REPORT NUMBER: R&D-CAL-11-010

MOVING BARRIER TO VEHICLE CRASH TEST IN SUPPORT OF NHTSA'S FRONTAL OBLIQUE OFFSET PROGRAM
RESEARCH MOVING BARRIER DEFORMABLE BARRIER INTO LEFT FRONT OF A

2011 FORD EXPLORER
56 MPH, 7° ANGLE, 20% OVERLAP

TEST DATE: JULY 19, 2011
NHTSA NO: RB0222

PREPARED BY:
CALSPAN CORPORATION
4455 GENESEE ST
BUFFALO, NY

FINAL REPORT SUBMITTED:

FEBRUARY 15, 2012

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
VEHICLE SAFETY RESEARCH
1200 NEW JERSEY AVE, SE
ROOM W46-446
WASHINGTON, DC 20590

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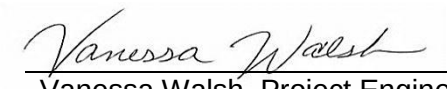
Prepared by:  Date: February 15, 2012

Vanessa Walsh, Project Engineer

Approved by:  Date: February 15, 2012

David Travale, Technical Director,
Transportation Operations

FINAL REPORT ACCEPTANCE BY OCWS:

_____

Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

_____

COTR, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

TECHNICAL REPORT STANDARD TITLE PAGE

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4. Title and Subtitle Report for Frontal Oblique Offset Program Testing of a 2011 Ford Explorer Utility Vehicle NHTSA No. RB0222		**5. Report Date** 3/23/2015 **6. Performing Organization Code** CAL
7. Author(s) David J. Travale, Program Manager Edward Dutton / Vanessa Walsh - Test Engineer		**8. Performing Organization Report No.** TR2527
9. Performing Organization Name and Address Calspan Corporation 4455 Genesee Street Buffalo, New York 14225		**10. Work Unit No.** **11. Contract or Grant No.** DTNH22-10-D-00155
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards 1200 New Jersey Ave SE, Room W43-410 Washington, DC 20590		**13. Type of Report and Period Covered** Draft Report, 7/27/2011 **14. Sponsoring Agency Code** NPO-320
15. Supplementary Notes		

16. Abstract

A test was conducted in accordance with Task Order 0001 of Contract DTNH22-10-D-00155. The Test consisted of a research moving deformable barrier (RMDB) traveling at a target speed of 90.12 kph into a stationary 2011 Ford Explorer utility vehicle. The struck vehicle was positioned 7 degrees relative to the moving barrier, and impacted 20% of the left side of the vehicle. The test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at the Calspan Corporation's crash test facility in Buffalo, New York on July 19, 2011.

The impact velocity of the vehicle was 89.58 km/h, and the ambient temperature at the barrier face at the time of impact was 35.5°C. The target vehicle post-test maximum crush was 573 mm of Vehicle. The test vehicle's performance is as follows:

Measurement Description	Driver ATD			Pass. ATD		
	Units	Threshold	Result	Units	Threshold	Result
Head Injury Criteria (HIC_{15})	N/A	700	53.64	N/A	700	104.74
Maximum Chest Compression	mm	63	-38.42	mm	52	22.41
Nij	N/A	1	0.19	N/A	1	0.55
Neck Tension	N	4,170	1177.99	N	2,620	1289.70
Neck Compression	N	4,000	-122.97	N	2,520	-292.17
Left Femur Force	N	10,008	-3005.92	N	6,805	-647.41
Right Femur Force	N	10,008	-3293.42	N	6,805	-98.36

17. Key Words 56 mph Frontal Barrier Impact test, RMDB, Research 2011 Ford Explorer, 7 degree, 20% THOR Oblique Small overlap offset	***18. Distribution Statement*** Copies of this report are available from: NHTSA Technical Reference Division National Highway Traffic Safety Admin. 1200 New Jersey Ave SE Washington, DC 20590

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SECTION 1

PURPOSE

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7° angle, 20% Offset	Test Date	7/19/2011

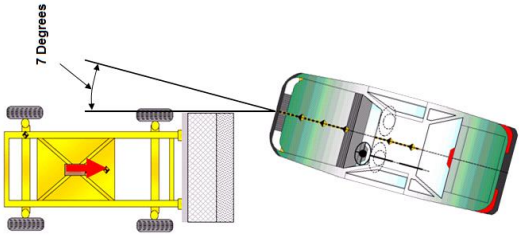
This 90.12 km/h (56 mph) Moving Barrier into a vehicle test is part of Frontal Offset Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No.DTNH22-10-D-00155. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

This test was conducted in accordance with the instructions set forth by NHTSA for a 7º, 20% offset moving barrier to vehicle impact, outlined in Task Order (TO) DTNH22-10-D-00155. Data was obtained indicant of Federal Motor Vehicle Safety Standard (FMVSS) 208-Occupant Crash Protection, FMVSS 212-Windshield Mounting, FMVSS 219 (partial)-Windshield Zone Intrusion, and FMVSS 301-Fuel System Integrity, in addition to the requirements of TO DTNH22-10-D-00155.

SECTION 2
SUMMARY OF TEST

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7° angle, 20% Offset	Test Date	7/19/2011

A model year 2011 Ford Explorer Utility Vehicle was impacted on the left front corner by an Research Moving Deformable Barrier (RMDB). This test vehicle was stationary and positioned at a target angle of 7º and at a target offset of 20% to the forward line of motion of the RMDB. The RMDB was towed down the test track in a full forward direction, without any crabbing, and the targeted impact velocity was 90.12 km/h (56 mph). The test vehicle mass was 2362.0 kg (5196 lbs), and the RMDB mass was 2486.2 kg (5481 lbs). The test was conducted by Calspan Corporation on July 19, 2011.



The test was documented by one (1) real time and Fifteen (15) high-speed video cameras. Camera locations and other pertinent data are located in Data Sheet No. 06 of this report. Pre- and post-test photographs of the test vehicle, the RMDB and the test setup were taken using a digital still camera. Photographic documentation of the test is presented in Appendix A of this report.

One 50% adult male THOR MK (Mod Kit) anthropomorphic test device (ATD) (Serial No.: 007) was seated in the left front (driver's) seating position and one Part 572O 5% adult female (HIII 5th) ATD (Serial No. 070) was seated in the left rear seating position. The THOR MK driver was positioned according to instructions specified in Laboratory Test Procedure for FMVSS No. 208, "Occupant Crash Protection", TP208 13, July 27, 2005. The HIII 5th% left rear seat occupant was positioned using a modified procedure of the Laboratory Test Procedure for FMVSS No. 214, "Side Impact Protection – Dynamic", TP214D-08, December 15, 2006.

The driver was restrained with a 3-point seat belt, a dual stage frontal airbag, as well as a curtain and seat mounted side airbag. The left rear passenger was restrained with a 3-point inflatable seat belt and side curtain airbag.

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7° angle, 20% Offset	Test Date	7/19/2011

One Hundred and Ninety Eight (198) channels of data from the two ATD's, test vehicle and RMDB were collected using a Kayser-Threde and Slice data acquisition system. Appendix B contains dummy data plots, as well as vehicle and RMDB response data plots.

There was 89.9% total windshield retention, with 81.4% and 98.5% retention on the left and right sides respectively. There appeared to be no intrusion into the protected zone of the windshield during any portion of the impact test. The maximum static crush of the vehicle was 573 mm at C1 to the left of the vehicle's centerline. The maximum crush of the lower bumper beam was 130 mm at C1 of the lower bumper beam, to the left of vehicle's centerline. Full vehicle measurements are presented in Section 3 of this report. All four vehicle doors remained closed and latched during the test. The left front door was jammed shut as a result of the impact. The left rear and right side doors remained operational.

Structure observations include the following:

- A-Pillar and the door sill buckled
- Left side of the front of the vehicle was sheered along the frame rail into the firewall.
- Left front wheel rim shattered as a result of the impact, and fell apart upon removal from the vehicle.

The driver ATD's visible contact points are as follows:

- Head contacted the steering wheel airbag, curtain airbag, and door frame.
- Torso contacted the torso airbag
- Chest contacted the airbag
- Both the left and right knees contacted the knee bolster.

The left rear passenger ATD's visible contact points are as follows:

- Head contacted the curtain airbag, seatbelt airbag, chest, C-Pillar and seatback
- Torso contacted the seatbelt airbag and passenger's side door
- Knees impacted the seat back of the driver seat.

SECTION 2 (CONTINUED)

CRASH VEHICLE SUMMARY

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7° angle, 20% Offset	Test Date	7/19/2011

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
RMDB Velocity at Impact	km/h	90.12
RMDB Test Weight	kg	2491
RMDB Maximum Static Crush	mm	292 (R2,C11)
Vehicle Test Weight	kg	2362
Actual Vehicle Angle	°	7°
Vehicle Maximum Static Crush	mm	573 mm to left centerline
Vertical Offset from Target Point	mm	13 (Below)
Lateral Offset from Target Point	mm	8 (Left)
Number of Data Channels		198
Number of Real-Time Cameras		1
Number of High-Speed Cameras		15

DUMMY CONTACTS

	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	Thor 007, 50% Male	N/A	5% Female, HIII 070	N/A
Head Contact	Steering wheel Airbag, Curtain Airbag, and door frame	A-37 A-48	Curtain Airbag, Seatbelt Airbag, Chest, Seatback, and Interior C-Pillar	A-49 A-52 A-58
Upper Torso Contact	Front Airbag and Torso Airbag	-	Seatbelt Airbag and Passenger's Door	-
Lower Torso Contact	Torso Airbag	A-46 A-47	Seatbelt Airbag	-
Left Knee Contact	Bolster	A-45	Driver Seatback	A-59
Right Knee Contact	Bolster	A-44	Driver Seatback	A-59

Data Anamolies:

V2P1 LEFT KNEE DX	->	Magnitude questionable
V2P1 LEFT ANKLE RZ	->	Questionable after 116 ms
V2P1 RIGHT FEMUR FY	->	Noise spikes 60 to 92 ms
V2P1 RIGHT FEMUR FZ	->	Noise spikes 60 to 92 ms
V2P4 8 STRING POD - UL MID	->	Data shape suspicious after 84.5

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2011 Ford Explorer Utility Vehicle NHTSA No.: RB0222
Test Program: Research and Development Narrow Offset Test Date: 7/19/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Head	Head Rotational Acceleration X	rad/s^2	SIMon	377507.74	-181802.26
	Head Rotational Acceleration Y	rad/s^2	SIMon	130908.23	-143451.77
	Head Rotational Acceleration Z	rad/s^2	SIMon	176068.18	-208751.82
	Head Rotational Acceleration Resultant	rad/s^2	Compute	447118.43	
	Head Rotational Velocity X	rad/s	SIMon	16.55	-71.42
	Head Rotational Velocity Y	rad/s	SIMon	19.55	-32.64
	Head Rotational Velocity Z	rad/s	SIMon	29.64	-16.63
	Head Rotational Velocity Resultant	rad/s	Compute	75.93	
	36 ms HIC		Compute	104.44	
	15 ms HIC		Compute	53.64	
	Head Resultant CG Acceleration, 3 ms Clip	g	Compute	26.57	
	Skull fracture correlate	-	SIMon	26.38	
	Cumulative strain (Tolerance = 0.05)	-	SIMon	0.99	0.00
	Cumulative strain (Tolerance = 0.10)	-	SIMon	0.57	0.00
	Cumulative strain (Tolerance = 0.15)	-	SIMon	0.13	0.00
Neck	UNLC Transferred to OC, Neck System, FX	N	1000	10.41	-868.90
	UNLC Neck System Tension, FZ	N	1000	1177.99	
	UNLC Neck System Compression, FZ	N	1000		-122.97
	UNLC Transferred to OC, Neck System Flexion, MY	N-m	Thortest	2.34	
	UNLC Transferred to OC, Neck System Extension, MY	N-m	Thortest		-23.03
	NIJ		Compute	0.19	
	On head acting through total neck section, FX	N	Thortest	196.13	-630.53
	On head acting through total neck section, FY	N	Thortest	413.02	-50.42
	On head acting through total neck section, FZ	N	Thortest	1273.47	-64.44
	On head acting through total neck section, MX	N-m	Thortest	41.91	-5.13
	On head acting through total neck section, MY	N-m	Thortest	20.60	-5.24
	On head acting through total neck section, MZ	N-m	Thortest	8.49	-24.22
	On head acting through O.C. joint only, FX	N	Thortest	25.23	-876.14
	On head acting through O.C. joint only, FZ	N	Thortest	1174.25	-200.59
	On head acting through O.C. joint only, MY	N-m	Thortest	2.34	-23.03
Chest	Upper Left Crux X – deflection	mm	Thortest	0.10	-24.51
	Upper Left Crux Y – deflection	mm	Thortest	4.91	-3.32
	Upper Left Crux Z – deflection	mm	Thortest	13.37	-9.37
	Upper Left Crux D – deflection	mm	Thortest	0.03	-20.37
	Upper Right Crux X – deflection	mm	Thortest	0.02	-39.90
	Upper Right Crux Y – deflection	mm	Thortest	11.42	-4.62
	Upper Right Crux Z – deflection	mm	Thortest	22.47	-5.47
	Upper Right Crux D – deflection	mm	Thortest	0.02	-38.42

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2011 Ford Explorer Utility Vehicle NHTSA No.: RB0222
Test Program: Research and Development Narrow Offset Test Date: 7/19/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Chest (Con't)	Lower Left Crux X – deflection	mm	Thortest	0.10	-24.51
	Lower Left Crux Y – deflection	mm	Thortest	4.91	-3.32
	Lower Left Crux Z – deflection	mm	Thortest	13.37	-9.37
	Lower Left Crux D – deflection	mm	Thortest	0.03	-20.37
	Lower Right Crux X – deflection	mm	Thortest	0.02	-39.90
	Lower Right Crux Y – deflection	mm	Thortest	11.42	-4.62
	Lower Right Crux Z – deflection	mm	Thortest	22.47	-5.47
	Lower Right Crux D – deflection	mm	Thortest	0.02	-38.42
	Chest CG Acceleration, 3 ms clip	g	Compute	31.57	
Abdomen	Lower Left X – deflection	mm	Thortest	0.14	-41.88
	Lower Left Y – deflection	mm	Thortest	8.31	-0.03
	Lower Left Z – deflection	mm	Thortest	11.05	-0.97
	Left Viscous Criterion Based on X - deflection		Compute	0.34	
	Lower Right X – deflection	mm	Thortest	0.13	-51.97
	Lower Right Y – deflection	mm	Thortest	3.65	-6.74
	Lower Right Z – deflection	mm	Thortest	7.23	-3.84
	Right Viscous Criterion Based on X - deflection		Compute	0.73	
Spine	Upper Spine (T1) AX	g	180	7.03	-31.24
	Upper Spine (T1) AY	g	180	61.30	-3.88
	Upper Spine (T1) AZ	g	180	14.77	-40.99
	Upper Spine (T1) Resultant	g	Compute	72.74	
	Middle Spine (T6) AX	g	180	5.89	-31.71
	Middle Spine (T6) AY	g	180	21.38	-5.17
	Middle Spine (T6) AZ	g	180	4.15	-6.43
	Middle Spine (T6) Resultant	g	Compute	31.72	
Pelvis	Pelvis CG Resultant Acceleration	g	Compute	37.82	
Acetabulum	Left FX force	N	600	663.54	-1491.75
	Left FY force	N	600	578.43	-571.18
	Left FZ force	N	600	741.89	-676.89
	Left Acetabulum Resultant	N	Compute	1650.78	
	Right FX force	N	600	466.06	-1029.47
	Right FY force	N	600	335.18	-1271.45
	Right FZ force	N	600	630.38	-155.77
	Right Acetabulum Resultant	N	Compute	1532.47	

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver Legs

Test Vehicle: 2011 Ford Explorer Utility Vehicle NHTSA No.: RB0222
Test Program: Research and Development Narrow Offset Test Date: 7/19/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Knee	Left Knee Displacement, DX	mm	180	0.01(1)	-0.00(1)
	Right Knee Displacement, DX	mm	180	4.71	-0.50
Femur	Left Femur Force, FZ	N	600	351.55	-3005.92
	Left Femur Moment, MX	N-m	600	43.90	-180.15
	Left Femur Moment, MY	N-m	600	21.24	-43.25
	Left Femur Res (MX / MY only, not MZ)	N-m	Compute	183.92	
	Right Femur Force, FZ	N	600	536.69(2)	-3293.42(2)
	Right Femur Moment, MX	N-m	600	48.87	-136.06
	Right Femur Moment, MY	N-m	600	89.06	-12.61
	Right Femur Res (MX / MY only, not MZ)	N-m	Compute	137.16	
Tibia	Left Upper Tibia, FZ	N	600	302.78	-842.79
	Left Upper Tibia, MY	N-m	600	89.90	-23.40
	Left Upper Tibia, Index		Compute	0.48	
	Right Upper Tibia, FZ	N	600	362.39	-1748.50
	Right Upper Tibia, MY	N-m	600	151.02(3)	-256.88(3)
	Right Upper Tibia, Index		Compute	1.19(3)	
	Left Lower Tibia, FZ	N	600	101.63	-968.60
	Left Lower Tibia, MY	N-m	600	31.70	-26.03
	Left Lower Tibia, Index		Compute	0.24	
	Right Lower Tibia, FZ	N	600	358.09	-2024.02
	Right Lower Tibia, MY	N-m	600	29.40	-19.54
	Right Lower Tibia, Index		Compute	0.36	
Ankle	Left Ankle Rotation, RX	Deg	180	25.28	-15.42
	Left Ankle Rotation, RY	Deg	180	23.35	-1.72
	Right Ankle Rotation, RX	Deg	180	11.74	-37.22
	Right Ankle Rotation, RY	Deg	180	0.72	-14.56

Anomalies

(1) Questionable Magnitude
(2) Noise spikes 60 to 92 ms
(3) Questionable Data

Test Vehicle: 2011 Ford Explorer Utility Vehicle NHTSA No.: RB0222
Test Program: Research and Development Narrow Offset Test Date: 7/19/2011

Left Rear Passenger: H3 Serial No. 070 Injury Summary

	Nomenclature	Source	Max	Min
Head	Angular acceleration (rad/sec^2) - X	SIMon	1295.60	-1358.90
	Angular acceleration (rad/sec^2) - Y	SIMon	695.09	-453.98
	Angular acceleration (rad/sec^2) - Z	SIMon	377.38	-550.28
	Angular acceleration - resultant (rad/sec^2)	SIMon	1359.56	
	Angular velocity (rad/sec) - X	SIMon	13.64	-9.62
	Angular velocity (rad/sec) - Y	SIMon	10.99	-4.09
	Angular velocity (rad/sec) - Z	SIMon	0.02	-13.45
	Angular velocity - resultant (rad/sec)	SIMon	20.13	
	36 ms HIC	Compute	183.09	
	15 ms HIC	Compute	104.74	
	Skull fracture correlate	SIMon	34.48	
	Cumulative strain (Tolerance = 0.05)	SIMon	0.46	
	Cumulative strain (Tolerance = 0.10)	SIMon	0.10	
	Cumulative strain (Tolerance = 0.15)	SIMon	0.02	
	Head resultant CG acceleration, 3 ms clip (g's)	Compute	36.27	
Neck	Upper Neck Tension (N) Fz	1000	1289.70	
	Upper Neck Compression (N) Fz	1000		-292.17
	Upper Neck NTF	Compute	0.45	
	Upper Neck NTE	Compute	0.55	
	Upper Neck NCF	Compute	0.06	
	Upper Neck NCE	Compute	0.49	
Chest	Chest Deflection (mm)	600	0.00	-22.41
	Upper Left Chest X (mm)	Compute	0.00(4)	-26.20(4)
	Upper Left Chest Y (mm)	Compute	34.41(4)	-23.87(4)
	Upper Right Chest X (mm)	Compute	2.14	-4.54
	Upper Right Chest Y (mm)	Compute	0.00	-17.13
	Lower Left Chest X (mm)	Compute	0.04	-11.41
	Lower Left Chest Y (mm)	Compute	14.71	-1.64
	Lower Right Chest X (mm)	Compute	0.00	-20.38
	Lower Right Chest Y (mm)	Compute	19.46	-0.82
	Chest CG acceleration, 3 ms clip, (G's)	Compute	43.45	
Femur	Right Fz Force (N)	600	2610.44	-647.41
	Left Fz Force (N)	600	3190.59	-98.36

Anomalies

(4) Data shape suspicious after 84.5 ms

SECTION 3

DATA SHEETS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7° angle, 20% Offset	Test Date	7/19/2011

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7° angle, 20% Offset	Test Date	7/19/2011

TEST VEHICLE INFORMATION

NHTSA No.	RB0222
Make	Ford
Model	Explorer
Body Style	Utility Vehicle
Year	2011
VIN	1FMHK7D81BGA75835
Color	Dark blue
Delivery Date	6/3/2011
Odometer Reading (mi)	35
Odometer Reading (km)	56.3
Dealer	DeLacy Ford
Transmission	6-Speed Automatic
Final Drive	Front Wheel Drive
Type/No. Cylinders	V6
Engine Disp. (L)	3.5
Engine Placement	Lateral
Roof Rack	Yes
Sunroof/T-Top	Yes
Tinted Glass	Yes
Traction Control	No
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

TEST VEHICLE OPTIONS

Anti-Lock Brakes	Yes
All-Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Side Airbag	Yes
Driver Head Airbag	No
Driver Curtain Airbag	Yes
Driver Knee Airbag	No
Pass. Front Airbag	No
Pass. Side Airbag	No
Pass. Head Airbag	No
Pass. Curtain Airbag	No
Pretensioners	No
Load Limiters	No
Bucket Seats	No
Air Cond.	No
AM/FM CD	No
Tilt Steering	Yes
Automatic Door Locks	No
Power Windows	Yes
Power Seats	Yes
Other	--
Other	--

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co
Date of Manufacture	5/11

GVWR (kg)	2,794
GAWR Front (kg)	1,397
GAWR Rear (kg)	1,497

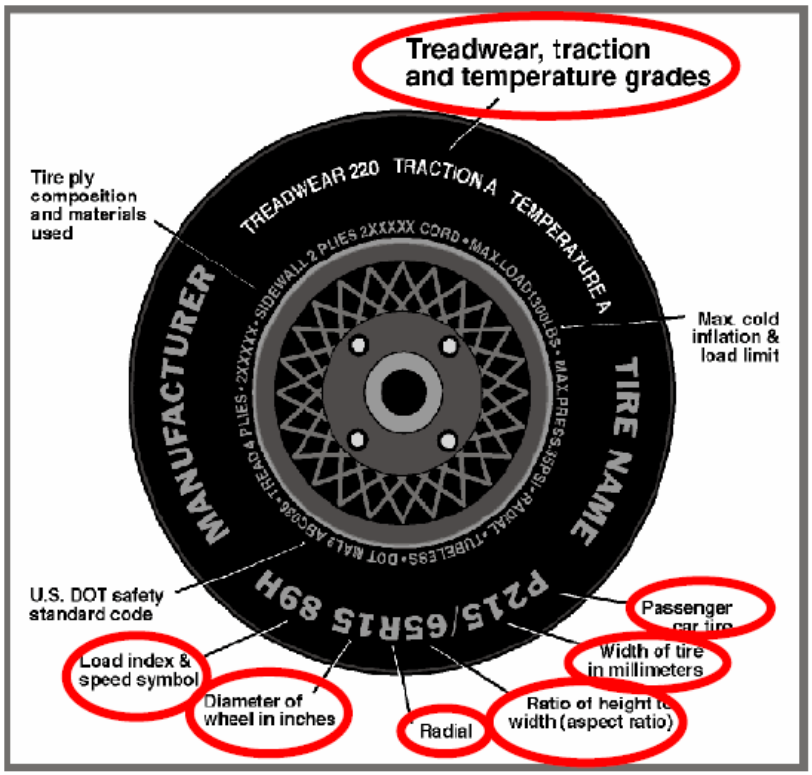
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				697
Cargo Wt. (RCLW) (kg)				136

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Measured Parameter	Front	Rear
Maximum Tire Pressure	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	P255/50R20	P255/50R20
Tire Size on Vehicle	P255/50R20	P255/50R20
Tire Manufacturer	Hankook	Hankook
Tire Model	Optimo H426	Optimo H426
Treadwear	440	440
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Steel, 2 Polyester, 2 Nylon	2 Steel, 2 Polyester, 2 Nylon
Tire Plies Body	2 Polyester	2 Polyester
Load Index/Speed Symbol	104H	104H
Tire Material	Rubber	Rubber
DOT Safety Code Right	5MYPPDLH0811	5MYPPDLH0811
DOT Safety Code Left	5MYPPDLH0811	5MYPPDLH0811

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	591.0	466.5		619.0	605.0	
Right	kg	561.5	462.0		561.0	577.0	
Ratio	%	51	49		50	50	
Totals	kg	1152.5	928.5	2,081.0	1,180.0	1,182.0	2,362.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2,081.0
Weight of 1 P572E ATD & 1 P572O ATD	kg	153.54
Rated Cargo/Luggage Weight (RCLW)	kg	136.0
Calculated Vehicle Target Weight (TVTW)	kg	2370.5

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	838	837	865	870	1280
As Tested	mm	829	834	831	842	1435
Post Test	mm	-	-	-	-	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2,868
Total Vehicle Length at Left Side	mm	4,899
Total Vehicle Length at Centerline	mm	5,008
Total Vehicle Length at Right Side	mm	4,899
Weight of Ballast in Cargo Area	kg	86
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	64.7

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: NONE

MASS OF BALLAST ADDED (KG) 86

DATA SHEET NO.1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	5008
2	Total Width	1981
3	Bumper Top Height	-75
4	Bumper Bottom Height	90
5	Longitudinal Member Top Height	-76
6	Distance Between Longitudinal Members	1193
7	Longitudinal Member Width	99
8	Engine Top Height	-393
9	Engine Bottom Height	311
10	Engine and Gearbox Width	754
11	Front Bumper-Engine Distance	509
12	Front Shock Absorber Fixing Height	-432
13	Bonnet Leading Edge Height	-426
14	Front Shock Absorber Fixing Width	1266
15	Front Bumper – Front Axle Distance	965
16	Front Axle – A Pillar Distance	542
17	A- Pillar – B-Pillar Distance	1104
18	B-Pillar – Rear Axle Distance	1227
19	B-Pillar – C-Pillar Distance	1116
20	Roof Sill Bottom Height	-981
21	Roof Sill Top Height	-1099
22	Floor Sill Bottom Height	215
23	Floor Sill Top Height	109

*Origin is defined as center of rear most point of rear bumper

DATA SHEET NO. 2

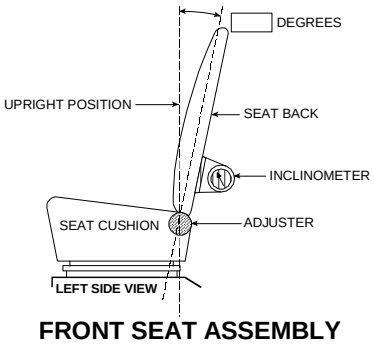
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

NOMINAL DESIGN RIDING POSITION

Inclinometer was zeroed on the door sill, then placed on the head rest post to measure the set angle, according to form 1.

	Deg.
Driver seat back angle:	16.7
Passenger seat back angle:	17.7



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

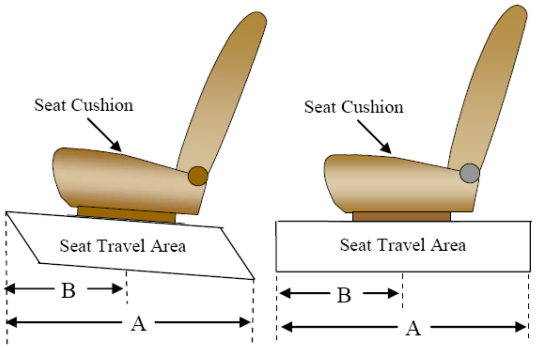
Seat was set to full forward, full up and marked. Then moved to the full rear, full down position, and marked. Mid point was measured, and seat was set to full down, mid position, as per form 1.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	334	167
Passenger Seat	Fixed	Fixed

SEAT BELT UPPER ANCHORAGE

Belt anchorages were moved along the full range of motion, and marked on the B-pillar to their respective possible positions. Photographic evidence can be found in appendix A of this report.

	Total # of Positions	Placed in Position #
Driver Seat	4	0 (Uppermost)
Passenger Seat	Fixed	Fixed

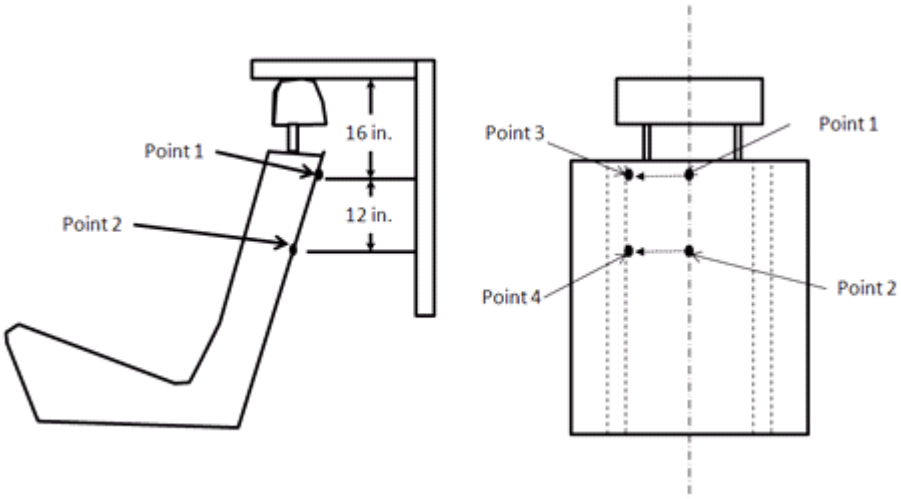


DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

SEAT BACK MEASUREMENT POINTS



Reference point: Rear most center of the top of rear bumper beam
+X - From the rear of the vehicle to the front of the vehicle
+Y - From left side of the vehicle to the right side of the vehicle
+Z - From the top of the vehicle to the bottom of the vehicle

	X	Y	Z
Point 3	2335.096	-500.324	-491.944
Point 4	2430.014	-537.805	-197.78

Note: See Appendix F.1 for detailed description of the CMM measurement procedure

DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

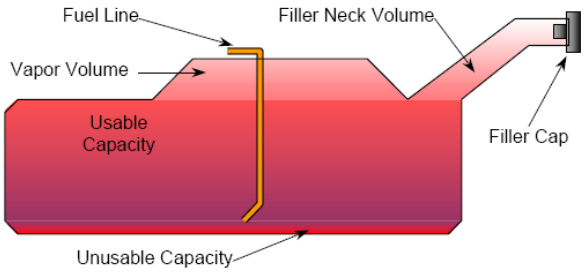
Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	70.4
Usable Capacity of "Optional Tank"	
92%-94% of Usable Capacity	64.7
Actual Amount of Solvent Used	64.7
1/3 of Usable Capacity	23

FUEL SYSTEM

Electric fuel pump is located by the right rear wheel and operates with the ignition in the 'on' position and the engine running.



VEHICLE FUEL TANK ASSEMBLY

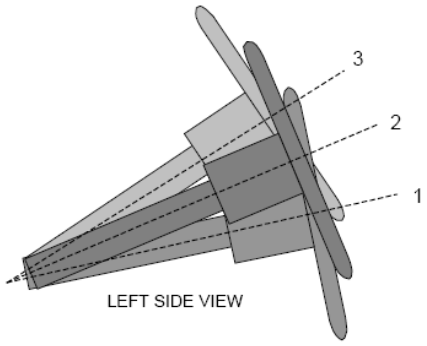
STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. Describe how this measurement was taken.

_____

_____

_____



STEERING COLUMN ASSEMBLY

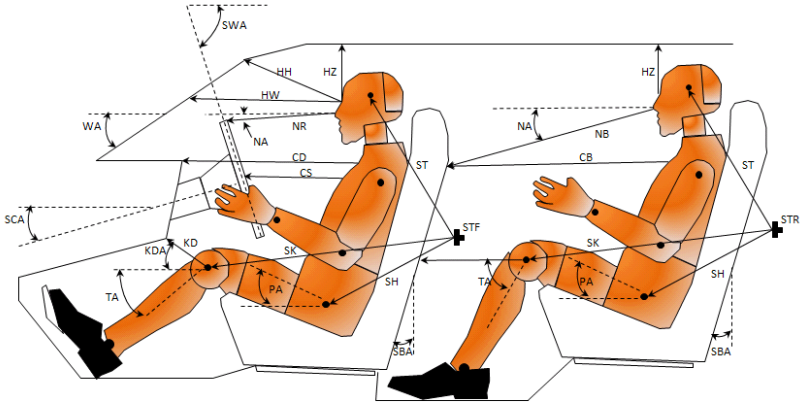
STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	60.0	
Geometric center position No. 2	62.7	
Uppermost position No. 3	65.3	
Telescoping Steering Wheel Travel		50
Test Position	62.7	25

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Code	Measurement Description	Driver		Left Rear Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WAº	Windshield Angle		-30.5		
SWAº	Steering Wheel Angle		26.9		
SCAº	Steering Column Angle		-26.4		
SAº	Seat Back Angle (on headrest post)		16.7		19.1
HZ	Head to Roof (Z)	215	90.0	302	90.0
HH	Head to Header	429	20.5		
HW	Head to Windshield	720	0.0		
NR/NB	Nose to Rim/Seat Back	465	-22.5	560	-14.1
CD/CB	Chest to Dash/Seat Back	580		540	
CS	Chest to Steering Hub	367	-16.3		
RA	Rim to Abdomen	162	0.0		
KDL/KBL	Left Knee to Dash/Seat Back	125	23.3	231	15.1
KDR/KBR	Right Knee to Dash/Seat Back	127	20.1	231	15.2
PAº	Pelvic Angle		23.2		19.6
TAº	Tibia Angle		-63.9		-79.0
SK	Striker to Knee	615	-2.1	815	-16.7
ST	Striker to Head	585	79.5	445	42.6
SH	Striker to H-Point	232	-28.8	406	-30.4
HAXº	Head Angle X		0.1		
HAYº	Head Angle Y		4.6		
NAXº	Neck Angle X		-.02		
NAYº	Neck Angle Y		1.4		
TAXº	T Angle X		14.5		
TAYº	T Angle Y		1.4		
LAXº	Lumbar Angle (X)		-1.1		
LAYº	Lumbar Angle (Y)		21.1		

DATA SHEET NO. 3 (CONTINUED)

DUMMY CMM MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

Description	Units	Driver			Left Rear Passenger		
		X	Y	Z	X	Y	Z
Striker (Driver/Passenger)	mm	2492.42	-857.863	-249.3	1375.133	-856.737	-433.822
Head CG	mm	2590.294	-474.784	-823.116	1693.129	-462.046	-724.111
Bridge of Nose	mm	2681.245	-391.003	-815.037	1776.77	-384.135	-728.654
Tip of Nose	mm	2678.376	-392.42	-773.08	1799.087	-383.946	-701.938
Shoulder Bolt	mm	2627.19	-590.396	-570.655	1685.179	-547.897	-506.424
Tip of Chin	mm	2670.857	-389.116	-692.719	1782.159	-387.865	-628.504
H-point	mm	2728.095	-585.377	-121.105	1763.174	-536.307	-202.829
Left Knee	mm	3126.232	-571.219	-275.857	2183.139	-500.955	-200.283
Right Knee	mm	3134.981	-306.248	-237.063	2174.855	-338.052	-198.061
Left Ankle	mm	3376.001	-560.846	62.435	2265.505	-494.15	143.6565
Right Ankle	mm	3414.917	-277.958	89.5366	2247.1	-330.06	143.6823
Left Heel	mm	3361.668	-548.452	192.4319	2181.817	-479.974	216.2921
Right Heel	mm	3404.88	-237.013	214.4523	2176.63	-317.421	216.5629
Driver's Outboard Seat Anchor Bolt	mm	3022.29	-581.571	161.3			
Outboard Head Restraint Post	mm	2355.4	-467.017	-641.302	1437.89	-449.552	-667.047
Top of Head Restraint*	mm	2393.102	-381.332	-894.409	1459.406	-385.442	-876.58
Center of Steering Wheel	mm	3030.51	-387.577	-517.9			

Reference point: Rear most center of the top of rear bumper beam

+X - From the rear of the vehicle to the front of the vehicle

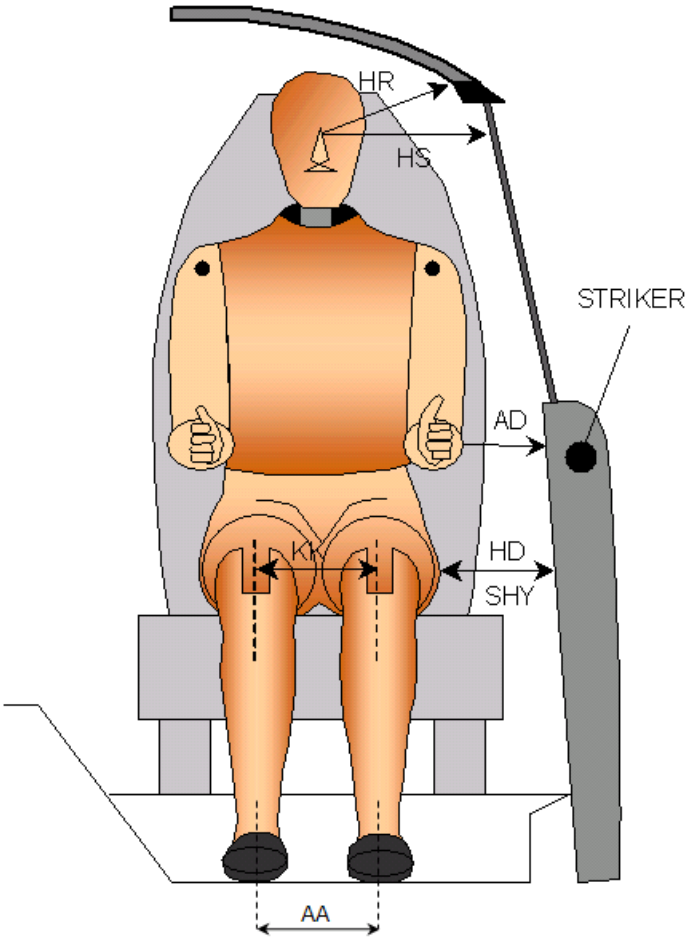
+Y - From left side of the vehicle to the right side of the vehicle

+Z - From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

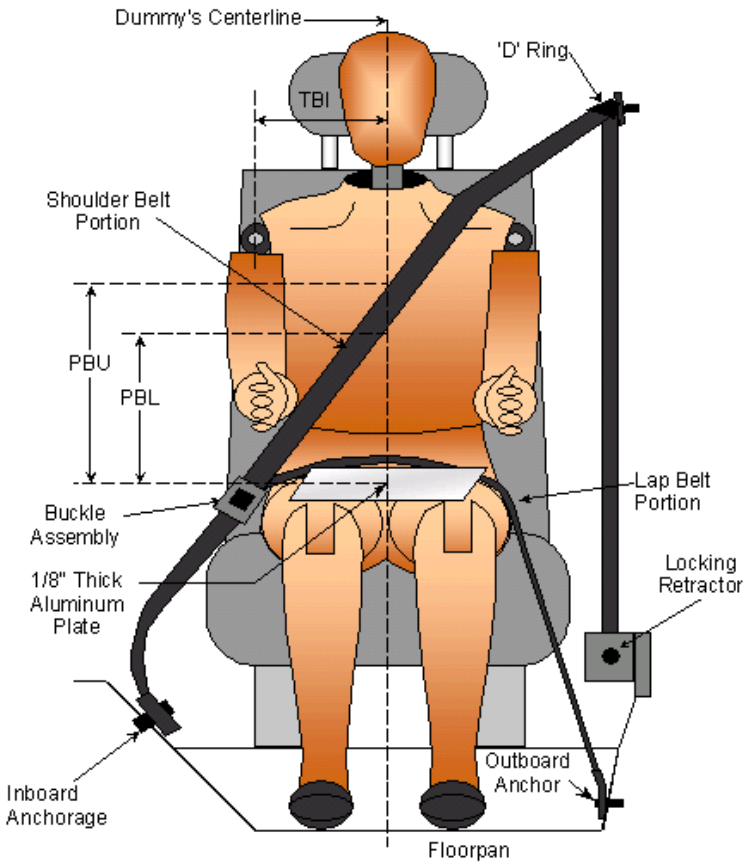


Code	Description	Units	Driver (P1)	Passenger (P4)
AD	Arm to Door	mm	167	94
HD	H-Point to Door	mm	152	185
HR	Head to Side Header	mm	253	334
HS	Head to Side Window	mm	403	430
KK	Knee to Knee	mm	268	165
SHY	Striker to H-Point (Y Direction)	mm	285	335
AA	Ankle to Ankle	mm	284	165

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of aluminum plate to belt upper edge	mm	357	284
PBL — Top surface of aluminum plate to belt lower edge	mm	282	197

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	920	960
Lap Belt Length as measured on ATD	mm	640	690
Remainder of belt on reel	mm	840	750
Total belt length for continuous webbing systems	mm	2,400	2,400

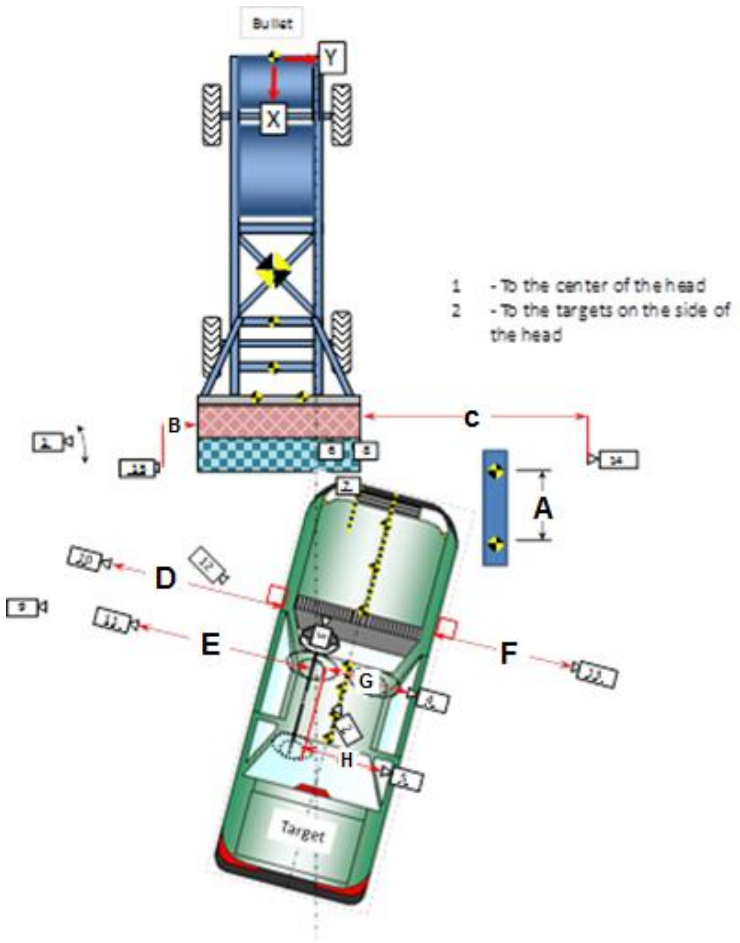
DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

Horizontal Location

A	mm	915
B	mm	9013
C	mm	8842
D	mm	9735
E	mm	10304
F	mm	7106
G	mm	993
H	mm	995

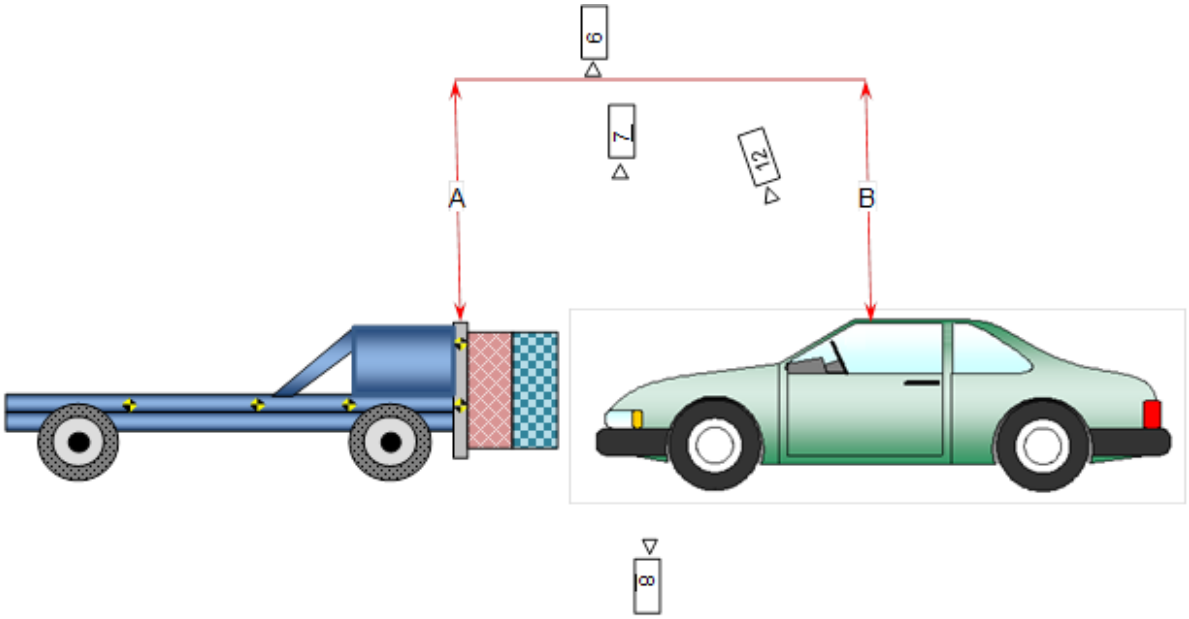


DATA SHEET NO. 6 (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

Horizontal Location



	Units	Value
A	mm	4104
B	mm	3671

DATA SHEET NO. 6 (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View	8468	5787	708		
2	Onboard Driver Over Shoulder	8228	1564	1618	25	500
3	Onboard Driver Lower Leg	6543	-1130	464	6.5	500
4	Onboard Driver Perpendicular	6814	-2175	1128	12.5	500
5	Onboard Left Rear Passenger Perpendicular	7764	-2009	1136	12.5	500
6	Overall Top View	6519	-616	5340	14	1000
7	Zoomed Top View	4630	1123	3866	24	1000
8	Pit Front	-	-	-	-	-
9	Overall Left Side	7089	9430	1370	24	1000
10	Target Vehicle Left Side	5488	9104	1299	24	1000
11	Driver's Motion	6514	9253	1391	50	1000
12	Look Down Driver's Motion	7318	535	3617	28	1000
13	Target Vehicle Right Side	8283	-9436	1342	24	1000
14	Bullet Vehicle Left Side	4918	-9968	1384	28	1000
15	Bullet Vehicle Right Side	4820	9013	1334	28	1000
16	Onboard RMDB	4923	-990	1918	13	1000

Reference point: center most rearward point of the RMDB when in contact with the Target Vehicle):

+X = from back of RMDB to front of RMDB

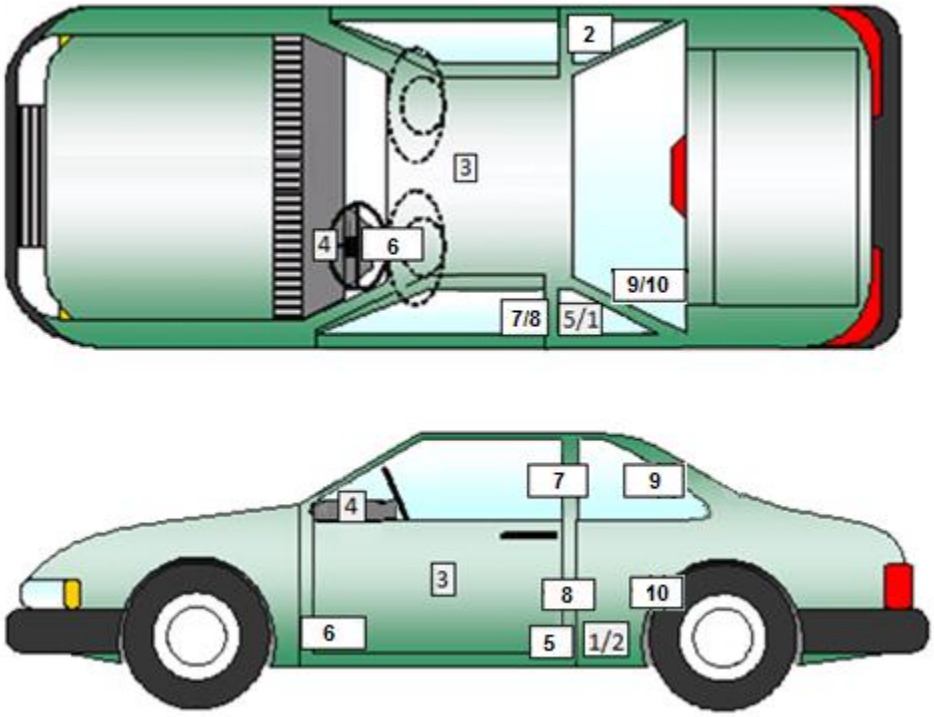
+Y = right of monorail center

+Z = up from ground

DATA SHEET NO. 7

VEHICLE INSTRUMENTATION LOCATIONS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Accelerometer Location	Axes	Units	Location		
			X	Y	Z
Left Rear Sill	X,Y	mm	2258	-682	172
Right Rear Sill	X,Y	mm	2272	678	159
Vehicle CG	X, Y, Z	mm	3062	101	88
Driver Seat Track	X	mm	2583	-458	107
Instrument Panel	X, Y, Z	mm	3182	34	-380
Behind Brake Pedal	X, Y, Z	mm	3719	-363	102

Reference point: Rear most center of the top of rear bumper beam

+X - From the rear of the vehicle to the front of the vehicle

+Y - From left side of the vehicle to the right side of the vehicle

+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 7 (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

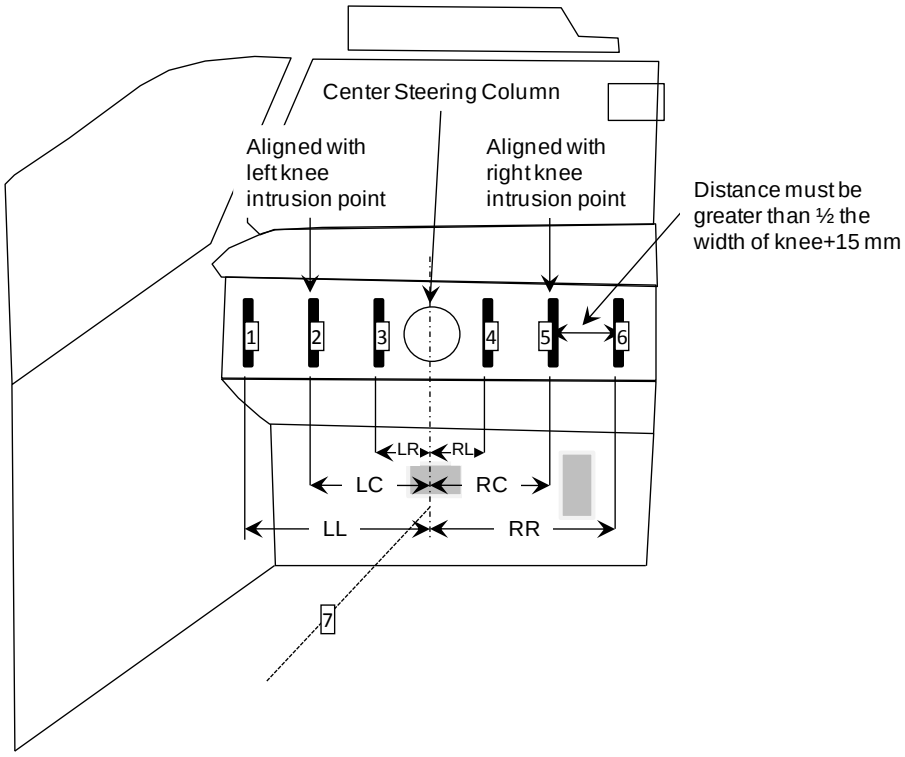
VEHICLE INSTRUMENTION DATA

Loc.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Max	Time (ms)
1	Left Rear Cross Member	X	G	6.56	20.80	-36.87	47.95
		Y	G	17.33	49.70	-2.41	3.15
2	Right Rear Cross Member	X	G	2.30	112.15	-23.08	67.80
		Y	G	12.42	43.95	-2.17	113.00
3	Vehicle CG	X	G	2.87	85.60	-34.08	57.25
		Y	G	23.62	73.75	-20.91	82.90
		Z	G	23.74	58.15	-16.23	82.30
4	Instrument Panel	X	G	11.83	26.65	39.88	73.60
5	Driver Seat Track	X	G	4.42	8.40	-30.92	49.75
		Y	G	24.06	61.20	-16.98	82.50
		Z	G	31.06	17.95	-16.29	14.60
6	Behind Brake Pedal	X	G	13.67	19.80	-48.93	49.80
		Y	G	29.87	47.85	-13.86	81.95
		Z	G	32.71	56.00	-7.08	22.15
7	Driver Shoulder Belt		N	4980.76	68.55	-60.48	8.10
8	Driver Lap Belt		N	3212.51	85.50	-29.93	9.90
9	Passenger Shoulder Belt		N	5708.34	96.95	-0.61	-50.00
10	Passenger Lap Belt		N	4953.70	91.75	-10.35	24.70

DATA SHEET NO. 7 (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Location	Distance (mm)	Location	Distance (mm)
LL	100	RL	100
LC	150	RC	150
LR	200	RR	200

VEHICLE INSTRUMENTION DATA

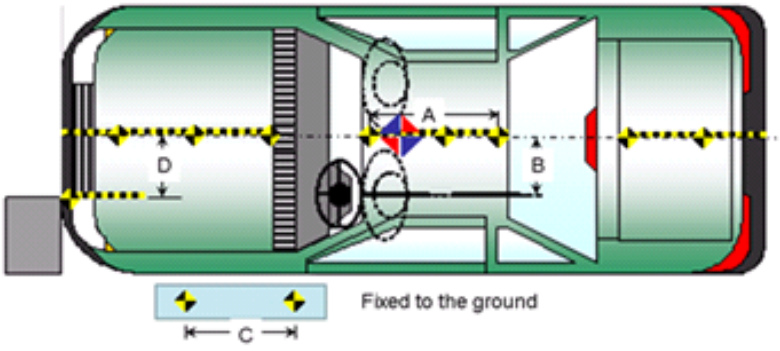
Loc.	Description		Positive Direction		Negative Direction	
			Max	Time (ms)	Max	Time (ms)
1	Left knee contact switch (LL) (ms)	*	0	-50	-1	54.45
2	Left knee contact switch (LC) (ms)	*	0	-50	-1	48.70
3	Left knee contact switch (LR) (ms)	*	0	-50	-1	31.90
4	Right knee contact switch (RL) (ms)	*	0	-50	-1	36.85
5	Right knee contact switch (RC) (ms)	*	0	-50	-1	52.90
6	Right knee contact switch (RR) (ms)	*	0	-50	-1	35.30
7	Toepan string pot (mm)		0.07	0.55	-33.91	98.60

* The measurement indicates the initial time the voltage changed

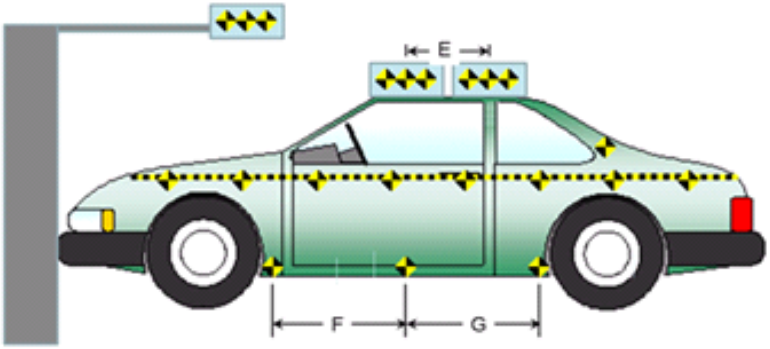
DATA SHEET NO. 8

VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

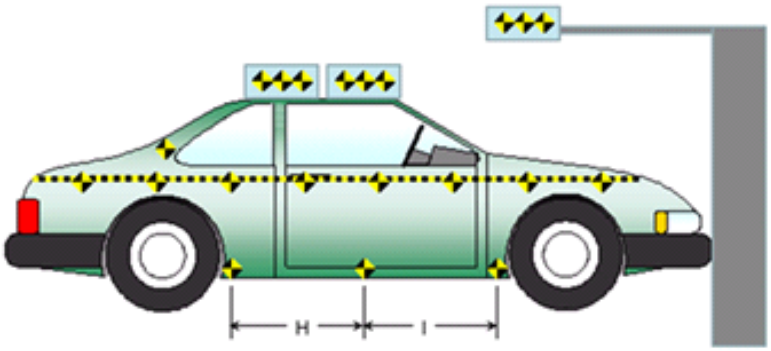
Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Top View



Left Side View



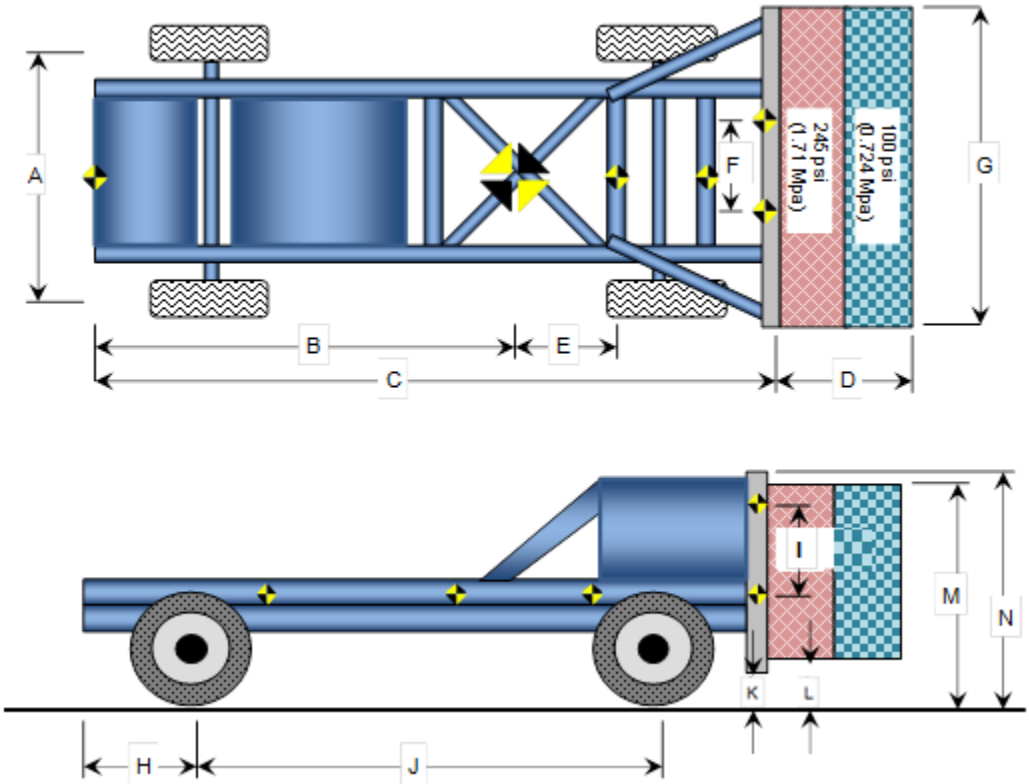
Right Side View

Item	Units	Value
A	mm	610
B	mm	453
C	mm	915
D	mm	600
E	mm	1223
F	mm	936
G	mm	937
H	mm	937
I	mm	932

DATA SHEET NO. 8 (CONTINUED)

RMDB PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



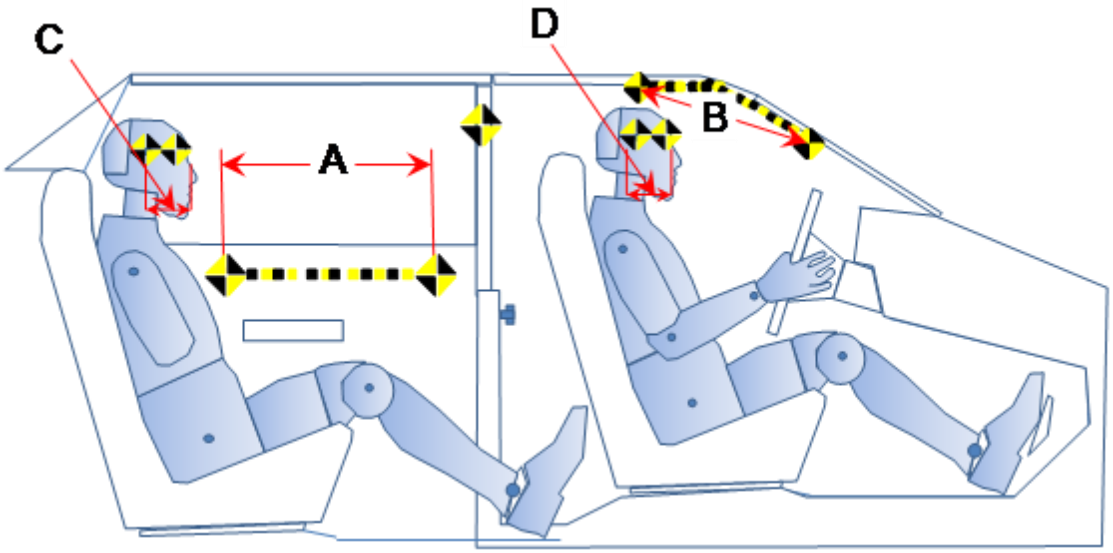
Item	Units	Value
A	mm	1550
B	mm	2215
C	mm	3940
D	mm	606
E	mm	1185
F	mm	1130
G	mm	2210
H	mm	795
I	mm	500
J	mm	2585
K	mm	90
L	mm	98
M	mm	1055
N	mm	1190

	Units	Front Axle	Rear Axle	Total
Left	kg	779.3	470.4	1249.7
Right	kg	749.3	487.2	1236.5
Ratio	%	61.5%	38.5%	100%
Total	kg	1528.6	957.6	2486.2
CG After of Front Axle	mm			1286

DATA SHEET NO. 8 (CONTINUED)

DUMMY PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Item	Units	Value
A	mm	305
B	mm	305
C	mm	50
D	mm	50

DATA SHEET NO. 9

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

INSTRUMENTATION

Driver Dummy Accelerometers	119
Passenger Dummy Accelerometers	34
Vehicle Structure Accelerometers	16
Total	169

CAMERA COVERAGE

High-Speed Vehicle Onboard	4
High-Speed Offboard	11
Real-Time Panning	1
Total	16

DATA SHEET NO. 10

POST TEST OBSERVATIONS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	THOR 50th Male	N/A	HIII 5th Female	N/A
Dummy Serial No.	0007	N/A	070	N/A
Lower Leg Type	THOR-FLX Lower Leg	N/A	HIII Lower Leg	N/A
Lower Leg Serial No.	LX103/LX104	N/A		N/A
Head Contact	Steering wheel Airbag, Curtain Airbag, and door frame	A-37 A-48	Curtain Airbag, Seatbelt Airbag, Chest, Seatback, and Interior C-Pillar	A-49 A-52 A-58
Upper Torso Contact	Steering wheel Airbag and Torso Airbag	-	Seatbelt Airbag and Passenger's Door	-
Lower Torso Contact	Torso Airbag	A-46 A-47	Seatbelt Airbag	-
Left Knee Contact	Knee Bolster	A-45	Driver Seatback	A-59
Right Knee Contact	Knee Bolster	A-44	Driver Seatback	A-59

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Jammed Shut, Closed	Operational, Closed
Rear Door Opening	Operational, Closed	Operational, Closed
Seat Track Shift (mm)	No Shift	No Shift
Seat Back Failure	No Failure	No Failure
Glazing Damage	Rolled down, shattered	Rolled Down, Shattered

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions	Picture Ref
Windshield Damage	Shattered, some separation in front of Driver	A-21
Window Damage	Shattered, Rolled down	A-36 / A-51
Other Notable Effects	None	-

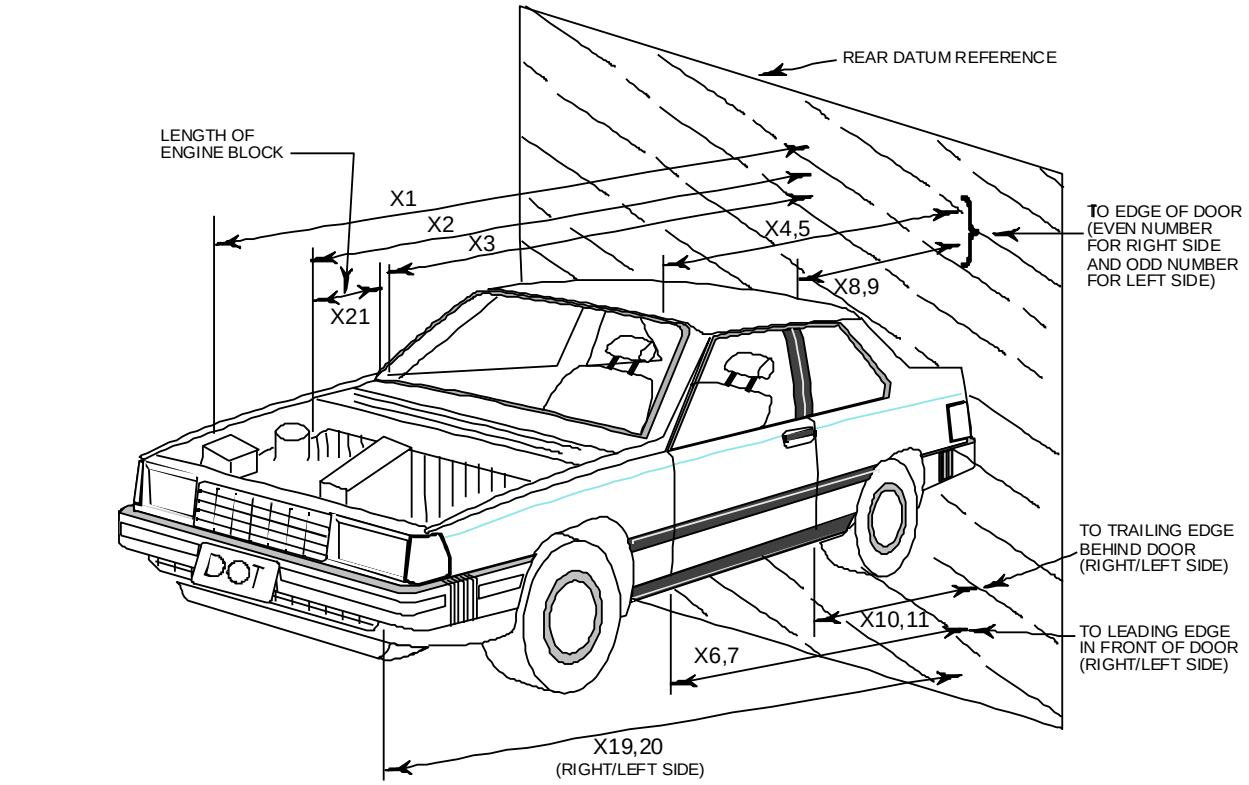
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

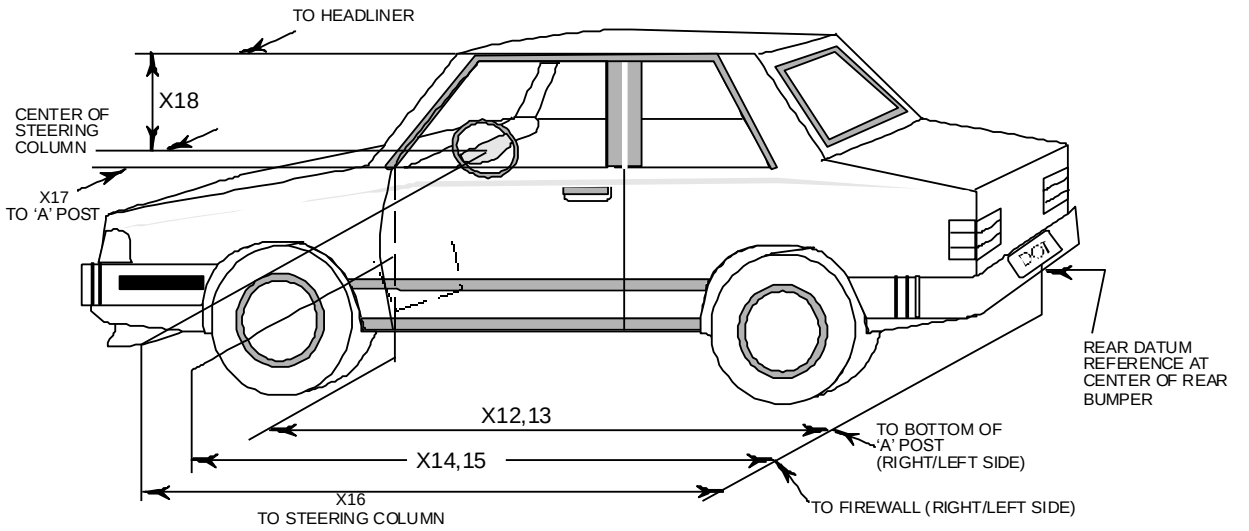
Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	No	
Combination Head/Torso Airbag	Yes	Yes	No	
Curtain (or other Head) Airbag	Yes	Yes	Yes	Yes
Knee Airbag	No	No	No	No
Seat Belt Pretensioner	Yes	Yes	No	No
Seat Belt Load Limiter	Yes	Yes	No	No

DATA SHEET NO. 11

VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011





DATA SHEET NO. 11 (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5008	4987	20
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4499	4455	44
3	RSOV to Firewall	4019	3894	125
4	RSOV to Upper Leading Edge of Right Door	3506	3507	-1
5	RSOV to Upper Leading Edge of Left Door	3506	3430	75
6	RSOV to Lower Leading Edge of Right Door	3484	3483	1
7	RSOV to Lower Leading Edge of Left Door	3481	3348	134
8	RSOV to Upper Trailing Edge of Right Door	2412	2412	0
9	RSOV to Upper Trailing Edge of Left Door	2410	2379	32
10	RSOV to Lower Trailing Edge of Right Door	2462	2465	-4
11	RSOV to Lower Trailing Edge of Left Door	2456	2412	44
12	RSOV to Bottom of “A” Post of Right Side	3485	3482	4
13	RSOV to Bottom of “A” Post of Left Side	3491	3418	73
14	RSOV to Firewall, Right Side	4067	4058	9
15	RSOV to Firewall, Left Side	4068	3747	320
16	RSOV to Steering Column	3031	2977	54
17	Center of Steering Column to “A” Post	313	310	3
18	Center of Steering Column to Headliner	454	484	-30
19	RSOV to Right Side of Front Bumper	4953	4949	3
20	RSOV to Left Side of Front Bumper	4955	4901*	55*
21	Length of Engine Block	515	515	0
RD	RSOV to Right Side of Dash Panel	3214	3206	8
CD	RSOV to Center of Dash Panel	3298	3221	77
LD	RSOV to Left Side of Dash Panel	3216	3112	104

All Dimensions in mm

*Measurements approximate, plastic may have fallen off vehicle

DATA SHEET NO. 12

ACCIDENT INVESTIGATION DIVISION DATA

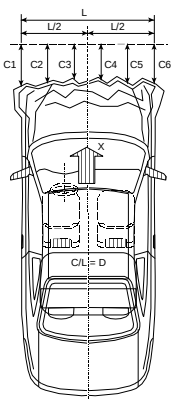
Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

VEHICLE INFORMATION

VIN:	1FMHK7D81BGA75835	Wheelbase:	2868
Vehicle Size Category:	Passenger	Test Weight (kg):	2362

ACCELEROMETER DATA

Accelerometer Locations:	Data Sheet No.7	Linearity:	>99%
Cal. Procedure/Interval:	Shaker table 180 days		
Integration Algorithm:	Trapezoidal		
Impact Velocity (km/h):	90.12		
Velocity Change (km/h):	90.12		



CRUSH PROFILE

Collision Deformation Classification :	12FLEE6
Midpoint of Damage:	C2
Damage Region Length (mm):	1447
Impact Mode:	20% offset, 7º Angle

CRUSH MEASUREMENTS: WITH BUMPER COVER

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4851	4278*	573*
C2	Crush zone 2 at left side	mm	4962	4921	41
C3	Crush zone 3 at left side	mm	5001	4974	27
C4	Crush zone 4 at right side	mm	5000	4985	15
C5	Crush zone 5 at right side	mm	4962	4957	5
C6	Crush zone 6 at right side	mm	4851	4855	-4
L	C1 to C6	mm	1447	1413	34

*Plastic Fell off, values approximate

CRUSH MEASUREMENTS: WITH BUMPER COVER REMOVED

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4880	4751	-130
C2	Crush zone 2 at left side	mm	4933	4842	-91
C3	Crush zone 3 at left side	mm	4965	4900	-65
C4	Crush zone 4 at right side	mm	4966	4925	-41
C5	Crush zone 5 at right side	mm	4936	4919	-18
C6	Crush zone 6 at right side	mm	4887	4890	4
L	C1 to C6	mm	4880	4751	-130

DATA SHEET NO. 13

VEHICLE INTRUSION MEASUREMENTS

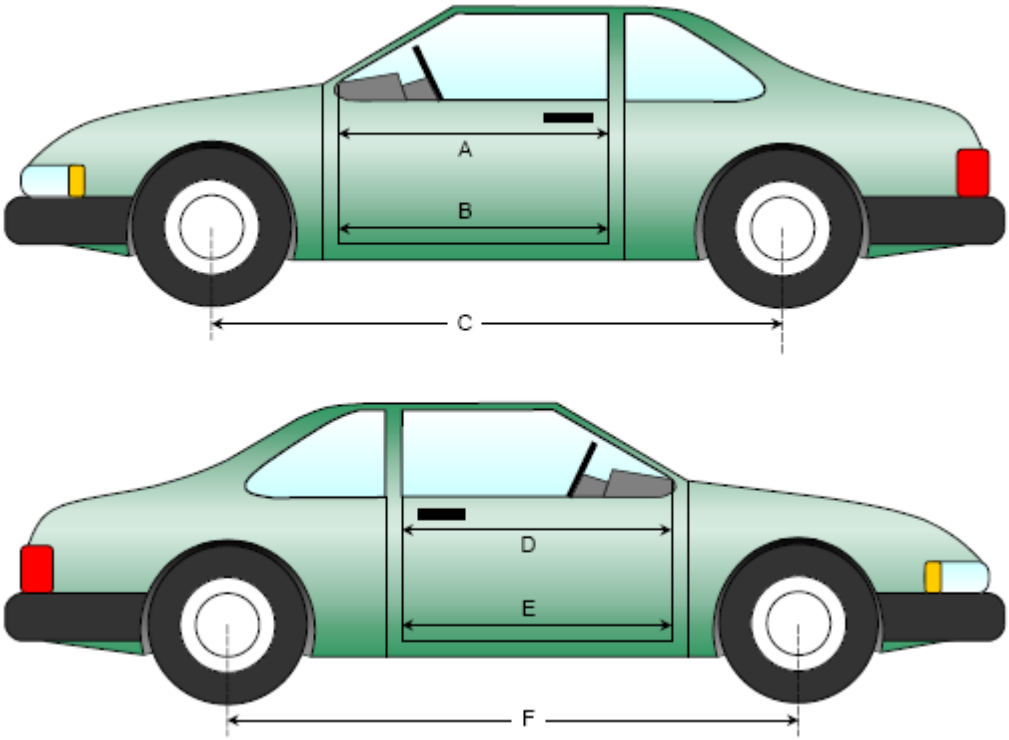
Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	957	879	-77
B	Left Side Lower	mm	874	795	-78
D	Right Side Upper	mm	959	964	5
E	Right Side Lower	mm	868	871	3

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2873	2681	-191
F	Right Side Wheelbase	mm	2864	2907	43



DATA SHEET NO.13 (CONTINUED)

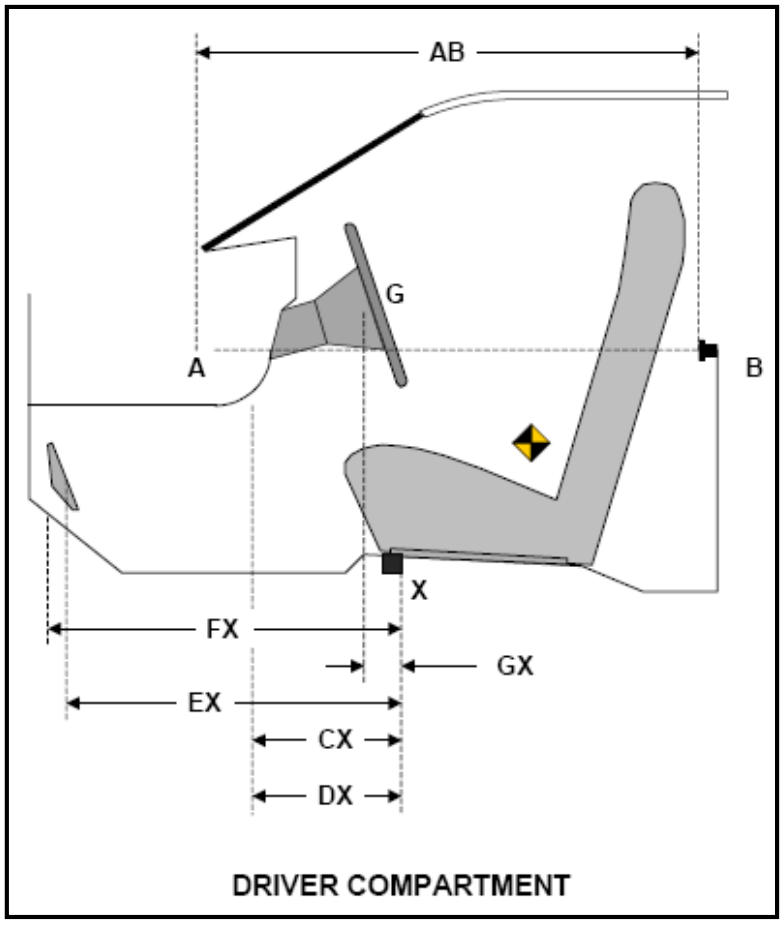
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	810	788	-22
CX	Left Knee Bolster to X	mm	284	198	-86
DX	Right Knee Bolster to X	mm	283	215	-69
EX	Brake Pedal to X	mm	470	449	-21
FX	Foot Rest to X	mm	531	501	-30
GX	Center of Steering Column Wheel Hub to X	mm	8	-17	-25

X = Front of Seat Track (Stationary)



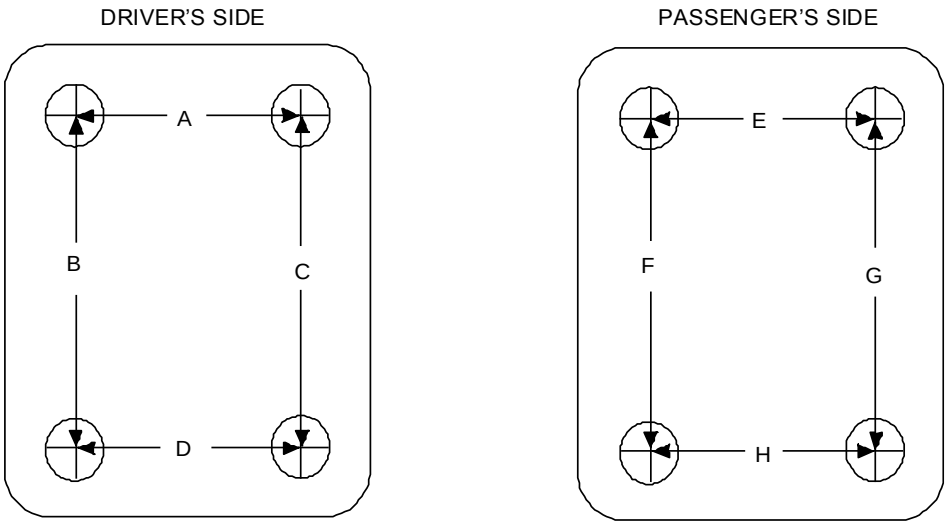
DRIVER COMPARTMENT

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

TOP VIEW THROUGH FLOOR PAN



UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	434	426	8
B	288	286	1
C	265	254	11
D	475	457	18
E	383	382	1
F	355	348	7
G	332	331	1
H	451	446	5

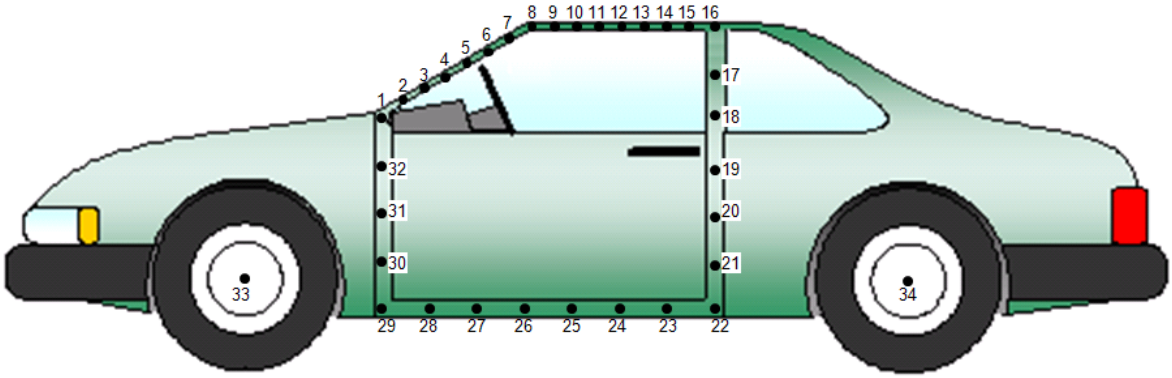
All units in millimeters

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

DRIVER SIDE DOOR SILL INTRUSIONS



Left Side View

Reference point: Rear most center of the top of rear bumper beam
+X – From the rear of the vehicle to the front of the vehicle
+Y – From left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Note: See appendix F.2 for detailed procedure to measure required Door sill intrusion**.**

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

DRIVER SIDE DOOR SILL INTRUSIONS

Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3382	-807	-660	3345	-732	-621	-37	76	39
2	3340	-794	-711	3309	-725	-678	-31	68	33
3	3283	-781	-754	3257	-719	-728	-26	62	27
4	3221	-769	-791	3201	-713	-772	-21	56	19
5	3162	-756	-827	3146	-705	-815	-17	51	12
6	3102	-743	-862	3089	-695	-858	-12	48	5
7	3039	-728	-897	3032	-684	-901	-8	45	-4
8	2977	-714	-931	2976	-670	-943	-1	44	-11
9	2915	-699	-964	2921	-655	-985	6	44	-21
10	2849	-686	-990	2854	-645	-999	5	41	-8
11	2781	-676	-1009	2784	-638	-1010	3	39	-1
12	2711	-672	-1019	2714	-635	-1014	2	37	5
13	2638	-672	-1024	2642	-636	-1012	4	36	12
14	2567	-672	-1026	2570	-638	-1007	3	34	19
15	2496	-672	-1026	2498	-642	-1002	2	30	24
16	2424	-676	-1017	2427	-647	-987	3	29	30
17	2407	-764	-843	2406	-725	-808	-2	39	35
18	2435	-819	-655	2431	-779	-620	-4	40	34
19	2462	-865	-468	2456	-824	-431	-6	41	37
20	2474	-907	-277	2464	-868	-240	-10	39	37
21	2509	-914	-85	2496	-874	-49	-13	40	37
22	2564	-893	101	2546	-850	140	-18	43	39
23	2680	-888	110	2661	-840	153	-19	48	43
24	2792	-856	148	2771	-804	193	-21	53	45
25	2908	-847	163	2886	-787	212	-22	60	49
26	3024	-846	164	3001	-781	216	-23	65	53
27	3144	-849	164	3119	-774	224	-25	74	60
28	3257	-849	165	3226	-756	235	-31	94	70
29	3378	-858	125	3314	-750	172	-64	108	47
30	3425	-857	-65	3329	-755	-24	-96	102	42
31	3426	-854	-255	3326	-768	-212	-100	87	43
32	3425	-847	-454	3345	-768	-410	-79	79	44
33	4042	-945	232	3843	-850	140	-200	95	-92
34	1170	-945	230	1161	-925	174	-9	20	-56

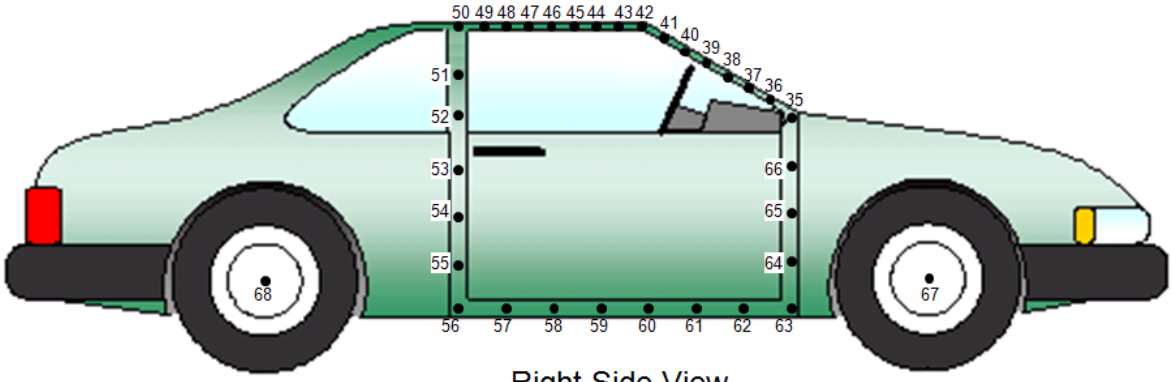
Note: See appendix F.2 for detailed procedure to measure required Door sill intrusion

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

PASSENGER SIDE DOOR SILL INTRUSIONS



Right Side View

Reference point: Rear most center of the top of rear bumper beam
+X – From the rear of the vehicle to the front of the vehicle
+Y – From left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Note: See appendix F.2 for detailed procedure to measure required Door sill intrusion**.**

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

PASSENGER SIDE DOOR SILL INTRUSION

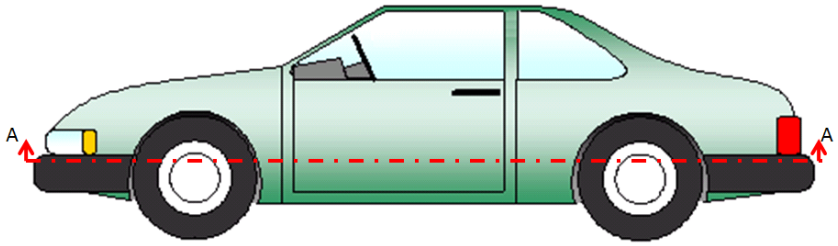
Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
35	3367	803	-688	3363	824	-685	-4	21	3
36	3320	789	-737	3316	808	-733	-4	19	4
37	3262	777	-777	3259	794	-771	-3	16	6
38	3205	766	-811	3202	779	-806	-3	14	5
39	3145	752	-846	3141	764	-842	-3	12	4
40	3086	739	-880	3082	749	-875	-3	10	5
41	3024	725	-914	3023	733	-908	-1	8	6
42	2964	710	-945	2964	718	-939	0	7	6
43	2903	696	-975	2901	702	-969	-2	5	5
44	2836	683	-1000	2836	688	-995	-1	5	5
45	2769	675	-1016	2767	679	-1011	-2	4	5
46	2700	671	-1025	2698	675	-1020	-2	4	6
47	2629	670	-1029	2626	675	-1024	-3	4	5
48	2556	670	-1030	2555	674	-1025	0	4	5
49	2484	671	-1029	2484	675	-1025	0	4	4
50	2417	679	-1016	2415	682	-1014	-2	3	2
51	2406	769	-842	2403	772	-839	-3	4	3
52	2440	820	-652	2435	825	-650	-5	5	3
53	2464	866	-479	2458	872	-474	-6	6	5
54	2471	910	-291	2464	916	-286	-7	5	4
55	2503	918	-98	2496	924	-93	-7	6	5
56	2507	897	97	2501	905	101	-7	7	3
57	2638	896	97	2631	905	105	-7	10	7
58	2765	871	128	2758	884	131	-7	13	3
59	2893	860	154	2886	876	157	-7	16	3
60	3021	860	154	3014	882	157	-7	22	3
61	3150	863	156	3143	888	157	-7	25	1
62	3280	863	156	3273	895	157	-7	32	1
63	3403	886	106	3397	920	106	-6	34	0
64	3428	856	-83	3426	883	-80	-2	27	2
65	3428	844	-286	3426	869	-283	-3	25	3
66	3425	833	-490	3422	857	-487	-3	23	3
67	4044	942.225	230.1	4095	931.1	173.59	50	-11	-57
68	1180	949.885	231.036	1187	947.8	254.83	7	-2	24

Note: See appendix F.2 for detailed procedure to measure required Door sill intrusion

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Reference point: Rear most center of the top of rear bumper beam
+X - From the rear of the vehicle to the front of the vehicle
+Y - From left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
1	795.8771	989.1461	-33.8379	1	826.2819	-987.966	-73.457
2	679.0812	959.8389	-33.2627	2	670.5705	-952.072	-66.5715
3	486.2857	911.0412	-35.6464	3	529.8628	-916.301	-57.9128
4	296.6528	846.4055	-28.43	4	417.6005	-885.115	-49.671
5	219.0988	798.7805	-27.1611	5	301.1703	-842.358	-42.6797
6	162.783	739.9183	-28.8208	6	208.5018	-784.732	-36.5142
7	119.6098	661.3039	-29.9499	7	170.1326	-744.624	-31.8571
8	63.8517	492.2689	-23.033	8	131.4982	-681.711	-28.2925
9	19.997	214.9822	-23.8031	9	92.9969	-593.408	-22.9654
10	6.3919	-0.0494	-18.0928	10	58.3696	-482.438	-13.5478
11	13.9836	-129.61	-24.3808	11	38.9668	-397.069	-10.0845
12	43.0747	-378	-22.9377	12	22.5482	-313.207	-1.6543
13	95.4111	-595.184	-25.0781	13	13.821	-243.633	1.826
14	145.4129	-707.454	-29.8408	14	5.2939	-136.141	8.2861
15	185.3922	-761.999	-27.4978	15	9.5684	75.5588	33.4764
16	246.8837	-812.761	-25.4796	16	34.3468	353.0478	47.4902
17	358.7722	-865.593	-27.4844	17	94.5402	624.7824	58.9098
18	481.2669	-902.987	-23.1897	18	129.4322	684.6276	61.9729
19	588.006	-932.076	-23.9641	19	211.2534	773.2806	62.277
20	794.0226	-984.995	-23.6355	20	358.2969	851.9358	62.974

Note: See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A (Continued)

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
21	3666.423	-1003.1	-53.5162	21	480.5556	894.2427	56.4396
22	3486.638	-985.786	-48.9182	22	596.3559	927.4016	55.8669
23	3285.769	-973.7	-46.8064	23	764.7763	973.4114	51.4163
24	3125.142	-977.628	-46.1873	24	1579.217	991.2354	18.7333
25	2982.459	-980.46	-46.5919	25	1727.415	995.0606	12.5418
26	2837.074	-982.482	-45.6572	26	1882.888	991.6787	8.1647
27	2645.155	-984	-44.7078	27	1993.426	992.2512	2.3243
28	2489.686	-984.28	-43.9097	28	2126.287	993.8109	-2.438
29	2417.744	-985.349	-43.5287	29	2265.491	994.9017	-7.3391
30	2255.491	-987.383	-42.844	30	2590.098	1004.667	-17.9604
31	2073.515	-988.894	-42.1389	31	2851.863	1007.39	-26.8087
32	1812.339	-992.199	-40.2015	32	3162.119	1006.479	-38.9079
33	1651.116	-998.944	-40.2773	33	3413.999	1006.849	-46.6673
34	1543.075	-1001.41	-42.289	34	3678.075	1024.885	-54.6164
35	4409.752	-976.557	-45.8654	35	4410.447	970.0585	-79.8783
36	4551.587	-931.811	-55.1575	36	4557.591	917.8092	-86.9788
37	4628.173	-874.616	-54.5272	37	4637.092	853.0936	-92.8535
38	4776.638	-768.746	-57.4648	38	4828.83	691.2349	-110.168
39	4860.208	-683.309	-59.6274	39	4900.724	573.193	-119.29
40	4926.97	-560.943	-59.7216	40	4930.814	464.9472	-124.83
41	4960.359	-433.86	-58.7464	41	4899.423	402.6918	-125.153
42	4976.436	-333.604	-54.1375	42	4925.671	-21.0815	-165.081
43	4995.151	-106.886	-62.4611	43	4922.959	-282.373	-178.325
44	4997.616	-3.9375	-65.5698	44	4833.222	-527.447	-189.851
45	4992.201	165.1062	-55.8171	45	4858.894	-559.032	-192.334
46	4970.994	366.6047	-59.0045	46	4709.783	-528.675	-194.955
47	4922.631	566.3927	-60.7066	47	4573.748	-502.922	-190.757
48	4873.552	659.7176	-59.5154	48	4518.09	-539.576	-191.692
49	4810.2	733.5266	-63.0962	49	4510.408	-555.828	-191.199
50	4711.728	813.8021	-59.2837	50	4407.326	-553.019	-188.377
51	4609.134	886.5395	-52.9678	51	4319.64	-507.986	-183.906
52	4555.922	927.5043	-53.6764	52	4128.857	-505.32	-176.596
53	4414.626	973.4467	-52.2168	53	4018.274	-602.383	-176.62
54	3667.694	1000.499	-46.7323	54	3964.404	-628.379	-176.393
55	3573.234	996.1897	-49.1761	55	4173.266	-798.92	-191.186

Note: See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A (Continued)

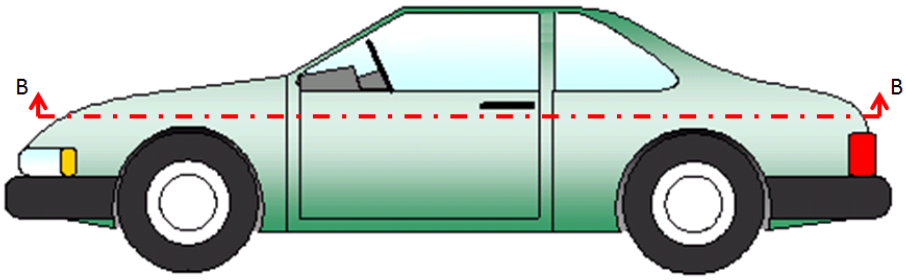
Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
56	3507.69	987.531	-51.0654	56	3994.427	-840.079	-193.308
57	3273.362	976.6956	-45.8278	57	3672.236	-843.124	-177.982
58	3000.394	982.8754	-47.0105	58	3530.144	-810.617	-174.088
59	2694.268	987.9212	-40.4809	59	3438.478	-844.914	-169.288
60	2455.885	989.728	-38.231	60	3355.273	-949.408	-171.417
61	2127.216	991.5879	-41.2776	61	3293.462	-863.805	-165.82
62	1906.74	992.3524	-40.3263	62	3236.594	-919.659	-164.451
63	1645.707	1000.77	-45.9794	63	3135.812	-942.39	-163.566
64	1550.977	1000.395	-35.6547	64	2976.924	-974.088	-157.825
65	795.8771	989.1461	-33.8379	65	2694.82	-1024.85	-147.241
				66	2621.073	-1022.41	-141.934
				67	2517.34	-959.279	-138.223
				68	2426.769	-912.642	-123.116
				69	2291.629	-920.059	-132.28
				70	2118.037	-927.771	-125.925
				71	1927.388	-935.054	-117.64
				72	1742.923	-955.838	-109.95
				73	1642.531	-977.087	-107.411
				74	1543.832	-983.079	-105.262
				75	1489.618	-986.9	-101.464
				76	826.2819	-987.966	-73.457

Note: See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



Page 3-15: Please change text below figure:
Reference point: Rear most center of the top of rear bumper beam
+X - From the rear of the vehicle to the front of the vehicle
+Y - From left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
1	990.0971	995.1974	-245.169	1	945.7906	-987.1	-290.373
2	843.5849	975.8675	-242.906	2	637.7101	-919.64	-273.533
3	701.7296	938.2678	-246.336	3	535.0687	-908.631	-269.281
4	544.8231	899.7439	-249.492	4	362.6005	-848.184	-256.545
5	399.8219	860.4783	-245.472	5	299.7823	-799.771	-250.845
6	323.702	821.6392	-246.616	6	215.4207	-657.507	-240.736
7	257.5578	746.5902	-242.556	7	167.2327	-492.426	-230.474
8	209.6945	652.0661	-244.447	8	143.973	-377.528	-221.109
9	147.1729	426.072	-242.082	9	126.0769	-258.762	-214.166
10	110.6556	179.4971	-241.029	10	109.6852	-104.258	-207.082
11	94.8944	-1.5984	-245.587	11	110.8487	-2.1683	-200.644
12	110.2121	-171.583	-241.53	12	109.3489	275.8088	-170.078
13	141.0646	-389.587	-237.804	13	150.4279	518.8217	-159.932
14	183.0193	-565.152	-239.553	14	191.8792	662.685	-154.057
15	264.7587	-752.131	-242.129	15	204.2164	705.4752	-153.057
16	319.6346	-814.46	-241.834	16	257.643	785.9968	-150.748
17	399.4263	-857.597	-239.364	17	288.8127	813.228	-150.619
18	523.4702	-892.5	-246.374	18	505.2491	899.2654	-154.816

Note: See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (Continued)

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
19	746.9227	-948.407	-241.215	19	658.516	940.1004	-158.435
20	781.7624	-957.044	-266.833	20	929.517	993.8125	-168.616
21	951.6295	-989.422	-245.169	21	1401.038	1003.216	-182.016
22	1080.182	-999.843	-242.906	22	1595.531	1001.266	-189.523
23	1235.574	-1004.02	-246.336	23	1748.331	984.6168	-194.914
24	1342.787	-1003.25	-249.492	24	1932.23	979.7889	-202.28
25	1467.809	-999.836	-245.472	25	2126.929	982.8461	-209.955
26	1644.978	-985.73	-246.616	26	2304.42	985.5388	-215.506
27	1757.99	-978.732	-242.556	27	2554.533	992.6525	-223.683
28	1959.798	-978.96	-244.447	28	2762.954	996.3237	-232.049
29	2132.791	-980.735	-242.082	29	3009.991	999.4727	-241.328
30	2289.23	-981.896	-241.029	30	3301.008	1001.738	-250.638
31	2561.5	-983.623	-245.587	31	3665.013	1008.839	-264.811
32	2721.886	-983.196	-241.53	32	3826.621	1012.402	-269.496
33	2896.503	-982.577	-237.804	33	3943.138	1007.651	-277.833
34	3062.577	-981.409	-239.553	34	3997.119	1005.152	-280.403
35	3273.074	-978.473	-242.129	35	4225.802	982.3709	-288.992
36	3499.02	-975.635	-241.834	36	4319.424	963.3431	-296.052
37	3664.158	-986.678	-239.364	37	4416.554	918.3775	-302.31
38	3841.373	-999.723	-246.374	38	4541.949	836.7662	-309.436
39	4059.745	-997.715	-241.215	39	4634.705	769.5781	-315.072
40	4100.144	-996.202	-260.609	40	4750.879	660.4877	-328.142
41	4240.067	-985.515	-265.948	41	4802.789	551.8233	-336.555
42	4350.375	-965.897	-268.061	42	4777.955	539.3668	-334.389
43	4472.681	-897.082	-270.949	43	4836.148	453.106	-341.16
44	4600.894	-818.895	-271.828	44	4854.914	341.5982	-348.118
45	4639.968	-789.457	-270.88	45	4829.158	246.1424	-351.763
46	4824.3	-571.217	-287.425	46	4834.122	95.6323	-362.377
47	4868.355	-471.303	-277.206	47	4854.878	-130.756	-402.386
48	4911.2	-309	-274.965	48	4810.844	-378.77	-416.821
49	4930.213	-126.183	-275.04	49	4756.064	-529.958	-422.631
50	4948.103	-107.386	-286.05	50	4685.607	-611.192	-424.499
51	4955.157	-5.3868	-282.418	51	4630.552	-571.403	-418.647
52	4948.056	103.5289	-283.248	52	4540.794	-608.671	-419.164

Note: See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (Continued)

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
53	4929.894	119.5457	-277.116	53	4336.34	-535.641	-407.442
54	4914.303	281.4872	-276.917	54	4101.098	-564.784	-400.672
55	4868.273	465.4494	-275.503	55	3987.023	-550.614	-395.328
56	4829.287	566.0445	-283.382	56	3864.949	-540.039	-397.305
57	4648.551	778.0633	-268.52	57	3785.553	-628.168	-393.437
58	4492.522	885.4283	-266.325	58	3766.728	-667.875	-395.758
59	4355.336	961.7948	-270.014	59	3732.246	-620.296	-386.008
60	4240.24	981.2381	-271.002	60	3693.962	-670.629	-385.204
61	4027.837	999.1406	-270.979	61	3637.845	-679.46	-385.214
62	3857.563	1000.141	-267.573	62	3600.311	-716.749	-374.892
63	3660.27	988.3732	-267.361	63	3589.287	-784.271	-387.92
64	3354.642	976.6167	-258.99	64	3561.862	-848.792	-387.383
65	3046.199	981.9409	-260.294	65	3509.465	-935.412	-388.221
66	2743.475	984.1352	-259.506	66	3416.669	-957.601	-386.618
67	2438.692	984.1811	-255.718	67	3398.711	-899.989	-381.781
68	2132.201	981.8054	-252.478	68	3328.063	-956.769	-382.528
69	1825.726	979.7825	-252.035	69	3313.343	-845.804	-376.463
70	1523.42	999.3743	-253.714	70	3141.928	-916.381	-373.282
71	1215.374	1004.312	-250.934	71	2959.458	-959.62	-369.389
72	1013.771	997.8925	-249.155	72	2792.861	-999.608	-363.181
73	990.0971	995.1974	-245.169	73	2689.744	-1016.33	-362.679
				74	2612.811	-1001.54	-358.745
				75	2410.312	-913.807	-341.688
				76	2188.325	-927.173	-338.348
				77	1903.617	-941.896	-329.993
				78	1614.46	-959.235	-317.318
				79	1422.659	-985.749	-310.071
				80	1278.912	-992.529	-298.496
				81	1077.247	-992.815	-295.803
				82	945.7906	-987.1	-290.373

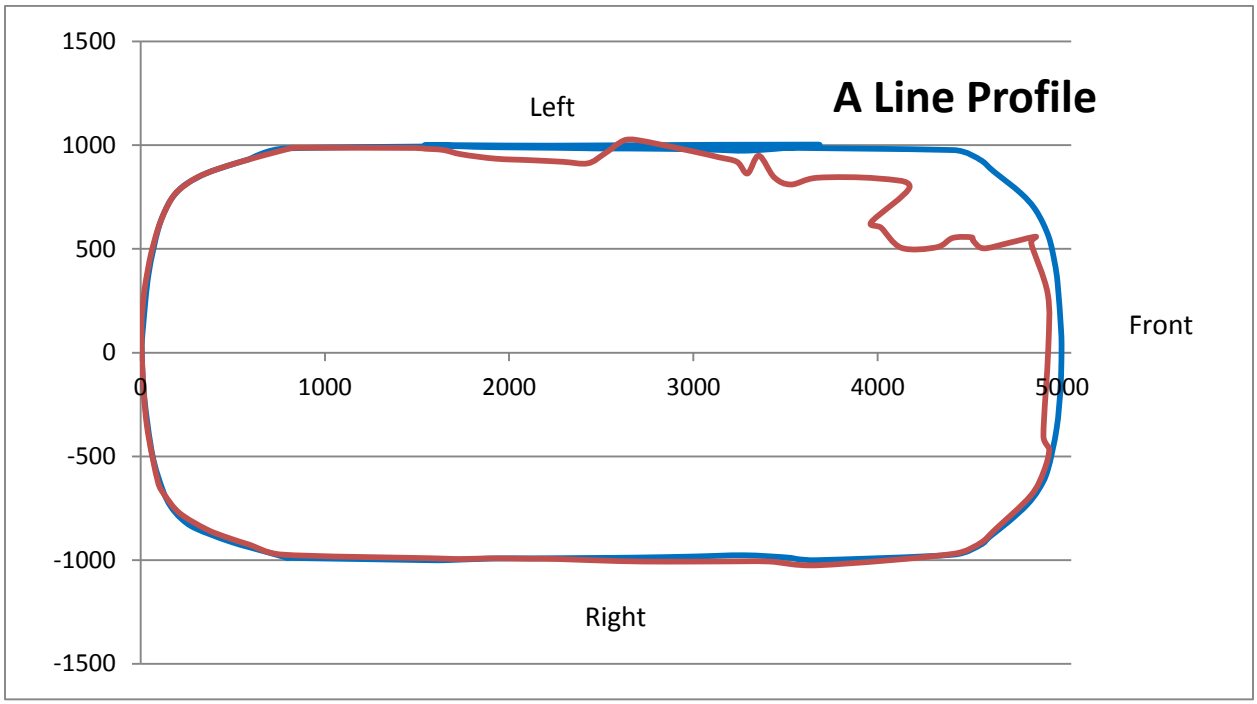
Note: See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile

DATA SHEET NO.13 (CONTINUED)

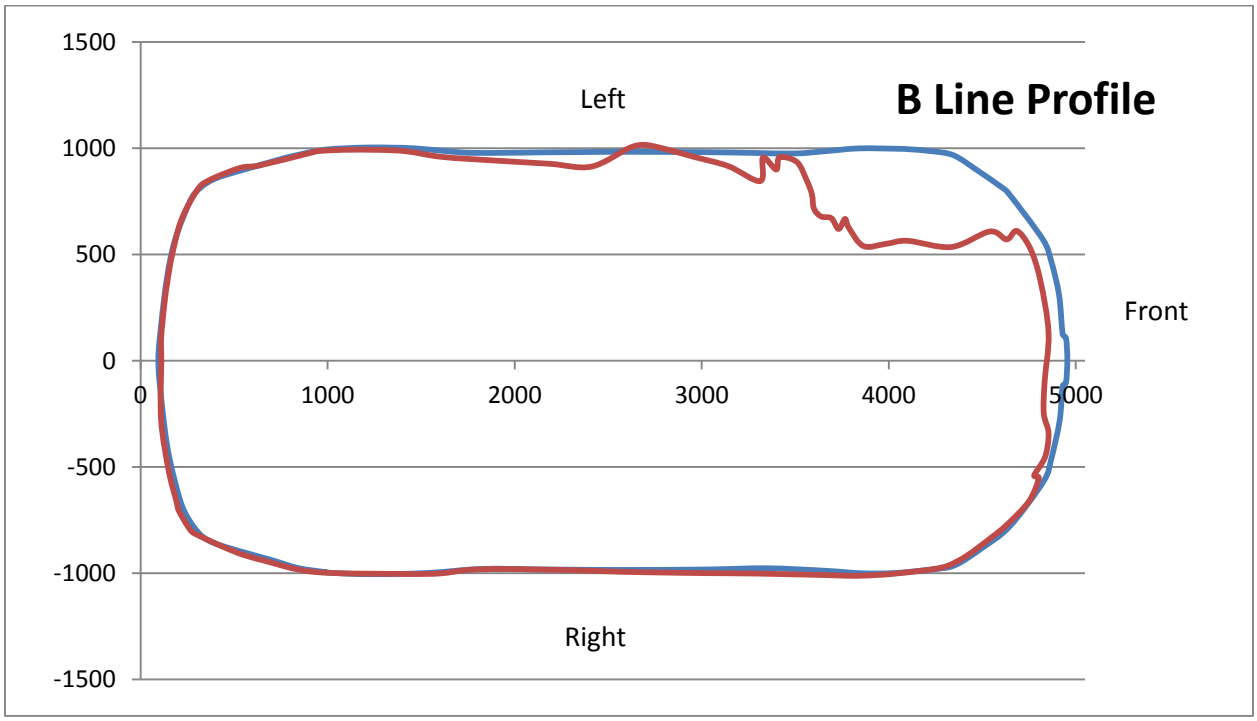
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

SECTION A-A



SECTION B-B



DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

Left Profile of the Dash

Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
LB3	3384	-539	-122	3287	-416	-84	-97	123	38
LB2	3353	-538	-161	3256	-419	-124	-97	119	38
LB1	3323	-536	-200	3223	-422	-163	-100	114	37
DIPL	3294	-536	-240	3193	-424	-201	-102	112	39
LT1	3266	-539	-284	3162	-430	-243	-103	108	41
LT2	3241	-542	-328	3138	-439	-284	-103	103	44
LT3	3219	-543	-374	3125	-439	-341	-94	104	32
LT4	3225	-542	-420	3099	-429	-399	-126	114	21
LT5	3255	-535	-458	3131	-424	-438	-124	111	20
LT6	3299	-535	-451	3175	-427	-430	-124	108	21
LT7	3358	-536	-438	3232	-428	-416	-127	108	22
LT8	3366	-536	-490	3239	-432	-471	-127	104	19
LT9	3354	-540	-541	3225	-438	-520	-128	102	20
LT10	3317	-535	-569	3186	-432	-548	-131	103	22
LT11	3306	-536	-605	3173	-436	-580	-133	100	25
LT12	3359	-537	-607	3227	-438	-586	-132	99	20

Reference point: Rear most center of the top of rear bumper beam
+X - From the rear of the vehicle to the front of the vehicle
+Y - From left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Note: See Appendix F.4 for a detailed procedure on how to measure the required profile dash

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

Right Profile of the Dash

Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
RB3	3389	-255	-118	3325	-161	-109	-64	94	9
RB2	3355	-249	-157	3287	-154	-141	-68	96	15
RB1	3324	-247	-197	3248	-148	-177	-76	99	20
DIPR	3295	-244	-236	3214	-141	-212	-81	103	24
RT1	3265	-243	-281	3181	-137	-252	-84	106	29
RT2	3240	-240	-321	3150	-133	-292	-90	107	30
RT3	3213	-239	-366	3130	-156	-353	-83	83	13
RT4	3229	-242	-412	3135	-159	-396	-95	83	16
RT5	3259	-248	-454	3152	-157	-451	-107	92	3
RT6	3303	-242	-456	3196	-154	-451	-107	88	5
RT7	3348	-234	-449	3234	-149	-442	-114	85	7
RT8	3367	-245	-493	3258	-157	-485	-109	88	8
RT9	3356	-240	-541	3246	-154	-534	-110	86	7
RT10	3311	-241	-575	3202	-153	-565	-109	88	9
RT11	3319	-238	-608	3210	-154	-598	-108	84	10
RT12	3369	-240	-613	3259	-160	-607	-110	80	5

Reference point: Rear most center of the top of rear bumper beam
+X - From the rear of the vehicle to the front of the vehicle
+Y - From left side of the vehicle to the right side of the vehicle
+Z – From the top of the vehicle to the bottom of the vehicle

Note: See Appendix F.4 for a detailed procedure on how to measure the required profile dash

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

	Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Lower Bumper Beam	1	4820	-421	-270	4789	-437	-306	-31	-16	-36
	2	4841	-257	-270	4813	-275	-305	-28	-18	-35
	3	4846	-91	-270	4823	-107	-304	-24	-16	-34
	4	4845	74	-270	4824	57	-303	-21	-17	-32
	5	4844	239	-270	4827	222	-301	-17	-17	-31
	6	4820	405	-270	4807	389	-299	-13	-16	-28
Upper Bumper Beam	1	4883	-621	-50	4759	-637	-76	-124	-16	-26
	2	4936	-375	-52	4847	-402	-84	-89	-27	-32
	3	4966	-127	-52	4900	-158	-83	-66	-31	-32
	4	4965	123	-52	4923	91	-82	-43	-32	-30
	5	4937	371	-52	4917	341	-80	-20	-30	-29
	6	4886	612	-52	4888	587	-78	2	-25	-26
Upper Radiator Support	1	4880	-619	79	4751	-633	42	-130	-14	-37
	2	4933	-385	80	4842	-411	47	-91	-26	-32
	3	4965	-132	76	4900	-163	45	-65	-30	-32
	4	4966	119	77	4925	88	47	-41	-31	-30
	5	4936	368	78	4919	339	51	-18	-29	-27
	6	4887	607	76	4890	580	48	4	-27	-28

Reference point: Rear most center of the top of rear bumper beam

+X - From the rear of the vehicle to the front of the vehicle

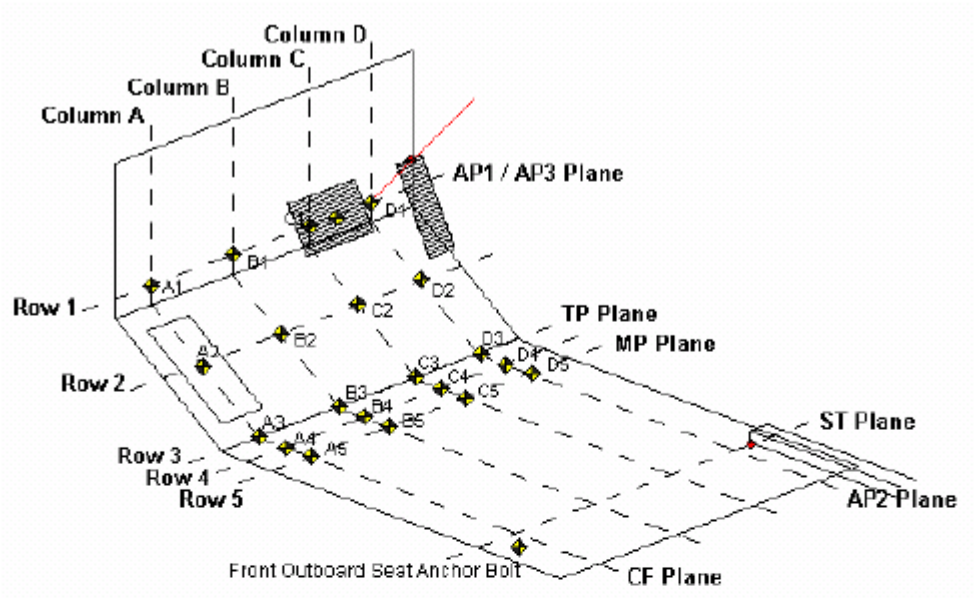
+Y - From left side of the vehicle to the right side of the vehicle

+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

MP: Y-Z plane, halfway between the ST plane and AP1 plane

CF Plane: X-Z plane passes through center of footrest.

BP Plane: X-Z plane passes through center of brake pedal

TP Plane: Y-Z plane, intersection of BP Plane and the intersection of the toe pan and floorboard

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3581	-579	98	3510	-482	105	-71	97	8
B1	3687	-452	100	3621	-358	97	-66	94	-3
C1	3719	-333	102	3669	-245	93	-51	87	-9
D1	3692	-217	104	3646	-127	88	-46	90	-16
A2	3553	-583	180	3494	-487	191	-59	96	11
B2	3639	-458	182	3586	-367	184	-52	91	2
C2	3626	-339	184	3566	-250	165	-60	89	-19
D2	3620	-213	187	3563	-120	157	-57	93	-29
A3	3527	-590	243	3478	-493	258	-49	97	15
B3	3521	-464	240	3474	-369	252	-48	95	11
C3	3510	-339	238	3466	-243	241	-45	96	3
D3	3512	-213	238	3478	-119	217	-34	94	-21
A4	3430	-590	247	3385	-489	273	-45	101	26
B4	3429	-467	244	3384	-369	264	-45	98	19
C4	3431	-341	244	3390	-246	246	-41	95	2
D4	3432	-210	244	3400	-123	215	-32	87	-29
A5	3348	-593	259	3304	-491	297	-45	101	38
B5	3346	-469	253	3302	-375	282	-43	94	29
C5	3348	-340	244	3314	-257	235	-34	83	-9
D5	3352	-211	244	3324	-127	240	-28	84	-5
Brake Pedal	3493	-366	59	3443	-283	88	-50	83	30
IP Left	3306	-523	-223	3192	-433	-214	-114	89	9
IP Right	3306	-229	-222	3208	-141	-208	-97	87	15
Steering Column	3031	-388	-518	2977	-309	-491	-54	78	27
Front Outboard Bolt	3022	-582	161	2994	-514	227	-29	68	66

Reference point: Rear most center of the top of rear bumper beam

+X - From the rear of the vehicle to the front of the vehicle

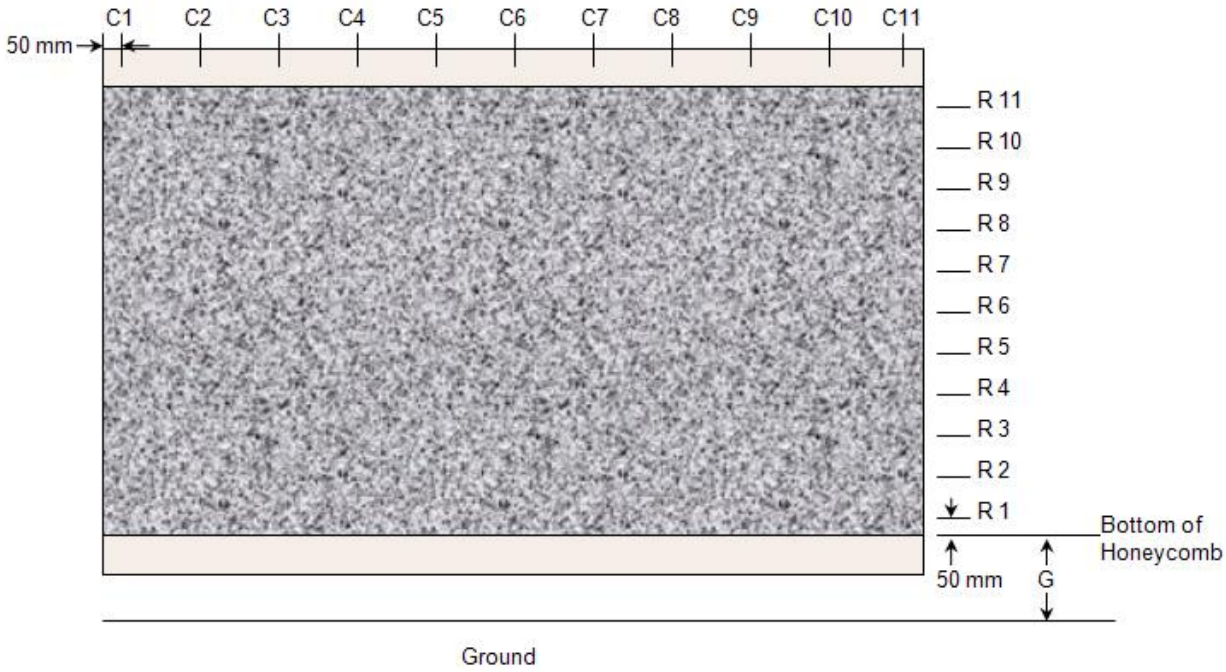
+Y - From left side of the vehicle to the right side of the vehicle

+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.14

RMDB CRUSH MEASUREMENTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



BARRIER X-CRUSH

		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
		50 mm	260 mm	470 mm	680 mm	890 mm	1100 mm	1310 mm	1520 mm	1730 mm	1940 mm	2150 mm
R11	910mm	0.9	2.7	3.0	2.5	2.8	2.6	2.3	2.1	6.5	102.0	157.7
R10	824mm	0.8	0.7	0.8	0.5	0.5	0.3	0.4	0.2	6.5	106.8	180.2
R9	738mm	0.9	0.4	0.6	0.5	0.1	0.2	0.0	-0.2	6.1	106.0	200.6
R8	652mm	1.0	0.4	0.4	0.4	0.1	0.0	-0.1	-0.1	4.4	90.8	215.5
R7	566mm	1.0	0.5	0.4	0.3	0.2	0.0	-0.1	-0.1	4.5	95.8	215.4
R6	480mm	1.0	0.3	0.3	0.3	0.3	-0.1	0.1	-0.1	41.0	136.6	200.8
R5	384mm	1.0	0.6	0.5	0.6	0.3	0.2	0.2	0.2	51.9	174.5	215.3
R4	308mm	0.8	0.5	0.5	0.8	0.5	0.2	0.4	0.2	51.9	201.2	230.5
R3	222mm	0.8	0.9	0.7	0.9	0.6	0.5	0.5	0.3	52.8	224.0	249.7
R2	136mm	0.6	0.6	1.1	1.2	0.9	0.8	0.6	0.4	58.0	242.8	292.4
R1	50mm	1.0	1.0	1.6	1.7	*	*	1.1	1.0	66.9	253.1	291.0

DATA SHEET NO. 15

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

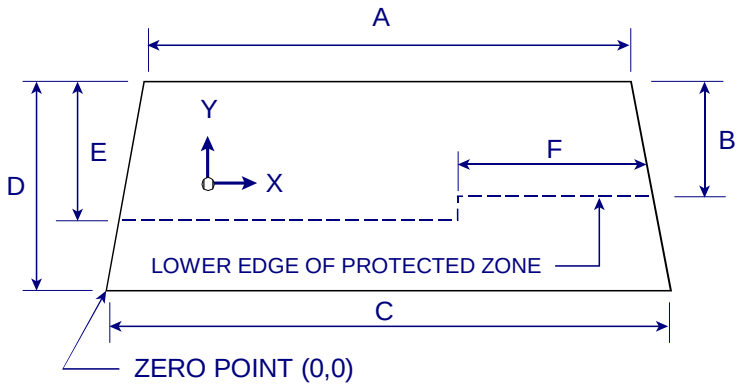
A rubber gasket holds the windshield in place around all the edges.

The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.3ºC

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2280	2280	100.0%
Right Side	2280	2280	100.0%
Total	4560	4560	100.0%



Pre-Test		
Item	Units	Value
A	mm	1400
B	mm	583
C	mm	1650
D	mm	755
E	mm	575
F	mm	475

AREAS OF PROTECTED ZONE FAILURES

A. Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.

- No Penetration

X	Y

B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

- Hood Penetration

X	Y
1485	62

DATA SHEET NO. 15 (CONTINUED)

SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 35.5ºC Test Time: 5:30 PM

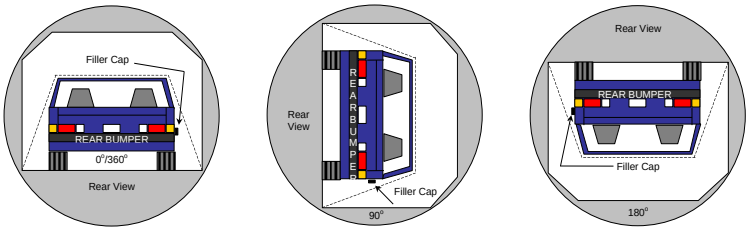
Stoddard Solvent Spillage Measurements

A.	From impact until vehicle motion ceases: (maximum allowable = 1 oz.)	0 oz.
B.	For the 5-minute period after motion ceases: (maximum allowable = 5 oz.)	0 oz.
C.	For the following 25 minutes: (maximum allowable = 1 oz./minute)	0 oz.
D.	Spillage:	0 oz.

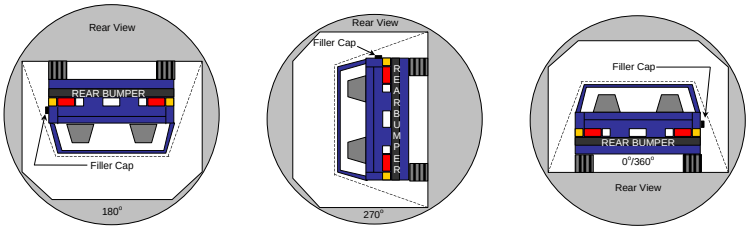
DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



0° TO 90° 90° TO 180°



180° TO 270° 270° TO 360°

1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
2. Details of Stoddard Solvent spillage: _____

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	65	300	365
90° to 180°	61	300	361
180° to 270°	70	300	370
270° to 360°	63	300	363

FMVSS 301 SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

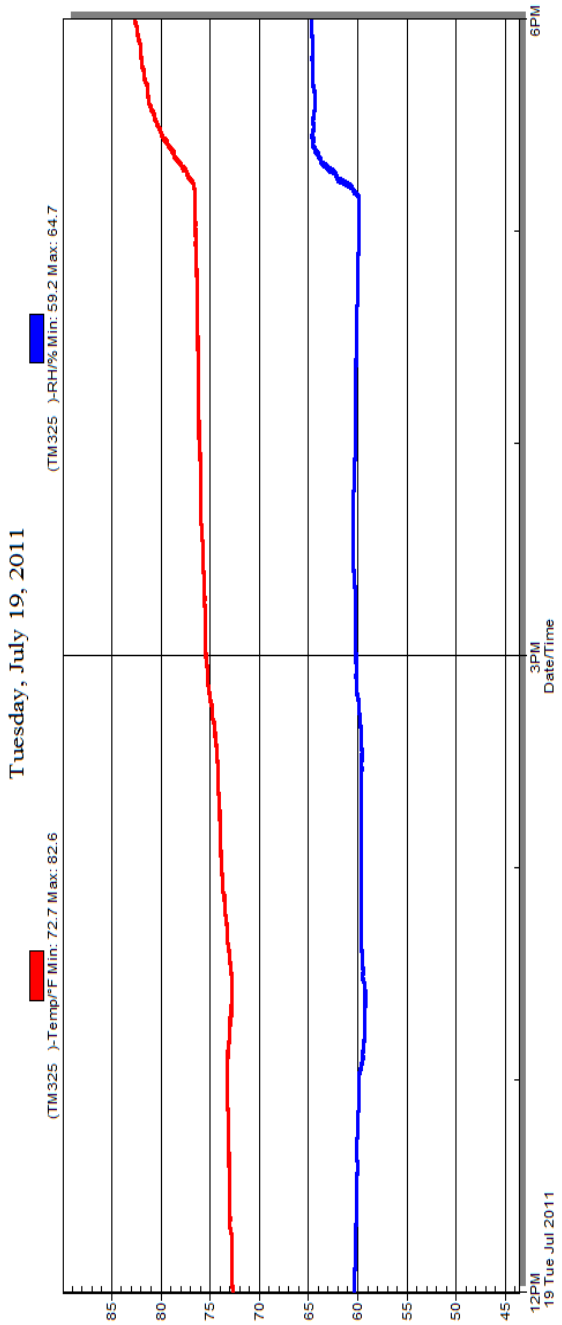
SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle:	2011 Ford Explorer	NHTSA No:	RB0222
Test Program:	R&D 56mph 7°/20% Offset	Test Date	7/19/2011



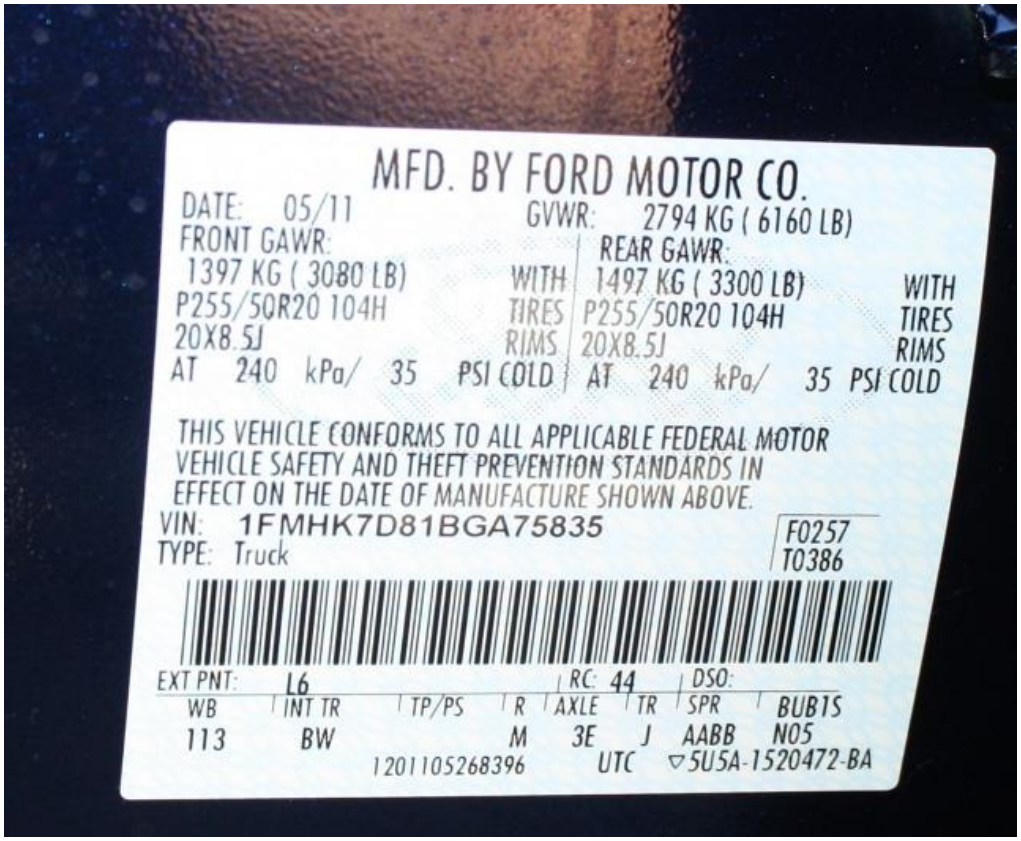
APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

No. 001 As Delivered Right Front 3-4 View of Test Vehicle

No. 002 As Delivered Left Rear 3-4 View of Test Vehicle



No. 003 Test Vehicle Certification Label

No. 004 Test Vehicle Tire Placard

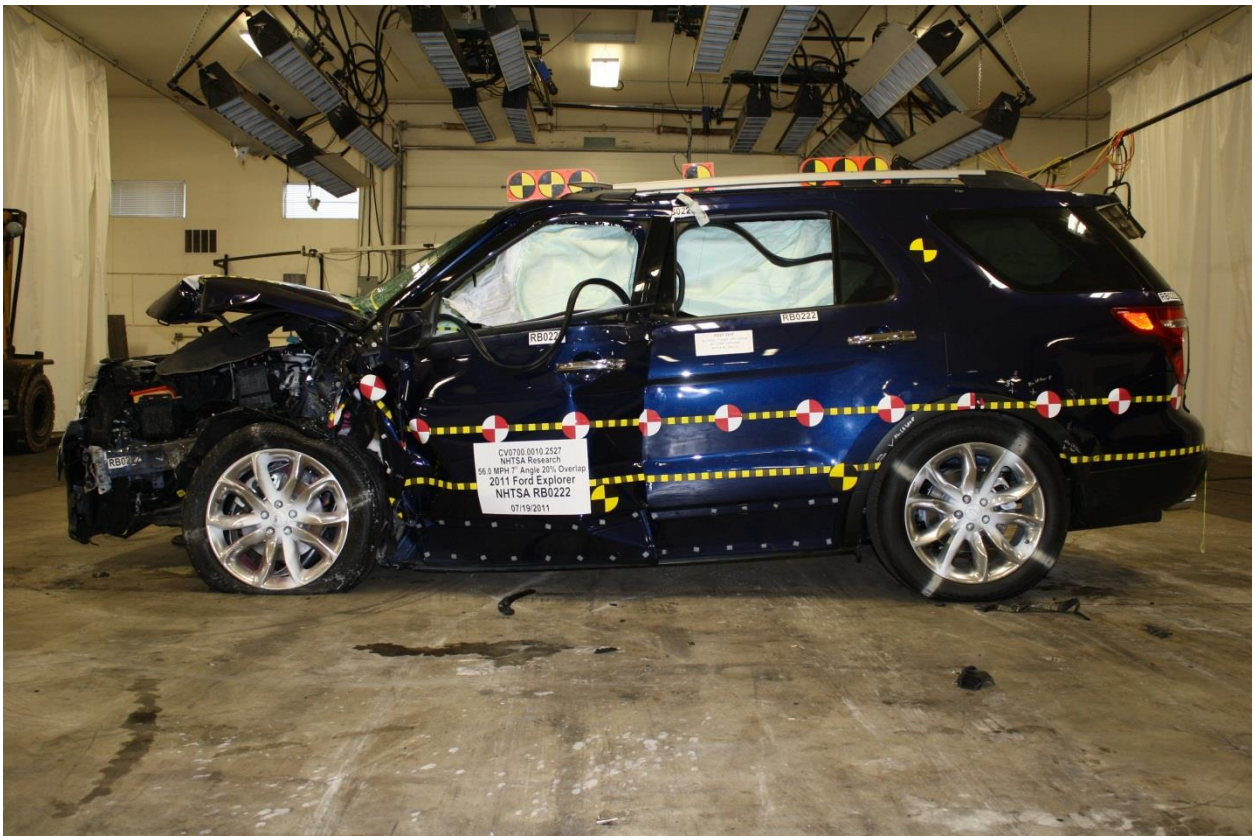
No. 005 Pre-Test Front View of Test Vehicle

No. 006 Post-Test Front View of Test Vehicle

No. 007 Pre-Test Left Front 3-4 View of Test Vehicle

No. 008 Post-Test Left Front 3-4 View of Test Vehicle

No. 009 Pre-Test Left Side View of Test Vehicle

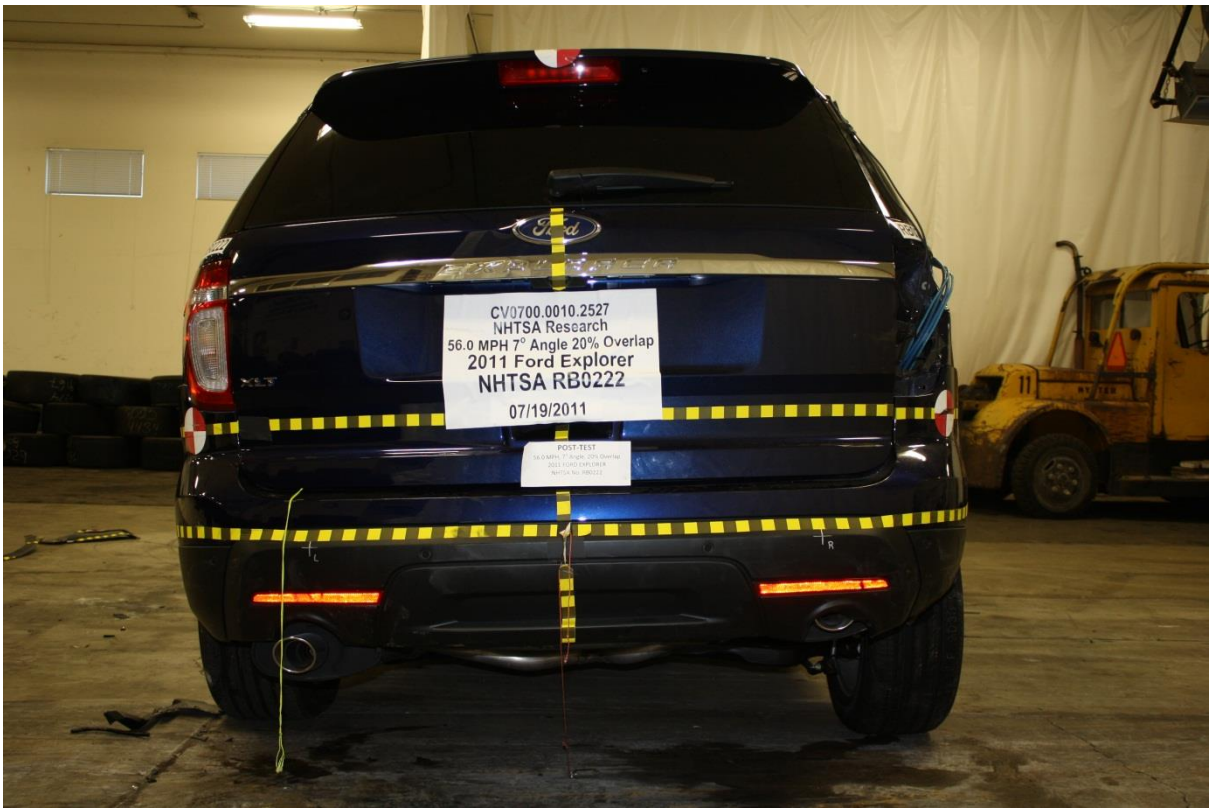


No. 010 Post-Test Left Side View of Test Vehicle

No. 011 Pre-Test Left Rear 3-4 View of Test Vehicle

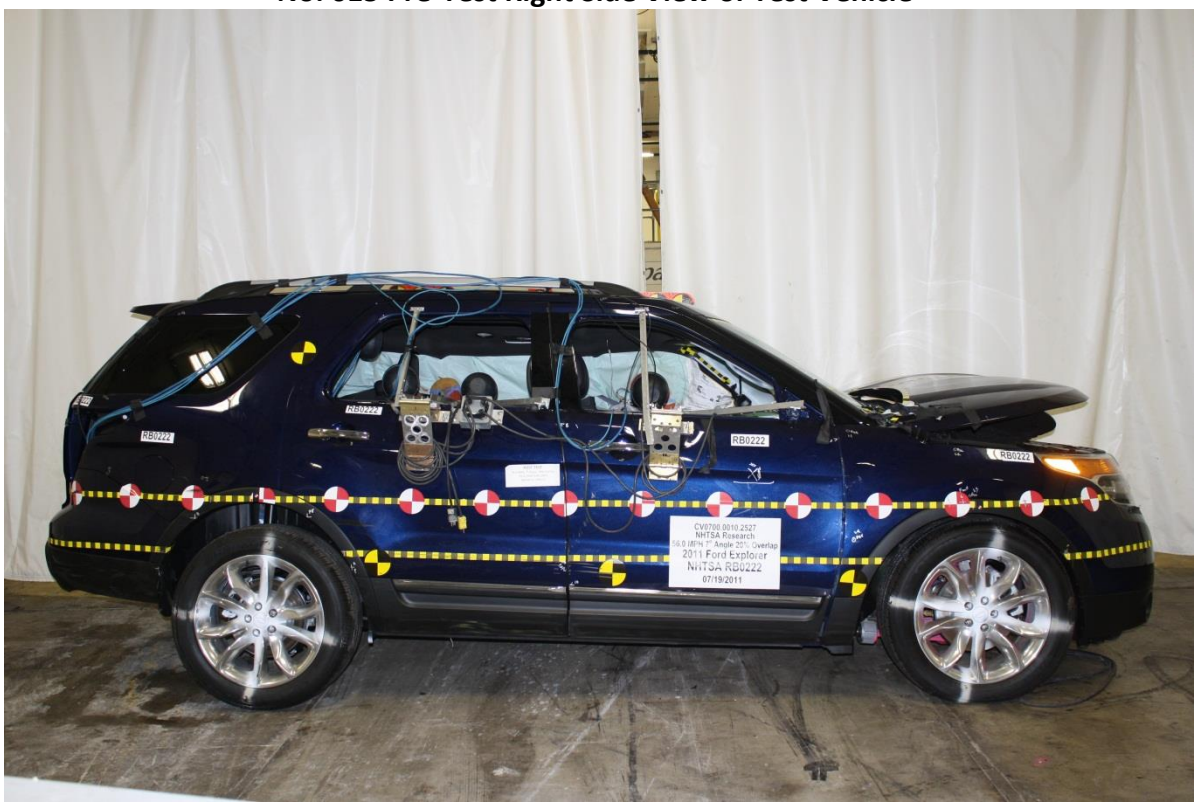
No. 012 Post-Test Left Rear 3-4 View of Test Vehicle

No. 013 Pre-Test Rear View of Test Vehicle



No. 014 Post-Test Rear View of Test Vehicle

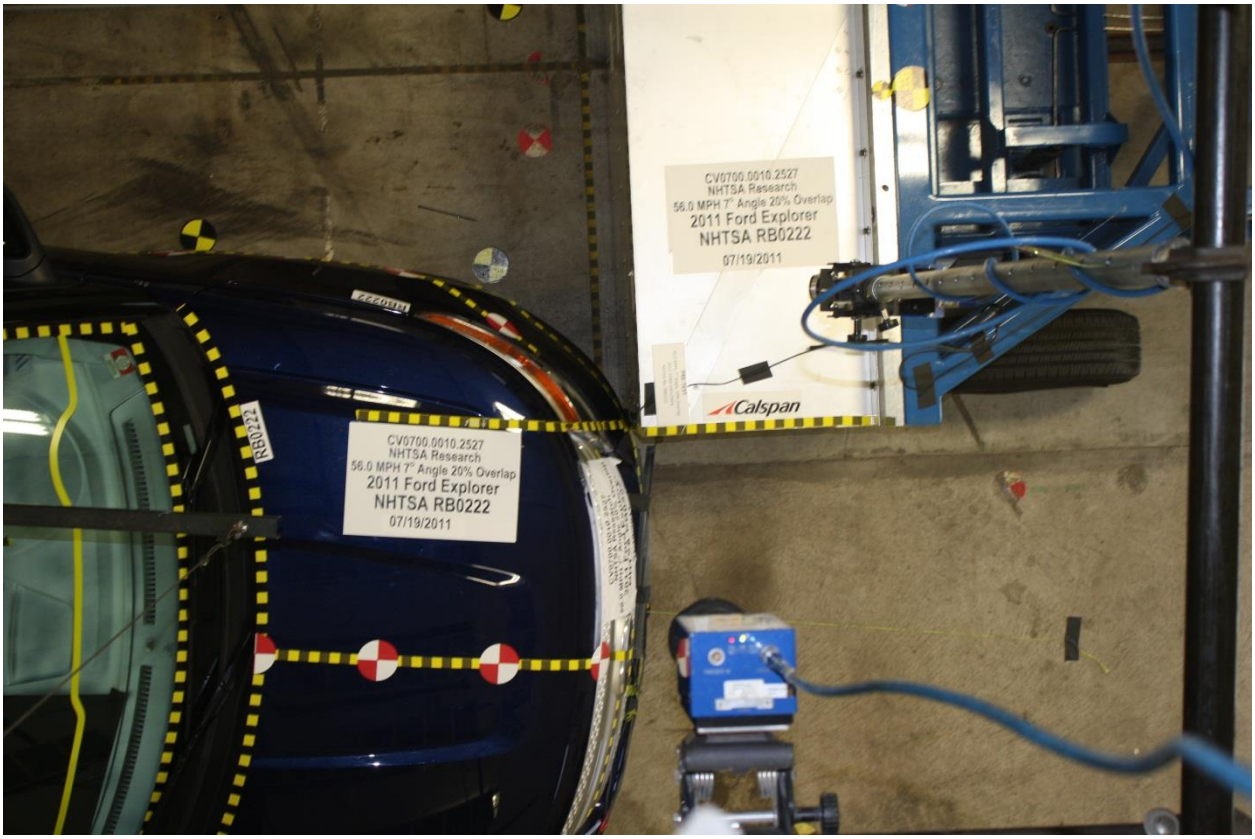
No. 015 Pre-Test Right Side View of Test Vehicle



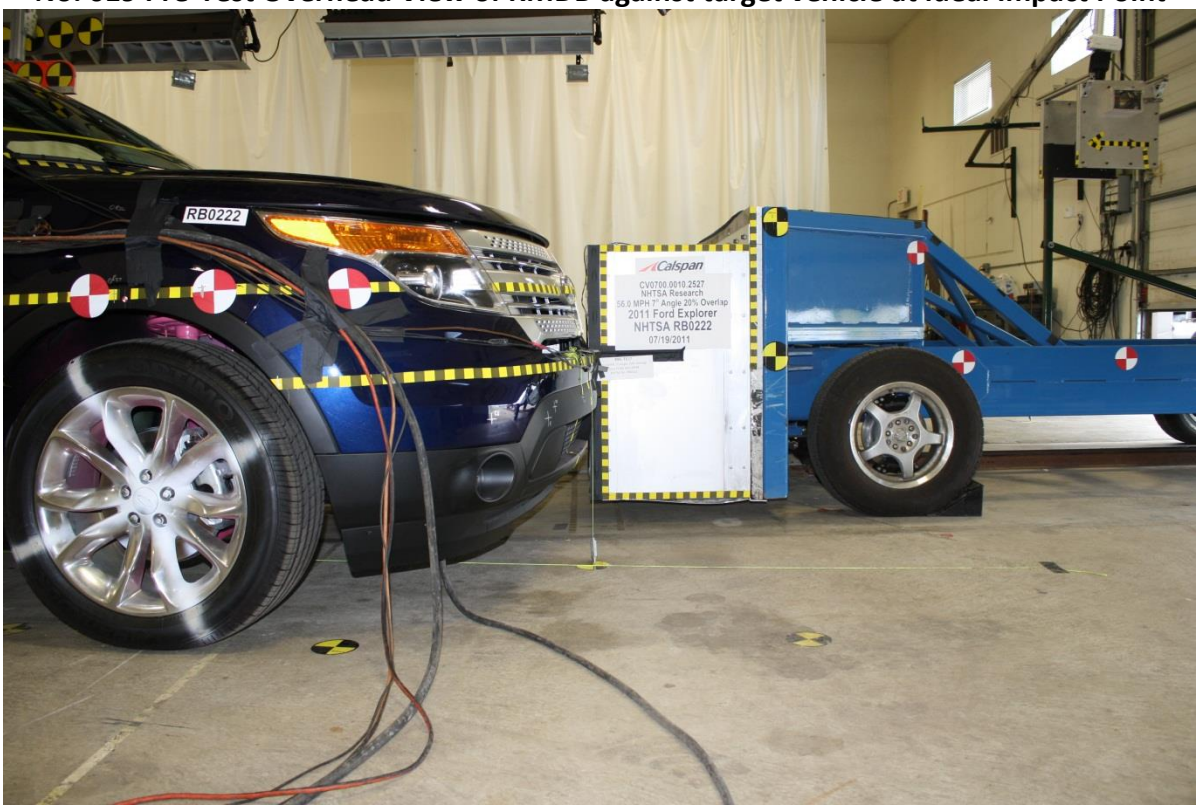
No. 016 Post-Test Right Side View of Test Vehicle

No. 017 Pre-Test Right Front 3-4 View of Test Vehicle

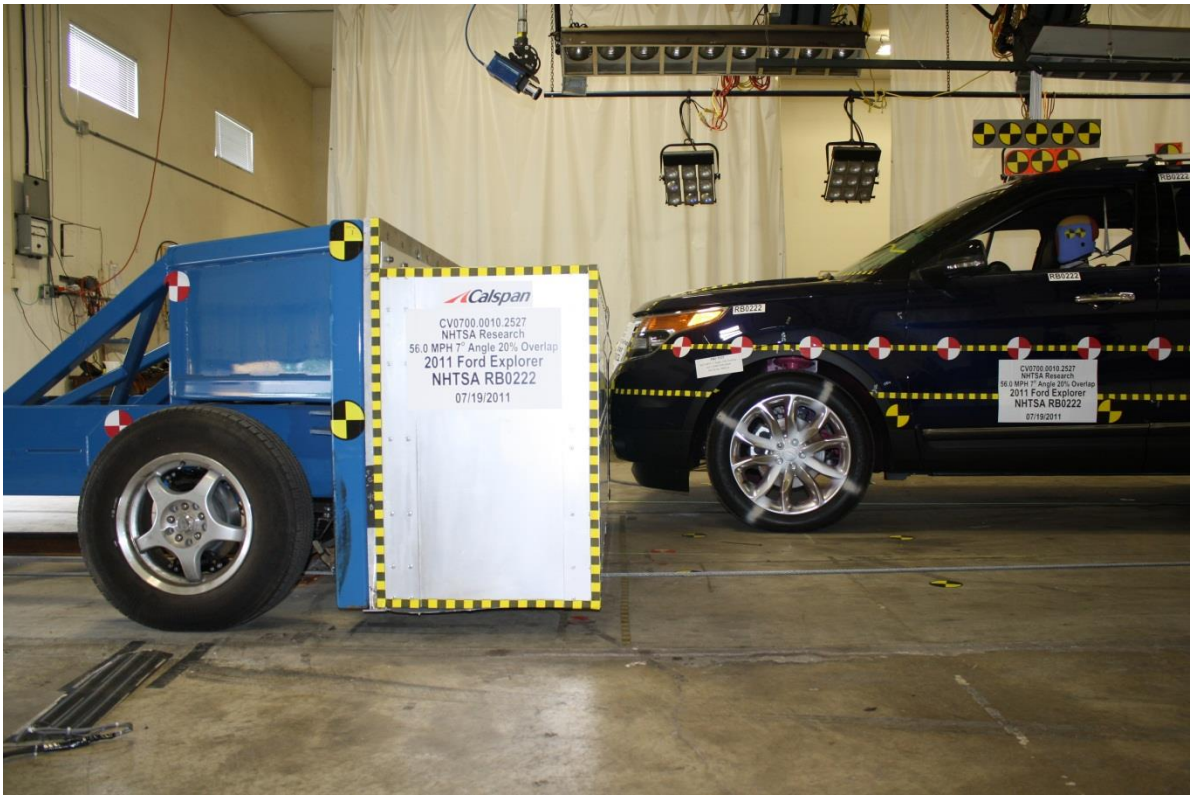
No. 018 Post-Test Right Front 3-4 View of Test Vehicle



No. 019 Pre-Test Overhead View of RMDB against target vehicle at ideal Impact Point

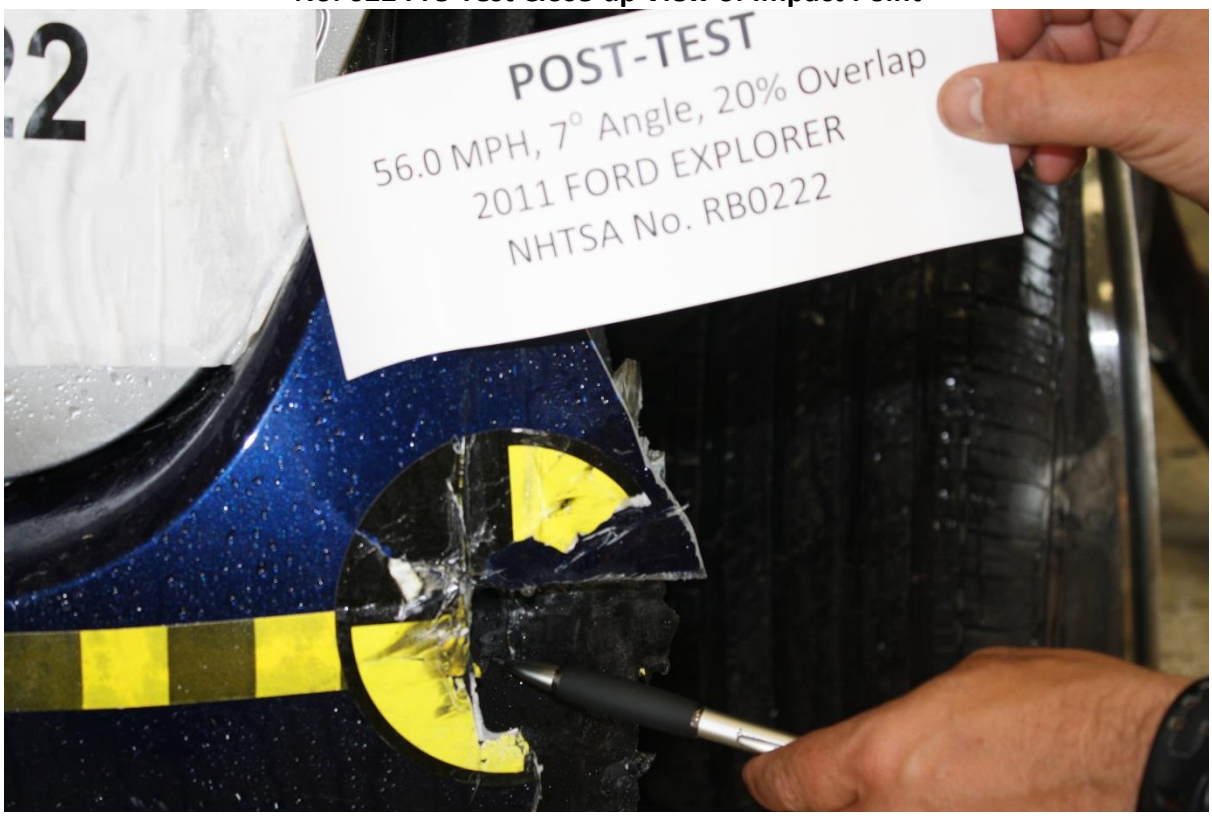


No. 020 Pre-Test Left Side View of RMDB against target vehicle at ideal Impact Point

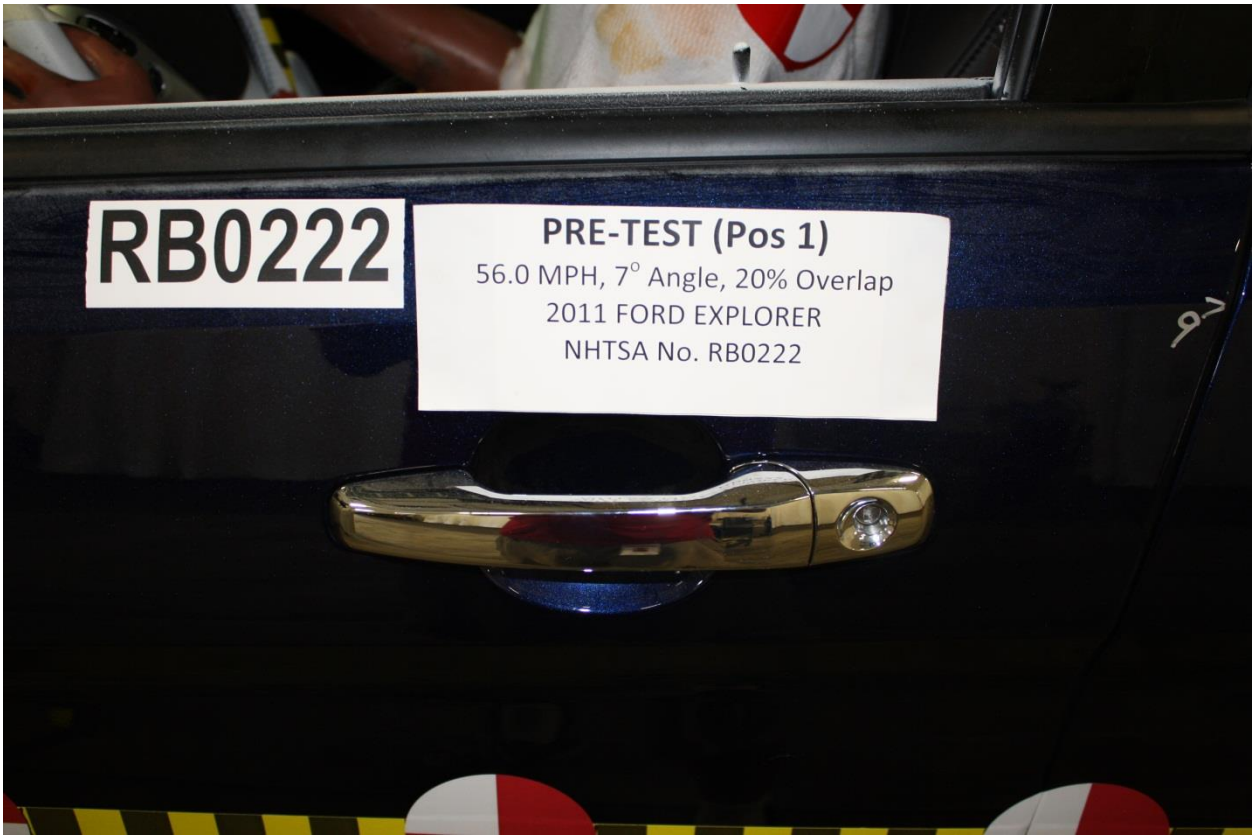


No. 021 Pre-Test Right Side View of RMDB against target vehicle at ideal Impact Point

No. 022 Pre-Test Close-up View of Impact Point



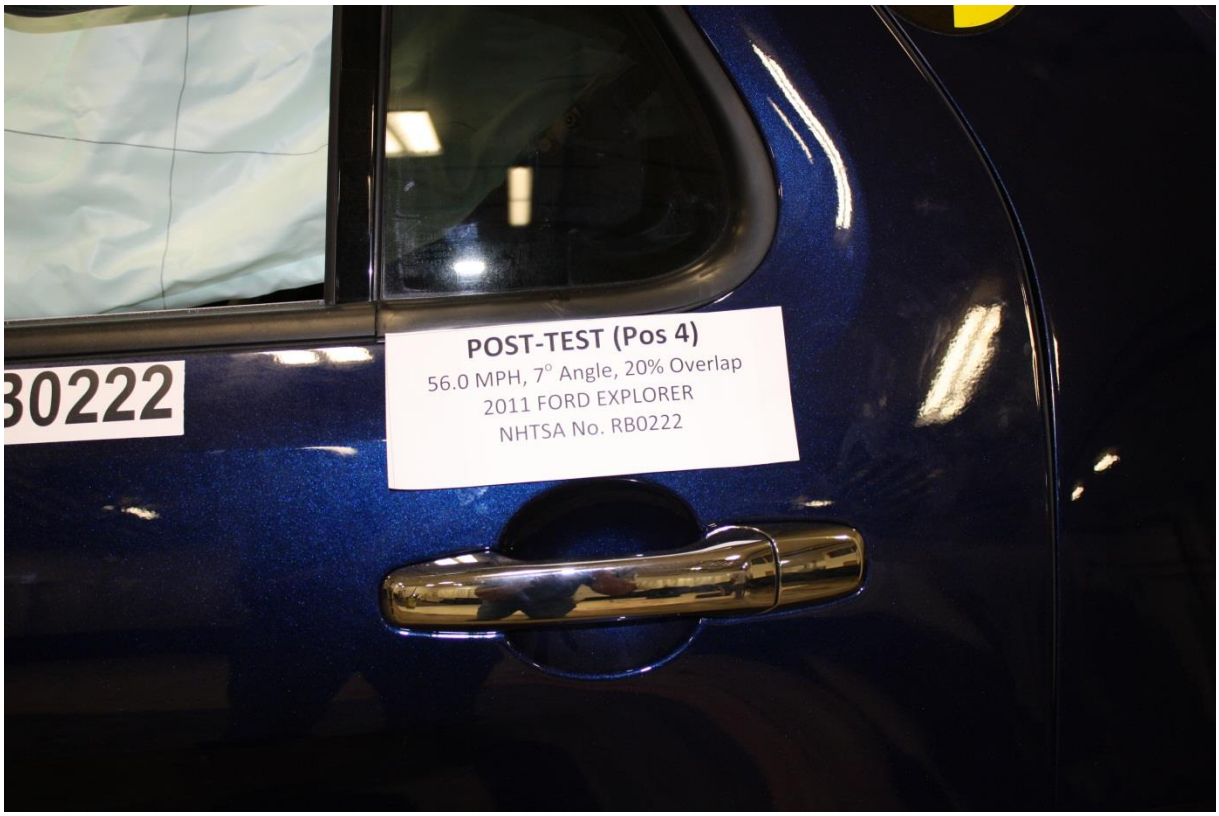
No. 023 Post-Test Close-up View of Impact Point



No. 024 Pre-Test Close-up View of Left Front Door Latch

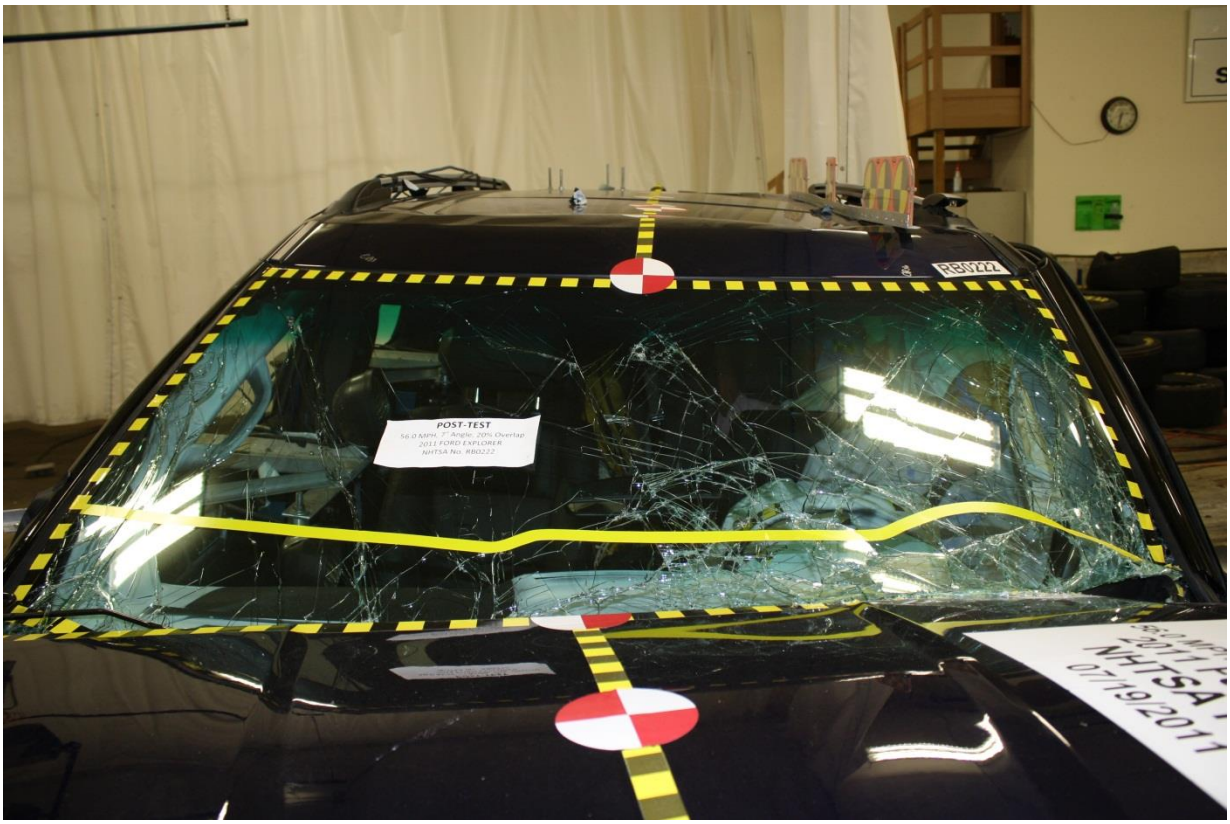
No. 025 Post-Test Close-up View of Left Front Door Latch

No. 026 Pre-Test Close-up View of Left Rear Door Latch



No. 027 Post-Test Close-up View of Left Rear Door Latch

No. 028 Pre-Test Windshield View



No. 029 Post-Test Windshield View

No. 030 Pre-Test View of Driver Inner Door Panel

No. 031 Post-Test View of Driver Inner Door Panel

No. 032 Pre-Test View of Passenger Inner Door Panel

No. 033 Post-Test View of Passenger Inner Door Panel

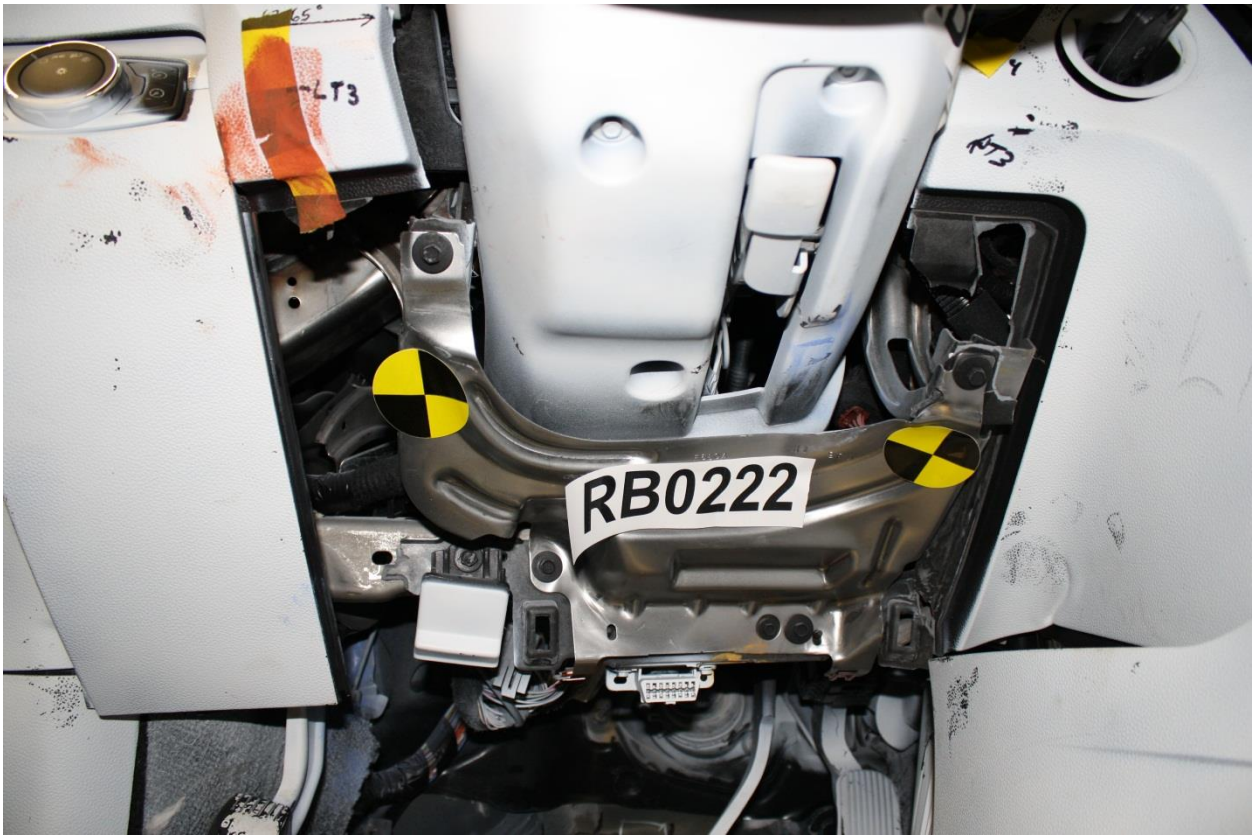
No. 034 Pre-Test Frontal View of Driver Seat pan

No. 035 Pre-Test Frontal View of Driver Seat back

No. 036 Pre-Test Frontal View of Left Rear Seat pan

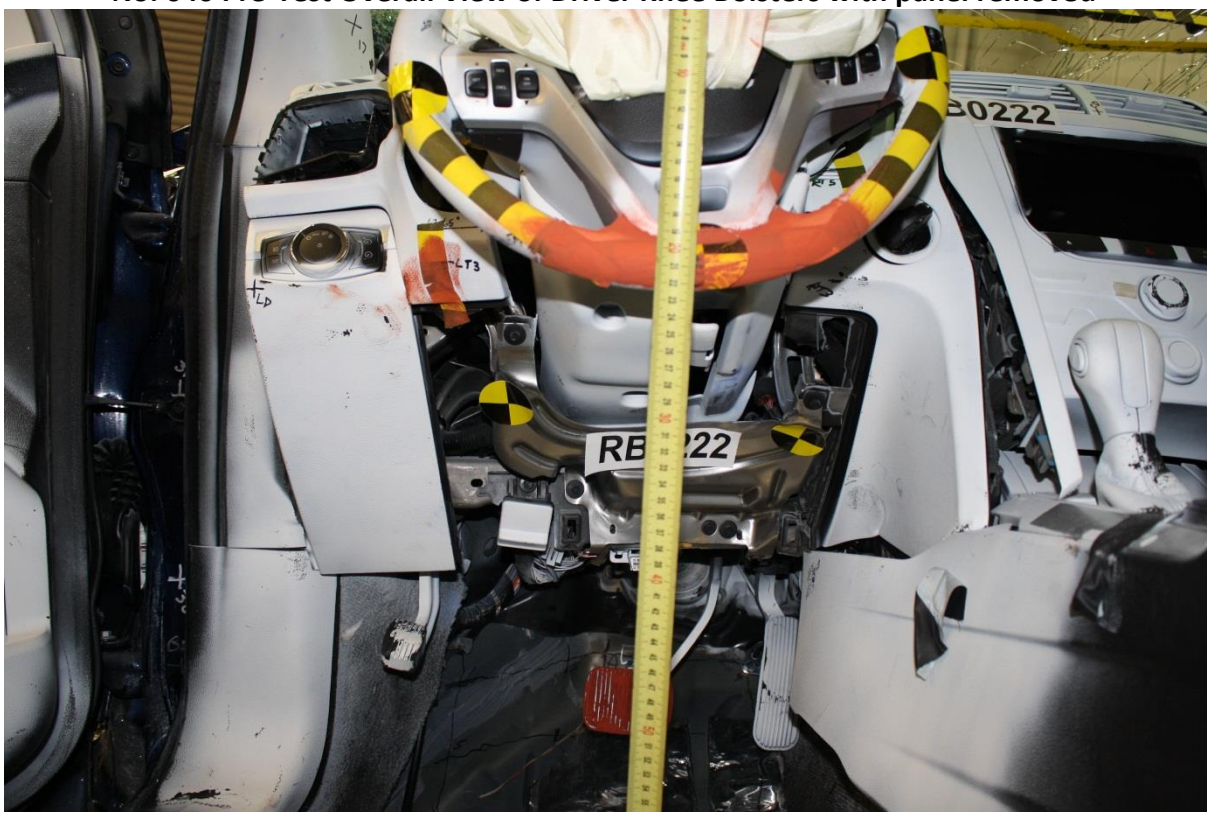
No. 037 Pre-Test Frontal View of Left Rear Seat back

No. 038 Pre-Test Overall View of Driver Knee Bolsters



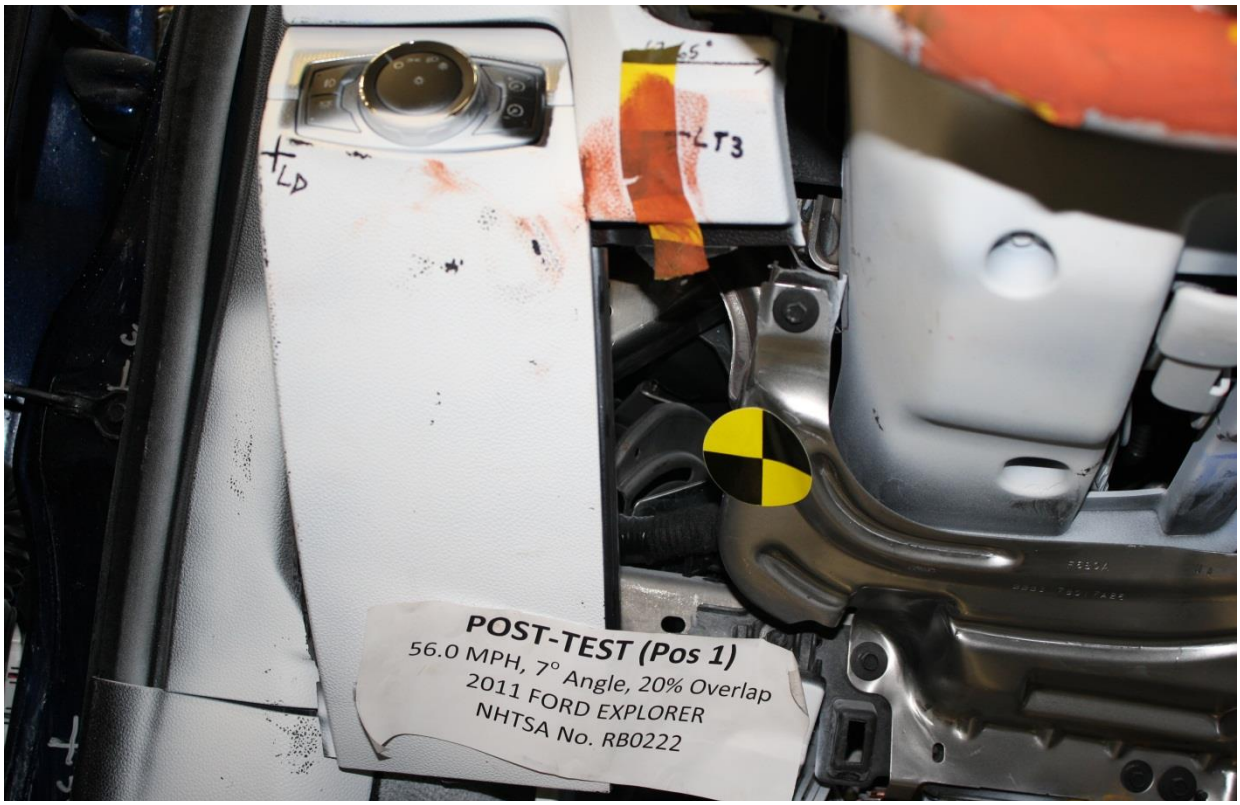
No. 039 Post-Test Overall View of Driver Knee Bolsters

No. 040 Pre-Test Overall View of Driver Knee Bolsters with panel removed



No. 041 Post-Test Overall View of Driver Knee Bolsters with panel removed

No. 042 Pre-Test Left Side View of Driver Knee Bolsters

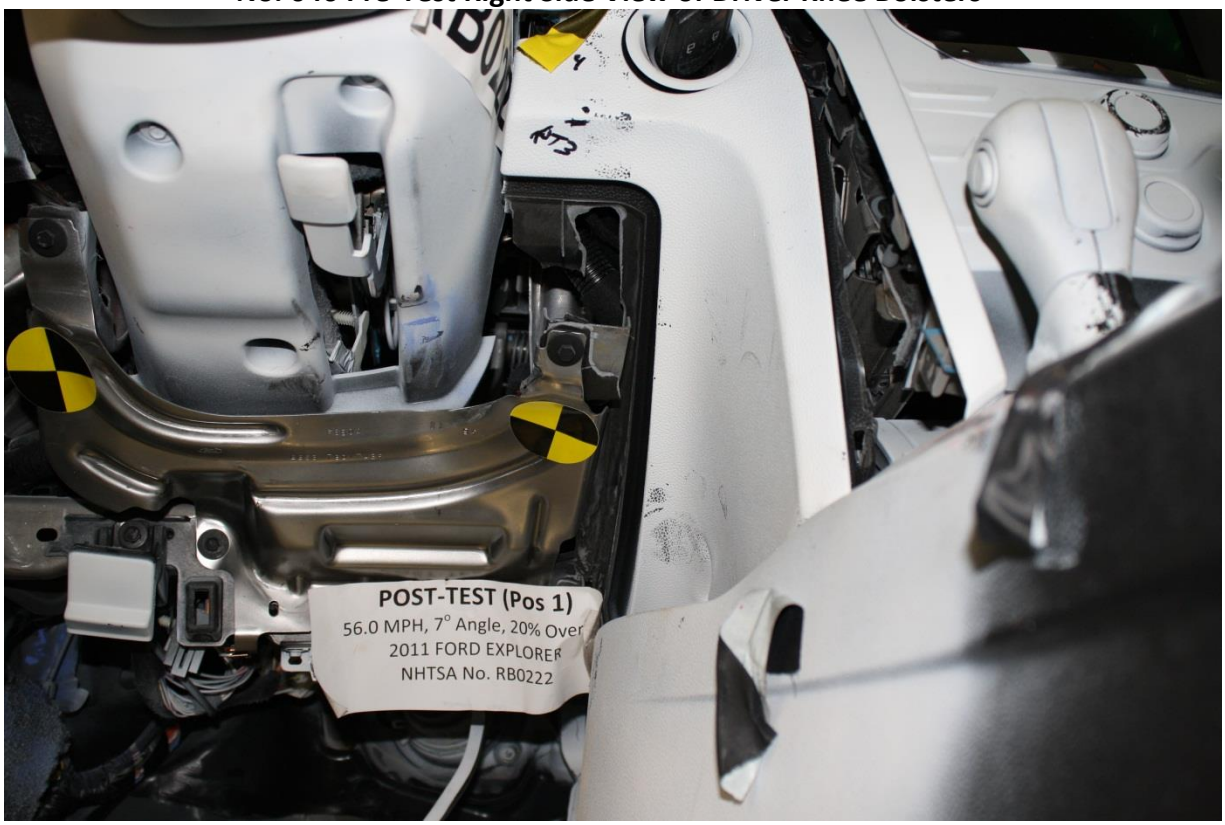


No. 043 Post-Test Left Side View of Driver Knee Bolsters

No. 044 Pre-Test Left Side View of Driver Knee Bolsters with panel removed

No. 045 Post-Test Left Side View of Driver Knee Bolsters with panel removed

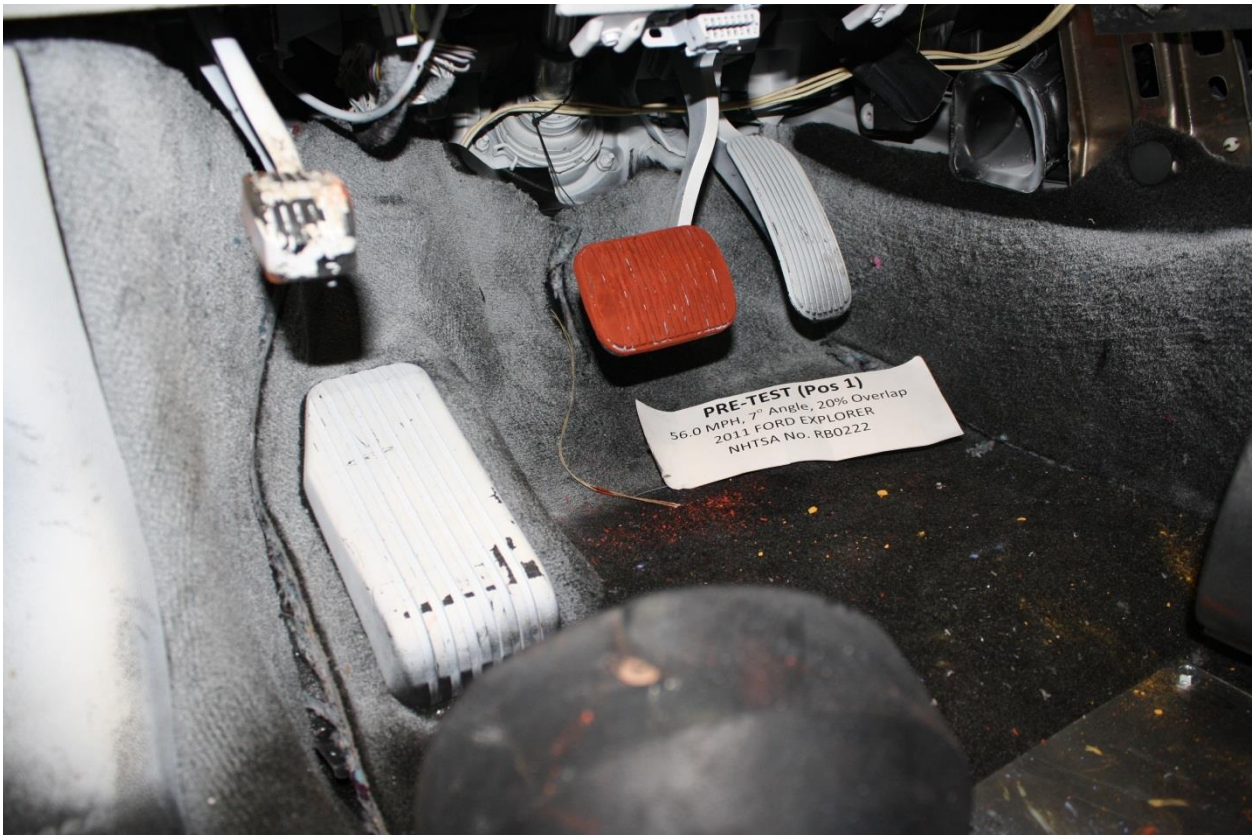
No. 046 Pre-Test Right Side View of Driver Knee Bolsters



No. 047 Post-Test Right Side View of Driver Knee Bolsters

No. 048 Pre-Test Right Side View of Driver Knee Bolster with panel removed

No. 049 Post-test right side view of driver knee bolster with panel removed



No. 050 Pre-Test View of Driver Floor pan at Left sill level

No. 051 Post-Test View of Driver Floor pan at Left sill level

No. 052 Pre-Test View of Driver Floor pan at Mid seat level

No. 053 Post-Test view of Driver Floor pan at Mid seat level

No. 054 Pre-Test Driver Dummy Front Windshield View

No. 055 Post-Test Driver Dummy Front Windshield View

No. 056 Pre-Test Left Side View of Driver Dummy and Interior

No. 057 Post-Test Left Side View of Driver Dummy and Interior

No. 058 Pre-Test Left Side Driver Dummy Window View

No. 059 Post-Test Left Side Driver Dummy Window View

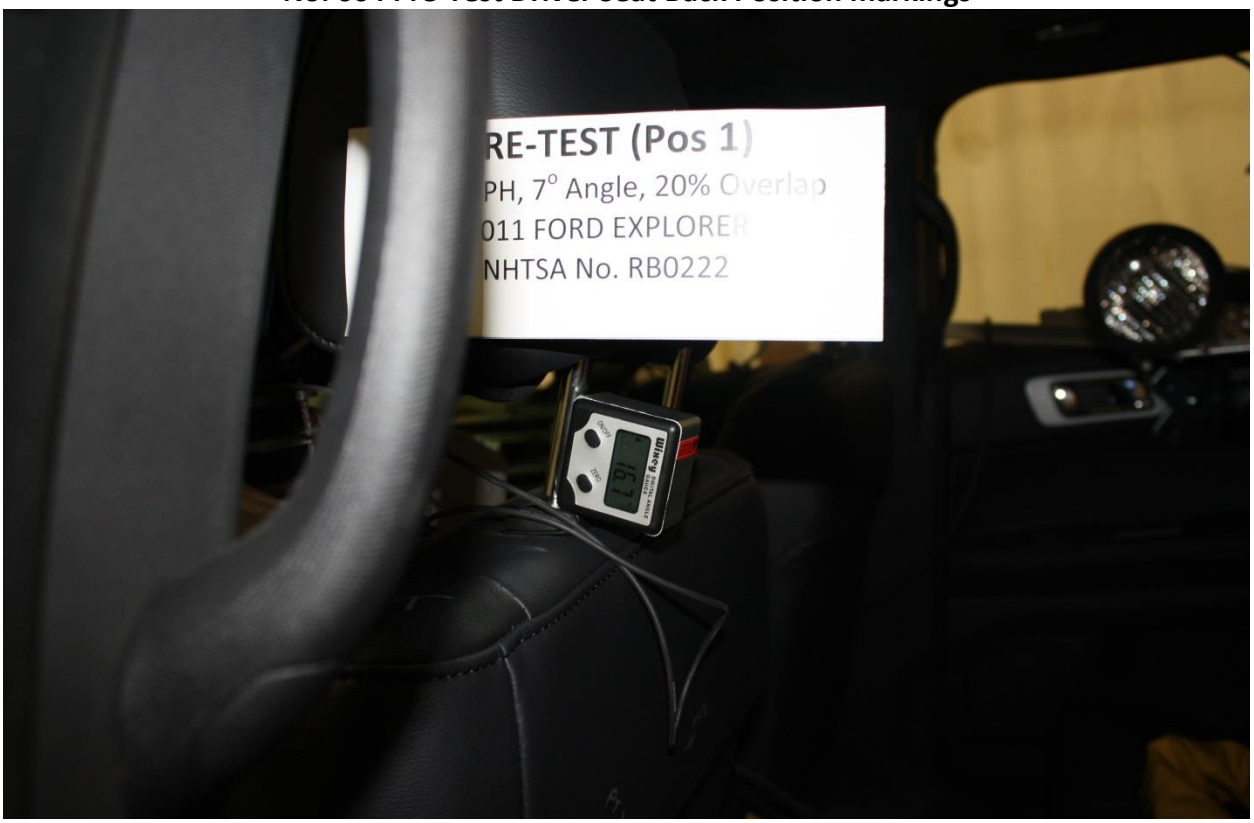
No. 060 Pre-Test Right Side View of Driver Dummy and Interior

No. 061 Post-Test Right Side View of Driver Dummy and Interior

No. 062 Pre-Test View of Driver Dummy Door Clearance

No. 063 Post-Test View of Driver Dummy Door Clearance

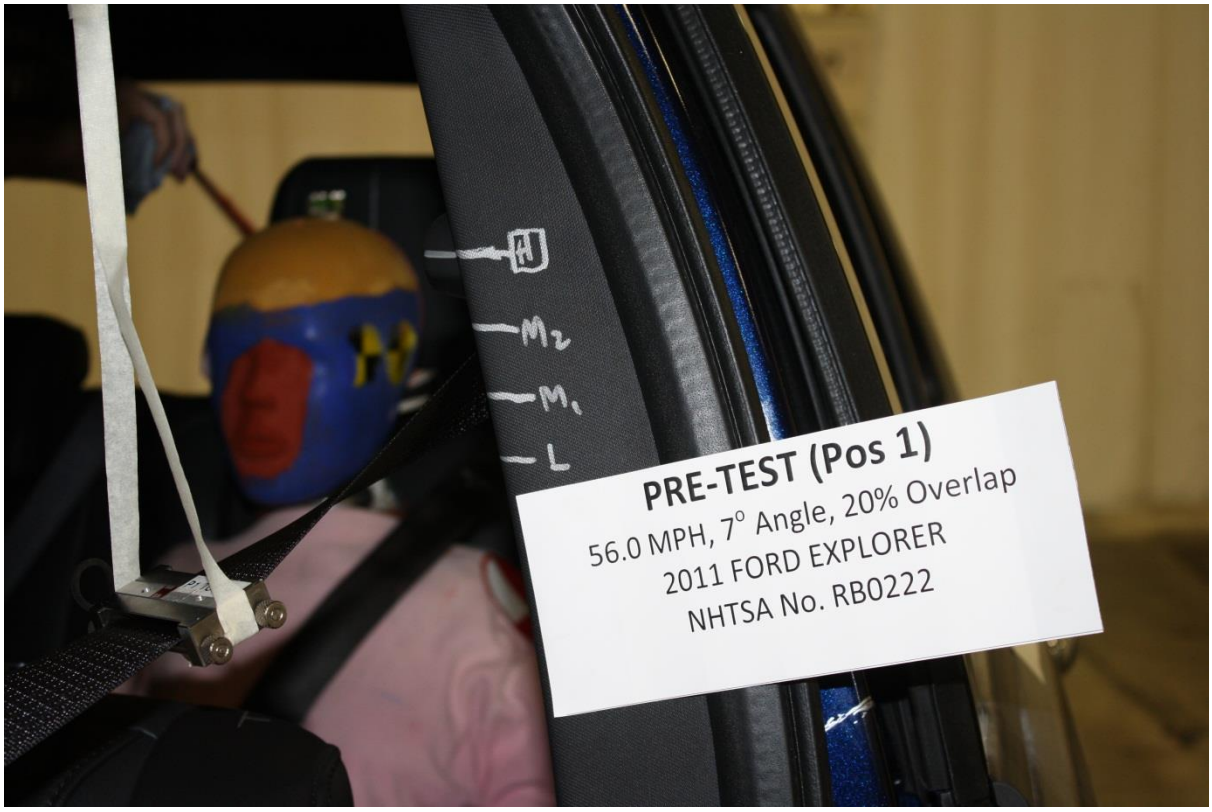
No. 064 Pre-Test Driver Seat Back Position markings



No. 065 Pre-Test Driver Seat Back Position with Level or Inclinometer

No. 066 Pre-Test Driver Seat Fore Aft Markings

No. 067 Post-Test Driver Seat Fore Aft Markings

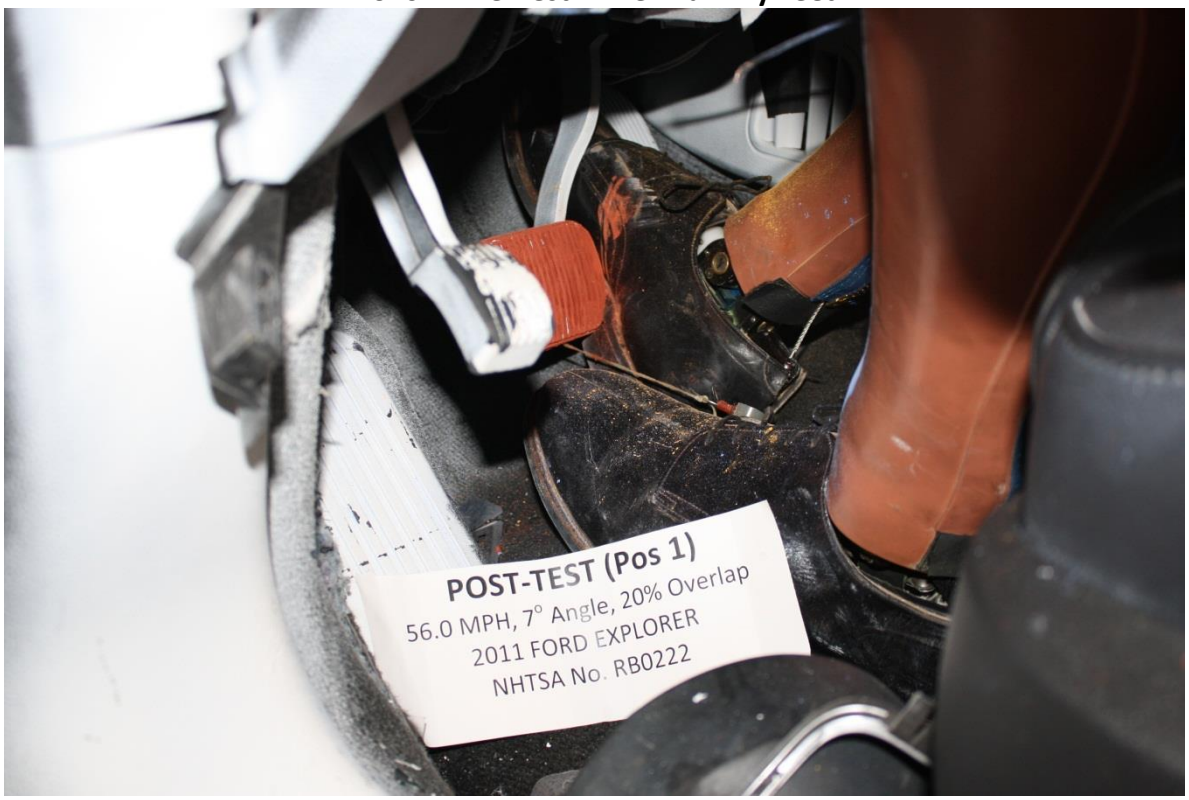


No. 068 Pre-Test Driver Adjustable D-ring

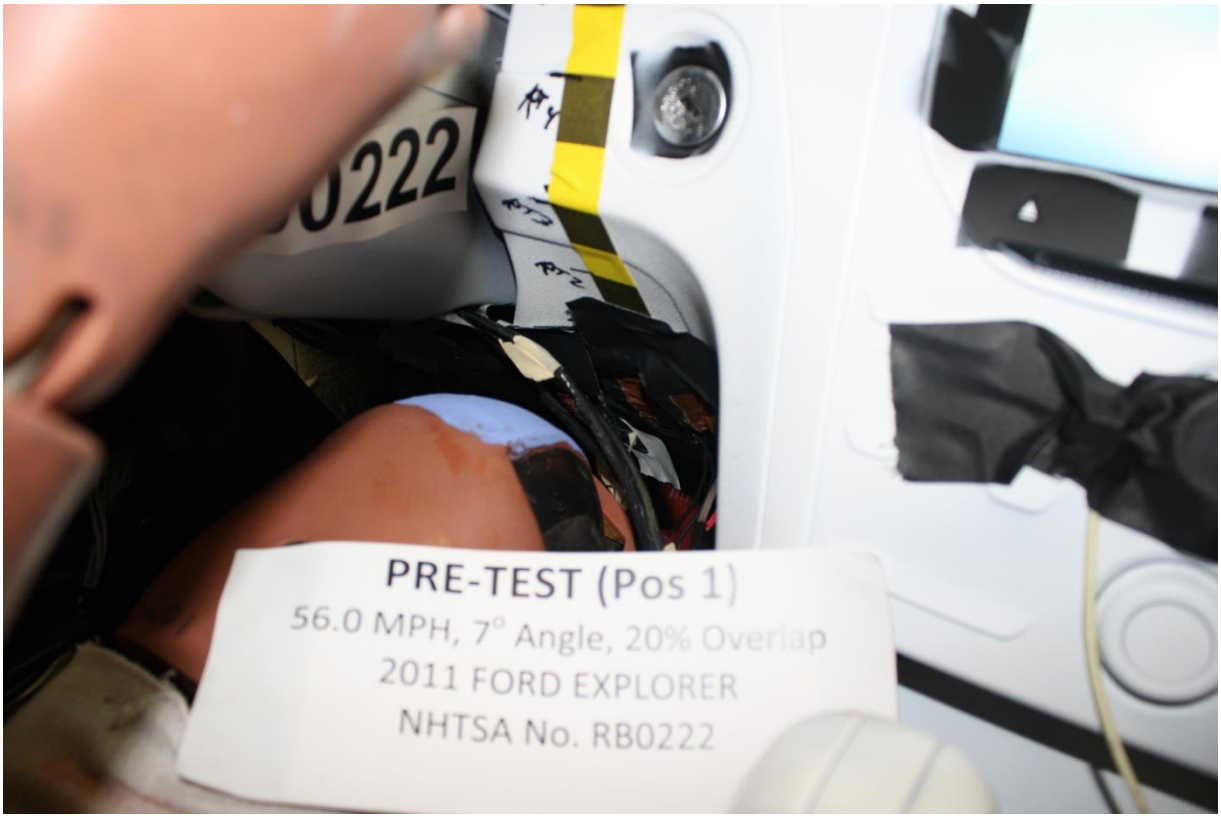
No. 069 Pre-Test Overhead View of Driver Dummy Thighs in seat

No. 070 Pre-Test View of Parking Brake

No. 071 Pre-Test Driver Dummy Feet

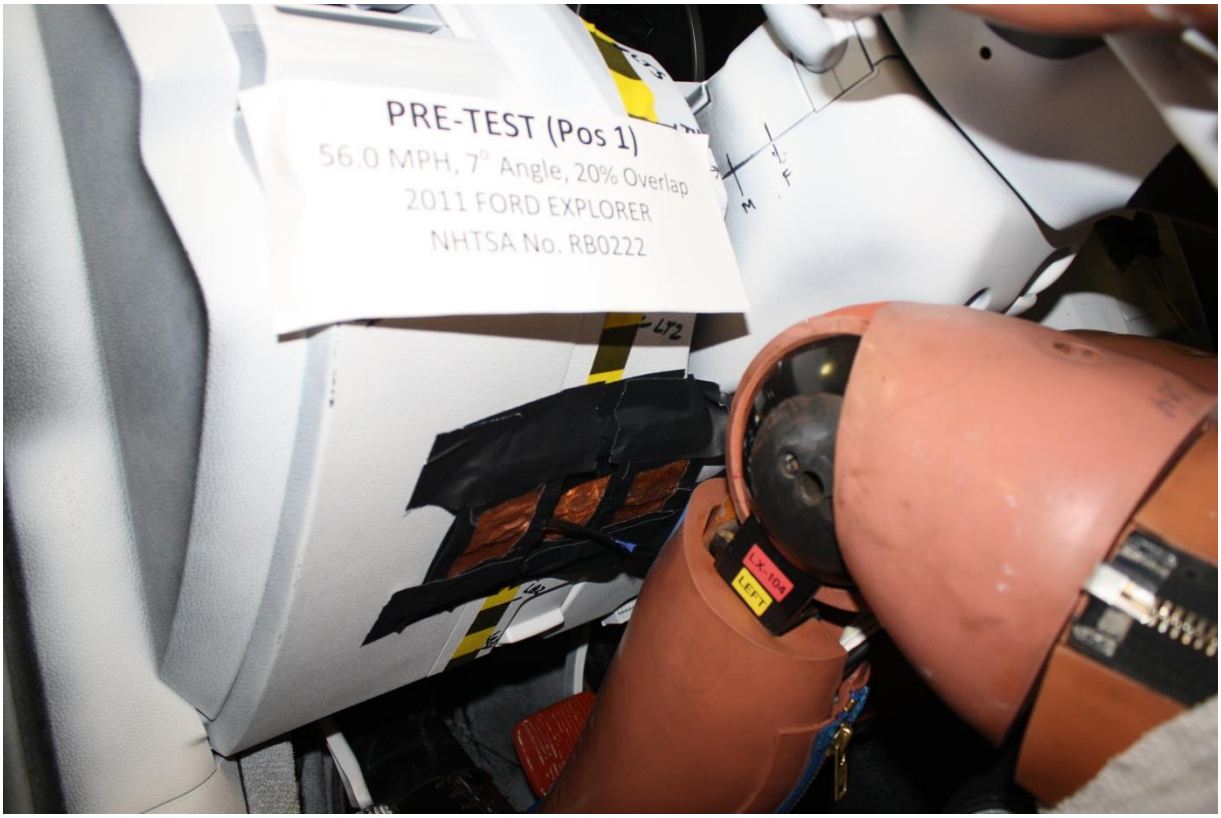


No. 072 Post-Test Driver Dummy Feet



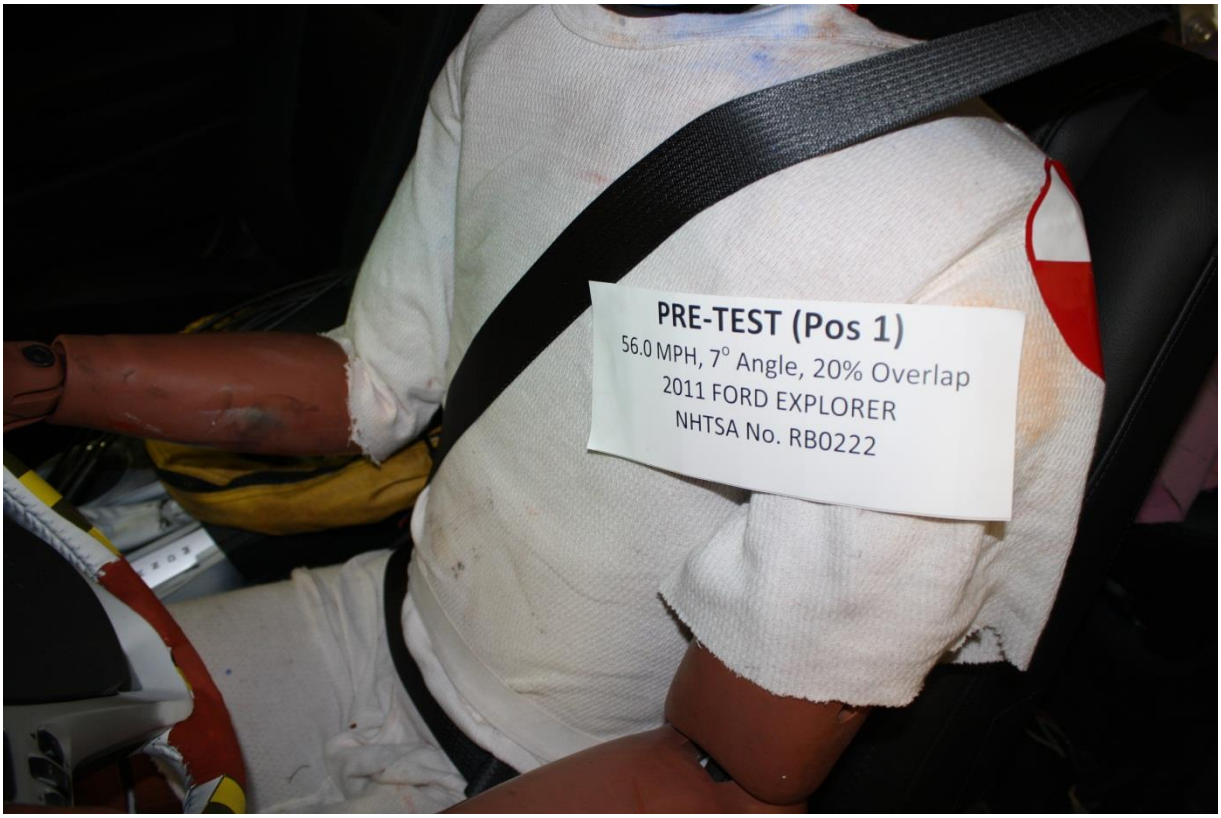
No. 073 Pre-Test View of Driver Dummy Right Knee and Bolster

No. 074 Post-Test View of Driver Dummy Right Knee and Bolster



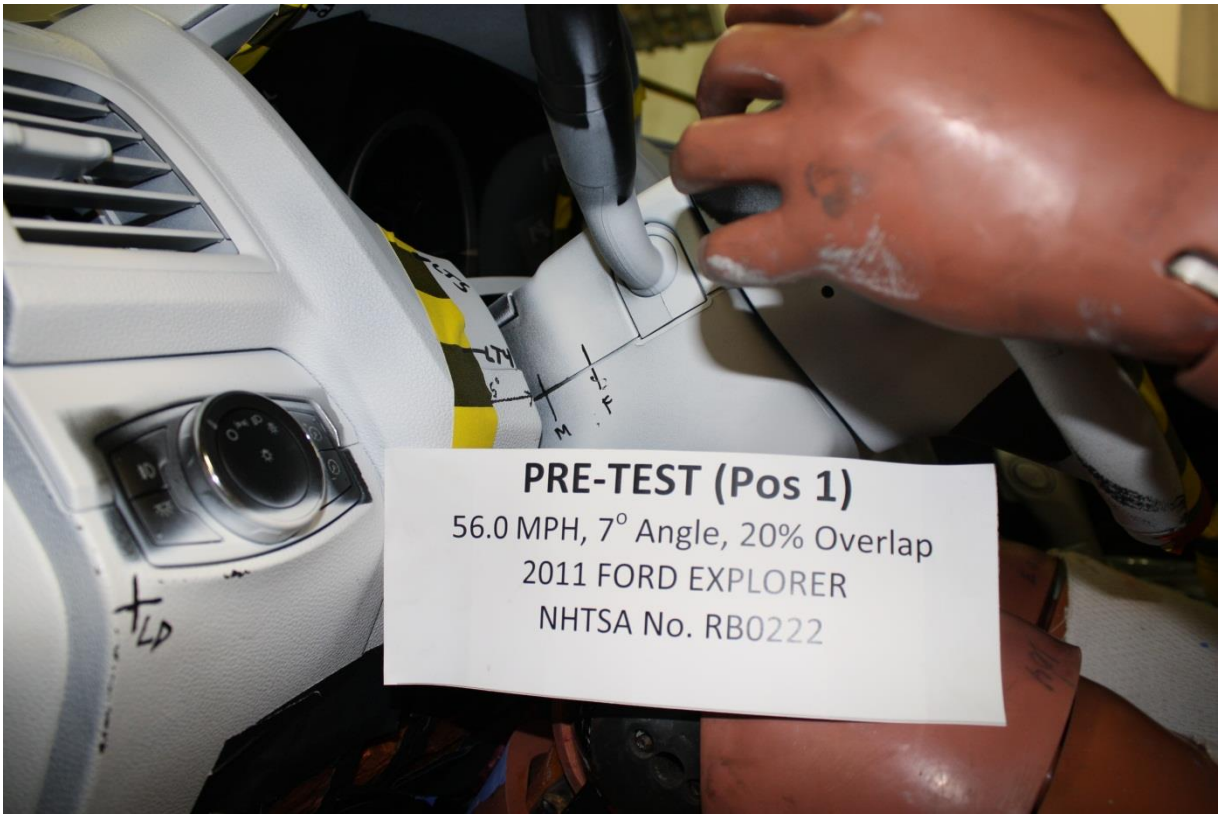
No. 075 Pre-Test View of Driver Dummy Left Knee and Bolster

No. 076 Post-Test View of Driver Dummy Left Knee and Bolster



No. 077 Pre-Test View of Driver Dummy Abdomen

No. 078 Post-Test View of Driver Dummy Abdomen



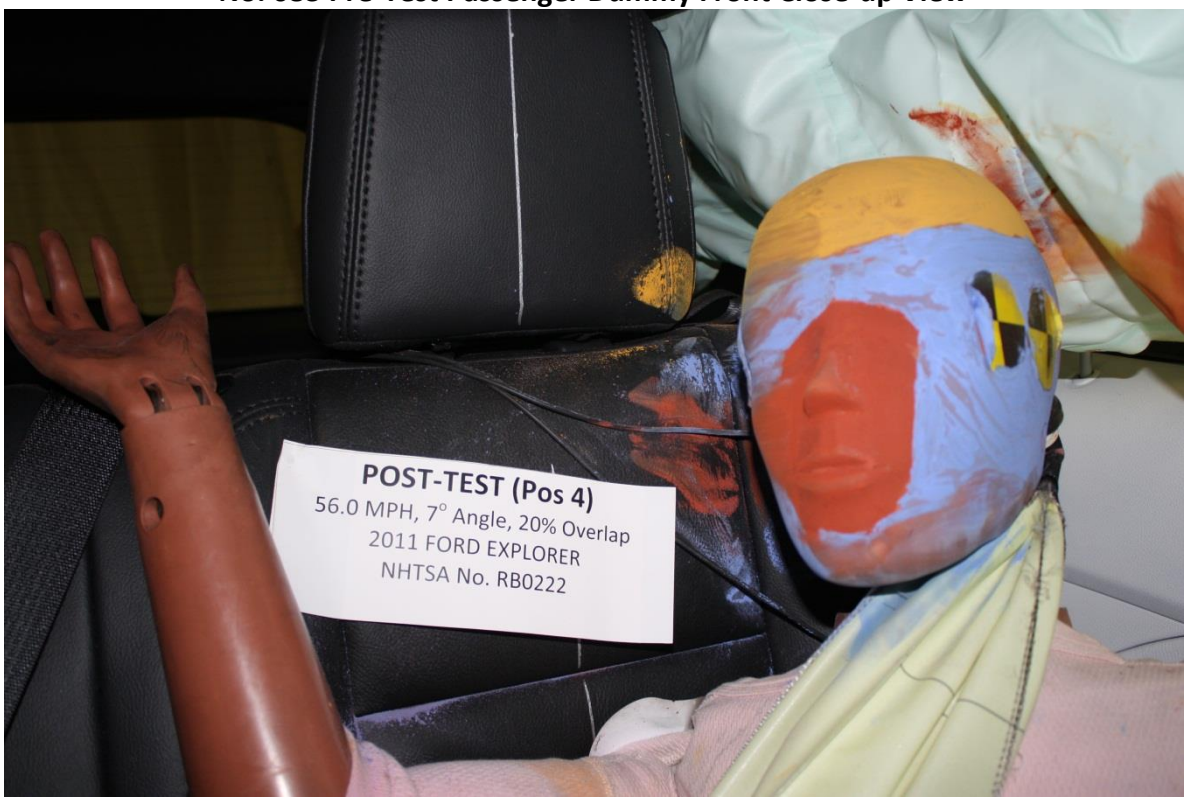
No. 079 Pre-Test Left Side View of Steering Wheel set position

No. 080 Post-Test Left Side View of Steering Wheel set position

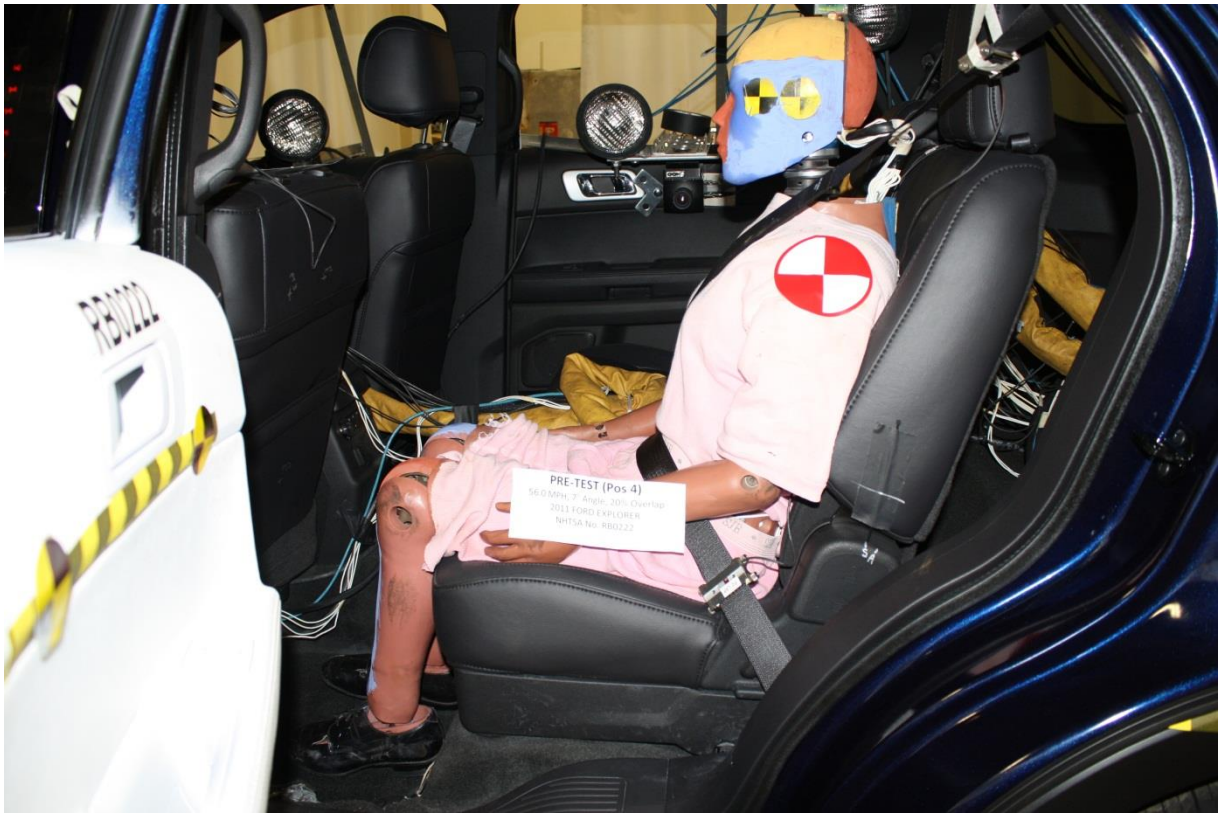
No. 081 Post-Test View of Driver Dummy Head Contact with Airbag

No. 082 Post-Test View of Driver Dummy Head Contact with Vehicle Interior (a, b, c, etc)

No. 083 Pre-Test Passenger Dummy Front Close-up View



No. 084 Post-Test Passenger Dummy Front Close-up View



No. 085 Pre-Test Left Side Passenger Dummy and Interior View

No. 086 Post-Test Left Side Passenger Dummy and Interior View

No. 087 Pre-Test Left Side Passenger Dummy Window View

No. 088 Post-Test Left Side Passenger Dummy Window View

No. 089 Pre-Test Right Side View of Passenger Dummy and Interior

No. 090 Post-Test Right Side View of Passenger Dummy and Interior

No. 091 Pre-Test View of Passenger Dummy Door Clearance

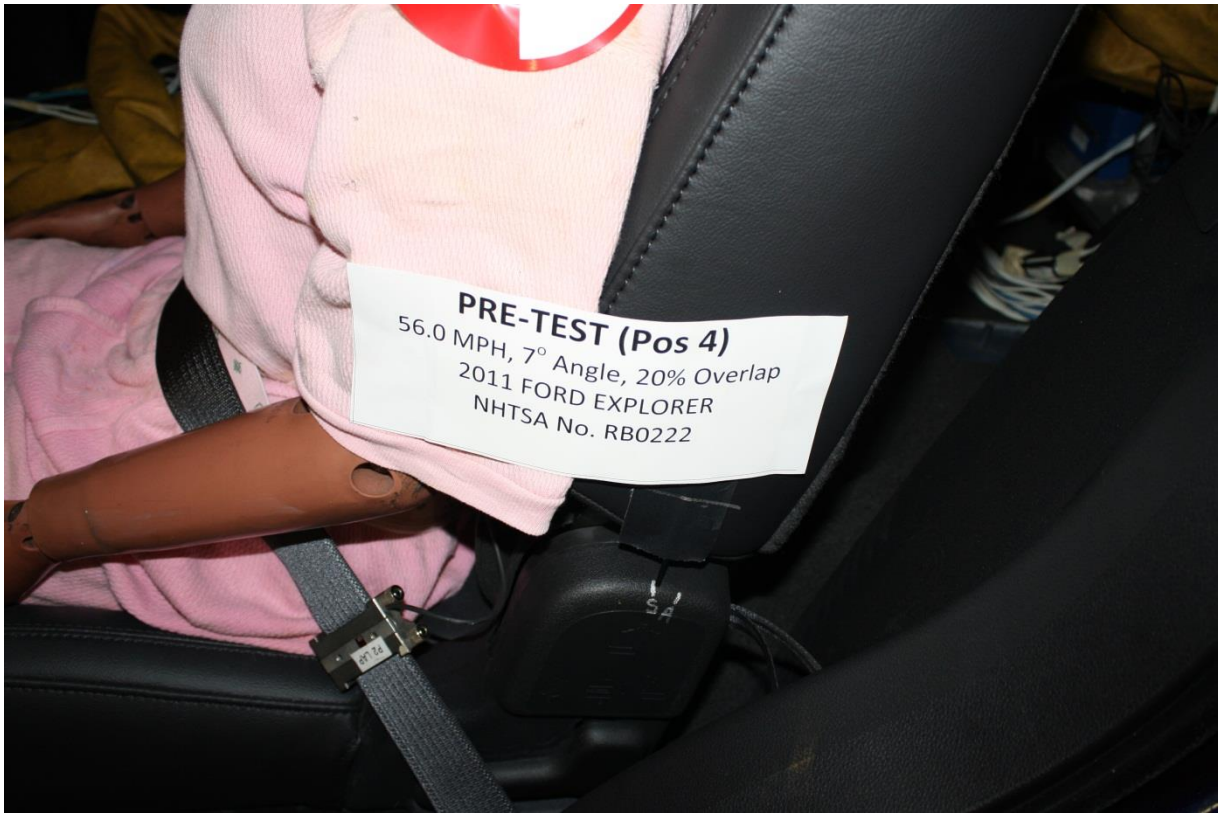
No. 092 Post-Test View of Passenger Dummy Door Clearance

No. 093 Pre-Test Passenger View Showing Head Level

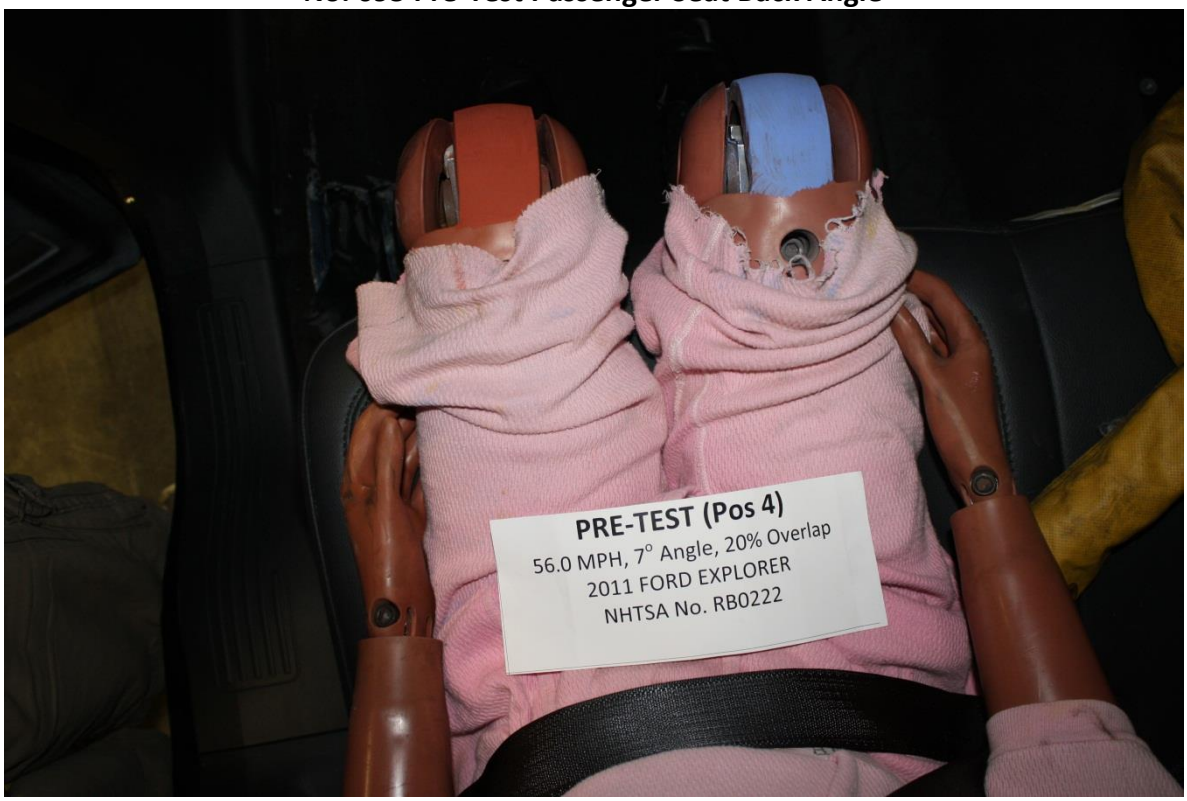
Photo Not Applicable

Passenger seat not adjustable fore/aft

No. 094 Pre-Test Passenger Seat Fore-Aft Markings



No. 095 Pre-Test Passenger Seat Back Angle



No. 096 Pre-Test Overhead View of Passenger Dummy Thighs on seat

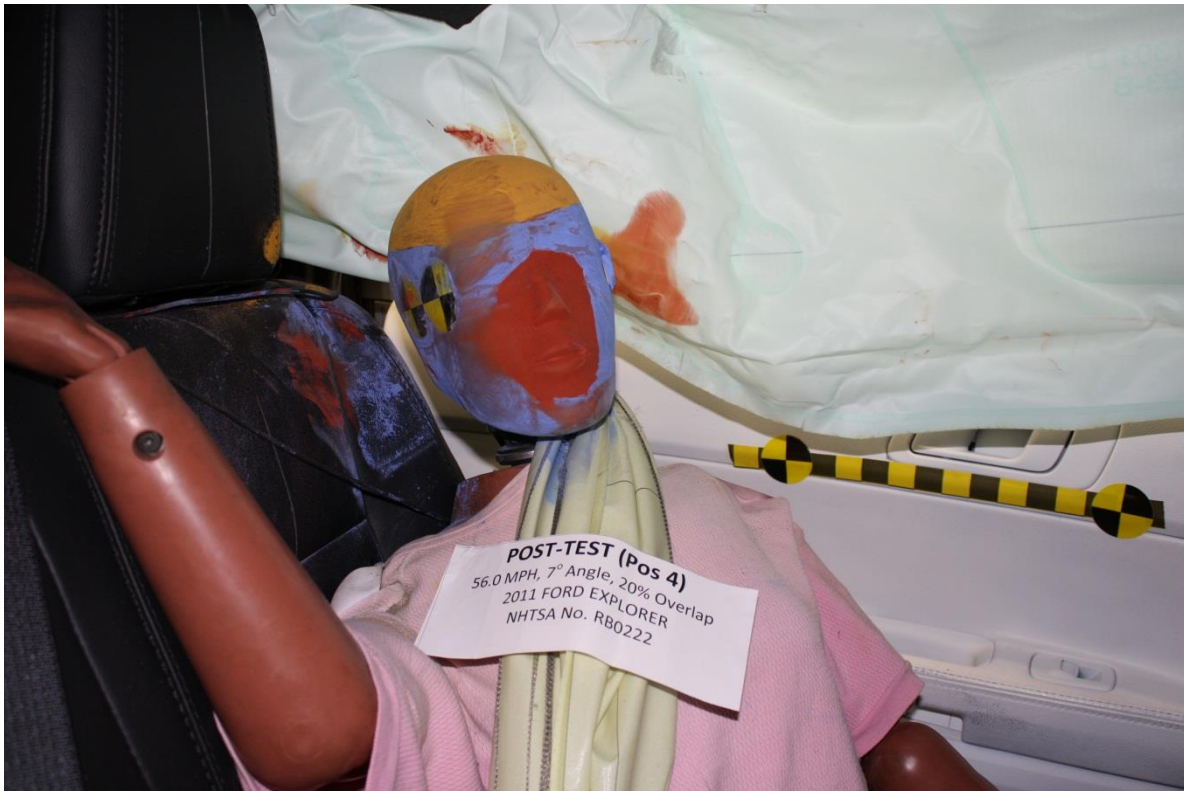
Photo Not Applicable

Passenger D-Ring Not Adjustable

No. 097 Pre-Test Passenger Adjustable D-ring

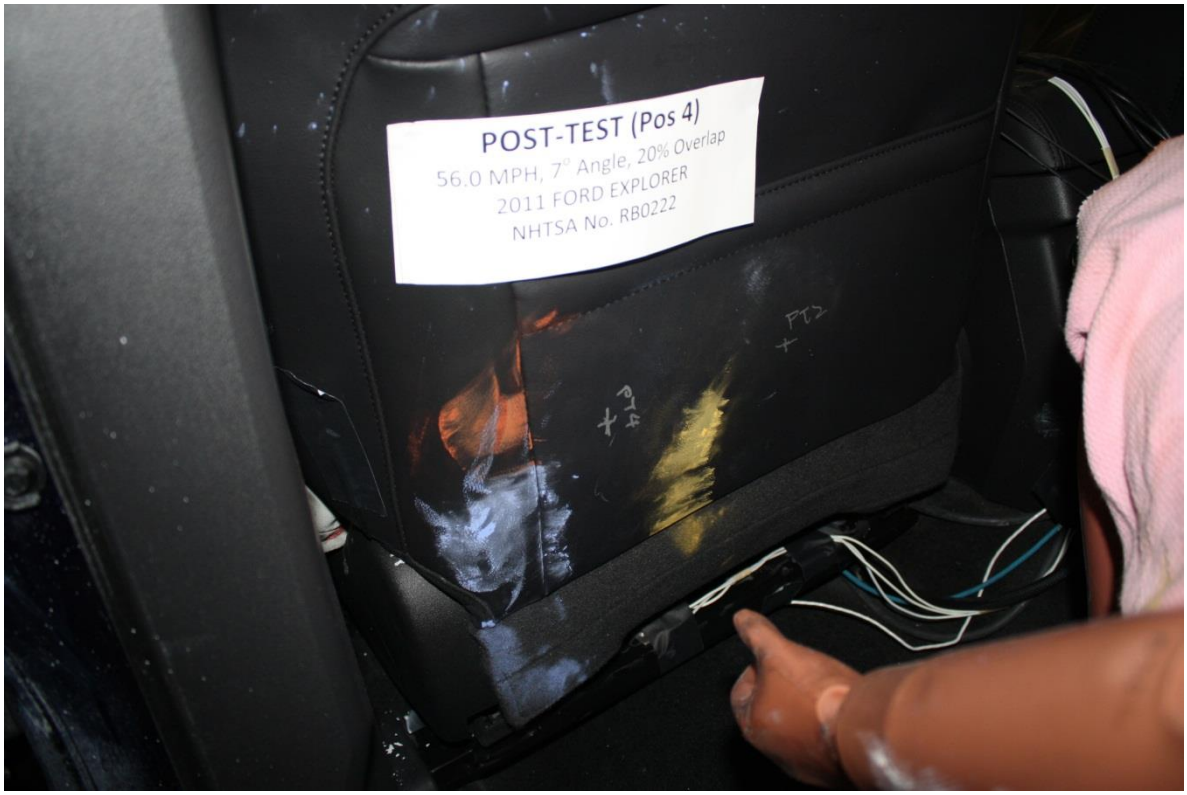
No. 098 Pre-Test View of Passenger Dummy Feet

No. 099 Post-Test View of Passenger Dummy Feet

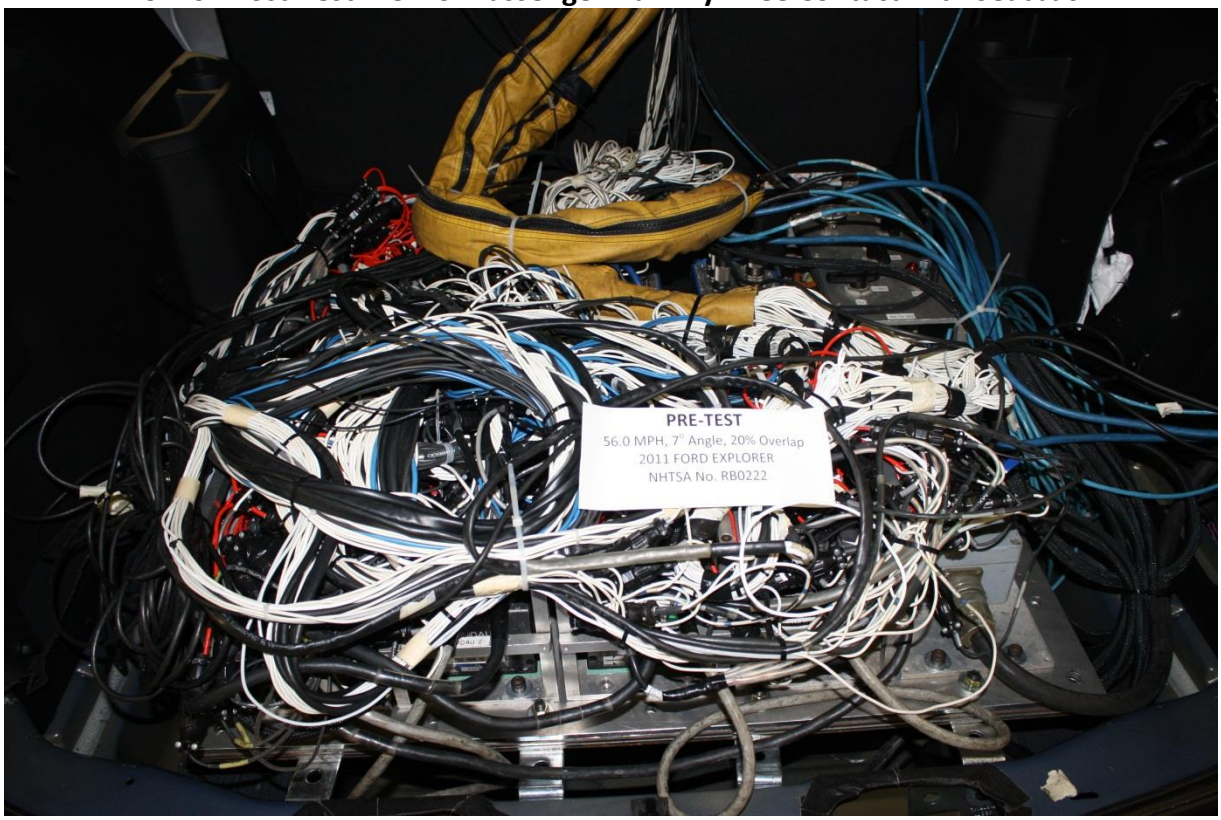


No. 100 Post-Test View of Passenger Dummy Head contact with Airbag

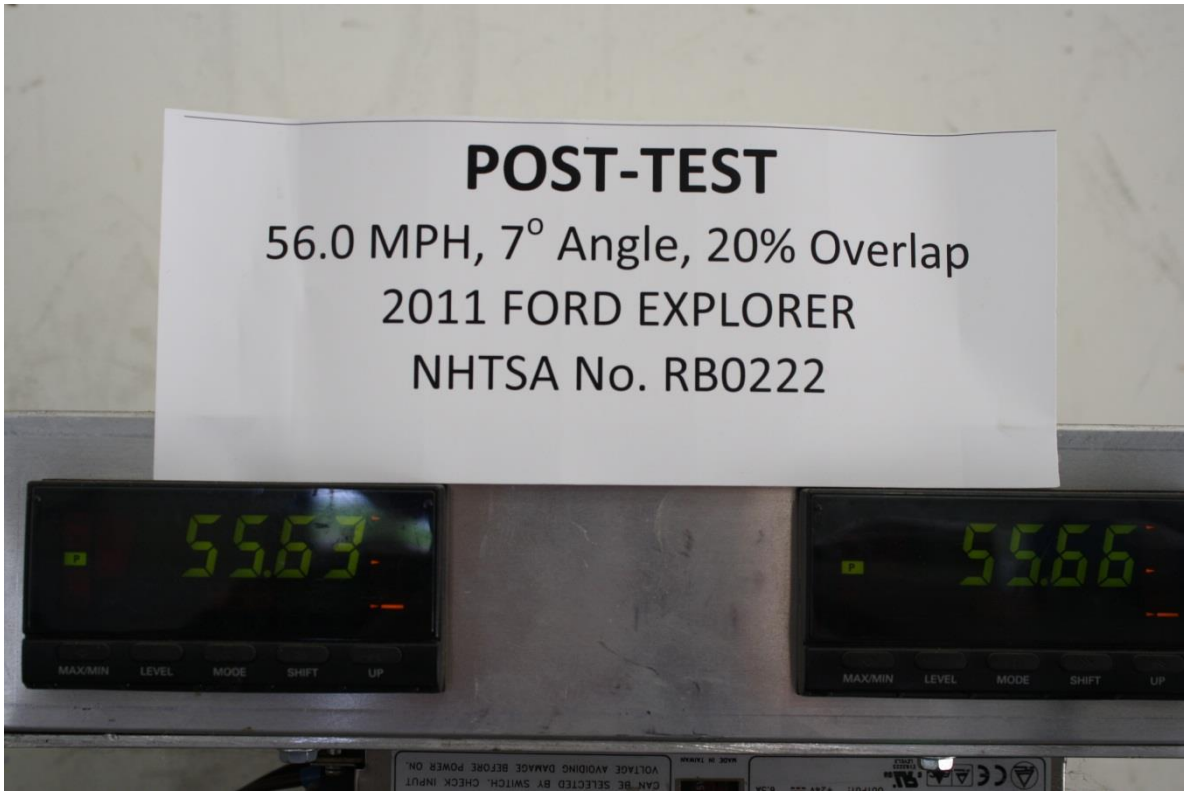
No. 101 Post-Test View of Passenger Dummy Head contact with Interior (a,b,c)



No. 102 Post-Test View of Passenger Dummy Knee Contact with Seatback



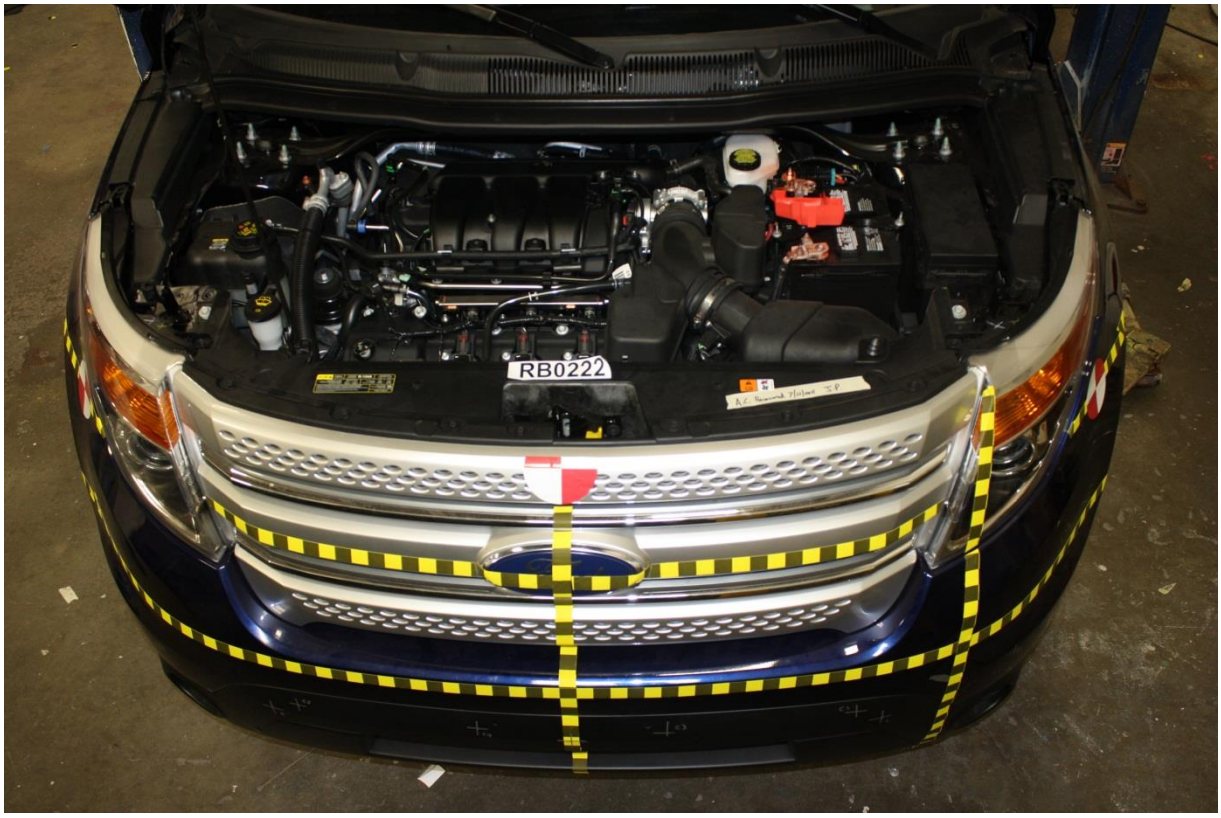
No. 103 Pre-Test Ballast Locations



No. 104 Post-Test Speed Trap Readout

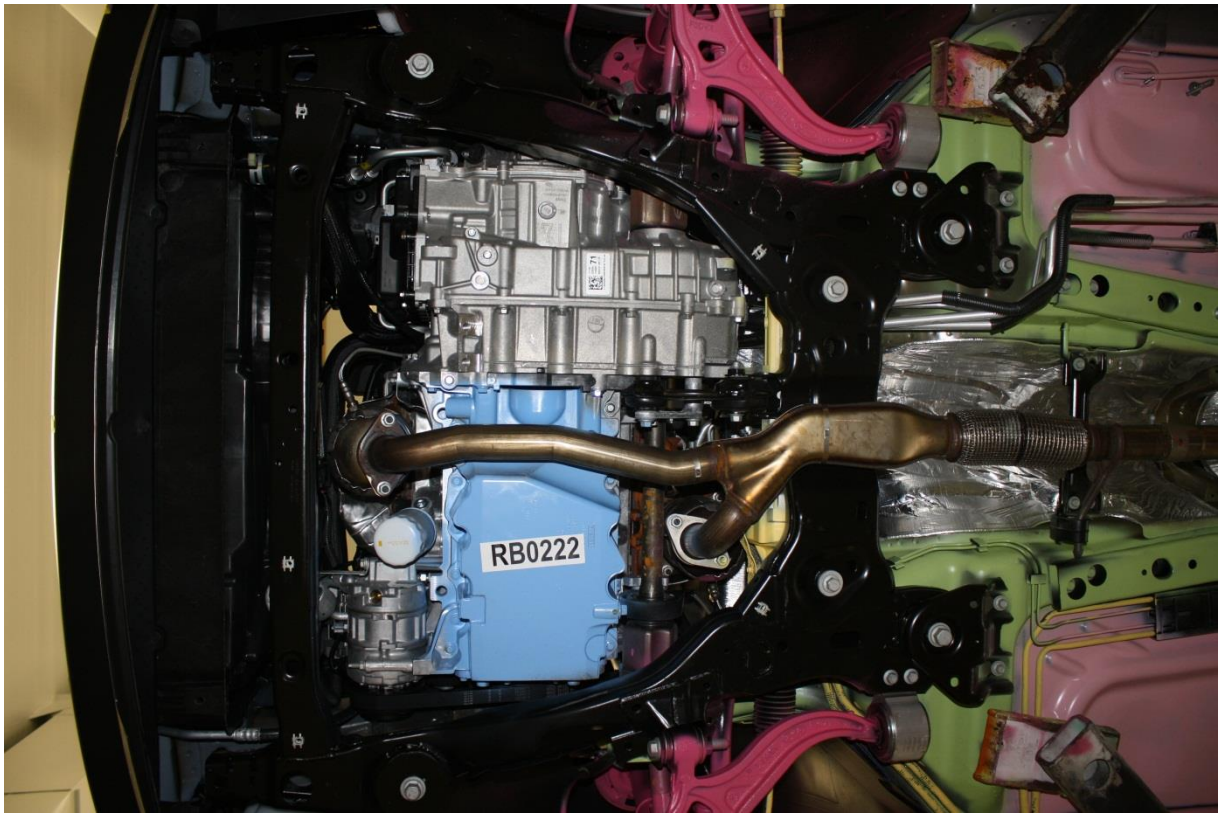
No. 105 Pre-Test View of Fuel Filler Cap

No. 106 Post-Test View of Fuel Filler Cap

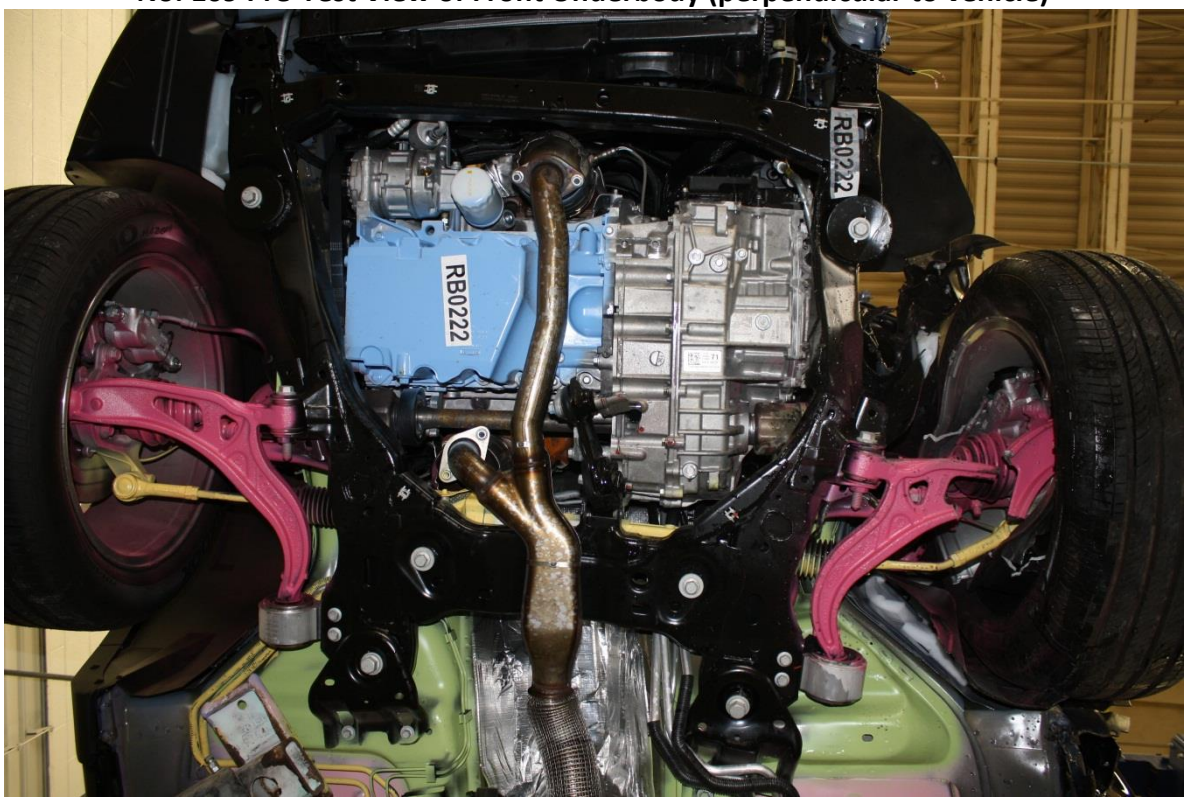


No. 107 Pre-Test Engine Compartment View

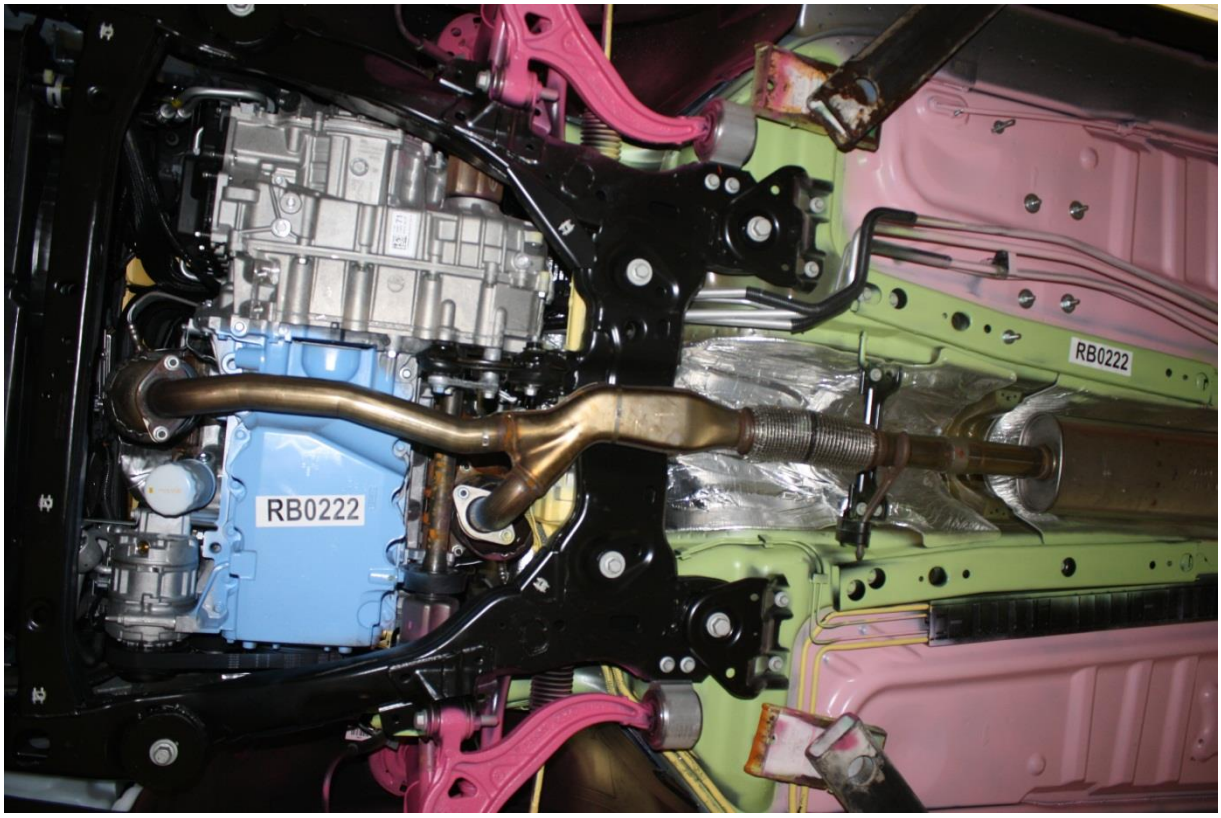
No. 108 Post-Test Engine Compartment View



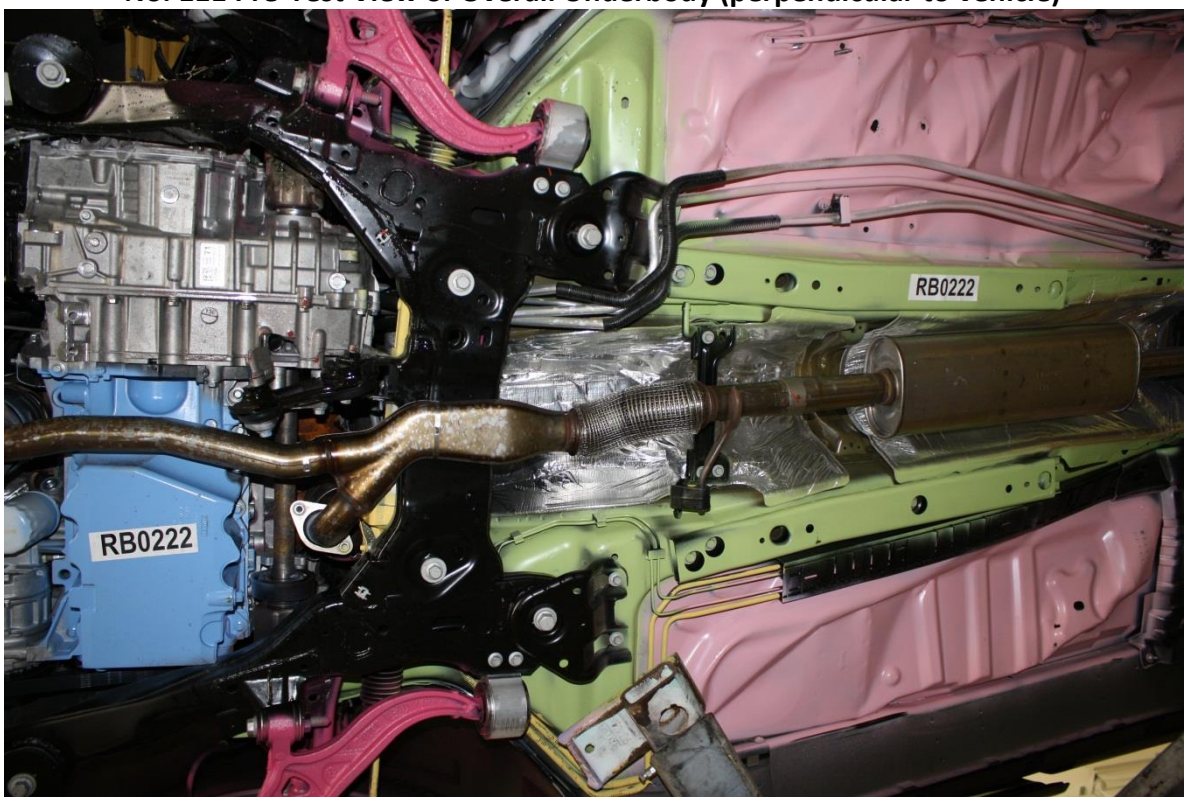
No. 109 Pre-Test View of Front Underbody (perpendicular to vehicle)



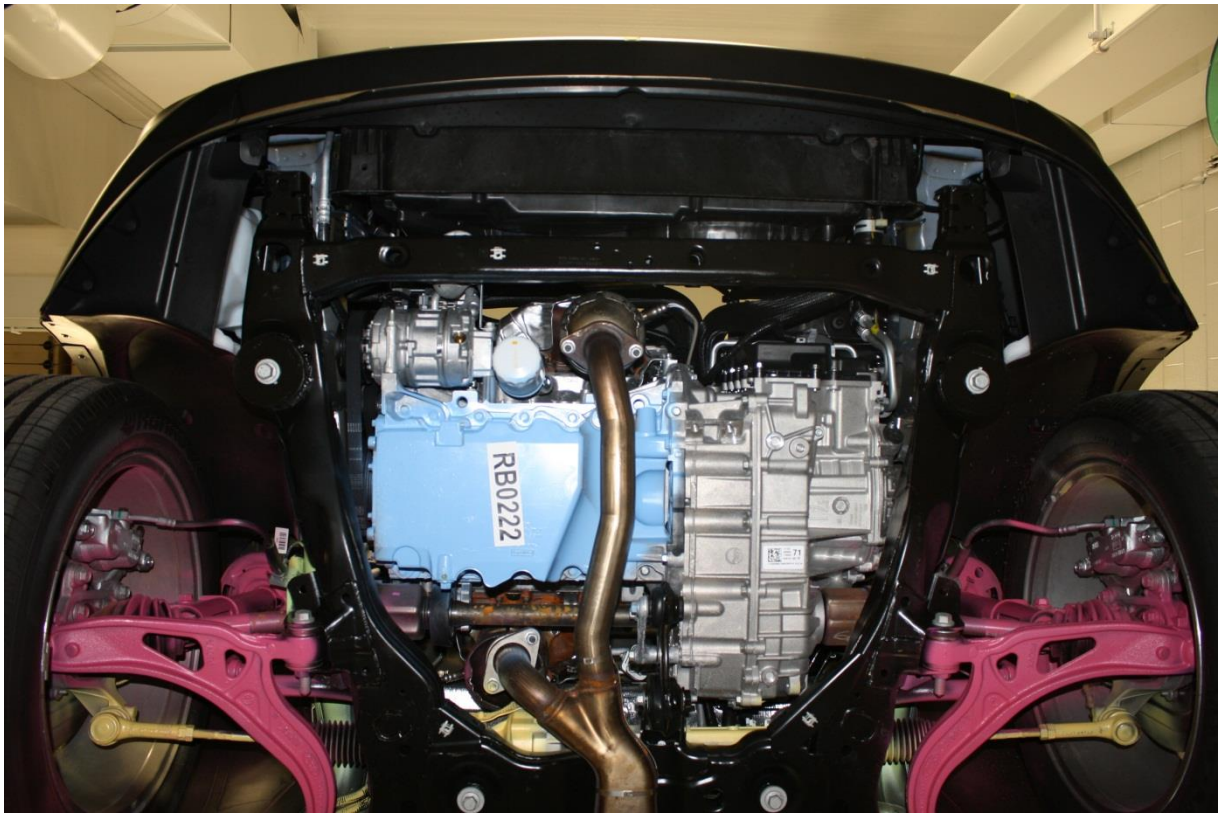
No. 110 Post-Test View of Front Underbody (perpendicular to vehicle)



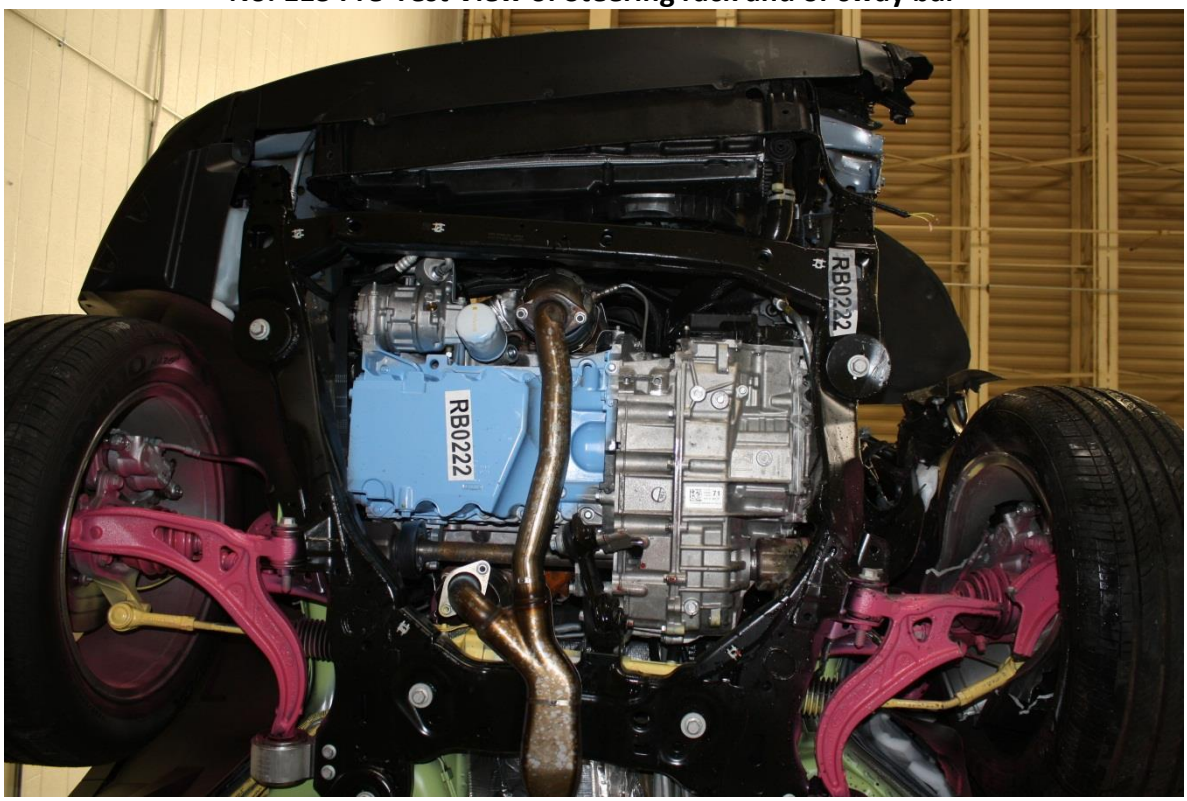
No. 111 Pre-Test View of Overall Underbody (perpendicular to vehicle)



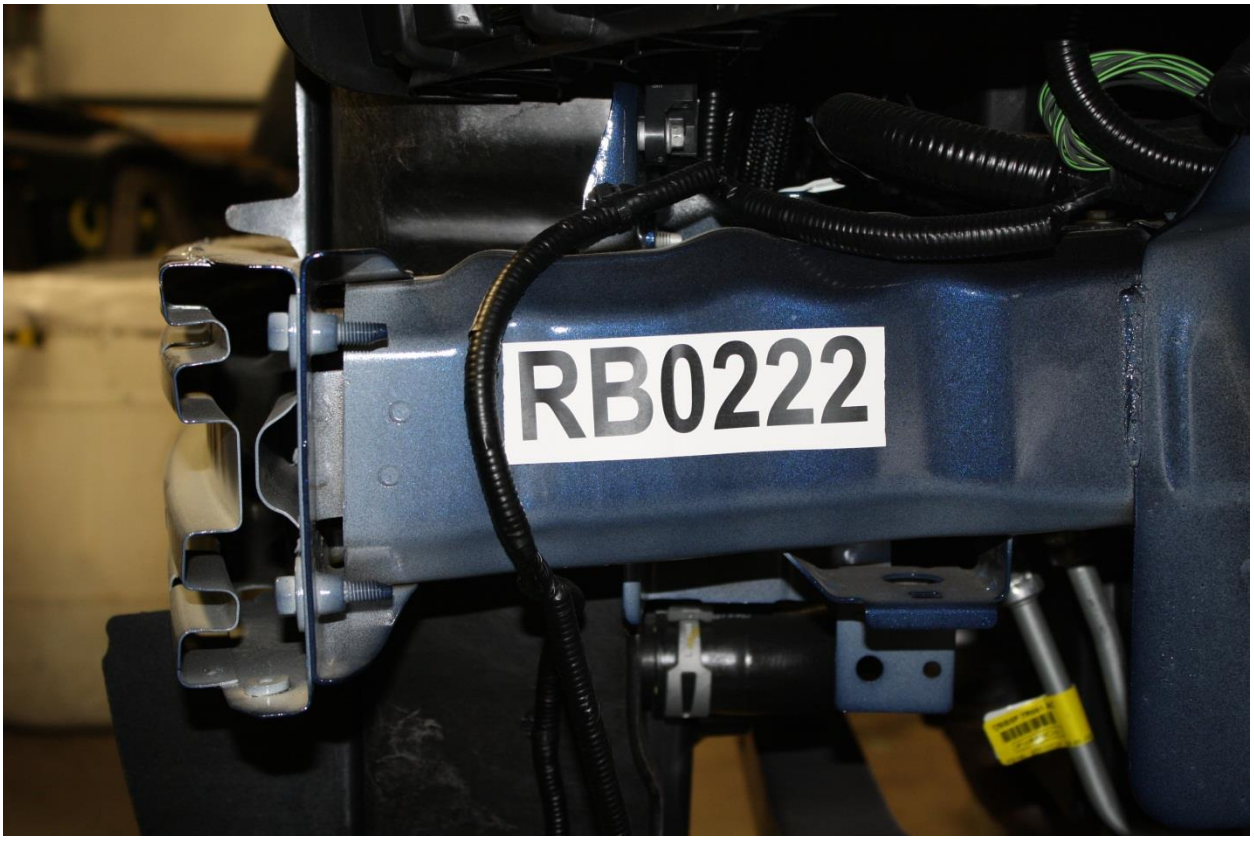
No. 112 Post-Test View of Overall Underbody (perpendicular to vehicle)



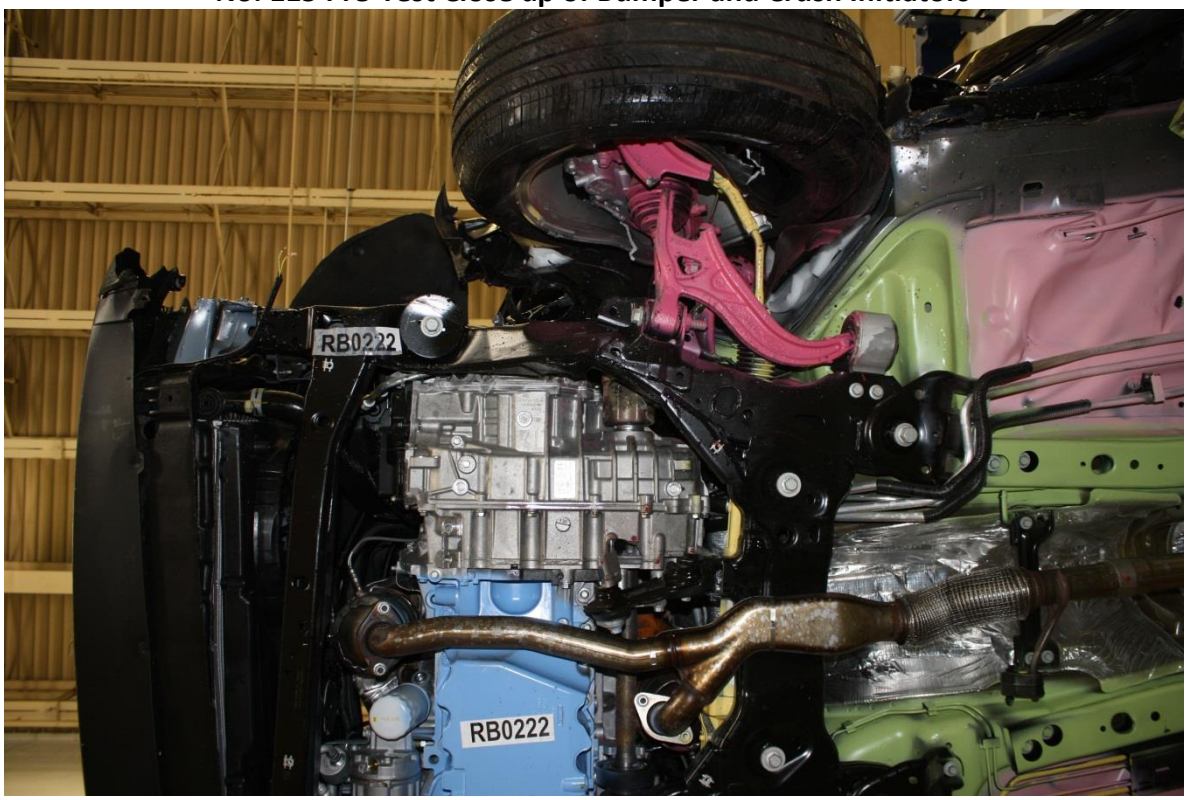
No. 113 Pre-Test View of Steering rack and or sway bar



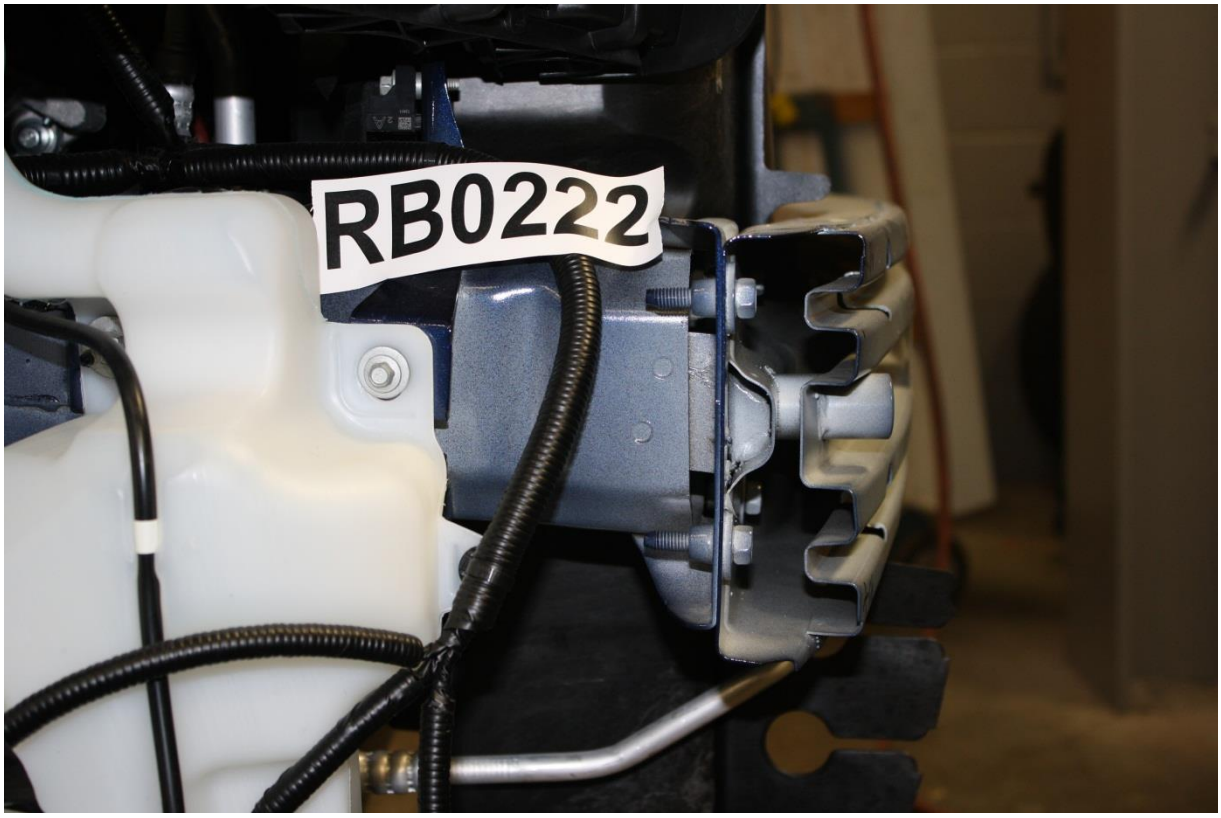
No. 114 Post-Test View of Steering rack and or sway bar



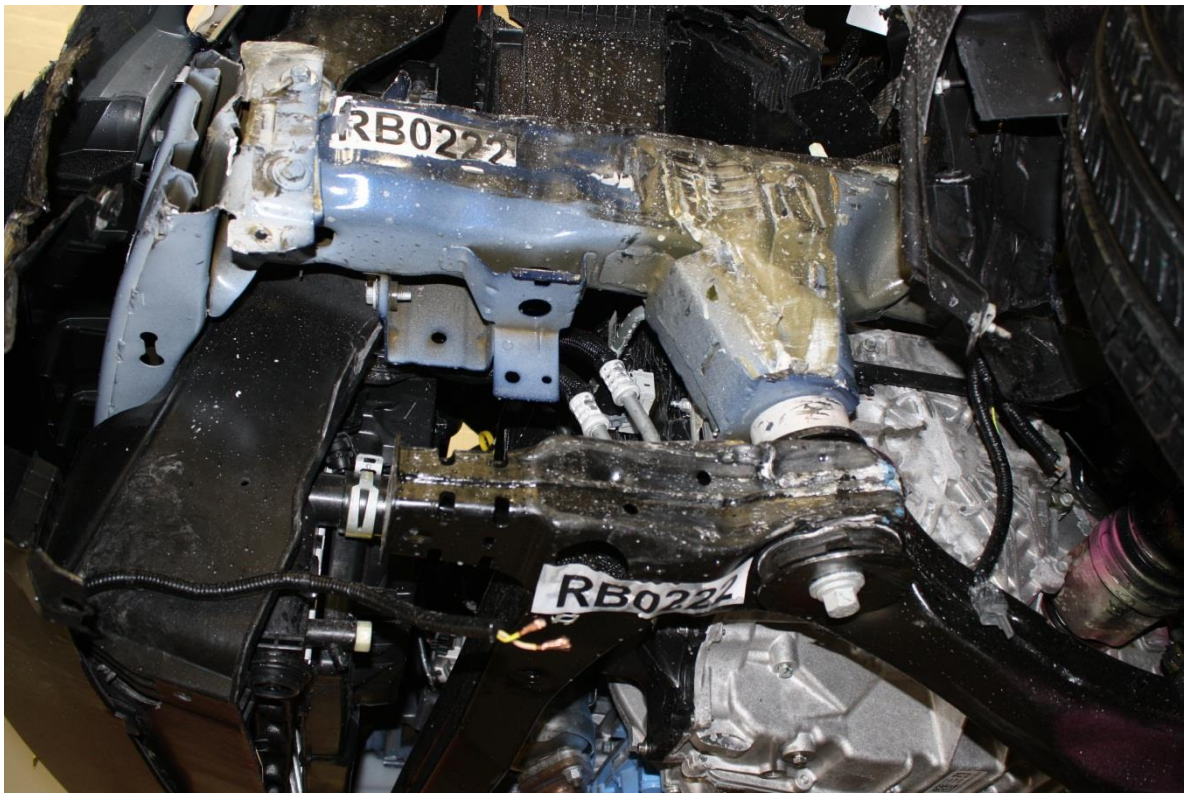
No. 115 Pre-Test Close up of Bumper and Crush Initiators



No. 116 Post-Test View of Front Sub-Frame Deformation



No. 117 Pre-Test Frame Rail with tire removed

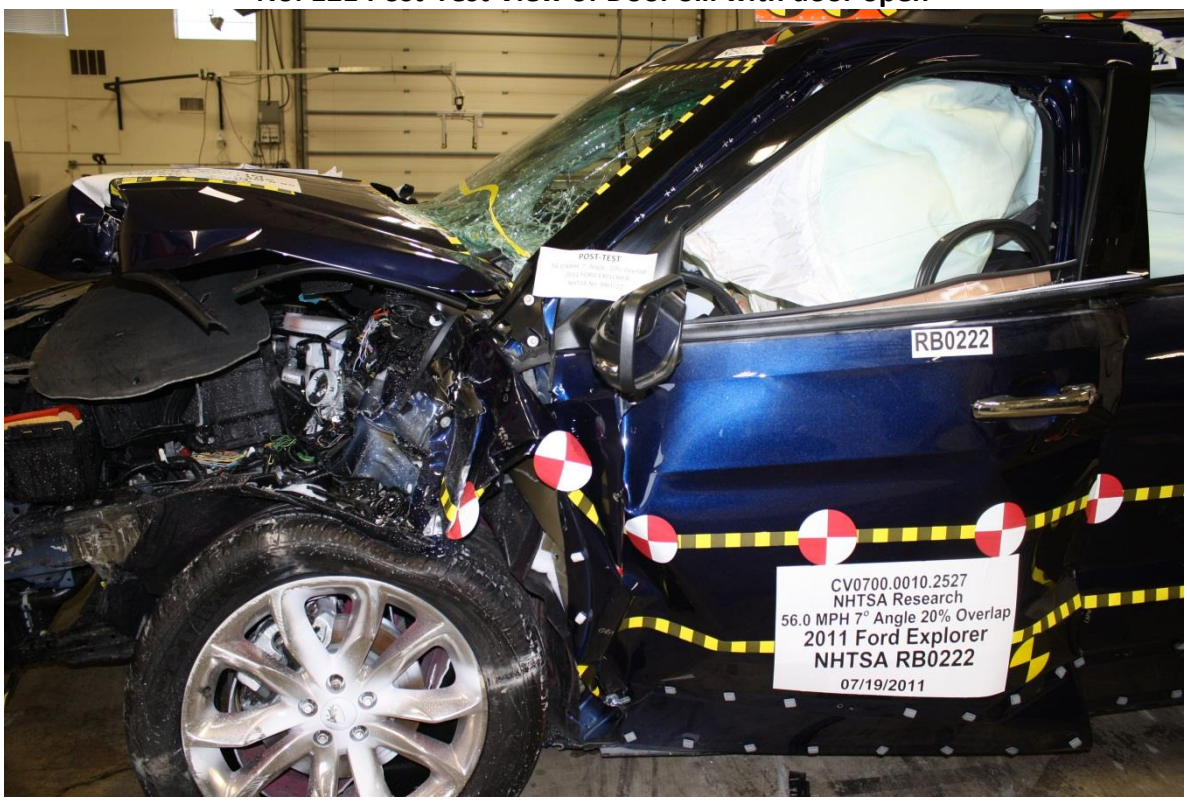


No. 118 Post-Test Frame Rail with tire removed

No. 119 Pre-Test View of Wheel Well with tire removed

No. 120 Post-Test View of Wheel Well with tire removed

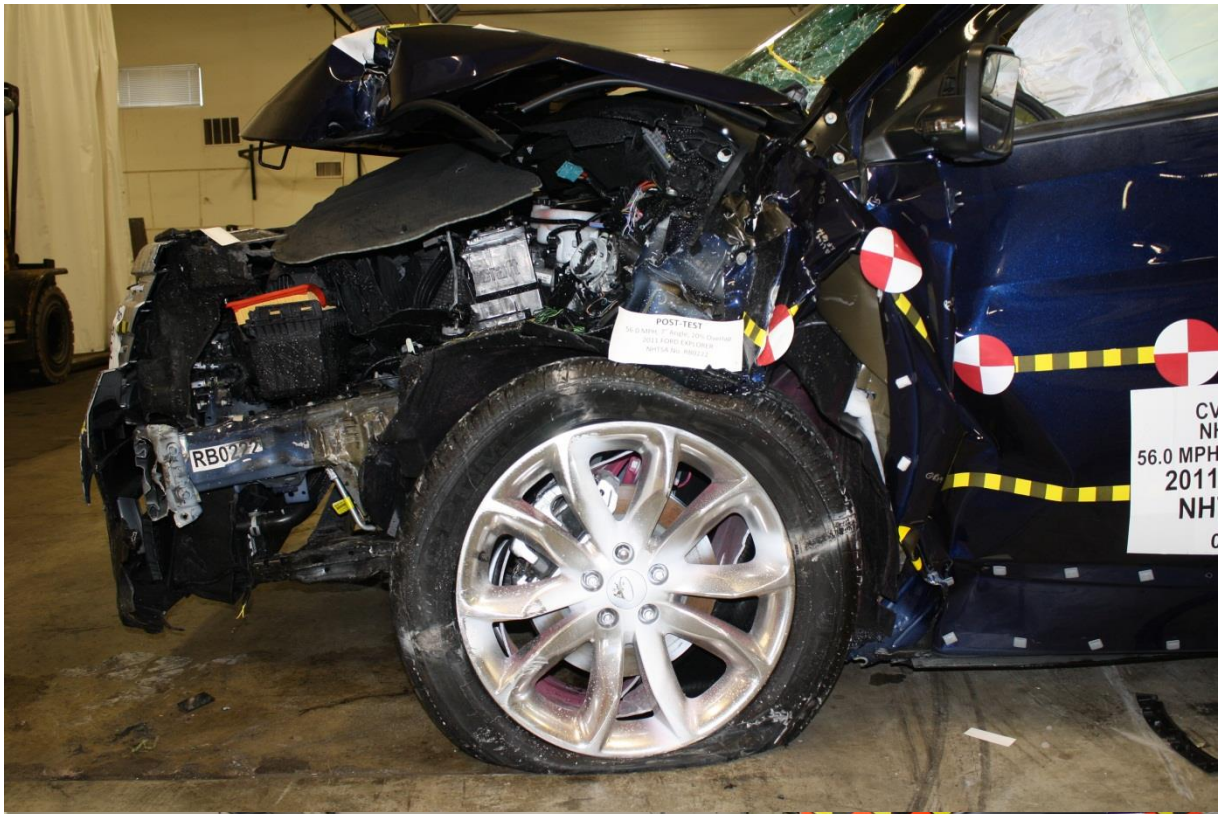
No. 121 Post-Test View of Door Sill with door open



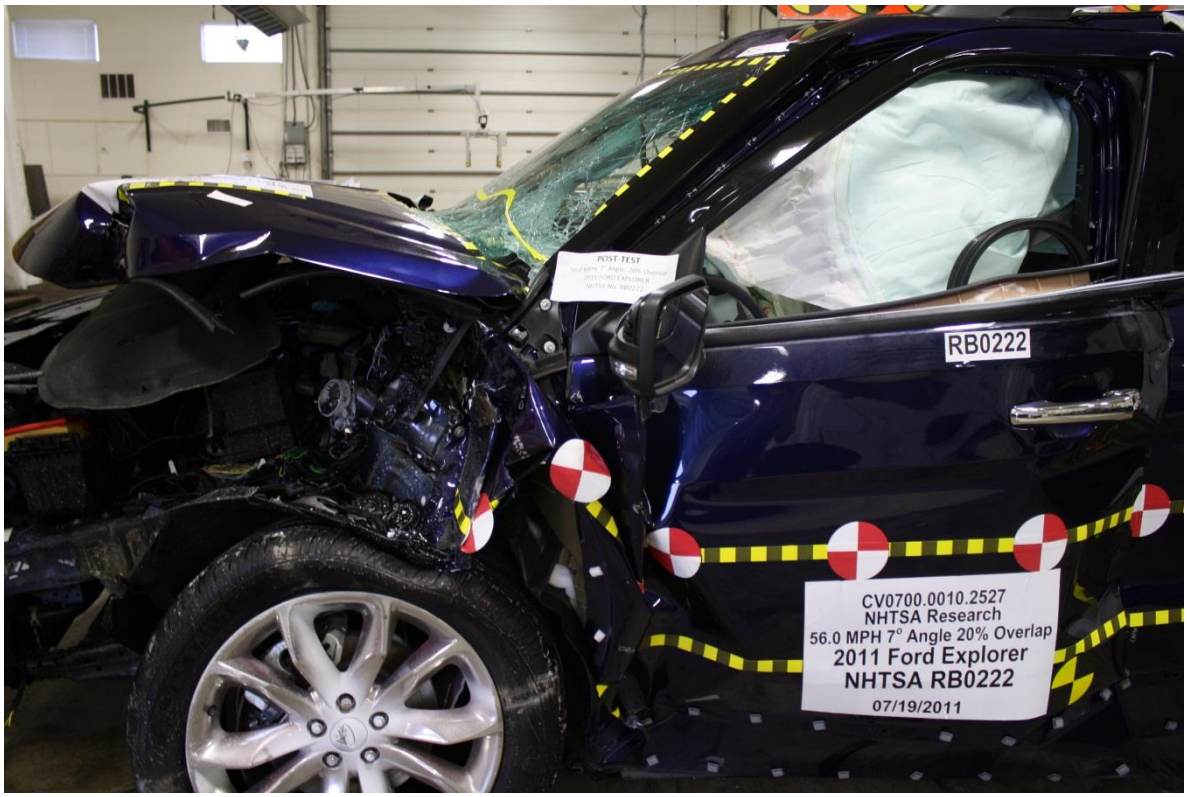
No. 122 Post-Test View of Deformation of A pillar

No. 123 Post-Test View of Deformation of B pillar

No. 124 Post-Test View of Deformation of C pillar



No. 125 Post-Test View of Wheel and or Tire Deformation



No. 126 Post-Test View of Deformation of Rocker or Post

No. 127 Post-Test View of Windshield Separation

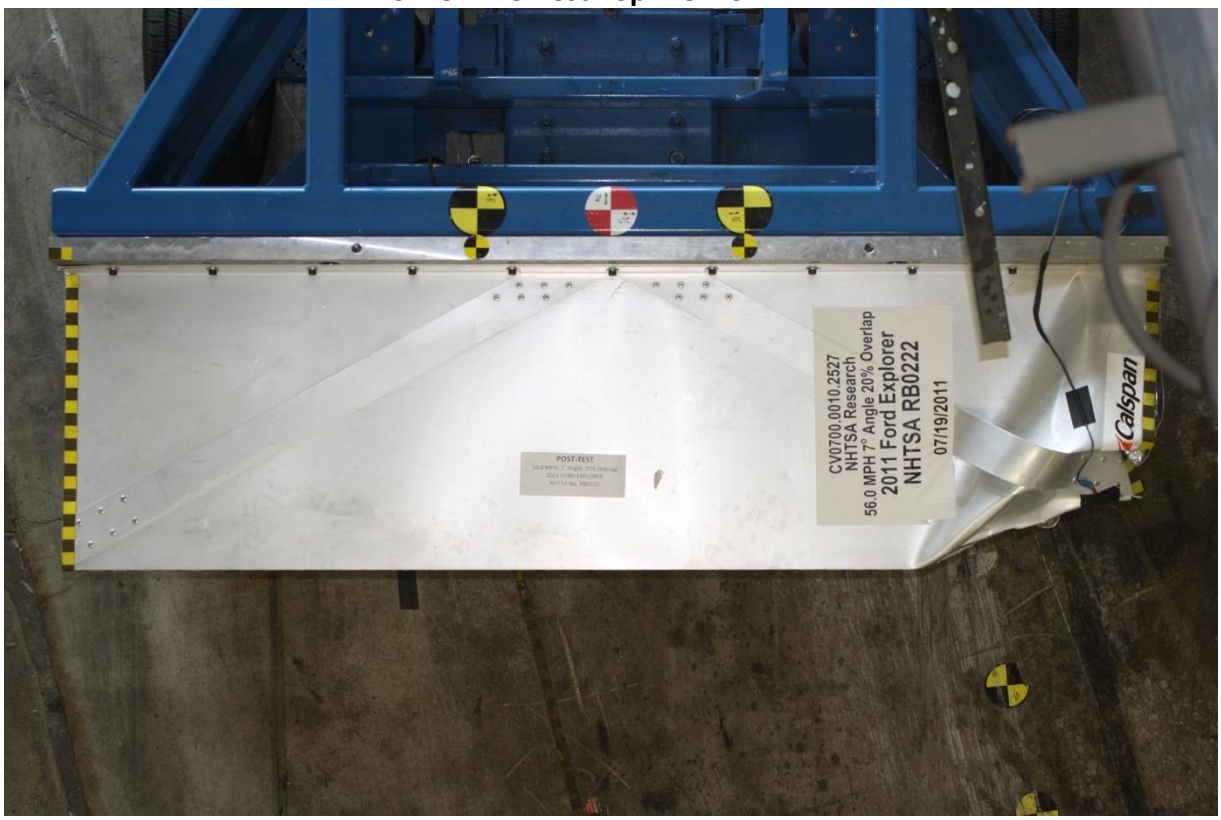
No. 128 Pre-Test Left Side View of RMDB

No. 129 Post-Test Left Side View of RMDB

No. 130 Pre-Test Right Side View of RMDB

No. 131 Post-Test Right Side View of RMDB

No. 132 Pre-Test Top View of RMDB



No. 133 Post-Test Top View of RMDB

No. 134 Pre-Test Front View of RMDB

No. 135 Post-Test Front View of RMDB

No. 136 Vehicle at 0 Degrees on Static Rollover Device

No. 137 Vehicle at 90 Degrees on Static Rollover Device

No. 138 Vehicle at 180 Degrees on Static Rollover Device

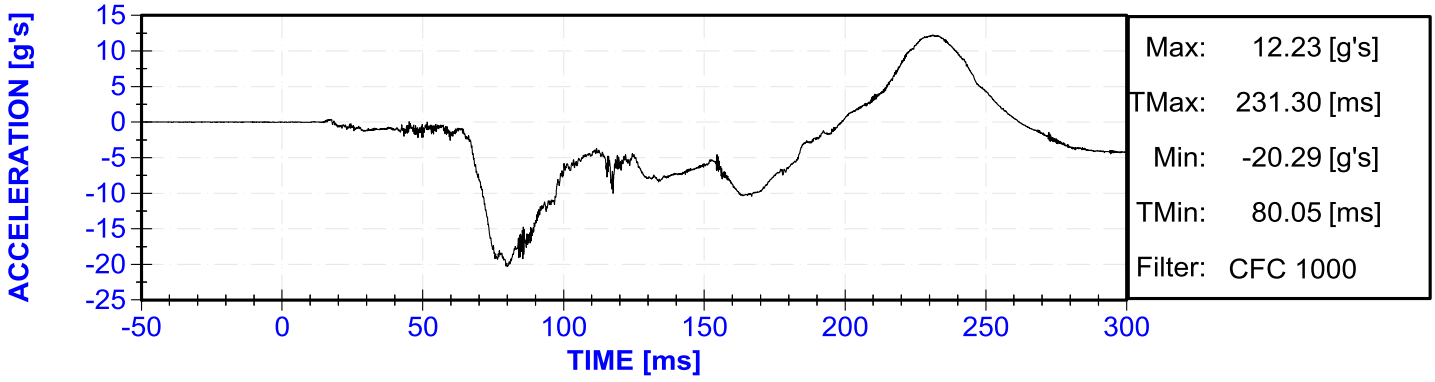
No. 139 Vehicle at 270 Degrees on Static Rollover Device

No. 140 Vehicle at 360 Degrees on Static Rollover Device

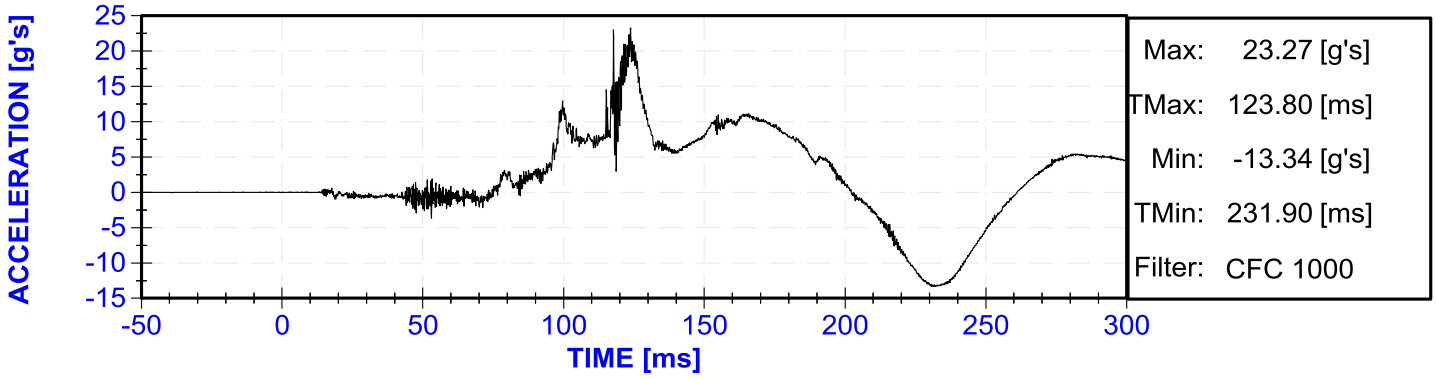
APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

Table of Data Plots

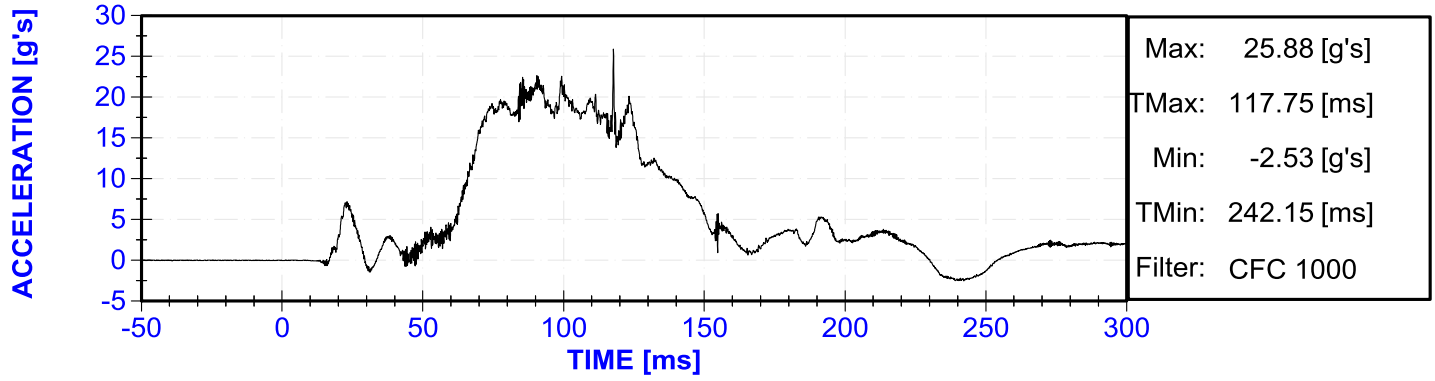
V2P1 Head CG X Acceleration



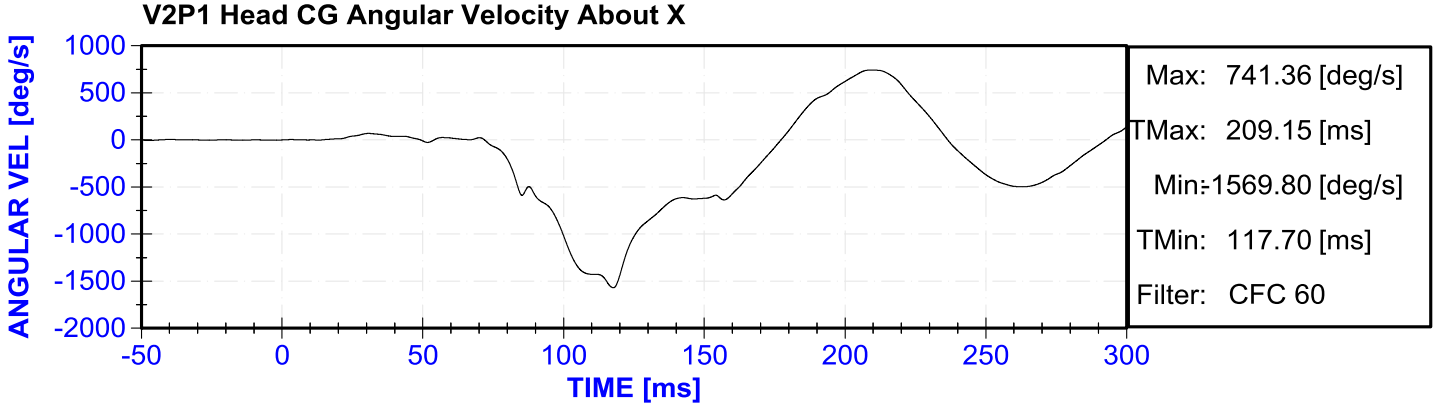
V2P1 Head CG Y Acceleration



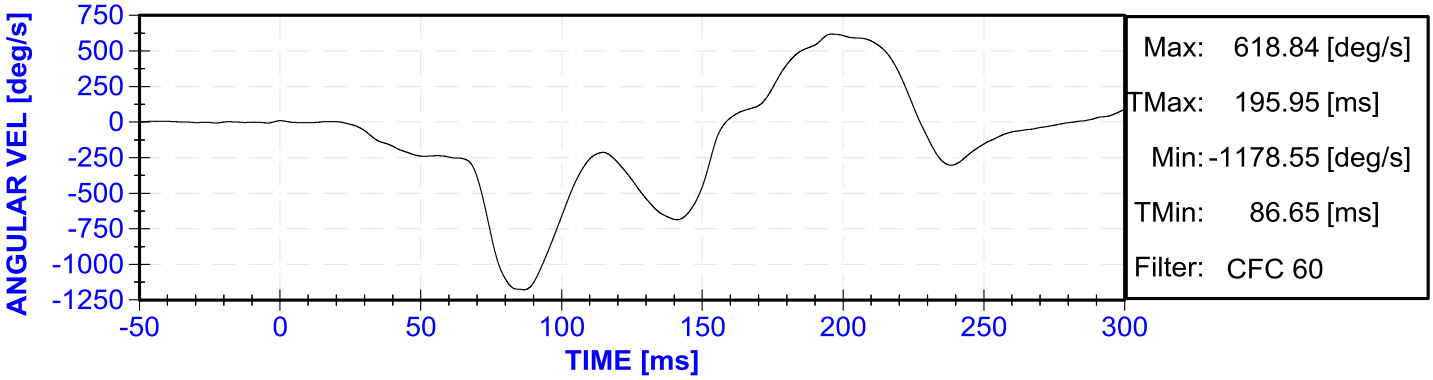
V2P1 Head CG Z Acceleration



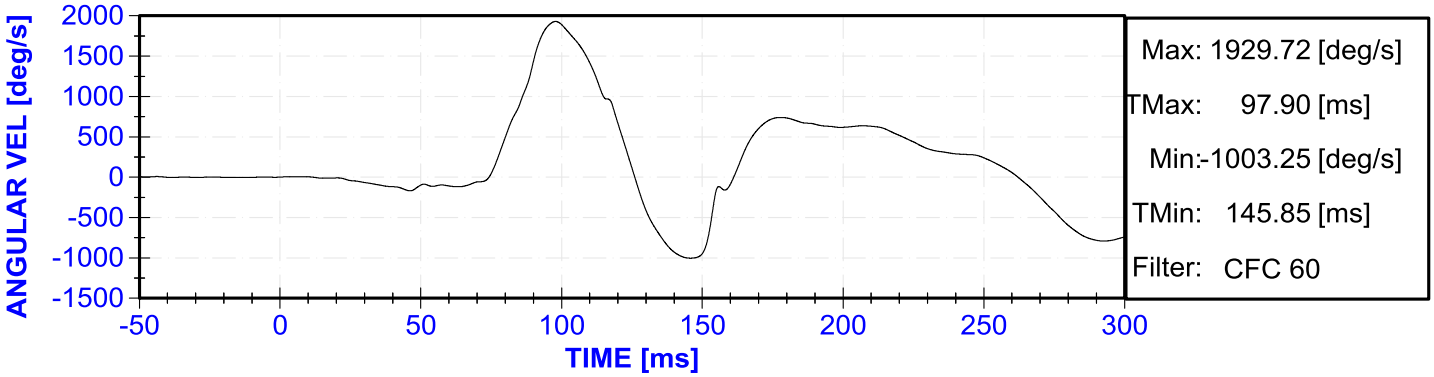
V2P1 Head CG Angular Velocity About X



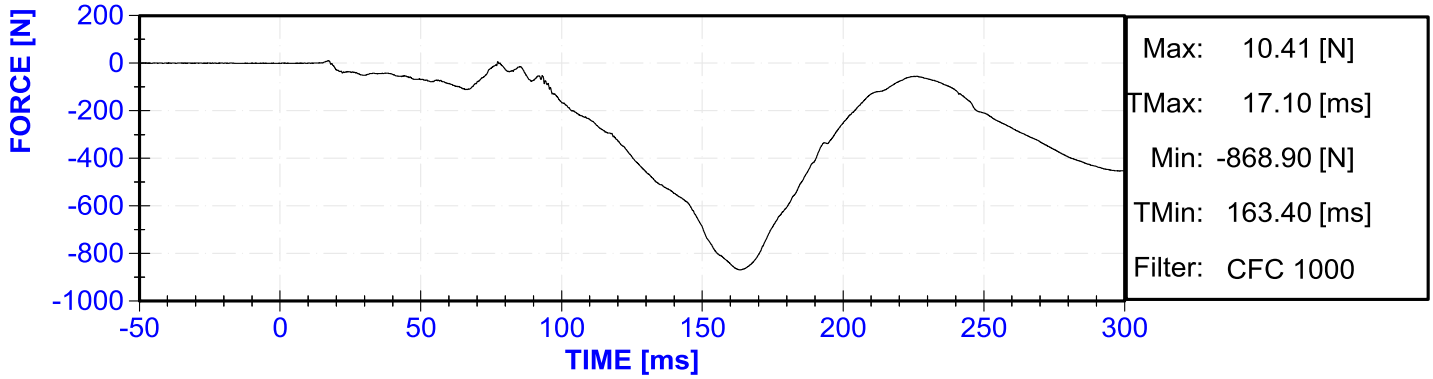
V2P1 Head CG Angular Velocity About Y



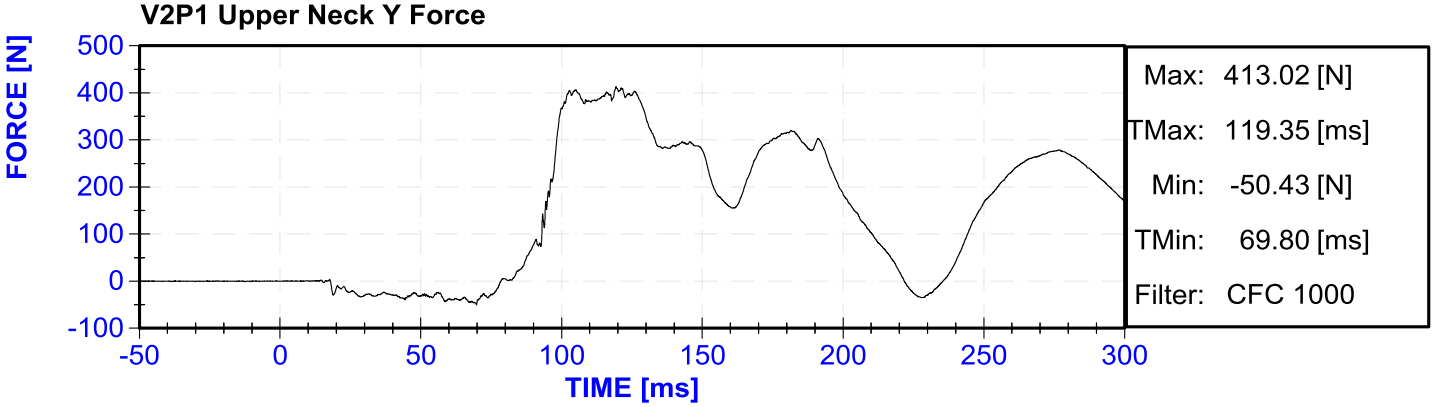
V2P1 Head CG Angular Velocity About Z



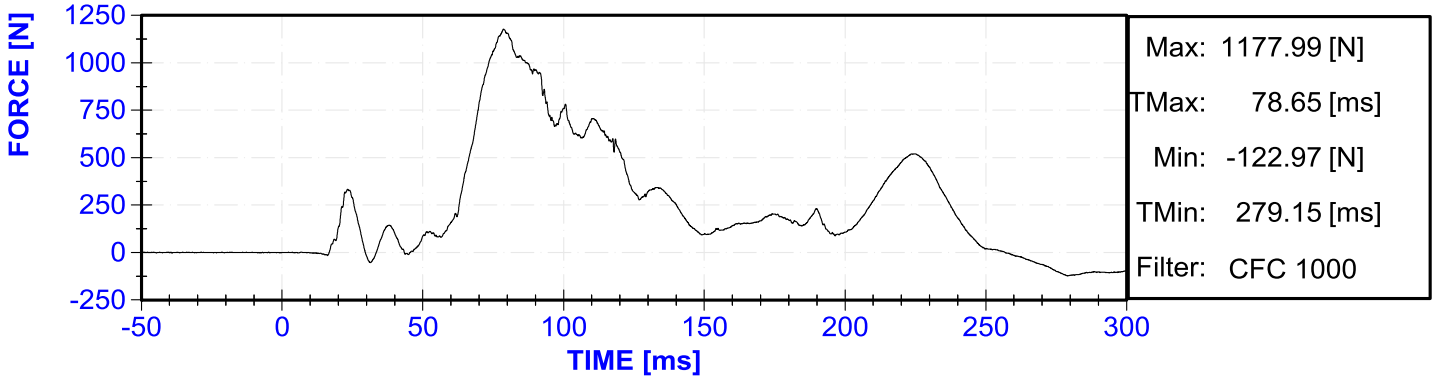
V2P1 Upper Neck X Force



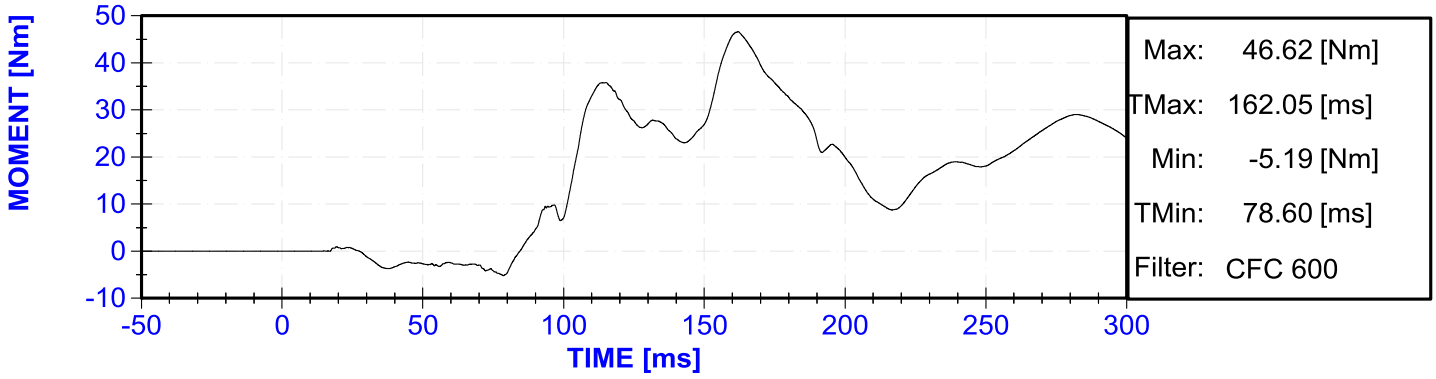
V2P1 Upper Neck Y Force



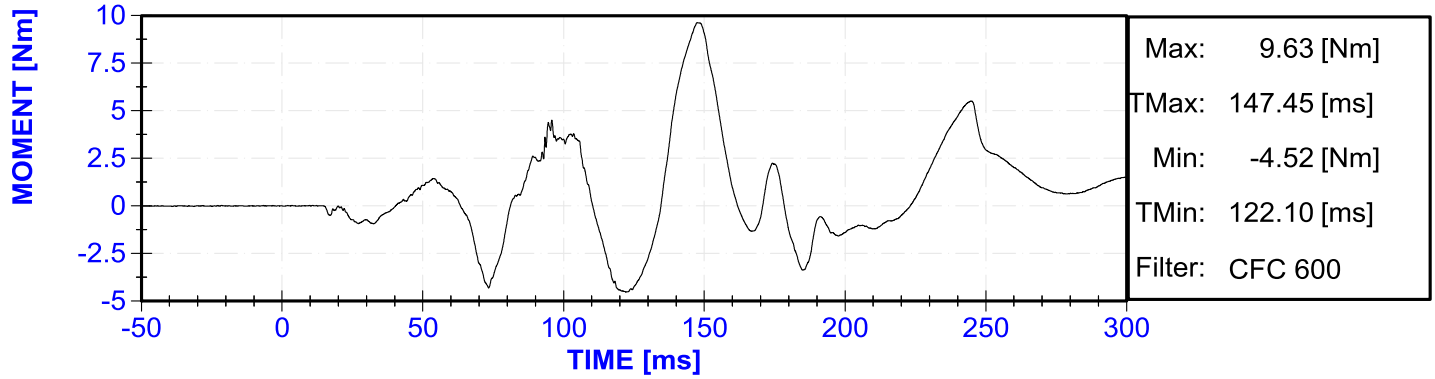
V2P1 Upper Neck Z Force



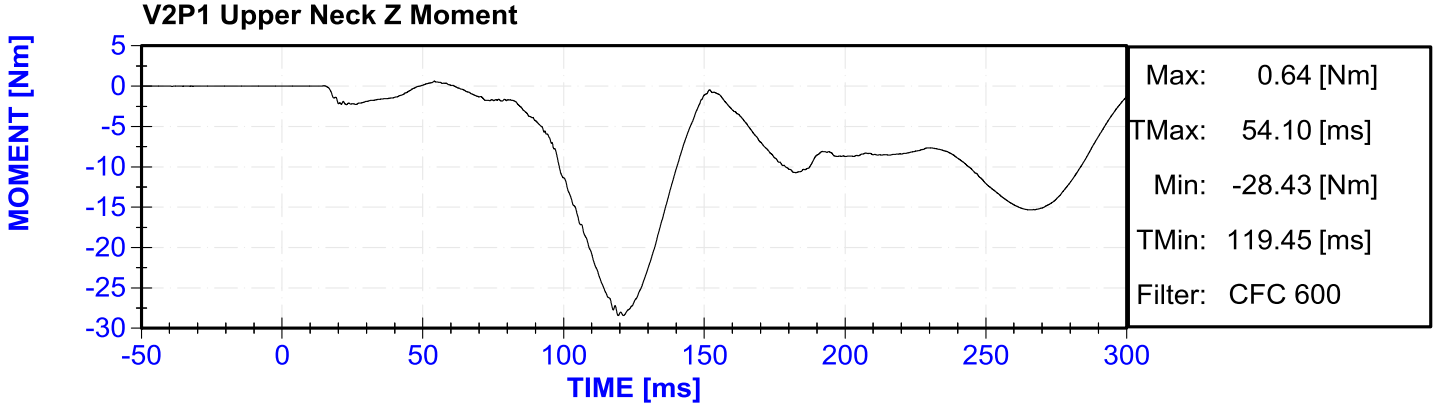
V2P1 Upper Neck X Moment



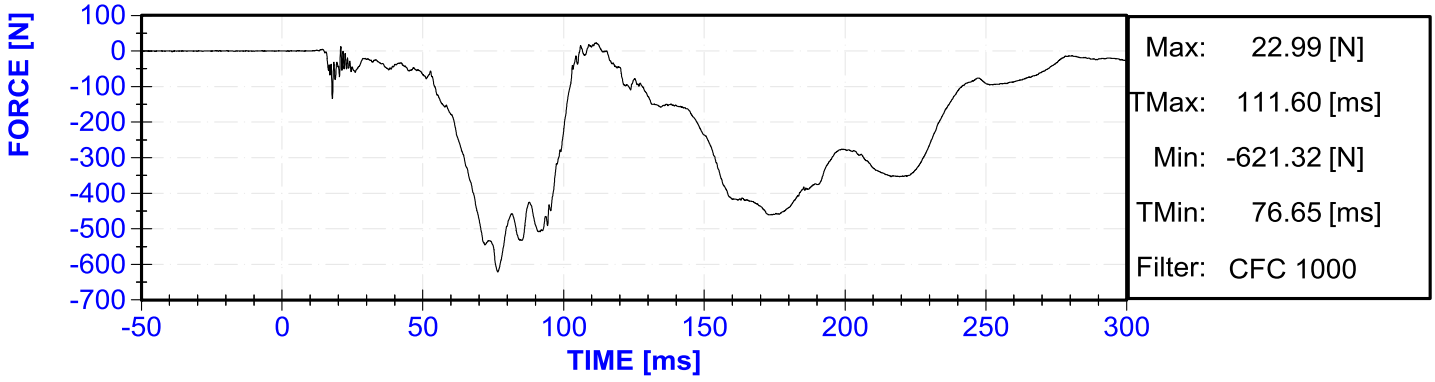
V2P1 Upper Neck Y Moment



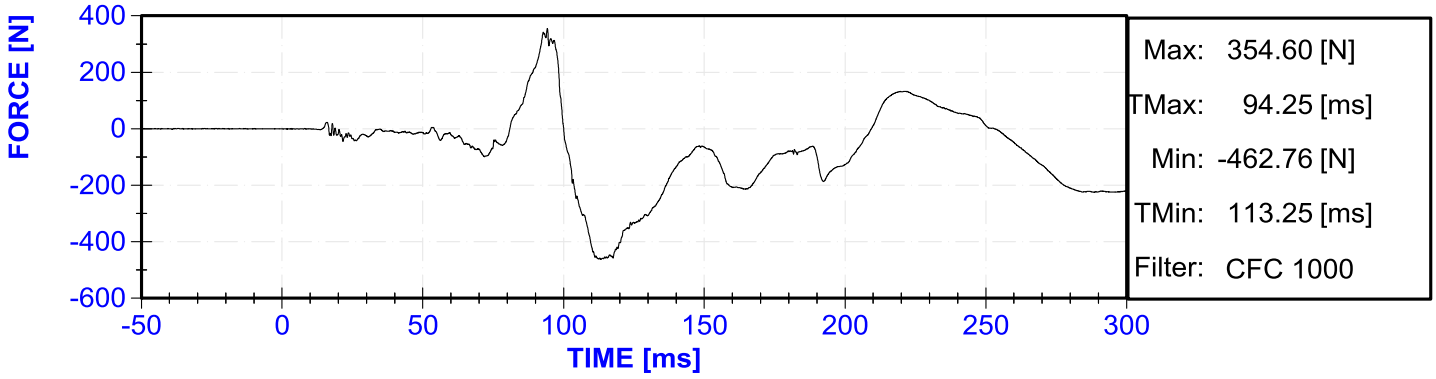
V2P1 Upper Neck Z Moment



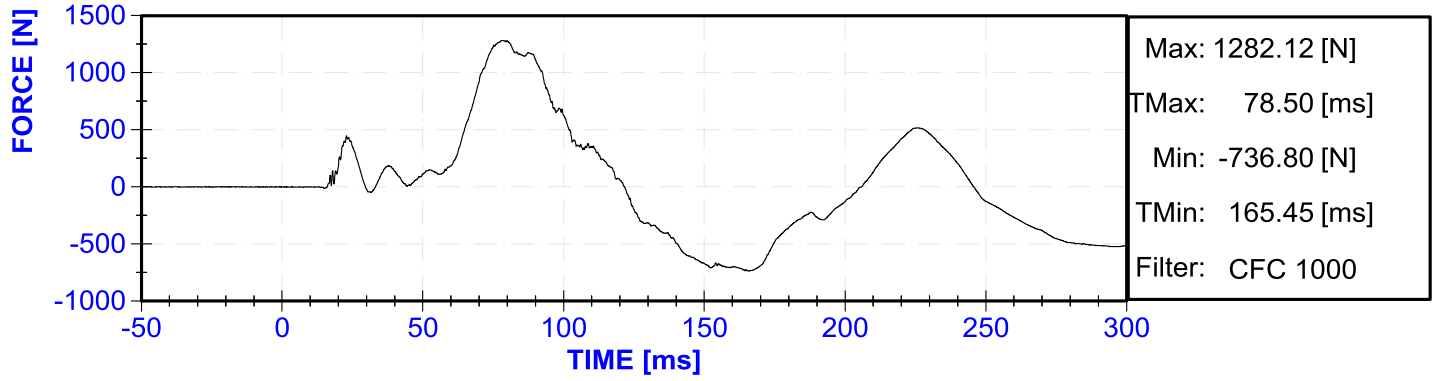
V2P1 Lower Neck X Force



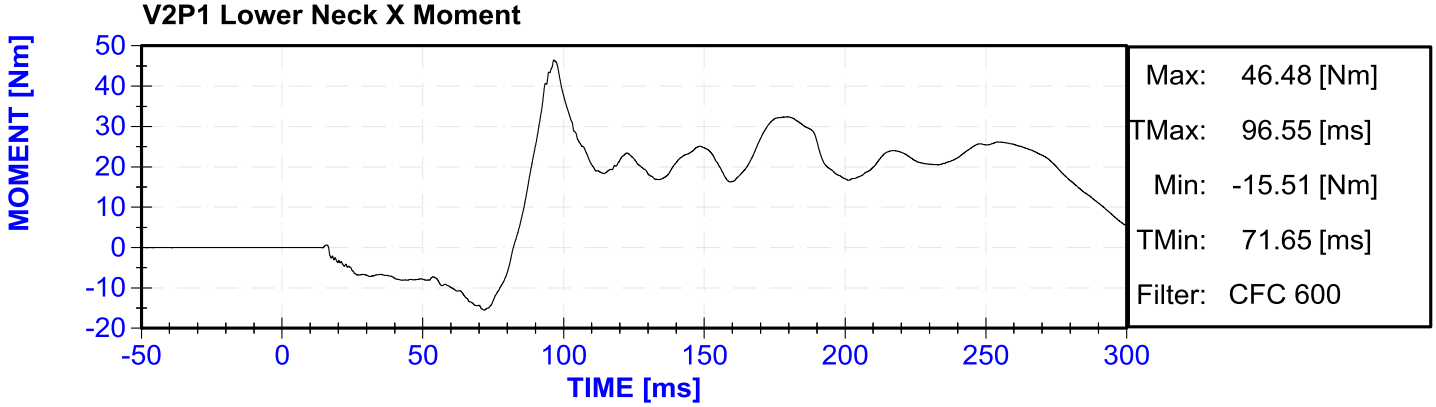
V2P1 Lower Neck Y Force



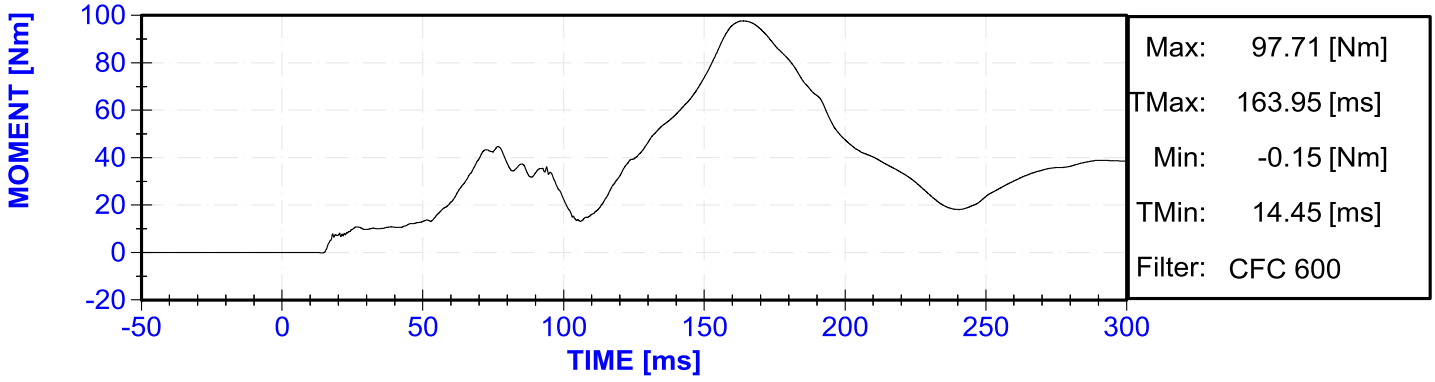
V2P1 Lower Neck Z Force



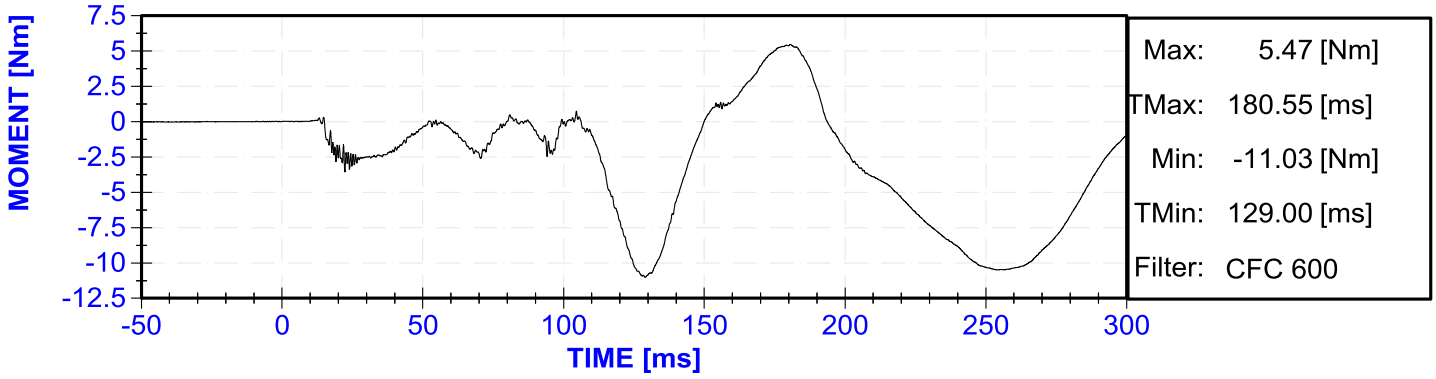
V2P1 Lower Neck X Moment



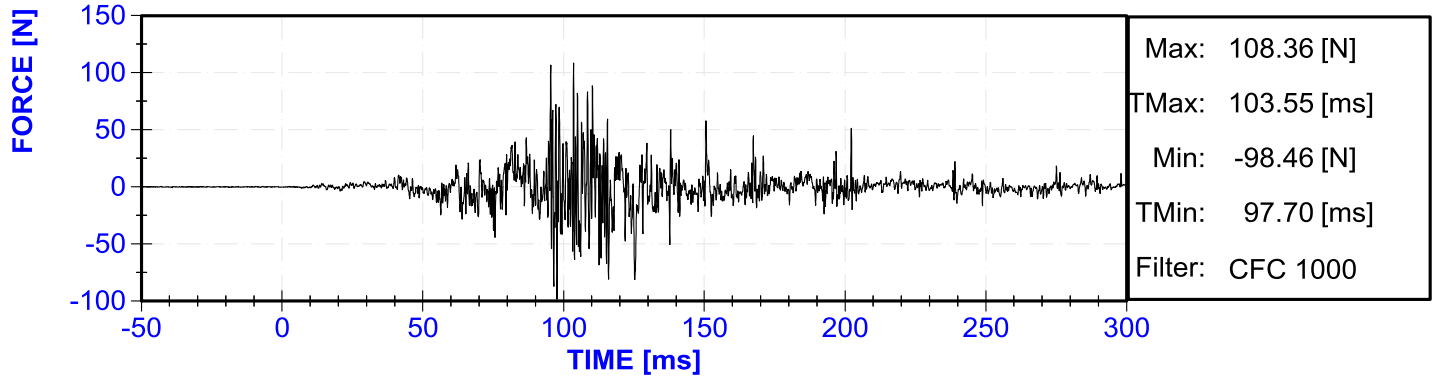
V2P1 Lower Neck Y Moment



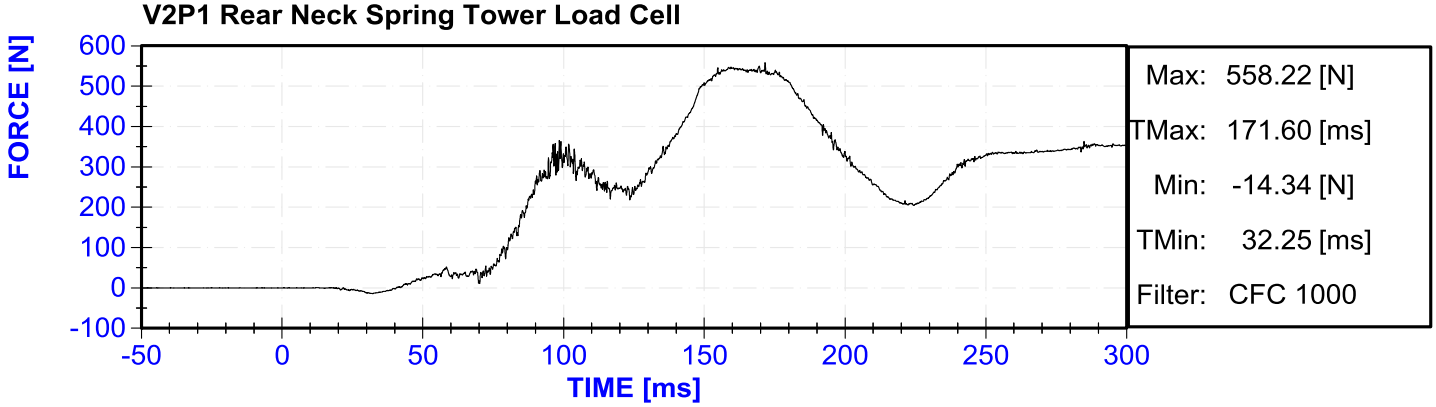
V2P1 Lower Neck Z Moment



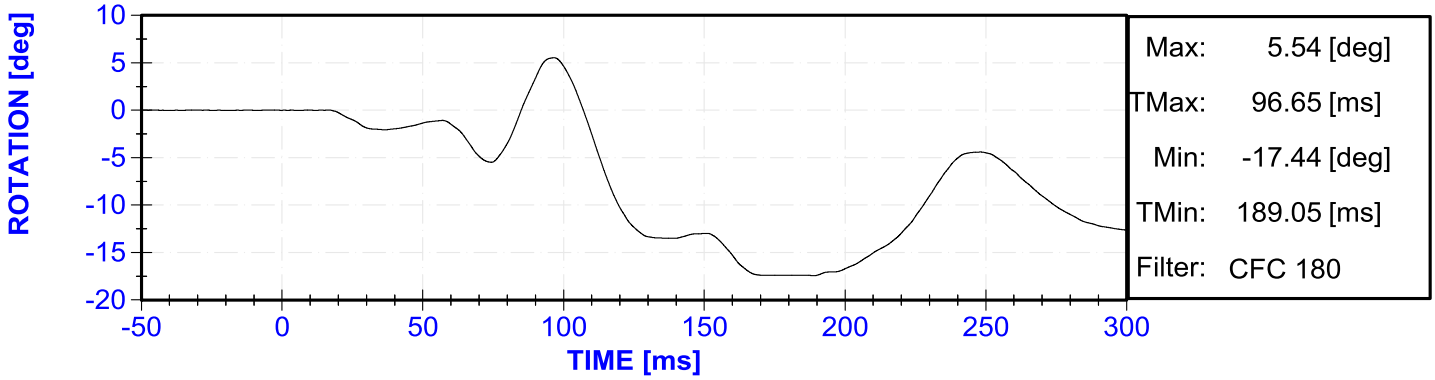
V2P1 Front Neck Spring Tower Load Cell



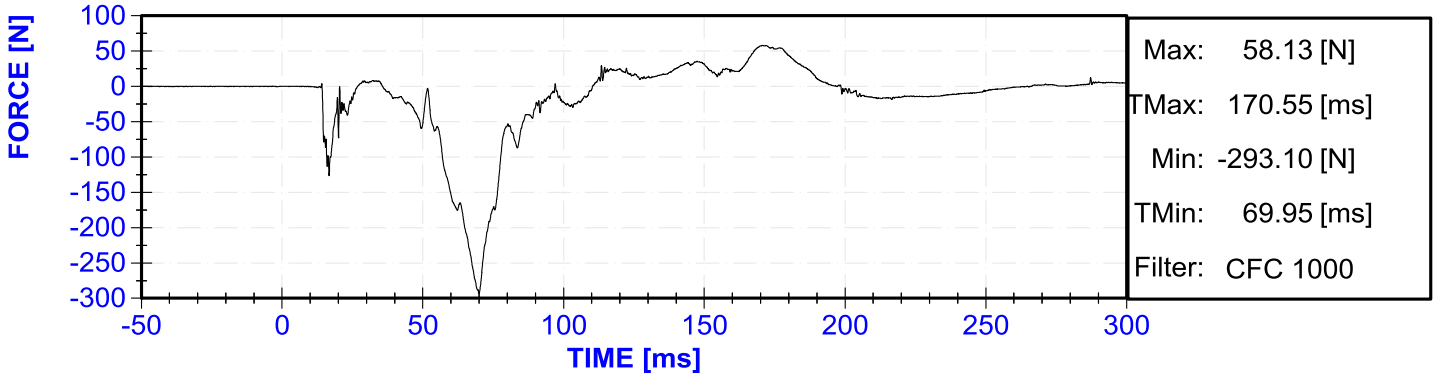
V2P1 Rear Neck Spring Tower Load Cell



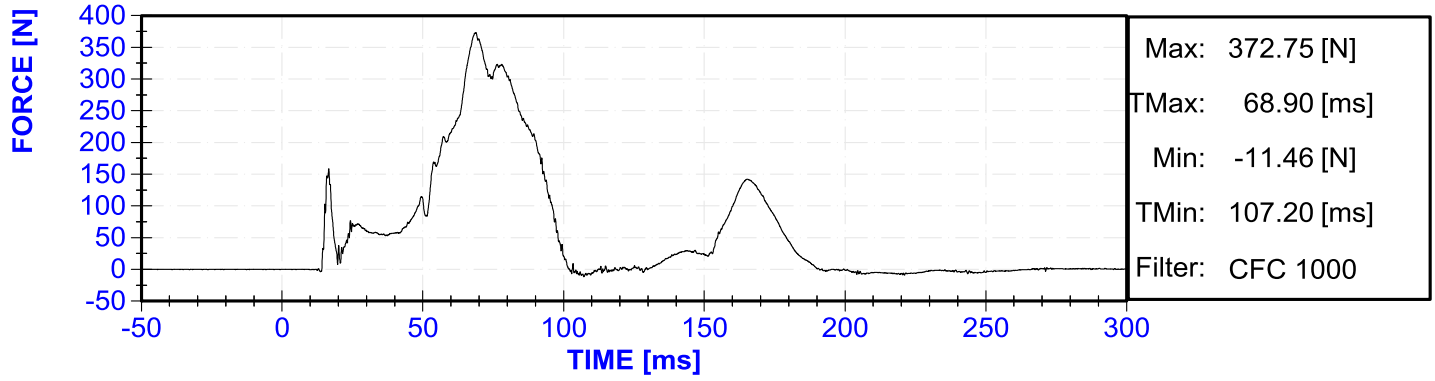
V2P1 Occipital Condyle Rotation Potentiometer



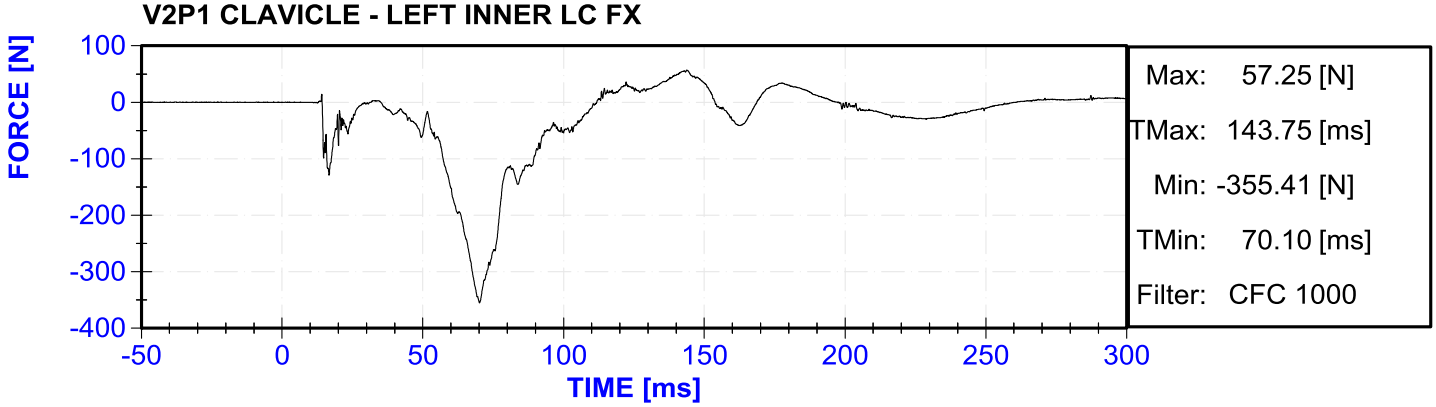
V2P1 CLAVICLE - LEFT OUTER LC FX



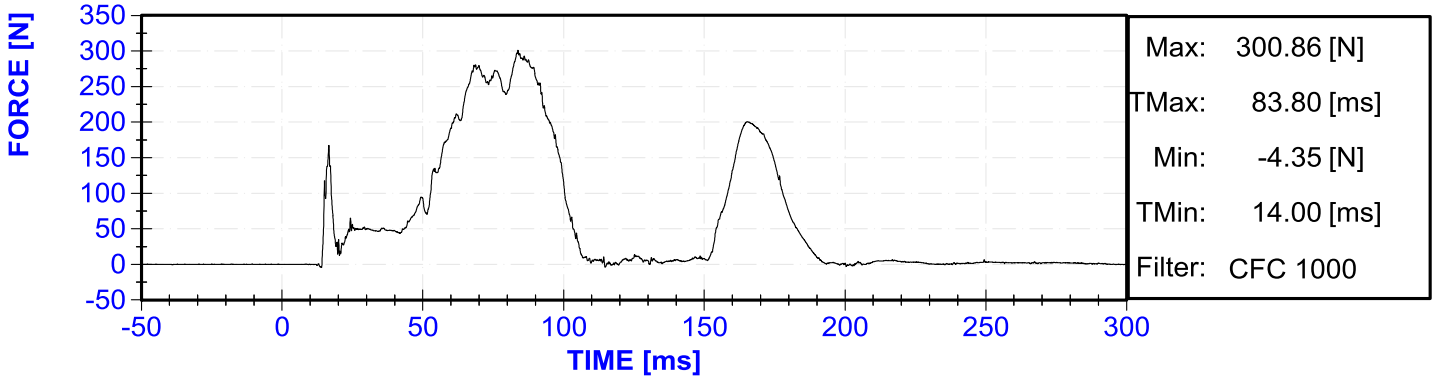
V2P1 CLAVICLE - LEFT OUTER LC FZ



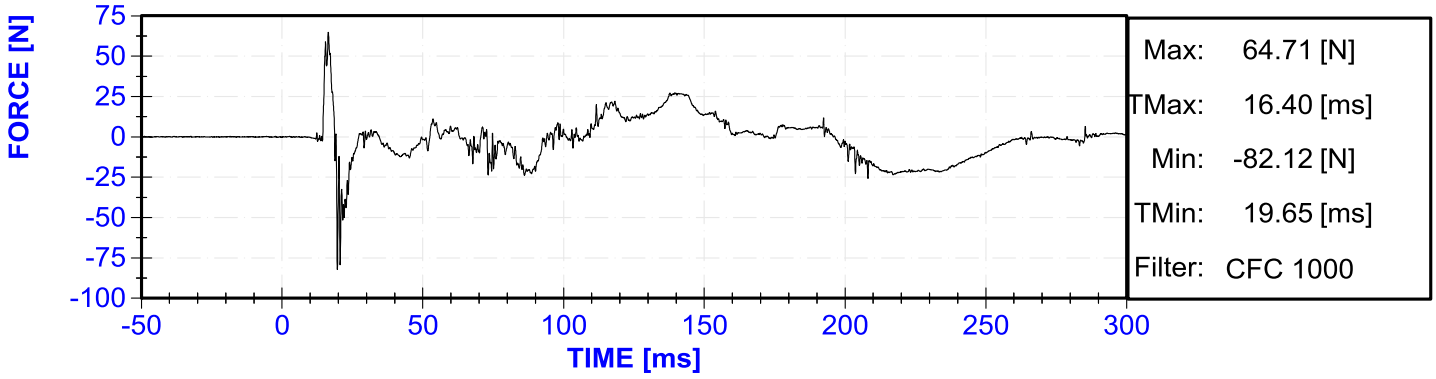
V2P1 CLAVICLE - LEFT INNER LC FX



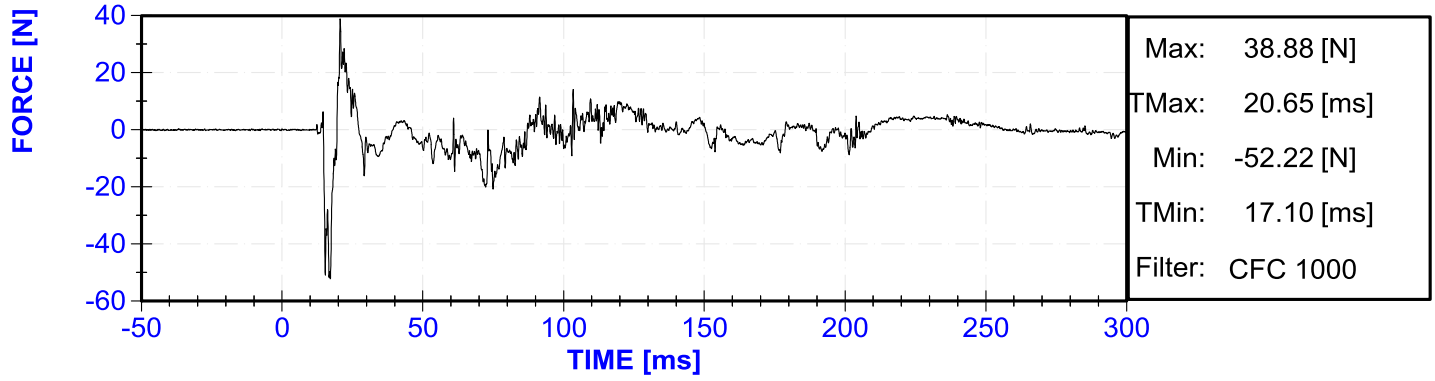
V2P1 CLAVICLE - LEFT INNER LC FZ



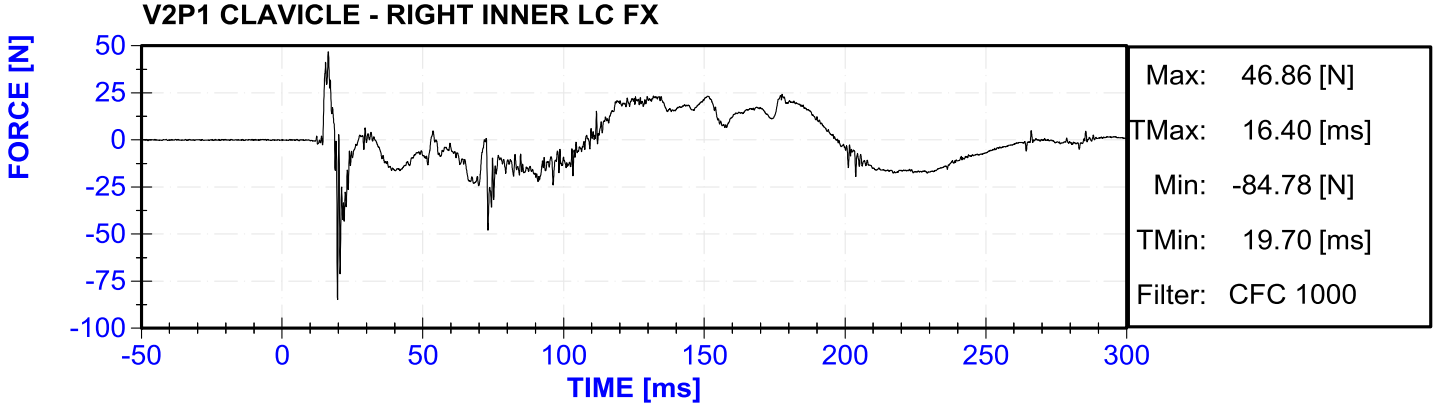
V2P1 CLAVICLE - RIGHT OUTER LC FX



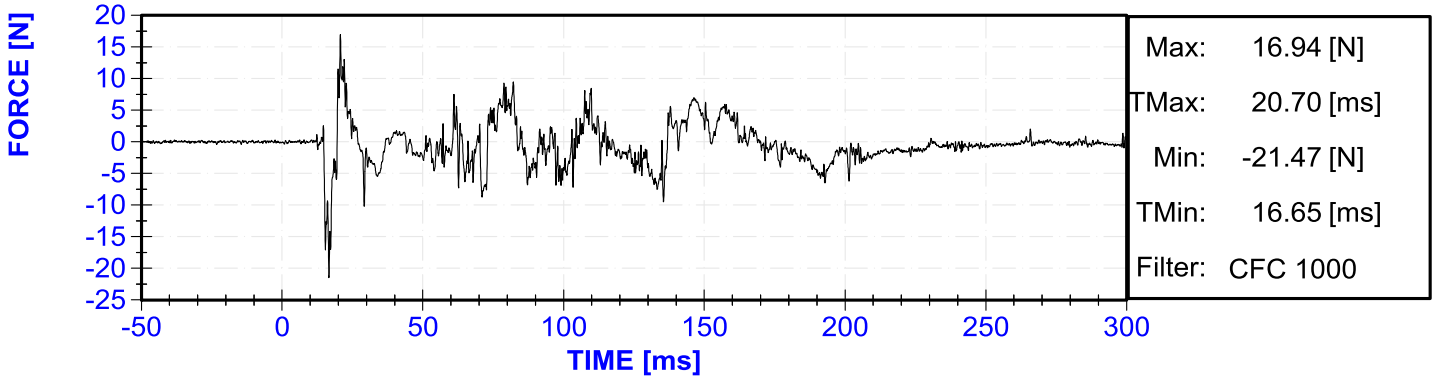
V2P1 CLAVICLE - RIGHT OUTER LC FZ



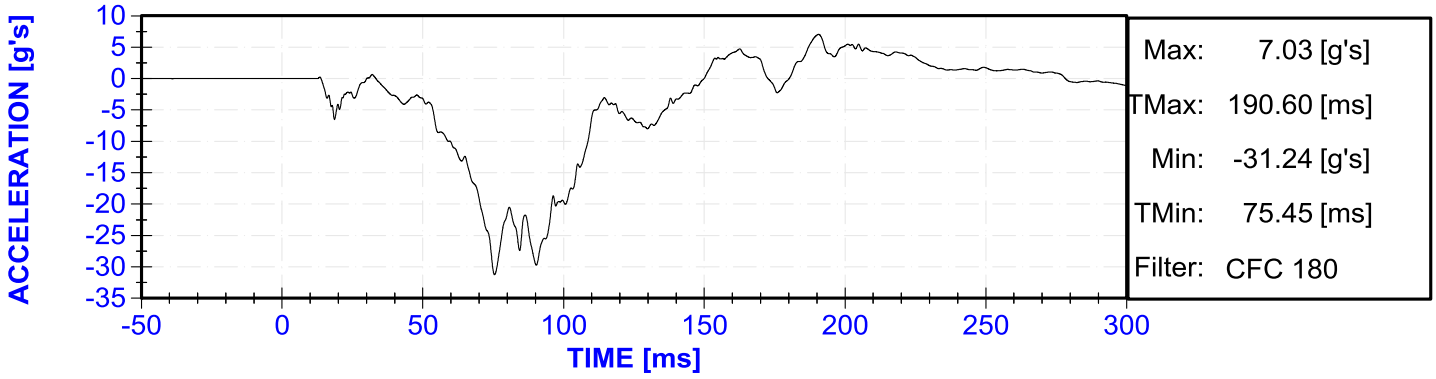
V2P1 CLAVICLE - RIGHT INNER LC FX



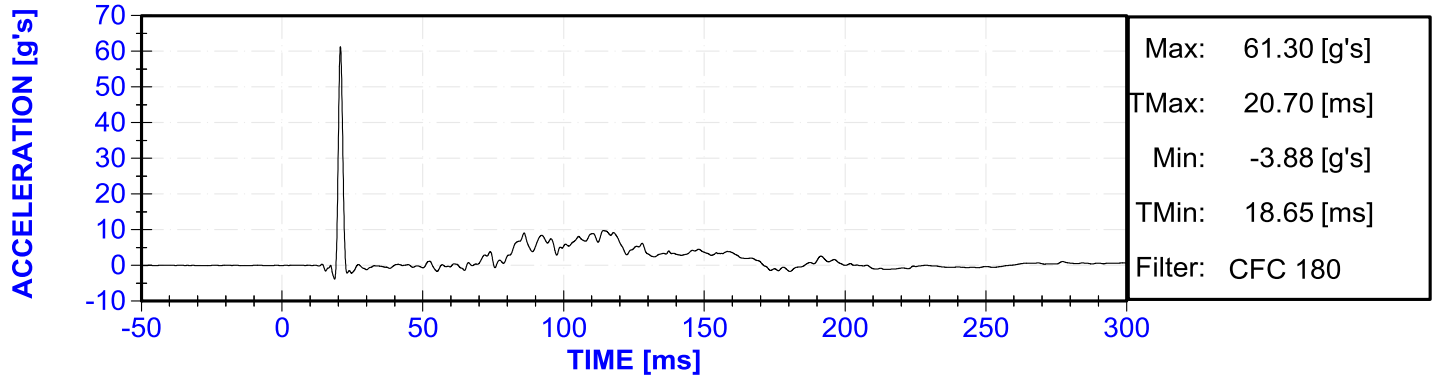
V2P1 CLAVICLE - RIGHT INNER LC FZ



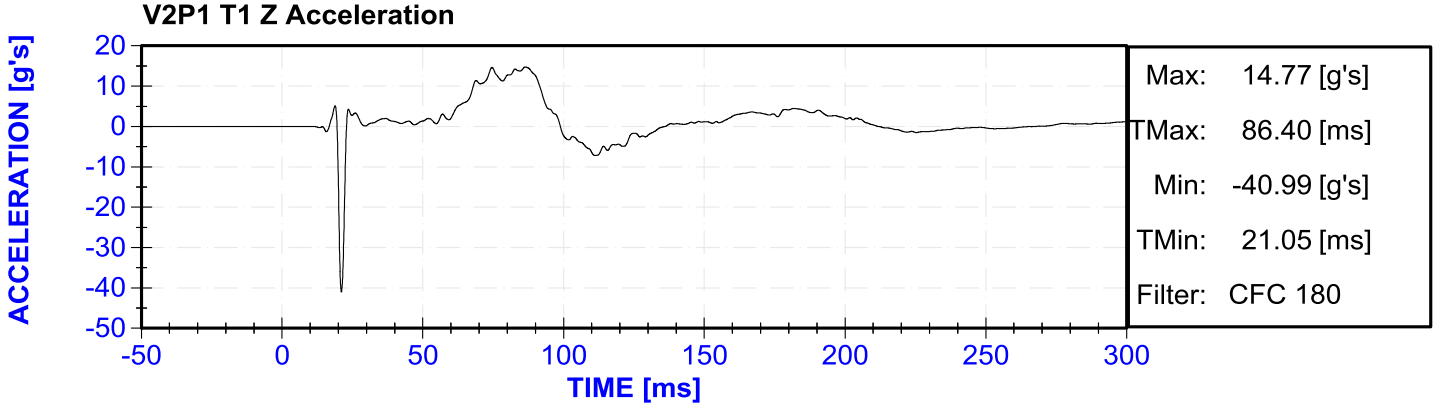
V2P1 T1 X Acceleration



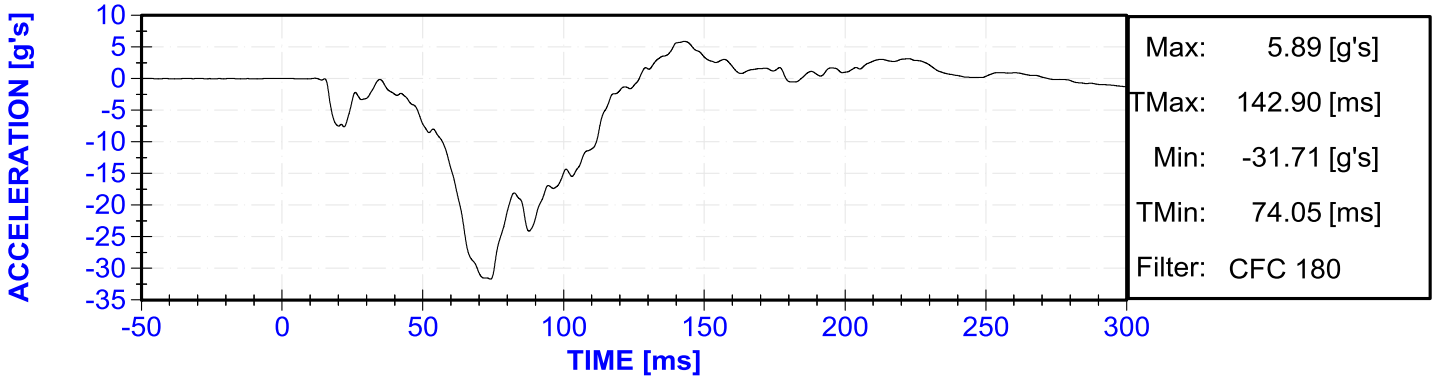
V2P1 T1 Y Acceleration



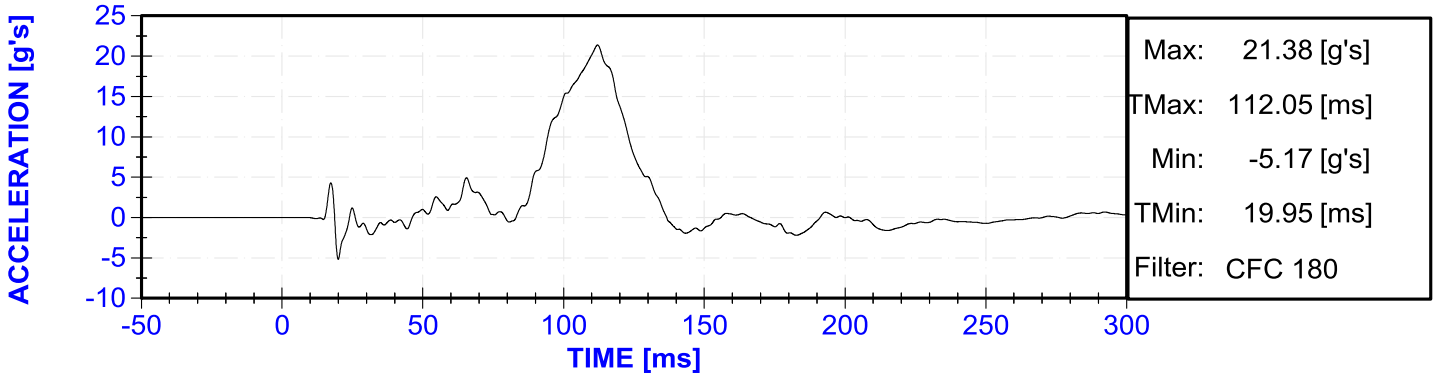
V2P1 T1 Z Acceleration



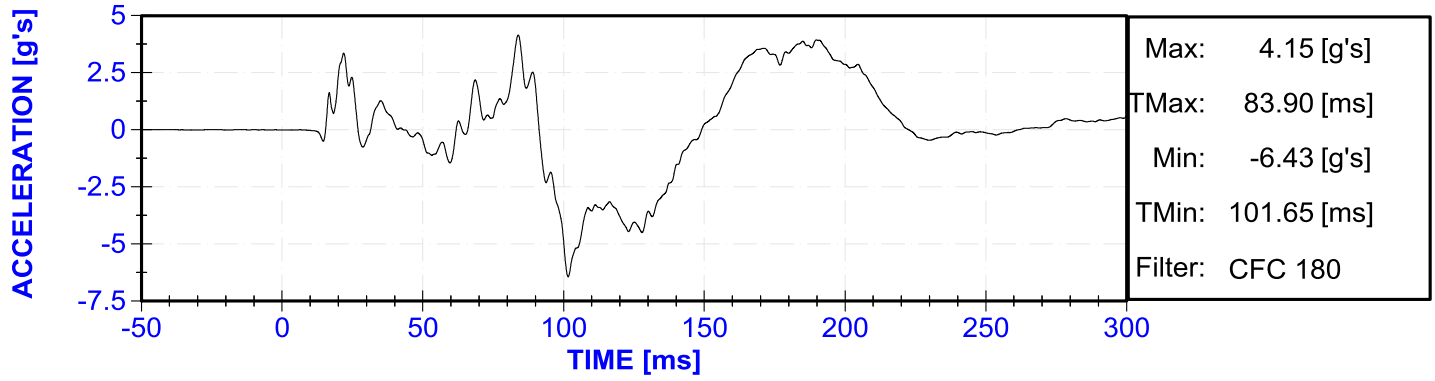
V2P1 T6 X Acceleration



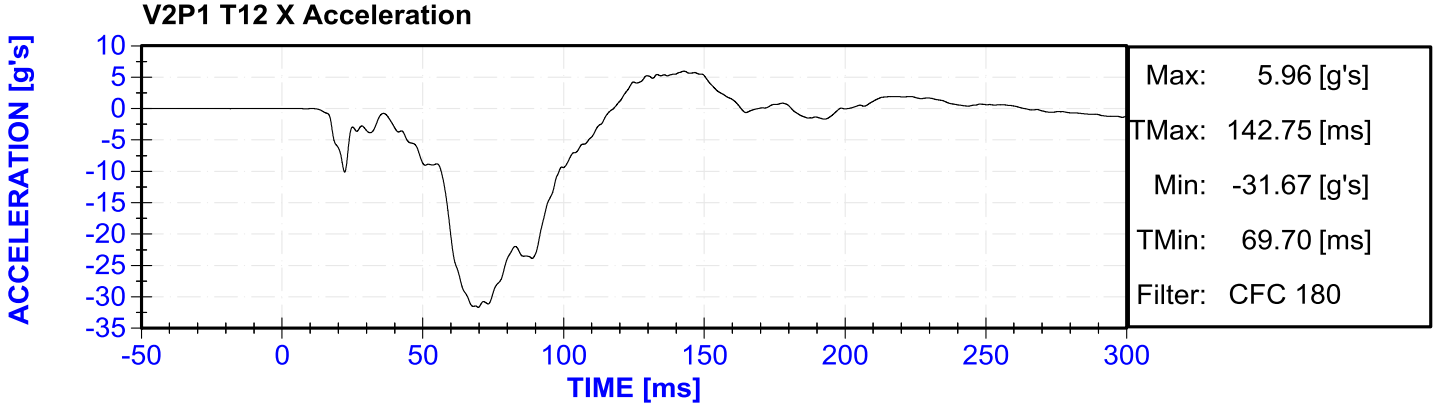
V2P1 T6 Y Acceleration



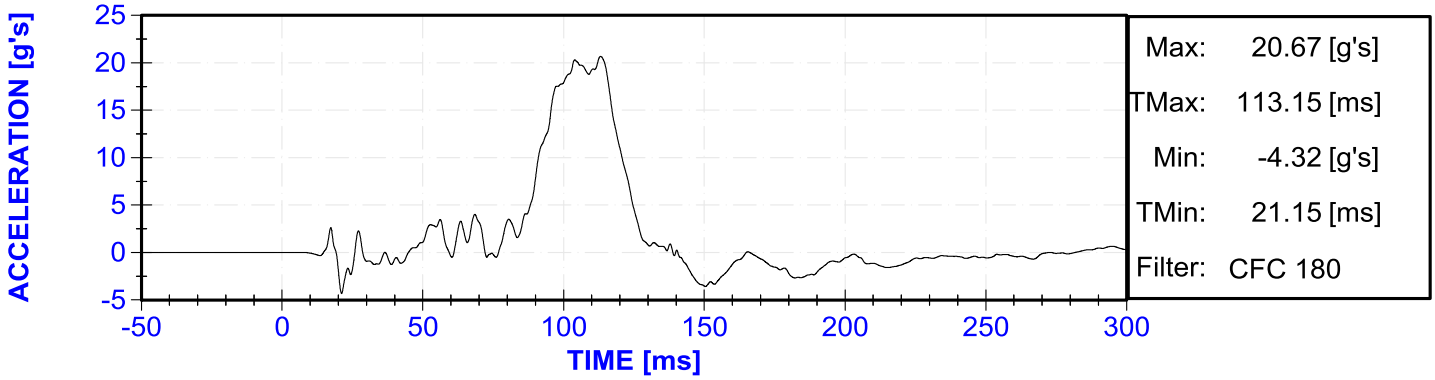
V2P1 T6 Z Acceleration



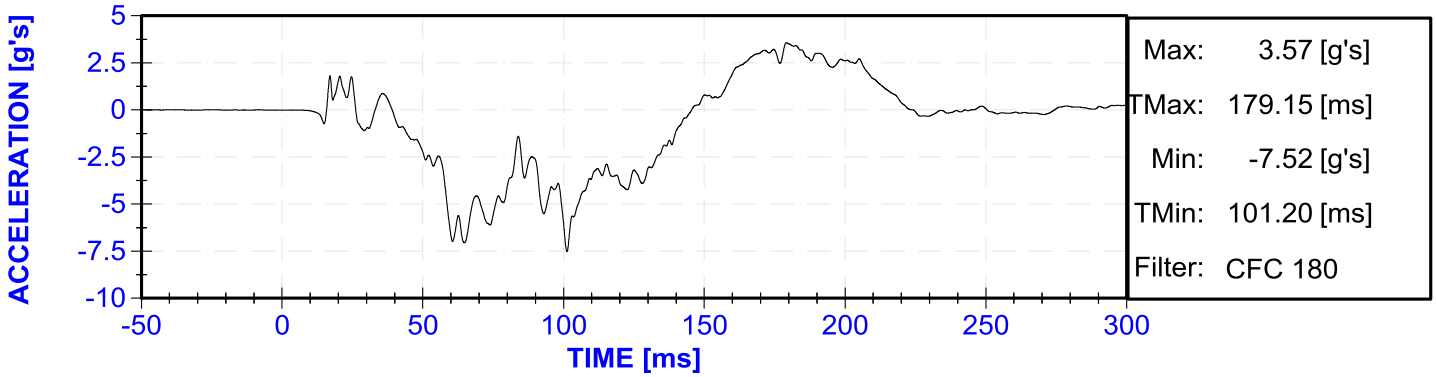
V2P1 T12 X Acceleration



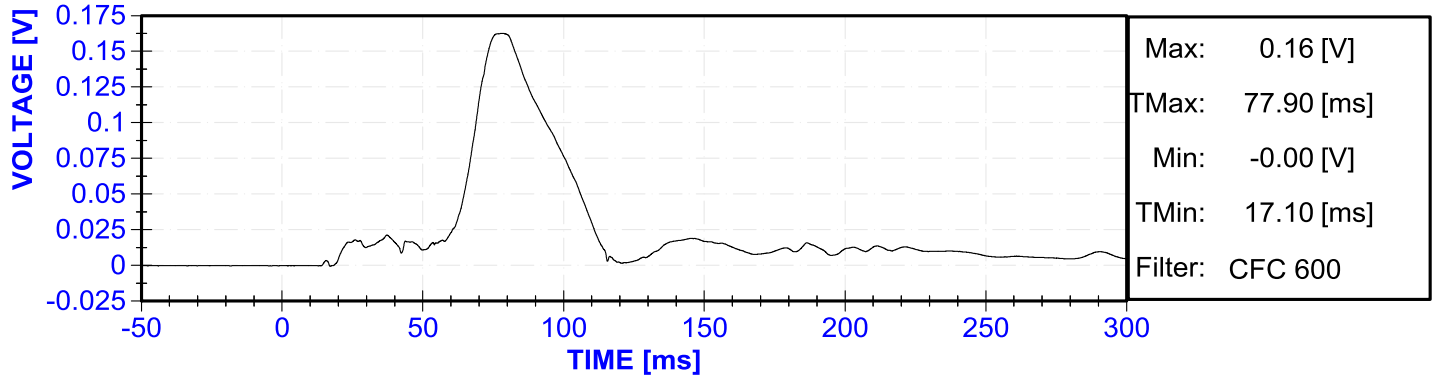
V2P1 T12 Y Acceleration



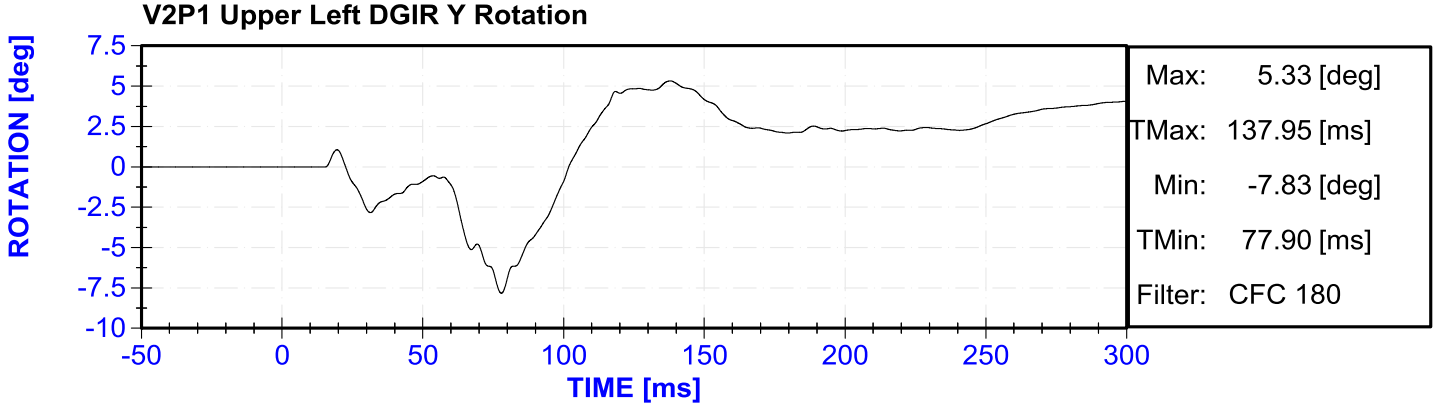
V2P1 T12 Z Acceleration



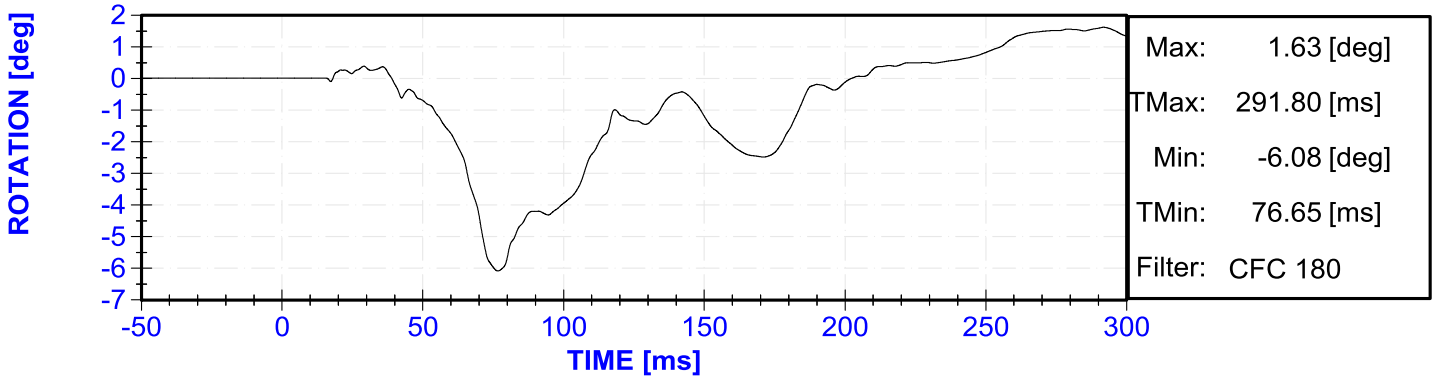
V2P1 Upper Left DGIR X Displacement



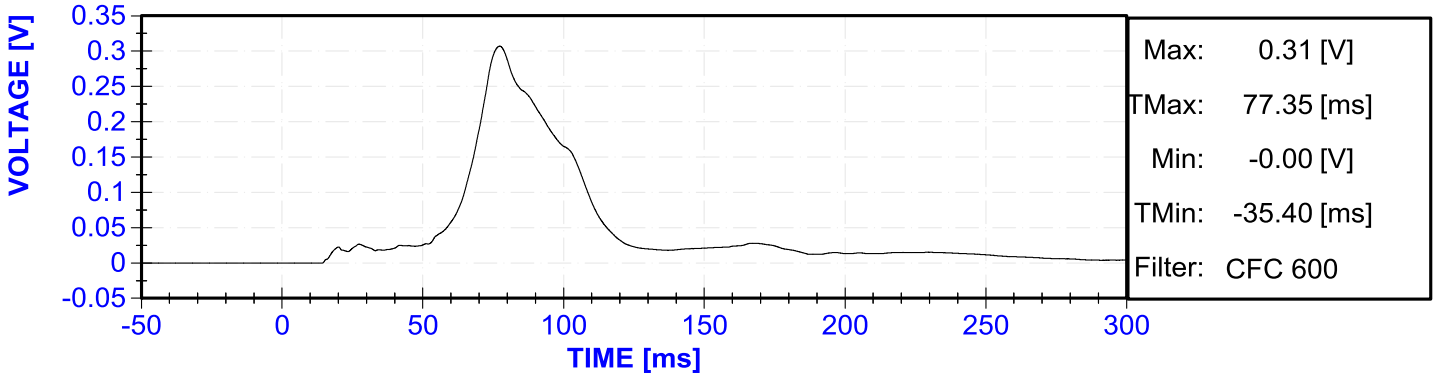
V2P1 Upper Left DGIR Y Rotation



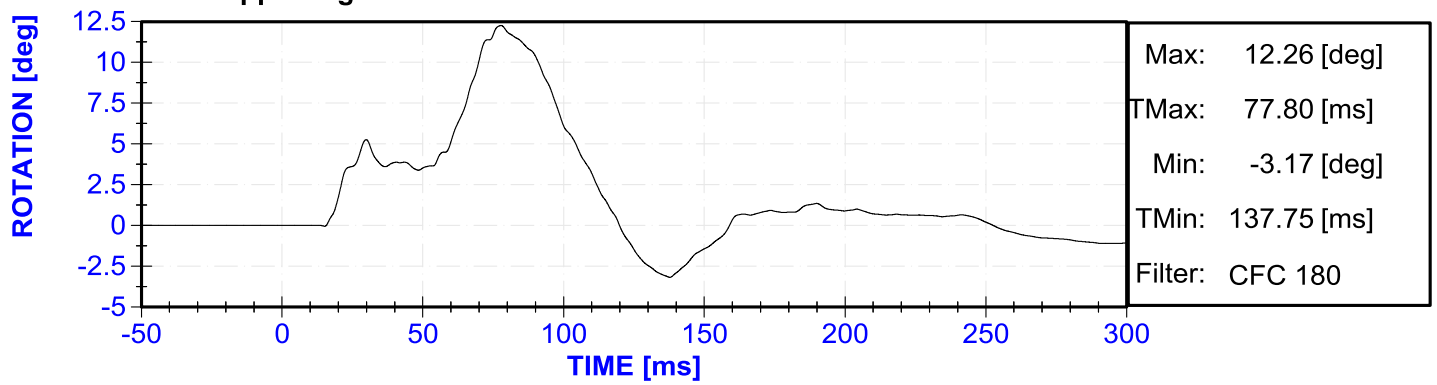
V2P1 Upper Left DGIR Z Rotation



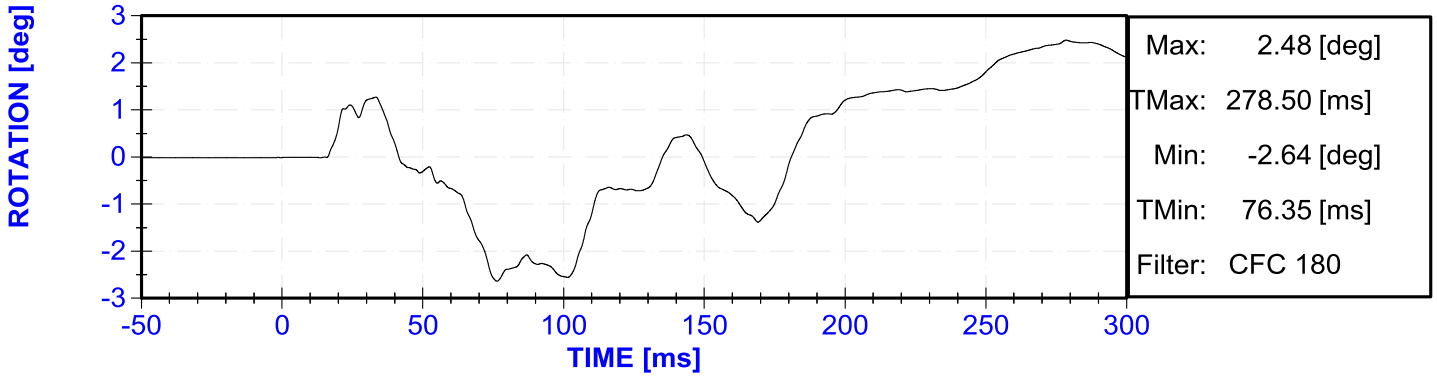
V2P1 Upper Right DGIR X Displacement



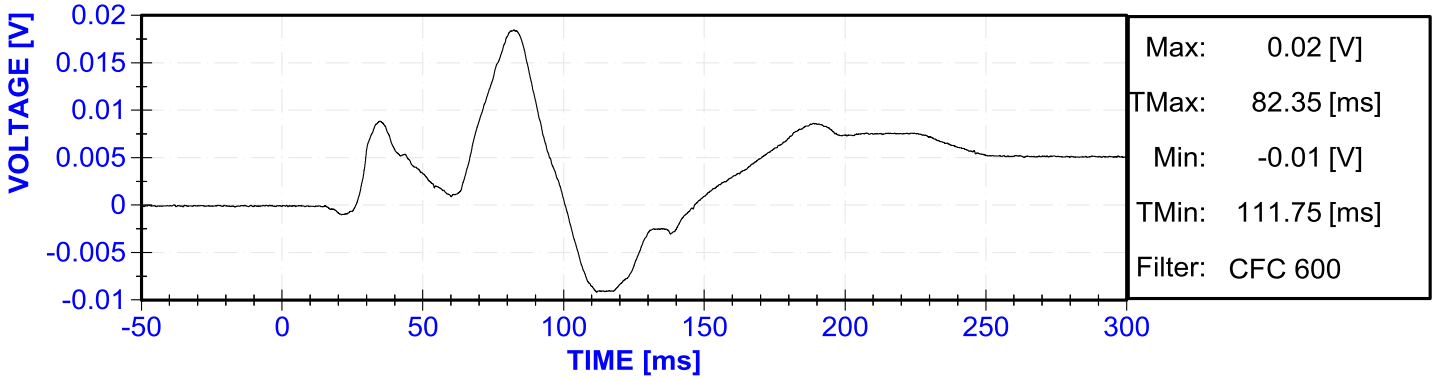
V2P1 Upper Right DGIR Y Rotation



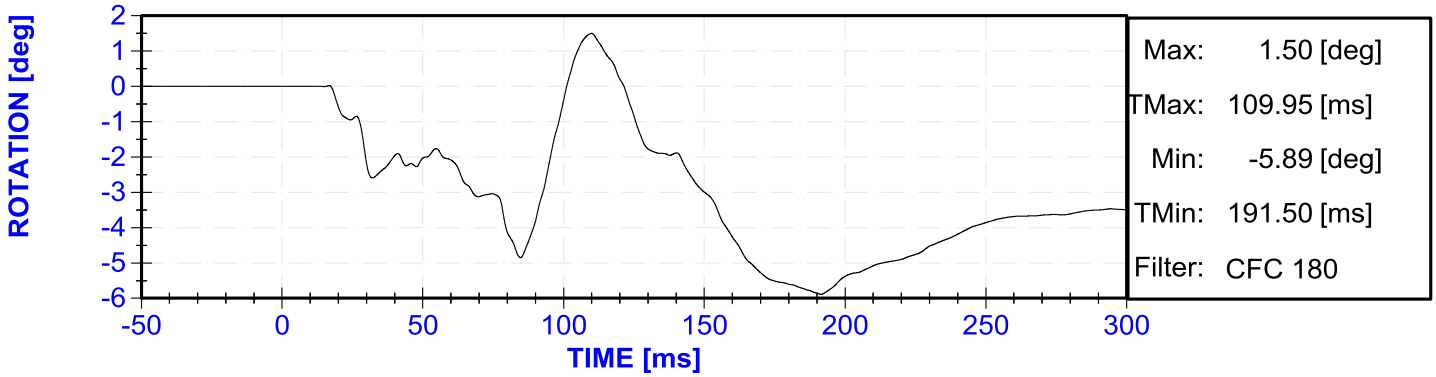
V2P1 Upper Right DGIR Z Rotation



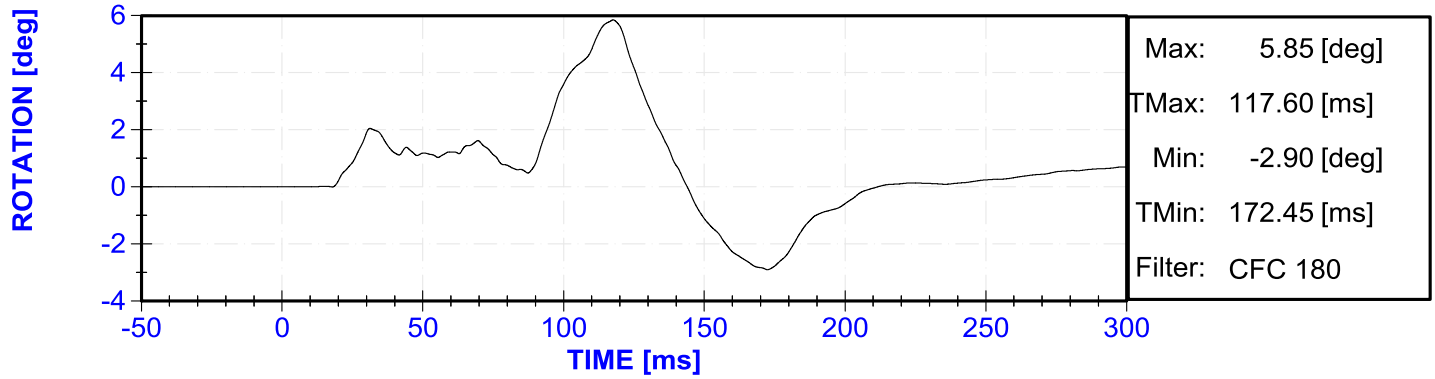
V2P1 Lower Left DGIR X Displacement



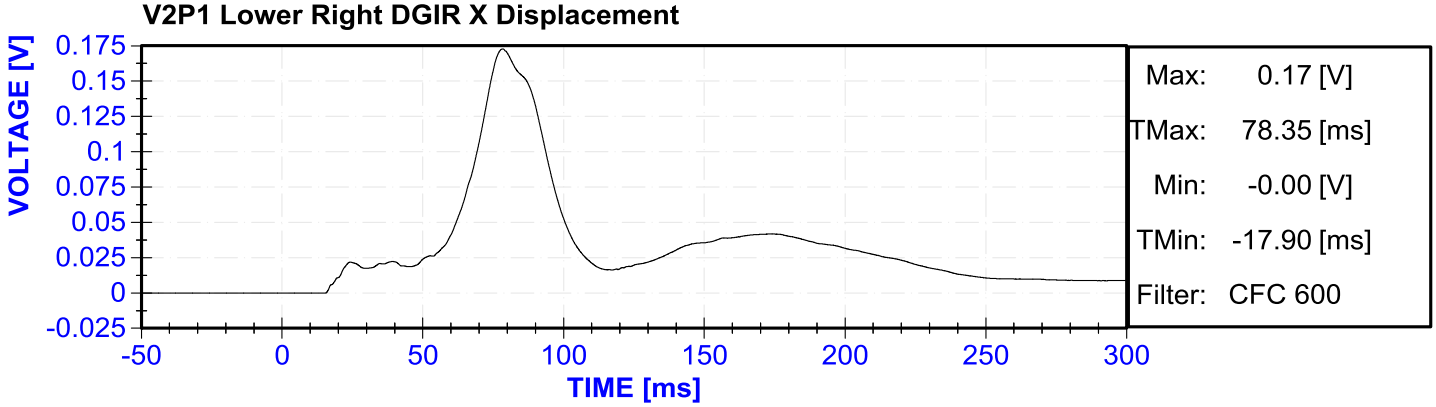
V2P1 Lower Left DGIR Y Rotation



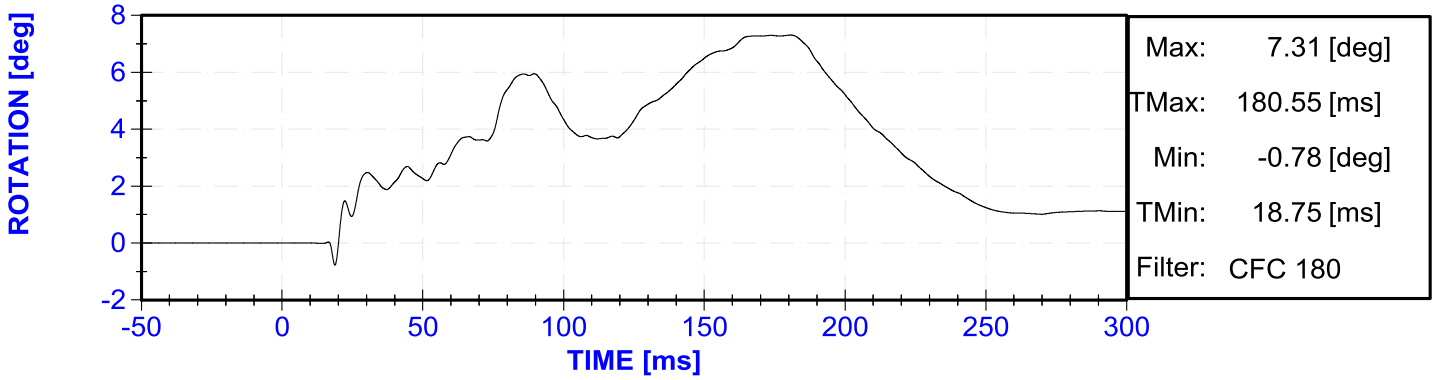
V2P1 Lower Left DGIR Z Rotation



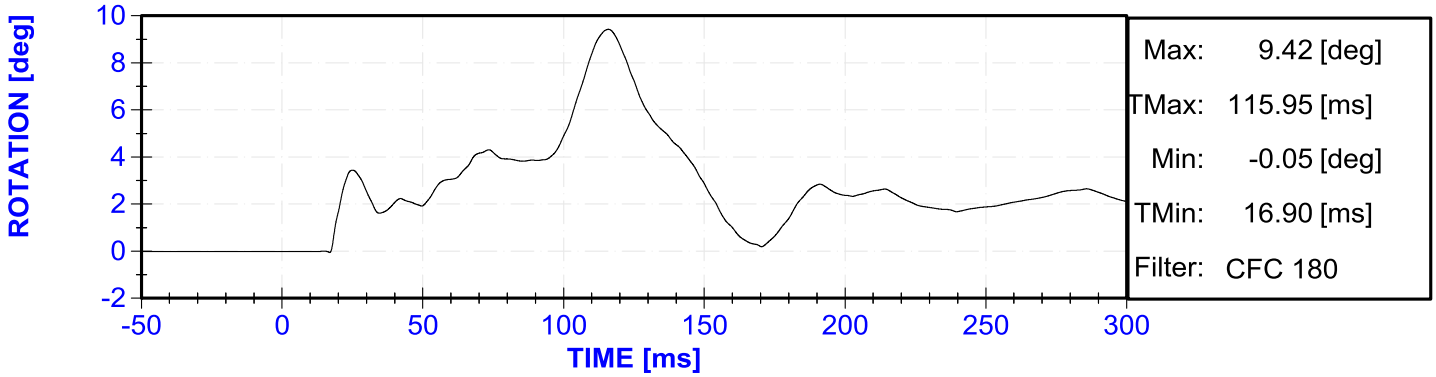
V2P1 Lower Right DGIR X Displacement



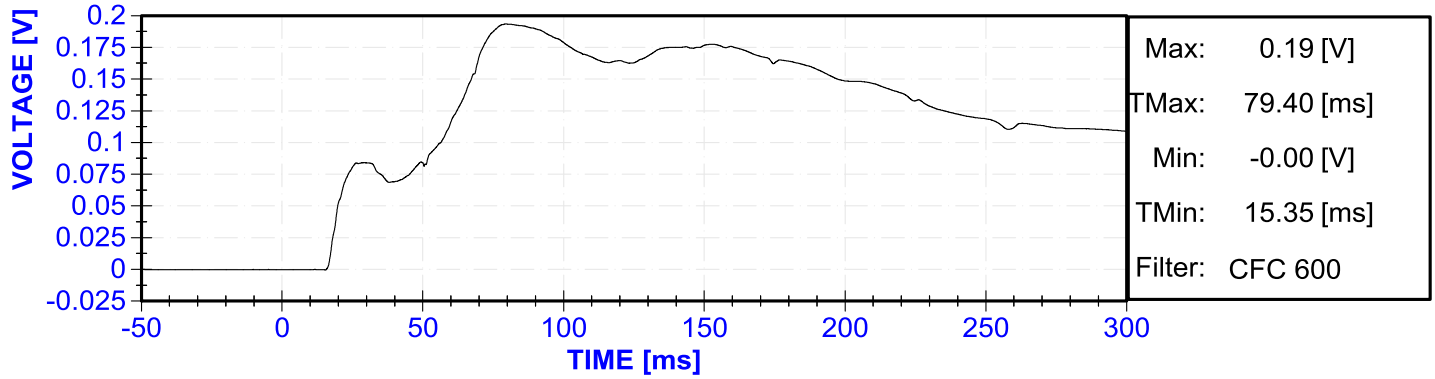
V2P1 Lower Right DGIR Y Rotation



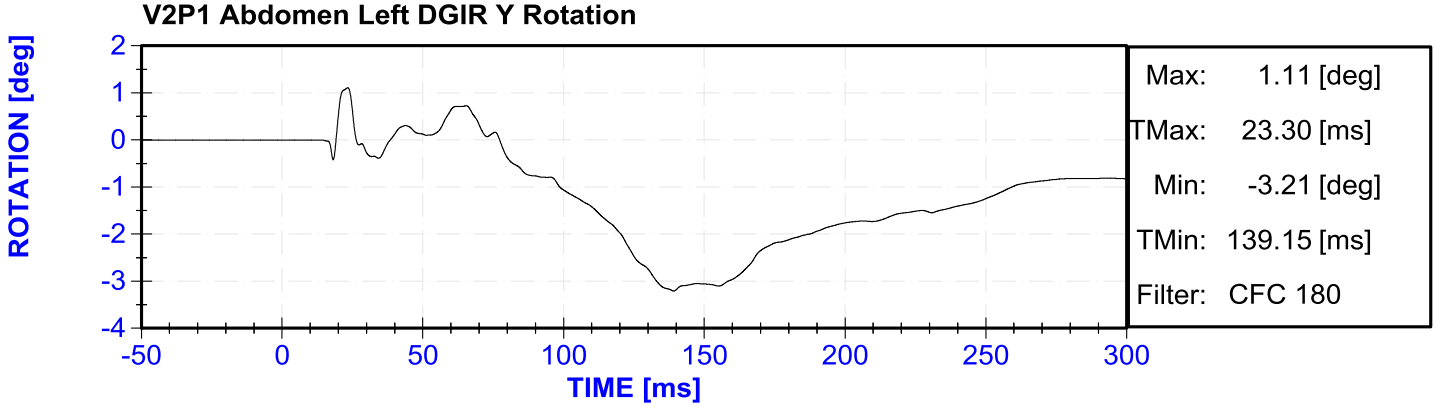
V2P1 Lower Right DGIR Z Rotation

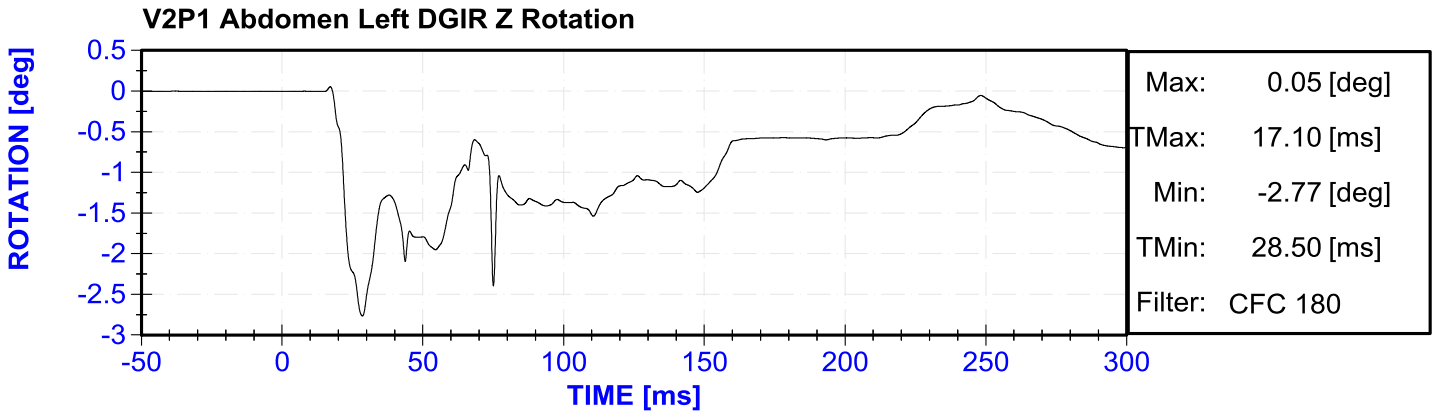


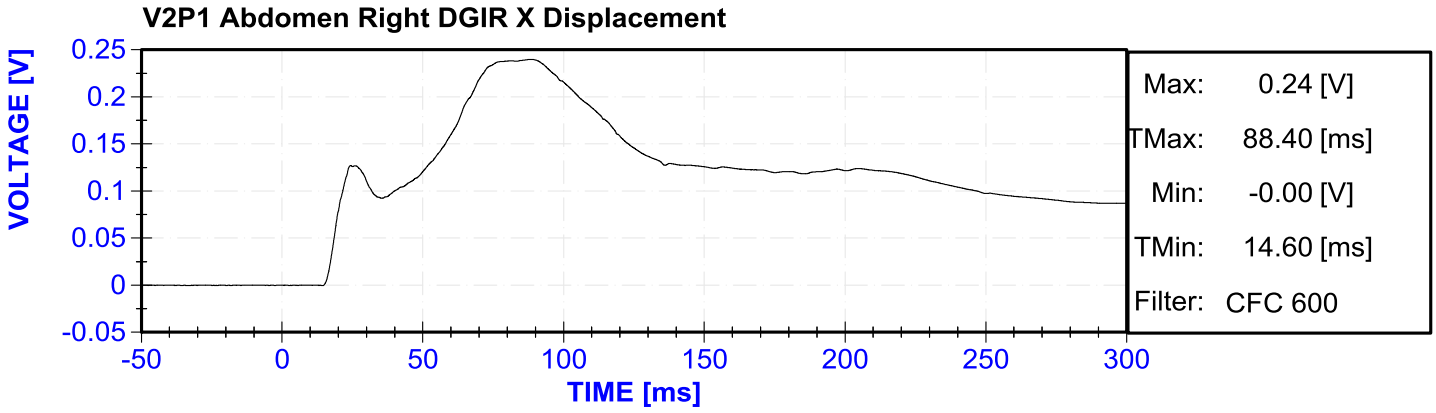
V2P1 Abdomen Left DGIR X Displacement

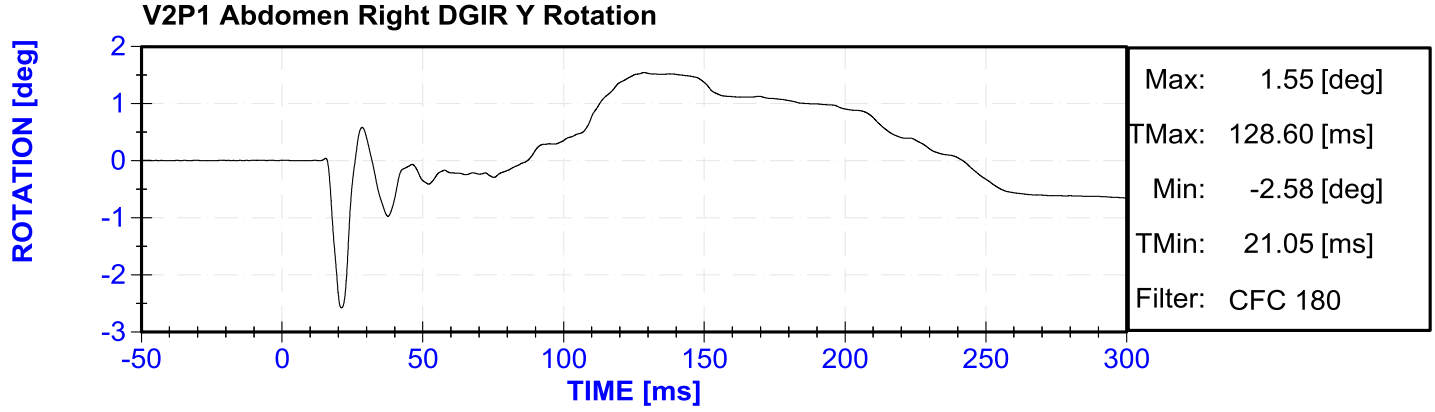


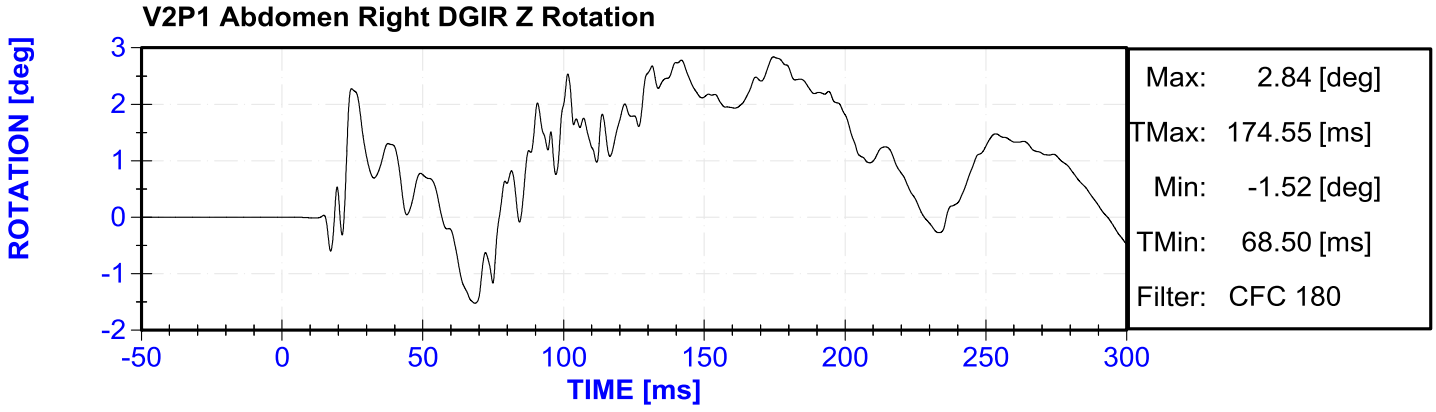
V2P1 Abdomen Left DGIR Y Rotation

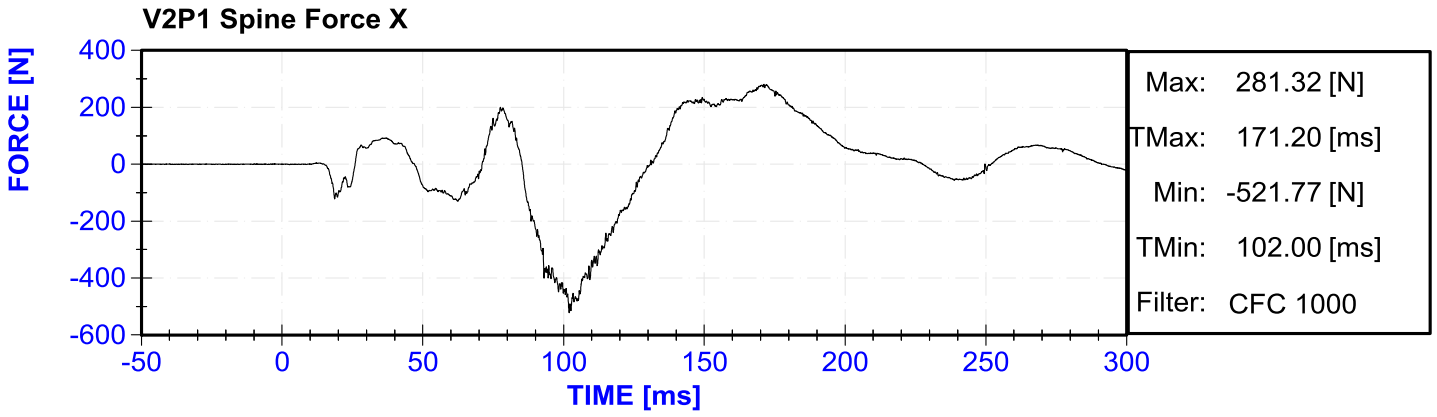


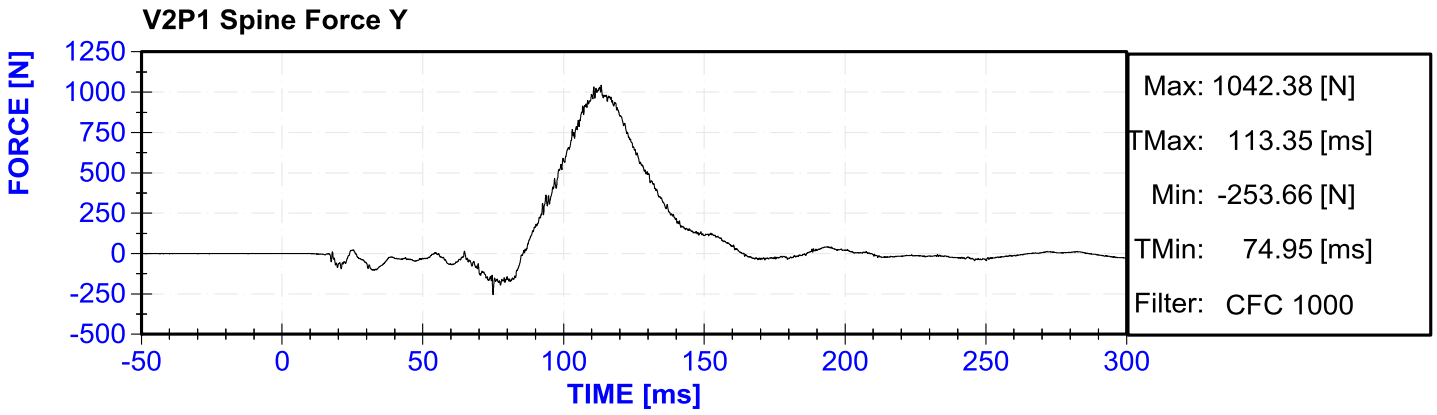

V2P1 Abdomen Left DGIR Z Rotation
ROTATION [deg]
0.5
0
-0.5
-1
-1.5
-2
-2.5
-3
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.05 [deg]
TMax: 17.10 [ms]
Min: -2.77 [deg]
TMin: 28.50 [ms]
Filter: CFC 180

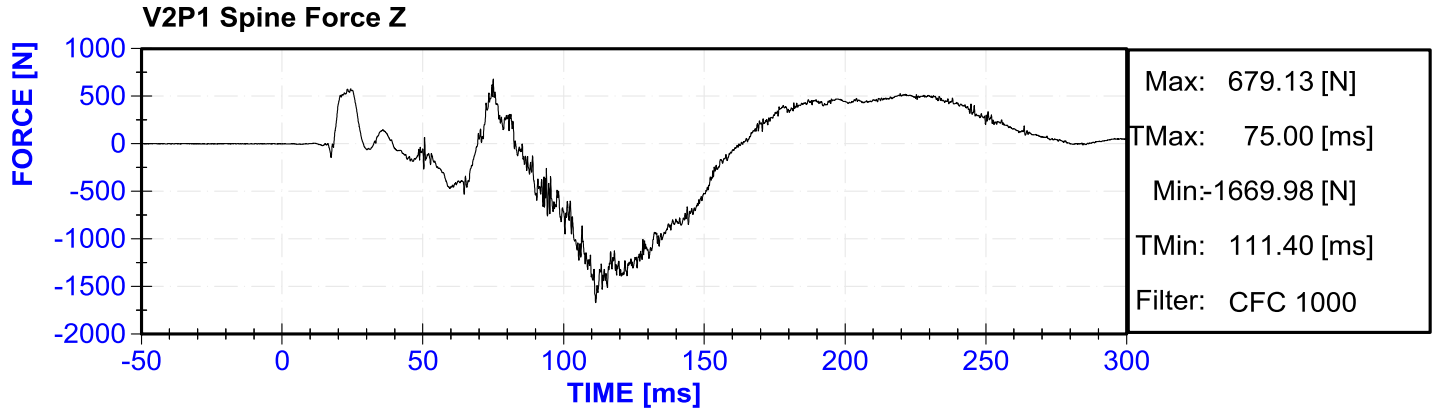

V2P1 Abdomen Right DGIR X Displacement
VOLTAGE [V]
0.25
0.2
0.15
0.1
0.05
0
-0.05
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.24 [V]
TMax: 88.40 [ms]
Min: -0.00 [V]
TMin: 14.60 [ms]
Filter: CFC 600

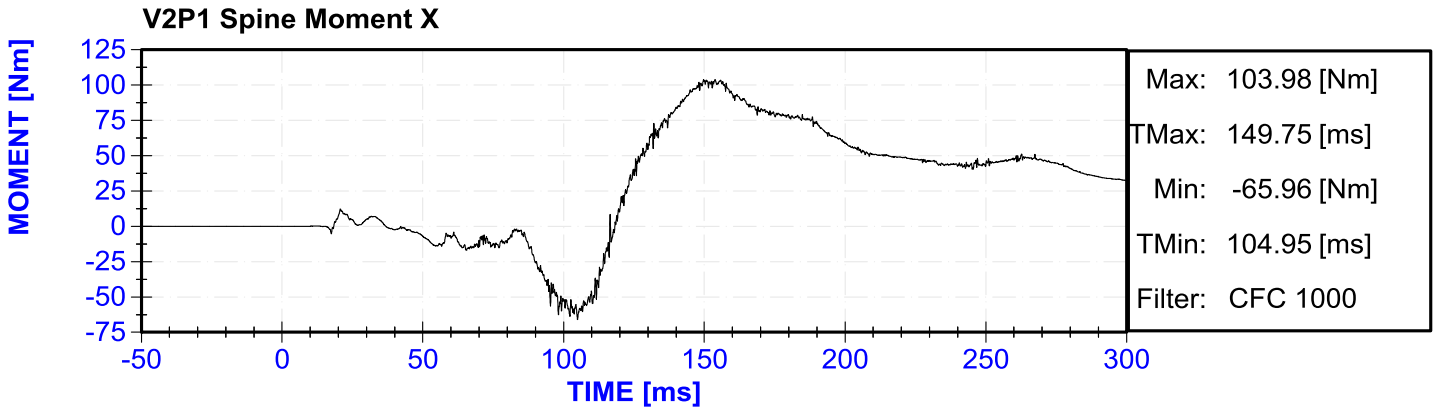

V2P1 Abdomen Right DGIR Y Rotation
ROTATION [deg]
2
1
0
-1
-2
-3
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1.55 [deg]
TMax: 128.60 [ms]
Min: -2.58 [deg]
TMin: 21.05 [ms]
Filter: CFC 180


V2P1 Abdomen Right DGIR Z Rotation
ROTATION [deg]
3
2
1
0
-1
-2
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 2.84 [deg]
TMax: 174.55 [ms]
Min: -1.52 [deg]
TMin: 68.50 [ms]
Filter: CFC 180

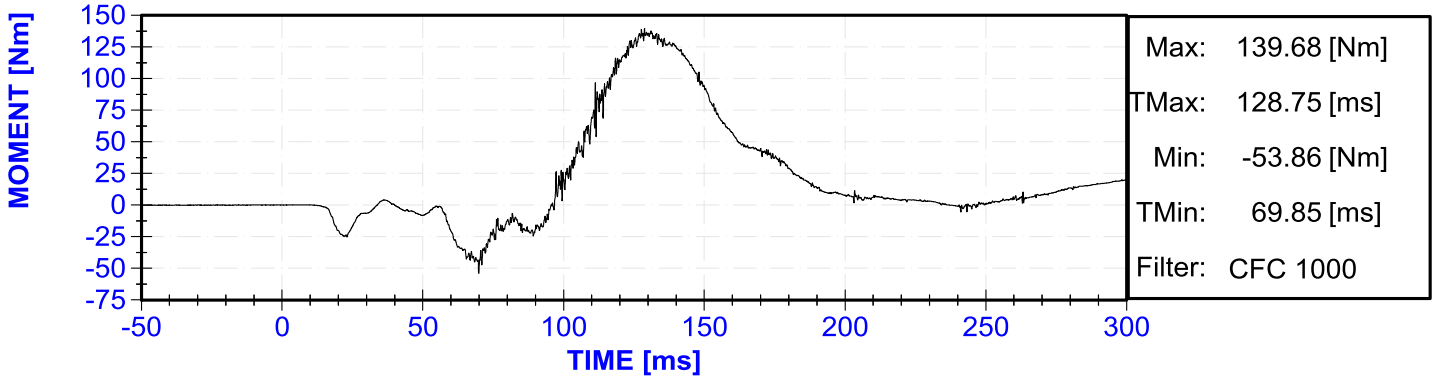

V2P1 Spine Force X
FORCE [N]
400
200
0
-200
-400
-600
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 281.32 [N]
TMax: 171.20 [ms]
Min: -521.77 [N]
TMin: 102.00 [ms]
Filter: CFC 1000


V2P1 Spine Force Y
FORCE [N]
1250
1000
750
500
250
0
-250
-500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1042.38 [N]
TMax: 113.35 [ms]
Min: -253.66 [N]
TMin: 74.95 [ms]
Filter: CFC 1000

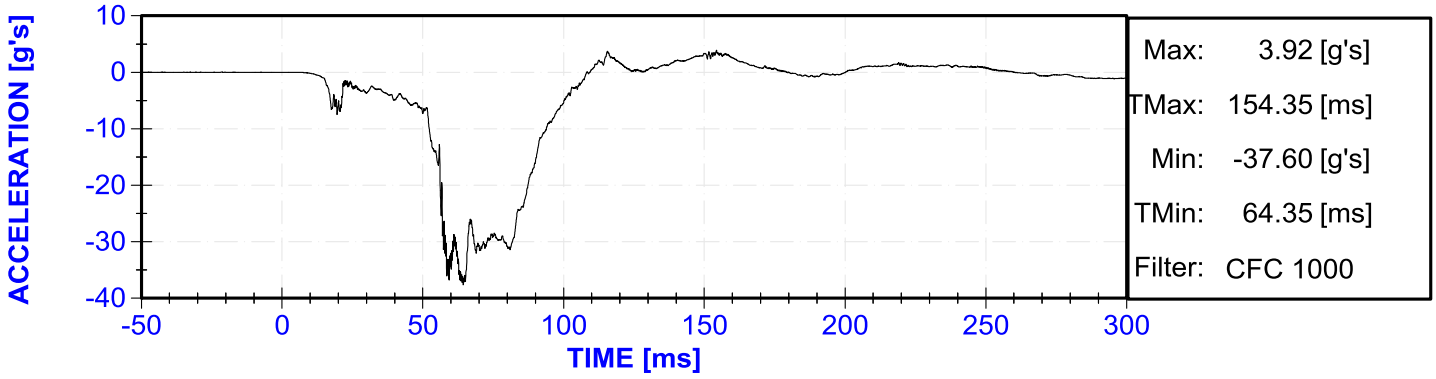

V2P1 Spine Force Z
FORCE [N]
1000
500
0
-500
-1000
-1500
-2000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 679.13 [N]
TMax: 75.00 [ms]
Min:-1669.98 [N]
TMin: 111.40 [ms]
Filter: CFC 1000


V2P1 Spine Moment X
MOMENT [Nm]
125
100
75
50
25
0
-25
-50
-75
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 103.98 [Nm]
TMax: 149.75 [ms]
Min: -65.96 [Nm]
TMin: 104.95 [ms]
Filter: CFC 1000

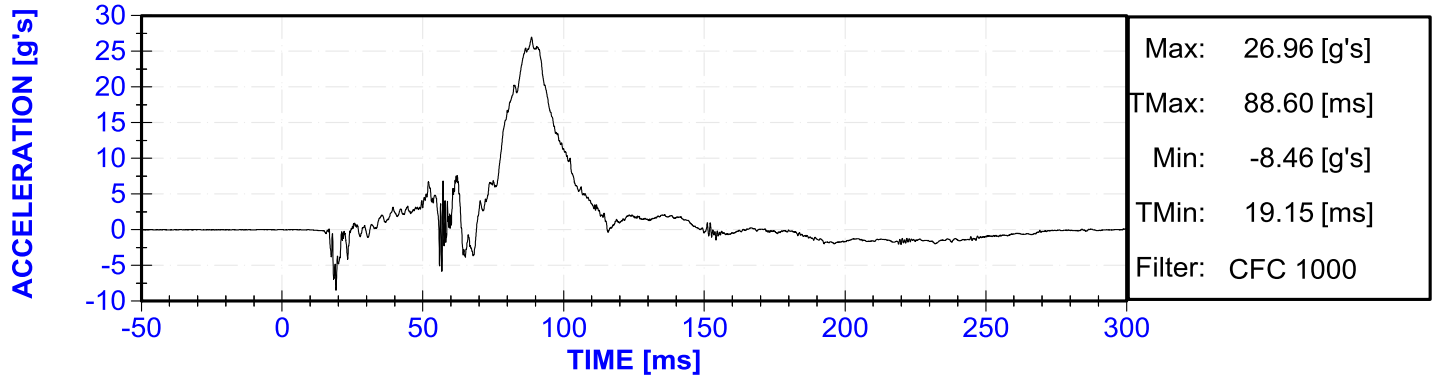
V2P1 Spine Moment Y



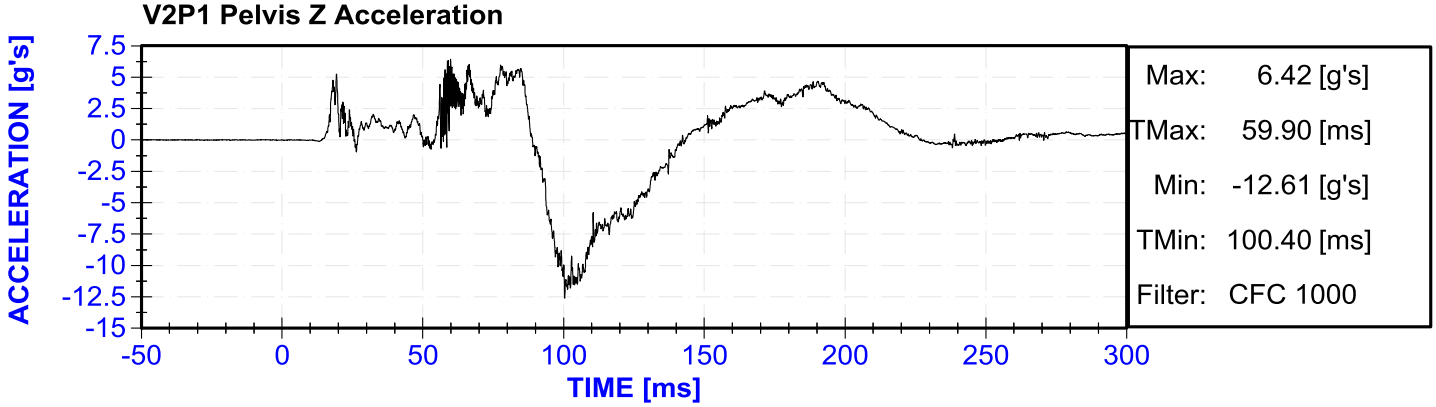
V2P1 Pelvis X Acceleration



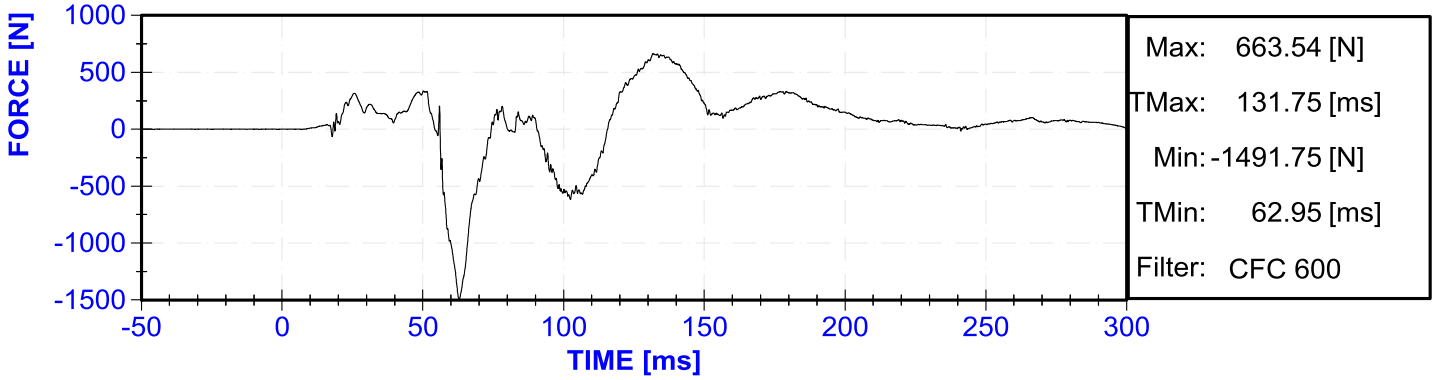
V2P1 Pelvis Y Acceleration



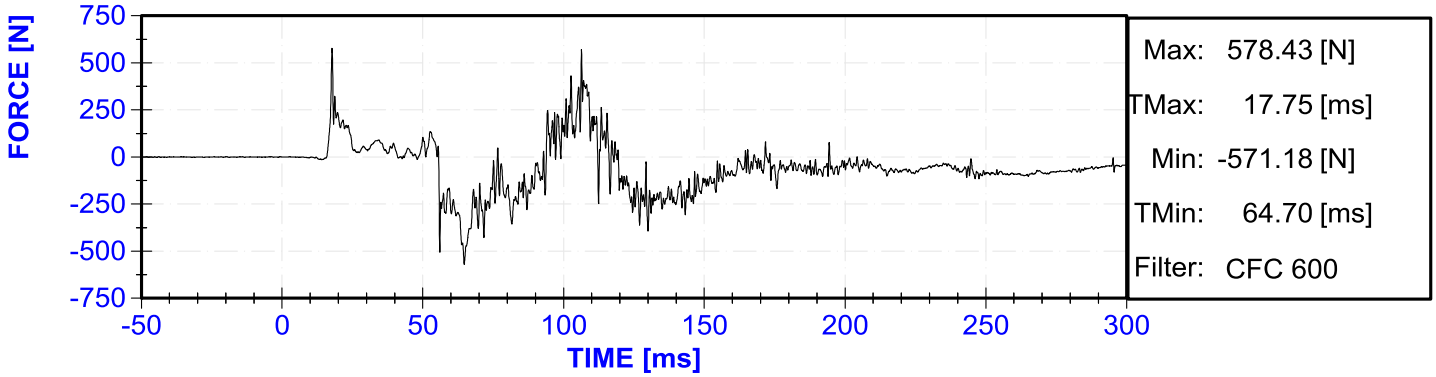
V2P1 Pelvis Z Acceleration



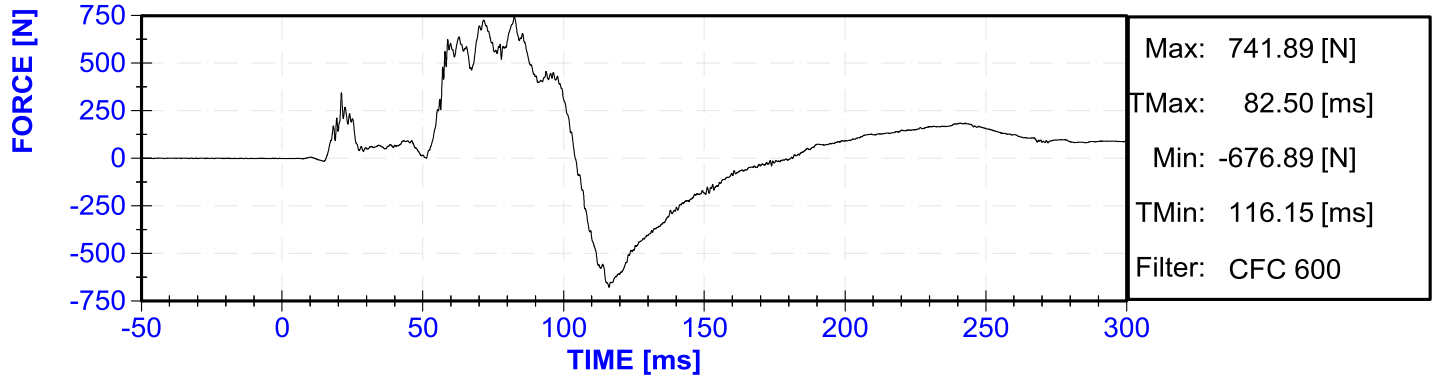
V2P1 Acetabulam Left X Force



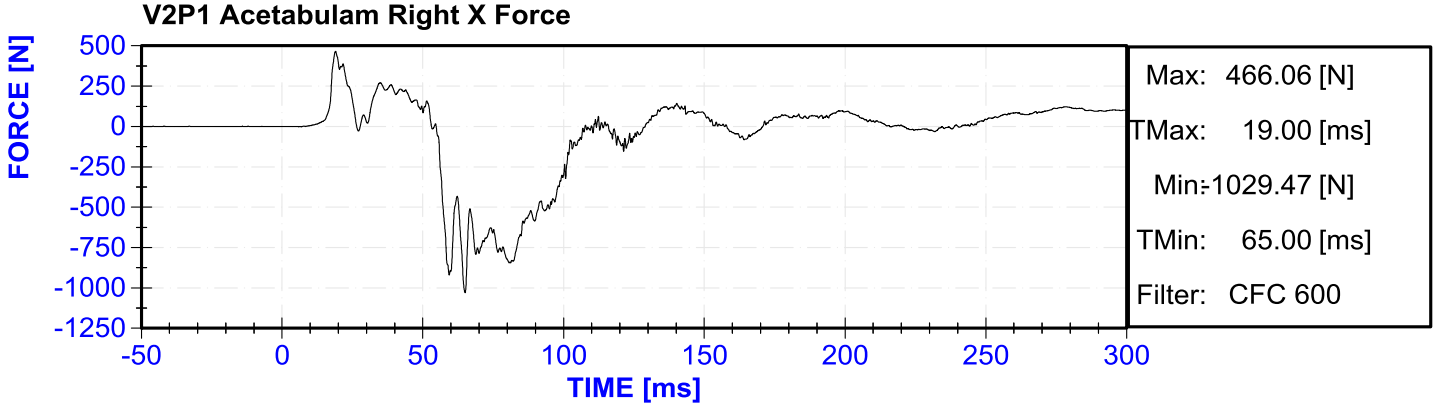
V2P1 Acetabulam Left Y Force



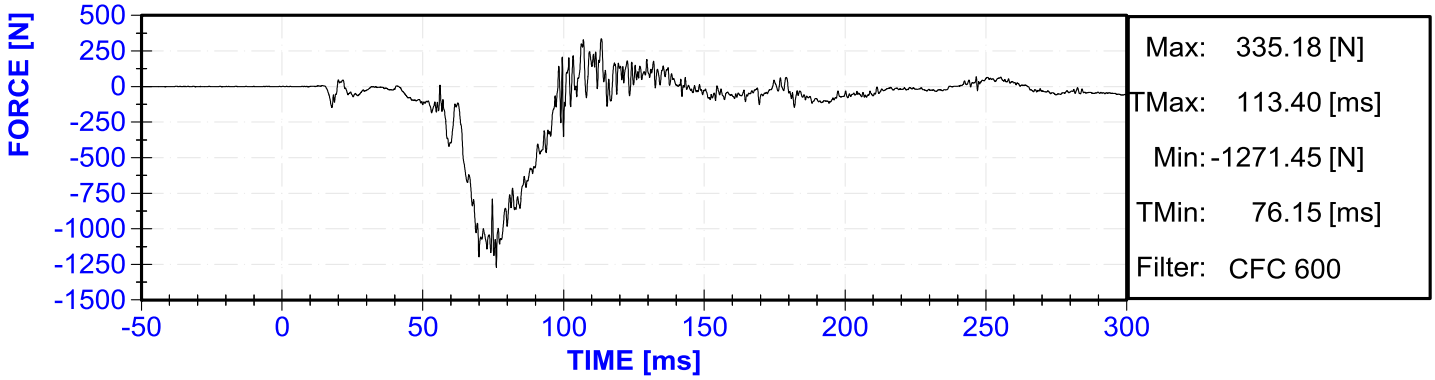
V2P1 Acetabulam Left Z Force



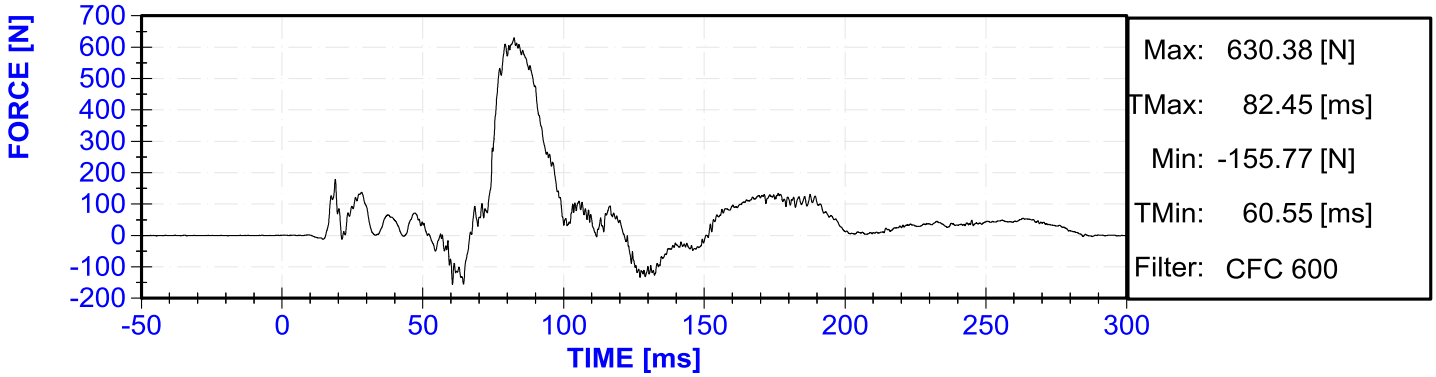
V2P1 Acetabulam Right X Force



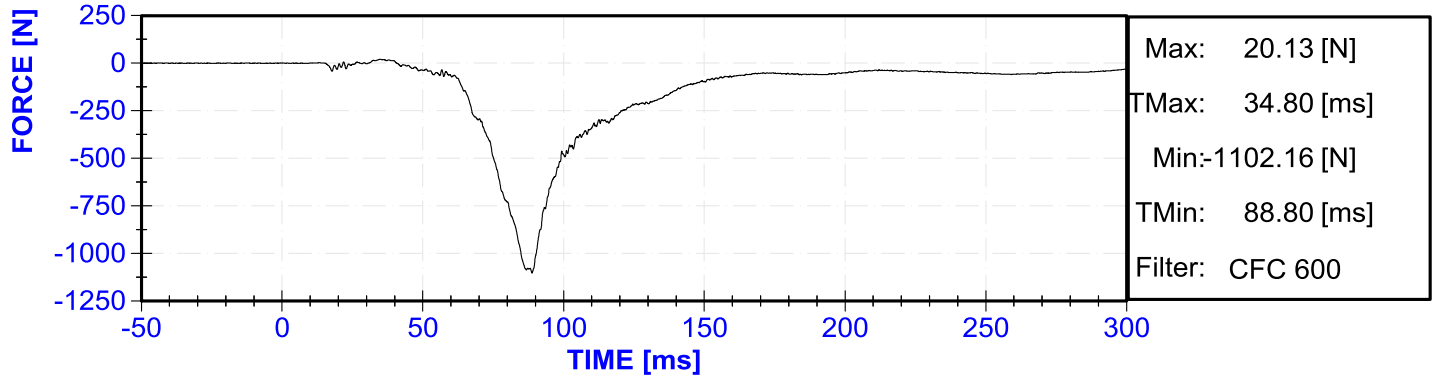
V2P1 Acetabulam Right Y Force



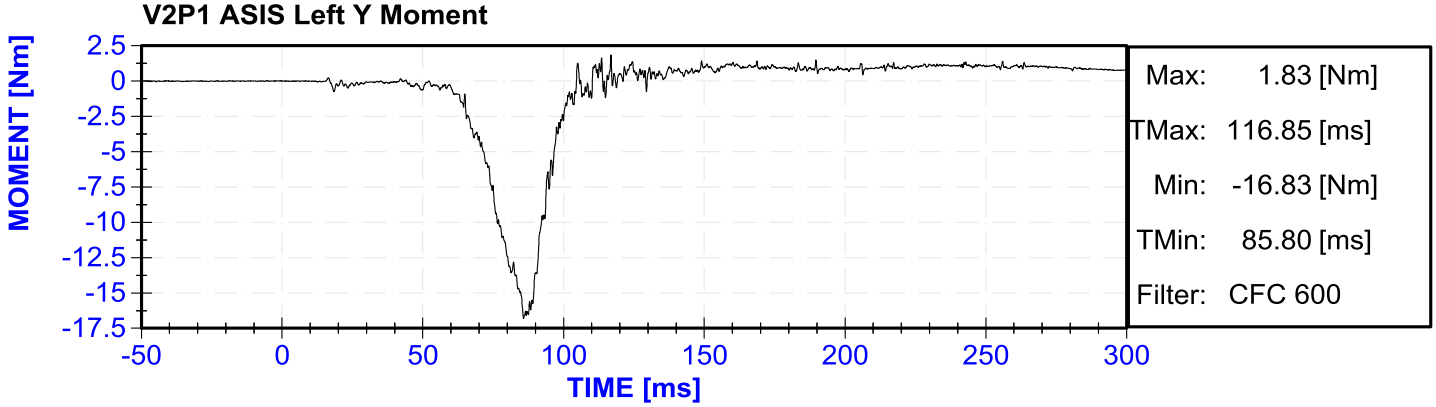
V2P1 Acetabulam Right Z Force



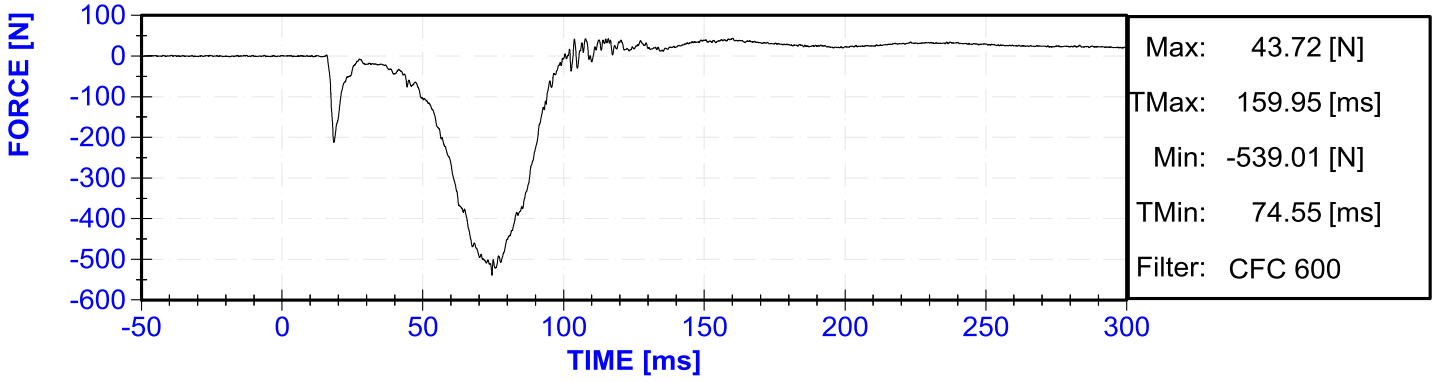
V2P1 ASIS Left X Force



V2P1 ASIS Left Y Moment

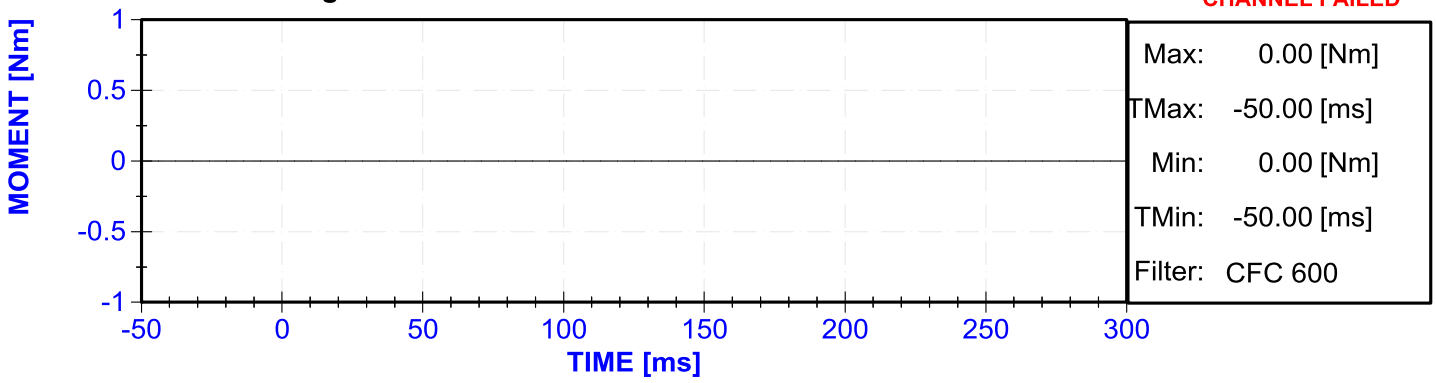


V2P1 ASIS Right X Force

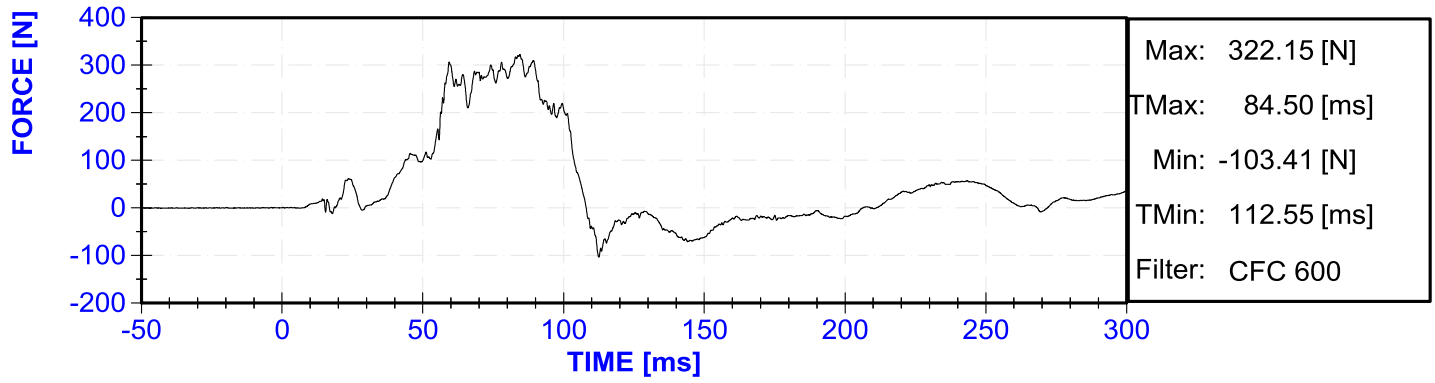


V2P1 ASIS Right Y Moment

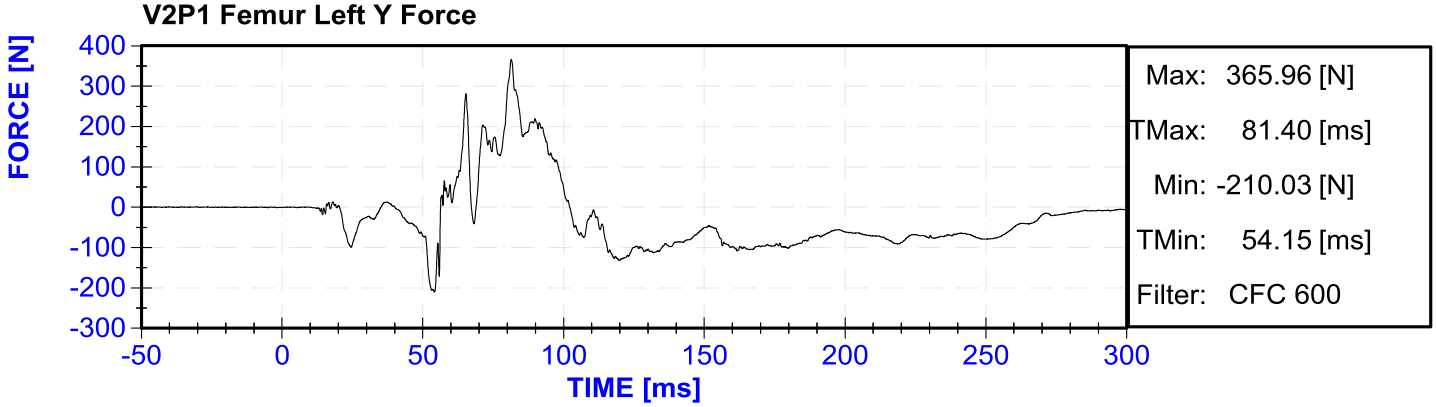
CHANNEL FAILED



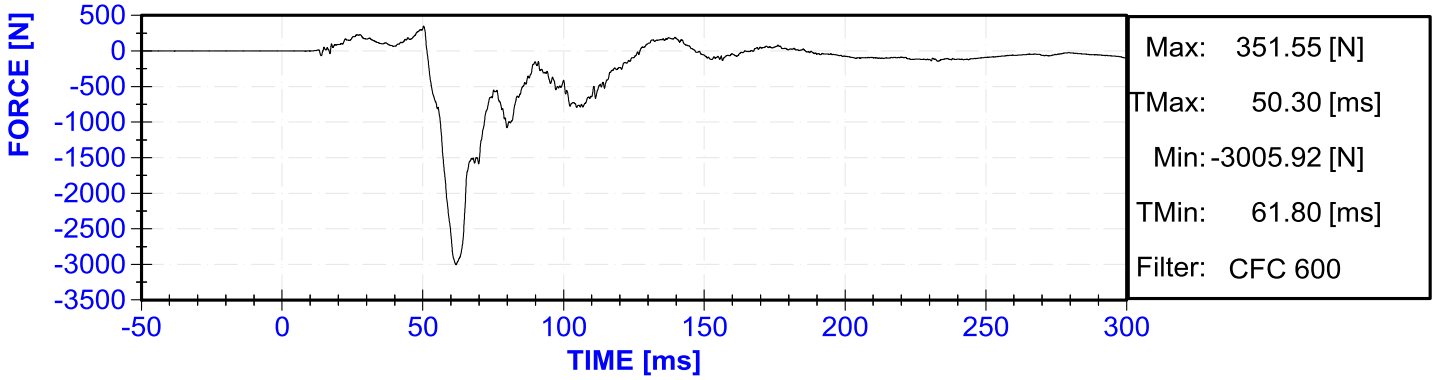
V2P1 Femur Left X Force



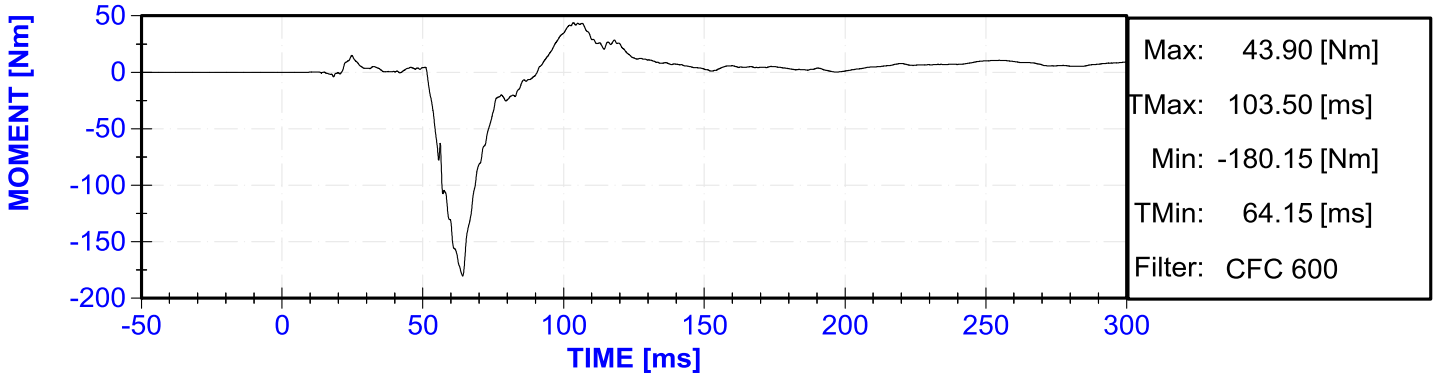
V2P1 Femur Left Y Force



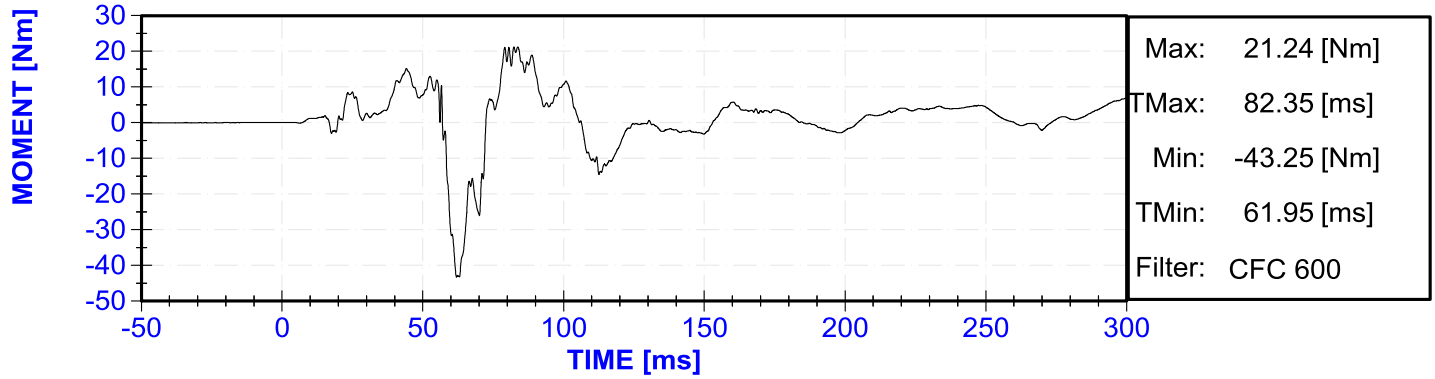
V2P1 Femur Left Z Force



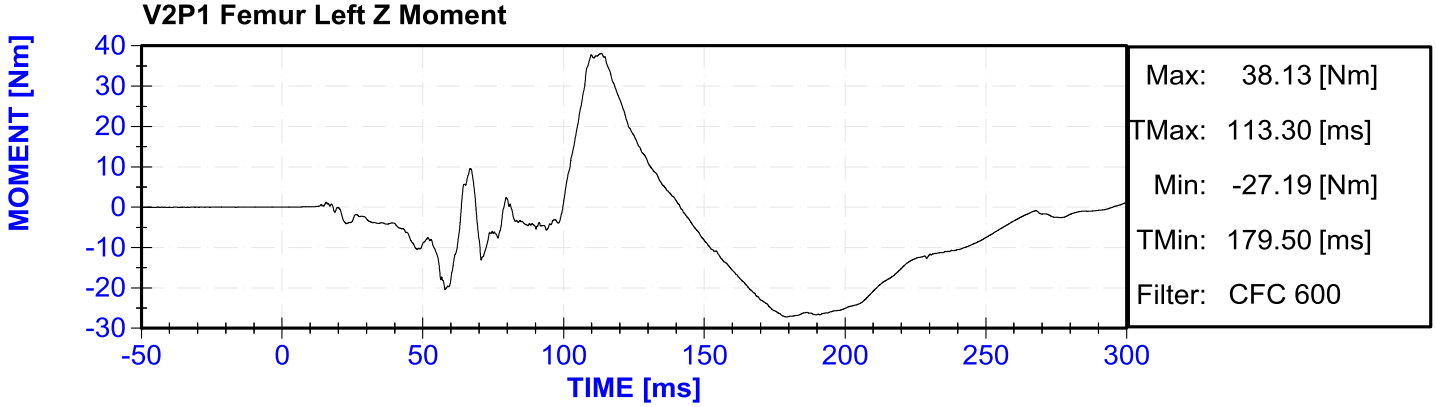
V2P1 Femur Left X Moment



V2P1 Femur Left Y Moment

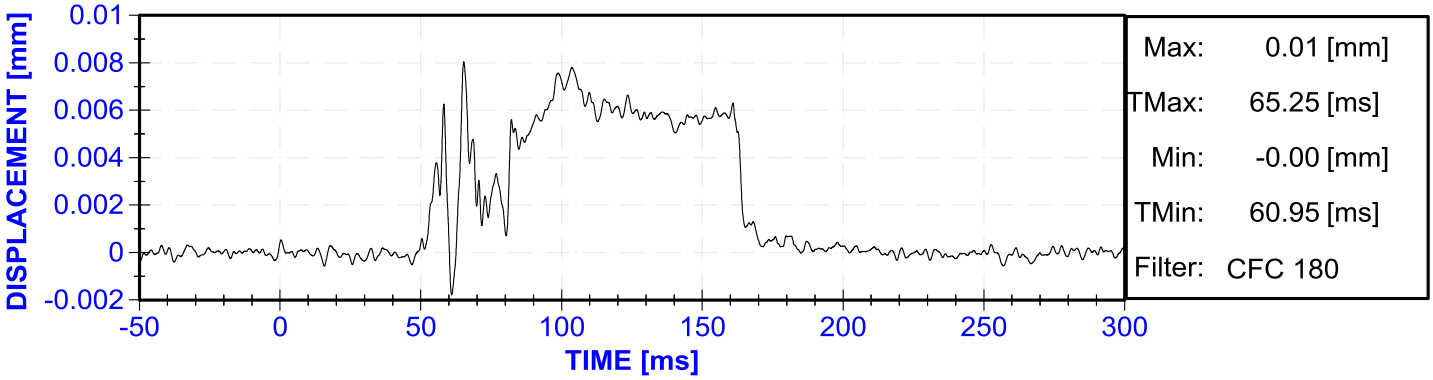


V2P1 Femur Left Z Moment

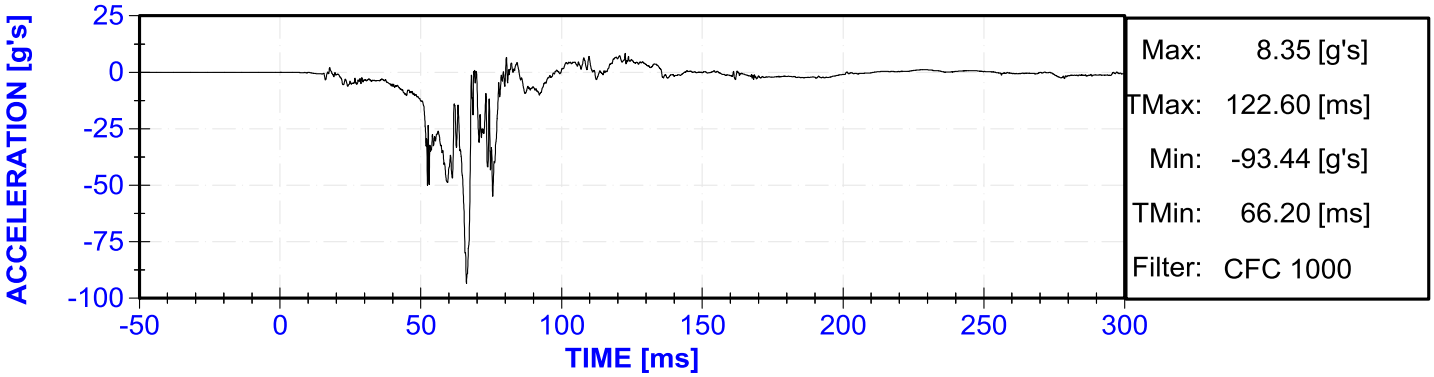


V2P1 Knee Left X Displacement

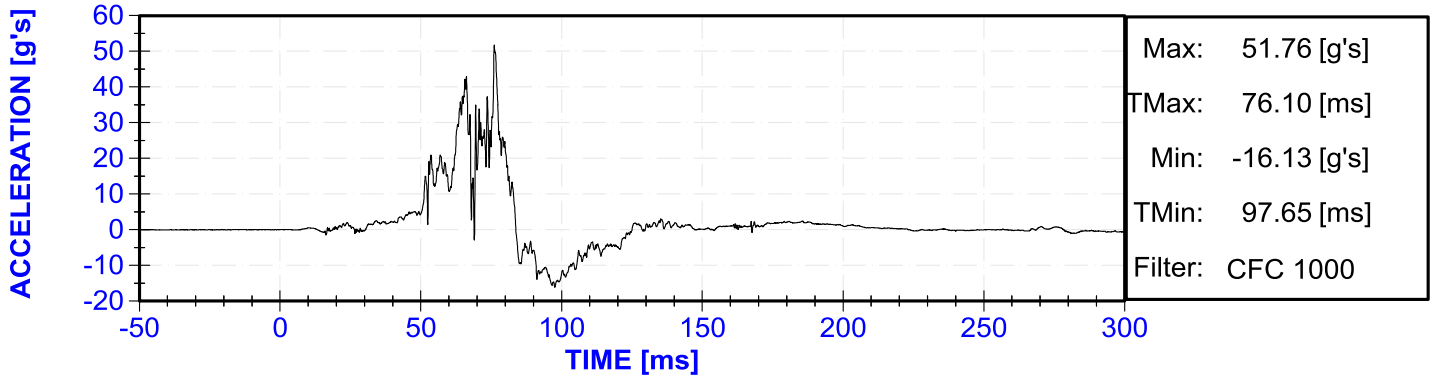
MAGNITUDE QUESTIONABLE



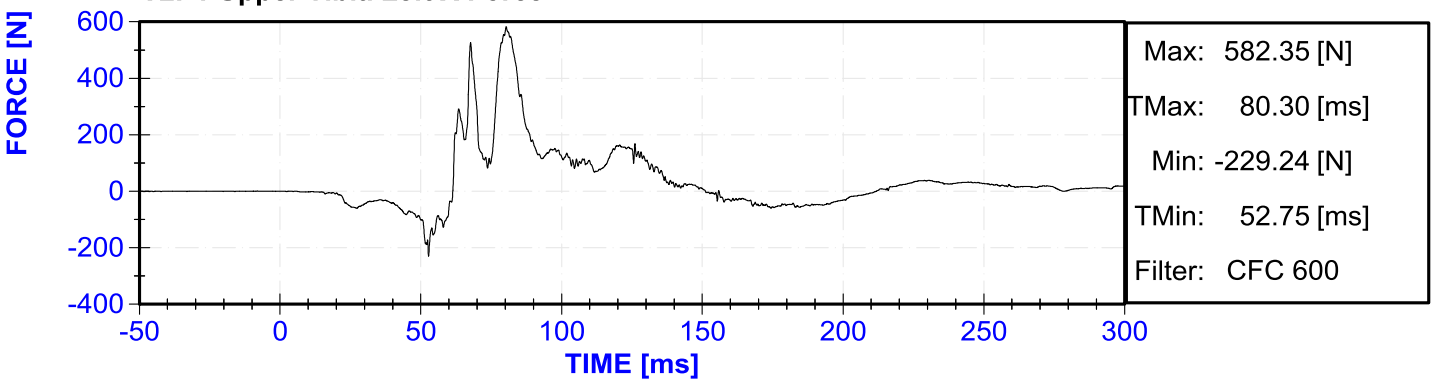
V2P1 Tibia Left X Acceleration



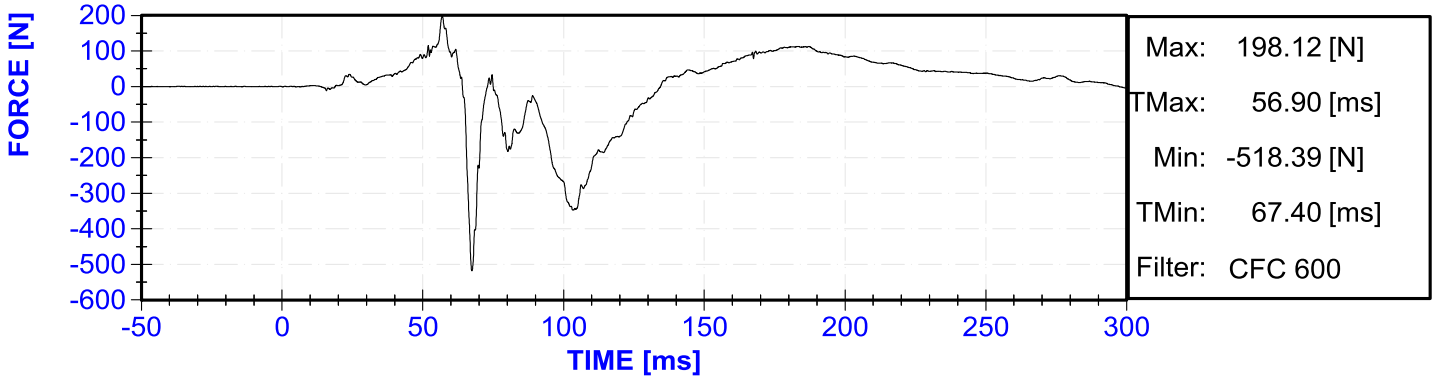
V2P1 Tibia Left Y Acceleration



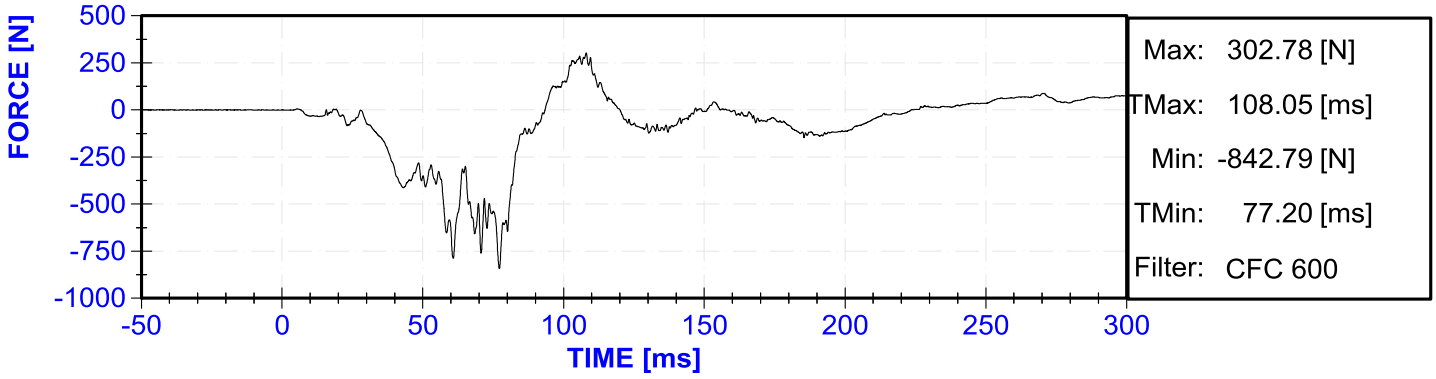
V2P1 Upper Tibia Left X Force



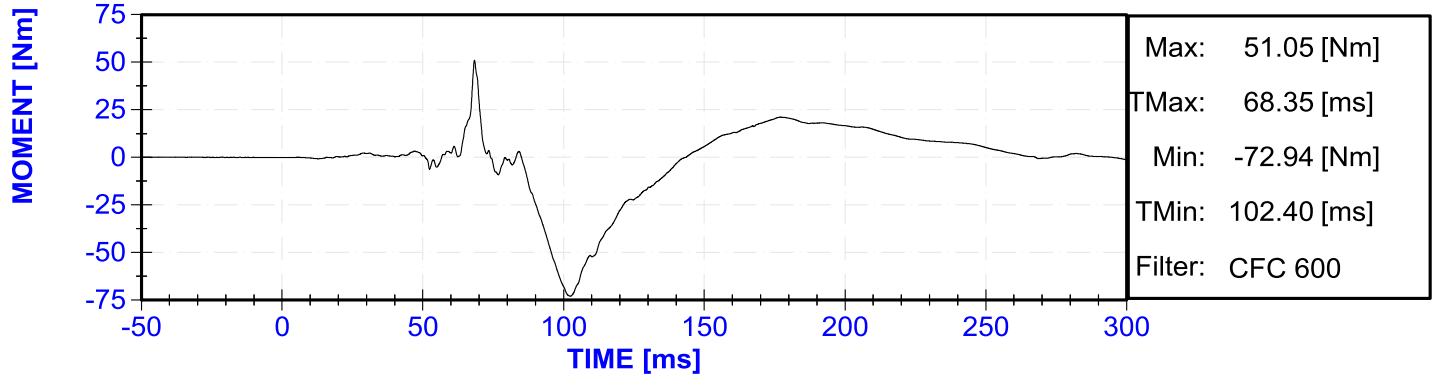
V2P1 Upper Tibia Left Y Force



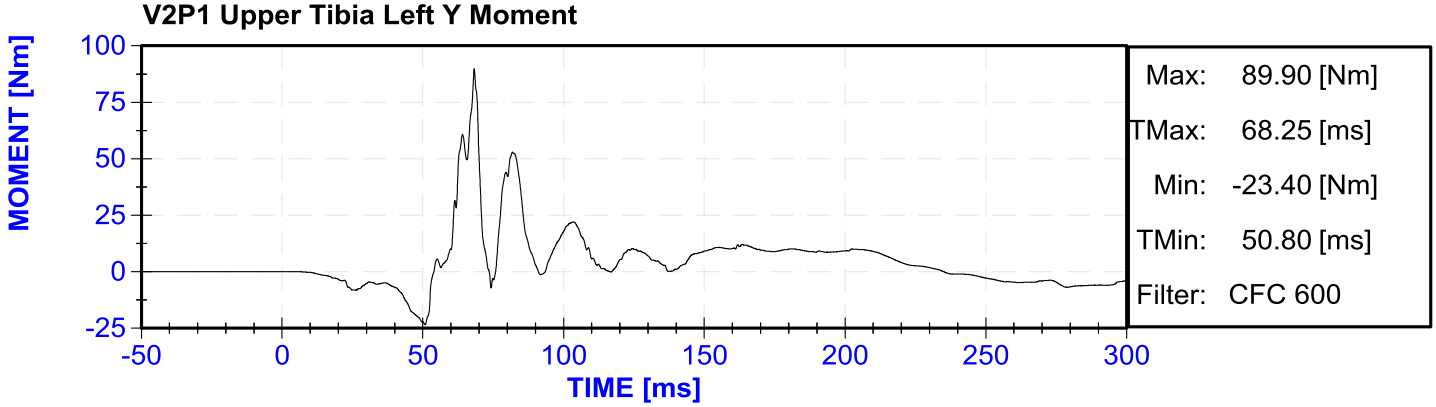
V2P1 Upper Tibia Left Z Force



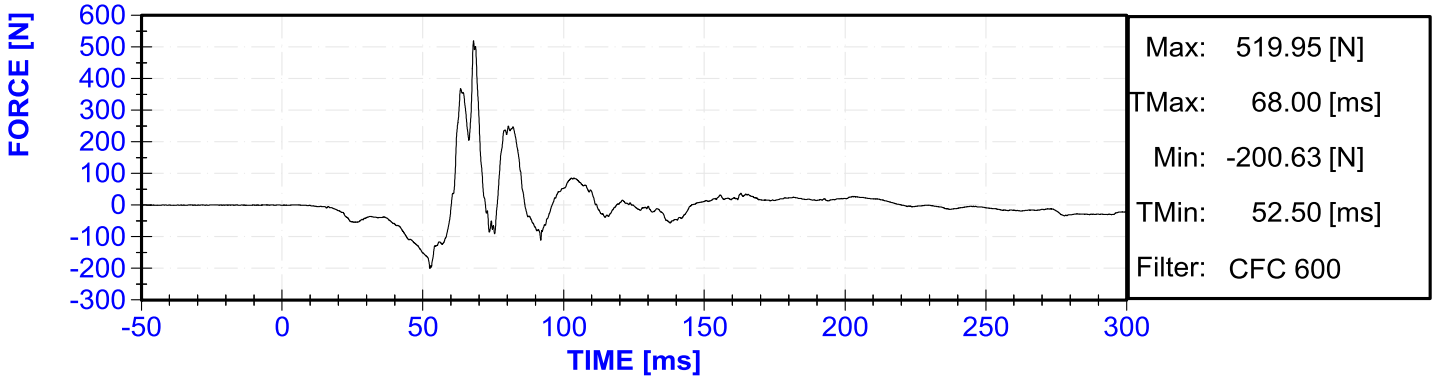
V2P1 Upper Tibia Left X Moment



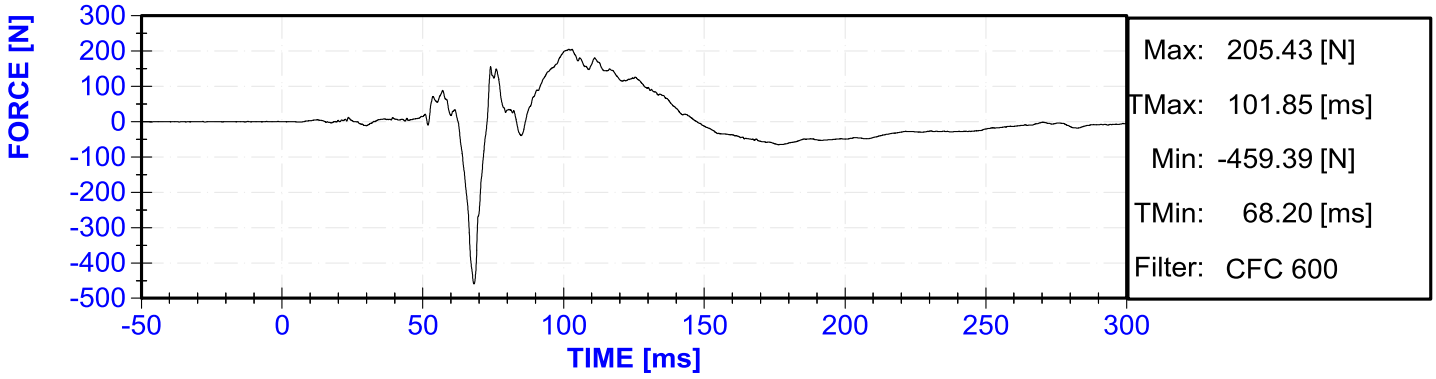
V2P1 Upper Tibia Left Y Moment



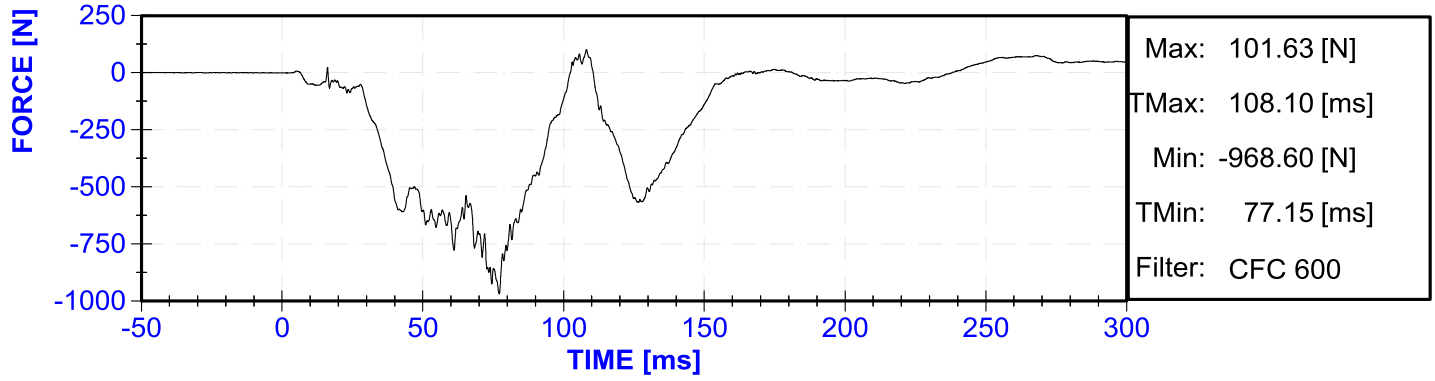
V2P1 Lower Tibia Left X Force



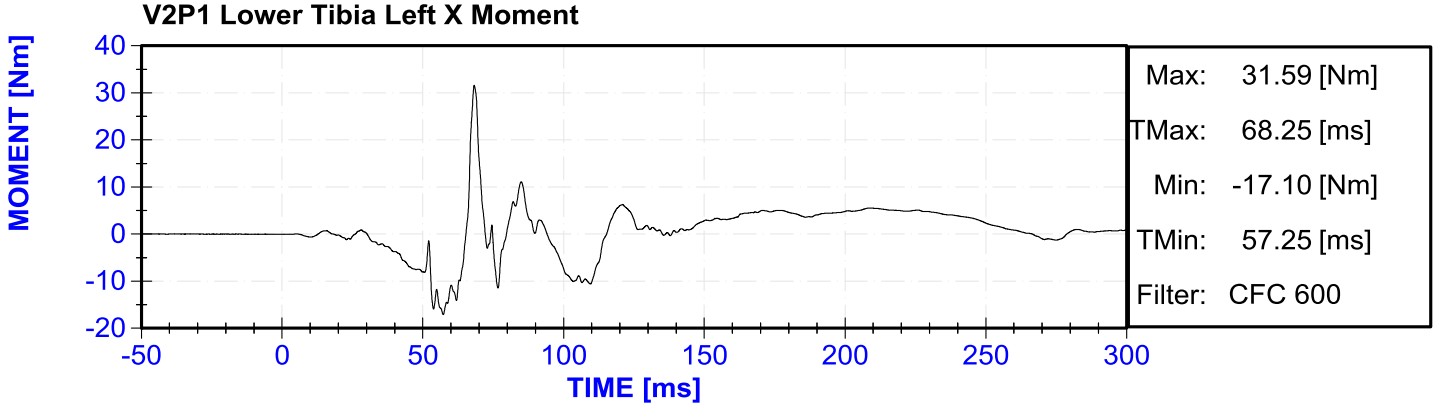
V2P1 Lower Tibia Left Y Force



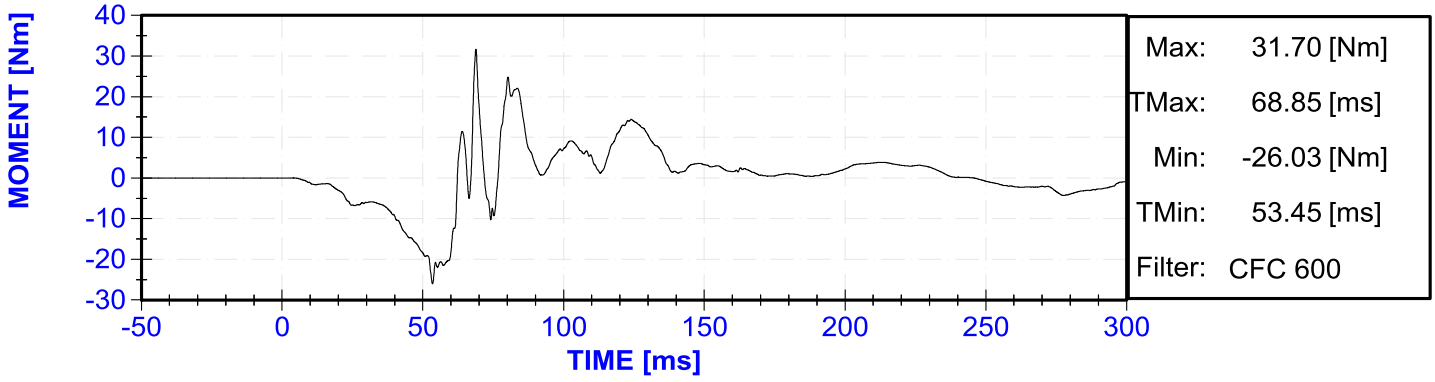
V2P1 Lower Tibia Left Z Force



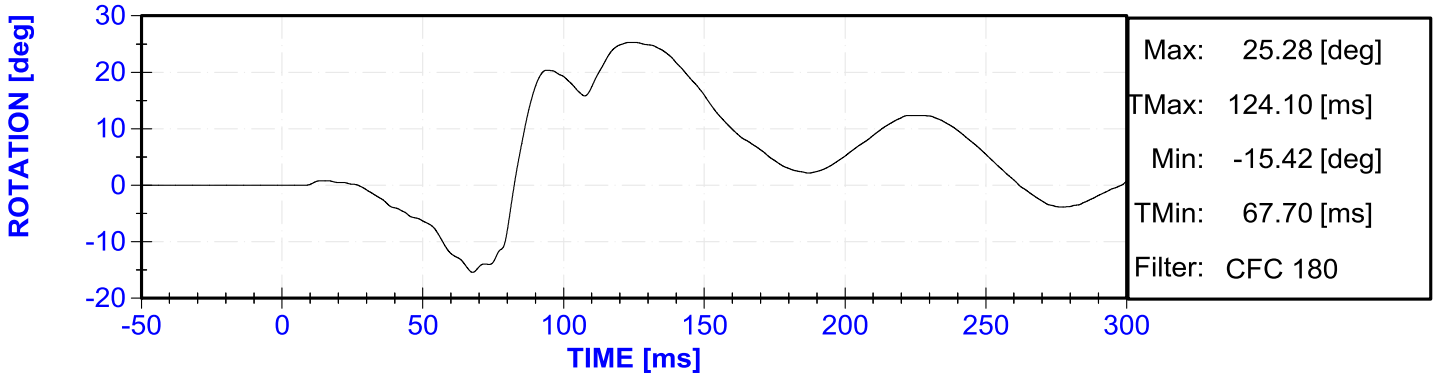
V2P1 Lower Tibia Left X Moment



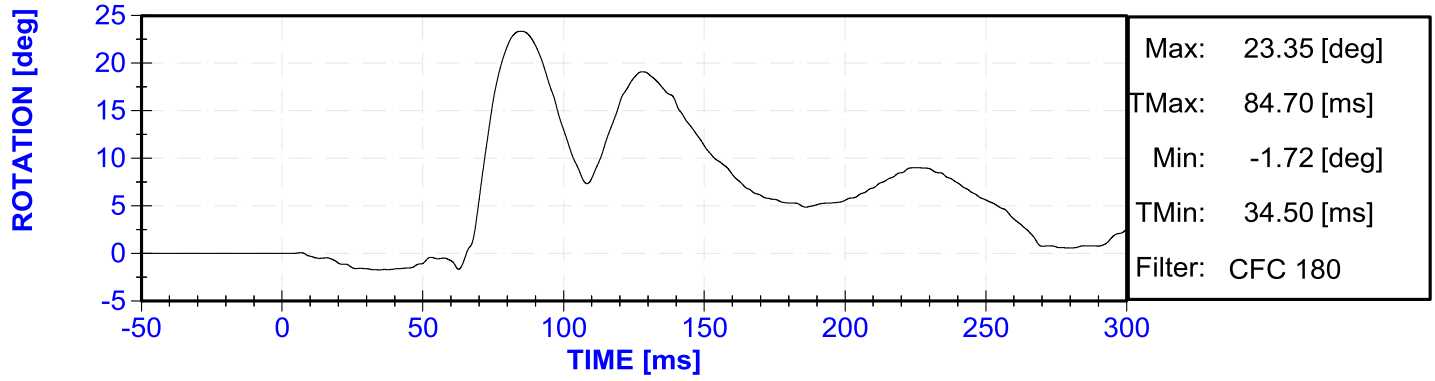
V2P1 Lower Tibia Left Y Moment



V2P1 Ankle Left X Rotation

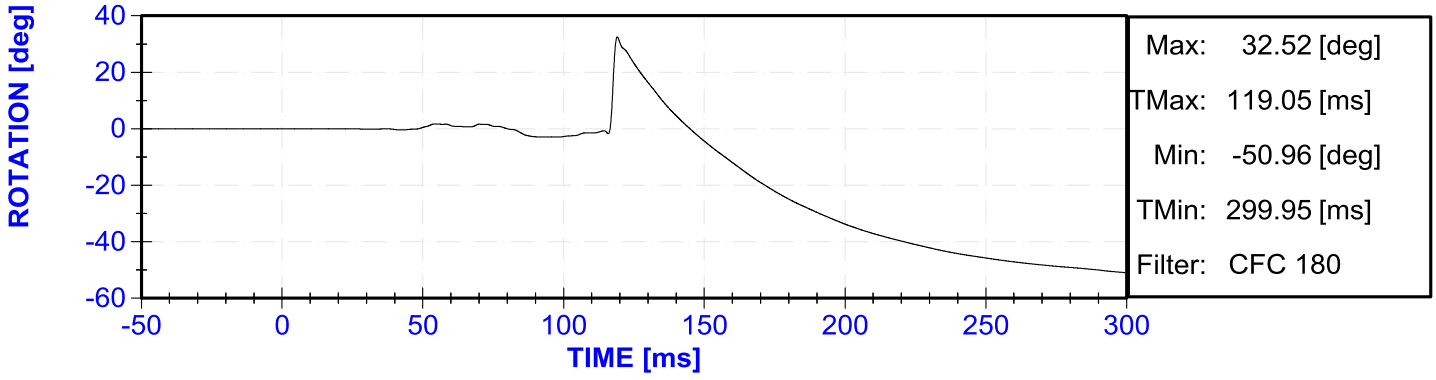


V2P1 Ankle Left Y Rotation

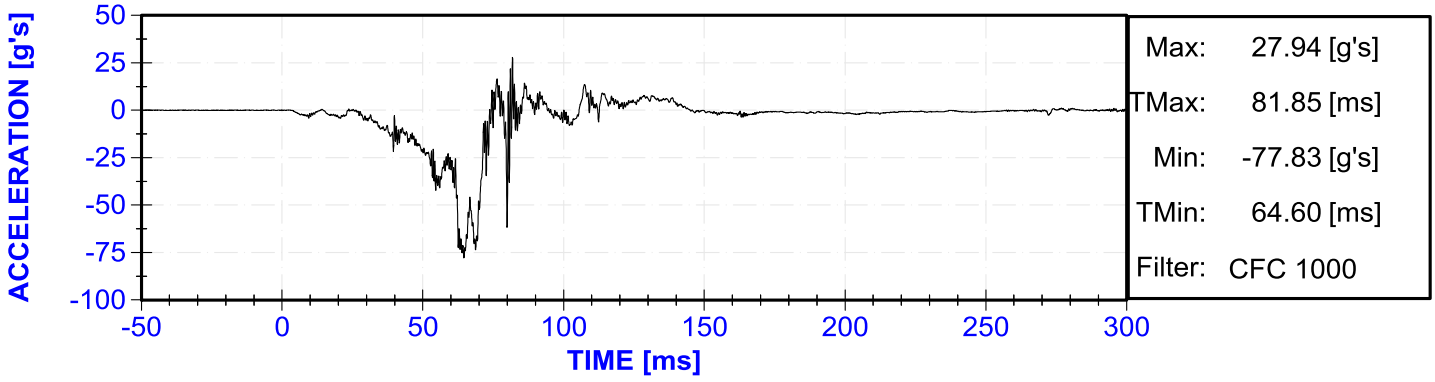


V2P1 Ankle Left Z Rotation

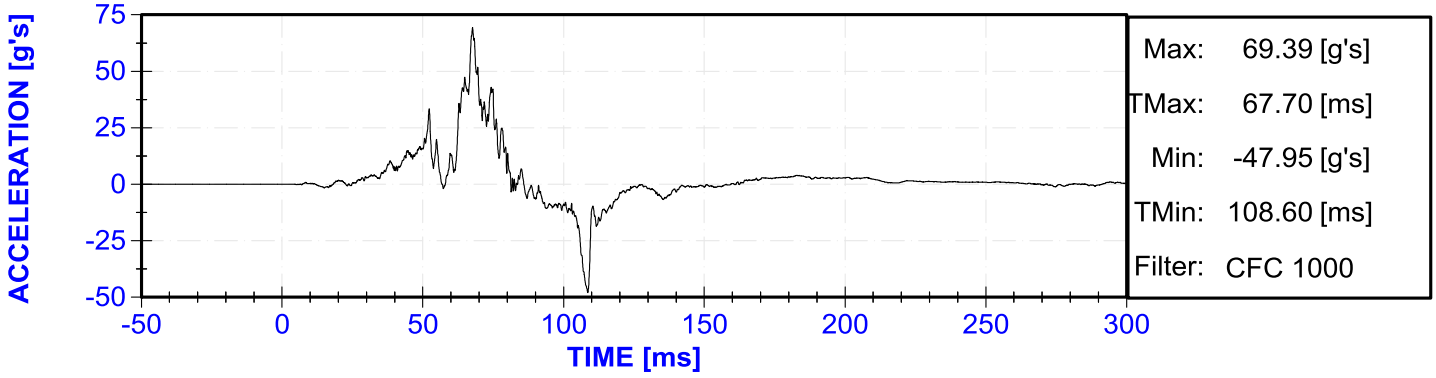
QUESTIONABLE AFTER 116 MS



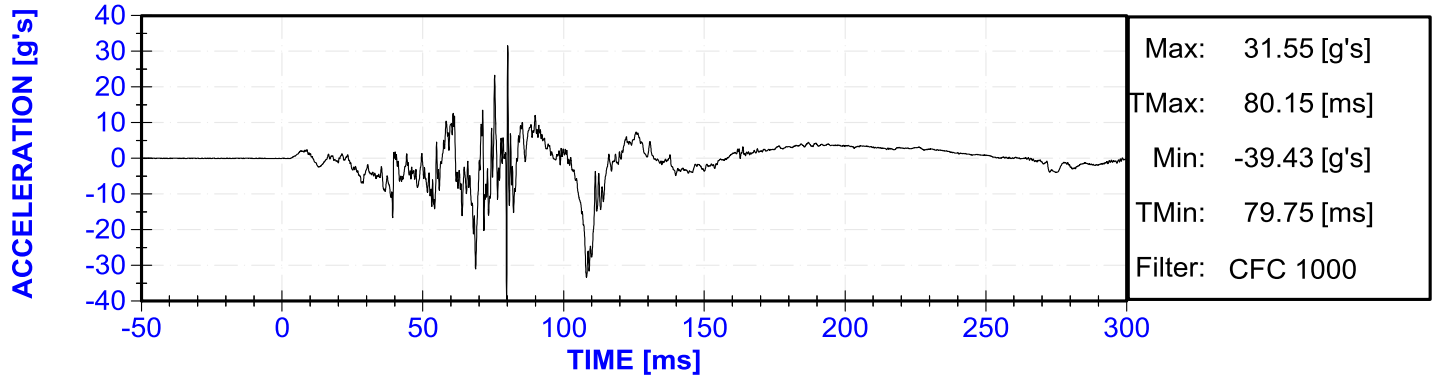
V2P1 Foot Left X Acceleration



V2P1 Foot Left Y Acceleration

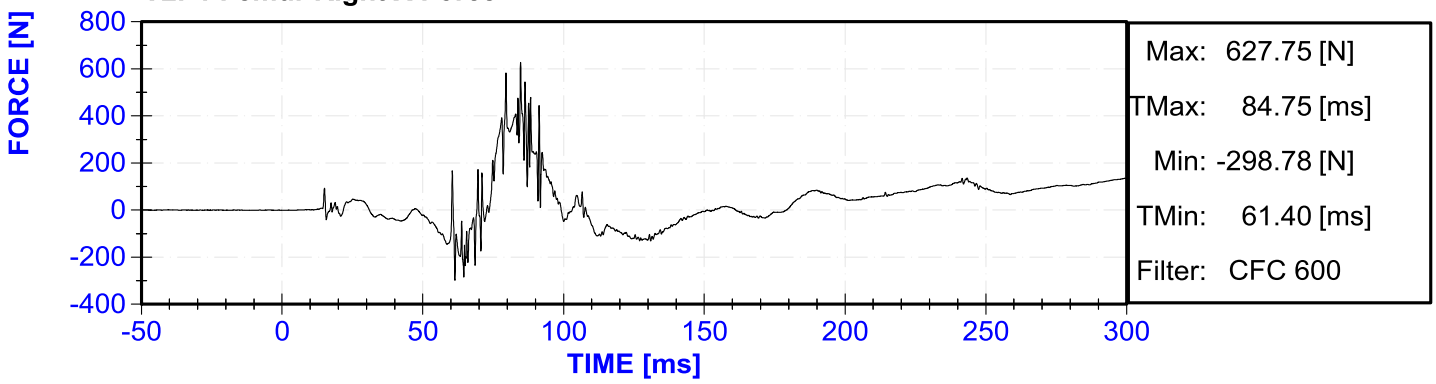


V2P1 Foot Left Z Acceleration



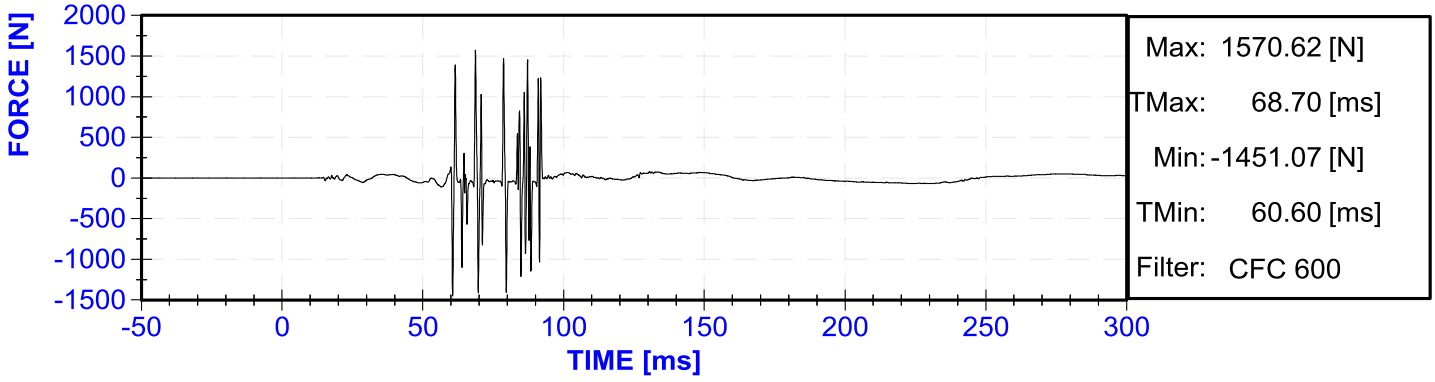
V2P1 Femur Right X Force

NOISE SPIKES 60 TO 92 MS



V2P1 Femur Right Y Force

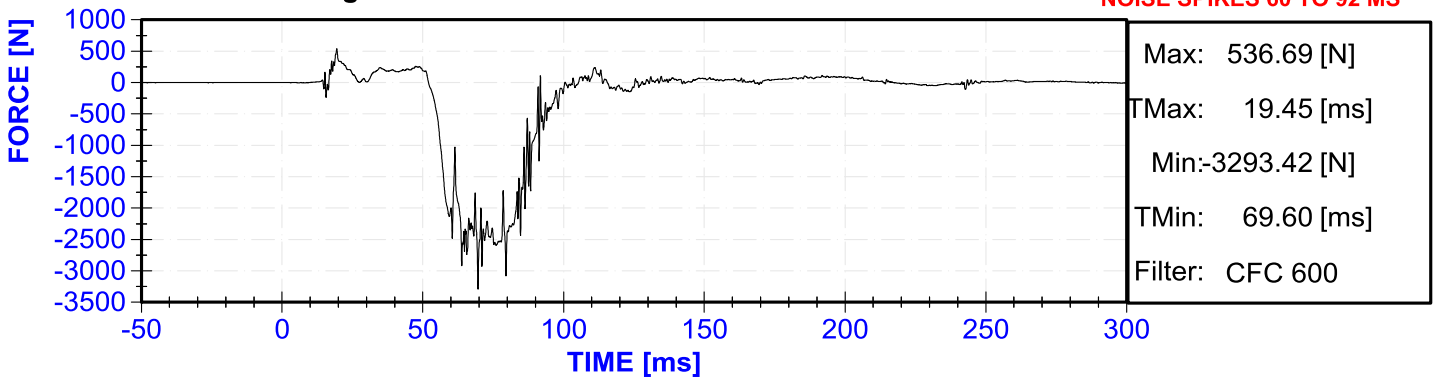
NOISE SPIKES 60 TO 92 MS



Max: 1570.62 [N]
TMax: 68.70 [ms]
Min: -1451.07 [N]
TMin: 60.60 [ms]
Filter: CFC 600

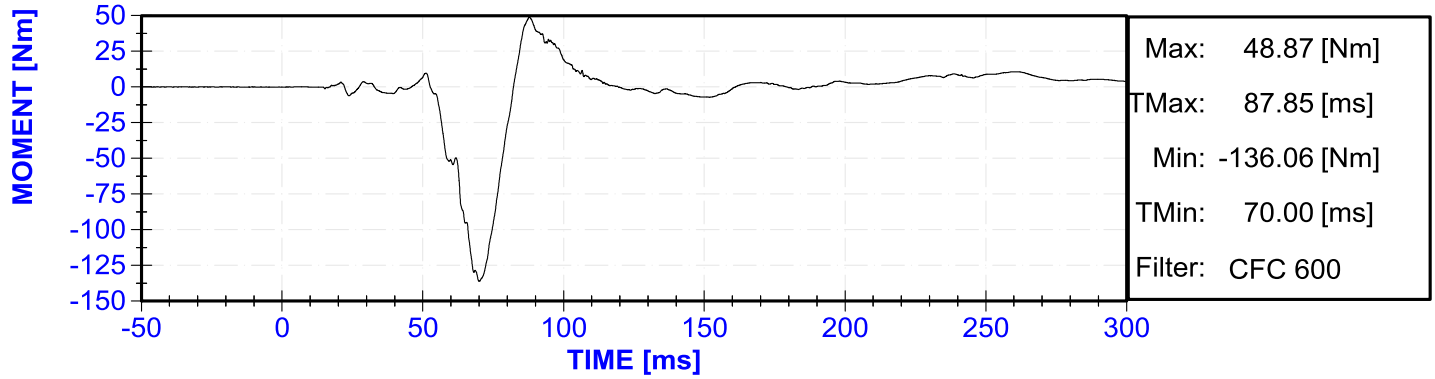
V2P1 Femur Right Z Force

NOISE SPIKES 60 TO 92 MS



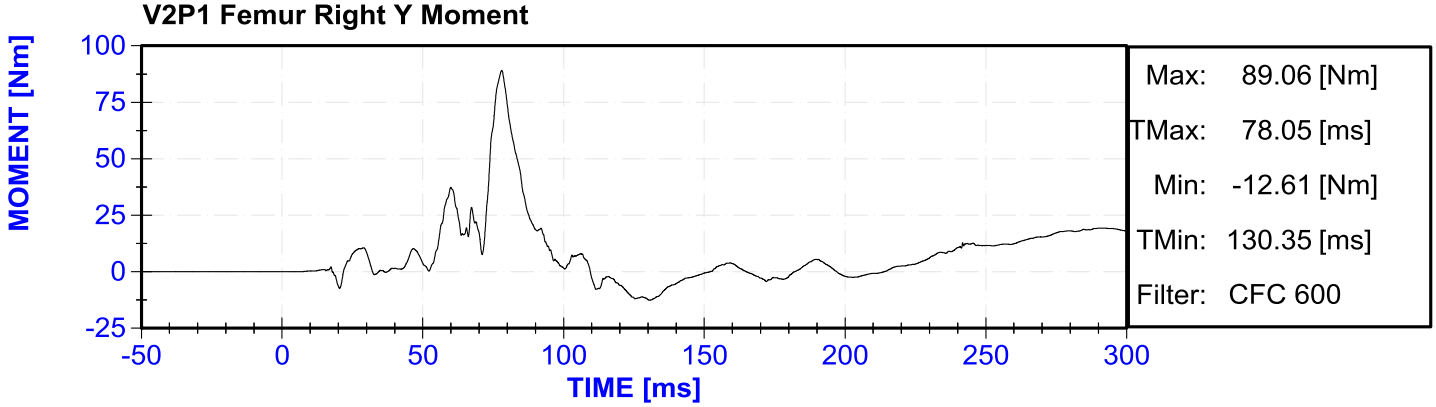
Max: 536.69 [N]
TMax: 19.45 [ms]
Min: -3293.42 [N]
TMin: 69.60 [ms]
Filter: CFC 600

V2P1 Femur Right X Moment



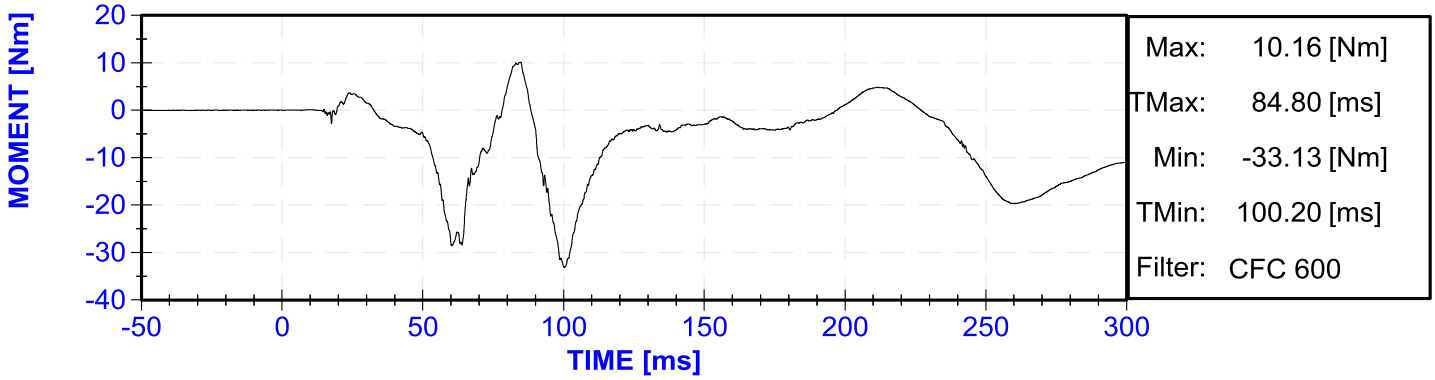
Max: 48.87 [Nm]
TMax: 87.85 [ms]
Min: -136.06 [Nm]
TMin: 70.00 [ms]
Filter: CFC 600

V2P1 Femur Right Y Moment

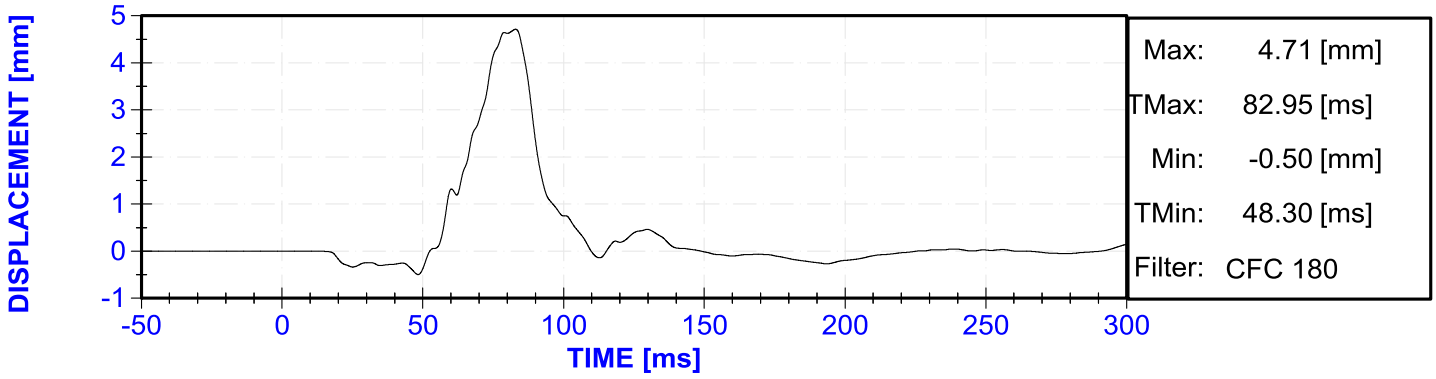


Max: 89.06 [Nm]
TMax: 78.05 [ms]
Min: -12.61 [Nm]
TMin: 130.35 [ms]
Filter: CFC 600

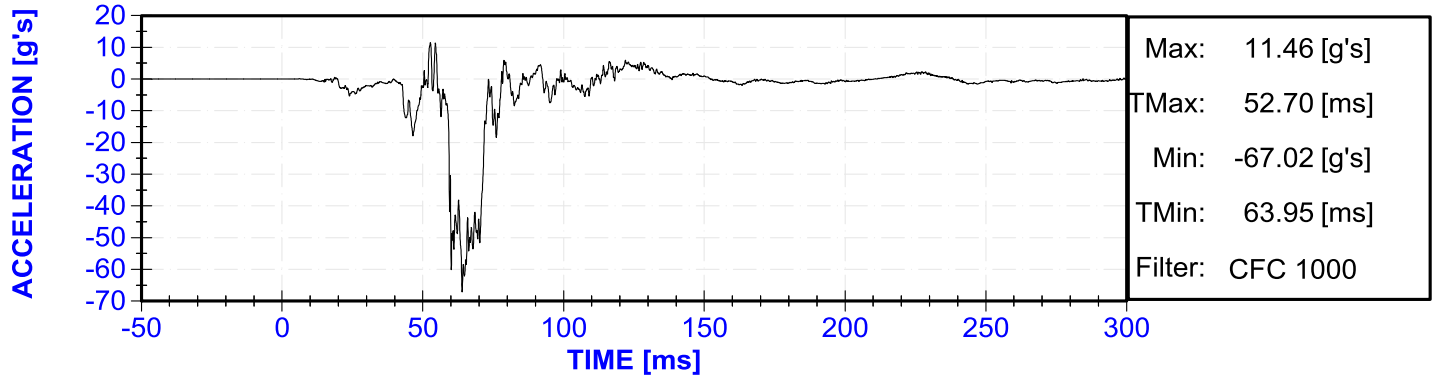
V2P1 Femur Right Z Moment



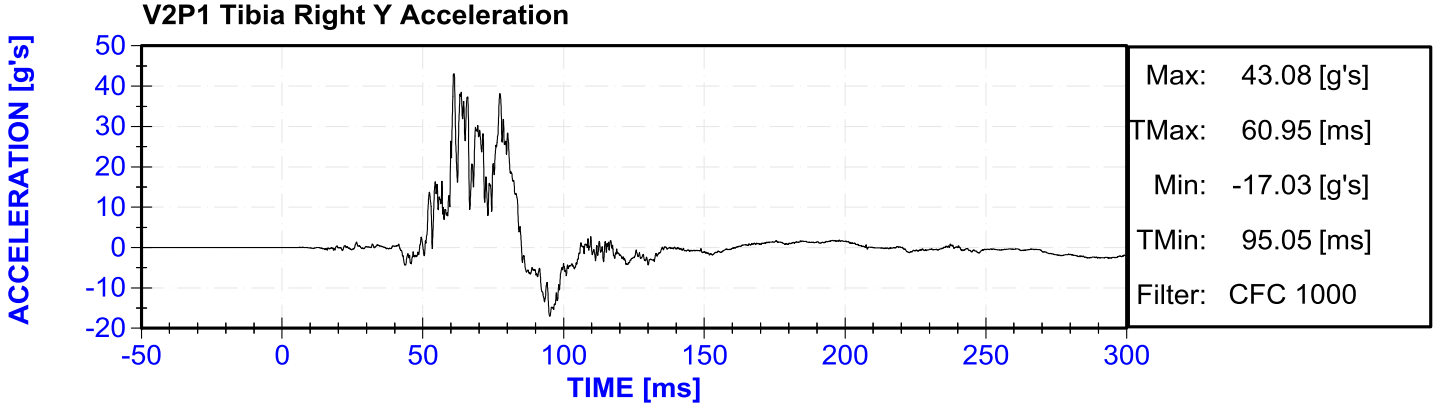
V2P1 Knee Right X Displacement

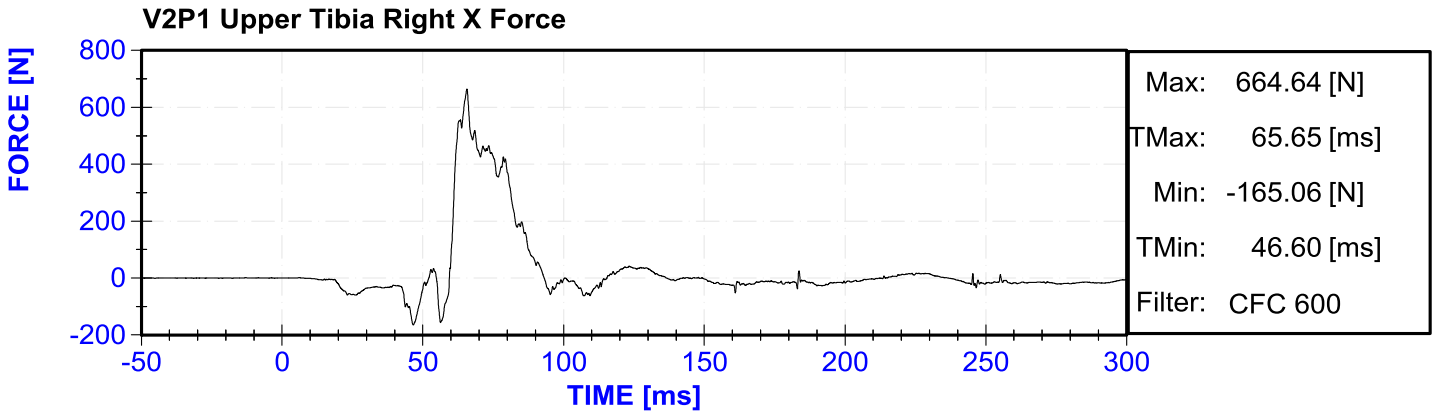


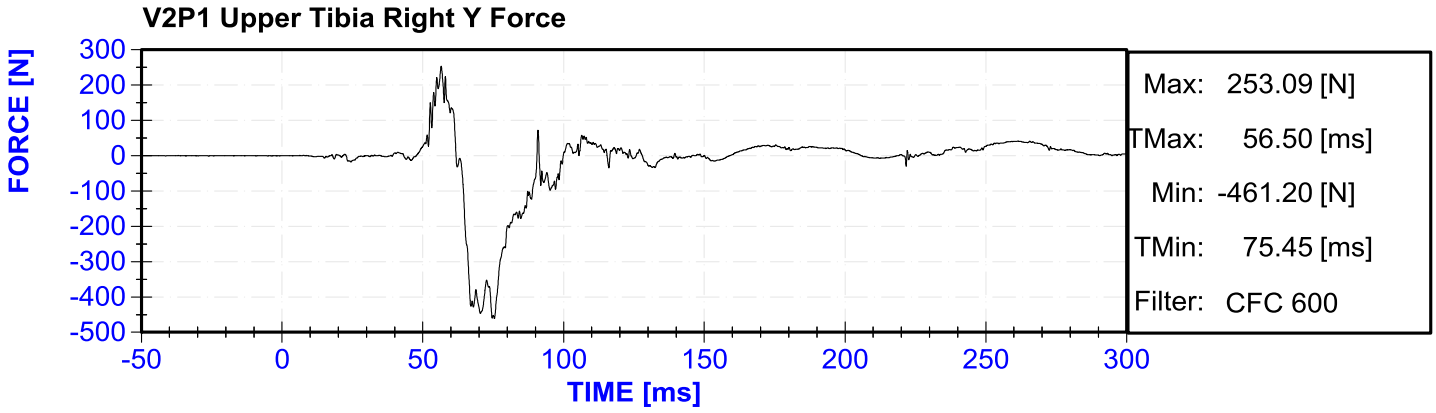
V2P1 Tibia Right X Acceleration

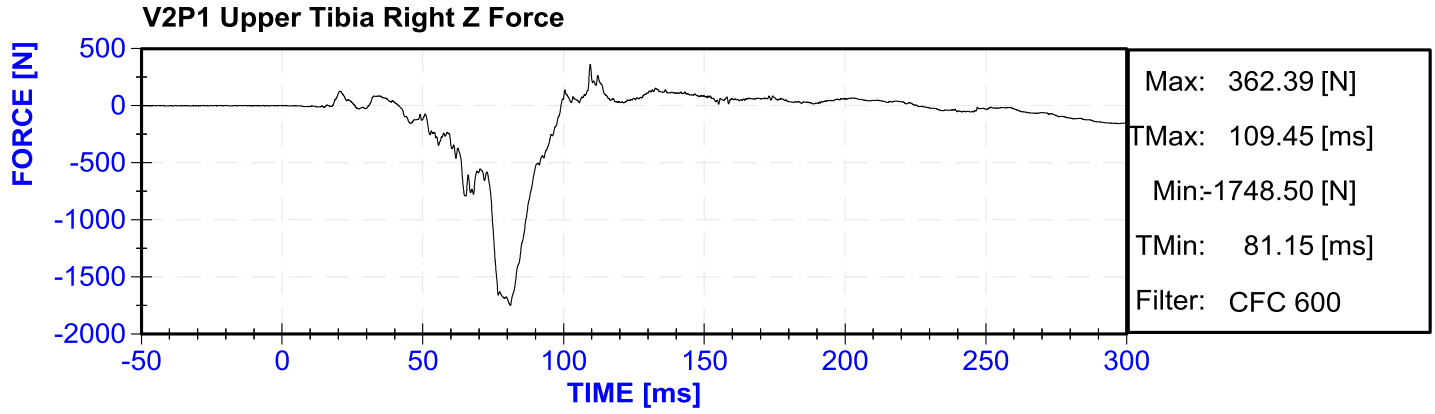


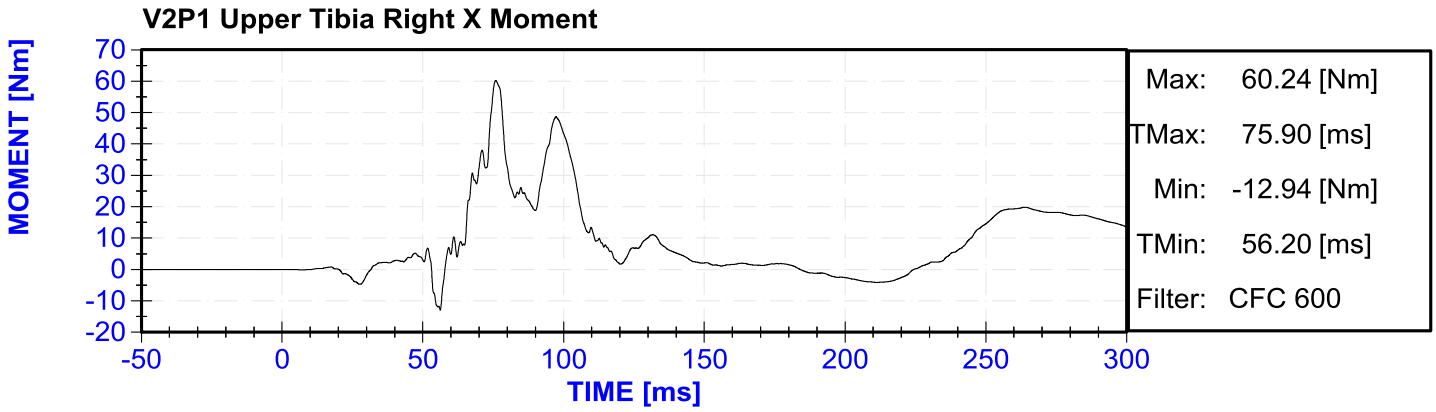
V2P1 Tibia Right Y Acceleration




V2P1 Upper Tibia Right X Force
FORCE [N]
800
600
400
200
0
-200
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 664.64 [N]
TMax: 65.65 [ms]
Min: -165.06 [N]
TMin: 46.60 [ms]
Filter: CFC 600

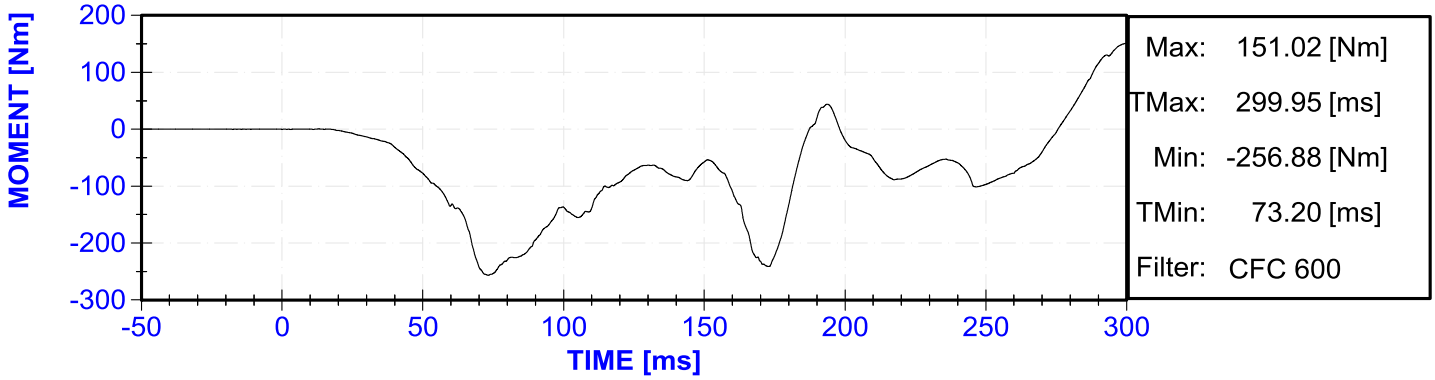

V2P1 Upper Tibia Right Y Force
FORCE [N]
300
200
100
0
-100
-200
-300
-400
-500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 253.09 [N]
TMax: 56.50 [ms]
Min: -461.20 [N]
TMin: 75.45 [ms]
Filter: CFC 600


V2P1 Upper Tibia Right Z Force
FORCE [N]
500
0
-500
-1000
-1500
-2000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 362.39 [N]
TMax: 109.45 [ms]
Min:-1748.50 [N]
TMin: 81.15 [ms]
Filter: CFC 600


V2P1 Upper Tibia Right X Moment
MOMENT [Nm]
70
60
50
40
30
20
10
0
-10
-20
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 60.24 [Nm]
TMax: 75.90 [ms]
Min: -12.94 [Nm]
TMin: 56.20 [ms]
Filter: CFC 600

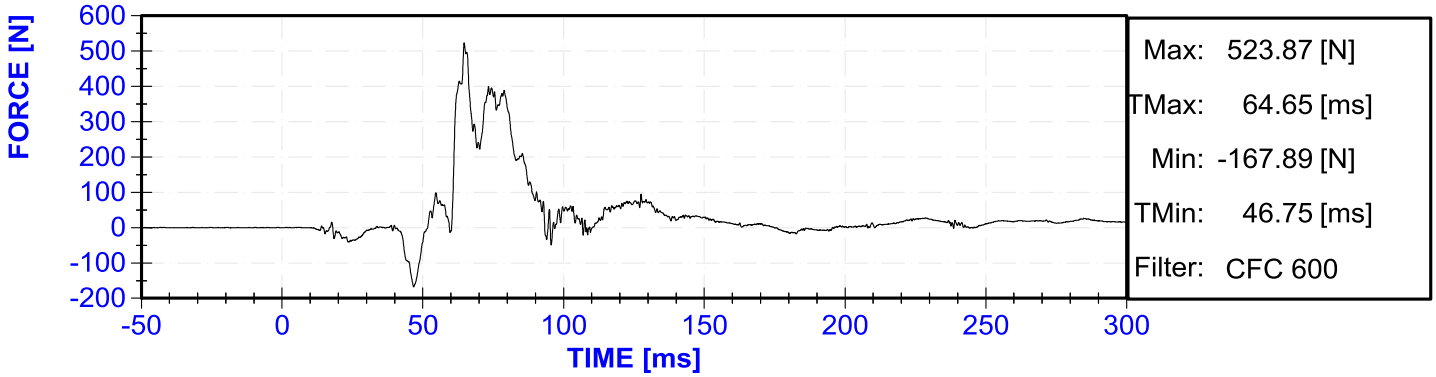
V2P1 Upper Tibia Right Y Moment

QUESTIONABLE DATA



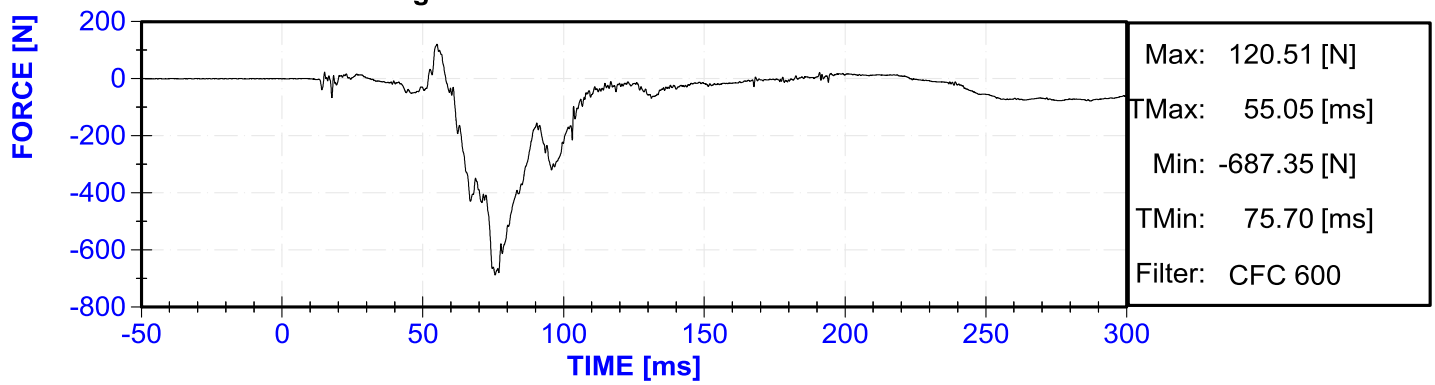
Max:	151.02 [Nm]
TMax:	299.95 [ms]
Min:	-256.88 [Nm]
TMin:	73.20 [ms]
Filter:	CFC 600

V2P1 Lower Tibia Right X Force



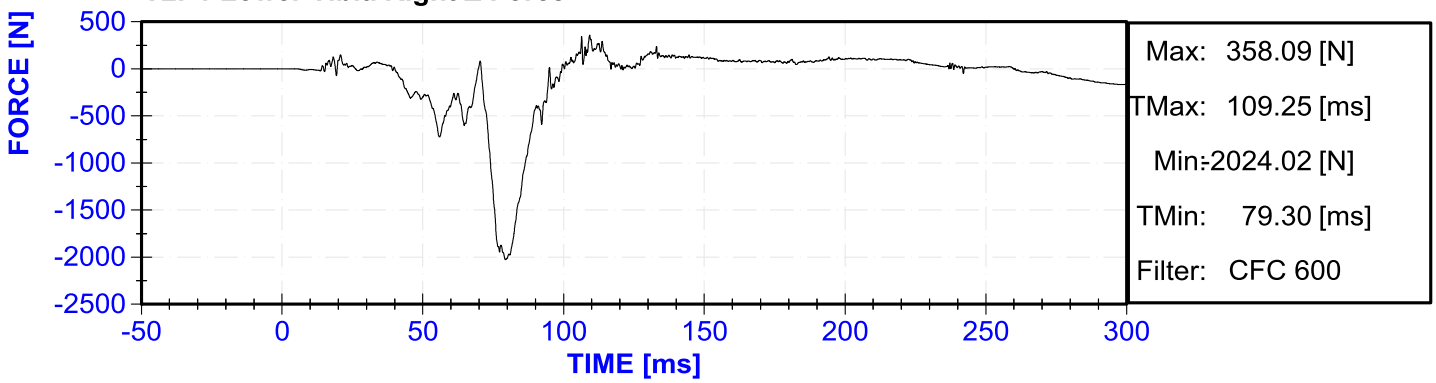
Max:	523.87 [N]
TMax:	64.65 [ms]
Min:	-167.89 [N]
TMin:	46.75 [ms]
Filter:	CFC 600

V2P1 Lower Tibia Right Y Force



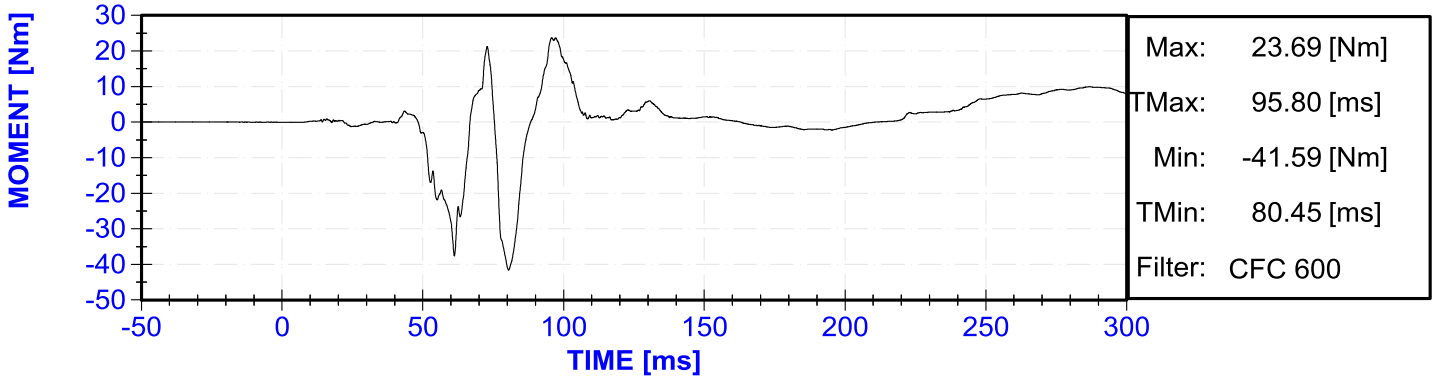
Max:	120.51 [N]
TMax:	55.05 [ms]
Min:	-687.35 [N]
TMin:	75.70 [ms]
Filter:	CFC 600

V2P1 Lower Tibia Right Z Force

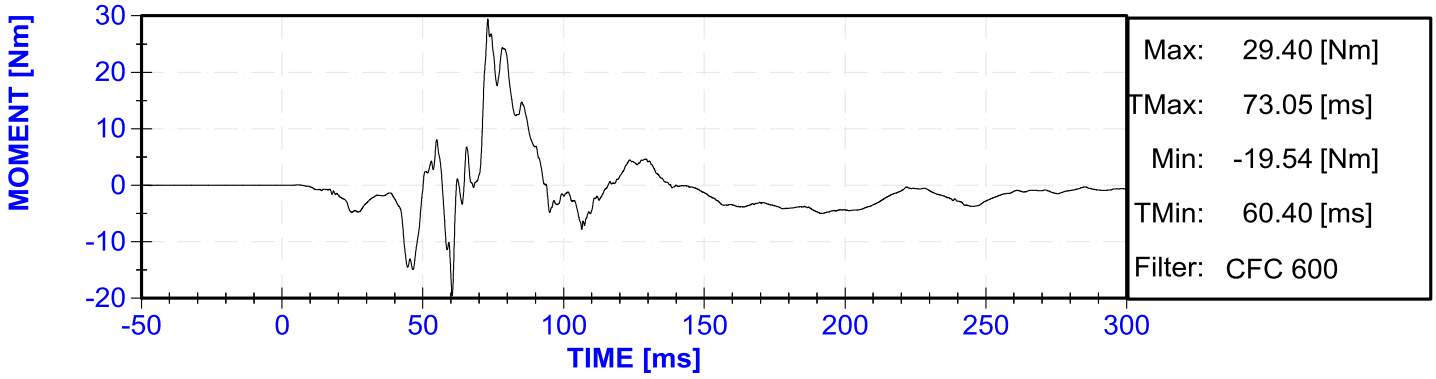


Max:	358.09 [N]
TMax:	109.25 [ms]
Min:	-2024.02 [N]
TMin:	79.30 [ms]
Filter:	CFC 600

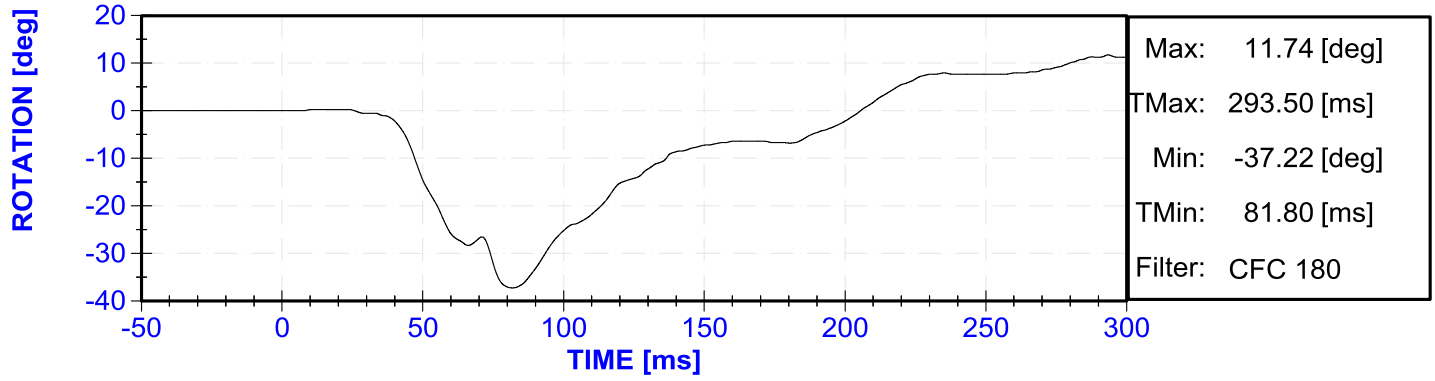
V2P1 Lower Tibia Right X Moment



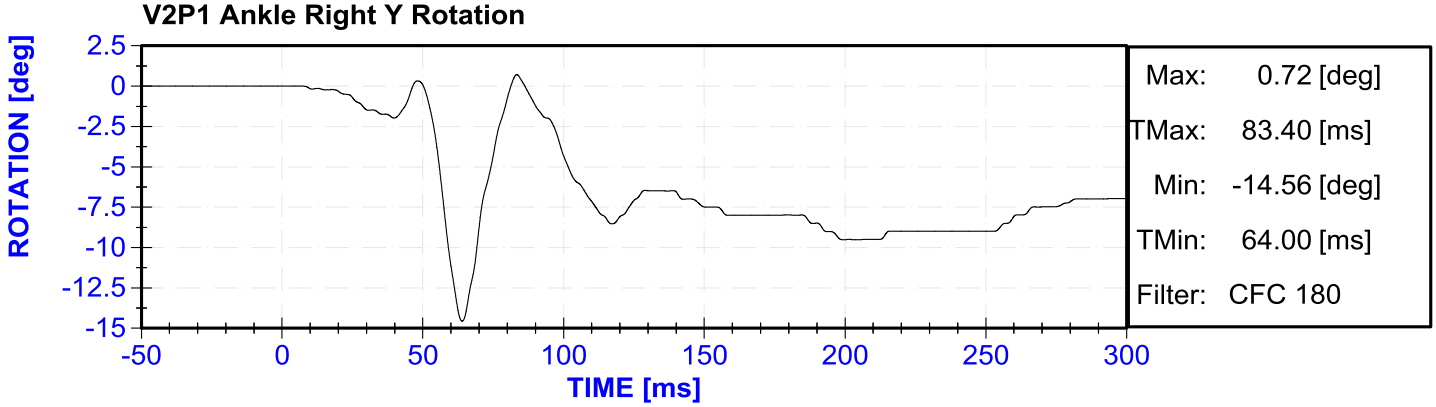
V2P1 Lower Tibia Right Y Moment



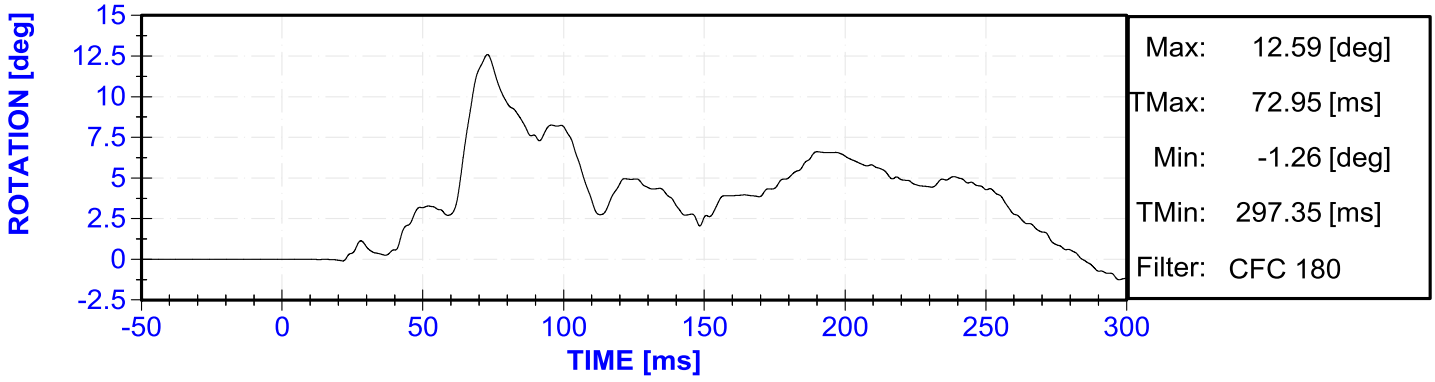
V2P1 Ankle Right X Rotation



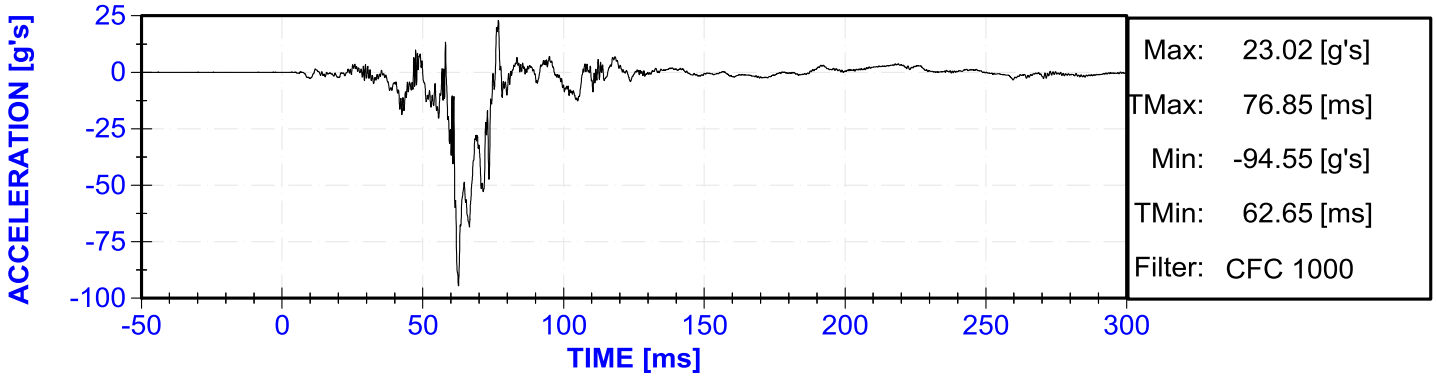
V2P1 Ankle Right Y Rotation



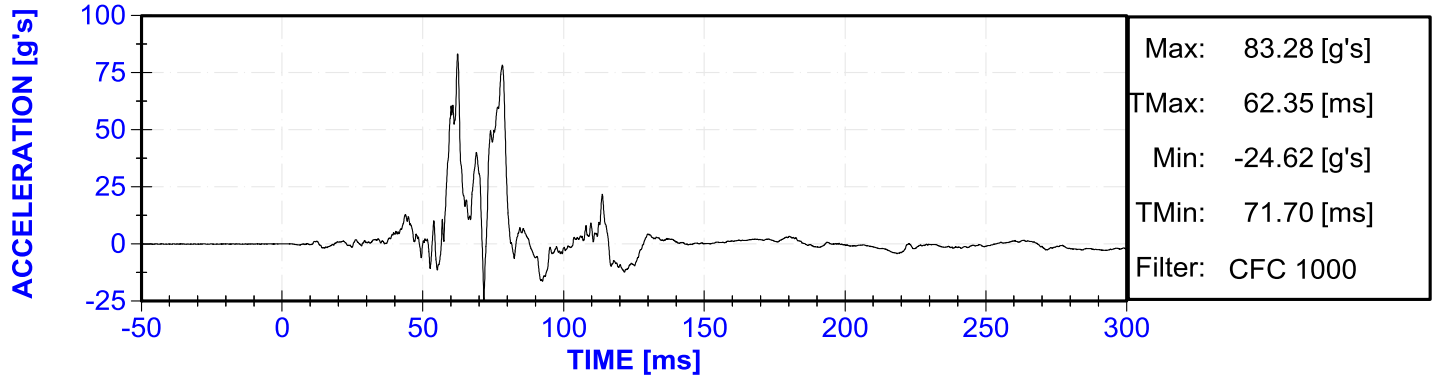
V2P1 Ankle Right Z Rotation



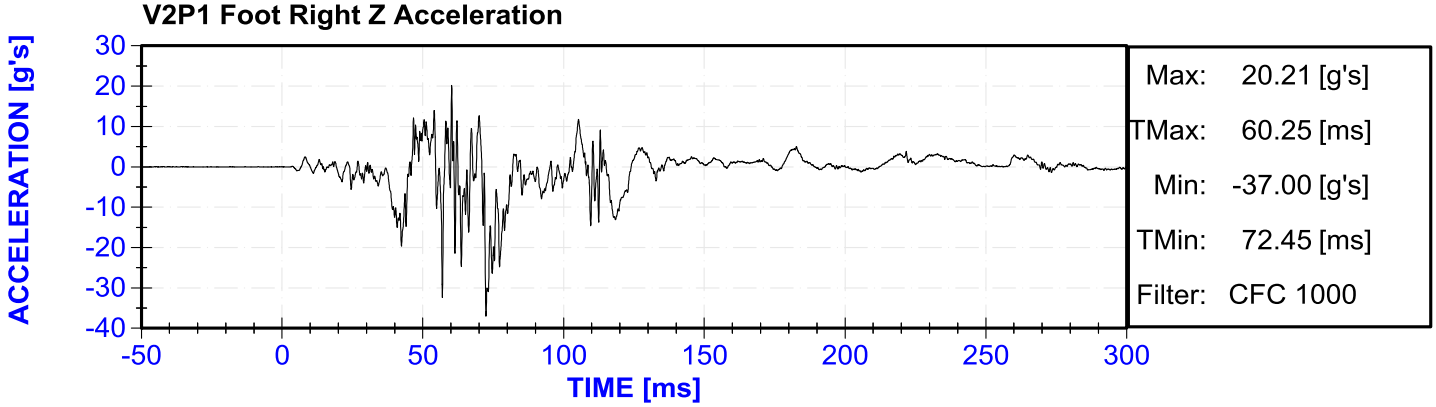
V2P1 Foot Right X Acceleration



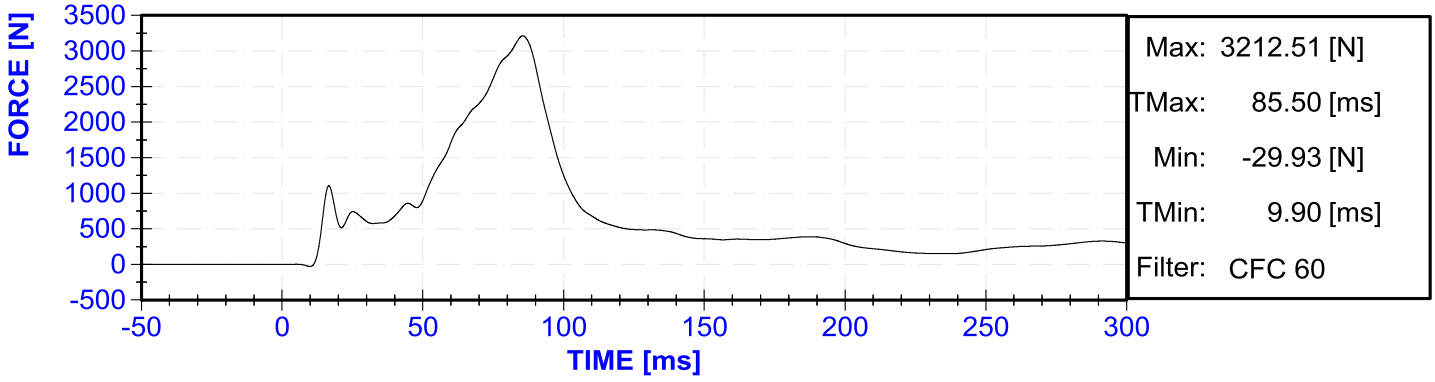
V2P1 Foot Right Y Acceleration



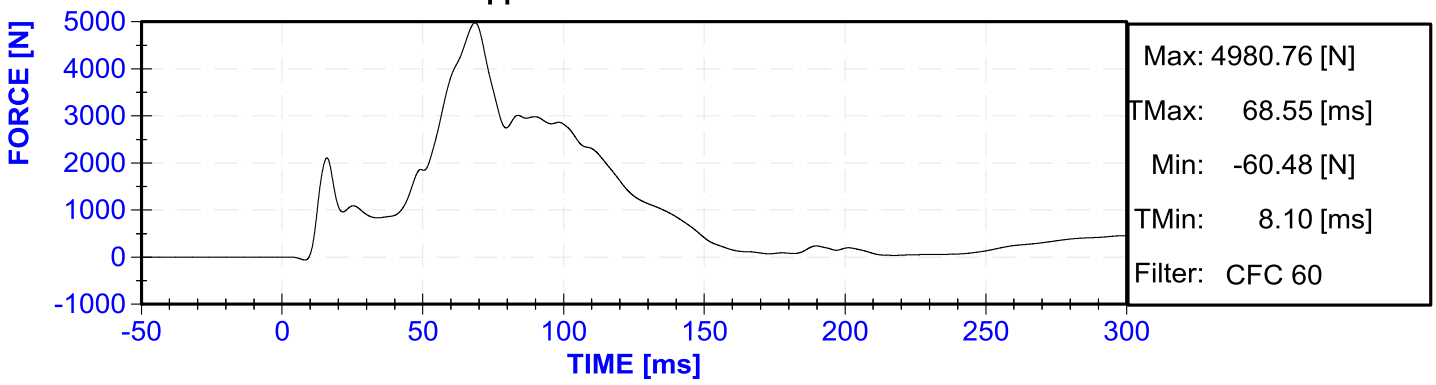
V2P1 Foot Right Z Acceleration



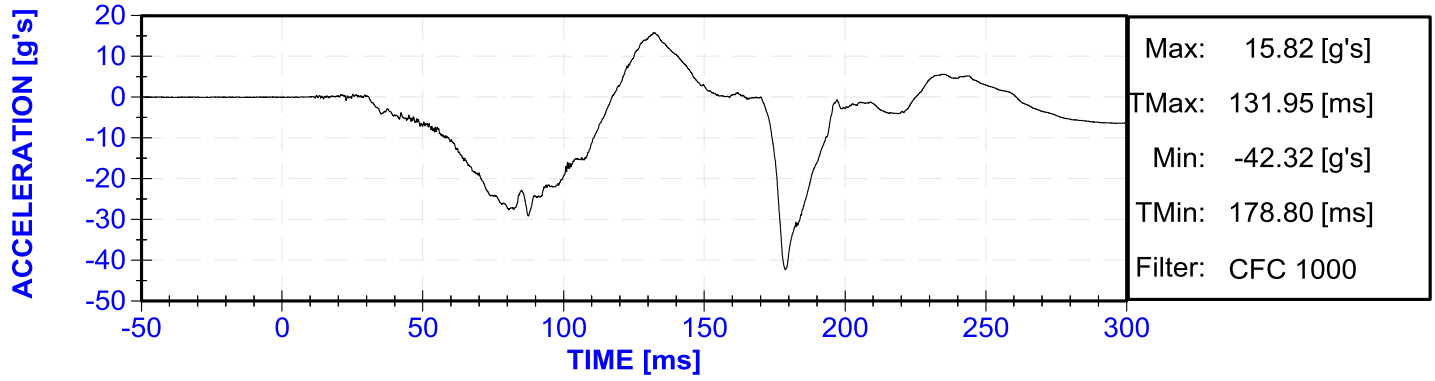
V2 Driver Lap Belt Force



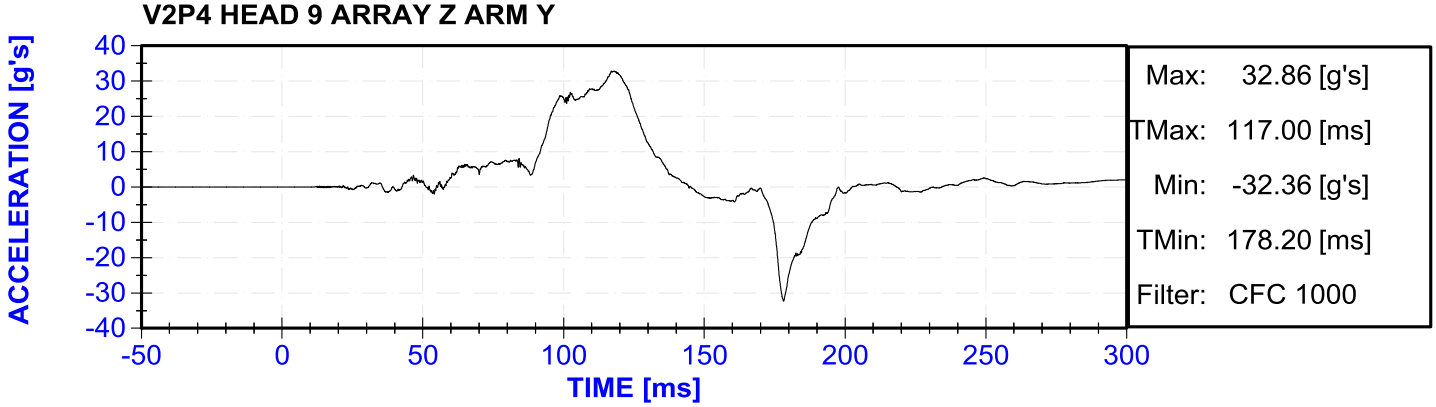
V2 Driver Shoulder Belt Upper Force



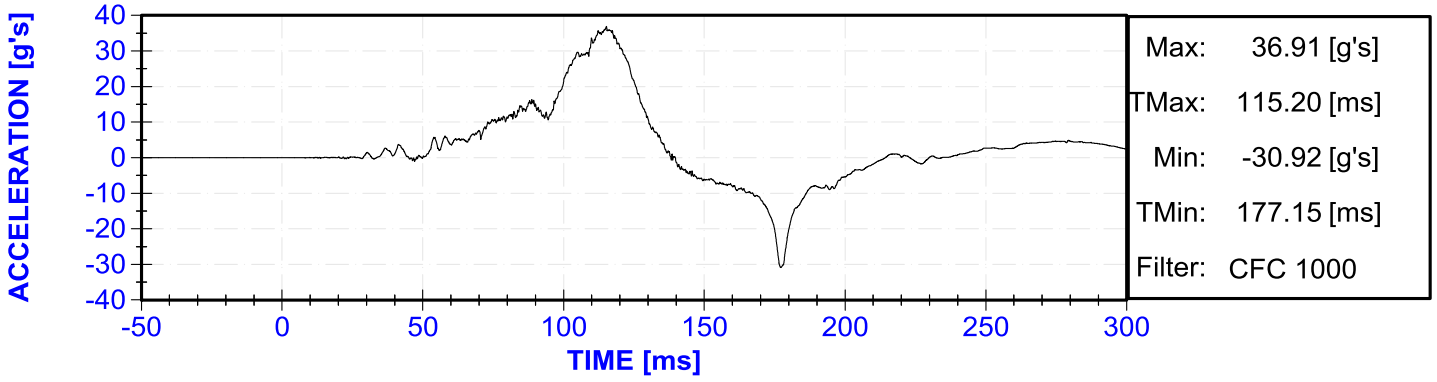
V2P4 HEAD 9 ARRAY Z ARM X



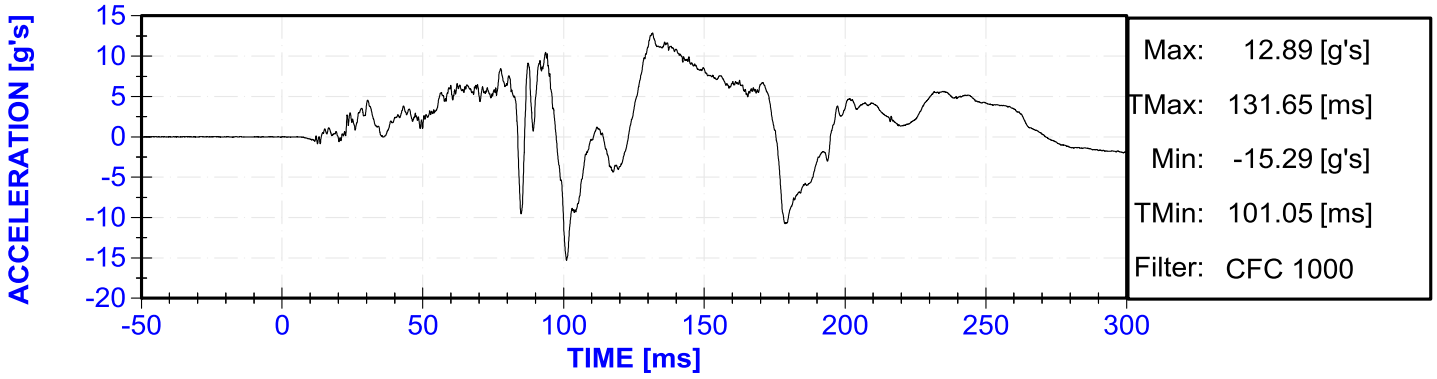
V2P4 HEAD 9 ARRAY Z ARM Y



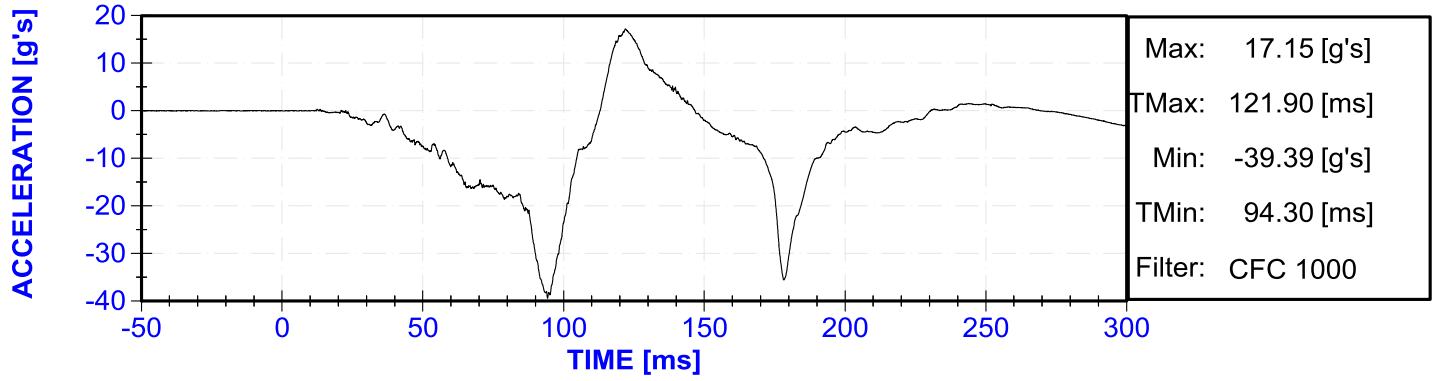
V2P4 HEAD 9 ARRAY X ARM Y



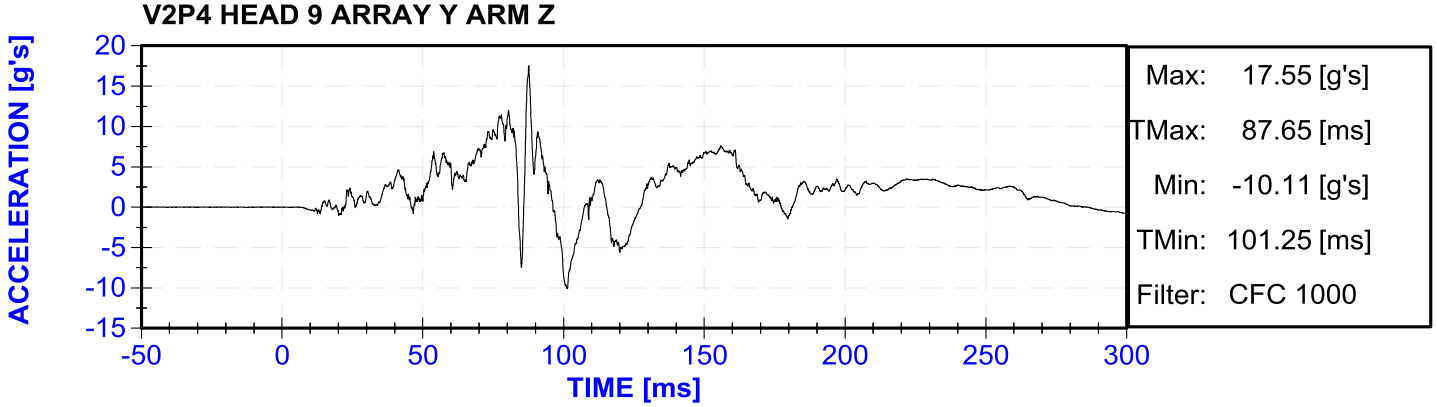
V2P4 HEAD 9 ARRAY X ARM Z



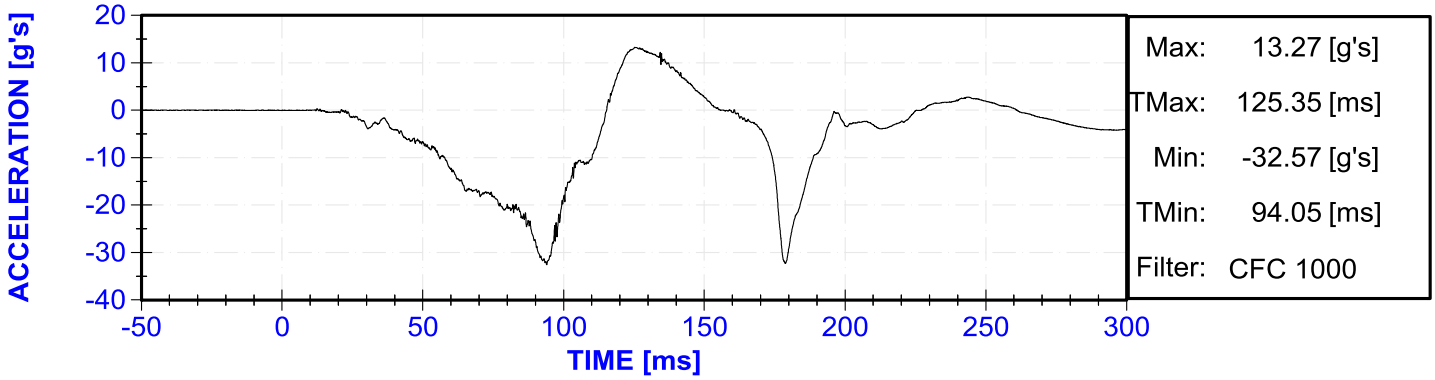
V2P4 HEAD 9 ARRAY Y ARM X



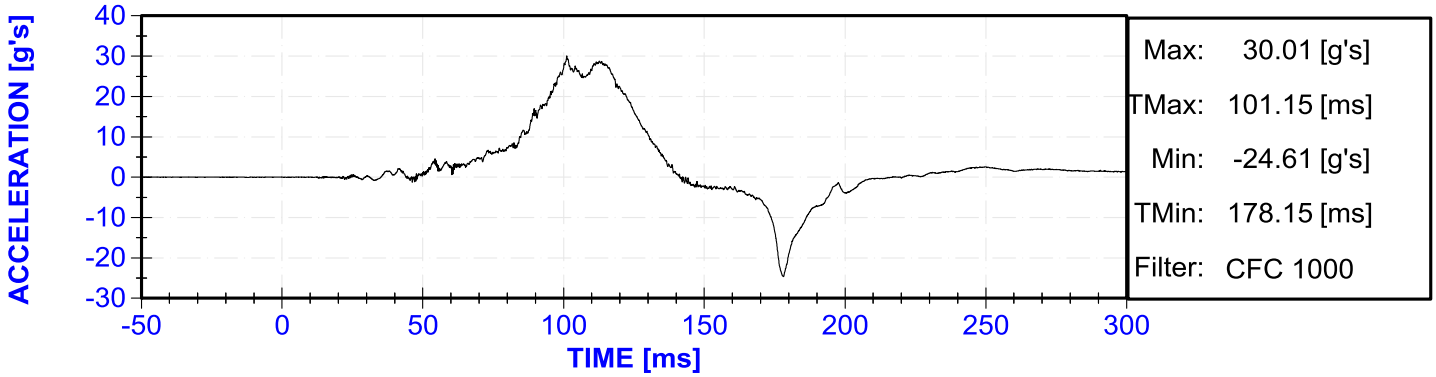
V2P4 HEAD 9 ARRAY Y ARM Z



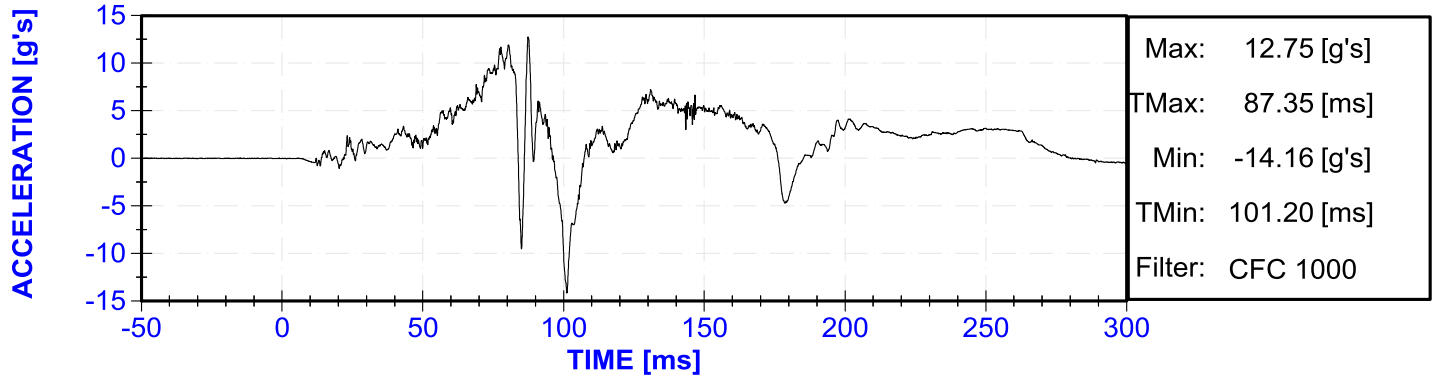
V2P4 HEAD CG X



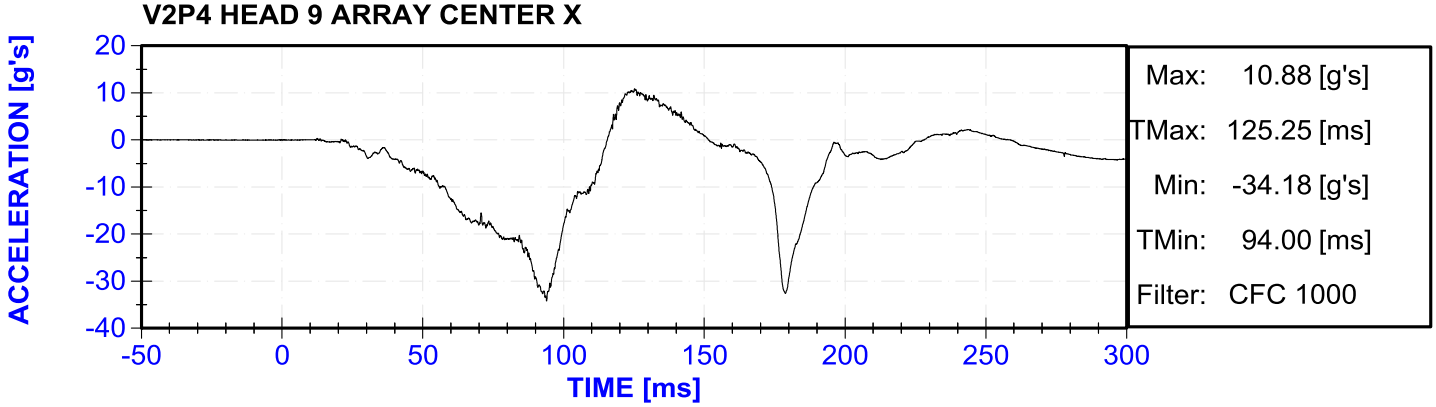
V2P4 HEAD CG Y



V2P4 HEAD CG Z



V2P4 HEAD 9 ARRAY CENTER X



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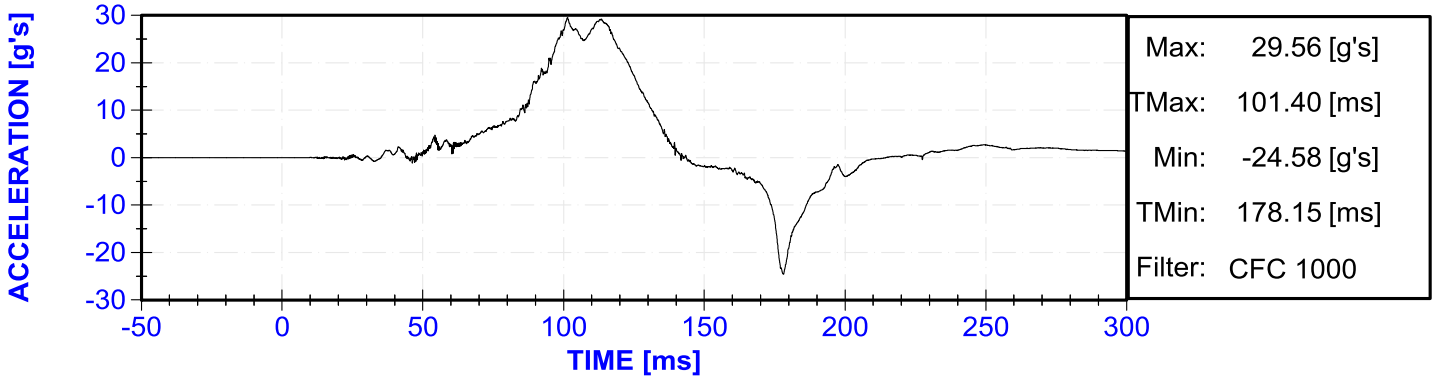
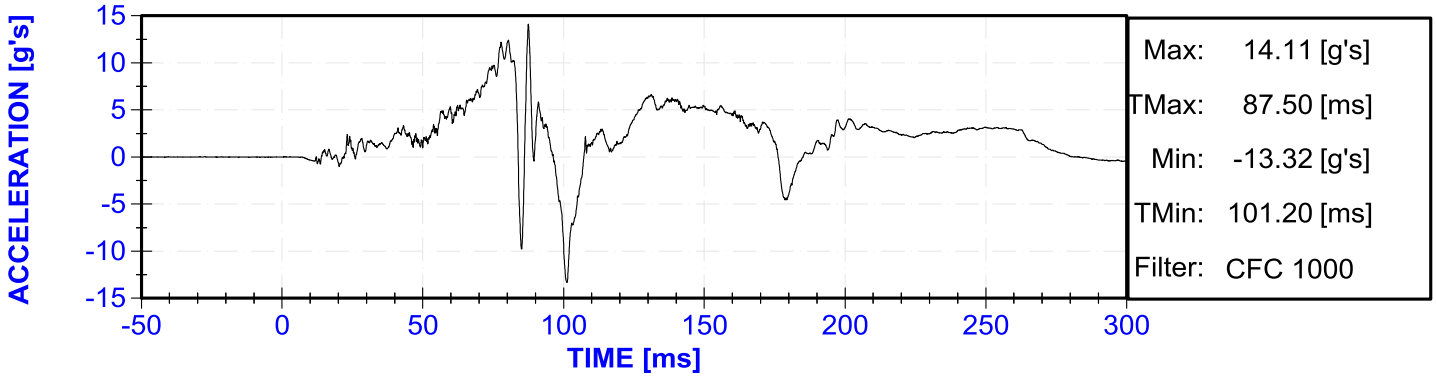
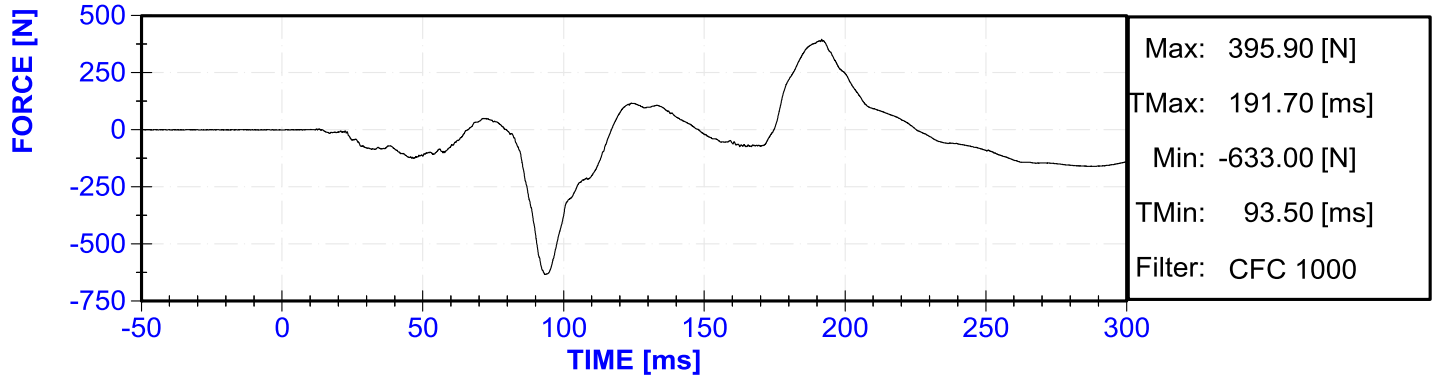


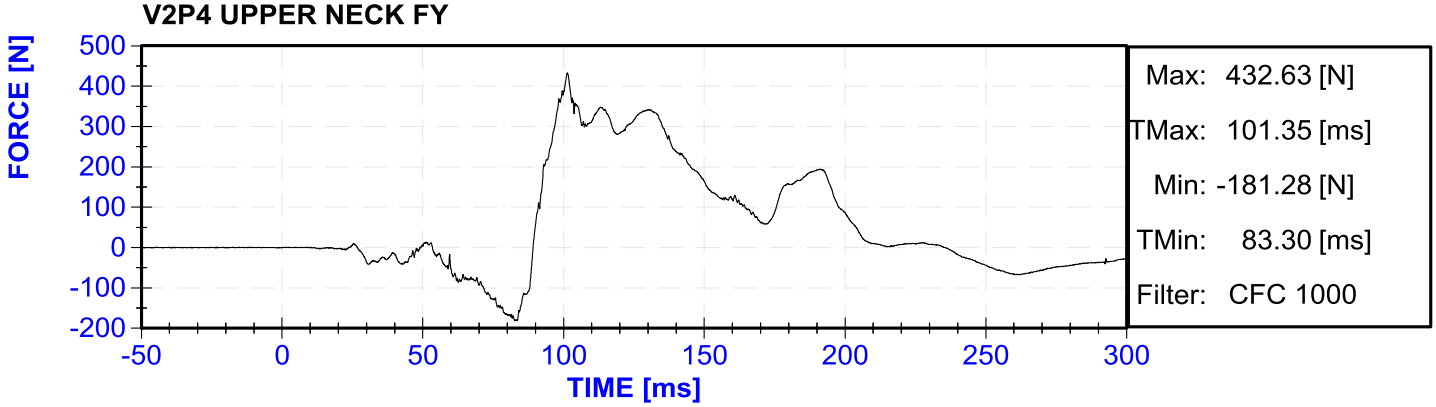
V2P4 HEAD 9 ARRAY CENTER Z



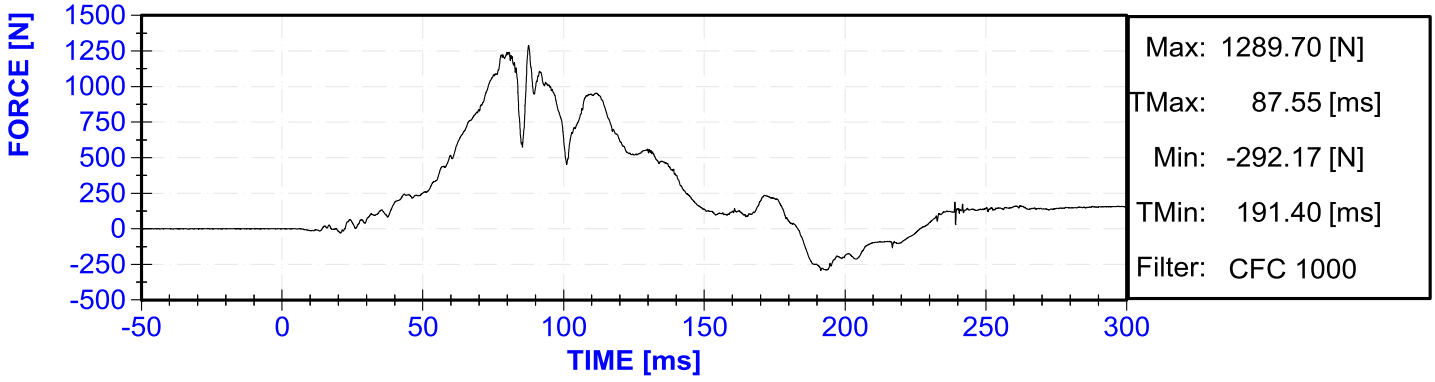
V2P4 UPPER NECK FX



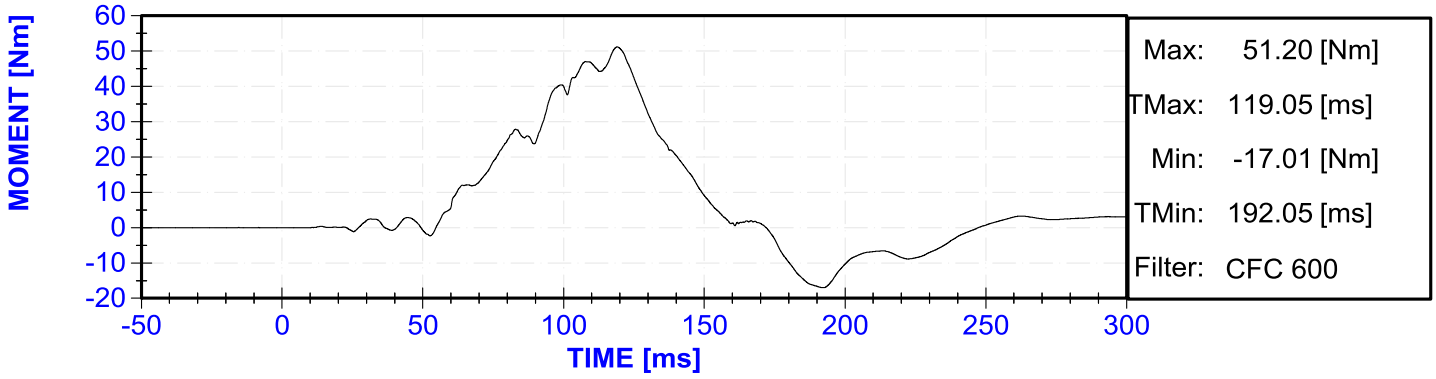
V2P4 UPPER NECK FY



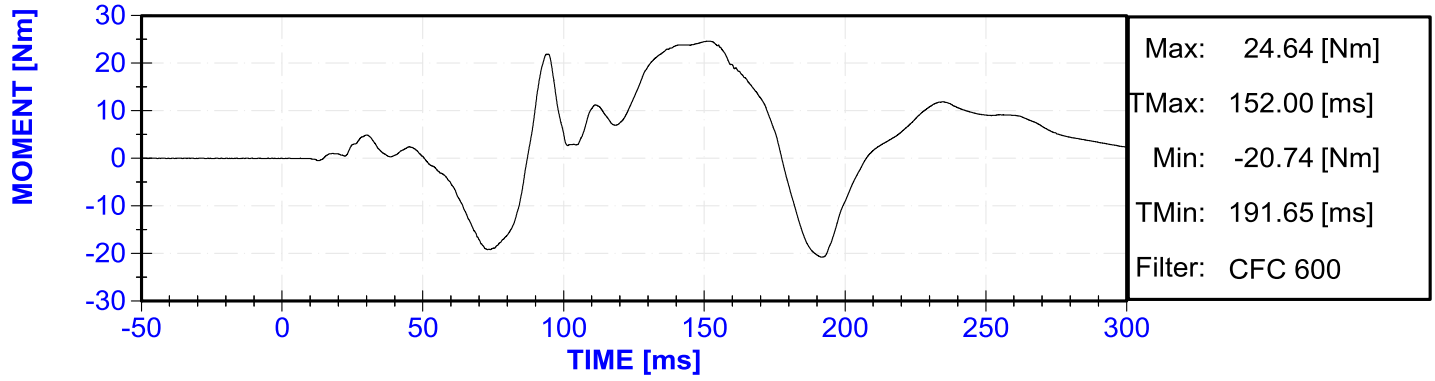
V2P4 UPPER NECK FZ



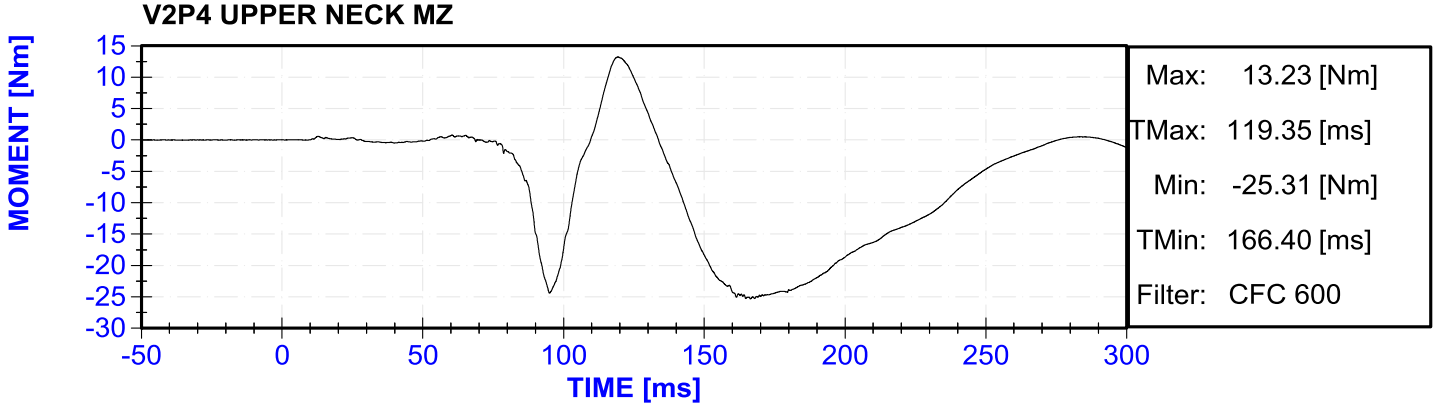
V2P4 UPPER NECK MX



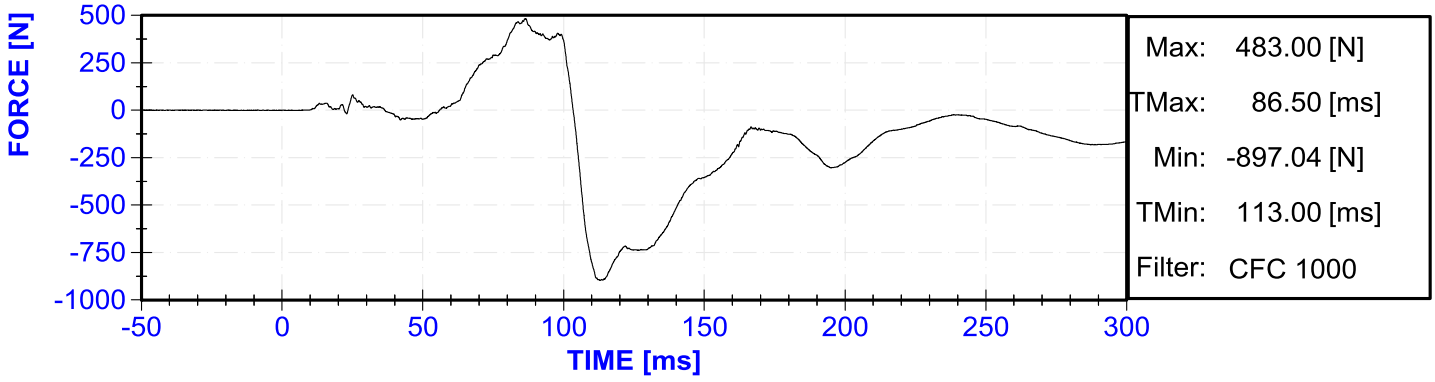
V2P4 UPPER NECK MY



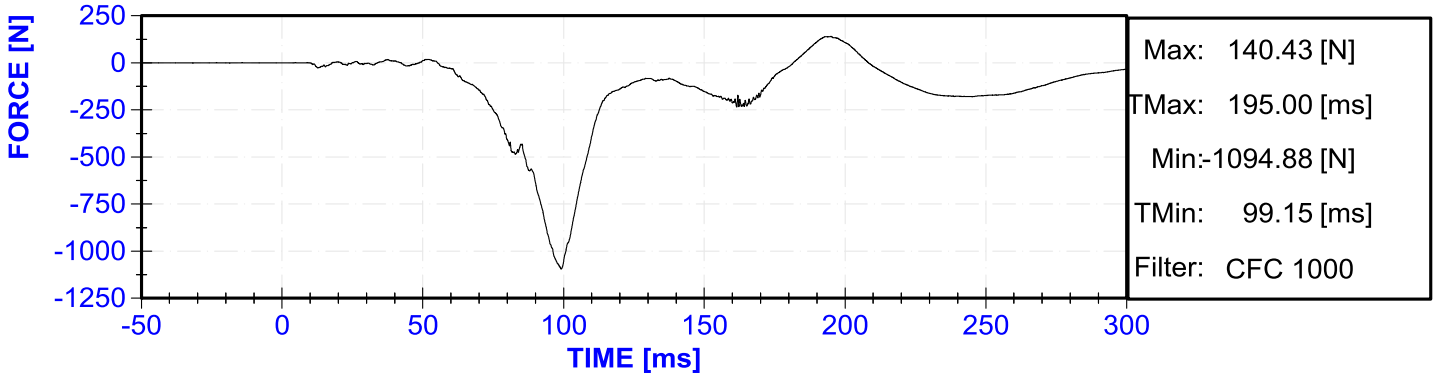
V2P4 UPPER NECK MZ



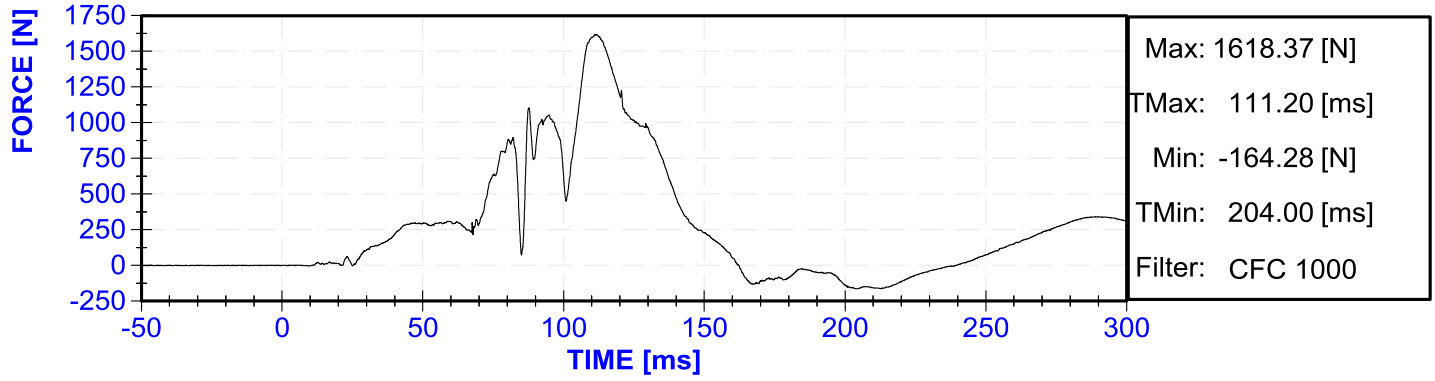
V2P4 LOWER NECK FX



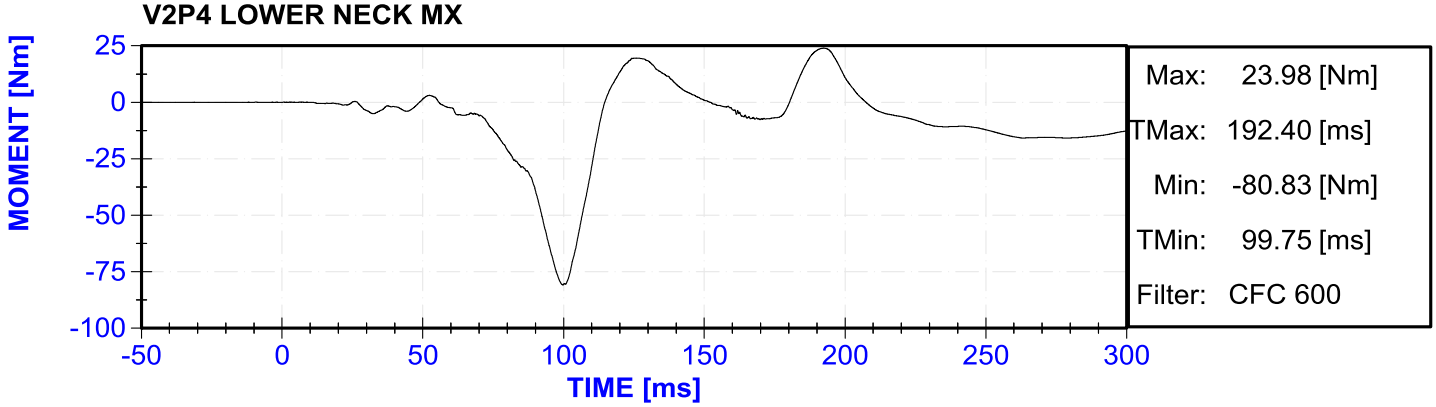
V2P4 LOWER NECK FY



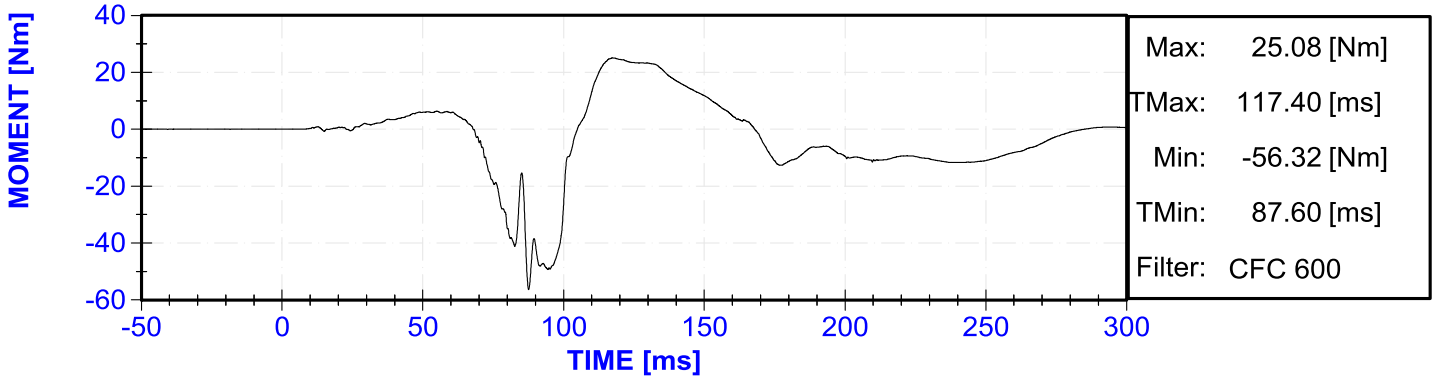
V2P4 LOWER NECK FZ



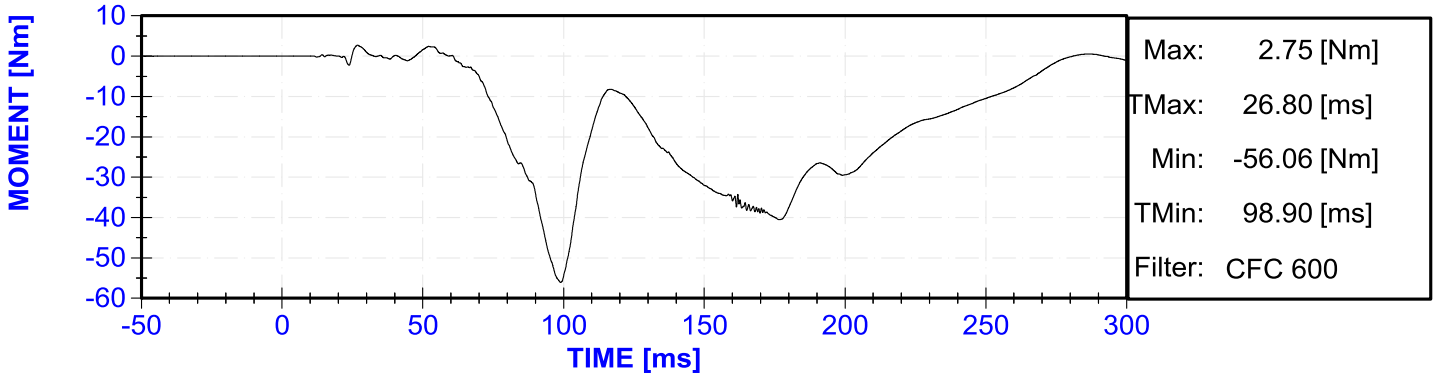
V2P4 LOWER NECK MX



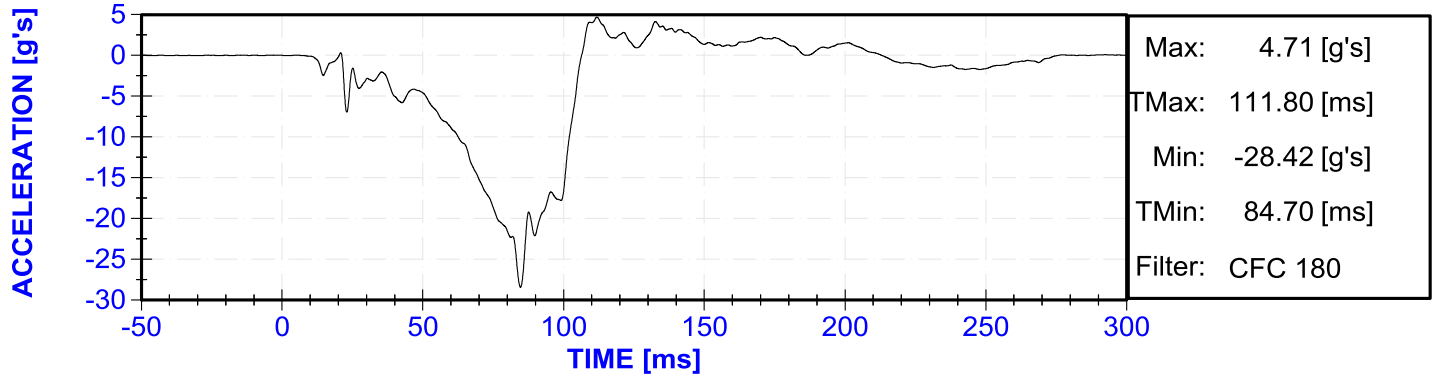
V2P4 LOWER NECK MY



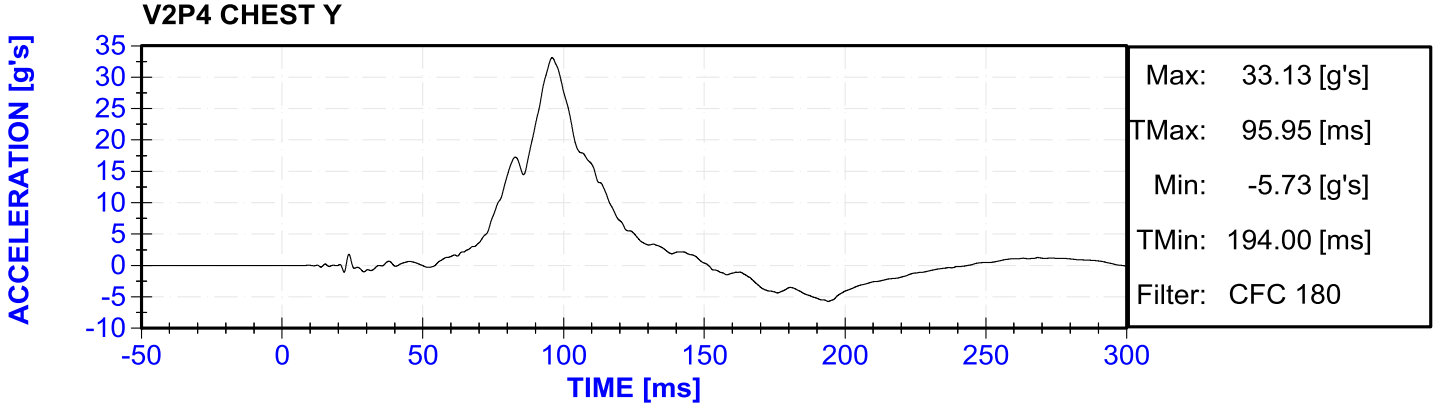
V2P4 LOWER NECK MZ



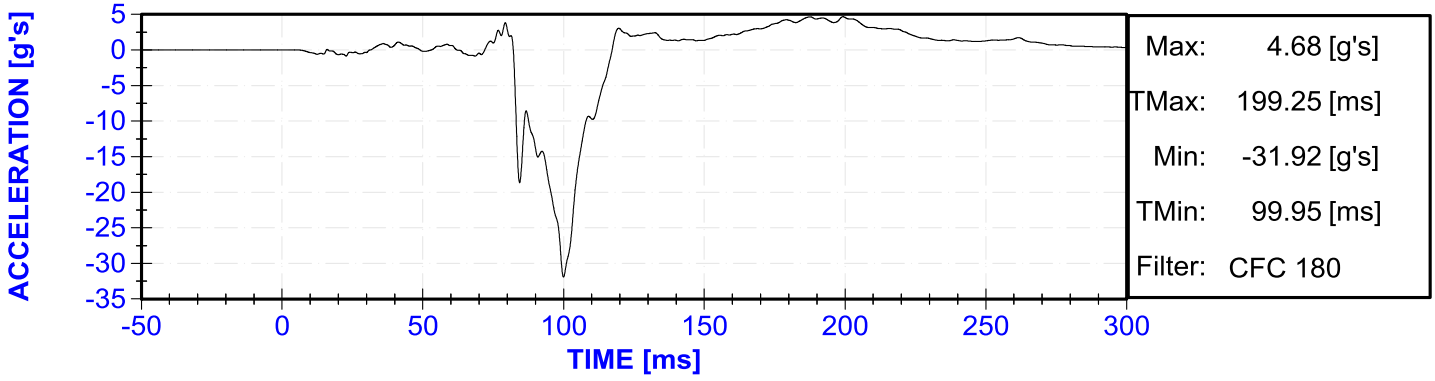
V2P4 CHEST X



V2P4 CHEST Y



V2P4 CHEST Z



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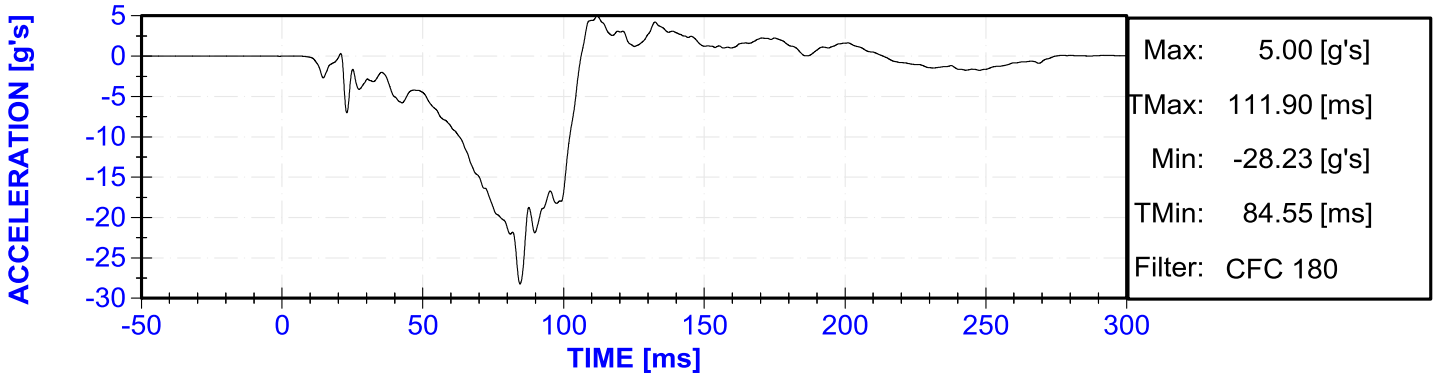

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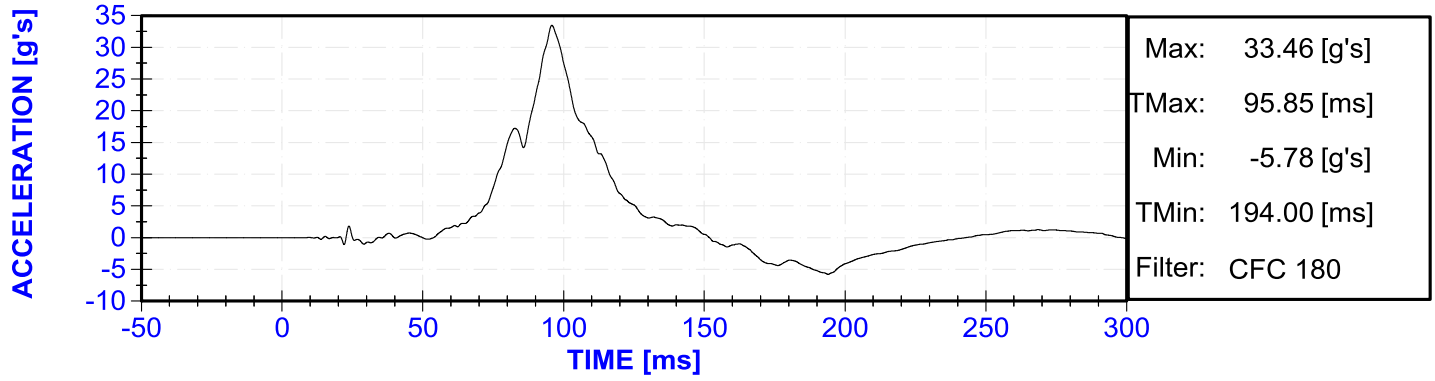

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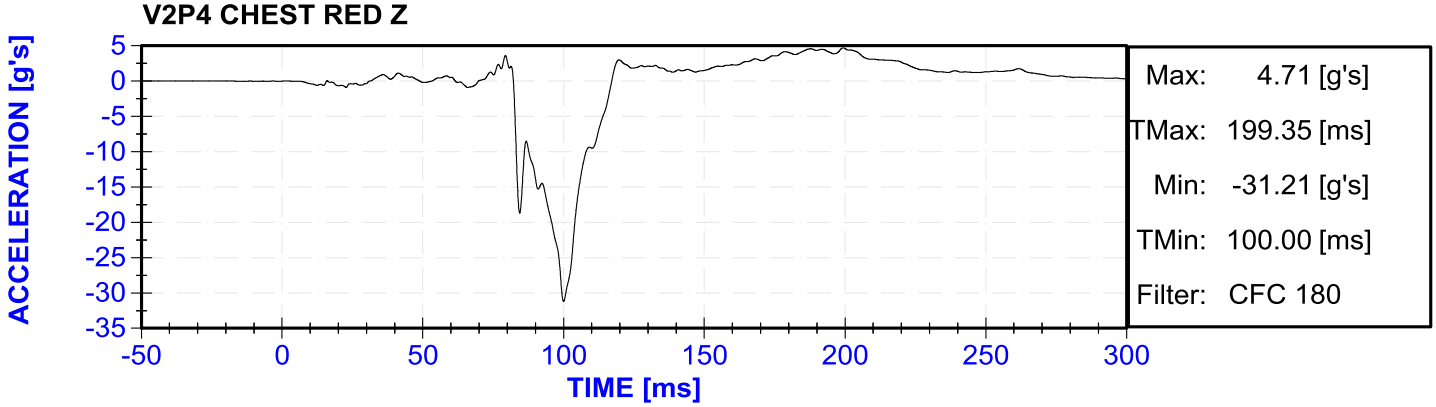
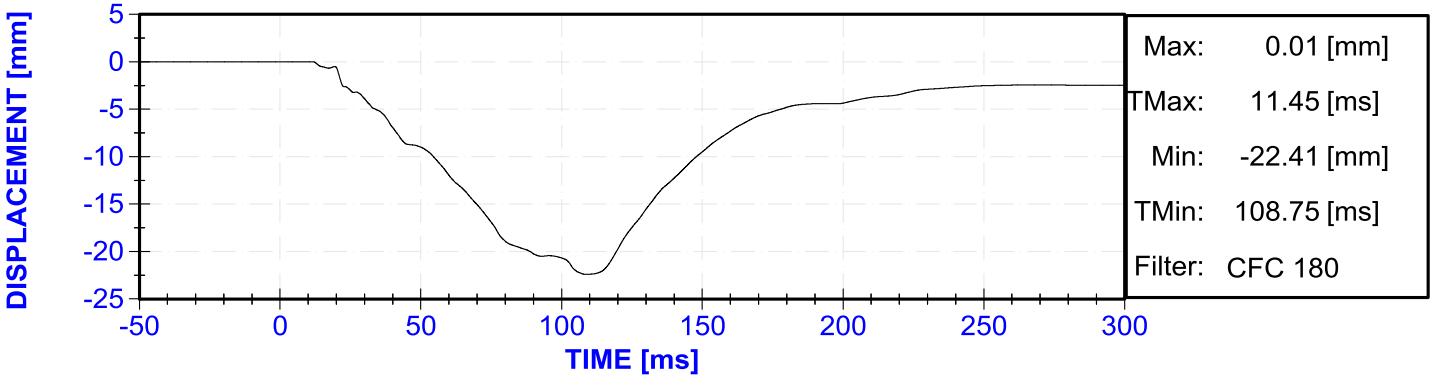
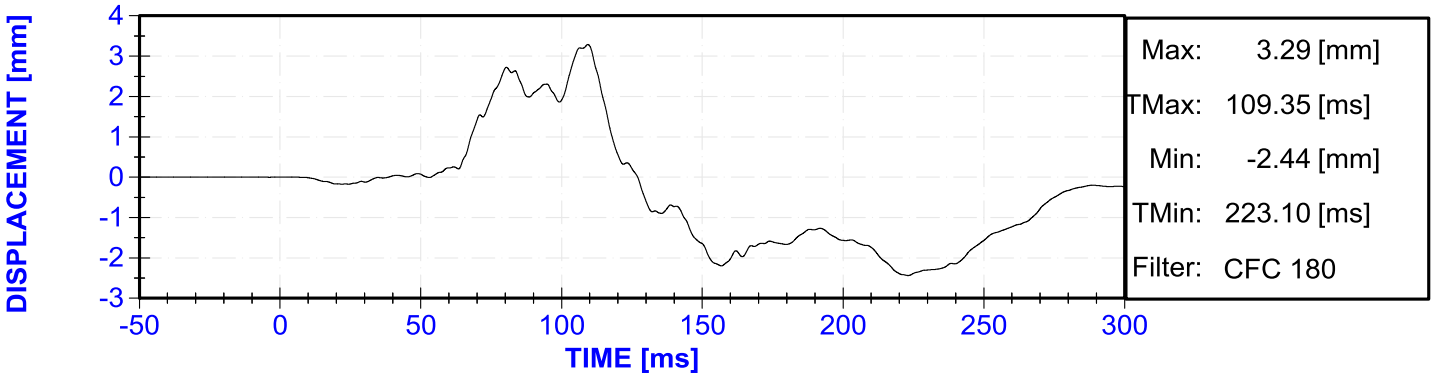


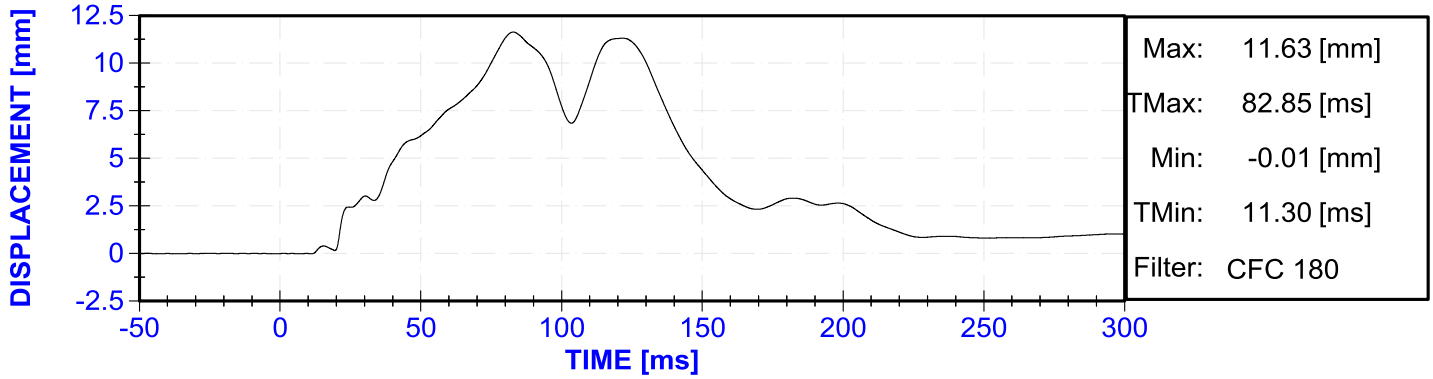
V2P4 CHEST DISPLACEMENT



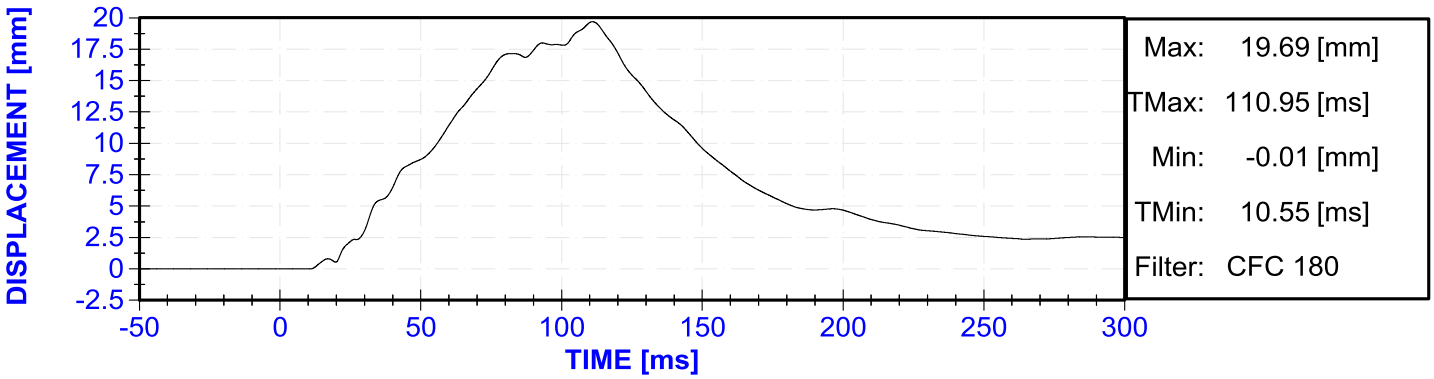
V2P4 8 STRING POD - UR TOP



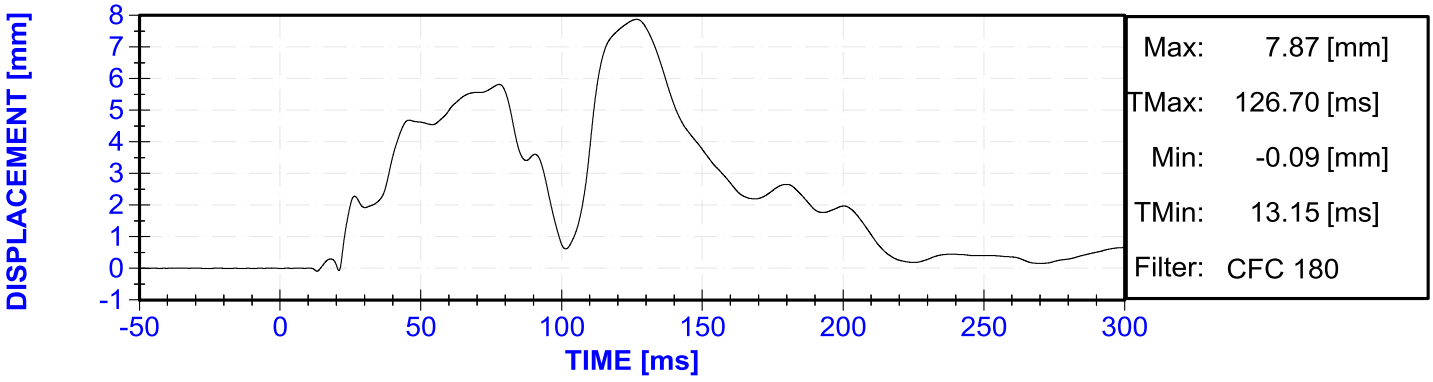
V2P4 8 STRING POD - UR MID



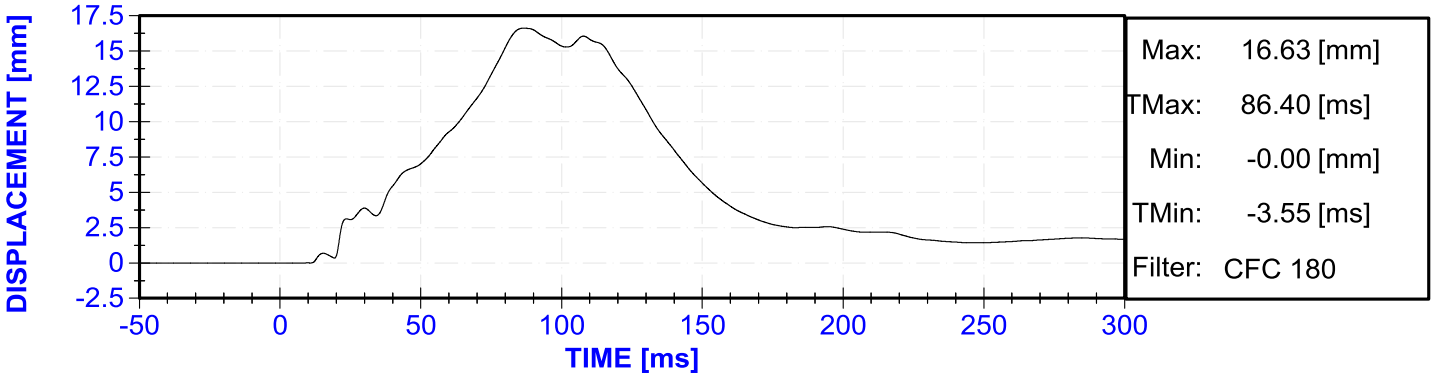
V2P4 8 STRING POD - LR MID



V2P4 8 STRING POD - LR BOTTOM

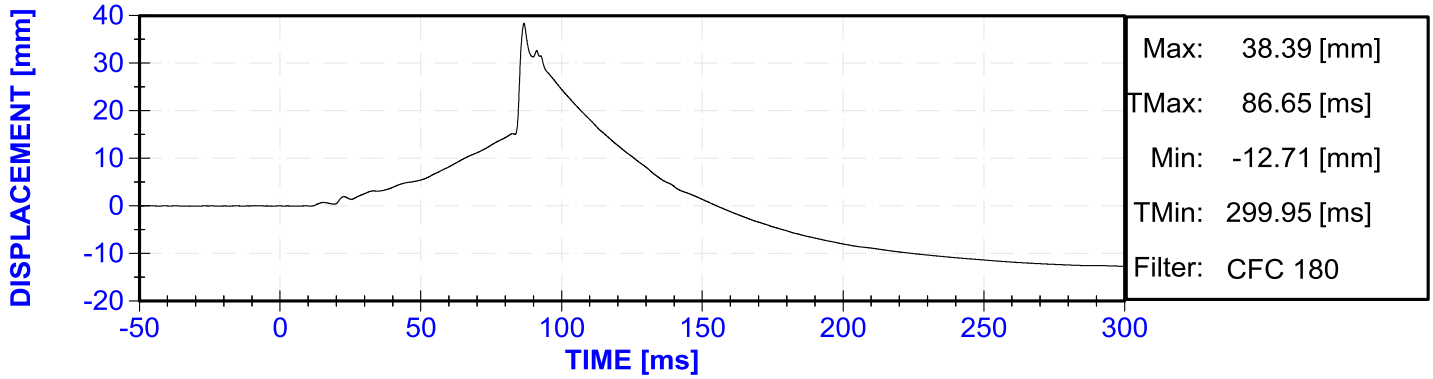


V2P4 8 STRING POD - UL TOP

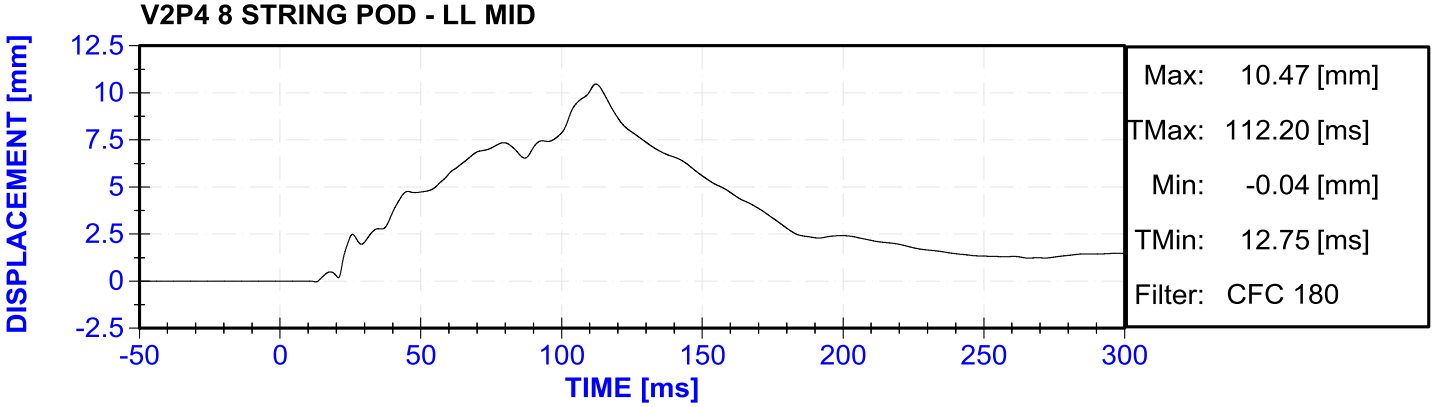


V2P4 8 STRING POD - UL MID

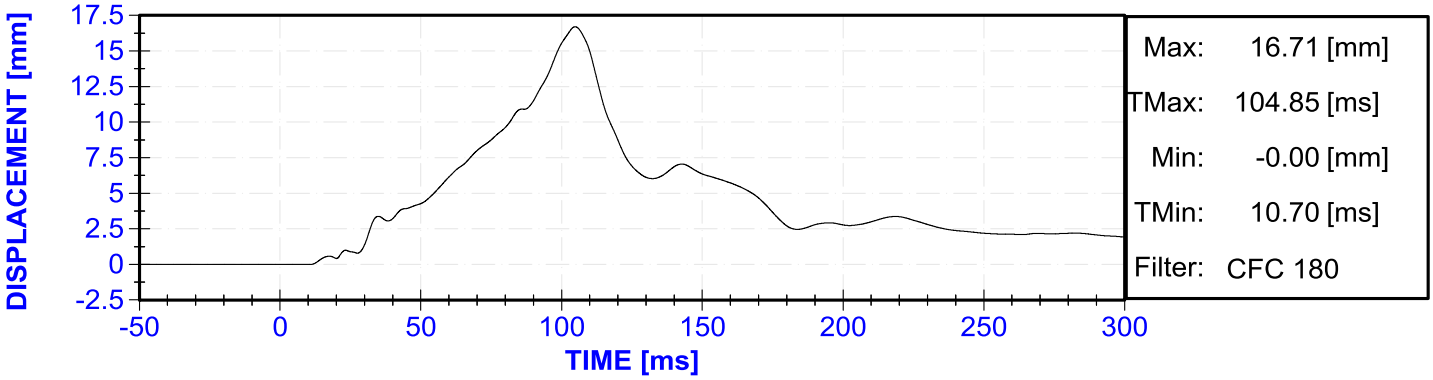
DATA SHAPE SUSPICIOUS AFTER 84.5



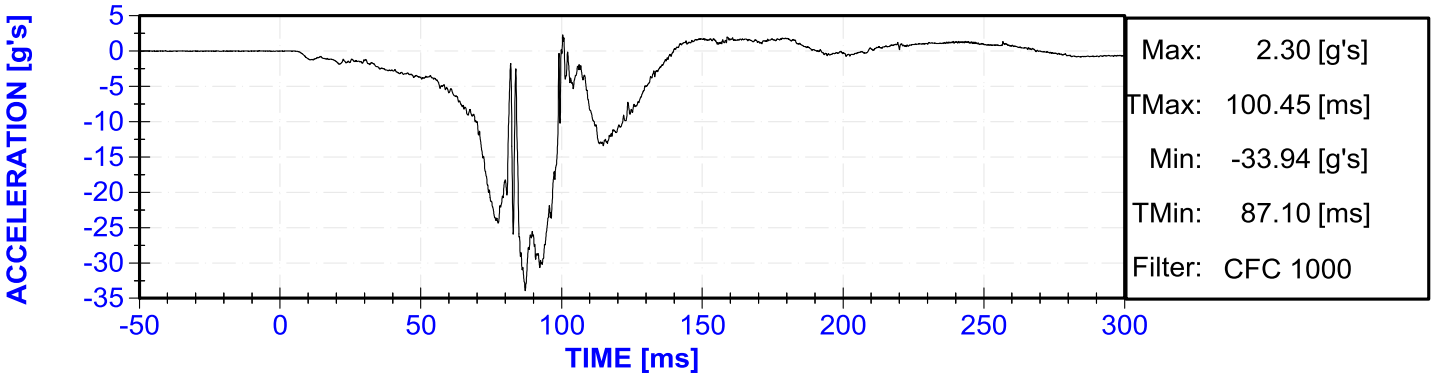
V2P4 8 STRING POD - LL MID



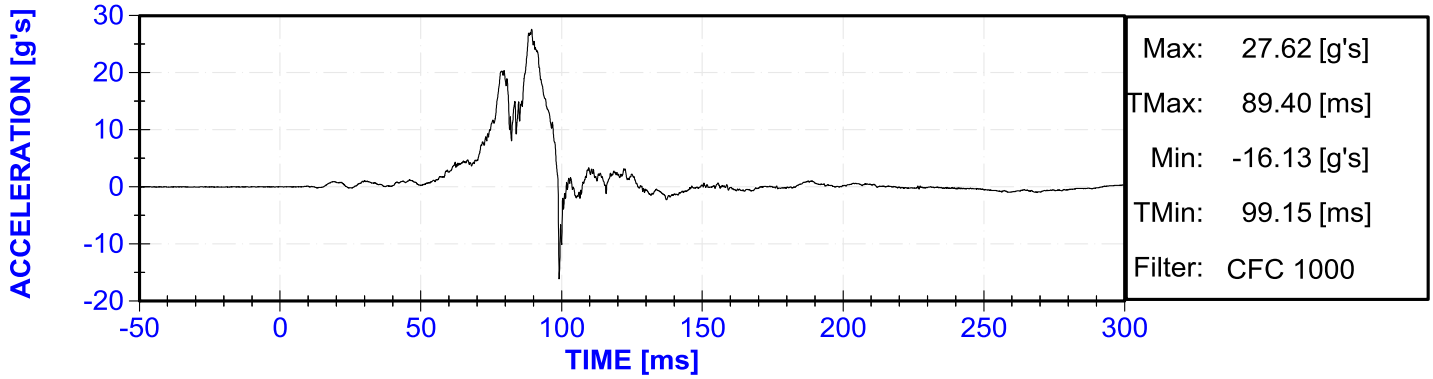
V2P4 8 STRING POD - LL BOTTOM



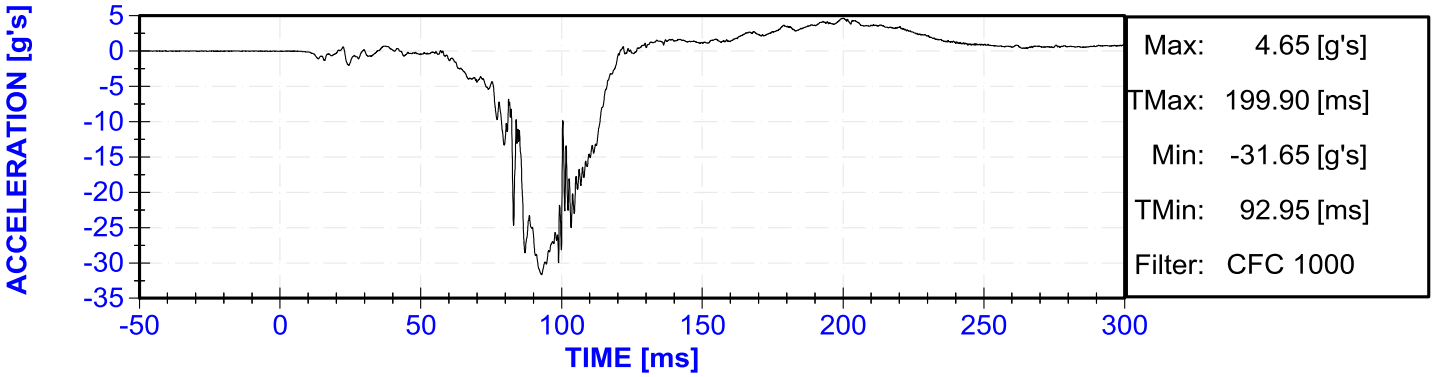
V2P4 PELVIC X



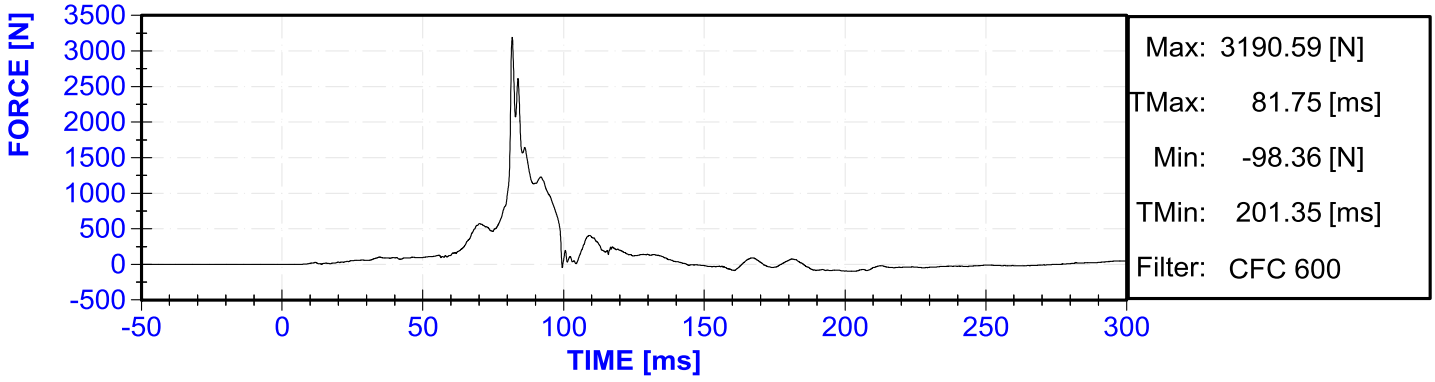
V2P4 PELVIC Y



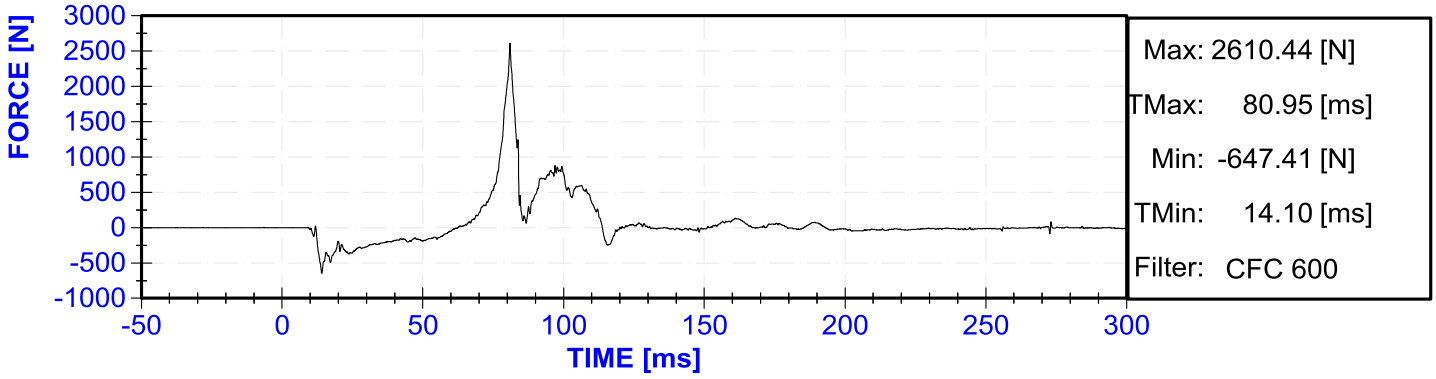
V2P4 PELVIC Z



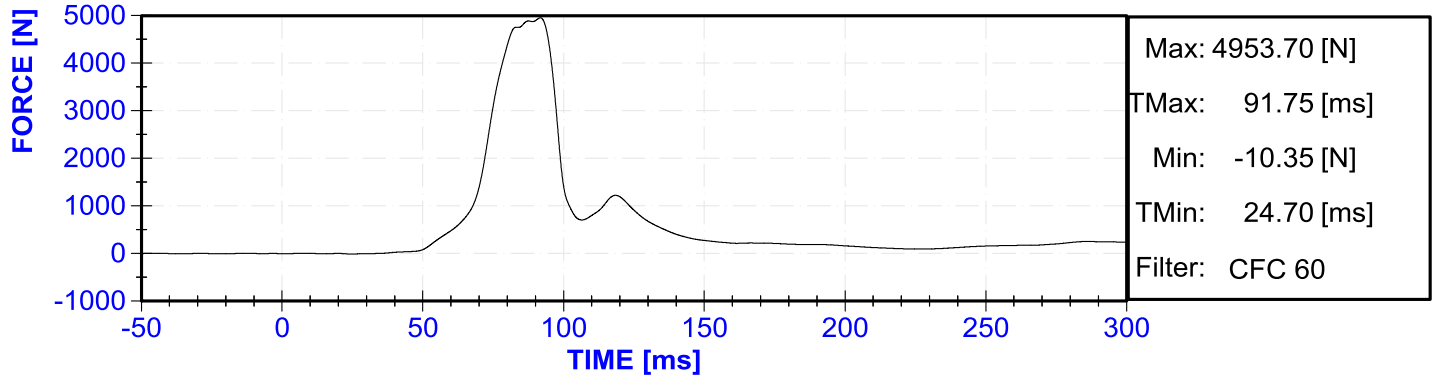
V2P4 LEFT FEMUR FZ



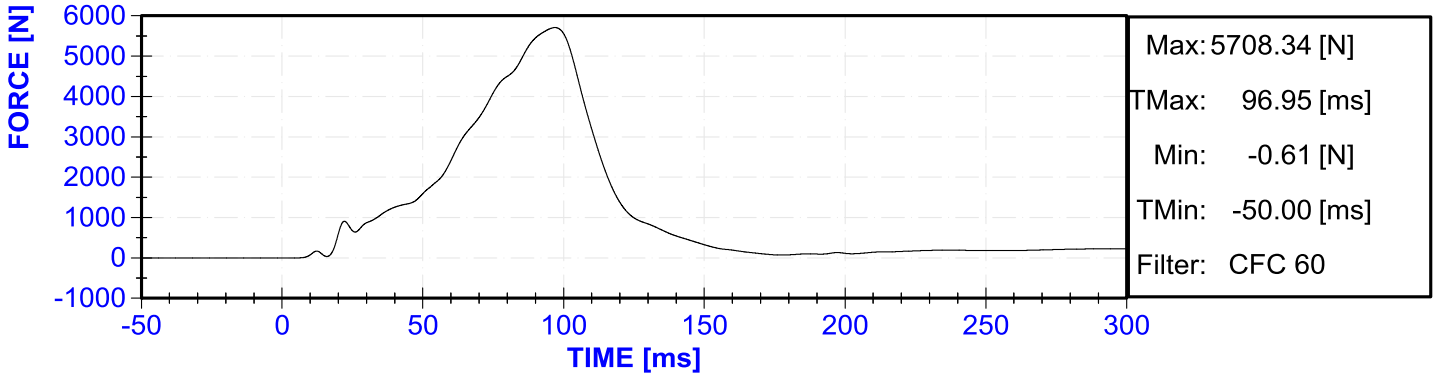
V2P4 RIGHT FEMUR FZ



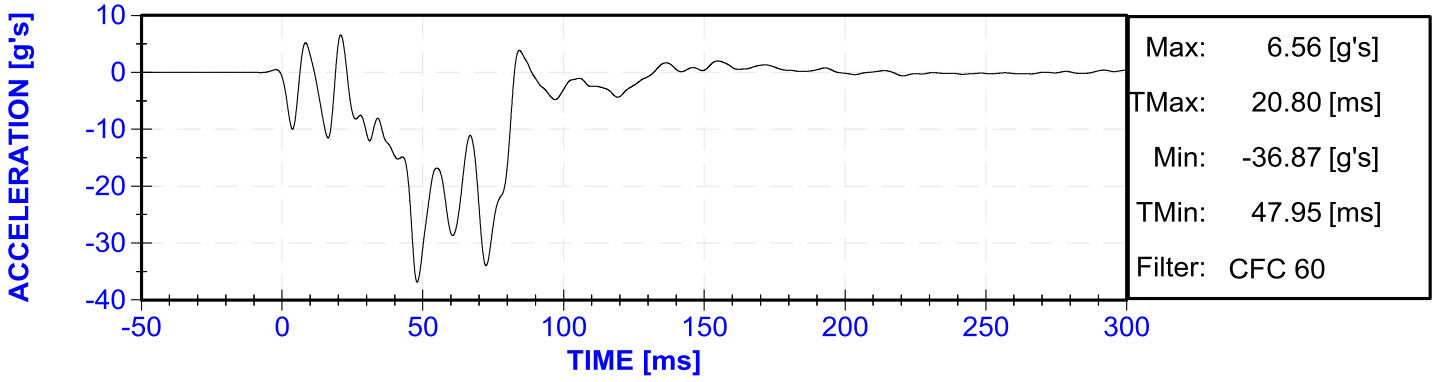
V2 Passenger Lap Belt Force



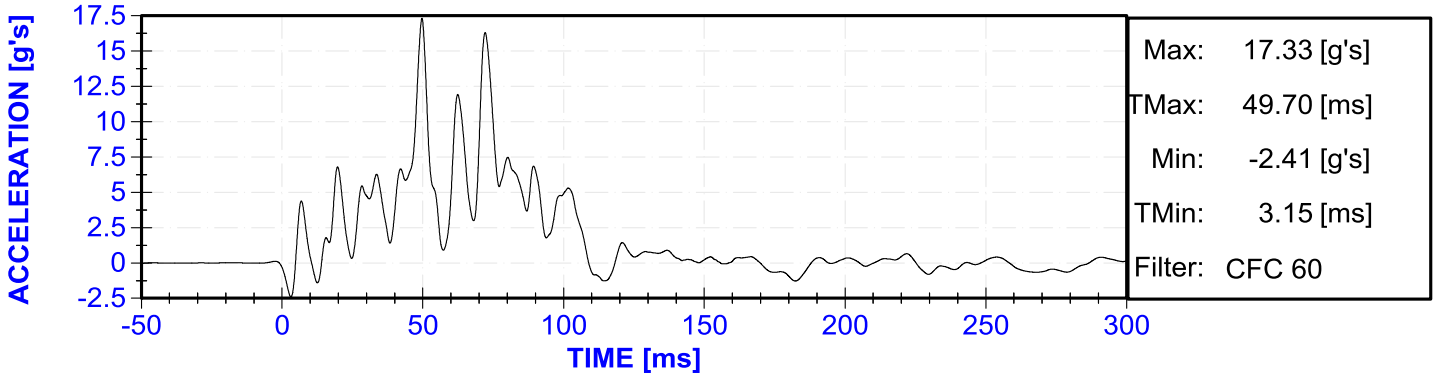
V2 Passenger Shoulder Belt Upper Force



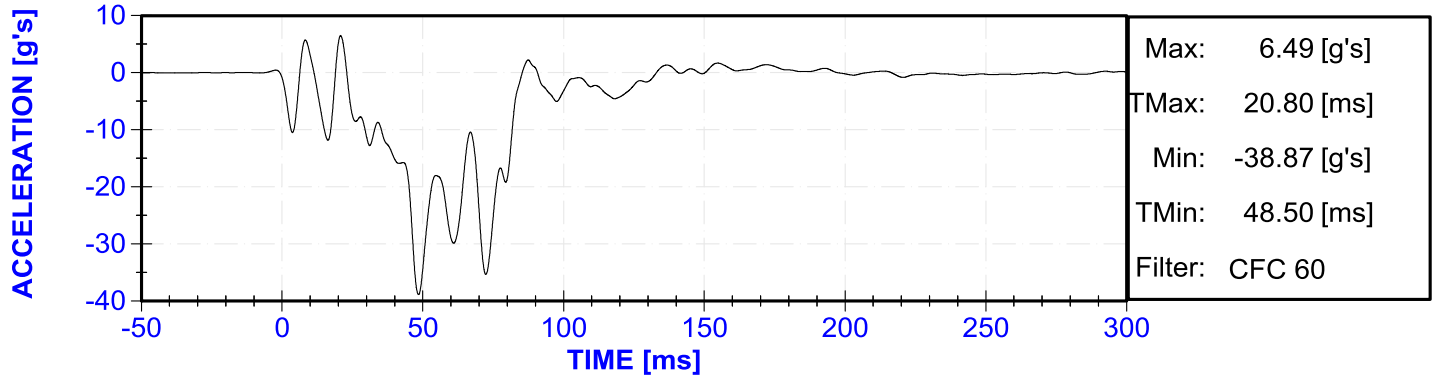
V2 Left Rear Sill X Acceleration



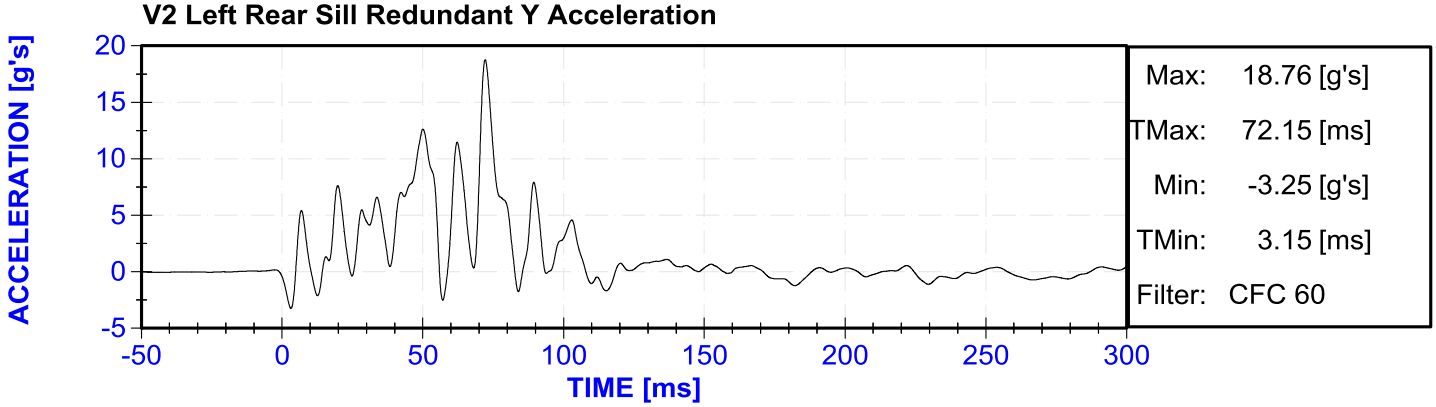
V2 Left Rear Sill Y Acceleration



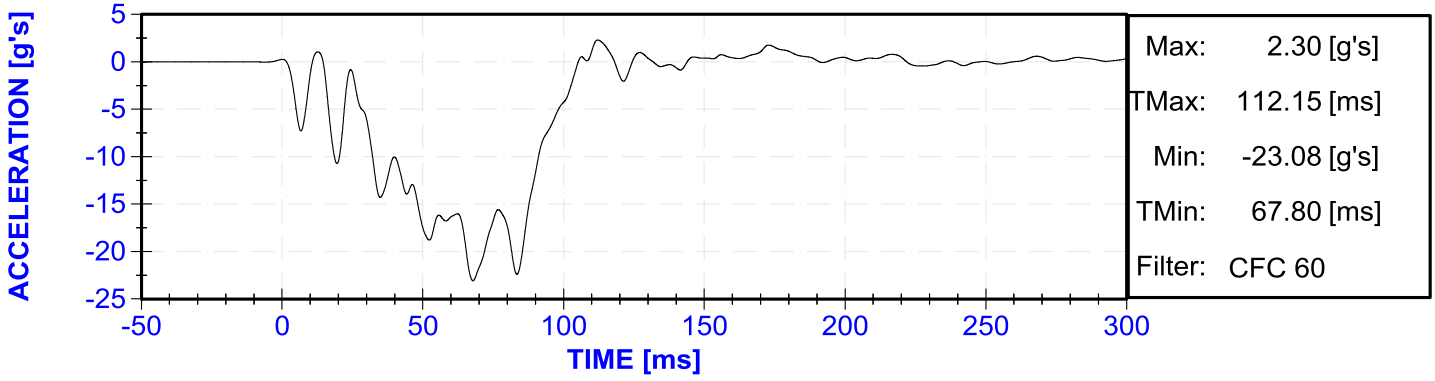
V2 Left Rear Sill Redundant X Acceleration



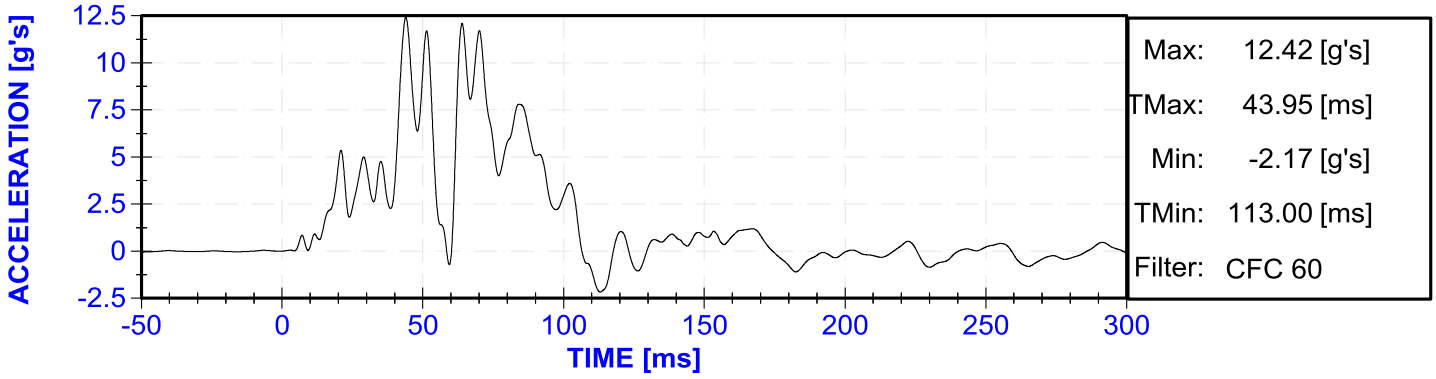
V2 Left Rear Sill Redundant Y Acceleration



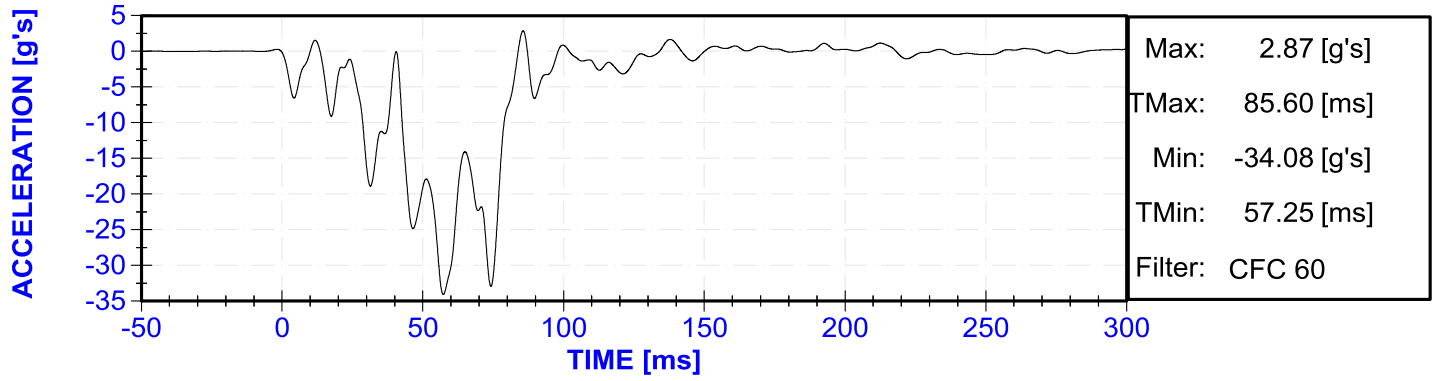
V2 Right Rear Sill X Acceleration



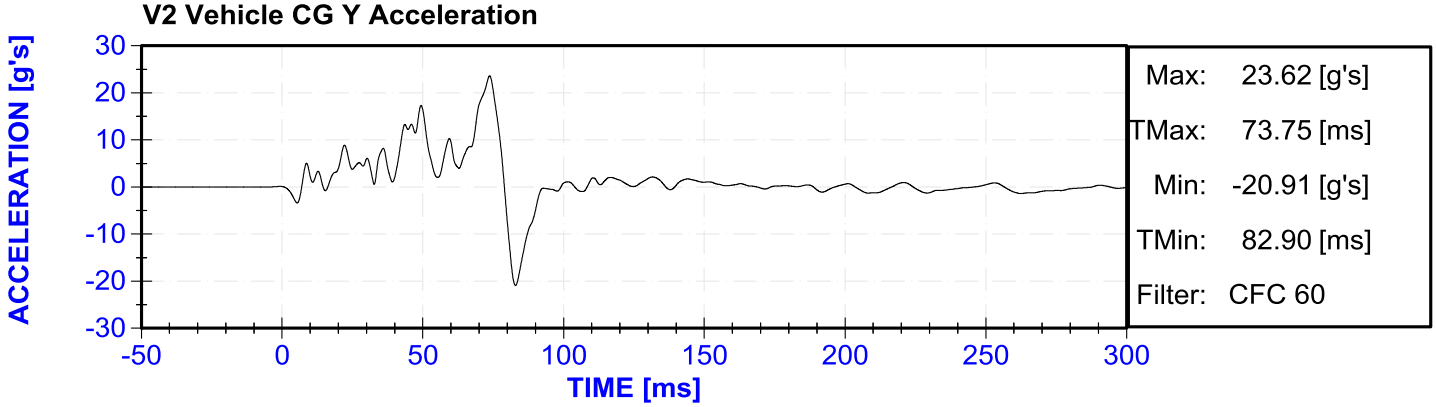
V2 Right Rear Sill Y Acceleration



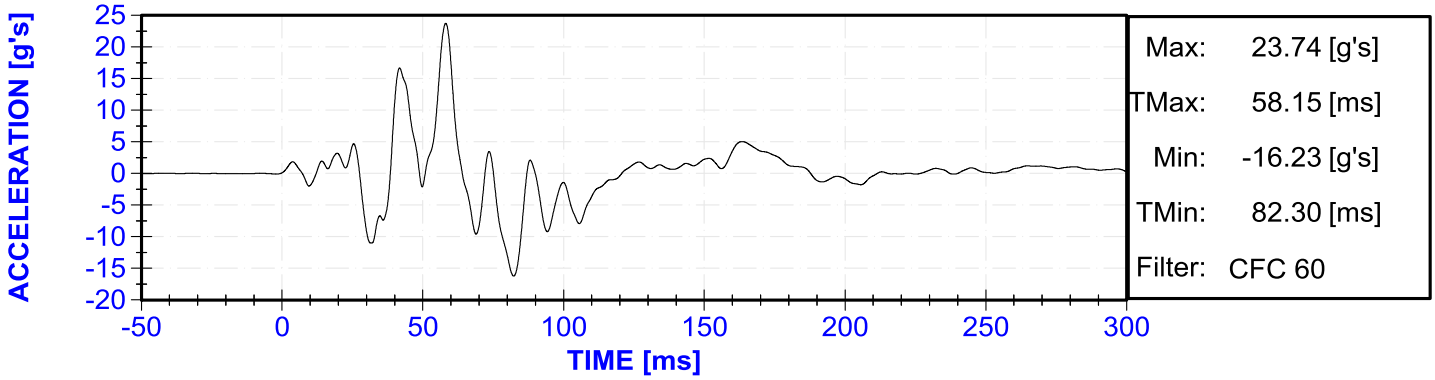
V2 Vehicle CG X Acceleration



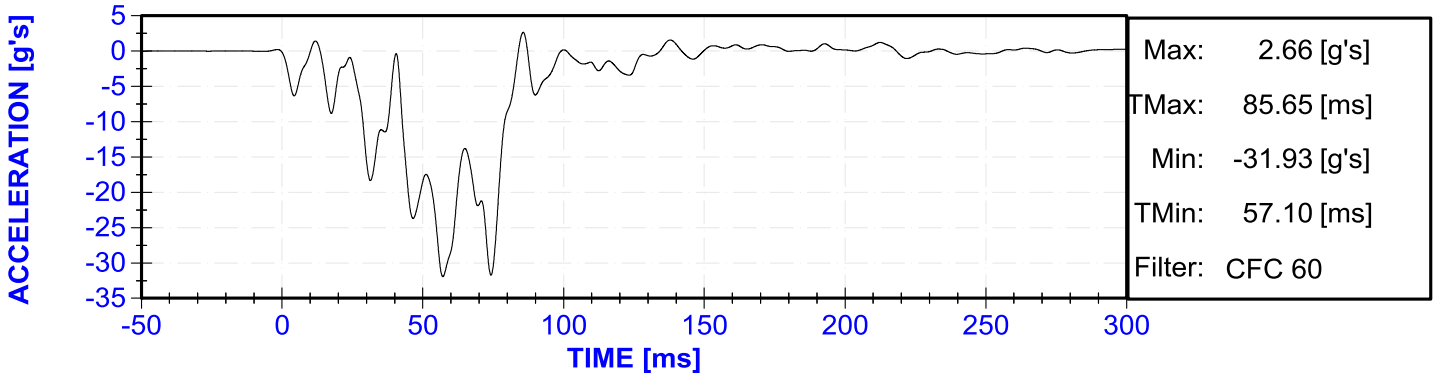
V2 Vehicle CG Y Acceleration



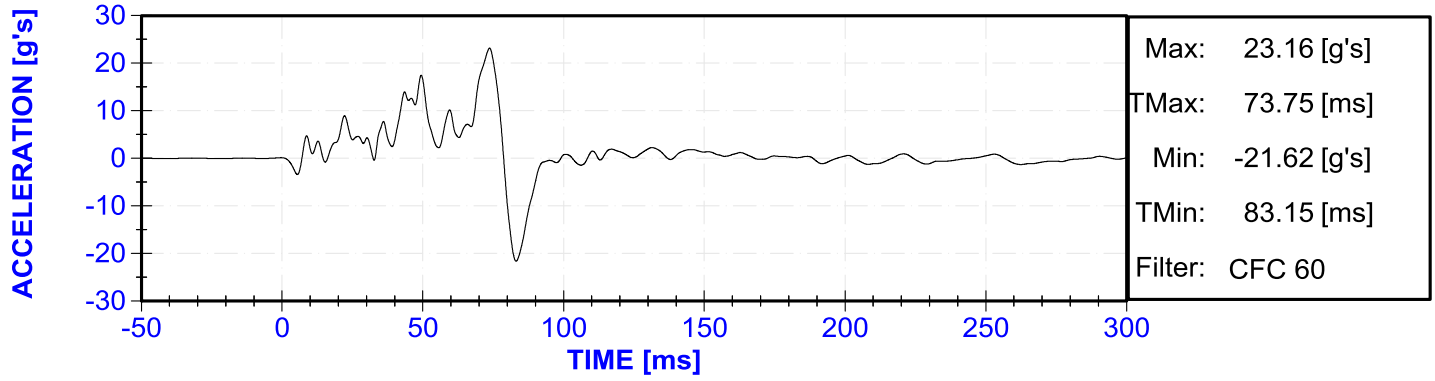
V2 Vehicle CG Z Acceleration



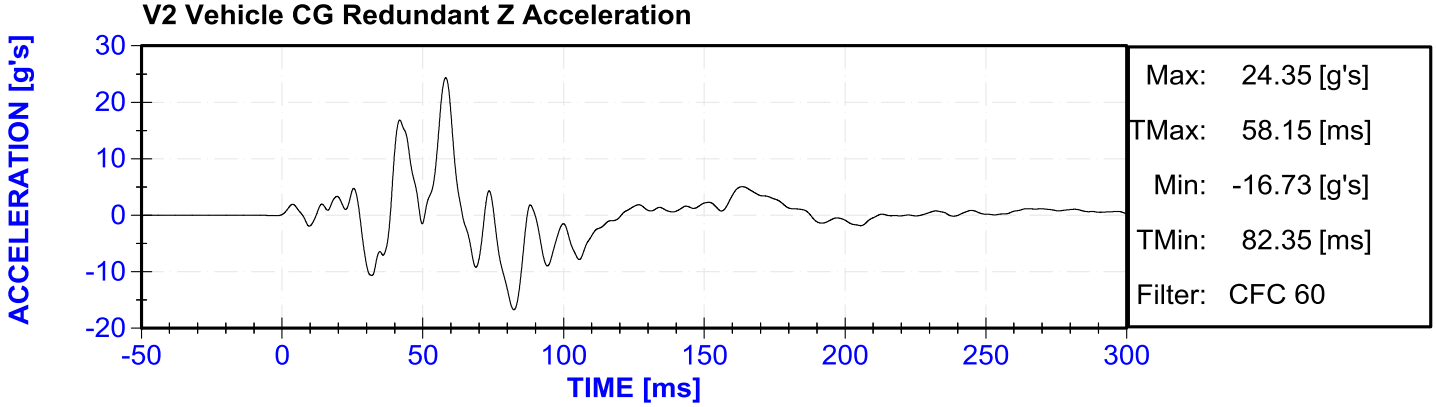
V2 Vehicle CG Redundant X Acceleration



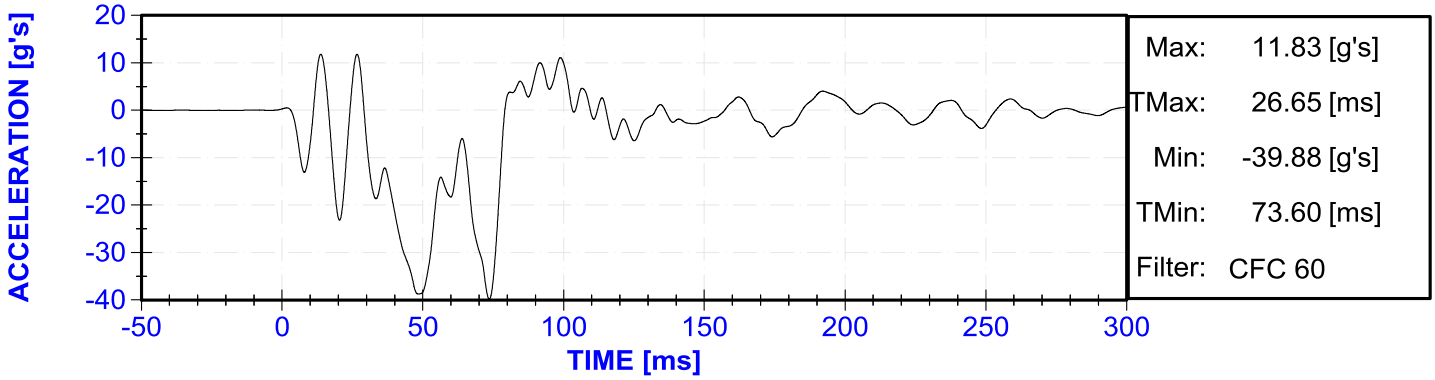
V2 Vehicle CG Redundant Y Acceleration



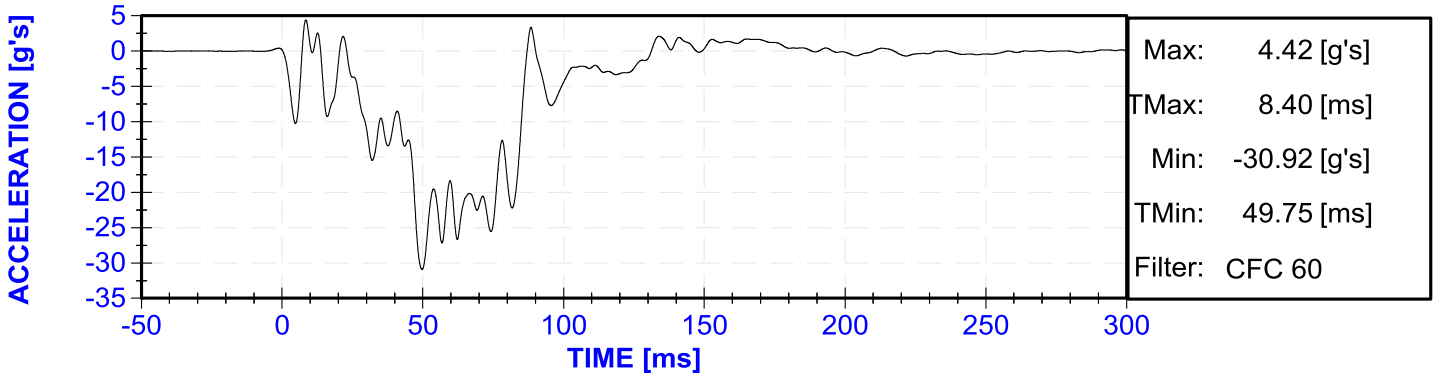
V2 Vehicle CG Redundant Z Acceleration



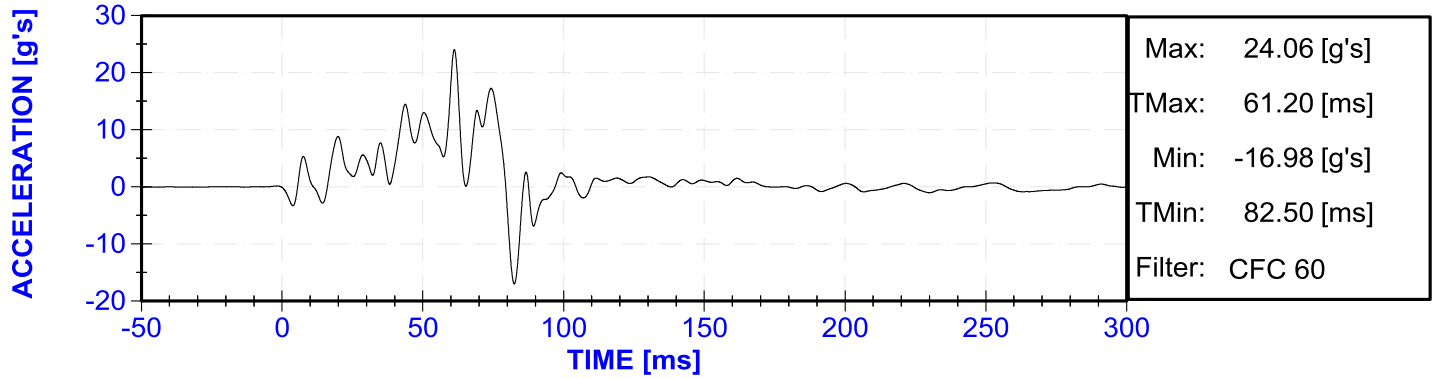
V2 Instrument Panel X Acceleration



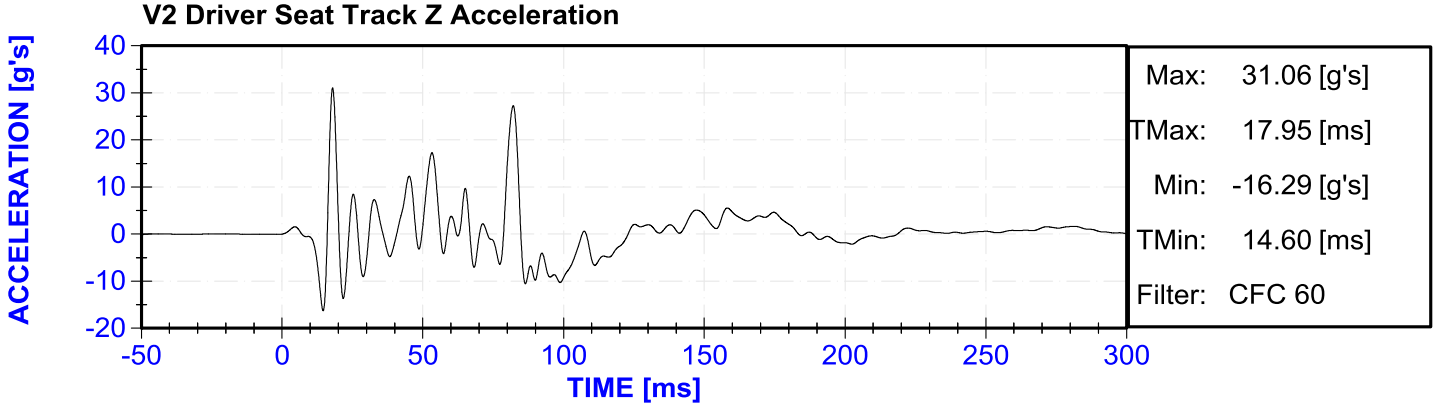
V2 Driver Seat Track X Acceleration



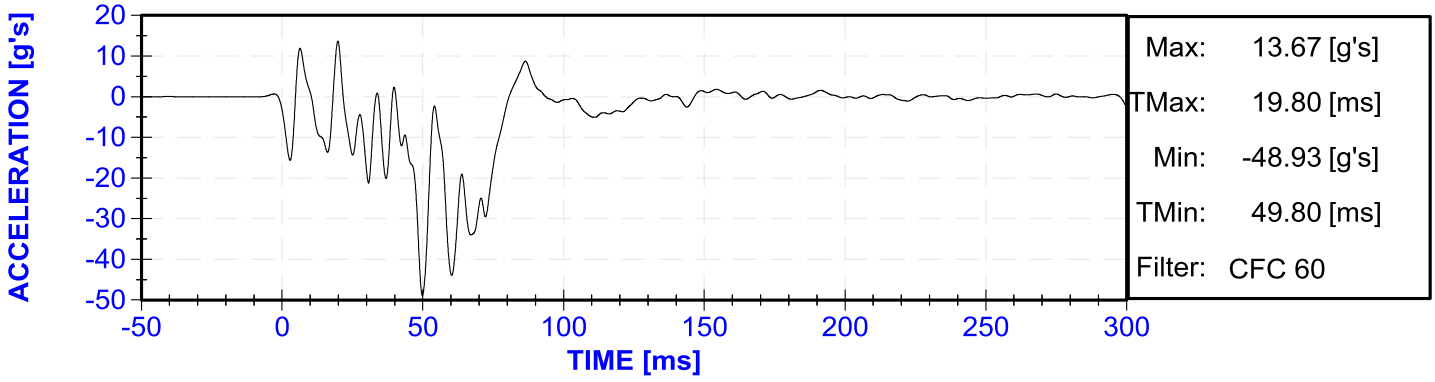
V2 Driver Seat Track Y Acceleration



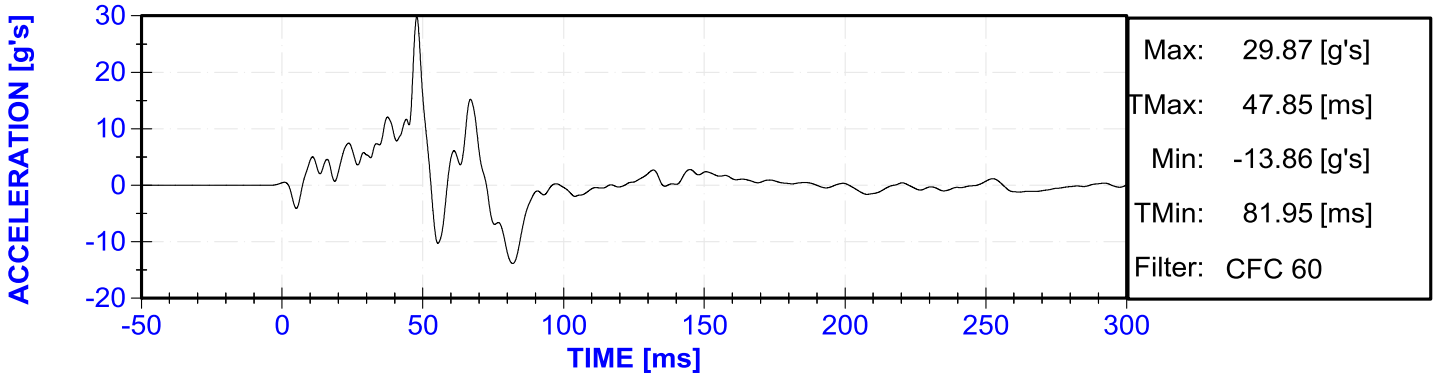
V2 Driver Seat Track Z Acceleration



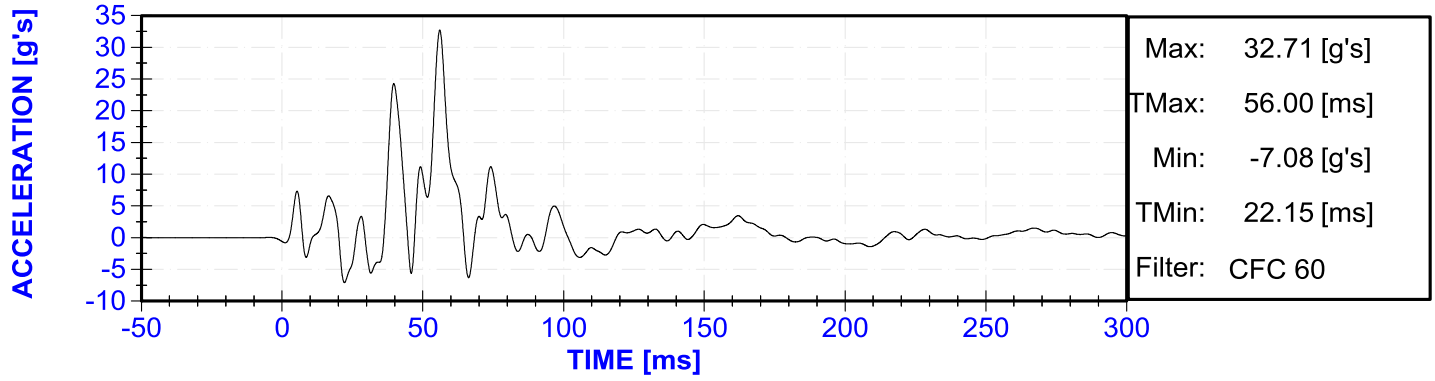
V2 Driver Floor Pan X Acceleration



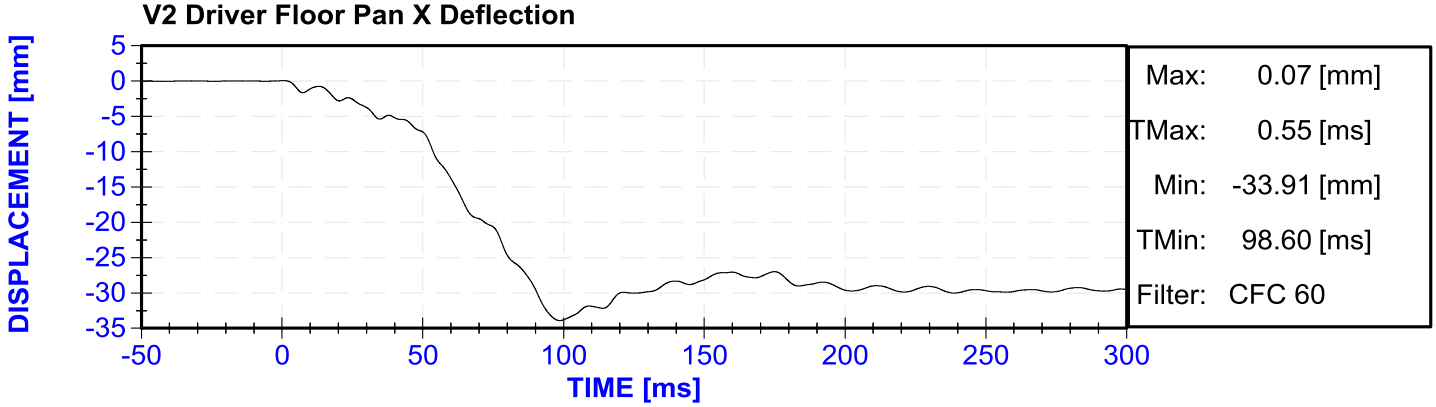
V2 Driver Floor Pan Y Acceleration



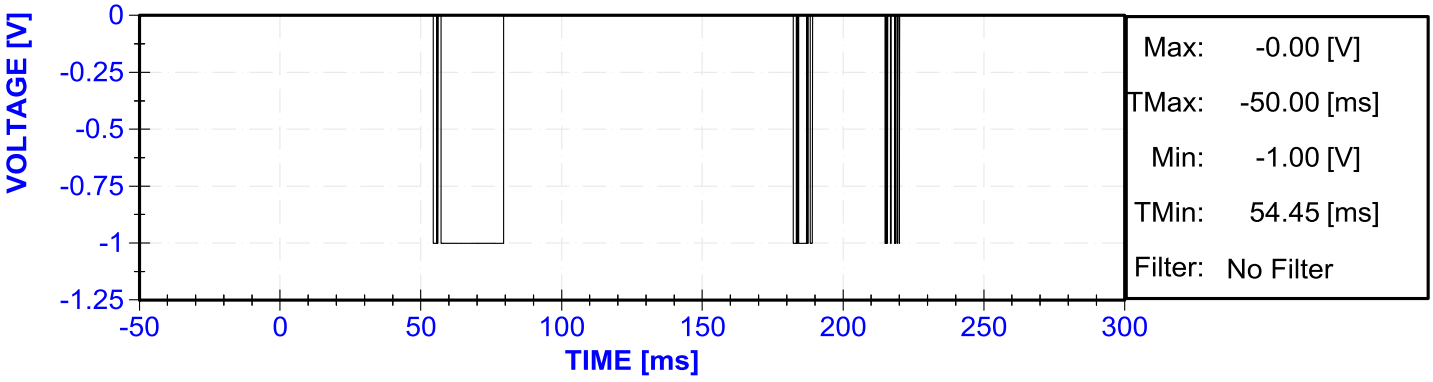
V2 Driver Floor Pan Z Acceleration



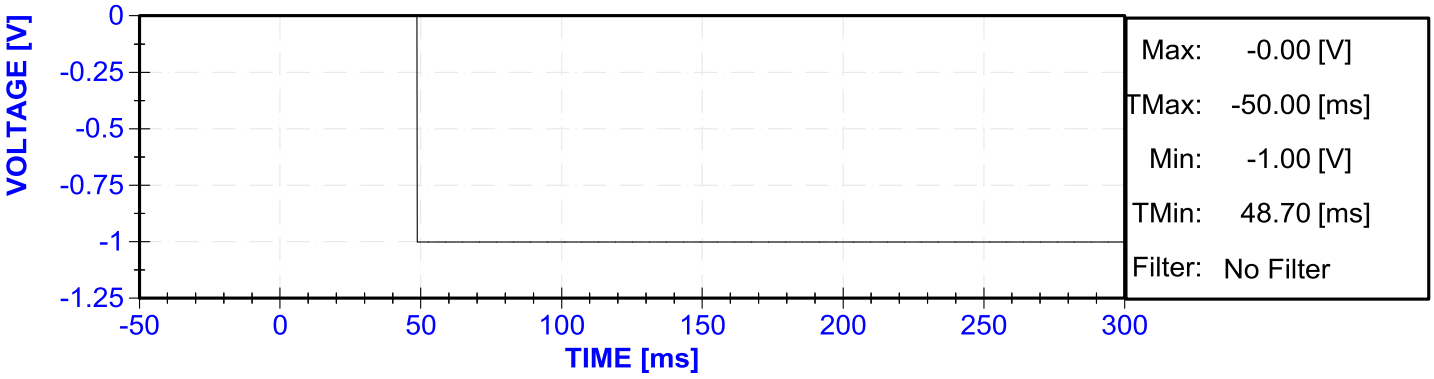
V2 Driver Floor Pan X Deflection



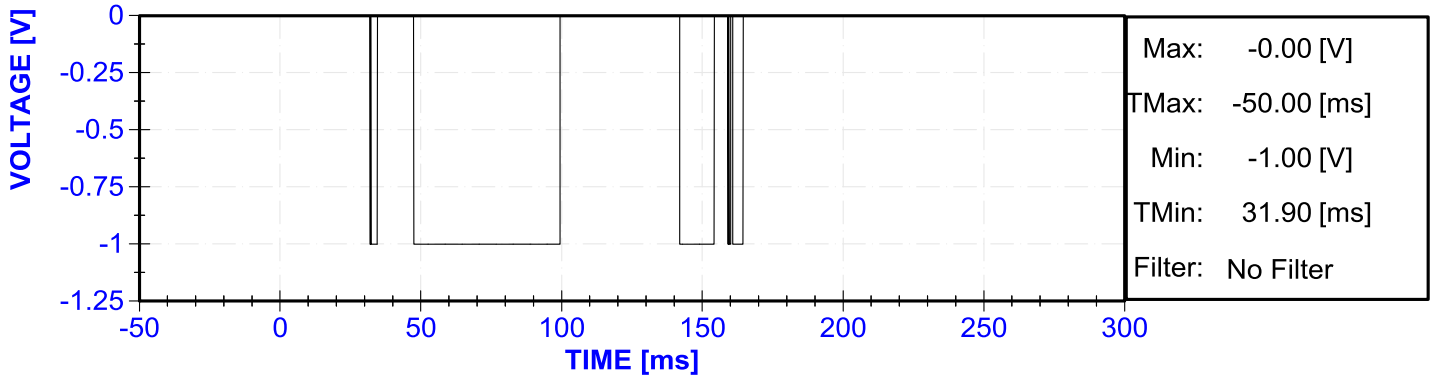
V2 Driver Left Knee CS1



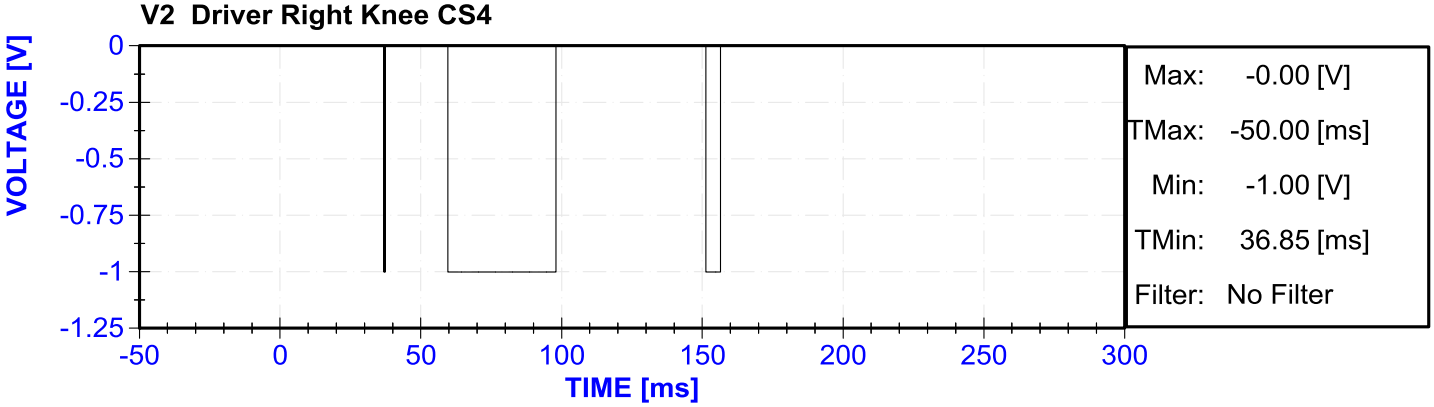
V2 Driver Left Knee CS2

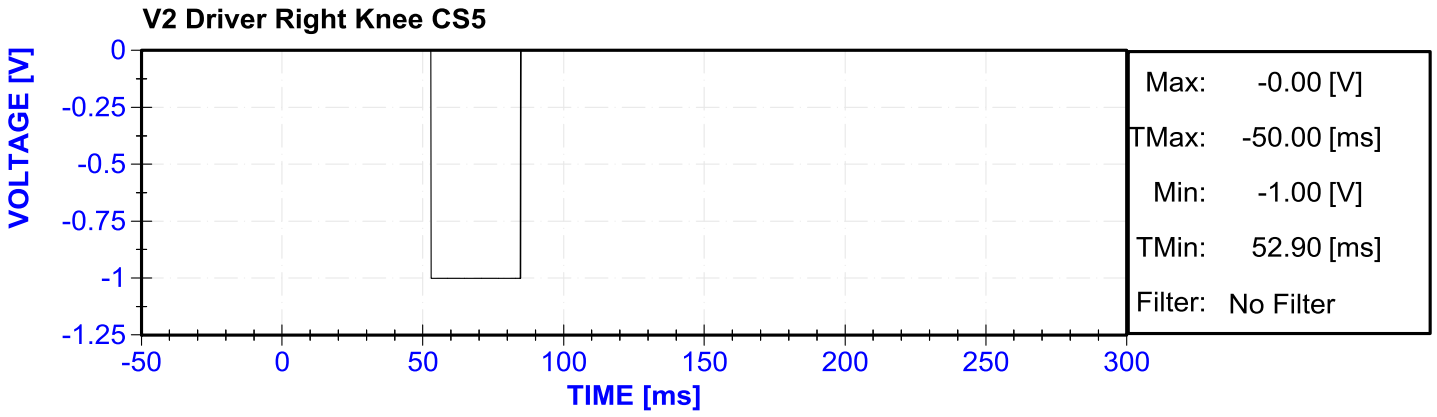


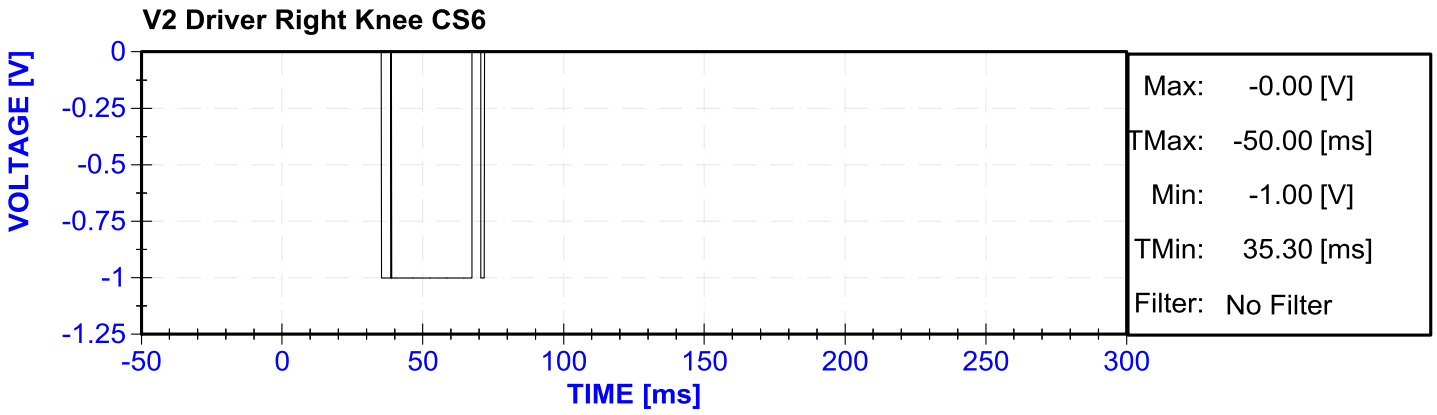
V2 Driver Left Knee CS3

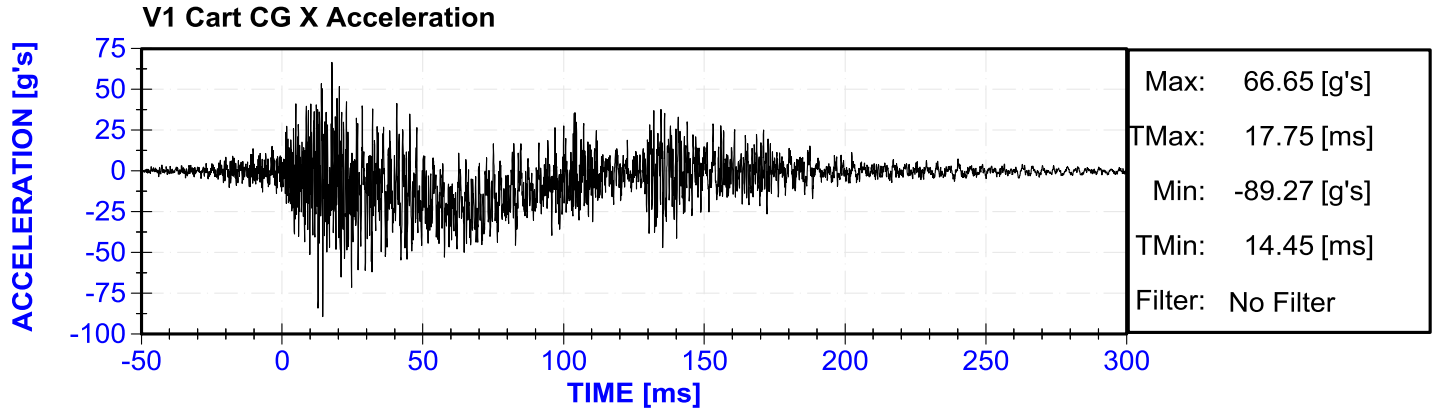


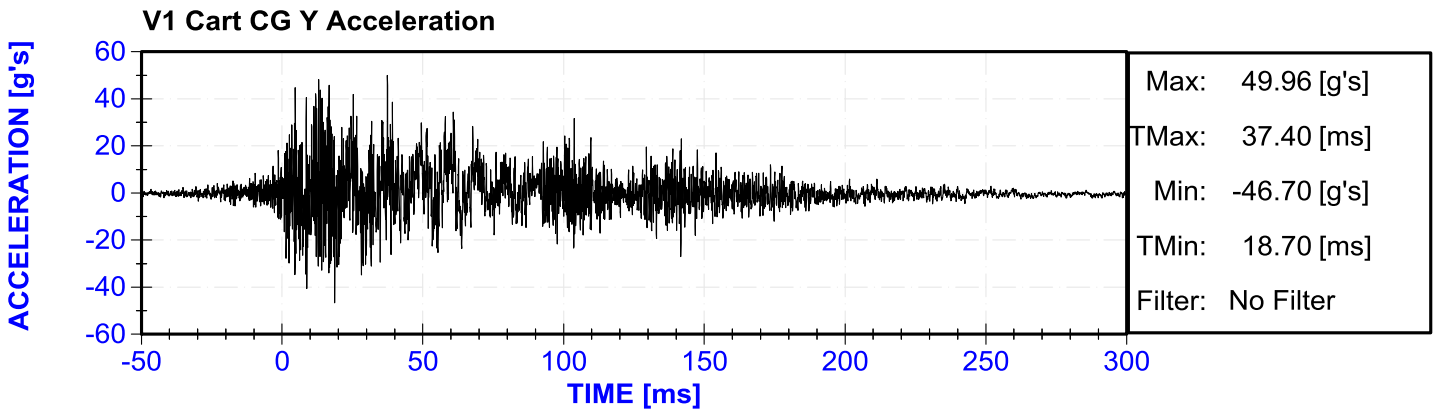
V2 Driver Right Knee CS4

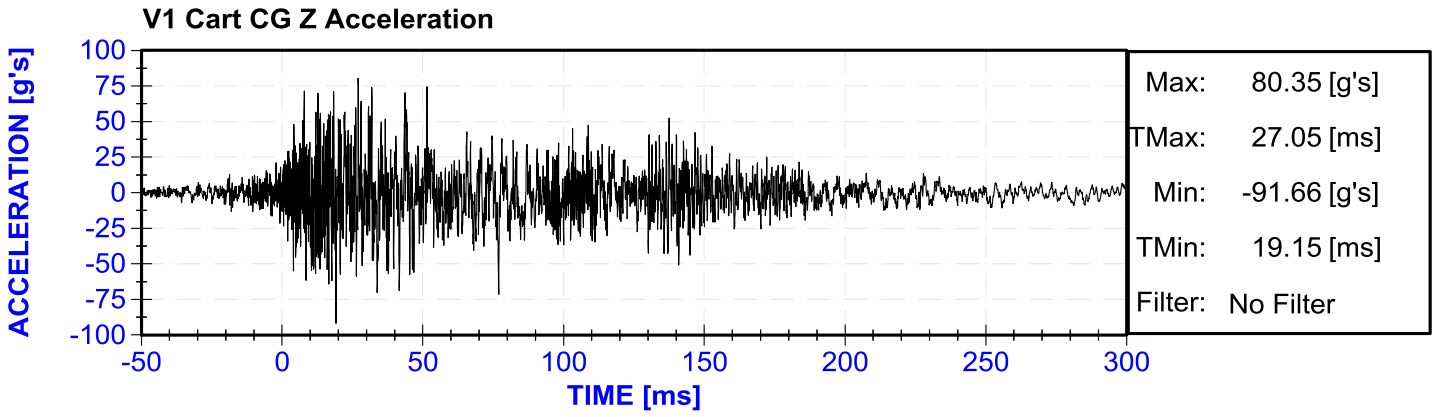


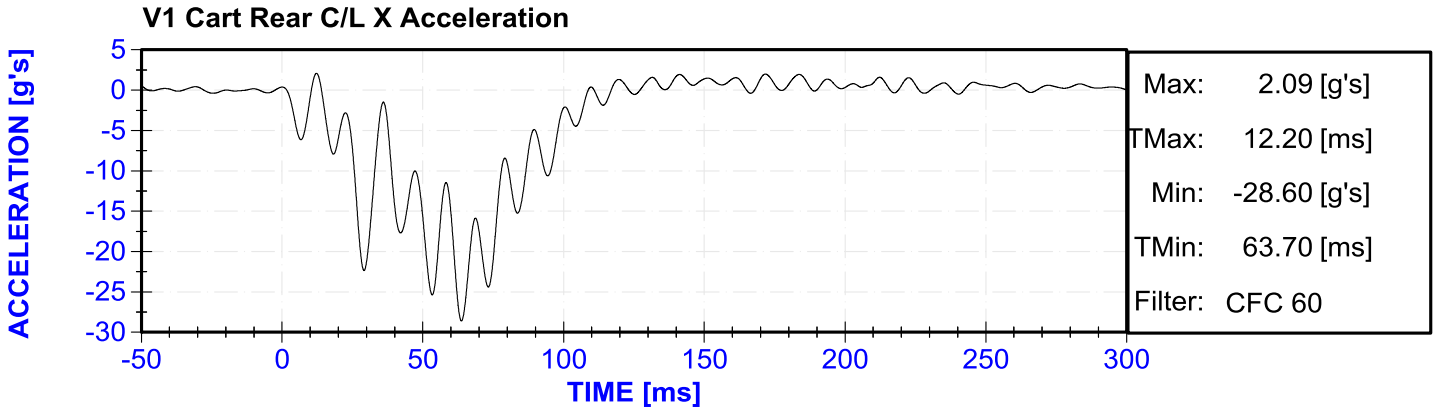

V2 Driver Right Knee CS5
VOLTAGE [V]
0
-0.25
-0.5
-0.75
-1
-1.25
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -0.00 [V]
TMax: -50.00 [ms]
Min: -1.00 [V]
TMin: 52.90 [ms]
Filter: No Filter

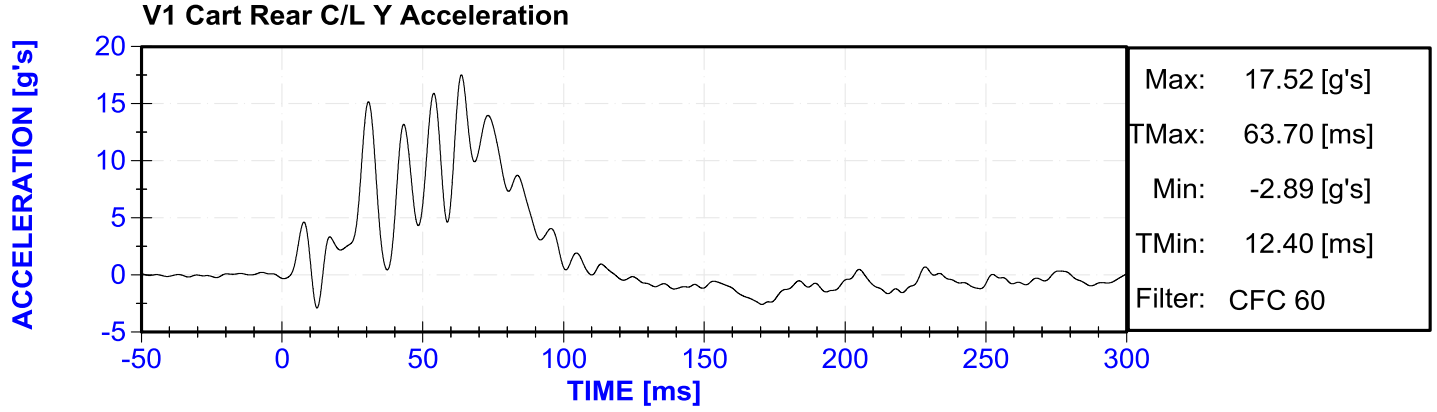

V2 Driver Right Knee CS6
VOLTAGE [V]
0
-0.25
-0.5
-0.75
-1
-1.25
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -0.00 [V]
TMax: -50.00 [ms]
Min: -1.00 [V]
TMin: 35.30 [ms]
Filter: No Filter

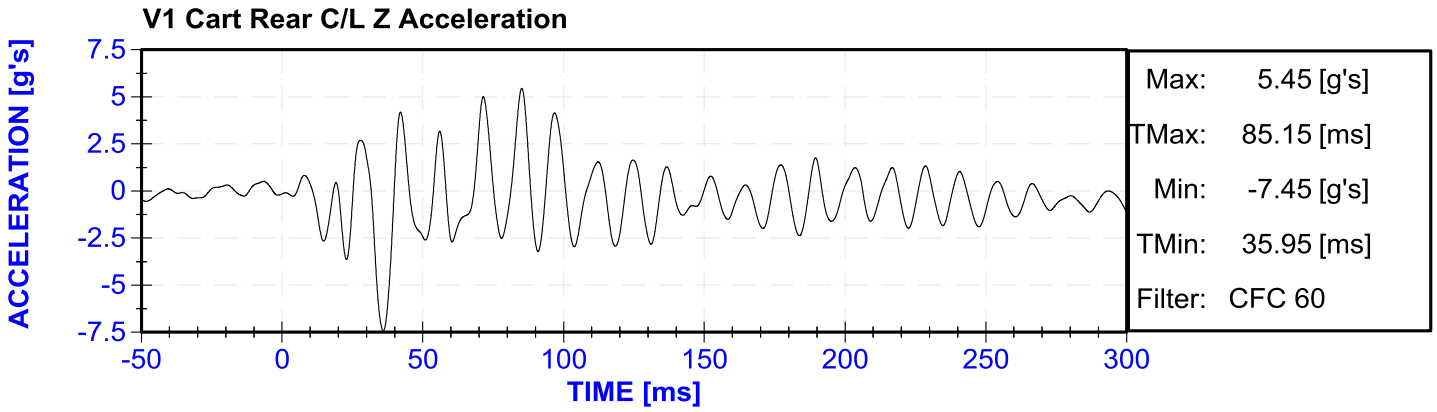

V1 Cart CG X Acceleration
ACCELERATION [g's]
75
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 66.65 [g's]
TMax: 17.75 [ms]
Min: -89.27 [g's]
TMin: 14.45 [ms]
Filter: No Filter


V1 Cart CG Y Acceleration
ACCELERATION [g's]
60
40
20
0
-20
-40
-60
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 49.96 [g's]
TMax: 37.40 [ms]
Min: -46.70 [g's]
TMin: 18.70 [ms]
Filter: No Filter

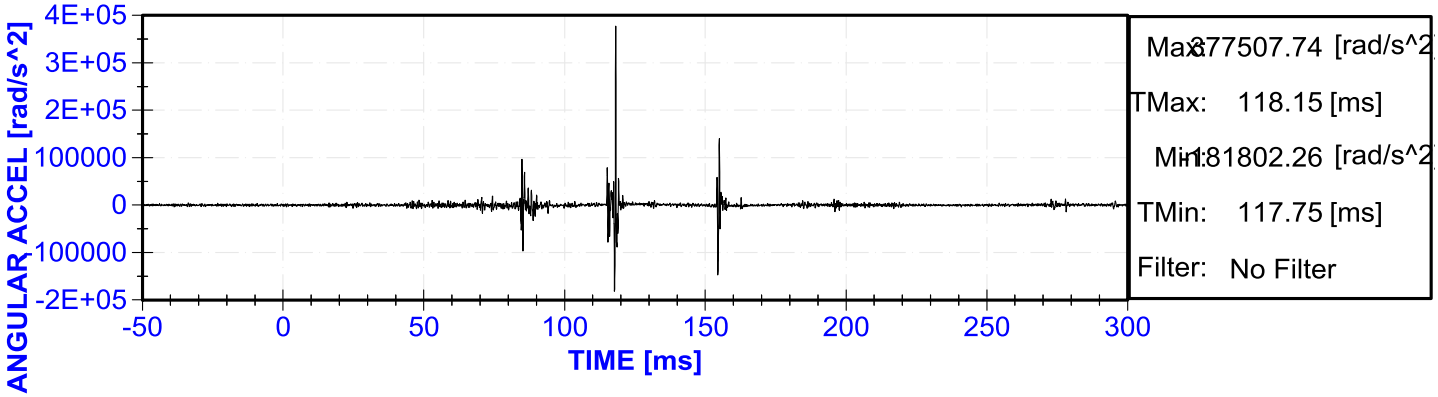

V1 Cart CG Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 80.35 [g's]
TMax: 27.05 [ms]
Min: -91.66 [g's]
TMin: 19.15 [ms]
Filter: No Filter


V1 Cart Rear C/L X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 2.09 [g's]
TMax: 12.20 [ms]
Min: -28.60 [g's]
TMin: 63.70 [ms]
Filter: CFC 60

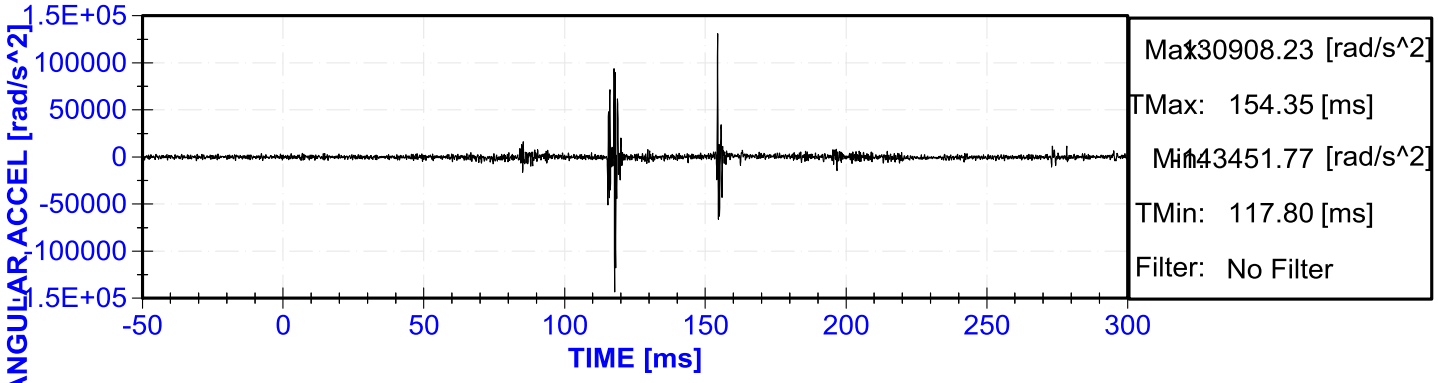

V1 Cart Rear C/L Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 17.52 [g's]
TMax: 63.70 [ms]
Min: -2.89 [g's]
TMin: 12.40 [ms]
Filter: CFC 60


V1 Cart Rear C/L Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 5.45 [g's]
TMax: 85.15 [ms]
Min: -7.45 [g's]
TMin: 35.95 [ms]
Filter: CFC 60

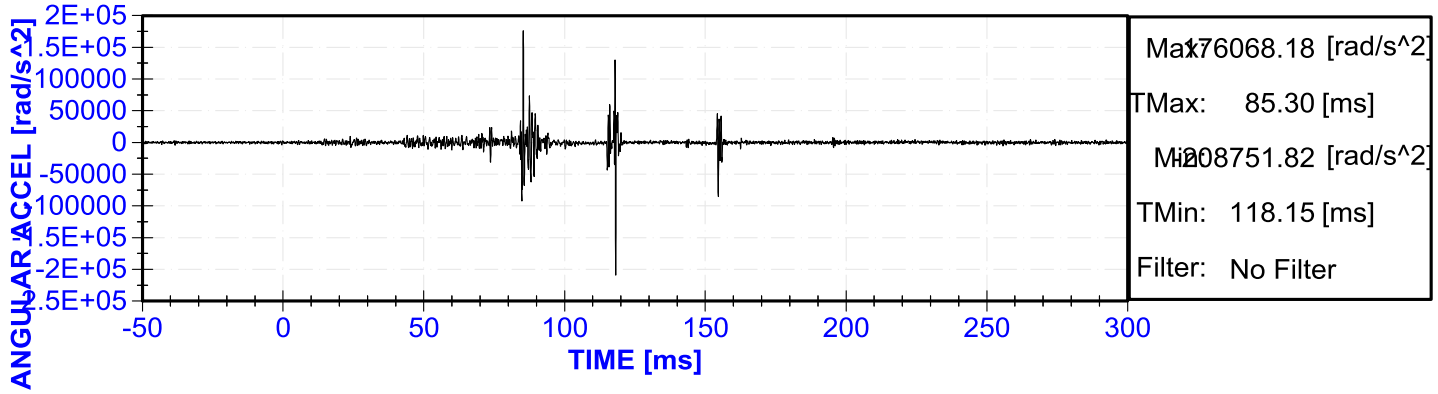
V2P1 HEAD ANGULAR ACCELERATION X [SIMON]



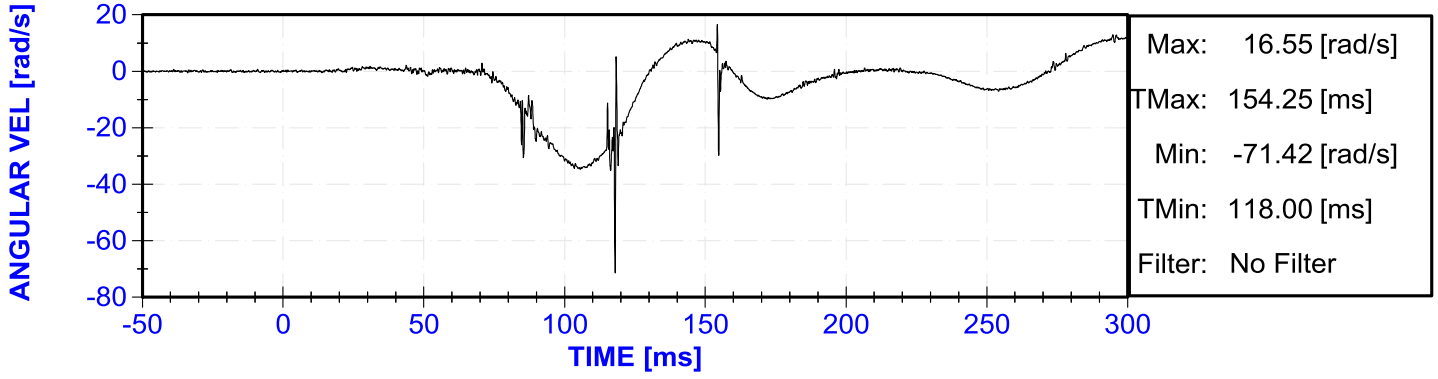
V2P1 HEAD ANGULAR ACCELERATION Y [SIMON]



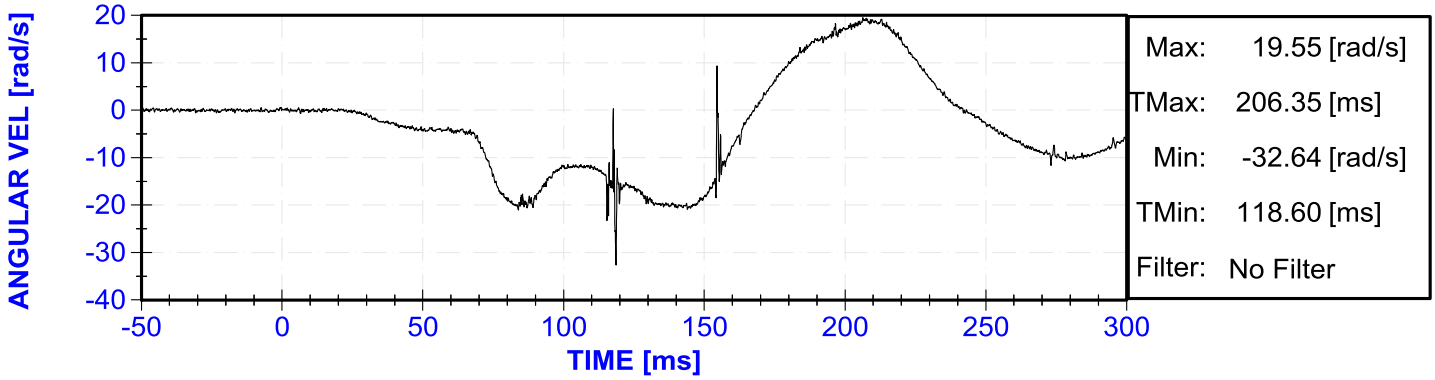
V2P1 HEAD ANGULAR ACCELERATION Z [SIMON]



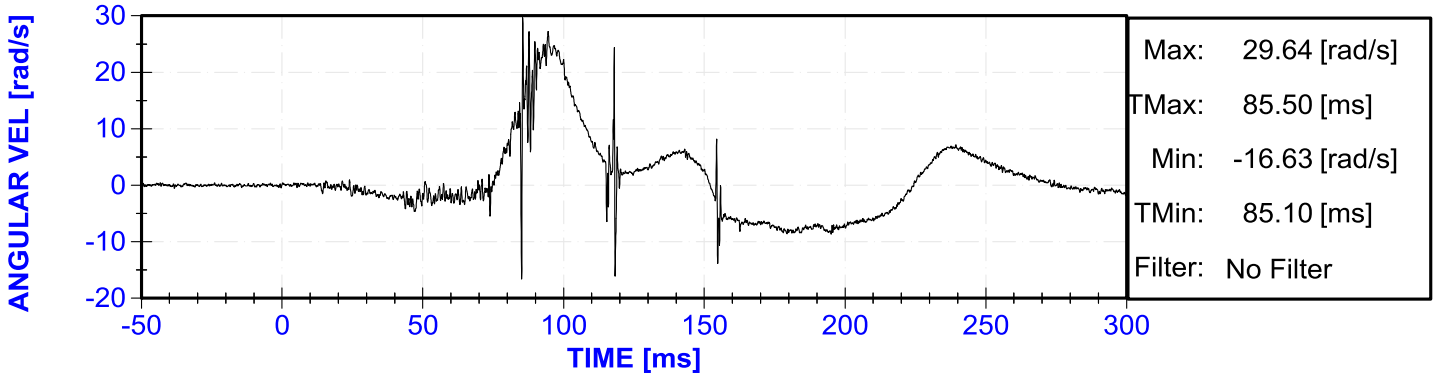
V2P1 HEAD ANGULAR VELOCITY X [SIMON]



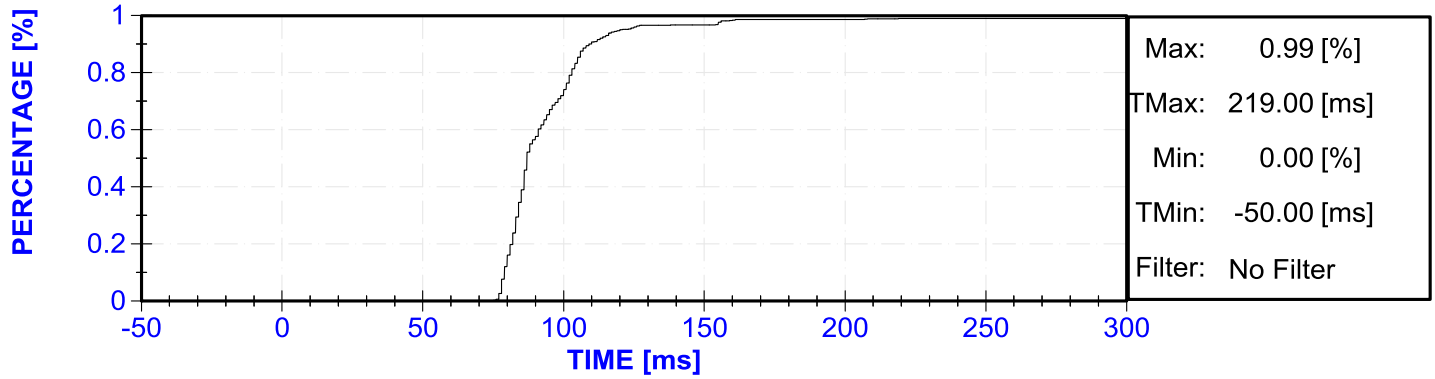
V2P1 HEAD ANGULAR VELOCITY Y [SIMON]



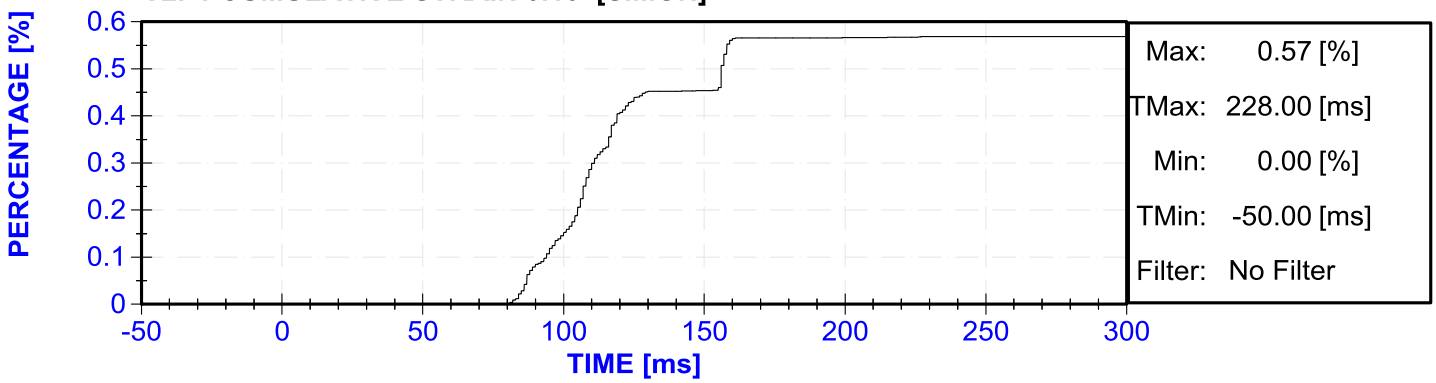
V2P1 HEAD ANGULAR VELOCITY Z [SIMON]



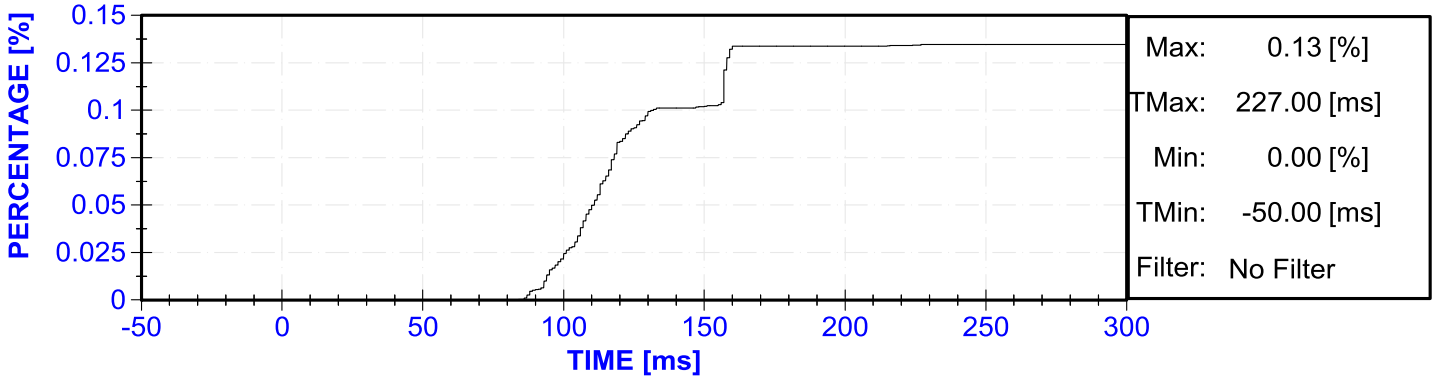
V2P1 CUMULATIVE STRAIN 0.05 [SIMON]



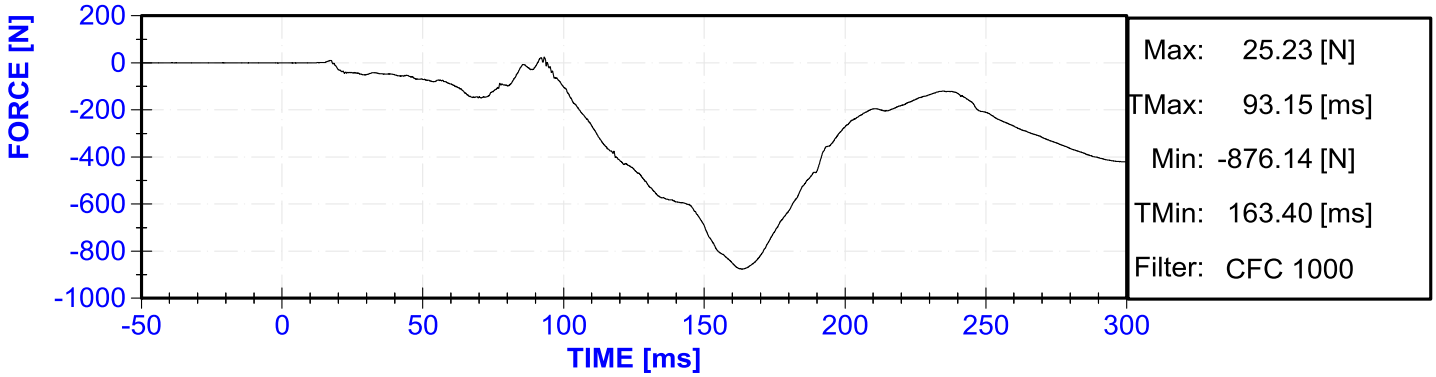
V2P1 CUMULATIVE STRAIN 0.10 [SIMON]



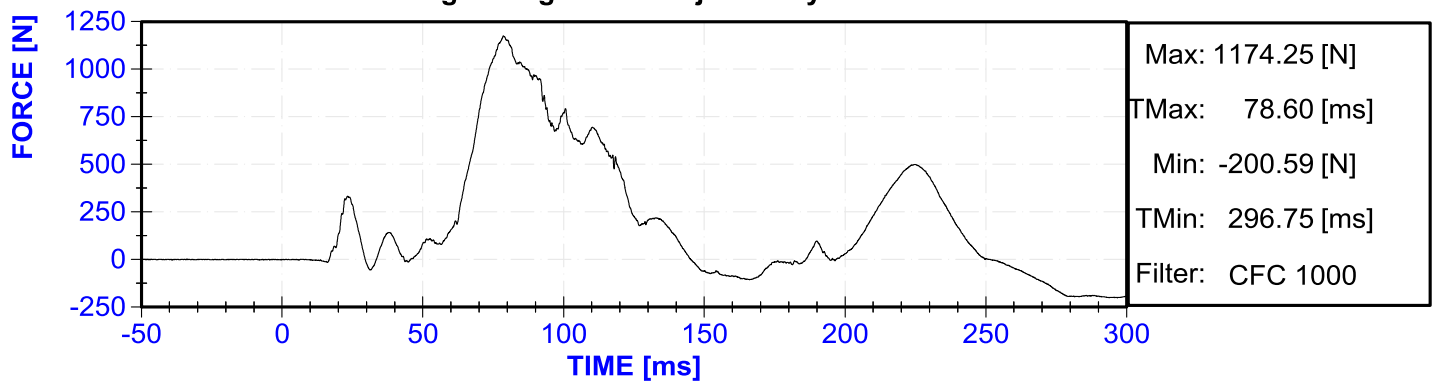
V2P1 CUMULATIVE STRAIN 0.15 [SIMON]



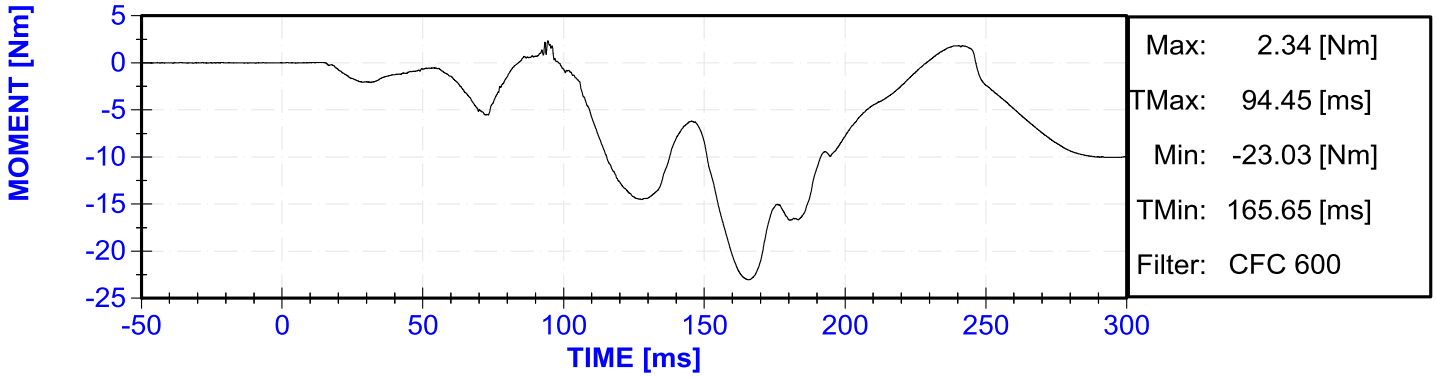
V2P1 Fx on head acting through the O.C. joint only



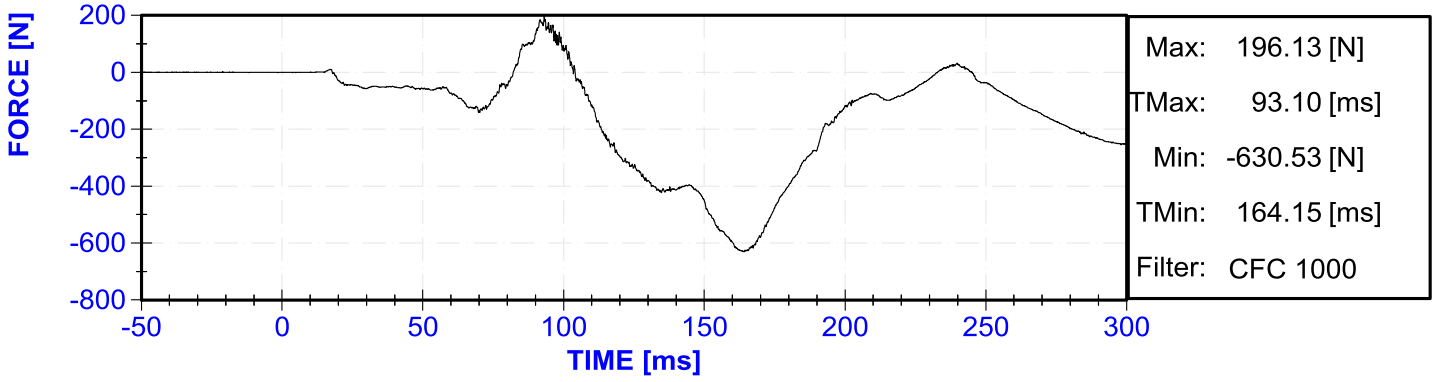
V2P1 Fz on head acting through the O.C. joint only



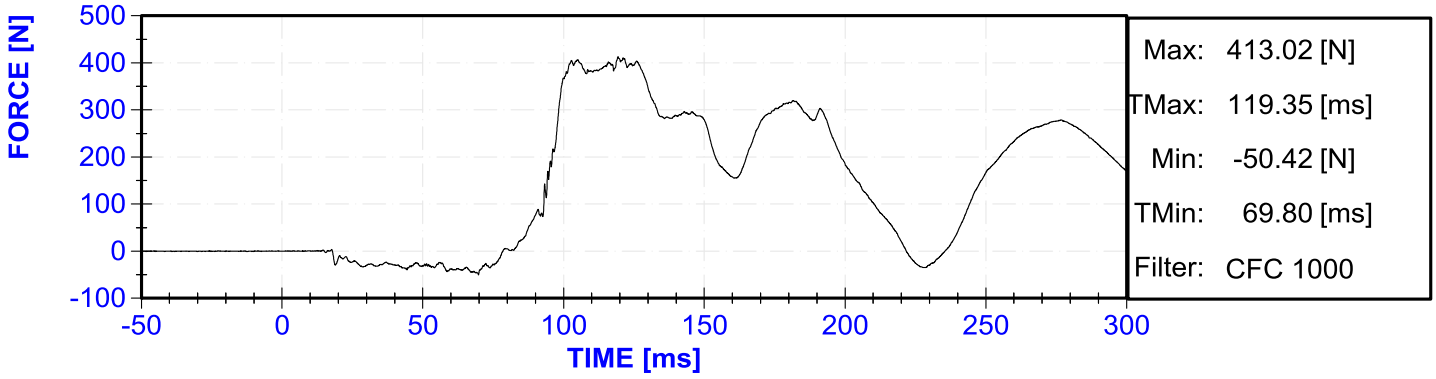
V2P1 My on head acting through the O.C. joint only



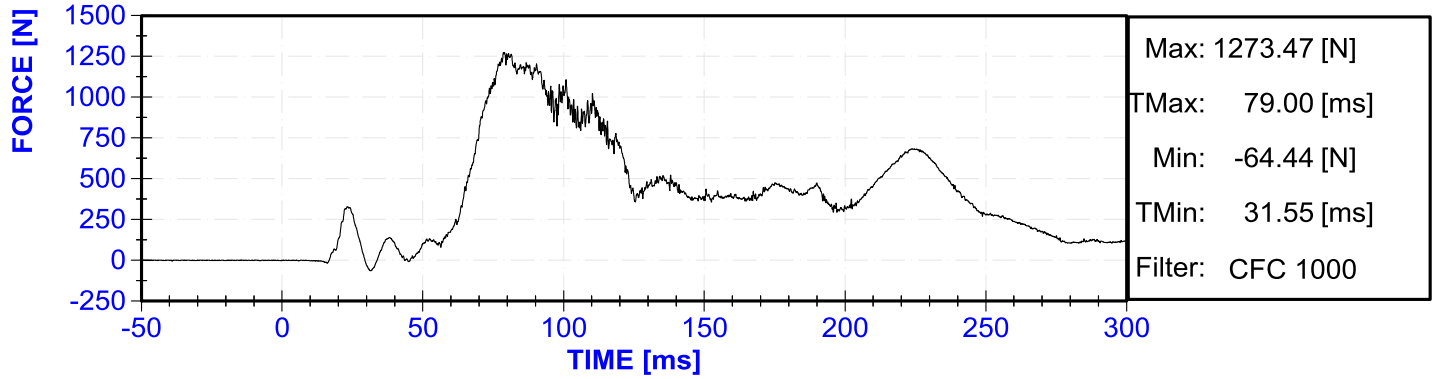
V2P1 Fx on head acting through the total neck section



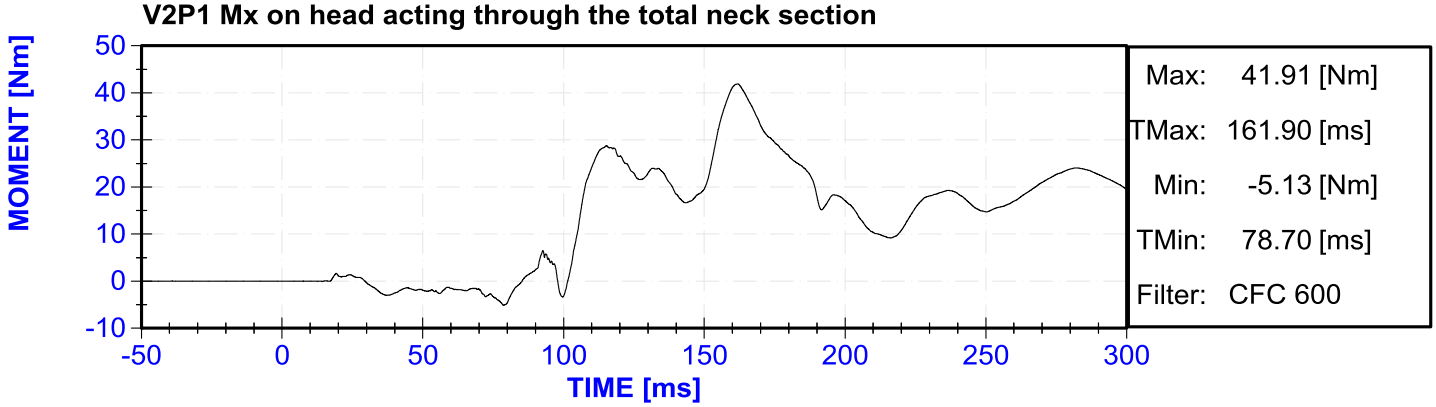
V2P1 Fy on head acting through the total neck section



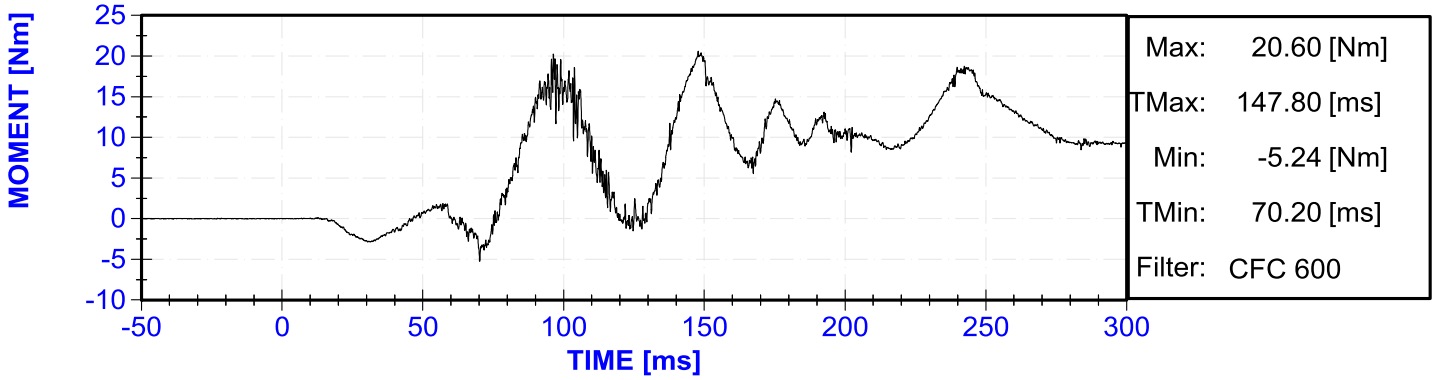
V2P1 Fz on head acting through the total neck section



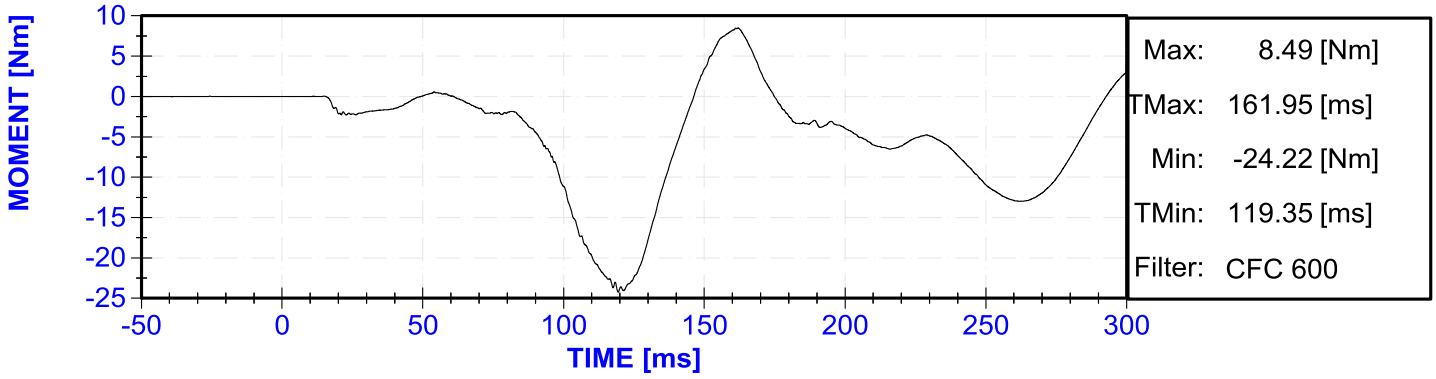
V2P1 Mx on head acting through the total neck section



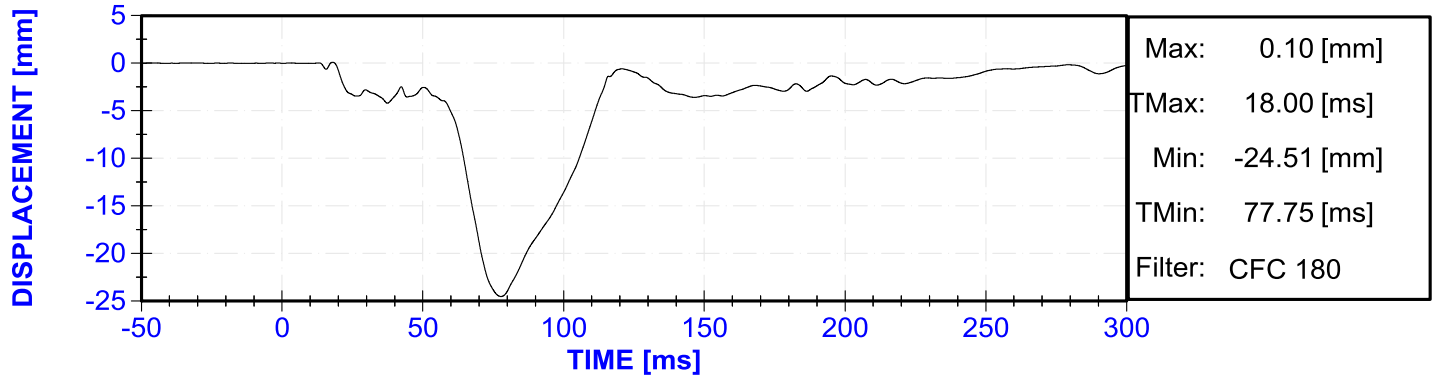
V2P1 My on head acting through the total neck section



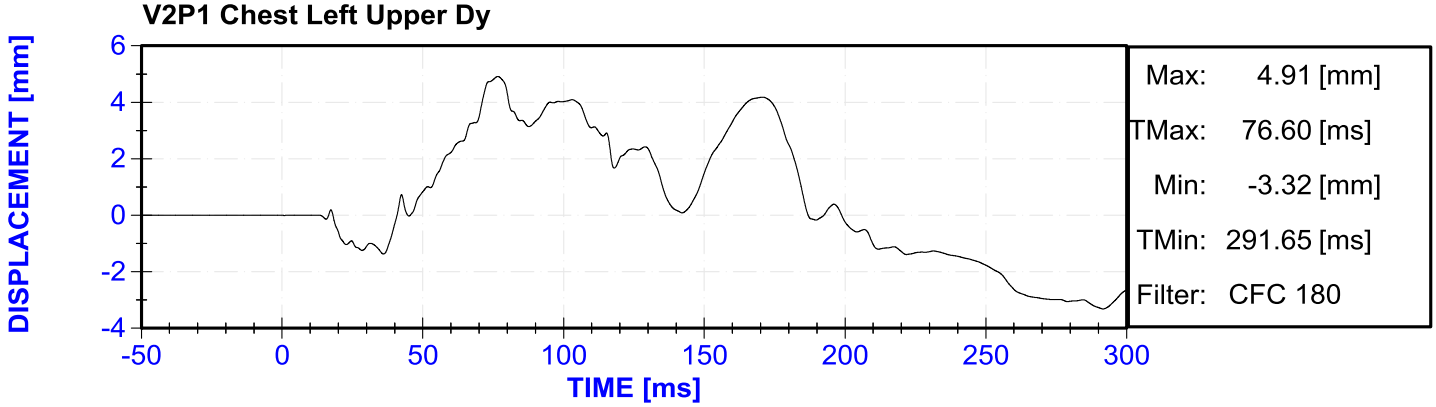
V2P1 Mz on head acting through the total neck section



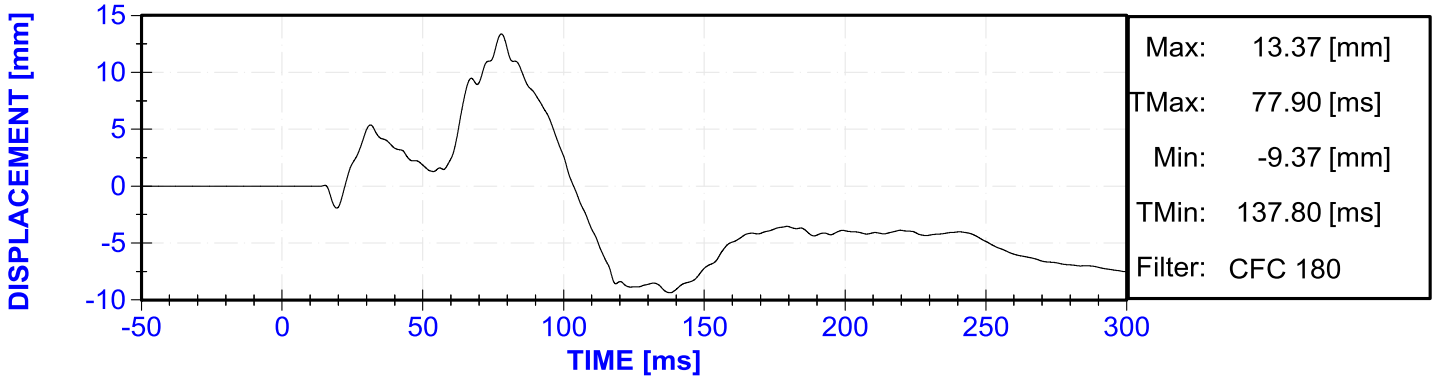
V2P1 Chest Left Upper Dx



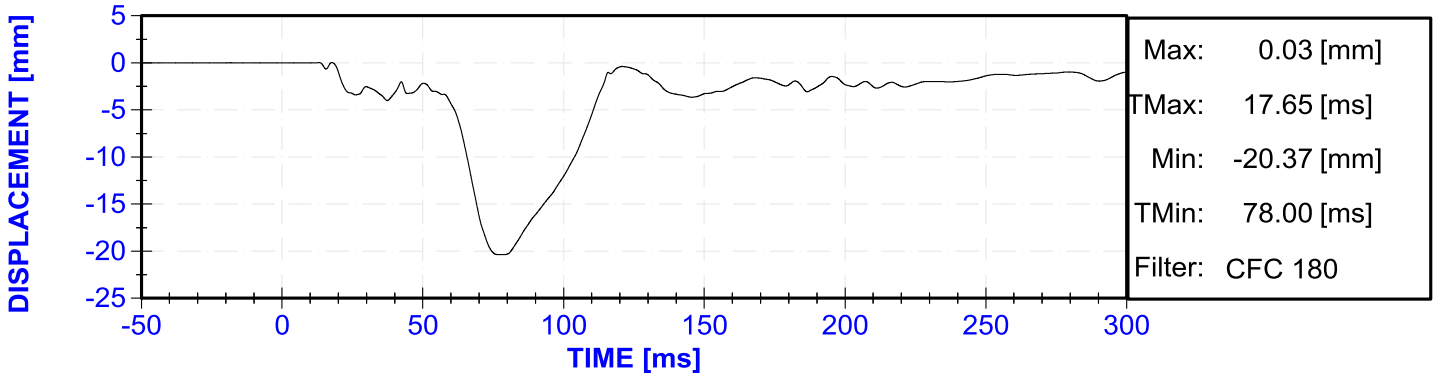
V2P1 Chest Left Upper Dy



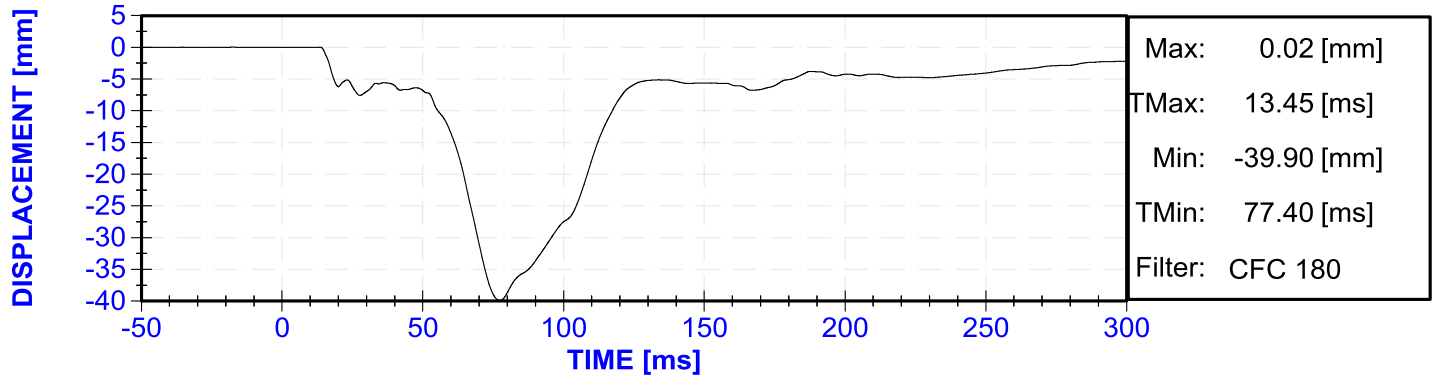
V2P1 Chest Left Upper Dz



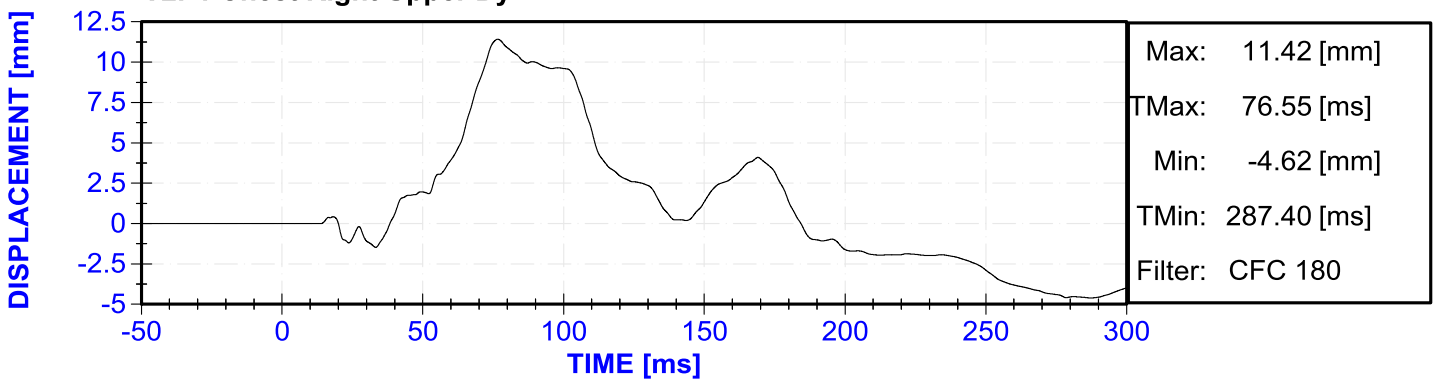
V2P1 Chest Left Upper D



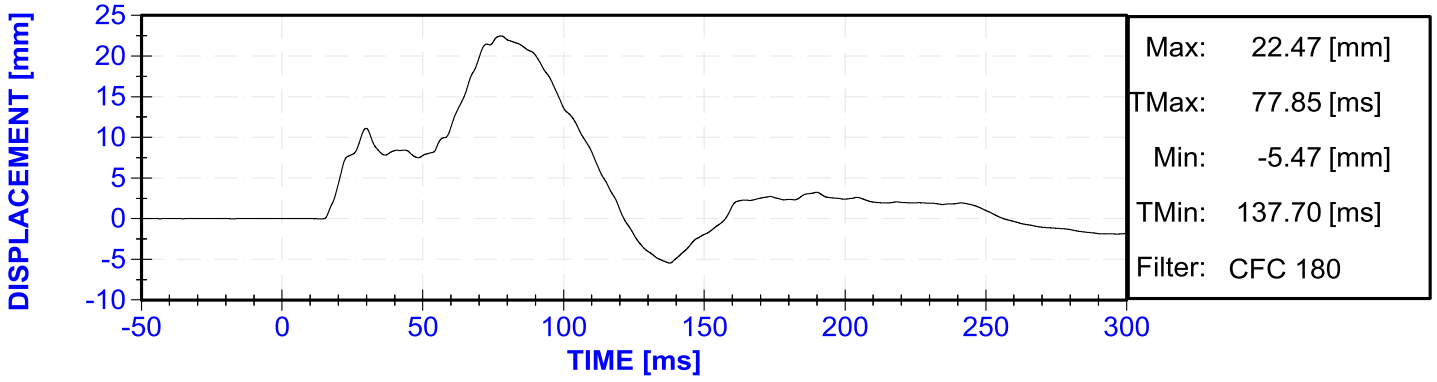
V2P1 Chest Right Upper Dx



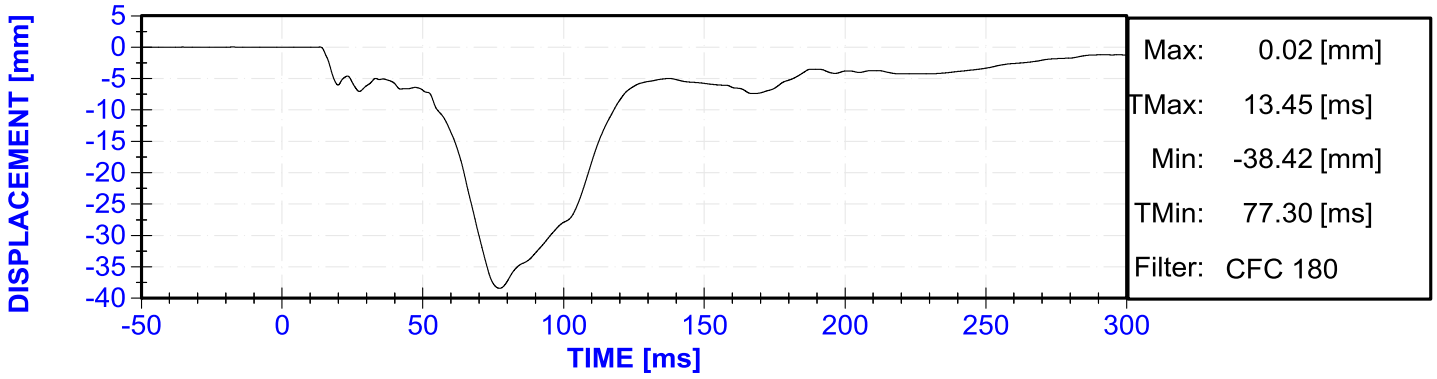
V2P1 Chest Right Upper Dy



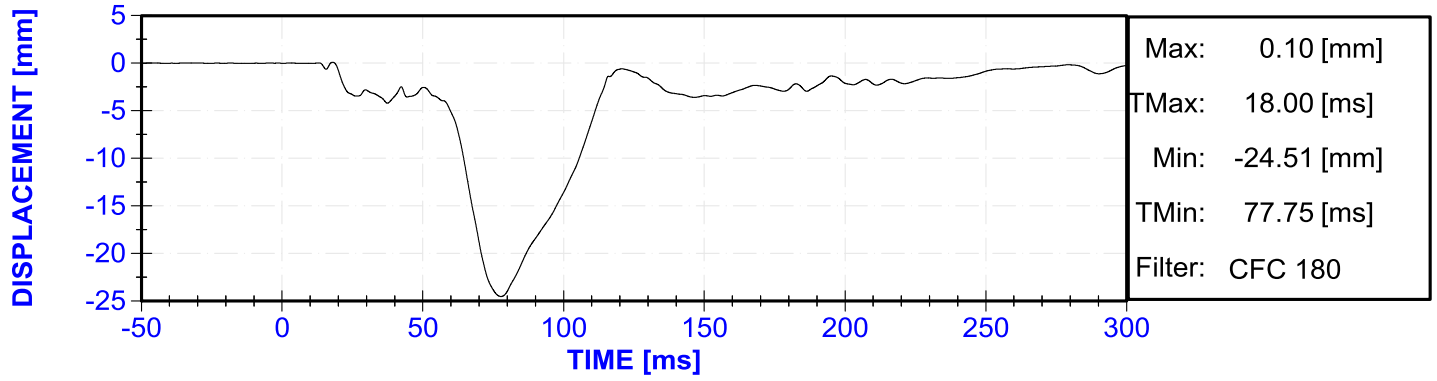
V2P1 Chest Right Upper Dz



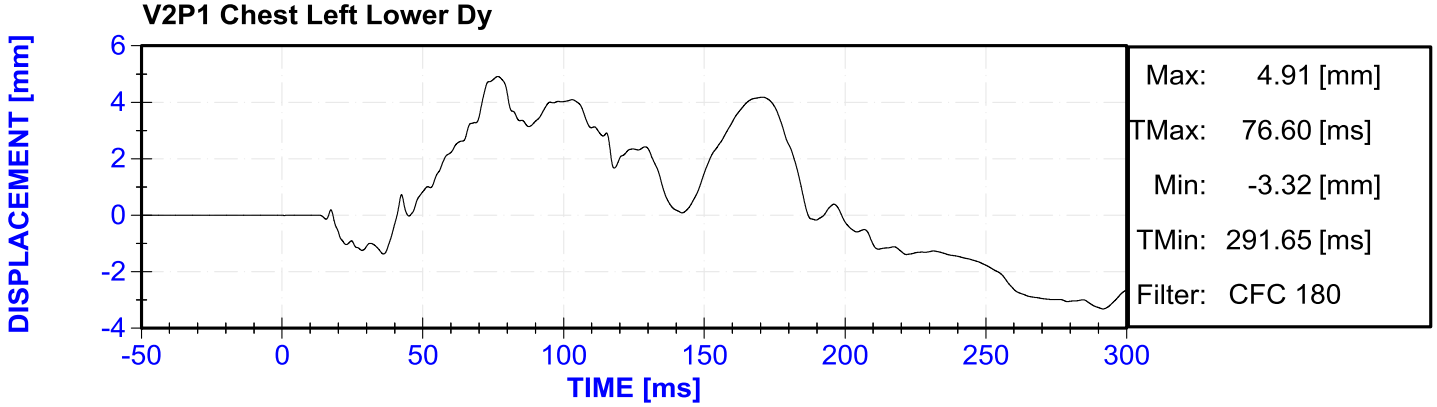
V2P1 Chest Right Upper D



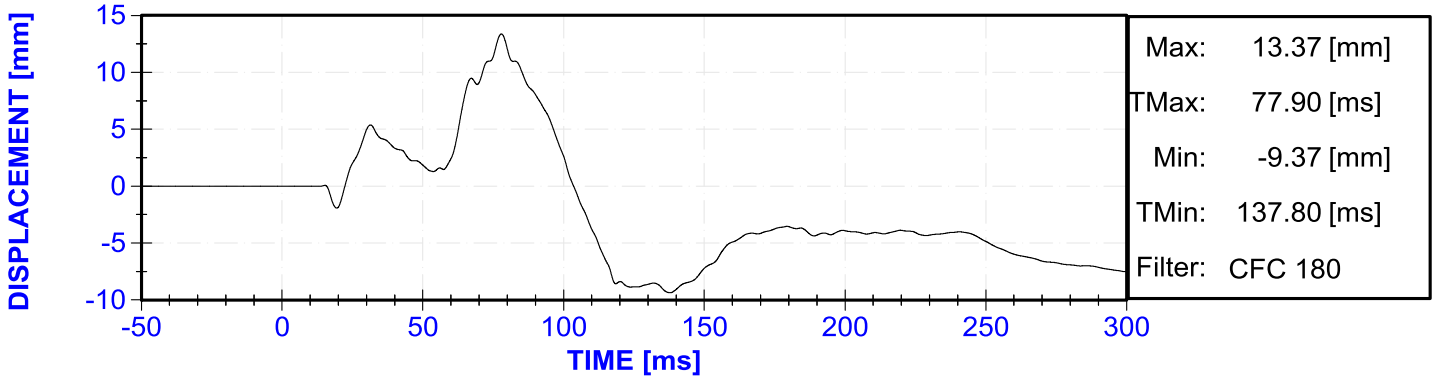
V2P1 Chest Left Lower Dx



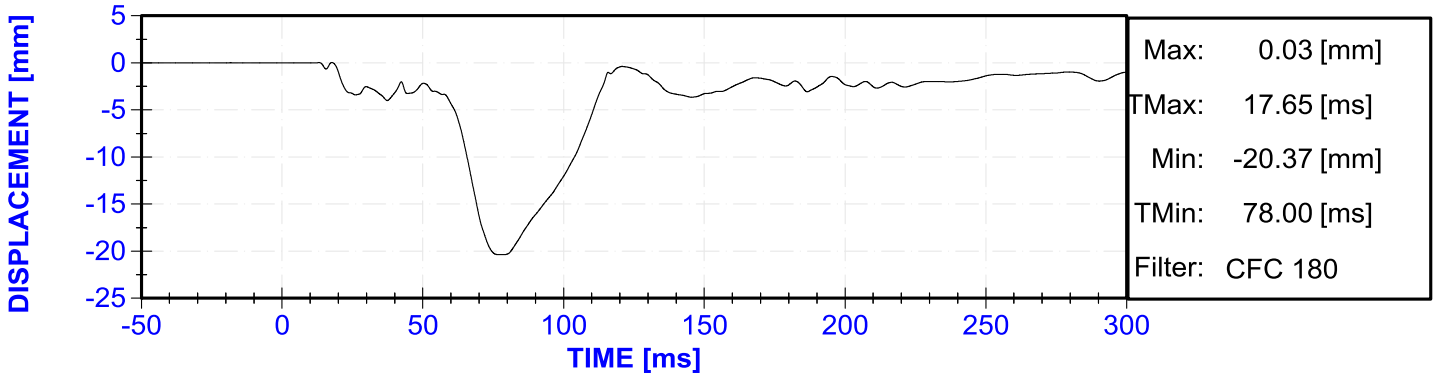
V2P1 Chest Left Lower Dy



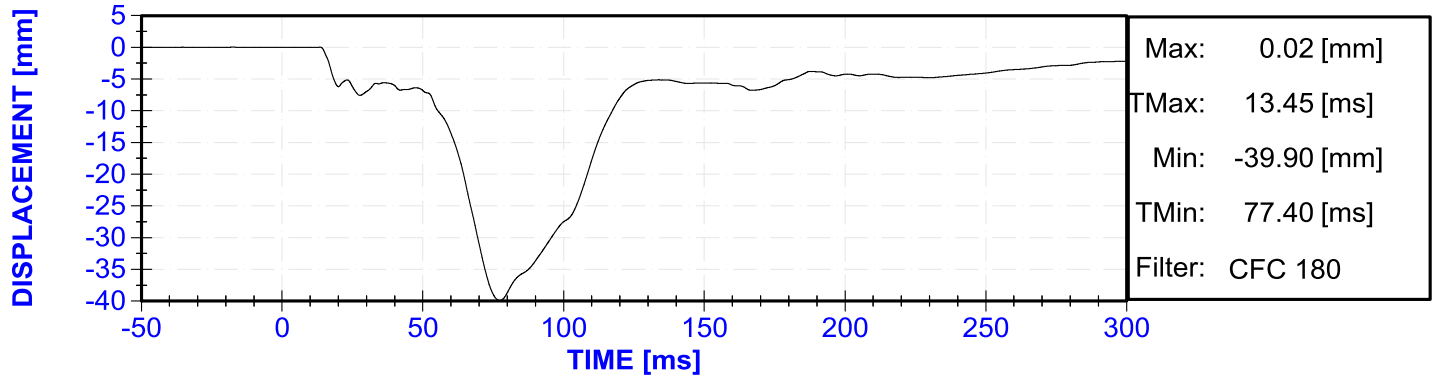
V2P1 Chest Left Lower Dz



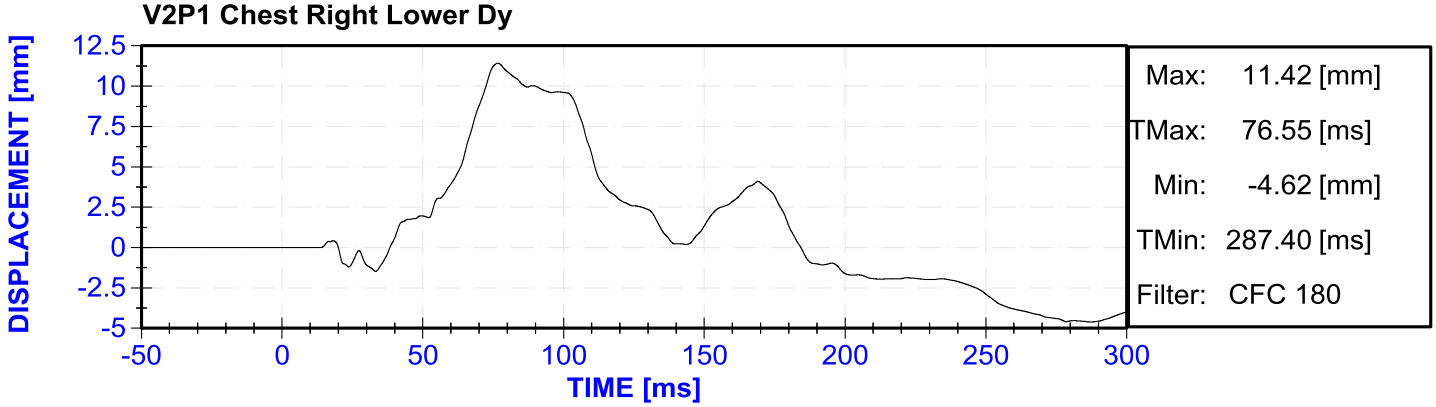
V2P1 Chest Left Lower D



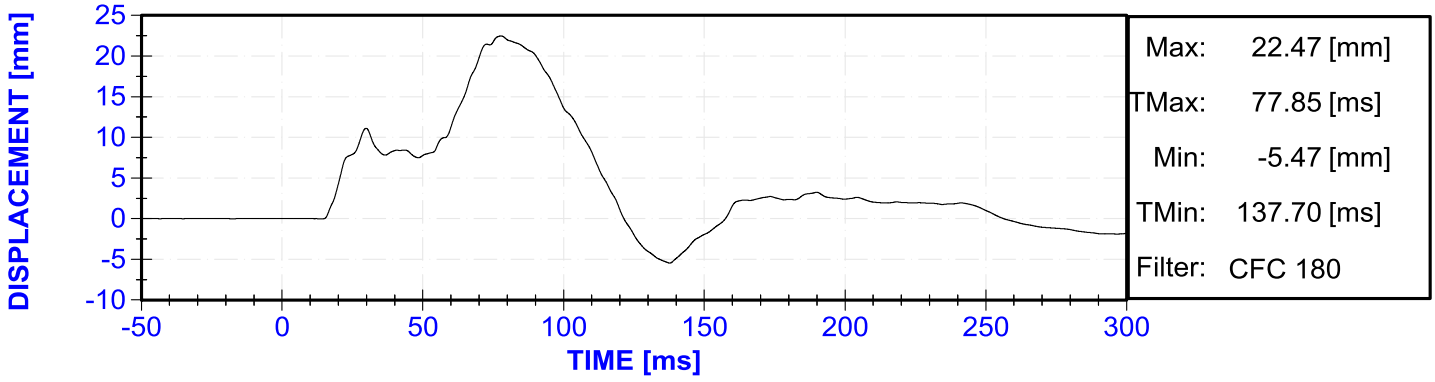
V2P1 Chest Right Lower Dx



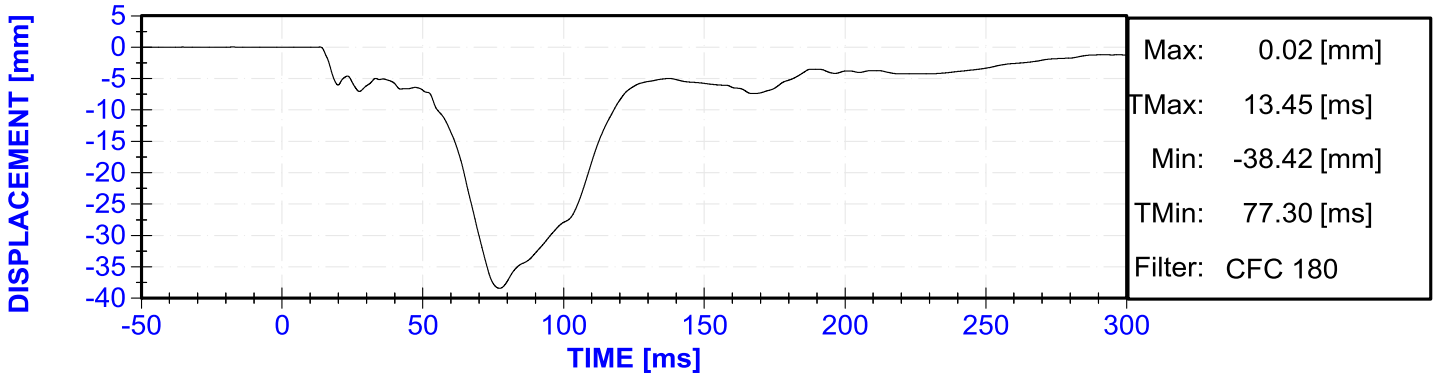
V2P1 Chest Right Lower Dy



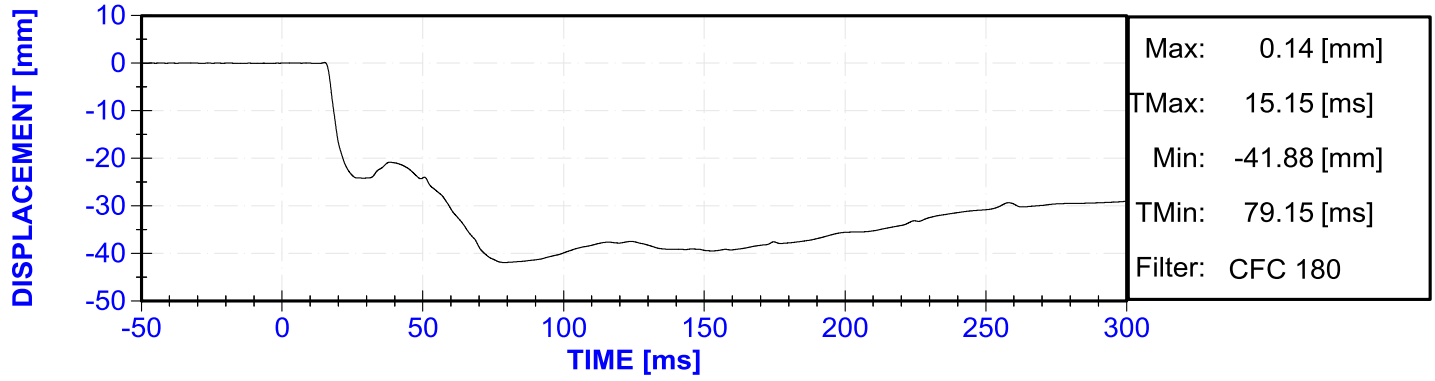
V2P1 Chest Right Lower Dz



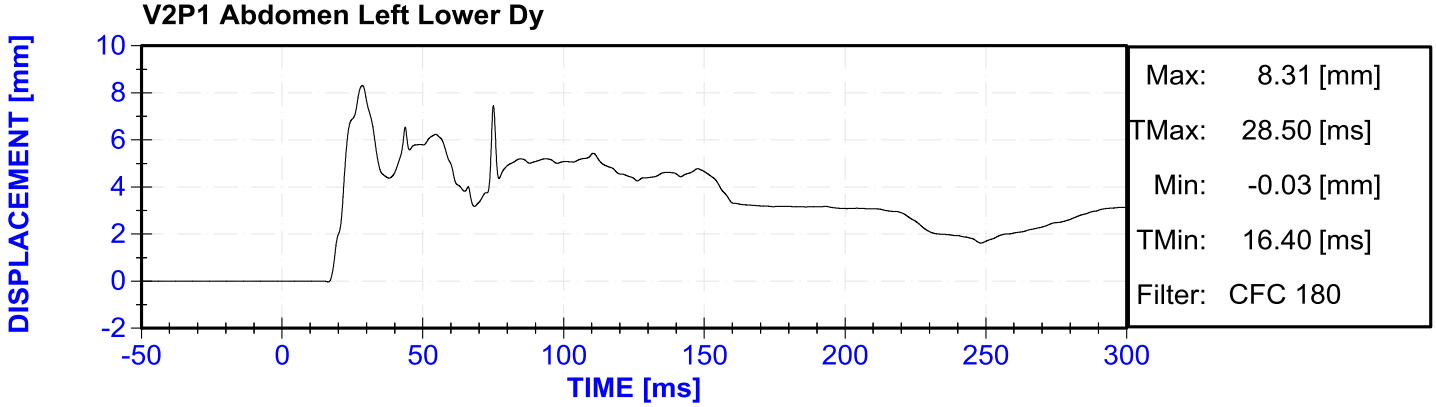
V2P1 Chest Right Lower D



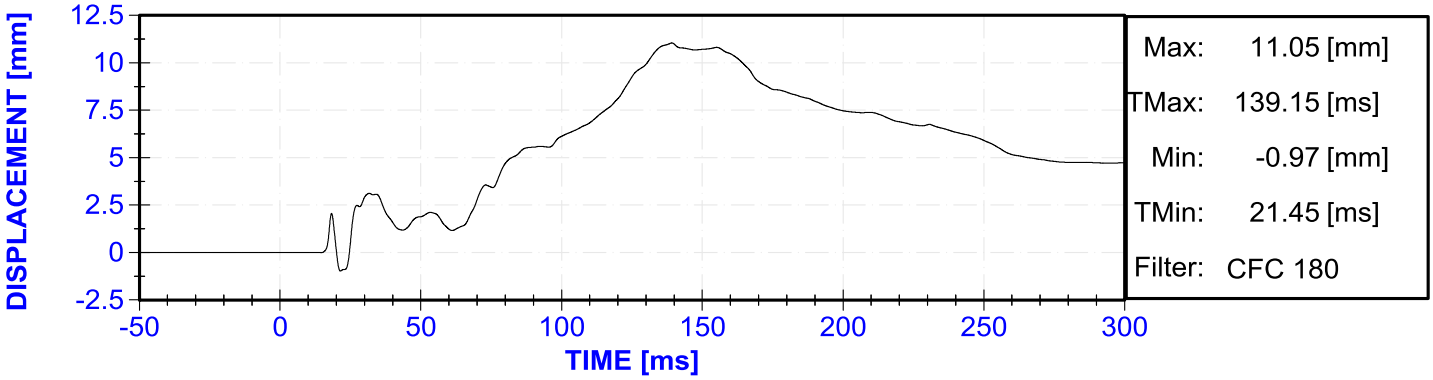
V2P1 Abdomen Left Lower Dx



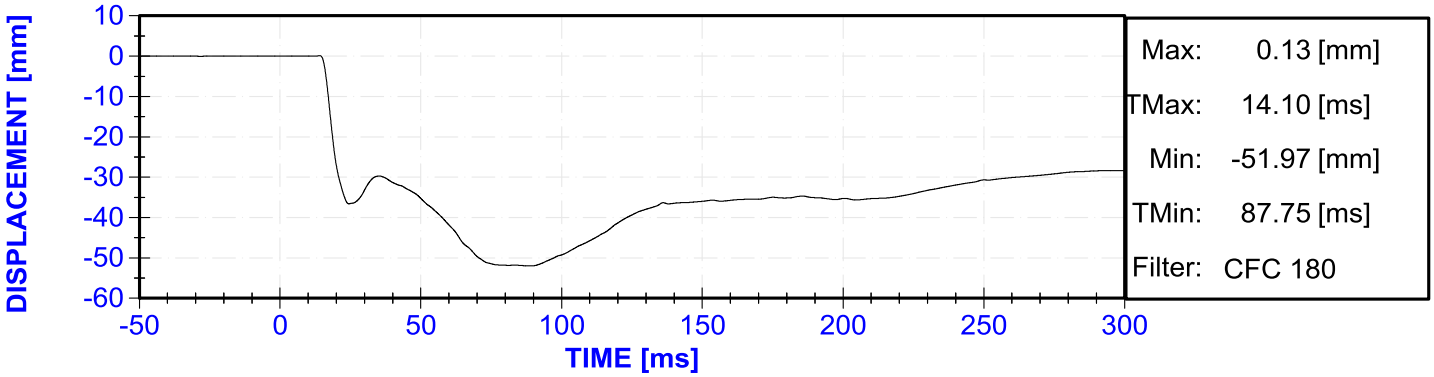
V2P1 Abdomen Left Lower Dy



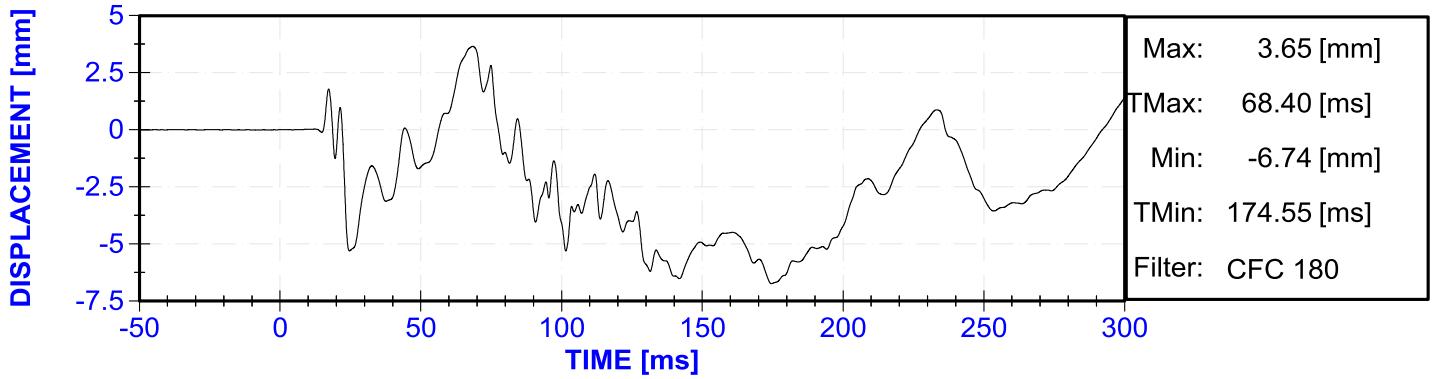
V2P1 Abdomen Left Lower Dz



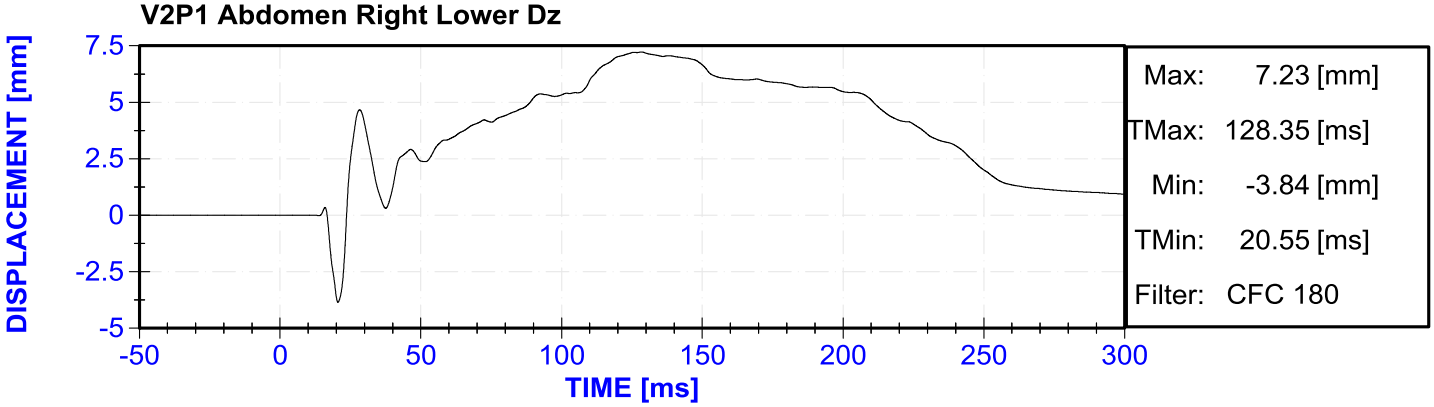
V2P1 Abdomen Right Lower Dx



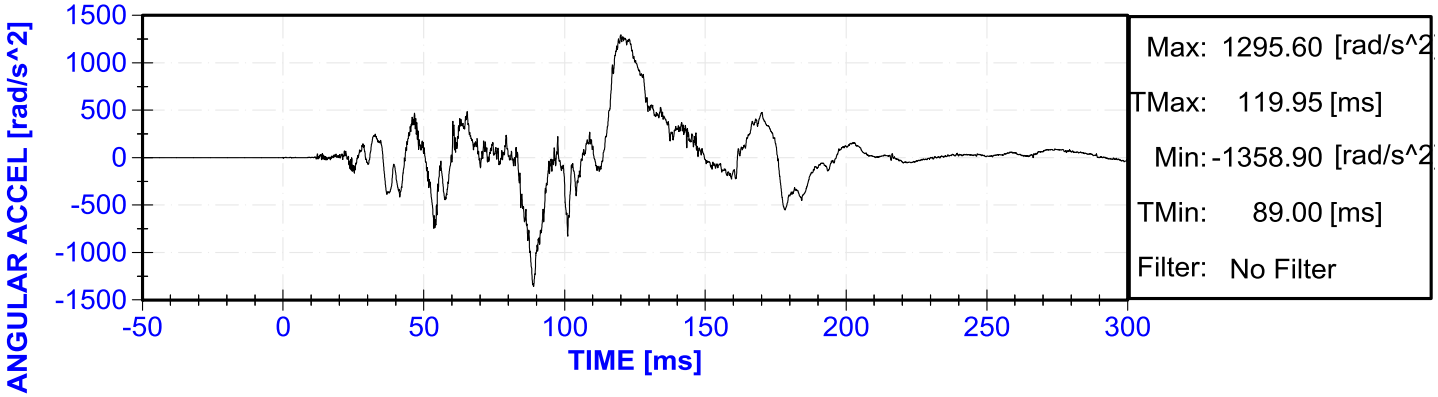
V2P1 Abdomen Right Lower Dy



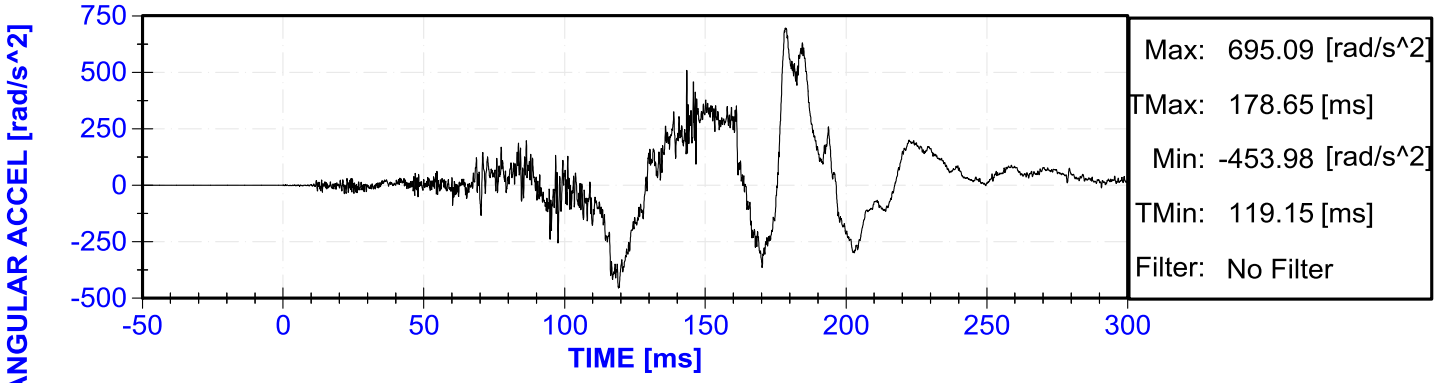
V2P1 Abdomen Right Lower Dz



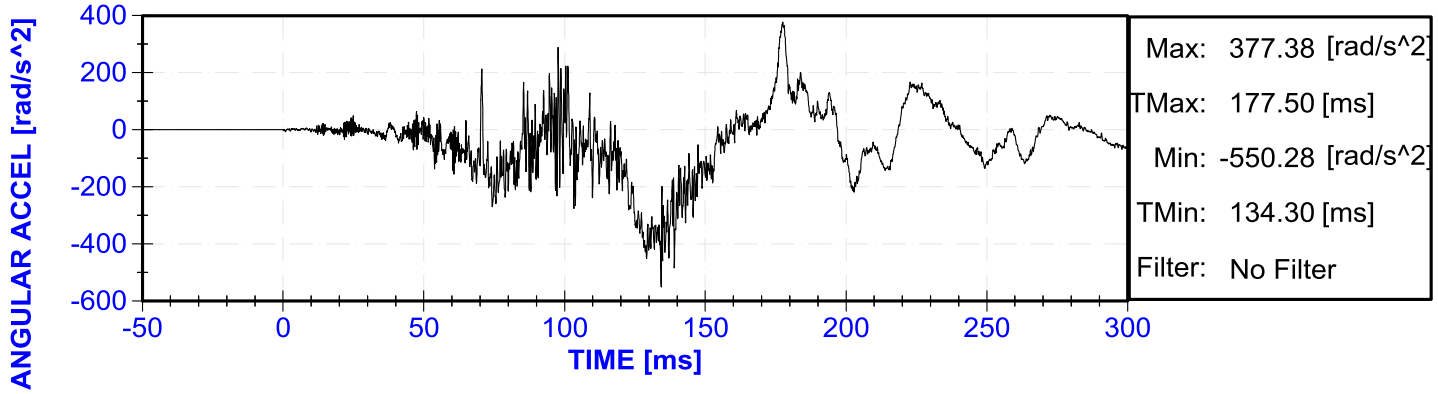
V2P4 HEAD ANGULAR ACCELERATION X [SIMON]



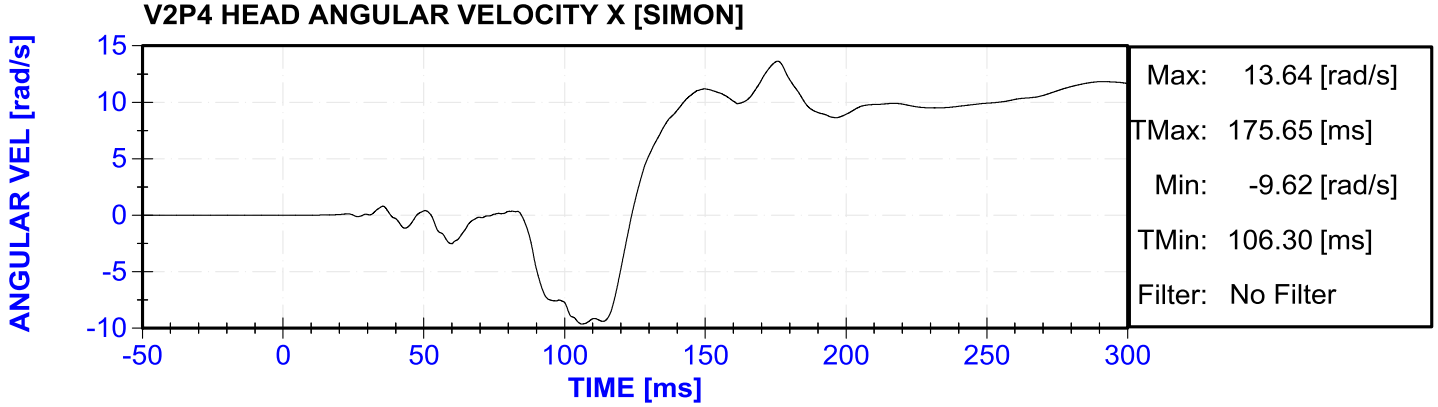
V2P4 HEAD ANGULAR ACCELERATION Y [SIMON]



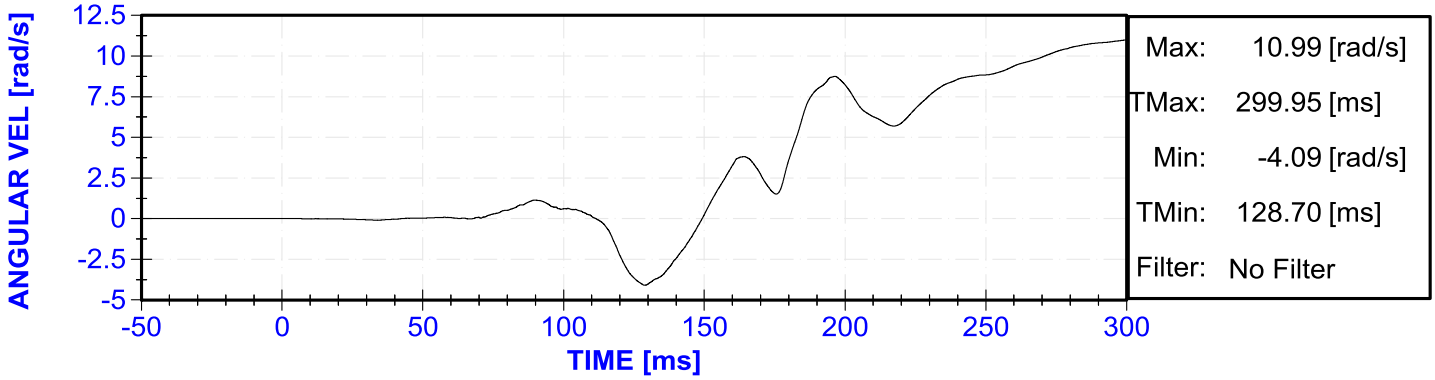
V2P4 HEAD ANGULAR ACCELERATION Z [SIMON]



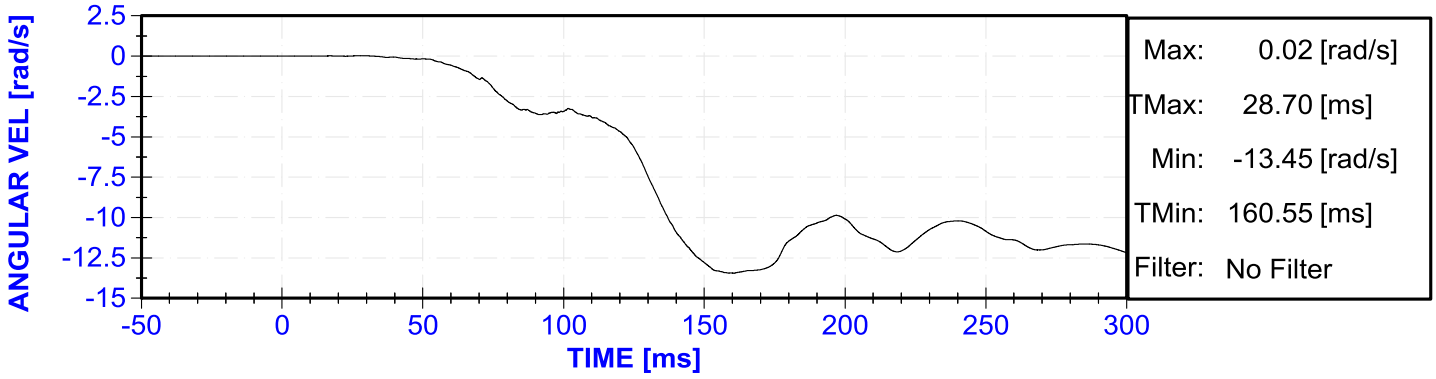
V2P4 HEAD ANGULAR VELOCITY X [SIMON]



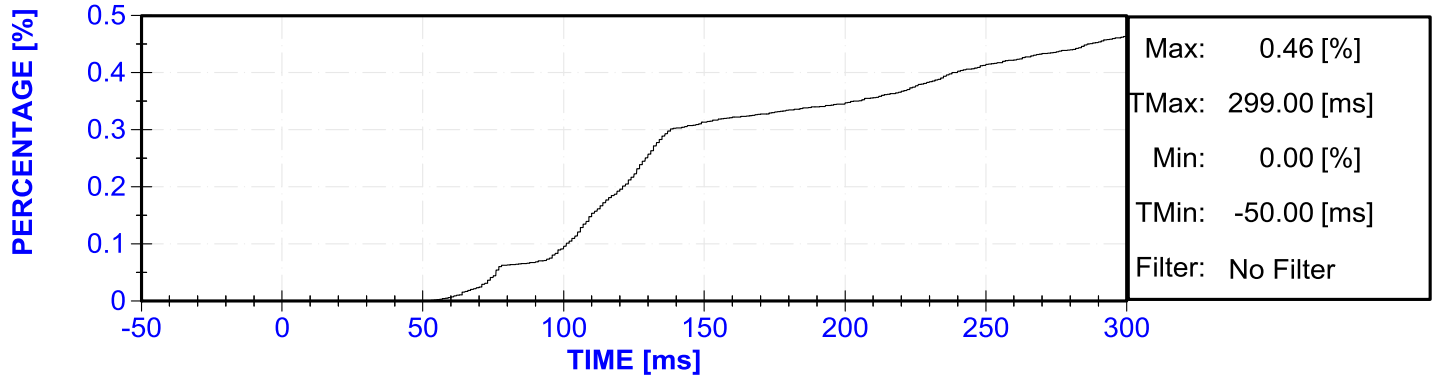
V2P4 HEAD ANGULAR VELOCITY Y [SIMON]



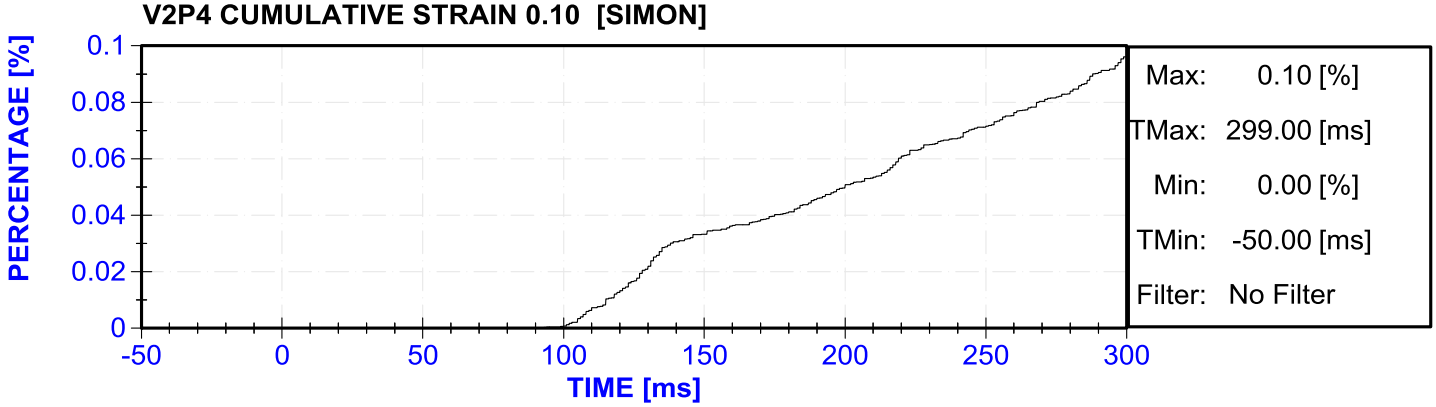
V2P4 HEAD ANGULAR VELOCITY Z [SIMON]



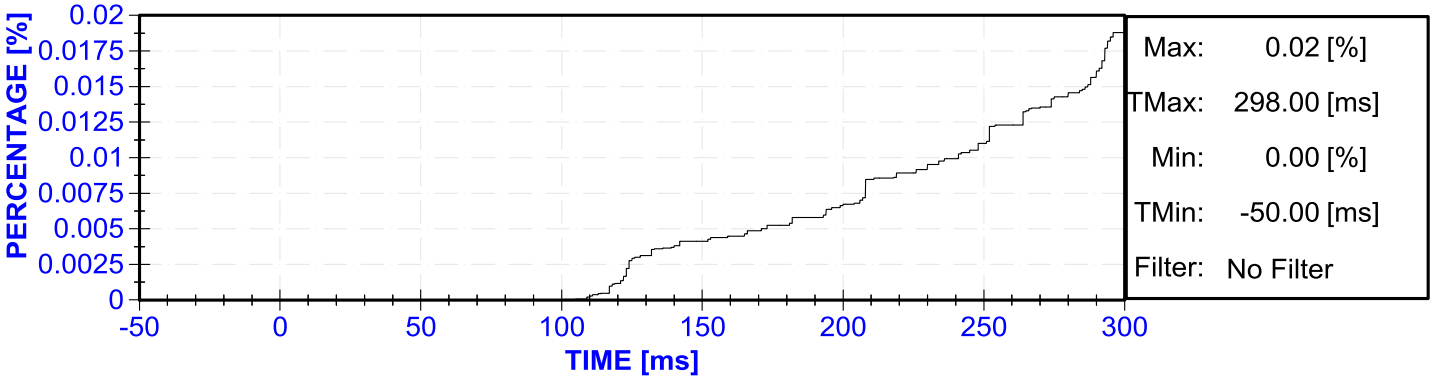
V2P4 CUMULATIVE STRAIN 0.05 [SIMON]



V2P4 CUMULATIVE STRAIN 0.10 [SIMON]

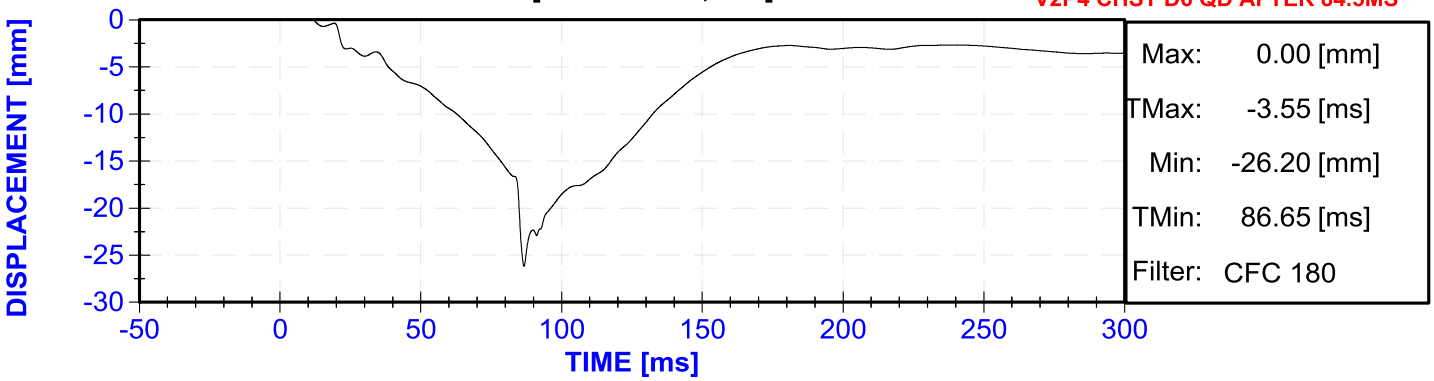


V2P4 CUMULATIVE STRAIN 0.15 [SIMON]



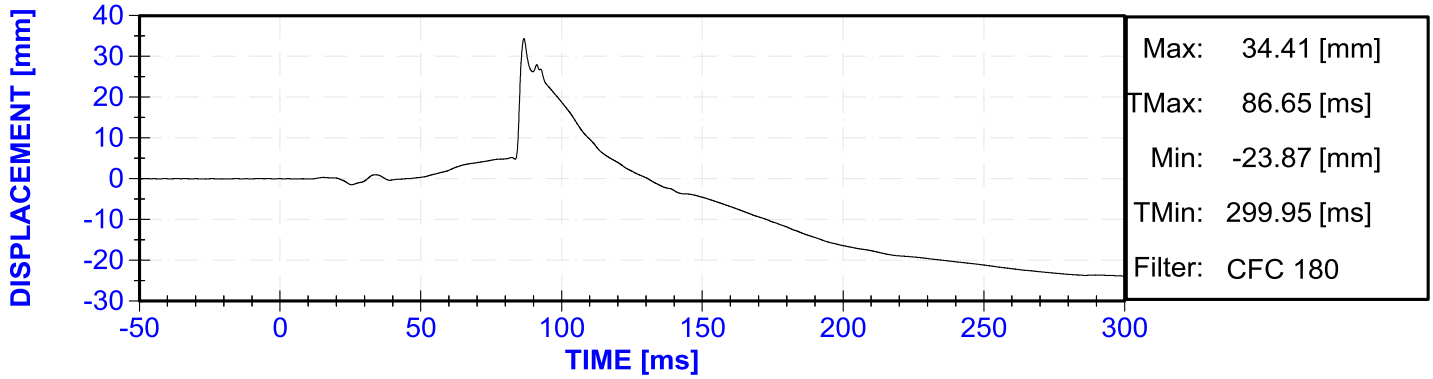
V2P4 CHEST UPPER LEFT X [COMPUTED, MM]

V2P4 CHST D6 QD AFTER 84.5MS

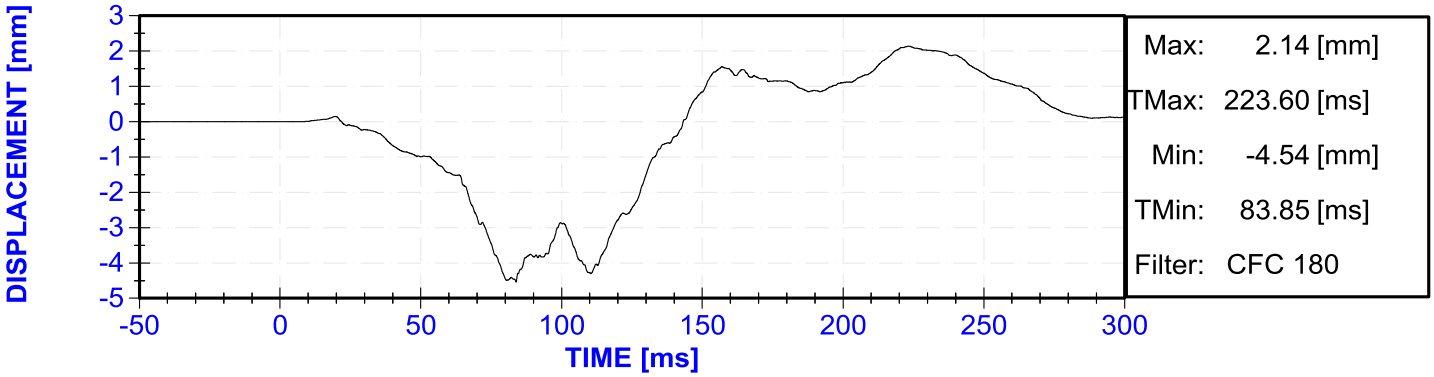


V2P4 CHEST UPPER LEFT Y [COMPUTED, MM]

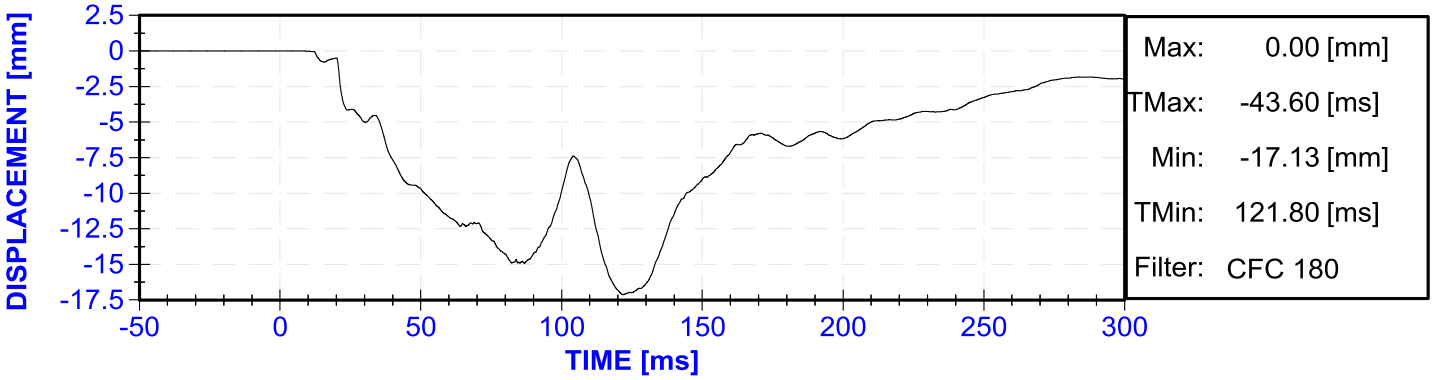
V2P4 CHST D6 QD AFTER 84.5MS



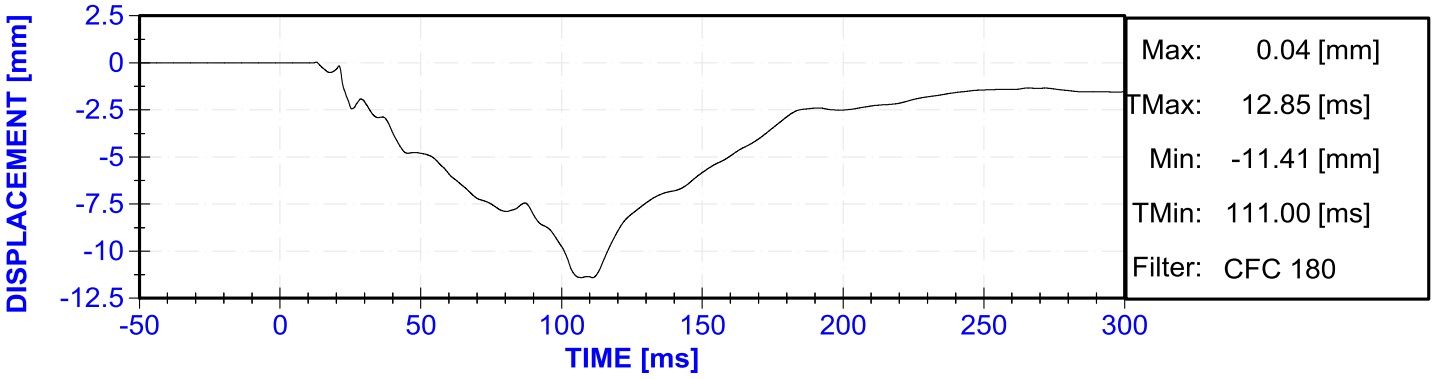
V2P4 CHEST UPPER RIGHT X [COMPUTED, MM]



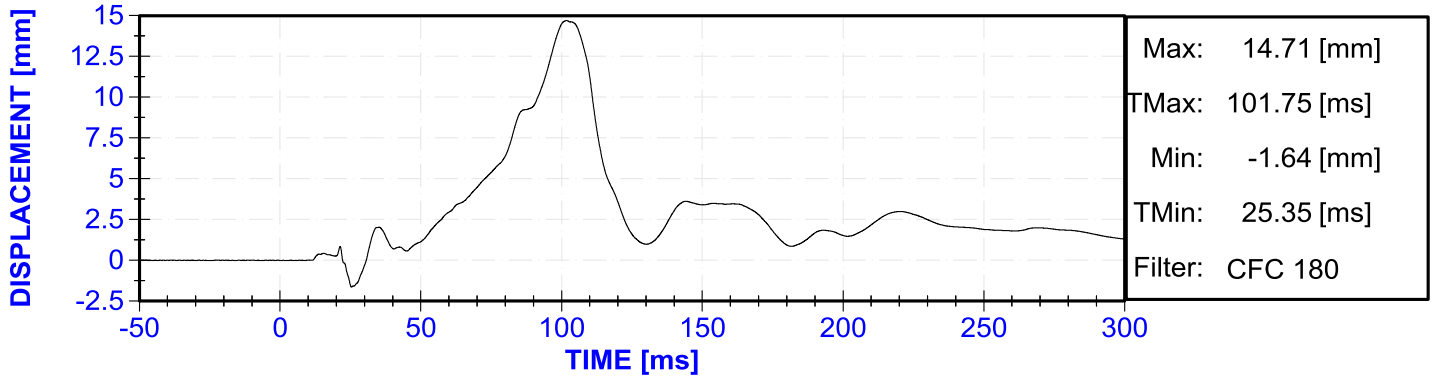
V2P4 CHEST UPPER RIGHT Y [COMPUTED, MM]



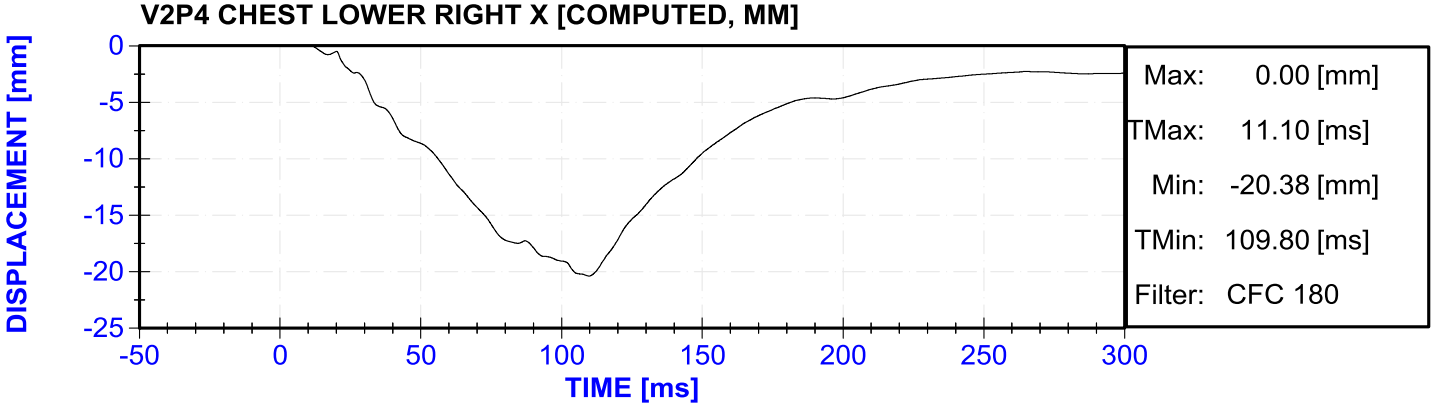
V2P4 CHEST LOWER LEFT X [COMPUTED, MM]

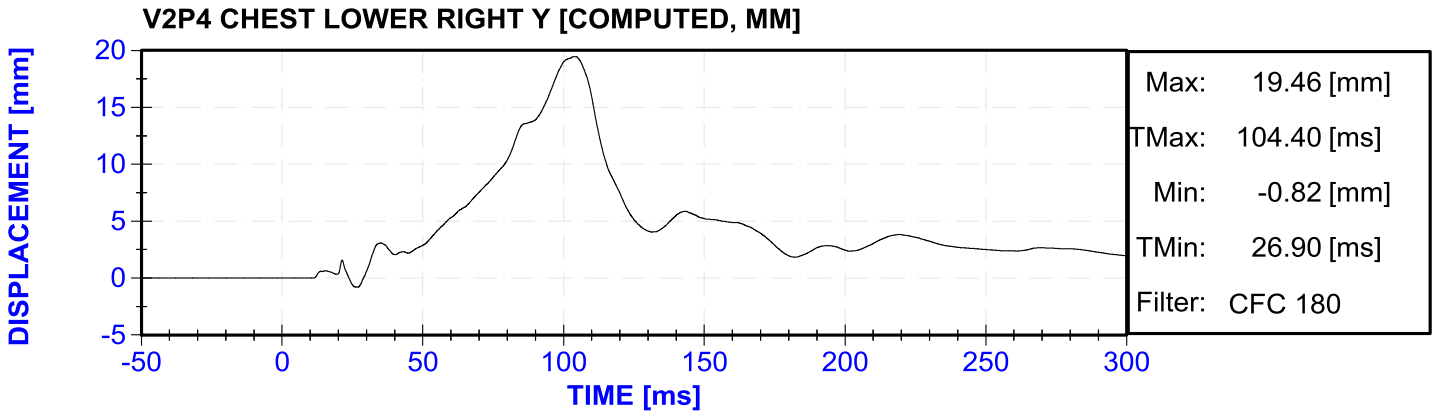


V2P4 CHEST LOWER LEFT Y [COMPUTED, MM]



V2P4 CHEST LOWER RIGHT X [COMPUTED, MM]




V2P4 CHEST LOWER RIGHT Y [COMPUTED, MM]
DISPLACEMENT [mm]
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 19.46 [mm]
TMax: 104.40 [ms]
Min: -0.82 [mm]
TMin: 26.90 [ms]
Filter: CFC 180

APPENDIX C

PART 572 E/O DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA SHEETS

TABLE OF CONTENT		
No.		Page

Table 1 – Dummy Information

TYPE	DESCRIPTION	SERIAL NUMBER
THOR Hybrid III	50^{TH} Male 5^{th} Female	0007

Table 2 – THOR6 Set File

LFTX	LFTY	LFTZ	RFTX	RFTY	RFTZ
Left Ankle X Rotation	Left Ankle Y Rotation	Left Ankle Z Rotation	Right Ankle X Rotation	Right Ankle X Rotation	Right Ankle X Rotation
-2.3995	11.422	-0.65837	-3.56913	8.69623	47.566

Table 3 - THOR Dummy Initial SetUp Information

THOR – NT S/N: 0006									Sensitivity (JARI)	Sensitivity (GESAC)	Setup Angle (GESAC)
Sensor	**Description/ Axis**	**MFG**	**Capacity**	**Unit 1**	**Unit 2**	**Range**	**Direction**	**CFC**	**V/Unit -1**	**V/Unit-1**	**Degrees**
NKCRP	Upper Right Base										
Thorax	Upper Right										
CRUX	Mid										
Thorax	Upper Right										
CRUX	Elbow										
Thorax	Upper Left										
CRUX	Base										
Thorax	Upper Left										
CRUX	Mid										
Thorax	Upper Left										
CRUX	Elbow										
Thorax	Lower Right										
CRUX	Base										
Thorax	Lower Right										
CRUX	Mid										
Thorax	Lower Right										
CRUX	Elbow										
Thorax	Lower Left										
CRUX	Base										
Thorax	Lower Left										
CRUX	Mid										
Thorax	Lower left										
CRUX	Elbow										
Thorax	Right										
CRUX	Abdomen X										
DGSP	Right Abdomen Y										
DGSP	Right Abdomen Z										
DGSP	Left Abdomen X										
DGSP	Left Abdomen Y										
DGSP	Left Abdomen Z										
DGSP	Upper Right Base										

Table 5 – Pre-Test Inspection

THOR Inspection Checklist

Date: July 25, 2011
NHTSA Representative: James Saunders
Witness(es):
Inspection type (circle one): PRE POST
Dummy S/N: 007
Dummy Description: THOR
Date of last Certification or Inspection: Post Test 7 – July 5, 2011
Tests conducted since last full certification or inspection: Three tests were completed since the last full certification
Known errors in data channels (no data, clipping, unexpected drops):
Physical evidence of damage:
Anecdotal evidence of damage:
Equipment delivered to Borrower:

HEAD	
(Y) / N	Rear head cap mounts securely to head
(Y) / N	Head skin fits securely over skull
(Y) / N	Head skin shows no sign of tears or damage
(Y) / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
(Y) / N	Head securely mounted to OC joint
OTHER	
NECK	
(Y) / N	Neck cables slide freely through holes in neck plates
(Y) / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / (N)	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): - Between puck 4&5 posterior
Y / (N)	No evidence of debonding or permanent compression in neck soft stop assemblies - Front anterior neck's soft stop is loose
(Y) / N	Neck securely attached to upper neck load cell
(Y) / N	Neck securely attached to lower neck load cell
(Y) / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	
SPINE	
(Y) / N	No evidence of debonding between thoracic spine flex joint and metal plates

Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
(Y) / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
SHOULDER	
Y / (N)	Urethane shoulder pads show no evidence of contact - Slight scuffing on the right shoulder's soft pad
(Y) / N	Clavicles securely attached to sternum and shoulder
Y / (N)	No evidence of debonding, tearing, or permanent compression of posterior soft stops - There is some debonding on top of the left shoulder stop
OTHER	
THORAX	
Y / (N)	No evidence of contact at top, bottom, or interior faces of rib damping material - Left side of Rib #4 - Right side of Rib #4
Y / (N)	No evidence of debonding between rib damping material and ribs - Left side of Rib #5 debonding
(Y) / N	CRUX anterior arms securely attached to anterior ribs
(Y) / N	CRUX posterior arms securely attached to double gimbals, spine
(Y) / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
(Y) / N	Ribs securely attached to posterior spine
(Y) / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	

ABDOMEN	
Y / (N)	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper - Very small tear on the top left side

Y / N	Upper abdomen insert securely attached to spine
(Y) / N	Upper abdomen insert shows no evidence of permanent set
(Y) / N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper
(Y) / N	Lower abdomen insert securely attached to spine
(Y) / N	Lower abdomen insert shows no evidence of permanent set
OTHER	
PELVIS	
(Y) / N	Pelvis flesh fits securely over pelvis bones
(Y) / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	
FEMUR	
(Y) / N	Acetabular load cells firmly attached
(Y) / N	Femur load cells firmly attached
(Y) / N	No evidence of deformation of knee slider bump stop
Y / (N)	No cuts, tears, or scuffing of knee flesh - Cuts on the right knee - Scuffs on the left knee - Note THOR SN006 femurs and lower extremities were used for this test
OTHER	

LOWER EXTREMITY (LX)	
(Y) / N	Rotational potentiometers in ankle securely attached
(Y) / N	Achilles tendon provides resistance to dorsiflexion

(Y)

Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops
OTHER	Left foot skin/flesh is torn at the heel
JACKET	
(Y) / N	Rib stiffeners show no sign of permanent deformation
(Y) / N	No evidence of tears or holes in jacket fabric, velcro, or zippers
OTHER	

Table 5 – Post-Test Inspection Report

THOR Inspection Checklist

Date: July 20, 2011
NHTSA Representative: James Saunders
Witness(es):
Inspection type (circle one): PRE (POST)
Dummy S/N: 007
Dummy Description: THOR
Date of last Certification or Inspection: 7/20/2011
Tests conducted since last full certification or inspection: This past inspection was done for the 2011 Ford Fiesta RB0224 – Test #11
Known errors in data channels (no data, clipping, unexpected drops):
Physical evidence of damage:
Anecdotal evidence of damage:
Equipment delivered to Borrower:

HEAD	
(Y) / N	Rear head cap mounts securely to head
(Y) / N	Head skin fits securely over skull
(Y) / N	Head skin shows no sign of tears or damage
(Y) / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
(Y) / N	Head securely mounted to OC joint
OTHER	
NECK	
(Y) / N	Neck cables slide freely through holes in neck plates
(Y) / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / (N)	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): 3. Between Puck 4 and 5
Y / (N)	No evidence of debonding or permanent compression in neck soft stop assemblies - Front neck soft stop is loose
(Y) / N	Neck securely attached to upper neck load cell
(Y) / N	Neck securely attached to lower neck load cell
(Y) / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	
SPINE	
(Y) / N	No evidence of debonding between thoracic spine flex joint and metal plates

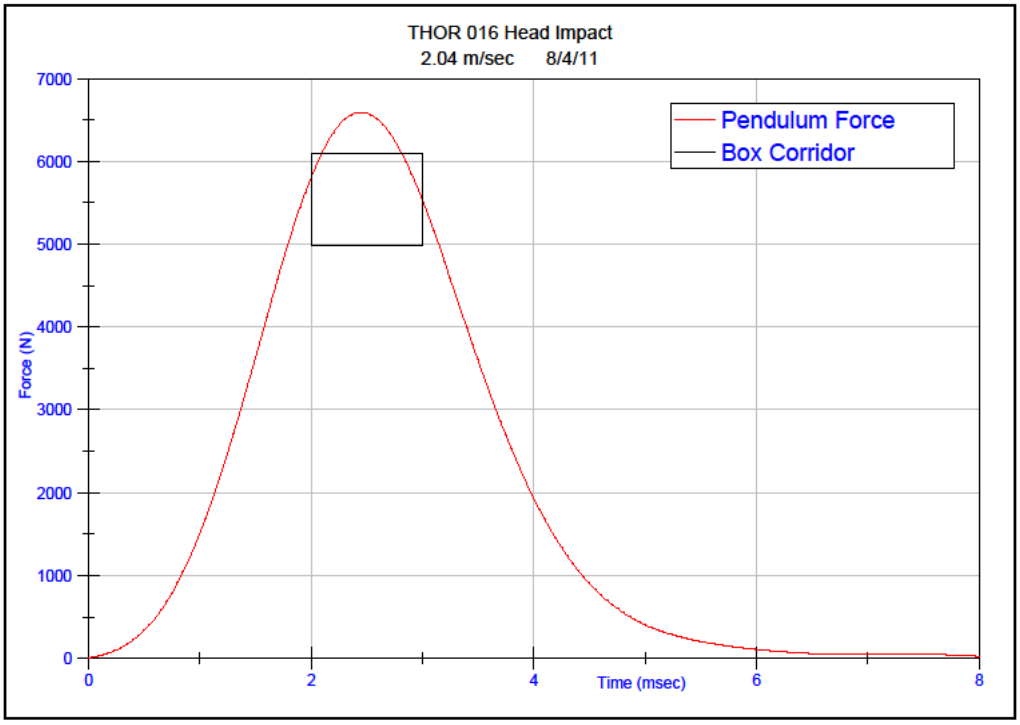
Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
(Y) / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
SHOULDER	
Y / (N)	Urethane shoulder pads show no evidence of contact - Slight abrasion on both pads
(Y) / N	Clavicles securely attached to sternum and shoulder
Y / (N)	No evidence of debonding, tearing, or permanent compression of posterior soft stops - Left soft stop slightly debonded
OTHER	
THORAX	
Y / (N)	No evidence of contact at top, bottom, or interior faces of rib damping material - Left, right interior on rib 4
Y / (N)	No evidence of debonding between rib damping material and ribs - Left side Rib #5 debonding
(Y) / N	CRUX anterior arms securely attached to anterior ribs
(Y) / N	CRUX posterior arms securely attached to double gimbals, spine
(Y) / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
(Y) / N	Ribs securely attached to posterior spine
(Y) / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	

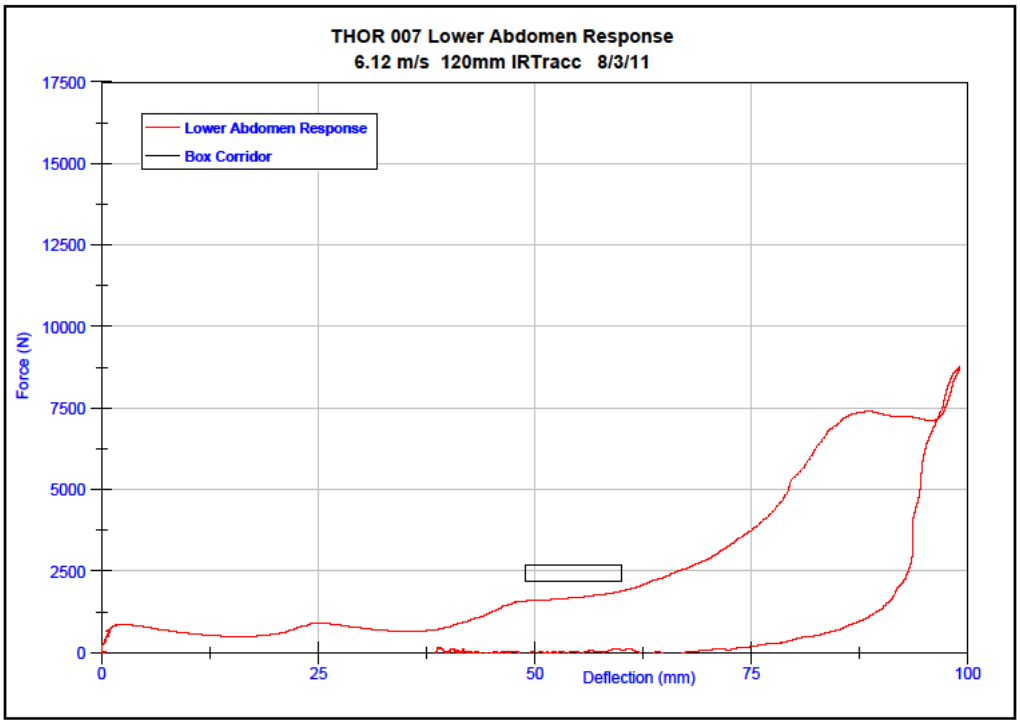
ABDOMEN	
Y / (N)	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper - There is a small tear top left side

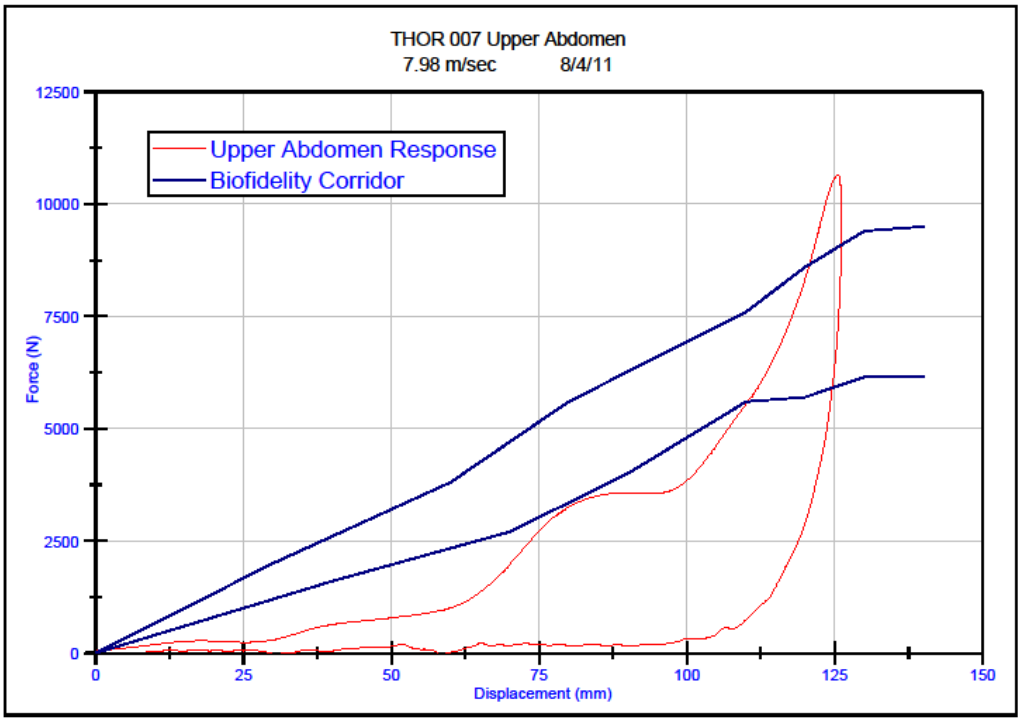
Y / N	Upper abdomen insert securely attached to spine
(Y) / N	Upper abdomen insert shows no evidence of permanent set
(Y) / N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper
(Y) / N	Lower abdomen insert securely attached to spine
(Y) / N	Lower abdomen insert shows no evidence of permanent set
OTHER	
PELVIS	
(Y) / N	Pelvis flesh fits securely over pelvis bones
(Y) / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	
FEMUR	
(Y) / N	Acetabular load cells firmly attached
(Y) / N	Femur load cells firmly attached
(Y) / N	No evidence of deformation of knee slider bump stop
Y / (N)	No cuts, tears, or suffing of knee flesh - Left knee is scuffed and cut - Right knee is scuffed
OTHER	
LOWER EXTREMITY (LX)	
(Y) / N	Rotational potentiometers in ankle securely attached

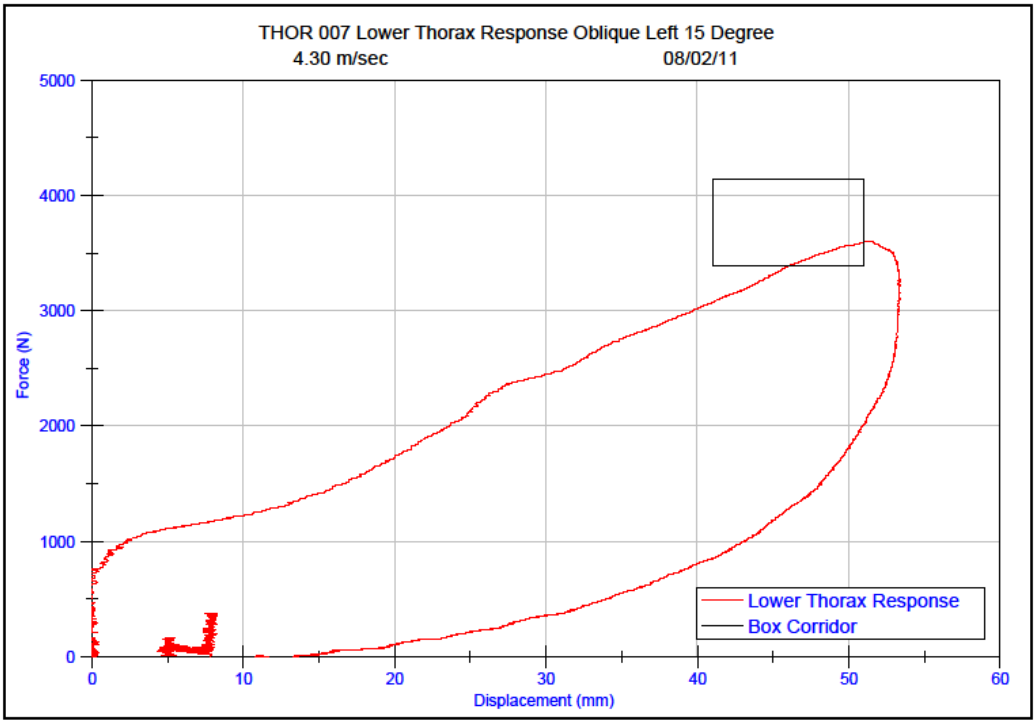
Y / N	Achilles tendon provides resistance to dorsiflexion
(Y) / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops
OTHER	Right leg shin has horizontal cut in flesh
JACKET	
(Y) / N	Rib stiffeners show no sign of permanent deformation
(Y) / N	No evidence of tears or holes in jacket fabric, velcro, or zippers
OTHER	

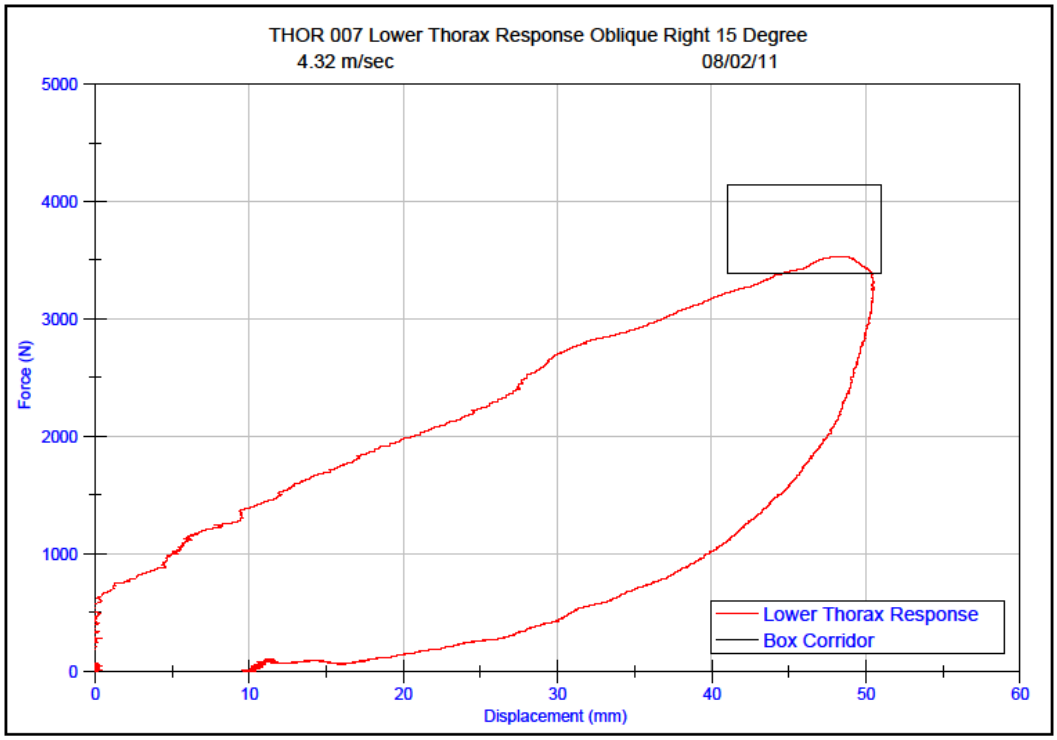
Dummy Calibration Plots

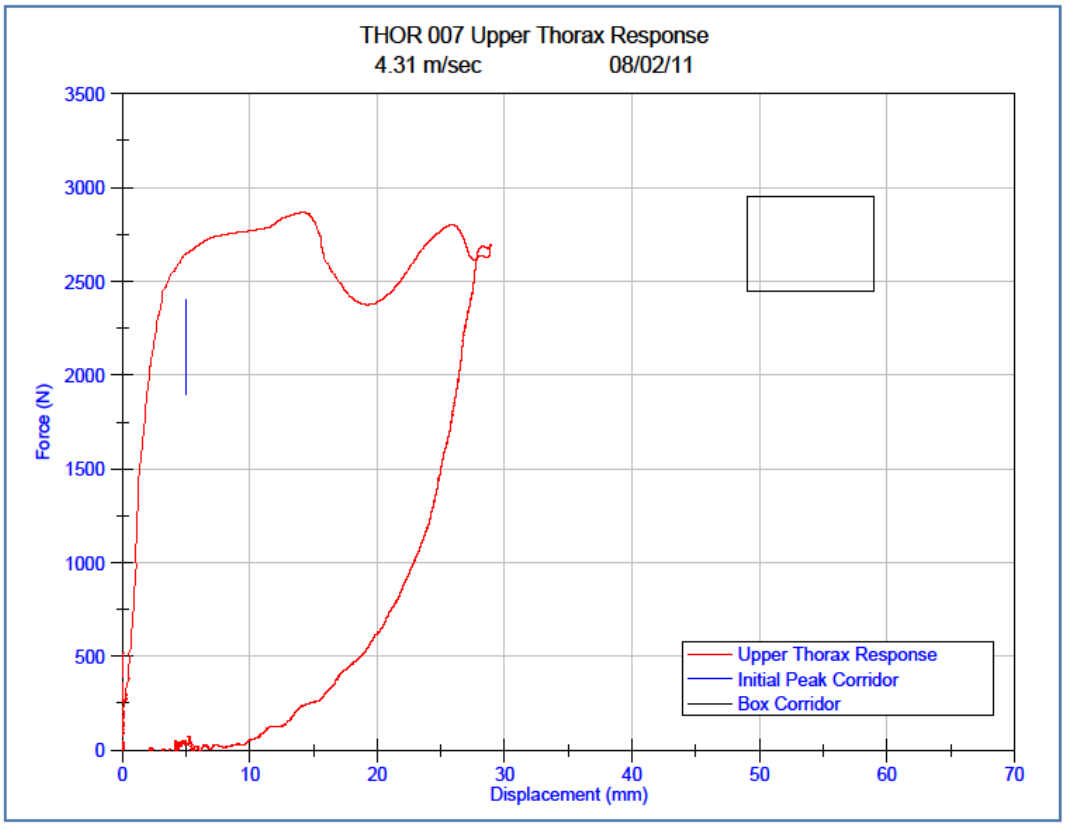

THOR 016 Head Impact
2.04 m/sec 8/4/11
Pendulum Force
Box Corridor
Force (N)
Time (msec)
0
1000
2000
3000
4000
5000
6000
7000
0
2
4
6
8

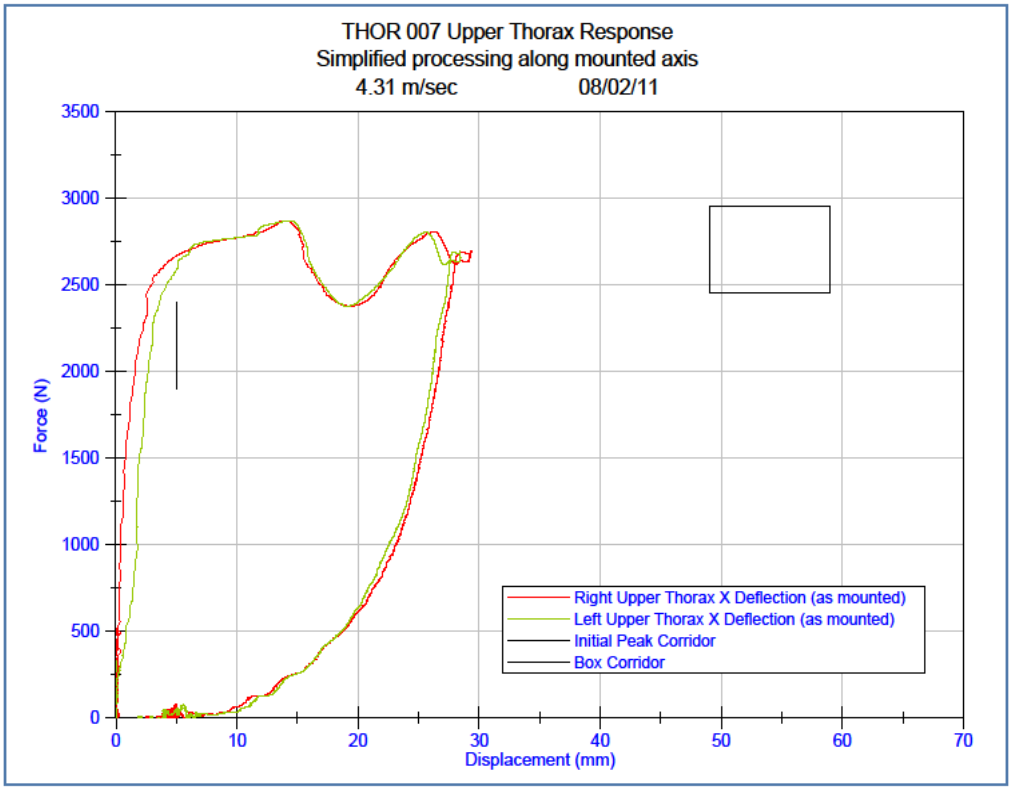

THOR 007 Lower Abdomen Response
6.12 m/s 120mm IRTracc 8/3/11
Lower Abdomen Response
Box Corridor
Force (N)
Deflection (mm)
0
2500
5000
7500
10000
12500
15000
17500
0
25
50
75
100


THOR 007 Upper Abdomen
7.98 m/sec 8/4/11
Upper Abdomen Response
Biofidelity Corridor
Force (N)
Displacement (mm)
12500
10000
7500
5000
2500
0
0
25
50
75
100
125
150

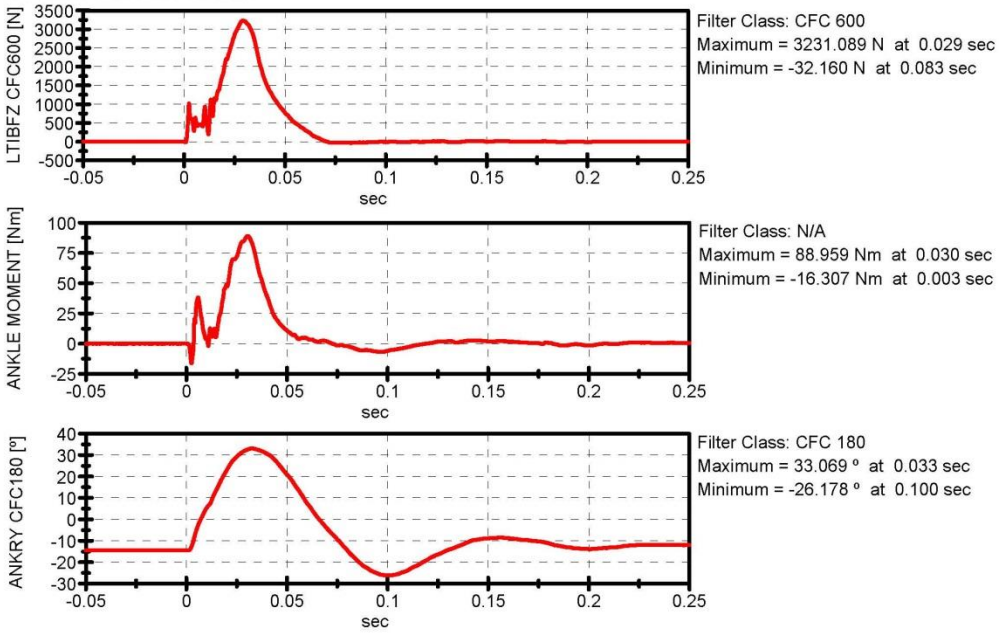

THOR 007 Lower Thorax Response Oblique Left 15 Degree
4.30 m/sec 08/02/11
Lower Thorax Response
Box Corridor
Force (N)
Displacement (mm)
5000
4000
3000
2000
1000
0
0
10
20
30
40
50
60


THOR 007 Lower Thorax Response Oblique Right 15 Degree
4.32 m/sec
08/02/11
Force (N)
Displacement (mm)
Lower Thorax Response
Box Corridor

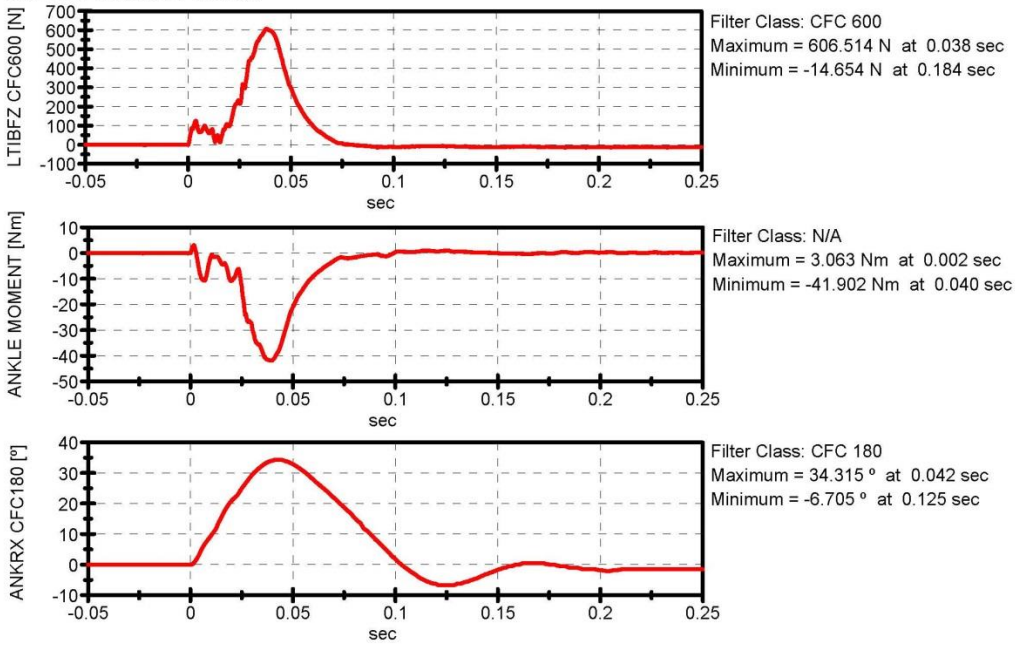

THOR 007 Upper Thorax Response
4.31 m/sec
08/02/11
Force (N)
Displacement (mm)
Upper Thorax Response
Initial Peak Corridor
Box Corridor


THOR 007 Upper Thorax Response
Simplified processing along mounted axis
4.31 m/sec
08/02/11
Force (N)
Displacement (mm)
Right Upper Thorax X Deflection (as mounted)
Left Upper Thorax X Deflection (as mounted)
Initial Peak Corridor
Box Corridor

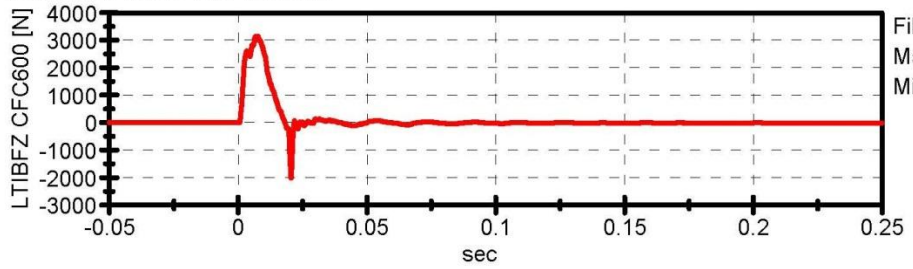
Test Performer: Vehicle Research and Test Center
Test Type: Dorsiflexion/Ball of Foot
Test Name: LX103R_2011_07_12_DORSI_01
Test Date: 12.07.2011 13:03:52



Test Performer: Vehicle Research and Test Center
Test Type: Eversion
Test Name: LX103R_2011_07_12_EVER_01
Test Date: 12.07.2011 14:00:09

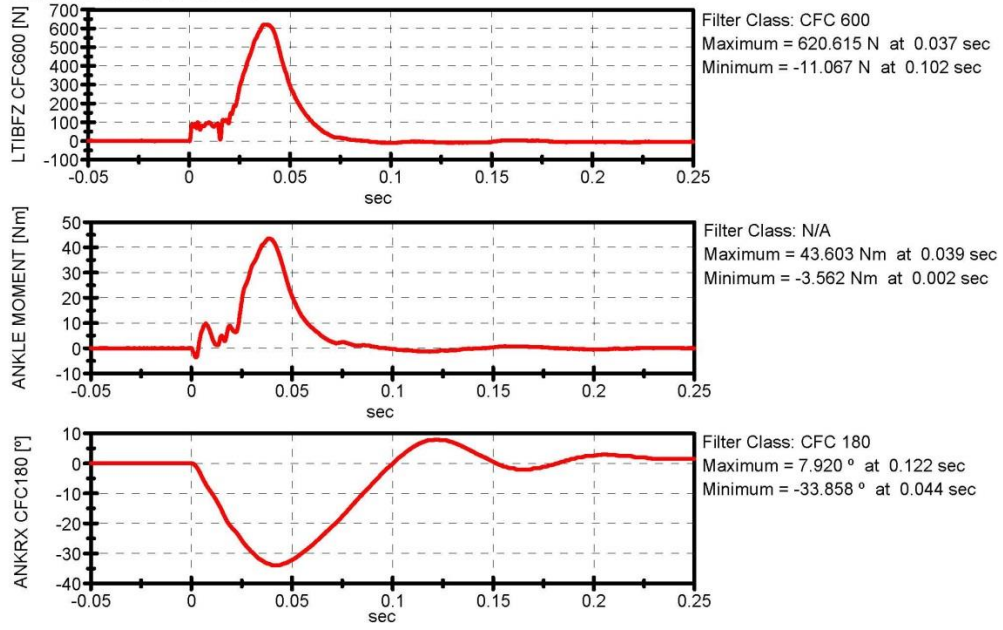


Test Performer: Vehicle Research and Test Center
Test Type: Heel of Foot
Test Name: LX103R_2011_07_12_HEEL_01
Test Date: 12.07.2011 12:23:32



Filter Class: CFC 600
Maximum = 3140.967 N at 0.008 sec
Minimum = -2014.830 N at 0.021 sec

Test Performer: Vehicle Research and Test Center
Test Type: Inversion
Test Name: LX103R_2011_07_12_INVER_01
Test Date: 12.07.2011 13:33:12



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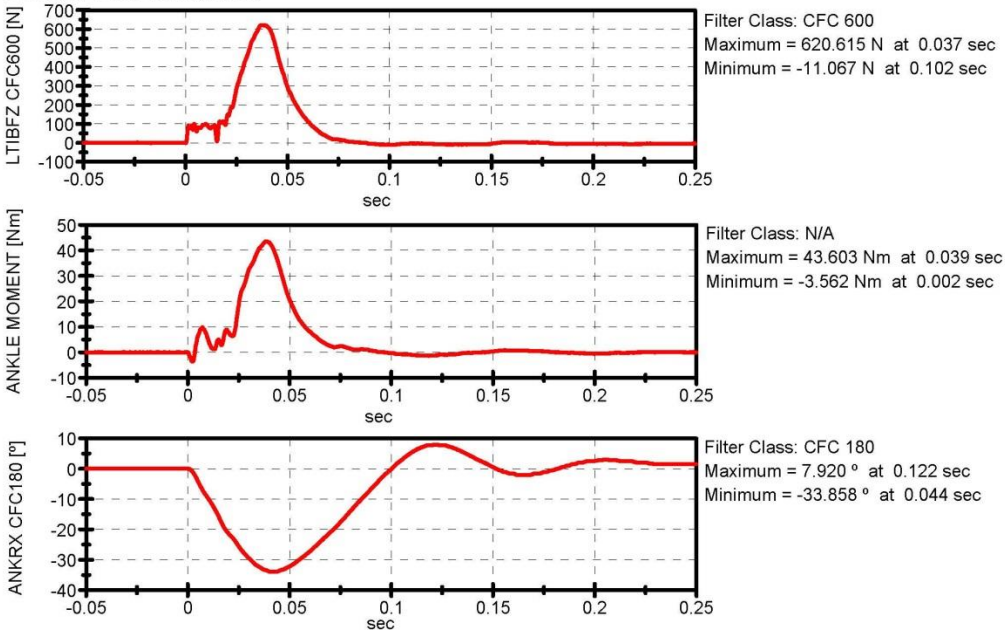
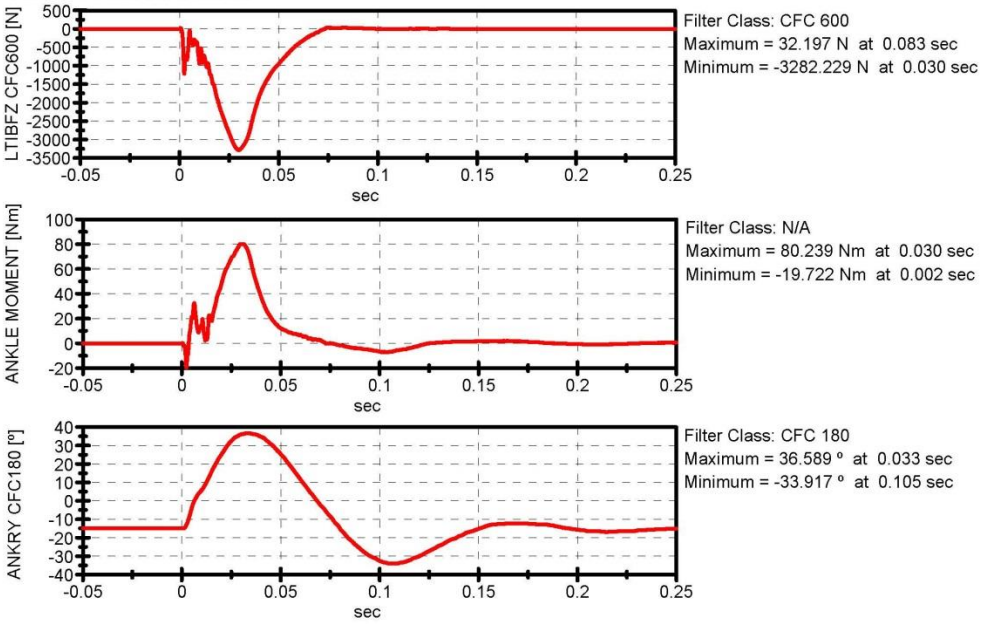
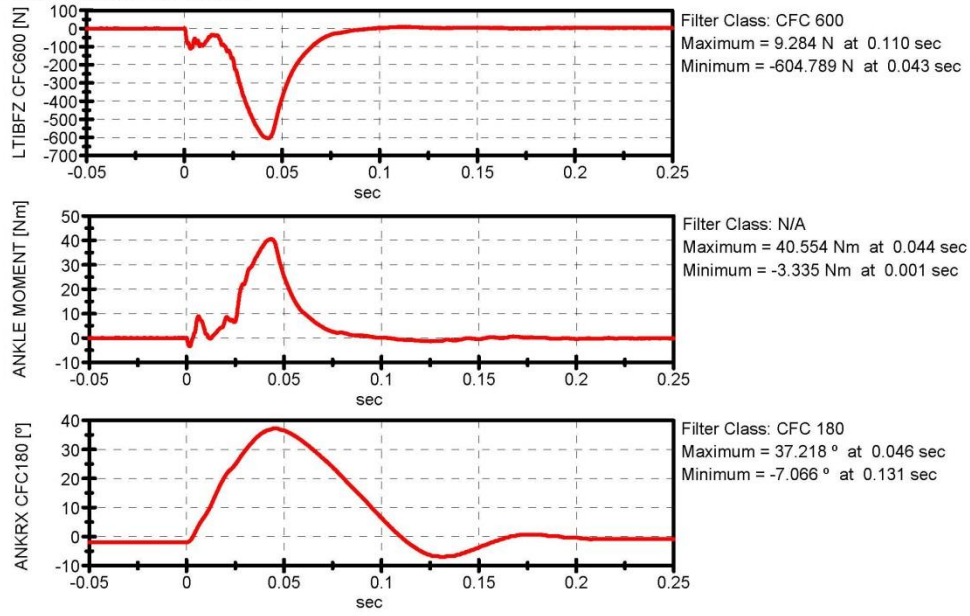
Test Type: Inversion
Test Name: LX103R_2011_07_12_INVER_01
Test Date: 12.07.2011 13:33:12



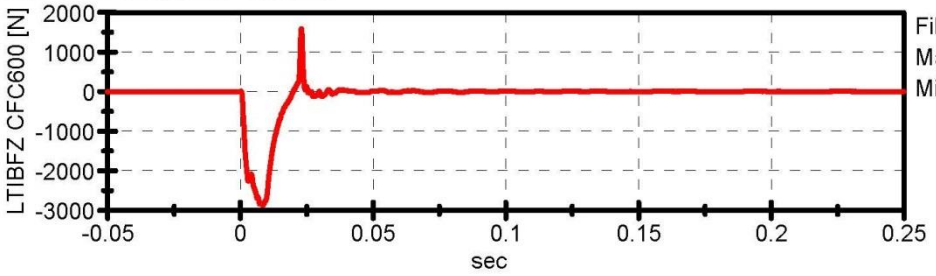
Test Performer: Vehicle Research and Test Center
Test Type: Dorsiflexion/Ball of Foot
Test Name: LX104L_2011_07_11_DORSI_02
Test Date: 12.07.2011 07:30:24



Test Performer: Vehicle Research and Test Center
Test Type: Eversion
Test Name: LX104L_2011_07_12_EVER_01
Test Date: 12.07.2011 08:58:27



Test Performer: Vehicle Research and Test Center
Test Type: Heel of Foot
Test Name: LX104L_2011_07_12_HEEL_01
Test Date: 12.07.2011 10:26:09



Filter Class: CFC 600
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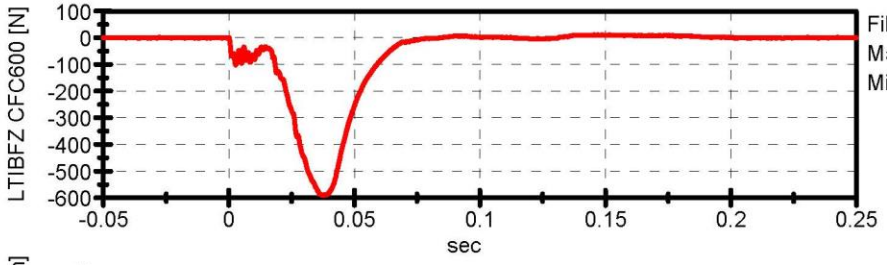
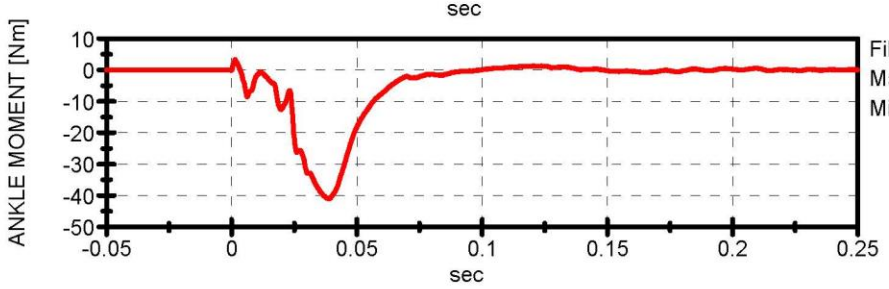
Minimum = -2861.040 N at 0.008 sec

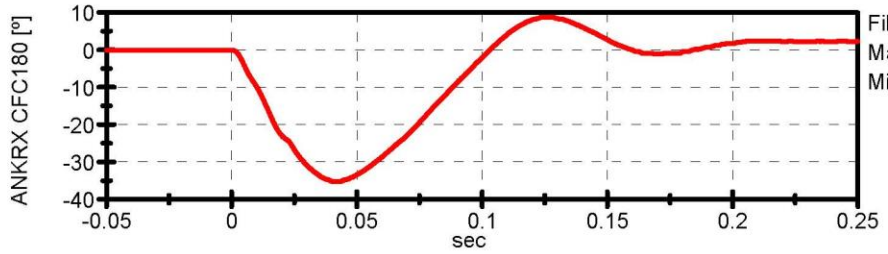
Test Performer: Vehicle Research and Test Center
Test Type: Inversion
Test Name: LX104L_2011_07_12_INVER_01
Test Date: 12.07.2011 08:18:46



Filter Class: CFC 600
Maximum = 10.894 N at 0.152 sec
Minimum = -589.823 N at 0.038 sec



Filter Class: N/A
Maximum = 3.314 Nm at 0.001 sec
Minimum = -40.998 Nm at 0.039 sec



Filter Class: CFC 180
Maximum = 8.754 ° at 0.125 sec
Minimum = -35.243 ° at 0.041 sec

APPENDIX D

Additional Measurements & Data Calculations

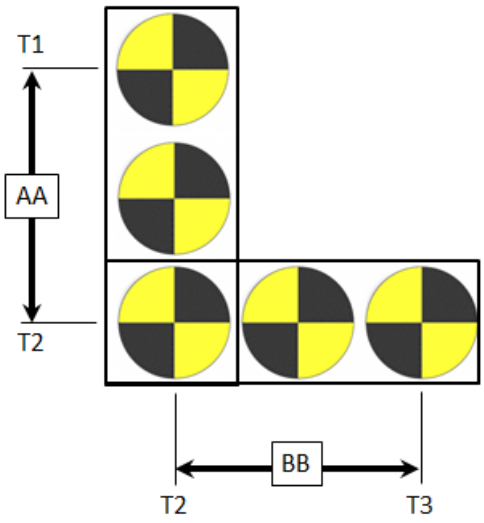
ADDITIONAL TARGETS

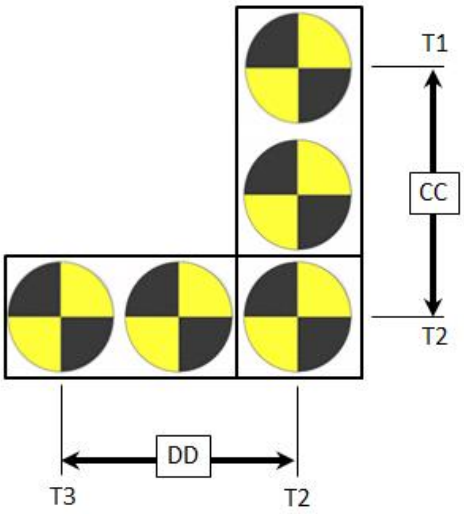
Overhead Reference Targets:

AA (T1 to T2)	237	mm
BB (T2 to T3)	237	mm

Ground Reference Targets:

CC (T1 to T2)	236	mm
DD (T2 to T3)	236	mm





APPENDIX E

Positioning Procedure for rear seat Part 572O 5th female ATD

The rear seat 5th female was positioned using a combination of the FMVSS 214D side impact and FMVSS 208 seating procedures.

The lateral seat centerline was determined by following the FMVSS 214D seating procedures for the rear seat.. Once the Part 572O 5th female dummy was located on the lateral centerline, the dummy was positioned following FMVSS 208 as if would be if it were in the front seating position. The legs would be positioned at the 120 degree angle and the pelvis would be pushed back against the seatback until the calves contacted the seat cushion. If the seatback was adjustable, the seatback would be raised to level the head. The 5th female dummy used in this test series had a lower neck transducer which prevented using the neck bracket as an adjustment to level the head.

APPENDIX F

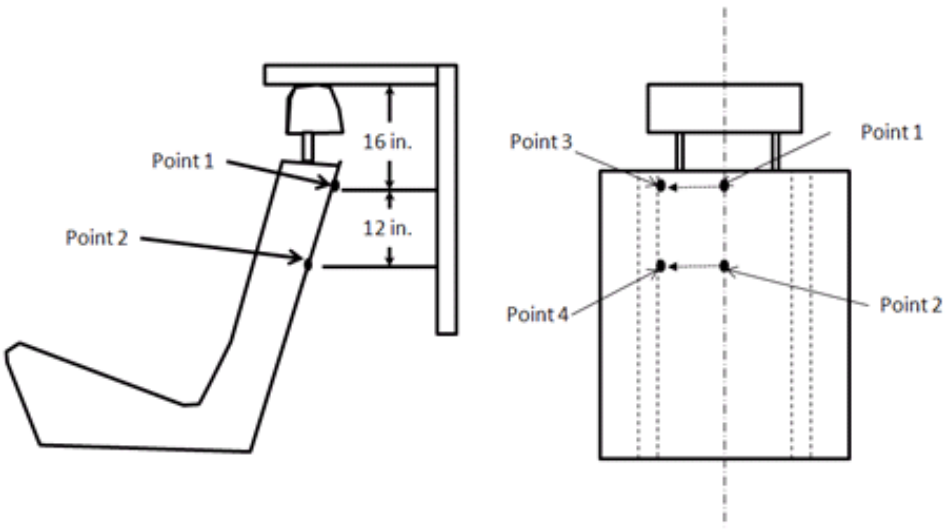
CMM MEASUREMENT PROCEDURES

SECTION F.1

SEAT BACK MEASUREMENT PROCEDURE

The following procedure was used in obtaining the required seat back measurements, please see the below diagram for additional clarification:

1. Measure Points 3 and 4 on the using the following method after positioning the dummy and head restraint:
2. Place a level at the center of the head restraint and make sure it is level to the horizontal
3. Measure down 16 inches from the bottom of the level in the vertical direction
4. Project a line in the longitudinal direction until contact with seat and mark point 1 with a marker
5. Project another line in the longitudinal direction until contact with seat and mark point 2 with a marker
6. Push on the seat fabric at point 1 and determine if there is any structure. Do not push in the longitudinal direction more than an inch
7. If no structure found push on the seat cloth and move in the lateral direction toward the outboard of the seat until seat structure is found
8. Cut a slit in the seat fabric
9. Mark Point 3 at the begin on the structure and measure the point
10. Perform the same procedure to determine Point 4 using Point 2



SECTION F.2

DOOR SILL INTRUSION MEASUREMENT PROCEDURE

The following procedure was conducted in order to obtain the required door sill intrusion measurements for this test. Please see the below picture for further clarifications:

1. Put steering wheel in center position. Create a horizontal plane (plane 1) that passes through the center of the steering wheel.
2. Point 1: Mark the sheet metal at the intersection of plane 1 and the outer edge of rubber part of the door sill running down the A-pillar.
3. Point 22: Mark the sheet metal at the intersection of plane 1 and the outer edge of rubber part of the door sill running down the B-pillar.
4. Mark 20 evenly spaced points between points 1 and 22 along the outer edge of the rubber door sill on the sheet metal. (A tape measure can be used to mark these points).
5. Mark 20 evenly spaced points between points 22 and 1 along the outer edge of the rubber door sill on the sheet metal. (A tape measure can be used to mark these points).
6. Measure points using CMM
7. Record in the appropriate data sheet and calculate the difference by subtracting the post-test minus the pre-test. A picture with the points labeled shall be included on the data sheet. All points shall be visible in the pictures.

8. Repeat on the passenger door.

SECTION F.3

VEHICLE EXTERIOR CRUSH PROFILE PROCEDURE

1. Expose the bumper beam and level the vehicle such that all attitudes are within 5 mm.

2. Cross section A-A is defined as a horizontal plane passing through the center of the front bumper beam at the centerline of the vehicle (Figure F.3.1). Record the height of this plane (d1) and take enough points at this height to create an exterior cross-section of the vehicle.

3. Perform the same procedure for cross-section B-B. Cross section B-B is defined as a plane passing through the top the upper radiator support.

4. Post-test put the vehicle back to its original coordinate system (Figure F.3.2). Take enough points at the height of d1 and d2 to create a post-test cross-section A-A and B-B. There can be more points measured posttest than pre-test (Figure F.3.3). Record these points in the appropriate data sheet.

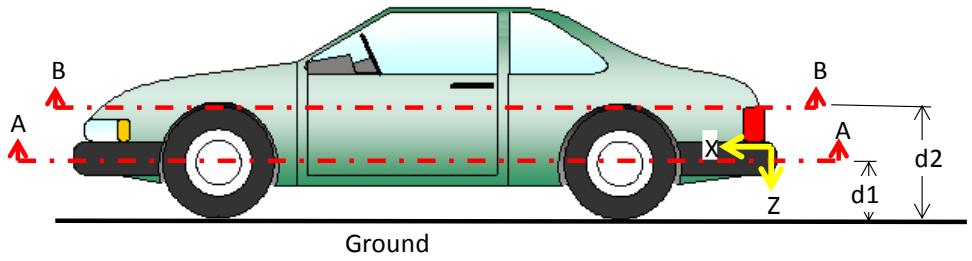


Figure F.3.1 - Pre-Test Cross-Sections

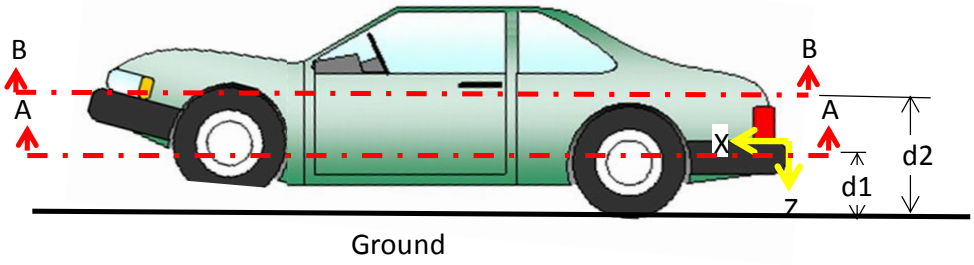


Figure F.3.2 - Post-Test Cross-Sections

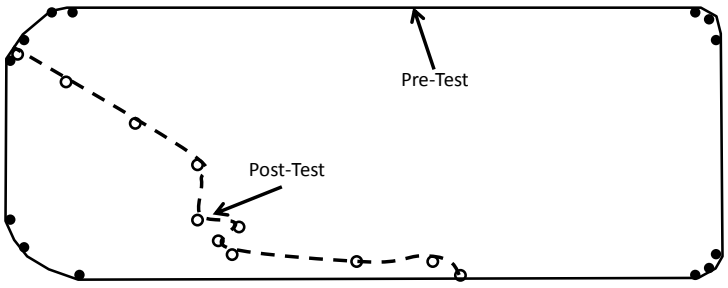


Figure F.3.3 - Plot of Cross-Section

SECTION F.4

DASH PROFILE MEASUREMENT PROCEDURE

The following procedure was used in order to obtain the dash profile measurements required for this test. Please see the diagram on the following page for further clarifications:

1. Left Plane: create a vertical plane that is parallel to the longitudinal axis of the vehicle and is located 150mm to the left of the center of the steering wheel (Figure 31).

2. Left Line: create a line on the IP/Knee Bolster at the intersection of the Left Plane and the IP/KneeBolster

3. L1: create a point on the dash that is located on the Left Line and is 450 mm above the floorboard (with floor mats removed). Note this is the Left IP point for the IP5 file and IP Left in DATA SHEET NO.13 (CONTINUED) - VEHICLE INTRUSION MEASUREMENTS.

4. Lt1: From L1 move up the Left Line 50 mm

5. Lt2: From Lt1 move up the Left Line 50 mm

6. Ltn: Mark points at 50 mm increments along Left Line until the window sill is reached.

7. Lb1: From L1 move down the Left Line 50 mm

8. Lb2: From Lb1 move down the Left Line 50 mm

9. Lbn: Mark points at 50 mm increments along Left Line until the bottom of the IP/Knee Bolster is reached.

10. Right Plane: create a vertical plane that is parallel to the longitudinal axis of the vehicle and is located 150mm to the right of the center of the steering wheel (Figure 31).

11. Right Line: create a line on the IP/Knee Bolster at the intersection of the Right Plane and the IP/KneeBolster

12. R1: create a point on the dash that is located on the Right Line and is 450 mm above the floorboard (with floor mats removed). Note this is the Right IP point for the IP5 file and IP Right in DATA SHEET NO.13 (CONTINUED) - VEHICLE INTRUSION MEASUREMENTS.

13. Rt1: From R1 move up the Right Line 50 mm

14. Rt2: From Rt1 move up the Right Line 50 mm

15. Rtn: Mark points at 50 mm increments along Right Line until the window sill is reached.

16. Rb1: From R1 move down the Right Line 50 mm

17. Rb2: From Rb1 move down the Right Line 50 mm

18. Rbn: Mark points at 50 mm increments along Right Line until the bottom of the IP/Knee Bolster is reached.

19. If dash panel or knee bolster loosens or breaks away in the crash, the post-test measurements are taken by pressing and holding the panel against the underlying structure. Record in the appropriate data sheet and calculate the difference by subtracting the post-test minus the pre-test. A picture with the points labeled shall be included on the data sheet. All points shall be visible in the picture.