

**Vehicle Research and Test Center
Ramp Rollover
of a 2007 Ford Expedition
TRC Inc. Test Number 100420**

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TRC TEST NUMBER: 100420

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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Test Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information	5
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	6
2	Seats and Seat Belts Data	9
3	Post-Test Observations	10
4	Dummy Measurements	12
5	Occupant Instrumentation Data	15
6	Vehicle Structural Measurements	18
7	Vehicle Exterior Crush Measurements	19
8	Vehicle Accelerometer Locations and Data Summary	32
9	High-Speed Camera Data	36
10	Dummy/Vehicle Temperature Stabilization Data	38
<u>Appendix</u>		
A	Photographs	A-1
B	Data Plots	B-1
C	Dummy Configuration and Performance Verification Data	C-1
D	Test Equipment List and Calibration Information	D-1
E	INSIA Report on Structural Measurements	E-1

SECTION 1

PURPOSE AND TEST PROCEDURE

This ramp rollover crash test was conducted to investigate the dynamics of belted occupants during rollover crashes. This test was conducted with a modified 2007 Ford Expedition moving at 48.4 km/h (30.1 mph), releasing the vehicle with its roll axis parallel to the direction of the rollover ramp position. The vehicle was modified by replacing the rear seat with a modified front seat to simulate similar characteristics in both seating positions. The center console was also removed. The test vehicle contained three (3) instrumented Part 572E dummies. The OEM belts and buckles were replaced in all positions. The driver was equipped with a motorized and buckle pretensioner and the right front passenger, and right rear passenger positions were equipped with a retractor and buckle pretensioner belt system¹. The curtain air bags and pretensioners were fired manually at 300ms into the event.

The rollover ramp consists of two independent sections. When the ramp is setup, section one inclines at 20 degrees and when assembled with section two the total incline is 50 degrees. Two sections were used for this test. The test was setup to impact the rollover ramp with the vehicles right front and right rear wheels. It was conducted for the National Highway Traffic Safety Administration's (NHTSA) Vehicle Research and Test Center (VRTC) by the Transportation Research Center Inc. (TRC Inc.).



Ramp Dimensions: Length measured along the base is 5600mm; Width measured along the base is 1000mm; Height from ground on lower side of ramp end is 700mm; and the Height from the ground on the higher side is 1900 mm.

¹ Belt systems were provided by TRW Automotive.

SECTION 2

SUMMARY OF TEST RESULTS

A 2007 Ford Expedition, containing three (3) instrumented Part 572E test dummies was towed and released at 48.4 km/h (30.1 mph). The test vehicle was attached to the tow cable of the drive system. After release, the vehicle impacted the ramp and rolled 90° coming to rest on the left side of the vehicle. The ramp rollover test was conducted by Transportation Research Center Inc. in East Liberty, Ohio on April 20, 2010. Pre-test and post-test photographs of the vehicle and the dummies are included in Appendix A.

Three (3) restrained Part 572E Hybrid III 50th percentile adult male anthropomorphic test devices (dummies) were placed in the driver, right front, and right rear designated seating positions relative to the placement procedures specified in Appendix F of Laboratory Procedure TP208-14. The dummies were instrumented with head, chest, and pelvis triaxial accelerometers, upper and lower six-axis neck load cells, and a chest deflection potentiometer. The ATDs in position (3) and (6) were also instrumented with triaxial head rotational rate gyroscopes. The ATD in position (1) was instrumented with six (6) additional head accelerometers to complete a 9-array head configuration. All dummies were restrained by 3-point seat belts. All dummy instrumentation is detailed in this report. Seventy-eight (78) dummy channels of acceleration, force, moment, rotation, and displacement data were collected for this test. A total of 186 channels of data were recorded.

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

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

TEST RESULTS SUMMARY

	Left Front ATD(#110)	Right Front ATD(#001)	Right Rear ATD(#043)
HIC15 CFC 1000	6	12	7
HIC36 CFC 1000	13	18	7
Chest Clip 3 ms (g) CFC 180	12.7	14.4	10.1
Chest Deflection (mm) CFC 600	-7.2	-17.0	-0.0
Neck Injury (NIJ) (ms) CFC 600			
NTE	0.06	0.15	0.08
NTF	0.04	0.07	0.08
NCE	0.12	0.27	0.12
NCF	0.06	0.08	0.13
Neck Tension (N) CFC1000	326.0	525.9	457.6
Neck Compression (N) CFC1000	-290.4	-1261.9	-767.5

	2007 Ford Expedition
Vehicle Test Weight	2916.2 kg
Left Side - Maximum Crush	120.0 mm
Right Side - Maximum Crush	23.0 mm
Roof - Maximum Crush	20.0 mm
Impact Speed	48.4 km/h

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

TEST NOTES:

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

The vehicle's top of engine X-axis acceleration data channel recorded no valid data throughout the impact event.

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

TEST VEHICLE INFORMATION AND OPTIONS

Make	Ford	Driv. & Front Pass. Front Airbag	Yes
Model Year	2007	Driv. & Front Pass. Side Airbag	Yes
Model	Expedition XLT	Driv. & Front Pass. Head Airbag	No
Body Style	4-door SUV	Driv. & Front Pass. Curtain Airbag	Yes
VIN	1FMFU15567LA41245	Driv. & Front Pass. Knee Airbag	No
Color	White	Rear Pass. Front Airbag	Yes
Delivery Date	12/02/09	Rear Pass. Side Airbag	Yes
Odometer Reading	44,501.5	Rear Pass. Head Airbag	No
Dealer	Provided by VRTC	Rear Pass. Curtain Airbag	Yes
Transmission	Automatic	Rear Pass. Knee Airbag	No
Final Drive	Rear wheel drive	Load Limiters	Yes ¹
Number of Cylinders	V8	Anti-lock Brakes	Yes
Engine Displacement (L)	5.4	All-Wheel Drive	No
Engine Placement	Longitudinal	Pretensioners	Yes ¹
Roof Rack	Yes / Removed	Air Conditioning	Yes
Sunroof / T-Top	No	Tilt Wheel	Yes
Tinted Glass	Yes	Power Seats	Yes
Traction Control	No	Power Windows	Yes
Power Brakes	Yes	Power Steering	Yes
Front Disc	Yes	AM/FM CD	Yes
Rear Disc	Yes	Automatic Door Locks	Yes
Does owner's manual provide instructions to turn off automatic door locks?		Other	N/A
			Yes

DATA FROM CERTIFICATION LABEL

Manufactured by	Ford Motor Co.
Date of Manufacture	03-07

GVWR (kg)	3357
GAWR Front (kg)	1497
GAWR Rear (kg)	1928

TEST VEHICLE SEAT TYPE AND CAPACITY

Measured Parameter	Front	Mid ²	Rear ²	Total
Type of Seats	Bucket	Split Bench	Split Bench	
Designated Seating Capacity (DSC)	2	3	3	8
Type of Seat Back	Manual Adjustable	Manual Adjustable	Fixed	
(A) Capacity Wt. (VCW) (kg)				789
(B) DSC x 68.08 kg				545
(A-B) Cargo Wt. (RCLW) (kg)				244

¹ The original pretensioners were replaced with TRW belt systems

² The original bench seats were removed and a bucket seat installed in the second row right seating position.

NOTE: The curtain airbags and pretensioners were manually fired for this test.

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) ¹			As Tested (ATW)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	642.6	637.0		677.4	786.4	
Right	kg	612.2	662.4		666.8	785.6	
Ratio	%	49.1	50.9		46.1	53.9	
Totals	kg	1254.8	1299.4	2554.2	1344.2	1572.0	2916.2

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value ¹
(A) Total Delivered Weight (UVW)	kg	2554.2
(B) Weight of 2 P572M ATDs	kg	165.2
(C) Rated Cargo/Luggage Weight (RCLW)	kg	136.0
(A+B+C) Vehicle Target Weight (TVTW)	kg	2855.4

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
Pre-Test	mm	895	893	878	870	1628
Post-Test	mm	900	910	861	900	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Test Vehicle Wheelbase	mm	3020
Total Vehicle Length at Left Side	mm	4885
Total Vehicle Length at Centerline	mm	1995
Total Vehicle Length at Right Side	mm	4885
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	51.8
Amount of Stoddard Solvent in Fuel Tank	liters	98.4

Vehicle parts removed to make Target Vehicle Test Weight: Spare tire, and exhaust from the muffler rearward.

¹ UVW and Target Test Weight was based on values recorded using a 5-passenger (DSC) vehicle as tested on December 3, 2008.

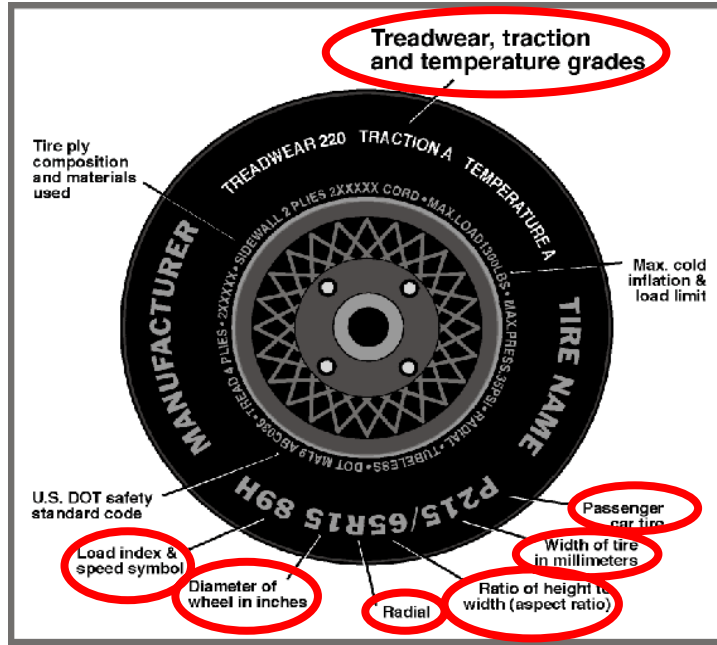
DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10



DATA FROM TIRE PLACARD

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold / Test Pressure (kPa)	240	240
Recommended Tire Size	P255/70R18	P255/70R18
Tire Size on Vehicle	P255/70R18	P255/70R18
Tire Manufacturer	Pirelli	Pirelli
Tire Name	Scorpion	Scorpion
Load Index & Speed Symbol	113S	113S
Tread wear	520	520
Traction Grade	A	A
Temperature Grade	B	B

DATA SHEET NO. 2
SEATS AND SEAT BELTS DATA

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

Test Date: 04/20/10

DUMMY RIDING POSITION

Driver: Total Number of detents:

Power Seat; 240 mm of travel

Passenger: Total Number of detents: 22

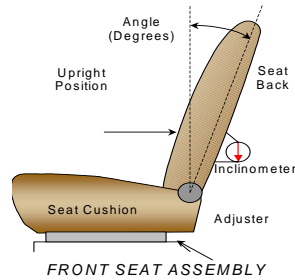
Right Rear Passenger: Total Number of detents: 22

Driver seat back angle: 11.5°¹

Passenger seat back angle: 11.7°¹

Right rear seat back angle: 9.5°¹

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



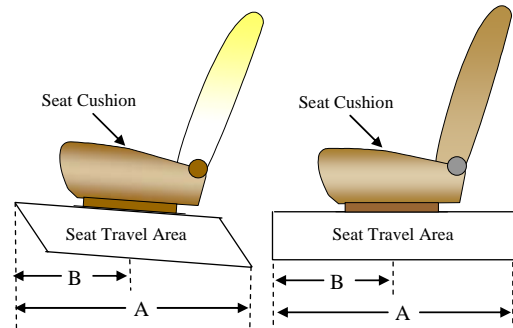
SEAT FORE/AFT POSITIONS

The total seat travel was measured from forward most position to rearmost position, irrespective of vertical seat height in those positions. The seat was set at the longitudinal mid position with vertical adjustment at the lowest position obtainable for both the driver and passenger.

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position No.
Driver Seat	240	Mid
Fr Pass	22	12 of 22
Rear Seat	22	17 of 22

Seat position number one is the full forward position.



SEAT BELT UPPER ANCHORAGE

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

Position number 1 is the uppermost adjustment position.

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

¹ The seat back angles were measured using an inclinometer at the head restraint.

DATA SHEET NO. 2 (CONTINUED)

SEATS AND SEAT BELTS DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

SEAT BELT CONFIGURATION

	Type	Configuration
Driver	3-PT Retractor and buckle pretensioner ¹	G
Right Front Passenger	3-PT motorized Retractor ² and buckle pretensioner ¹	I
Right Rear Passenger	3-PT motorized Retractor ² and buckle pretensioner ¹	I

¹ Pretensioners manually fired at 300 milliseconds.

² Motorized retractor activated at launch of test

DATA SHEET NO. 3

POST-TEST OBSERVATIONS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

TEST DUMMY INFORMATION AND CONTACT POINTS

Description	Left Front Seat Driver	Right Front Passenger	Rear Seat Passenger
Dummy Type/Serial No.	Hybrid III 50 th / 110	Hybrid III 50 th / 001	Hybrid III 50 th / 043
Head Contact	Curtain airbag, head restraint	Curtain airbag, Side header	Curtain airbag, side header
Upper Torso Contact	Airbag	Airbag	No visible contact
Lower Torso Contact	No visible contact	No visible contact	No visible contact
Left Knee Contact	Door liner	No visible contact	No visible contact
Right Knee Contact	No visible contact	Door liner	Door liner

POST-TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Locked/Unlocked Doors	Unlocked	Unlocked
Left Side Door Opening	Jammed and latched	Closed and latched
Right Side Door Opening	Closed and latched	Closed and latched
Seat Movement	None	None
Seat Back Failure	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Did not separate from vehicle
Sill Separation	Did not separate from vehicle
Windshield Damage	Cracked on left side corner
Window Damage	Front left and right, and tail gate windows shattered
Other Notable Effects	None

DATA SHEET NO. 3 (CONTINUED)

POST TEST OBSERVATIONS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

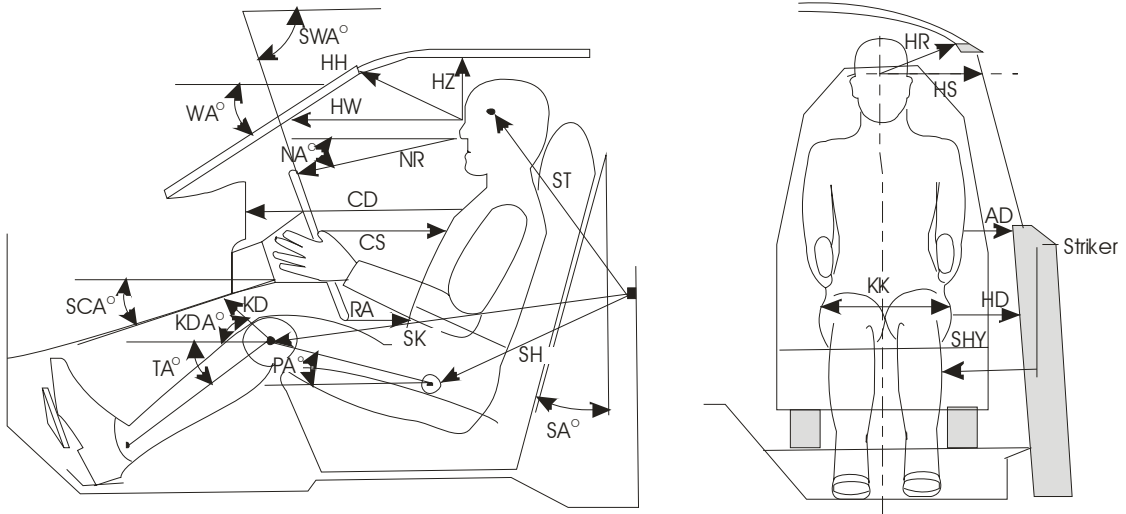
Restraint Type	Right Rear (Passenger) Occupant Location 06	
	Installed	Operation
Front Airbag	No	N/A
Side Airbag	No	N/A
Head Airbag	No	N/A
Curtain Airbag	Yes	Yes
Seat Belt Pretensioner	Yes	Yes

NOTE: The left and right side curtain airbags and pretensioners were deployed at 300 milliseconds using TRC Inc.'s airbag firing system.

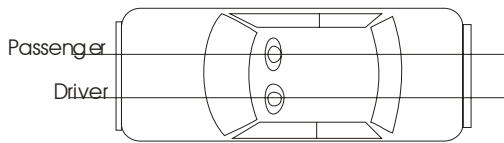
DATA SHEET NO. 4
DUMMY MEASUREMENTS

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

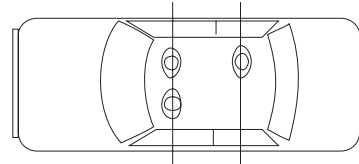
Test Date: 04/20/10



VERTICAL LONGITUDINAL PLANE



VERTICAL TRANSVERSE PLANE



DATA SHEET NO. 4 (CONTINUED)

DUMMY MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

FRONT SEAT OCCUPANTS

Code	Measurement Description	Driver (# 110)		Passenger (# 001)	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		31.4		28.7
SWA°	Steering Wheel Angle		--- ²		
SCA°	Steering Column Angle		--- ²		
SA°	Seat Back Angle (on headrest post)		12.4		12.0
HZ	Head to Roof (Z Direction)	247		211	
HH	Head to Header	454		426	
HW	Head to Windshield	716		666	
HR	Head to Side Header (Y Direction)	237		202	
NR	Nose to Rim	--- ²	--- ²		
CD	Chest to Dash	--- ¹		--- ¹	
CS	Steering Wheel to Chest	--- ²			
RA	Rim to Abdomen	--- ²			
KDL	Left Knee to Dash	178	17.4	213	
KDR	Right Knee to Dash	180		203	10.5
PA°	Pelvic Angle		22.3		21.0
TA°	Tibia Angle		47.8		42.7
KK	Knee to Knee (Y Direction)	283		266	
ST	Striker to Head	641	-82.9	677	-83.2
SK	Striker to Knee	610	-6.1	587	-6.4
SH	Striker to H-Point	219	11.2	193	0.5
SHY	Striker to H-Point (Y Direction)	184		179	
HS	Head to Side Window (Y Direction)	361		316	
HD	H-Point to Door (Y Direction)	92		85	
AD	Arm to Door (Y Direction)	143		133	

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

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

¹ Measurement is not available.

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

DATA SHEET NO. 4 (CONTINUED)

DUMMY MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

RIGHT REAR SEAT OCCUPANT

Code	Measurement Description	Right Rear Passenger (#043)	
		Length (mm)	Angle(°)
WA°	Windshield Angle		
SWA°	Steering Wheel Angle		
SCA°	Steering Column Angle		
SA°	Seat Back Angle (on headrest post)		8.5
HZ	Head to Roof (Z Direction)	243	
HH	Head to Header	573	
HW	Head to Windshield	548	
HR	Head to Side Header (Y Direction)	232	
NR	Nose to Rim		
CD	Chest to Dash		
CS	Steering Wheel to Chest		
RA	Rim to Abdomen		
KDL	Left Knee to Dash (Seatback)	193	
KDR	Right Knee to Dash (Seatback)	209	6.3
PA°	Pelvic Angle		23.0
TA°	Tibia Angle		54.1
KK	Knee to Knee (Y Direction)	239	
ST	Striker to Head	547	-70.3
SK	Striker to Knee	684	1.0
SH	Striker to H-Point	334	25.2
SHY	Striker to H-Point (Y Direction)	190	
HS	Head to Side Window (Y Direction)	337	
HD	H-Point to Door (Y Direction)	92	
AD	Arm to Door (Y Direction)	151	

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

¹ Measurement not available.

DATA SHEET NO. 5

OCCUPANT INSTRUMENTATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

LEFT FRONT

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
Head Acceleration	X	g	3.9	448.5	-7.3	314.3
	Y	g	10.4	1443.0	-6.3	314.8
	Z	g	6.5	308.6	-3.6	359.8
	R	g	11.5	1441.7		
Head Front Acceleration	Y	g	14.8	1454.8	-2.8	312.6
	Z	g	7.2	308.6	-4.3	373.5
Head Top Acceleration	X	g	6.0	448.4	-6.5	1749.8
	Y	g	15.9	1430.6	-3.8	334.6
Head Side Acceleration	X	g	4.7	448.8	-7.3	1422.9
	Z	g	7.1	308.2	-2.7	369.9
Upper Neck Force	X	N	44.7	1661.3	-129.2	1758.2
	Y	N	107.1	1744.6	-289.3	1458.2
	Z	N	326.0	307.8	-290.4	1444.7
Upper Neck Moment	X	Nm	7.0	1432.4	-12.1	1415.8
	Y	Nm	9.1	361.3	-11.4	1446.6
	Z	Nm	15.5	1454.3	-3.9	1542.9
Lower Neck Force	X	N	101.7	1573.3	-114.3	1468.2
	Y	N	165.4	1569.6	-251.8	1451.8
	Z	N	381.6	308.1	-222.0	1409.0
Lower Neck Moment	X	Nm	27.2	1745.2	-40.5	1465.0
	Y	Nm	40.2	356.6	-22.7	442.2
	Z	Nm	11.8	1498.3	-10.5	1417.1
Chest Acceleration	X	g	2.0	383.0	-7.1	306.7
	Y	g	11.8	1409.2	-2.8	317.8
	Z	g	11.8	1409.1	-3.6	362.1
	R	g	16.7	1409.2		
Chest Displacement	X	mm	4.2	1446.6	-7.2	314.6
Pelvis Acceleration	X	g	2.6	359.4	-6.9	1433.7
	Y	g	16.3	1435.1	-2.8	305.5
	Z	g	4.4	1458.7	-3.1	346.0
	R	g	18.0	1435.0		

Positive Direction

Longitudinal: Forward

Lateral: Rightward

Vertical: Downward

Negative Direction

Longitudinal: Rearward

Lateral: Leftward

Vertical: Upward

DATA SHEET NO. 5 (CONTINUED)
OCCUPANT INSTRUMENTATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

RIGHT FRONT

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
Head Acceleration	X	g	10.4	301.5	-13.9	308.2
	Y	g	9.9	1509.3	-32.7	308.2
	Z	g	38.5	308.3	-19.1	310.5
	R	g	51.6	308.2		
Head Rate Gyro	X	°/s	3640.6	306.9	-1210.8	307.6
	Y	°/s	563.1	308.9	-1264.3	307.0
	Z	°/s	1347.8	308.2	-1563.9	309.3
Upper Neck Force	X	N	58.2	965.0	-244.8	314.8
	Y	N	377.1	1509.4	-100.5	308.4
	Z	N	525.9	1468.1	-1261.9	309.9
Upper Neck Moment	X	Nm	19.5	1531.6	-6.4	1613.9
	Y	Nm	13.6	360.6	-17.0	313.5
	Z	Nm	8.4	1486.0	-8.3	335.6
Chest Acceleration	X	g	4.2	314.2	-7.9	1464.4
	Y	g	10.7	1456.5	-4.4	308.6
	Z	g	7.6	308.9	-6.8	314.0
	R	g	14.5	1456.6		
Chest Displacement	X	mm	0.0	109.3	-17.0	1470.9
Lower Neck Force	X	N	82.8	304.7	-283.0	1468.1
	Y	N	403.4	1512.6	-128.7	319.4
	Z	N	642.0	1462.5	-1103.5	309.5
Lower Neck Moment	X	Nm	100.3	1523.0	-24.1	1628.3
	Y	Nm	83.2	310.4	-28.8	1005.1
	Z	Nm	14.0	1512.2	-10.9	331.1
Pelvis Acceleration	X	g	4.1	1513.9	-11.7	1453.8
	Y	g	17.6	1444.9	-1.8	313.0
	Z	g	2.9	1742.0	-3.8	321.1
	R	g	20.3	1450.6		

Positive Direction

Longitudinal: Forward
Lateral: Rightward
Vertical: Downward

Negative Direction

Longitudinal: Rearward
Lateral: Leftward
Vertical: Upward

DATA SHEET NO. 5 (CONTINUED)
OCCUPANT INSTRUMENTATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

RIGHT REAR

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
Head Acceleration	X	g	25.1	308.5	-7.1	345.0
	Y	g	5.9	1514.6	-25.8	308.9
	Z	g	26.4	308.3	-4.9	320.1
	R	g	39.1	308.9		
Head Rate Gyro	X	°/s	1720.6	311.2	-1471.7	310.8
	Y	°/s	1464.2	309.4	-2392.6	310.7
	Z	°/s	4297.6	310.8	-757.0	314.2
Upper Neck Force	X	N	226.5	308.5	-374.1	308.1
	Y	N	233.3	1515.0	-298.7	306.0
	Z	N	457.6	305.8	-767.5	310.2
Upper Neck Moment	X	Nm	11.6	1529.4	-16.9	321.2
	Y	Nm	13.0	361.0	-11.7	307.9
	Z	Nm	6.7	1504.8	-6.1	310.3
Chest Acceleration	X	g	1.7	953.4	-10.4	307.2
	Y	g	8.1	1453.8	-2.1	337.4
	Z	g	4.3	306.1	-4.0	322.1
	R	g	10.8	307.1		
Chest Displacement	X	mm	10.3	1455.9	0.0	116.6
Lower Neck Force	X	N	1718.4	1516.6	-744.3	1121.4
	Y	N	2012.6	344.7	-816.8	1714.4
	Z	N	1892.6	305.9	-2518.0	1452.4
Lower Neck Moment	X	Nm	8.9	304.5	-9.1	308.3
	Y	Nm	12.7	306.0	-8.4	1451.3
	Z	Nm	2.6	1469.0	-4.5	310.9
Pelvis Acceleration	X	g	2.2	356.1	-9.7	1450.6
	Y	g	12.3	1449.8	-1.9	340.6
	Z	g	2.9	1711.1	-3.8	1453.9
	R	g	15.5	1449.5		

Positive Direction

Longitudinal: Forward
 Lateral: Rightward
 Vertical: Downward

Negative Direction

Longitudinal: Rearward
 Lateral: Leftward
 Vertical: Upward

DATA SHEET NO. 6
VEHICLE STRUCTURAL MEASUREMENTS^{1,2}

Test Vehicle: 2007 Ford Expedition
 Test Program: Improved Restraints in Rollovers Test Date: 04/20/10

STRUCTURAL MEASUREMENTS

	Elements	Pre-Test
1	Total Length	5208
2	Total Width	1995
3	Bumper Top Height	479
4	Bumper Bottom Height	404
5	Longitudinal Member Top Height	504
6	Longitudinal Member Bottom Height	424
7	Distance Between Longitudinal Members	845
7 ³	Longitudinal Member Width	100
8	Engine Top Height	982
9	Engine Bottom Height	282
10	Engine and Gearbox Width	750
11	Front Bumper - Engine Distance	650
12	Front Shock Absorber Fixing Height	812
13	Bonnet Leading Edge Height	1104
14	Front Shock Absorber Fixing Width	920
15	Front Bumper - Front Axle Distance	960
16	Front Axle - A Pillar Distance	675
17	A Pillar - B Pillar Distance	1065
18	B Pillar - Rear Axle Distance	1280
19	B Pillar - C Pillar Distance	995
20	Roof Sill Bottom Height	1639
21	Roof Sill Top Height	1778
22	Floor Sill Bottom Height	476
23	Floor Sill Top Height	529

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

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

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

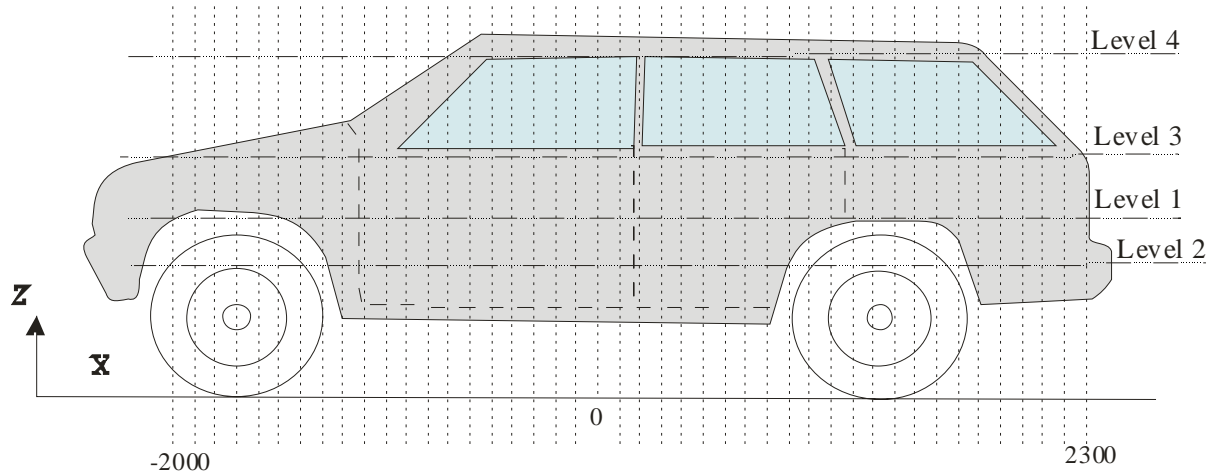
³ Measurement not recorded.

DATA SHEET NO. 7
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10



Left Side View
All measurements are in millimeters

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

Measurements along the vertical 0 mm line shown above.

Horizontal measurement spacing is approximately 100 millimeters.

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

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

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

LEFT SIDE CRUSH

	Pre-Test				Post-Test				Difference			
	1	2	3	4	1	2	3	4	1	2	3	4
-2000			-833				-786				-47	
-1900			-853				-795				-58	
-1800			-868				-801				-67	
-1700			-880				-810				-70	
-1600			-889				-815				-74	
-1500	-989		-897		-869		-820		-120		-77	
-1400	-990		-903		-874		-825		-116		-78	
-1300	-985		-908		-874		-829		-111		-79	
-1200	-968		-913		-870		-833		-98		-80	
-1100	-960	-972	-917		-869	-883	-835		-91	-89	-82	
-1000	-961	-964	-921		-870	-881	-840		-91	-83	-81	
-900	-963	-965	-924	-884	-873	-883	-843	-800	-90	-82	-81	-84
-800	-967	-968	-929	-854	-881	-892	-838	-810	-86	-76	-91	-44
-700	-970	-971	-933	-827	-888	-897	-821	-794	-82	-74	-112	-33
-600	-973	-974	-937	-798	-893	-902	-824	-769	-80	-72	-113	-29
-500	-976	-976	-941	-764	-899	-907	-842	-745	-77	-69	-99	-19
-400	-978	-978	-945	-731	-904	-913	-852	-718	-74	-65	-93	-13
-300	-980	-980	-947	-700	-908	-918	-861	-694	-72	-62	-86	-6
-200	-982	-982	-949	-684	-911	-923	-863	-681	-71	-59	-86	-3
-100	-983	-983	-952	-681	-909	-927	-872	-677	-74	-56	-80	-4
0	-984	-984	-954	-679	-916	-931	-880	-675	-68	-53	-74	-4
100	-985	-985	-956	-678	-922	-933	-888	-673	-63	-52	-68	-5
200	-986	-985	-957	-677	-927	-935	-898	-673	-59	-50	-59	-4
300	-987	-986	-958	-678	-933	-939	-900	-668	-54	-47	-58	-10
400	-987	-986	-960	-680	-938	-943	-906	-668	-49	-43	-54	-12
500	-988	-987	-961	-682	-942	-948	-910	-668	-46	-39	-51	-14
600	-988	-987	-962	-683	-944	-951	-914	-668	-44	-36	-48	-15
700	-988	-987	-963	-684	-947	-953	-917	-668	-41	-34	-46	-16
800	-988	-987	-963	-684	-950	-955	-920	-668	-38	-32	-43	-16
900	-987	-986	-963	-686	-952	-956	-922	-669	-35	-30	-41	-17
1000	-987	-985	-964	-688	-955	-958	-923	-669	-32	-27	-41	-19
1100	-987	-993	-963	-689	-958	-963	-917	-674	-29	-30	-46	-15
1200	-995		-963	-689	-960		-917	-674	-35		-46	-15
1300	-1008		-960	-689	-955		-923	-675	-53		-37	-14
1400	-1012		-960	-689	-950		-922	-676	-62		-38	-13
1500	-1011		-960	-688	-949		-925	-676	-62		-35	-12
1600	-1009		-958	-688	-955		-929	-677	-54		-29	-11
1700	-1005		-956	-688	-962		-932	-677	-43		-24	-11
1800	-987		-954	-687	-954		-934	-677	-33		-20	-10
1900	-975		-952	-686	-956		-936	-676	-19		-16	-10
2000			-950	-685			-935	-675			-15	-10
2100			-948	-682			-934	-673			-14	-9
2200			-945	-679			-933	-669			-12	-10
2300			-943				-929				-14	

DATA SHEET NO. 7 (CONTINUED)

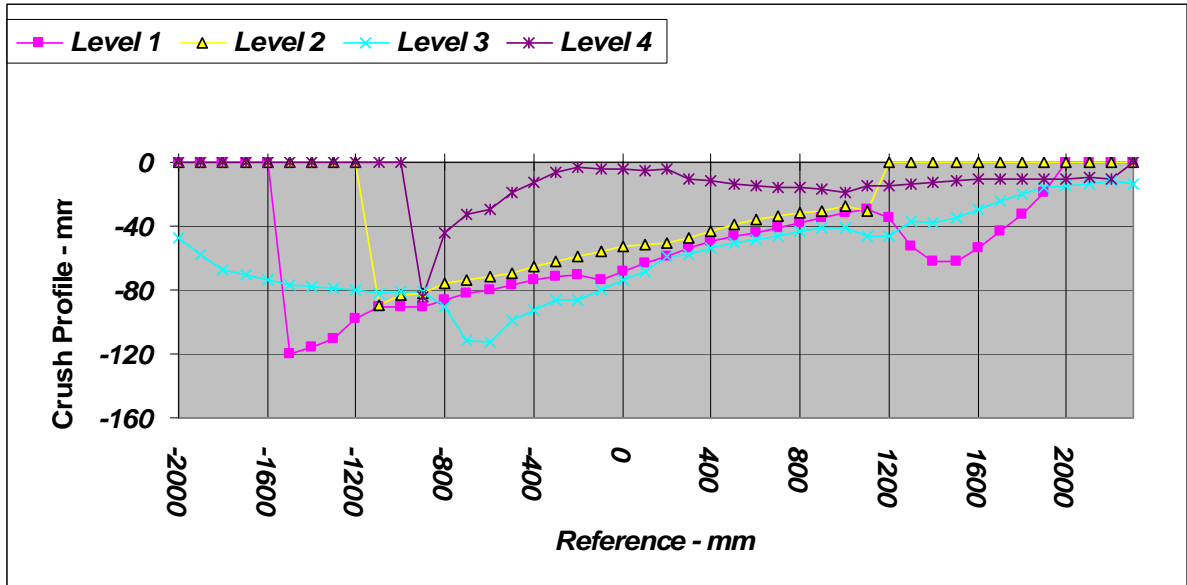
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

LEFT SIDE CRUSH



The side vehicle crush measurements and plot reported are lateral.

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

RIGHT SIDE CRUSH

	Pre-Test				Post-Test				Difference			
	1	2	3	4	1	2	3	4	1	2	3	4
-2000			845				867				-22	
-1900			865				887				-22	
-1800			879				900				-21	
-1700			889				910				-21	
-1600			898				918				-20	
-1500	992		904		1006		924		-14		-20	
-1400	993		910		1007		928		-14		-18	
-1300	992		914		1005		932		-13		-18	
-1200	974		918		986		935		-12		-17	
-1100	966	977	923		977	988	939		-11	-11	-16	
-1000	965	969	927		976	978	942		-11	-9	-15	
-900	967	968	929	889	977	977	944	906	-10	-9	-15	-17
-800	971	972	933	858	981	981	948	876	-10	-9	-15	-18
-700	974	975	937	831	983	983	951	849	-9	-8	-14	-18
-600	976	977	941	800	986	986	954	819	-10	-9	-13	-19
-500	979	980	944	766	988	988	957	787	-9	-8	-13	-21
-400	981	982	946	731	991	990	960	753	-10	-8	-14	-22
-300	983	984	949	698	992	992	963	720	-9	-8	-14	-22
-200	985	985	952	686	994	993	965	709	-9	-8	-13	-23
-100	986	986	954	682	994	994	967	704	-8	-8	-13	-22
0	987	987	956	681	995	995	969	703	-8	-8	-13	-22
100	988	988	957	680	996	995	970	702	-8	-7	-13	-22
200	989	989	958	681	997	995	971	703	-8	-6	-13	-22
300	989	988	959	680	996	995	970	696	-7	-7	-11	-16
400	989	988	960	680	996	995	971	697	-7	-7	-11	-17
500	988	988	961	681	996	995	972	697	-8	-7	-11	-16
600	988	988	962	682	996	994	972	697	-8	-6	-10	-15
700	988	988	963	684	995	994	973	699	-7	-6	-10	-15
800	988	987	963	684	995	993	973	699	-7	-6	-10	-15
900	988	986	963	684	995	992	973	698	-7	-6	-10	-14
1000	987	985	963	686	994	991	972	699	-7	-6	-9	-13
1100	987	992	962	687	994	998	972	701	-7	-6	-10	-14
1200	995		962	687	1001		970	701	-6		-8	-14
1300	1010		961	687	1016		969	700	-6		-8	-13
1400	1013		961	687	1018		969	700	-5		-8	-13
1500	1012		960	687	1017		968	700	-5		-8	-13
1600	1010		958	688	1014		966	700	-4		-8	-12
1700	1006		955	687	1010		963	699	-4		-8	-12
1800	988		952	686	992		960	698	-4		-8	-12
1900	976		950	685	980		957	697	-4		-7	-12
2000			947	684			953	695			-6	-11
2100			944	682			950	693			-6	-11
2200			941	679			947	689			-6	-10
2300			938				943				-5	

DATA SHEET NO. 7 (CONTINUED)

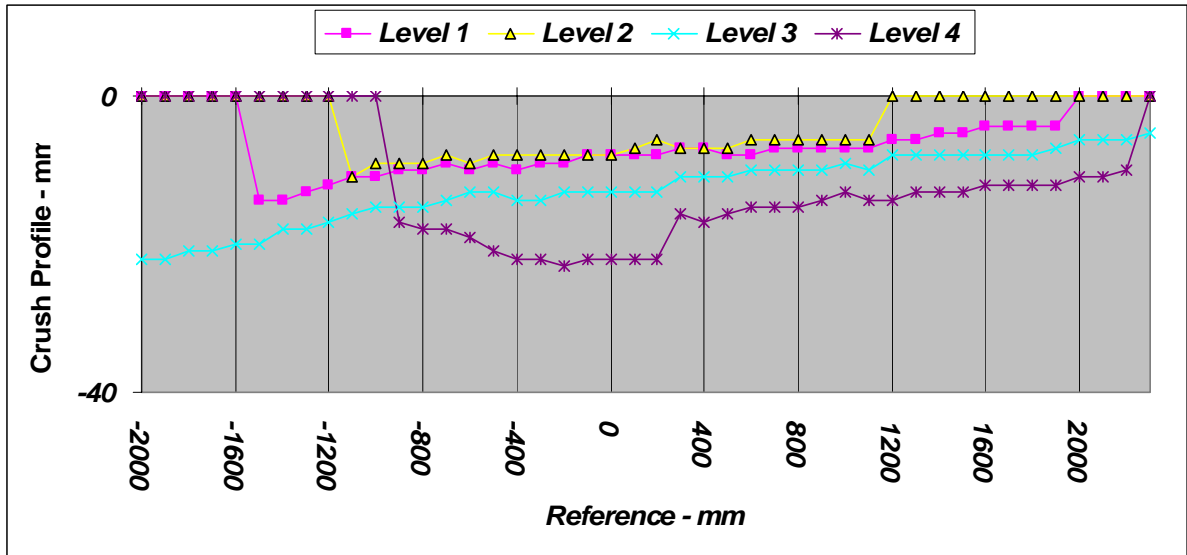
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

RIGHT SIDE CRUSH



The side vehicle crush measurements and plot reported are lateral.

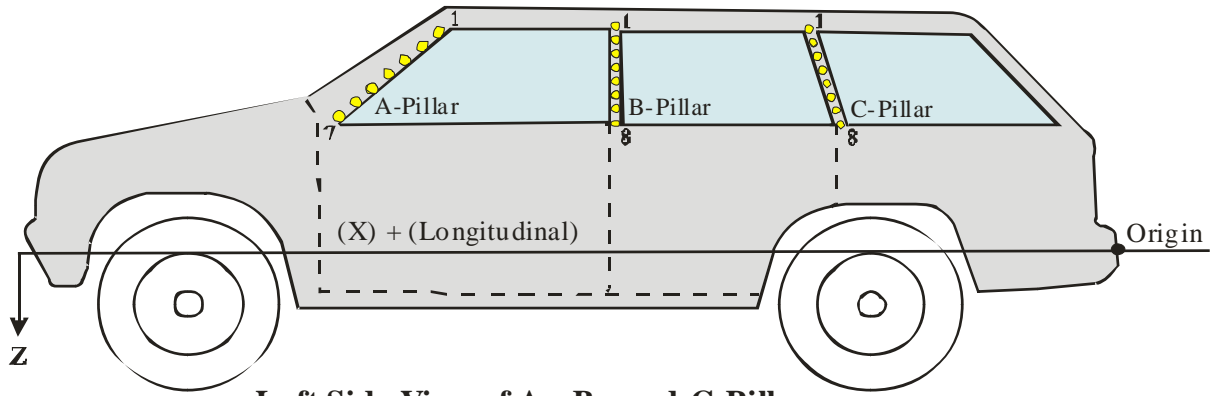
DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10



Left Side View of A-, B-, and C-Pillars

Vertical measurement spacing is approximately 100 millimeters.

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

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

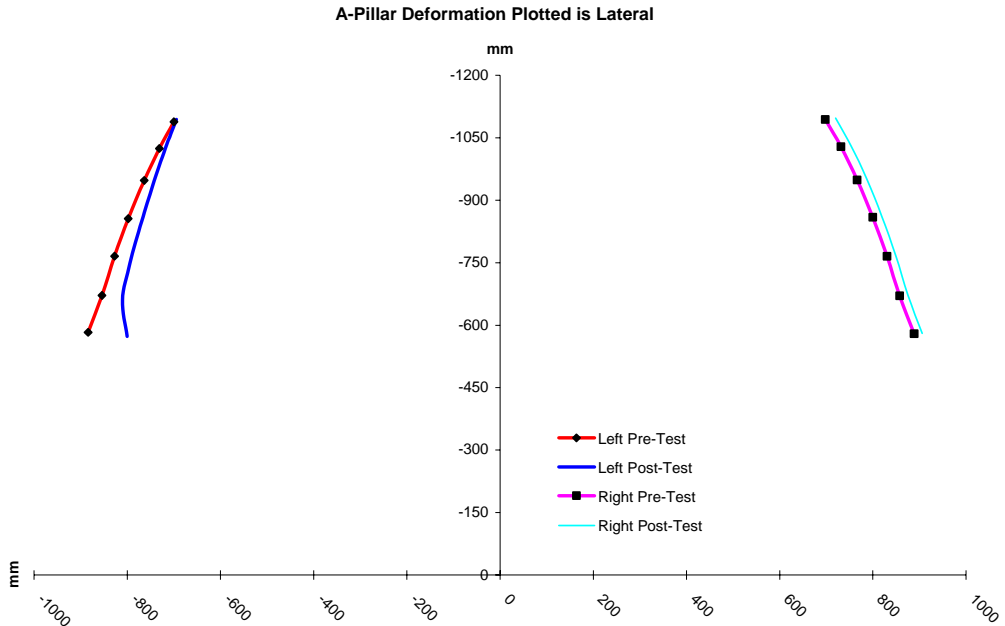
Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

A-PILLAR MEASUREMENTS

Index	Pre-Test			Post-Test			Difference		
	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
Left B-Pillar									
(1)	3630	-884	-583	3614	-800	-573	16	-84	-10
(2)	3533	-854	-672	3514	-810	-660	19	-44	-11
(3)	3431	-827	-766	3414	-794	-748	16	-33	-18
(4)	3333	-798	-856	3313	-769	-849	20	-29	-7
(5)	3229	-764	-947	3220	-745	-936	9	-18	-12
(6)	3135	-731	-1024	3121	-718	-1025	14	-13	0
(7)	3033	-700	-1088	3020	-694	-1094	13	-6	6
(8)	3630	-884	-583	3614	-800	-573	16	-84	-10
Right B-Pillar									
(1)	3629	889	-579	3630	906	-580	-1	-17	1
(2)	3531	858	-671	3531	876	-672	0	-18	1
(3)	3431	831	-765	3432	849	-767	-1	-19	1
(4)	3330	800	-859	3330	819	-861	0	-19	2
(5)	3225	766	-948	3226	787	-950	0	-21	2
(6)	3128	731	-1028	3127	753	-1031	0	-21	3
(7)	3018	698	-1094	3018	720	-1097	0	-22	3
(8)	3629	889	-579	3630	906	-580	-1	-17	1



DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

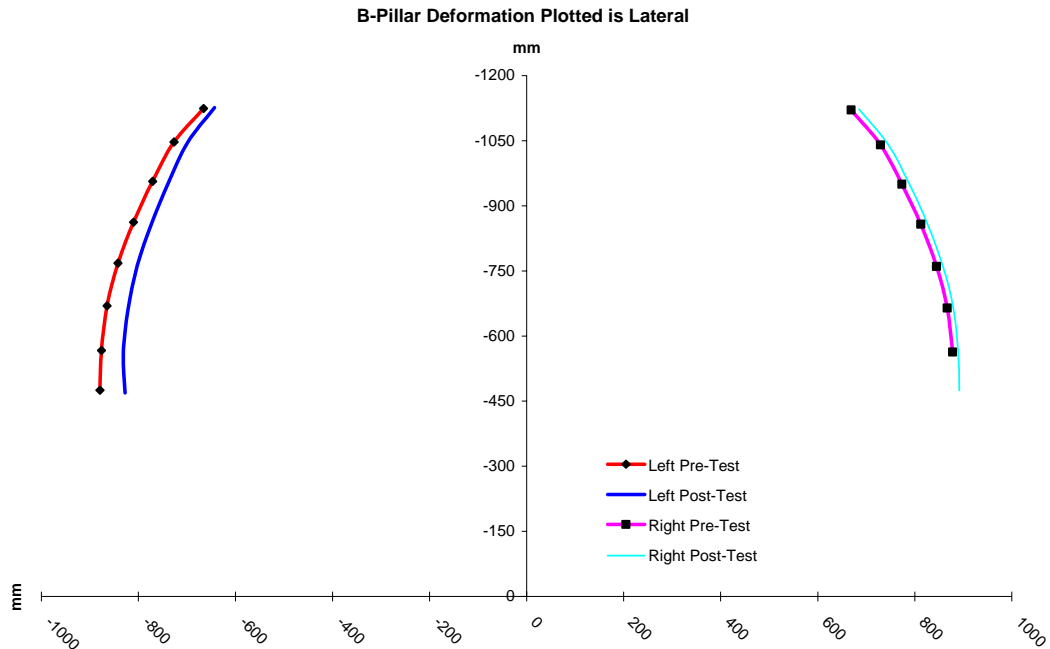
Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

B-PILLAR MEASUREMENTS

Index	Pre-Test			Post-Test			Difference		
	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
Left B-Pillar									
(1)	2476	-666	-1124	2479	-643	-1126	-3	-23	2
(2)	2480	-727	-1047	2482	-699	-1046	-2	-28	-1
(3)	2486	-771	-957	2488	-738	-953	-2	-32	-3
(4)	2492	-810	-862	2493	-774	-857	-1	-36	-5
(5)	2494	-842	-768	2495	-802	-762	-1	-40	-6
(6)	2500	-865	-669	2501	-821	-663	-1	-43	-7
(7)	2504	-876	-567	2504	-831	-559	0	-45	-8
(8)	2505	-880	-475	2507	-828	-469	-2	-52	-6
Right B-Pillar									
(1)	2478	669	-1121	2478	685	-1123	0	-16	2
(2)	2479	729	-1040	2479	745	-1042	0	-16	1
(3)	2484	774	-950	2485	789	-951	0	-15	1
(4)	2490	812	-857	2490	826	-858	0	-14	1
(5)	2494	845	-760	2494	859	-760	0	-13	0
(6)	2501	867	-665	2501	880	-664	0	-12	0
(7)	2504	878	-563	2504	889	-563	0	-12	0
(8)	2507	881	-475	2508	892	-474	0	-11	-1



DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

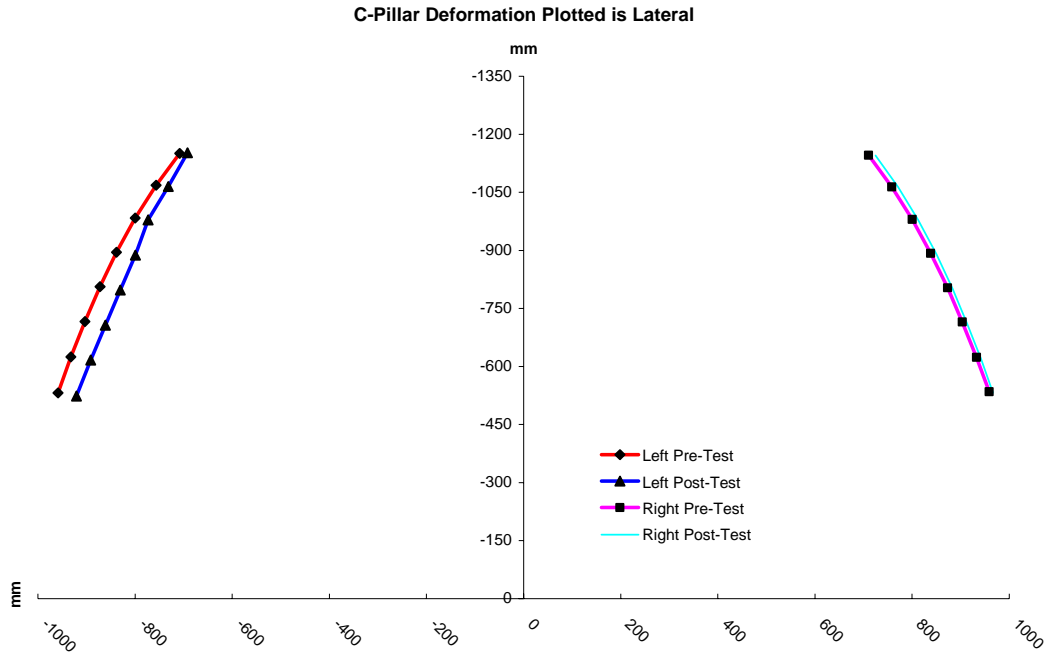
Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

C-PILLAR MEASUREMENTS

Index	Pre-Test			Post-Test			Difference		
	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)	X (mm)	Y (mm)	Z (mm)
Left C-Pillar									
(1)	1569	-708	-1151	1572	-692	-1152	-3	-16	1
(2)	1539	-757	-1069	1542	-731	-1065	-3	-25	-4
(3)	1508	-800	-984	1511	-773	-979	-3	-27	-4
(4)	1477	-838	-896	1480	-799	-888	-3	-39	-8
(5)	1448	-872	-806	1451	-831	-798	-3	-42	-9
(6)	1418	-903	-716	1422	-861	-707	-3	-42	-9
(7)	1389	-932	-625	1393	-892	-617	-3	-41	-8
(8)	1361	-959	-532	1364	-921	-524	-4	-38	-8
Right C-Pillar									
(1)	1574	711	-1146	1574	725	-1146	0	-14	0
(2)	1539	758	-1064	1539	771	-1064	0	-13	0
(3)	1505	800	-980	1505	812	-979	0	-12	-1
(4)	1472	838	-893	1472	850	-891	0	-11	-1
(5)	1440	873	-803	1440	883	-802	0	-10	-2
(6)	1409	903	-715	1409	913	-713	0	-9	-1
(7)	1377	933	-623	1377	942	-621	0	-9	-2
(8)	1347	959	-535	1347	967	-532	0	-8	-2



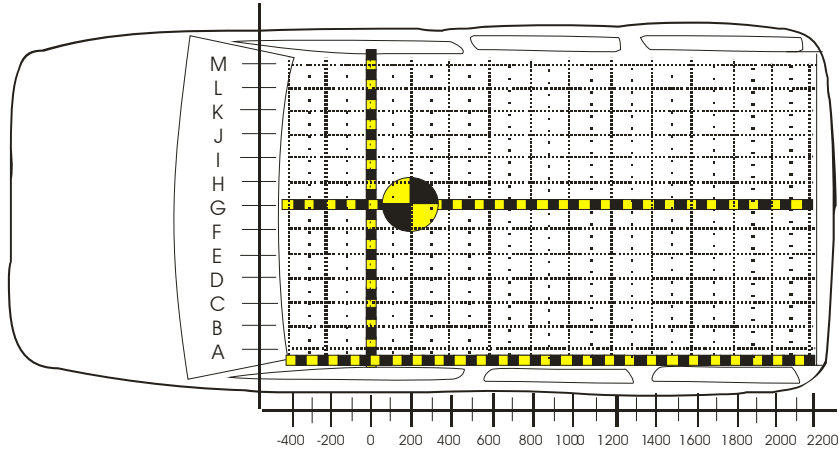
DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10



ROOF EXTERIOR CRUSH LEFT (ROWS A – D)

	Pre-Test				Post-Test				Difference			
	A	B	C	D	A	B	C	D	A	B	C	D
-400	-597	-497	-394	-297	-580	-478	-376	-279	-17	-19	-18	-18
-300	-597	-498	-398	-298	-581	-480	-381	-280	-16	-18	-17	-18
-200	-597	-499	-400	-297	-582	-481	-381	-281	-15	-18	-19	-16
-100	-597	-500	-399	-296	-581	-483	-382	-279	-16	-17	-17	-17
0	-598	-499	-401	-297	-582	-482	-383	-280	-16	-17	-18	-17
100	-598	-500	-400	-297	-583	-484	-382	-280	-15	-16	-18	-17
200	-598	-501	-399	-297	-582	-485	-383	-281	-16	-16	-16	-16
300	-597	-500	-399	-297	-581	-485	-382	-281	-16	-15	-17	-16
400	-597	-501	-401	-294	-582	-486	-384	-280	-15	-15	-17	-14
500	-597	-500	-400	-296	-582	-485	-384	-281	-15	-15	-16	-15
600	-598	-501	-400	-297	-583	-486	-385	-282	-15	-15	-15	-15
700	-598	-501	-401	-297	-584	-487	-386	-283	-14	-14	-15	-14
800	-598	-500	-400	-296	-583	-486	-385	-282	-15	-14	-15	-14
900	-600	-502	-400	-297	-585	-488	-387	-282	-15	-14	-13	-15
1000	-600	-502	-401	-297	-585	-489	-387	-283	-15	-13	-14	-14
1100	-598	-496	-397	-296	-583	-484	-384	-281	-15	-12	-13	-15
1200	-598	-503	-403	-298	-583	-490	-389	-284	-15	-13	-14	-14
1300	-598	-502	-401	-298	-584	-489	-387	-284	-14	-13	-14	-14
1400	-598	-501	-401	-297	-584	-489	-388	-284	-14	-12	-13	-13
1500	-597	-501	-400	-297	-585	-489	-388	-285	-12	-12	-12	-12
1600	-597	-502	-402	-294	-586	-490	-390	-282	-11	-12	-12	-12
1700	-597	-503	-402	-296	-586	-492	-391	-285	-11	-11	-11	-11
1800	-598	-503	-403	-296	-588	-492	-392	-285	-10	-11	-11	-11
1900	-600	-505	-405	-297	-589	-494	-394	-286	-11	-11	-11	-11
2000	-601	-503	-403	-298	-591	-493	-393	-286	-10	-10	-10	-12
2100	-600	-506	-405	-299	-590	-496	-394	-288	-10	-10	-11	-11
2200	-601	-503		-300	-591	-493		-290	-10	-10		-10

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

ROOF EXTERIOR CRUSH CENTER (ROWS E – I)

	Pre-Test					Post-Test					Difference				
	E	F	G	H	I	E	F	G	H	I	E	F	G	H	I
-400	-196	-96	-0	97	197	-178	-76	19	116	217	-18	-20	-19	-19	-20
-300	-198	-98	-0	93	193	-180	-79	18	112	211	-18	-19	-18	-19	-18
-200	-200	-97	-1	95	195	-182	-78	17	113	214	-18	-19	-18	-18	-19
-100	-200	-99	-1	95	194	-182	-81	16	114	213	-18	-18	-17	-19	-19
0	-201	-99	-1	96	197	-184	-83	15	115	214	-17	-16	-16	-19	-17
100	-200	-98	-2	95	196	-184	-81	15	114	214	-16	-17	-17	-19	-18
200	-199	-99	-1	95	195	-184	-84	15	112	213	-15	-15	-16	-17	-18
300	-199	-97	-2	98	198	-184	-83	14	114	215	-15	-14	-16	-16	-17
400	-200	-99	-2	96	197	-185	-85	14	113	214	-15	-14	-16	-17	-17
500	-200	-98	-2	96	197	-185	-83	14	113	215	-15	-15	-16	-17	-18
600	-200	-101	-2	95	196	-186	-87	13	111	212	-14	-14	-15	-16	-16
700	-201	-98	-2	95	195	-186	-83	13	111	212	-15	-15	-15	-16	-17
800	-200	-97	-2	95	194	-186	-84	12	111	210	-14	-13	-14	-16	-16
900	-202	-99	-2	94	193	-188	-85	11	110	209	-14	-14	-13	-16	-16
1000	-201	-98	-4	97	192	-188	-85	10	111	207	-13	-13	-14	-14	-15
1100	-197	-98	-3	96	192	-183	-84	11	110	206	-14	-14	-14	-14	-14
1200	-204	-101	-3	95	193	-189	-87	11	109	207	-15	-14	-14	-14	-14
1300	-202	-99	-4	94	195	-188	-86	10	108	210	-14	-13	-14	-14	-15
1400	-201	-101	-4	97	196	-189	-87	9	110	210	-12	-14	-13	-13	-14
1500	-200	-100	-4	96	195	-188	-87	9	109	208	-12	-13	-13	-13	-13
1600	-204	-100	-5	96	195	-191	-88	8	109	209	-13	-12	-13	-13	-14
1700	-204	-102	-5	95	195	-191	-90	6	108	209	-13	-12	-11	-13	-14
1800	-204	-101	-6	96	193	-192	-89	6	109	207	-12	-12	-12	-13	-14
1900	-205	-101	-6	95	194	-193	-89	5	108	207	-12	-12	-11	-13	-13
2000	-204	-101	-6	95	191	-191	-89	4	108	204	-13	-12	-10	-13	-13
2100	-207	-98	-7	94	191	-194	-88	4	106	204	-13	-10	-11	-12	-13
2200	-209	-100	-7	93	191	-197	-89	3	105	203	-12	-11	-10	-12	-12

DATA SHEET NO. 7 (CONTINUED)

VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

ROOF EXTERIOR CRUSH RIGHT (ROWS J – M)

	Pre-Test				Post-Test				Difference			
	J	K	L	M	J	K	L	M	J	K	L	M
-400	295	400	495	601	315	419	515	619	-20	-19	-20	-18
-300	295	399	499	600	315	419	518	619	-20	-20	-19	-19
-200	295	396	496	598	314	415	515	616	-19	-19	-19	-18
-100	295	396	496	596	314	414	514	614	-19	-18	-18	-18
0	295	397	496	595	314	415	514	613	-19	-18	-18	-18
100	294	395	496	594	312	414	513	612	-18	-19	-17	-18
200	294	396	496	594	311	413	513	612	-17	-17	-17	-18
300	292	394	494	594	309	412	512	611	-17	-18	-18	-17
400	294	395	495	595	311	412	511	611	-17	-17	-16	-16
500	294	394	494	596	311	411	511	612	-17	-17	-17	-16
600	293	394	494	595	309	410	510	611	-16	-16	-16	-16
700	292	394	494	593	309	410	510	609	-17	-16	-16	-16
800	293	393	493	595	308	409	509	610	-15	-16	-16	-15
900	293	393	493	596	309	409	509	611	-16	-16	-16	-15
1000	290	393	493	597	305	409	508	611	-15	-16	-15	-14
1100	289	392	493	596	305	408	508	611	-16	-16	-15	-15
1200	292	391	493	595	308	406	507	610	-16	-15	-14	-15
1300	294	395	495	595	308	409	509	610	-14	-14	-14	-15
1400	294	396	496	595	308	410	510	611	-14	-14	-14	-16
1500	294	394	495	595	308	408	508	608	-14	-14	-13	-13
1600	295	395	496	595	308	408	509	609	-13	-13	-13	-14
1700	296	396	496	594	308	409	509	608	-12	-13	-13	-14
1800	293	393	493	594	305	405	506	607	-12	-12	-13	-13
1900	293	395	495	595	306	408	507	607	-13	-13	-12	-12
2000	291	393	492	596	303	404	504	608	-12	-11	-12	-12
2100	293	392	493	597	306	404	505	609	-13	-12	-12	-12
2200	293		494	596	305		506	607	-12		-12	-11

DATA SHEET NO. 7 (CONTINUED)

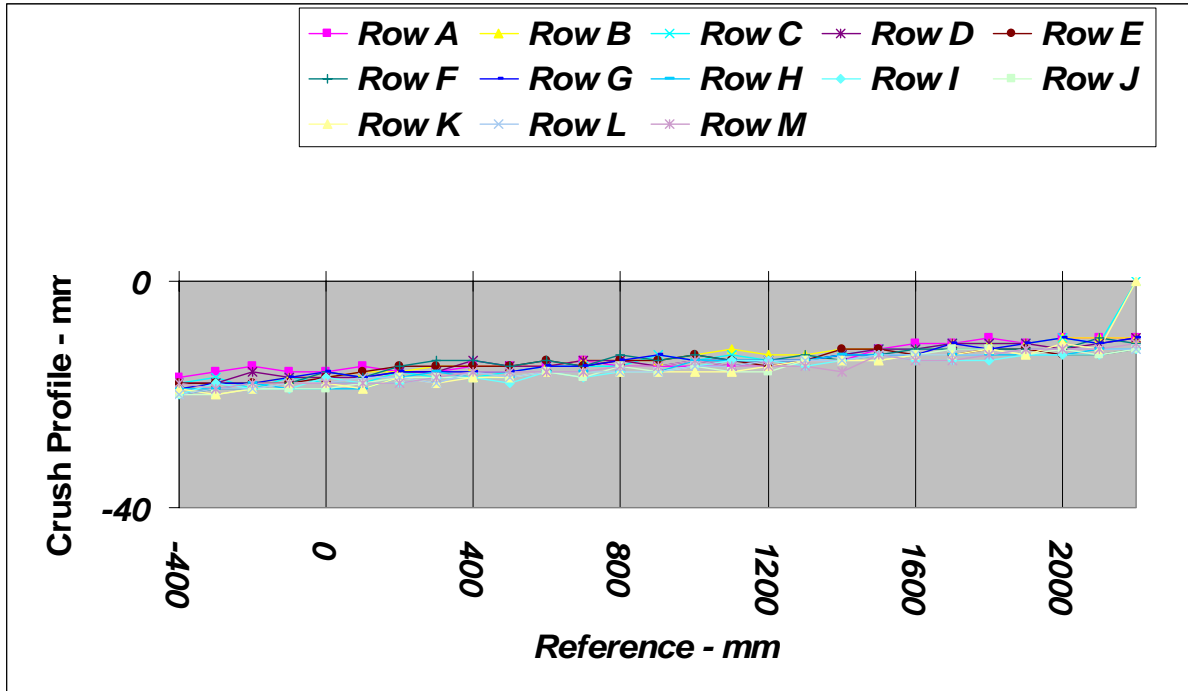
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

ROOF CRUSH



The roof crush measurements and plot reported are vertical.

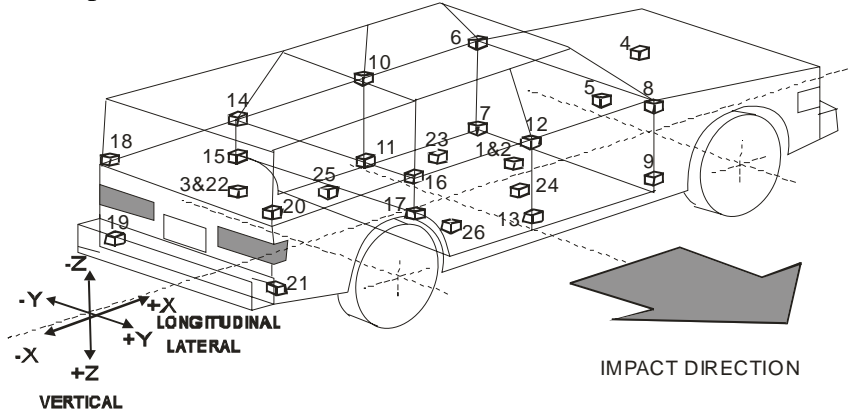
DATA SHEET NO. 8

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10



Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Vehicle Center of Gravity	2550	50	-665
2	Vehicle Center of Gravity ROLL	2550	10	-665
3	Rear Deck (cargo area) ROLL	380	0	-805
4	Top of Engine	4360	178	-910
5	Bottom of Engine	4010	0	-291
6	Left A-Pillar Upper	2990	-537	-1665
7	Left A-Pillar Lower	3550	-810	-603
8	Right A-Pillar Upper	3005	537	-1665
9	Right A-Pillar Lower	3530	810	-553
10	Left B-Pillar Upper	2450	-625	-1695
11	Left B-Pillar Lower	2450	-837	-578
12	Right B-Pillar Upper	2460	625	-1700
13	Right B-Pillar Lowe	2425	837	-560
14	Left C-Pillar Upper	1640	-672	-1670
15	Left C-Pillar Lower	1820	-842	-600
16	Right C-Pillar Upper	1640	672	-1675
17	Right C-Pillar Lower	1825	842	-613
18	Left D-Pillar Upper	445	-630	-1635
19	Left D-Pillar Lower	295	-725	-965
20	Right D-Pillar Upper	460	630	-1635
21	Right D-Pillar Lower	290	725	-960
22	Vehicle Rear Deck	345	0	-805
23	LF Seat Position (on floor)	2790	-450	-585
24	RF Seat Position (on floor)	2798	470	-613
25	LR Seat Position (on floor)	1830	-387	-585
26	RR Seat Position (on floor)	1870	436	-592

Measurements were acquired using a tape measure.

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
(1) Vehicle Center of Gravity Acceleration	X	g	3.3	303.8	-6.0	1414.4
	Y	g	15.4	1411.2	-3.5	323.8
	Z	g	17.0	306.6	-19.1	303.0
	R	g	19.2	303.0		
(2) Vehicle Center of Gravity Gyro	X	°/s	721.2	1420.6	-496.7	1413.0
	Y	°/s	553.6	305.4	-652.6	1420.7
	Z	°/s	649.8	1415.4	-730.3	309.4
(3) Rear Deck Gyro (cargo area)	X	°/s	370.6	598.1	-499.1	597.6
	Y	°/s	472.0	1434.1	-518.0	1432.6
	Z	°/s	171.3	1405.6	-526.8	598.1
(4) Top of Engine ¹	X	g	0.0	6492.9	0.0	6498.6
	Y	g	26.0	1425.9	-6.3	547.9
	Z	g	583.8	1432.6	-356.4	1451.8
	R	g	584.0	1432.6		
(5) Bottom of Engine	X	g	1.6	1506.6	-7.5	1417.1
	Y	g	30.9	1423.0	-4.7	521.6
	Z	g	10.4	1440.9	-3.9	1452.3
	R	g	31.2	1423.0		
(6) Left A-Pillar Upper	X	g	10.7	1423.9	-3.9	1437.5
	Y	g	19.4	1417.5	-4.7	311.8
	Z	g	24.4	303.1	-10.6	1398.7
	R	g	24.8	303.1		
(7) Left A-Pillar Lower	X	g	3.4	1424.9	-9.6	1412.2
	Y	g	56.4	1397.8	-15.8	1404.0
	Z	g	10.7	1414.8	-10.0	1423.7
	R	g	57.0	1397.8		
(8) Right A-Pillar Upper	X	g	2.2	530.2	-15.7	1415.8
	Y	g	11.0	1425.4	-5.4	1443.4
	Z	g	12.3	1416.0	-4.7	307.1
	R	g	20.6	1416.2		
(9) Right A-Pillar Lower	X	g	1.8	925.3	-9.6	1420.9
	Y	g	20.5	1435.8	-4.0	520.0
	Z	g	7.0	518.5	-3.5	305.4
	R	g	21.2	1436.0		

¹ See Test Notes.

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

Location		Unit	Positive Direction		Negative Direction	
			Max.	Time (ms)	Max.	Time (ms)
(10) Left B-Pillar Upper	X	g	3.5	1444.0	-5.0	1433.8
	Y	g	19.4	1392.9	-7.6	1442.0
	Z	g	7.2	1396.2	-14.8	1390.9
	R	g	21.2	1392.2		
(11) Left B-Pillar Lower	X	g	10.4	307.5	-3.7	1432.3
	Y	g	25.7	1391.0	-15.7	307.4
	Z	g	13.2	1391.4	-4.3	327.8
	R	g	28.8	1391.1		
(12) Right B-Pillar Upper	X	g	2.4	923.2	-11.0	1415.8
	Y	g	13.9	1417.9	-8.5	314.0
	Z	g	10.9	1424.9	-4.5	317.1
	R	g	18.4	1417.7		
(13) Right B-Pillar Lower	X	g	2.0	919.3	-9.0	1421.0
	Y	g	17.0	1421.8	-4.4	304.6
	Z	g	5.7	1439.6	-5.3	304.0
	R	g	19.1	1421.7		
(14) Left C-Pillar Upper	X	g	285.1	1680.9	-7.1	1637.0
	Y	g	16.1	308.4	-100.0	1673.6
	Z	g	7.2	1726.6	-100.4	1643.0
	R	g	292.5	1681.0		
(15) Left C-Pillar Lower	X	g	3.2	1396.2	-2.7	1432.6
	Y	g	12.3	1400.6	-1.4	2809.0
	Z	g	5.9	308.2	-5.8	313.7
	R	g	12.6	1400.6		
(16) Right C-Pillar Upper	X	g	2.6	922.5	-9.4	1416.3
	Y	g	12.1	1420.2	-6.6	1444.5
	Z	g	8.5	1425.0	-8.7	318.2
	R	g	15.3	1419.8		
(17) Right C-Pillar Lower	X	g	2.0	908.6	-9.4	1421.7
	Y	g	24.2	1436.3	-5.8	1433.0
	Z	g	7.0	1437.0	-6.4	1433.7
	R	g	24.9	1436.4		
(18) Left D-Pillar Upper	X	g	16.0	1705.3	-4.3	1406.6
	Y	g	7.4	1709.0	-4.5	1442.6
	Z	g	3.9	308.0	-5.7	909.3
	R	g	17.2	1705.3		

DATA SHEET NO. 8 (CONTINUED)

VEHICLE ACCELEROMETER LOCATIONS AND DATA SUMMARY

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

Location		Unit	Positive Direction		Negative Direction	
			Max. (ms)	Time	Max. (ms)	Time
(19) Left D-Pillar Lower	X	g	2.3	1394.6	-4.3	1407.0
	Y	g	10.2	908.1	-61.9	900.2
	Z	g	5.0	1412.6	-4.4	908.2
	R	g	61.9	900.2		
(20) Right D-Pillar Upper	X	g	3.8	921.4	-8.7	1416.2
	Y	g	5.8	916.1	-3.9	1485.8
	Z	g	30.3	302.3	-5.6	1444.1
	R	g	30.4	302.3		
(21) Right D-Pillar Lower	X	g	2.9	907.7	-10.4	1420.4
	Y	g	6.9	1404.6	-2.7	1430.2
	Z	g	4.4	1686.2	-4.4	319.1
	R	g	10.8	1420.3		
(22) Vehicle Rear Deck	X	g	1.0	1362.0	-5.0	1423.8
	Y	g	7.0	906.9	-2.8	1429.7
	Z	g	7.3	1338.4	-4.1	905.4
	R	g	8.4	1404.6		
(23) LF Seat Position (on floor)	X	g	1.9	303.6	-6.9	1411.7
	Y	g	15.9	1413.1	-1.8	521.2
	Z	g	7.8	1439.5	-10.7	302.4
	R	g	17.3	1411.8		
(24) RF Seat Position (on floor)	X	g	1.4	304.9	-6.8	1421.4
	Y	g	16.5	1420.7	-2.2	522.9
	Z	g	10.5	1443.2	-10.0	302.6
	R	g	18.2	1420.7		
(25) LR Seat Position (on floor)	X	g	1.3	317.3	-4.5	1405.1
	Y	g	12.2	1419.5	-1.1	523.0
	Z	g	7.4	1427.5	-7.2	1431.1
	R	g	12.3	1411.8		
(26) RR Seat Position (on floor)	X	g	1.5	907.6	-7.7	1422.3
	Y	g	13.8	1419.1	-1.3	522.4
	Z	g	7.9	1419.9	-8.4	303.1
	R	g	16.7	1419.6		

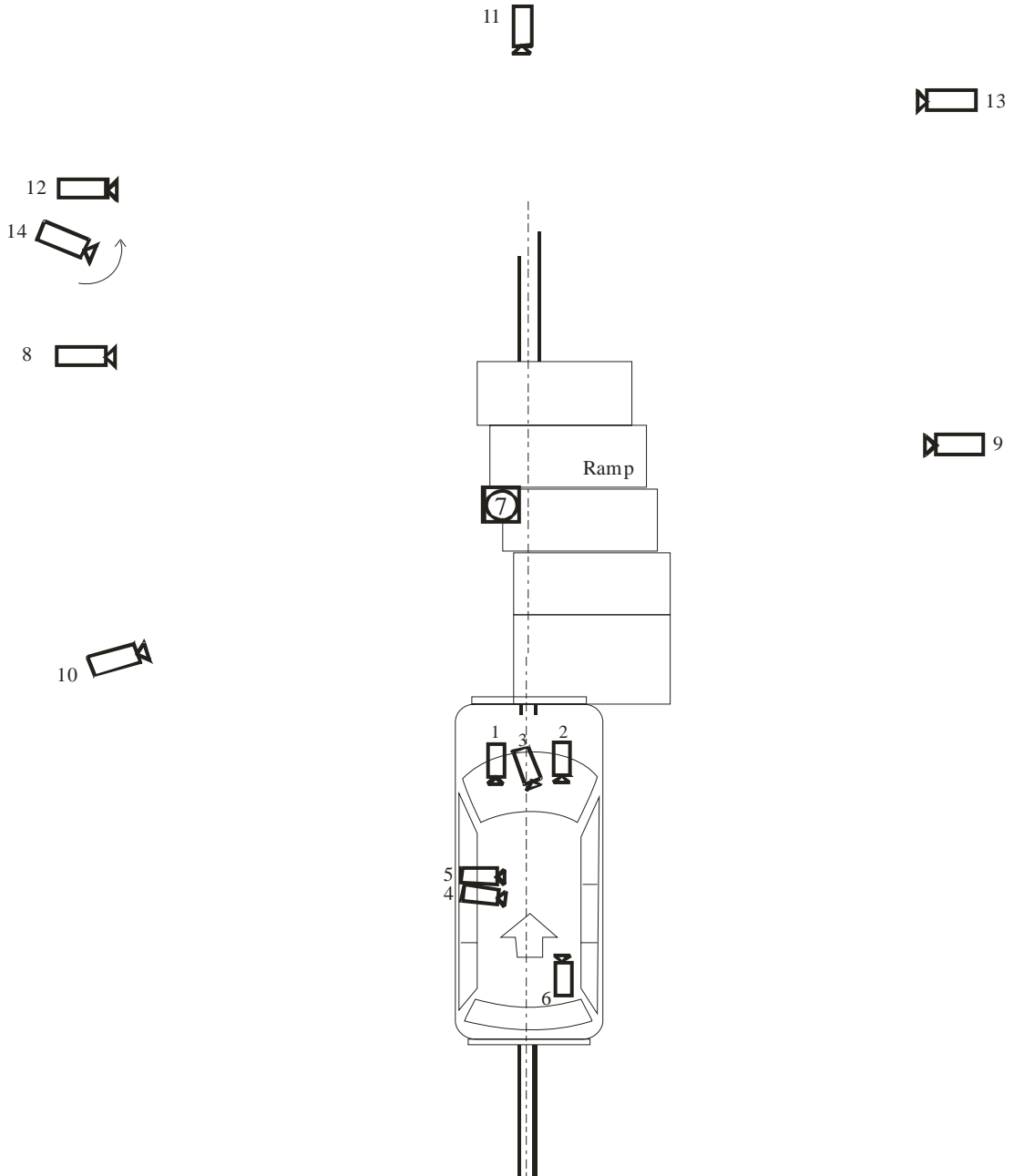
Reference: X: + Forward from rear bumper
 Y: + Rightward from vehicle centerline
 Z: + Downward from ground level

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

DATA SHEET NO. 9
HIGH-SPEED CAMERA DATA

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

Test Date: 04/20/10



DATA SHEET NO. 9 (CONTINUED)

HIGH-SPEED CAMERA DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

No.	Camera View	Camera Type	Lens (mm)	Speed (fps)	Trigger Delay (ms)
1	Driver Overall - Onboard	VRTC – 1	6	500	0
2	Passenger Overall - Onboard	VRTC – 2	6	500	0
3	Passenger Pelvis Area - Onboard	VRTC – 3	4.8	500	0
4	Rear Passenger Waste Up	Redlake – LE	8.5	500	0
5	Rear Passenger Overall	Redlake – LE	5.8	500	0
6	Rear Passenger Head	Redlake – LE	6	500	0
7	Overhead Wide	Redlake – LE	4.5	500	0
8	Left Wide from Edge of Ramp	Visario G1	4.8	500	0
9	Right Wide from Edge of Ramp	Visario G1	6	500	0
10	Rear View Wide	Visario G1	25	500	0
11	Front View Wide	Redlake – LE	12.5	500	0
12	Left Side Launch to End of Event	Visario G1	4	500	0
13	Right Side Launch to End of Event	Redlake – LE	6	500	0
14	Real-time Panning	Canon	zoom	24	

DATA SHEET NO. 10

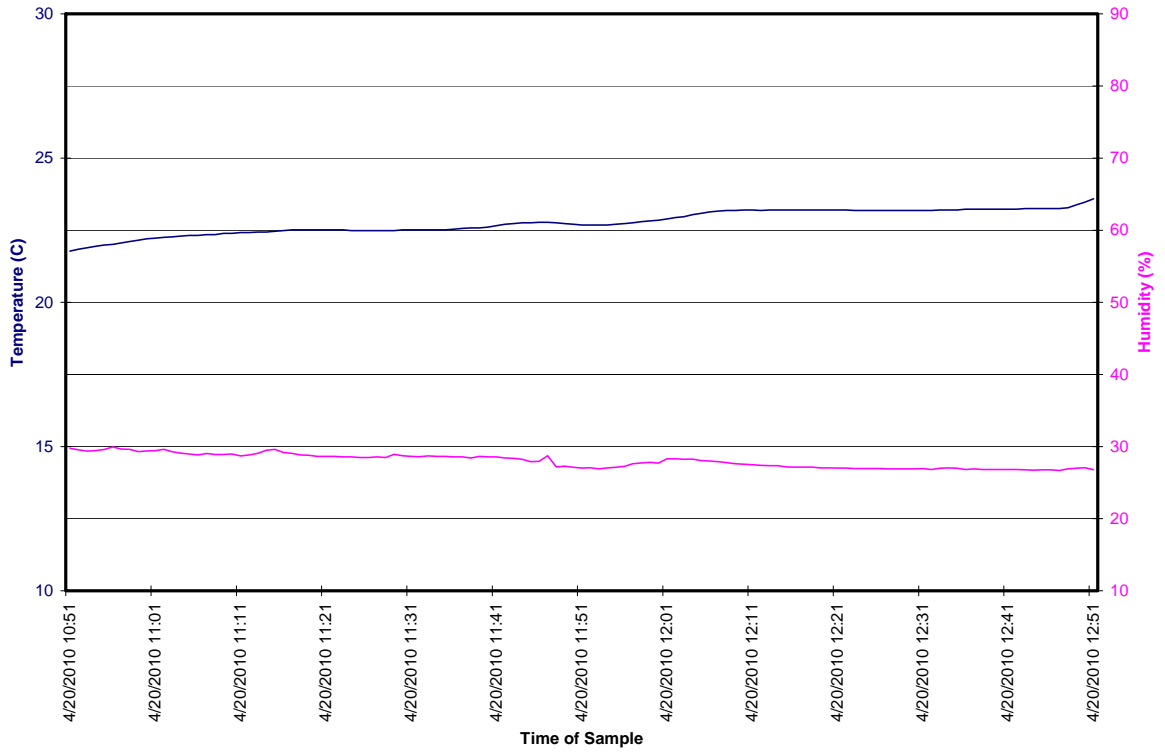
DUMMY / VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle: 2007 Ford Expedition

Test Program: Improved Restraints in Rollovers

Test Date: 04/20/10

Corkscrew Rollover 2007 Ford Expedition 100420; Test Time 12:51



APPENDIX A
PHOTOGRAPHS

LIST OF PHOTOGRAPHS

Figure		Page
A-1	Pre-Test Front View	A-5
A-2	Post-Test Front View	A-5
A-3	Pre-Test Left Front View	A-6
A-4	Post-Test Left Front View	A-6
A-5	Pre-Test Left Side View	A-7
A-6	Post-Test Left Side View	A-7
A-7	Pre-Test Left Rear View	A-8
A-8	Post-Test Left Rear View	A-8
A-9	Pre-Test Rear View	A-9
A-10	Post-Test Rear View – Photograph not available	A-9
A-11	Pre-Test Right Rear View	A-10
A-12	Post-Test Right Rear View	A-10
A-13	Pre-Test Right Side View	A-11
A-14	Post-Test Right Side View	A-11
A-15	Pre-Test Right Front View	A-12
A-16	Post-Test Right Front View	A-12
A-17	Pre-Test Front Underbody View	A-13
A-18	Post-Test Front Underbody View	A-13
A-19	Pre-Test Rear Underbody View	A-14
A-20	Post-Test Rear Underbody View	A-14
A-21	Pre-Test Windshield View	A-15
A-22	Post-Test Windshield View	A-15
A-23	Pre-Test Windshield View - Driver Dummy	A-16
A-24	Post-Test Windshield View - Driver Dummy	A-16
A-25	Pre-Test Driver Dummy - View 1	A-17
A-26	Post-Test Driver Dummy - View 1	A-17

LIST OF PHOTOGRAPHS (CONTINUED)

<u>Figure</u>		<u>Page</u>
A-27	Pre-Test Driver Dummy - View 2	A-18
A-28	Post-Test Driver Dummy - View 2	A-18
A-29	Pre-Test Driver Dummy - View 3	A-19
A-30	Post-Test Driver Dummy - View 3	A-19
A-31	Pre-Test Driver Dummy - View 4	A-20
A-32	Post-Test Driver Dummy - View 4 – Photograph not available	A-20
A-33	Pre-Test Driver Dummy - View 5	A-21
A-34	Post-Test Driver Dummy - View 5	A-21
A-35	Pre-Test Driver Dummy - View 6	A-22
A-36	Post-Test Driver Dummy - View 6	A-22
A-37	Pre-Test Windshield View – Right Front Passenger	A-23
A-38	Post-Test Windshield View – Right Front Passenger	A-23
A-39	Pre-Test Right Front Passenger Dummy - View 1	A-24
A-40	Post-Test Right Front Passenger Dummy - View 1	A-24
A-41	Pre-Test Right Front Passenger Dummy - View 2	A-25
A-42	Post-Test Right Front Passenger Dummy - View 2	A-25
A-43	Pre-Test Right Front Passenger Dummy - View 3	A-26
A-44	Post-Test Right Front Passenger Dummy - View 3	A-26
A-45	Pre-Test Right Front Passenger Dummy - View 4	A-27
A-46	Post-Test Right Front Passenger Dummy - View 4	A-27
A-47	Pre-Test Right Front Passenger Dummy - View 5	A-28
A-48	Post-Test Right Front Passenger Dummy - View 5	A-28
A-49	Pre-Test Right Front Passenger Dummy - View 6	A-29
A-50	Post-Test Right Front Passenger Dummy - View 6	A-29
A-51	Pre-Test Right Rear Passenger Dummy - View 1	A-30
A-52	Post-Test Right Rear Passenger Dummy - View 1	A-30
A-53	Pre-Test Right Rear Passenger Dummy - View 2	A-31
A-54	Post-Test Right Rear Passenger Dummy - View 2	A-31

LIST OF PHOTOGRAPHS (CONTINUED)

Figure		Page
A-55	Pre-Test Right Rear Passenger Dummy - View 3	A-32
A-56	Post-Test Right Rear Passenger Dummy - View 3	A-32
A-57	Pre-Test Right Rear Passenger Dummy - View 4	A-33
A-58	Post-Test Right Rear Passenger Dummy - View 4	A-33
A-59	Pre-Test Right Rear Passenger Dummy - View 5	A-34
A-60	Post-Test Right Rear Passenger Dummy - View 5	A-34
A-61	Pre-Test Right Rear Passenger Dummy - View 6	A-35
A-62	Post-Test Right Rear Passenger Dummy - View 6 – Photograph Not Available	A-35
A-63	Vehicle Certification Label View	A-36
A-64	Vehicle Tire Pressure Label View	A-36
A-65	Post-Test Driver Dummy Overall View	A-37
A-66	Post-Test Driver Dummy Contact – View 1	A-37
A-67	Post-Test Driver Dummy Contact – View 2	A-38
A-68	Post-Test Driver Dummy Contact – View 3	A-38
A-69	Post-Test Right Front Passenger Dummy Overall View	A-39
A-70	Post-Test Right Front Passenger Dummy Contact – View 1	A-39
A-71	Post-Test Right Front Passenger Dummy Contact – View 2	A-40
A-72	Post-Test Right Rear Passenger Dummy Overall View	A-41
A-73	Post-Test Right Rear Passenger Dummy Contact – View 1	A-41
A-74	Post-Test Right Rear Passenger Dummy Contact – View 2	A-42
A-75	Post-Test Right Rear Passenger Dummy Contact – View 3	A-42
A-76	Post-Test Vehicle Resting Position – Front View	A-43
A-77	Post-Test Vehicle Resting Position – Left Side View	A-43
A-78	Post-Test Vehicle Resting Position – Rear View	A-44
A-79	Post-Test Vehicle Resting Position – Right Side View	A-44
A-80	Pre-Test Corkscrew Ramp – Front View	A-45
A-81	Pre-Test Corkscrew Ramp – Left Side View	A-45
A-82	Pre-Test Corkscrew Ramp – End View	A-46
A-83	Pre-Test Corkscrew Ramp – Right Side View	A-46
A-84	Pre-Test Ballast Location	A-47



Figure A-1 Pre-Test Front View



Figure A-2 Post-Test Front View



Figure A-3 Pre-Test Left Front View



Figure A-4 Post-Test Left Front View



Figure A-5 Pre-Test Left Side View



Figure A-6 Post-Test Left Side View



Figure A-7 Pre-Test Left Rear View



Figure A-8 Post-Test Left Rear View



Figure A-9 Pre-Test Rear View

Photo Not Available

Figure A-10 Post-Test Rear View



Figure A-11 Pre-Test Right Rear View



Figure A-12 Post-Test Right Rear View



Figure A-13 Pre-Test Right Side View



Figure A-14 Post-Test Right Side View



Figure A-15 Pre-Test Right Front View



Figure A-16 Post-Test Right Front View



Figure A-17 Pre-Test Front Underbody View



Figure A-18 Post-Test Front Underbody View

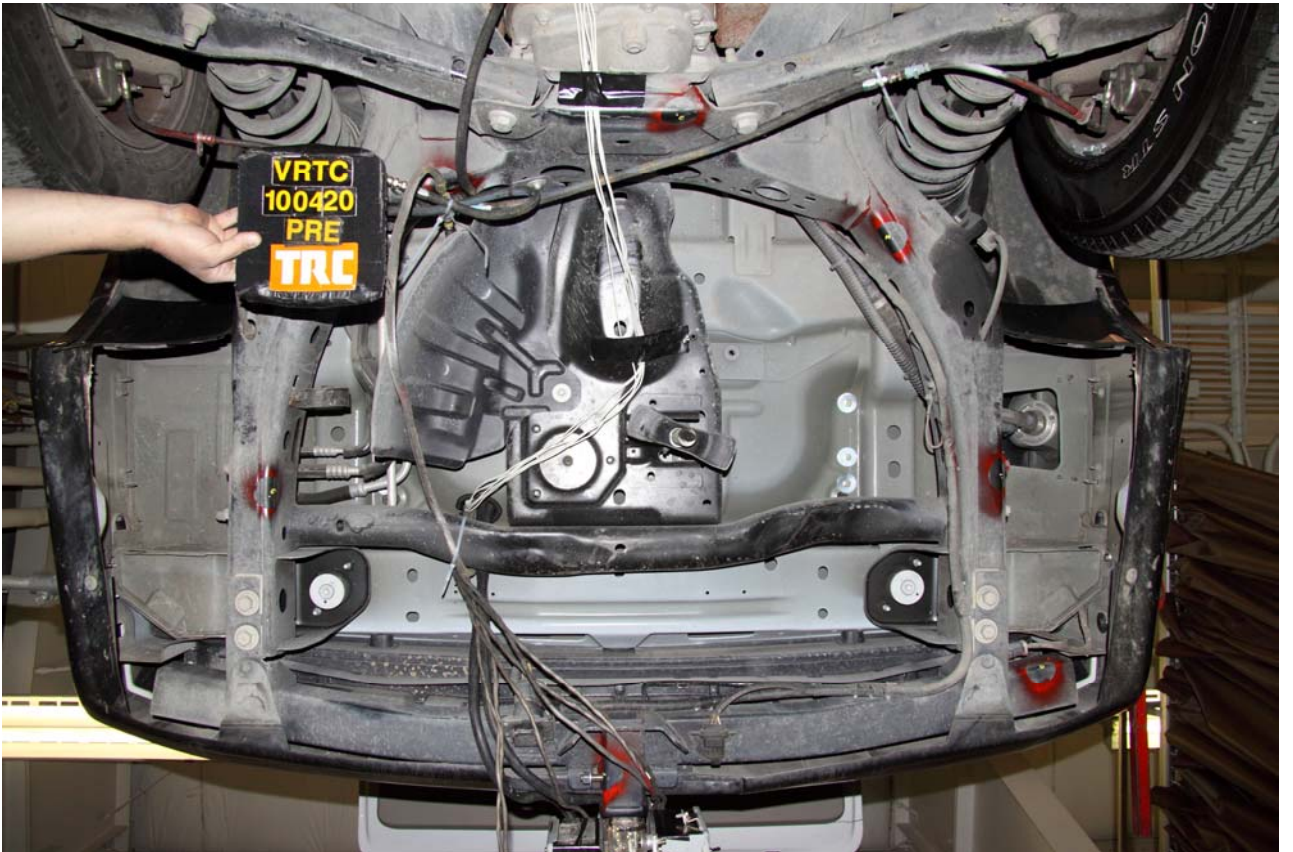


Figure A-19 Pre-Test Rear Underbody View

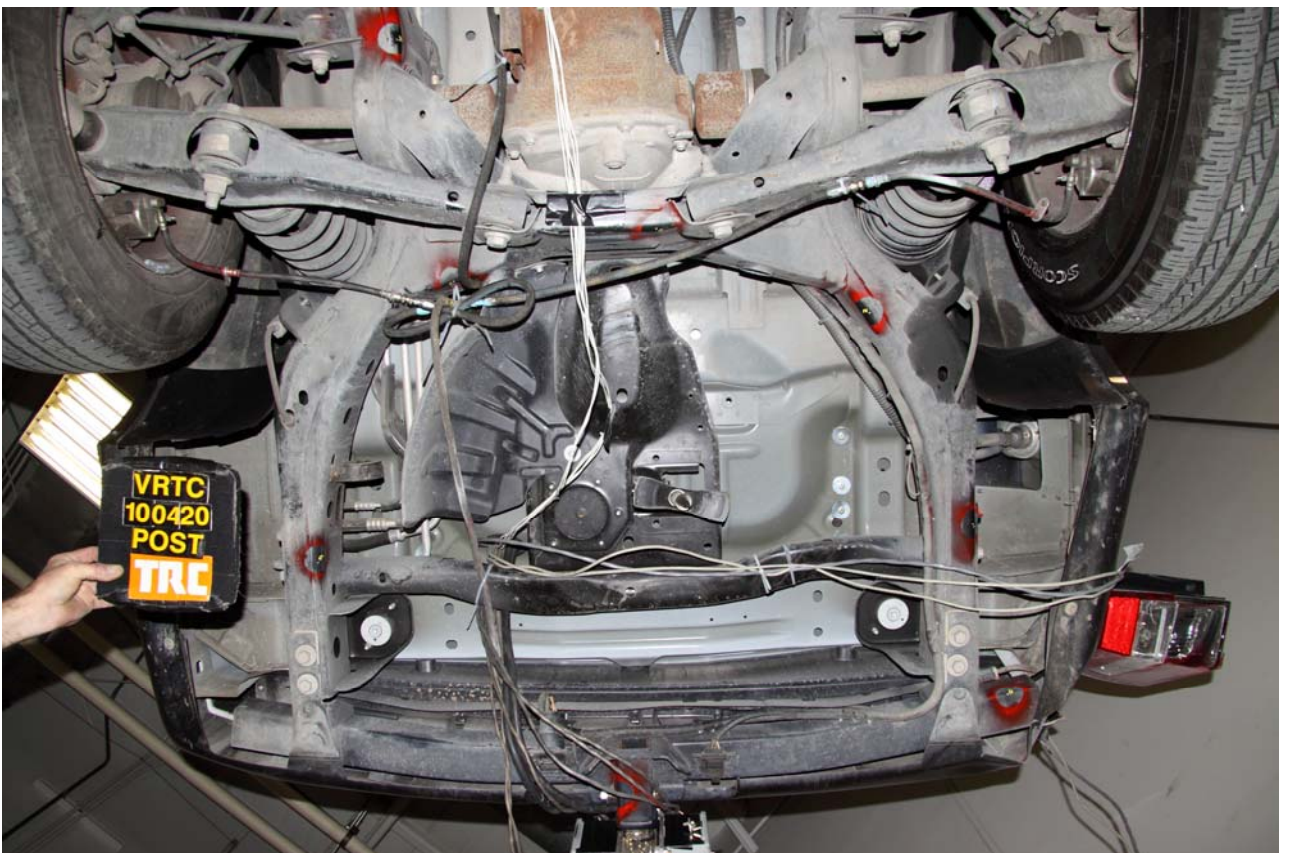


Figure A-20 Post-Test Rear Underbody View



Figure A-21 Pre-Test Windshield View

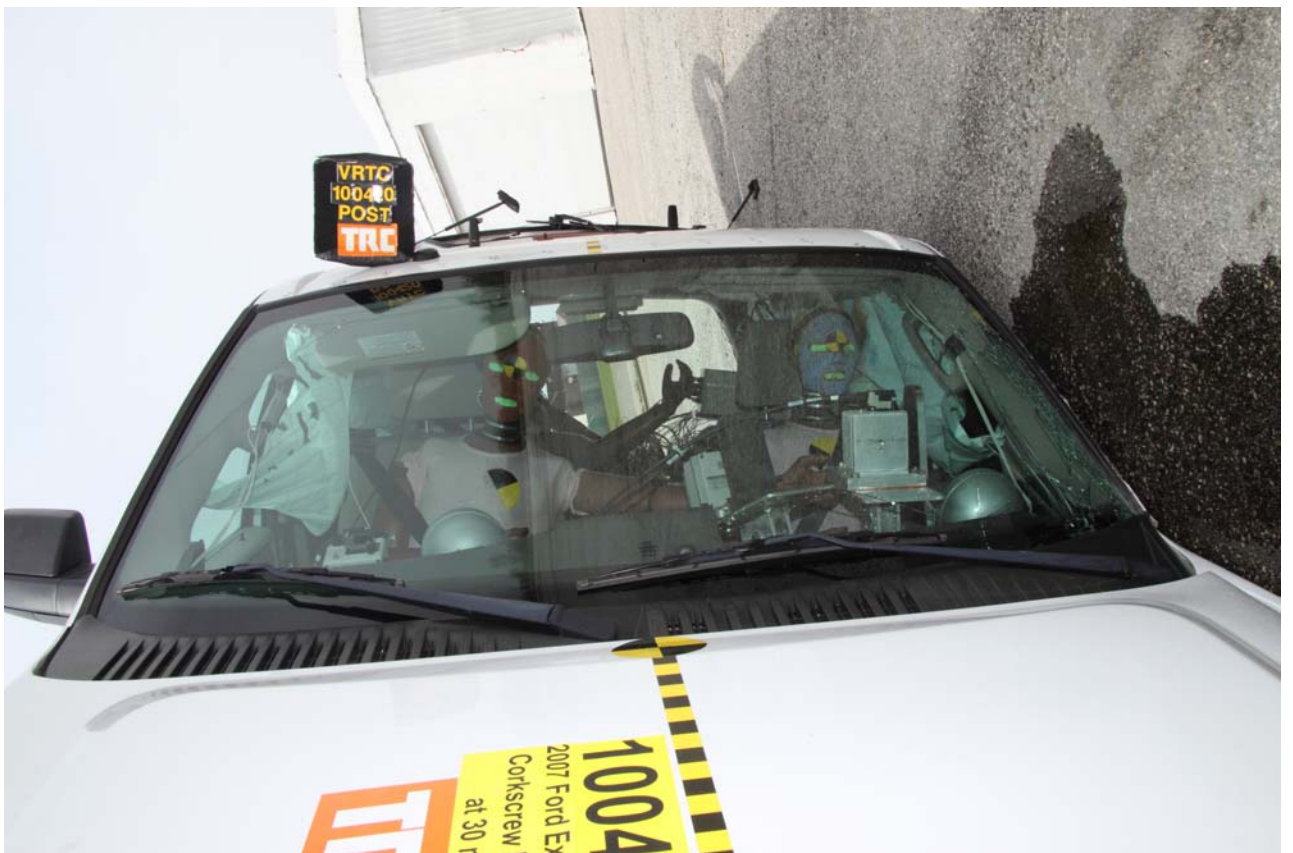


Figure A-22 Post-Test Windshield View



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



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



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



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



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



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



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



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



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

Photo Not Available

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



Figure A-33 Post-Test Driver Dummy - View 5



Figure A-34 Post-Test Driver Dummy - View 5



Figure A-35 Pre-Test Driver Dummy - View 6



Figure A-36 Post-Test Driver Dummy - View 6



Figure A-37 Pre-Test Windshield View – Right Front Passenger



Figure A-38 Post-Test Windshield View – Right Front Passenger



Figure A-39 Pre-Test Right Front Passenger Dummy - View 1



Figure A-40 Post-Test Right Front Passenger Dummy - View 1



Figure A-41 Pre-Test Right Front Passenger Dummy - View 2



Figure A-42 Post-Test Right Front Passenger Dummy - View 2



Figure A-43 Pre-Test Right Front Passenger Dummy - View 3



Figure A-44 Post-Test Right Front Passenger Dummy - View 3



Figure A-45 Pre-Test Right Front Passenger Dummy - View 4



Figure A-46 Post-Test Right Front Passenger Dummy - View 4



Figure A-47 Pre-Test Right Front Passenger Dummy - View 5



Figure A-48 Post-Test Right Front Passenger Dummy - View 5



Figure A-49 Pre-Test Right Front Passenger Dummy - View 6



Figure A-50 Post-Test Right Front Passenger Dummy - View 6



Figure A-51 Pre-Test Right Rear Passenger Dummy - View 1



Figure A-52 Post-Test Right Rear Passenger Dummy - View 1



Figure A-53 Pre-Test Right Rear Passenger Dummy - View 2



Figure A-54 Post-Test Right Rear Passenger Dummy - View 2



Figure A-55 Pre-Test Right Rear Passenger Dummy - View 3



Figure A-56 Post-Test Right Rear Passenger Dummy - View 3



Figure A-57 Pre-Test Right Rear Passenger Dummy - View 4



Figure A-58 Post-Test Right Rear Passenger Dummy - View 4



Figure A-59 Pre-Test Right Rear Passenger Dummy - View 5

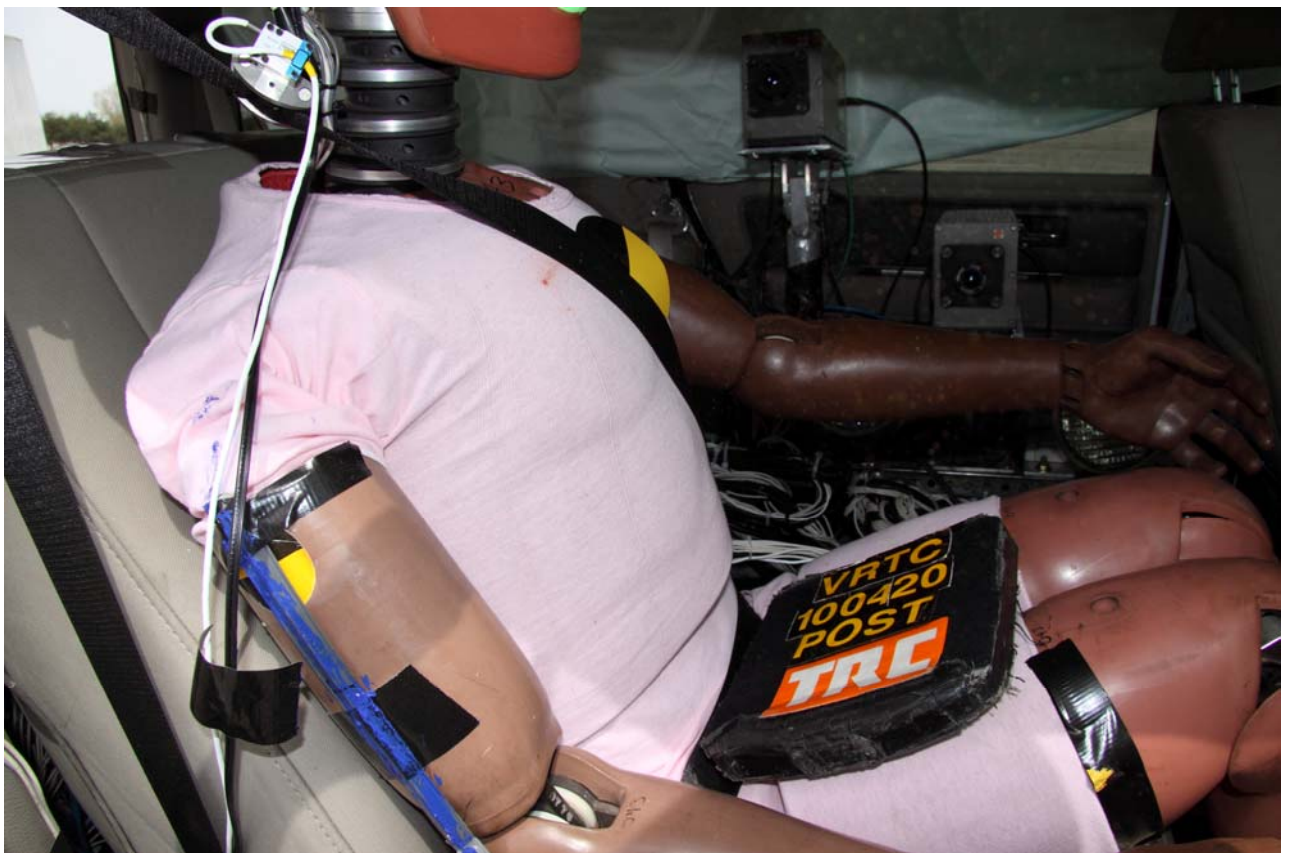


Figure A-60 Post-Test Right Rear Passenger Dummy - View 5



Figure A-61 Pre-Test Right Rear Passenger Dummy - View 6

Photograph Not Available

Figure A-62 Post-Test Right Rear Passenger Dummy - View 6

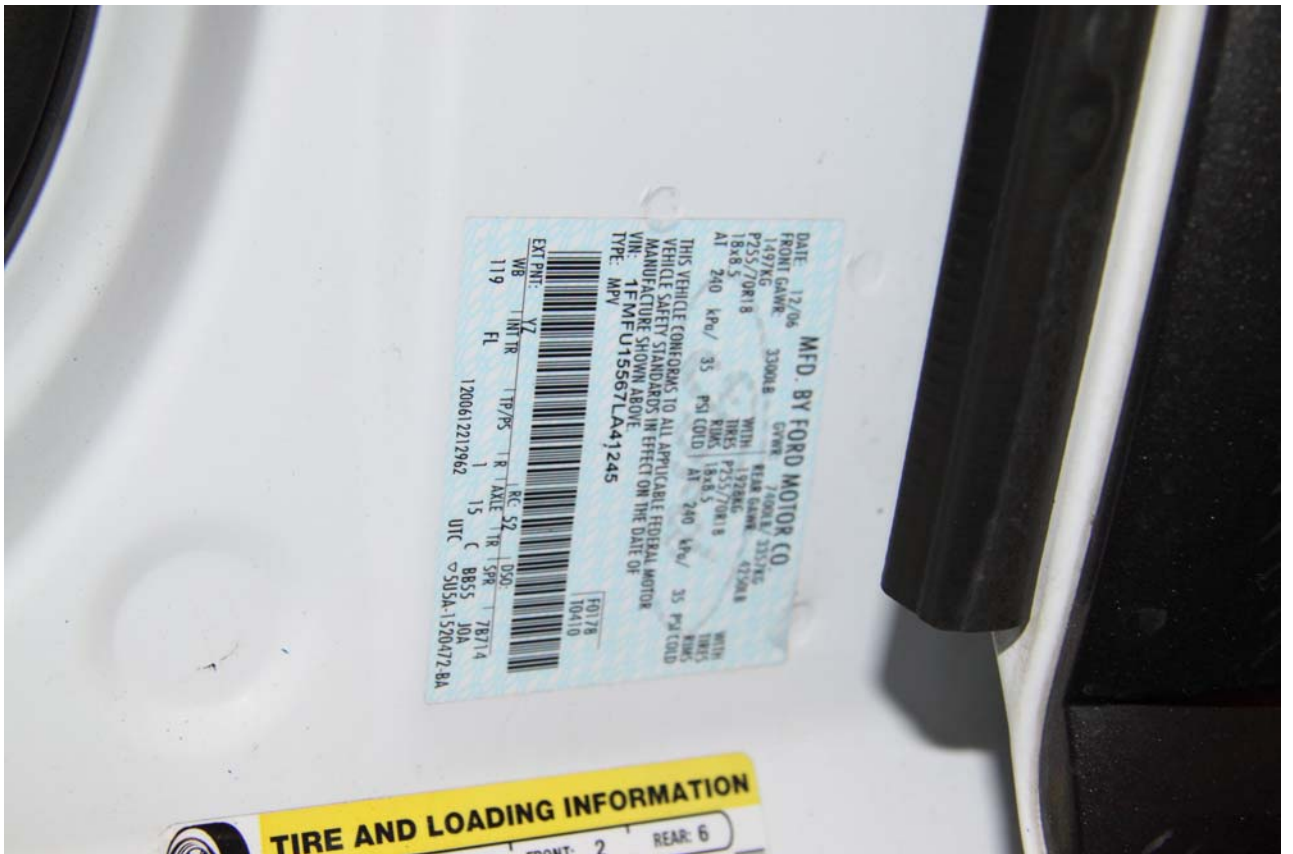


Figure A-63 Vehicle Certification Label View



Figure A-64 Vehicle Tire Pressure Label View

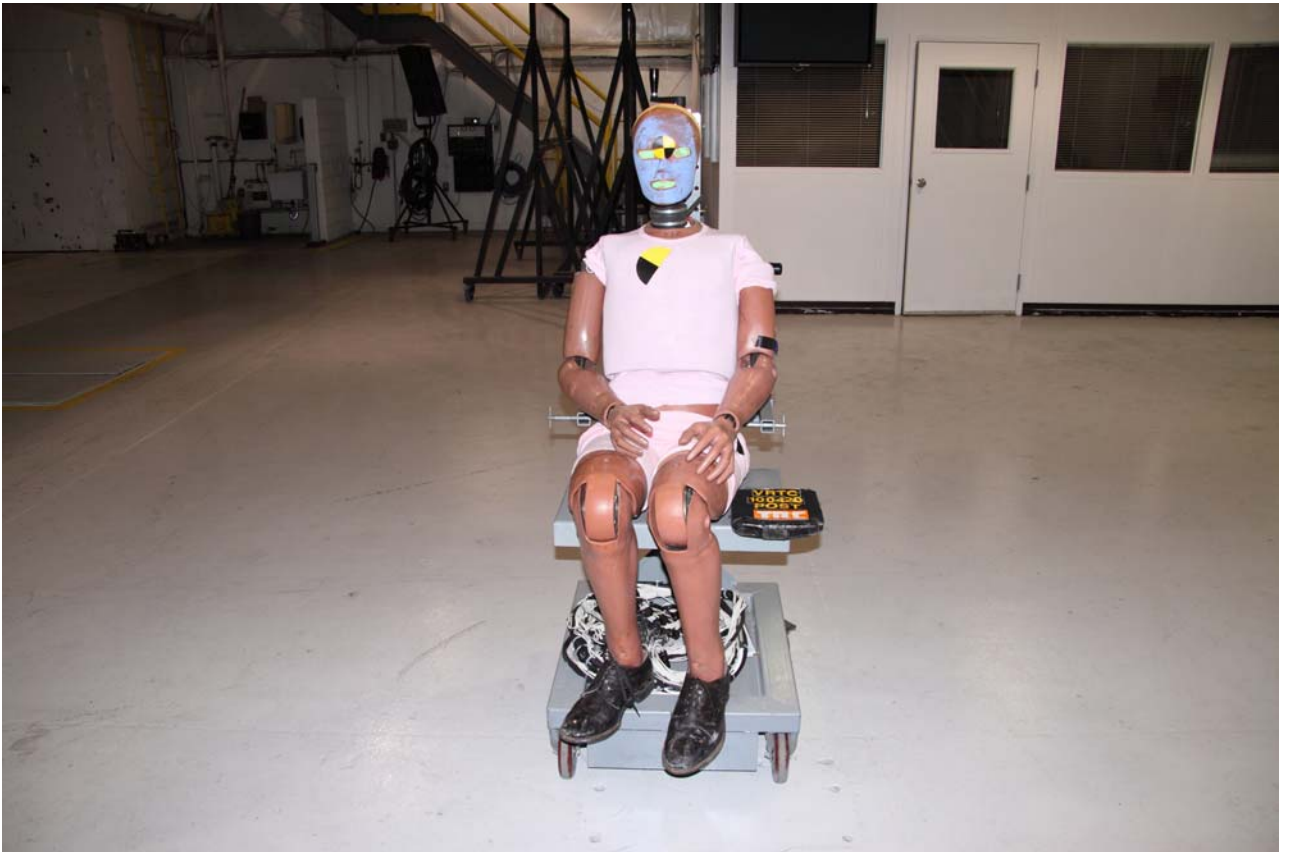


Figure A-65 Post-Test Driver Dummy Overall



Figure A-66 Post-Test Driver Dummy Contact - View 1



Figure A-67 Post-Test Driver Dummy Contact - View 2



Figure A-68 Post-Test Driver Dummy Contact - View 3



Figure A-69 Post-Test Right Front Passenger Dummy Overall



Figure A-70 Post-Test Right Front Passenger Dummy Contact - View 1



Figure A-71 Post-Test Right Front Passenger Dummy Contact - View 2

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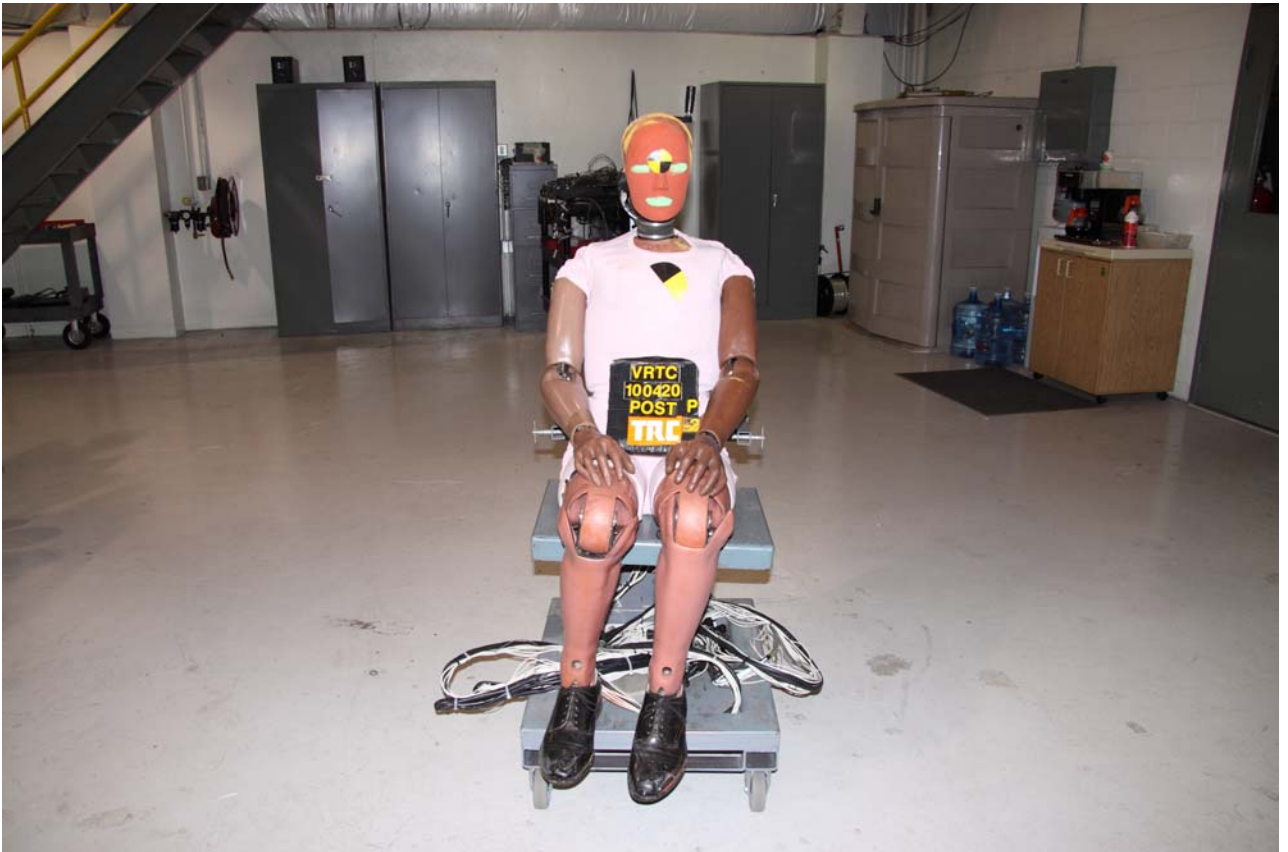


Figure A-72 Post-Test Right Rear Passenger Dummy Overall



Figure A-73 Post-Test Right Rear Passenger Dummy Contact – View 1



Figure A-74 Post-Test Right Rear Passenger Dummy Contact – View 2



Figure A-75 Post-Test Right Rear Passenger Dummy Contact - View 3



Figure A-76 Post-Test Vehicle Resting Position – Front View



Figure A-77 Post-Test Vehicle Resting Position – Left Side View



Figure A-78 Post-Test Vehicle Resting Position – Rear View



Figure A-79 Post-Test Vehicle Resting Position – Right Side View



Figure A-80 Pre-Test Corkscrew Ramp – Front View



Figure A-81 Pre-Test Corkscrew Ramp – Left Side View



Figure A-82 Pre-Test Corkscrew Ramp – End View



Figure A-83 Pre-Test Corkscrew Ramp – Right Side View

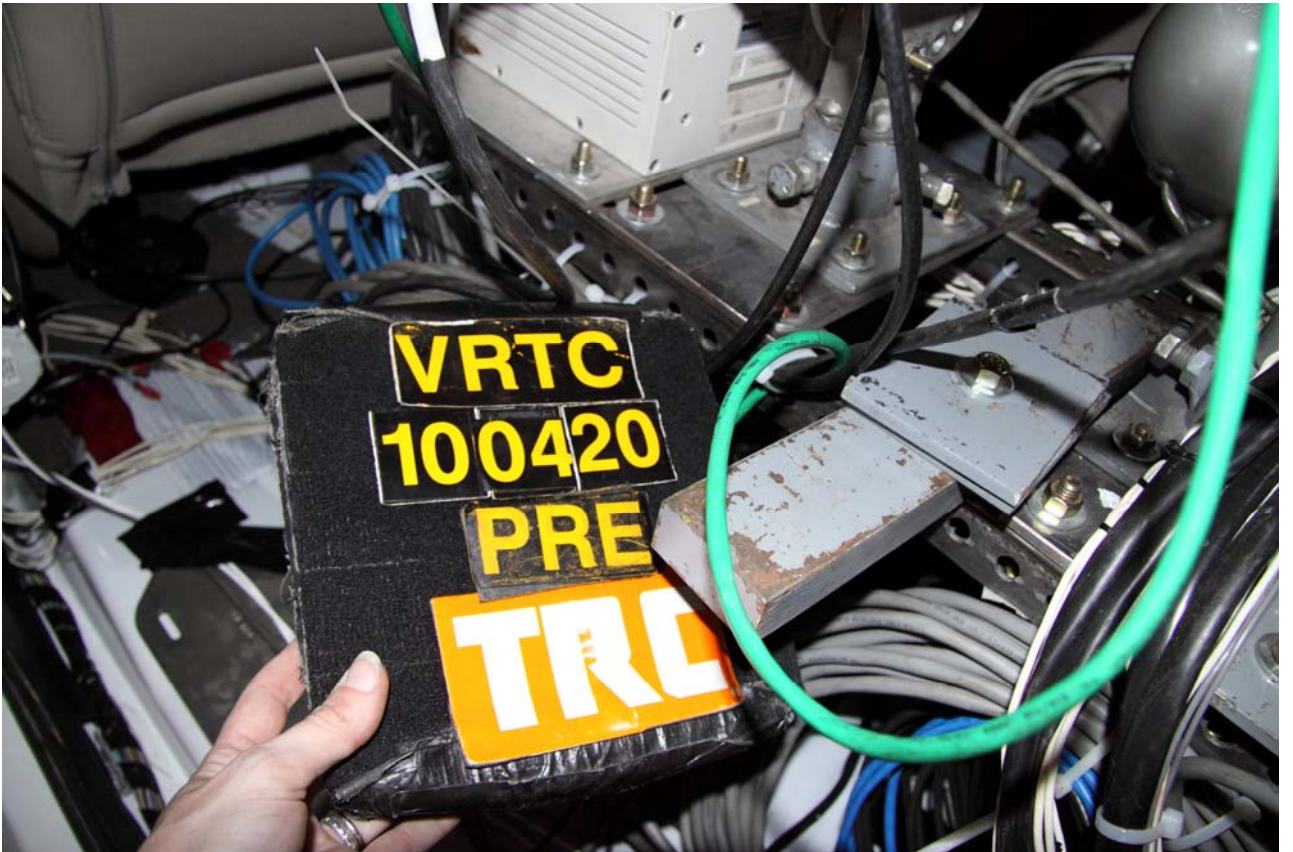


Figure A-84 Pre-Test Ballast Location

APPENDIX B
DATA PLOTS



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head X-Axis Acceleration

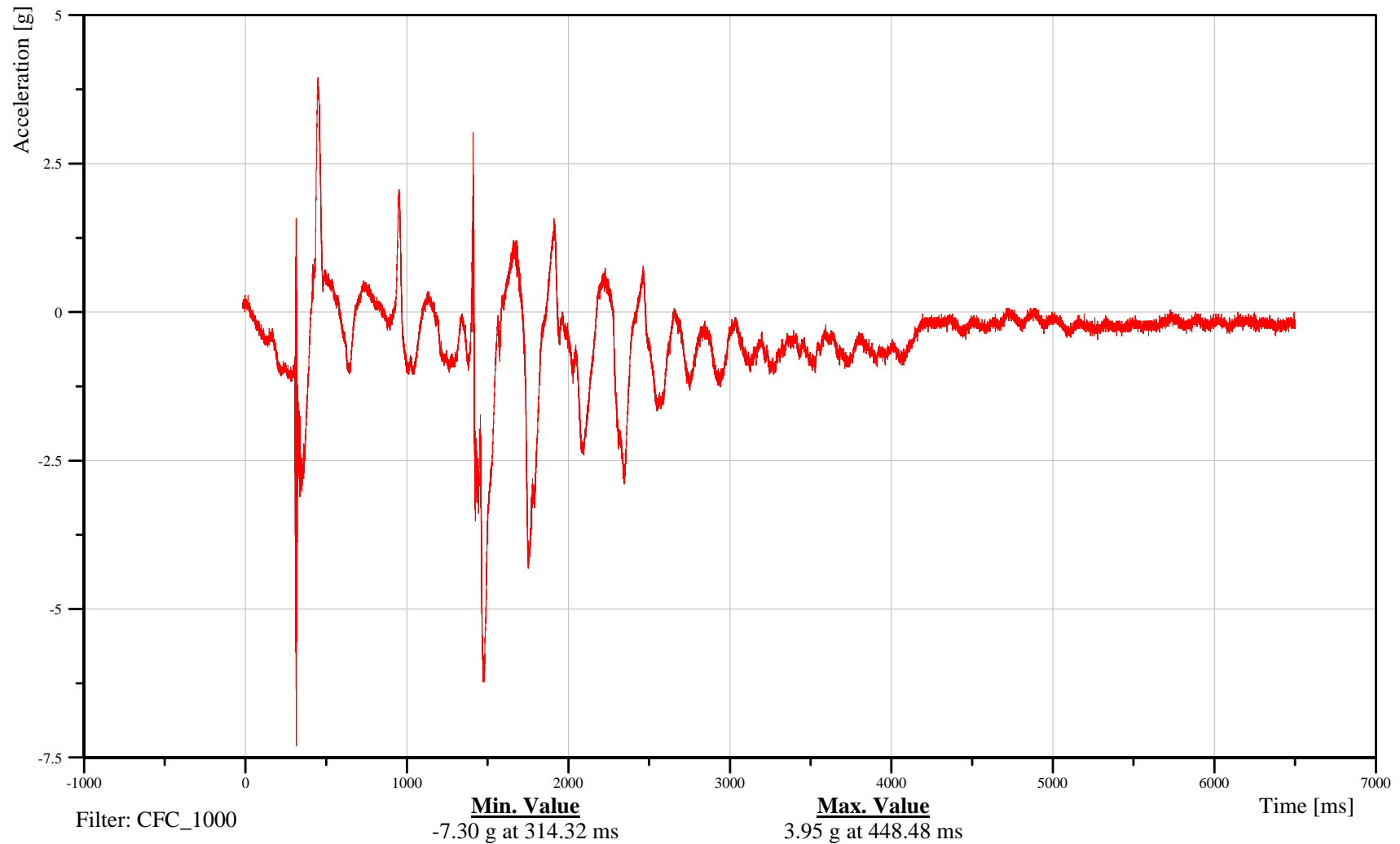
Time: 14:32

Customer: VRTC

11HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-2

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head Y-Axis Acceleration

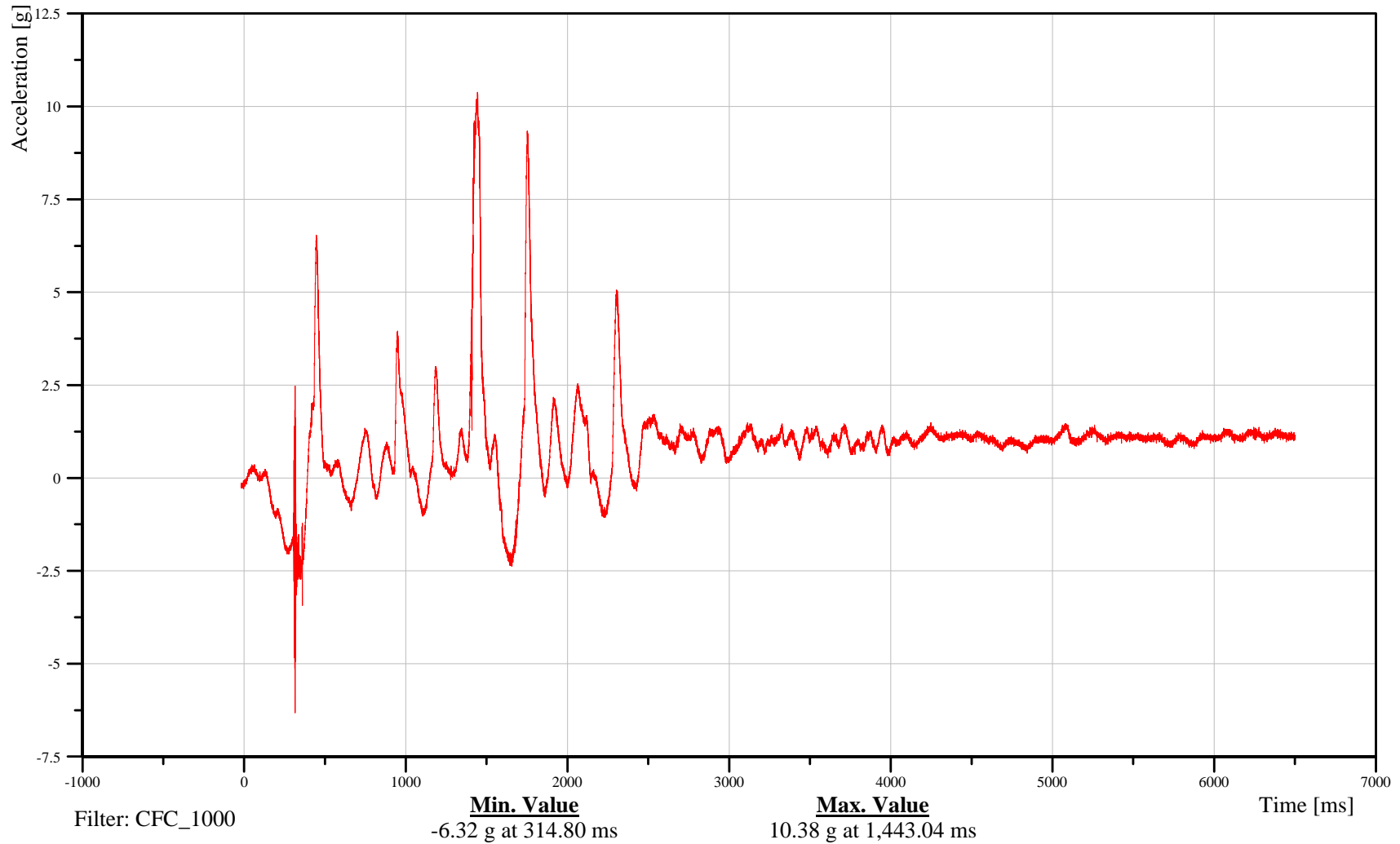
Time: 14:32

Customer: VRTC

11HEADCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-3

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head Z-Axis Acceleration

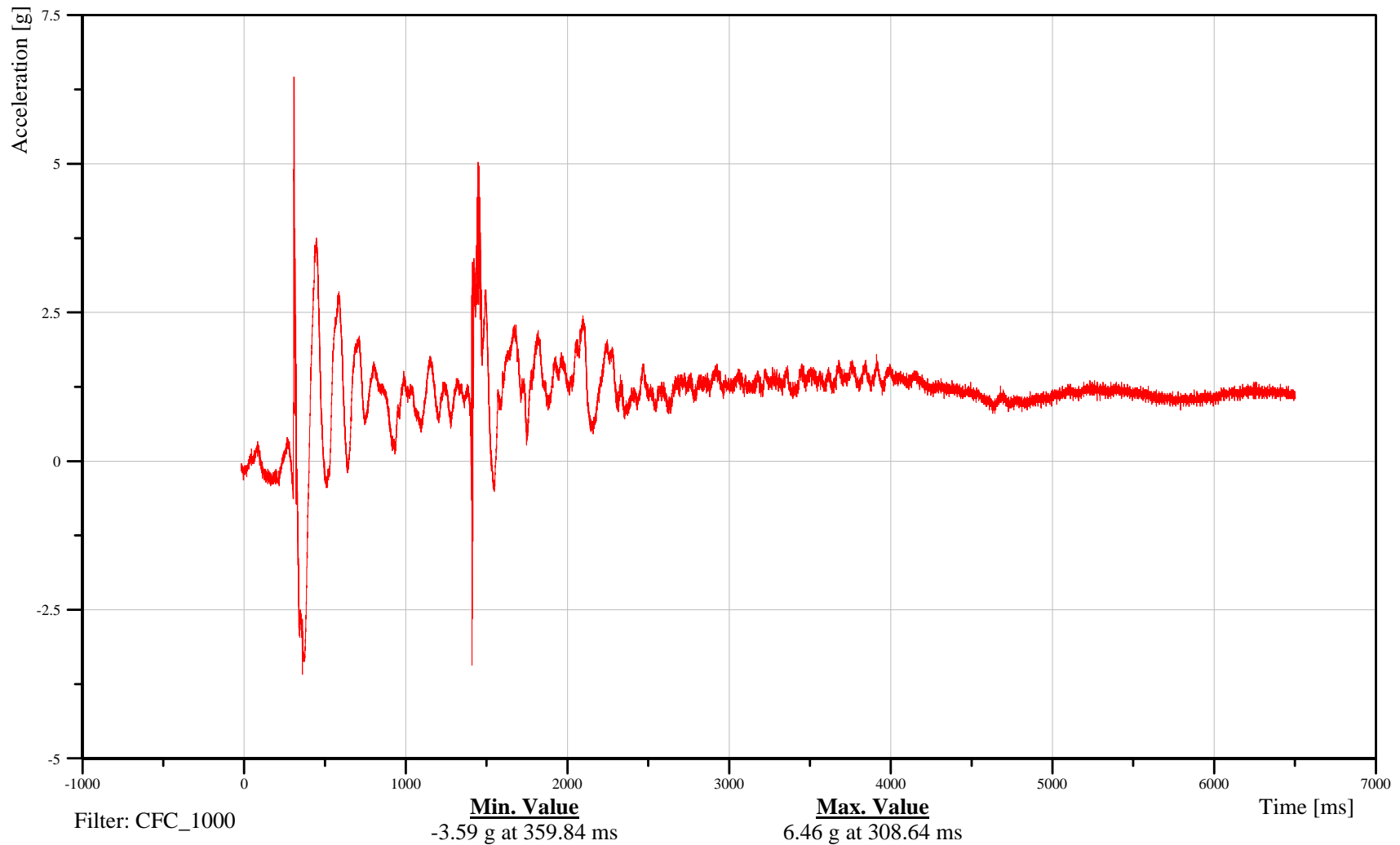
Time: 14:32

Customer: VRTC

11HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-4

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

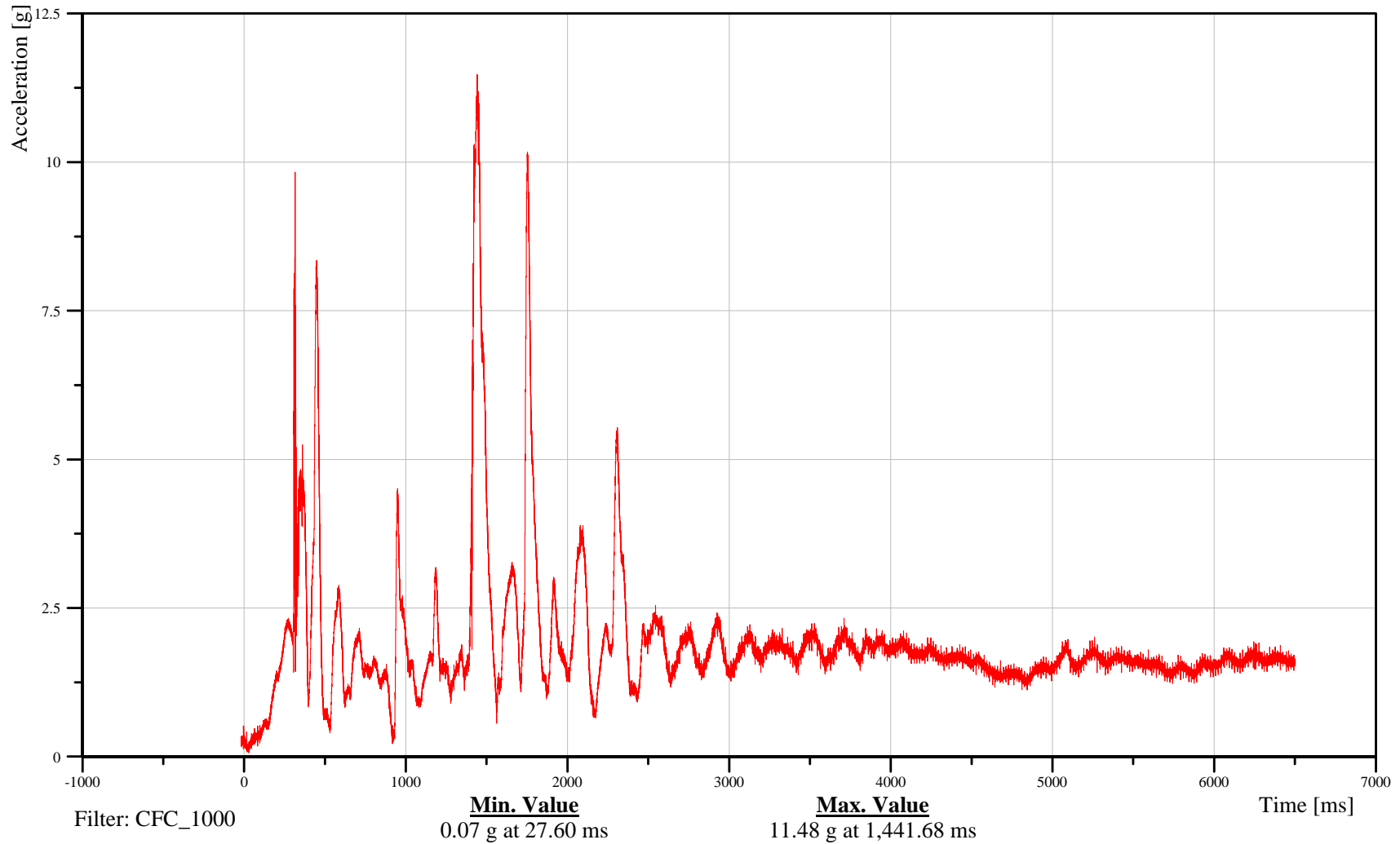
Driver Head Resultant Acceleration

Customer: VRTC

11HEADCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-5

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head Front Y-Axis Acceleration

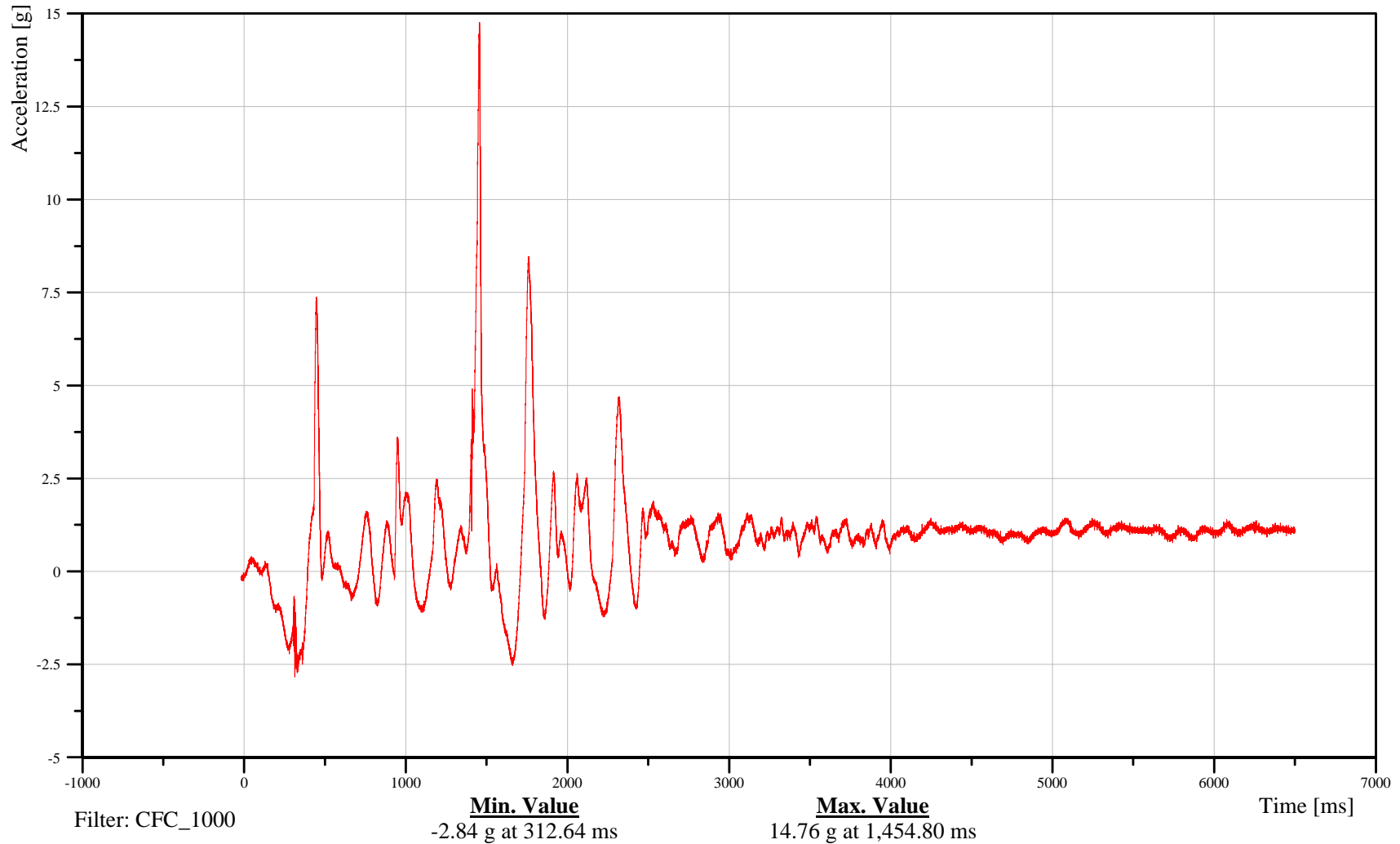
Time: 14:32

Customer: VRTC

11HEADFR00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-6

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head Front Z-Axis Acceleration

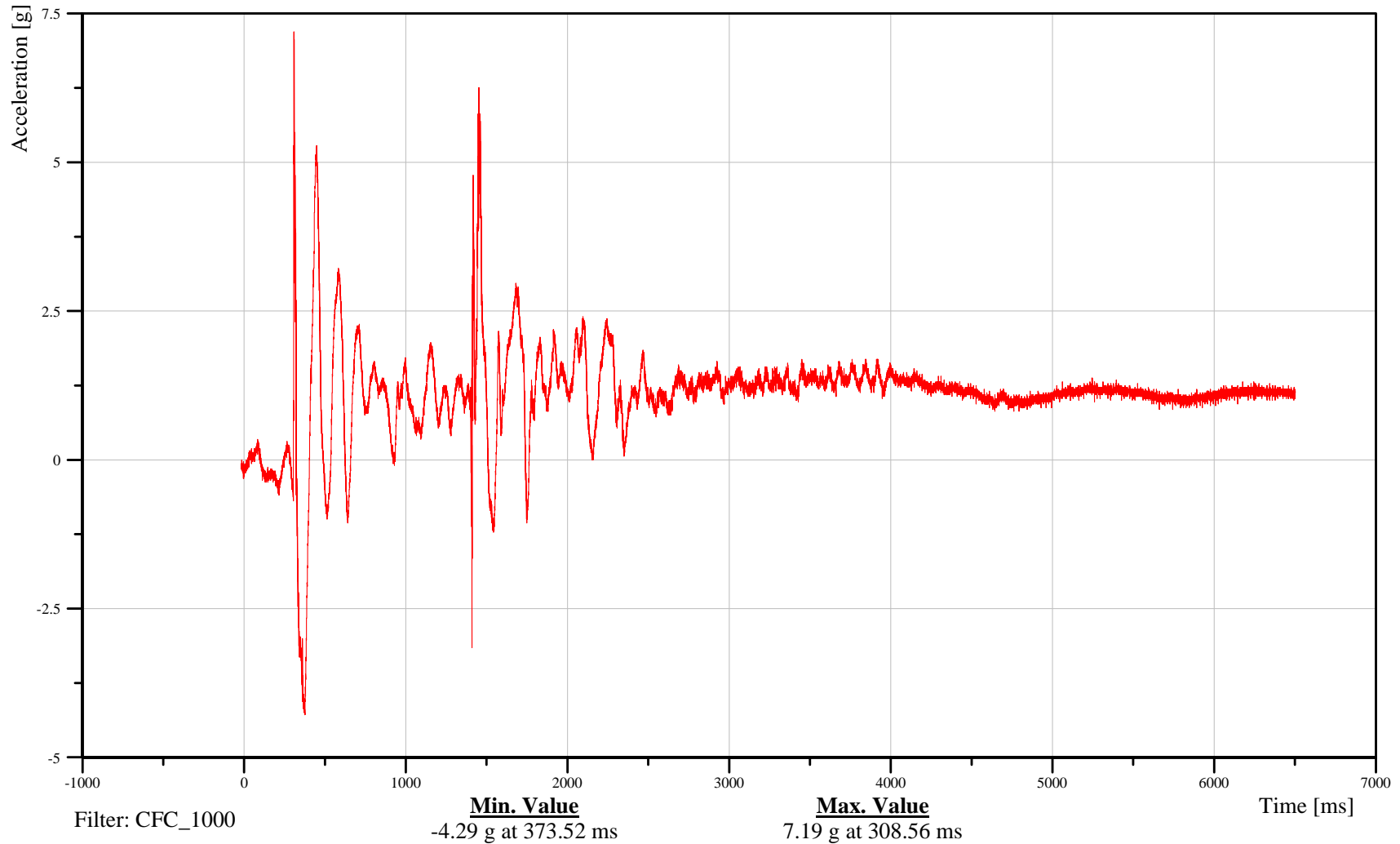
Time: 14:32

Customer: VRTC

11HEADFR00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-7

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

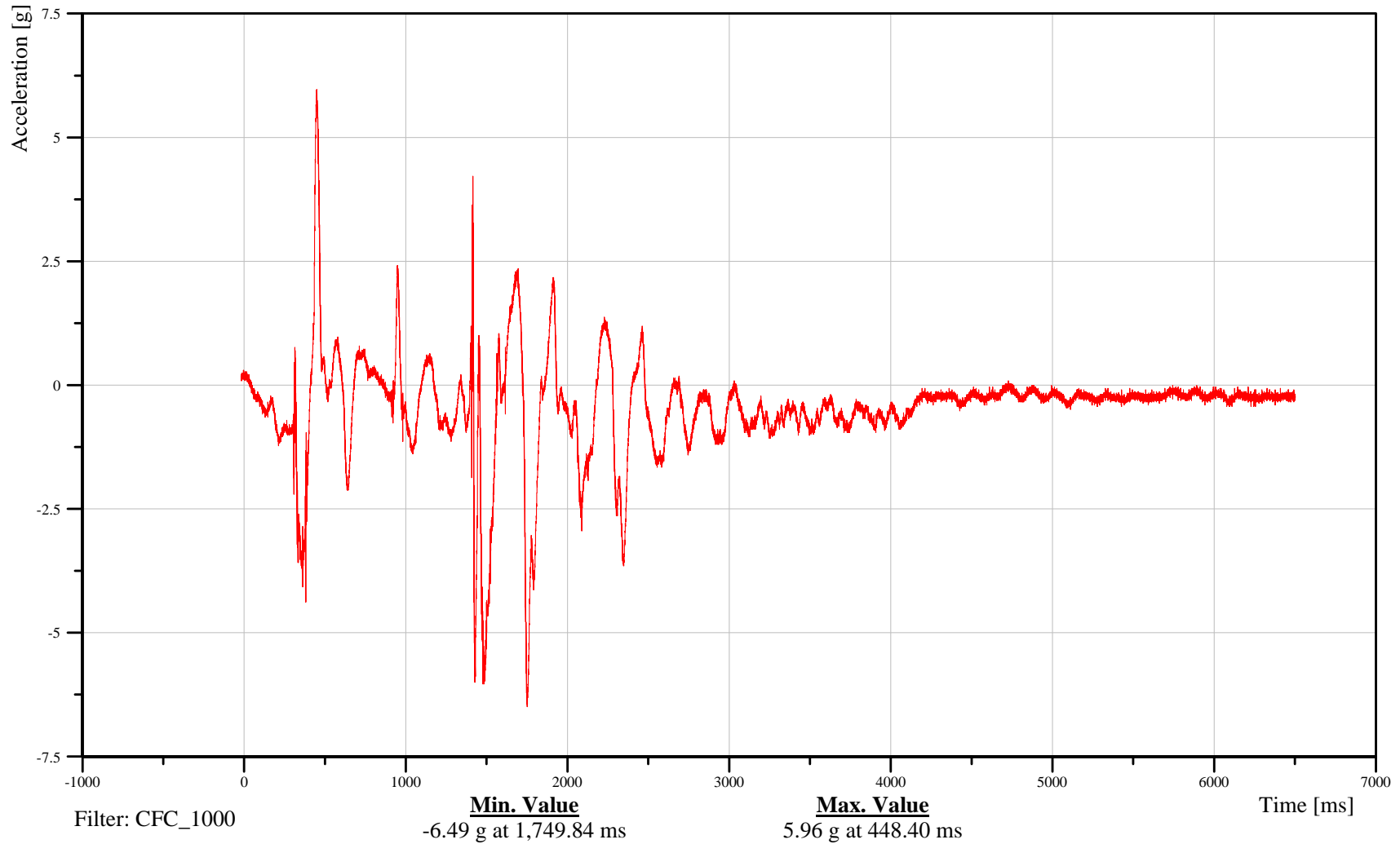
Driver Head Top X-Axis Acceleration

Customer: VRTC

11HEADUP00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-8

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head Top Y-Axis Acceleration

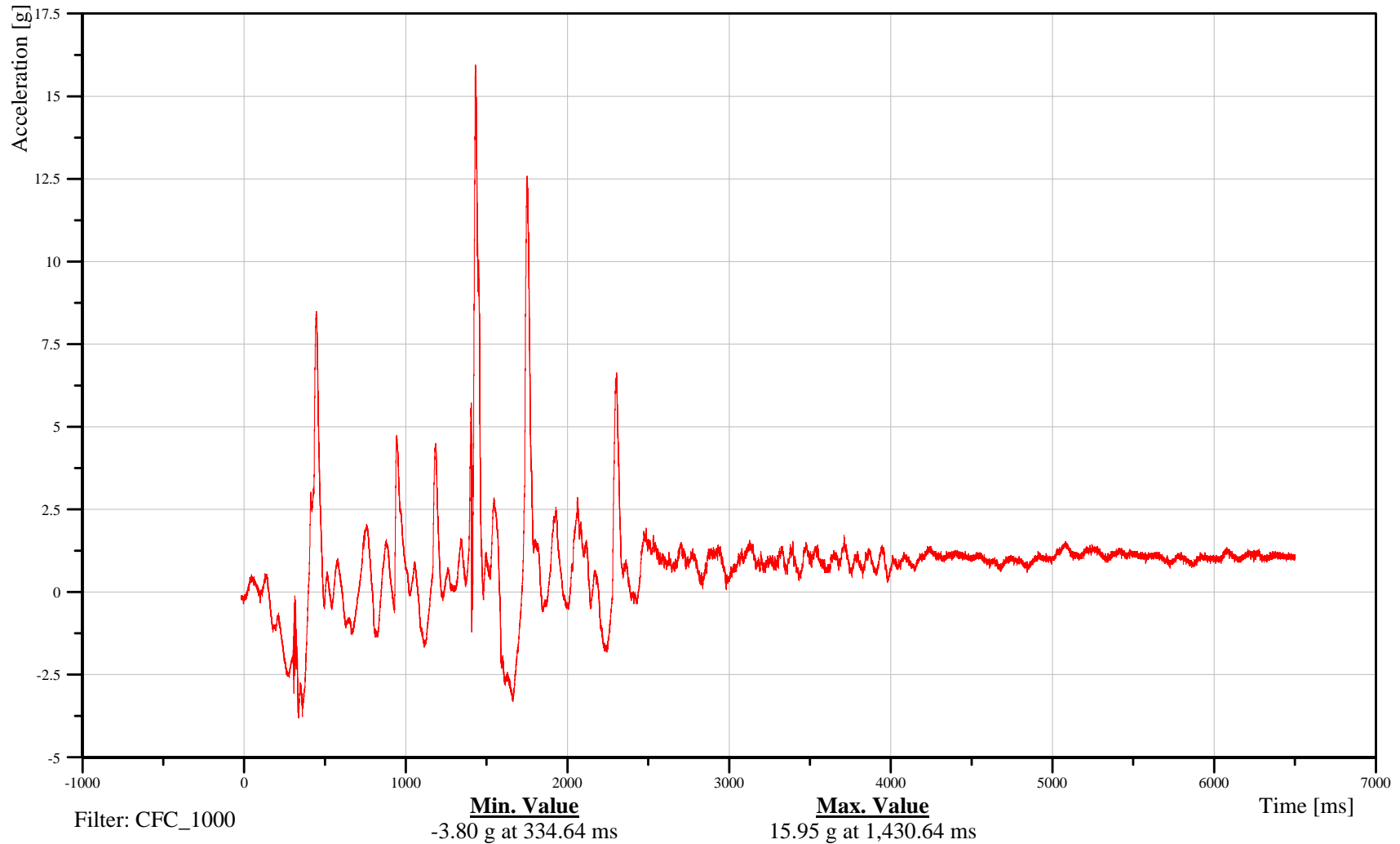
Time: 14:32

Customer: VRTC

11HEADUP00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-9

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head Left X-Axis Acceleration

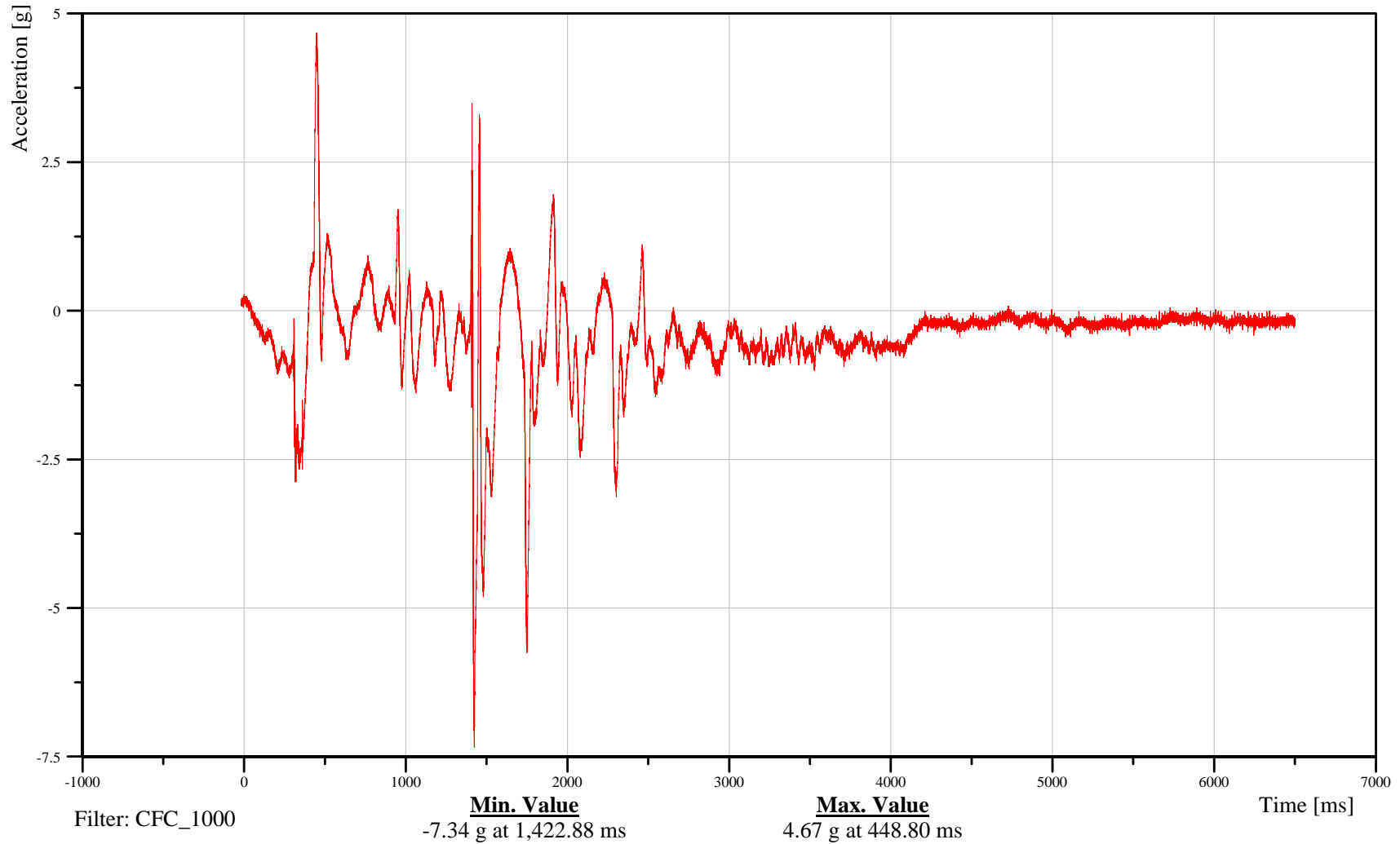
Time: 14:32

Customer: VRTC

11HEADLE00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-10

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Head Left Z-Axis Acceleration

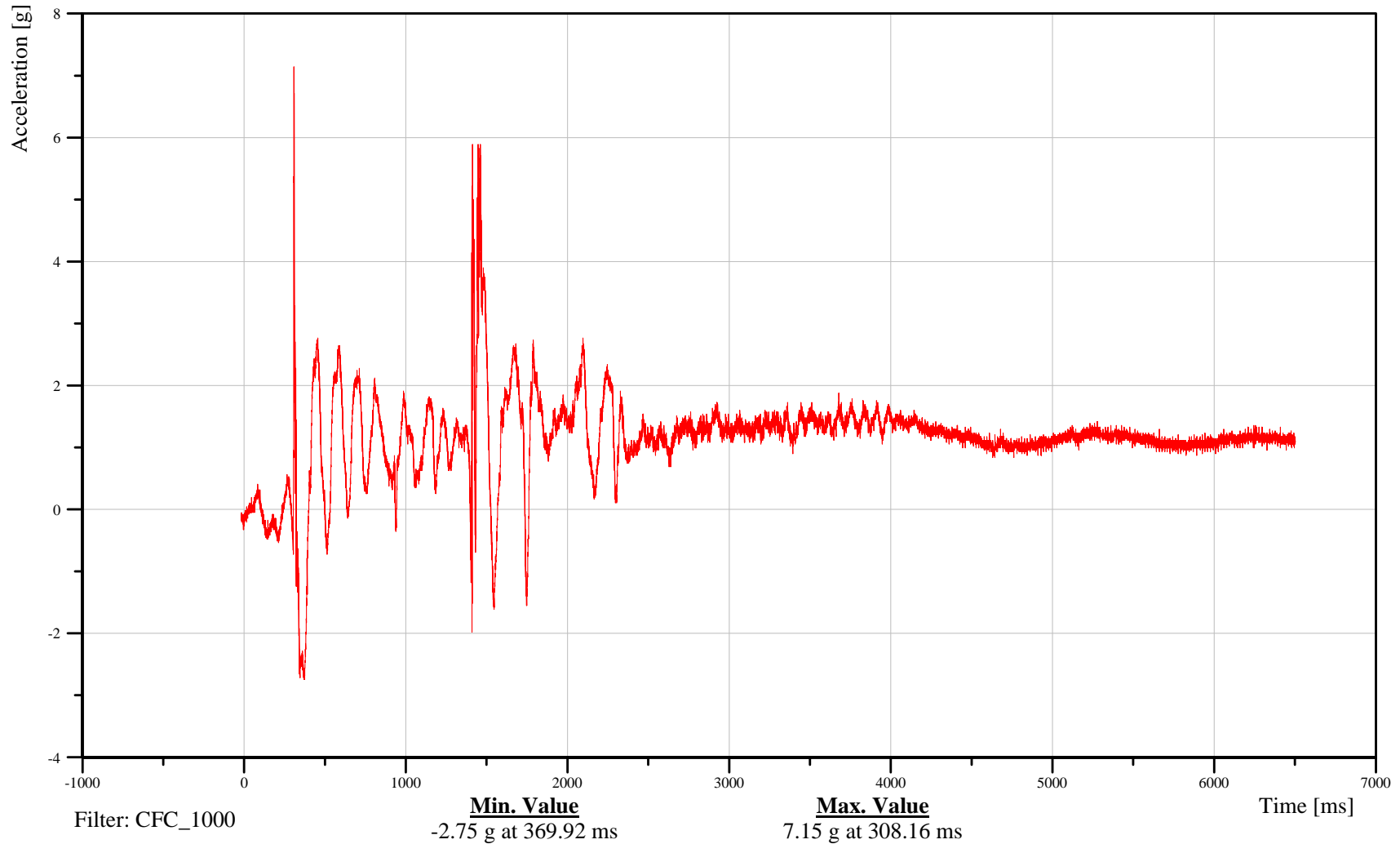
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Customer: VRTC

11HEADLE00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-11

100420



Corkscrew Rollover 2007 Ford Expedition

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Time: 14:32

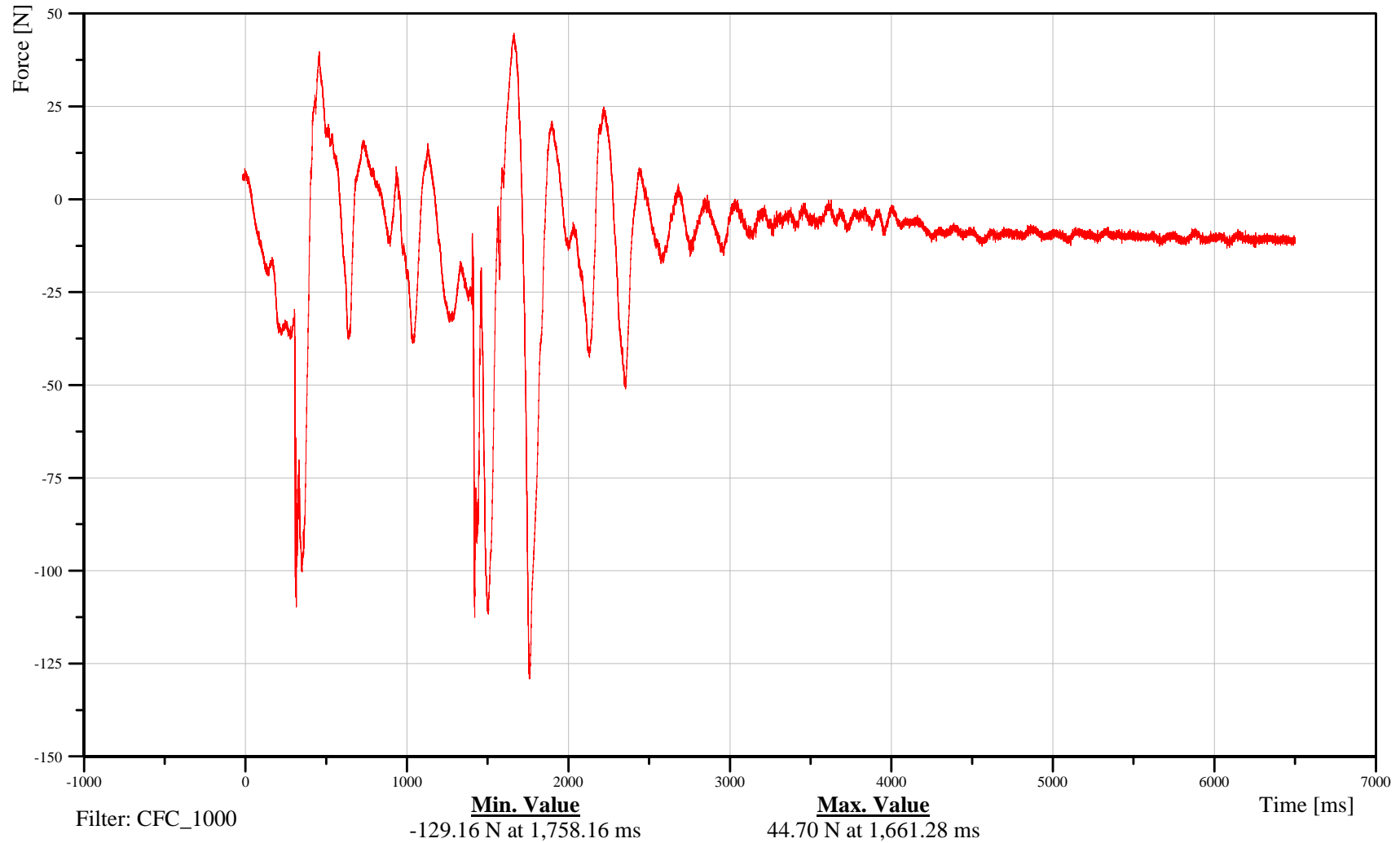
Driver Upper Neck X-Axis Force

Customer: VRTC

11NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-12

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

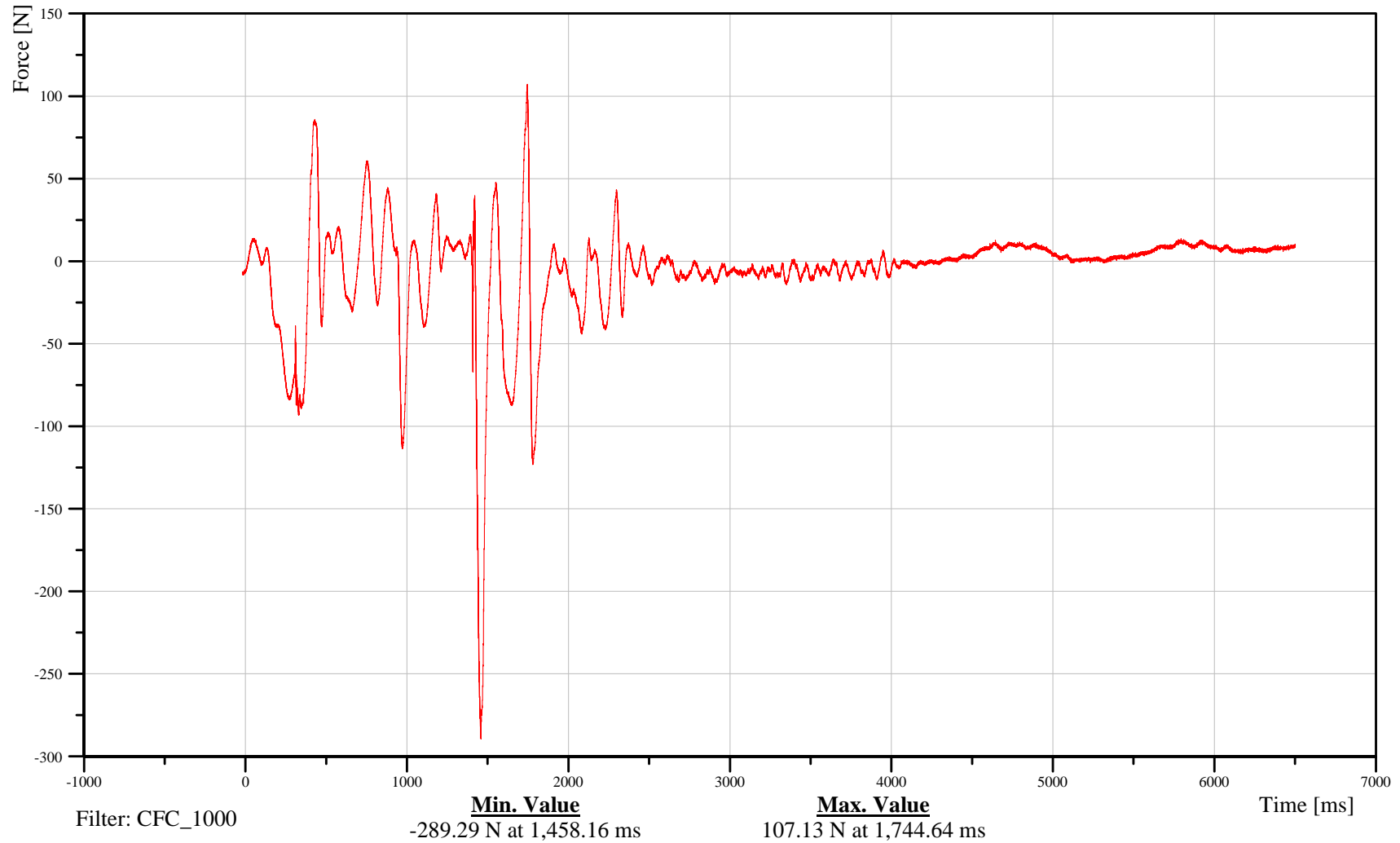
Driver Upper Neck Y-Axis Force

Customer: VRTC

11NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-13

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

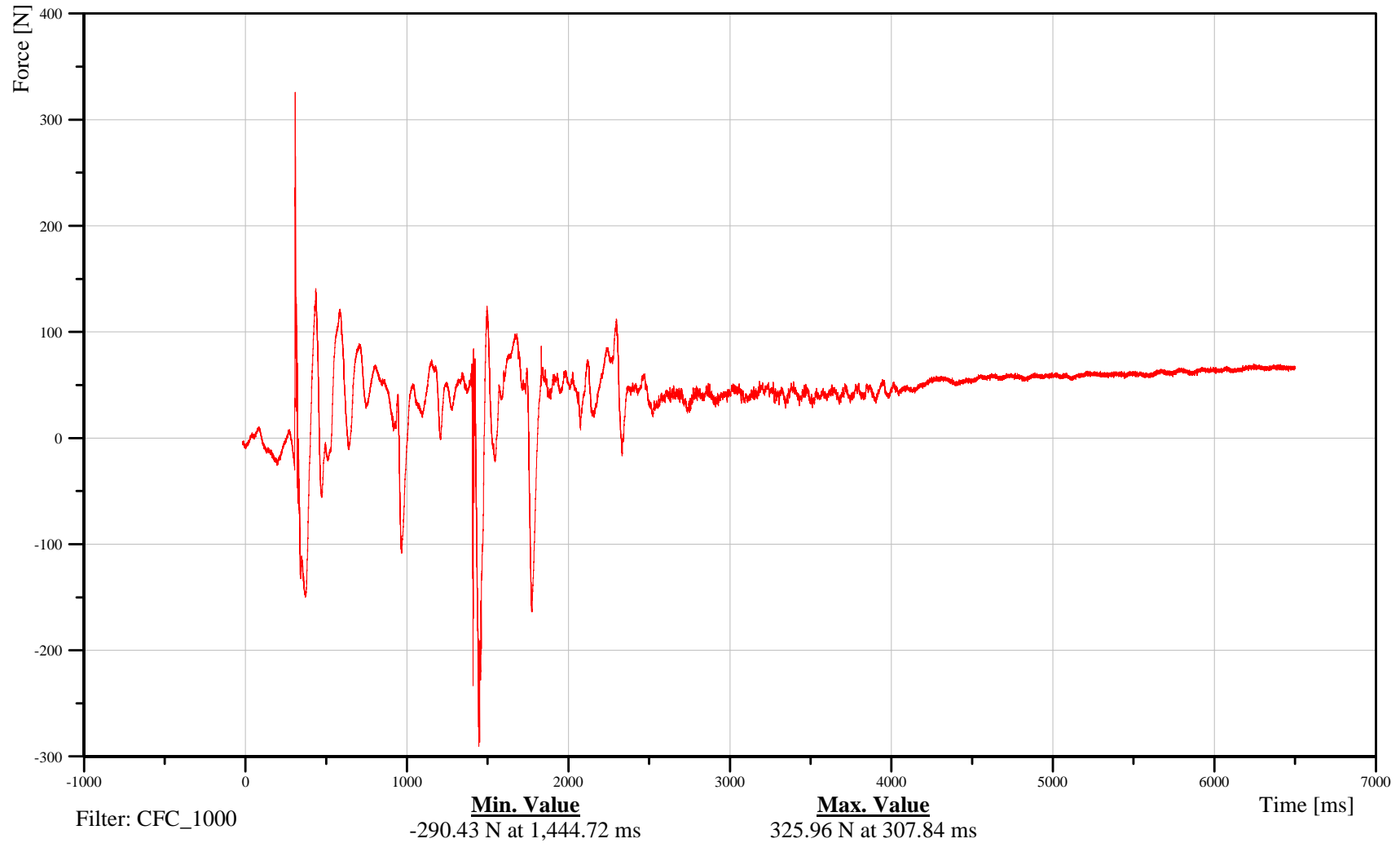
Driver Upper Neck Z-Axis Force

Customer: VRTC

11NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-14

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

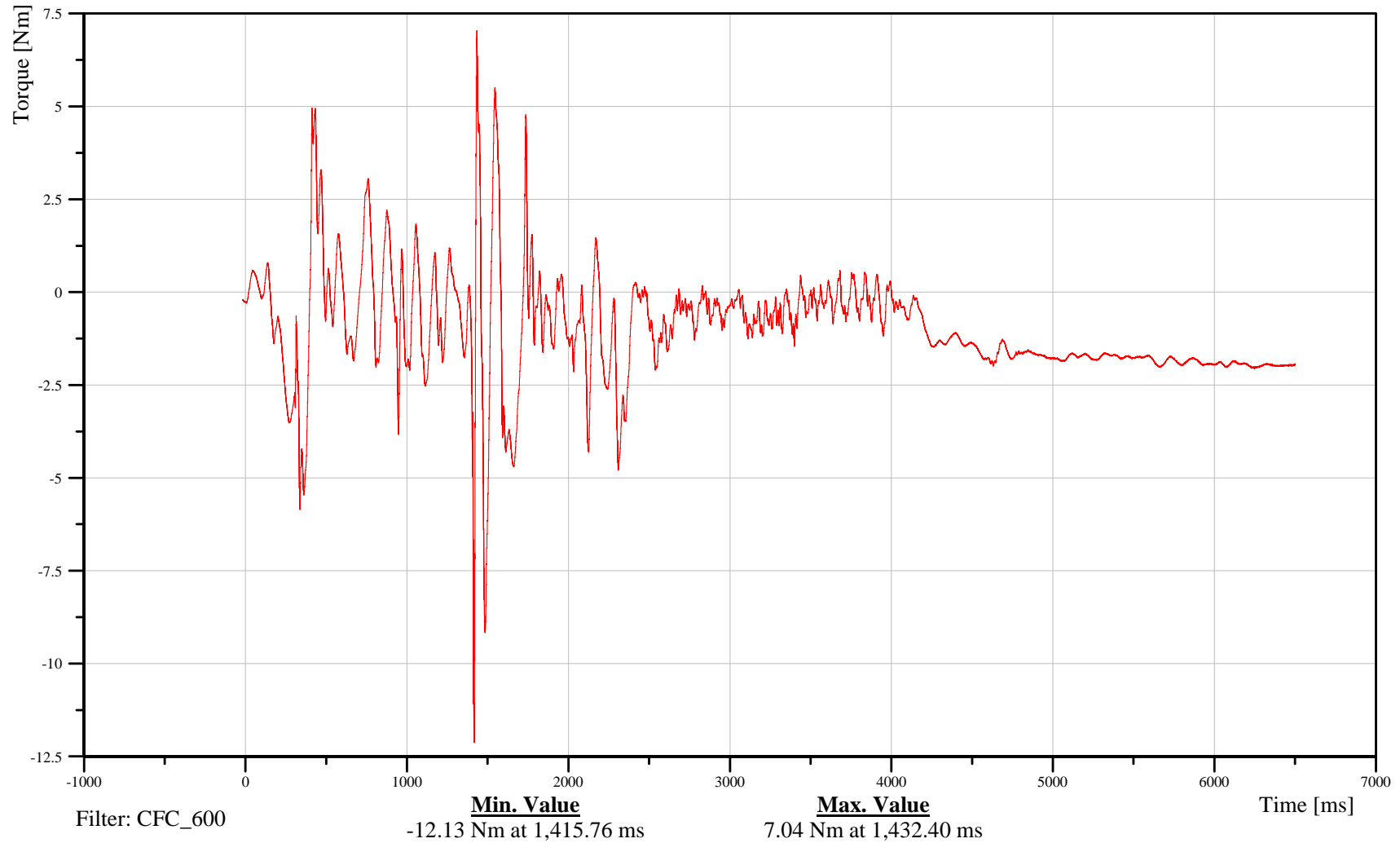
Driver Upper Neck Moment About X Axis

Customer: VRTC

11NECKUP00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-15

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

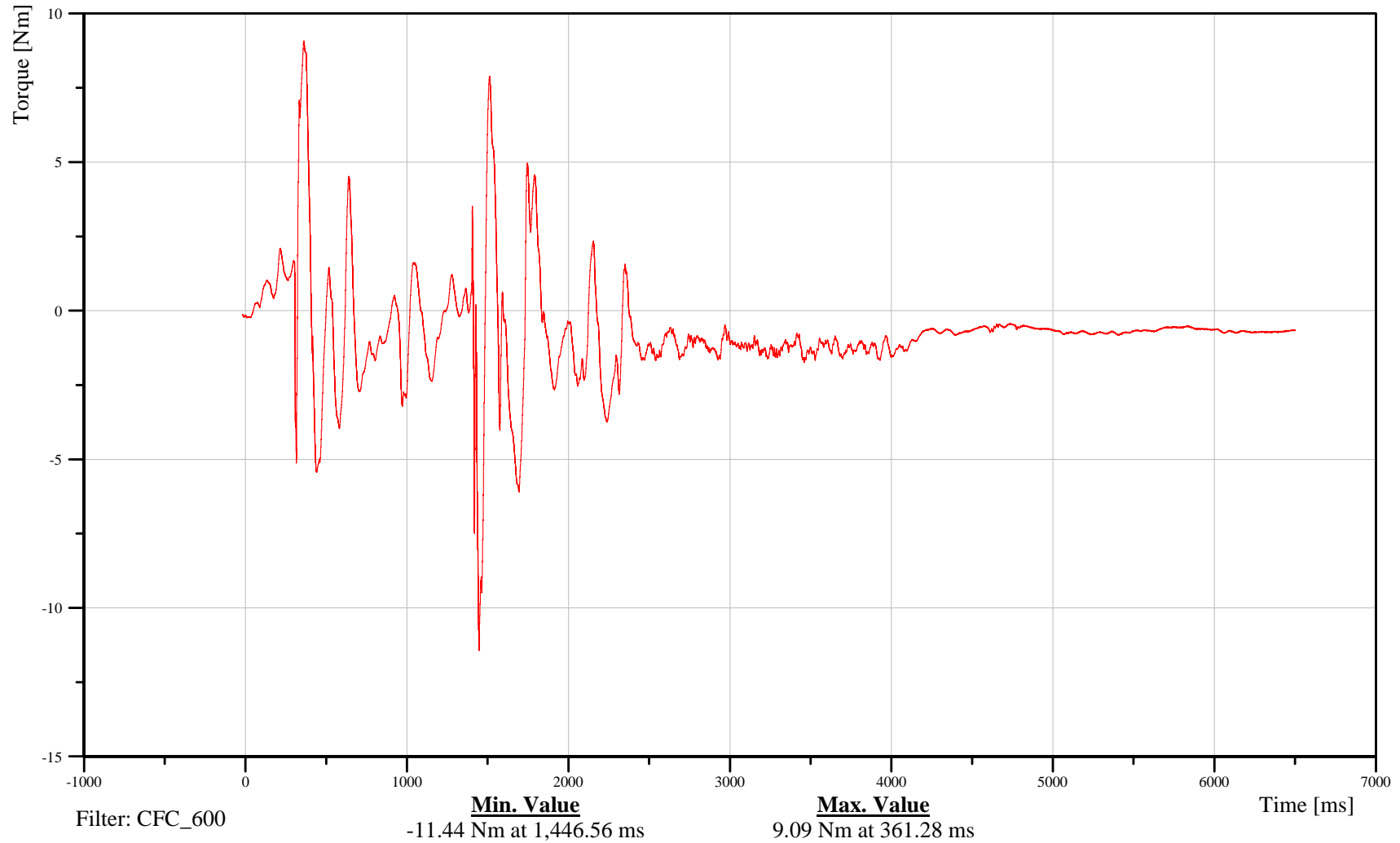
Driver Upper Neck Moment About Y Axis

Customer: VRTC

11NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-16

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Upper Neck Moment About Z Axis

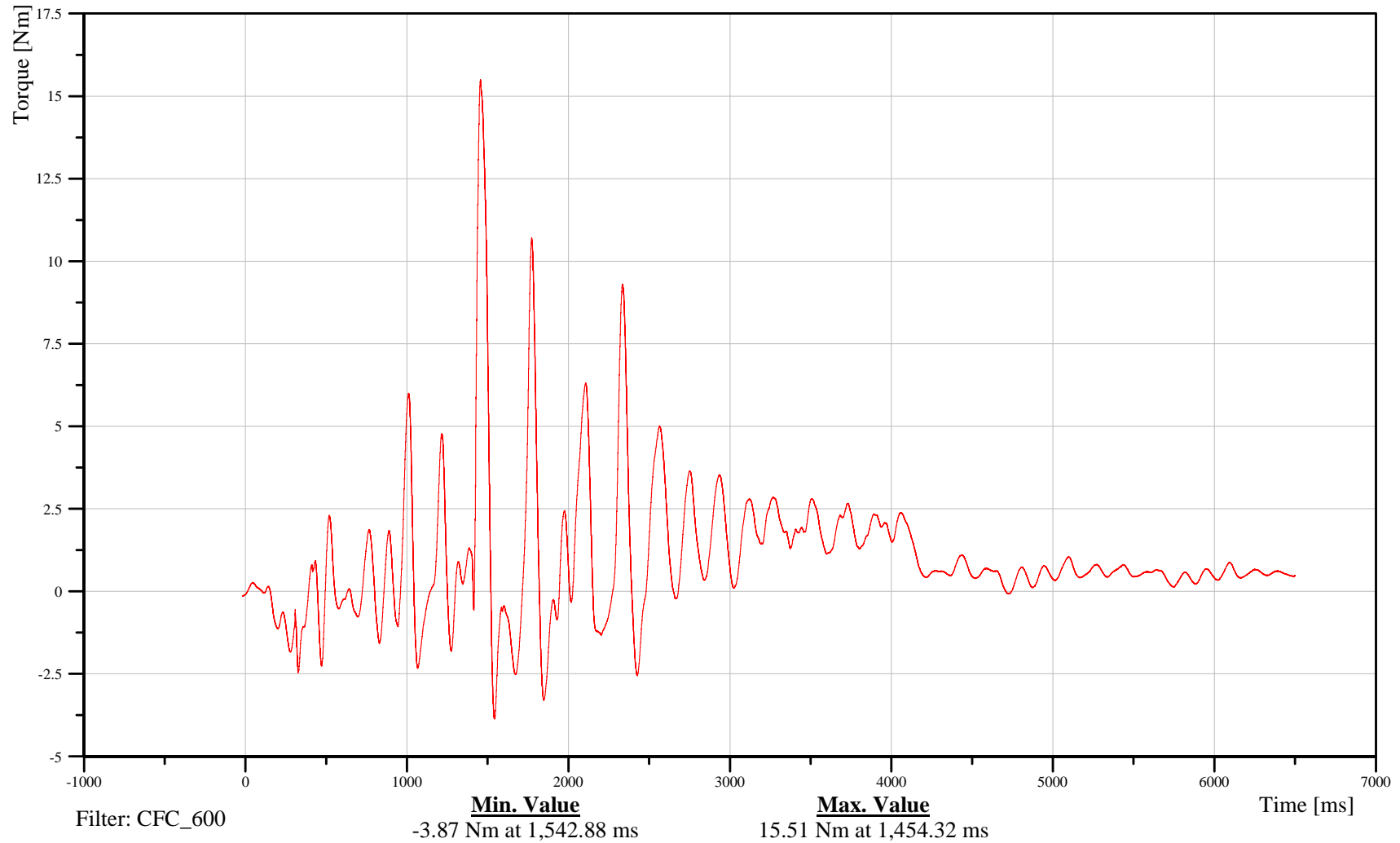
Time: 14:32

Customer: VRTC

11NECKUP00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-17

100420



Corkscrew Rollover 2007 Ford Expedition

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Time: 14:32

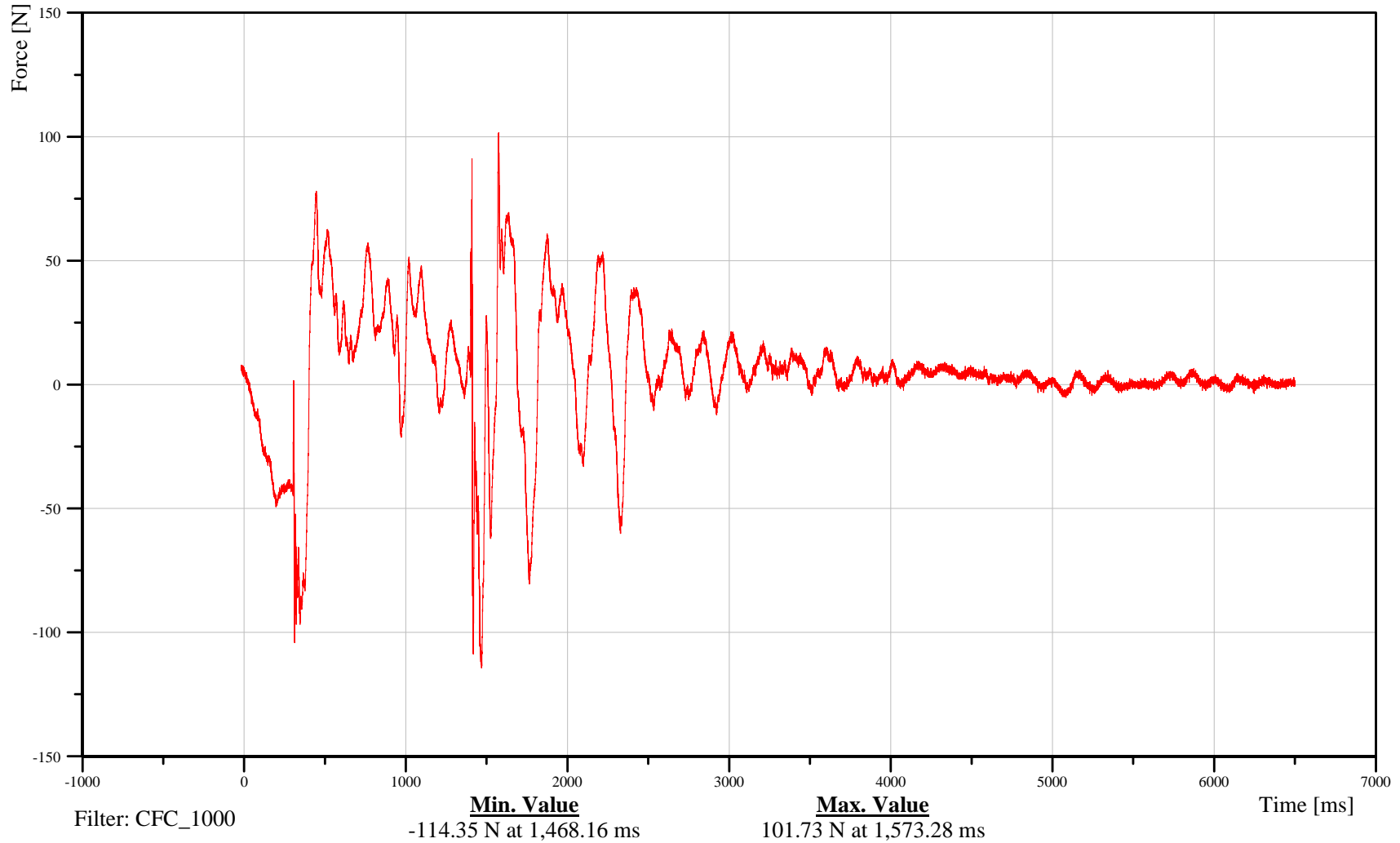
Driver Lower Neck X-Axis Force

Customer: VRTC

11NECKLO00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-18

100420



Corkscrew Rollover 2007 Ford Expedition

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Time: 14:32

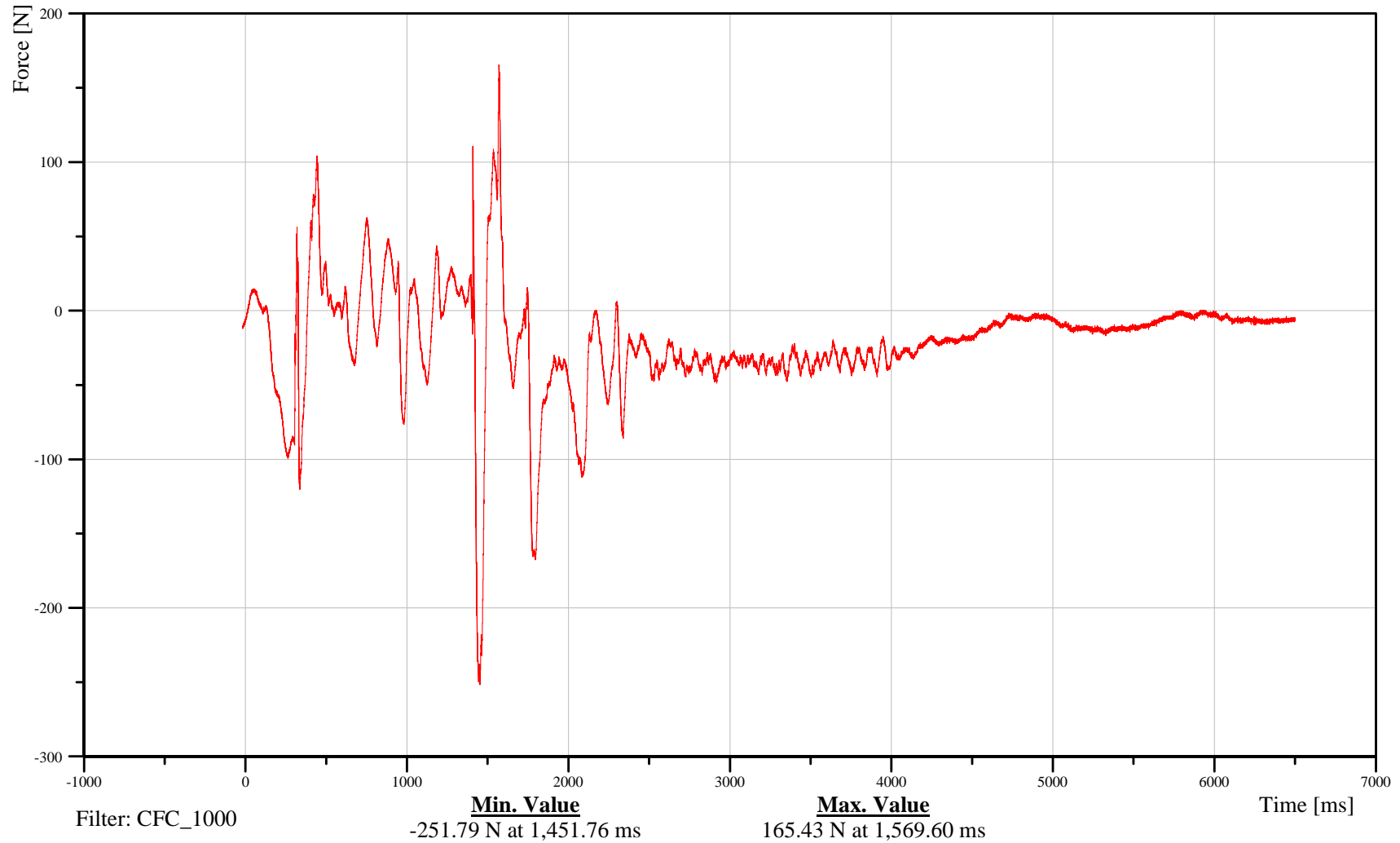
Driver Lower Neck Y-Axis Force

Customer: VRTC

11NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-19

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Lower Neck Z-Axis Force

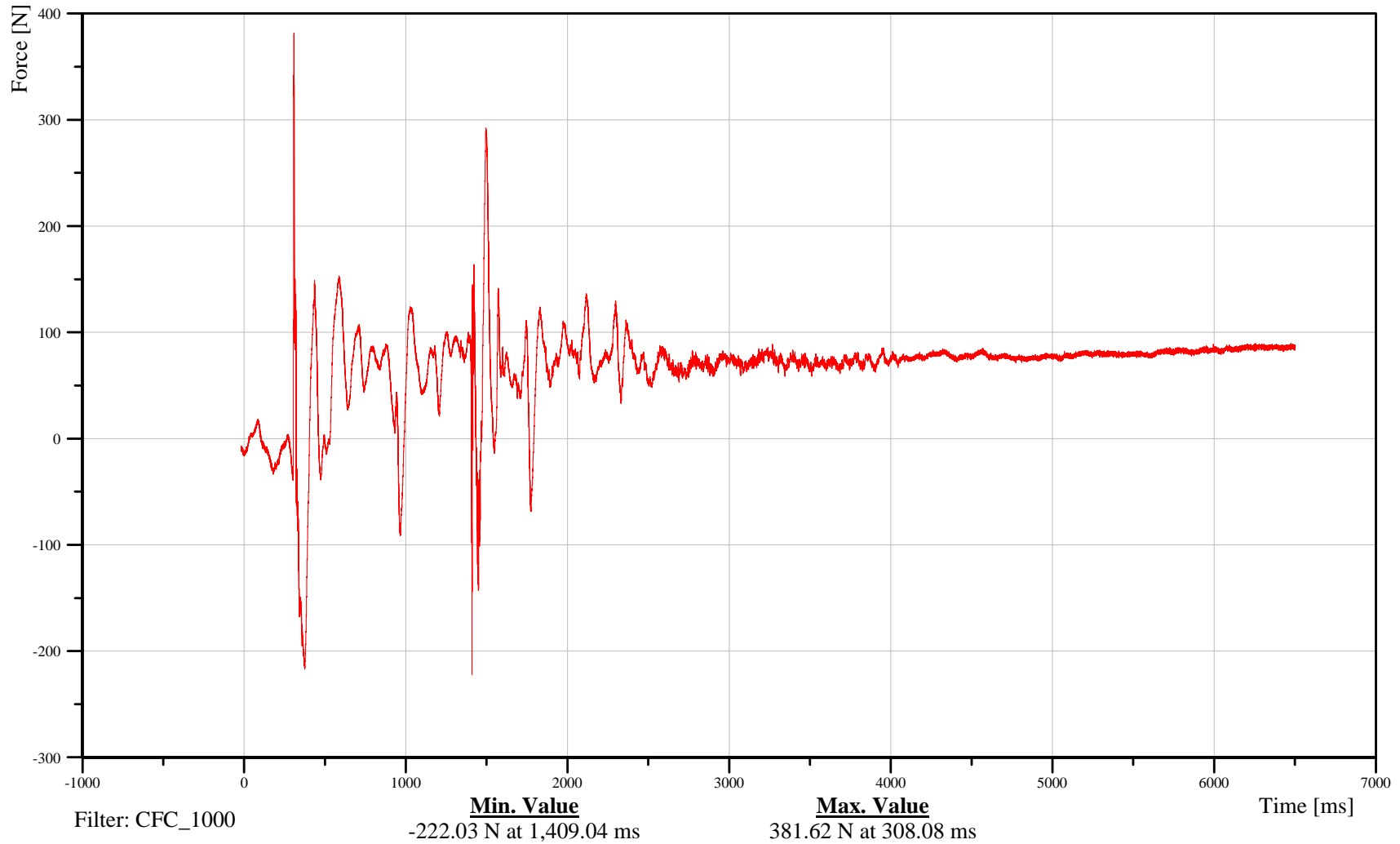
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Customer: VRTC

11NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-20

100420



Corkscrew Rollover 2007 Ford Expedition

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Time: 14:32

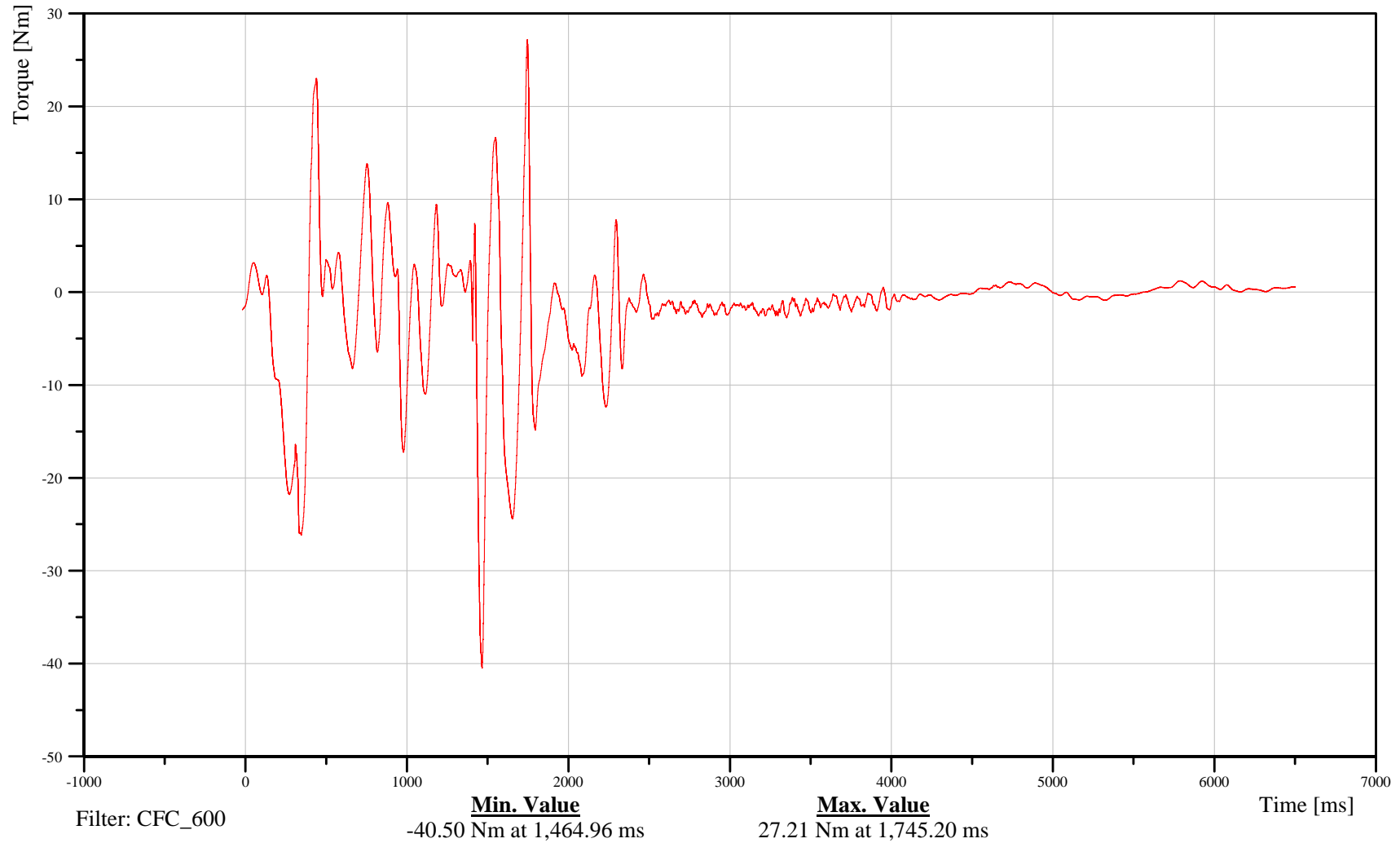
Driver Lower Neck Moment About X Axis

Customer: VRTC

11NECKLO00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-21

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

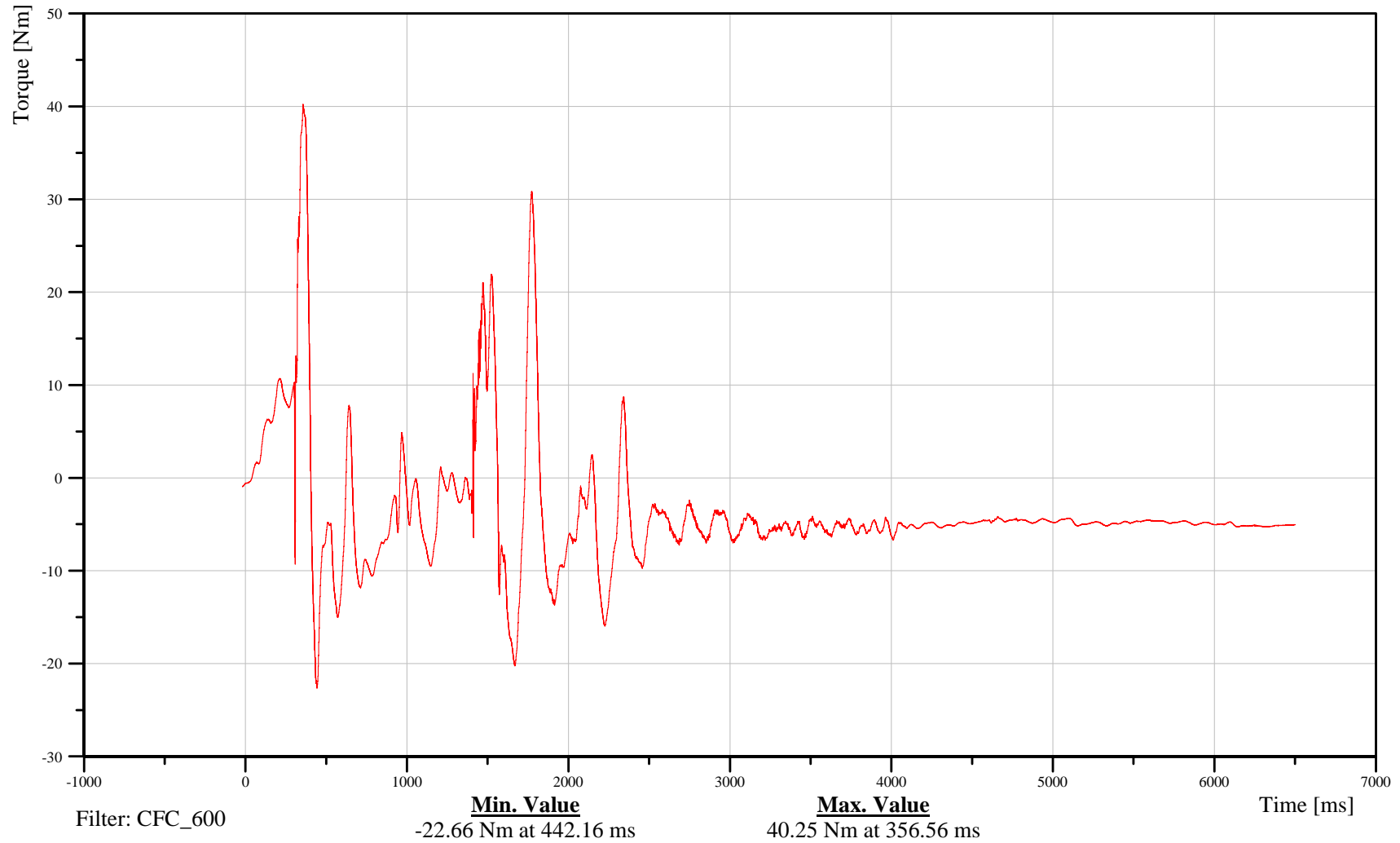
Driver Lower Neck Moment About Y Axis

Customer: VRTC

11NECKLO00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-22

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

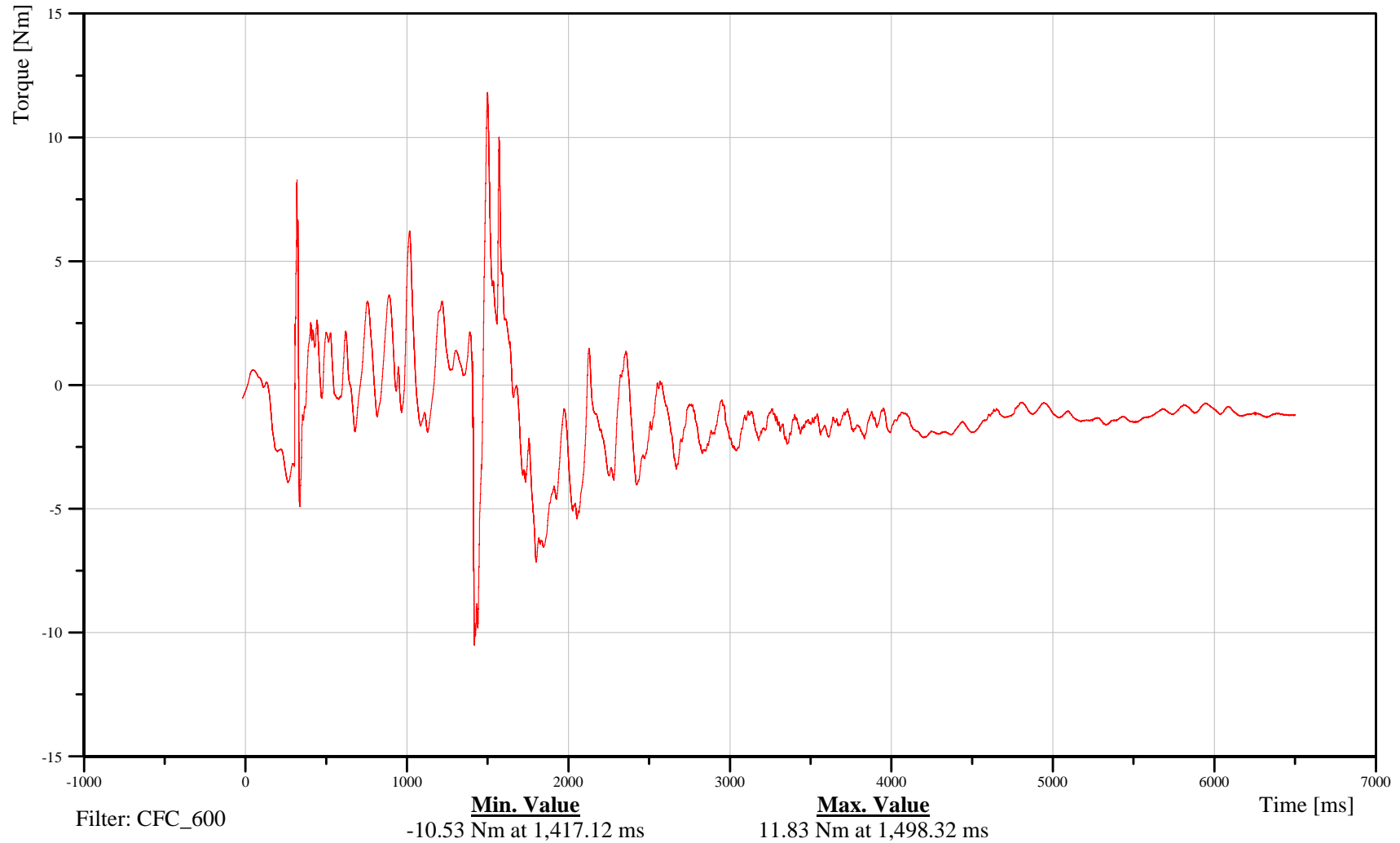
Driver Lower Neck Moment About Z Axis

Customer: VRTC

11NECKLO00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-23

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Chest X-Axis Acceleration

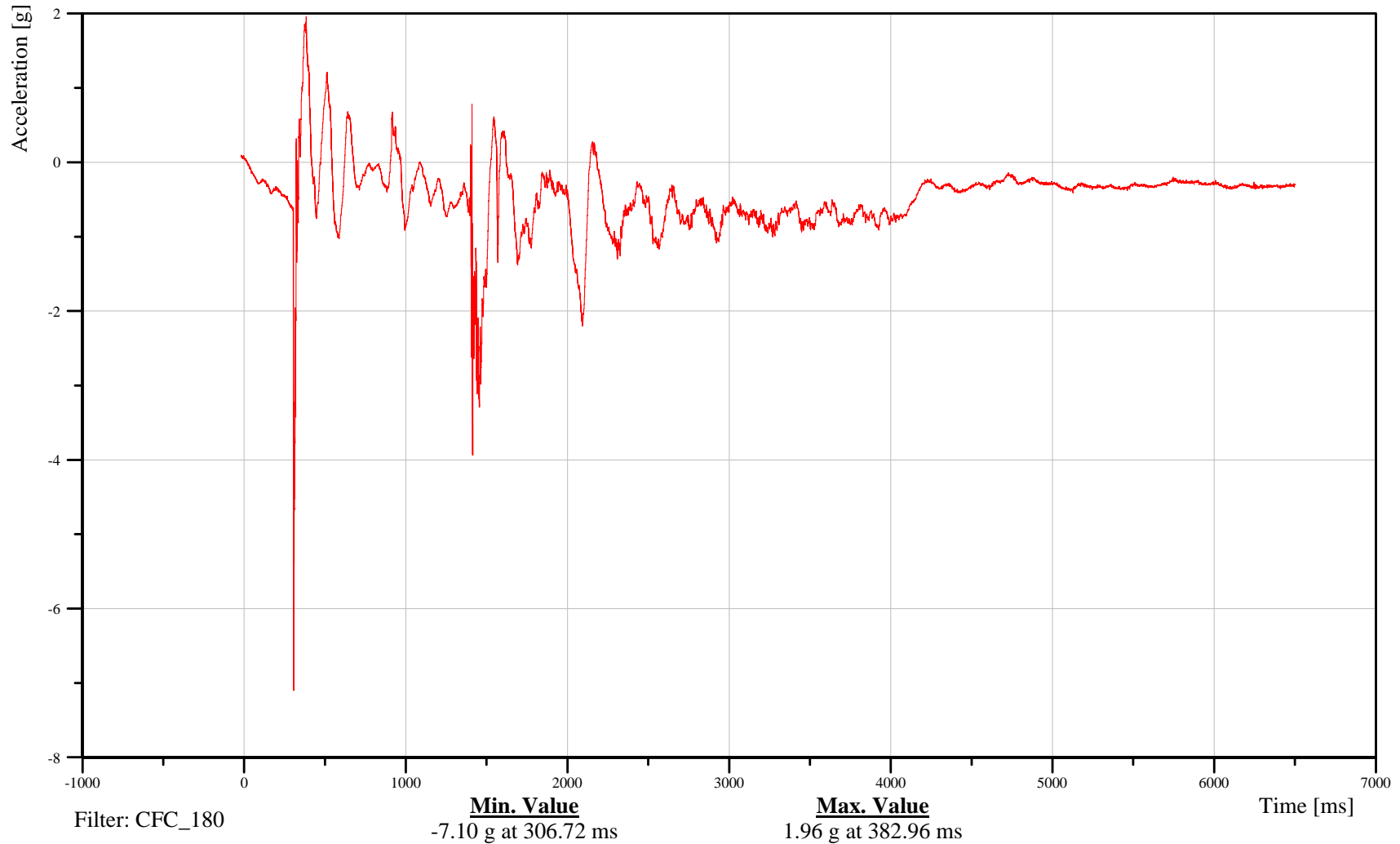
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Customer: VRTC

11CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-24

100420



Corkscrew Rollover 2007 Ford Expedition

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Time: 14:32

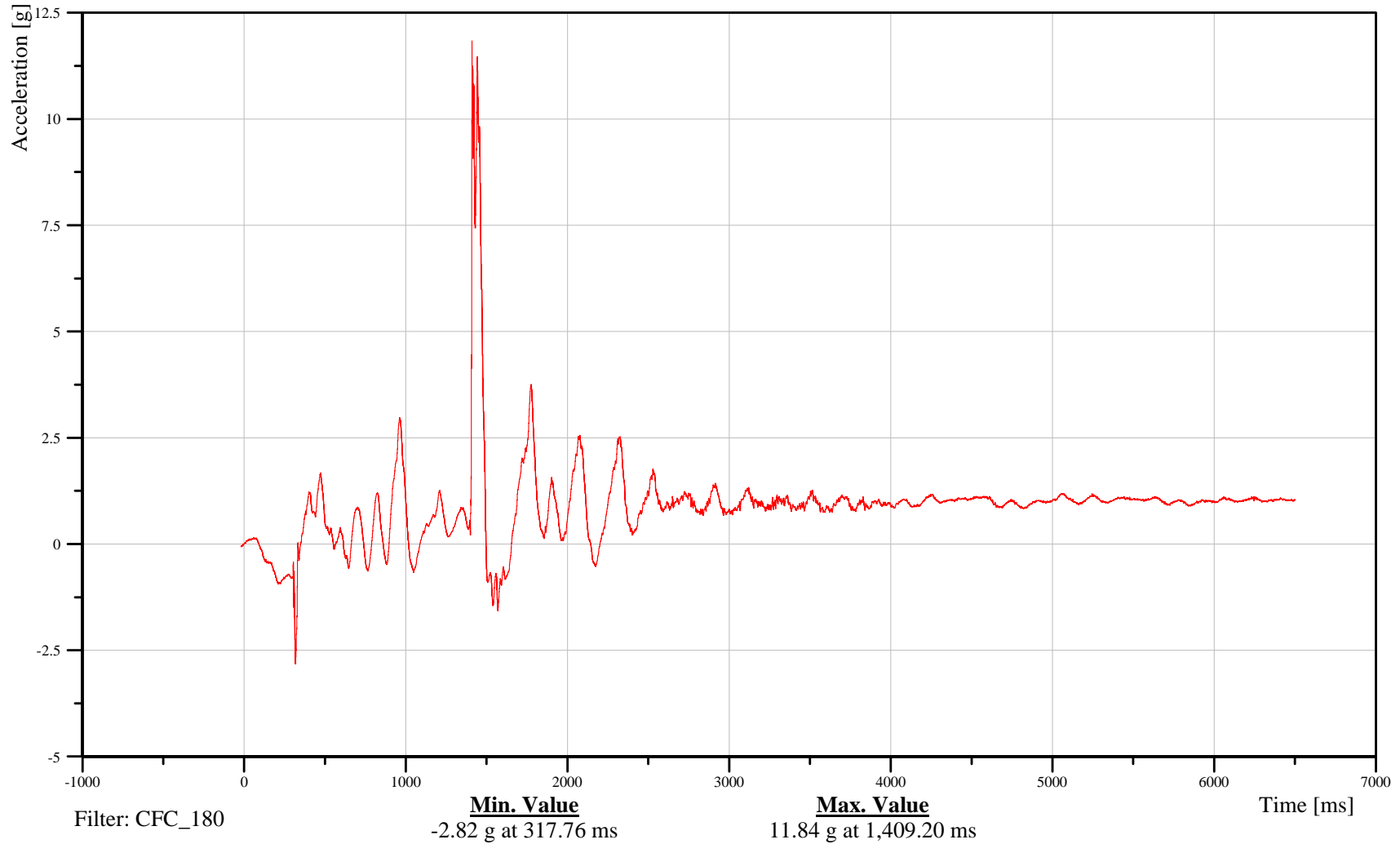
Driver Chest Y-Axis Acceleration

Customer: VRTC

11CHSTCG00H3ACYC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-25

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

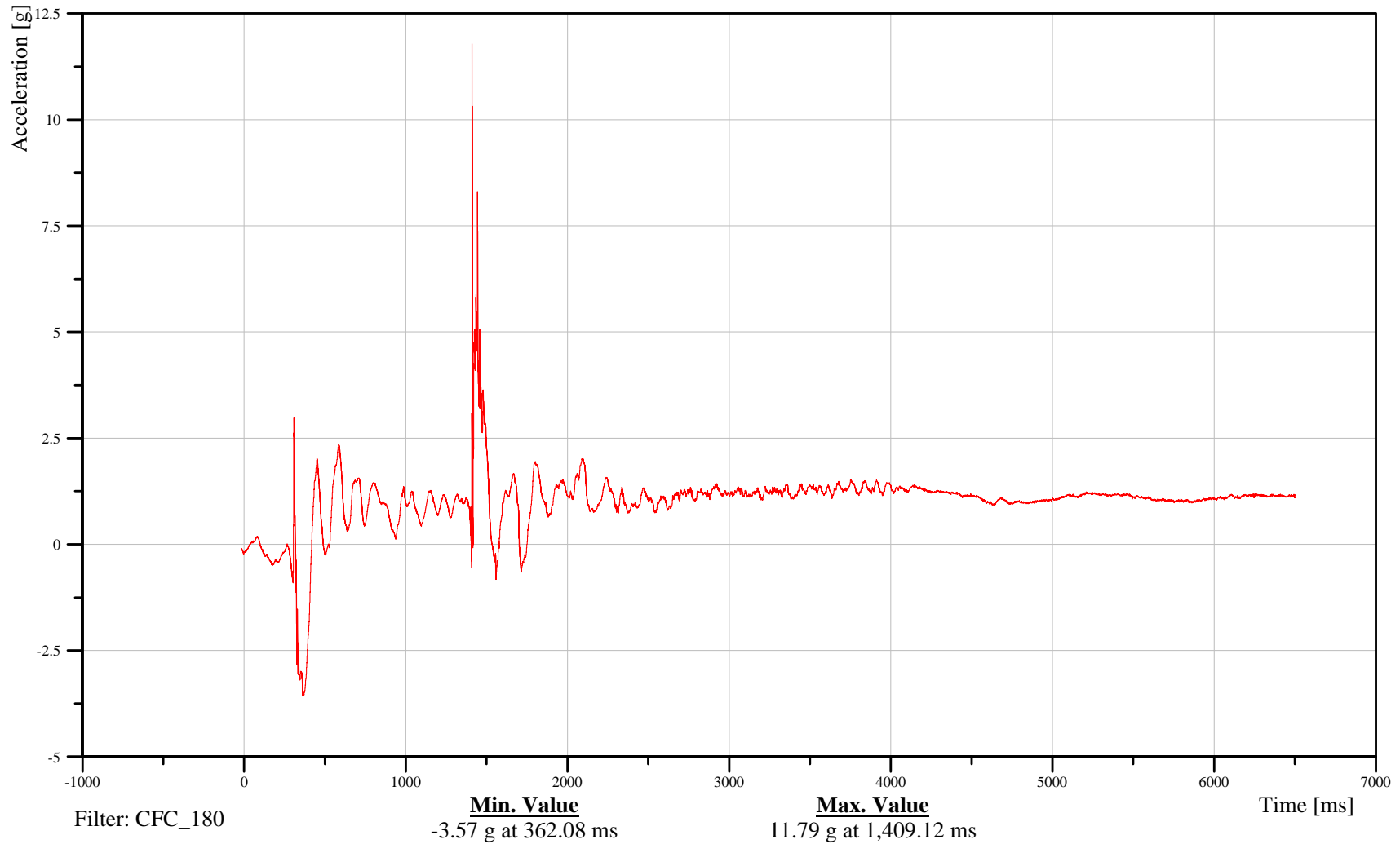
Driver Chest Z-Axis Acceleration

Customer: VRTC

11CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-26

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Chest Resultant Acceleration

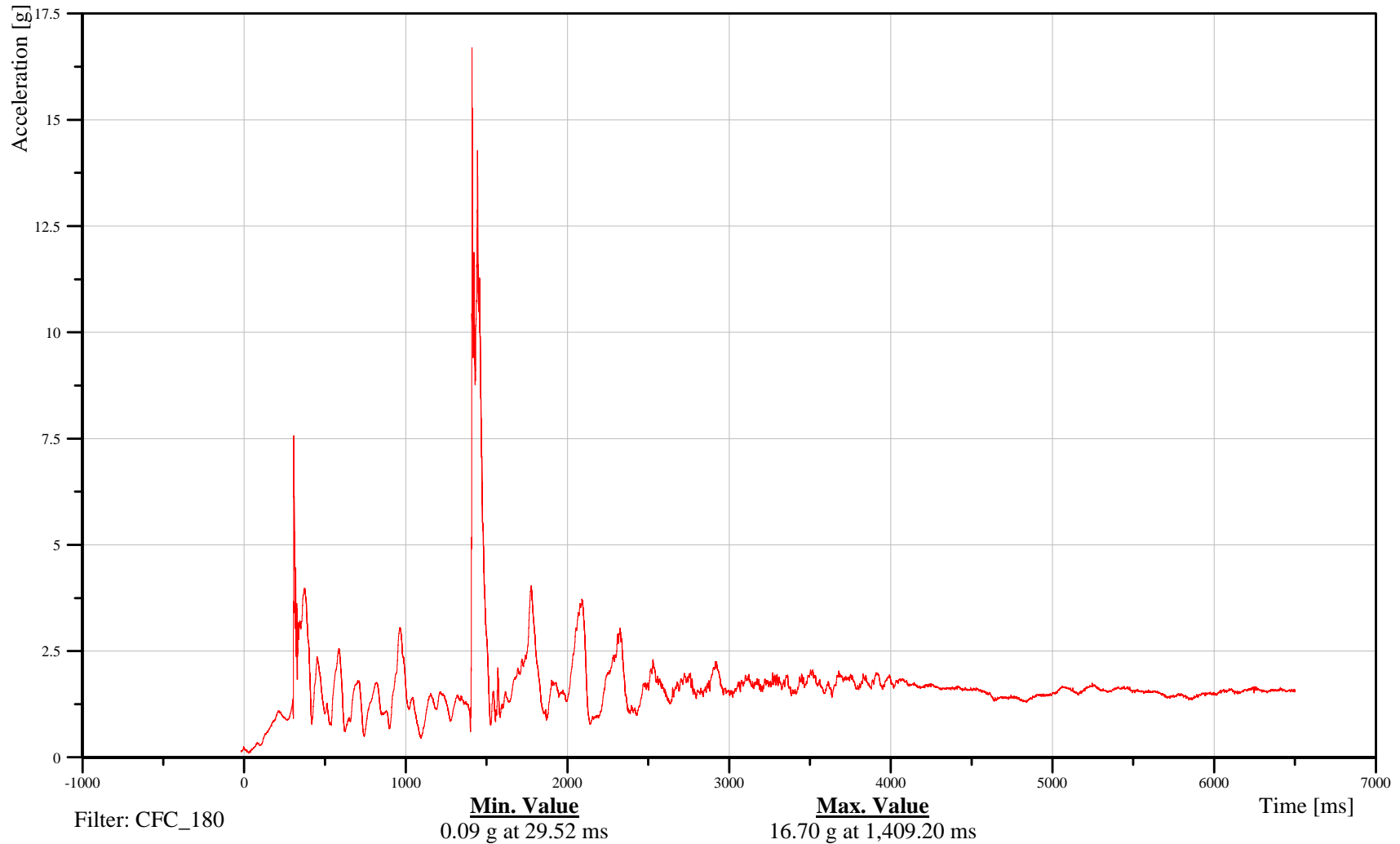
Time: 14:32

Customer: VRTC

11CHSTCG00H3ACRC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-27

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

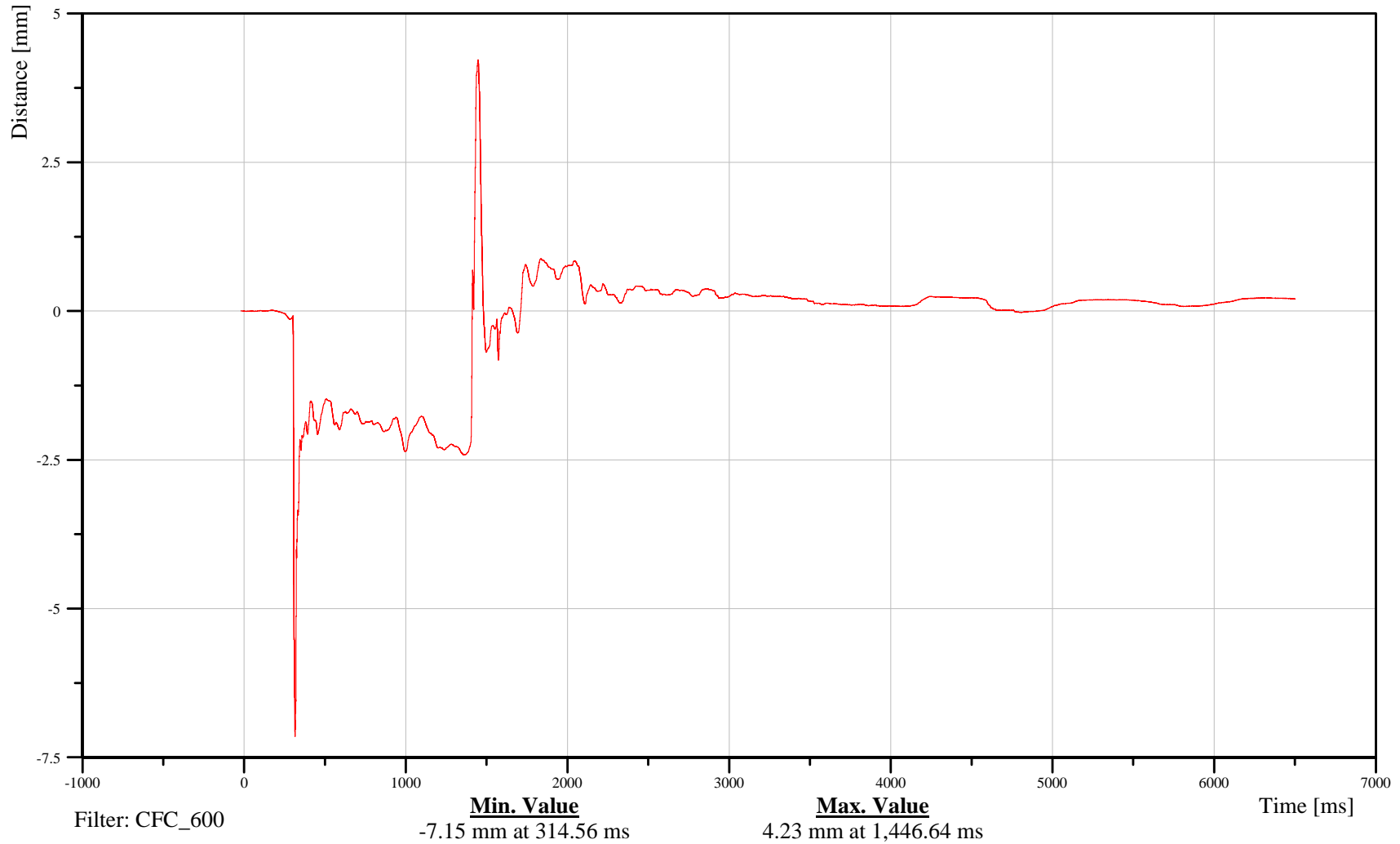
Driver Chest X-Axis Displacement

Customer: VRTC

11CHST0000H3DSXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-28

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Pelvis X-Axis Acceleration

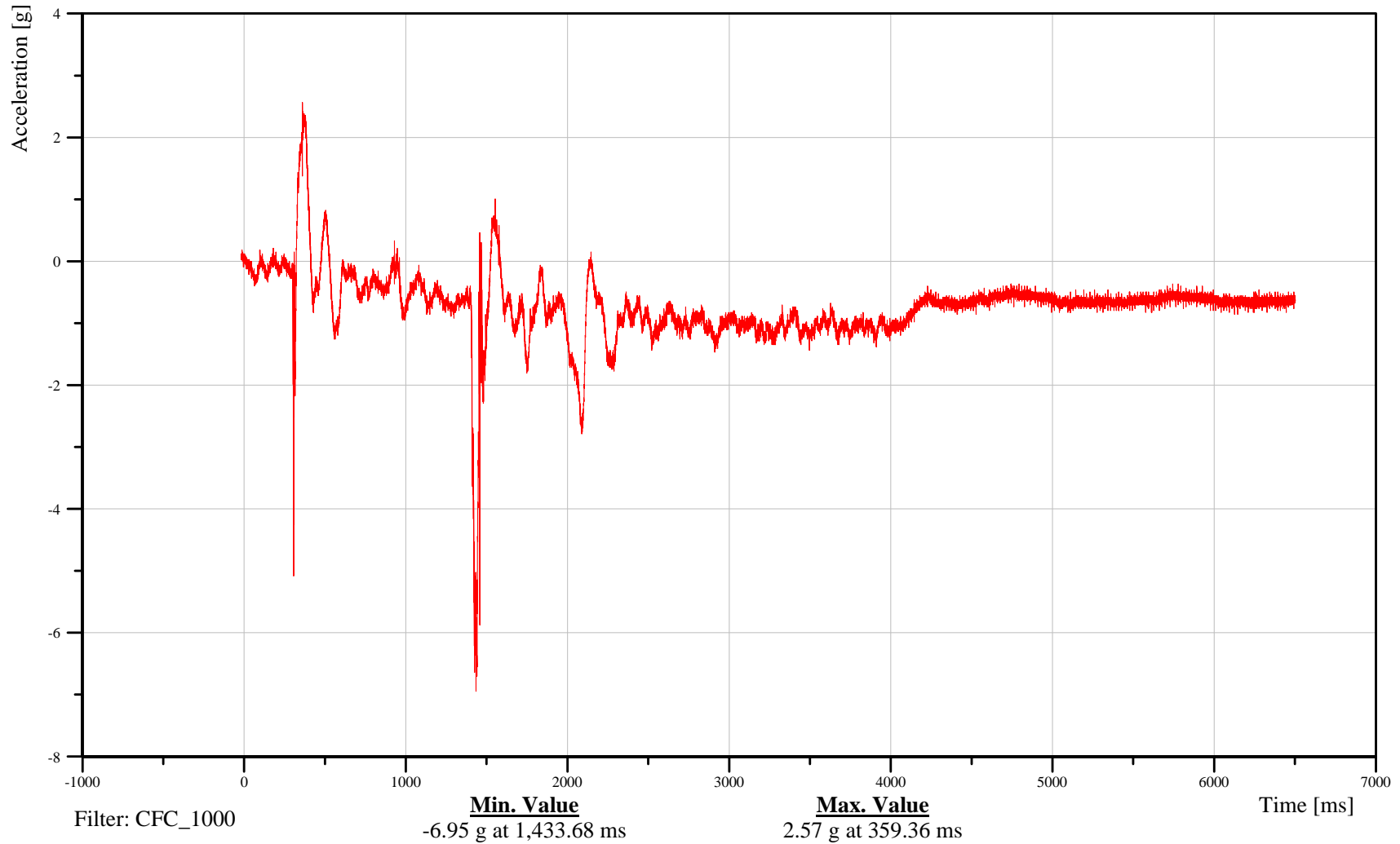
Time: 14:32

Customer: VRTC

11PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-29

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

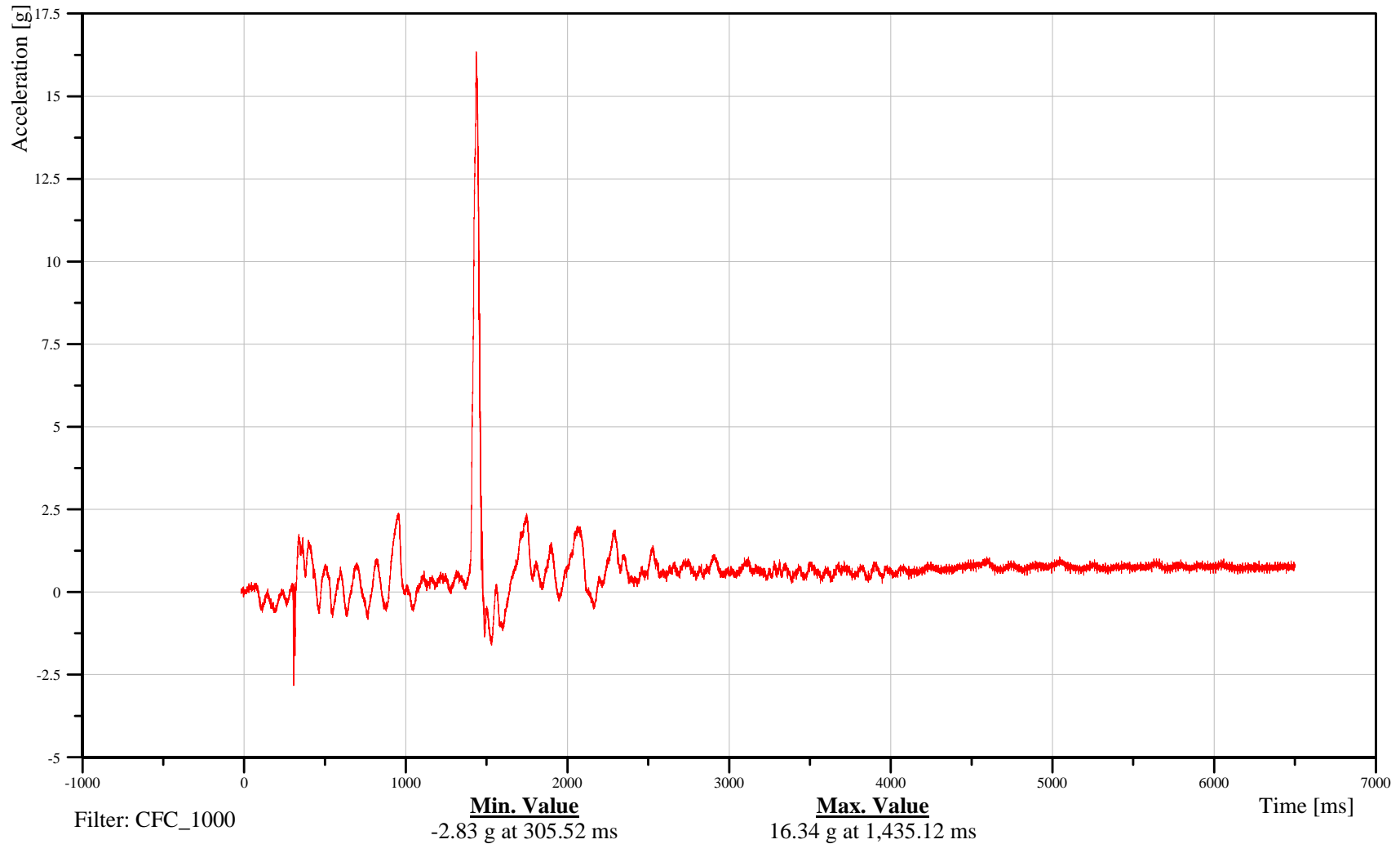
Driver Pelvis Y-Axis Acceleration

Customer: VRTC

11PELVCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-30

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

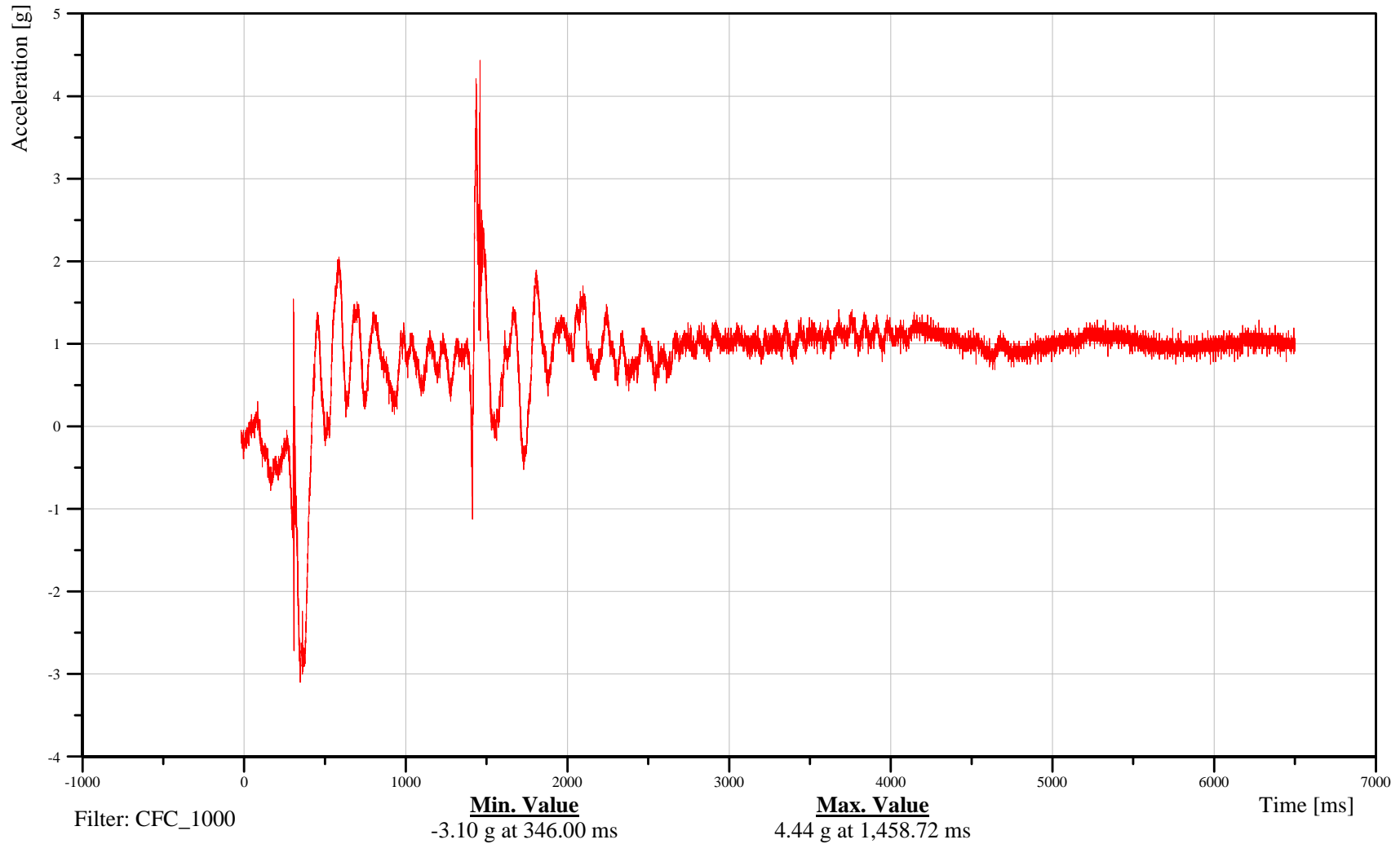
Driver Pelvis Z-Axis Acceleration

Customer: VRTC

11PELVCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-31

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Driver Pelvis Resultant Acceleration

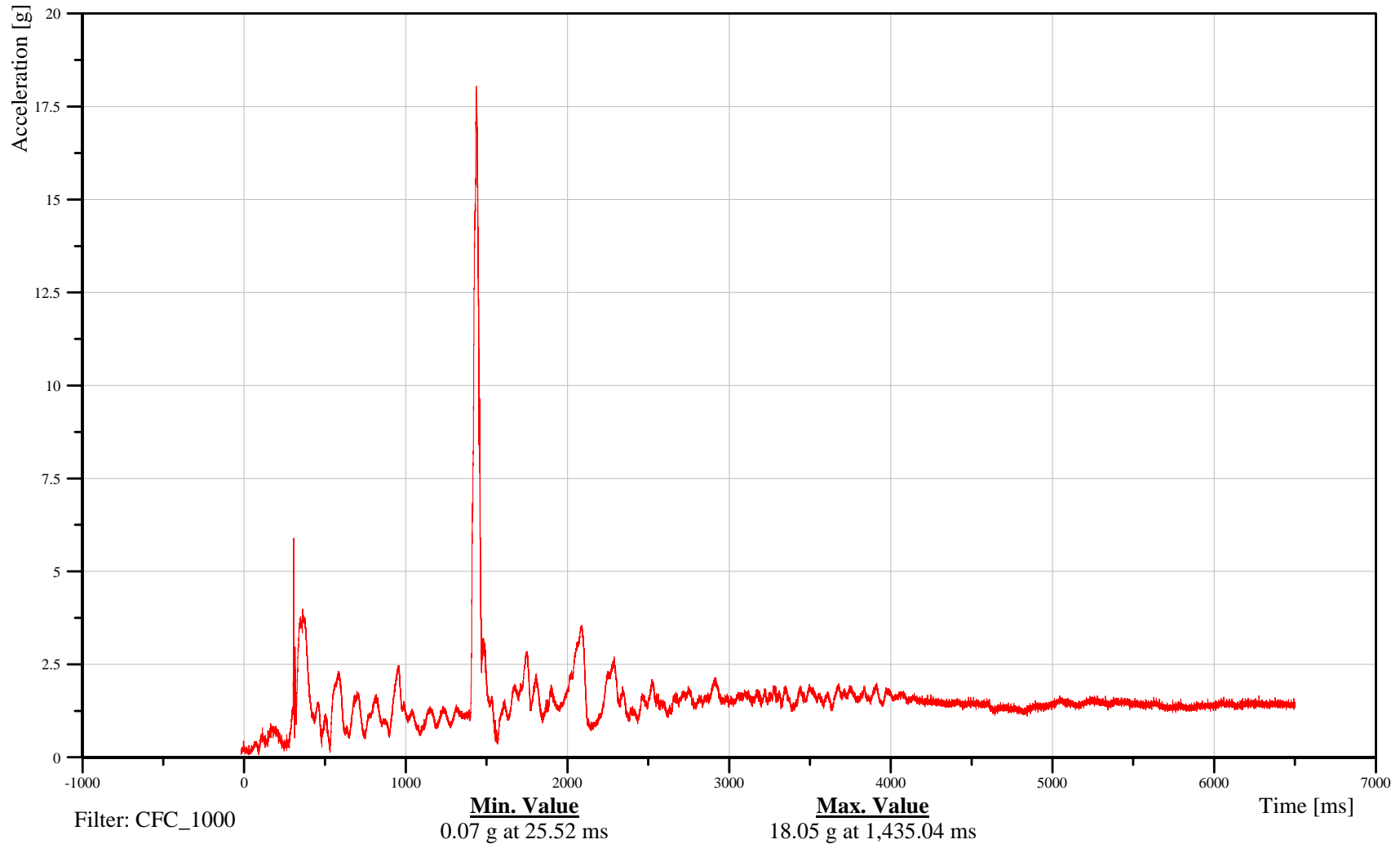
Time: 14:32

Customer: VRTC

11PELVCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-32

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Head X-Axis Acceleration

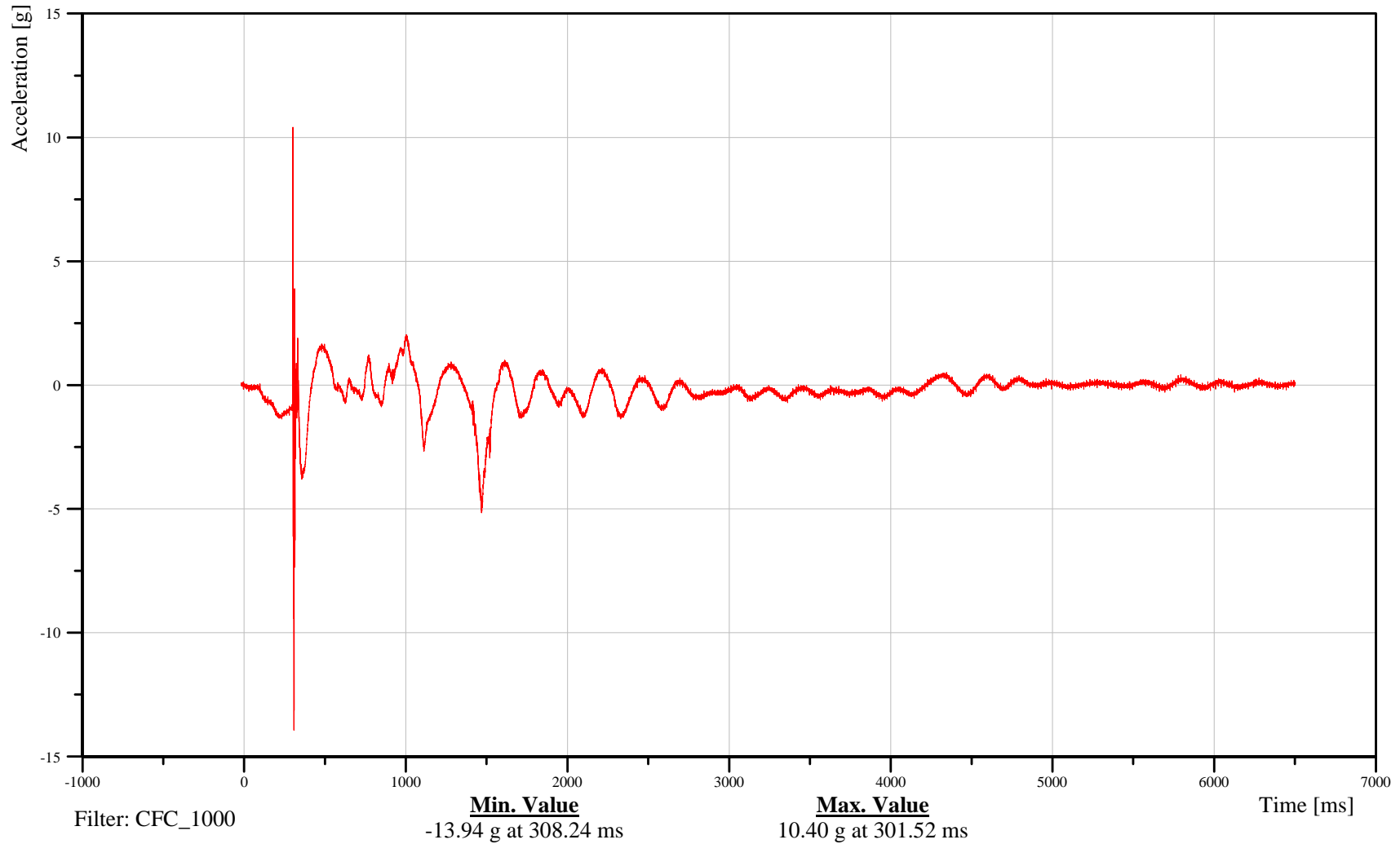
Time: 14:32

Customer: VRTC

13HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-33

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Head Y-Axis Acceleration

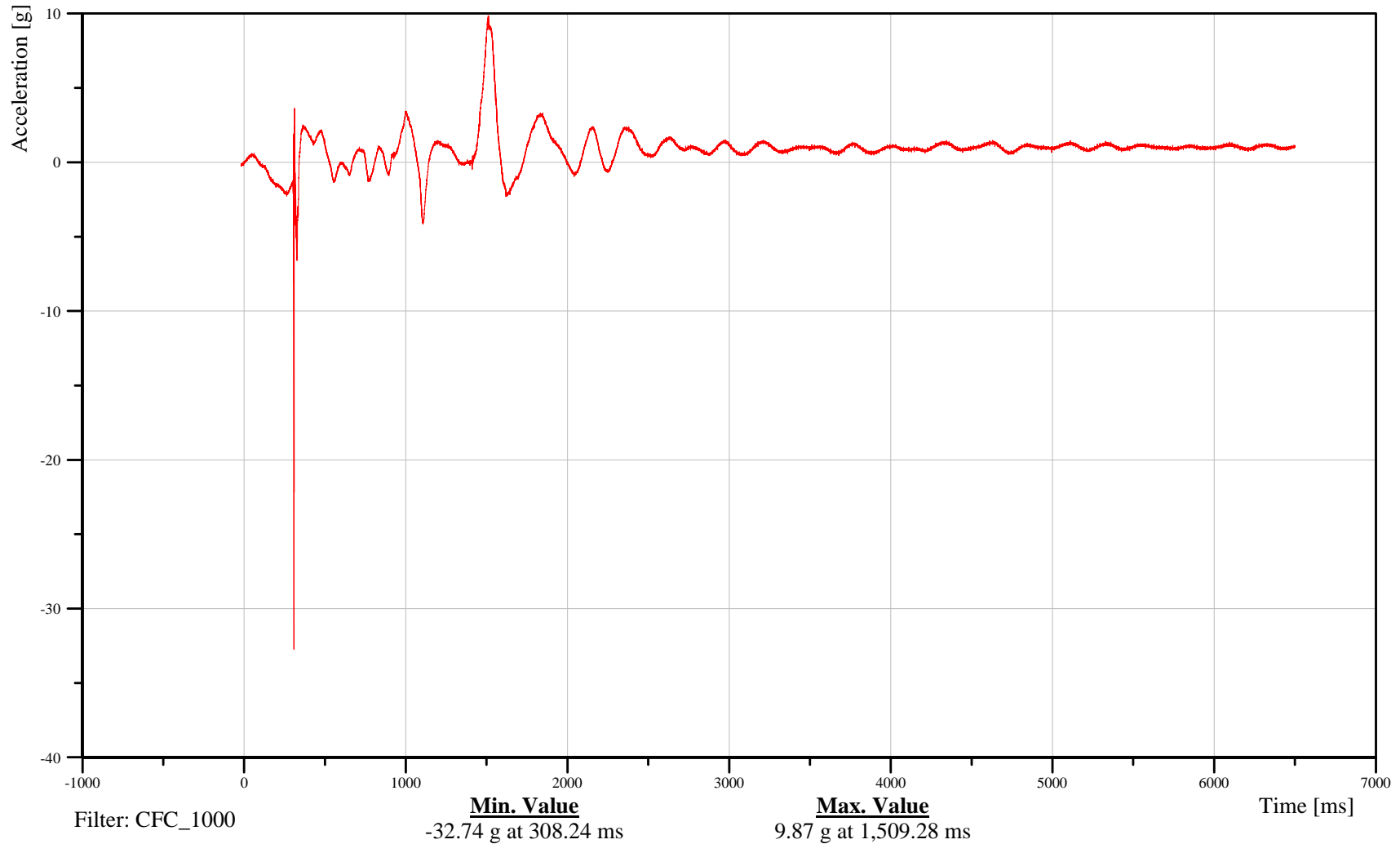
Time: 14:32

Customer: VRTC

13HEADCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-34

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Head Z-Axis Acceleration

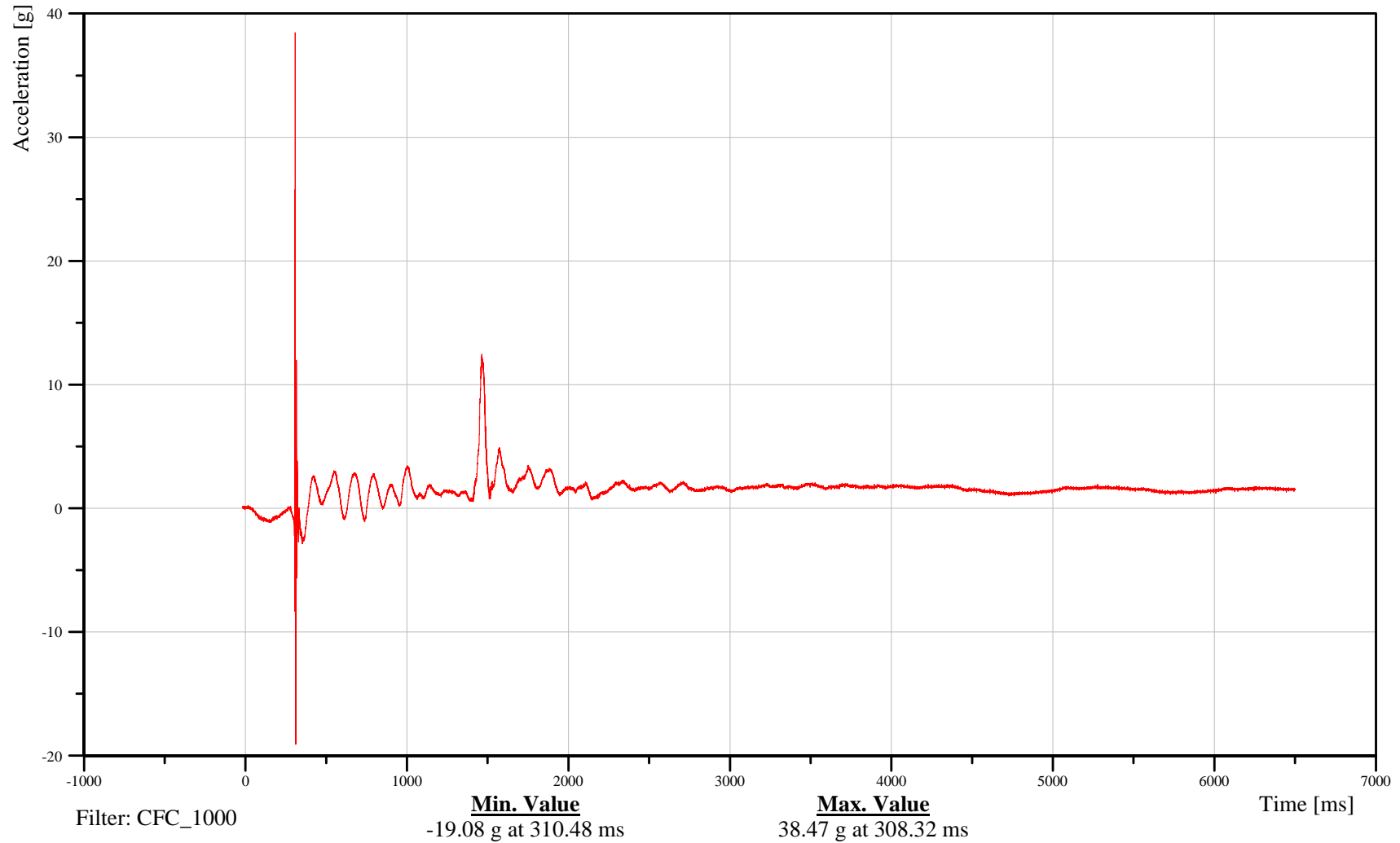
Time: 14:32

Customer: VRTC

13HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-35

100420



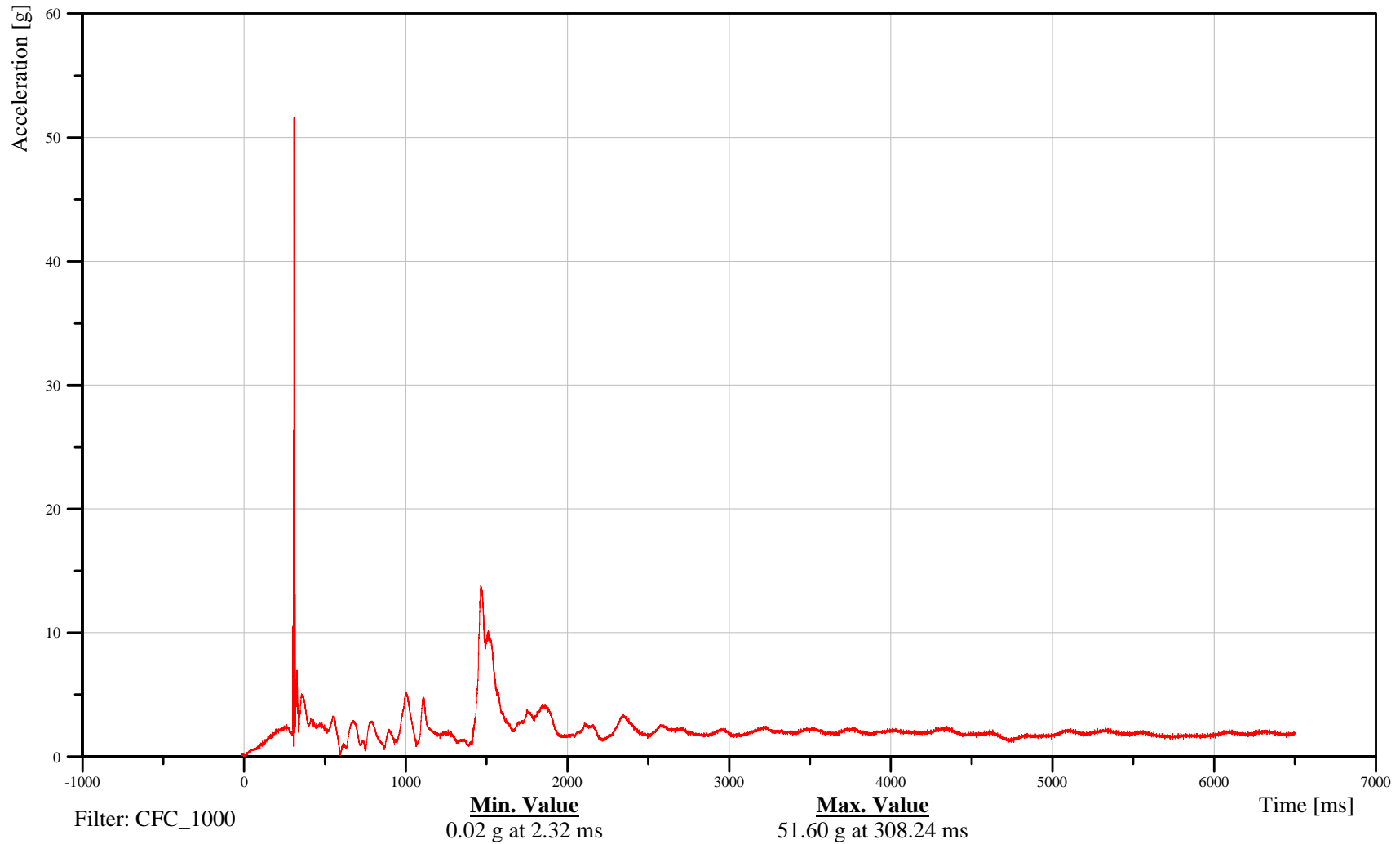
Corkscrew Rollover 2007 Ford Expedition
Right Front Passenger Head Resultant Acceleration

Date: 04/20/2010
Time: 14:32

Customer: VRTC

13HEADCG00H3ACRA

TRC Inc. Test Lab: CTF
Test Number: 100420



B-36

100420



Corkscrew Rollover 2007 Ford Expedition
Right Front Passenger Head (DTS ARS) Rate Gyro X

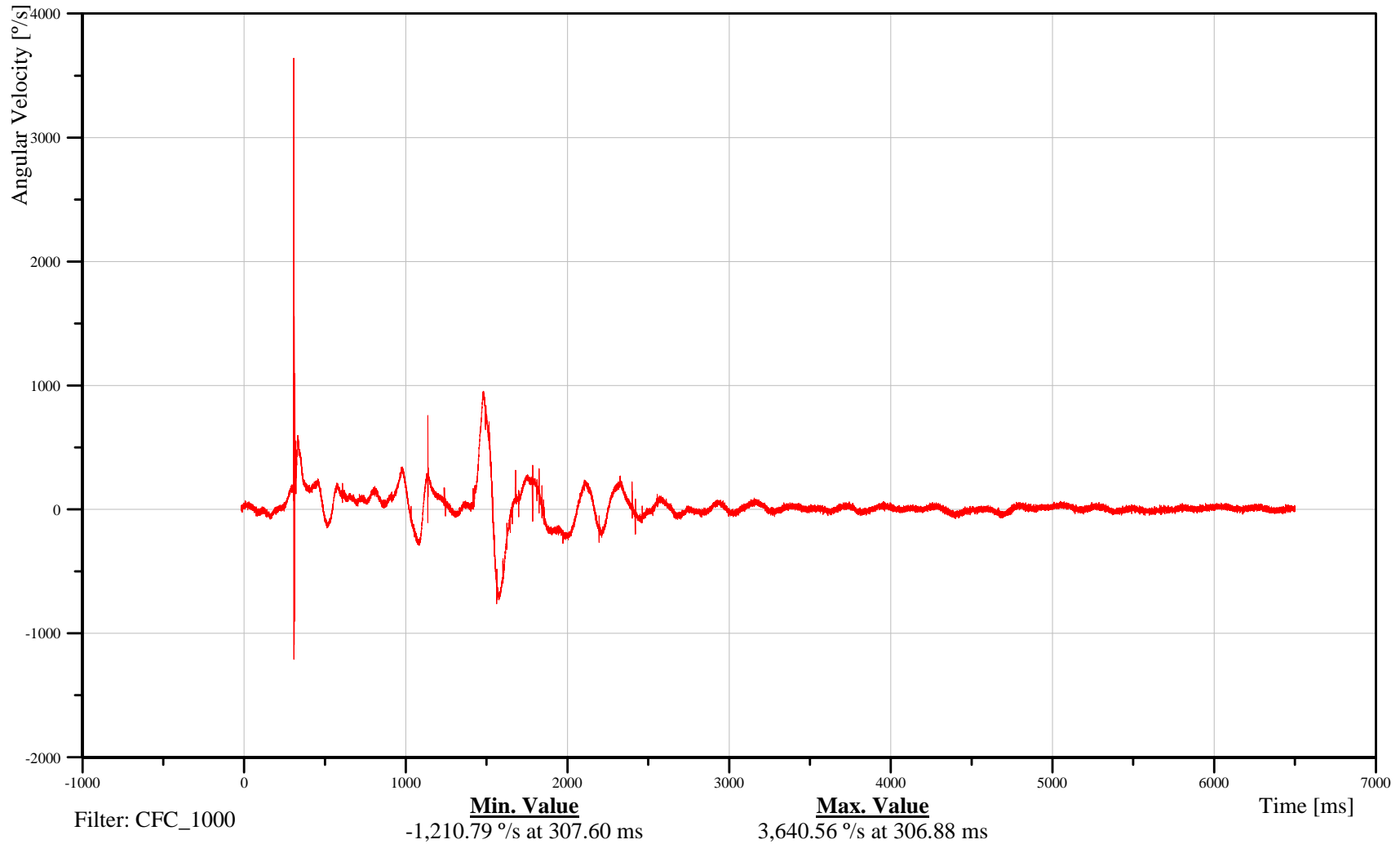
Date: 04/20/2010
Time: 14:32

Customer: VRTC

13HEADCG00H3AVXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-37

100420



Corkscrew Rollover 2007 Ford Expedition
Right Front Passenger Head (DTS ARS) Rate Gyro Y

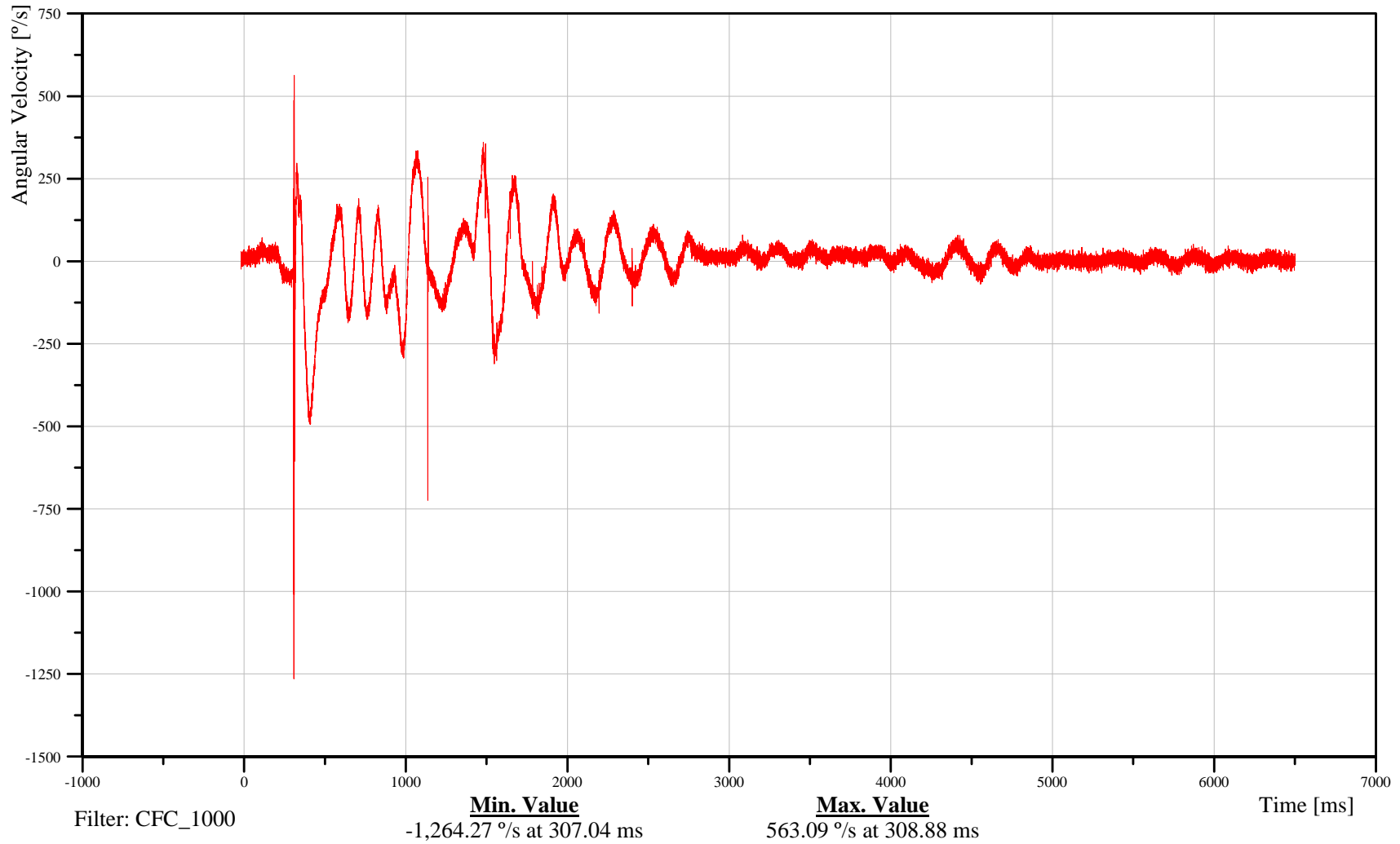
Date: 04/20/2010
Time: 14:32

Customer: VRTC

13HEADCG00H3AVYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-38

100420



Corkscrew Rollover 2007 Ford Expedition
Right Front Passenger Head (DTS ARS) Rate Gyro Z

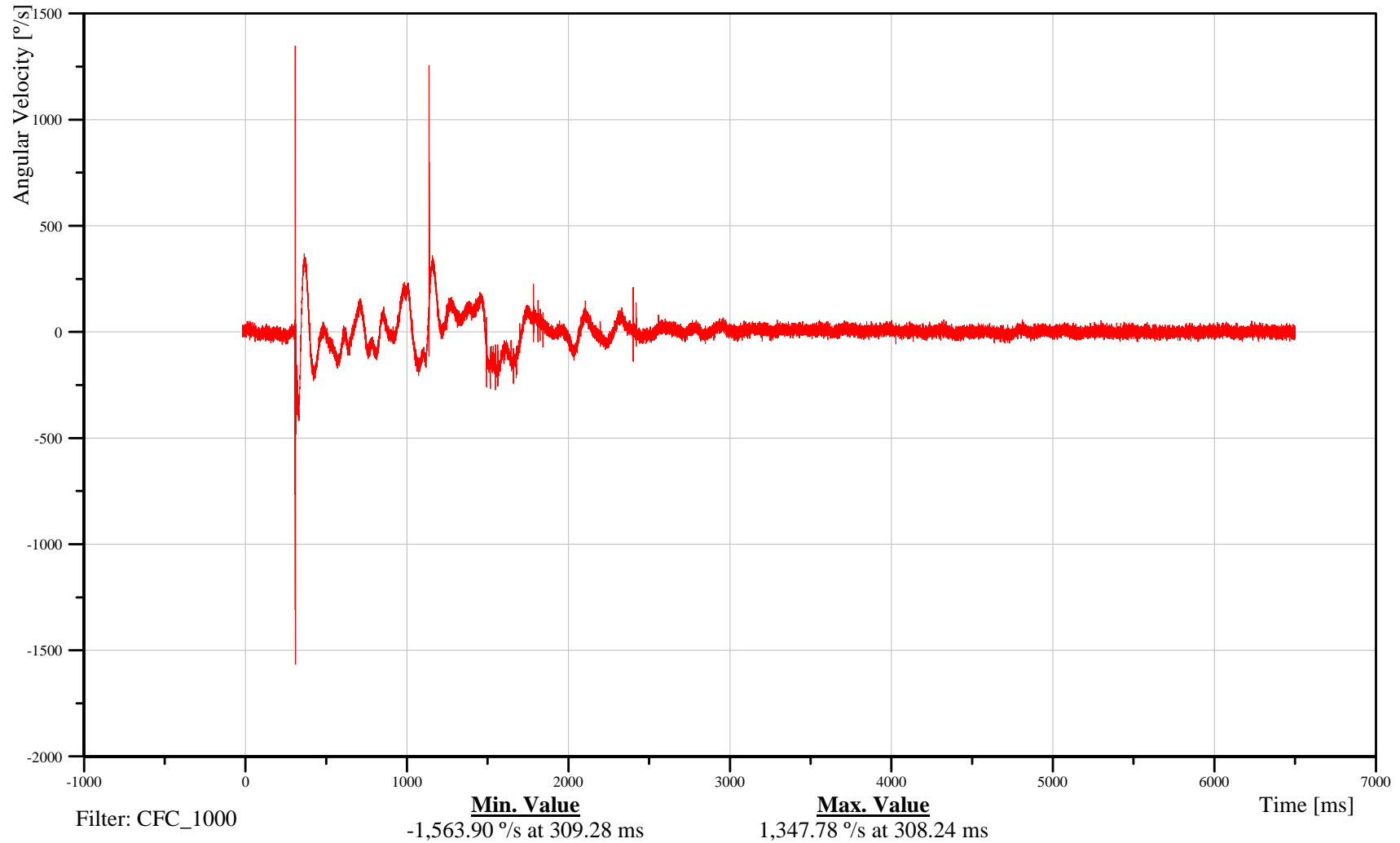
Date: 04/20/2010
Time: 14:32

Customer: VRTC

13HEADCG00H3AVZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-39

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

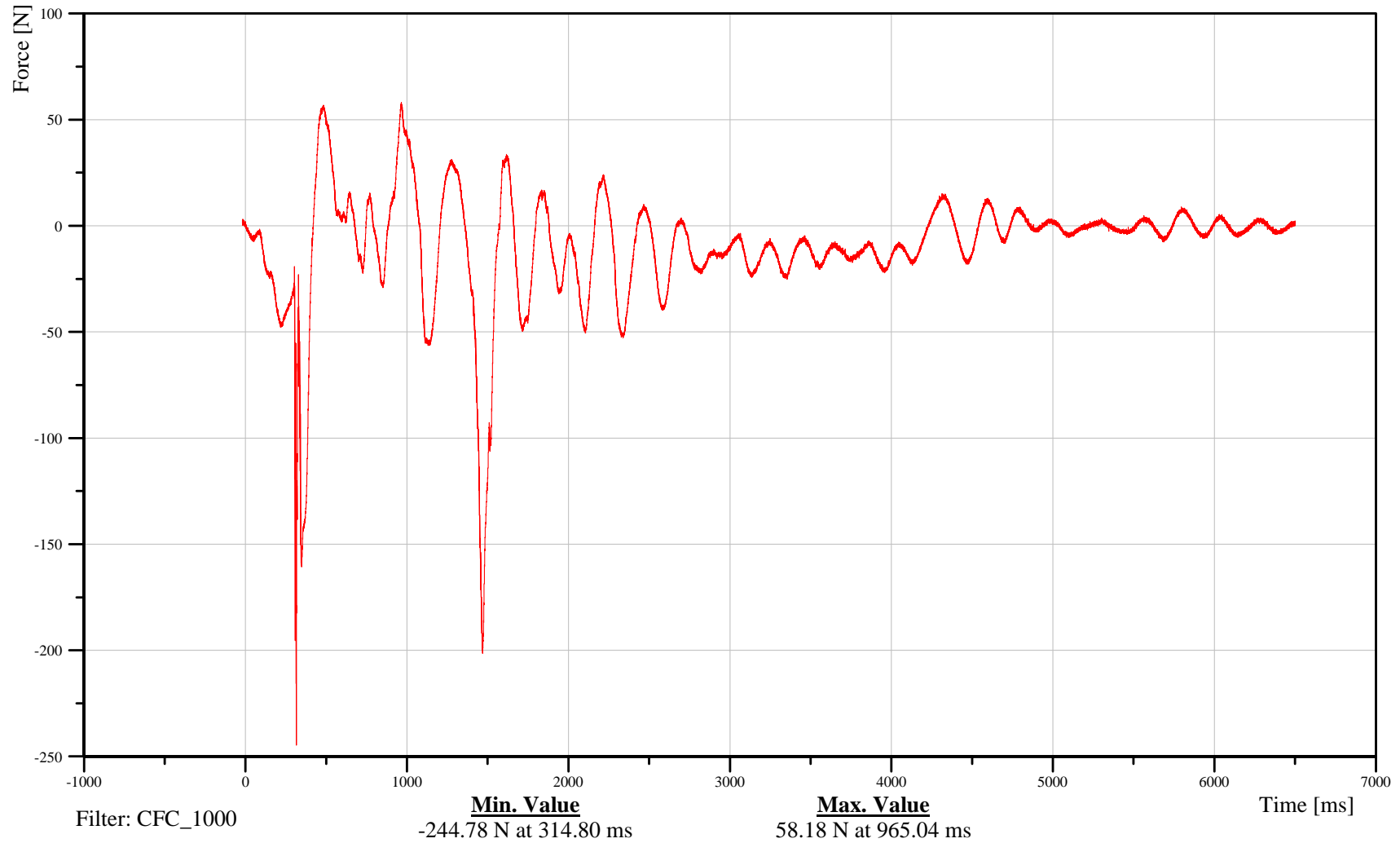
Right Front Passenger Upper Neck X-Axis Force

Customer: VRTC

13NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-40

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Upper Neck Y-Axis Force

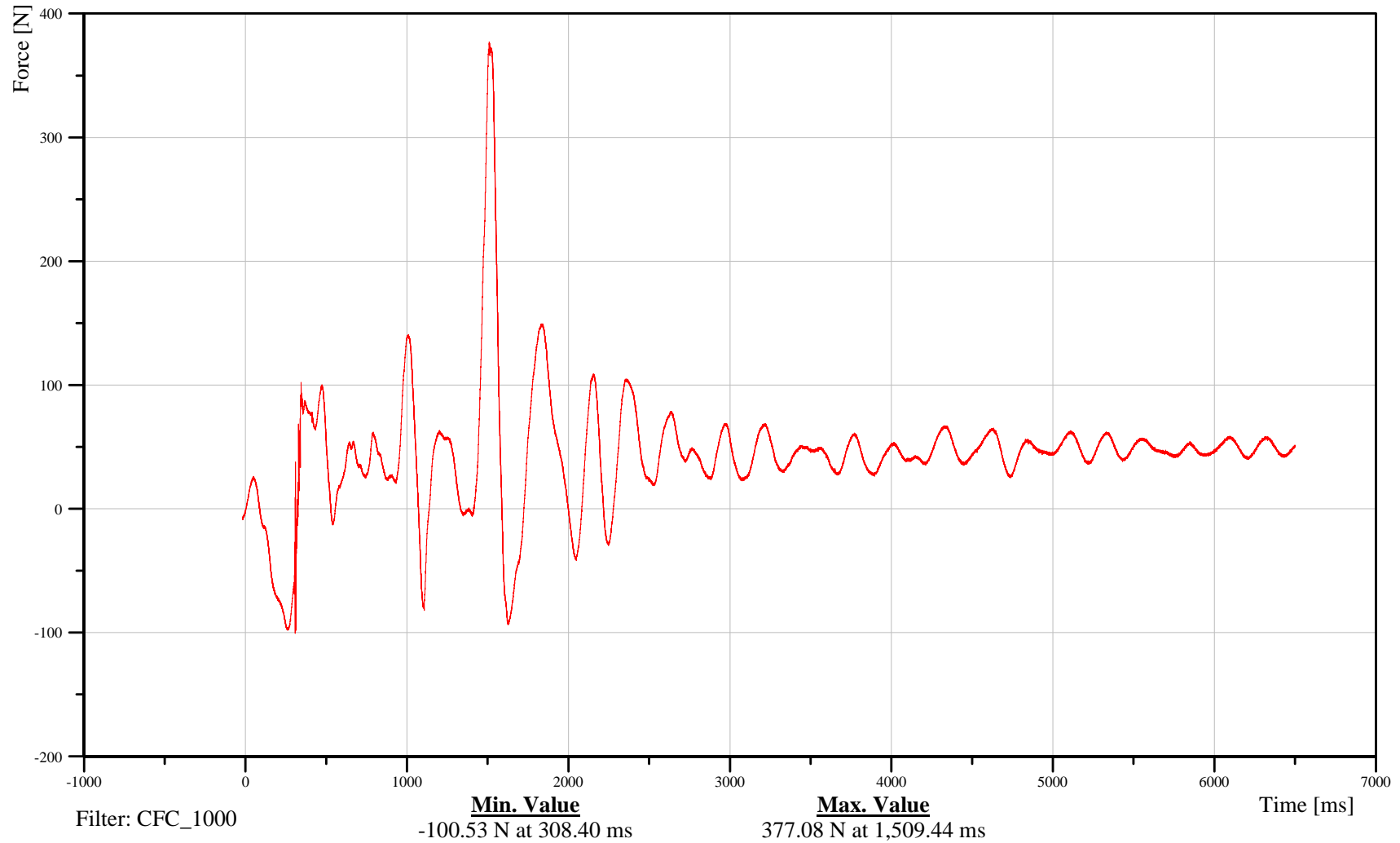
Time: 14:32

Customer: VRTC

13NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-41

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Upper Neck Z-Axis Force

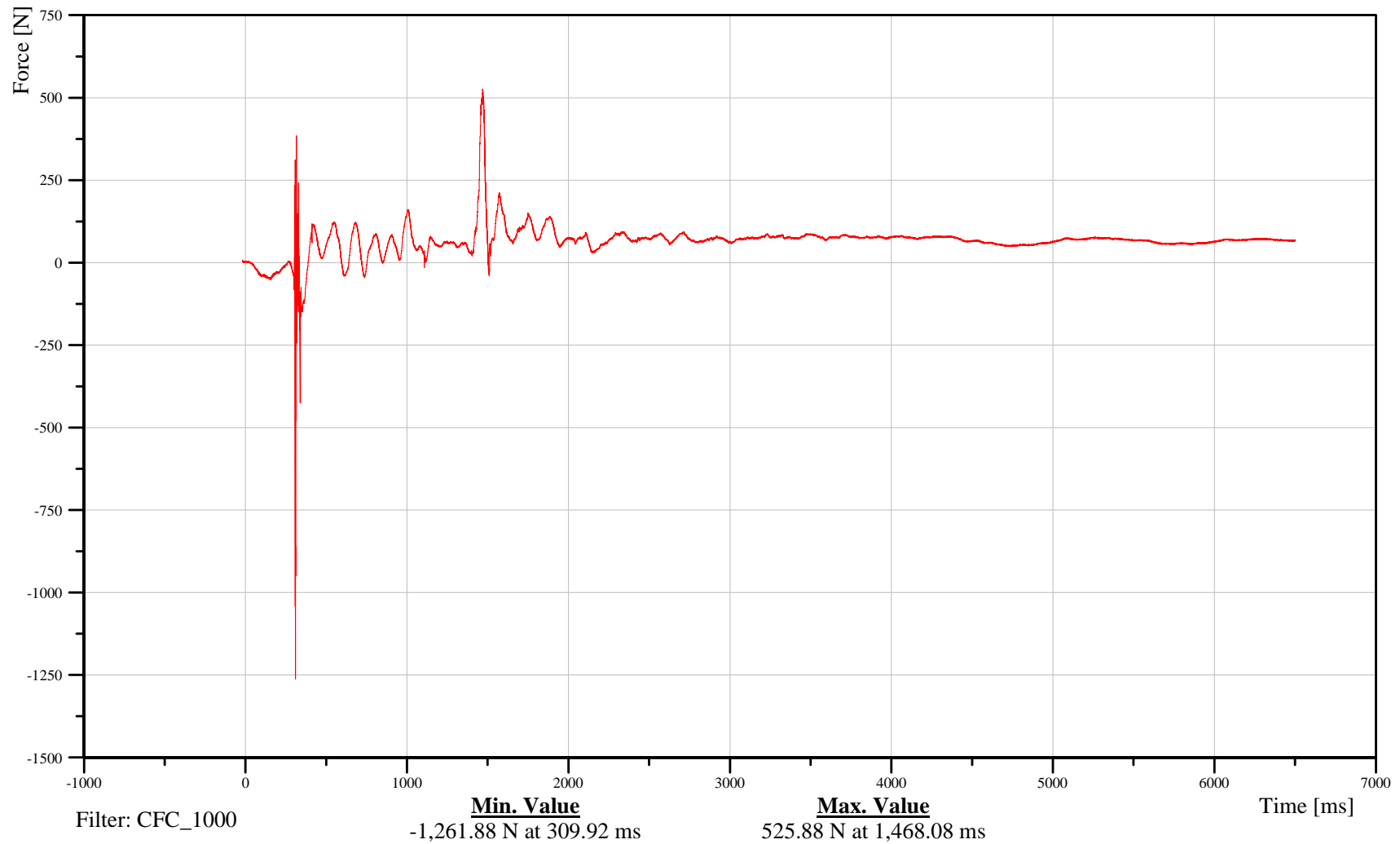
Time: 14:32

Customer: VRTC

13NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-42

100420



Corkscrew Rollover 2007 Ford Expedition

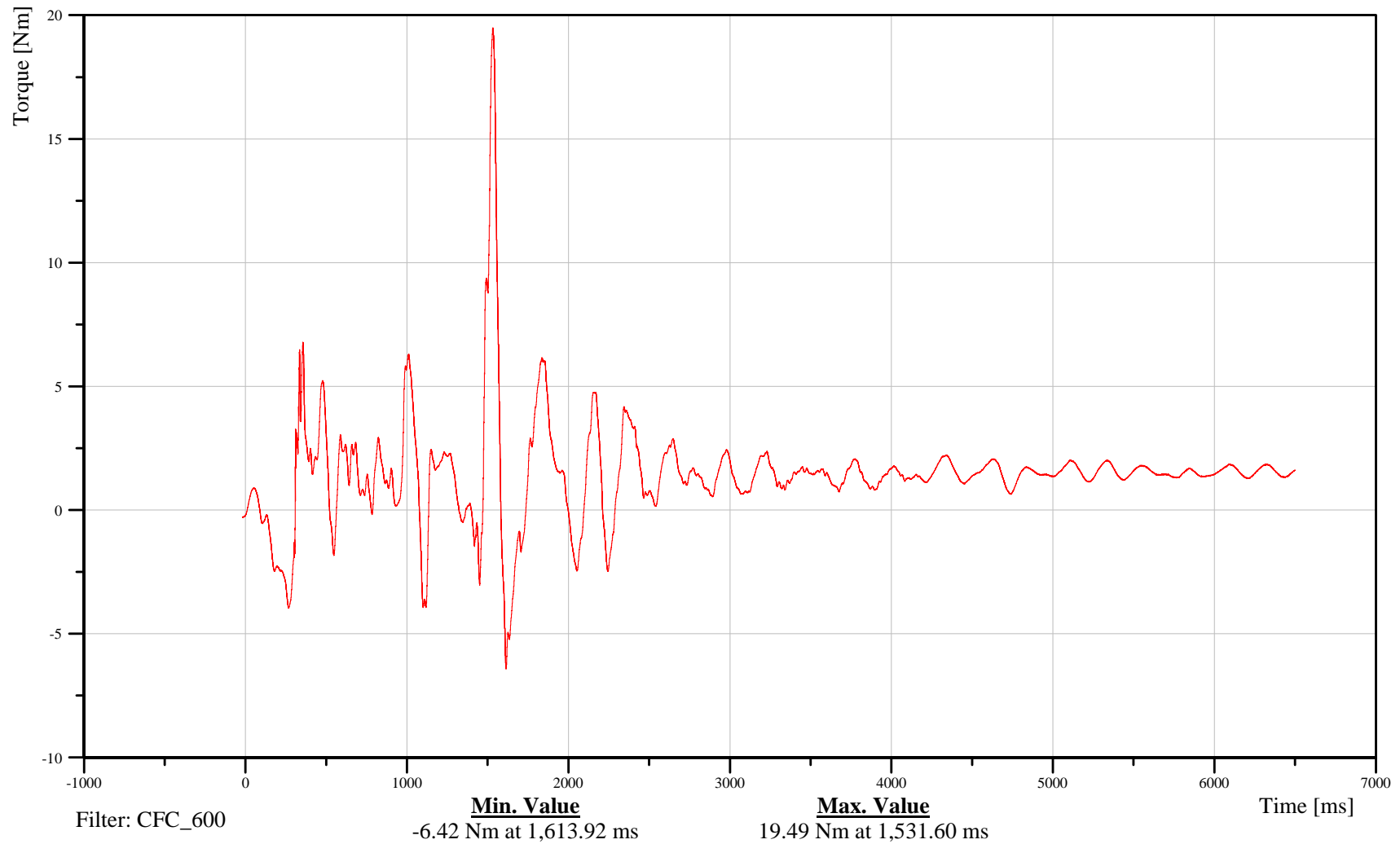
Right Front Passenger Upper Neck Moment About X Axis

Date: 04/20/2010
Time: 14:32

Customer: VRTC

13NECKUP00H3MOXB

TRC Inc. Test Lab: CTF
Test Number: 100420



B-43

100420



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

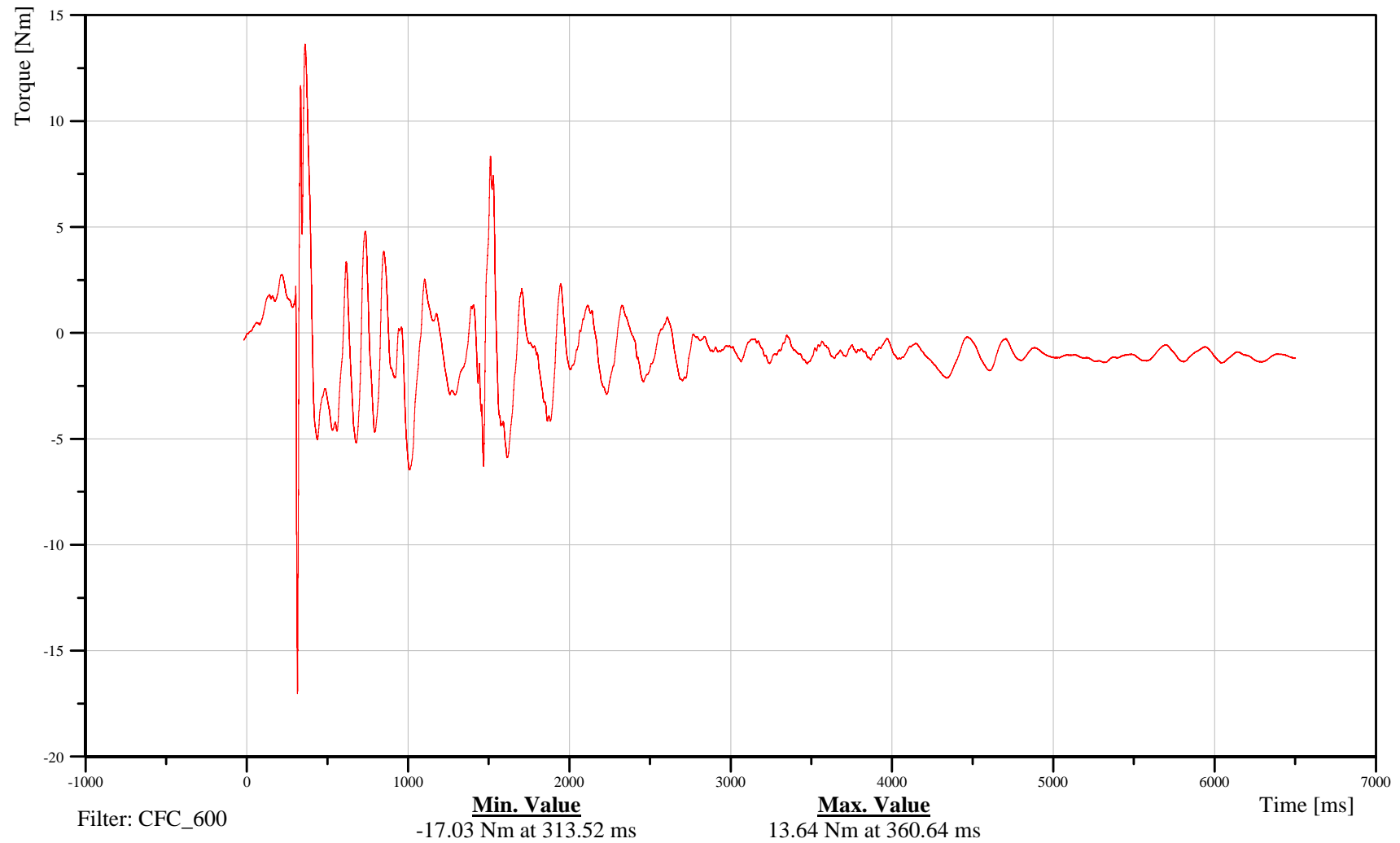
Date: 04/20/2010
Time: 14:32

Customer: VRTC

13NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-44

100420



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

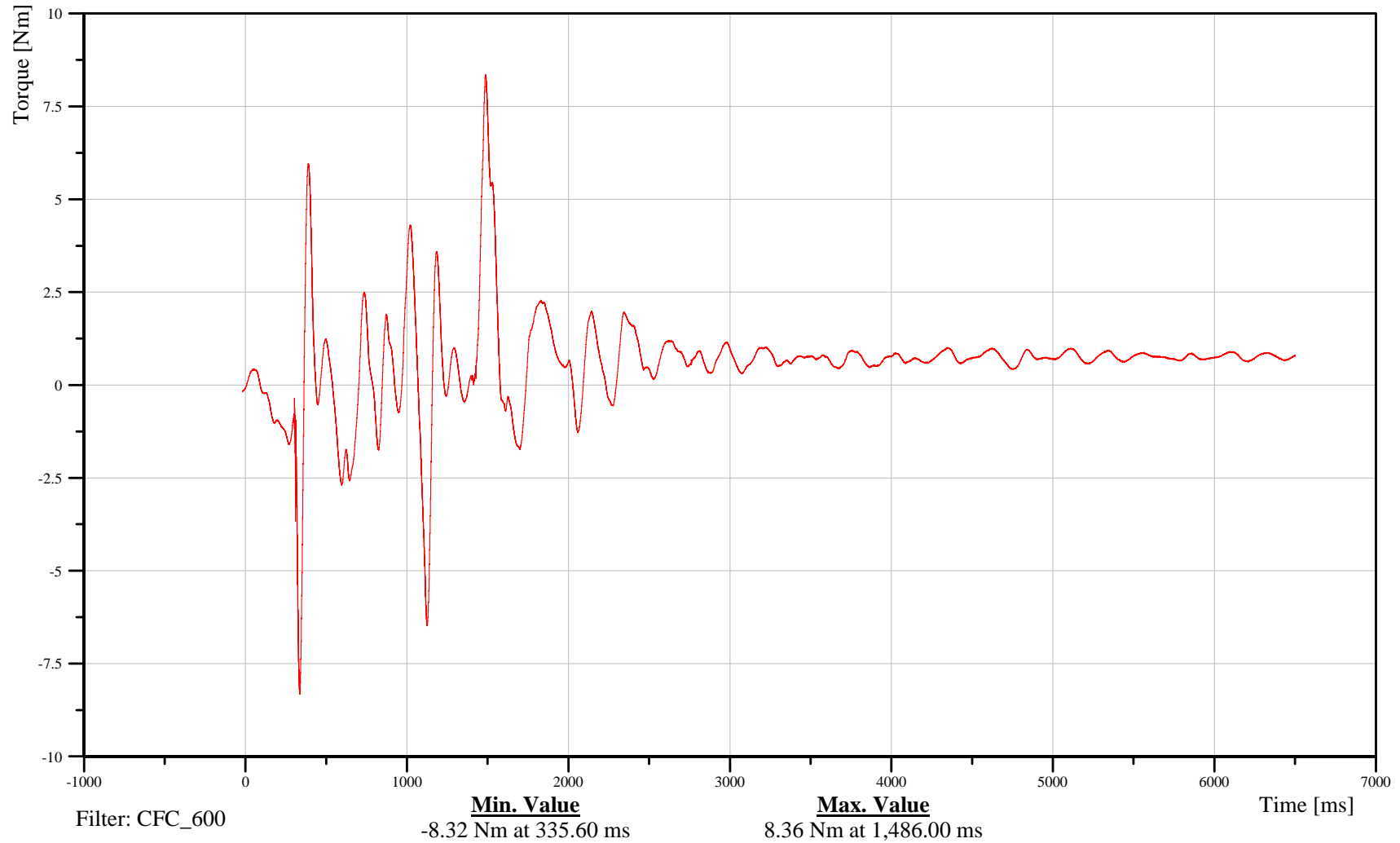
Date: 04/20/2010
Time: 14:32

Customer: VRTC

13NECKUP00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-45

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Chest X-Axis Acceleration

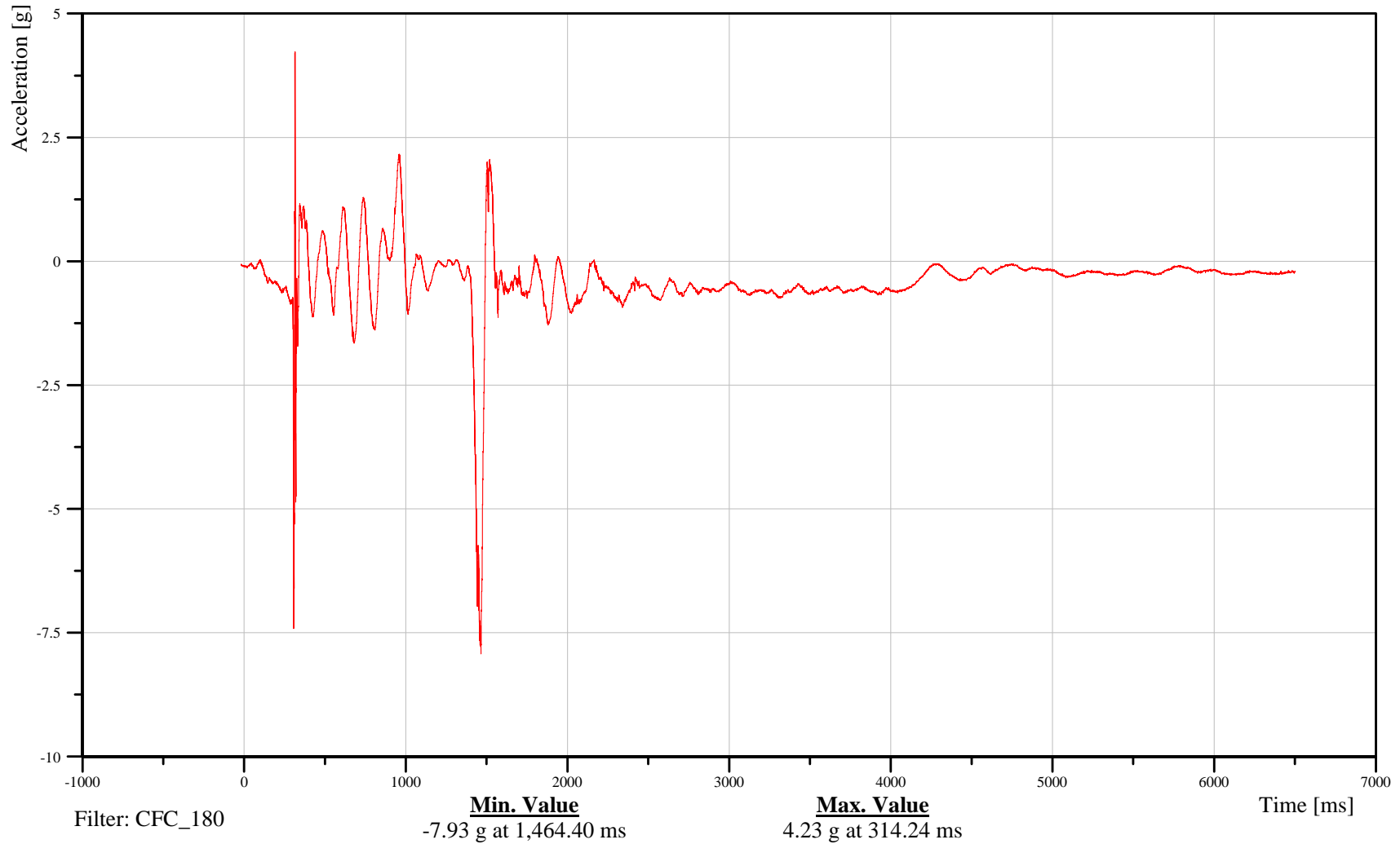
Time: 14:32

Customer: VRTC

13CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-46

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Chest Y-Axis Acceleration

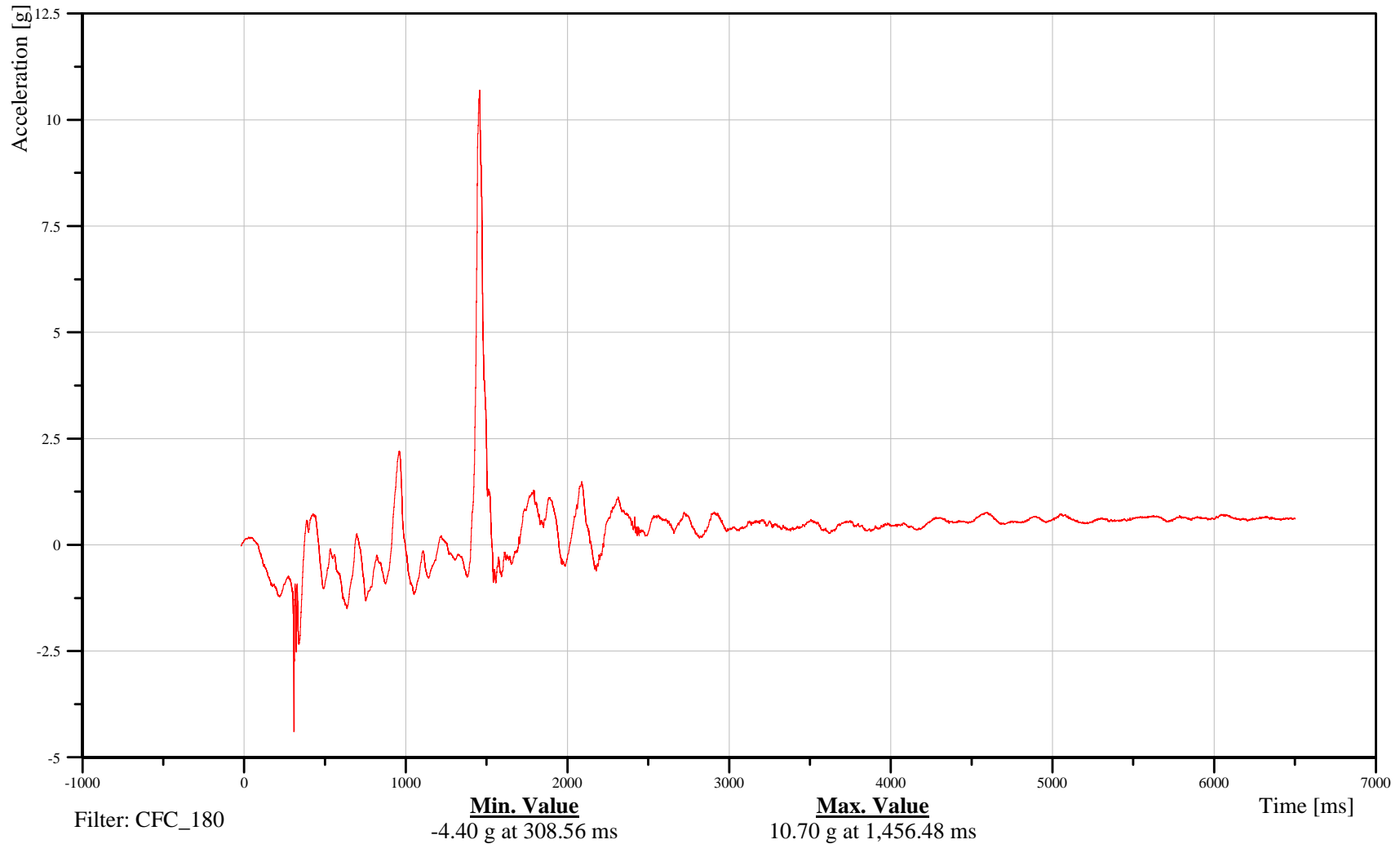
Time: 14:32

Customer: VRTC

13CHSTCG00H3ACYC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-47

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Chest Z-Axis Acceleration

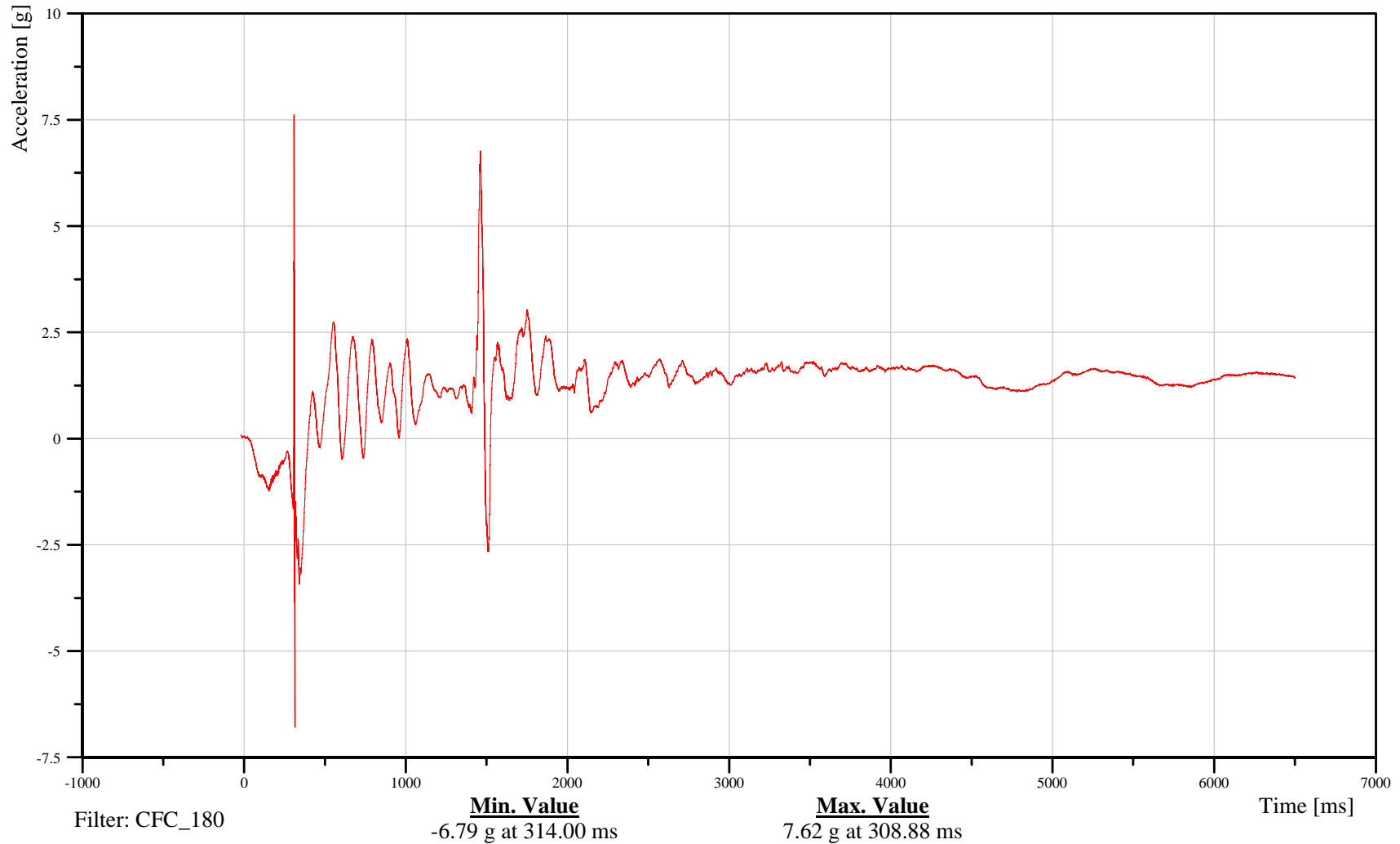
Time: 14:32

Customer: VRTC

13CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-48

100420



Corkscrew Rollover 2007 Ford Expedition

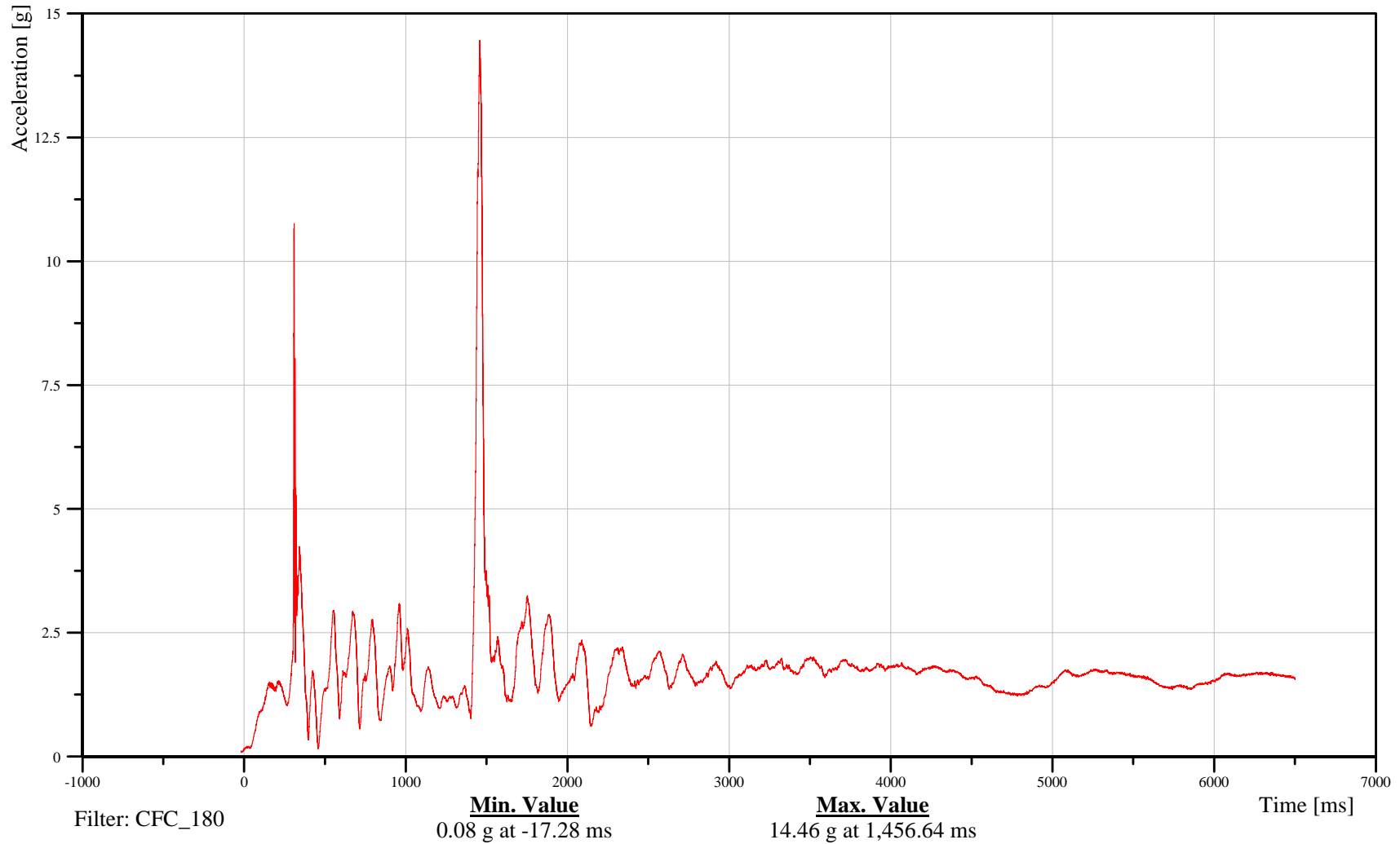
Right Front Passenger Chest Resultant Acceleration

Date: 04/20/2010
Time: 14:32

Customer: VRTC

13CHSTCG00H3ACRC

TRC Inc. Test Lab: CTF
Test Number: 100420



B-49

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

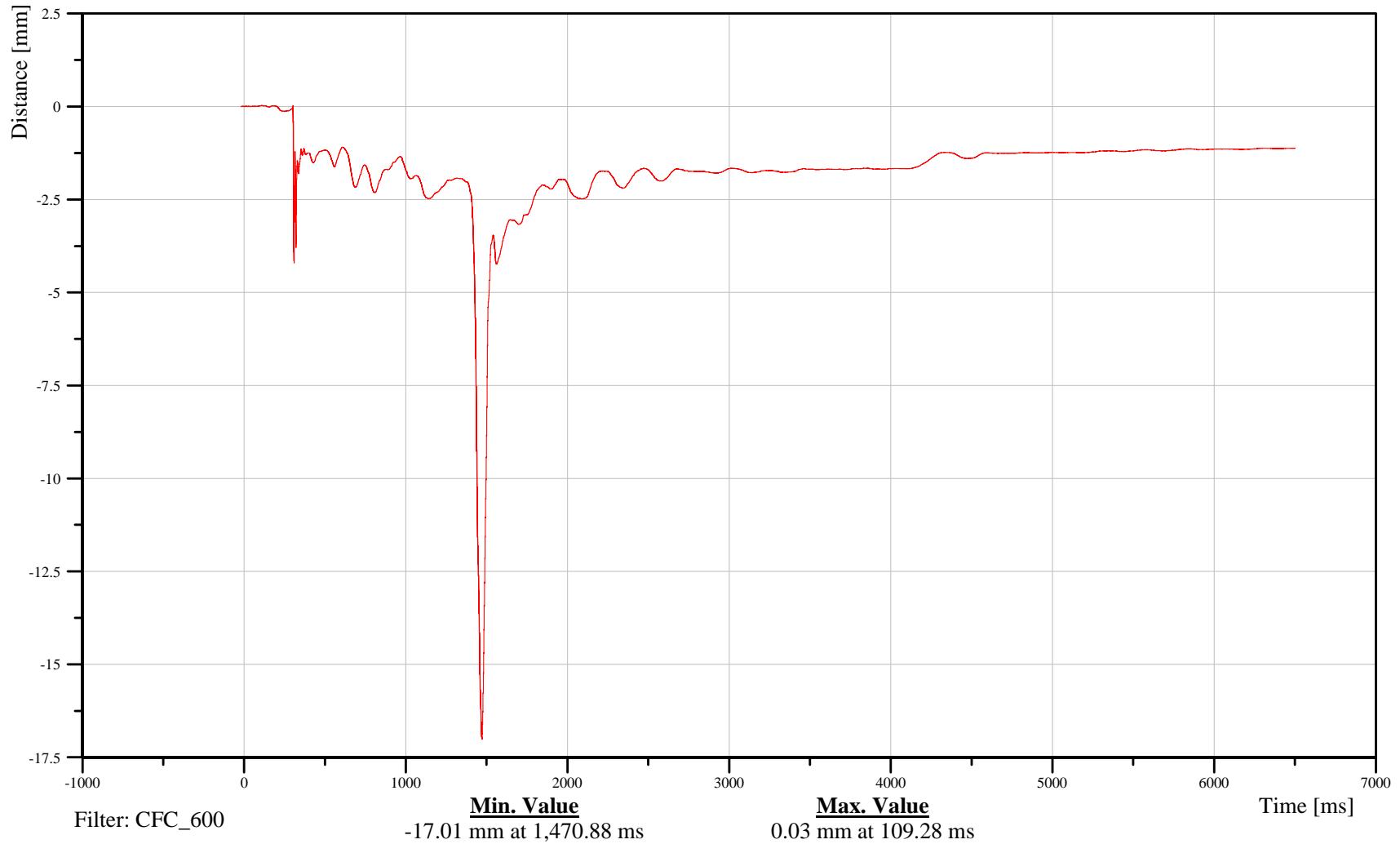
Right Front Passenger Chest X-Axis Displacement

Customer: VRTC

13CHST0000H3DSXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-50

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Lower Neck X-Axis Force

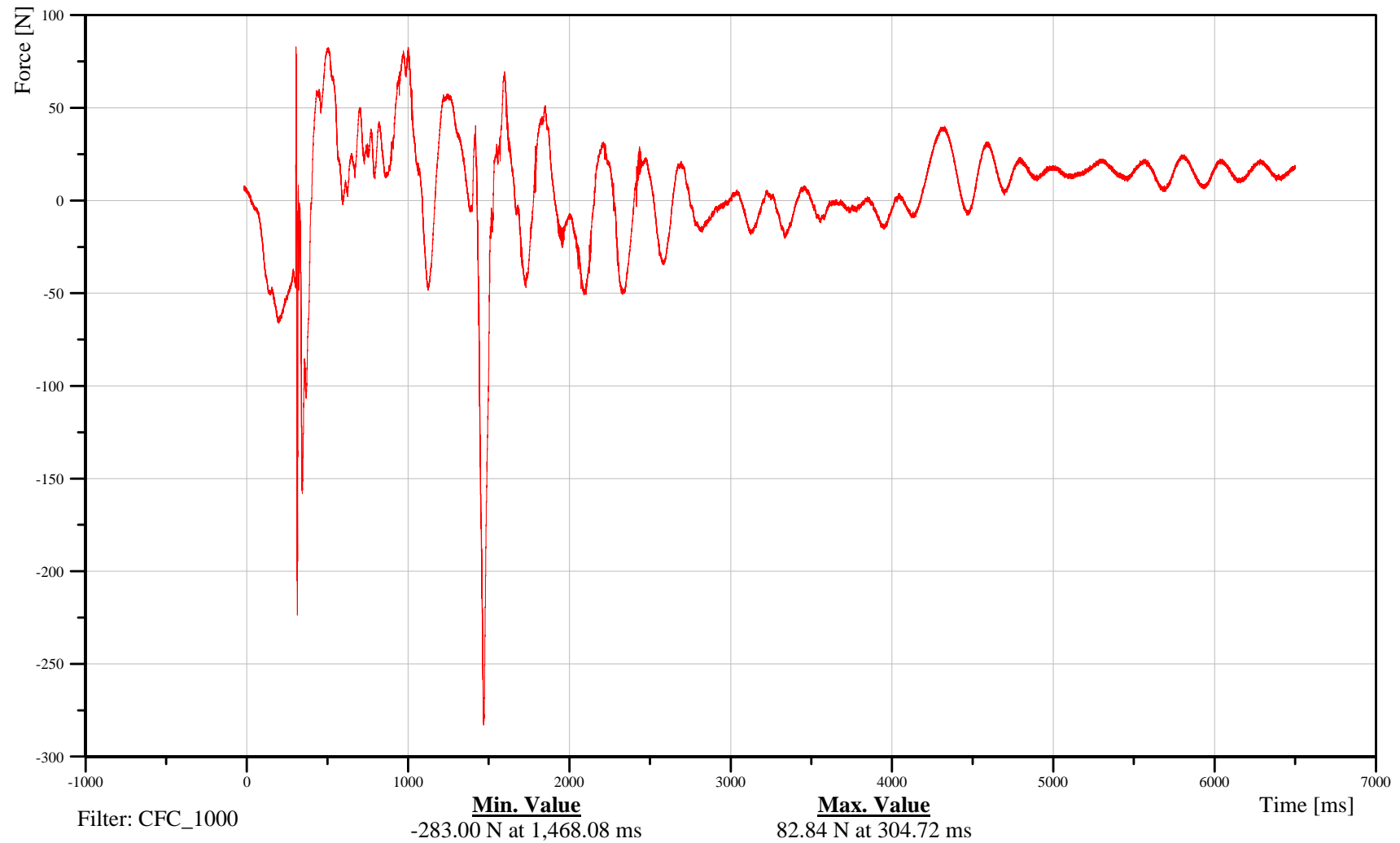
Time: 14:32

Customer: VRTC

13NECKLO00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-51

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

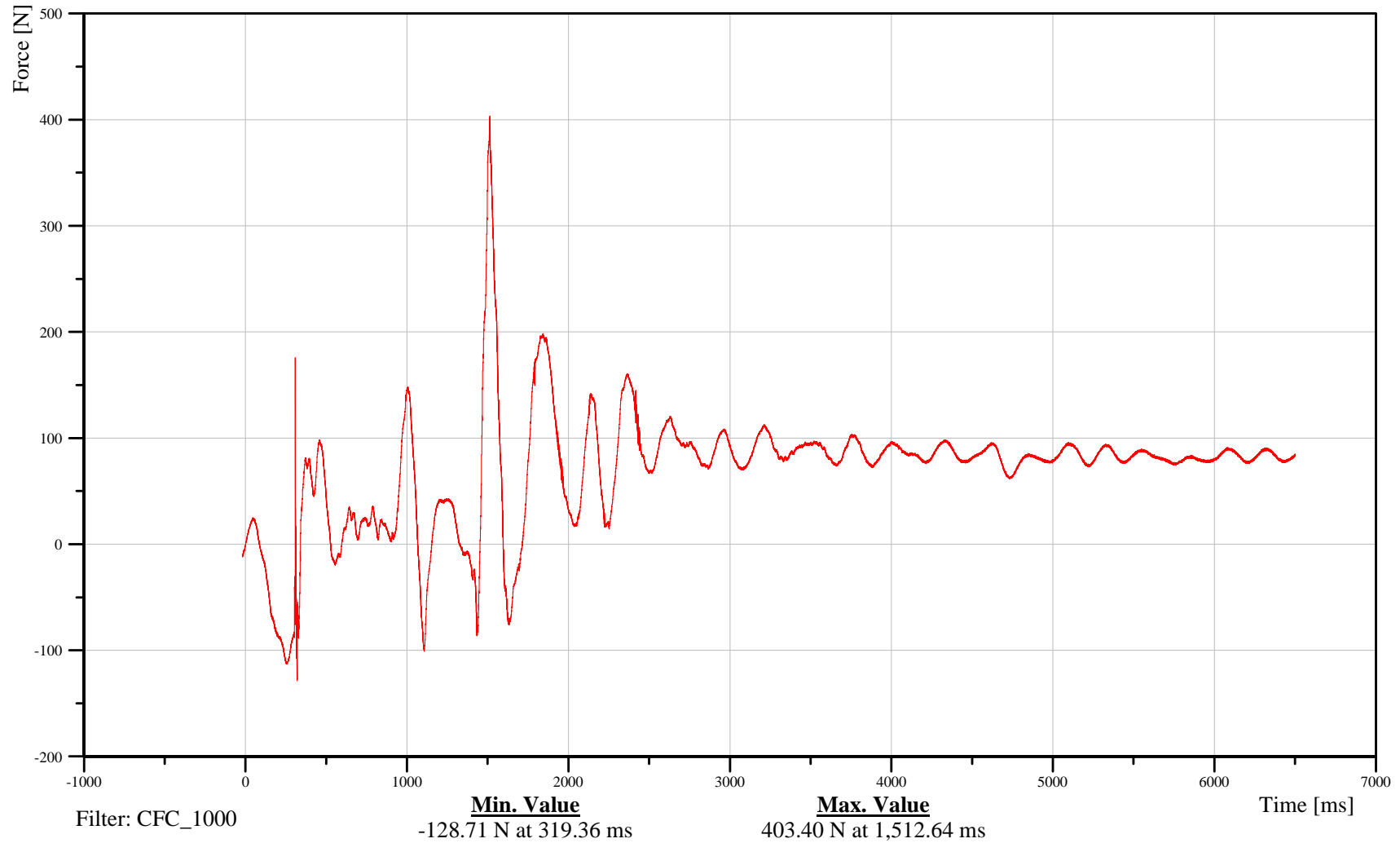
Right Front Passenger Lower Neck Y-Axis Force

Customer: VRTC

13NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-52

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

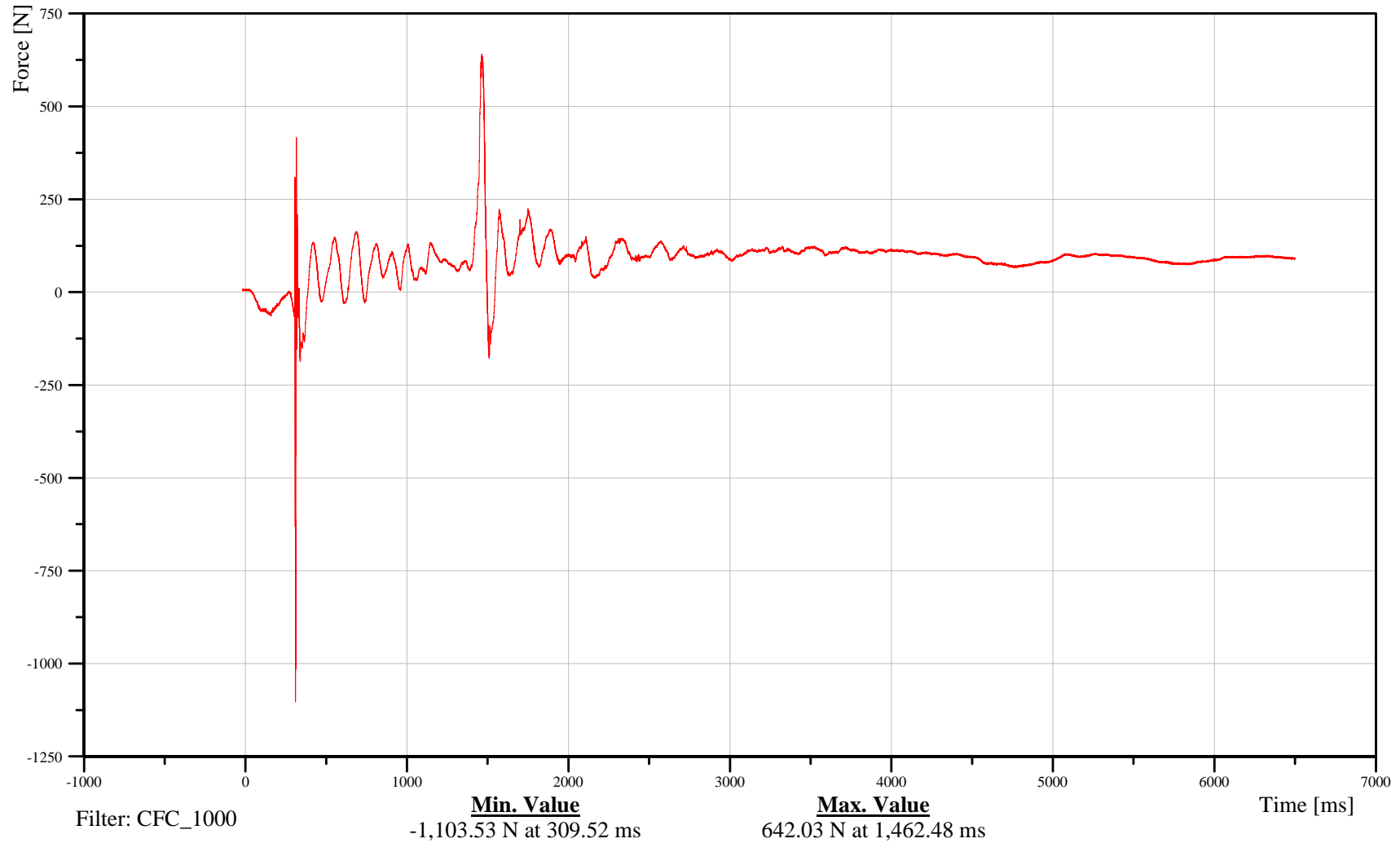
Right Front Passenger Lower Neck Z-Axis Force

Customer: VRTC

13NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-53

100420



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

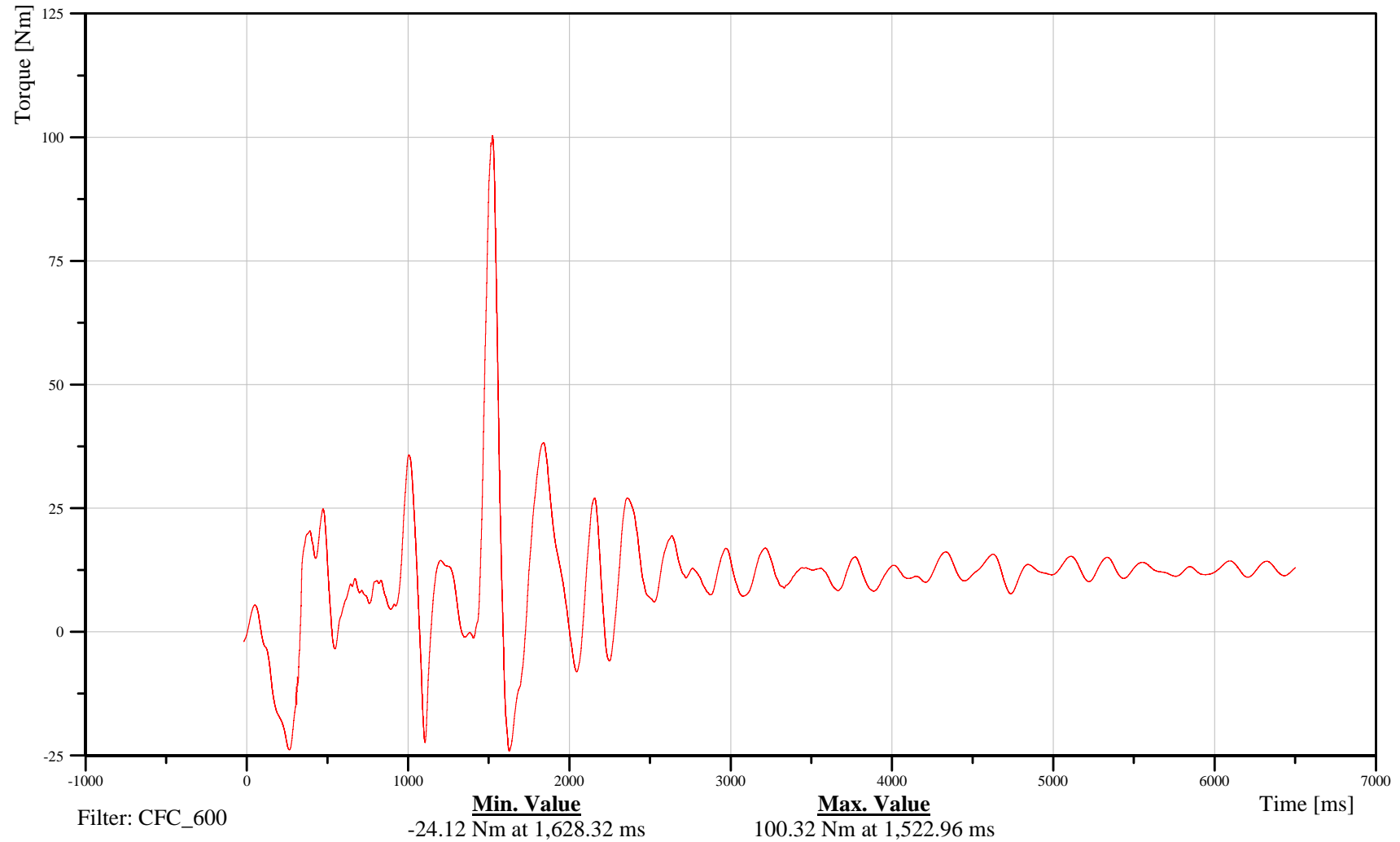
Date: 04/20/2010
Time: 14:32

Customer: VRTC

13NECKLO00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-54

100420



Corkscrew Rollover 2007 Ford Expedition

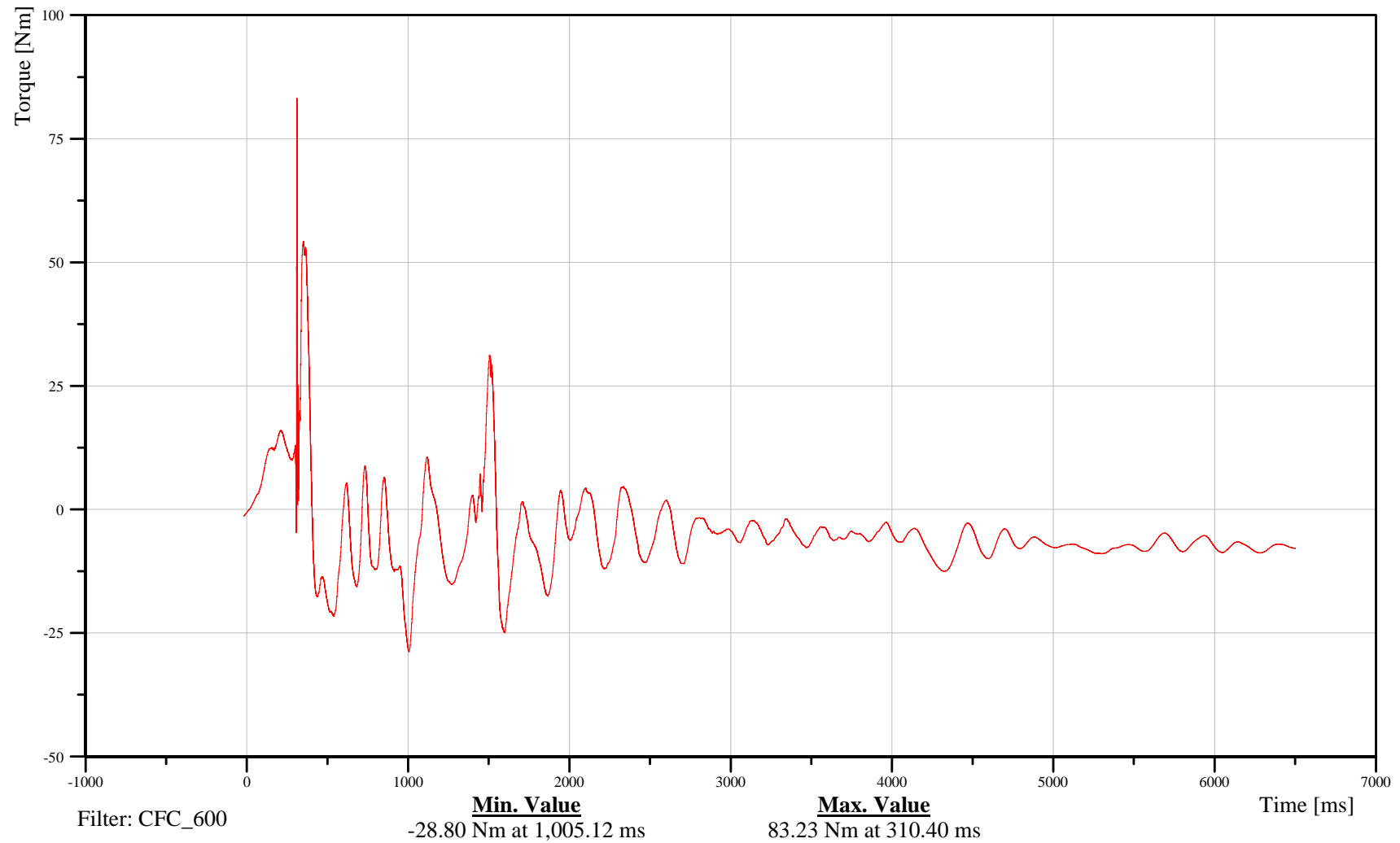
Right Front Passenger Lower Neck Moment About Y Axis

Date: 04/20/2010
Time: 14:32

Customer: VRTC

13NECKLO00H3MOYB

TRC Inc. Test Lab: CTF
Test Number: 100420



B-55

100420



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

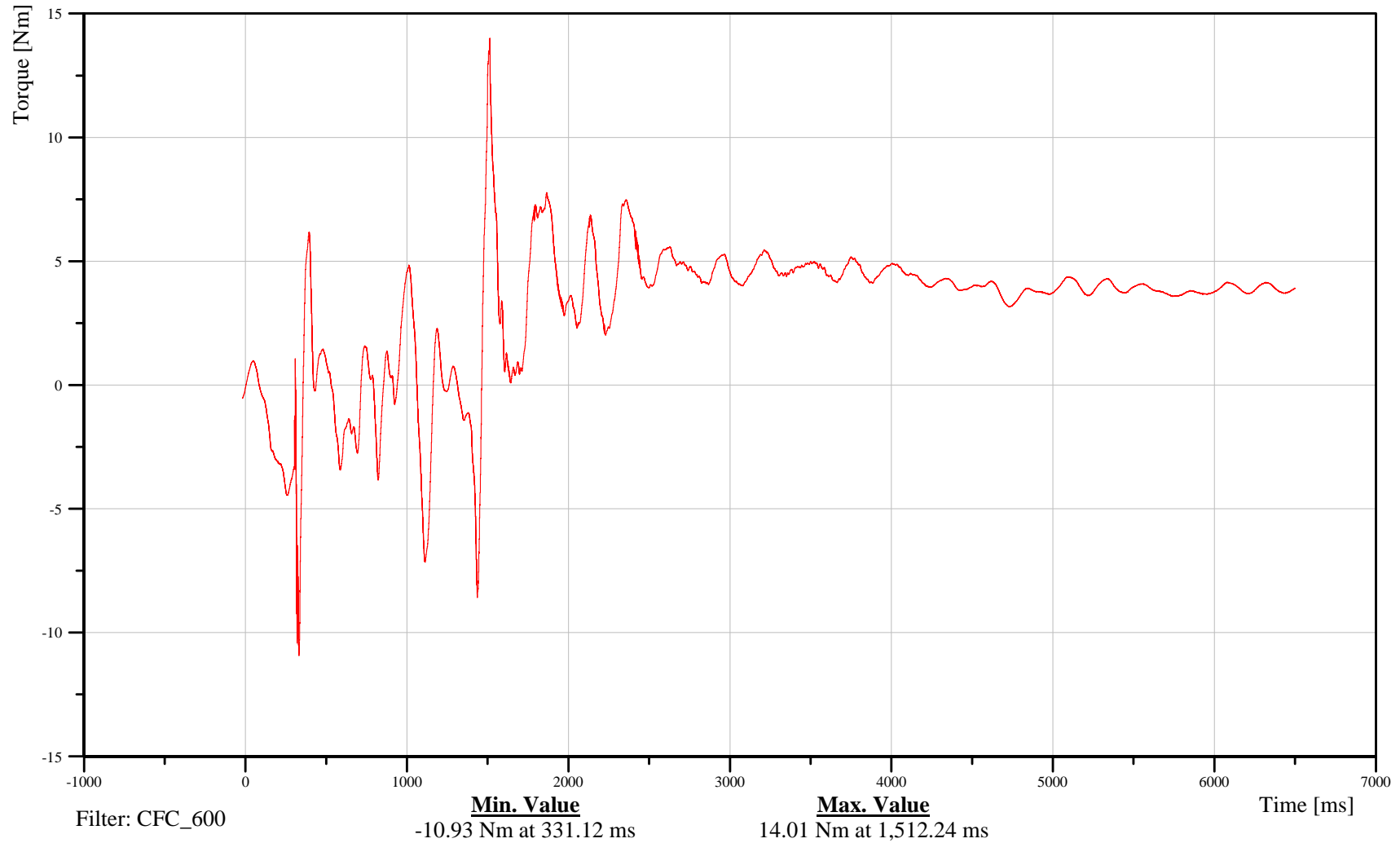
Date: 04/20/2010
Time: 14:32

Customer: VRTC

13NECKLO00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-56

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Pelvis X-Axis Acceleration

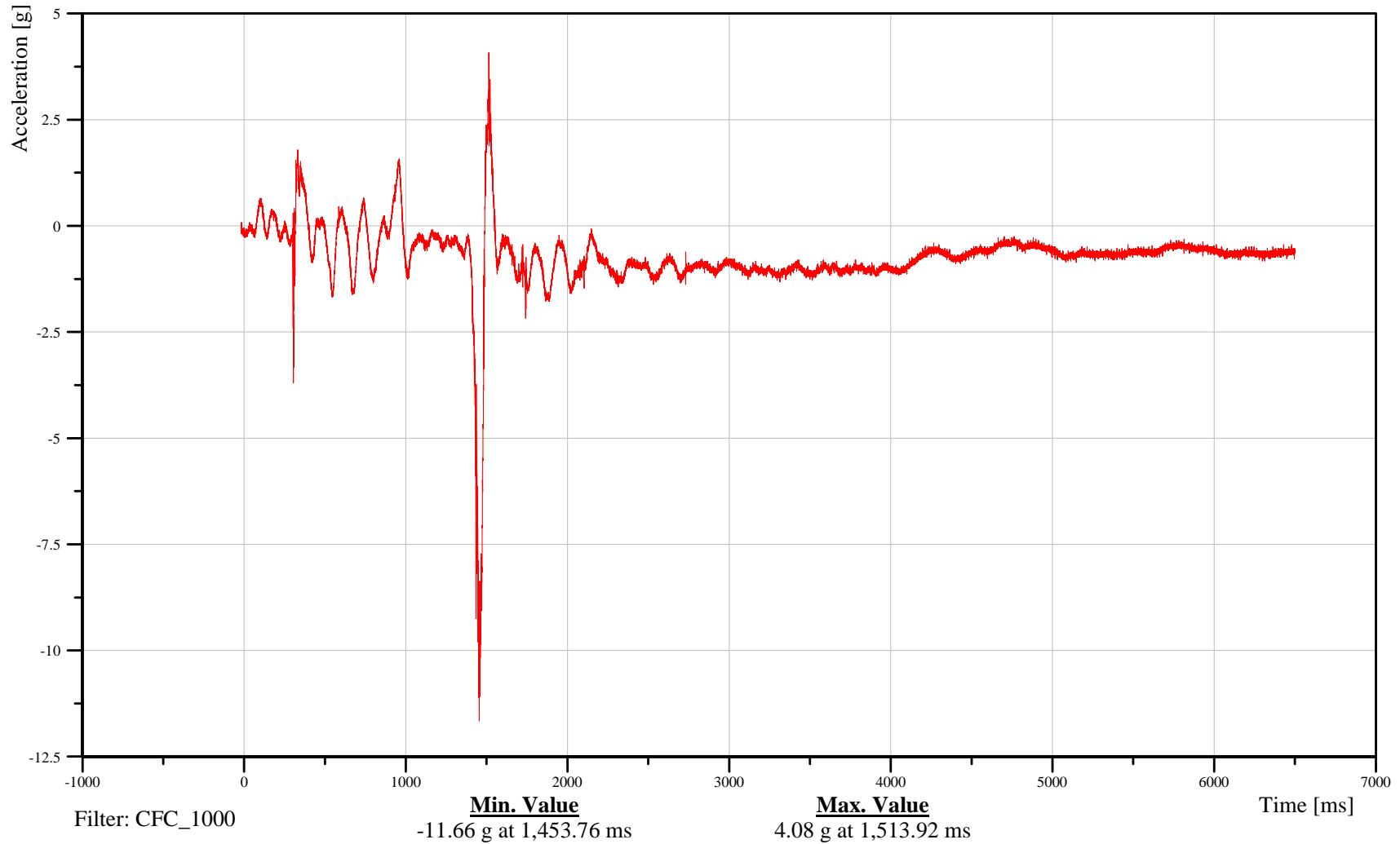
Time: 14:32

Customer: VRTC

13PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-57

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Pelvis Y-Axis Acceleration

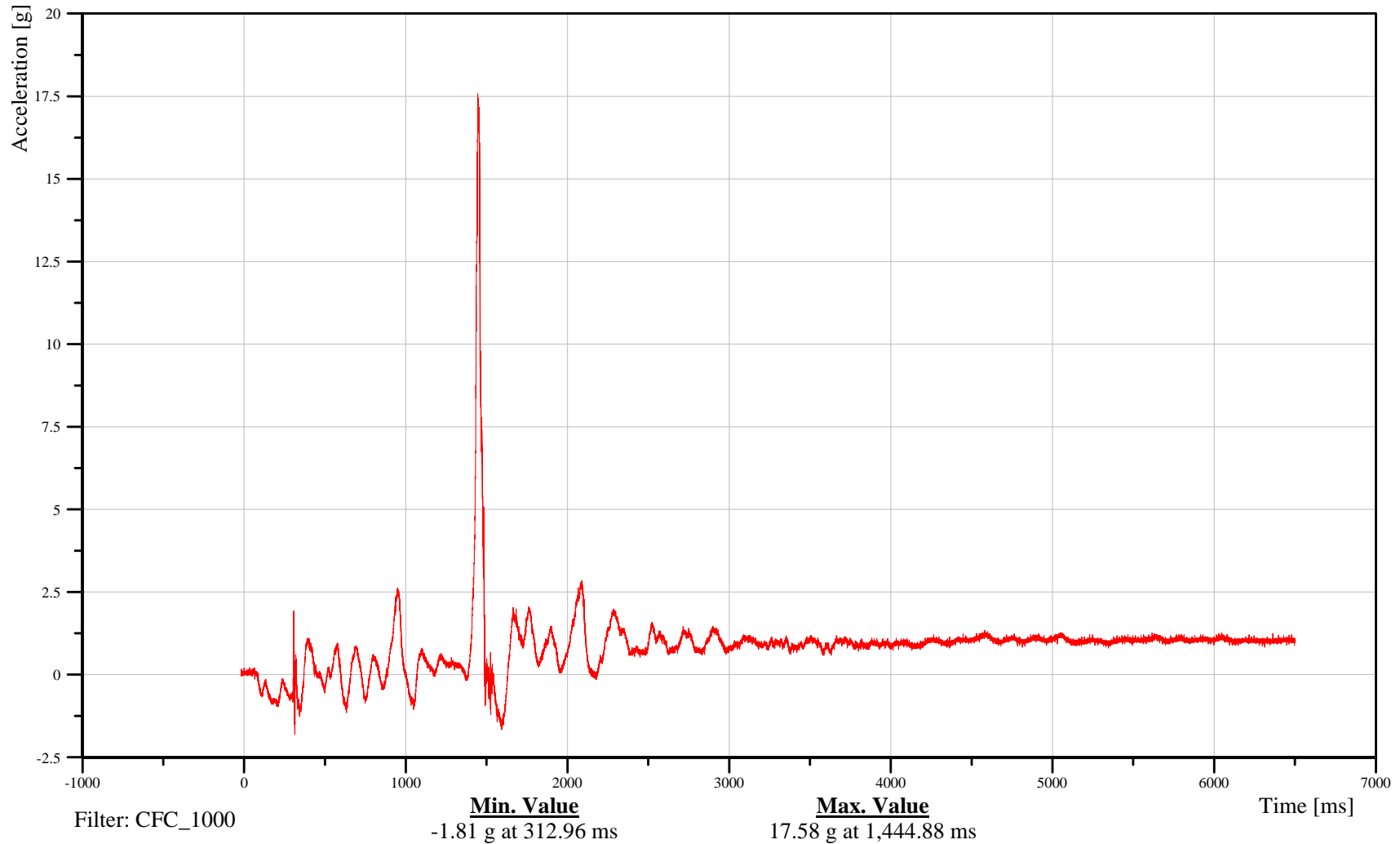
Time: 14:32

Customer: VRTC

13PELVCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-58

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Pelvis Z-Axis Acceleration

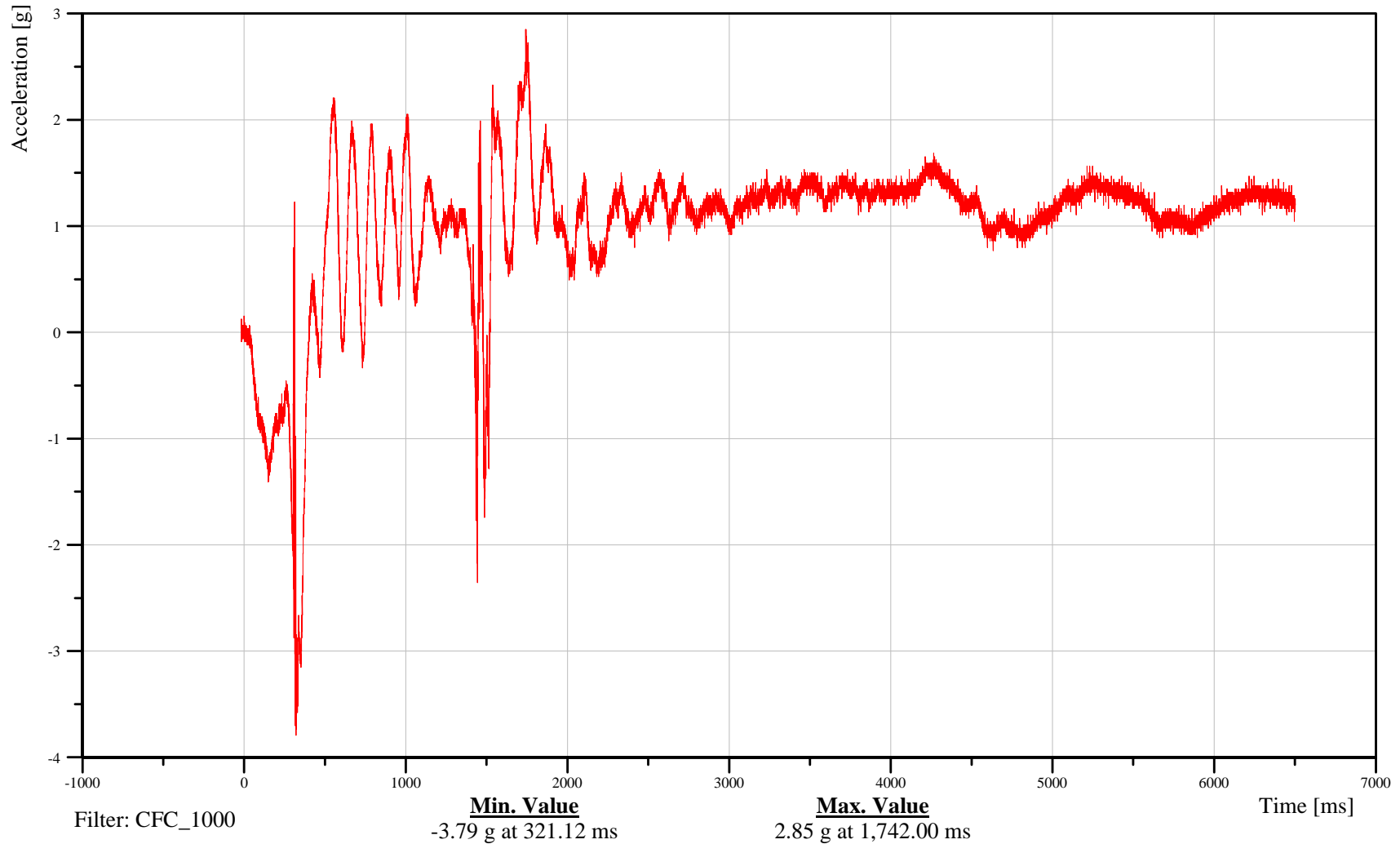
Time: 14:32

Customer: VRTC

13PELVCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-59

100420



Corkscrew Rollover 2007 Ford Expedition

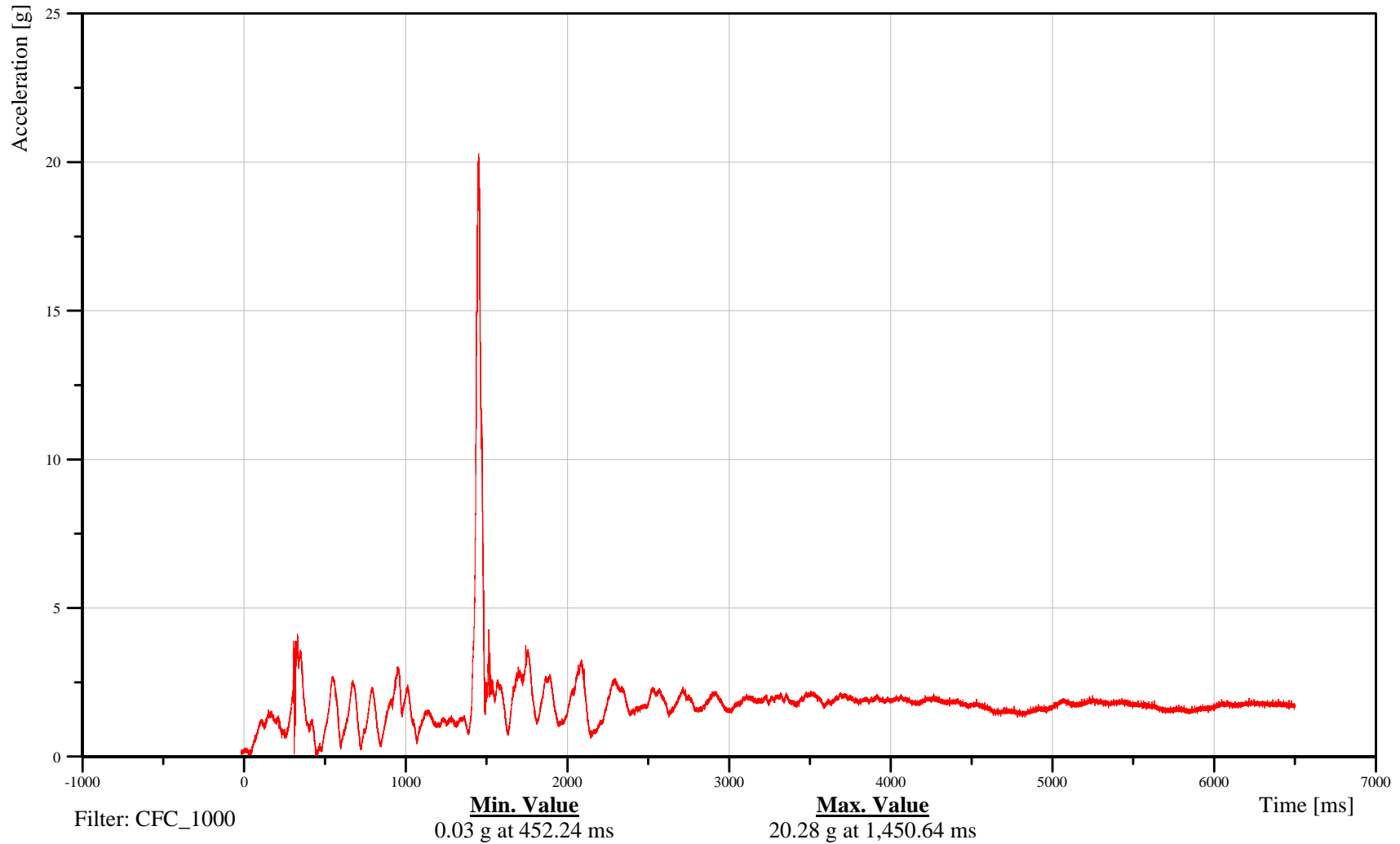
Right Front Passenger Pelvis Resultant Acceleration

Date: 04/20/2010
Time: 14:32

Customer: VRTC

13PELVCG00H3ACRA

TRC Inc. Test Lab: CTF
Test Number: 100420



B-60

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Head X-Axis Acceleration

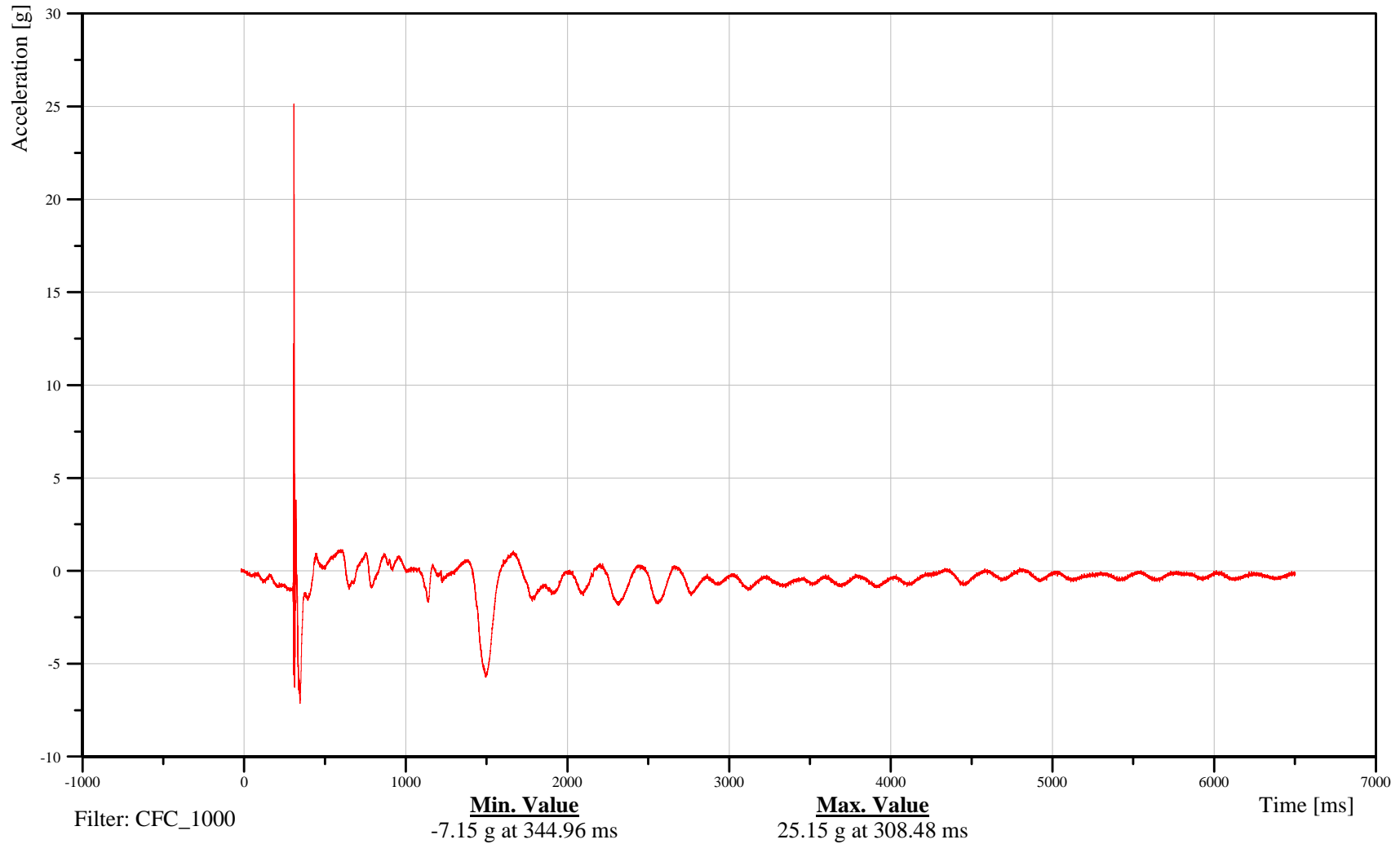
Time: 14:32

Customer: VRTC

16HEADCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-61

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Head Y-Axis Acceleration

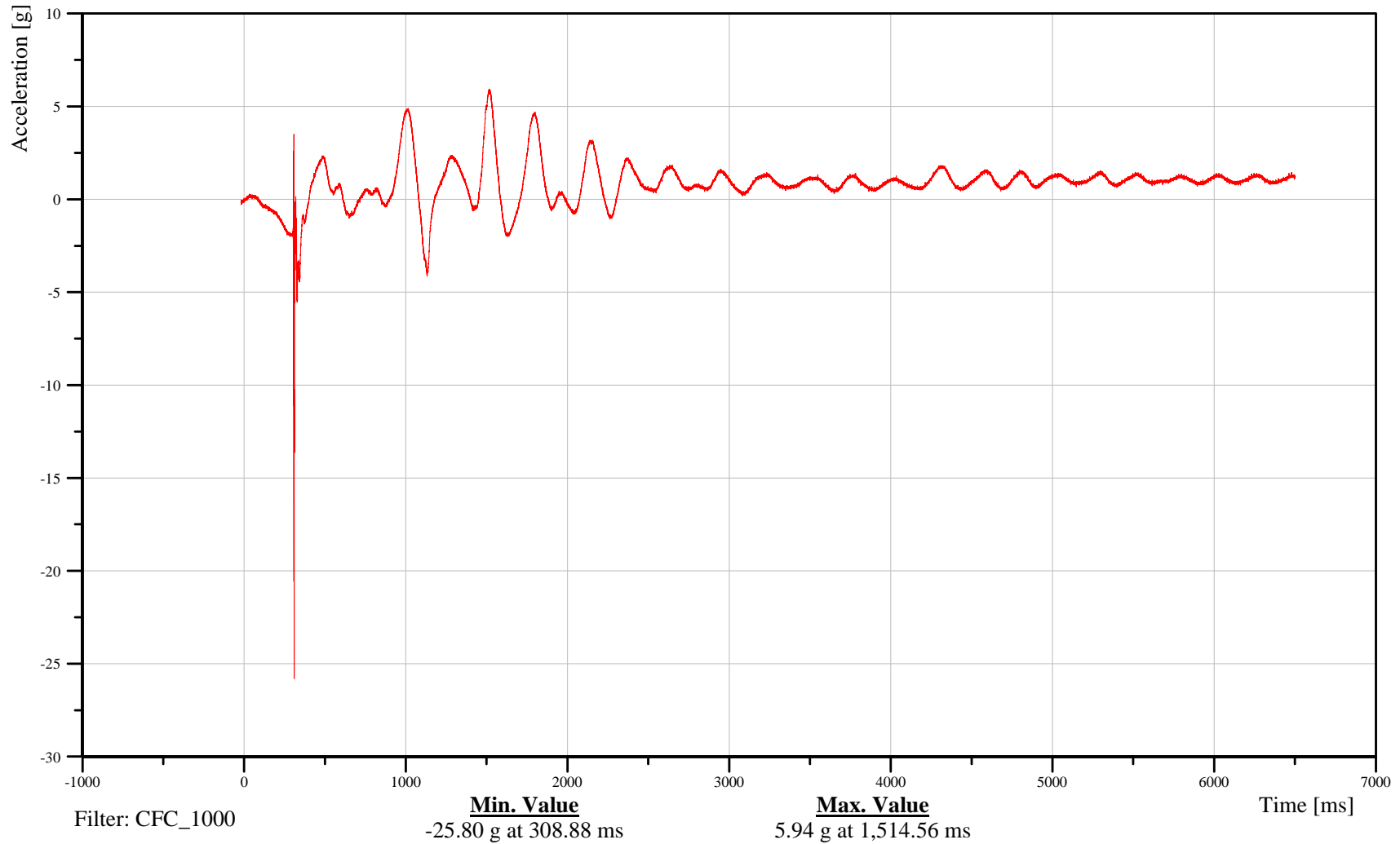
Time: 14:32

Customer: VRTC

16HEADCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-62

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

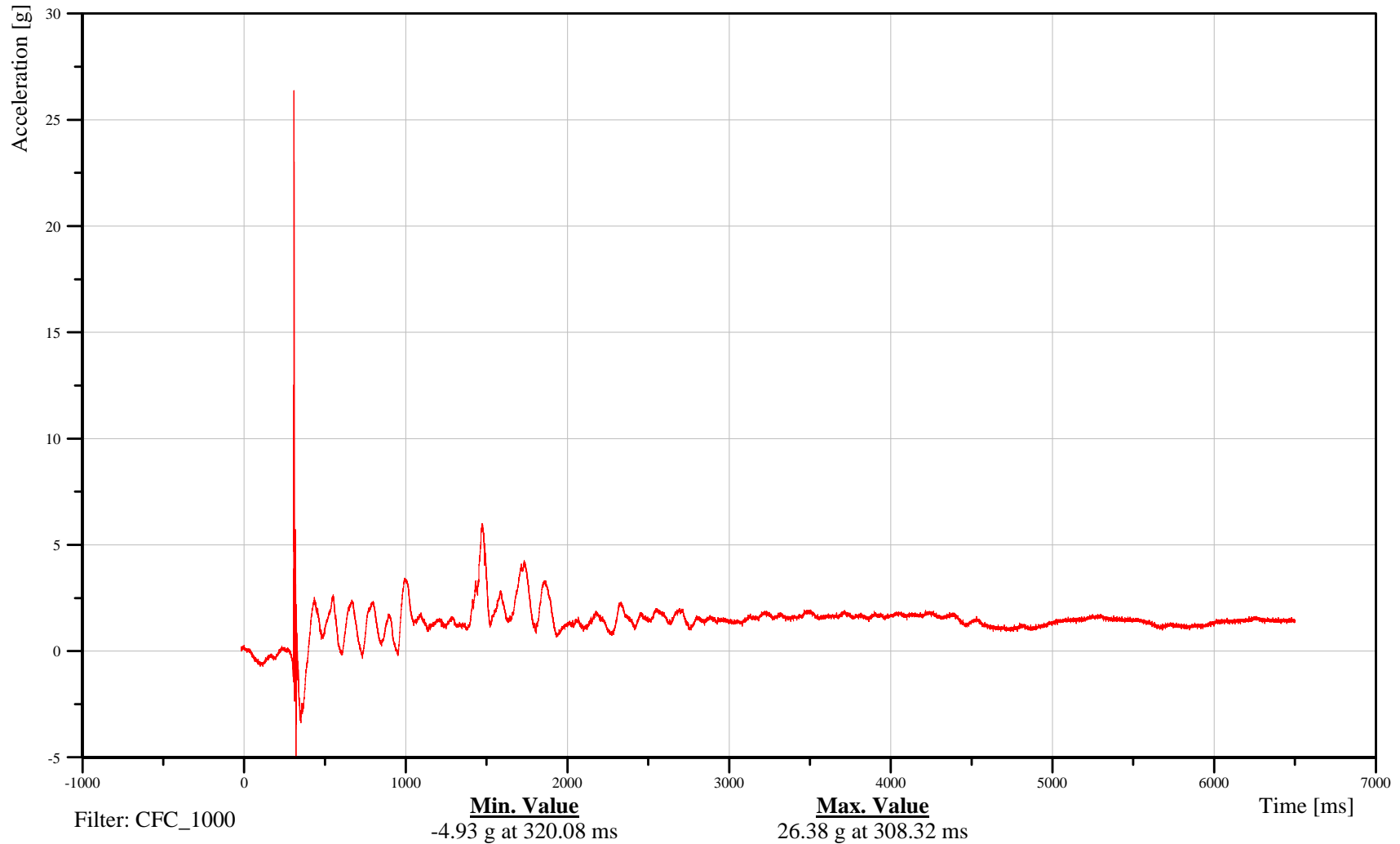
Right Rear Passenger Head Z-Axis Acceleration

Customer: VRTC

16HEADCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-63

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Head Resultant Acceleration

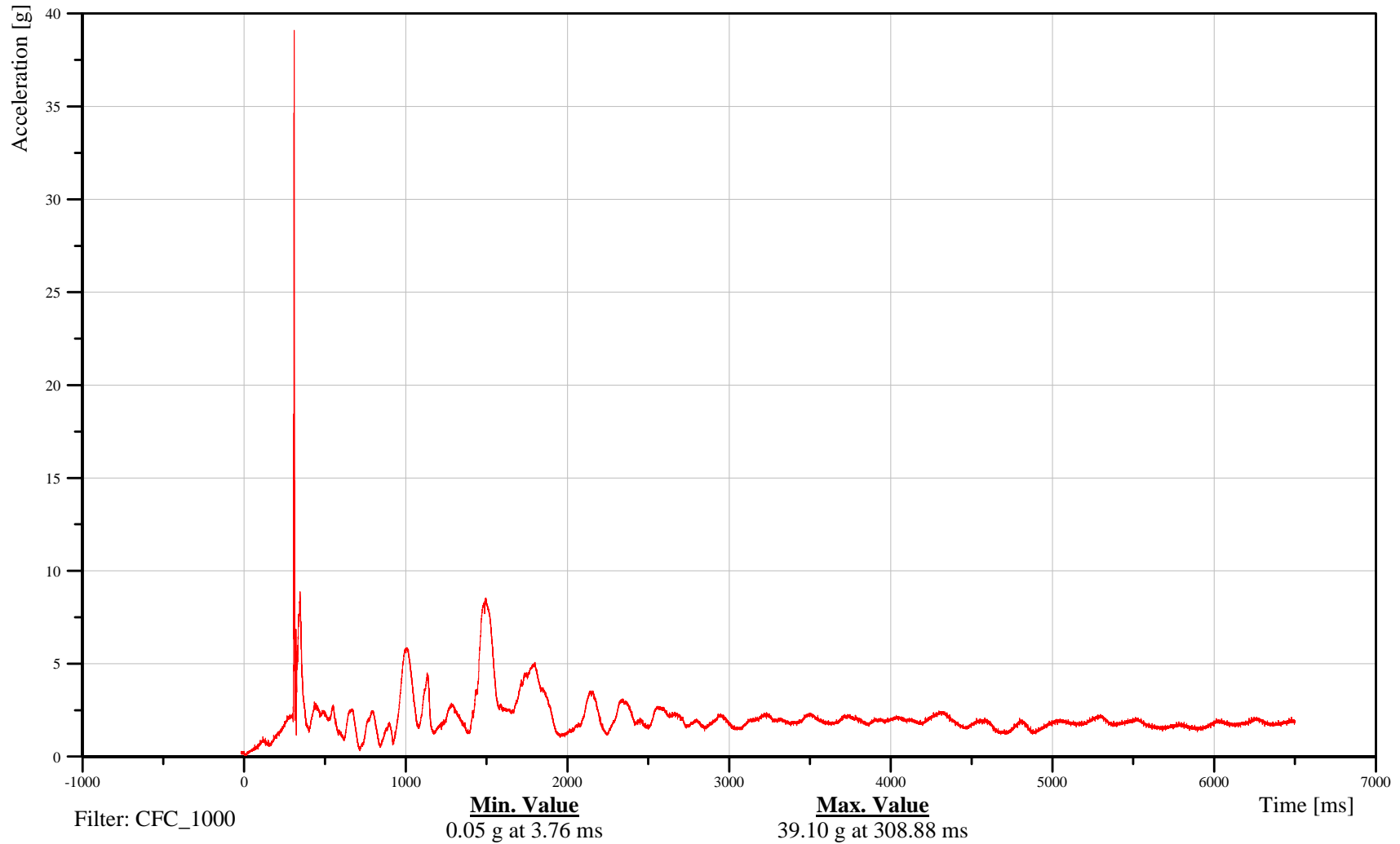
Time: 14:32

Customer: VRTC

16HEADCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-64

100420



Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Head (DTS ARS) Rate Gyro X

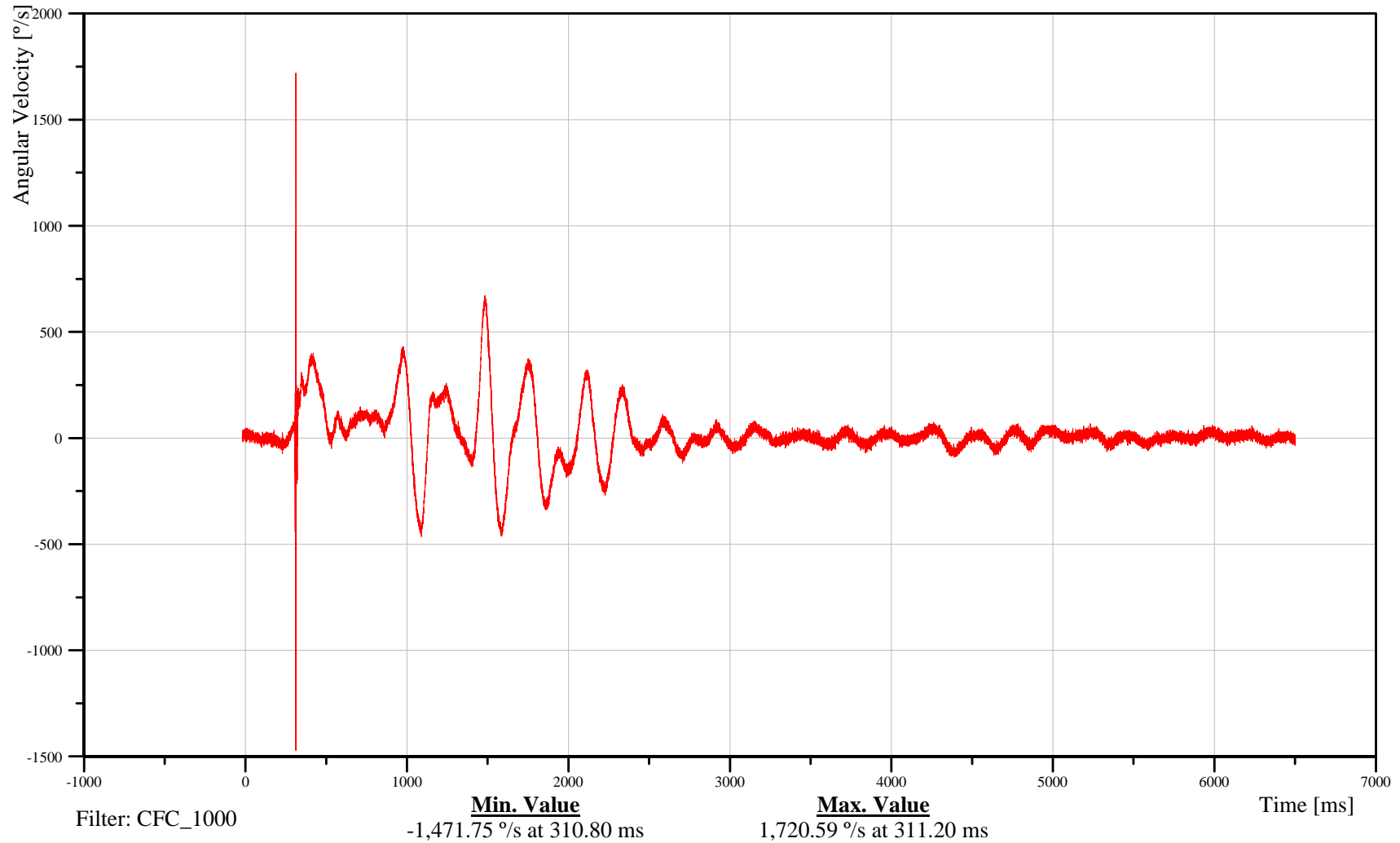
Date: 04/20/2010
Time: 14:32

Customer: VRTC

16HEADCG00H3AVXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-65

100420



Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Head (DTS ARS) Rate Gyro Y

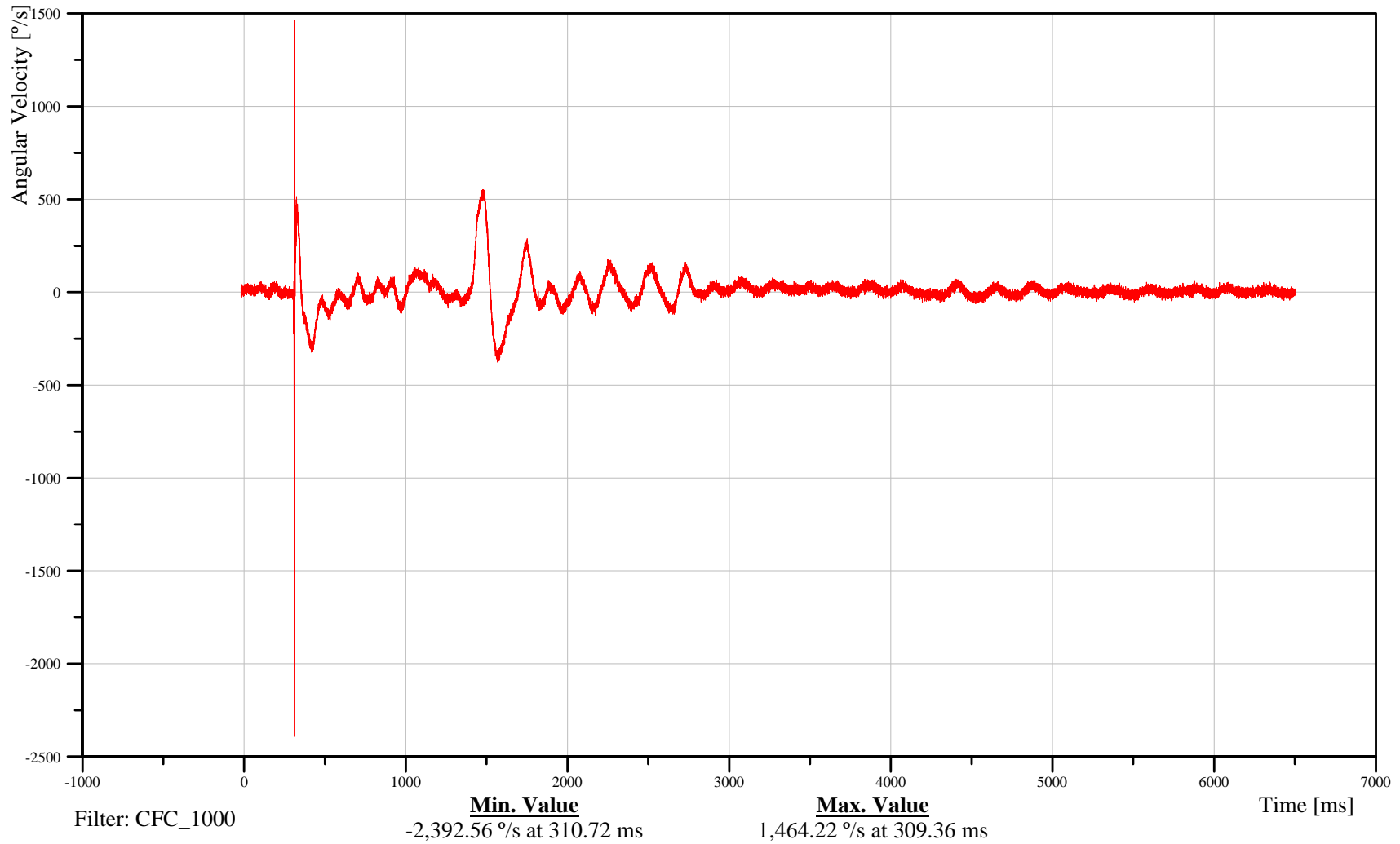
Date: 04/20/2010
Time: 14:32

Customer: VRTC

16HEADCG00H3AVYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-66

100420



Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Head (DTS ARS) Rate Gyro Z

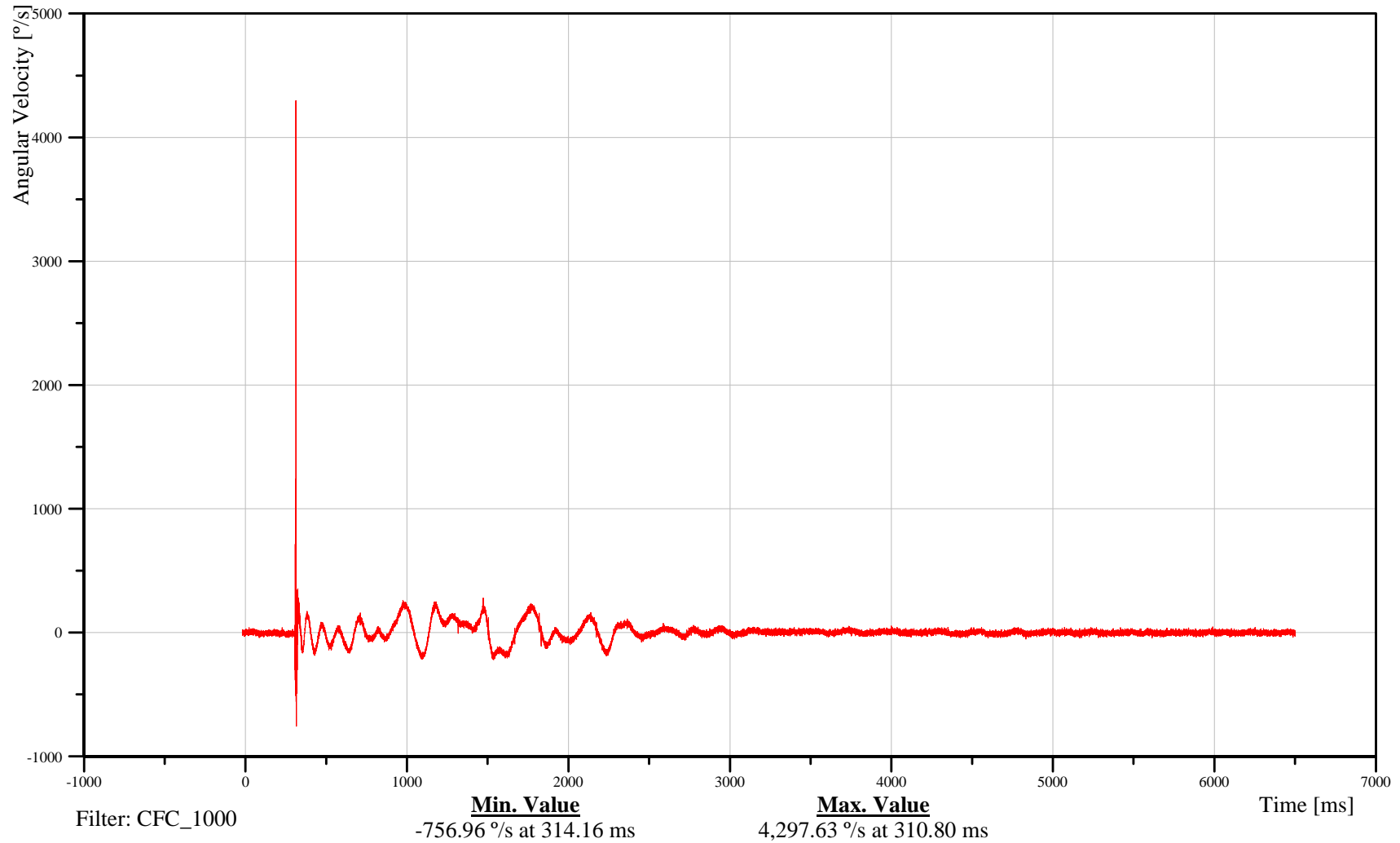
Date: 04/20/2010
Time: 14:32

Customer: VRTC

16HEADCG00H3AVZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-67

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Upper Neck X-Axis Force

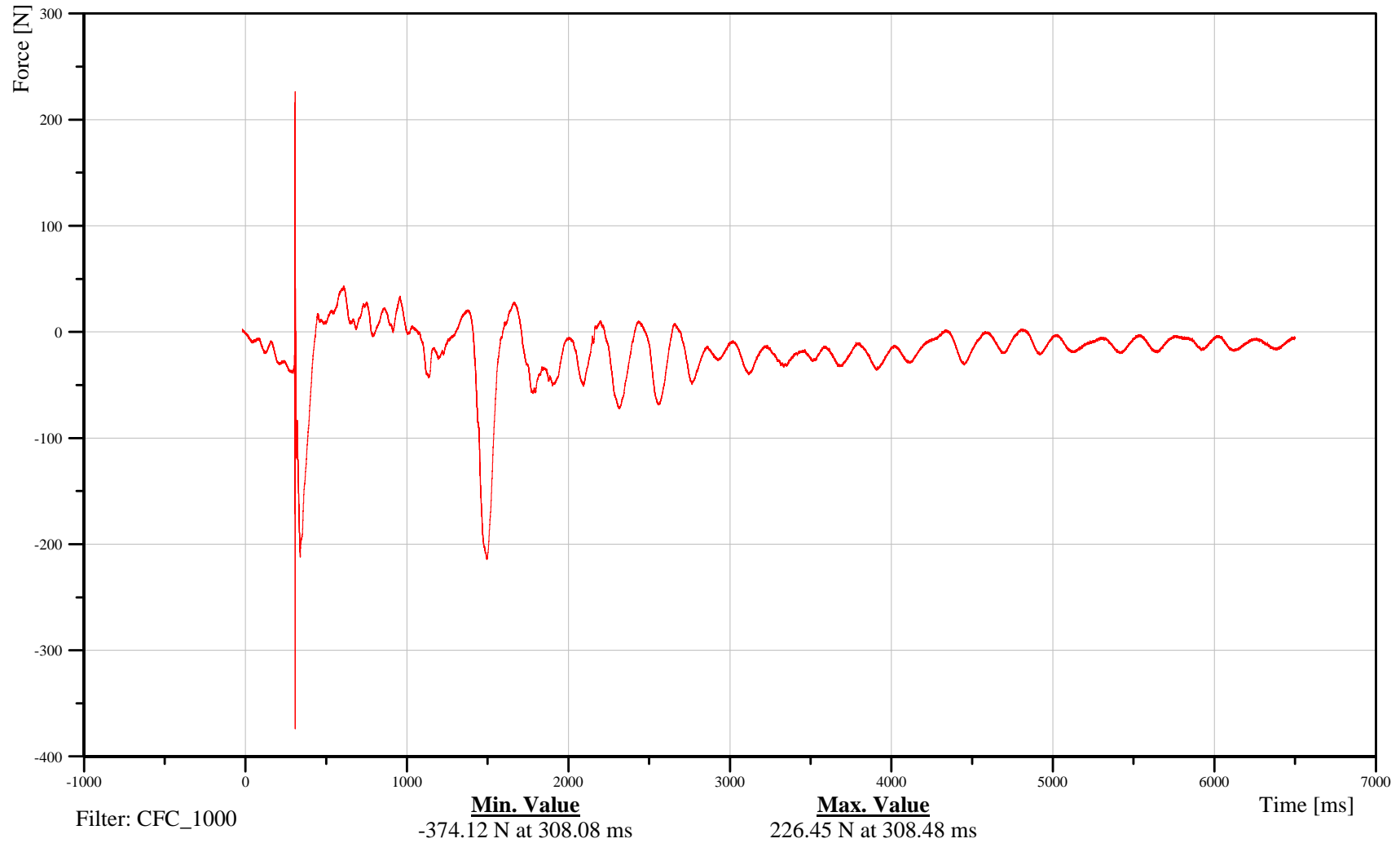
Time: 14:32

Customer: VRTC

16NECKUP00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-68

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Upper Neck Y-Axis Force

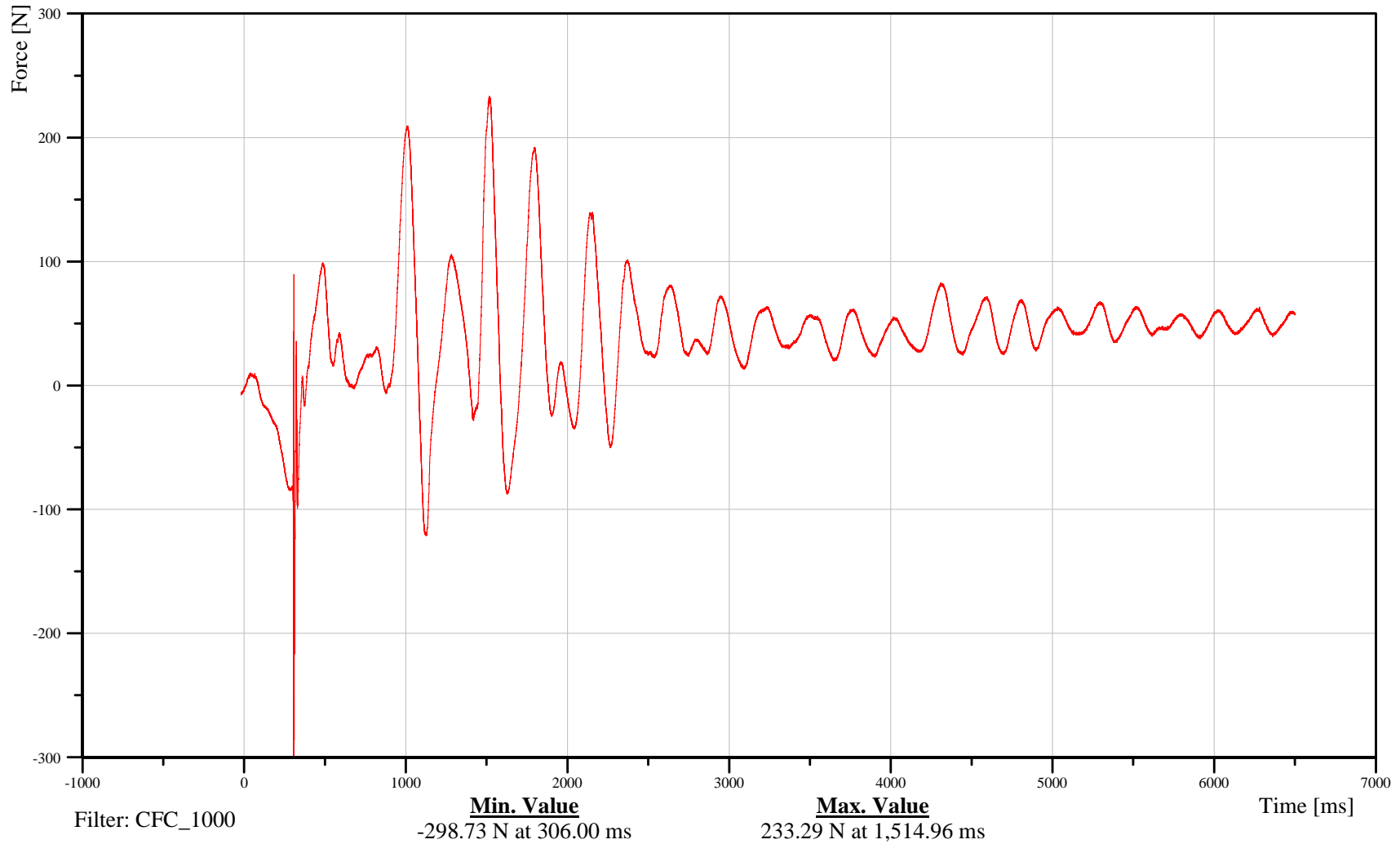
Time: 14:32

Customer: VRTC

16NECKUP00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-69

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Upper Neck Z-Axis Force

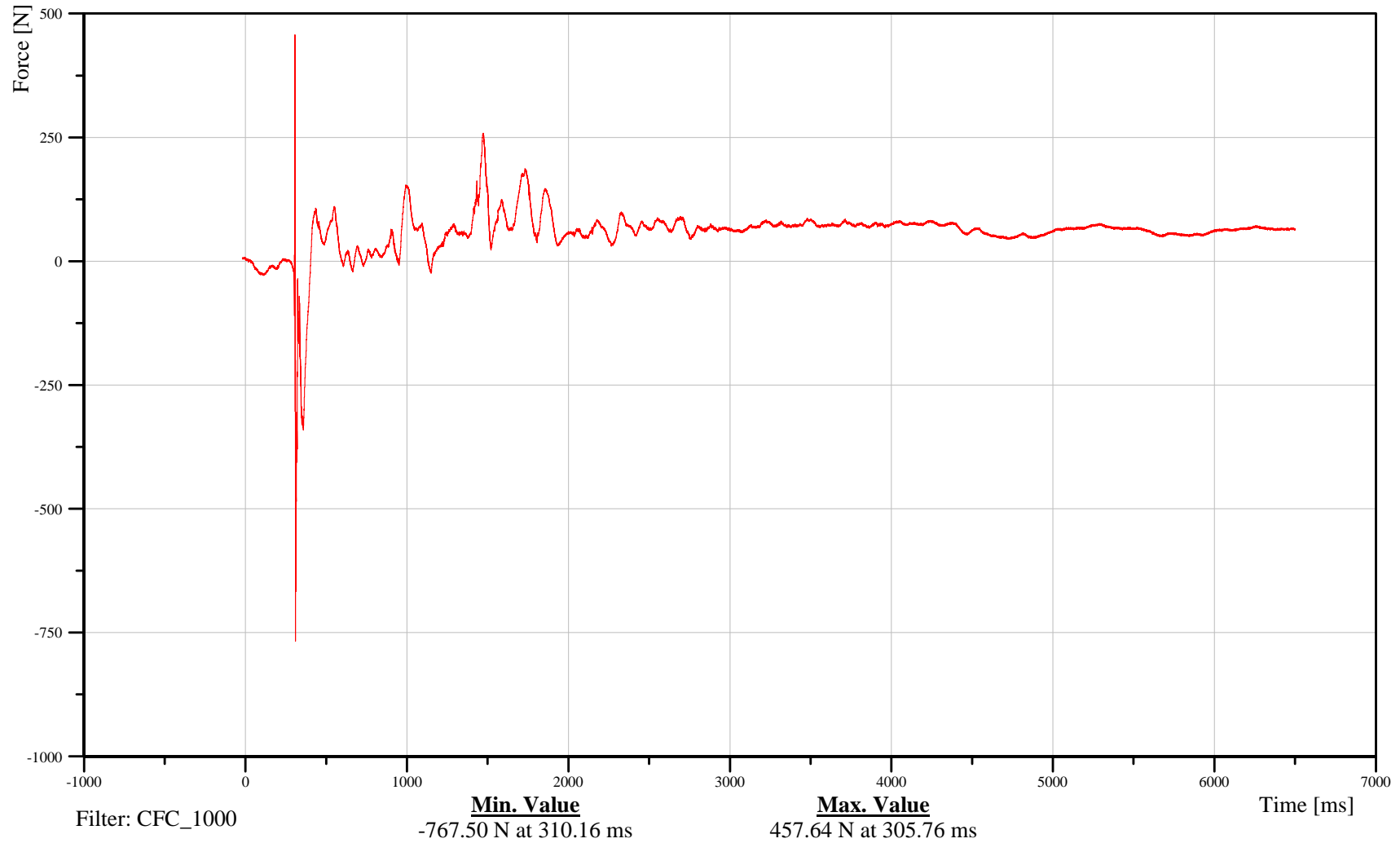
Time: 14:32

Customer: VRTC

16NECKUP00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-70

100420



Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Upper Neck Moment About X Axis

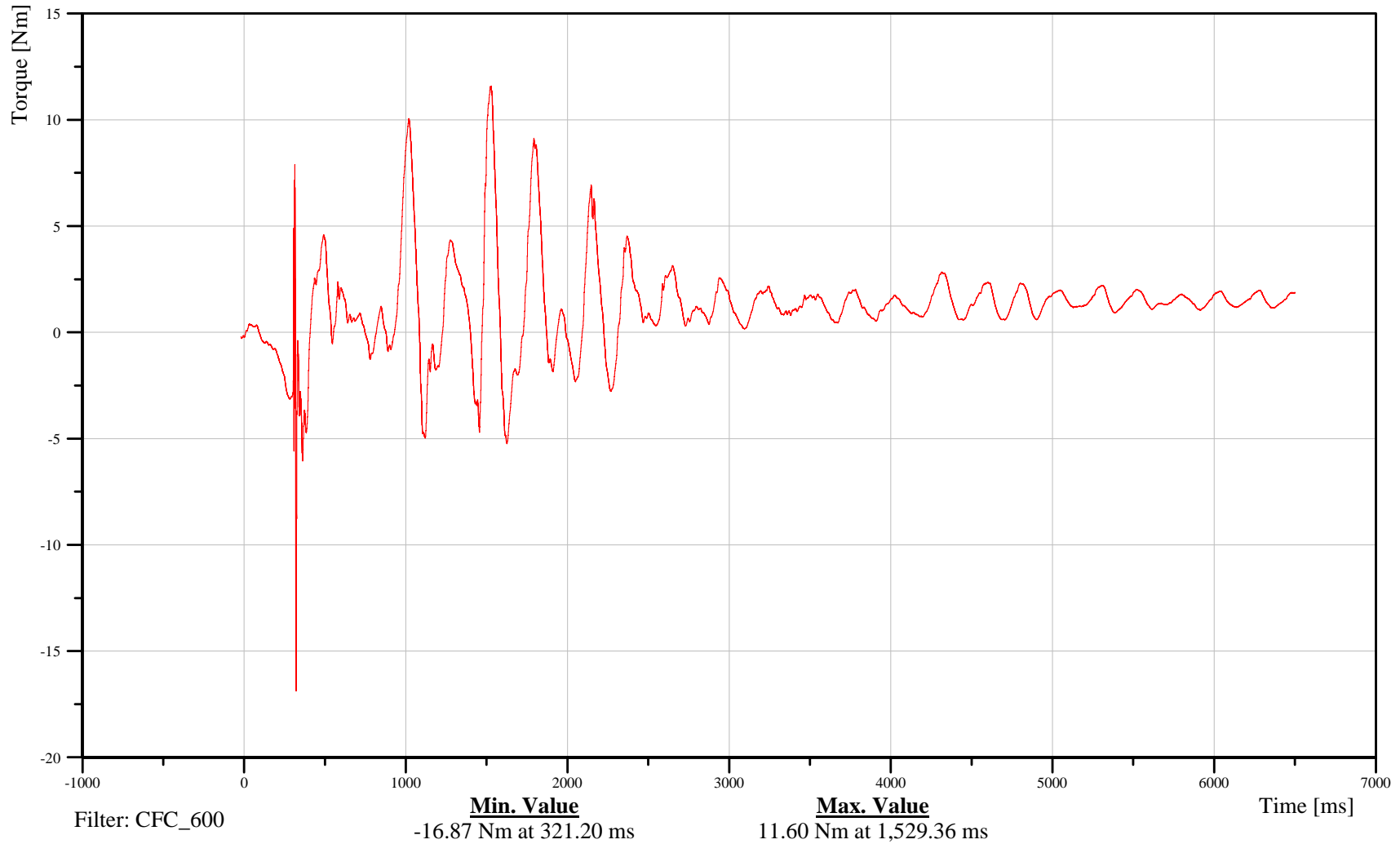
Date: 04/20/2010
Time: 14:32

Customer: VRTC

16NECKUP00H3MOXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-71

100420



Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Upper Neck Moment About Y Axis

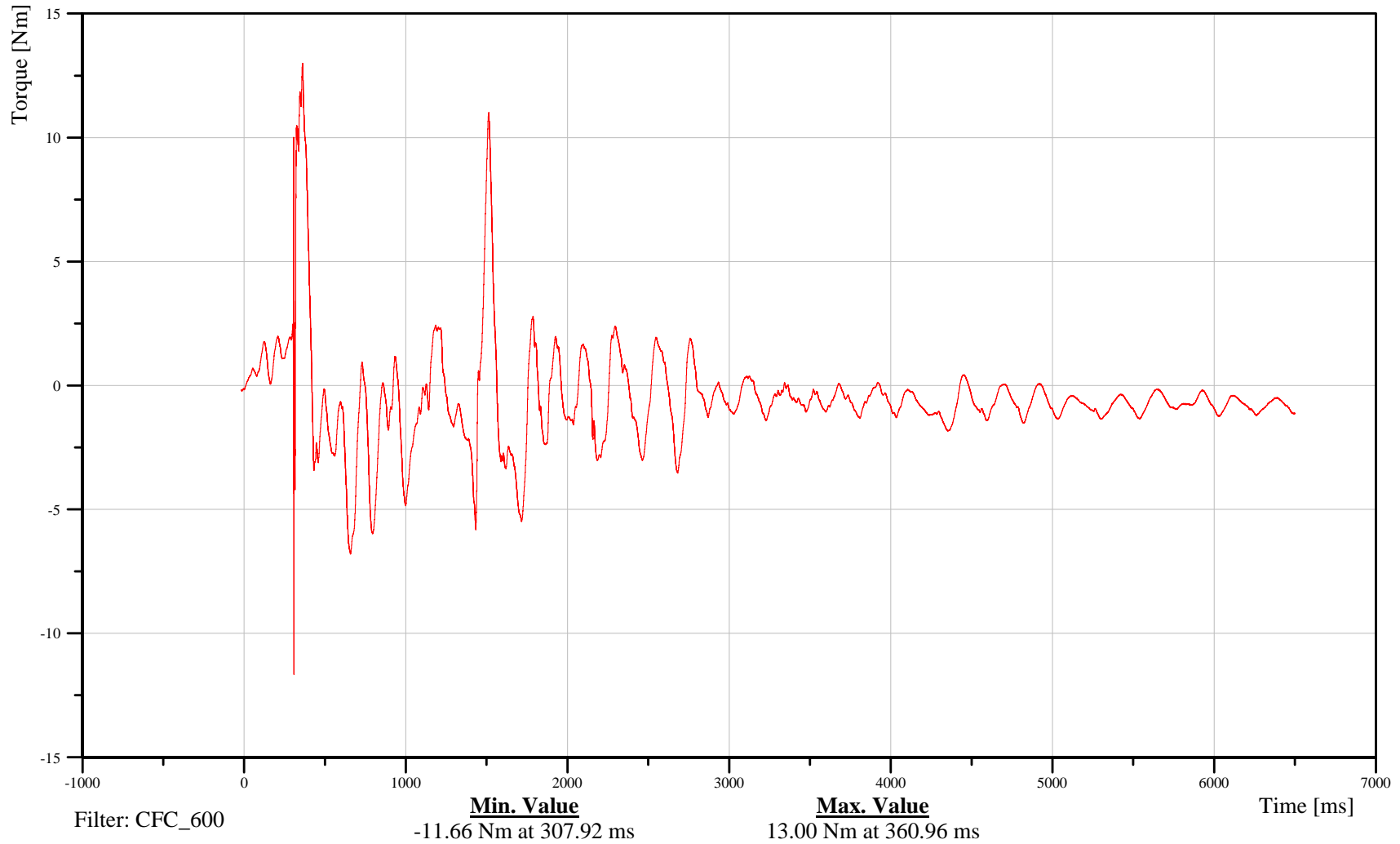
Date: 04/20/2010
Time: 14:32

Customer: VRTC

16NECKUP00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-72

100420



Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Upper Neck Moment About Z Axis

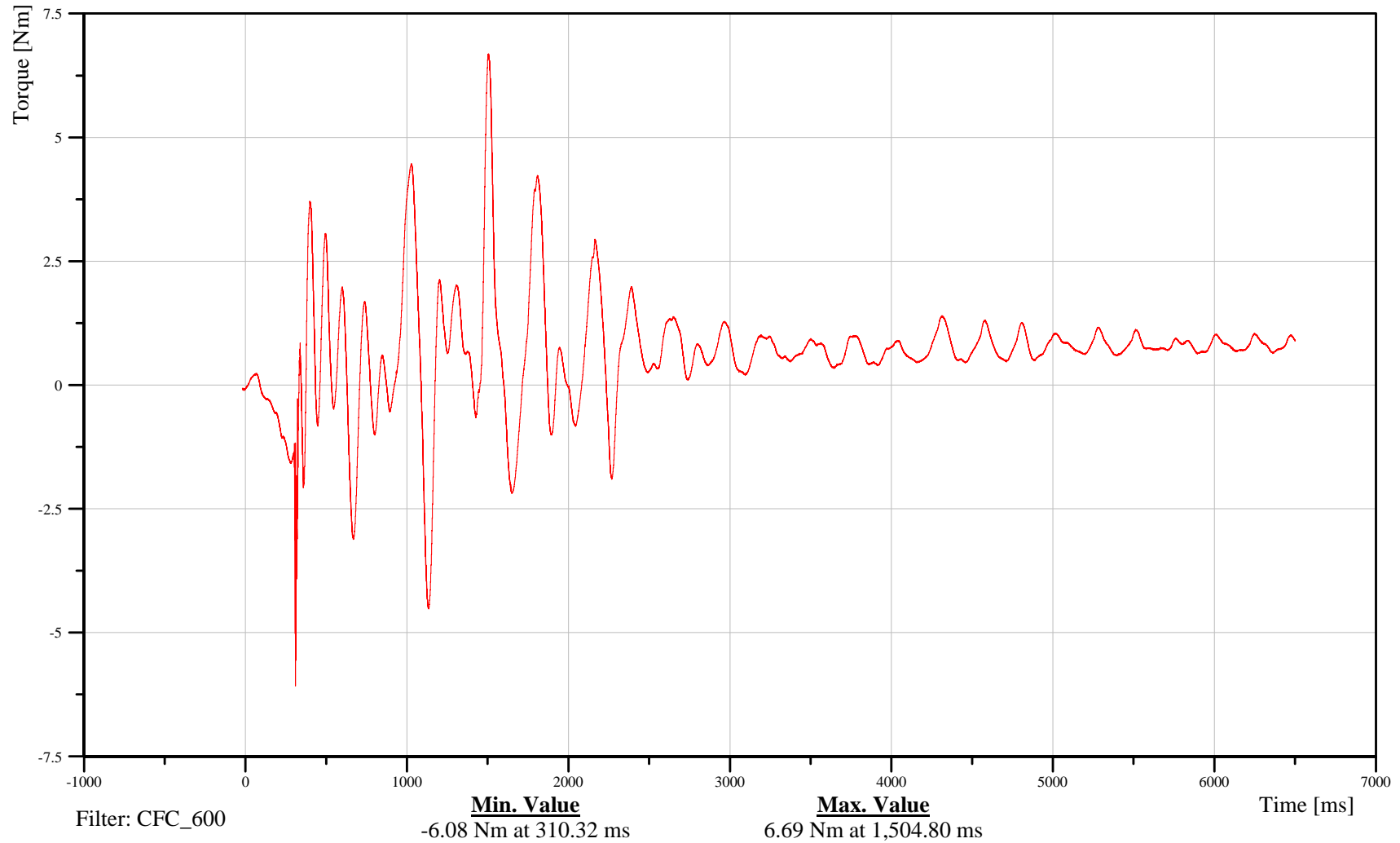
Date: 04/20/2010
Time: 14:32

Customer: VRTC

16NECKUP00H3MOZB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-73

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Chest X-Axis Acceleration

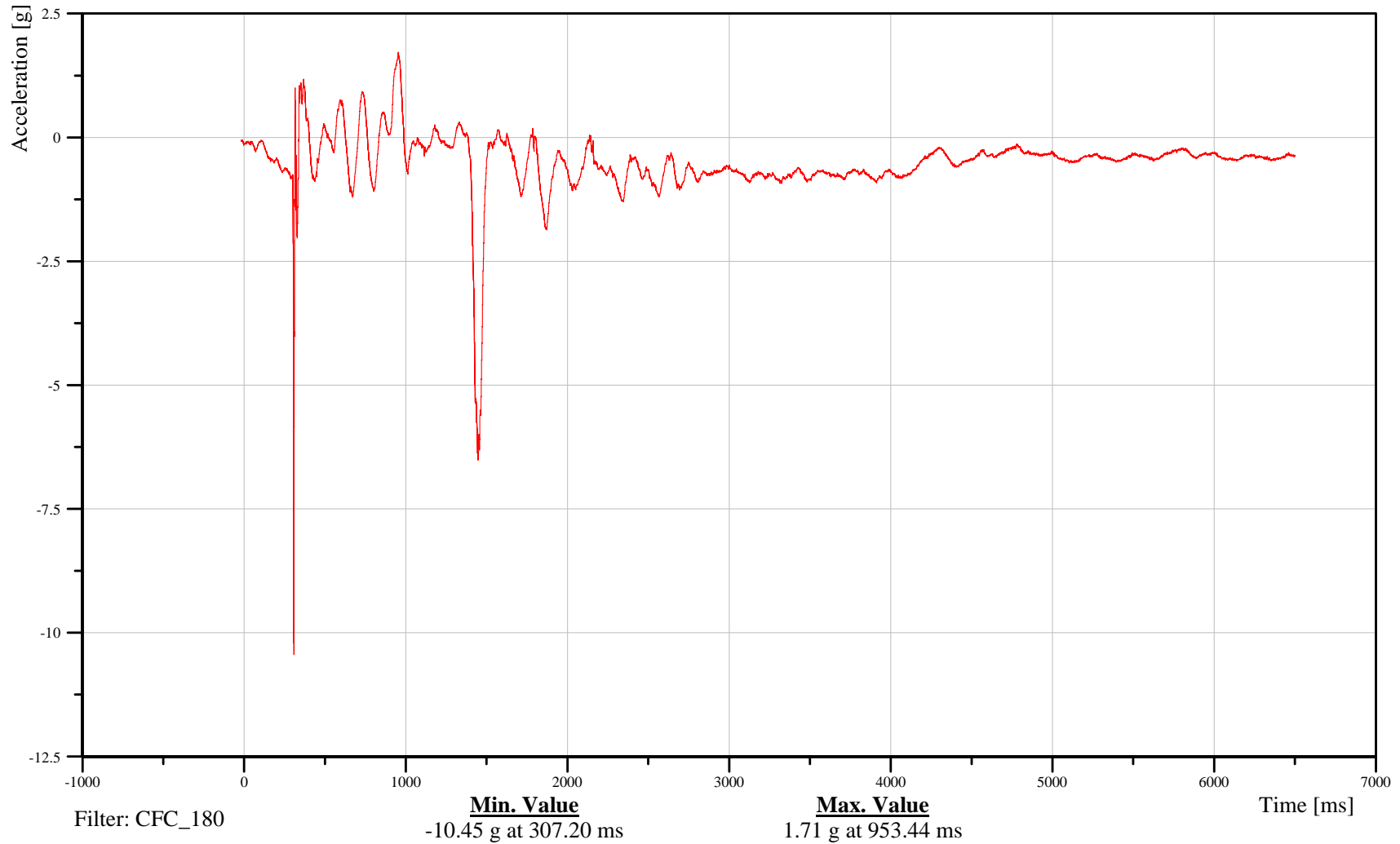
Time: 14:32

Customer: VRTC

16CHSTCG00H3ACXC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-74

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

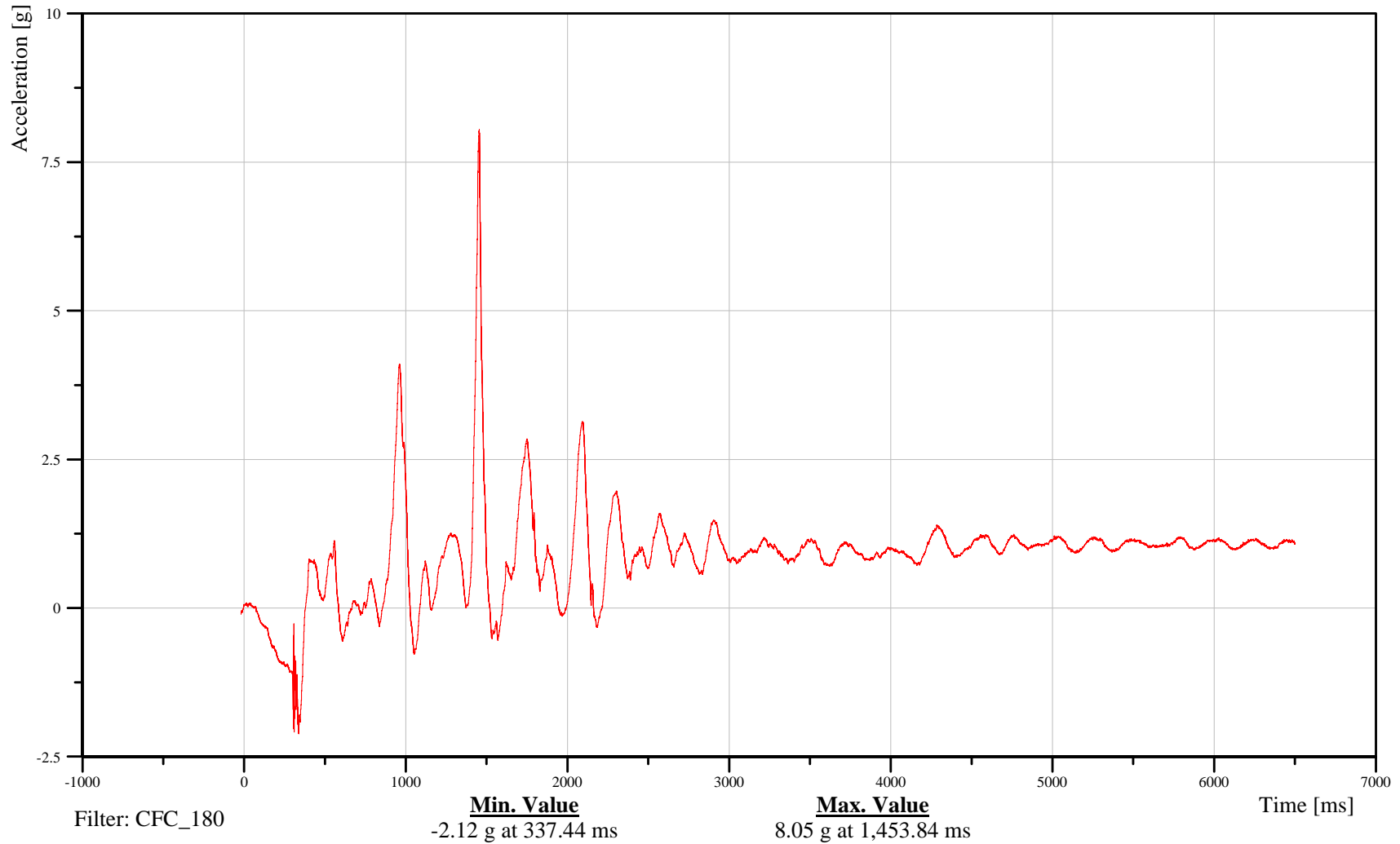
Right Rear Passenger Chest Y-Axis Acceleration

Customer: VRTC

16CHSTCG00H3ACYC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-75

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Chest Z-Axis Acceleration

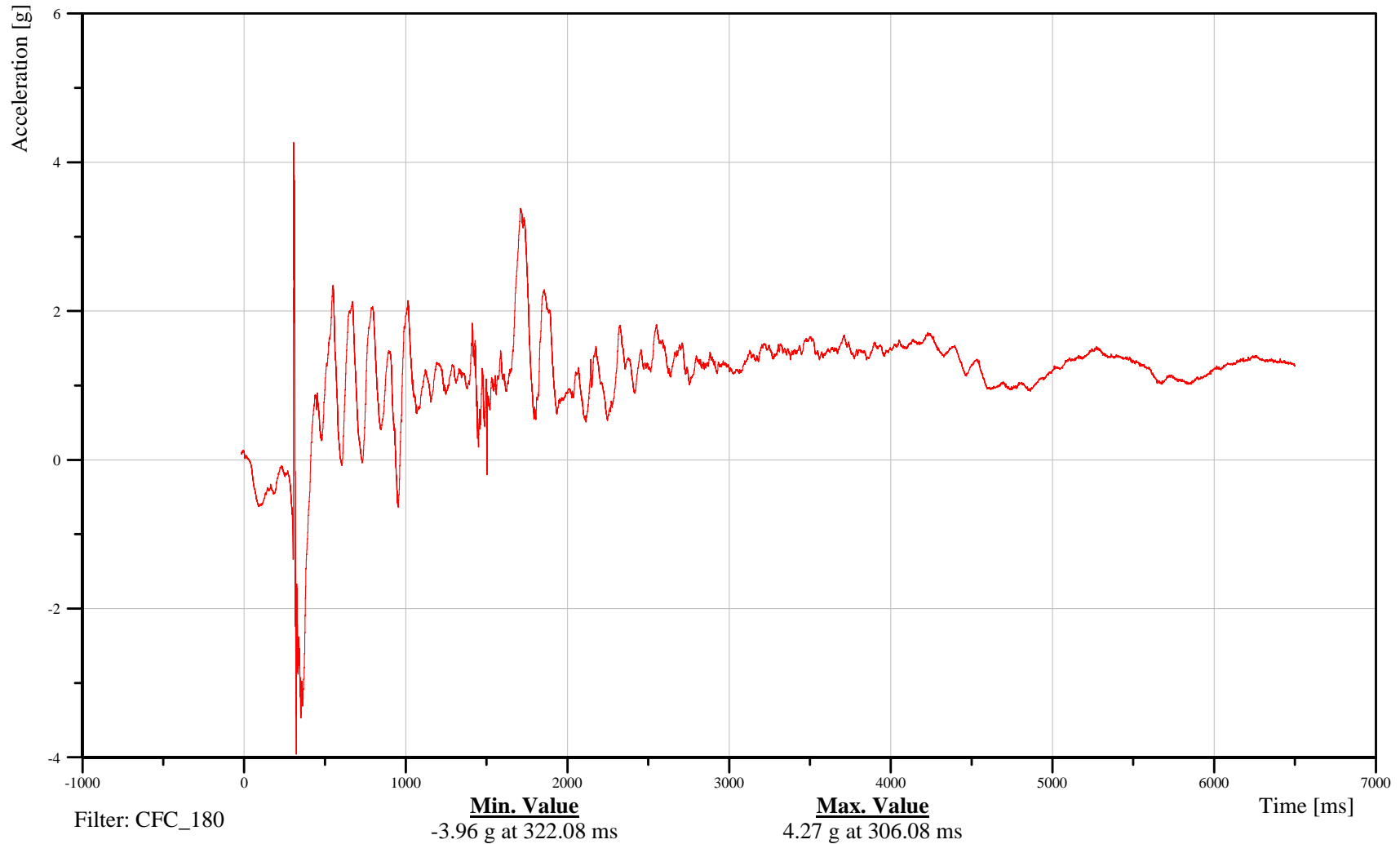
Time: 14:32

Customer: VRTC

16CHSTCG00H3ACZC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-76

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Chest Resultant Acceleration

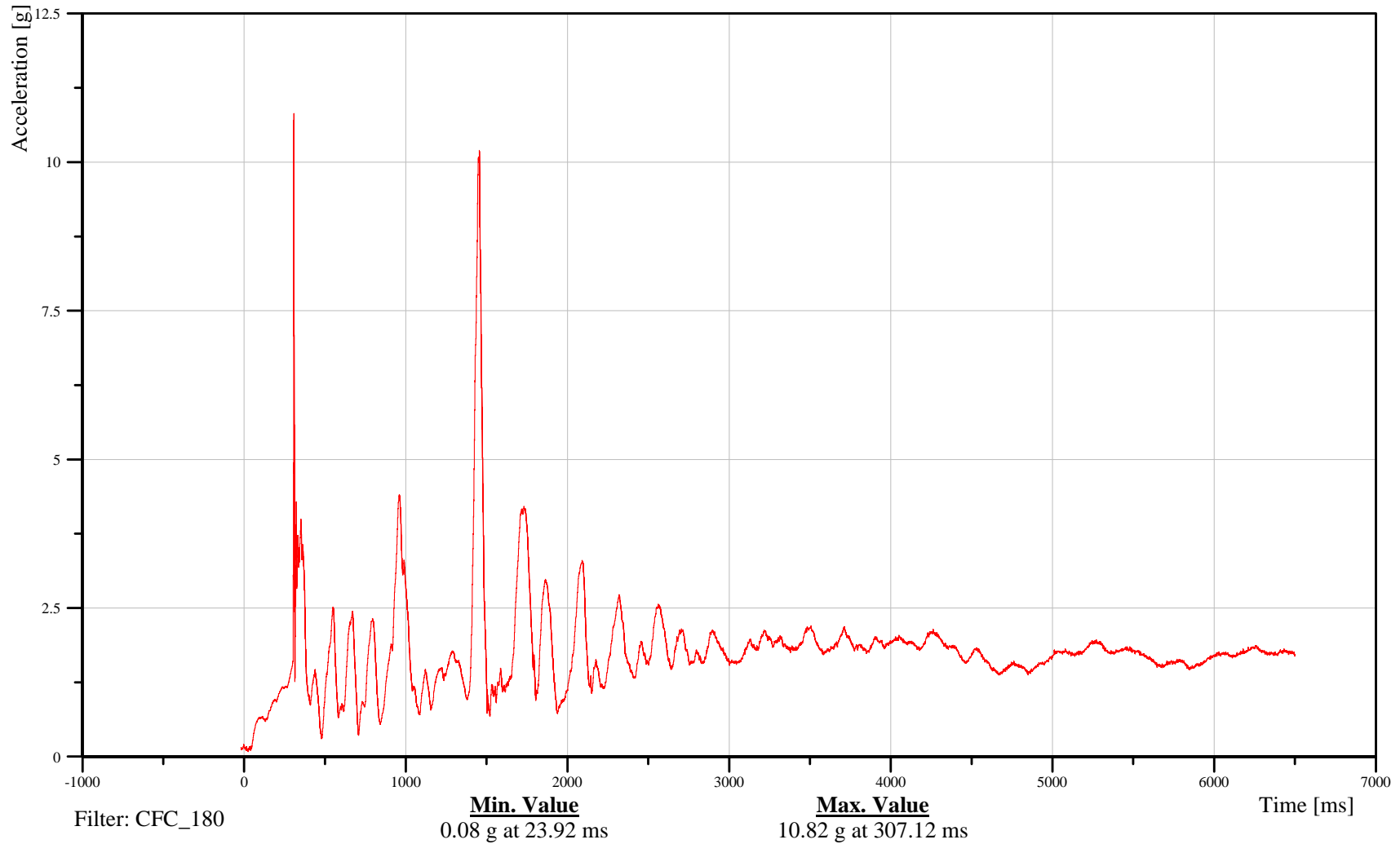
Time: 14:32

Customer: VRTC

16CHSTCG00H3ACRC

TRC Inc. Test Lab: CTF

Test Number: 100420



B-77

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Chest X-Axis Displacement

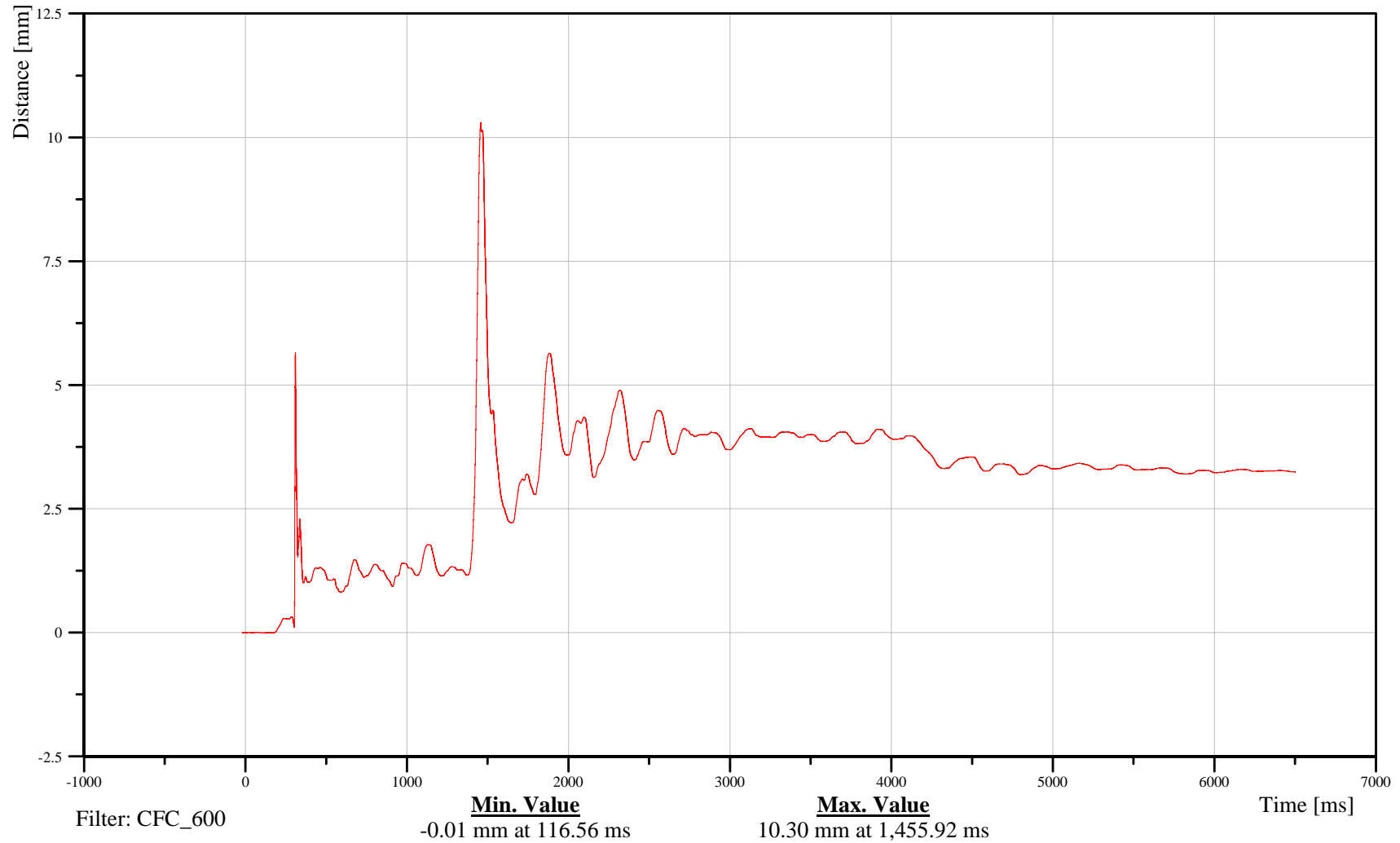
Time: 14:32

Customer: VRTC

16CHST0000H3DSXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-78

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Lower Neck X-Axis Force

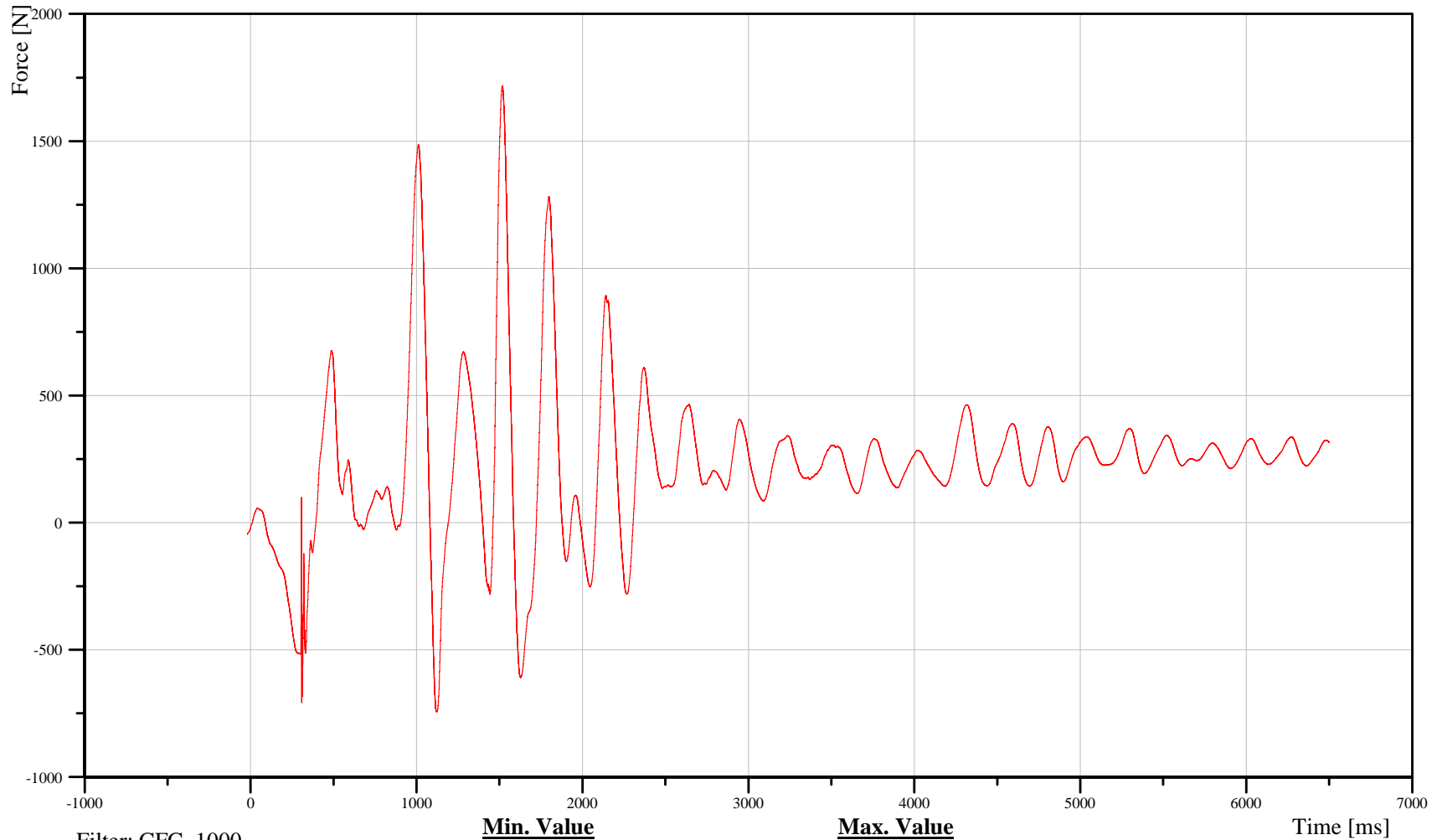
Time: 14:32

Customer: VRTC

16NECKLO00H3FOXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-79

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

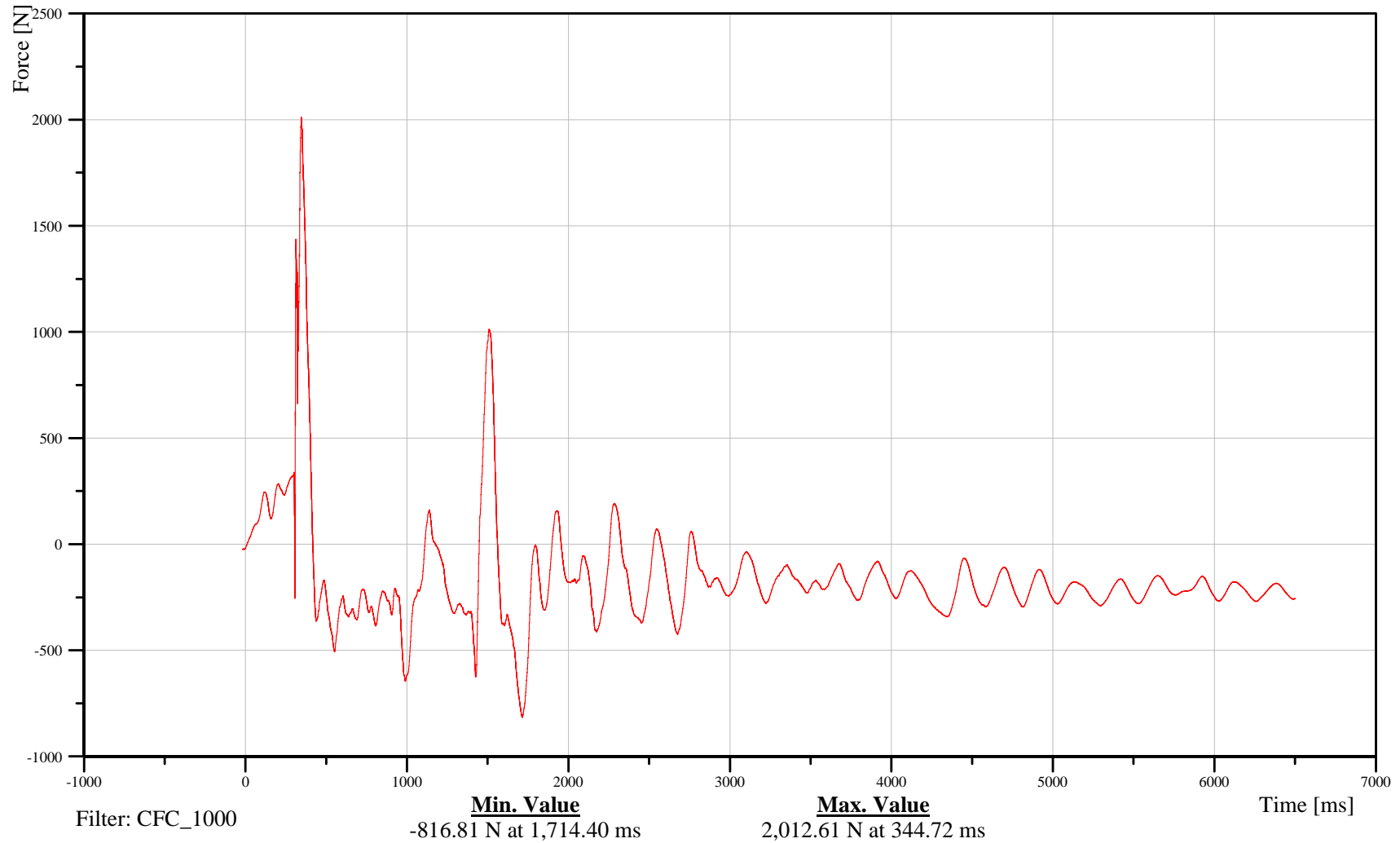
Right Rear Passenger Lower Neck Y-Axis Force

Customer: VRTC

16NECKLO00H3FOYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-80

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Lower Neck Z-Axis Force

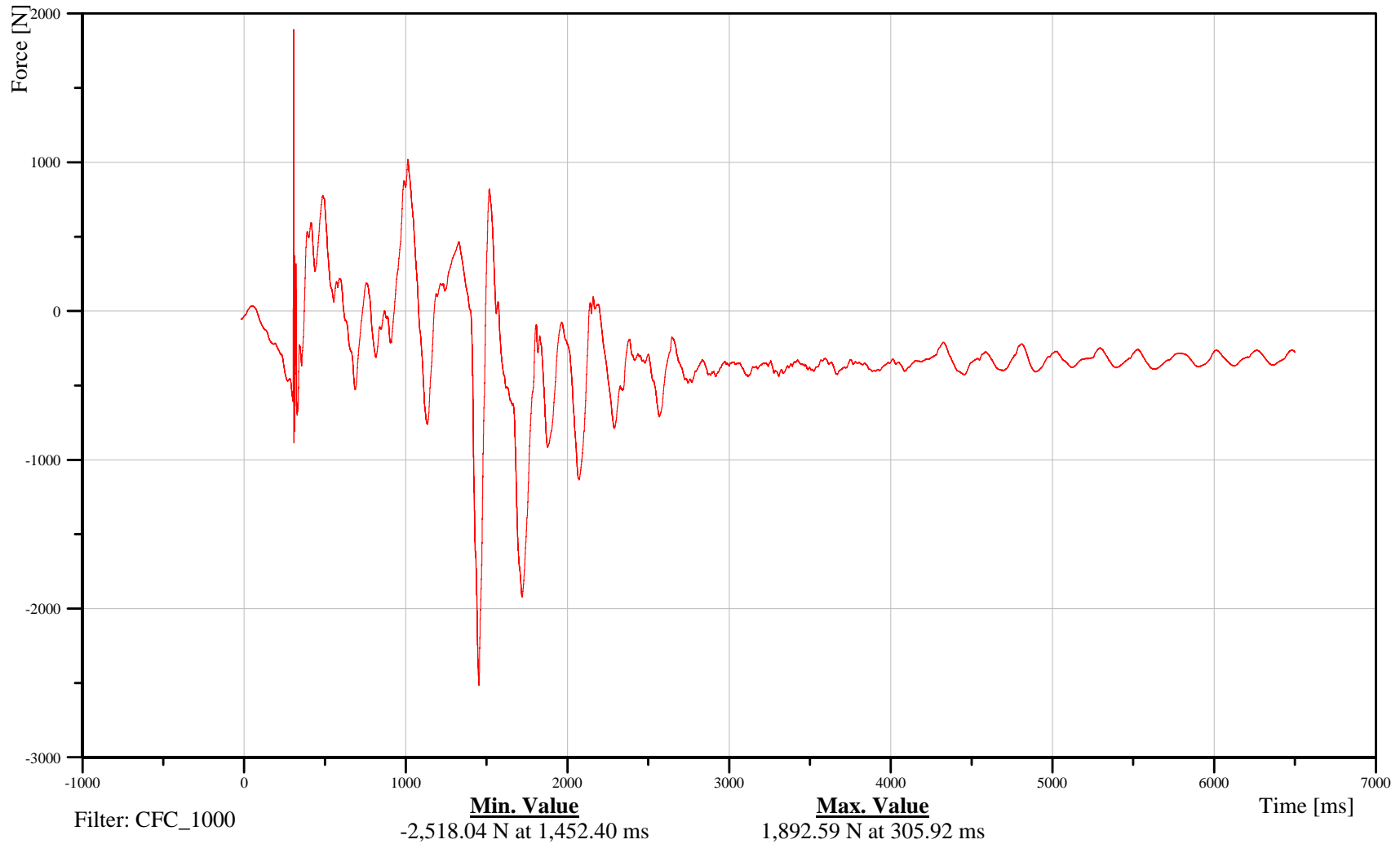
Time: 14:32

Customer: VRTC

16NECKLO00H3FOZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-81

100420



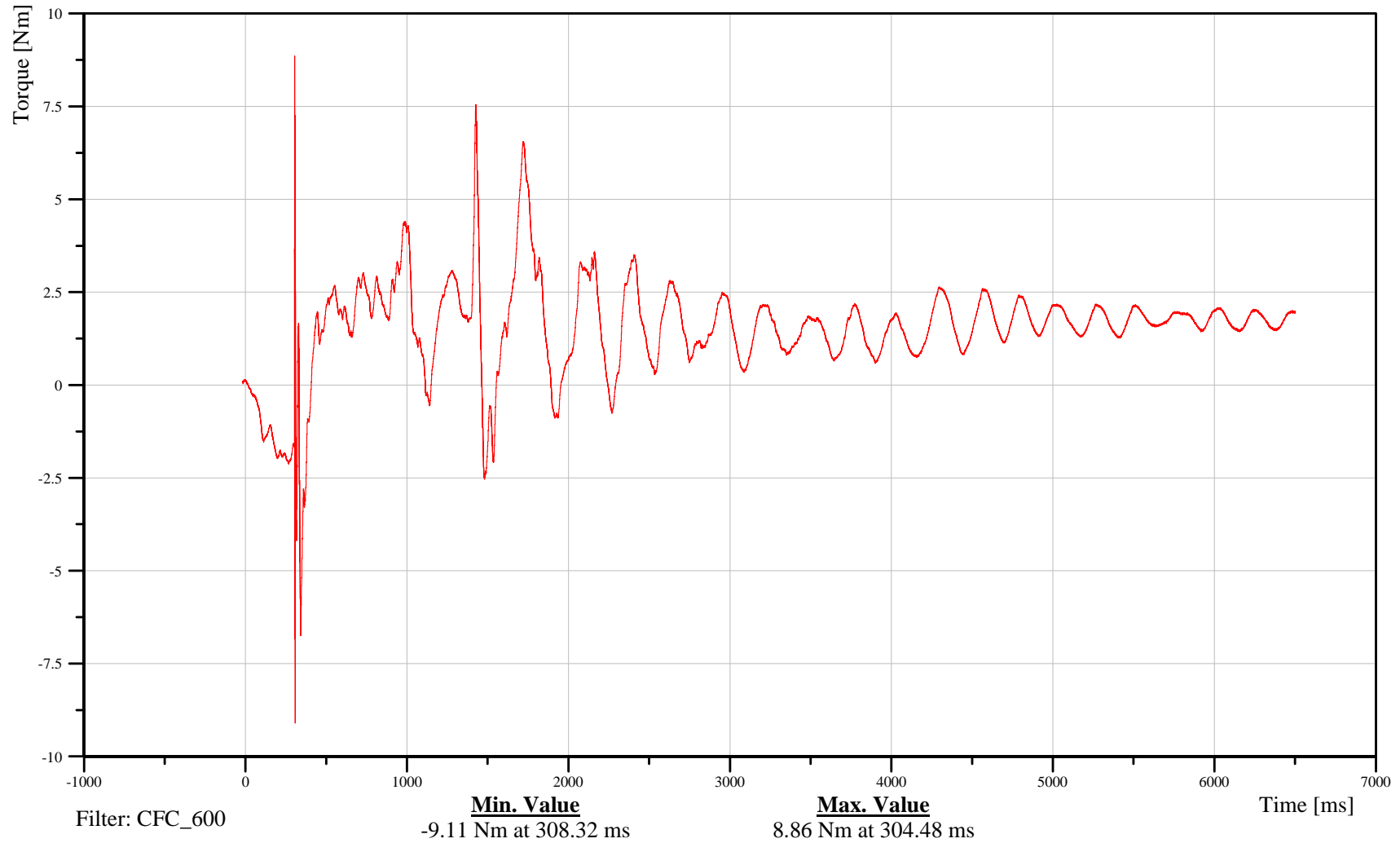
Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Lower Neck Moment About X Axis

Date: 04/20/2010
Time: 14:32

Customer: VRTC

16NECKLO00H3MOXB

TRC Inc. Test Lab: CTF
Test Number: 100420



B-82

100420



Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Lower Neck Moment About Y Axis

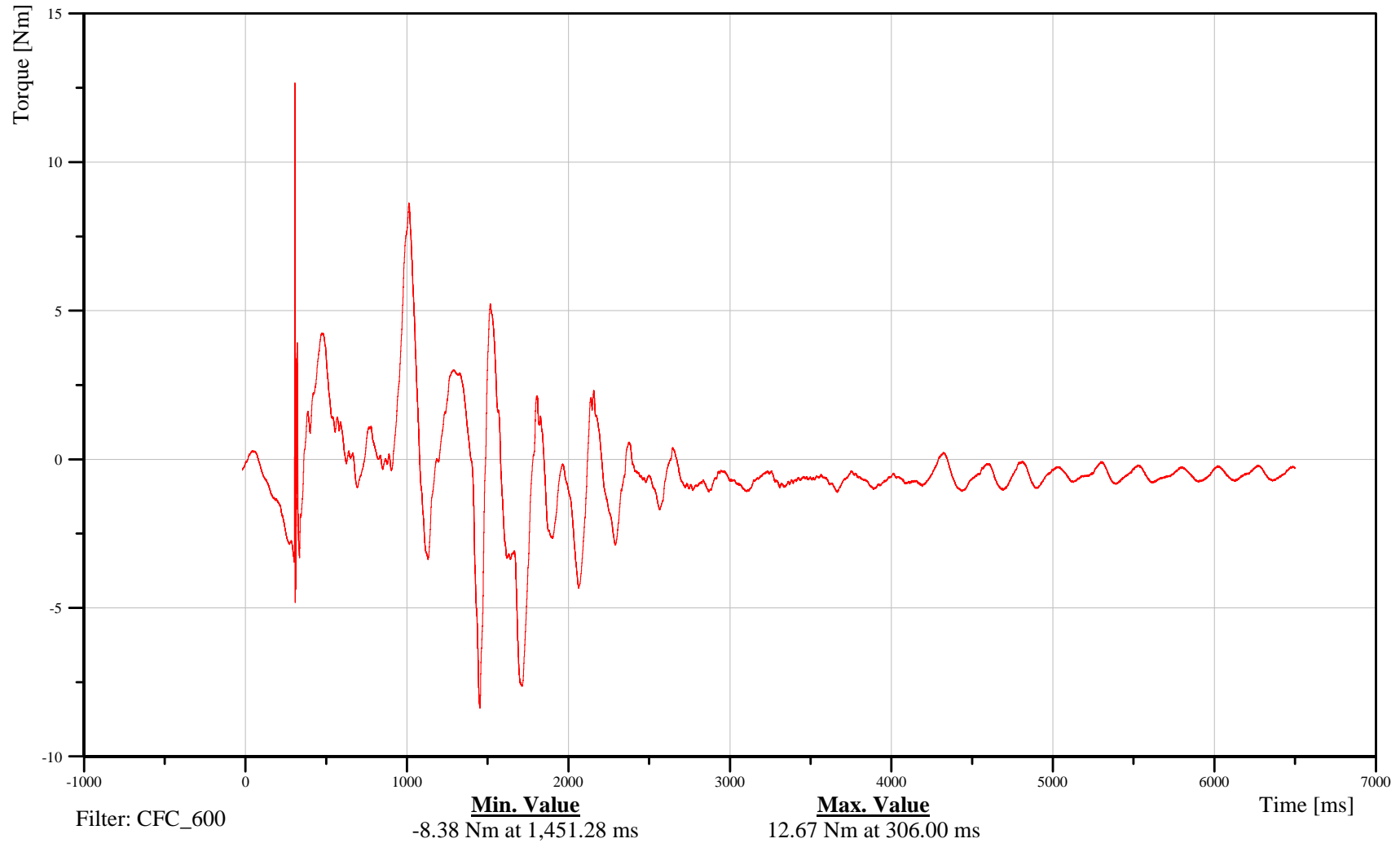
Date: 04/20/2010
Time: 14:32

Customer: VRTC

16NECKLO00H3MOYB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-83

100420



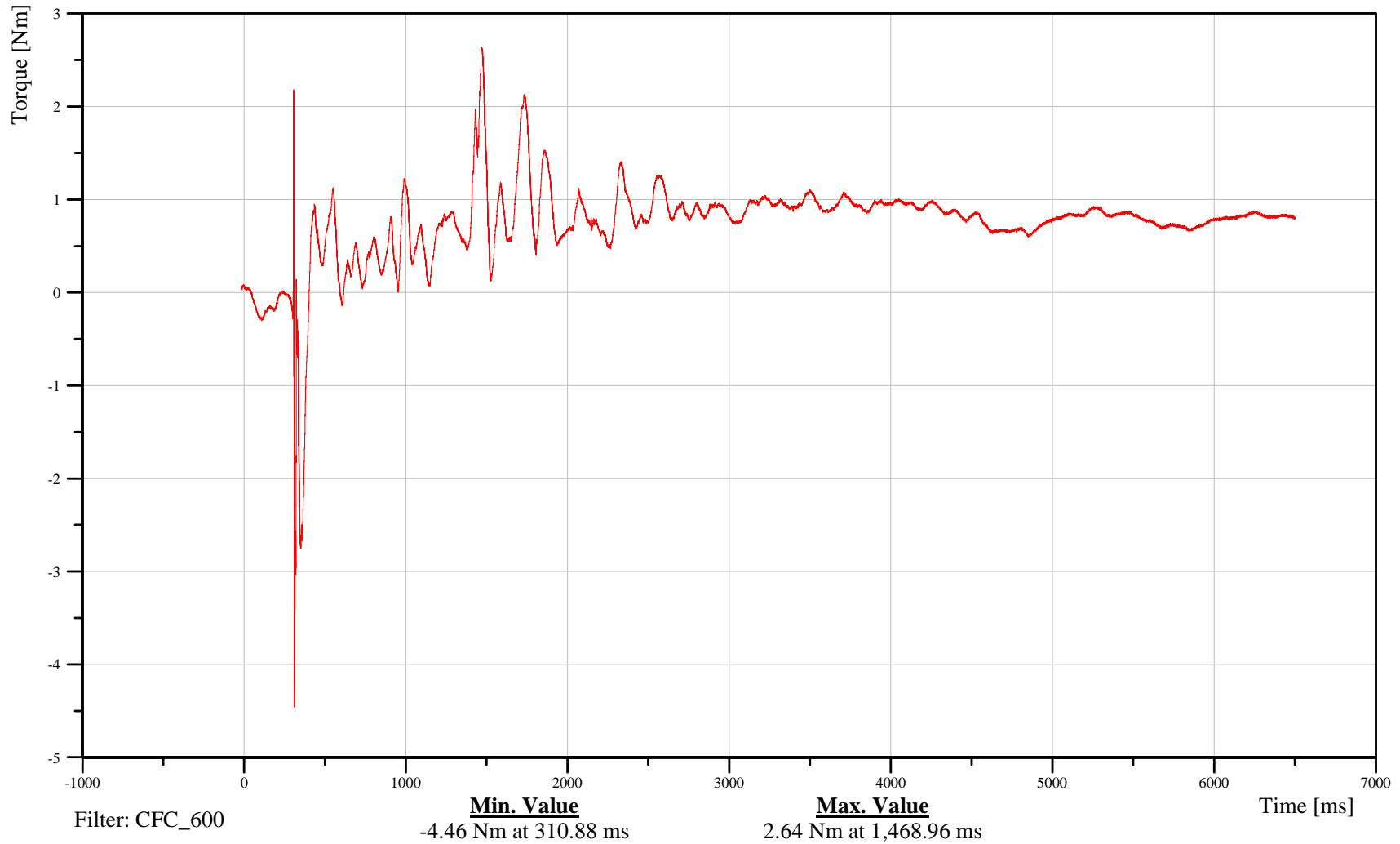
Corkscrew Rollover 2007 Ford Expedition
Right Rear Passenger Lower Neck Moment About Z Axis

Date: 04/20/2010
Time: 14:32

Customer: VRTC

16NECKLO00H3MOZB

TRC Inc. Test Lab: CTF
Test Number: 100420



B-84

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Pelvis X-Axis Acceleration

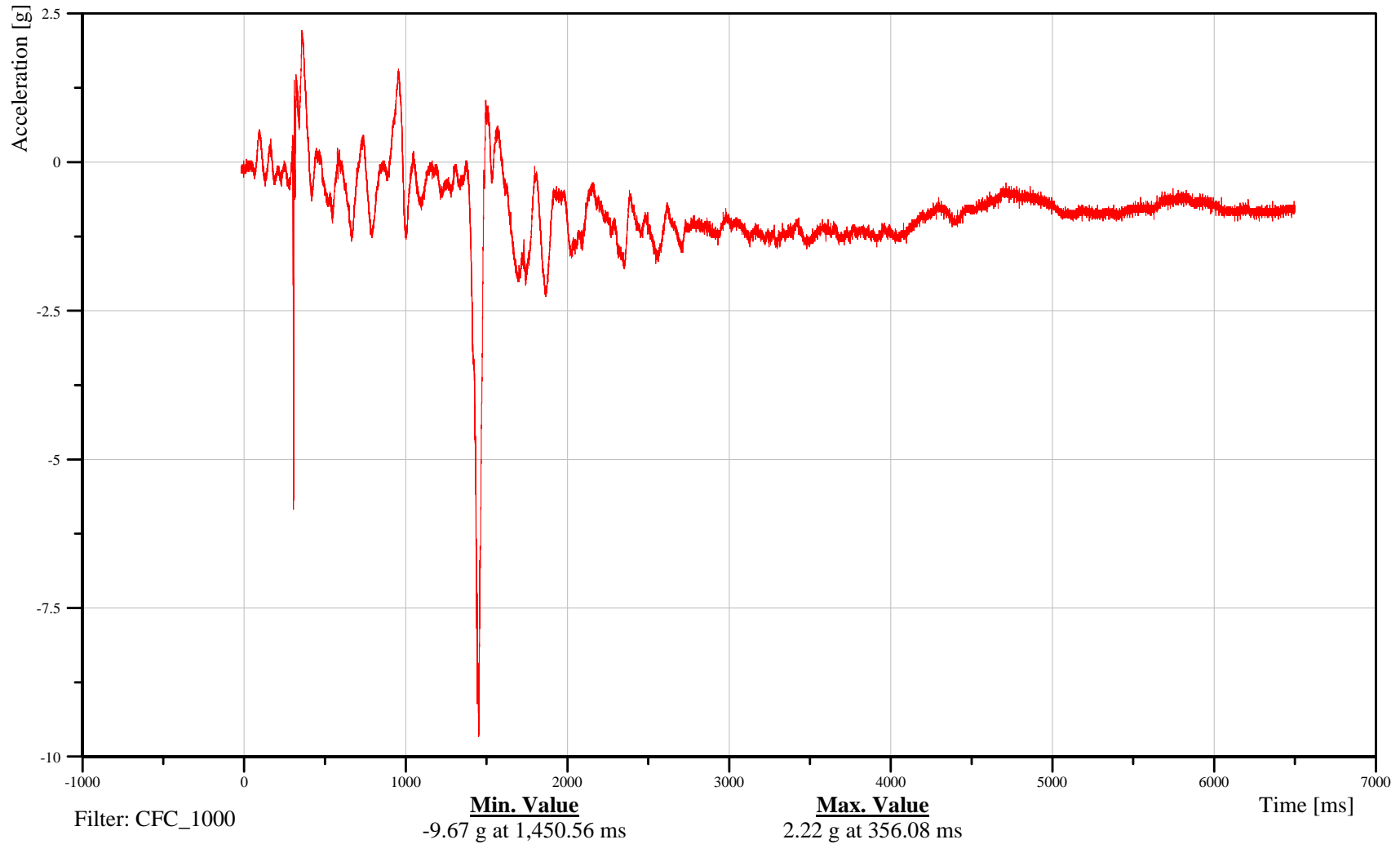
Time: 14:32

Customer: VRTC

16PELVCG00H3ACXA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-85

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Pelvis Y-Axis Acceleration

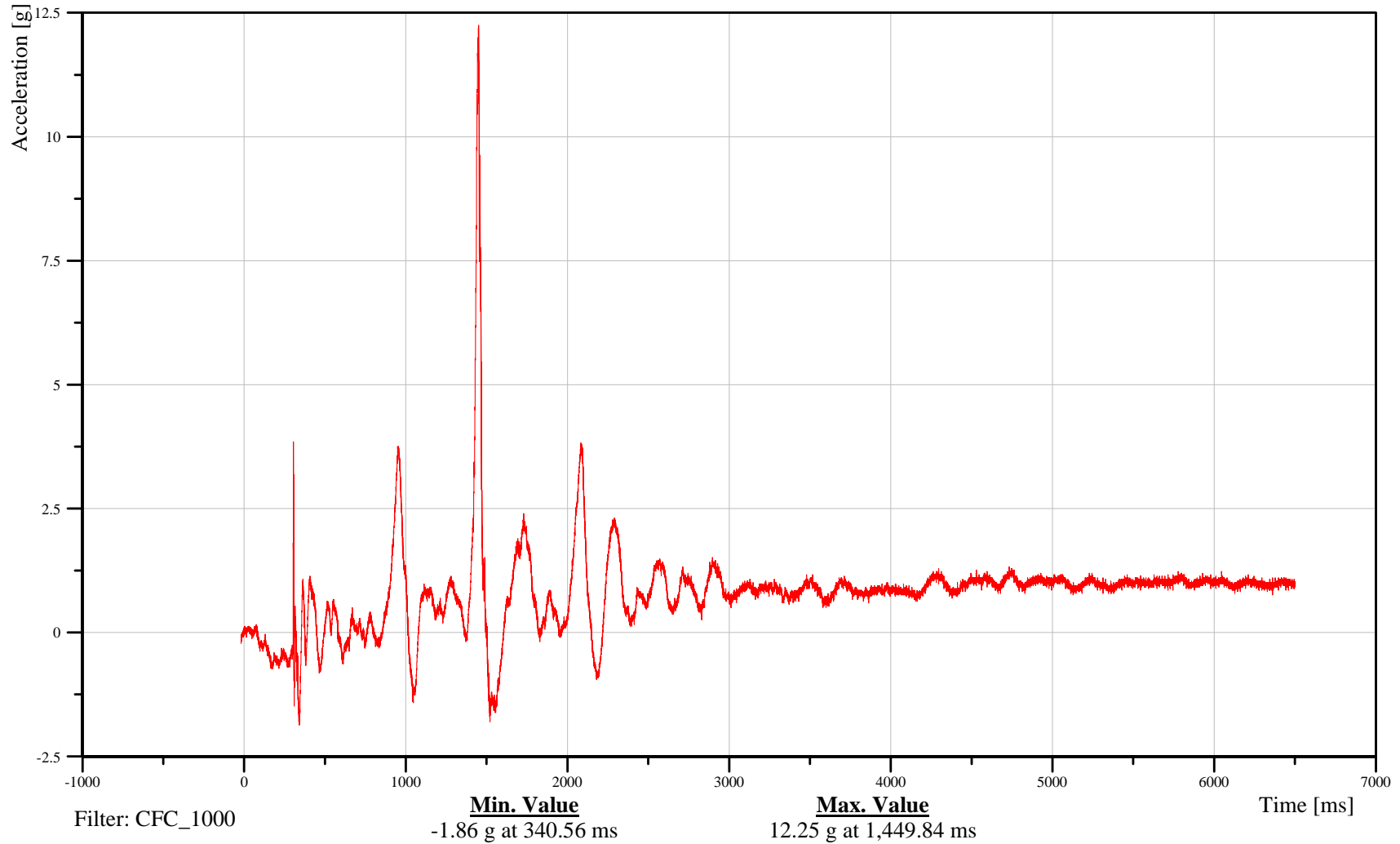
Time: 14:32

Customer: VRTC

16PELVCG00H3ACYA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-86

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Pelvis Z-Axis Acceleration

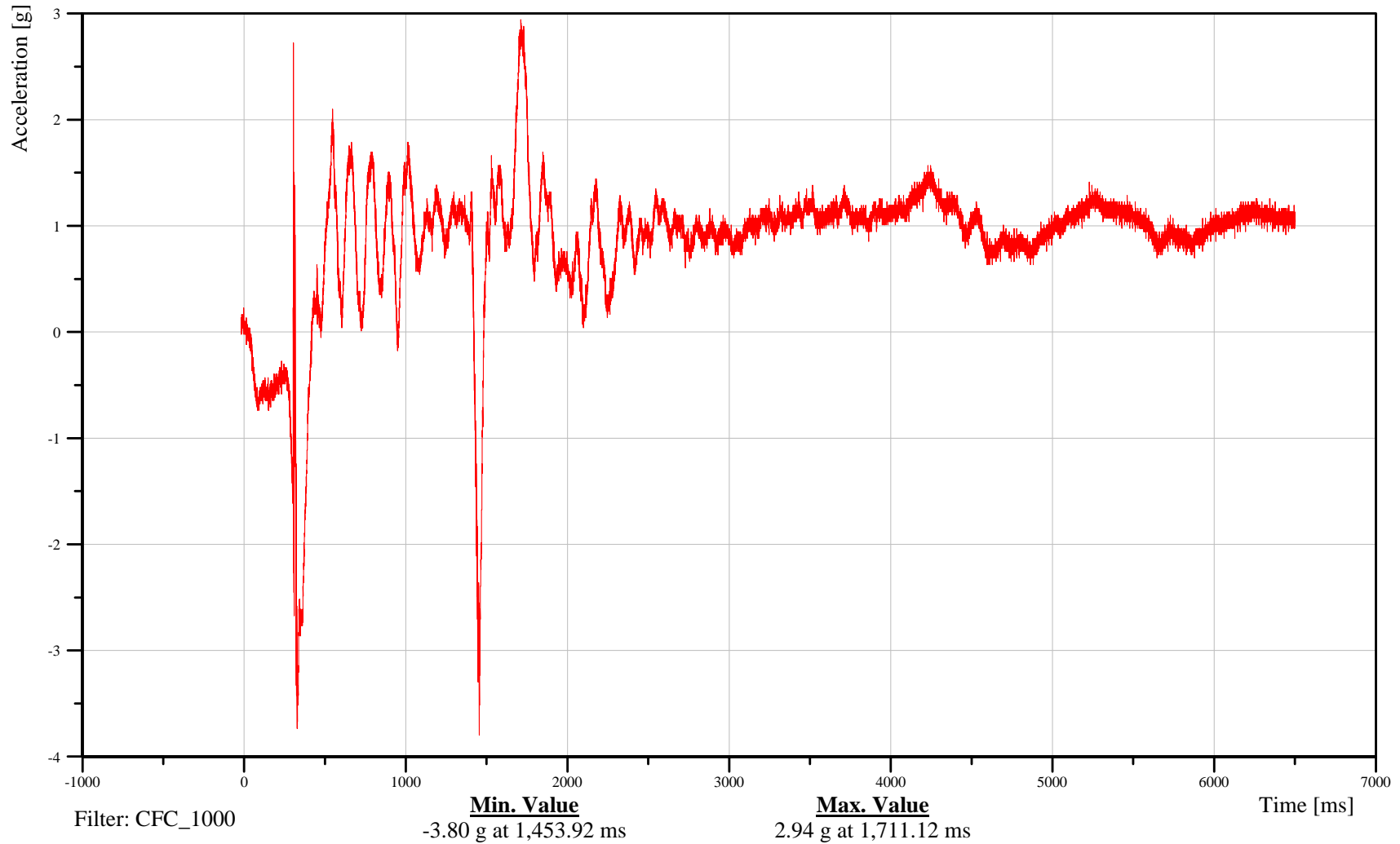
Time: 14:32

Customer: VRTC

16PELVCG00H3ACZA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-87

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Rear Passenger Pelvis Resultant Acceleration

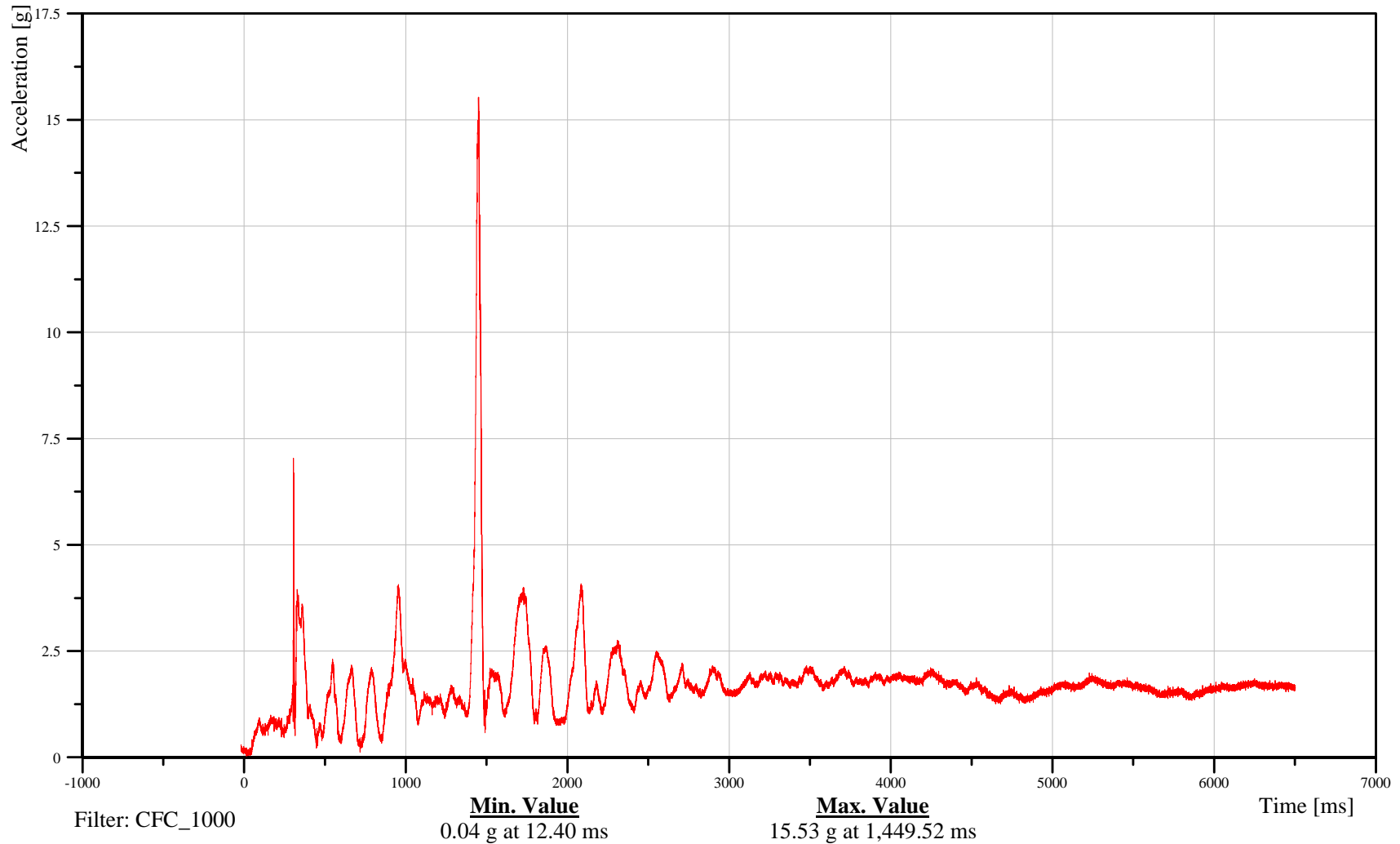
Time: 14:32

Customer: VRTC

16PELVCG00H3ACRA

TRC Inc. Test Lab: CTF

Test Number: 100420



B-88

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Vehicle Center of Gravity X-Axis Acceleration

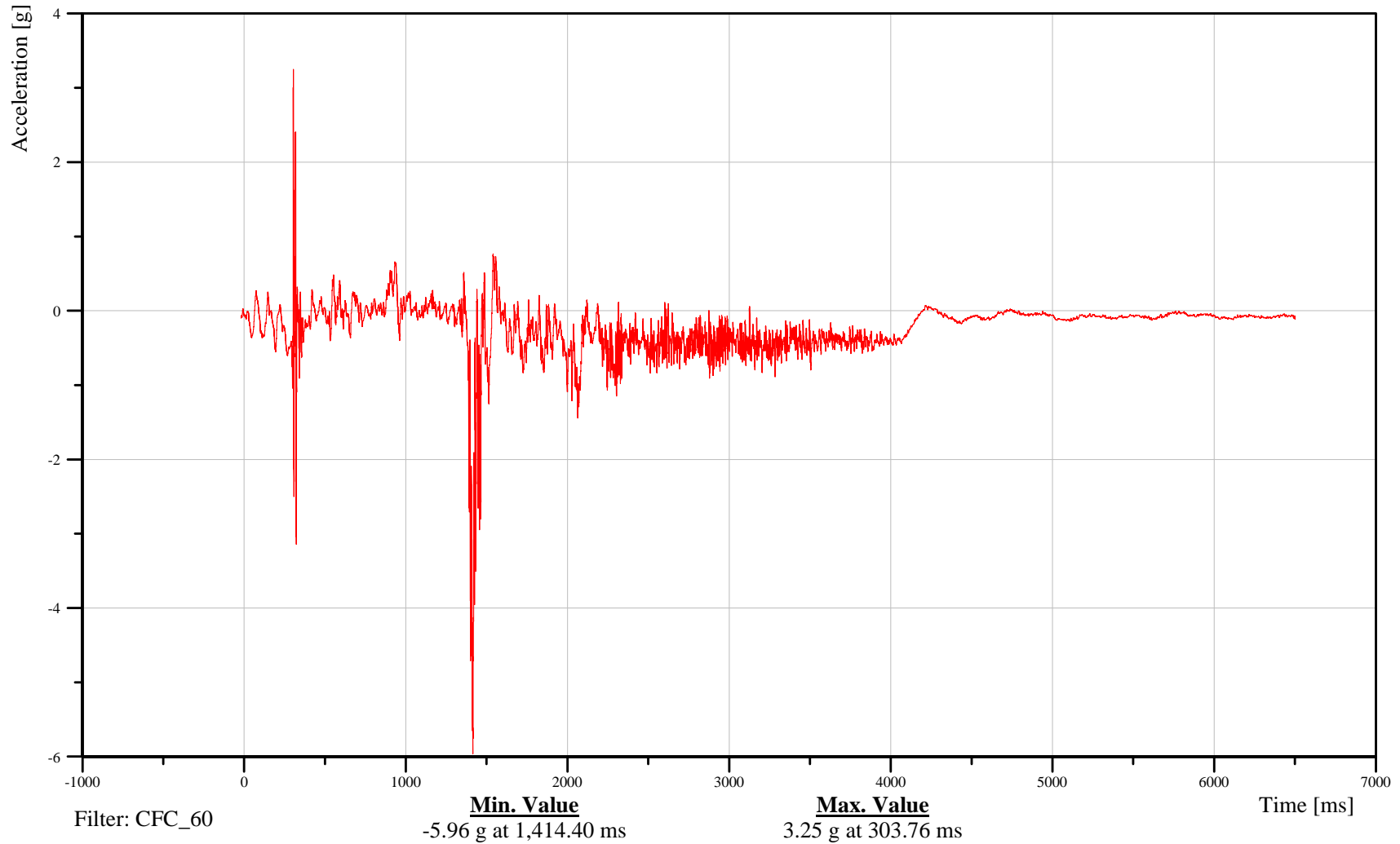
Time: 14:32

Customer: VRTC

10VEHCCG0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-89

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Vehicle Center of Gravity Y-Axis Acceleration

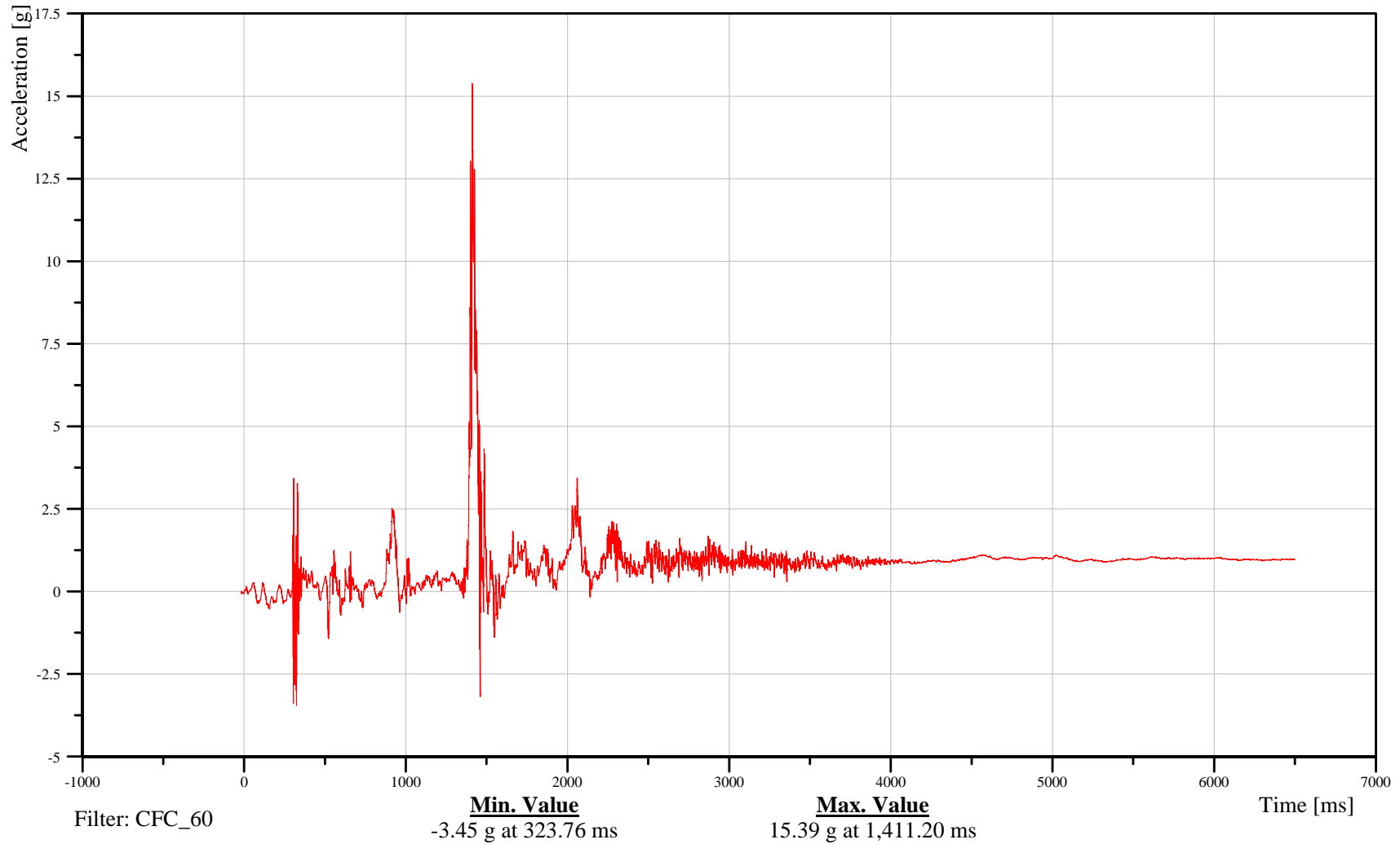
Time: 14:32

Customer: VRTC

10VEHCCG0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-90

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Vehicle Center of Gravity Z-Axis Acceleration

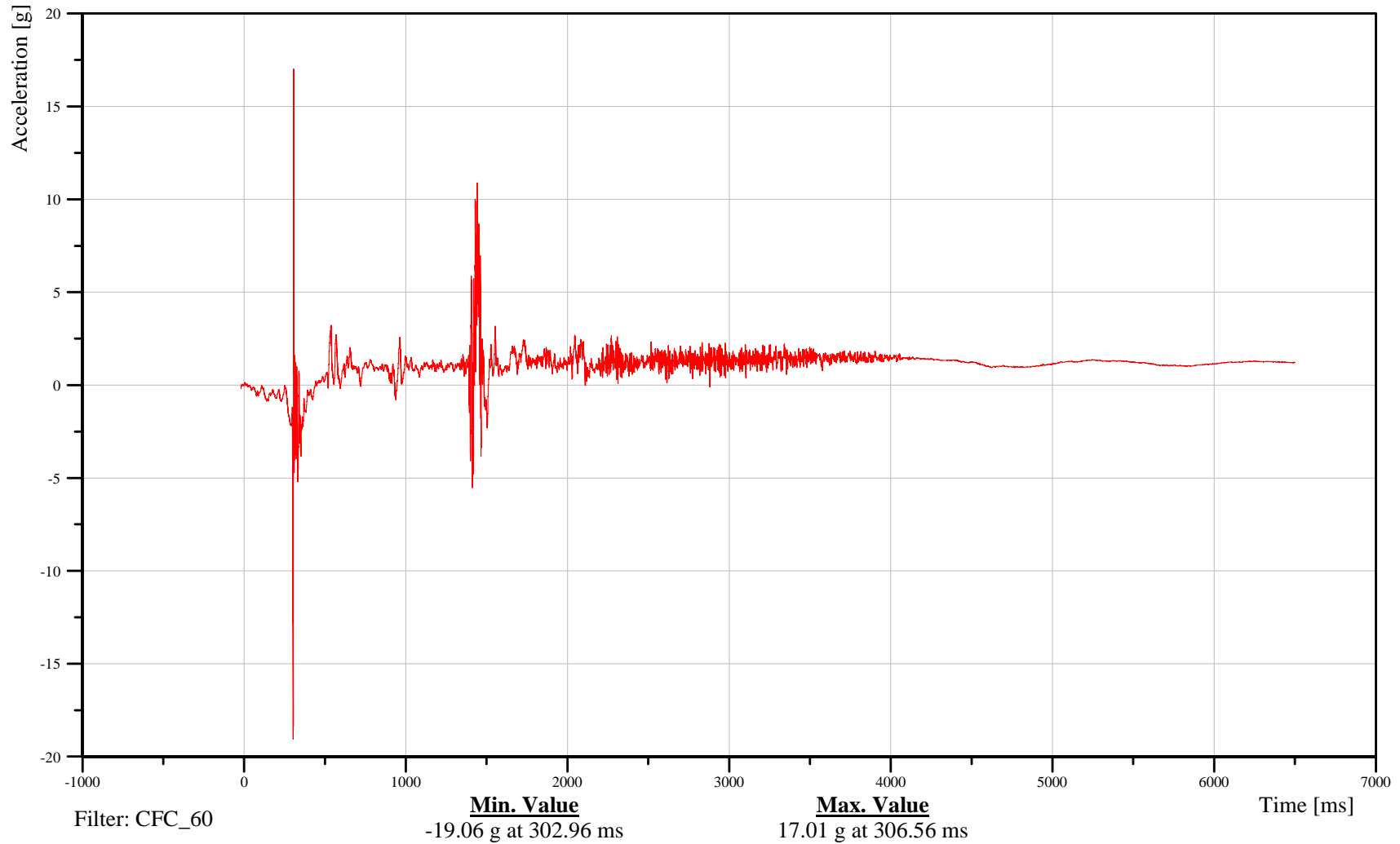
Time: 14:32

Customer: VRTC

10VEHCCG0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-91

100420



Corkscrew Rollover 2007 Ford Expedition

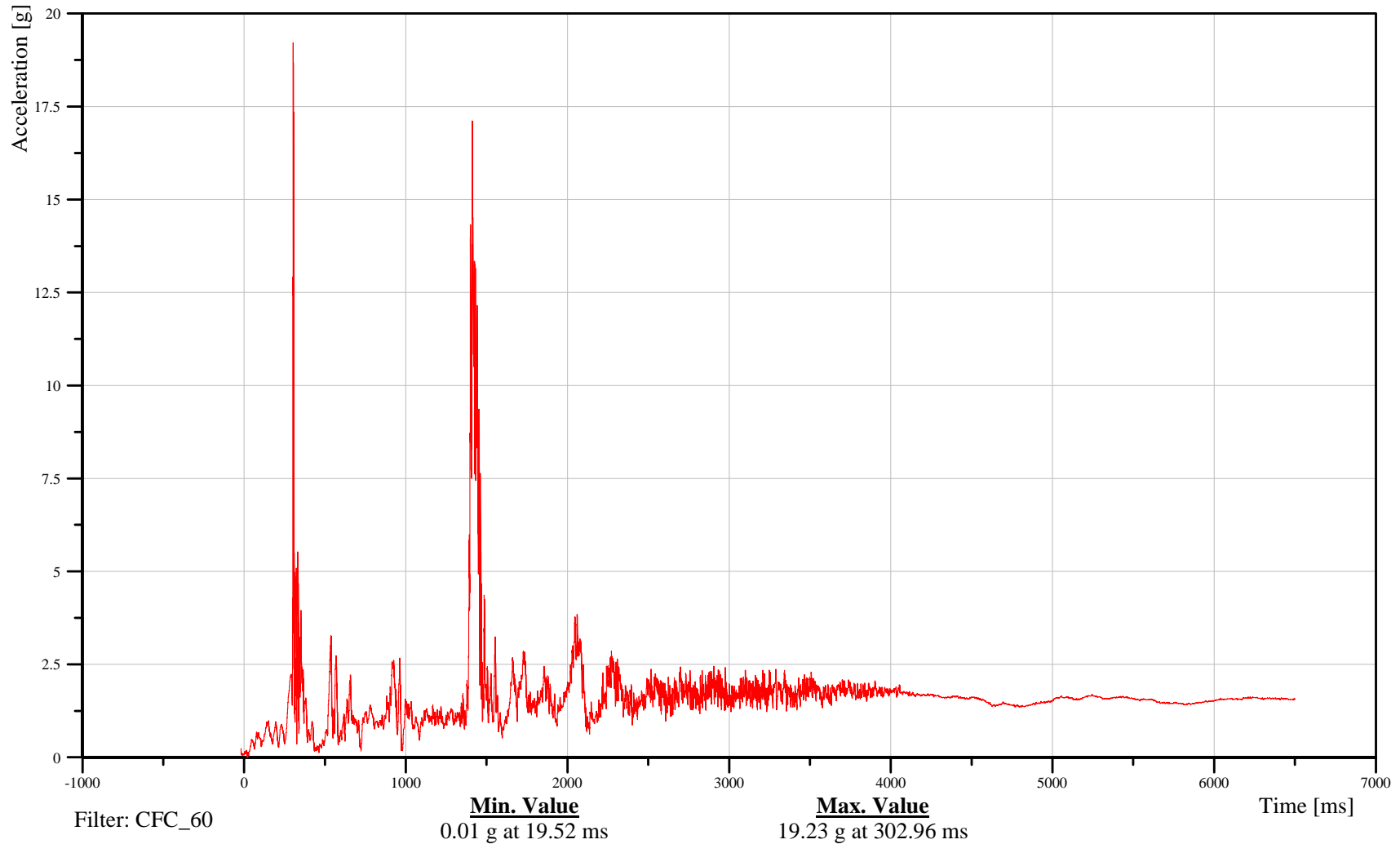
Vehicle Center of Gravity Resultant Acceleration

Date: 04/20/2010
Time: 14:32

Customer: VRTC

10VEHCCG0000ACRD

TRC Inc. Test Lab: CTF
Test Number: 100420



B-92

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

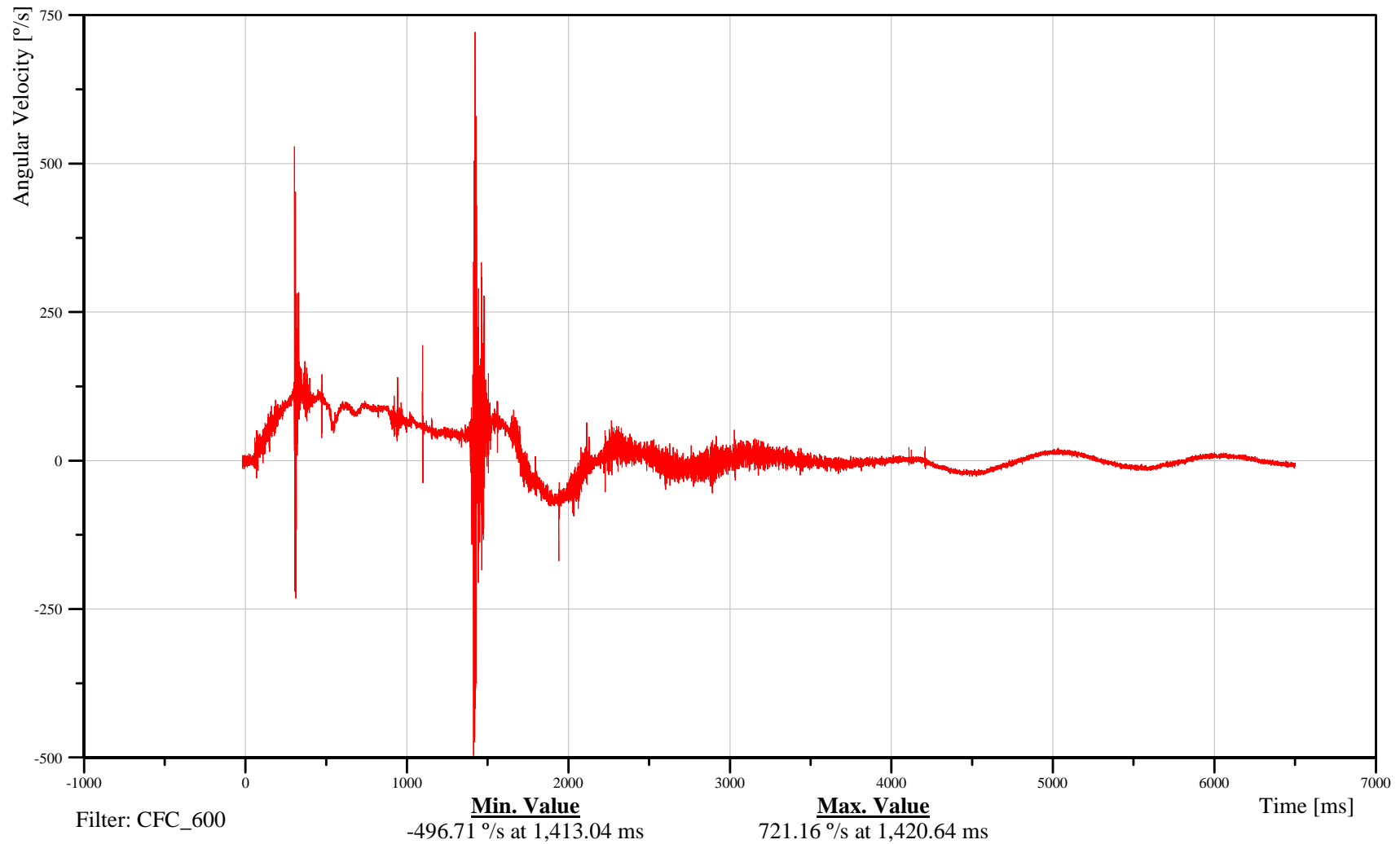
Vehicle Roll Rate

Customer: VRTC

10VEHCCG0000AVXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-93

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Vehicle Pitch Rate

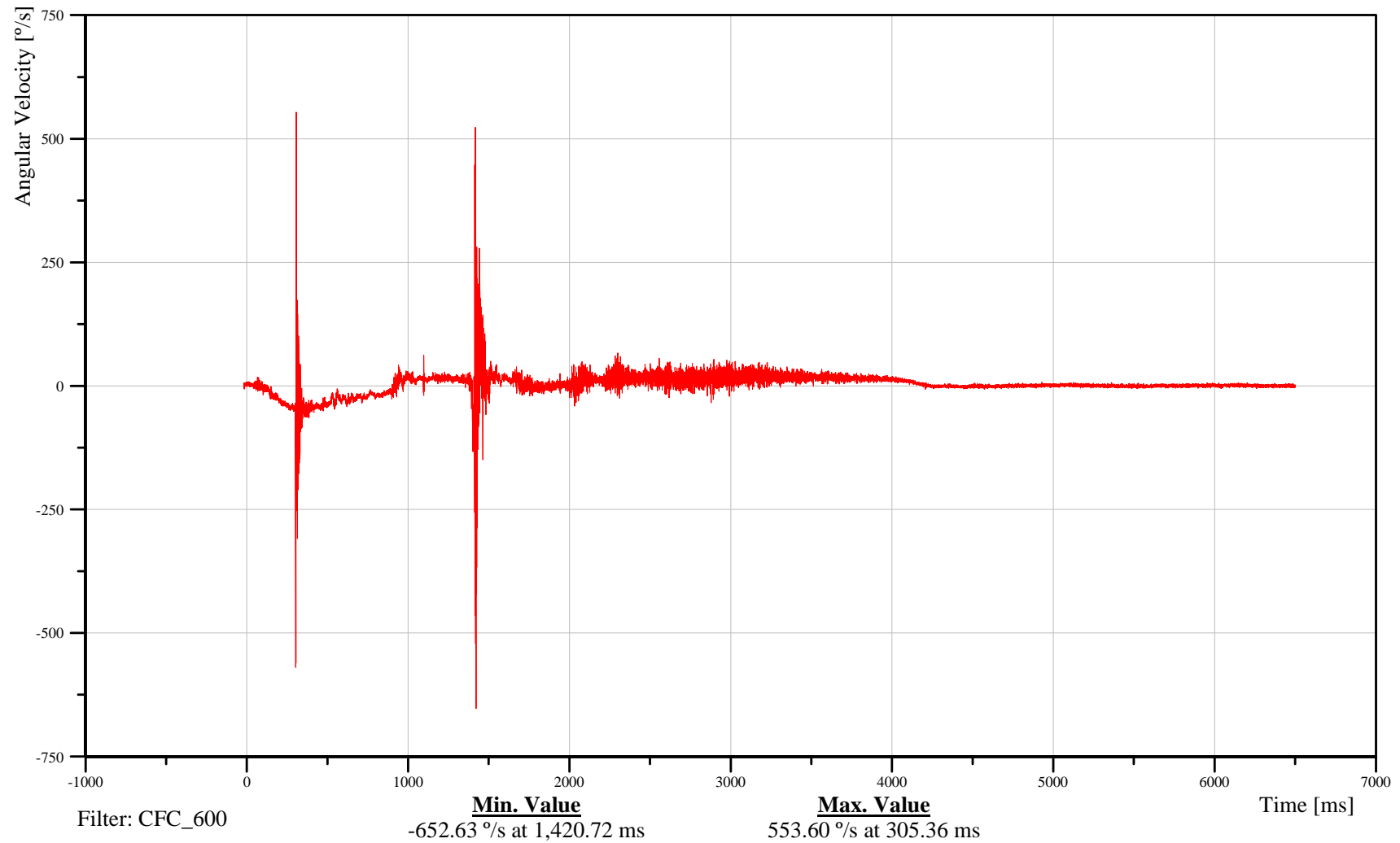
Time: 14:32

Customer: VRTC

10VEHCCG0000AVYB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-94

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

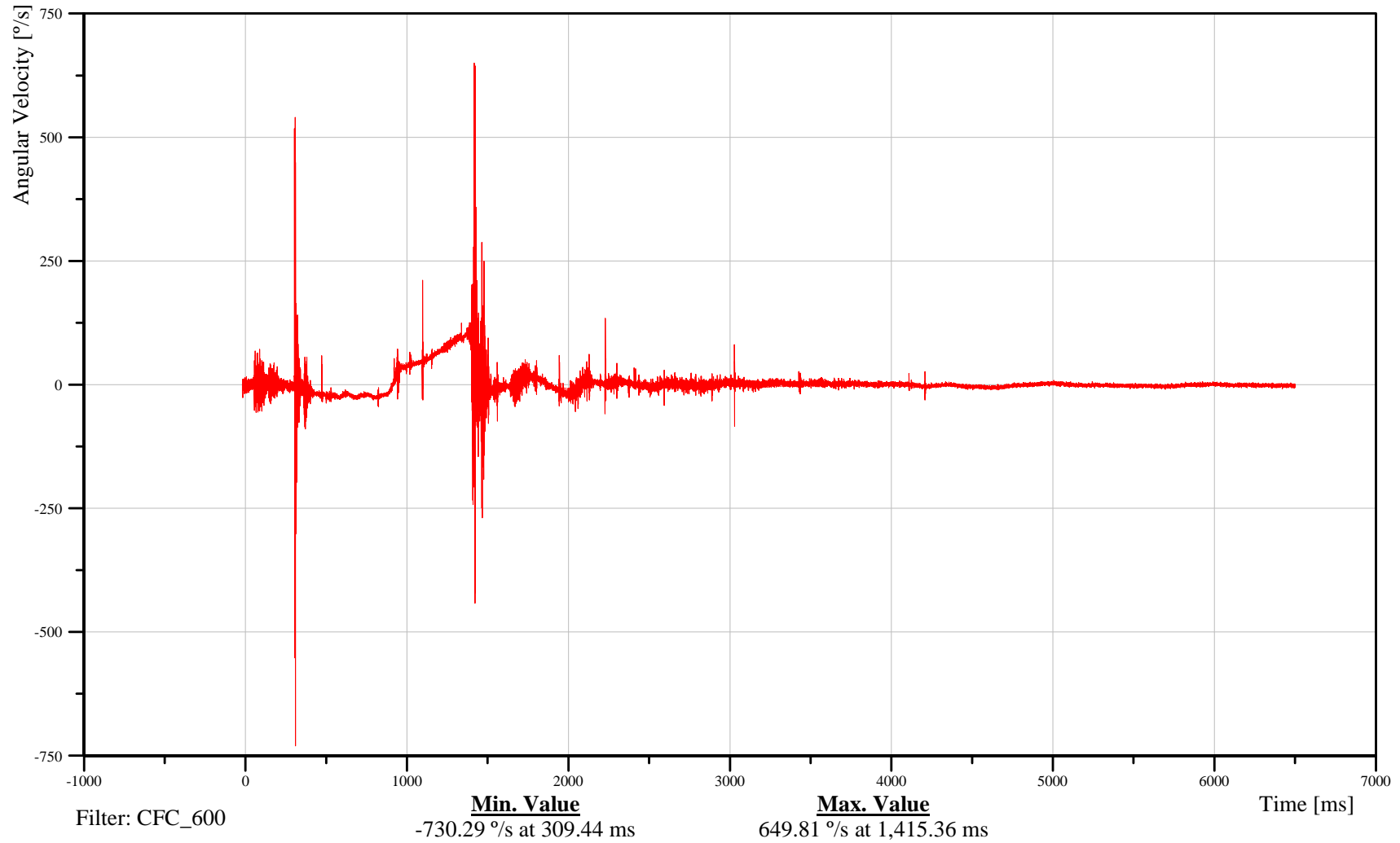
Vehicle Yaw Rate

Customer: VRTC

10VEHCCG0000AVZB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-95

100420



Corkscrew Rollover 2007 Ford Expedition

Rear Deck Roll Rate Redundant

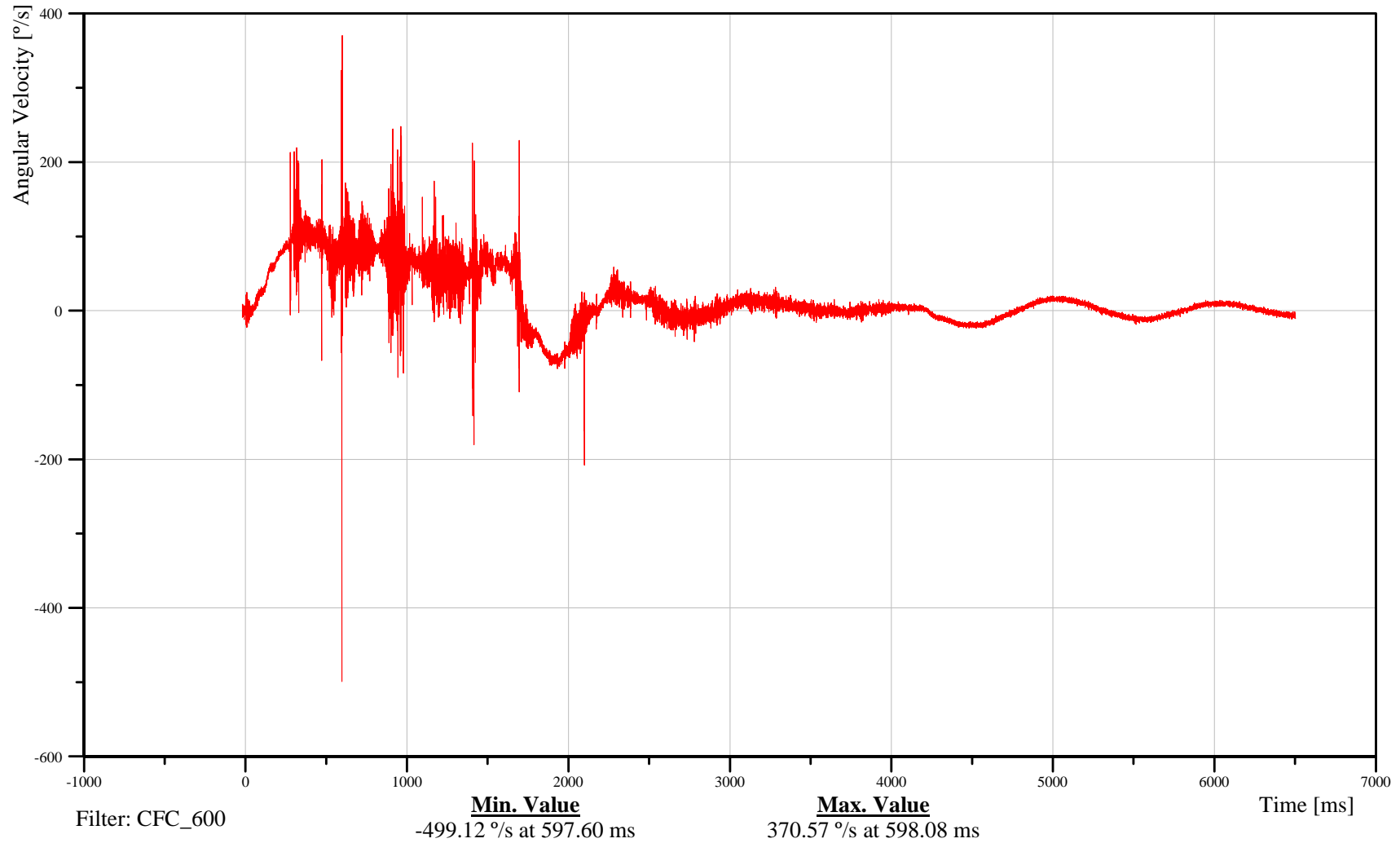
Date: 04/20/2010
Time: 14:32

Customer: VRTC

10VEHCREDK00AVXB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-96

100420



Corkscrew Rollover 2007 Ford Expedition

Rear Deck Pitch Rate Redundant

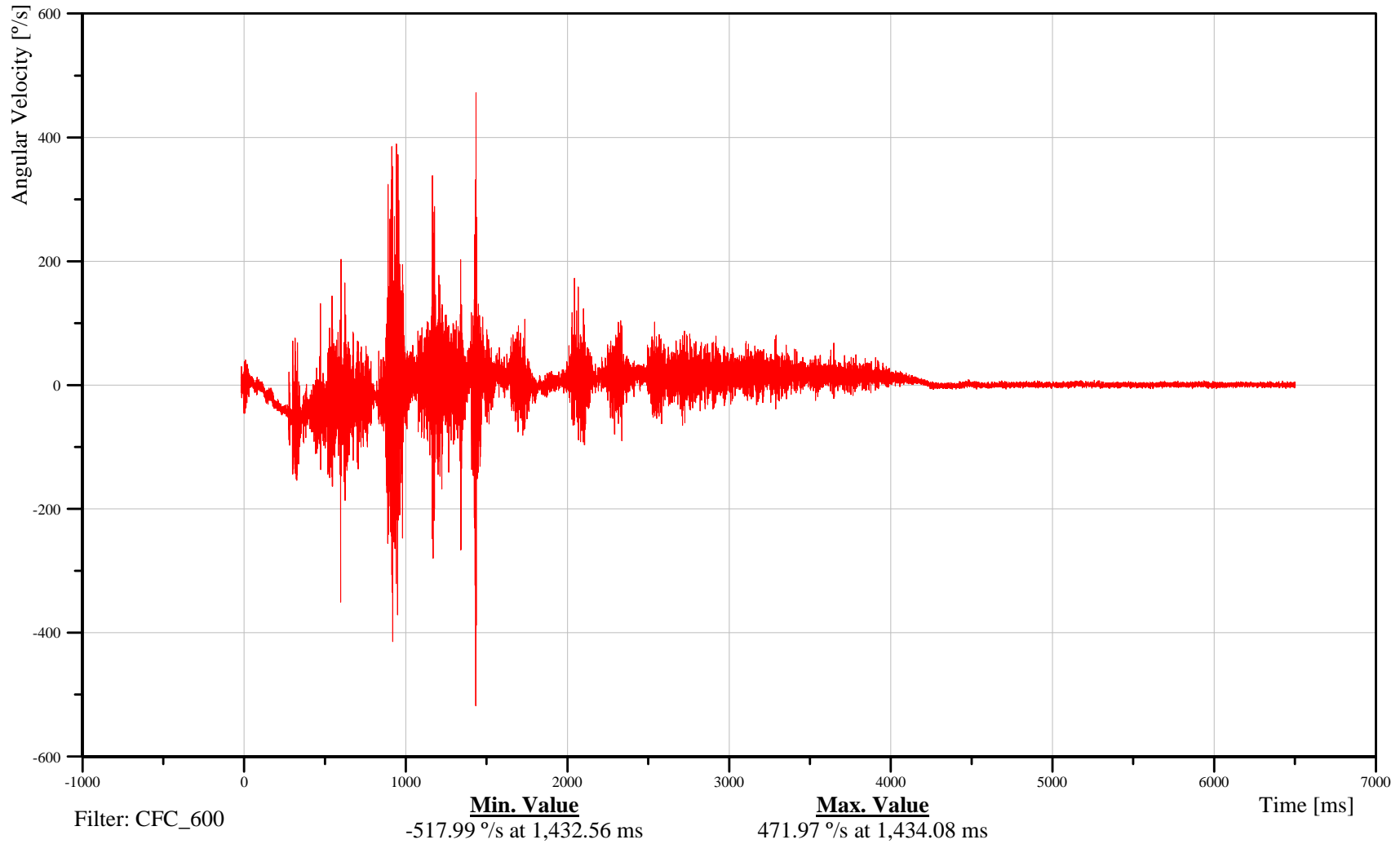
Date: 04/20/2010
Time: 14:32

Customer: VRTC

10VEHCREDK00AVYB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-97

100420



Corkscrew Rollover 2007 Ford Expedition

Rear Deck Yaw Rate Redundant

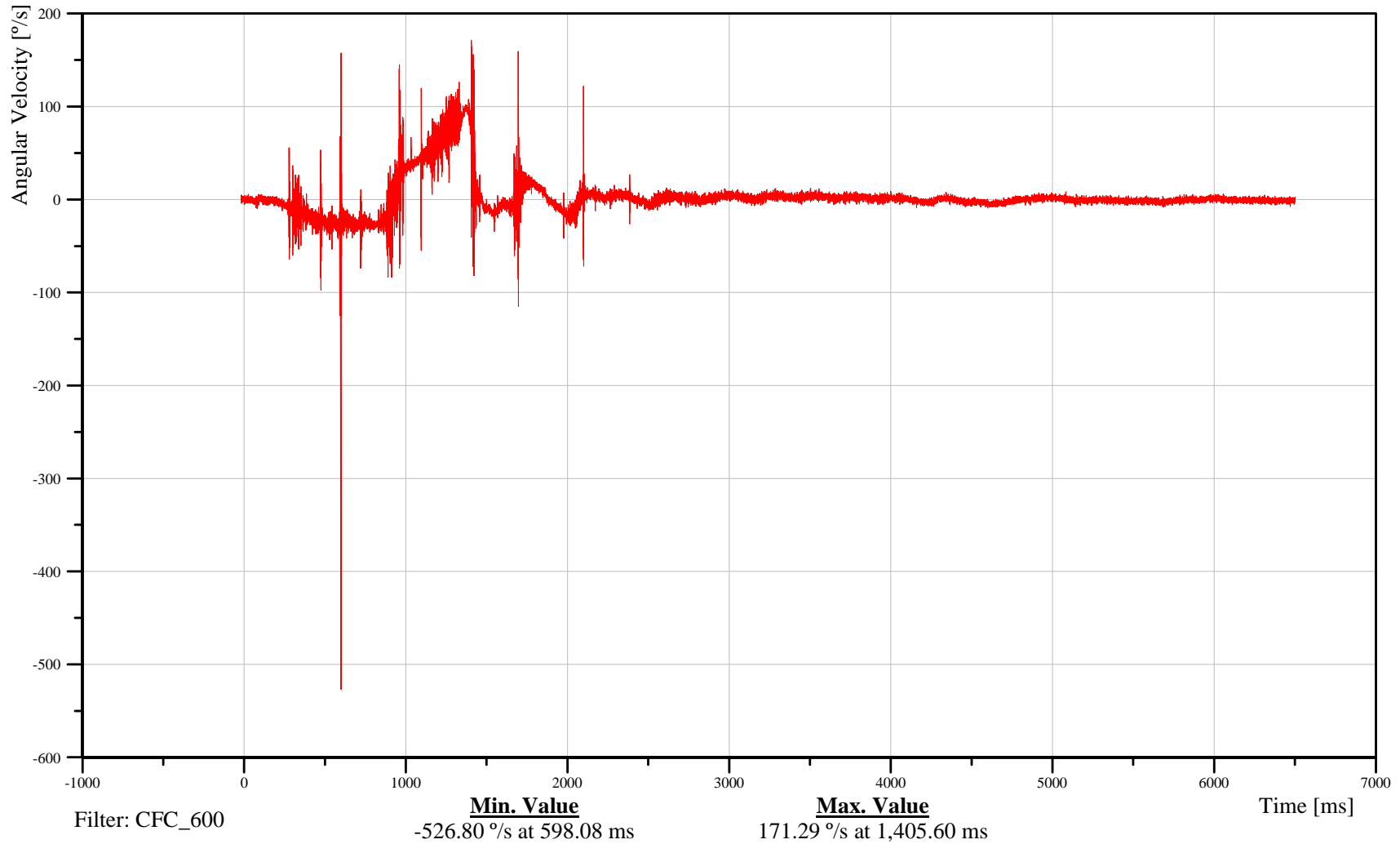
Date: 04/20/2010
Time: 14:32

Customer: VRTC

10VEHCREDK00AVZB

TRC Inc. Test Lab: CTF

Test Number: 100420



B-98

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

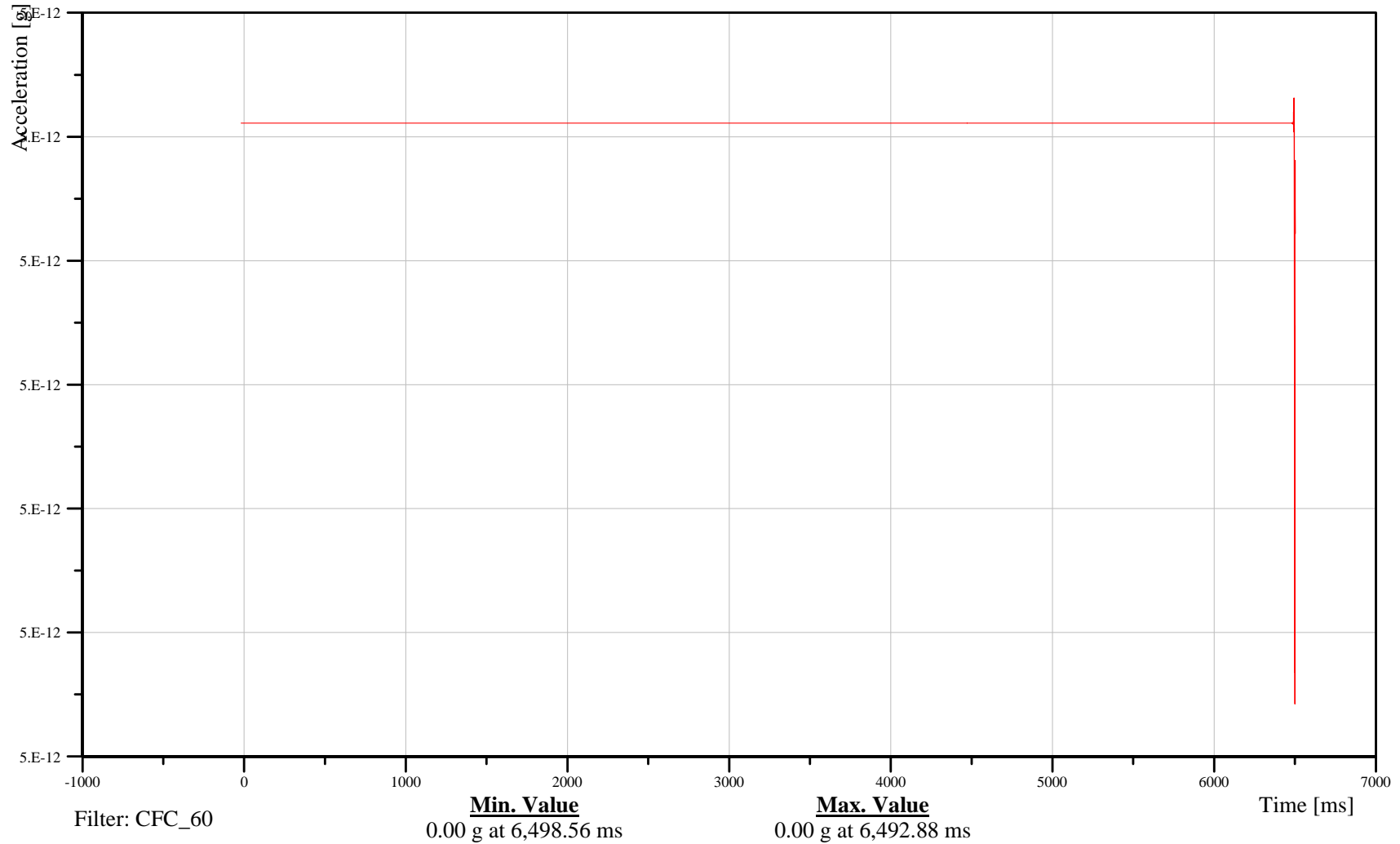
Top of Engine X-Axis Acceleration

Customer: VRTC

10ENGNTTP0000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-99

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Top of Engine Y-Axis Acceleration

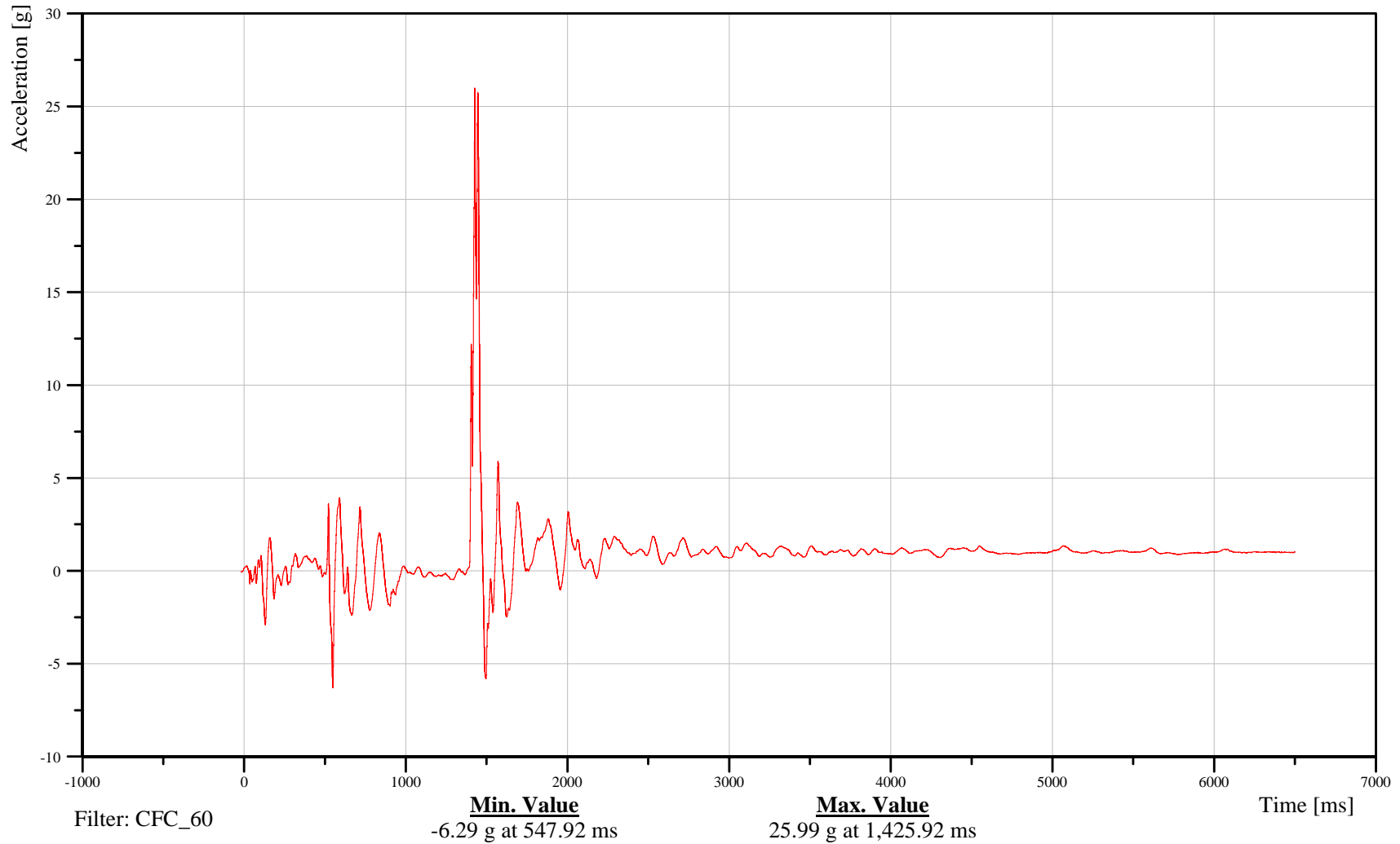
Time: 14:32

Customer: VRTC

10ENGNTTP0000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-100

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

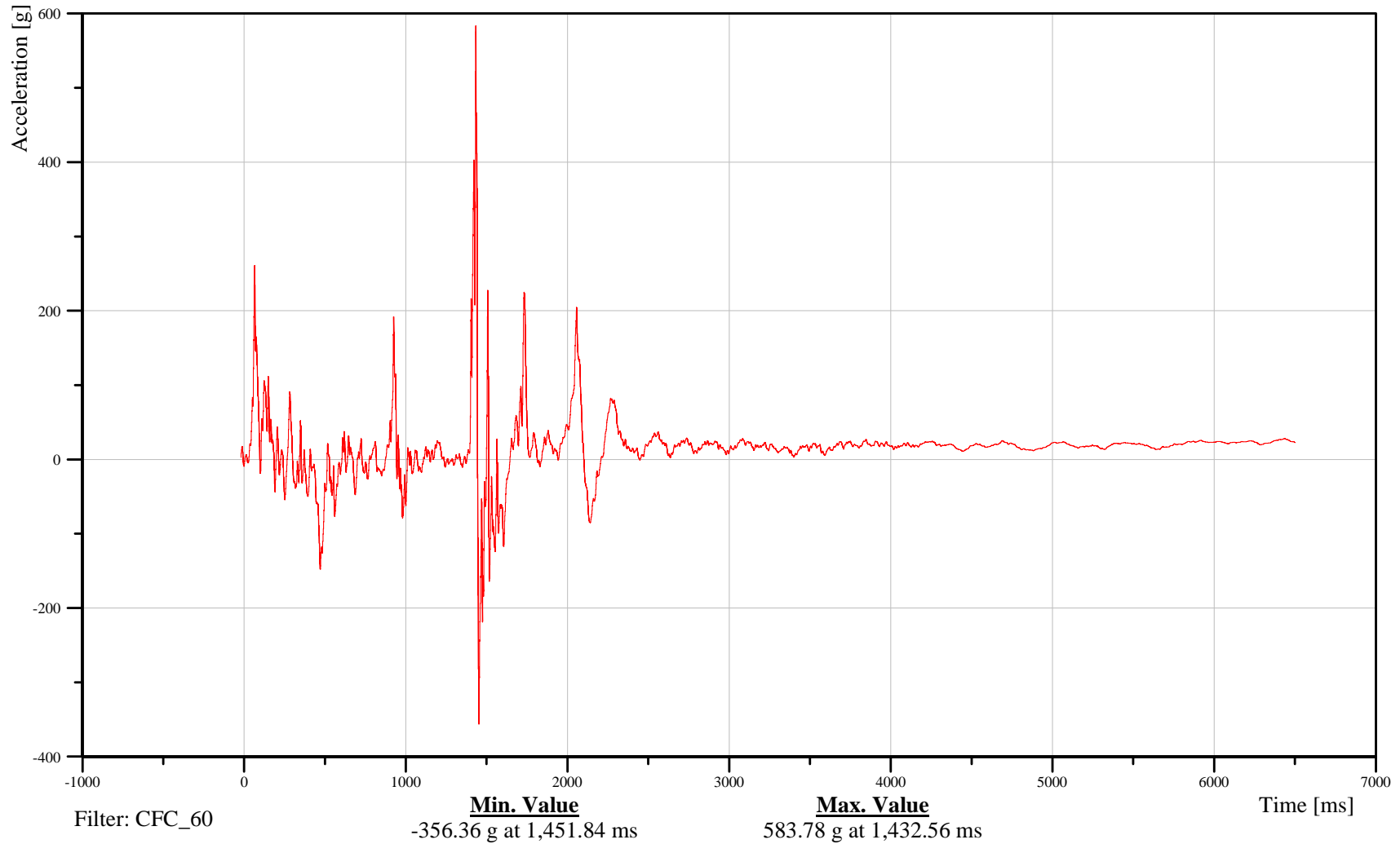
Top of Engine Z-Axis Acceleration

Customer: VRTC

10ENGNTTP0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-101

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

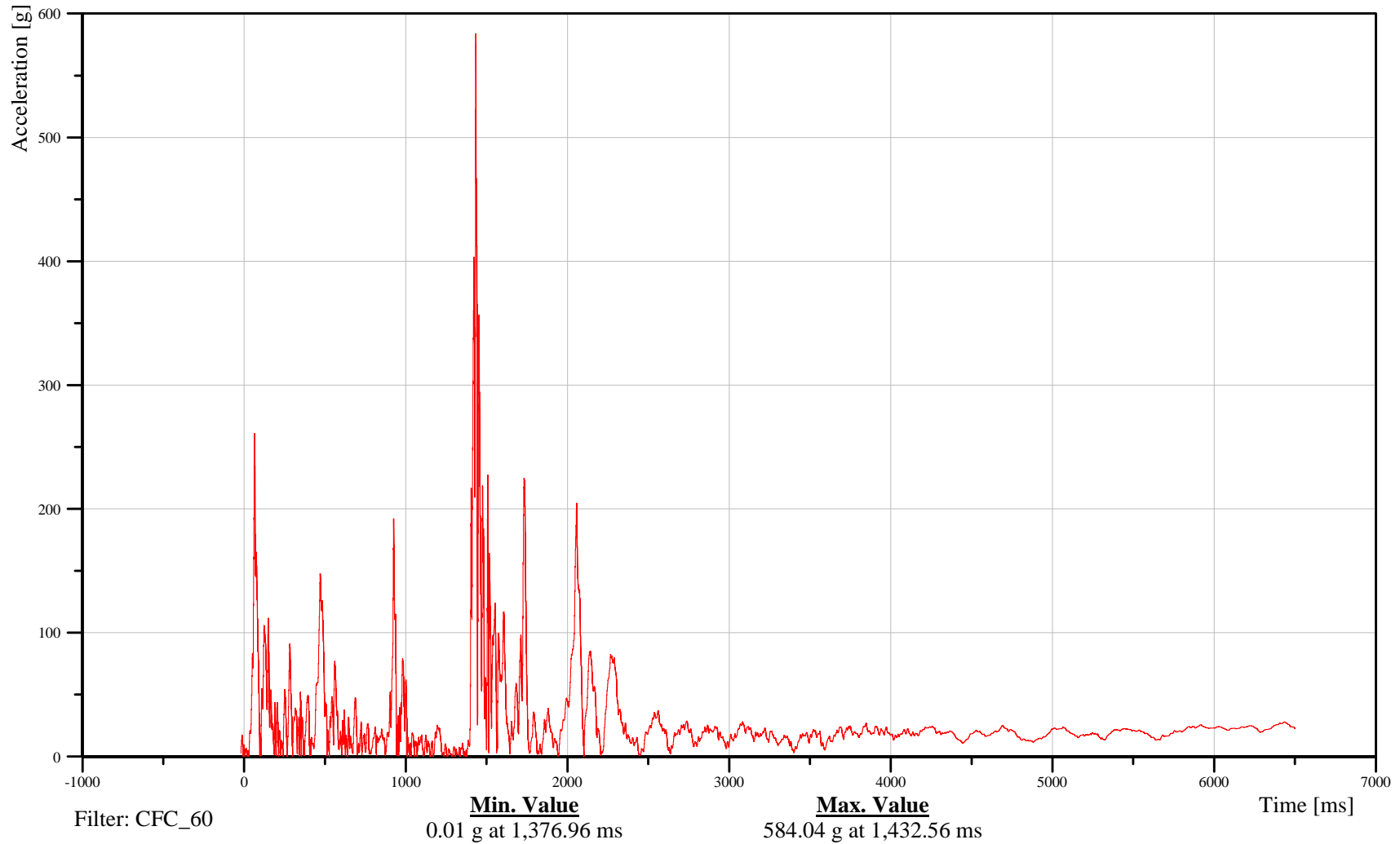
Top of Engine Resultant Acceleration

Customer: VRTC

10ENGNTTP0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-102

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

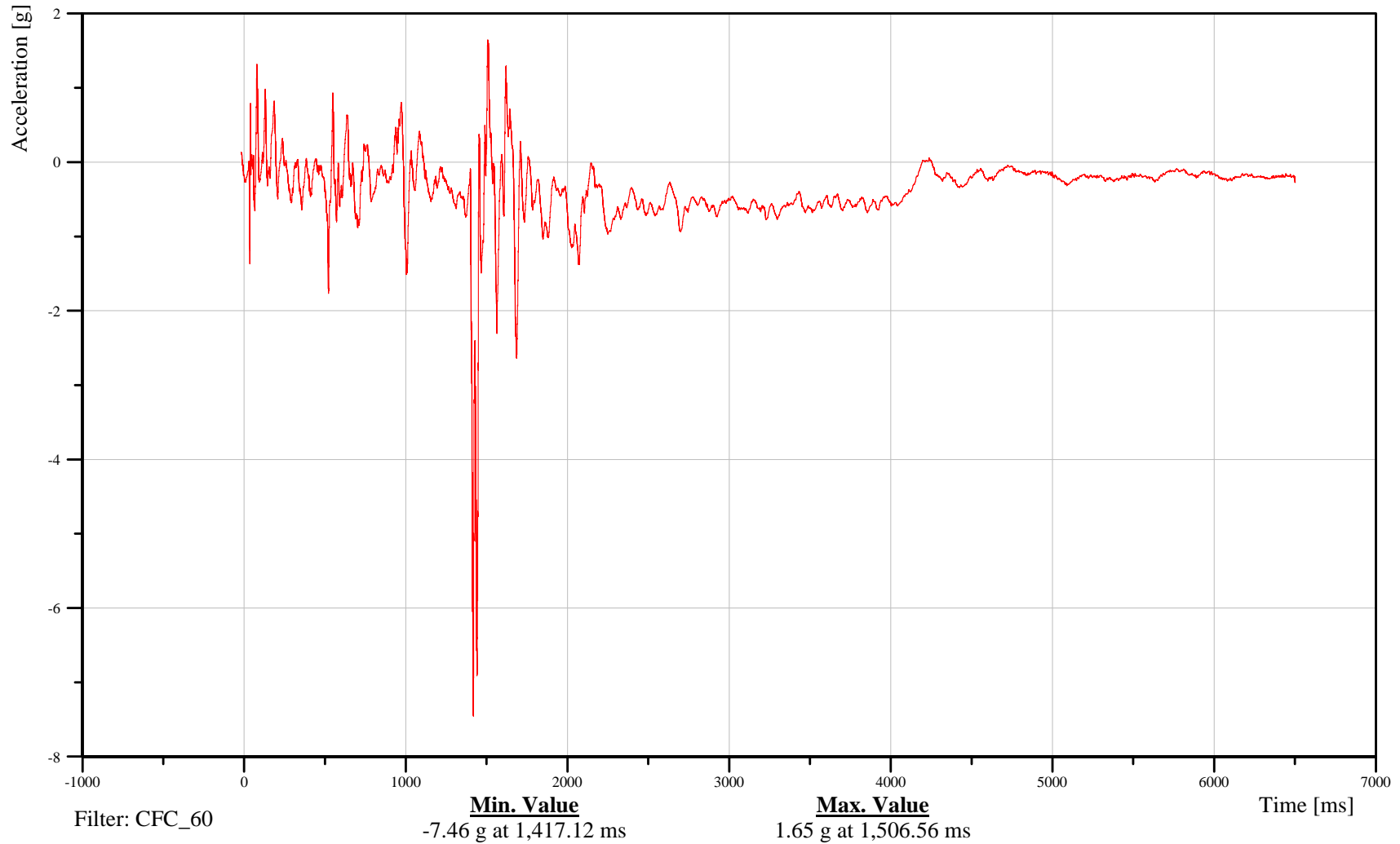
Bottom of Engine X-Axis Acceleration

Customer: VRTC

10ENGNB00000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-103

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

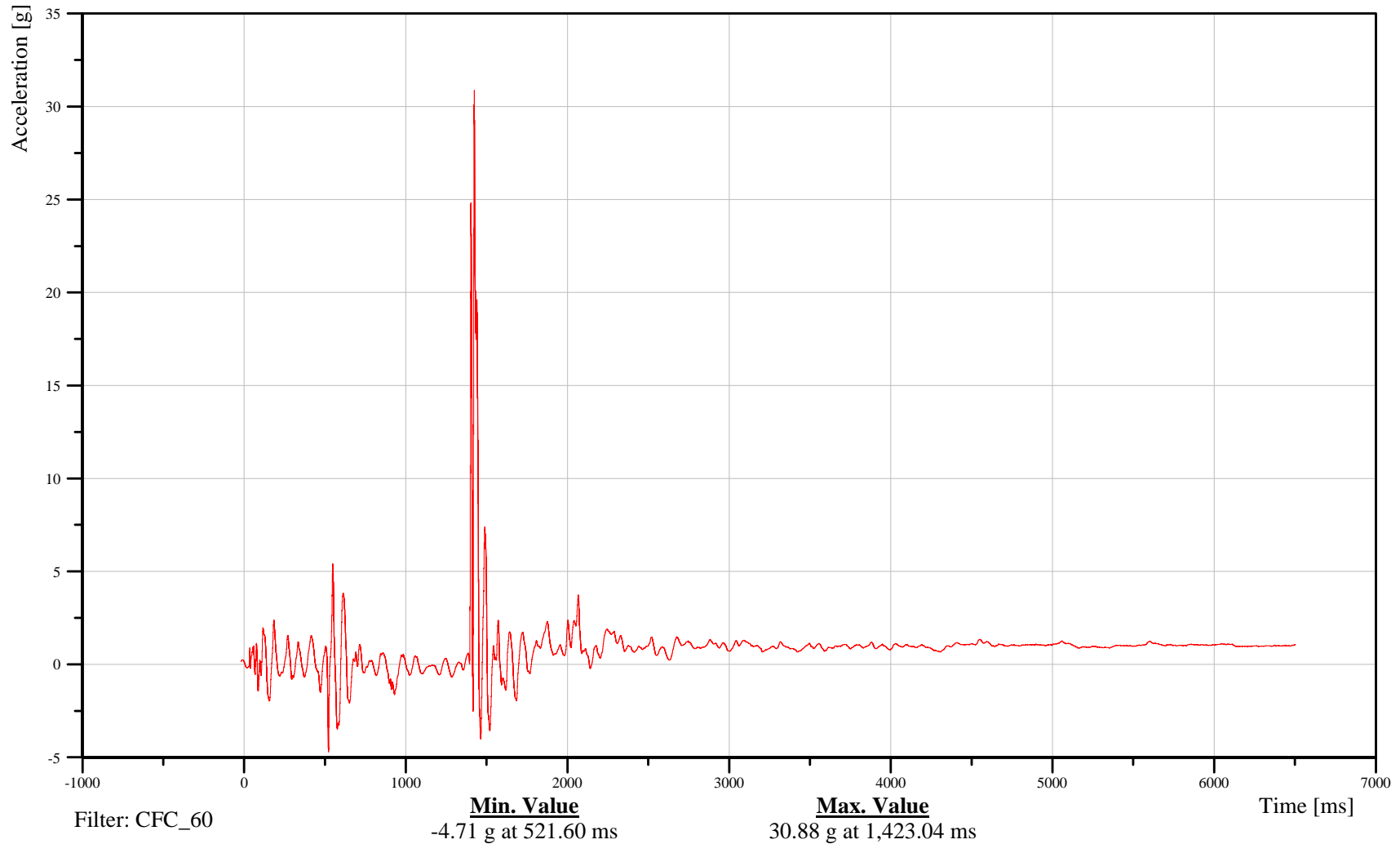
Bottom of Engine Y-Axis Acceleration

Customer: VRTC

10ENGNB00000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-104

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

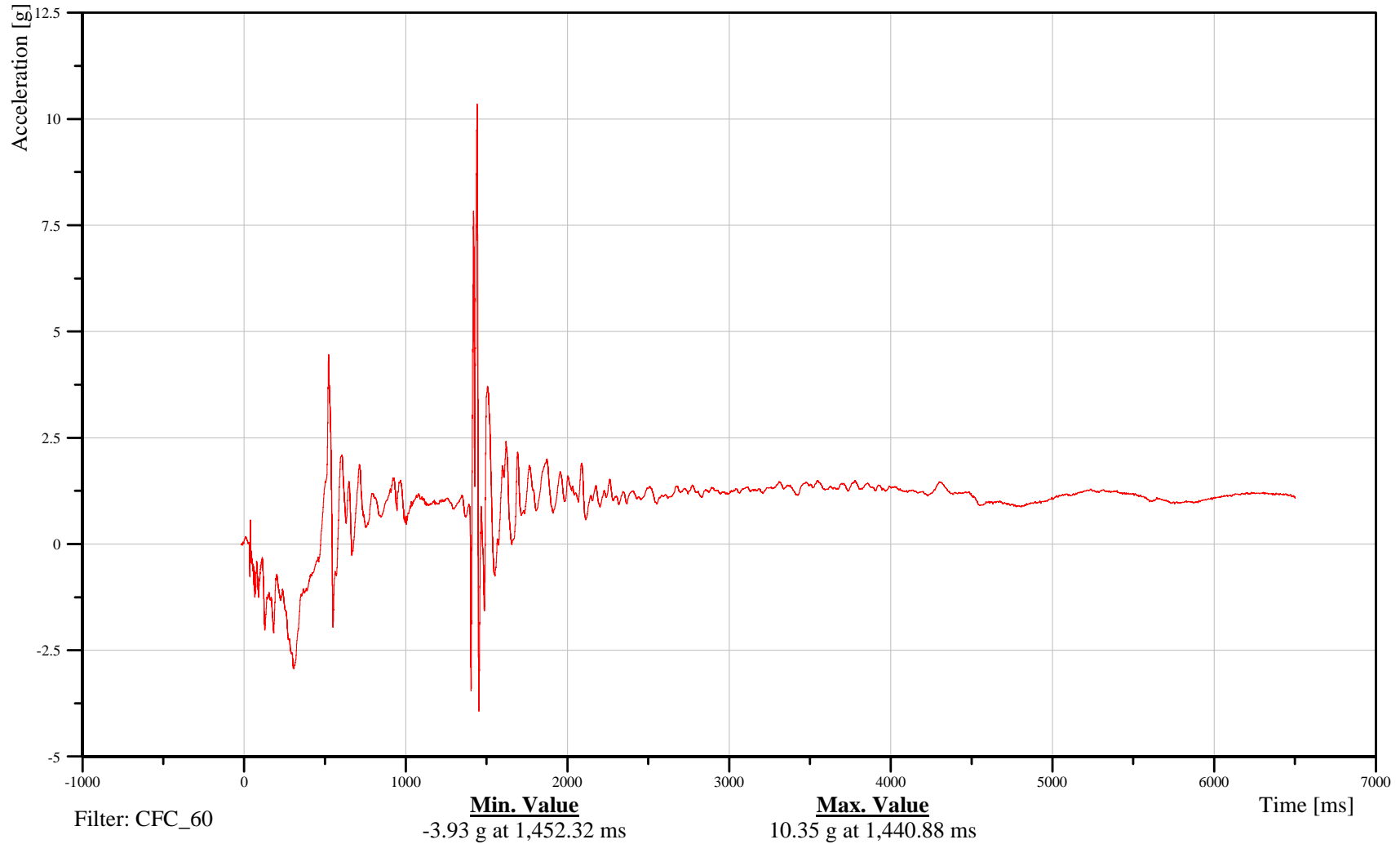
Bottom of Engine Z-Axis Acceleration

Customer: VRTC

10ENGNBO0000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-105

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

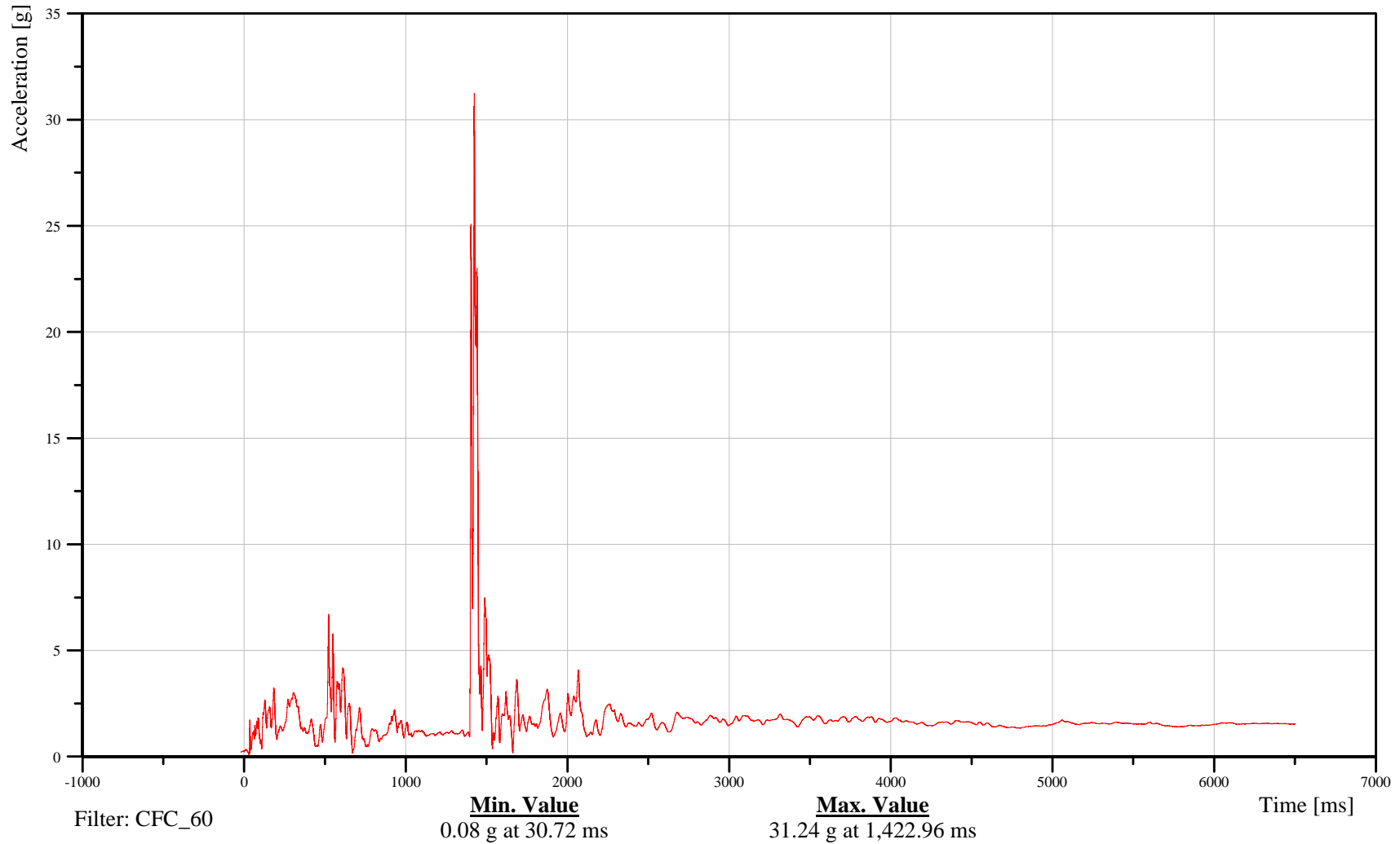
Bottom of Engine Resultant Acceleration

Customer: VRTC

10ENGNB0000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-106

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

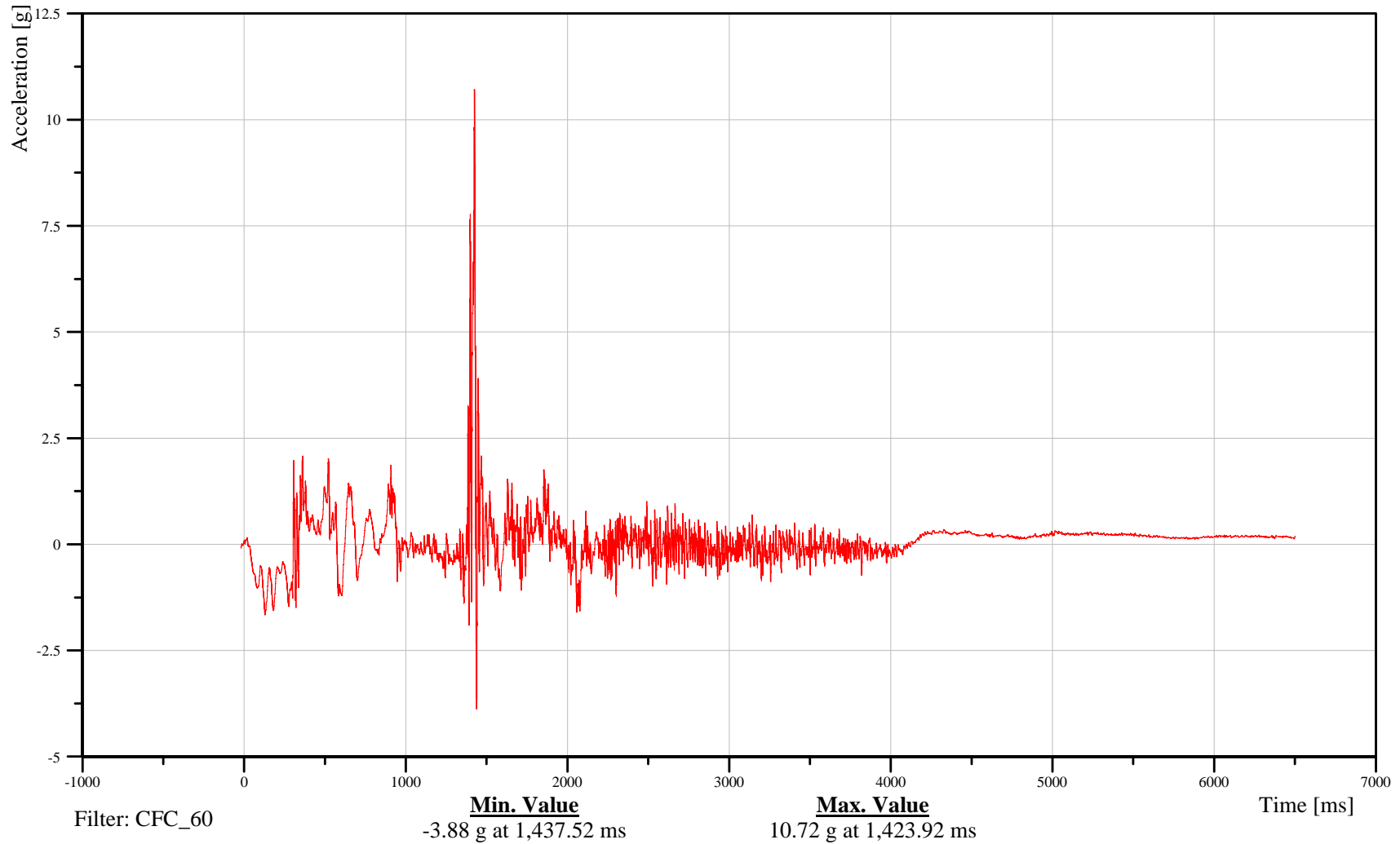
Left A-Pillar Upper X-Axis Acceleration

Customer: VRTC

10APILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-107

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

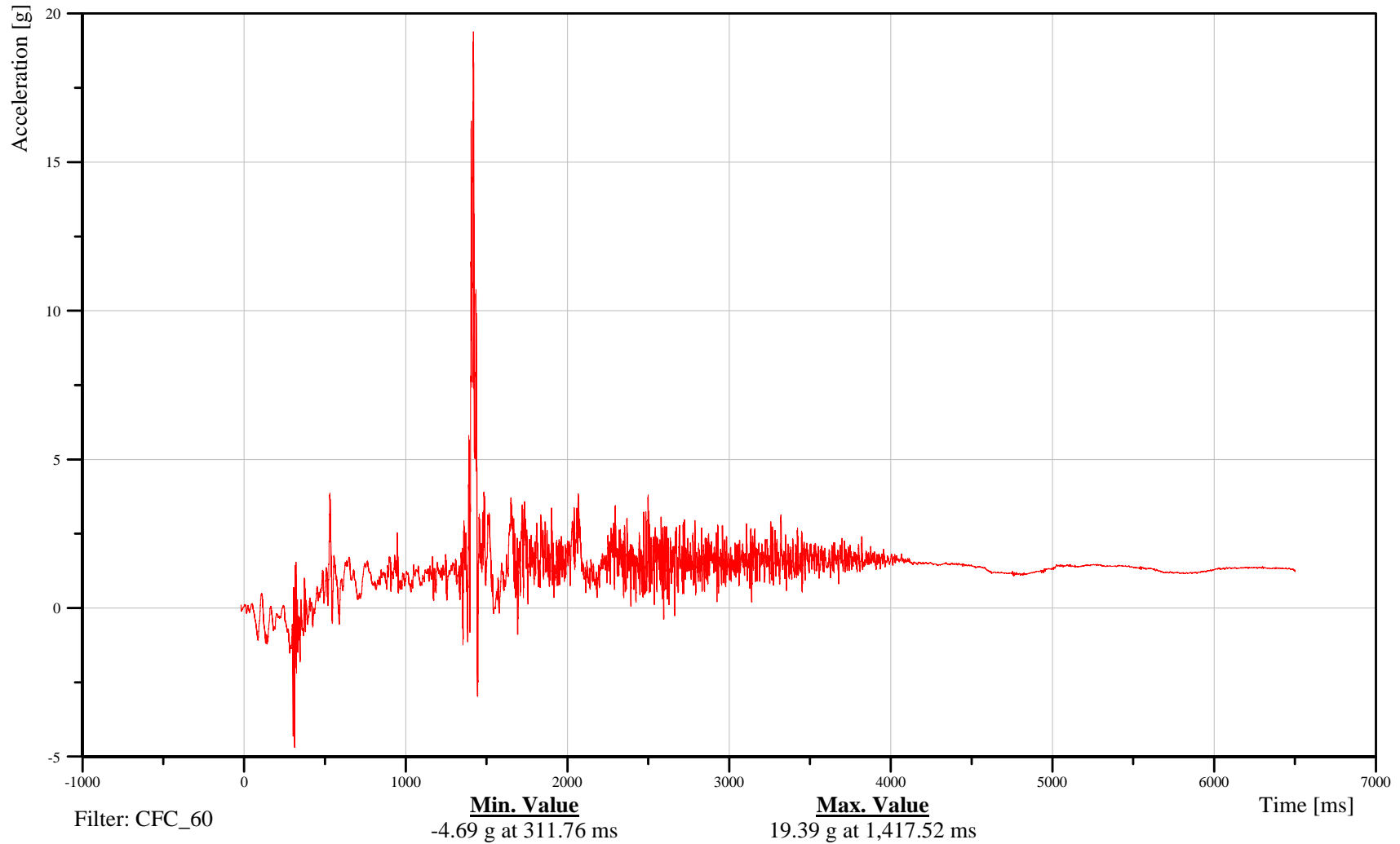
Left A-Pillar Upper Y-Axis Acceleration

Customer: VRTC

10APILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-108

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

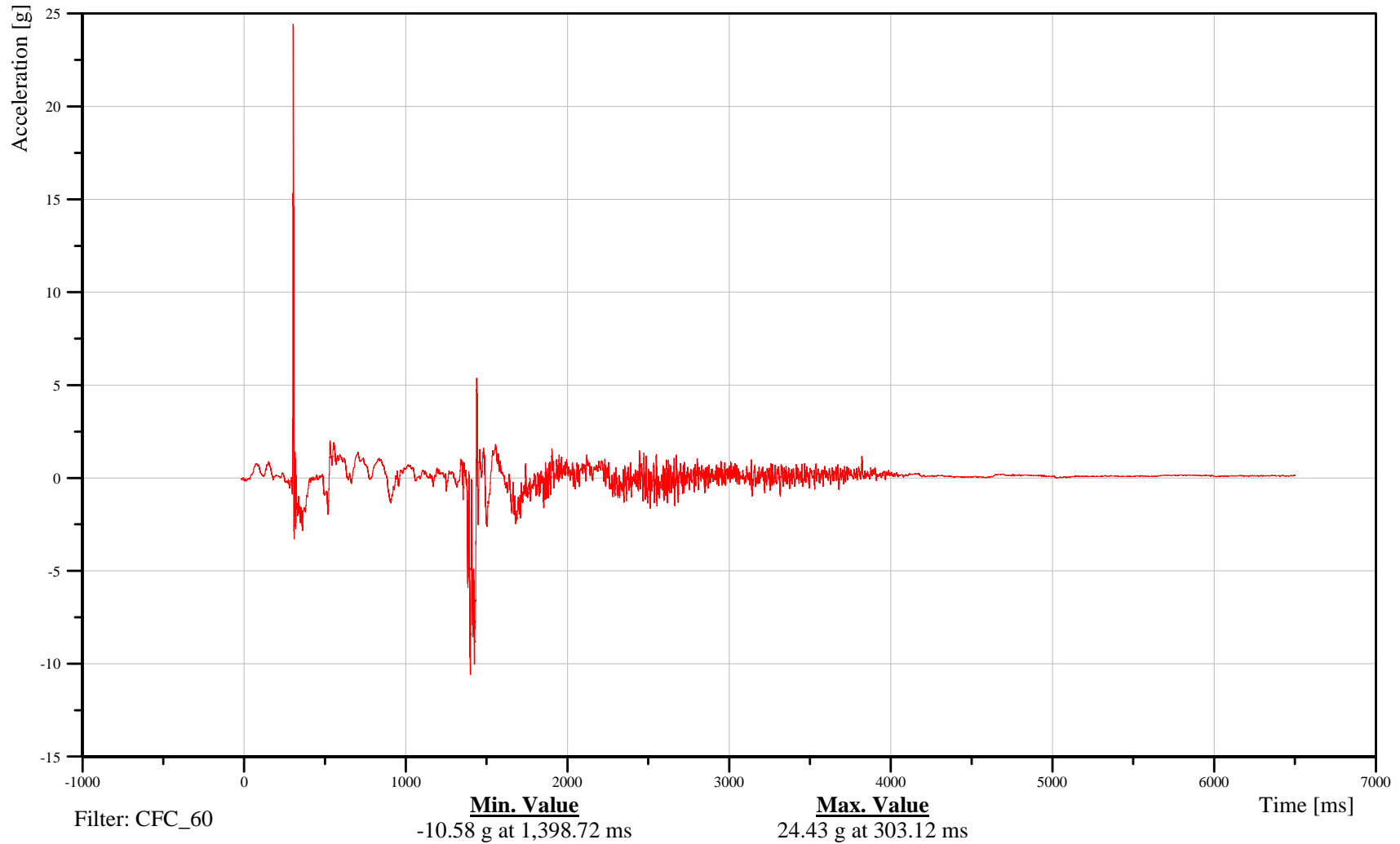
Left A-Pillar Upper Z-Axis Acceleration

Customer: VRTC

10APILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-109

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

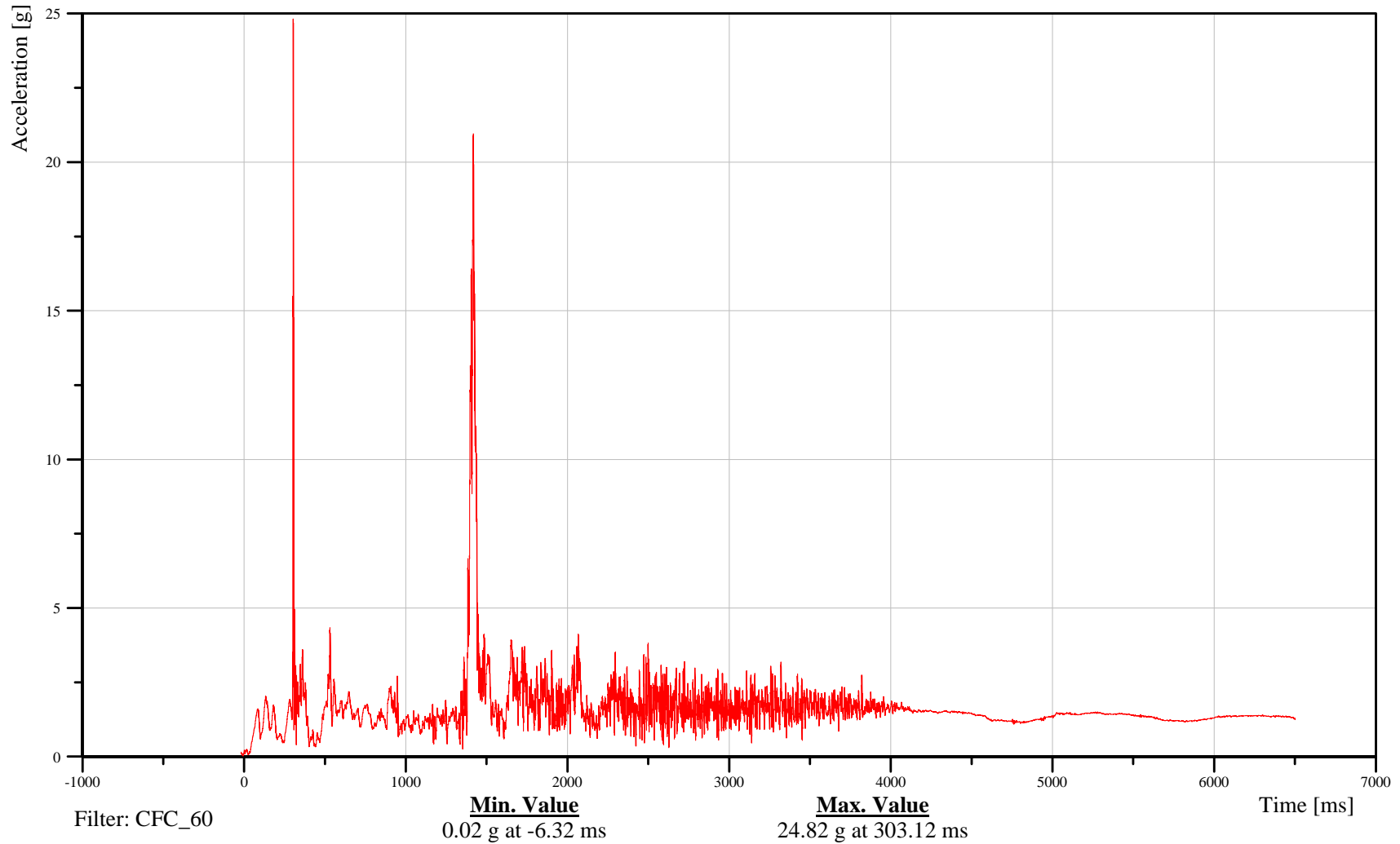
Left A-Pillar Upper Resultant Acceleration

Customer: VRTC

10APILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-110

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

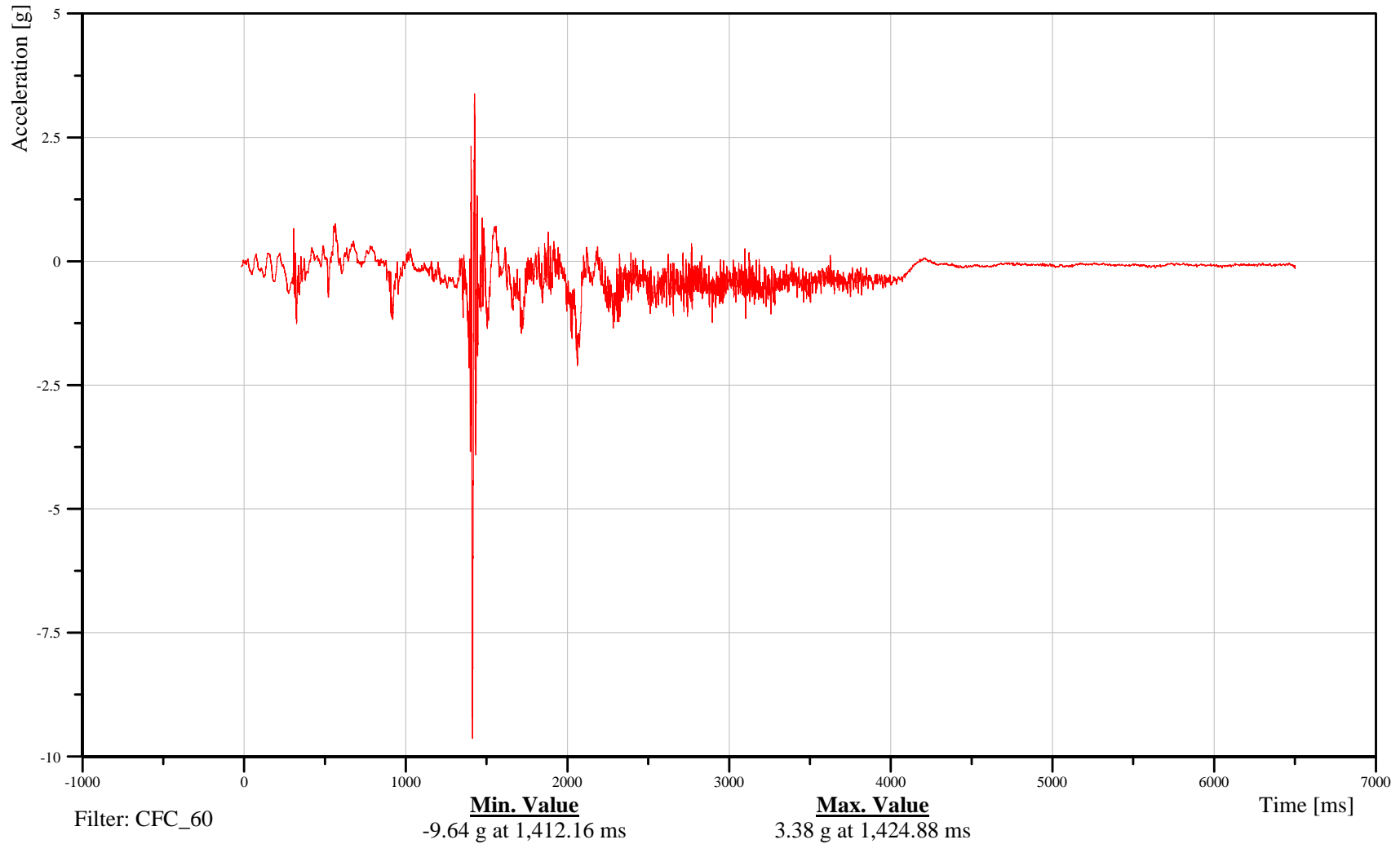
Left A-Pillar Lower X-Axis Acceleration

Customer: VRTC

10APILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-111

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

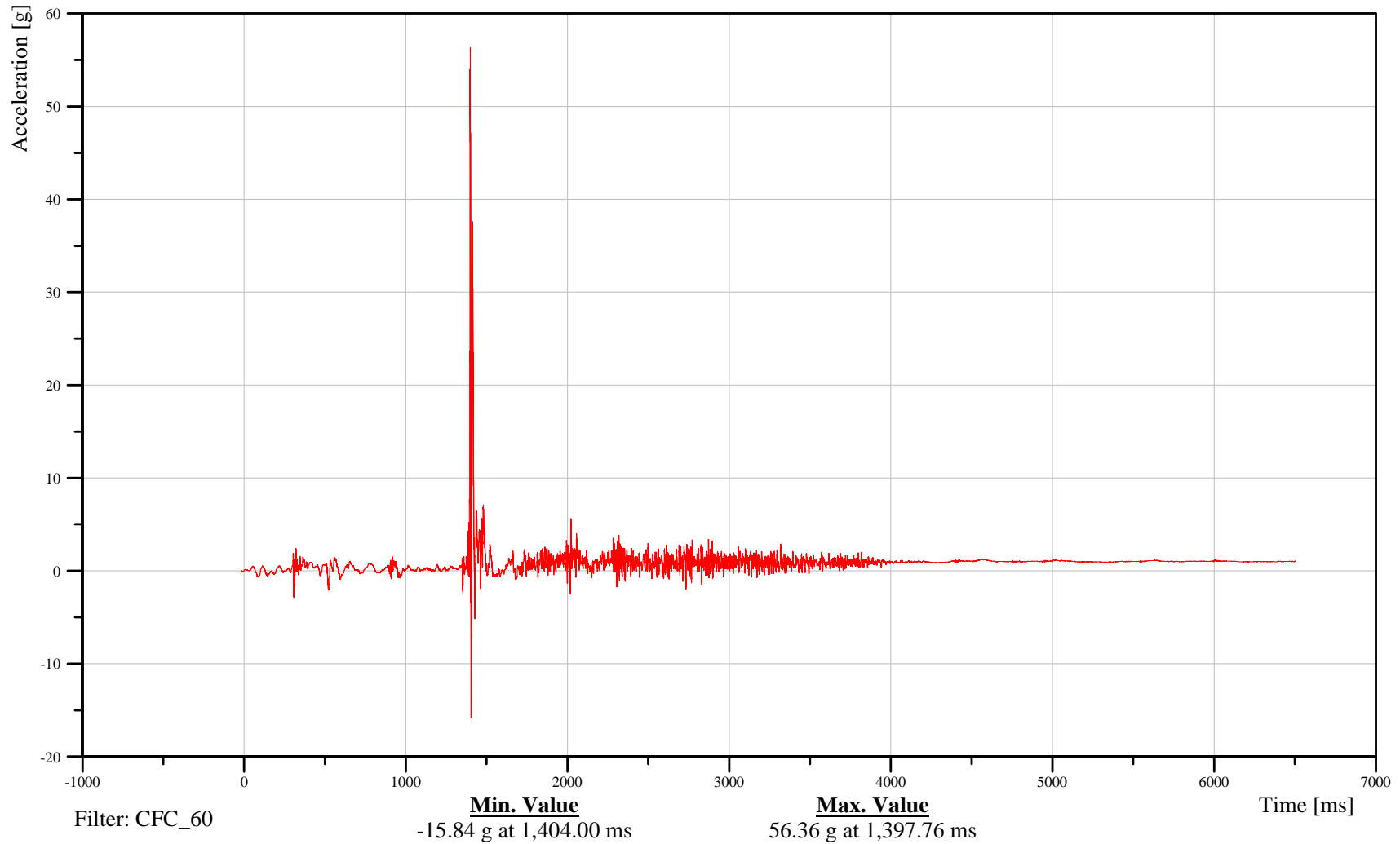
Left A-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10APILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-112

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left A-Pillar Lower Z-Axis Acceleration

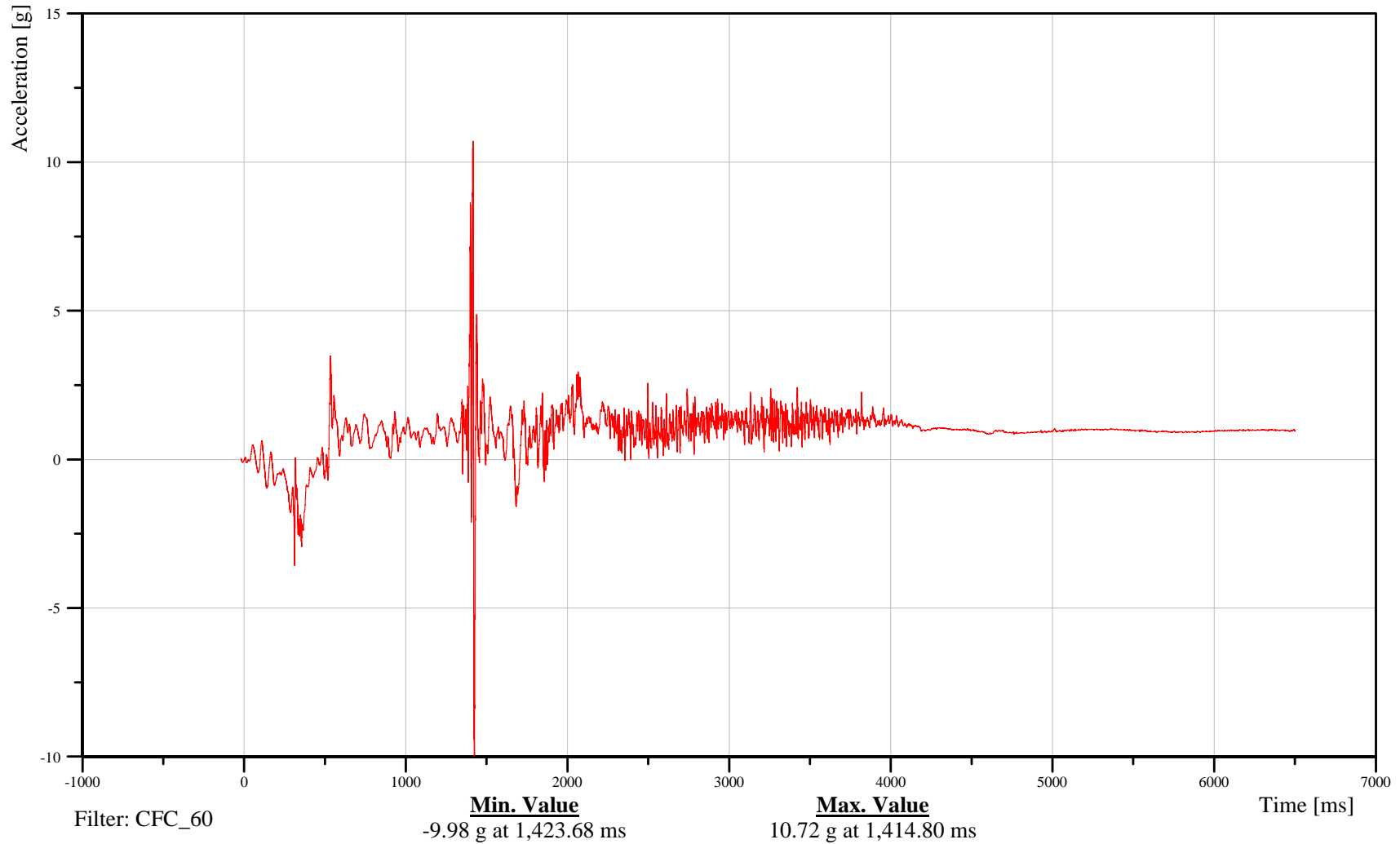
Time: 14:32

Customer: VRTC

10APILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-113

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left A-Pillar Lower Resultant Acceleration

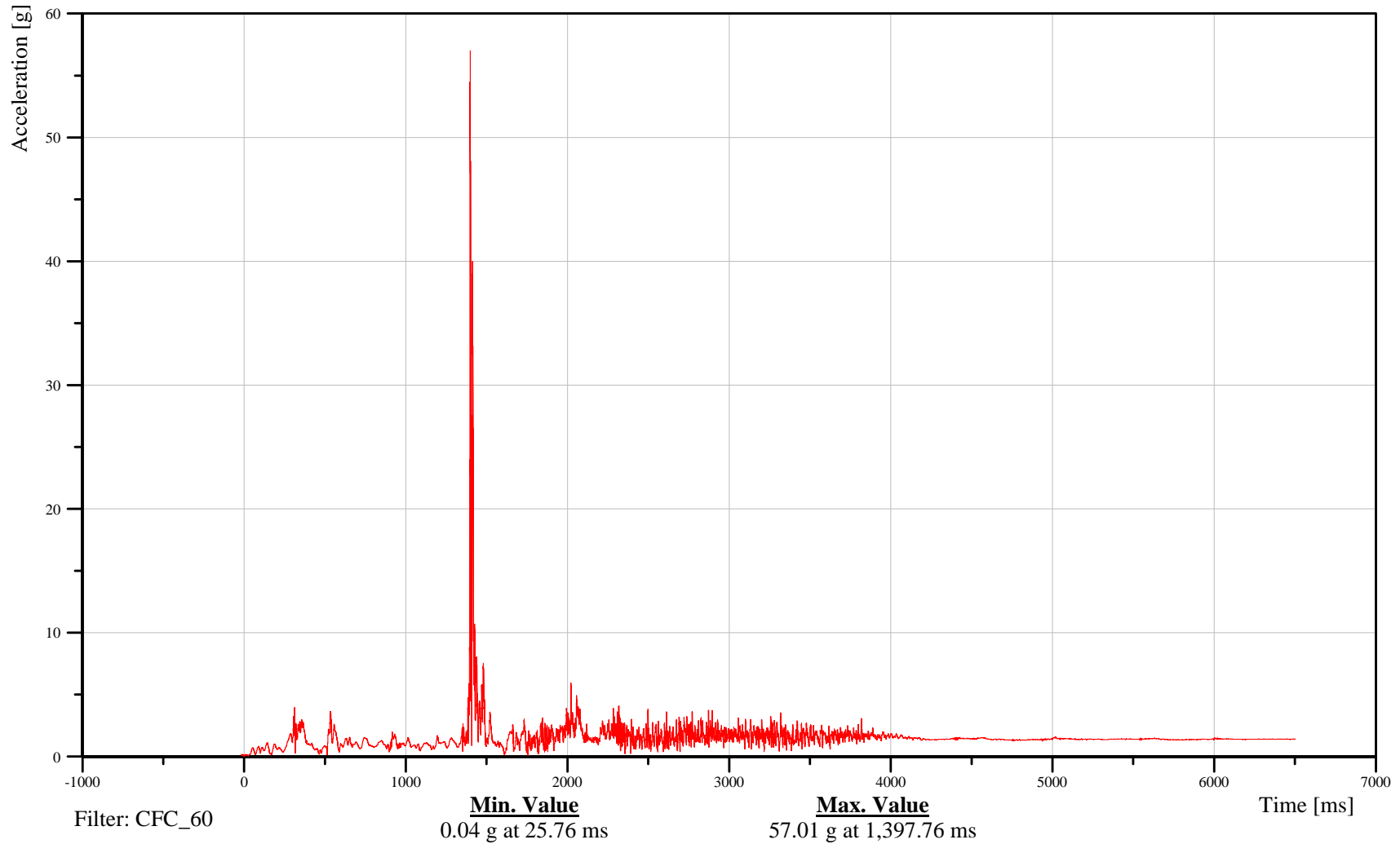
Time: 14:32

Customer: VRTC

10APILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-114

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

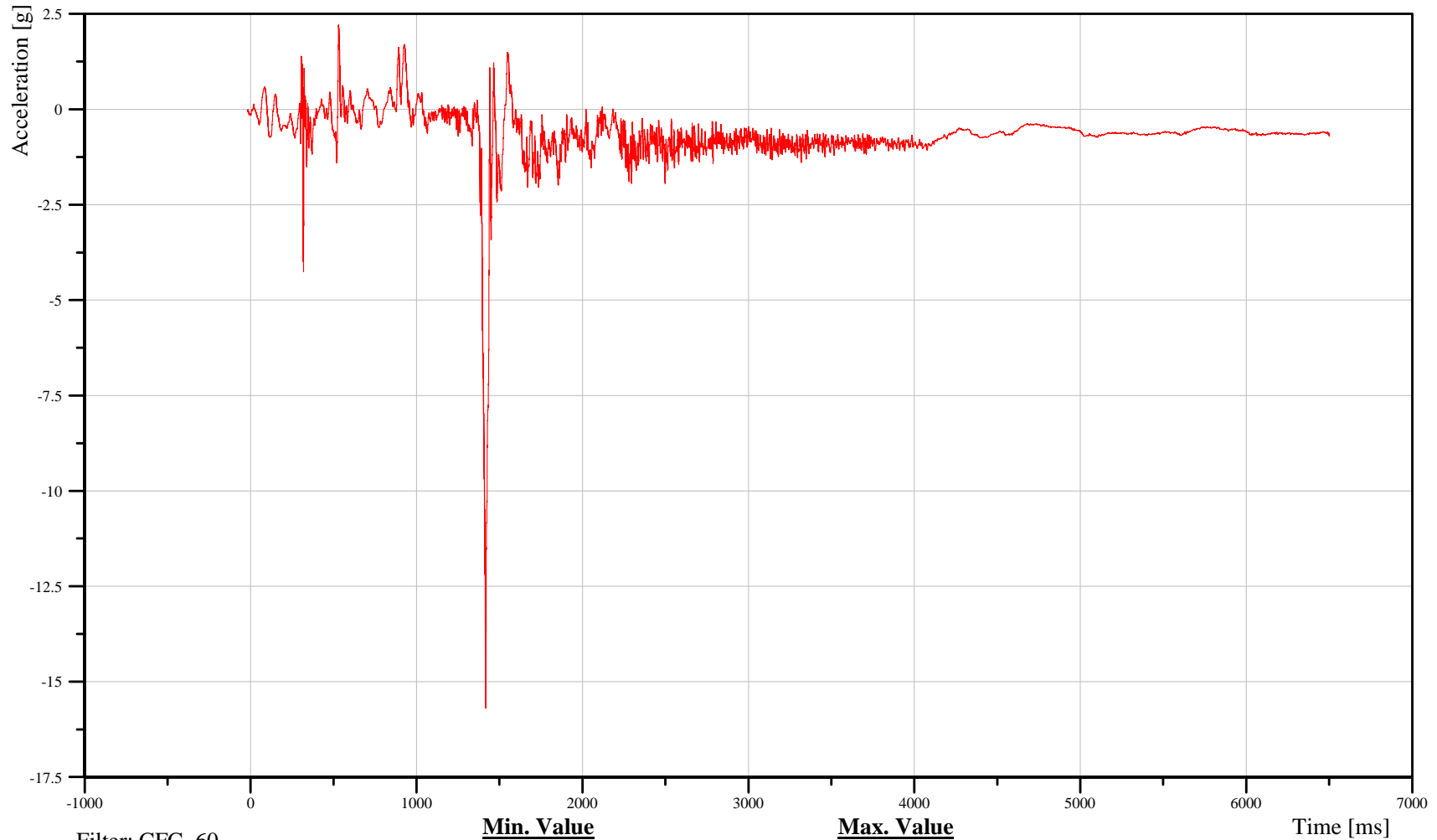
Right A-Pillar Upper X-Axis Acceleration

Customer: VRTC

10APILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



Filter: CFC_60

Min. Value
-15.70 g at 1,415.84 ms

Max. Value
2.22 g at 530.24 ms

Time [ms]

B-115

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

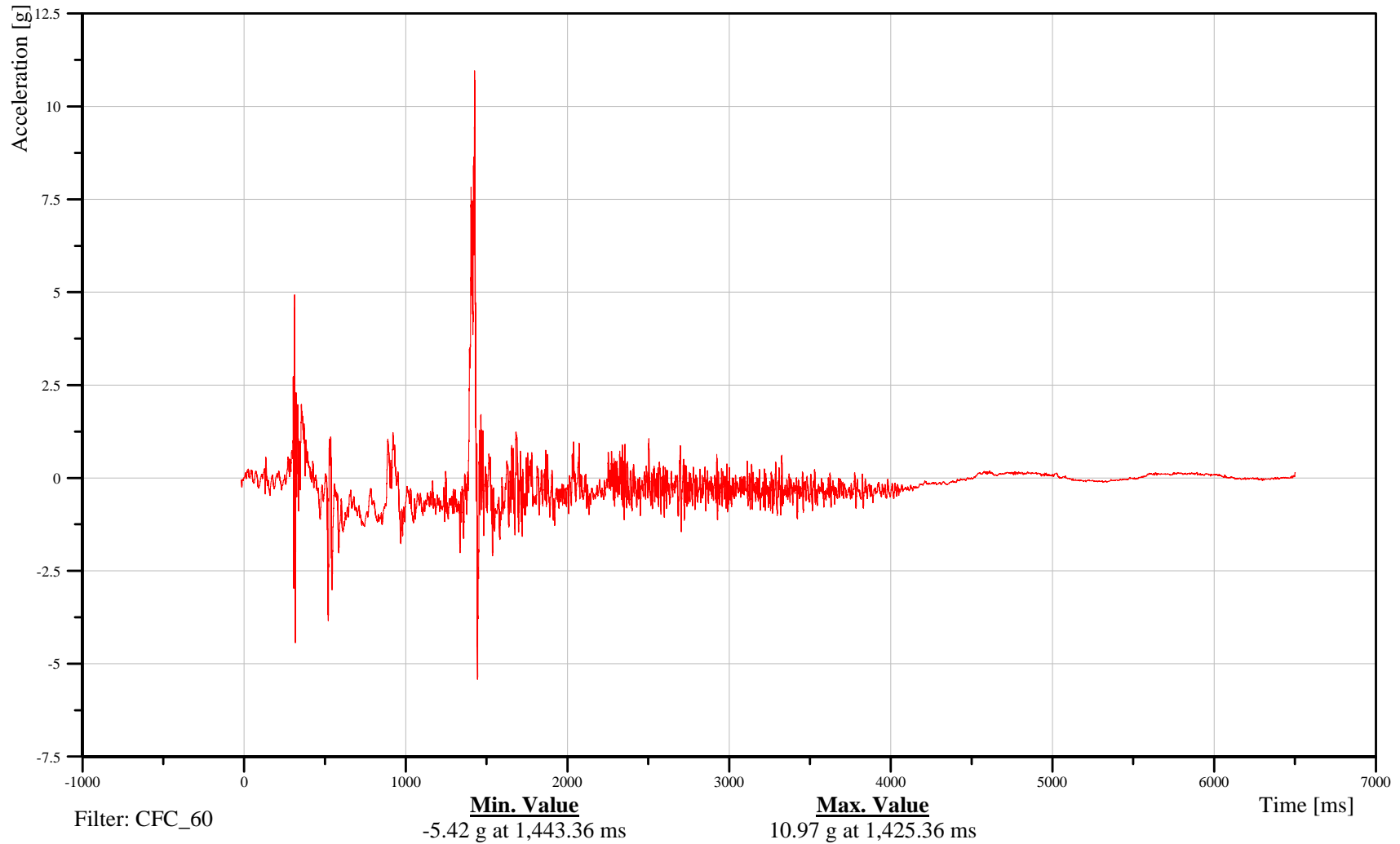
Right A-Pillar Upper Y-Axis Acceleration

Customer: VRTC

10APILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-116

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

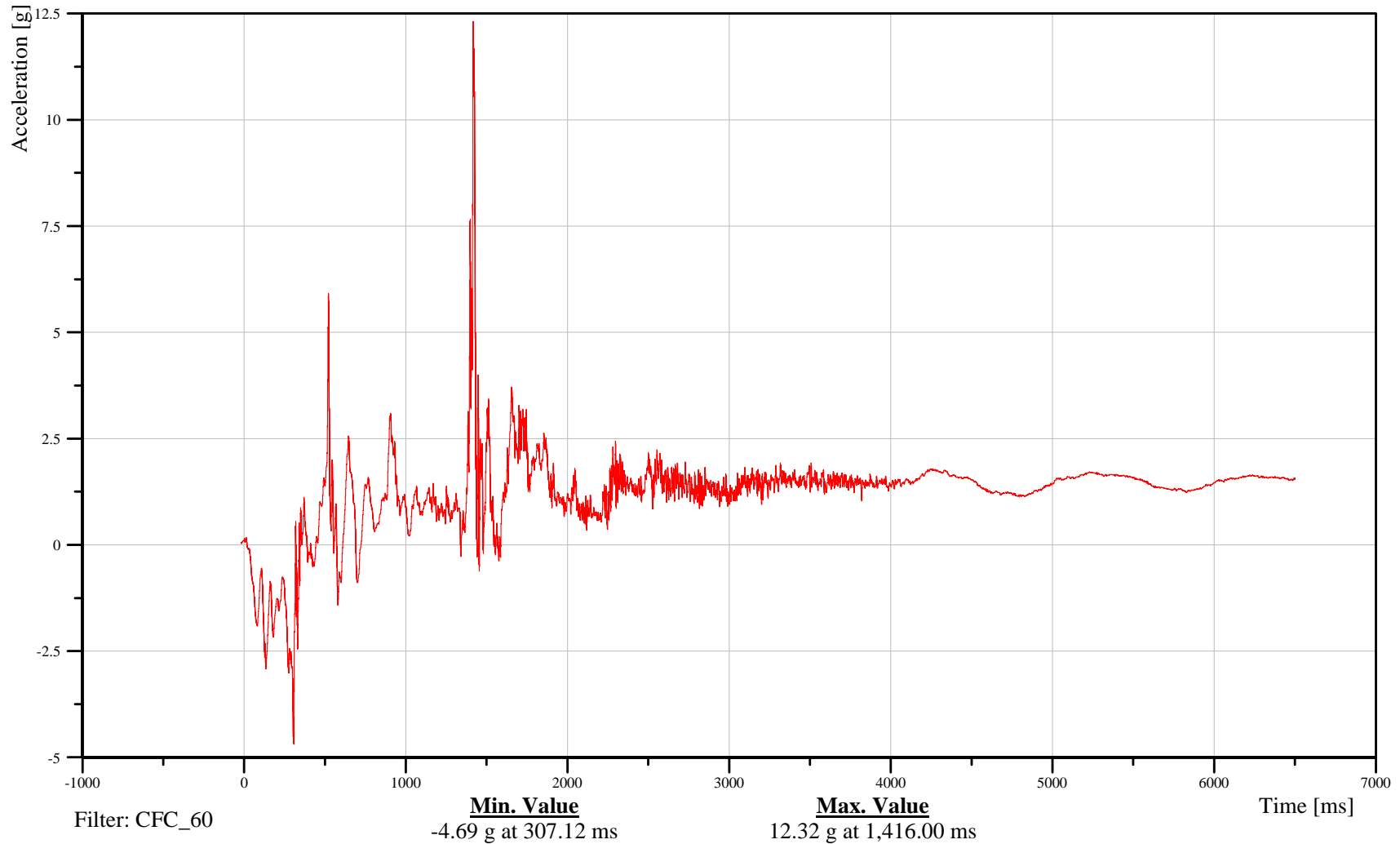
Right A-Pillar Upper Z-Axis Acceleration

Customer: VRTC

10APILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-117

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

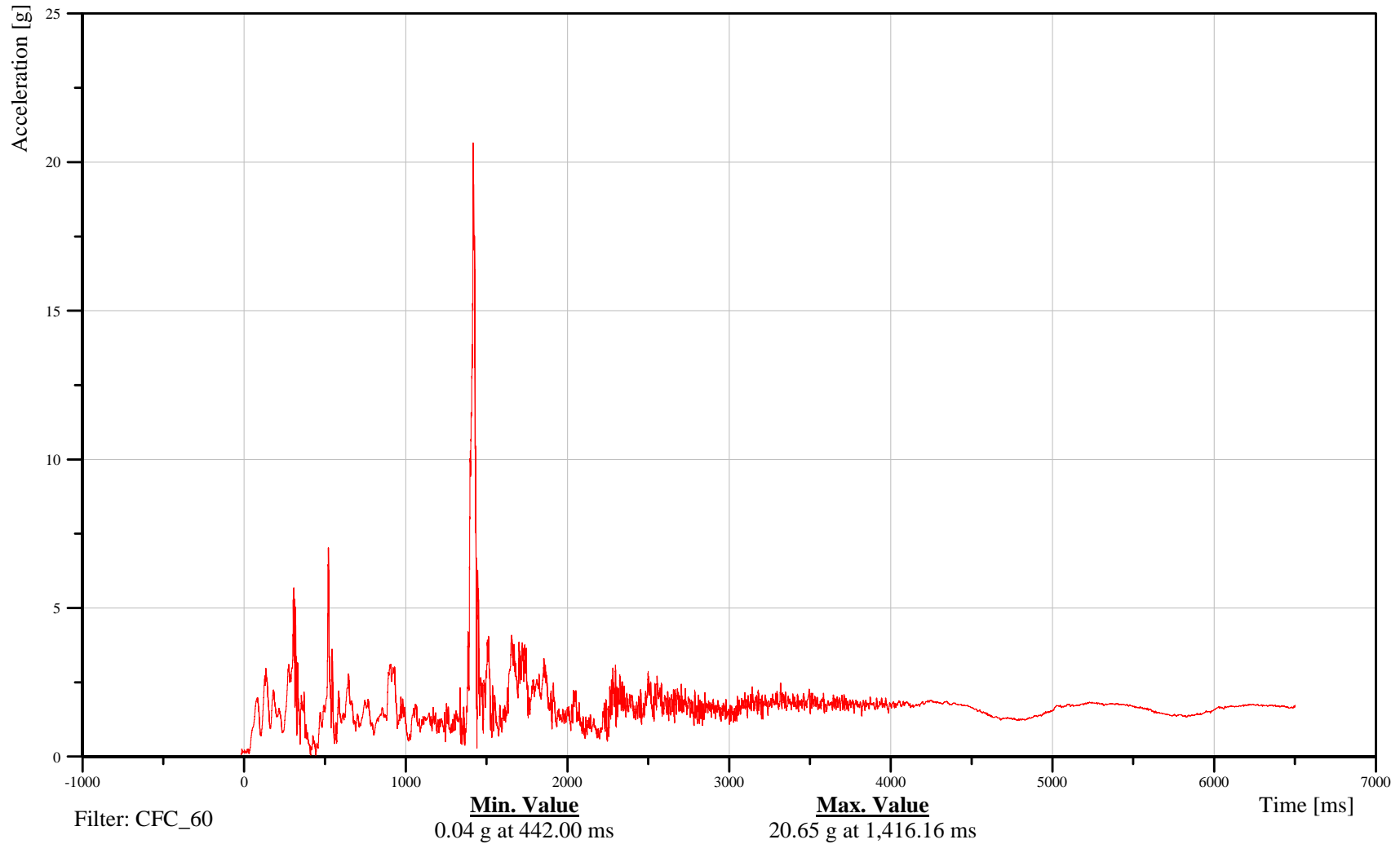
Right A-Pillar Upper Resultant Acceleration

Customer: VRTC

10APILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-118

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right A-Pillar Lower X-Axis Acceleration

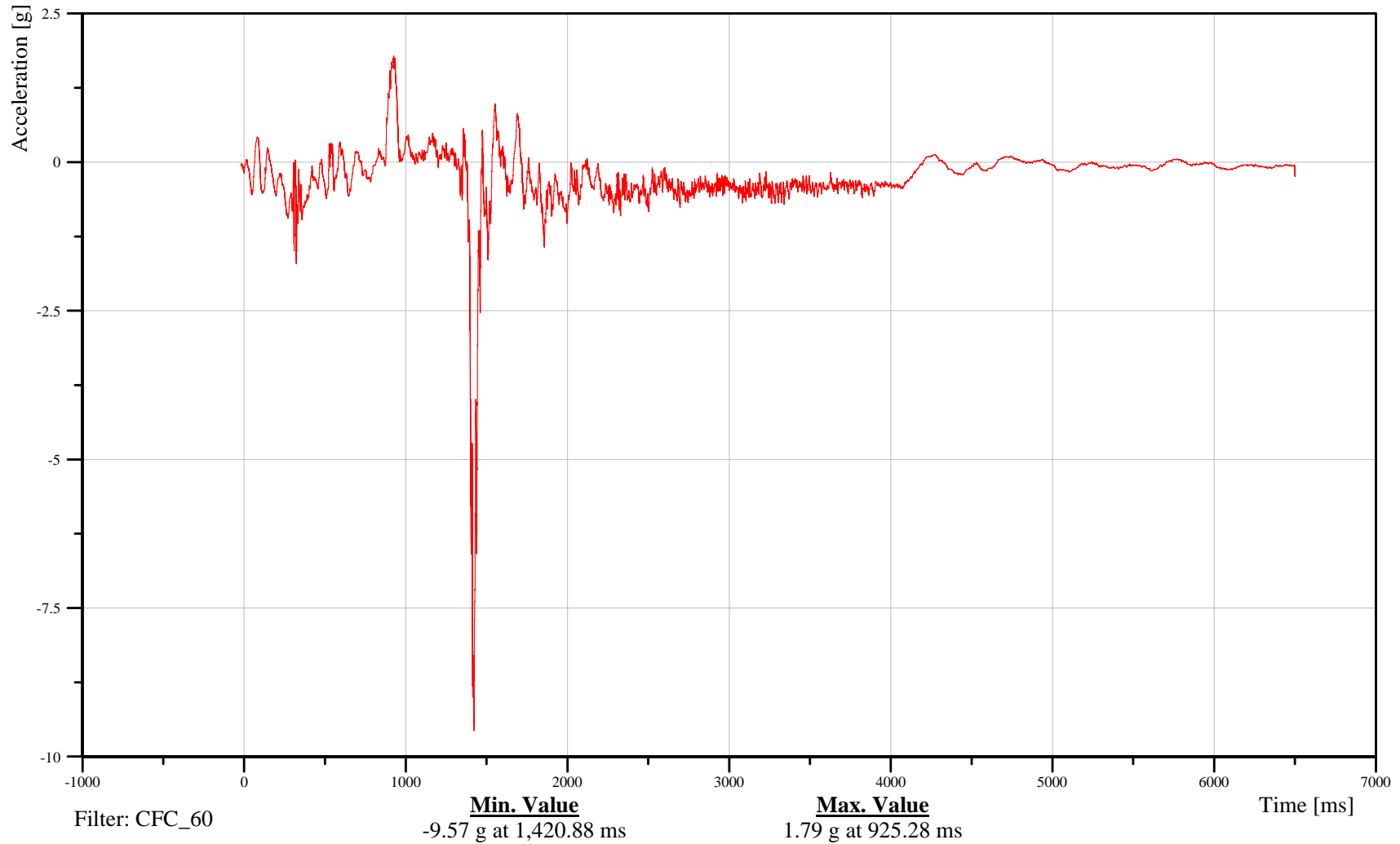
Time: 14:32

Customer: VRTC

10APILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-119

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

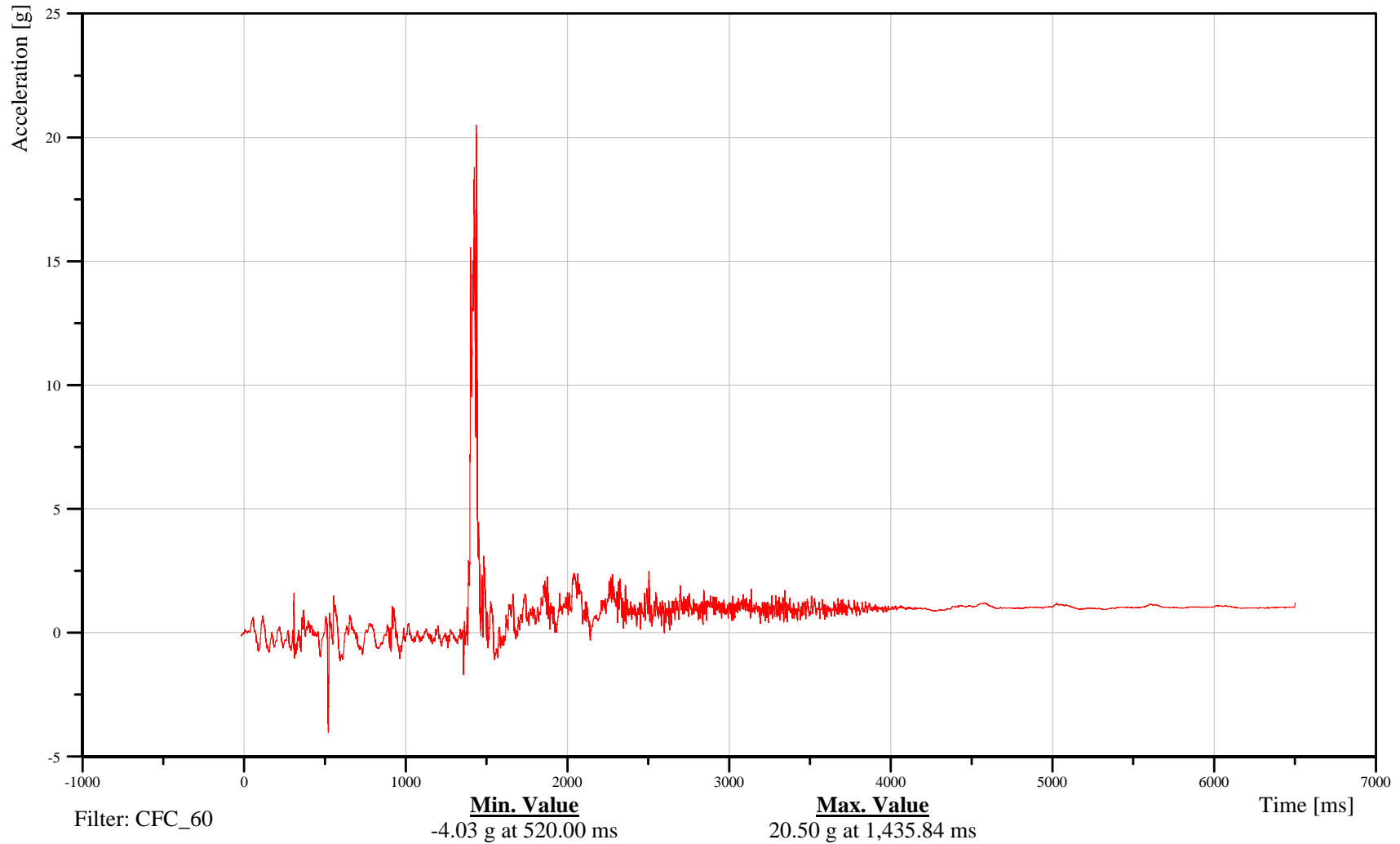
Right A-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10APILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-120

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right A-Pillar Lower Z-Axis Acceleration

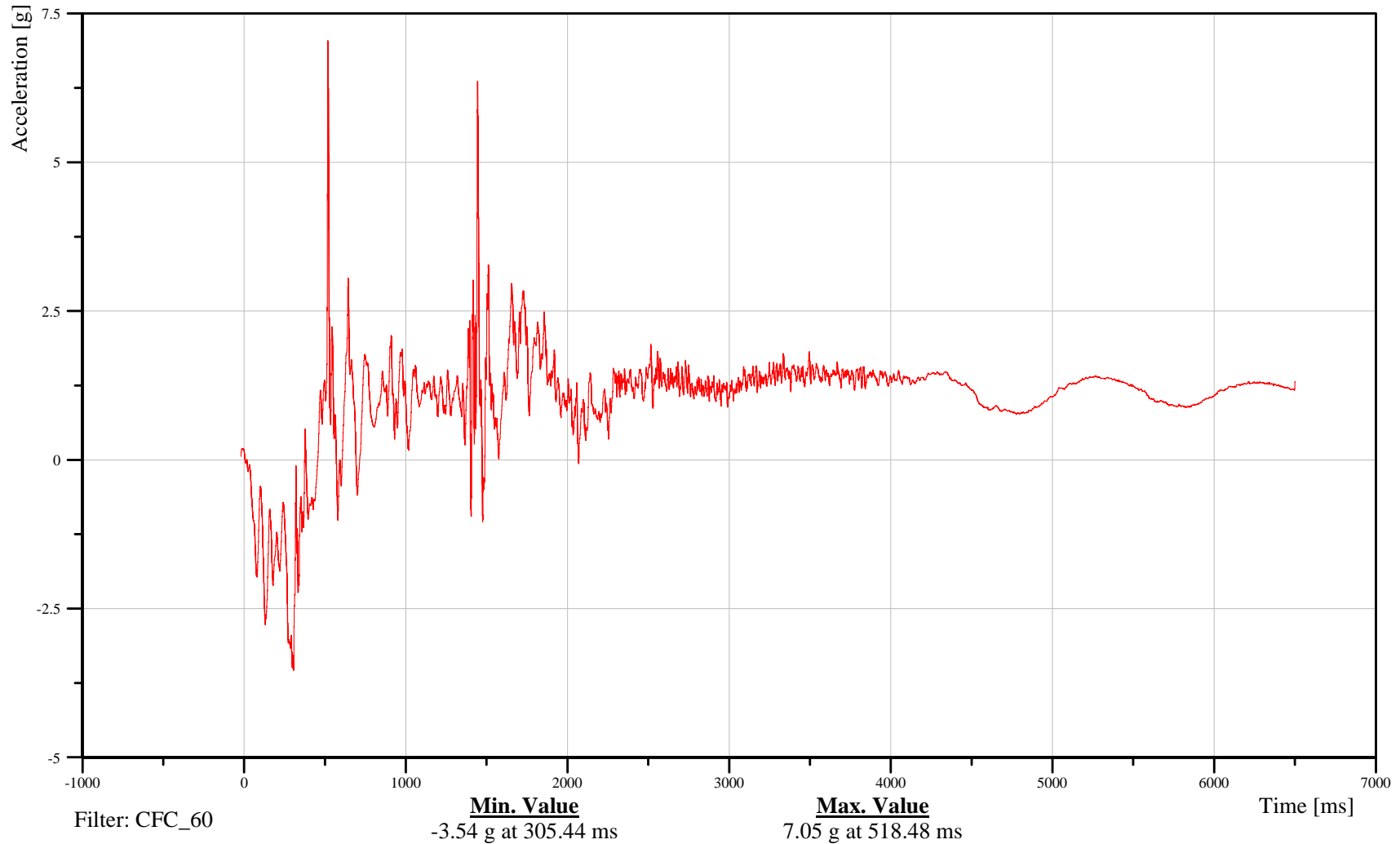
Time: 14:32

Customer: VRTC

10APILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-121

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

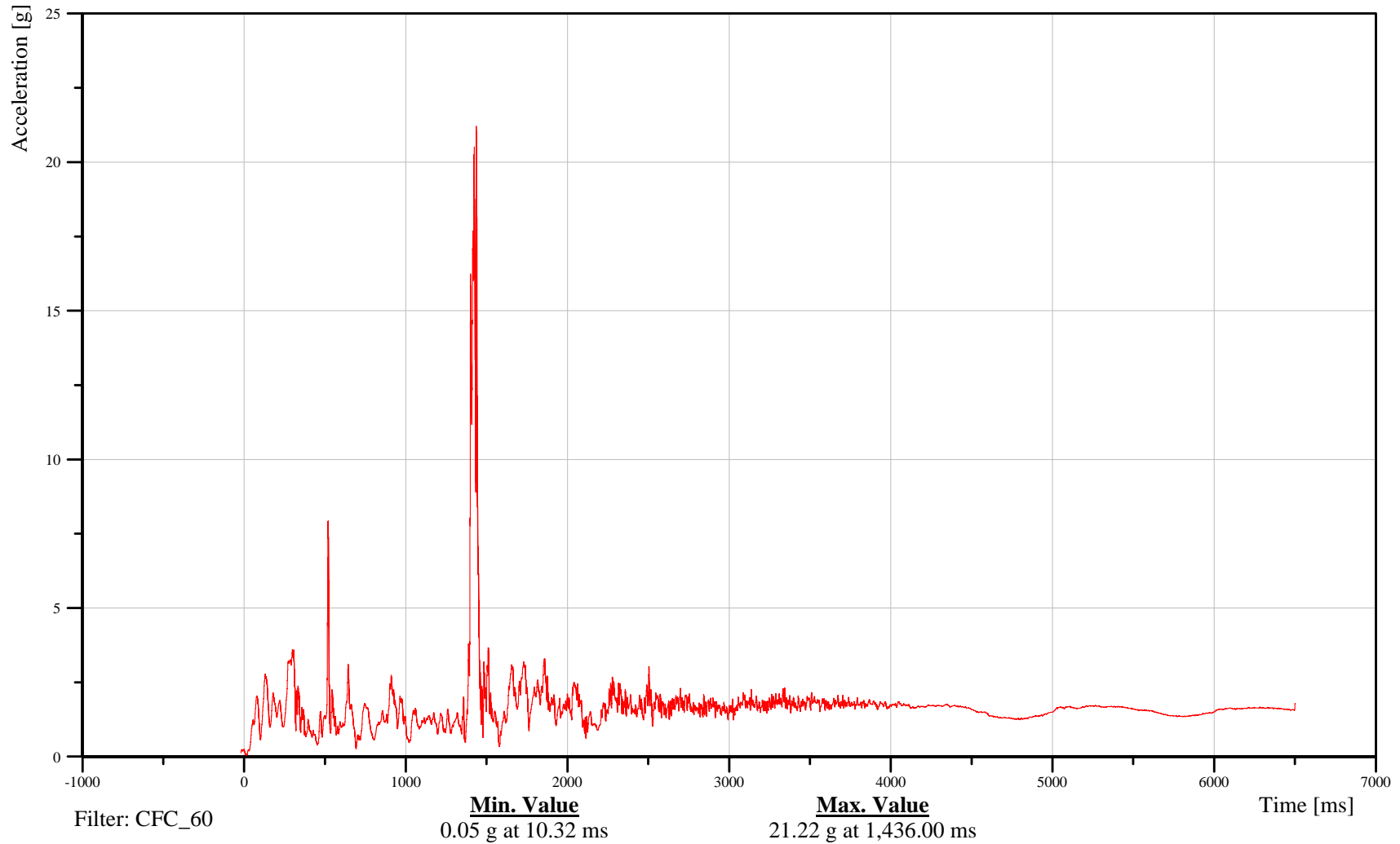
Right A-Pillar Lower Resultant Acceleration

Customer: VRTC

10APILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-122

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left B-Pillar Upper X-Axis Acceleration

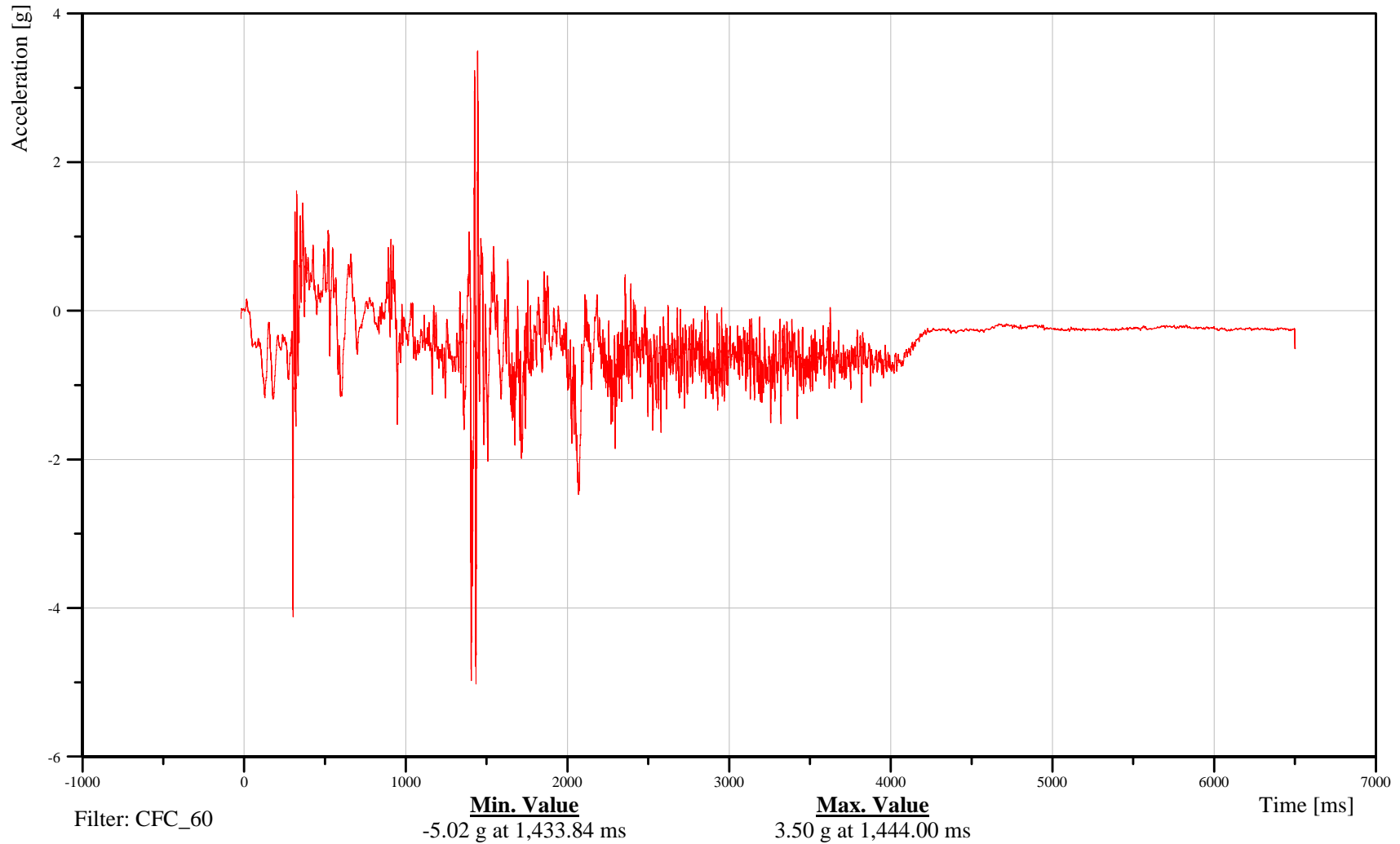
Time: 14:32

Customer: VRTC

10BPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-123

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

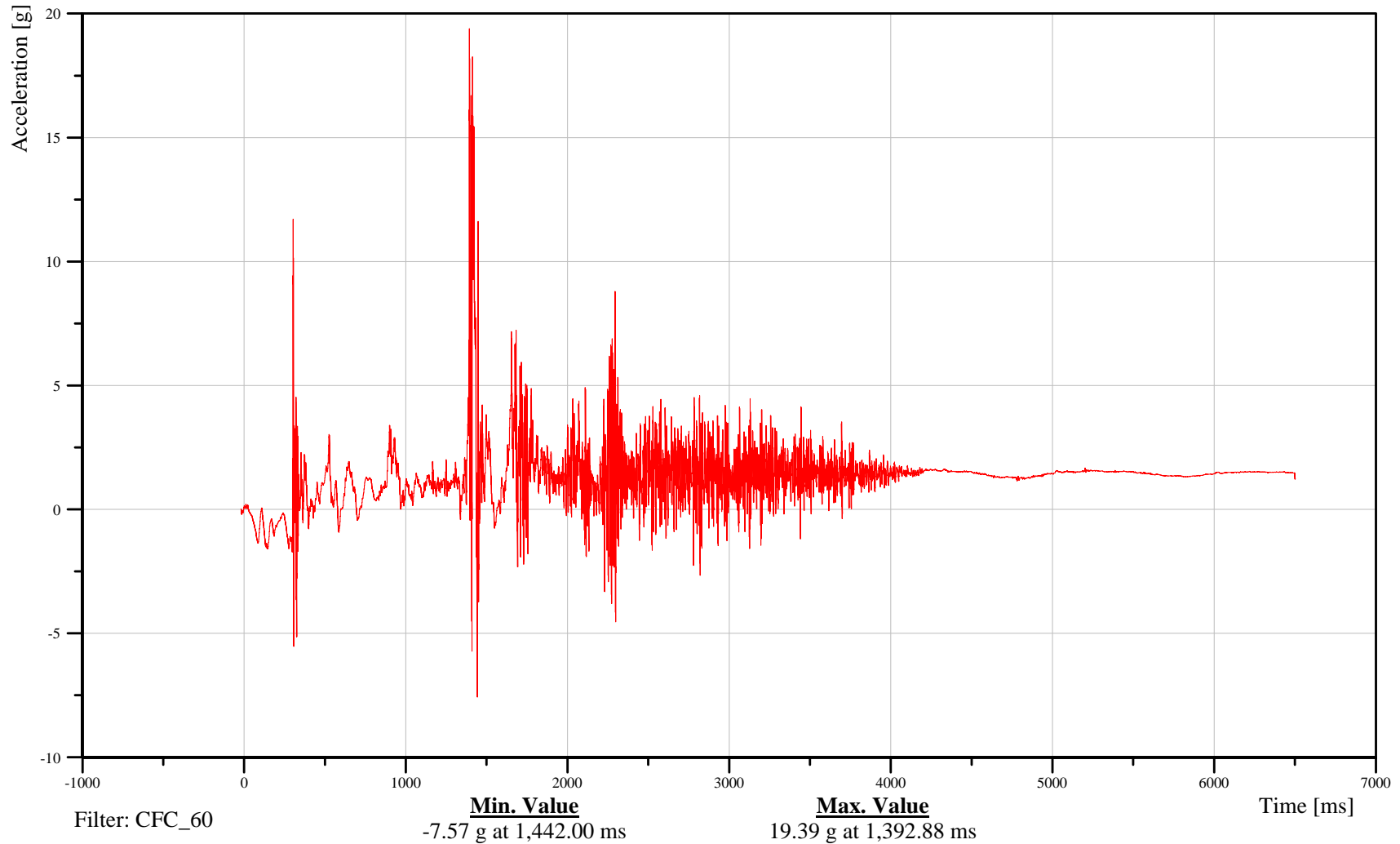
Left B-Pillar Upper Y-Axis Acceleration

Customer: VRTC

10BPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-124

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

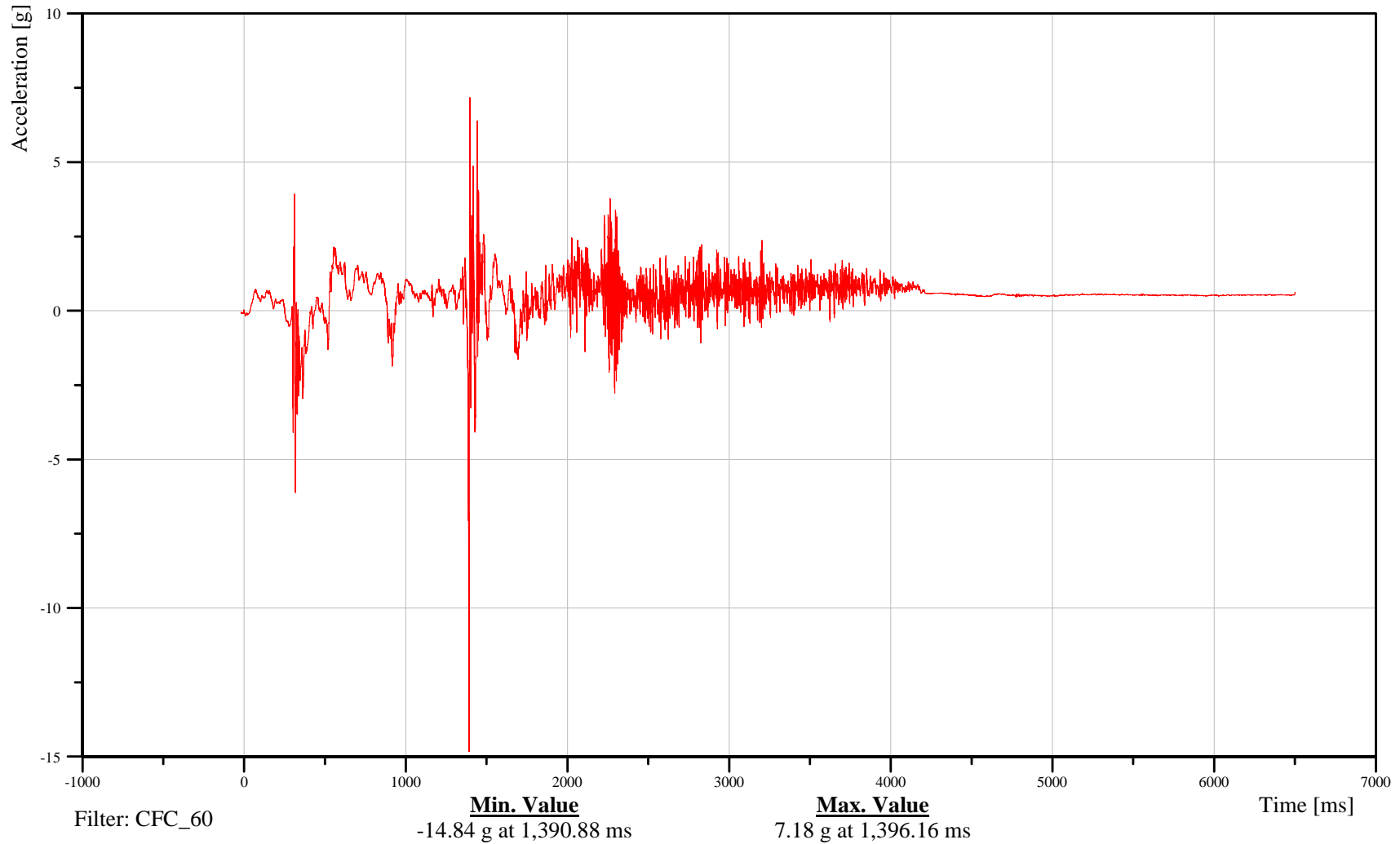
Left B-Pillar Upper Z-Axis Acceleration

Customer: VRTC

10BPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-125

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left B-Pillar Upper Resultant Acceleration

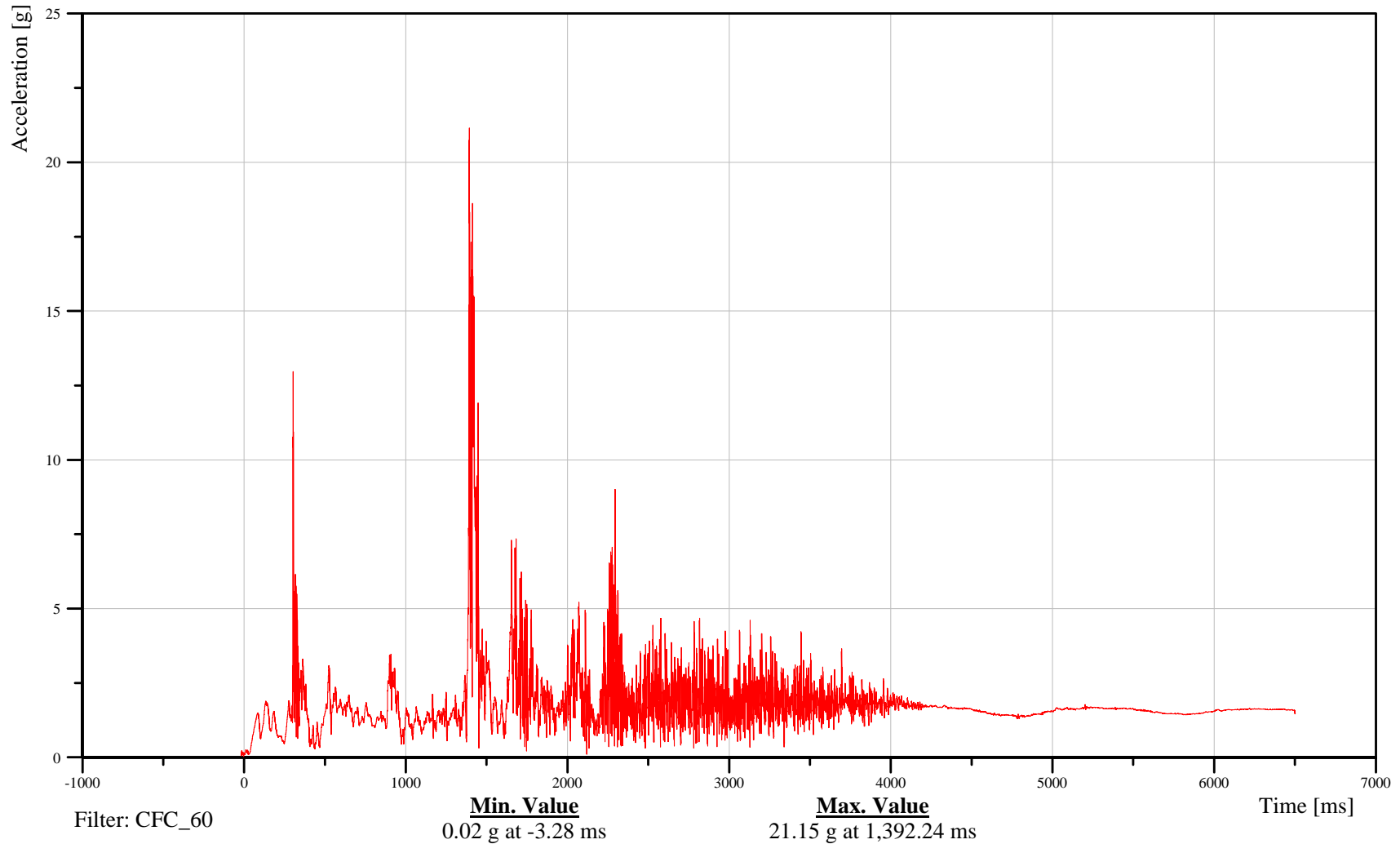
Time: 14:32

Customer: VRTC

10BPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-126

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

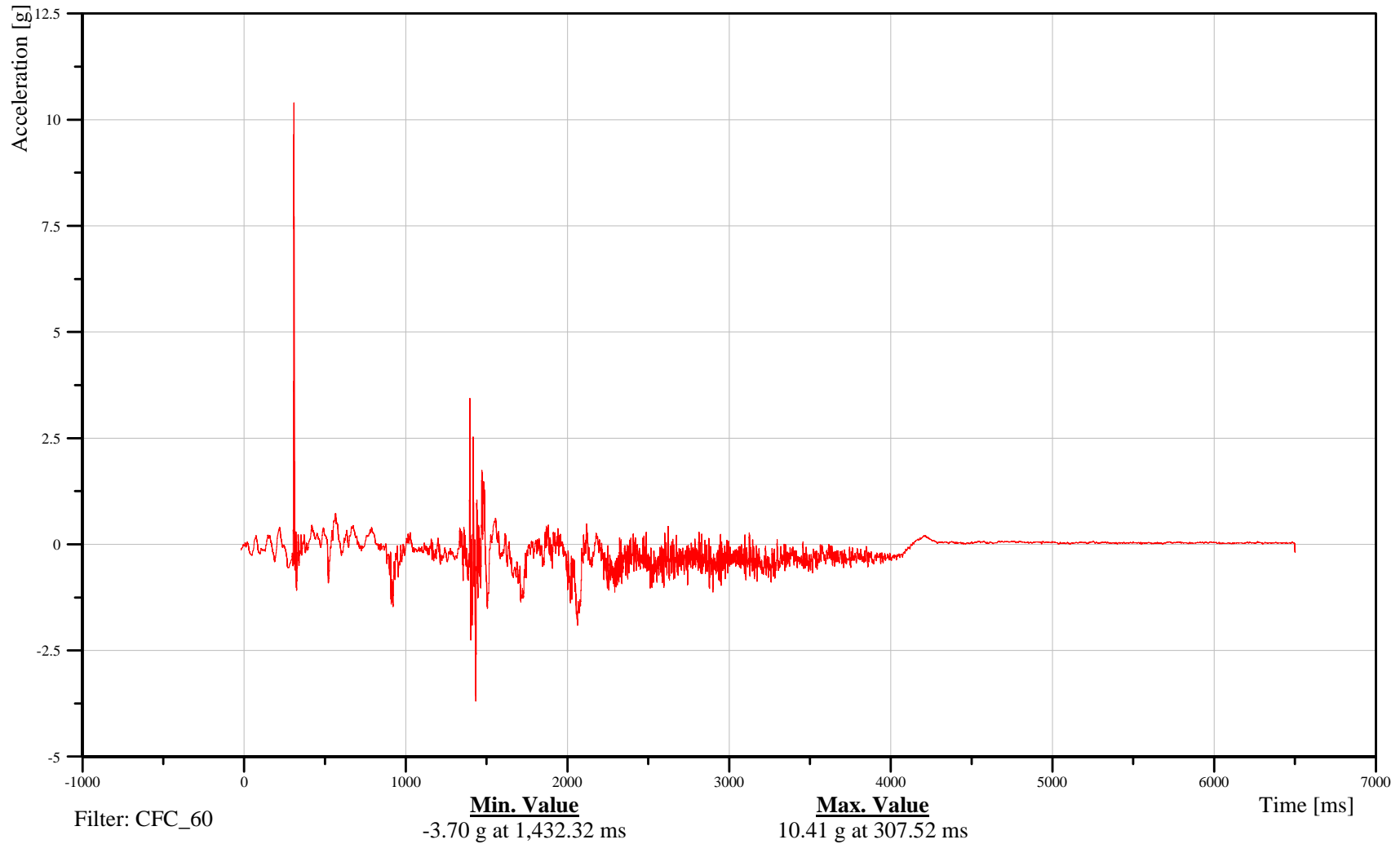
Left B-Pillar Lower X-Axis Acceleration

Customer: VRTC

10BPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-127

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

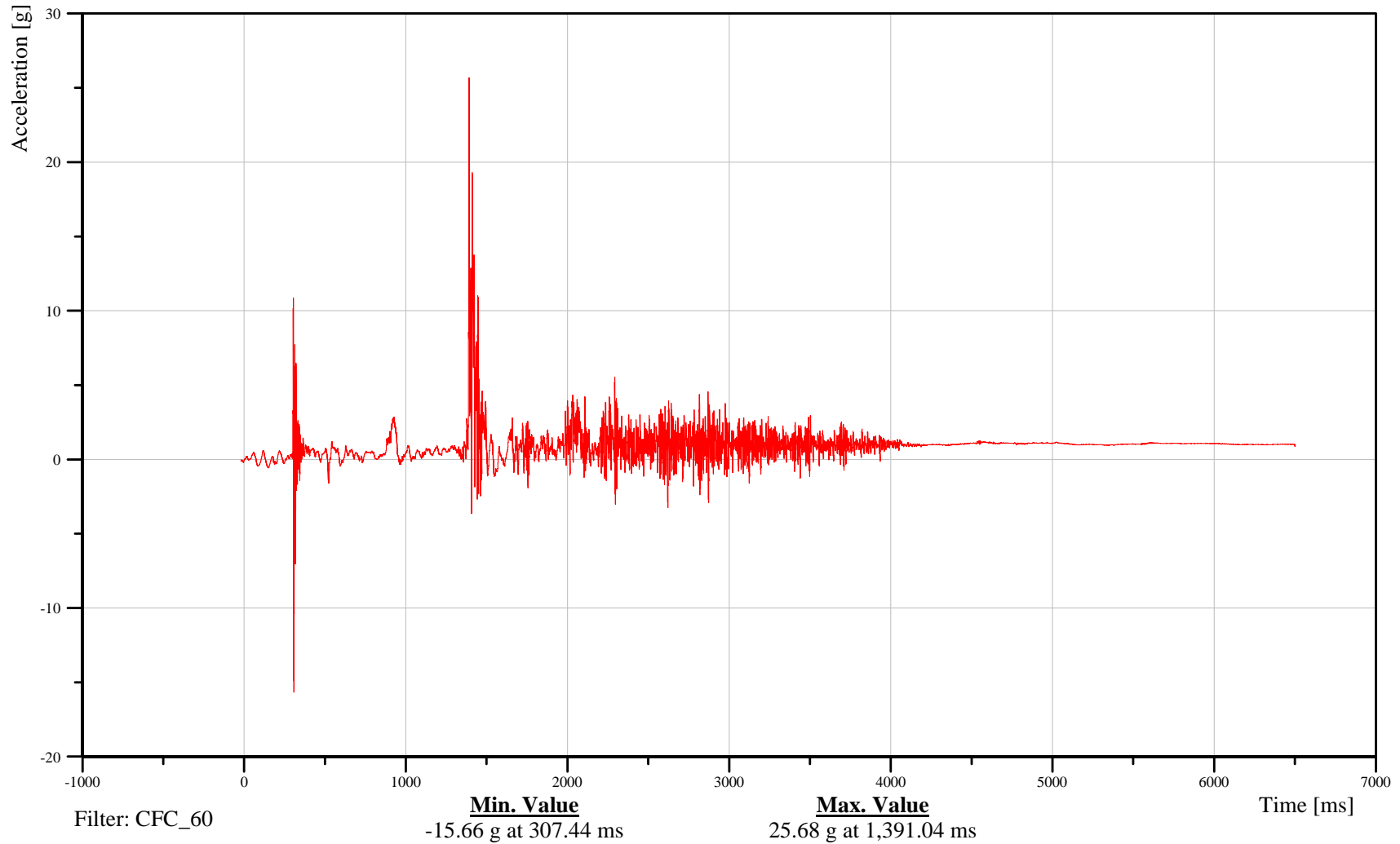
Left B-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10BPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-128

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

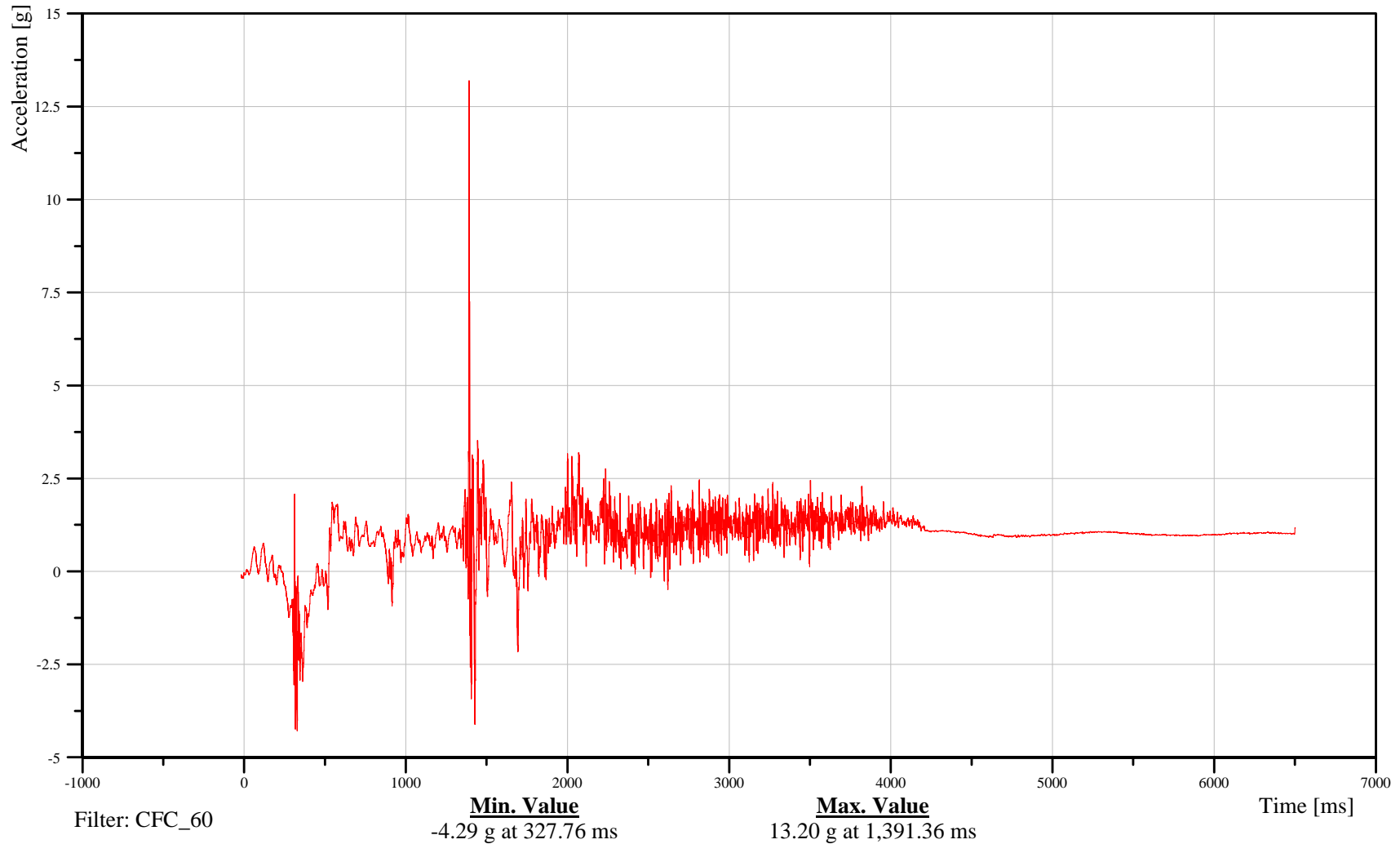
Left B-Pillar Lower Z-Axis Acceleration

Customer: VRTC

10BPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-129

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left B-Pillar Lower Resultant Acceleration

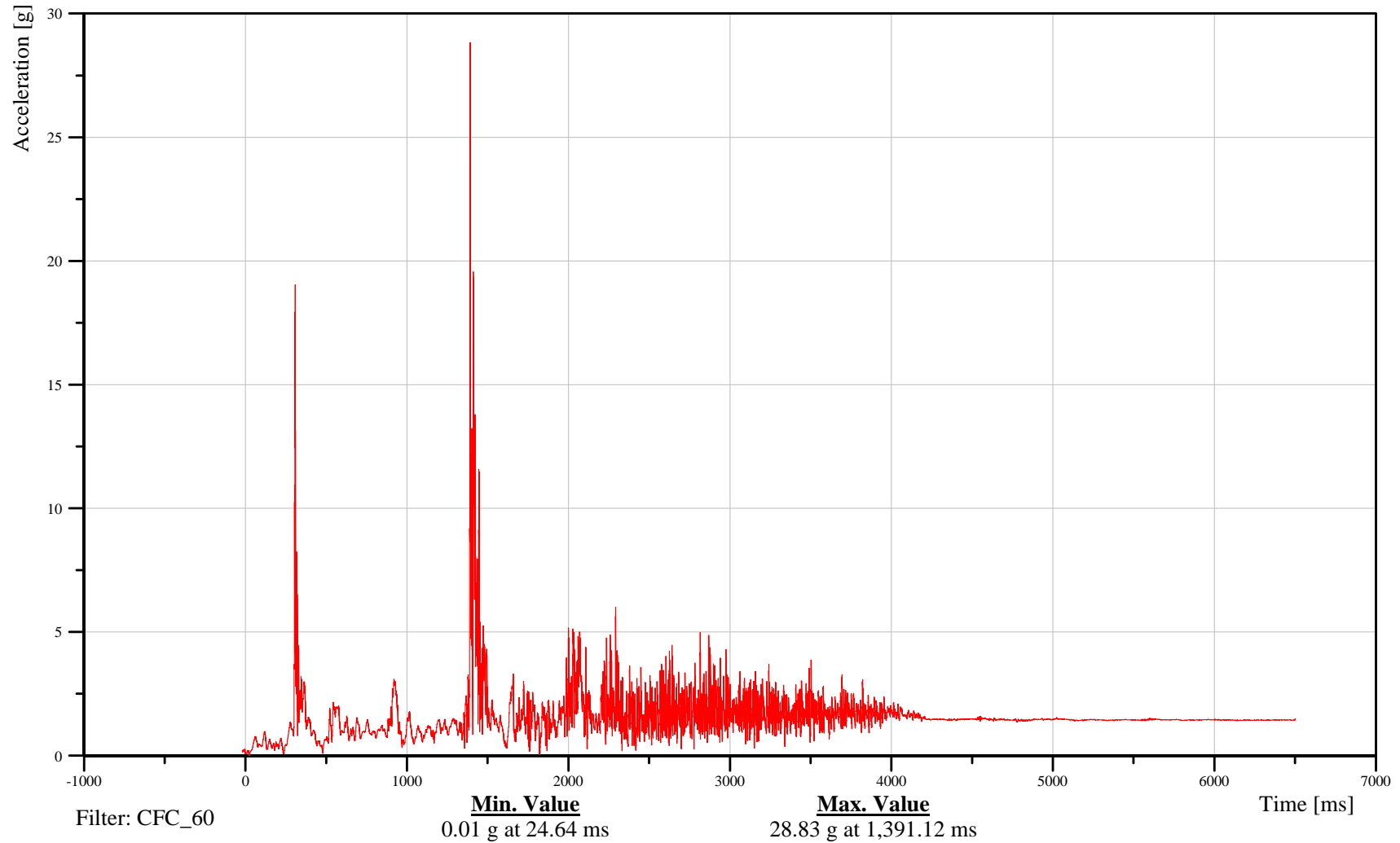
Time: 14:32

Customer: VRTC

10BPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-130

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

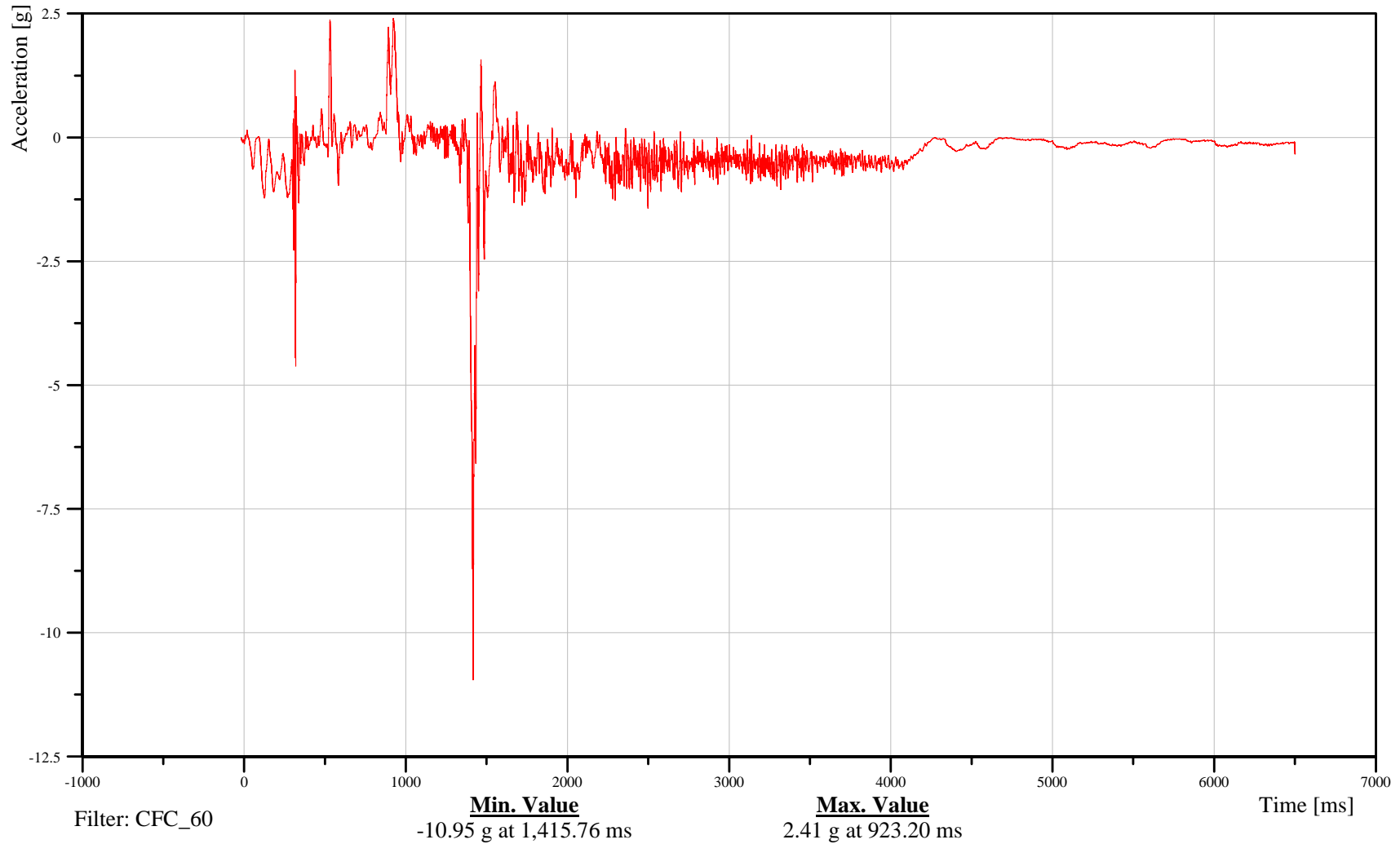
Right B-Pillar Upper X-Axis Acceleration

Customer: VRTC

10BPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-131

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

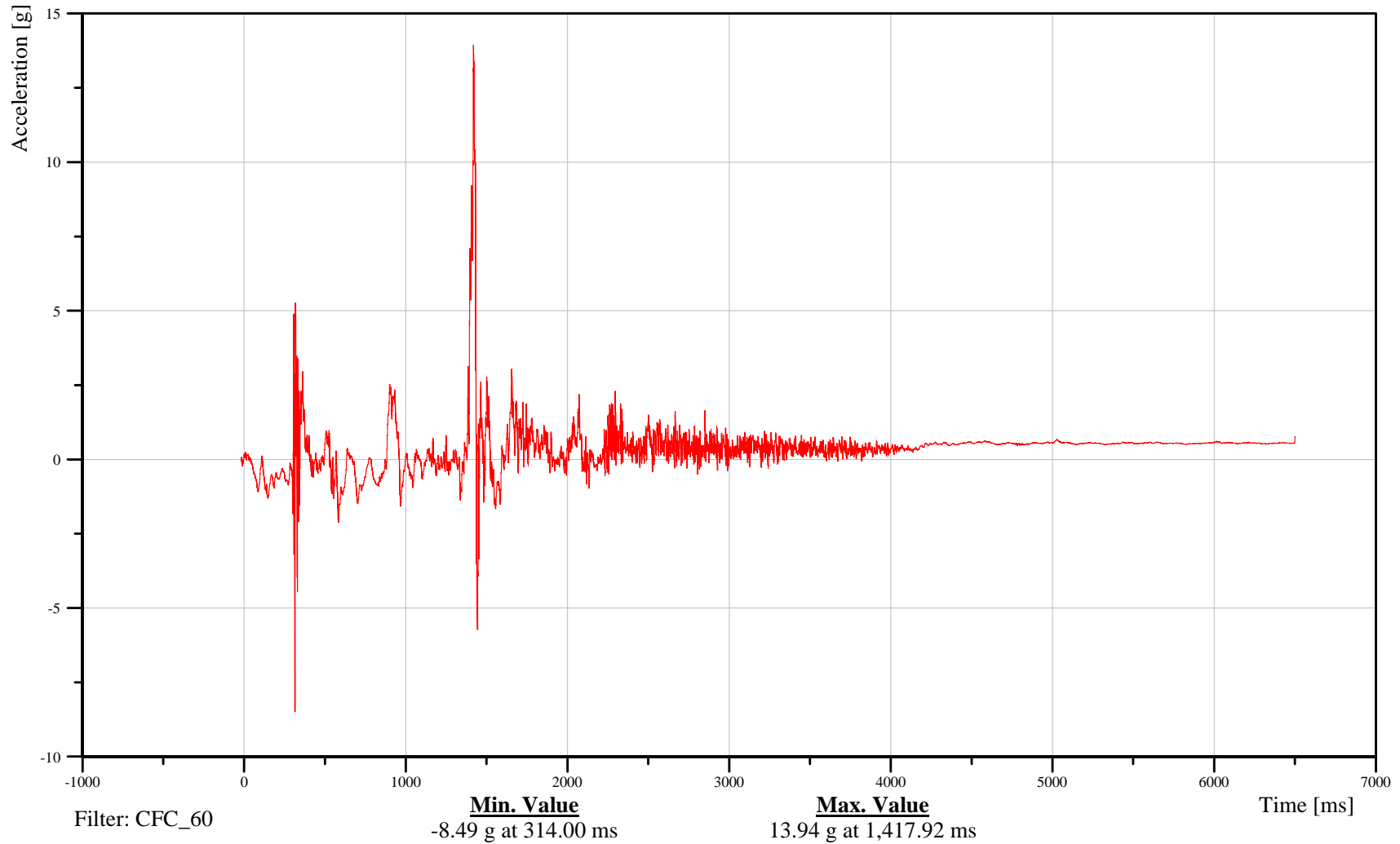
Right B-Pillar Upper Y-Axis Acceleration

Customer: VRTC

TRC Inc. Test Lab: CTF

10BPILUPRI00ACYD

Test Number: 100420



B-132

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

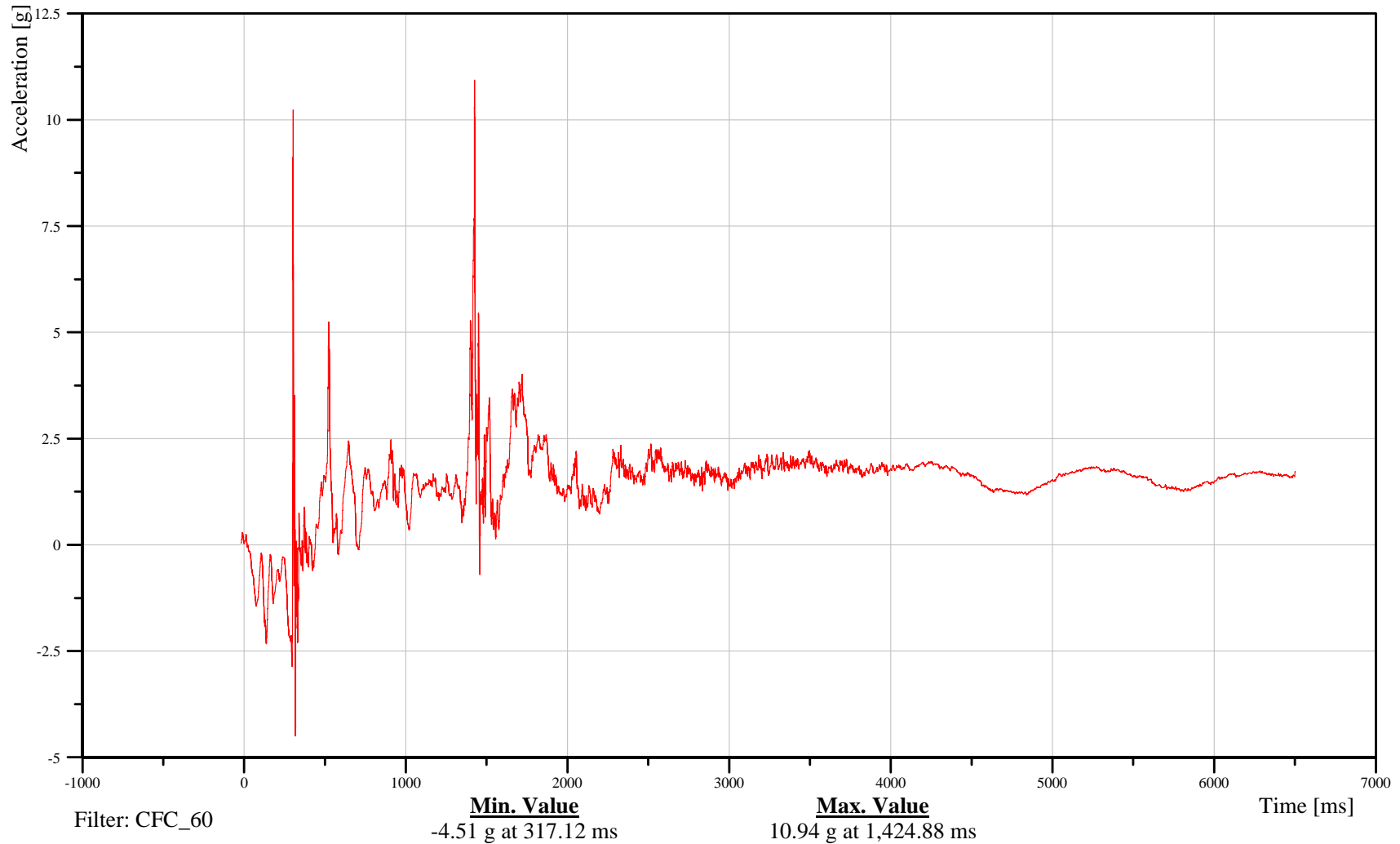
Right B-Pillar Upper Z-Axis Acceleration

Customer: VRTC

TRC Inc. Test Lab: CTF

10BPILUPRI00ACZD

Test Number: 100420



B-133

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

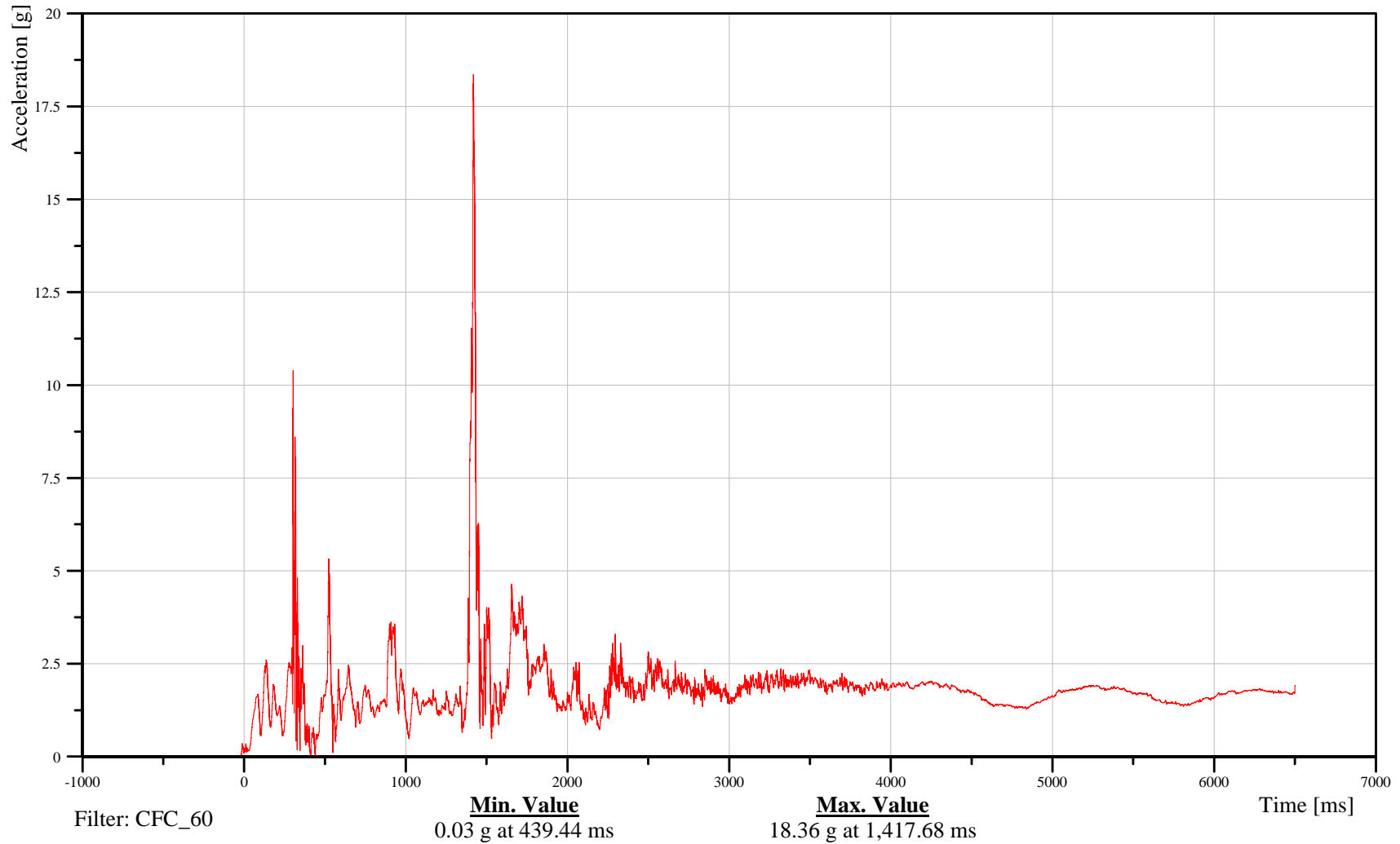
Right B-Pillar Upper Resultant Acceleration

Customer: VRTC

10BPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-134

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

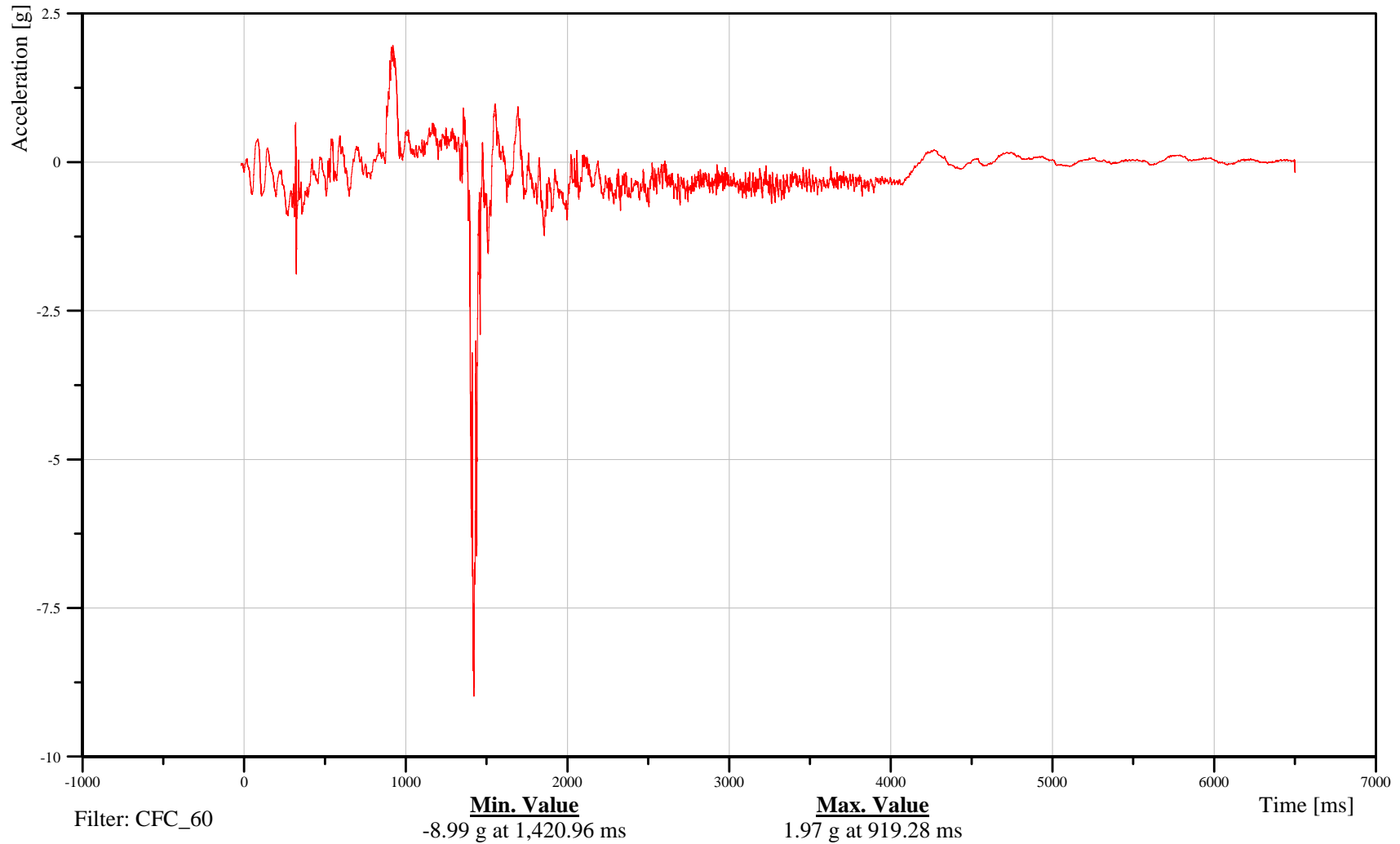
Right B-Pillar Lower X-Axis Acceleration

Customer: VRTC

10BPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-135

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

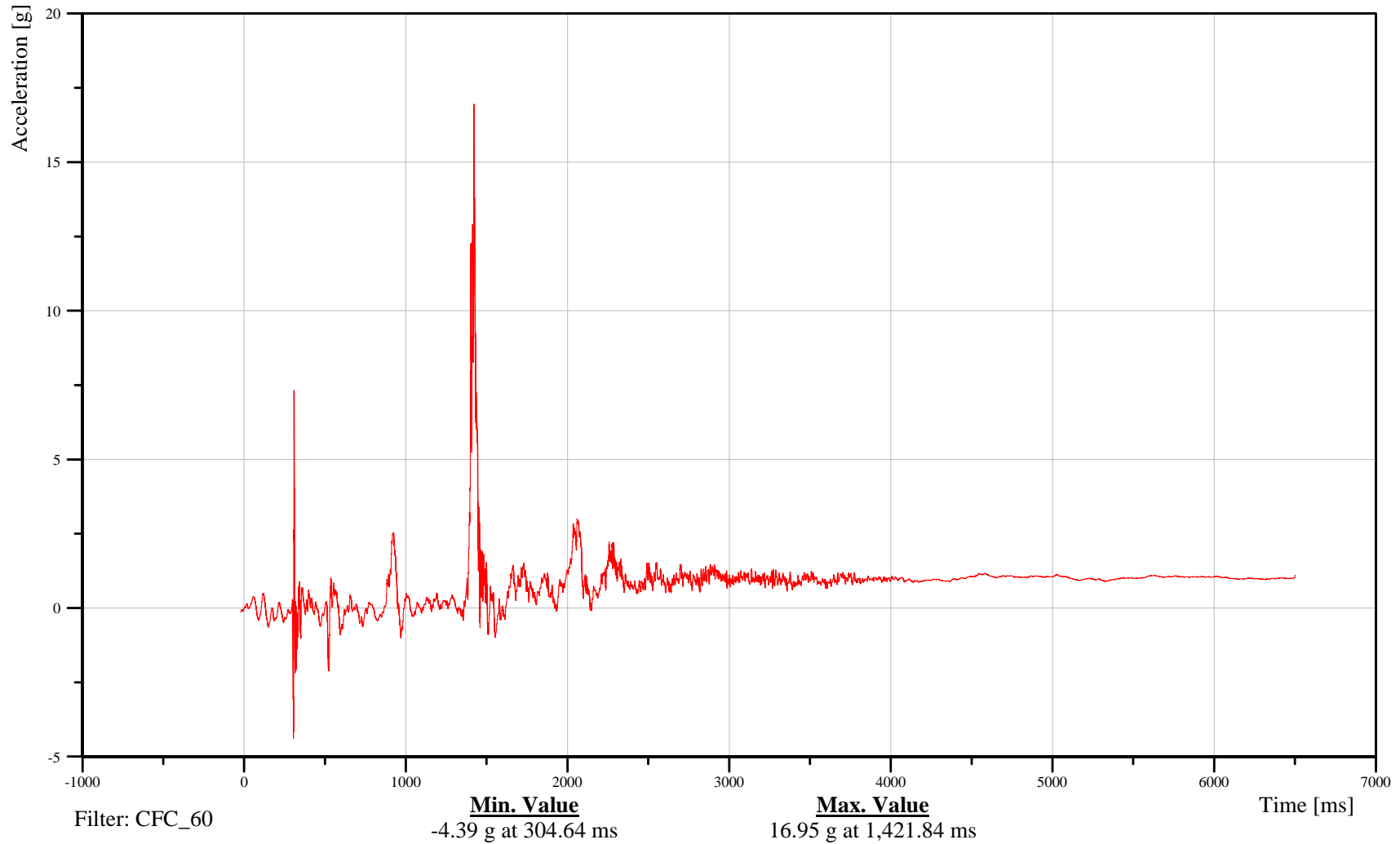
Right B-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10BPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-136

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right B-Pillar Lower Z-Axis Acceleration

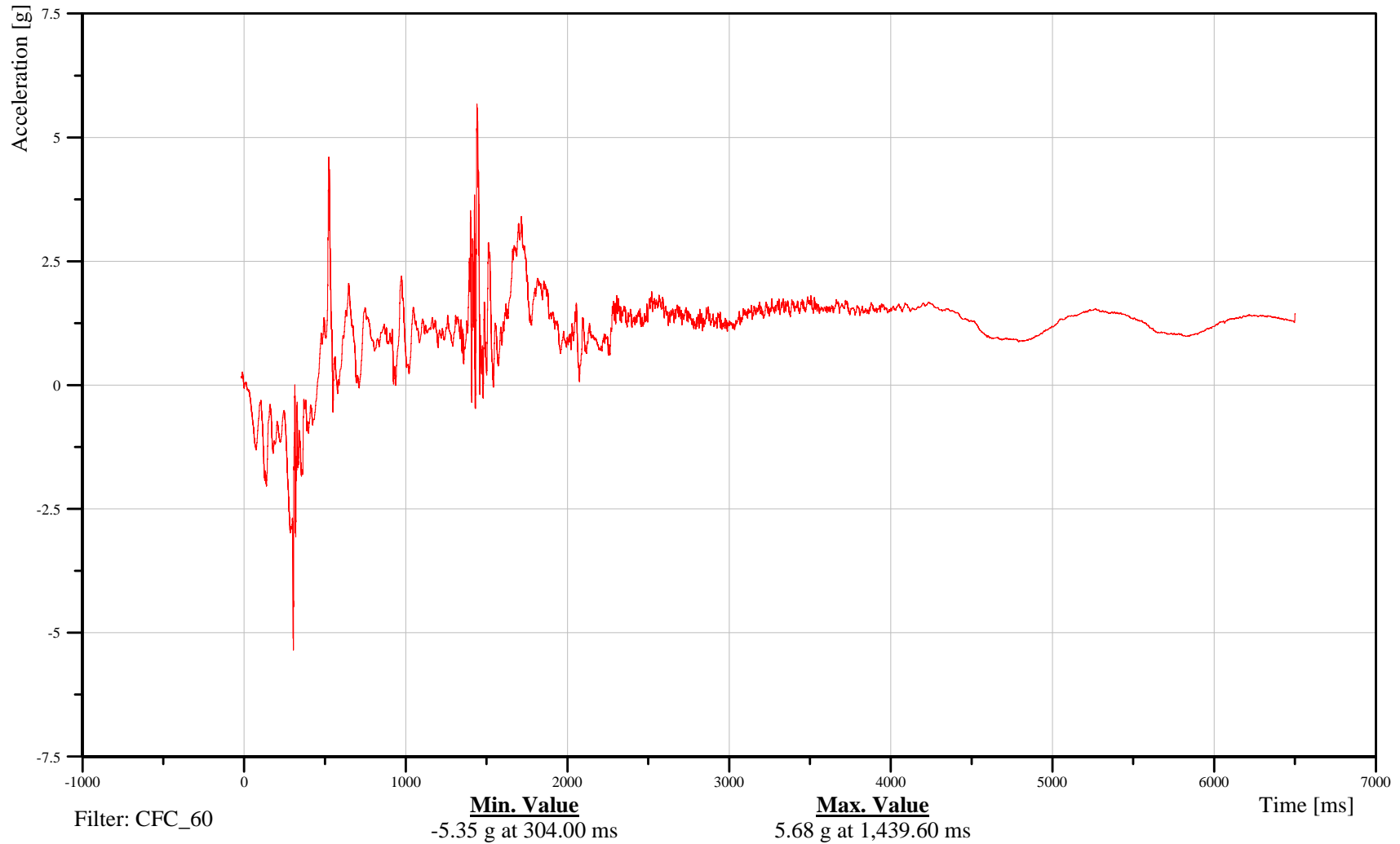
Time: 14:32

Customer: VRTC

10BPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-137

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

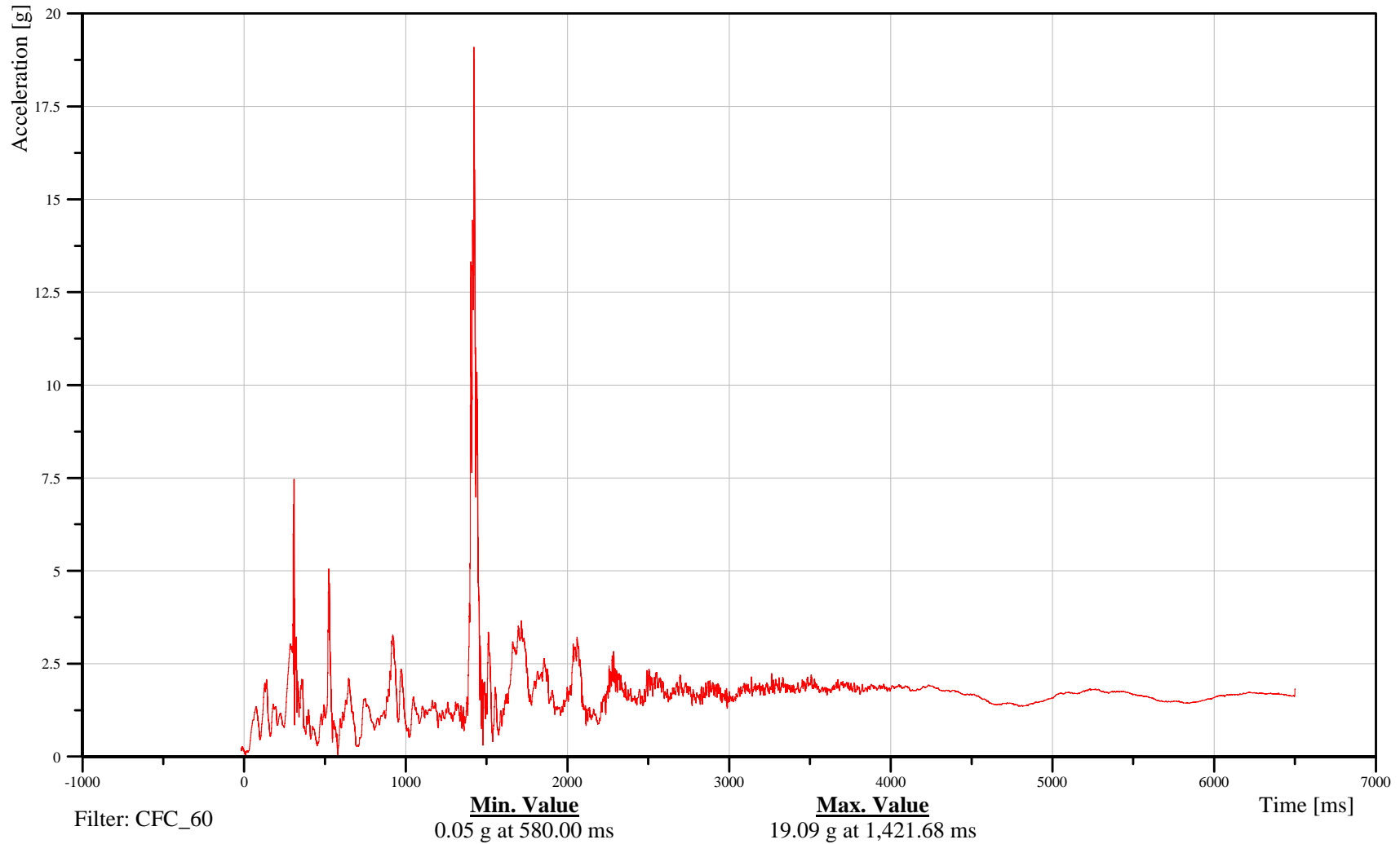
Right B-Pillar Lower Resultant Acceleration

Customer: VRTC

10BPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-138

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

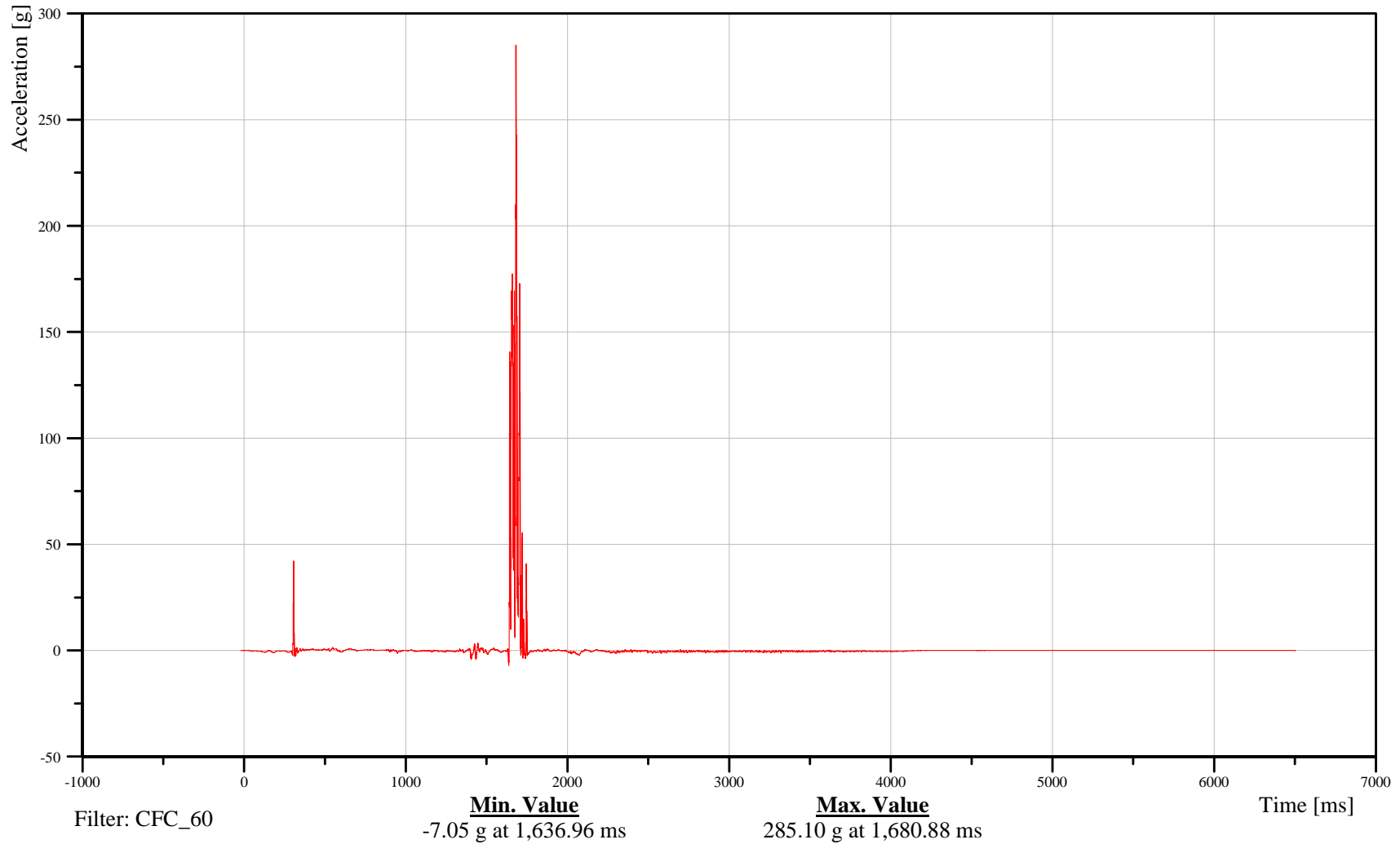
Left C-Pillar Upper X-Axis Acceleration

Customer: VRTC

10CPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-139

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left C-Pillar Upper Y-Axis Acceleration

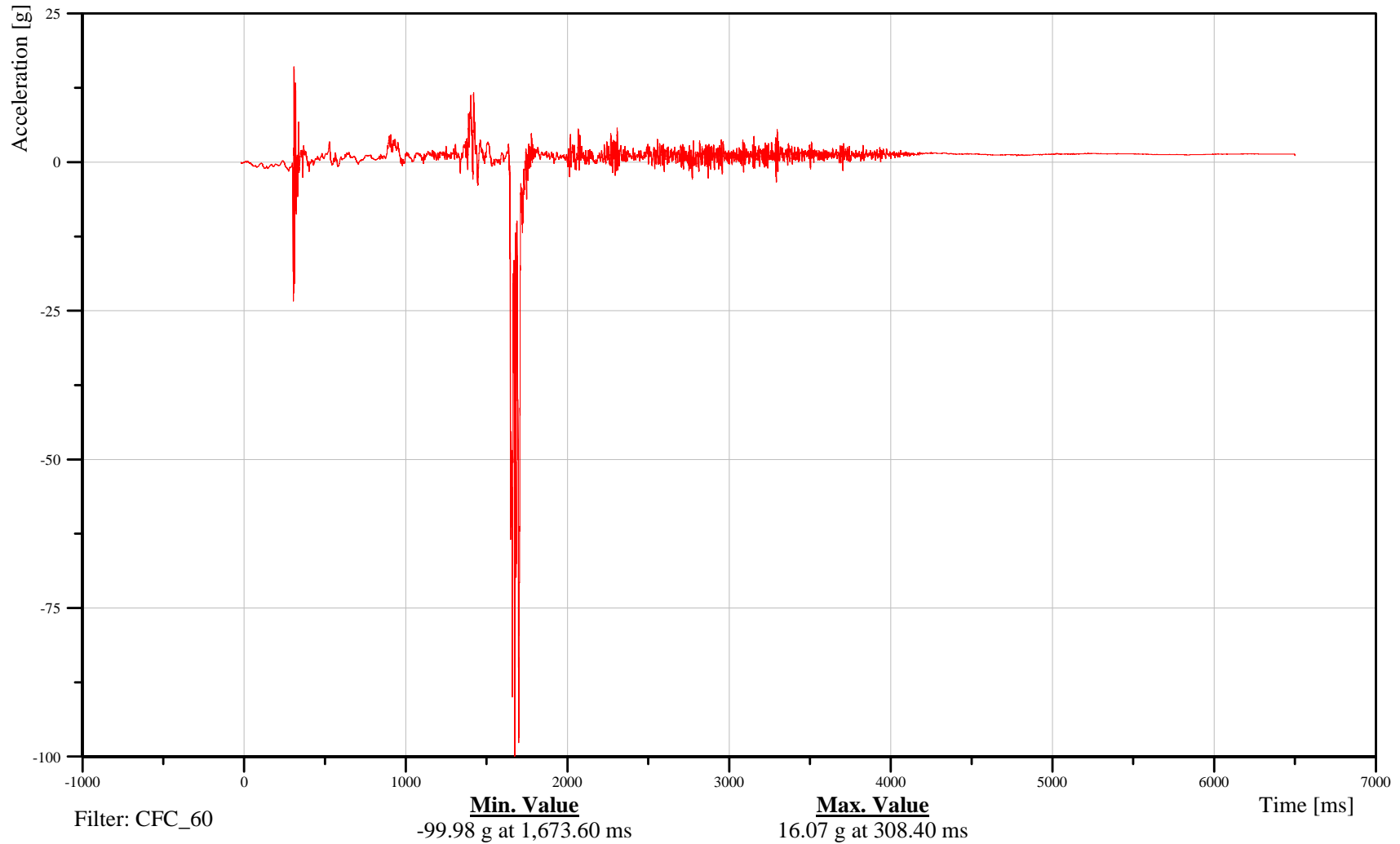
Time: 14:32

Customer: VRTC

10CPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-140

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

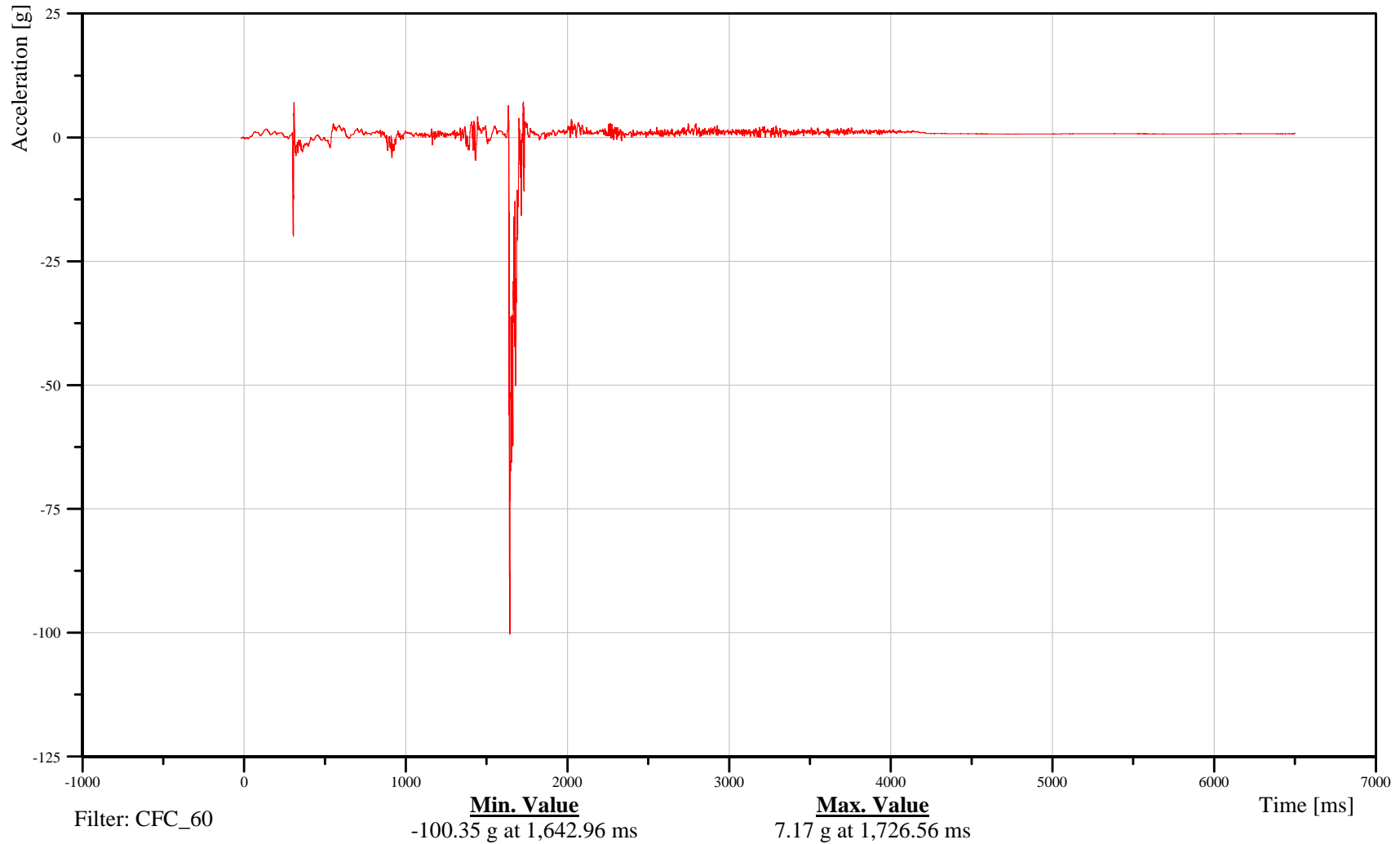
Left C-Pillar Upper Z-Axis Acceleration

Customer: VRTC

10CPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-141

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

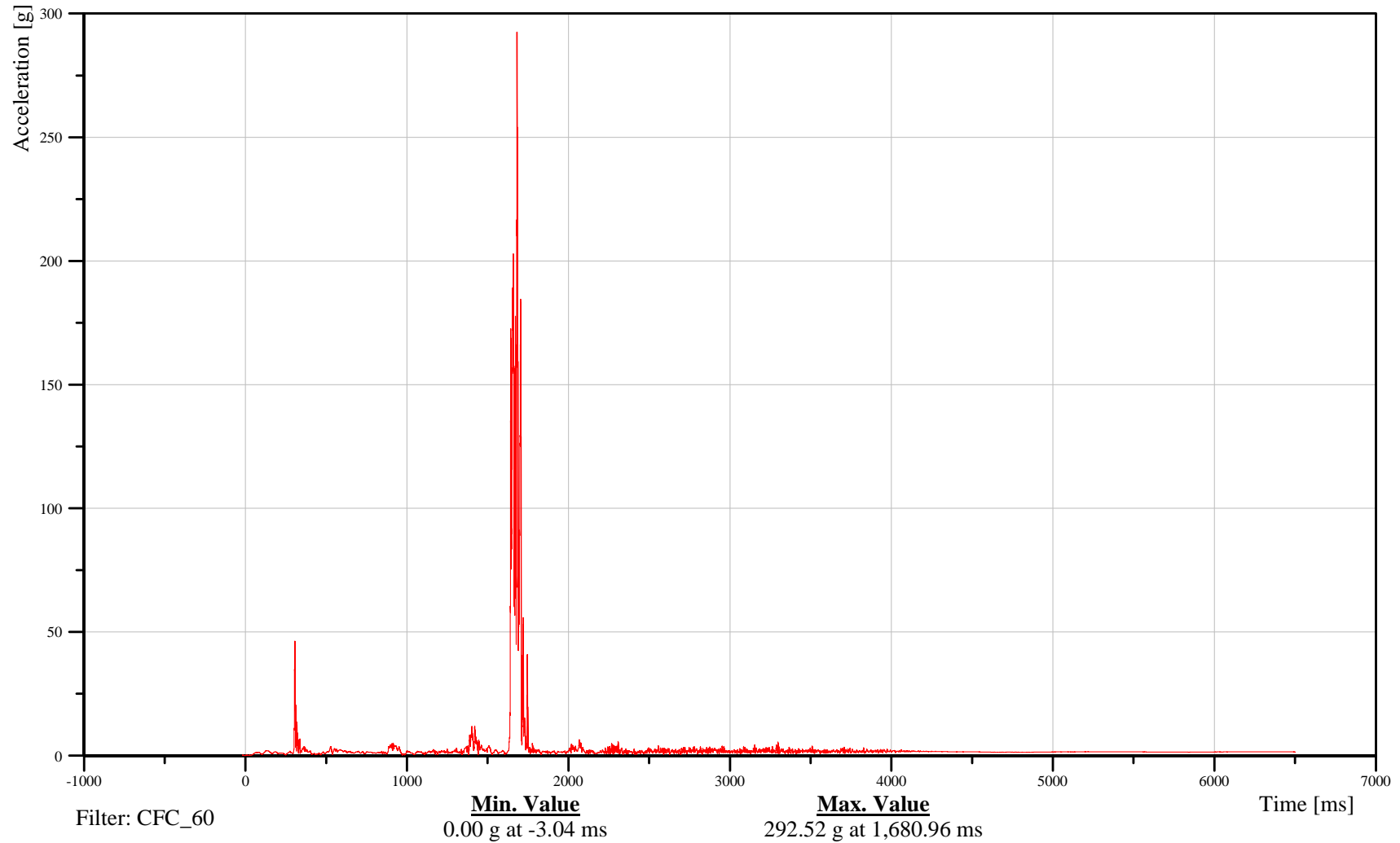
Left C-Pillar Upper Resultant Acceleration

Customer: VRTC

10CPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-142

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

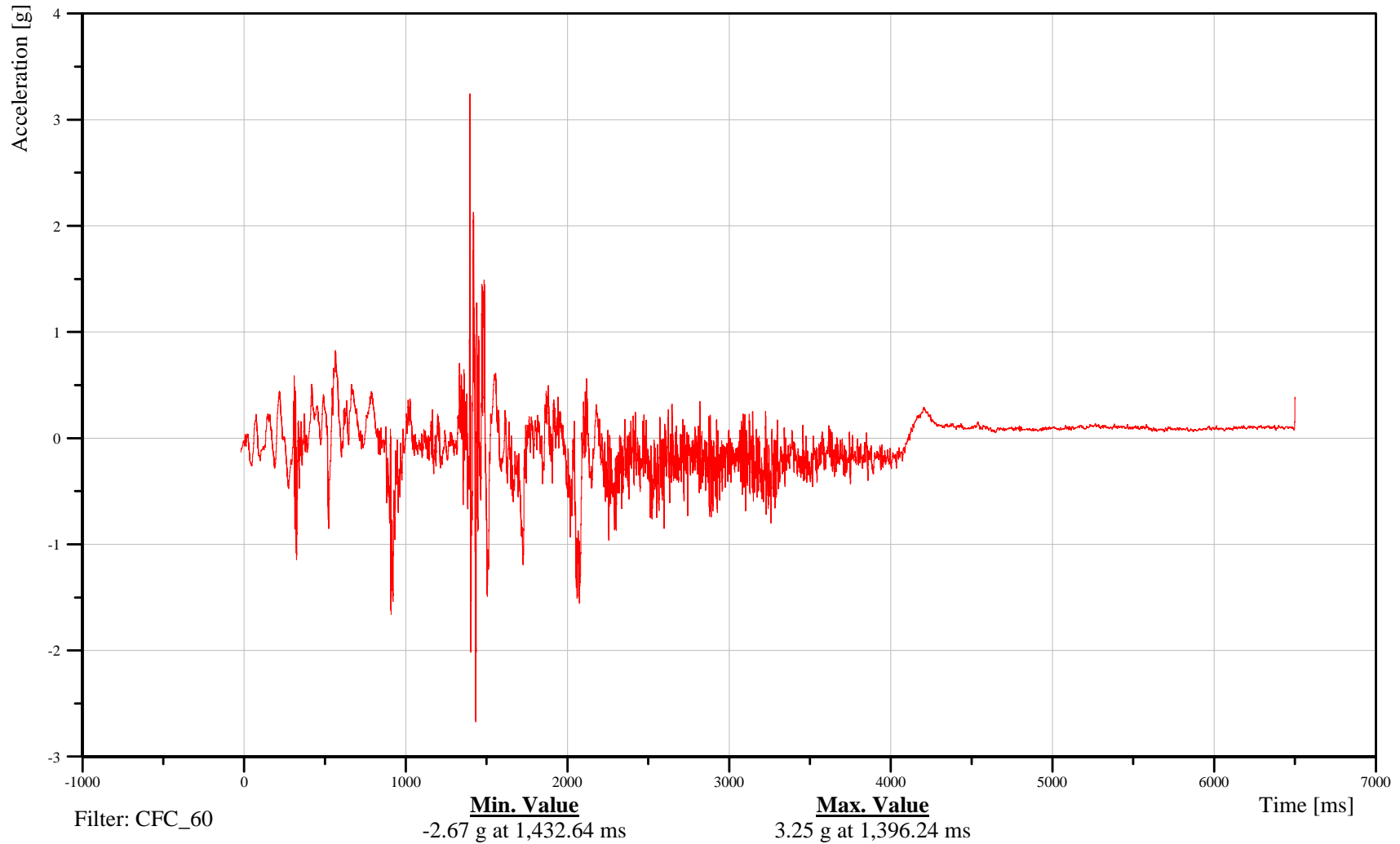
Left C-Pillar Lower X-Axis Acceleration

Customer: VRTC

10CPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-143

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

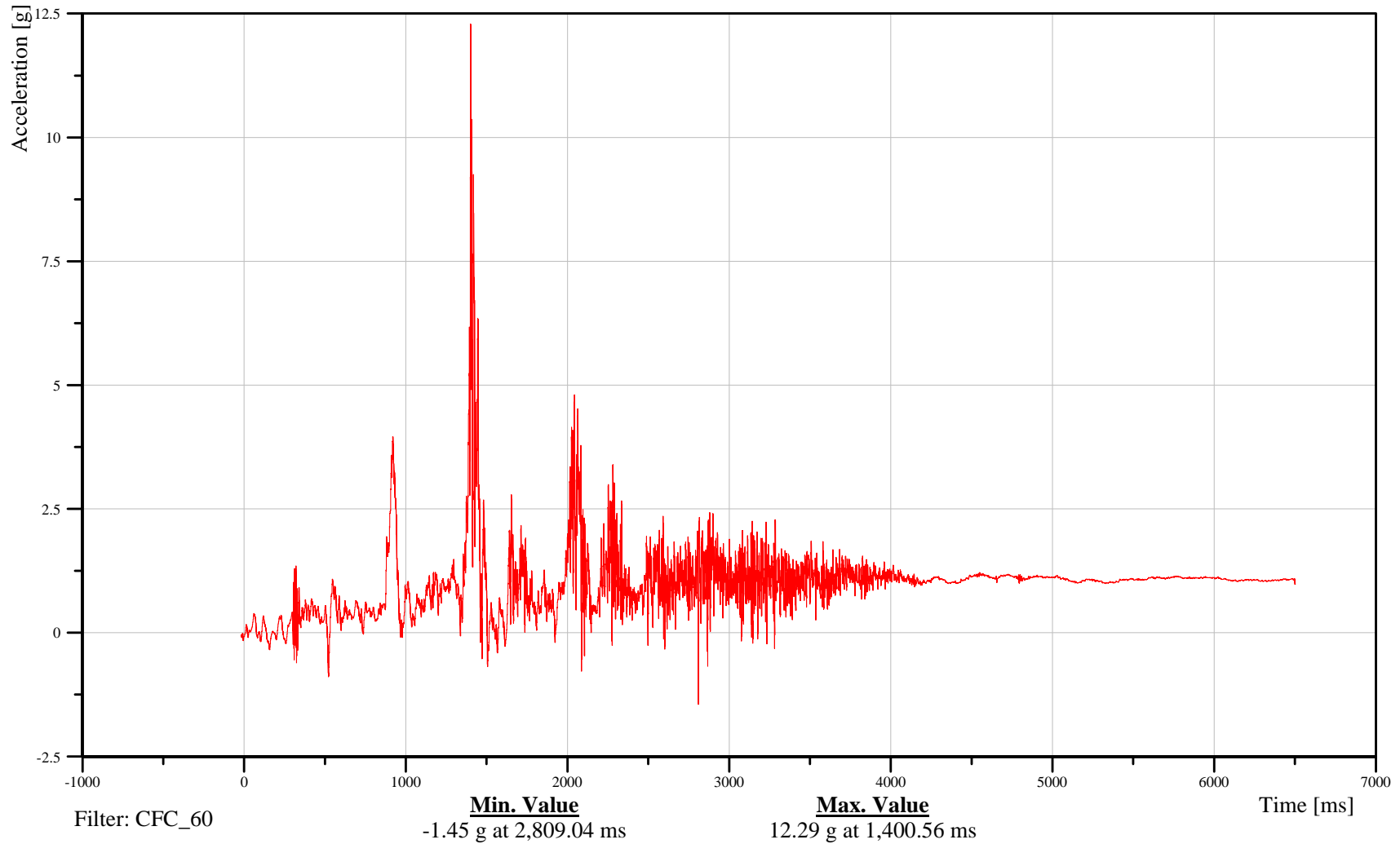
Left C-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10CPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-144

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

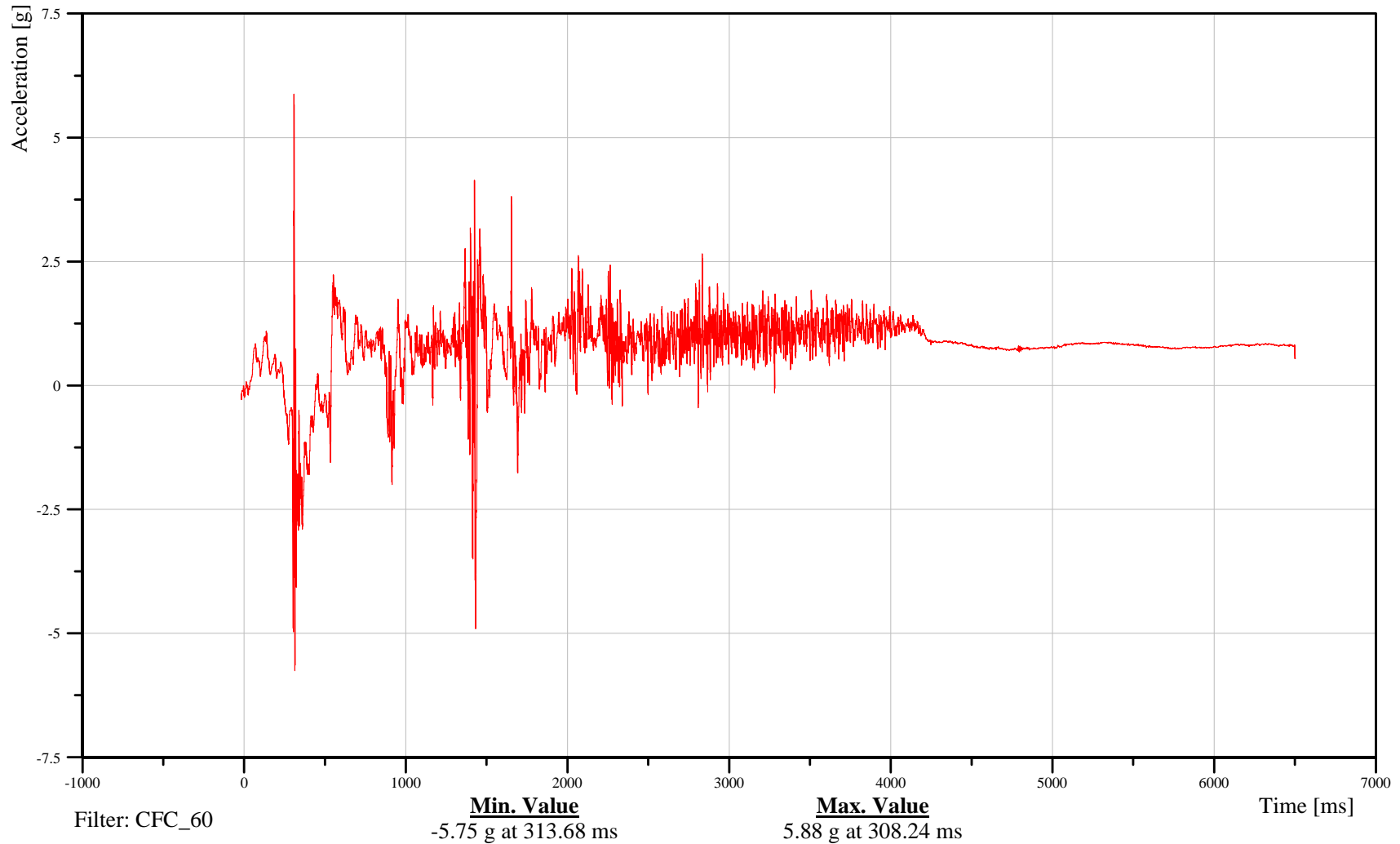
Left C-Pillar Lower Z-Axis Acceleration

Customer: VRTC

10CPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-145

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left C-Pillar Lower Resultant Acceleration

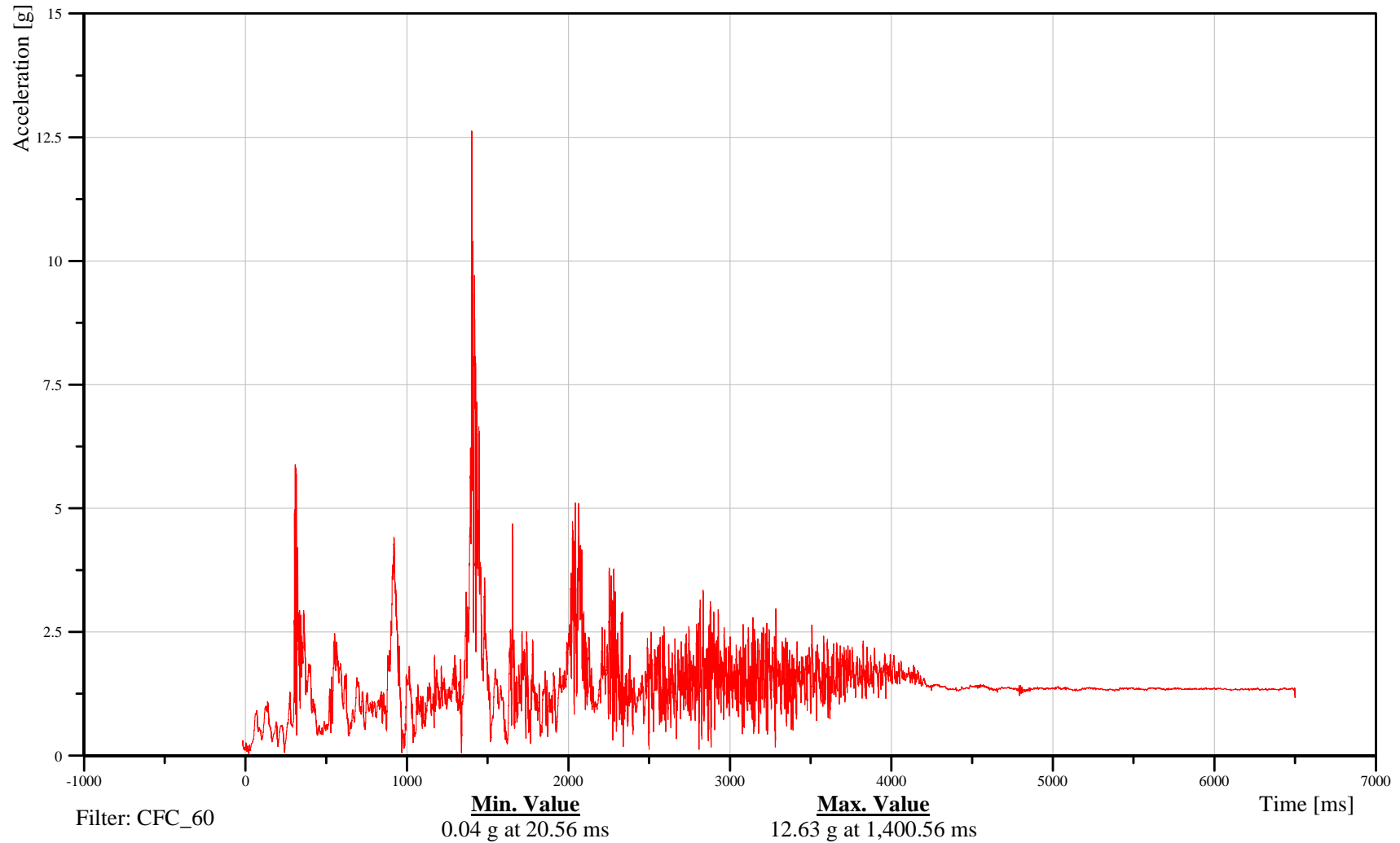
Time: 14:32

Customer: VRTC

10CPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-146

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

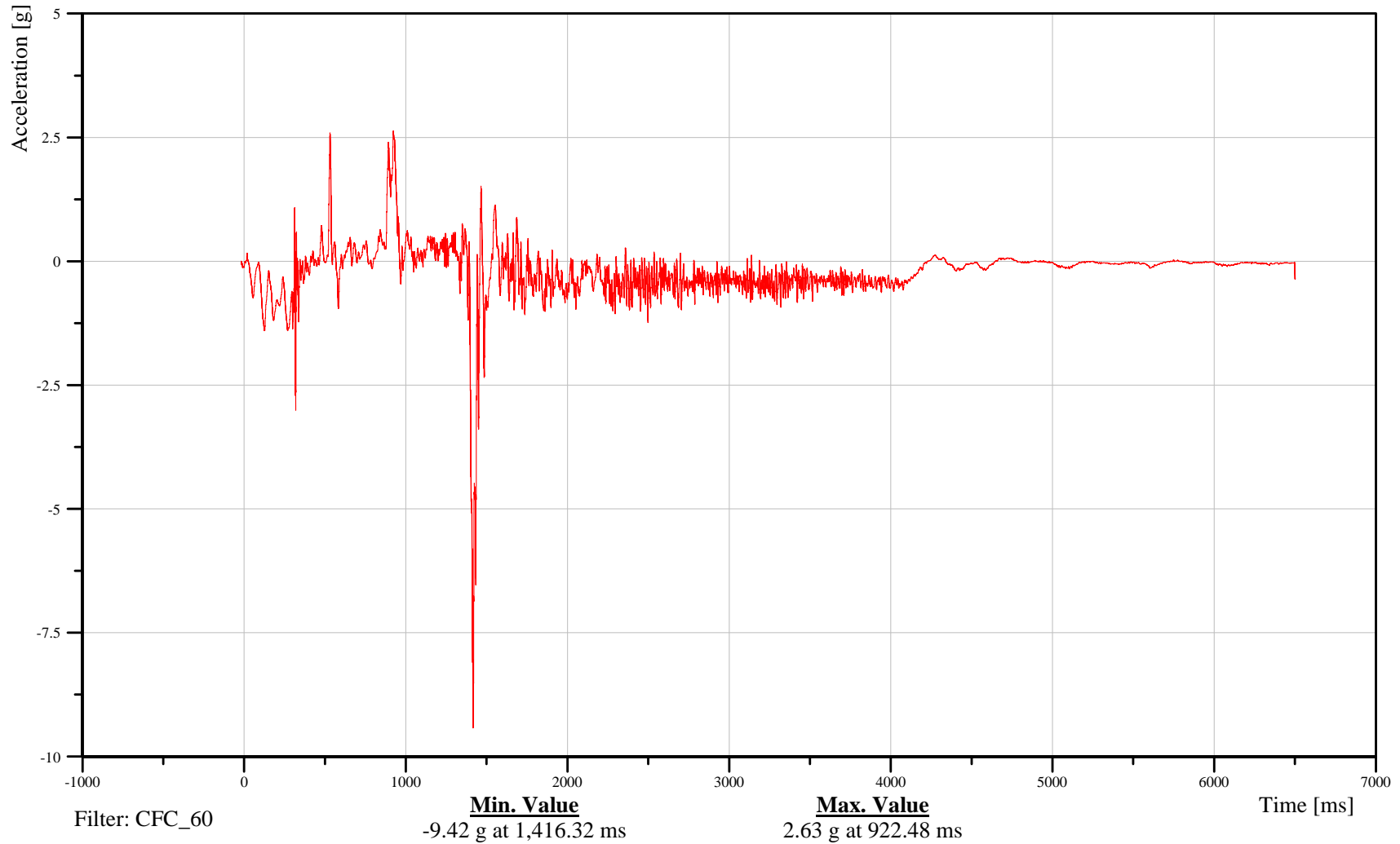
Right C-Pillar Upper X-Axis Acceleration

Customer: VRTC

10CPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-147

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right C-Pillar Upper Y-Axis Acceleration

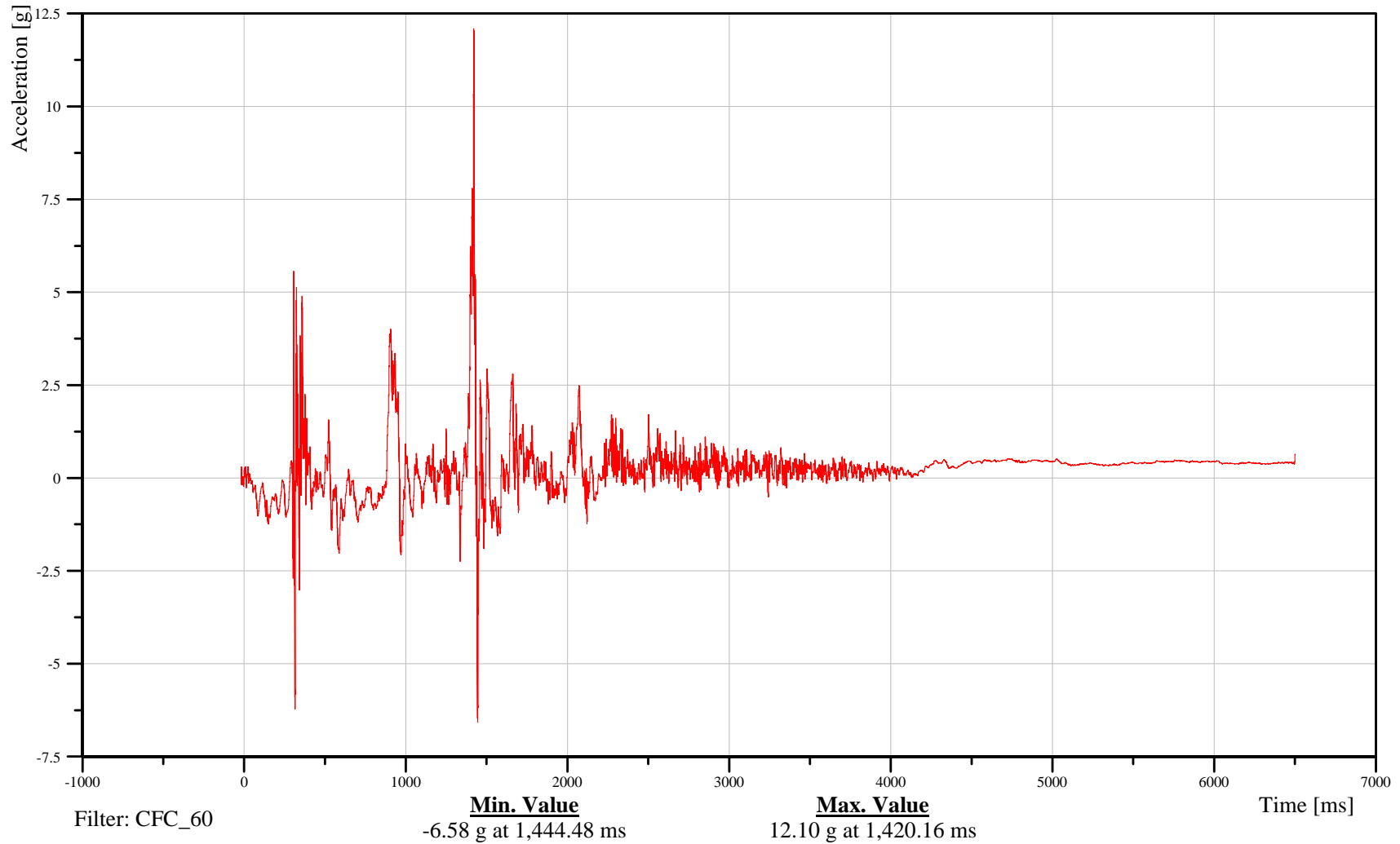
Time: 14:32

Customer: VRTC

10CPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-148

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right C-Pillar Upper Z-Axis Acceleration

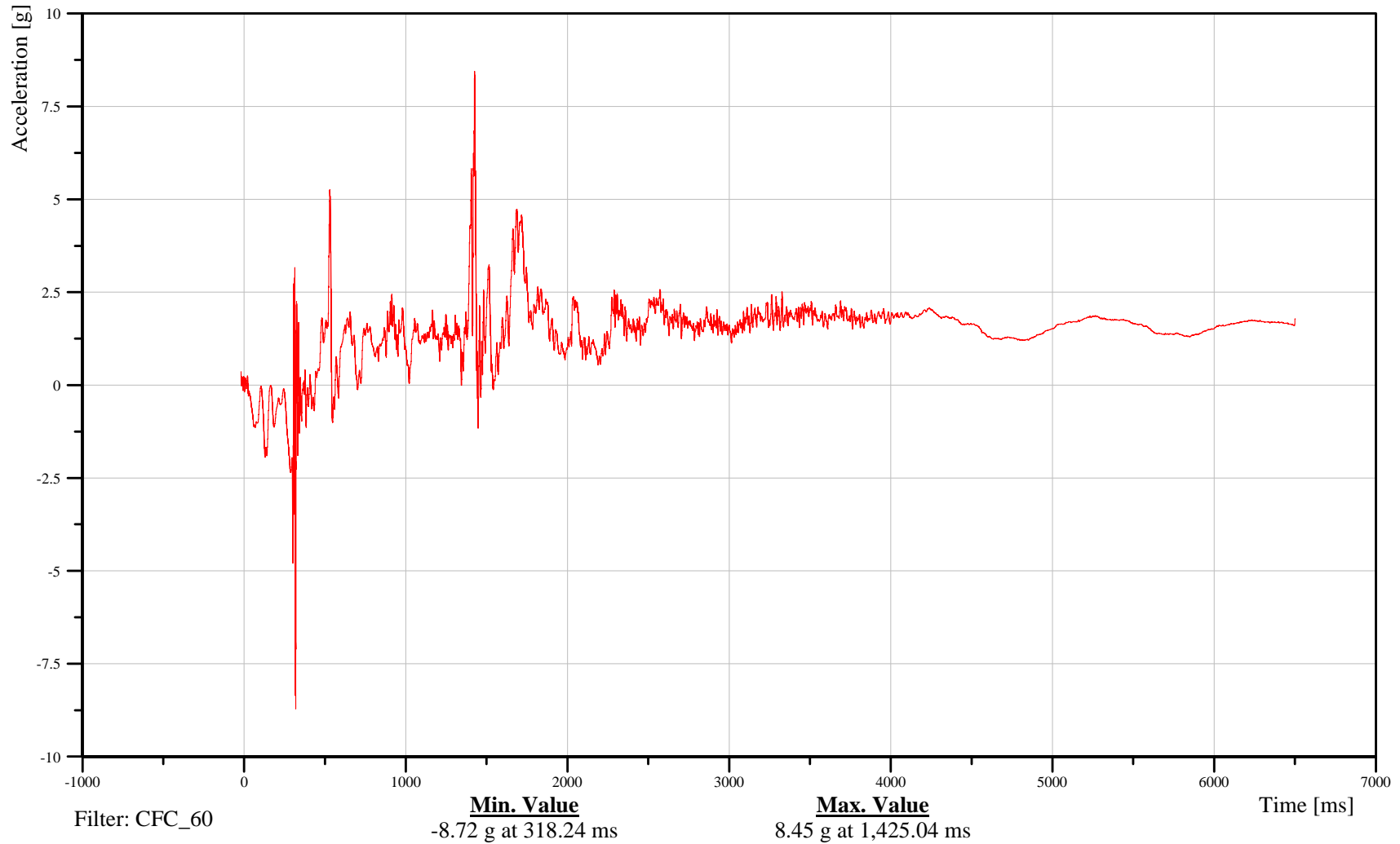
Time: 14:32

Customer: VRTC

10CPILUPRI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-149

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

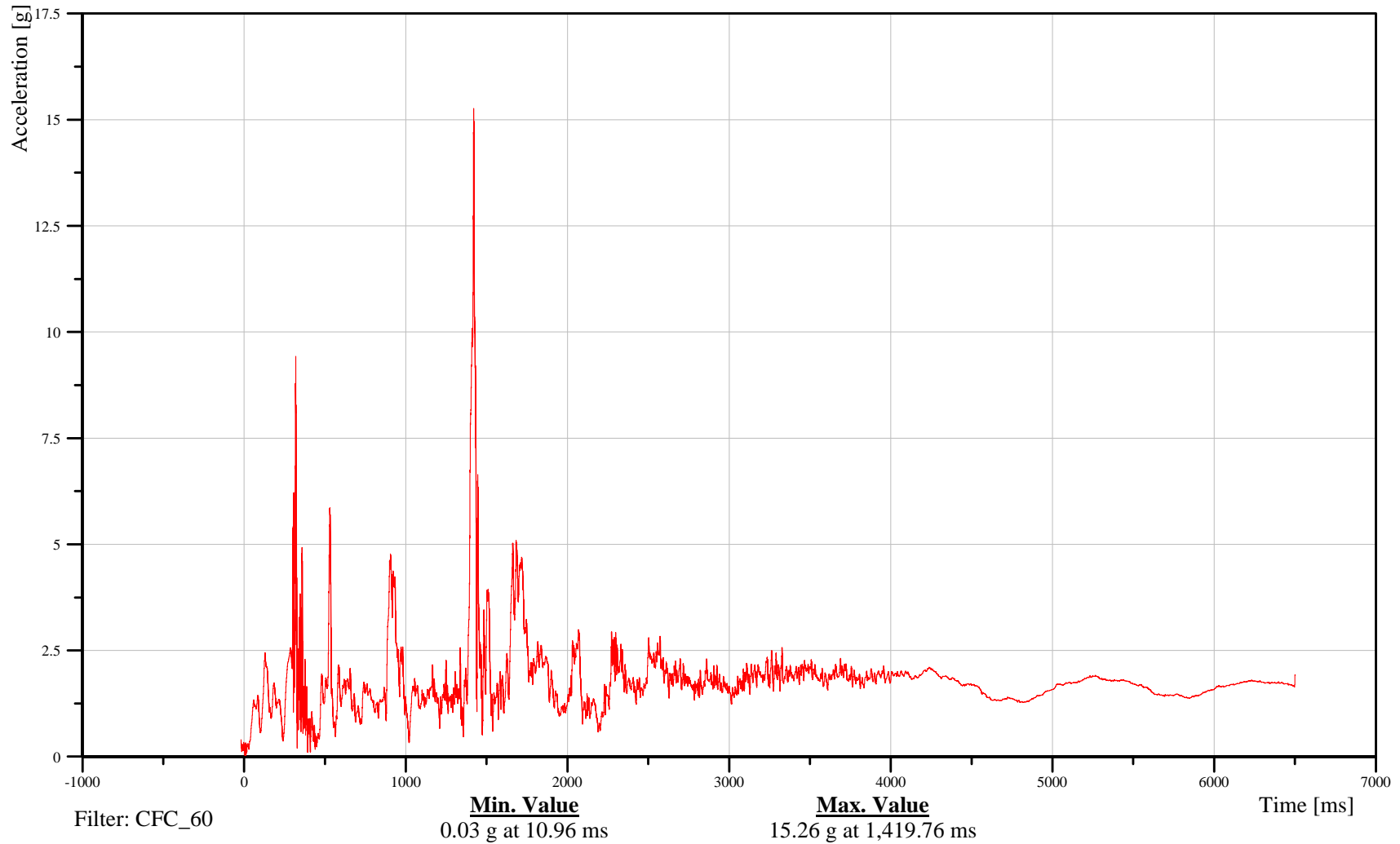
Right C-Pillar Upper Resultant Acceleration

Customer: VRTC

10CPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-150

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right C-Pillar Lower X-Axis Acceleration

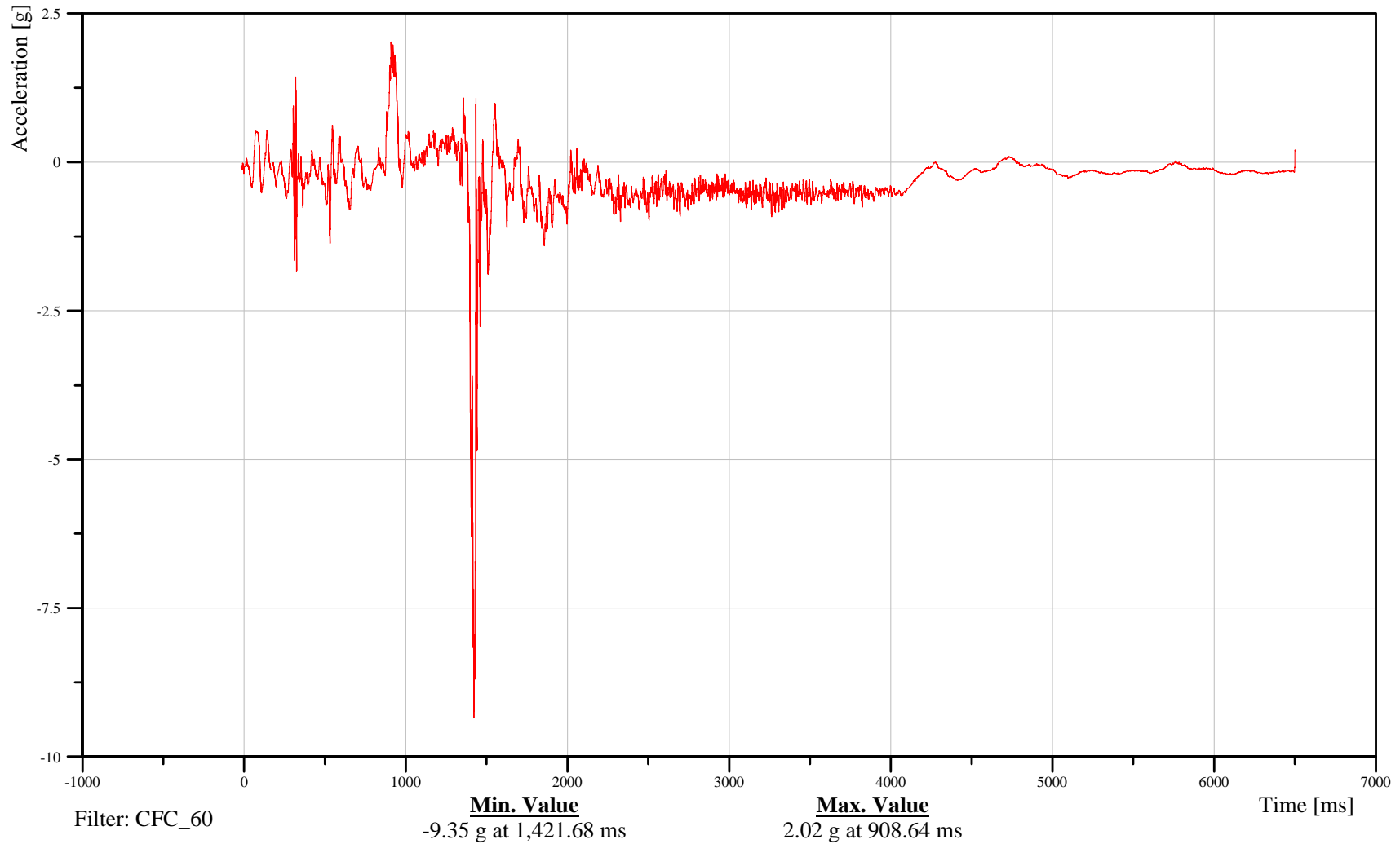
Time: 14:32

Customer: VRTC

10CPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-151

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

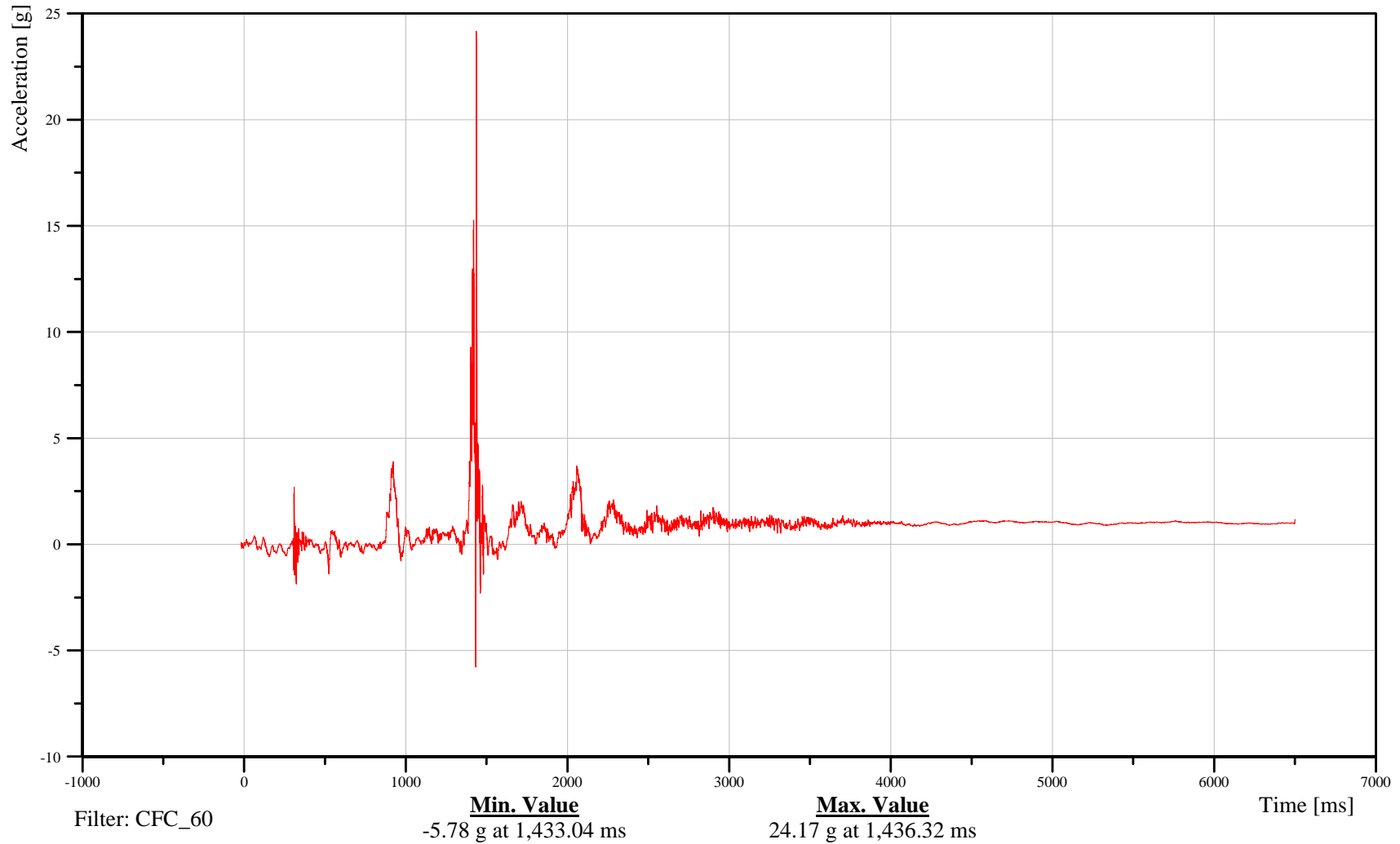
Right C-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10CPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-152

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right C-Pillar Lower Z-Axis Acceleration

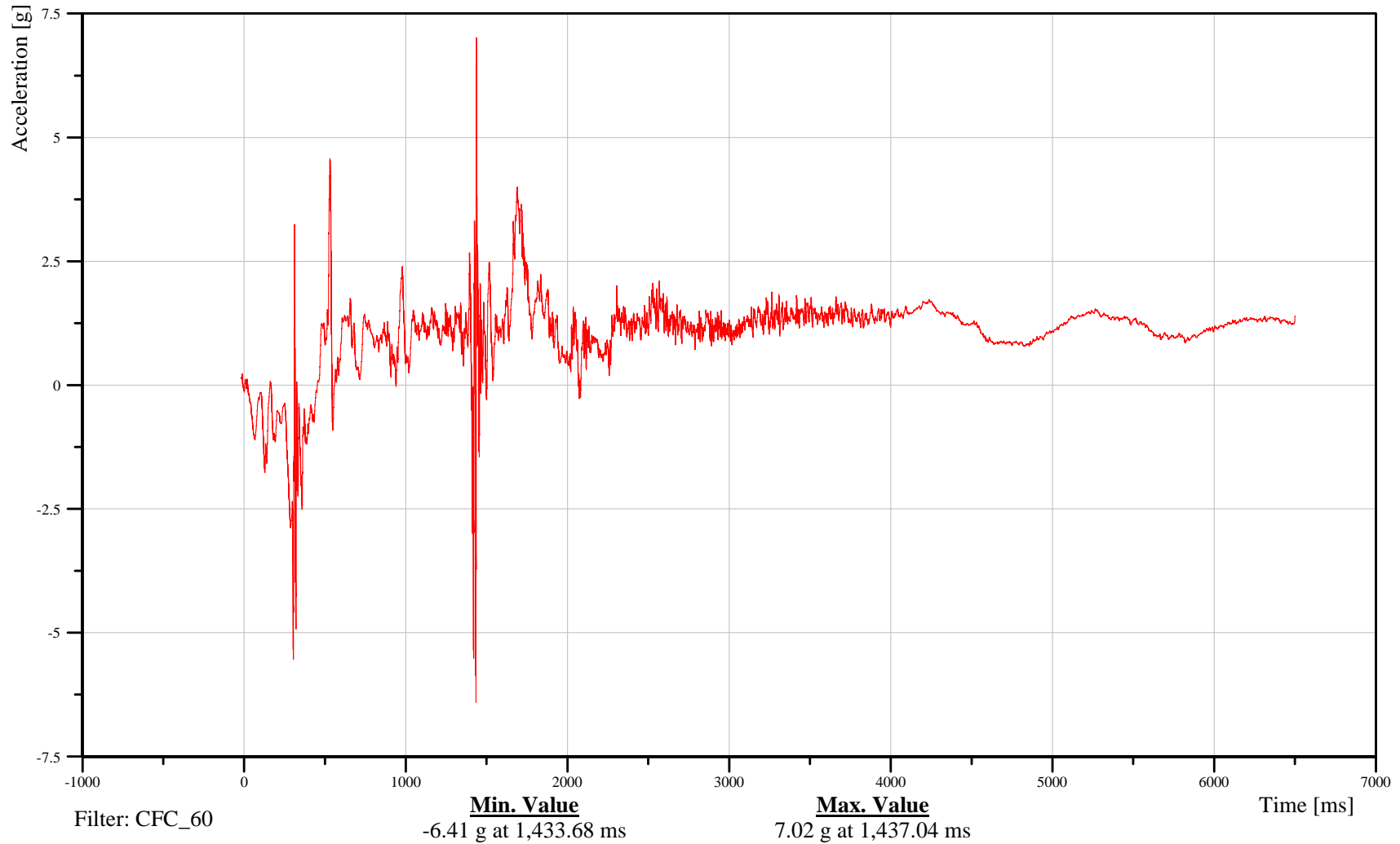
Time: 14:32

Customer: VRTC

10CPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-153

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right C-Pillar Lower Resultant Acceleration

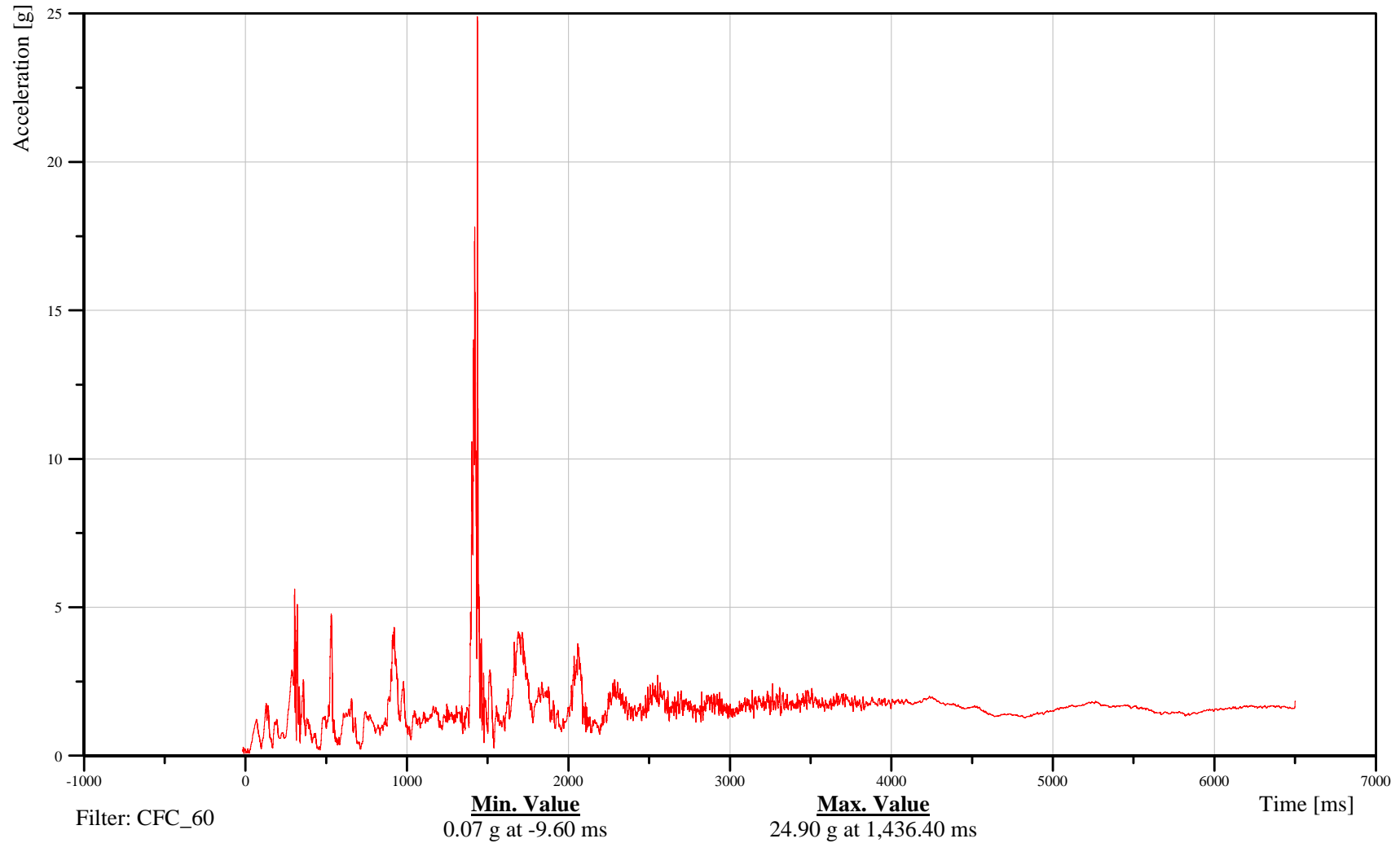
Time: 14:32

Customer: VRTC

10CPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-154

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

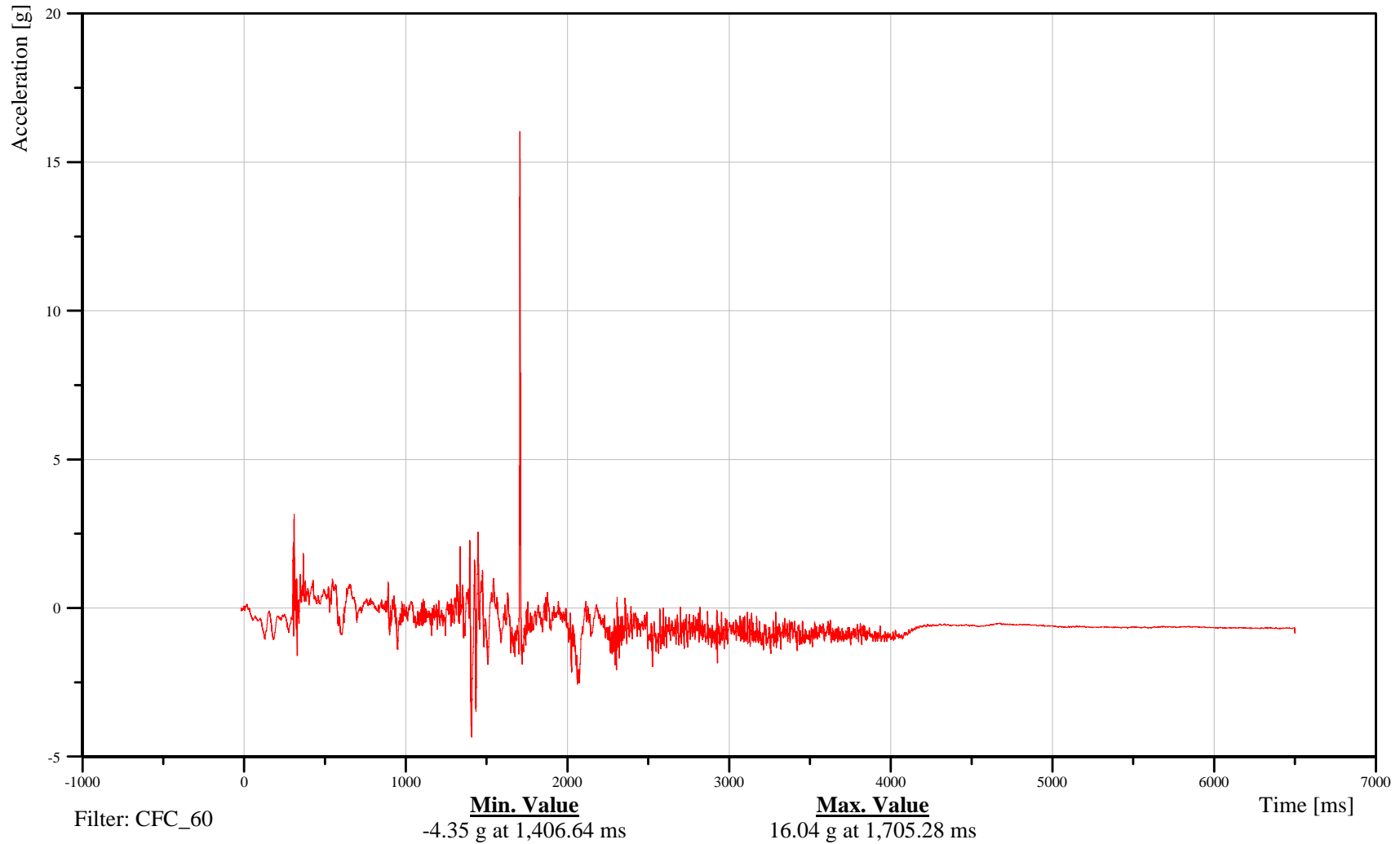
Left D-Pillar Upper X-Axis Acceleration

Customer: VRTC

10DPILUPLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-155

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

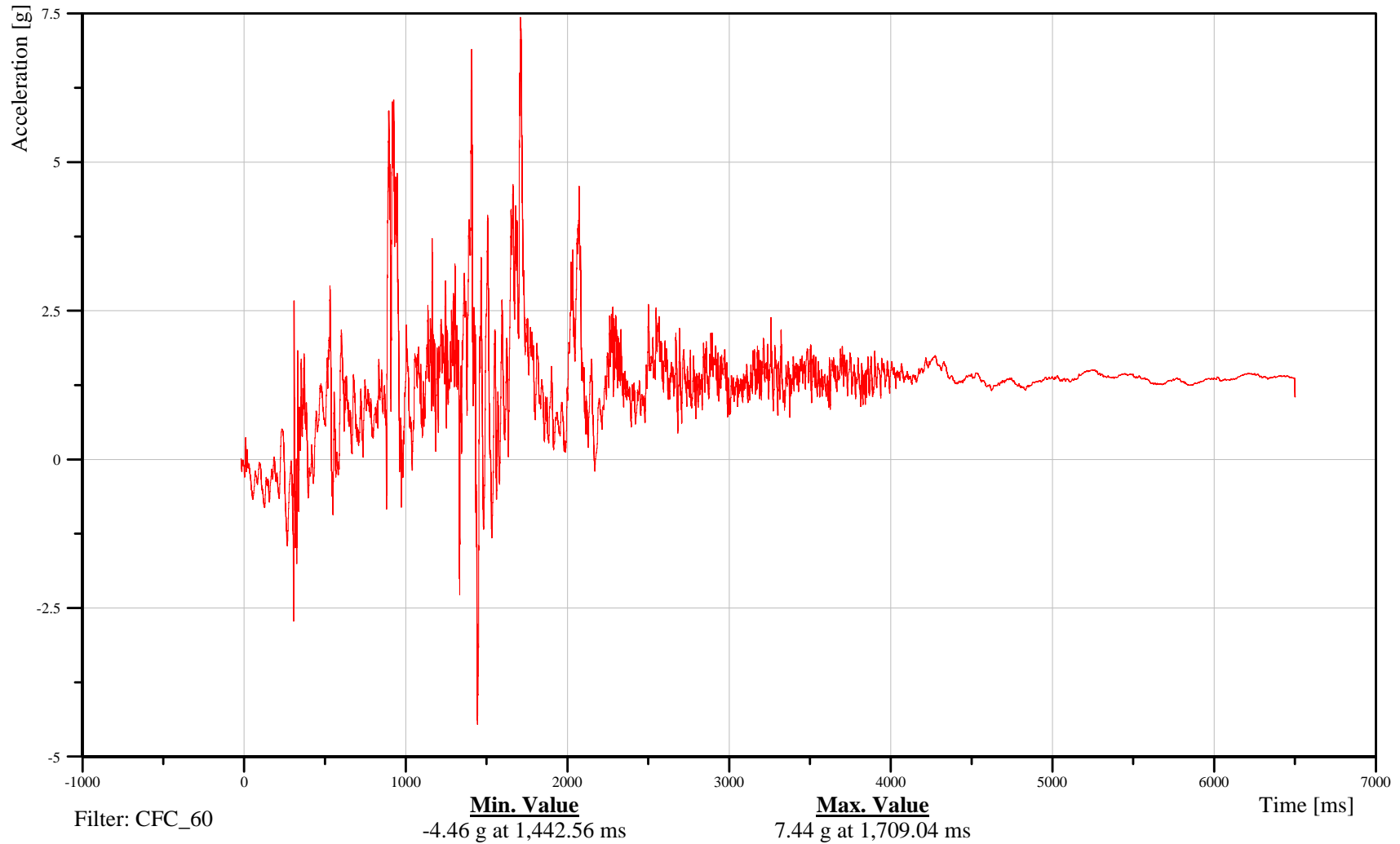
Left D-Pillar Upper Y-Axis Acceleration

Customer: VRTC

10DPILUPLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-156

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

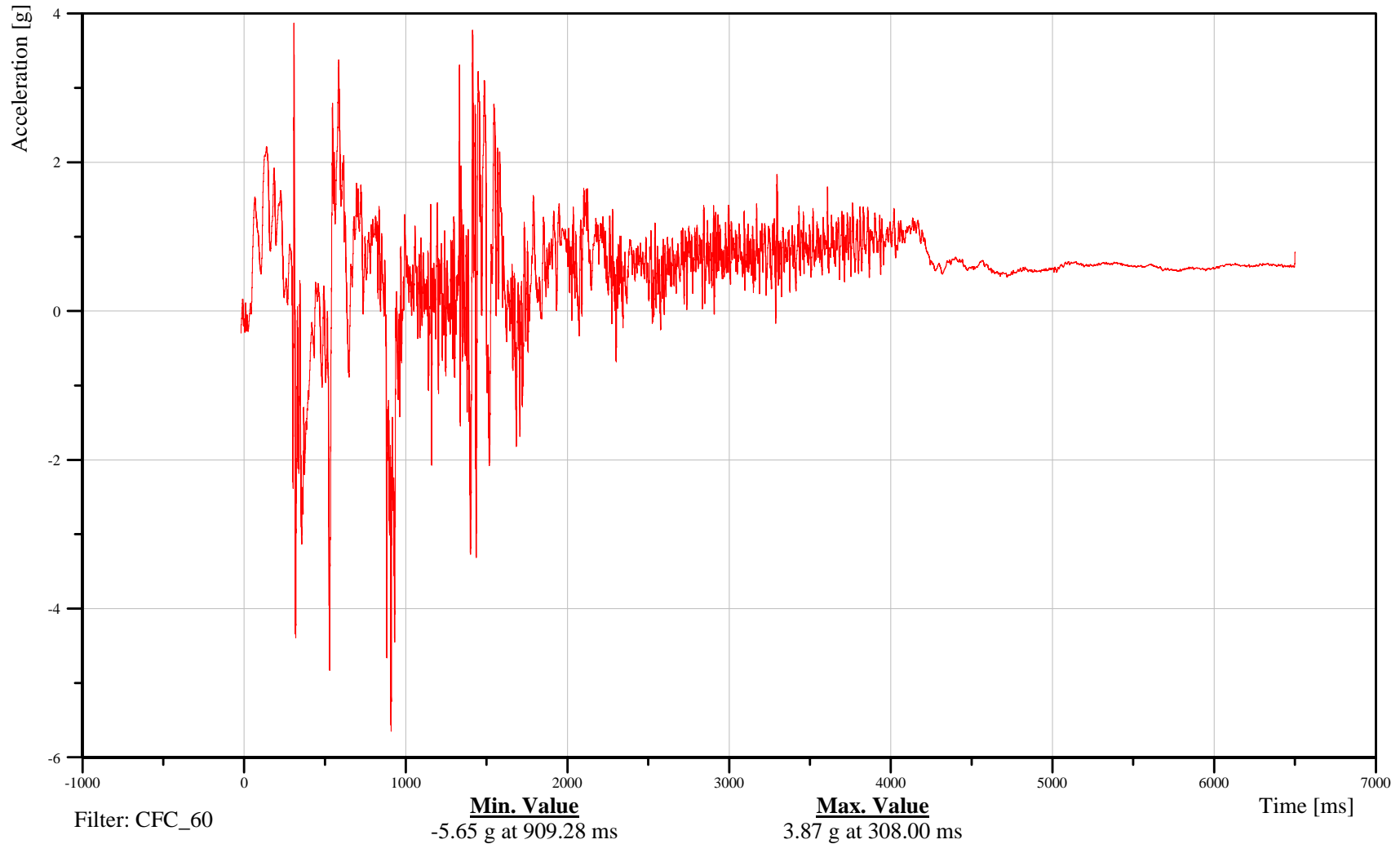
Left D-Pillar Upper Z-Axis Acceleration

Customer: VRTC

10DPILUPLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-157

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

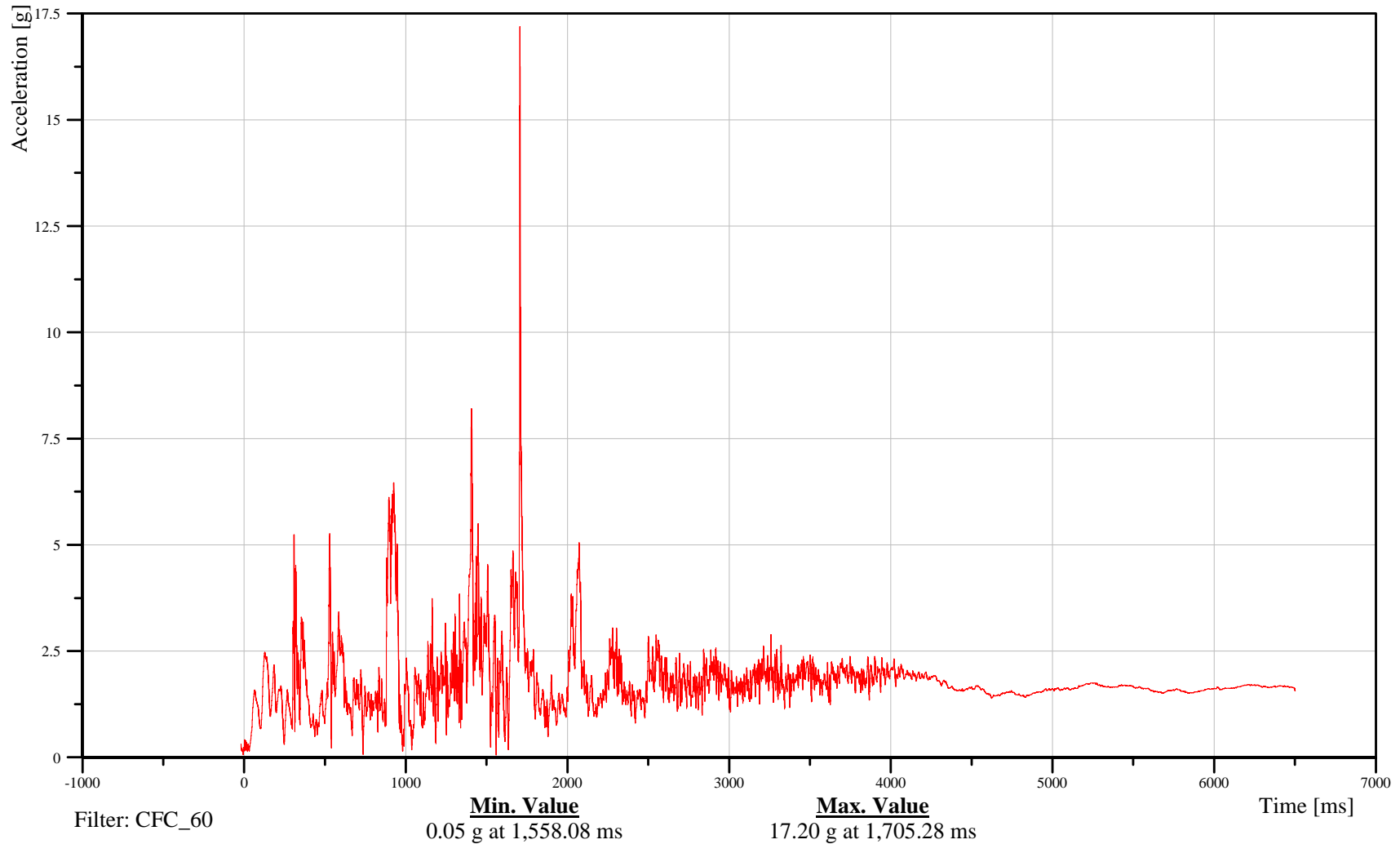
Left D-Pillar Upper Resultant Acceleration

Customer: VRTC

10DPILUPLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-158

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left D-Pillar Lower X-Axis Acceleration

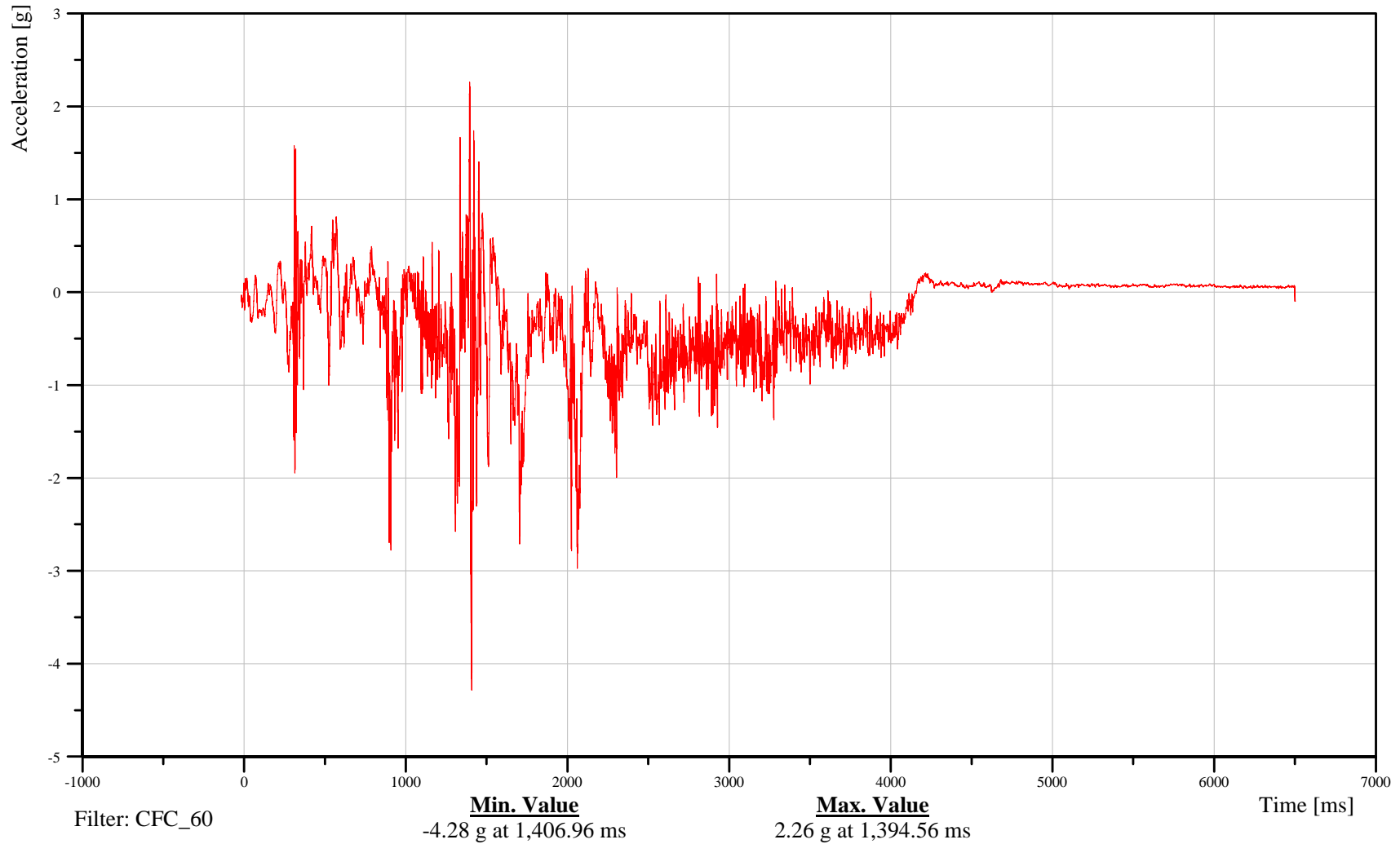
Time: 14:32

Customer: VRTC

10DPILLOLE00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-159

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

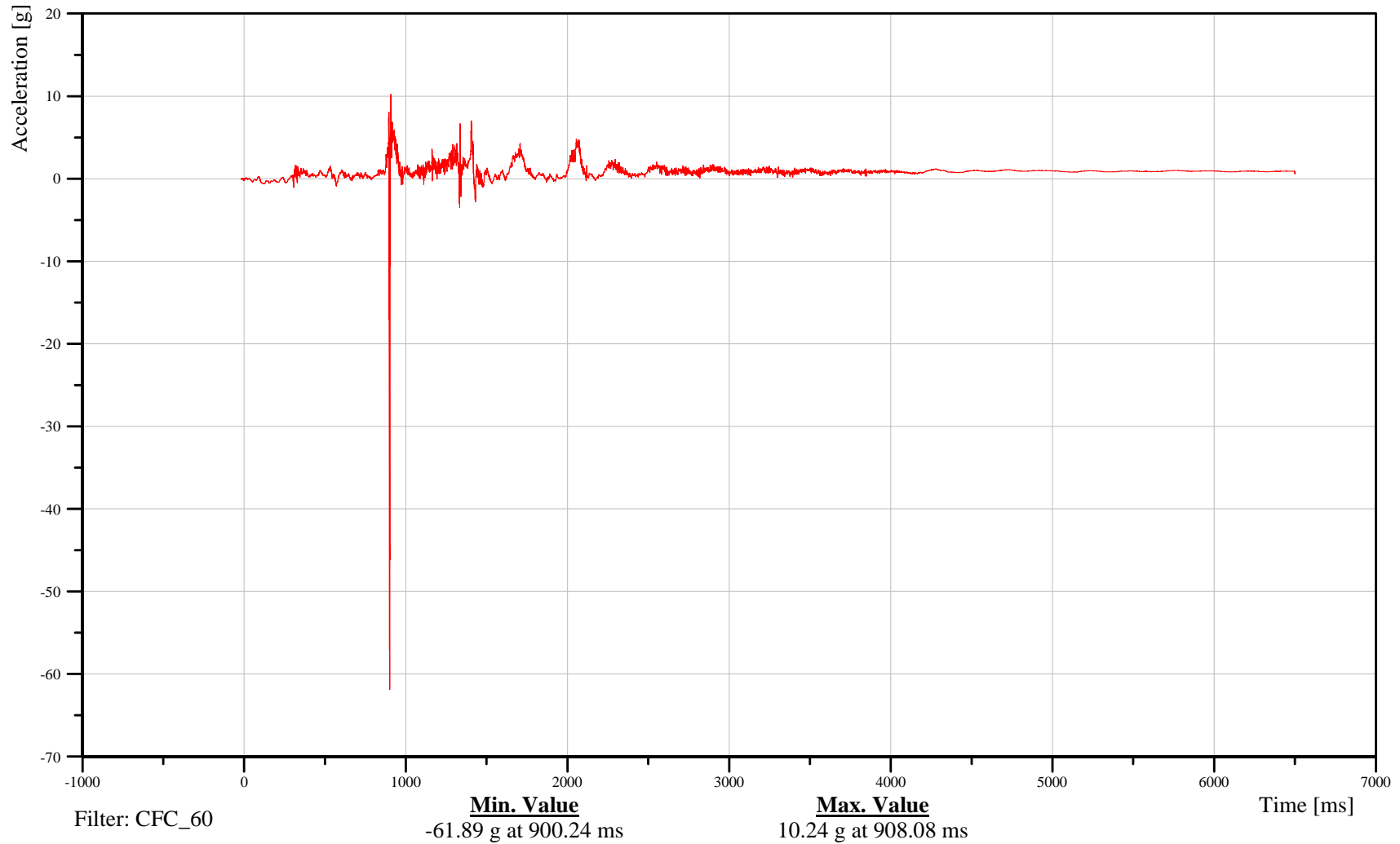
Left D-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10DPILLOLE00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-160

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

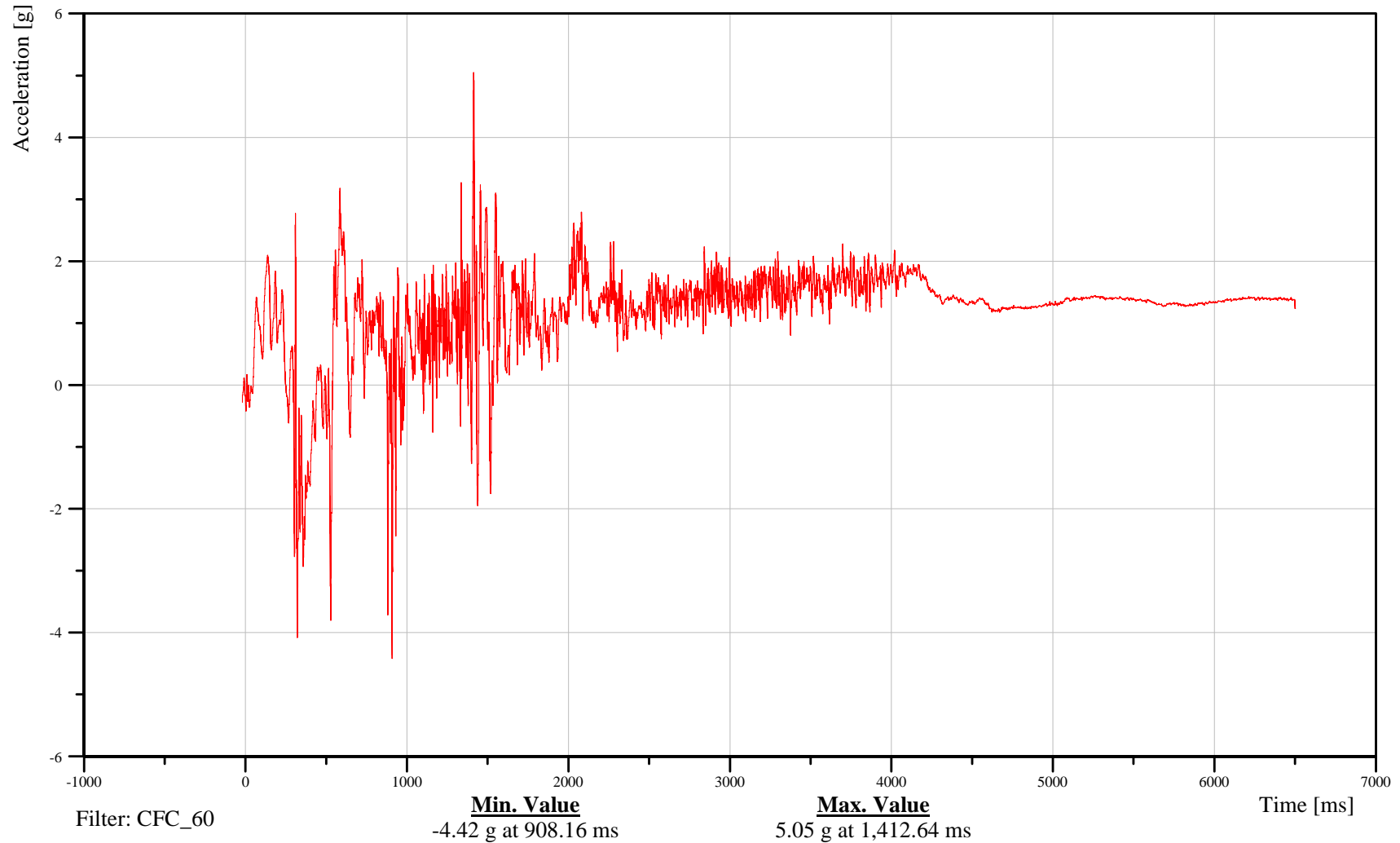
Left D-Pillar Lower Z-Axis Acceleration

Customer: VRTC

10DPILLOLE00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-161

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left D-Pillar Lower Resultant Acceleration

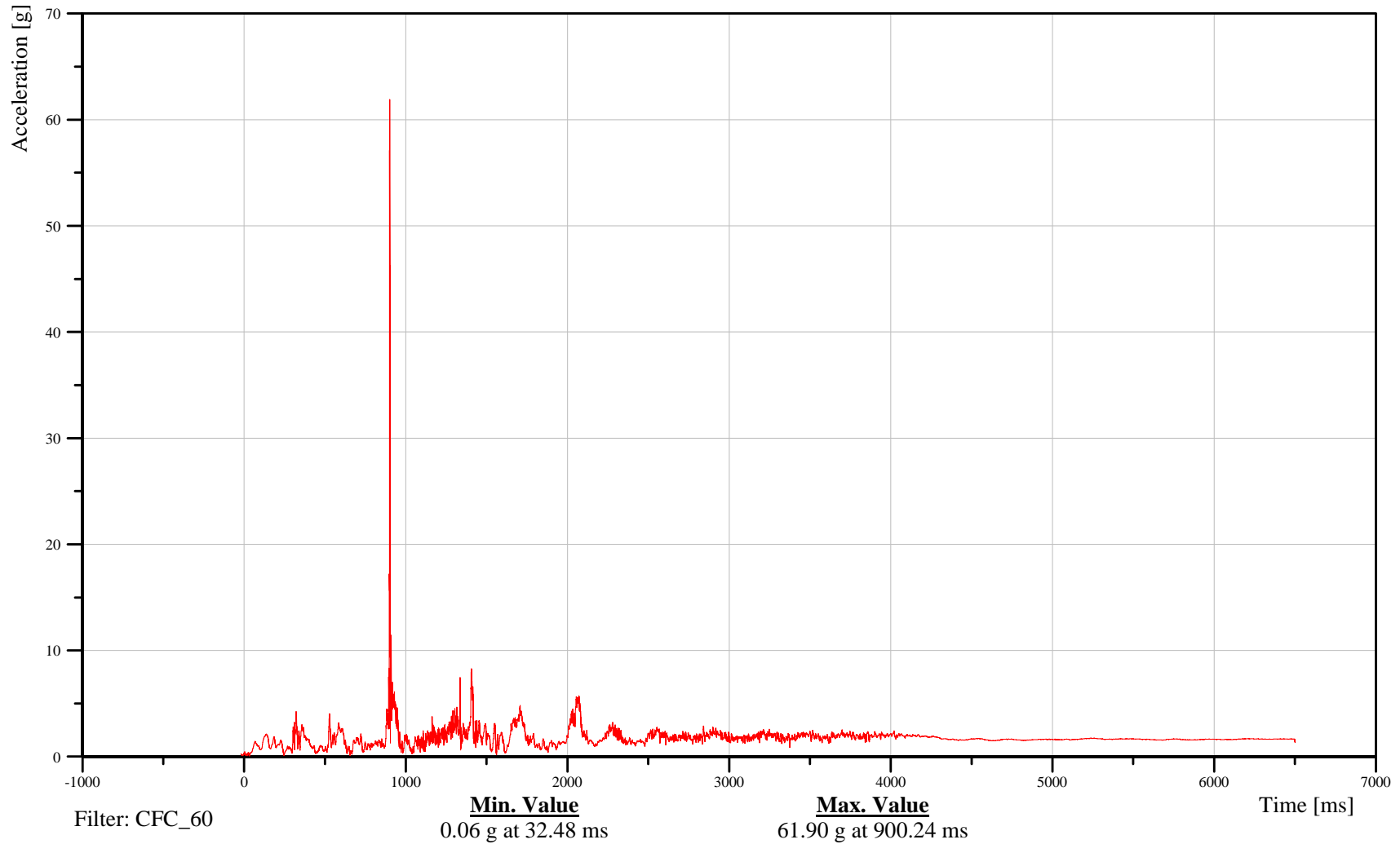
Time: 14:32

Customer: VRTC

10DPILLOLE00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-162

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right D-Pillar Upper X-Axis Acceleration

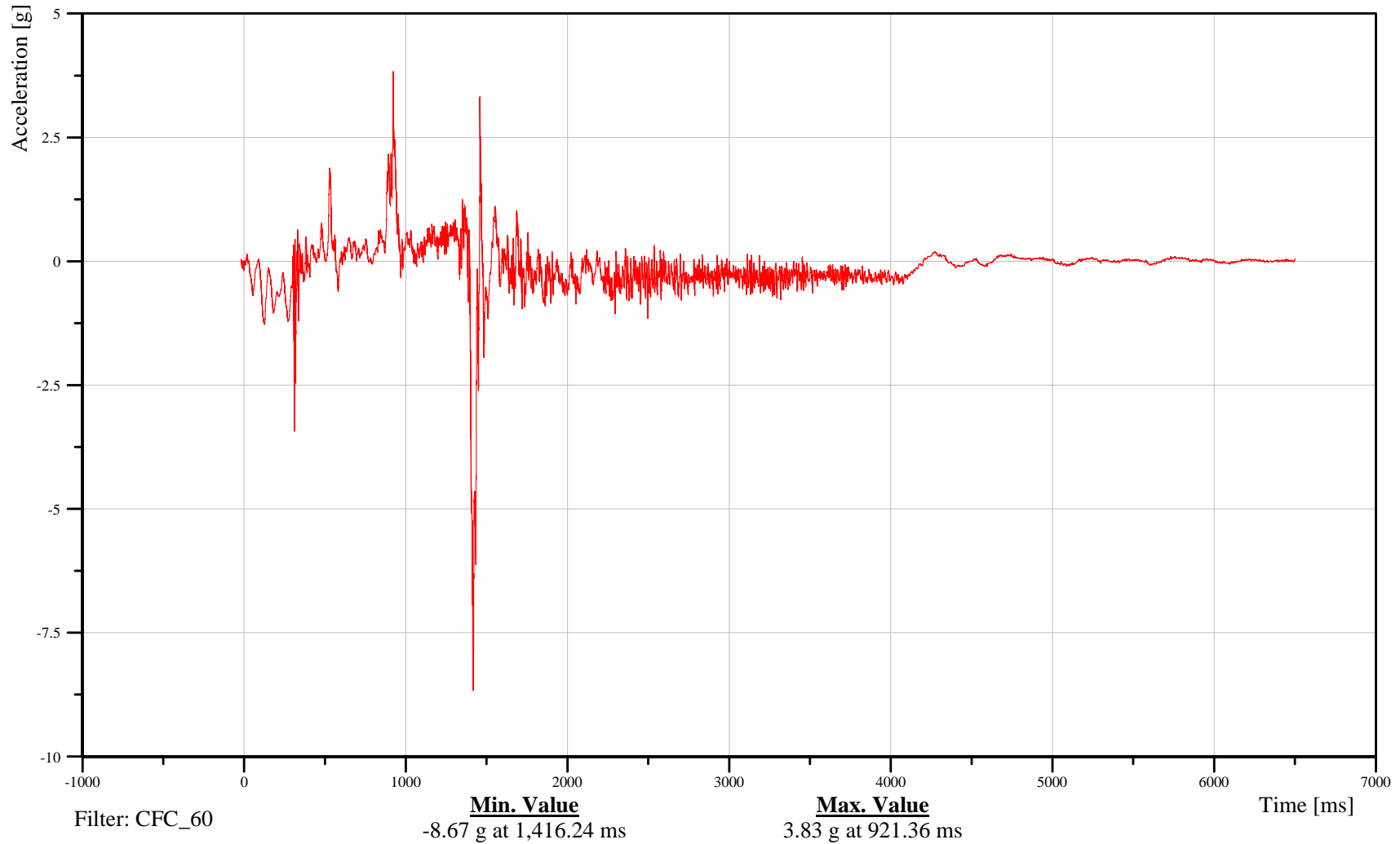
Time: 14:32

Customer: VRTC

10DPILUPRI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-163

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

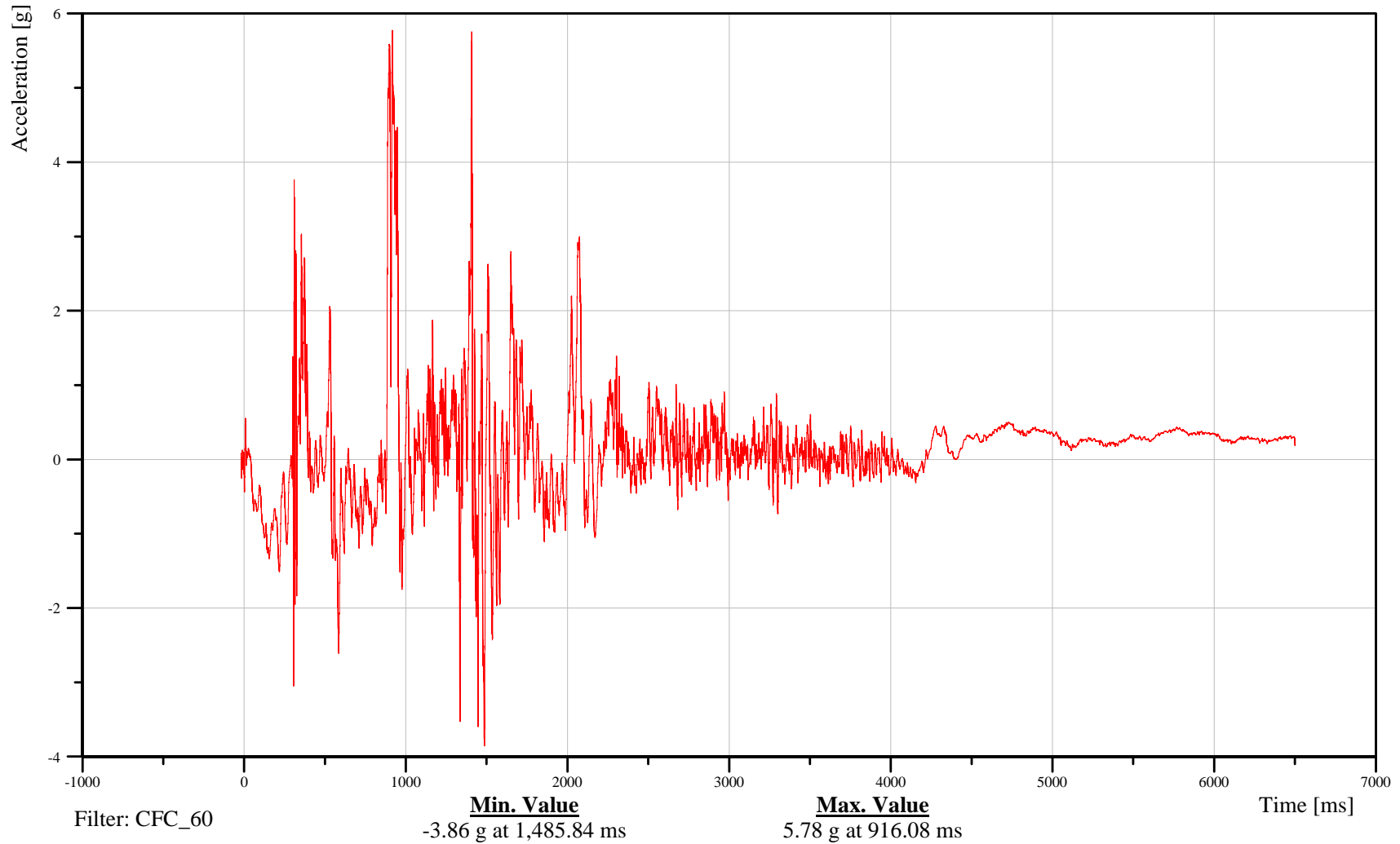
Right D-Pillar Upper Y-Axis Acceleration

Customer: VRTC

10DPILUPRI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-164

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

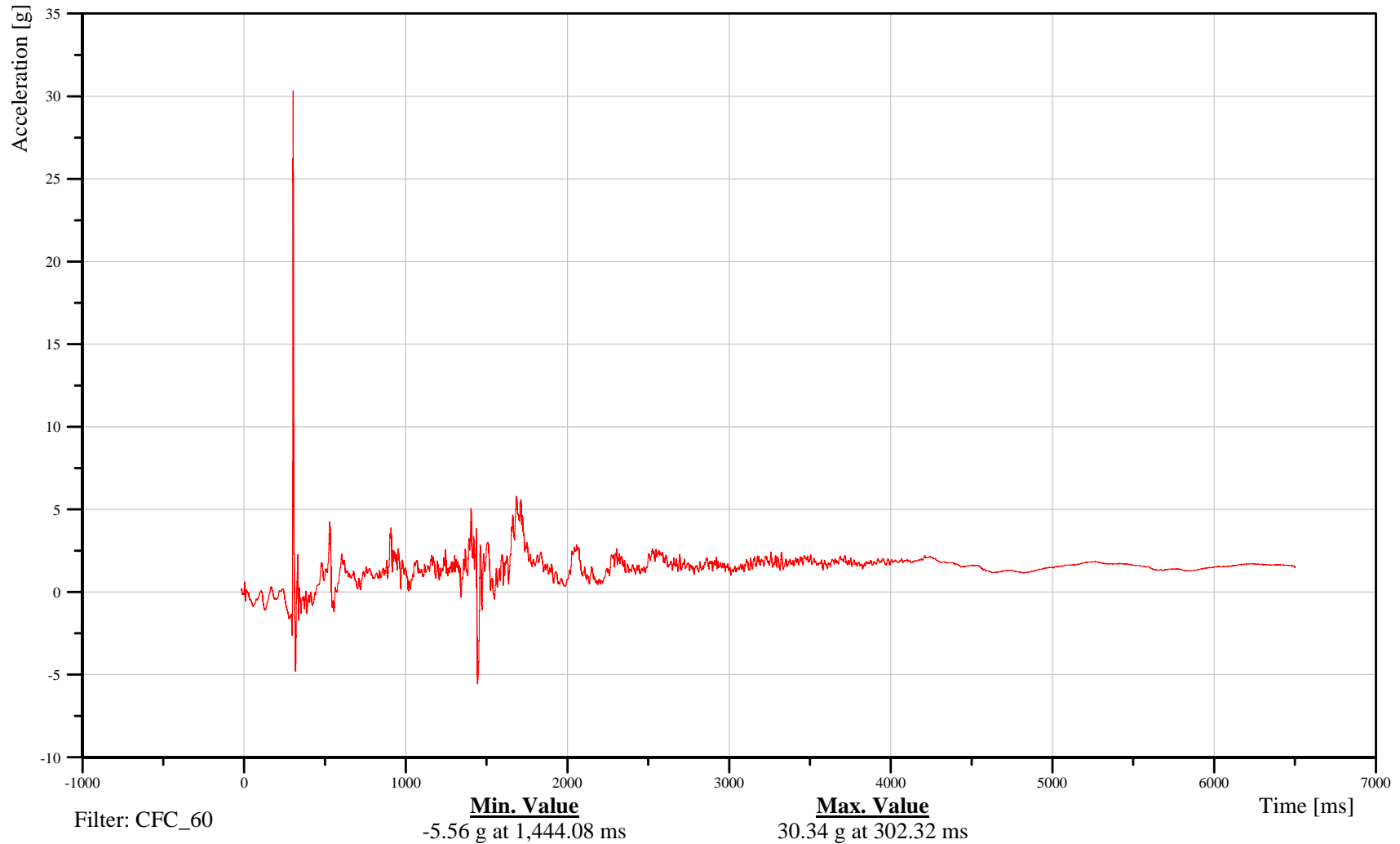
Right D-Pillar Upper Z-Axis Acceleration

Customer: VRTC

TRC Inc. Test Lab: CTF

10DPILUPRI00ACZD

Test Number: 100420



B-165

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

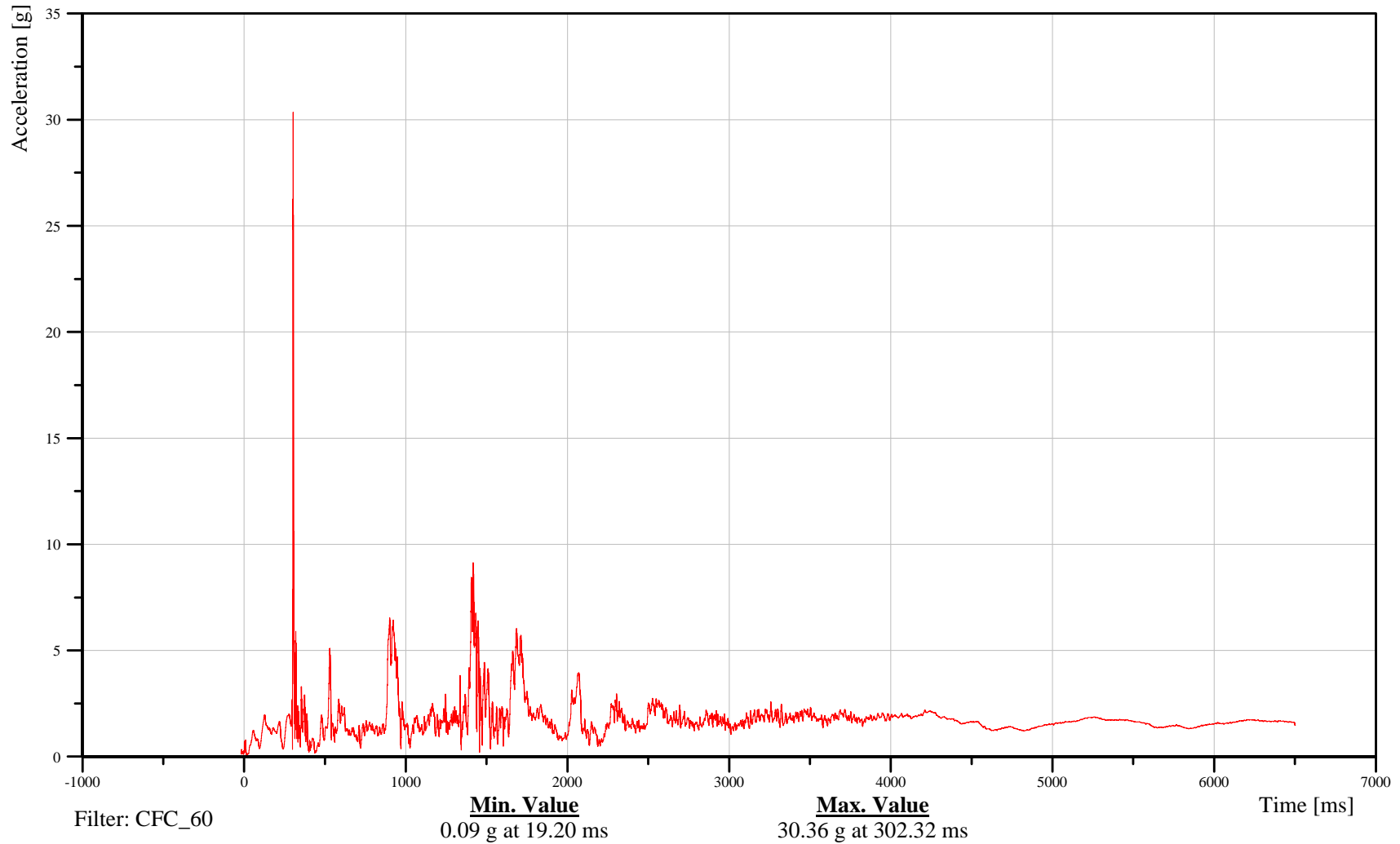
Right D-Pillar Upper Resultant Acceleration

Customer: VRTC

10DPILUPRI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-166

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right D-Pillar Lower X-Axis Acceleration

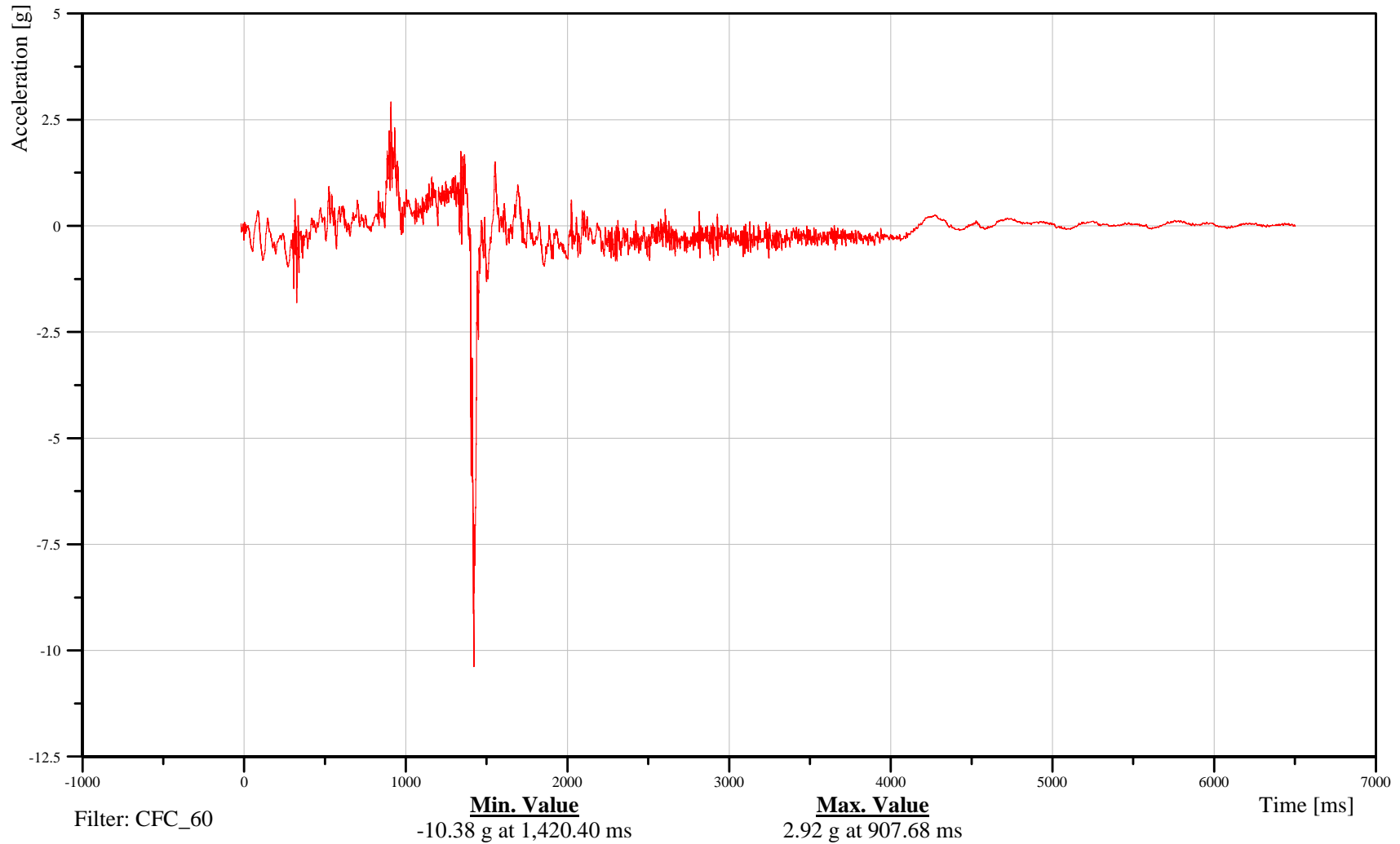
Time: 14:32

Customer: VRTC

10DPILLORI00ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-167

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

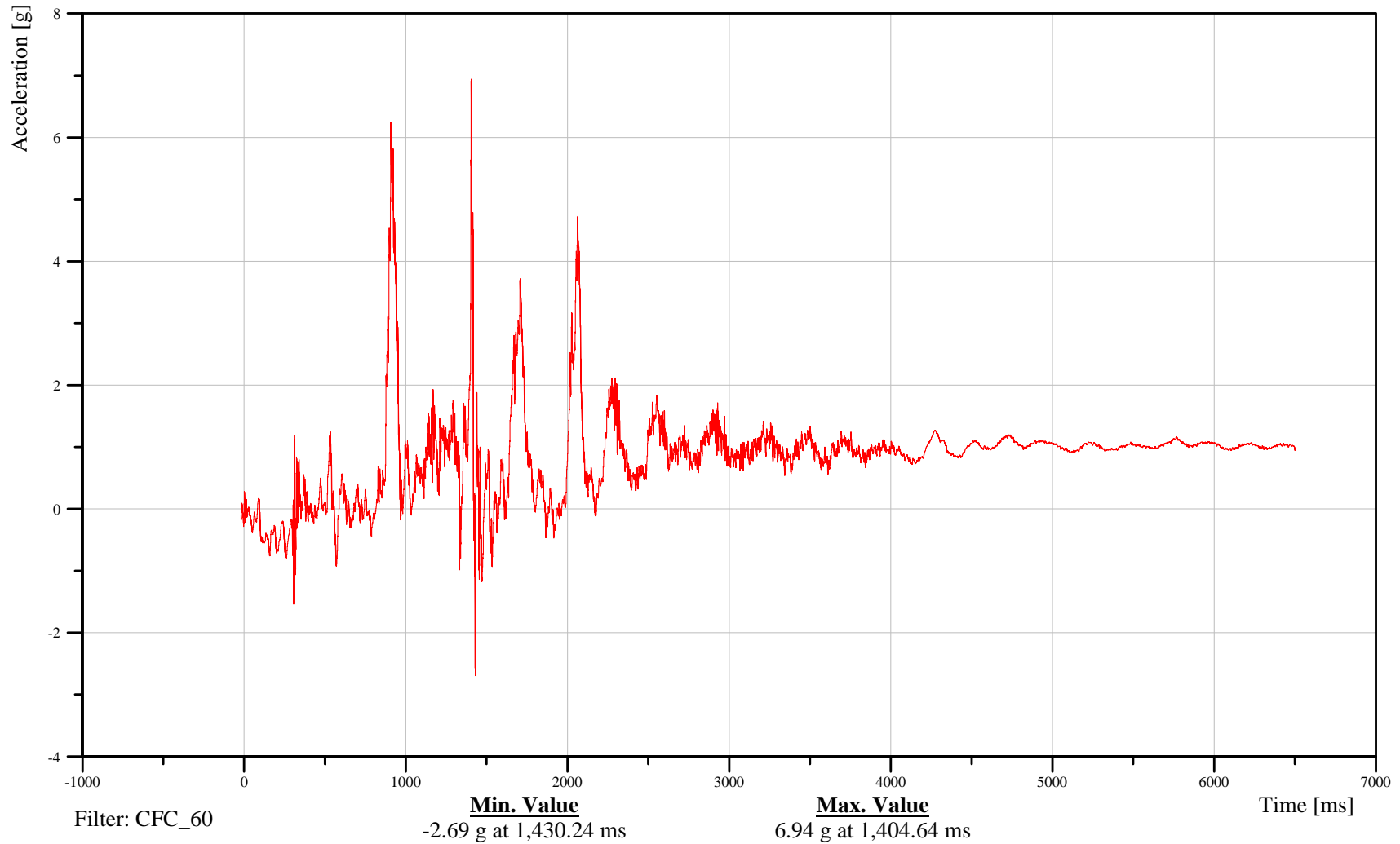
Right D-Pillar Lower Y-Axis Acceleration

Customer: VRTC

10DPILLORI00ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-168

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right D-Pillar Lower Z-Axis Acceleration

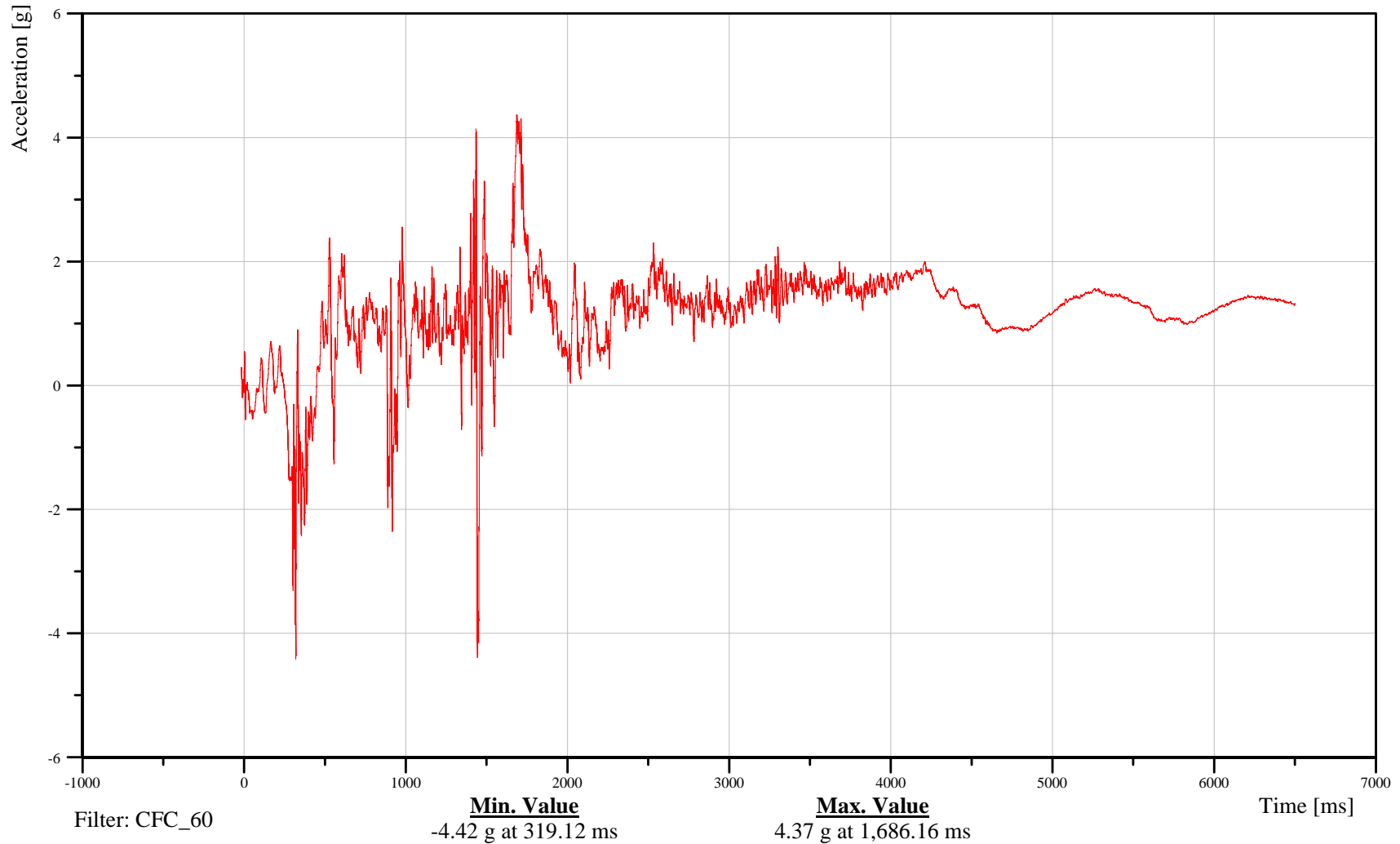
Time: 14:32

Customer: VRTC

10DPILLORI00ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-169

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right D-Pillar Lower Resultant Acceleration

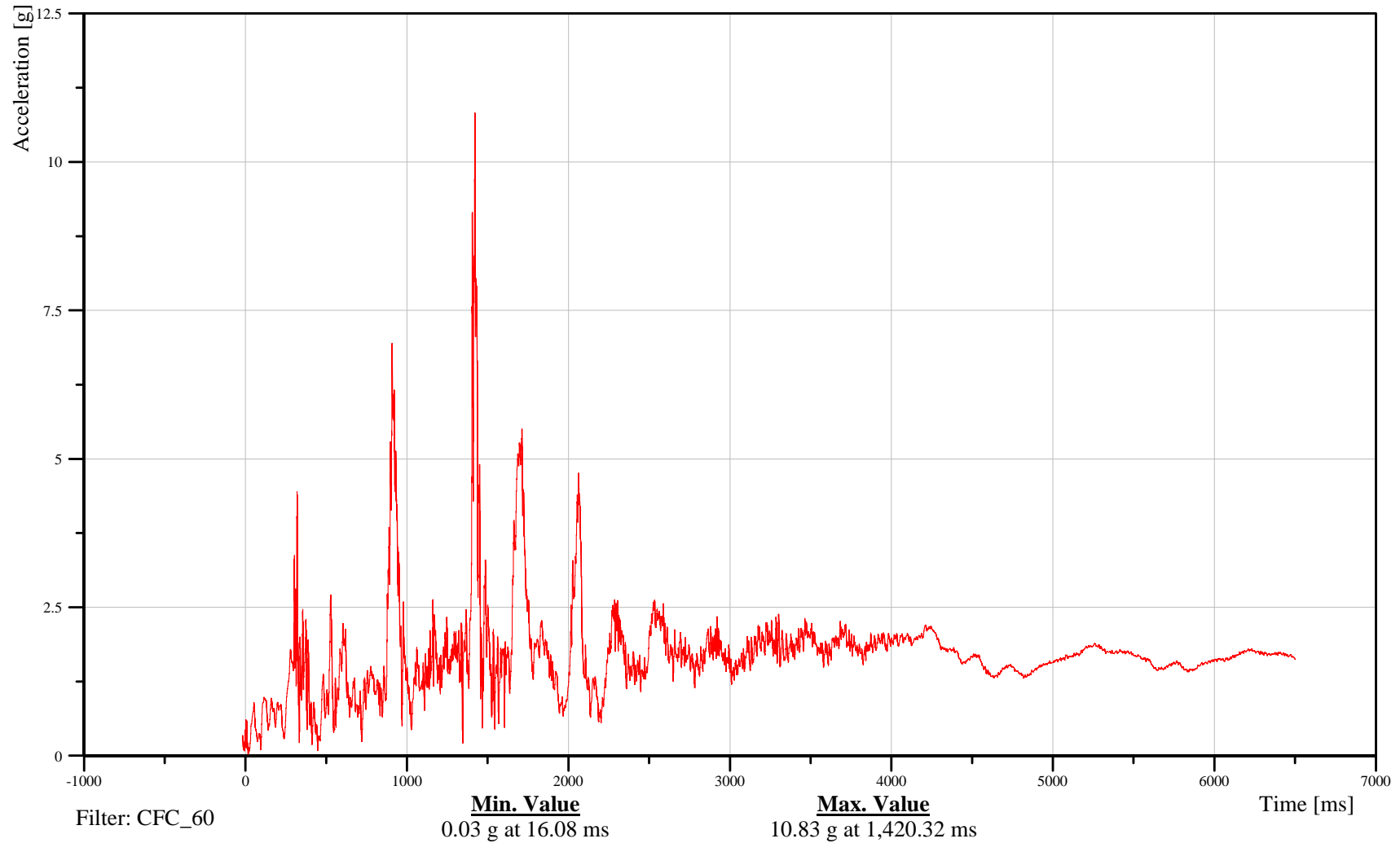
Time: 14:32

Customer: VRTC

10DPILLORI00ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-170

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Vehicle Rear Deck X-Axis Acceleration

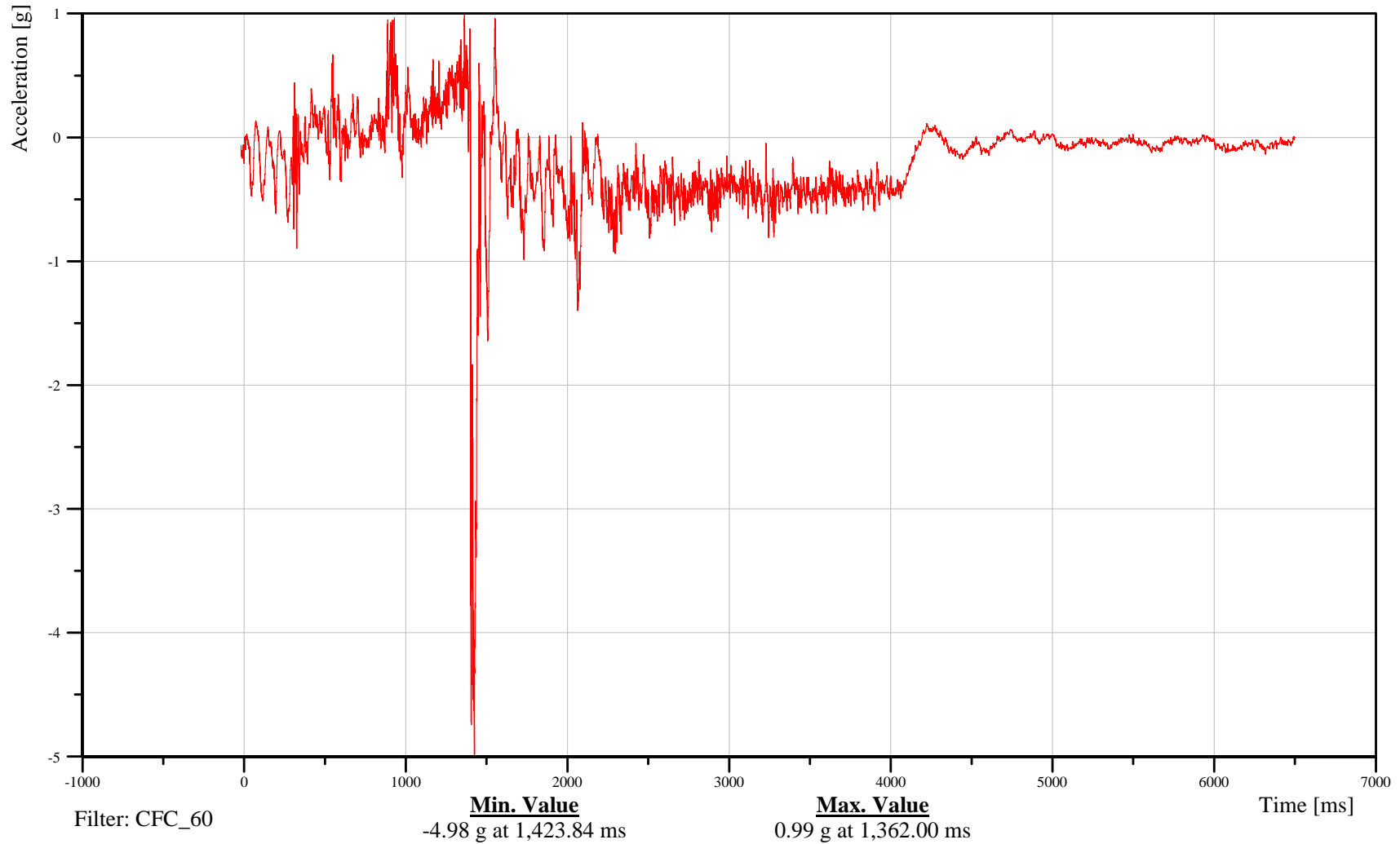
Time: 14:32

Customer: VRTC

102RDK000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-171

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

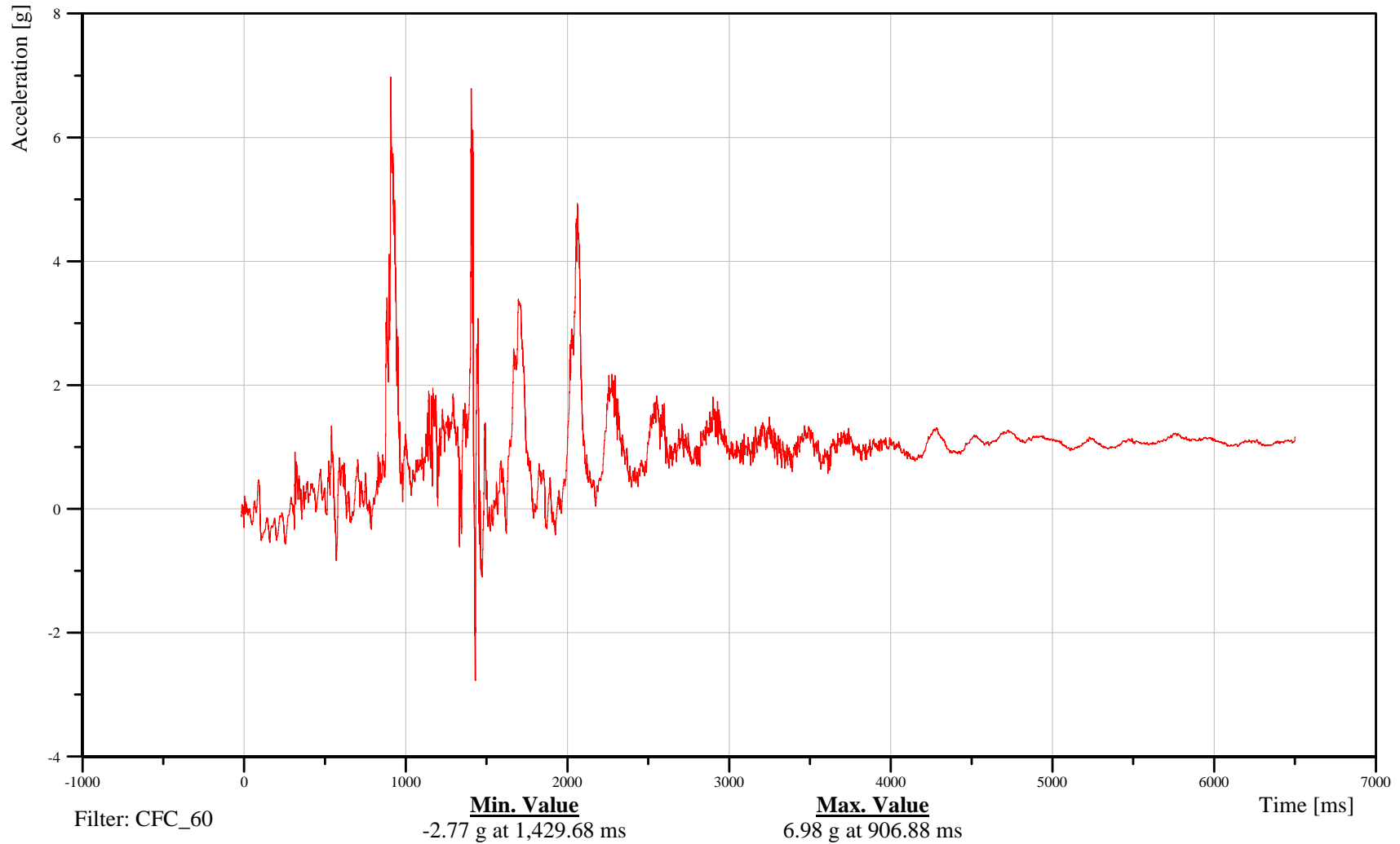
Vehicle Rear Deck Y-Axis Acceleration

Customer: VRTC

102RDK000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-172

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

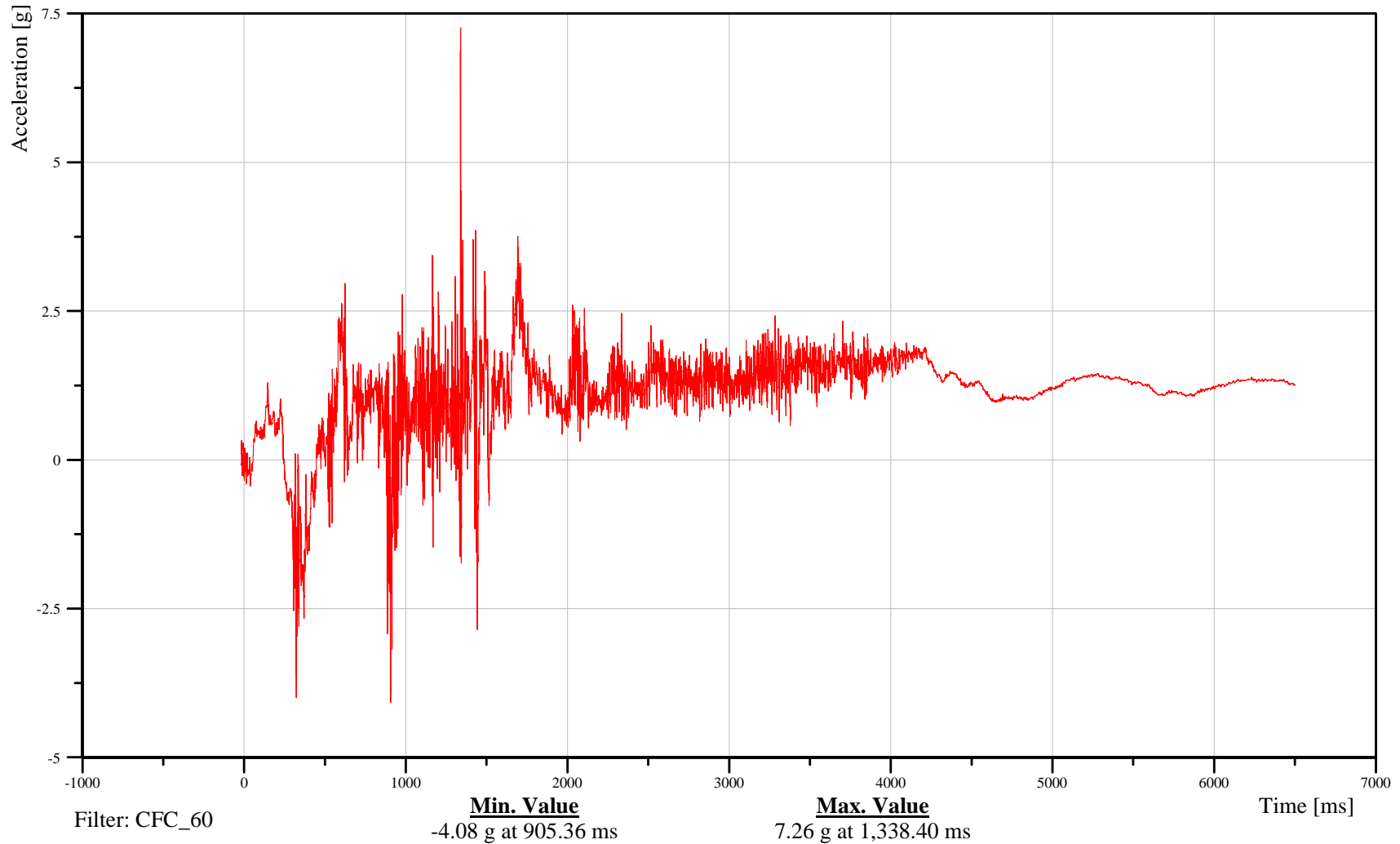
Vehicle Rear Deck Z-Axis Acceleration

Customer: VRTC

102RDK000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-173

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Vehicle Rear Deck Resultant Acceleration

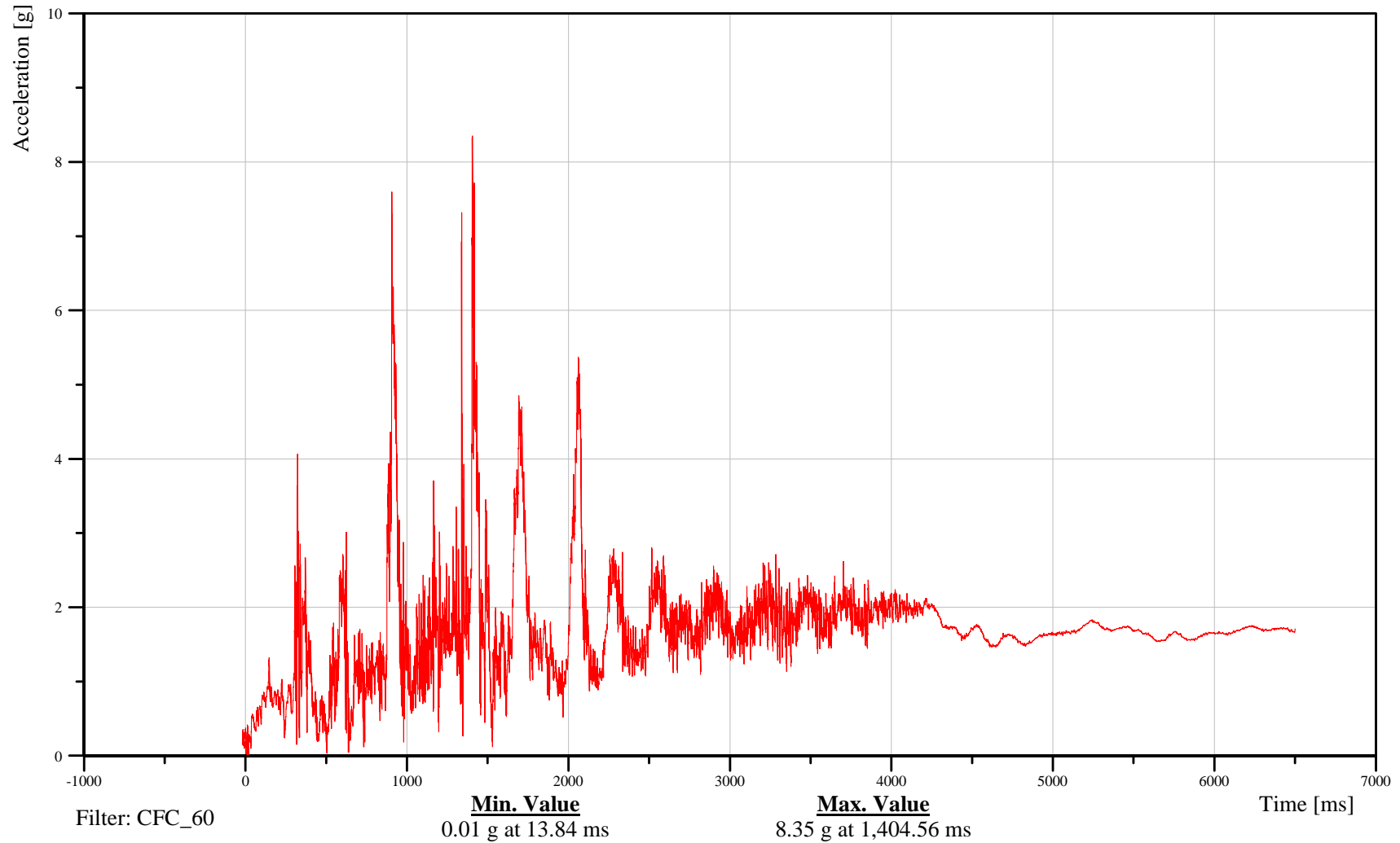
Time: 14:32

Customer: VRTC

102RDK000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-174

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

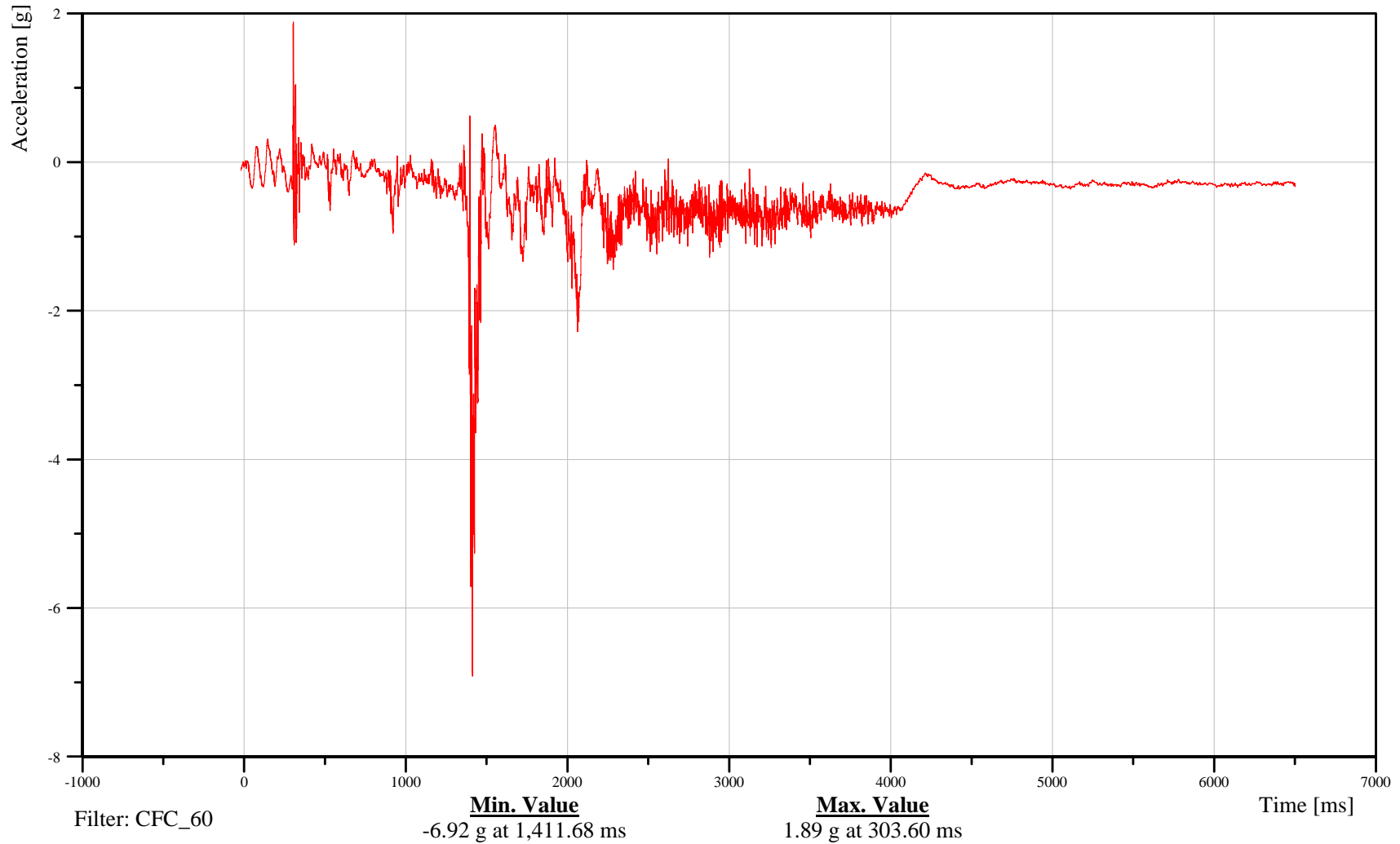
LF Seat Position (on floor) X-Axis Acceleration

Customer: VRTC

11SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-175

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

LF Seat Position (on floor) Y-Axis Acceleration

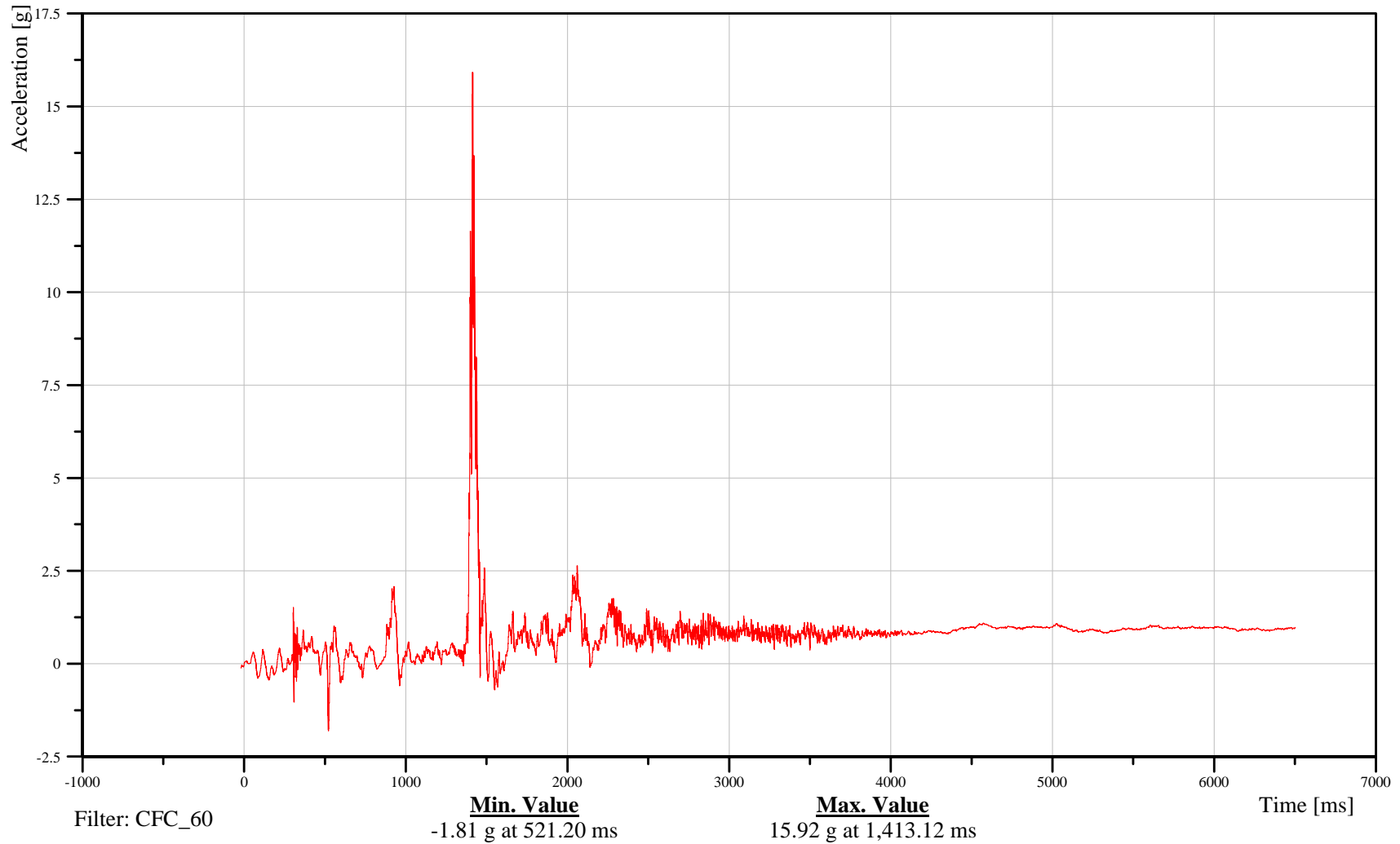
Time: 14:32

Customer: VRTC

11SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-176

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

LF Seat Position (on floor) Z-Axis Acceleration

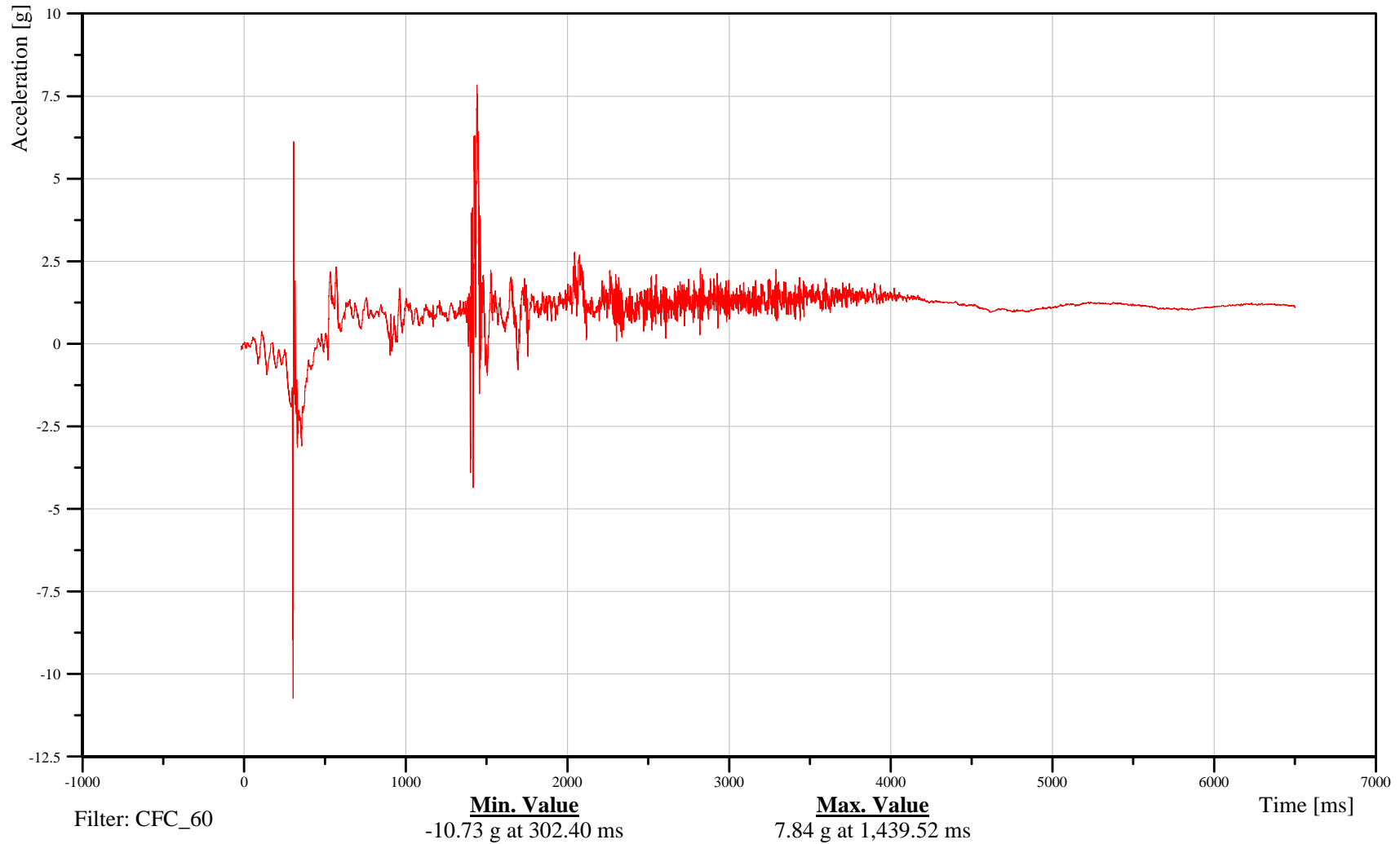
Time: 14:32

Customer: VRTC

11SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-177

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

LF Seat Position (on floor) Resultant Acceleration

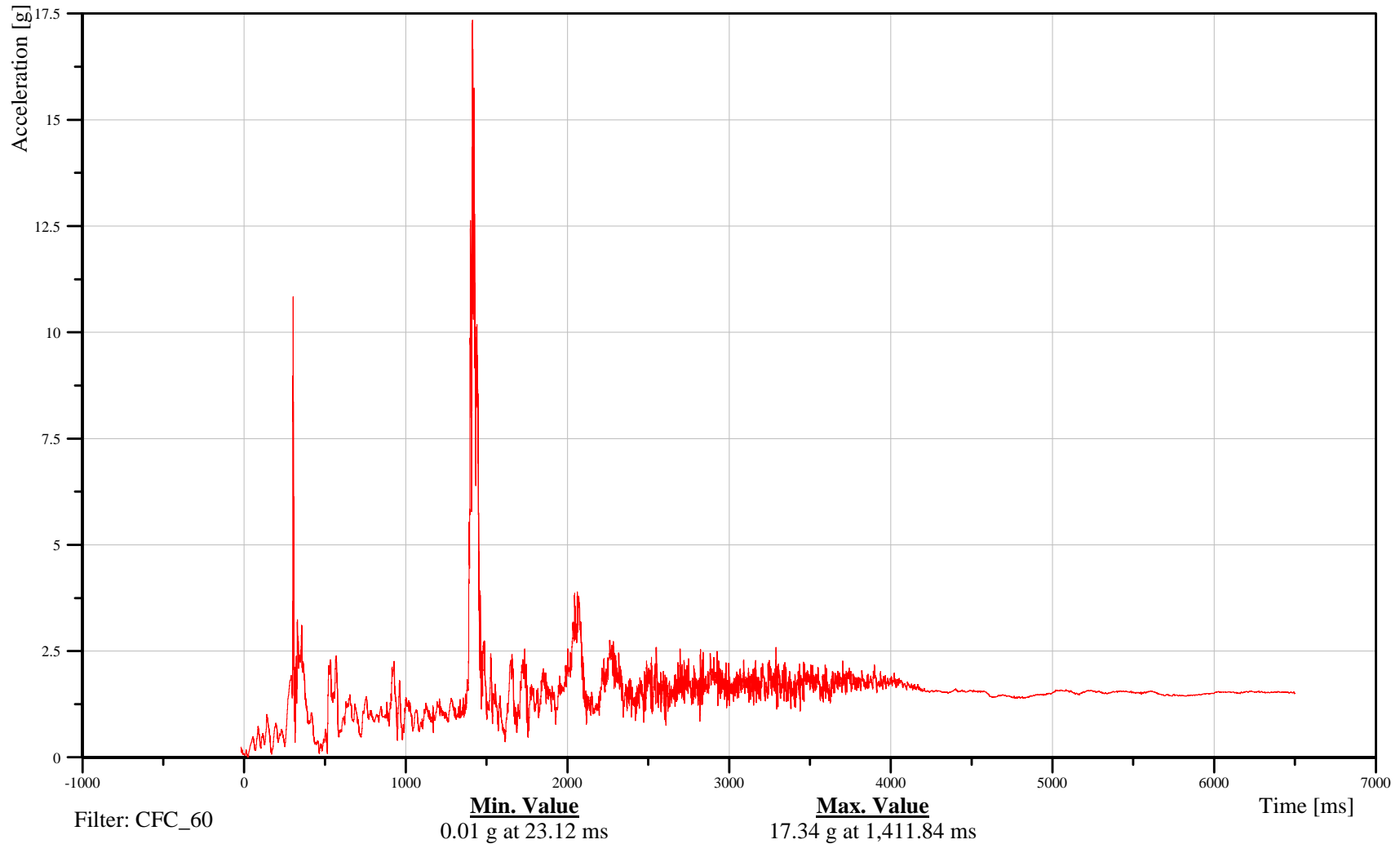
Time: 14:32

Customer: VRTC

11SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-178

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RF Seat Position (on floor) X-Axis Acceleration

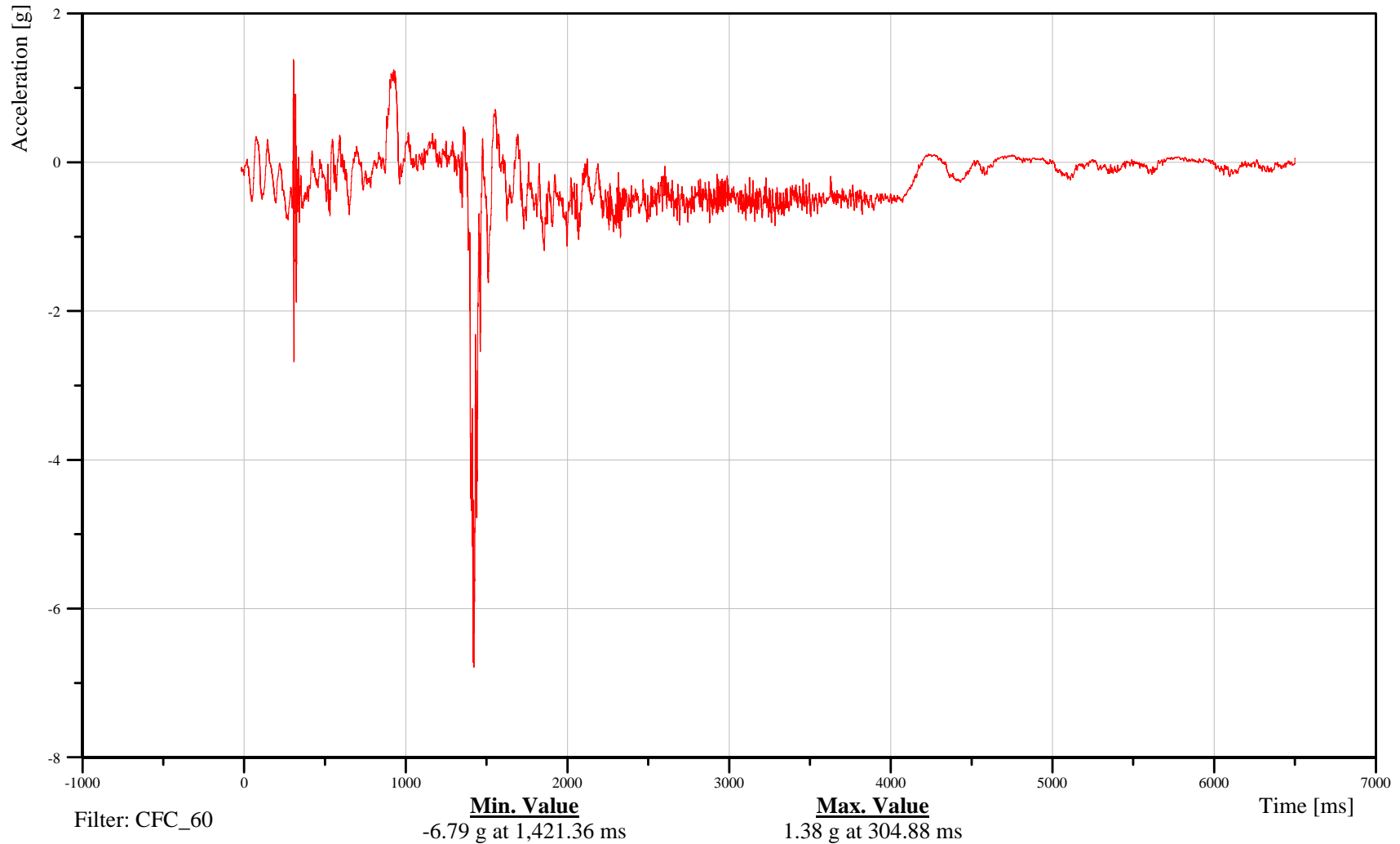
Time: 14:32

Customer: VRTC

13SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-179

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RF Seat Position (on floor) Y-Axis Acceleration

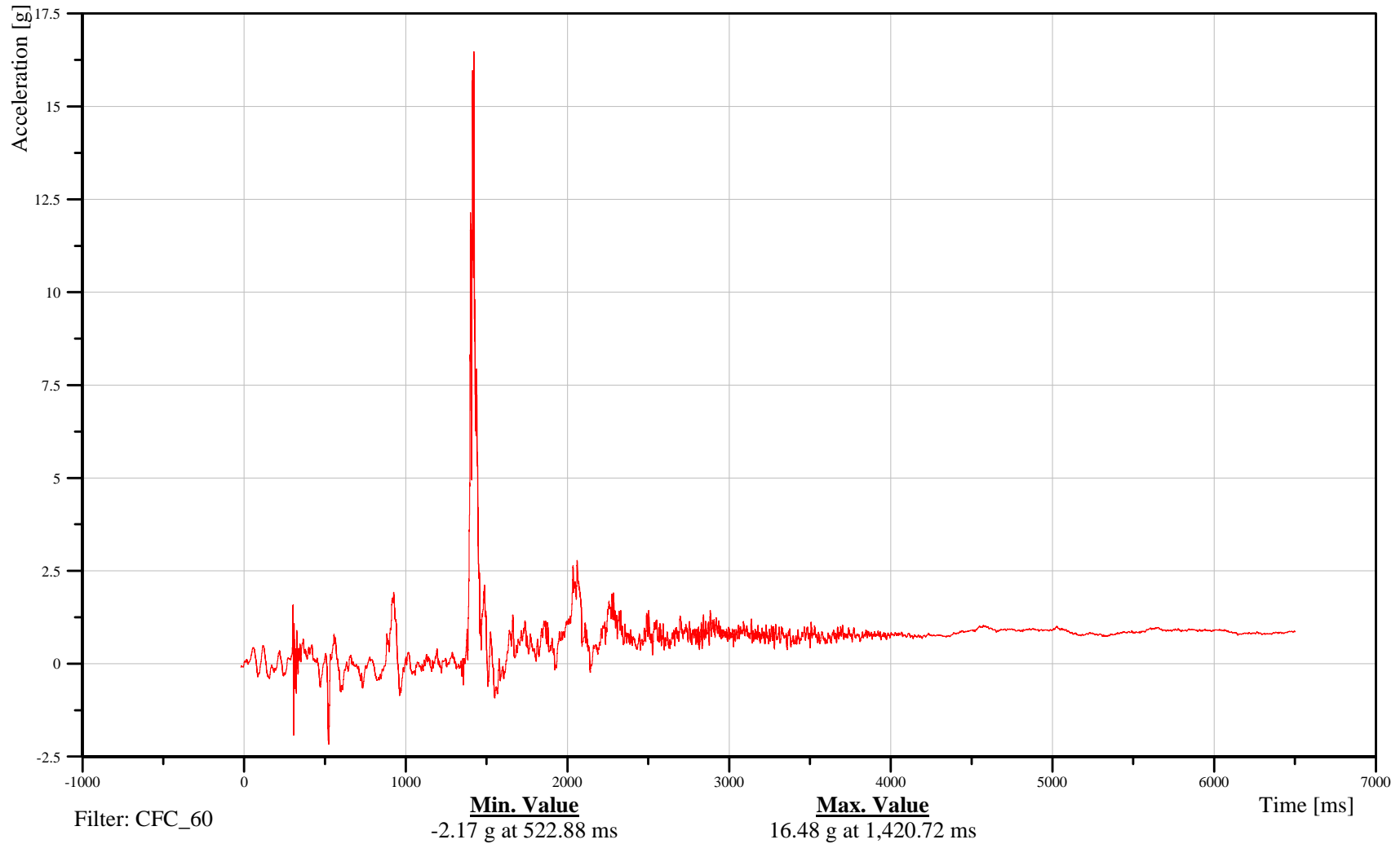
Time: 14:32

Customer: VRTC

13SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-180

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RF Seat Position (on floor) Z-Axis Acceleration

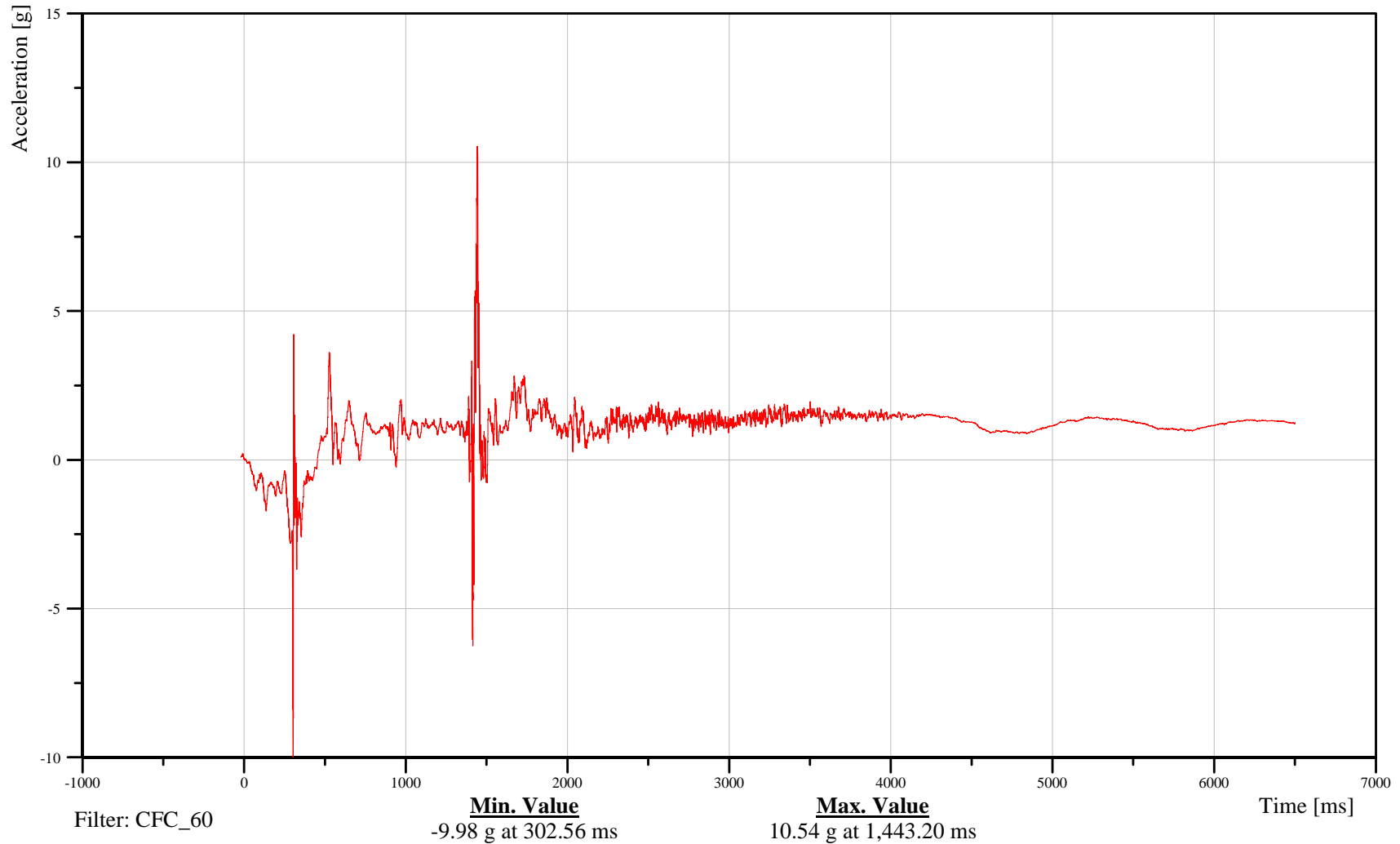
Time: 14:32

Customer: VRTC

13SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-181

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RF Seat Position (on floor) Resultant Acceleration

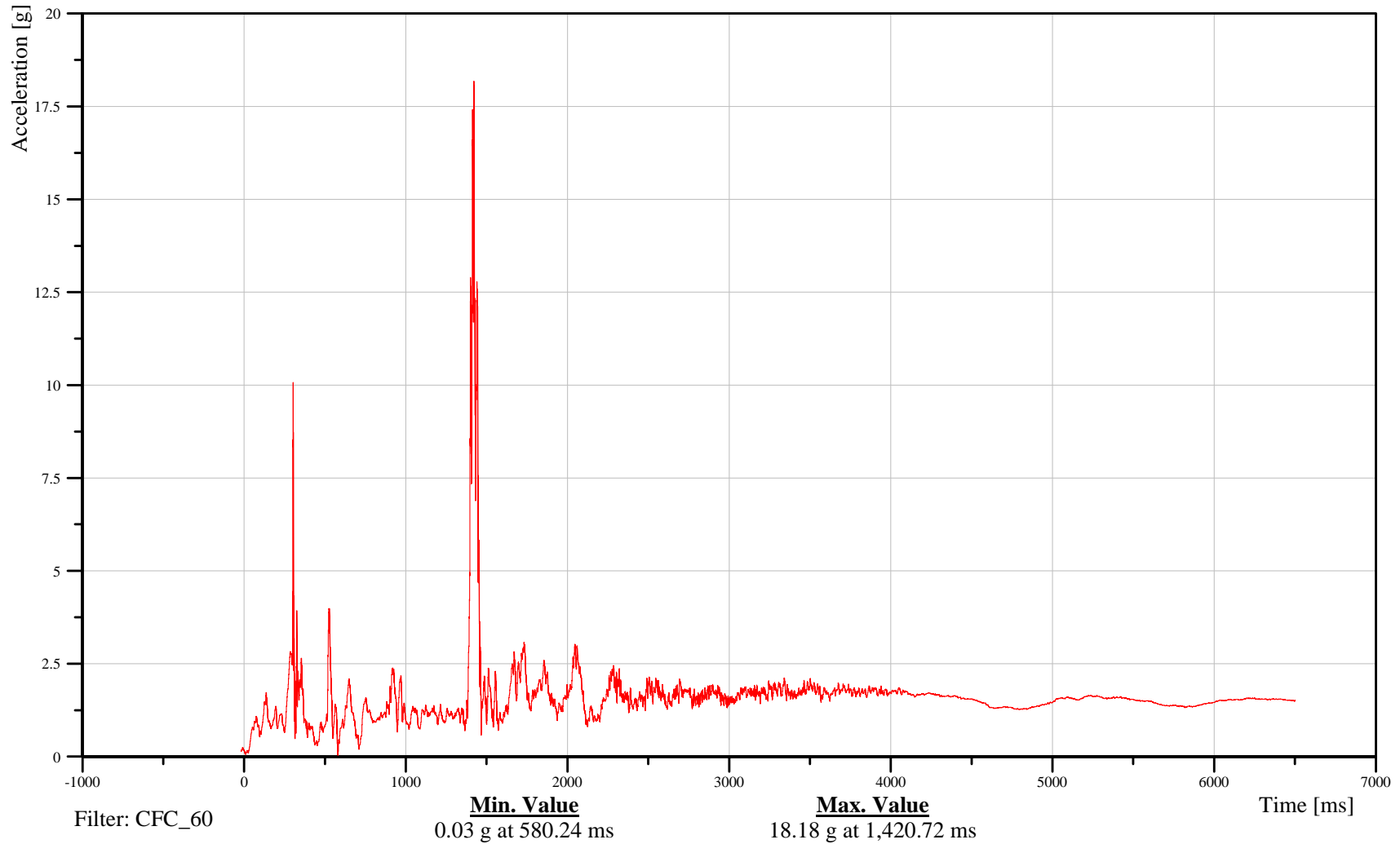
Time: 14:32

Customer: VRTC

13SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-182

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

LR Seat Position (on floor) X-Axis Acceleration

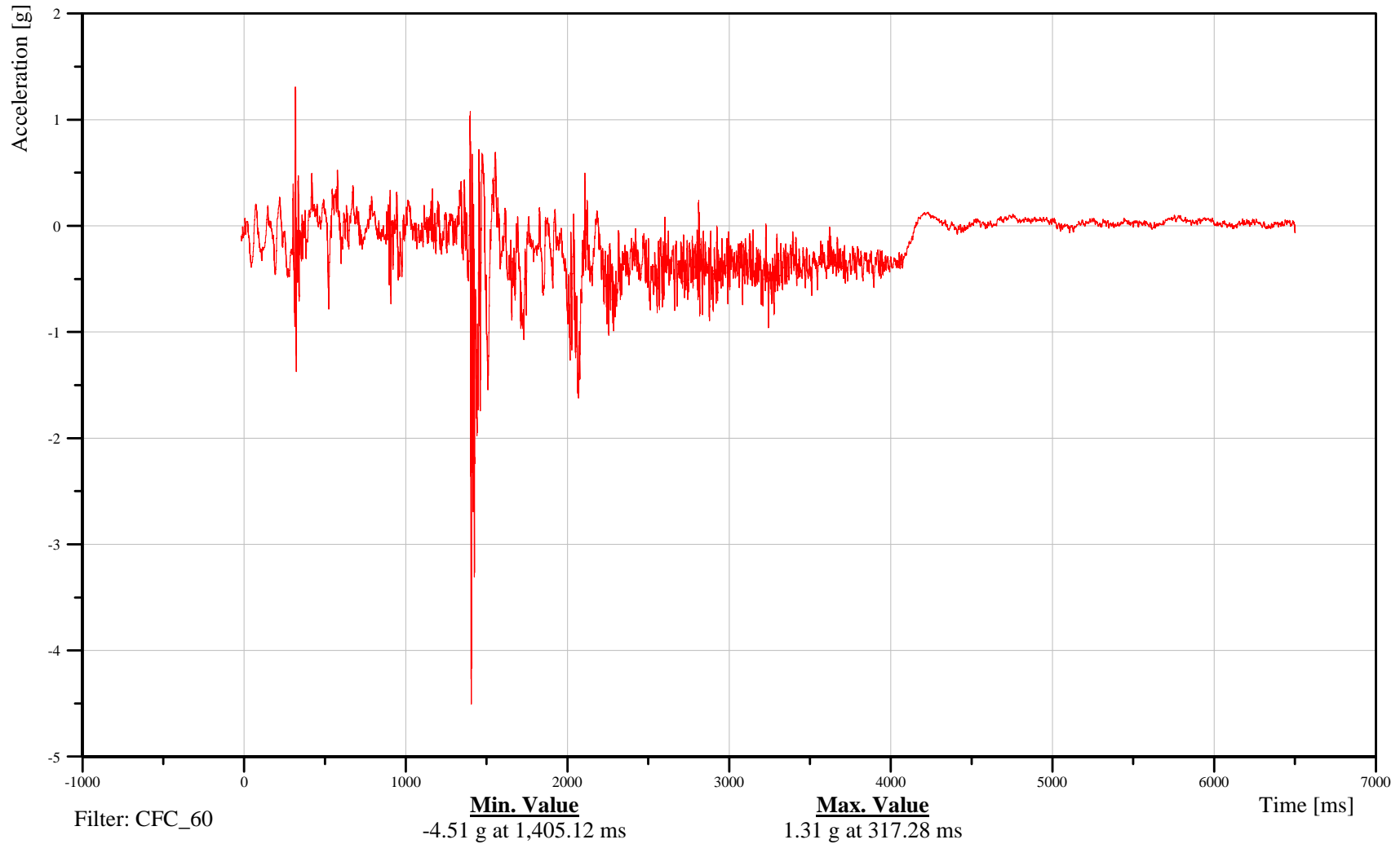
Time: 14:32

Customer: VRTC

14SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-183

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

LR Seat Position (on floor) Y-Axis Acceleration

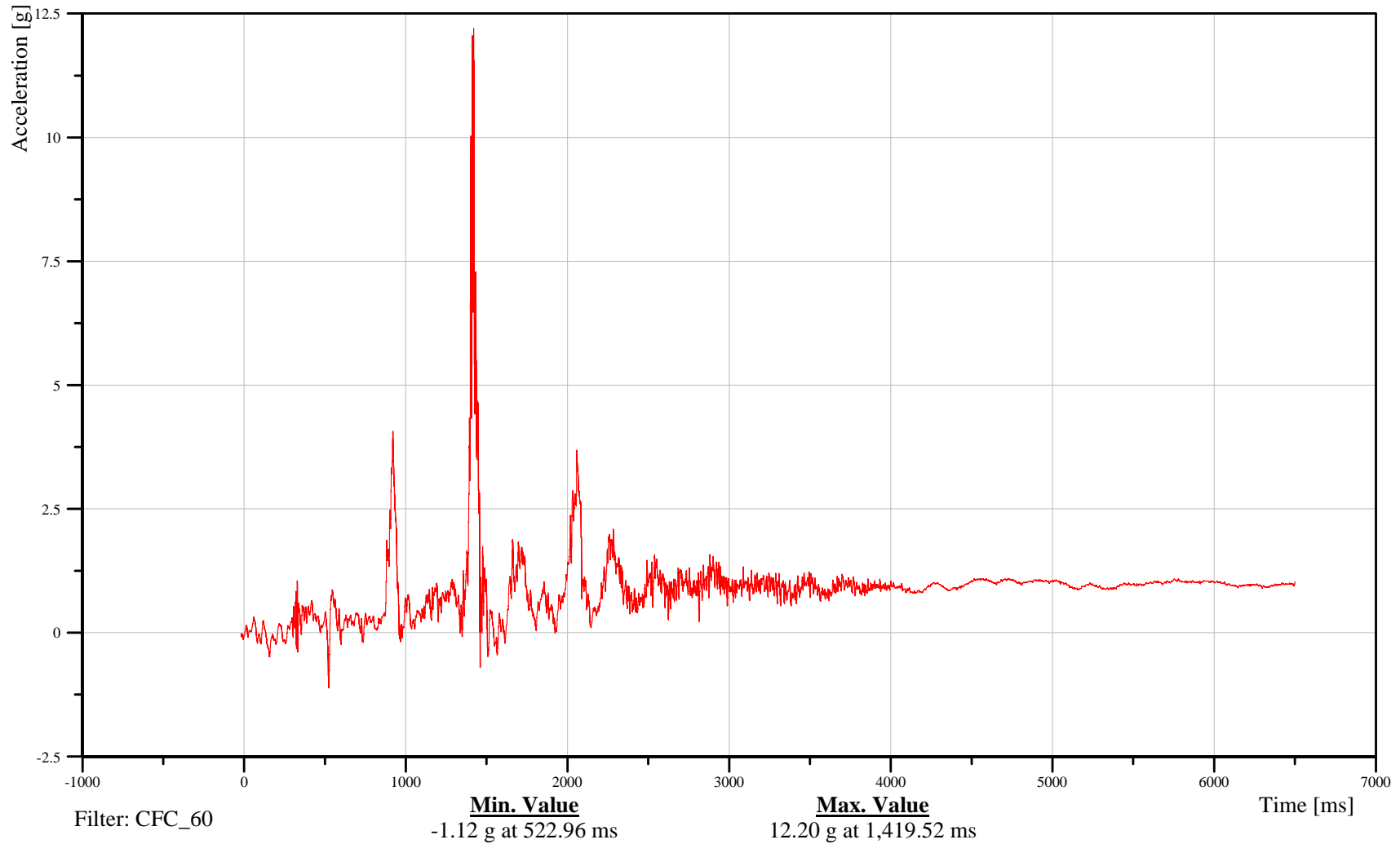
Time: 14:32

Customer: VRTC

14SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-184

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

LR Seat Position (on floor) Z-Axis Acceleration

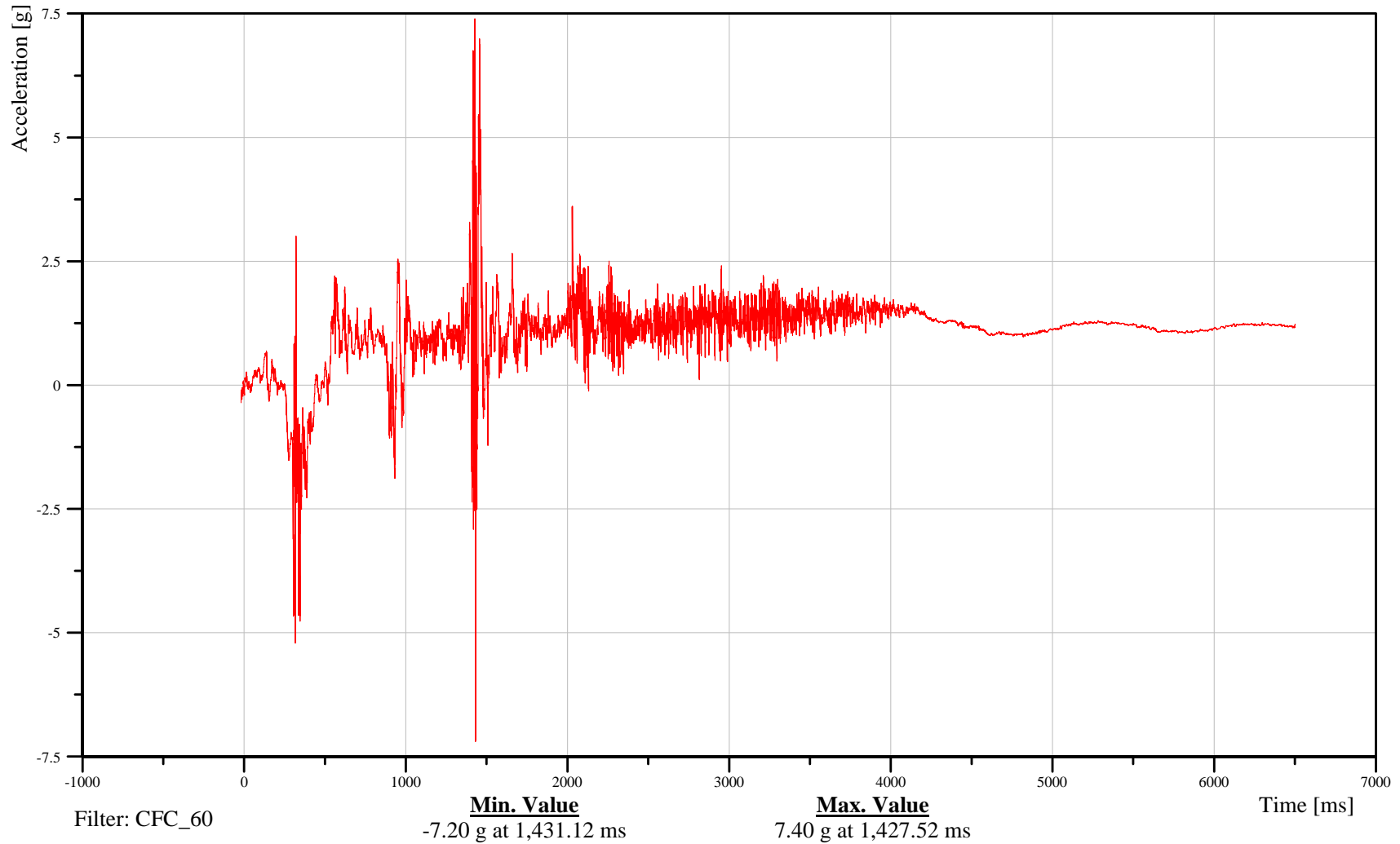
Time: 14:32

Customer: VRTC

14SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-185

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

LR Seat Position (on floor) Resultant Acceleration

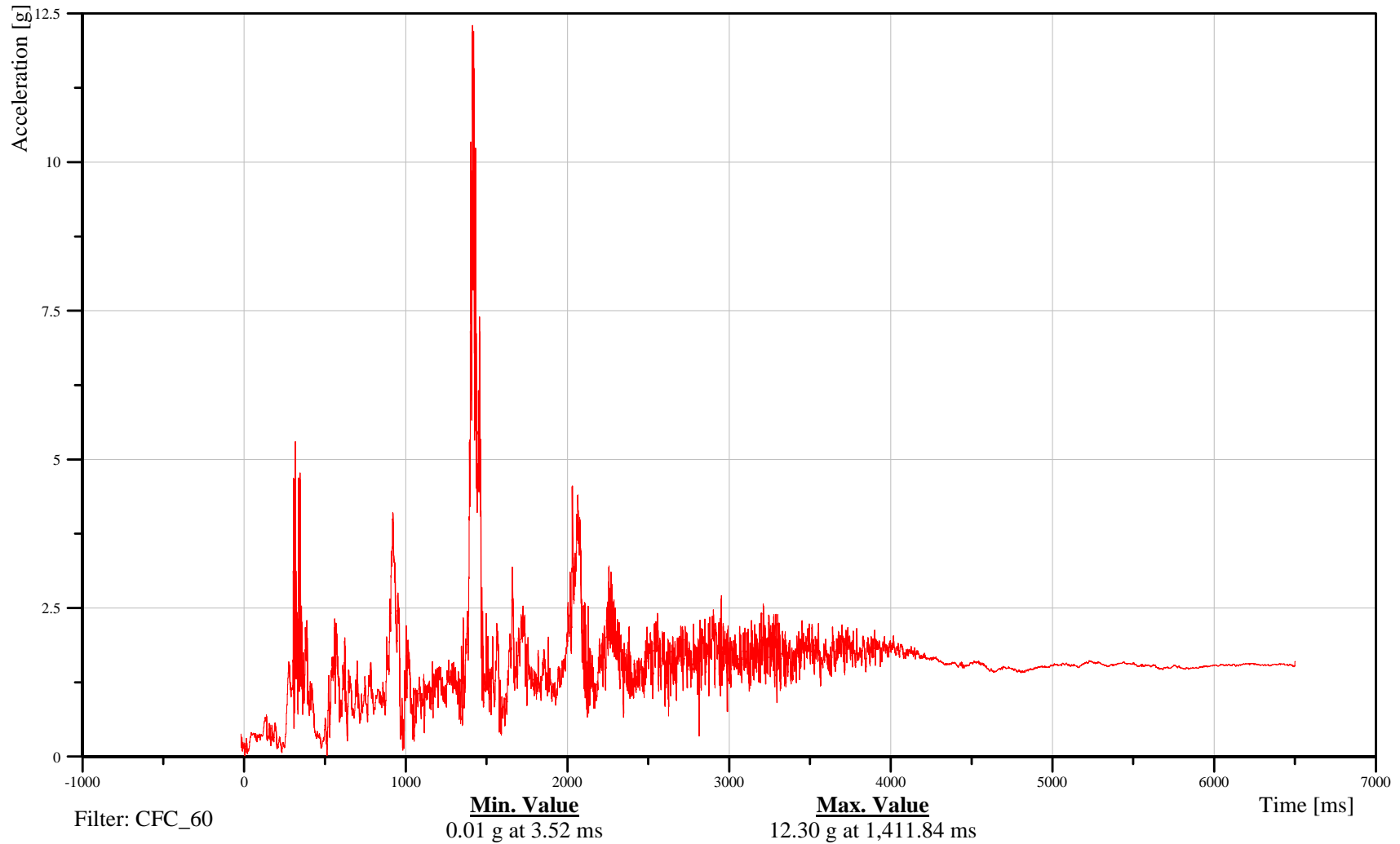
Time: 14:32

Customer: VRTC

14SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-186

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RR Seat Position (on floor) X-Axis Acceleration

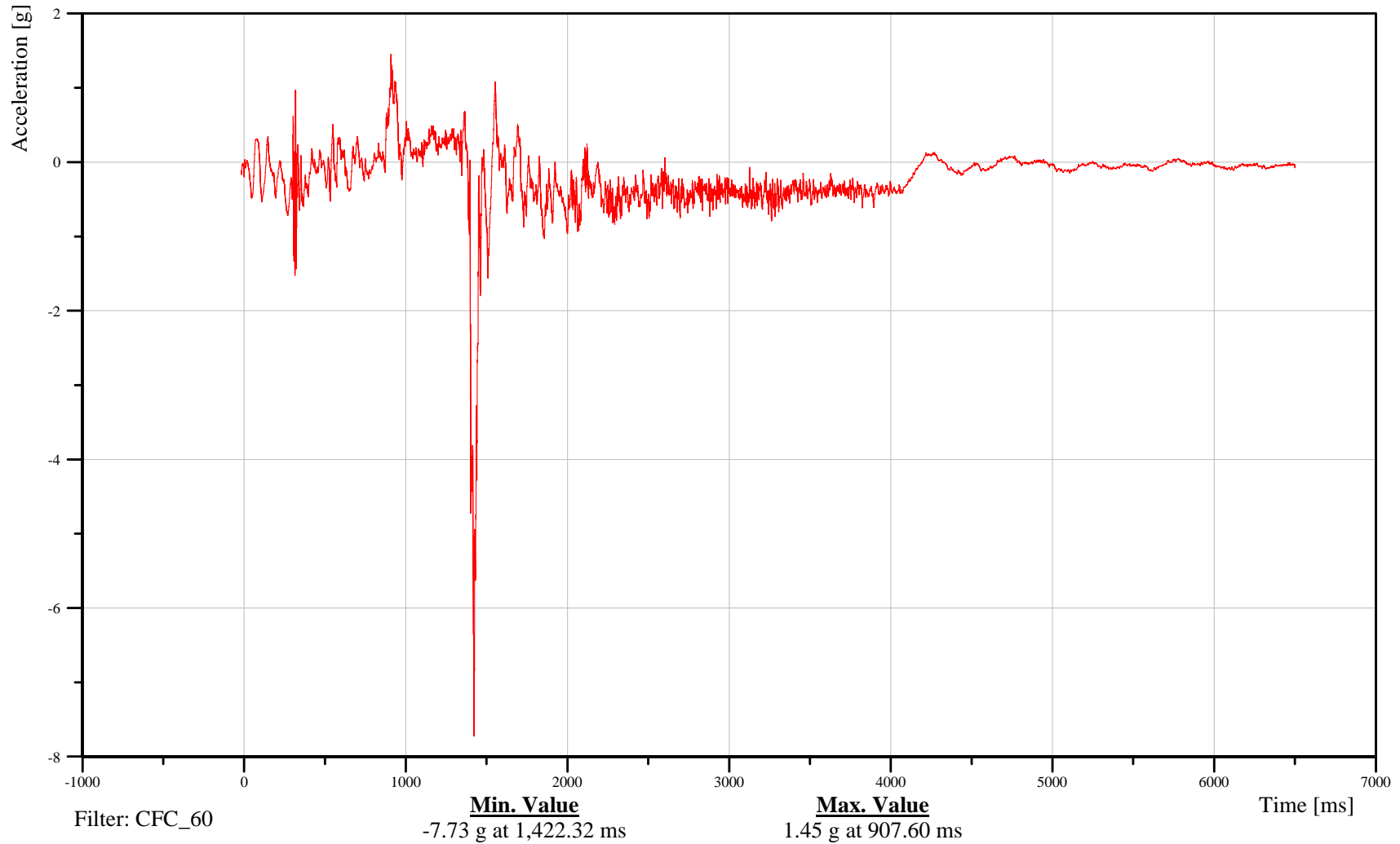
Time: 14:32

Customer: VRTC

16SEAT000000ACXD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-187

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RR Seat Position (on floor) Y-Axis Acceleration

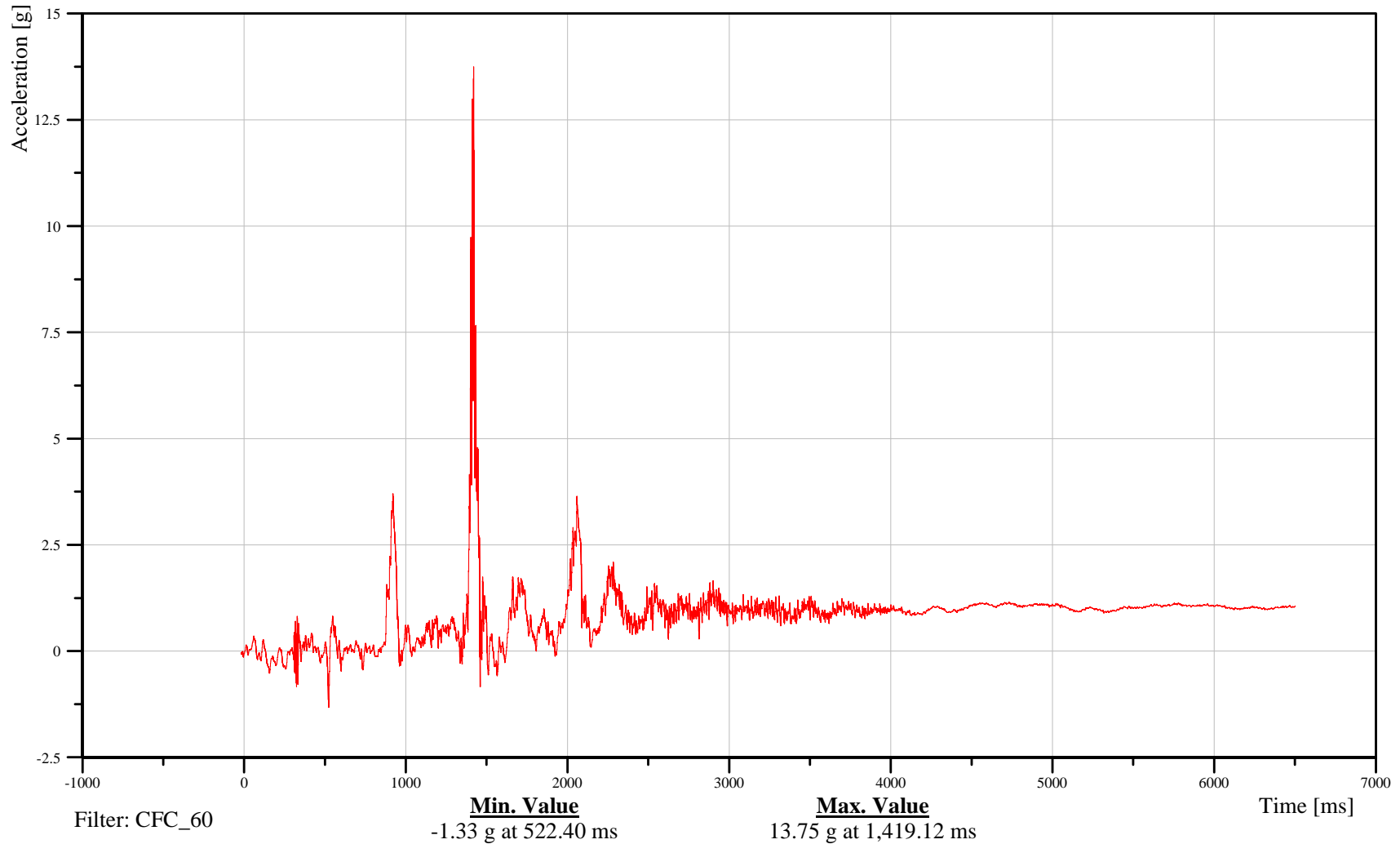
Time: 14:32

Customer: VRTC

16SEAT000000ACYD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-188

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RR Seat Position (on floor) Z-Axis Acceleration

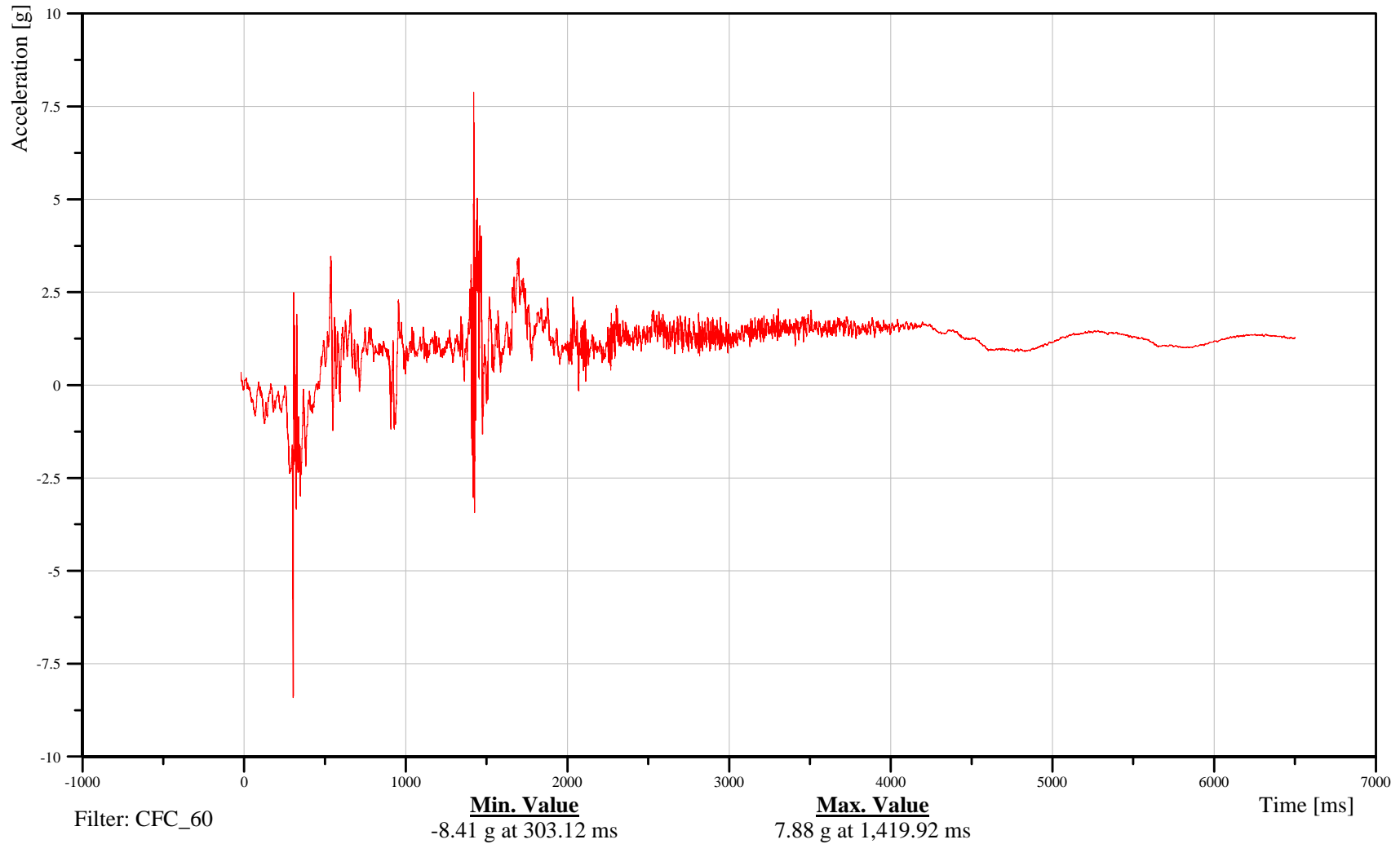
Time: 14:32

Customer: VRTC

16SEAT000000ACZD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-189

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

RR Seat Position (on floor) Resultant Acceleration

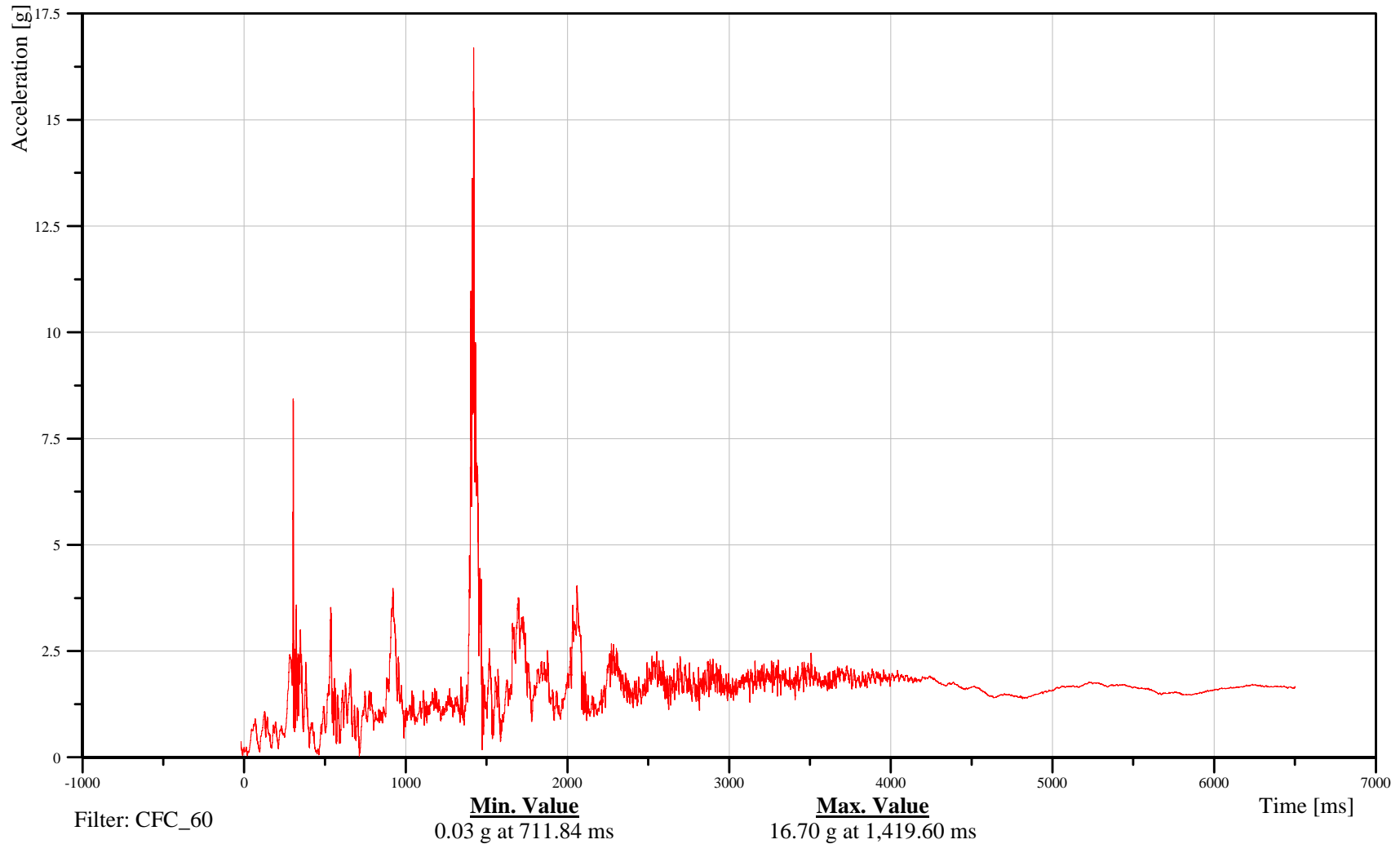
Time: 14:32

Customer: VRTC

16SEAT000000ACRD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-190

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

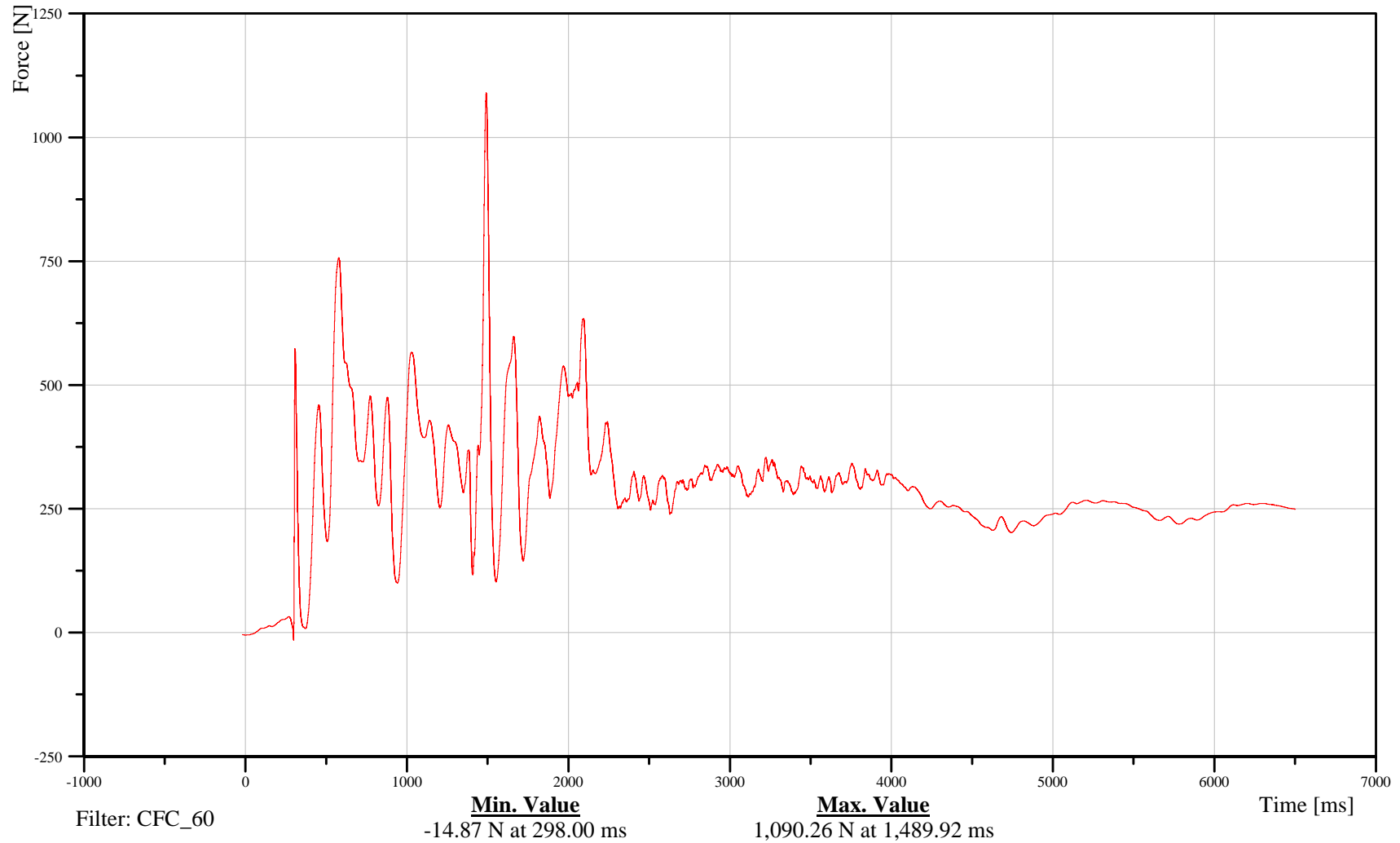
Driver Lap Belt Force

Customer: VRTC

11SEBE0000B5FOOD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-191

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

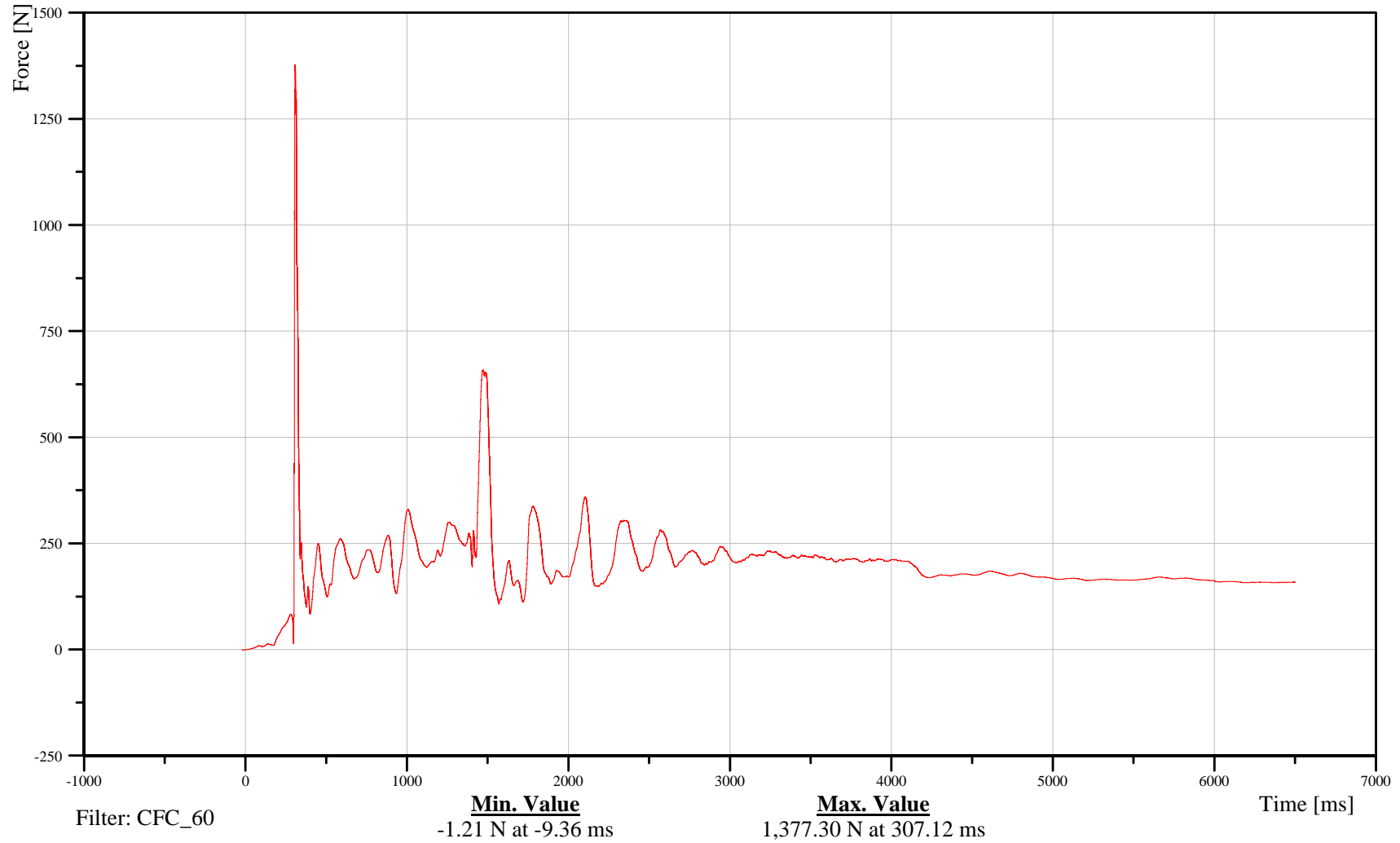
Driver Shoulder Belt Force

Customer: VRTC

11SEBE0000B3FOOD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-192

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

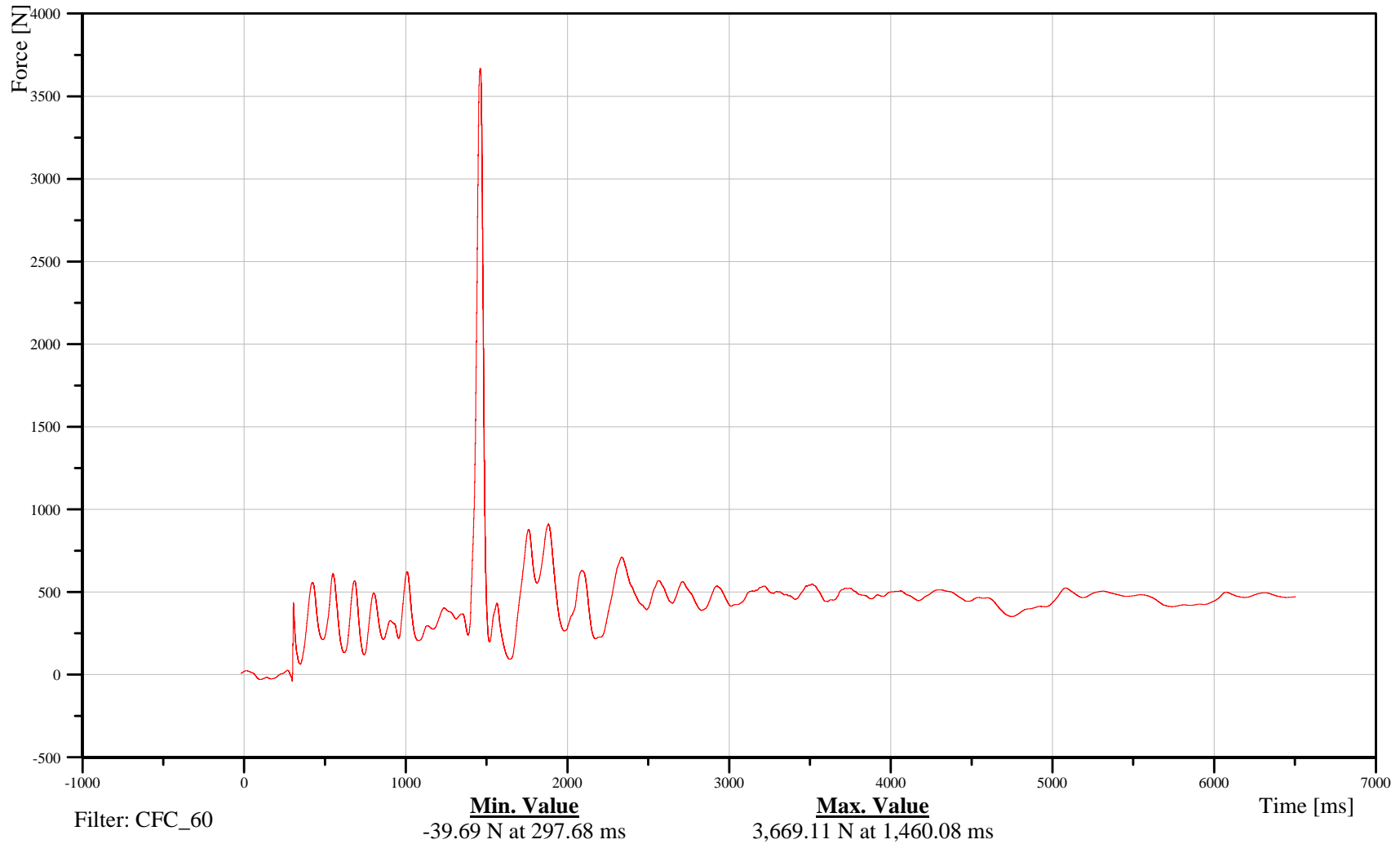
Right Front Passenger Lap Belt Force

Customer: VRTC

13SEBE0000B5FO0D

TRC Inc. Test Lab: CTF

Test Number: 100420



B-193

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

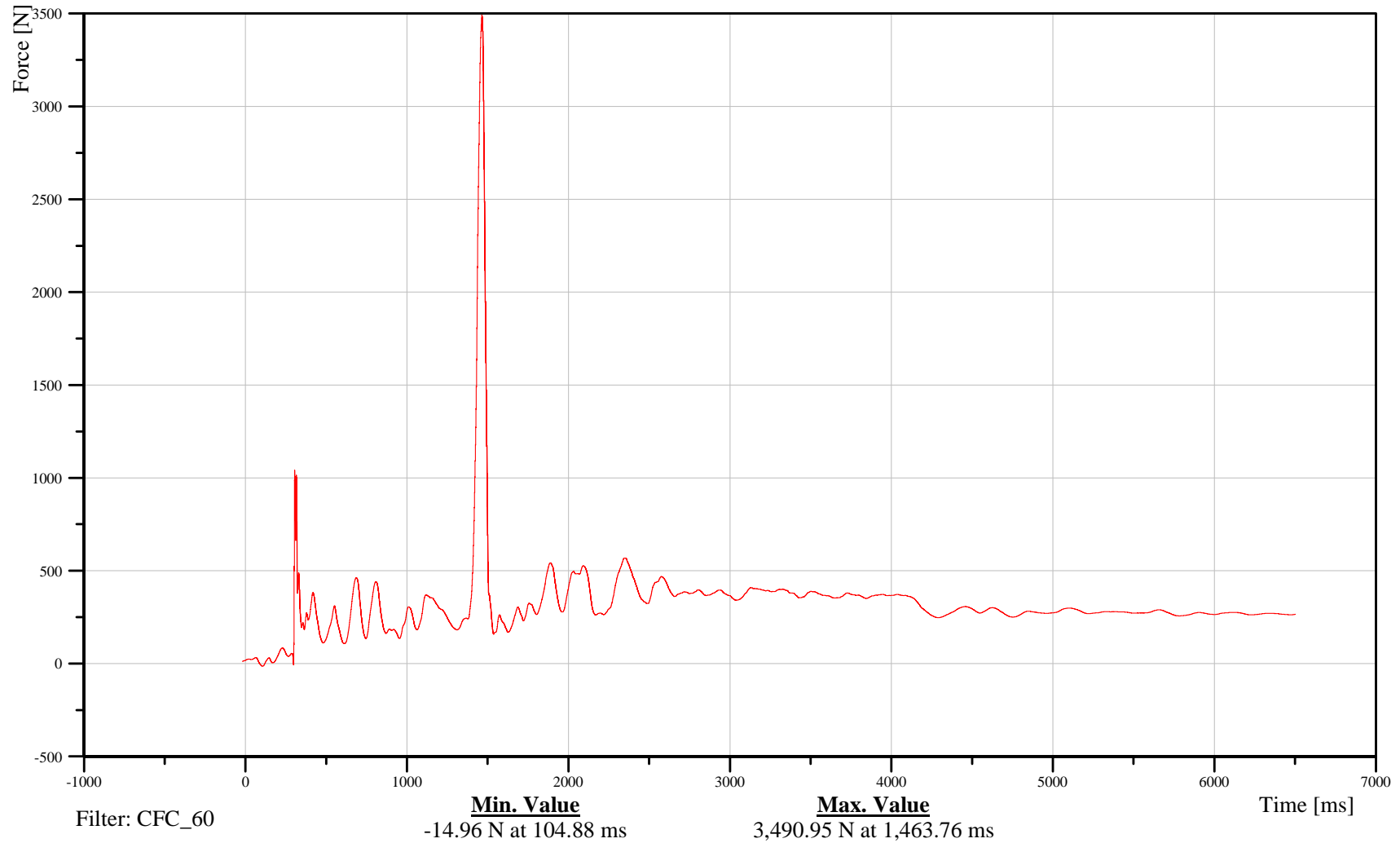
Right Front Passenger Shoulder Belt Force

Customer: VRTC

13SEBE0000B3FOOD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-194

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

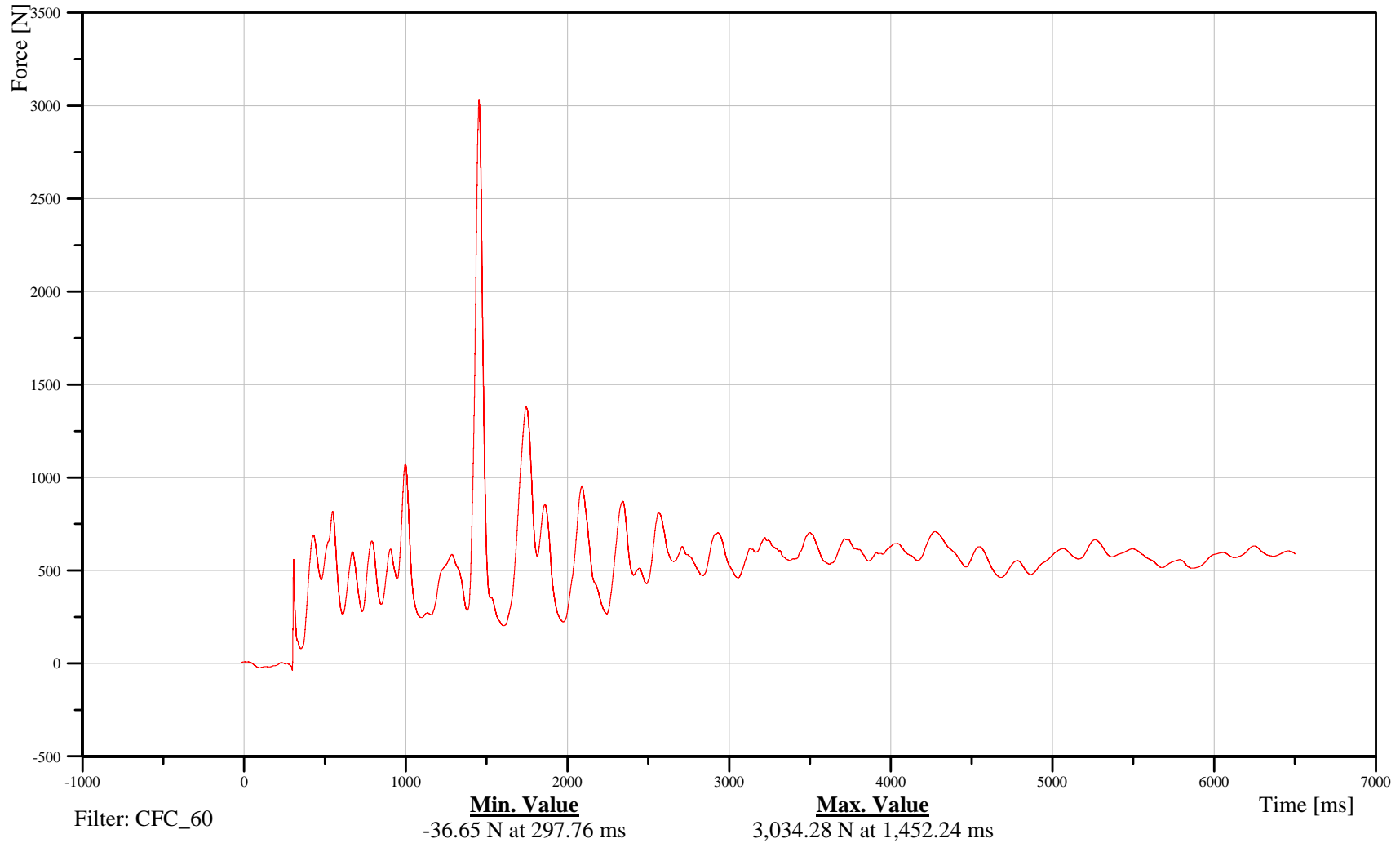
Right Rear Passenger Lap Belt Force

Customer: VRTC

14SEBE0000B5FOOD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-195

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

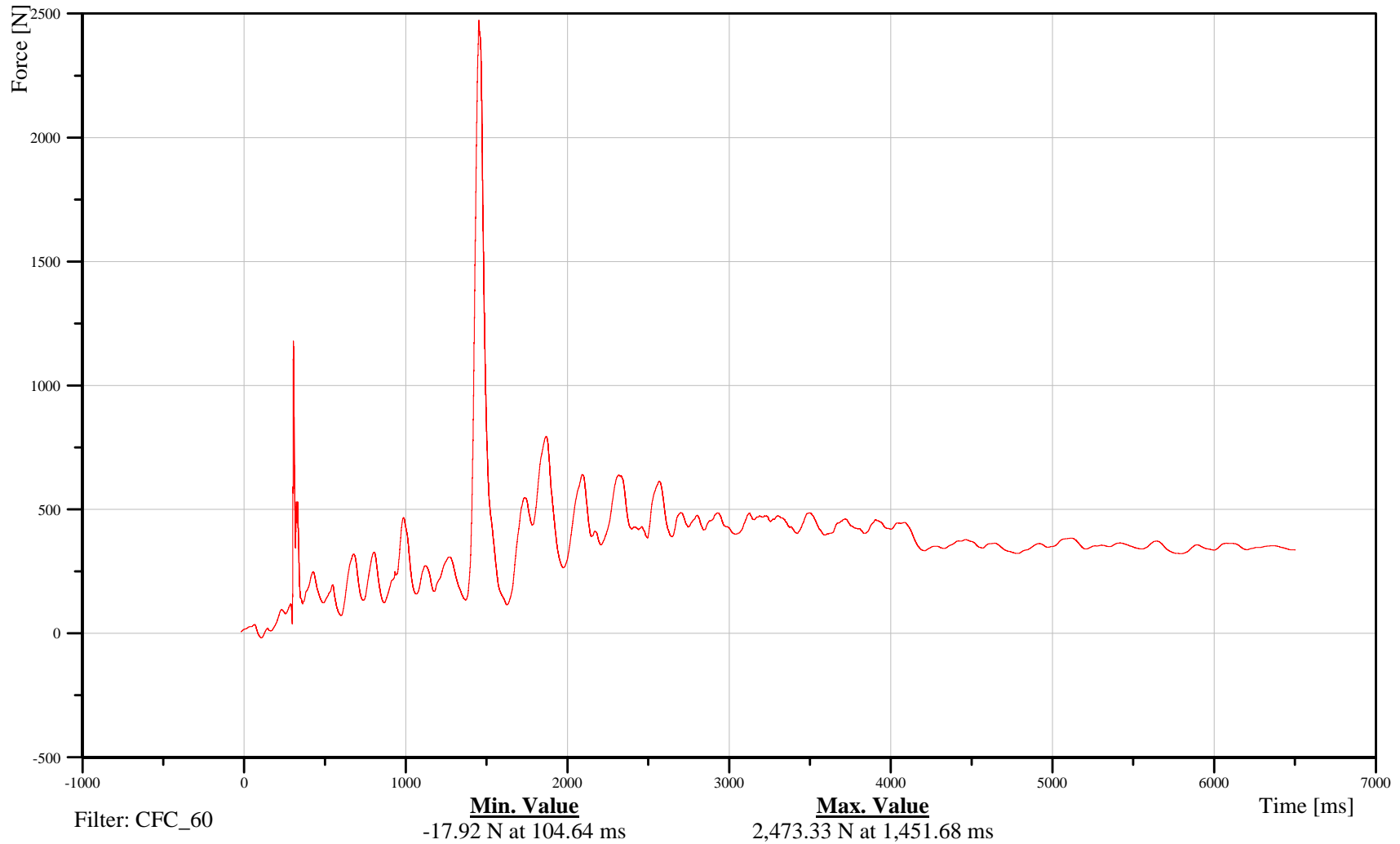
Right Rear Passenger Shoulder Belt Force

Customer: VRTC

14SEBE0000B3FOOD

TRC Inc. Test Lab: CTF

Test Number: 100420



B-196

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

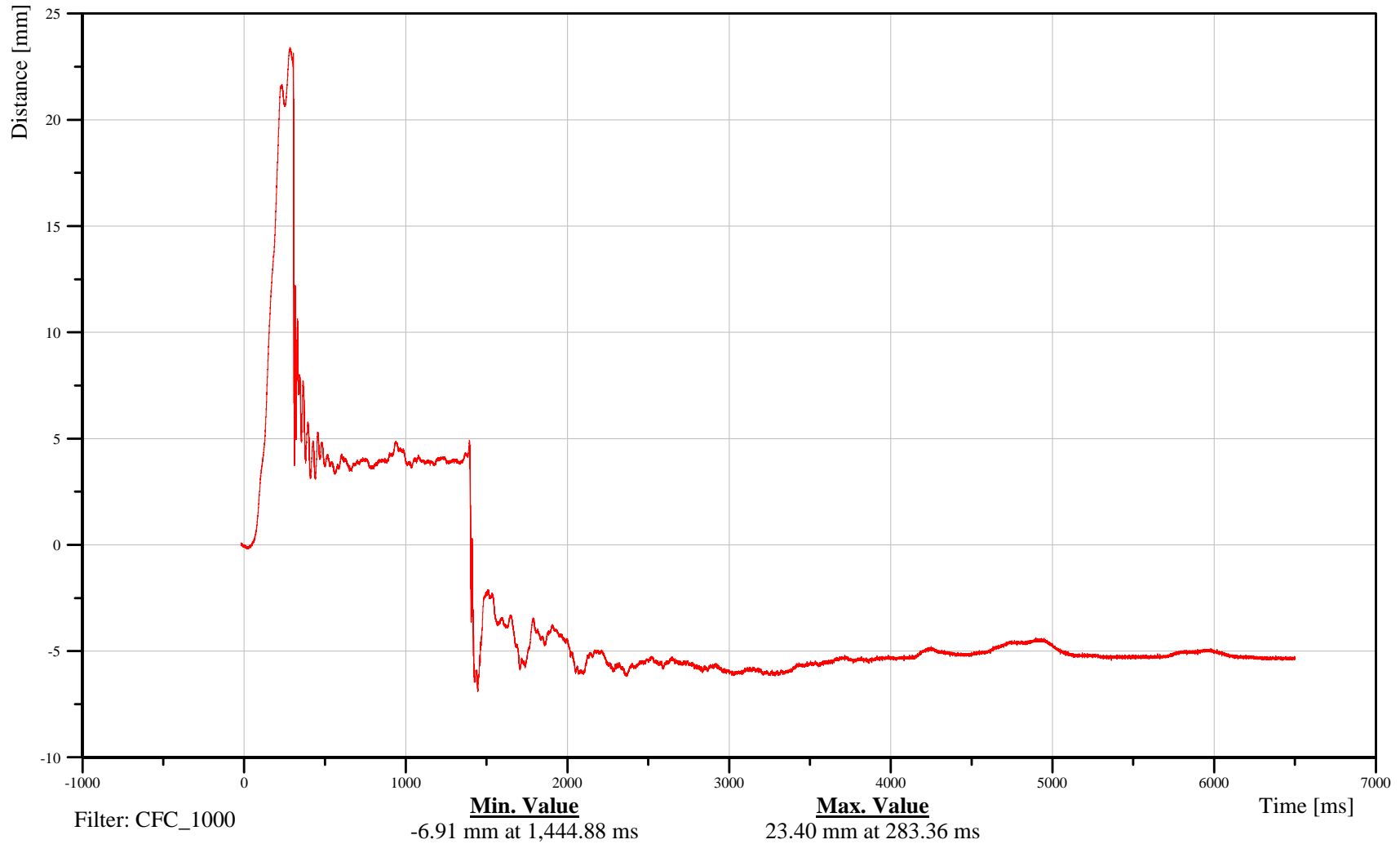
Driver Seat Belt Spool Potentiometer

Customer: VRTC

11SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-197

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Right Front Passenger Belt Spool Potentiometer

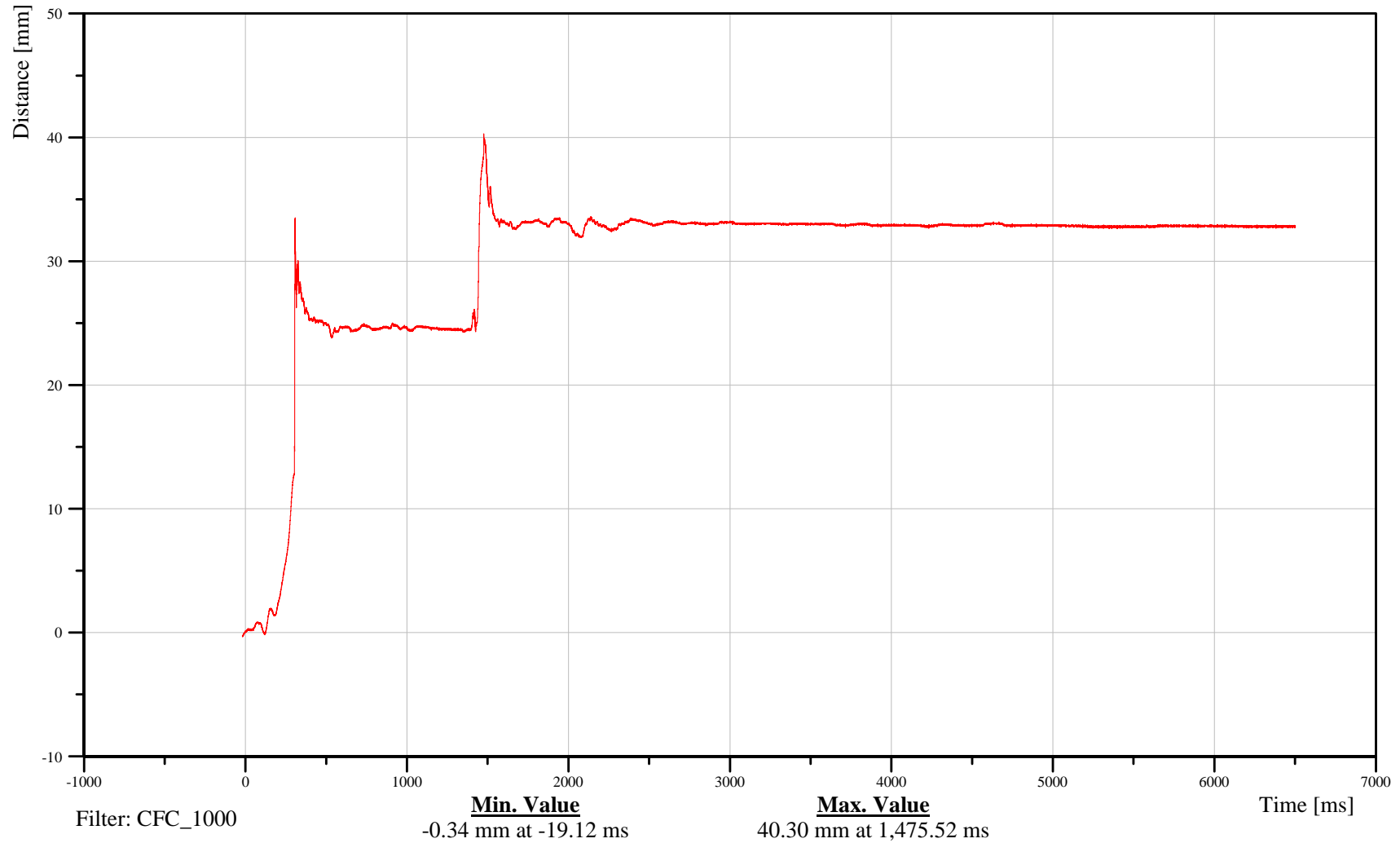
Time: 14:32

Customer: VRTC

13SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-198

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

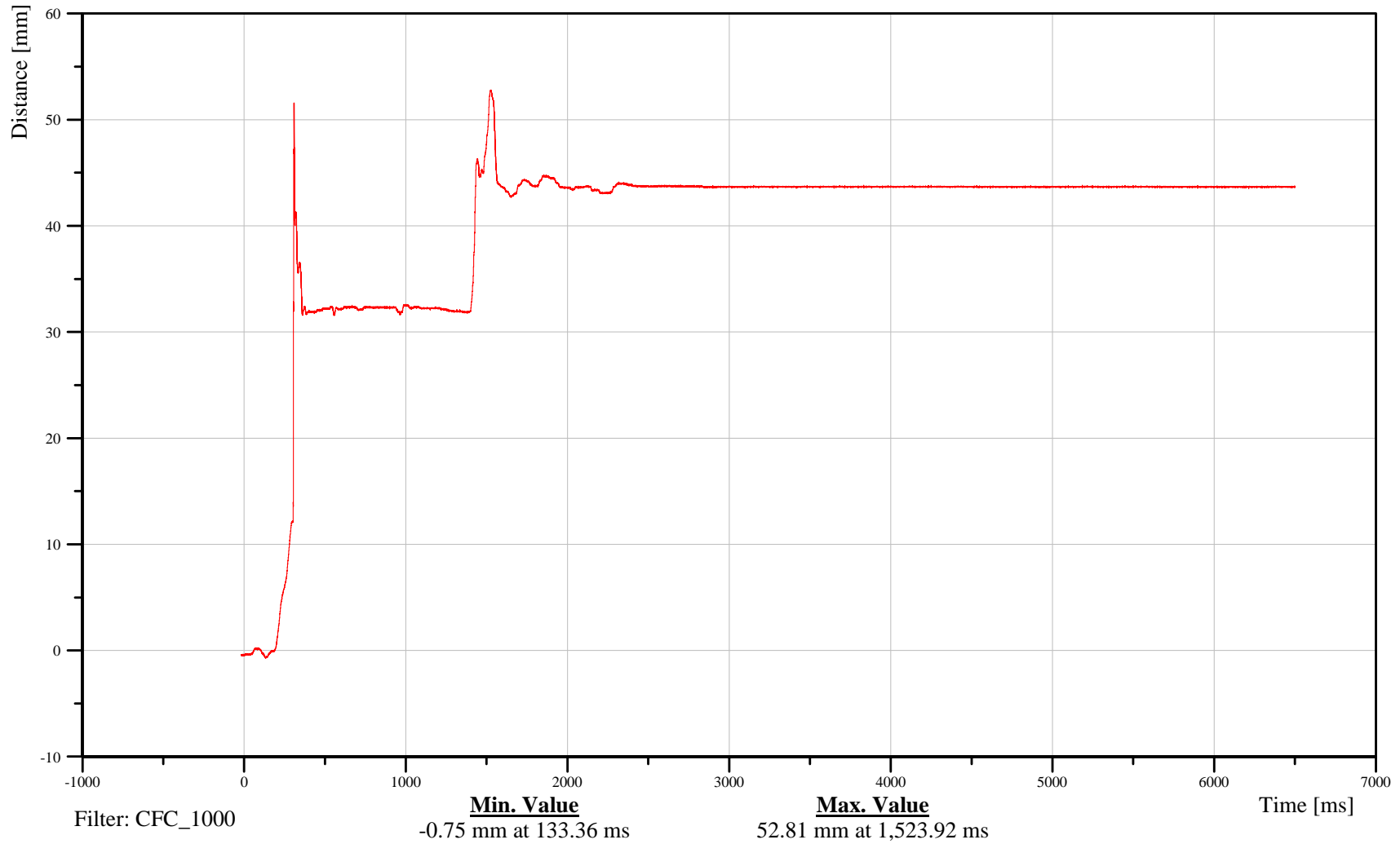
Right Rear Passenger Belt Spool Potentiometer

Customer: VRTC

16SEBE0000B5DS0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-199

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

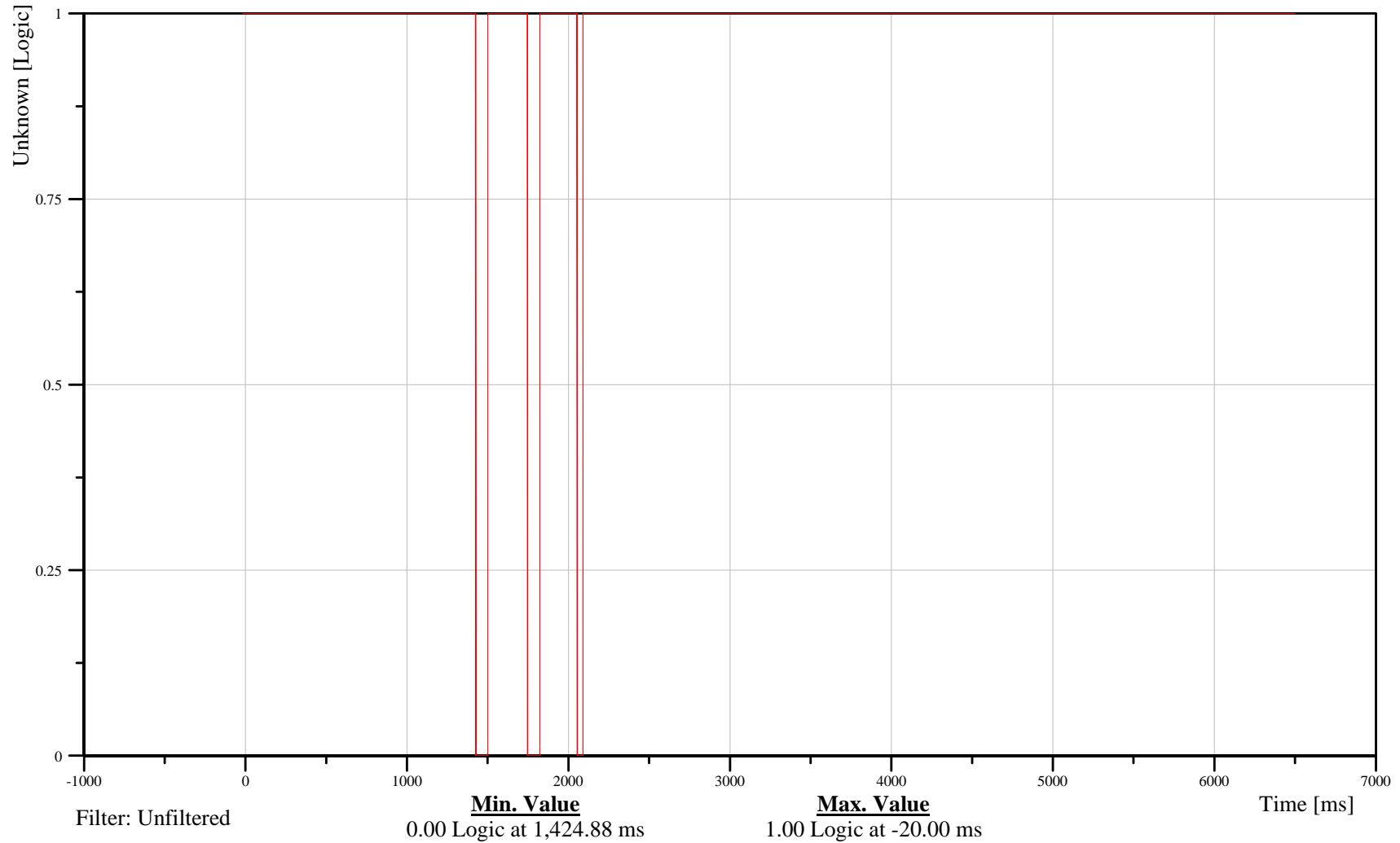
Driver Head Contact

Customer: VRTC

11CONT000023EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-200

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

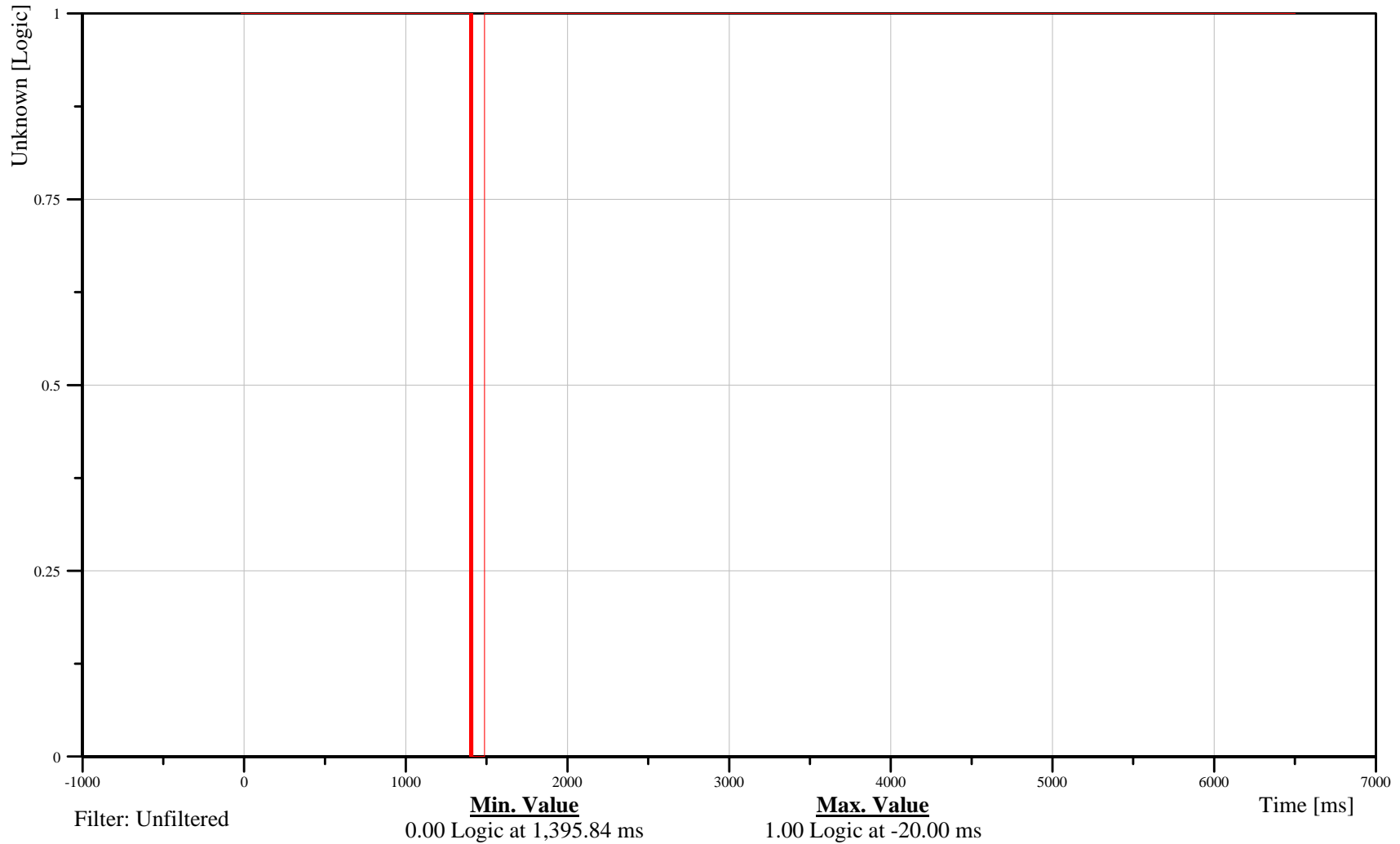
Driver Thorax Contact

Customer: VRTC

11CONT000024EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-201

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

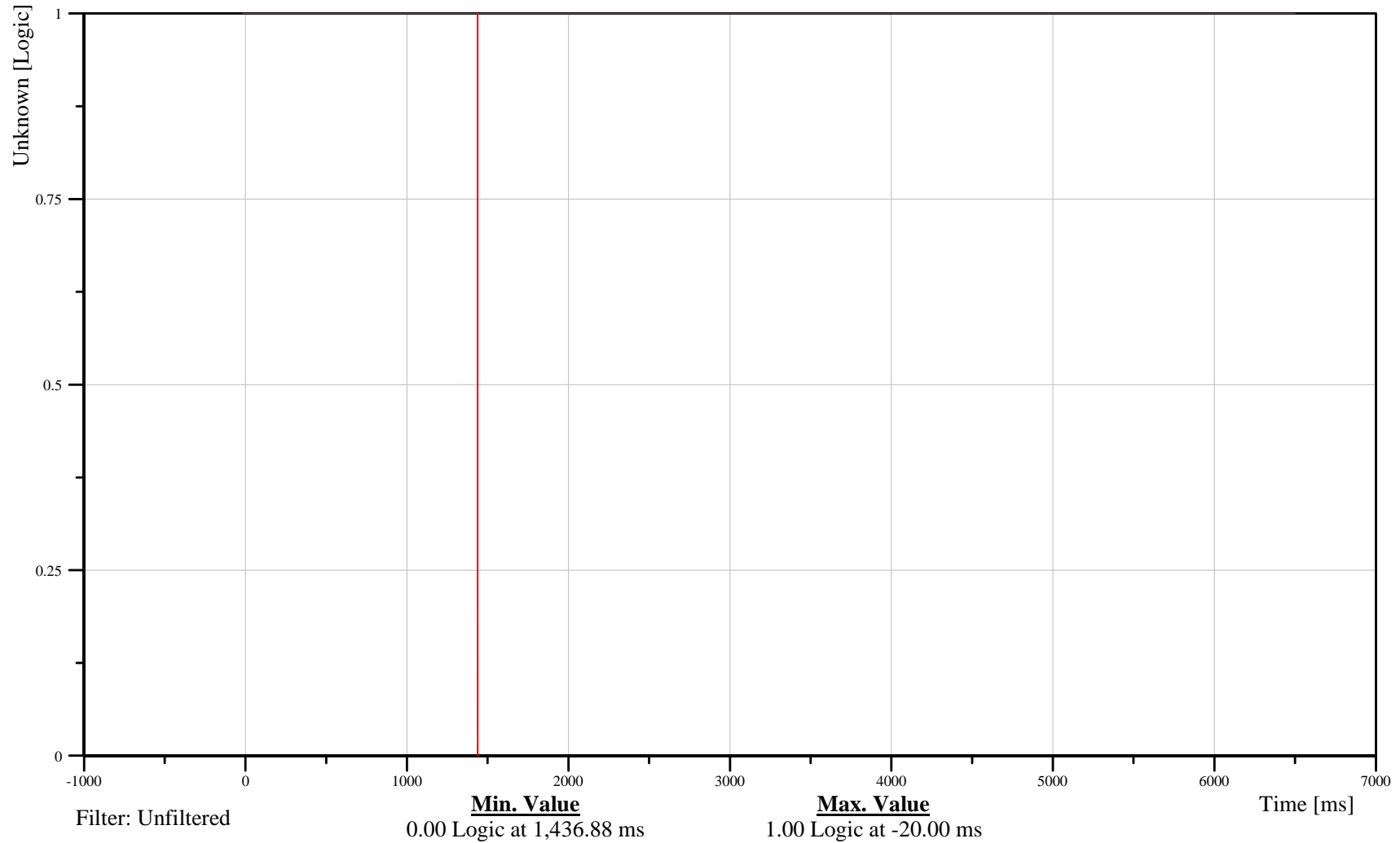
Driver Pelvis Contact

Customer: VRTC

11CONT000025EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-202

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

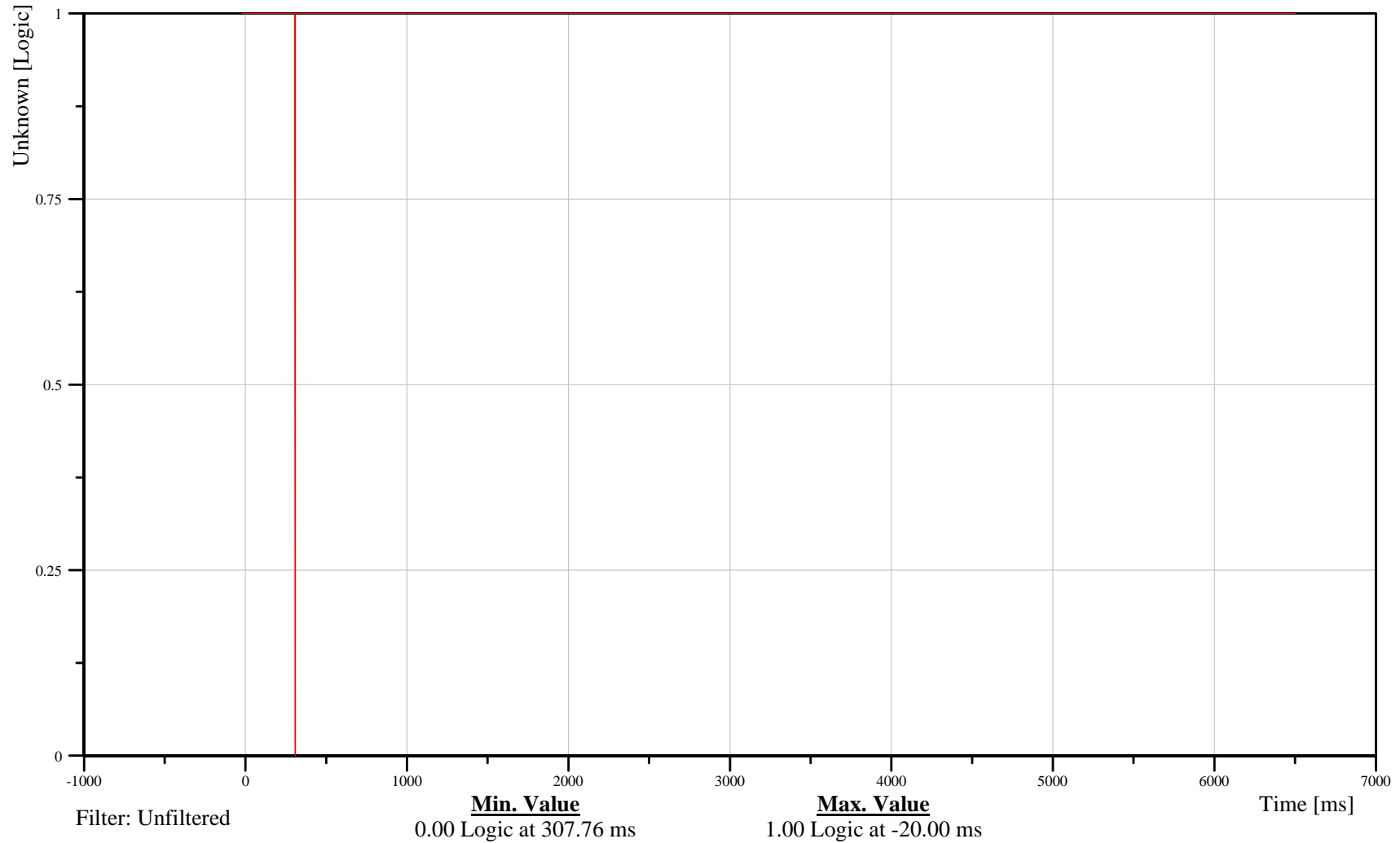
Right Front Passenger Head Contact Switch

Customer: VRTC

13CONT000026EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-203

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

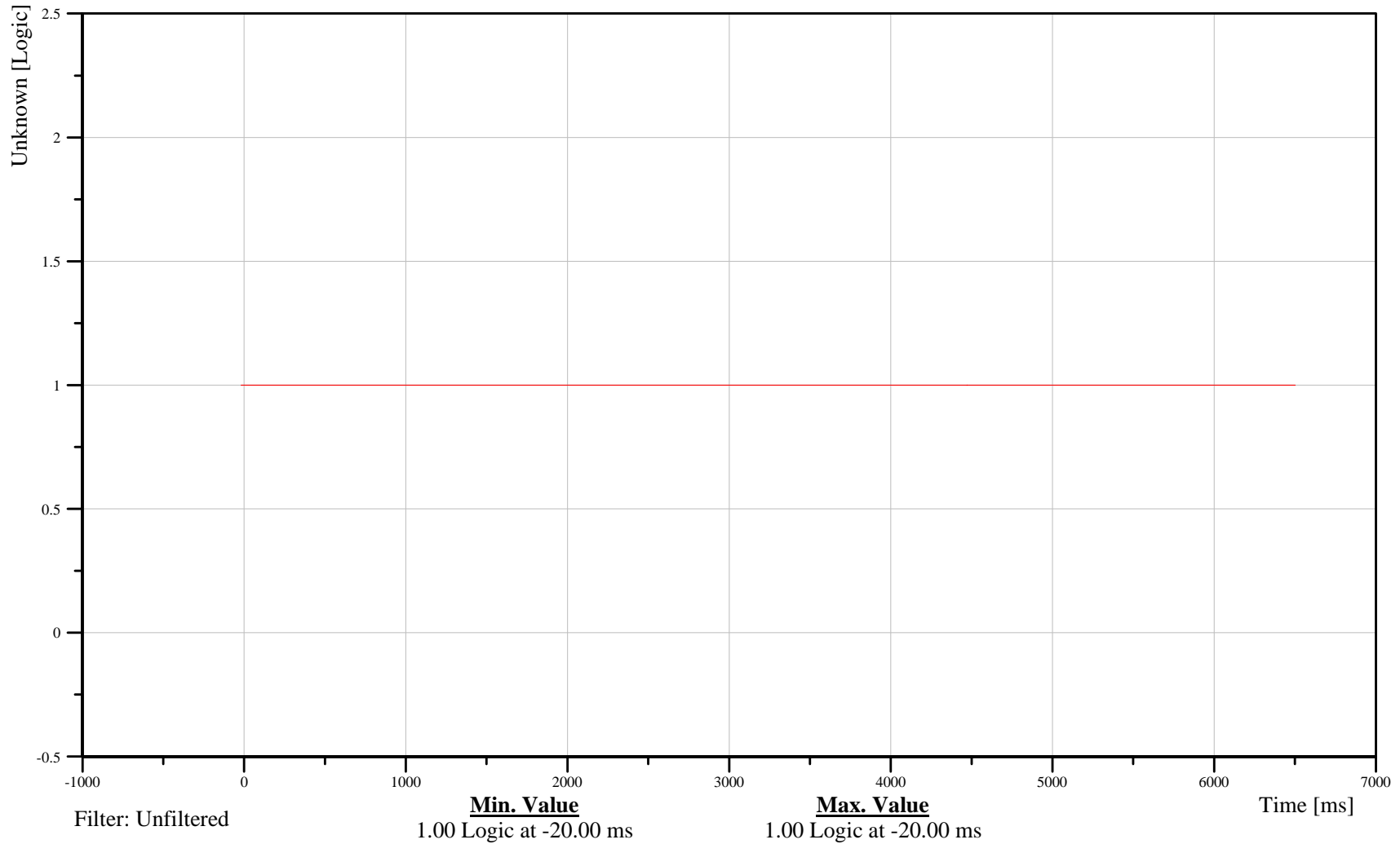
Right Front Passenger Thorax Contact Switch

Customer: VRTC

13CONT000027EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-204

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

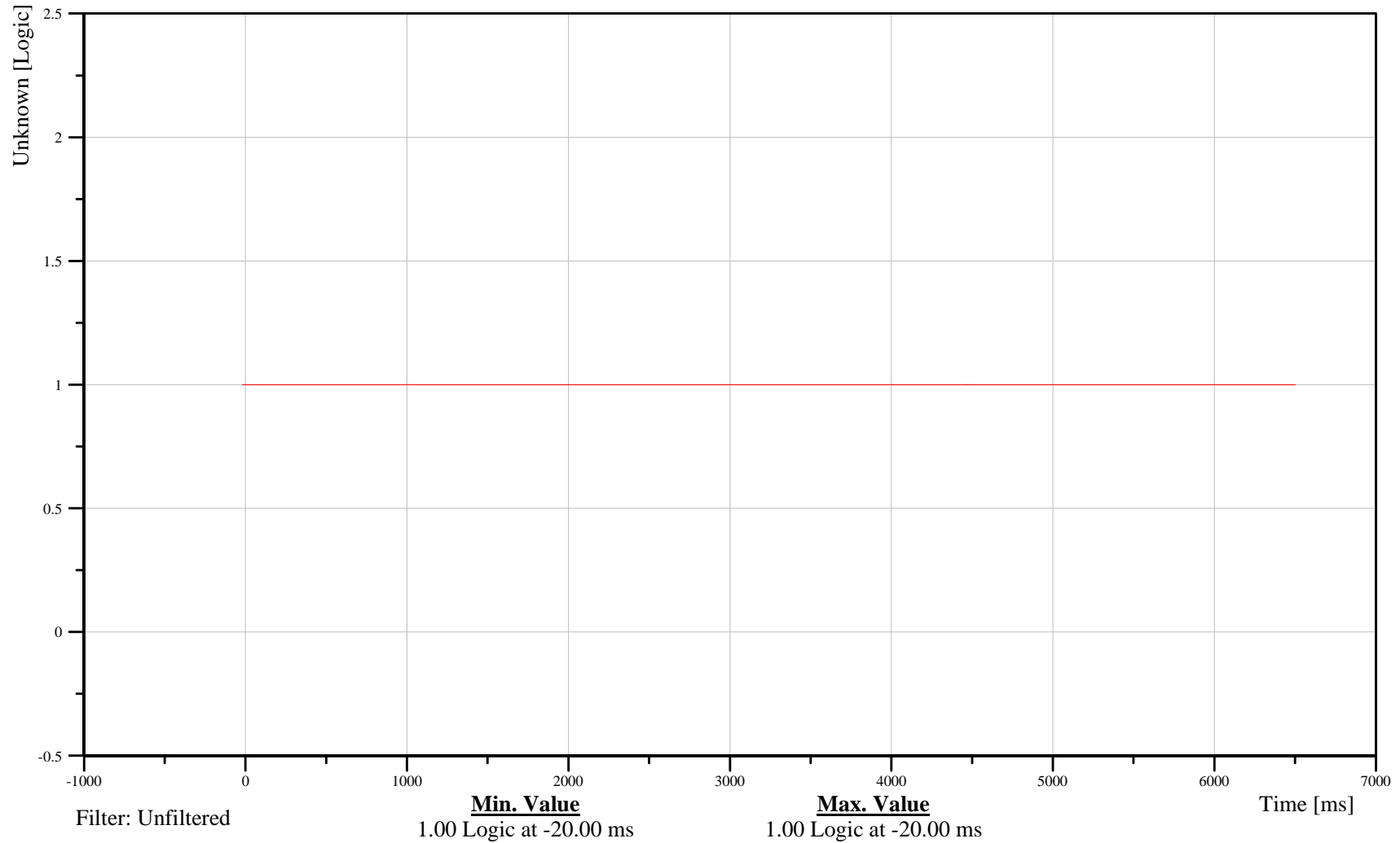
Right Front Passenger Pelvis Contact Switch

Customer: VRTC

13CONT000028EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-205

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

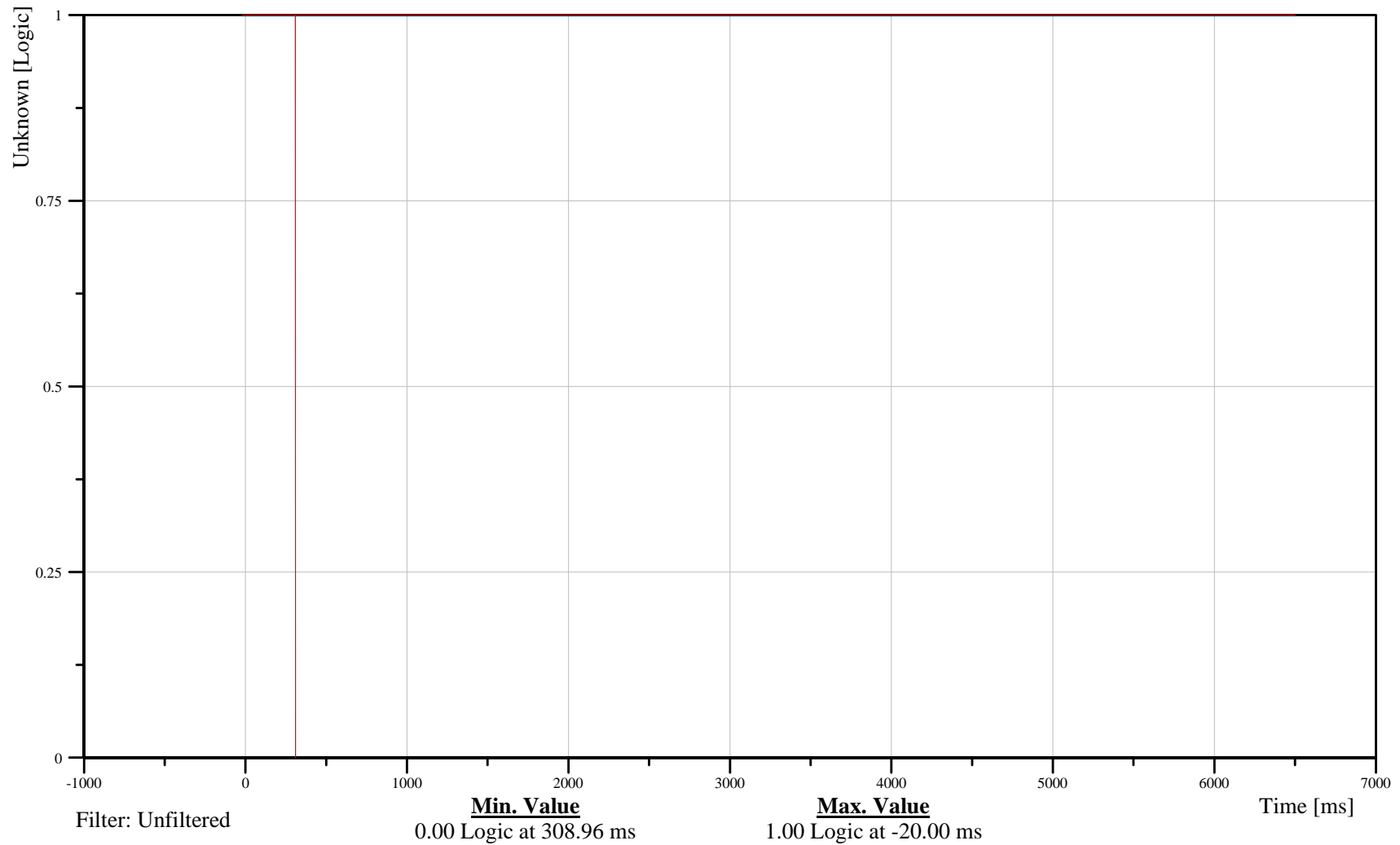
Right Rear Passenger Head Contact

Customer: VRTC

16CONT000029EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-206

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

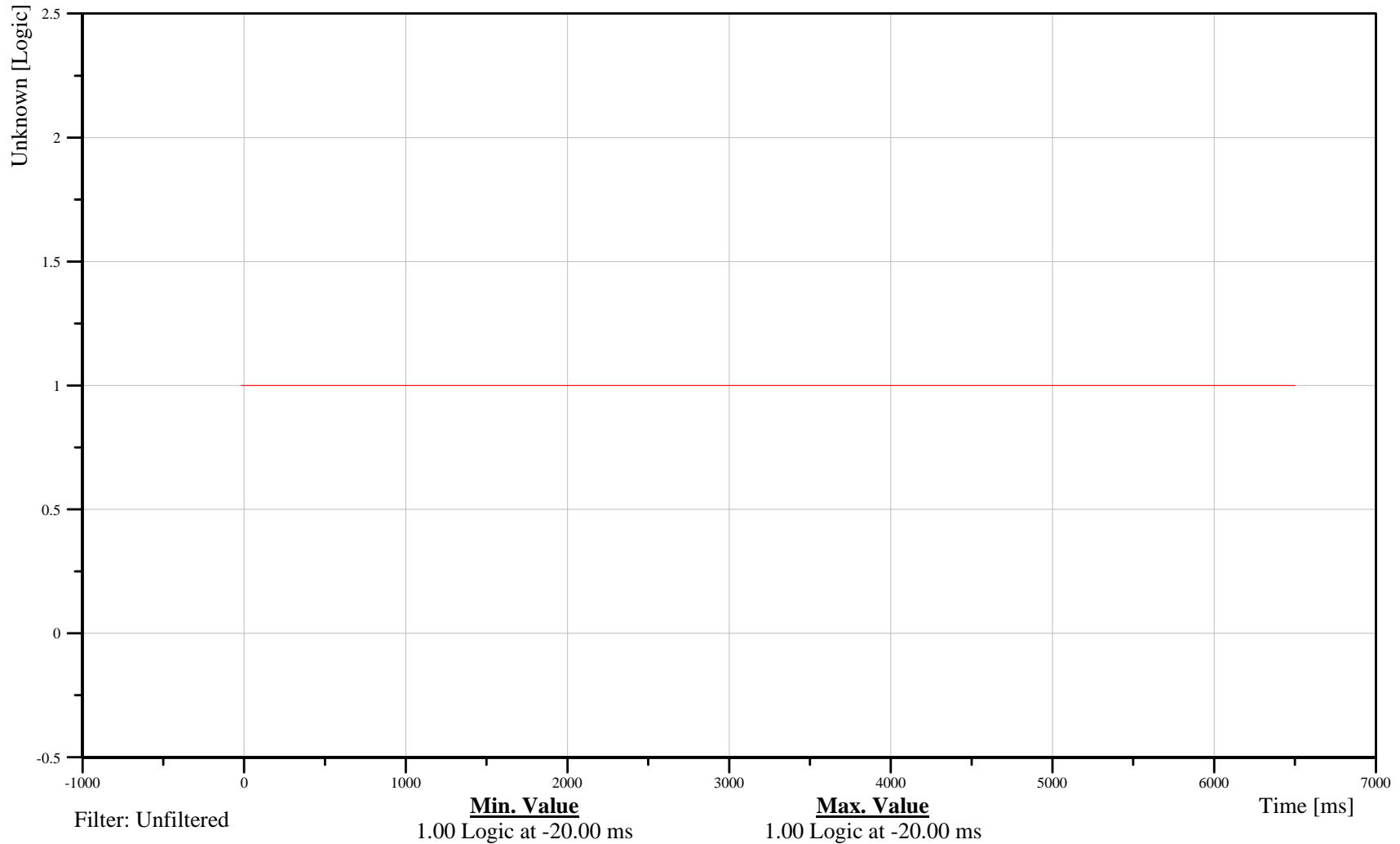
Right Rear Passenger Thorax Contact

Customer: VRTC

16CONT000030EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-207

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

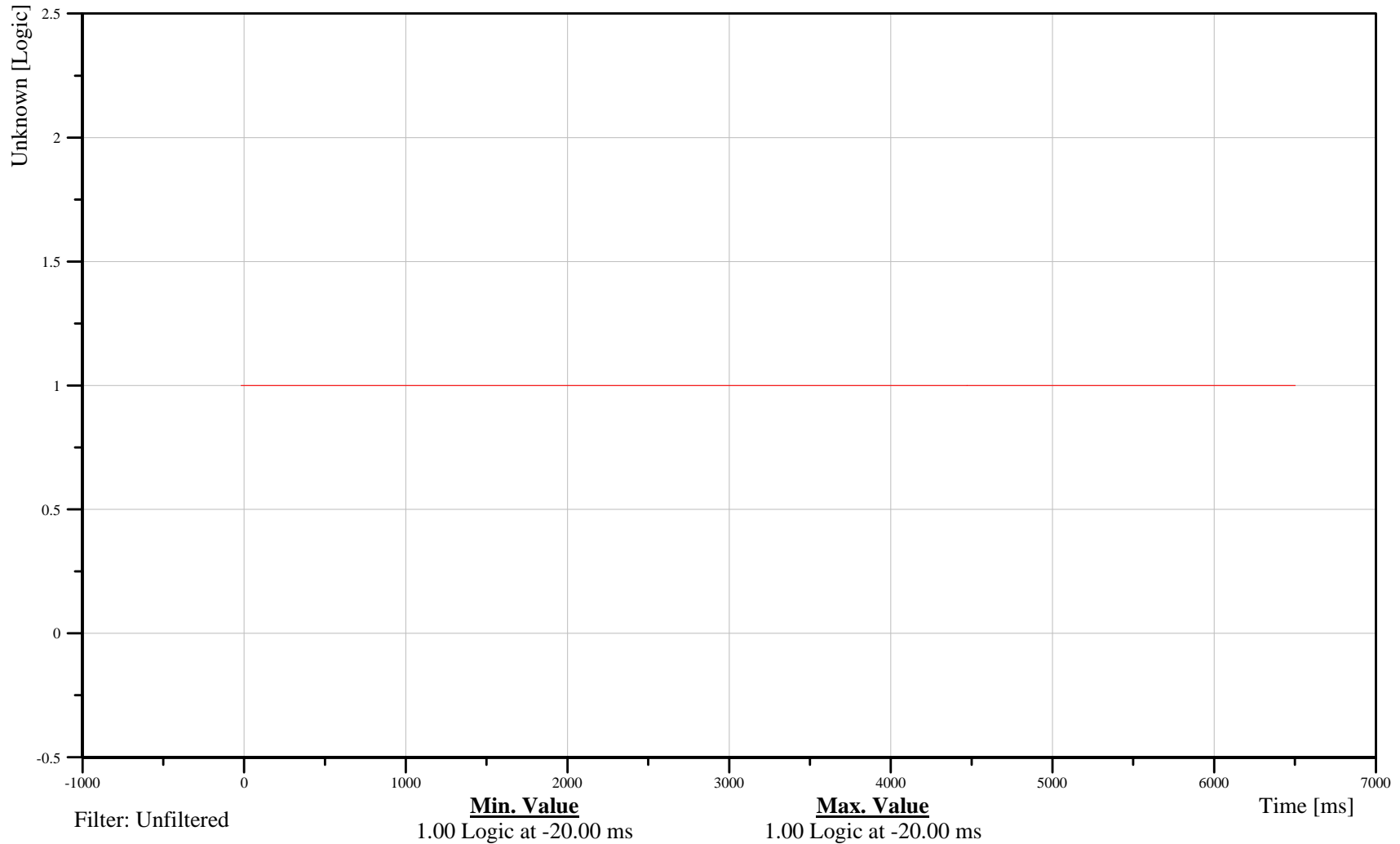
Right Rear Passenger Pelvis Contact

Customer: VRTC

16CONT000031EV00

TRC Inc. Test Lab: CTF

Test Number: 100420



B-208

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

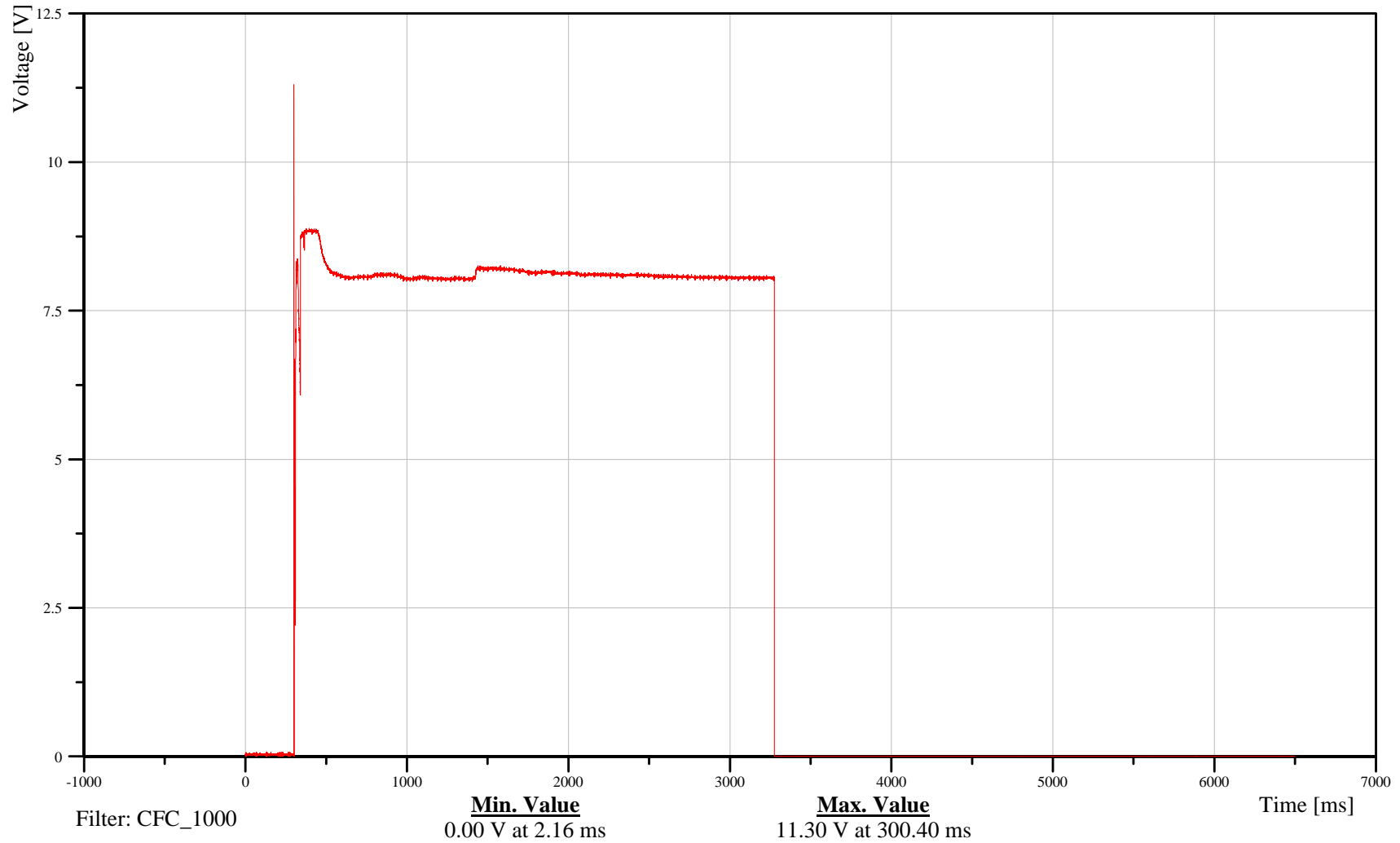
Left Side Curtain Voltage

Customer: VRTC

11AIRB000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-209

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

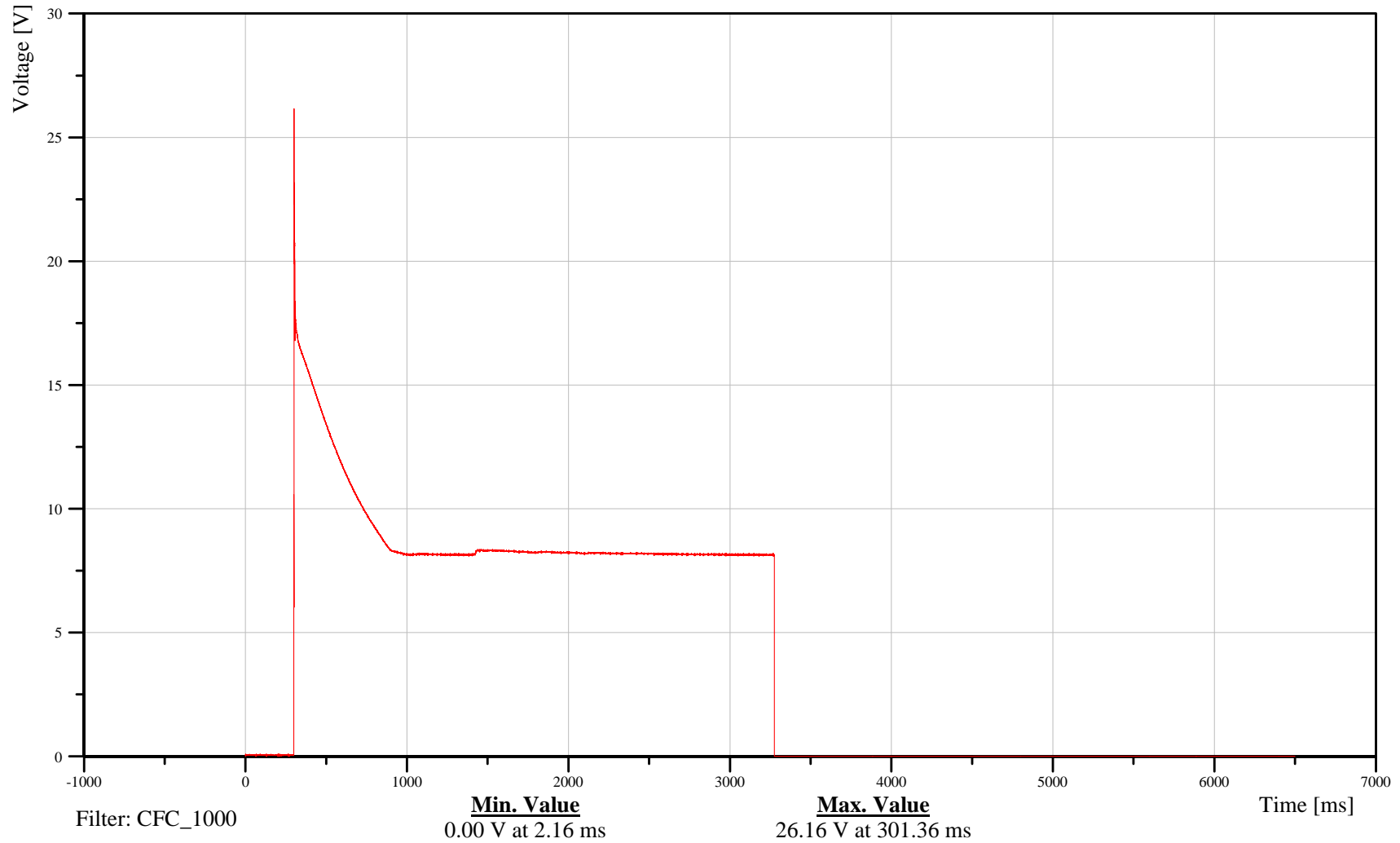
Right Side Curtain Voltage

Customer: VRTC

13AIRB000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-210

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left Side Curtain Current

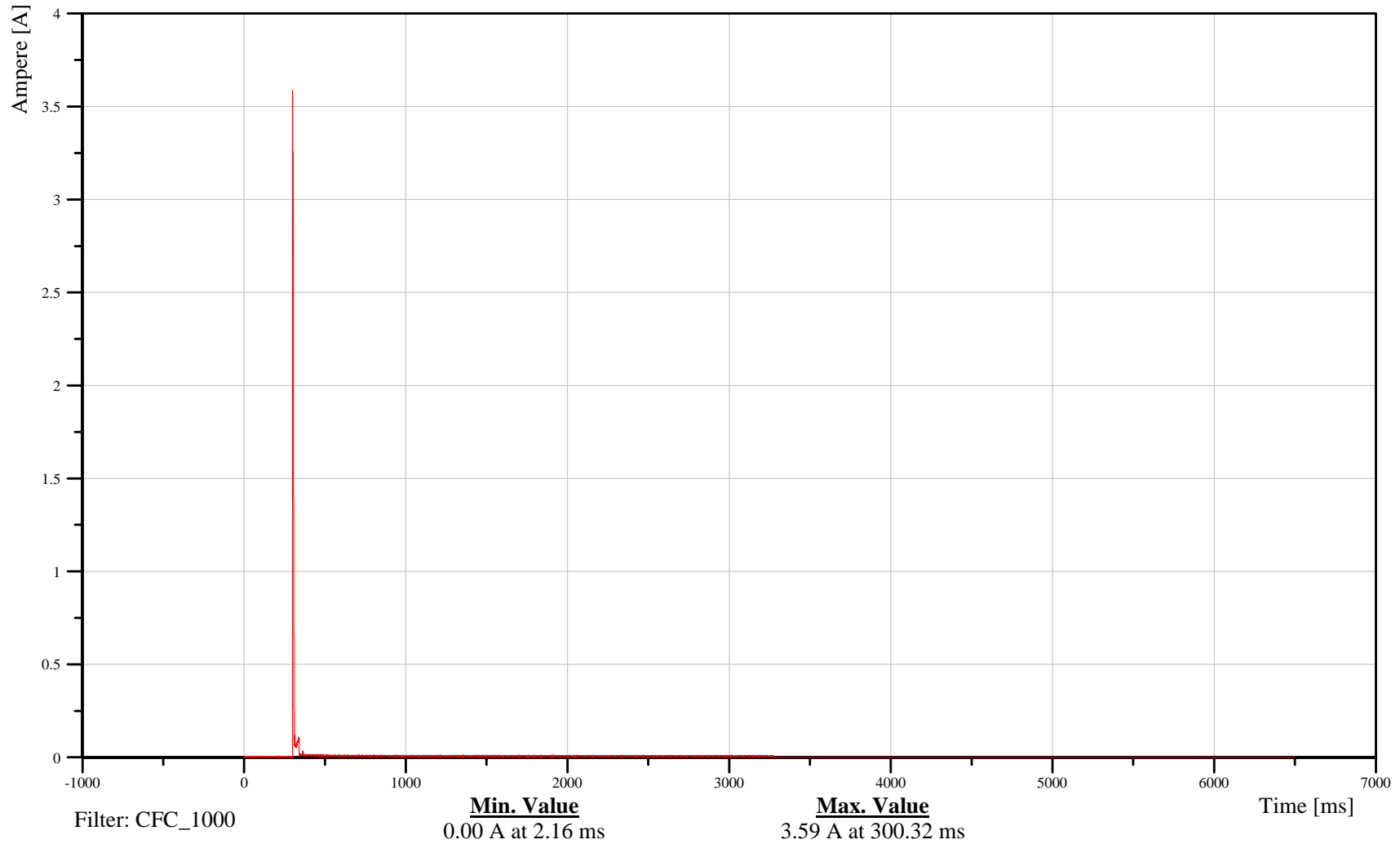
Time: 14:32

Customer: VRTC

11AIRB000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-211

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

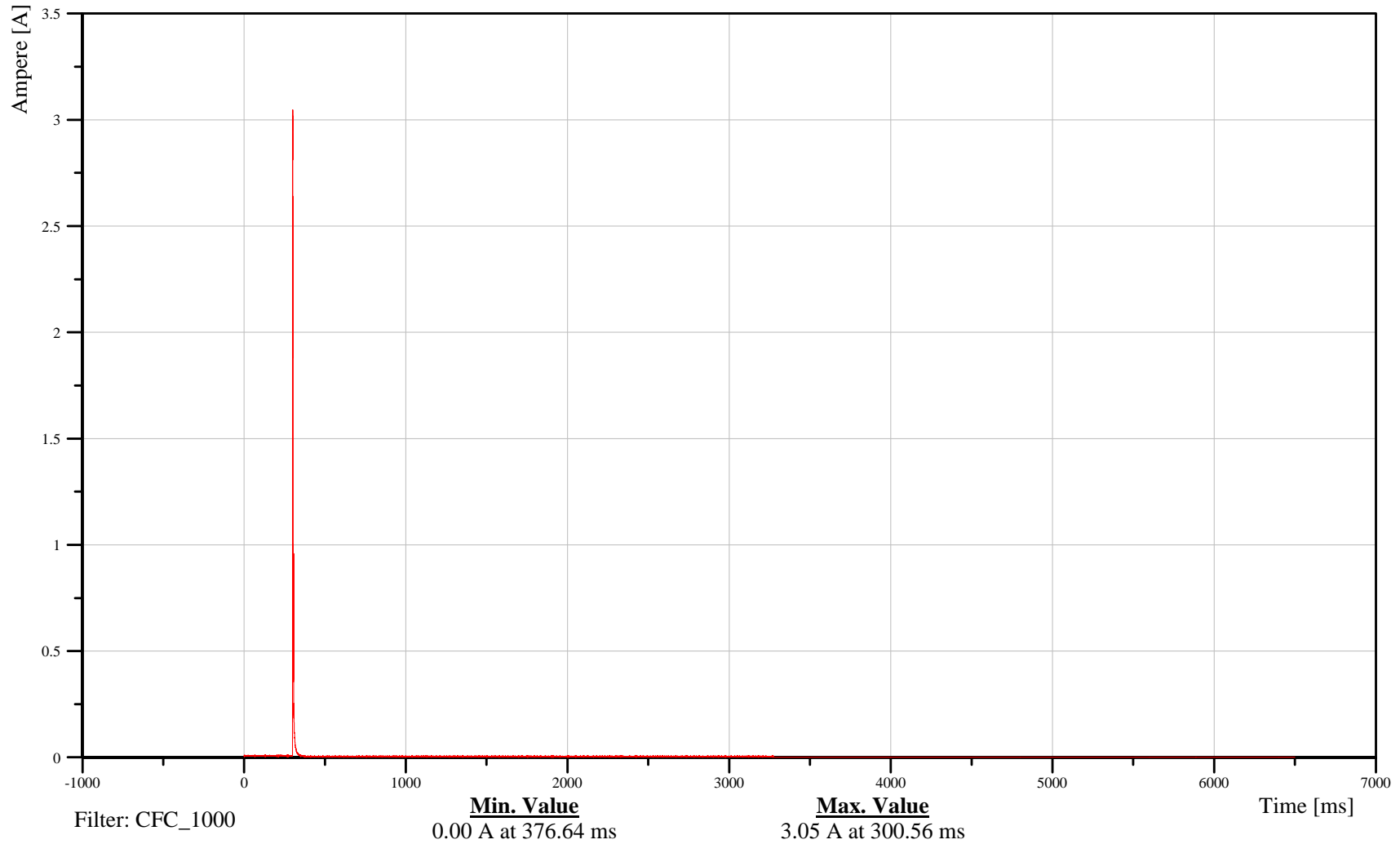
Right Side Curtain Current

Customer: VRTC

13AIRB000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-212

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left Front Buckle Pretensioner Voltage

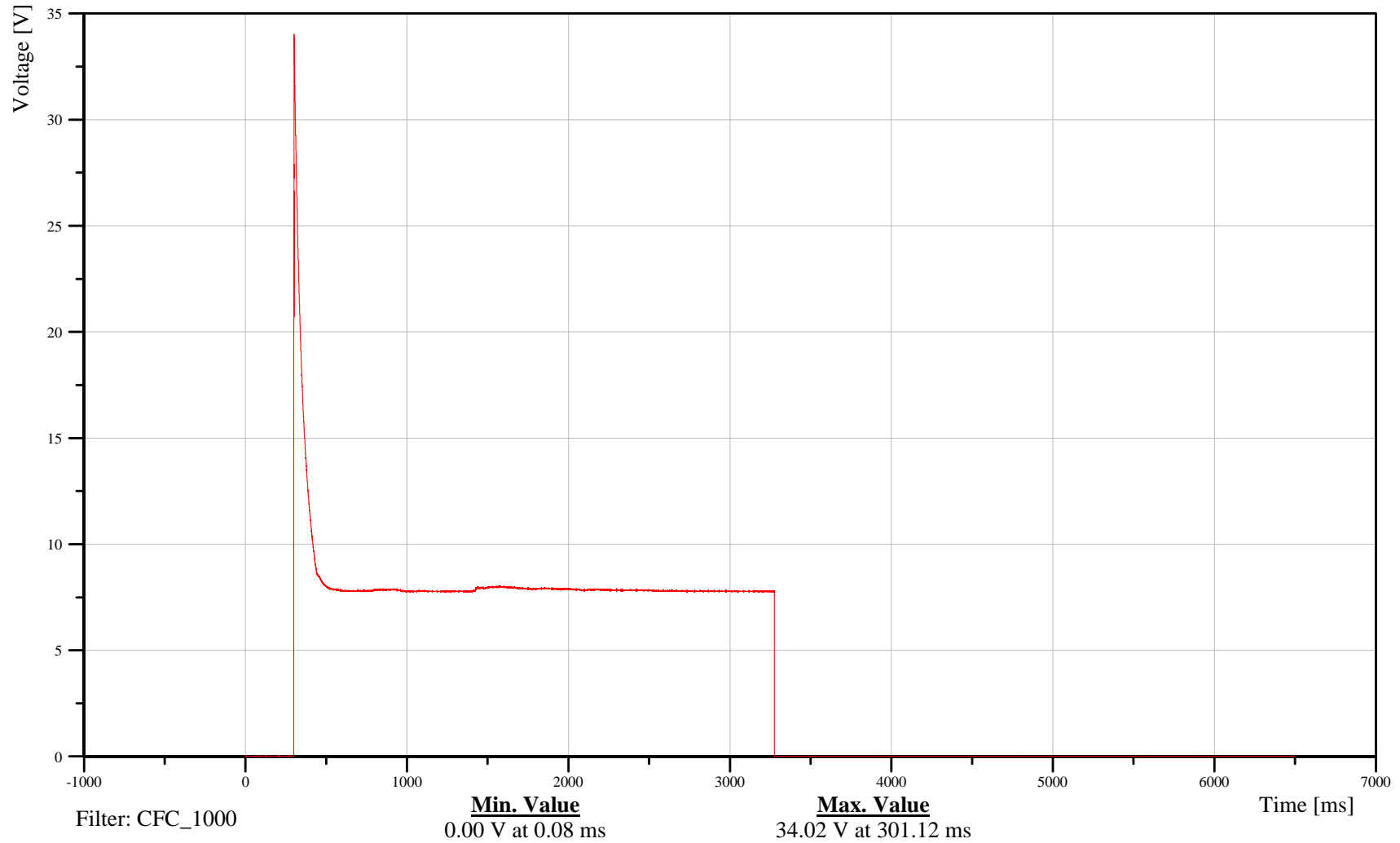
Time: 14:32

Customer: VRTC

11PRET000000V00A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-213

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

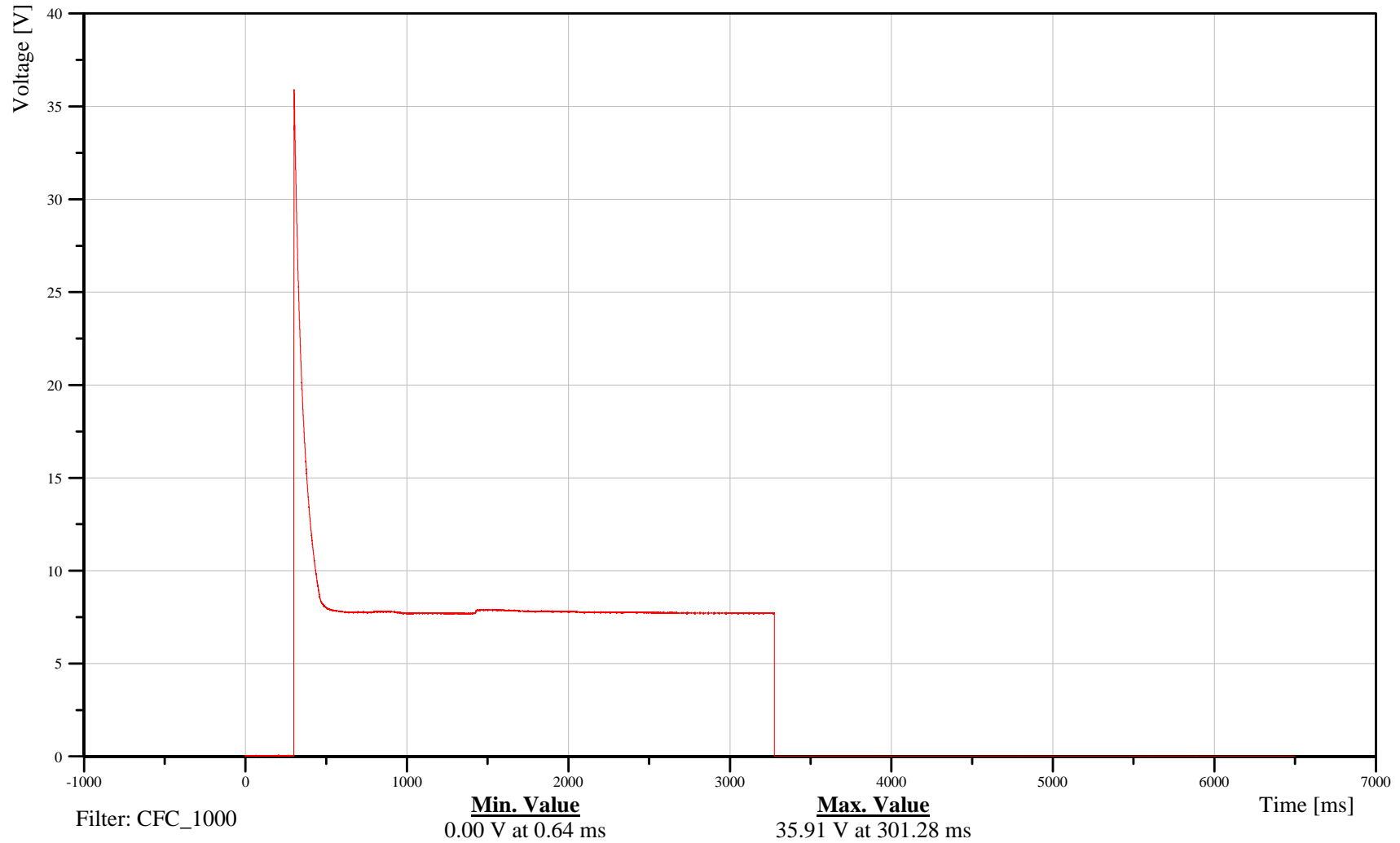
Right Front Buckle Pretensioner Voltage

Customer: VRTC

13PRET000000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-214

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

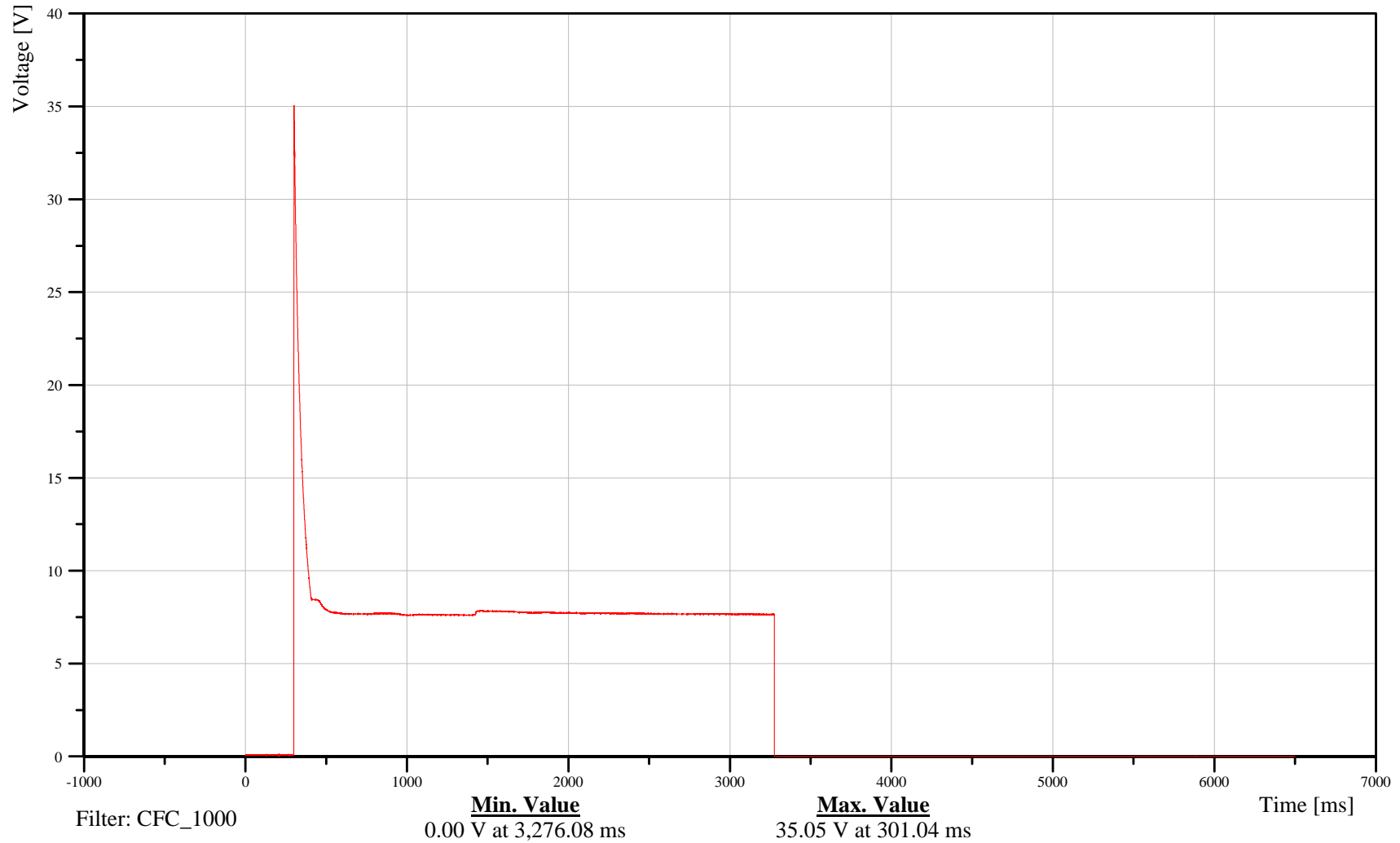
Right Rear Buckle Pretensioner Voltage

Customer: VRTC

16PRET020000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-215

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

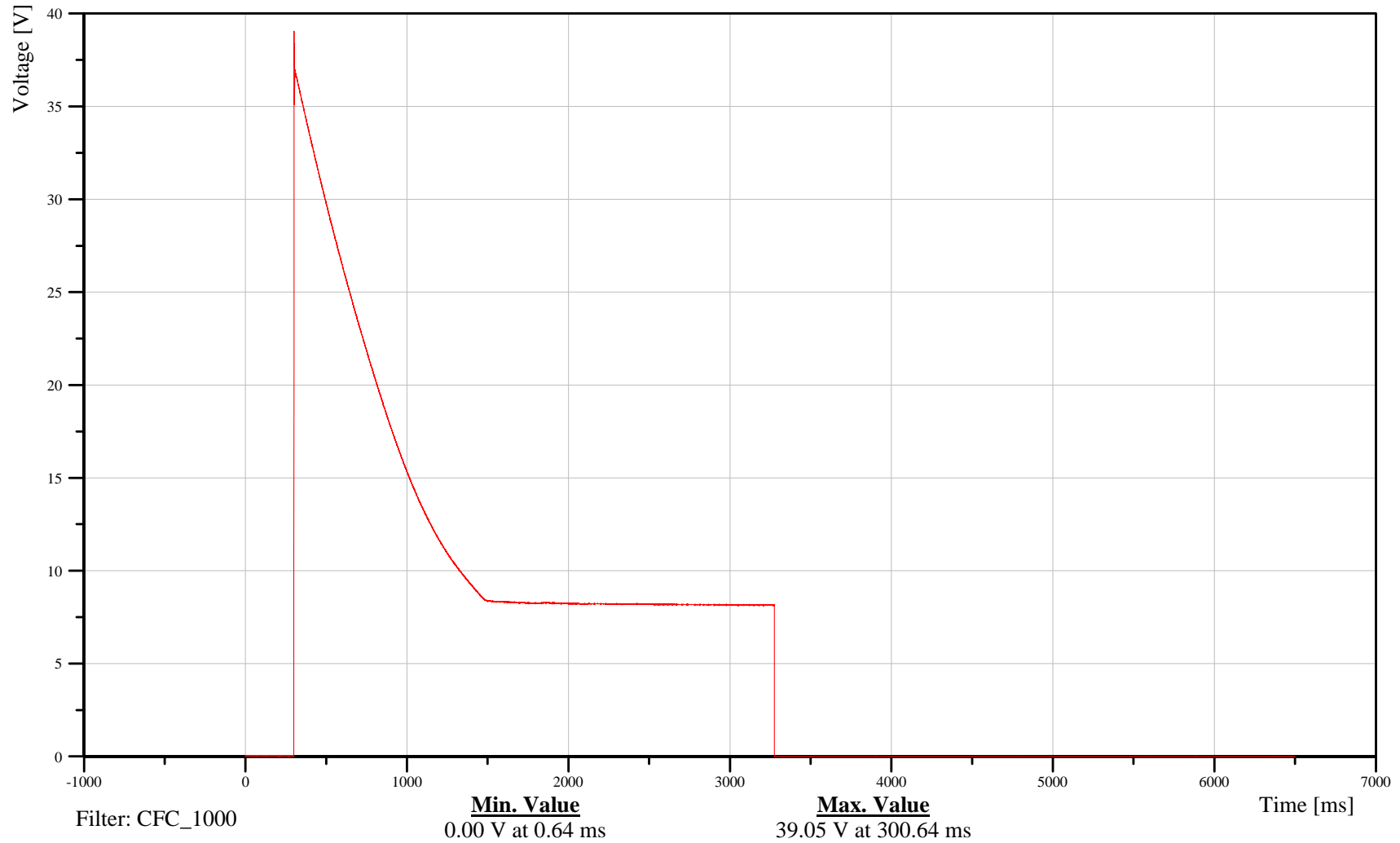
Left Front Retractor Pretensioner Voltage

Customer: VRTC

11PRET010000VO0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-216

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Left Front Buckle Pretensioner Current

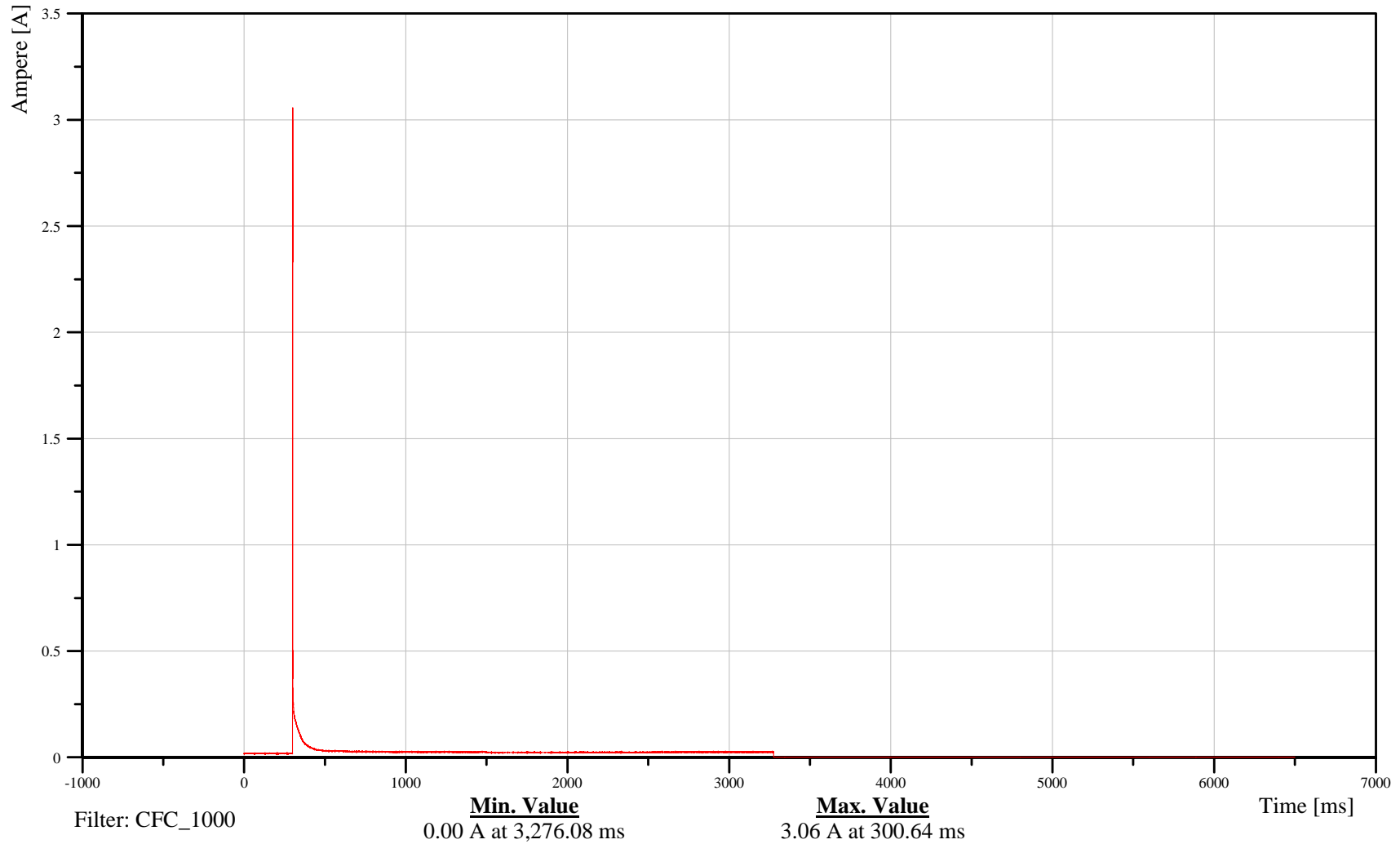
Time: 14:32

Customer: VRTC

11PRET000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-217

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010

Time: 14:32

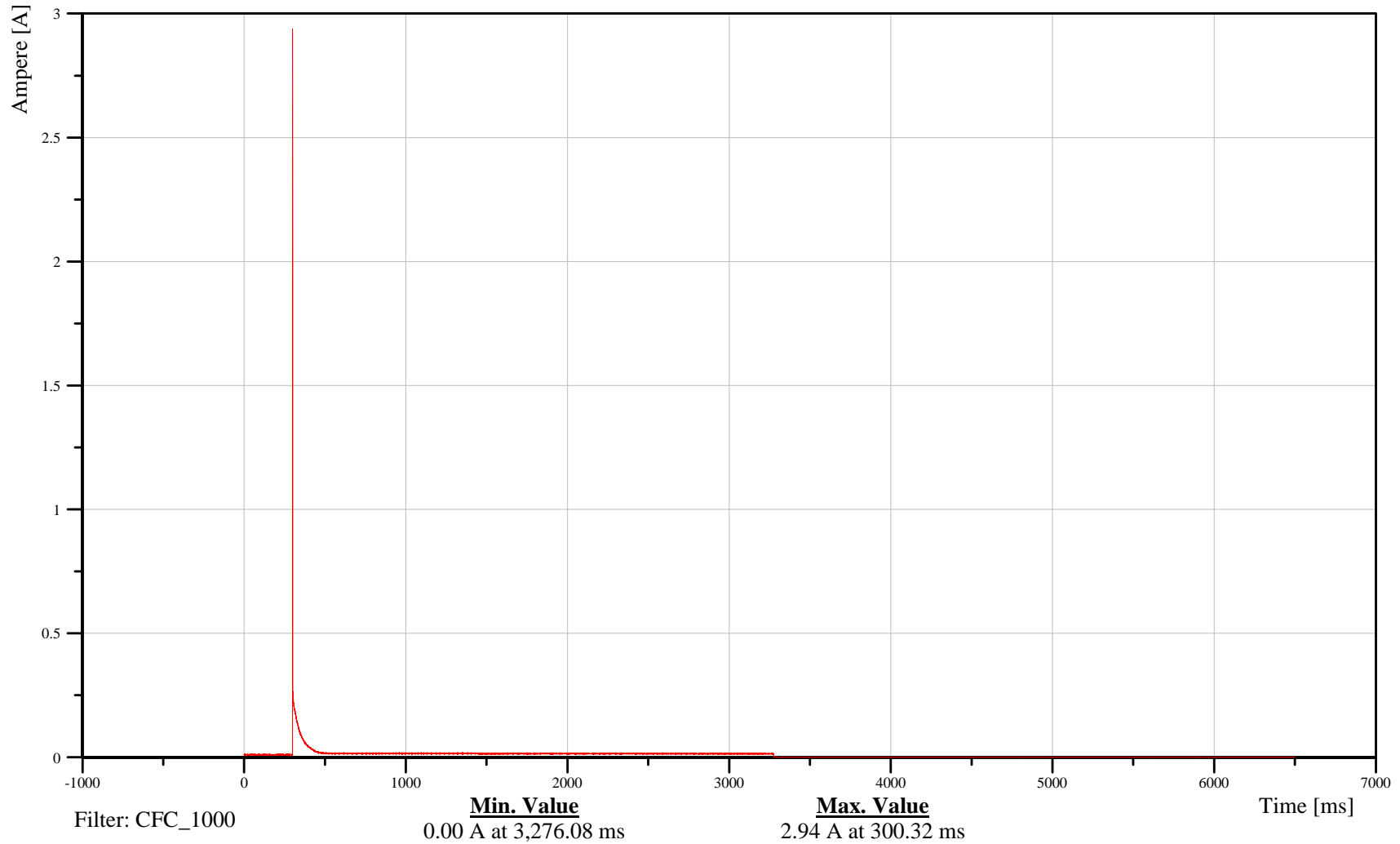
Right Front Buckle Pretensioner Current

Customer: VRTC

13PRET000000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-218

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

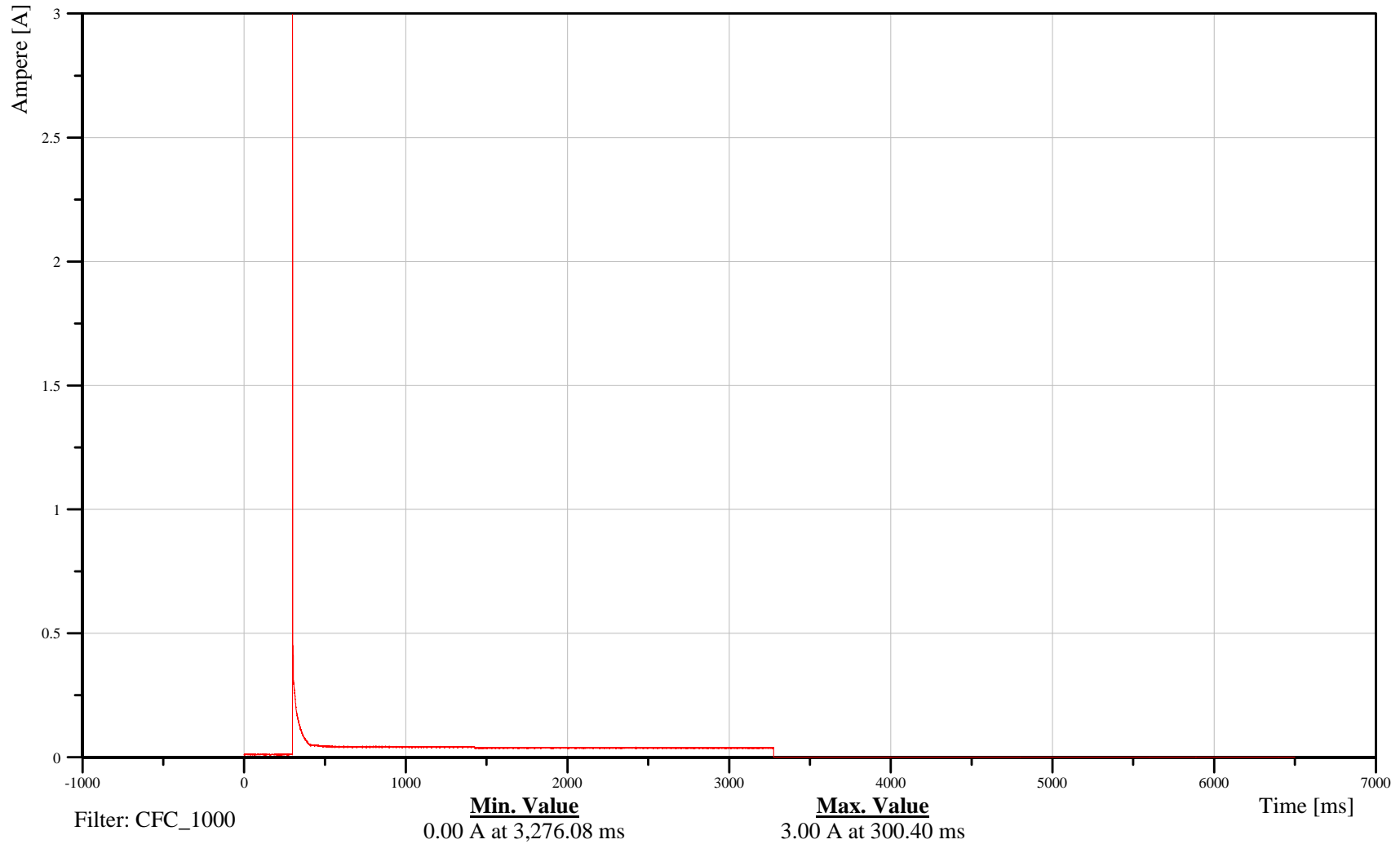
Right Rear Buckle Pretensioner Current

Customer: VRTC

16PRET020000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-219

100420



Corkscrew Rollover 2007 Ford Expedition

Date: 04/20/2010
Time: 14:32

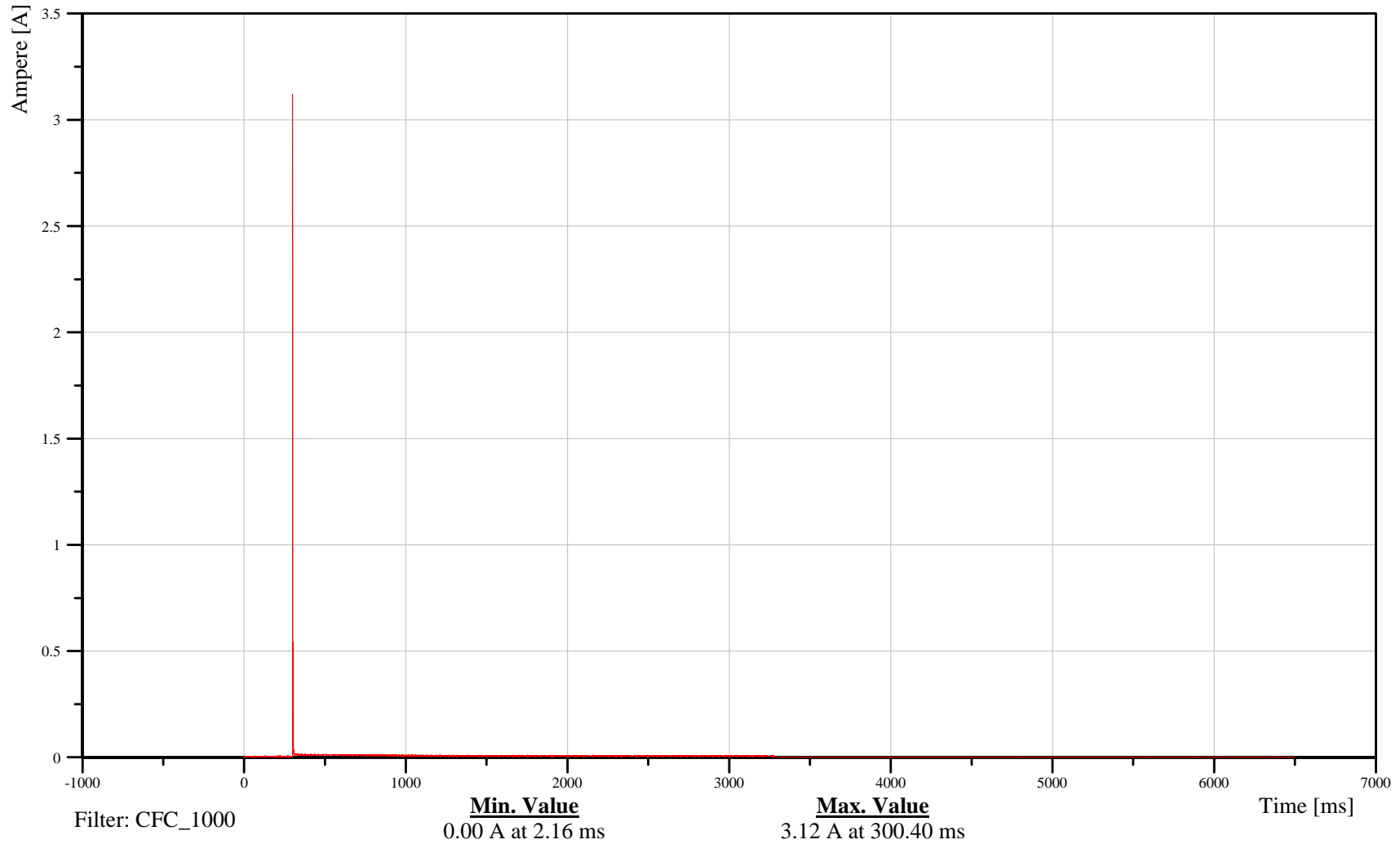
Left Front Retractor Current

Customer: VRTC

11PRET010000CU0A

TRC Inc. Test Lab: CTF

Test Number: 100420



B-220

100420

APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

Calibration Test Results

Pre-Test

Driver Dummy S/N: 110

Transportation Research Center Inc.

Front Head Drop

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

Test Date: 1/22/2010

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

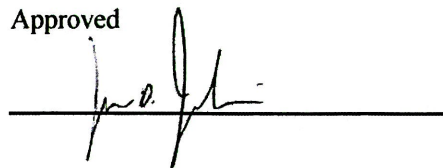
Test meets specifications.

Comments:

Technician



Approved



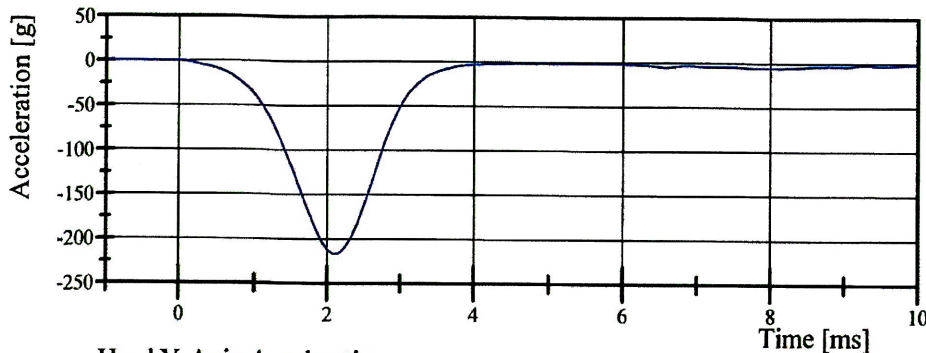
Transportation Research Center Inc.

Front Head Drop

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

Test Date: 1/22/2010

Head X-Axis Acceleration

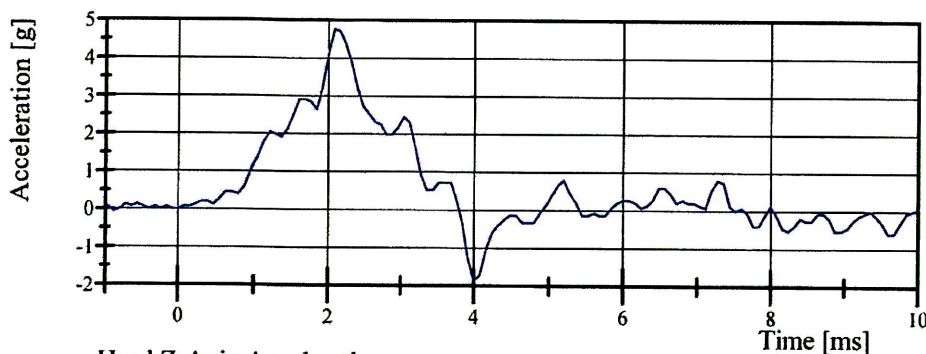


Filter Class: CFC_1000

Max: 0.1 g at -0.4 ms

Min: -216.8 g at 2.1 ms

Head Y-Axis Acceleration

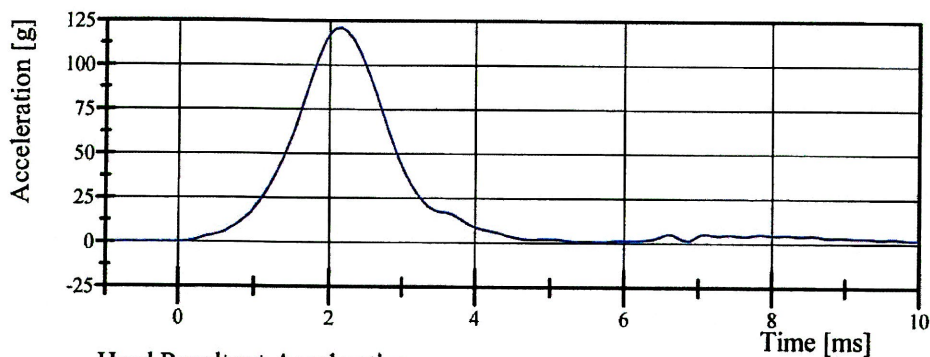


Filter Class: CFC_1000

Max: 4.8 g at 2.1 ms

Min: -1.9 g at 4.0 ms

Head Z-Axis Acceleration

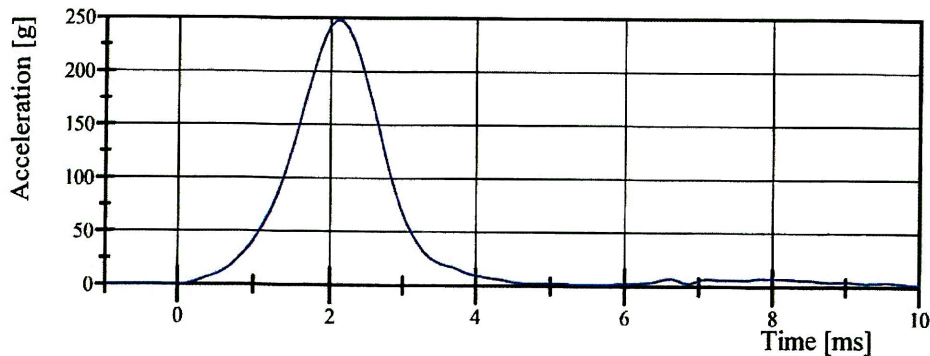


Filter Class: CFC_1000

Max: 121.1 g at 2.2 ms

Min: -0.0 g at -1.0 ms

Head Resultant Acceleration



Filter Class: CFC_1000

Max: 248.1 g at 2.1 ms

Min: 0.0 g at -0.8 ms

Transportation Research Center Inc.

Neck Flexion

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

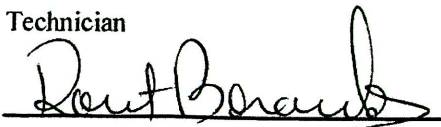
Test Date: 1/25/2010

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

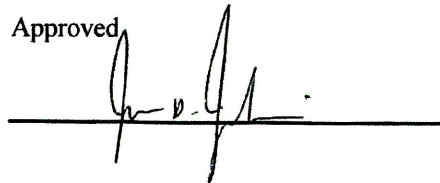
Test meets specifications.

Comments:

Technician



Approved



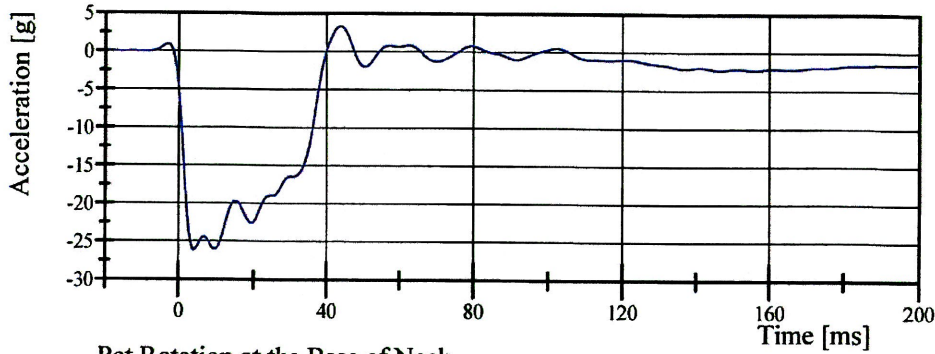
Transportation Research Center Inc.

Neck Flexion

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

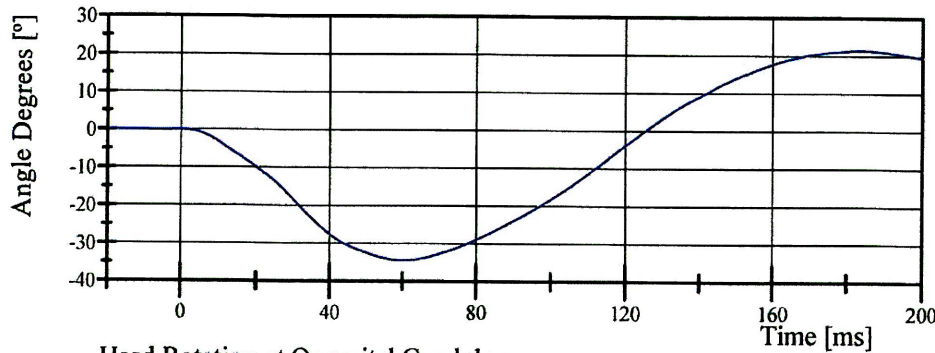
Test Date: 1/25/2010

Pendulum Acceleration



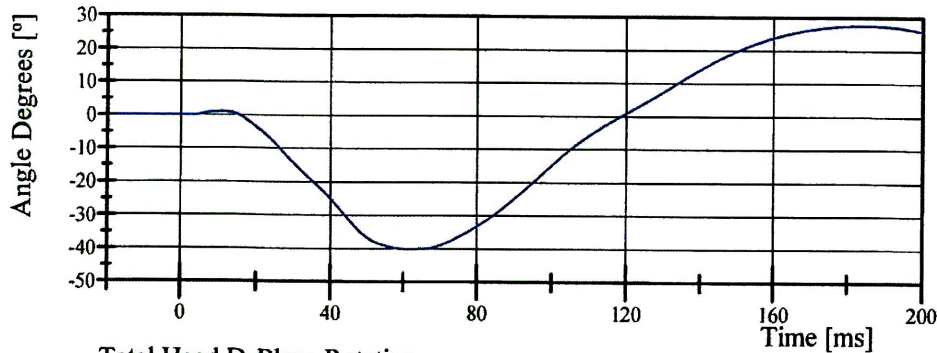
Filter Class: CFC_60
Max: 3.4 g at 43.9 ms
Min: -26.1 g at 4.1 ms

Pot Rotation at the Base of Neck



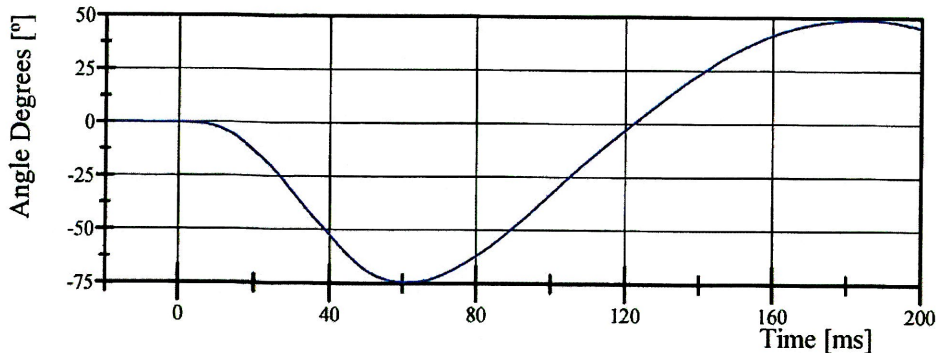
Filter Class: CFC_60
Max: 21.5 ° at 183.5 ms
Min: -34.4 ° at 60.3 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 27.6 ° at 184.8 ms
Min: -40.1 ° at 61.6 ms

Total Head D-Plane Rotation



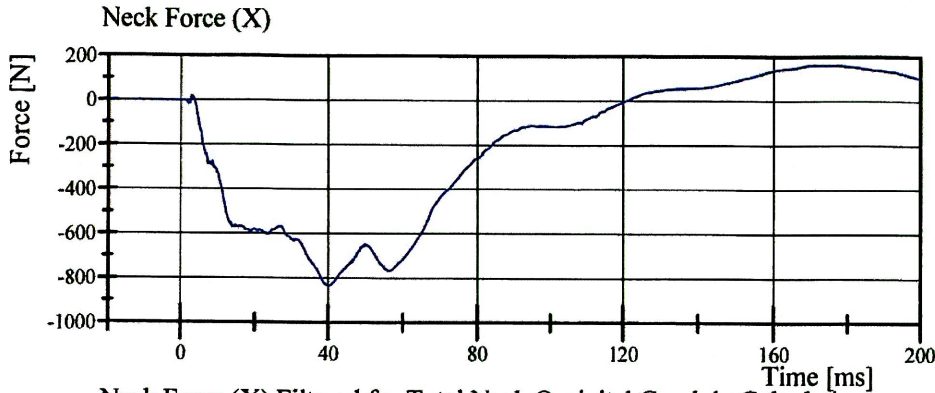
Filter Class: CFC_60
Max: 49.1 ° at 183.9 ms
Min: -74.5 ° at 61.1 ms

Transportation Research Center Inc.

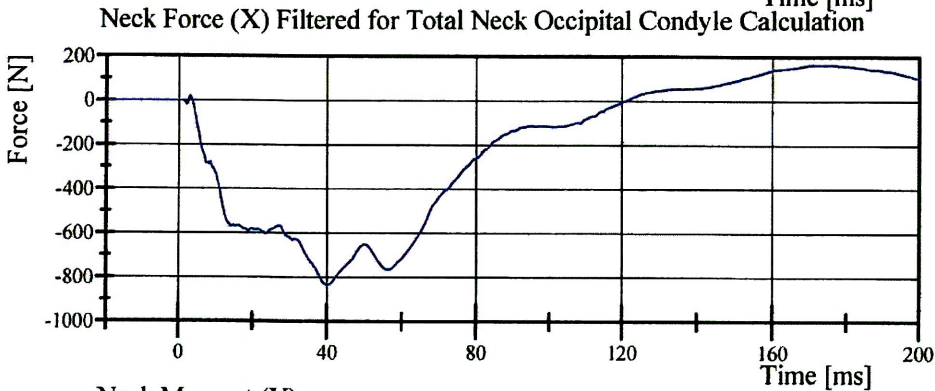
Neck Flexion

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

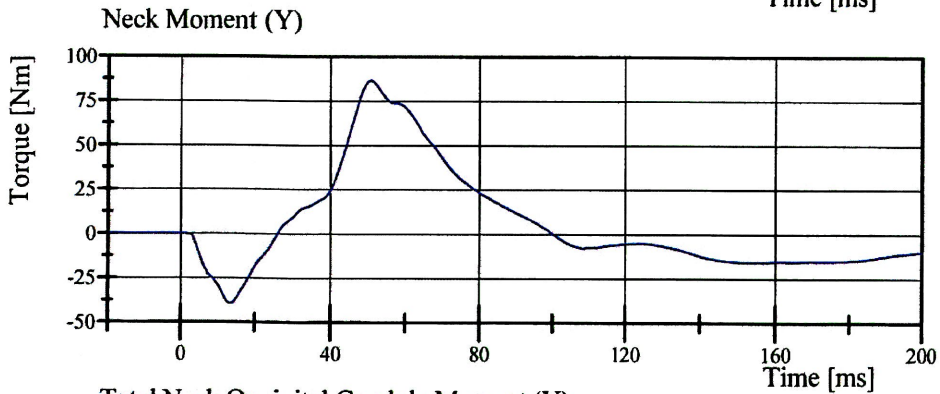
Test Date: 1/25/2010



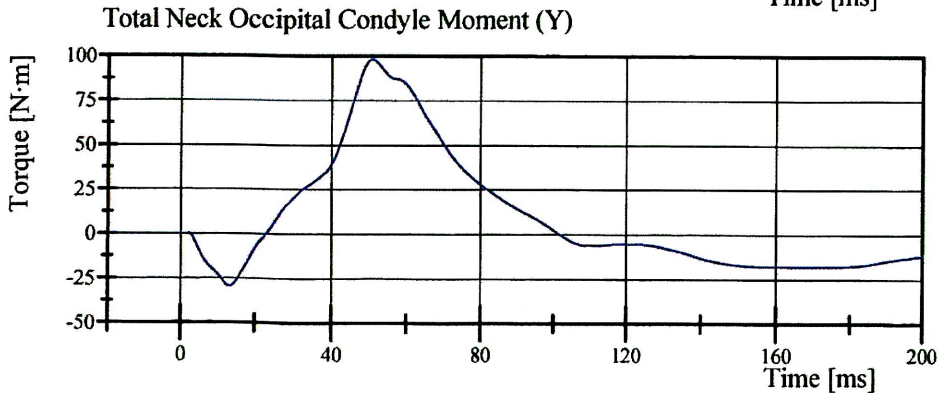
Filter Class: CFC_1000
Max: 164.2 N at 170.7 ms
Min: -834.1 N at 40.2 ms



Filter Class: CFC_600
Max: 164.1 N at 170.9 ms
Min: -833.7 N at 40.0 ms



Filter Class: CFC_600
Max: 86.6 Nm at 50.7 ms
Min: -39.3 Nm at 13.6 ms



Filter Class: CFC_600
Max: 98.2 N·m at 50.8 ms
Min: -29.5 N·m at 13.5 ms

Transportation Research Center Inc.

Neck Extension

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

Test Date: 1/25/2010

Test Parameter	Specification	Test Results	Pass
Temperature	20.6 - 22.2 °C	22.1 °C	Yes
Relative Humidity	10 - 70 %	33 %	Yes
Pendulum Velocity	(-5.95) - (-6.18) m/s	-5.986 m/s	Yes
Pendulum Acceleration Decay Crossing 5g	38 - 46 ms	40.0 ms	Yes
Pendulum Acceleration at 10ms	17.2 - 21.2 g	20.36 g	Yes
Pendulum Acceleration at 20ms	14.0 - 19.0 g	16.99 g	Yes
Pendulum Acceleration at 30ms	11.0 - 16.0 g	14.34 g	Yes
Pendulum Acceleration > 30ms	<= 22.0 g	14.34 g	Yes
Total Head D-Plane Rotation Peak	81 - 106 °	97.1 °	Yes
Total Head D-Plane Rotation Time of Peak	72 - 82 ms	77.0 ms	Yes
Total Head D-Plane Rotation Decay to 0°	147 - 174 ms	156.3 ms	Yes
Total Neck Occipital Condyles Moment Peak	(-53) - (-80) N·m	-70.3 N·m	Yes
Total Neck Occipital Condyles Moment Time of Peak	65 - 79 ms	70.5 ms	Yes
Total Neck Occipital Condyles Moment Decay to 0 N·m	120 - 148 ms	141.8 ms	Yes

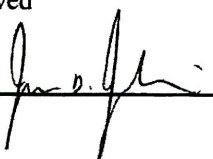
Test meets specifications.

Comments:

Technician



Approved



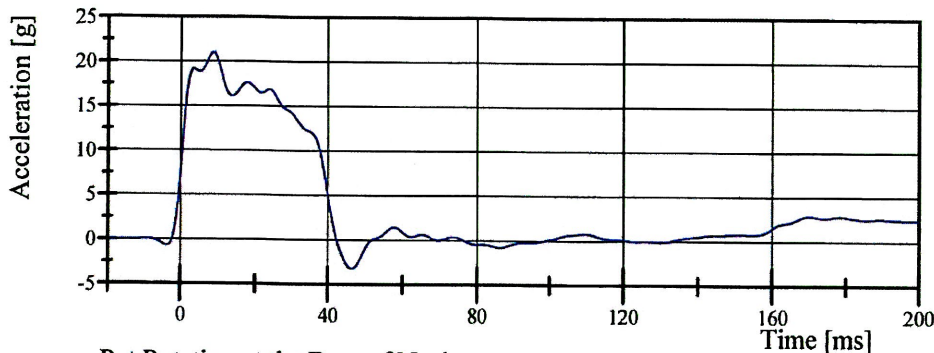
Transportation Research Center Inc.

Neck Extension

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

Test Date: 1/25/2010

Pendulum Acceleration

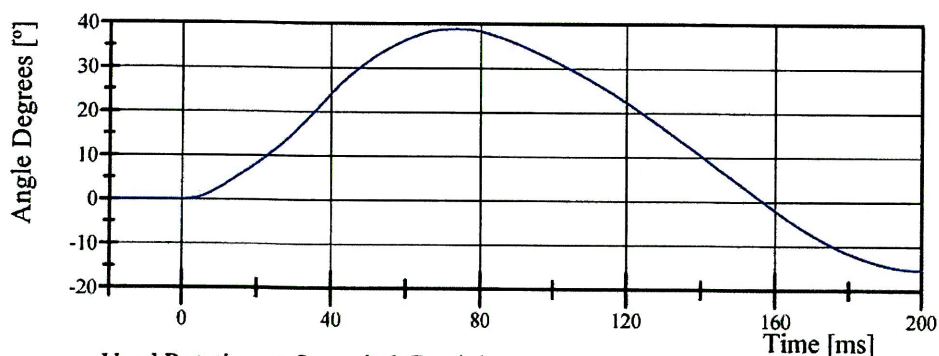


Filter Class: CFC_60

Max: 21.0 g at 8.9 ms

Min: -3.2 g at 46.5 ms

Pot Rotation at the Base of Neck

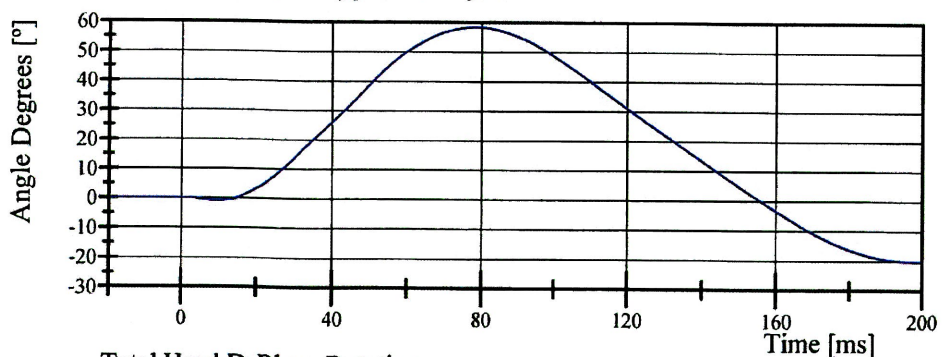


Filter Class: CFC_60

Max: 38.9 ° at 73.6 ms

Min: -15.4 ° at 200.0 ms

Head Rotation at Occypital Condyles

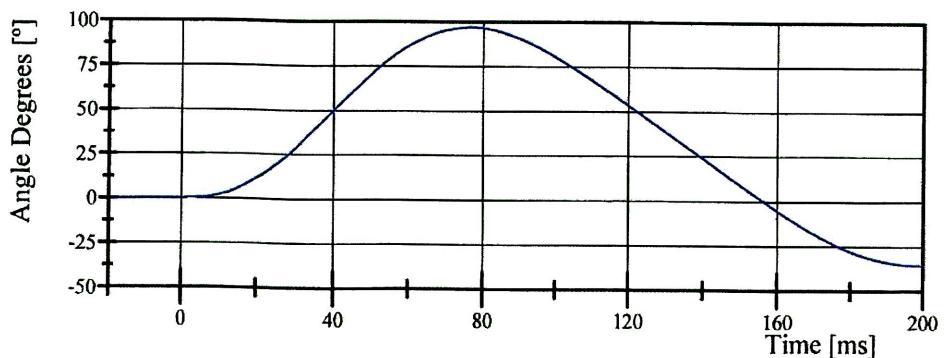


Filter Class: CFC_60

Max: 58.4 ° at 78.9 ms

Min: -20.2 ° at 198.9 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 97.1 ° at 77.0 ms

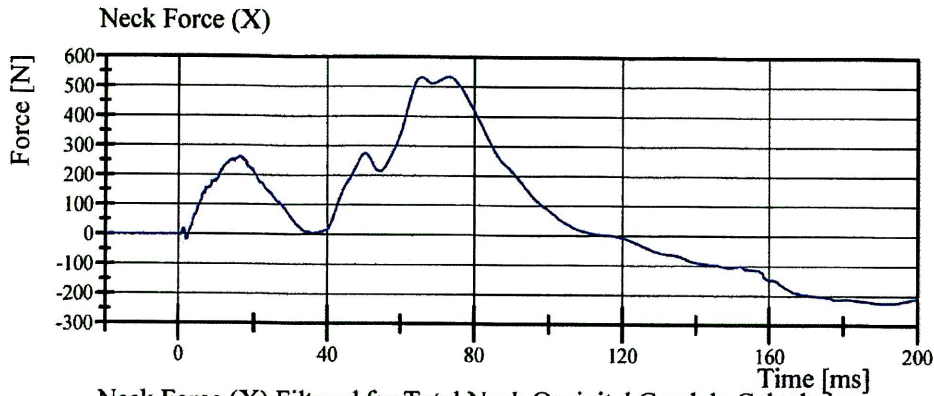
Min: -35.6 ° at 199.8 ms

Transportation Research Center Inc.

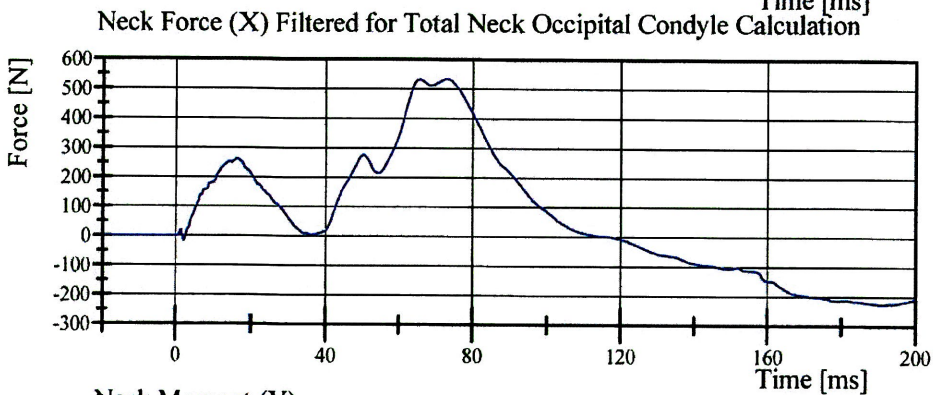
Neck Extension

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

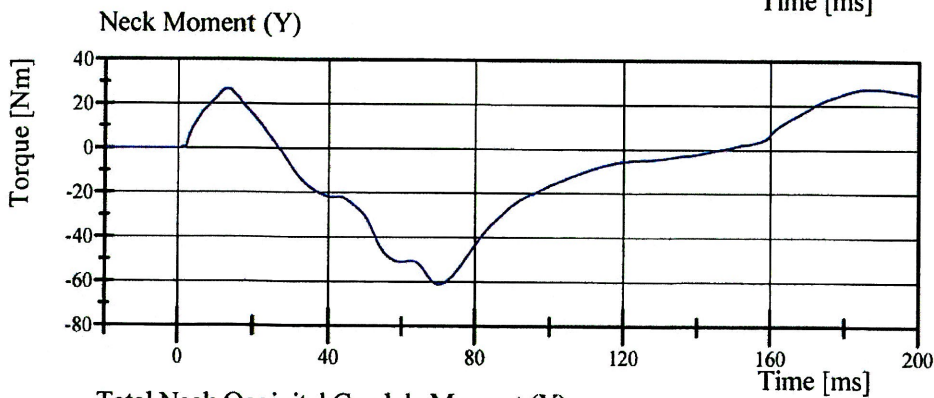
Test Date: 1/25/2010



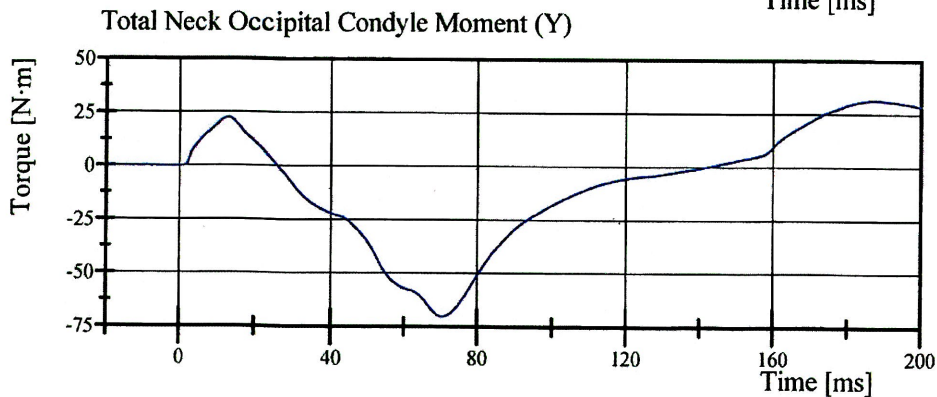
Filter Class: CFC_1000
Max: 535.4 N at 73.2 ms
Min: -225.1 N at 191.9 ms



Filter Class: CFC_600
Max: 535.0 N at 73.1 ms
Min: -224.6 N at 191.7 ms



Filter Class: CFC_600
Max: 27.6 Nm at 187.3 ms
Min: -61.1 Nm at 70.4 ms



Filter Class: CFC_600
Max: 31.5 N·m at 188.2 ms
Min: -70.3 N·m at 70.5 ms

Transportation Research Center Inc.

Front Thorax

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

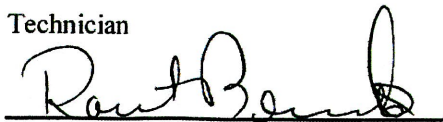
Test Date: 1/27/2010

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

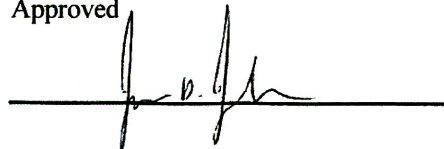
Test meets specifications.

Comments:

Technician



Approved



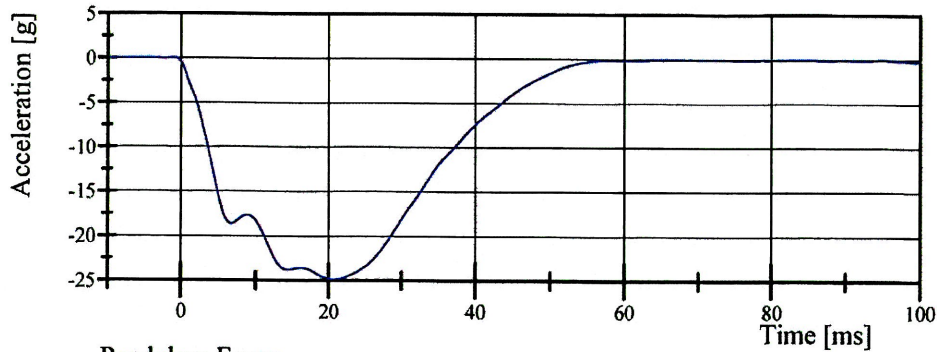
Transportation Research Center Inc.

Front Thorax

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

Test Date: 1/27/2010

Pendulum Acceleration

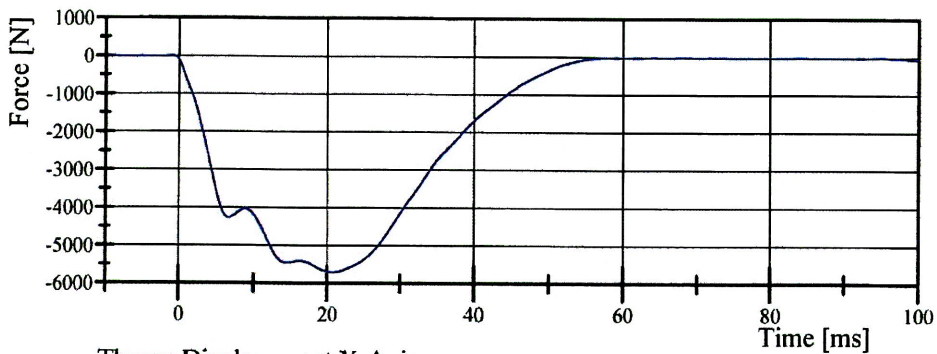


Filter Class: CFC_180

Max: 0.0 g at -1.0 ms

Min: -24.9 g at 20.7 ms

Pendulum Force

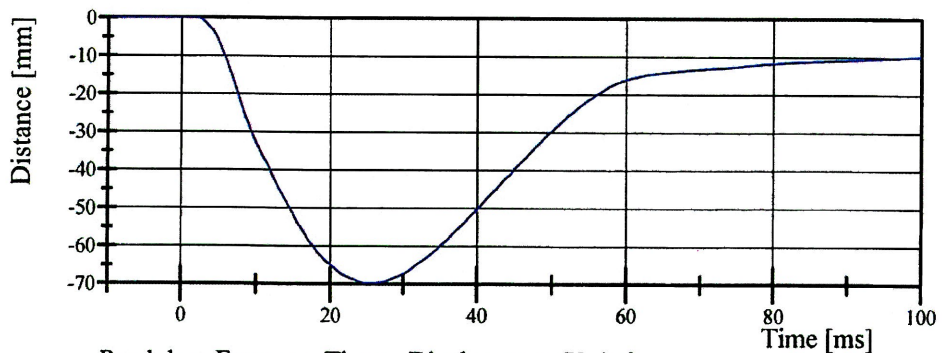


Filter Class: CFC_180

Max: 11.3 N at -1.0 ms

Min: -5,704.6 N at 20.7 ms

Thorax Displacement X-Axis

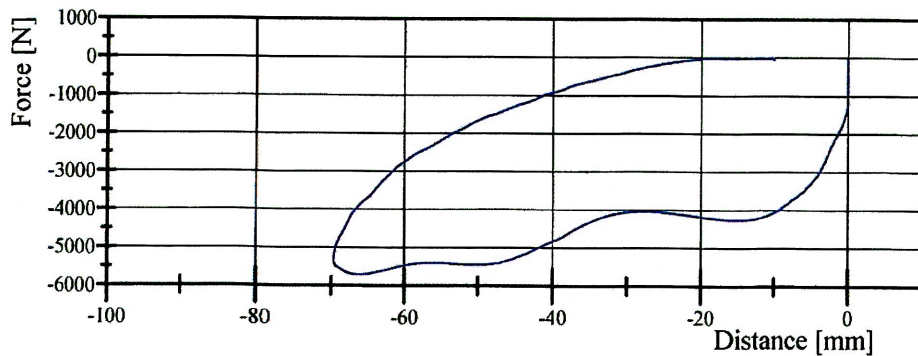


Filter Class: CFC_600

Max: 0.0 mm at -1.4 ms

Min: -69.7 mm at 25.2 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180

Max: 11.3 N at -0.0 mm

Min: -5,704.6 N at -66.1 mm

Transportation Research Center Inc

Hybrid III Hip Range of Motion

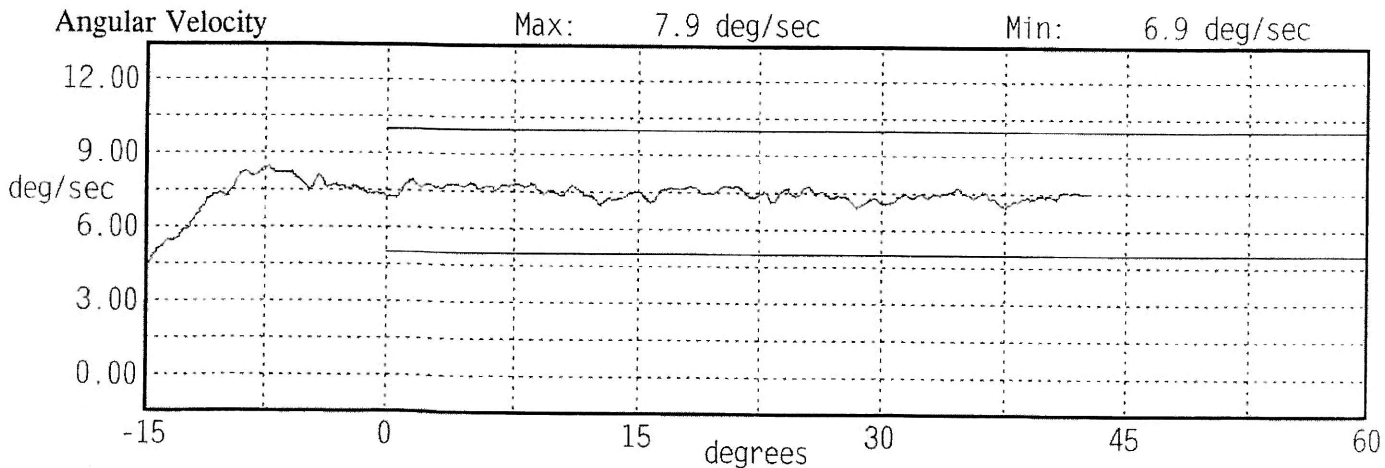
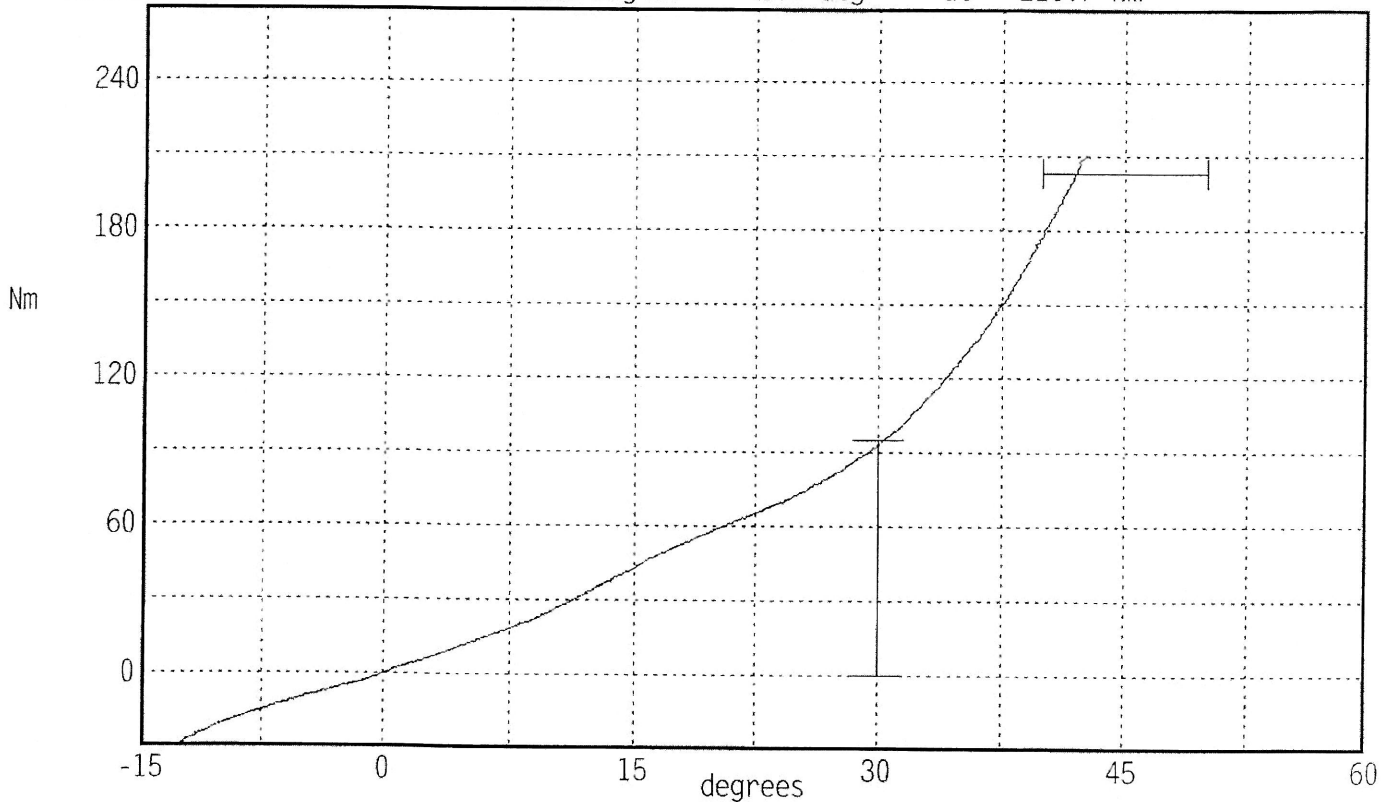
Serial Number: 110L
 Test Number: 110C33

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

Comments:

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

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



Transportation Research Center Inc

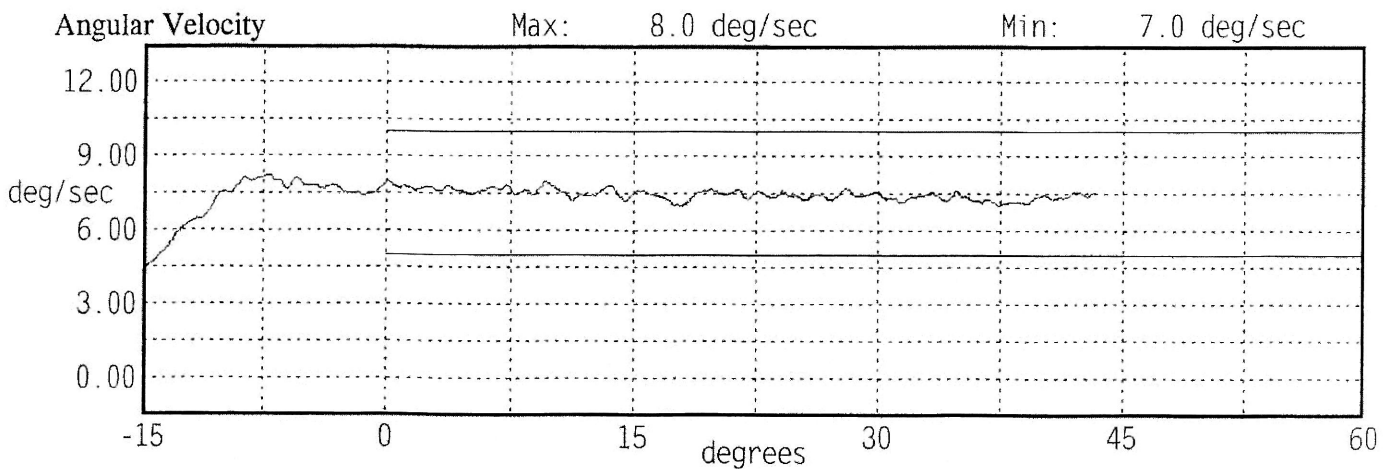
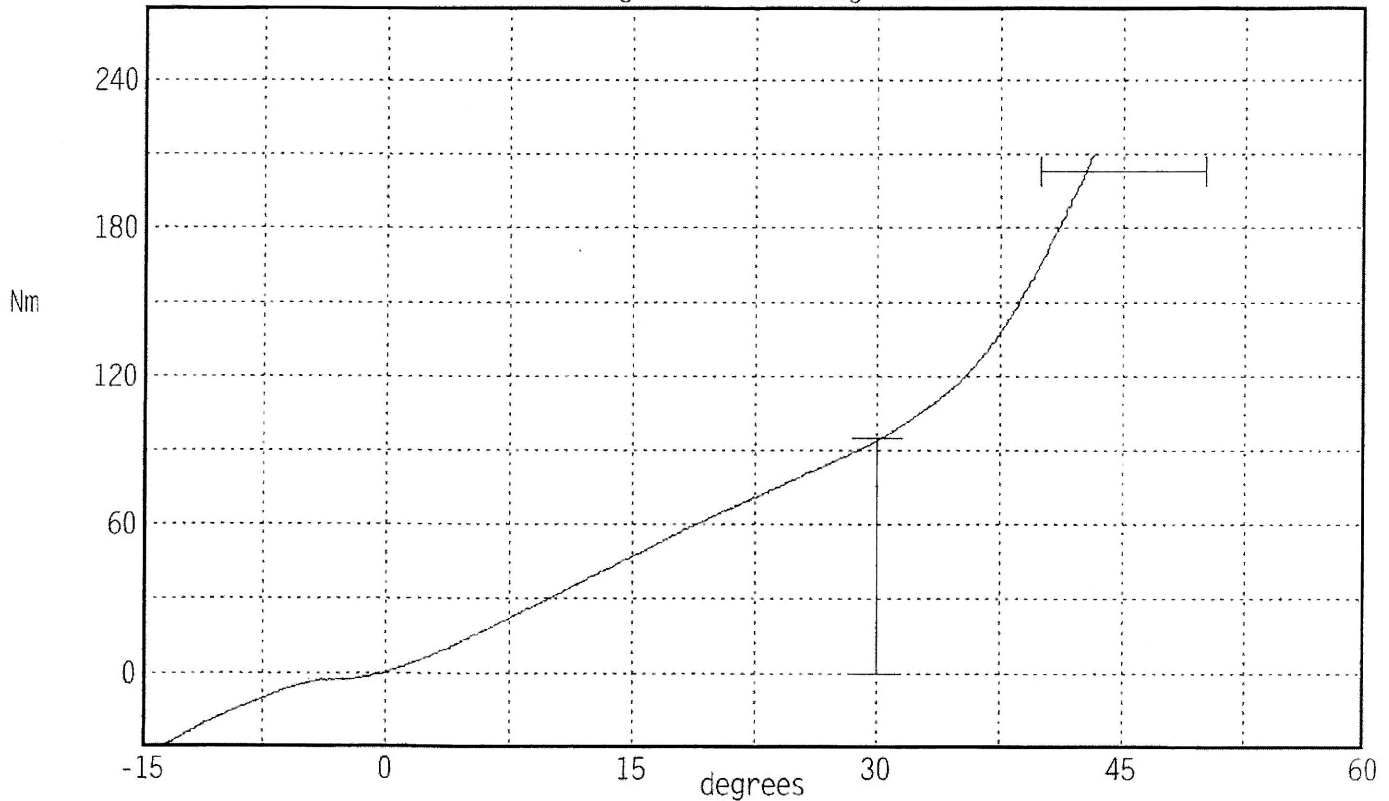
Hybrid III Hip Range of Motion

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

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

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

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



Transportation Research Center Inc.

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

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

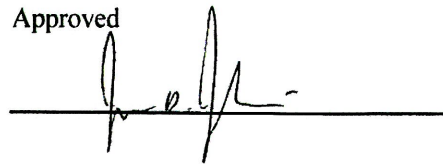
Test meets specifications.

Comments:

Technician



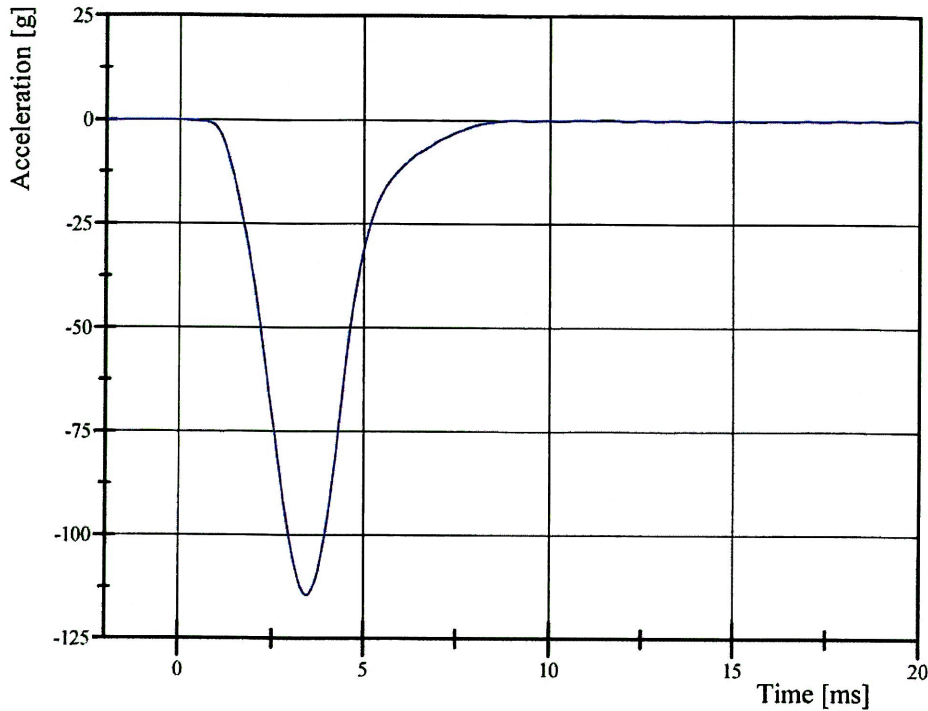
Approved



Transportation Research Center Inc.

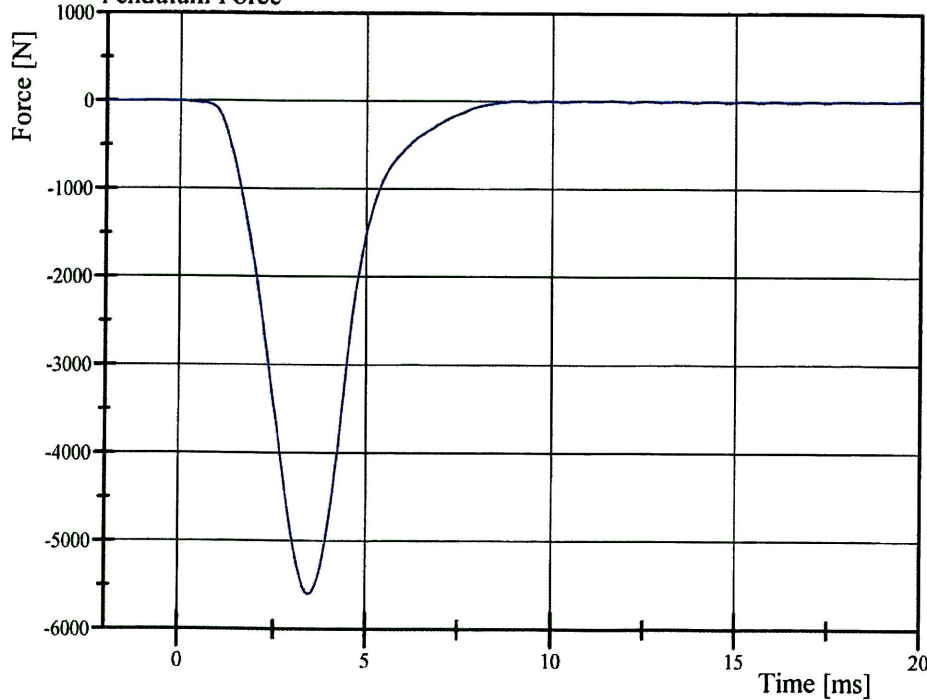
Left Knee Femur Response Test
HIII 50th Serial No. 110 Certification No. 33-1
Test Date: 1/25/2010

Pendulum Acceleration



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

Pendulum Force



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

Transportation Research Center Inc.

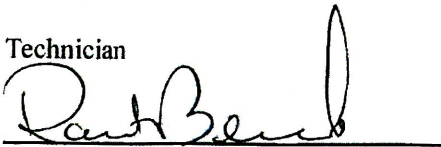
Right Knee Femur Response Test
HIII 50th Serial No. 110 Certification No. 33-2
Test Date: 1/25/2010

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

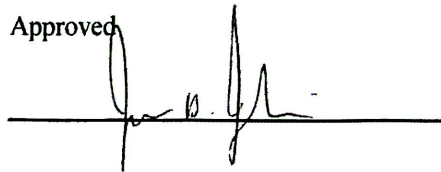
Test meets specifications.

Comments:

Technician

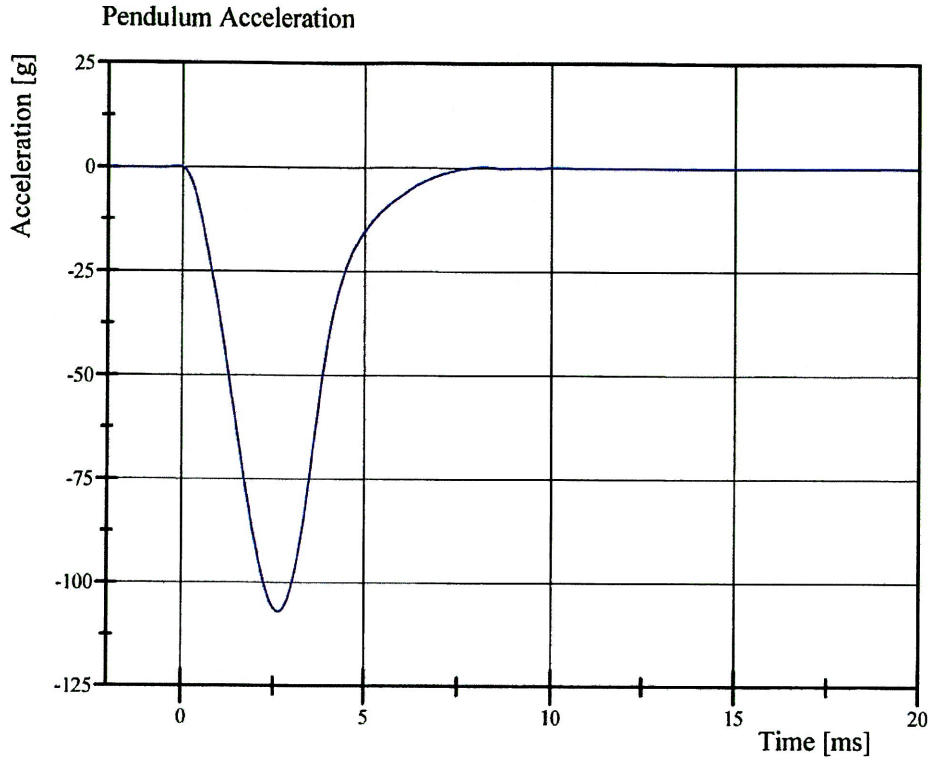


Approved

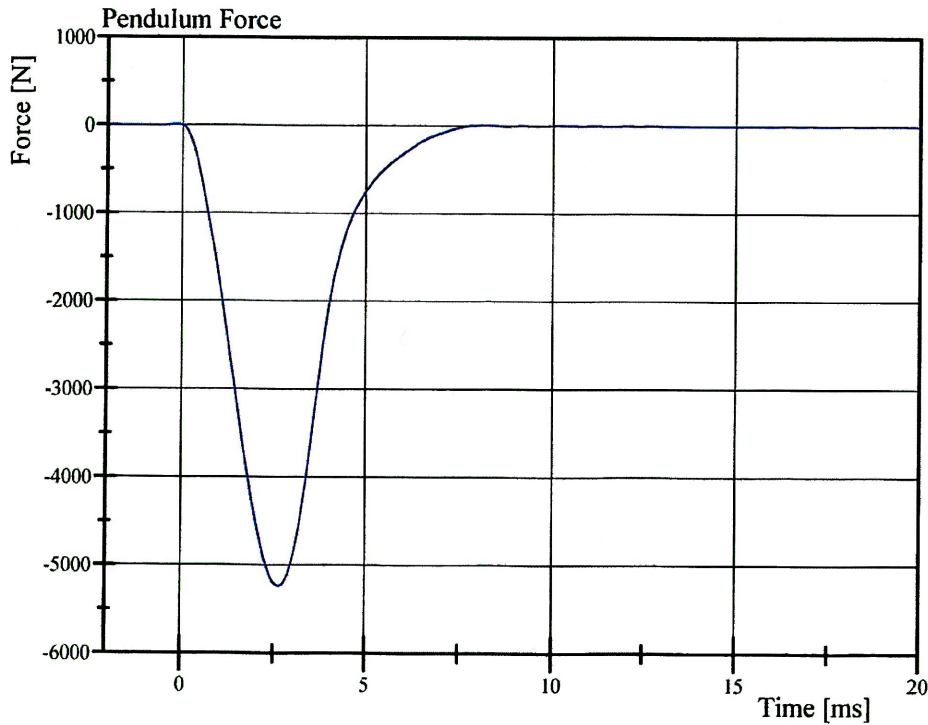


Transportation Research Center Inc.

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



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



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

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

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

Technician

Approved

Calibration Test Results

Pre-Test

Right Front Passenger Dummy S/N: 001

Transportation Research Center Inc.

Front Head Drop

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

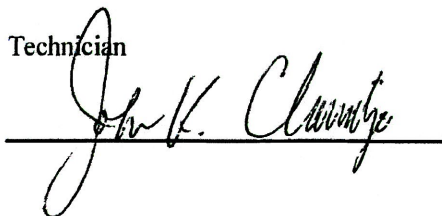
Test Date: 1/25/2010

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

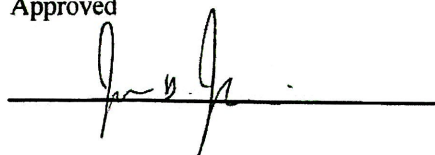
Test meets specifications.

Comments:

Technician



Approved

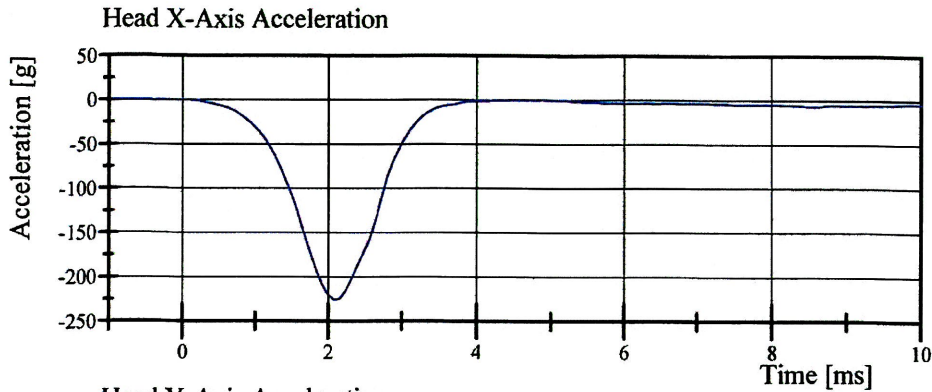


Transportation Research Center Inc.

Front Head Drop

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

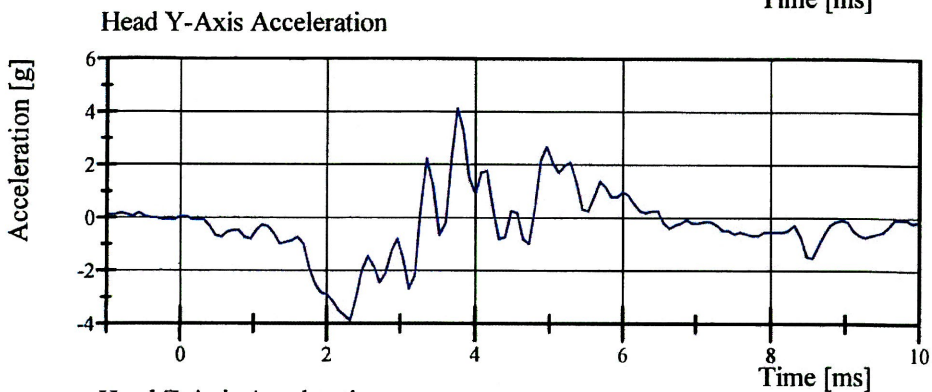
Test Date: 1/25/2010



Filter Class: CFC_1000

Max: 0.4 g at 4.9 ms

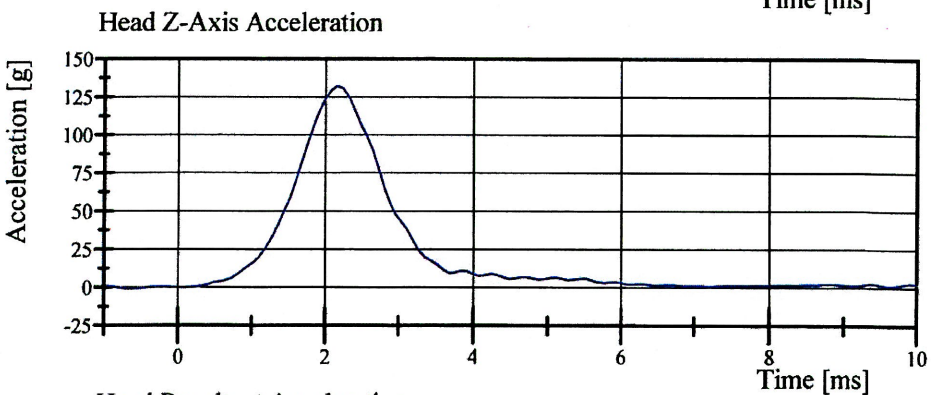
Min: -226.0 g at 2.1 ms



Filter Class: CFC_1000

Max: 4.1 g at 3.8 ms

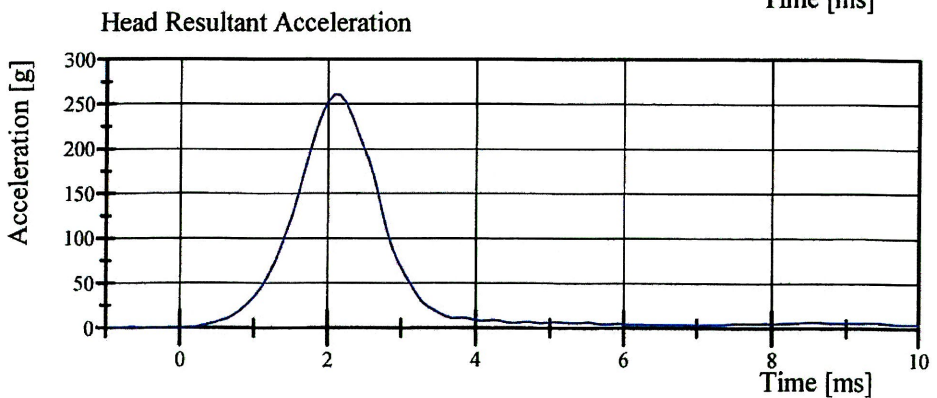
Min: -3.9 g at 2.3 ms



Filter Class: CFC_1000

Max: 132.4 g at 2.2 ms

Min: -0.9 g at -0.6 ms



Filter Class: CFC_1000

Max: 260.6 g at 2.1 ms

Min: 0.1 g at 0.0 ms

Transportation Research Center Inc.

Neck Flexion

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

Test Date: 1/25/2010

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

Test meets specifications.

Comments:

Technician



Approved



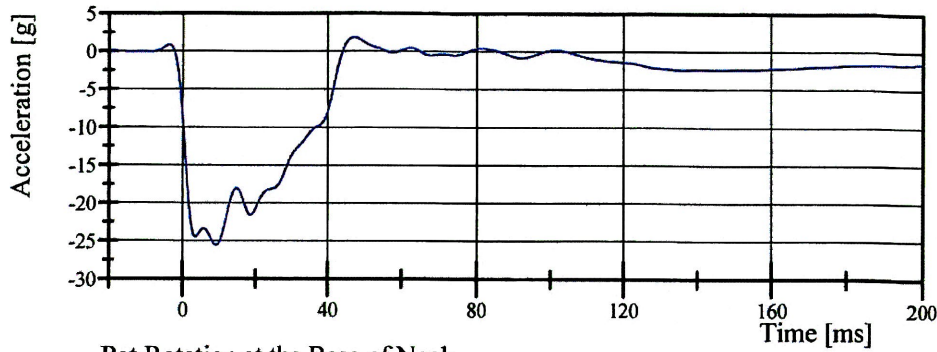
Transportation Research Center Inc.

Neck Flexion

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

Test Date: 1/25/2010

Pendulum Acceleration

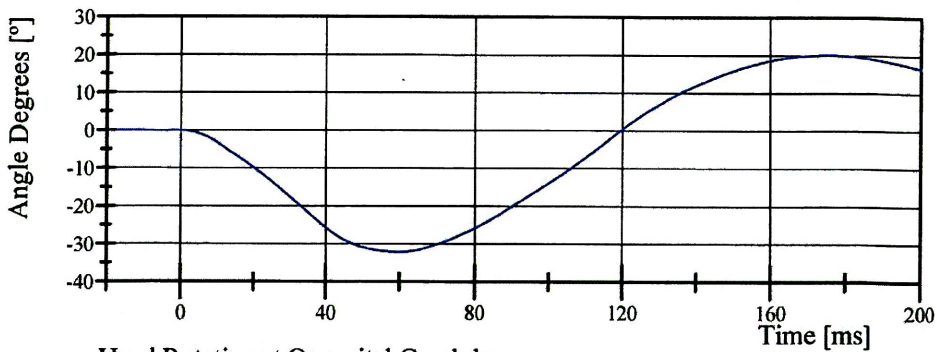


Filter Class: CFC_60

Max: 1.9 g at 47.0 ms

Min: -25.5 g at 9.1 ms

Pot Rotation at the Base of Neck

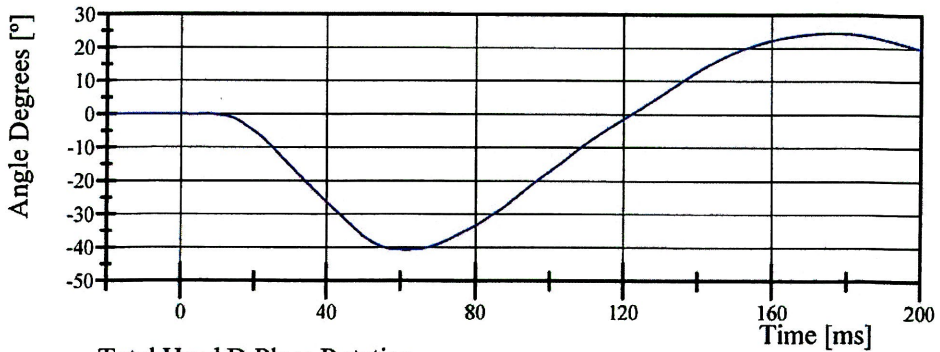


Filter Class: CFC_60

Max: 20.1 ° at 175.7 ms

Min: -32.1 ° at 59.9 ms

Head Rotation at Occypital Condyles

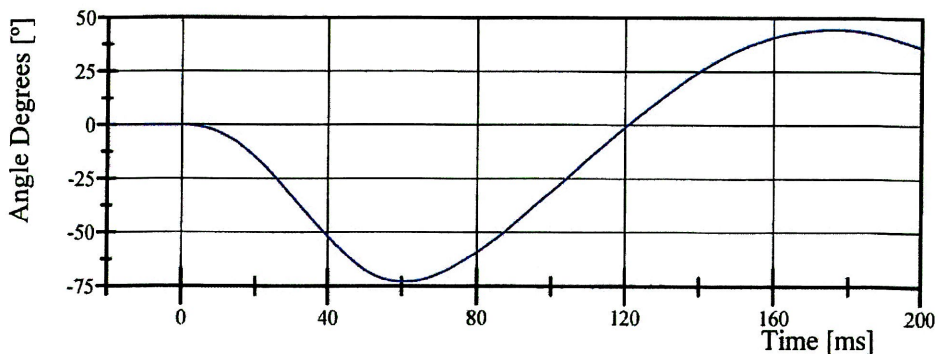


Filter Class: CFC_60

Max: 24.5 ° at 176.7 ms

Min: -40.6 ° at 61.6 ms

Total Head D-Plane Rotation



Filter Class: CFC_60

Max: 44.6 ° at 176.3 ms

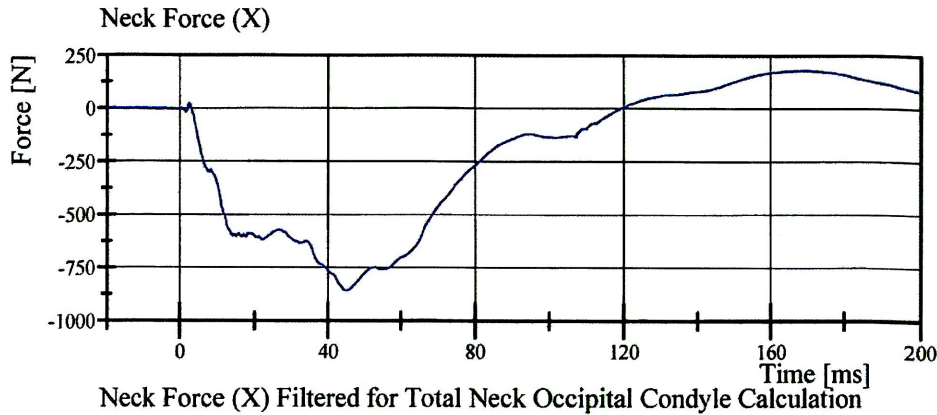
Min: -72.7 ° at 60.5 ms

Transportation Research Center Inc.

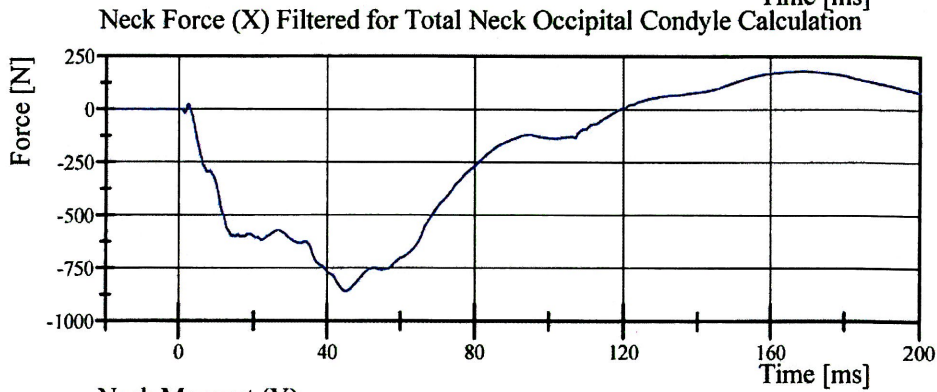
Neck Flexion

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

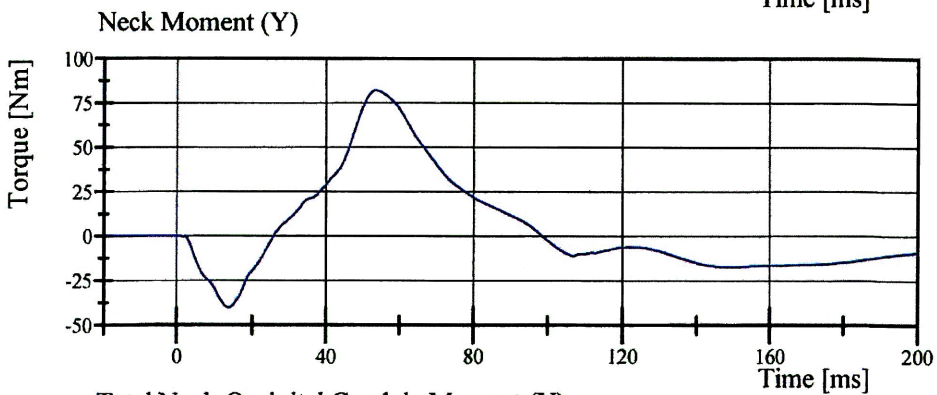
Test Date: 1/25/2010



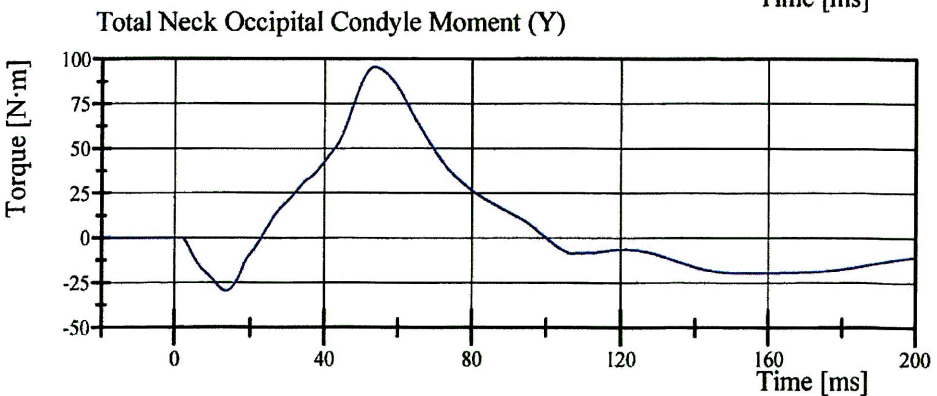
Filter Class: CFC_1000
Max: 183.1 N at 168.4 ms
Min: -858.6 N at 44.8 ms



Filter Class: CFC_600
Max: 183.0 N at 168.6 ms
Min: -858.6 N at 45.0 ms



Filter Class: CFC_600
Max: 82.2 Nm at 53.4 ms
Min: -40.0 Nm at 13.8 ms



Filter Class: CFC_600
Max: 95.5 N·m at 53.5 ms
Min: -29.7 N·m at 13.4 ms

Transportation Research Center Inc.

Neck Extension

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

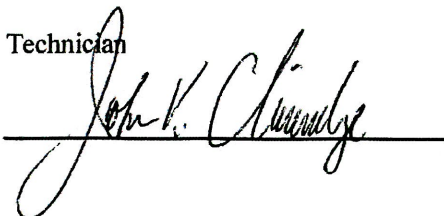
Test Date: 1/25/2010

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

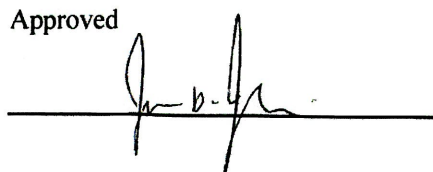
Test meets specifications.

Comments:

Technician



Approved



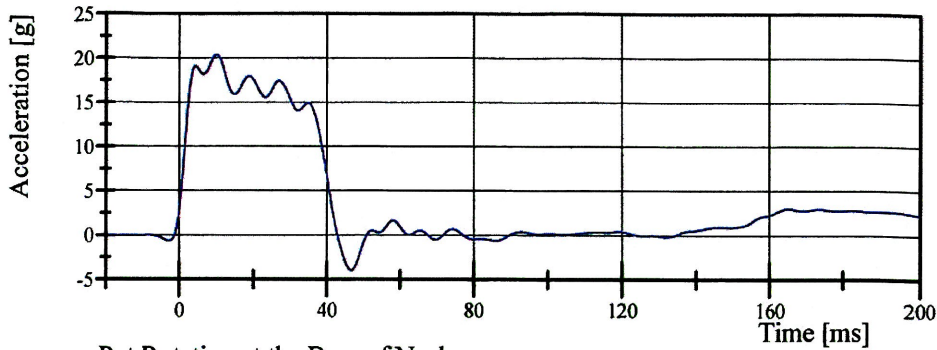
Transportation Research Center Inc.

Neck Extension

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

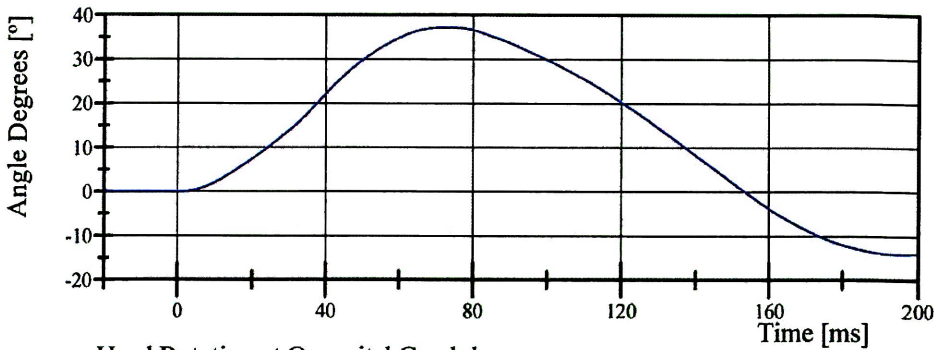
Test Date: 1/25/2010

Pendulum Acceleration



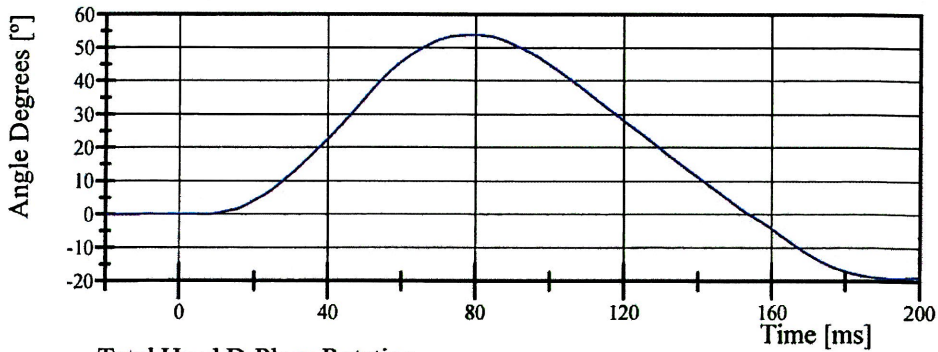
Filter Class: CFC_60
Max: 20.4 g at 10.1 ms
Min: -4.0 g at 46.6 ms

Pot Rotation at the Base of Neck



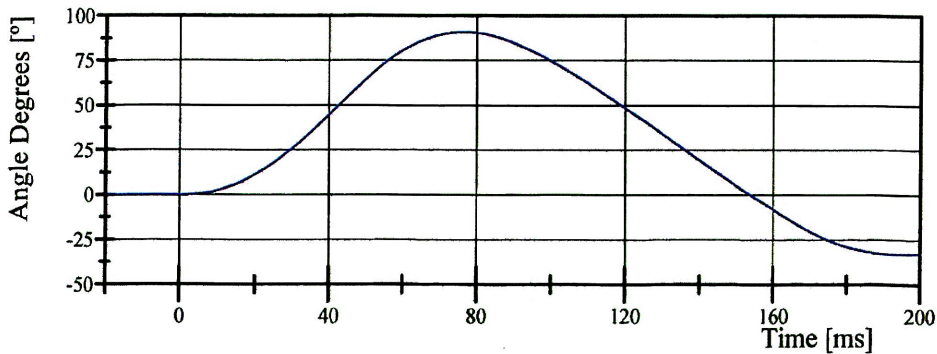
Filter Class: CFC_60
Max: 37.2 ° at 72.6 ms
Min: -14.0 ° at 195.8 ms

Head Rotation at Occipital Condyles



Filter Class: CFC_60
Max: 53.9 ° at 79.4 ms
Min: -19.0 ° at 193.8 ms

Total Head D-Plane Rotation



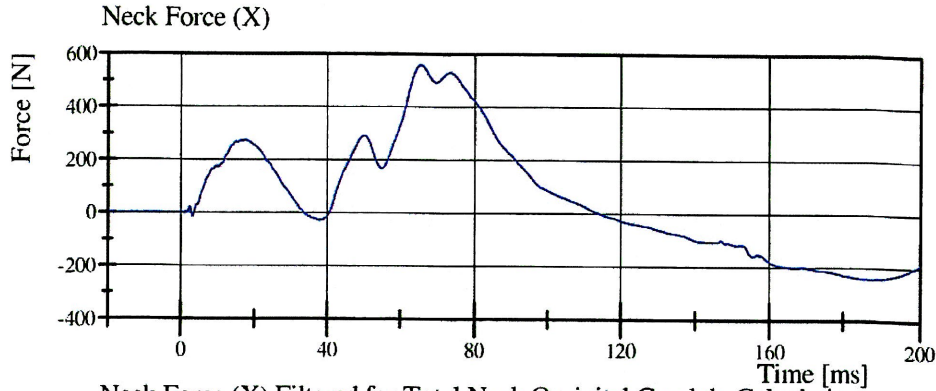
Filter Class: CFC_60
Max: 90.9 ° at 76.7 ms
Min: -33.0 ° at 194.8 ms

Transportation Research Center Inc.

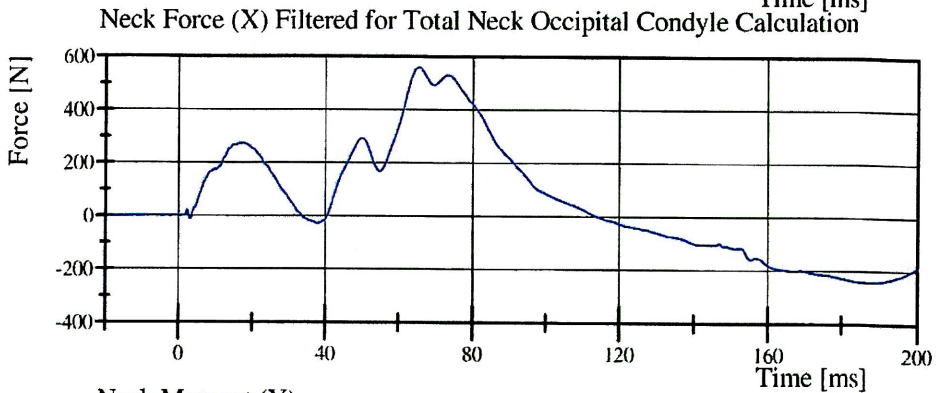
Neck Extension

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

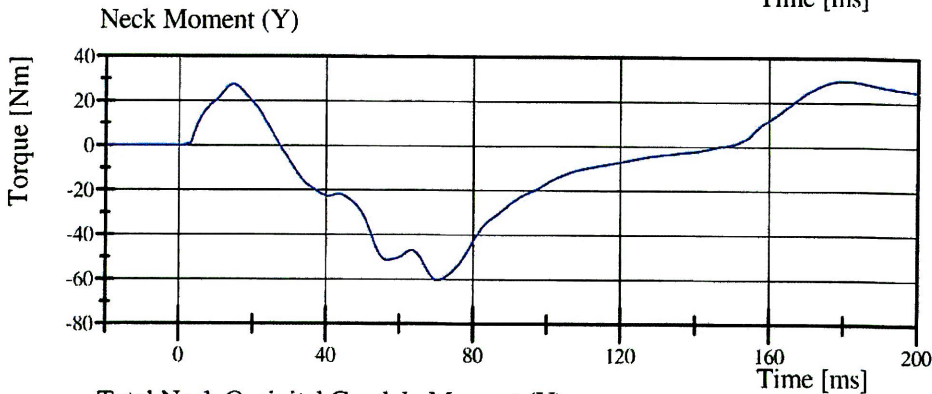
Test Date: 1/25/2010



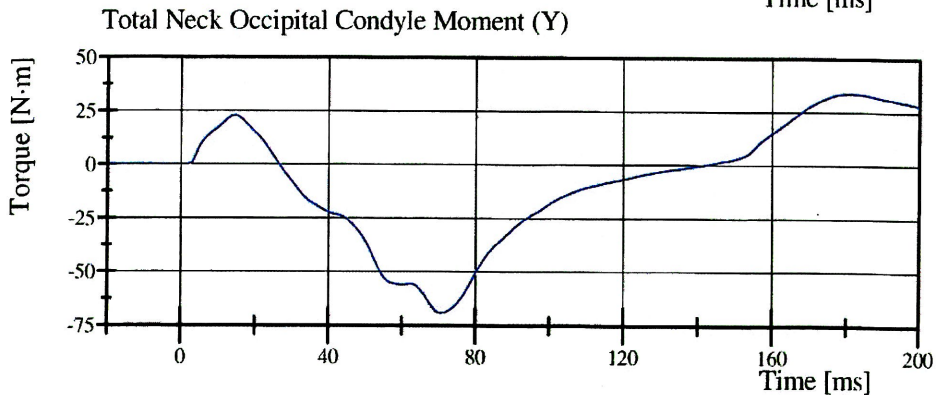
Filter Class: CFC_1000
Max: 559.6 N at 65.5 ms
Min: -242.8 N at 187.7 ms



Filter Class: CFC_600
Max: 559.5 N at 65.6 ms
Min: -242.4 N at 187.6 ms



Filter Class: CFC_600
Max: 29.5 Nm at 179.9 ms
Min: -60.5 Nm at 70.4 ms



Filter Class: CFC_600
Max: 33.6 N·m at 181.5 ms
Min: -69.3 N·m at 70.6 ms

Transportation Research Center Inc.

Front Thorax

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

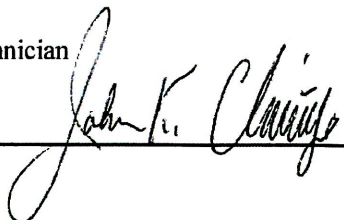
Test Date: 1/26/2010

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

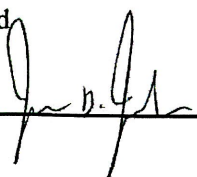
Test meets specifications.

Comments:

Technician



Approved

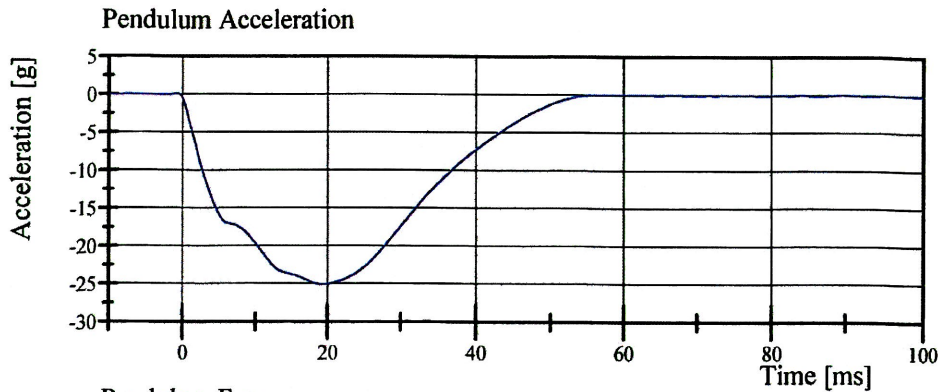


Transportation Research Center Inc.

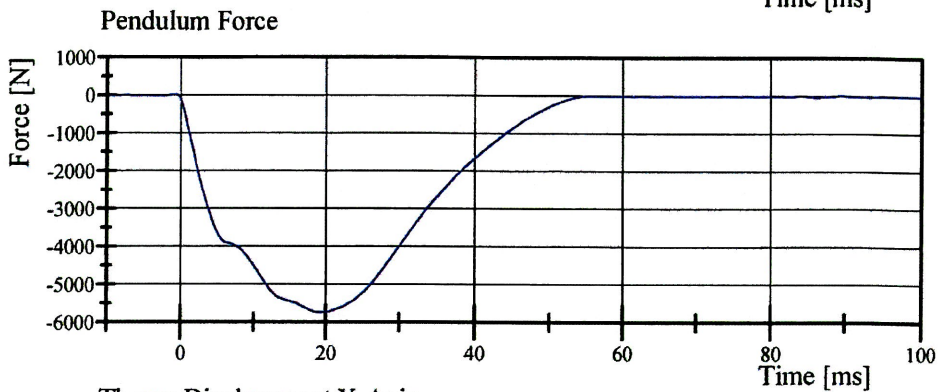
Front Thorax

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

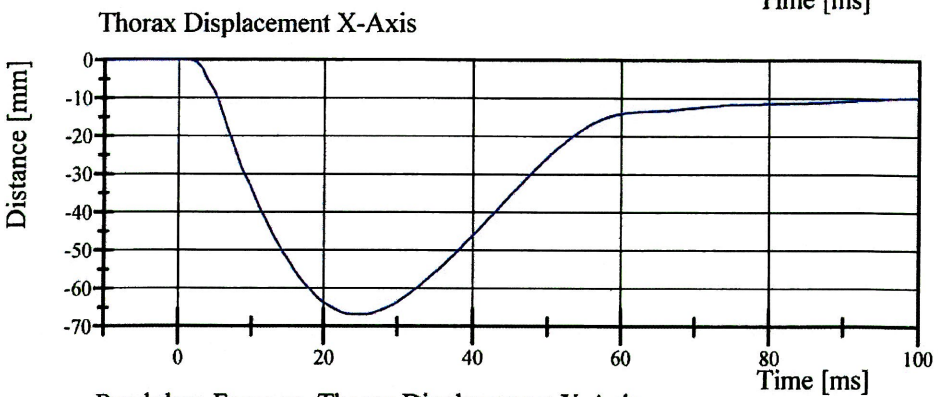
Test Date: 1/26/2010



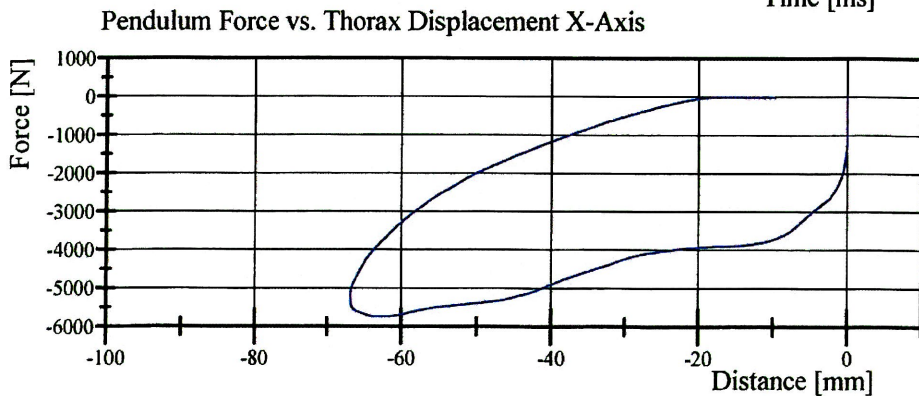
Filter Class: CFC_180
Max: 0.1 g at -0.8 ms
Min: -25.0 g at 19.7 ms



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



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



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

Transportation Research Center Inc

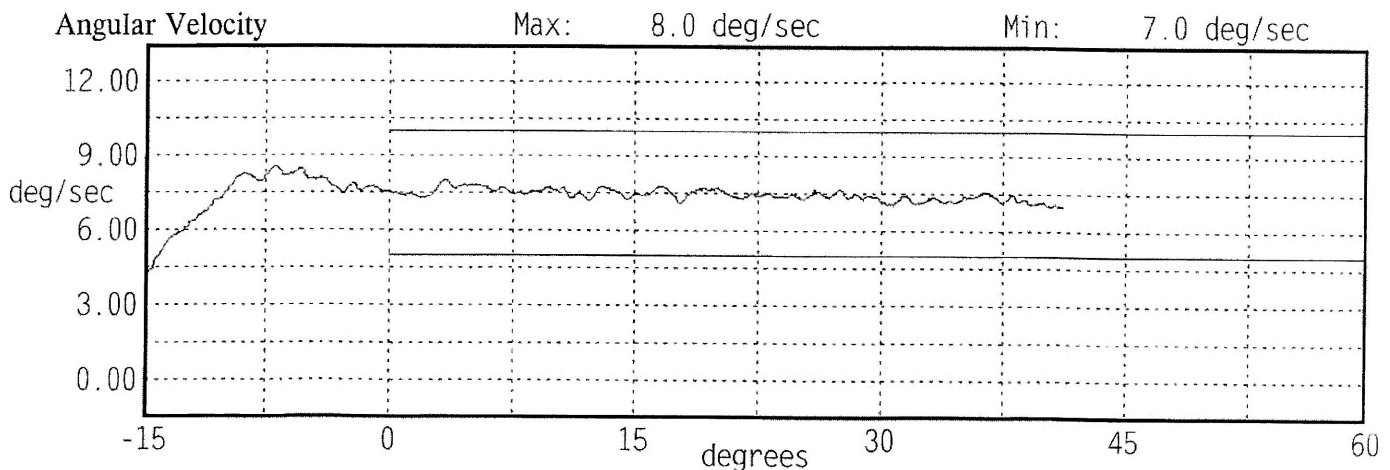
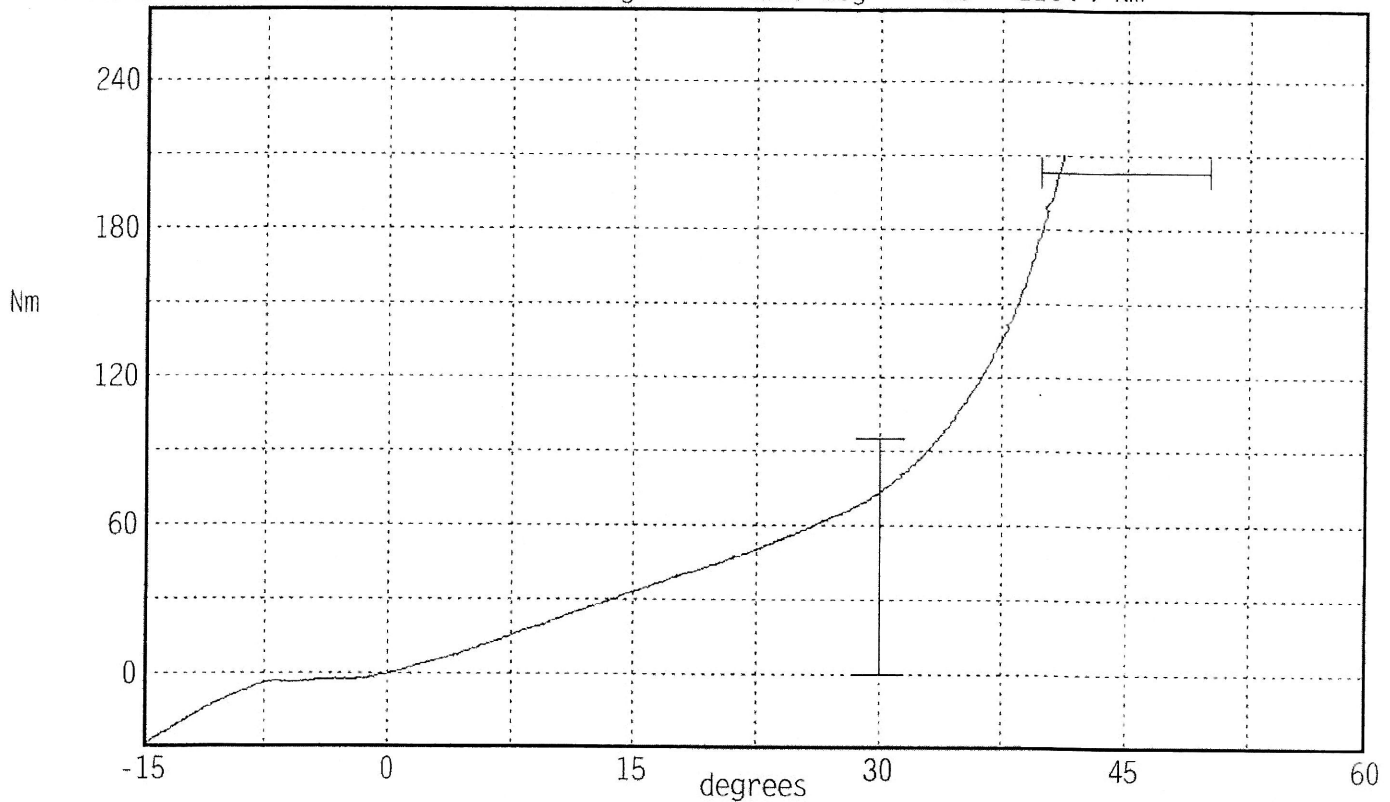
Hybrid III Hip Range of Motion

Serial Number: 001L
Test Number: 001C13
Comments:

Date: 01/22/2010
Time: 10:49

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

Moment About H-Point
Peak Moment: 210.4 Nm at 41.3 deg
Peak Angle: 41.3 deg at 210.4 Nm



Transportation Research Center Inc

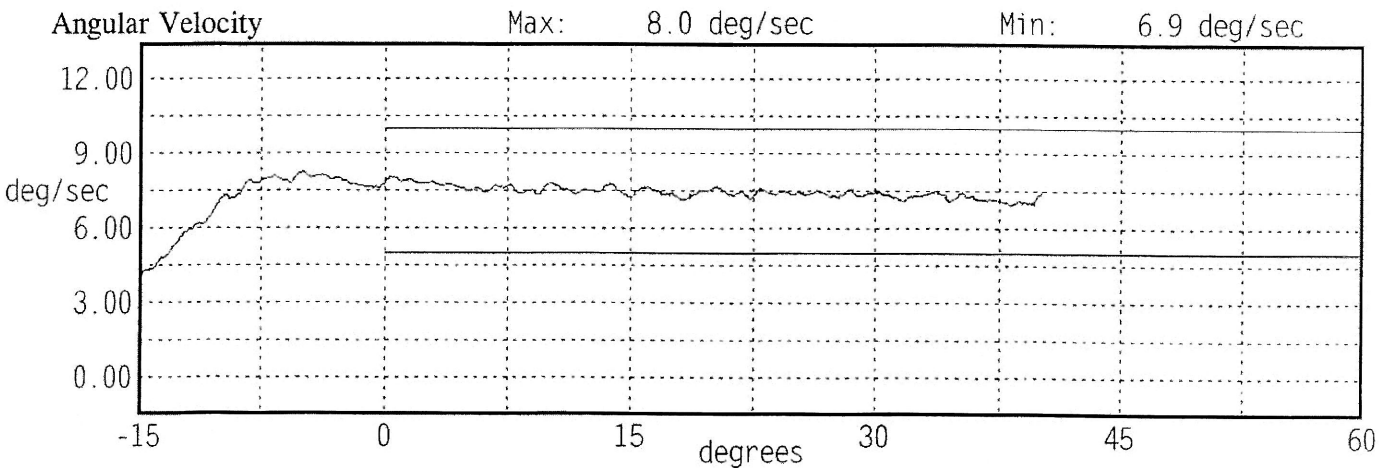
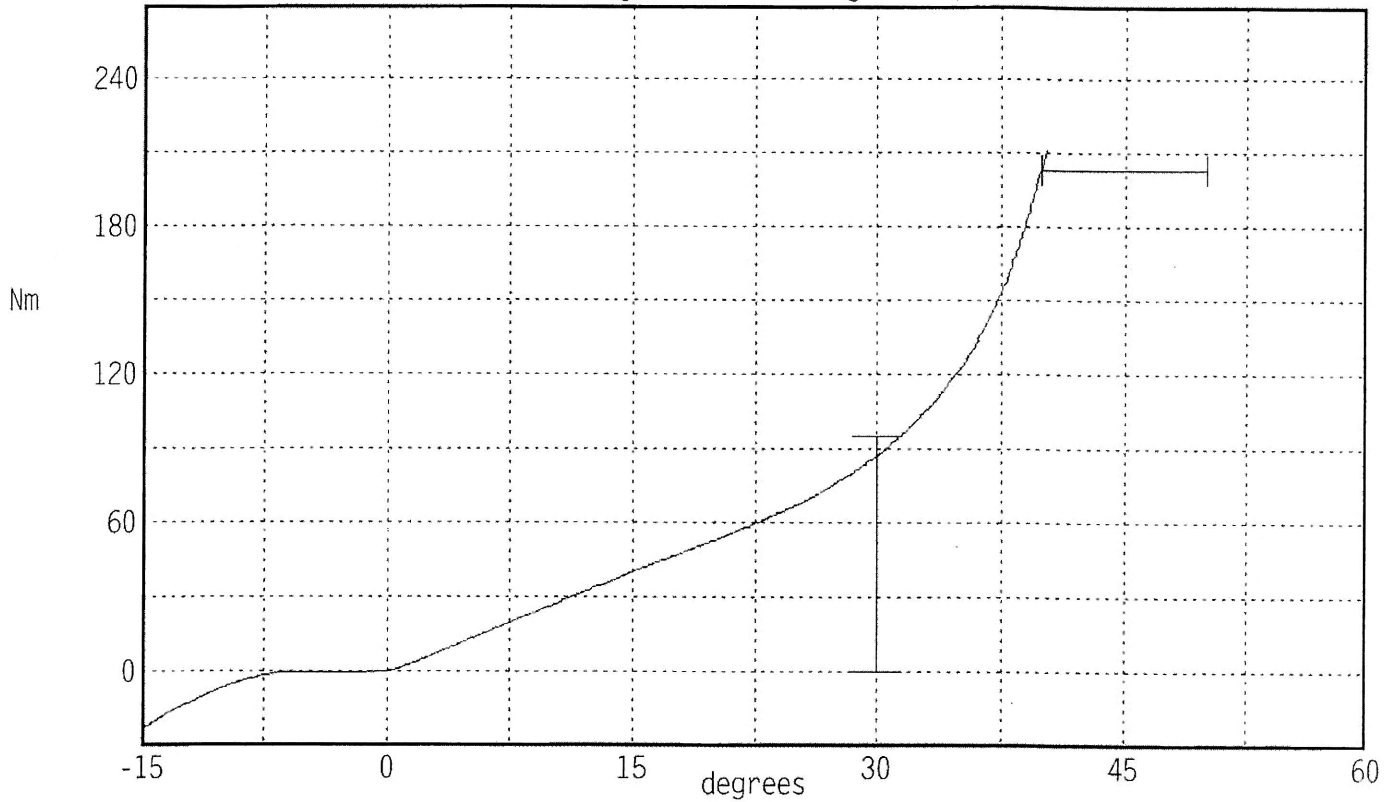
Hybrid III Hip Range of Motion

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

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

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

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



Transportation Research Center Inc.

Left Knee Femur Response Test

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

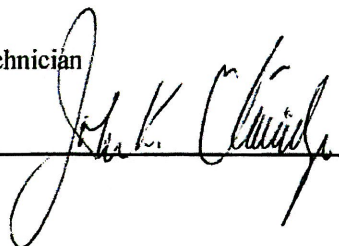
Test Date: 1/25/2010

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

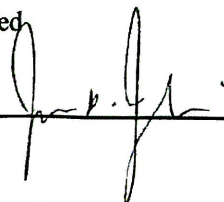
Test meets specifications.

Comments:

Technician



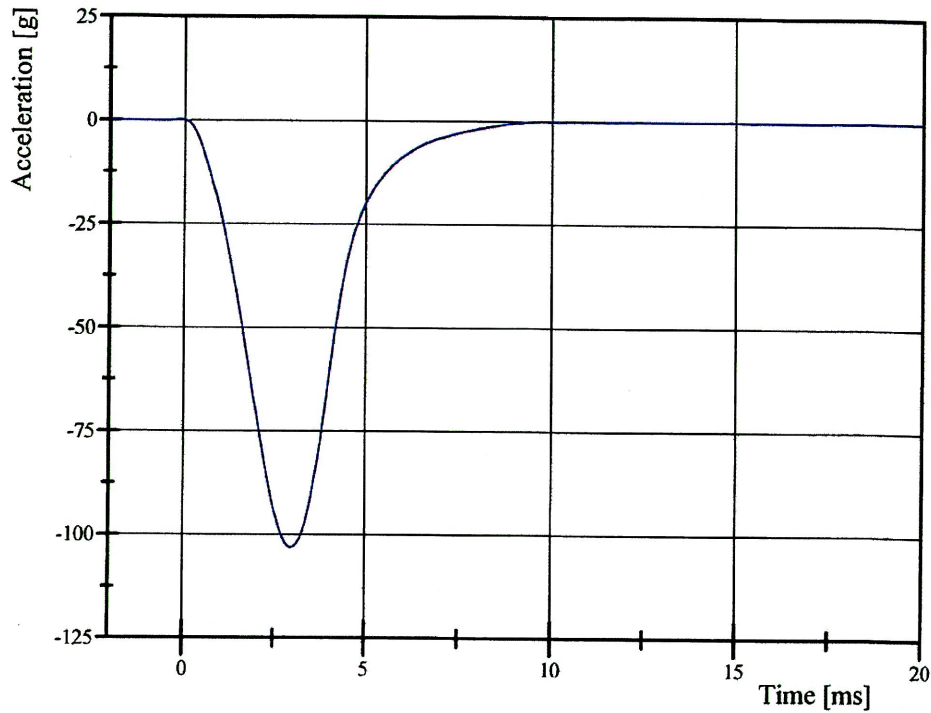
Approved



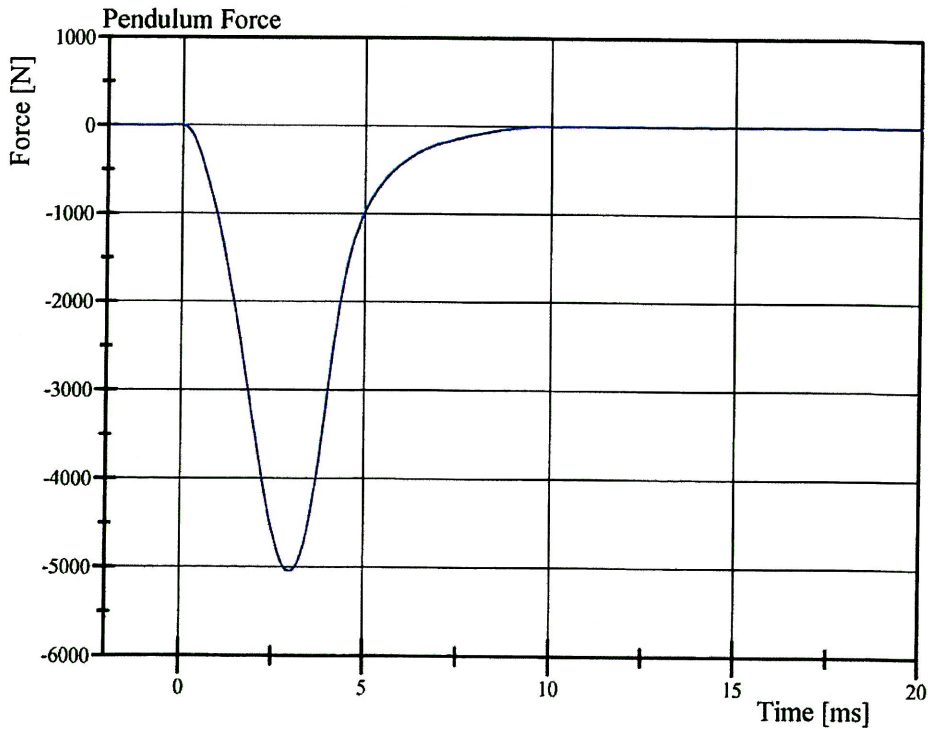
Transportation Research Center Inc.

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

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at -0.1 ms
Min: -103.1 g at 3.0 ms



Filter Class: CFC_600
Max: 7.6 N at -0.1 ms
Min: -5,043.2 N at 3.0 ms

Transportation Research Center Inc.

Right Knee Femur Response Test

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

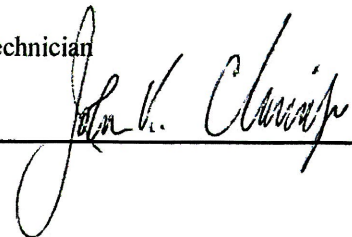
Test Date: 1/25/2010

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

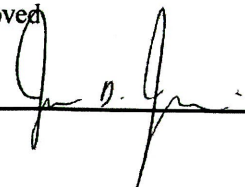
Test meets specifications.

Comments:

Technician



Approved



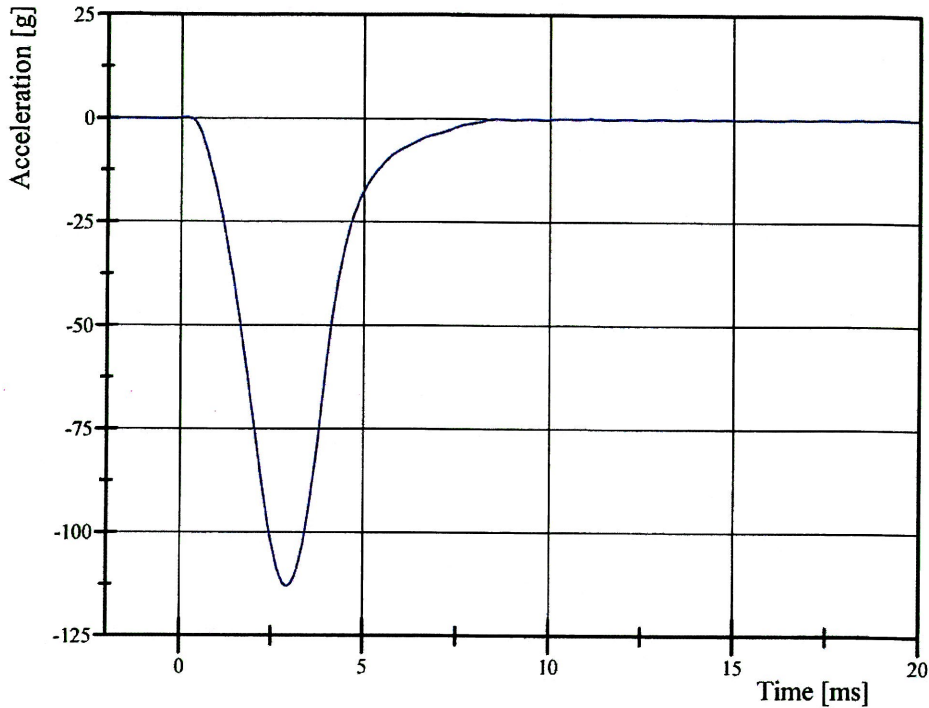
Transportation Research Center Inc.

Right Knee Femur Response Test

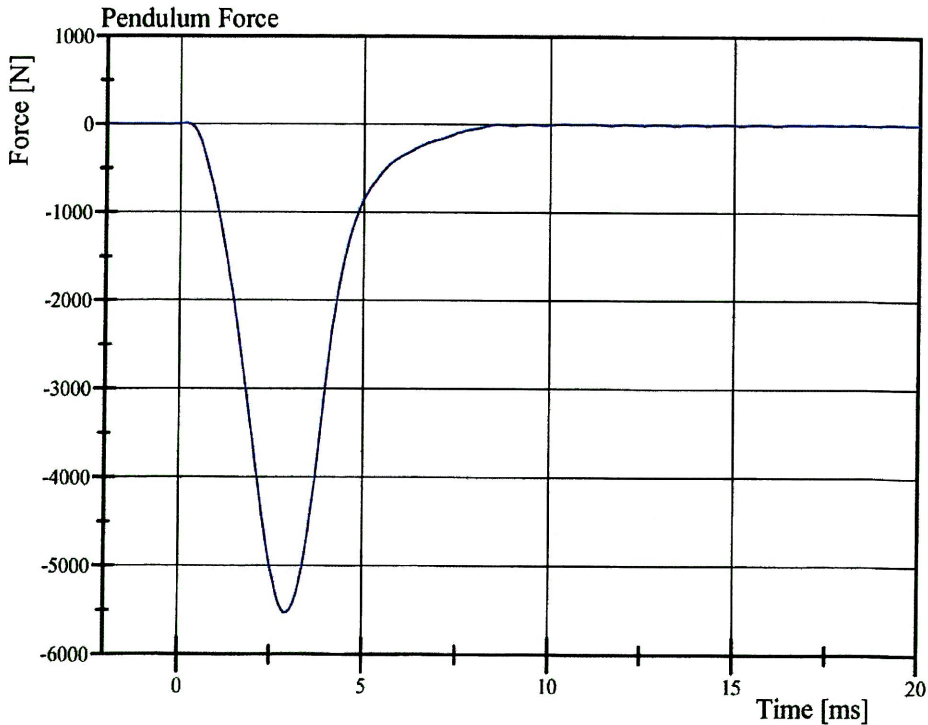
HIII 50th Serial No. 001 Certification No. 13-1

Test Date: 1/25/2010

Pendulum Acceleration



Filter Class: CFC_600
Max: 0.2 g at 0.2 ms
Min: -113.0 g at 3.0 ms

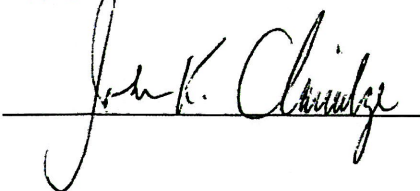


Filter Class: CFC_600
Max: 10.7 N at 0.2 ms
Min: -5,527.7 N at 3.0 ms

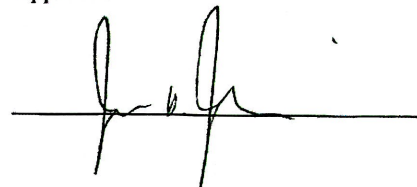
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 001 Calibration No. 13

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

Technician



Approved



Calibration Test Results

Pre-Test

Right Rear Passenger Dummy S/N: 043

Transportation Research Center Inc.

Front Head Drop

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

Test Date: 1/25/2010

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

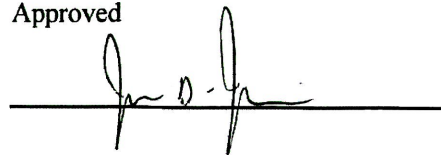
Test meets specifications.

Comments:

Technician



Approved



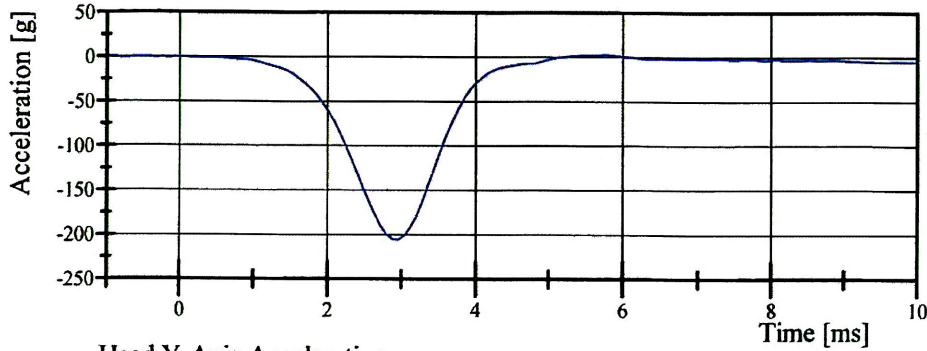
Transportation Research Center Inc.

Front Head Drop

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

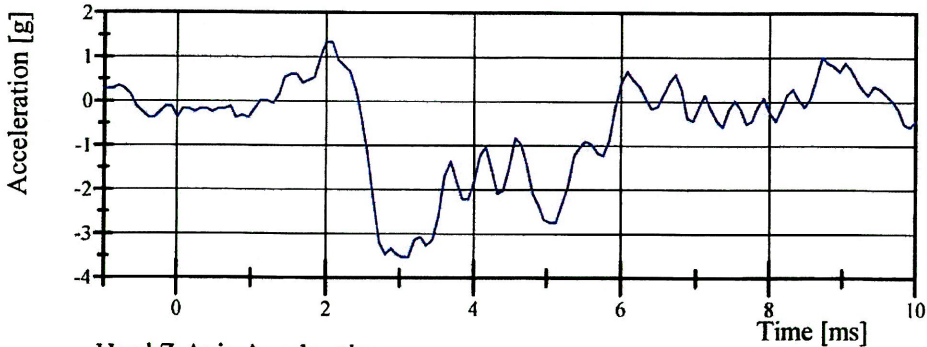
Test Date: 1/25/2010

Head X-Axis Acceleration



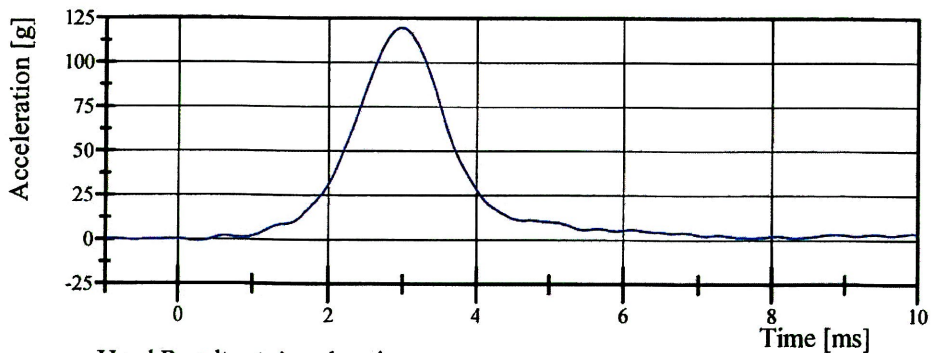
Filter Class: CFC_1000
Max: 3.1 g at 5.8 ms
Min: -205.7 g at 3.0 ms

Head Y-Axis Acceleration



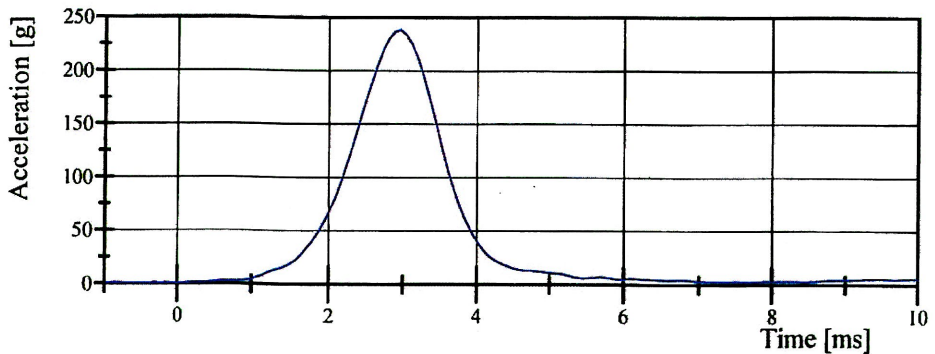
Filter Class: CFC_1000
Max: 1.3 g at 2.0 ms
Min: -3.5 g at 3.0 ms

Head Z-Axis Acceleration



Filter Class: CFC_1000
Max: 119.8 g at 3.0 ms
Min: -1.0 g at 0.2 ms

Head Resultant Acceleration



Filter Class: CFC_1000
Max: 238.0 g at 3.0 ms
Min: 0.6 g at -0.5 ms

Transportation Research Center Inc.

Neck Flexion

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

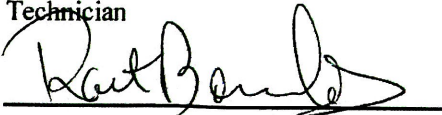
Test Date: 1/25/2010

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

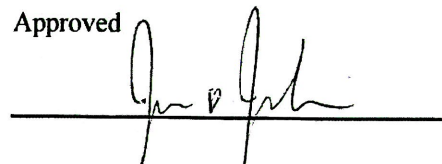
Test meets specifications.

Comments:

Technician



Approved



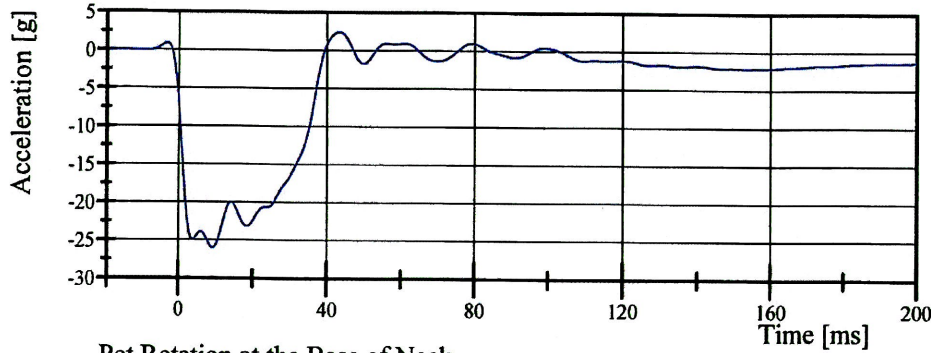
Transportation Research Center Inc.

Neck Flexion

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

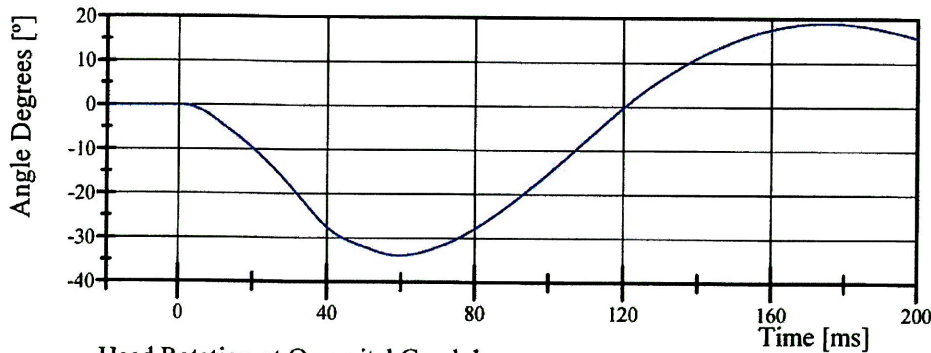
Test Date: 1/25/2010

Pendulum Acceleration



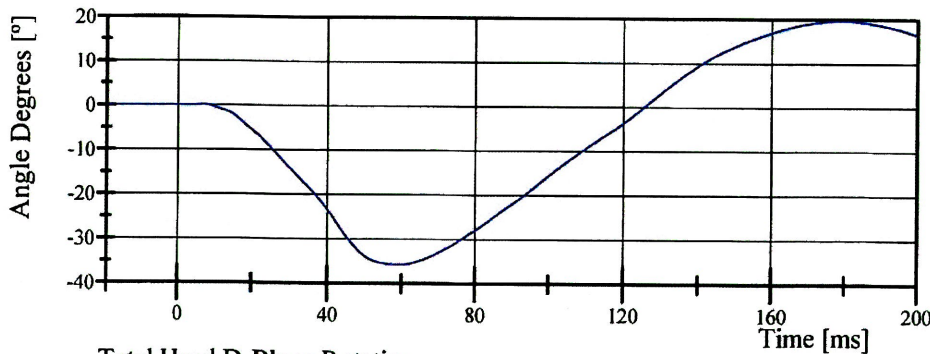
Filter Class: CFC_60
Max: 2.4 g at 43.3 ms
Min: -26.0 g at 9.4 ms

Pot Rotation at the Base of Neck



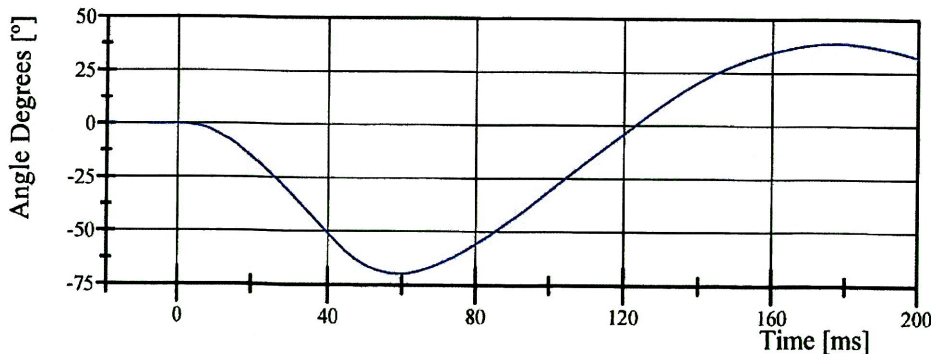
Filter Class: CFC_60
Max: 19.0 ° at 175.2 ms
Min: -33.9 ° at 59.6 ms

Head Rotation at Occypital Condyles



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

Total Head D-Plane Rotation



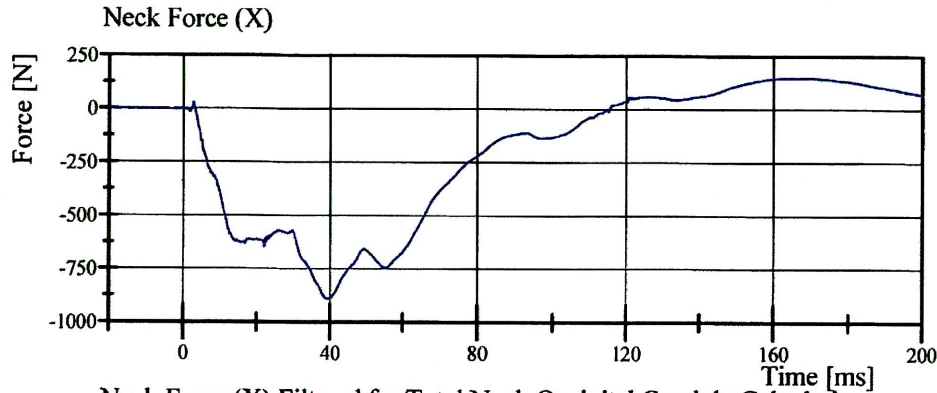
Filter Class: CFC_60
Max: 38.6 ° at 177.4 ms
Min: -69.7 ° at 59.5 ms

Transportation Research Center Inc.

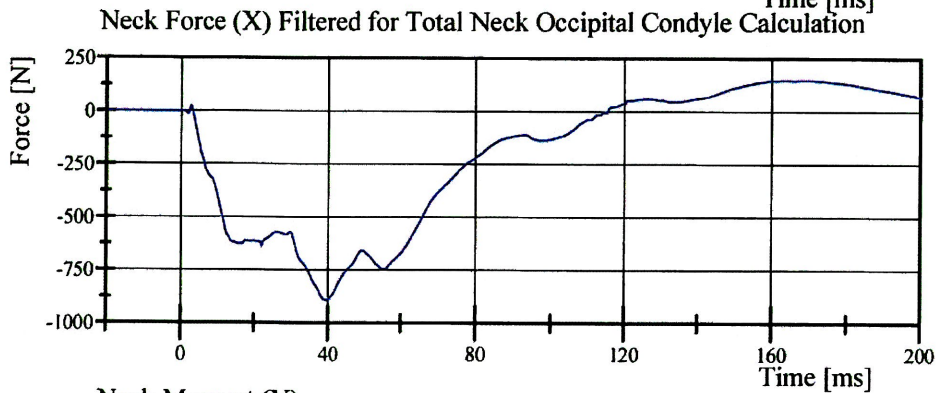
Neck Flexion

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

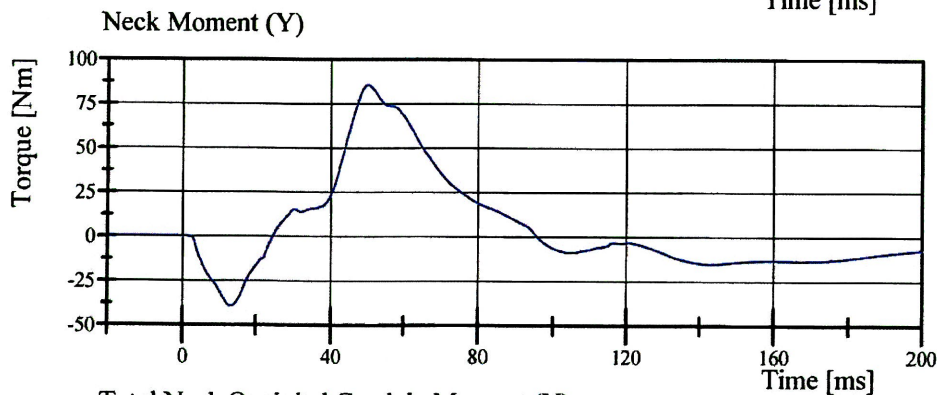
Test Date: 1/25/2010



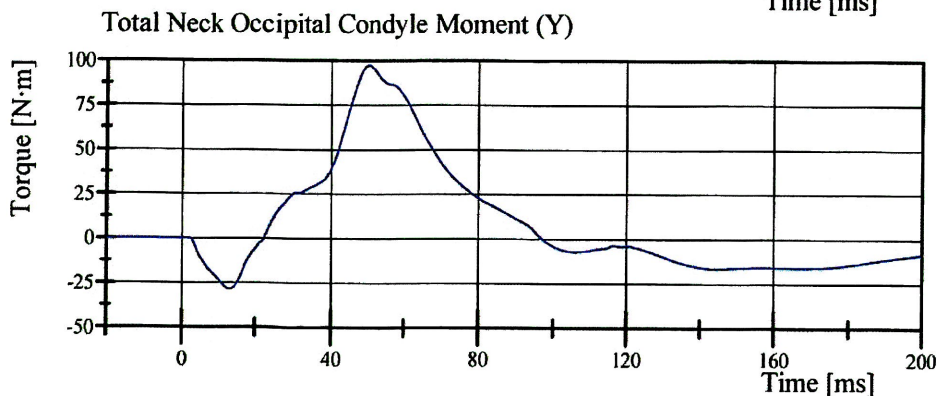
Filter Class: CFC_1000
Max: 150.1 N at 169.5 ms
Min: -892.1 N at 39.3 ms



Filter Class: CFC_600
Max: 149.5 N at 169.5 ms
Min: -891.4 N at 39.3 ms



Filter Class: CFC_600
Max: 85.5 Nm at 50.1 ms
Min: -39.3 Nm at 13.5 ms



Filter Class: CFC_600
Max: 97.3 N·m at 50.2 ms
Min: -28.7 N·m at 12.8 ms

Transportation Research Center Inc.

Neck Extension

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

Test Date: 1/25/2010

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

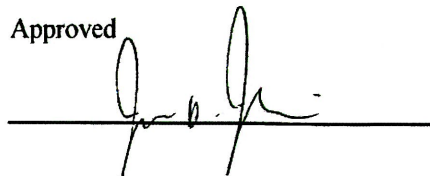
Test meets specifications.

Comments:

Technician



Approved



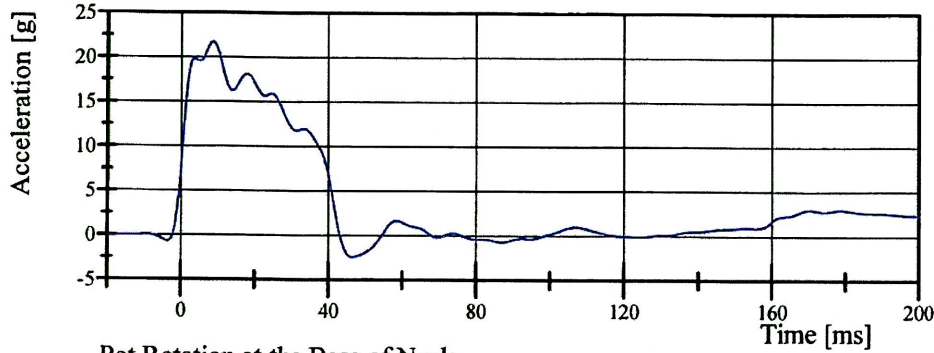
Transportation Research Center Inc.

Neck Extension

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

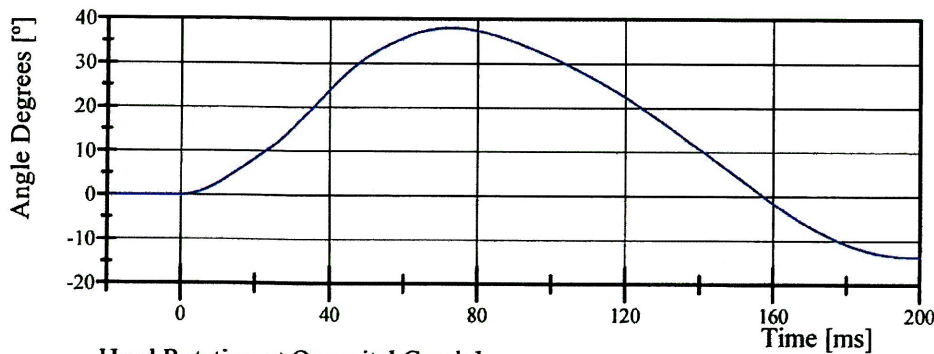
Test Date: 1/25/2010

Pendulum Acceleration



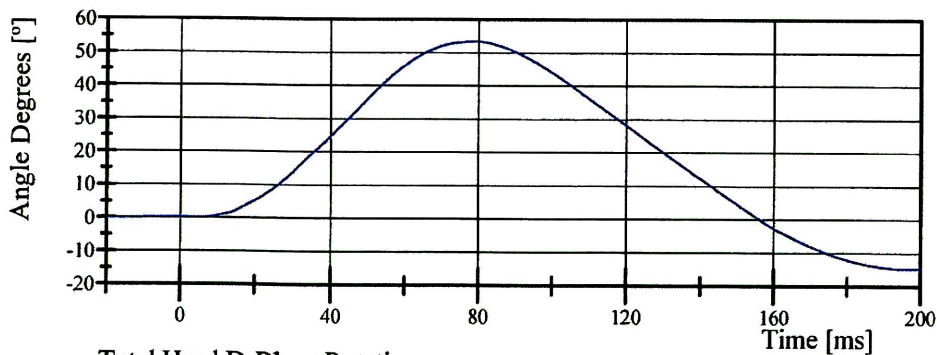
Filter Class: CFC_60
Max: 21.7 g at 8.6 ms
Min: -2.4 g at 46.5 ms

Pot Rotation at the Base of Neck



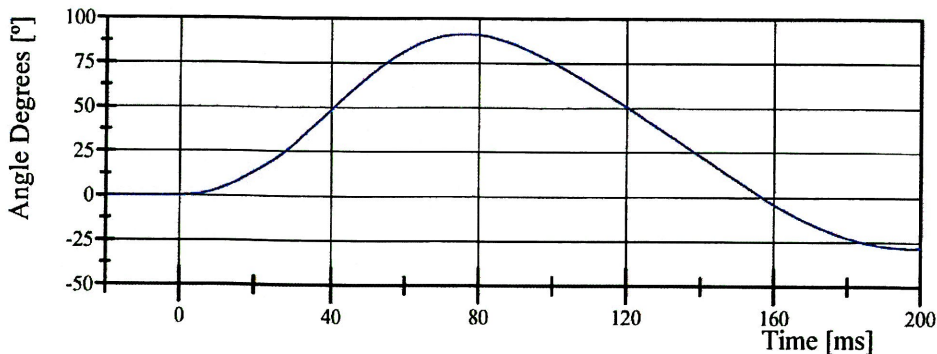
Filter Class: CFC_60
Max: 38.0 ° at 72.8 ms
Min: -13.7 ° at 198.6 ms

Head Rotation at Occypital Condyles



Filter Class: CFC_60
Max: 53.4 ° at 79.0 ms
Min: -14.7 ° at 196.8 ms

Total Head D-Plane Rotation



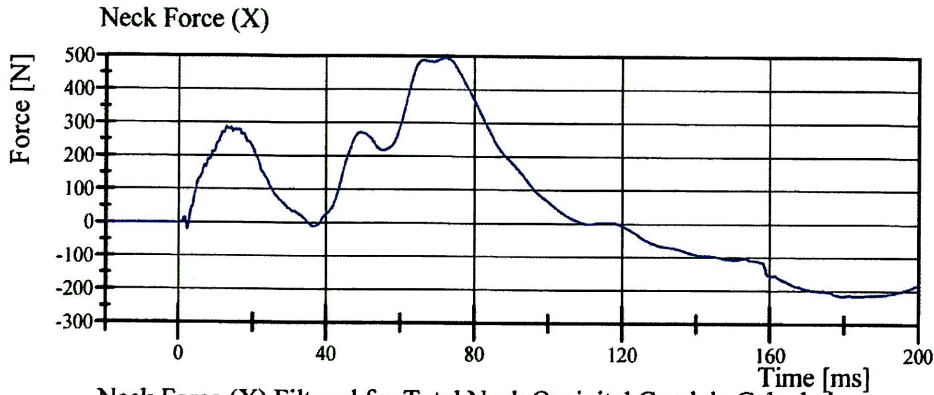
Filter Class: CFC_60
Max: 91.1 ° at 76.2 ms
Min: -28.4 ° at 197.6 ms

Transportation Research Center Inc.

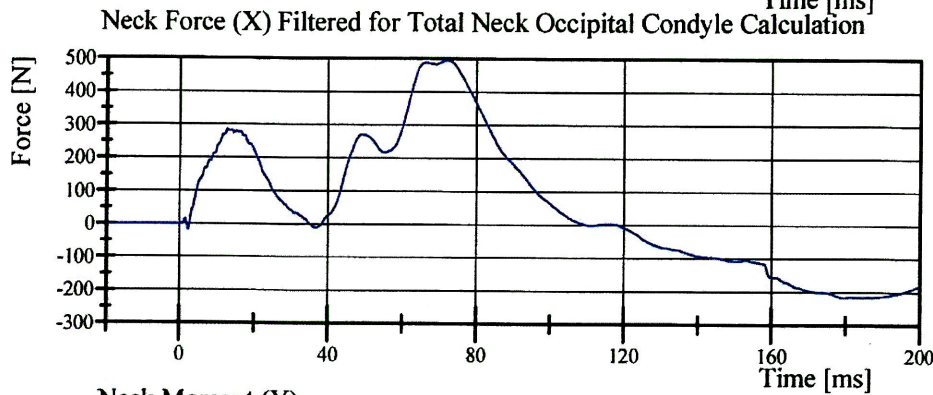
Neck Extension

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

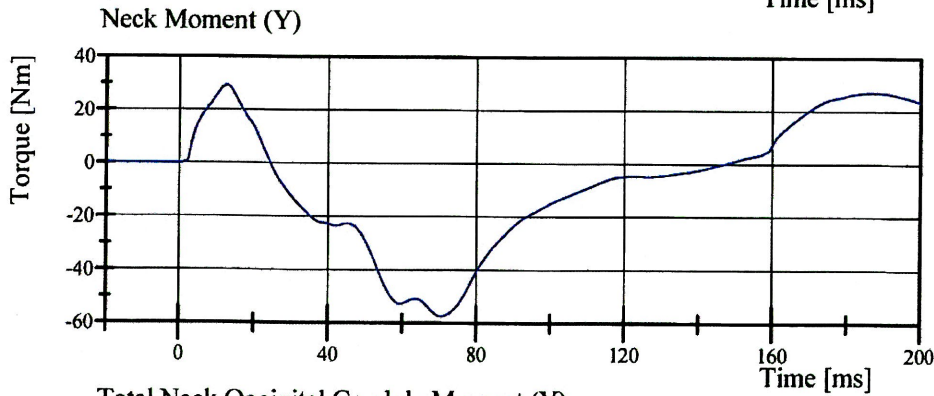
Test Date: 1/25/2010



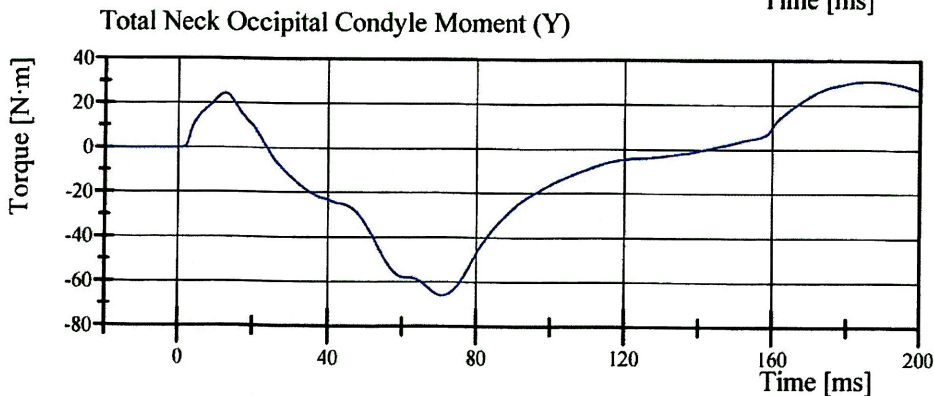
Filter Class: CFC_1000
Max: 496.0 N at 72.1 ms
Min: -216.6 N at 179.4 ms



Filter Class: CFC_600
Max: 495.8 N at 72.2 ms
Min: -216.1 N at 179.4 ms



Filter Class: CFC_600
Max: 29.3 Nm at 12.8 ms
Min: -57.4 Nm at 70.6 ms



Filter Class: CFC_600
Max: 30.9 N·m at 187.3 ms
Min: -66.1 N·m at 70.7 ms

Transportation Research Center Inc.

Front Thorax

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

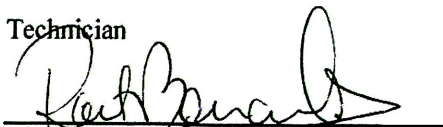
Test Date: 1/25/2010

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

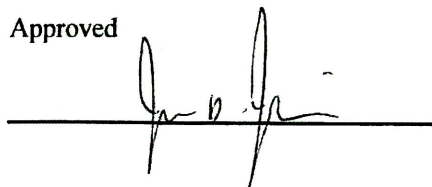
Test meets specifications.

Comments:

Technician



Approved



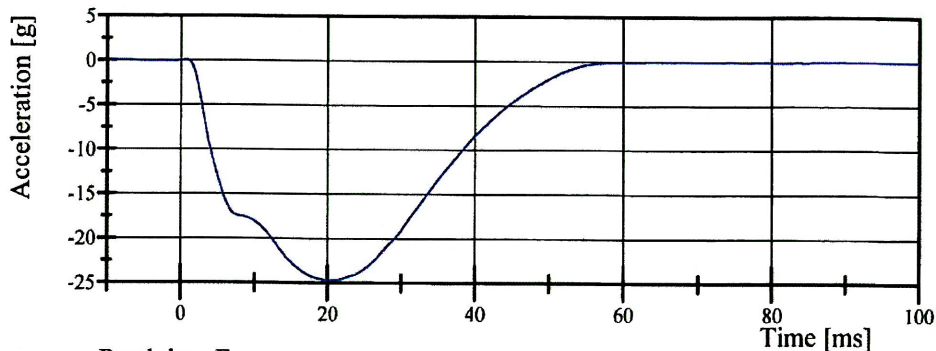
Transportation Research Center Inc.

Front Thorax

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

Test Date: 1/25/2010

Pendulum Acceleration

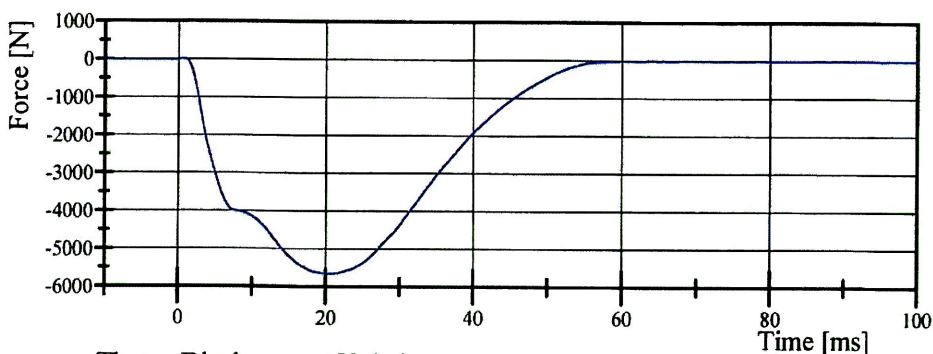


Filter Class: CFC_180

Max: 0.1 g at 0.6 ms

Min: -24.7 g at 20.3 ms

Pendulum Force

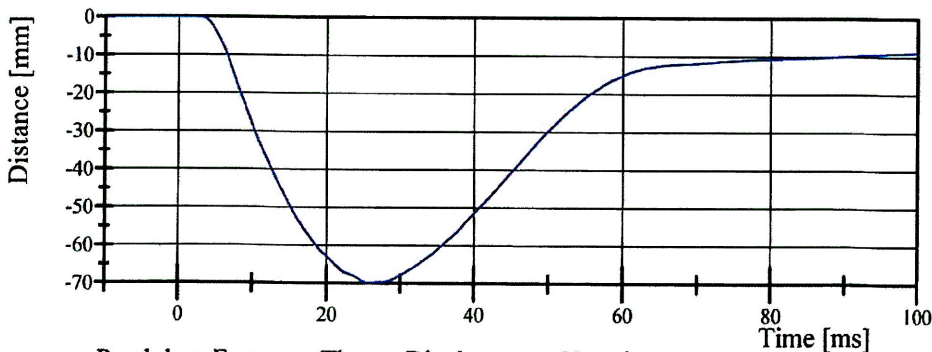


Filter Class: CFC_180

Max: 19.8 N at 0.6 ms

Min: -5,651.6 N at 20.3 ms

Thorax Displacement X-Axis

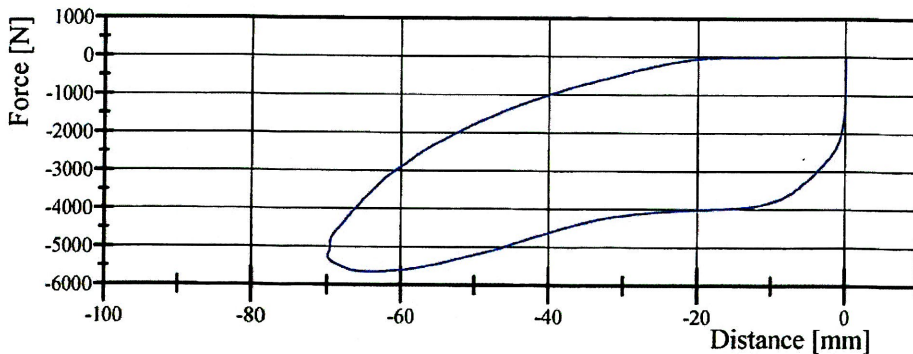


Filter Class: CFC_600

Max: 0.0 mm at -1.7 ms

Min: -70.0 mm at 25.8 ms

Pendulum Force vs. Thorax Displacement X-Axis



Filter Class: CFC_180

Max: 19.8 N at 0.0 mm

Min: -5,651.6 N at -63.6 mm

Transportation Research Center Inc

Hybrid III Hip Range of Motion

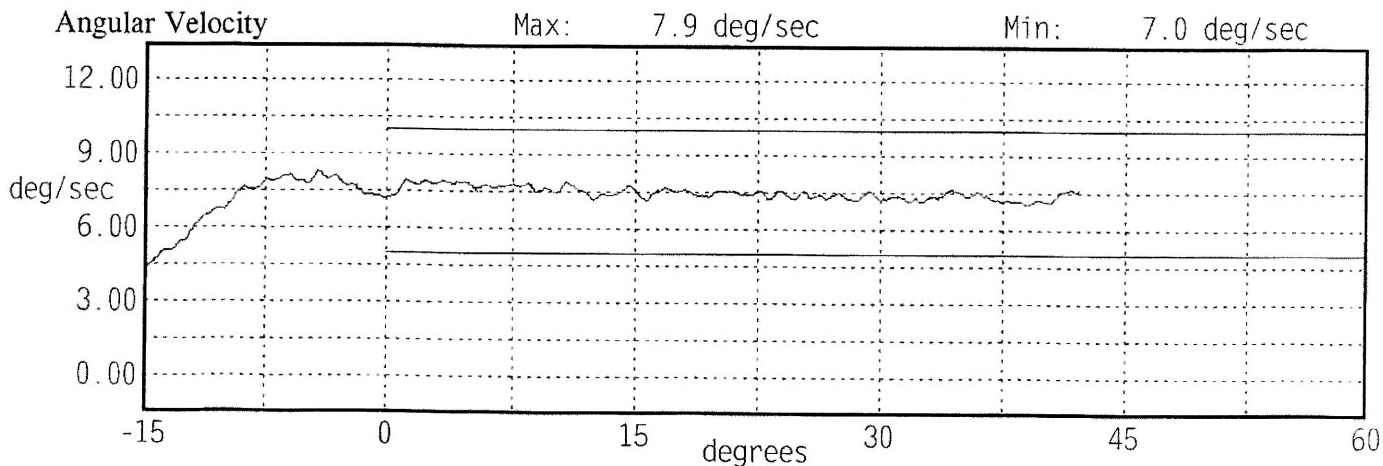
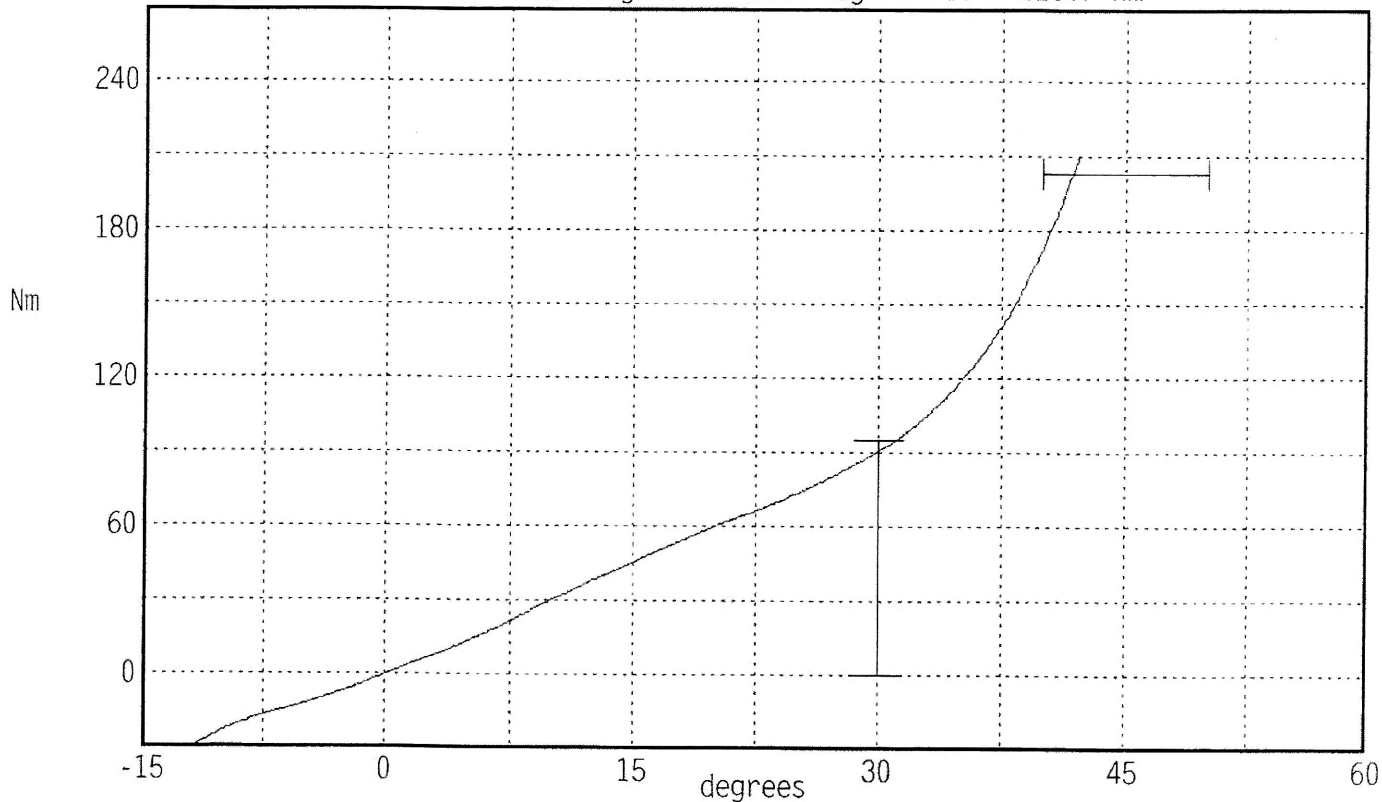
Serial Number: 043L
 Test Number: 043C09

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

Comments:

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

Moment About H-Point
 Peak Moment: 210.7 Nm at 42.2 deg
 Peak Angle: 42.2 deg at 210.7 Nm



Transportation Research Center Inc

Hybrid III Hip Range of Motion

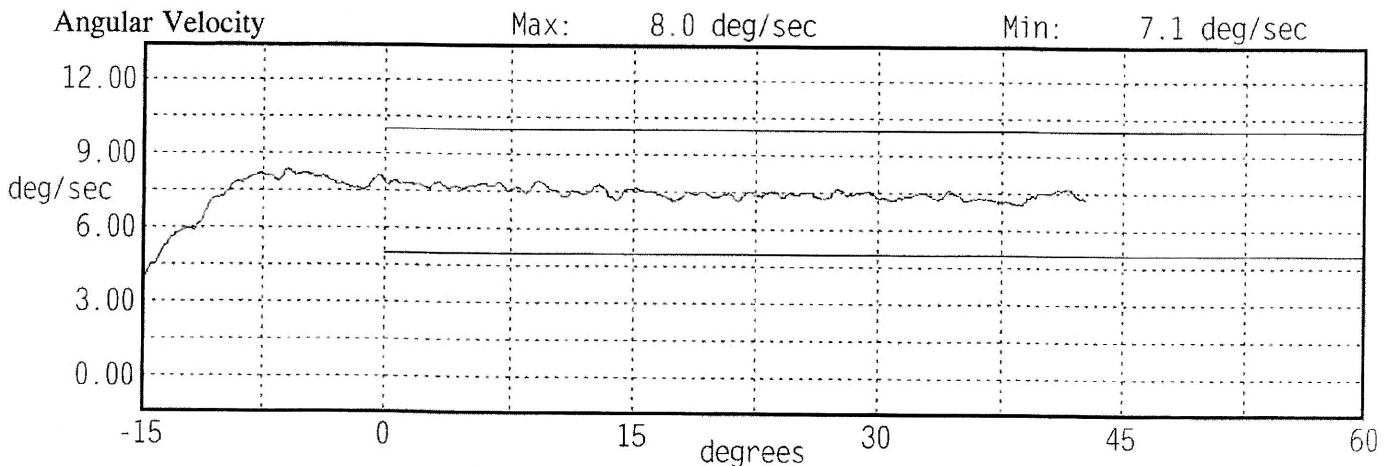
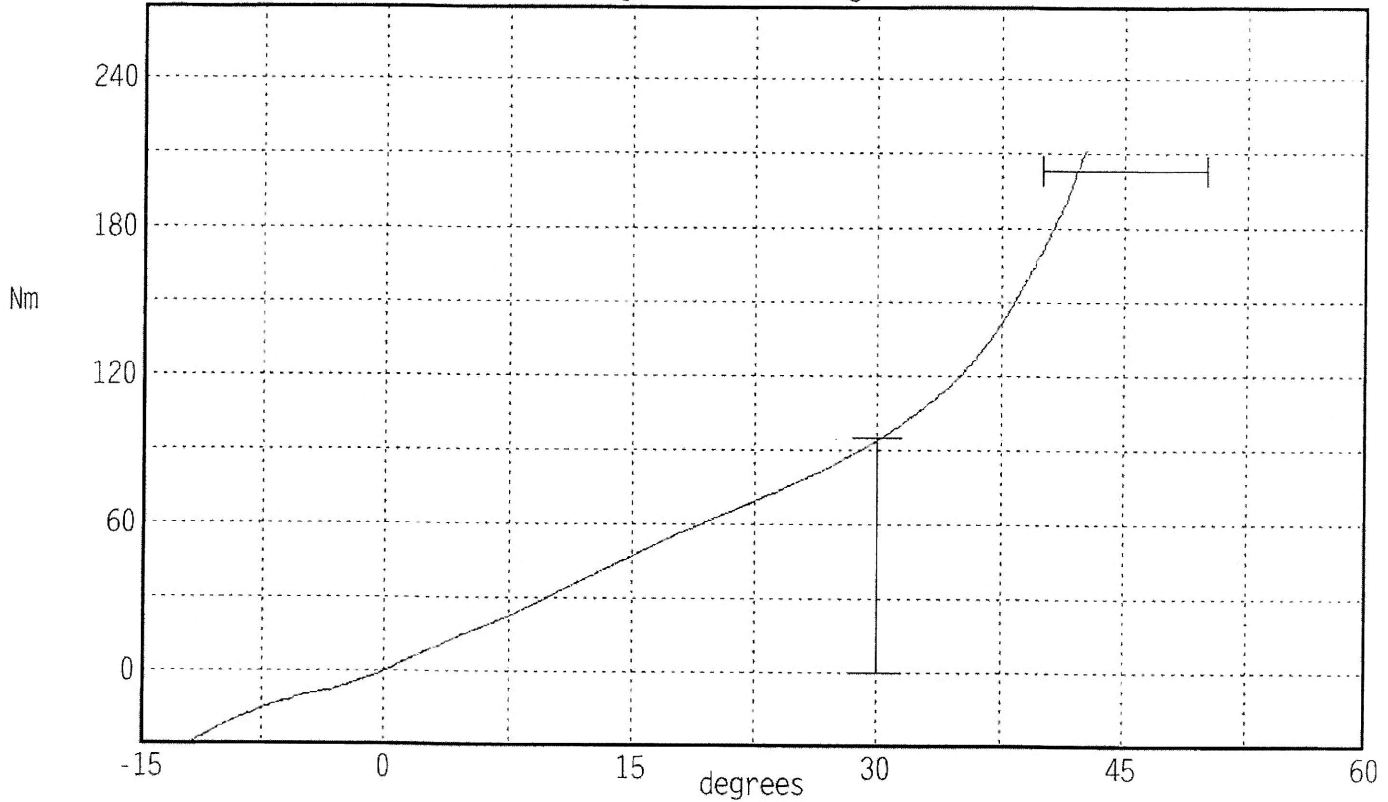
Serial Number: 043R
Test Number: 043C09

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

Comments:

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

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



Transportation Research Center Inc.

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

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

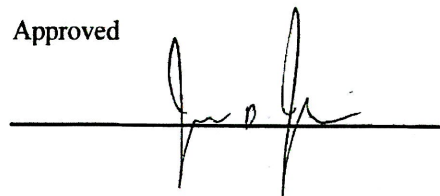
Test meets specifications.

Comments:

Technician

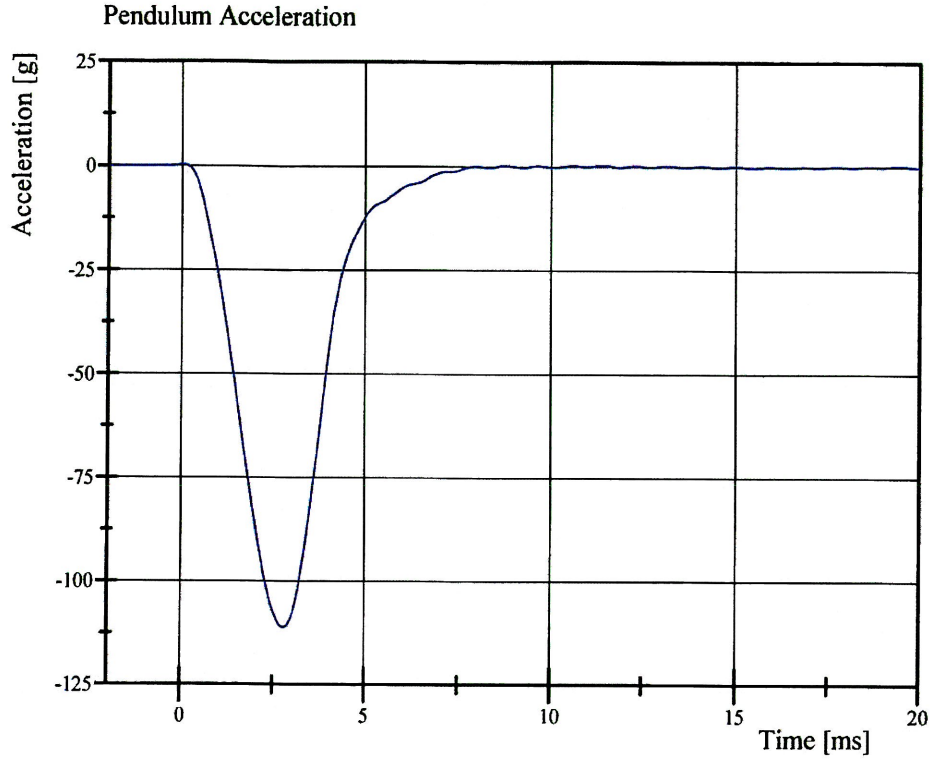


Approved

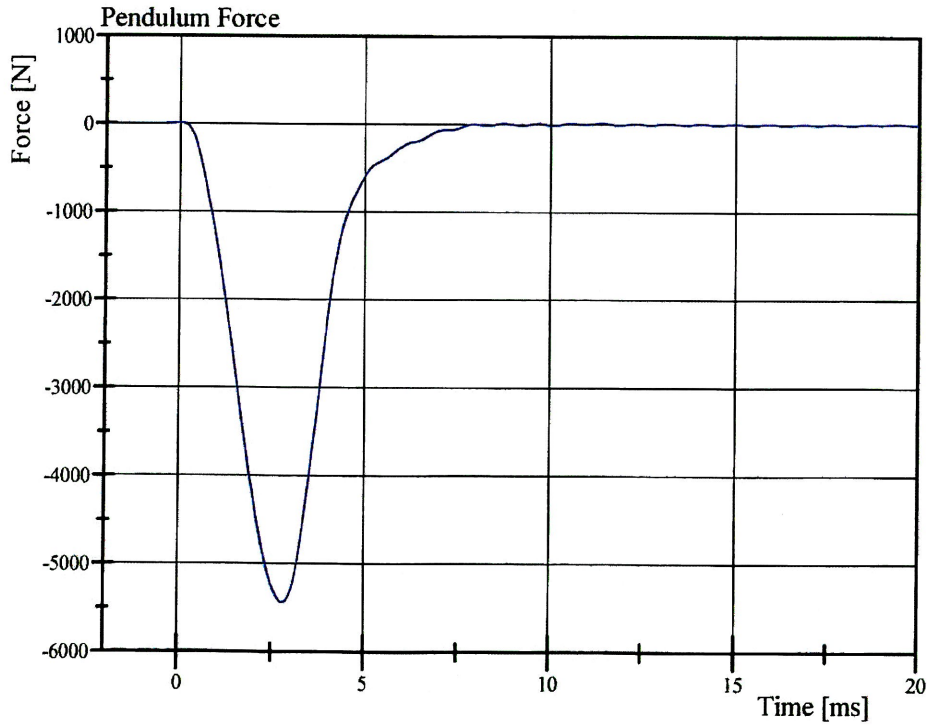


Transportation Research Center Inc.

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



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



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

Transportation Research Center Inc.

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

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

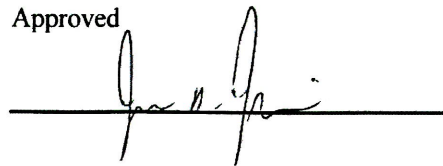
Test meets specifications.

Comments:

Technician

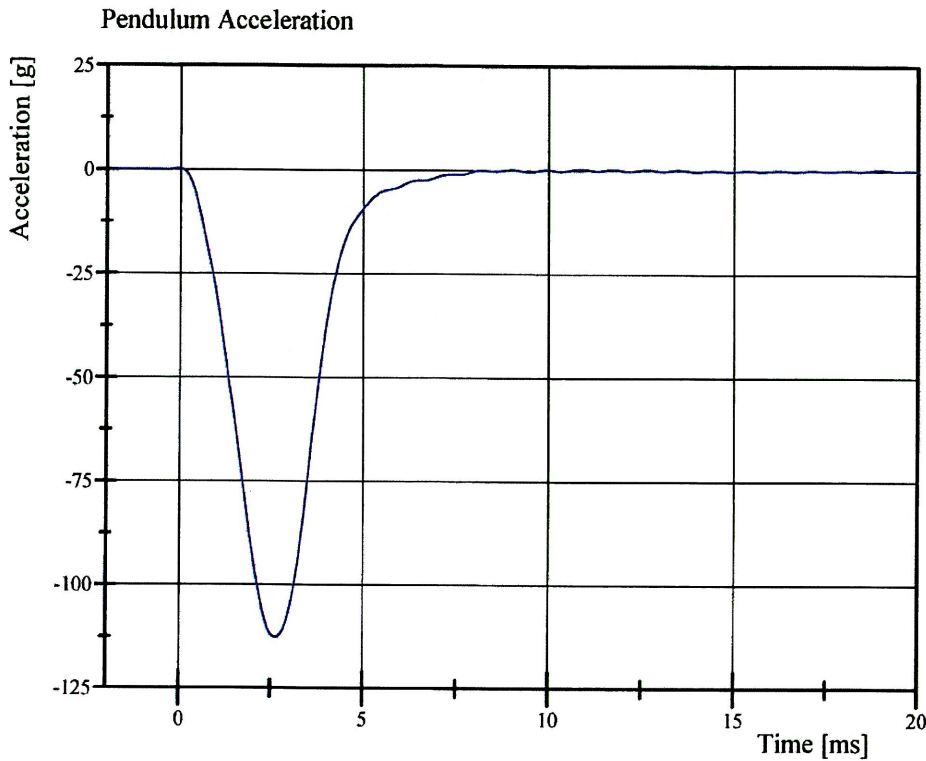


Approved

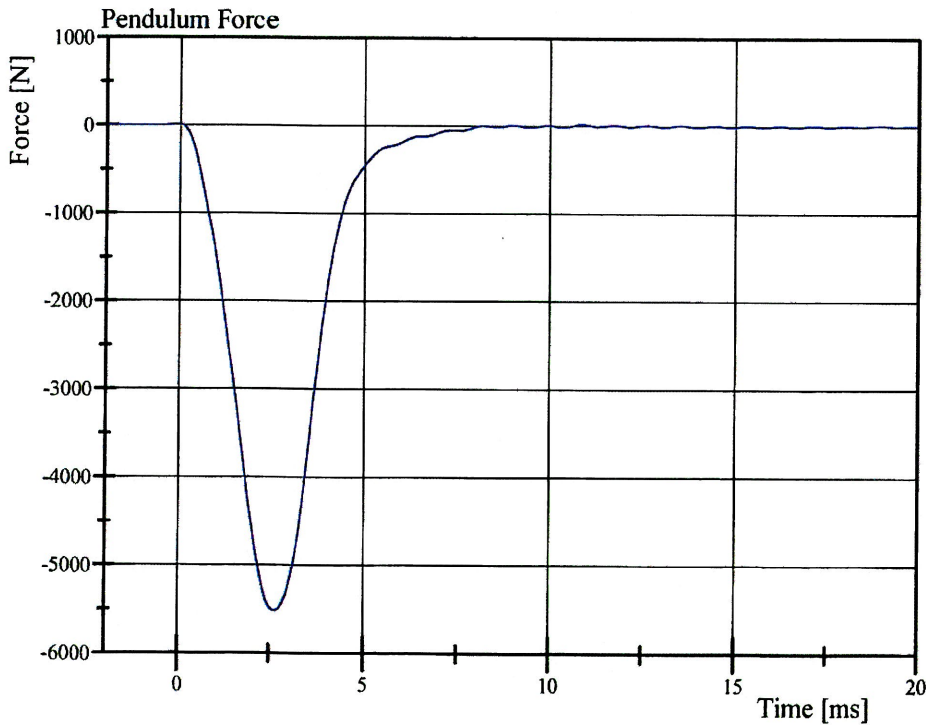


Transportation Research Center Inc.

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



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

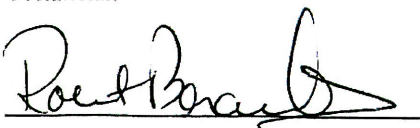


Filter Class: CFC_600
Max: 19.1 N at 10.9 ms
Min: -5,514.9 N at 2.6 ms

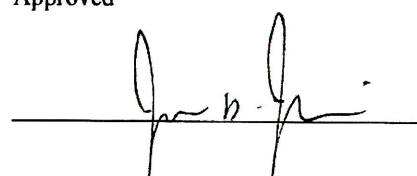
Transportation Research Center Inc.
572E HIII 50th Male Dummy
External Dimensions
Serial No. 043 Calibration No. 9

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

Technician



Approved



APPENDIX D
TEST EQUIPMENT LIST AND CALIBRATION INFORMATION

Sign Convention
SAE J211 MAR95

Accelerometers:

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

Potentiometers:

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

Rotation potentiometers:

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

Load cells:

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

Neck load cells:

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

Tibia load cells:

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

Sign Convention (Continued)
SAE J211 MAR95

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

Frequency Response Classes
SAE J211 MAR95

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

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

Channel Report Test Number 100420

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
1	Trig D1	10ZERO000000VO0A	EVENT		1 Logic	Bipolar	
2	05G20-L12	11HEADCG00H3ACXA	Head Accel X	1000	g	Bipolar	1-110 HIII 50th FTSS.001
3	02A18-N15	11HEADCG00H3ACYA	Head Accel Y	1000	g	-Bipolar	1-110 HIII 50th FTSS.002
4	02I02I05-F09	11HEADCG00H3ACZA	Head Accel Z	1000	g	-Bipolar	1-110 HIII 50th FTSS.003
5	P51712	11HEADFR00H3ACYA	Head (FT) Accel Y	1000	g	-Bipolar	1-110 HIII 50th FTSS.004
6	P51717	11HEADFR00H3ACZA	Head (FT) Accel Z	1000	g	-Bipolar	1-110 HIII 50th FTSS.005
7	P50099	11HEADUP00H3ACXA	Head (TP) Accel X	1000	g	Bipolar	1-110 HIII 50th FTSS.006
8	B02A25-N01	11HEADUP00H3ACYA	Head (TP) Accel Y	1000	g	-Bipolar	1-110 HIII 50th FTSS.007
9	02A18-N01	11HEADLE00H3ACXA	Head (LT) Accel X	1000	g	Bipolar	1-110 HIII 50th FTSS.008
10	03F03J01-R11	11HEADLE00H3ACZA	Head (LT) Accel Z	1000	g	-Bipolar	1-110 HIII 50th FTSS.009
11	1716A-1597-FX	11NECKUP00H3FOXA	Neck Force X	8896.4	N	-Bipolar	1-110 HIII 50th FTSS.010
12	1716A-1597-FY	11NECKUP00H3FOYA	Neck Force Y	8896.4	N	Bipolar	1-110 HIII 50th FTSS.011
13	1716A-1597-FZ	11NECKUP00H3FOZA	Neck Force Z	13344.6	N	Bipolar	1-110 HIII 50th FTSS.012
14	1716A-1597-MX	11NECKUP00H3MOXA	Neck Moment X	282.4	Nm	-Bipolar	1-110 HIII 50th FTSS.013
15	1716A-1597-MY	11NECKUP00H3MOYA	Neck Moment Y	282.4	Nm	Bipolar	1-110 HIII 50th FTSS.014
16	1716A-1597-MZ	11NECKUP00H3MOZA	Neck Moment Z	282.4	Nm	Bipolar	1-110 HIII 50th FTSS.015
17	1794A-0216-FX	11NECKLO00H3FOXA	Neck Lower Force X	13345	N	-Bipolar	1-110 HIII 50th FTSS.016
18	1794A-0216-FY	11NECKLO00H3FOYA	Neck Lower Force Y	13344.6	N	Bipolar	1-110 HIII 50th FTSS.017
19	1794A-0216-FZ	11NECKLO00H3FOZA	Neck Lower Force Z	13344.6	N	Bipolar	1-110 HIII 50th FTSS.018
20	1794A-0216-MX	11NECKLO00H3MOXA	Neck Lower Moment X	452	Nm	-Bipolar	1-110 HIII 50th FTSS.019
21	1794A-0216-MY	11NECKLO00H3MOYA	Neck Lower Moment Y	452	Nm	Bipolar	1-110 HIII 50th FTSS.020
22	1794A-0216-MZ	11NECKLO00H3MOZA	Neck Lower Moment Z	452	Nm	Bipolar	1-110 HIII 50th FTSS.021
23	99H12-F24	11CHSTCG00H3ACXA	Chest Accel X	1000	g	Bipolar	1-110 HIII 50th FTSS.022
24	02I02I05-F04	11CHSTCG00H3ACYA	Chest Accel Y	1000	g	-Bipolar	1-110 HIII 50th FTSS.023
25	03D03C27-N07	11CHSTCG00H3ACZA	Chest Accel Z	1000	g	-Bipolar	1-110 HIII 50th FTSS.024
26	14CB1-2897-9528	11CHST0000H3DSXA	Chest Deflection X (CST110)	75	mm	Bipolar	1-110 HIII 50th FTSS.028
27	P52008	11PELVCG00H3ACXA	Pelvis Accel X	1000	g	-Bipolar	1-110 HIII 50th FTSS.029
28	04J04I20-Z24	11PELVCG00H3ACYA	Pelvis Accel Y	1000	g	-Bipolar	1-110 HIII 50th FTSS.030
29	98H13-F19	11PELVCG00H3ACZA	Pelvis Accel Z	1000	g	-Bipolar	1-110 HIII 50th FTSS.031
30	P51954	13HEADCG00H3ACXA	Head Accel X	1000	g	-Bipolar	3-001 VRTC H3 50th.001
31	P58726	13HEADCG00H3ACYA	Head Accel Y	1000	g	-Bipolar	3-001 VRTC H3 50th.002
32	P51266	13HEADCG00H3ACZA	Head Accel Z	1000	g	-Bipolar	3-001 VRTC H3 50th.003
33	ARS-12K-ARS1082	13HEADCG00H3AVXA	Head (DTS ARS) Rate Gyro X	12000	□/s	Bipolar	3-001 HIII 50th VRTC.031
34	ARS-12K-ARS2630	13HEADCG00H3AVYA	Head(DTS ARS) Rate Gyro Y	12000	□/s	Bipolar	3-001 HIII 50th VRTC.032
35	ARS-12K-ARS1034	13HEADCG00H3AVZA	Head (DTS ARS) Rate Gyro Z	12000	□/s	Bipolar	3-001 HIII 50th VRTC.033

Channel Report Test Number 100420

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
36	IF-205-261-FX	13NECKUP00H3FOXA	Neck Force X	8896	N	-Bipolar	3-001 VRTC H3 50th.007
37	IF-205-261-FY	13NECKUP00H3FOYA	Neck Force Y	8896	N	Bipolar	3-001 VRTC H3 50th.008
38	IF-205-261-FZ	13NECKUP00H3FOZA	Neck Force Z	13344	N	Bipolar	3-001 VRTC H3 50th.009
39	IF-205-261-MX	13NECKUP00H3MOXA	Neck Moment X	282.5	Nm	-Bipolar	3-001 VRTC H3 50th.010
40	IF-205-261-MY	13NECKUP00H3MOYA	Neck Moment Y	282.5	Nm	Bipolar	3-001 VRTC H3 50th.011
41	IF-205-261-MZ	13NECKUP00H3MOZA	Neck Moment Z	282.5	Nm	Bipolar	3-001 VRTC H3 50th.012
42	P52081	13CHSTCG00H3ACXA	Chest Accel X	1000	g	Bipolar	3-001 VRTC H3 50th.013
43	02102105-F11	13CHSTCG00H3ACYA	Chest Accel Y	1000	g	-Bipolar	3-001 VRTC H3 50th.014
44	P58771	13CHSTCG00H3ACZA	Chest Accel Z	1000	g	-Bipolar	3-001 VRTC H3 50th.015
45	81422-84394-43	13CHST0000H3DSXA	Chest Deflection X CST001	84	mm	Bipolar	3-001 HIII 50th VRTC.019
46	1794A-249-FX	13NECKLO00H3FOXA	Lower Neck Force X	8896	N	-Bipolar	3-001 VRTC H3 50th.025
47	1794A-249-FY	13NECKLO00H3FOYA	Lower Neck Force Y	8896	N	Bipolar	3-001 VRTC H3 50th.026
48	1794A-249-FZ	13NECKLO00H3FOZA	Lower Neck Force Z	13345	N	Bipolar	3-001 VRTC H3 50th.027
49	1794A-249-MX	13NECKLO00H3MOXA	Lower Neck Moment X	282.5	Nm	-Bipolar	3-001 VRTC H3 50th.028
50	1794A-249-MY	13NECKLO00H3MOYA	Lower Neck Moment Y	282.5	Nm	Bipolar	3-001 VRTC H3 50th.029
51	1794A-249-MZ	13NECKLO00H3MOZA	Lower Neck Moment Z	282.5	Nm	Bipolar	3-001 VRTC H3 50th.030
52	P58870	13PELVCG00H3ACXA	Pelvis Accel X	1000	g	-Bipolar	3-001 VRTC H3 50th.020
53	P52071	13PELVCG00H3ACYA	Pelvis Accel Y	1000	g	-Bipolar	3-001 VRTC H3 50th.021
54	P52086	13PELVCG00H3ACZA	Pelvis Accel Z	1000	g	-Bipolar	3-001 VRTC H3 50th.022
55	P52023	16HEADCG00H3ACXA	Head Accel X	1000	g	-Bipolar	6-043 HIII 50th VRTC.001
56	P52013	16HEADCG00H3ACYA	Head Accel Y	1000	g	-Bipolar	6-043 HIII 50th VRTC.002
57	P52083	16HEADCG00H3ACZA	Head Accel Z	1000	g	-Bipolar	6-043 HIII 50th VRTC.003
58	ARS-12K-ARS2240	16HEADCG00H3AVXA	Head (DTS ARS) Rate Gyro X	12000	1/s	Bipolar	6-043 HIII 50th VRTC.025
59	ARS-12K-ARS2238	16HEADCG00H3AVYA	Head (DTS ARS) Rate Gyro Y	12000	1/s	Bipolar	6-043 HIII 50th VRTC.026
60	ARS-12K-ARS0253	16HEADCG00H3AVZA	Head (DTS ARS) Rate Gyro Z	12000	1/s	Bipolar	6-043 HIII 50th VRTC.027
61	1716A-798-FX	16NECKUP00H3FOXA	Upper Neck Force X	8896	N	-Bipolar	6-043 HIII 50th VRTC.004
62	1716A-798-FY	16NECKUP00H3FOYA	Upper Neck Force Y	8896	N	Bipolar	6-043 HIII 50th VRTC.005
63	1716A-798-FZ	16NECKUP00H3FOZA	Upper Neck Force Z	13344	N	Bipolar	6-043 HIII 50th VRTC.006
64	1716A-798-MX	16NECKUP00H3MOXA	Upper Neck Moment X	282	Nm	-Bipolar	6-043 HIII 50th VRTC.007
65	1716A-798-MY	16NECKUP00H3MOYA	Upper Neck Moment Y	282	Nm	Bipolar	6-043 HIII 50th VRTC.008
66	1716A-798-MZ	16NECKUP00H3MOZA	Upper Neck Moment Z	282	Nm	Bipolar	6-043 HIII 50th VRTC.009
67	P16899	16CHSTCG00H3ACXA	Chest Accel X	1000	g	Bipolar	6-043 HIII 50th VRTC.010
68	P16517	16CHSTCG00H3ACYA	Chest Accel Y	1000	g	-Bipolar	6-043 HIII 50th VRTC.011
69	P51702	16CHSTCG00H3ACZA	Chest Accel Z	1000	g	-Bipolar	6-043 HIII 50th VRTC.012
70	84892-A-CST043	16CHST0000H3DSXA	Chest Deflection X	84	mm	-Bipolar	6-043 HIII 50th VRTC.013

Channel Report Test Number 100420

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
71	1794A-250-FX	16NECKLO00H3FOXA	Lower Neck Force X	8896	N	-Bipolar	6-043 HIII 50th VRTC.016
72	1794A-250-FY	16NECKLO00H3FOYA	Lower Neck Force Y	8896	N	Bipolar	6-043 HIII 50th VRTC.017
73	1794A-250-FZ	16NECKLO00H3FOZA	Lower Neck Force Z	13345	N	Bipolar	6-043 HIII 50th VRTC.018
74	1794A-250-MX	16NECKLO00H3MOXA	Lower Neck Moment X	282	Nm	-Bipolar	6-043 HIII 50th VRTC.019
75	1794A-250-MY	16NECKLO00H3MOYA	Lower Neck Moment Y	282	Nm	Bipolar	6-043 HIII 50th VRTC.020
76	1794A-250-MZ	16NECKLO00H3MOZA	Lower Neck Moment Z	282	Nm	Bipolar	6-043 HIII 50th VRTC.021
77	P52108	16PELVCG00H3ACXA	Pelvis Accel X	1000	g	-Bipolar	6-043 HIII 50th VRTC.022
78	P51710	16PELVCG00H3ACYA	Pelvis Accel Y	1000	g	-Bipolar	6-043 HIII 50th VRTC.023
79	P16225	16PELVCG00H3ACZA	Pelvis Accel Z	1000	g	-Bipolar	6-043 HIII 50th VRTC.024
80	P58576	10VEHCCG0000ACXA	Vehicle Center of Gravity X-axis Accel	2000	g	Bipolar	
81	P62232	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-axis Accel	2000	g	-Bipolar	
82	P61732	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-axis Accel	2000	g	-Bipolar	
83	P63200	10ENGNTTP0000ACXA	Top of Engine X-axis Accel	2000	g	Bipolar	
84	P62559	10ENGNTTP0000ACYA	Top of Engine Y-axis Accel	2000	g	-Bipolar	
85	P64883	10ENGNTTP0000ACZA	Top of Engine Z-axis Accel	2000	g	-Bipolar	
86	P64908	10ENGNBO0000ACXA	Bottom of Engine X-axis Accel	2000	g	Bipolar	
87	P63175	10ENGNBO0000ACYA	Bottom of Engine Y-axis Accel	2000	g	-Bipolar	
88	P63129	10ENGNBO0000ACZA	Bottom of Engine Z-axis Accel	2000	g	Bipolar	
89	P63179	10APILUPLE00ACXA	Left A-Pillar Upper X-Axis Acceleration	2000	g	Bipolar	
90	P64869	10APILUPLE00ACYA	Left A-Pillar Upper Y-Axis Acceleration	2000	g	Bipolar	
91	P63117	10APILUPLE00ACZA	Left A-Pillar Upper Z-Axis Acceleration	2000	g	-Bipolar	
92	P57207	10APILLOLE00ACXA	Left A-Pillar Lower X-Axis Acceleration	2000	g	Bipolar	
93	P62215	10APILLOLE00ACYA	Left A-Pillar Lower Y-Axis Acceleration	2000	g	Bipolar	
94	P57876	10APILLOLE00ACZA	Left A-Pillar Lower Z-Axis Acceleration	2000	g	-Bipolar	
95	P62620	10APILUPRI00ACXA	Right A-Pillar Upper X-Axis Acceleratic	2000	g	Bipolar	
96	P61765	10APILUPRI00ACYA	Right A-Pillar Upper Y-Axis Acceleratic	2000	g	-Bipolar	
97	P62617	10APILUPRI00ACZA	Right A-Pillar Upper Z-Axis Acceleratic	2000	g	-Bipolar	
98	P63201	10APILLORI00ACXA	Right A-Pillar Lower X-Axis Acceleratic	2000	g	Bipolar	
99	P64881	10APILLORI00ACYA	Right A-Pillar Lower Y-Axis Acceleratic	2000	g	-Bipolar	
100	P62797	10APILLORI00ACZA	Right A-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
101	P57790	10BPILUPLE00ACXA	Left B-Pillar Upper X-Axis Acceleration	2000	g	Bipolar	
102	P34212	10BPILUPLE00ACYA	Left B-Pillar Upper Y-Axis Acceleration	2000	g	Bipolar	
103	P61754	10BPILUPLE00ACZA	Left B-Pillar Upper Z-Axis Acceleration	2000	g	-Bipolar	
104	P57160	10BPILLOLE00ACXA	Left B-Pillar Lower X-Axis Acceleration	2000	g	Bipolar	
105	P63196	10BPILLOLE00ACYA	Left B-Pillar Lower Y-Axis Acceleration	2000	g	Bipolar	

Channel Report Test Number 100420

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
106	P63193	10BPILLOLE00ACZA	Left B-Pillar Lower Z-Axis Acceleration	2000	g	-Bipolar	
107	P49042	10BPILUPRI00ACXA	Right B-Pillar Upper X-Axis Acceleratic	2000	g	Bipolar	
108	P63085	10BPILUPRI00ACYA	Right B-Pillar Upper Y-Axis Acceleratic	2000	g	-Bipolar	
109	P64864	10BPILUPRI00ACZA	Right B-Pillar Upper Z-Axis Acceleratic	2000	g	-Bipolar	
110	P46509	10BPILLORI00ACXA	Right B-Pillar Lower X-Axis Acceleratic	2000	g	Bipolar	
111	P61314	10BPILLORI00ACYA	Right B-Pillar Lower Y-Axis Acceleratic	2000	g	-Bipolar	
112	P62628	10BPILLORI00ACZA	Right B-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
113	P62197	10CPILUPLE00ACXA	Left C-Pillar Upper X-Axis Acceleratior	2000	g	Bipolar	
114	P61319	10CPILUPLE00ACYA	Left C-Pillar Upper Y-Axis Acceleration	2000	g	Bipolar	
115	P63123	10CPILUPLE00ACZA	Left C-Pillar Upper Z-Axis Acceleration	2000	g	-Bipolar	
116	P61400	10CPILLOLE00ACXA	Left C-Pillar Lower X-Axis Acceleration	2000	g	-Bipolar	
117	P63194	10CPILLOLE00ACYA	Left C-Pillar Lower Y-Axis Acceleration	2000	g	Bipolar	
118	P64865	10CPILLOLE00ACZA	Left C-Pillar Lower Z-Axis Acceleration	2000	g	Bipolar	
119	P61712	10CPILUPRI00ACXA	Right C-Pillar Upper X-Axis Acceleratic	2000	g	Bipolar	
120	P63158	10CPILUPRI00ACYA	Right C-Pillar Upper Y-Axis Acceleratic	2000	g	-Bipolar	
121	P45659	10CPILUPRI00ACZA	Right C-Pillar Upper Z-Axis Acceleratic	2000	g	-Bipolar	
122	P61270	10CPILLORI00ACXA	Right C-Pillar Lower X-Axis Acceleratic	2000	g	-Bipolar	
123	P48116	10CPILLORI00ACYA	Right C-Pillar Lower Y-Axis Acceleratic	2000	g	-Bipolar	
124	P64880	10CPILLORI00ACZA	Right C-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
125	P63177	10DPILUPLE00ACXA	Left D-Pillar Upper X-Axis Acceleration	2000	g	Bipolar	
126	P64885	10DPILUPLE00ACYA	Left D-Pillar Upper Y-Axis Acceleration	2000	g	Bipolar	
127	P64877	10DPILUPLE00ACZA	Left D-Pillar Upper Z-Axis Acceleration	2000	g	-Bipolar	
128	P47331	10DPILLOLE00ACXA	Left D-Pillar Lower X-Axis Acceleration	2000	g	Bipolar	
129	P47536	10DPILLOLE00ACYA	Left D-Pillar Lower Y-Axis Acceleration	2000	g	Bipolar	
130	P64874	10DPILLOLE00ACZA	Left D-Pillar Lower Z-Axis Acceleration	2000	g	-Bipolar	
131	P64866	10DPILUPRI00ACXA	Right D-Pillar Upper X-Axis Acceleratic	2000	g	Bipolar	
132	P63174	10DPILUPRI00ACYA	Right D-Pillar Upper Y-Axis Acceleratic	2000	g	-Bipolar	
133	P64872	10DPILUPRI00ACZA	Right D-Pillar Upper Z-Axis Acceleratic	2000	g	-Bipolar	
134	P64888	10DPILLORI00ACXA	Right D-Pillar Lower X-Axis Acceleratic	2000	g	Bipolar	
135	P62564	10DPILLORI00ACYA	Right D-Pillar Lower Y-Axis Acceleratic	2000	g	-Bipolar	
136	P63134	10DPILLORI00ACZA	Right D-Pillar Lower Z-Axis Acceleratic	2000	g	-Bipolar	
137	P64906	102RDK000000ACXA	Vehicle Rear Deck X-Axis Acceleratior	2000	g	Bipolar	
138	P64893	102RDK000000ACYA	Vehicle Rear Deck Y-Axis Acceleratior	2000	g	Bipolar	
139	P64902	102RDK000000ACZA	Vehicle Rear Deck Z-Axis Acceleratior	2000	g	-Bipolar	
140	P63180	11SEAT000000ACXA	LF Seat Position (on floor) X-Axis Acce	2000	g	Bipolar	

Channel Report Test Number 100420

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
141	P62550	11SEAT000000ACYA	LF Seat Position (on floor)Y-Axis Acce	2000	g	Bipolar	
142	P63195	11SEAT000000ACZA	LF Seat Position (on floor) Z-Axis Acce	2000	g	-Bipolar	
143	P61388	13SEAT000000ACXA	RF Seat Position (on floor) X-Axis Acc	2000	g	Bipolar	
144	P62632	13SEAT000000ACYA	RF Seat Position (on floor) Y-Axis Acc	2000	g	Bipolar	
145	P63173	13SEAT000000ACZA	RF Seat Position (on floor) Z-Axis Acc	2000	g	-Bipolar	
146	P63270	14SEAT000000ACXA	LR Seat Position (on floor) X-Axis Acc	2000	g	Bipolar	
147	P64875	14SEAT000000ACYA	LR Seat Position (on floor) Y-Axis Acc	2000	g	Bipolar	
148	P63191	14SEAT000000ACZA	LR Seat Position (on floor) Z-Axis Acc	2000	g	-Bipolar	
149	P63176	16SEAT000000ACXA	RR Seat Position (on floor) X-Axis Acc	2000	g	Bipolar	
150	P62630	16SEAT000000ACYA	RR Seat Position (on floor) Y-Axis Acc	2000	g	Bipolar	
151	P62546	16SEAT000000ACZA	RR Seat Position (on floor) Z-Axis Acc	2000	g	-Bipolar	
152	ARS-1500-ARS1091	10VEHCCG0000AVXA	Vehicle CG Roll Rate	1500	□/s	Bipolar	
153	ARS-1500-ARS2609	10VEHCCG0000AVYA	Vehicle CG Pitch Rate	1500	□/s	-Bipolar	
154	ARS-1500-ARS0738	10VEHCCG0000AVZA	Vehicle CG Yaw Rate	1500	□/s	-Bipolar	
155	ARS-1500-ARS1055	10VEHCREDK00AVXA	Rear Deck Roll Rate Redundant	1500	□/s	Bipolar	
156	ARS-1500-ARS0737	10VEHCREDK00AVYA	Rear Deck Pitch Rate Redundant	1500	□/s	-Bipolar	
157	ARS-1500-ARS0665	10VEHCREDK00AVZA	Rear Deck Yaw Rate Redundant	1500	□/s	-Bipolar	
158	B2001121B	11SEBE0000B5DS0A	Driver Seat Belt Spool Potentiometer	750	mm	Bipolar	
159	B2001122B	13SEBE0000B5DS0A	Right Front Belt Spool Potentiometers	750	mm	Bipolar	
160	B2001120B	16SEBE0000B5DS0A	Right Rear Passenger Belt Spool Pote	750	mm	Bipolar	
161	3255-387	11SEBE0000B5FO0A	Driver Lap Belt Force	13344	N	Bipolar	
162	3255-390	11SEBE0000B3FO0A	Driver Shoulder Belt Force	13344	N	Bipolar	
163	3255-386	13SEBE0000B5FO0A	Front Pass. Lap Belt Force	13344	N	Bipolar	
164	3255-388	13SEBE0000B3FO0A	Front Pass. Shldr. Belt Force	13344	N	Bipolar	
165	3255-392	14SEBE0000B5FO0A	Left Rear Pass. Lap Belt Force	13344	N	Bipolar	
166	3255-393	14SEBE0000B3FO0A	Left Rear Pass. Shldr. Belt Force	13344	N	Bipolar	
167	Bit.00	11CONT000023EV00	DRIV. Head Contact Switch	1	Logic	Bipolar	
168	Bit.01	11CONT000024EV00	DRIV. Thorax Contact Switch	1	Logic	Bipolar	
169	Bit.02	11CONT000025EV00	DRIV. Pelvis Contact Switch	1	Logic	Bipolar	
170	Bit.03	13CONT000026EV00	Pass. Head Contact Switch	1	Logic	Bipolar	
171	Bit.04	13CONT000027EV00	Pass. Thorax Contact Switch	1	Logic	Bipolar	
172	Bit.05	13CONT000028EV00	Pass. Pelvis Contact Switch	1	Logic	Bipolar	
173	Bit.06	16CONT000029EV00	Right Rear Passenger Head Contact	1	Logic	Bipolar	
174	Bit.07	16CONT000030EV00	Right Rear Passenger Thorax Contact	1	Logic	Bipolar	
175	Bit.08	16CONT000031EV00	Right Rear Passenger Pelvis Contact	1	Logic	Bipolar	

Channel Report Test Number 100420

Ref	Transducer ID	ISO Signal Identifier	Description	FScale	Units	Polarity	Assembly
176	ABT squib volts	11AIRB000000VO0A	Left Side Curtain Airbag Voltage	50	V	Bipolar	
177	ABT squib volts	13AIRB000000VO0A	Right Side Curtain Airbag Voltage	50	V	Bipolar	
178	ABT squib volts	11PRET000000VO0A	Left Front Buckle Pretensioner Voltage	50	V	Bipolar	
179	ABT squib volts	13PRET000000VO0A	Right Front Buckle Pretensioner Voltage	50	V	Bipolar	
180	ABT squib volts	16PRET020000VO0A	Right Rear Buckle Pretensioner Voltage	50	V	Bipolar	
181	ABT squib volts	11PRET010000VO0A	Left Front Retractor Pretensioner Voltage	50	V	Bipolar	
182	ABT squib amps	11AIRB000000CU0A	Left Side Curtain Airbag Current	5	A	Bipolar	
183	ABT squib amps	13AIRB000000CU0A	Right Side Curtain Airbag Current	5	A	Bipolar	
184	ABT squib amps	11PRET000000CU0A	Left Front Buckle Pretensioner Current	5	A	Bipolar	
185	ABT squib amps	13PRET000000CU0A	Right Front Buckle Pretensioner Current	5	A	Bipolar	
186	ABT squib amps	16PRET020000CU0A	Right Rear Buckle Pretensioner Current	5	A	Bipolar	
187	ABT squib amps	11PRET010000CU0A	Left Front Retractor Current	5	A	Bipolar	

Command File Test Number 100420

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
	1	11HEADCG00H3ACXA	Driver Head X-Axis Acceleration	1000 +	yes	1000
	2	11HEADCG00H3ACYA	Driver Head Y-Axis Acceleration	1000 +	yes	1000
	3	11HEADCG00H3ACZA	Driver Head Z-Axis Acceleration	1000 +	yes	1000
3A		11HEADCG00H3ACRA	Driver Head Resultant Acceleration	1000		
	4	11HEADFR00H3ACYA	Driver Head Front Y-Axis Acceleration	1000 +	yes	1000
	5	11HEADFR00H3ACZA	Driver Head Front Z-Axis Acceleration	1000 +	yes	1000
	6	11HEADUP00H3ACXA	Driver Head Top X-Axis Acceleration	1000 +	yes	1000
	7	11HEADUP00H3ACYA	Driver Head Top Y-Axis Acceleration	1000 +	yes	1000
	8	11HEADLE00H3ACXA	Driver Head Left X-Axis Acceleration	1000 +	yes	1000
	9	11HEADLE00H3ACZA	Driver Head Left Z-Axis Acceleration	1000 +	yes	1000
	10	11NECKUP00H3FOXA	Driver Upper Neck X-Axis Force	1000 +	yes	8896.4
	11	11NECKUP00H3FOYA	Driver Upper Neck Y-Axis Force	1000 +	yes	8896.4
	12	11NECKUP00H3FOZA	Driver Upper Neck Z-Axis Force	1000 +	yes	13344.6
	13	11NECKUP00H3MOXA	Driver Upper Neck Moment About X Axis	600 +	yes	282.4
	14	11NECKUP00H3MOYA	Driver Upper Neck Moment About Y Axis	600 +	yes	282.4
	15	11NECKUP00H3MOZA	Driver Upper Neck Moment About Z Axis	600 +	yes	282.4
	16	11NECKLO00H3FOXA	Driver Lower Neck X-Axis Force	1000 +	yes	13345
	17	11NECKLO00H3FOYA	Driver Lower Neck Y-Axis Force	1000 +	yes	13344.6
	18	11NECKLO00H3FOZA	Driver Lower Neck Z-Axis Force	1000 +	yes	13344.6
	19	11NECKLO00H3MOXA	Driver Lower Neck Moment About X Axis	600 +	yes	452
	20	11NECKLO00H3MOYA	Driver Lower Neck Moment About Y Axis	600 +	yes	452
	21	11NECKLO00H3MOZA	Driver Lower Neck Moment About Z Axis	600 +	yes	452
	22	11CHSTCG00H3ACXA	Driver Chest X-Axis Acceleration	180 +	yes	1000
	23	11CHSTCG00H3ACYA	Driver Chest Y-Axis Acceleration	180 +	yes	1000
	24	11CHSTCG00H3ACZA	Driver Chest Z-Axis Acceleration	180 +	yes	1000
24A		11CHSTCG00H3ACRA	Driver Chest Resultant Acceleration	180		
	25	11CHST0000H3DSXA	Driver Chest X-Axis Displacement	600 +	yes	75
	26	11PELVCG00H3ACXA	Driver Pelvis X-Axis Acceleration	1000 +	yes	1000
	27	11PELVCG00H3ACYA	Driver Pelvis Y-Axis Acceleration	1000 +	yes	1000
	28	11PELVCG00H3ACZA	Driver Pelvis Z-Axis Acceleration	1000 +	yes	1000
28A		11PELVCG00H3ACRA	Driver Pelvis Resultant Acceleration	1000		
	29	13HEADCG00H3ACXA	Right Front Passenger Head X-Axis Acceleration	1000 +	yes	1000
	30	13HEADCG00H3ACYA	Right Front Passenger Head Y-Axis Acceleration	1000 +	yes	1000
	31	13HEADCG00H3ACZA	Right Front Passenger Head Z-Axis Acceleration	1000 +	yes	1000
31A		13HEADCG00H3ACRA	Right Front Passenger Head Resultant Acceleration	1000		

Command File Test Number 100420

Channel	ISO mnemonic	Channel Title	Filter	Class	Flip	Zero	Full Scale
	32	13HEADCG00H3AVXA	Right Front Passenger Head (DTS ARS) Rate Gyro X	1000	+	yes	12000
	33	13HEADCG00H3AVYA	Right Front Passenger Head (DTS ARS) Rate Gyro Y	1000	+	yes	12000
	34	13HEADCG00H3AVZA	Right Front Passenger Head (DTS ARS) Rate Gyro Z	1000	+	yes	12000
	35	13NECKUP00H3FOXA	Right Front Passenger Upper Neck X-Axis Force	1000	+	yes	8896
	36	13NECKUP00H3FOYA	Right Front Passenger Upper Neck Y-Axis Force	1000	+	yes	8896
	37	13NECKUP00H3FOZA	Right Front Passenger Upper Neck Z-Axis Force	1000	+	yes	13344
	38	13NECKUP00H3MOXA	Right Front Passenger Upper Neck Moment About X Axis	600	+	yes	282.5
	39	13NECKUP00H3MOYA	Right Front Passenger Upper Neck Moment About Y Axis	600	+	yes	282.5
	40	13NECKUP00H3MOZA	Right Front Passenger Upper Neck Moment About Z Axis	600	+	yes	282.5
	41	13CHSTCG00H3ACXA	Right Front Passenger Chest X-Axis Acceleration	180	+	yes	1000
	42	13CHSTCG00H3ACYA	Right Front Passenger Chest Y-Axis Acceleration	180	+	yes	1000
	43	13CHSTCG00H3ACZA	Right Front Passenger Chest Z-Axis Acceleration	180	+	yes	1000
43A		13CHSTCG00H3ACRA	Right Front Passenger Chest Resultant Acceleration	180			
	44	13CHST0000H3DSXA	Right Front Passenger Chest X-Axis Displacement	600	+	yes	84
	45	13NECKLO00H3FOXA	Right Front Passenger Lower Neck X-Axis Force	1000	+	yes	8896
	46	13NECKLO00H3FOYA	Right Front Passenger Lower Neck Y-Axis Force	1000	+	yes	8896
	47	13NECKLO00H3FOZA	Right Front Passenger Lower Neck Z-Axis Force	1000	+	yes	13345
	48	13NECKLO00H3MOXA	Right Front Passenger Lower Neck Moment About X Axis	600	+	yes	282.5
	49	13NECKLO00H3MOYA	Right Front Passenger Lower Neck Moment About Y Axis	600	+	yes	282.5
	50	13NECKLO00H3MOZA	Right Front Passenger Lower Neck Moment About Z Axis	600	+	yes	282.5
	51	13PELVCG00H3ACXA	Right Front Passenger Pelvis X-Axis Acceleration	1000	+	yes	1000
	52	13PELVCG00H3ACYA	Right Front Passenger Pelvis Y-Axis Acceleration	1000	+	yes	1000
	53	13PELVCG00H3ACZA	Right Front Passenger Pelvis Z-Axis Acceleration	1000	+	yes	1000
53A		13PELVCG00H3ACRA	Right Front Passenger Pelvis Resultant Acceleration	1000			
	54	16HEADCG00H3ACXA	Right Rear Passenger Head X-Axis Acceleration	1000	+	yes	1000
	55	16HEADCG00H3ACYA	Right Rear Passenger Head Y-Axis Acceleration	1000	+	yes	1000
	56	16HEADCG00H3ACZA	Right Rear Passenger Head Z-Axis Acceleration	1000	+	yes	1000
56A		16HEADCG00H3ACRA	Right Rear Passenger Head Resultant Acceleration	1000			
	57	16HEADCG00H3AVXA	Right Rear Passenger Head (DTS ARS) Rate Gyro X	1000	+	yes	12000
	58	16HEADCG00H3AVYA	Right Rear Passenger Head (DTS ARS) Rate Gyro Y	1000	+	yes	12000
	59	16HEADCG00H3AVZA	Right Rear Passenger Head (DTS ARS) Rate Gyro Z	1000	+	yes	12000
	60	16NECKUP00H3FOXA	Right Rear Passenger Upper Neck X-Axis Force	1000	+	yes	8896
	61	16NECKUP00H3FOYA	Right Rear Passenger Upper Neck Y-Axis Force	1000	+	yes	8896
	62	16NECKUP00H3FOZA	Right Rear Passenger Upper Neck Z-Axis Force	1000	+	yes	13344
	63	16NECKUP00H3MOXA	Right Rear Passenger Upper Neck Moment About X Axis	600	+	yes	282

Command File Test Number 100420

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
	64	16NECKUP00H3MOYA	Right Rear Passenger Upper Neck Moment About Y Axis	600 +	yes	282
	65	16NECKUP00H3MOZA	Right Rear Passenger Upper Neck Moment About Z Axis	600 +	yes	282
	66	16CHSTCG00H3ACXA	Right Rear Passenger Chest X-Axis Acceleration	180 +	yes	400
	67	16CHSTCG00H3ACYA	Right Rear Passenger Chest Y-Axis Acceleration	180 +	yes	400
	68	16CHSTCG00H3ACZA	Right Rear Passenger Chest Z-Axis Acceleration	180 +	yes	400
68A		16CHSTCG00H3ACRA	Right Rear Passenger Chest Resultant Acceleration	180		
	69	16CHST0000H3DSXA	Right Rear Passenger Chest X-Axis Displacement	600 +	yes	84
	70	16NECKLO00H3FOXA	Right Rear Passenger Lower Neck X-Axis Force	1000 +	yes	8896
	71	16NECKLO00H3FOYA	Right Rear Passenger Lower Neck Y-Axis Force	1000 +	yes	8896
	72	16NECKLO00H3FOZA	Right Rear Passenger Lower Neck Z-Axis Force	1000 +	yes	13345
	73	16NECKLO00H3MOXA	Right Rear Passenger Lower Neck Moment About X Axis	600 +	yes	282
	74	16NECKLO00H3MOYA	Right Rear Passenger Lower Neck Moment About Y Axis	600 +	yes	282
	75	16NECKLO00H3MOZA	Right Rear Passenger Lower Neck Moment About Z Axis	600 +	yes	282
	76	16PELVCG00H3ACXA	Right Rear Passenger Pelvis X-Axis Acceleration	1000 +	yes	1000
	77	16PELVCG00H3ACYA	Right Rear Passenger Pelvis Y-Axis Acceleration	1000 +	yes	1000
	78	16PELVCG00H3ACZA	Right Rear Passenger Pelvis Z-Axis Acceleration	1000 +	yes	1000
78A		16PELVCG00H3ACRA	Right Rear Passenger Pelvis Resultant Acceleration	1000		
	79	10VEHCCG0000ACXA	Vehicle Center of Gravity X-Axis Acceleration	60 +	yes	2000
	80	10VEHCCG0000ACYA	Vehicle Center of Gravity Y-Axis Acceleration	60 +	yes	2000
	81	10VEHCCG0000ACZA	Vehicle Center of Gravity Z-Axis Acceleration	60 +	yes	2000
81A		10VEHCCG0000ACRA	Vehicle Center of Gravity Resultant Acceleration	60		
	82	10VEHCCG0000AVXA	Vehicle Roll Rate	600 +	yes	1500
	83	10VEHCCG0000AVYA	Vehicle Pitch Rate	600 +	yes	1500
	84	10VEHCCG0000AVZA	Vehicle Yaw Rate	600 +	yes	1500
	85	10VEHCREDK00AVXA	Rear Deck Roll Rate Redundant	600 +	yes	1500
	86	10VEHCREDK00AVYA	Rear Deck Pitch Rate Redundant	600 +	yes	1500
	87	10VEHCREDK00AVZA	Rear Deck Yaw Rate Redundant	600 +	yes	1500
	88	10ENGNTTP0000ACXA	Top of Engine X-Axis Acceleration	60 +	yes	2000
	89	10ENGNTTP0000ACYA	Top of Engine Y-Axis Acceleration	60 +	yes	2000
	90	10ENGNTTP0000ACZA	Top of Engine Z-Axis Acceleration	60 +	yes	2000
90A		10ENGNTTP0000ACRA	Top of Engine Resultant Acceleration	60		
	91	10ENGNBO0000ACXA	Bottom of Engine X-Axis Acceleration	60 +	yes	2000
	92	10ENGNBO0000ACYA	Bottom of Engine Y-Axis Acceleration	60 +	yes	2000
	93	10ENGNBO0000ACZA	Bottom of Engine Z-Axis Acceleration	60 +	yes	2000
93A		10ENGNBO0000ACRA	Bottom of Engine Resultant Acceleration	60		

Command File Test Number 100420

Channel	ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
	94	10APILUPLE00ACXA	Left A-Pillar Upper X-Axis Acceleration	60 +	yes	2000
	95	10APILUPLE00ACYA	Left A-Pillar Upper Y-Axis Acceleration	60 +	yes	2000
	96	10APILUPLE00ACZA	Left A-Pillar Upper Z-Axis Acceleration	60 +	yes	2000
96A		10APILUPLE00ACRA	Left A-Pillar Upper Resultant Acceleration	60		
	97	10APILLOLE00ACXA	Left A-Pillar Lower X-Axis Acceleration	60 +	yes	2000
	98	10APILLOLE00ACYA	Left A-Pillar Lower Y-Axis Acceleration	60 +	yes	2000
	99	10APILLOLE00ACZA	Left A-Pillar Lower Z-Axis Acceleration	60 +	yes	2000
99A		10APILLOLE00ACRA	Left A-Pillar Lower Resultant Acceleration	60		
	100	10APILUPRI00ACXA	Right A-Pillar Upper X-Axis Acceleration	60 +	yes	2000
	101	10APILUPRI00ACYA	Right A-Pillar Upper Y-Axis Acceleration	60 +	yes	2000
	102	10APILUPRI00ACZA	Right A-Pillar Upper Z-Axis Acceleration	60 +	yes	2000
102A		10APILUPRI00ACRA	Right A-Pillar Upper Resultant Acceleration	60		
	103	10APILLORI00ACXA	Right A-Pillar Lower X-Axis Acceleration	60 +	yes	2000
	104	10APILLORI00ACYA	Right A-Pillar Lower Y-Axis Acceleration	60 +	yes	2000
	105	10APILLORI00ACZA	Right A-Pillar Lower Z-Axis Acceleration	60 +	yes	2000
105A		10APILLORI00ACRA	Right A-Pillar Lower Resultant Acceleration	60		
	106	10BPILUPLE00ACXA	Left B-Pillar Upper X-Axis Acceleration	60 +	yes	2000
	107	10BPILUPLE00ACYA	Left B-Pillar Upper Y-Axis Acceleration	60 +	yes	2000
	108	10BPILUPLE00ACZA	Left B-Pillar Upper Z-Axis Acceleration	60 +	yes	2000
108A		10BPILUPLE00ACRA	Left B-Pillar Upper Resultant Acceleration	60		
	109	10BPILLOLE00ACXA	Left B-Pillar Lower X-Axis Acceleration	60 +	yes	2000
	110	10BPILLOLE00ACYA	Left B-Pillar Lower Y-Axis Acceleration	60 +	yes	2000
	111	10BPILLOLE00ACZA	Left B-Pillar Lower Z-Axis Acceleration	60 +	yes	2000
111A		10BPILLOLE00ACRA	Left B-Pillar Lower Resultant Acceleration	60		
	112	10BPILUPRI00ACXA	Right B-Pillar Upper X-Axis Acceleration	60 +	yes	2000
	113	10BPILUPRI00ACYA	Right B-Pillar Upper Y-Axis Acceleration	60 +	yes	2000
	114	10BPILUPRI00ACZA	Right B-Pillar Upper Z-Axis Acceleration	60 +	yes	2000
114A		10BPILUPRI00ACRA	Right B-Pillar Upper Resultant Acceleration	60		
	115	10BPILLORI00ACXA	Right B-Pillar Lower X-Axis Acceleration	60 +	yes	2000
	116	10BPILLORI00ACYA	Right B-Pillar Lower Y-Axis Acceleration	60 +	yes	2000
	117	10BPILLORI00ACZA	Right B-Pillar Lower Z-Axis Acceleration	60 +	yes	2000
117A		10BPILLORI00ACRA	Right B-Pillar Lower Resultant Acceleration	60		
	118	10CPILUPLE00ACXA	Left C-Pillar Upper X-Axis Acceleration	60 +	yes	2000
	119	10CPILUPLE00ACYA	Left C-Pillar Upper Y-Axis Acceleration	60 +	yes	2000
	120	10CPILUPLE00ACZA	Left C-Pillar Upper Z-Axis Acceleration	60 +	yes	2000

Command File Test Number 100420

Channel ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
120A 10CPILUPLE00ACRA	Left C-Pillar Upper Resultant Acceleration	60			
121 10CPILLOLE00ACXA	Left C-Pillar Lower X-Axis Acceleration	60 +	yes		2000
122 10CPILLOLE00ACYA	Left C-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
123 10CPILLOLE00ACZA	Left C-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
123A 10CPILLOLE00ACRA	Left C-Pillar Lower Resultant Acceleration	60			
124 10CPILUPRI00ACXA	Right C-Pillar Upper X-Axis Acceleration	60 +	yes		2000
125 10CPILUPRI00ACYA	Right C-Pillar Upper Y-Axis Acceleration	60 +	yes		2000
126 10CPILUPRI00ACZA	Right C-Pillar Upper Z-Axis Acceleration	60 +	yes		2000
126A 10CPILUPRI00ACRA	Right C-Pillar Upper Resultant Acceleration	60			
127 10CPILLORI00ACXA	Right C-Pillar Lower X-Axis Acceleration	60 +	yes		2000
128 10CPILLORI00ACYA	Right C-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
129 10CPILLORI00ACZA	Right C-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
129A 10CPILLORI00ACRA	Right C-Pillar Lower Resultant Acceleration	60			
130 10DPILUPLE00ACXA	Left D-Pillar Upper X-Axis Acceleration	60 +	yes		2000
131 10DPILUPLE00ACYA	Left D-Pillar Upper Y-Axis Acceleration	60 +	yes		2000
132 10DPILUPLE00ACZA	Left D-Pillar Upper Z-Axis Acceleration	60 +	yes		2000
132A 10DPILUPLE00ACRA	Left D-Pillar Upper Resultant Acceleration	60			
133 10DPILLOLE00ACXA	Left D-Pillar Lower X-Axis Acceleration	60 +	yes		2000
134 10DPILLOLE00ACYA	Left D-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
135 10DPILLOLE00ACZA	Left D-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
135A 10DPILLOLE00ACRA	Left D-Pillar Lower Resultant Acceleration	60			
136 10DPILUPRI00ACXA	Right D-Pillar Upper X-Axis Acceleration	60 +	yes		2000
137 10DPILUPRI00ACYA	Right D-Pillar Upper Y-Axis Acceleration	60 +	yes		2000
138 10DPILUPRI00ACZA	Right D-Pillar Upper Z-Axis Acceleration	60 +	yes		2000
138A 10DPILUPRI00ACRA	Right D-Pillar Upper Resultant Acceleration	60			
139 10DPILLORI00ACXA	Right D-Pillar Lower X-Axis Acceleration	60 +	yes		2000
140 10DPILLORI00ACYA	Right D-Pillar Lower Y-Axis Acceleration	60 +	yes		2000
141 10DPILLORI00ACZA	Right D-Pillar Lower Z-Axis Acceleration	60 +	yes		2000
141A 10DPILLORI00ACRA	Right D-Pillar Lower Resultant Acceleration	60			
142 102RDK000000ACXA	Vehicle Rear Deck X-Axis Acceleration	60 +	yes		2000
143 102RDK000000ACYA	Vehicle Rear Deck Y-Axis Acceleration	60 +	yes		2000
144 102RDK000000ACZA	Vehicle Rear Deck Z-Axis Acceleration	60 +	yes		2000
144A 102RDK000000ACRA	Vehicle Rear Deck Resultant Acceleration	60			
145 11SEAT000000ACXA	LF Seat Position (on floor) X-Axis Acceleration	60 +	yes		2000
146 11SEAT000000ACYA	LF Seat Position (on floor) Y-Axis Acceleration	60 +	yes		2000

Command File Test Number 100420

Channel ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
147	11SEAT000000ACZA	LF Seat Position (on floor) Z-Axis Acceleration	60 +	yes	2000
147A	11SEAT000000ACRA	LF Seat Position (on floor) Resultant Acceleration	60		
148	13SEAT000000ACXA	RF Seat Position (on floor) X-Axis Acceleration	60 +	yes	2000
149	13SEAT000000ACYA	RF Seat Position (on floor) Y-Axis Acceleration	60 +	yes	2000
150	13SEAT000000ACZA	RF Seat Position (on floor) Z-Axis Acceleration	60 +	yes	2000
150A	13SEAT000000ACRA	RF Seat Position (on floor) Resultant Acceleration	60		
151	14SEAT000000ACXA	LR Seat Position (on floor) X-Axis Acceleration	60 +	yes	2000
152	14SEAT000000ACYA	LR Seat Position (on floor) Y-Axis Acceleration	60 +	yes	2000
153	14SEAT000000ACZA	LR Seat Position (on floor) Z-Axis Acceleration	60 +	yes	2000
153A	14SEAT000000ACRA	LR Seat Position (on floor) Resultant Acceleration	60		
154	16SEAT000000ACXA	RR Seat Position (on floor) X-Axis Acceleration	60 +	yes	2000
155	16SEAT000000ACYA	RR Seat Position (on floor) Y-Axis Acceleration	60 +	yes	2000
156	16SEAT000000ACZA	RR Seat Position (on floor) Z-Axis Acceleration	60 +	yes	2000
156A	16SEAT000000ACRA	RR Seat Position (on floor) Resultant Acceleration	60		
157	11SEBE0000B5FO0A	Driver Lap Belt Force	60 +	yes	13344
158	11SEBE0000B3FO0A	Driver Shoulder Belt Force	60 +	yes	13344
159	13SEBE0000B5FO0A	Right Front Passenger Lap Belt Force	60 +	yes	13344
160	13SEBE0000B3FO0A	Right Front Passenger Shoulder Belt Force	60 +	yes	13344
161	14SEBE0000B5FO0A	Right Rear Passenger Lap Belt Force	60 +	yes	13344
162	14SEBE0000B3FO0A	Right Rear Passenger Shoulder Belt Force	60 +	yes	13344
163	11SEBE0000B5DS0A	Driver Seat Belt Spool Potentiometer	1000 +	yes	750
164	13SEBE0000B5DS0A	Right Front Passenger Belt Spool Potentiometer	1000 +	yes	750
165	16SEBE0000B5DS0A	Right Rear Passenger Belt Spool Potentiometer	1000 +	yes	750
166	11CONT000023EV00	Driver Head Contact	0 +	no	1
167	11CONT000024EV00	Driver Thorax Contact	0 +	no	1
168	11CONT000025EV00	Driver Pelvis Contact	0 +	no	1
169	13CONT000026EV00	Right Front Passenger Head Contact Switch	0 +	no	1
170	13CONT000027EV00	Right Front Passenger Thorax Contact Switch	0 +	no	1
171	13CONT000028EV00	Right Front Passenger Pelvis Contact Switch	0 +	no	1
172	16CONT000029EV00	Right Rear Passenger Head Contact	0 +	no	1
173	16CONT000030EV00	Right Rear Passenger Thorax Contact	0 +	no	1
174	16CONT000031EV00	Right Rear Passenger Pelvis Contact	0 +	no	1
175	11AIRB000000VO0A	Left Side Curtain Voltage	1000 +	no	50
176	13AIRB000000VO0A	Right Side Curtain Voltage	1000 +	no	50
177	11AIRB000000CU0A	Left Side Curtain Current	1000 +	no	5

Command File Test Number 100420

Channel ISO mnemonic	Channel Title	Filter Class	Flip	Zero	Full Scale
178 13AIRB000000CU0A	Right Side Curtain Current	1000	+	no	5
179 11PRET000000VO0A	Left Front Buckle Pretensioner Voltage	1000	+	no	50
180 13PRET000000VO0A	Right Front Buckle Pretensioner Voltage	1000	+	no	50
181 16PRET020000VO0A	Right Rear Buckle Pretensioner Voltage	1000	+	no	50
182 11PRET010000VO0A	Left Front Retractor Pretensioner Voltage	1000	+	no	50
183 11PRET000000CU0A	Left Front Buckle Pretensioner Current	1000	+	no	5
184 13PRET000000CU0A	Right Front Buckle Pretensioner Current	1000	+	no	5
185 16PRET020000CU0A	Right Rear Buckle Pretensioner Current	1000	+	no	5
186 11PRET010000CU0A	Left Front Retractor Current	1000	+	no	5

APPENDIX E
INSIA Report on Structural Measurements

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

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March, 1999

REPORT DOCUMENTATION PAGE**Title:**

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

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Supplementary notes:

Under contract to:

THE EUROPEAN COMMUNITY

Project: “Improvement of Crash Compatibility between Cars”
Contract N°: RO – 97 – SC.1064

Abstract:

The main aim of this working package -*Structural Survey of Cars*- is the reduction of incompatibilities, both structural and geometric, between passenger vehicles and their potential collision partners. The understanding of these incompatibilities needs a previous step for the knowledge of the existing car fleet.

Firstly, it is necessary to select the main resistant elements in the car body. These elements have to be chosen from the point of view of the sort of collision that we want to study, that is to say, frontal and side impacts.

Detailed measurements have been taken from exterior and interior elements, spread to a total number of 74 models selected from the main vehicle manufacturers at Spain. All of them are being sold this year. Using the information available from the previous measurements in vehicles, the geometric characteristics of the main resistant elements involved in the geometric compatibility between cars will be defined.

This report shows the methodology followed to get these measurements.

Subject terms:

Crash compatibility, geometric compatibility, resistant elements, measure methodology

Date:

March, 1999

1.- METHODOLOGY.

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

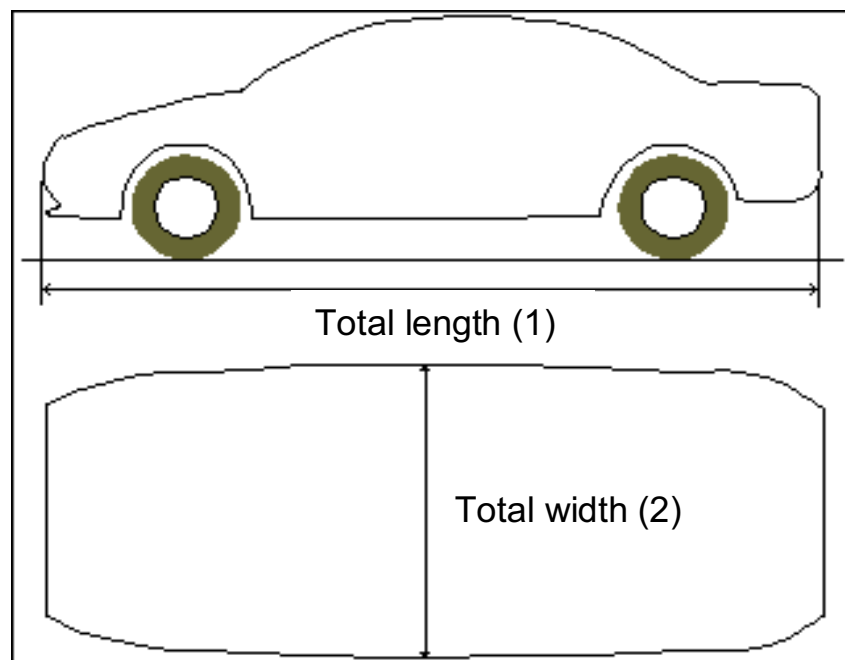


Figure 1.- Definition of the main resistant elements. General dimensions.

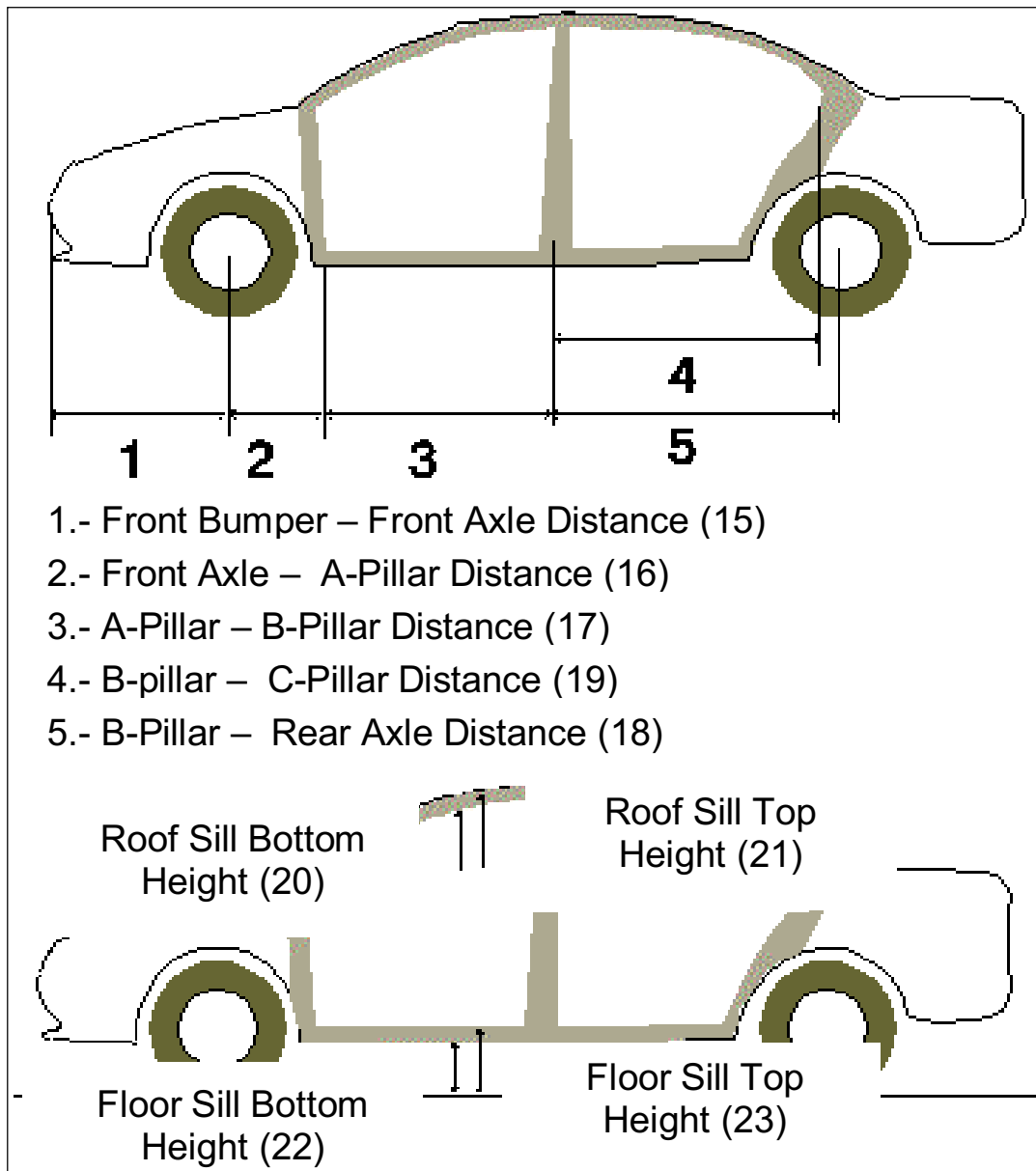


Figure 2.- Definition of the main resistant elements. Side elements.

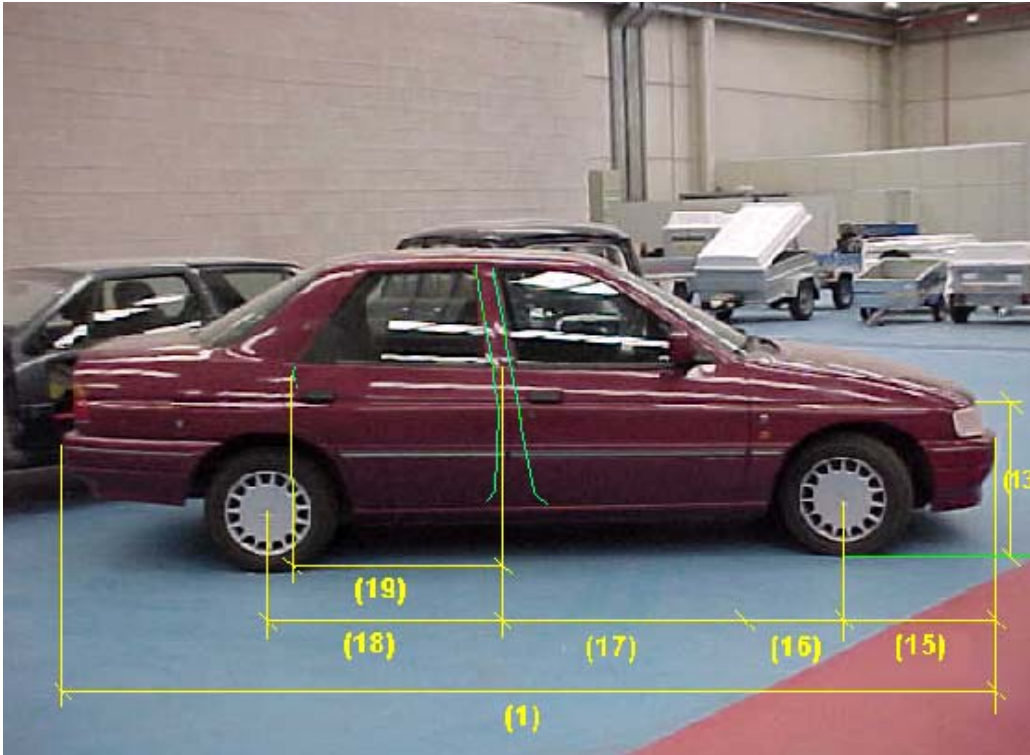
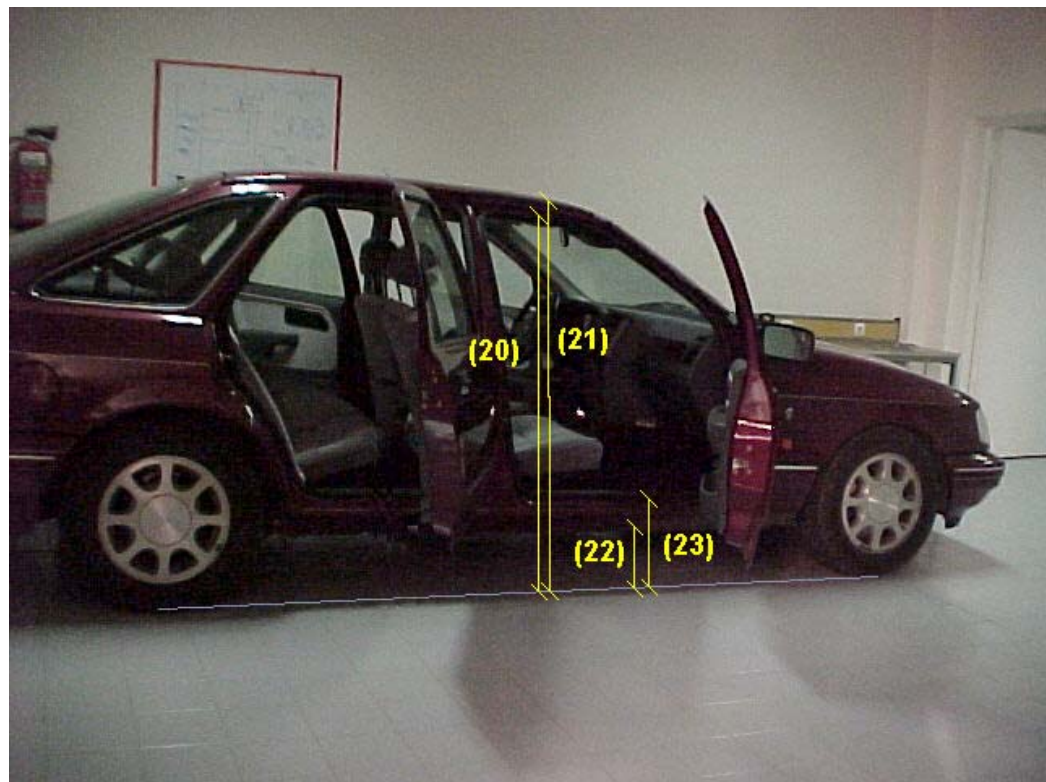


Figure 3.-
Measurements of
the side resistant
elements (outer).

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



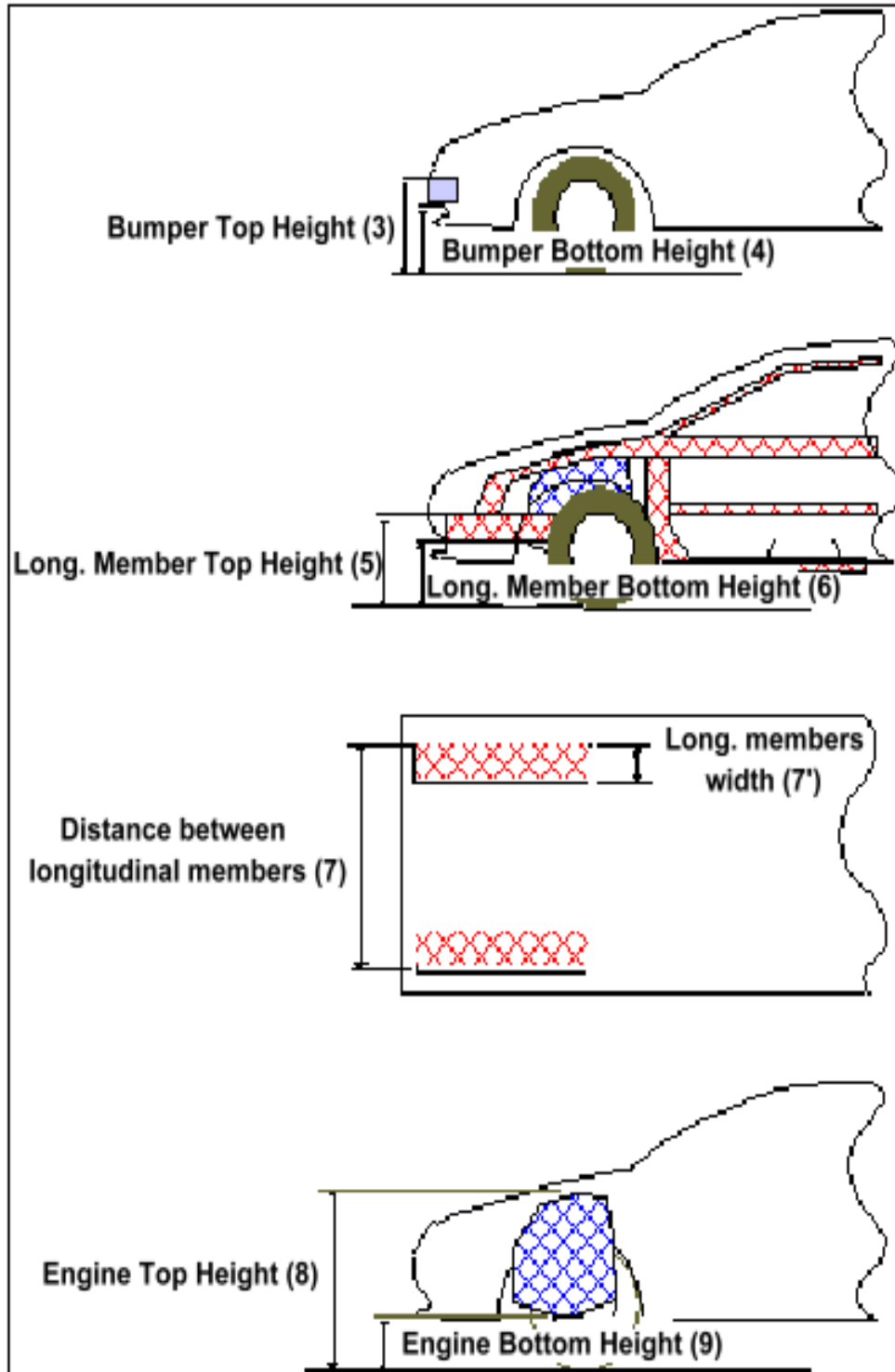


Figure 5.- Definition of the main resistant elements. Front elements.

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

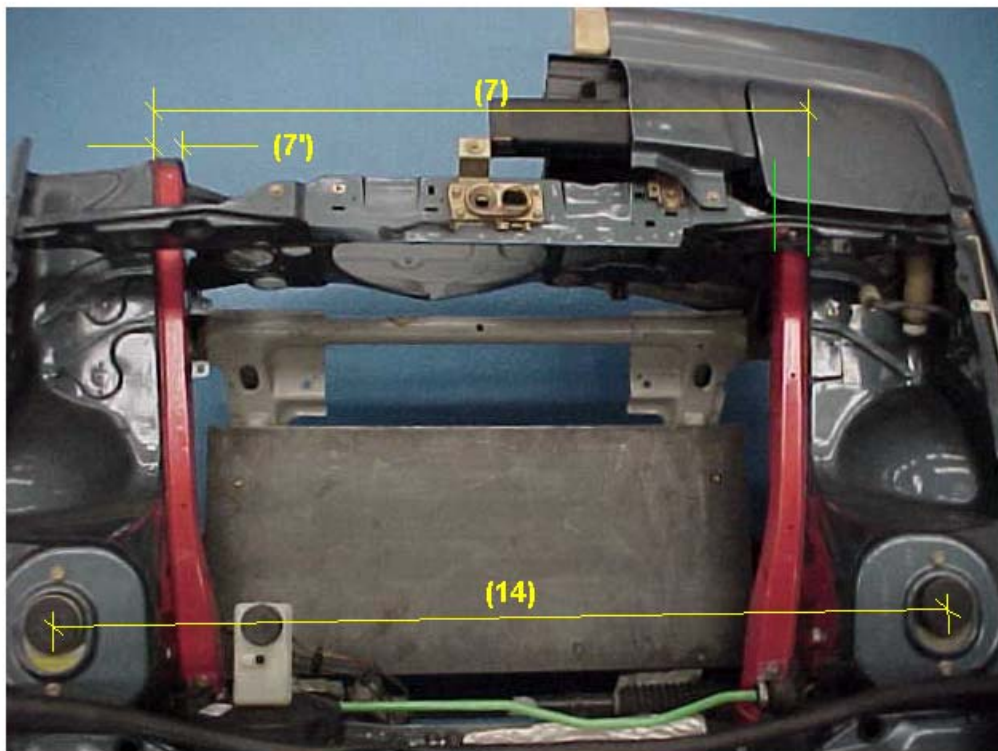
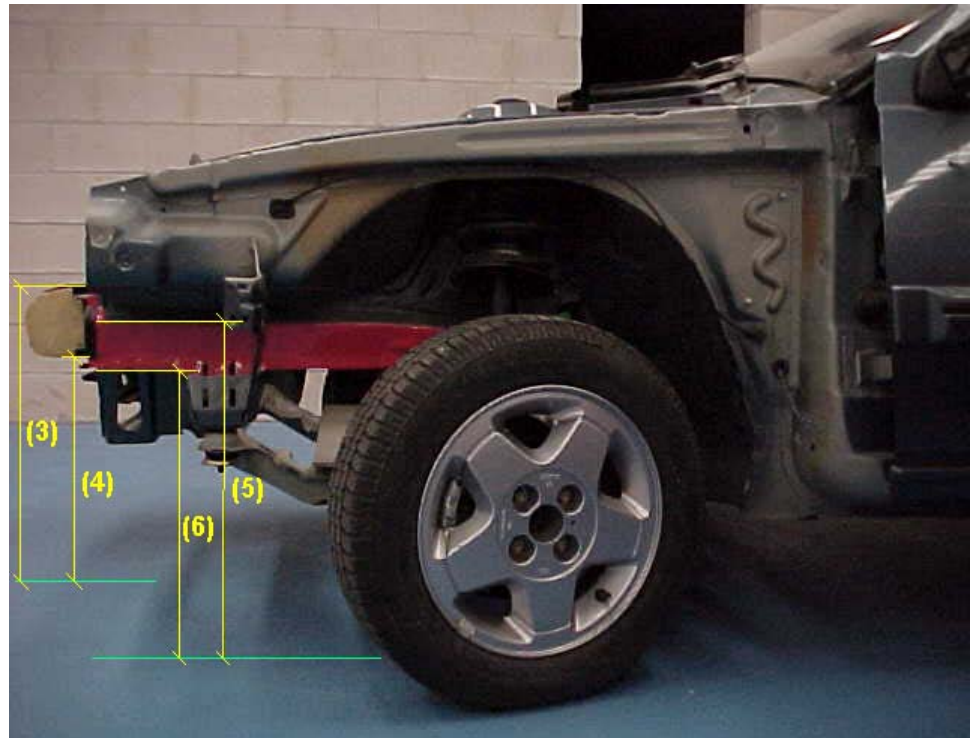


Figure 7.-
Measurements
of the main
resistant
elements. Front
elements 2.

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

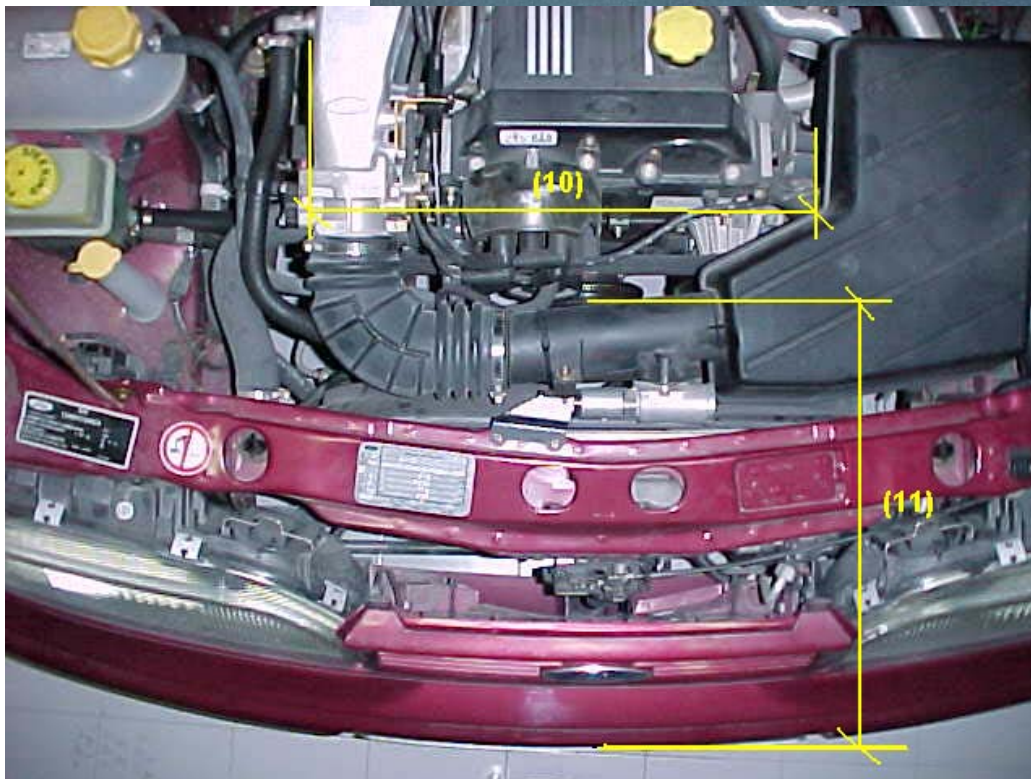
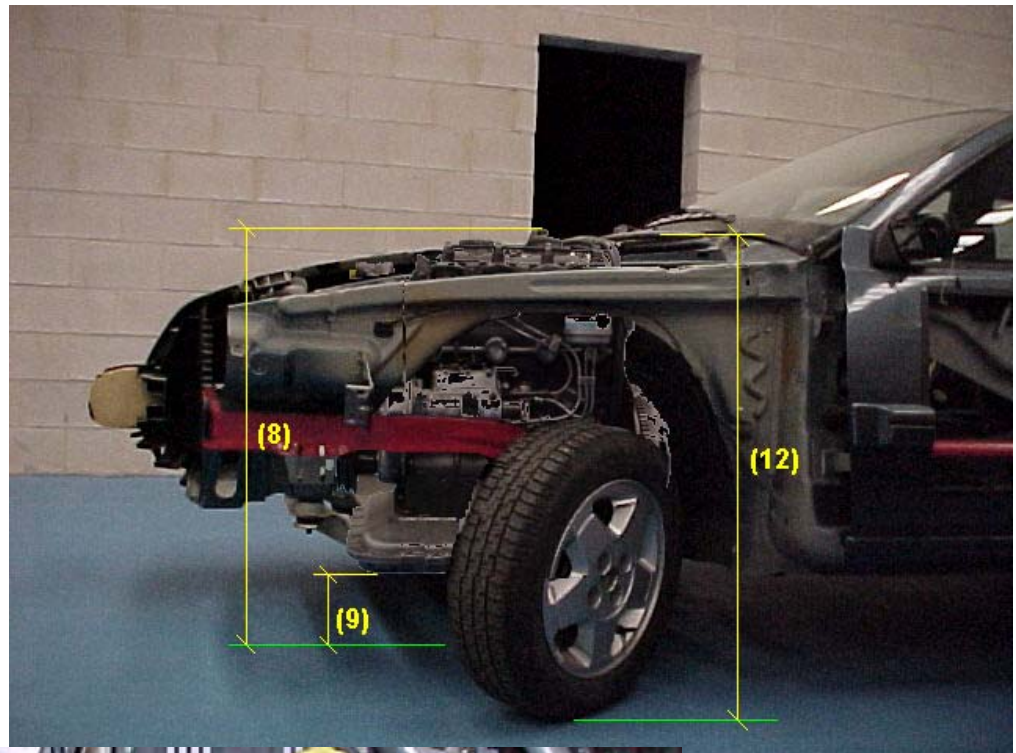


Figure 9.-
Definition of
the main
resistant
elements. Front
elements
(Longitudinal
engine).

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

FRONT ELEMENTS

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

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

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

-
- **Engine top height (8) (Front Sheet N column):** distance between the ground and the highest point on the engine that can be a resistant member in case of accident (usually, the highest point on the head, or the highest point of the inlet or exhaust manifolds).

 - **Engine bottom height (9) (Front Sheet M column):** distance between the ground and the lowest point on the engine (usually, the lowest point on the crankcase).

 - **Engine and Gearbox width (10) (Front Sheet O & P columns):**
 - *Transverse configuration engine:* distance between extreme points in the gearbox-cylinder block unit or others resistant members attached to the cylinder block unit, i.e. fan belts (from a front point of view).

 - *Longitudinal configuration engine:* distance between extreme points in the cylinder block unit (from a front point of view).

 - **Front bumper - Engine distance (11) (Front Sheet Q column):** distance between the point in the front bumper further on and the point in the engine further on that is a resistant element, i.e. the further on point of the exhaust manifold placed in the front of the engine.

 - **Front shock absorber fixing width (14) (Front Sheet R column):** transverse distance between the front shock absorber - body car joints.

 - **Front shock absorber fixing height (12) (Front Sheet S column):** distance between the ground and the front shock absorber-body car joint.

 - **Bonnet leading edge height (Front Sheet T column):** distance between the ground and the bonnet edge further on.

SIDE ELEMENTS

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

NOTE

- N/A: dimension not available.