUWSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-92

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

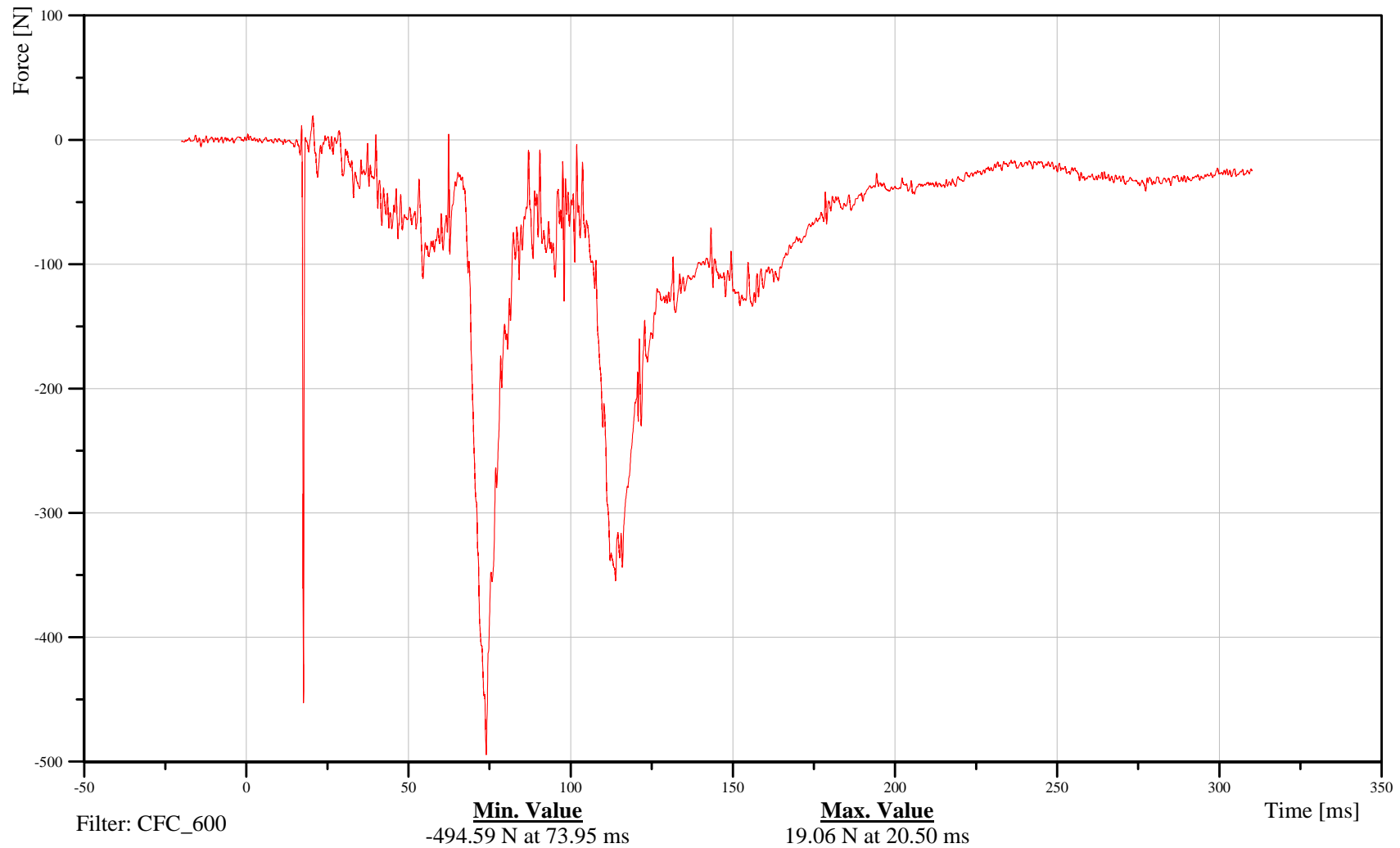
## Left Knee Inboard Y-Axis Force

Customer: VRTC

# 11KNEELEINWSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-93

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

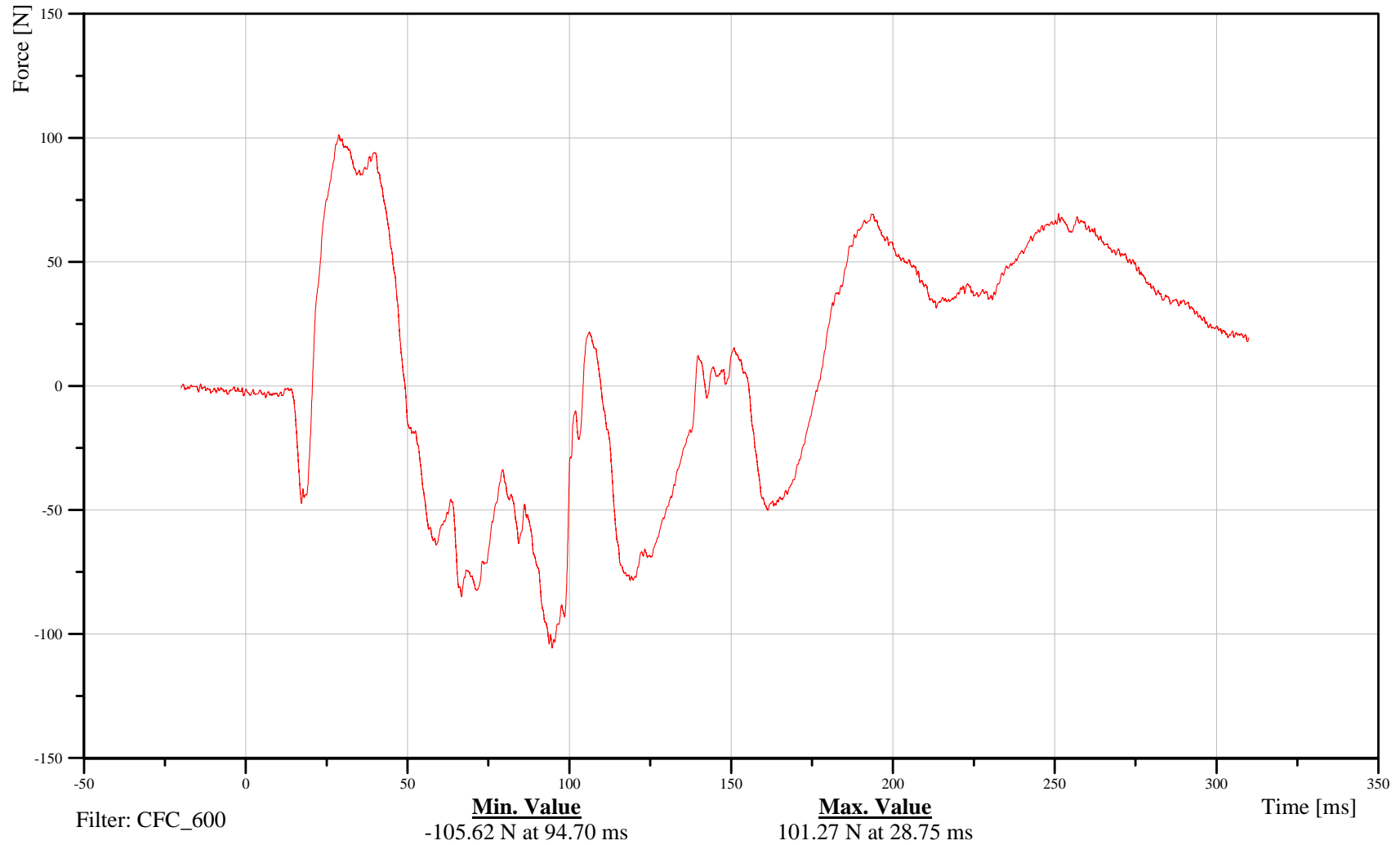
## Right Femur X-Axis Force

Customer: VRTC

# 11FEMRRL00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-94

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

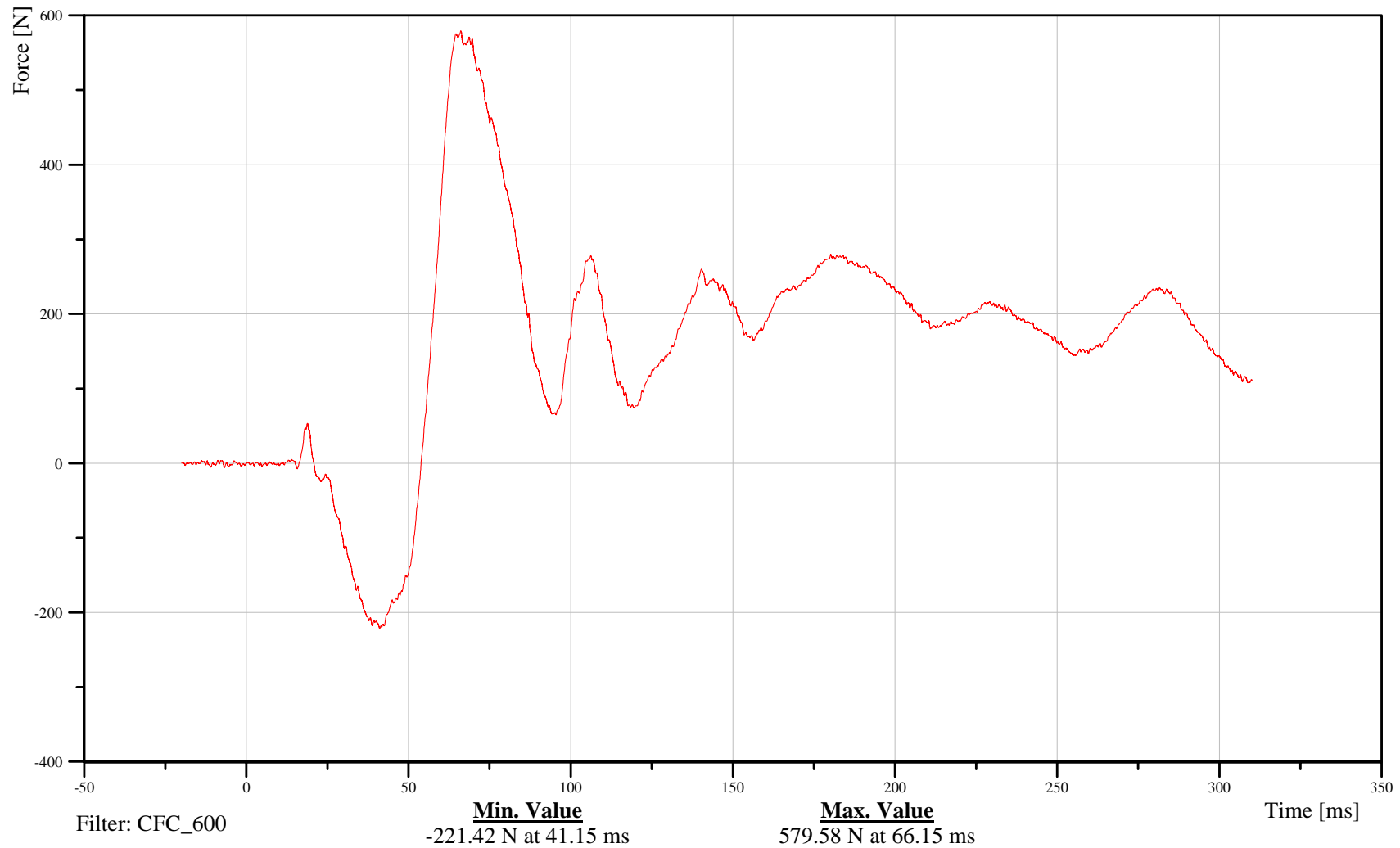
## Right Femur Y-Axis Force

Customer: VRTC

# 11FEMRRL00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-95

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

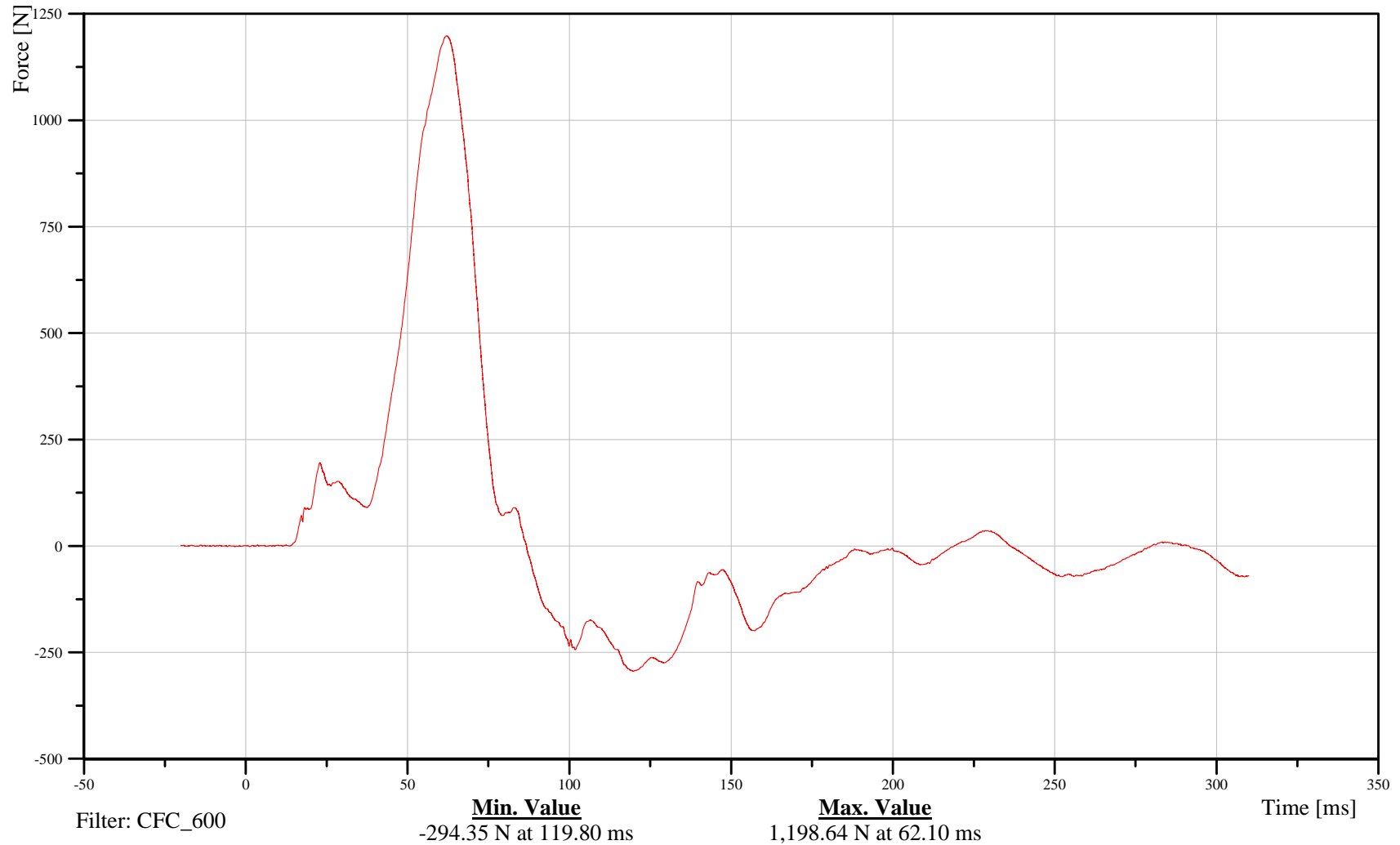
## Right Femur Z-Axis Force

Customer: VRTC

# 11FEMRRL00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 100211



B-96

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

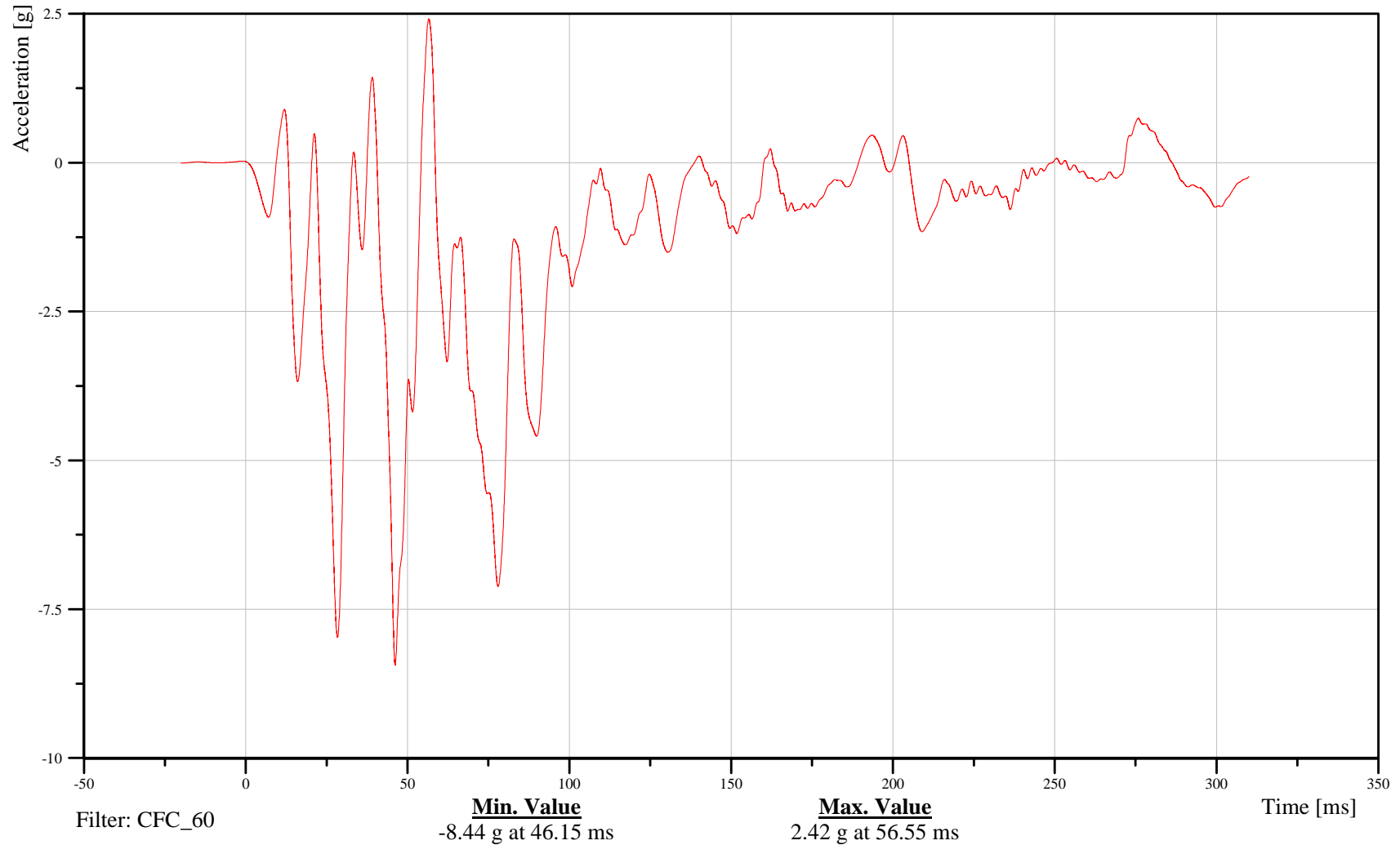
## Vehicle Center of Gravity X-Axis Acceleration

Customer: VRTC

# 10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-97

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

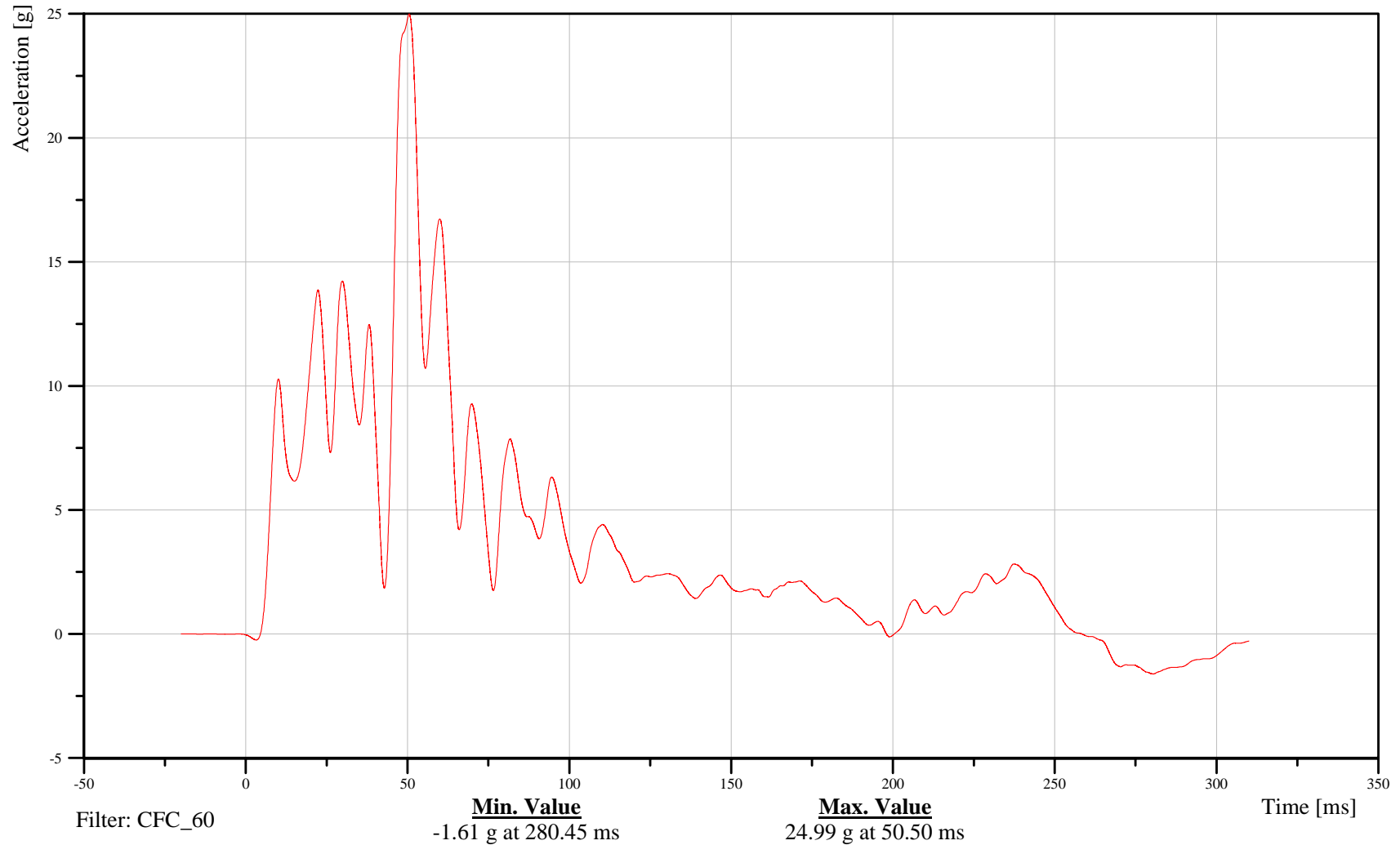
## Vehicle Center of Gravity Y-Axis Acceleration

Customer: VRTC

# 10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-98

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

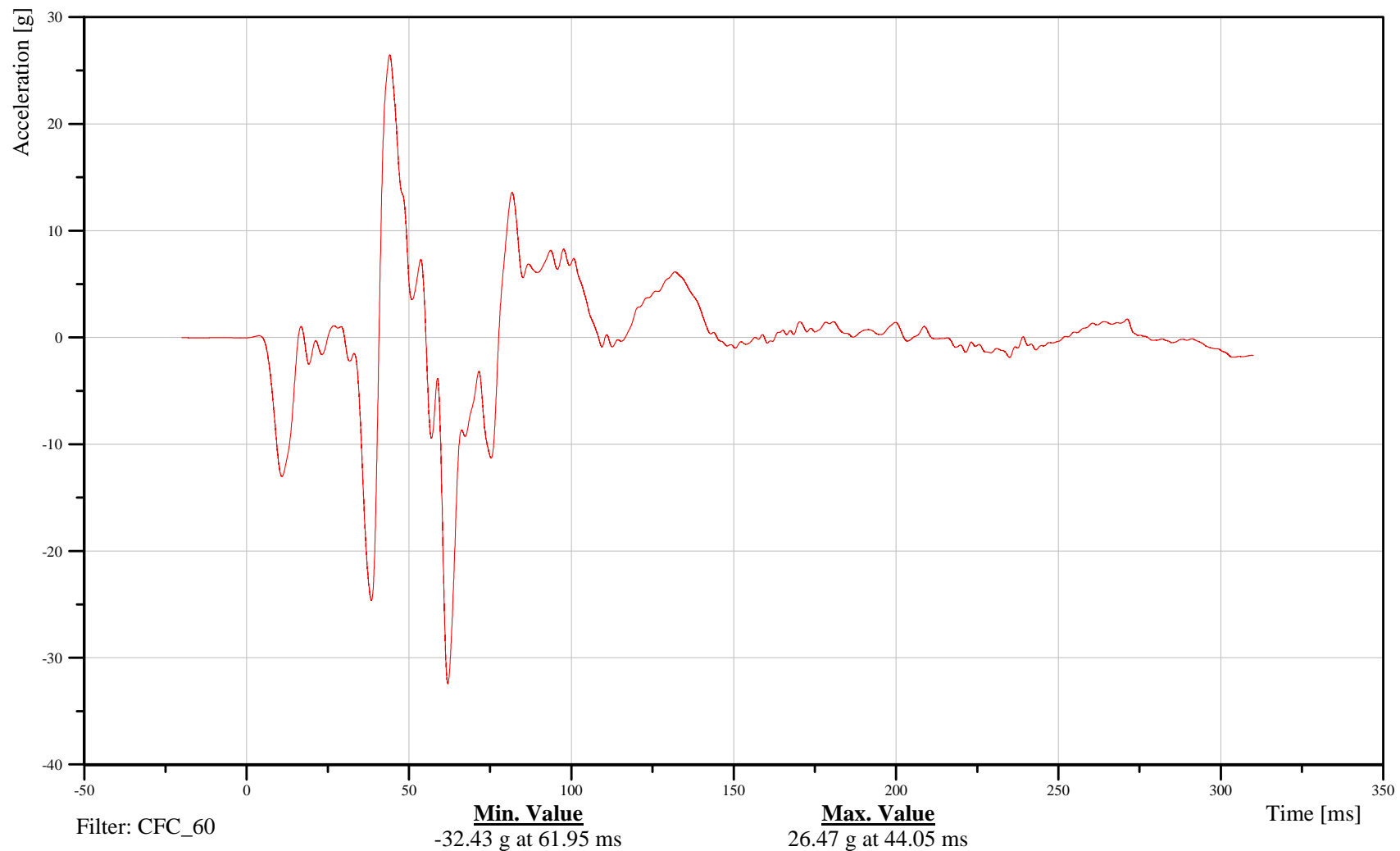
## Vehicle Center of Gravity Z-Axis Acceleration

Customer: VRTC

# 10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-99

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

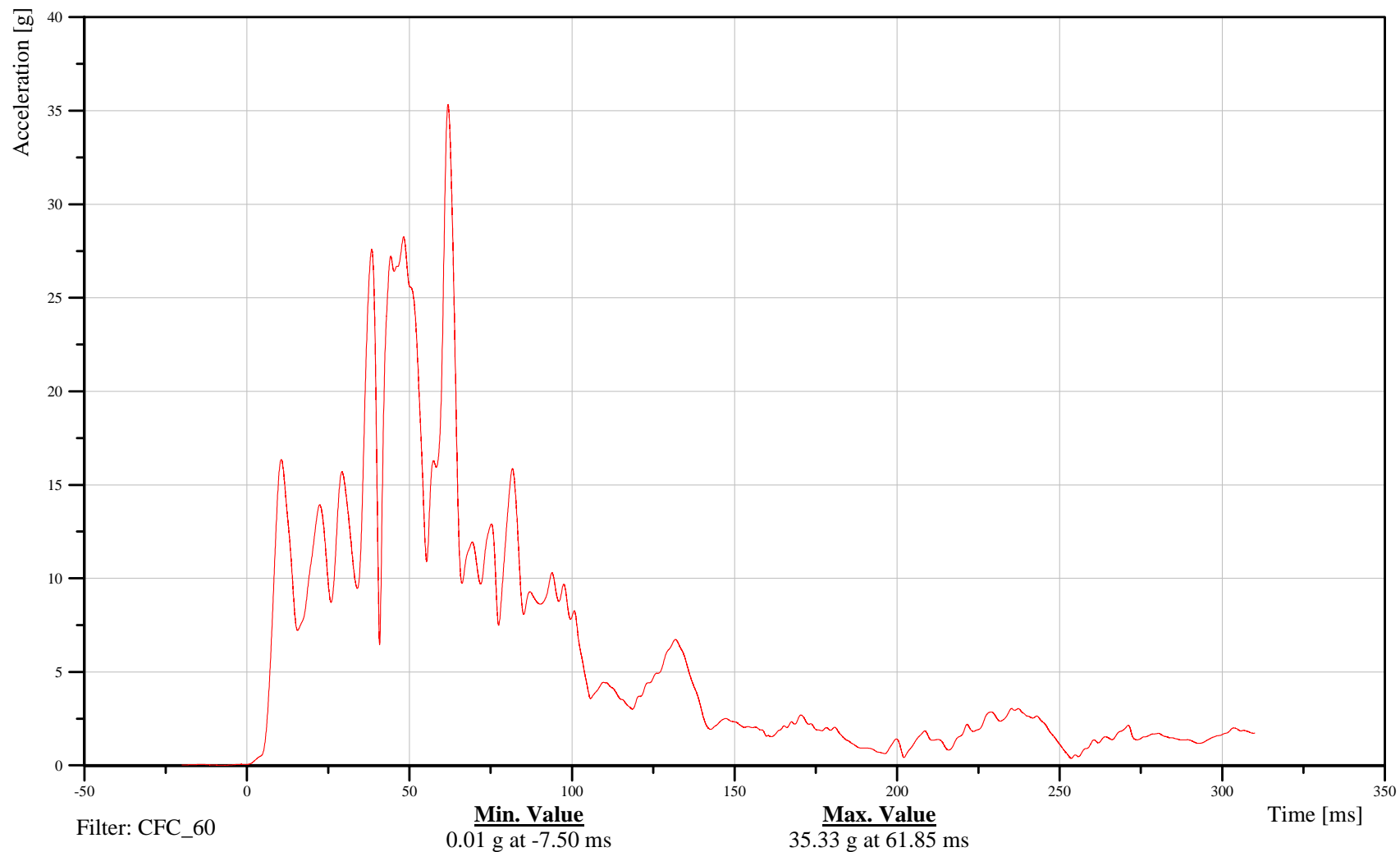
## Vehicle Center of Gravity Resultant Acceleration

Customer: VRTC

# 10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-100

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

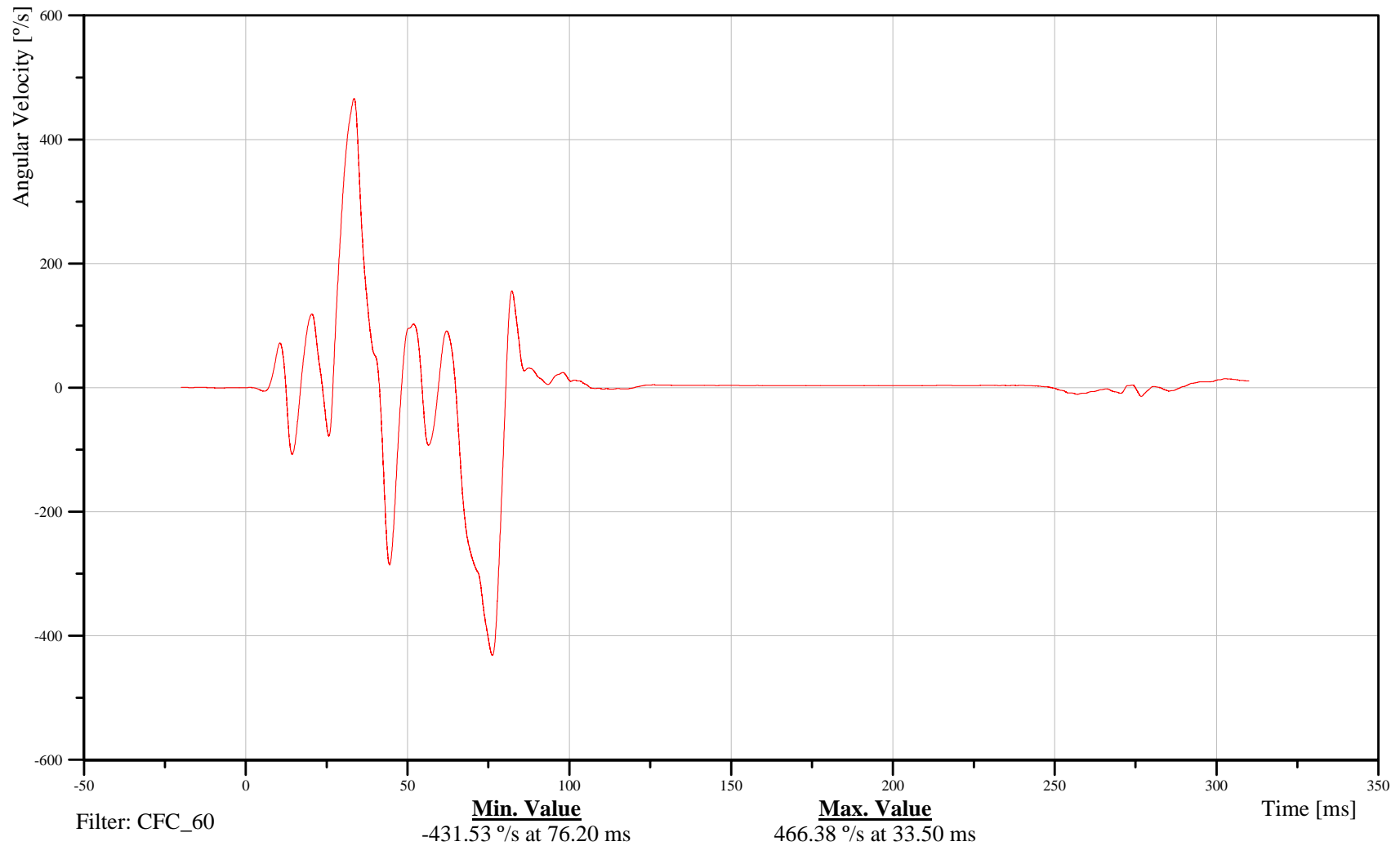
## Vehicle Center of Gravity Roll Rate Gyroscope

Customer: VRTC

# 10VEHCCG0000AVXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-101

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

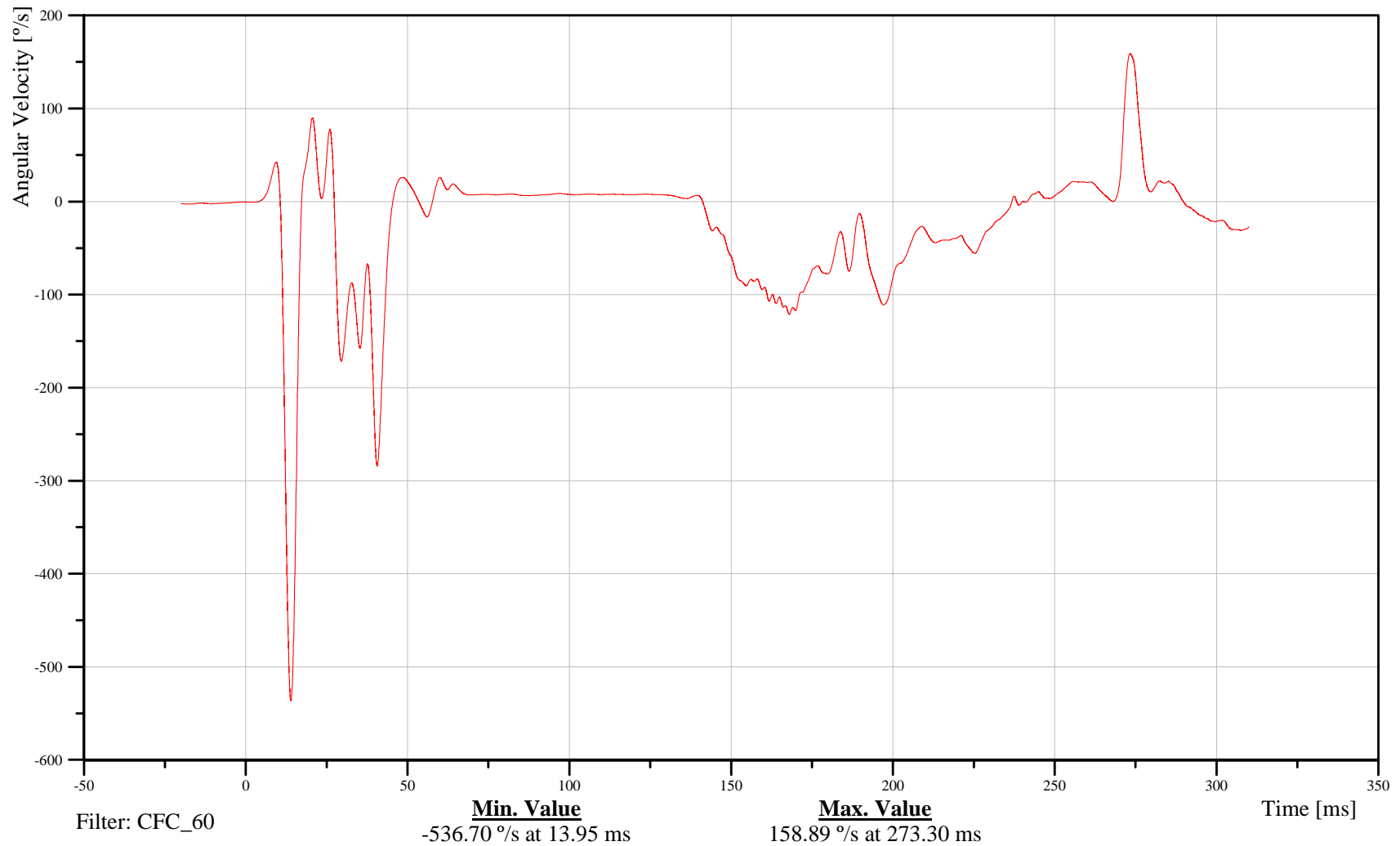
## Vehicle Center of Gravity Pitch Rate Gyroscope

Customer: VRTC

# 10VEHCCG0000AVYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-102

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

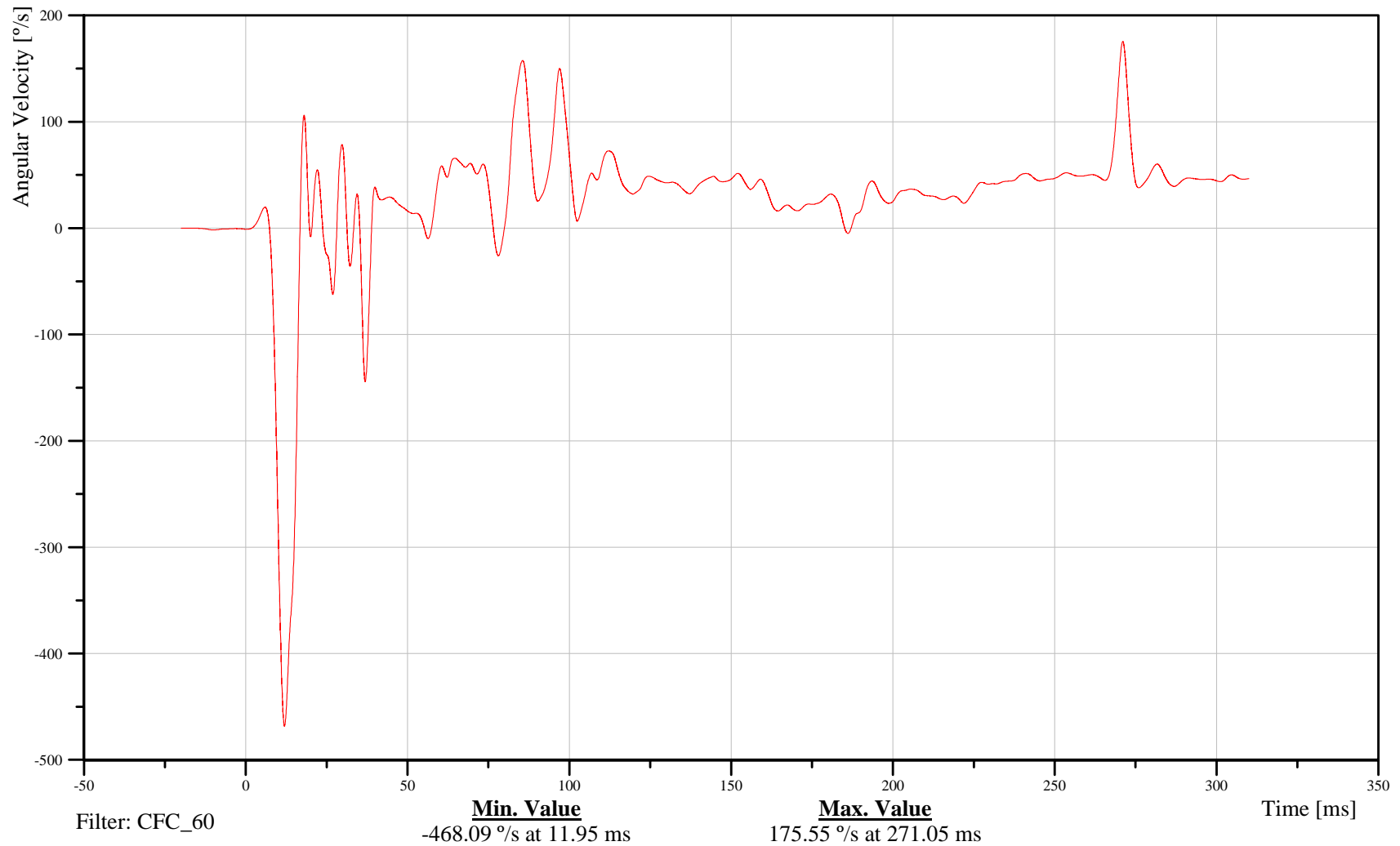
## Vehicle Center of Gravity Yaw Rate Gyroscope

Customer: VRTC

### 10VEHCCG0000AVZD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-103

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

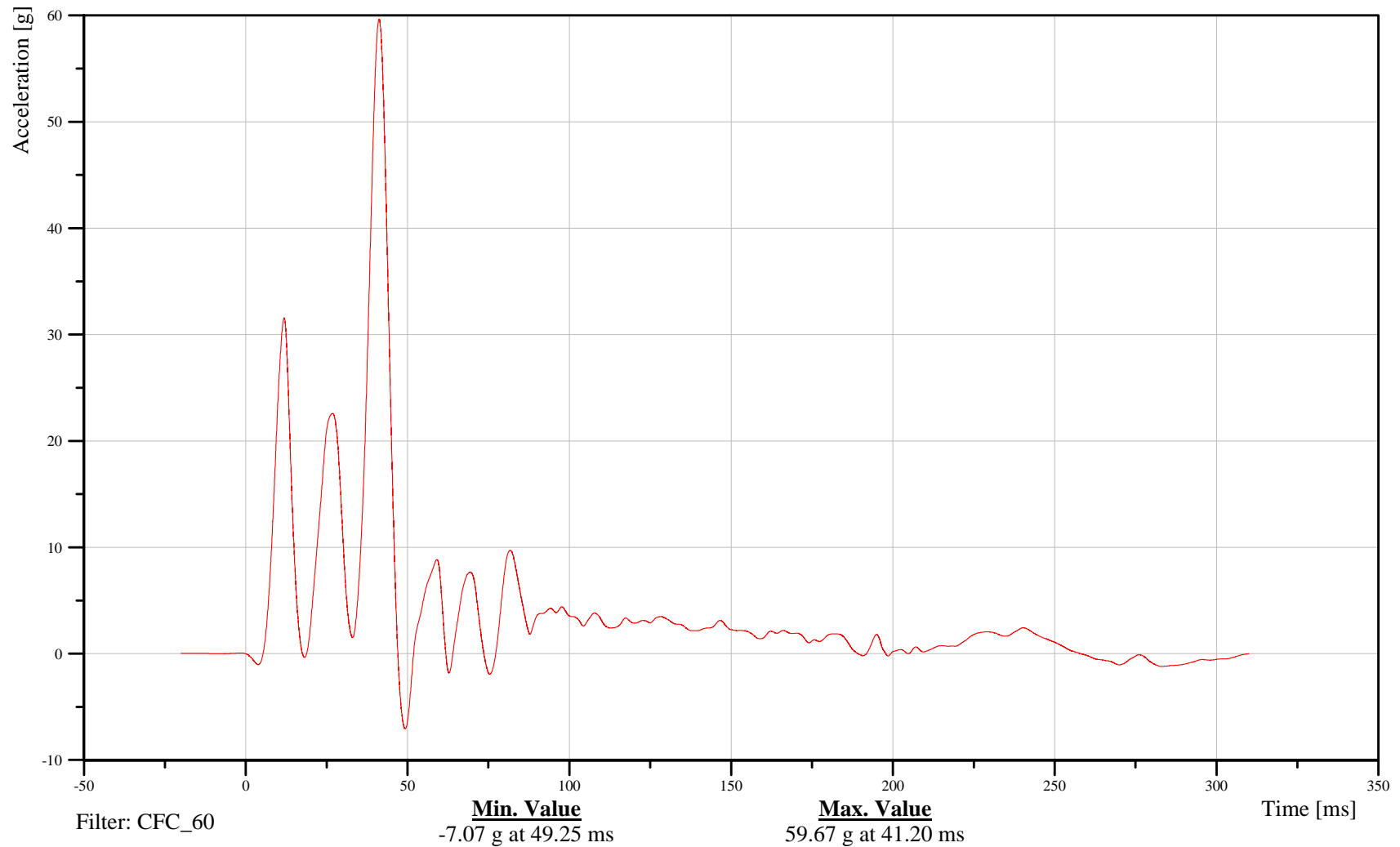
## Left Side Sill Near Impact Point Y-Axis Acceleration

Customer: VRTC

# 11SILBRE0100ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-104

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

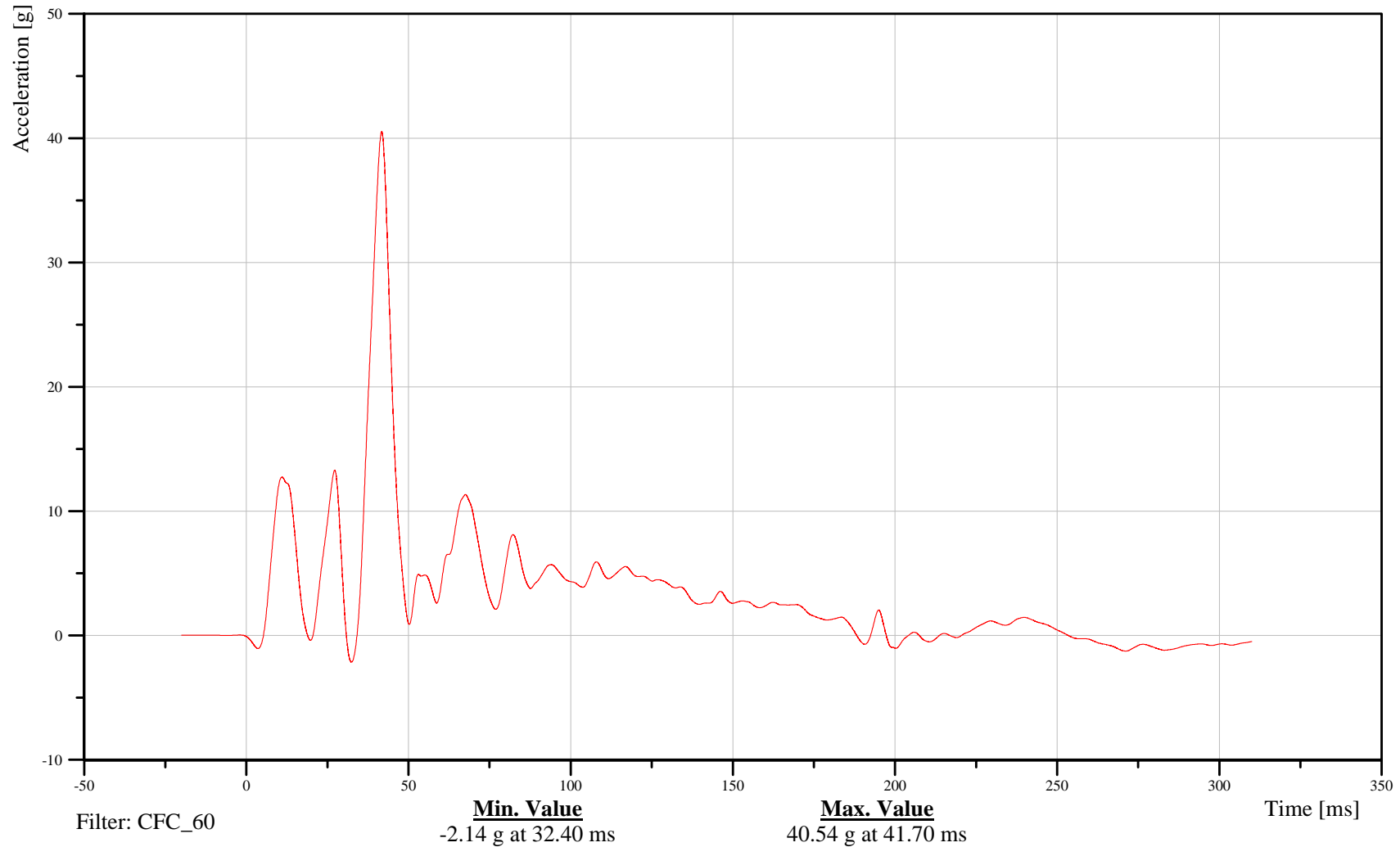
## Left A-Pillar Side Sill Y-Axis Acceleration

Customer: VRTC

# 14SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-105

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

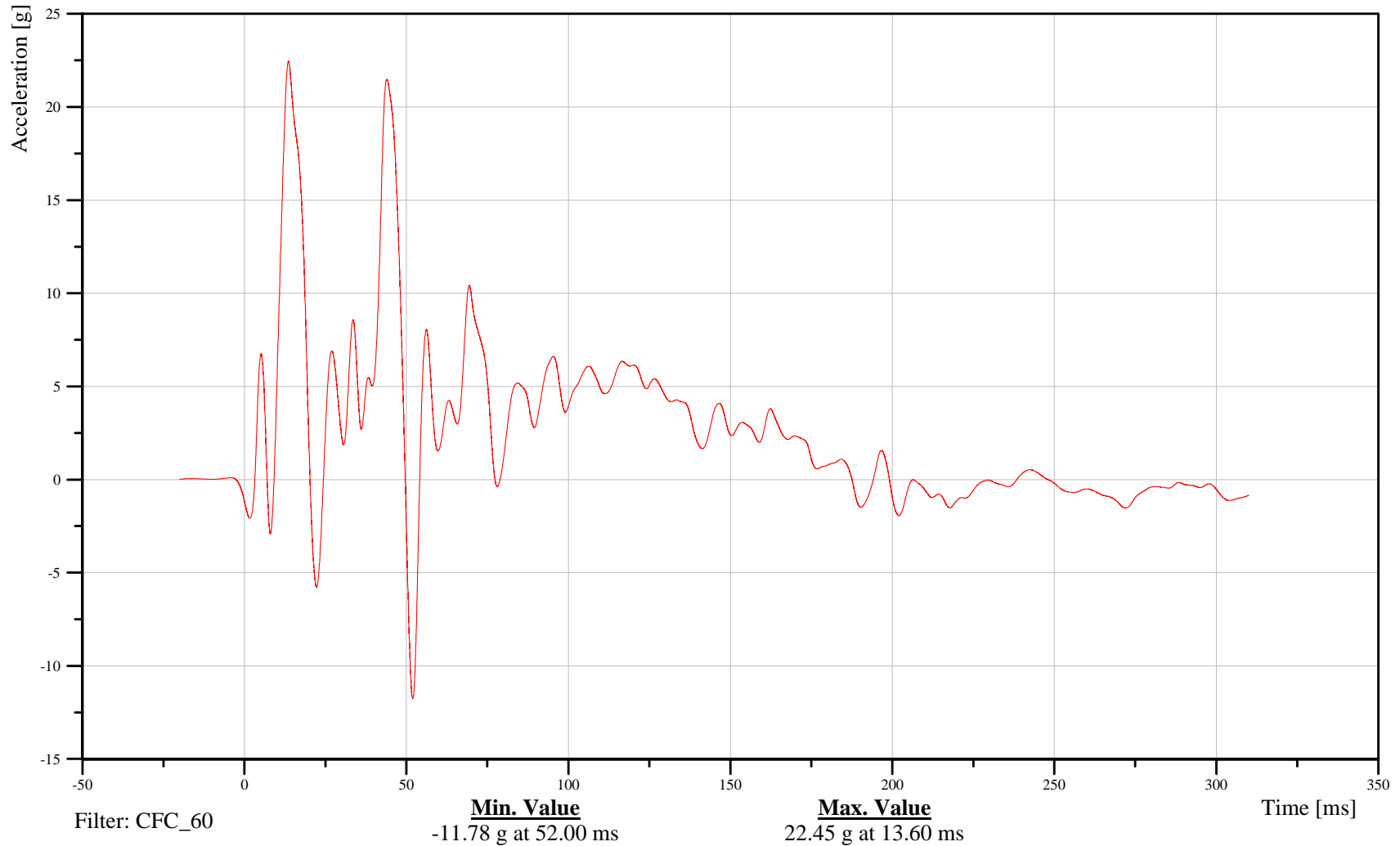
## Left Lower A-Pillar Y-Axis Acceleration

Customer: VRTC

# 11APILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-106

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

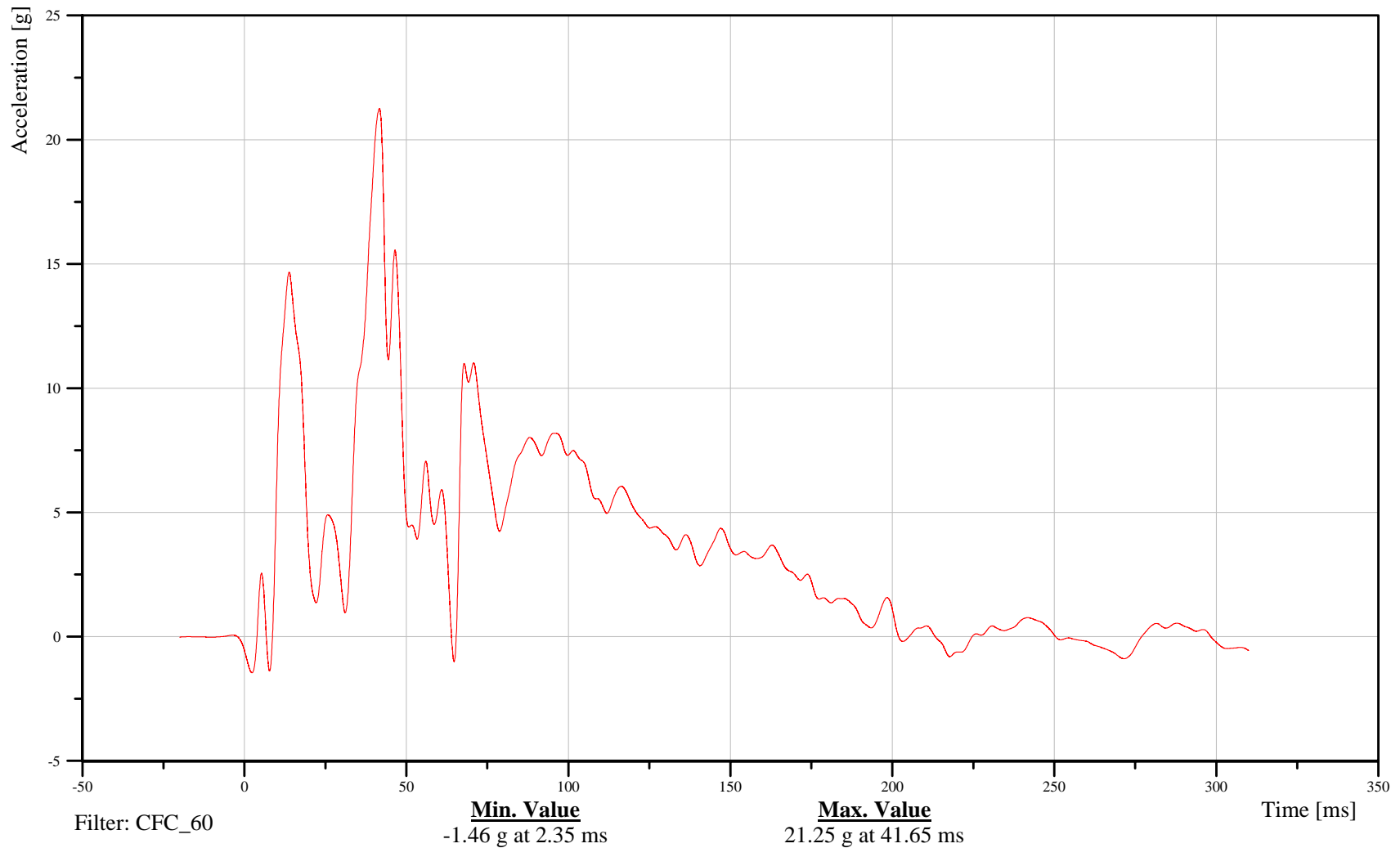
## Left Mid A-Pillar Y-Axis Acceleration

Customer: VRTC

# 11APILMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-107

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

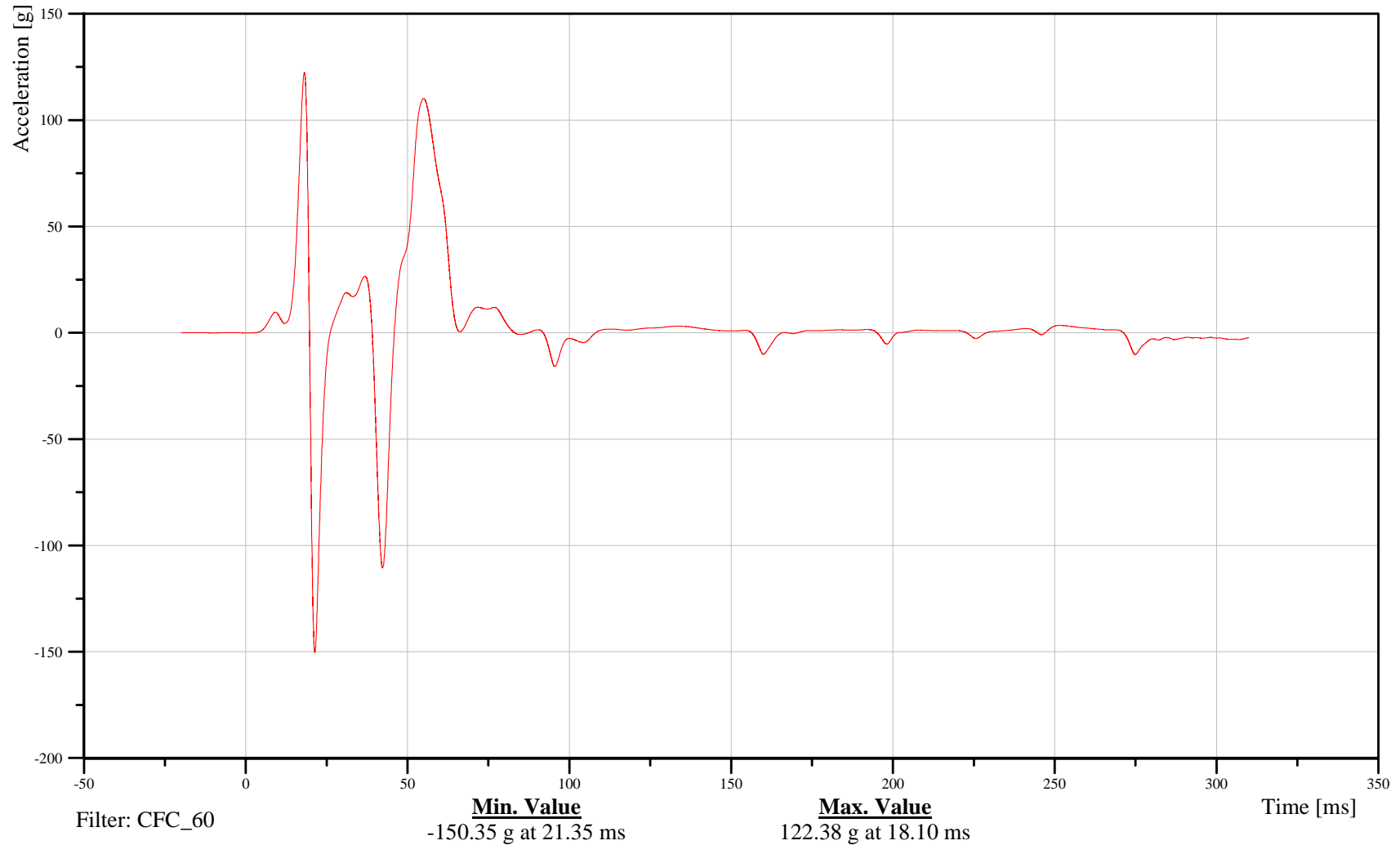
## Left Side Sill at Rear Seat Y-Axis Acceleration

Customer: VRTC

# 14SILBRE0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-108

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

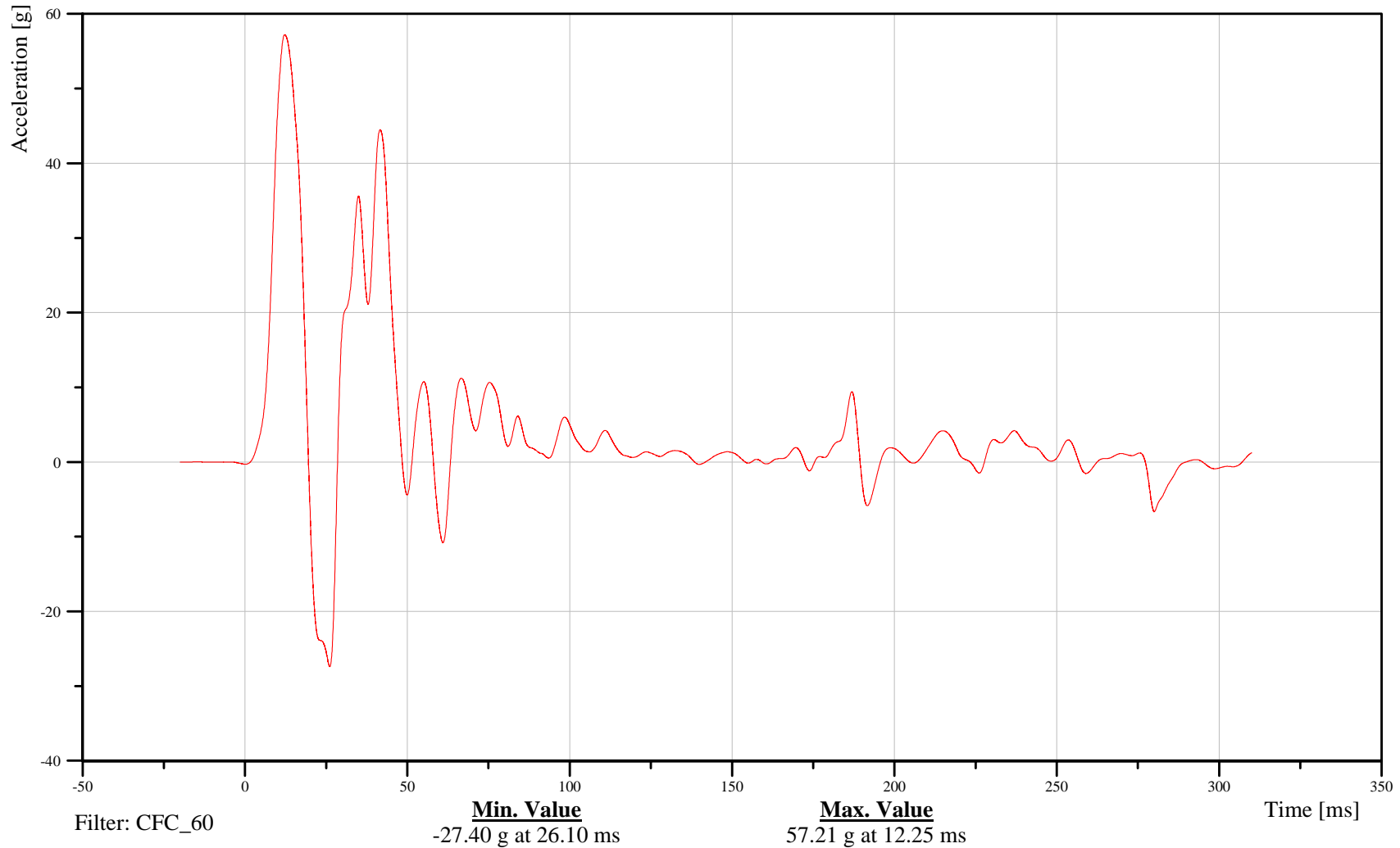
## Left Lower B-Pillar Y-Axis Acceleration

Customer: VRTC

# 14BPILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-109

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

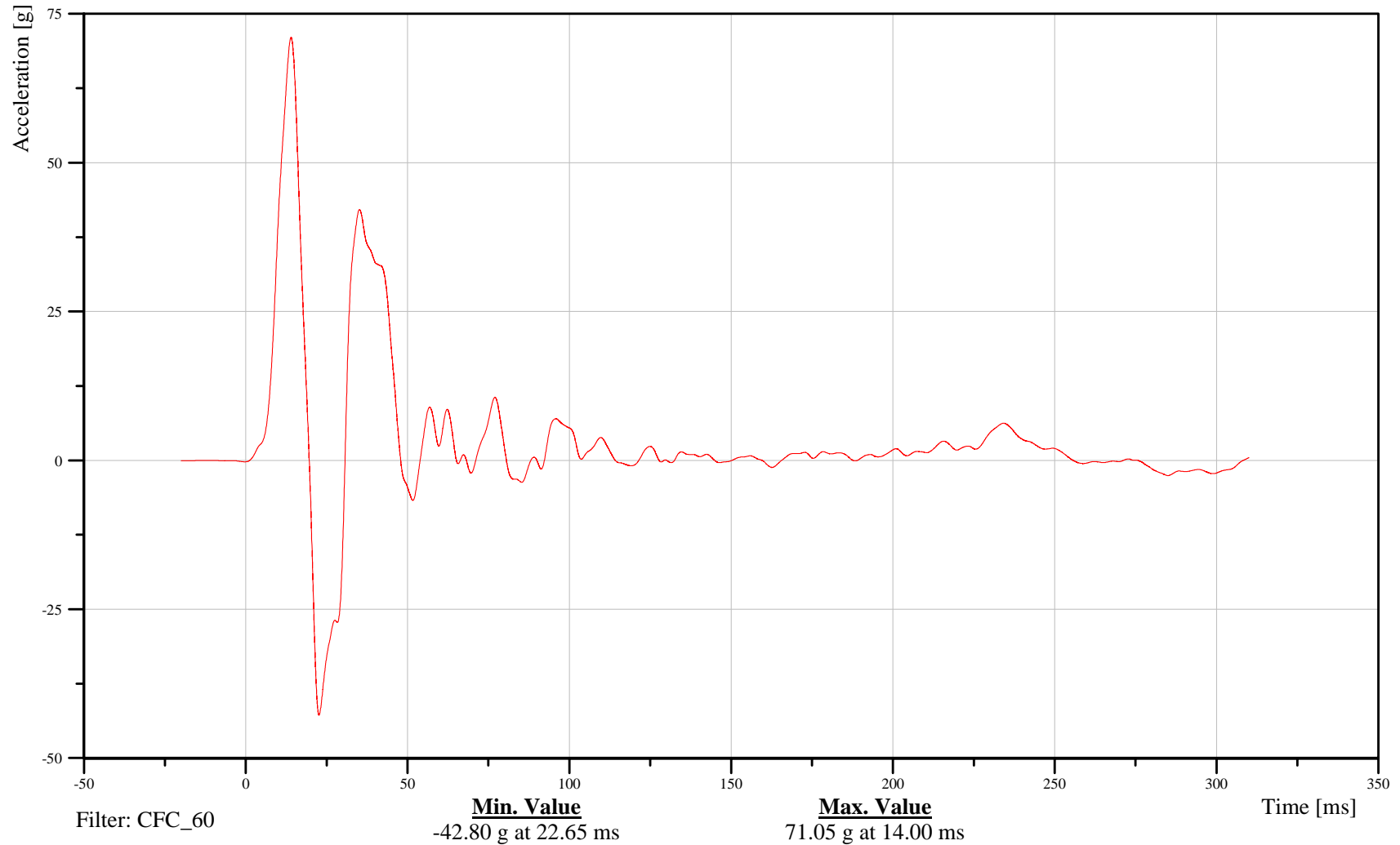
## Left Mid B-Pillar Y-Axis Acceleration

Customer: VRTC

# 14BPILMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-110

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

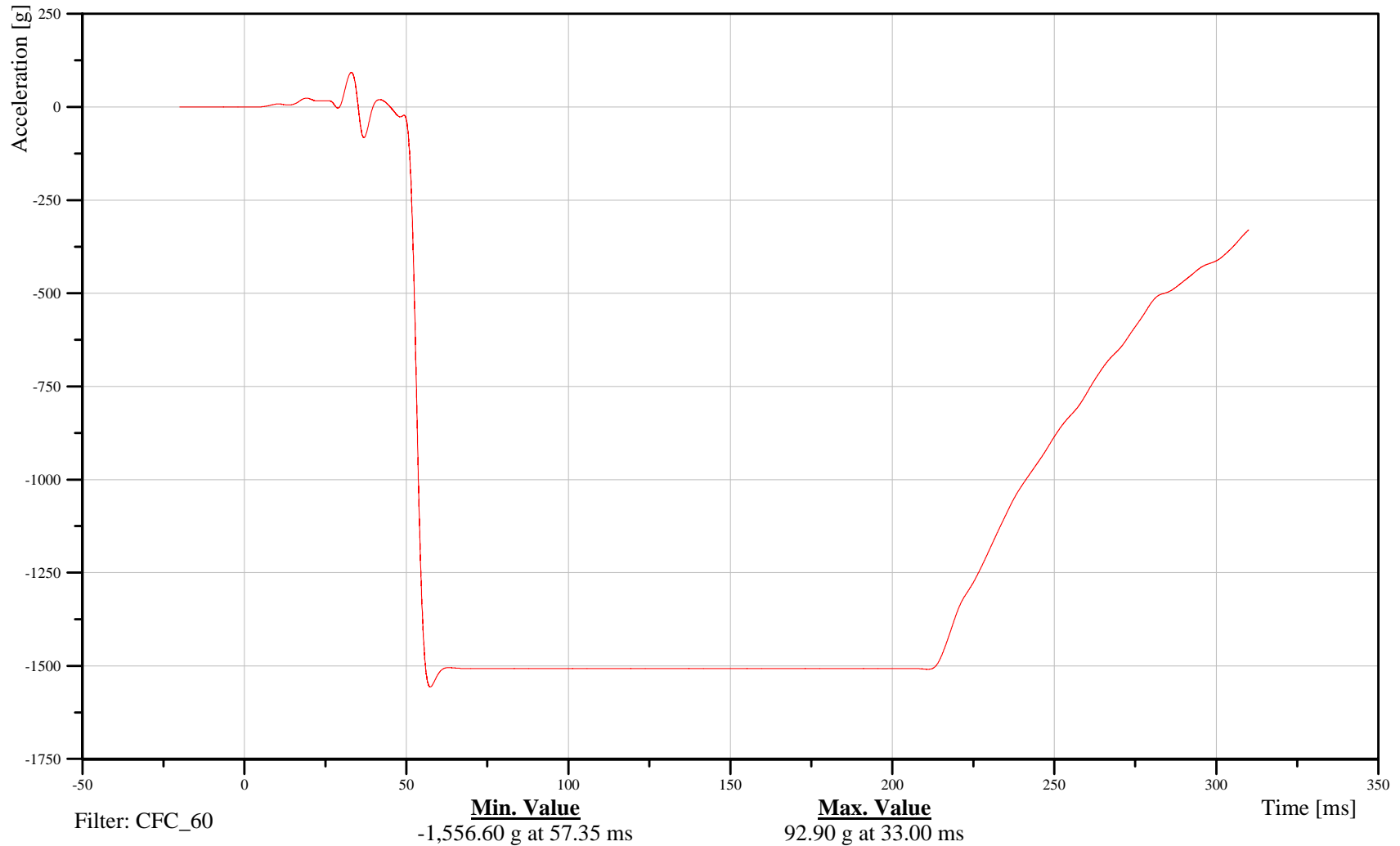
## Left Front Seat Track at H-Point Y-Axis Acceleration

Customer: VRTC

# 11SETRFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-111

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

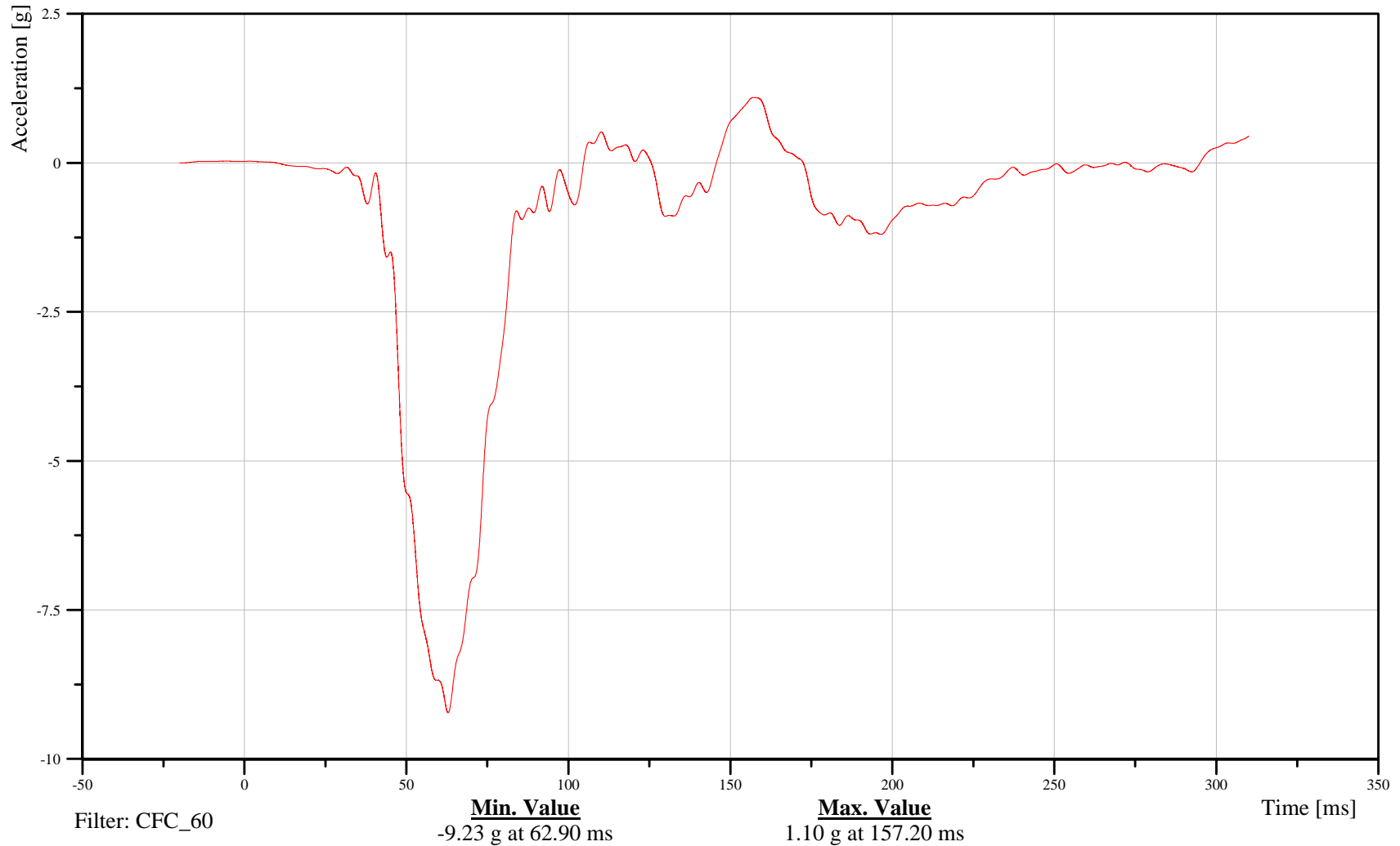
## Top of Engine X-Axis Acceleration

Customer: VRTC

# 12ENGNTTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-112

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

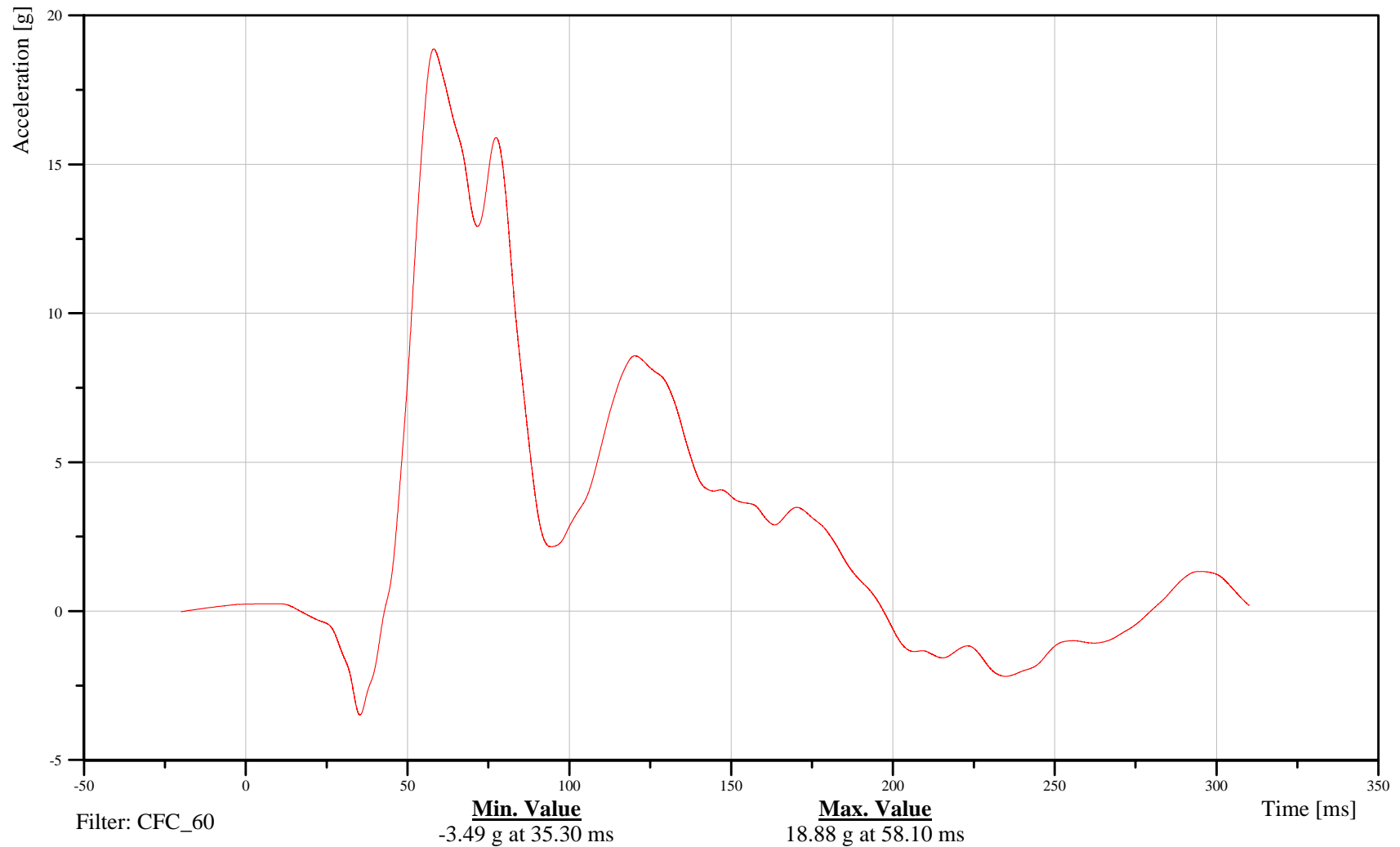
## Top of Engine Y-Axis Acceleration

Customer: VRTC

# 12ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-113

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

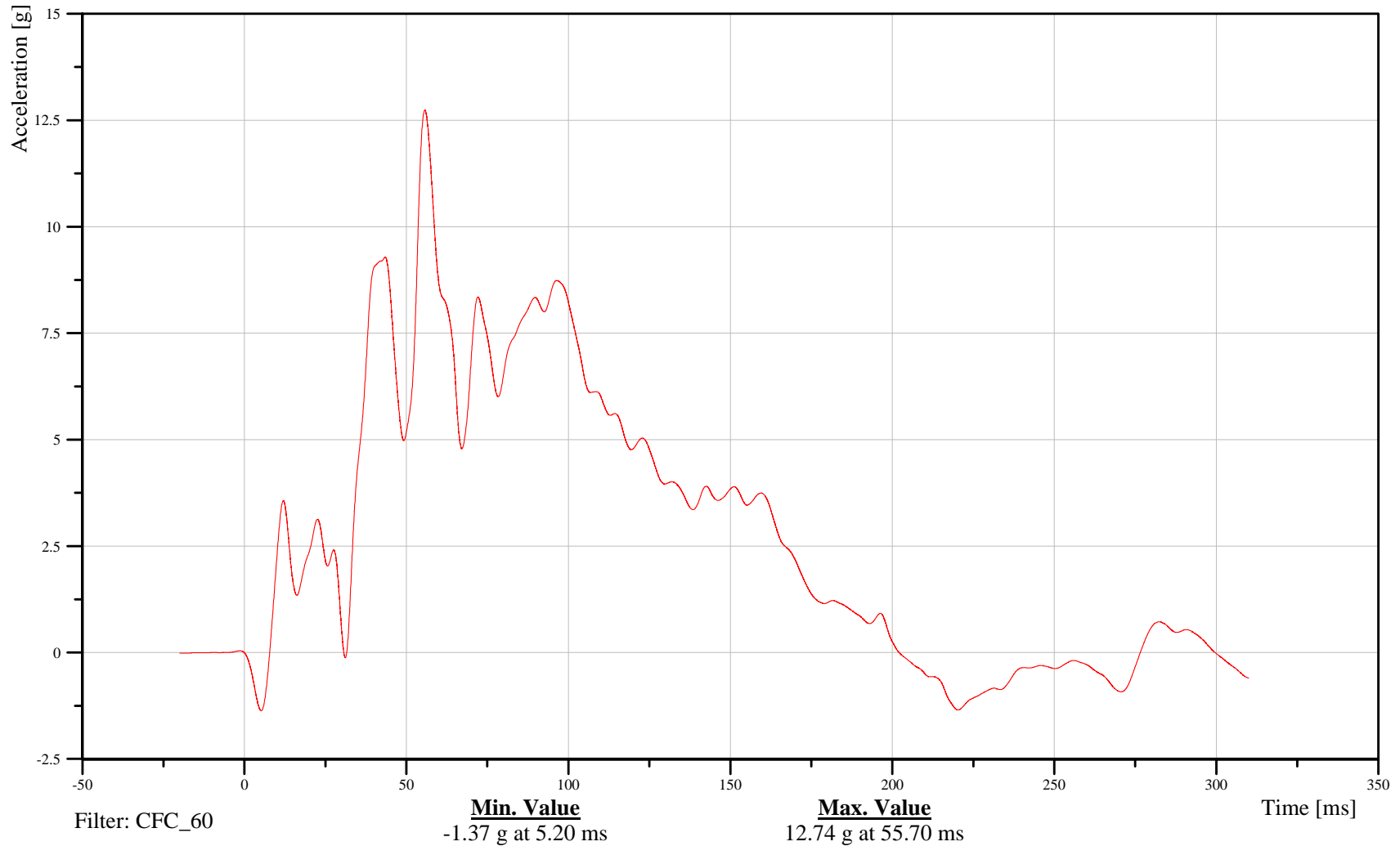
## Firewall Y-Axis Acceleration

Customer: VRTC

# 12VEHC000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-114

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

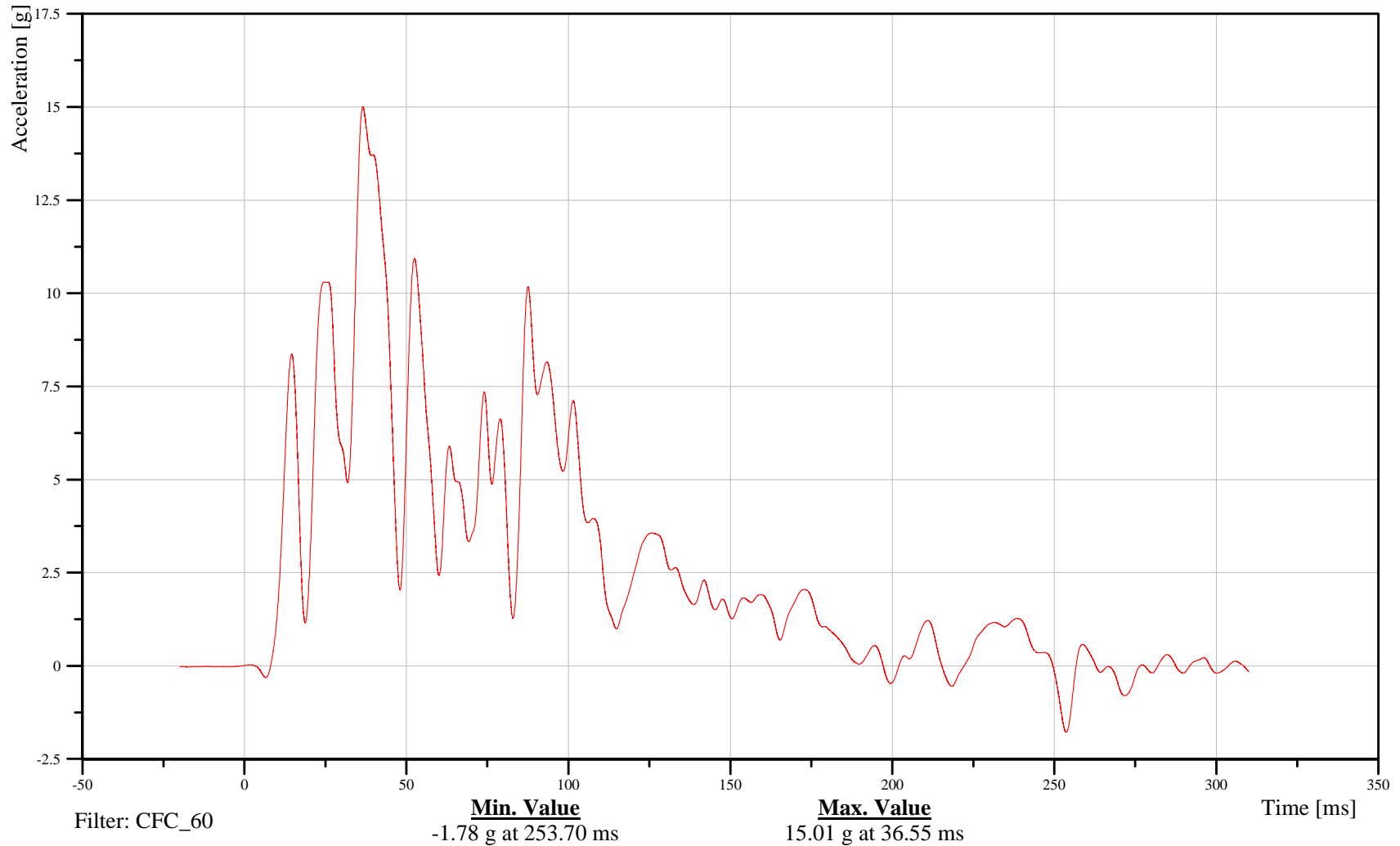
## Right Side Roof Rail Y-Axis Acceleration

Customer: VRTC

# 13ROOF000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-115

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

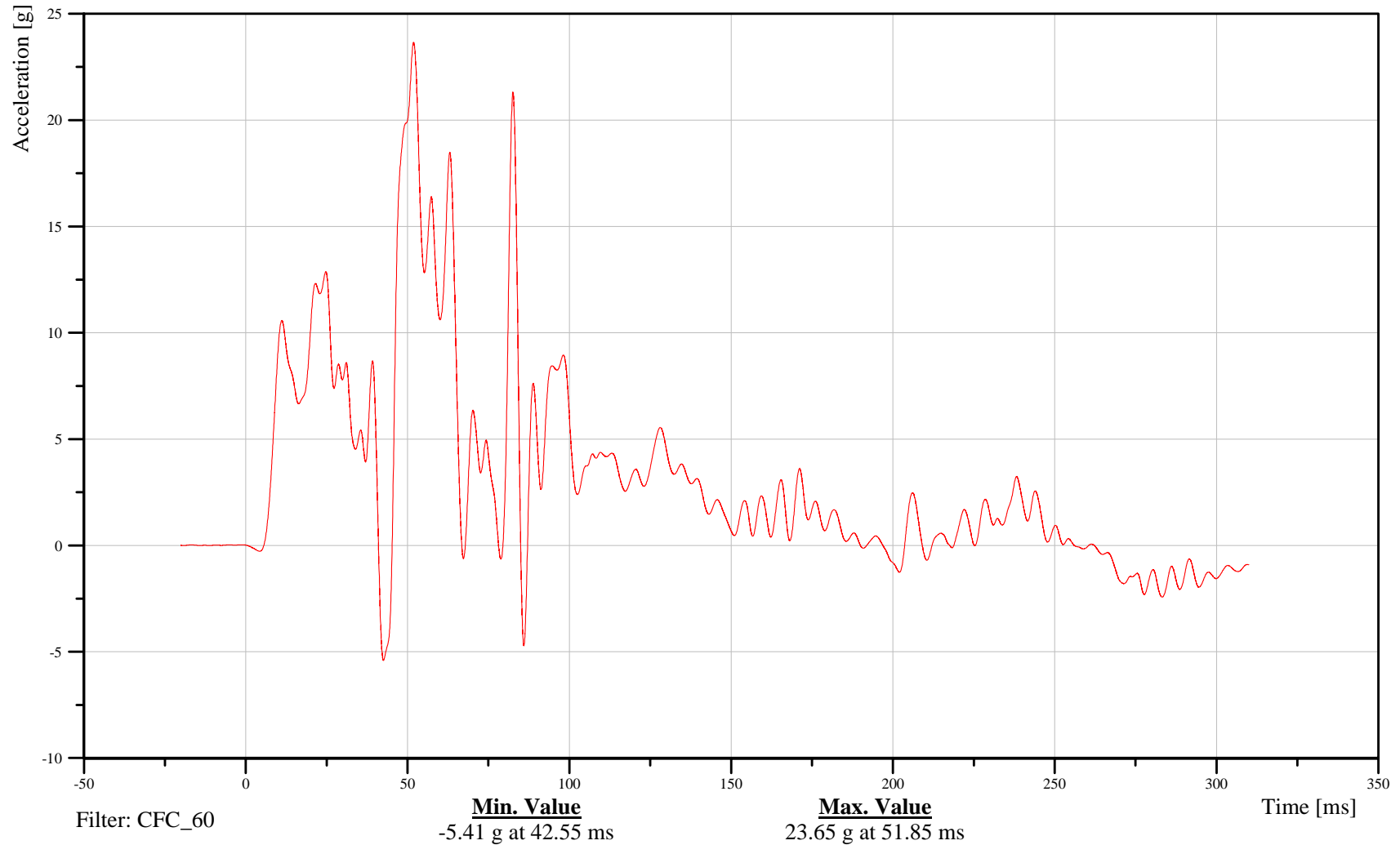
## Right Side Sill Y-Axis Acceleration

Customer: VRTC

# 13SILBFR0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-116

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

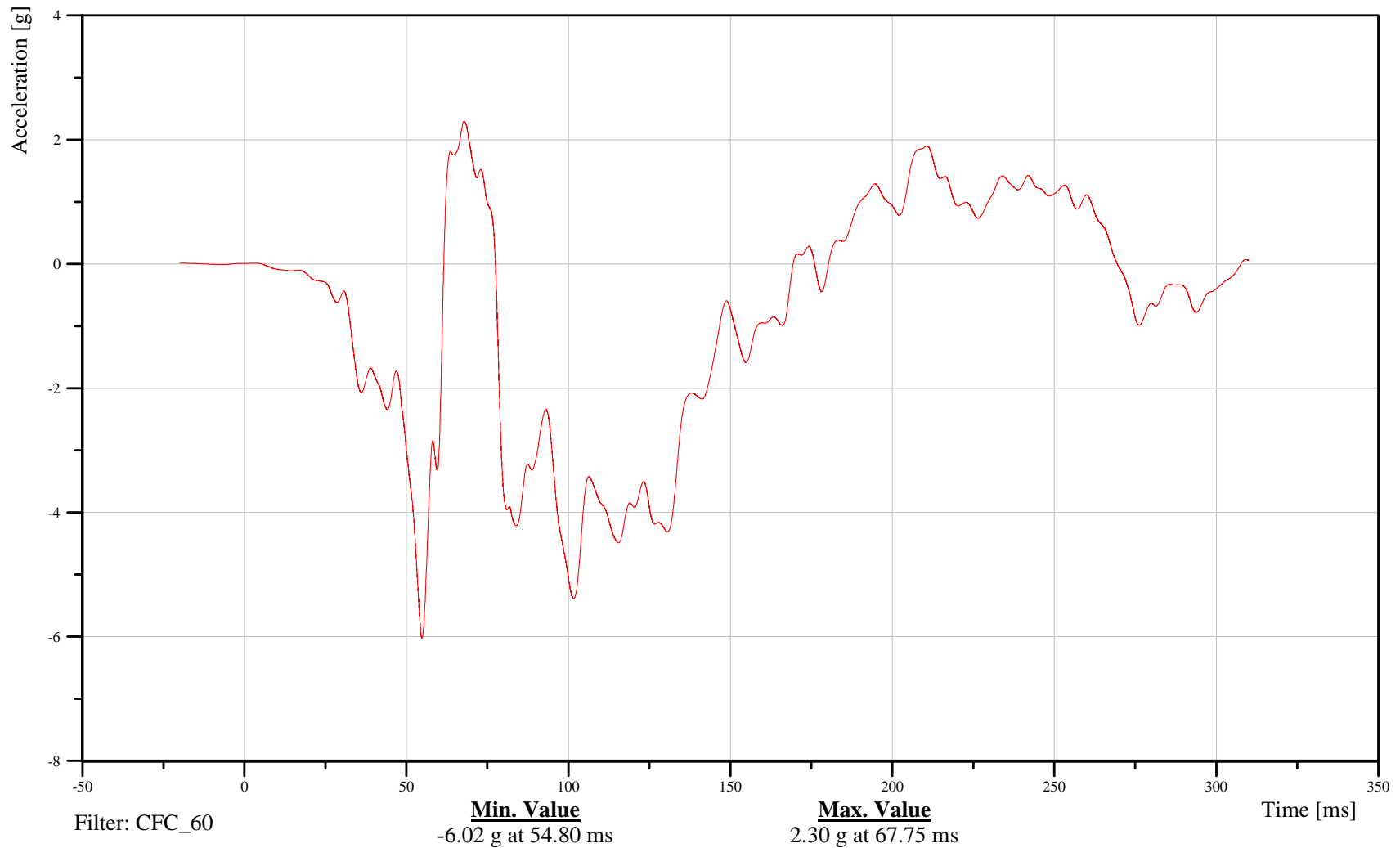
## Rear Deck Behind Rear Axle X-Axis Acceleration

Customer: VRTC

# 18FORA000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-117

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

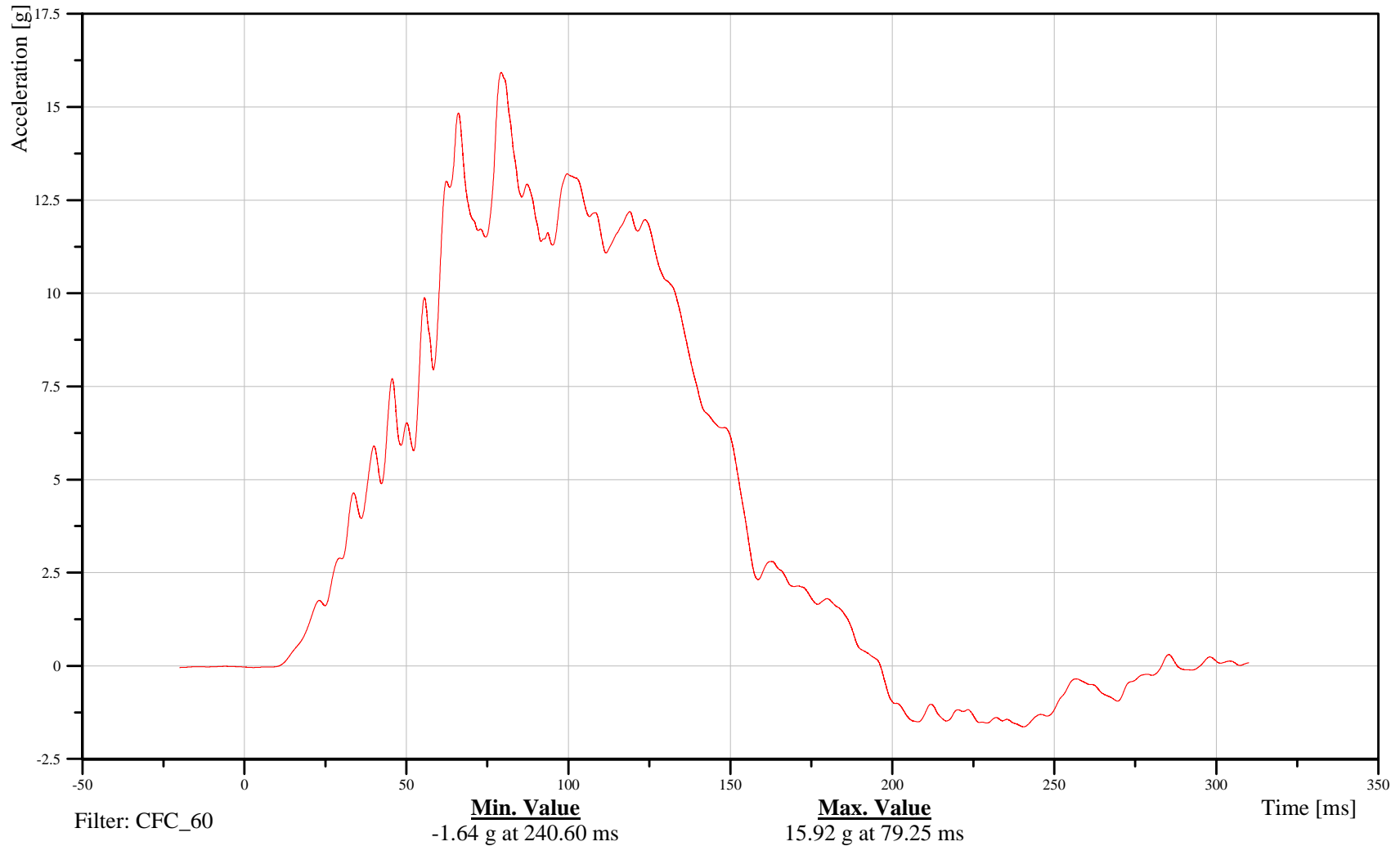
## Rear Deck Behind Rear Axle Y-Axis Acceleration

Customer: VRTC

# 18FORA000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-118

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

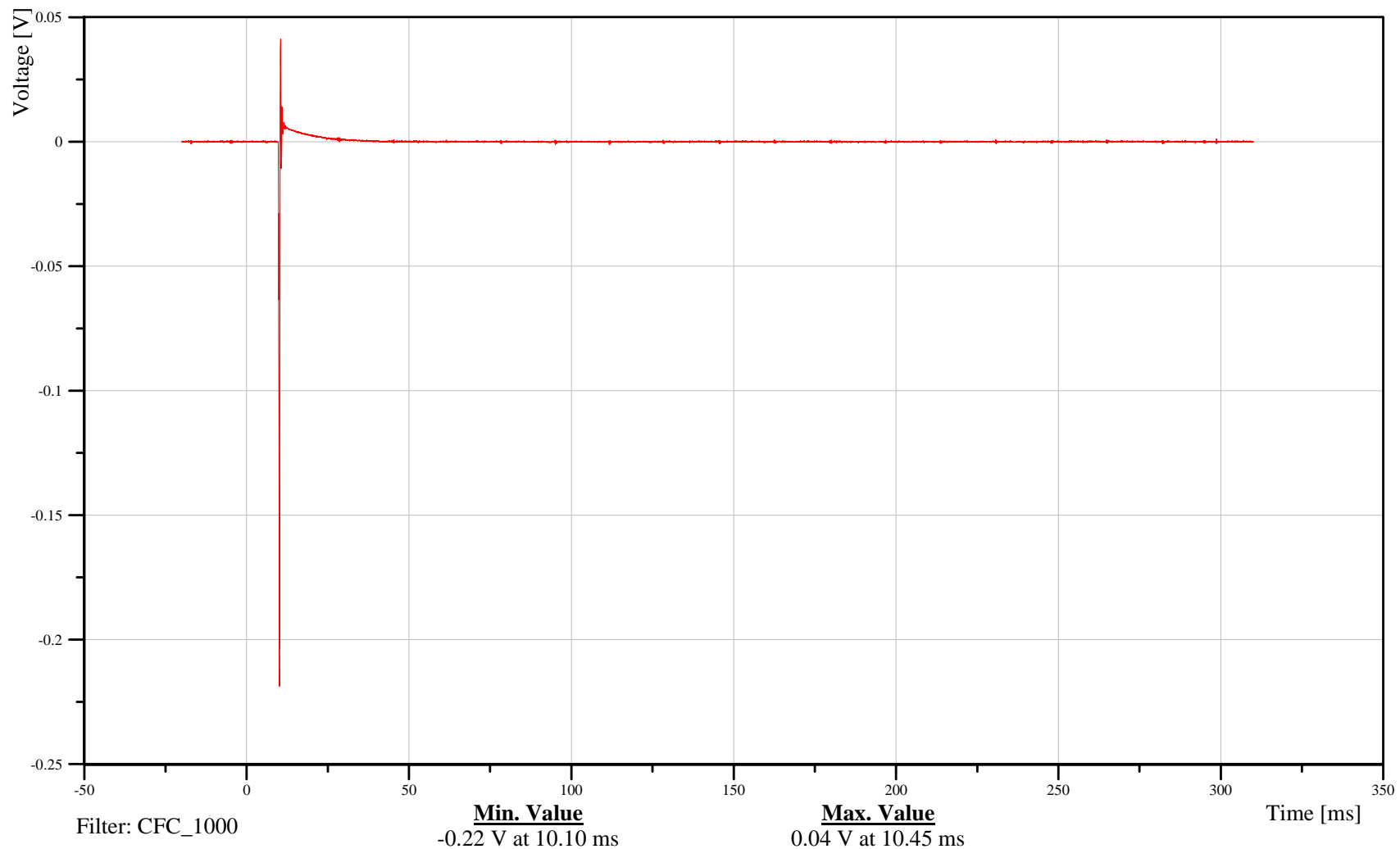
## Driver Side Curtain Inductor

Customer: VRTC

# 11AIRBTPLESEEVOA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-119

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

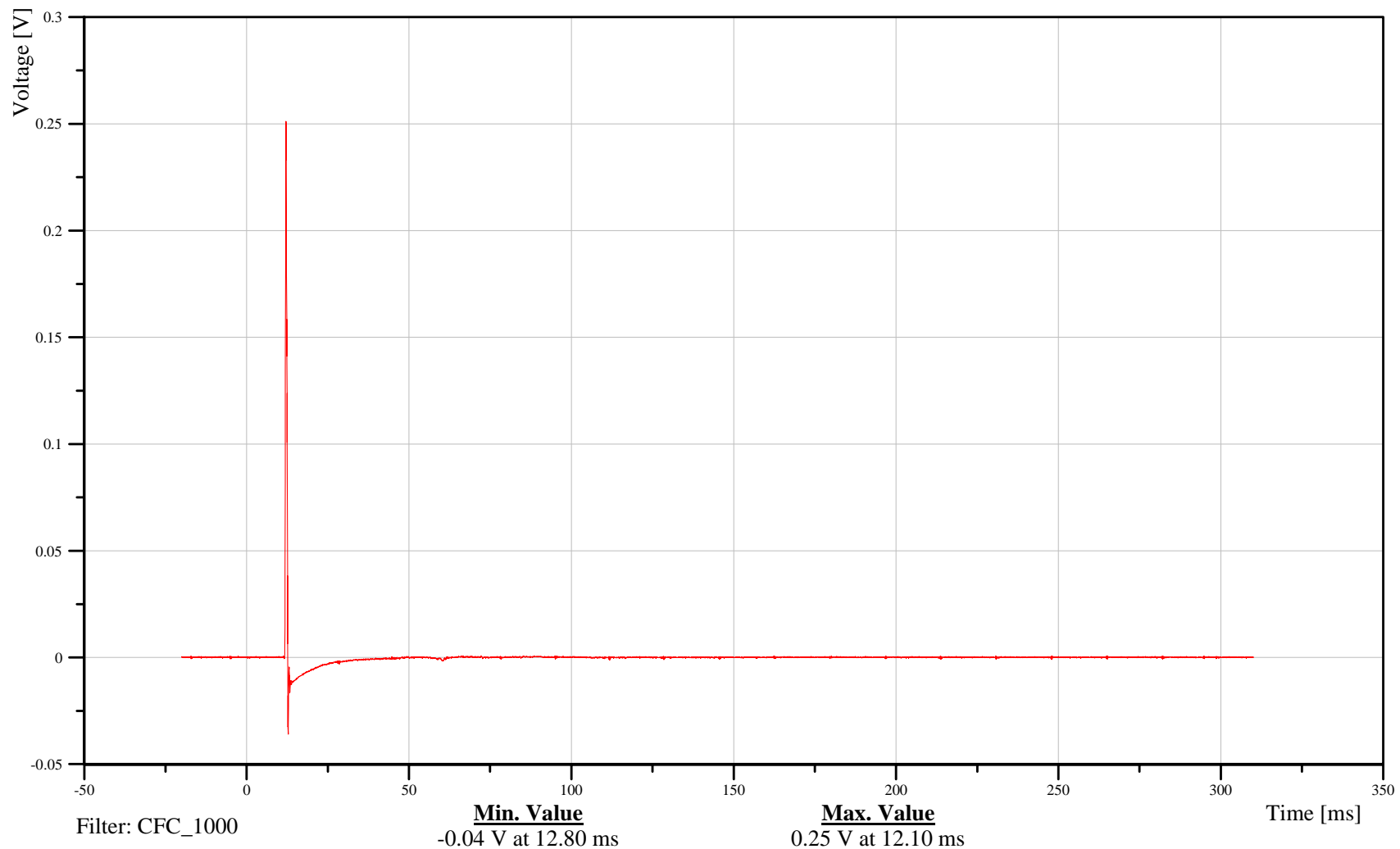
## Driver Torso Airbag Fire Inductor

Customer: VRTC

# 11AIRB0000SEEVOA

TRC Inc. Test Lab: CTF

Test Number: 100211



B-120

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

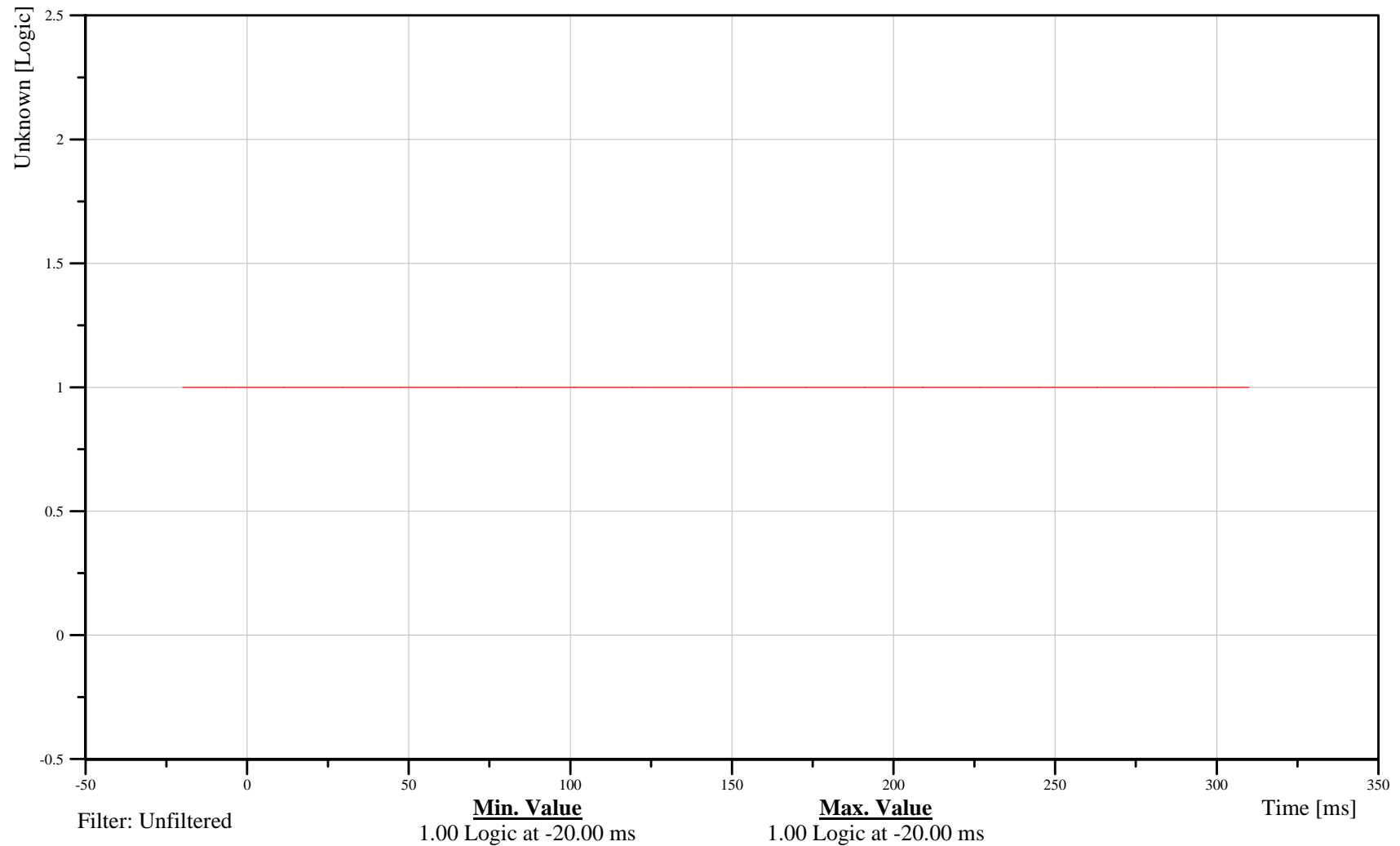
## Head Contact Switch

Customer: VRTC

# 11CONT000001VO00

TRC Inc. Test Lab: CTF

Test Number: 100211



B-121

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

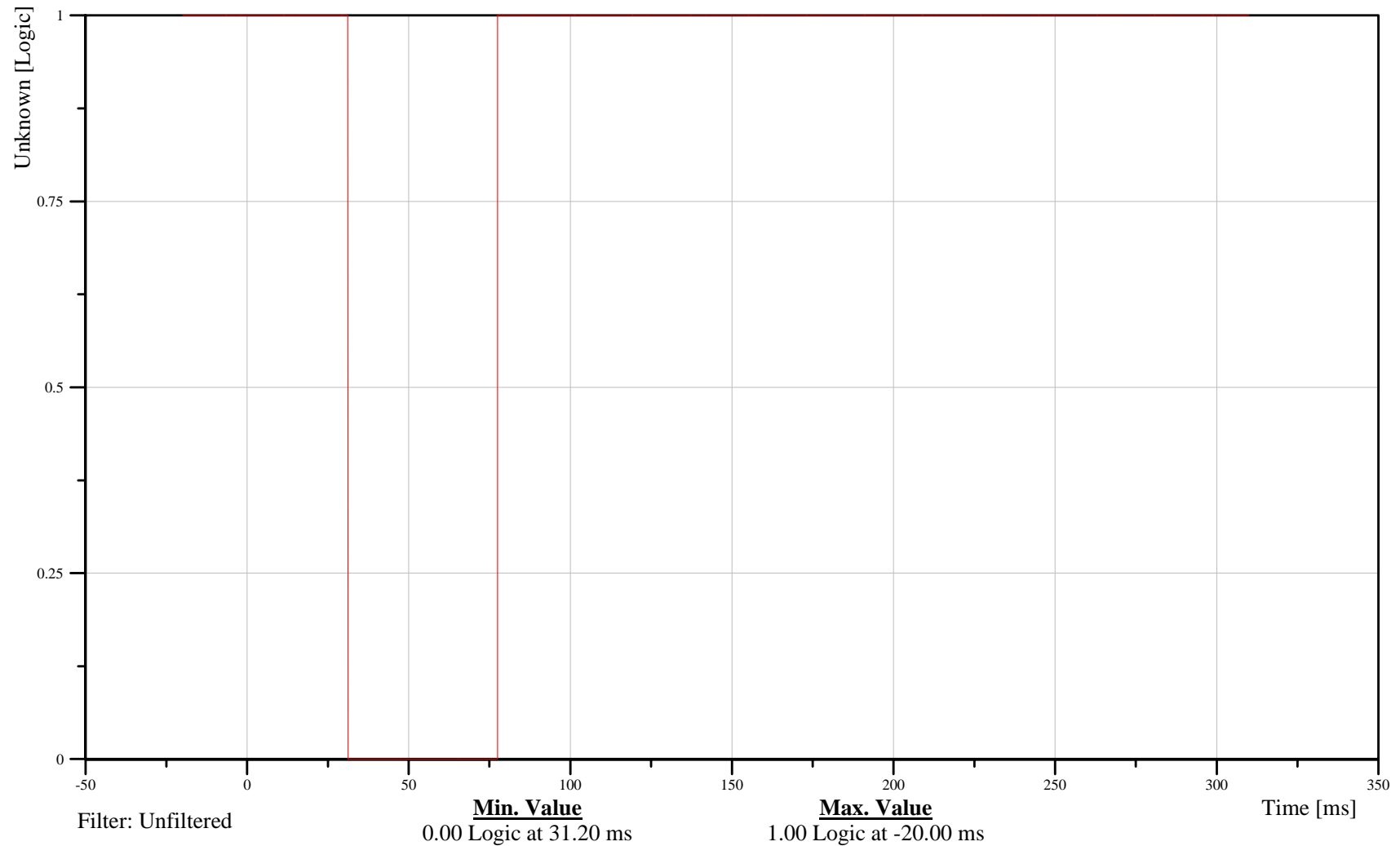
## Shoulder Contact Switch

Customer: VRTC

# 11CONT000002VO00

TRC Inc. Test Lab: CTF

Test Number: 100211



B-122

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

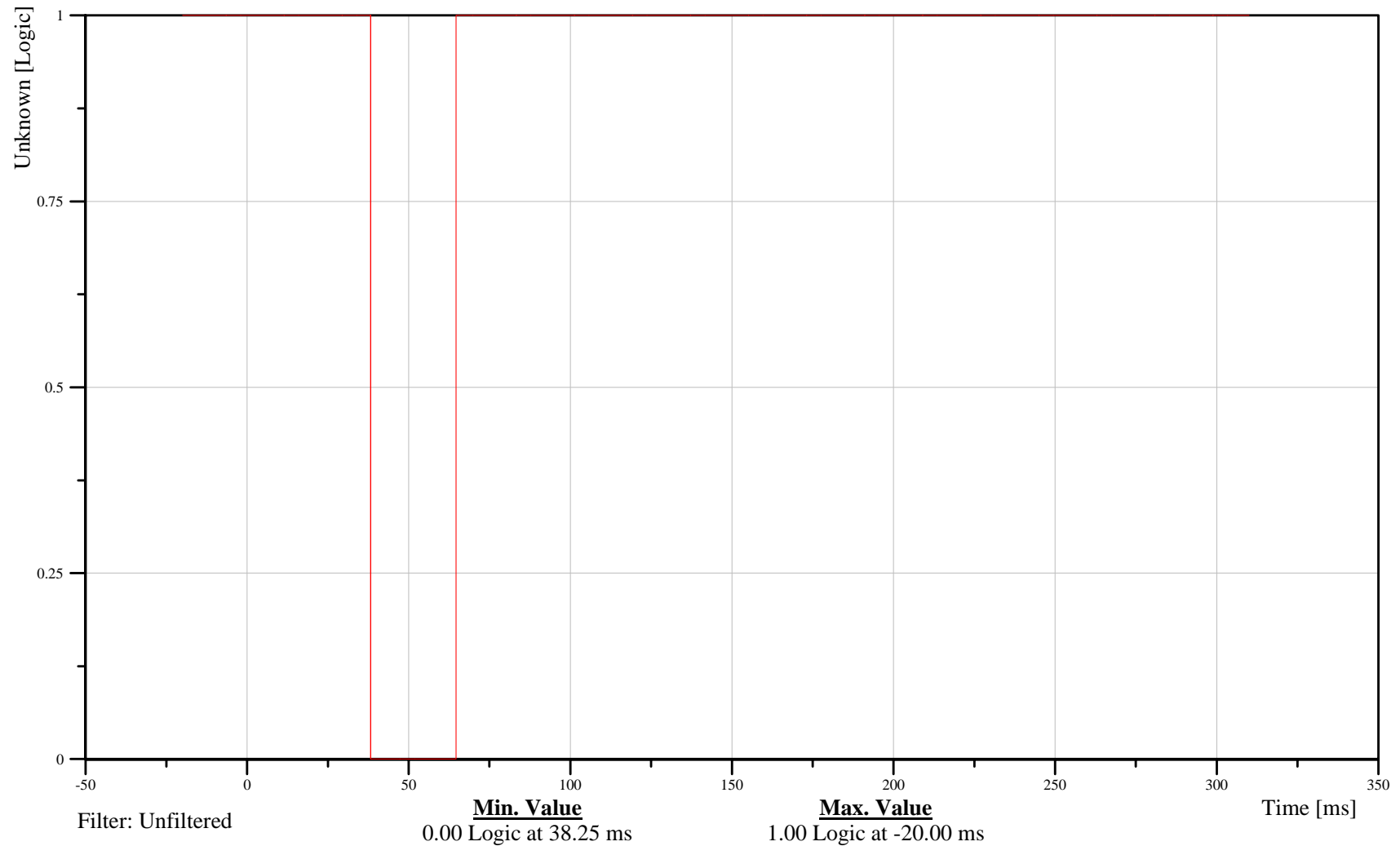
## Torso Contact Switch

Customer: VRTC

# 11CONT000003VO00

TRC Inc. Test Lab: CTF

Test Number: 100211



B-123

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

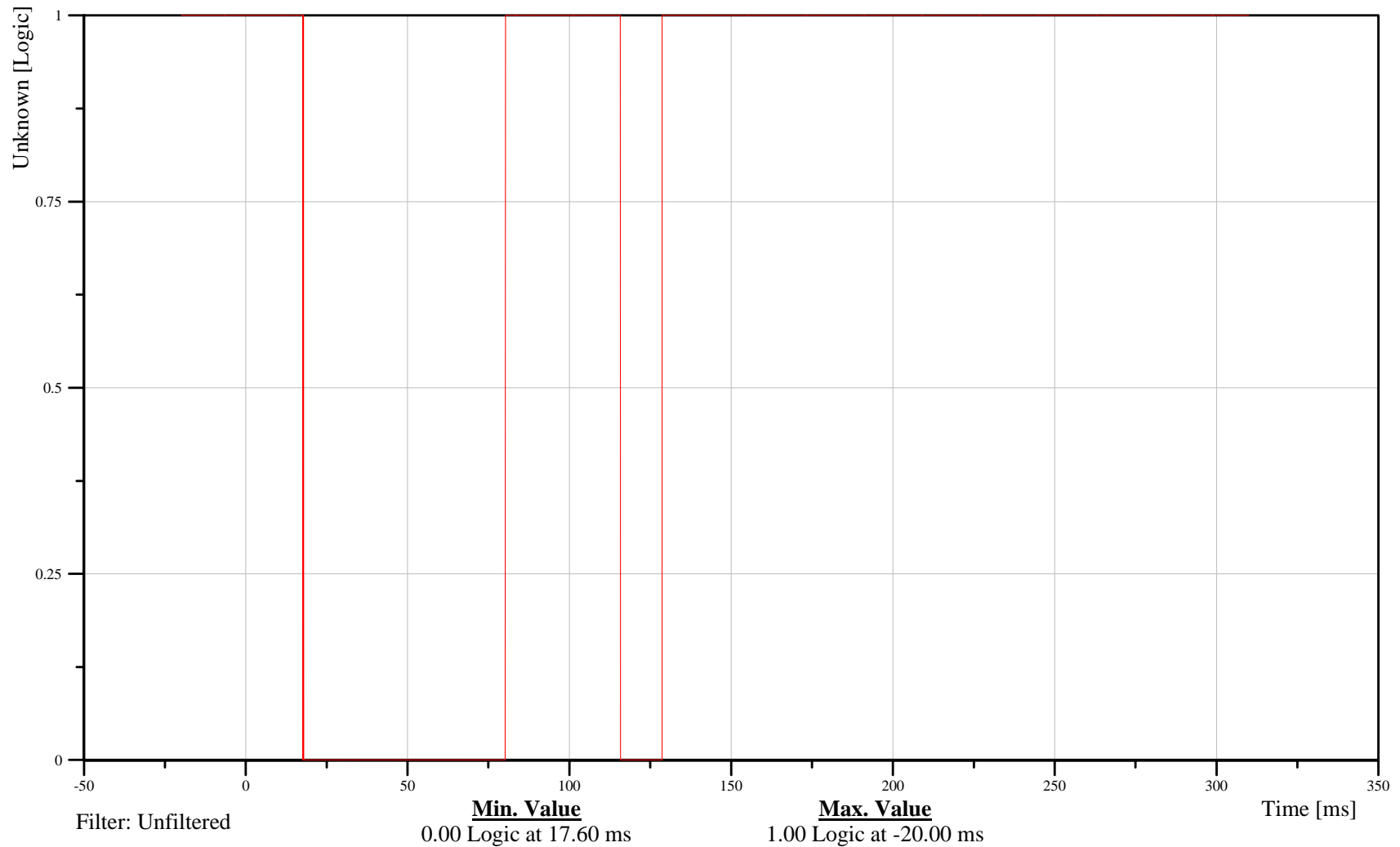
## Left Contact Switch

Customer: VRTC

# 11CONT000004VO00

TRC Inc. Test Lab: CTF

Test Number: 100211



B-124

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

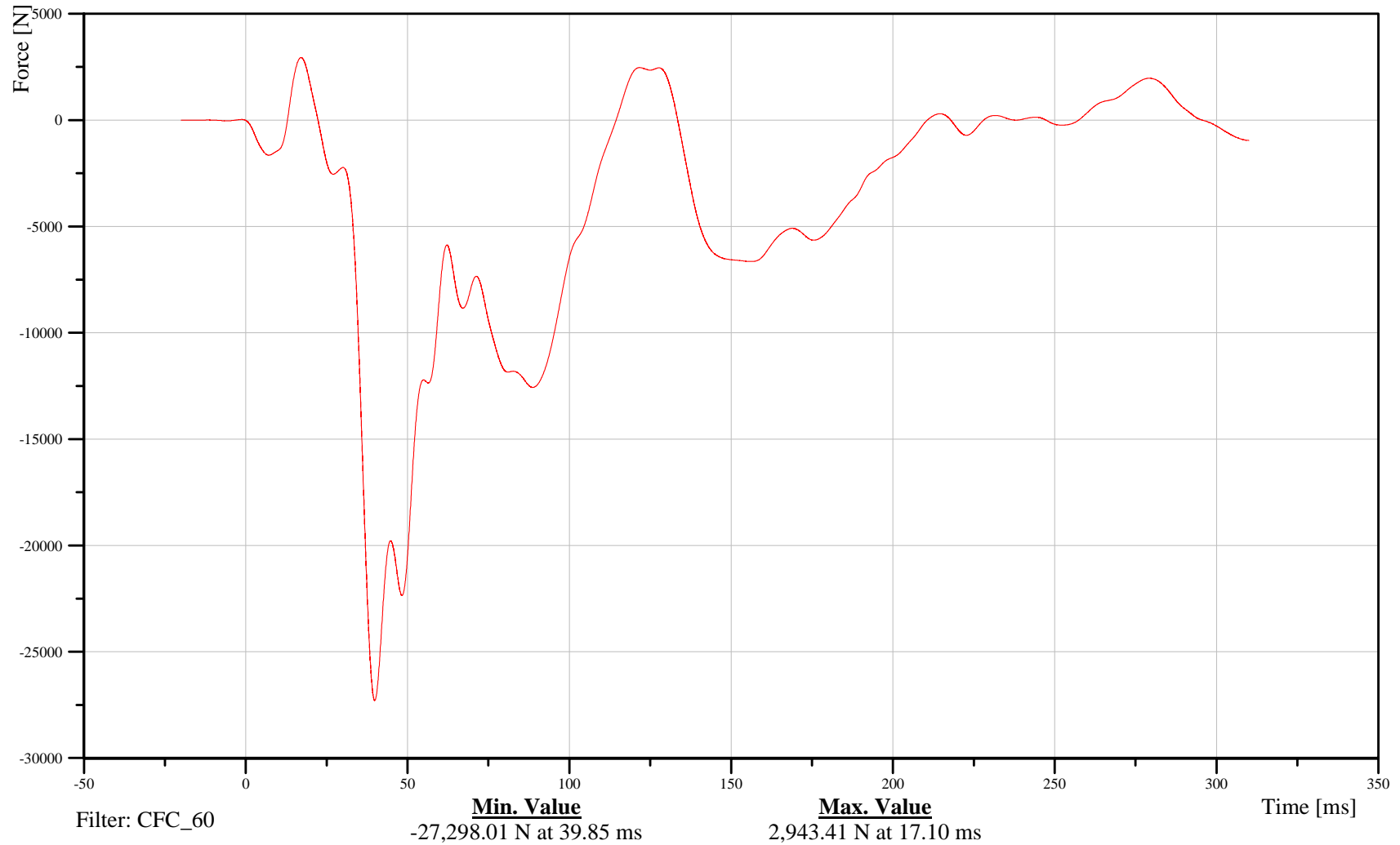
Pole Load Cell 1

Customer: VRTC

## K0FBAR010000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-125

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

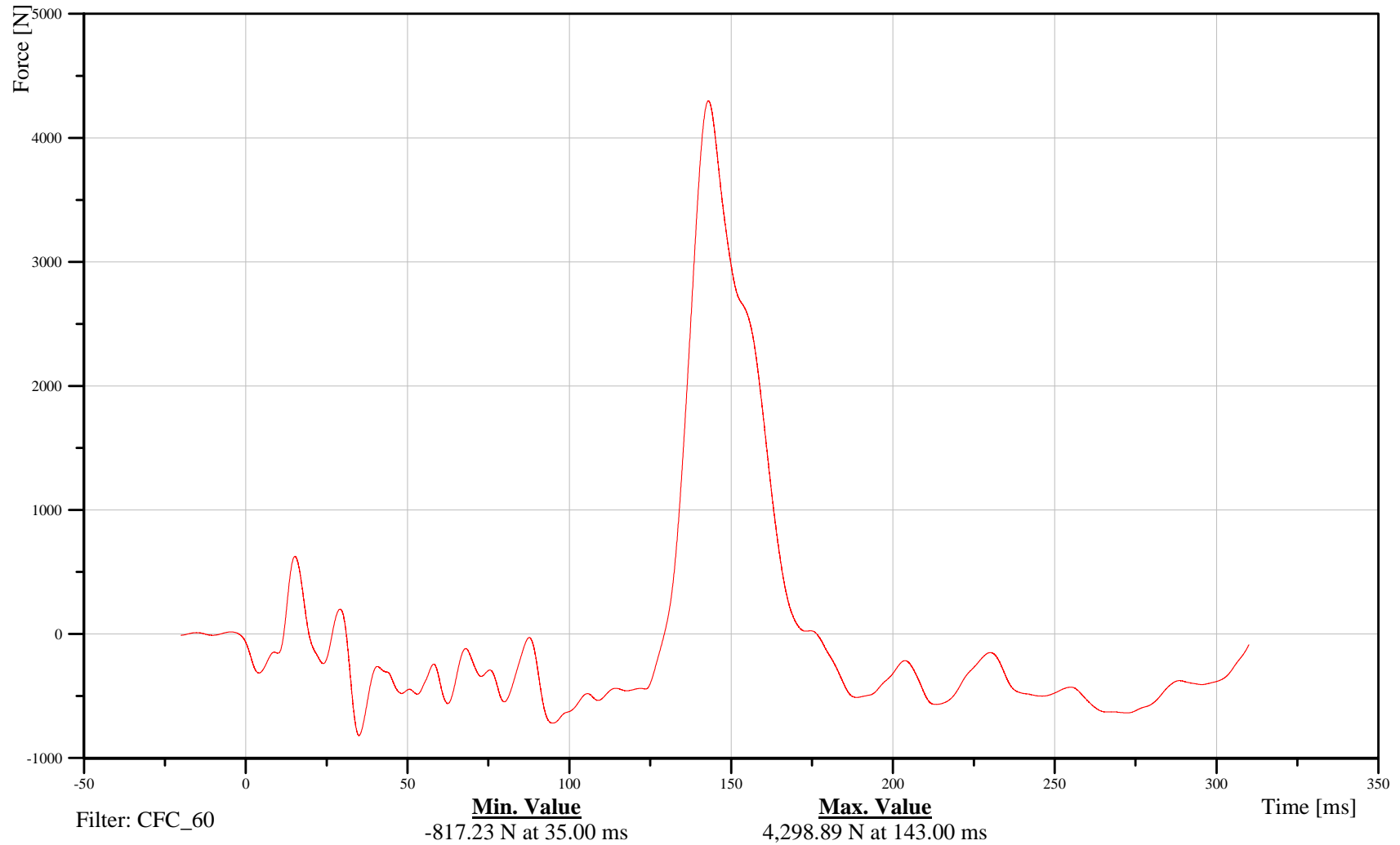
Pole Load Cell 2

Customer: VRTC

## K0FBAR020000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-126

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

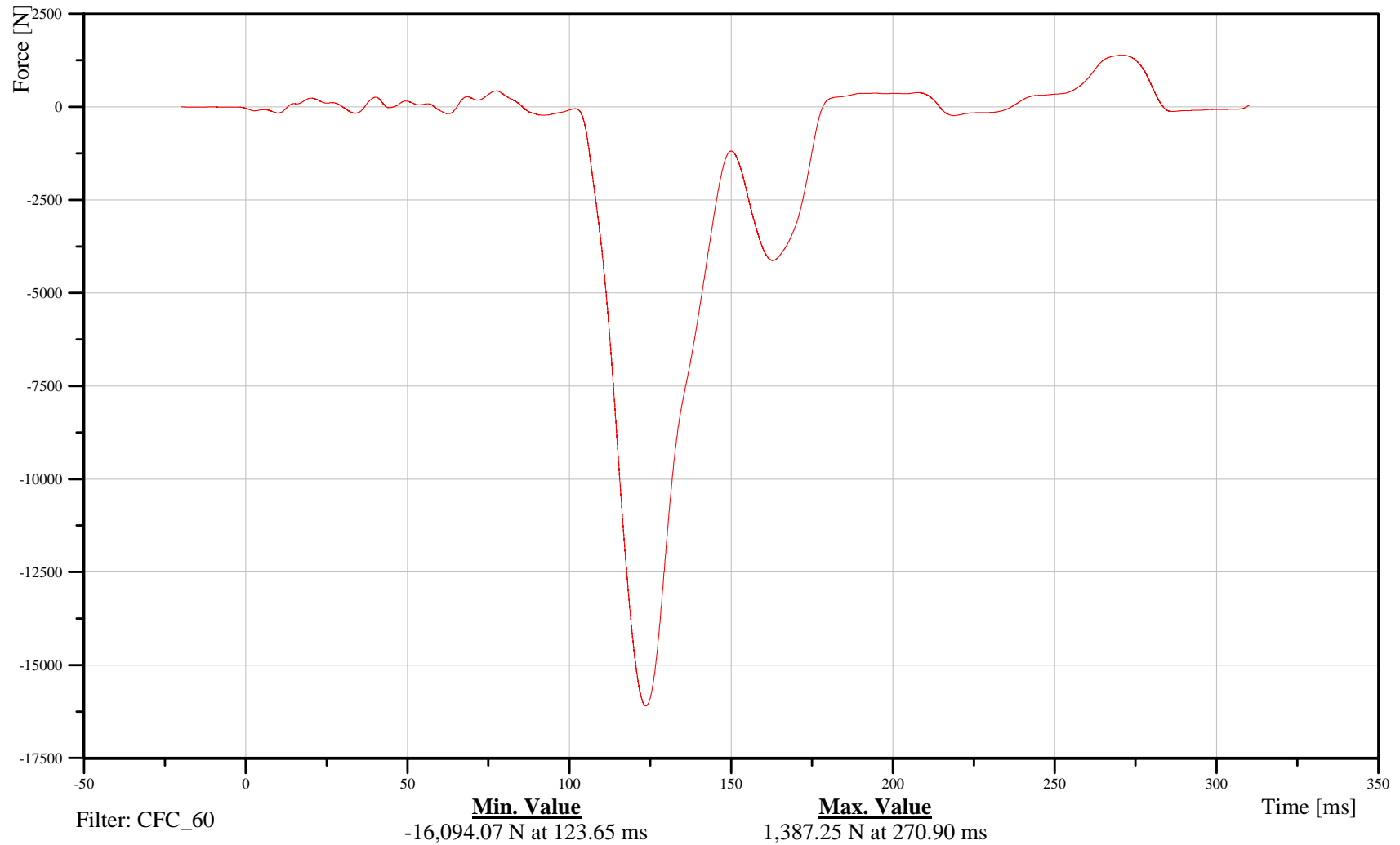
Pole Load Cell 3

Customer: VRTC

## K0FBAR030000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-127

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

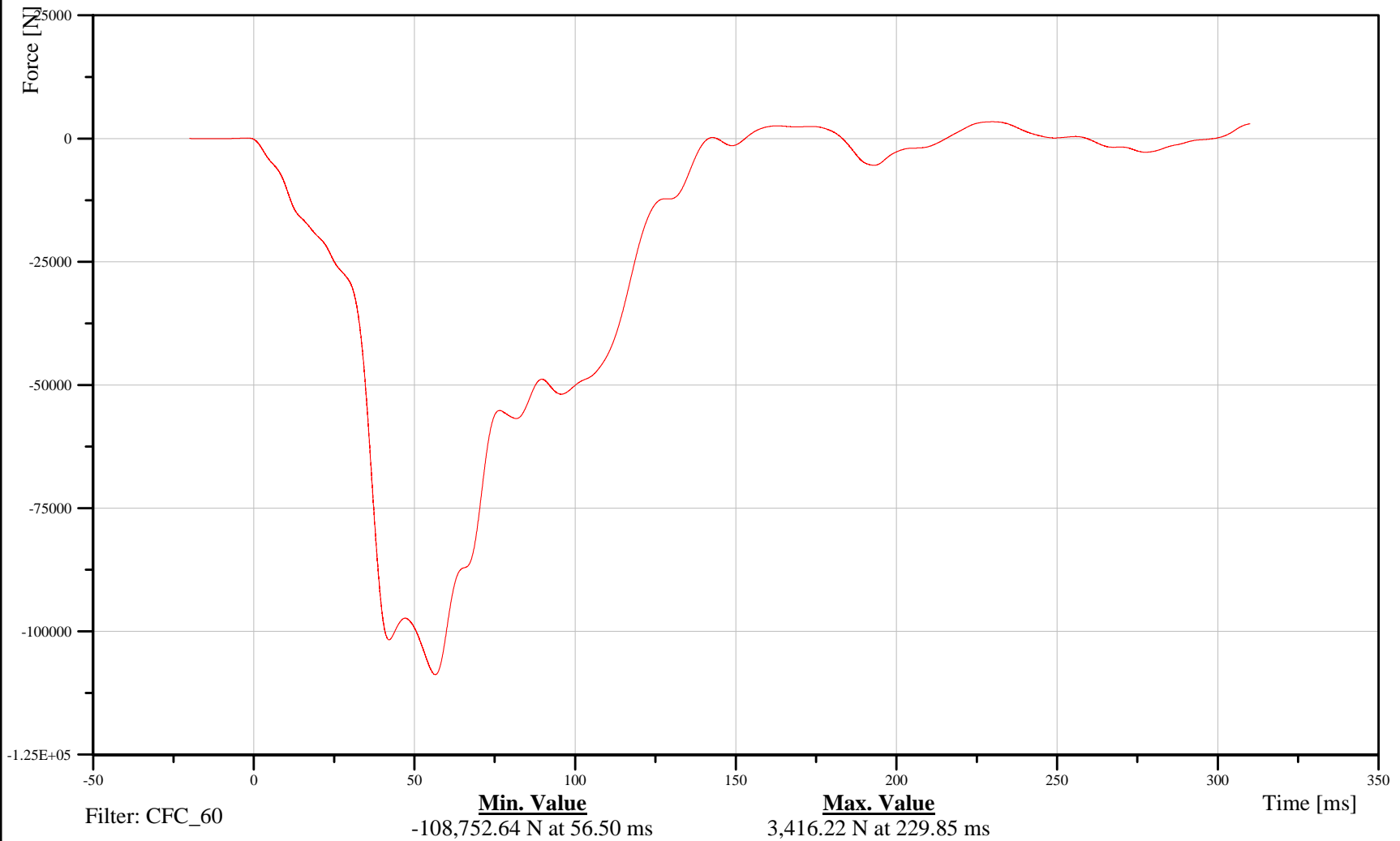
Pole Load Cell 4

Customer: VRTC

## K0FBAR040000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-128

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

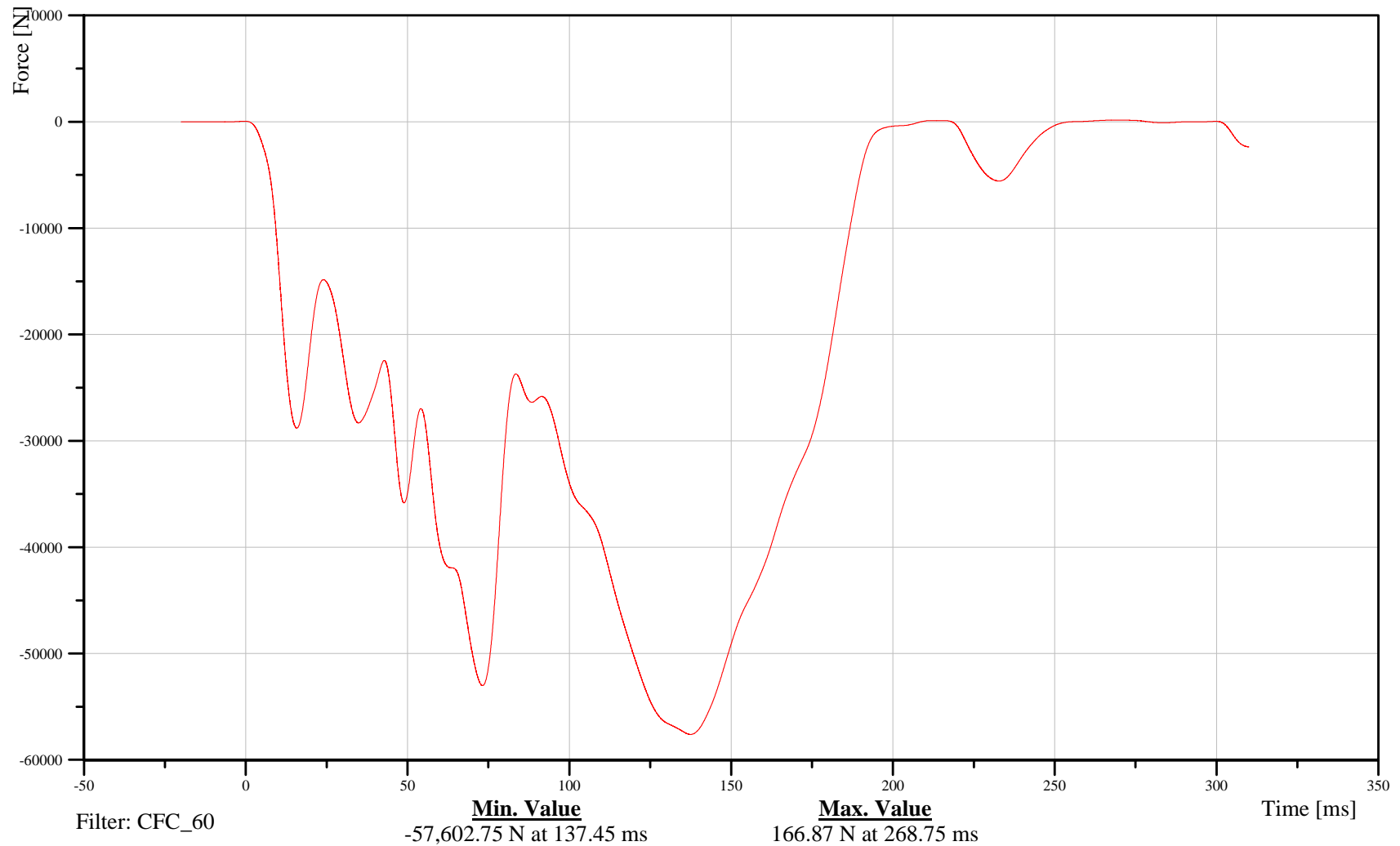
Pole Load Cell 5

Customer: VRTC

## K0FBAR050000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-129

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

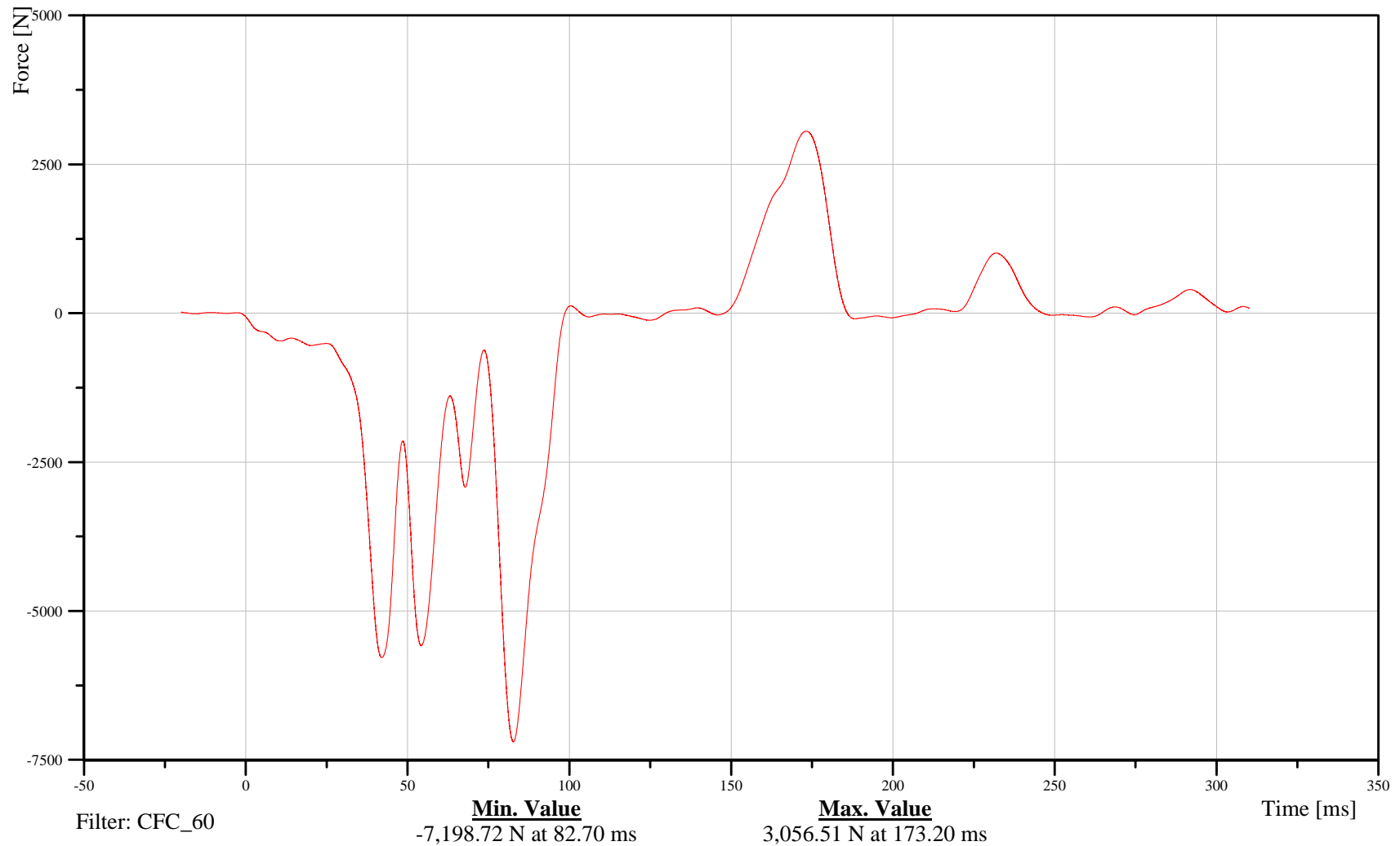
Pole Load Cell 6

Customer: VRTC

## K0FBAR060000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-130

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

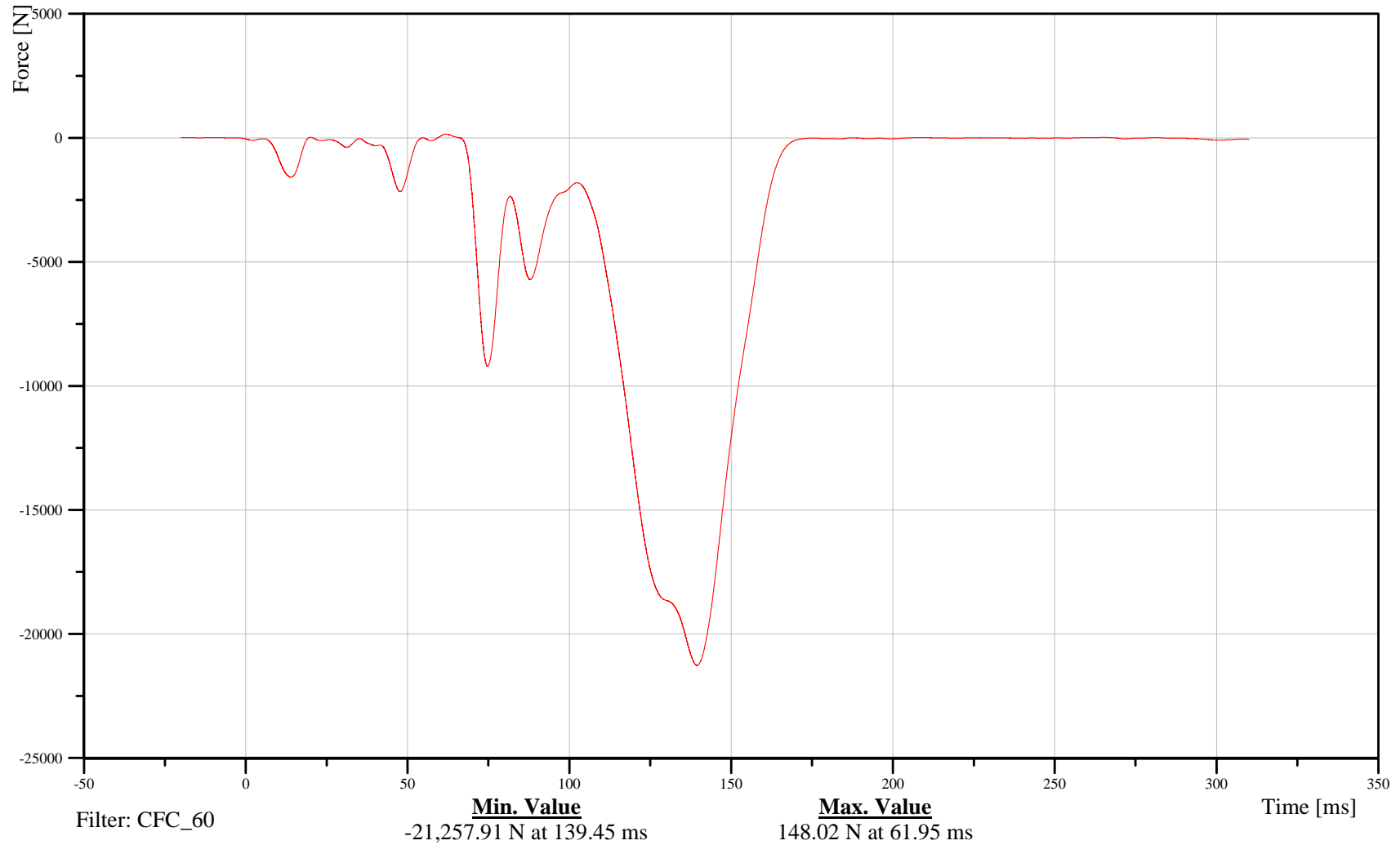
Pole Load Cell 7

Customer: VRTC

## K0FBAR070000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-131

100211



# 2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph

Date: 02/15/2010  
Time: 08:38

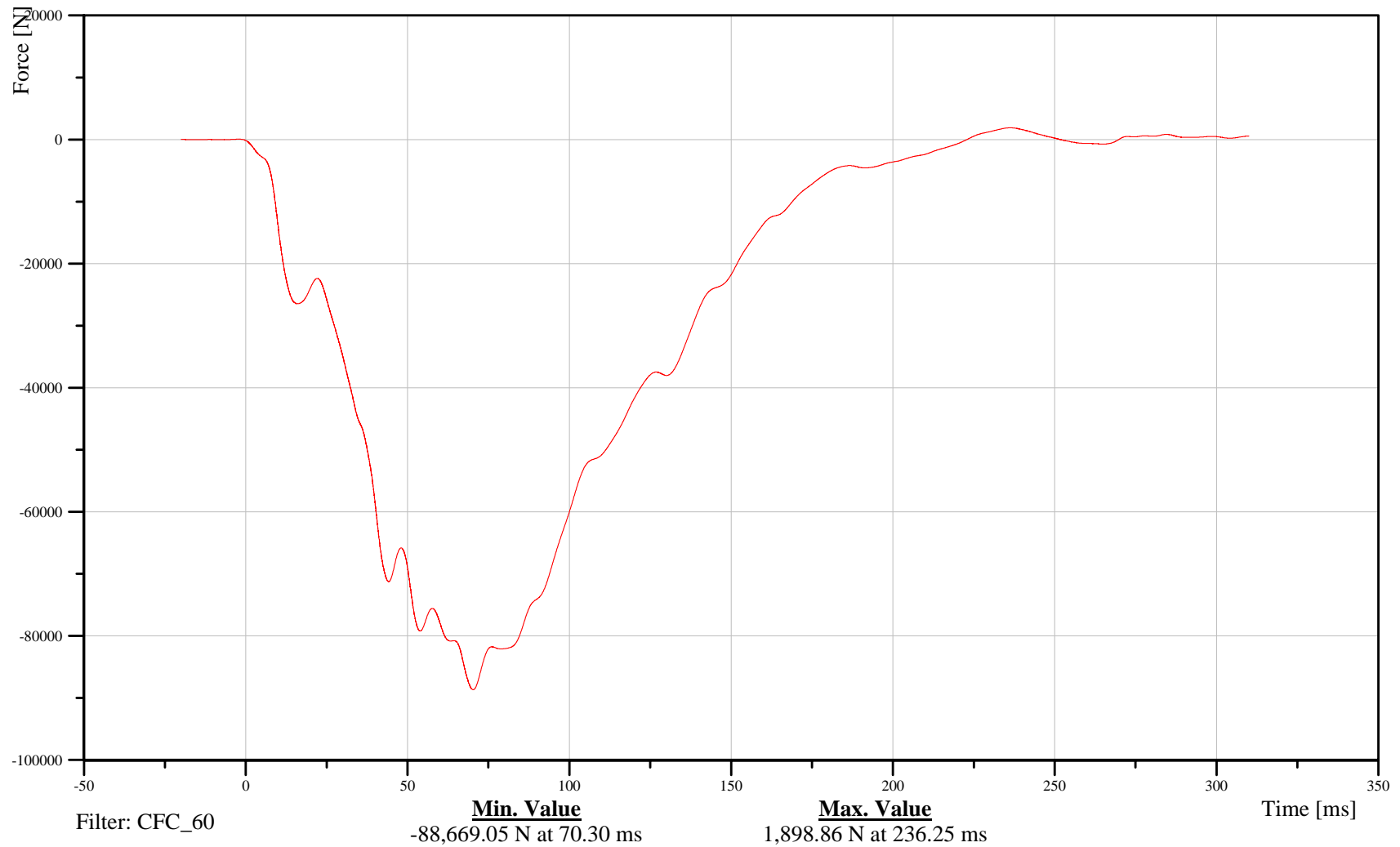
Pole Load Cell 8

Customer: VRTC

## K0FBAR080000FOXD

TRC Inc. Test Lab: CTF

Test Number: 100211



B-132

100211

Appendix C

World SID Configuration and Performance Verification Data

Calibration Test Results

Pre-Test

World SID: 016

Configured for Left Side Impact

# Transportation Research Center Inc.

Front Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-1

Test Date: 2/3/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.7 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Peak Head Resultant Acceleration	225 - 275 g	227.7 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	13.8 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

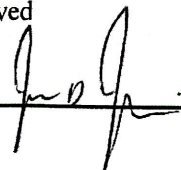
**Test meets specifications.**

**Comments:**

Technician

  
\_\_\_\_\_

Approved

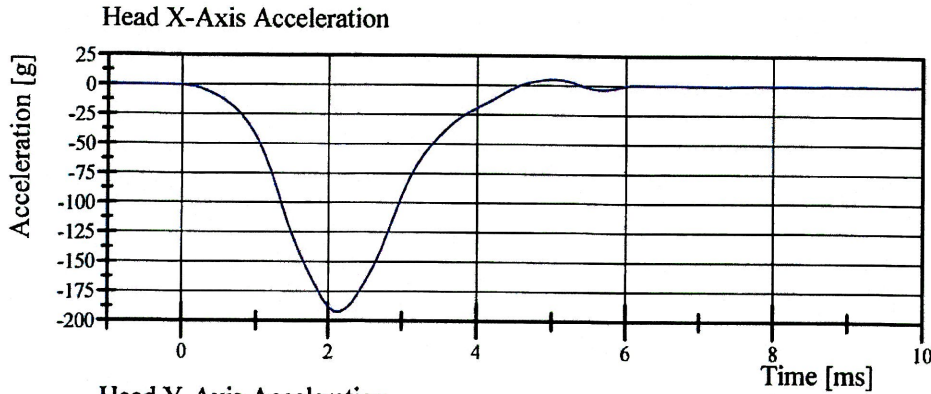
  
\_\_\_\_\_

# Transportation Research Center Inc.

## Front Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-1

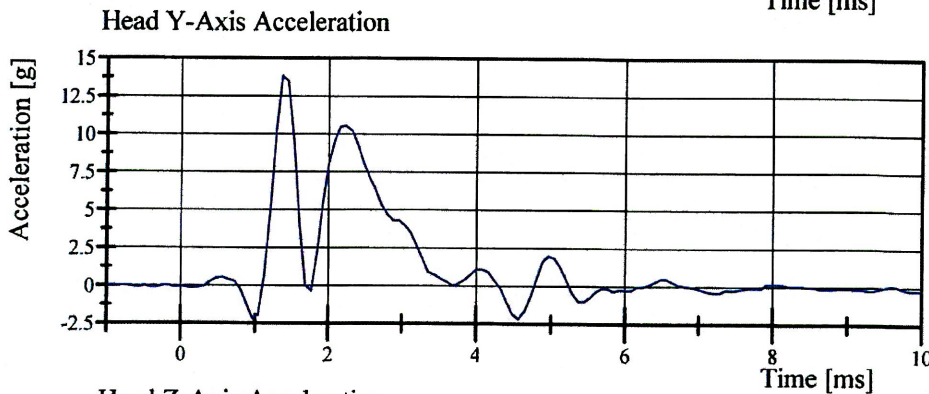
Test Date: 2/3/2010



Filter Class: CFC\_1000

Max: 5.3 g at 5.0 ms

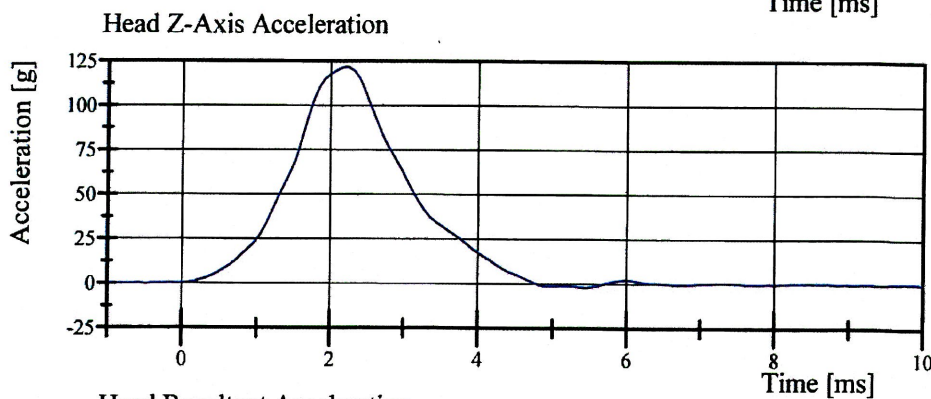
Min: -192.5 g at 2.2 ms



Filter Class: CFC\_1000

Max: 13.8 g at 1.4 ms

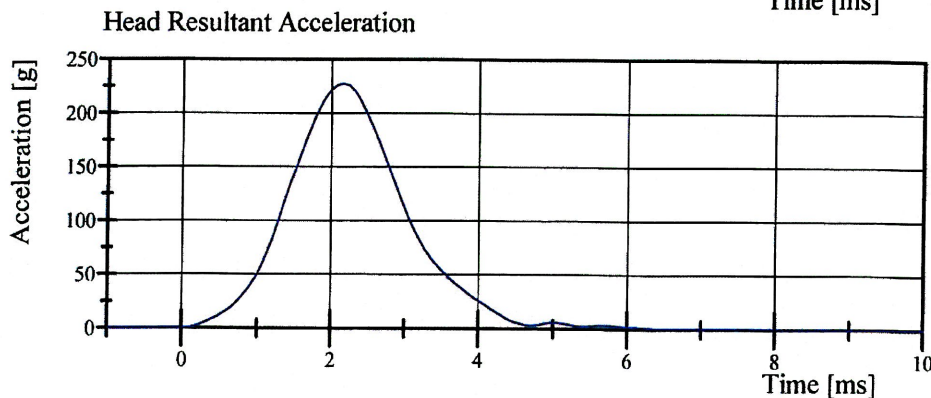
Min: -2.2 g at 1.0 ms



Filter Class: CFC\_1000

Max: 121.6 g at 2.2 ms

Min: -1.9 g at 5.4 ms



Filter Class: CFC\_1000

Max: 227.7 g at 2.2 ms

Min: 0.0 g at -1.0 ms

# Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-1

Test Date: 2/4/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	112.9 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-6.6 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

**Test meets specifications.**

**Comments:**

Technician

Robert Baranda

Approved

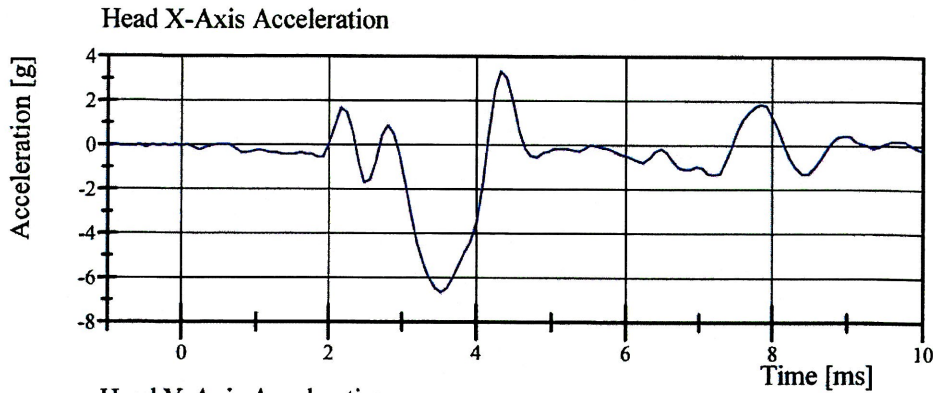
[Signature]

# Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-1

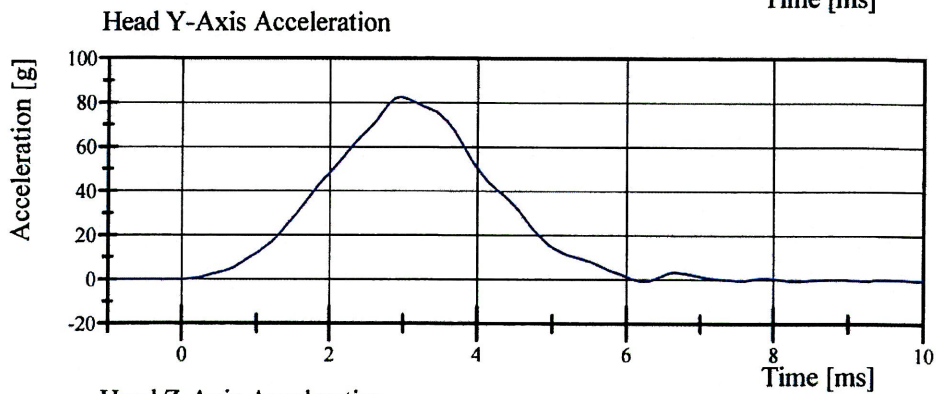
Test Date: 2/4/2010



Filter Class: CFC\_1000

Max: 3.3 g at 4.3 ms

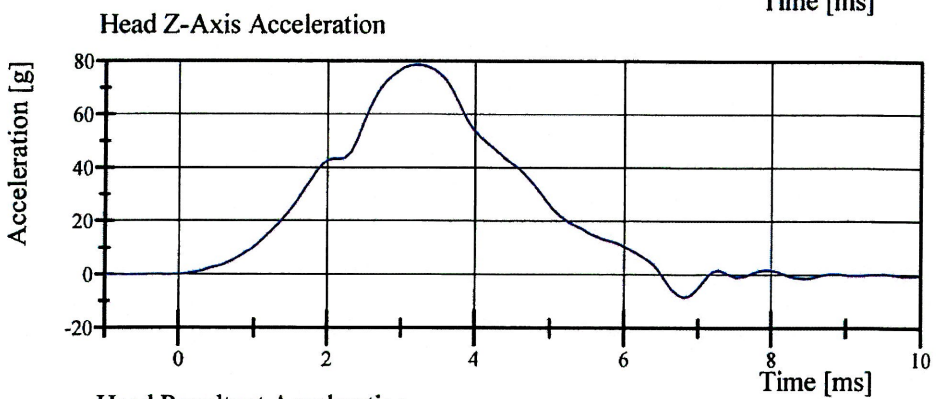
Min: -6.6 g at 3.5 ms



Filter Class: CFC\_1000

Max: 82.7 g at 3.0 ms

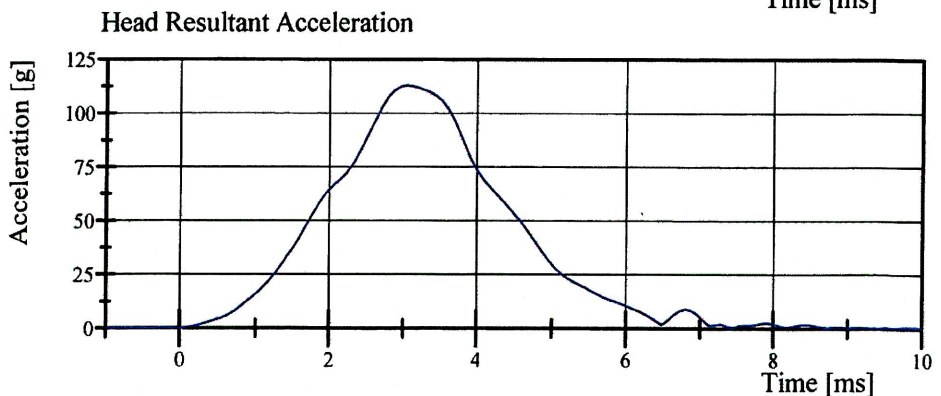
Min: -0.7 g at 6.2 ms



Filter Class: CFC\_1000

Max: 78.7 g at 3.2 ms

Min: -8.5 g at 6.8 ms



Filter Class: CFC\_1000

Max: 112.9 g at 3.0 ms

Min: 0.1 g at -0.6 ms

# Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

Test Date: 2/4/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.6 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Peak Head Resultant Acceleration	99 - 121 g	120.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-8.1 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	No	No

**Test does not meet specifications.**

**Comments:**

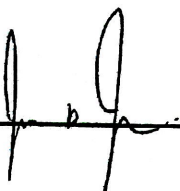
The failure was known to the Federal Engineer and it was decided to use the dummy as-is.

Technician



---

Approved



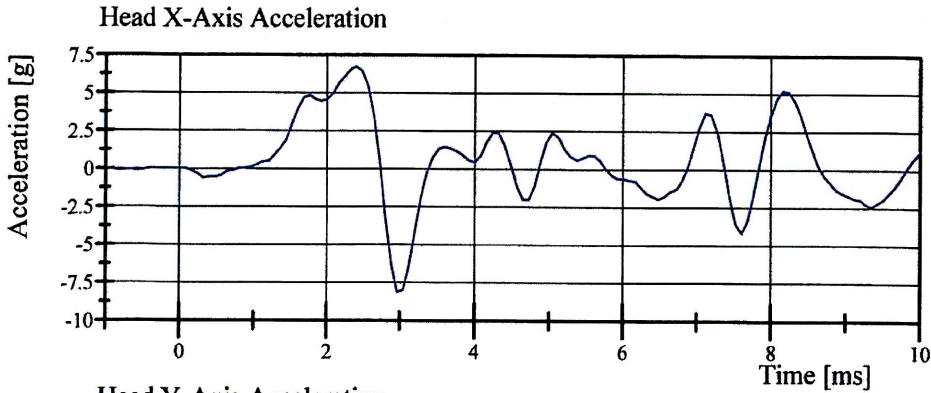
---

# Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

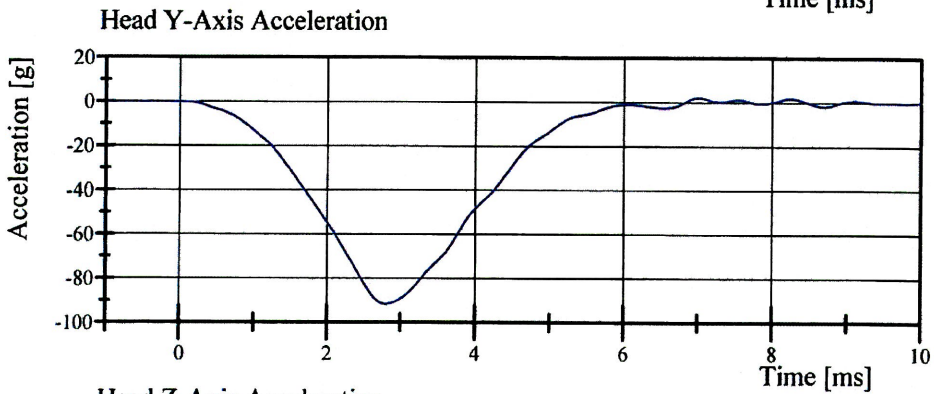
Test Date: 2/4/2010



Filter Class: CFC\_1000

Max: 6.8 g at 2.4 ms

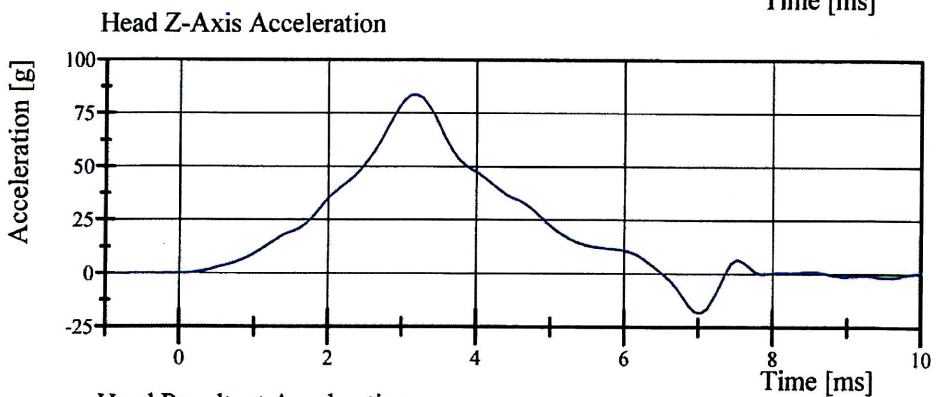
Min: -8.1 g at 3.0 ms



Filter Class: CFC\_1000

Max: 2.2 g at 7.0 ms

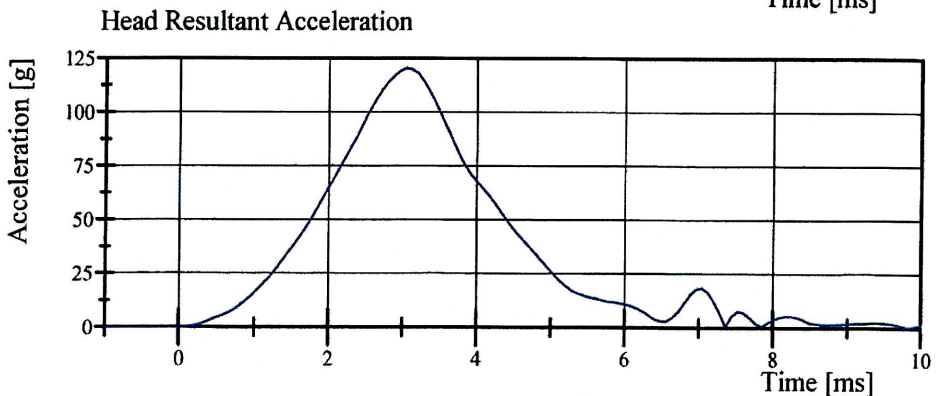
Min: -91.6 g at 2.8 ms



Filter Class: CFC\_1000

Max: 83.8 g at 3.2 ms

Min: -18.2 g at 7.0 ms



Filter Class: CFC\_1000

Max: 120.4 g at 3.0 ms

Min: 0.0 g at -0.4 ms

# Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

Test Date: 2/3/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	32 %	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.35 m/s	Yes
Pendulum Integrated Velocity			
Change at 4 ms	0.77 - 1.04 m/s	0.938 m/s	Yes
Change at 8 ms	1.6 - 2.16 m/s	1.916 m/s	Yes
Change at 12 ms	2.43 - 3.29 m/s	2.977 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-54.1 deg	Yes
Headform Flexion Decay			
- from Peak to Zero Degrees	58 - 72 ms	64.8 ms	Yes
Total Neck Occipital Condyles Moment	55 - 68 N·m	60.8 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	71 - 87 ms	79.0 ms	Yes
Maximum Forward Pot Rotation			
Peak	(-32) - (-39) °	-35.0 °	Yes
Time of Peak	56 - 68 ms	57.5 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-30) - (-37) °	-31.5 °	Yes
Time of Peak	56 - 68 ms	58.2 ms	Yes

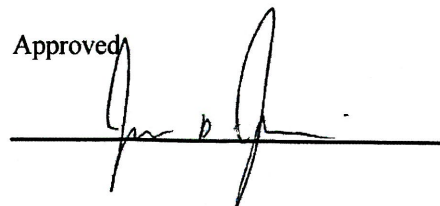
**Test meets specifications.**

**Comments:**

Technician

  
\_\_\_\_\_

Approved

  
\_\_\_\_\_

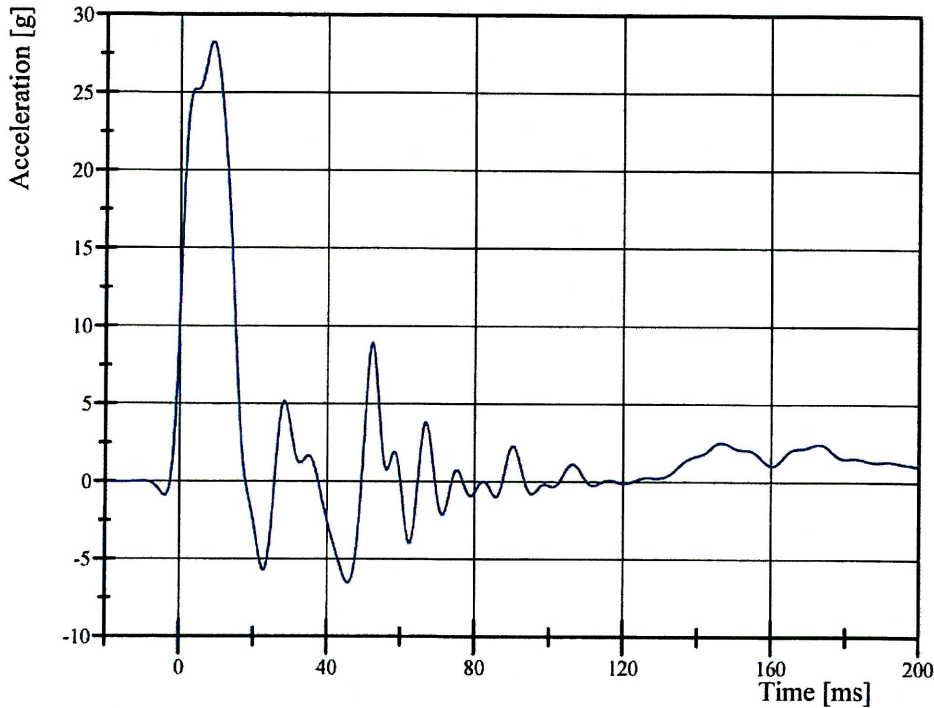
# Transportation Research Center Inc.

Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

Test Date: 2/3/2010

Pendulum Acceleration

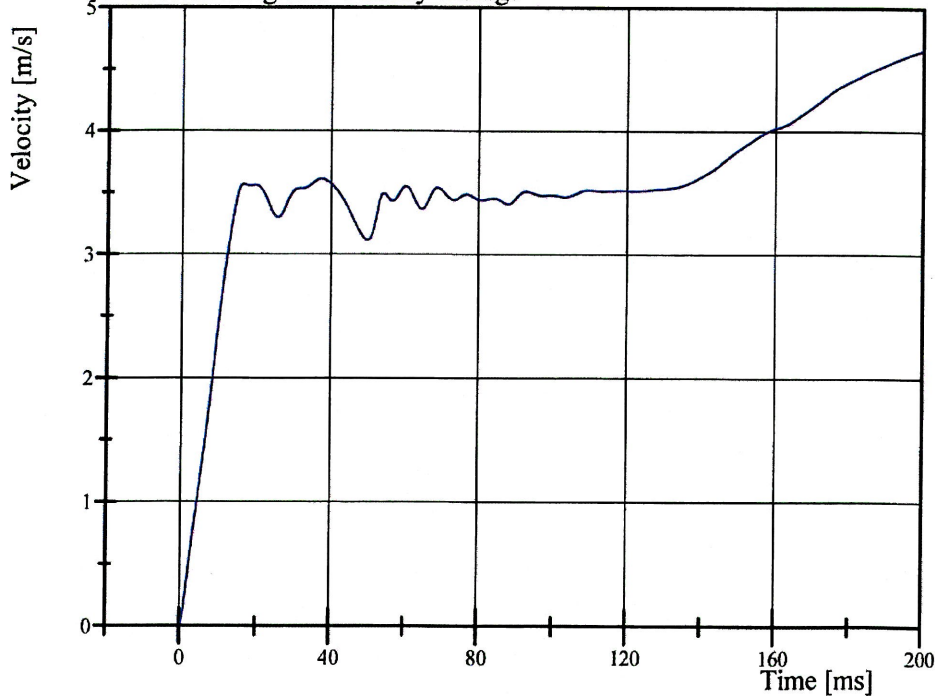


Filter Class: CFC\_60

Max: 28.3 g at 8.7 ms

Min: -6.5 g at 45.7 ms

Pendulum Integrated Velocity Change



Filter Class: CFC\_180

Max: 4.7 m/s at 200.0 ms

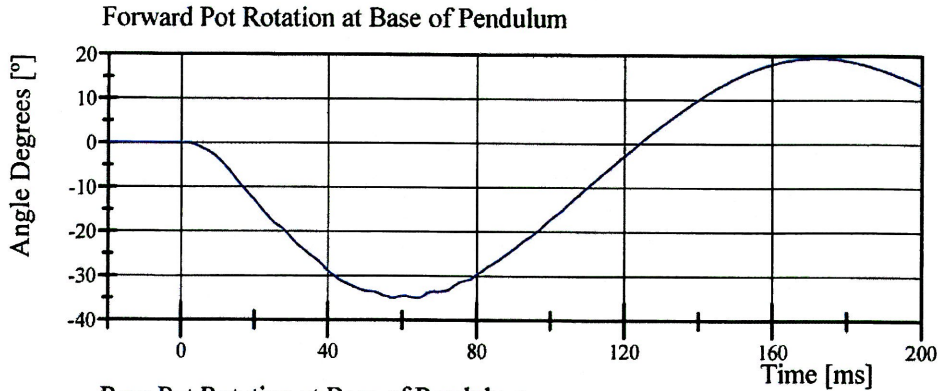
Min: 0.0 m/s at 0.0 ms

# Transportation Research Center Inc.

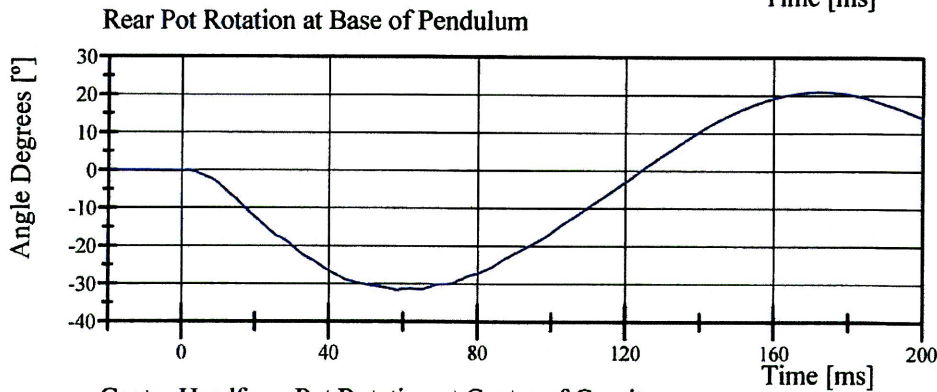
Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

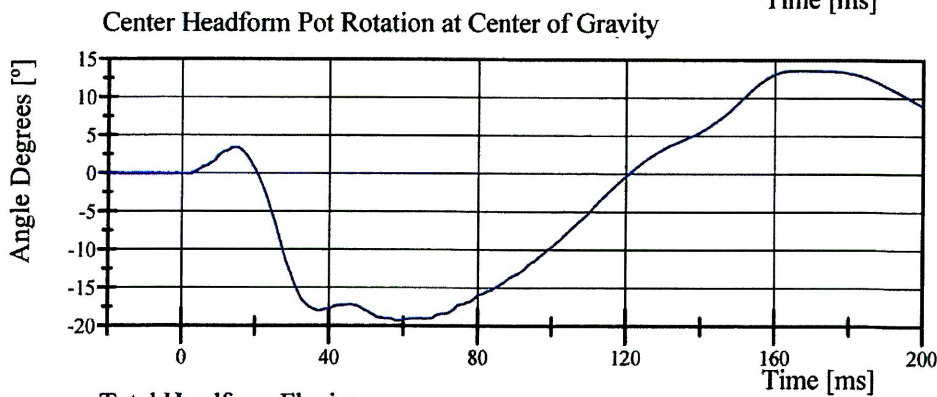
Test Date: 2/3/2010



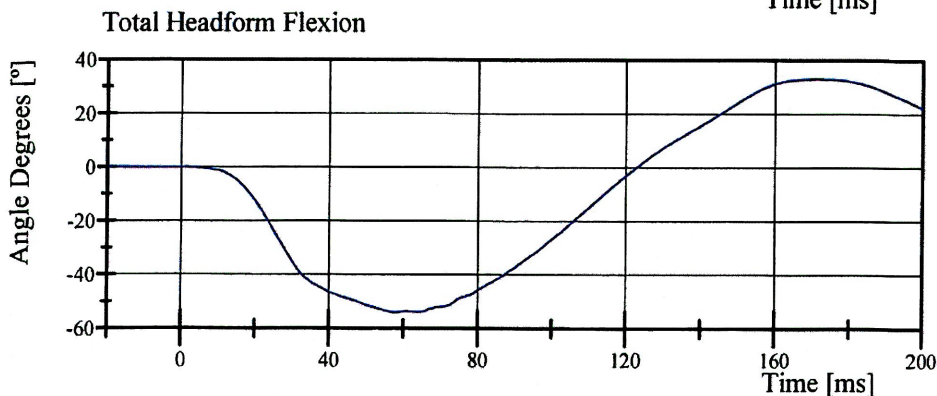
Filter Class: CFC\_1000  
Max: 19.6 ° at 172.8 ms  
Min: -35.0 ° at 57.5 ms



Filter Class: CFC\_1000  
Max: 21.0 ° at 171.7 ms  
Min: -31.5 ° at 58.2 ms



Filter Class: CFC\_1000  
Max: 13.7 ° at 165.3 ms  
Min: -19.3 ° at 58.5 ms



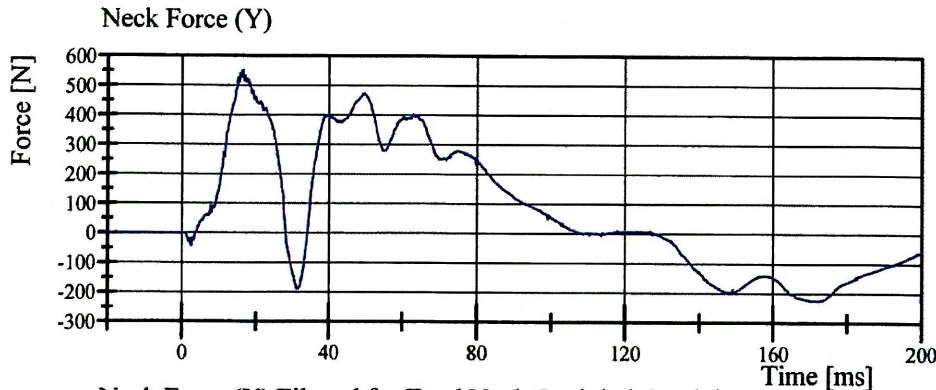
Filter Class: CFC\_1000  
Max: 33.2 ° at 171.0 ms  
Min: -54.1 ° at 58.0 ms

# Transportation Research Center Inc.

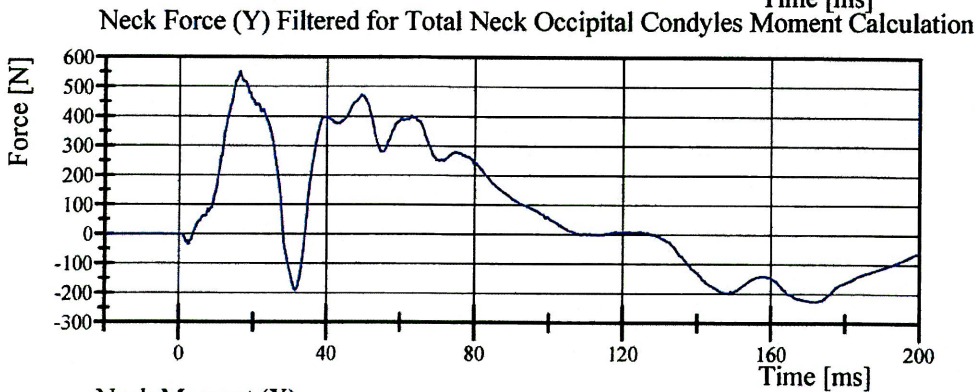
Left Lateral Neck

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

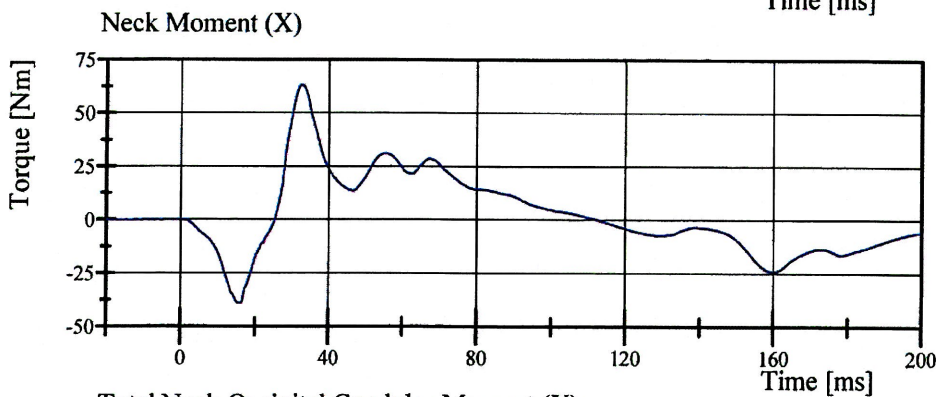
Test Date: 2/3/2010



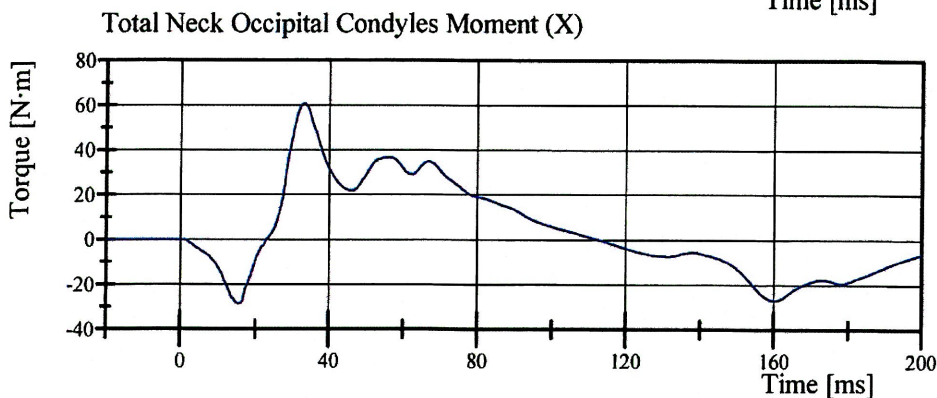
Filter Class: CFC\_1000  
Max: 553.2 N at 16.5 ms  
Min: -226.4 N at 172.4 ms



Filter Class: CFC\_600  
Max: 550.2 N at 16.3 ms  
Min: -225.6 N at 172.4 ms



Filter Class: CFC\_600  
Max: 63.4 Nm at 32.6 ms  
Min: -39.2 Nm at 16.1 ms



Filter Class: CFC\_600  
Max: 60.8 N·m at 33.0 ms  
Min: -28.8 N·m at 15.4 ms

# Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-1

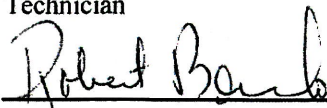
Test Date: 2/8/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	25 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.38 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-2,647.0 N	Yes
Shoulder Displacement	35 - 44 mm	37.6 mm	Yes

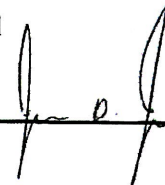
**Test meets specifications.**

**Comments:**

Technician

  
\_\_\_\_\_

Approved

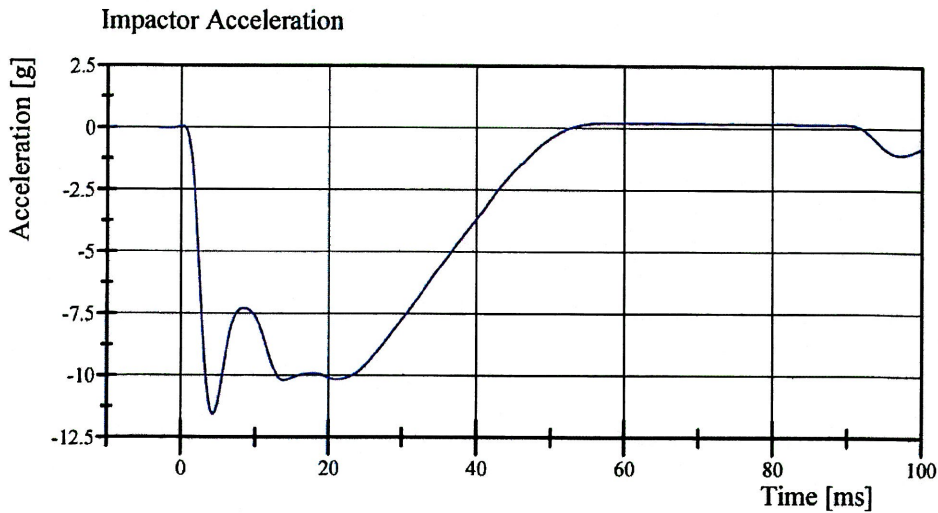
  
\_\_\_\_\_

# Transportation Research Center Inc.

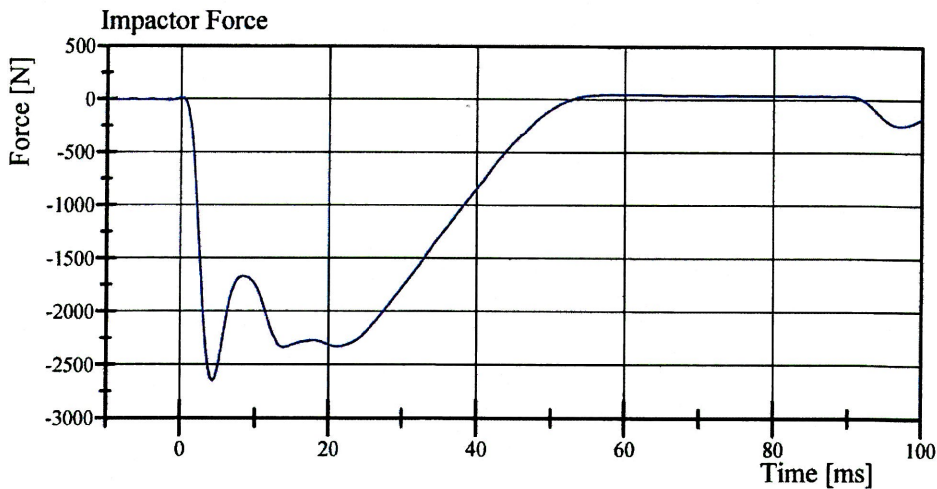
Left Lateral Shoulder

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-1

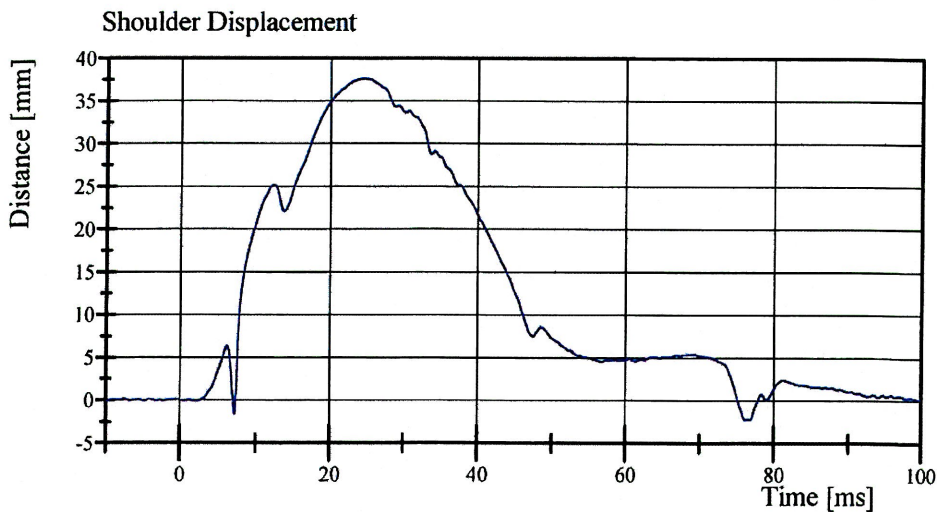
Test Date: 2/8/2010



Filter Class: CFC\_180  
Max: 0.2 g at 58.1 ms  
Min: -11.6 g at 4.3 ms



Filter Class: CFC\_180  
Max: 50.0 N at 58.1 ms  
Min: -2,647.0 N at 4.3 ms



Filter Class: CFC\_600  
Max: 37.6 mm at 24.6 ms  
Min: -2.2 mm at 76.8 ms

# Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-4

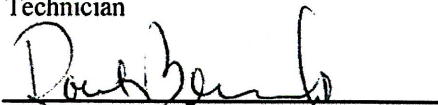
Test Date: 2/9/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.75 m/s	Yes
Impactor Force	(-4,700) - (-6,400) N	-5,692.0 N	Yes
Upper Thorax Rib Displacement	35 - 47 mm	37.4 mm	Yes
Center Thorax Rib Displacement	42 - 57 mm	47.3 mm	Yes
Lower Thorax Rib Displacement	40 - 54 mm	40.6 mm	Yes
Upper Spine Lateral Acceleration	24 - 33 g	30.7 g	Yes
Lower Spine Lateral Acceleration	20 - 28 g	25.4 g	Yes

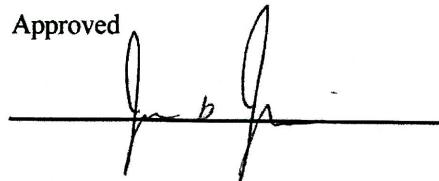
**Test meets specifications.**

**Comments:**

Technician



Approved

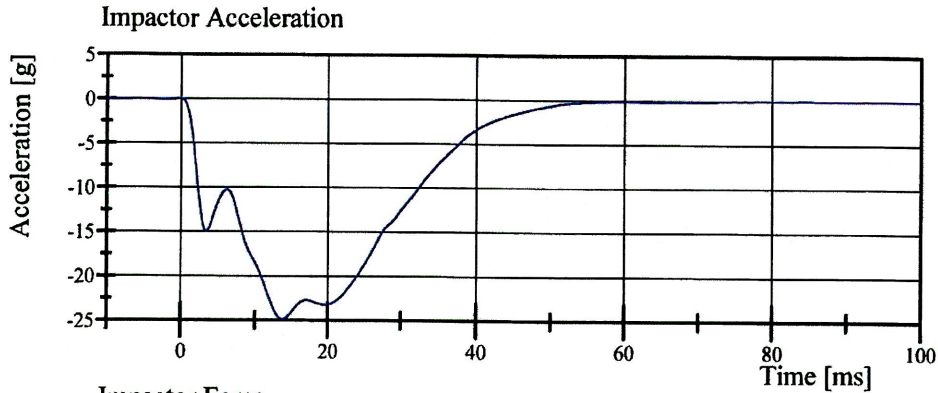


# Transportation Research Center Inc.

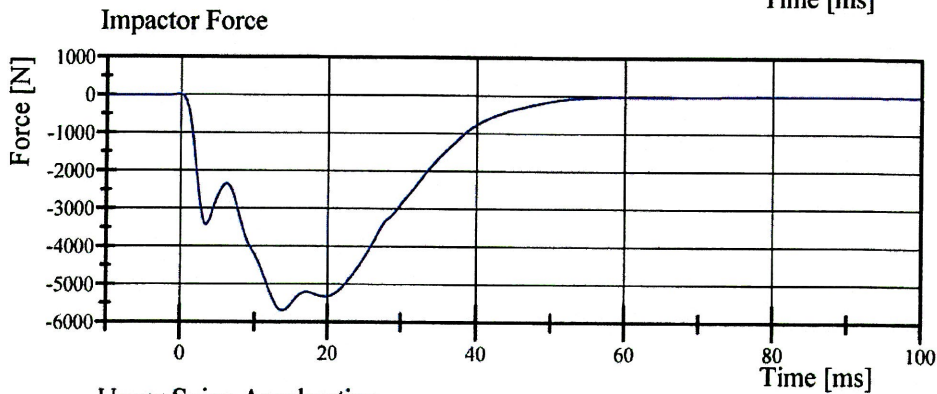
Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-4

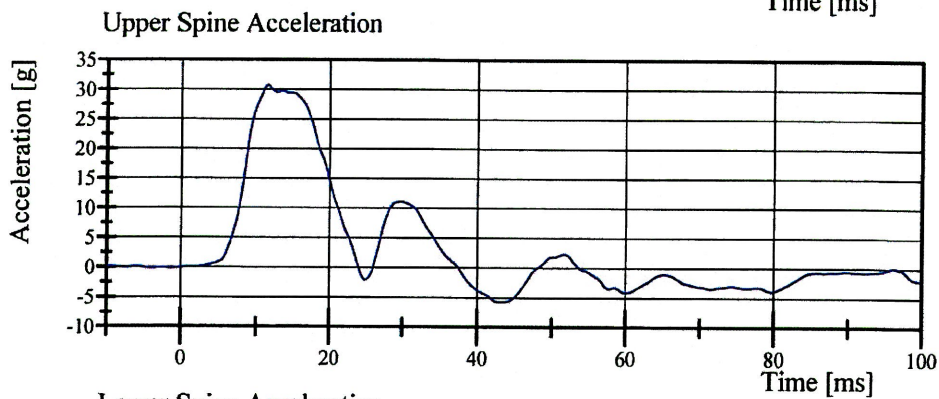
Test Date: 2/9/2010



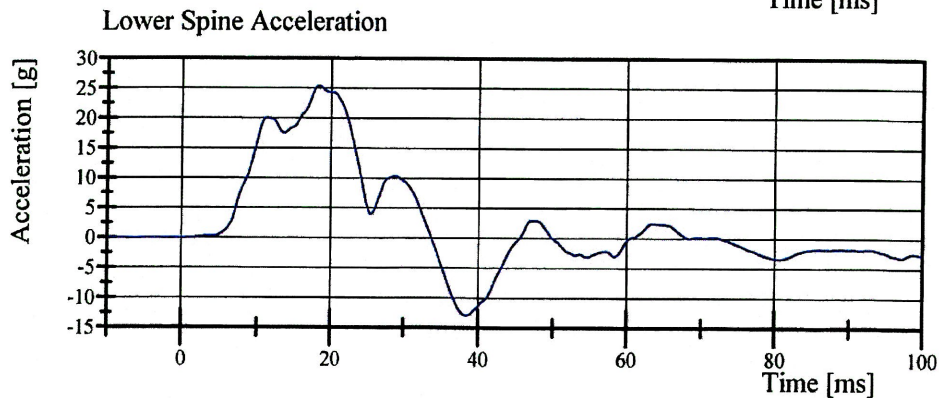
Filter Class: CFC\_180  
Max: 0.1 g at -0.2 ms  
Min: -24.8 g at 13.8 ms



Filter Class: CFC\_180  
Max: 22.7 N at -0.2 ms  
Min: -5,692.0 N at 13.8 ms



Filter Class: CFC\_180  
Max: 30.7 g at 11.5 ms  
Min: -5.8 g at 43.0 ms



Filter Class: CFC\_180  
Max: 25.4 g at 18.3 ms  
Min: -13.0 g at 38.4 ms

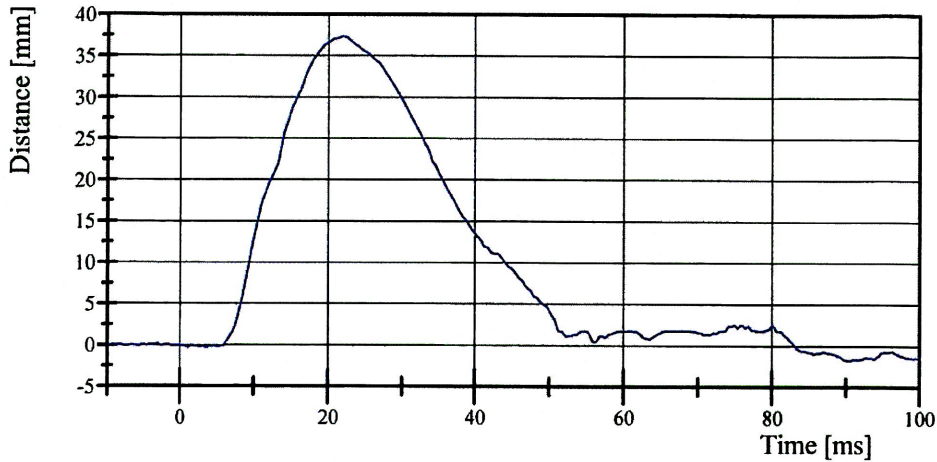
# Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-4

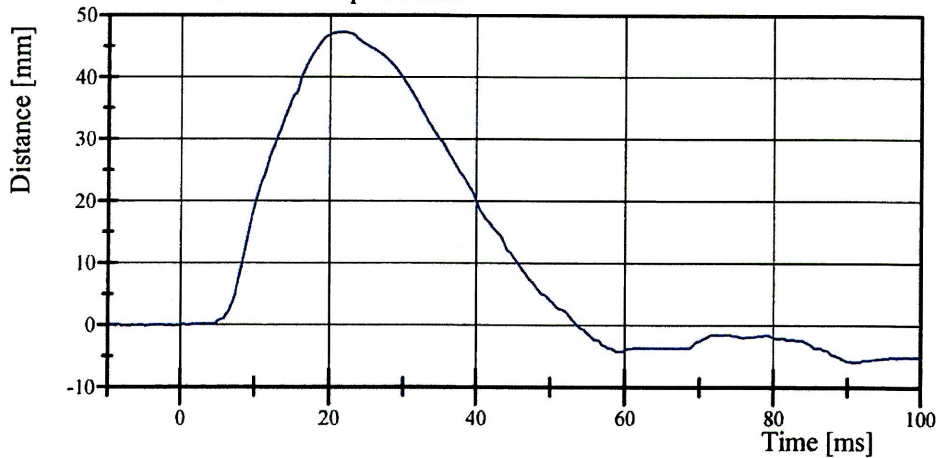
Test Date: 2/9/2010

### Upper Thorax Rib Displacement



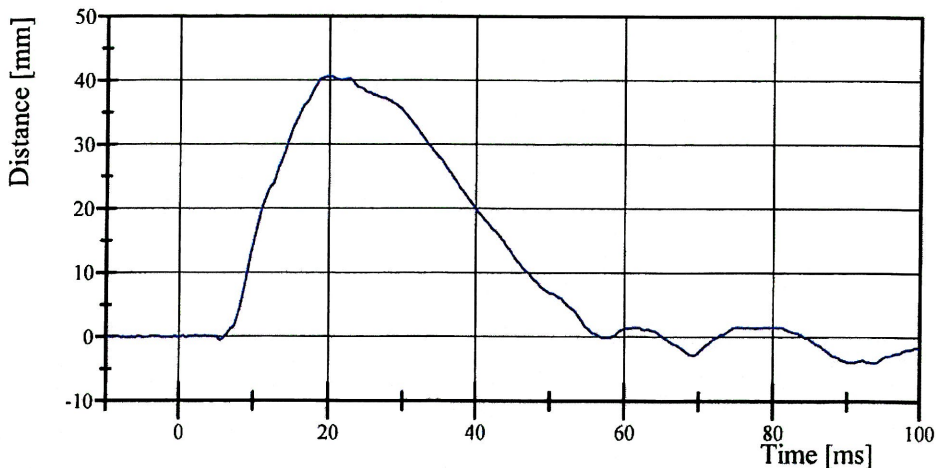
Filter Class: CFC\_600  
Max: 37.4 mm at 22.0 ms  
Min: -1.8 mm at 90.5 ms

### Center Thorax Rib Displacement



Filter Class: CFC\_600  
Max: 47.3 mm at 21.9 ms  
Min: -6.0 mm at 90.9 ms

### Lower Thorax Rib Displacement



Filter Class: CFC\_600  
Max: 40.6 mm at 20.2 ms  
Min: -4.0 mm at 93.9 ms

# Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-3

Test Date: 2/9/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	30 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.351 m/s	Yes
Impactor Force	(-3,200) - (-3,900) N	-3,774.7 N	Yes
Upper Thorax Rib Displacement	34 - 43 mm	33.9 mm	No
Center Thorax Rib Displacement	34 - 43 mm	37.2 mm	Yes
Lower Thorax Rib Displacement	34 - 43 mm	36.7 mm	Yes
Upper Spine Lateral Acceleration	12 - 17 g	15.7 g	Yes
Lower Spine Lateral Acceleration	15 - 21 g	15.4 g	Yes

**Test does not meet specifications.**

**Comments:**

The failure was known to the Federal Engineer and it was decided to use the dummy as-is.

Technician

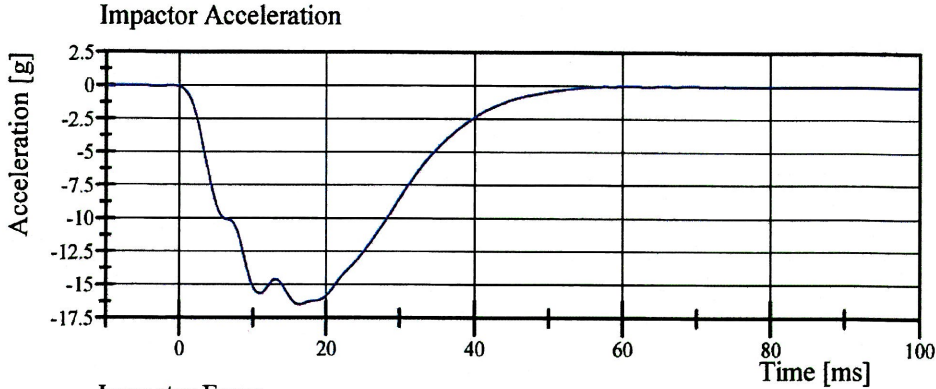
Approved

# Transportation Research Center Inc.

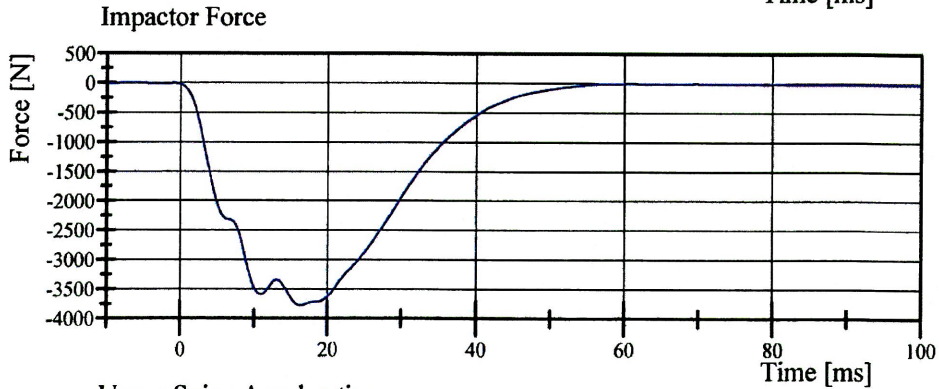
Left Lateral Thorax without Arm

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-3

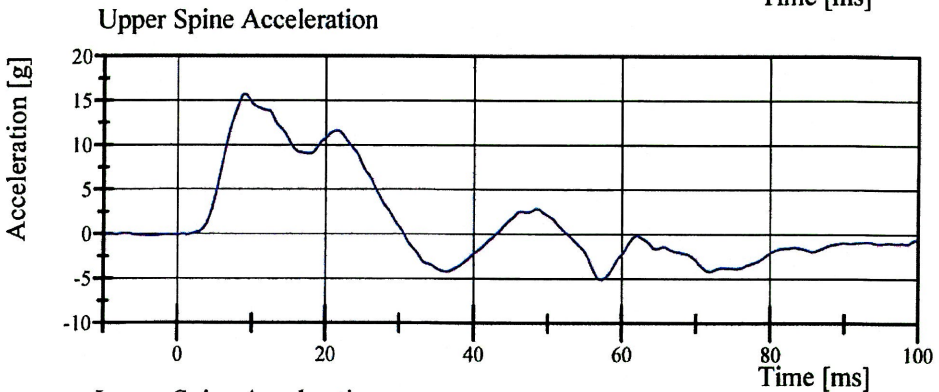
Test Date: 2/9/2010



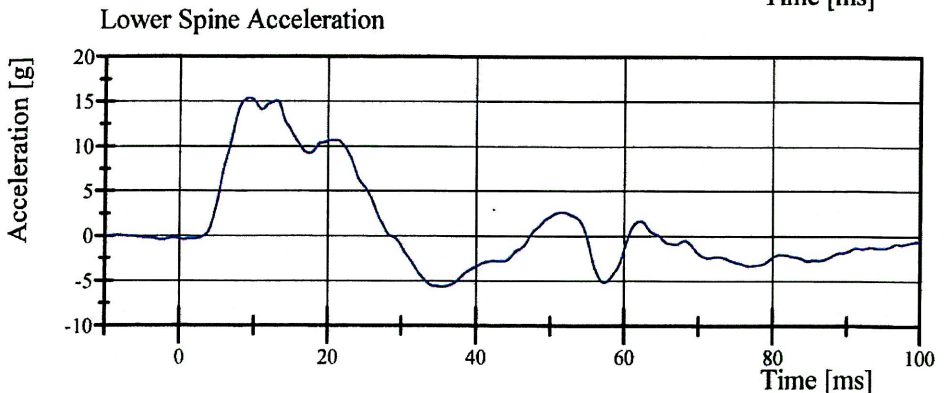
Filter Class: CFC\_180  
Max: 0.0 g at -5.4 ms  
Min: -16.5 g at 16.3 ms



Filter Class: CFC\_180  
Max: 1.1 N at -5.4 ms  
Min: -3,774.7 N at 16.3 ms



Filter Class: CFC\_180  
Max: 15.7 g at 9.1 ms  
Min: -5.1 g at 57.2 ms

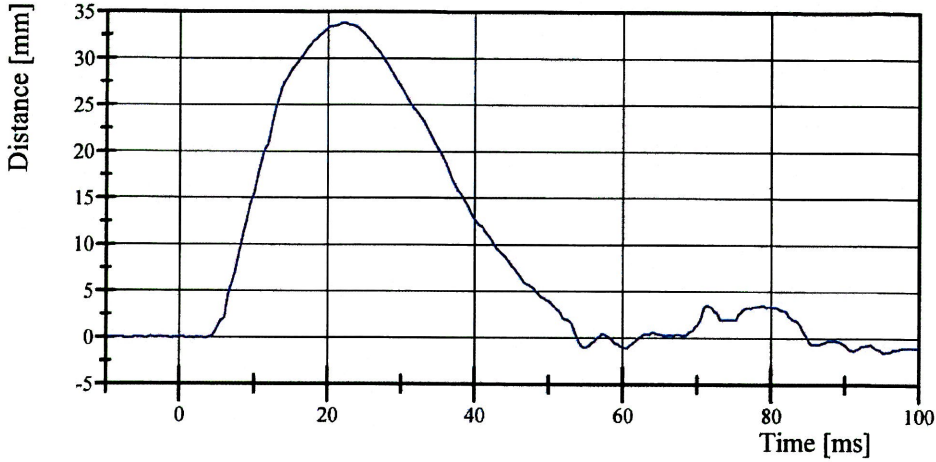


Filter Class: CFC\_180  
Max: 15.4 g at 9.4 ms  
Min: -5.7 g at 35.4 ms

# Transportation Research Center Inc.

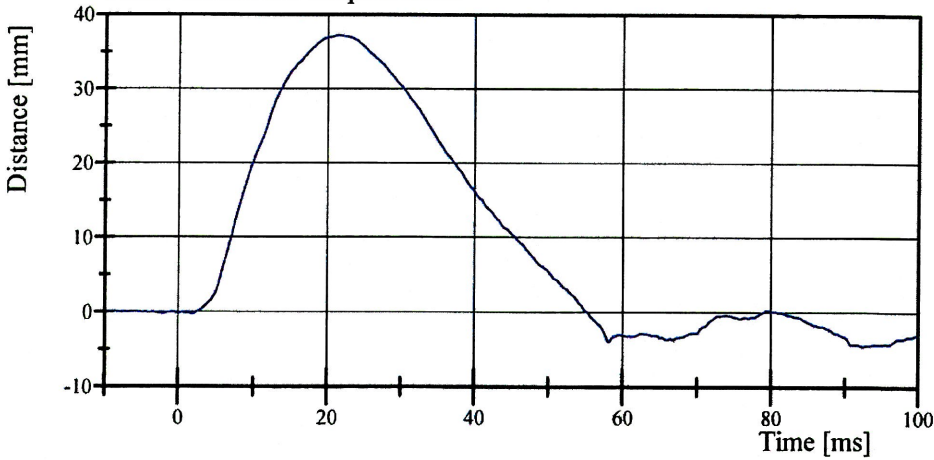
Left Lateral Thorax without Arm  
WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-3  
Test Date: 2/9/2010

Upper Thorax Rib Displacement



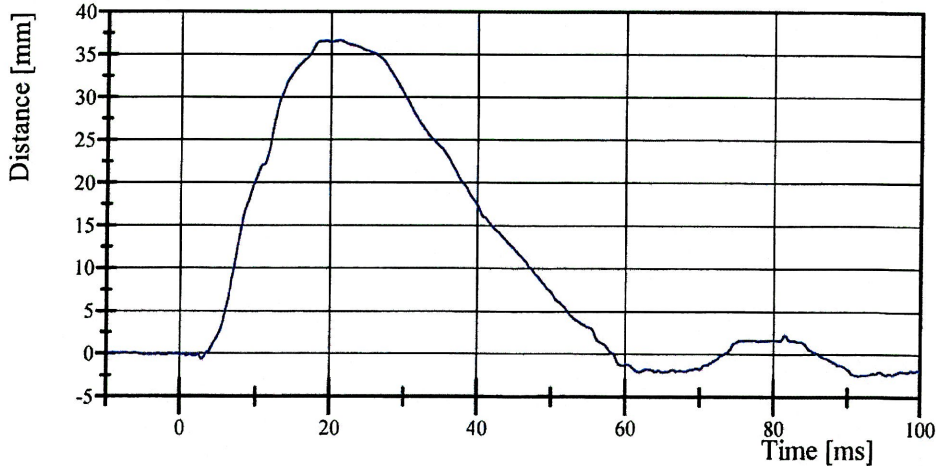
Filter Class: CFC\_600  
Max: 33.9 mm at 22.2 ms  
Min: -1.5 mm at 95.4 ms

Center Thorax Rib Displacement



Filter Class: CFC\_600  
Max: 37.2 mm at 21.4 ms  
Min: -4.5 mm at 92.4 ms

Lower Thorax Rib Displacement



Filter Class: CFC\_600  
Max: 36.7 mm at 21.2 ms  
Min: -2.5 mm at 91.5 ms

# Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-3

Test Date: 2/9/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.0 °C	Yes
Relative Humidity	10 - 70 %	26 %	Yes
Impactor Velocity	4.2 - 4.4 m/s	4.29 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-2,790.1 N	Yes
Upper Abdominal Rib Displacement	33 - 41 mm	37.0 mm	Yes
Lower Abdominal Rib Displacement	31 - 39 mm	32.6 mm	Yes
Lower Spine Lateral Acceleration	15 - 20 g	15.9 g	Yes

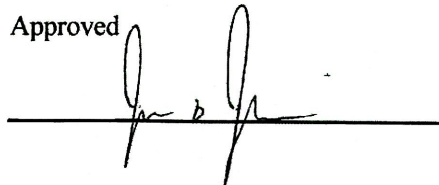
**Test meets specifications.**

**Comments:**

Technician



Approved

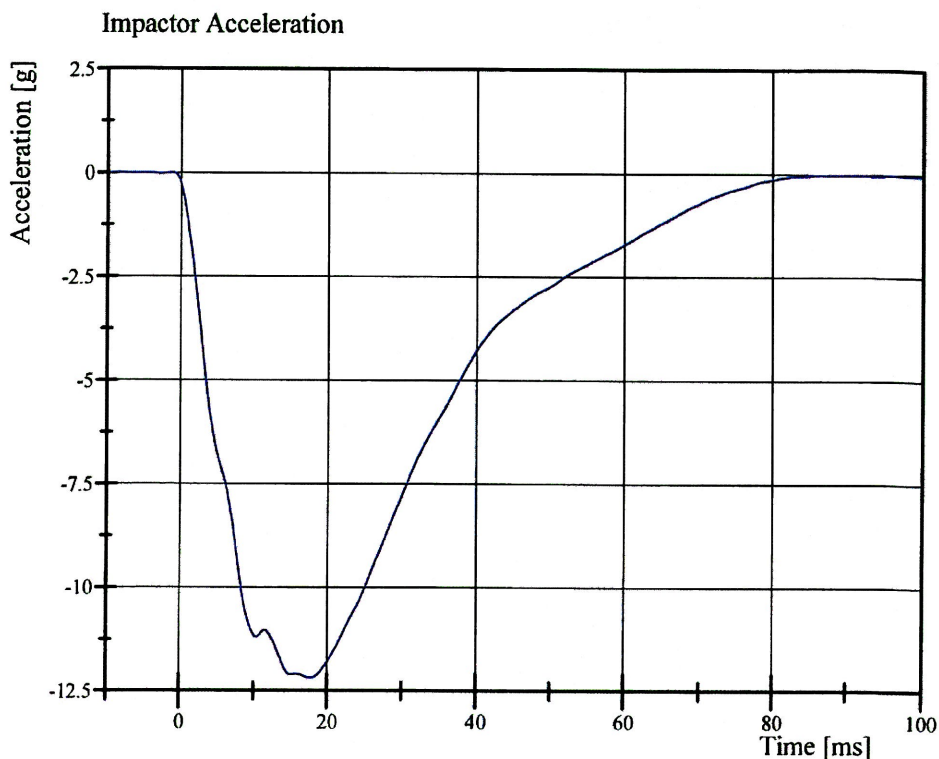


# Transportation Research Center Inc.

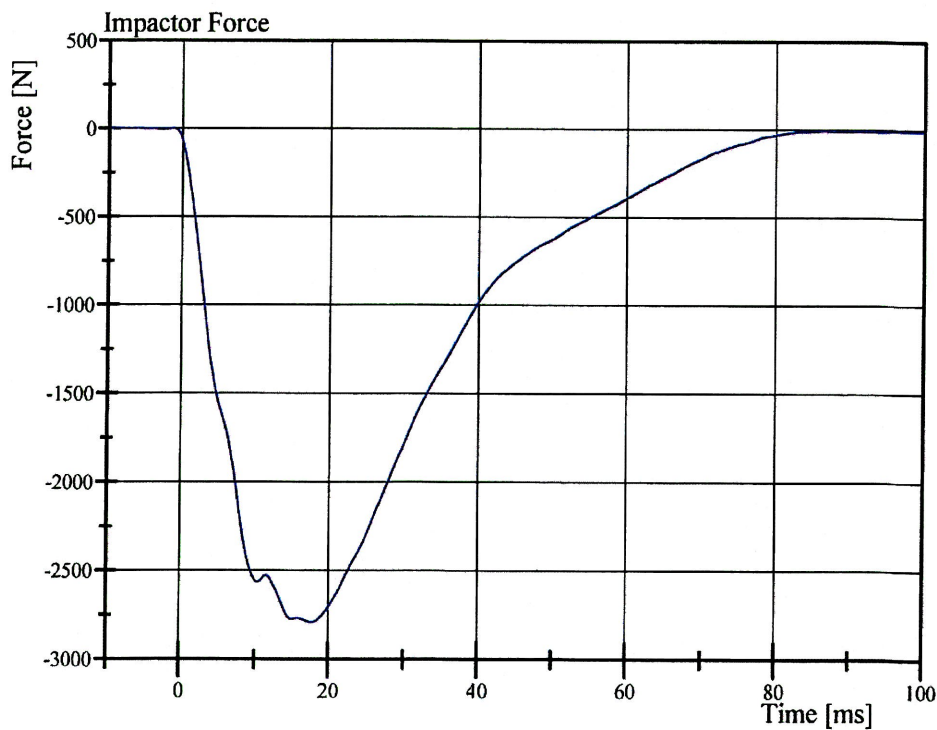
Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-3

Test Date: 2/9/2010



Filter Class: CFC\_180  
Max: 0.0 g at -8.8 ms  
Min: -12.2 g at 17.8 ms



Filter Class: CFC\_180  
Max: 2.4 N at -8.8 ms  
Min: -2,790.1 N at 17.8 ms

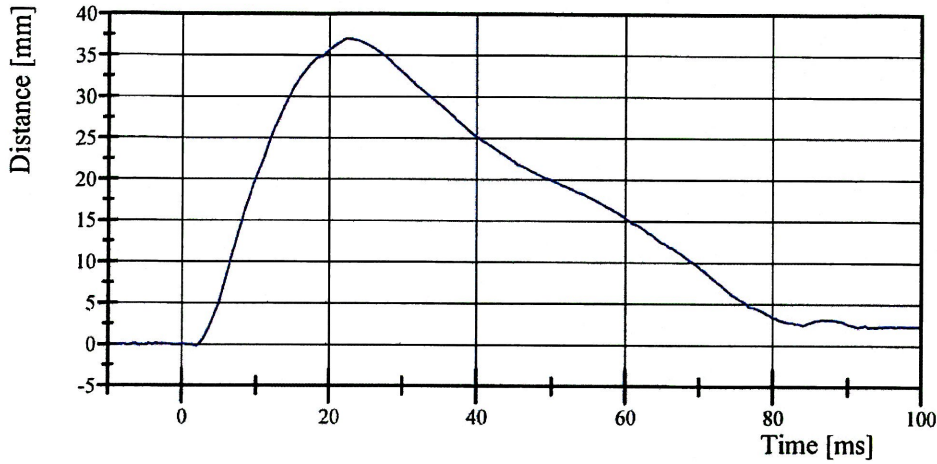
# Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-3

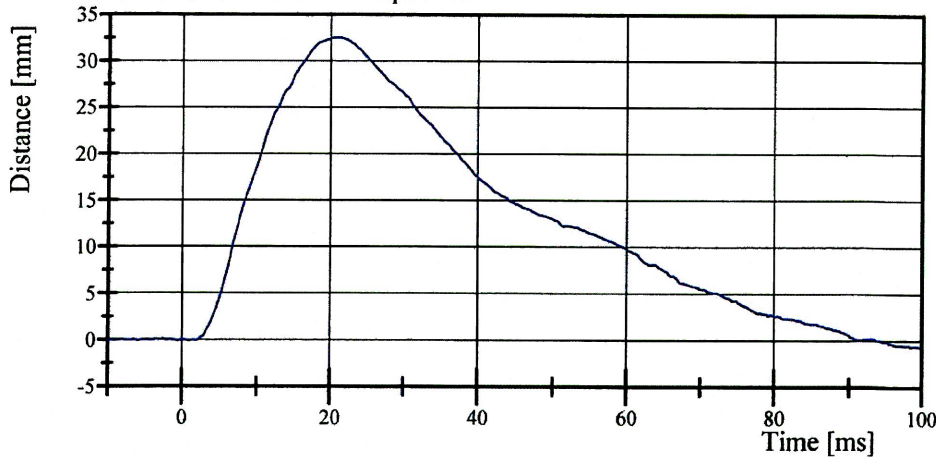
Test Date: 2/9/2010

Upper Abdominal Rib Displacement



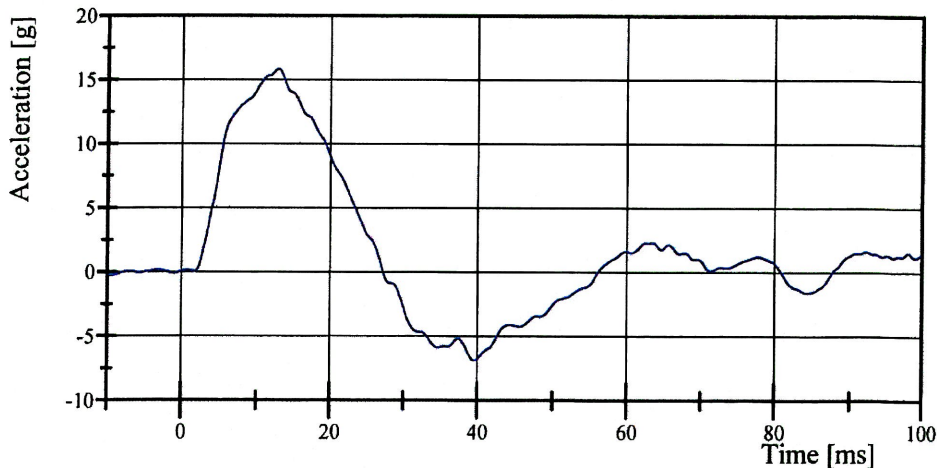
Filter Class: CFC\_600  
Max: 37.0 mm at 22.4 ms  
Min: -0.2 mm at 1.8 ms

Lower Abdominal Rib Displacement



Filter Class: CFC\_600  
Max: 32.6 mm at 21.2 ms  
Min: -0.8 mm at 100.0 ms

Lower Spine Acceleration (Y)



Filter Class: CFC\_180  
Max: 15.9 g at 12.9 ms  
Min: -6.9 g at 39.6 ms

# Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

Test Date: 2/9/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	31 %	Yes
Impactor Velocity	6.6 - 6.8 m/s	6.76 m/s	Yes
Impactor Force	(-6,300) - (-7,800) N	-7,500.4 N	Yes
Pelvis Lateral Acceleration	41 - 51 g	43.1 g	Yes
Lower Spine Lateral Acceleration	10 - 14 g	11.4 g	Yes

**Test meets specifications.**

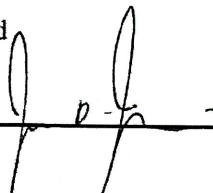
**Comments:**

Technician



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Approved



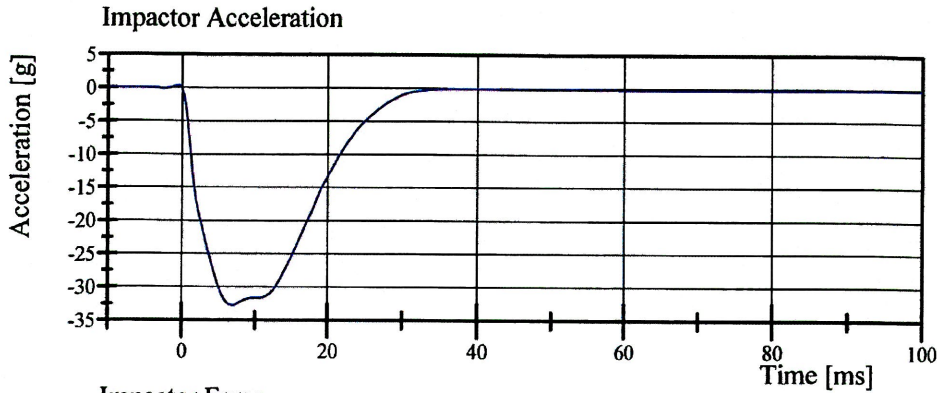
---

# Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID ISO 15830-2 Serial No. 016 Certification No. 7-2

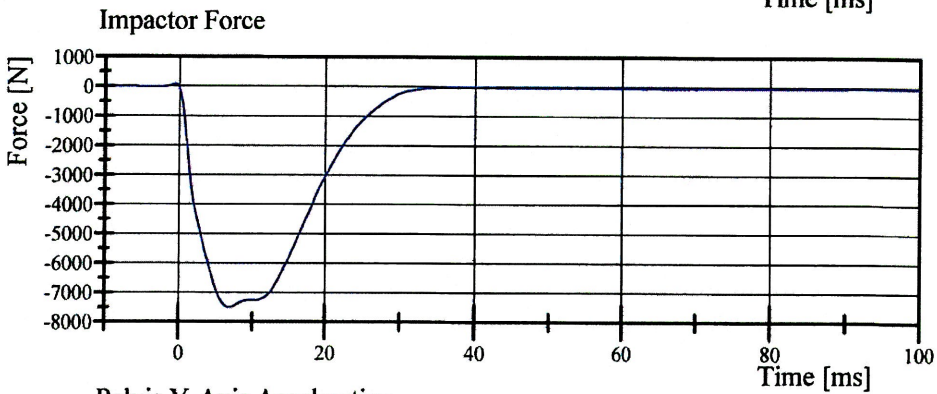
Test Date: 2/9/2010



Filter Class: CFC\_180

Max: 0.4 g at -0.5 ms

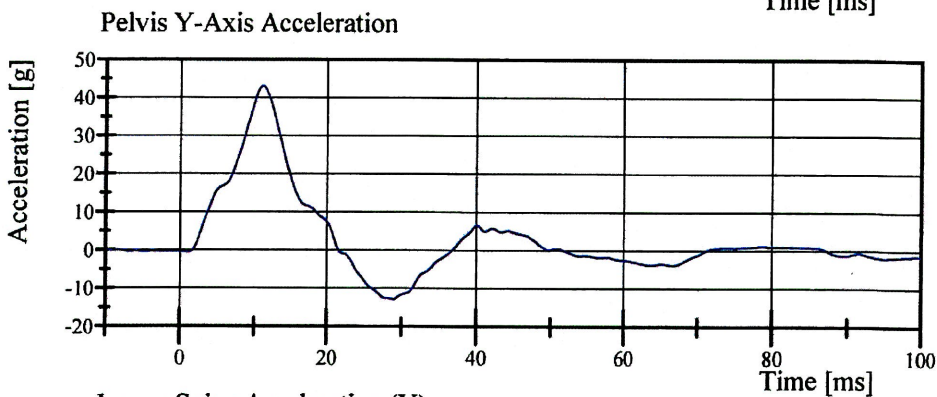
Min: -32.7 g at 6.9 ms



Filter Class: CFC\_180

Max: 89.5 N at -0.5 ms

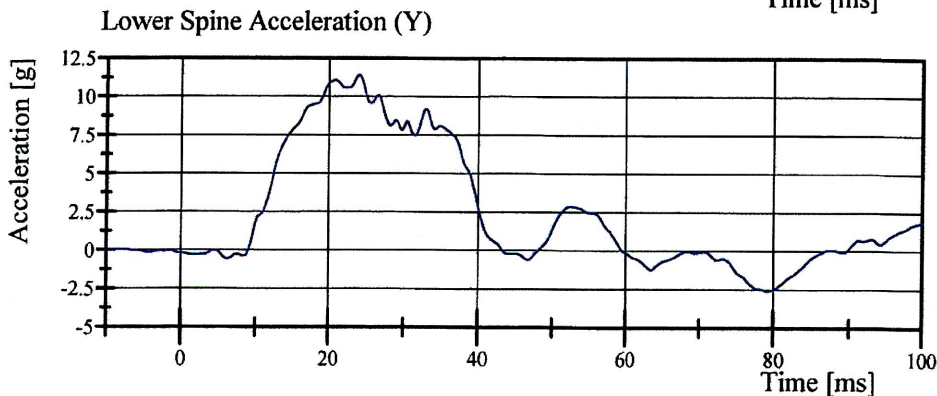
Min: -7,500.4 N at 6.9 ms



Filter Class: CFC\_180

Max: 43.1 g at 11.2 ms

Min: -12.8 g at 28.9 ms



Filter Class: CFC\_180

Max: 11.4 g at 24.0 ms

Min: -2.6 g at 79.3 ms

Appendix D

Test Equipment List and Calibration Information

Sign Convention  
SAE J211 MAR95

Accelerometers:

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

Potentiometers:

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

Rotation potentiometers:

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

Load cells:

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

Neck load cells:

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

Tibia load cells:

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

Sign Convention (Continued)  
SAE J211 MAR95

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

Frequency Response Classes  
SAE J211 MAR95

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

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

# Channel Report Test Number 100211

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
1	Trig D1	10ZERO000000VO0A	EVENT	1	Logic	Bipolar	
2	P63135	10VEHCCG0000ACXA	Vehicle Center of Gravity X-Axis Acceleration	1000	g	Bipolar	
3	P62208	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-Axis Acceleration	1000	g	#NAME?	
4	P46517	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-Axis Acceleration	1000	g	#NAME?	
5	ARS-1500-ARS1091	10VEHCCG0000AVXA	VEHICLE CENTER OF GRAVITY (X) ROLL R/A	1500	%s	Bipolar	
6	ARS-1500-ARS1055	10VEHCCG0000AVYA	VEHICLE CENTER OF GRAVITY (Y) PITCH R	1500	%s	#NAME?	
7	ARS-1500-ARS0738	10VEHCCG0000AVZA	VEHICLE CENTER OF GRAVITY (Z) YAW RA	1500	%s	#NAME?	
8	P63195	11SILBRE0100ACYA	LEFT SIDE SILL Between A-Pillar & Impact Po	2000	g	#NAME?	
9	P63180	14SILBFR0000ACYA	Left A Pillar Side Sill Y-Axis Acceleration (Local	1000	g	#NAME?	
10	P45012	11APILLO0000ACYA	Left Lower A-Pillar Y-Axis Acceleration 1/3 from	1500	g	#NAME?	
11	P62833	11APILMI0000ACYA	Left Mid A-Pillar Y-Axis Acceleration 2/3 from fl	1500	g	#NAME?	
12	P62555	14SILBRE0000ACYA	Left Side Sill at Rear Seat Y-Axis Acceleration	1000	g	#NAME?	
13	P63160	14BPILLO0000ACYA	Left Lower B-Pillar Y-Axis Acceleration 1/3 fro	1500	g	#NAME?	
14	P63172	14BPILMI0000ACYA	Left Mid B-Pillar Y-Axis Acceleration 2/3 from f	1500	g	#NAME?	
15	P61280	11SETRFR0000ACYA	Left Front Seat Track @ H-Point Y-Axis Accele	1500	g	Bipolar	
16	P63198	12ENGNTPO000ACXA	Top of Engine X-Axis Acceleration (Location 1C	1000	g	Bipolar	
17	P64868	12ENGNTPO000ACYA	Top of Engine Y-Axis Acceleration (Location 1C	1000	g	#NAME?	
18	P63137	12VEHC000000ACYA	Firewall Centerline Y-Axis Acceleration (Locatic	1000	g	#NAME?	
19	P62553	13ROOF000000ACYA	Right Side Roof Rail (in line with impact point) \	1000	g	#NAME?	
20	P62830	13SILBFR0000ACYA	Right Side Floor Sill (in-line with impact locatio	1000	g	#NAME?	
21	P61319	18DECK000000ACXA	Rear Deck Centerline Behind Rear Axle X-Axis	1000	g	Bipolar	
22	P61270	18DECK000000ACYA	Rear Deck Centerline Behind Rear Axle Y-Axis	1000	g	#NAME?	
23	ABFire1	11AIRBTPLE00EV0A	Driver Side Curtain Fire Inductor	5	V	Bipolar	
24	ABFire2	11AIR02N0000EVOA	LH Torso Airbag Fire Inductor	5	V	Bipolar	
25	Bit.00	11CONT000001VO00	Head Contact Switch	1	Logic	Bipolar	
26	Bit.01	11CONT000002VO00	Shoulder Contact Switch	1	Logic	Bipolar	
27	Bit.02	11CONT000003VO00	Torso Contact Switch	1	Logic	Bipolar	
28	Bit.03	11CONT000004VO00	Left Contact Switch	1	Logic	Bipolar	
29	68047	K0FBAR010000FOXA	POLE LOAD CELL 1	222400	N	Bipolar	0-Barrier 201 Pole.001
30	1220TX-50K-68054	K0FBAR020000FOXA	POLE LOAD CELL 2	222400	N	Bipolar	0-Barrier 201 Pole.002
31	1220TX-50K-68056A	K0FBAR030000FOXA	POLE LOAD CELL 3	222400	N	Bipolar	0-Barrier 201 Pole.003
32	1220BZY-50K-122061A	K0FBAR040000FOXA	POLE LOAD CELL 4	222400	N	Bipolar	0-Barrier 201 Pole.004
33	1220TX-50K-68022A	K0FBAR050000FOXA	POLE LOAD CELL 5	222400	N	Bipolar	0-Barrier 201 Pole.005
34	1220BZY-50K-122067A	K0FBAR060000FOXA	POLE LOAD CELL 6	222400	N	Bipolar	0-Barrier 201 Pole.006
35	1220BZY-50K-122027A	K0FBAR070000FOXA	POLE LOAD CELL 7	222400	N	Bipolar	0-Barrier 201 Pole.007
36	1220BZY-50K-114016A	K0FBAR080000FOXA	POLE LOAD CELL 8	222400	N	Bipolar	0-Barrier 201 Pole.008

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100211

# Command File Test Number 100211

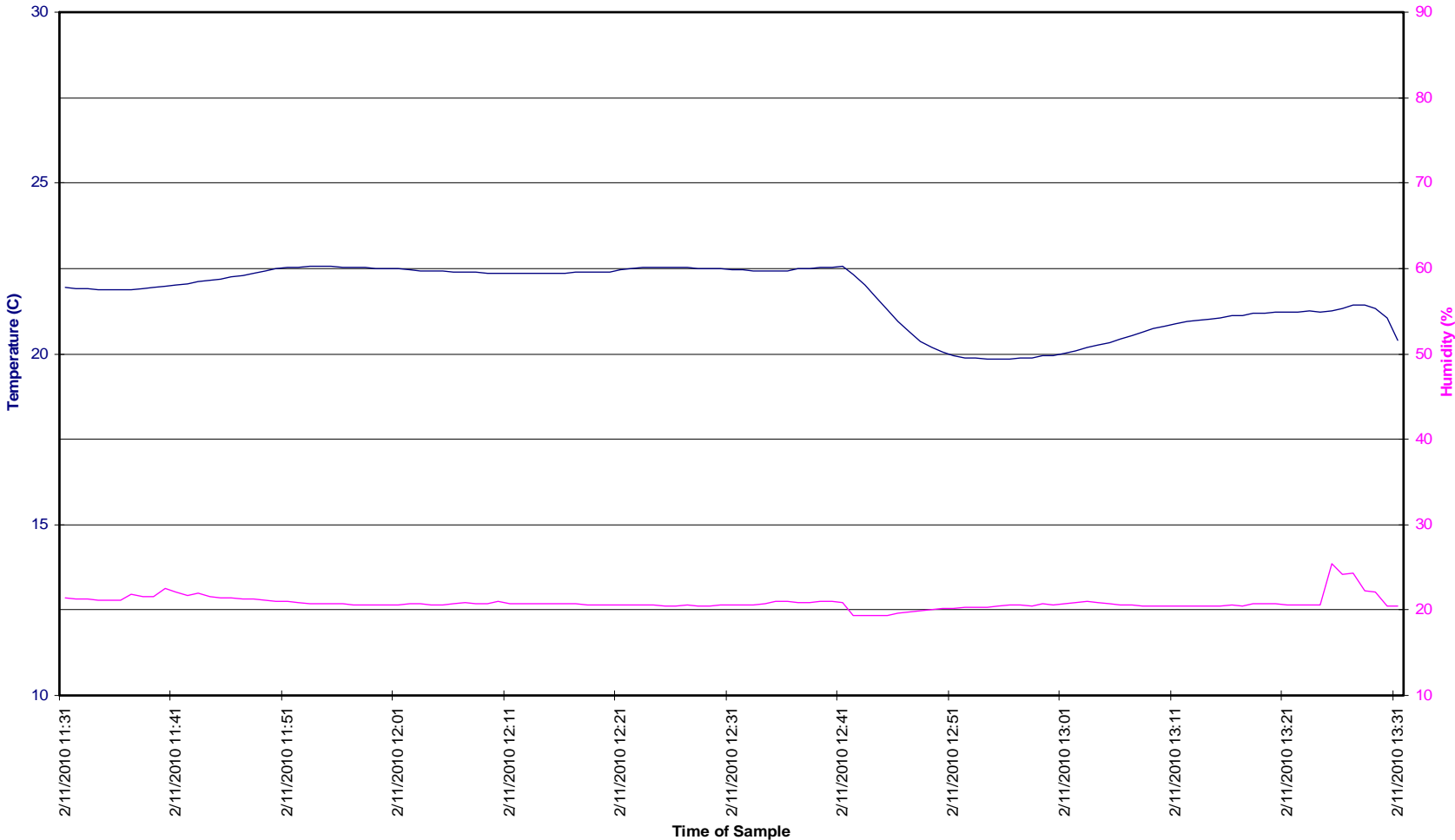
Channel	ISO mnemonic	Channel Title	Filter	(	Flip	Zero	Full	Scale
1	11HEADCG00WSACXP	Head X-Axis Acceleration	1000	+	yes		2000	
2	11HEADCG00WSACYP	Head Y-Axis Acceleration	1000	+	yes		2000	
3	11HEADCG00WSACZP	Head Z-Axis Acceleration	1000	+	yes		2000	
3A	11HEADCG00WSACRA	Head Resultant Acceleration	1000					
4	11HEADCG00WSANXP	Head X-Axis Angular Displacement	1000	+	yes		50000	
5	11HEADCG00WSANYP	Head Y-Axis Angular Displacement	1000	+	yes		50000	
6	11HEADCG00WSANZP	Head Z-Axis Angular Displacement	1000	+	yes		50000	
7	11NECKUP00WSFOXP	Upper Neck X-Axis Force	1000	+	yes		10000	
8	11NECKUP00WSFOYP	Upper Neck Y-Axis Force	1000	+	yes		10000	
9	11NECKUP00WSFOZP	Upper Neck Z-Axis Force	1000	+	yes		12000	
10	11NECKUP00WSMOXP	Upper Neck Moment About X Axis	600	+	yes		300	
11	11NECKUP00WSMOYP	Upper Neck Moment About Y Axis	600	+	yes		300	
12	11NECKUP00WSMOZP	Upper Neck Moment About Z Axis	600	+	yes		200	
13	11NECKLO00WSFOXP	Lower Neck X-Axis Force	1000	+	yes		10000	
14	11NECKLO00WSFOYP	Lower Neck Y-Axis Force	1000	+	yes		10000	
15	11NECKLO00WSFOZP	Lower Neck Z-Axis Force	1000	+	yes		12000	
16	11NECKLO00WSMOXP	Lower Neck Moment About X Axis	600	+	yes		300	
17	11NECKLO00WSMOYP	Lower Neck Moment About Y Axis	600	+	yes		300	
18	11NECKLO00WSMOZP	Lower Neck Moment About Z Axis	600	+	yes		200	
19	11SHLDLE00WSFOXP	Shoulder X-Axis Force	600	+	yes		5000	
20	11SHLDLE00WSFOYP	Shoulder Y-Axis Force	600	+	yes		10000	
21	11SHLDLE00WSFOZP	Shoulder Z-Axis Force	600	+	yes		5000	
22	11SHLDLE00WSDSYP	Shoulder Y-Axis Displacement	600	+	yes		90	
23	11SHLDLE00WSACXP	Shoulder X-Axis Acceleration	1000	+	yes		2000	
24	11SHLDLE00WSACYP	Shoulder Y-Axis Acceleration	1000	+	yes		2000	
25	11SHLDLE00WSACZP	Shoulder Z-Axis Acceleration	1000	+	yes		2000	
25A	11SHLDLE00WSACRA	Shoulder Resultant Acceleration	1000					
26	11THSP0100WSACXP	T1 X-Axis Acceleration	180	+	yes		2000	
27	11THSP0100WSACYP	T1 Y-Axis Acceleration	180	+	yes		2000	
28	11THSP0100WSACZP	T1 Z-Axis Acceleration	180	+	yes		2000	
28A	11THSP0100WSACRA	T1 Resultant Acceleration	180					
29	11THSP0400WSACXP	T4 X-Axis Acceleration	180	+	yes		2000	
30	11THSP0400WSACYP	T4 Y-Axis Acceleration	180	+	yes		2000	
31	11THSP0400WSACZP	T4 Z-Axis Acceleration	180	+	yes		2000	
31A	11THSP0400WSACRA	T4 Resultant Acceleration	180					
32	11THSP1200WSACXP	T12 X-Axis Acceleration	180	+	yes		2000	
33	11THSP1200WSACYP	T12 Y-Axis Acceleration	180	+	yes		2000	
34	11THSP1200WSACZP	T12 Z-Axis Acceleration	180	+	yes		2000	

Channel	ISO mnemonic	Channel Title	Filter	(	Flip	Zero	Full	Scale
34A	11THSP1200WSACRA	T12 Resultant Acceleration	180					
35	11TRRILE01WSDSYP	Thorax Rib 1 Y-Axis Displacement	600	+	yes			90
36	11TRRILE01WSACXP	Thorax Rib 1 X-Axis Acceleration	1000	+	yes			2000
37	11TRRILE01WSACYP	Thorax Rib 1 Y-Axis Acceleration	1000	+	yes			2000
38	11TRRILE01WSACZP	Thorax Rib 1 Z-Axis Acceleration	1000	+	yes			2000
38A	11TRRILE01WSACRA	Thorax Rib 1 Resultant Acceleration	1000					
39	11TRRILE02WSDSYP	Thorax Rib 2 Y-Axis Displacement	600	+	yes			90
40	11TRRILE02WSACXP	Thorax Rib 2 X-Axis Acceleration	1000	+	yes			2000
41	11TRRILE02WSACYP	Thorax Rib 2 Y-Axis Acceleration	1000	+	yes			2000
42	11TRRILE02WSACZP	Thorax Rib 2 Z-Axis Acceleration	1000	+	yes			2000
42A	11TRRILE02WSACRA	Thorax Rib 2 Resultant Acceleration	1000					
43	11TRRILE03WSDSYP	Thorax Rib 3 Y-Axis Displacement	600	+	yes			90
44	11TRRILE03WSACXP	Thorax Rib 3 X-Axis Acceleration	1000	+	yes			2000
45	11TRRILE03WSACYP	Thorax Rib 3 Y-Axis Acceleration	1000	+	yes			2000
46	11TRRILE03WSACZP	Thorax Rib 3 Z-Axis Acceleration	1000	+	yes			2000
46A	11TRRILE03WSACRA	Thorax Rib 3 Resultant Acceleration	1000					
47	11ABRILE01WSDSYP	Abdominal Rib 1 Y-Axis Displacement	600	+	yes			90
48	11ABRILE01WSACXP	Abdominal Rib 1 X-Axis Acceleration	1000	+	yes			2000
49	11ABRILE01WSACYP	Abdominal Rib 1 Y-Axis Acceleration	1000	+	yes			2000
50	11ABRILE01WSACZP	Abdominal Rib 1 Z-Axis Acceleration	1000	+	yes			2000
50A	11ABRILE01WSACRA	Abdominal Rib 1 Resultant Acceleration	1000					
51	11ABRILE02WSDSYP	Abdominal Rib 2 Y-Axis Displacement	600	+	yes			90
52	11ABRILE02WSACXP	Abdominal Rib 2 X-Axis Acceleration	1000	+	yes			2000
53	11ABRILE02WSACYP	Abdominal Rib 2 Y-Axis Acceleration	1000	+	yes			2000
54	11ABRILE02WSACZP	Abdominal Rib 2 Z-Axis Acceleration	1000	+	yes			2000
54A	11ABRILE02WSACRA	Abdominal Rib 2 Resultant Acceleration	1000					
55	11LUSP0000WSFOXP	Lumbar X-Axis Force	600	+	yes			10000
56	11LUSP0000WSFOYP	Lumbar Y-Axis Force	600	+	yes			10000
57	11LUSP0000WSFOZP	Lumbar Z-Axis Force	600	+	yes			12000
58	11LUSP0000WSMOXP	Lumbar Moment About X Axis	600	+	yes			300
59	11LUSP0000WSMOYP	Lumbar Moment About Y Axis	600	+	yes			300
60	11LUSP0000WSMOZP	Lumbar Moment About Z Axis	600	+	yes			200
61	11PELVCG00WSACXP	Pelvis X-Axis Acceleration	1000	+	yes			2000
62	11PELVCG00WSACYP	Pelvis Y-Axis Acceleration	1000	+	yes			2000
63	11PELVCG00WSACZP	Pelvis Z-Axis Acceleration	1000	+	yes			2000
63A	11PELVCG00WSACRA	Pelvis Resultant Acceleration	1000					
64	11SACRLE00WSFOXP	Sacro-Iliac Left X-Axis Force	600	+	yes			6000
65	11SACRLE00WSFOYP	Sacro-Iliac Left Y-Axis Force	600	+	yes			6000
66	11SACRLE00WSFOZP	Sacro-Iliac Left Z-Axis Force	600	+	yes			6000
67	11SACRLE00WSMOXP	Sacro-Iliac Left Moment About X Axis	600	+	yes			1000

Channel	ISO mnemonic	Channel Title	Filter	(Flip	Zero	Full	Scale
68	11SACRLE00WSMOYP	Sacro-Iliac Left Moment About Y Axis	600	+	yes		400
69	11SACRLE00WSMOZP	Sacro-Iliac Left Moment About Z Axis	600	+	yes		400
70	11SACRRI00WSFOXP	Sacro-Iliac Right X-Axis Force	600	+	yes		6000
71	11SACRRI00WSFOYP	Sacro-Iliac Right Y-Axis Force	600	+	yes		6000
72	11SACRRI00WSFOZP	Sacro-Iliac Right Z-Axis Force	600	+	yes		6000
73	11SACRRI00WSMOXP	Sacro-Iliac Right Moment About X Axis	600	+	yes		1000
74	11SACRRI00WSMOYP	Sacro-Iliac Right Moment About Y Axis	600	+	yes		400
75	11SACRRI00WSMOZP	Sacro-Iliac Right Moment About Z Axis	600	+	yes		400
76	11PUBC0000WSFOYP	Pubic Y-Axis Force	600	+	yes		12000
77	11FEMRLL00WSFOXP	Left Femur X-Axis Force	600	+	yes		10000
78	11FEMRLL00WSFOYP	Left Femur Y-Axis Force	600	+	yes		25000
79	11FEMRLL00WSFOZP	Left Femur Z-Axis Force	600	+	yes		10000
80	11KNEELEOUWSFOYP	Left Knee Outboard Y-Axis Force	600	+	yes		20000
81	11KNEELEINWSFOYP	Left Knee Inboard Y-Axis Force	600	+	yes		20000
82	11FEMRRL00WSFOXP	Right Femur X-Axis Force	600	+	yes		10000
83	11FEMRRL00WSFOYP	Right Femur Y-Axis Force	600	+	yes		25000
84	11FEMRRL00WSFOZP	Right Femur Z-Axis Force	600	+	yes		10000
85	10VEHCCG0000ACXA	Vehicle Center of Gravity X-Axis Acceleration	60	+	yes		1000
86	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-Axis Acceleration	60	+	yes		1000
87	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-Axis Acceleration	60	+	yes		1000
87A	10VEHCCG0000ACRA	Vehicle Center of Gravity Resultant Acceleration	60				
88	10VEHCCG0000AVXA	Vehicle Center of Gravity Roll Rate Gyroscope	60	+	yes		1500
89	10VEHCCG0000AVYA	Vehicle Center of Gravity Pitch Rate Gyroscope	60	+	yes		1500
90	10VEHCCG0000AVZA	Vehicle Center of Gravity Yaw Rate Gyroscope	60	+	yes		1500
91	11SILBRE0100ACYA	Left Side Sill Near Impact Point Y-Axis Acceleration	60	+	yes		2000
92	14SILBFR0000ACYA	Left A-Pillar Side Sill Y-Axis Acceleration	60	+	yes		1000
93	11APILLO0000ACYA	Left Lower A-Pillar Y-Axis Acceleration	60	+	yes		1500
94	11APILMI0000ACYA	Left Mid A-Pillar Y-Axis Acceleration	60	+	yes		1500
95	14SILBRE0000ACYA	Left Side Sill at Rear Seat Y-Axis Acceleration	60	+	yes		1000
96	14BPILLO0000ACYA	Left Lower B-Pillar Y-Axis Acceleration	60	+	yes		1500
97	14BPILMI0000ACYA	Left Mid B-Pillar Y-Axis Acceleration	60	+	yes		1500
98	11SETRFR0000ACYA	Left Front Seat Track at H-Point Y-Axis Acceleration	60	+	yes		1500
99	12ENGNTTP0000ACXA	Top of Engine X-Axis Acceleration	60	+	yes		1000
100	12ENGNTTP0000ACYA	Top of Engine Y-Axis Acceleration	60	+	yes		1000
101	12VEHC000000ACYA	Firewall Y-Axis Acceleration	60	+	yes		1000
102	13ROOF000000ACYA	Right Side Roof Rail Y-Axis Acceleration	60	+	yes		1000
103	13SILBFR0000ACYA	Right Side Sill Y-Axis Acceleration	60	+	yes		1000
104	18FORA000000ACXA	Rear Deck Behind Rear Axle X-Axis Acceleration	60	+	yes		1000
105	18FORA000000ACYA	Rear Deck Behind Rear Axle Y-Axis Acceleration	60	+	yes		1000

Channel	ISO mnemonic	Channel Title	Filter	(	Flip	Zero	Full	Scale
106	11AIRBTPLESEEOVA	Driver Side Curtain Inductor	1000	+	no			5
107	11AIRB00000SEEVOA	Driver Torso Airbag Fire Inductor	1000	+	no			5
108	11CONT000001VO00	Head Contact Switch	0	+	no			1
109	11CONT000002VO00	Shoulder Contact Switch	0	+	no			1
110	11CONT000003VO00	Torso Contact Switch	0	+	no			1
111	11CONT000004VO00	Left Contact Switch	0	+	no			1
112	K0FBAR010000FOXA	Pole Load Cell 1	60	+	yes		222400	
113	K0FBAR020000FOXA	Pole Load Cell 2	60	+	yes		222400	
114	K0FBAR030000FOXA	Pole Load Cell 3	60	+	yes		222400	
115	K0FBAR040000FOXA	Pole Load Cell 4	60	+	yes		222400	
116	K0FBAR050000FOXA	Pole Load Cell 5	60	+	yes		222400	
117	K0FBAR060000FOXA	Pole Load Cell 6	60	+	yes		222400	
118	K0FBAR070000FOXA	Pole Load Cell 7	60	+	yes		222400	
119	K0FBAR080000FOXA	Pole Load Cell 8	60	+	yes		222400	

2010 Ford F150 Left Side FMVSS 214 Pole Impact 32 kph 100211; Test Time 13:31



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