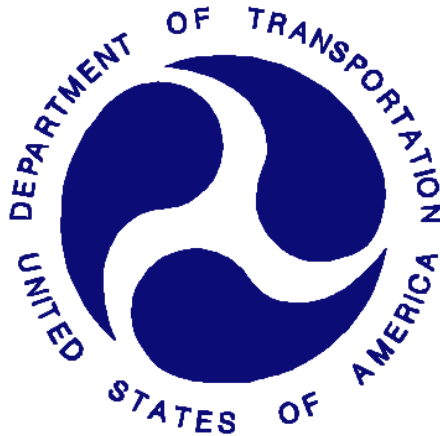


**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**Toyota Motor Manufacturing, Inc.
2015 Toyota Sienna**

**PREPARED BY:
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Report Date: July 30, 2016

DRAFT REPORT

**PREPARED FOR:
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TRC TEST NUMBER: 160614

Project Manager, Melinda Lackey

Report Approved July 30, 2016:

Transportation Research Center Inc.

Final Report Accepted by:

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Section 1

Purpose and Test Procedure

Purpose

This rigid pole side impact test is part of the Federal Motor Vehicle Safety Standard 214 Side Impact Protection program. It was conducted for the National Highway Traffic Safety Administration's (NHTSA) Vehicle Research and Test Center (VRTC) by Transportation Research Center Inc. (TRC Inc.). The purpose of this test was to perform crash tests with the WorldSID 50th dummy to refine the seating procedure and to evaluate dummy response. The test was conducted using the National Highway Traffic Safety Administration's new car assessment program (NCAP) or side impact rigid pole test procedure (TP-SPNCAP-POLE) dated October 2015 and VRTC guidance:

WorldSID-50M dummy was used instead of the SIDIIIs listed in the test procedure.

SECTION 2

SUMMARY OF TEST RESULTS

A 2015 Toyota Sienna impacted the rigid pole on the left side, at a velocity of 32.08 km/h (19.93 mph). The target vehicle was moving and was positioned at an angle of 285°. The side impact test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on June 14, 2016. Pre-test and post-test photographs of the test vehicle, the rigid pole, and the side impact dummy (WorldSID-50M) are included in Appendix A.

One restrained Side Impact Dummy (WorldSID-50M) S/N 016, was placed in the driver (Position #1) designated seating position according to the instructions specified in the VRTC WS50M_Draft Seating Procedure¹. The dummy was calibrated prior to this test using specifications found in the Humanetics User Manual². The side impact test was documented by two (2) real-time cameras and nine (9) high-speed digital cameras. Camera locations and other pertinent camera information are included in this report.

The passenger front airbag, passenger side curtain and torso airbags were disabled prior to the test performance.

The WorldSID dummy was instrumented with one-hundred twenty-seven (127) dummy channels of acceleration, force, moment, angle, and displacement data were collected for this test. It was also instrumented with a Ribeye system manufactured by Boxboro Systems³ in the chest in place of the IRTRACCs. Each rib (1 shoulder, 3 thorax, and 2 abdomen) had three LEDs placed at the middle, front and rear location to measure X, Y, and Z position location. The position measurements were used to calculate a change of length at each rib at each location.

Additional information about the Ribeye locations and calculations can be found in Appendix E. The 50th male WorldSID dummy had a fifty-nine (59) channel chest band on thorax rib 1 using only fifty-six (56) channels. The results of the chest band data can be found in Appendix F. All of the dummy channels are detailed in section 3 Table 1.

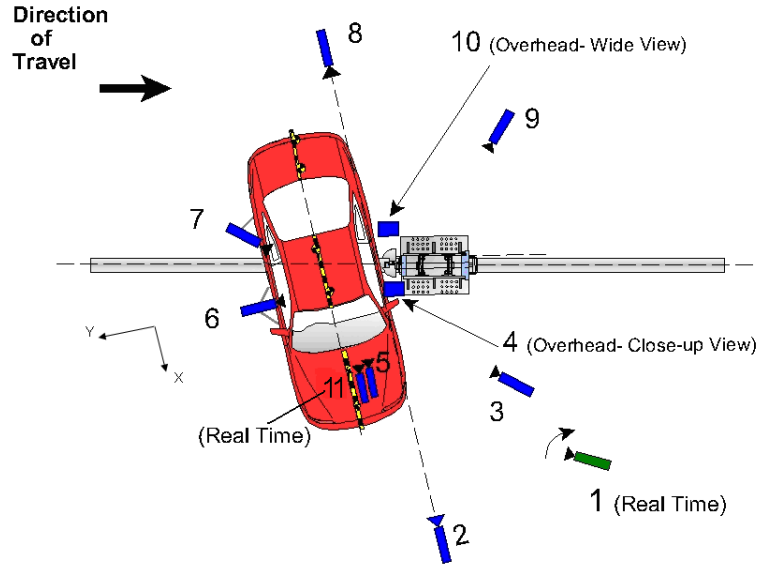
¹ See Appendix G for WorldSID Draft Seating Procedure used for this testing.

² Humanetics User Manual: <http://www.humaneticsatd.com>

³ <http://www.boxborosystems.com/ribeye.html>

A total of two-hundred twenty-one (221) channels of data were recorded. Appendix A contains pre-test and post-test photographs. Appendix B contains the vehicle, barrier and dummy response data traces. A summary of the side impact dummy (WorldSID-50M) configuration and verification test data can be found in Appendix C. Appendix D contains miscellaneous test information. Appendix E contains Ribeye information and Appendix F contains chest band information.

Test Results Summary



	Driver WorldSID 50th (#016)
HIC15 (g) CFC 1000	412
HIC36 (g) CFC 1000	469
BRIC Injury Criteria	0.47
Shoulder Force (N) CFC 600	-1646
Maximum Shoulder Deflection (mm)	50
Maximum Thoracic Rib 1-3 Deflection (mm)	41
Maximum Abdomen Rib 1-2 Deflection (mm)	28
Lower Spine Resultant (g) CFC 180	44
Pelvis Resultant Acceleration	51
Pubic Symphysis Force (N) CFC 600	-1267
Sacro Iliac FY (N) CFC 600	-2,783

	2015 Toyota Sienna
Vehicle Test Weight	2155.4 kg
Impact Point (Horizontal) rearward of front axle	1239 mm
Impact Angle	285°
Maximum Crush	345 mm Level 2
Impact Speed	32.08 km/h

Data Acquisition Explanations

Left Middle B-Pillar Sill Y-Axis Acceleration: questionable data after 30.0 milliseconds.

Chest band gage 5: no valid data throughout the event.

Chest band gage 27: questionable data after 150.0 milliseconds.

Chest band gage 30: no valid data throughout the event.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.		Traction Control System (TCS)	Yes
Model Year	2015	Auto-Leveling System	No
Make	Toyota	Automatic Door Locks (ADL)	Yes
Model	Sienna	Power Window Auto-Reverse	Yes
Body Style	MPV	Other Optional Feature	
VIN	5TDKK3DC1FS687956	Driver Front Airbag	Yes
Body Color	Gray	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	61 mi.	Driver Head/Torso Airbag	No
Engine Displacement (L)	3.5	Driver Torso Airbag	No
Type/No. Cylinders	6	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Front/Transverse	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	6	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	FWD	Rear Pass. Torso Airbag	No
Roof Rack	Rails	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	No
Power Seats	Driver only	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Safety Restraint	

Does owner's manual provide instructions to turn off automatic door locks?

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufacturing, Inc.	GVWR (kg)	2715
Date of Manufacturer	12/15	GAWR Front (kg)	1405
Vehicle Type	MPV	GAWR Rear (kg)	1405

VEHICLE SEATING AND WEIGHT CAPACITY DATA

	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	3	8
Vehicle Capacity Weight (VCW) (kg)				609
DSC X 68.04 kg				544.32
Rated Cargo and Luggage Weight (RCLW) (kg)				64.68

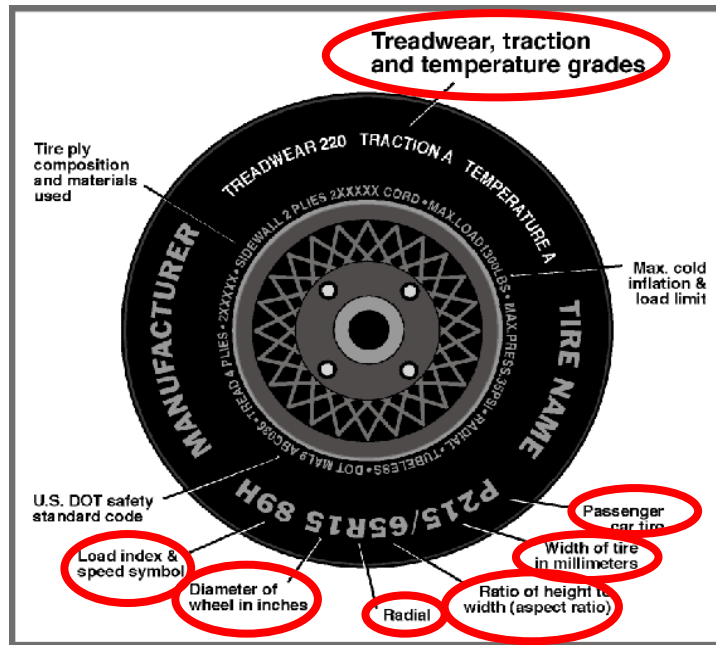
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	Yes						Yes
Rear or Second Row Seat			Yes	Yes		Yes	
Third row seat			Yes	Yes		Strap	

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P235/60R17	P235/60R17
Tire Size on Vehicle	P235/60R17	P235/60R17
Tire Manufacturer	Firestone	Firestone
Tire Model	FR 710	FR 710
Treadwear	560	560
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2	2
Tire Plies Body	4	4
Load Index/Speed Symbol	100 T	100 T
Tire Material	Polyester, Steel & Nylon	Polyester, Steel & Nylon
DOT Safety Code Left	W2OU CKD 4515	W2OU CKD 4515
DOT Safety Code Right	W2OU CKD 4515	W2OU CKD 4515

DATA SHEET NO. 1 (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	39	40	39	40
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa				
As Tested	kPa	240	240	240	240

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	584.4	445.2		620	490.2		607.6	509.6	
Right	kg	571.0	420.2		580.2	465.		574.4	469.0	
Ratio	%	57.2	42.8		55.7	44.3		54.7	45.3	
Totals	kg	1155.4	865.4	2020.8	1200.2	955.2	2155.4	1182.0	978.6	2160.6

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2020.8	(A)
Actual Weight of 1 ATD (WorldSID) Dummy Used	kg	75.0	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	64.68	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2160.48	(A+B+C)

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to 9 kg)? ☒ YES ☐ NO

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	Deg.	+ 0.5	+0.6	+ 0.6	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg.	- 0.5	+0.4	0.0	Yes
Front Bumper-Line Angle (left-to-right)**	Deg.	- 0.5	-0.2	- 0.2	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg.	+ 0.1	-0.2	- 0.2	Yes
Vehicle CG (Aft of Front Axle)	mm	1298		1372	
Vehicle CG (Left (+) / Right (-) from longitudinal Centerline)	mm	+16		+29	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for "Meets Requirements".

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Ballast:	0
Components removed:	0
Test height adjustable suspension setting, if applicable:	N/A

DATA SHEET NO. 2

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2015 Toyota Sienna

Test Program: SPNCAP Side Impact

Test Date: 6/14/16

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max.	Min.	Mid
Driver Seat	15.4	3.9	9.6
Front Passenger Seat			
Front Center Seat*			
Struck Side Rear Seat			
Non-Struck Side Rear Seat			
Rear Center Seat*			

* If applicable.

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRIP Height (mm)	SCRIP Height Position	SCRIP Height (mm)		
				Rearmost	Mid- Fore/Aft	Forward- Most
Driver Seat	9.6	304	Max	318	326	335
			Mid	295	304	313
			Min	275	283	294
Front Passenger Seat			Max			
			Mid			
			Min			
Front Center Seat*			Max			
			Mid			
			Min			
Struck Side Rear Seat			Max			
			Mid			
			Min			
Non-Struck Side Rear Seat			Max			
			Mid			
			Min			
Rear Center Seat*			Max			
			Mid			
			Min			

* If applicable.

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2015 Toyota Sienna

Test Program: SPNCAP Side Impact

Test Date: 6/14/16

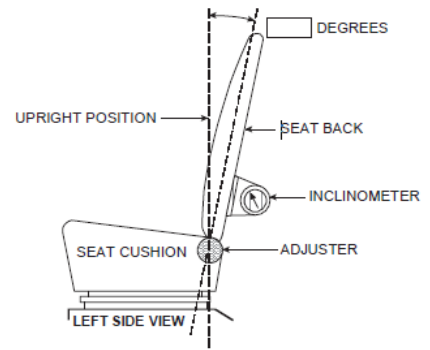
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	240		120	
Front Passenger Seat				
Front Center Seat*				
Struck Side Rear Seat				
Non-Struck Side Rear Seat				
Rear Center Seat*				

* If applicable.

Driver seat: The driver's seat back is positioned at 5.8° rearward measured at the head rest post per Form 1 instructions. The seat was positioned at mid-track fore and aft travel.

Right Front Passenger Seat: The right front passenger seat back was positioned in a similar manner as the driver's seat back.



FRONT SEAT ASSEMBLY

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detent*
Driver Seat w/ Seated Dummy	51.8		5.7	
Front Passenger Seat				
Front Center Seat*				
Struck Side Rear Seat				
Non-Struck Side Rear Seat				
Rear Center Seat*				

* If applicable.

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted with the information provided by the manufacturer on Form No. 1

	Total # of Positions	Placed in Position #
Driver Seat	4	1

HEAD RESTRAINT ADJUSTMENT

Head restraints are adjusted to the highest and full rearward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	3	1

DATA SHEET NO. 2 (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

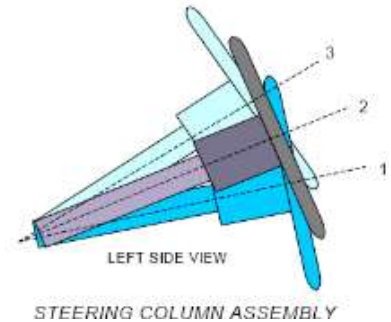
Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel geometric locus it describes when moved through its full range of motion.

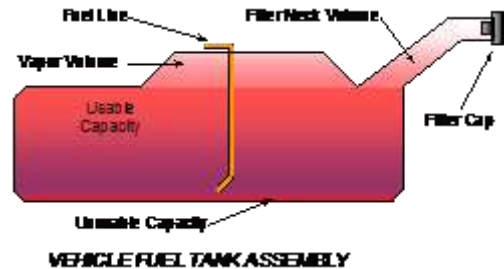
	Degrees	Fore/Aft Position, mm
Lowermost, Position No. 1	28.2	
Geometric Center, Position No. 2	26.2	
Uppermost, Position No. 3	24.2	
Telescoping Steering Wheel Travel		40
Test Position	26.2	20



FUEL PUMP

Describe the fuel pump type, details about how it operates and the location of the fuel filler neck:

Pump will run for about 3 seconds when the key is turned on and then will not run unless the engine is cranking or running



FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	79.1
Usable Capacity of "Optional" Tank (see Form No. 1)	79.1
Usable Capacity of Standard Tank (see Owner's Manual)	79.1
Usable Capacity of Optional Tank (see Owner's Manual)	
93% of Usable Capacity	73.6
Actual Amount of Solvent Used in Test	73.6
1/3 of Usable Capacity	26.4

Is the Actual Amount of Solvent Used in the test equal to 93% +/- 1% of the Usable Capacity stated on Form No. 1? ☒ YES ☐ NO

Table 1 WorldSID Instrumentation Data

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Head Acceleration (g)	X	9.887	136.75	-18.589	56.9
	Y	63.788	56.5	-10.757	157.15
	Z	5.261	69.95	-7.374	48.2
	R	66.425	56.5		
Head Angular Velocity	X	1,122.49	137.9	-1,066.10	210.2
	Y	527.403	106.35	-569.74	255.2
	Z	363.719	84.55	-788.191	58.95
Upper Neck Force	X	145.014	134.25	-217.905	54.75
	Y	215.456	276.45	-422.758	157.1
	Z	671.331	49.75	-43.347	31.35
Upper Neck Moment	X	16.528	264.9	-47.042	54.45
	Y	8.608	285.7	-21.258	57.55
	Z	7.826	65.3	-13.329	98.55
Lower Neck Force	X	183.153	118.8	-414.889	53.5
	Y	755.241	52.5	-439.089	129.65
	Z	801.912	50.25	-354.466	157.2
Lower Neck Moment	X	51.733	276.4	-92.194	158.3
	Y	32.15	55.35	-43.733	132.35
	Z	8.042	68.6	-15.519	102.6
T1 Acceleration (g)	X	9.67	49.65	-4.463	95.15
	Y	41.787	62.7	-11.6	112.6
	Z	14.906	57.3	-4.043	129.45
	R	43.707	62.65		
T4 Acceleration (g)	X	8.732	31.8	-3.008	170.8
	Y	10.305	111.7	-34.012	61.9
	Z	4.513	111.85	-15.413	57.4
	R	36.467	61.8		
T12 Acceleration (g)	X	10.789	23.5	-7.285	66.4
	Y	43.864	50	-11.699	89.55
	Z	10.19	57.7	-6.748	105.8
	R	44.353	50		

Table 1 WorldSID Instrumentation Data (Continued)

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Shoulder Force (N)	X	218.865	42.65	-479.809	57.2
	Y	124.703	113.45	-1,646.47	49.35
	Z	814.54	43.05	-102.014	112.75
Pubic Symphysis (N)	Y	9.545	-10.9	-1,267.03	43.3
Sacro-Iliac Left Force (N)	X	140.012	21.3	-367.22	53.9
	Y	11.655	-14.35	-2,782.92	47.45
	Z	147.89	110.1	-511.305	66.15
Sacro-Iliac Left Moment (Nm)	X	27.974	66.5	-43.787	43.95
	Y	23.847	54.15	-11.931	26.1
	Z	26.82	20.9	-26.417	60.5
Lumbar Force (N)	X	465.054	62.6	-313.747	20.5
	Y	835.809	50.35	-364.648	96.7
	Z	1,715.37	65.7	-480.713	108.5
Lumbar Moment (Nm)	X	49.004	53.1	-43.885	103.9
	Y	15.444	20.65	-23.402	62.55
	Z	13.299	51	-6.034	96.35
Pelvis Acceleration (g)	X	11.673	20.75	-8.546	70.4
	Y	50.074	45.05	-19.665	81.05
	Z	10.259	40.45	-5.4	48.65
	R	50.421	45.05		
Left Femur Force (N)	X	93.233	67.95	-59.362	156.1
	Y	44.614	242.45	-679.03	48.05
	Z	848.97	66.6	-125.18	19
Left Femur Moment (Nm)	X	186.362	45.05	-13.451	18.65
	Y	41.836	52.85	-12.757	112.5
	Z	54.893	53.8	-5.652	32.05
Left Femoral Neck Force (N)	X	811.894	52.15	-30.827	156.35
	Y	40.832	16.25	-1,930.28	45.15
	Z	17.402	16.2	-1,893.32	46

Table 1 WorldSID Instrumentation Data, (Continued)

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Shoulder Rear Ribeye Position (mm)	X	-26.884	100.7	-61.772	61.2
	Y	-61.197	58.5	-84.865	94.9
	Z	24.612	116.1	-8.435	71.8
Length of Change (mm)		5.728	53.7		
Shoulder Middle Ribeye Position (mm)	X	6.548	103.5	-36.043	61.4
	Y	-55.8	59.3	-94.247	223.4
	Z	25.043	117.7	-8.536	46.2
Length of Change (mm)		25.508	53.7		
Shoulder Front Ribeye Position (mm)	X	38.131	101.4	13.263	61
	Y	-39.113	59	-88.746	223.6
	Z	21.052	118.5	-13.387	46
Length of Change (mm)		49.813	60.4		
Thorax Rib 1 Rear Ribeye Position (mm)	X	-32.508	109	-38.179	40.7
	Y	-74.954	51.5	-100.785	293.8
	Z	5.026	114.6	-10.977	39.7
Length of Change (mm)		23.1	56		
Thorax Rib 1 Middle Ribeye Position (mm)	X	4.778	57.3	-2.032	296.7
	Y	-69.671	56.2	-113.995	208
	Z	6.07	115.3	-12.732	40
Length of Change (mm)		41.177	56.2		
Thorax Rib 1 Front Ribeye Position (mm)	X	44.801	57.6	33.504	133.3
	Y	-51.131	56.6	-104.837	206.1
	Z	4.919	115.3	-12.992	38.1
Length of Change (mm)		39.22	56.5		
Thorax Rib 2 Rear Ribeye Position (mm)	X	-22.305	59.2	-35.916	37.9
	Y	-75.943	49.8	-101.801	139.3
	Z	-10.761	113.3	-24.91	65
Length of Change (mm)		24.546	52.9		
Thorax Rib 2 Middle Ribeye Position (mm)	X	19.266	57.6	1.3	154
	Y	-76.551	51.5	-112.072	189.2
	Z	-8.183	112.9	-23.983	65.2
Length of Change (mm)		32.034	51.4		

Table 1 WorldSID Instrumentation Data, (Continued)

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Thorax Rib 2 Front Ribeye Position (mm)	X	57.837	55.1	34.809	152.2
	Y	-67.024	56.8	-106.842	197.8
	Z	-4.81	113	-19.089	66.1
Length of Change (mm)		22.343	49.8		
Thorax Rib 3 Rear Ribeye Position (mm)	X	-15.93	59.5	-32.043	37.4
	Y	-77.771	54	-95.856	133.9
	Z	12.364	110.9	-1.877	64.2
Length of Change (mm)		19.669	56		
Thorax Rib 3 Middle Ribeye Position (mm)	X	23.418	57.2	1.54	223.6
	Y	-80.821	55	-103.655	234.7
	Z	14.103	110.5	-2.068	64.2
Length of Change (mm)		19.144	54		
Thorax Rib 3 Front Ribeye Position (mm)	X	58.385	56.4	32.156	148.8
	Y	-70.696	54.8	-93.803	150.6
	Z	13.263	111	-0.843	64.5
Length of Change (mm)		8.434	51.2		
Abdomen Rib 1 Rear Ribeye Position (mm)	X	-20.536	58.1	-38.265	36.7
	Y	-72.599	55	-97.578	206.5
	Z	0.944	111	-13.112	64.7
Length of Change (mm)		25.64	55		
Abdomen Rib 1 Middle Ribeye Position (mm)	X	21.934	57.6	0.137	302.3
	Y	-76.141	54.8	-108.664	259.1
	Z	2.219	111.8	-14.279	64.5
Length of Change (mm)		27.924	54.7		
Abdomen Rib 1 Front Ribeye Position (mm)	X	58.83	56.6	31.752	2.3
	Y	-67.274	55.7	-97.871	137.9
	Z	0.506	113.4	-14.69	64
Length of Change (mm)		14.05	49.7		
Abdomen Rib 2 Rear Ribeye Position (mm)	X	-19.85	57.6	-41.771	36.6
	Y	-69.785	50.3	-94.836	246.3
	Z	-11.338	110.9	-24.272	63.2
Length of Change (mm)		25.028	52.4		

Table 1 WorldSID Instrumentation Data, (Continued)

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

Driver Dummy Serial Number: 016

Location		Positive Direction		Negative Direction	
		Max.	Time (ms)	Max.	Time (ms)
Abdomen Rib 2 Middle Ribeye Position (mm)	X	19.756	56.9	-6.185	83.3
	Y	-74.252	51.7	-104.241	263.9
	Z	-12.082	113.2	-27.191	63.1
Length of Change (mm)		28.293	50.4		
Abdomen Rib 2 Front Ribeye Position (mm)	X	54.281	56.5	26.635	83.7
	Y	-64.717	52.1	-95.451	211.6
	Z	-11.513	114.8	-25.846	61.8
Length of Change (mm)		18.039	49.4		

Positive Direction

Longitudinal: Forward
 Lateral: Rightward
 Vertical: Downward

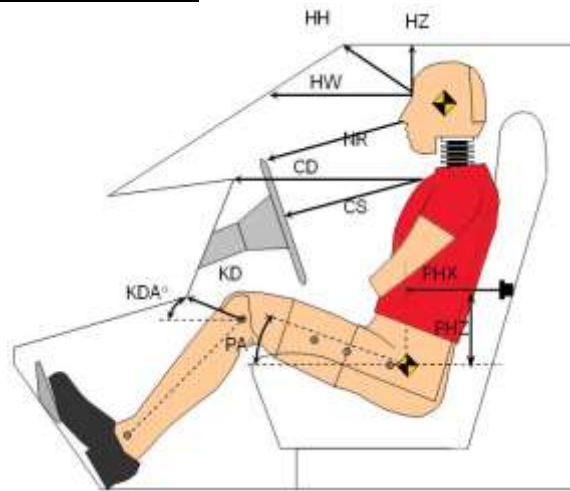
Negative Direction

Longitudinal: Rearward
 Lateral: Leftward
 Vertical: Upward

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



Left Side View

Code	Measurement Description	Driver WorldSID # 016	
		Length (mm)	Angle
HH	Header to Header	310	
HW	Header to Windshield	820	
HZ	Head to Roof Liner	261	
NR	Nose to Rim/Seat Back	501	
CD	Chest to Dash/Seat Back	599	
CS	Chest to Steering Wheel	403	
KD(L)/KDA(L)°	Left Knee to Dash/Seat Back	137	31.2
KD(R)/KDA(R)°	Right Knee to Dash/Seat Back	75	45.2
PAX°	Pelvic Tilt Angle X		1.5
PAY°	Pelvic Tilt Angle Y		0.1
PHX	Hip Point to Striker (X-Axis)	237	
PHZ	Hip Point to Striker (Z-Axis)	159	
HAX°	Head Tilt Angle X		1.5
HAY	Head Tilt Angle Y		-0.7
TAX°	Thorax Tilt Angle X		2.1
TAY°	Thorax Tilt Angle Y		-0.5
	Head Rest Angle		5.8
	H-Point Tool Angle		45.8
	Torso Angle		14.5
	Windshield Angle		59.6

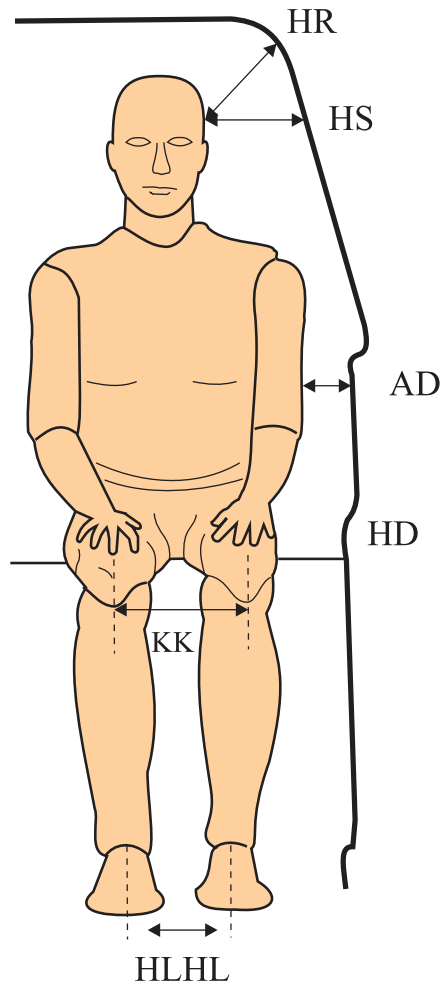
Note: All measurements are in millimeters. 2-door vehicle shown. Rear dummy HX, HZ, PHX and PHZ measurements for 4-door vehicle would use the C-post striker as a reference point.

All tilt sensor angles are recorded digitally

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



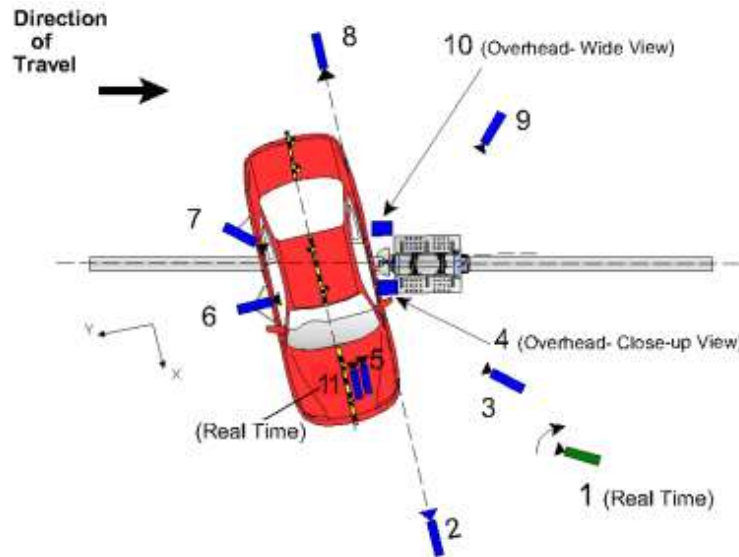
Code	Measurement Description	Driver WorldSID # 016
HR	Head to Side Header	278
HS	Head to Side Window	389
AD	Arm to Door	130
HD	Hip Point to Door	94
KK	Knee to Knee	317
HLHL	Heel to Heel	320

Note: All measurements are in millimeters.

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



REFERENCE: (from point of impact for X and Y; from ground for Z)
 + X = Forward of vehicle, + Y = Right of vehicle, + Z = Down

Camera No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real time (24-30 fps) pan view of impact				Zoom	30
2	Front ground level – impact view	5236	-305	-1421	20	1000
3	Impact side 45° – forward pole view	3380	-734	-1941	20	1000
4	Overhead Close-up view of impact	0	115	-5773	28	1000
5	Onboard – dummy front view				25	1000
6	Onboard – dummy side view				12.5	1000
7	Onboard – dummy rear oblique view				12.5	1000
8	Rear ground level – impact view	-5996	0	-1226	18	1000
9	Impact side 45° – rearward pole view	-3977	-2728	-1464	20	1000
10	Overhead wide view of impact	0	557	-5773	8.5	1000
11	Real time dummy front view				Zoom	30

All measurements accurate to +/- 6 mm.

NOTE: Vehicle was at a 75° angle to the rigid pole.

If applicable, explain why camera(s) did not run: Not Applicable

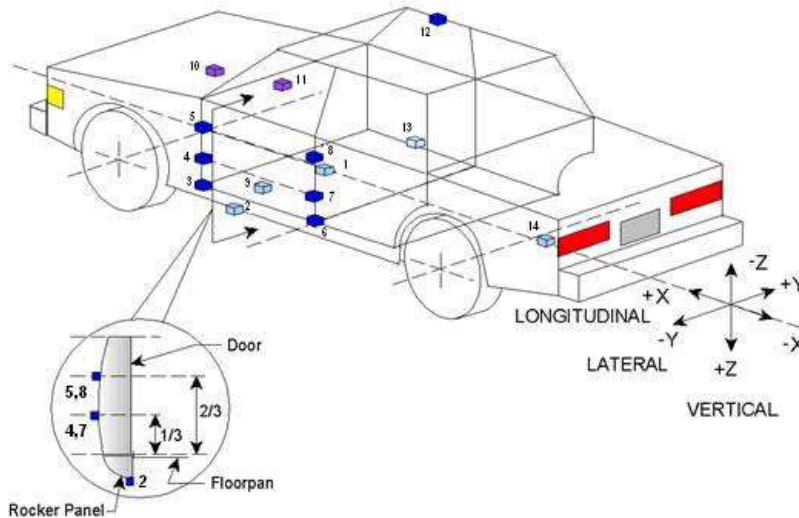
INSTRUMENTATION

	Number of Channels
Driver Dummy	127
Chest Band	56
Vehicle Structure	30
Pole Load Cells	8
TOTAL	221

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
1	Vehicle CG	3310	75	-385				
	Longitudinal (g)				2.065	16.75	-5.926	38.8
	Lateral (g)				18.761	17.15	-0.867	182.55
	Vertical (g)				5.644	27.75	-6.504	61.65
	Resultant (g)				18.92	17.05		
2	Left Floor Sill	3254	-796	-378				
	Lateral (g)				78.744	15.15	-10.303	23.3
3	Left A-Pillar Sill	3576	-795	-393				
	Lateral (g)				34.351	15.7	-0.743	219.35
4	Left Lower A-Pillar	3677	-923	-646				
	Lateral (g)				25.344	16.95	-1.562	1.9
5	Left Mid A-Pillar	3702	-895	-982				
	Lateral (g)				20.272	23.9	-2.4	1.9
6	Left B-Pillar Sill	2522	-780	-330				
	Lateral (g)				42.34	36.55	-3.972	55.1
7	Left Lower B-Pillar	2723	-849	-723				
	Lateral (g)				54.613	14	-17.488	19.7
8	Left Mid B-Pillar	2678	-846	-995				
	Lateral (g)				59.274	29.65	-13.115	23.3
9	Driver Seat Track at Dummy H-Point	2915	-643	-424				
	Lateral (g)				192.942	185.1	-2,149.26	106.45
10	Engine Top	4445	-43	-791				
	Longitudinal (g)				3.393	135.2	-16.312	47.8
	Lateral (g)				26.049	51.45	-2.929	146.1

DATA SHEET NO. 6 (Continued)
VEHICLE ACCELEROMETER DATA

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

Location		Coordinates (mm)			Positive Direction		Negative Direction	
		X	Y	Z	Max	Time (ms)	Max	Time (ms)
11	Firewall Center	4258	0	-884				
	Lateral (g)				15.912	40.9	-1.207	4.7
12	Right Roof at Vertical Impact Reference Line	2631	750	-1653				
	Lateral (g)				26.883	33.65	-6.814	49.6
13	Right Sill at Vertical Impact Reference Line	3278	792	-386				
	Lateral (g)				19.361	17.3	-0.743	181.25
14	Rear Floorpan Behind Rear Axle at Centerline	967	-10	-528				
	Longitudinal (g)				1.161	118.3	-4.677	27.8
	Lateral (g)				126.324	11.15	-38.56	24.4
15	Left Front Door Mid Centerline	3160	-856	-772				
	Lateral (g)				122.547	6.25	-22.664	16.4
16	Left Front Door Mid Rear	3160	-854	-772				
	Lateral (g)				92.69	13.5	-47.258	21.1
17	Left Front Door Upper Centerline	2826	-853	-750				
	Lateral (g)				31.647	38.2	-12.547	69.5
18	Left Rear Door Mid Rear	1712	-878	-708				
	Lateral (g)				46.264	50.25	-18.835	73.65
19	Left Rear Door Upper Centerline	2085	-977	-1044				
	Lateral (g)				16.5	17.95	-1.709	177.75

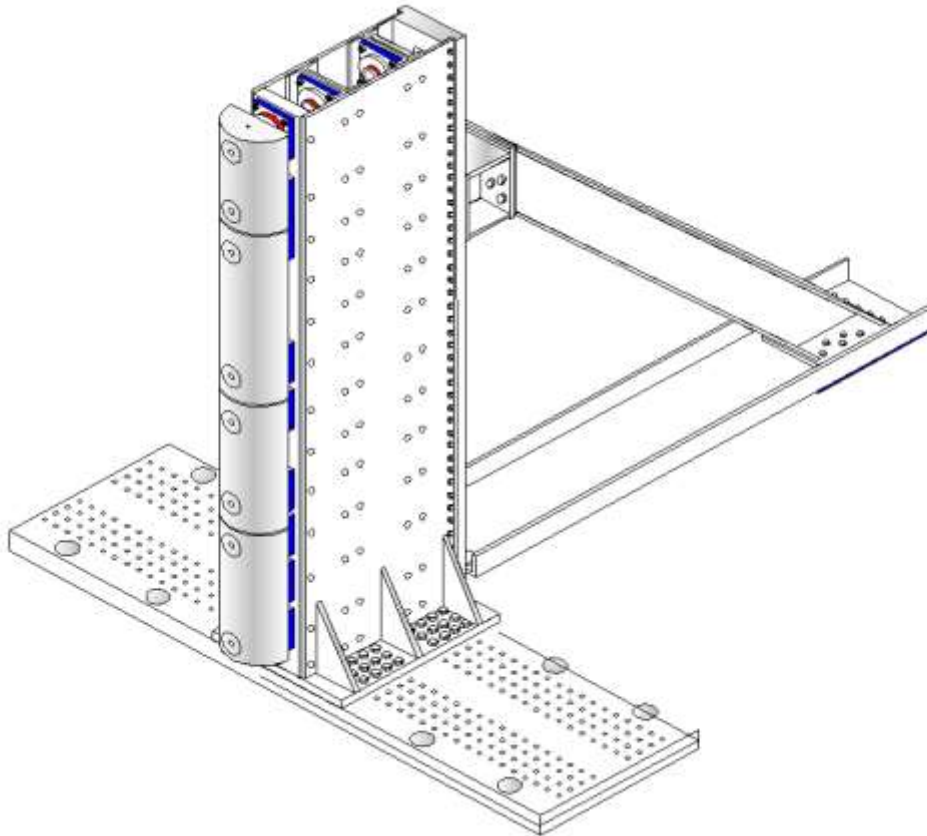
*0,0,0 located at rear bumper

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2015 Toyota Sienna
Test Program: SPNCAP Side Impact

Test Date: 6/14/16

FOIL 300K RIGID POLE



Load Cell Locations	
ID	Height From Top of Carrier (mm)
1	87
2	468
3	648
4	978
5	1168
6	1651
7	1816
8	2057

**DATA SHEET NO. 8
POST TEST OBSERVATIONS**

Test Vehicle: 2015 Toyota Sienna
Test Program: SPNCAP Side Impact

Test Date: 6/14/16

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-11s Dummy
Face	SCAB
Top of Head	SCAB
Left Side of Head	SCAB
Back of Head	SCAB
Left Shoulder	Torso Bag
Upper Torso	Torso Bag
Lower Torso	Door Panel
Left Hip	Door Panel
Left Knee	Door Panel

POST TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)					

* Indicate "Yes", "No", or "NA".

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	None	None	None	None
Seat Disengagement from Floor pan	None	None	None	None
Seat Back Movement from Initial Position	None	None	None	None
Seat Back Collapse	None	None	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Major Deformation
Sill Separation	None Visible
Windshield Damage	Broken
Side Window Damage	Left Front- Shattered; Left Rear OK
Other Notable Effects	

DATA SHEET NO. 8 (CONTINUED)
POST TEST OBSERVATIONS

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side (Driver)		Struck Side (Rear Passenger)	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Knee Airbag	Yes	Yes		
Side Curtain Airbag	Yes	Yes	Yes	Yes
Side Torso/Pelvis Airbag	Yes	Yes		
Side Torso Airbag				
Seat Belt Pretensioner	Yes	Yes		
Seat Belt Load Limiter	Yes	Yes		
Other				

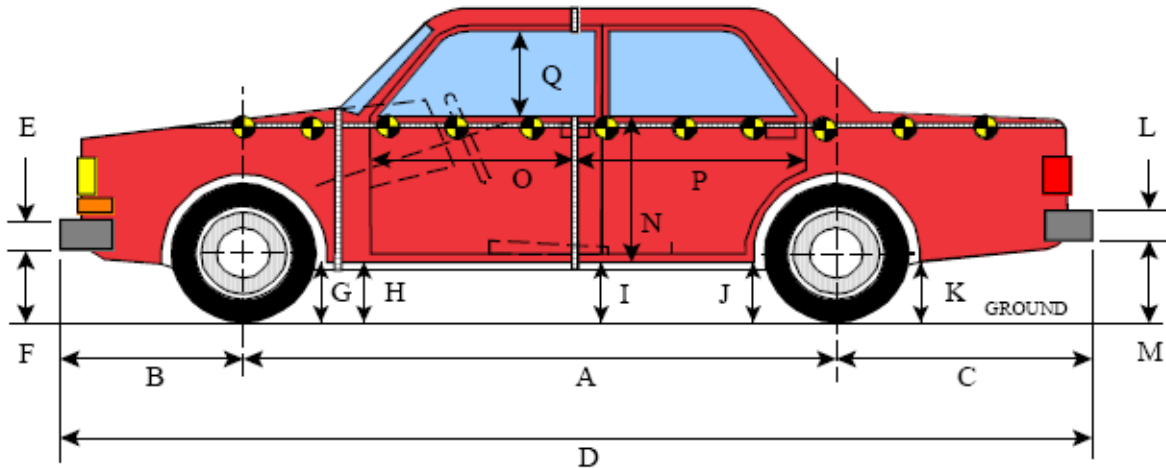
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle) (Intended Impact Point)	mm		1239
Actual Impact Point (Aft of Front Axle)	mm		1238
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 of Intended Impact point	+1
Angle Between Vehicle's Longitudinal Centerline and Line of Motion	degrees	75 +/- 3	75
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.08
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.07

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

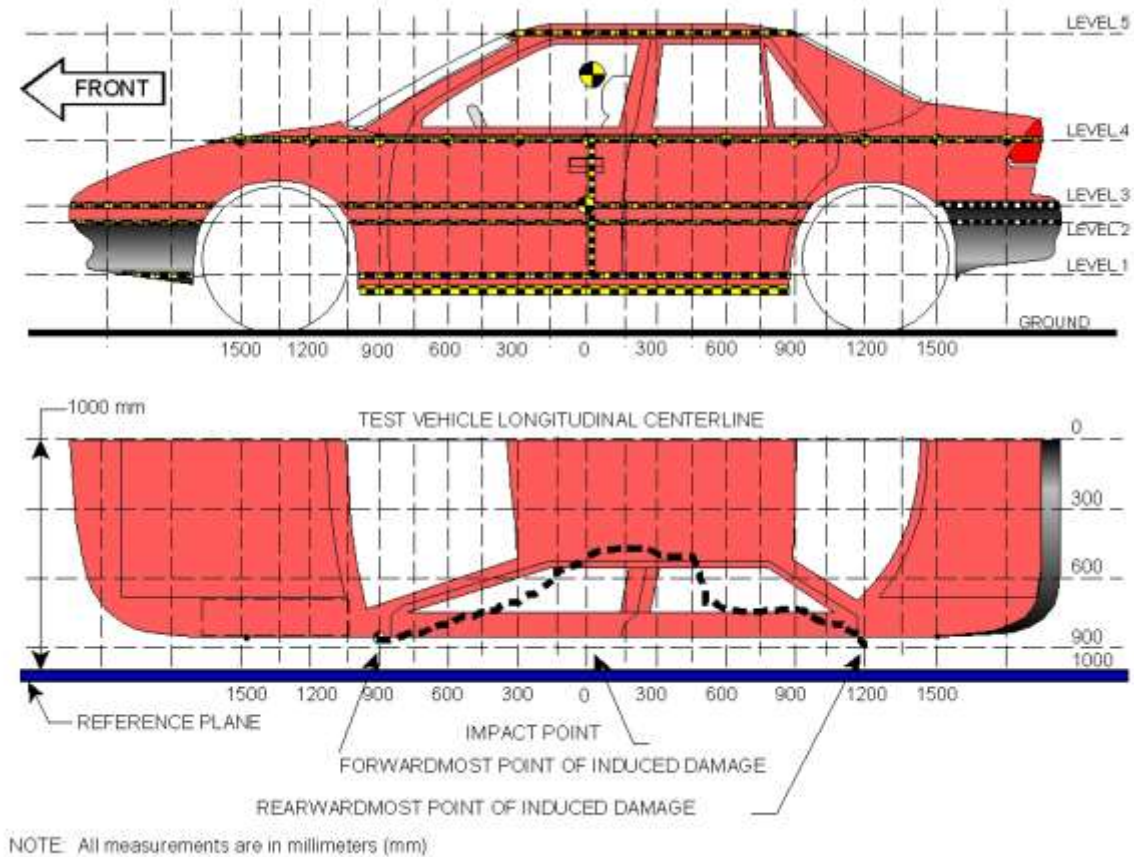
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3030	2986	44
B	Front Axle to Front Surface of Vehicle	950	950	0
C	Rear Axle to Rear Surface of Vehicle	1100	1135	-35
D	Total Length at Centerline	5080	5071	9
E	Front Bumper Thickness	190	190	0
F	Front Bumper Bottom to Ground	460	484	-24
G	Sill Height at Front Wheel Well	254	259	-5
H	Sill Height at Front Door Leading Edge	273	298	-25
I	Sill Height at B-Pillar	265	278	-13
J1	Sill Height at Rear Wheel Well	246	292	-46
J2	Pinch Weld Height at Rear Wheel Well	232	272	-40
K	Sill Height Aft of Rear Wheel Well	327	361	-34
L	Rear Bumper Thickness	162	162	0
M	Rear Bumper Bottom to Ground	387	387	0
N	Sill Height to Bottom of Front Window Sill	830	831	-1
O	Front Door Leading Edge to Impact CL	808	756	52
P	Rear Door Trailing Edge to Impact CL	1343	1494	-151
Q	Front Window Opening	522	493	29
R	Right Side Length	4900	4911	-11
S	Left Side Length	4900	4881	19
T	Vehicle Width at "B" Pillars	1975	1786	189
U	Maximum Width	1980	1984	-4

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	391	287	0
2	Occupant H-Point	723	345	0
3	Mid-Door	678	341	0
4	Window Sill	1048	320	0
5	Window Top	1660	117	0

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1200				911					988					-77	
-1050		1000		921			1052		981			-52		-60	
-900		998	1000	925			1035	1037	968			-37	-37	-43	
-750	982	991	991	928		992	998	999	948		-10	-7	-8	-20	
-600	961	992	991	932		938	926	927	896		23	66	64	36	
-450	958	993	992	938		876	864	867	833		82	129	125	105	
-300	959	994	993	943	649	816	807	811	771	615	143	187	182	172	34
-150	959	995	993	949	682	749	732	735	706	619	210	263	258	243	63
0	960	996	994	955	704	673	651	653	635	587	287	345	341	320	117
150	961	996	994	960	712	728	702	703	700	629	233	294	291	260	83
300	961	996	994	966	717	871	898	898	855	687	90	98	96	111	30
450	962	996	993	953	720	888	914	913	862	704	74	82	80	91	16
600	963	995	992	973	722	906	929	928	900	716	57	66	64	73	6
750	963	994	991	974	723	922	945	943	919	728	41	49	48	55	-5
900	964	993	990	974	723	939	960	958	938	738	25	33	32	36	-15
1050	966	991	988	974	721	956	975	973	957	748	10	16	15	17	-27
1200	976	989	986	974	720	982	989	987	975	757	-6	0	-1	-1	-37
1350	985	991	992	973	717	997	1008	1010	992	766	-12	-17	-18	-19	-49
1500		998	999	971	712		1006	1007	1008	723		-8	-8	-37	-11
1650				968	707				978	717				-10	-10
1800				965	702				973	711				-8	-9
1950				962	696				969	703				-7	-7
2100				957	685				963	690				-6	-5
2250				950	671				955	676				-5	-5

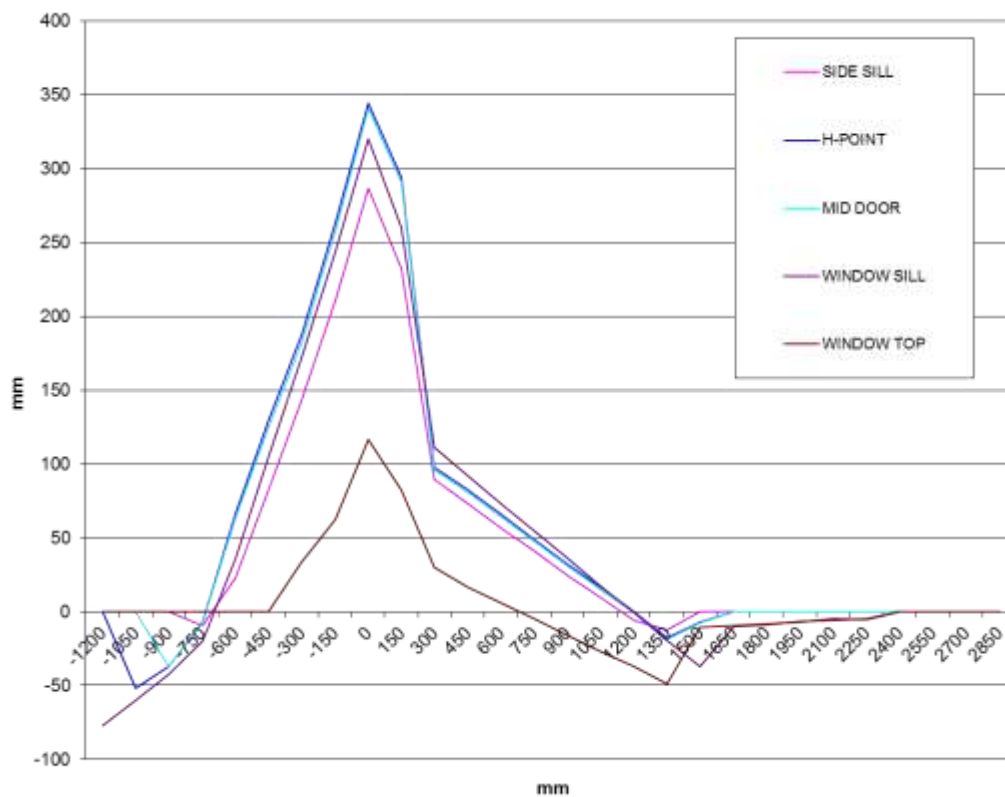
NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy’s head.

¹ The vertical impact reference line was set at (0, 0, 0) with the seat set mid track minus 20 mm per the COR.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2015 Toyota Sienna
Test Program: SPNCAP Side Impact

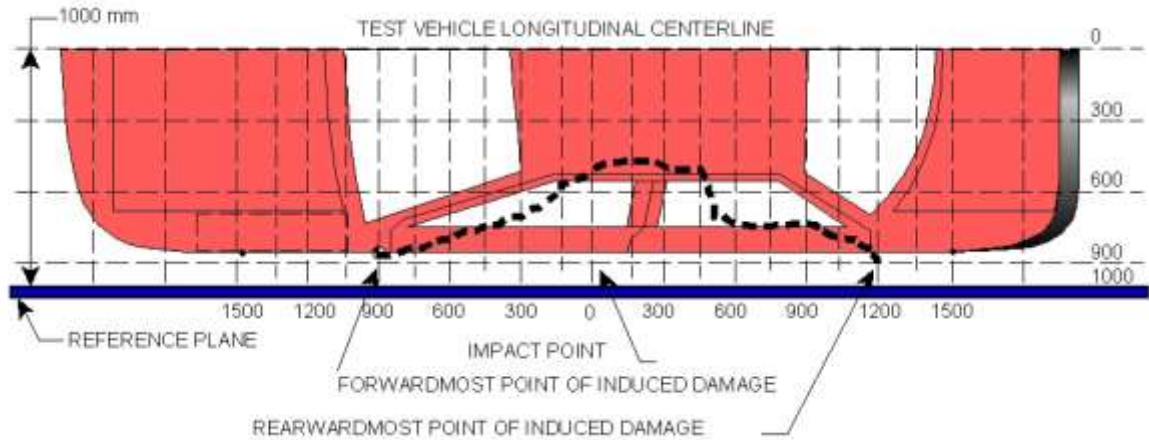
Test Date: 6/14/16



DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2015 Toyota Sienna
 Test Program: SPNCAP Side Impact

Test Date: 6/14/16



VEHICLE DAMAGE PROFILE DISTANCES¹

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	1050	4	657	974	0
2	750	4	919	974	55
3	450	4	862	953	91
4	0	2	651	996	345
5	-300	2	807	994	187
6	-600	2	926	992	0

¹ DPD defined as zero crush since the crush does not extend to the end of the vehicle.

DATA SHEET NO. 12

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA¹

Test Vehicle: 2015 Toyota Sienna
Test Program: SPNCAP Side Impact

Test Date: 6/14/16

¹ Temperature and humidity were not recorded

APPENDIX A
PHOTOGRAPHS



Figure A-1 As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



Figure A-2 As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle

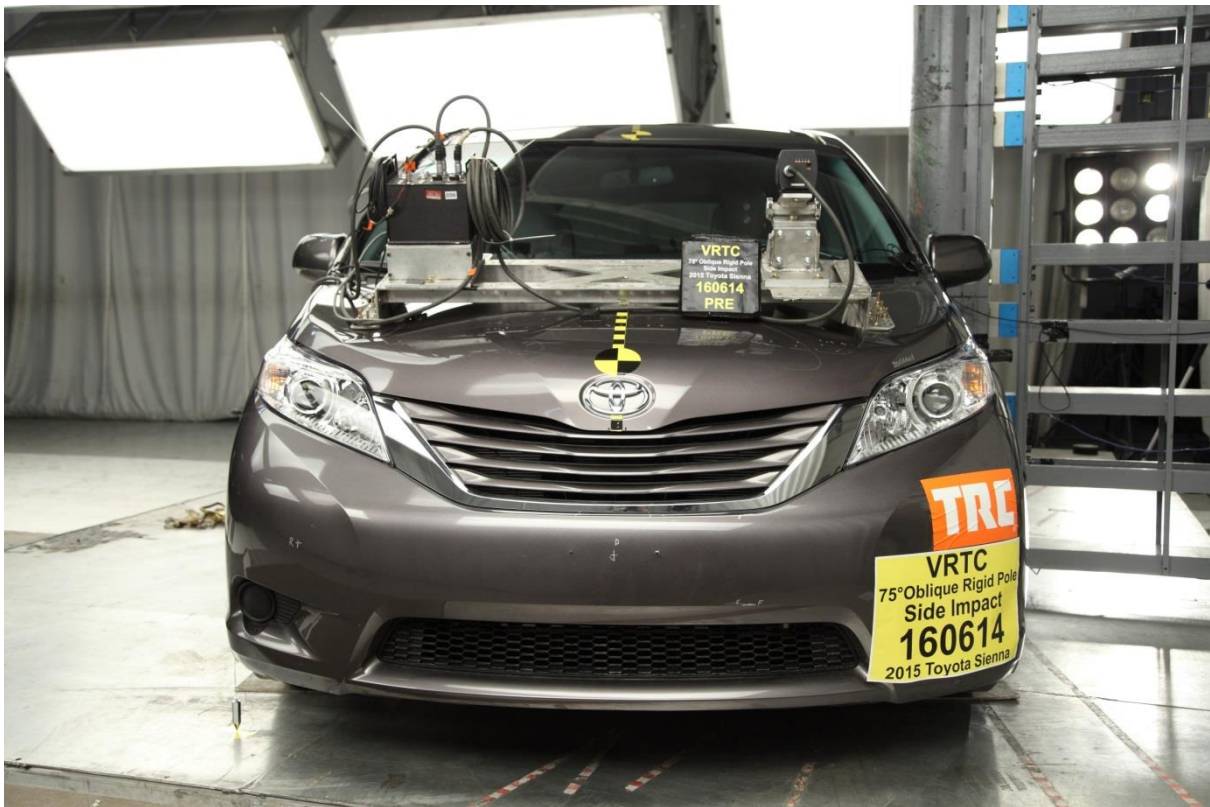


Figure A-3 Pre-Test Frontal View of Test Vehicle

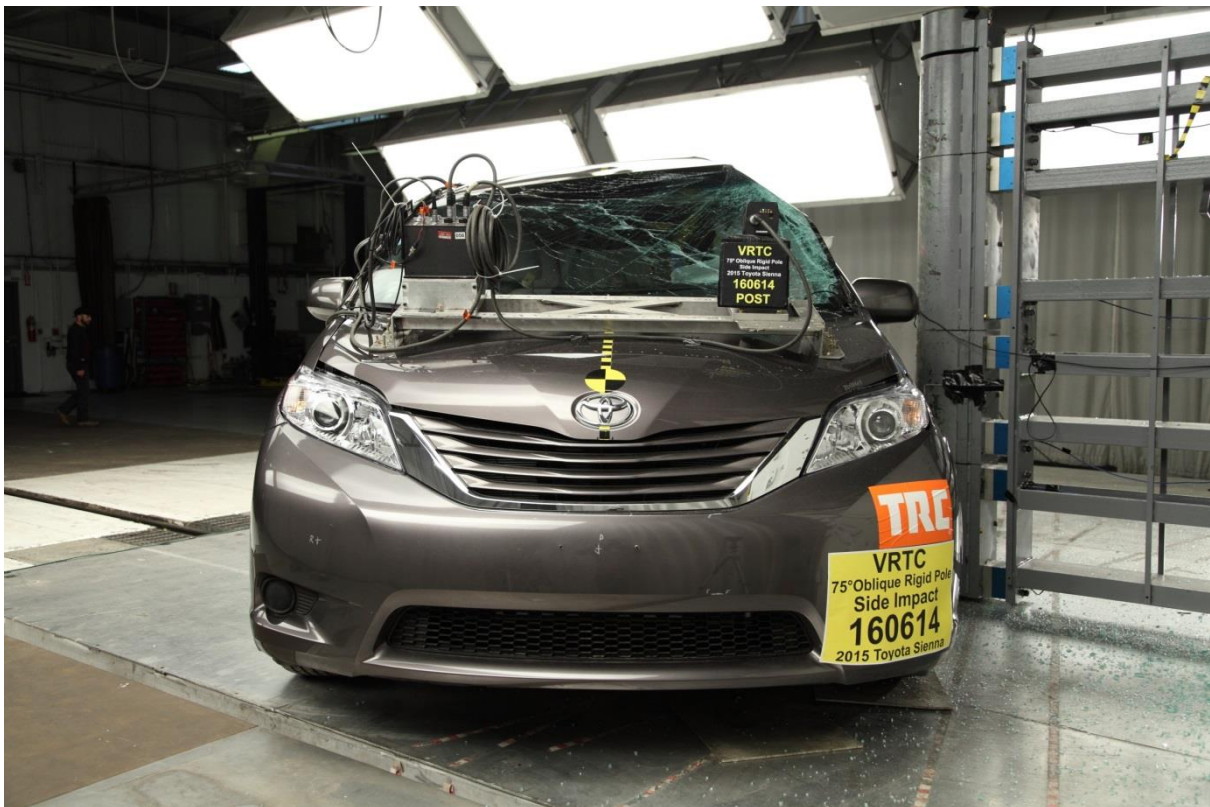


Figure A-4 Post-Test Frontal View of Test Vehicle



Figure A-5 Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



Figure A-6 Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



Figure A-7 Pre-Test Left Side View of Test Vehicle



Figure A-8 Post-Test Left Side View of Test Vehicle



Figure A-9 Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



Figure A-10 Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



Figure A-11 Pre-Test Rear View of Test Vehicle



Figure A-12 Post-Test Rear View of Test Vehicle



Figure A-13 Pre-Test Right Side View of Test Vehicle



Figure A-14 Post-Test Right Side View of Test Vehicle



Figure A-15 Pre-Test Overhead View of Test Area



Figure A-16 Post-Test Overhead View of Test Area



Figure A-17 Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



Figure A-18 Pre-Test Right Side View of Pole Positioned Against Side of Vehicle



Figure A-19 Pre-Test Close Up View of Impact Point Target



Figure A-20 Post-Test Close Up View of Impact Point Target Showing Impact Location



Figure A-21 Pre-Test Front Close Up View of Dummy Head and Chest



Figure A-22 Post-Test Front Close Up View of Dummy



Figure A-23 Pre-Test Left Side View of Dummy Showing Belt and Chalking

Intentionally Left Blank



Figure A-24 Pre-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-25 Post-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-26 Pre-Test Front View of Seat Back Prior to Dummy Positioning



Figure A-27 Pre-Test Front Close Up View of Dummy Head and Shoulders in Relation to Head Restraint



Figure A-28 Pre-Test Front View of Seat Pan Prior to Dummy Positioning



Figure A-29 Pre-Test Overhead View of Dummy Thighs on Seat Pan

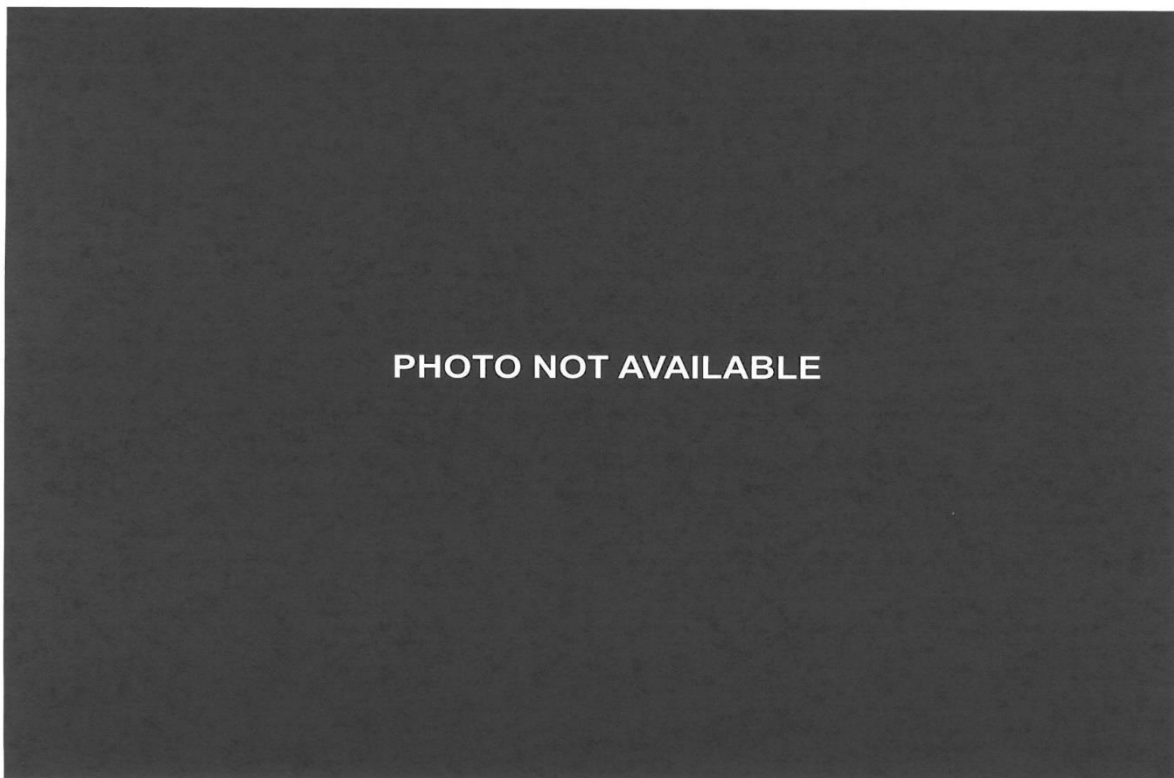


Figure A-30 Pre-Test Left Side View of Dummy Neck Showing Position of Adjustable Neck Bracket

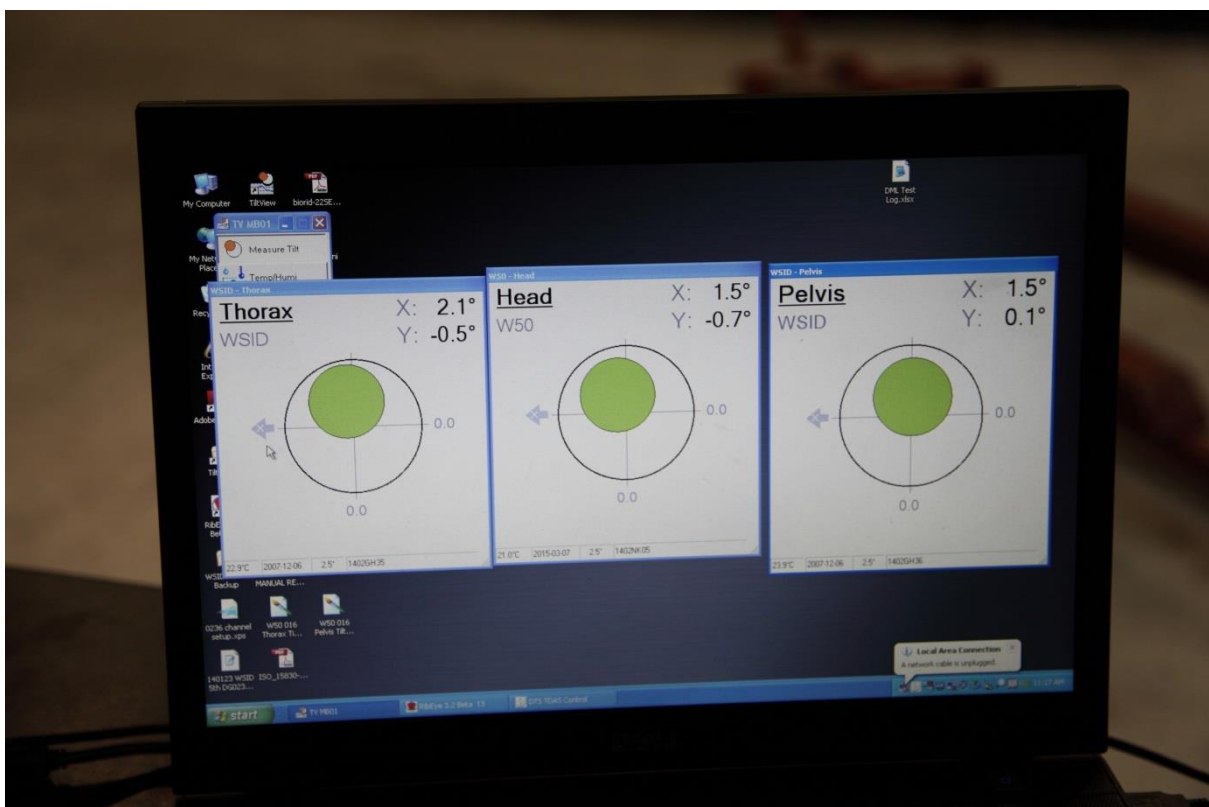


Figure A-31 Pre-Test Tilt Sensor View



Figure A-32 Pre-Test Placement of Dummy Feet



Figure A-33 Pre-Test View of Belt Anchorage for Dummy

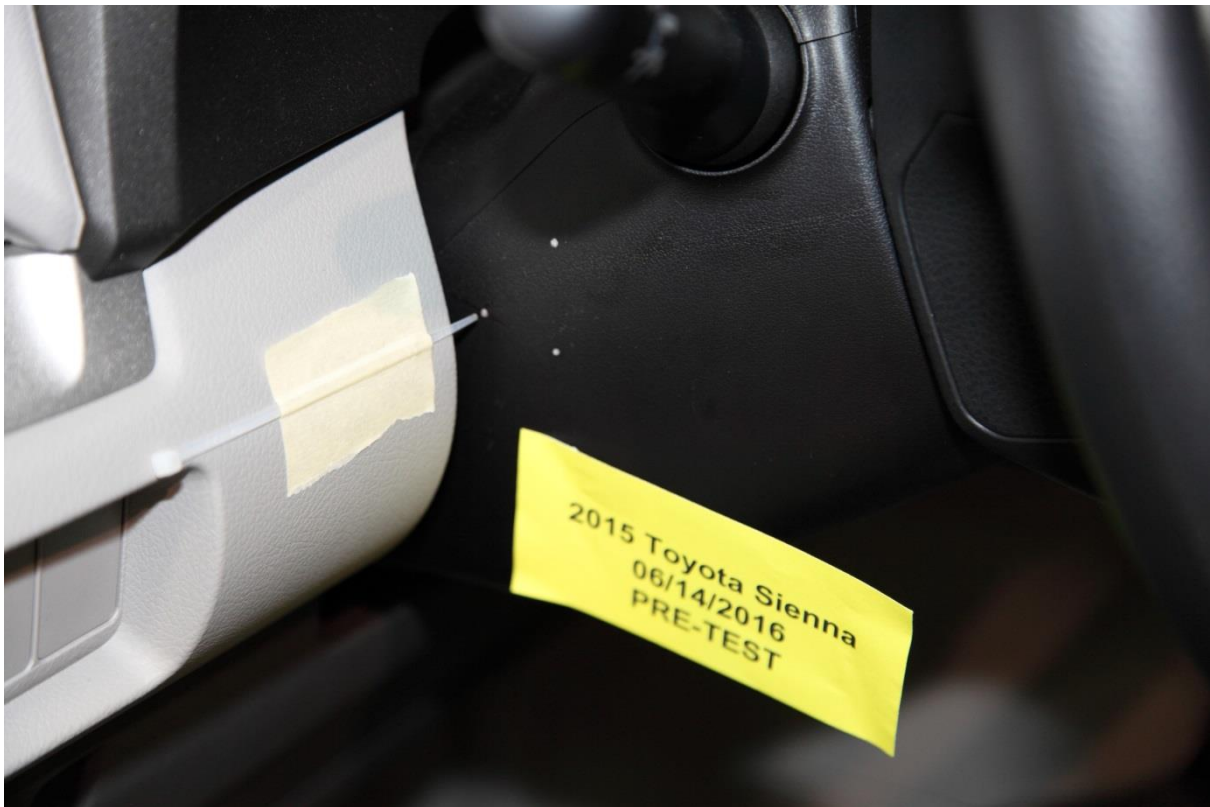


Figure A-34 Pre-Test Left Side View of Steering Wheel



Figure A-35 Pre-Test View of Disengaged Parking Brake



Figure A-36 Pre-Test View of Parking Brake



Figure A-37 Pre-Test Close Up Left Side View of Driver Seat Track



Figure A-38 Pre-Test Close-Up of Driver Head Restraint

Intentionally Left Blank



Figure A-39 Pre-Test Dummy and Door Clearance View



Figure A-40 Post-Test Dummy and Door Clearance View



Figure A-41 Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-42 Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-43 Pre-Test Inner Door Panel View



Figure A-44 Post-Test Inner Door Panel View

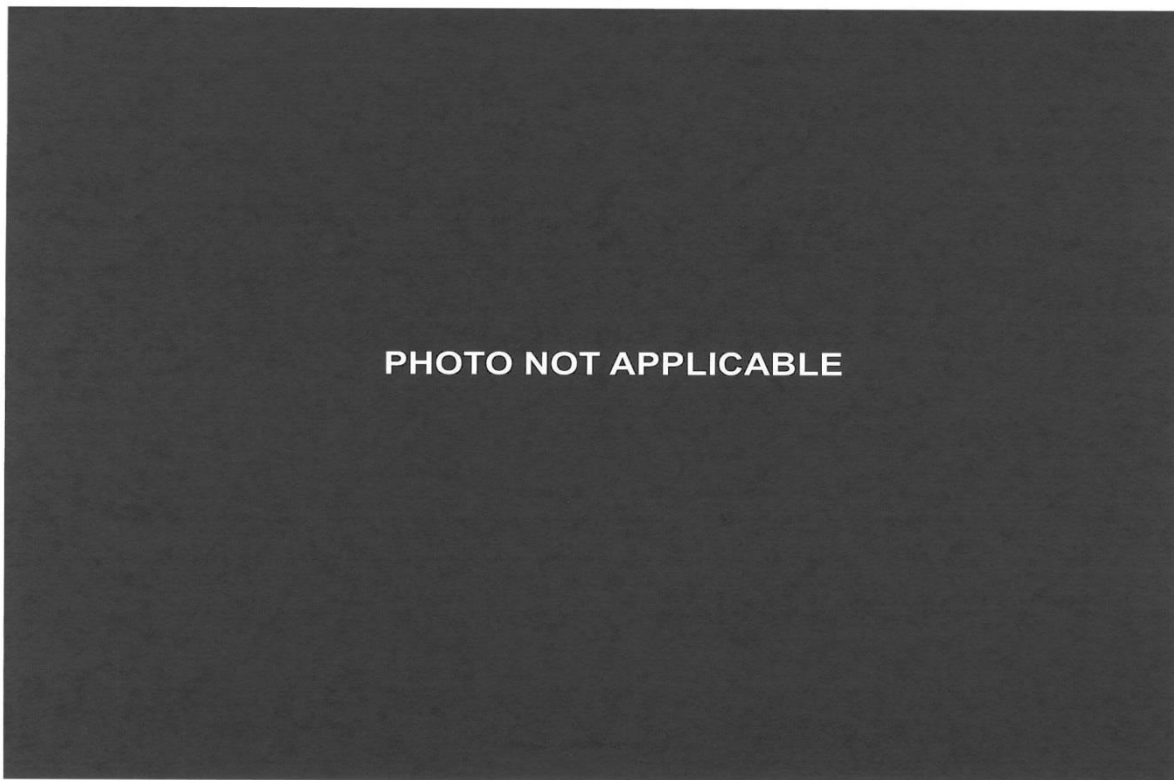


Figure A-45 Post-Test Dummy Close Up Head Contact with Vehicle Interior View



Figure A-46 Post-Test Dummy Close Up Head Contact with Side Airbag View



Figure A-47 Post-Test Dummy Close Up Torso Contact with Vehicle Interior View



Figure A-48 Post-Test Dummy Close Up Torso Contact with Side Airbag View



Figure A-49 Post-Test Dummy Close Up Pelvis Contact with Vehicle Interior View



Figure A-50 Post-Test Dummy Close Up Pelvis Contact with Side Airbag View



Figure A-51 Post-Test Dummy Close Up Knee Contact with Vehicle Interior View



Figure A-52 Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-53 Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-54 Close-Up View of Vehicle Certification Label



Figure A-55 Close-Up View of Vehicle Tire Information Placard or Label



Figure A-56 Close-Up View of Load Capacity Label

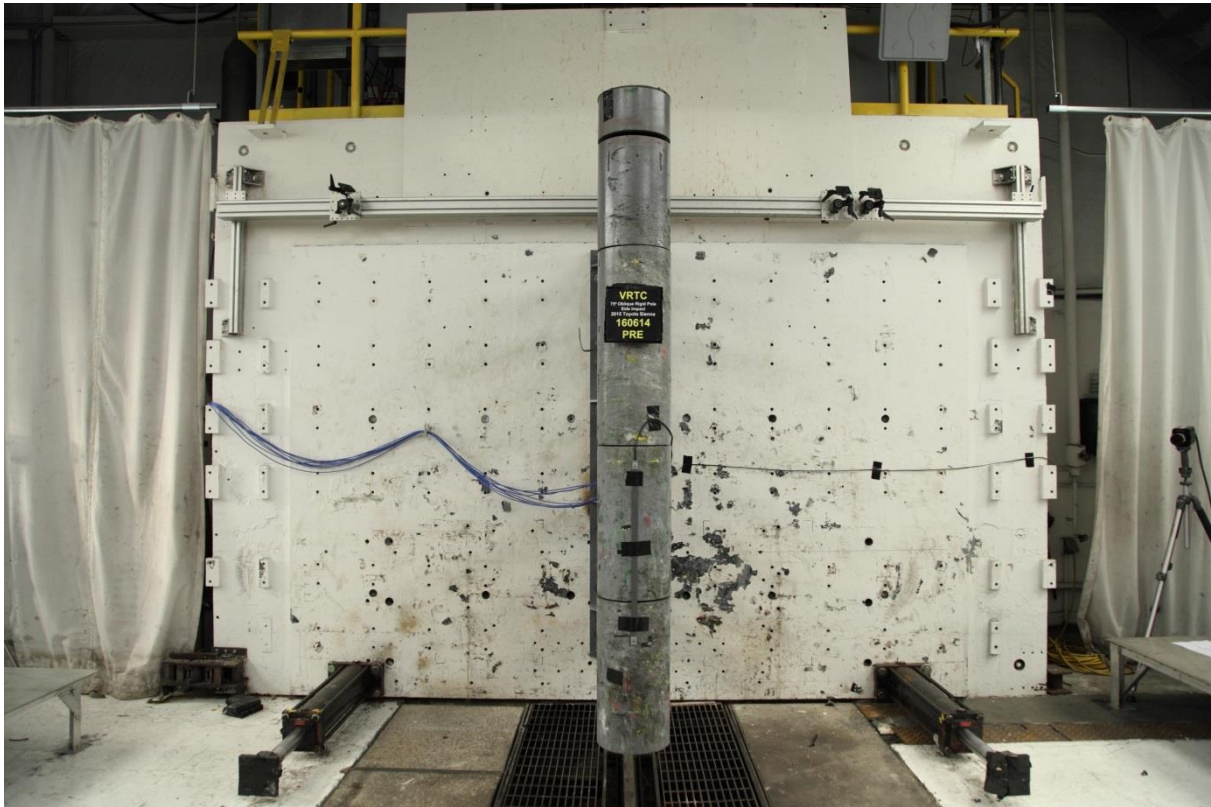


Figure A-57 Pre-Test Pole Barrier Front View



Figure A-58 Post-Test Pole Barrier Front View

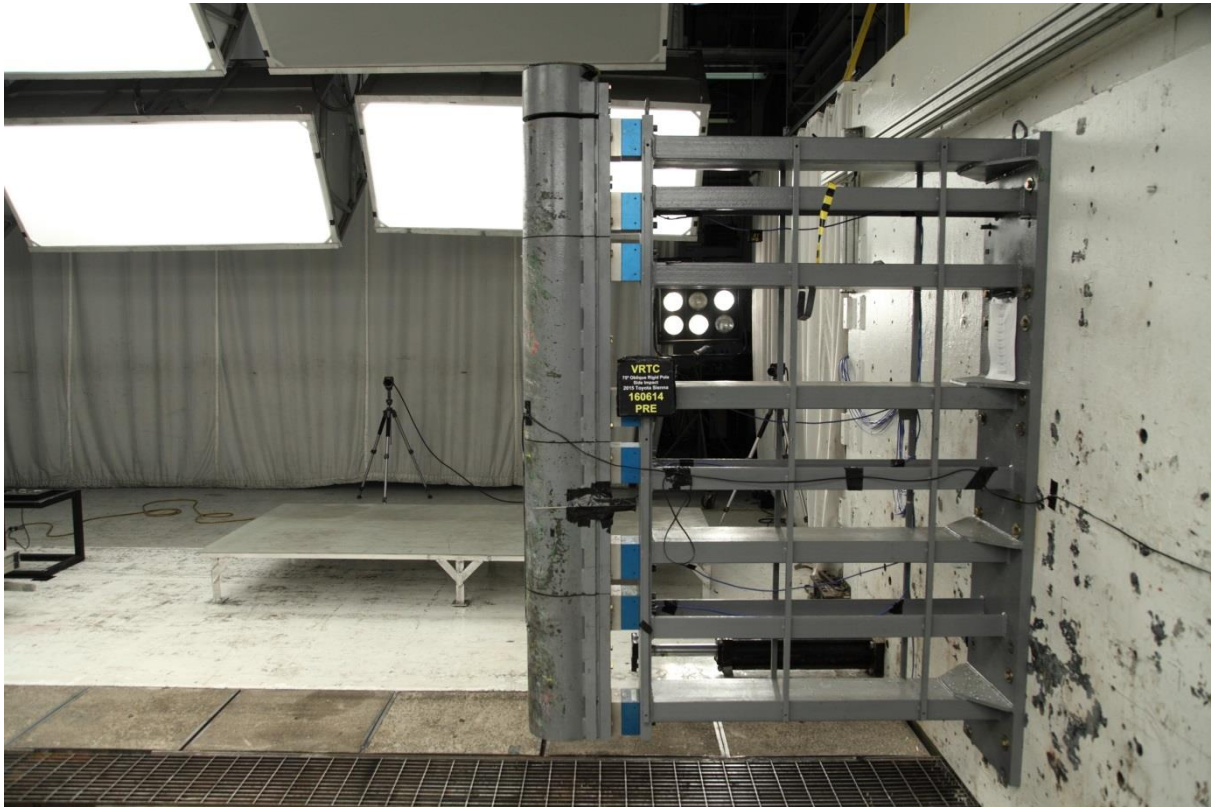


Figure A-59 Pre-Test Pole Barrier Side View

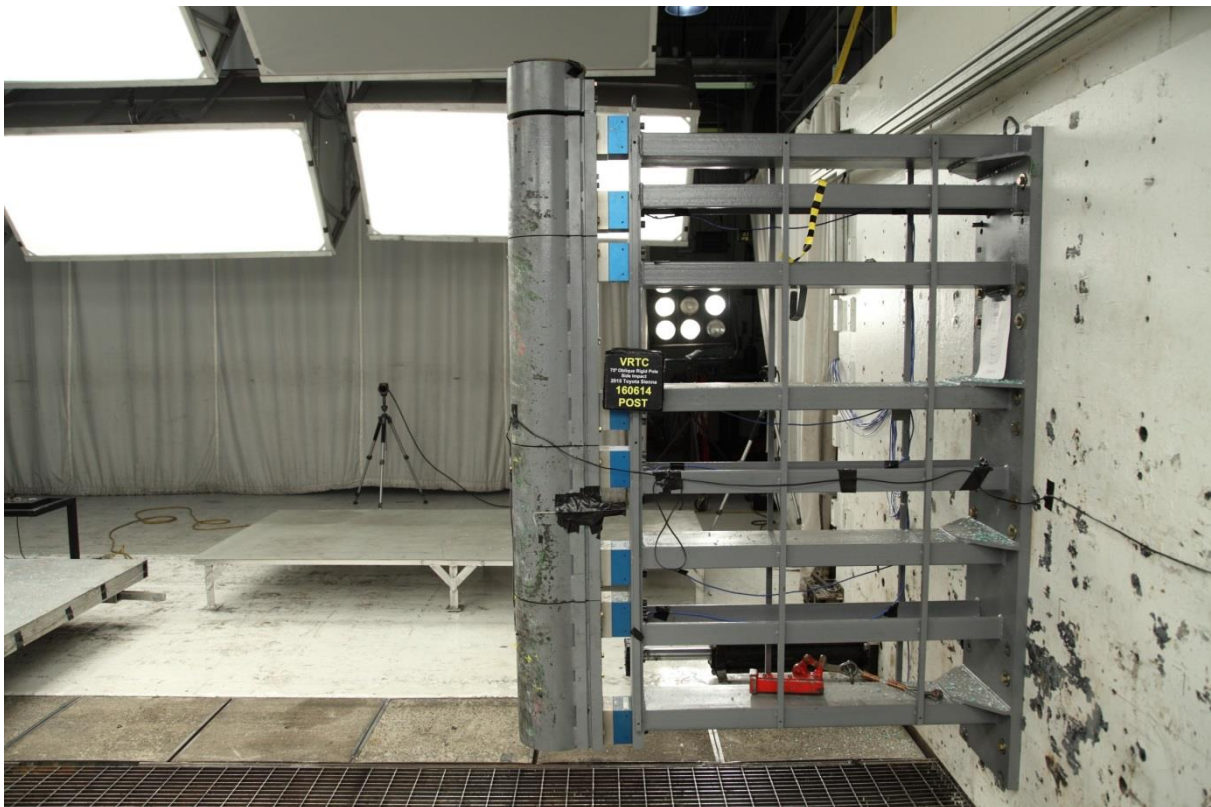


Figure A-60 Post-Test Pole Barrier Side View



Figure A-61 Pre-Test Ballast View

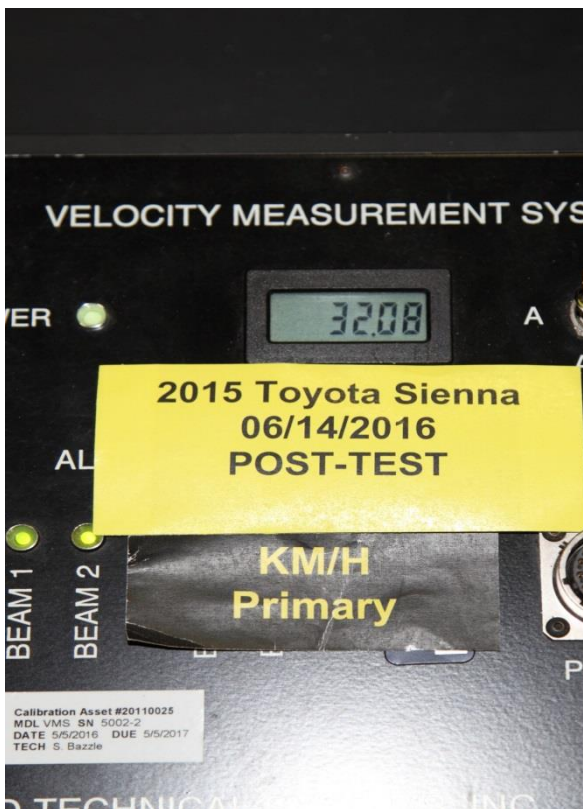


Figure A-62 Post-Test Primary and Redundant Speed Trap Read Out



Figure A-63 Impact Event

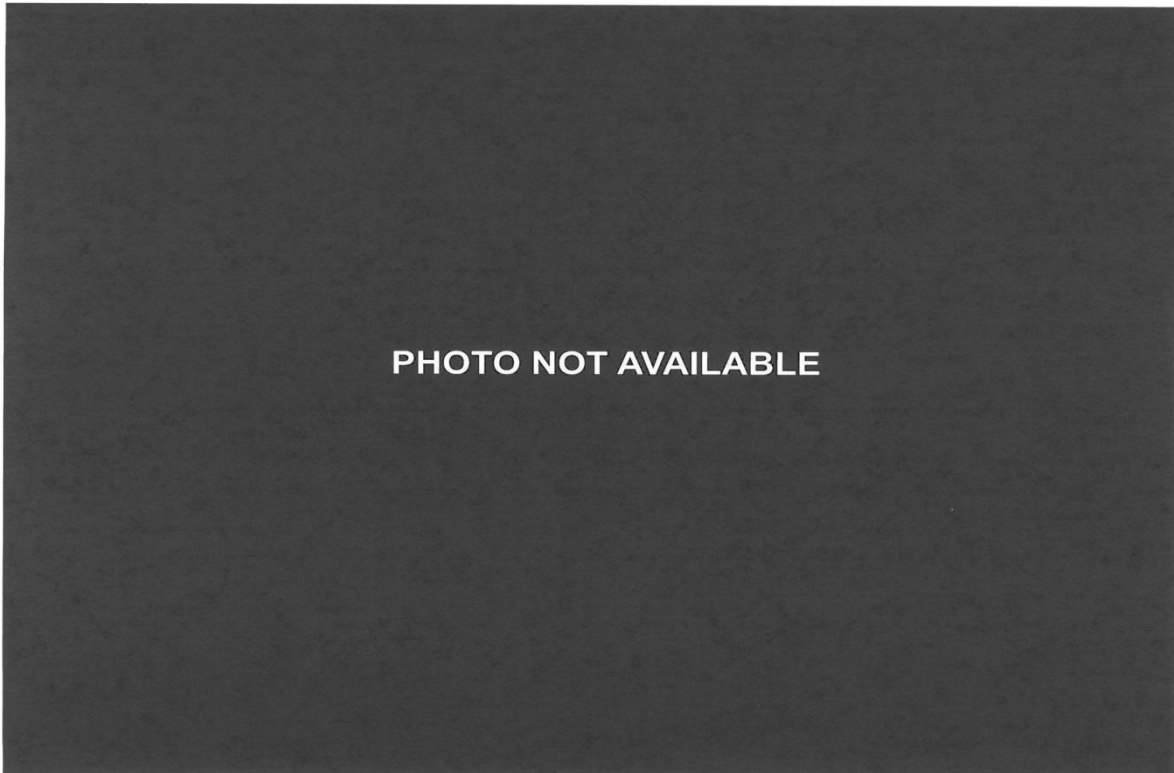


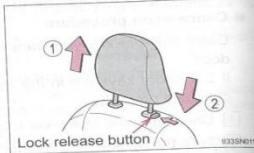
Figure A-64 Monroney Label

Head restraints

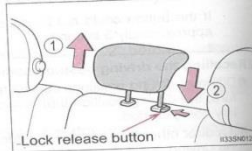
Head restraints are provided for all seats.

Front and second outside seats

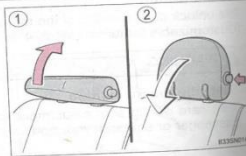
- ① Up
Pull the head restraints up.
- ② Down
Push the head restraint down while pressing the lock release button.

**Second center* and third center seats**

- ① Up
Pull the head restraints up.
 - ② Down
Push the head restraint down while pressing the lock release button.
- *: 8-passenger models only

**Third outside seats**

- ① To use
Pull the head restraints up.
- ② To fold
Press the button.

**Removing the head restraints****► Front and second outside seats**

Pull the head restraint up while pressing the lock release button.

**► Second center* and third center seats**

Pull the head restraint up while pressing the lock release button.

*: 8-passenger models only

**► Third outside seats**

The head restraint cannot be removed.

Figure A-65 Head Restraint Use and Adjustment Information from Vehicle Owner Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS



2015 Toyota Sienna WorldSID Side Pole Impact

Head X-Axis Acceleration

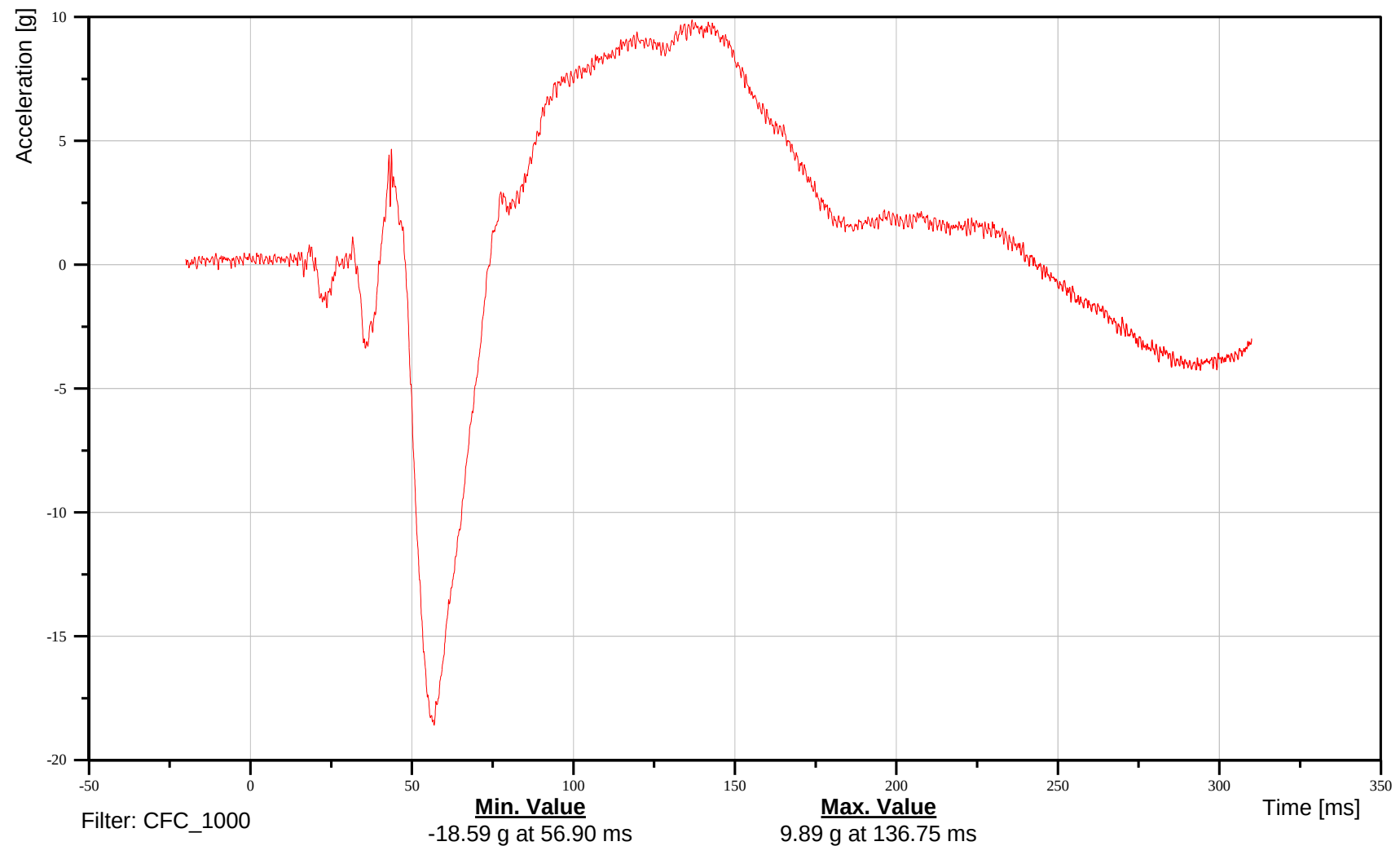
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11HEADCG00WSACXA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Head Y-Axis Acceleration

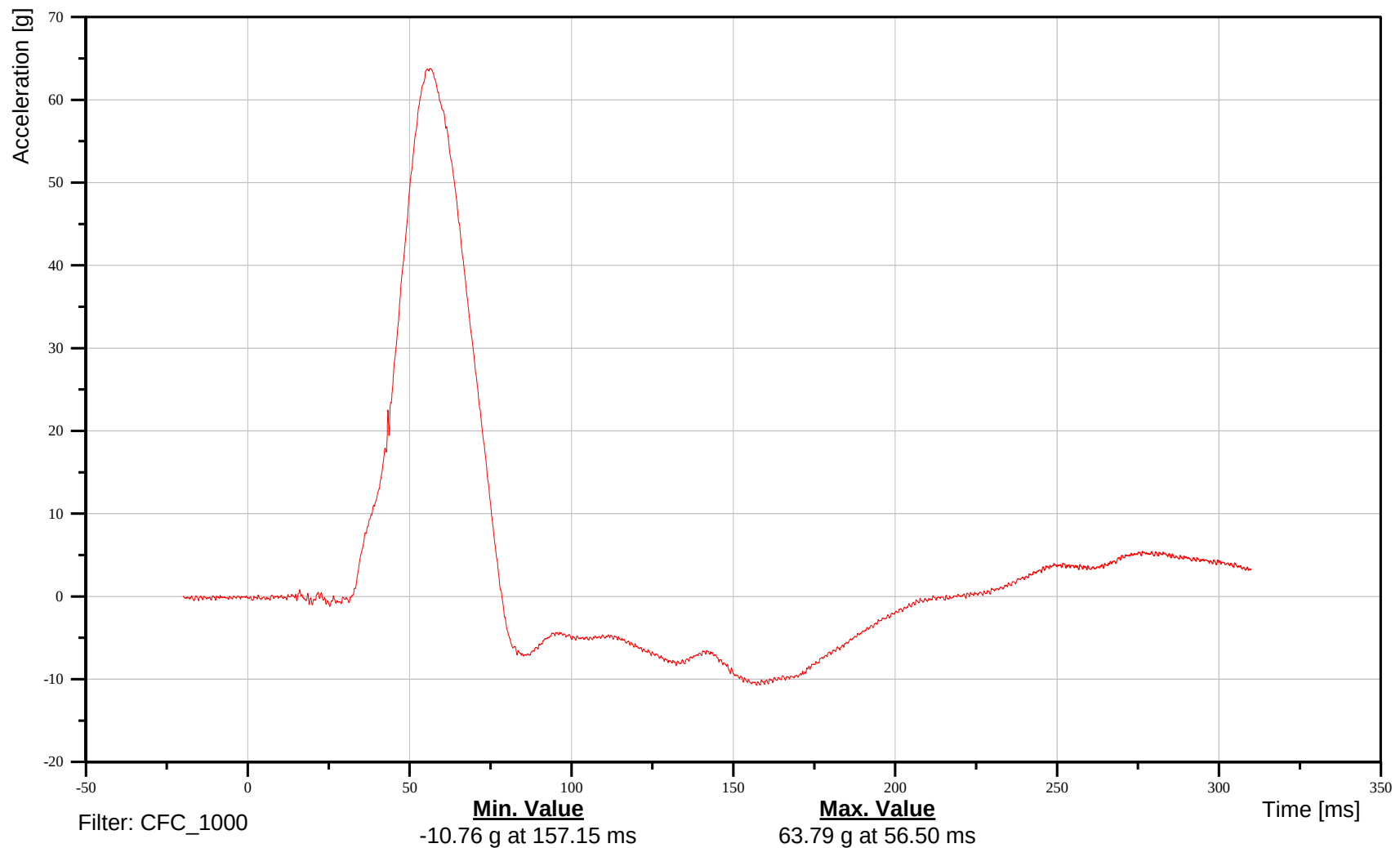
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Time: 14:31

Customer: VRTC

11HEADCG00WSACYA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Head Z-Axis Acceleration

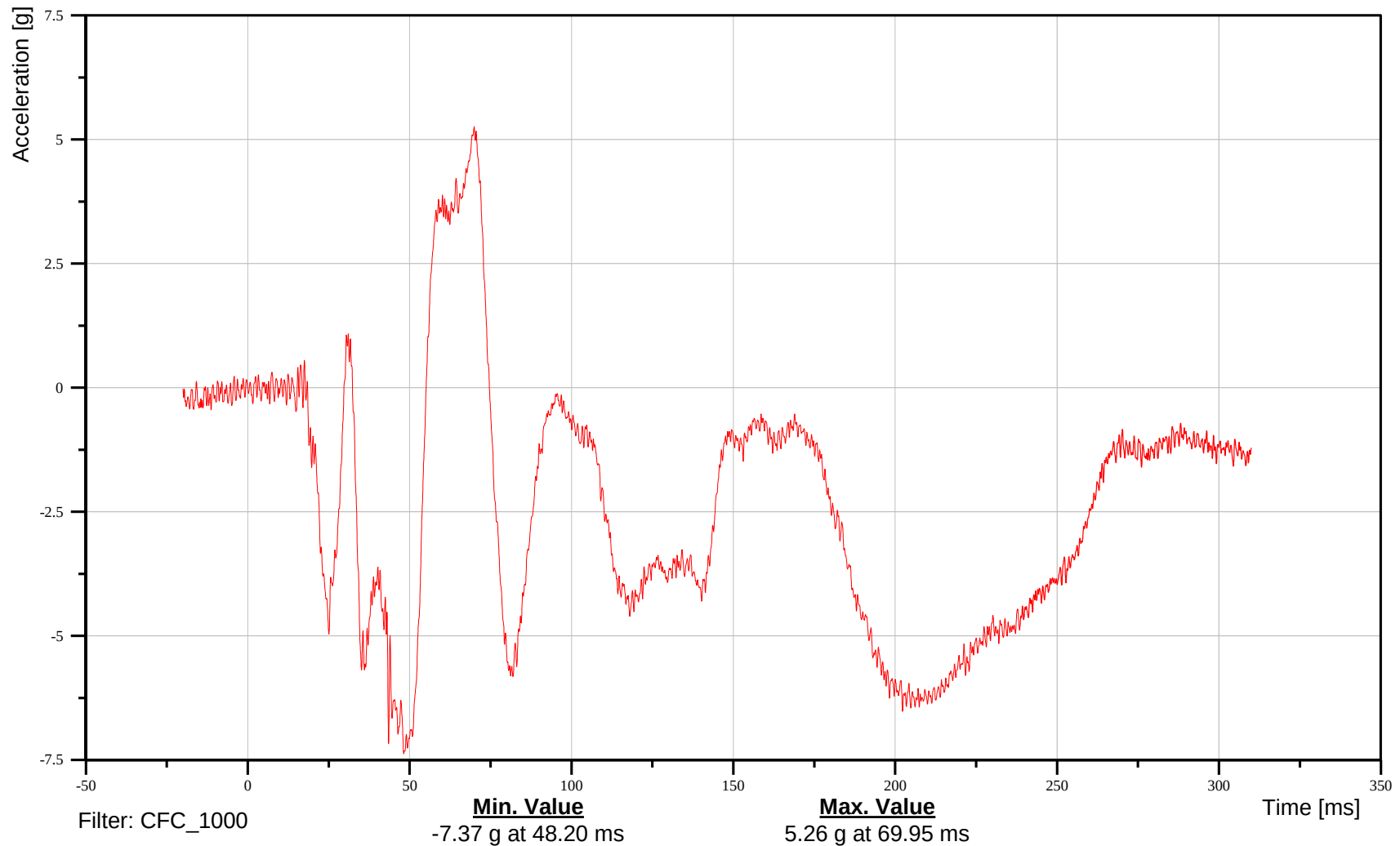
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11HEADCG00WSACZA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Head A Resultant

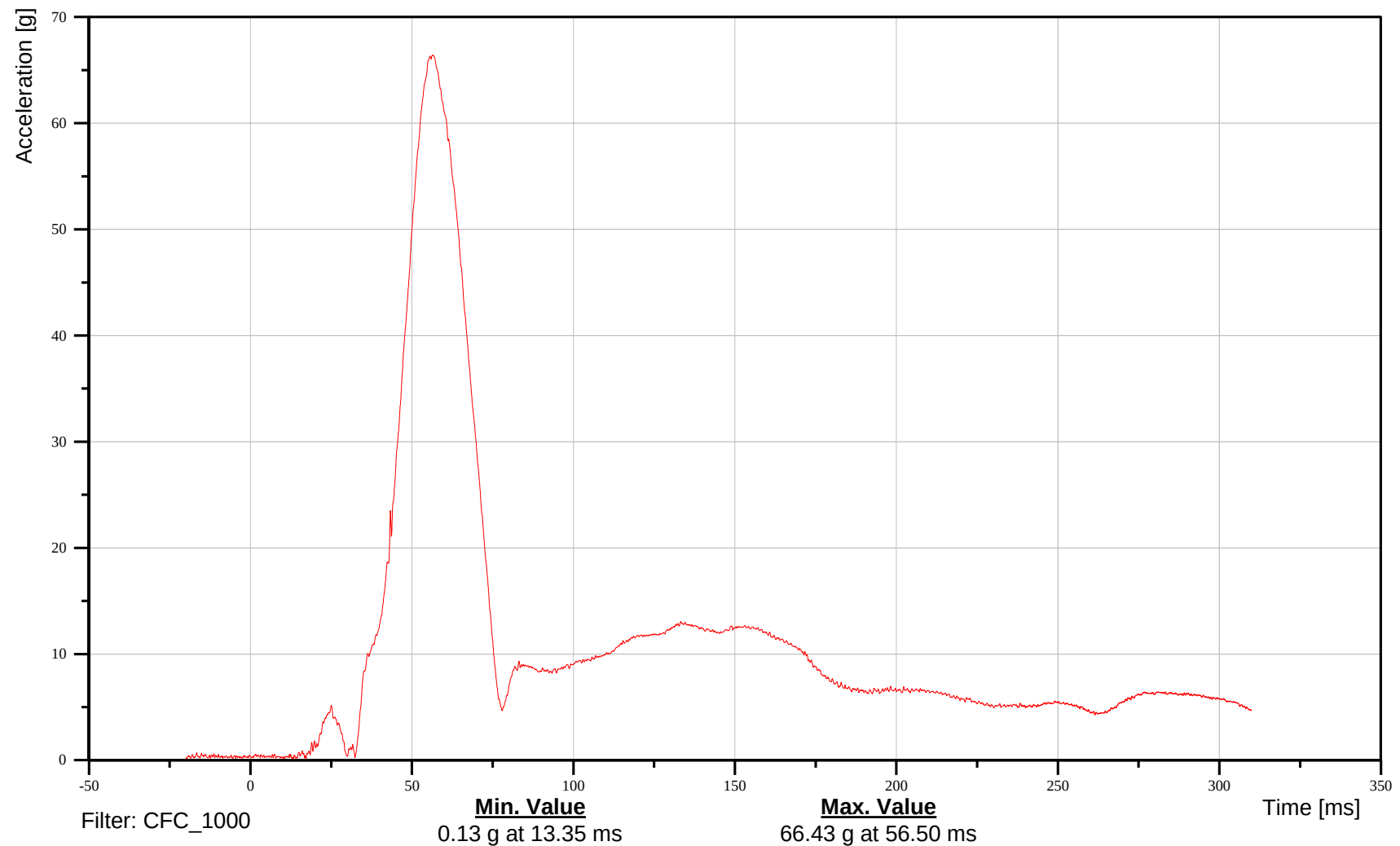
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11HEADCG00WSACRA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Head X-Axis Angular Velocity

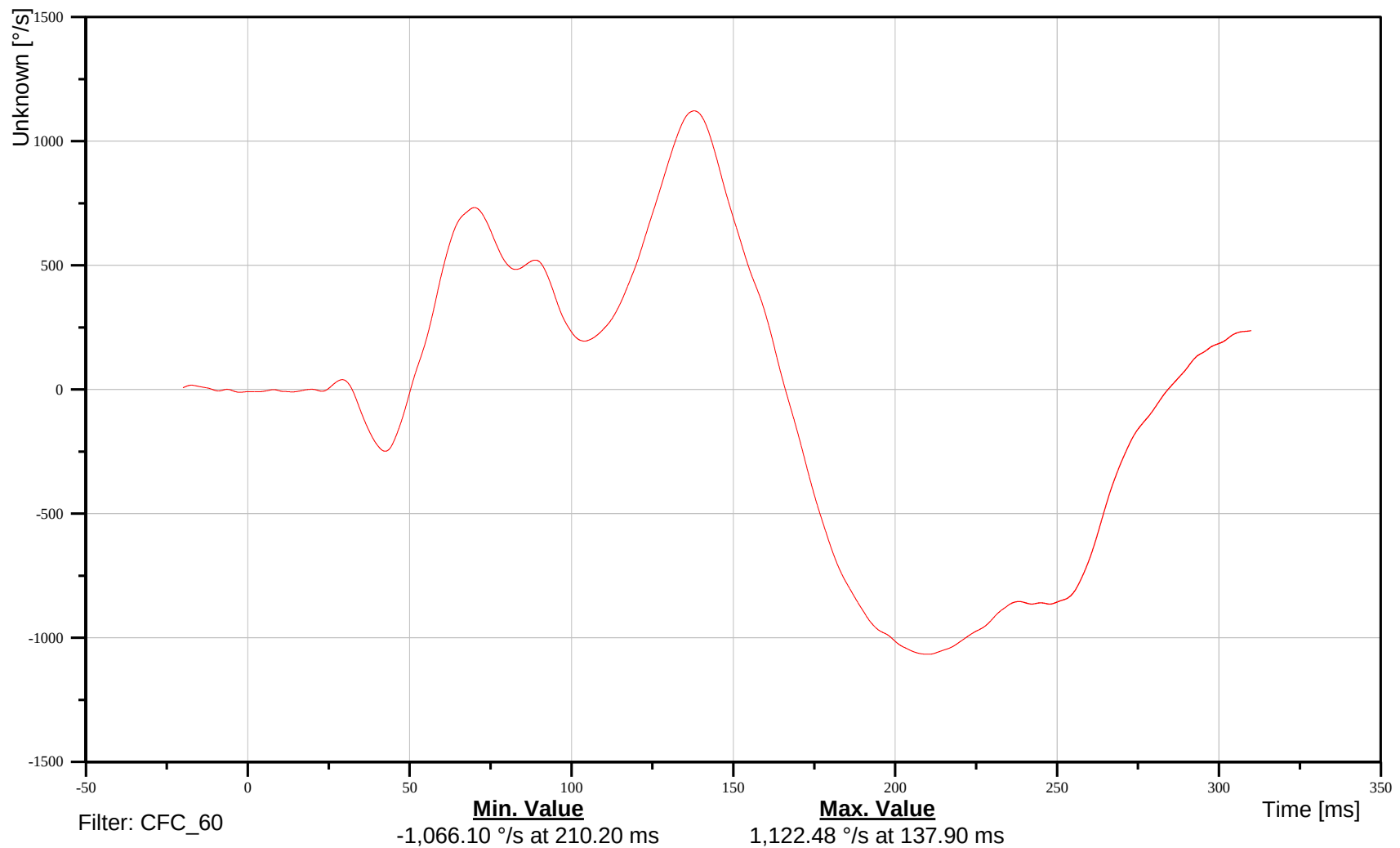
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11HEADCG00WSAVXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Head Y-Axis Angular Velocity

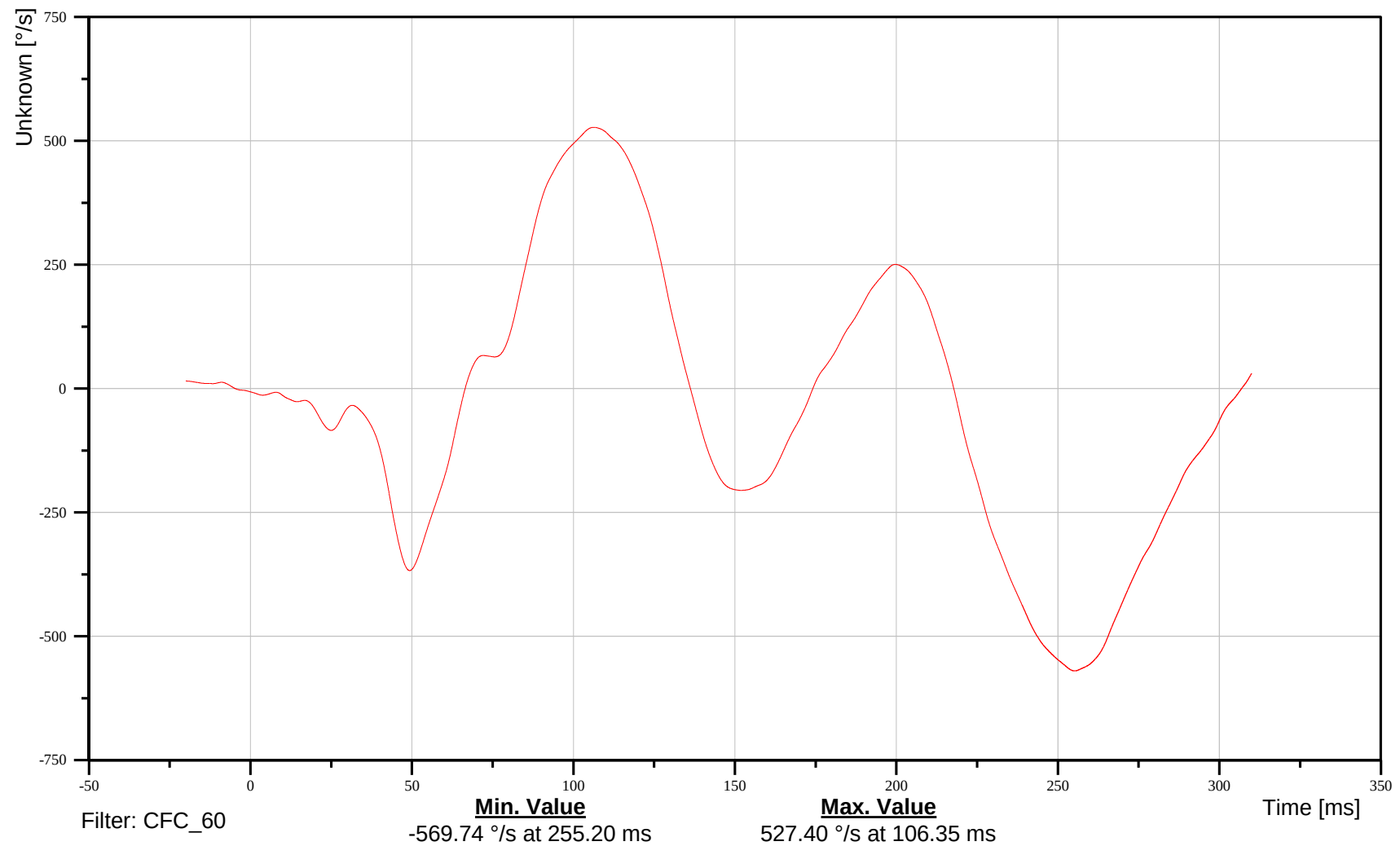
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Time: 14:31

Customer: VRTC

11HEADCG00WSAVYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Head Z-Axis Angular Velocity

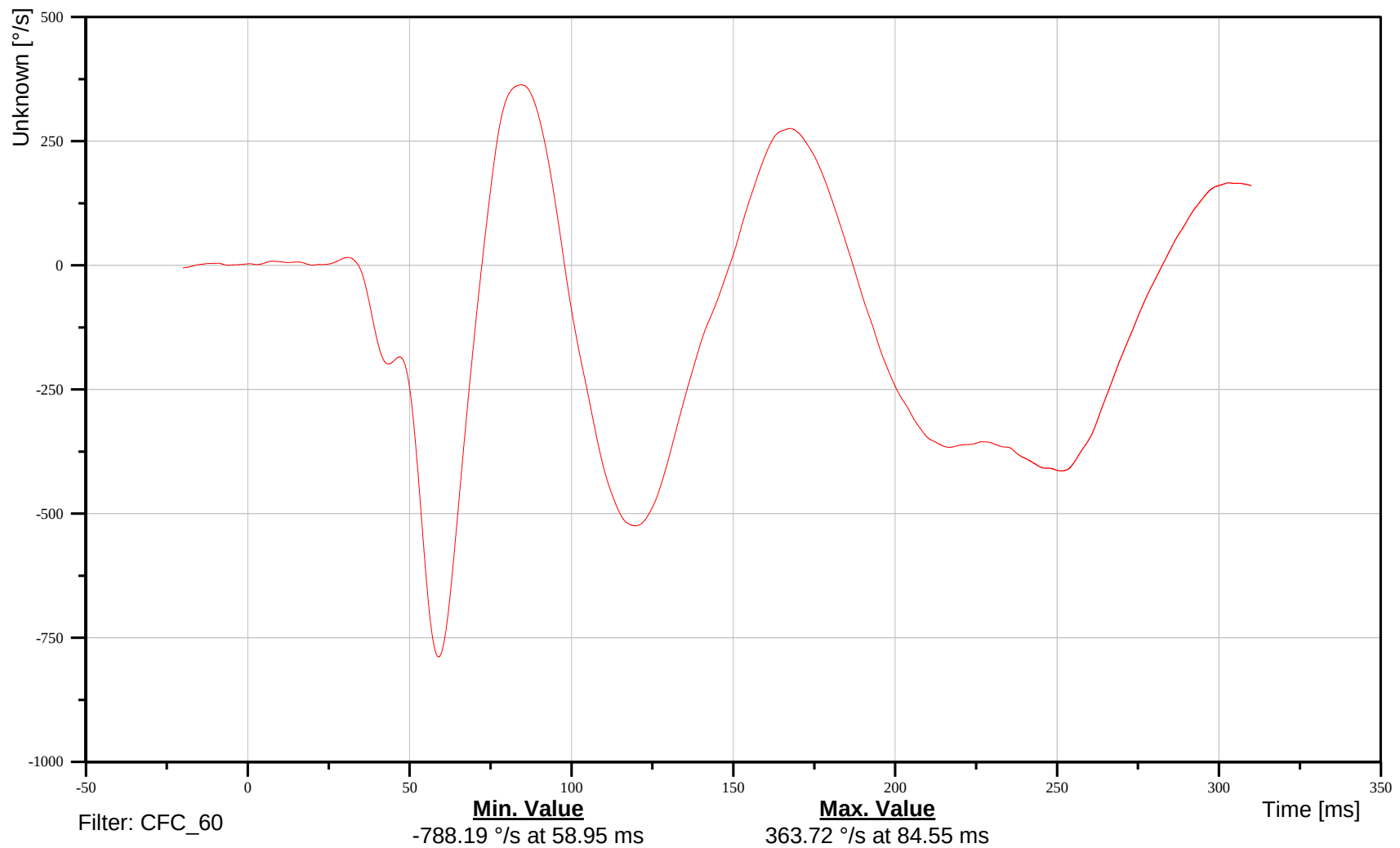
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Time: 14:31

Customer: VRTC

11HEADCG00WSAVZD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Upper Neck X-Axis Force

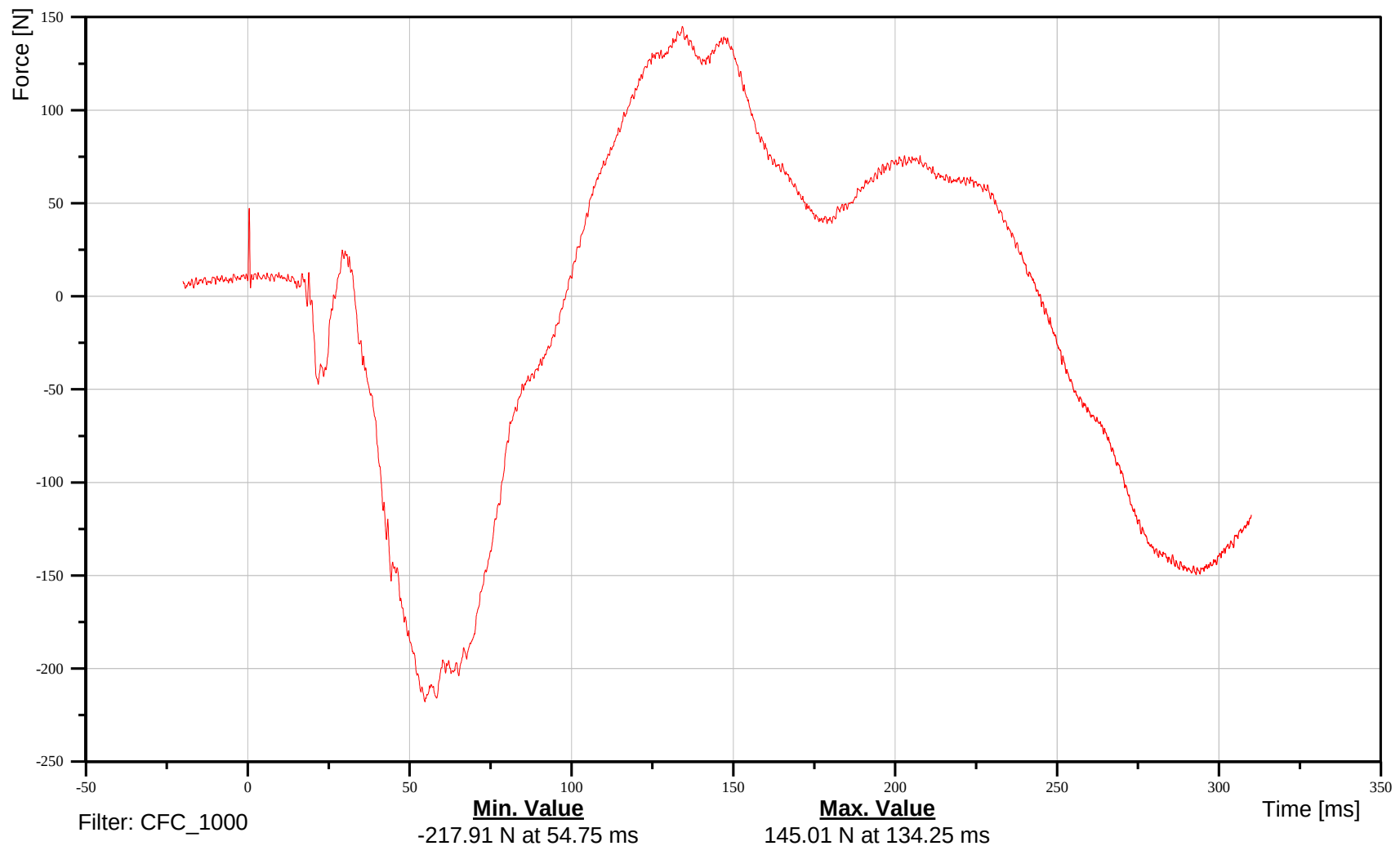
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11NECKUP00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Upper Neck Y-Axis Force

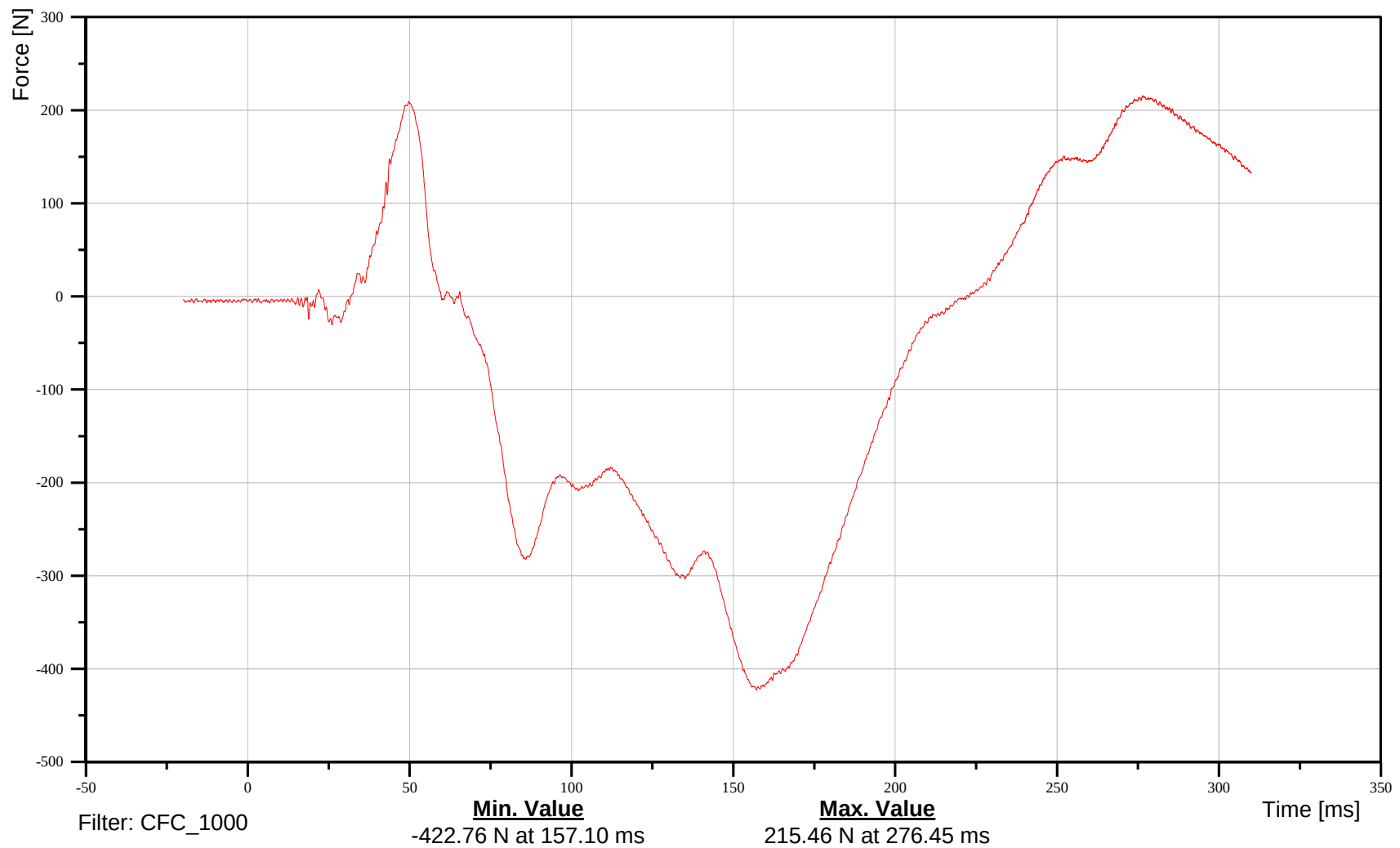
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Time: 14:31

Customer: VRTC

11NECKUP00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Upper Neck Z-Axis Force

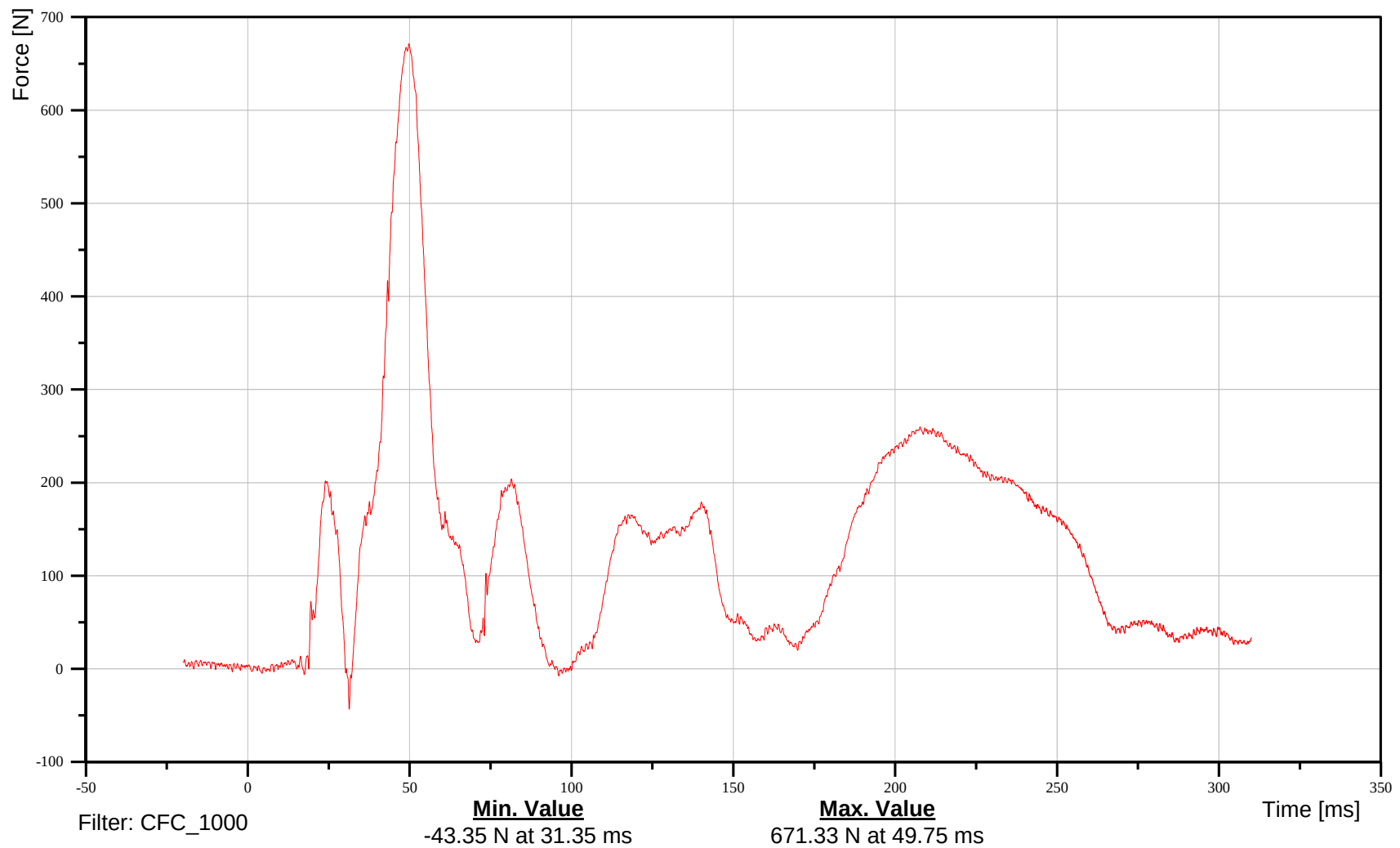
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Time: 14:31

Customer: VRTC

11NECKUP00WSFOZA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Upper Neck Moment About X Axis

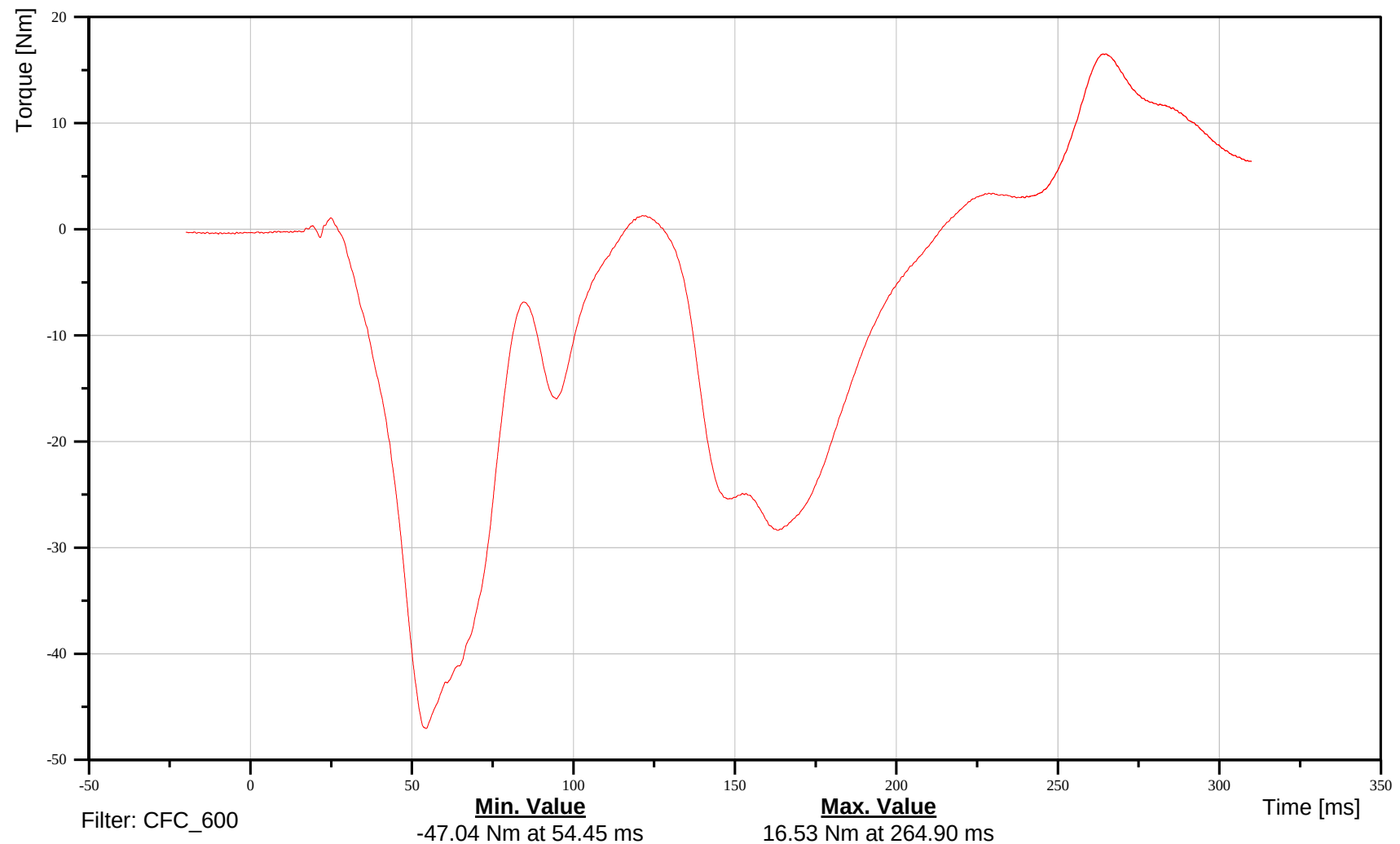
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Time: 14:31

Customer: VRTC

11NECKUP00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Upper Neck Moment About Y Axis

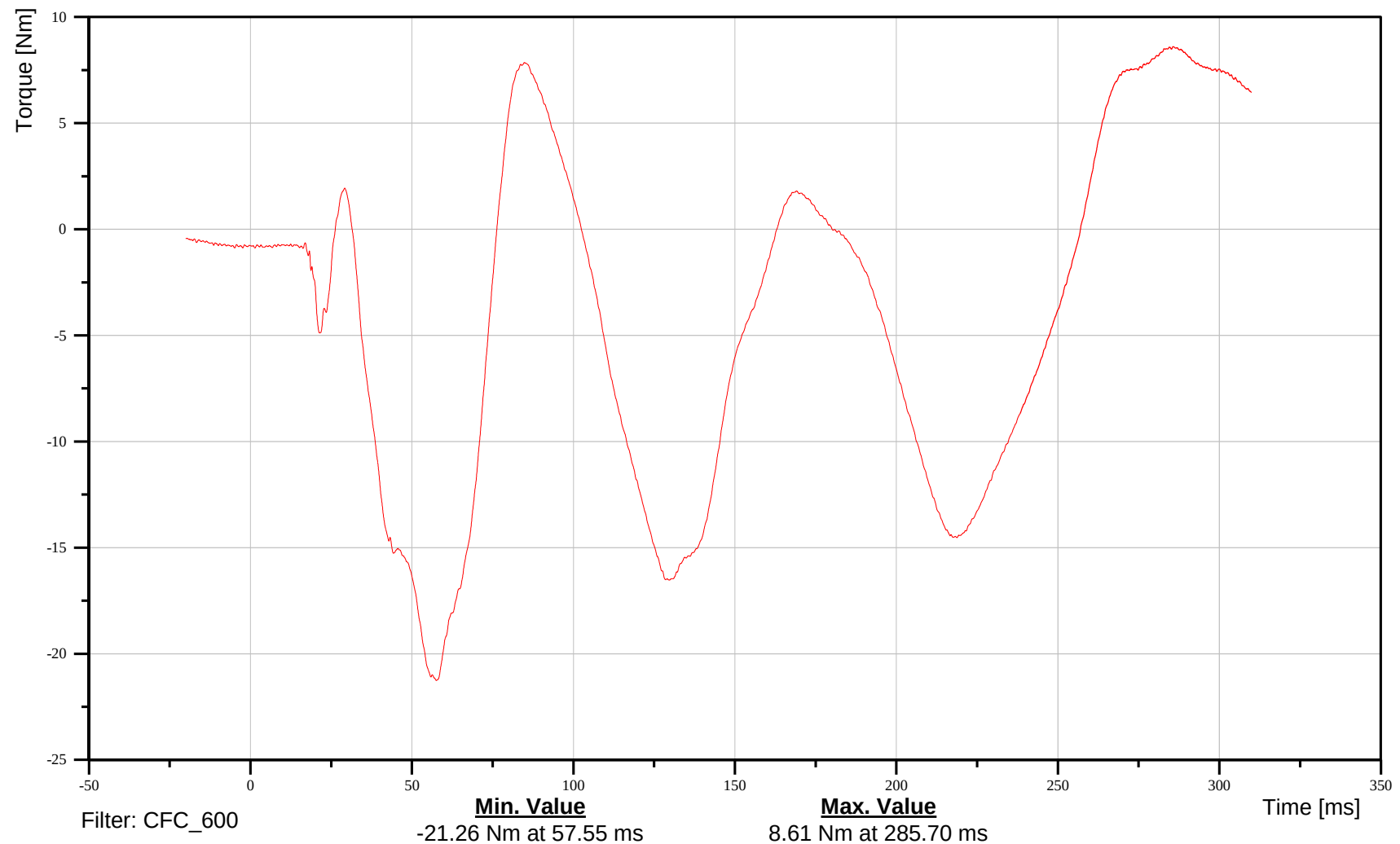
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Time: 14:31

Customer: VRTC

11NECKUP00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Upper Neck Moment About Z Axis

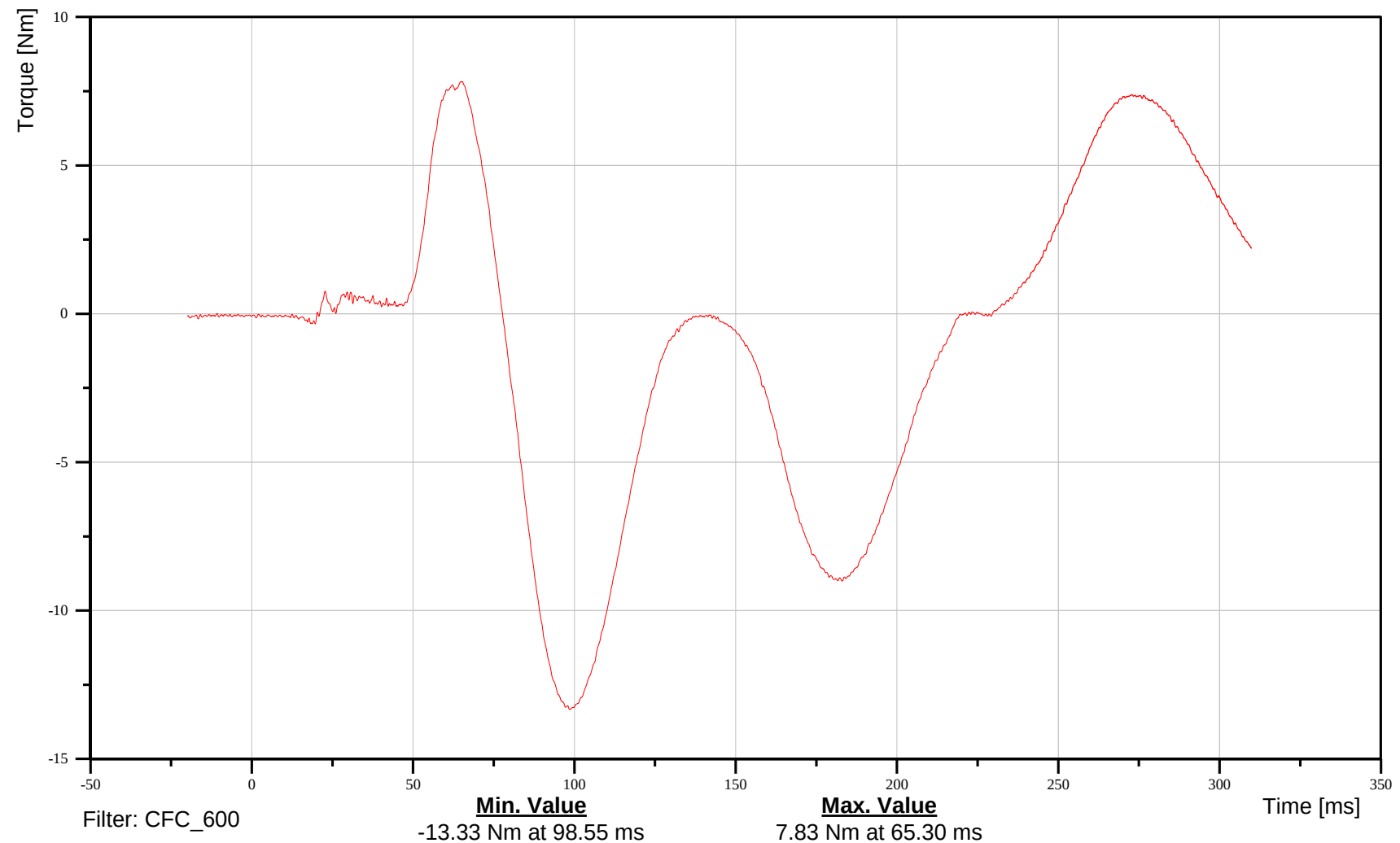
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Time: 14:31

Customer: VRTC

11NECKUP00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lower Neck X-Axis Force

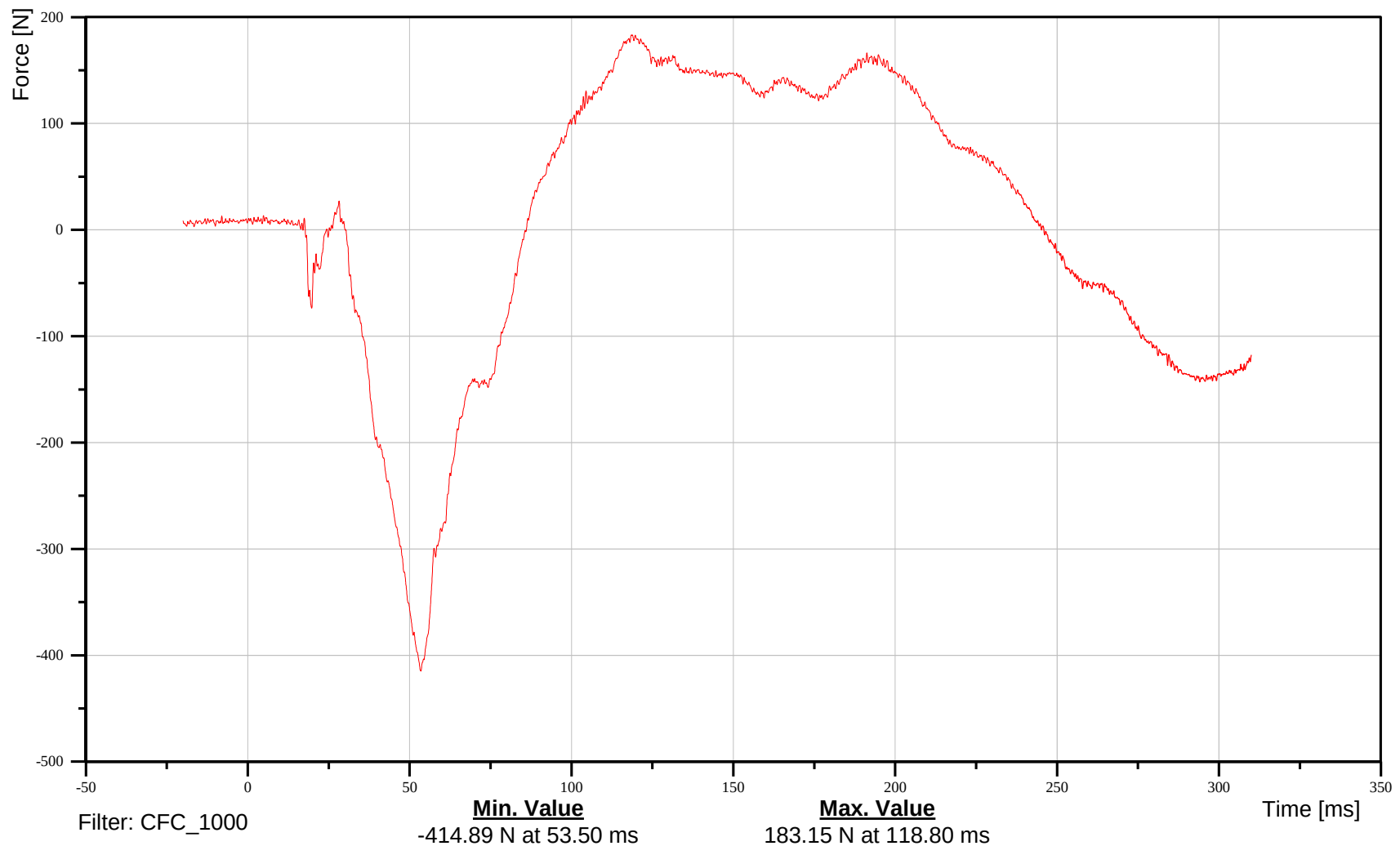
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Time: 14:31

Customer: VRTC

11NECKLO00WSFOXA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lower Neck Y-Axis Force

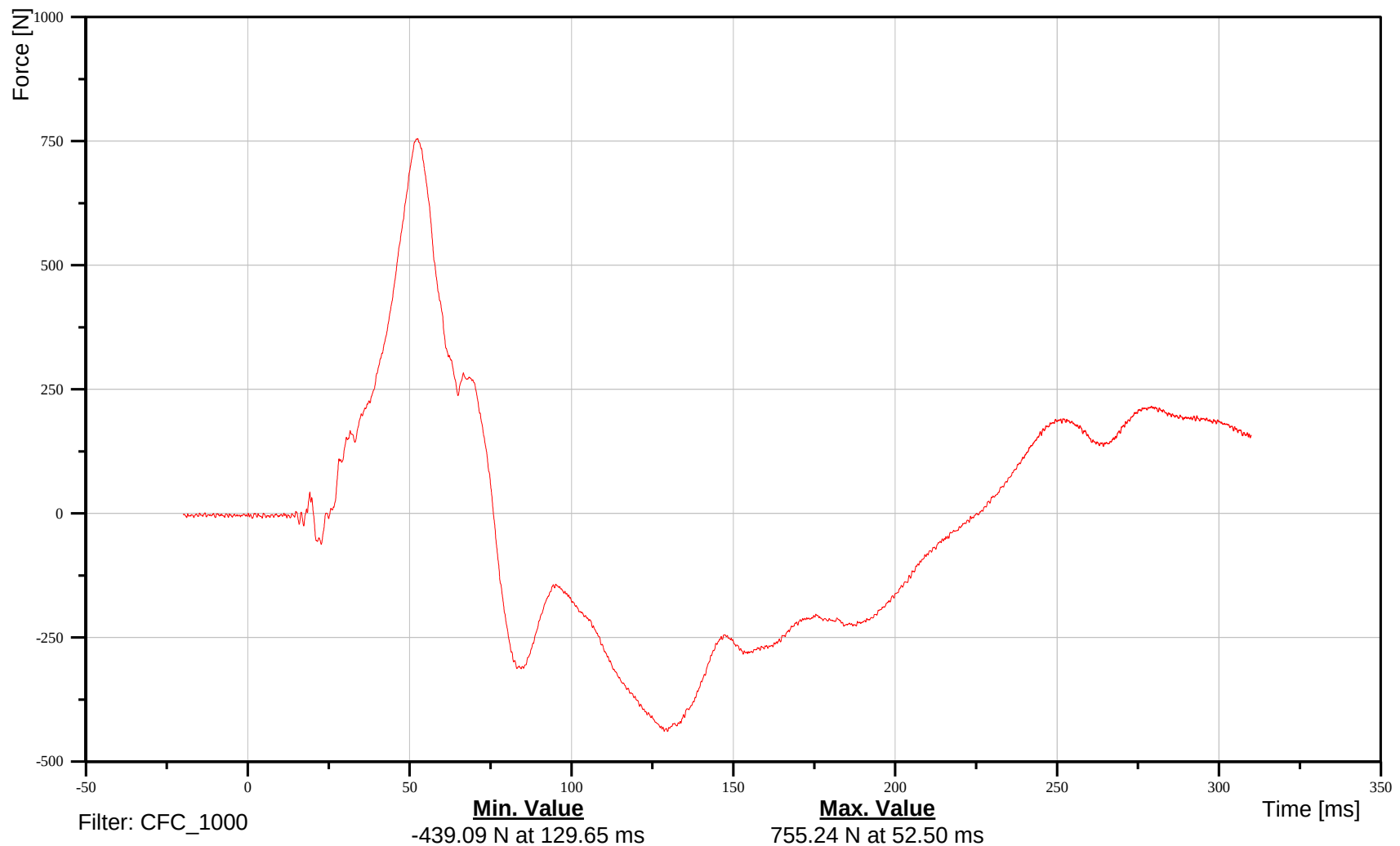
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Time: 14:31

Customer: VRTC

11NECKLO00WSFOYA

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lower Neck Z-Axis Force

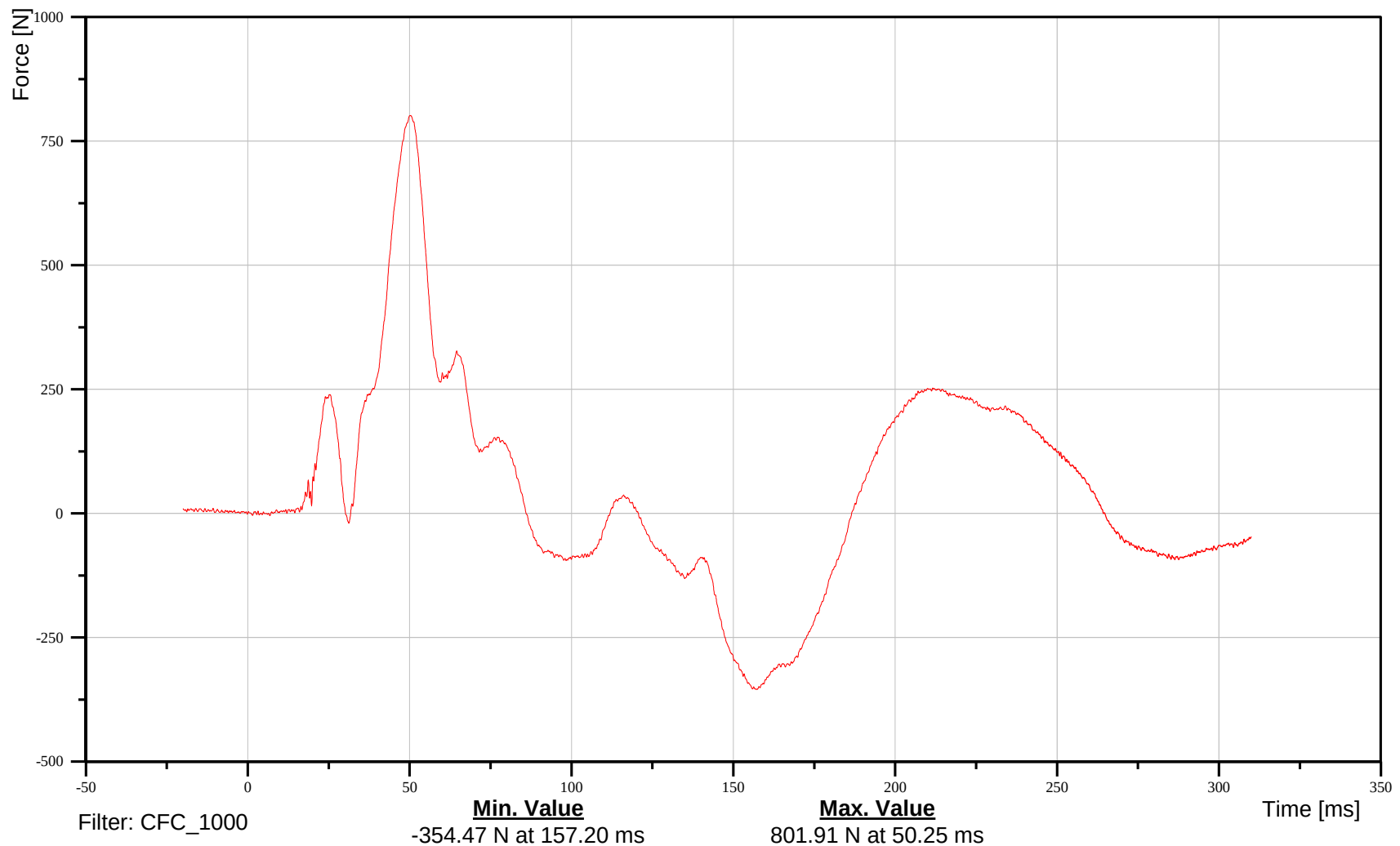
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Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lower Neck Moment About X Axis

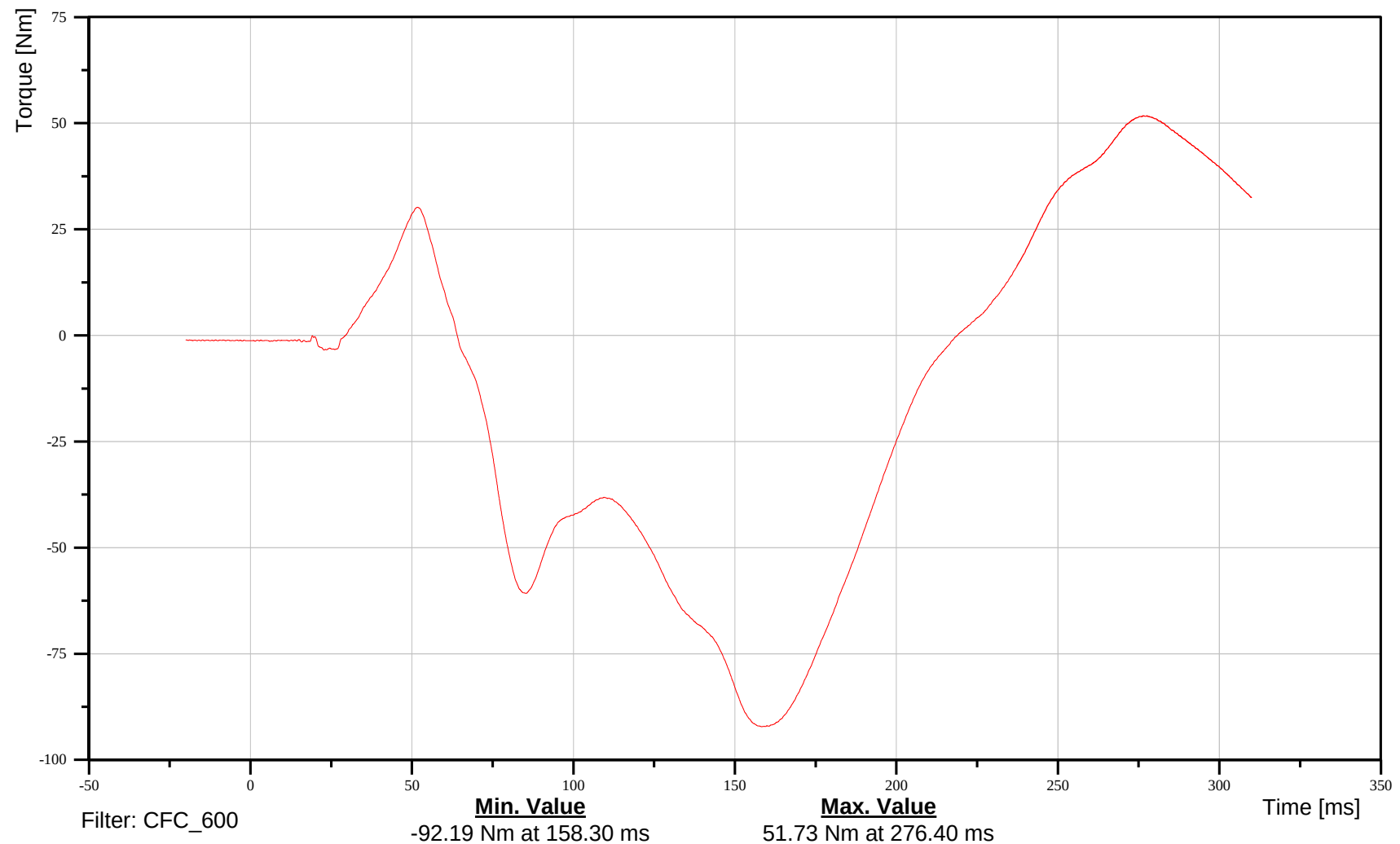
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Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lower Neck Moment About Y Axis

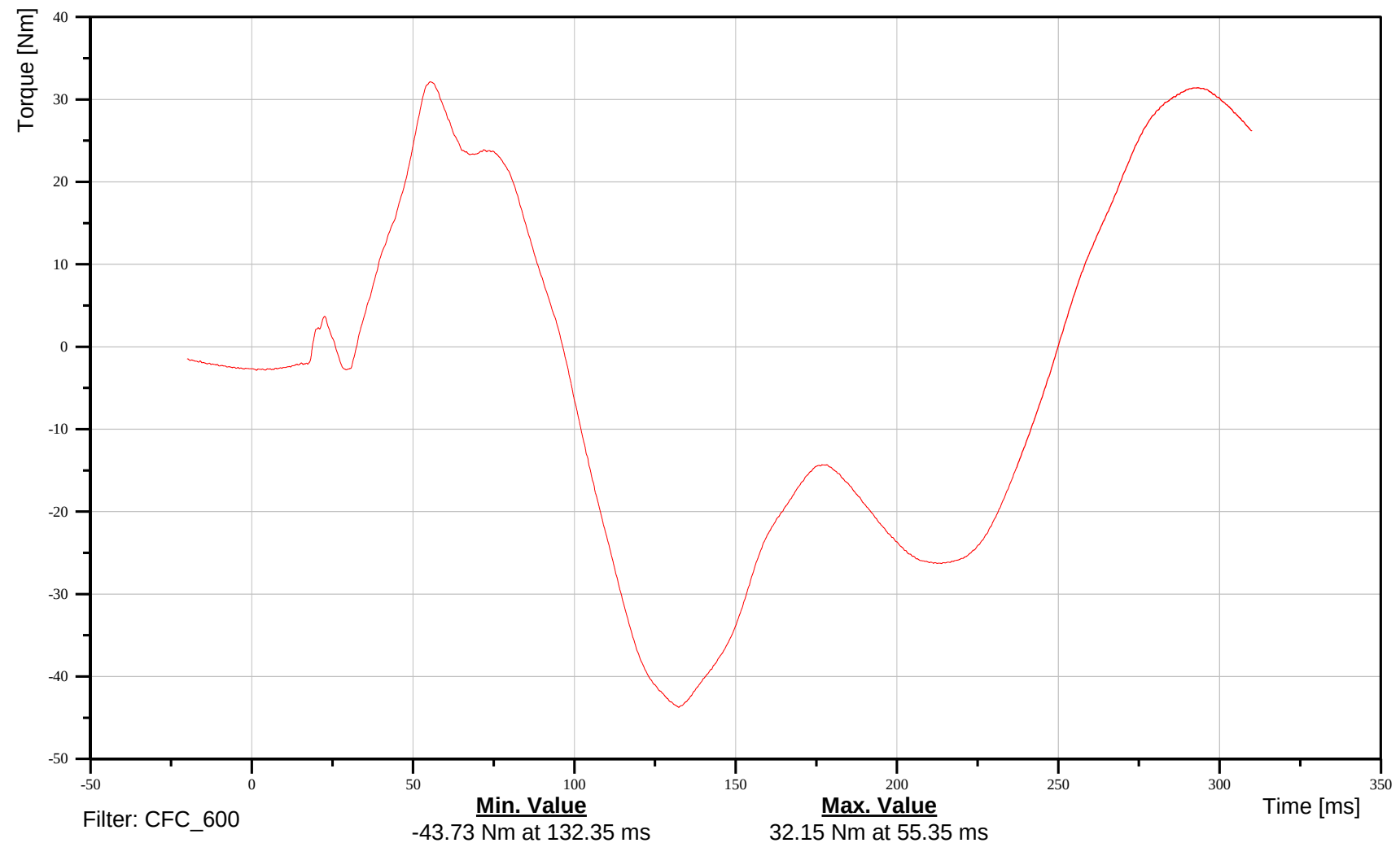
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Time: 14:31

Customer: VRTC

11NECKLO00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lower Neck Moment About Z Axis

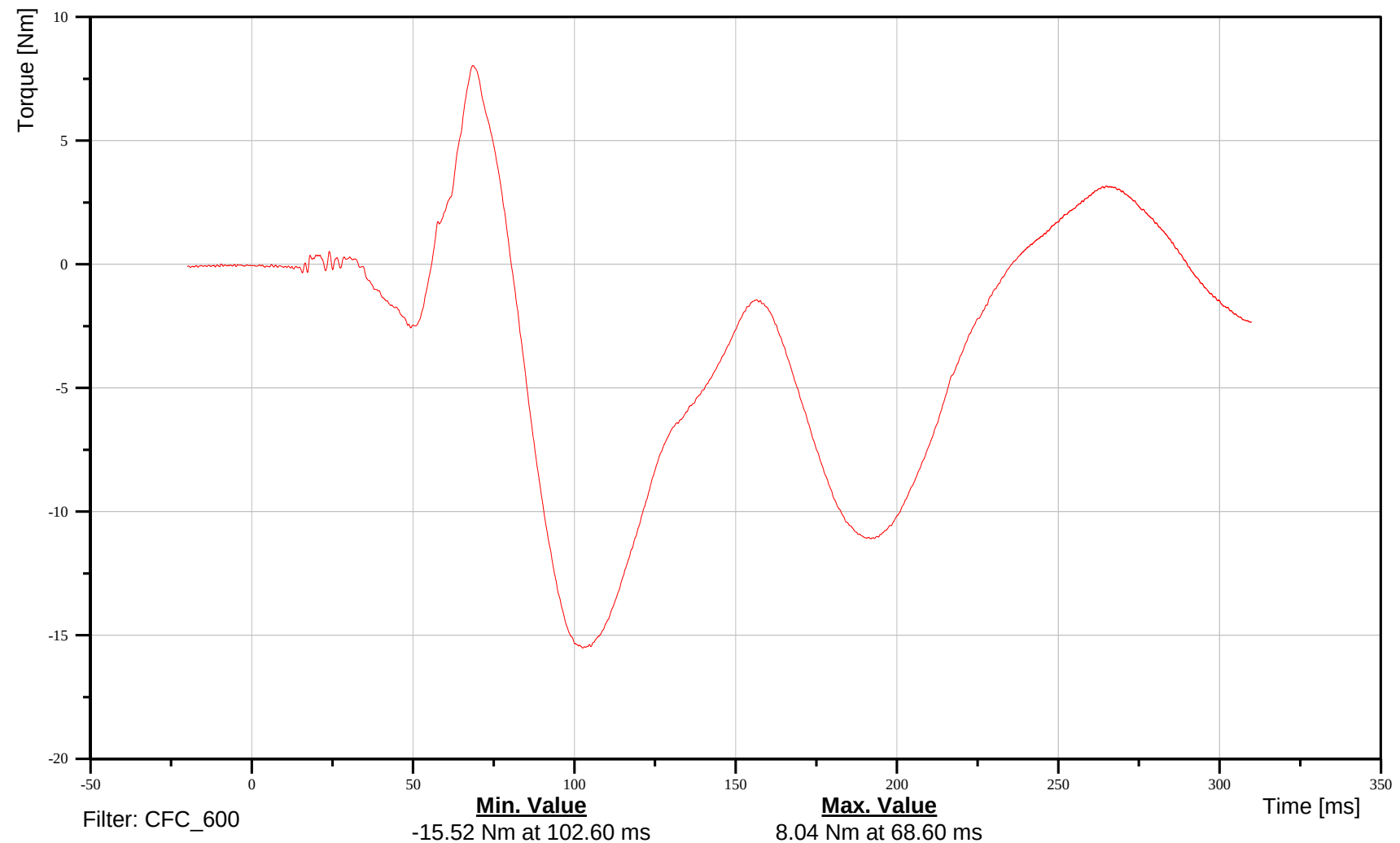
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11NECKLO00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T1 Longitudinal Ax

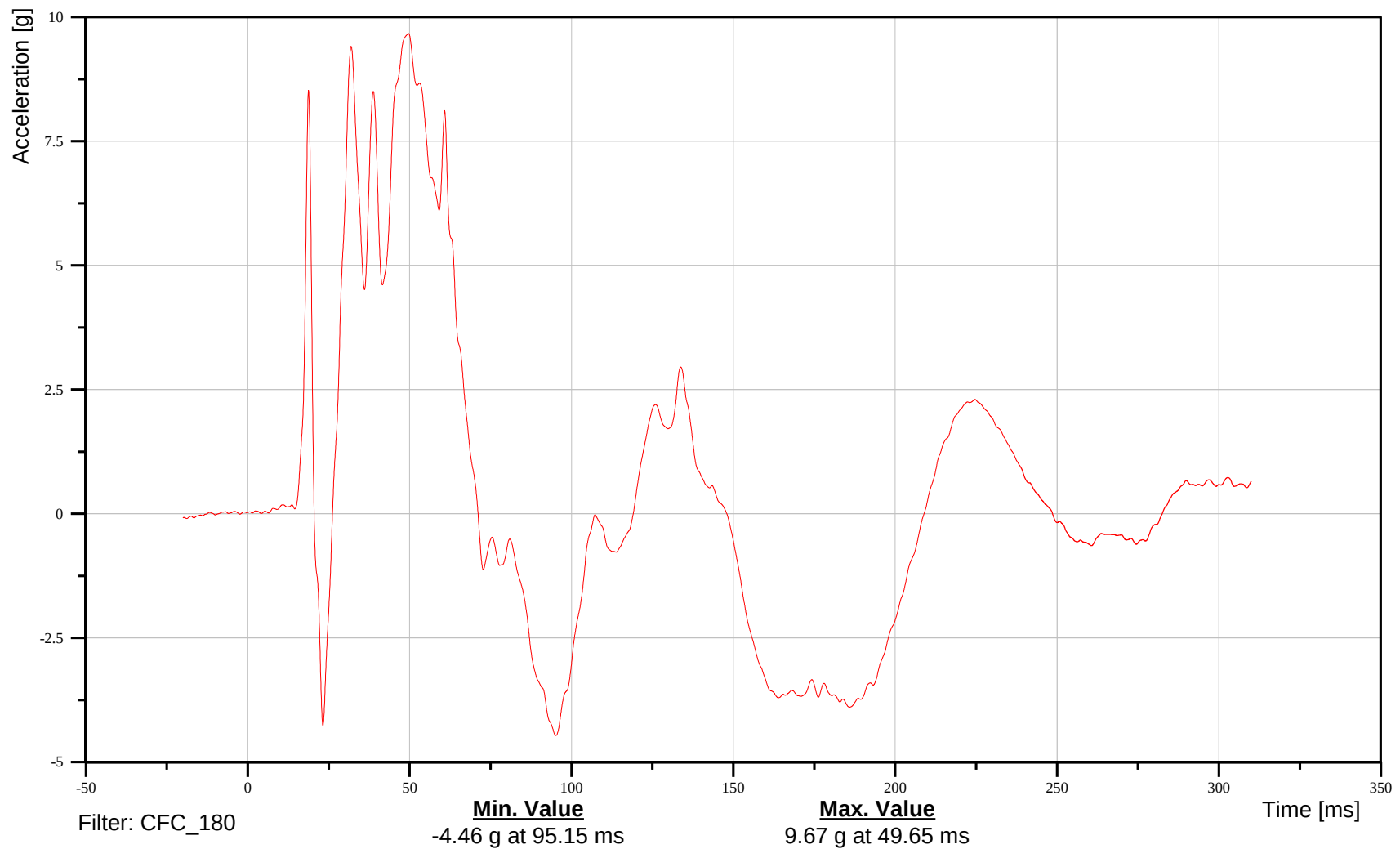
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Time: 14:31

Customer: VRTC

11THSP0100WSACXC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T1 Lateral Ay

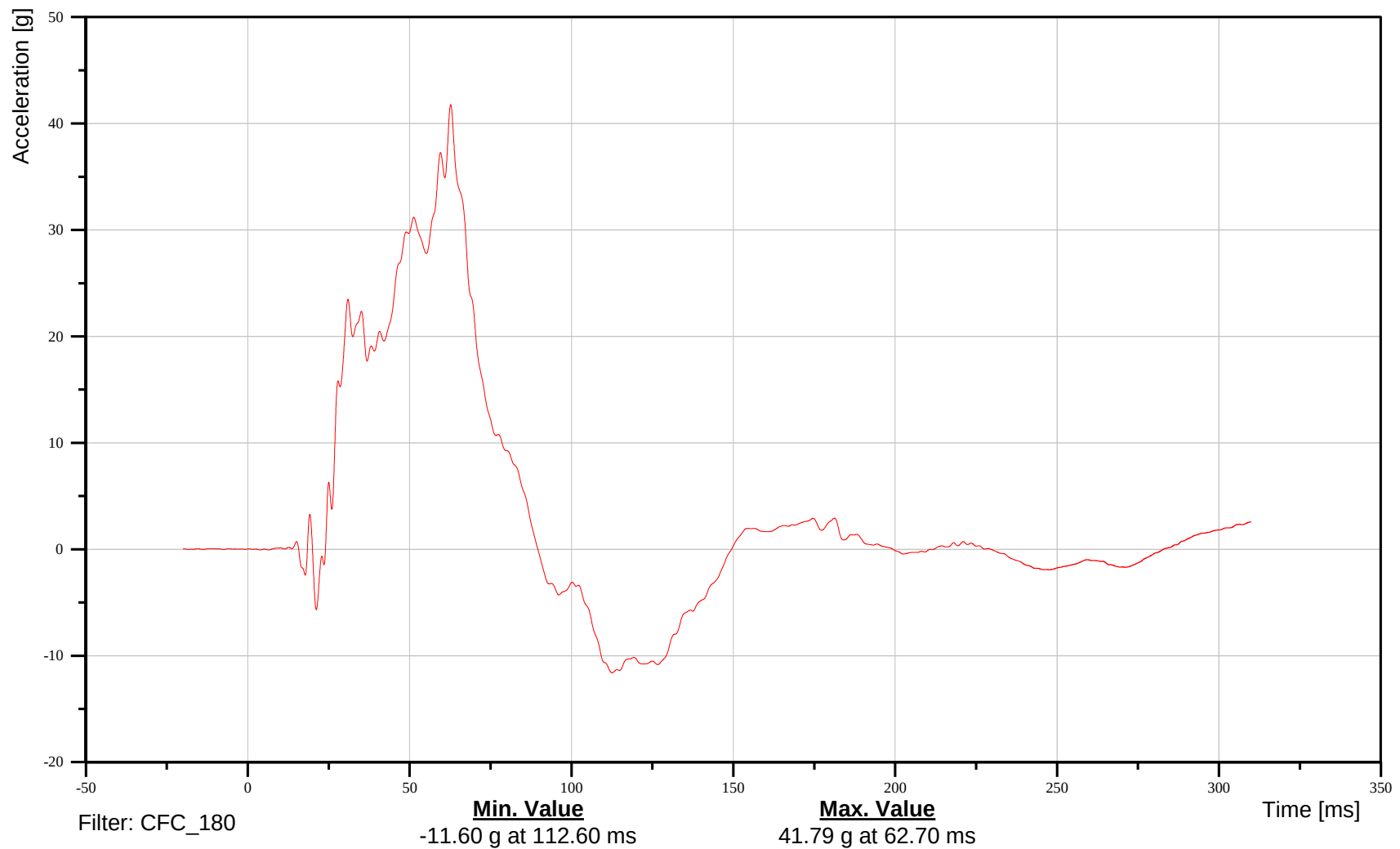
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THSP0100WSACYC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T1 Vertical Az

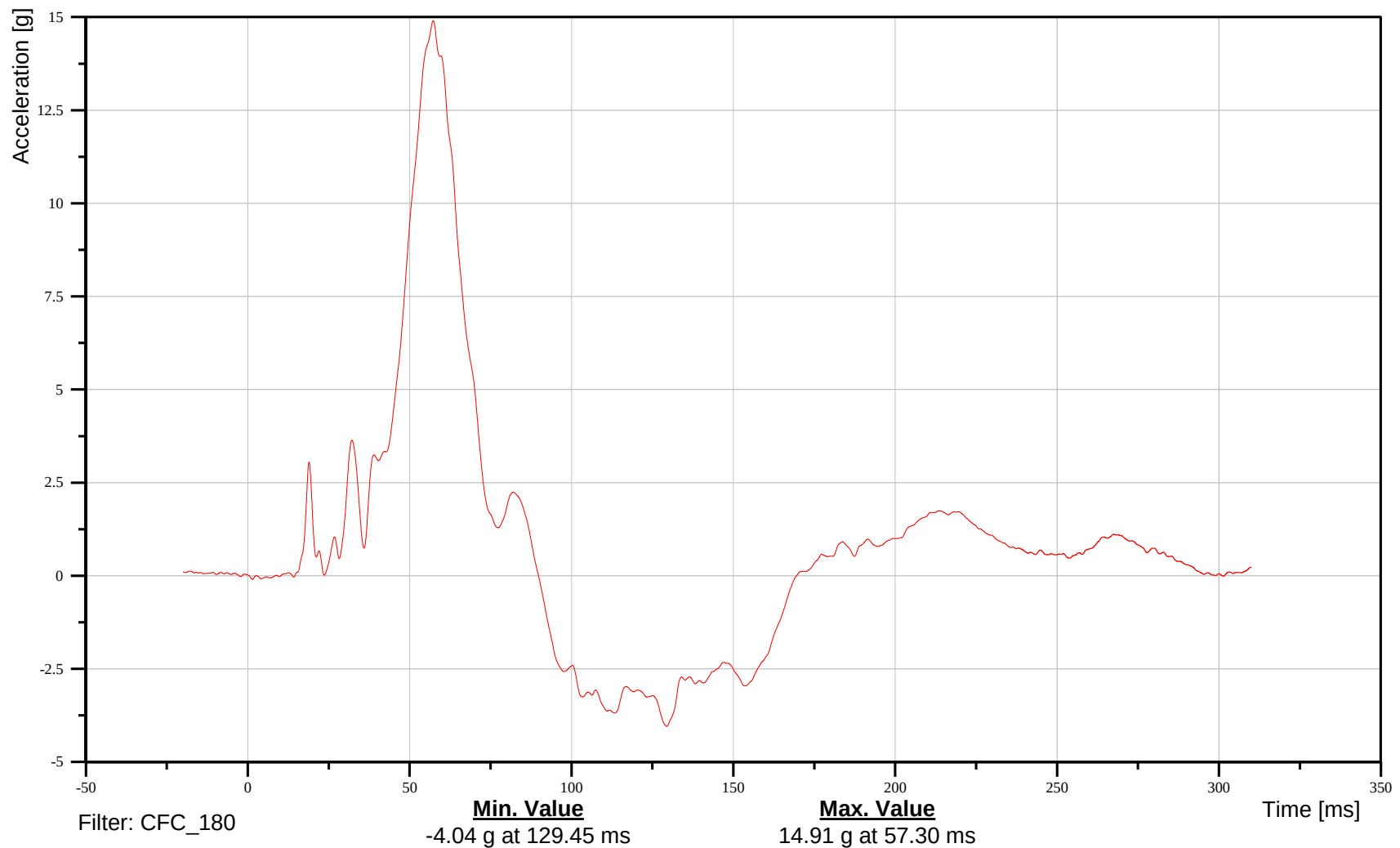
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THSP0100WSACZC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T1 A Resultant

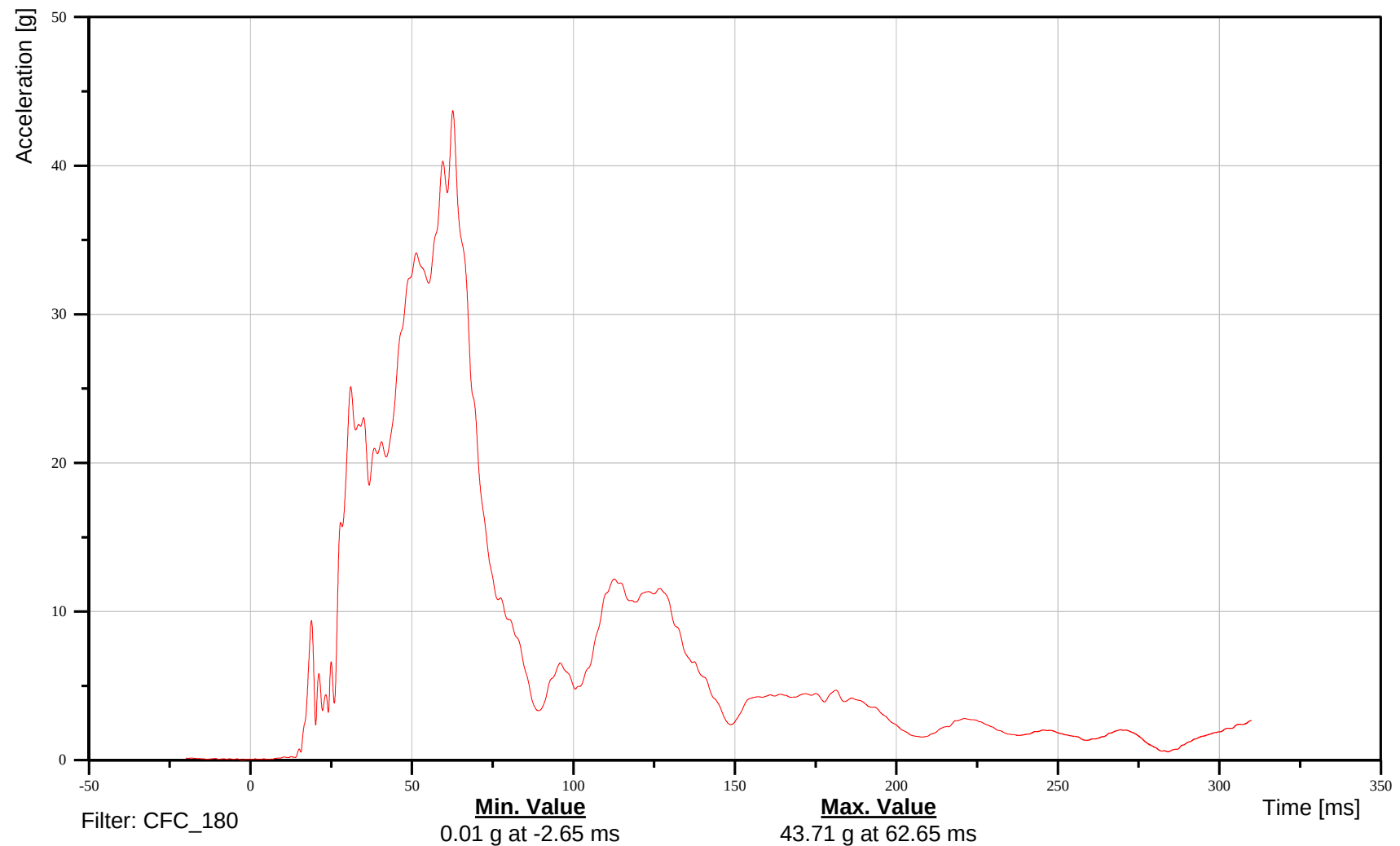
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Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T4 Longitudinal Ax

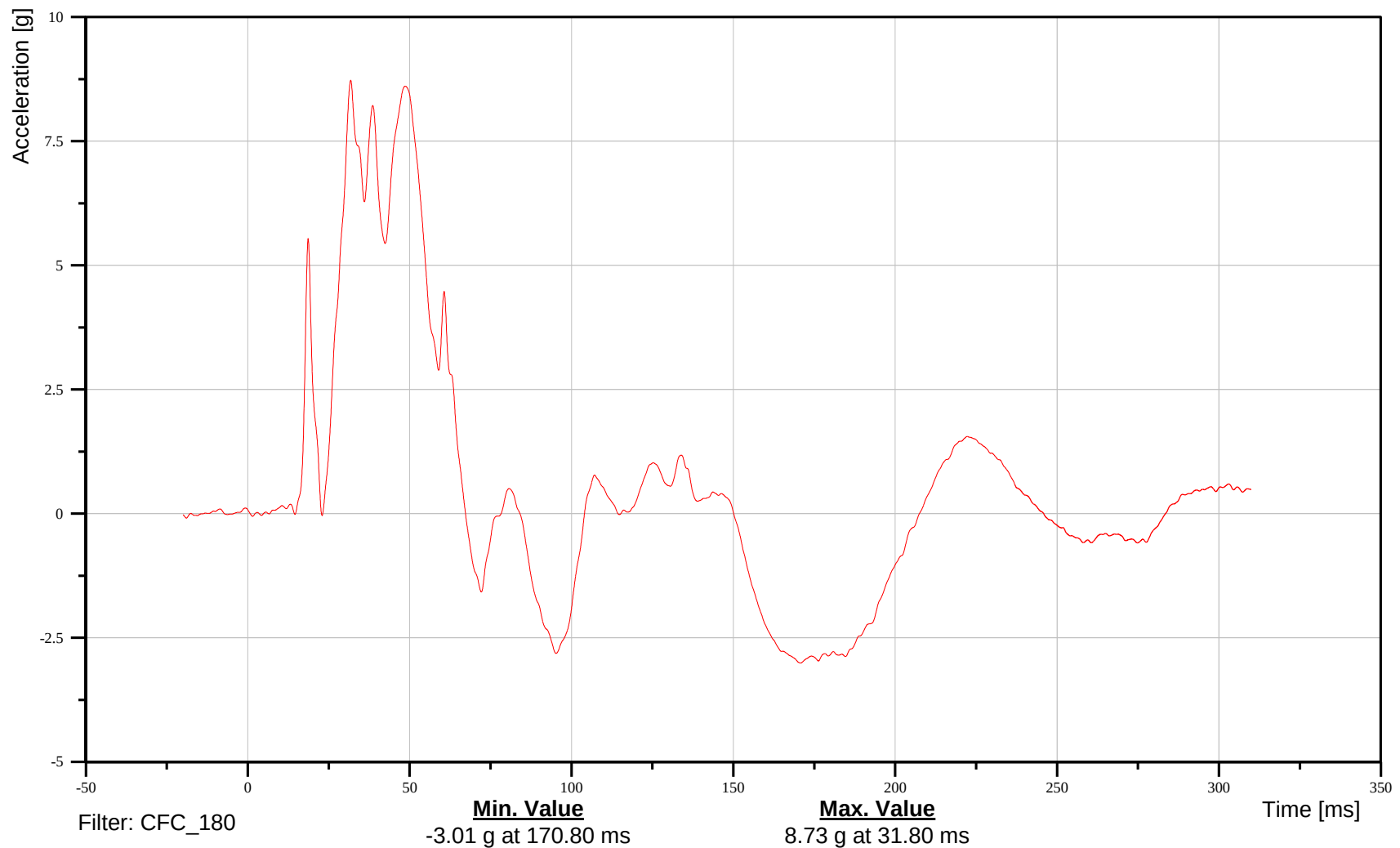
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Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T4 Lateral Ay

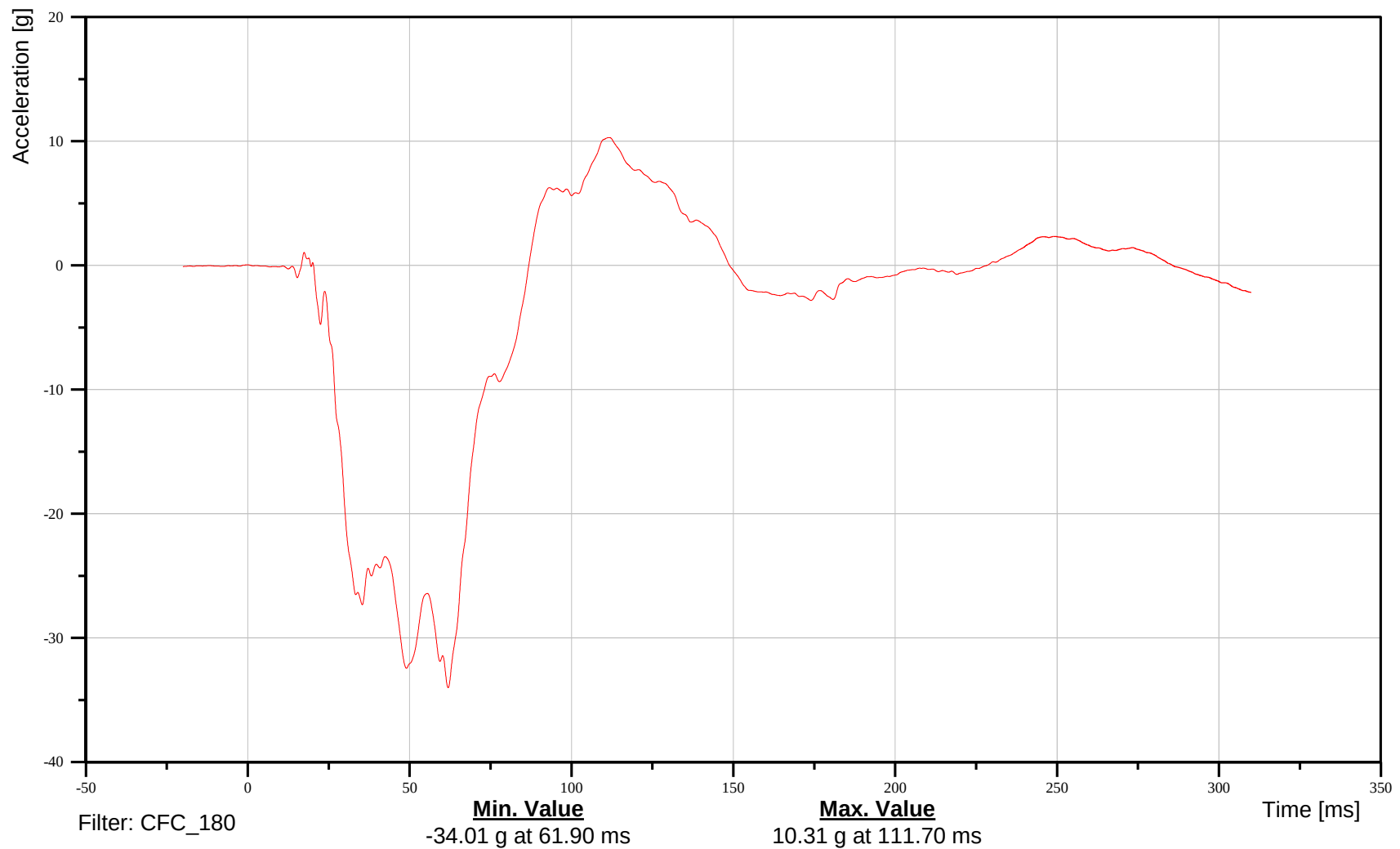
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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T4 Vertical Az

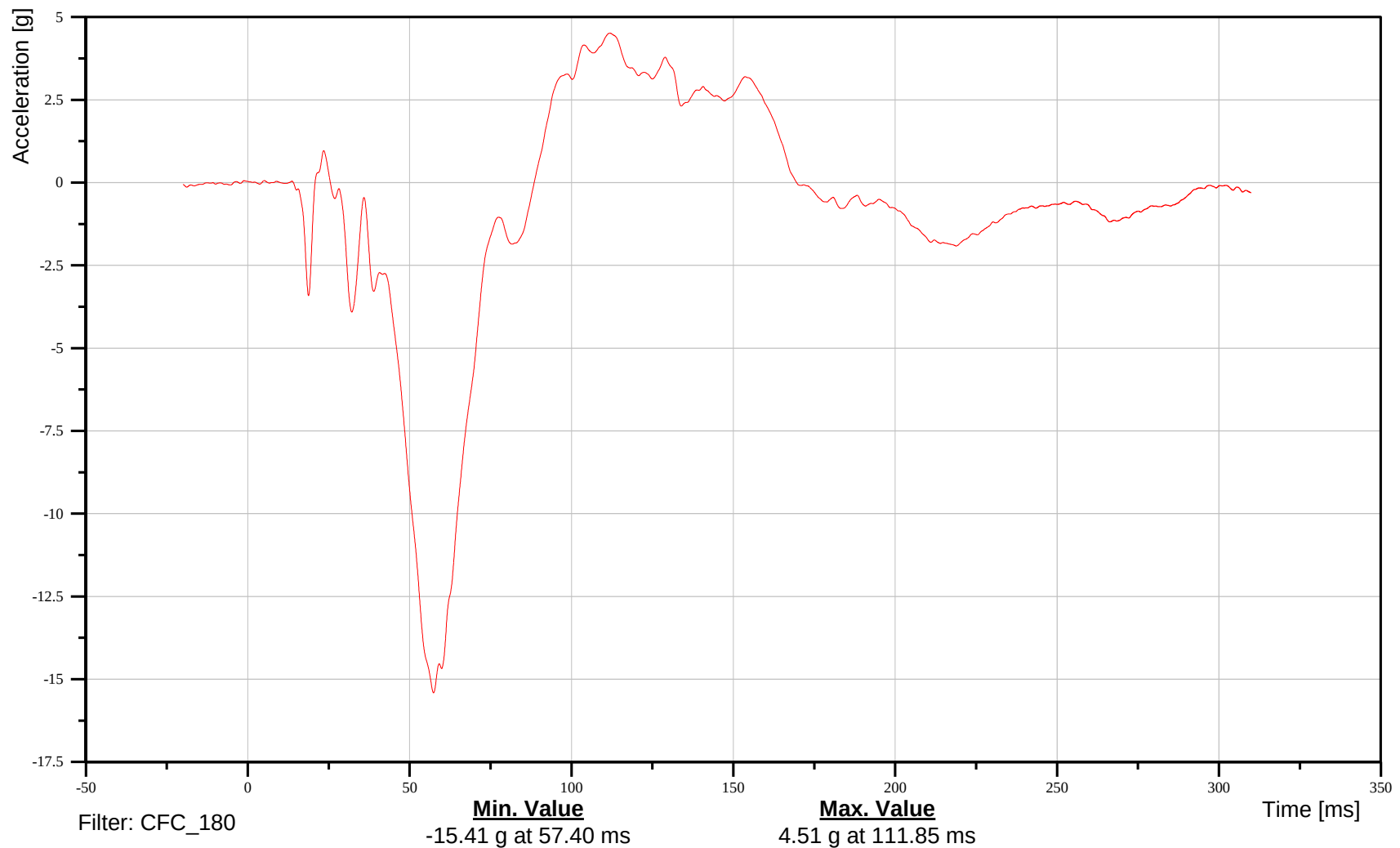
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Time: 14:31

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T4 A Resultant

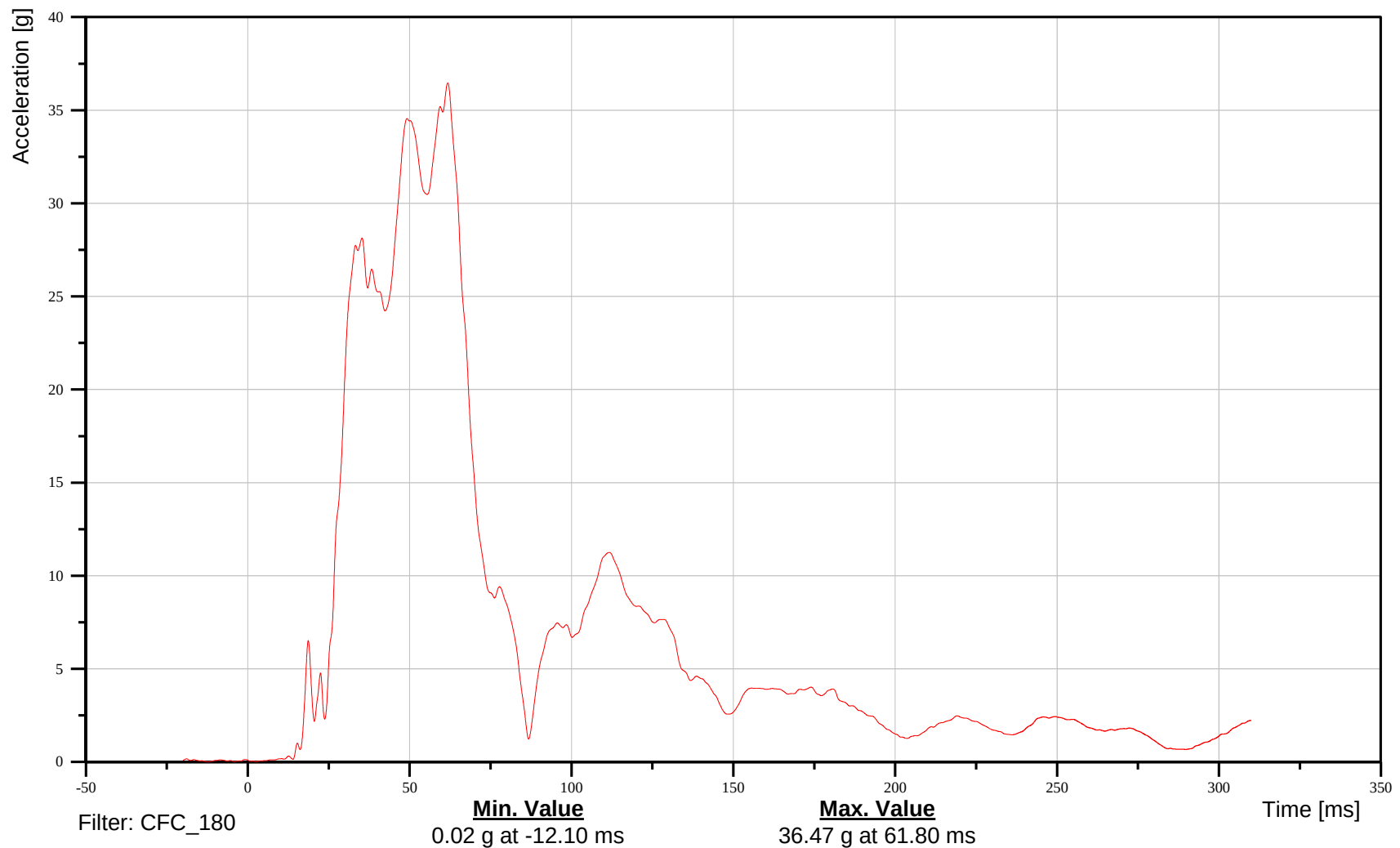
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Time: 14:31

Customer: VRTC

11THSP0400WSACRC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T12 Longitudinal Ax

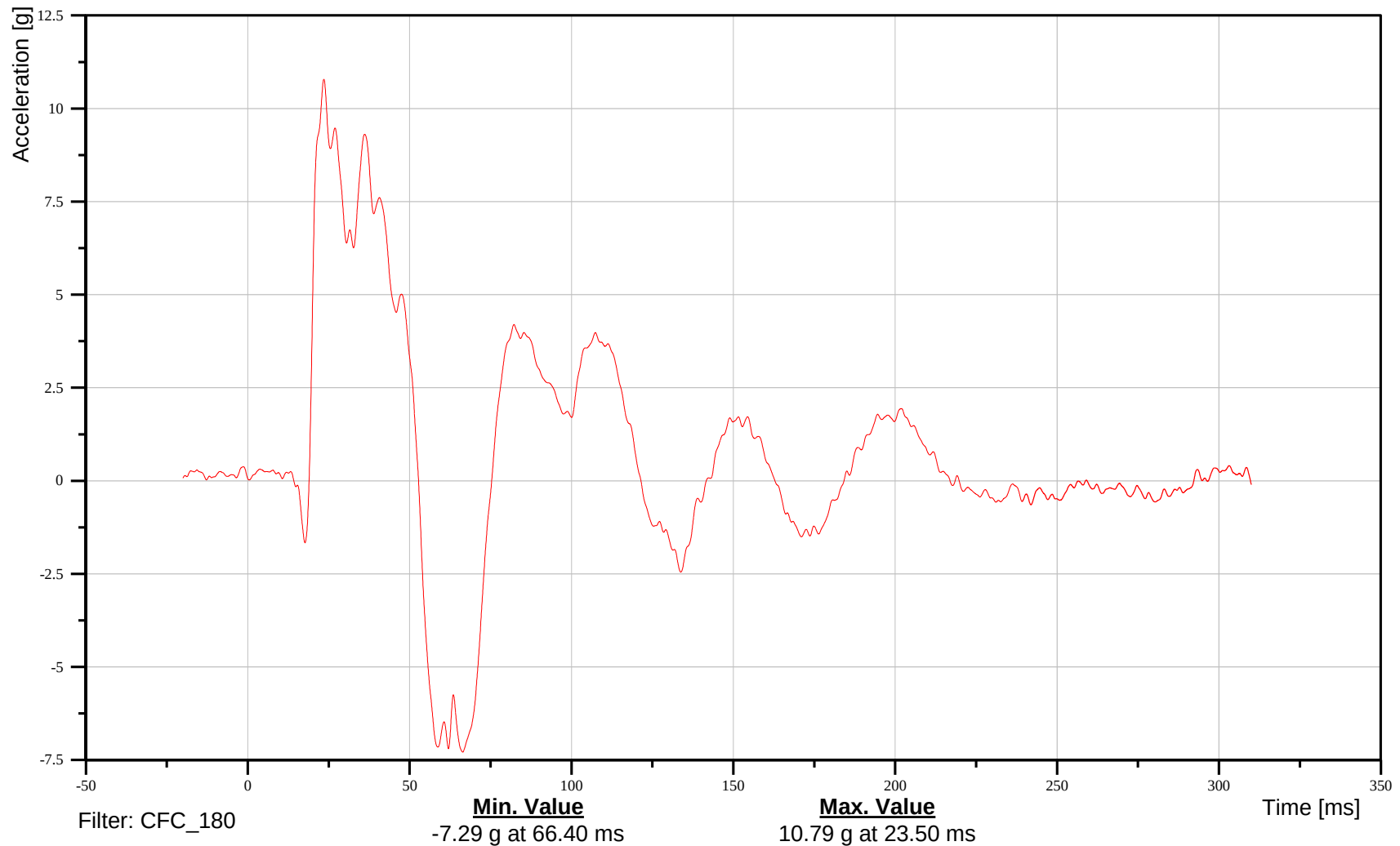
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Time: 14:31

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T12 Lateral Ay

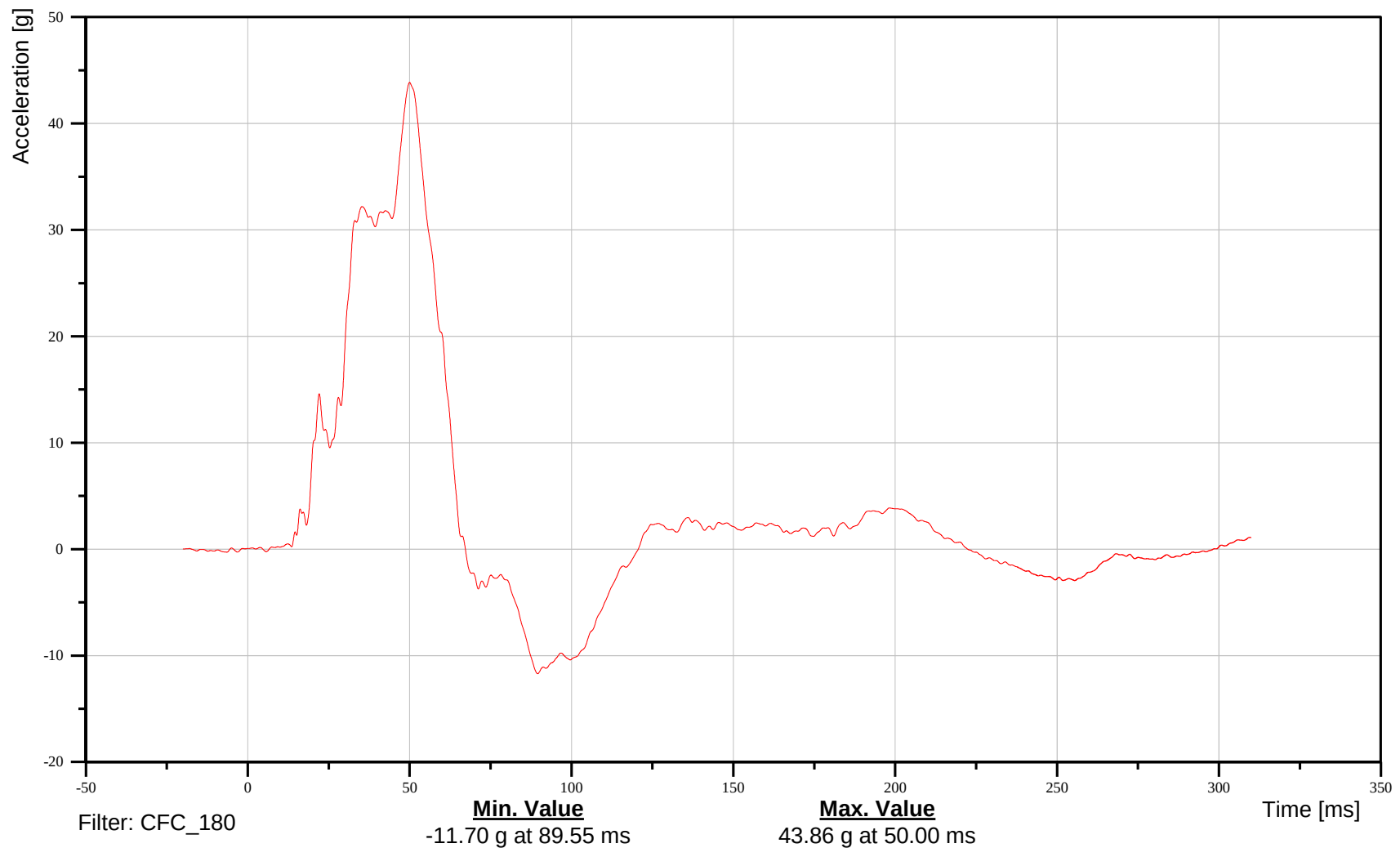
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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T12 Vertical Az

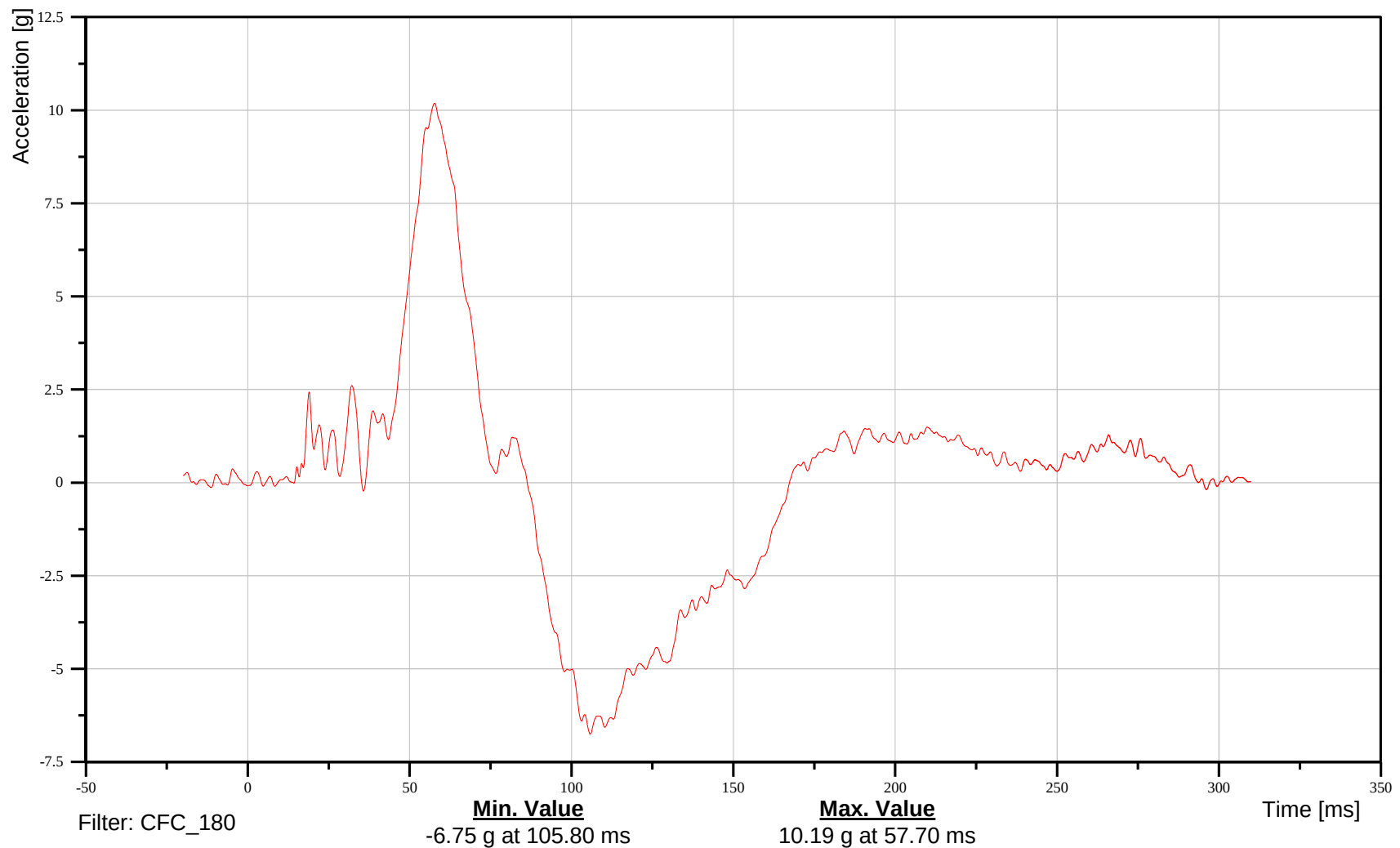
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11THSP1200WSACZC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

T12 A Resultant

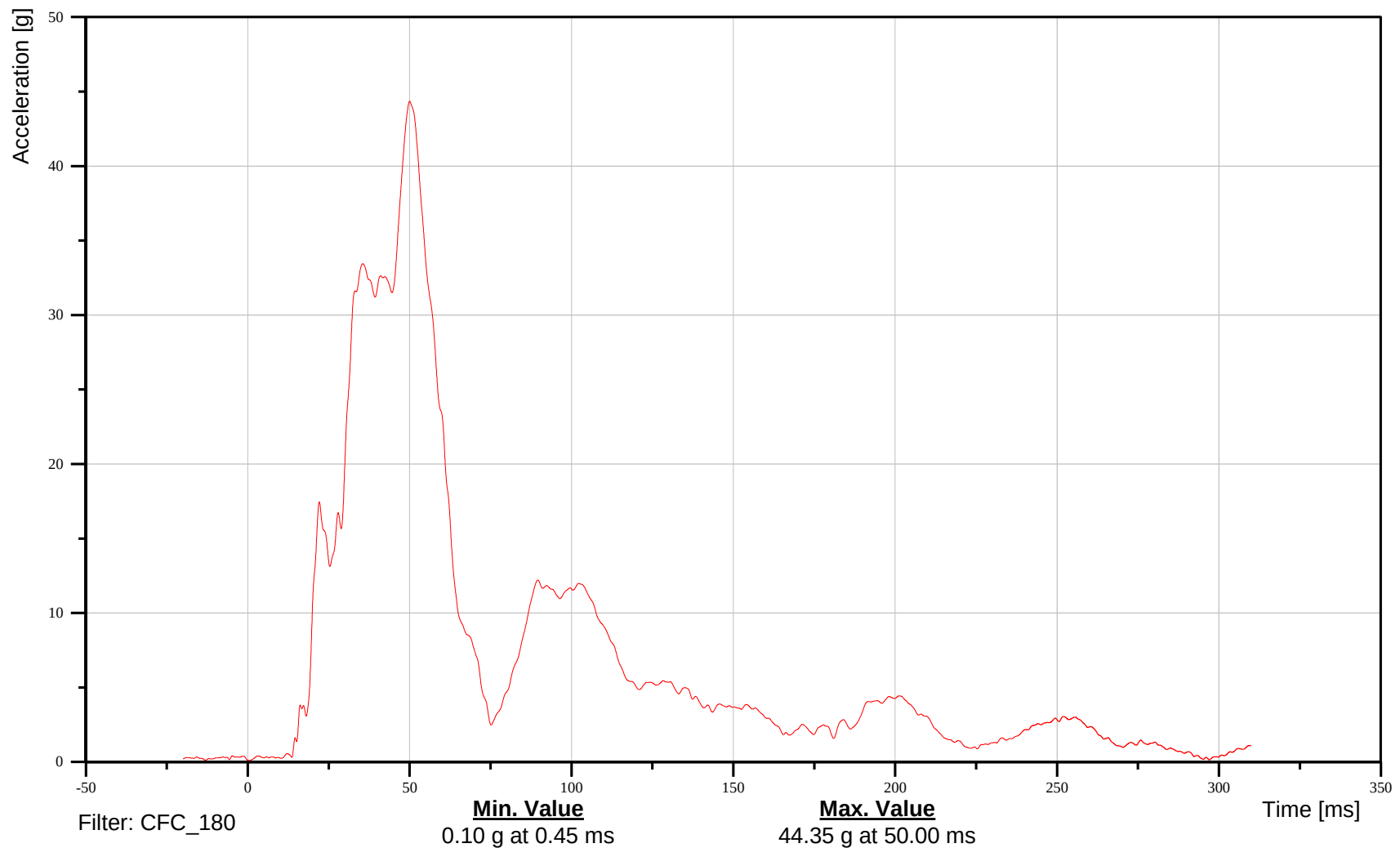
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THSP1200WSACRC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder X-Axis Force

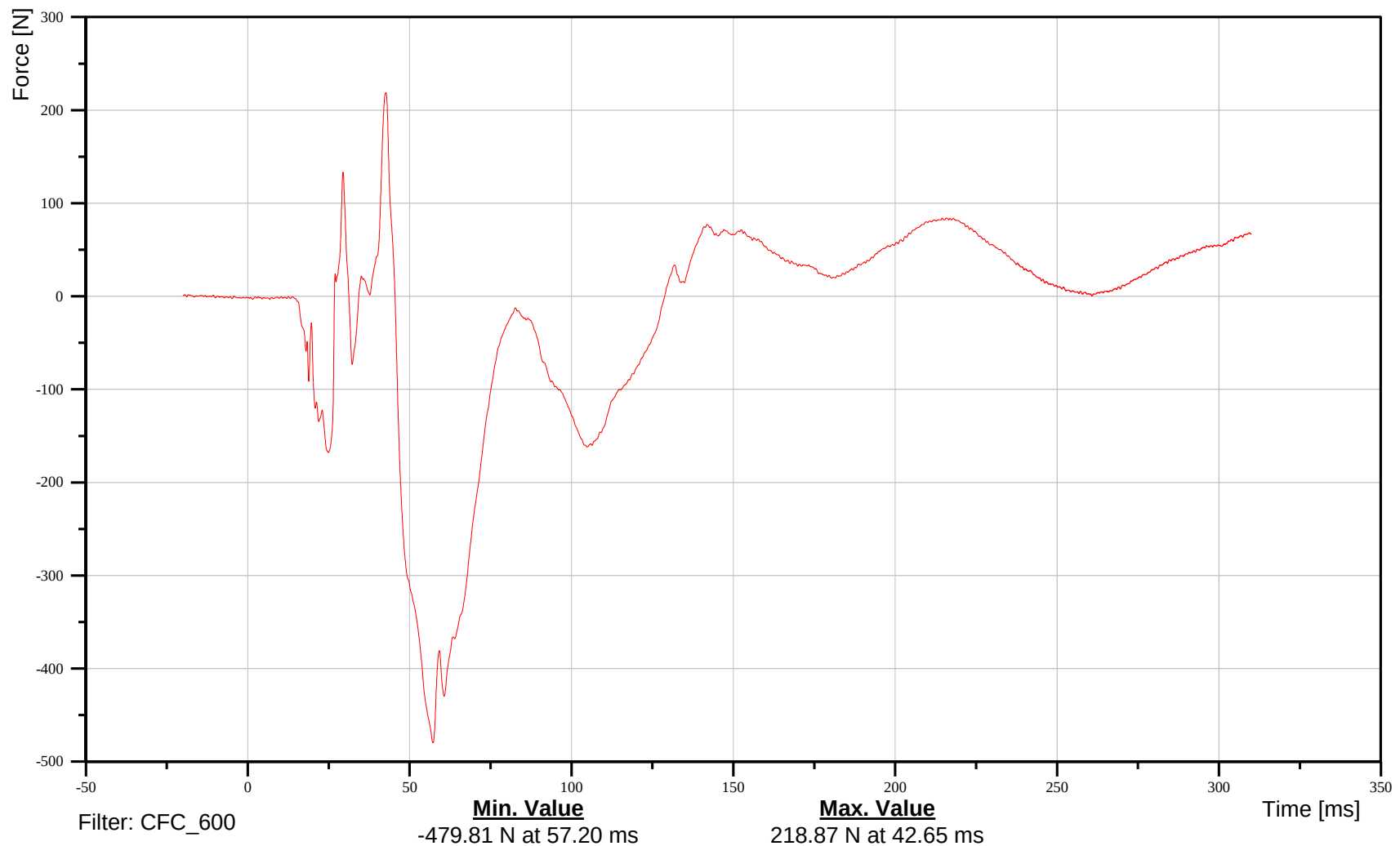
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Time: 14:31

Customer: VRTC

11SHLDLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Y-Axis Force

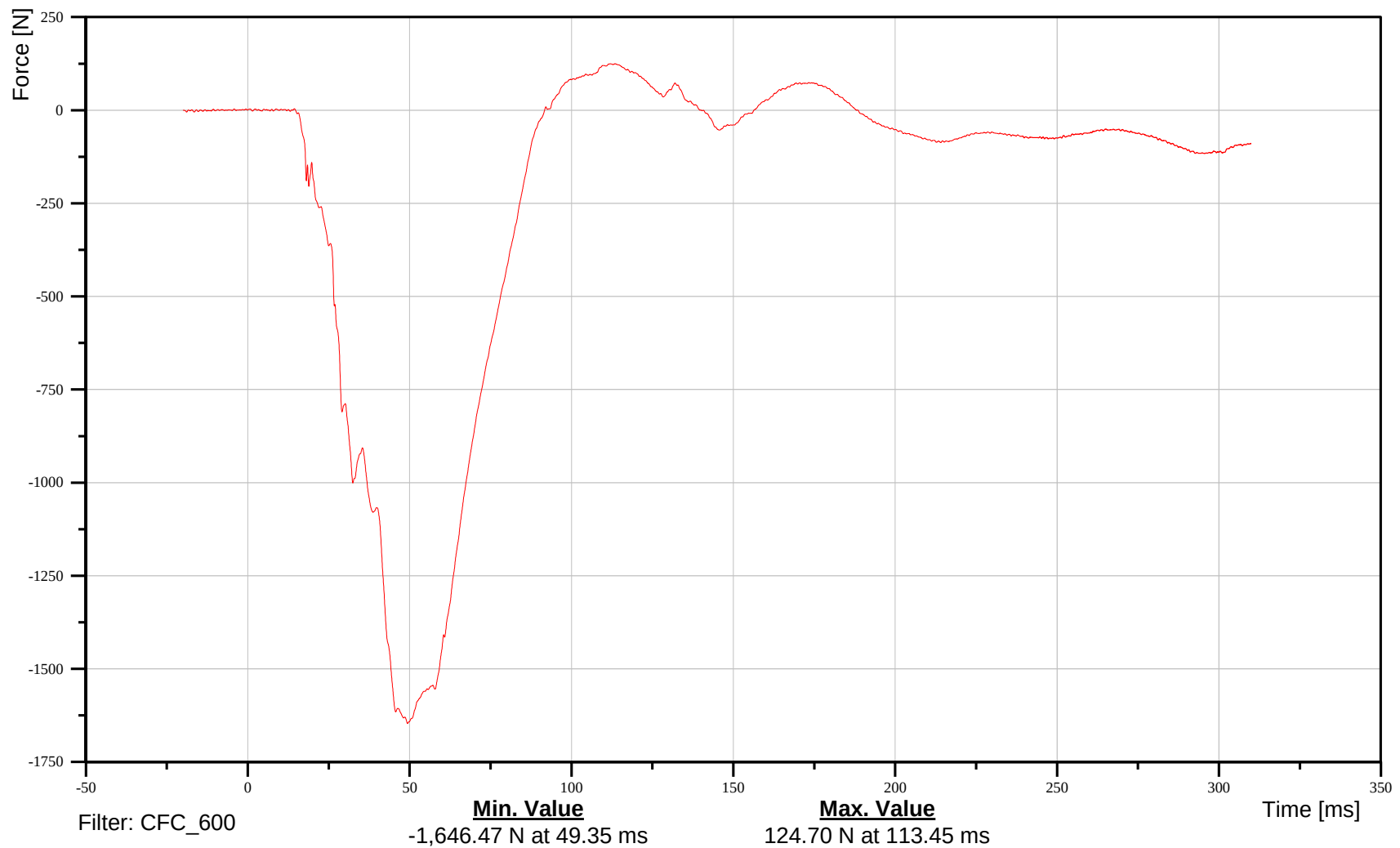
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Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Z-Axis Force

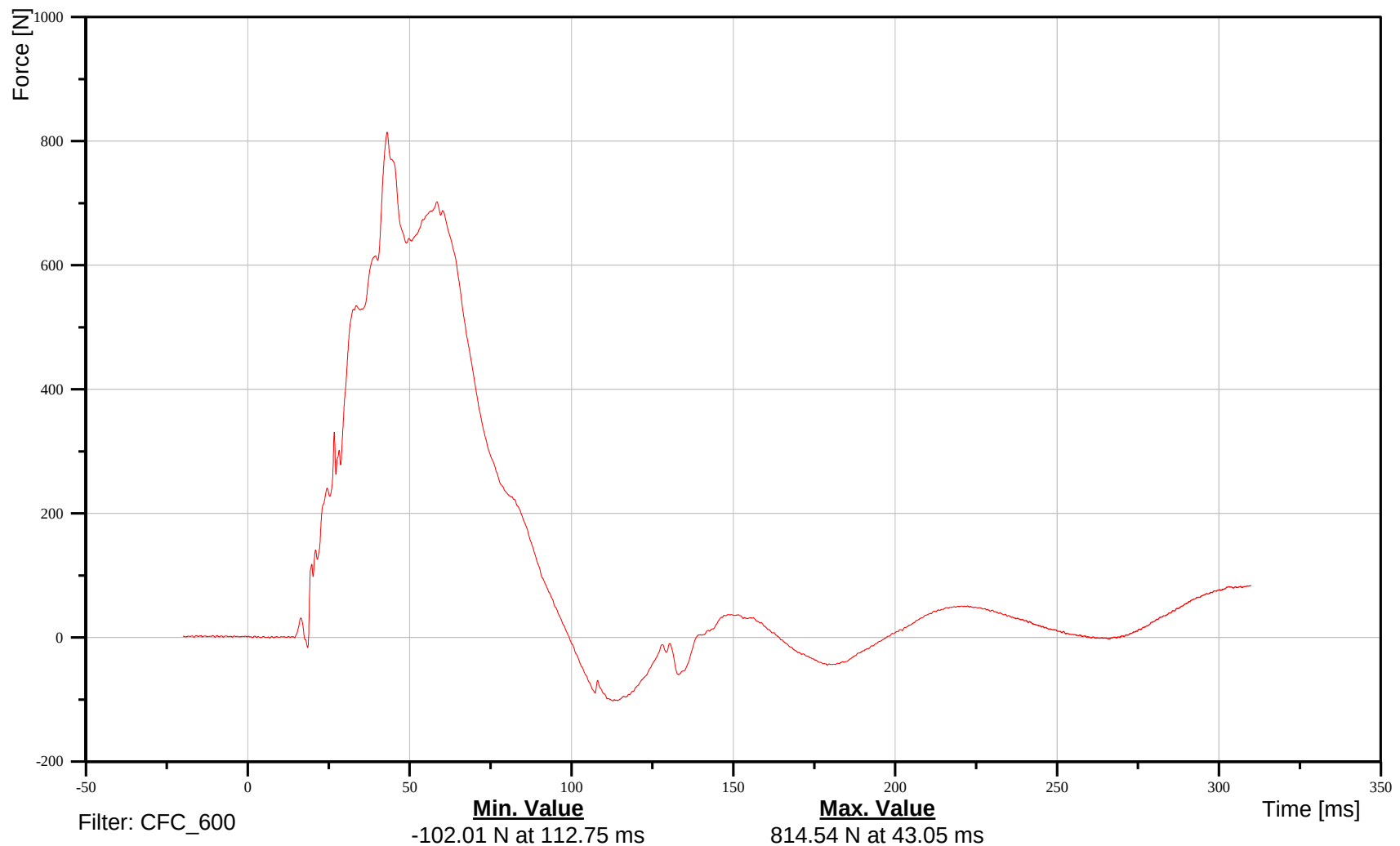
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Time: 14:31

Customer: VRTC

11SHLDLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Pubic Symphysis Y-Axis Force

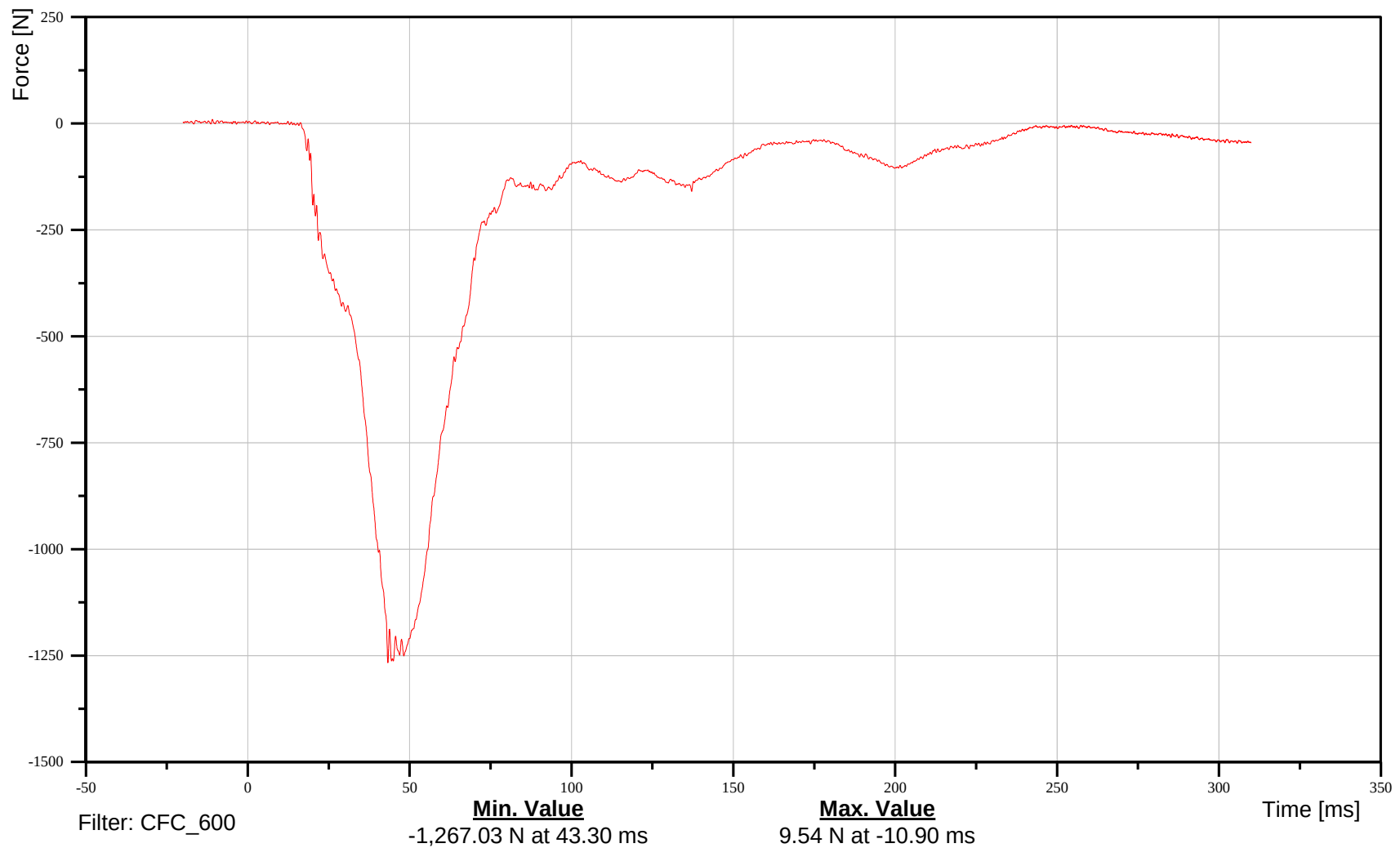
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Time: 14:31

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Sacro-Iliac Left X-Axis Force

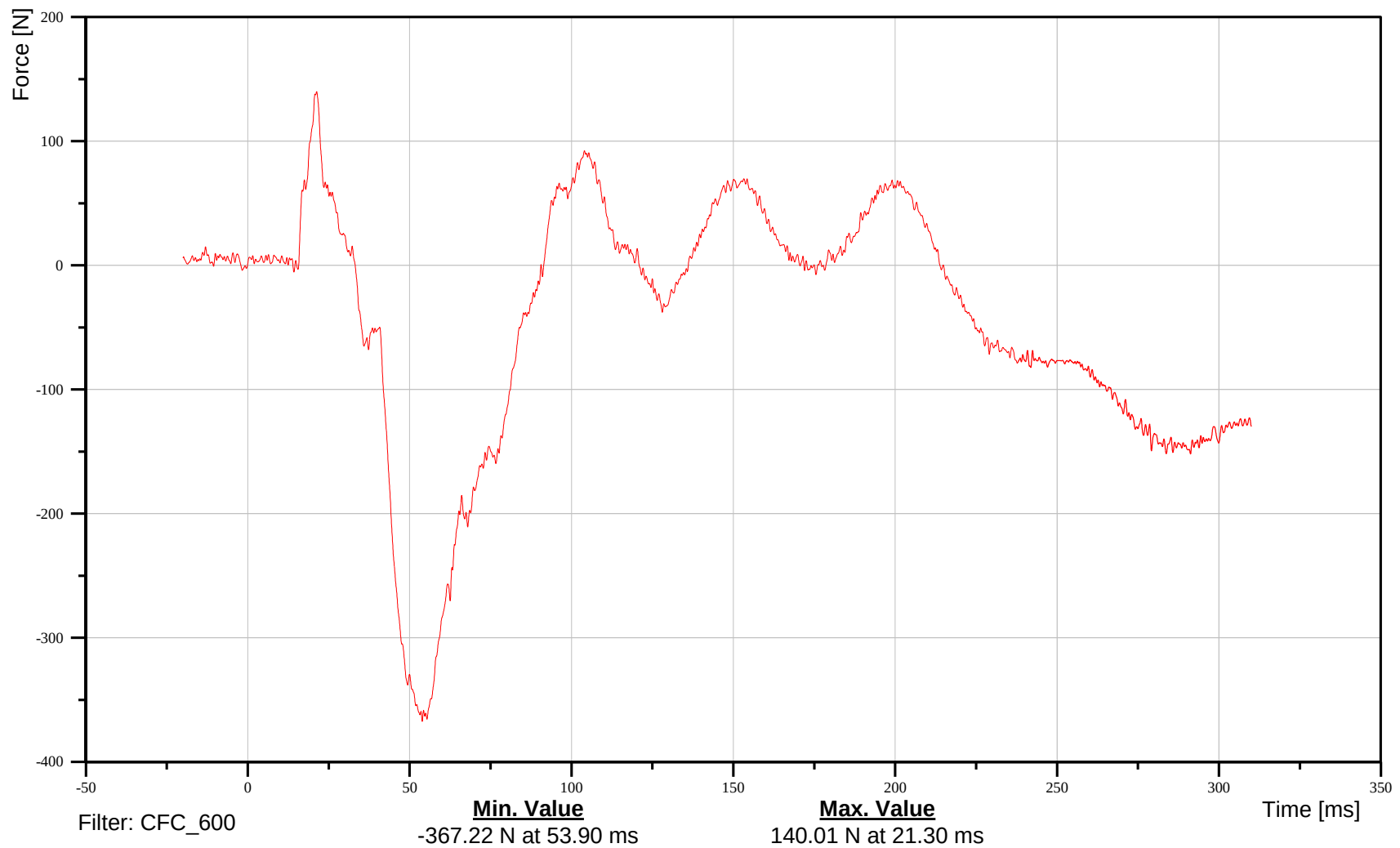
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SACRLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Sacro-Iliac Left Y-Axis Force

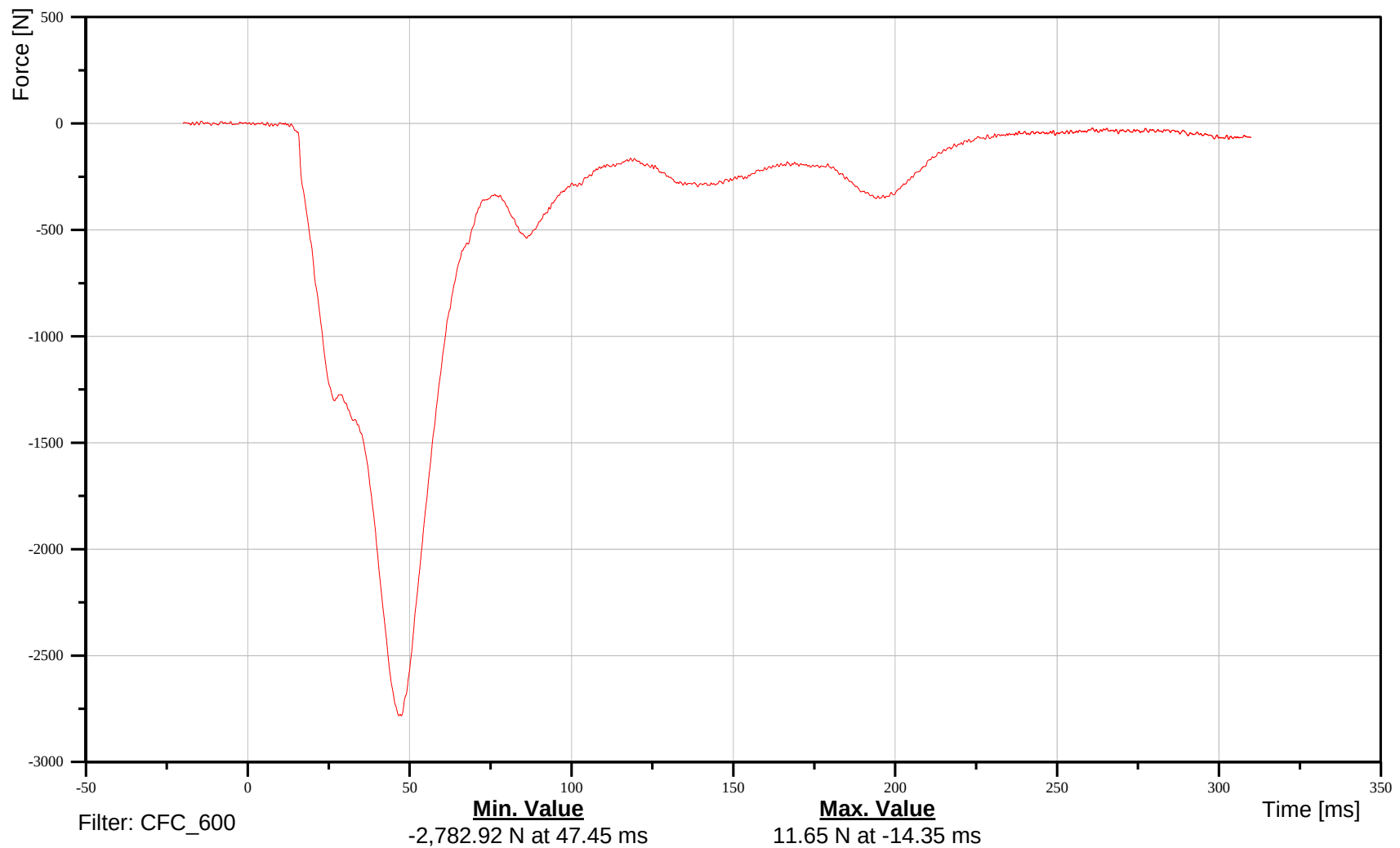
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SACRLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Sacro-Iliac Left Z-Axis Force

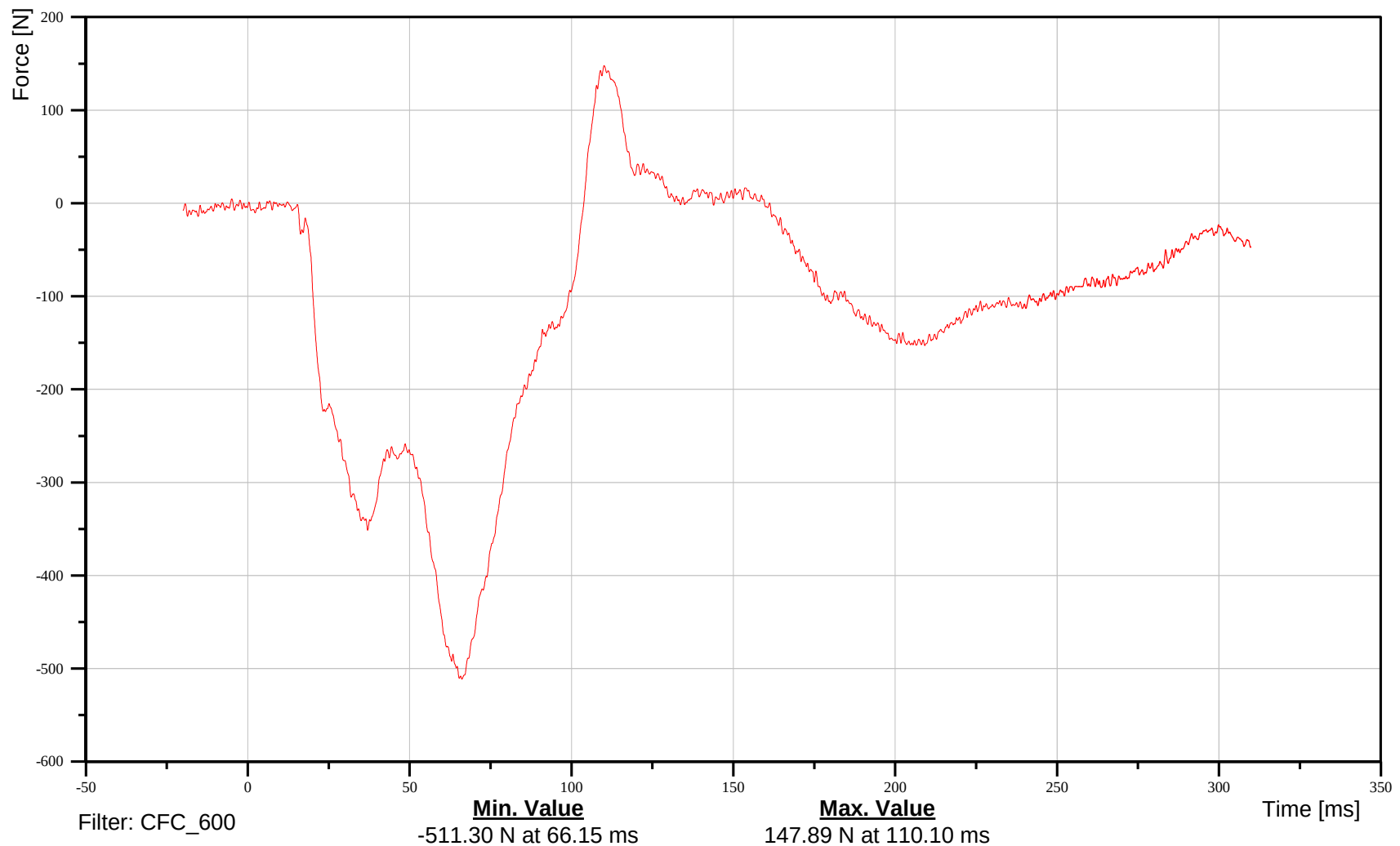
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SACRLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Sacro-Iliac Left Moment About X Axis

Date: 06/14/2016

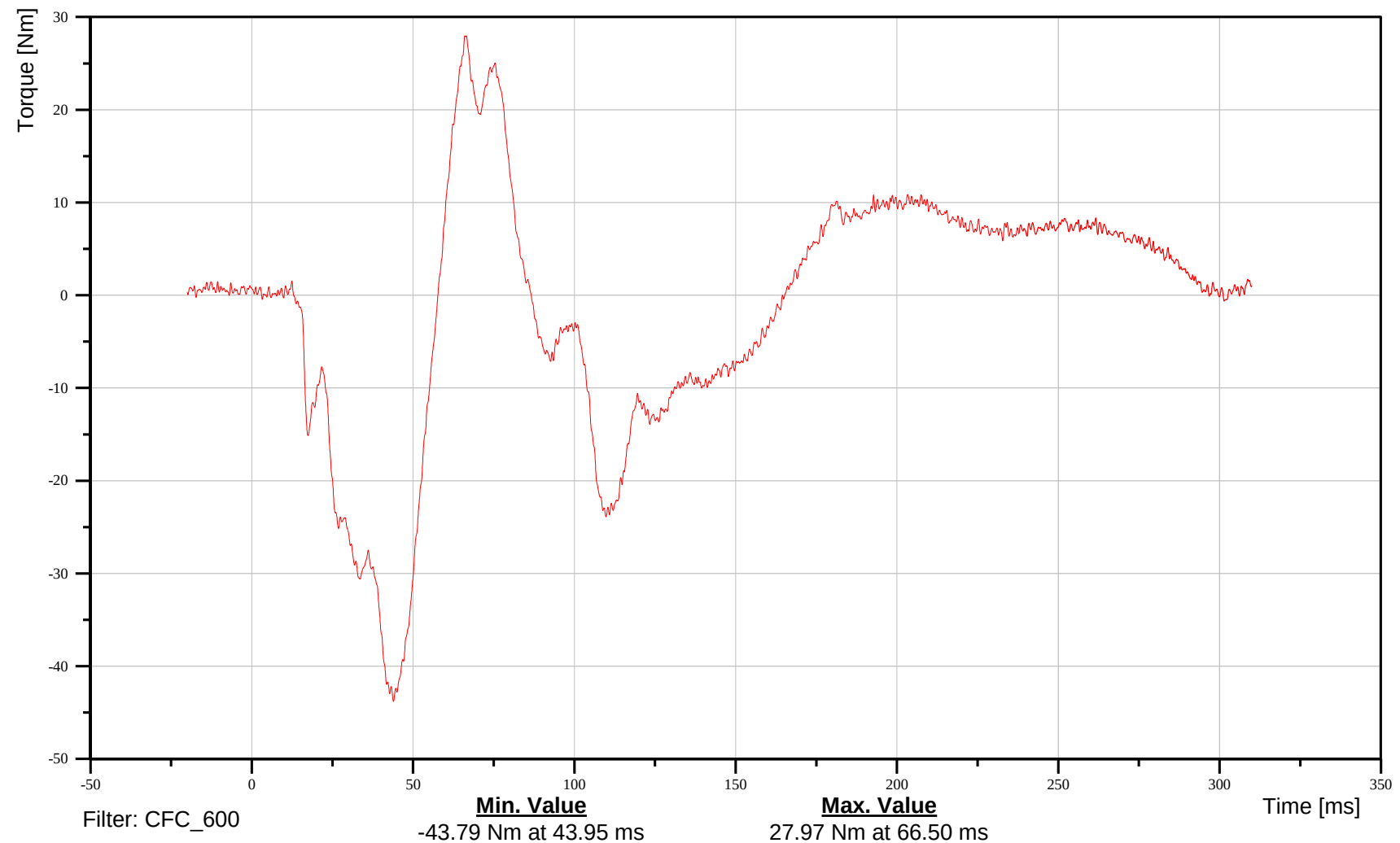
Time: 14:31

Customer: VRTC

11SACRLE00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Sacro-Iliac Left Moment About Y Axis

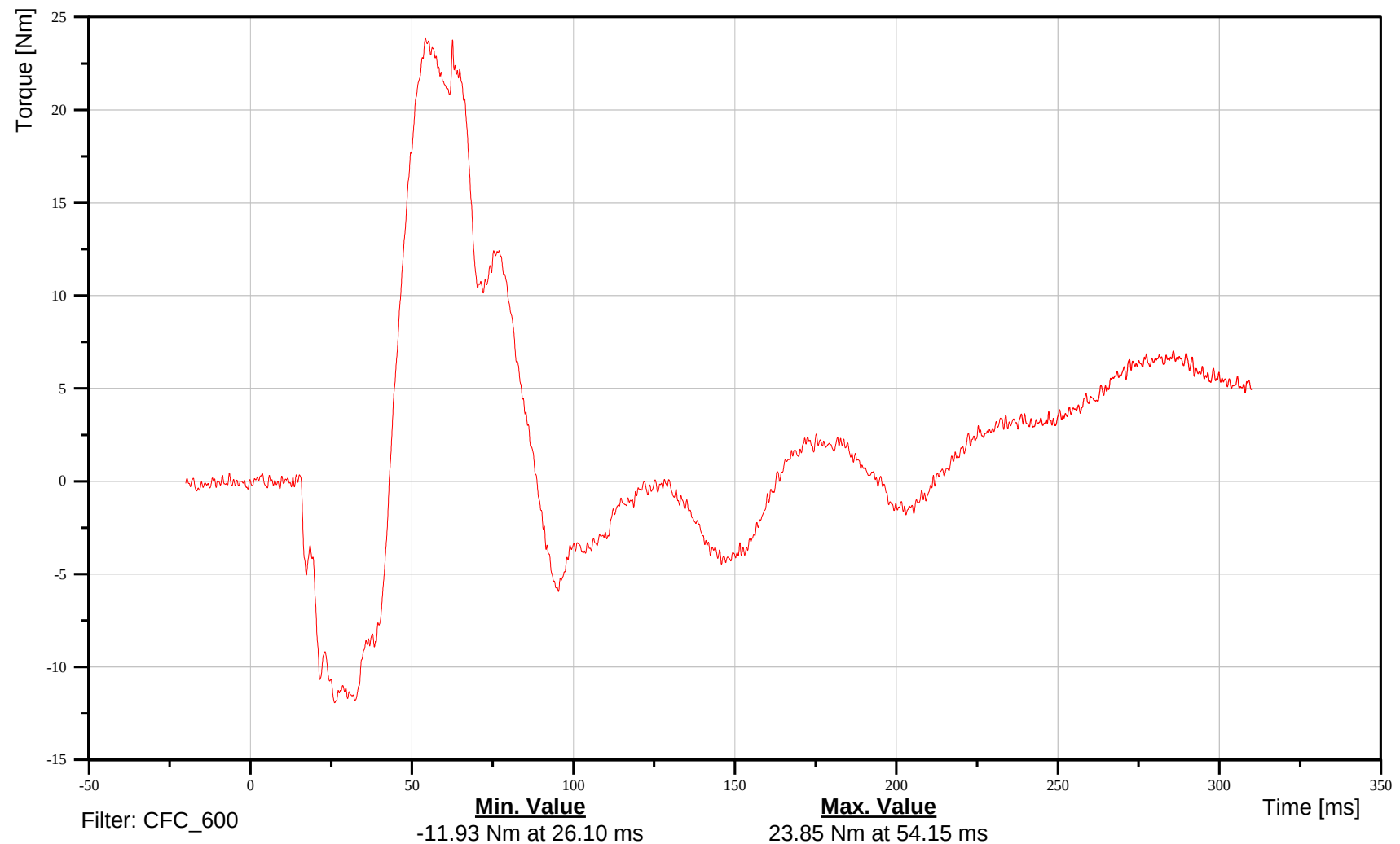
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SACRLE00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Sacro-Iliac Left Moment About Z Axis

Date: 06/14/2016

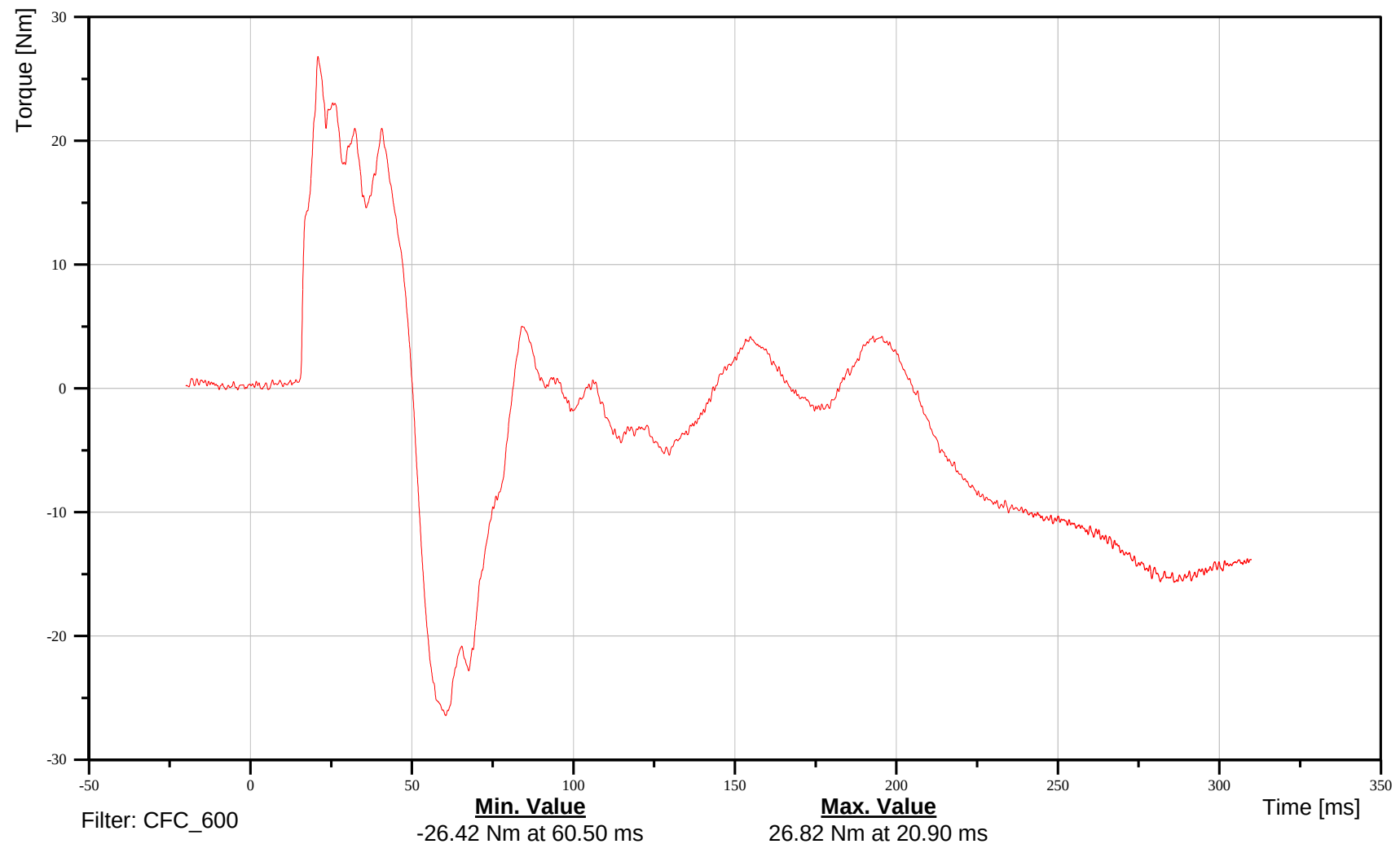
Time: 14:31

Customer: VRTC

11SACRLE00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lumbar X-Axis Force

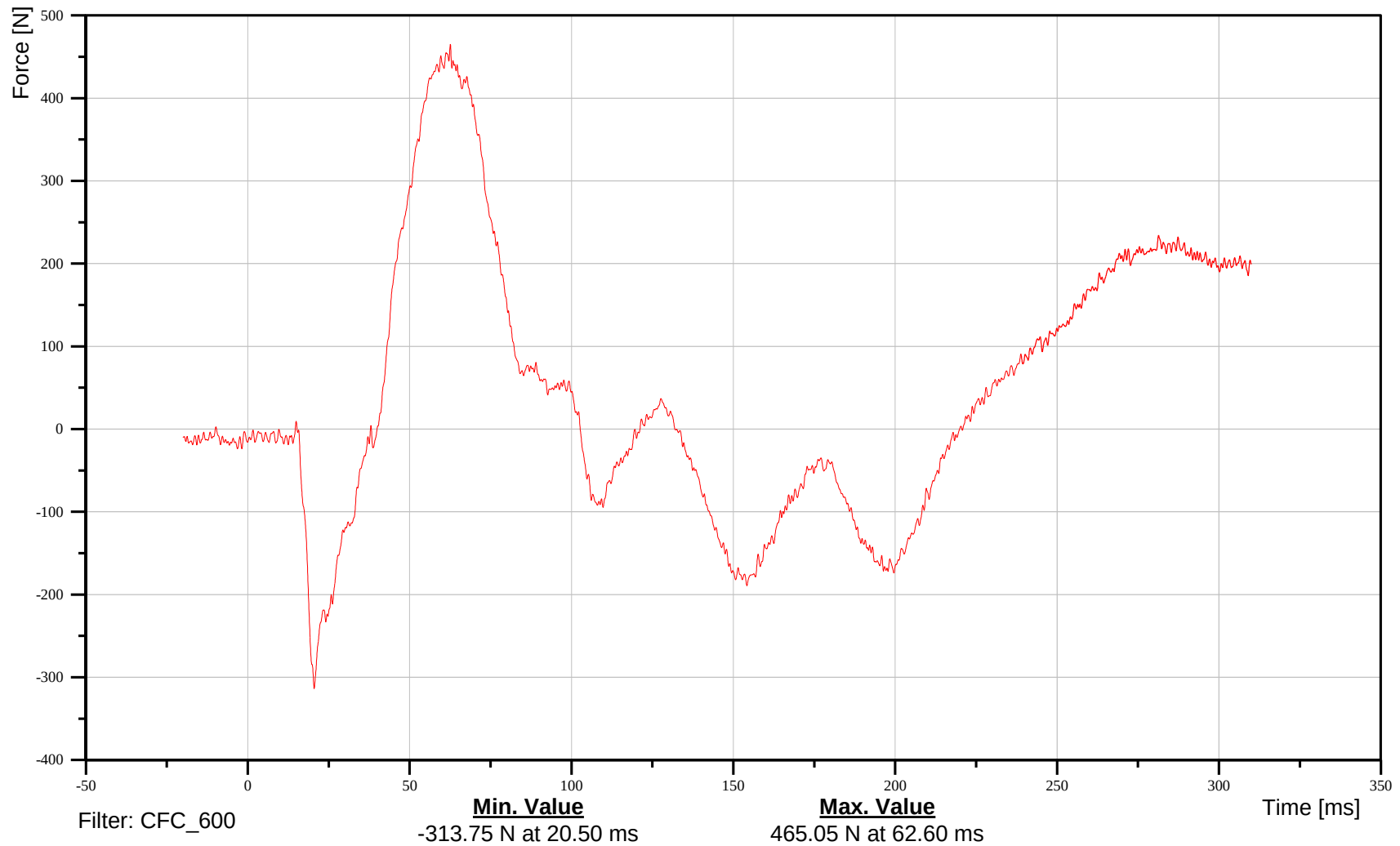
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11LUSP0000WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lumbar Y-Axis Force

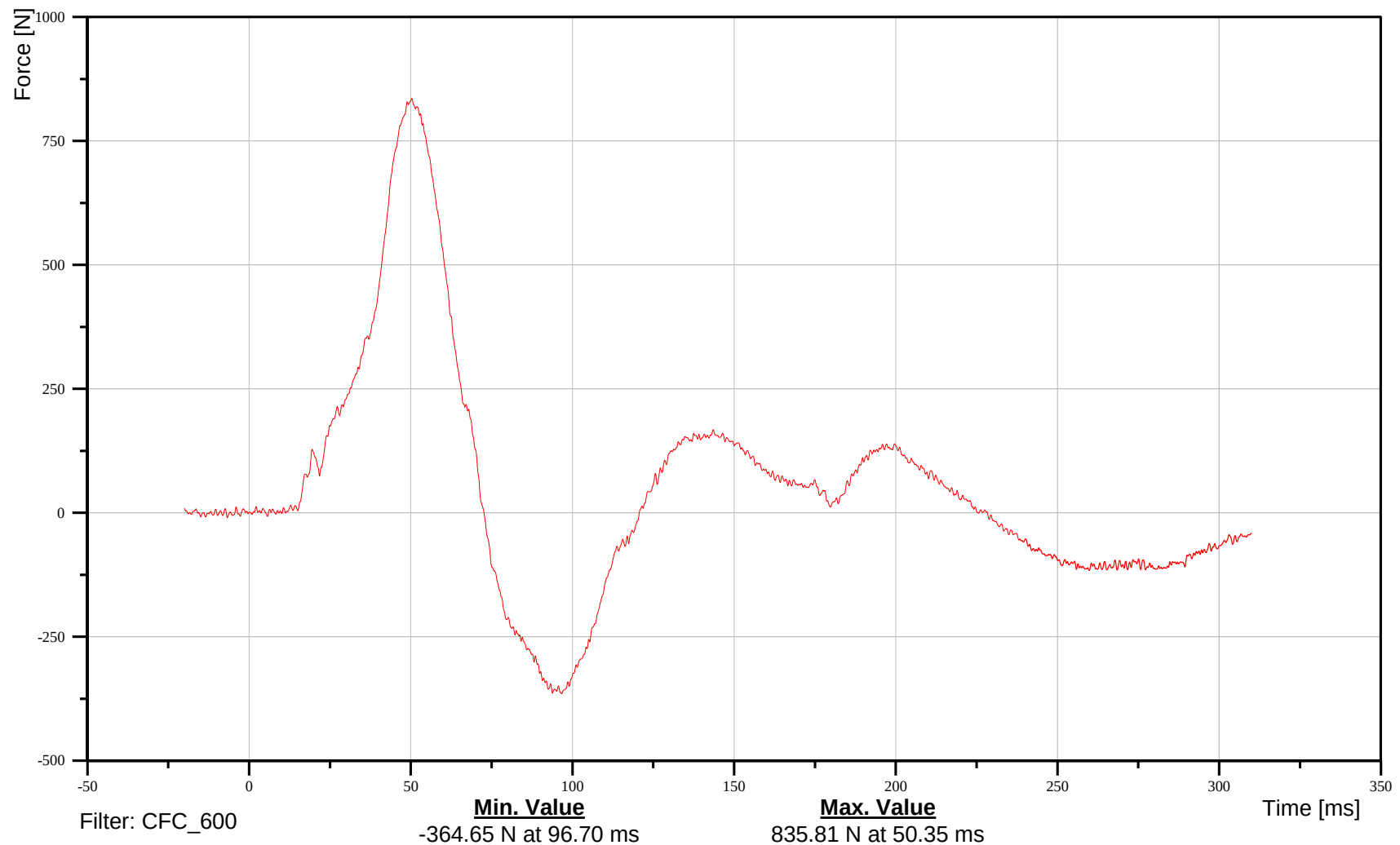
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11LUSP0000WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lumbar Z-Axis Force

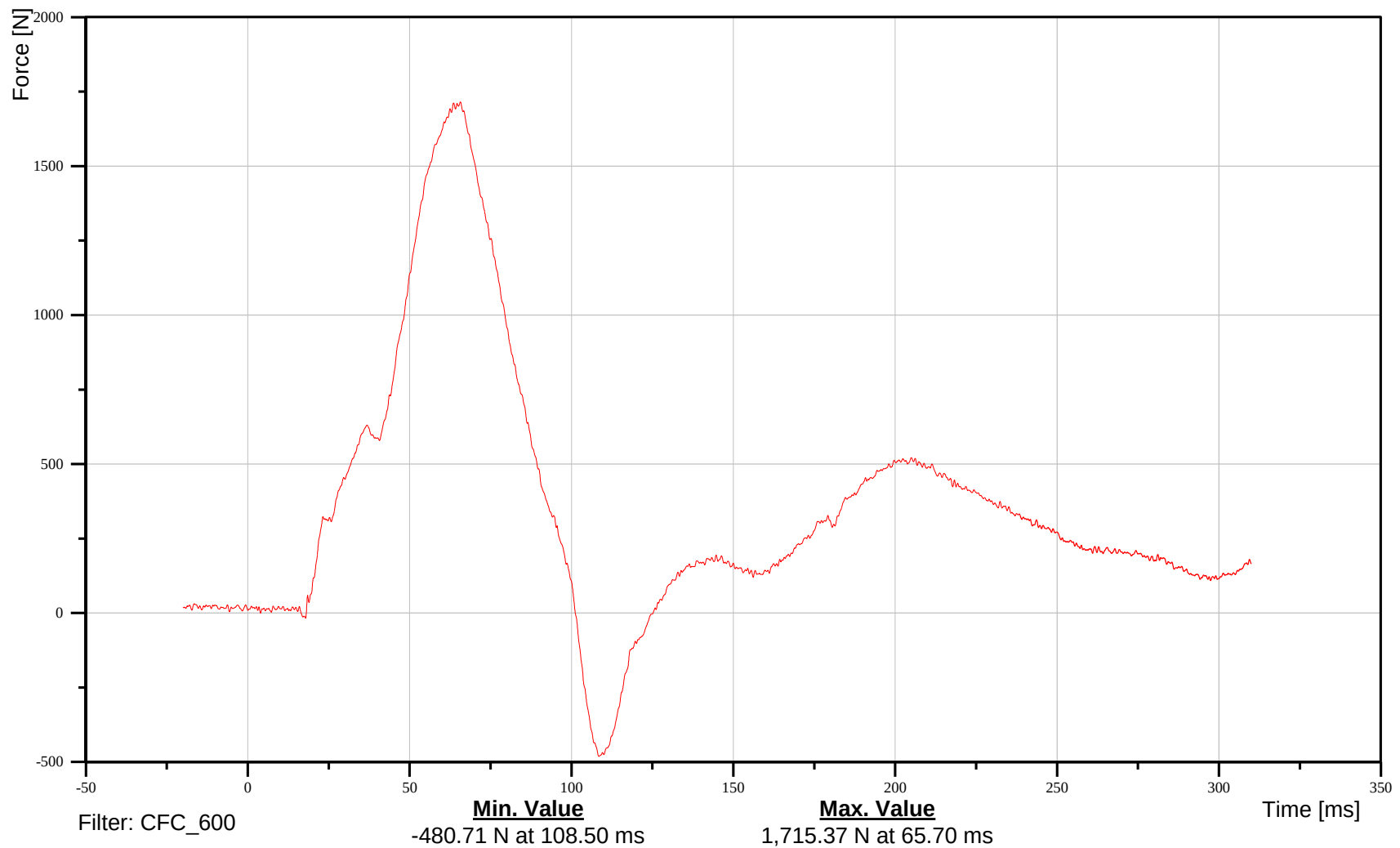
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11LUSP0000WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lumbar Moment About X Axis

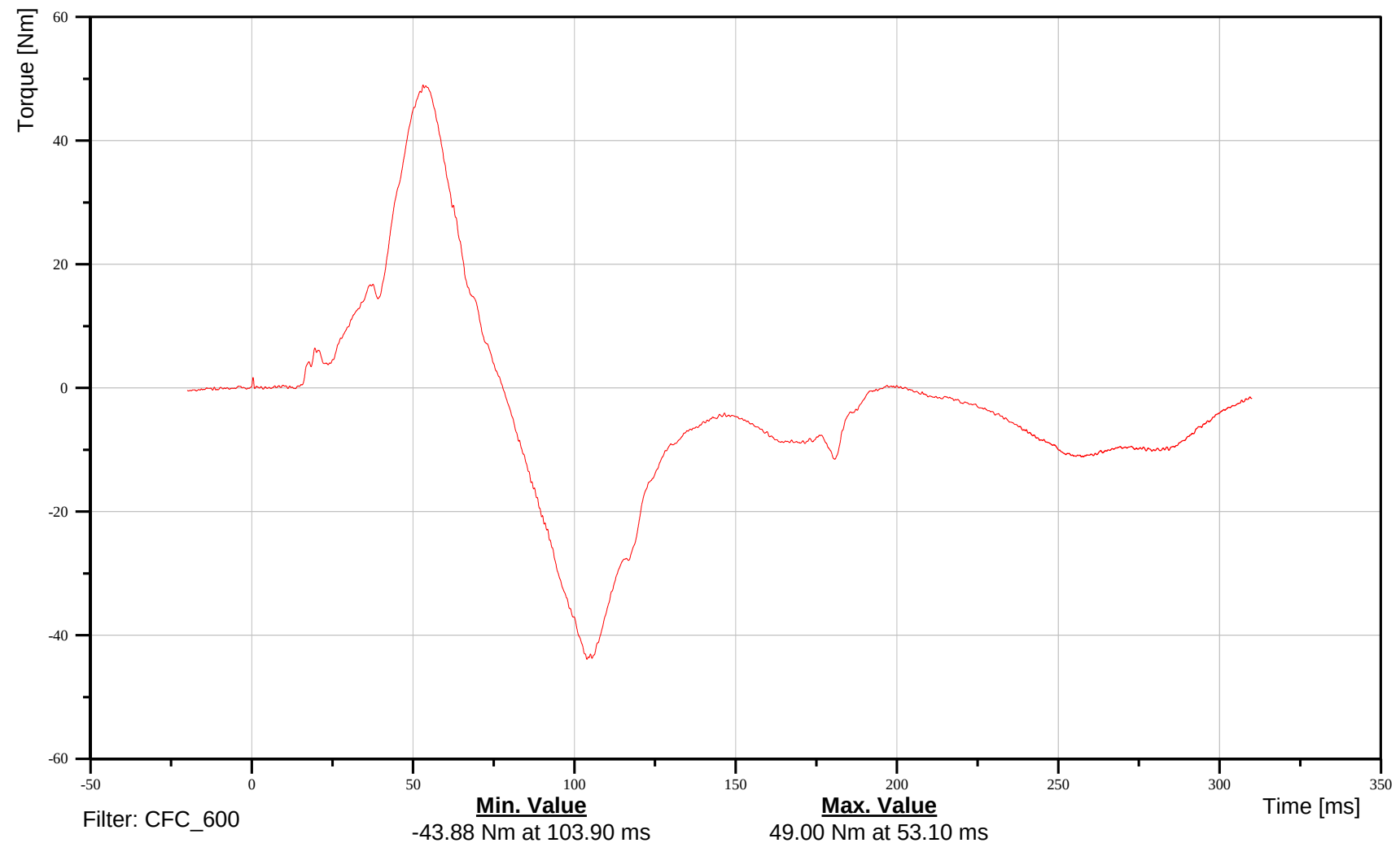
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11LUSP0000WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lumbar Moment About Y Axis

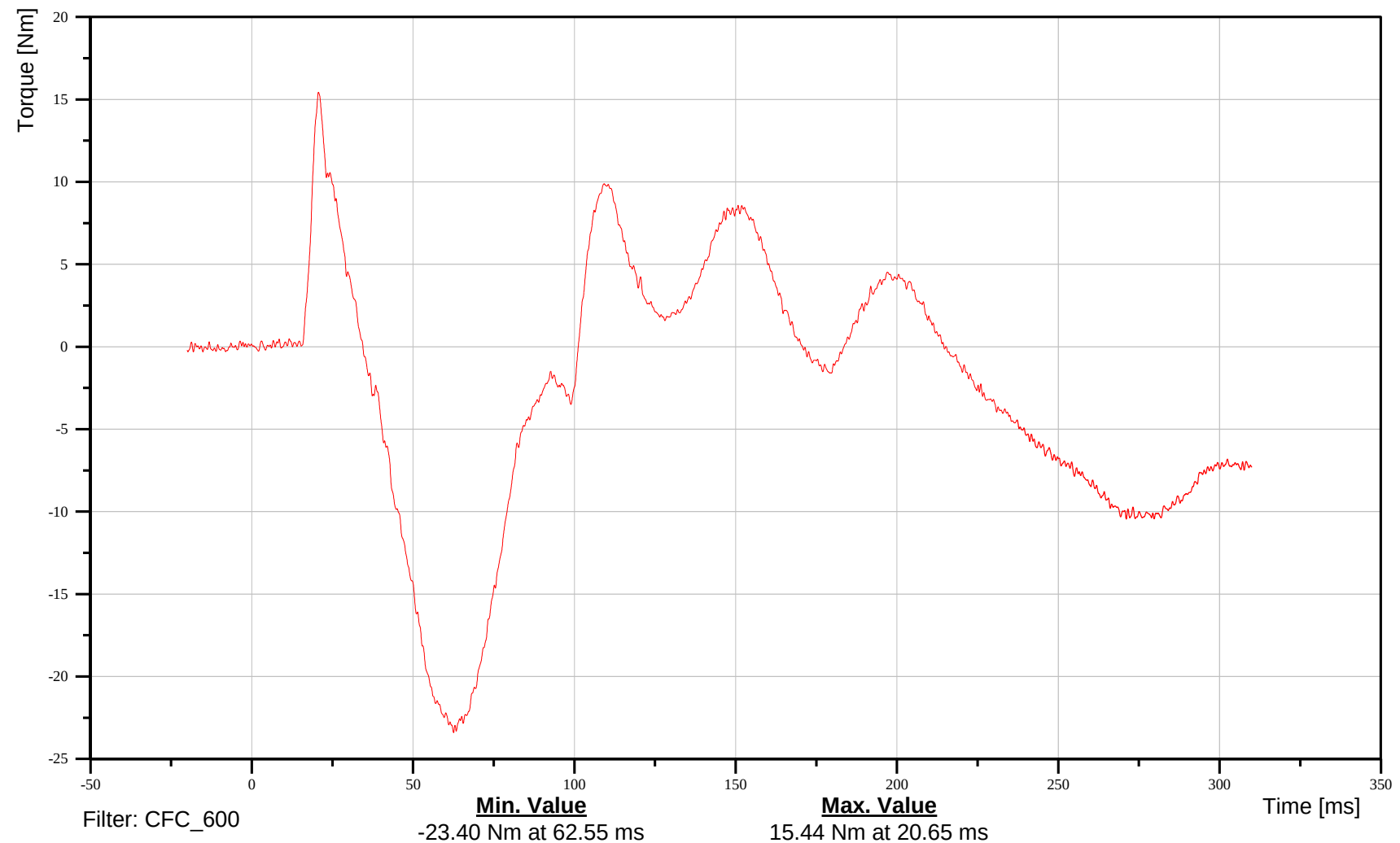
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11LUSP0000WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Lumbar Moment About Z Axis

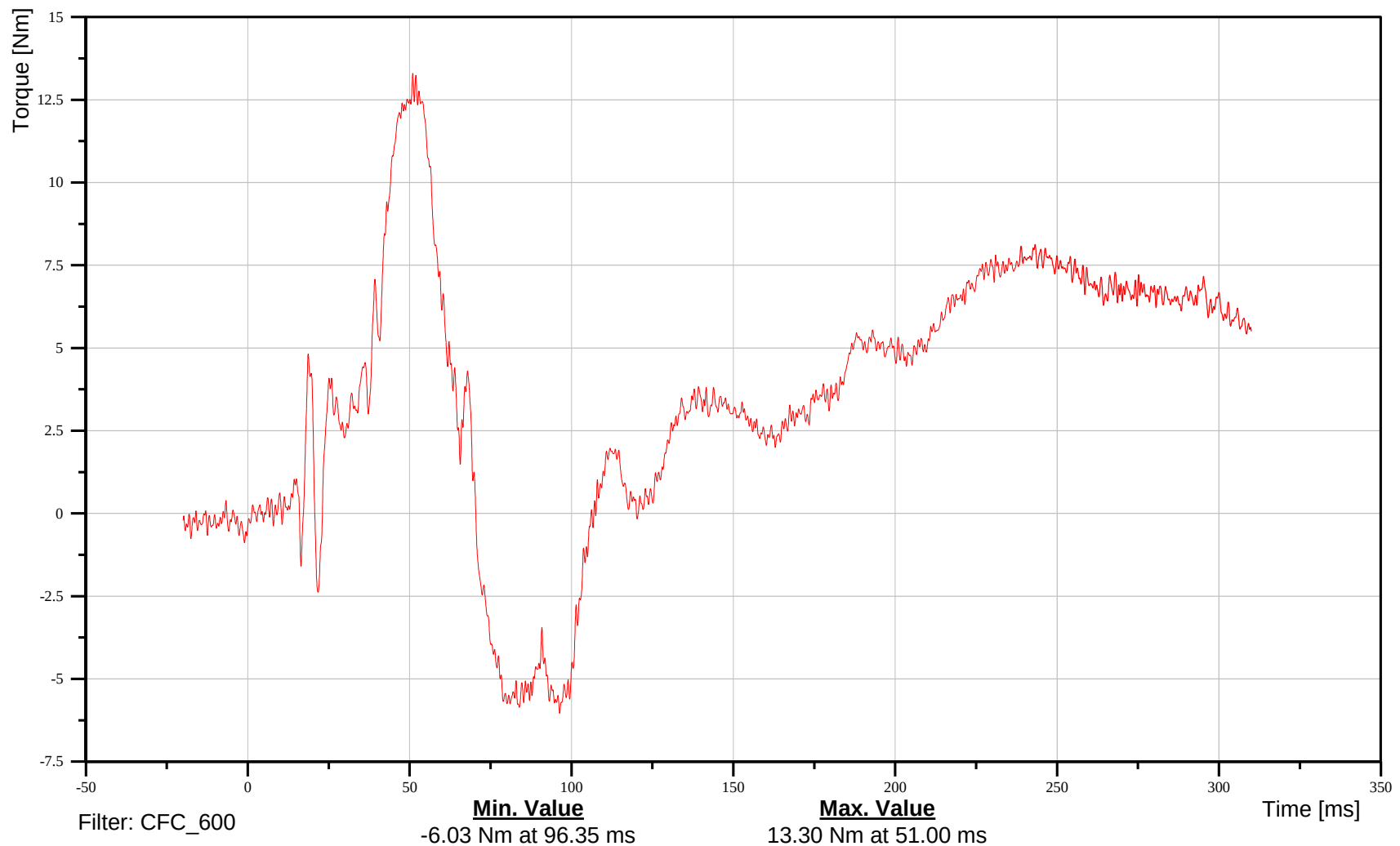
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11LUSP0000WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Pelvis Longitudinal Ax

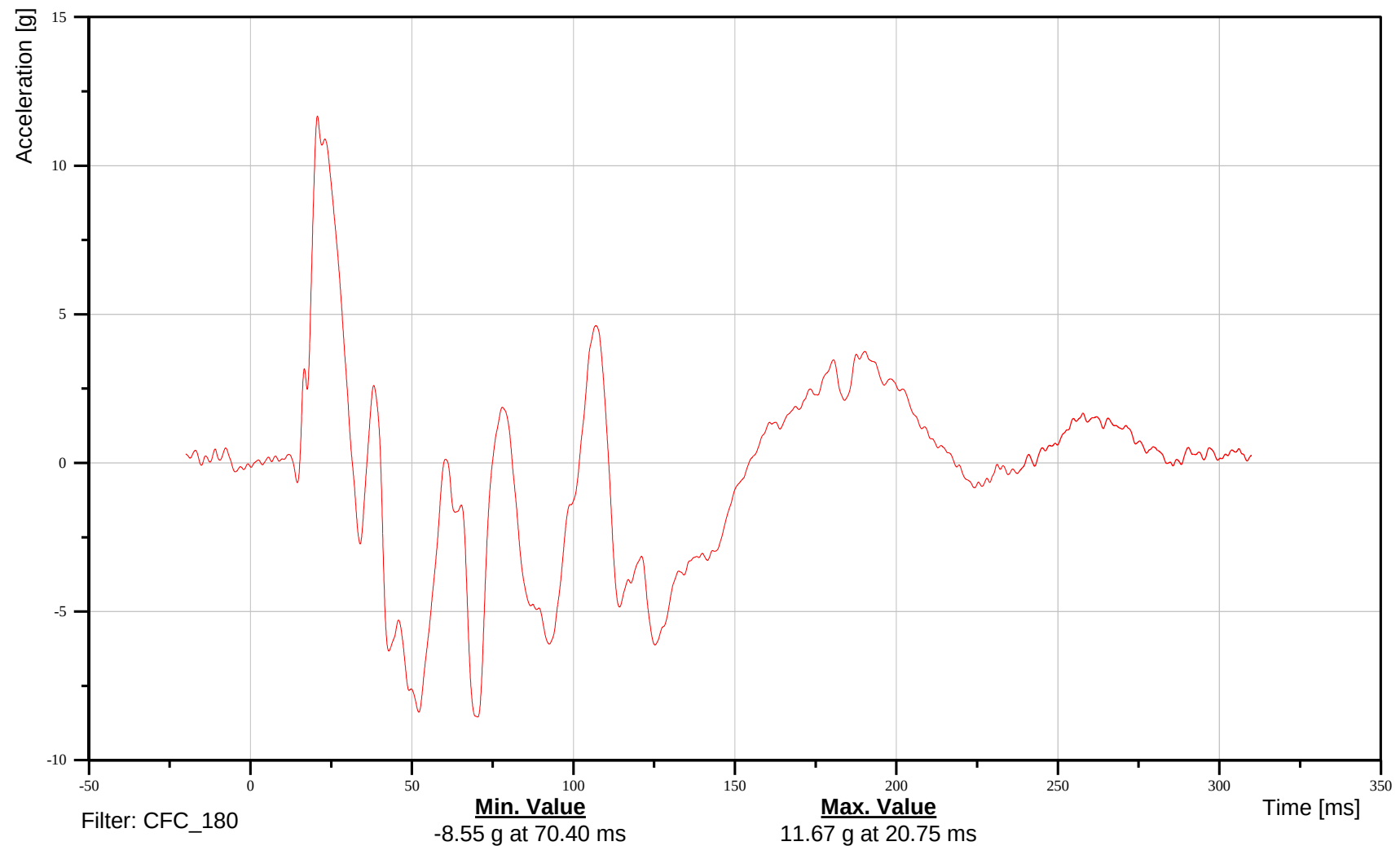
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11PELV0000WSACXC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Pelvis Lateral Ay

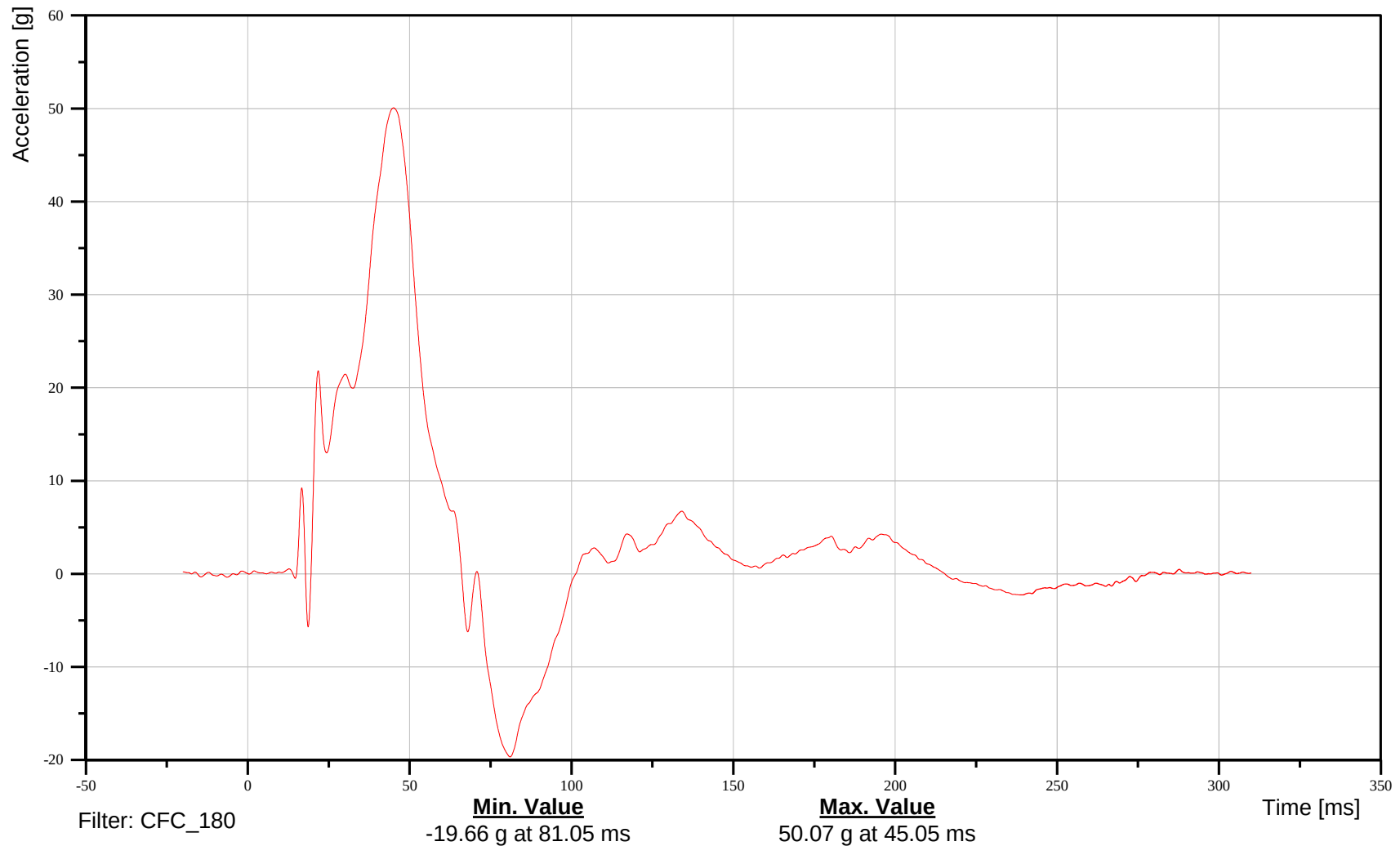
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11PELV0000WSACYC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Pelvis Vertical Az

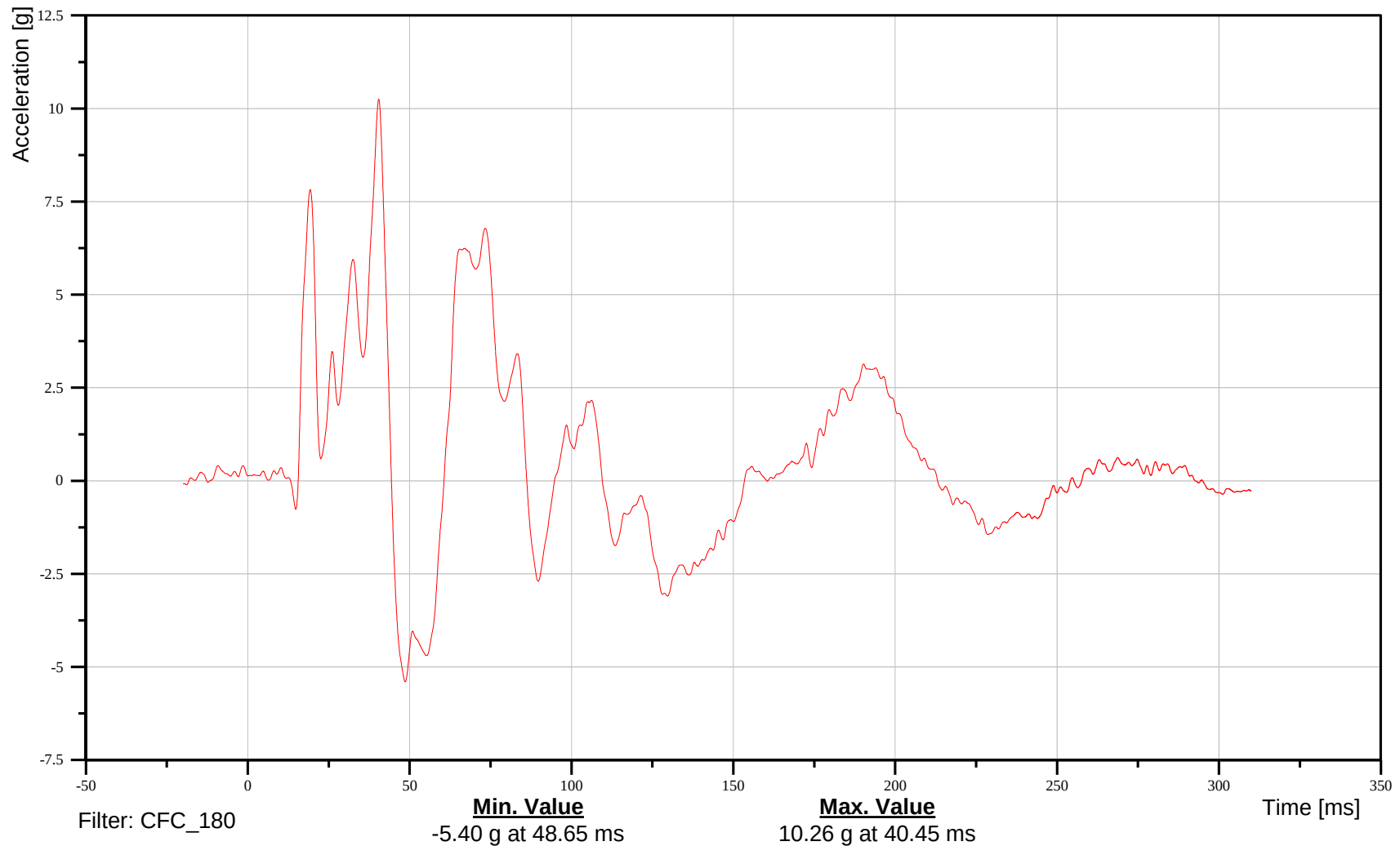
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11PELV0000WSACZC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Pelvis A Resultant

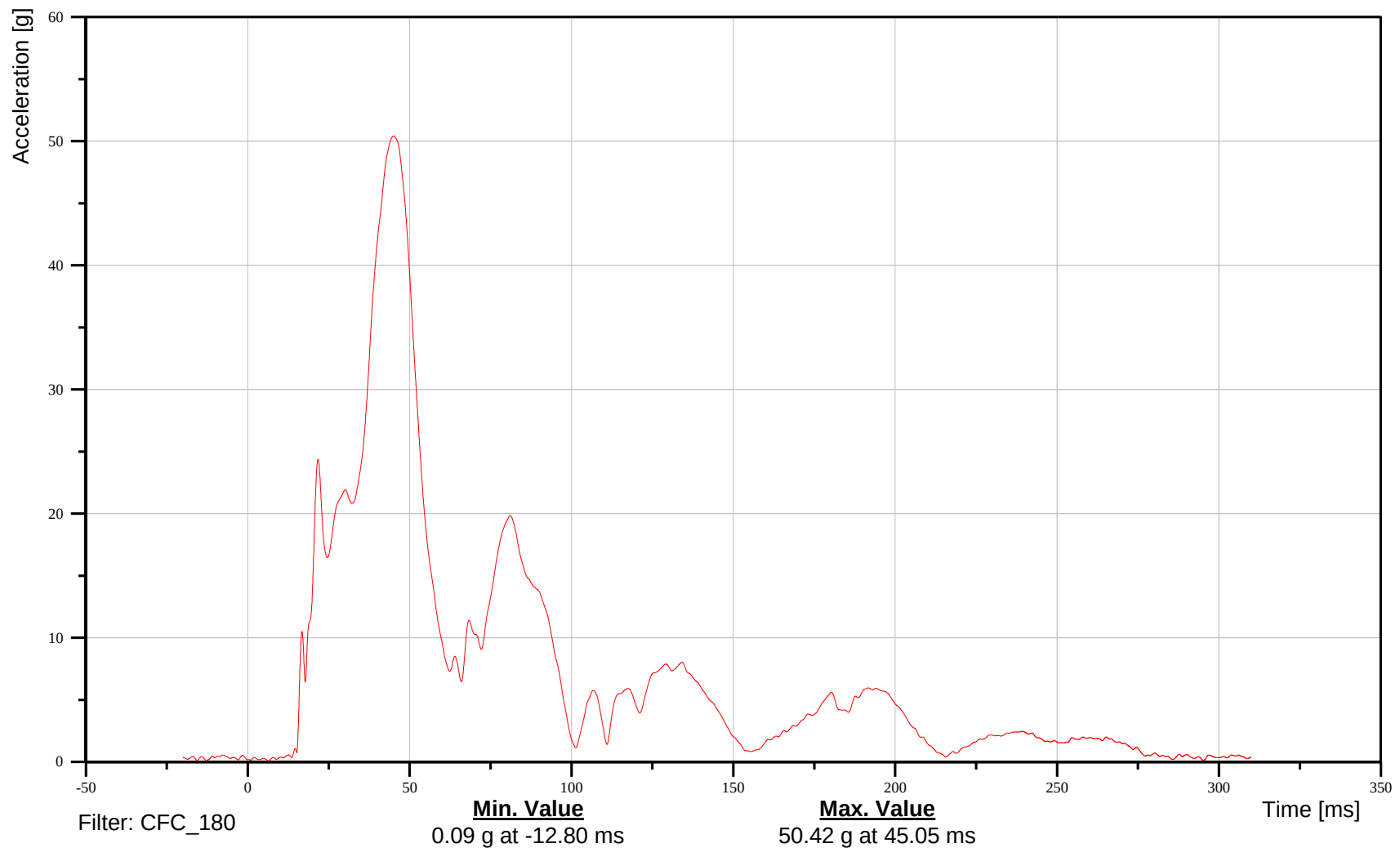
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11PELV0000WSACRC

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femur X-Axis Force

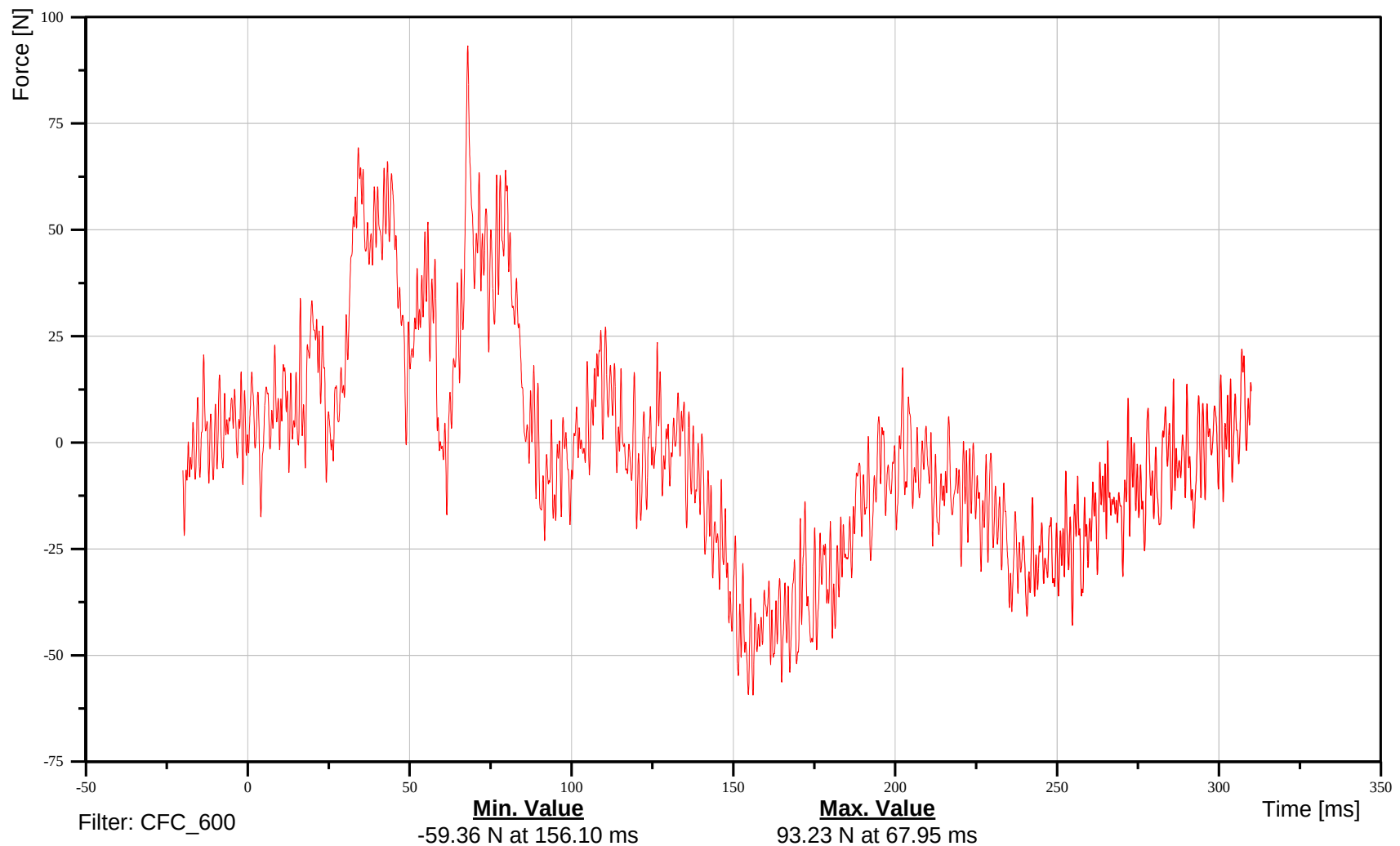
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11FEMRLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femur Y-Axis Force

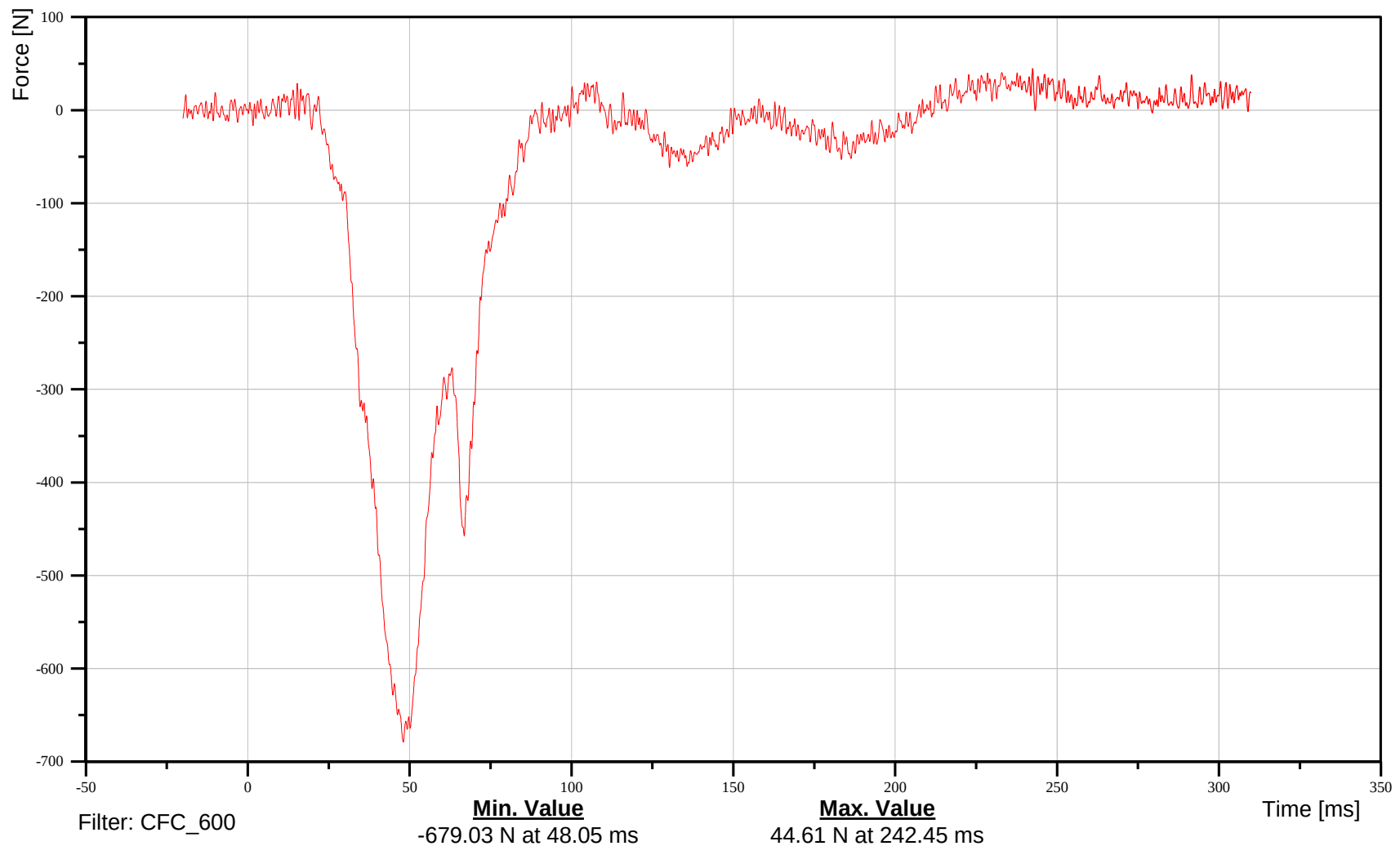
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11FEMRLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femur Z-Axis Force

Date: 06/14/2016

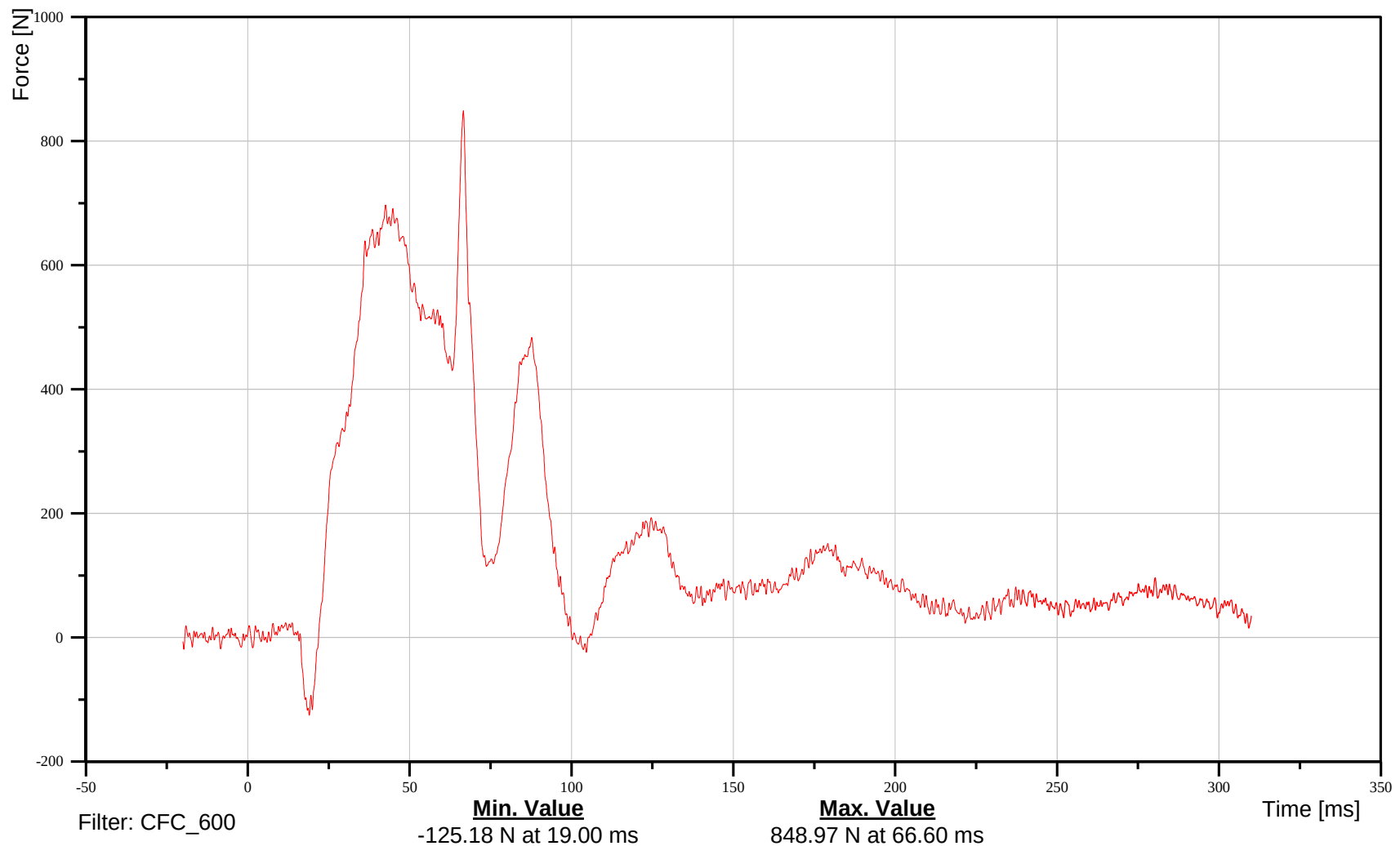
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femur Moment About X Axis

Date: 06/14/2016

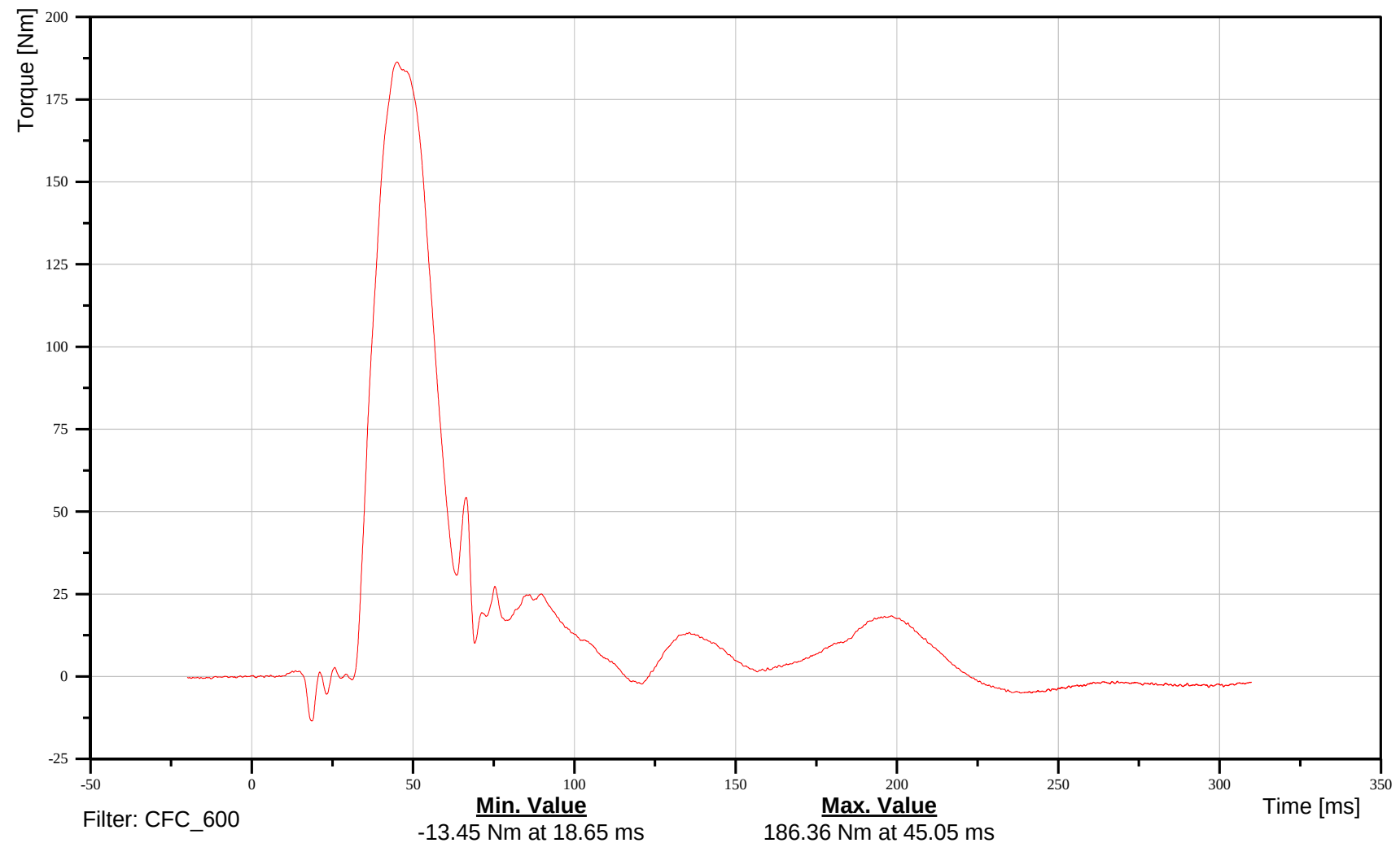
Time: 14:31

Customer: VRTC

11FEMRLE00WSMOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femur Moment About Y Axis

Date: 06/14/2016

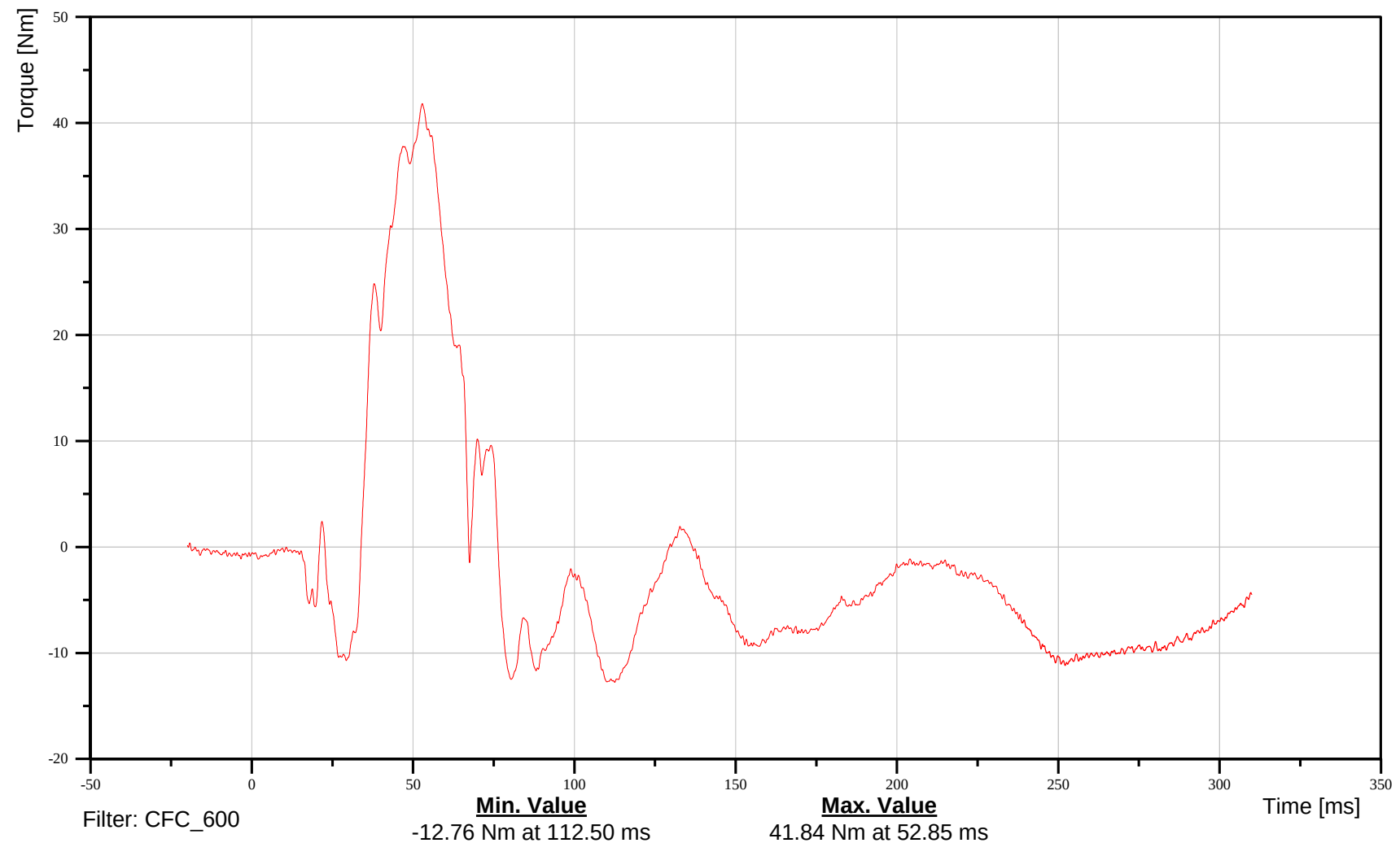
Time: 14:31

Customer: VRTC

11FEMRLE00WSMOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femur Moment About Z Axis

Date: 06/14/2016

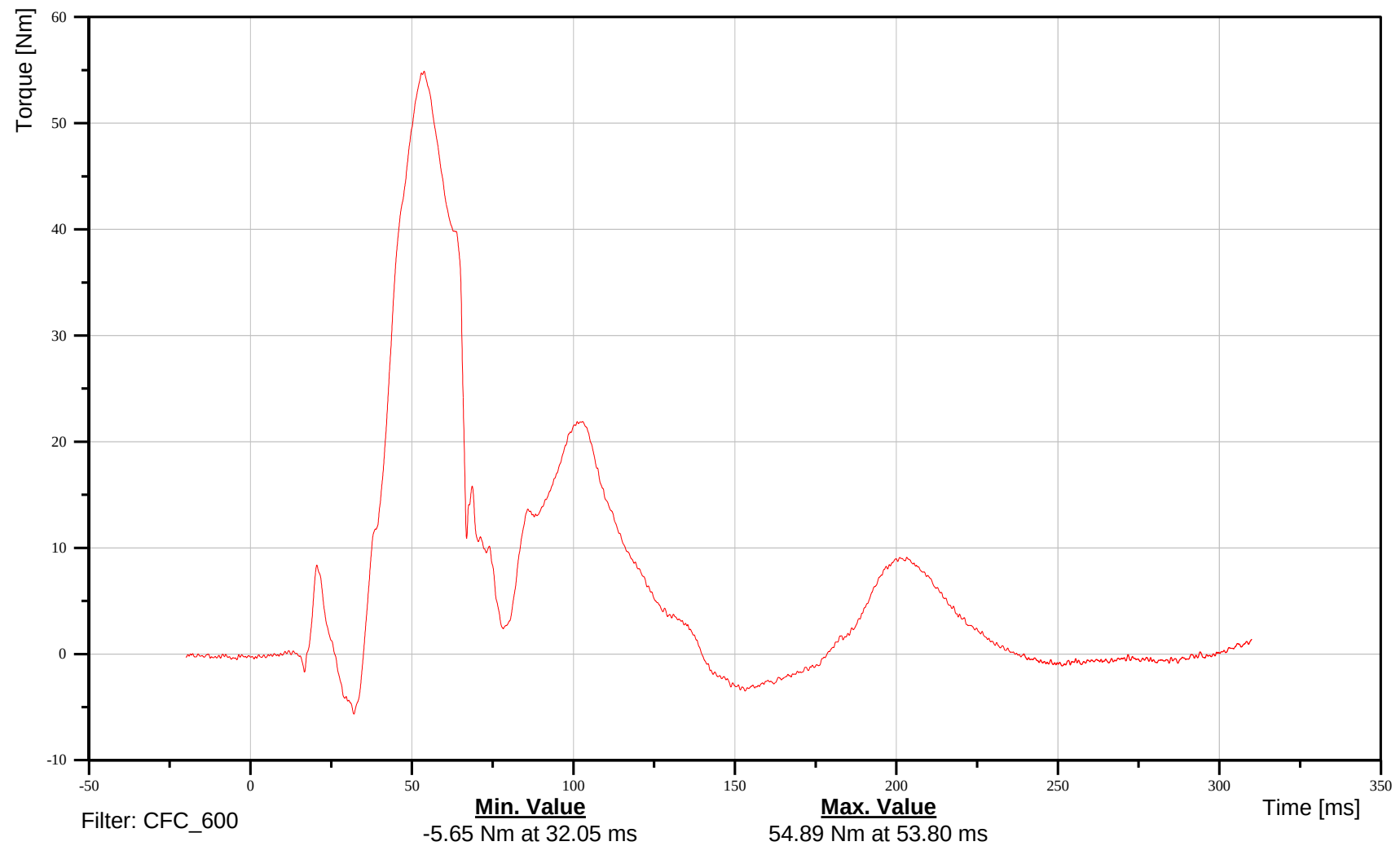
Time: 14:31

Customer: VRTC

11FEMRLE00WSMOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femoral Neck Force X

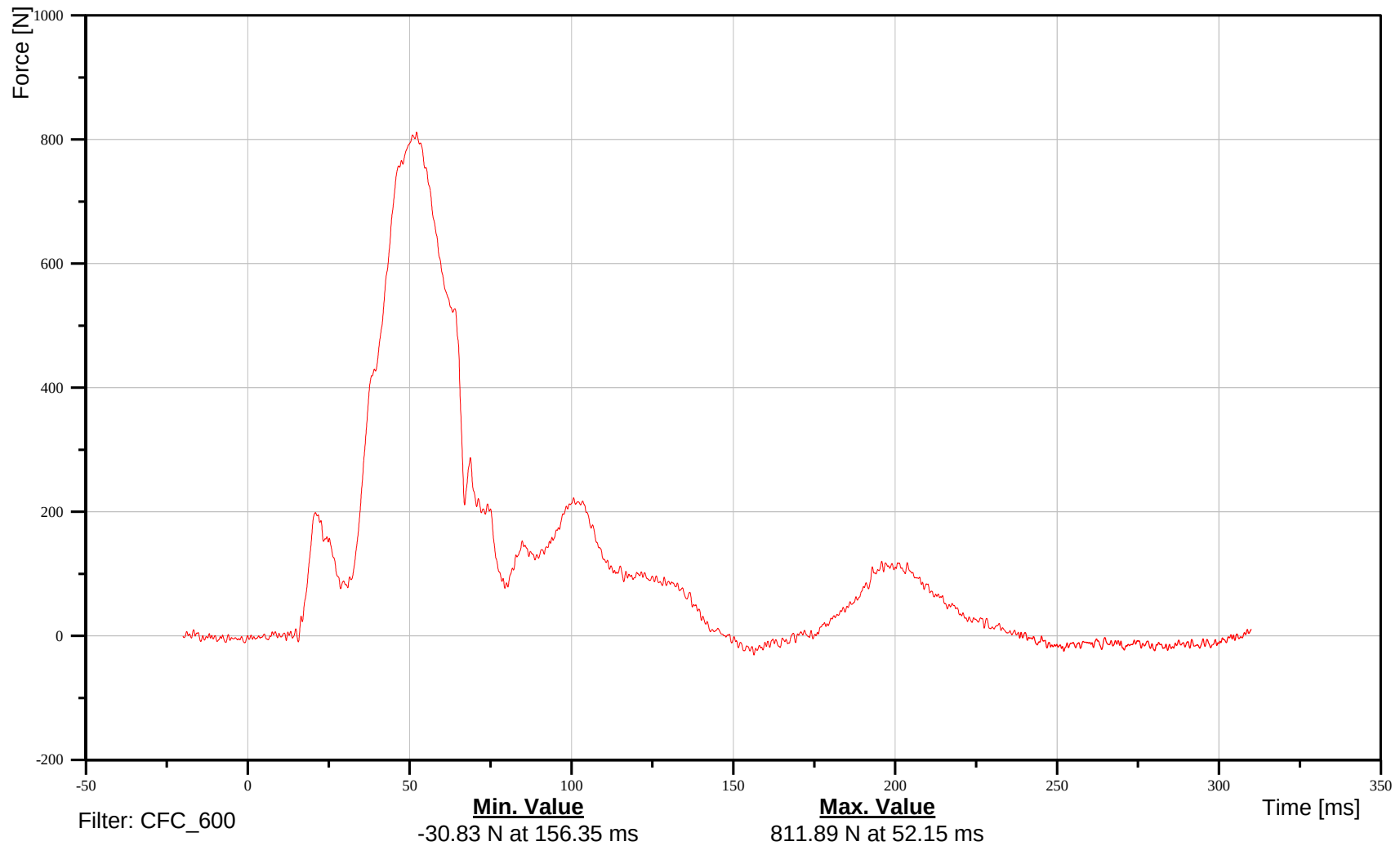
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11FEACLE00WSFOXB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femoral Neck Force Y

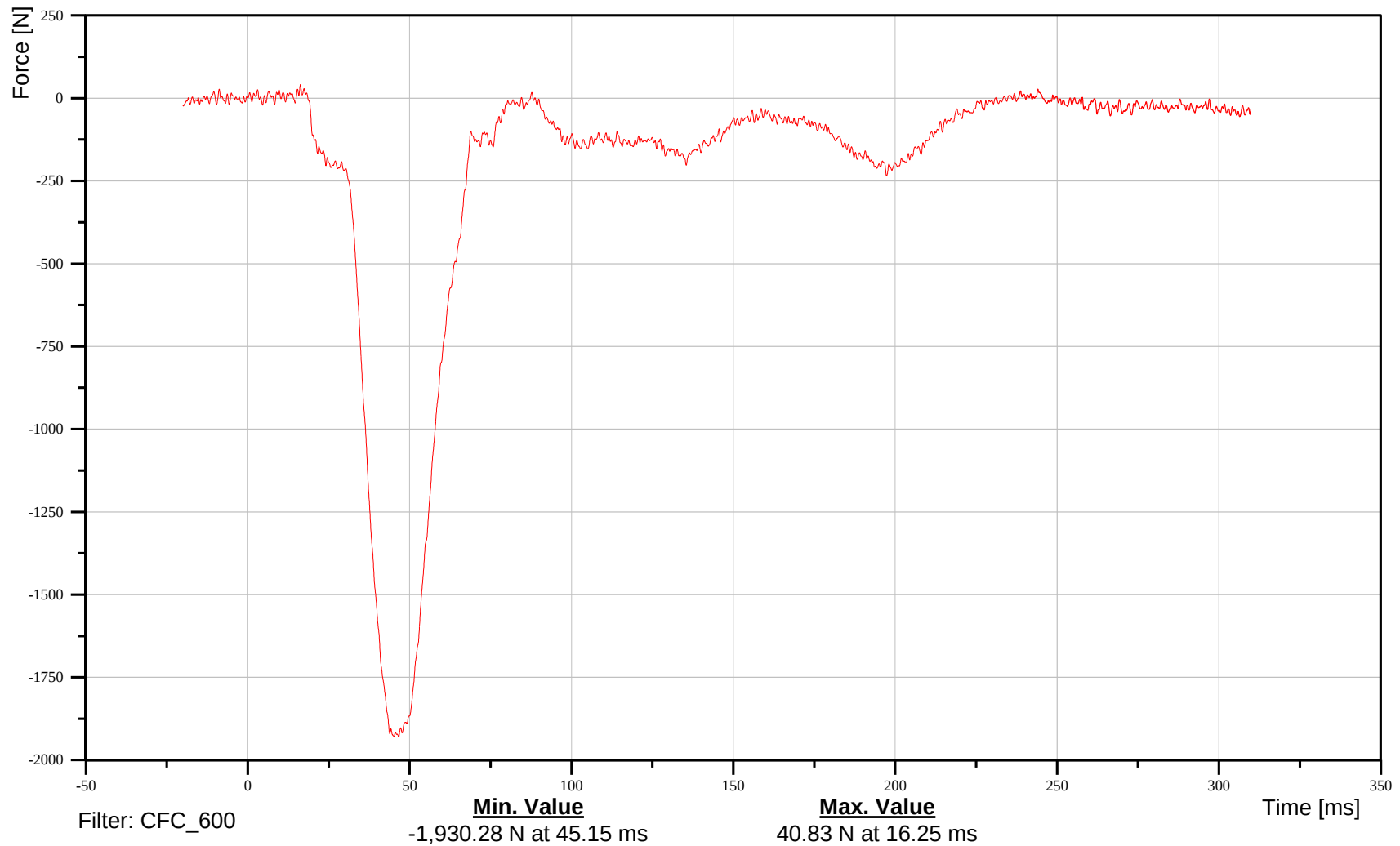
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11FEACLE00WSFOYB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Femoral Neck Force Z

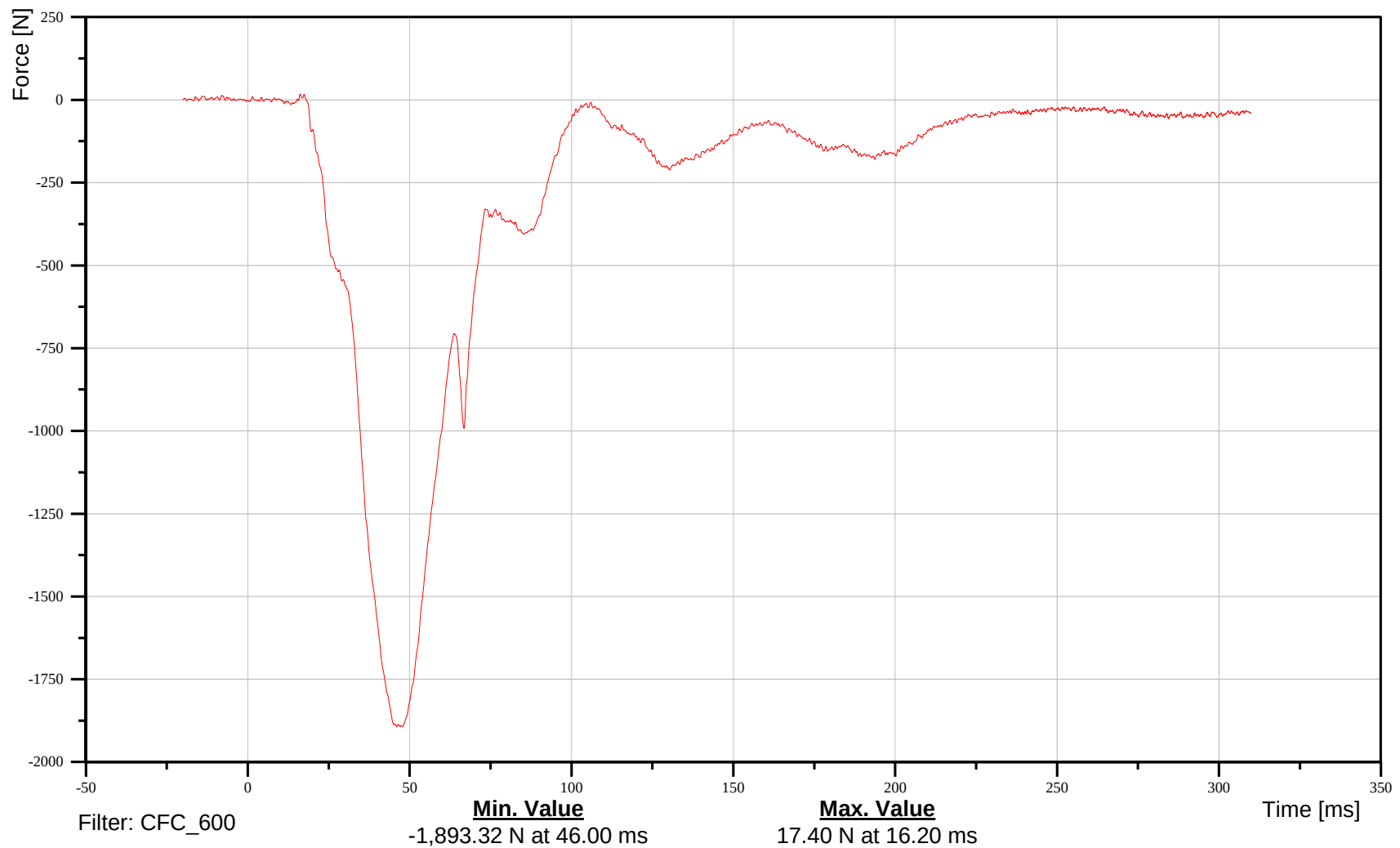
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11FEACLE00WSFOZB

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Rear Ribeye X-Axis Displacement

Date: 06/14/2016

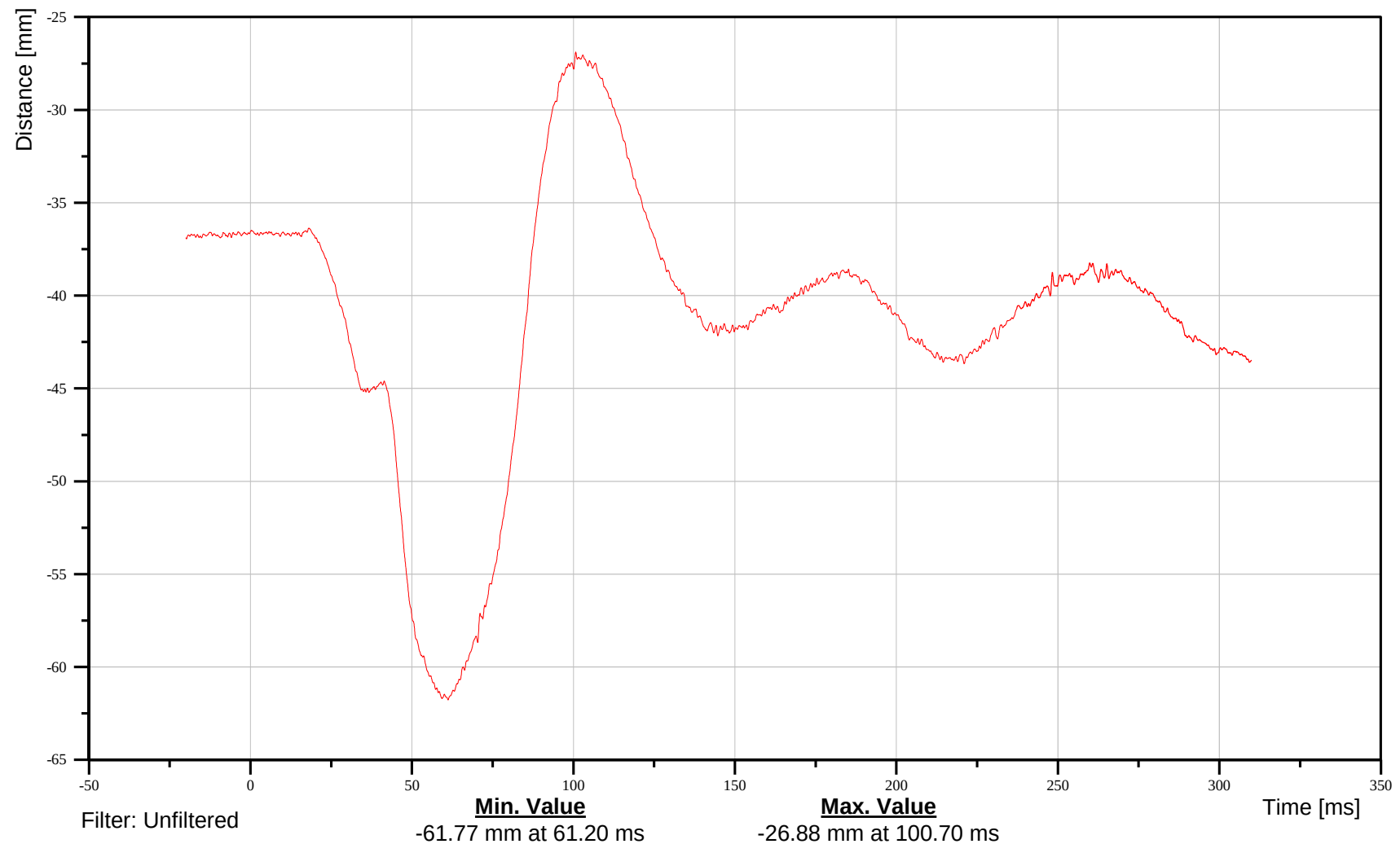
Time: 14:31

Customer: VRTC

11SHRI00REWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Rear Ribeye Y-Axis Displacement

Date: 06/14/2016

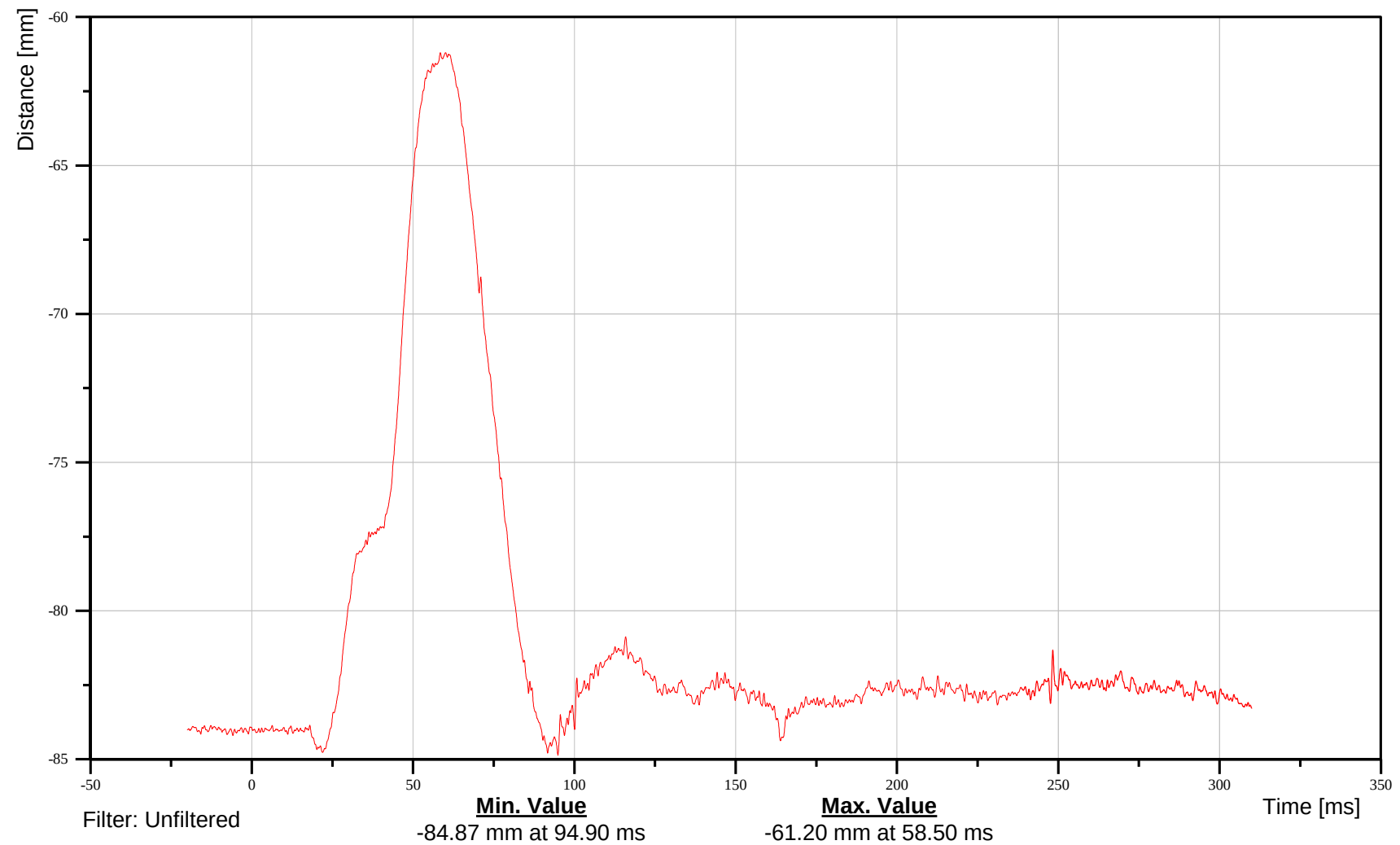
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Rear Ribeye Z-Axis Displacement

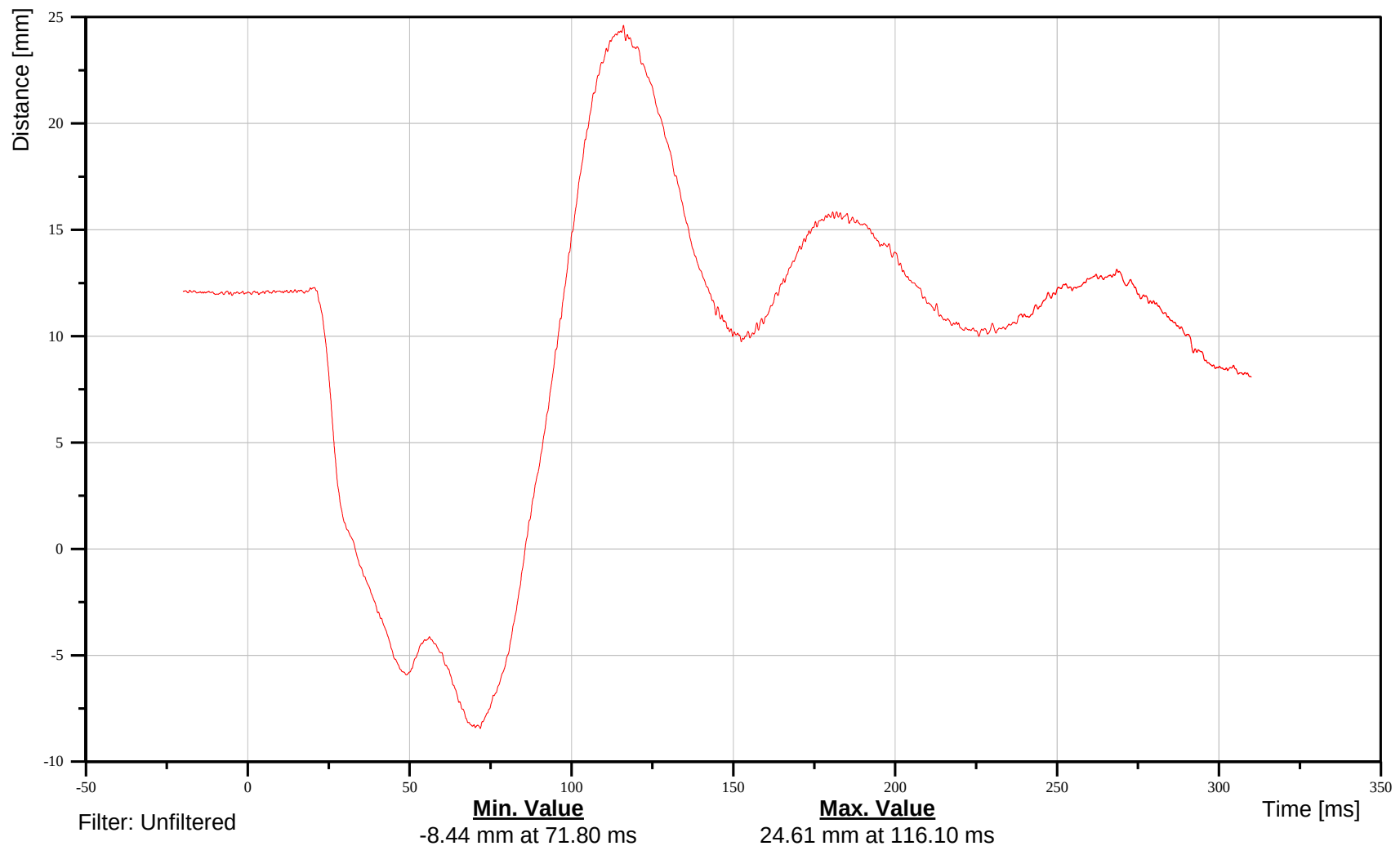
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SHRI00REWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Rear Ribeye Length Change

Date: 06/14/2016

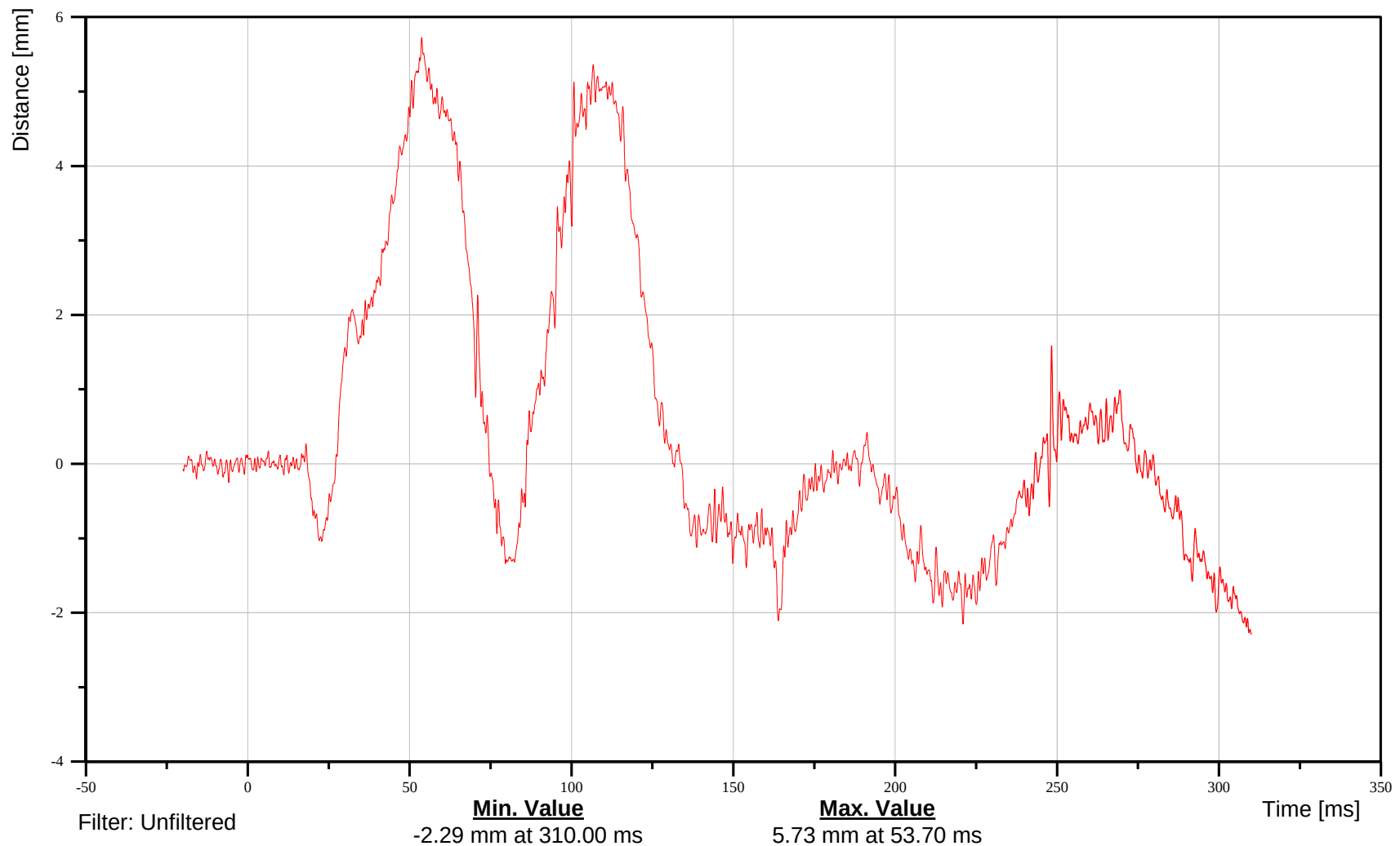
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Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Middle Ribeye X-Axis Displacement

Date: 06/14/2016

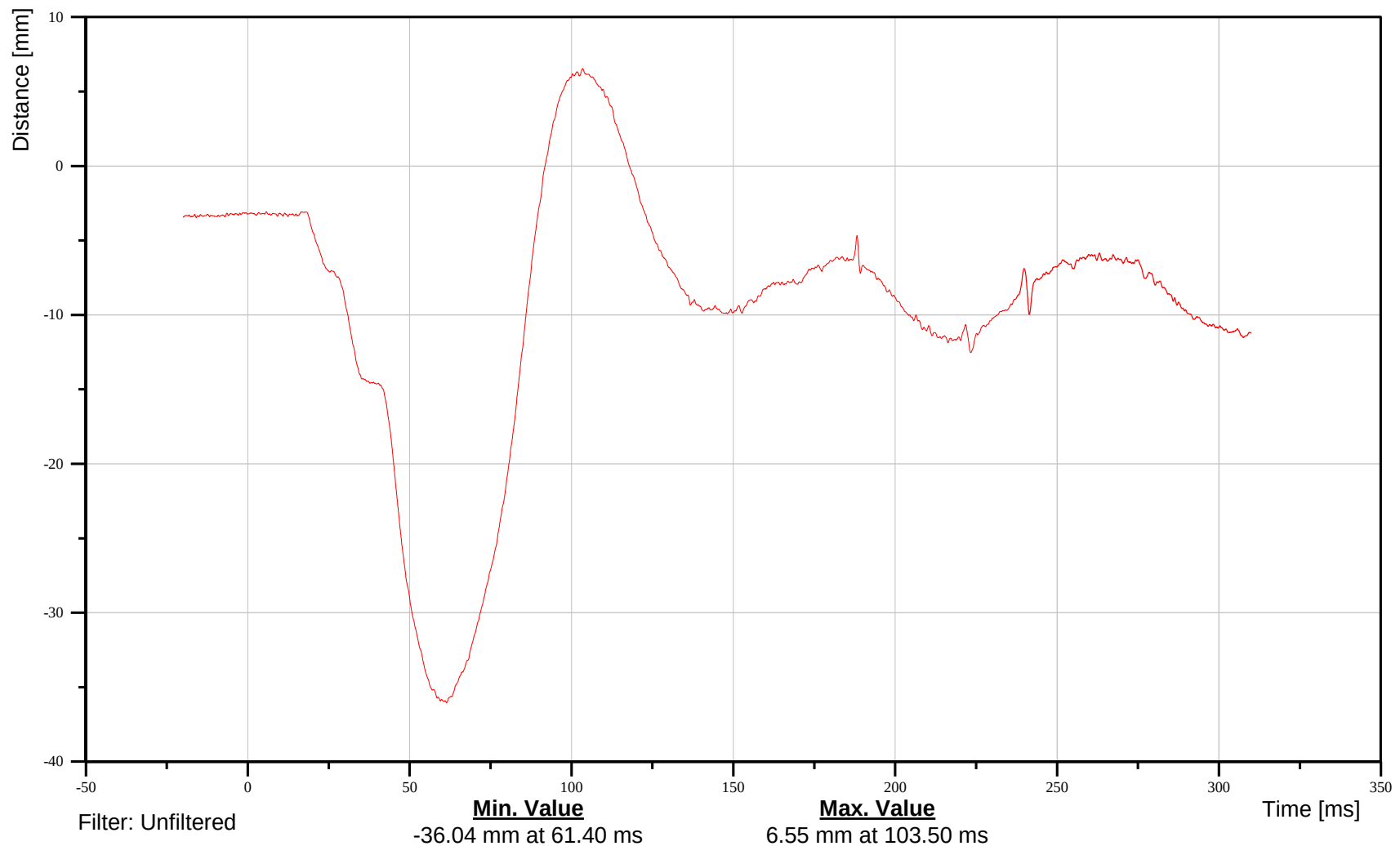
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Middle Ribeye Y-Axis Displacement

Date: 06/14/2016

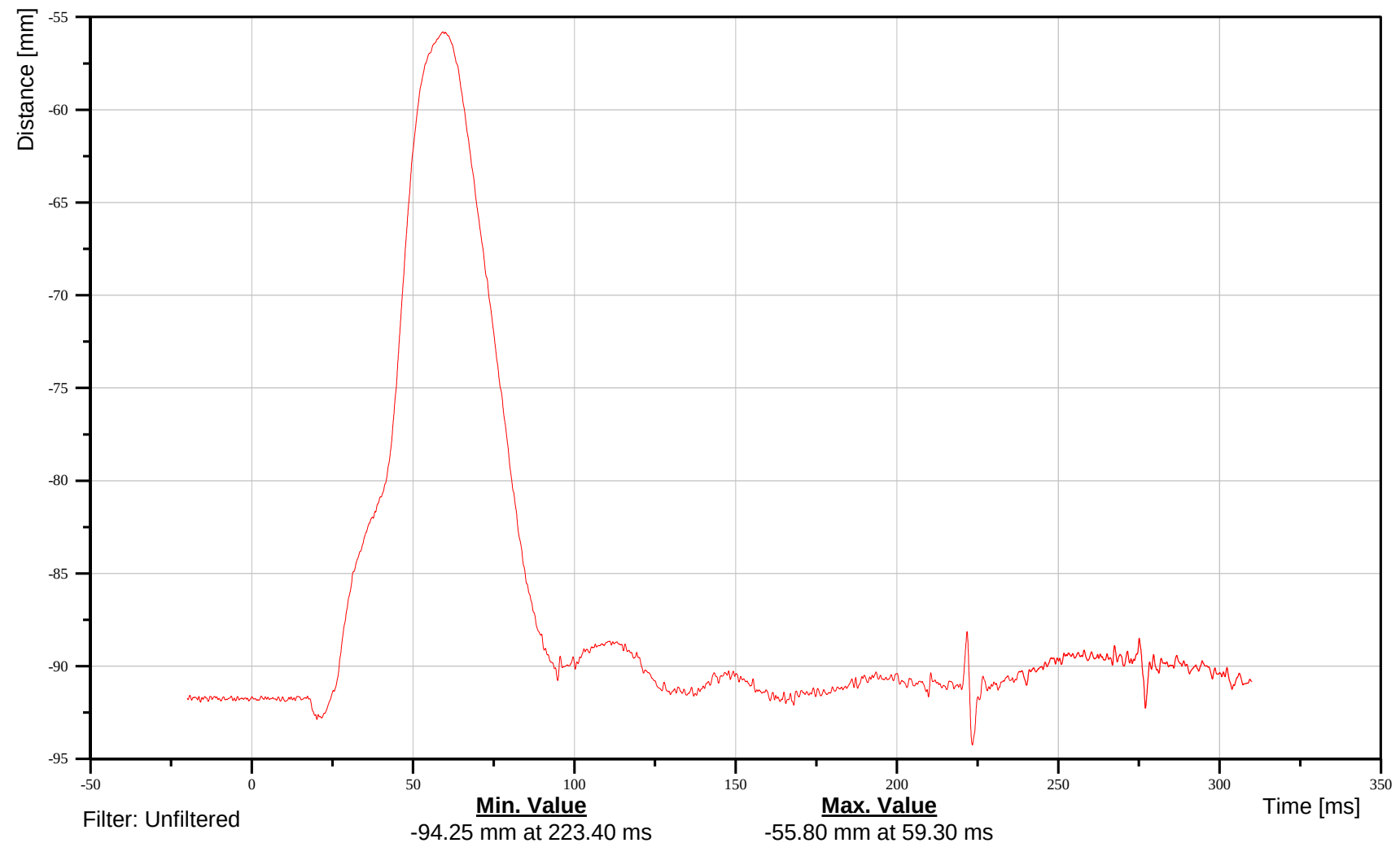
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Middle Ribeye Z-Axis Displacement

Date: 06/14/2016

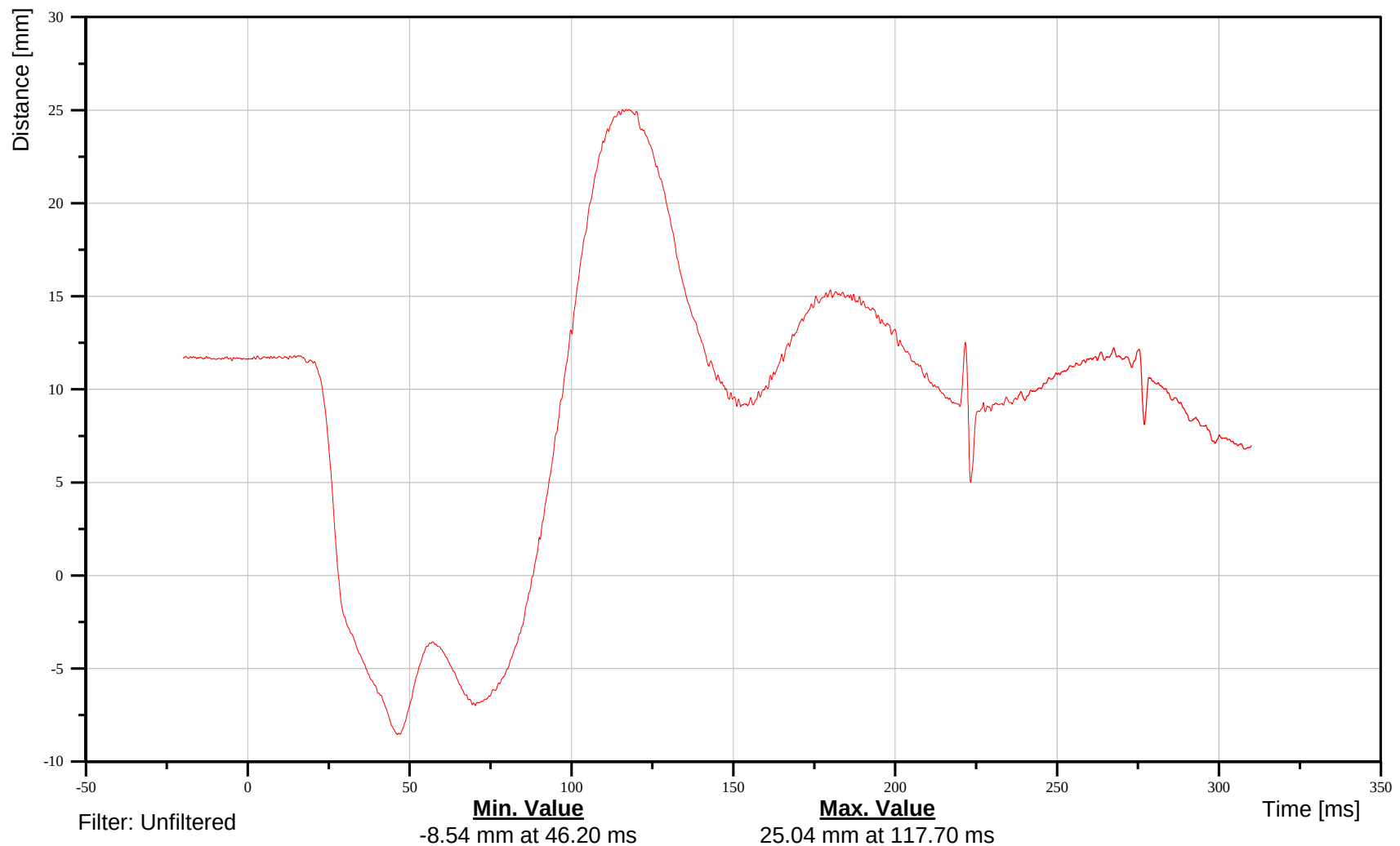
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Middle Ribeye Length Change

Date: 06/14/2016

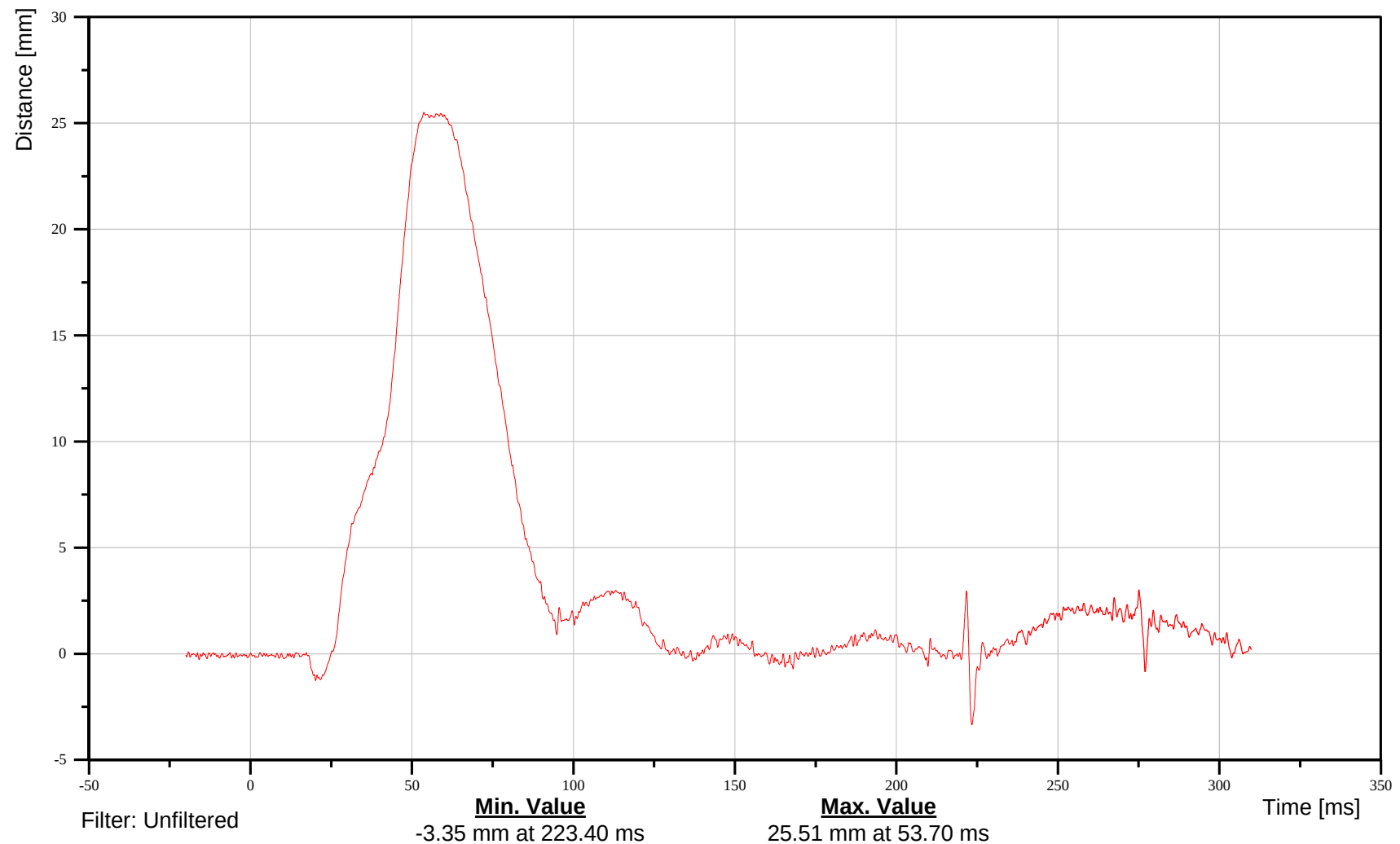
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Front Ribeye X-Axis Displacement

Date: 06/14/2016

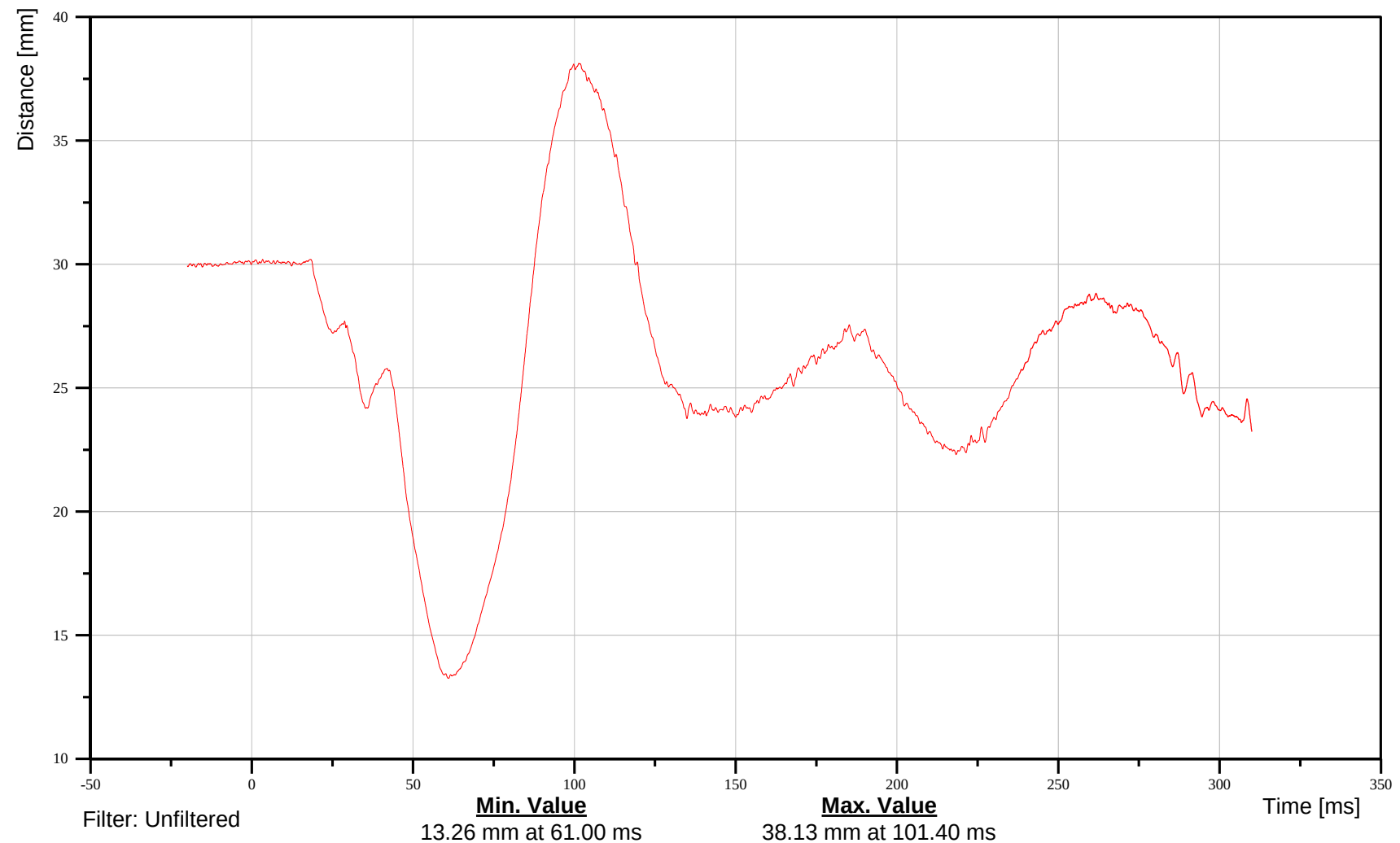
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Front Ribeye Y-Axis Displacement

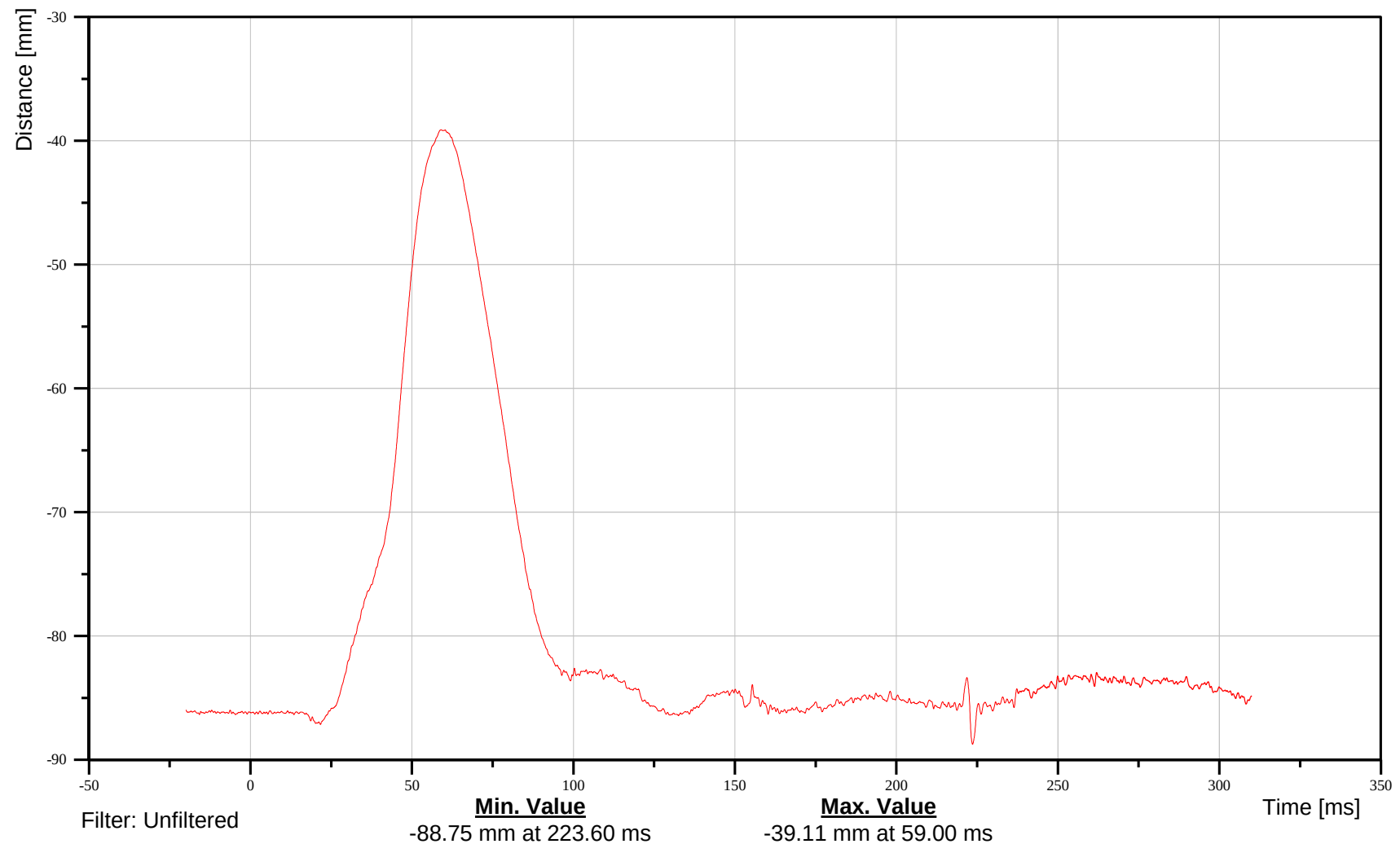
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SHRI00FRWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Front Ribeye Z-Axis Displacement

Date: 06/14/2016

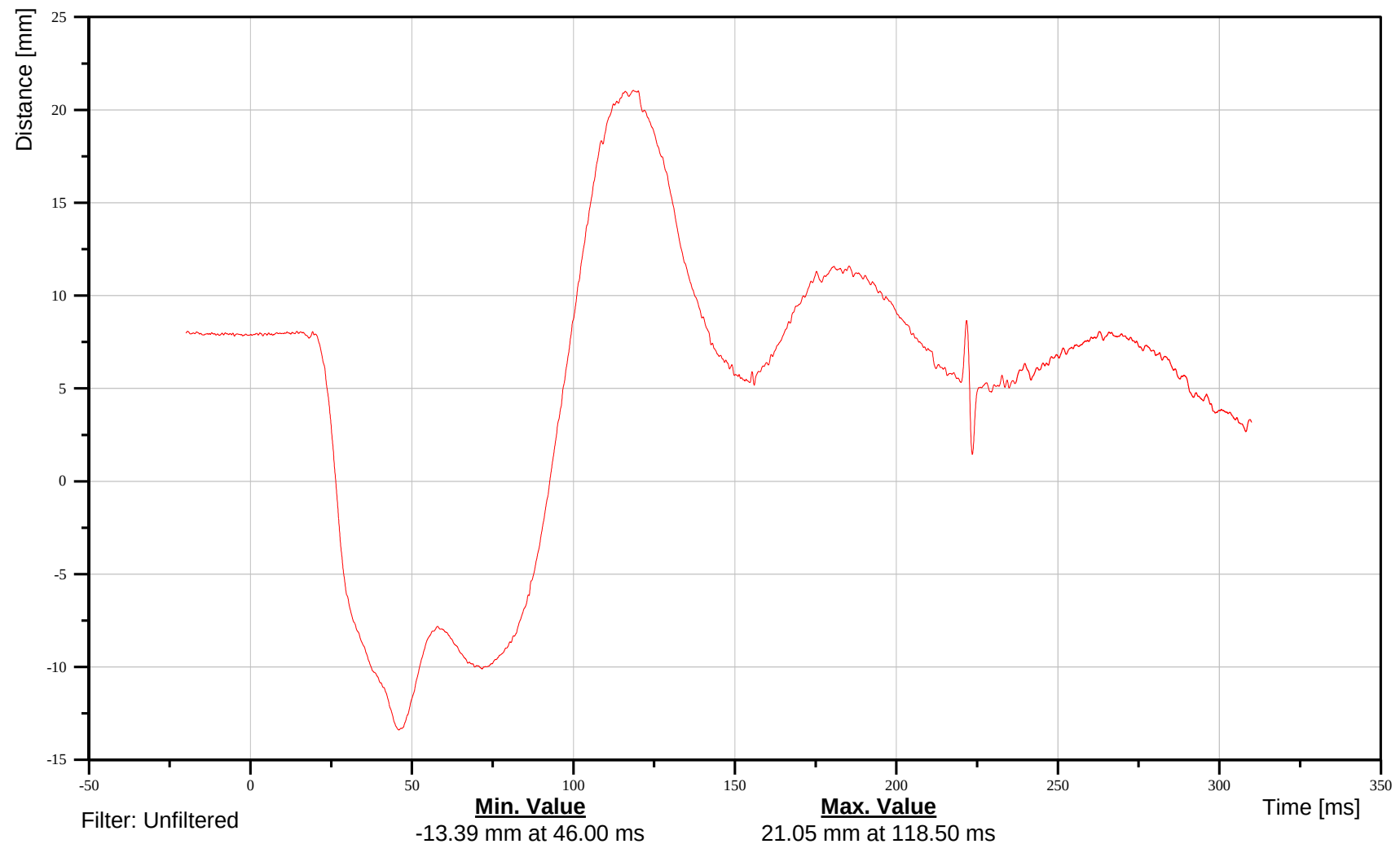
Time: 14:31

Customer: VRTC

11SHRI00FRWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Front Ribeye Length Change

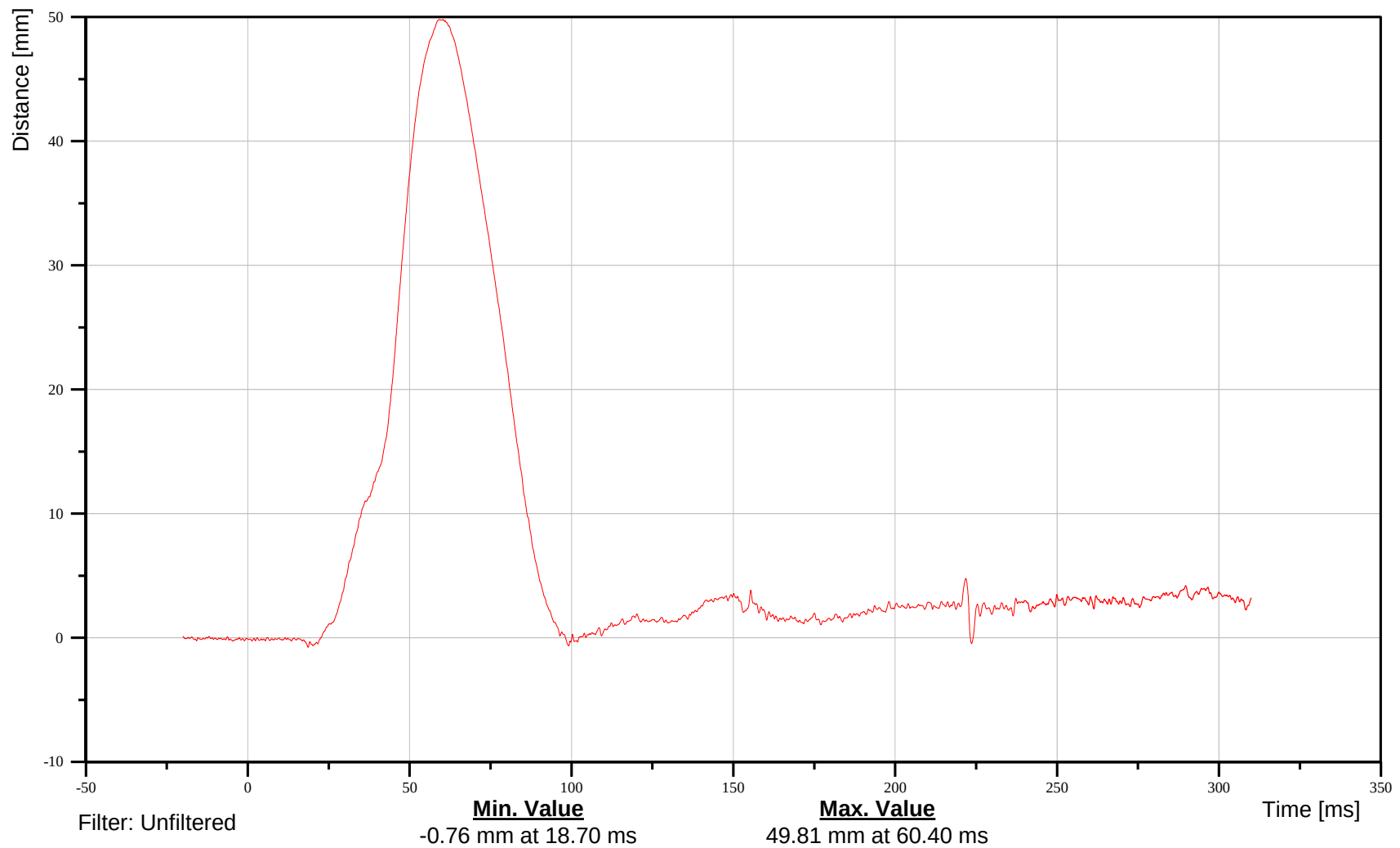
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SHRI00FRWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Rear Ribeye X-Axis Displacement

Date: 06/14/2016

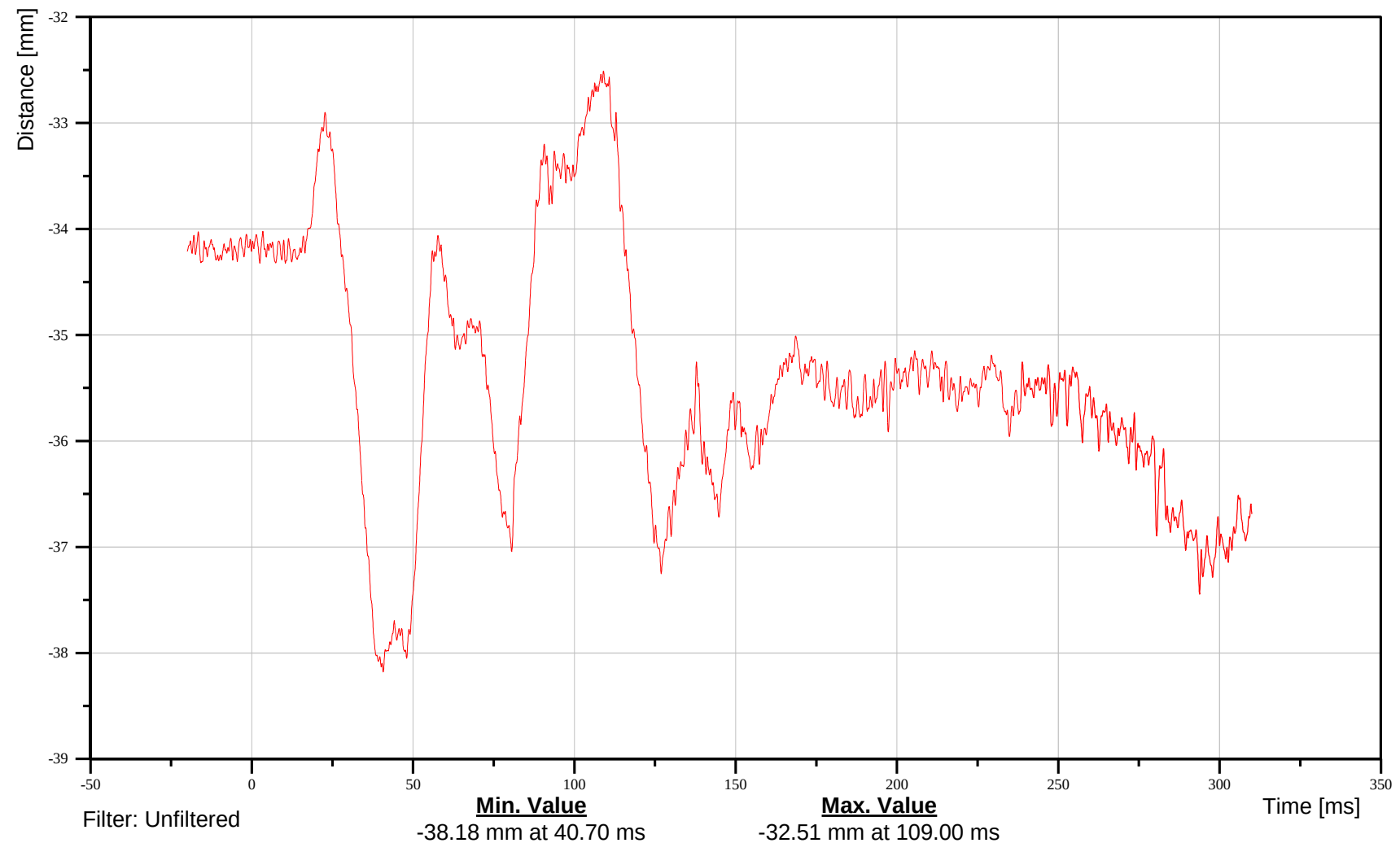
Time: 14:31

Customer: VRTC

11THRI01REWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Rear Ribeye Y-Axis Displacement

Date: 06/14/2016

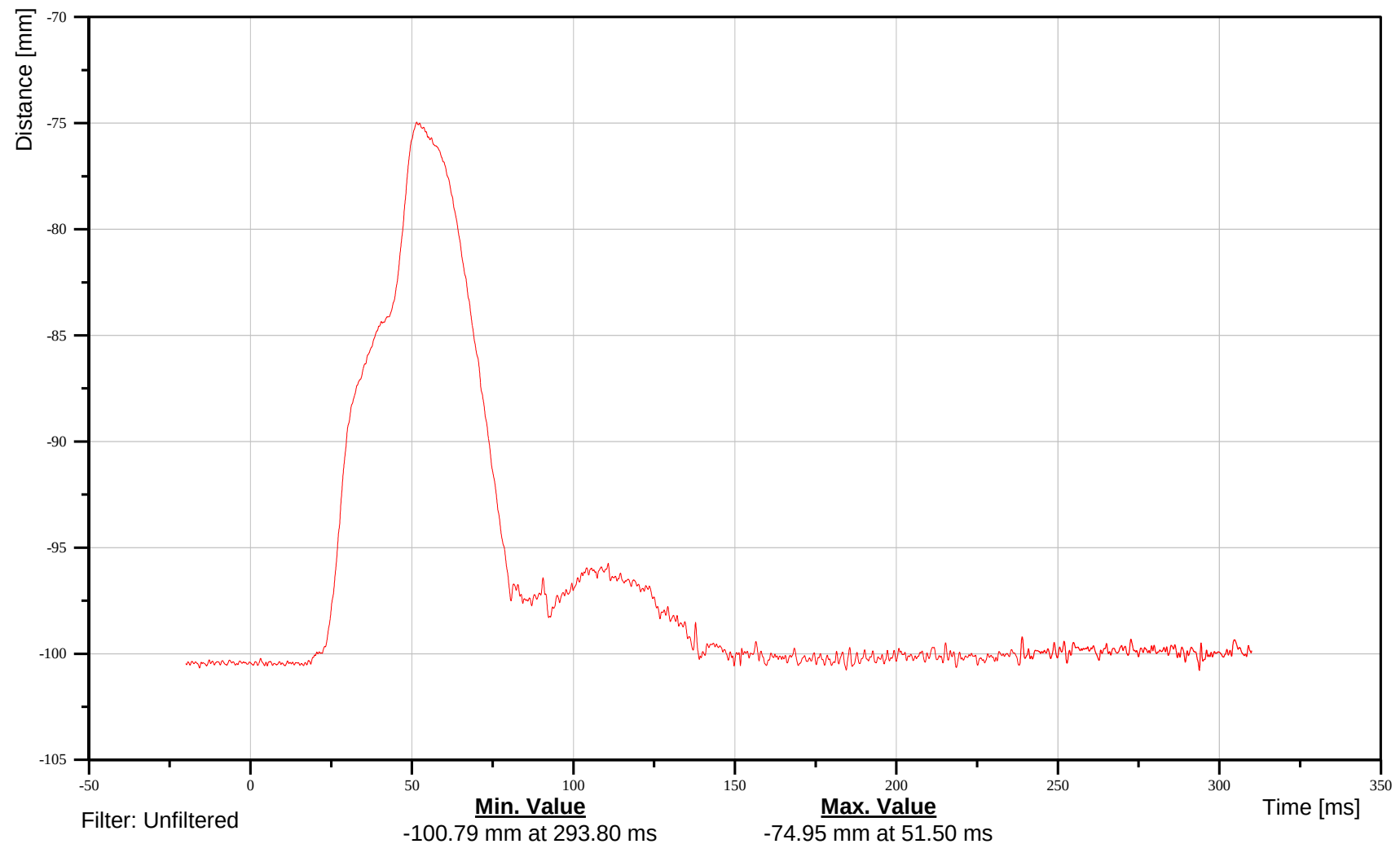
Time: 14:31

Customer: VRTC

11THRI01REWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Rear Ribeye Z-Axis Displacement

Date: 06/14/2016

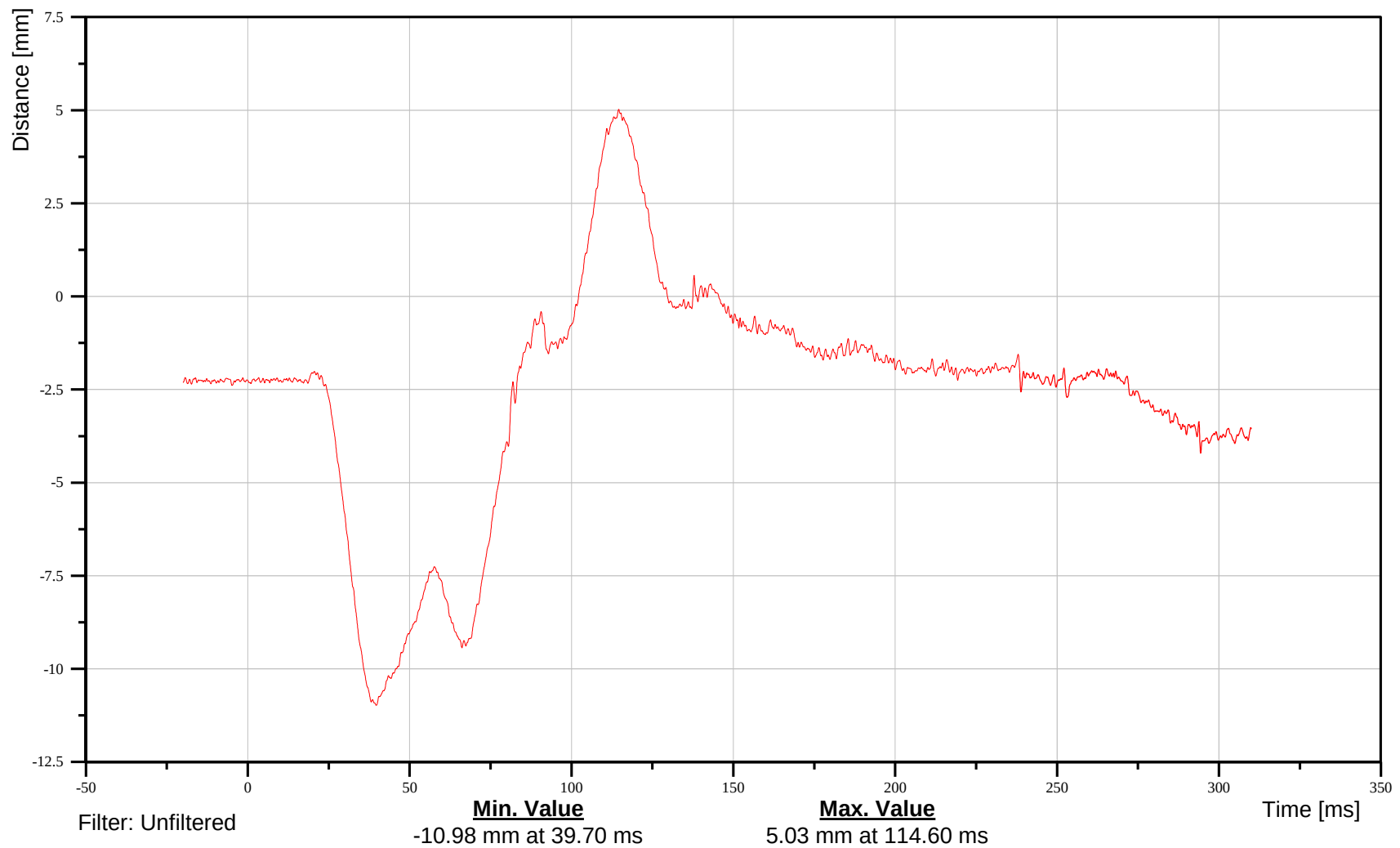
Time: 14:31

Customer: VRTC

11THRI01REWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Rear Ribeye Length Change

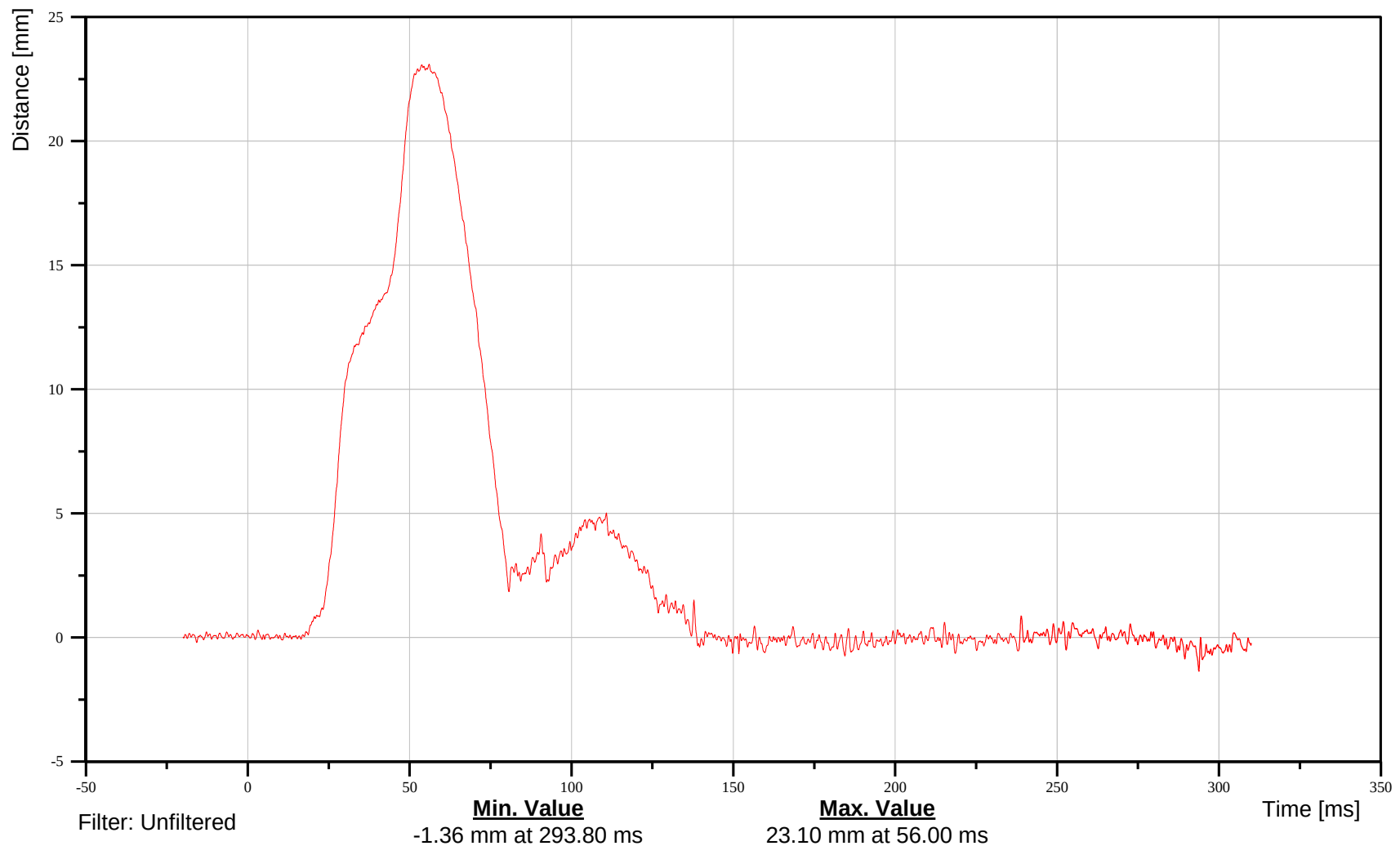
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI01REWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Middle Ribeye X-Axis Displacement

Date: 06/14/2016

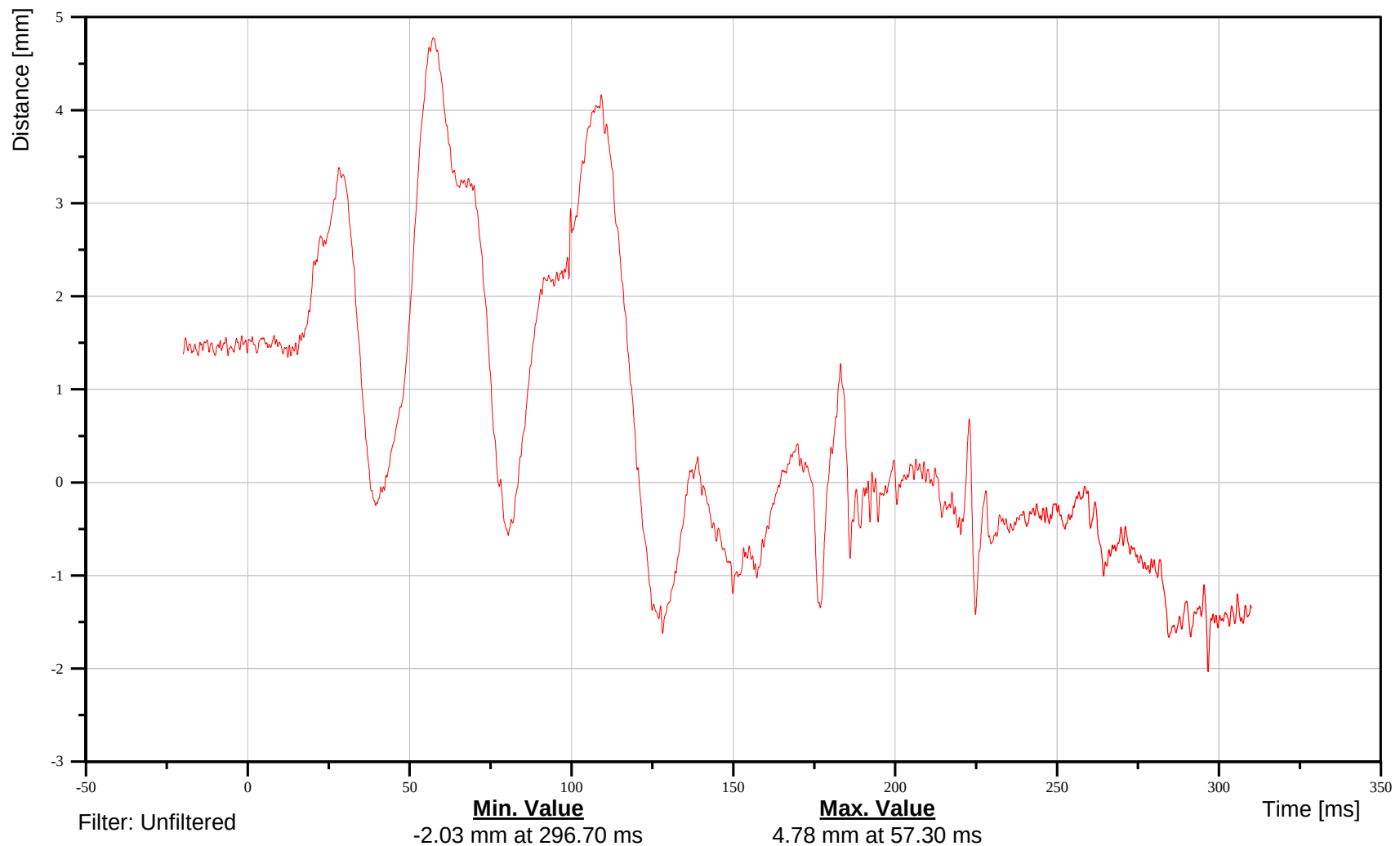
Time: 14:31

Customer: VRTC

11THRI01MIWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Middle Ribeye Y-Axis Displacement

Date: 06/14/2016

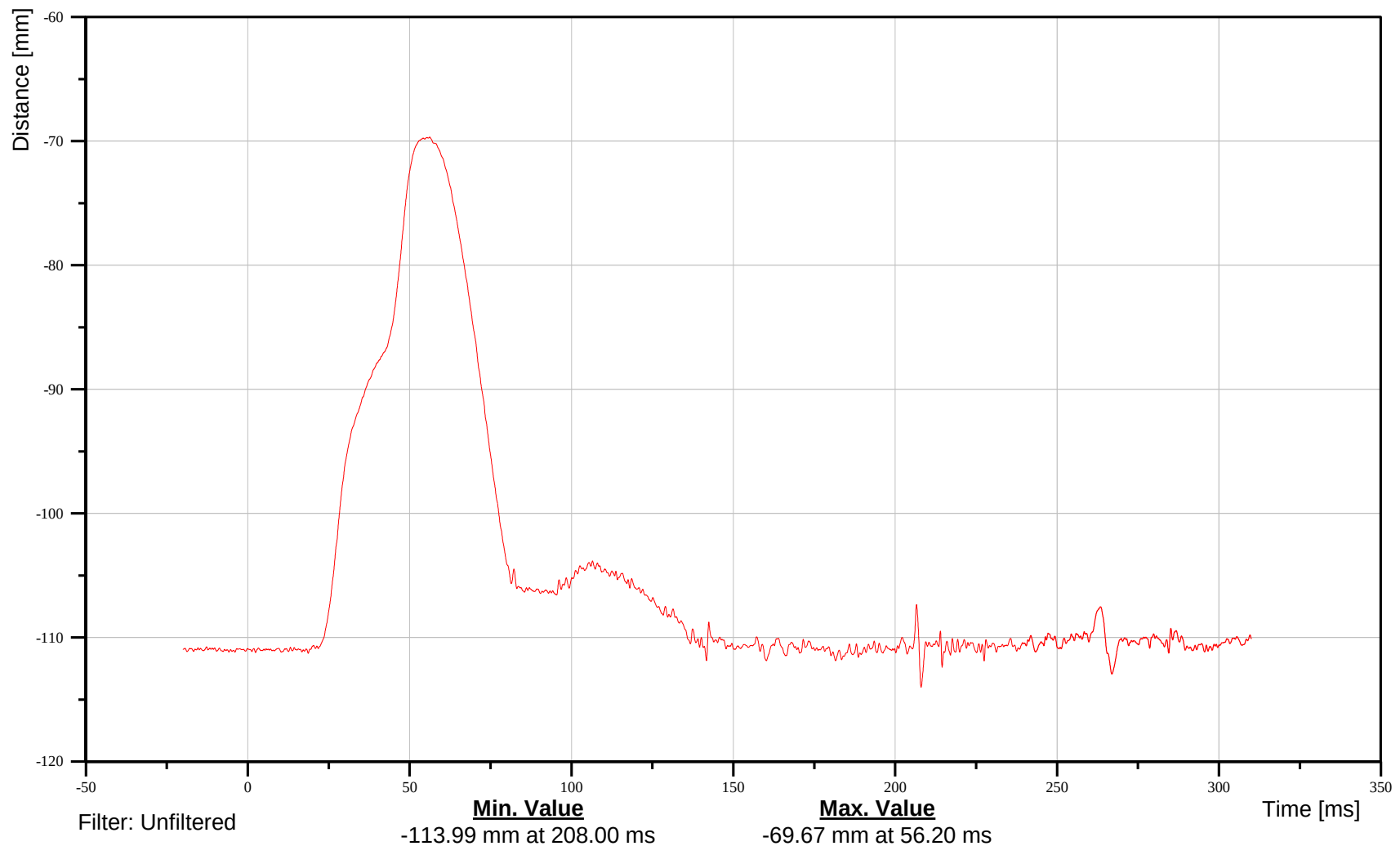
Time: 14:31

Customer: VRTC

11THRI01MIWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Middle Ribeye Z-Axis Displacement

Date: 06/14/2016

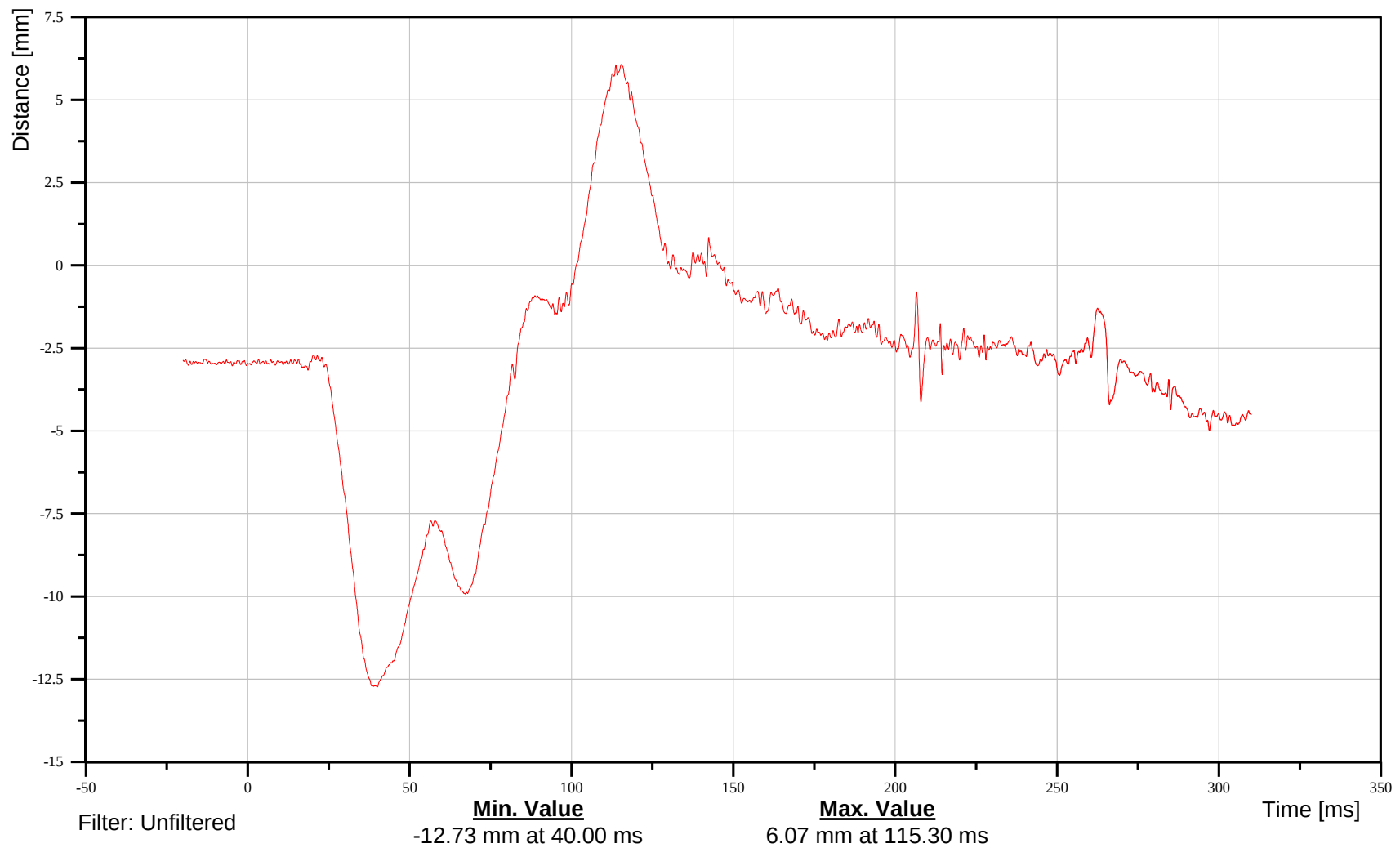
Time: 14:31

Customer: VRTC

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TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Middle Ribeye Length Change

Date: 06/14/2016

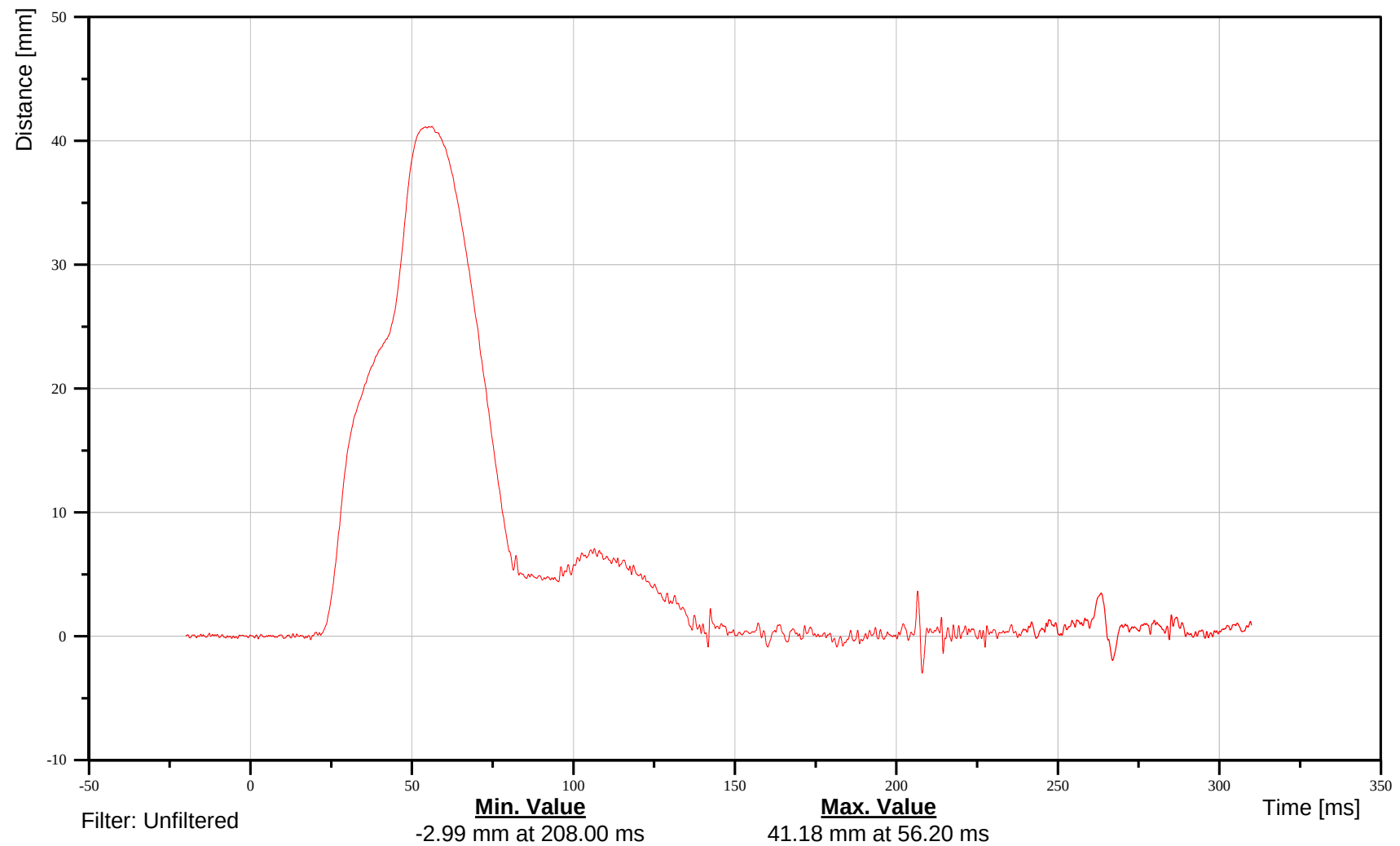
Time: 14:31

Customer: VRTC

11THRI01MIWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Front Ribeye X-Axis Displacement

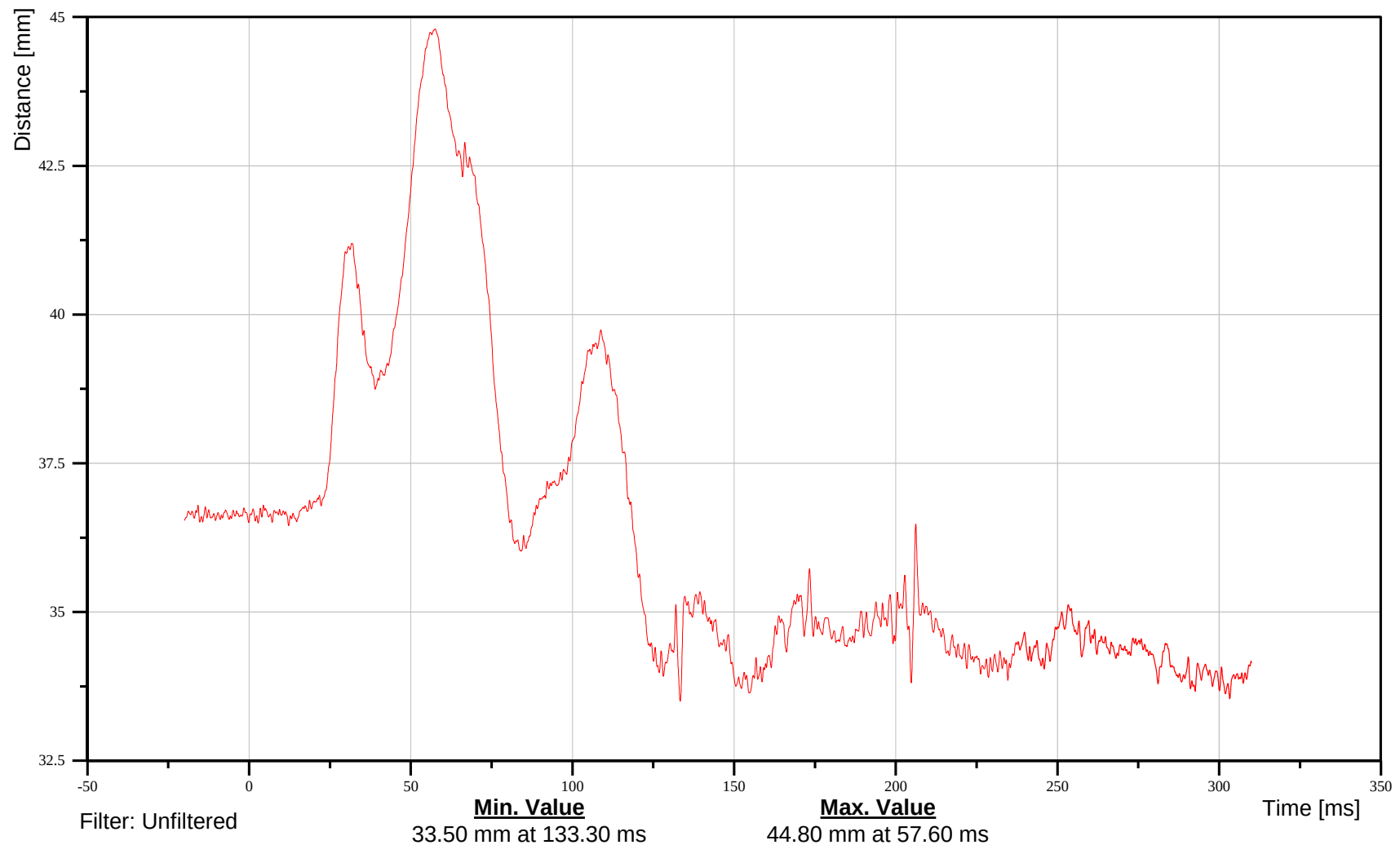
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI01FRWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Front Ribeye Y-Axis Displacement

Date: 06/14/2016

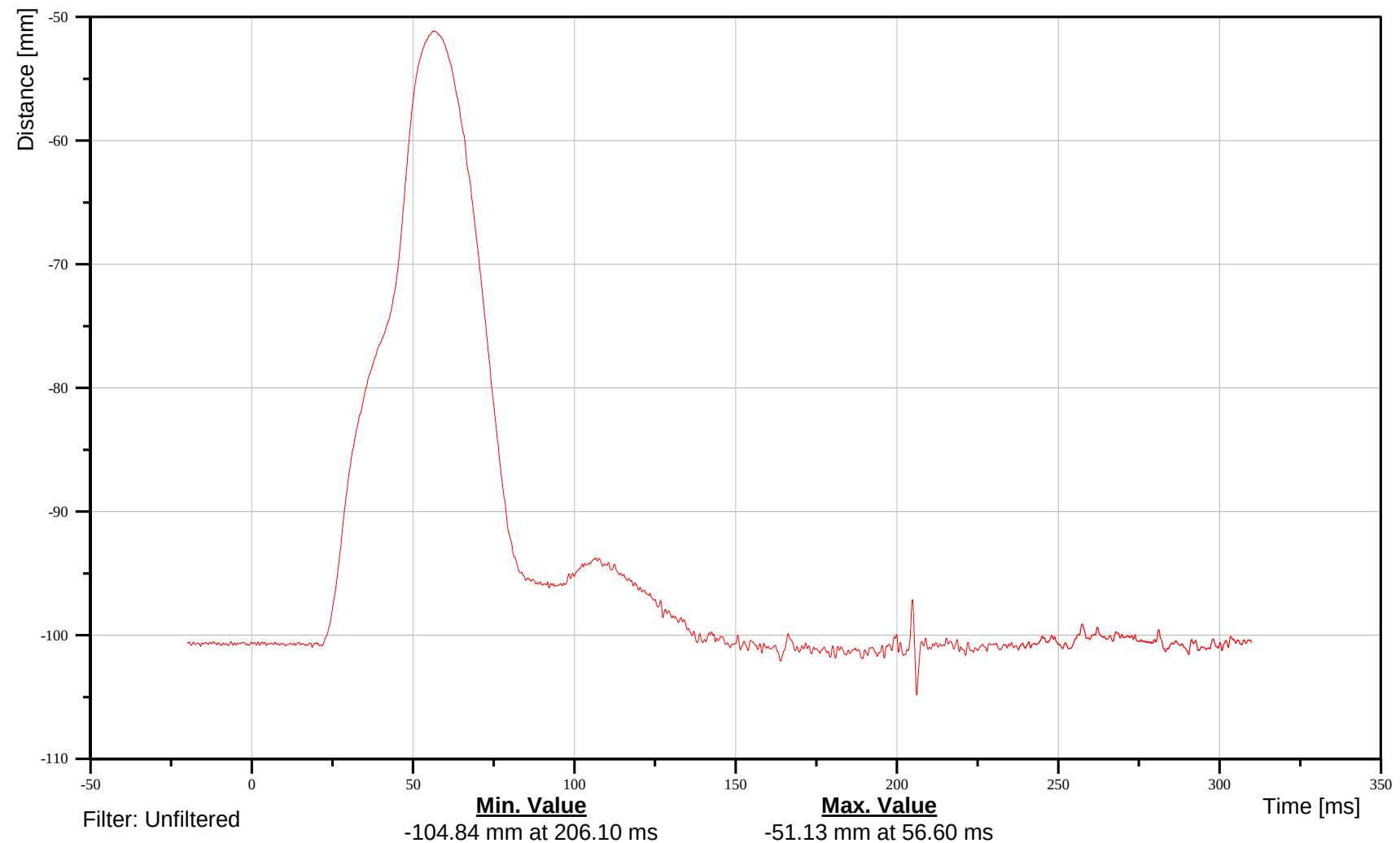
Time: 14:31

Customer: VRTC

11THRI01FRWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Front Ribeye Z-Axis Displacement

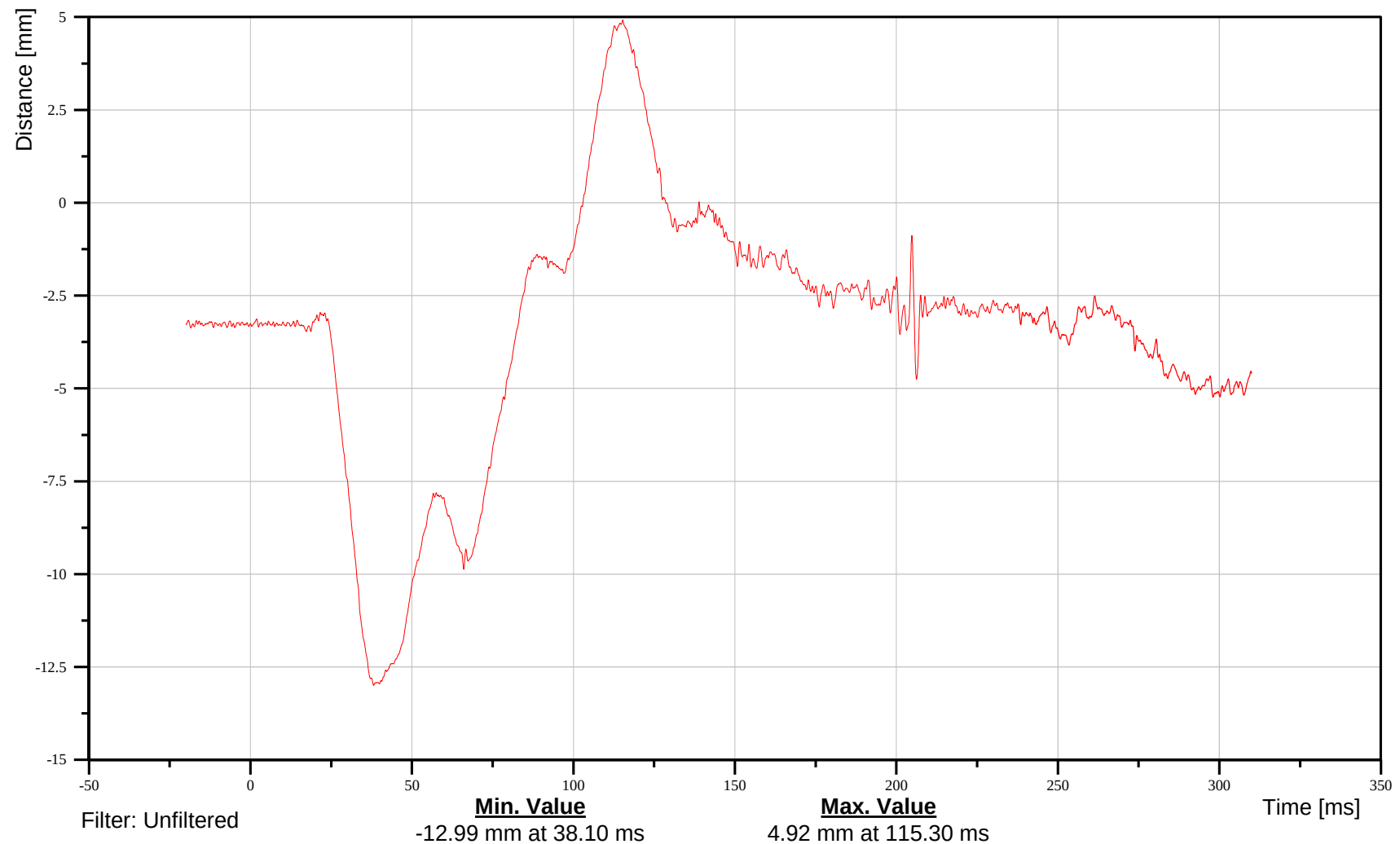
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI01FRWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 1 Front Ribeye Length Change

Date: 06/14/2016

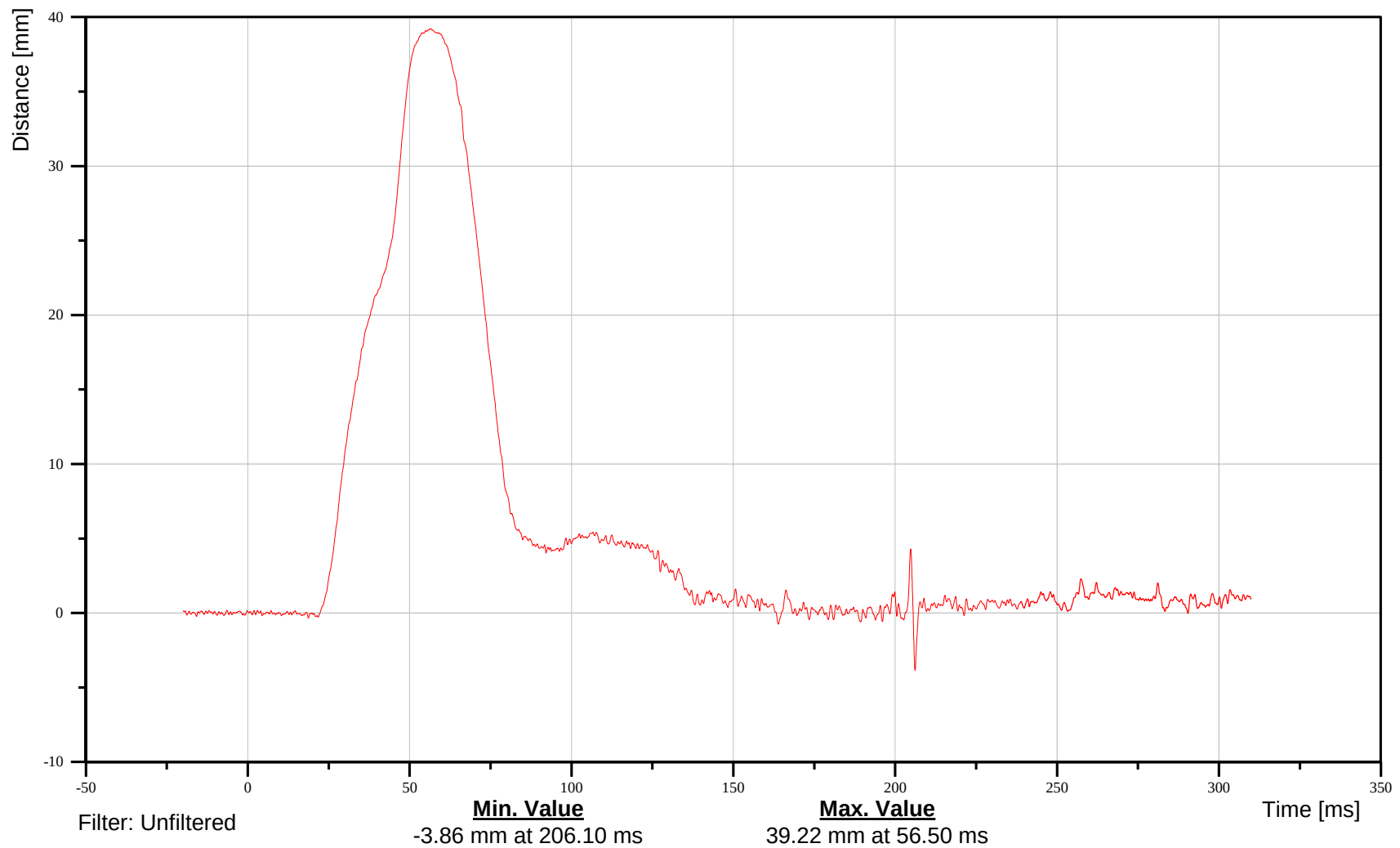
Time: 14:31

Customer: VRTC

11THRI01FRWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Rear Ribeye X-Axis Displacement

Date: 06/14/2016

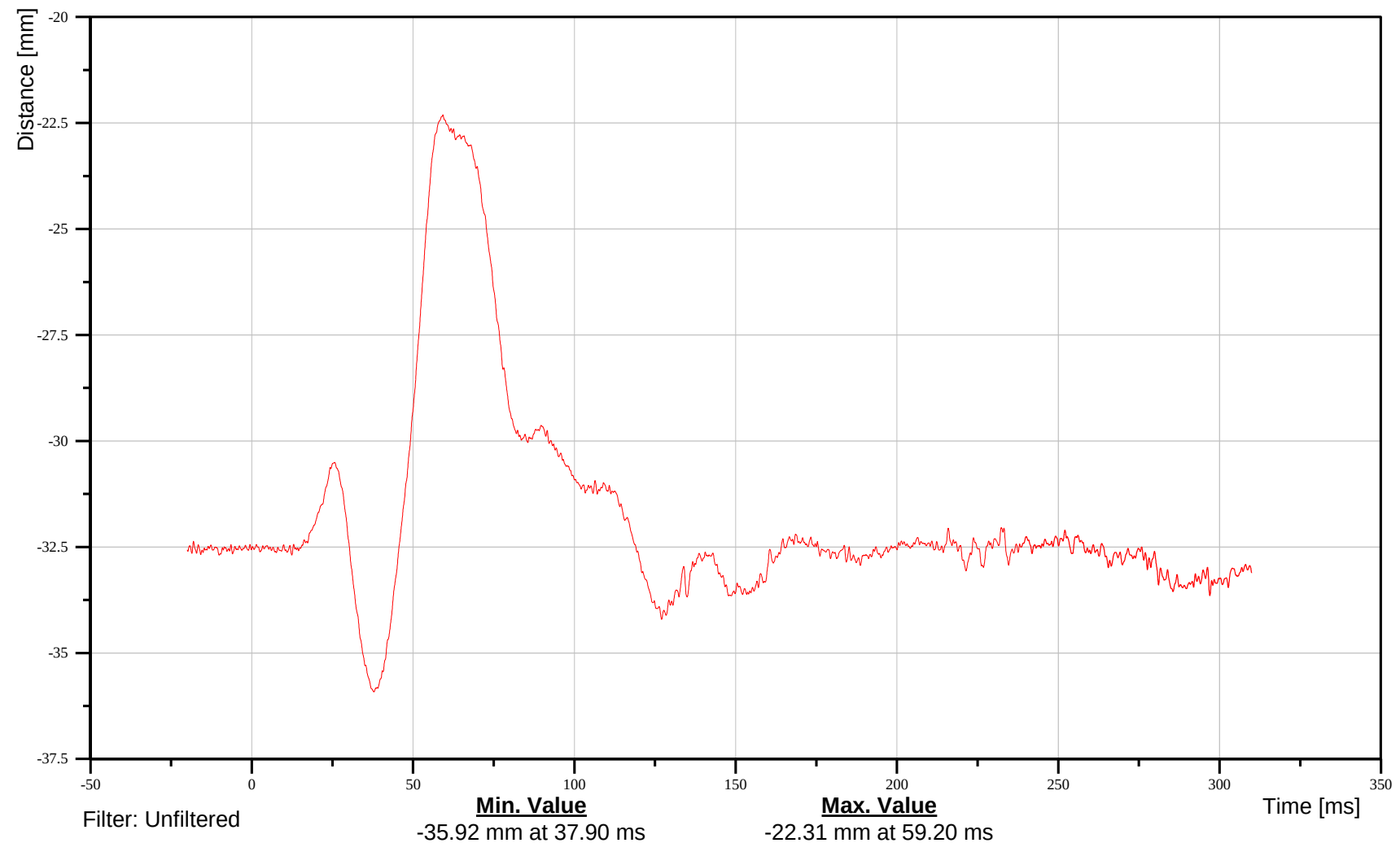
Time: 14:31

Customer: VRTC

11THRI02REWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Rear Ribeye Y-Axis Displacement

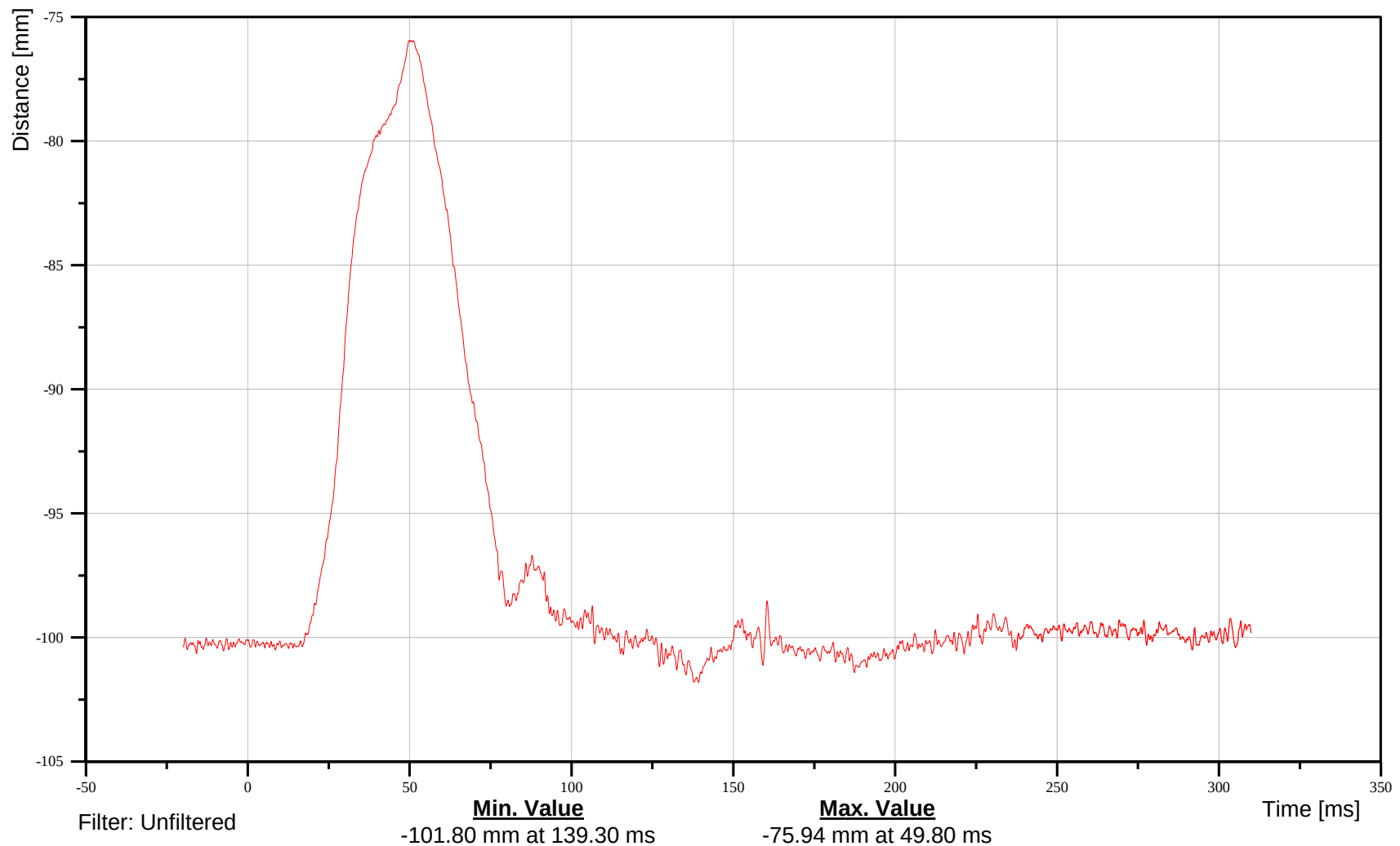
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI02REWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Rear Ribeye Z-Axis Displacement

Date: 06/14/2016

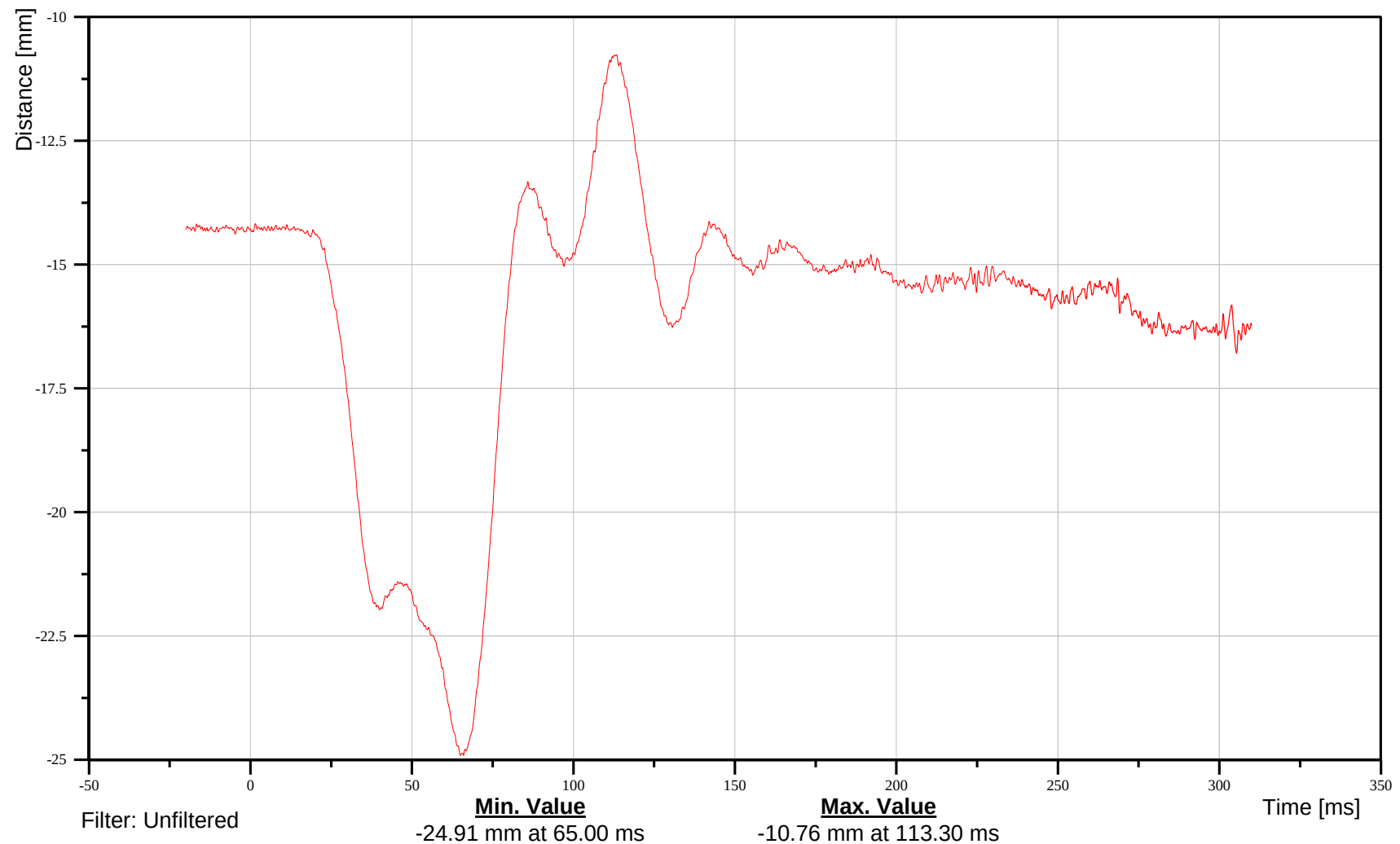
Time: 14:31

Customer: VRTC

11THRI02REWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Rear Ribeye Length Change

Date: 06/14/2016

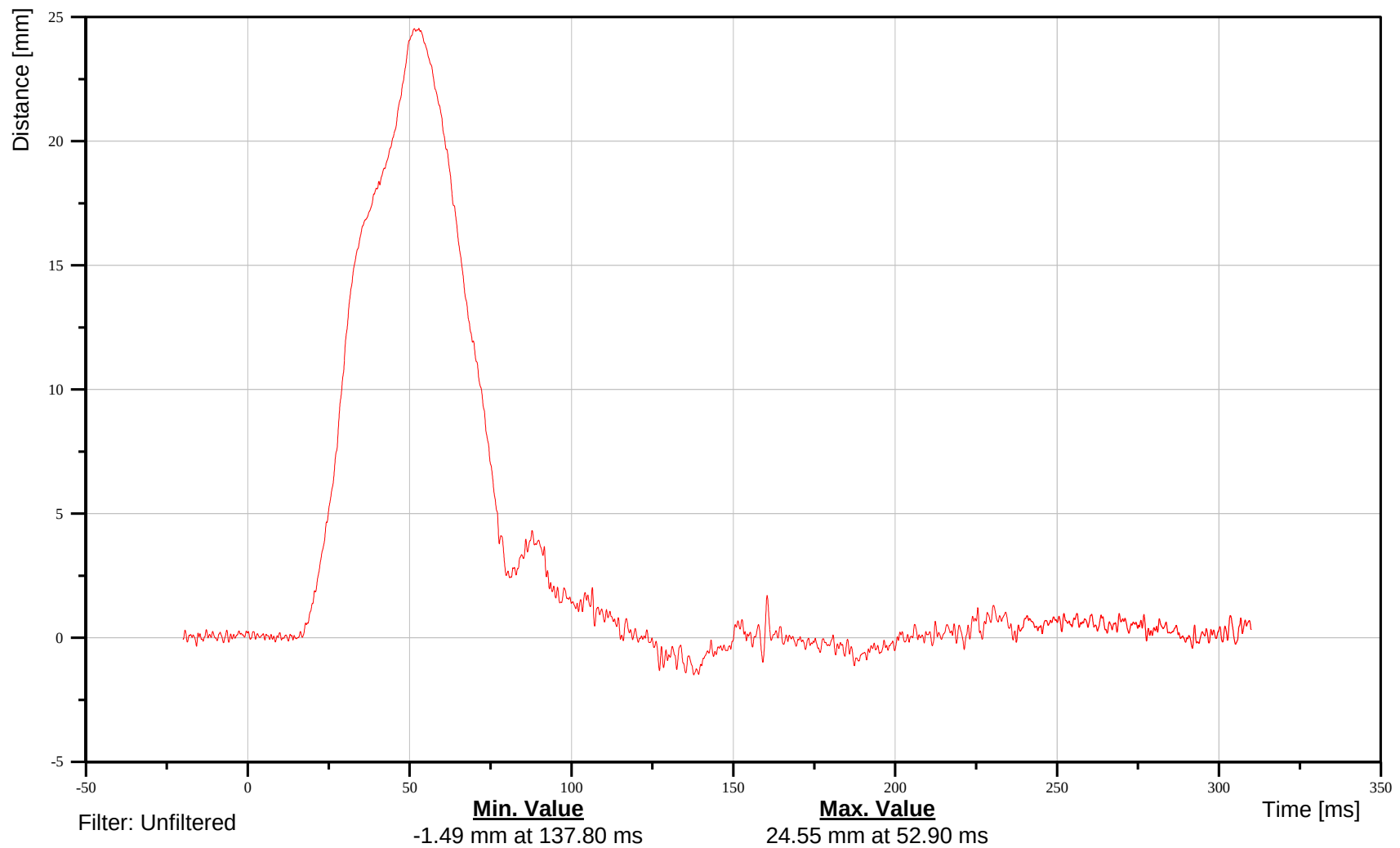
Time: 14:31

Customer: VRTC

11THRI02REWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Middle Ribeye X-Axis Displacement

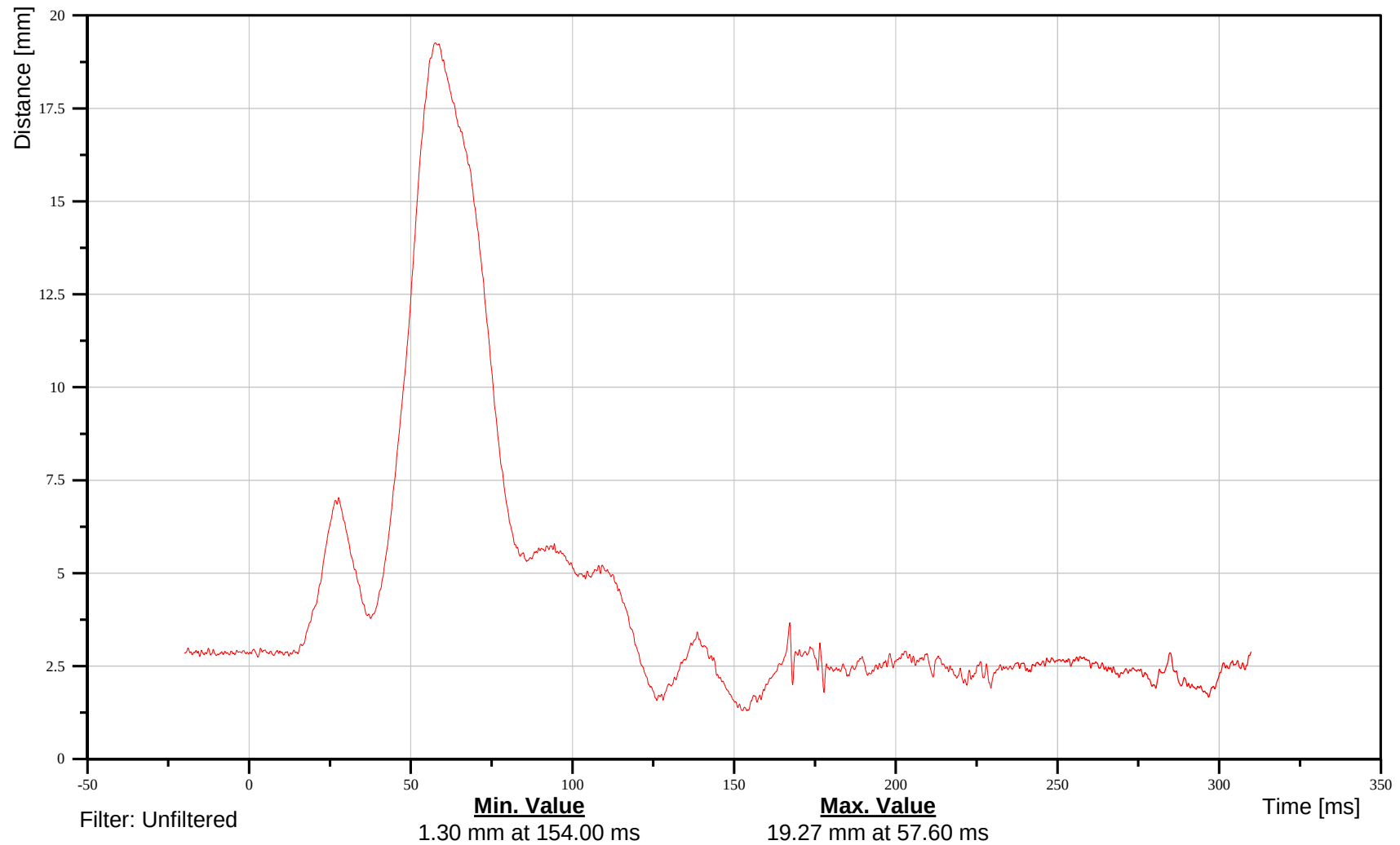
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRIO2MIWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Middle Ribeye Y-Axis Displacement

Date: 06/14/2016

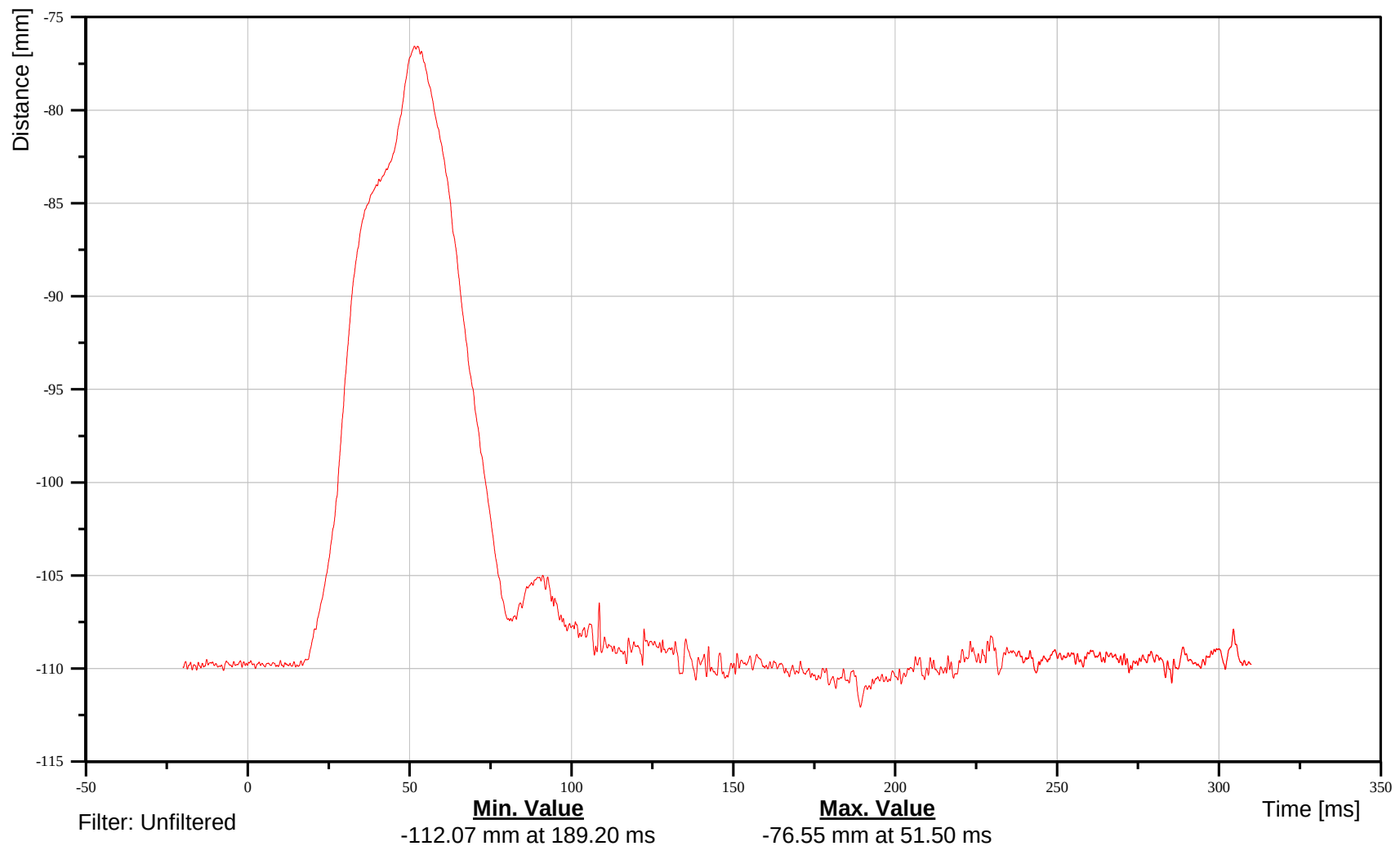
Time: 14:31

Customer: VRTC

11THRIO2MIWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Middle Ribeye Z-Axis Displacement

Date: 06/14/2016

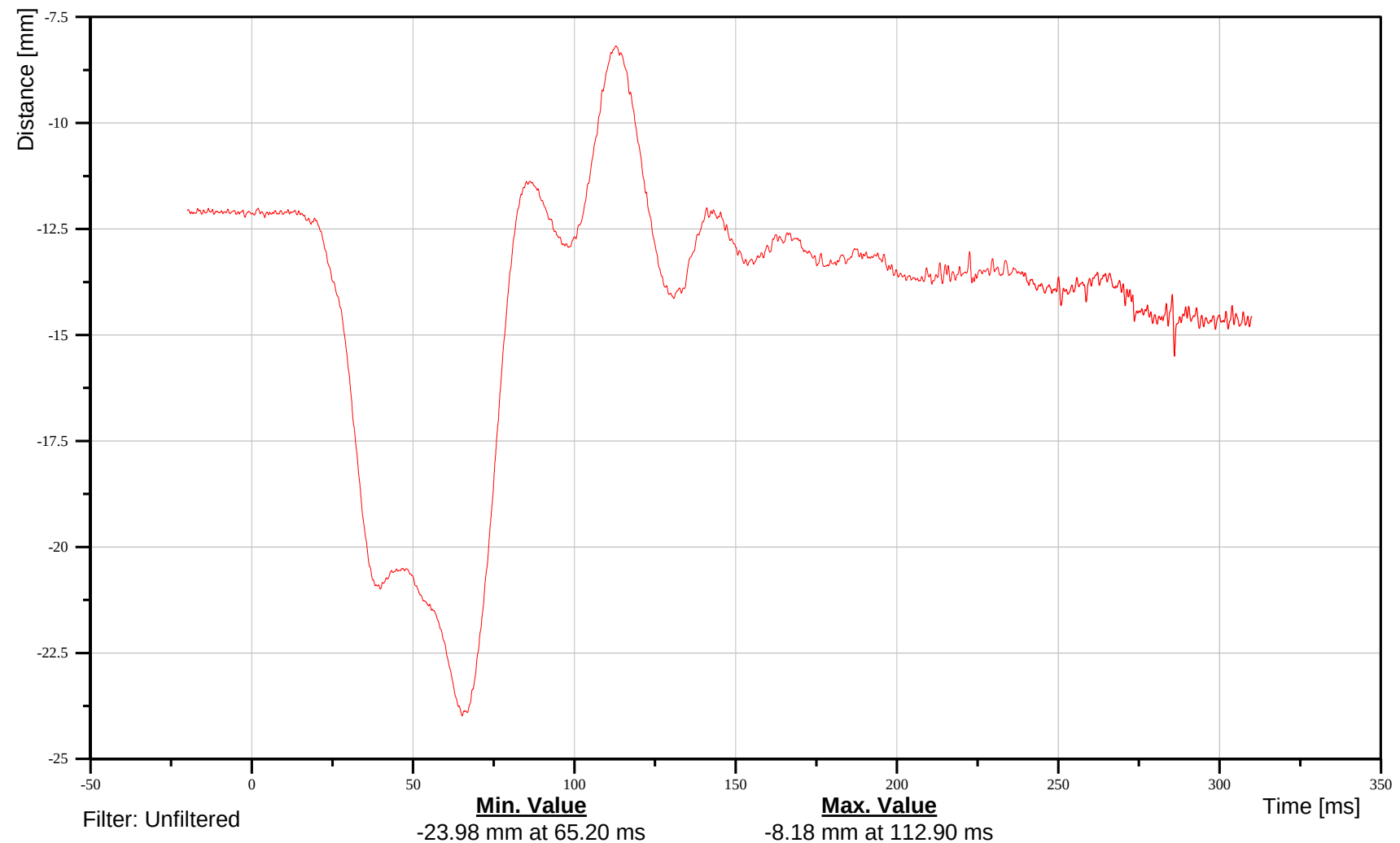
Time: 14:31

Customer: VRTC

11THRI02MIWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Middle Ribeye Length Change

Date: 06/14/2016

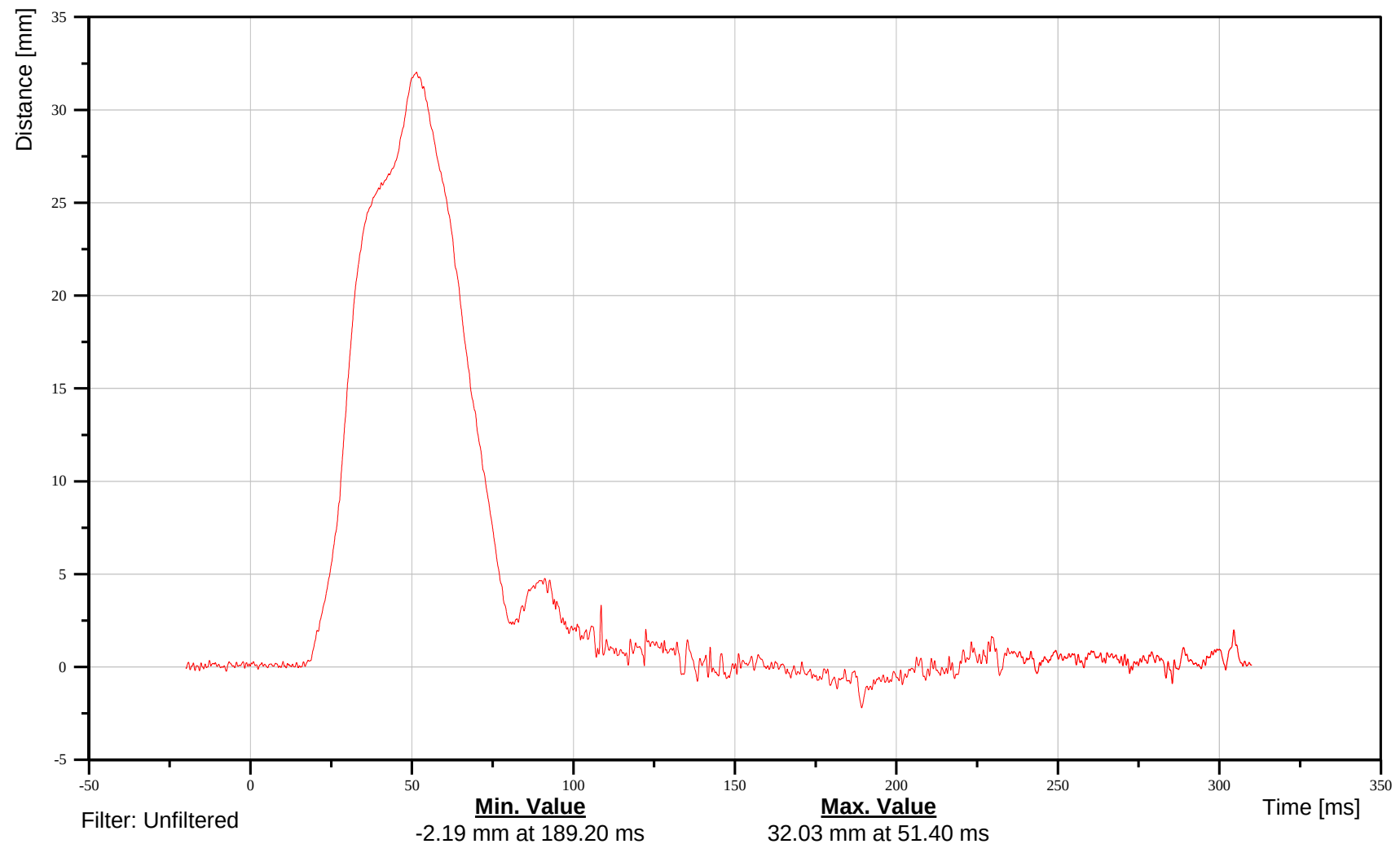
Time: 14:31

Customer: VRTC

11THRI02MIWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Front Ribeye X-Axis Displacement

Date: 06/14/2016

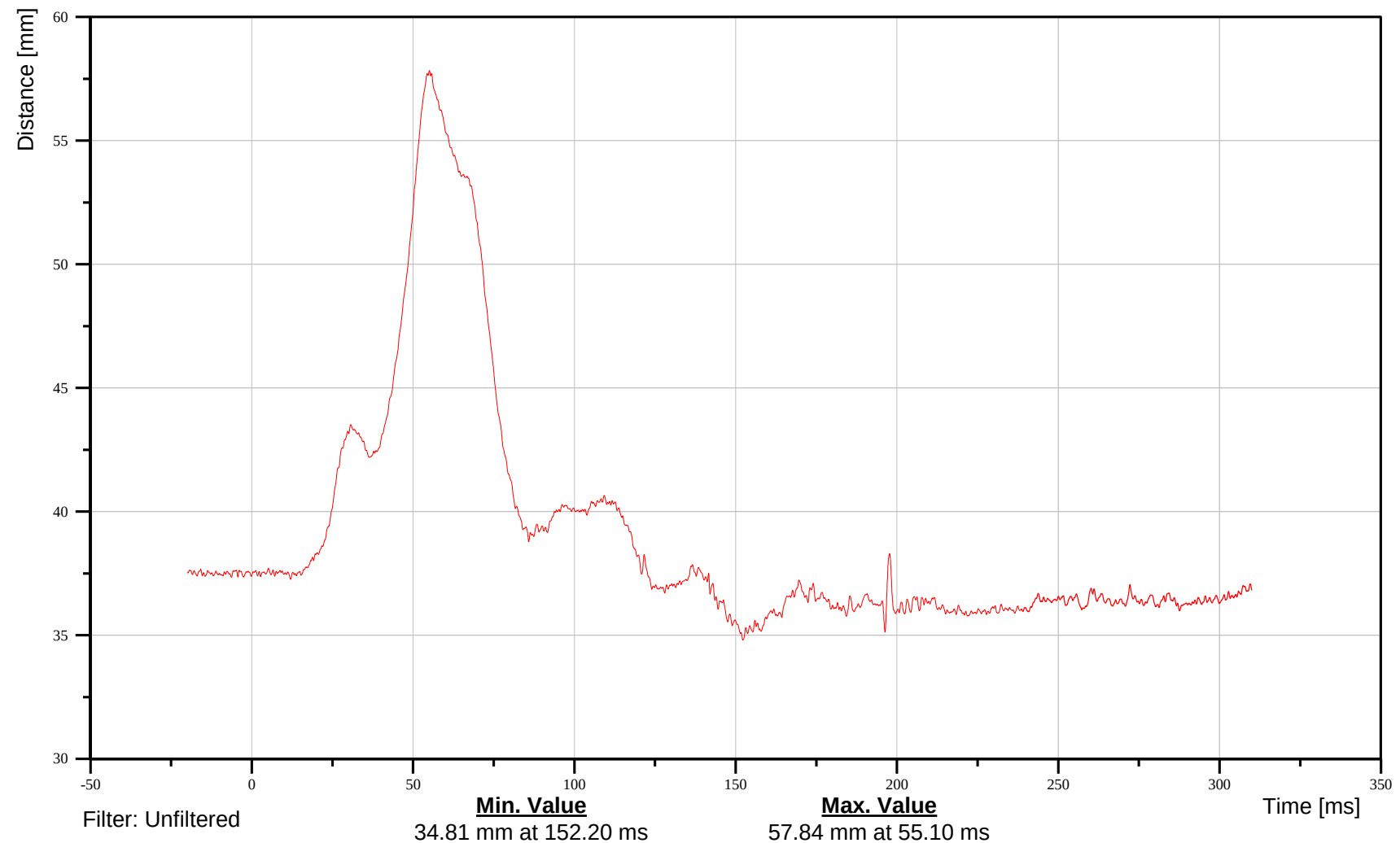
Time: 14:31

Customer: VRTC

11THRI02FRWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Front Ribeye Y-Axis Displacement

Date: 06/14/2016

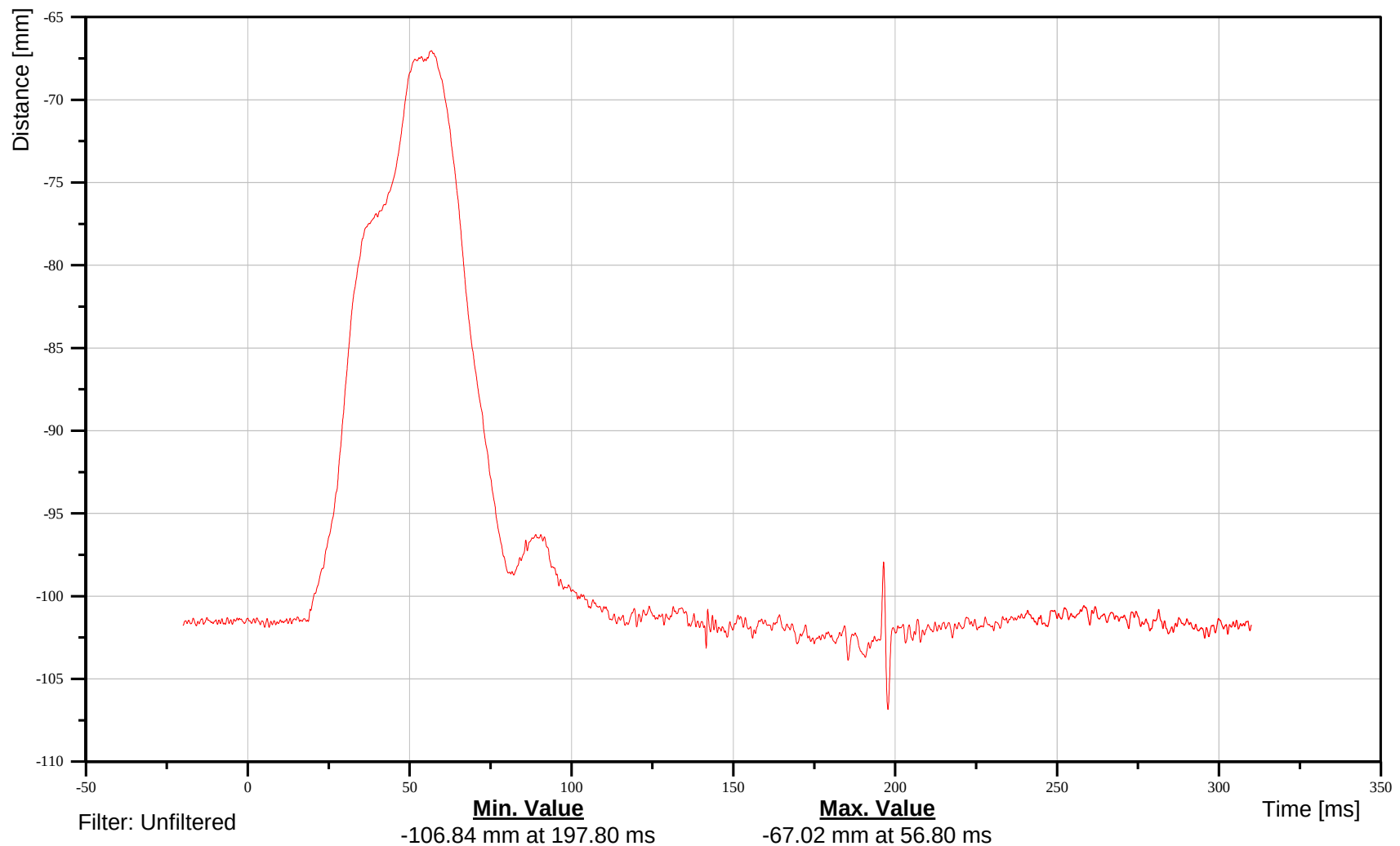
Time: 14:31

Customer: VRTC

11THRI02FRWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Front Ribeye Z-Axis Displacement

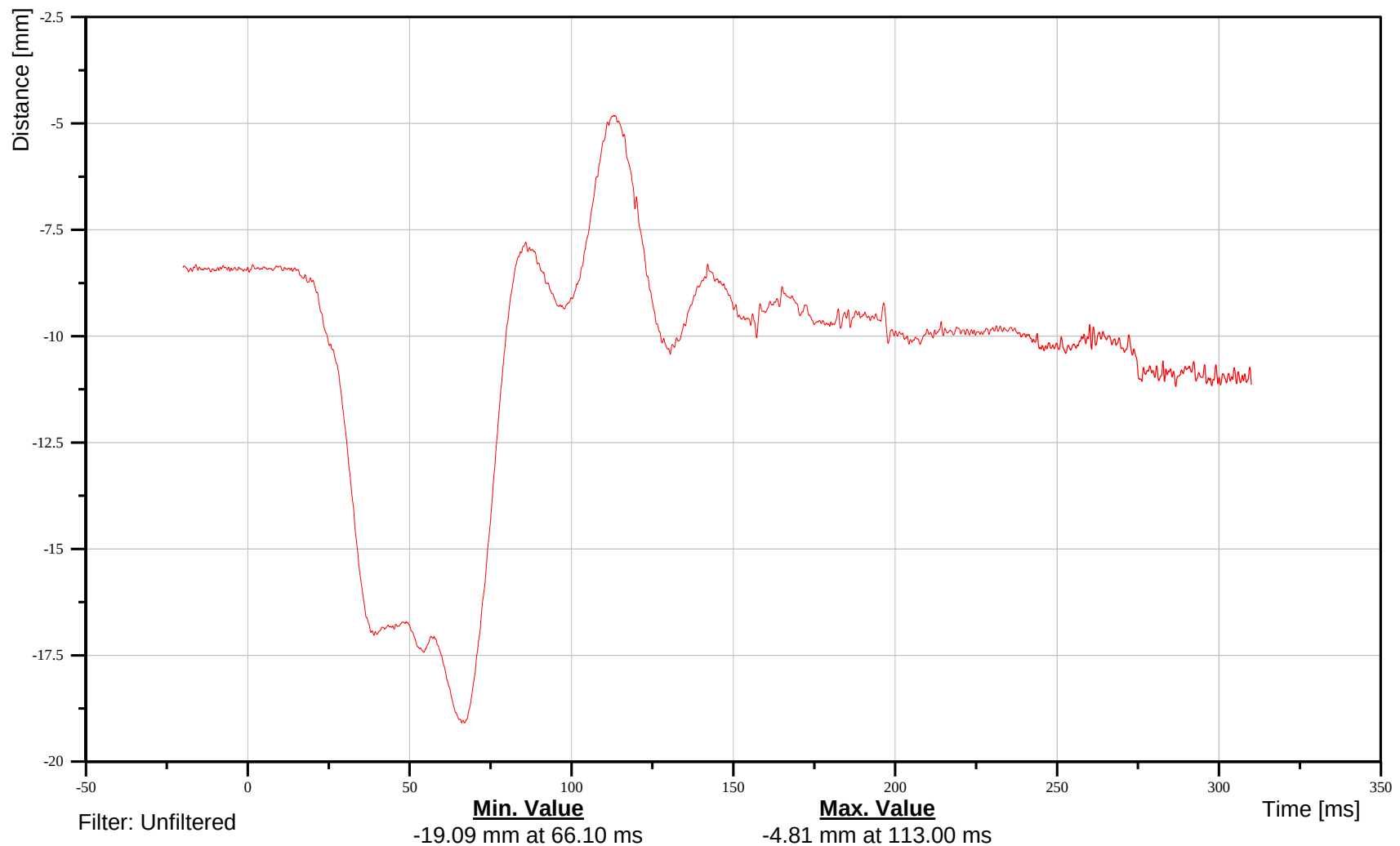
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI02FRWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 2 Front Ribeye Length Change

Date: 06/14/2016

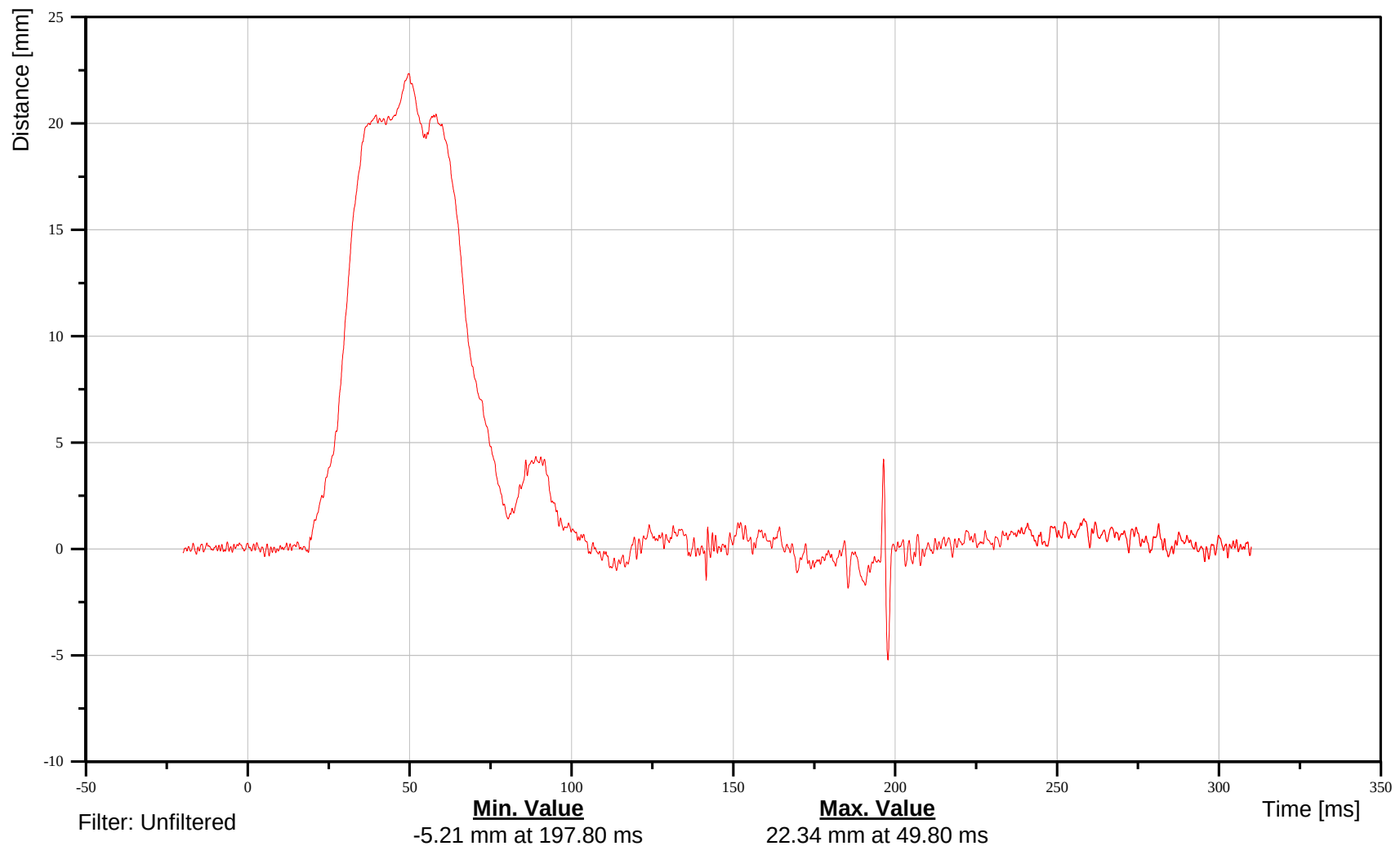
Time: 14:31

Customer: VRTC

11THRI02FRWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Rear Ribeye X-Axis Displacement

Date: 06/14/2016

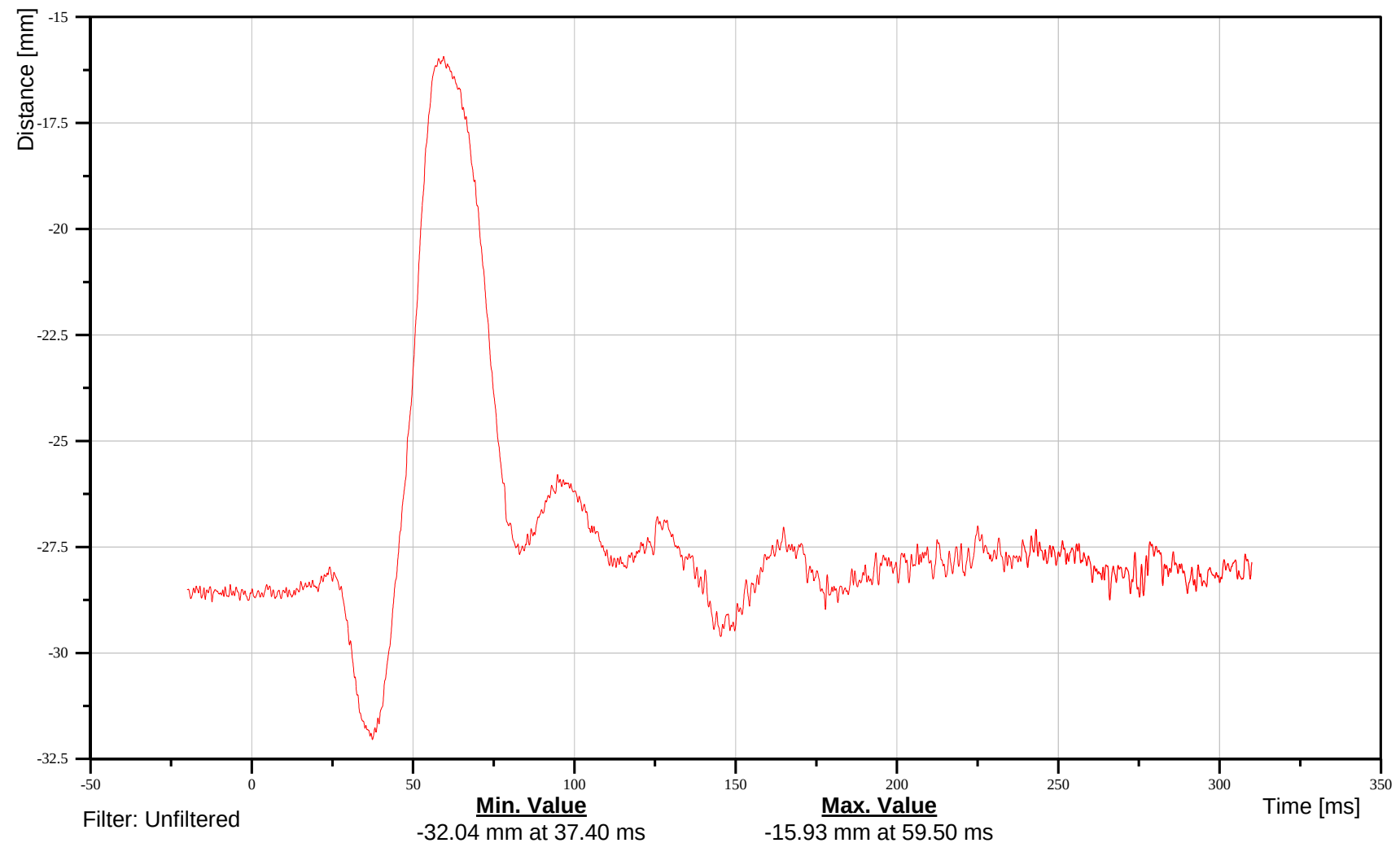
Time: 14:31

Customer: VRTC

11THRI03REWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Rear Ribeye Y-Axis Displacement

Date: 06/14/2016

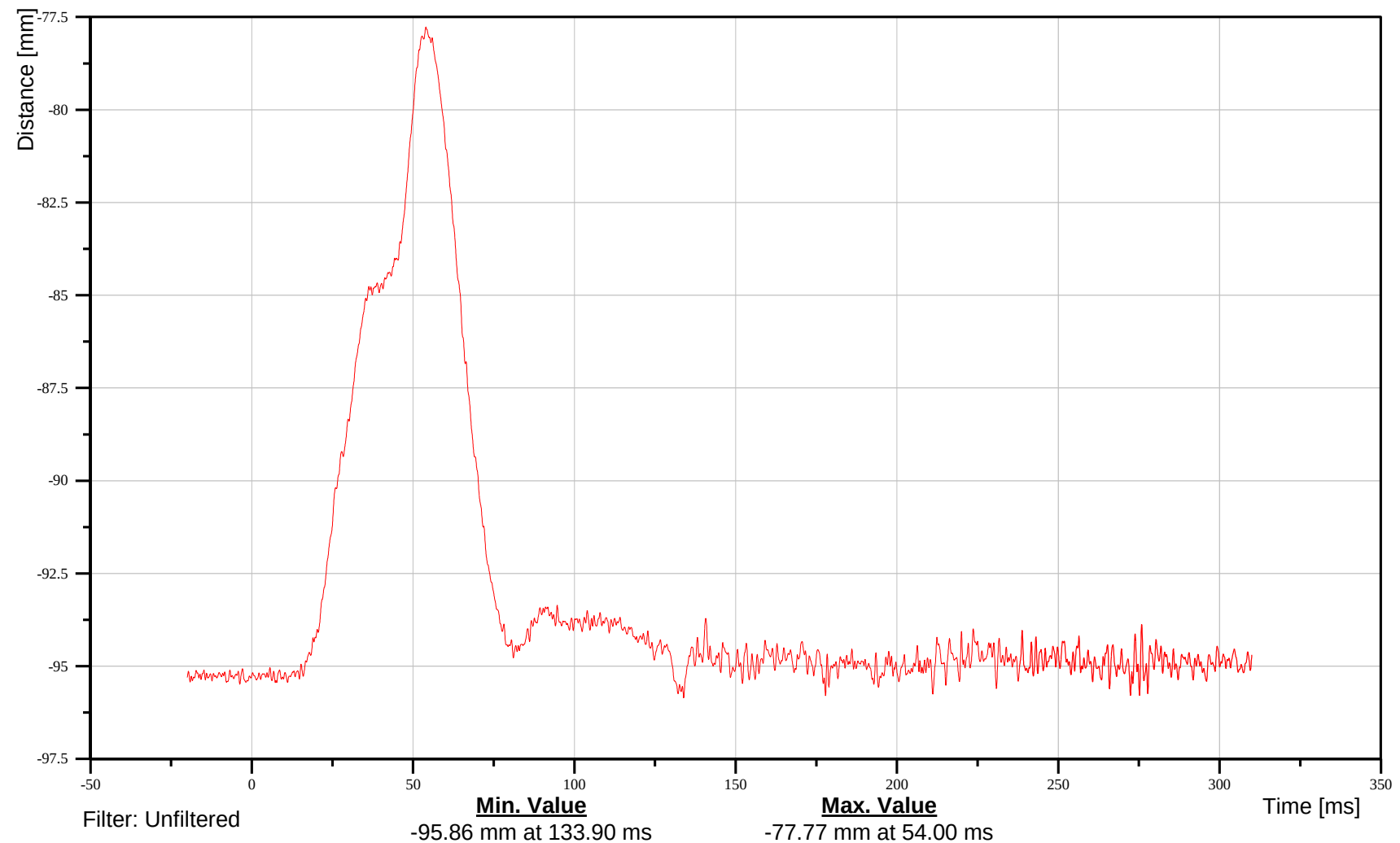
Time: 14:31

Customer: VRTC

11THRI03REWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Rear Ribeye Z-Axis Displacement

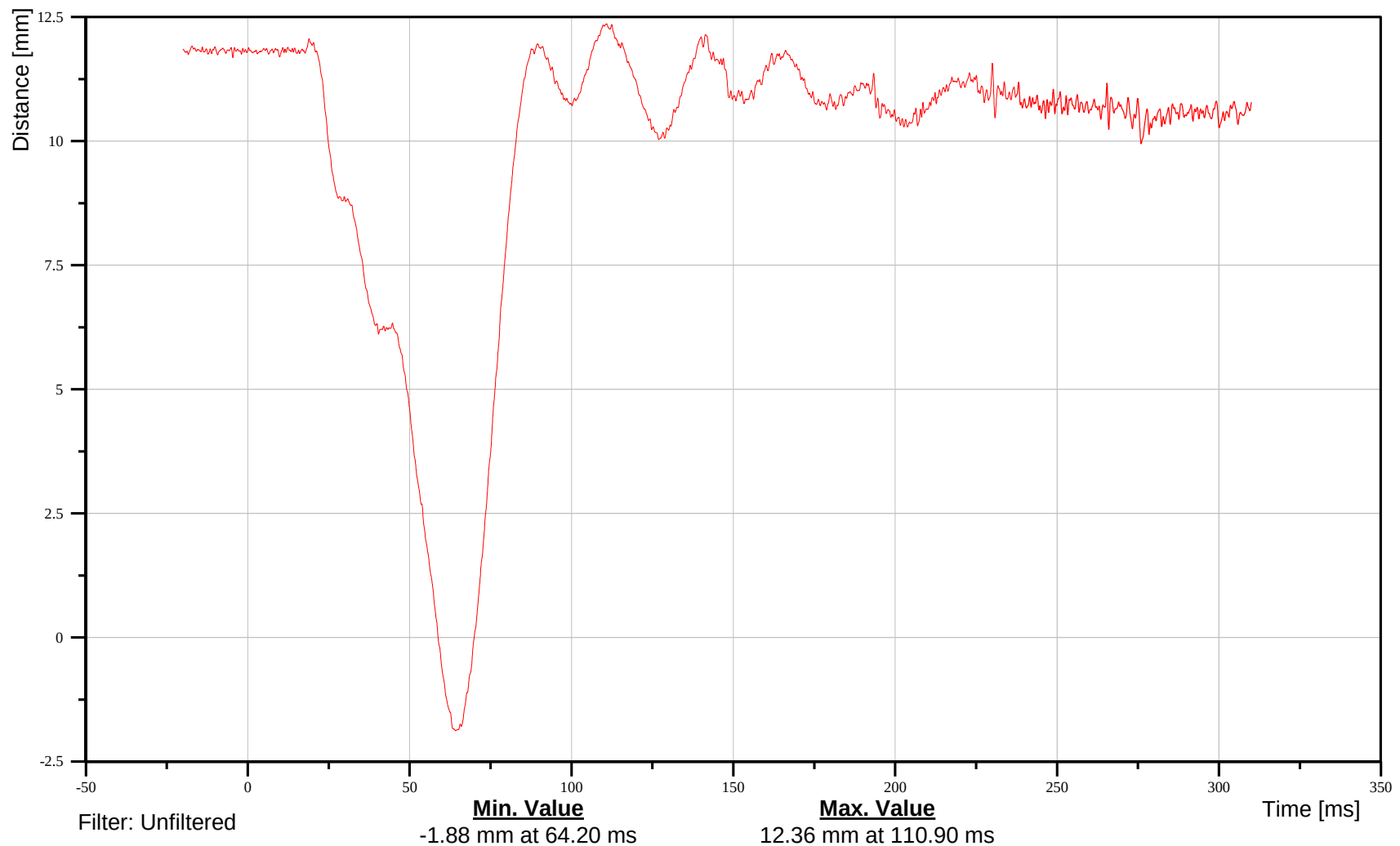
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI03REWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Rear Ribeye Length Change

Date: 06/14/2016

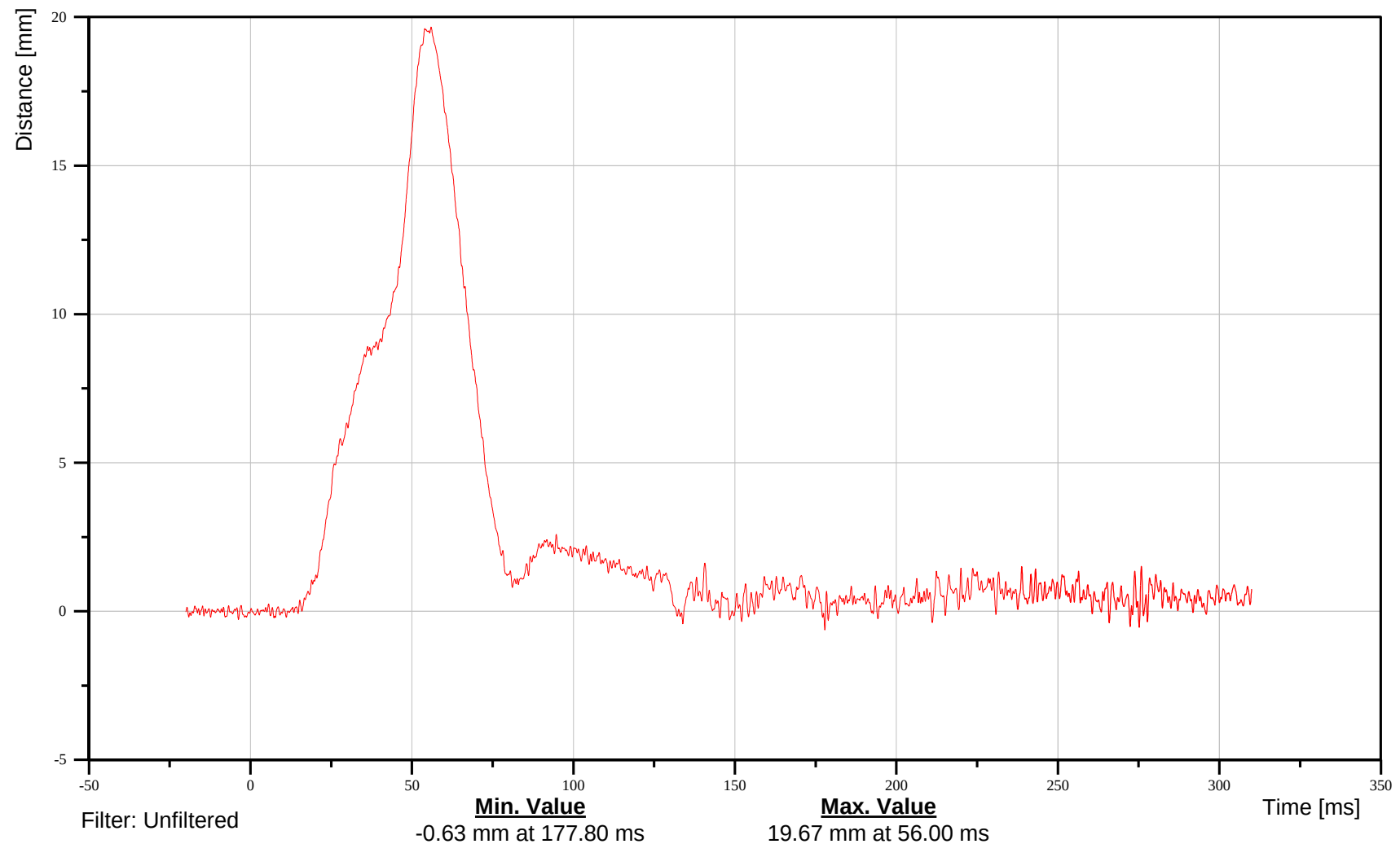
Time: 14:31

Customer: VRTC

11THRI03REWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Middle Ribeye X-Axis Displacement

Date: 06/14/2016

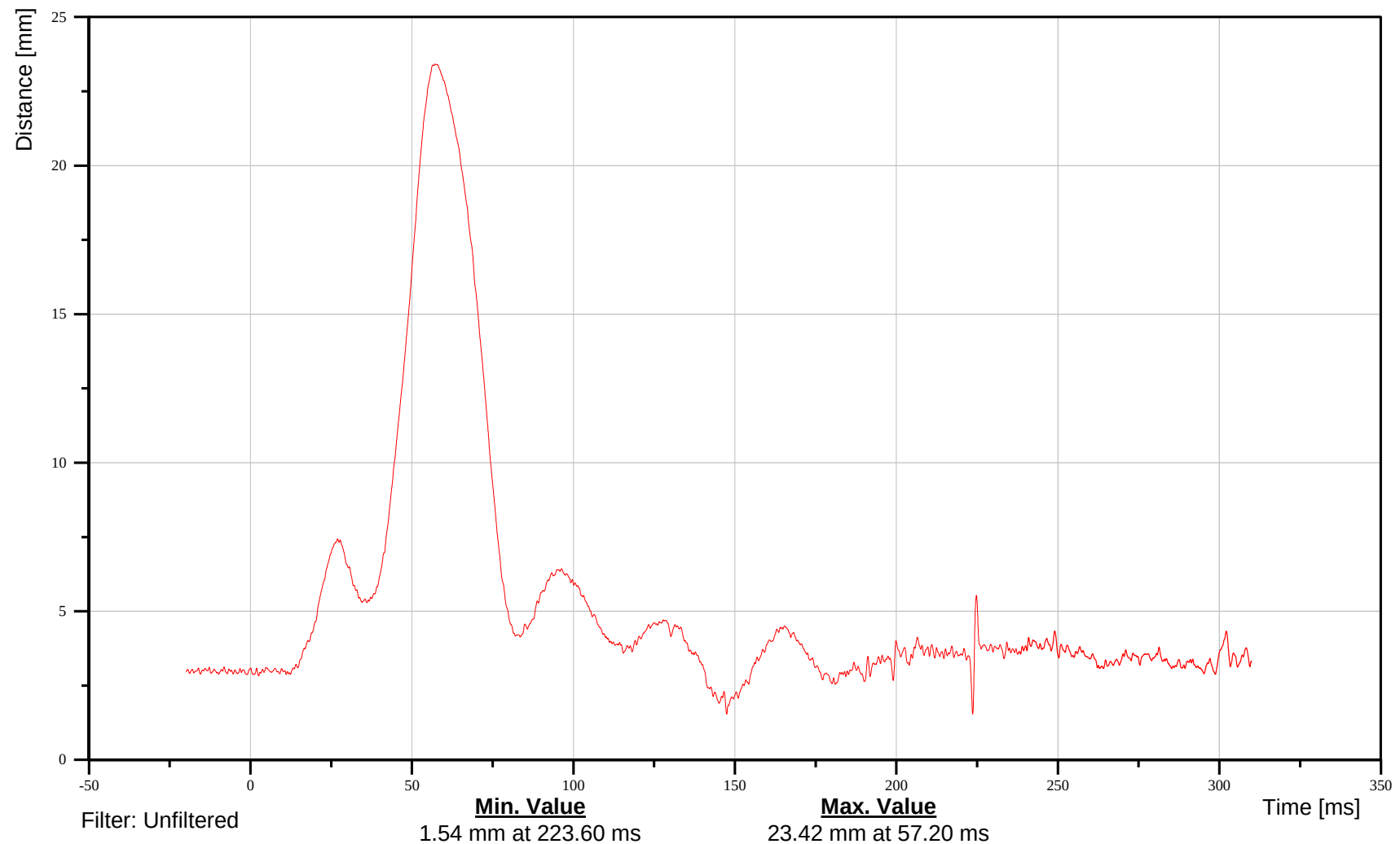
Time: 14:31

Customer: VRTC

11THRI03MIWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Middle Ribeye Y-Axis Displacement

Date: 06/14/2016

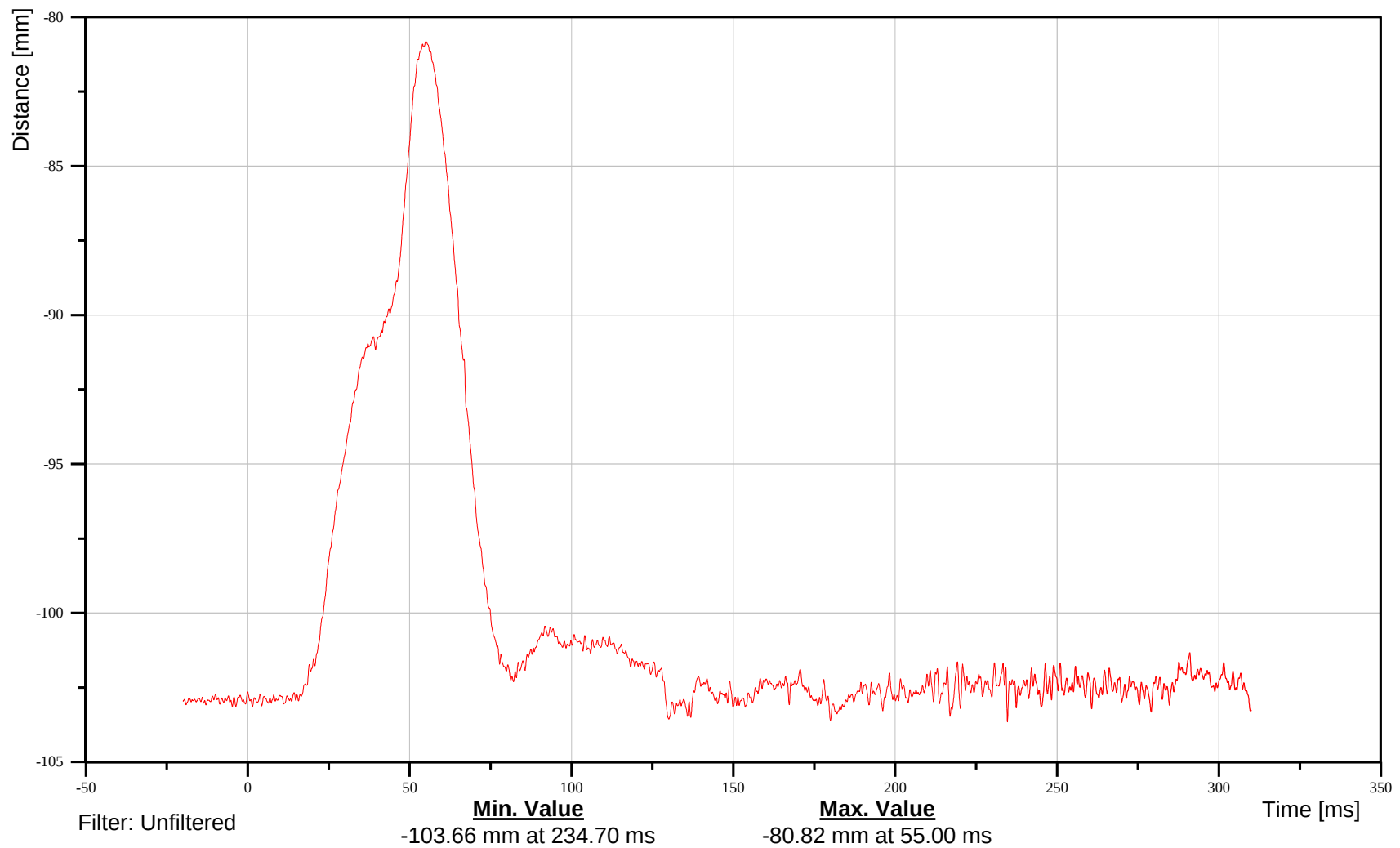
Time: 14:31

Customer: VRTC

11THRI03MIWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Middle Ribeye Z-Axis Displacement

Date: 06/14/2016

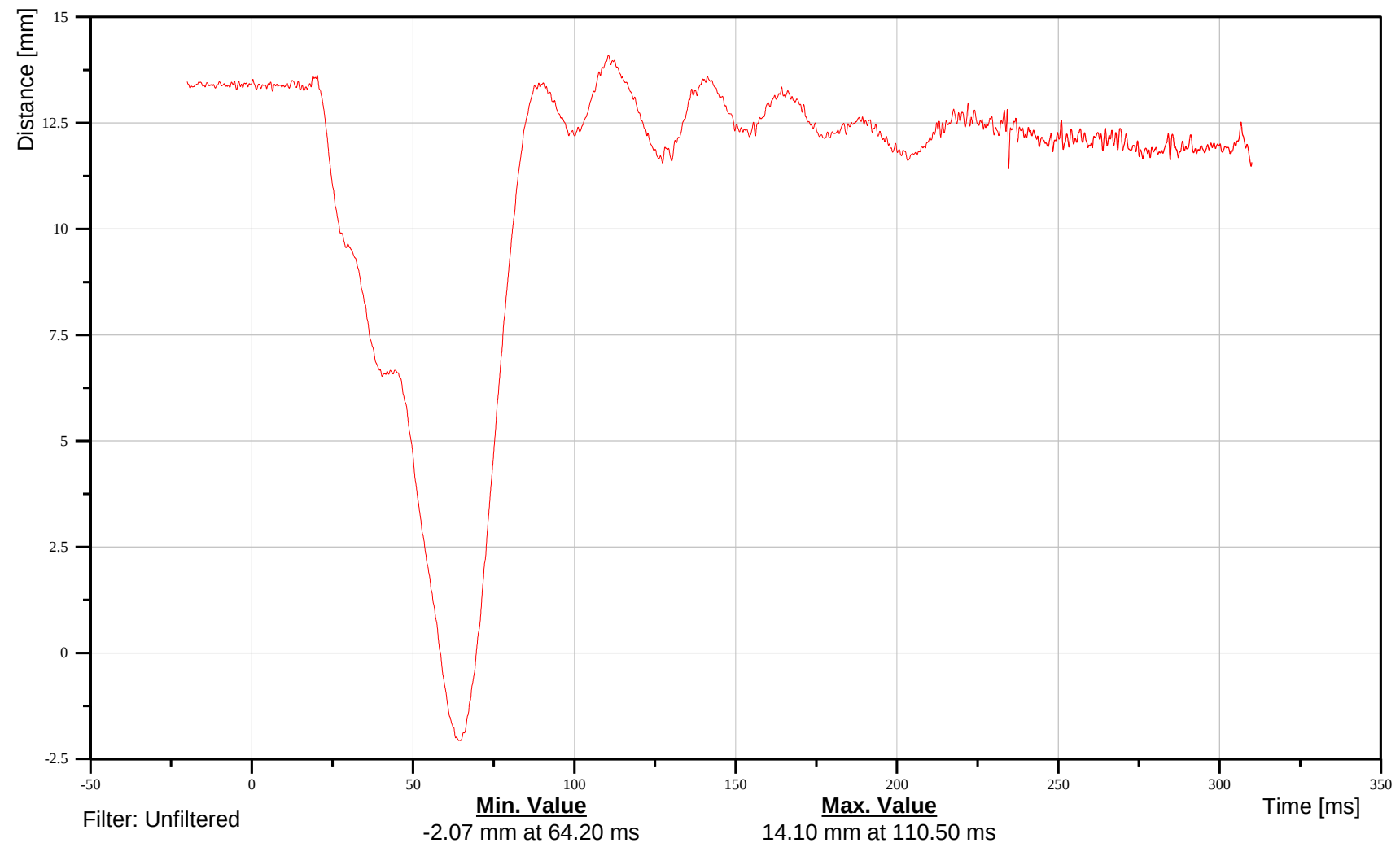
Time: 14:31

Customer: VRTC

11THRI03MIWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Middle Ribeye Length Change

Date: 06/14/2016

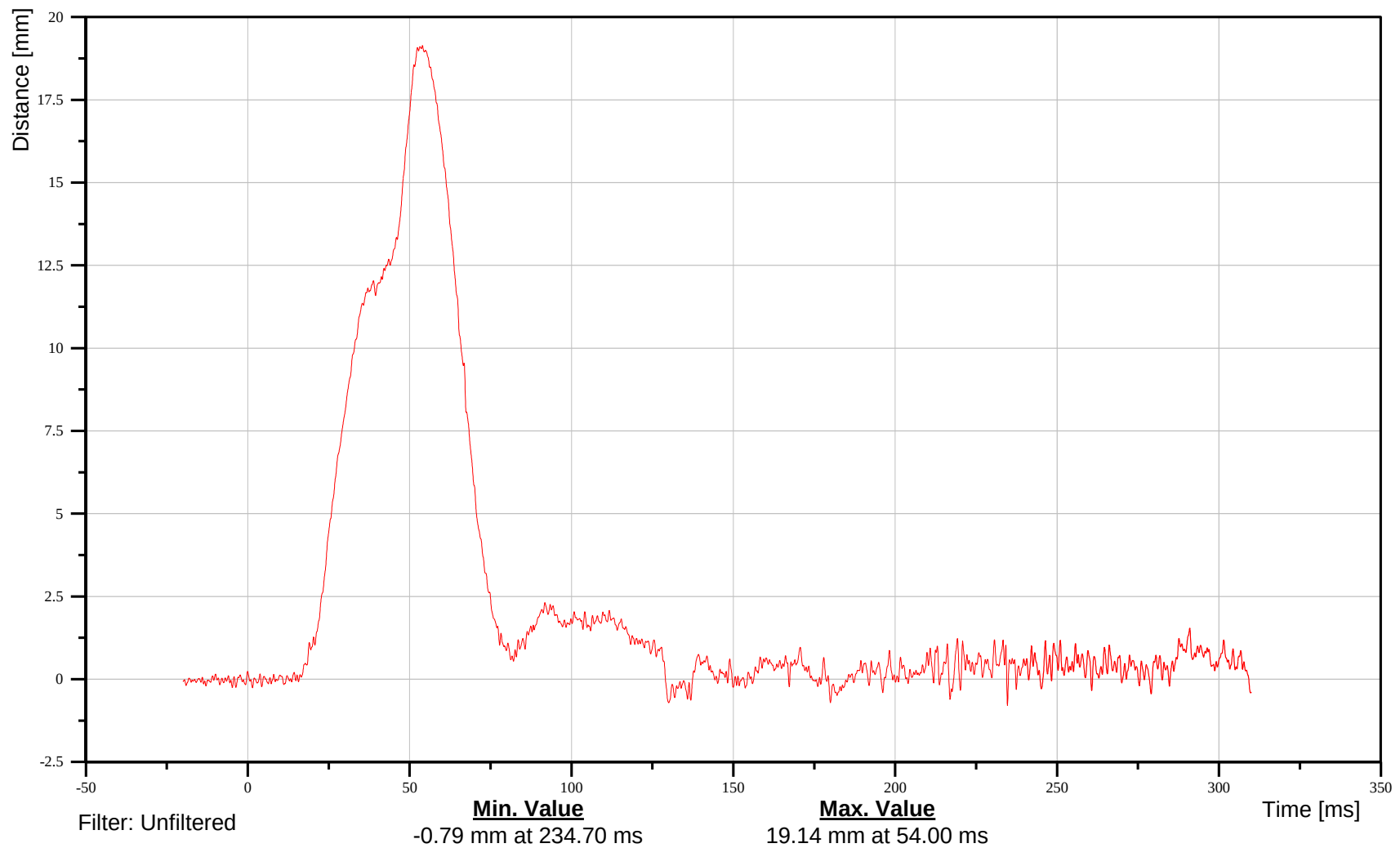
Time: 14:31

Customer: VRTC

11THRI03MIWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Front Ribeye X-Axis Displacement

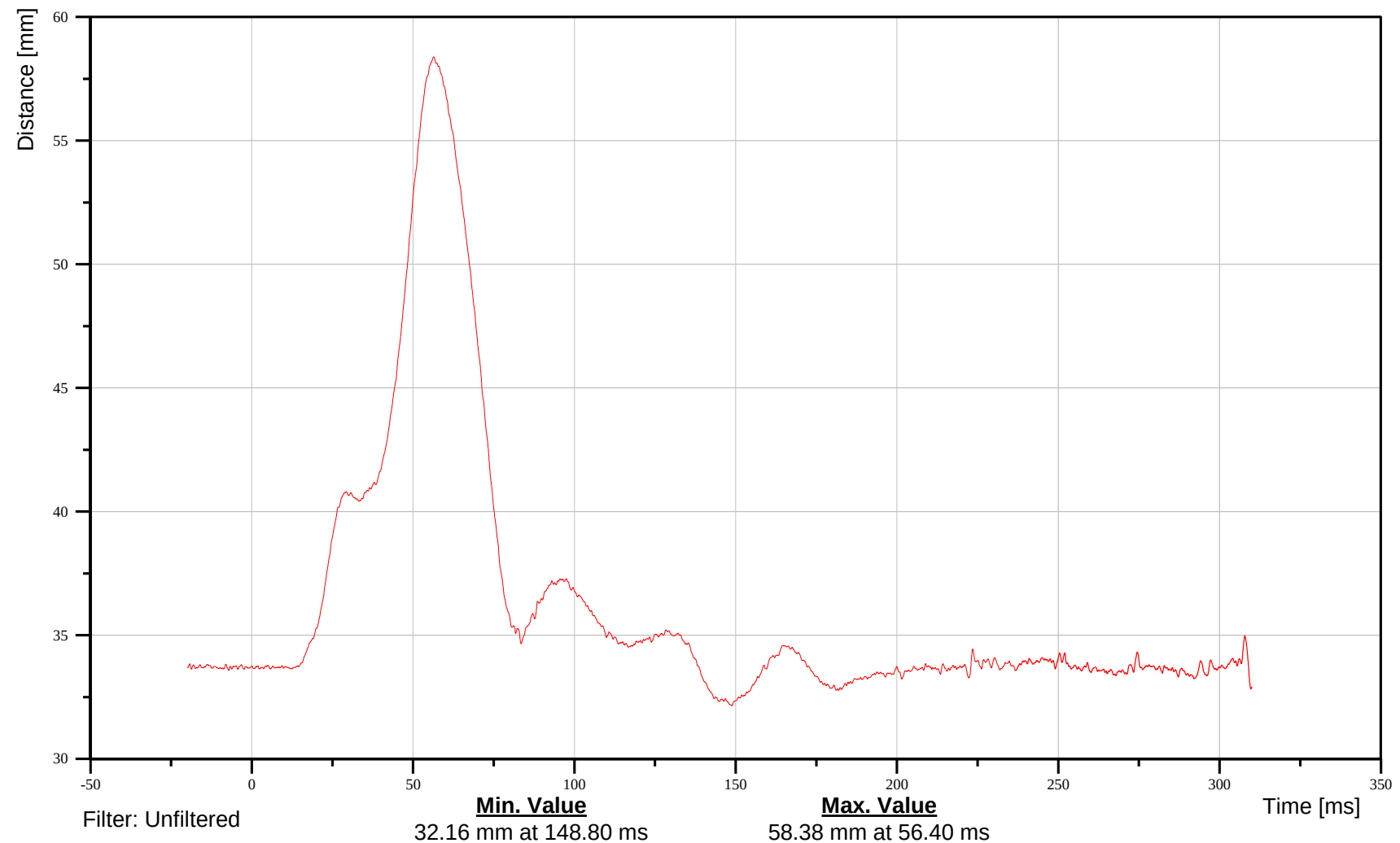
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI03FRWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Date: 06/14/2016

Time: 14:31

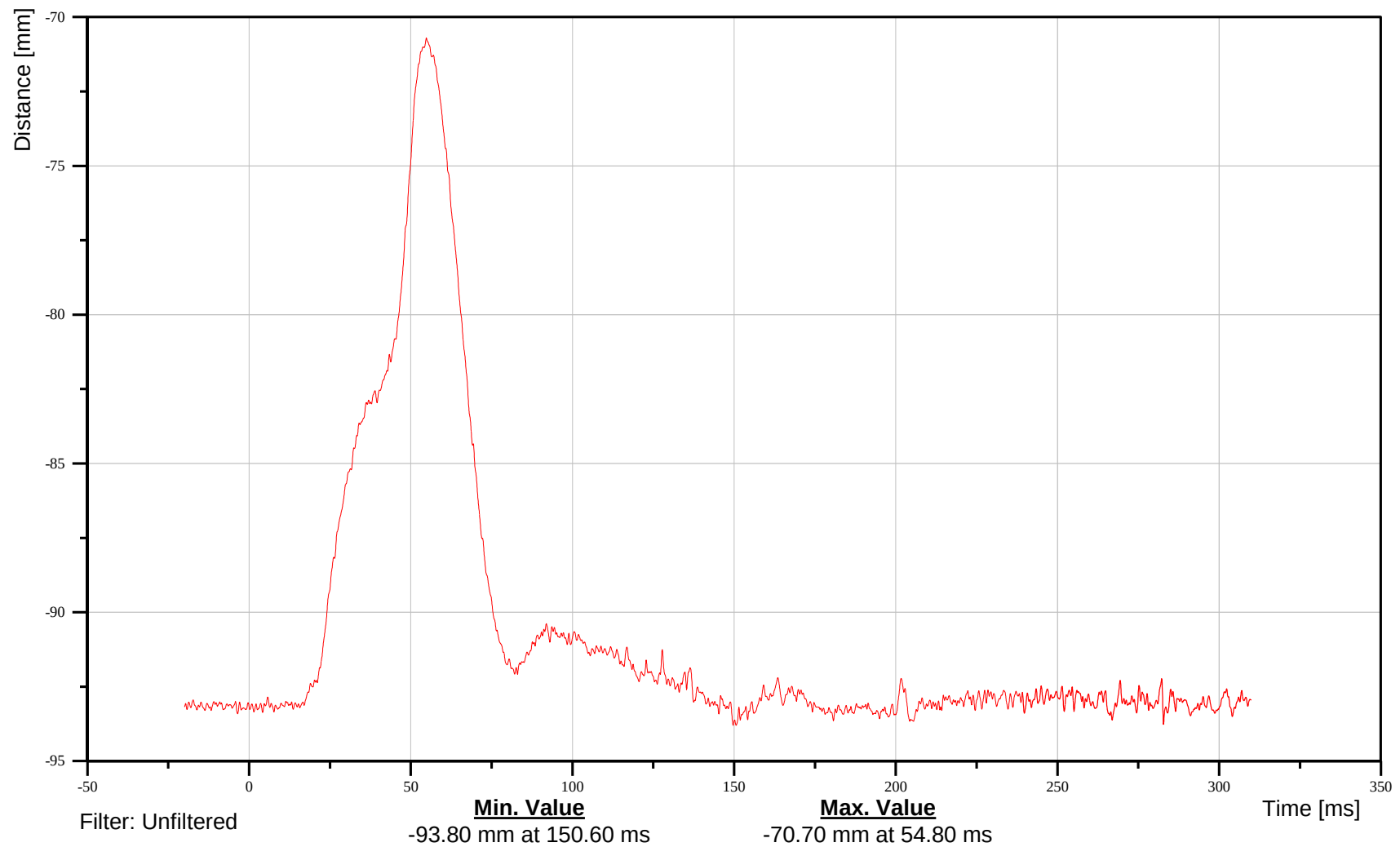
Thorax Rib 3 Front Ribeye Y-Axis Displacement

Customer: VRTC

11THRI03FRWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Front Ribeye Z-Axis Displacement

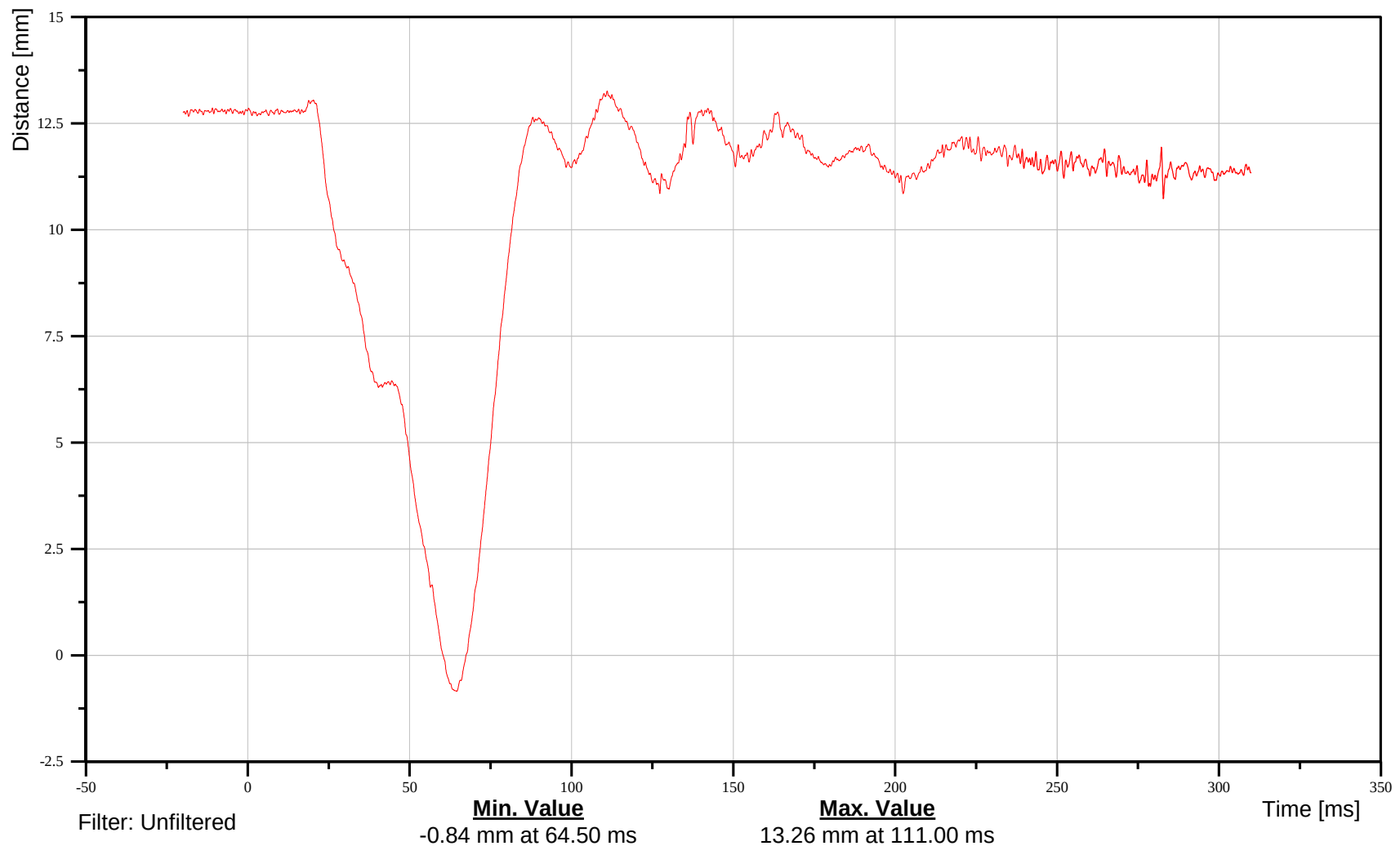
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11THRI03FRWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Rib 3 Front Ribeye Length Change

Date: 06/14/2016

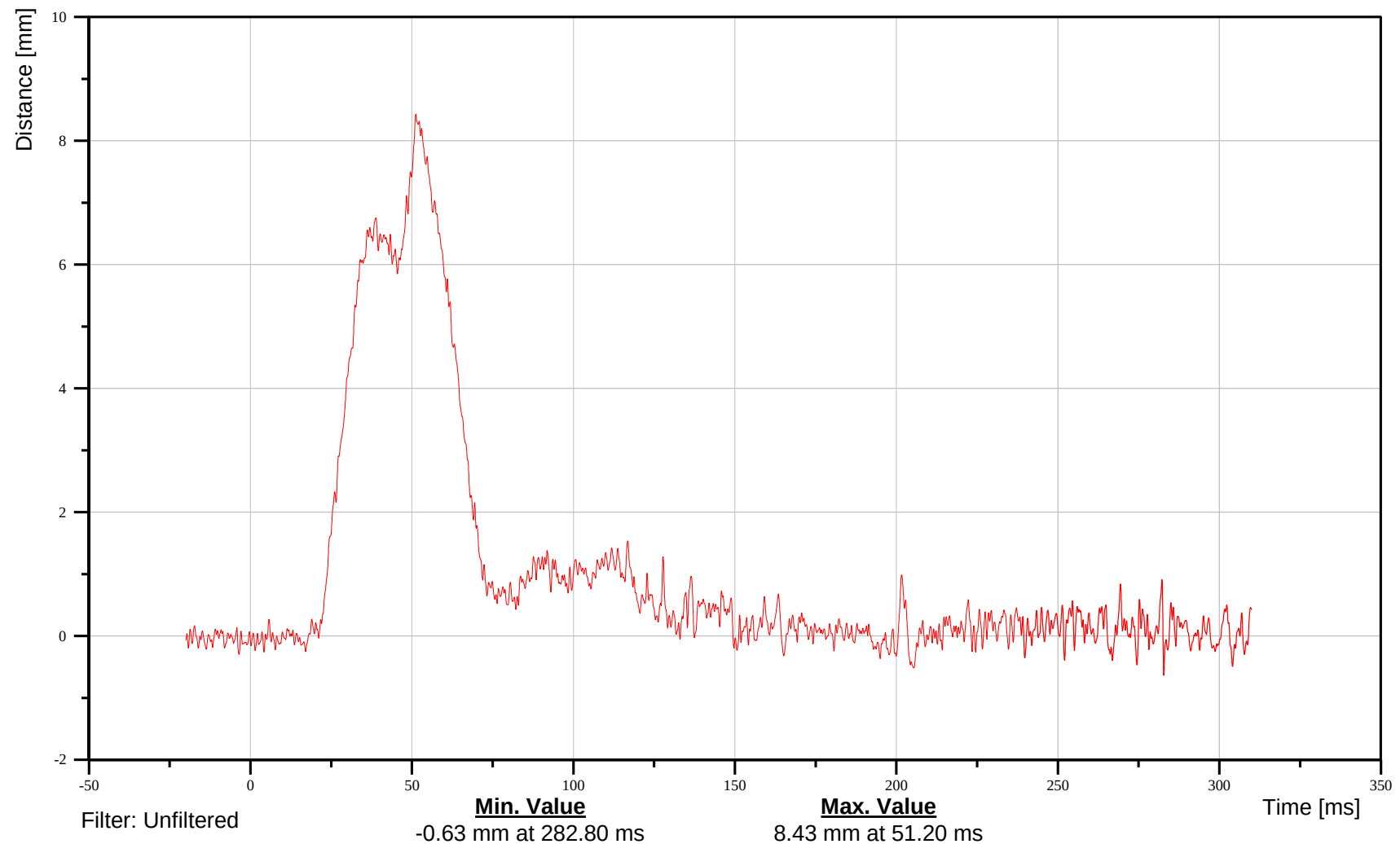
Time: 14:31

Customer: VRTC

11THRI03FRWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Rear Ribeye X-Axis Displacement

Date: 06/14/2016

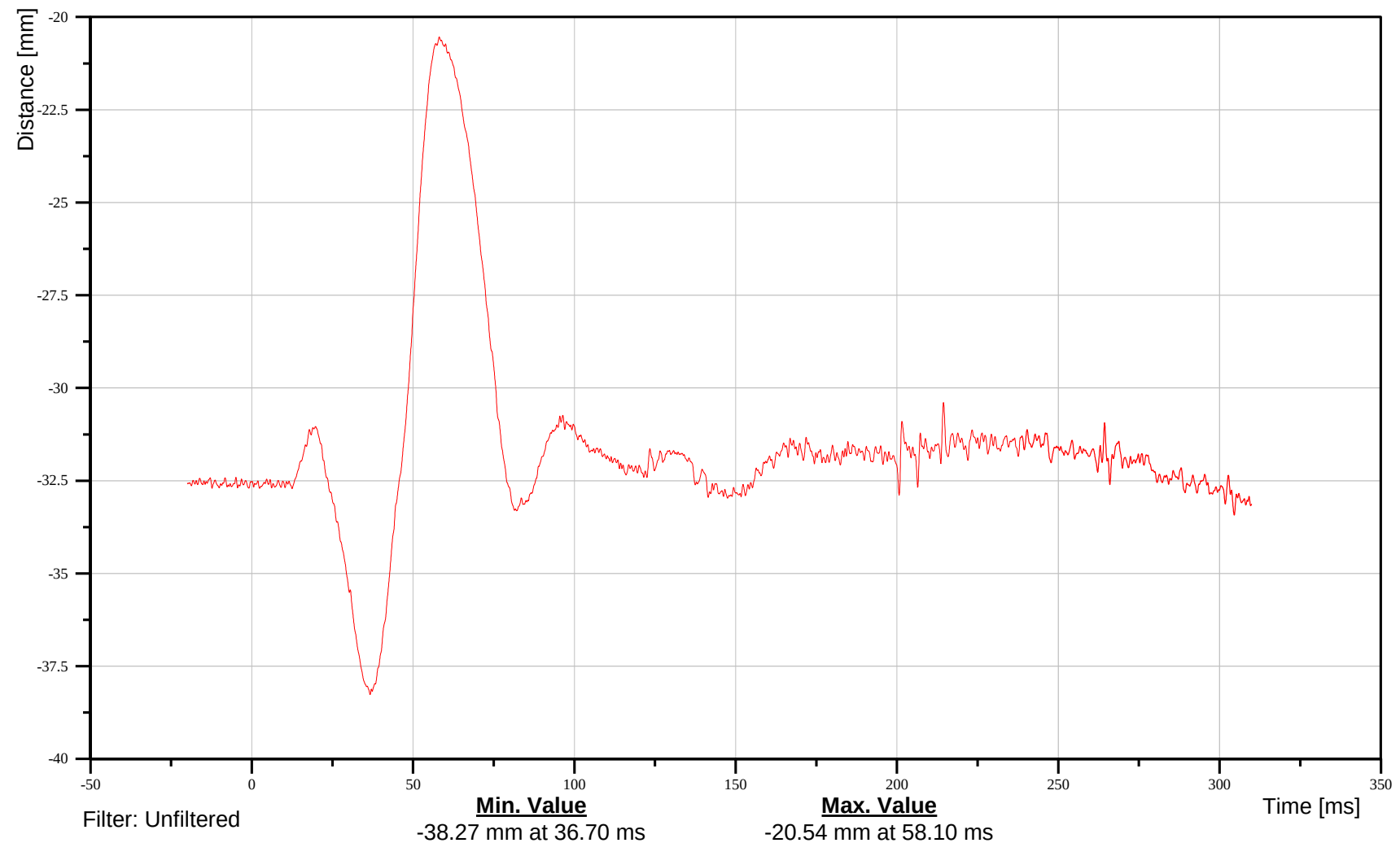
Time: 14:31

Customer: VRTC

11ABRI01REWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Rear Ribeye Y-Axis Displacement

Date: 06/14/2016

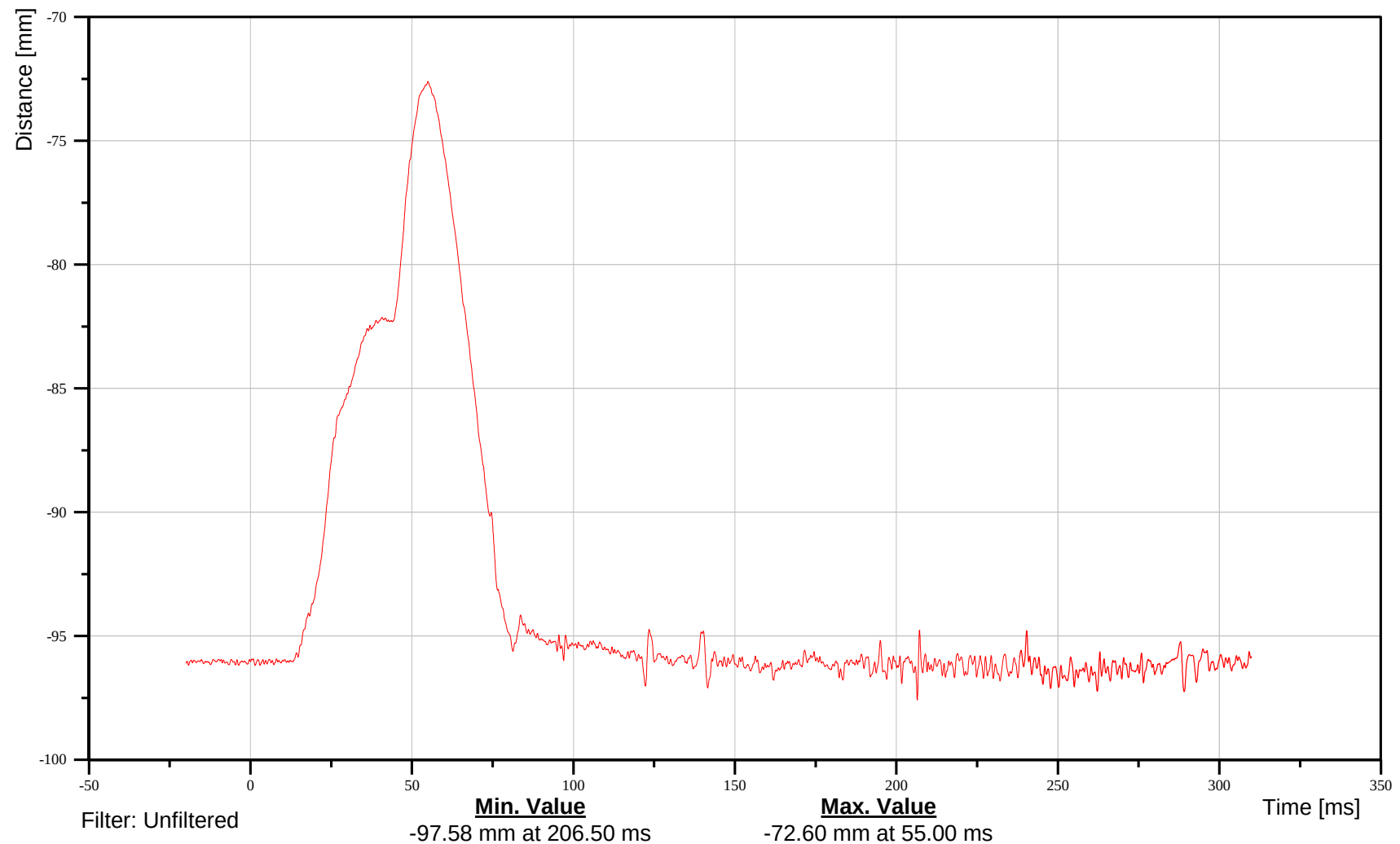
Time: 14:31

Customer: VRTC

11ABRI01REWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Rear Ribeye Z-Axis Displacement

Date: 06/14/2016

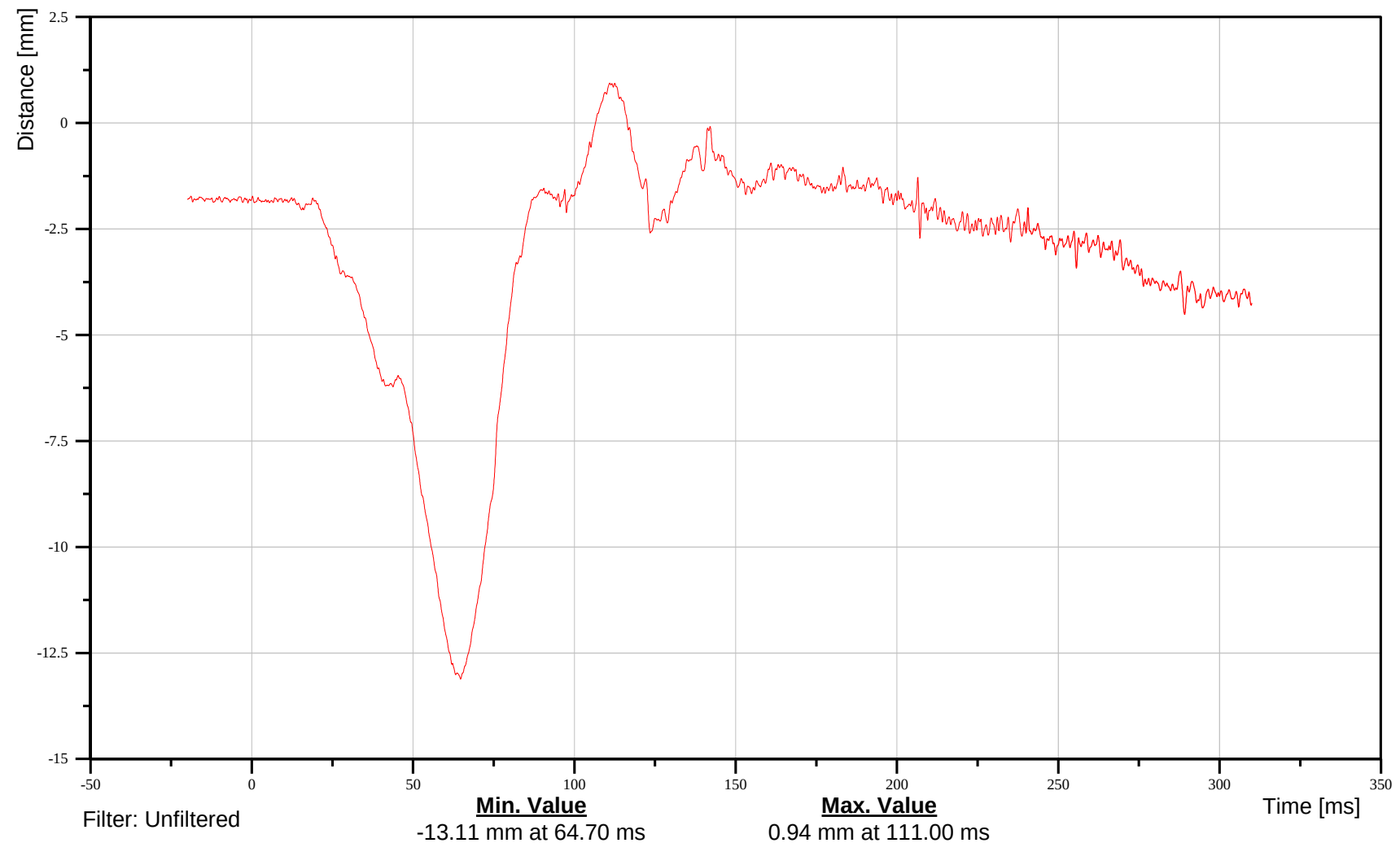
Time: 14:31

Customer: VRTC

11ABRI01REWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Rear Ribeye Length Change

Date: 06/14/2016

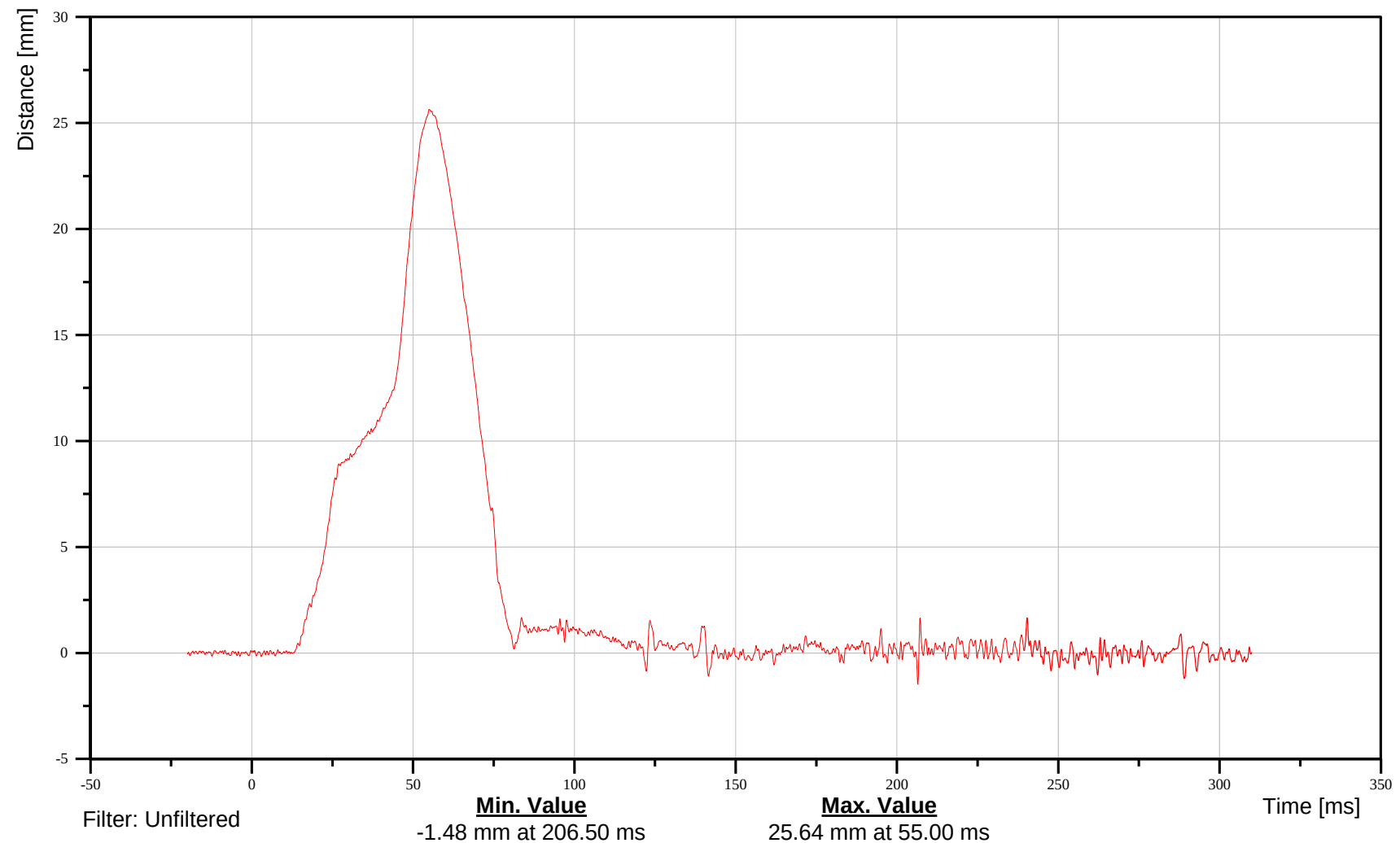
Time: 14:31

Customer: VRTC

11ABRI01REWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Middle Ribeye X-Axis Displacement

Date: 06/14/2016

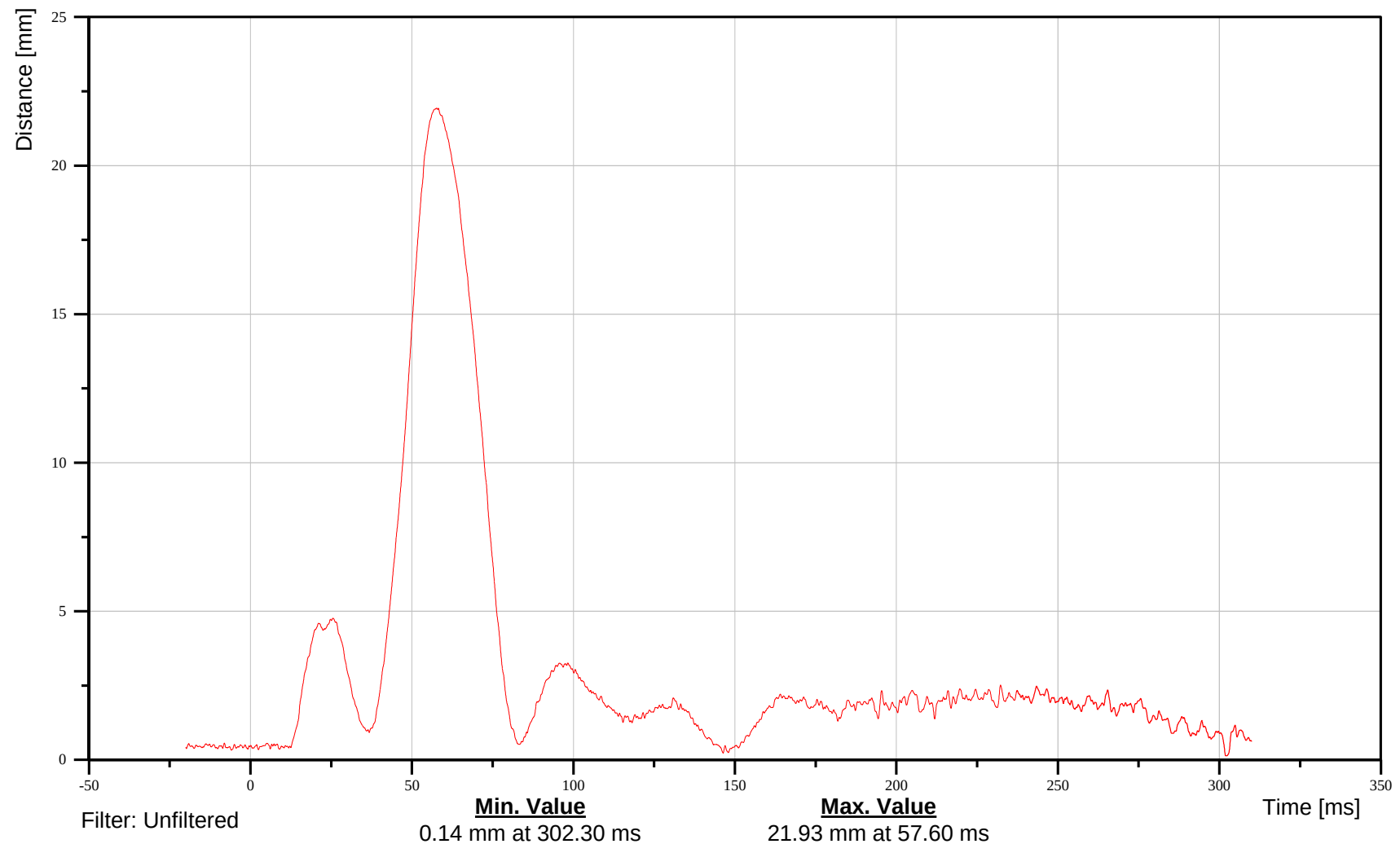
Time: 14:31

Customer: VRTC

11ABRI01MIWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Middle Ribeye Y-Axis Displacement

Date: 06/14/2016

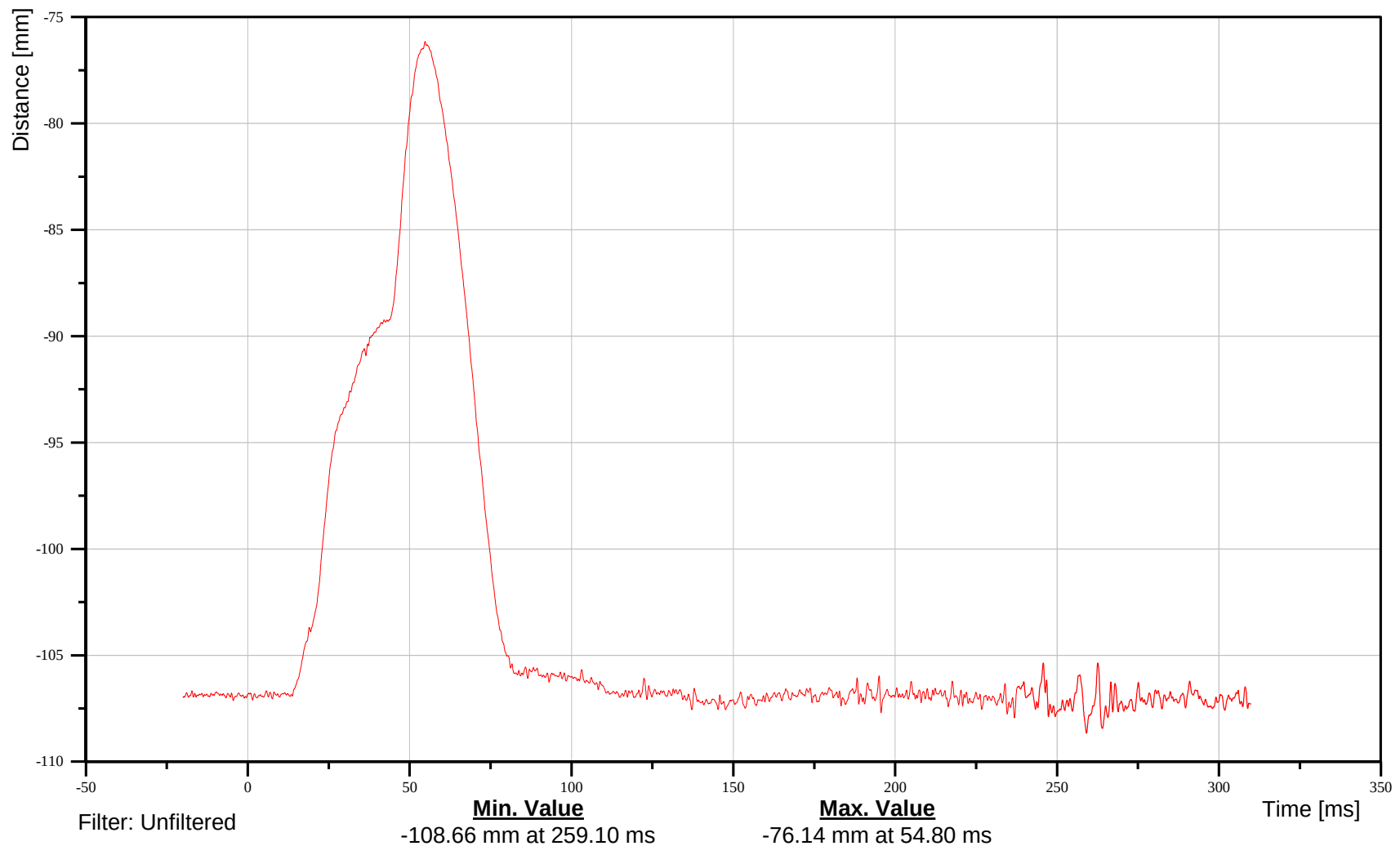
Time: 14:31

Customer: VRTC

11ABRI01MIWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Middle Ribeye Z-Axis Displacement

Date: 06/14/2016

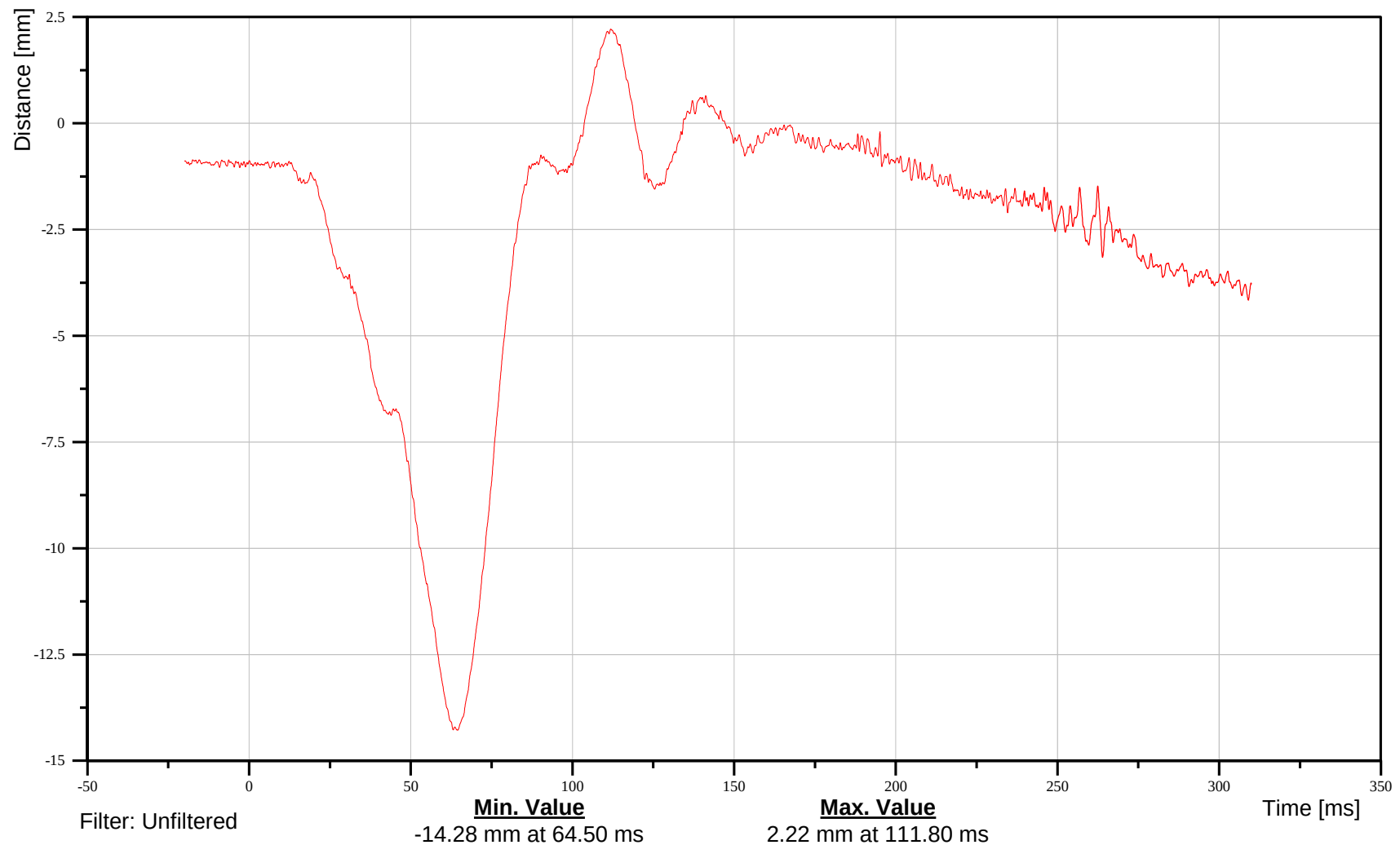
Time: 14:31

Customer: VRTC

11ABRI01MIWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Middle Ribeye Length Change

Date: 06/14/2016

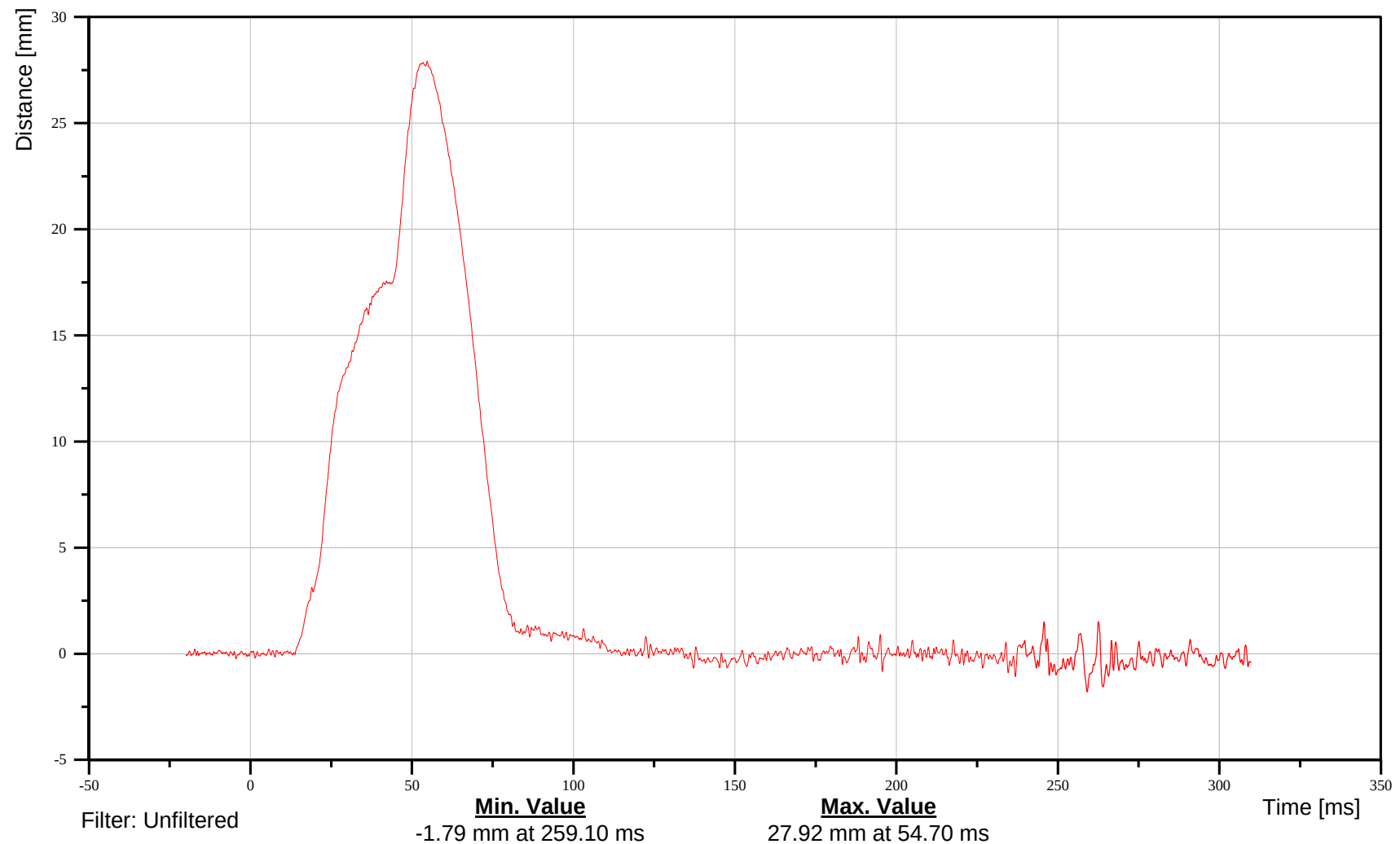
Time: 14:31

Customer: VRTC

11ABRI01MIWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Front Ribeye X-Axis Displacement

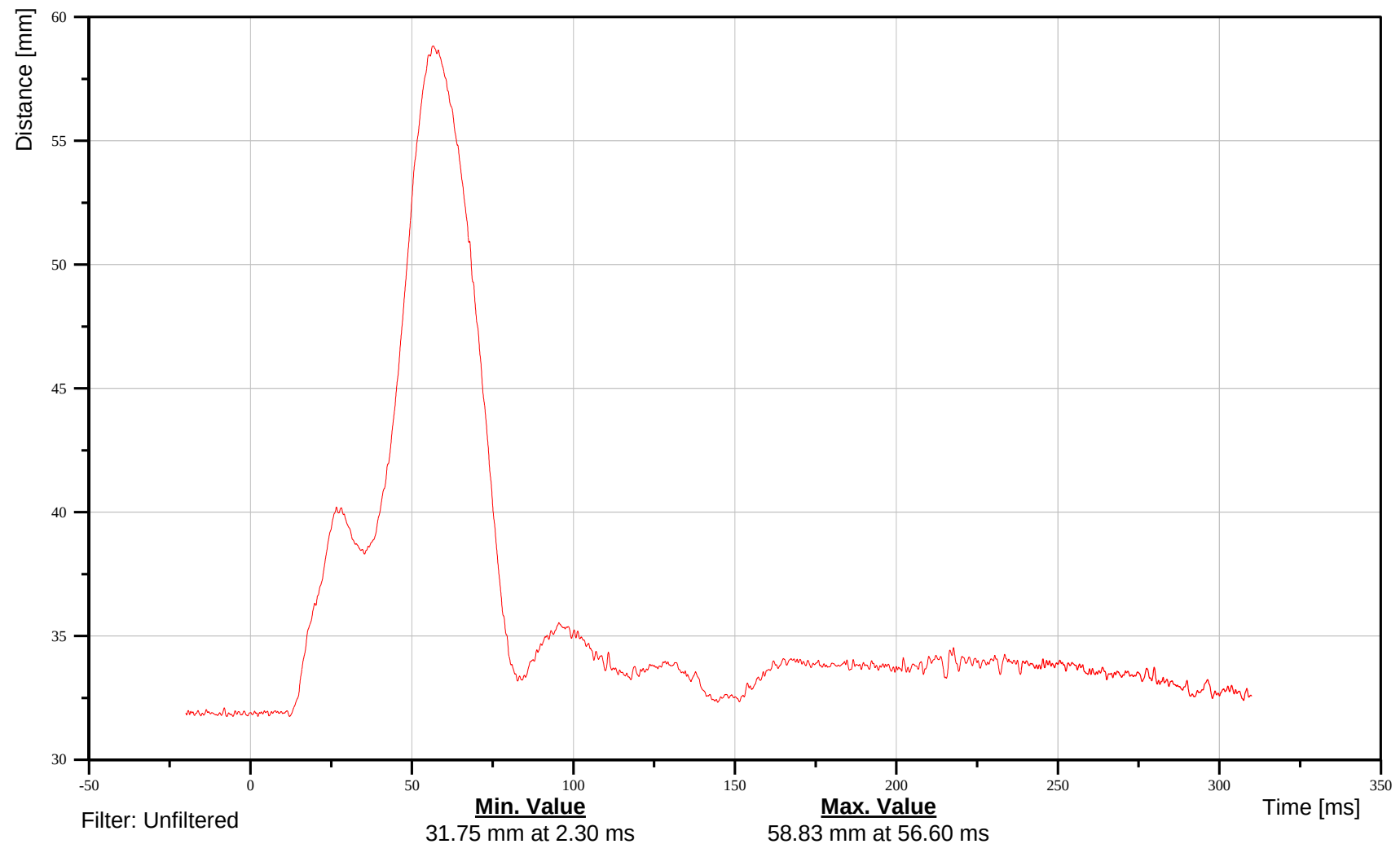
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11ABRI01FRWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Front Ribeye Y-Axis Displacement

Date: 06/14/2016

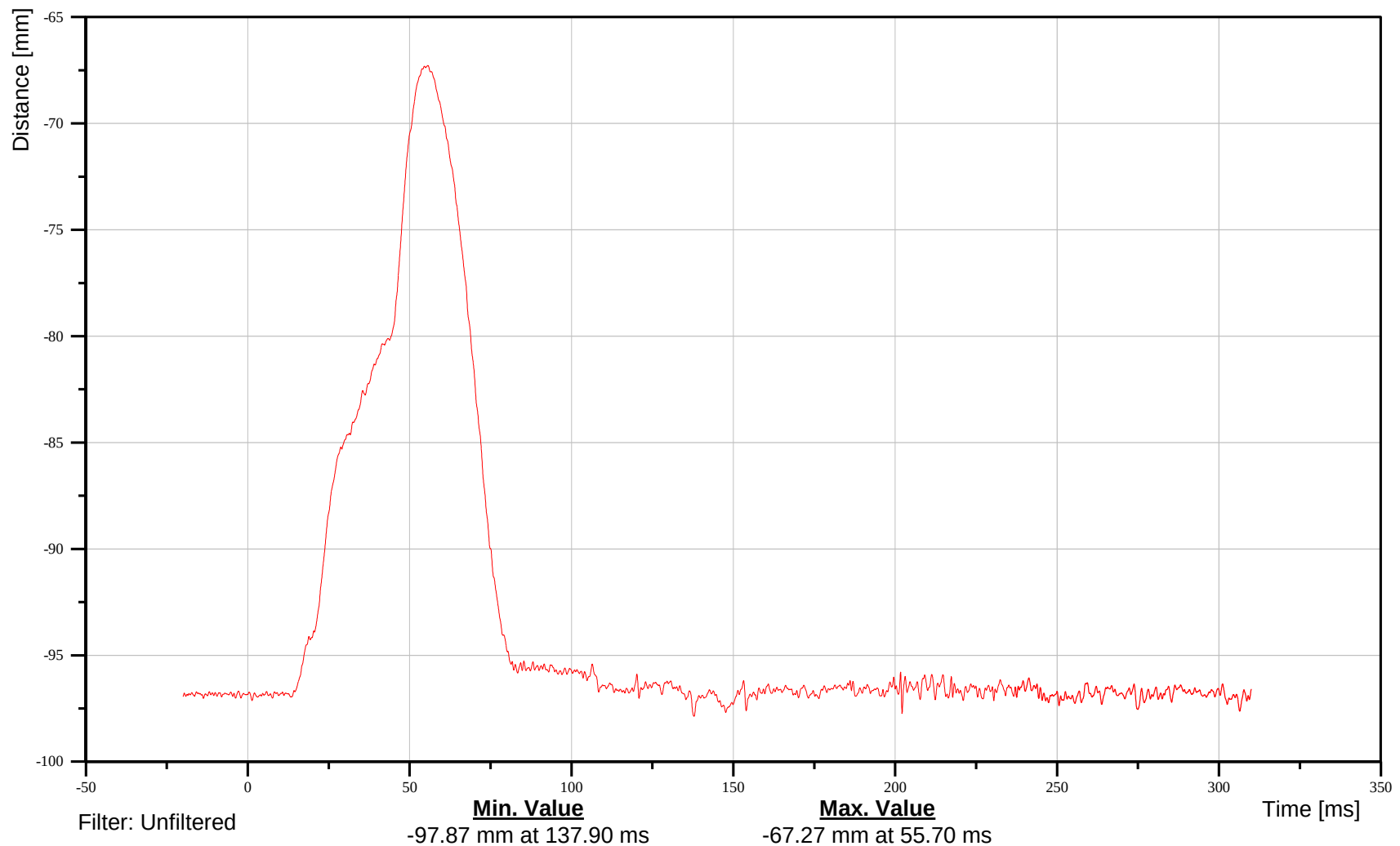
Time: 14:31

Customer: VRTC

11ABRI01FRWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Front Ribeye Z-Axis Displacement

Date: 06/14/2016

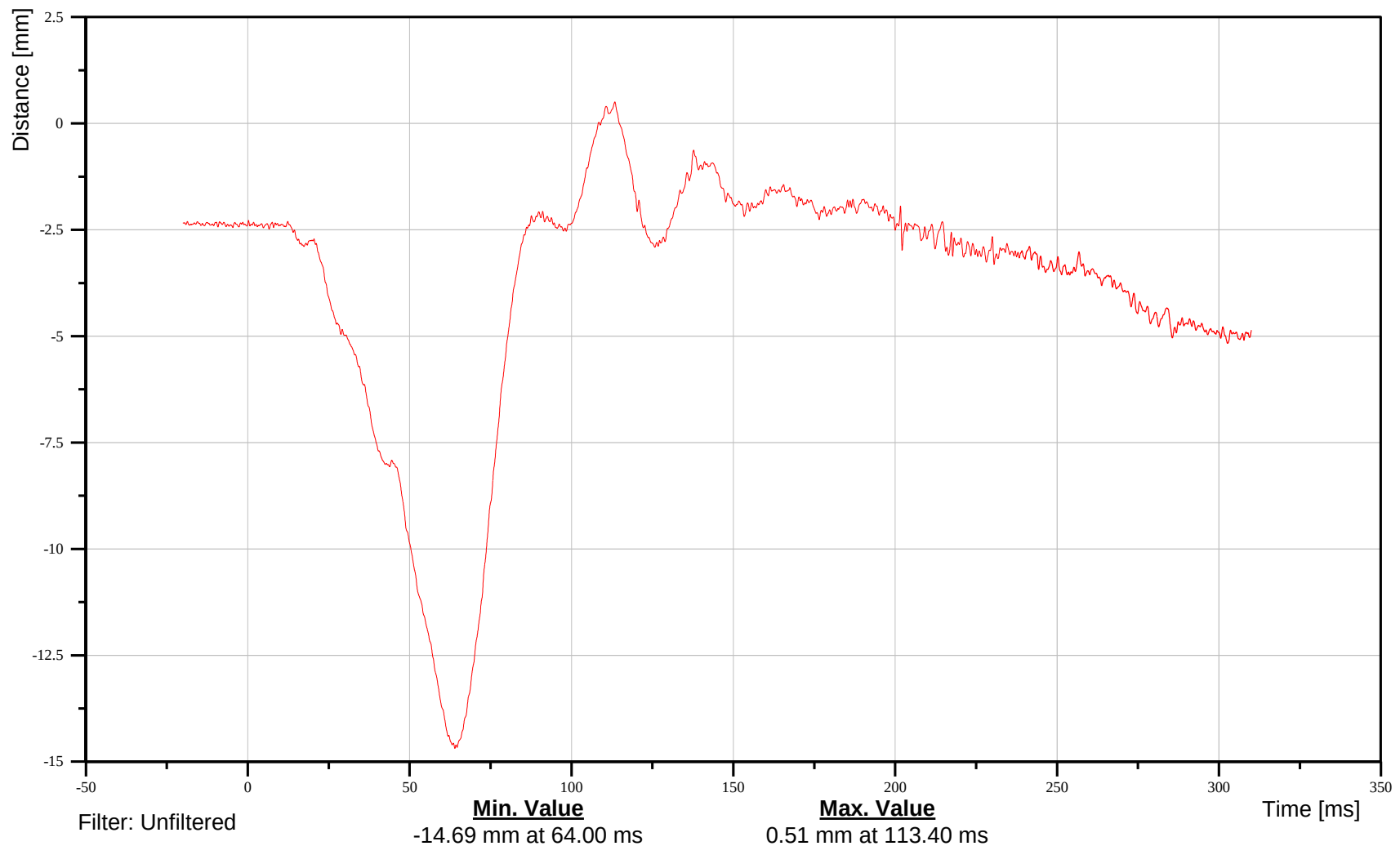
Time: 14:31

Customer: VRTC

11ABRI01FRWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 1 Front Ribeye Length Change

Date: 06/14/2016

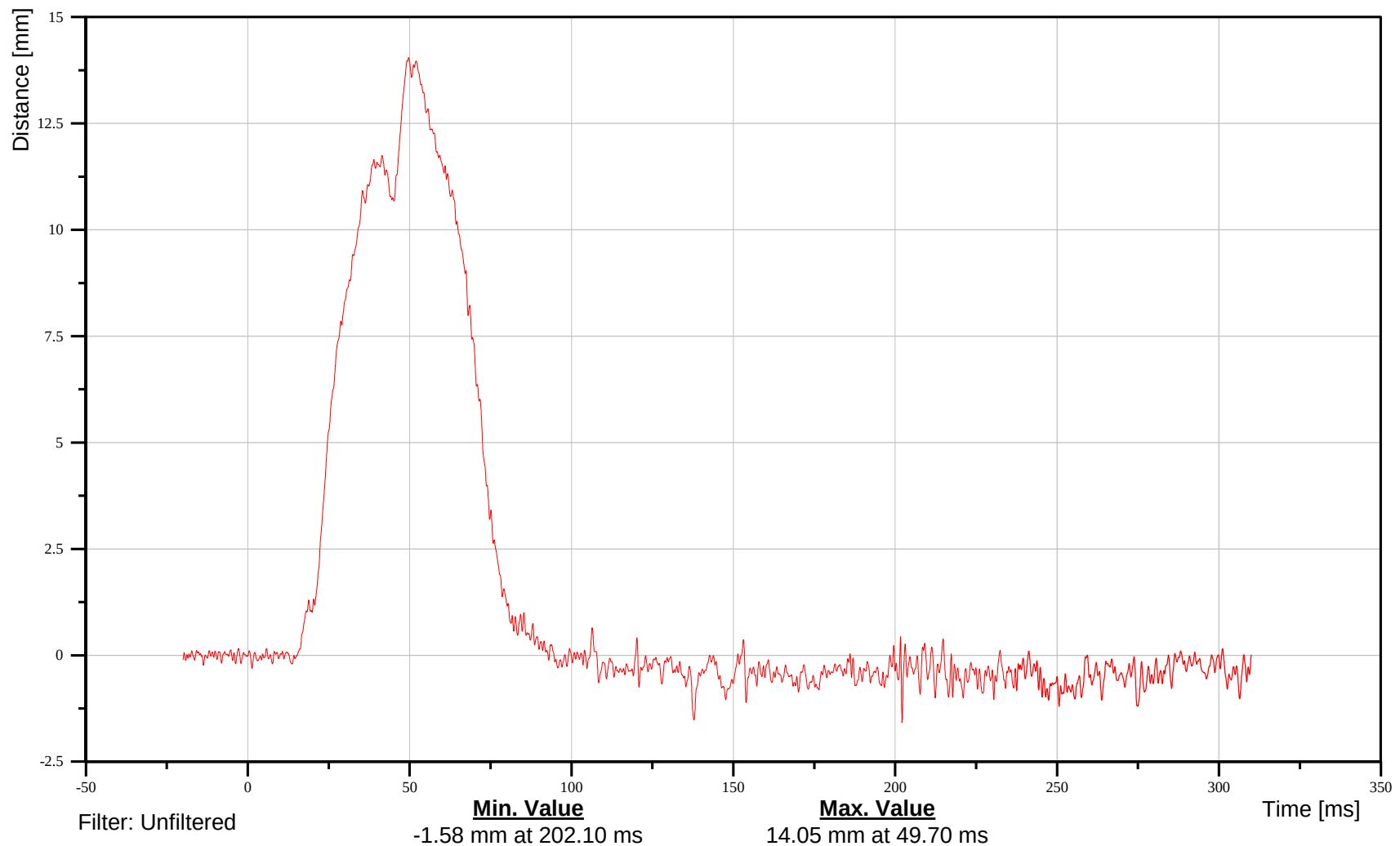
Time: 14:31

Customer: VRTC

11ABRI01FRWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Rear Ribeye X-Axis Displacement

Date: 06/14/2016

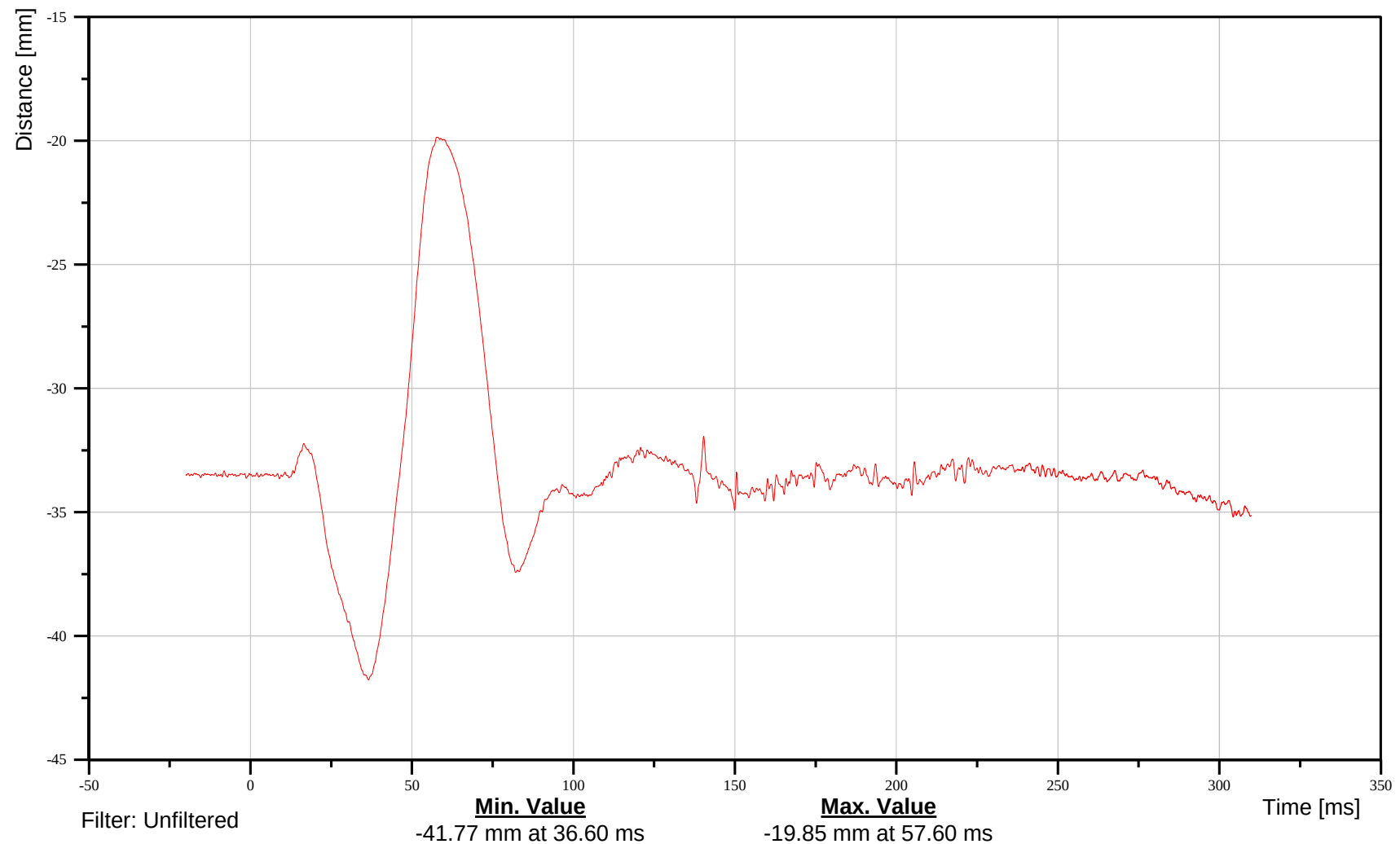
Time: 14:31

Customer: VRTC

11ABRI02REWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Rear Ribeye Y-Axis Displacement

Date: 06/14/2016

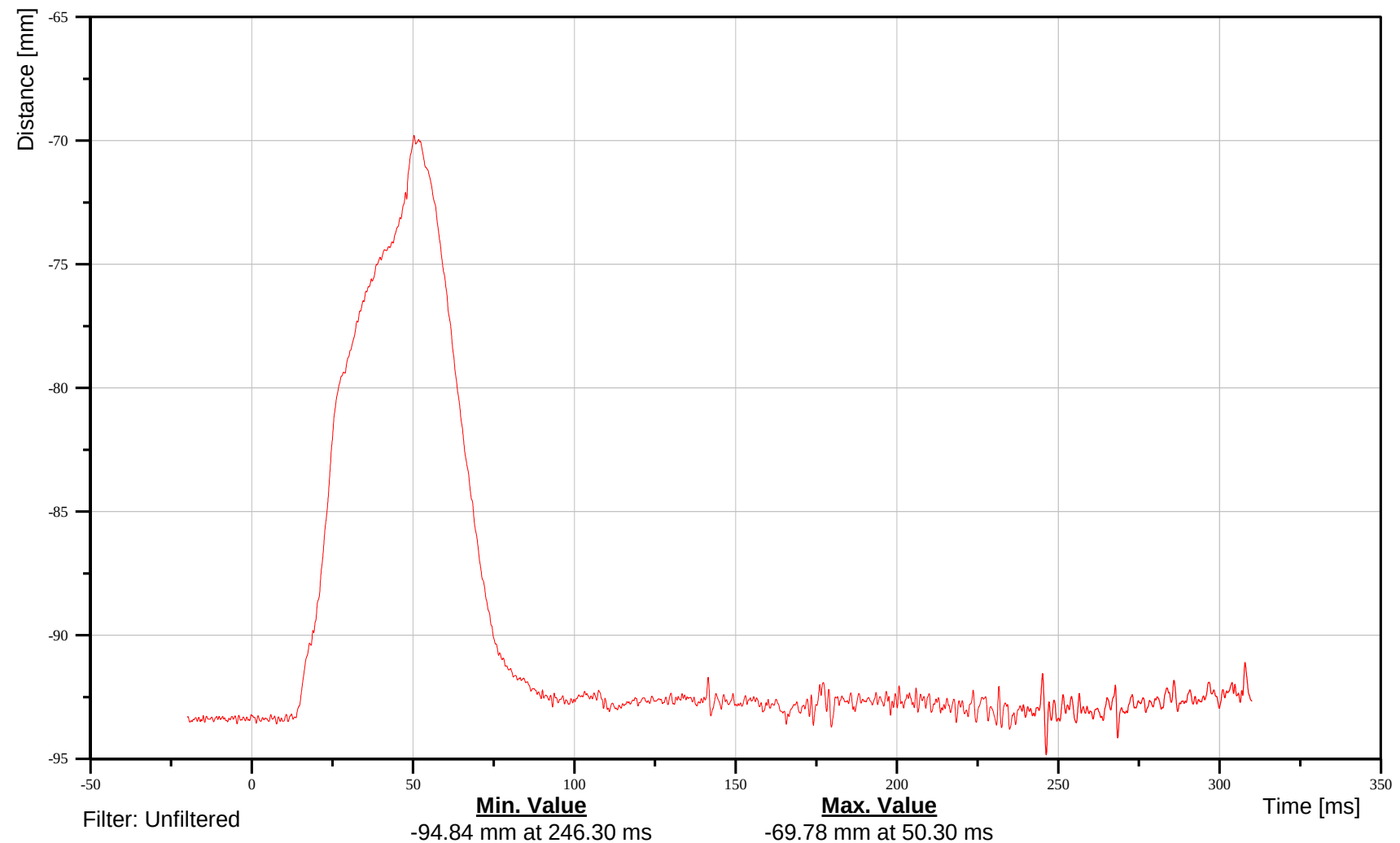
Time: 14:31

Customer: VRTC

11ABRI02REWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Rear Ribeye Z-Axis Displacement

Date: 06/14/2016

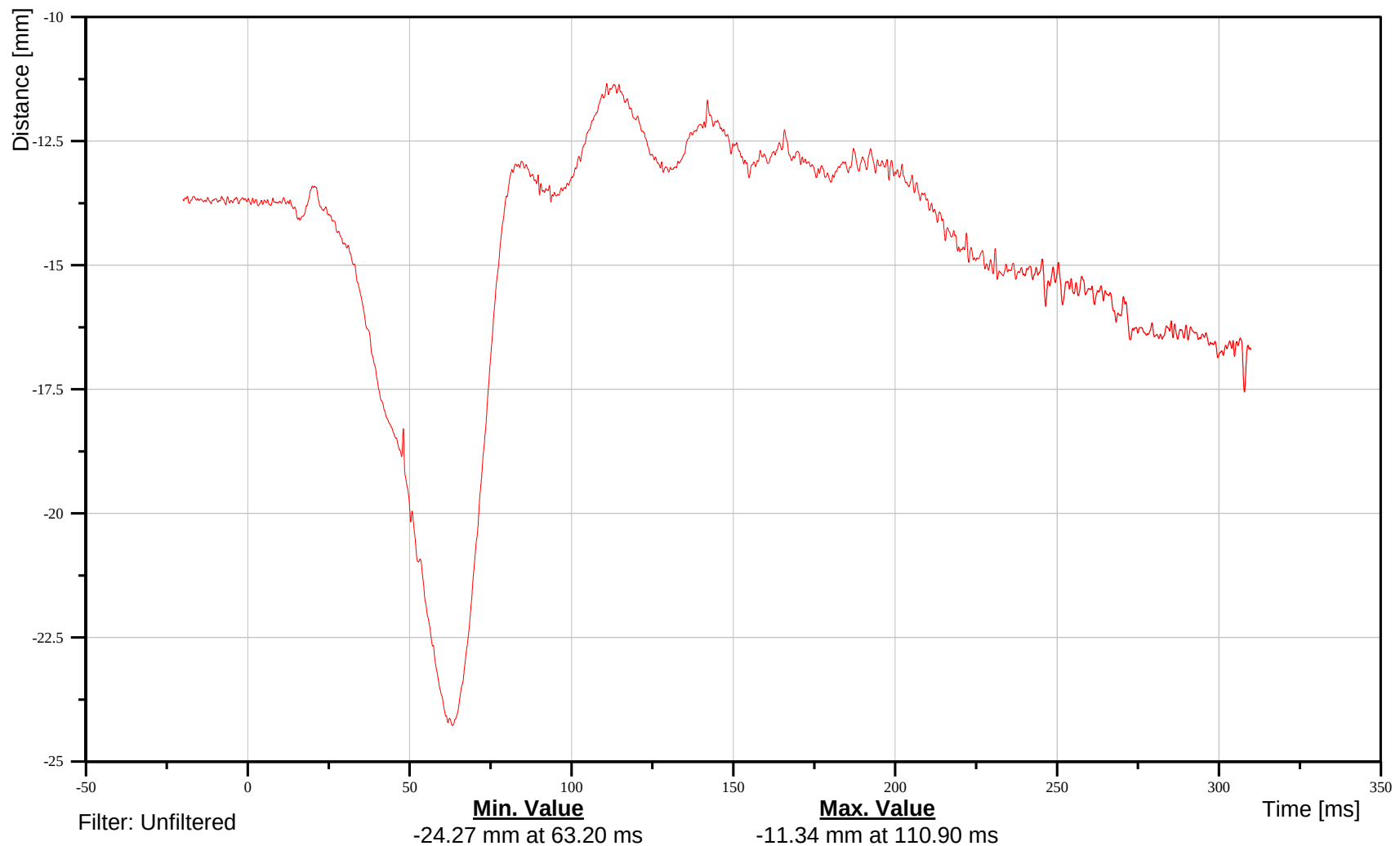
Time: 14:31

Customer: VRTC

11ABRI02REWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Rear Ribeye Length Change

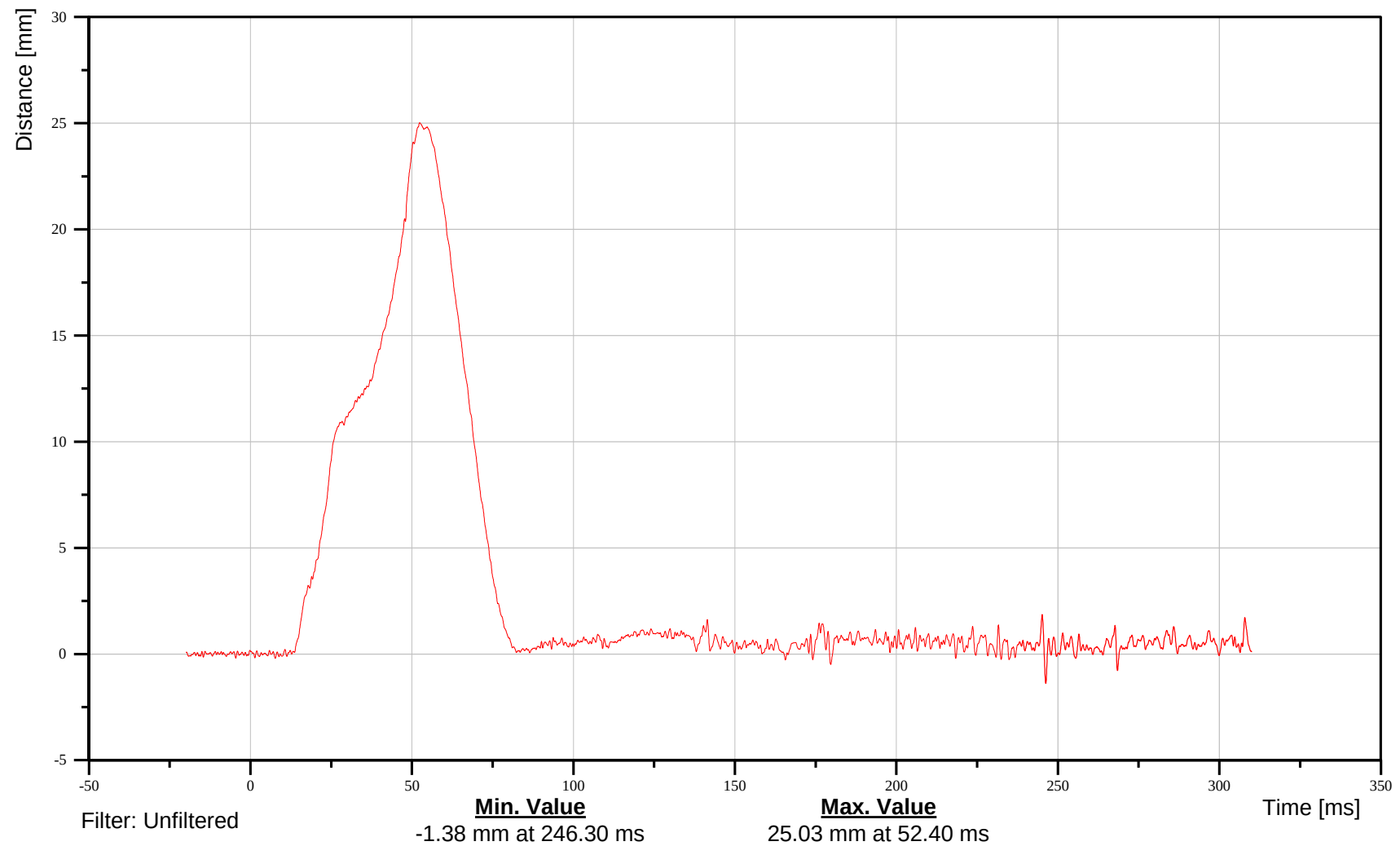
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11ABRI02REWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Middle Ribeye X-Axis Displacement

Date: 06/14/2016

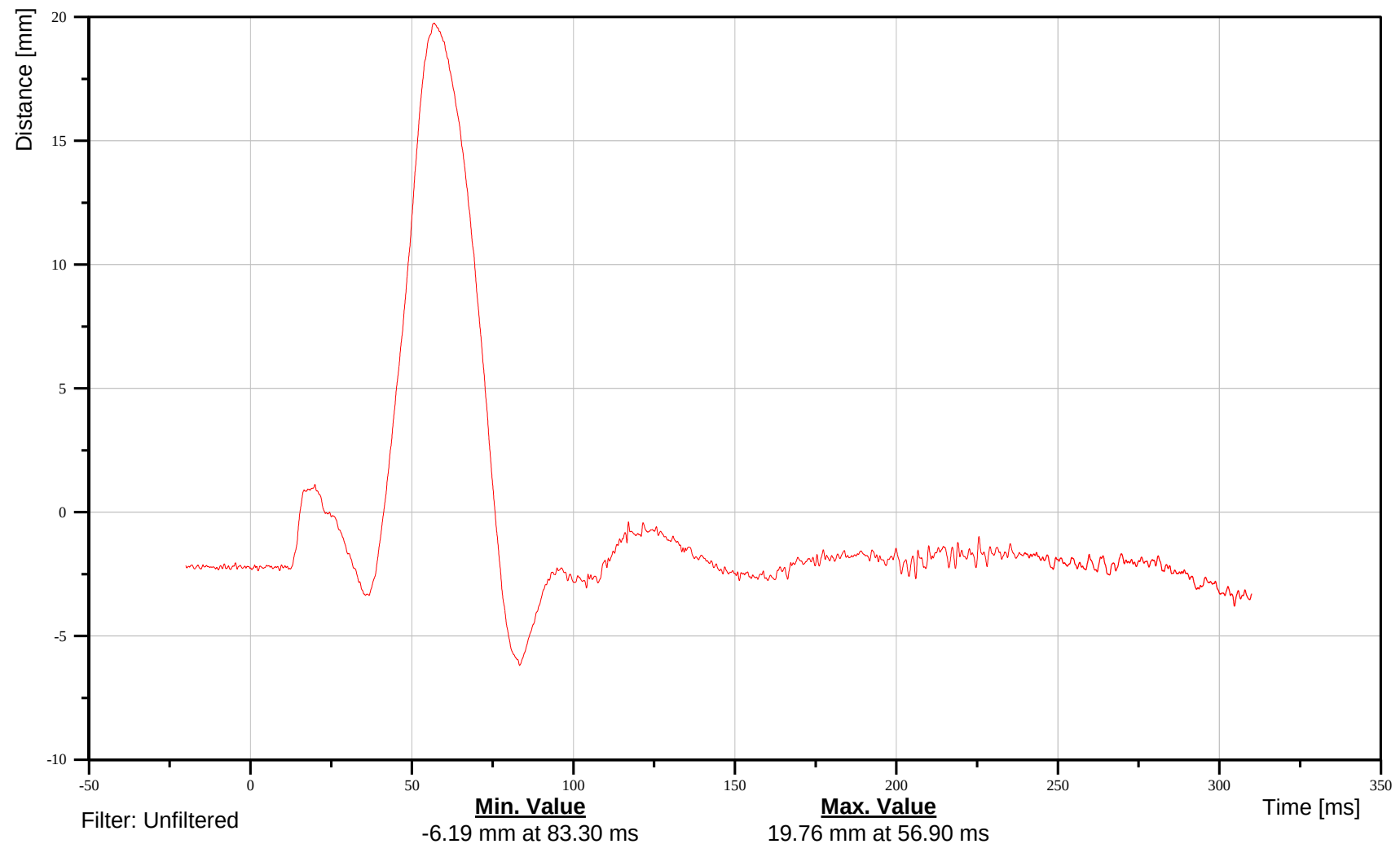
Time: 14:31

Customer: VRTC

11ABRI02MIWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Middle Ribeye Y-Axis Displacement

Date: 06/14/2016

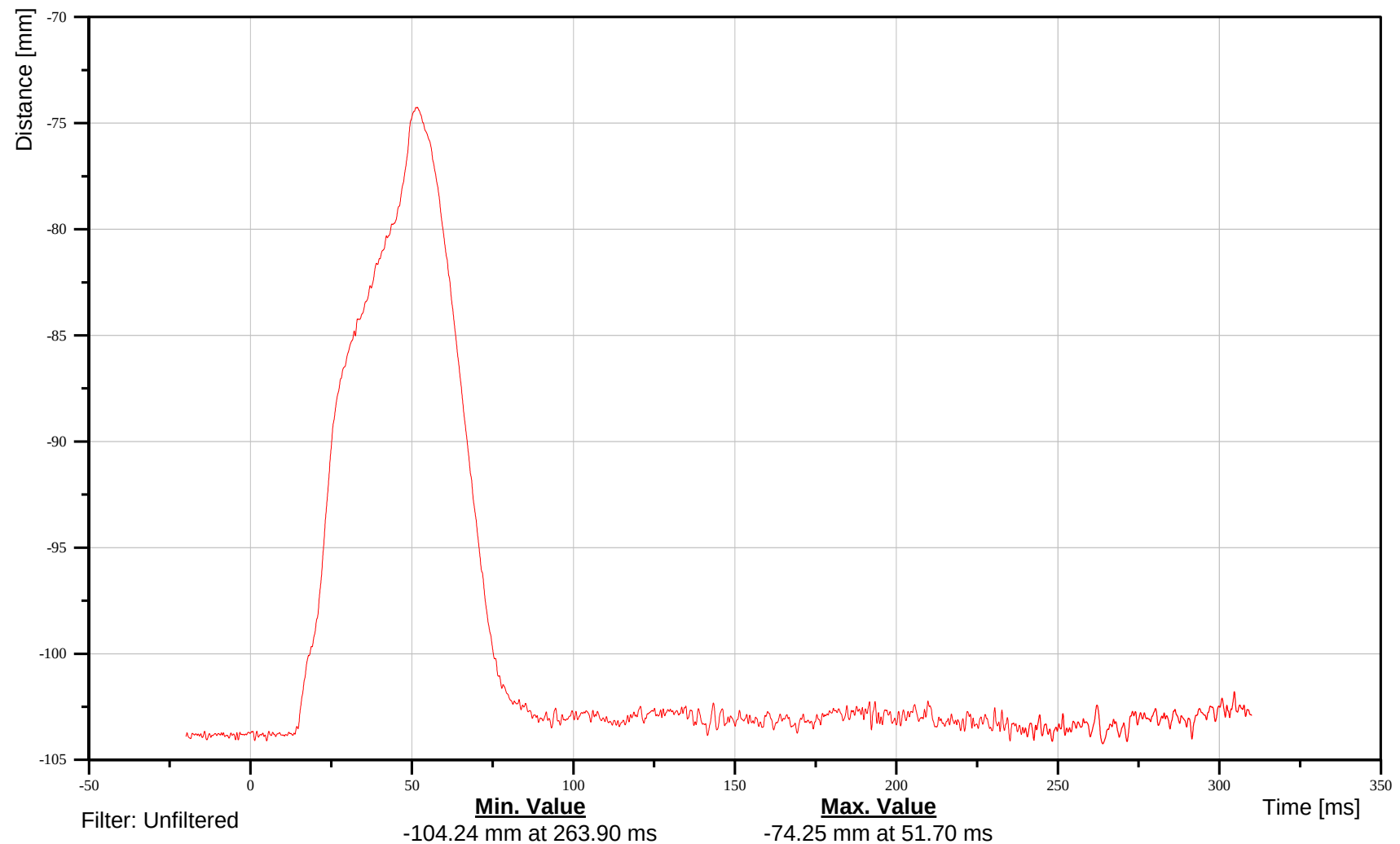
Time: 14:31

Customer: VRTC

11ABRI02MIWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Middle Ribeye Z-Axis Displacement

Date: 06/14/2016

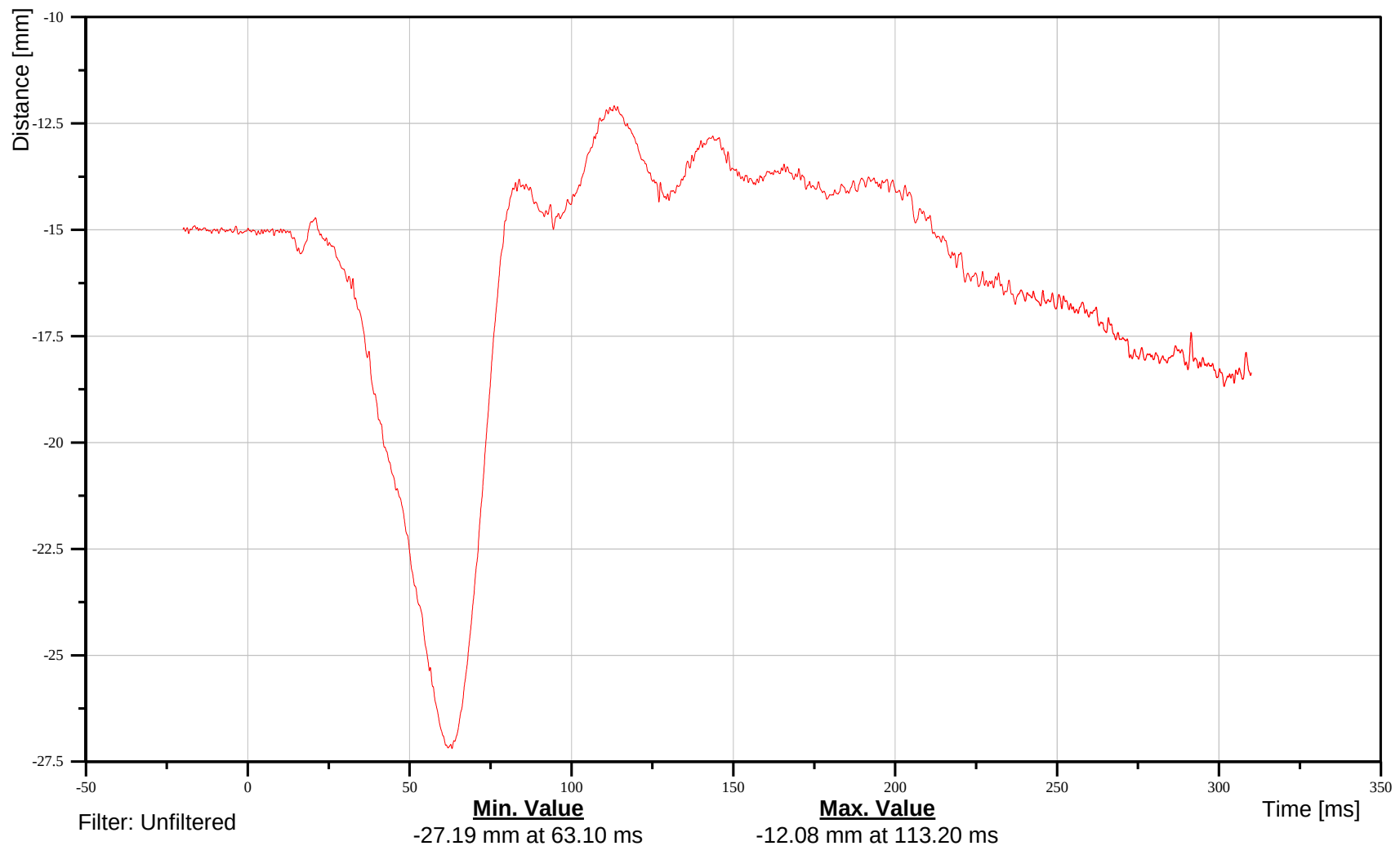
Time: 14:31

Customer: VRTC

11ABRI02MIWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Middle Ribeye Length Change

Date: 06/14/2016

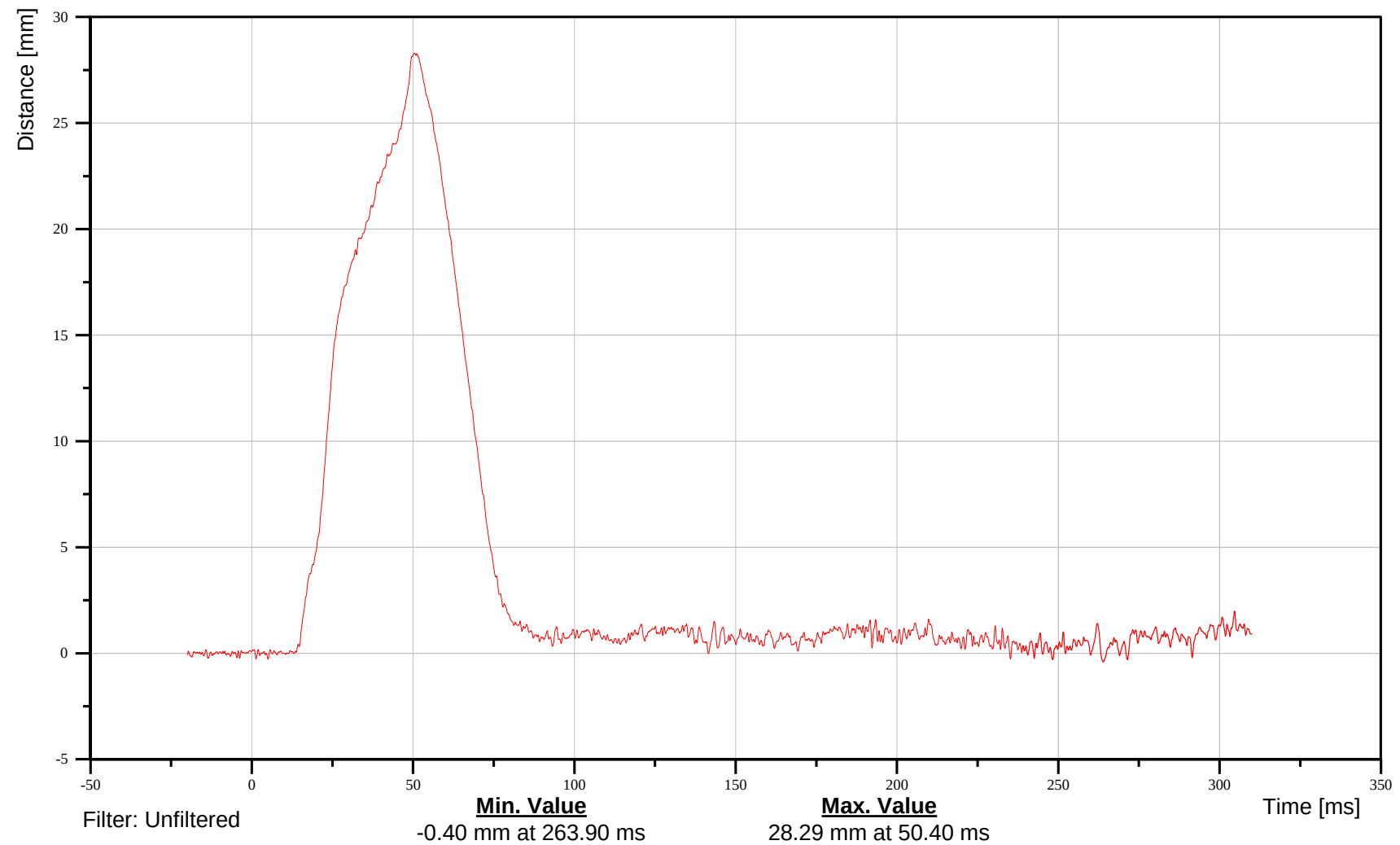
Time: 14:31

Customer: VRTC

11ABRI02MIWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Front Ribeye X-Axis Displacement

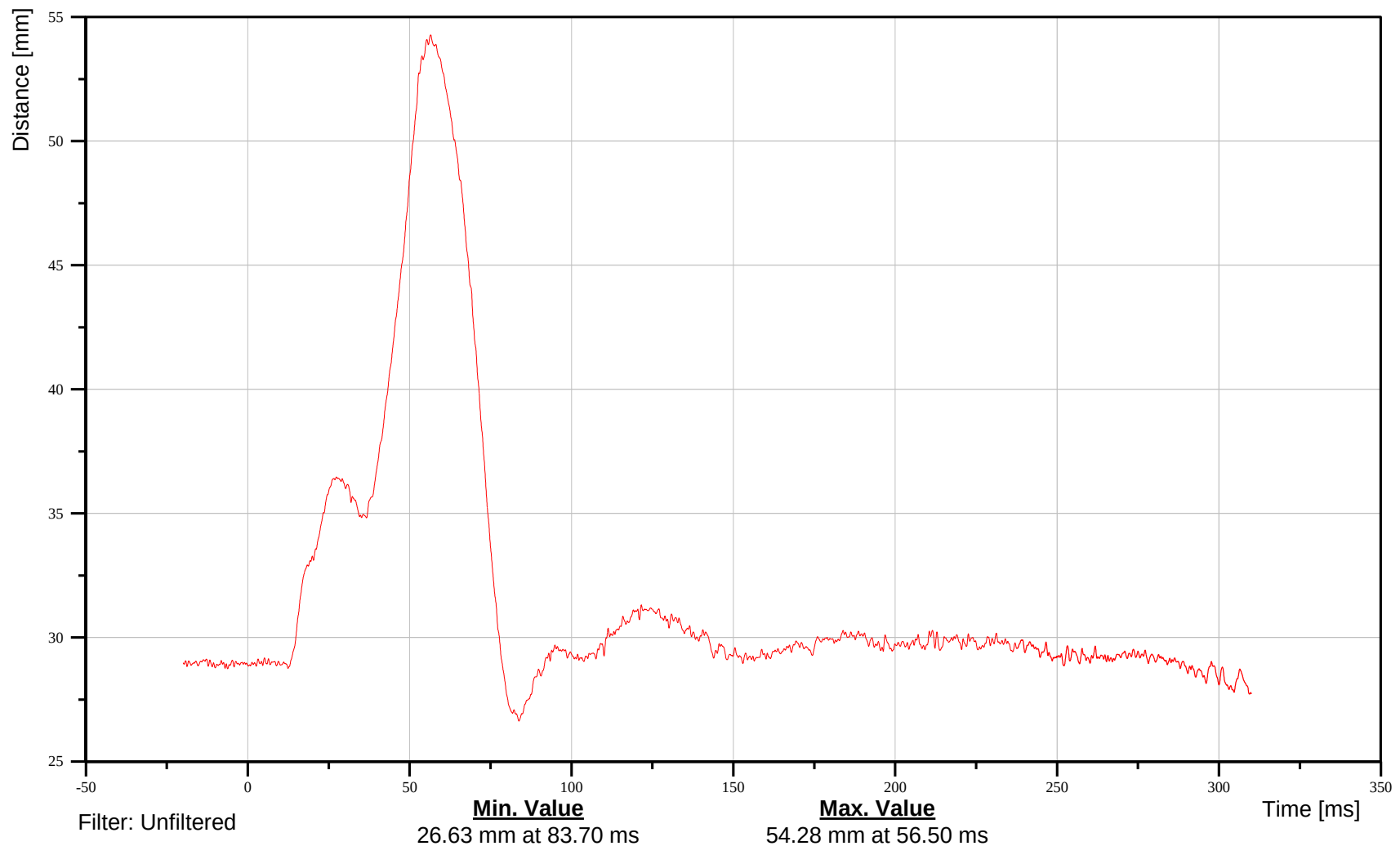
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11ABRI02FRWSDSX0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Front Ribeye Y-Axis Displacement

Date: 06/14/2016

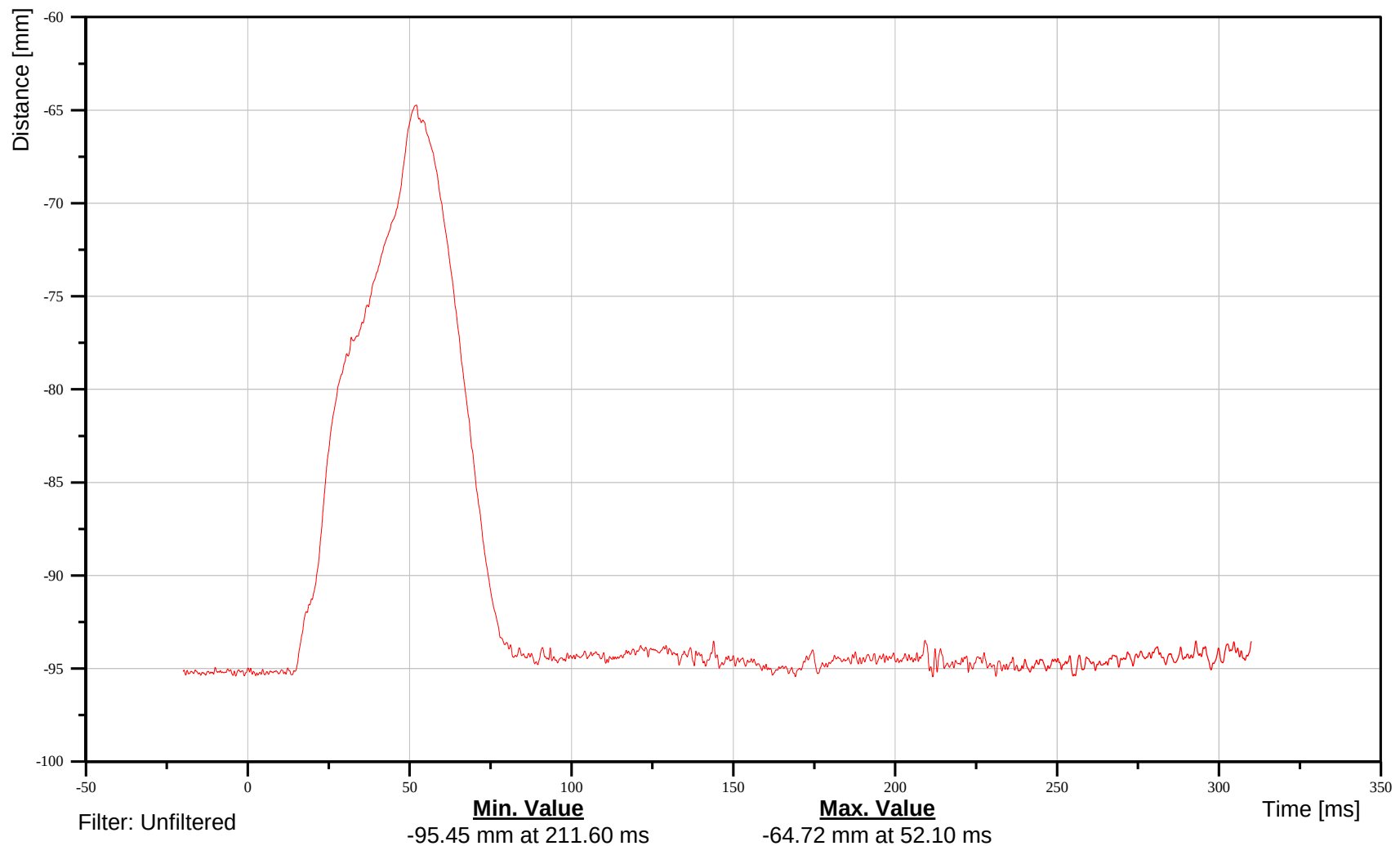
Time: 14:31

Customer: VRTC

11ABRI02FRWSDSY0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Front Ribeye Z-Axis Displacement

Date: 06/14/2016

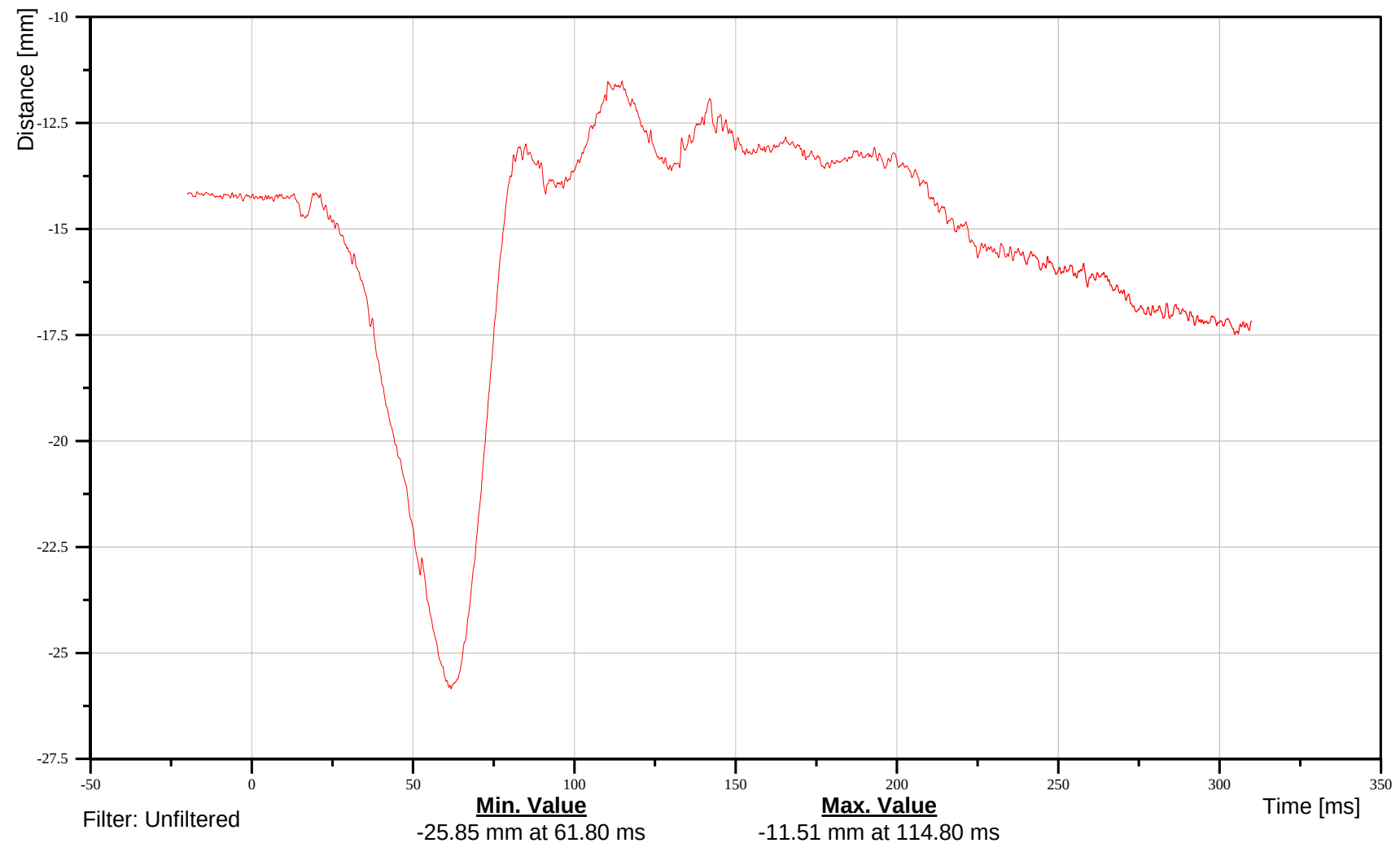
Time: 14:31

Customer: VRTC

11ABRI02FRWSDSZ0

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Abdomen Rib 2 Front Ribeye Length Change

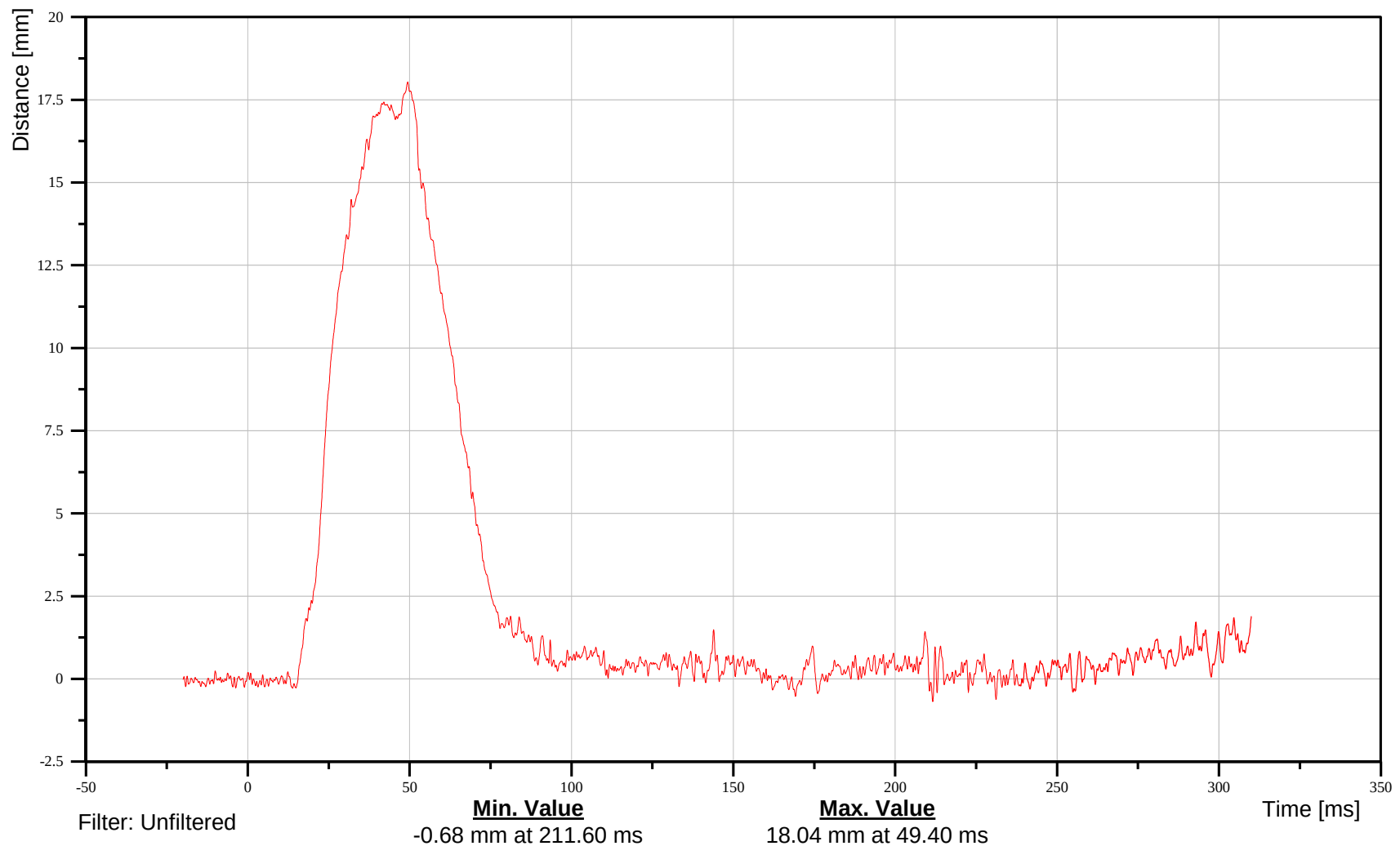
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11ABRI02FRWSDS00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-1

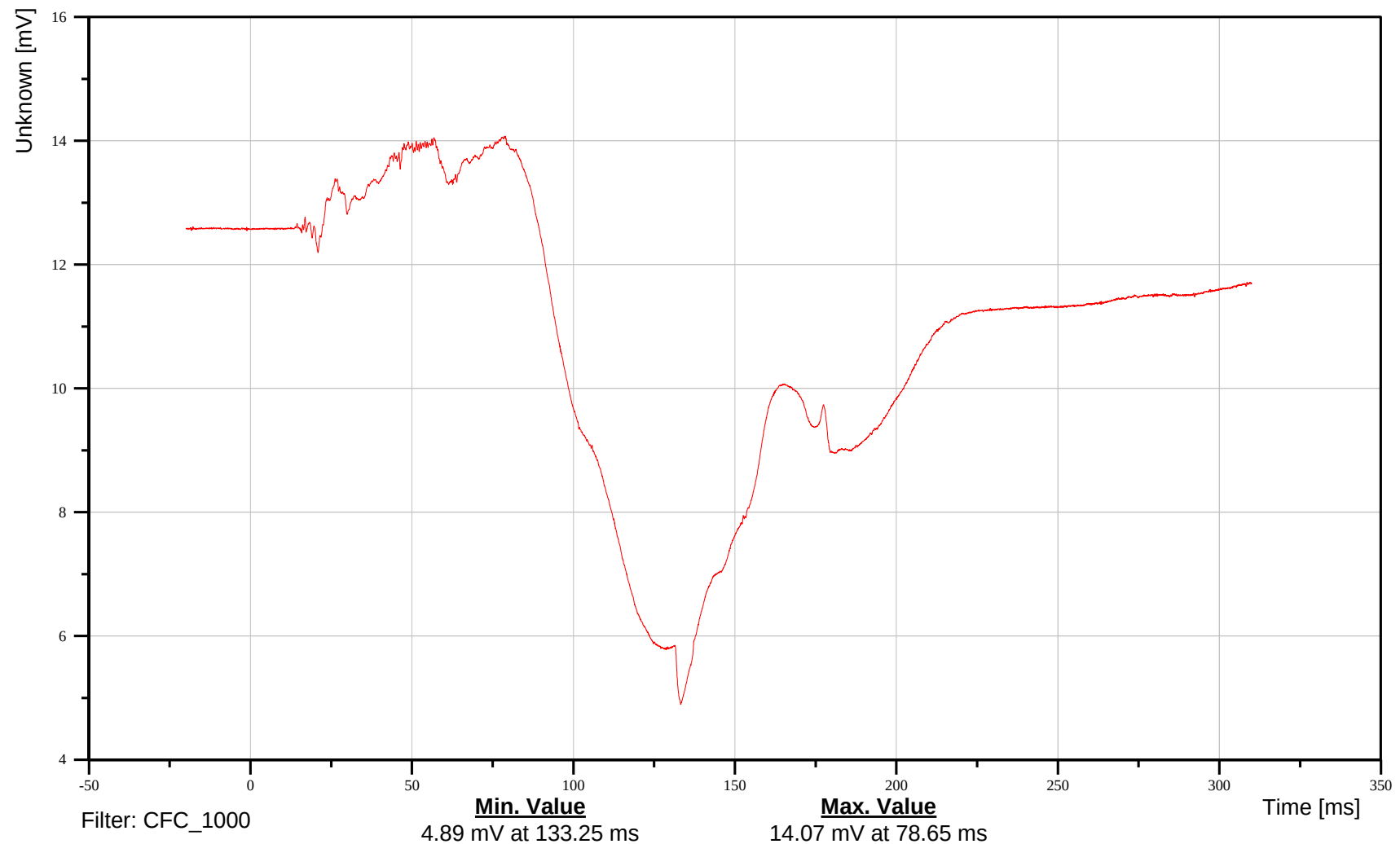
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0100WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-2

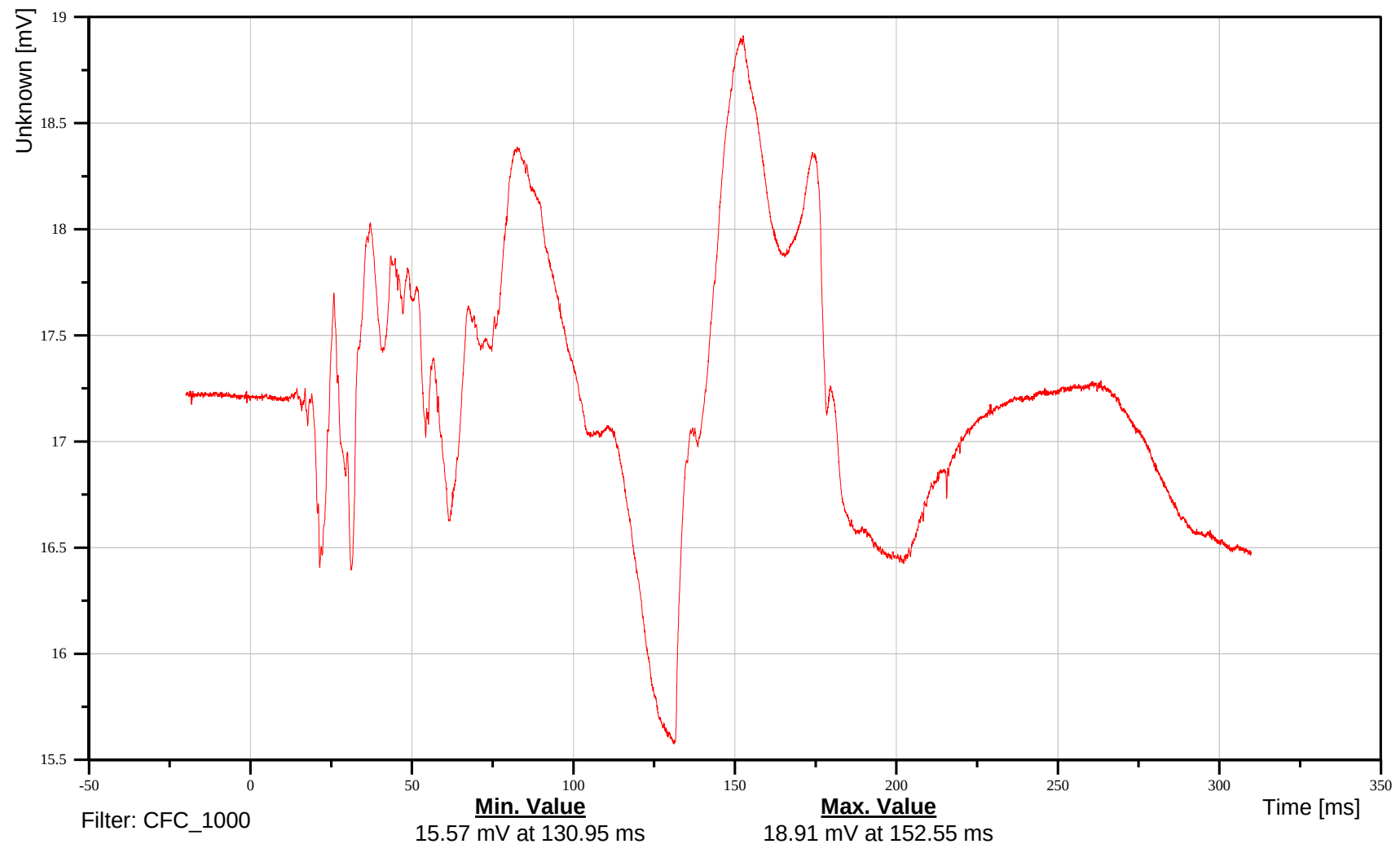
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0200WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-3

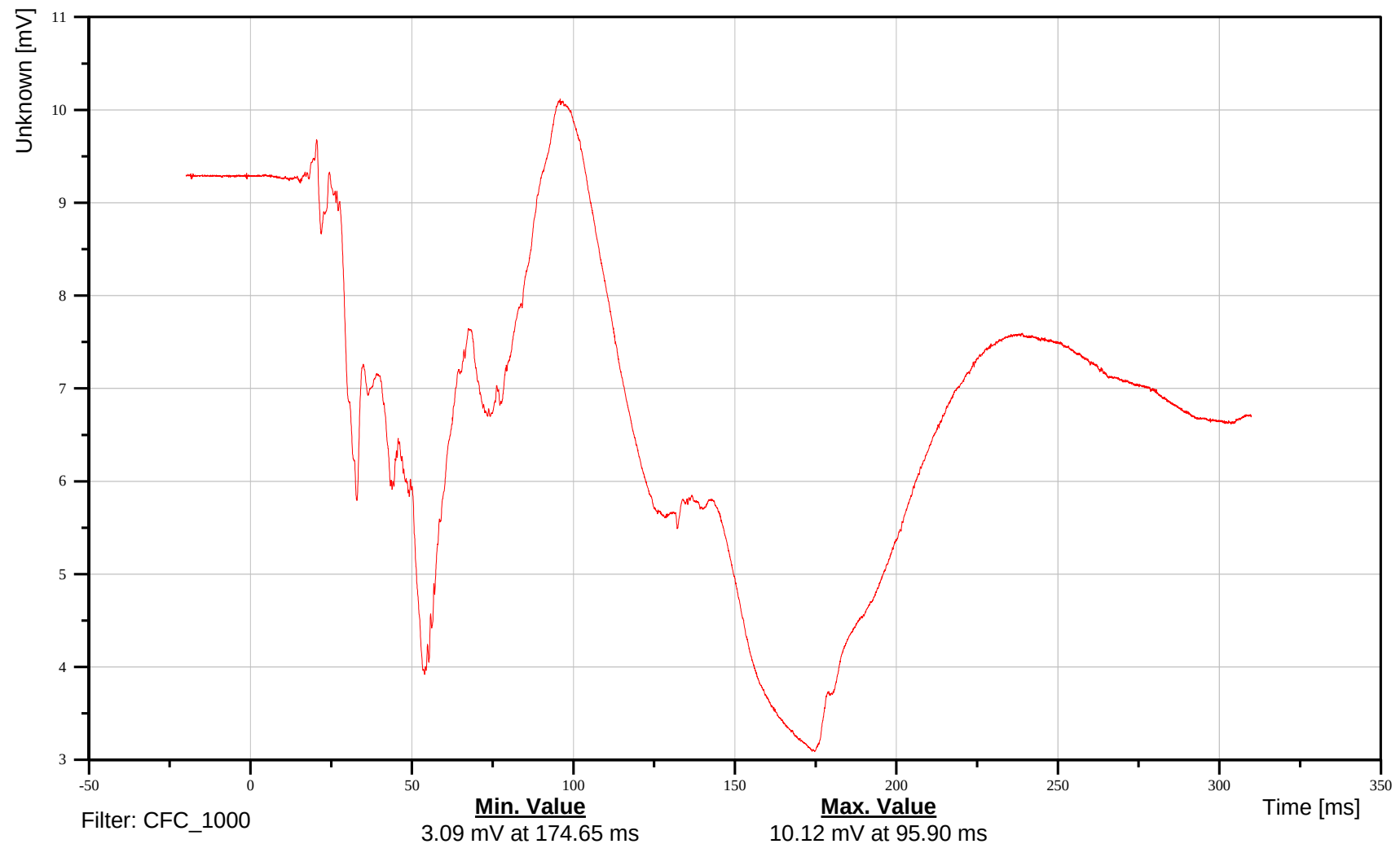
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0300WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-4

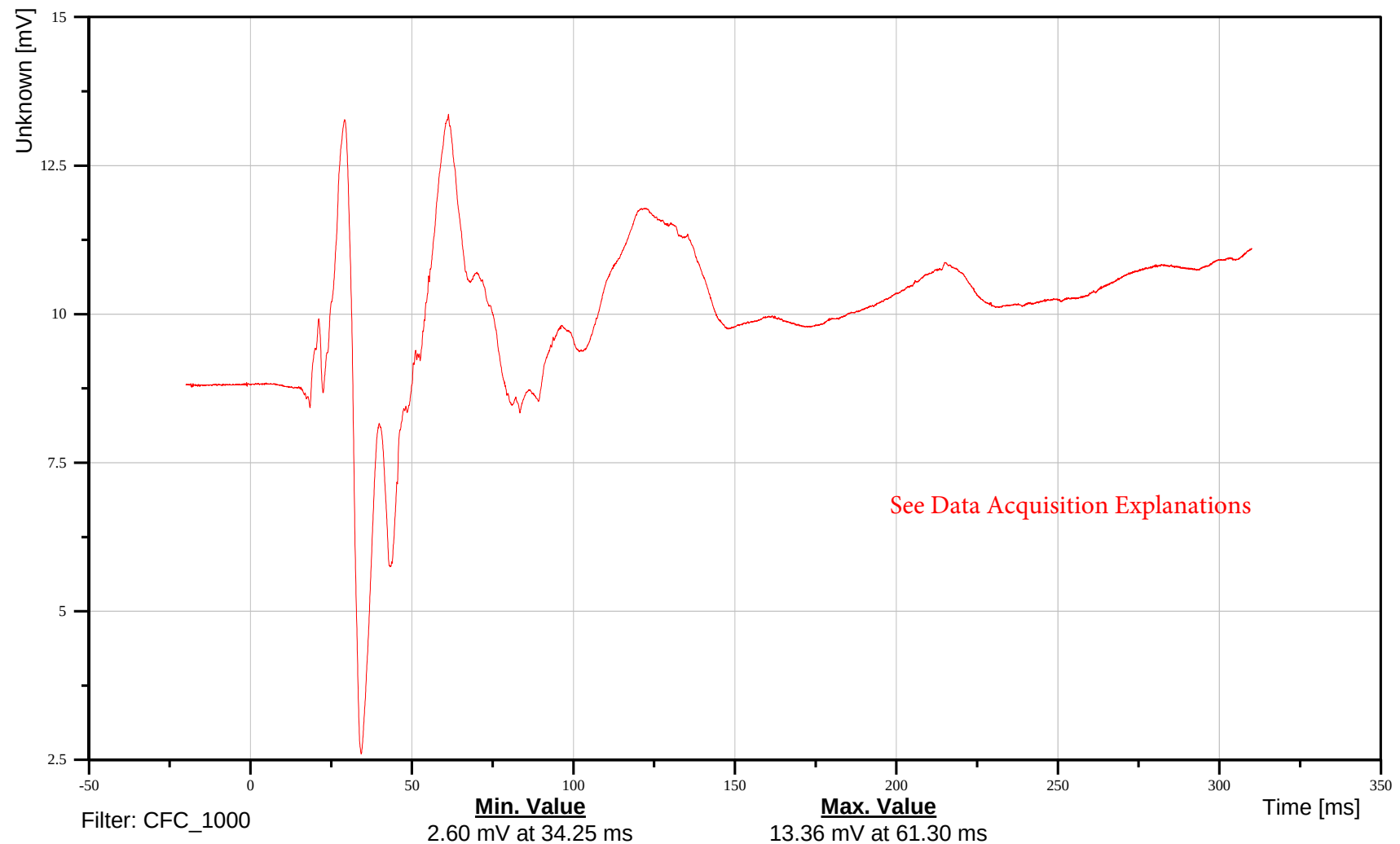
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0400WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-5

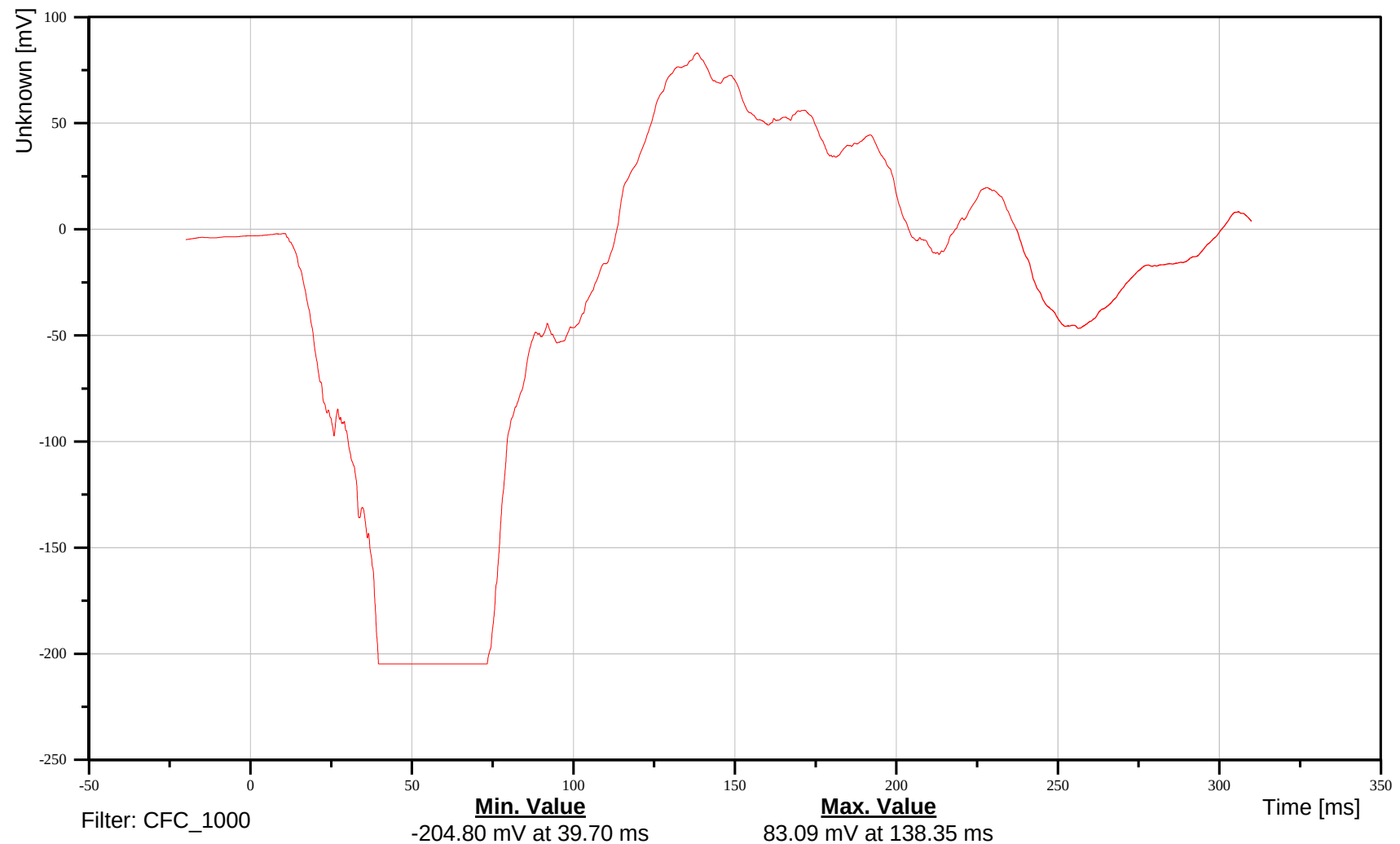
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0500WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-6

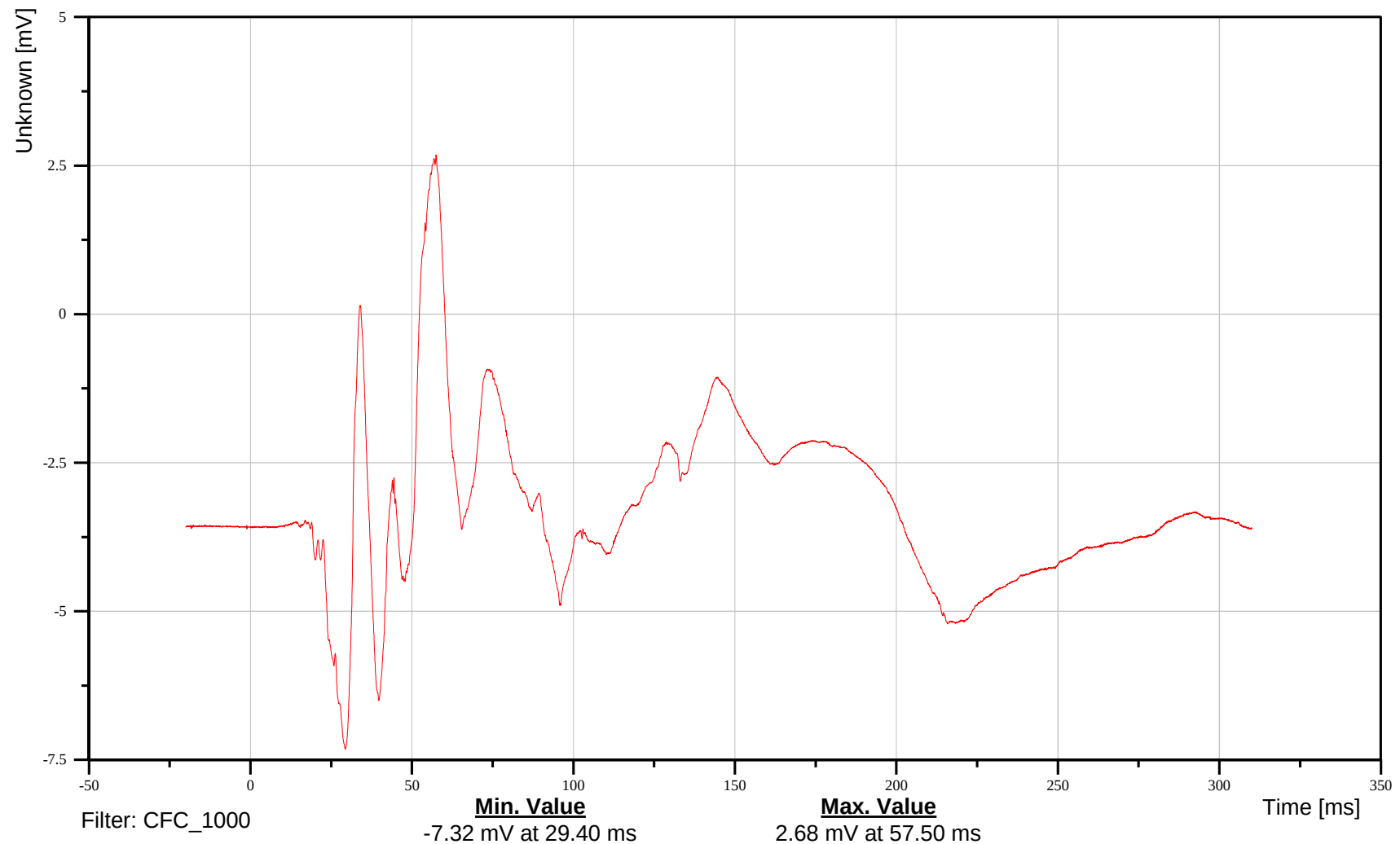
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0600WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-7

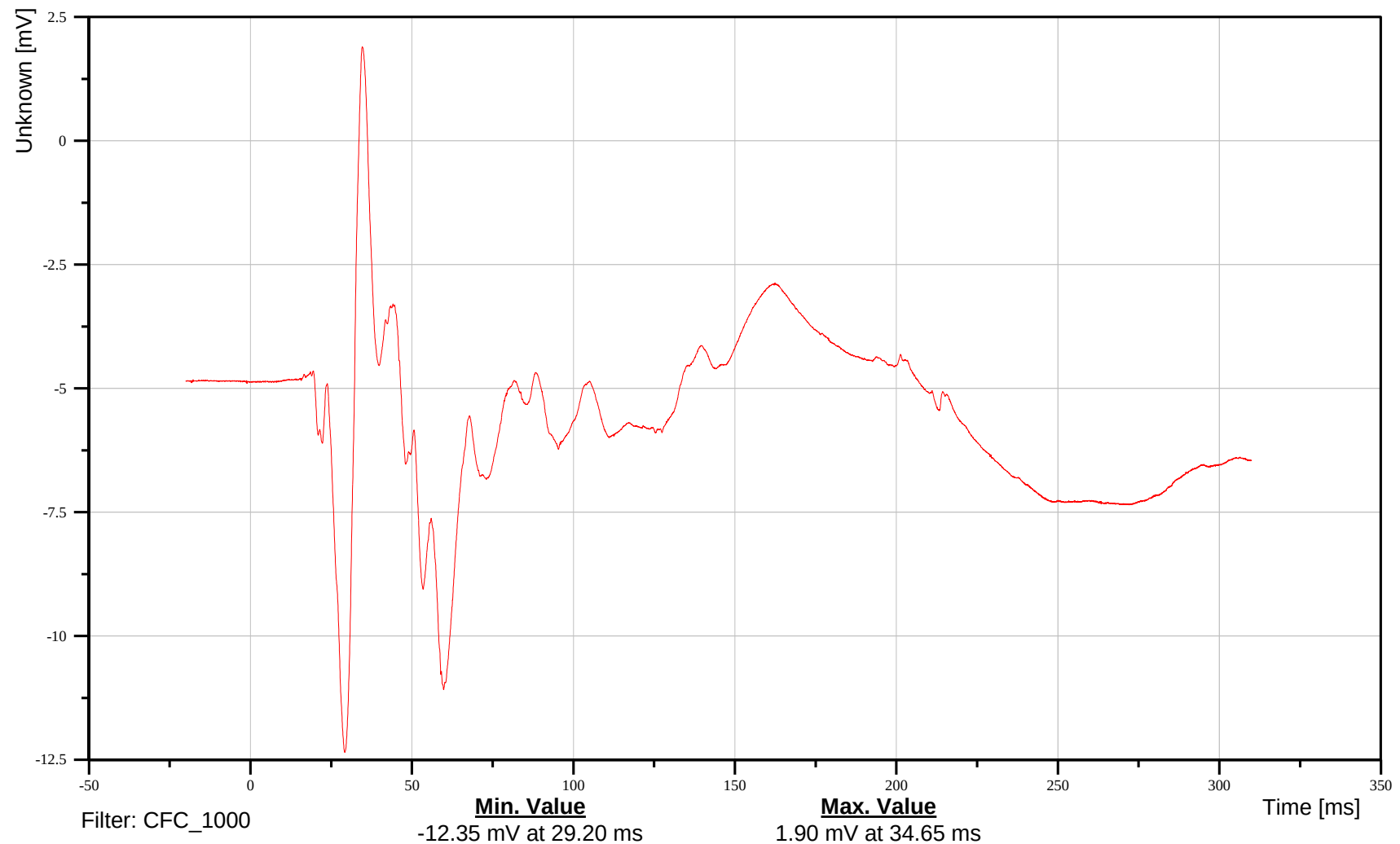
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0700WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





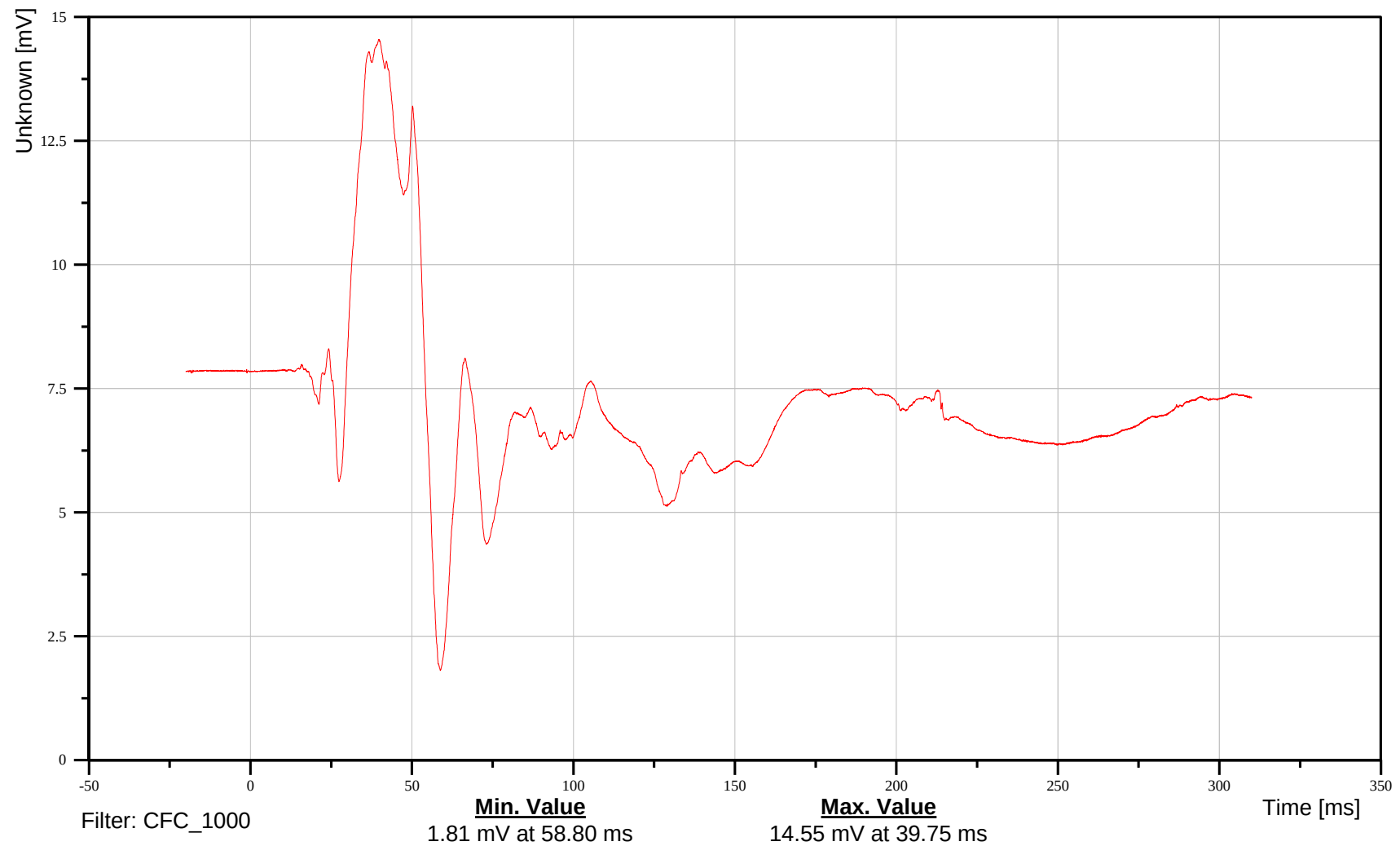
2015 Toyota Sienna WorldSID Side Pole Impact W50-8

Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0800WSVO0A

TRC Inc. Test Lab: CTF
Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-9

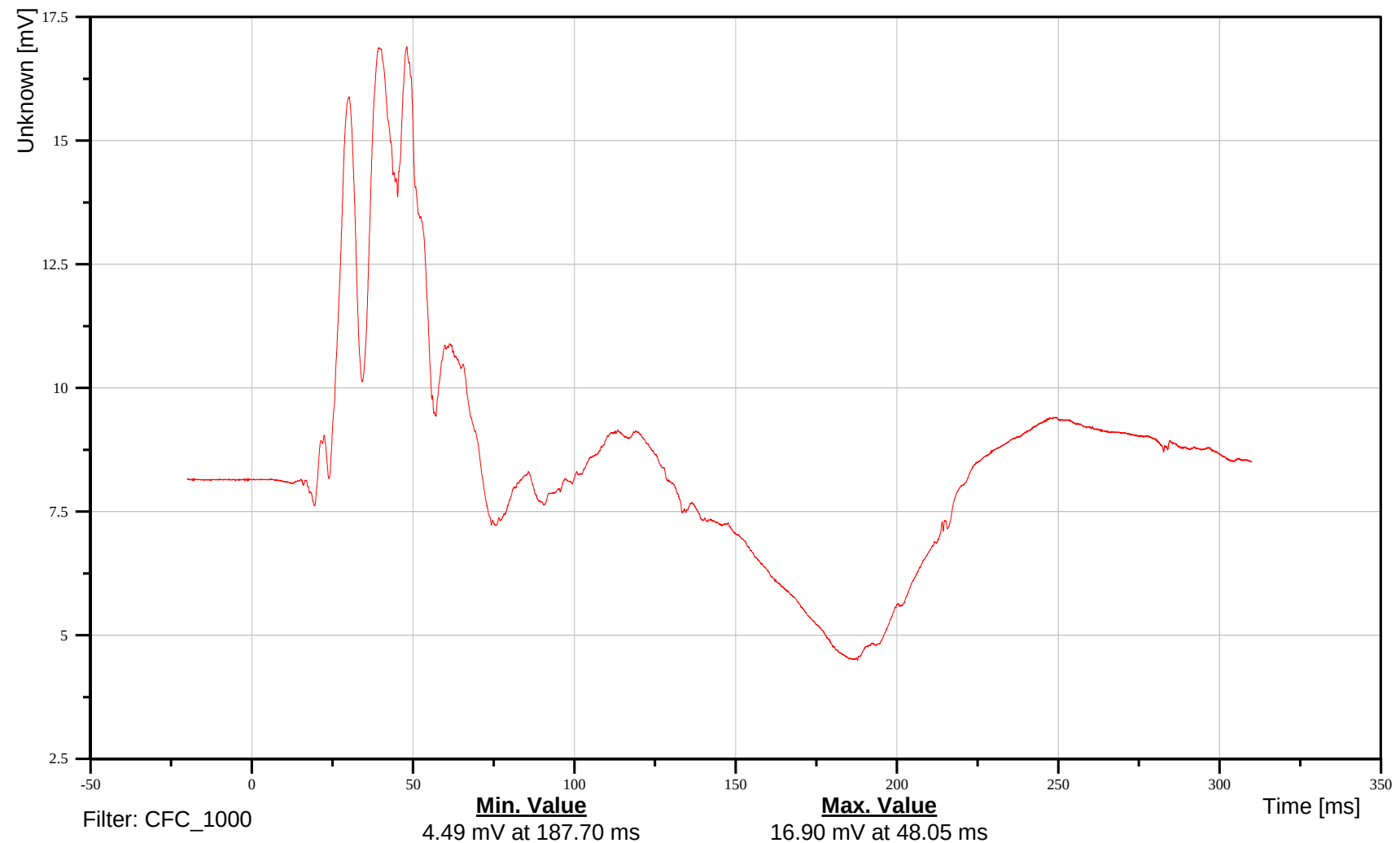
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA0900WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-10

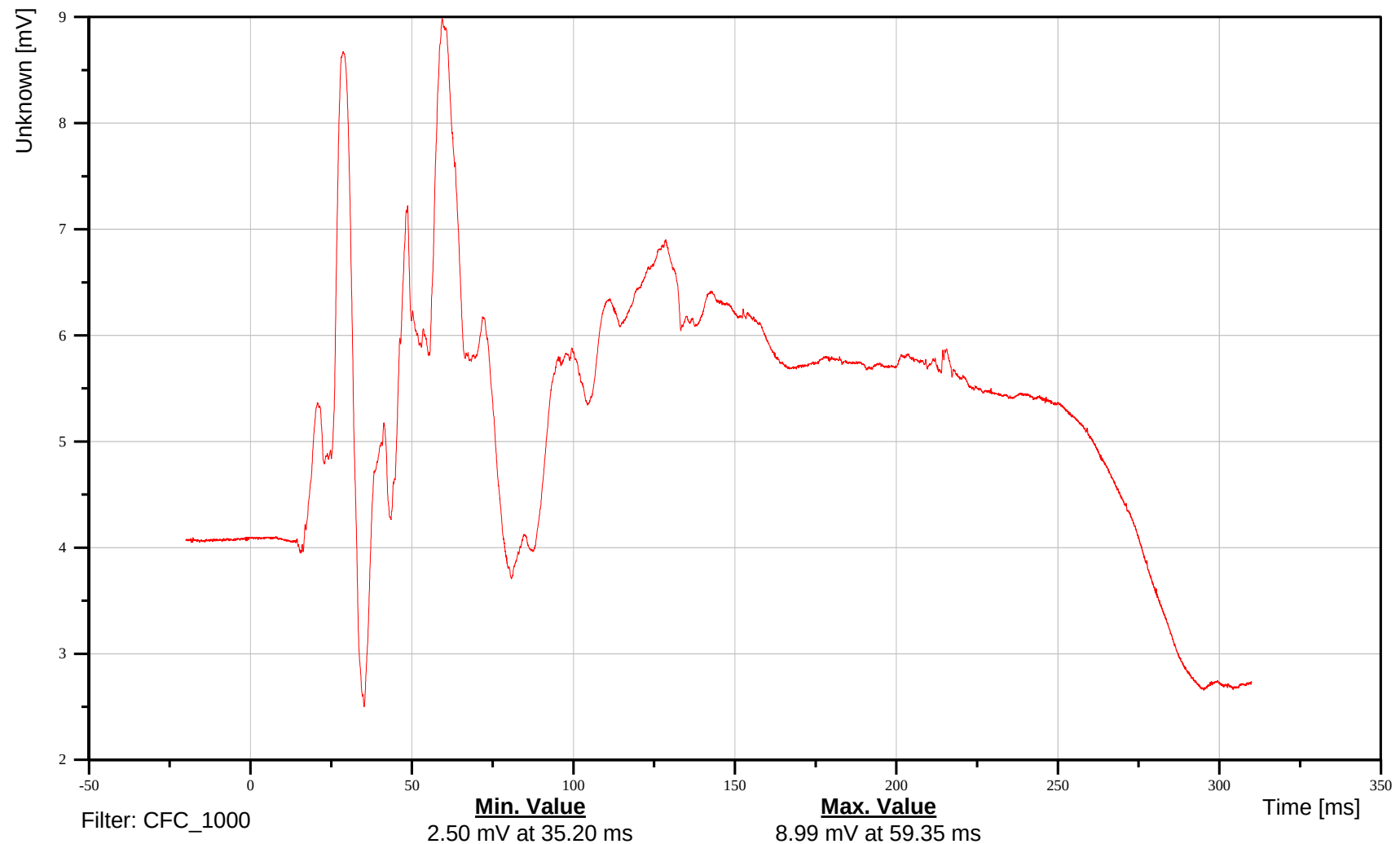
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1000WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-11

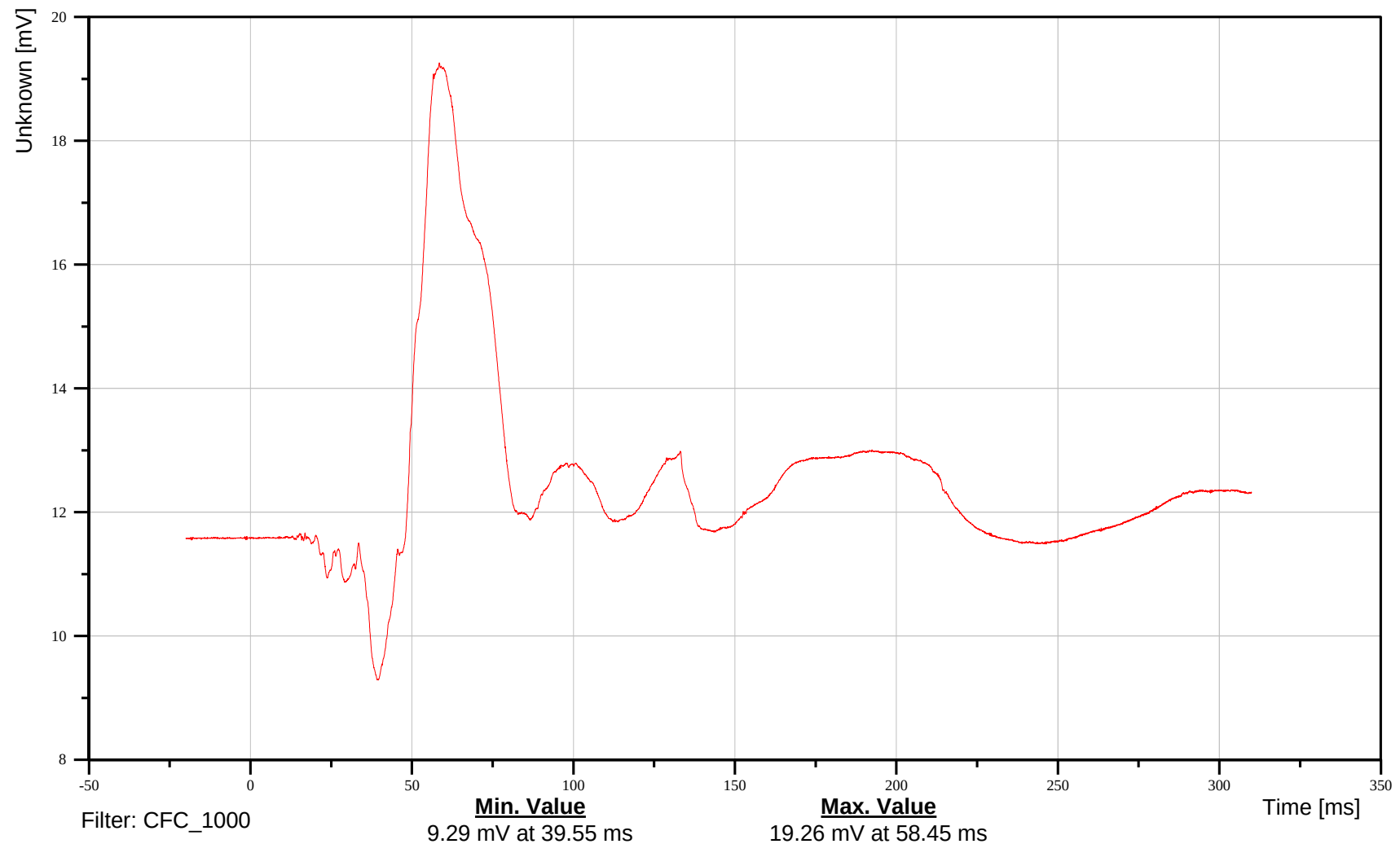
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1100WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-12

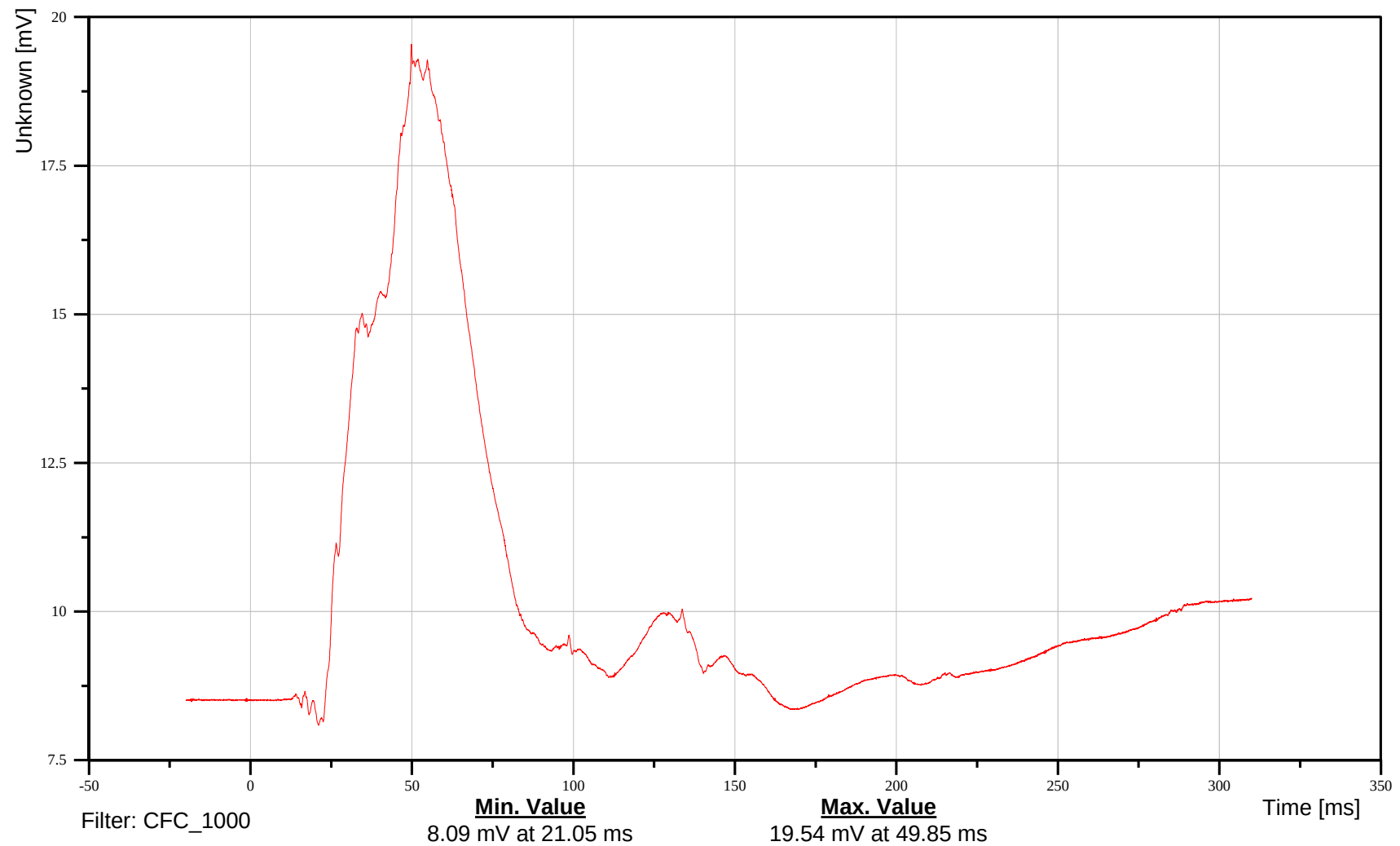
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1200WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-13

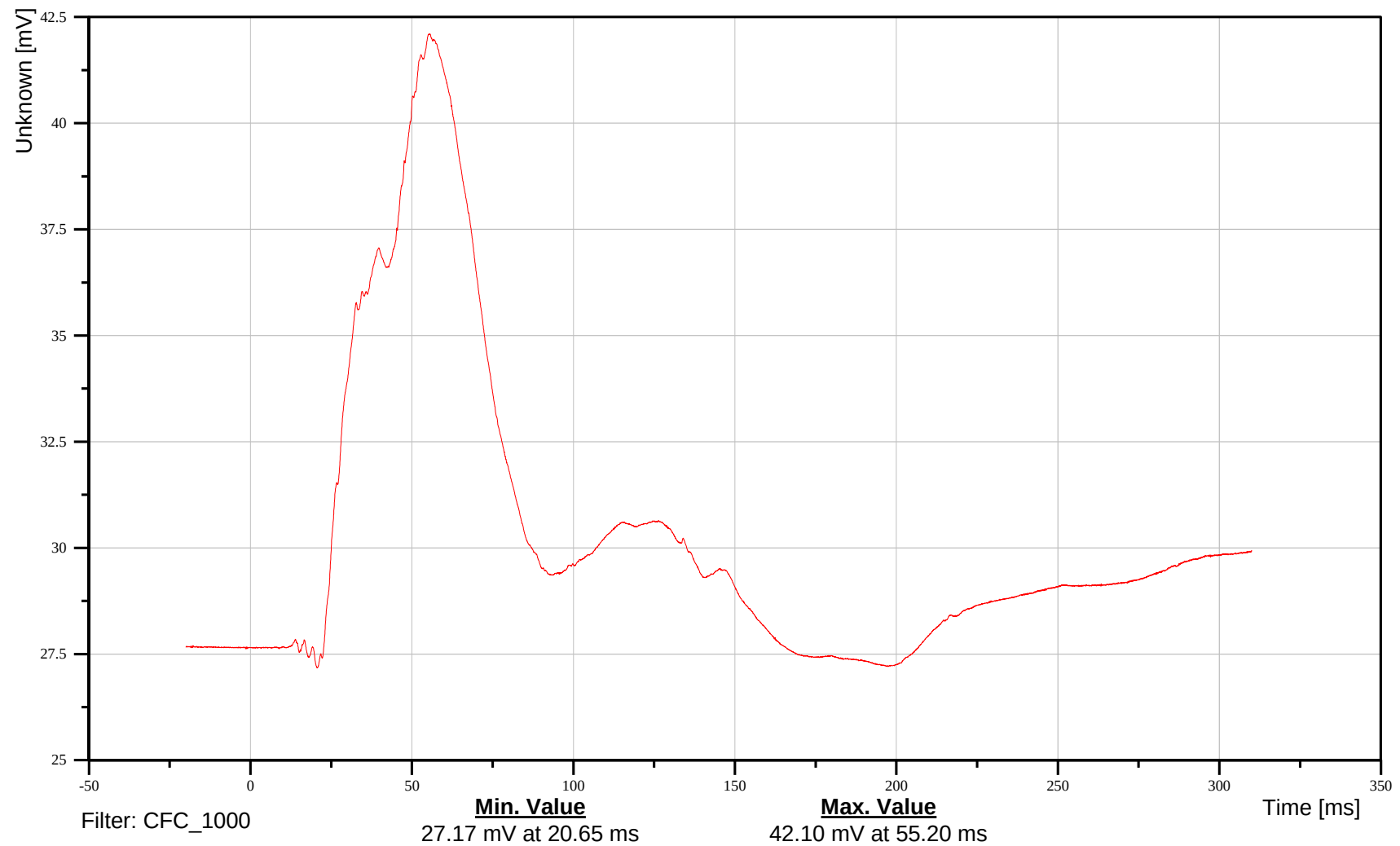
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1300WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-14

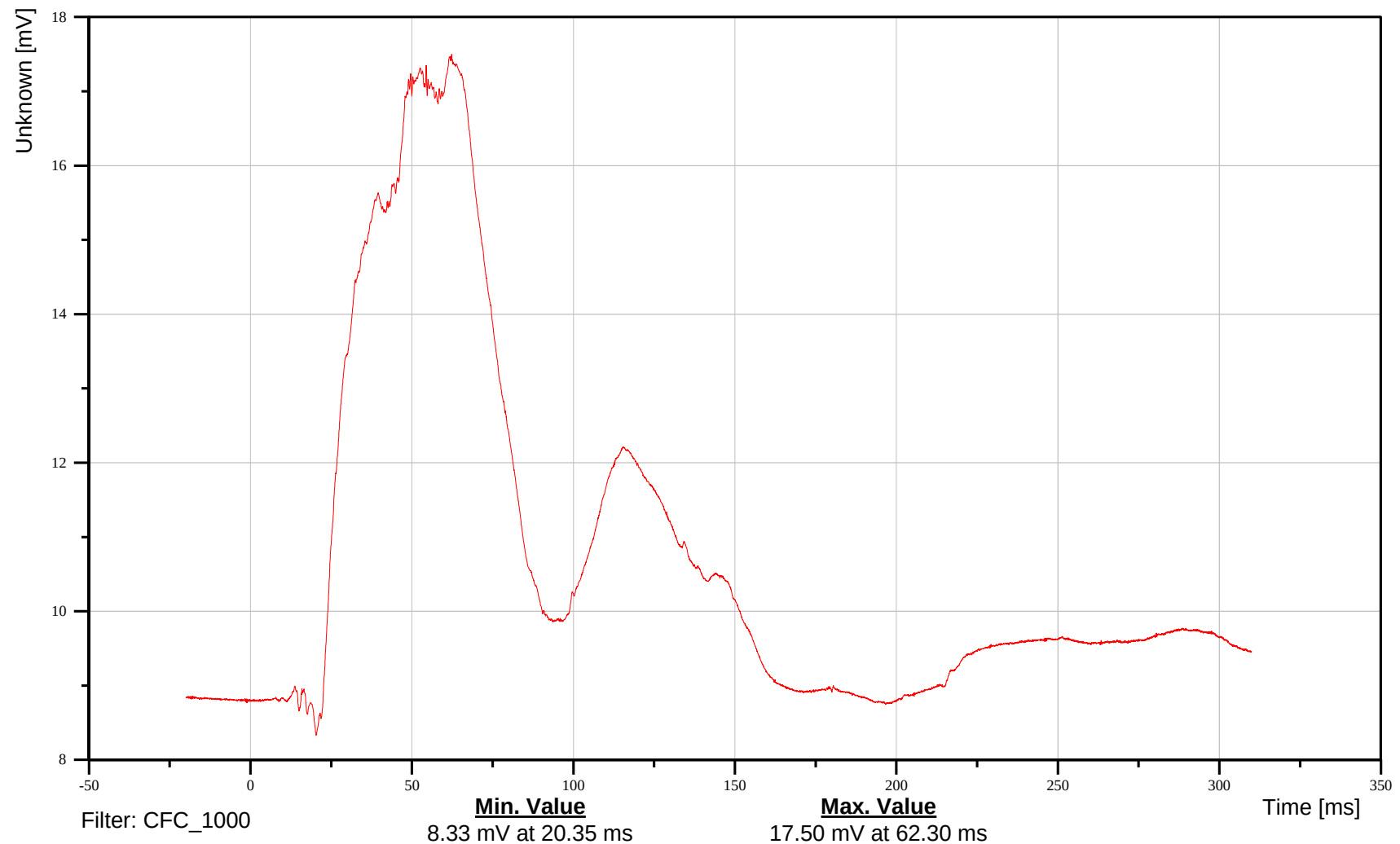
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1400WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-15

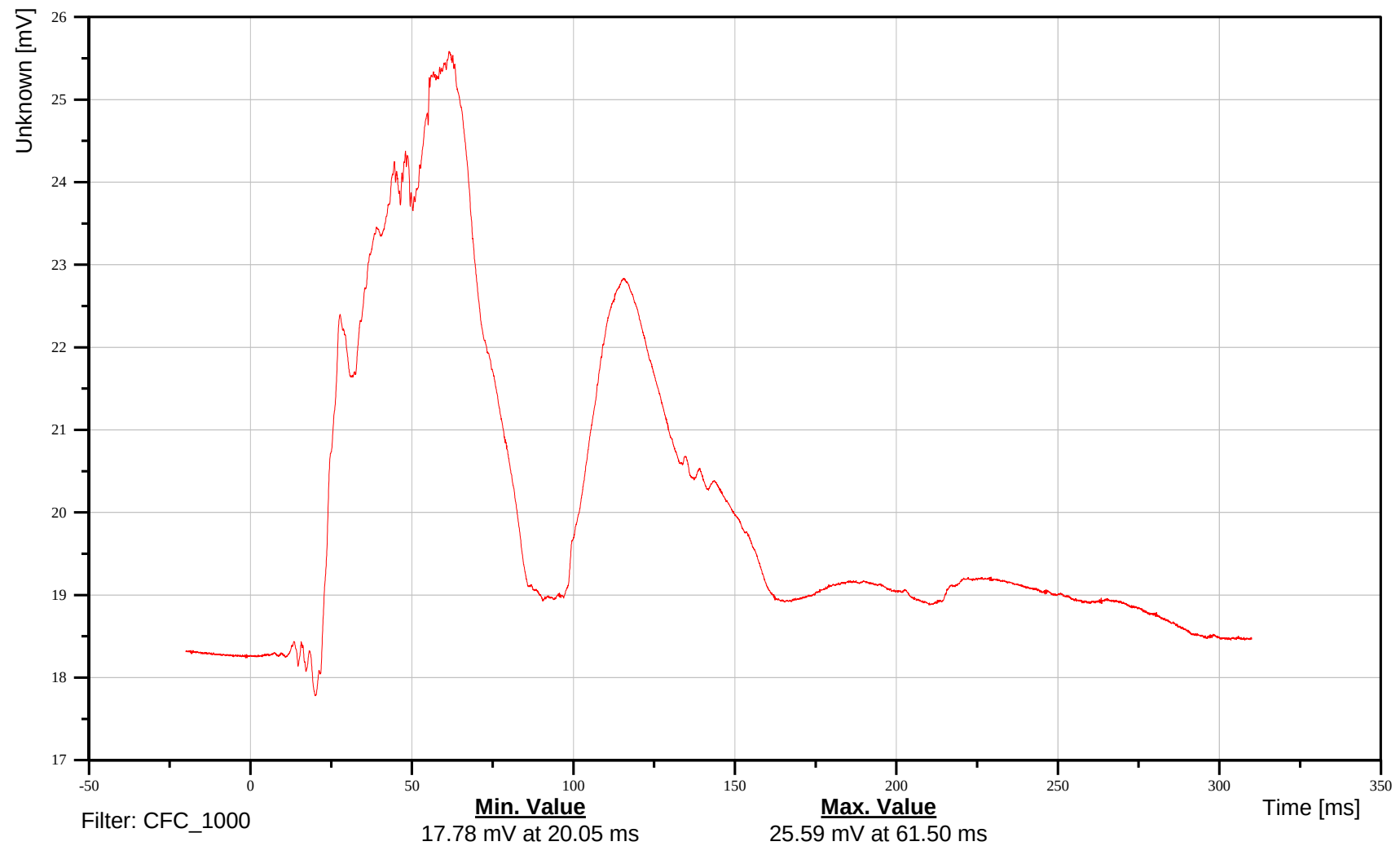
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1500WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-16

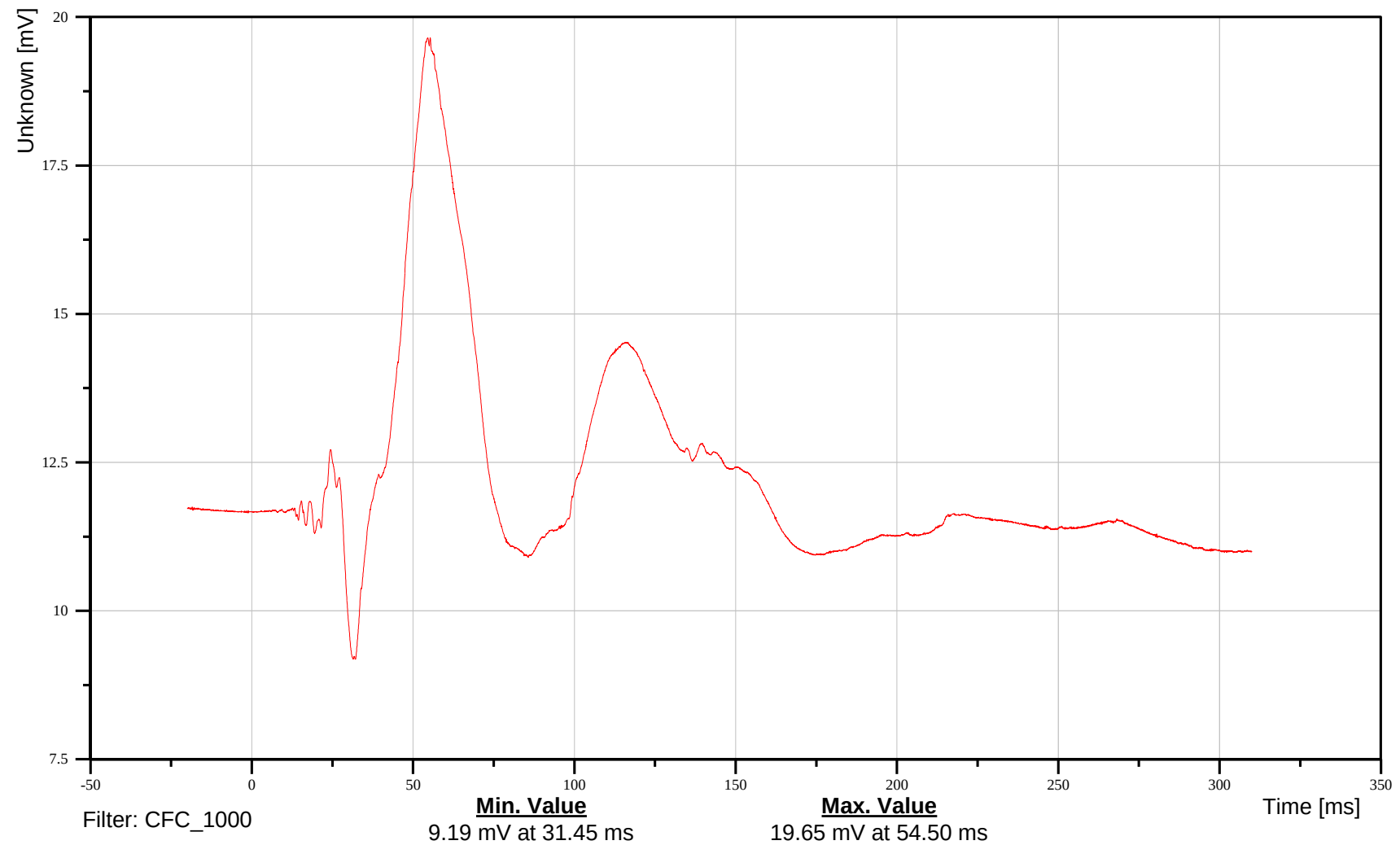
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1600WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-17

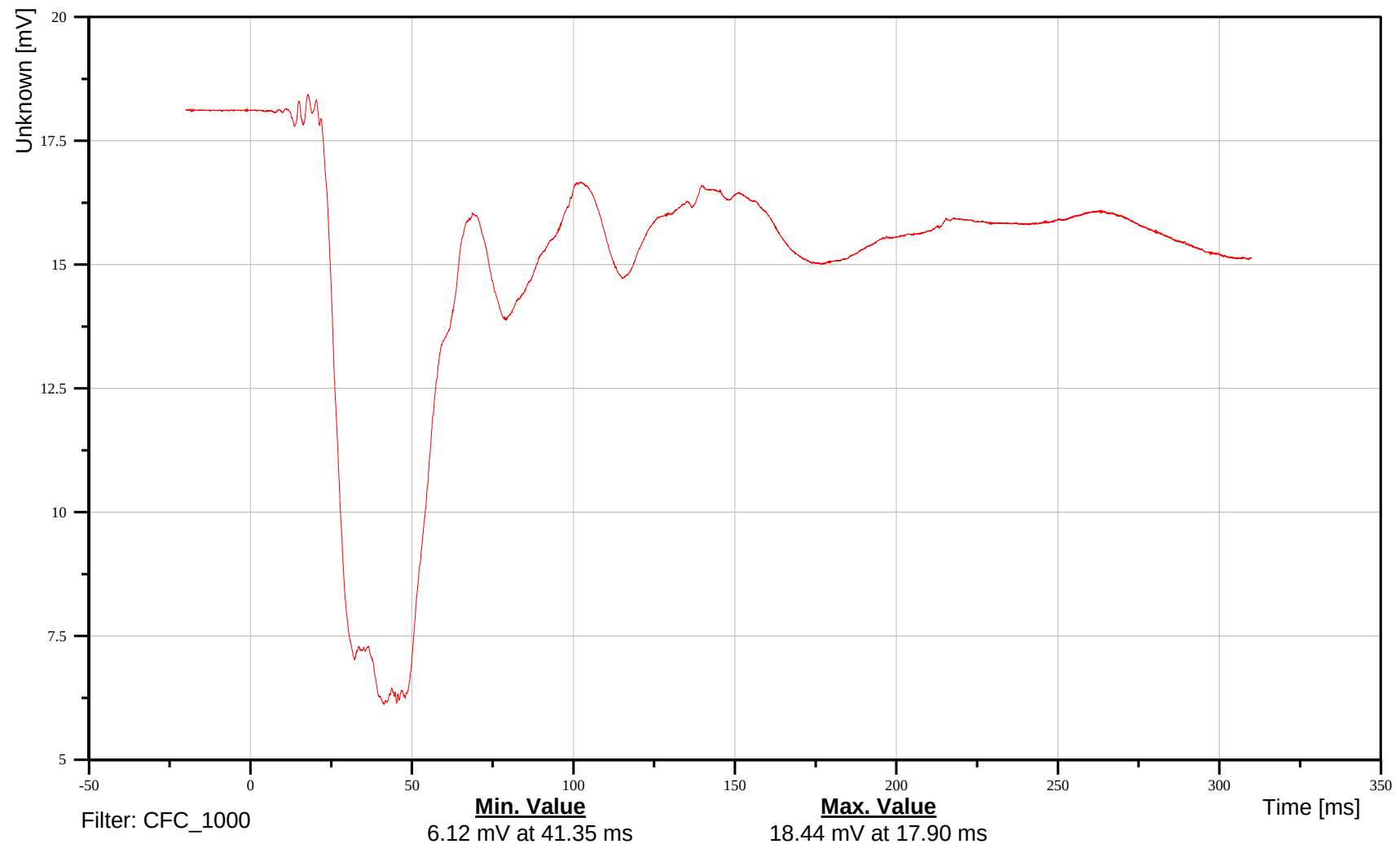
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1700WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-18

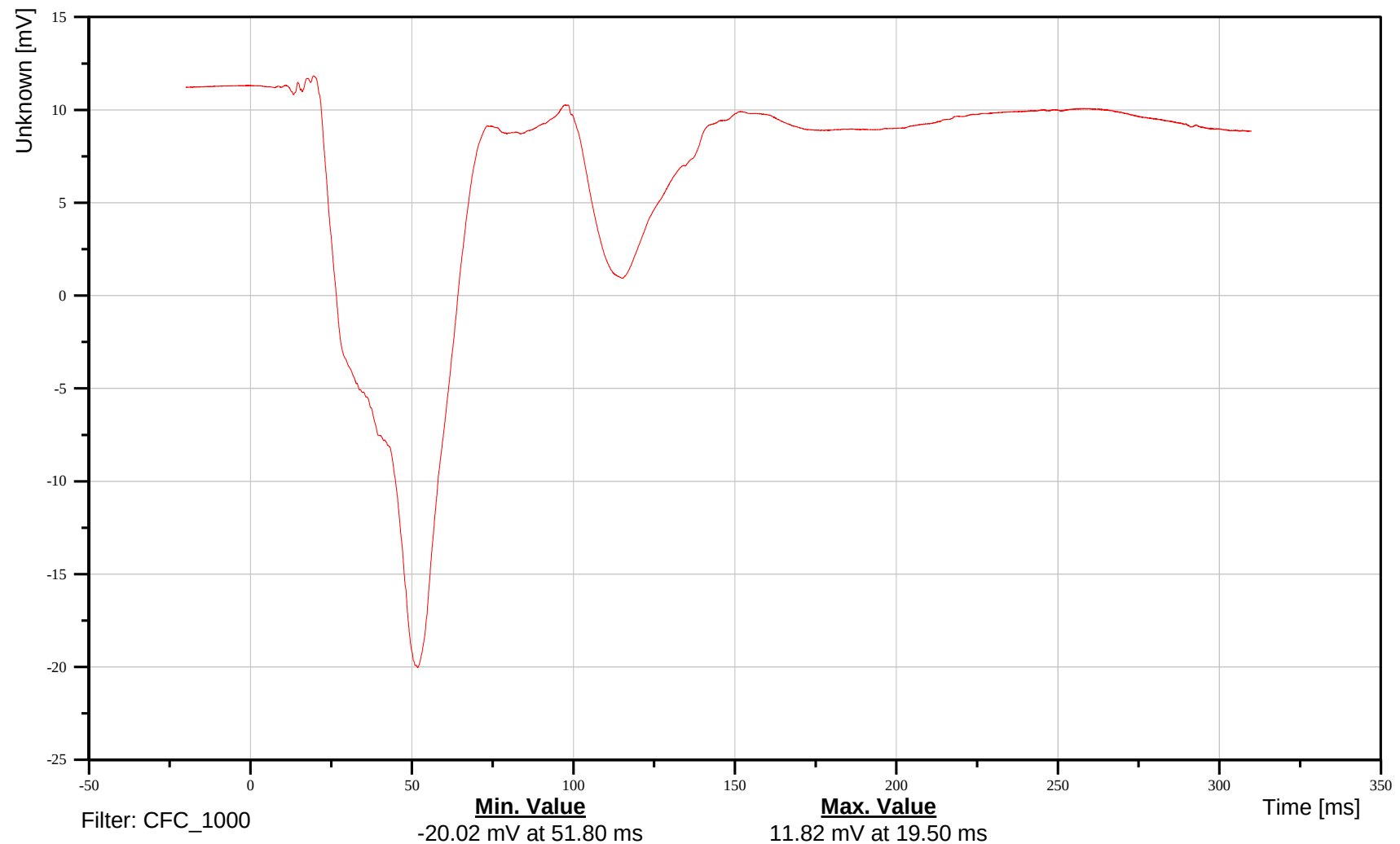
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1800WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-19

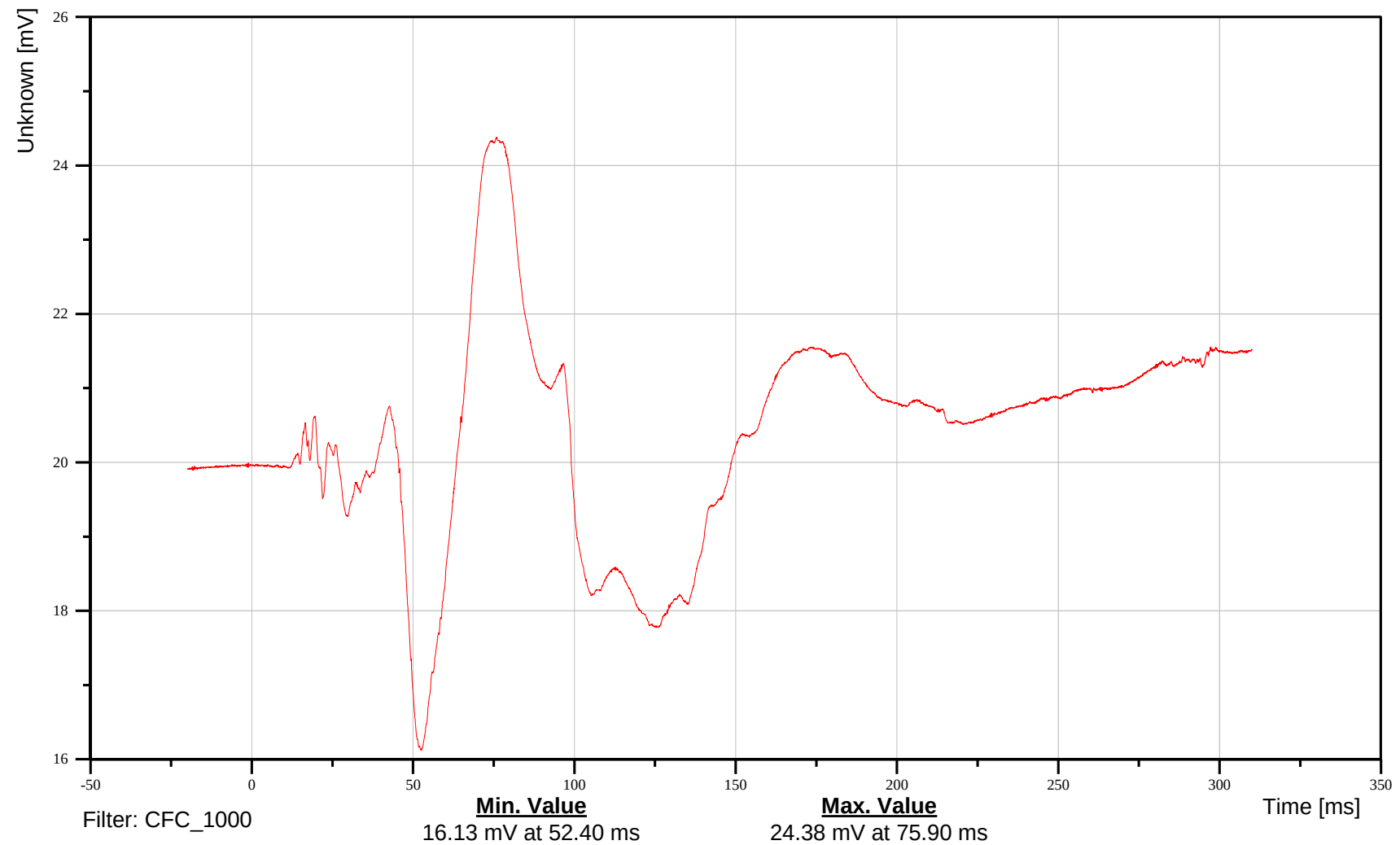
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA1900WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-20

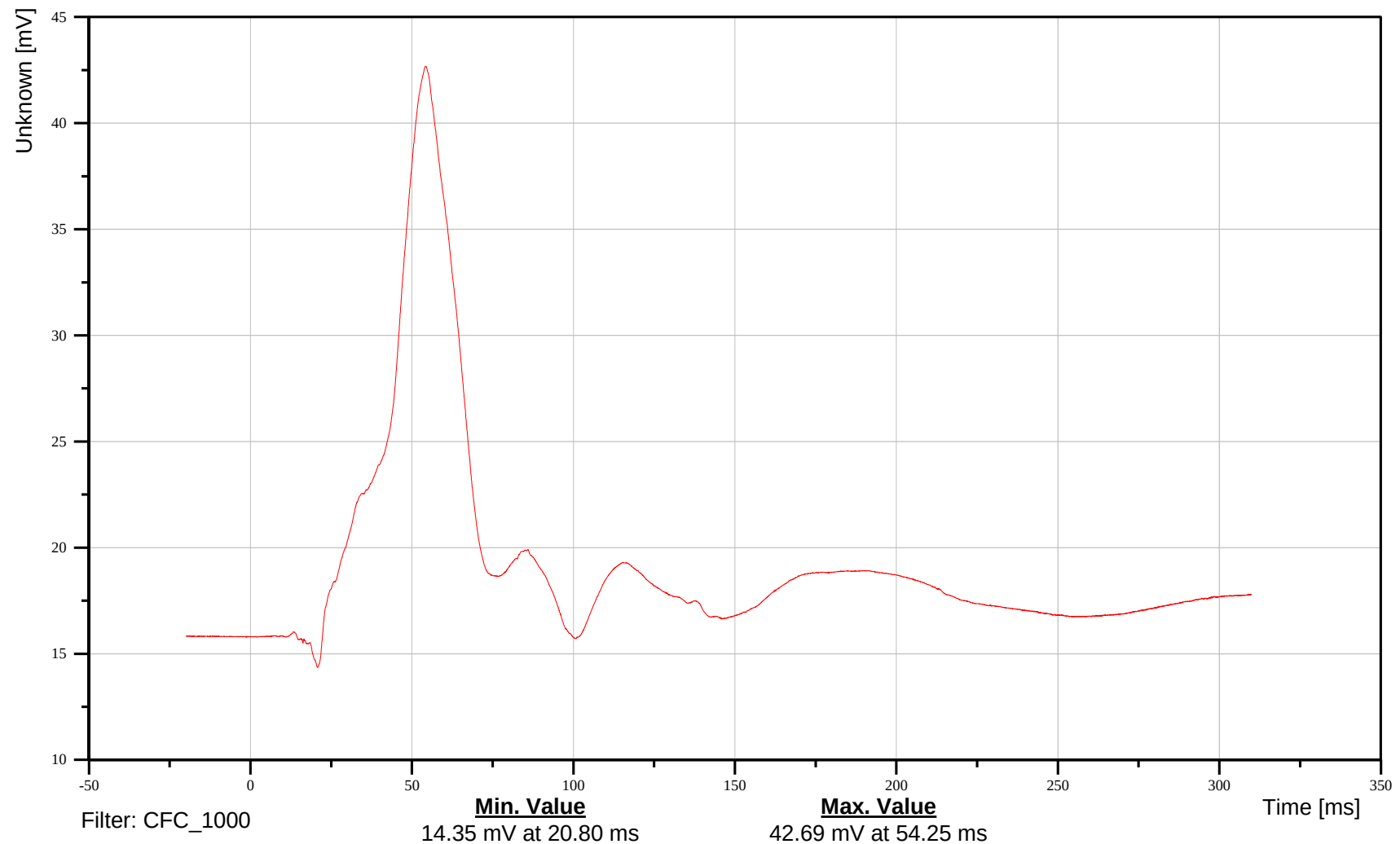
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2000WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-21

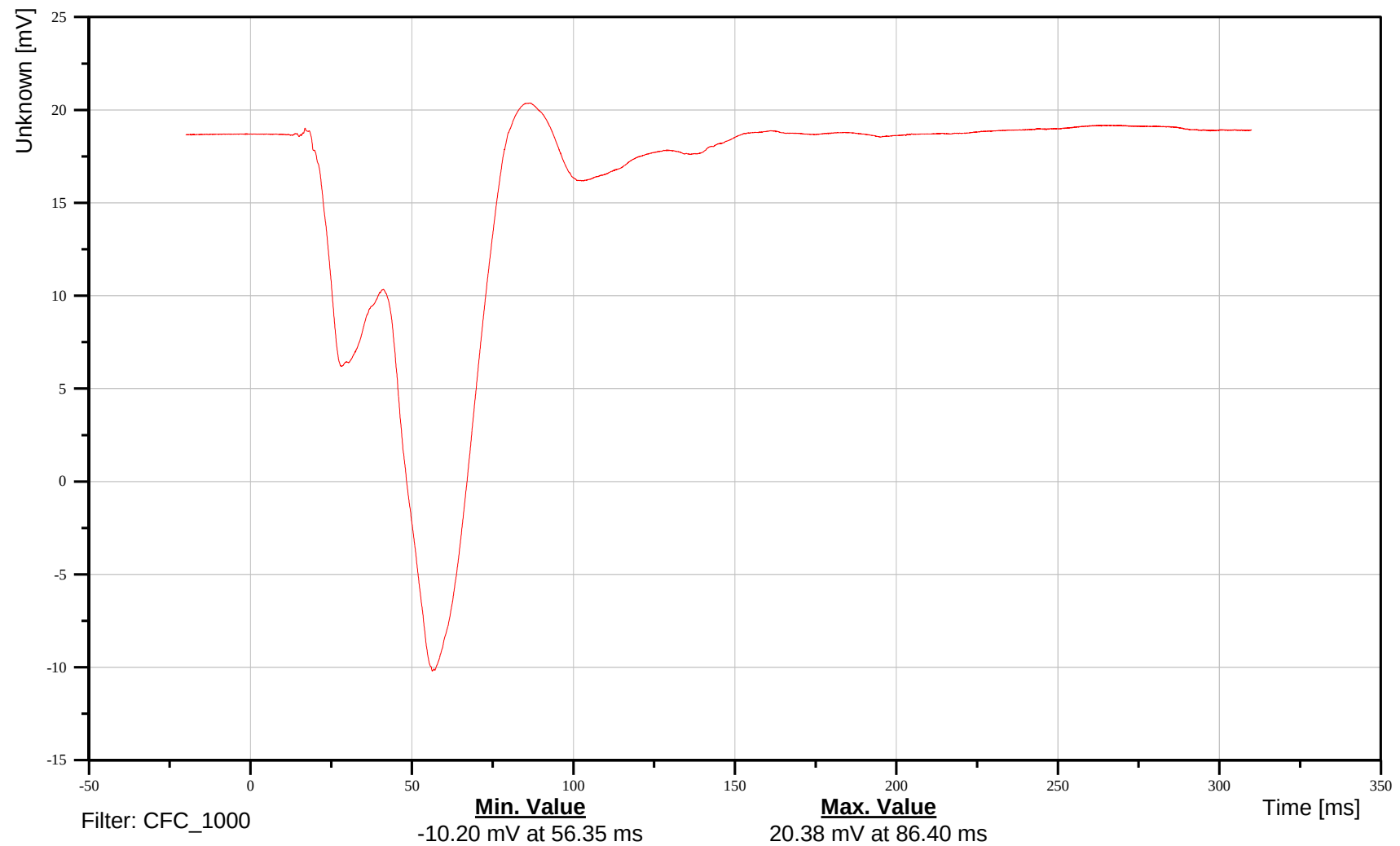
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2100WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-22

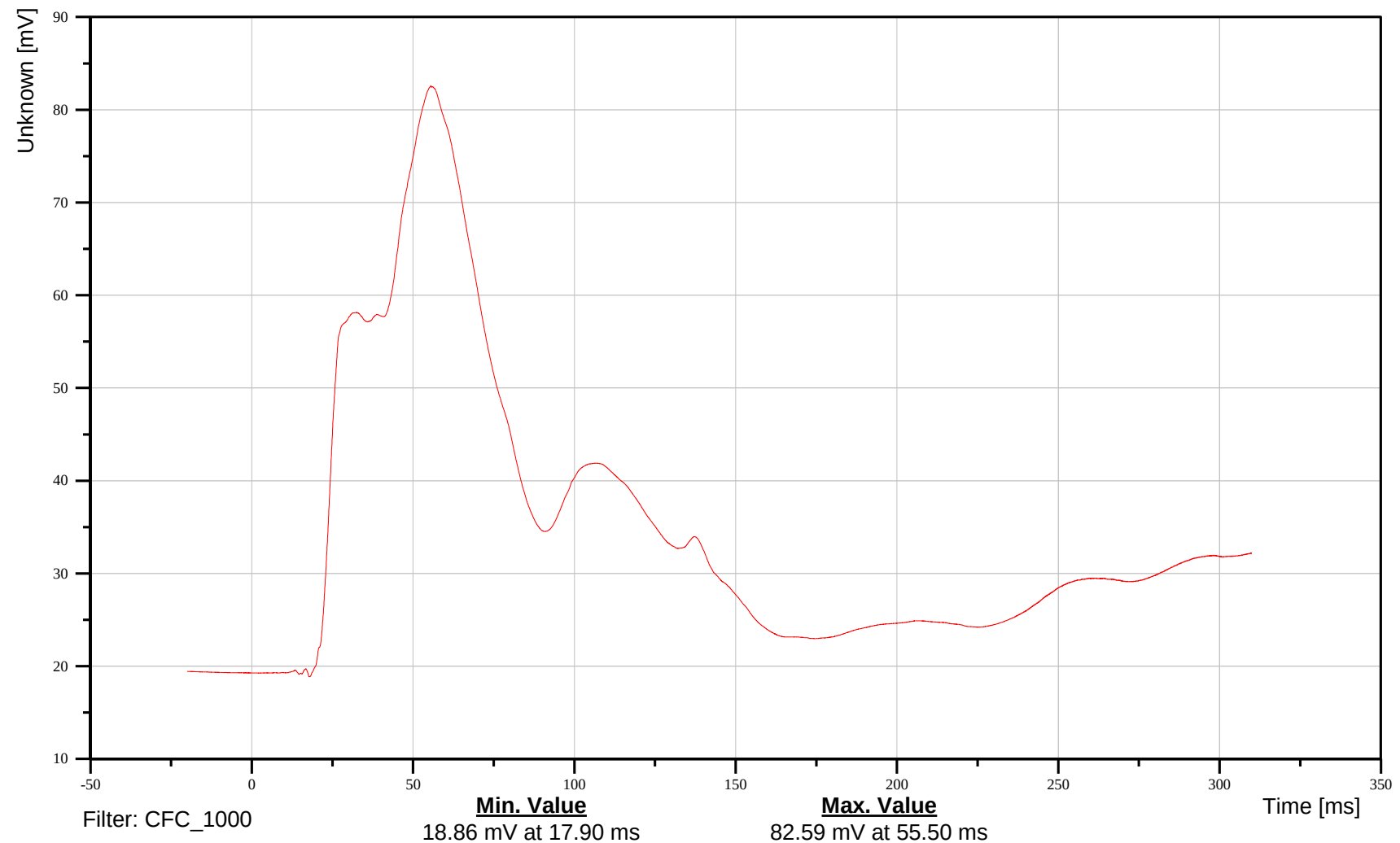
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2200WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-23

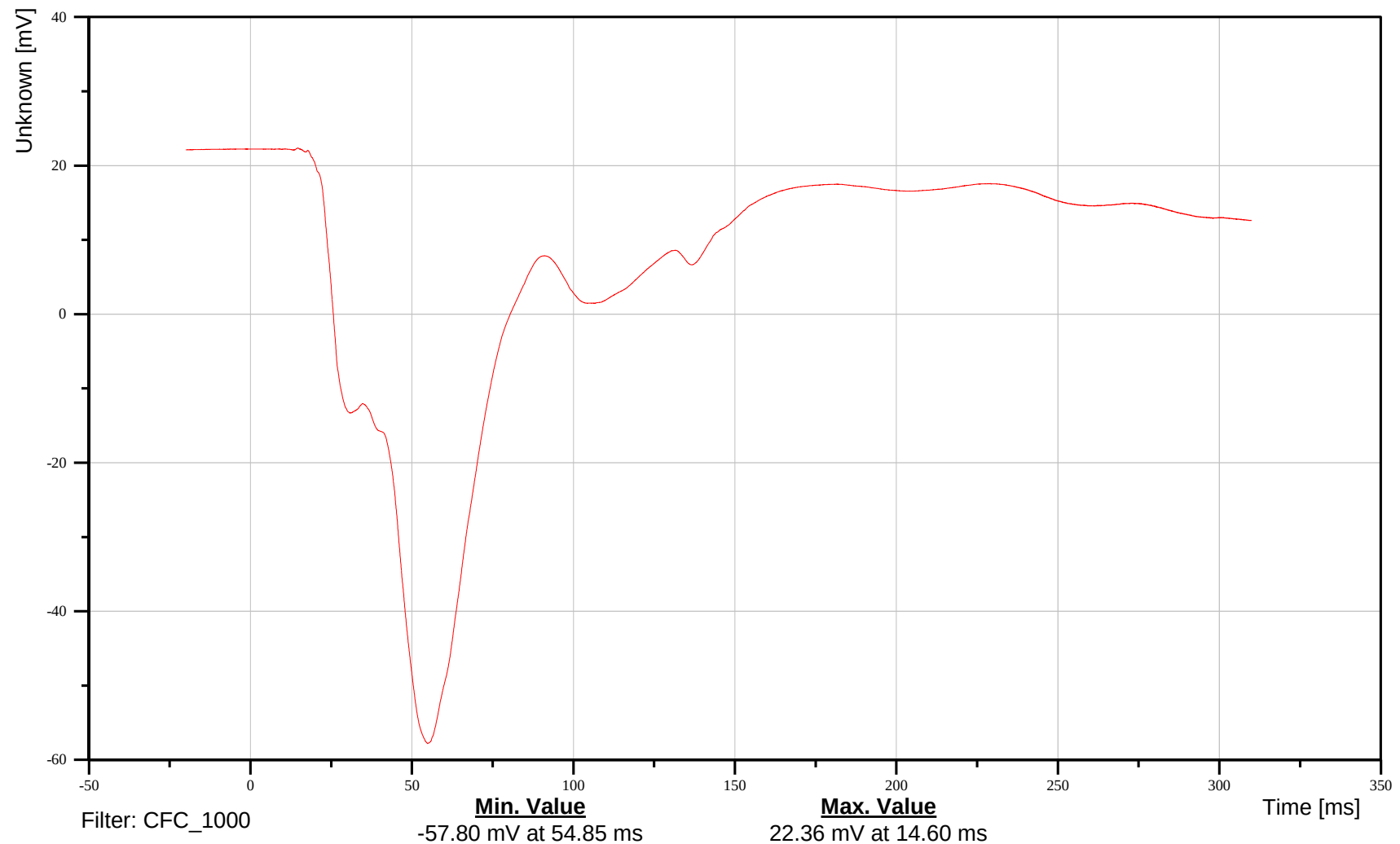
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2300WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-24

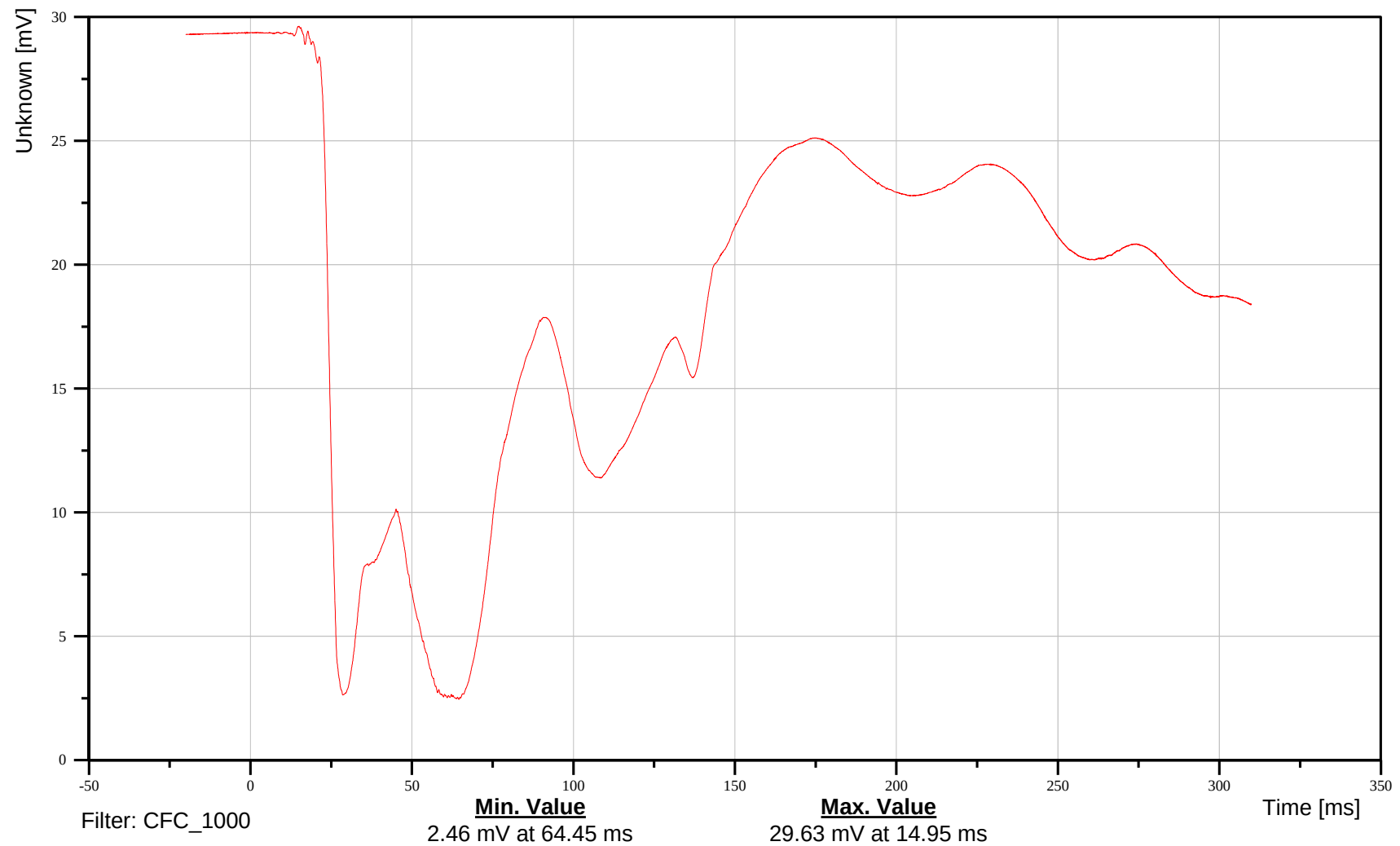
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2400WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





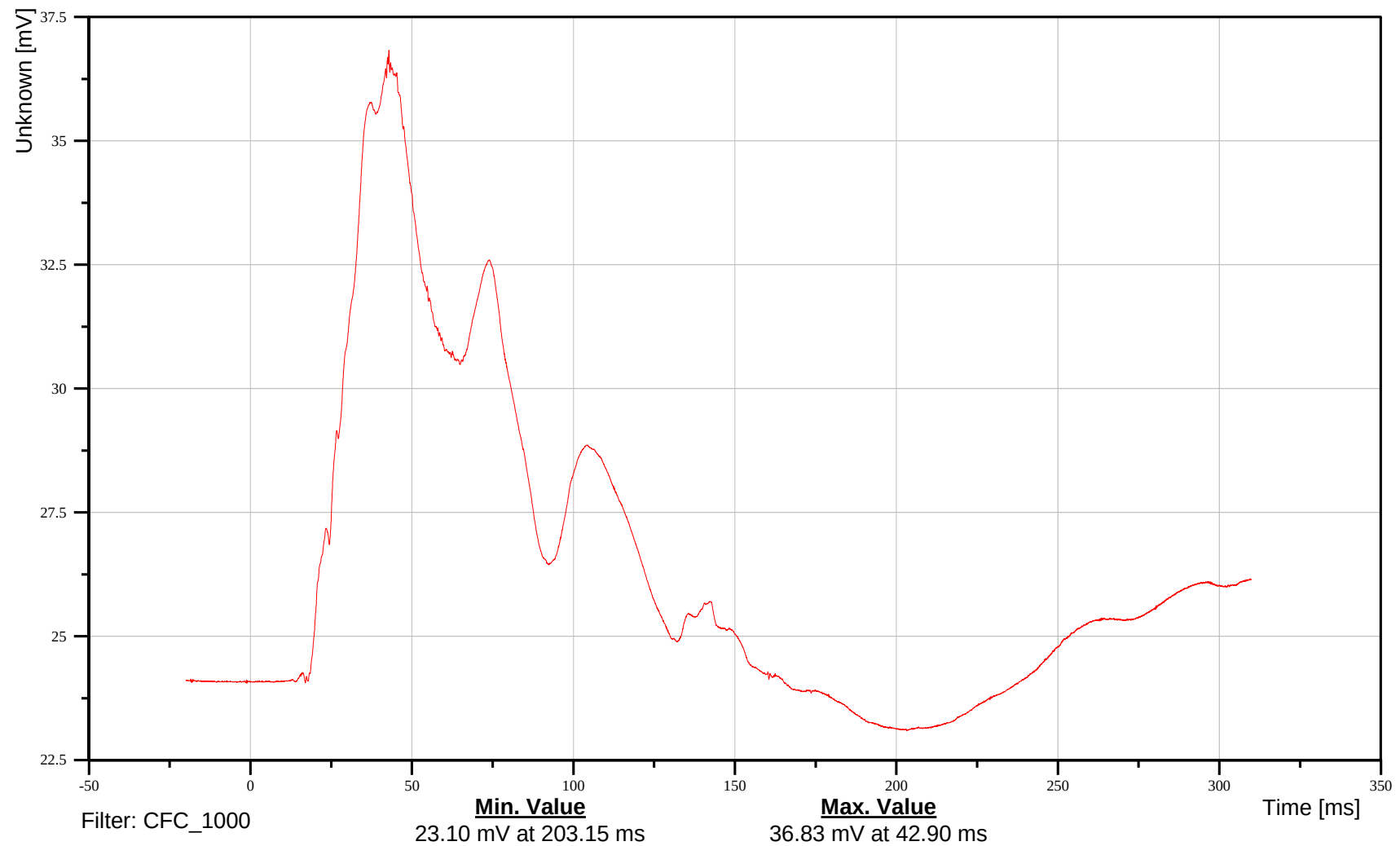
2015 Toyota Sienna WorldSID Side Pole Impact W50-25

Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2500WSVO0A

TRC Inc. Test Lab: CTF
Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-26

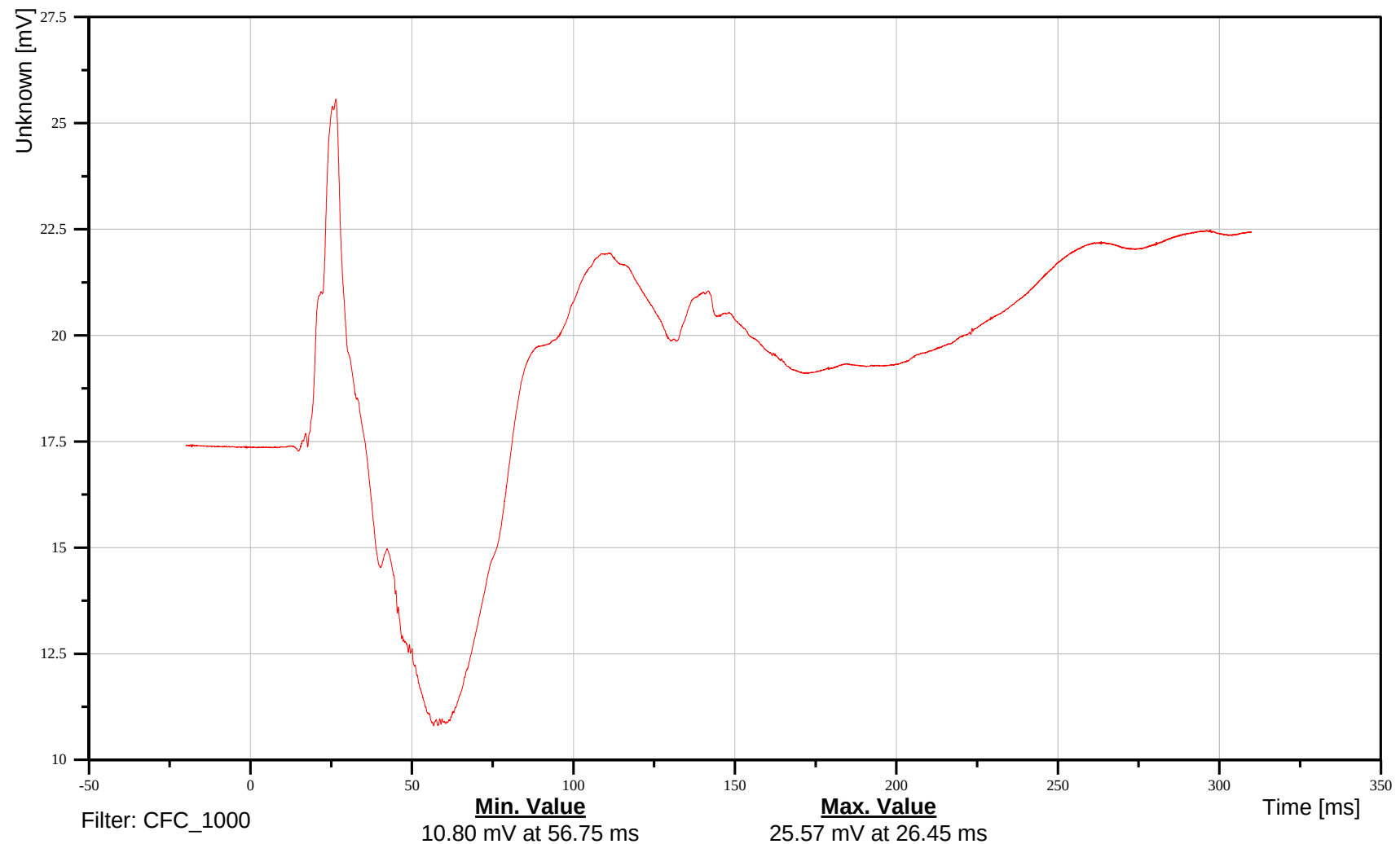
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2600WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-27

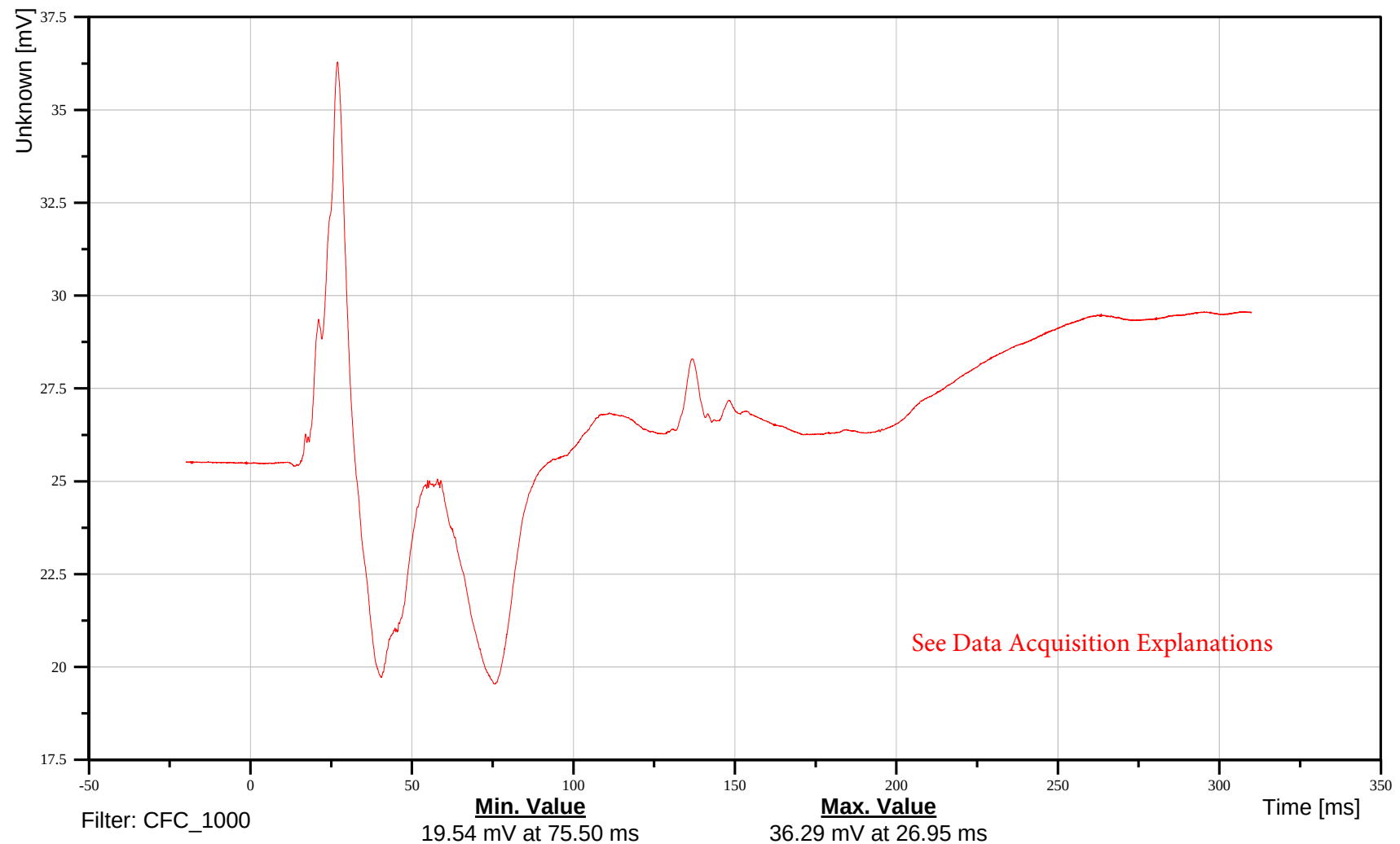
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2700WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-28

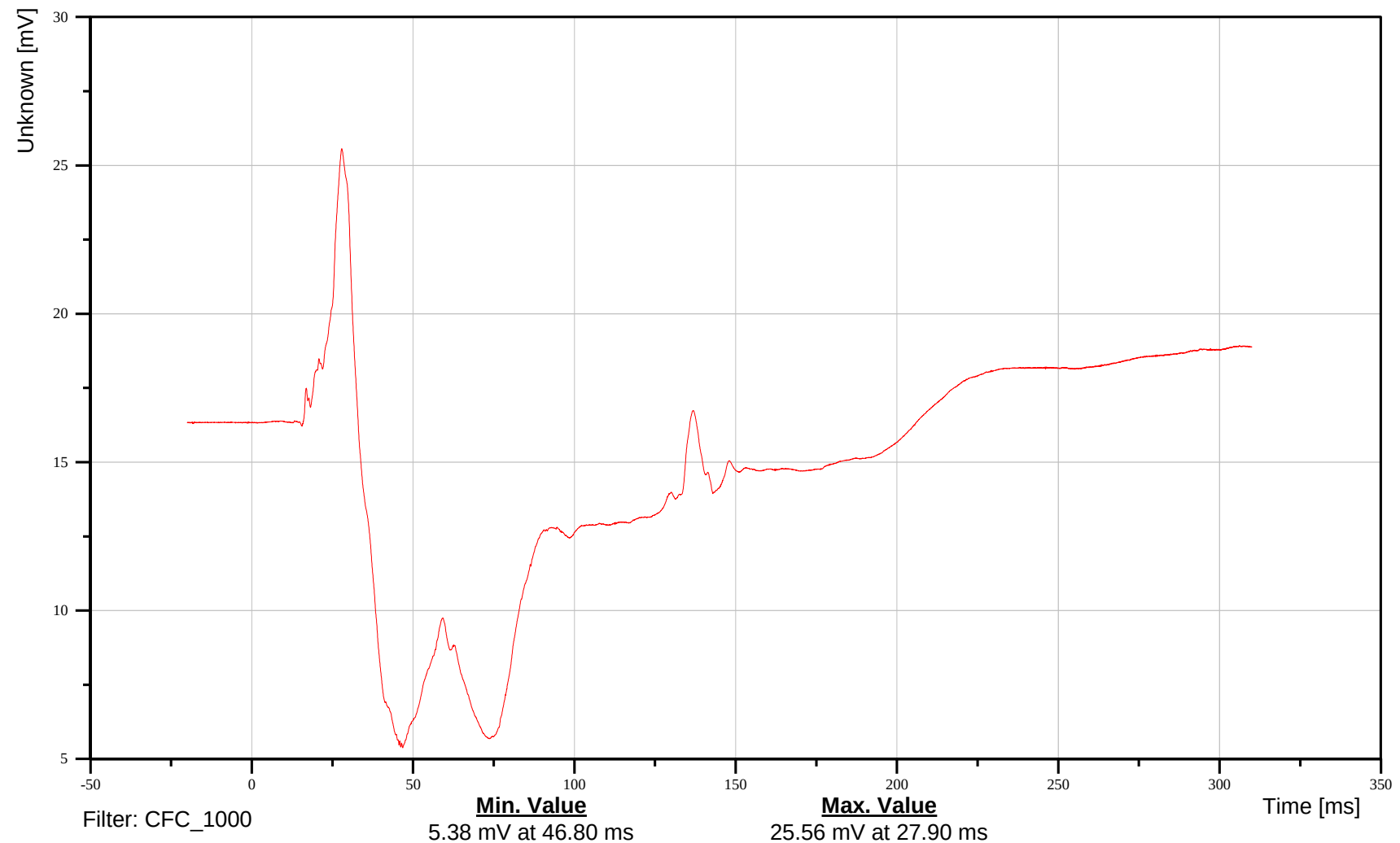
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2800WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-29

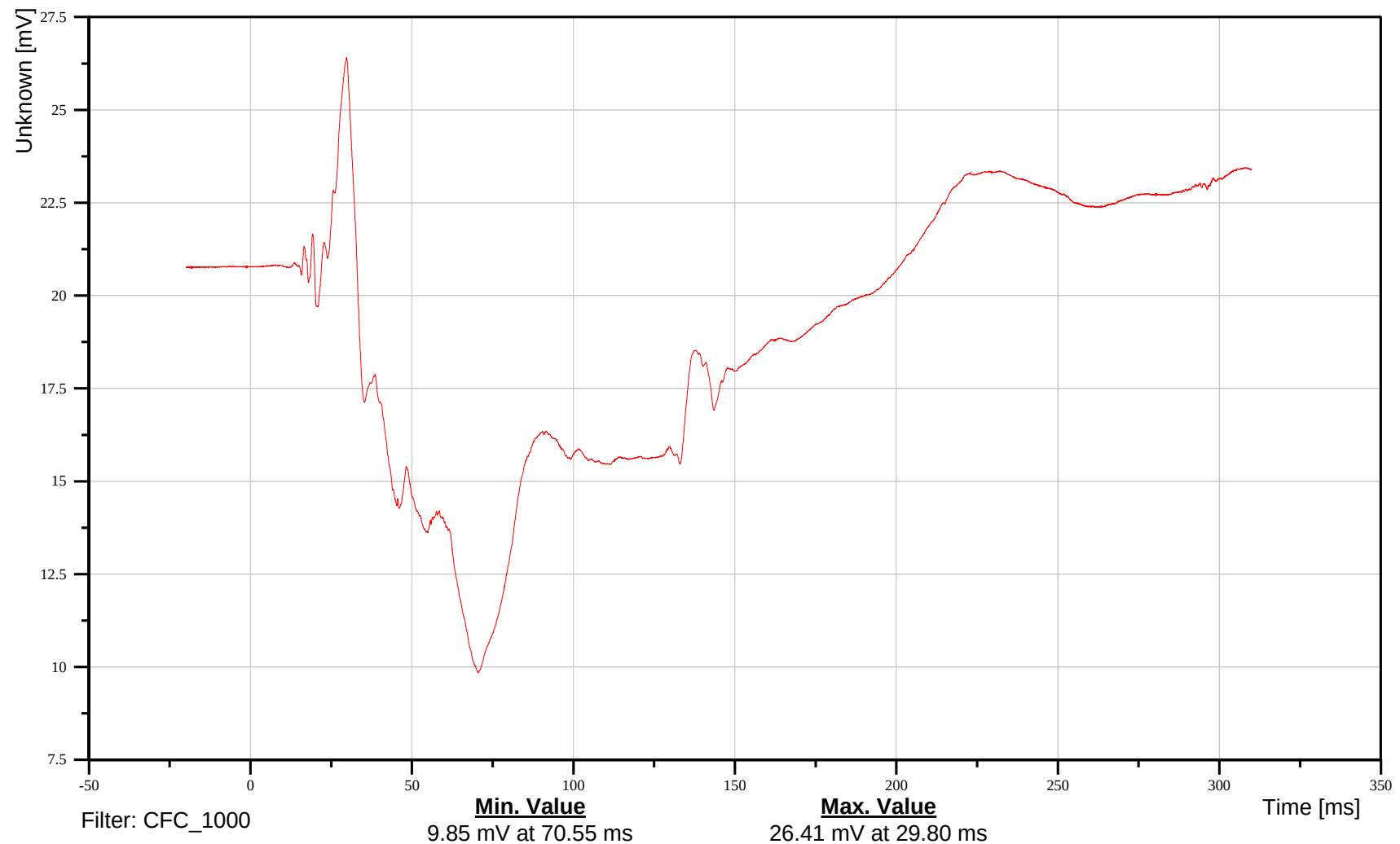
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA2900WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





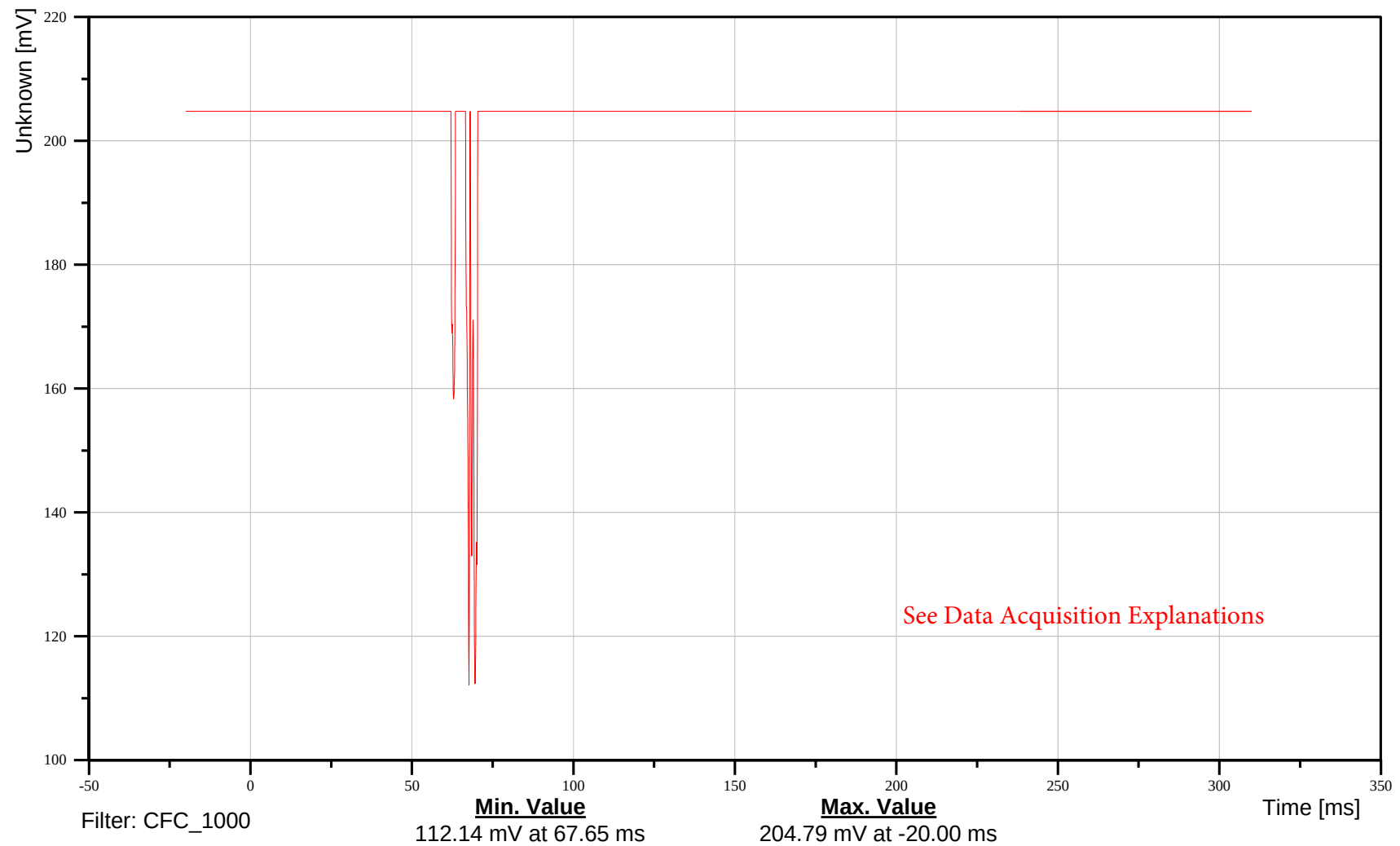
2015 Toyota Sienna WorldSID Side Pole Impact W50-30

Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3000WSVO0A

TRC Inc. Test Lab: CTF
Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-31

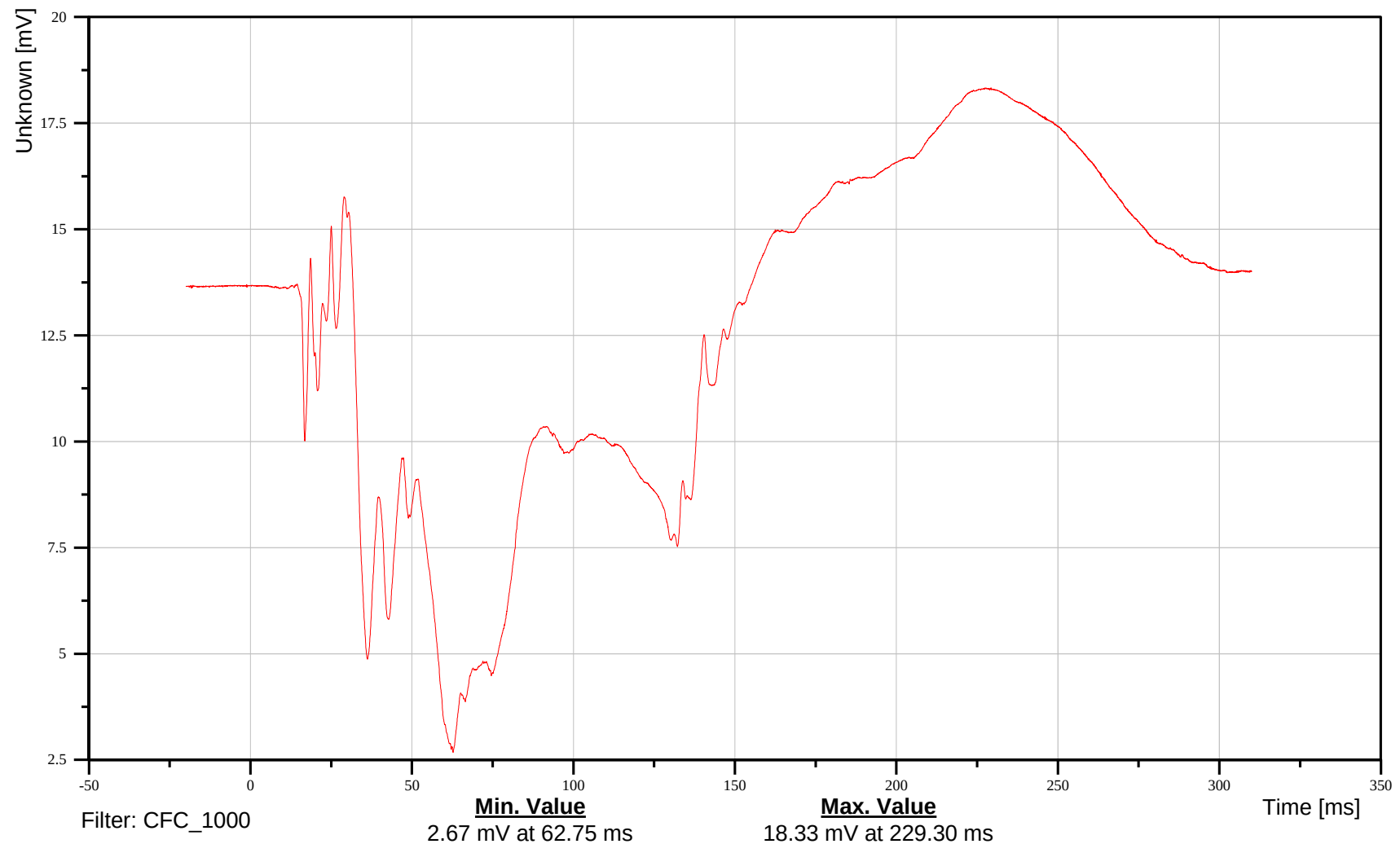
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3100WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-32

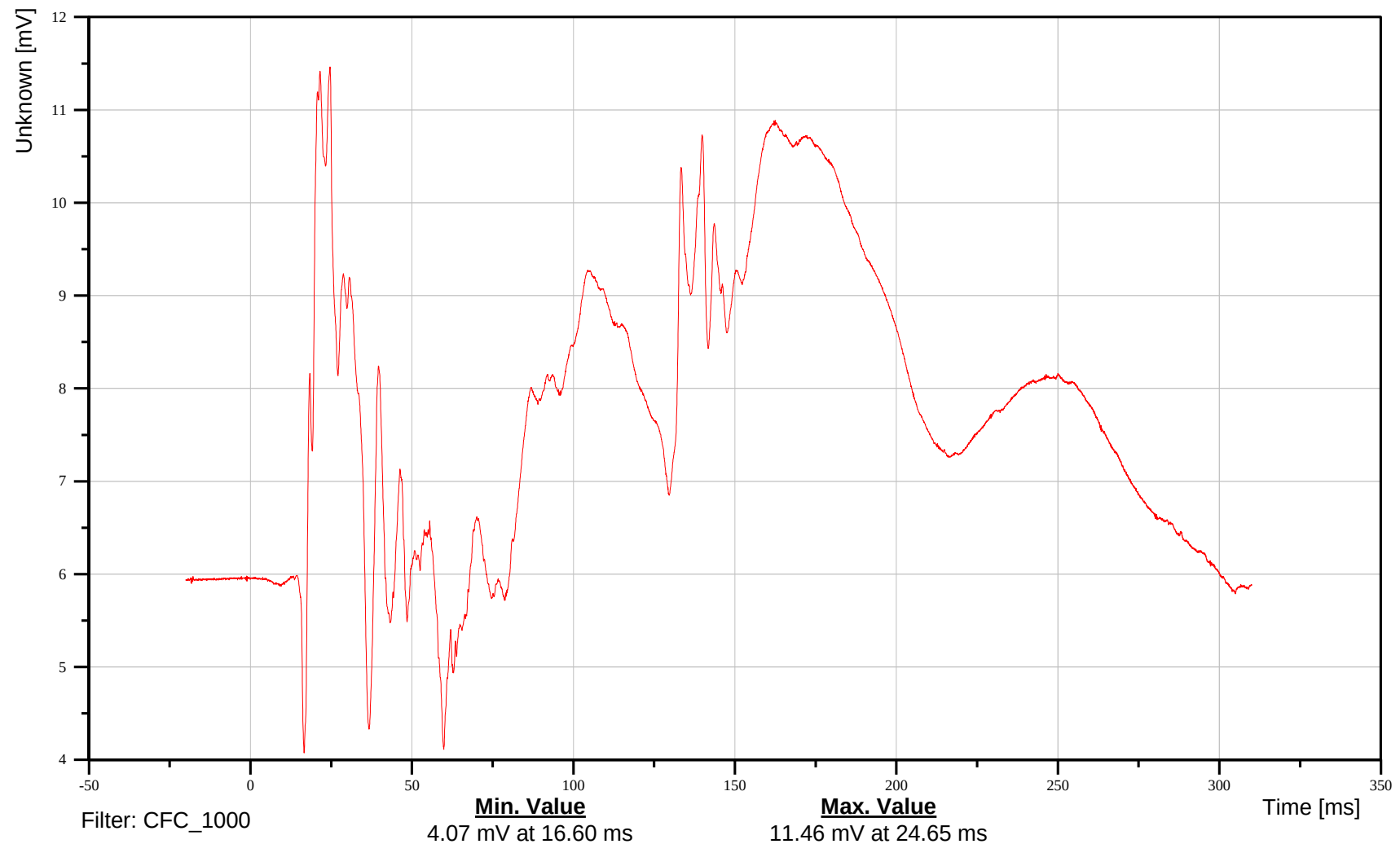
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3200WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-33

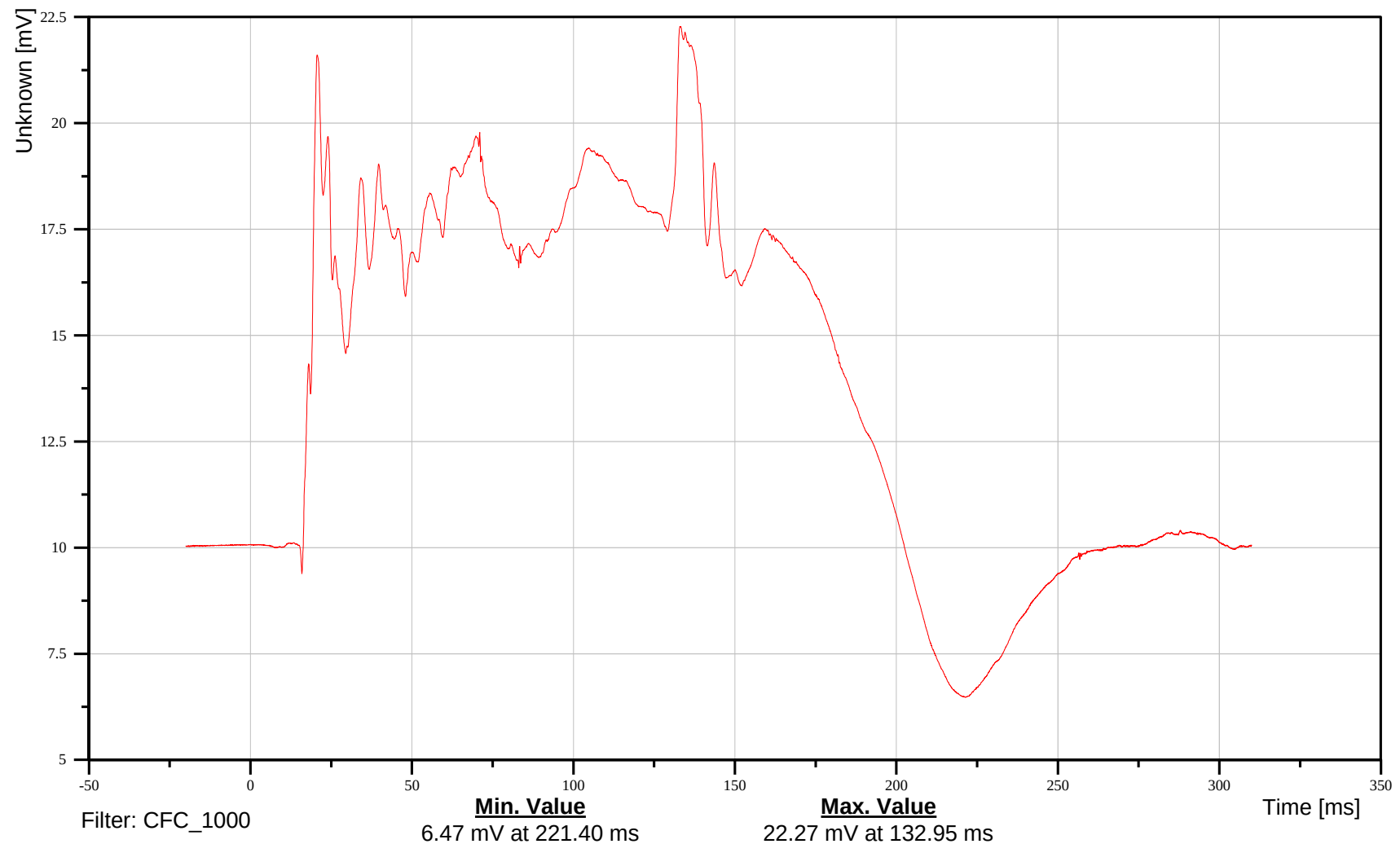
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3300WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-34

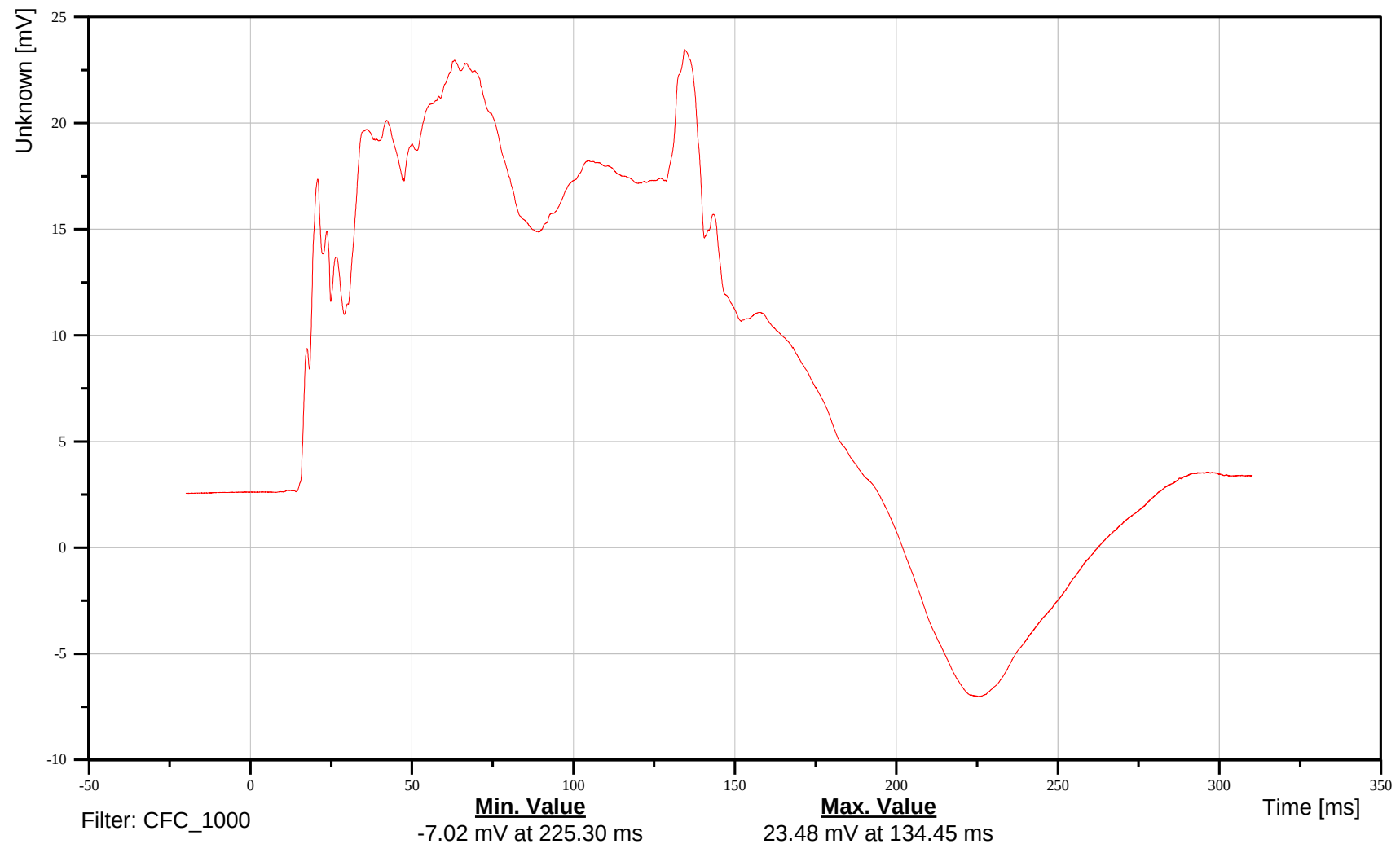
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3400WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-35

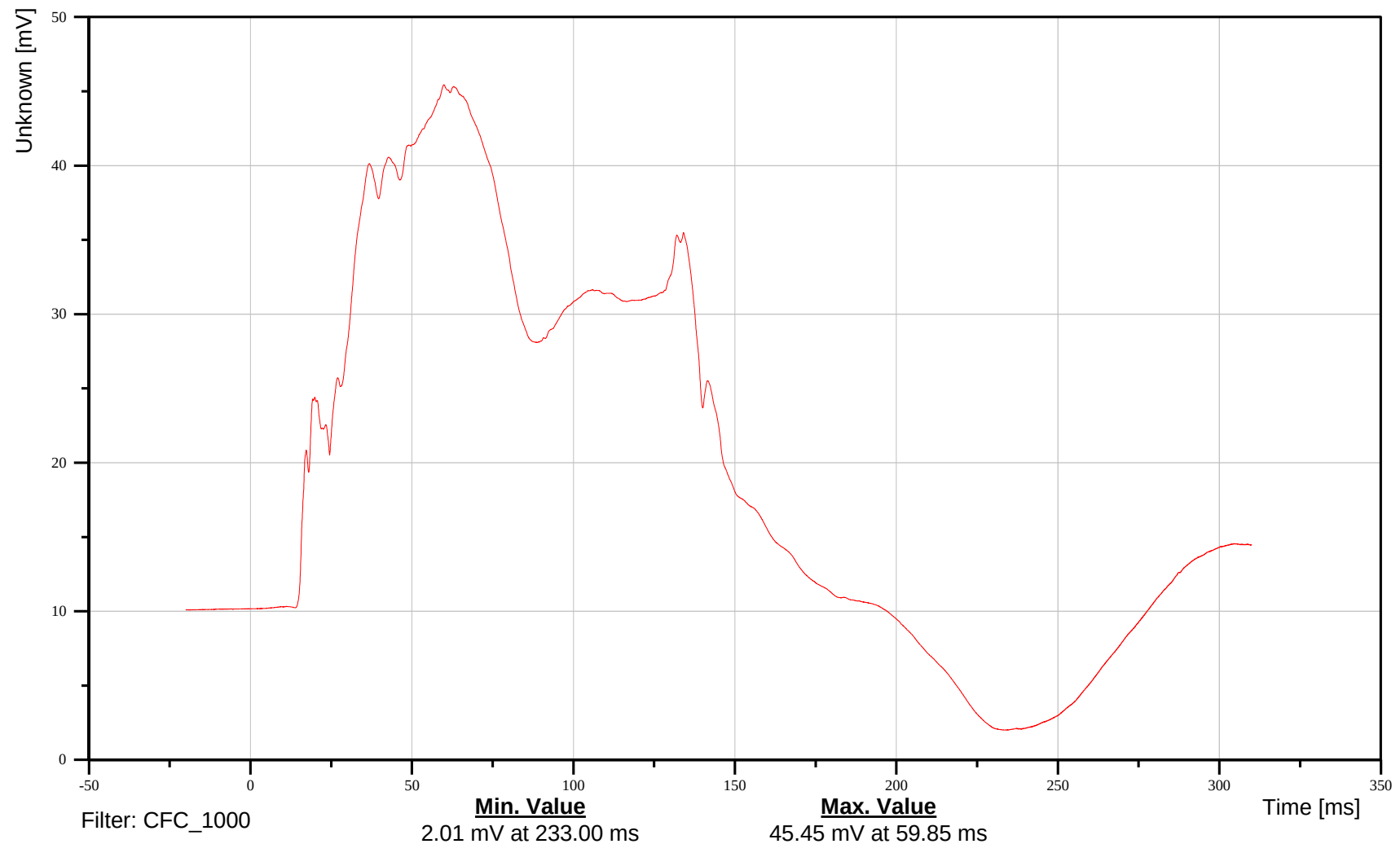
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3500WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-36

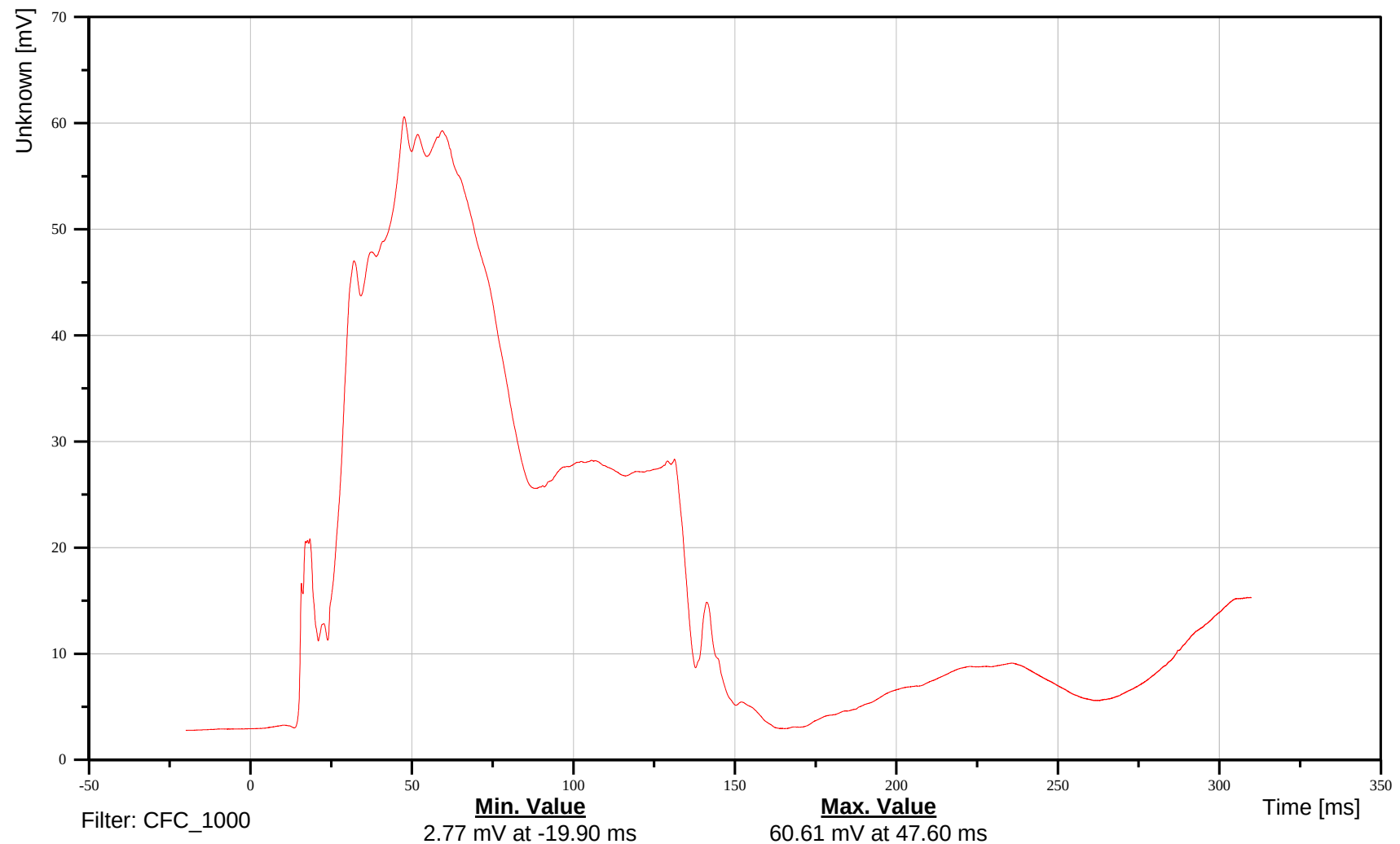
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3600WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-37

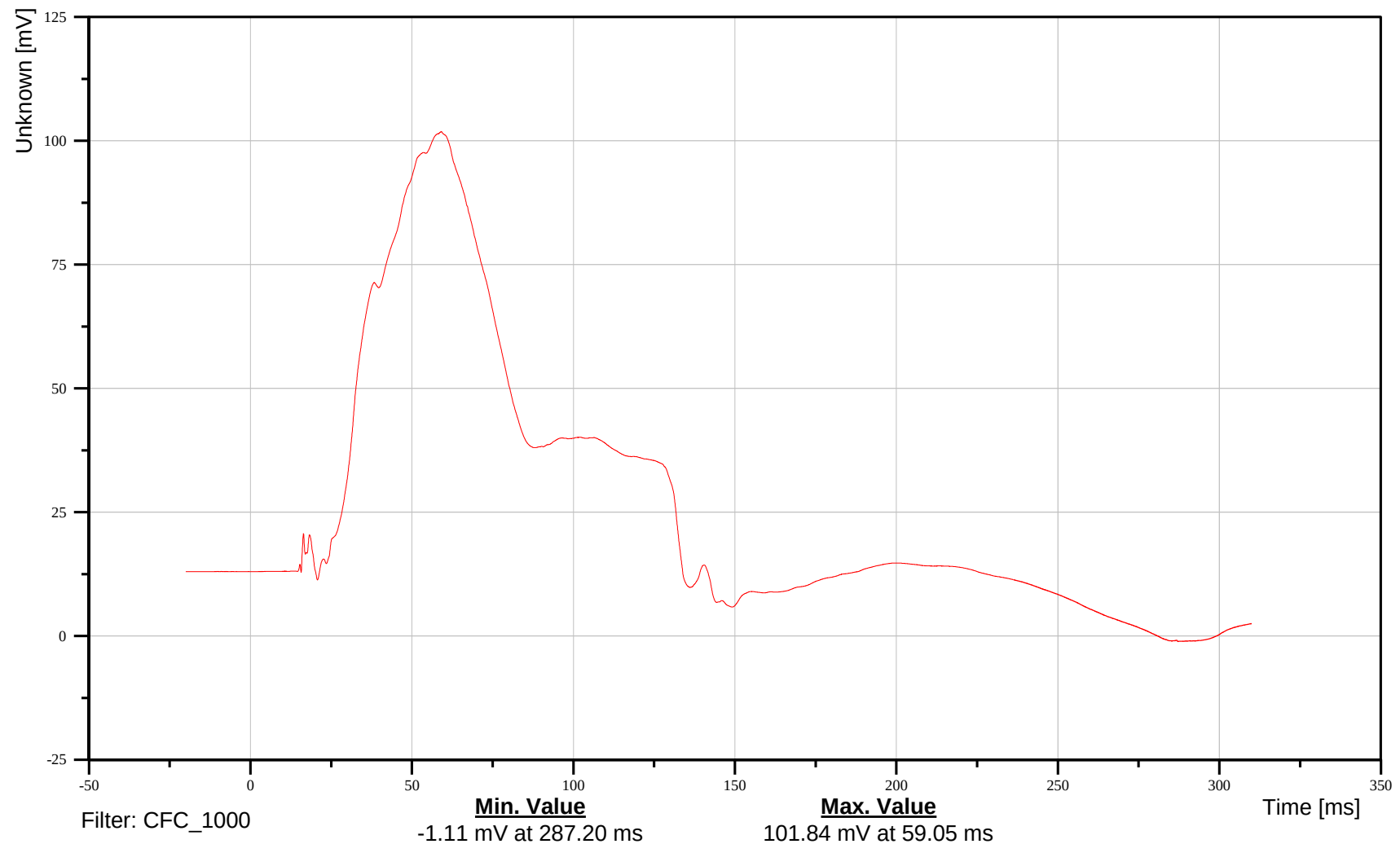
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3700WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-38

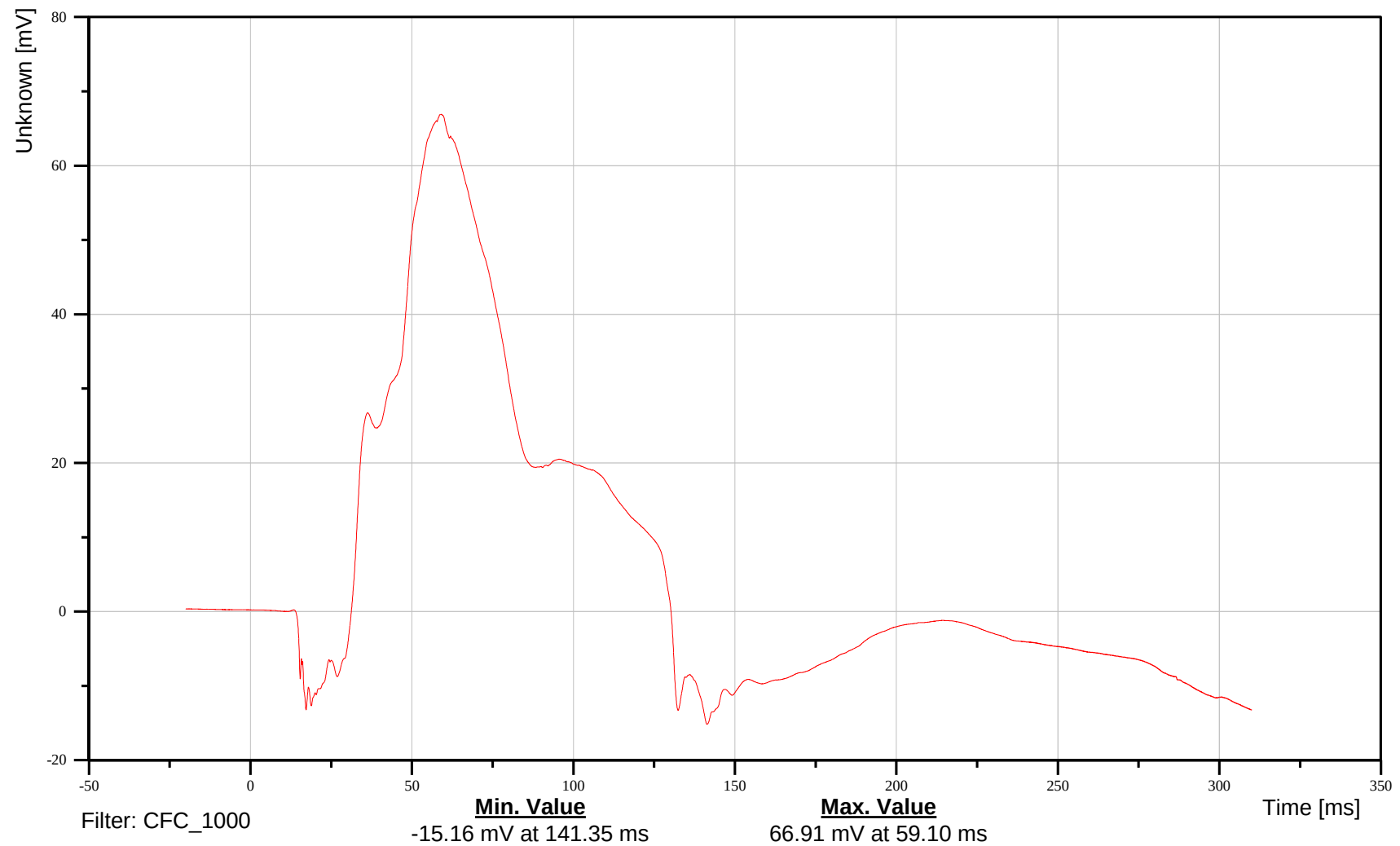
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3800WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-39

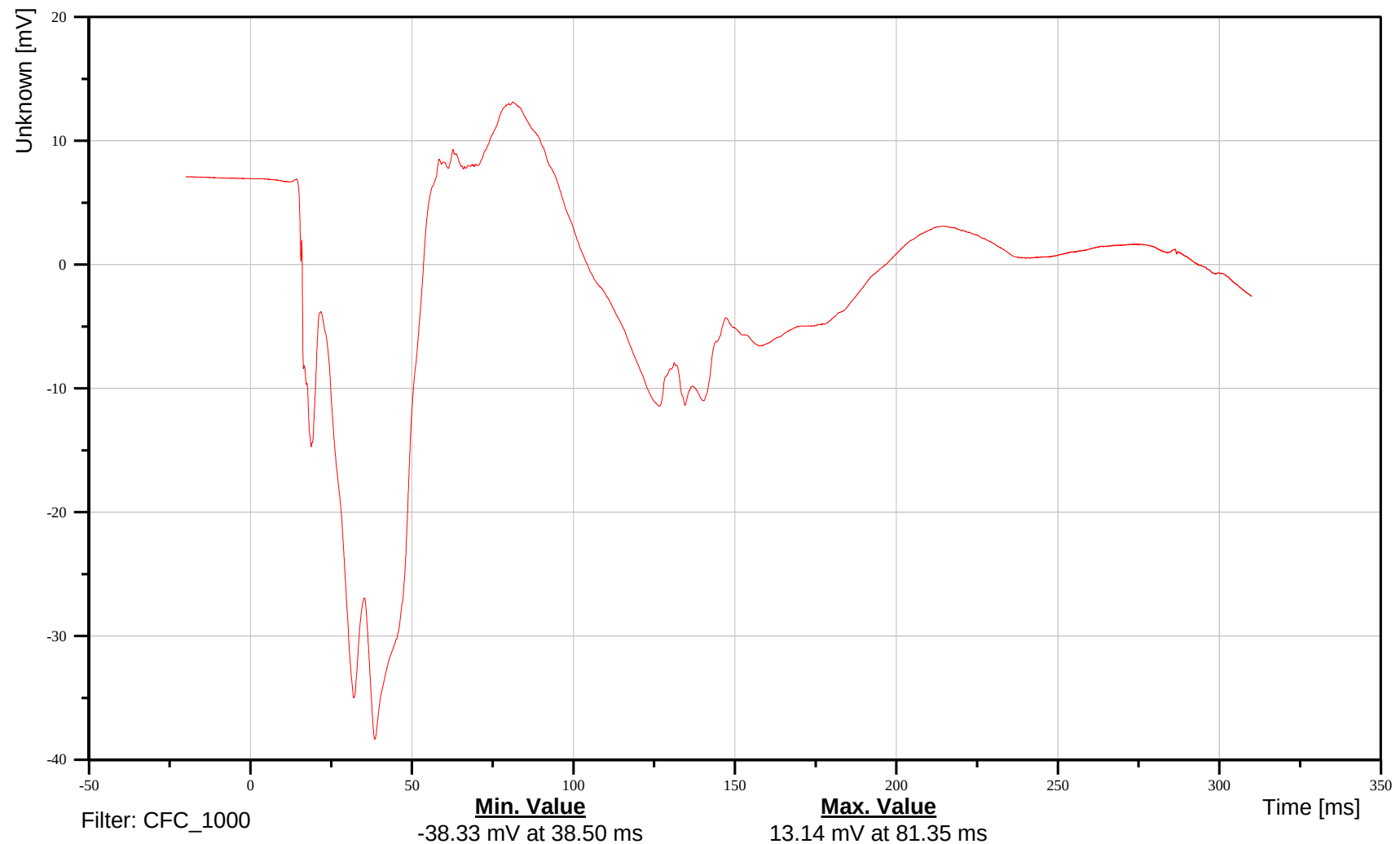
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA3900WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-40

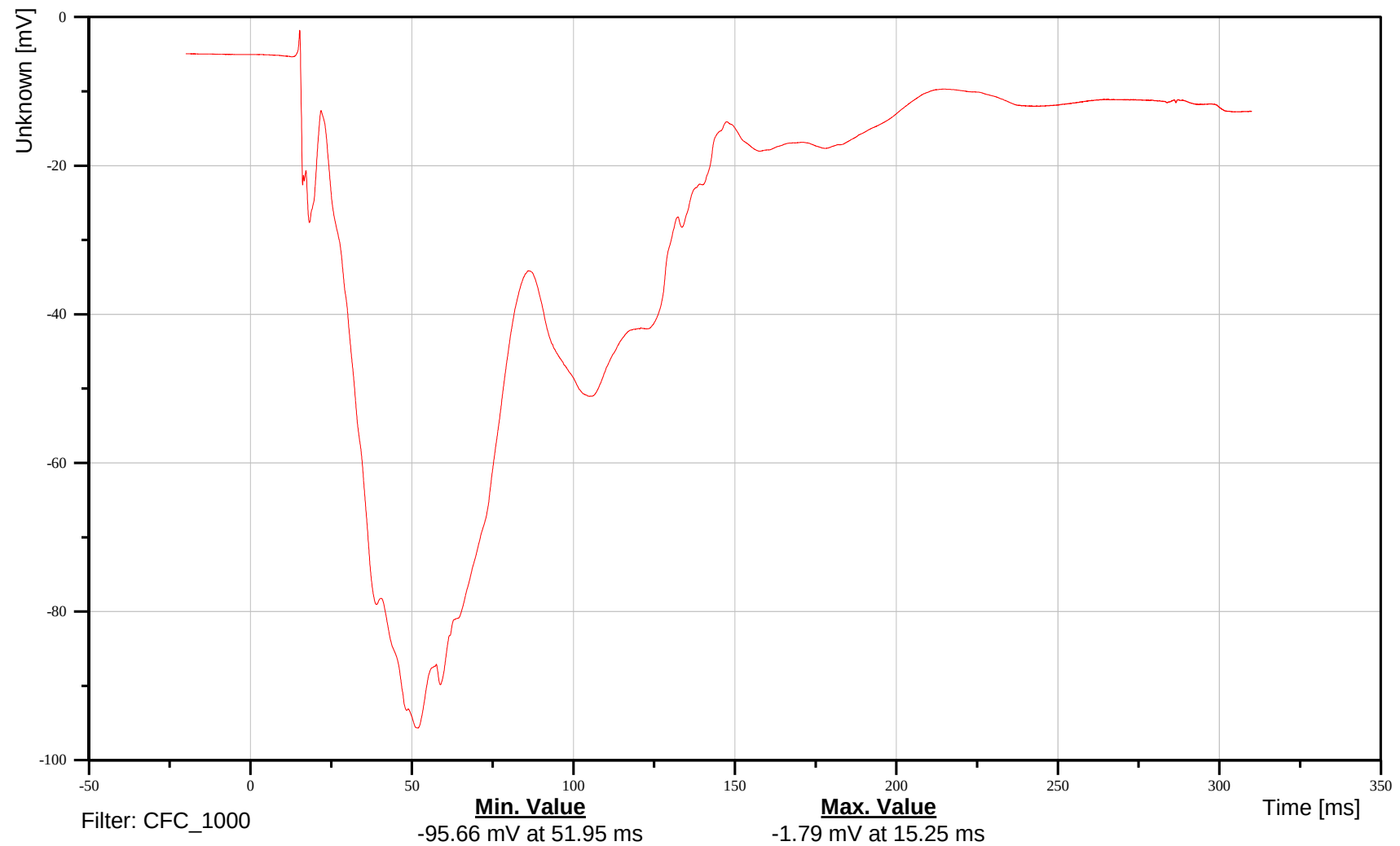
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4000WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-41

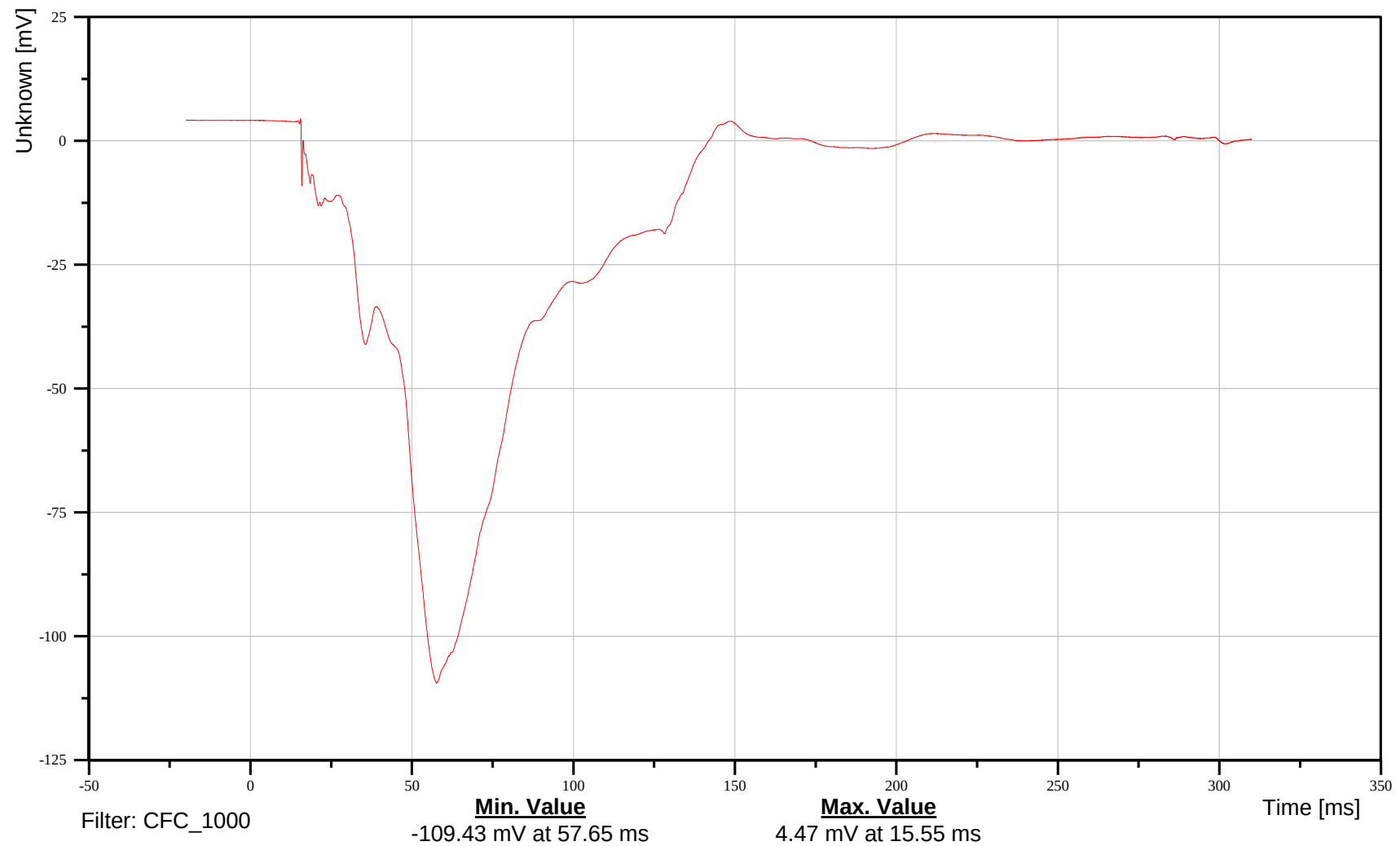
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4100WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-42

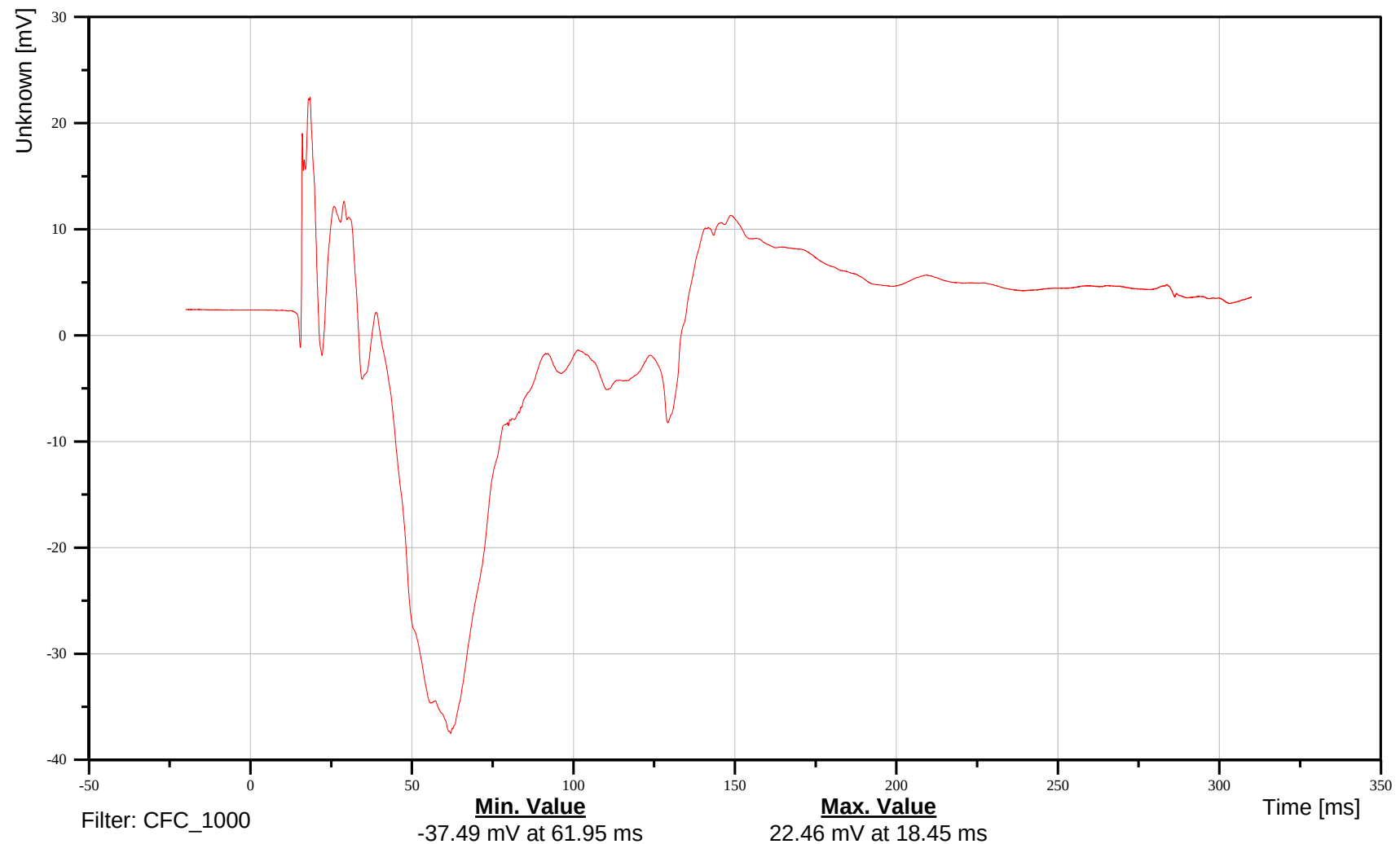
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4200WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-43

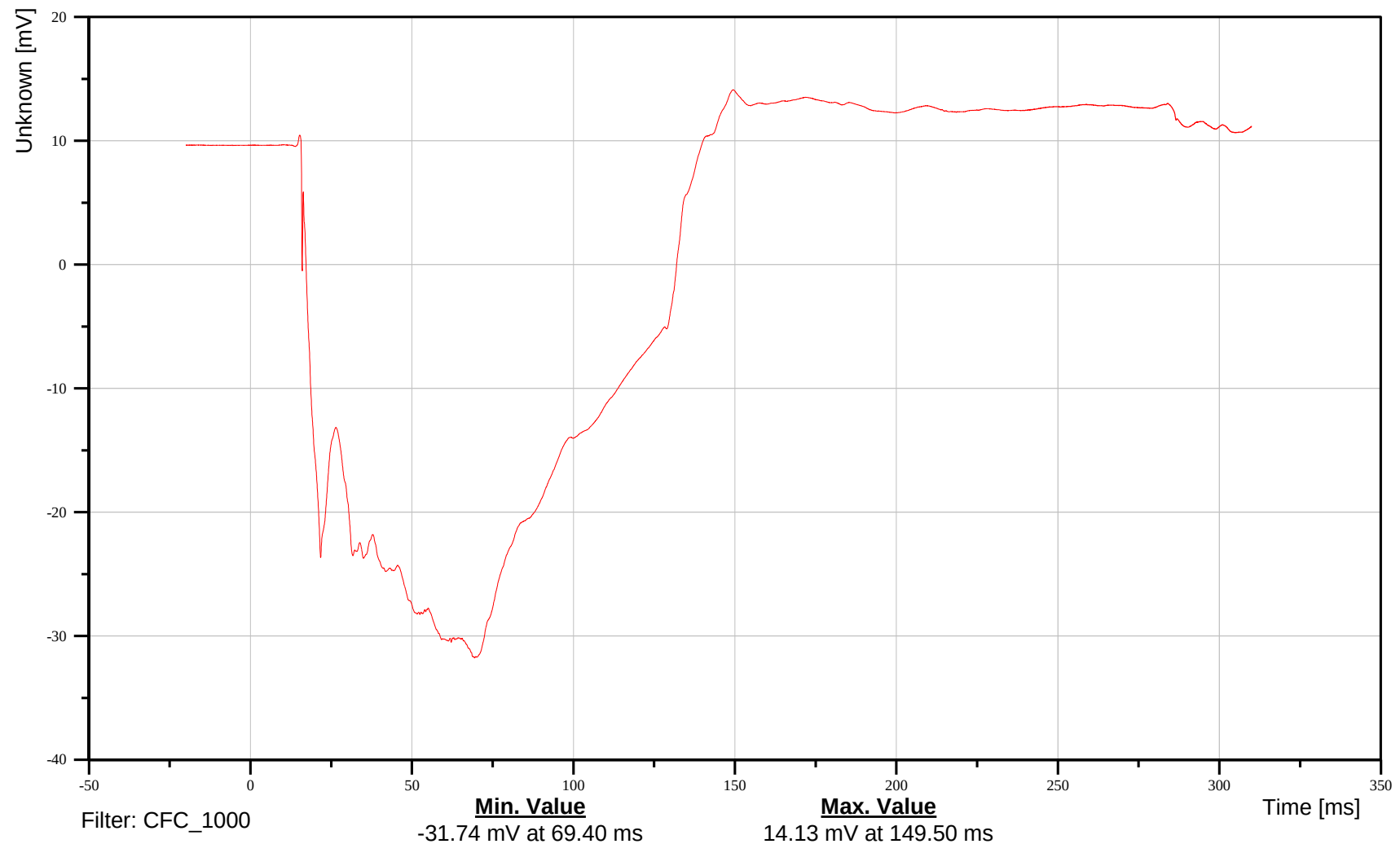
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4300WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-44

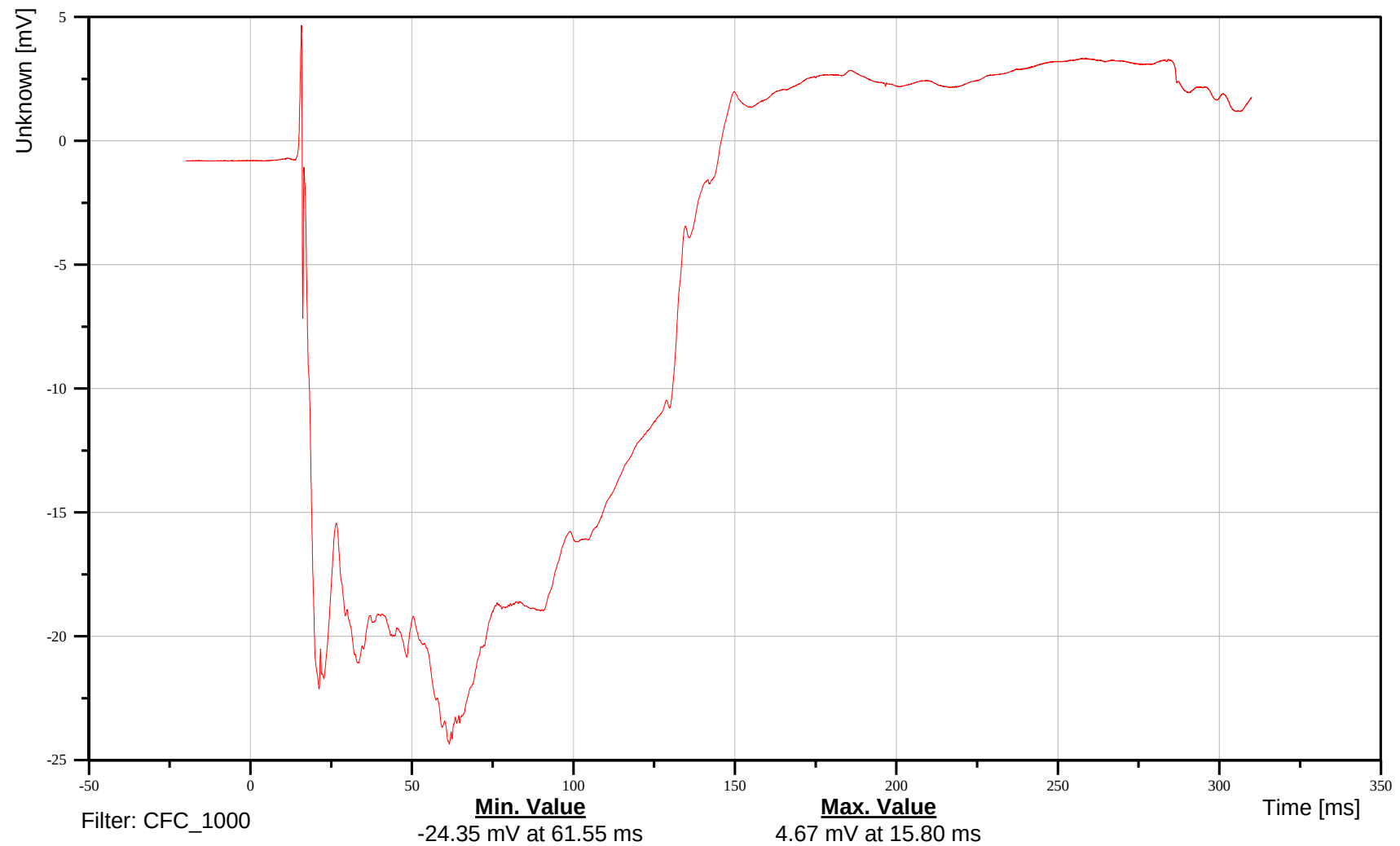
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4400WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-45

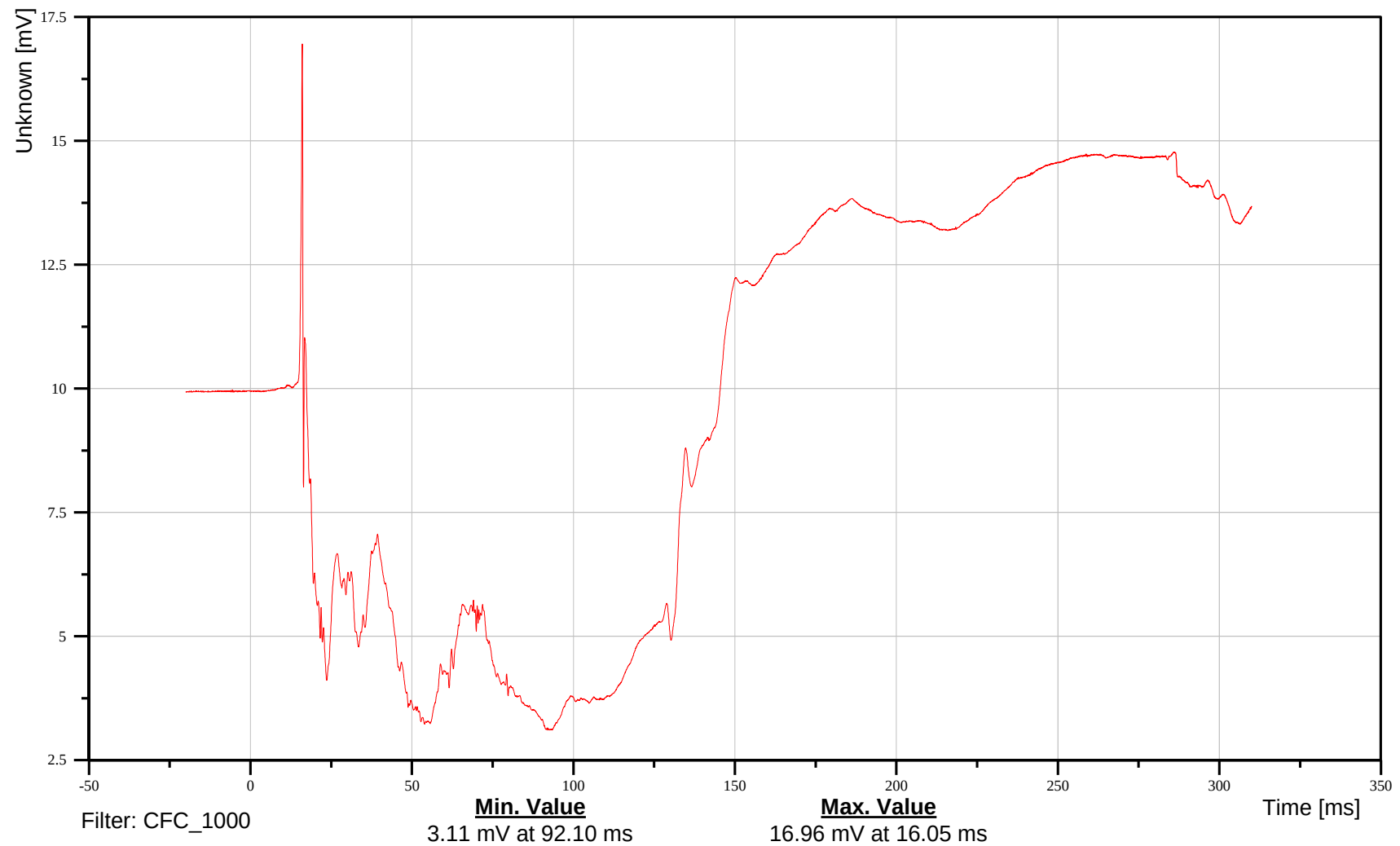
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4500WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-46

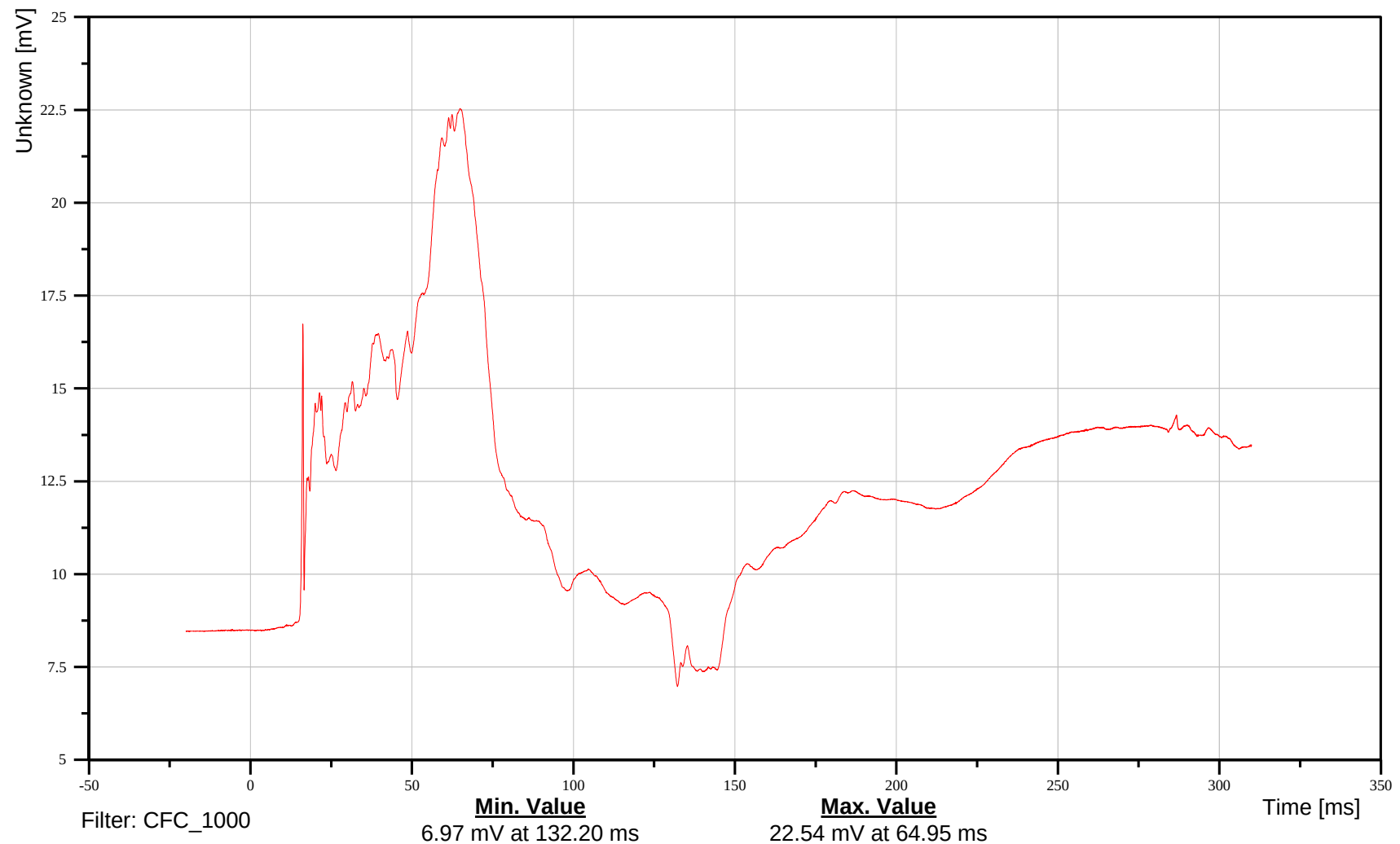
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4600WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-47

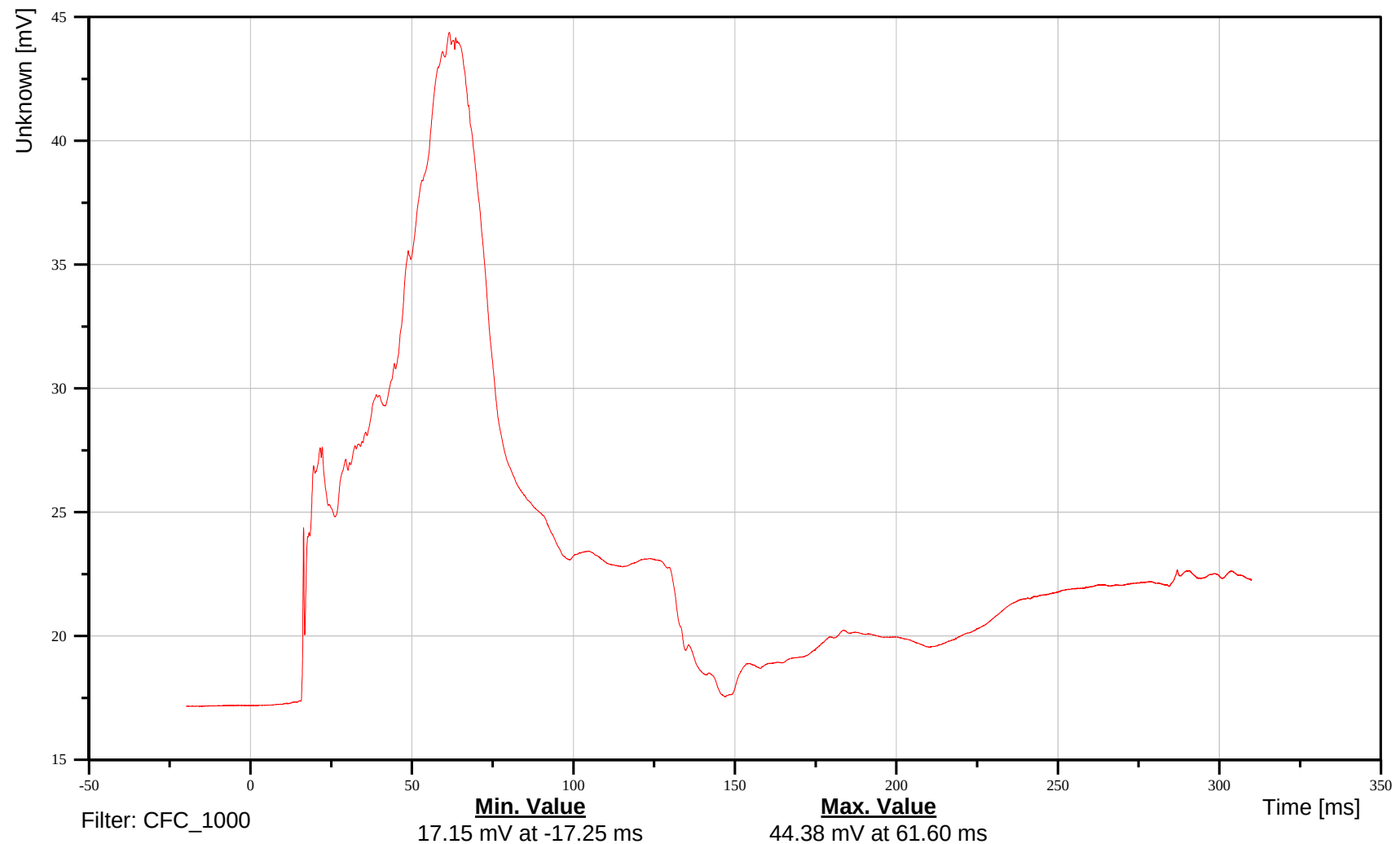
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4700WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-48

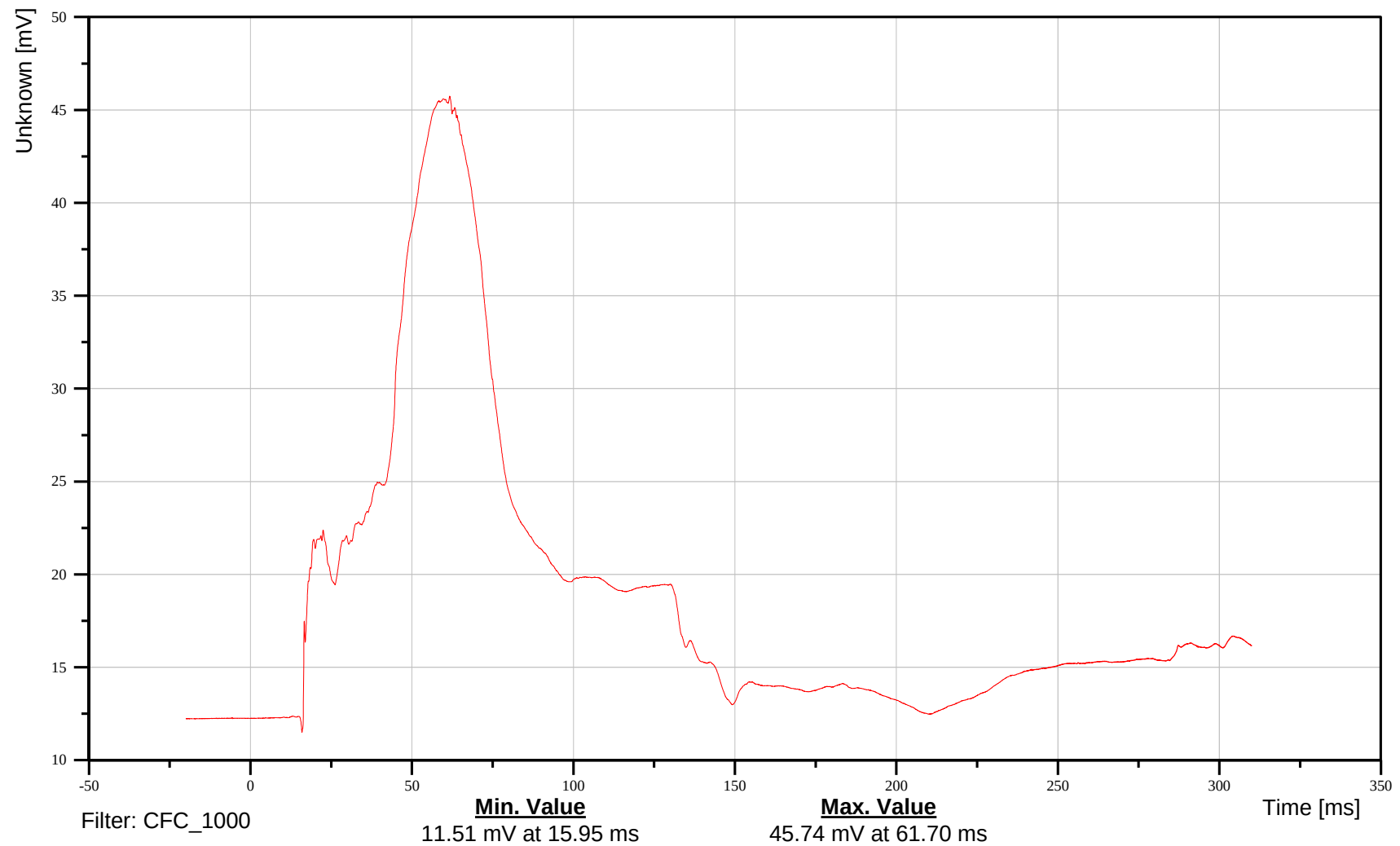
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4800WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-49

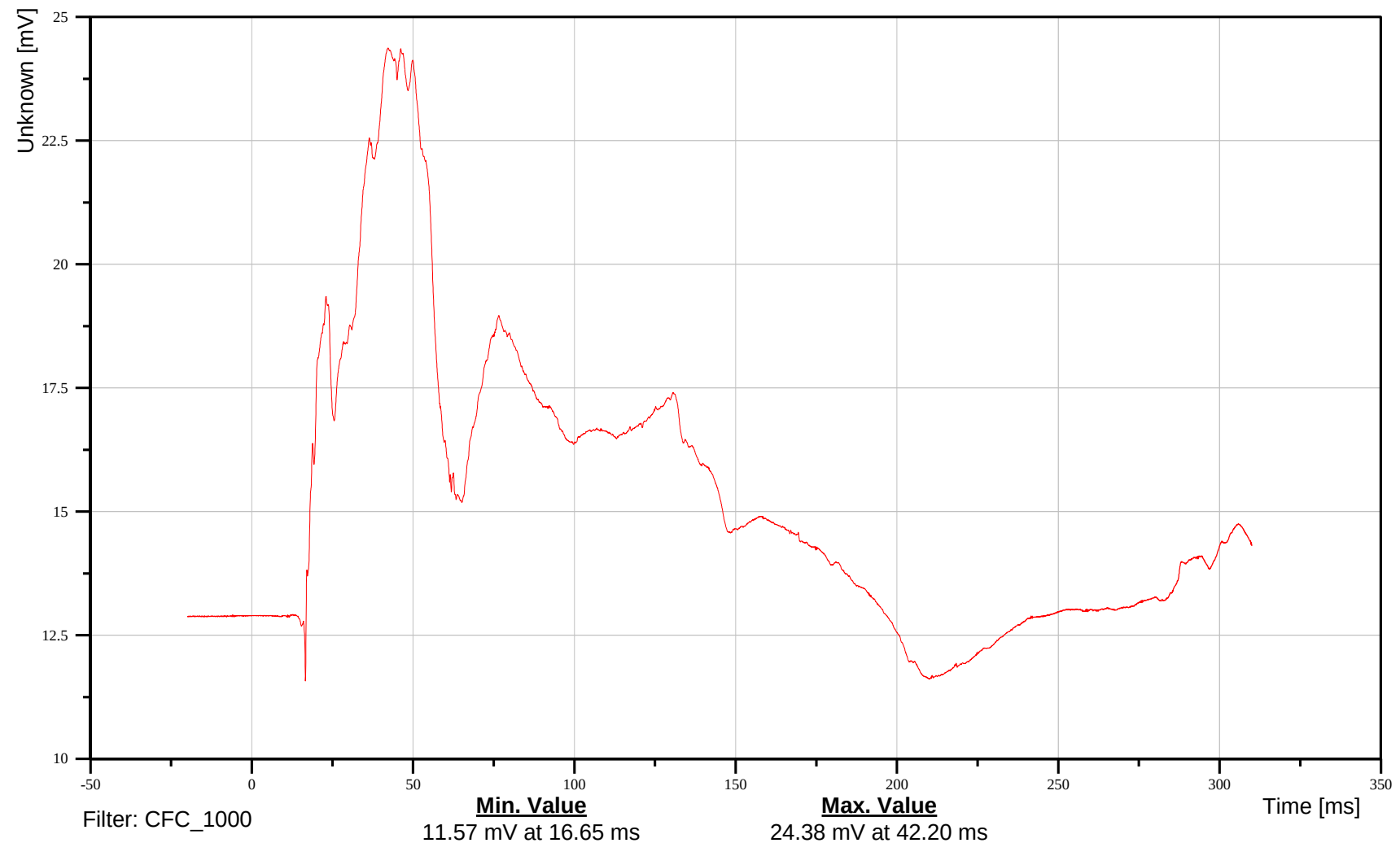
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA4900WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-50

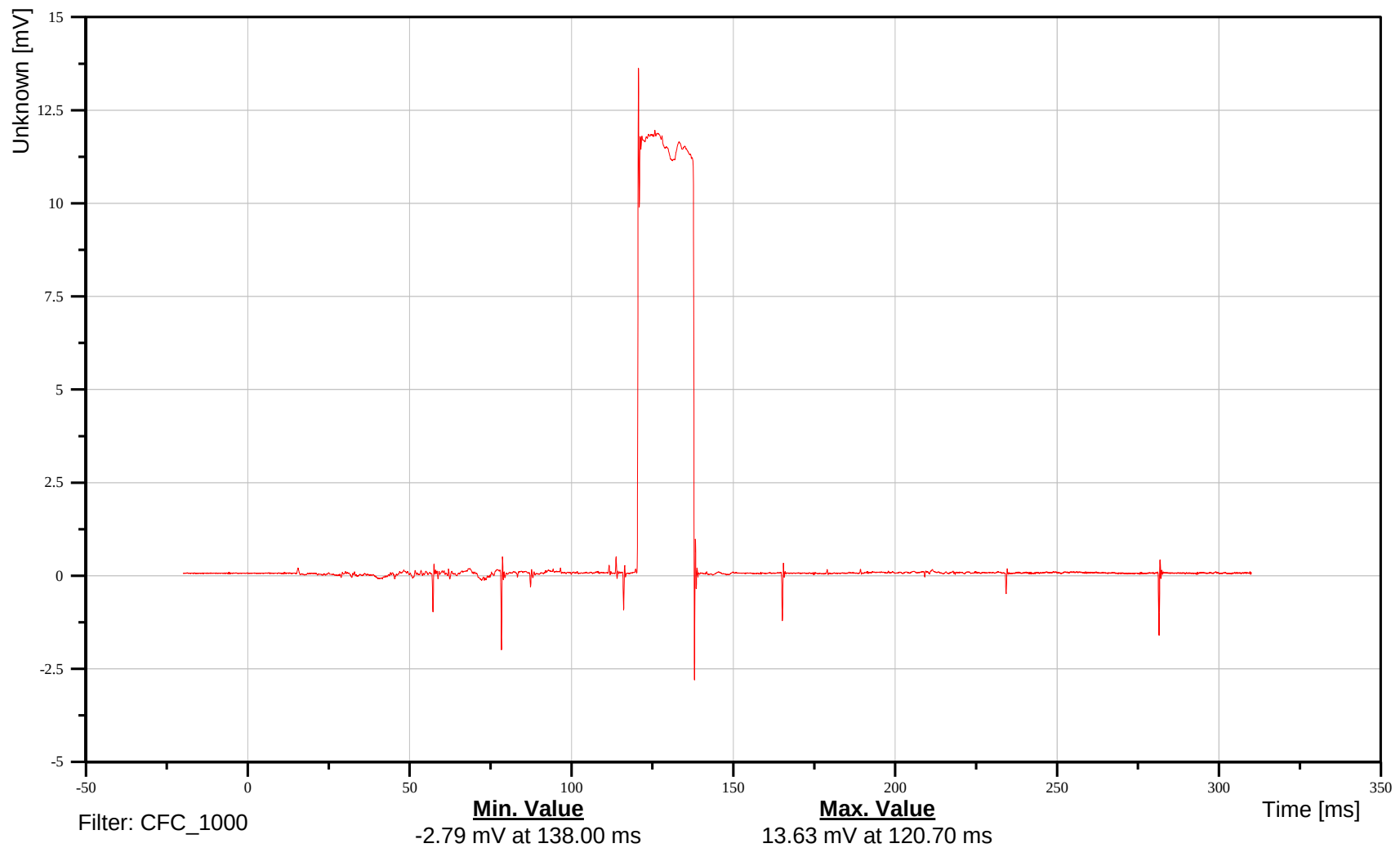
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA5000WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-51

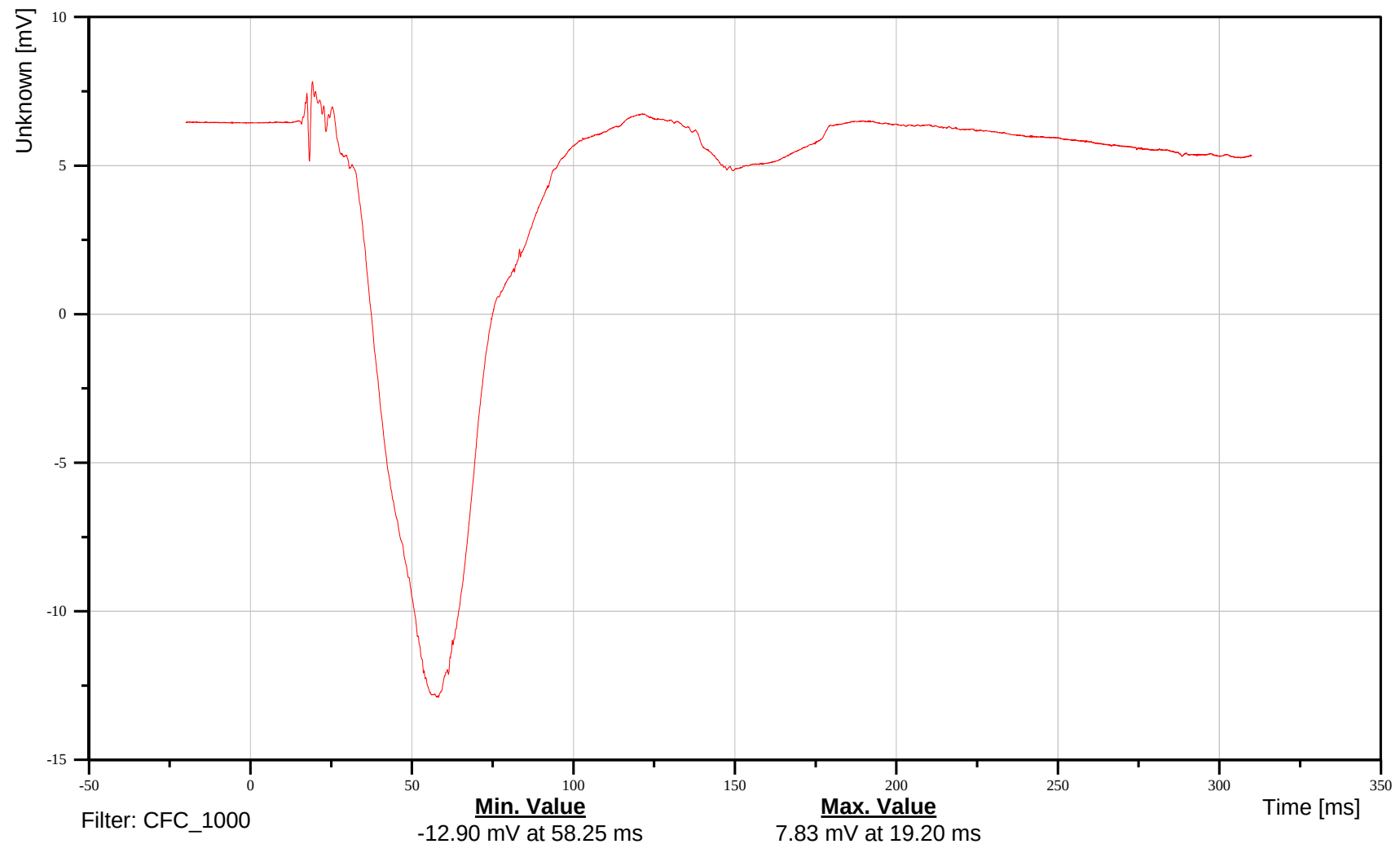
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA5100WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-52

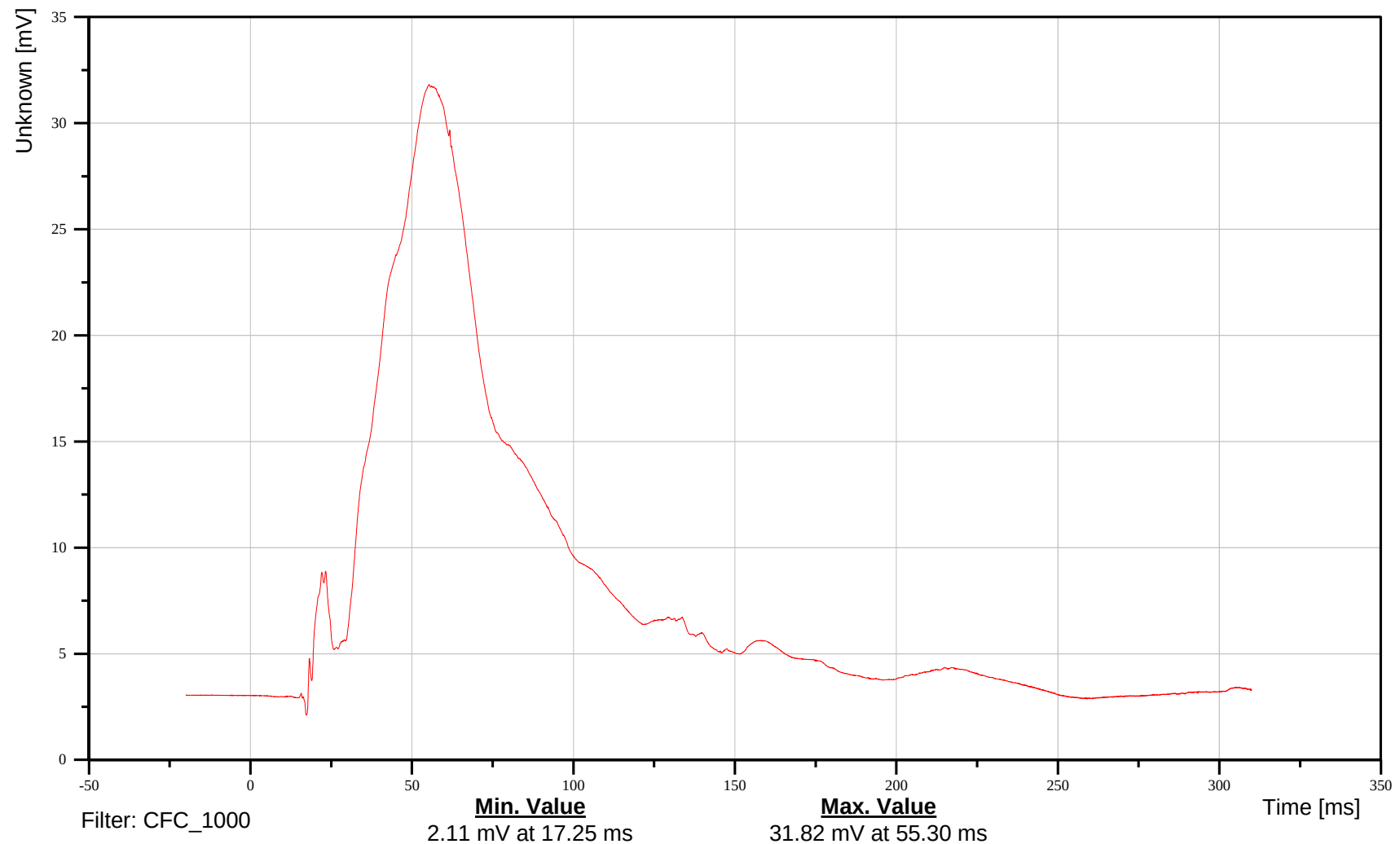
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA5200WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-53

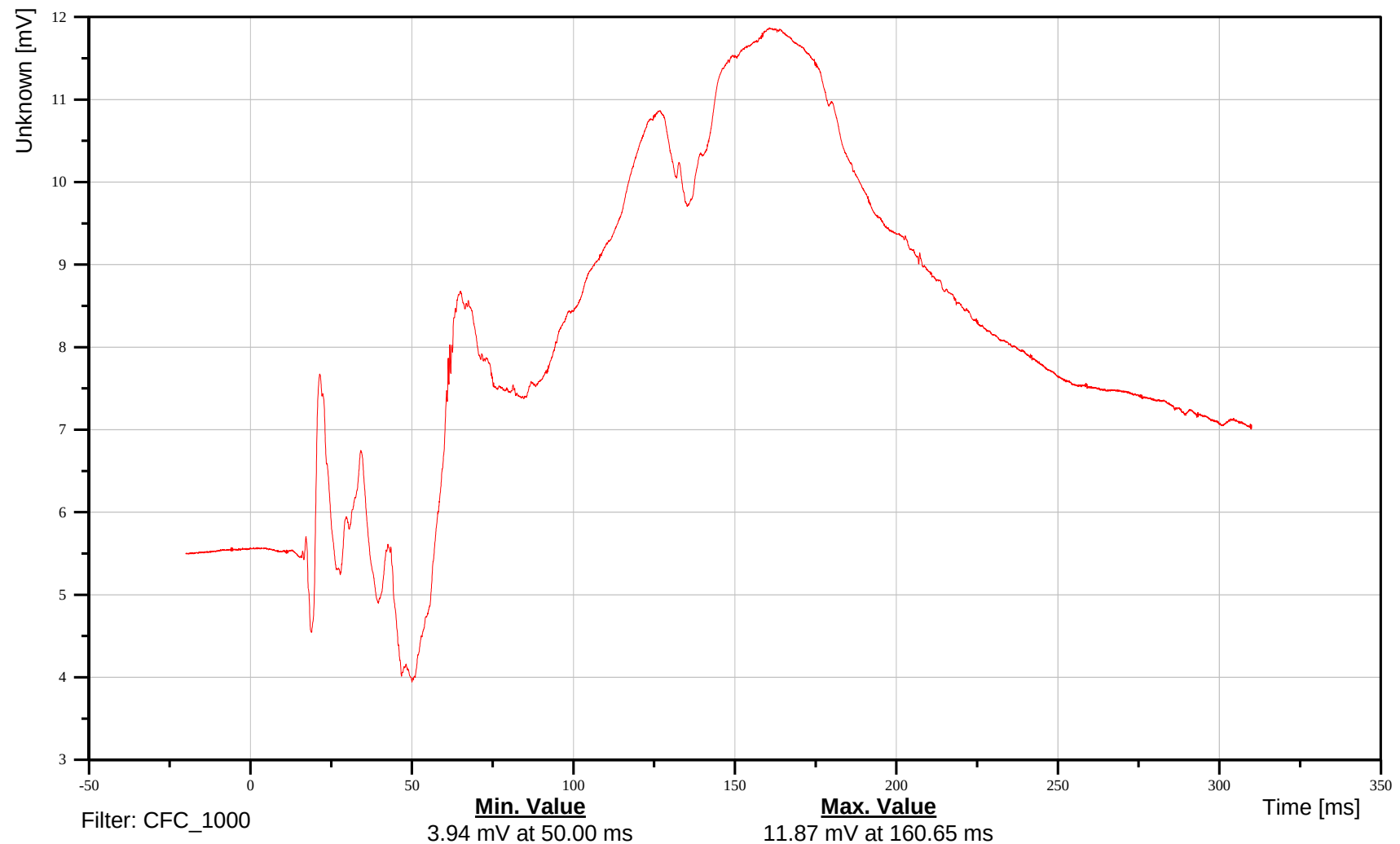
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA5300WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-54

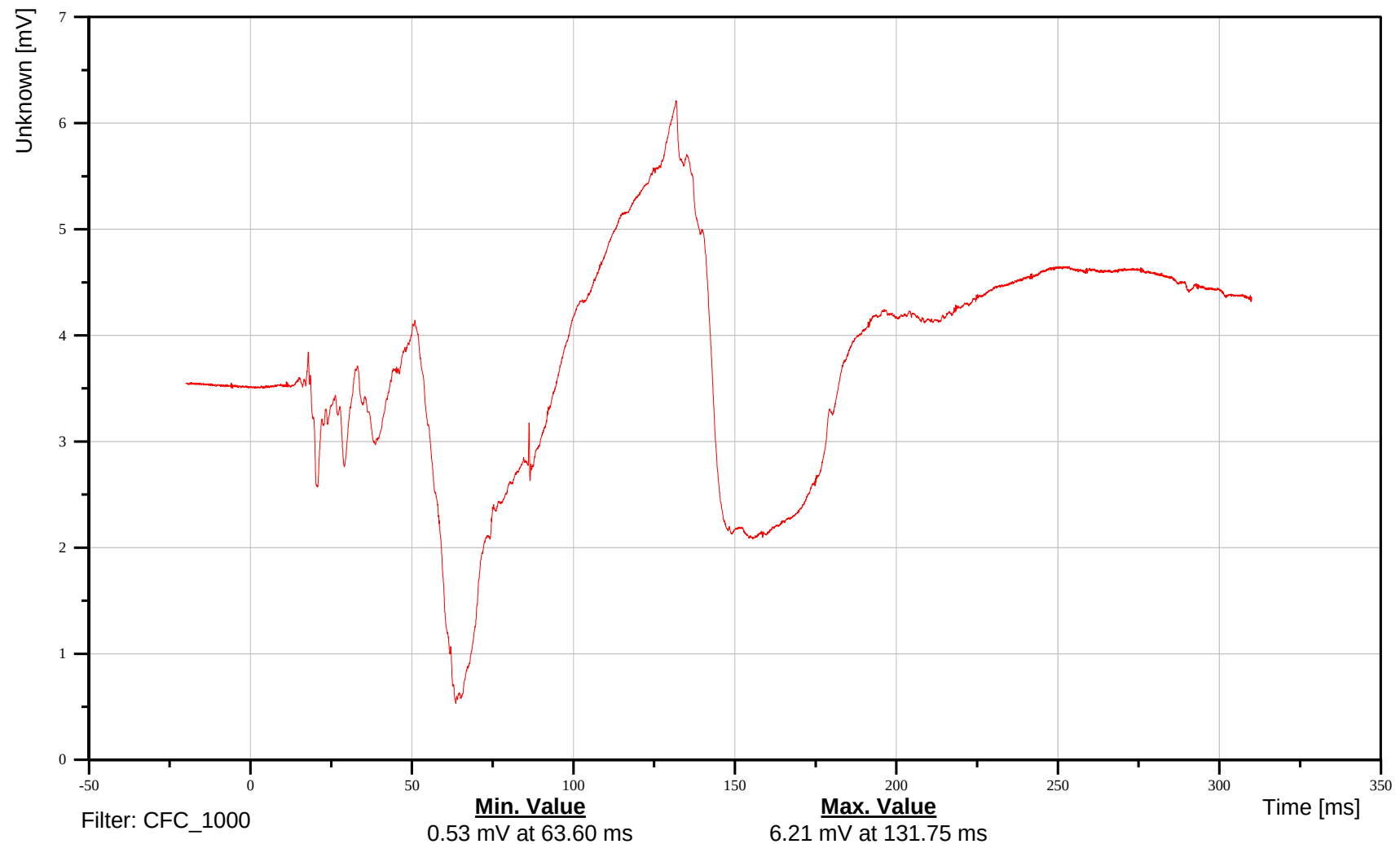
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA5400WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

W50-55

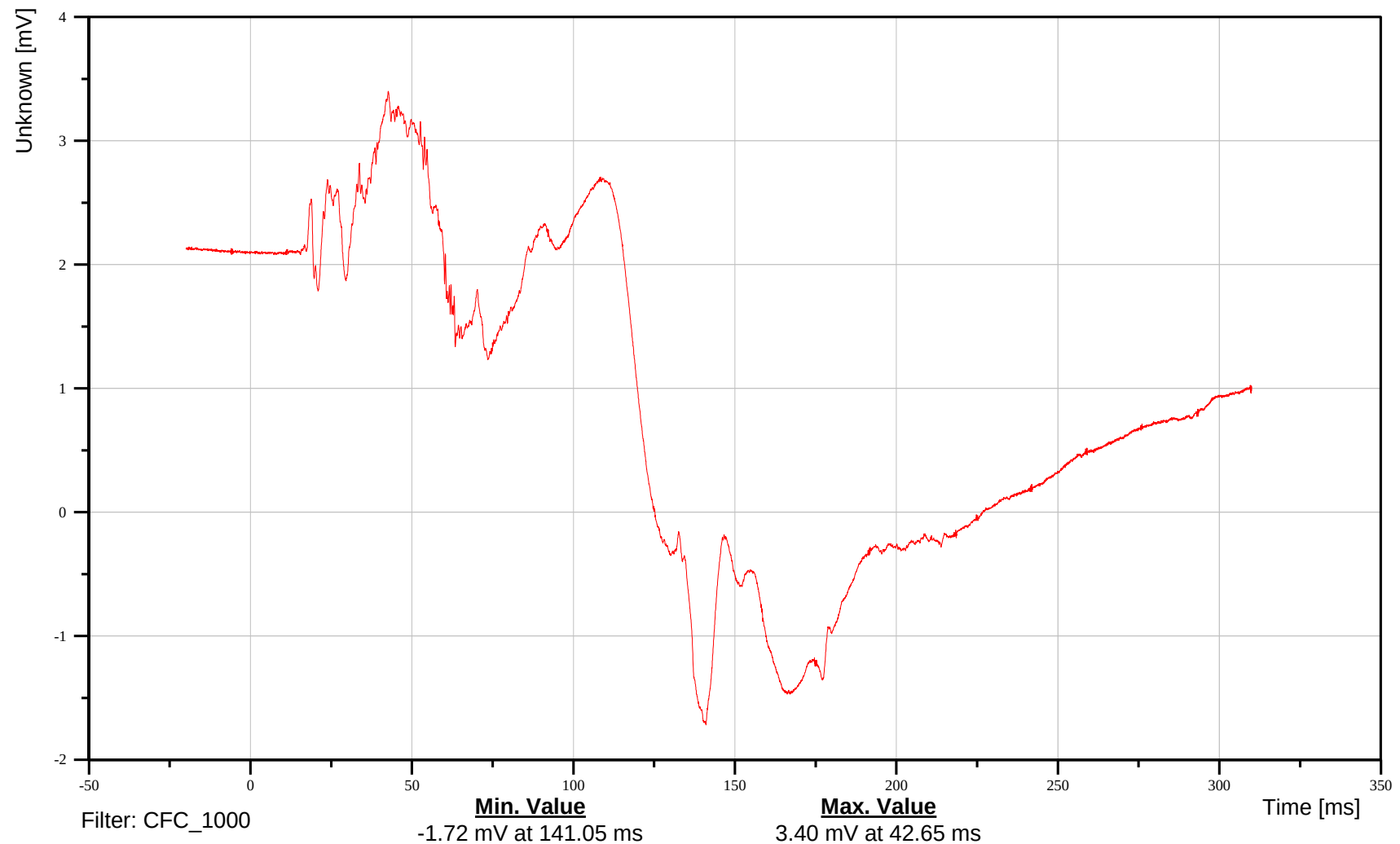
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11CHBA5500WSVO0A

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Vehicle Center of Gravity X-Axis Acceleration

Date: 06/14/2016

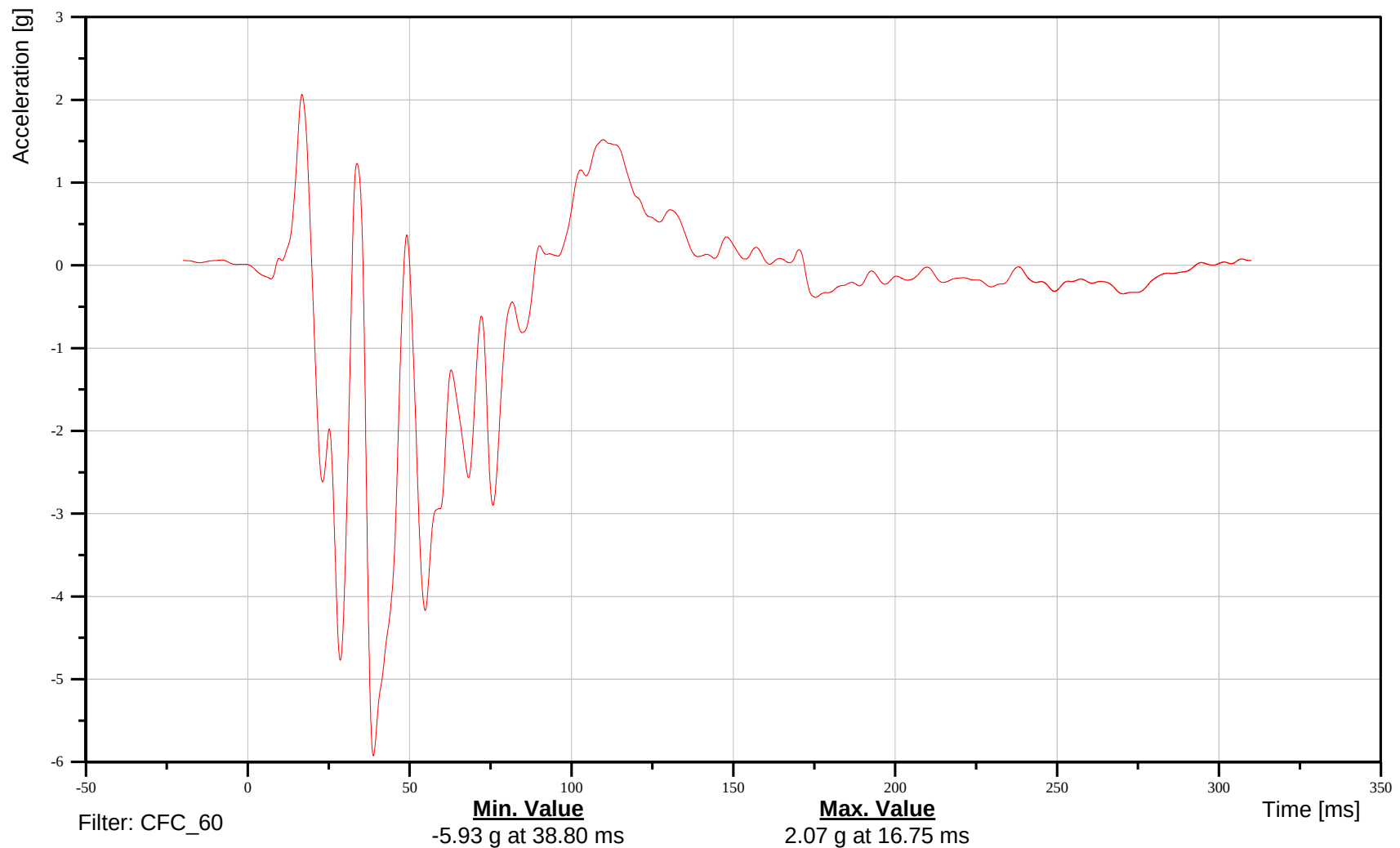
Time: 14:31

Customer: VRTC

11VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Vehicle Center of Gravity Y-Axis Acceleration

Date: 06/14/2016

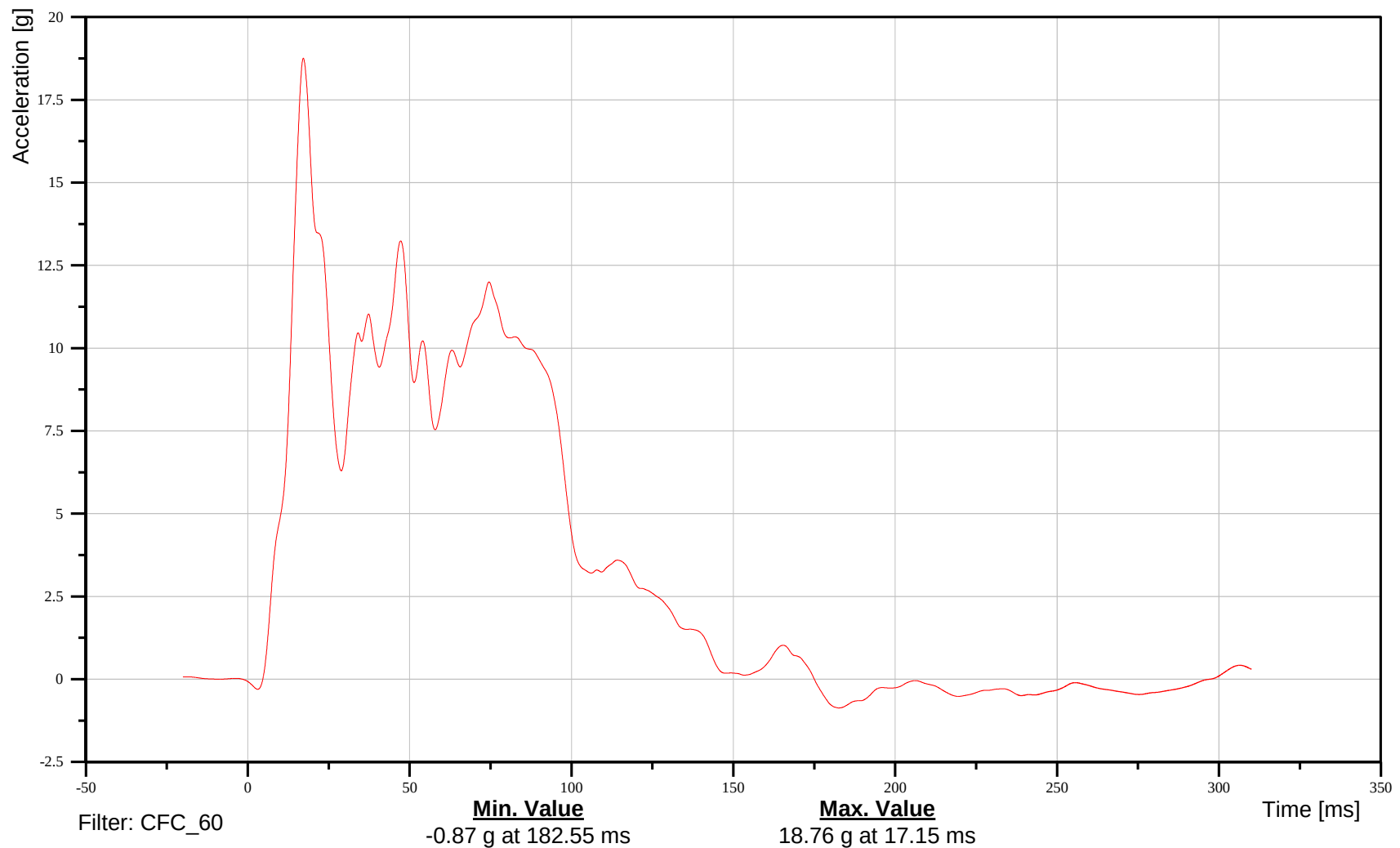
Time: 14:31

Customer: VRTC

11VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Vehicle Center of Gravity Z-Axis Acceleration

Date: 06/14/2016

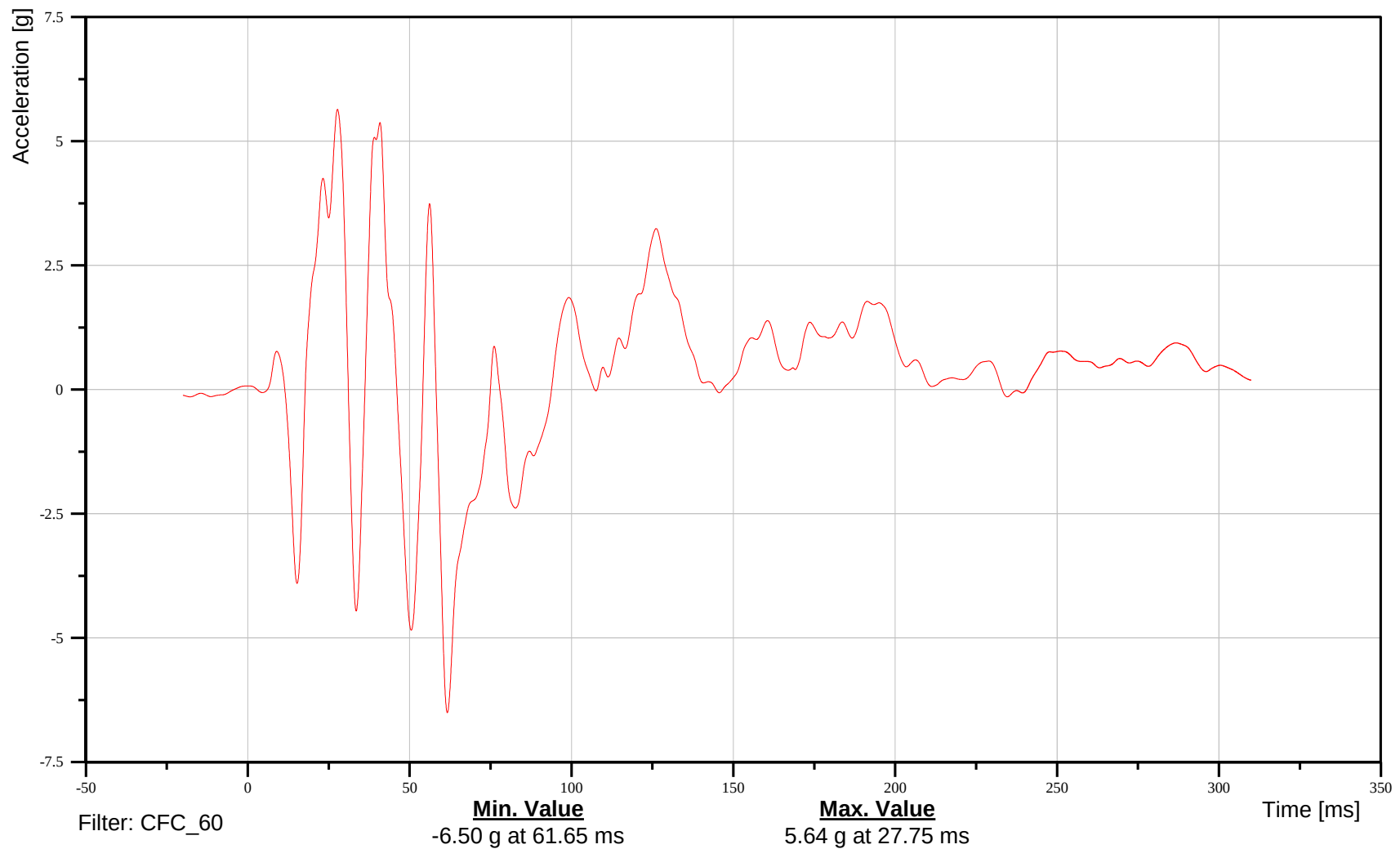
Time: 14:31

Customer: VRTC

11VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Vehicle Center of Gravity Resultant Acceleration

Date: 06/14/2016

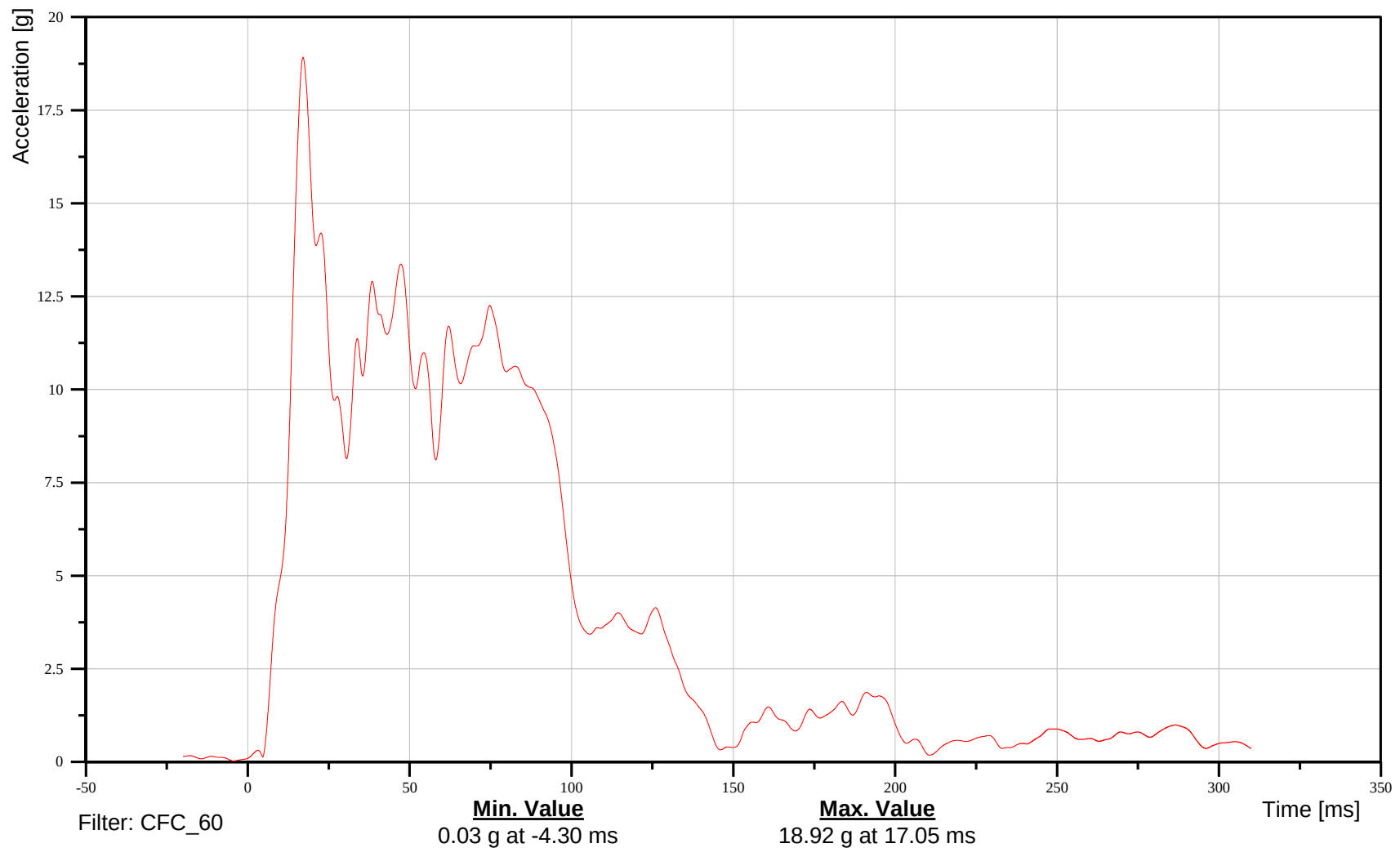
Time: 14:31

Customer: VRTC

11VEHCCG0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Floor Sill Y

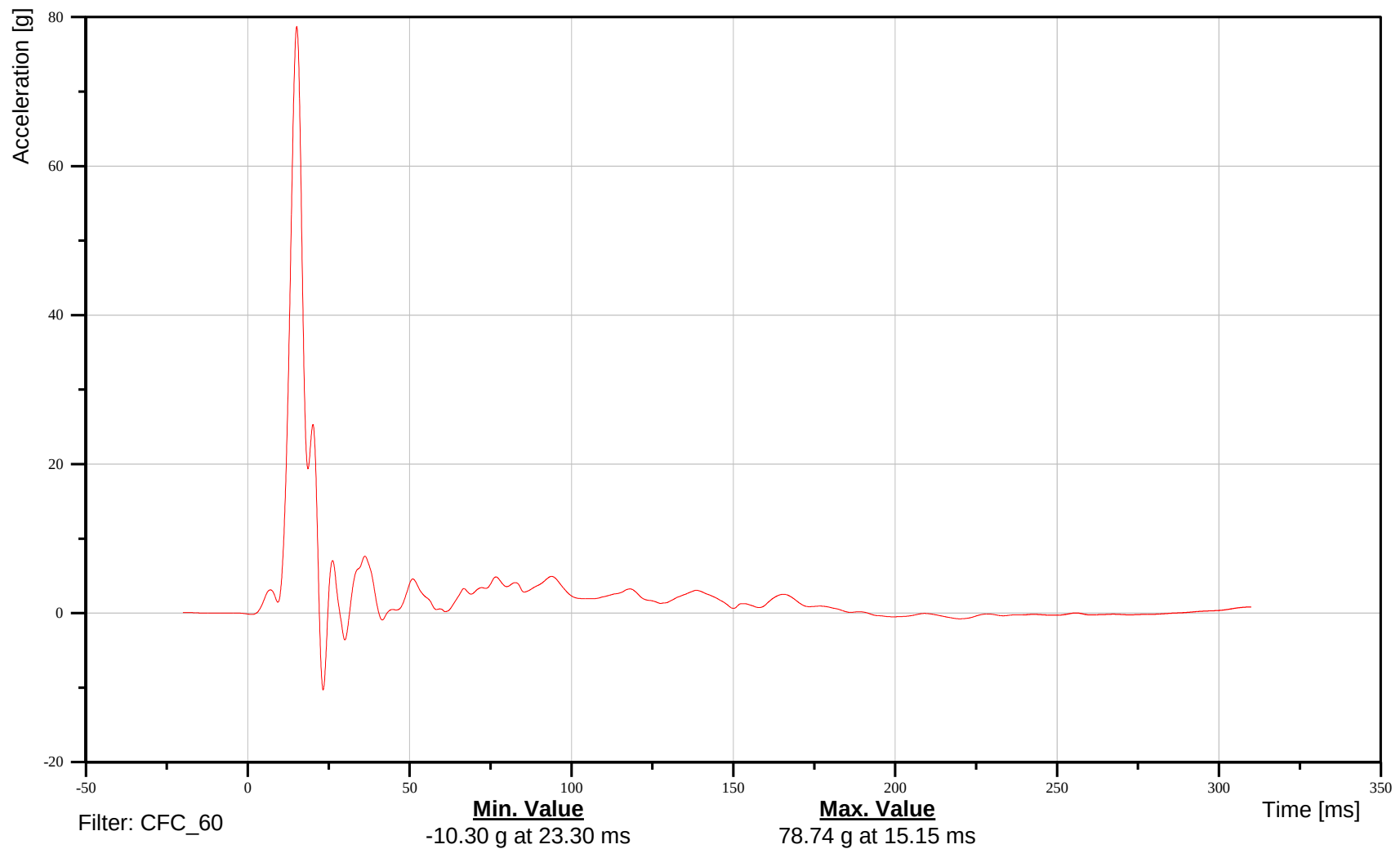
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11VEHC00LO00ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left A-Pillar Sill Y-Axis Acceleration

Date: 06/14/2016

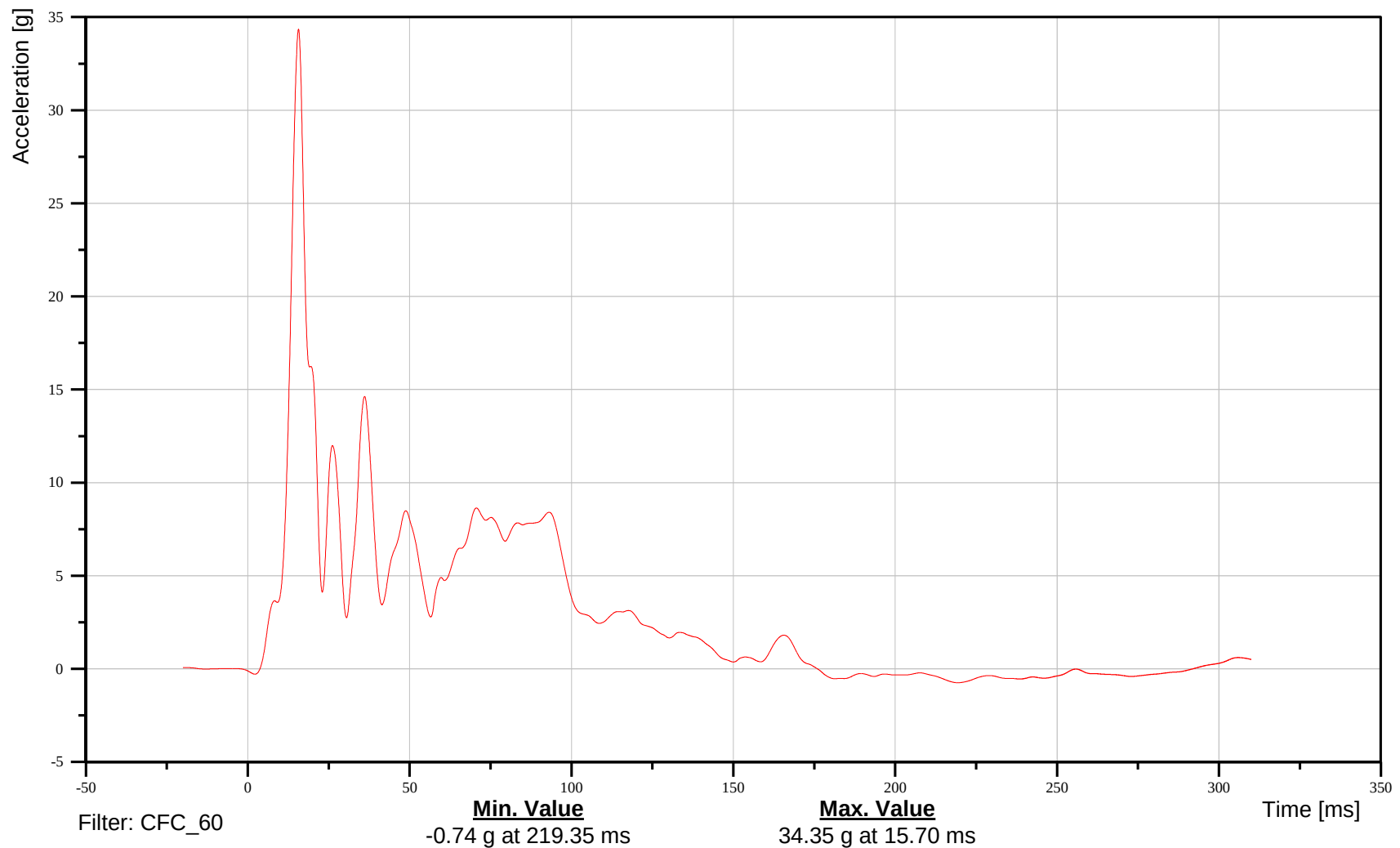
Time: 14:31

Customer: VRTC

11APIL000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Lower A-Pillar Y-Axis Acceleration

Date: 06/14/2016

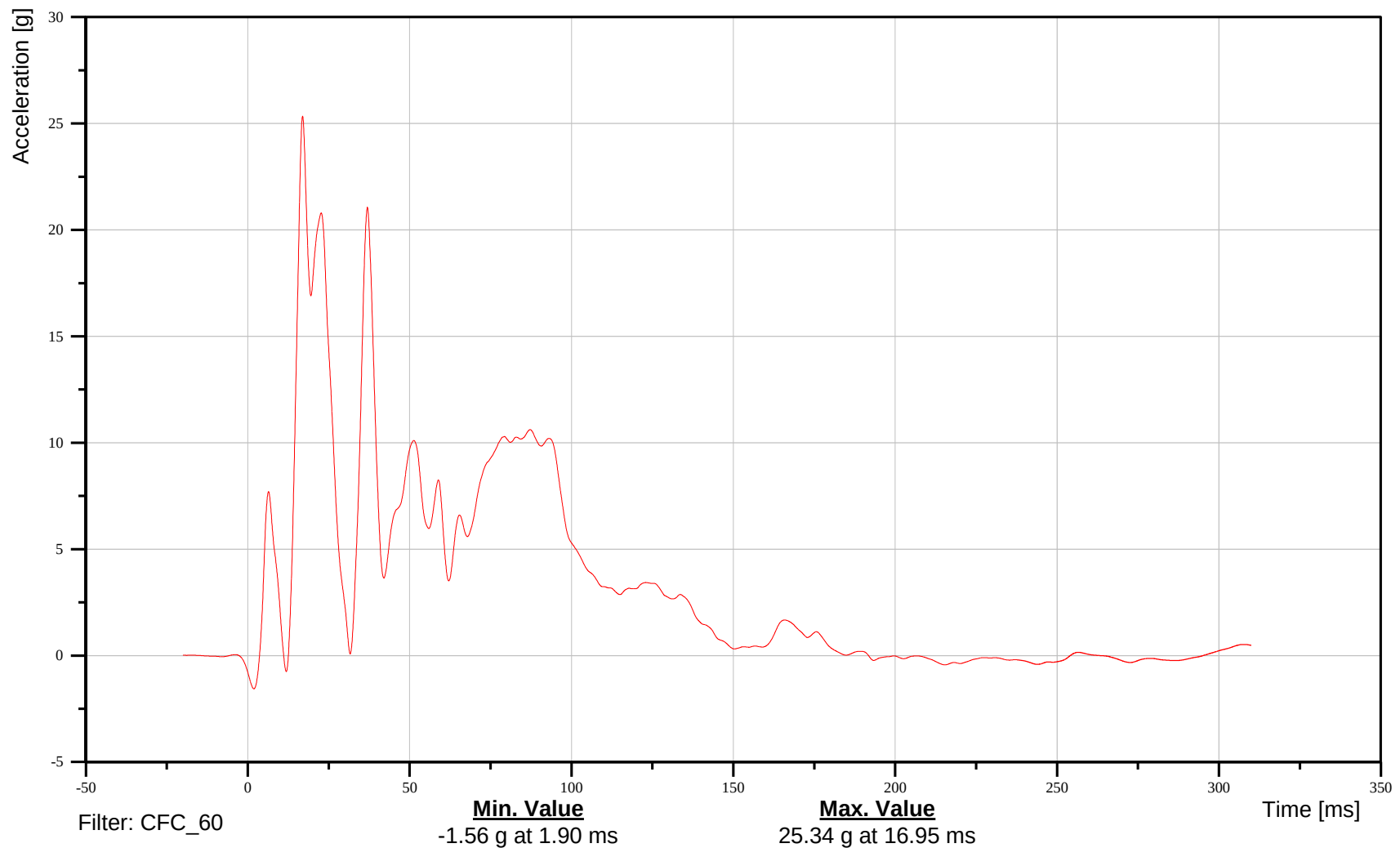
Time: 14:31

Customer: VRTC

11APILO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Mid A-Pillar Y-Axis Acceleration

Date: 06/14/2016

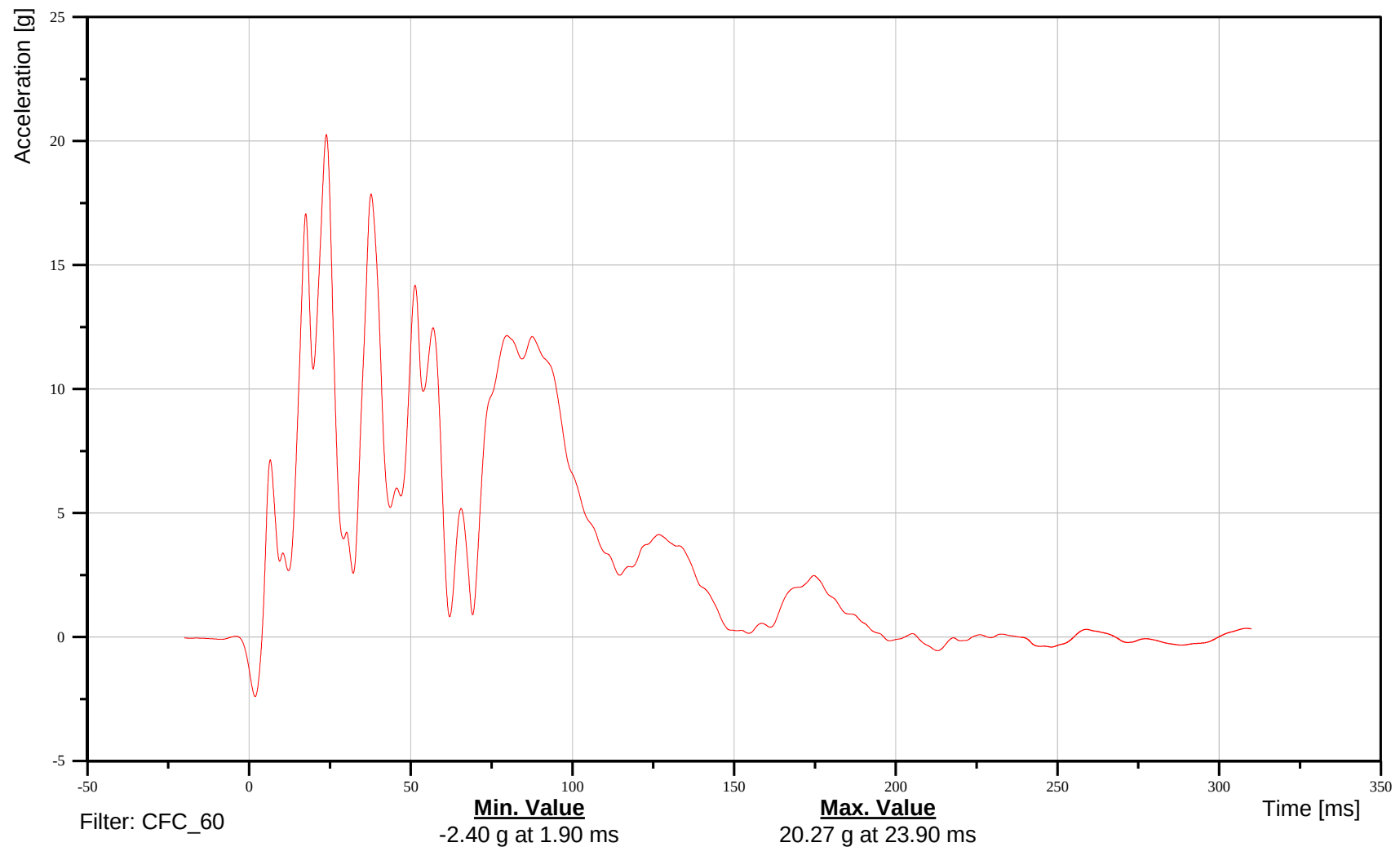
Time: 14:31

Customer: VRTC

11APILMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left B-Pillar Sill Y-Axis Acceleration

Date: 06/14/2016

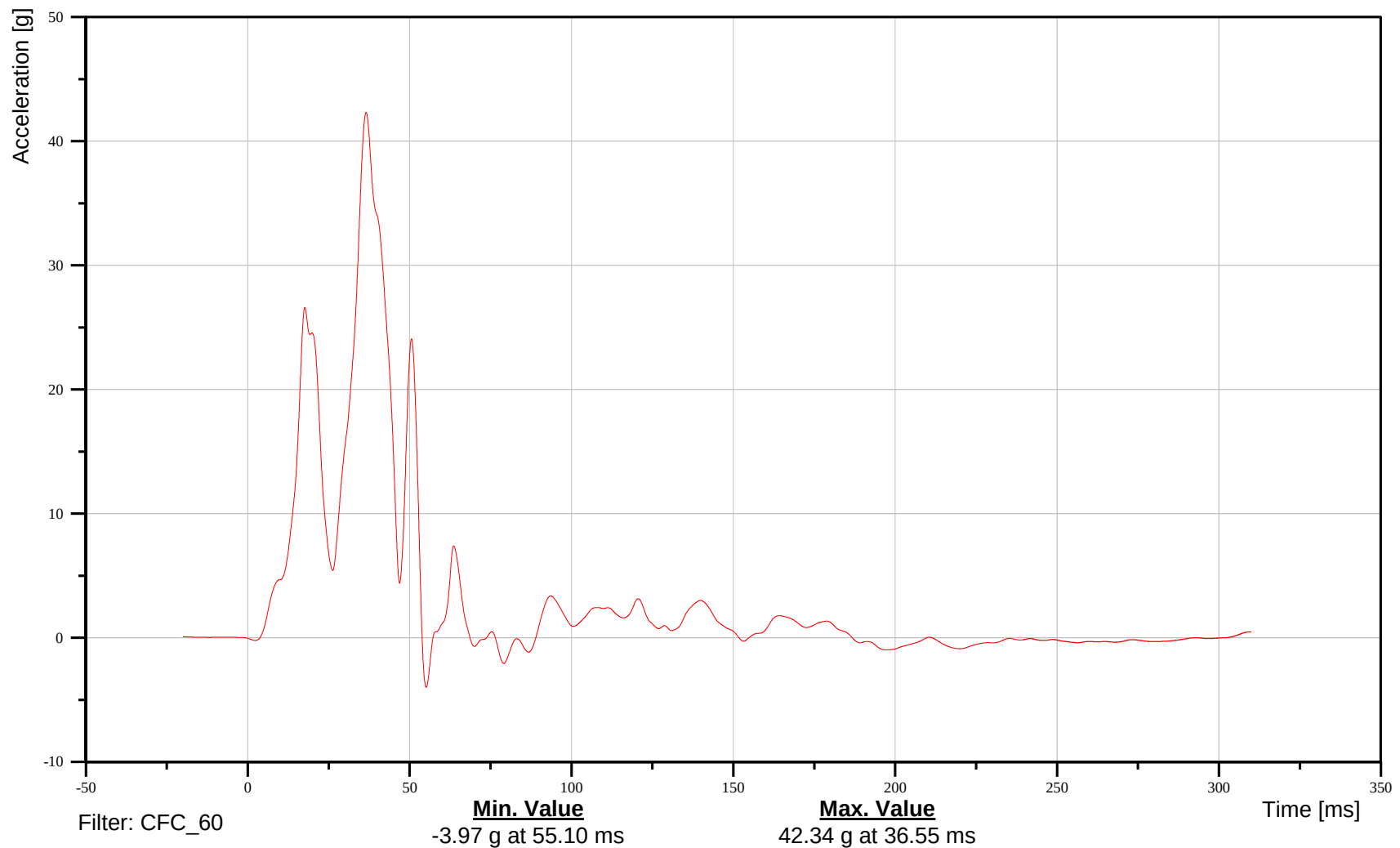
Time: 14:31

Customer: VRTC

11BPIL000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Lower B-Pillar Y-Axis Acceleration

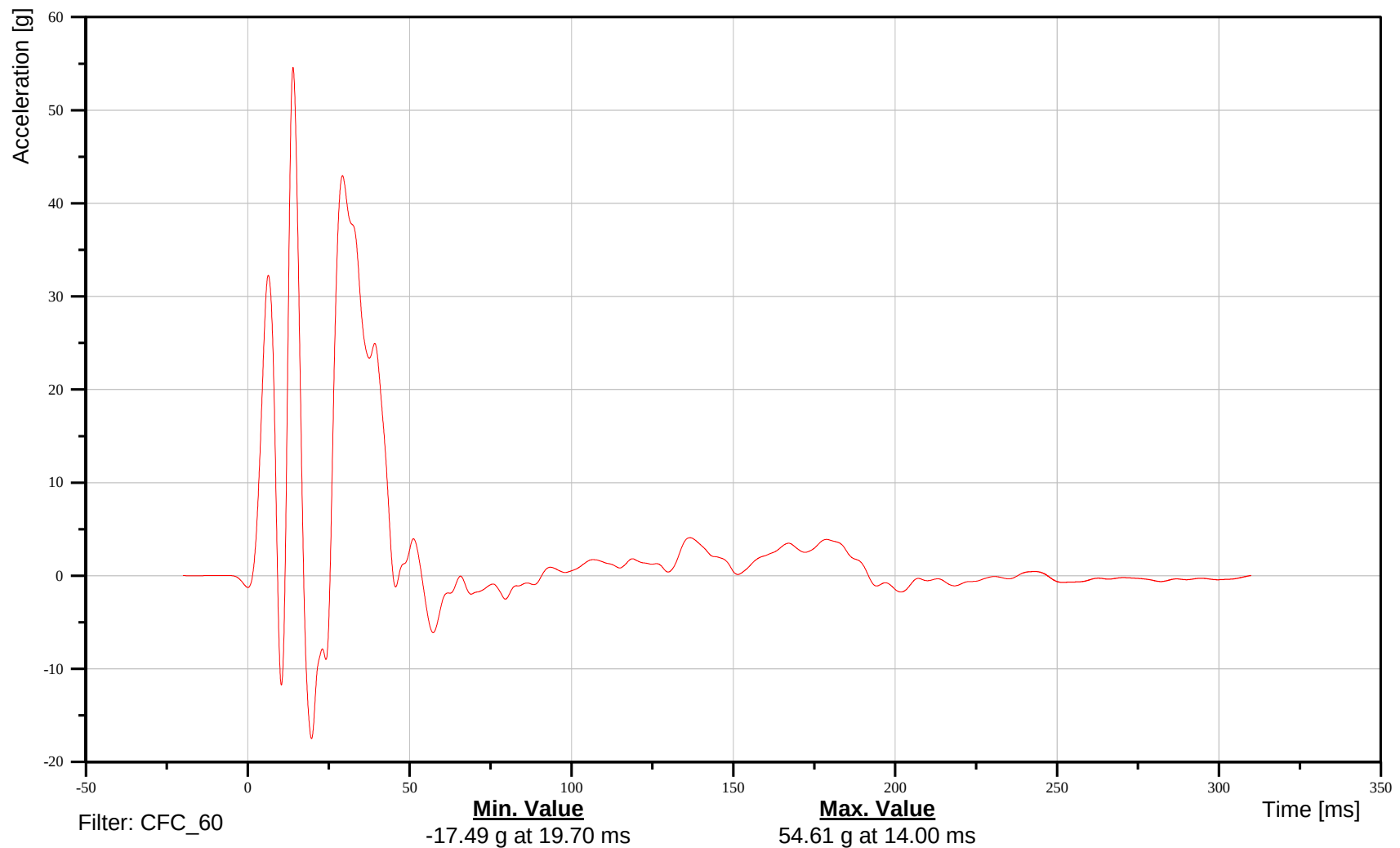
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11BPILLO0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Mid B-Pillar Y-Axis Acceleration

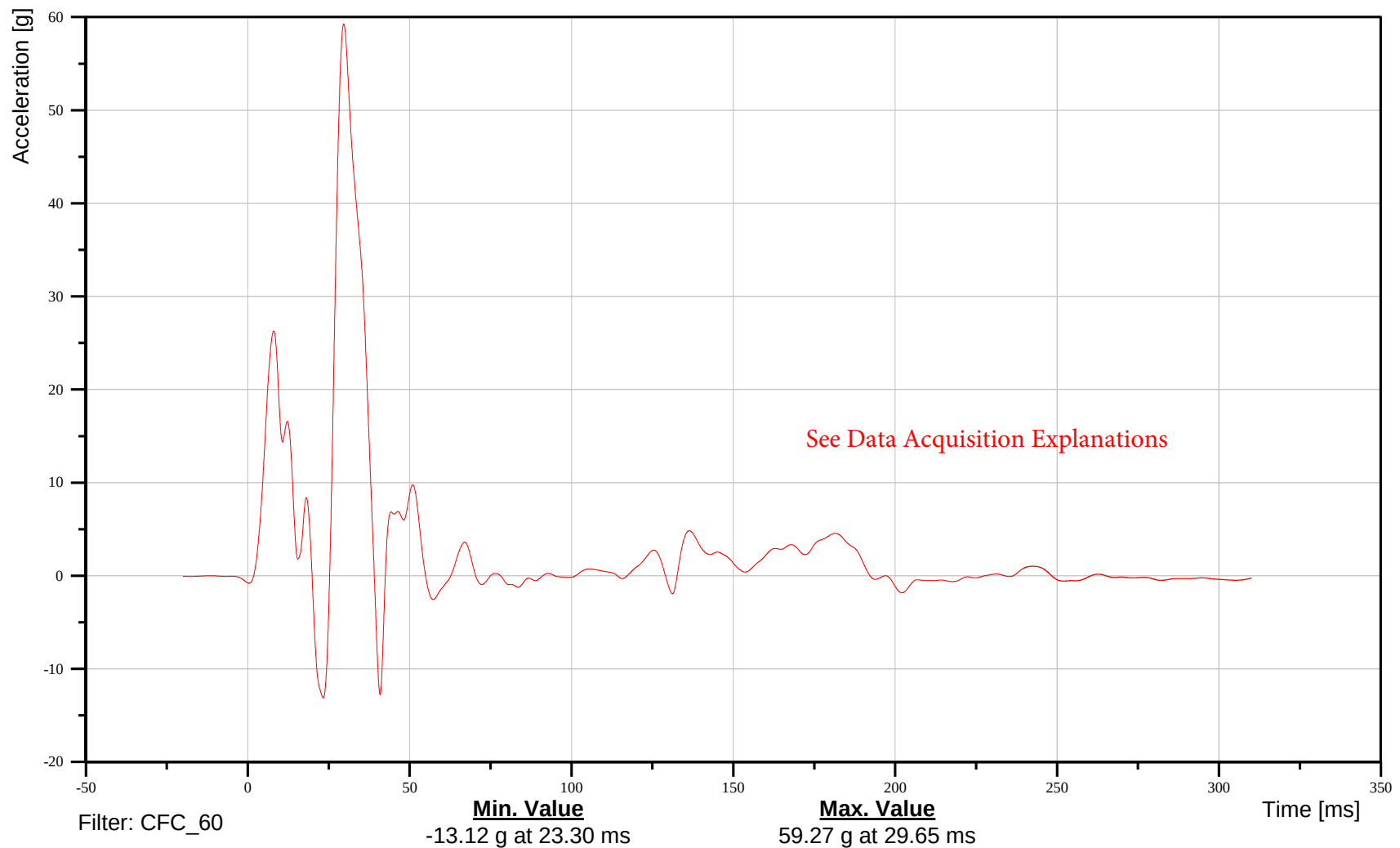
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11BPILMI0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Driver Seat Track at Dummy H-Point Y-Axis Acceleration

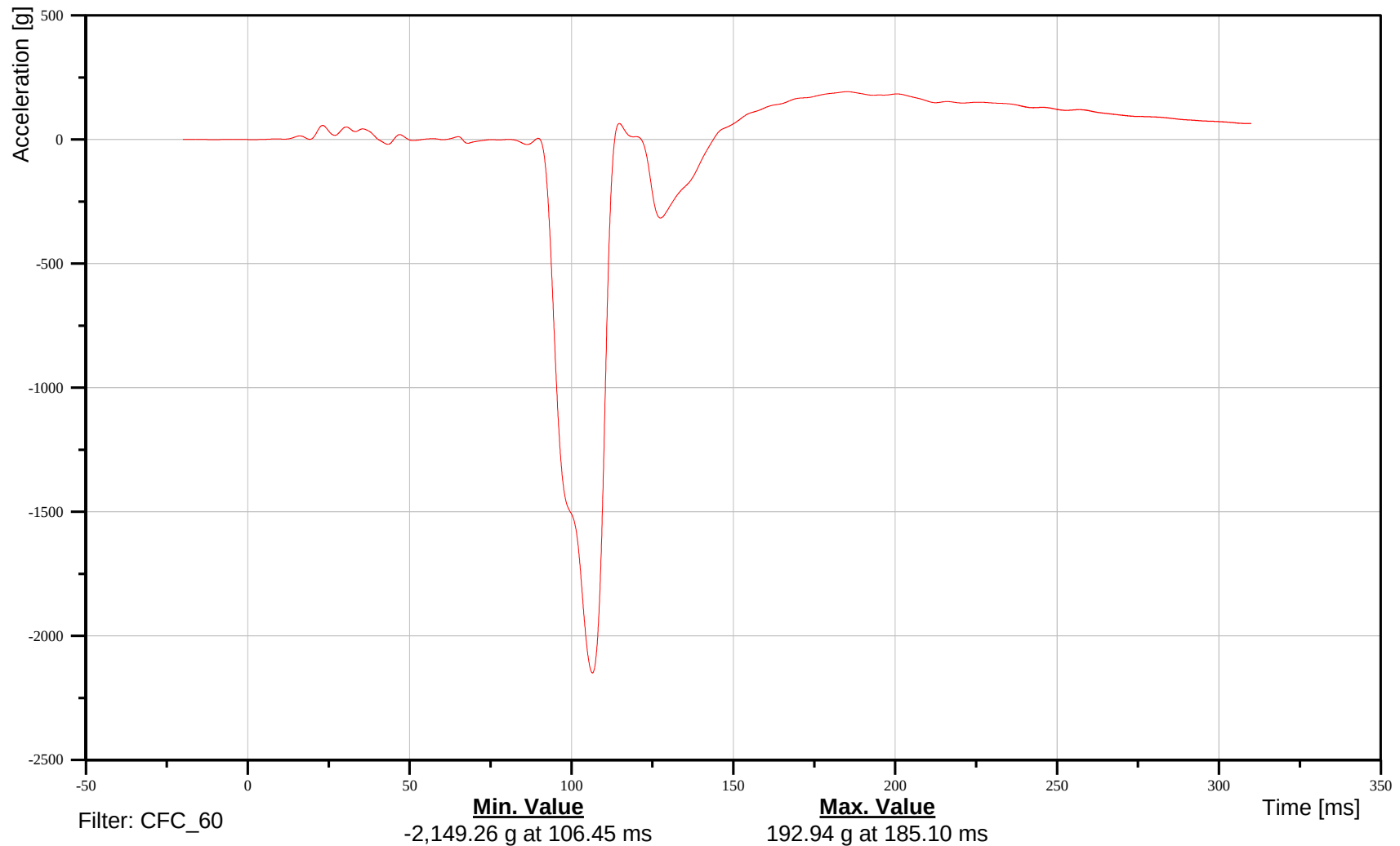
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SETR000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Engine Top X-Axis Acceleration

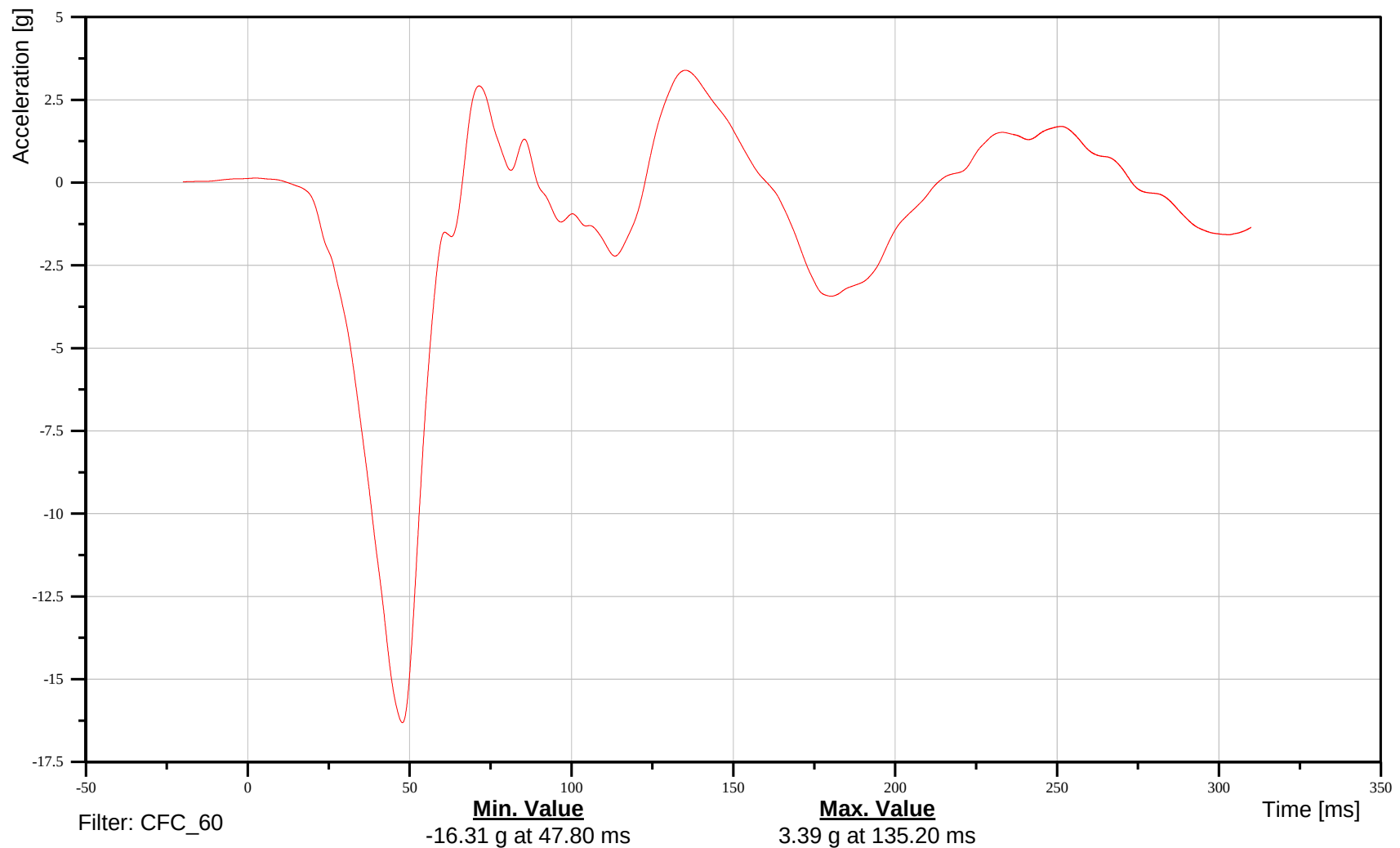
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11ENGNTTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Engine Top Y-Axis Acceleration

Date: 06/14/2016

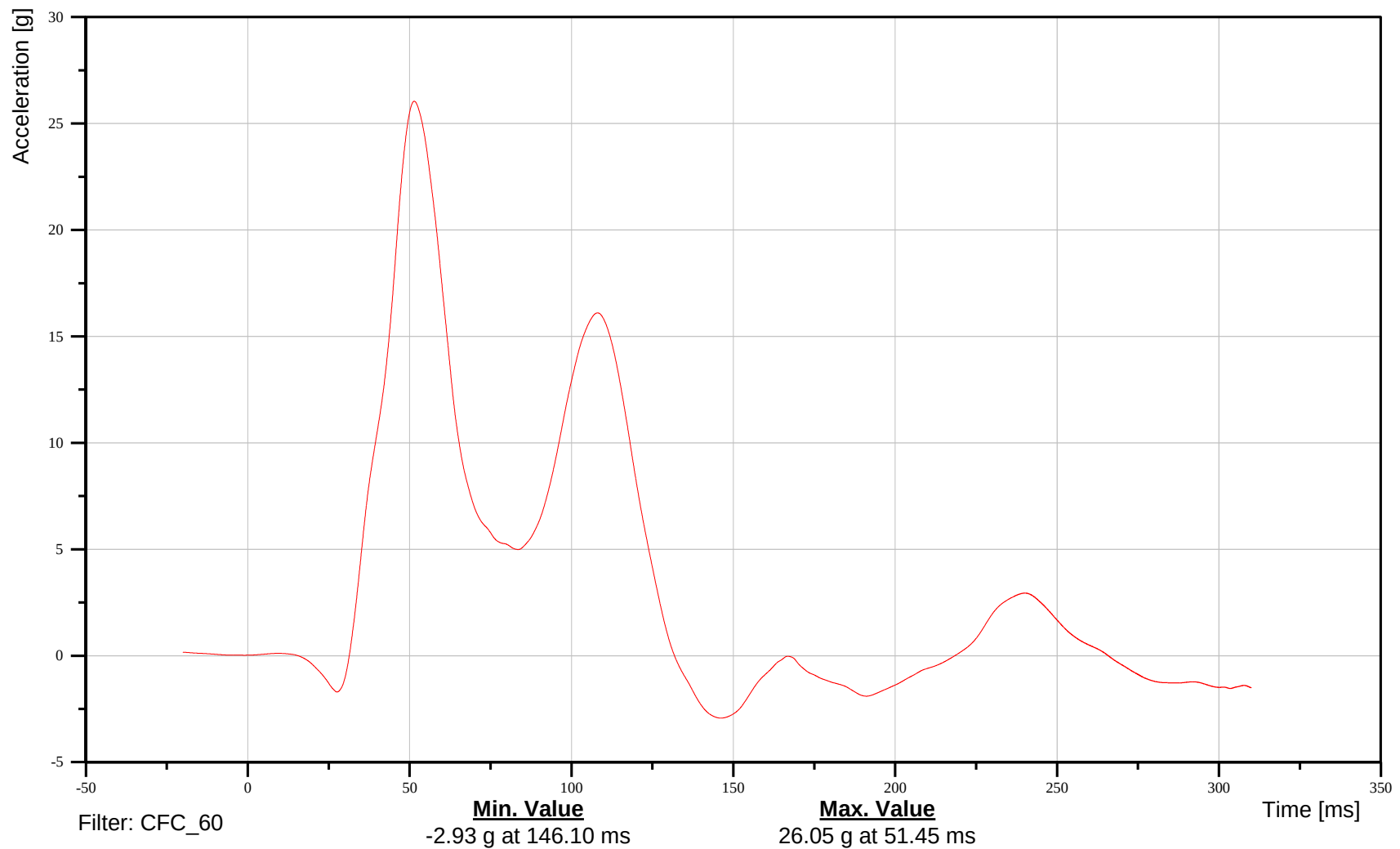
Time: 14:31

Customer: VRTC

11ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Firewall Center Y-Axis Acceleration

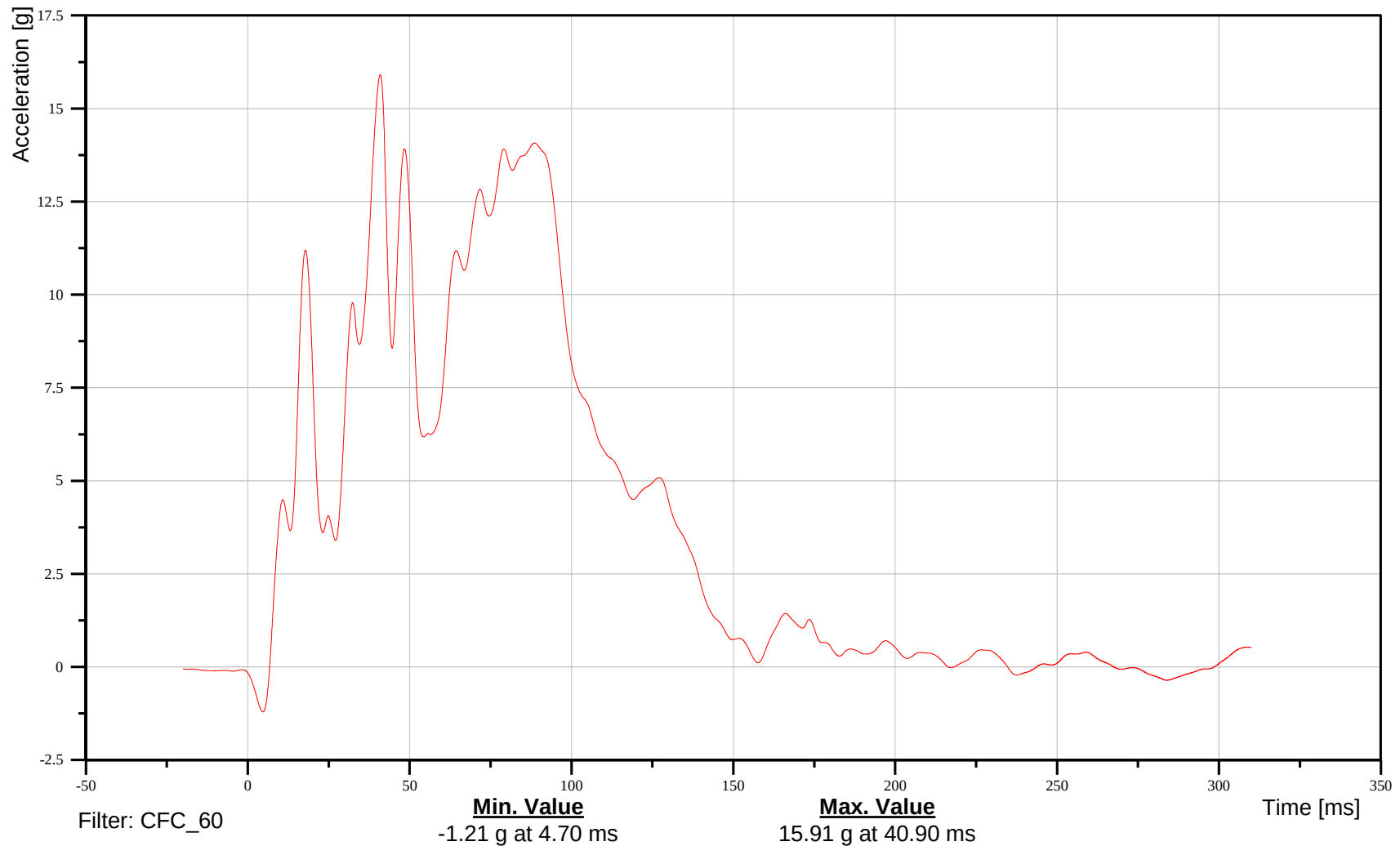
Date: 06/14/2016
Time: 14:31

Customer: VRTC

12FIRCX00000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Right Roof at Vertical Impact Reference Line Y-Axis Acceleration

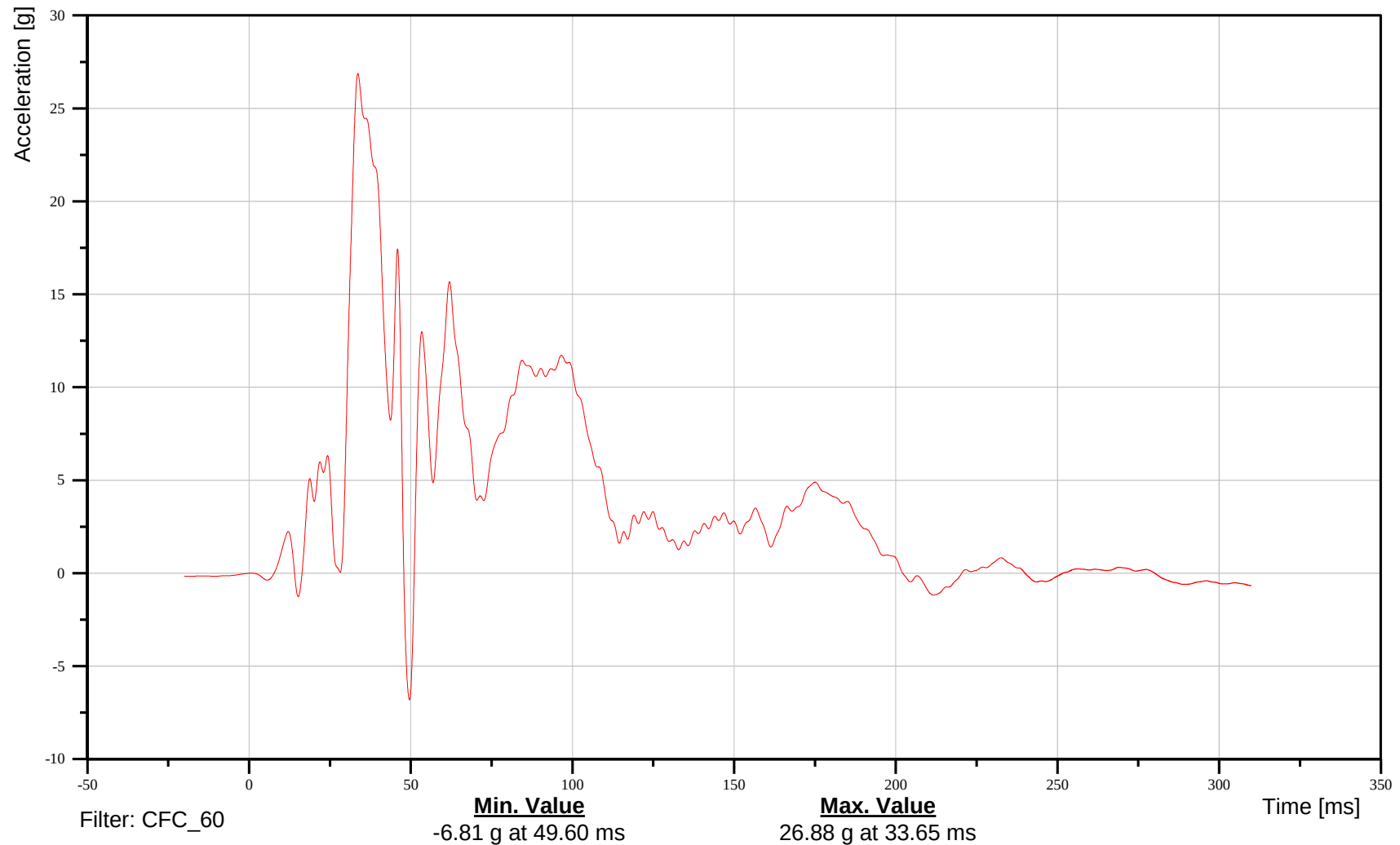
Date: 06/14/2016
Time: 14:31

Customer: VRTC

13ROFR000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

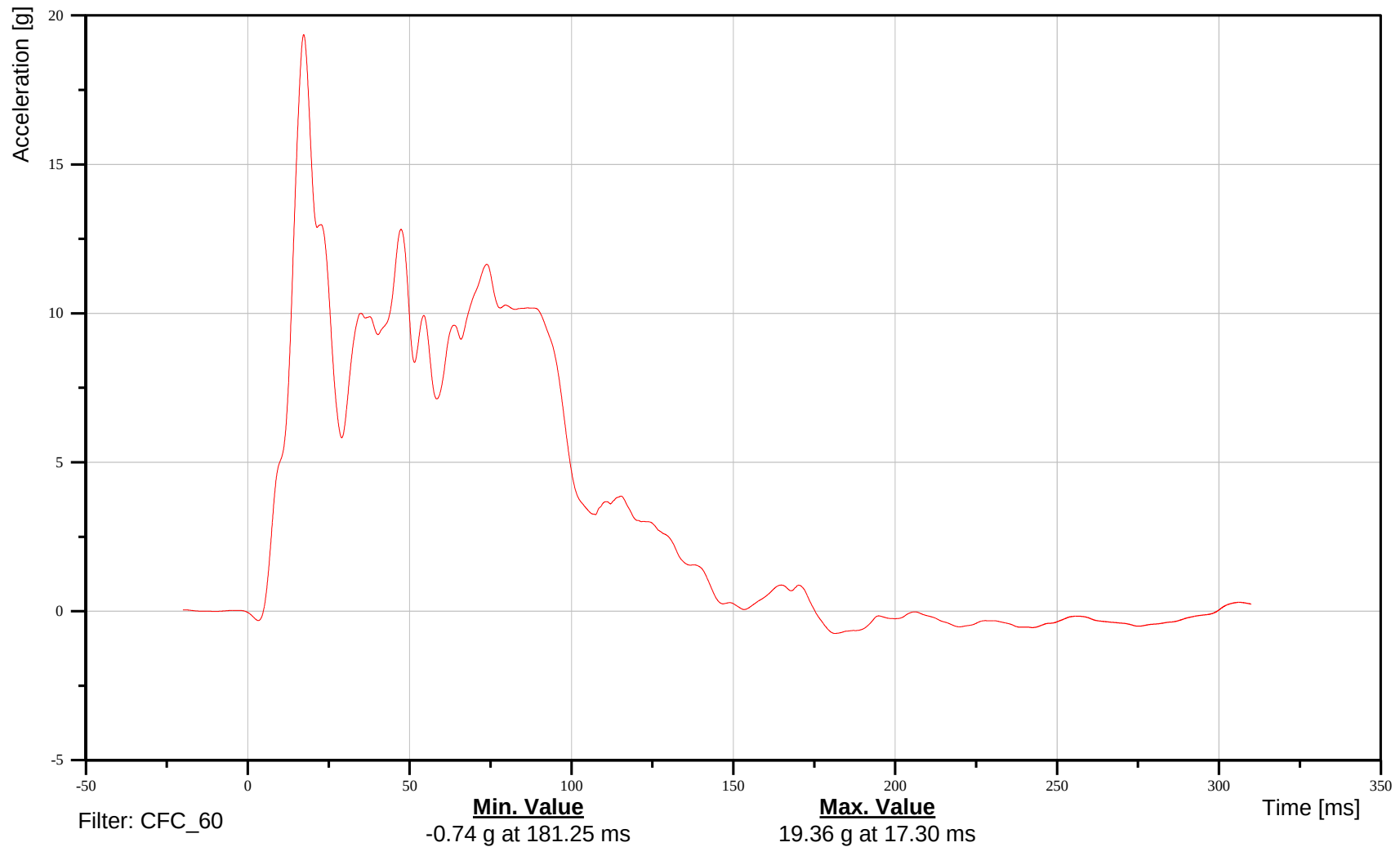
Right Sill at Vertical Impact Reference Line Y-Axis Acceleration

Date: 06/14/2016
Time: 14:31

Customer: VRTC

13SILB000000ACYD

TRC Inc. Test Lab: CTF
Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Date: 06/14/2016
Time: 14:31

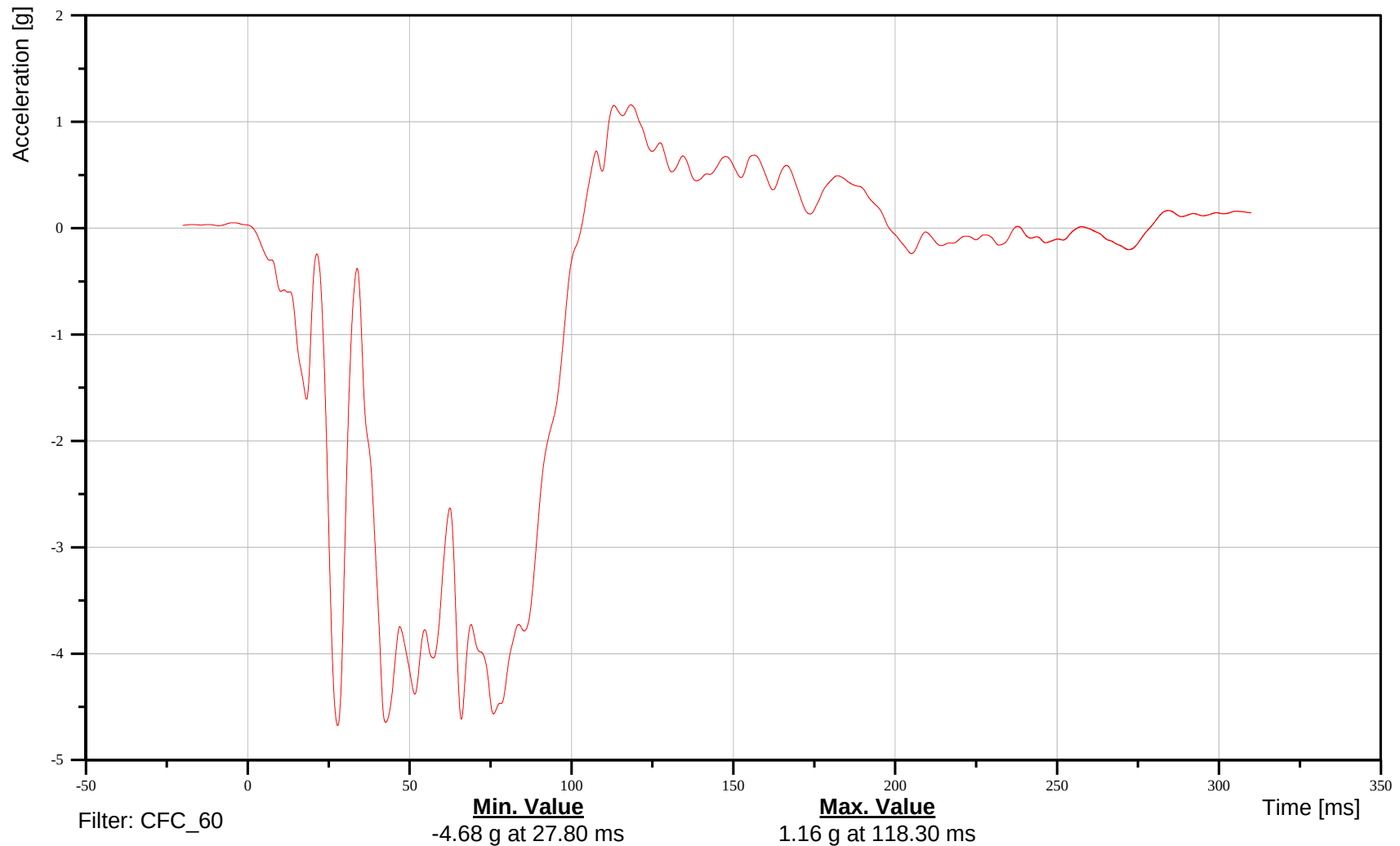
Rear Floorpan Behind Rear Axle at Centerline Acceleration X-Axis Acceleration

Customer: VRTC

11FORA000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Front Door Mid Centerline (Y)

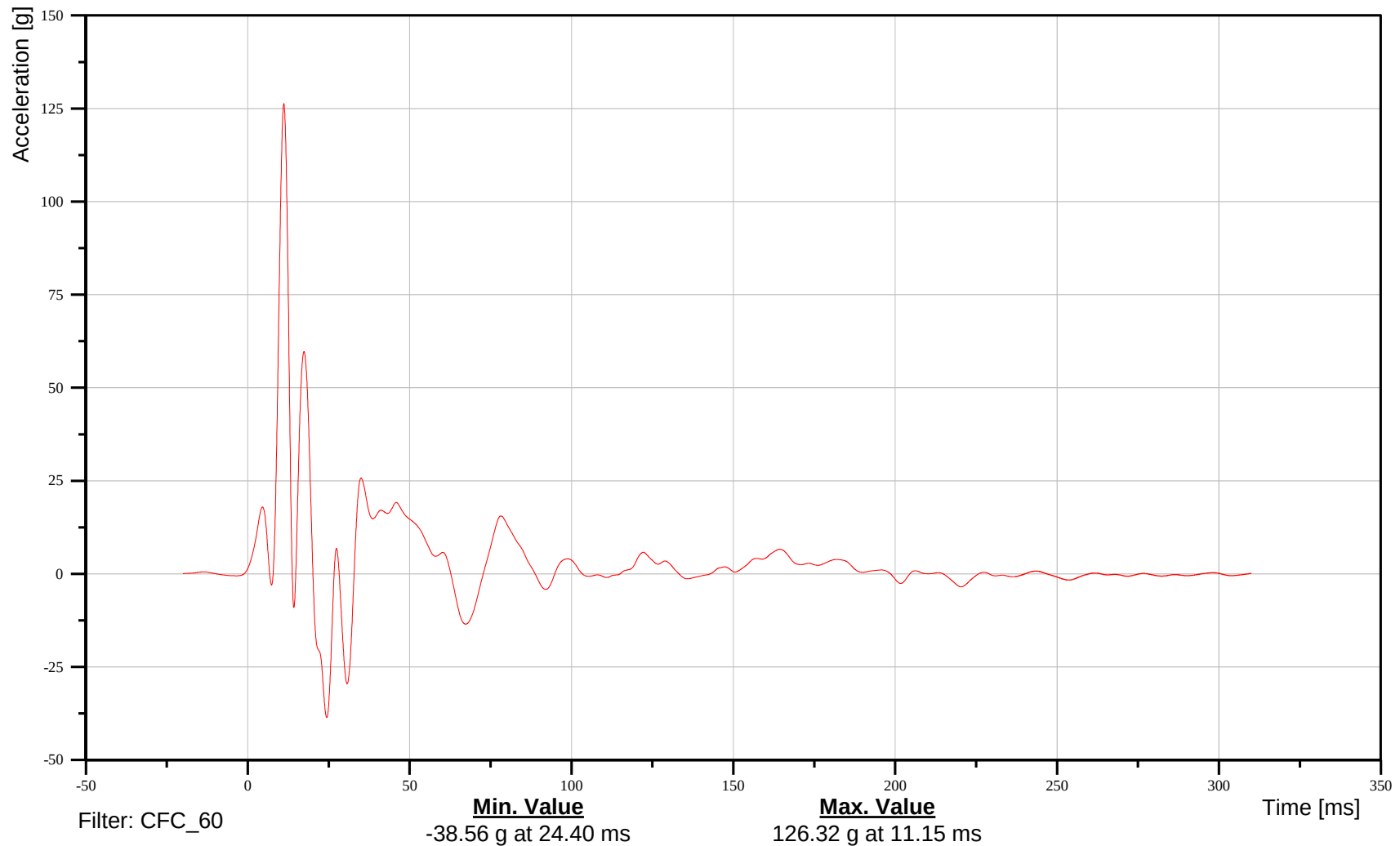
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11DOORMIMI71ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Front Door Mid Rear (Y)

Date: 06/14/2016

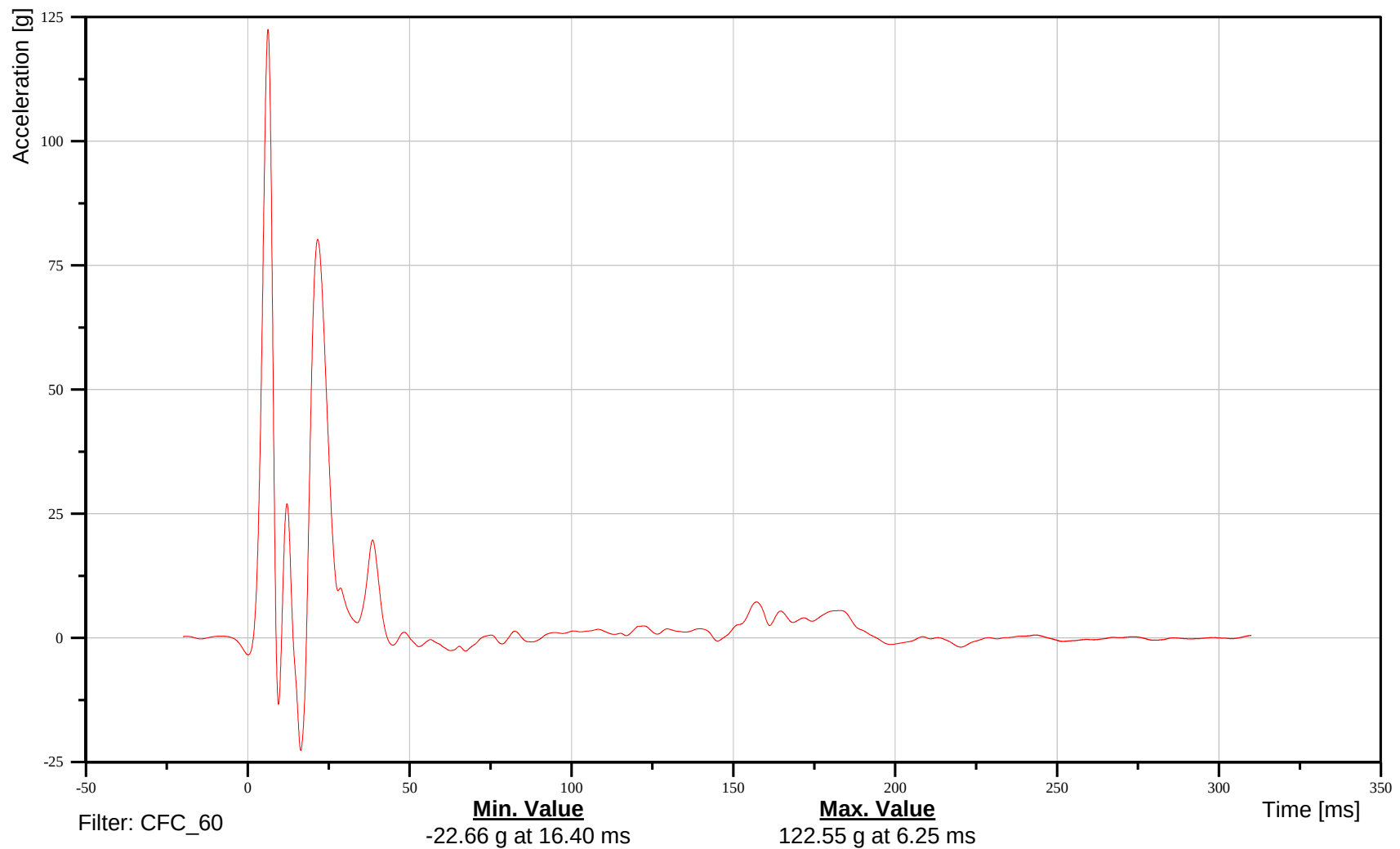
Time: 14:31

Customer: VRTC

11DOORMIRE71ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Front Door Upper Centerline (Y)

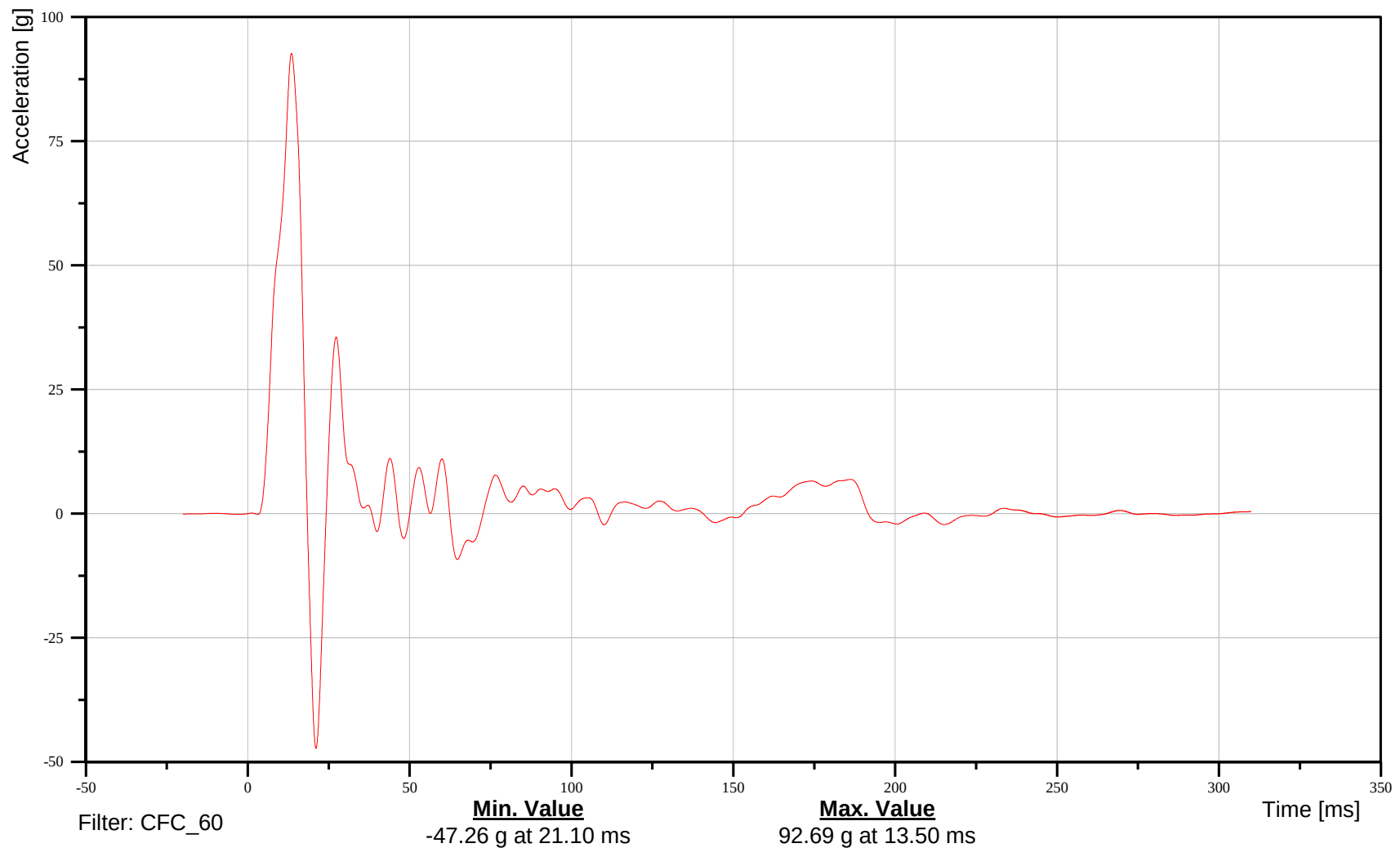
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11DOORMIUP71ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Rear Door Mid Rear (Y)

Date: 06/14/2016

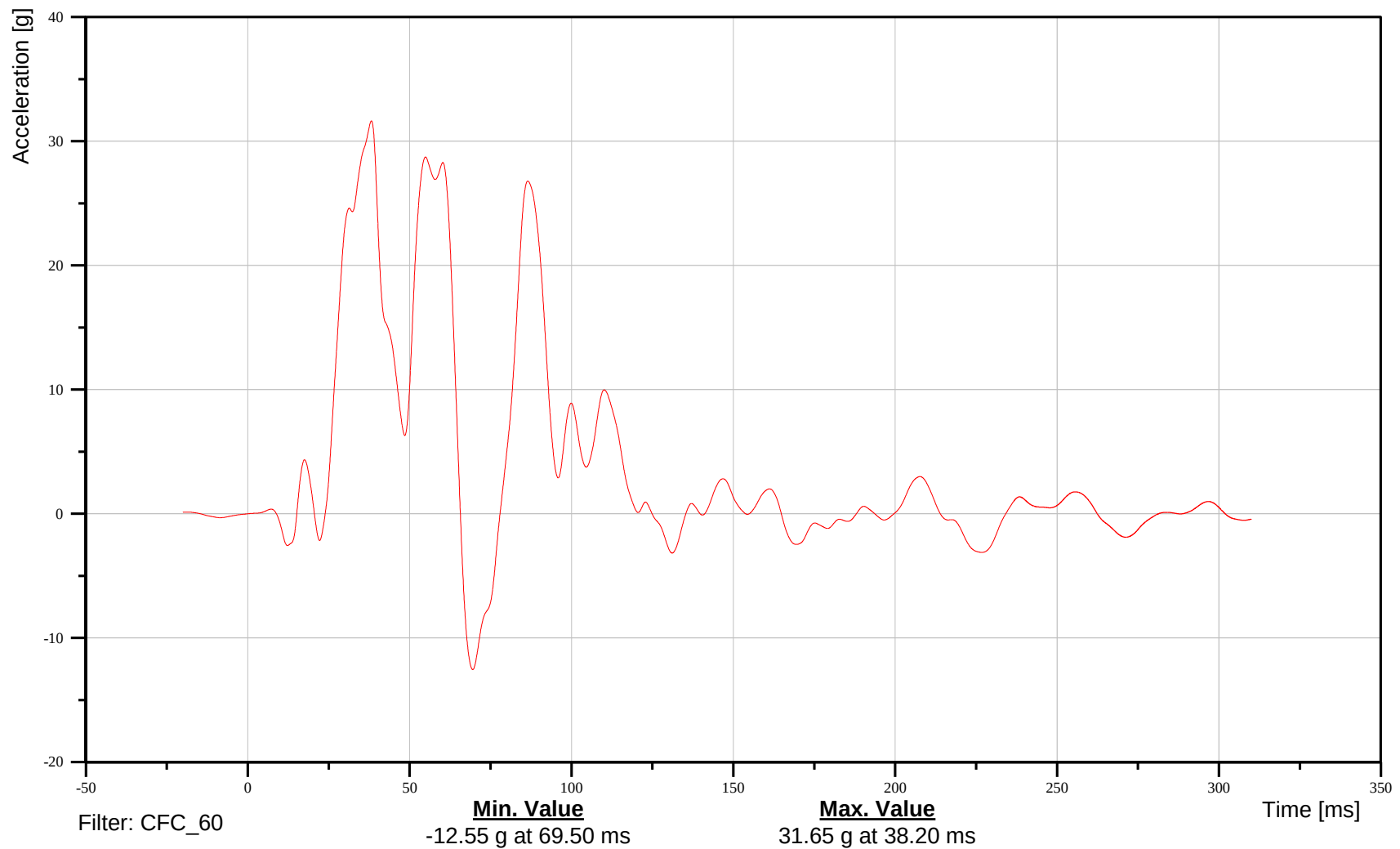
Time: 14:31

Customer: VRTC

14DOORMIRE71ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Left Rear Door Upper Centerline (Y)

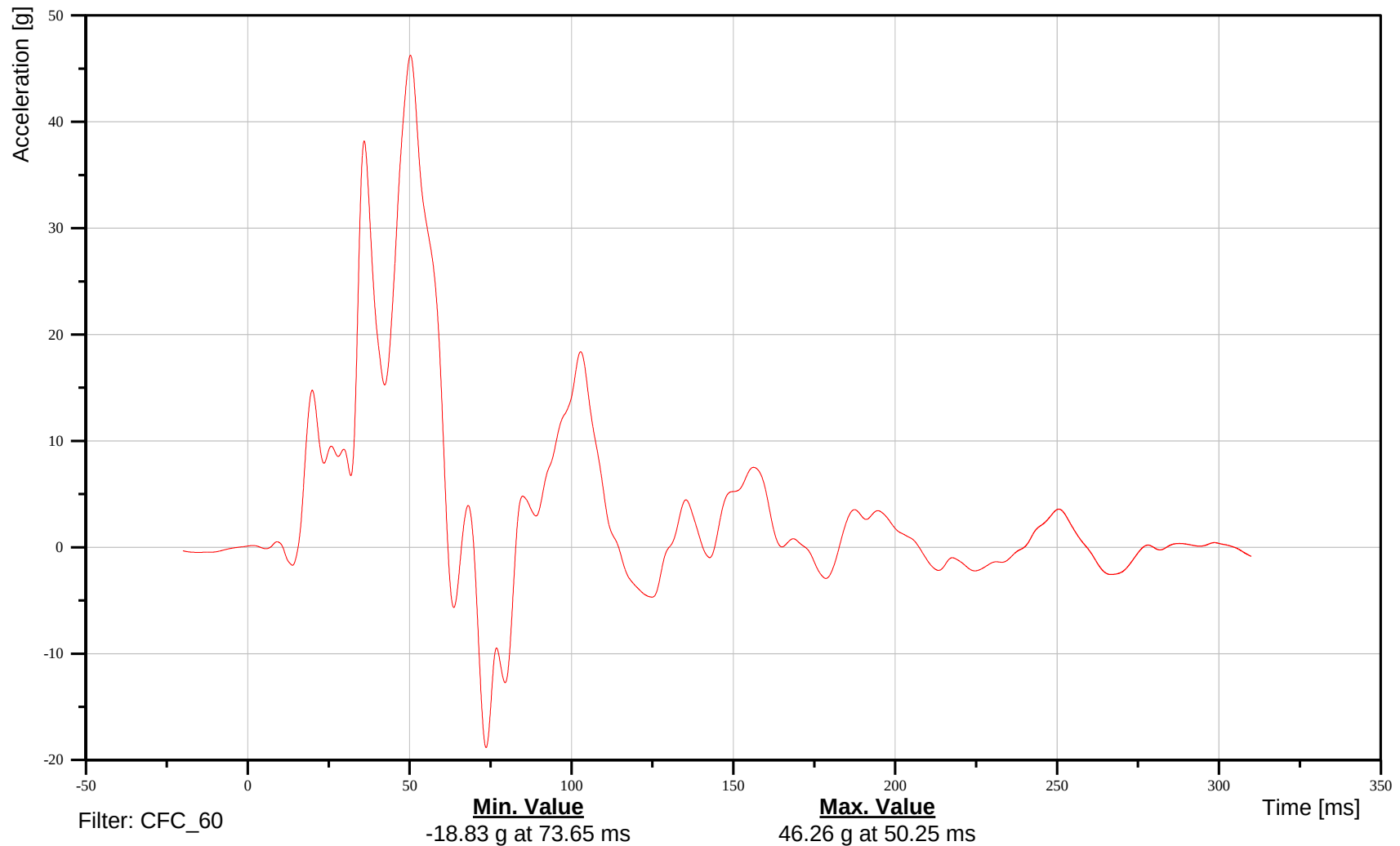
Date: 06/14/2016
Time: 14:31

Customer: VRTC

14DOORMIUP71ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Date: 06/14/2016
Time: 14:31

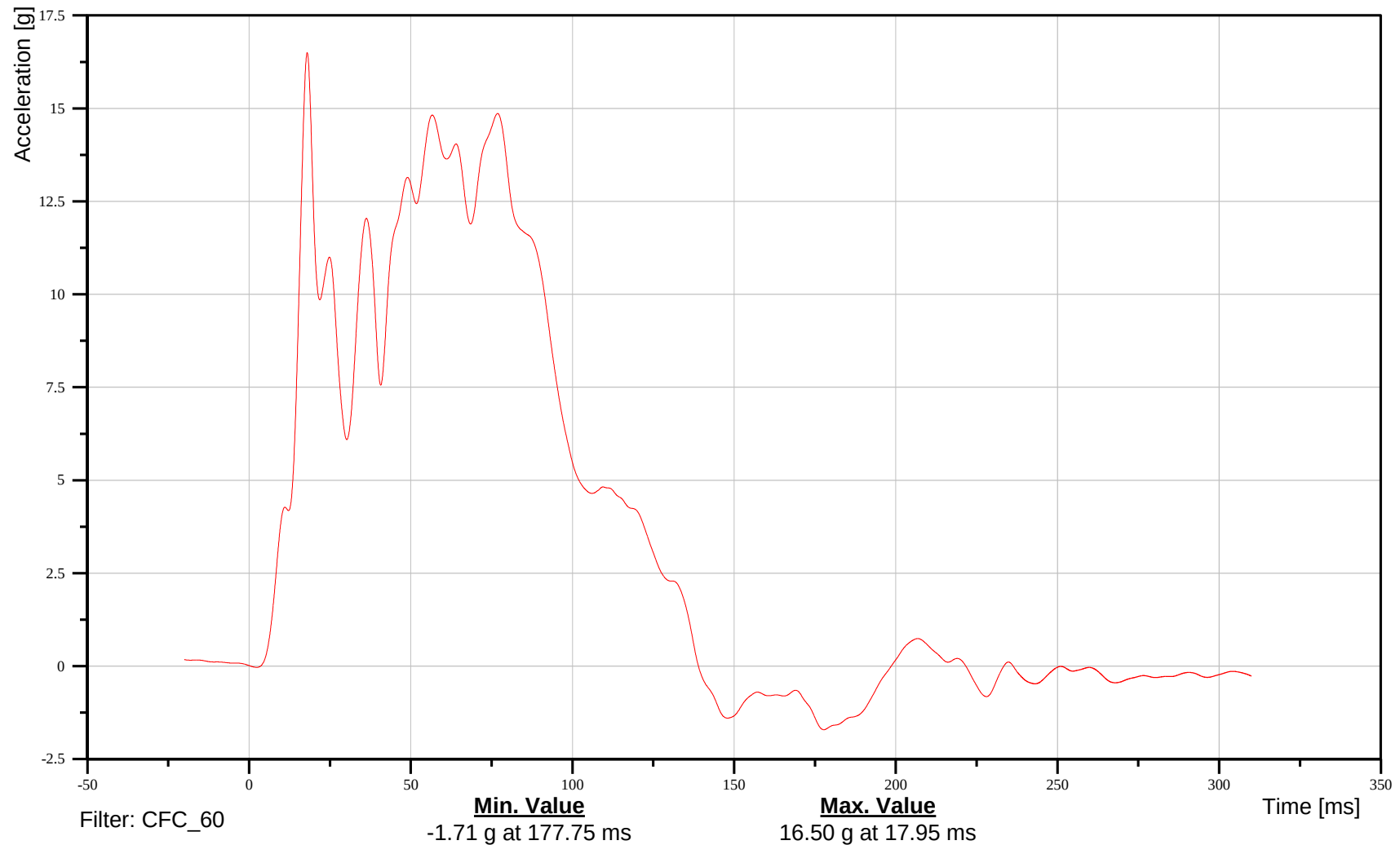
Rear Floorpan Behind Rear Axle at Centerline Acceleration Y-Axis Acceleration

Customer: VRTC

11FORA000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Head Contact

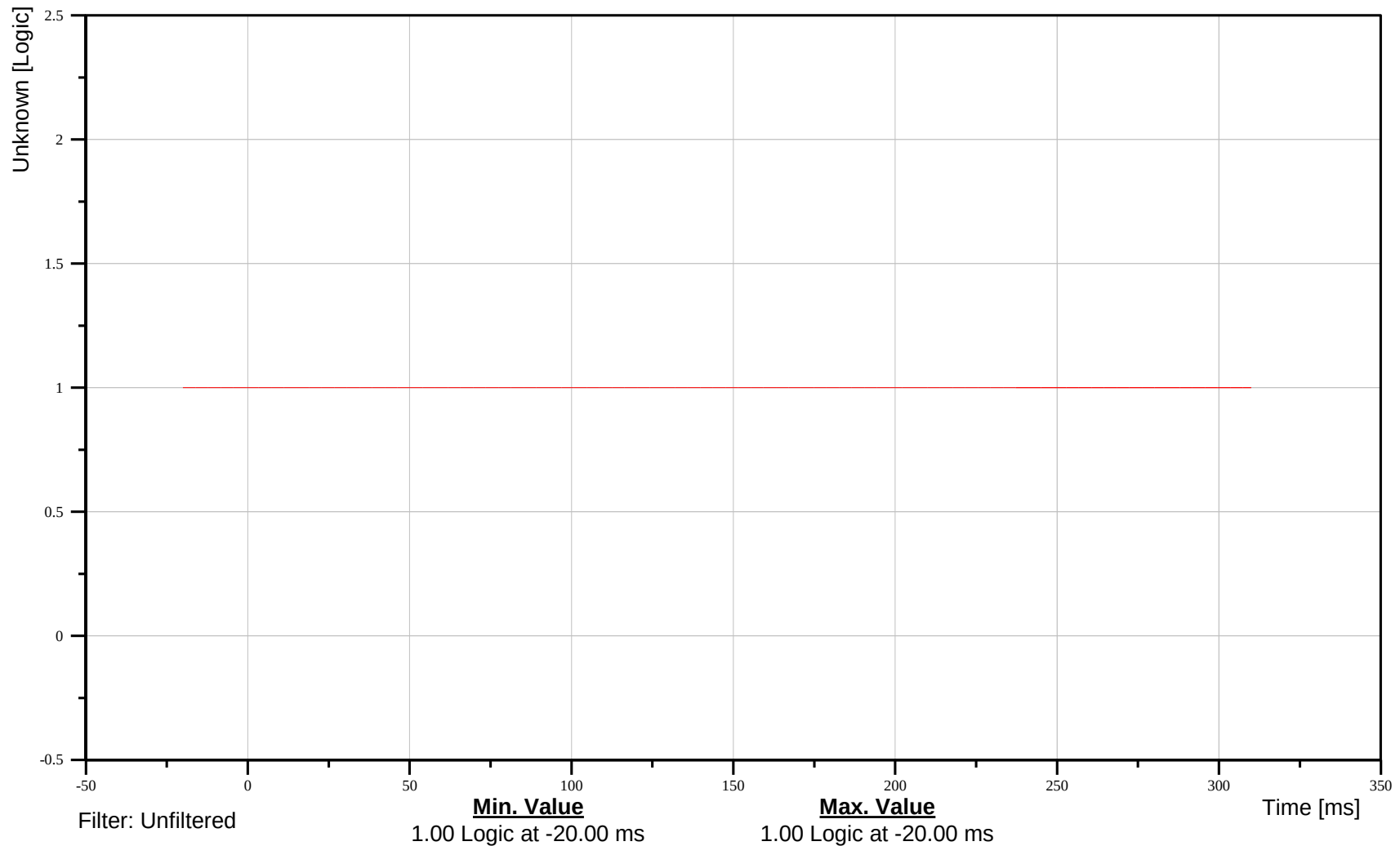
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11HEAD000000EV00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Shoulder Contact

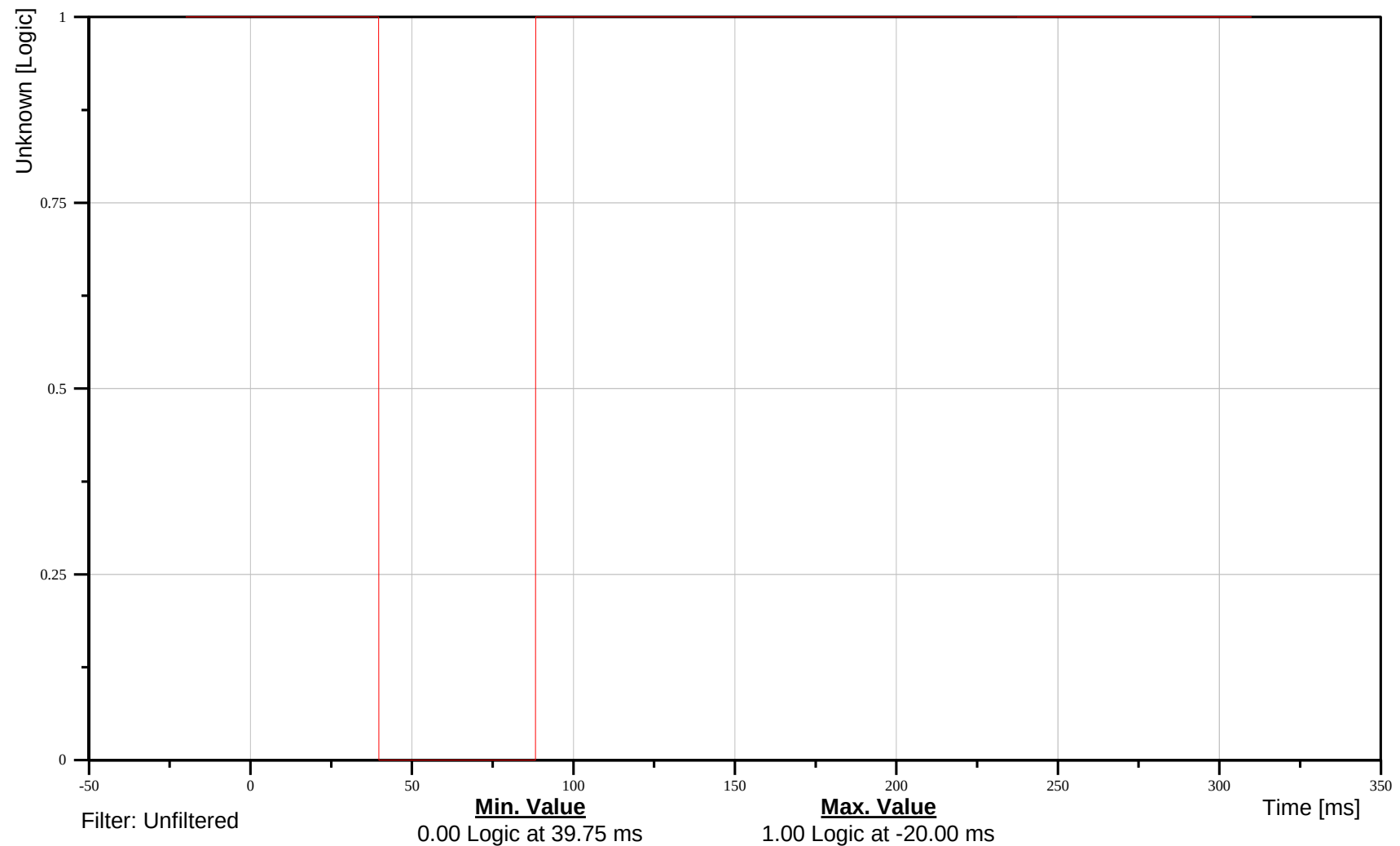
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11SHLD000000EV00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Thorax Contact

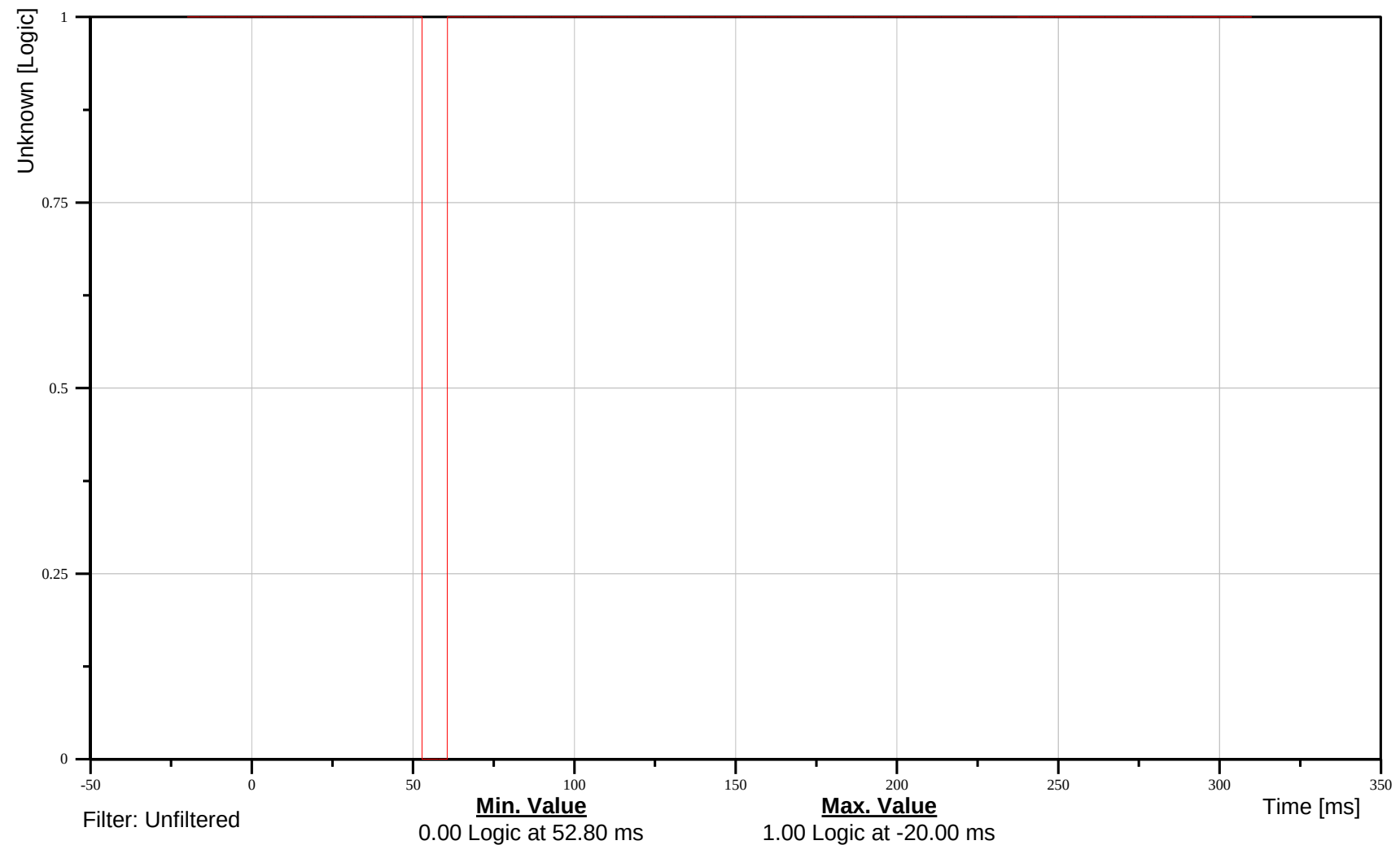
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11TRRI000000EV00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

Pelvis Contact

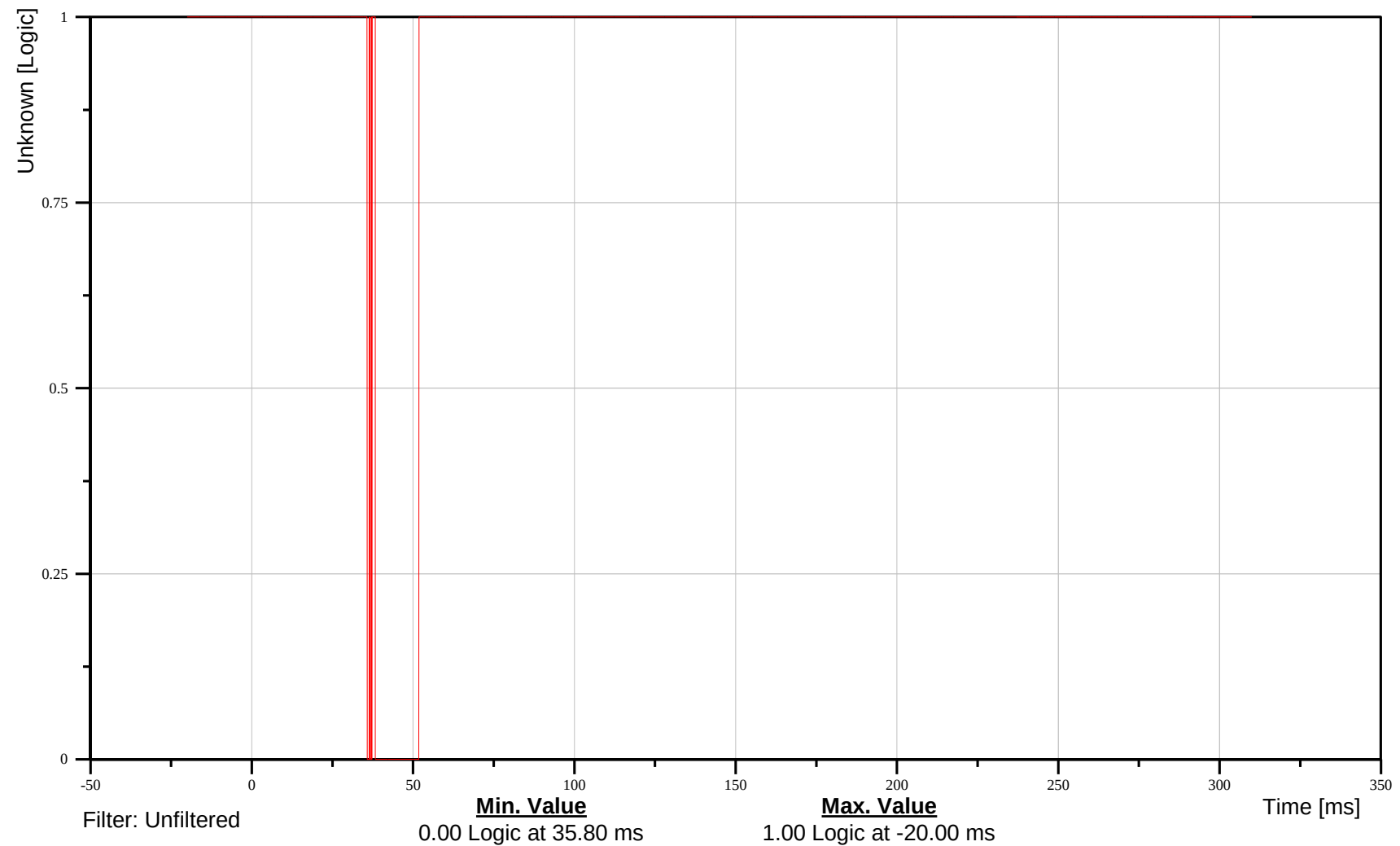
Date: 06/14/2016
Time: 14:31

Customer: VRTC

11PELV000000EV00

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 1

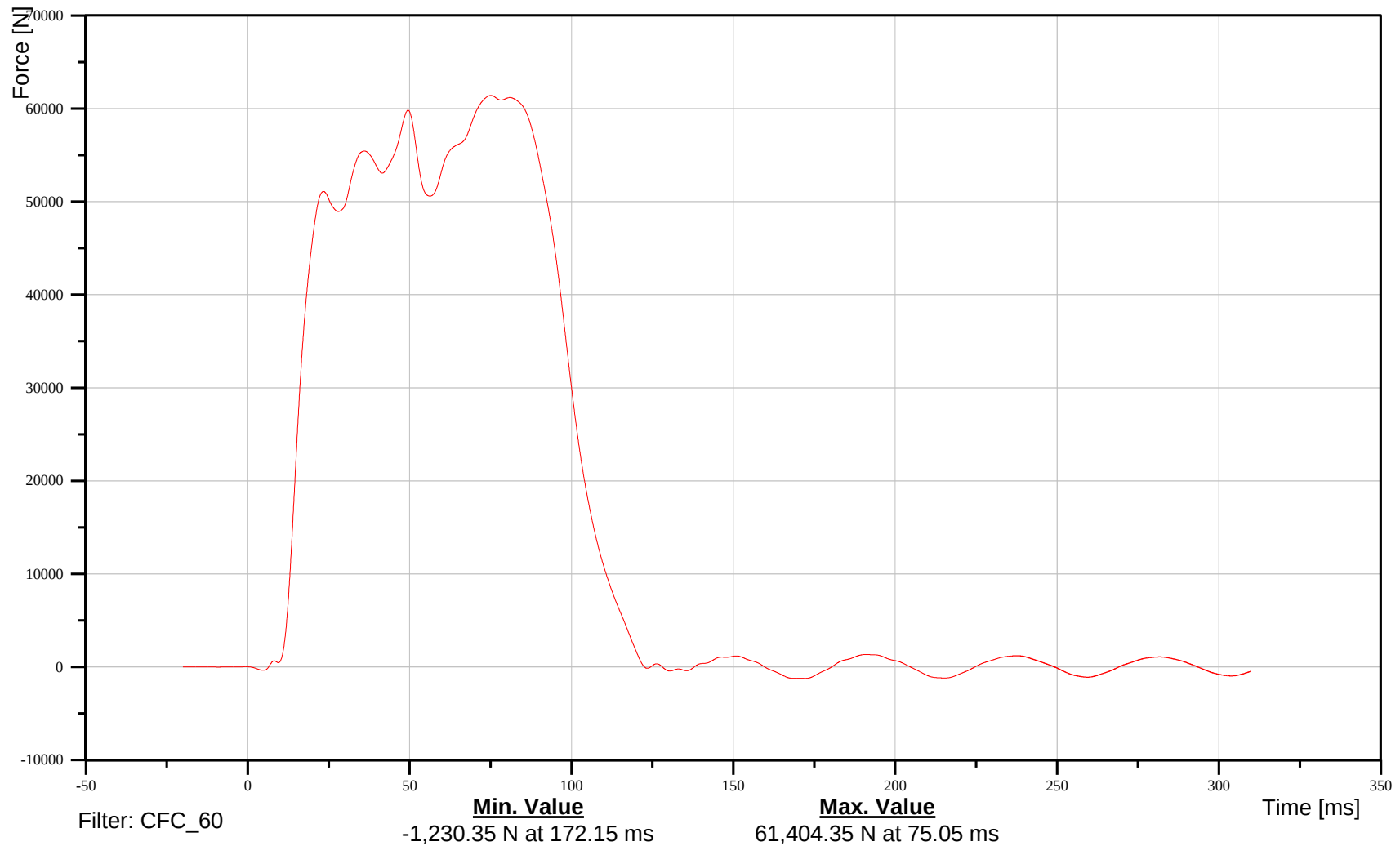
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR010000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 2

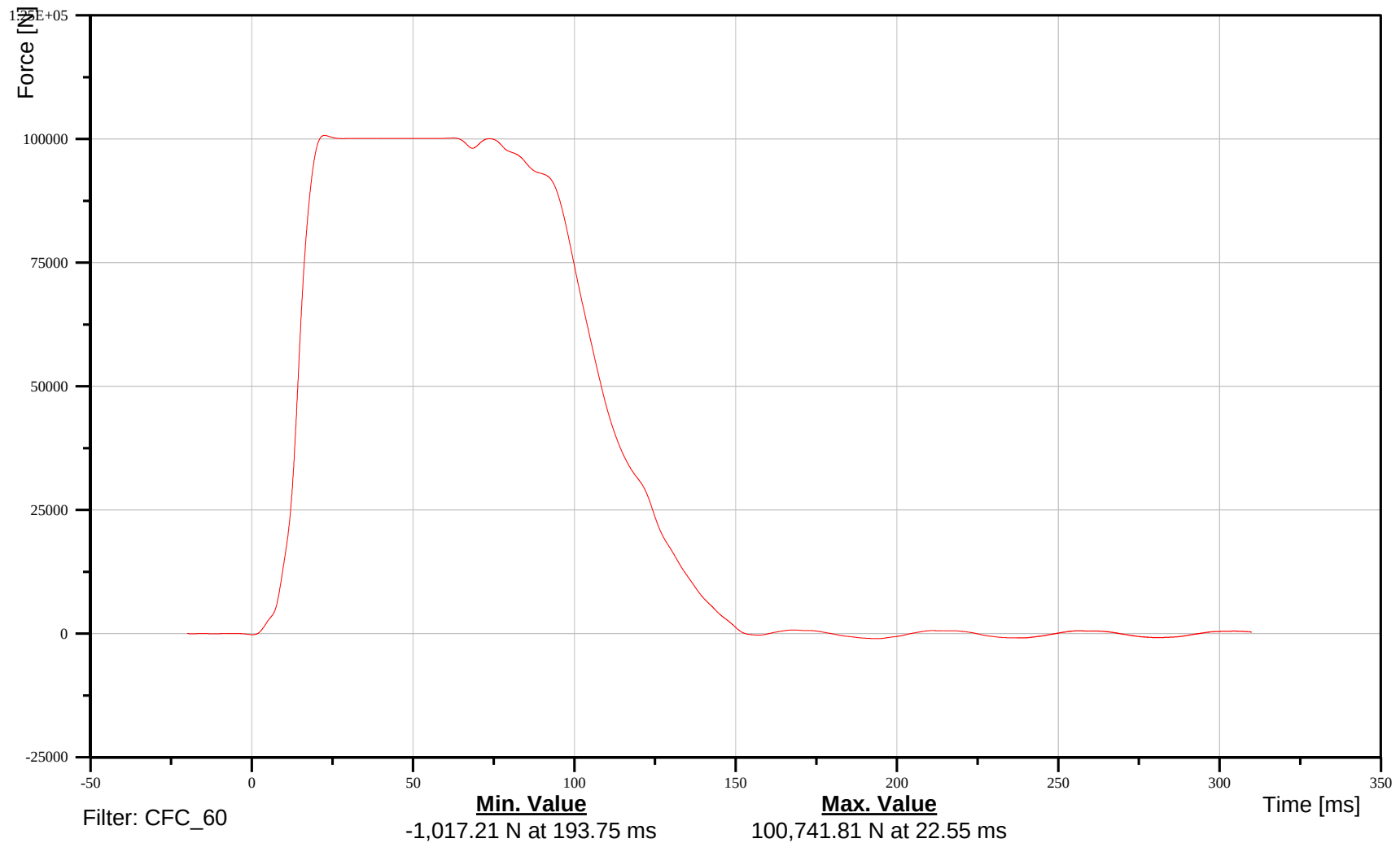
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR020000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 3

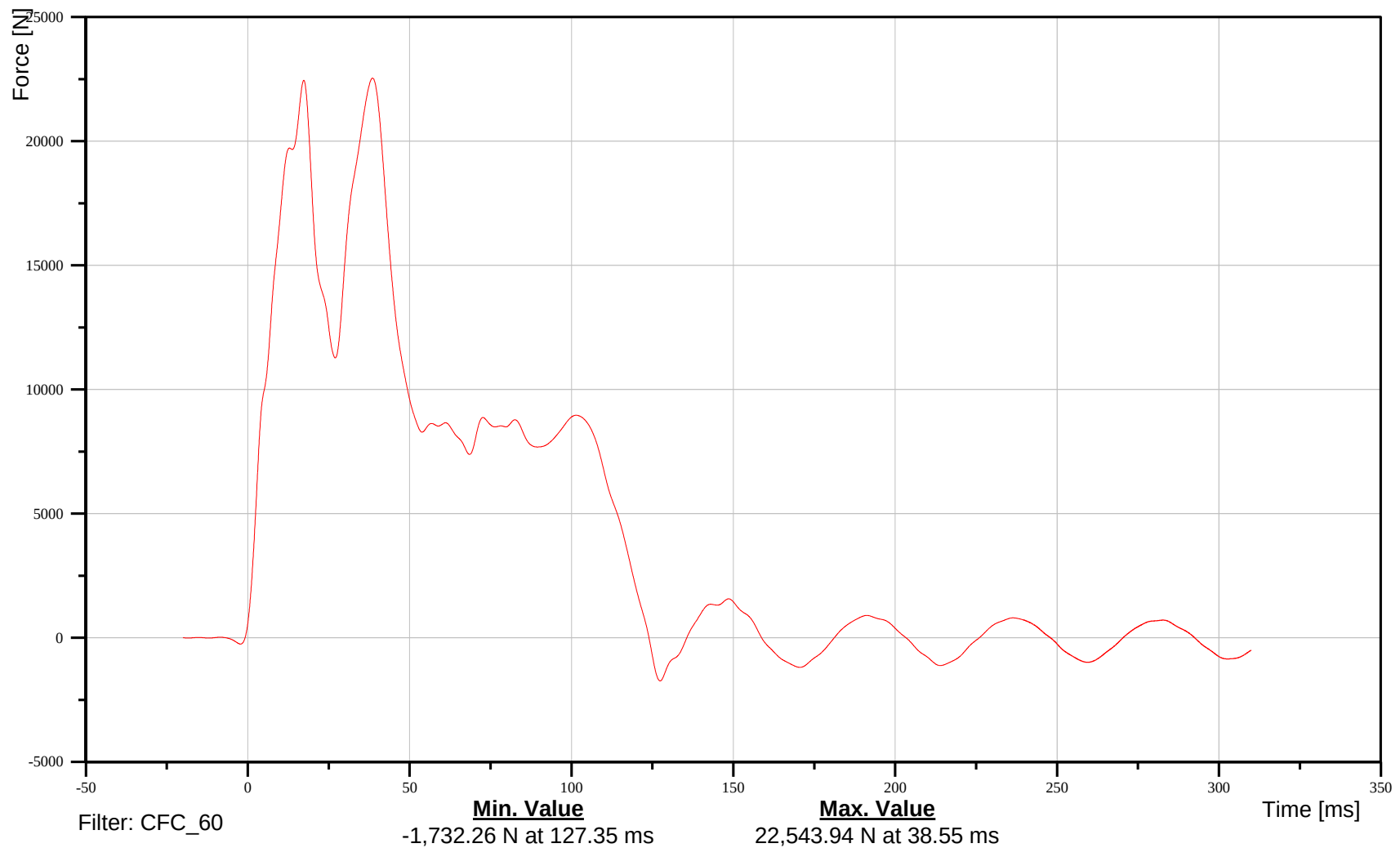
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR030000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 4

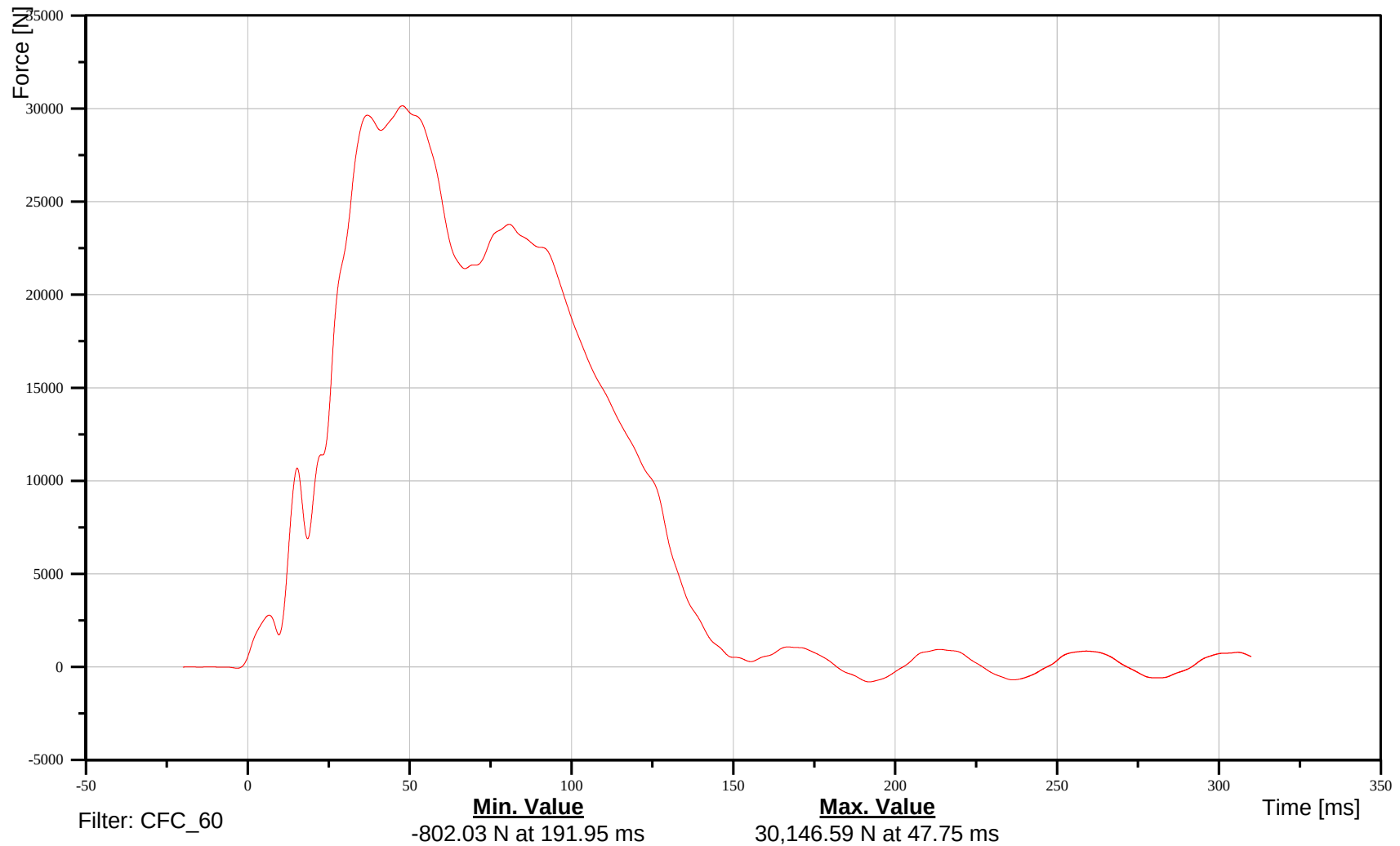
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR040000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 5

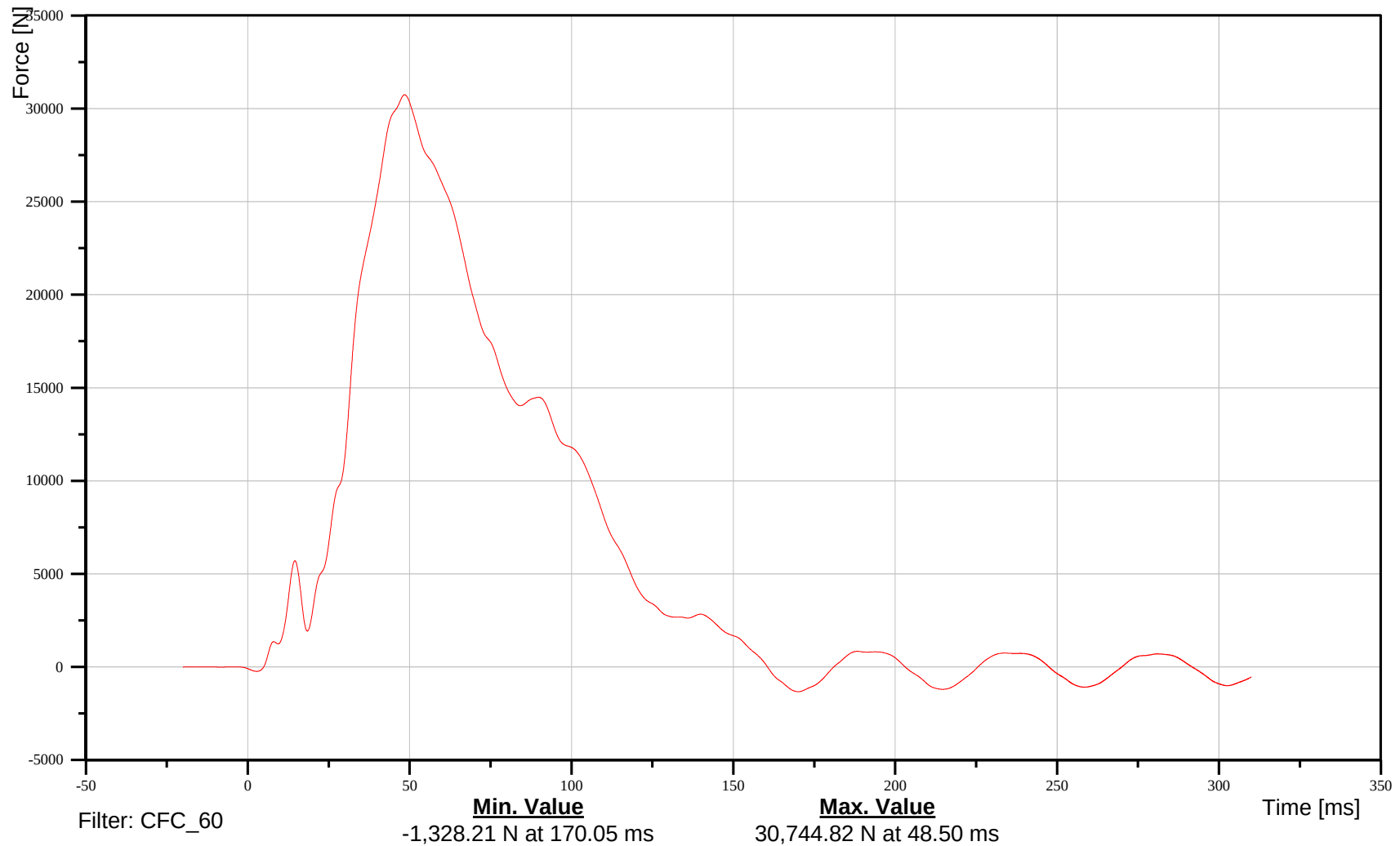
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR050000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 6

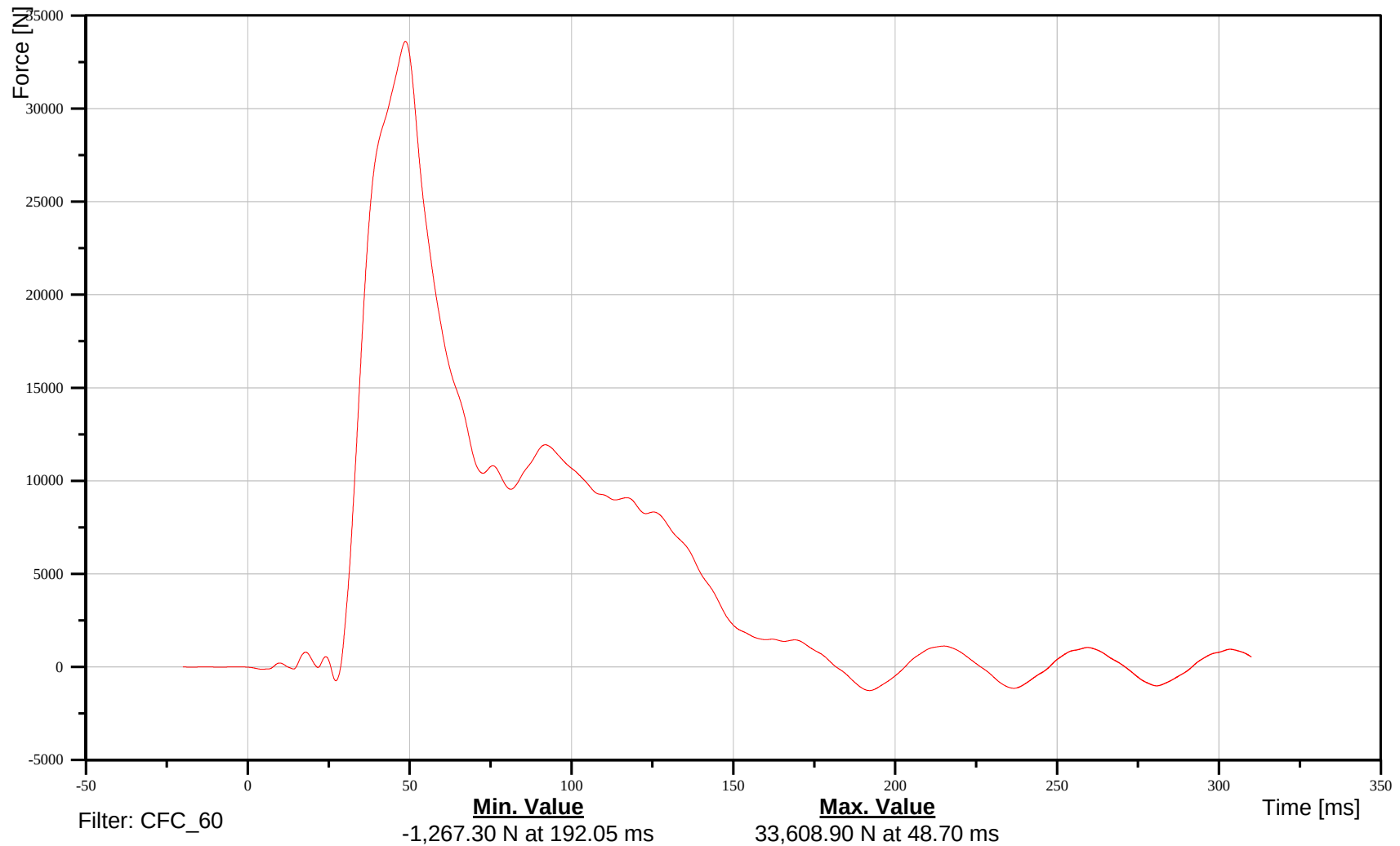
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR060000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 7

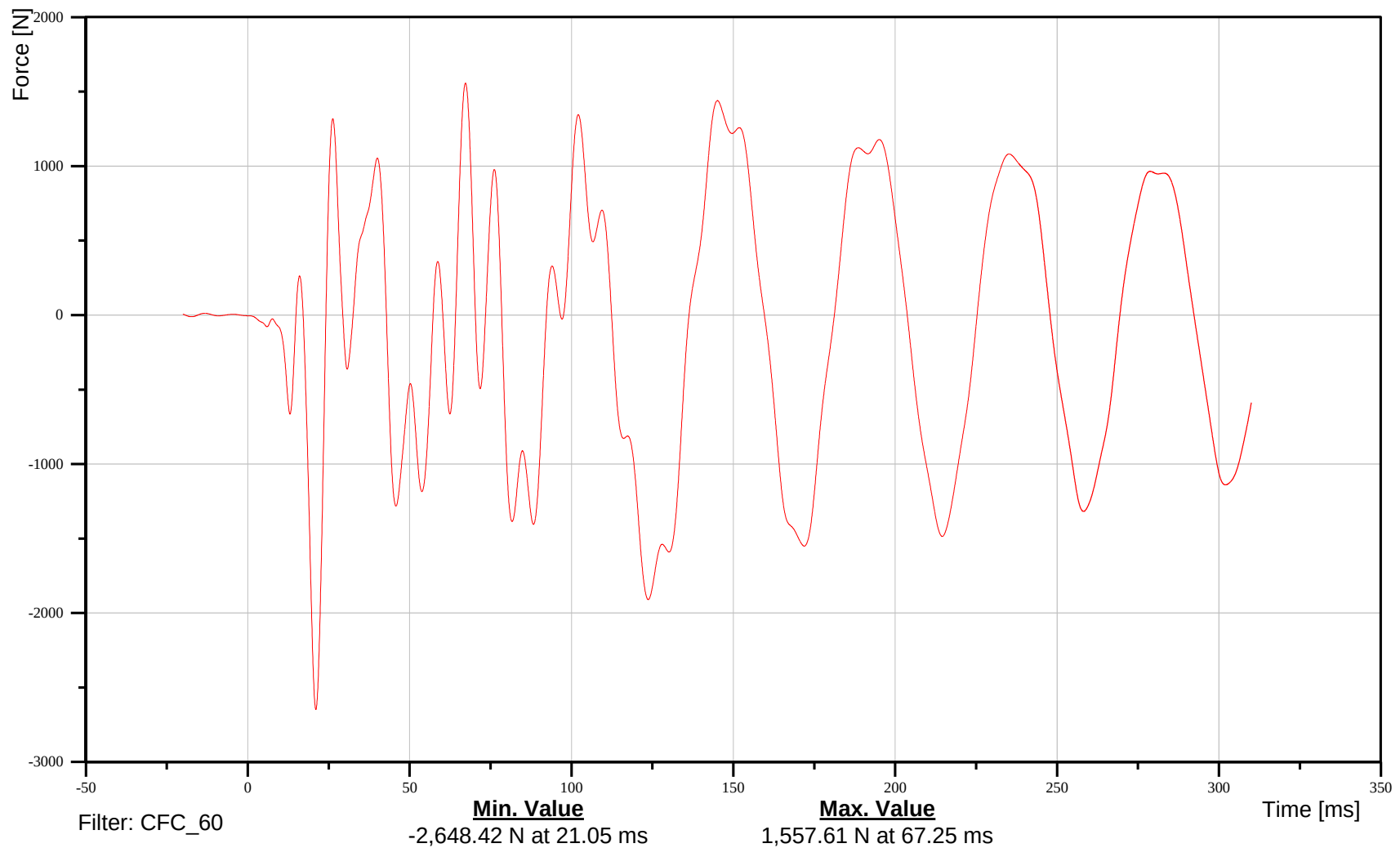
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR070000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614





2015 Toyota Sienna WorldSID Side Pole Impact

POLE LOAD CELL 8

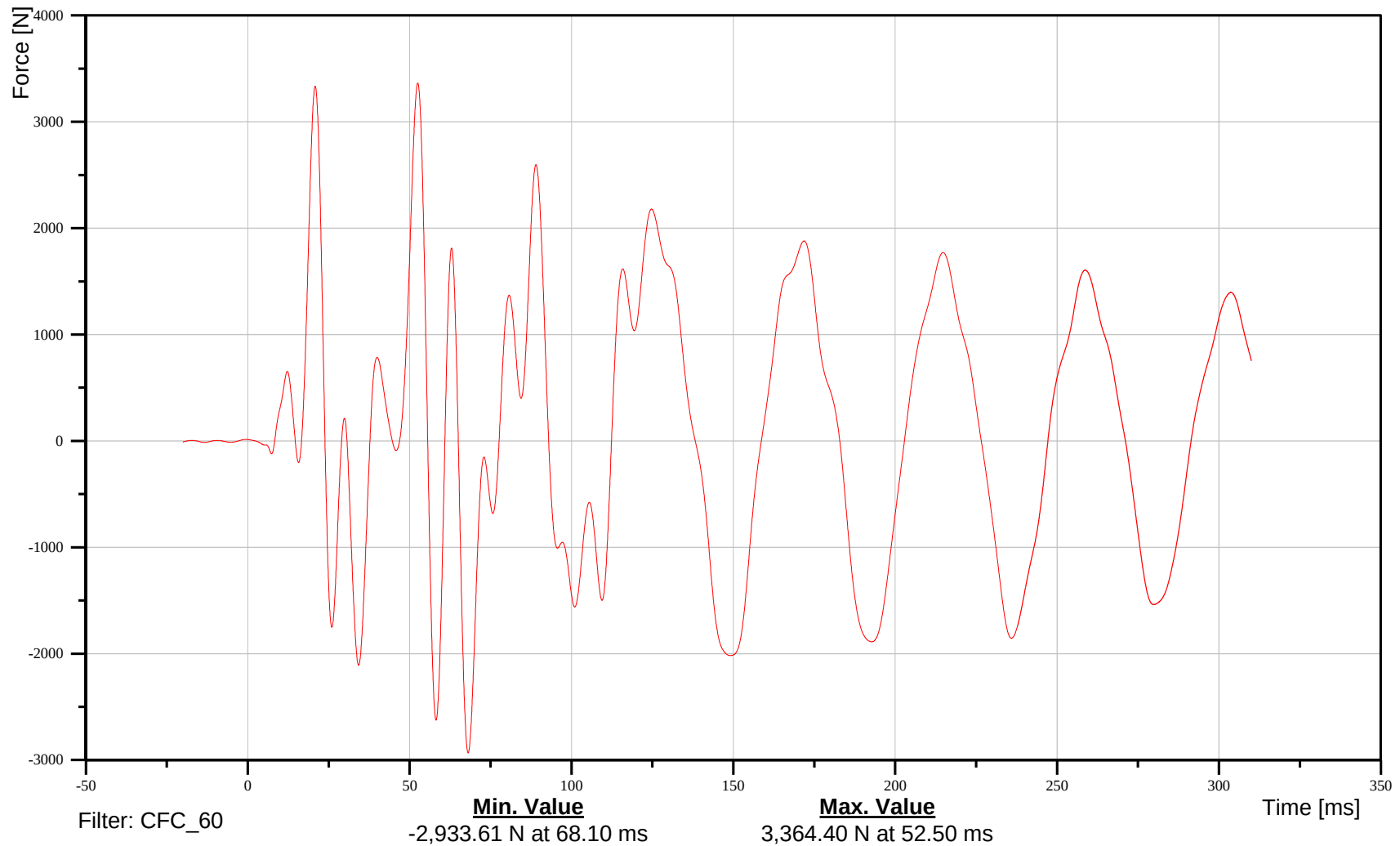
Date: 06/14/2016
Time: 14:31

Customer: VRTC

K0FBAR080000FOXD

TRC Inc. Test Lab: CTF

Test Number: 160614



APPENDIX C
DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS
WorldSID-50M 016

Transportation Research Center Inc.

ATD Calibration Report

for

VRTC

**World SID Serial No. 016
Calibration No. 21**



Transportation Research Center Inc.
P.O. Box B-67
10820 St. Rt. 347
East Liberty, OH 43319-0367

Transportation Research Center Inc.

Front Head Drop

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	205 - 255 g	254.5 g	Yes
Peak Head Lateral Acceleration	(-15) - 15 g	5.3 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

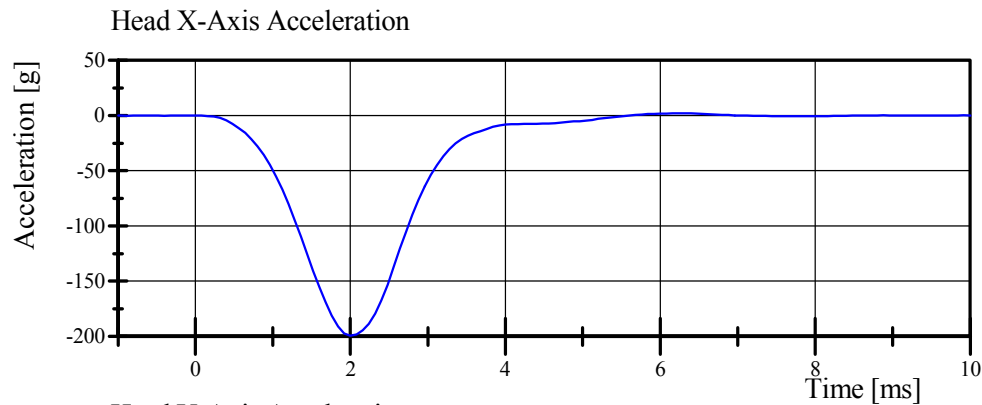
Head: DL8882

Transportation Research Center Inc.

Front Head Drop

WorldSID 50th Serial No. 016 Certification No. 21-1

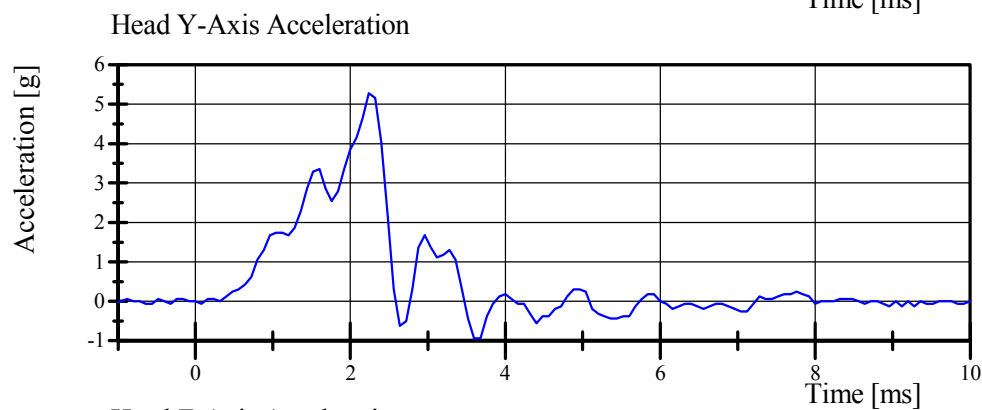
Test Date: 6/2/2016



Filter Class: CFC_1000

Max: 2.3 g at 6.2 ms

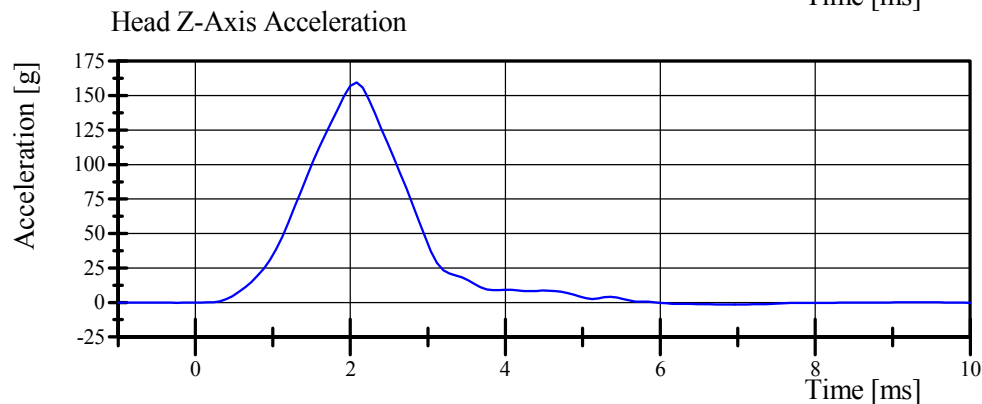
Min: -199.4 g at 2.0 ms



Filter Class: CFC_1000

Max: 5.3 g at 2.2 ms

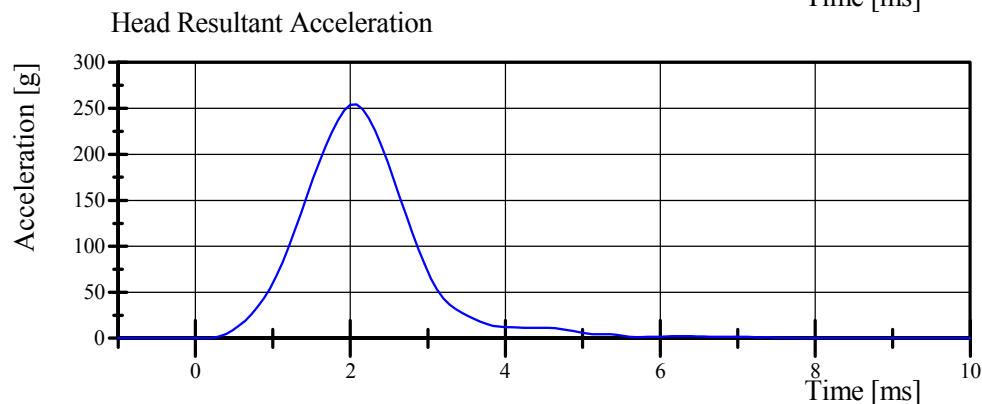
Min: -0.9 g at 3.6 ms



Filter Class: CFC_1000

Max: 159.5 g at 2.1 ms

Min: -1.5 g at 7.0 ms



Filter Class: CFC_1000

Max: 254.5 g at 2.1 ms

Min: 0.0 g at -1.0 ms

Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID 50th Serial No. 016 Certification No. 21-3

Test Date: 6/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	104 - 123 g	120.1 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	-2.9 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

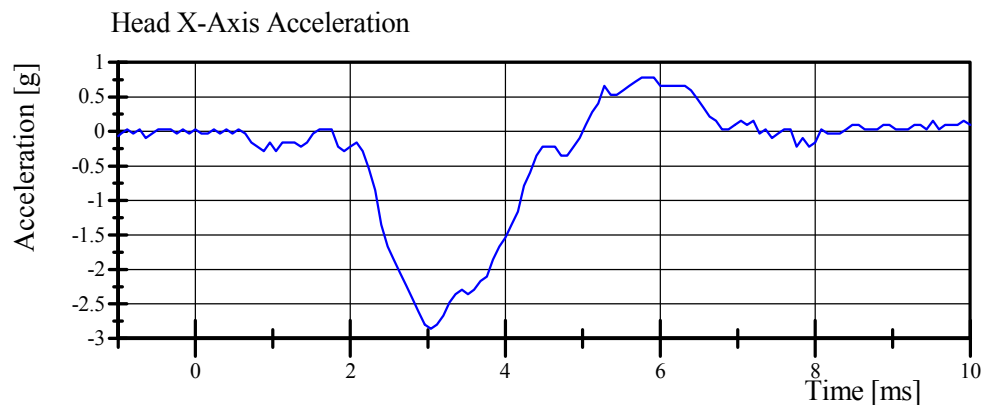
Head: DL8882

Transportation Research Center Inc.

Left Lateral Head Drop

WorldSID 50th Serial No. 016 Certification No. 21-3

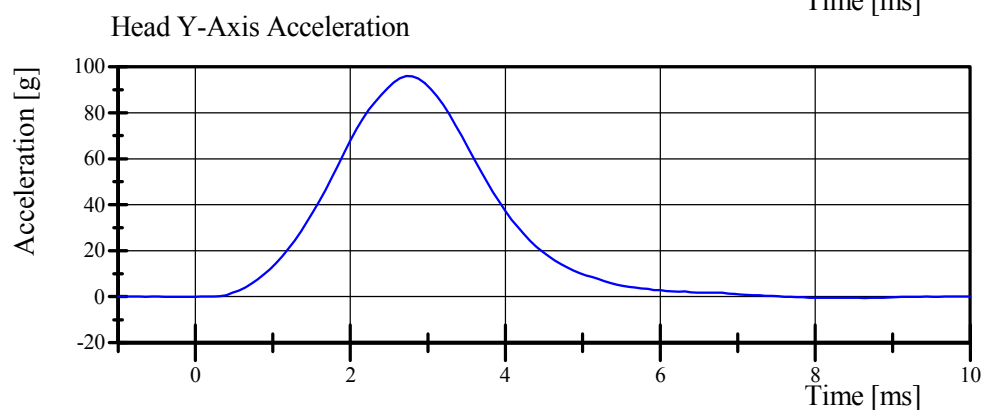
Test Date: 6/2/2016



Filter Class: CFC_1000

Max: 0.8 g at 5.8 ms

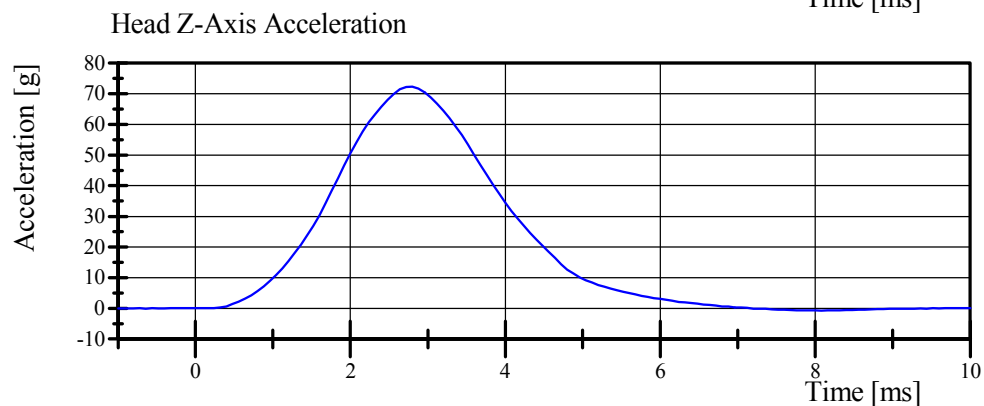
Min: -2.9 g at 3.0 ms



Filter Class: CFC_1000

Max: 96.0 g at 2.7 ms

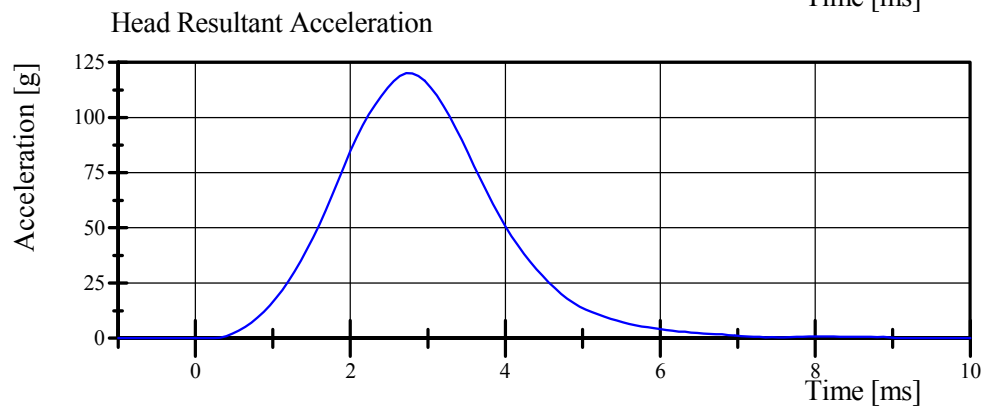
Min: -0.6 g at 8.6 ms



Filter Class: CFC_1000

Max: 72.3 g at 2.8 ms

Min: -0.8 g at 8.1 ms



Filter Class: CFC_1000

Max: 120.1 g at 2.7 ms

Min: 0.0 g at -0.4 ms

Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/2/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.3 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Peak Head Resultant Acceleration	104 - 123 g	117.4 g	Yes
Peak Head Longitudinal Acceleration	(-15) - 15 g	2.1 g	Yes
Is Acceleration Curve Unimodal within 10% of Peak?	Yes	Yes	Yes

Test meets specifications.

Comments:

Head: DL8882

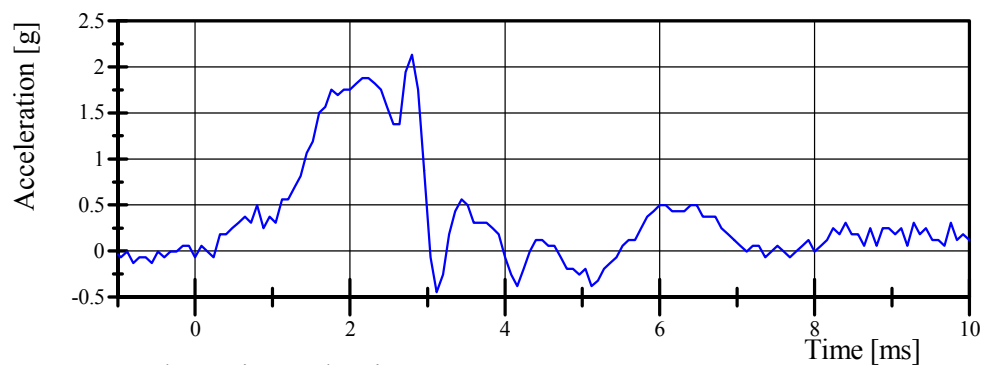
Transportation Research Center Inc.

Right Lateral Head Drop

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/2/2016

Head X-Axis Acceleration

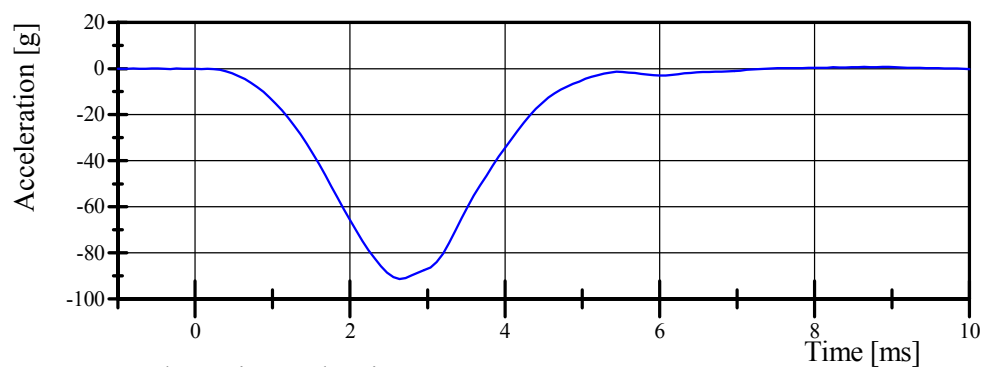


Filter Class: CFC_1000

Max: 2.1 g at 2.8 ms

Min: -0.4 g at 3.1 ms

Head Y-Axis Acceleration

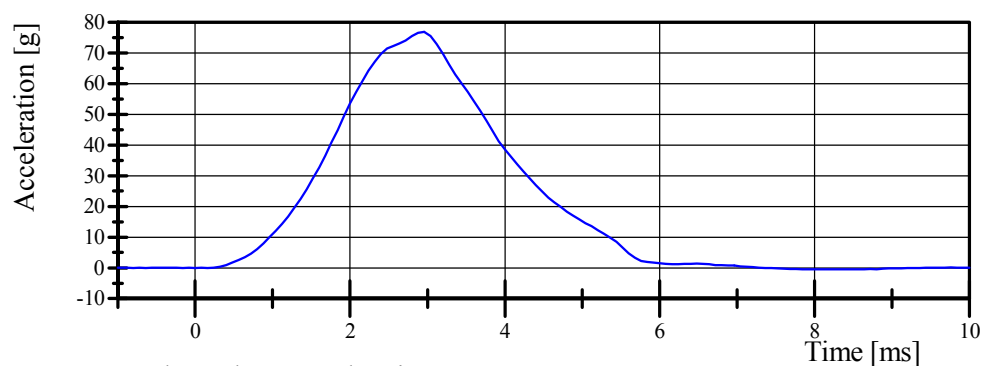


Filter Class: CFC_1000

Max: 0.7 g at 8.6 ms

Min: -91.4 g at 2.6 ms

Head Z-Axis Acceleration

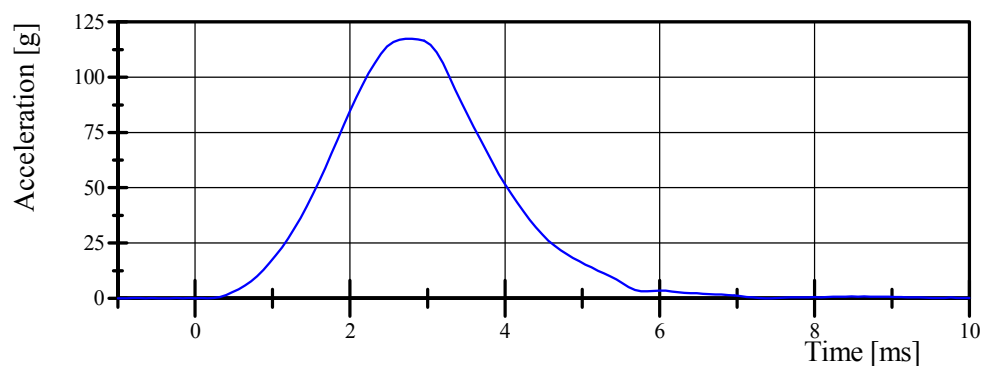


Filter Class: CFC_1000

Max: 76.9 g at 3.0 ms

Min: -0.5 g at 8.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 117.4 g at 2.7 ms

Min: 0.0 g at 0.2 ms

Transportation Research Center Inc.

Left Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/3/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	(-3.3) - (-3.5) m/s	-3.40 m/s	Yes
Pendulum Integrated Velocity			
Change at 4 ms	0.77 - 1.04 m/s	0.806 m/s	Yes
Change at 8 ms	1.6 - 1.9 m/s	1.66 m/s	Yes
Change at 12 ms	2.43 - 3.29 m/s	2.604 m/s	Yes
Maximum Headform Flexion	(-50) - (-61) deg	-51.7 deg	Yes
Headform Flexion Decay			
- from Peak to Zero Degrees	58 - 72 ms	58.5 ms	Yes
Total Neck Occipital Condyles Moment	55 - 68 N·m	65.8 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	71 - 87 ms	73.3 ms	Yes
Maximum Forward Pot Rotation			
Peak	(-32) - (-39) °	-33.3 °	Yes
Time of Peak	56 - 68 ms	59.3 ms	Yes
Maximum Rear Pot Rotation			
Peak	(-30) - (-37) °	-30.0 °	Yes
Time of Peak	56 - 68 ms	57.1 ms	Yes

Test meets specifications.

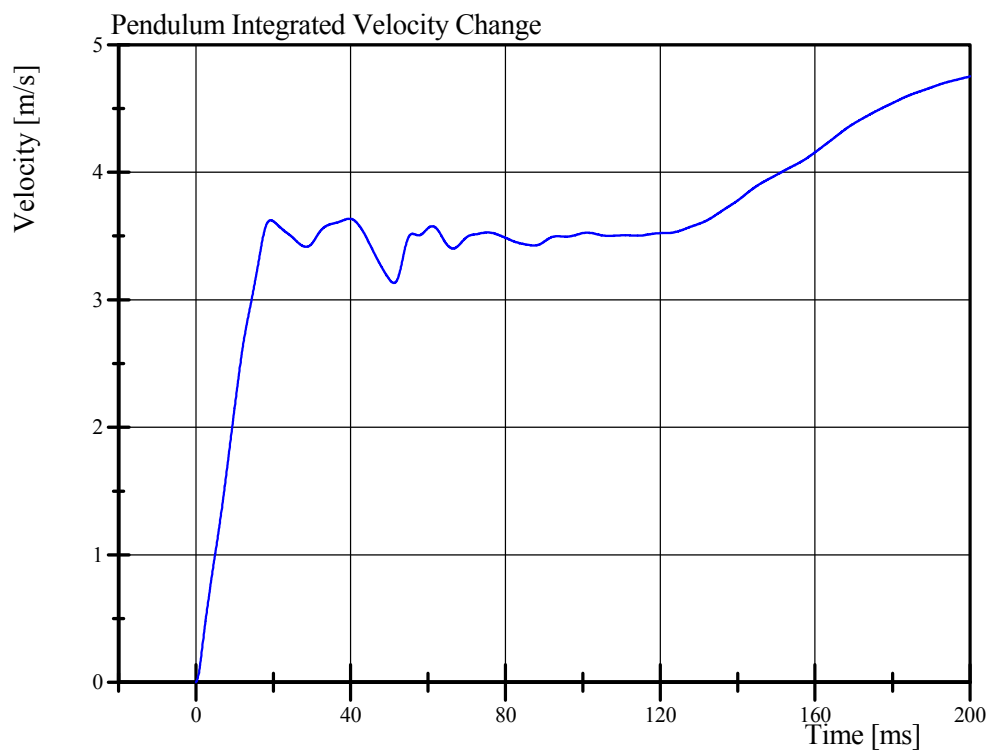
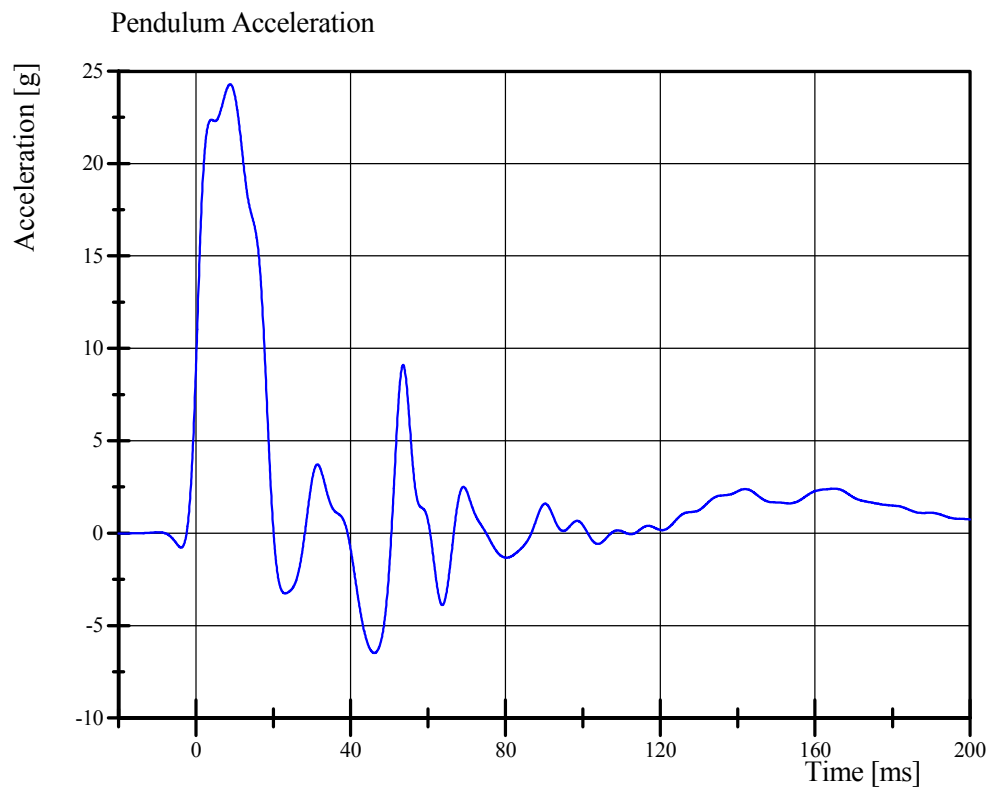
Comments:

Transportation Research Center Inc.

Left Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/3/2016



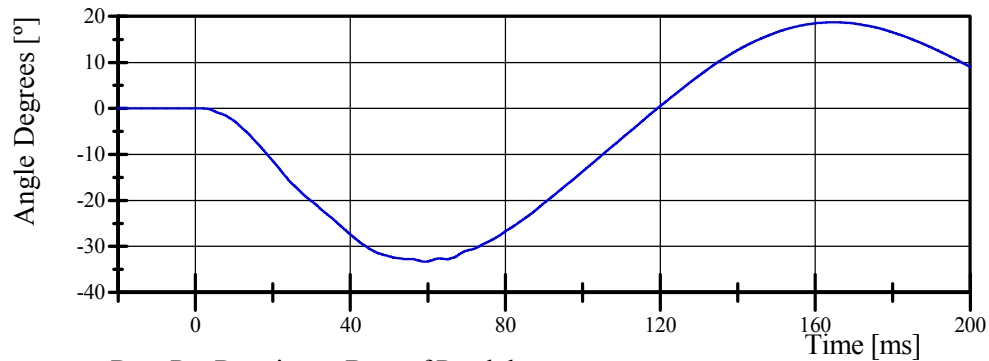
Transportation Research Center Inc.

Left Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/3/2016

Forward Pot Rotation at Base of Pendulum

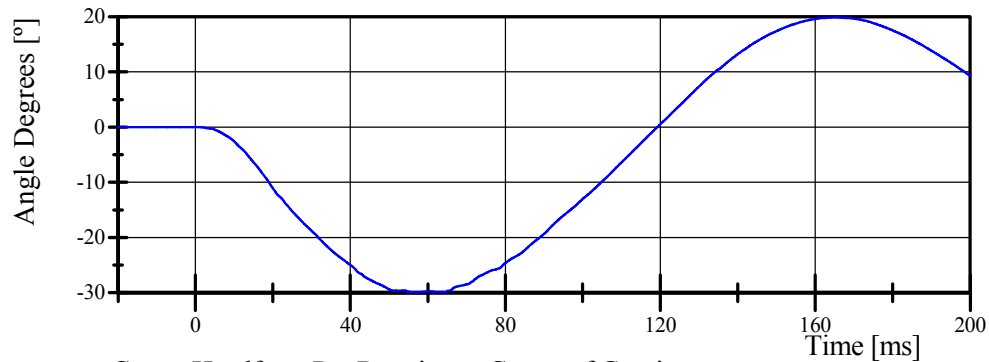


Filter Class: CFC_1000

Max: 18.8 ° at 164.3 ms

Min: -33.3 ° at 59.3 ms

Rear Pot Rotation at Base of Pendulum

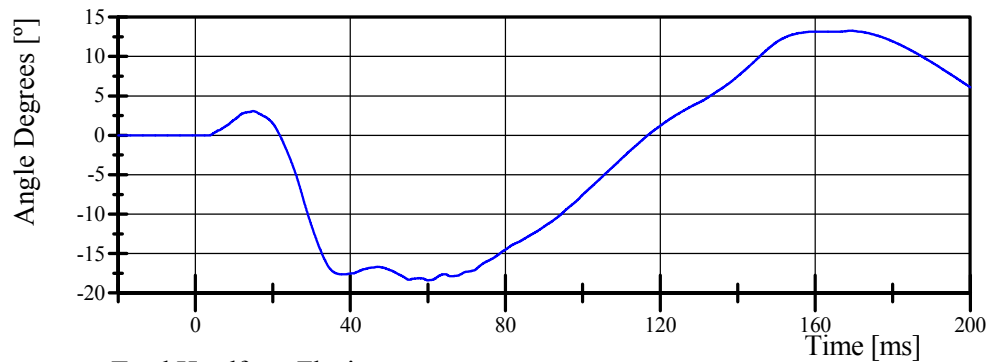


Filter Class: CFC_1000

Max: 19.9 ° at 166.0 ms

Min: -30.0 ° at 57.1 ms

Center Headform Pot Rotation at Center of Gravity

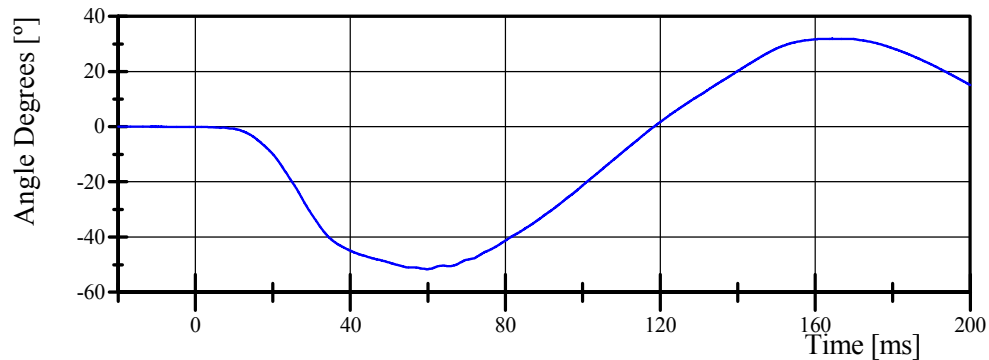


Filter Class: CFC_1000

Max: 13.3 ° at 169.0 ms

Min: -18.4 ° at 60.0 ms

Total Headform Flexion



Filter Class: CFC_1000

Max: 31.9 ° at 164.3 ms

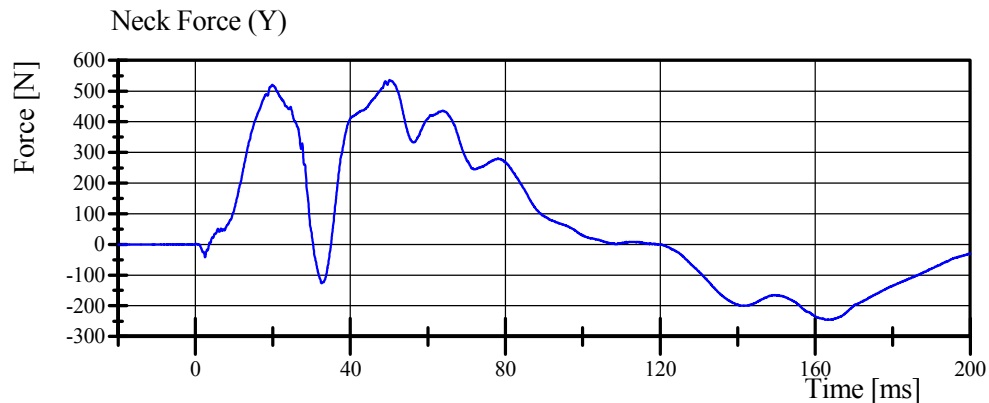
Min: -51.7 ° at 59.9 ms

Transportation Research Center Inc.

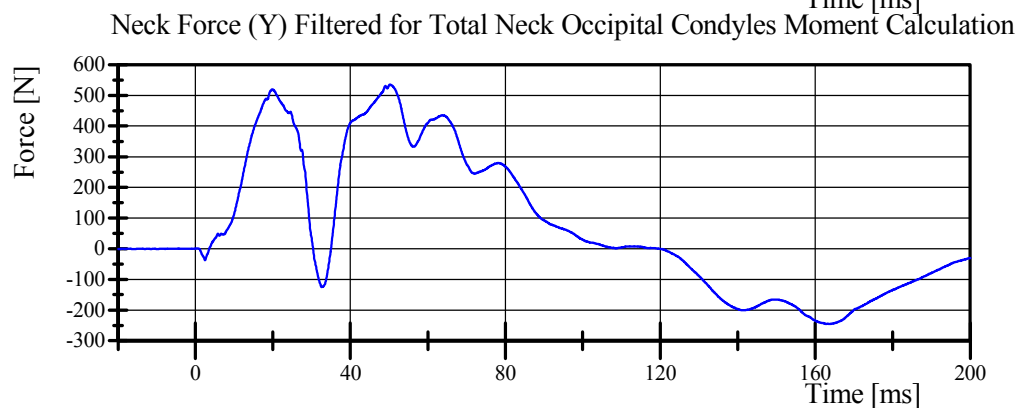
Left Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-1

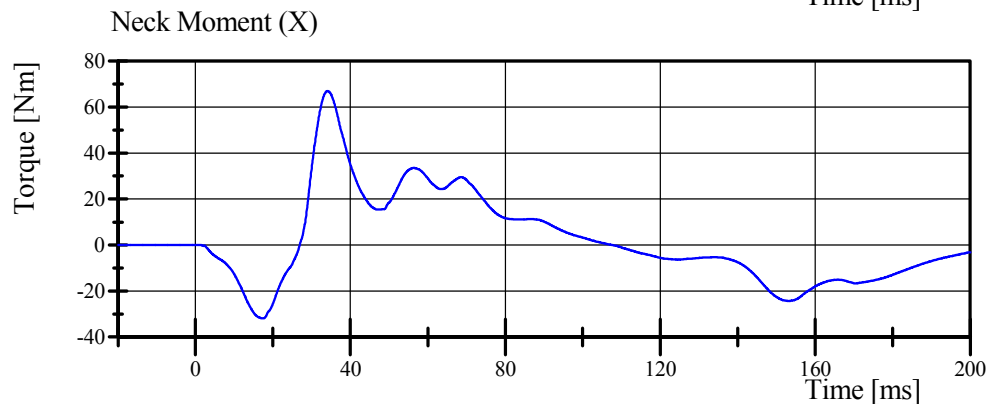
Test Date: 6/3/2016



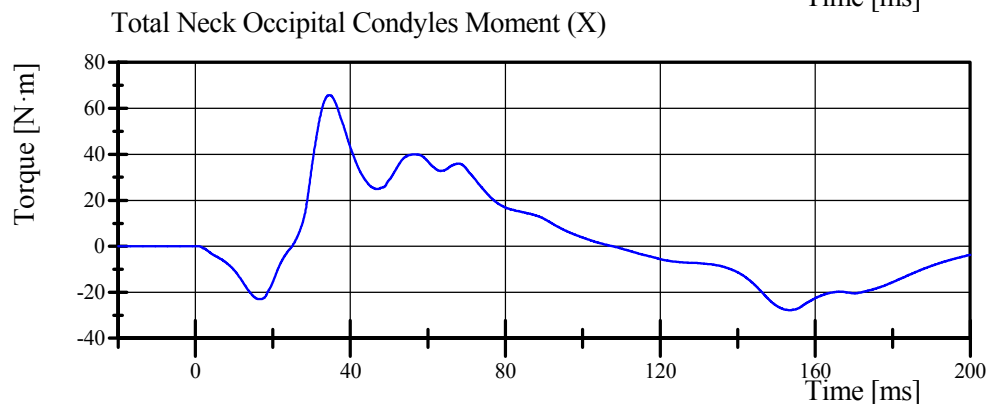
Filter Class: CFC_1000
Max: 535.8 N at 50.1 ms
Min: -246.0 N at 163.8 ms



Filter Class: CFC_600
Max: 535.3 N at 50.2 ms
Min: -245.5 N at 163.8 ms



Filter Class: CFC_600
Max: 67.0 Nm at 34.1 ms
Min: -31.9 Nm at 17.3 ms



Filter Class: Without_(Constar
Max: 65.8 N·m at 34.6 ms
Min: -27.8 N·m at 153.5 ms

Transportation Research Center Inc.

Right Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-2

Test Date: 6/3/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Pendulum Velocity	3.3 - 3.5 m/s	3.43 m/s	Yes
Pendulum Integrated Velocity			
Change at 4 ms	(-0.77) - (-1.04) m/s	-0.787 m/s	Yes
Change at 8 ms	(-1.6) - (-1.9) m/s	-1.66 m/s	Yes
Change at 12 ms	(-2.43) - (-3.29) m/s	-2.685 m/s	Yes
Maximum Headform Flexion	50 - 61 deg	52.6 deg	Yes
Headform Flexion Decay			
- from Peak to Zero Degrees	58 - 72 ms	59.0 ms	Yes
Total Neck Occipital Condyles Moment	(-55) - (-68) N·m	-66.0 N·m	Yes
Total Neck Occipital Condyles Moment			
Decay Time to 0 N·m	71 - 87 ms	74.3 ms	Yes
Maximum Forward Pot Rotation			
Peak	32 - 39 °	33.7 °	Yes
Time of Peak	56 - 68 ms	59.6 ms	Yes
Maximum Rear Pot Rotation			
Peak	30 - 37 °	30.4 °	Yes
Time of Peak	56 - 68 ms	62.1 ms	Yes

Test meets specifications.

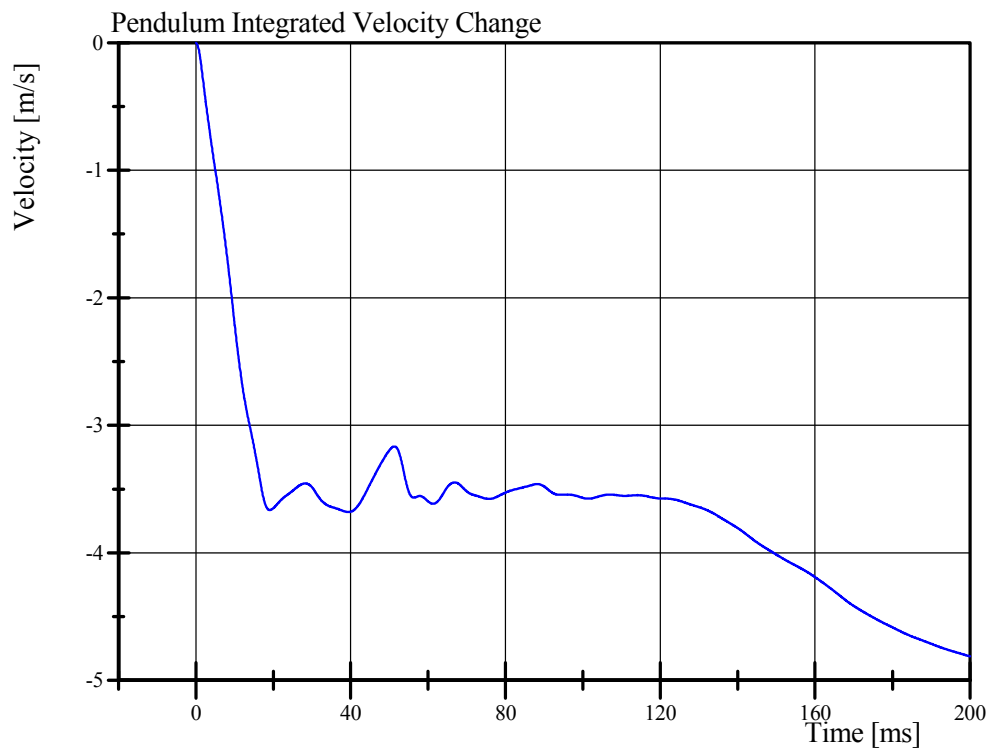
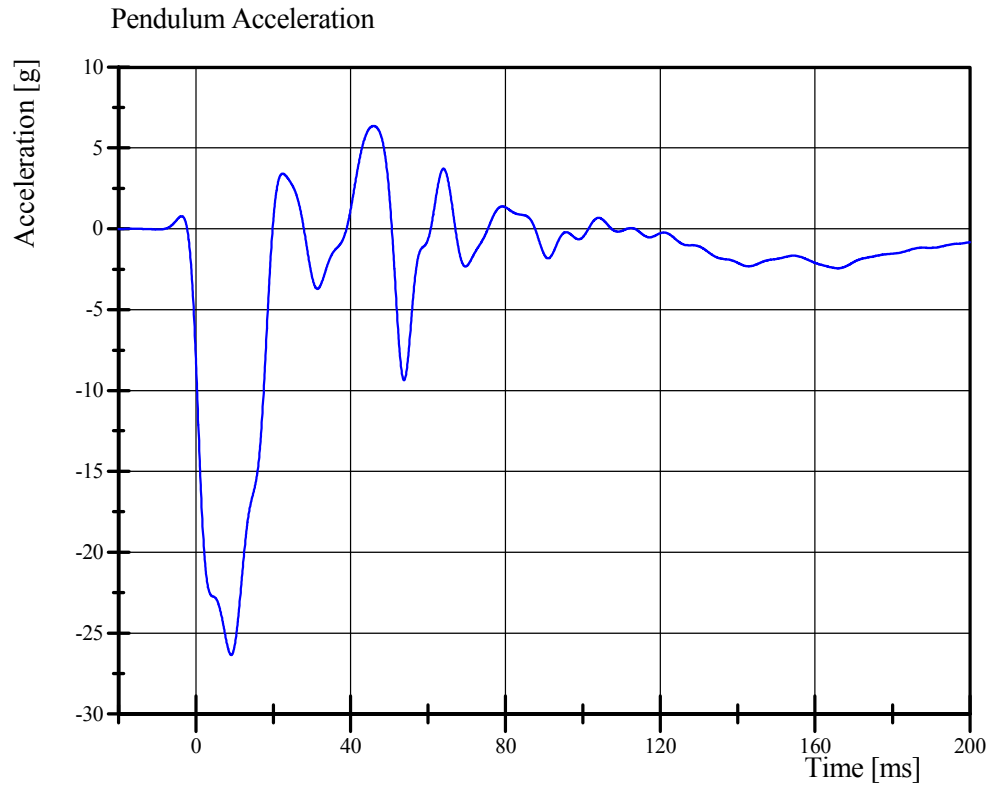
Comments:

Transportation Research Center Inc.

Right Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-2

Test Date: 6/3/2016



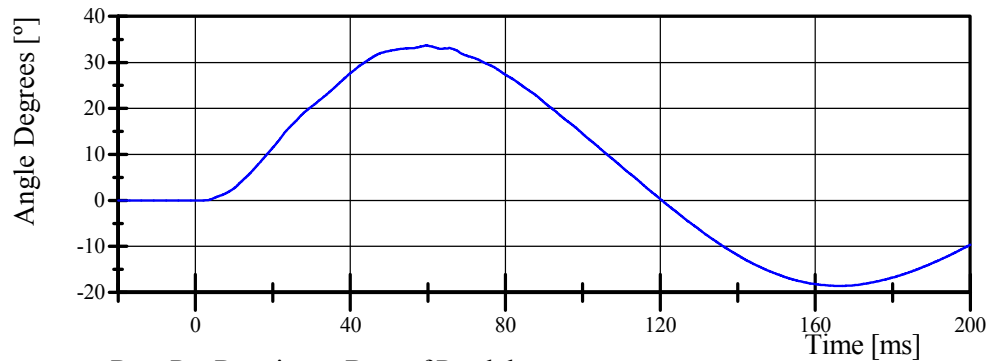
Transportation Research Center Inc.

Right Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-2

Test Date: 6/3/2016

Forward Pot Rotation at Base of Pendulum

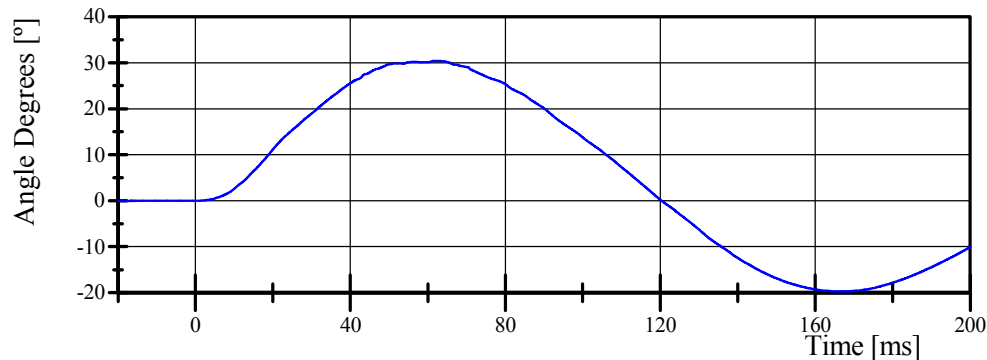


Filter Class: CFC_1000

Max: 33.7 ° at 59.6 ms

Min: -18.6 ° at 166.3 ms

Rear Pot Rotation at Base of Pendulum

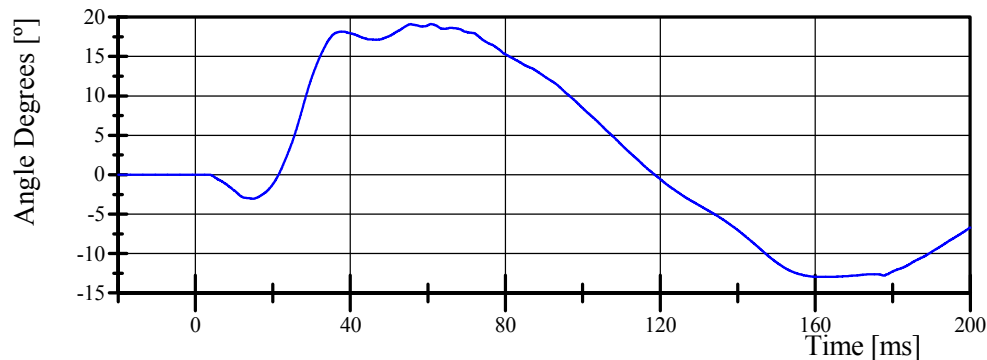


Filter Class: CFC_1000

Max: 30.4 ° at 62.1 ms

Min: -19.7 ° at 166.3 ms

Center Headform Pot Rotation at Center of Gravity

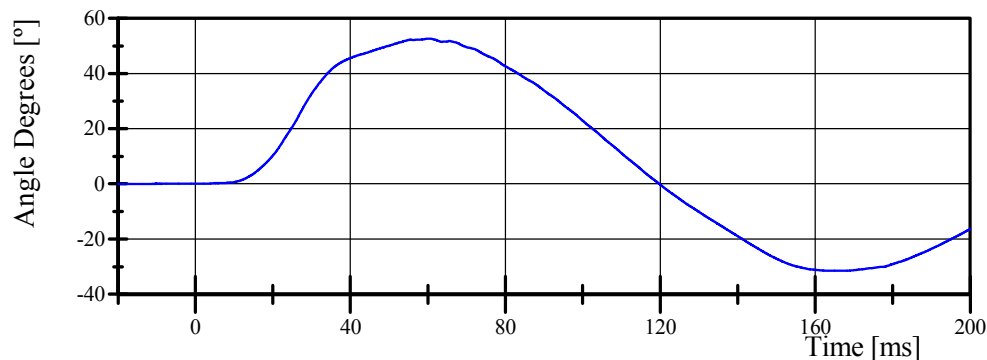


Filter Class: CFC_1000

Max: 19.1 ° at 60.8 ms

Min: -13.0 ° at 162.3 ms

Total Headform Flexion



Filter Class: CFC_1000

Max: 52.6 ° at 60.8 ms

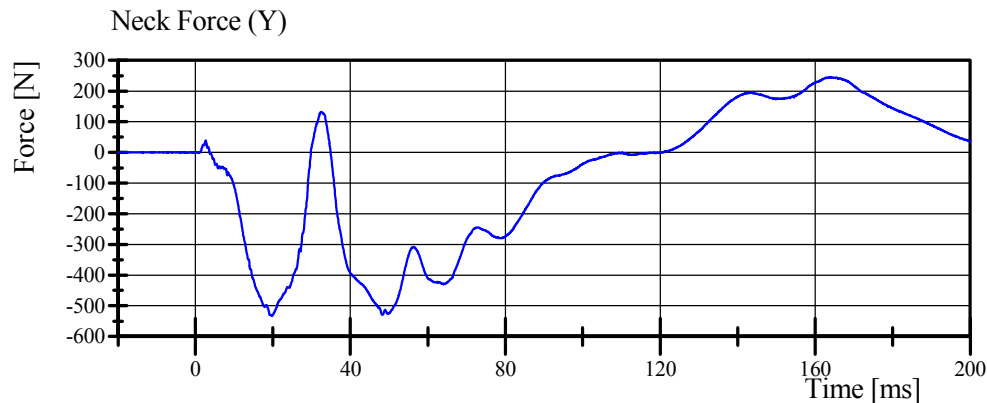
Min: -31.5 ° at 164.9 ms

Transportation Research Center Inc.

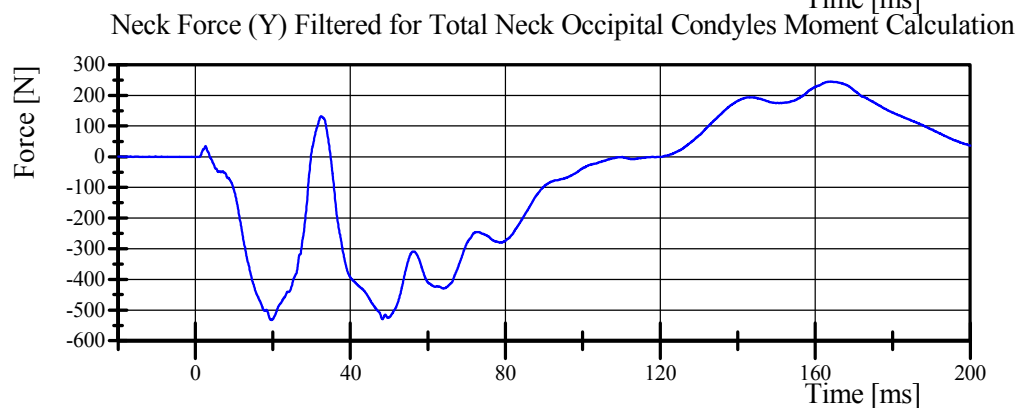
Right Lateral Neck

WorldSID 50th Serial No. 016 Certification No. 21-2

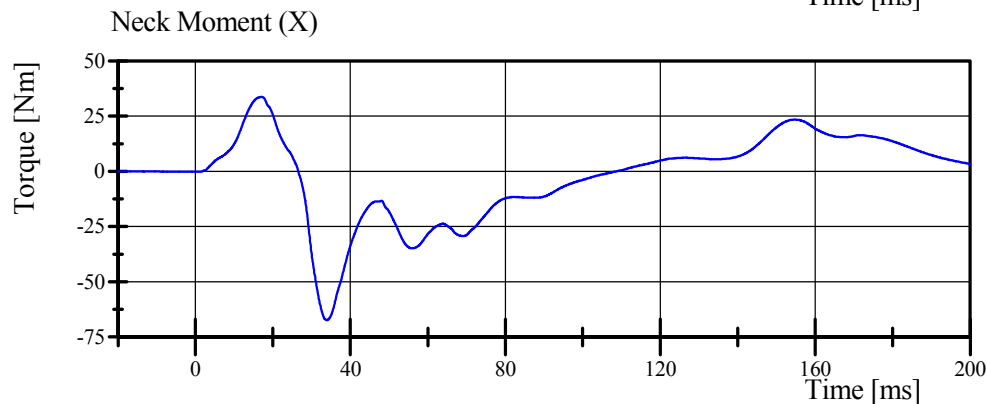
Test Date: 6/3/2016



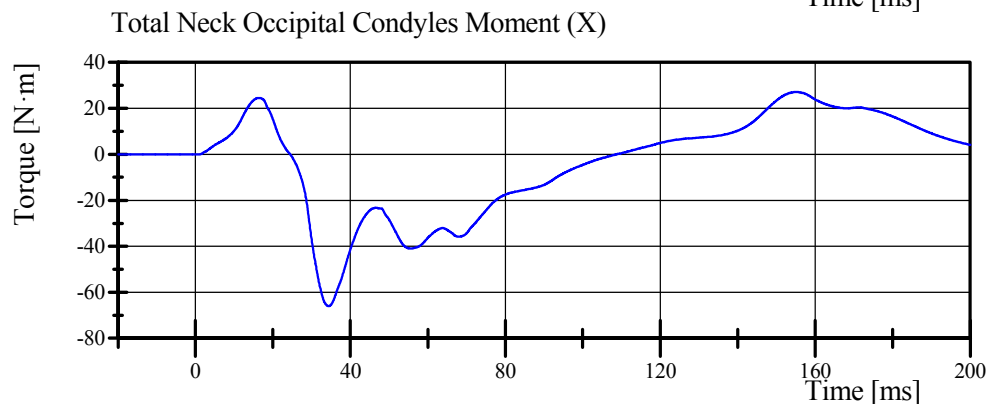
Filter Class: CFC_1000
Max: 245.0 N at 163.6 ms
Min: -533.1 N at 19.9 ms



Filter Class: CFC_600
Max: 244.7 N at 163.7 ms
Min: -532.2 N at 19.8 ms



Filter Class: CFC_600
Max: 33.7 Nm at 17.1 ms
Min: -67.3 Nm at 33.9 ms



Filter Class: Without_(Constar
Max: 27.1 N·m at 155.0 ms
Min: -66.0 N·m at 34.4 ms

Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.1 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.300 m/s	Yes
Impactor Force	(-2,600) - (-3,300) N	-2,700.0 N	Yes
Shoulder Displacement	35 - 45 mm	42.3 mm	Yes

Test meets specifications.

Comments:

Shoulder Rib: DL9341

Thorax Rib 1: DW8861

Thorax Rib 2: DW8862

Thorax Rib 3: DW8863

Abdomen Rib 1: DW9381

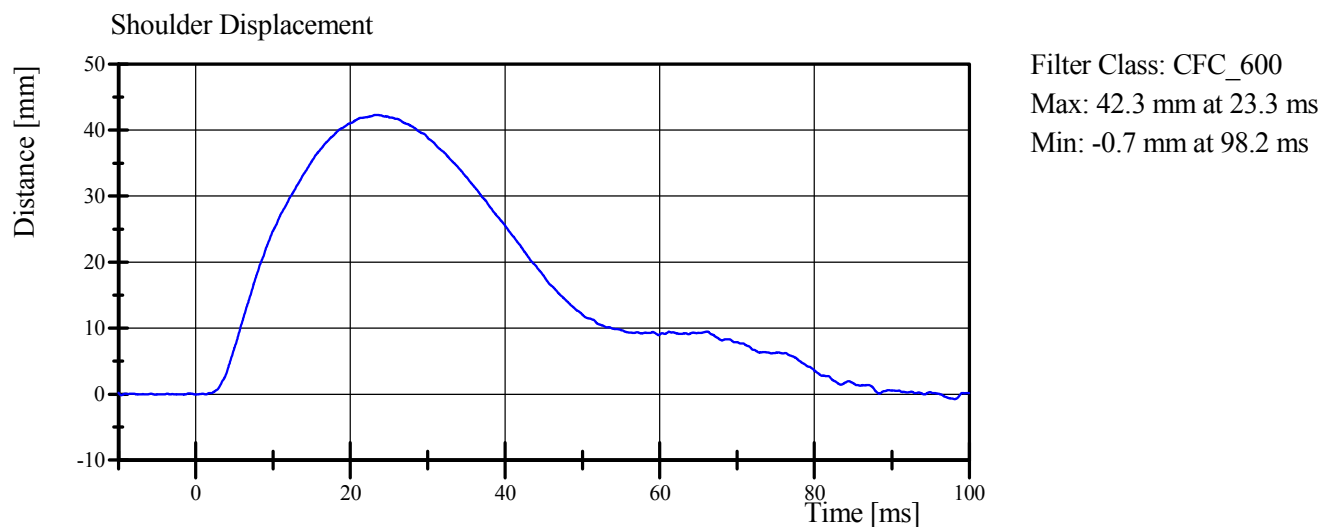
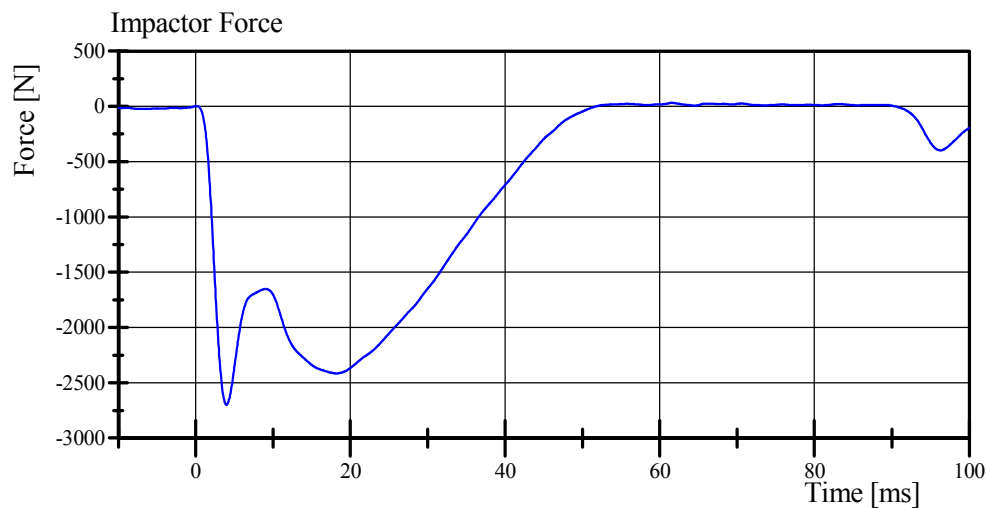
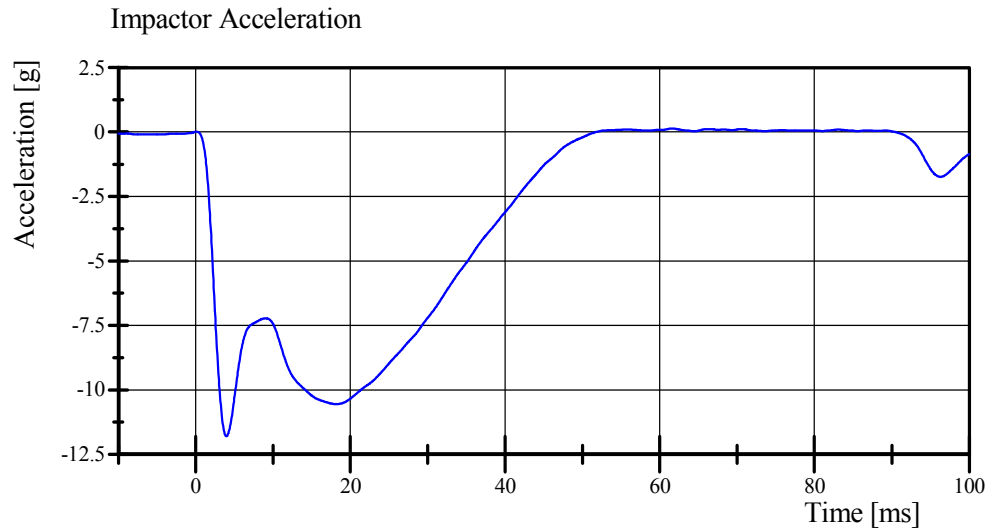
Abdomen Rib 2:DW9382

Transportation Research Center Inc.

Left Lateral Shoulder

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016



Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	20.9 °C	Yes
Relative Humidity	10 - 70 %	53 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.716 m/s	Yes
Impactor Force	(-4,900) - (-5,800) N	-5,552.0 N	Yes
Upper Thorax Rib Displacement	35 - 47 mm	36.7 mm	Yes
Center Thorax Rib Displacement	46 - 56 mm	42.2 mm	No
Lower Thorax Rib Displacement	39 - 46 mm	36.7 mm	No
Upper Spine Lateral Acceleration	28 - 37 g	31.3 g	Yes
Lower Spine Lateral Acceleration	22 - 28 g	21.8 g	No

Test does not meet specifications.

Comments:

Shoulder Rib: DL9341

Thorax Rib 1: DW8861

Thorax Rib 2: DW8862

Thorax Rib 3: DW8863

Abdomen Rib 1: DW9381

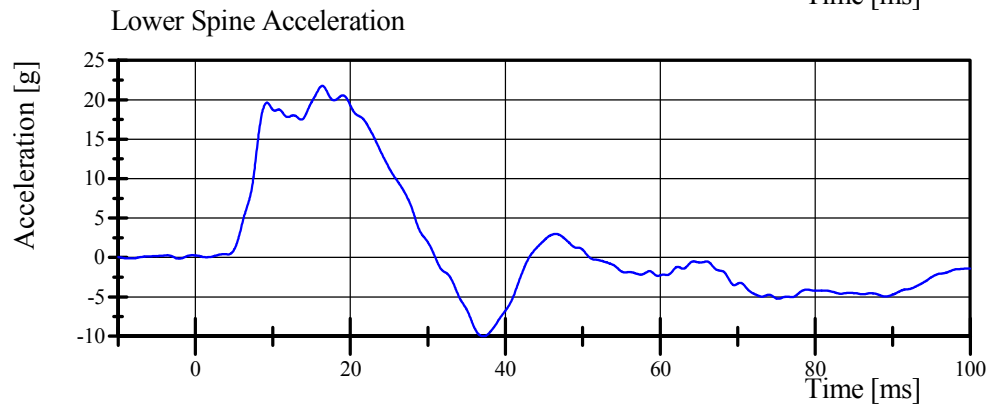
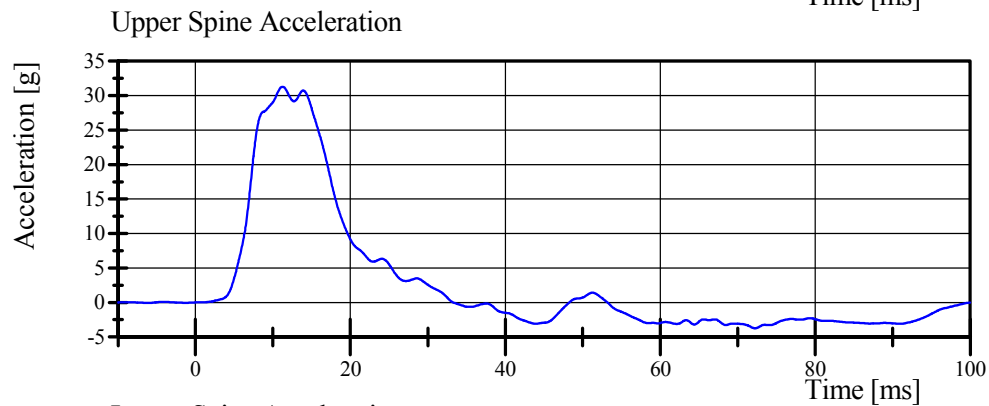
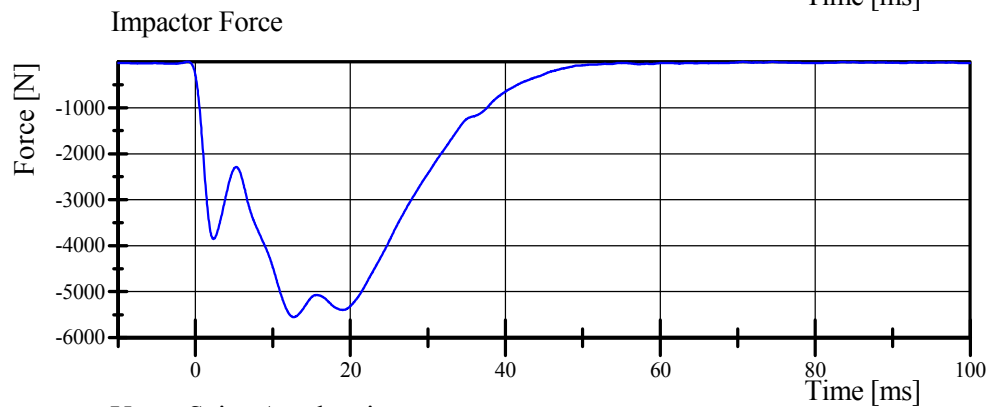
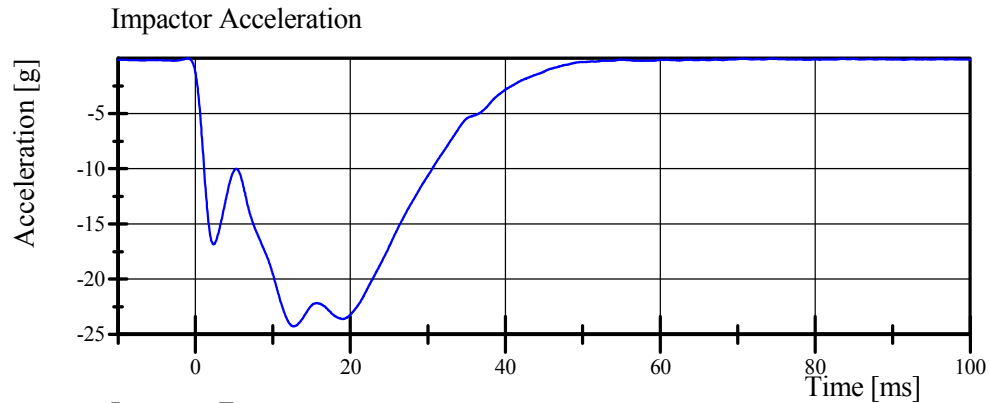
Abdomen Rib 2:DW9382

Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016



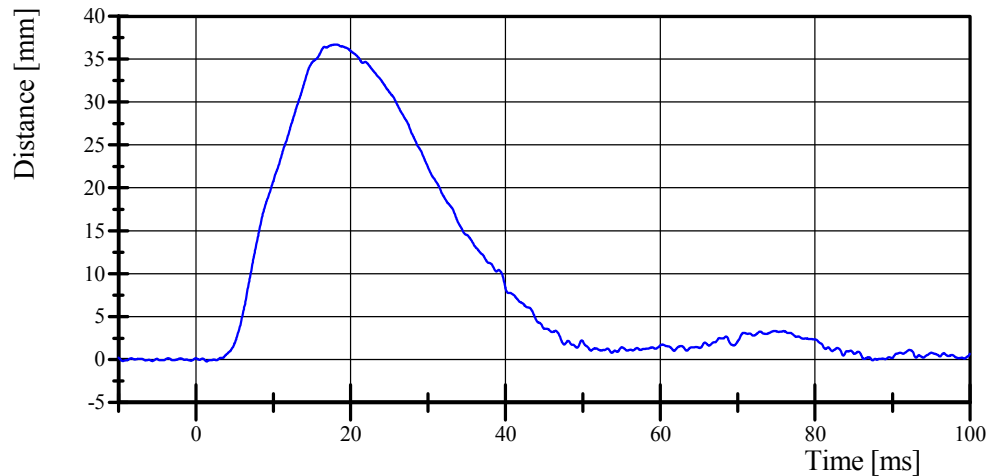
Transportation Research Center Inc.

Left Lateral Thorax with Arm

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Upper Thorax Rib Displacement

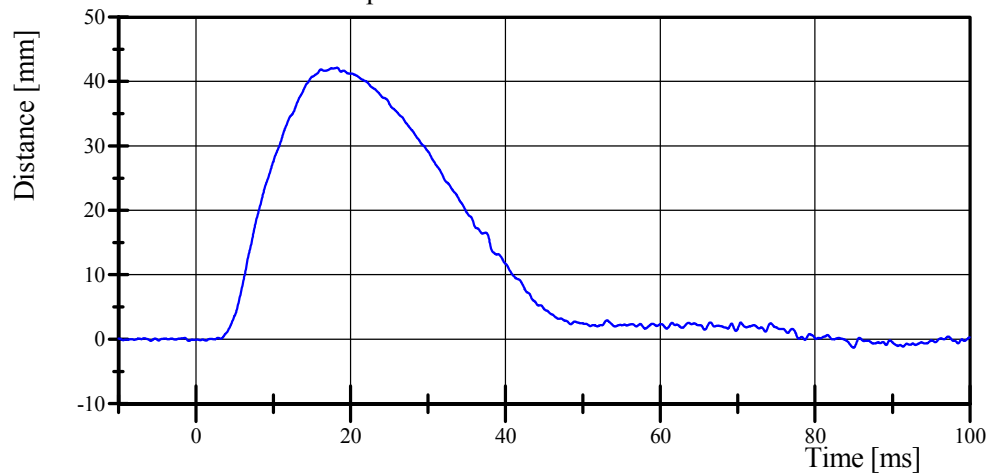


Filter Class: CFC_600

Max: 36.7 mm at 18.0 ms

Min: -0.2 mm at 1.4 ms

Center Thorax Rib Displacement

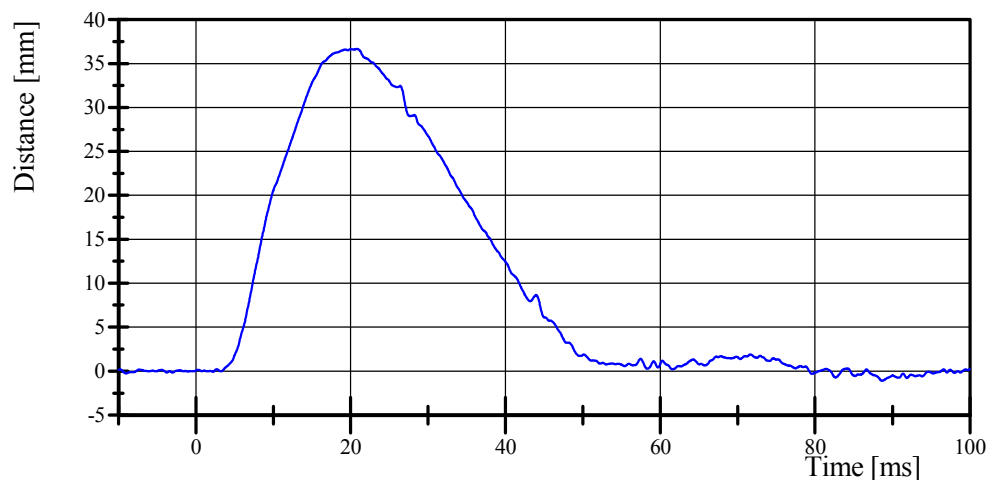


Filter Class: CFC_600

Max: 42.2 mm at 18.3 ms

Min: -1.3 mm at 85.0 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600

Max: 36.7 mm at 20.8 ms

Min: -1.1 mm at 88.7 ms

Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.303 m/s	Yes
Impactor Force	(-3,200) - (-3,800) N	-3,772.8 N	Yes
Upper Thorax Rib Displacement	33 - 43 mm	35.8 mm	Yes
Center Thorax Rib Displacement	35 - 43 mm	39.3 mm	Yes
Lower Thorax Rib Displacement	32 - 40 mm	34.3 mm	Yes
Upper Spine Lateral Acceleration	14 - 20 g	14.7 g	Yes
Lower Spine Lateral Acceleration	14 - 22 g	13.1 g	No

Test does not meet specifications.

Comments:

Shoulder Rib: DL9341

Thorax Rib 1: DW8861

Thorax Rib 2: DW8862

Thorax Rib 3: DW8863

Abdomen Rib 1: DW9381

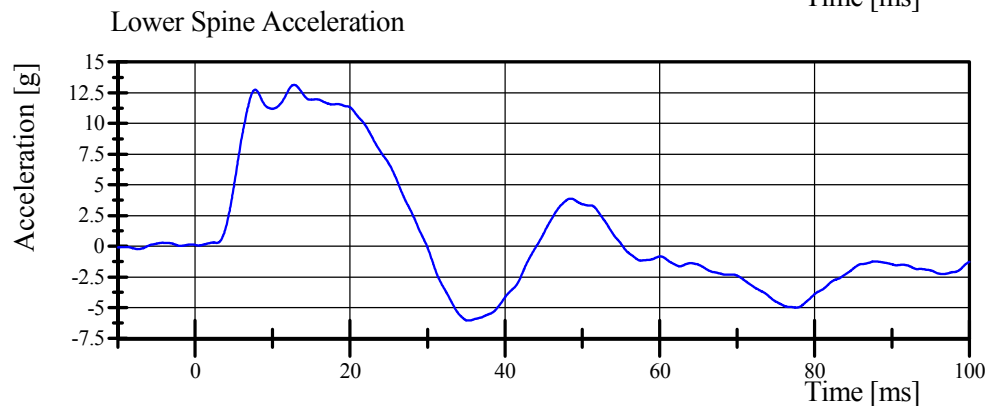
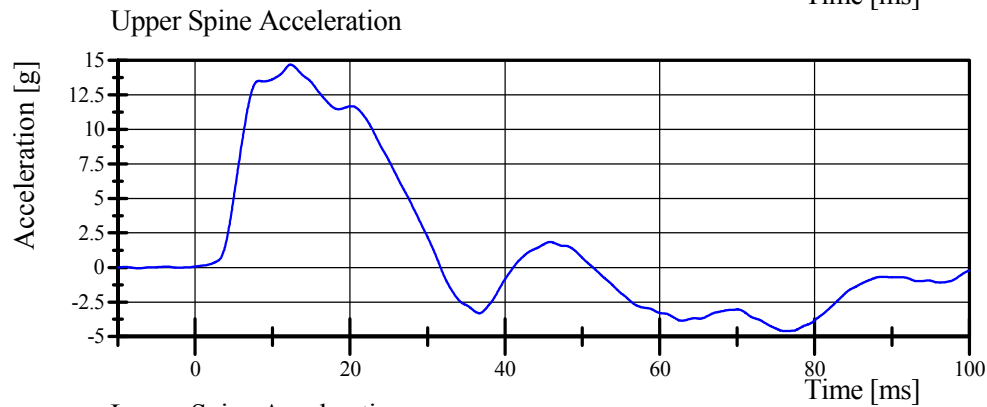
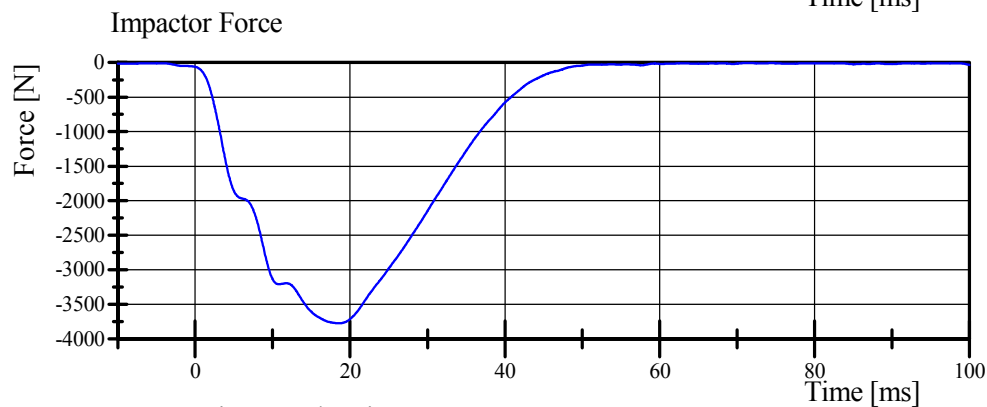
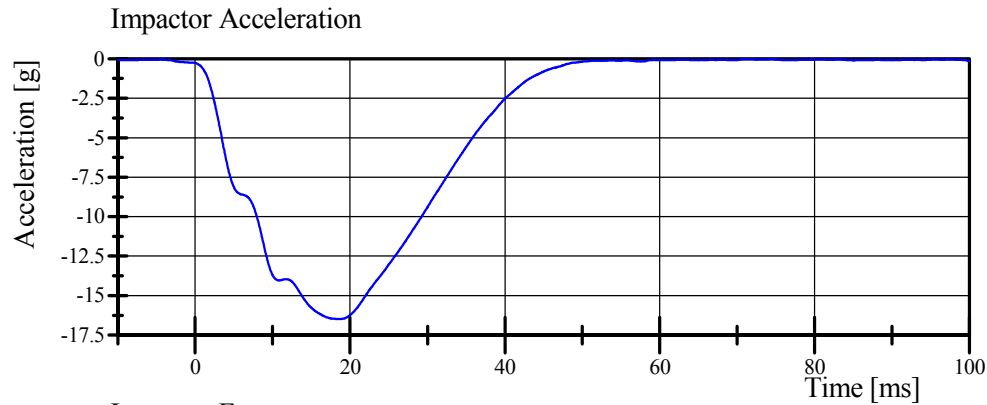
Abdomen Rib 2:DW9382

Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016



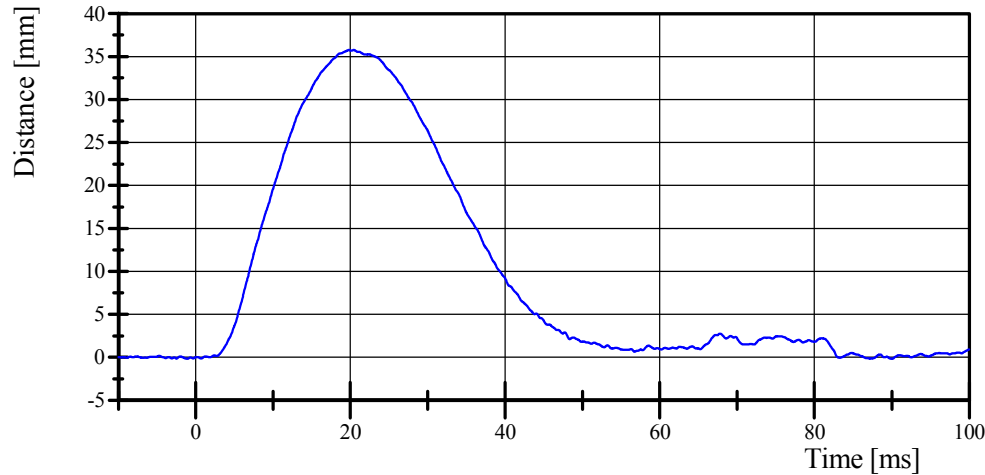
Transportation Research Center Inc.

Left Lateral Thorax without Arm

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Upper Thorax Rib Displacement

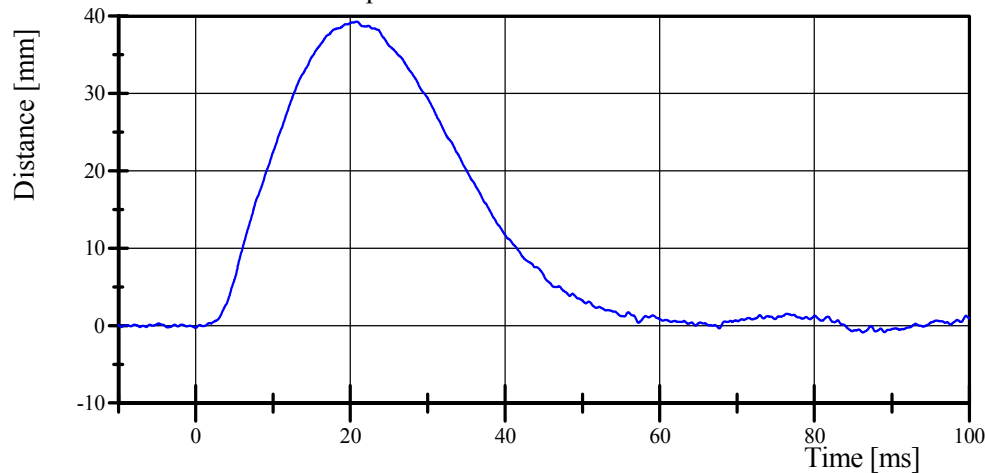


Filter Class: CFC_600

Max: 35.8 mm at 20.5 ms

Min: -0.2 mm at -1.1 ms

Center Thorax Rib Displacement

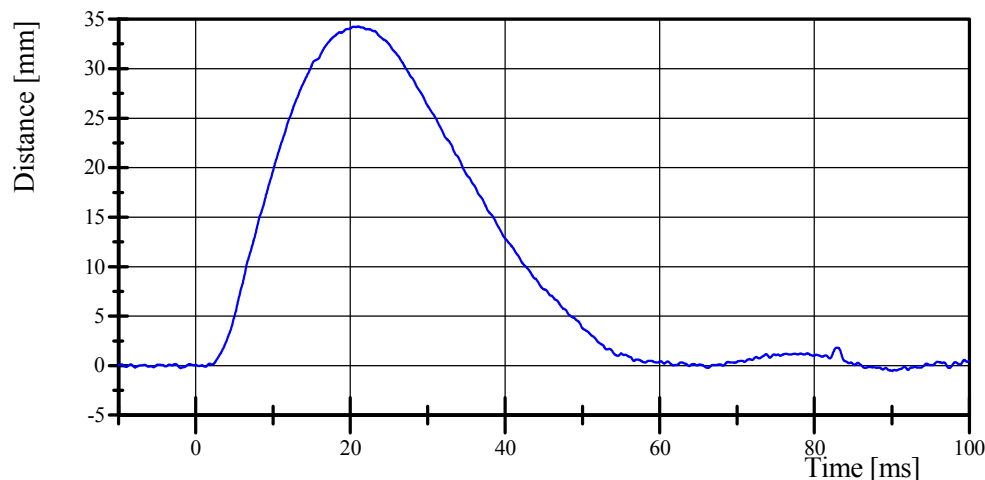


Filter Class: CFC_600

Max: 39.3 mm at 20.9 ms

Min: -0.9 mm at 86.3 ms

Lower Thorax Rib Displacement



Filter Class: CFC_600

Max: 34.3 mm at 21.0 ms

Min: -0.5 mm at 90.1 ms

Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	52 %	Yes
Impactor Velocity	4.20 - 4.40 m/s	4.294 m/s	Yes
Impactor Force	(-2,700) - (-3,100) N	-2,954.1 N	Yes
Upper Abdominal Rib Displacement	33 - 40 mm	34.1 mm	Yes
Lower Abdominal Rib Displacement	30 - 36 mm	35.2 mm	Yes
Lower Spine Lateral Acceleration	15 - 20 g	16.3 g	Yes

Test meets specifications.

Comments:

Shoulder Rib: DL9341

Thorax Rib 1: DW8861

Thorax Rib 2: DW8862

Thorax Rib 3: DW8863

Abdomen Rib 1: DW9381

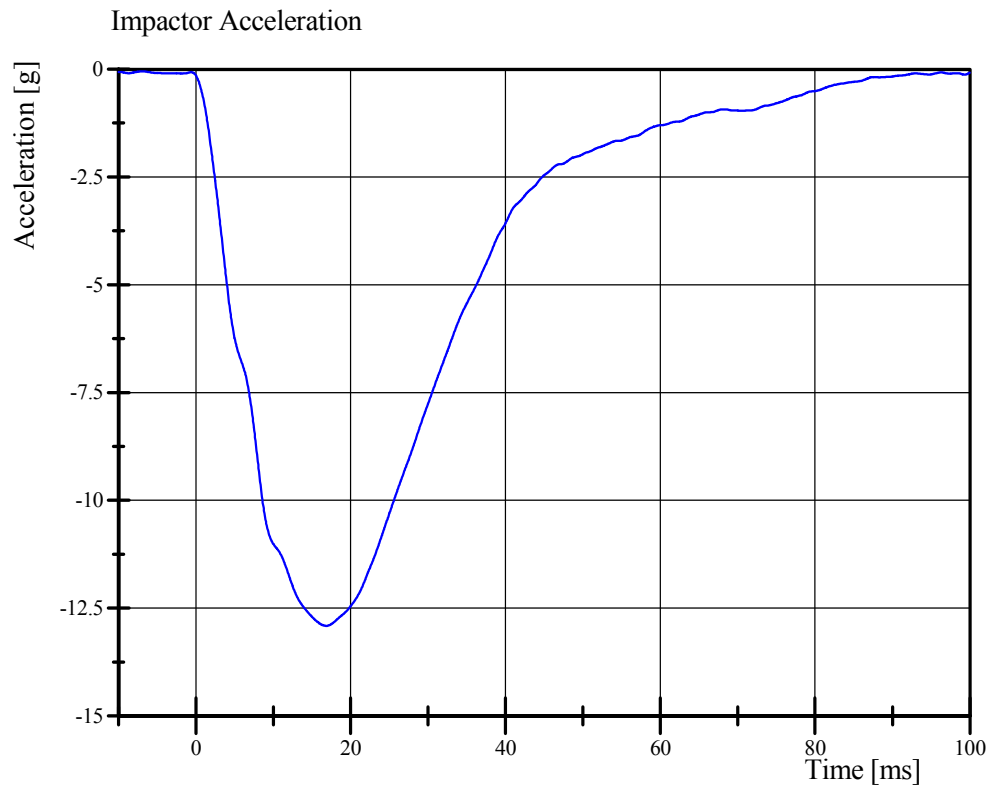
Abdomen Rib 2:DW9382

Transportation Research Center Inc.

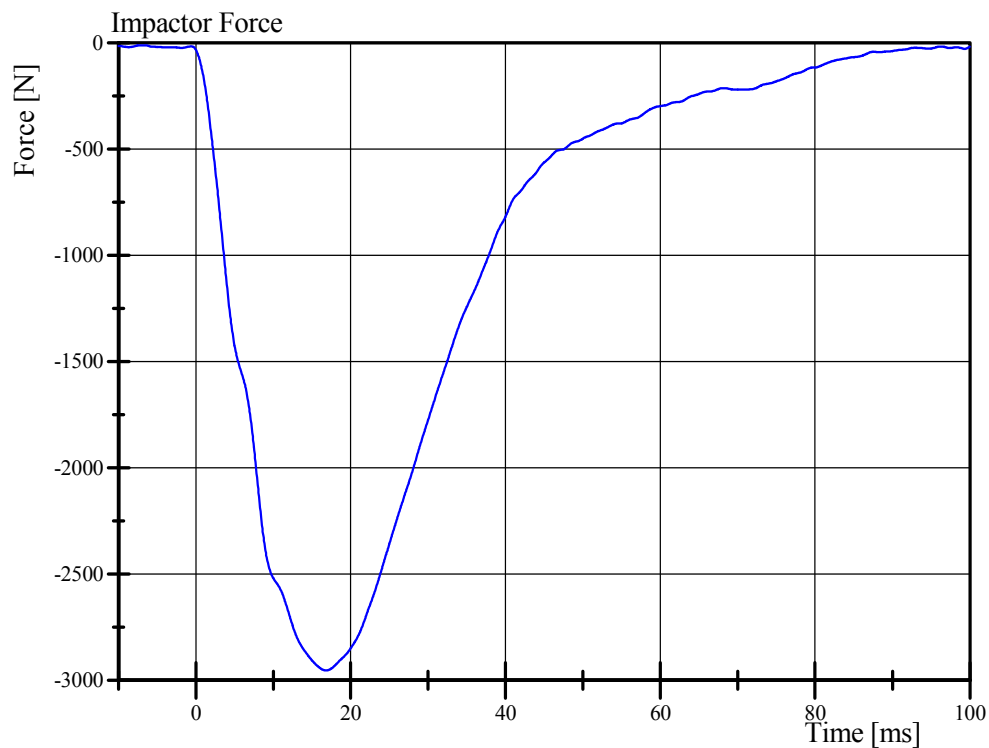
Left Lateral Abdomen

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016



Filter Class: CFC_180
Max: -0.1 g at -6.8 ms
Min: -12.9 g at 16.9 ms



Filter Class: CFC_180
Max: -11.7 N at -6.8 ms
Min: -2,954.1 N at 16.9 ms

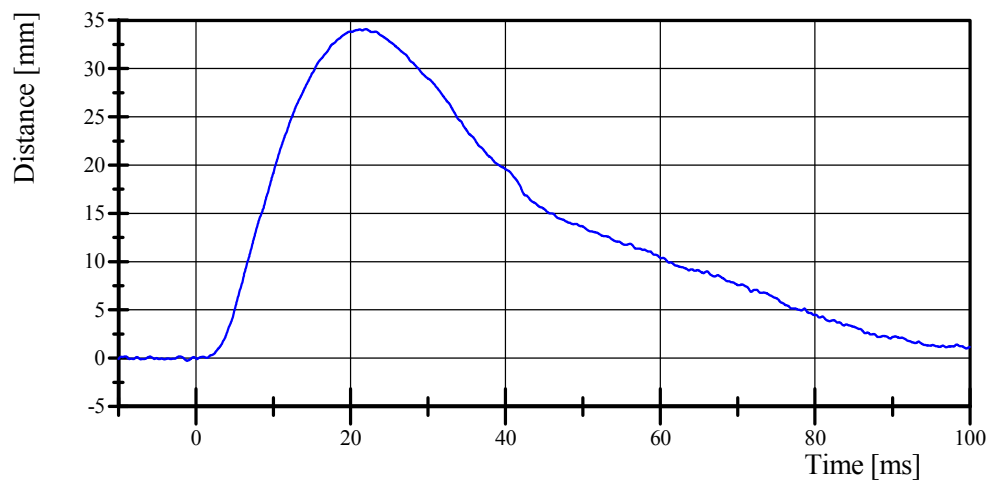
Transportation Research Center Inc.

Left Lateral Abdomen

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Upper Abdominal Rib Displacement

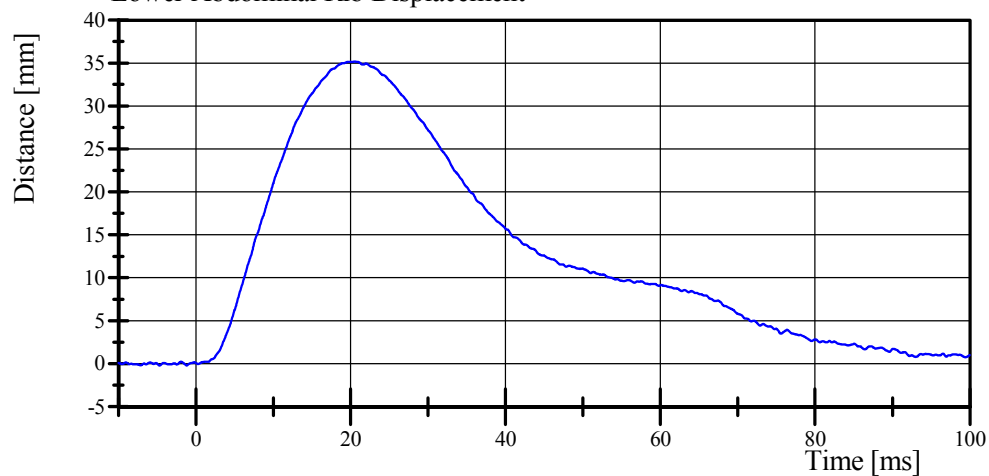


Filter Class: CFC_600

Max: 34.1 mm at 22.0 ms

Min: -0.3 mm at -1.2 ms

Lower Abdominal Rib Displacement

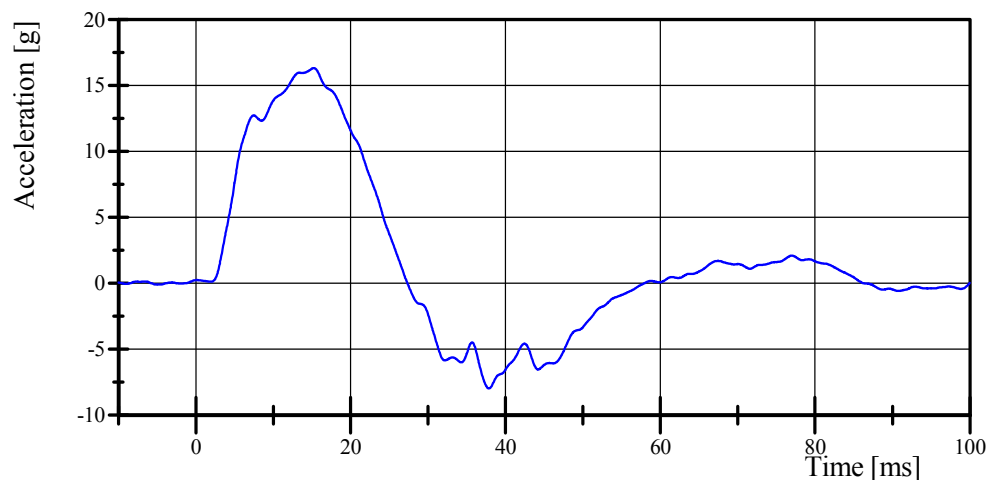


Filter Class: CFC_600

Max: 35.2 mm at 20.6 ms

Min: -0.2 mm at -4.7 ms

Lower Spine Acceleration (Y)



Filter Class: CFC_180

Max: 16.3 g at 15.3 ms

Min: -8.0 g at 37.9 ms

Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	21.2 °C	Yes
Relative Humidity	10 - 70 %	51 %	Yes
Impactor Velocity	6.60 - 6.80 m/s	6.694 m/s	Yes
Impactor Force	(-6,800) - (-8,200) N	-7,256.5 N	Yes
Pelvis Lateral Acceleration	37 - 47 g	41.7 g	Yes
Lower Spine Lateral Acceleration	10 - 14 g	12.9 g	Yes

Test meets specifications.

Comments:

Shoulder Rib: DL9341

Thorax Rib 1: DW8861

Thorax Rib 2: DW8862

Thorax Rib 3: DW8863

Abdomen Rib 1: DW9381

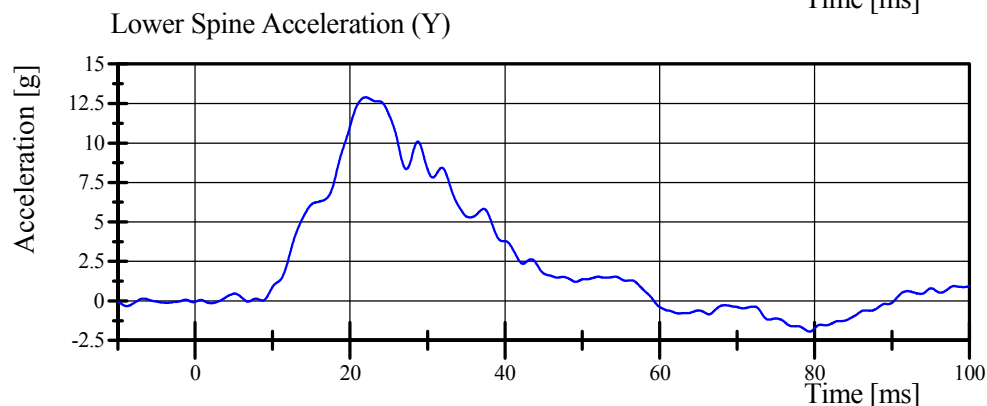
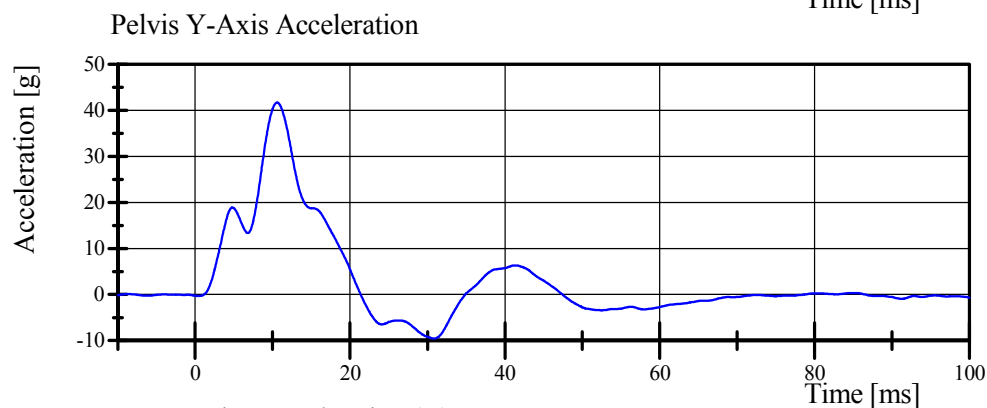
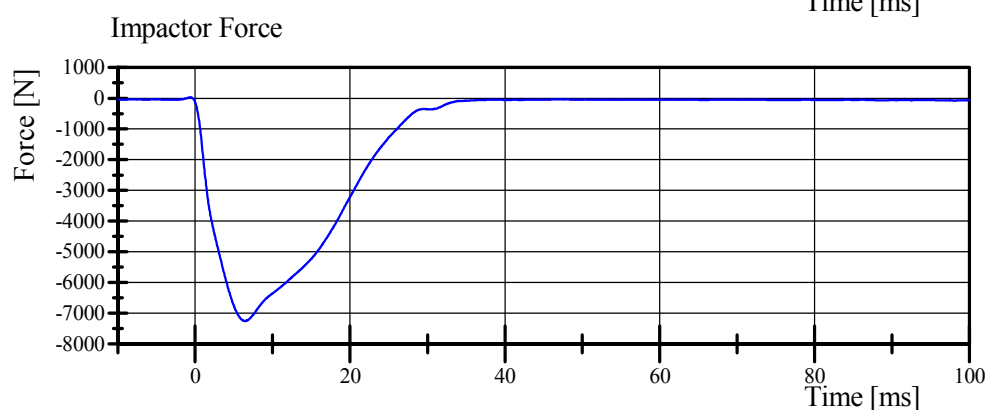
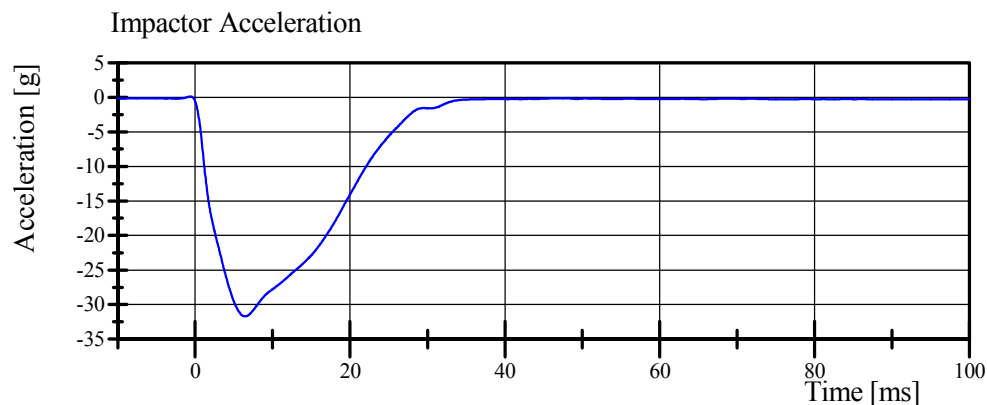
Abdomen Rib 2:DW9382

Transportation Research Center Inc.

Left Lateral Pelvis

WorldSID 50th Serial No. 016 Certification No. 21-1

Test Date: 6/1/2016



APPENDIX D
MISCELLANEOUS TEST INFORMATION

TABLE 1 – DUMMY INSTRUMENTATION (WSID-50M)

		WSID-50M S/N 016		
		Serial Number	Manufacturer	Calibration Date
Head Accelerometers	X	10172-1	Endevco	13-Jan-16
	Y	10172-3	Endevco	13-Jan-16
	Z	10172-2	Endevco	13-Jan-16
Head Gyros	X	ARS5988	DTS	1-Mar-16
	Y	ARS5989	DTS	26-Jan-16
	Z	ARS6017	DTS	26-Jan-16
Upper Neck Force	X	75	Denton	7-Jan-16
	Y	75	Denton	7-Jan-16
	Z	75	Denton	7-Jan-16
Upper Neck Moment	X	75	Denton	7-Jan-16
	Y	75	Denton	7-Jan-16
	Z	75	Denton	7-Jan-16
Lower Neck Force	X	DQ6781	Denton	7-Jan-16
	Y	DQ6781	Denton	7-Jan-16
	Z	DQ6781	Denton	7-Jan-16
Lower Neck Moment	X	DQ6781	Denton	7-Jan-16
	Y	DQ6781	Denton	7-Jan-16
	Z	DQ6781	Denton	7-Jan-16
Upper Spine Accelerometers (T1)	X	10659-3	Endevco	13-Jan-16
	Y	10659-2	Endevco	13-Jan-16
	Z	10659-1	Endevco	13-Jan-16
Middle Spine Accelerometers (T4)	X	10839-3	Endevco	13-Jan-16
	Y	10839-2	Endevco	13-Jan-16
	Z	10839-1	Endevco	13-Jan-16
Lower Spine Accelerometers (T12)	X	10848-3	Endevco	13-Jan-16
	Y	10848-2	Endevco	13-Jan-16
	Z	10848-1	Endevco	13-Jan-16
Shoulder Force	X	92	Humanetics	15-Jan-16
	Y	92	Humanetics	15-Jan-16
	Z	92	Humanetics	15-Jan-16
Pubic Symphysis Force	Y	AC4889	FTSS	14-Jan-16
Sacro-Iliac Left Force	X	87	Denton	14-Jan-16
	Y	87	Denton	14-Jan-16
	Z	87	Denton	14-Jan-16
Sacro-Iliac Left Moment	X	87	Denton	14-Jan-16
	Y	87	Denton	14-Jan-16
	Z	87	Denton	14-Jan-16

TABLE 1 – DUMMY INSTRUMENTATION (WSID-50M) (CONTINUED)

		WSID-50M S/N 016		
		Serial Number	Manufacturer	Calibration Date
Lumbar Force	X	95	Denton	15-Jan-16
	Y	95	Denton	15-Jan-16
	Z	95	Denton	15-Jan-16
Lumbar Moment	X	95	Denton	15-Jan-16
	Y	95	Denton	15-Jan-16
	Z	95	Denton	15-Jan-16
Pelvis Accelerometers	X	10046-3	Endevco	13-Jan-16
	Y	10046-2	Endevco	13-Jan-16
	Z	10046-1	Endevco	13-Jan-16
Left Femur Force	X	91	Humanetics	8-Jan-16
	Y	91	Humanetics	8-Jan-16
	Z	91	Humanetics	8-Jan-16
Left Femur Moment	X	91	Humanetics	8-Jan-16
	Y	91	Humanetics	8-Jan-16
	Z	91	Humanetics	8-Jan-16
Left Femoral Neck Force	X	78	Humanetics	15-Jan-16
	Y	78	Humanetics	15-Jan-16
	Z	78	Humanetics	15-Jan-16

TABLE 1 – DUMMY INSTRUMENTATION (WSID-50M) (CONTINUED)

			WSID-50M S/N 016		
			Serial Number	Manufacturer	Calibration Date
Shoulder Ribeye	Front	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Middle	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Rear	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
Thorax Rib 1	Front	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Middle	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Rear	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
Thorax Rib 2	Front	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Middle	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Rear	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
Thorax Rib 3	Front	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Middle	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Rear	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016

TABLE 1 – DUMMY INSTRUMENTATION (WSID-50M) (CONTINUED)

			WSID-50M S/N 016		
			Serial Number	Manufacturer	Calibration Date
Abdomen Rib 1	Front	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Middle	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Rear	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
Abdomen Rib 2	Front	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Middle	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016
	Rear	X	123	Boxboro Systems	29/Jan/2016
		Y	123	Boxboro Systems	29/Jan/2016
		Z	123	Boxboro Systems	29/Jan/2016

TABLE 2 – Chest Band INSTRUMENTATION

	Serial Number	Manufacturer	Calibration Date
W50-1	DK0833 01	HUMANETICS	13-JAN-2016
W50-2	DK0833 02	HUMANETICS	13-JAN-2016
W50-3	DK0833 03	HUMANETICS	13-JAN-2016
W50-4	DK0833 04	HUMANETICS	13-JAN-2016
W50-5	DK0833 05	HUMANETICS	13-JAN-2016
W50-6	DK0833 06	HUMANETICS	13-JAN-2016
W50-7	DK0833 07	HUMANETICS	13-JAN-2016
W50-8	DK0833 08	HUMANETICS	13-JAN-2016
W50-9	DK0833 09	HUMANETICS	13-JAN-2016
W50-10	DK0833 10	HUMANETICS	13-JAN-2016
W50-11	DK0833 11	HUMANETICS	13-JAN-2016
W50-12	DK0833 12	HUMANETICS	13-JAN-2016
W50-13	DK0833 13	HUMANETICS	13-JAN-2016
W50-14	DK0833 14	HUMANETICS	13-JAN-2016
W50-15	DK0833 15	HUMANETICS	13-JAN-2016
W50-16	DK0833 16	HUMANETICS	13-JAN-2016
W50-17	DK0833 17	HUMANETICS	13-JAN-2016
W50-18	DK0833 18	HUMANETICS	13-JAN-2016
W50-19	DK0833 19	HUMANETICS	13-JAN-2016
W50-20	DK0833 20	HUMANETICS	13-JAN-2016
W50-21	DK0833 21	HUMANETICS	13-JAN-2016
W50-22	DK0833 22	HUMANETICS	13-JAN-2016
W50-23	DK0833 23	HUMANETICS	13-JAN-2016
W50-24	DK0833 24	HUMANETICS	13-JAN-2016
W50-25	DK0833 25	HUMANETICS	13-JAN-2016
W50-26	DK0833 26	HUMANETICS	13-JAN-2016
W50-27	DK0833 27	HUMANETICS	13-JAN-2016
W50-28	DK0833 28	HUMANETICS	13-JAN-2016
W50-29	DK0833 29	HUMANETICS	13-JAN-2016
W50-30	DK0833 30	HUMANETICS	13-JAN-2016
W50-31	DK0833 31	HUMANETICS	13-JAN-2016
W50-32	DK0833 32	HUMANETICS	13-JAN-2016
W50-33	DK0833 33	HUMANETICS	13-JAN-2016
W50-34	DK0833 34	HUMANETICS	13-JAN-2016
W50-35	DK0833 35	HUMANETICS	13-JAN-2016
W50-36	DK0833 36	HUMANETICS	13-JAN-2016
W50-37	DK0833 37	HUMANETICS	13-JAN-2016

TABLE 2 – Chest Band INSTRUMENTATION (Continued)

W50-38	DK0833 38	HUMANETICS	13-JAN-2016
W50-39	DK0833 39	HUMANETICS	13-JAN-2016
W50-40	DK0833 40	HUMANETICS	13-JAN-2016
W50-41	DK0833 41	HUMANETICS	13-JAN-2016
W50-42	DK0833 42	HUMANETICS	13-JAN-2016
W50-43	DK0833 43	HUMANETICS	13-JAN-2016
W50-44	DK0833 44	HUMANETICS	13-JAN-2016
W50-45	DK0833 45	HUMANETICS	13-JAN-2016
W50-46	DK0833 46	HUMANETICS	13-JAN-2016
W50-47	DK0833 47	HUMANETICS	13-JAN-2016
W50-48	DK0833 48	HUMANETICS	13-JAN-2016
W50-49	DK0833 49	HUMANETICS	13-JAN-2016
W50-50	DK0833 50	HUMANETICS	13-JAN-2016
W50-51	DK0833 51	HUMANETICS	13-JAN-2016
W50-52	DK0833 52	HUMANETICS	13-JAN-2016
W50-53	DK0833 53	HUMANETICS	13-JAN-2016
W50-54	DK0833 54	HUMANETICS	13-JAN-2016
W50-55	DK0833 55	HUMANETICS	13-JAN-2016
W50-56	DK0833 56	HUMANETICS	13-JAN-2016

TABLE 3 – VEHICLE INSTRUMENTATION

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	P91970	ENDEVCO	29-Feb-2016
	Y	P91882	ENDEVCO	29-Feb-2016
	Z	P91479	ENDEVCO	29-Feb-2016
Left Floor Sill	Y	P91631	ENDEVCO	10-May-2016
Left A-Pillar Sill	Y	P91523	ENDEVCO	3-May-2016
Left Lower A-Pillar	Y	P93448	ENDEVCO	10-Jun-2016
Left Mid A-Pillar	Y	P46005	ENDEVCO	23-May-2016
Left B-Pillar Sill	Y	P58527	ENDEVCO	16-May-2016
Left Lower B-Pillar	Y	P81659	ENDEVCO	30-Mar-2016
Left Mid B-Pillar	Y	P91537	ENDEVCO	18-Apr-2016
Driver Seat Track at Dummy H-Point	Y	P58759	ENDEVCO	6-Jan-2016
Engine Top	X	P91188	ENDEVCO	10-May-2016
	Y	P90856	ENDEVCO	10-May-2016
Firewall Center	Y	P88548	ENDEVCO	16-May-2016
Right Roof at Vertical Impact Reference Line	Y	P41298	ENDEVCO	23-May-2016
Right Sill at Vertical Impact Reference Line	Y	P81599	ENDEVCO	14-Jan-2016
Rear Floorpan Behind Rear Axle at Centerline	X	P91608	ENDEVCO	3-May-2016
Left Front Door Mid Centerline	Y	P81616	ENDEVCO	16-May-2016
Left Front Door Mid Rear	Y	P45591	ENDEVCO	14-Jan-2016
Left Front Door Upper Centerline	Y	P91186	ENDEVCO	29-Feb-2016
Left Rear Door Mid Rear	Y	P61718	ENDEVCO	1-Mar-2016
Left Rear Door Upper Centerline	Y	P50473	ENDEVCO	10-May-2016
Rear Floorpan Behind Rear Axle at Centerline	Y	P91606	ENDEVCO	3-May-2016

TABLE 4 – POLE INSTRUMENTATION

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	5763-88-FX	Denton	13-Nov-2015
Load Cell 2	5763-77-FX	Denton	13-Nov-2015
Load Cell 3	5764-103-FX	Denton	13-Nov-2015
Load Cell 4	5764-101-FX	Denton	13-Nov-2015
Load Cell 5	5763-92-FX	Denton	13-Nov-2015
Load Cell 6	5763-84-FX	Denton	13-Nov-2015
Load Cell 7	5764-97-FX	Denton	13-Nov-2015
Load Cell 8	5763-87-FX	Denton	13-Nov-2015

Sign Convention
SAE J211 MAR95

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

<u>Potentiometers:</u>	+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

<u>Tibia load cells:</u>	+X force:	Ankle forward, knee rearward
	+Y force:	Ankle rightward, knee leftward
	+Z force:	Tension
	+X moment:	Bottom of tibia moving leftward
	+Y moment:	Bottom of tibia moving rearward

Sign Convention (Continued)
SAE J211 MAR95

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

Frequency Response Classes
SAE J211 MAR95

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

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
1	11HEADCG00WSACXP	Head X-Axis Acceleration	1000	+	no	2000
2	11HEADCG00WSACYP	Head Y-Axis Acceleration	1000	+	no	2000
3	11HEADCG00WSACZP	Head Z-Axis Acceleration	1000	+	no	2000
3A	11HEADCG00WSACRP	Head A Resultant	1000			
4	11HEADCG00WSAVXP	Head X-Axis Angular Velocity	60	+	no	18000
5	11HEADCG00WSAVYP	Head Y-Axis Angular Velocity	60	+	no	18000
6	11HEADCG00WSAVZP	Head Z-Axis Angular Velocity	60	+	no	18000
7	11NECKUP00WSFOXP	Upper Neck X-Axis Force	1000	+	no	10000
8	11NECKUP00WSFOYP	Upper Neck Y-Axis Force	1000	+	no	10000
9	11NECKUP00WSFOZP	Upper Neck Z-Axis Force	1000	+	no	12000
10	11NECKUP00WSMOXP	Upper Neck Moment About X Axis	600	+	no	300
11	11NECKUP00WSMOYP	Upper Neck Moment About Y Axis	600	+	no	300
12	11NECKUP00WSMOZP	Upper Neck Moment About Z Axis	600	+	no	200
13	11NECKLO00WSFOXP	Lower Neck X-Axis Force	1000	+	no	10000
14	11NECKLO00WSFOYP	Lower Neck Y-Axis Force	1000	+	no	10000
15	11NECKLO00WSFOZP	Lower Neck Z-Axis Force	1000	+	no	12000
16	11NECKLO00WSMOXP	Lower Neck Moment About X Axis	600	+	no	300
17	11NECKLO00WSMOYP	Lower Neck Moment About Y Axis	600	+	no	300
18	11NECKLO00WSMOZP	Lower Neck Moment About Z Axis	600	+	no	200
19	11THSP0100WSACXP	T1 Longitudinal Ax	180	+	no	2000
20	11THSP0100WSACYP	T1 Lateral Ay	180	+	no	2000
21	11THSP0100WSACZP	T1 Vertical Az	180	+	no	2000
21A	11THSP0100WSACRP	T1 A Resultant	180			
22	11THSP0400WSACXP	T4 Longitudinal Ax	180	+	no	2000
23	11THSP0400WSACYP	T4 Lateral Ay	180	+	no	2000
24	11THSP0400WSACZP	T4 Vertical Az	180	+	no	2000
24A	11THSP0400WSACRP	T4 A Resultant	180			
25	11THSP1200WSACXP	T12 Longitudinal Ax	180	+	no	2000
26	11THSP1200WSACYP	T12 Lateral Ay	180	+	no	2000
27	11THSP1200WSACZP	T12 Vertical Az	180	+	no	2000
27A	11THSP1200WSACRP	T12 A Resultant	180			
28	11SHLDLE00WSFOXP	Shoulder X-Axis Force	600	+	no	5000
29	11SHLDLE00WSFOYP	Shoulder Y-Axis Force	600	+	no	10000
30	11SHLDLE00WSFOZP	Shoulder Z-Axis Force	600	+	no	5000
31	11PUBC0000WSFOYP	Pubic Symphysis Y-Axis Force	600	+	no	12000
32	11SACRLE00WSFOXP	Sacro-Iliac Left X-Axis Force	600	+	no	6000
33	11SACRLE00WSFOYP	Sacro-Iliac Left Y-Axis Force	600	+	no	12000
34	11SACRLE00WSFOZP	Sacro-Iliac Left Z-Axis Force	600	+	no	6000
35	11SACRLE00WSMOXP	Sacro-Iliac Left Moment About X Axis	600	+	no	800
36	11SACRLE00WSMOYP	Sacro-Iliac Left Moment About Y Axis	600	+	no	400
37	11SACRLE00WSMOZP	Sacro-Iliac Left Moment About Z Axis	600	+	no	400
38	11LUSP0000WSFOXP	Lumbar X-Axis Force	600	+	no	10000
39	11LUSP0000WSFOYP	Lumbar Y-Axis Force	600	+	no	10000
40	11LUSP0000WSFOZP	Lumbar Z-Axis Force	600	+	no	12000
41	11LUSP0000WSMOXP	Lumbar Moment About X Axis	600	+	no	300

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
42	11LUSP0000WSMOYP	Lumbar Moment About Y Axis	600	+	no	300
43	11LUSP0000WSMOZP	Lumbar Moment About Z Axis	600	+	no	200
44	11PELV0000WSACXP	Pelvis Longitudinal Ax	180	+	no	2000
45	11PELV0000WSACYP	Pelvis Lateral Ay	180	+	no	2000
46	11PELV0000WSACZP	Pelvis Vertical Az	180	+	no	2000
46A	11PELV0000WSACRP	Pelvis A Resultant	180			
47	11FEMRLE00WSFOXP	Left Femur X-Axis Force	600	+	no	15000
48	11FEMRLE00WSFOYP	Left Femur Y-Axis Force	600	+	no	15000
49	11FEMRLE00WSFOZP	Left Femur Z-Axis Force	600	+	no	15000
50	11FEMRLE00WSMOXP	Left Femur Moment About X Axis	600	+	no	350
51	11FEMRLE00WSMOYP	Left Femur Moment About Y Axis	600	+	no	350
52	11FEMRLE00WSMOZP	Left Femur Moment About Z Axis	600	+	no	300
53	11FEACLE00WSFOXP	Left Femoral Neck Force X	600	+	no	10000
54	11FEACLE00WSFOYP	Left Femoral Neck Force Y	600	+	no	25000
55	11FEACLE00WSFOZP	Left Femoral Neck Force Z	600	+	no	10000
56	11SHRI00REWSDSX0	Shoulder Rear Ribeye X-Axis Displacement	0	+	no	60
57	11SHRI00REWSDSY0	Shoulder Rear Ribeye Y-Axis Displacement	0	+	no	60
58	11SHRI00REWSDSZ0	Shoulder Rear Ribeye Z-Axis Displacement	0	+	no	60
59	11SHRI00REWSDS00	Shoulder Rear Ribeye Length Change	0	+	no	60
60	11SHRI00MIWSDSX0	Shoulder Middle Ribeye X-Axis Displacement	0	+	no	60
61	11SHRI00MIWSDSY0	Shoulder Middle Ribeye Y-Axis Displacement	0	+	no	60
62	11SHRI00MIWSDSZ0	Shoulder Middle Ribeye Z-Axis Displacement	0	+	no	60
63	11SHRI00MIWSDS00	Shoulder Middle Ribeye Length Change	0	+	no	60
64	11SHRI00FRWSDSX0	Shoulder Front Ribeye X-Axis Displacement	0	+	no	60
65	11SHRI00FRWSDSY0	Shoulder Front Ribeye Y-Axis Displacement	0	+	no	60
66	11SHRI00FRWSDSZ0	Shoulder Front Ribeye Z-Axis Displacement	0	+	no	60
67	11SHRI00FRWSDS00	Shoulder Front Ribeye Length Change	0	+	no	60
68	11THRI01REWSDSX0	Thorax Rib 1 Rear Ribeye X-Axis Displacement	0	+	no	60
69	11THRI01REWSDSY0	Thorax Rib 1 Rear Ribeye Y-Axis Displacement	0	+	no	60
70	11THRI01REWSDSZ0	Thorax Rib 1 Rear Ribeye Z-Axis Displacement	0	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
71	11THRI01REWSDS00	Thorax Rib 1 Rear Ribeye Length Change	0	+	no	60
72	11THRI01MIWSDSX0	Thorax Rib 1 Middle Ribeye X-Axis Displacement	0	+	no	60
73	11THRI01MIWSDSY0	Thorax Rib 1 Middle Ribeye Y-Axis Displacement	0	+	no	60
74	11THRI01MIWSDSZ0	Thorax Rib 1 Middle Ribeye Z-Axis Displacement	0	+	no	60
75	11THRI01MIWSDS00	Thorax Rib 1 Middle Ribeye Length Change	0	+	no	60
76	11THRI01FRWSDSX0	Thorax Rib 1 Front Ribeye X-Axis Displacement	0	+	no	60
77	11THRI01FRWSDSY0	Thorax Rib 1 Front Ribeye Y-Axis Displacement	0	+	no	60
78	11THRI01FRWSDSZ0	Thorax Rib 1 Front Ribeye Z-Axis Displacement	0	+	no	60
79	11THRI01FRWSDS00	Thorax Rib 1 Front Ribeye Length Change	0	+	no	60
80	11THRI02REWSDSX0	Thorax Rib 2 Rear Ribeye X-Axis Displacement	0	+	no	60
81	11THRI02REWSDSY0	Thorax Rib 2 Rear Ribeye Y-Axis Displacement	0	+	no	60
82	11THRI02REWSDSZ0	Thorax Rib 2 Rear Ribeye Z-Axis Displacement	0	+	no	60
83	11THRI02REWSDS00	Thorax Rib 2 Rear Ribeye Length Change	0	+	no	60
84	11THRI02MIWSDSX0	Thorax Rib 2 Middle Ribeye X-Axis Displacement	0	+	no	60
85	11THRI02MIWSDSY0	Thorax Rib 2 Middle Ribeye Y-Axis Displacement	0	+	no	60
86	11THRI02MIWSDSZ0	Thorax Rib 2 Middle Ribeye Z-Axis Displacement	0	+	no	60
87	11THRI02MIWSDS00	Thorax Rib 2 Middle Ribeye Length Change	0	+	no	60
88	11THRI02FRWSDSX0	Thorax Rib 2 Front Ribeye X-Axis Displacement	0	+	no	60
89	11THRI02FRWSDSY0	Thorax Rib 2 Front Ribeye Y-Axis Displacement	0	+	no	60
90	11THRI02FRWSDSZ0	Thorax Rib 2 Front Ribeye Z-Axis Displacement	0	+	no	60
91	11THRI02FRWSDS00	Thorax Rib 2 Front Ribeye Length Change	0	+	no	60
92	11THRI03REWSDSX0	Thorax Rib 3 Rear Ribeye X-Axis Displacement	0	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
93	11THRI03REWSDSY0	Thorax Rib 3 Rear Ribeye Y-Axis Displacement	0	+	no	60
94	11THRI03REWSDSZ0	Thorax Rib 3 Rear Ribeye Z-Axis Displacement	0	+	no	60
95	11THRI03REWSDS00	Thorax Rib 3 Rear Ribeye Length Change	0	+	no	60
96	11THRI03MIWSDSX0	Thorax Rib 3 Middle Ribeye X-Axis Displacement	0	+	no	60
97	11THRI03MIWSDSY0	Thorax Rib 3 Middle Ribeye Y-Axis Displacement	0	+	no	60
98	11THRI03MIWSDSZ0	Thorax Rib 3 Middle Ribeye Z-Axis Displacement	0	+	no	60
99	11THRI03MIWSDS00	Thorax Rib 3 Middle Ribeye Length Change	0	+	no	60
100	11THRI03FRWSDSX0	Thorax Rib 3 Front Ribeye X-Axis Displacement	0	+	no	60
101	11THRI03FRWSDSY0	Thorax Rib 3 Front Ribeye Y-Axis Displacement	0	+	no	60
102	11THRI03FRWSDSZ0	Thorax Rib 3 Front Ribeye Z-Axis Displacement	0	+	no	60
103	11THRI03FRWSDS00	Thorax Rib 3 Front Ribeye Length Change	0	+	no	60
104	11ABRI01REWSDSX0	Abdomen Rib 1 Rear Ribeye X-Axis Displacement	0	+	no	60
105	11ABRI01REWSDSY0	Abdomen Rib 1 Rear Ribeye Y-Axis Displacement	0	+	no	60
106	11ABRI01REWSDSZ0	Abdomen Rib 1 Rear Ribeye Z-Axis Displacement	0	+	no	60
107	11ABRI01REWSDS00	Abdomen Rib 1 Rear Ribeye Length Change	0	+	no	60
108	11ABRI01MIWSDSX0	Abdomen Rib 1 Middle Ribeye X-Axis Displacement	0	+	no	60
109	11ABRI01MIWSDSY0	Abdomen Rib 1 Middle Ribeye Y-Axis Displacement	0	+	no	60
110	11ABRI01MIWSDSZ0	Abdomen Rib 1 Middle Ribeye Z-Axis Displacement	0	+	no	60
111	11ABRI01MIWSDS00	Abdomen Rib 1 Middle Ribeye Length Change	0	+	no	60
112	11ABRI01FRWSDSX0	Abdomen Rib 1 Front Ribeye X-Axis Displacement	0	+	no	60
113	11ABRI01FRWSDSY0	Abdomen Rib 1 Front Ribeye Y-Axis Displacement	0	+	no	60
114	11ABRI01FRWSDSZ0	Abdomen Rib 1 Front Ribeye Z-Axis Displacement	0	+	no	60

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
115	11ABRI01FRWSDS00	Abdomen Rib 1 Front Ribeye Length Change	0	+	no	60
116	11ABRI02REWSDSX0	Abdomen Rib 2 Rear Ribeye X-Axis Displacement	0	+	no	60
117	11ABRI02REWSDSY0	Abdomen Rib 2 Rear Ribeye Y-Axis Displacement	0	+	no	60
118	11ABRI02REWSDSZ0	Abdomen Rib 2 Rear Ribeye Z-Axis Displacement	0	+	no	60
119	11ABRI02REWSDS00	Abdomen Rib 2 Rear Ribeye Length Change	0	+	no	60
120	11ABRI02MIWSDSX0	Abdomen Rib 2 Middle Ribeye X-Axis Displacement	0	+	no	60
121	11ABRI02MIWSDSY0	Abdomen Rib 2 Middle Ribeye Y-Axis Displacement	0	+	no	60
122	11ABRI02MIWSDSZ0	Abdomen Rib 2 Middle Ribeye Z-Axis Displacement	0	+	no	60
123	11ABRI02MIWSDS00	Abdomen Rib 2 Middle Ribeye Length Change	0	+	no	60
124	11ABRI02FRWSDSX0	Abdomen Rib 2 Front Ribeye X-Axis Displacement	0	+	no	60
125	11ABRI02FRWSDSY0	Abdomen Rib 2 Front Ribeye Y-Axis Displacement	0	+	no	60
126	11ABRI02FRWSDSZ0	Abdomen Rib 2 Front Ribeye Z-Axis Displacement	0	+	no	60
127	11ABRI02FRWSDS00	Abdomen Rib 2 Front Ribeye Length Change	0	+	no	60
128	11CHBA0100WSVO0A	W50-1	1000	+	no	100
129	11CHBA0200WSVO0A	W50-2	1000	+	no	100
130	11CHBA0300WSVO0A	W50-3	1000	+	no	100
131	11CHBA0400WSVO0A	W50-4	1000	+	no	100
132	11CHBA0500WSVO0A	W50-5	1000	+	no	100
133	11CHBA0600WSVO0A	W50-6	1000	+	no	100
134	11CHBA0700WSVO0A	W50-7	1000	+	no	100
135	11CHBA0800WSVO0A	W50-8	1000	+	no	100
136	11CHBA0900WSVO0A	W50-9	1000	+	no	100
138	11CHBA1100WSVO0A	W50-11	1000	+	no	100
139	11CHBA1200WSVO0A	W50-12	1000	+	no	100
140	11CHBA1300WSVO0A	W50-13	1000	+	no	100
141	11CHBA1400WSVO0A	W50-14	1000	+	no	100
142	11CHBA1500WSVO0A	W50-15	1000	+	no	100
143	11CHBA1600WSVO0A	W50-16	1000	+	no	100
144	11CHBA1700WSVO0A	W50-17	1000	+	no	100
145	11CHBA1800WSVO0A	W50-18	1000	+	no	100
146	11CHBA1900WSVO0A	W50-19	1000	+	no	100
147	11CHBA2000WSVO0A	W50-20	1000	+	no	100

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
148	11CHBA2100WSVO0A	W50-21	1000	+	no	100
149	11CHBA2200WSVO0A	W50-22	1000	+	no	100
150	11CHBA2300WSVO0A	W50-23	1000	+	no	100
151	11CHBA2400WSVO0A	W50-24	1000	+	no	100
152	11CHBA2500WSVO0A	W50-25	1000	+	no	100
153	11CHBA2600WSVO0A	W50-26	1000	+	no	100
154	11CHBA2700WSVO0A	W50-27	1000	+	no	100
155	11CHBA2800WSVO0A	W50-28	1000	+	no	100
156	11CHBA2900WSVO0A	W50-29	1000	+	no	100
157	11CHBA3000WSVO0A	W50-30	1000	+	no	100
158	11CHBA3100WSVO0A	W50-31	1000	+	no	100
159	11CHBA3200WSVO0A	W50-32	1000	+	no	100
160	11CHBA3300WSVO0A	W50-33	1000	+	no	100
161	11CHBA3400WSVO0A	W50-34	1000	+	no	100
162	11CHBA3500WSVO0A	W50-35	1000	+	no	100
163	11CHBA3600WSVO0A	W50-36	1000	+	no	100
164	11CHBA3700WSVO0A	W50-37	1000	+	no	100
165	11CHBA3800WSVO0A	W50-38	1000	+	no	100
166	11CHBA3900WSVO0A	W50-39	1000	+	no	100
167	11CHBA4000WSVO0A	W50-40	1000	+	no	100
168	11CHBA4100WSVO0A	W50-41	1000	+	no	100
169	11CHBA4200WSVO0A	W50-42	1000	+	no	100
170	11CHBA4300WSVO0A	W50-43	1000	+	no	100
171	11CHBA4400WSVO0A	W50-44	1000	+	no	100
172	11CHBA4500WSVO0A	W50-45	1000	+	no	100
173	11CHBA4600WSVO0A	W50-46	1000	+	no	100
174	11CHBA4700WSVO0A	W50-47	1000	+	no	100
175	11CHBA4800WSVO0A	W50-48	1000	+	no	100
176	11CHBA4900WSVO0A	W50-49	1000	+	no	100
177	11CHBA5000WSVO0A	W50-50	1000	+	no	100
178	11CHBA5100WSVO0A	W50-51	1000	+	no	100
179	11CHBA5200WSVO0A	W50-52	1000	+	no	100
180	11CHBA5300WSVO0A	W50-53	1000	+	no	100
181	11CHBA5400WSVO0A	W50-54	1000	+	no	100
182	11CHBA5500WSVO0A	W50-55	1000	+	no	100
183	11CHBA5600WSVO0A	W50-56	1000	+	no	100
184	11VEHCCG0000ACXA	Vehicle Center of Gravity X-Axis Acceleration	60	+	no	2000
185	11VEHCCG0000ACYA	Vehicle Center of Gravity Y-Axis Acceleration	60	+	no	2000
186	11VEHCCG0000ACZA	Vehicle Center of Gravity Z-Axis Acceleration	60	+	no	2000
186A	11VEHCCG0000ACRA	Vehicle Center of Gravity Resultant Acceleration	60			

Channel Number	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
187	11VEHC00LO00ACYA	Left Floor Sill Y	60	+	no	2000
188	11APIL000000ACYA	Left A-Pillar Sill Y-Axis Acceleration	60	+	no	2000
189	11APILLO0000ACYA	Left Lower A-Pillar Y-Axis Acceleration	60	+	no	2000
190	11APILMI0000ACYA	Left Mid A-Pillar Y-Axis Acceleration	60	+	no	2000
191	11BPIL000000ACYA	Left B-Pillar Sill Y-Axis Acceleration	60	+	no	2000
192	11BPILLO0000ACYA	Left Lower B-Pillar Y-Axis Acceleration	60	+	no	2000
193	11BPILMI0000ACYA	Left Mid B-Pillar Y-Axis Acceleration	60	+	no	2000
194	11SETR000000ACYA	Driver Seat Track at Dummy H-Point Y-Axis Acceleration	60	+	no	2000
195	11ENGNT00000ACXA	Engine Top X-Axis Acceleration	60	+	no	2000
196						
197	11ENGNT00000ACYA	Engine Top Y-Axis Acceleration	60	+	no	2000
198	12FIRCX00000ACYA	Firewall Center Y-Axis Acceleration	60	+	no	2000
199	13ROFR000000ACYA	Right Roof at Vertical Impact Reference Line Y-Axis Acceleration	60	+	no	2000
200	13SILB000000ACYA	Right Sill at Vertical Impact Reference Line Y-Axis Acceleration	60	+	no	2000
201	11FORA000000ACXA	Rear Floorpan Behind Rear Axle at Centerline Acceleration X-Axis Acceleration	60	+	no	2000
202	11DOORMIMI71ACYA	Left Front Door Mid Centerline (Y)	60	+	no	2000
203	11DOORMIRE71ACYA	Left Front Door Mid Rear (Y)	60	+	no	2000
204	11DOORMIUP71ACYA	Left Front Door Upper Centerline (Y)	60	+	no	2000
205	14DOORMIRE71ACYA	Left Rear Door Mid Rear (Y)	60	+	no	2000
206	14DOORMIUP71ACYA	Left Rear Door Upper Centerline (Y)	60	+	no	2000
207	11FORA000000ACYA	Rear Floorpan Behind Rear Axle at Centerline Acceleration Y-Axis Acceleration	60	+	no	2000
208	11HEAD000000EV00	Head Contact	0	+	no	1
209	11SHLD000000EV00	Shoulder Contact	0	+	no	1
210	11TRRI000000EV00	Thorax Contact	0	+	no	1
211	11PELV000000EV00	Pelvis Contact	0	+	no	1
212	K0FBAR010000FOXA	POLE LOAD CELL 1	60	+	no	100000
213	K0FBAR020000FOXA	POLE LOAD CELL 2	60	+	no	100000
214	K0FBAR030000FOXA	POLE LOAD CELL 3	60	+	no	100000
215	K0FBAR040000FOXA	POLE LOAD CELL 4	60	+	no	100000
216	K0FBAR050000FOXA	POLE LOAD CELL 5	60	+	no	100000
217	K0FBAR060000FOXA	POLE LOAD CELL 6	60	+	no	100000
218	K0FBAR070000FOXA	POLE LOAD CELL 7	60	+	no	100000
219	K0FBAR080000FOXA	POLE LOAD CELL 8	60	+	no	100000



DESC.: SIENNA LE 3.5L FWD 8 PSGR
VIN: 5TDKK3DC1FS687956

YR/MDL: 2015/5338C
CLR: PREDAWN GRAY MICA/FC14 (01H114)
FINAL ASSEMBLY POINT: PRINCETON, INDIANA, U.S.A.

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score ★★★★★

Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver Passenger	★★★★★
---------------	------------------	-------

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash	Front seat Rear seat	★★★★★
------------	----------------------	-------

Based on the risk of injury in a side impact.

Rollover		★★★★★
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Based on the risk of rollover in a single-vehicle crash.

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

EPA DOT Fuel Economy and Environment

Fuel Economy

MPG Minivans range from 19 to 24 MPG. The best vehicle rates 119 MPGe

21 18 25

combined city/hwy city highway

4.8 gallons per 100 miles

Annual fuel cost

\$ 2,500

This vehicle emits 430 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Fuel Economy & Greenhouse Gas Rating (tailpipe only)



Smog Rating (tailpipe only)



Gasoline Vehicle

You spend

\$ 1,500

more in fuel costs over 5 years compared to the average new vehicle.

STANDARD EQUIPMENT

MECHANICAL & PERFORMANCE

- 3.5L DOHC 24-valve Dual VVT-I V6
- 6-Spd Electronically Controlled Auto Overdrive Trans. w/ Intelligence (ECT-I)
- 17" 5-spoke Alloy Wheels w/P235/60R17 Tires

SAFETY & CONVENIENCE

- Star Safety System: Enhanced Vehicle Stability Control, Traction Control, Anti-Lock Brake System, Electronic Brake-Force Distribution, Brake Assist & Smart Stop Technology

- 8 Airbags: Dr & Fr Psgr Active Headrests Advanced Airbag System, Dr & Fr Psgr Seat-mounted Side, Dr Knee, Fr Psgr Seat Cushion & 3-rw Side Curtain Airbags

- 4 LATCH (Lower Anchor & Tethers for Children) Locations

EXTERIOR

- Projector-Beam Headlights w/Auto On/Off
- Dual Power Sliding Side Doors
- Daytime Running Lights
- Color-Keyed Heated Pwr Outside Mirrors with Integrated Blind Spot Mirrors

INTERIOR

- Easy Clean Fabric 8-way Pwr Dr Seat w/ Pwr Lumbar, 4-way Fr Psgr Seat,Removable Easy Clean 2nd Row Captain's Chairs w/ Stowable Center Seat w/Tip Up & Long Slide,60/40 Split&Slow w/One-Motion Slow 3rd Row Seat

- 3-Zone Auto A/C -Driver, Passenger, Rear

- 7" Hi-Res Touch-Screen,AM/FM/CD/USB/AUX, Bluetooth, XM All Access 3-mo Trial, HD Radio & Integrated Backup Camera Display

- 3.5" LCD Multi-Info Display Screen

- ***Full Tank of Gas***

MANUFACTURER'S SUGGESTED RETAIL PRICE \$31,430.00

OPTIONAL EQUIPMENT

FE 50 State Emissions
DK. Preferred Owner's Portfolio
CF. Carpet Floor Mats/Door Sill Protector 330.00

TOTAL

\$32,660.00

The New Vehicle Limited Warranty provides 3-year/50,000 mile basic coverage, 5-year/60,000 mile powertrain coverage, and 5-year/unlimited mile corrosion coverage. See Warranty and Maintenance Guide for details. An extended service contract may be available for the vehicle.

Ask dealer for details. Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Gasoline, license and title fees, applicable federal, state and local taxes and dealer and distributor installed options and accessories are not included in the manufacturer's suggested retail price.

TouchCare, which covers normal factory scheduled maintenance for two years or 25,000 miles, whichever occurs first, is included as part of the suggested price of the vehicle for qualifying buyers. See participating dealer for eligibility and coverage details.

Delivered by Truck to: 31145

FOX TOYOTA-SUBARU
188 GRANT AVENUE
AUBURN NY13021



Driver WSID 50th Seating Worksheet

Vehicle	2016 Ford F-150	Technician	M. Postle/
VIN #	1FTEW1CG7GKD30154	Position	Engineering Technician
ATD	WSID 50th	Date	6/8 thru 6/9/2016
SEATING #			

SCRL Angle	Max	12.2	WSID 50th Tilt Sensors		X	Y
	Min -	12.2	Head	0°±2	-0.4	-1.6
	Difference	0	T1	0°±2		
	/2	0	T6	0°±2	0.5	-1.7
	Min +	0	T12	0°±2		
	Mid Angle	12.2	Pelvis	0°±2	0	2

Seat Back Angle	W/Level °	23.5	HEAD REST POST		FINAL HEAD REST	
Seat Pan Angle	W/Level °	13.6	ANGLE	2.8 rearward	POST ANGLE	3.5

Pelvis Angle	WSID 50th 0° +/-2.5°	Manual Inclinometer	
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Collected Points			
Name	Meas X	Meas Y	Meas Z
SBU -	-34.113	-5.771	-18.236
SBL -	-32.926	-7.952	17.981
STRIKER -	0.000	0.000	0.000
FOSB -	550.881	258.165	360.609
FISB -	550.934	602.066	360.581
ROSB -	57.555	223.603	354.196
RISB -	95.753	627.103	352.667
RHP -	1,000.002	575.170	404.097
LHP -	999.879	285.490	408.016
SO -	640.798	425.357	-307.468
TS -	707.035	425.305	-477.465
BS -	564.667	421.910	-135.957
SC1 -	861.371	313.176	-158.666
OSCAR H-POINT -	305.005	232.889	60.789
DR PROJECTED WSID H-POINT AT MID-POSITION -	326.000		152.000
DRIVER STP 14.27 MID-POSITION -	325.893	175.546	152.295
DRIVER STP STEP 17.6 TRIAL 1 -	298.401	175.100	153.077
DR PROJECTED WSID H-POINT STEP 17.6.2 TRIAL 1 -	212.000		258.000
DRIVER STP STEP 17.6 TRIAL 2 -	326.049	174.726	152.351
DR PROJECTED WSID H-POINT STEP 17.6.2 TRIAL 2 -	237.000		256.000
DRIVER STP STEP 17.6 TRIAL 3 -			
DR PROJECTED WSID H-POINT STEP 17.6.2 TRIAL 3 -			
3DRHCG-	196.420	515.769	-619.823
3DLHCG-	193.030	360.652	-614.731
LHDCG -	171.379	359.125	-620.067
BON -	268.011	438.149	-615.931
TN -	265.787	438.317	-569.408
TC -	249.287	439.163	-496.031
SHLD R1 -	228.059	437.584	-394.688
THX R1 -	263.282	433.993	-316.416
THX R2 -	302.126	432.088	-255.076
THX R3 -	315.386	433.696	-203.682
ABD R1 -	330.222	428.941	-151.269
ABD R2 -	351.229	428.950	-110.663

C1 -	239.502	443.581	-366.384
C2 -	278.766	423.893	-305.810
C3 -	347.575	430.704	-137.215
SHT -	132.568	221.225	-363.135
E1 -	353.091	160.400	-213.645
P1 -	274.933	214.815	-4.695
H-POINT -	329.520	212.650	43.916
OK -	755.496	207.459	-46.854
IK -	760.539	506.361	-73.351
OA -	998.281	214.874	279.149
IA -	972.289	545.654	288.316
OH -	1,011.219	227.249	411.025
IH -	1,001.594	562.189	411.609
OP -	-58.425	345.538	-479.441
R -	267.460	437.311	-848.468
H -	728.247	437.383	-778.623
W1 -	990.204	439.037	-615.816
W2 -	1,186.154	441.150	-486.627
D1 -	884.432	442.703	-446.689
D2 -	851.186	207.577	-80.948
D3 -	821.554	505.889	-93.321
HRP -	265.675	261.241	-753.791
HSP -	268.215	76.736	-617.018
ADP -	350.685	30.356	-214.290
HDP -	330.340	93.630	44.536

Calculated Measurements					
Name	Cal X	Cal Y	Cal Z	Cal 3D Distance	Deg
HZ -			232.537		
HH -				488.147	
HW -	722.194				
NR -				450.913	
CD -				649.911	
CS -	362.032				
IKD -				64.202	
OKD -				101.583	
HR -				224.293	
HS -		361.413			
AD -		130.044			
HD -		119.020			
HLHL -				335.079	
KK -				300.116	
SH -				394.629	
HRA -					3.5
H-POINT TOOL ANGLE -					48.314
TORSO ANGLE -					13.397
WINDSHIELD ANGLE -					56.603

APPENDIX E
RIBEYE INFORMATION

RibEye

A relatively new instrument called RibEye was used in the WorldSID 50th percentile dummy to evaluate the ability of RibEye to capture maximum deflection. When configured for the WorldSID 50th dummy, the RibEye consists of two groups of three sensors (receivers) mounted on the impact side of the spine box, one at each rib level, and three Light Emitting Diodes (LEDs) per rib, mounted on the inner surface of the inner rib on the impact side (Figure 1). The RibEye measures x, y, and z positions for each LED at 10,000 samples per second. The top set of sensors uses red optical filters and monitors the red LEDs mounted on the top three ribs (shoulder, thorax rib 1, and thorax rib 2). The bottom set of sensors uses blue optical filters and monitors the blue LEDs mounted on the bottom three ribs (thorax rib 3, abdomen ribs 1 and 2). Within each group of three sensors, position data from each sensor is reported with respect to a coordinate system that has its origin in the middle sensor of each set. Within each group of three sensors, the LEDs are installed using angled mounting blocks on the top and bottom ribs, and no mounting block on the middle rib (Figure 1). Note that the sensors (Figure 2) are also angled on the top and bottom ribs and flat on the middle rib. The LEDs and sensors are mounted this way so that the LED light is better aimed toward the sensors. The RibEye also includes its own data acquisition system and controller, which are installed on the non-impact side of the spine box. The WorldSID 50th Dummy RibEye Hardware Manual¹ calls for an optional shoulder rib foam strap and stopper plate, which were not utilized in this evaluation. Figure 3 shows the final placement of the LEDs when used in this series of crash testing.

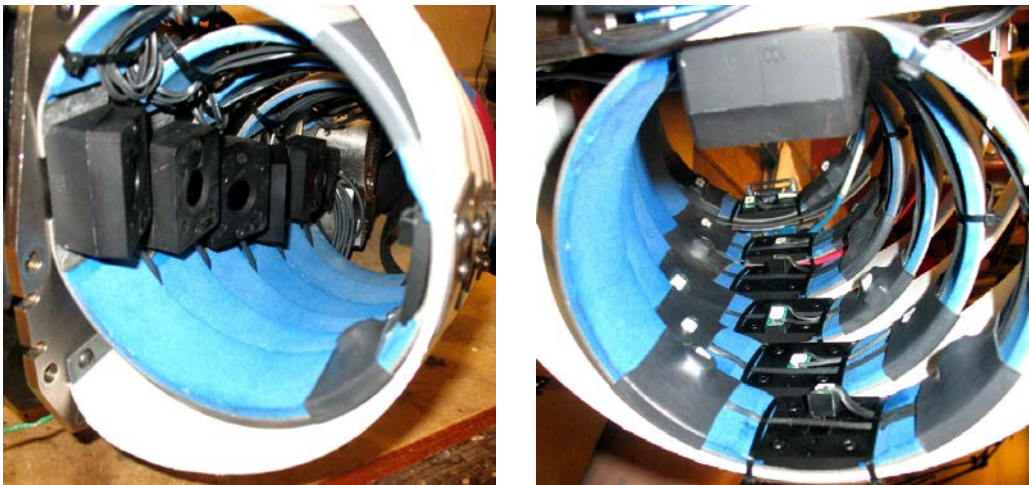


Figure 1. RibEye sensors (left) and LEDs (right) installed in WorldSID 50th dummy. Note that for a group of three sensors, the sensors for the top and bottom ribs are mounted at an angle, and the sensor for the middle rib is mounted flat. View is from pelvis upward. Photo copyright Boxboro Systems.

¹ Boxboro Systems, "Hardware User Manual - RibEye™ Multi-Point Deflection Measurement System: 3-Axis Version for the WorldSID 50th Male ATD," www.boxborosystems.com, May 2016

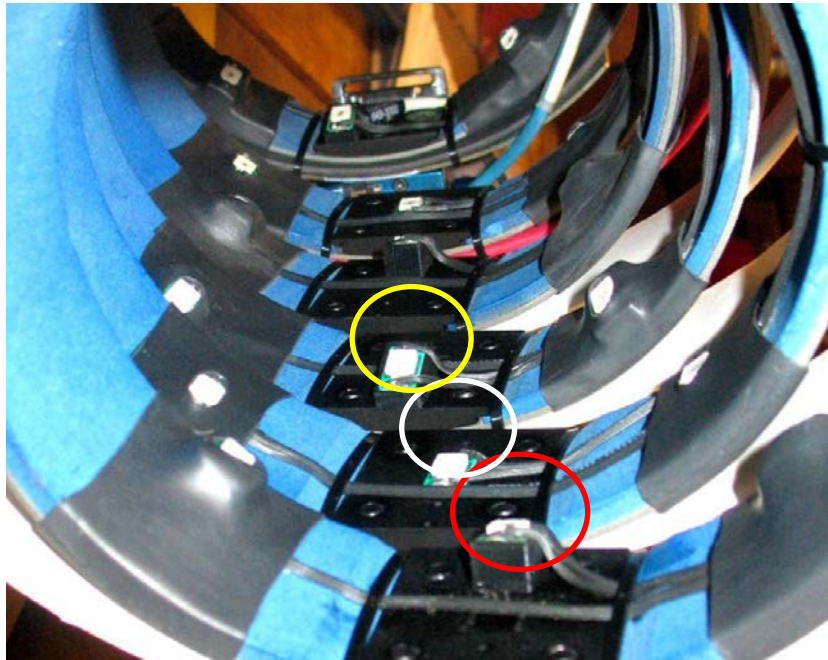


Figure 2. Close-up view of LEDs mounted to ribs. Circles denote angled mounting blocks on the top and bottom ribs (yellow and red), and no mounting block on the middle rib (white). Photo copyright Boxboro Systems.

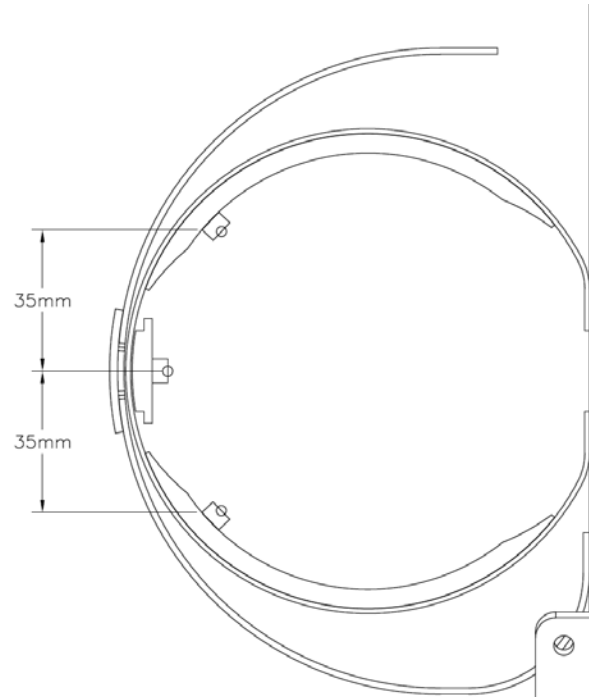


Figure 3. Schematic of a rib showing the final locations for the three LEDs used in the crash tests

RibEye Field of View and Error Codes

Each sensor has a finite field of view, within which it can sense the position of the LEDs. If an LED moves outside the field of view of the sensor, its position can no longer be sensed, and an error code will be produced by the RibEye software. If an error code occurs, all three axes (x, y, and z) will be forced to the same error code. In addition, error codes can occur if the light from an LED gets blocked and cannot be reached by one of the sensors. Too much ambient light can also cause the RibEye to generate error codes. Before a sensor becomes completely blocked, it gets partially blocked, which causes the sensor to report bad data. Thus, if an error code occurs, the data a few milliseconds before and after the error code should be discounted. The error code values are single digit numbers 1-9 and can be positive or negative. Each code indicates a different error (Table 1). It is important to note that removing the bias or filtering can alter the values of the error codes, which could be misleading. Thus, it is important to review the unfiltered absolute position data in order to preserve the error codes. To determine if an LED moved beyond the field of view of the RibEye sensor's range, an X-Y or Y-Z plot of the absolute position data and the RibEye range should be plotted together as shown in Figure 4.

Table 1. RibEye Error Code Descriptions

Error Code	Description
1	The top sensor is blocked or sees too much ambient light
2	The bottom sensor is blocked or sees too much ambient light
3	Both top and bottom sensors are blocked or see too much ambient light
4	The middle sensor is blocked or sees too much ambient light
5	The middle and top sensors are blocked or see too much ambient light
6	The middle and bottom sensors are blocked or see too much ambient
7	All three sensors are blocked or see too much ambient light
8	A divide-by-zero condition occurred in the data processing
9	Data goes past the end of the calibration curves

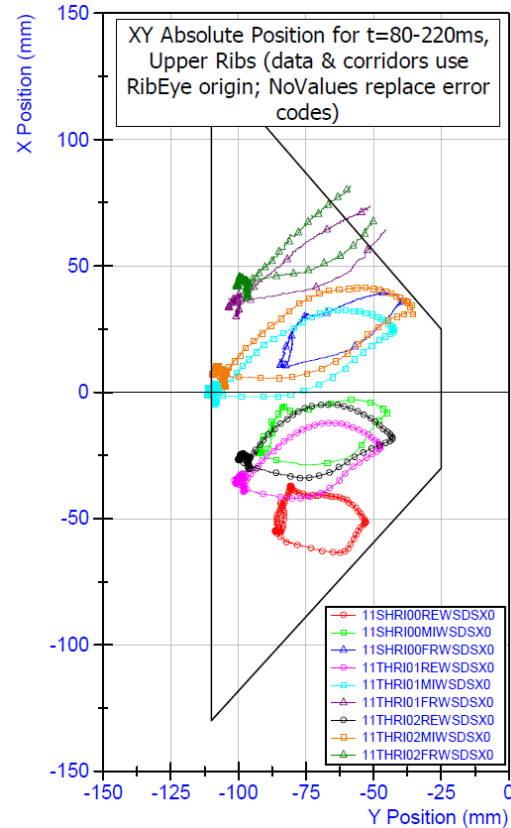


Figure 4. RibEye X-Y position (see legend) and sensor range (trapezoidal area outlined in black) for upper three ribs. Note that thorax rib 1 and thorax rib 2 front LEDs moved beyond the sensor range and their positions were no longer measured.

RibEye Change in Length

In order to assess injury, deflection toward the spine is calculated from the x and y position data from the RibEye as the x-y change in length (or deflection) of the LED from the RibEye origin. However, since the RibEye origin is located at the middle sensor for each group of three sensors, in order to measure the x-y length change for each LED, the origin is first translated to the same relative location for the rib of interest (i.e., for the shoulder rib, the middle sensor origin at thorax rib 1 is translated to the top sensor). Because the WorldSID dummy's ribs are offset in the x (anterior-posterior) and z (superior-inferior) directions, the RibEye origin must be translated in both of these directions so that all of the rib deflections will be measured relative to the center of the inside face of the sensor of the rib of interest (Figure 5).

Table 2 lists the offsets from the RibEye origin for each rib's sensor, measured with the RibEye origin sensor setting the x- and z-axis directions parallel to- and perpendicular to- it, respectively.

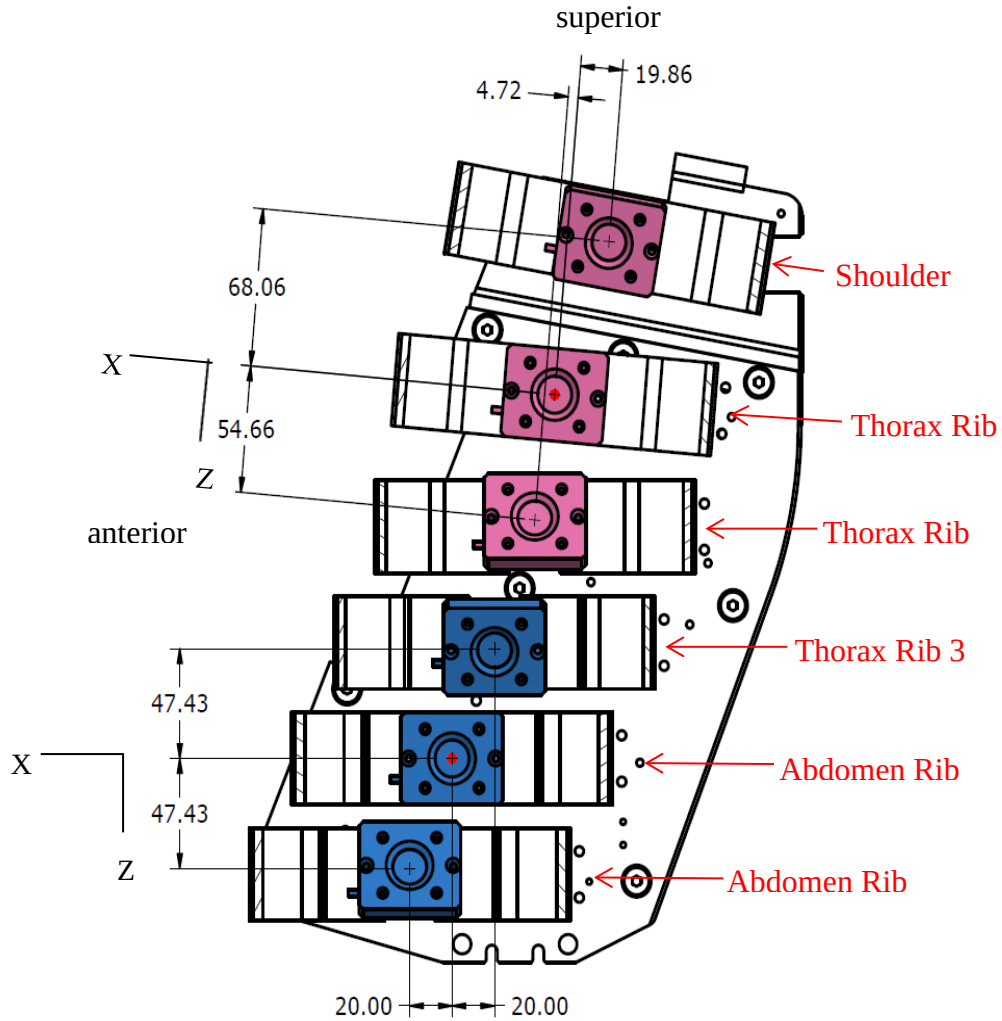


Figure 5. Schematic showing left side cross-section view of thorax with RibEye sensors. Upper set of sensors shown in pink; lower set of sensors shown in blue. RibEye origins denoted by red dots; x and z axes directions defined by the orientation of the origin sensor for each set of sensors. Dimensions indicate location of center of top and bottom sensors from the origin for the upper and lower sets of three sensors.

Table 2. RibEye Origin Offset for Each Rib

RibEye Sensor Group	Rib	Offset from RibEye Origin (mm)	
		X	Z
Red	Shoulder	-19.86	-68.06
	Thorax Rib 1	0	0
	Thorax Rib 2	4.72	54.66
Blue	Thorax Rib 3	-20	-47.43
	Abdomen Rib 1	0	0
	Abdomen Rib 2	20	47.43

For example, if we are interested in the x-y displacement of thorax Rib 2, the RibEye origin would need to be translated in the x and z directions from its location at the middle sensor of thorax rib 1. Then, the change in length is calculated as shown in Figure 6 and Equations 1-3 for any time, t . This measurement is similar to the change in length of the IR-TRACC telescoping tube.

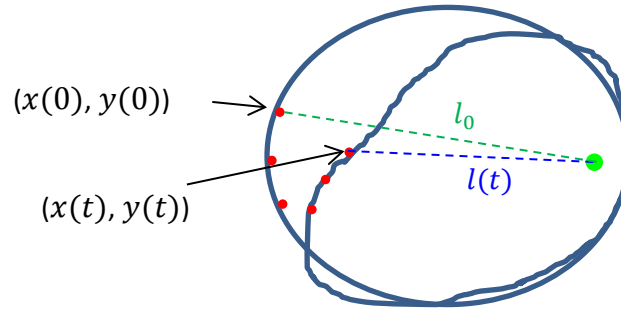


Figure 6. Schematic showing inner rib prior to impact and deformed at some time t , LEDs (red), origin at the rib of interest (green), and lengths between the front LED and the origin at time zero (l_0) and at time t , ($l(t)$). The change in length is $l_0 - l(t)$.

$$l_0 = \sqrt{x(0)^2 + y(0)^2} \quad (1)$$

$$l(t) = \sqrt{x(t)^2 + y(t)^2} \quad (2)$$

$$\text{Length change} = l_0 - l(t) \quad (3)$$

If error codes occur in the RibEye data, they can cause the length change calculation to be problematic, so to avoid this, the error codes are replaced with null data. Filtering null data may generate erroneous data. After the length change is calculated, the null data are put back in, removing the erroneous data due to filtering null data.

Given these conditions, the data processing steps used for RibEye are as follows:

1. Replace error codes in unfiltered absolute position data with null data
2. Filter at CFC 600
3. Translate absolute position data in x and z directions (per Table 2) to get position data relative to the center of the inside face of the sensor for each rib
4. Calculate length change
5. Replace filtered null data with null data

For more information on the RibEye system and or implementation see the following reports located in the NHTSA Docket.

- “Implementation of RibEye in the WorldSID 50th Percentile Dummy,” May 2016, Rhule, H., Mallory, A., Millis, W., Stricklin, J.; NHTSA docket no. NHTSA-2015-0119.
- “Evaluation of RibEye Installed in the WorldSID 50th Percentile Dummy,” July 2016, Rhule, H., Stricklin, J., Millis, W., Suntay, B.; NHTSA docket no. NHTSA-2015-0119.

APPENDIX F
CHEST BAND INFORMATION

APPENDIX - CHEST BAND INFORMATION

One 59-channel chest band was installed on the WorldSID 50th male dummy in the driver seat. The chest band was installed directly on the rib denoted in Table 1 using double-sided foam tape to ensure that the band followed the rib's motion (Figures 1-4). The band was used in this test to determine the shape of the rib contour throughout the crash event. Pertinent information regarding the location of the band on the dummy (Table 1) may be used for processing the chest band data in RBandPC or CrashStar software. Table 1 and Figure 5 show results from processing the chest band data using CrashStar. Deflections are measured from each chest band gage left of the spine and sternum to a location that corresponds to the Ribeye origin. Deflection is calculated to be the difference between the initial and final distances of the gage relative to the origin. Information related to the chest band used in this test may be directed to heather.rhule@dot.gov.

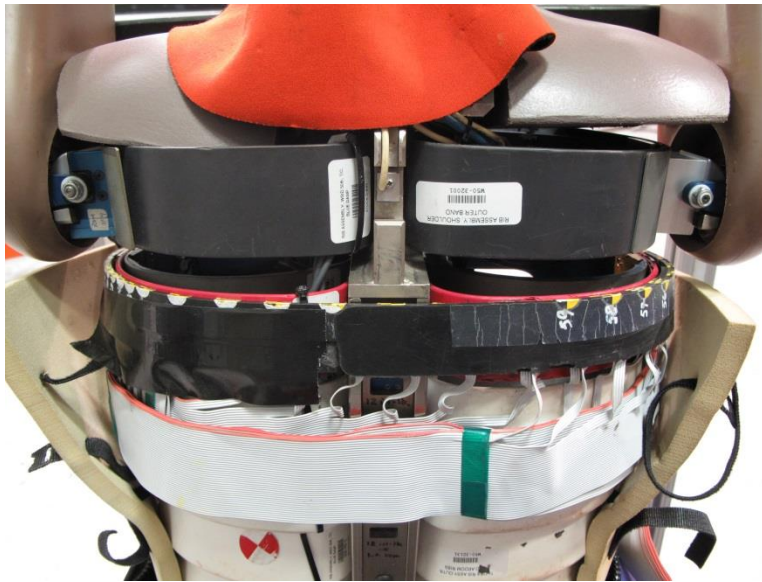


Figure 1. Rear of WorldSID 50th male dummy showing chest band location

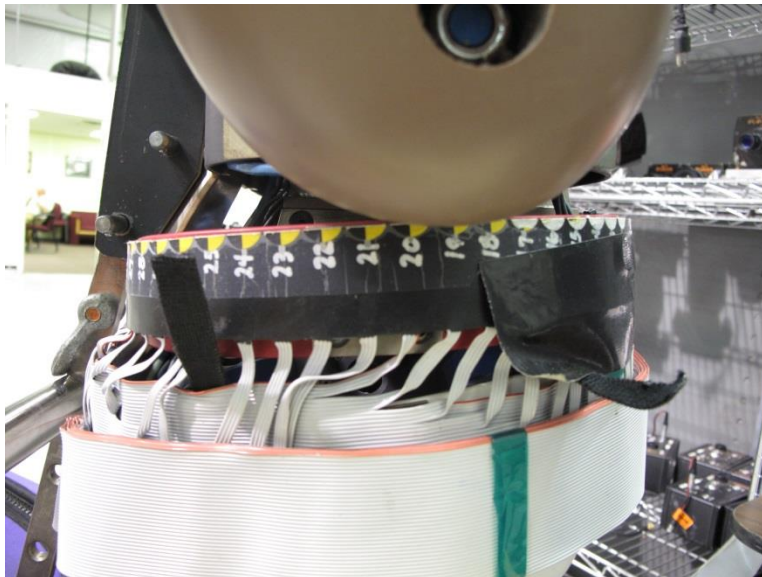


Figure 2. Left side of WorldSID 50th male dummy showing chest band location

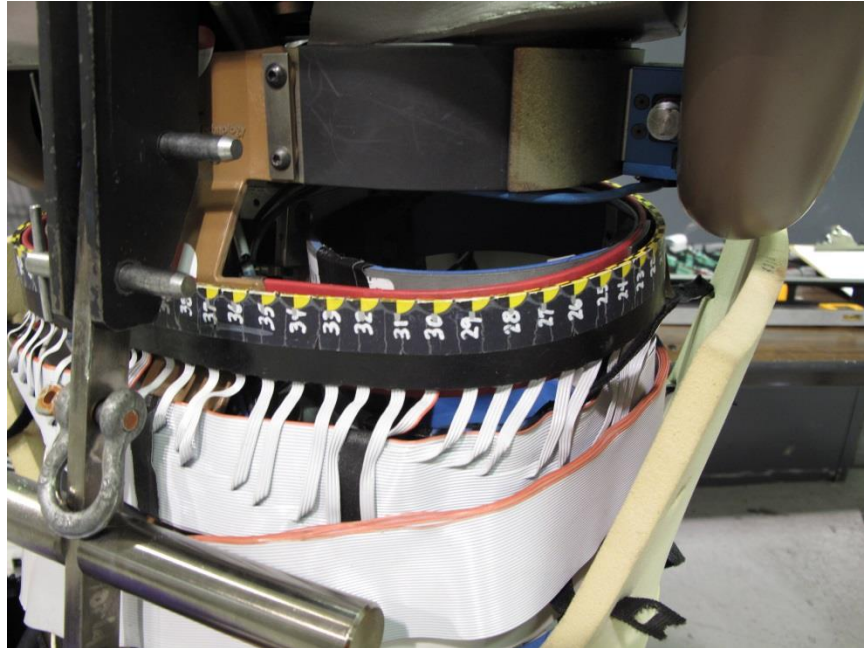


Figure 3. Front of WorldSID 50th male dummy showing chest band location

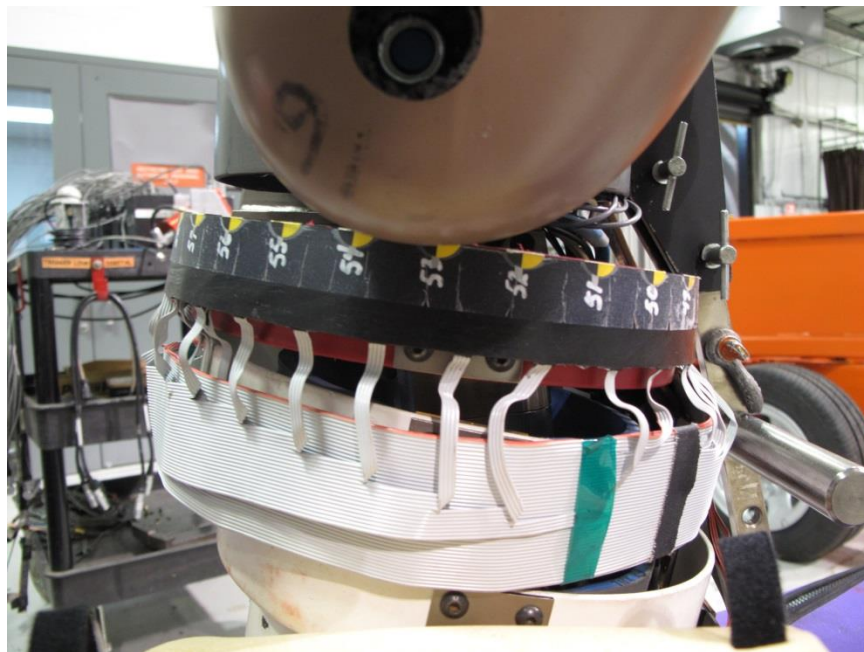


Figure 4. Right side of WorldSID 50th male dummy showing chest band location

Table 1. Chest Band Information

Test date	6/14/2016
Test vehicle	2015 Toyota Sienna
Dummy	WorldSID 50 th Male
Seating position	Driver seat
Chest band location	Thorax Rib 1
Chest circumference	939.8 mm
Number of active gages*	55
Gage closest to spine	7
Distance from spine**	0 mm
Gage closest to sternum	39
Distance from sternum**	0 mm
Maximum chest deflection from chest band data	53.2 mm
Gage of Max Deflection	22

*The number of active gages is the number of gages encircling the subject.

**Distance from anatomical reference (spine or sternum) is positive when the closest gage lies before the anatomical reference when moving around the chest band in a clock-wise direction

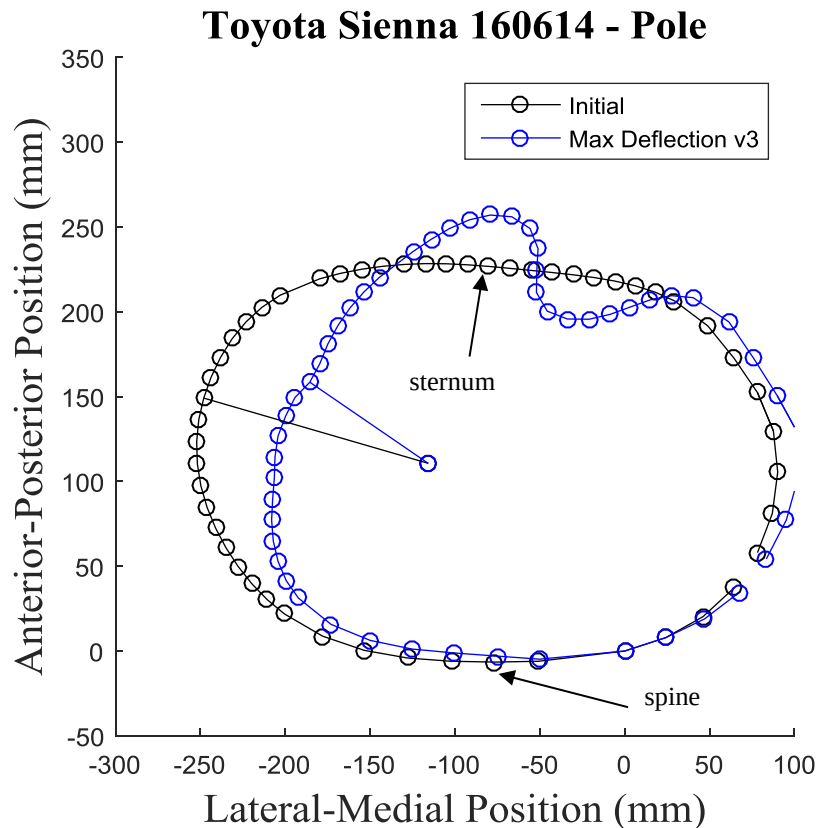


Figure 5. Chest band contours at initial position and maximum deflection for the WorldSID 50th dummy. Chest band gages #5 and #30 were removed due to poor signals.

APPENDIX G
WORLD SID DRAFT SEATING PROCEDURE

- SEATING AND DUMMY POSITIONING PROCEDURES FOR THE WSID 50TH MALE DRIVER DUMMY

__1 Determine the seat type

Visually inspect the seats to determine type (i.e., bucket or bench).

Driver seat:

☐ Bench

☐ Bucket

__2 Position lumbar supports

Position the seat's adjustable lumbar supports to the lowest, retracted or deflated adjustment positions.

☐ N/A No lumbar adjustment

__3 Position additional supports

Position any adjustable parts of the seat that provide additional support so that they are in the lowest or most open adjustment position.

☐ N/A No additional support adjustment

__4 Position leg supports

Position an adjustable leg support system in its rearmost position.

☐ N/A No adjustable leg support system

__5 Position the head restraint

☐ 5.1 Using any adjustment of the head restraint, position it to its highest position.

☐ 5.2 Using any adjustment of the head restraint, position it to the full rearward position. If it rotates, rotate it such that the head restraint extends as far rearward as possible.

☐ N/A The test vehicle is equipped with automatically adjusting head restraints or there is no head restraint adjustment,

__6 Mark the centerline of the seats in the XZ plane (complete ONLY the one that is applicable to seat being marked)

☐ 6.1 Bucket Seat: Locate and **mark** for future reference the centerline of the seat cushion in the XZ plane. The intersection of the XZ plane that passes through the SgRP and the seat cushion upper surface determines the centerline of a bucket seat cushion.

☐ 6.2 Bench Seat:

Locate and **mark** for future reference the line on the seat cushion that marks the intersection of the XZ plane through the centerline of the steering wheel and the seat cushion upper surface.

__7 Mark the range of seat travel

Prior to marking the seat for fore/aft travel, move the seat through its full range of motion using all available controls. Separately, operate each control to determine whether it moves the seat and/or seat cushion primarily in the fore-aft or up-down directions.

Seating procedures used for March-June 2016 testing

__7.1 Mark a point (seat cushion reference point - **SCR**P) on the side of the seat cushion that is between 150 mm and 250 mm from the front edge of the seat cushion. For seat cushions that move up and down independently from the seat housing, mark the point on the side of the cushion in an area that will not be obscured by the seat housing when the seat cushion is at its lowest height position.

__7.2 Draw a horizontal line (seat cushion reference line - **SCR**L) through the **SCR**P.

__7.3 Use only the controls that primarily move the seat in the fore-aft direction to move the **SCR**P to the rearmost position.

__7.4 If the seat cushion adjusts fore-aft, independent of the seat back, use only the controls that primarily move the seat cushion in the fore-aft direction to move the **SCR**P to the rearmost position.

__ N/A No independent fore-aft seat cushion adjustment

__7.5 Use any part of any control, other than the parts just used for fore-aft positioning, to determine the range of angles of the **SCR**L and to set the **SCR**L at mid-angle. Record the maximum, minimum and mid-angles in the table below.

SCR L°	Max	Min	Mid
Driver			

__7.6 If the seat and/or seat cushion height is adjustable, use any part of any control other than the parts which primarily move the seat or seat cushion fore-aft, to put the **SCR**P in its lowest position with the **SCR**L angle at the mid-angle found in 7.5.

__ N/A No seat height adjustment

__7.7 Use only the controls that primarily move the seat in the fore-aft direction to verify the seat is in the rearmost position

__7.8 Use only the controls that primarily move the seat in the fore-aft direction to **mark** the fore-aft seat positions. **Mark** each position so that there is a visual indication when the seat is at a particular position. For manual seats, move the seat forward one detent at a time and **mark** each detent. For power seats, **mark** only the rearmost, middle, and foremost positions. Label three of the positions with the following: F for foremost, M for mid-position (if there is no mid-position, label the closest adjustment position to the rear of the mid-point), and R for rearmost.

Measure the SCRP fore-aft travel for each seat position on the table below.

	SCRL Mid- Angle°							SCRP Height (mm) Spacing measurement Between detents (if applicable)
		Rearmost		Mid-fore/aft		Full forward		
		X	Z	X	Z	X	Z	X
Driver								

__7.8.1 While at mid-position, also mark or label 25 mm rearward on the seat travel.

Two possible methods for marking the fore-aft seat positions are illustrated in the photos below.



__8 **Locate and mark the Right Heel Point (RHP) on the carpet.**

__8.1 Find the Pedal Center Point (PCP).

Place adjustable pedals in the full forward position (towards the front of the vehicle.)

__N/A – the pedals are not adjustable.

__8.2 Using Diagrams below locate the midpoint between left most and right most edge of the accelerator pedal surface; mark a line on the accelerator pedal and floor pan that represents the intersection of the accelerator midpoint and the vertical longitudinal plane. This center line shall be referred to as L1.

__8.3 Find and mark the Pedal Center Point (PCP) using measurement PL from the top to the bottom edge illustrated in the picture below.

__8.4 Mark a point on the outboard edge of the accelerator pedal surface at the same height as the

PCP. This point shall be referred to as A.

__8.5 Using a 200mm bar, place one end on the outboard edge of the accelerator pedal at point A and sweep the other end in a downward arc in the vertical longitudinal plane until contacting the floor pan. This point of contact shall be referred to as A'.

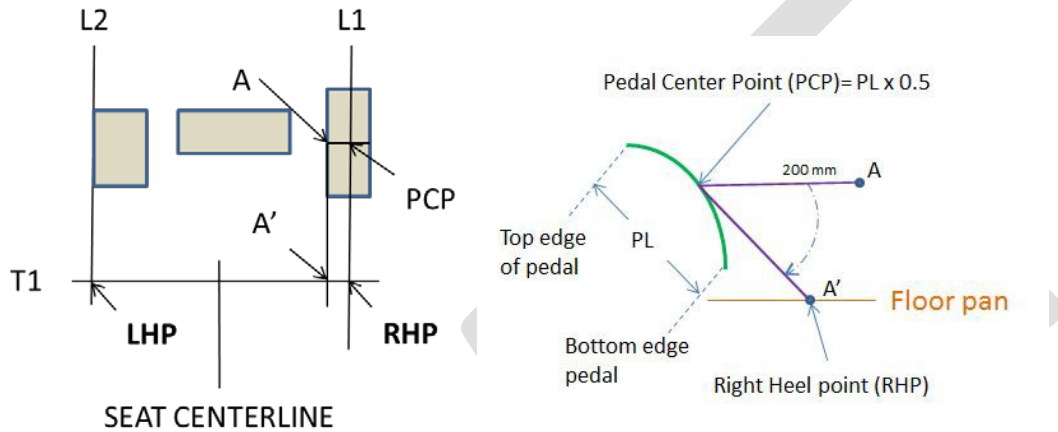
__8.6 Mark a transverse line T1 through the point A' on the floor pan. The intersection of the T1 Line and the L1 line becomes the Right Heel Point (RHP). Mark this location for future placement of the right heel.

Seating procedures used for March-June 2016 testing

9 Locate and mark the Left Heel Point (LHP) on the carpet.

__9.1 Mark a point on line T1 the same distance to the left of the seat centerline as the RHP is to the right the seat centerline. This point is the Left Heel Point (LHP). Mark a line on the floor pan and toe board that represents the intersection of the LHP and the vertical longitudinal plane. This line shall be referred to as L2.

__9.2 Mark two lines on the floor pan parallel to line T1, the first 10mm forward and the second 10mm rearward of the T1. This zone between these two lines will be used for placement of both the left and right heels.



__10 Set the seat for a test dummy

Using the reference marks on the seat, set the seat in the mid fore-aft, lowest height at mid seat cushion angle position as follows;

__10.1 If the seat or seat cushion height is adjustable, other than by the controls that primarily move the seat or seat cushion fore and aft set the height of the **SCRp** to the minimum height, with the **SCRl** set as closely as possible to the mid-angle determined in previous sheets.

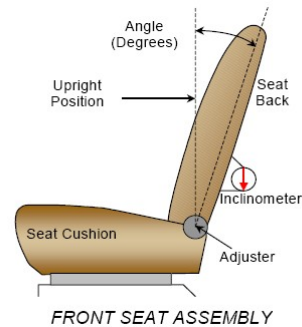
__10.2 Using the control that primarily moves the seat fore and aft, move the **SCR** to the mid-travel (i.e., mid-fore aft) position.

10.3 Set the seat back angle at the manufacturer's nominal design riding position for a 50th

If the position is not specified, set the seat back in the position that produces a torso (back) angle of 25° from vertical when measured with the SAE J826 H-point machine. For seat backs with discrete positions, if a torso (back) angle of 25° from vertical cannot be achieved, set the seat back in the detent that yields a torso (back) angle as close as possible to 25° from vertical. Describe the method used to achieve the nominal design riding position and record the seat back angle.

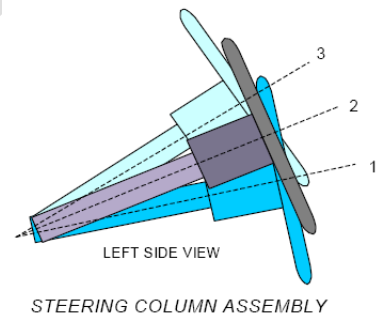
Seat Back Angle _____°

___N/A The seat back does not adjust.



11 Set the steering wheel to the mid-position

Use the markings to position the steering wheel hub at the geometric center of full range of driving positions including any telescoping positions. For steering columns with discrete positions and no detent at the mid-angle, position the column in the next lowest detent from the mid-angle.



Complete the following table;

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1		
Geometric Center – Position 2		
Uppermost – Position 3		
Telescoping Steering Wheel Travel		
Test Position		

___N/A The steering wheel does not adjust.

__12 Set adjustable seat belt upper anchorages

Use the markings to position an adjustable seat belt upper anchorage at the manufacturer's nominal design position for a 50th percentile male adult occupant. Fill in the following table;

Seat	Total # of Positions	Placed in Position #
Driver		

__N/A The seat belt upper anchorage does not adjust.

__13 Retract the armrest

Retract any folding armrest

__N/A No armrest or armrest is fixed, not retractable.

__14 Determine the H-point location with the H-Point machine;

Position the three dimensional H-point manikin (i.e., H-point machine) specified in Society of Automotive Engineers (SAE) Surface Vehicle Standard J826, revised July 1995, Devices for Use in Defining and Measuring Vehicle Seating Accommodation in the seat as follows;

__14.1 Place a 910 mm² piece of muslin cotton cloth over the seat area. (The muslin cloth shall be comparable to 48 threads/in² and density of 2.85 lb/yd.) Tuck the muslin cloth in a sufficient amount to prevent hammocking of the material.

__14.2 Place the seat and back assembly of the H-Point machine such that its plane of symmetry is coincident with the centerline marking on the seat.

__14.3 Install the lower leg, and foot segments.

__14.4 Set the length of the lower leg segment at 414 mm (16.3 in) and the length of the thigh bar at 401 mm (15.8 in).

__14.5 Leg and foot placement

__14.5.1 Insert the pin so that the right foot angle is not less than 87°.

__14.5.2 Place the right foot on the un-depressed accelerator pedal with the sole of the foot on the pedal and the heel as far forward as allowable. Do not place the heel on the toe board.

__14.5.3 Adjust the left leg to be the same distance from H-point machine centerline as the right leg.

__14.5.4 With the T-bar level, place the left foot on the toe board with the rearmost point of the heel resting on the floor pan as close as possible to the point of intersection of the planes described by the toe board and the floor pan and not on the wheel well projection. If the foot cannot be positioned on the toe board, set it on the floor pan.

__Foot on toe board

__Foot on floor pan

__14.6 Apply the lower leg weights.

__14.7 Apply the thigh weights.

__14.8 Tilt the back pan forward against the forward stop and draw the H-point machine away from the seatback using the T-bar.

Seating procedures used for March-June 2016 testing

- __14.9 Re-positioning the H-point machine.
- __14.9.1 Allow the H-point machine to slide rearward until a forward horizontal restraining load on the T-bar is no longer required due to the seat pan contacting the seat back.
- __The seat pan does not slide rearward. Go to 14.9.2
- __14.9.2 Slide the H-point machine rearward by a horizontal rearward load applied at the T-bar until the seat pan contacts the seat back.
- __14.10 Apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.
- __14.11 Again apply a 10 kg load at the intersection of the hip angle quadrant and the T-bar housing along a line from the above intersection to a point just above the thigh bar housing.
- __14.12 Carefully return the back pan to the seat back.
- __14.13 Install the right and left buttock weights.
- __14.14 Install the eight torso weights alternately the installation between right and left.
- __14.15 Tilt the back pan forward until the stop is contacted.
- __14.16 Rock the H-point from side to side over a 10° arc (5° to each side of the vertical centerline) for three complete cycles. Restrain the T-bar during rocking so that the seat pan does not change position. Minimize any inadvertent exterior loads applied in a vertical or fore-aft direction. The feet are free to move during this rocking motion.
- __14.17 Without applying a forward or lateral load, lift the right foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.
- __14.18 Lower the right foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor, toe board, or undepressed accelerator pedal.
- __14.19 Without applying a forward or lateral load, lift the left foot off the floor the minimum amount necessary until no additional forward foot movement is obtained.
- __14.20 Lower the left foot until the heel is in contact with the floor pan and the ball of the foot is in contact with the floor or toe board.
- __14.21 Is the seat pan level?
- __Yes. Go to 14.23
- __No. Go to 14.22
- __14.22 Apply a sufficient lateral load to the top of the seatback pan to level the H-point machine seat pan on the seat.
- __14.23 Holding the T-bar to prevent the H-point from sliding forward on the seat cushion, return the seatback pan to the seatback.
- __14.24 Holding the T-bar to prevent the H-point from sliding forward on the seat cushion, apply rearward force perpendicular to the back angle bar just above the torso weights until either 66 N (15 lb) of force is reached or the hip angle is increased by 3°, whichever occurs first. Minimize the exterior downward or side forces applied to the H-point machine. Release the force. Repeat this step until the resulting hip angle readout is identical. Complete as many force applications as necessary and record the results in the following table:

Force App.	Hip Angle
1	
2	
3	
4	
5	

__14.25 Is the H-point machine level?

__Yes, Go to 14.26

__No, Go back to step 14.15 and repeat steps to re-level H-point machine.

__14.26 Record the H-point location in the table below;

Oscar H-point location	
Torso Angle	°
X (Positive (+) forward of striker)	(mm)
Z (Positive (+) below striker)	(mm)



Reference:

X-Axis is Positive forward of Striker

Y-Axis is Positive Right of Striker

Z-Axis Is Positive Below Striker

__14.27 Create a Seat Tracking Point (STP): Place a target point 20mm forward of the Oscar H- point on a rigid part of the seat and record its location in the table below. (This reference point will be used to locate the dummy H-point relative to the seat if the seat cannot be set to the mid fore-aft position.)

Seat Tracking Point (STP) location at mid-position	
X (Positive (+) forward of striker)	(mm)
Z (Positive (+) below striker)	(mm)

__14.28 Remove the H-point machine

Seating procedures used for March-June 2016 testing

__15 Calculate the WSID 50TH H-point Target at Mid-position

__15.1 The WSID 50TH H-point is offset 20mm forward and 20mm above the Oscar H-point as determined in the table below:

WSID 50TH Target H-point at Mid-position			
	Oscar H-point (14.26)	+/- Offset	= WSID 50TH H-Point at Mid-position
X (Positive (+) forward of striker)	()	+ 20mm	mm
Z (Positive (+) below striker)	()	- 20mm	mm

Once the H-point has been determined, position a qualified WSID 50TH test dummy in the driver seat of the test vehicle.

__16 Check that all joints are set between 1 and 2 g. If they are not, follow the procedures in the WSID 50TH Qualification Manual for setting the joint torques.

__16.1 Place size 11EEE shoes meeting MIL-S-13192(1976) on each foot.

__16.2 Make sure the head and pelvis tilt sensors installed in the dummy are reading correctly about the X & Y axes.

__17 Positioning the test dummy in the seat

__17.1 Move the seat to the full rearward position and place the test dummy in the seat.

__17.2 Position the test dummy in the seat such that its plane of symmetry (i.e., mid-sagittal plane) is coincident with the centerline marking on the seat cushion, seat back and head restraint and its H-point is directly above the STP.

__17.3 Bend the upper torso forward and then lay it back against the seat back. Push the shoulders of the dummy fully rearward. Position the dummy so that it sits square and level in the seat.

__17.4 Align the centerline of the right foot with the centerline of the accelerator pedal while keeping the leg as vertical as practicable.

__17.4.1 Does this vehicle have a footrest?

__Yes, Starting with the foot and leg inboard of the footrest, rotate the leg about the hip the minimal amount needed in order to maximize coverage of the sole of the shoe over the footrest (when viewed longitudinally) while keeping the midline of the foot in a vertical plane and the leg as vertical as practicable.

__ No, Adjust the left leg so the knees are an equal distance from seat center line apart measured at the outer knee flange while keeping the leg as vertical as practicable.

__17.5 Lift the feet and slide the seat forward to 25 mm rearward of mid-position or the detent closest to this position that is **not greater than 25mm** rearward of mid-position

__17.6 Verify the SCRP position then measure the Seat Tracking Point (STP) and record in table below

Seating procedures used for March-June 2016 testing

Seat Tracking Point location	
X (Positive (+) forward of striker)	(mm)
Z (Positive (+) below striker)	(mm)
Seat Tracking Point location Trial 2 (if applicable)	
X (Positive (+) forward of striker)	(mm)
Z (Positive (+) below striker)	(mm)
Seat Tracking Point location Trial 3 (if applicable)	
X (Positive (+) forward of striker)	(mm)
Z (Positive (+) below striker)	(mm)

__17.6.1 Calculate and record the Seat Tracking Point Difference (**STPD**)

$$\text{STPD} = \text{Current (STP) from step 17.6} - (\text{STP) Measured in step 14.27}$$

Record in table below

Trial 1			
	Results from 17.6	-	Results from 14.27 = STPD
X (Positive (+) forward of striker)	()	-	() mm
Z (Positive (+) below striker)	()	-	() mm

Trial 2			
	Results from 17.6	-	Results from 14.27 = STPD
X (Positive (+) forward of striker)	()	-	() mm
Z (Positive (+) below striker)	()	-	() mm

Trial 3			
	Results from 17.6	-	Results from 14.27 = STPD
X (Positive (+) forward of striker)	()	-	() mm
Z (Positive (+) below striker)	()	-	() mm

__17.6.2 Calculate and record the Current WSID 50TH Target H-point for seat position.

X: WSID 50TH Target H-point 17.6.2 = (WSID 50TH Target H-point from 15.1) + (STPD from 17.6.1)

Z: WSID 50TH Target H-point 17.6.2 = (WSID 50TH Target H-point from 15.1) + (STPD from 17.6.1)

Trial 1			
	Results from 15.1	- Results from 17.6.1 =	Current Target H-point
X (Positive (+) forward of striker)	()	+ ()	mm
Z (Positive (+) below striker)	()	+ ()	mm

Trial 2			
	Results from 15.1	- Results from 17.6.1 =	Current Target H-point
X (Positive (+) forward of striker)	()	()	mm
Z (Positive (+) below striker)	()	+ ()	mm

Trial 3			
	Results from 15.1	- Results from 17.6.1 =	Current Target H-point
X (Positive (+) forward of striker)	()	+ ()	mm
Z (Positive (+) below striker)	()	+ ()	mm

Note: When Seat is at the Mid-Position the WSID 50TH H-point Target should be within the tolerance of the values from step 15.1

__17.7 Confirm that the dummy is positioned such that a horizontal (lateral) line passing through the dummy's hip pivot center is perpendicular to the center XZ plane of the seat – adjust the dummy if necessary.

__17.8 Measure the pelvic angles using the tilt angle sensors installed in the test dummy. Verify that the pelvic angle is $0^\circ \pm 2.5^\circ$ (X) and $0^\circ \pm 2.5^\circ$ (Y).

__17.9 Confirm that the H-point is within $\pm 5\text{mm}$ of the location (X & Z) determined in step 17.6 – adjust the dummy if necessary.

__17.10 Is the pelvis tilt angle within specification (described in step 17.8)?

__Yes, Go to step 17.11

__No, Go back to step 17.7 and repeat steps to re-adjust pelvic angle the position of the test dummy.

__Proper position cannot be achieved, contact COTR immediately.

__17.11 Measure the head angles using the tilt angle sensors installed in the test dummy. Verify that the head angle is $0^\circ \pm 2.5^\circ$ (X) and $0^\circ \pm 2.5^\circ$ (Y).

__17.11.1 Is the head level within specification?

__Yes, Go to step 17.12

__No, Head is not touching head rest, go back to step 17.7 and adjust the pelvis angle while maintaining the H-point Target position within tolerance to try to achieve head level.

__No, Head is not level, pelvis has been adjusted and head is not touching headrest.

– Go to step 17.11.2

__No, Head is touching head rest.

Note: If the seat back has not already been adjusted from of the Manufactures specified angle and moving the seat it will help achieve a closer (0°) head angle – Go to Step 17.11.3

– Go to step 17.11.3

__No, Seat back has been adjusted already, contact COTR immediately.

Record Final Head Angle _____

__17.11.2 Adjust the Neck Bracket to adjust the head tilt sensor to $0^\circ \pm 2.5^\circ$ (X) and $0^\circ \pm 2.5^\circ$ (Y).

__Neck was adjusted to achieve Head Level

__Neck was adjusted, Head is now touching Head rest and Head is still not level

–Go to Step 17.11.3

__17.11.3 Adjust seatback a maximum of 1 detent for manual seats and not more than 2° from the manufactures recommended angle found in Step 8.3, to bring the head level to $0^\circ \pm 2.5^\circ$ and return to step 17.7

Record original angle before adjustment: _____ ° Record the new angle: _____ °

__17.12 Right Foot Placement

__17.12.2 Without inducing pelvis or torso movement, position the right foot in contact with the accelerator pedal such that the midline of the foot is in the same vertical plane as L1 (which passes through the center of the accelerator pedal) and heel is resting in the heel point zone as close as practicable to the right heel point (RHP) (as determined in steps 8 and 9). To the extent practicable keep the right thigh and the leg in a vertical plane by measuring at knee flange. Rotate the toe towards the shin of the dummy to minimize the compression of the accelerator pedal while maintaining contact with the pedal. The heel shall remain within the heel point zone as close as practicable to the right heel point (RHP).

__17.12.3 If there is no footrest, rotate the left leg and thigh laterally to equalize the distance between each knee and the seat cushion marking as determined in step 6. The knees should be placed equal distance apart from seat center line measured at the outer knee flange. If either of the dummy's legs contact the steering wheel, separate the knees the minimum amount required to avoid contact, not to exceed 5 mm clearance.

__N/A- there was no leg contact

__Knees were separated for clearance

Final Knee Spacing: _____ mm

__17.12.4 **Left Foot Placement** – Does the vehicle have a footrest?

__Yes, Go to 17.12.5

__No, Go to 17.12.7

__17.12.5 Does the foot rest elevate the left heel more than 20mm above the right heel?

__Yes, Go to 17.12.7 and position the foot off the foot rest

__No, Go to 17.12.6

__17.12.6 To the extent practicable, keep the left thigh and leg in a vertical plane. Rotate the leg about the hip the minimal amount needed in order to maximize contact with the sole of the shoe and the foot rest while keeping the midline of the foot in a vertical plane. Place the heel on the floor pan at the intersection of the foot rest and the floor pan. Go to step 17.13

__17.12.7 To the extent practicable keep the left thigh and the leg in a vertical plane throughout the procedure. With the midline of the foot in the same vertical plane as L2, place the heel on the left heel point (LHP) within the heel point zone. If the left heel cannot be placed within the heel point zone, place the heel as near to the heel point zone and the LHP as practicable while keeping the midline of the foot in the same vertical plane as L2. Rotate the foot towards the toe board (plantar flexion) to the maximum extent practicable while maintaining the heel position. Check the **ONLY** one of the following that applies.

__The left foot reaches the toe board without adjusting the foot or leg. Go to step 17.13

__The foot does not reach the toe board and does not contact the brake or clutch pedal with foot rotated forward as far as possible (plantar flexion), Go to step 17.13

__The left foot contacts the brake or clutch pedal.

__Rotate the foot about the leg (abduction) the minimal amount needed to avoid pedal contact. If the heel is not in the heel point zone, move the heel forward to the middle of the heel point zone and the LHP to the extent practicable. Rotate the foot towards the toe board (plantar flexion) to the maximum extent practicable while maintaining the heel position. If the foot still contacts the brake or clutch pedal continue to the next step, otherwise Go to step 17.13.

__Rotate the leg outboard about the hip the minimum distance necessary to avoid pedal contact. If the heel is not in the heel point zone, move the heel forward to the middle of the heel point zone to the extent practicable. Rotate the foot towards the toe board (plantar flexion) to the maximum extent practicable while maintain the heel position. Go to step 17.13

__17.13 For a seat that is not in mid-position, if the dummy leg to knee bolster/instrument panel has a clearance of 5 mm or greater, the seat may be moved forward.

__N/A, seat already at mid-position. Go to step 17.14

__ Dummy leg to knee bolster/instrument panel clearance is greater than 5 mm. Adjust the seat forward **without going past mid-position** until a clearance of 5 mm or less is achieved or the seat is in the closest position to mid-position that does not cause dummy contact.

Record seat position: _____ mm rearward of mid-position and Return to step 17.6

Seating procedures used for March-June 2016 testing

__Clearance unchanged. No adjustments required.

Record seat position: _____mm rearward of Mid-position. Go to 17.14

__17.14 Arm and Belt Placement for test dummy placed in driver seating position

__17.14.1 Place right arm at the first detent downward of the most upward detent.

Is the driver seat belt used for this test?

__Yes, Continue

__No, Go to 17.15

__17.14.2 Fasten the seat belt around the dummy.

__17.14.3 Remove all slack from the lap belt portion.

__17.14.4 Pull the upper torso webbing out of the retractor and allow it to retract; repeat this four times.

__17.14.5 Apply a 2 to 4 pound tension load to the lap belt.

__pound load applied

__17.14.6 Is the belt system equipped with a tension-relieving device?

__Yes, Continue

__No, Go to 17.15

__17.14.7 Introduce the maximum amount of slack into the upper torso bet that is recommended by the vehicle manufacturer in the vehicle owner's manual.

__17.15 Place left arm at the first detent downward of the most upward detent.

14.26	
Oscar H-point location	
Torso Angle	°
X (Positive (+) forward of striker)	mm
Z (Positive (+) below striker)	mm

14.27	
Seat Tracking Point (STP) location at mid-position	
X (Positive (+) forward of striker)	mm
Z (Positive (+) below striker)	mm

15.1				
WSID Target H-point at Mid-position				
	Oscar H-point (14.26)	+/-	20mm	= WSID H-Point at Mid-position
X (Positive (+) forward of striker)	0	+	20	= mm
Z (Positive (+) below striker)	0	-	20	= mm

17.6	
Seat Tracking Point location	
X (Positive (+) forward of striker)	mm
Z (Positive (+) below striker)	mm
Seat Tracking Point location Trial 2 (if applicable)	
X (Positive (+) forward of striker)	mm
Z (Positive (+) below striker)	mm
Seat Tracking Point location Trial 3 (if applicable)	
X (Positive (+) forward of striker)	mm
Z (Positive (+) below striker)	mm

Fill in cells to calculate H-point Location

WSID H-point Target

WSID H-point Target at midtrack

17.6.1				
Trial 1				
	Results from (17.6)	-	Results from (14.27)	= STPD
X (Positive (+) forward of striker)	0	-	0	= 0 mm
Z (Positive (+) below striker)	0	-	0	= 0 mm

Trial 2				
	Results from (17.6)	-	Results from (14.27)	= STPD
X (Positive (+) forward of striker)	0	-	0	= 0 mm
Z (Positive (+) below striker)	0	-	0	= 0 mm

Trial 2				
	Results from (17.6)	-	Results from (14.27)	= STPD
X (Positive (+) forward of striker)	0	-	0	= 0 mm
Z (Positive (+) below striker)	0	-	0	= 0 mm

17.6.2				
Trial 1				
	Results from (15.1)	+	Results from (17.6.1)	= Current H-point Target
X (Positive (+) forward of striker)	0	+	0	= 0 mm
Z (Positive (+) below striker)	0	+	0	= 0 mm

Trial 2				
	Results from (15.1)	+	Results from (17.6.1)	= Current H-point Target
X (Positive (+) forward of striker)	0	+	0	= 0 mm
Z (Positive (+) below striker)	0	+	0	= 0 mm

Trial 3				
	Results from (15.1)	+	Results from (17.6.1)	= Current H-point Target
X (Positive (+) forward of striker)	0	+	0	= 0 mm
Z (Positive (+) below striker)	0	+	0	= 0 mm