REPORT NUMBER: R&D – CAL – 11 – 019

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

2011 DODGE RAM 1500
56 MPH, 7 DEGREE ANGLE, 20% OVERLAP

TEST DATE: SEPTEMBER 14th 2011
NHTSA NO: RB0330

PREPARED BY;
CALSPAN CORPORATION
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FINAL REPORT SUBMITTED:

FEBRUARY 10, 2012

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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Prepared by: Vanessa Walsh Date: February 10, 2012
Vanessa Walsh, Test Engineer

Approved by: David Travale Date: February 10, 2012
David Travale, Program Manager

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 DOCUMENT PAGE

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4. Title and Subtitle Report for Frontal Oblique Offset Program Testing of a 2011 Dodge Ram 1500 NHTSA No. RB0330		**5. Report Date** 9/20/2011 **6. Performing Organization Code** CAL
7. Author(s) David J. Travale, Program Manager Vanessa Walsh, Test Engineer		**8. Performing Organization Report No.** TR2536
9. Performing Organization Name and Address Calspan Corporation 4455 Genesee Street Buffalo, NY 14225		**10. Work Unit No.** **11. Contract or Grant No.** DTNH22-10-D-00155
12. Sponsoring Agency Name and Address US Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Research 1200 New Jersey Ave SE Room W46-446 Washington, DC 20590		**13. Type of Report and Period Covered** Draft Report, 9/14/11 – 9/20/11 **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 four door 2011 Dodge Ram 1500. 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 9/14/2011

The impact velocity of the vehicle was 90.6 km/h, and the ambient temperature at the barrier face at the time of impact was 22.78°C. The target vehicle post-test maximum crush was 451 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	178.15	N/A	700	270.04
Maximum Chest Compression	mm	63	-33.38	mm	52	-25.24
Nij	N/A	1	0.25	N/A	1	0.80
Neck Tension	N	4,170	1098.26	N	2,620	1732.03
Neck Compression	N	4,000	-573.79	N	2,520	-1701.29
Left Femur Force	N	10,008	-4298.36	N	6,805	1391.12
Right Femur Force	N	10,008	-3524.57	N	6,805	1402.55

17. Key Words THOR Oblique Small overlap Offset		**18. Distribution Statement** Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave, SE Washington, D.C. 20590	
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Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

SECTION 1

PURPOSE

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

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.

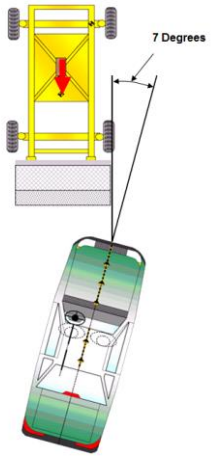
This test was conducted in accordance with the instructions set forth by NHTSA for a 7º angle, 20% offset moving barrier to vehicle impact, outlined in Task Order (TO) of DTNH22-10-D-00155. Data was obtained indicant of Federal Motor Vehicle Safety Standard (FMVSS) 208-Occupant Crash Protection, FMVSS 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 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

A model year 2011 four door Dodge Ram 1500 was impacted on the left front corner by an Research Moving Deformable Barrier. The 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 MDB. The MDB 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) into the test vehicle. The test vehicle mass was 2610.5 kg (5750 lbs), and the MDB mass was 2486.2 kg (5481.0 lbs). The test was conducted by Calspan Corporation on 9/14/11.



The test was documented by one (1) real time and fourteen (14) 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 MDB 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, and a curtain airbag. The left rear passenger was restrained with a 3-point seat belt along with a curtain airbag.

One hundred and ninety eight (198) channels of data from the two ATD's, test vehicle and MDB were collected using Kayser-Threde and Slice data acquisition systems. Appendix B contains dummy data plots, as well as vehicle and MDB response data plots.

There was 69.8% total windshield retention, with 63% and 76.6% 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 451 mm at C1 to the left of the vehicle's centerline. The maximum crush of the lower bumper beam was 477 mm at C1, 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, but was able to be opened. The left rear, right front, and right rear doors all remained operational after the test.

Structure observations include the following:

The A-Pillar and the door sill buckled, causing some separation at the top of the door from the vehicle.

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

Head contacted the steering wheel airbag, as well as the B-pillar and side door.

Torso contacted the front airbag, bottom of the steering wheel, and the door.

Knees contacted the knee bolsters.

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

Head contacted the headrest on the back of the head, and the vehicle's interior C-Pilllar

CRASH VEHICLE SUMMARY

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
MDB Velocity at Impact	km/h	90.6
MDB Test Weight	kg	2491
MDB Maximum Static Crush	mm	281.1
Vehicle Test Weight	kg	2610.5
Actual Vehicle Angle	o	7
Vehicle Maximum Static Crush	mm	451
Vertical Offset from Target Point	mm	20 Down
Lateral Offset from Target Point	mm	31 Left
Number of Data Channels		198
Number of Real-Time Cameras		1
Number of High-Speed Cameras		14

DUMMY CONTACTS

	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	50% Male, Thor 007	N/A	5% HIII Female, 070	N/A
Head Contact	Steering wheel airbag, B-Pillar, and side door	A-37 A-48	Headrest, and the interior C-Pillar	A-49 A-52 A-58
Upper Torso Contact	Steering wheel airbag and side door	-	None	-
Lower Torso Contact	Steering wheel	A-46 A-47	N/A	-
Left Knee Contact	Knee bolster	A-45	None	A-59
Right Knee Contact	Knee bolster	A-44	None	A-59

Data Anamolies:

V2P1 ABDOMEN LEFT RZ	->	Noise on data 56-85 ms
V2P1 RIGHT ILIAC FX	->	Questionable after 61 ms
V2P1 RIGHT ILIAC MY	->	Channel failed
V2P1 LEFT FEMUR FX	->	Questionable 99-110 ms - saturated
V2P1 TIBIA LEFT x	->	Channel failed
V2P1 TIBIA LEFT UPPER FZ	->	Questionable after 45 ms
V2P1 RIGHT FEMUR MX	->	Questionable after 43 ms
V2P1 TIBIA RIGHT LOWER MY	->	Questionable after 334 ms
V2P4 LOWER NECK MZ	->	Questionable after 72 ms
V2P4 8 STRING POD - UR TOP	->	Questionable after 148 ms

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2011 Dodge Ram 1500ST Truck NHTSA No.: RB0330
Test Program: Research and Development Narrow Offset Test Date: 9/14/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Head	Head Rotational Acceleration X	rad/s^2	SIMon	344682.95	-408777.05
	Head Rotational Acceleration Y	rad/s^2	SIMon	271540.69	-154079.31
	Head Rotational Acceleration Z	rad/s^2	SIMon	198446.98	-149023.02
	Head Rotational Acceleration Resultant	rad/s^2	Compute	454793.43	
	Head Rotational Velocity X	rad/s	SIMon	34.72	-45.10
	Head Rotational Velocity Y	rad/s	SIMon	28.09	-60.18
	Head Rotational Velocity Z	rad/s	SIMon	26.77	-46.06
	Head Rotational Velocity Resultant	rad/s	Compute	74.43	
	36 ms HIC		Compute	178.15	
	15 ms HIC		Compute	178.15	
	Head Resultant CG Acceleration, 3 ms Clip	g	Compute	57.53	
	Skull fracture correlate	-	SIMon	73.86	
	Cumulative strain (Tolerance = 0.05)	-	SIMon	0.99	0.00
	Cumulative strain (Tolerance = 0.10)	-	SIMon	0.79	0.00
	Cumulative strain (Tolerance = 0.15)	-	SIMon	0.44	0.00
Neck	UNLC Transferred to OC, Neck System, FX	N	1000	183.71	-821.03
	UNLC Neck System Tension, FZ	N	1000	1098.26	
	UNLC Neck System Compression, FZ	N	1000		-573.79
	UNLC Transferred to OC, Neck System Flexion, MY	N-m	Thortest	1.54	
	UNLC Transferred to OC, Neck System Extension, MY	N-m	Thortest		-16.73
	NIJ		Compute	0.25	
	On head acting through total neck section, FX	N	Thortest	156.41	-717.32
	On head acting through total neck section, FY	N	Thortest	284.68	-57.28
	On head acting through total neck section, FZ	N	Thortest	1335.95	-352.08
	On head acting through total neck section, MX	N-m	Thortest	14.68	-14.46
	On head acting through total neck section, MY	N-m	Thortest	37.75	-17.15
	On head acting through total neck section, MZ	N-m	Thortest	8.56	-14.59
	On head acting through O.C. joint only, FX	N	Thortest	189.56	-961.09
	On head acting through O.C. joint only, FZ	N	Thortest	1056.20	-575.47
	On head acting through O.C. joint only, MY	N-m	Thortest	1.54	-16.73
Chest	Upper Left Crux X – deflection	mm	Thortest	0.04	-17.18
	Upper Left Crux Y – deflection	mm	Thortest	9.10	-1.19
	Upper Left Crux Z – deflection	mm	Thortest	13.29	-5.11
	Upper Left Crux D – deflection	mm	Thortest	0.97	-12.98
	Upper Right Crux X – deflection	mm	Thortest	0.39	-32.64
	Upper Right Crux Y – deflection	mm	Thortest	1.25	-12.74
	Upper Right Crux Z – deflection	mm	Thortest	12.65	-1.87
	Upper Right Crux D – deflection	mm	Thortest	0.47	-33.38

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2011 Dodge Ram 1500ST Truck NHTSA No.: RB0330
Test Program: Research and Development Narrow Offset Test Date: 9/14/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Chest (Con't)	Lower Left Crux X – deflection	mm	Thortest	4.49	-5.95
	Lower Left Crux Y – deflection	mm	Thortest	3.47	-5.88
	Lower Left Crux Z – deflection	mm	Thortest	10.05	-2.89
	Lower Left Crux D – deflection	mm	Thortest	4.42	-5.68
	Lower Right Crux X – deflection	mm	Thortest	0.92	-24.42
	Lower Right Crux Y – deflection	mm	Thortest	2.49	-7.00
	Lower Right Crux Z – deflection	mm	Thortest	13.40	-3.40
	Lower Right Crux D – deflection	mm	Thortest	0.97	-24.20
	Chest CG Acceleration, 3 ms clip	g	Compute	30.89	
Abdomen	Lower Left X – deflection	mm	Thortest	0.07	-37.86
	Lower Left Y – deflection	mm	Thortest	9.47	-0.95
	Lower Left Z – deflection	mm	Thortest	1.46(1)	-7.19(1)
	Left Viscous Criterion Based on X - deflection		Compute	0.26(1)	
	Lower Right X – deflection	mm	Thortest	0.03	-44.33
	Lower Right Y – deflection	mm	Thortest	10.19	-4.48
	Lower Right Z – deflection	mm	Thortest	2.45	-6.49
	Right Viscous Criterion Based on X - deflection		Compute	0.29	
Spine	Upper Spine (T1) AX	g	180	5.91	-39.48
	Upper Spine (T1) AY	g	180	9.20	-3.47
	Upper Spine (T1) AZ	g	180	9.79	-0.81
	Upper Spine (T1) Resultant	g	Compute	40.03	
	Middle Spine (T6) AX	g	180	2.78	-31.04
	Middle Spine (T6) AY	g	180	14.26	-2.07
	Middle Spine (T6) AZ	g	180	4.67	-7.15
	Middle Spine (T6) Resultant	g	Compute	31.40	
Pelvis	Pelvis CG Resultant Acceleration	g	Compute	43.99	
Acetabulum	Left FX force	N	600	660.59	-2692.65
	Left FY force	N	600	446.88	-677.44
	Left FZ force	N	600	731.33	-83.42
	Left Acetabulum Resultant	N	Compute	2707.60	
	Right FX force	N	600	308.99	-2080.17
	Right FY force	N	600	104.27	-1426.79
	Right FZ force	N	600	903.86	-136.72
	Right Acetabulum Resultant	N	Compute	2448.61	

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver Legs

Test Vehicle: 2011 Dodge Ram 1500ST Truck NHTSA No.: RB0330
Test Program: Research and Development Narrow Offset Test Date: 9/14/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Knee	Left Knee Displacement, DX	mm	180	1.99	-11.36
	Right Knee Displacement, DX	mm	180	1.42	-3.92
Femur	Left Femur Force, FZ	N	600	332.38	-4298.36
	Left Femur Moment, MX	N-m	600	28.74	-178.24
	Left Femur Moment, MY	N-m	600	0.65(2)	-475.65(2)
	Left Femur Res (MX / MY only, not MZ)	N-m	Compute	475.66(2)	
	Right Femur Force, FZ	N	600	306.63	-3524.57
	Right Femur Moment, MX	N-m	600	375.39(3)	-372.94(3)
	Right Femur Moment, MY	N-m	600	112.32	-39.37
	Right Femur Res (MX / MY only, not MZ)	N-m	Compute	387.80(3)	
Tibia	Left Upper Tibia, FZ	N	600	8555.26(4)	-12594.58(4)
	Left Upper Tibia, MY	N-m	600	66.19	-282.47
	Left Upper Tibia, Index		Compute	1.34(4)	
	Right Upper Tibia, FZ	N	600	467.20	-2080.73
	Right Upper Tibia, MY	N-m	600	31.37	-95.46
	Right Upper Tibia, Index		Compute	0.70	
	Left Lower Tibia, FZ	N	600	2.86	-6846.09
	Left Lower Tibia, MY	N-m	600	128.41	-227.13
	Left Lower Tibia, Index		Compute	1.64	
	Right Lower Tibia, FZ	N	600	122.69	-3125.83
	Right Lower Tibia, MY	N-m	600	27.14(5)	-59.94(5)
	Right Lower Tibia, Index		Compute	0.67(5)	
Ankle	Left Ankle Rotation, RX	Deg	180	34.47	-7.23
	Left Ankle Rotation, RY	Deg	180	63.33	-4.82
	Right Ankle Rotation, RX	Deg	180	1.35	-32.32
	Right Ankle Rotation, RY	Deg	180	23.59	-8.27

Anomalies

(1) Noise at 56-85 ms
(2) Questionable Maximum throughout
(3) Questionable after 43 ms
(4) Questionable after 45 ms
(5) Questionable after 334 ms

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY

Test Vehicle: 2011 Dodge Ram 1500ST Truck NHTSA No.: RB0330
Test Program: Research and Development Narrow Offset Test Date: 9/14/2011

Left Rear Passenger: H3 Serial No. 070 Injury Summary

	Nomenclature	Source	Max	Min
Head	Angular acceleration (rad/sec^2) - X	SIMon	1840.50	-3048.10
	Angular acceleration (rad/sec^2) - Y	SIMon	768.99	-1468.00
	Angular acceleration (rad/sec^2) - Z	SIMon	667.45	-1372.40
	Angular acceleration - resultant (rad/sec^2)	SIMon	3053.85	
	Angular velocity (rad/sec) - X	SIMon	8.58	-16.61
	Angular velocity (rad/sec) - Y	SIMon	15.39	-0.63
	Angular velocity (rad/sec) - Z	SIMon	0.02	-65.71
	Angular velocity - resultant (rad/sec)	SIMon	66.76	
	36 ms HIC	Compute	496.91	
	15 ms HIC	Compute	270.04	
	Skull fracture correlate	SIMon	50.36	
	Cumulative strain (Tolerance = 0.05)	SIMon	0.99	
	Cumulative strain (Tolerance = 0.10)	SIMon	0.82	
	Cumulative strain (Tolerance = 0.15)	SIMon	0.46	
	Head resultant CG acceleration, 3 ms clip (g's)	Compute	61.81	
Neck	Upper Neck Tension (N) Fz	1000	1732.03	
	Upper Neck Compression (N) Fz	1000		-1701.29
	Upper Neck NTF	Compute	0.60	
	Upper Neck NTE	Compute	0.66	
	Upper Neck NCF	Compute	0.14	
	Upper Neck NCE	Compute	0.80	
Chest	Chest Deflection (mm)	600	0.01	-25.24
	Upper Left Chest X (mm)	Compute	0.01	-22.69
	Upper Left Chest Y (mm)	Compute	1.08	-5.48
	Upper Right Chest X (mm)	Compute	5.98(6)	-23.20(6)
	Upper Right Chest Y (mm)	Compute	21.06(6)	-15.97(6)
	Lower Left Chest X (mm)	Compute	0.04	-12.24
	Lower Left Chest Y (mm)	Compute	5.17	-2.50
	Lower Right Chest X (mm)	Compute	0.03	-23.44
	Lower Right Chest Y (mm)	Compute	12.27	-0.46
	Chest CG acceleration, 3 ms clip, (G's)	Compute	31.99	
Femur	Right Fz Force (N)	600	1402.55	-87.97
	Left Fz Force (N)	600	1391.12	-150.17

Anomalies
(6) Questionable Data after 148ms

SECTION 3

DATA SHEETS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Dodge Ram 1500 NHTSA No: RB0330
Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

TEST VEHICLE INFORMATION

NHTSA No.	RB0331
Model Year	2011
Make	Ram
Model	1500
Body Style	Truck
VIN	1D7RB1CP2BS560681
Body Color	Dark green
Delivery Date	7/28/2011
Odometer Reading (km/mi)	239.8 km / 149 mi
Dealer	MT Ephraim Chrysler Dodge
Transmission	5-Speed Automatic
Final Drive	Front Wheel Drive
Type/No. Cylinders	V8
Engine Displacement (L)	4.7
Engine Placement	Longitudinal
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	No
Traction Control	No
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes
Other	--

TEST VEHICLE OPTIONS

Anti-Lock Brakes	Yes
All-Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Front Pass. Front Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	No
Front Pass. Knee Airbag	No
Pretensioners	Yes
Load Limiters	No
Tilt Steering	Yes
Automatic Door Locks	No
Power Windows	Yes
Power Seats	No
Air Conditioning	Yes

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Chrysler Group LLC
Date of Manufacture	12/10

GVWR (kg)	3085
GAWR Front (kg)	1679
GAWR Rear (kg)	1770

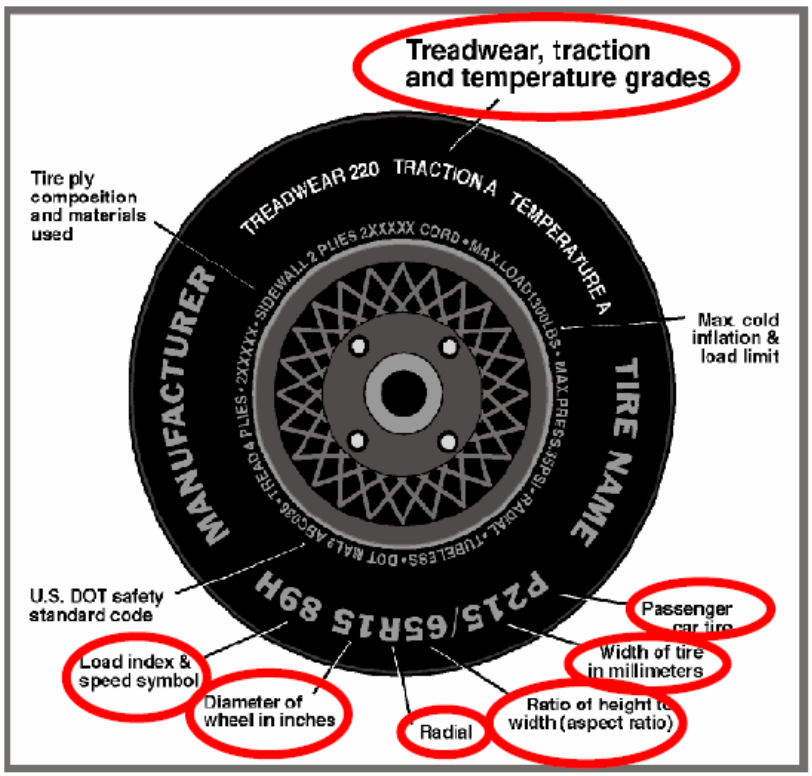
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Split Bench	-	
Number of Occupants	3	3	-	6
Capacity Wt. (VCW) (kg)				765
Cargo Wt. (RCLW) (kg)				136

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Cold Pressure (kPa)	276	276
Recommended Tire Size	P265/70R17	P265/70R17
Tire Size on Vehicle	P265/70R17	P265/70R17
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler SR-A	Wrangler SR-A
Treadwear	500	500
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel	2 Polyester, 2 Steel
Load Index/Speed Symbol	104H	104H
Tire Material	Rubber	Rubber
DOT Safety Code Right	4BT6EXWR4610	4BT6EXWR4610
DOT Safety Code Left	4BT6EXWR4610	4BT6EXWR4610

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Dodge Ram 1500 NHTSA No: RB0330

Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	683	505		727.5	623	
Right	kg	627.5	511		658	602	
Ratio	%	56.3%	43.7%		53.1%	46.9%	
Totals	kg	1310.5	1016	2326.5	1385.5	1225	2610.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	2326.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	153.54
Rated Cargo/Luggage Weight (RCLW)	kg	136
Calculated Vehicle Target Weight (TVTW)	kg	2611.54

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	910	910	990	999	1559
As Tested	mm	897	901	953	961	1675
Post Test	mm	-	-	-	-	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3570
Total Vehicle Length at Left Side	mm	5740
Total Vehicle Length at Centerline	mm	5821
Total Vehicle Length at Right Side	mm	5740
Weight of Ballast in Cargo Area	kg	63.6
Weight of Vehicle Components Removed	kg	0.0
Amount of Stoddard Solvent in Fuel Tank	L	90.46

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: None

MASS OF BALLAST ADDED (kg) 63.6

DATA SHEET NO.1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	5821
2	Total Width	2012
3	Bumper Top Height	-125
4	Bumper Bottom Height	115
5	Longitudinal Member Top Height	-62
6	Distance Between Longitudinal Members	914
7	Longitudinal Member Width	65
8	Engine Top Height	-590
9	Engine Bottom Height	49
10	Engine and Gearbox Width	642
11	Front Bumper-Engine Distance	777
12	Front Shock Absorber Fixing Height	-114
13	Bonnet Leading Edge Height	-572
14	Front Shock Absorber Fixing Width	871
15	Front Bumper – Front Axle Distance	1021
16	Front Axle – A Pillar Distance	780
17	A- Pillar – B-Pillar Distance	904
18	B-Pillar – Rear Axle Distance	1889
19	B-Pillar – C-Pillar Distance	682
20	Roof Sill Bottom Height	-1216
21	Roof Sill Top Height	-1281
22	Floor Sill Bottom Height	33
23	Floor Sill Top Height	-7

DATA SHEET NO. 2

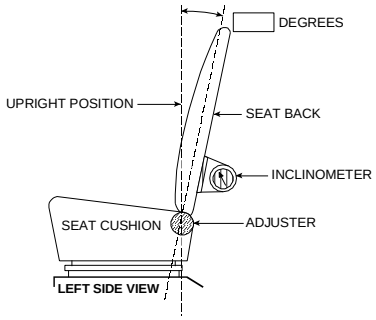
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

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:	26
Passenger seat back angle:	FIXED



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

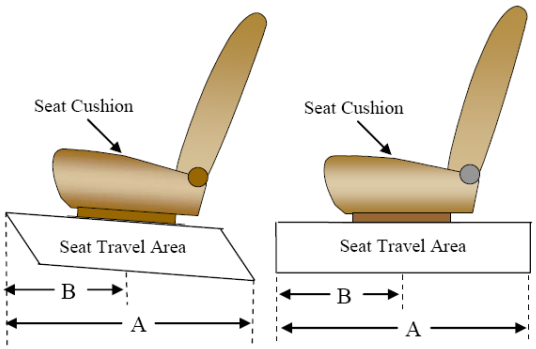
Seat was set to full forward, full up and marked. Then moved to the full rear, full down position, and marked. Mid-point was measured, and seat was set to full down, mid position, as per form 1.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	230	120
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	5	2
Passenger Seat	FIXED	FIXED

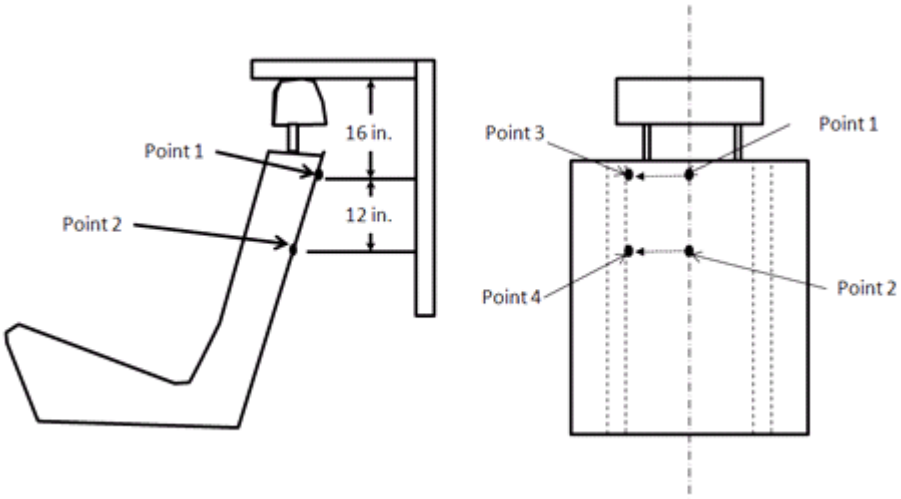


DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

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	2971.631	-654.269	-728.306
Point 4	3110.152	-655.85	-421.58

*Please see Appendix F.1 for a detailed description of the CMM measurement procedure.

DATA SHEET NO. 2 (CONTINUED)

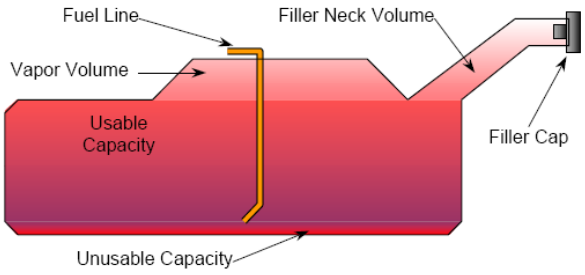
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	98.41
Usable Capacity of "Optional Tank"	
92%-94% of Usable Capacity	90.46
Actual Amount of Solvent Used	90.46
1/3 of Usable Capacity	32.8

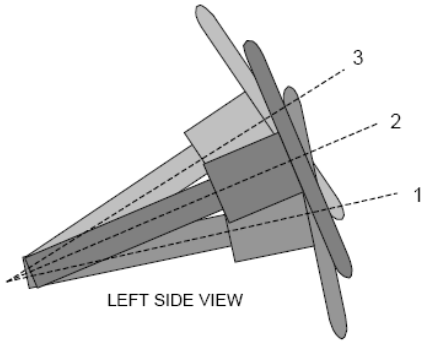
Electric fuel pump is located on top of the tank. Blue/Red wire (+), Black (-)



VEHICLE FUEL TANK ASSEMBLY

STEERING COLUMN ADJUSTMENT

A level line was drawn on the steering wheel and an inclinometer was used to determine the angle of adjustment. The steering column was then moved full in and full out. Positions were marked and the steering wheel was set to the geometric center of its possible movement.



STEERING COLUMN ASSEMBLY

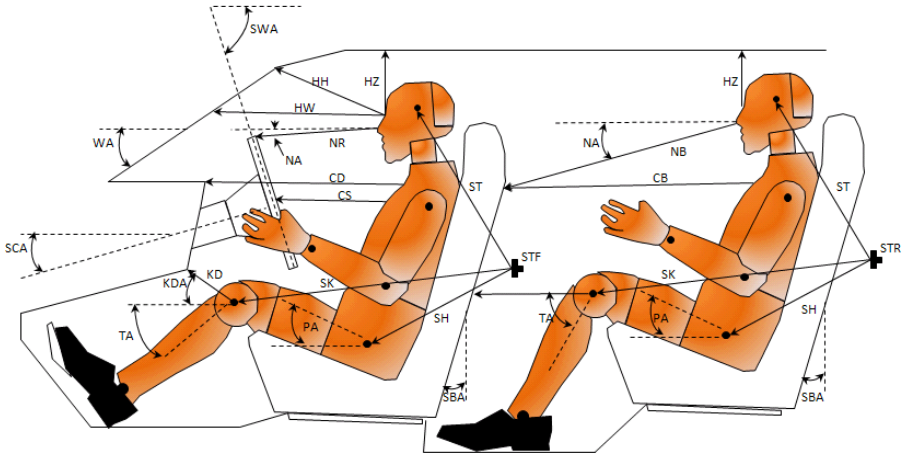
STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	74.9	
Geometric center position No. 2	66.4	
Uppermost position No. 3	57.8	
Telescoping Steering Wheel Travel		
Test Position	Set to detent 5 with 1 being the lowest detent	

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



Code	Measurement Description	Driver		Left Rear Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WAº	Windshield Angle		-32		
SWAº	Steering Wheel Angle		66.5		
SCAº	Steering Column Angle		-19.1		
SAº	Seat Back Angle (on headrest post)		5.2		-4.5
HZ	Head to Roof (Z)	222	90	336	90
HH	Head to Header	471	16.3		
HW	Head to Windshield	736	0		
NR/NB	Nose to Rim/Seat Back	483	-13	603	-8.7
CD/CB	Chest to Dash/Seat Back	628		629	
CS	Chest to Steering Hub	413	-16.9		
RA	Rim to Abdomen	193	0		
KDL/KBL	Left Knee to Dash/Seat Back	139	25.1	312	25.1
KDR/KBR	Right Knee to Dash/Seat Back	118	21	310	23.9
PAº	Pelvic Angle		-24		19
TAº	Tibia Angle		-51.6		-72.1
SK	Striker to Knee	607	5.5	572	6.2
ST	Striker to Head	692	83.4	593	80.1
SH	Striker to H-Point	207	-5.2	154	12.5
HAXº	Head Angle X		0.1		
HAYº	Head Angle Y		4.2		
NAXº	Neck Angle X		-0.5		
NAYº	Neck Angle Y		0.4		
TAXº	T6 Angle X		15.3		
TAYº	T6 Angle Y		0.5		
LAXº	Lumbar Angle (X)		-0.3		
LAYº	Lumbar Angle (Y)		22.4		

DATA SHEET NO. 3 (CONTINUED)

DUMMY CMM MEASUREMENTS

Test Vehicle: 2011 Dodge Ram 1500 NHTSA No: RB0330

Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

Description	Units	Driver			Left Rear Passenger		
		X	Y	Z	X	Y	Z
Striker (Driver/Passenger)	mm	3184.526	-891.384	-377.416	2155.398	-906.984	-406.751
Head CG	mm	3249.88	-569.615	-1055.82	2254.729	-558.411	-977.977
Bridge of Nose	mm	3343.481	-483.06	-1061.91	2339.995	-478.584	-975.002
Tip of Nose	mm	3339.91	-483.091	-1008.77	2251.426	-643.785	-739.182
Shoulder Bolt	mm	3291.687	-680.059	-808.625	2348.898	-478.588	-871.4
Tip of Chin	mm	3332.888	-483.121	-925.682	2338.346	-608.091	-442.037
H-point	mm	3410.023	-677.135	-364.121	2754.684	-592.444	-453.607
Left Knee	mm	3815.396	-664.161	-433.771	2750.522	-421.037	-453.214
Right Knee	mm	3804.996	-393.923	-474.017	2863.384	-584.075	-119.324
Left Ankle	mm	4104.057	-670.408	-130.406	2853.454	-413.15	-124.048
Right Ankle	mm	4060.471	-388.326	-141.294	2784.674	-573.928	-53.7316
Left Heel	mm	4062.597	-648.859	7.9409	2779.115	-399.289	-53.7547
Right Heel	mm	4061.533	-370.419	4.9229	2155.398	-906.984	-406.751
Driver's Outboard Seat Anchor Bolt	mm	3696.529	-654.31	-58.1517			
Outboard Head Restraint Post	mm	3009.675	-543.801	-864.115	2060.522	-543.323	-899.579
Top of Head Restraint*	mm	3078.914	-488.181	-1129.18	2102.043	-480.209	-1119.67
Center of Steering Wheel	mm	3739.451	-477.716	-716.263			

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

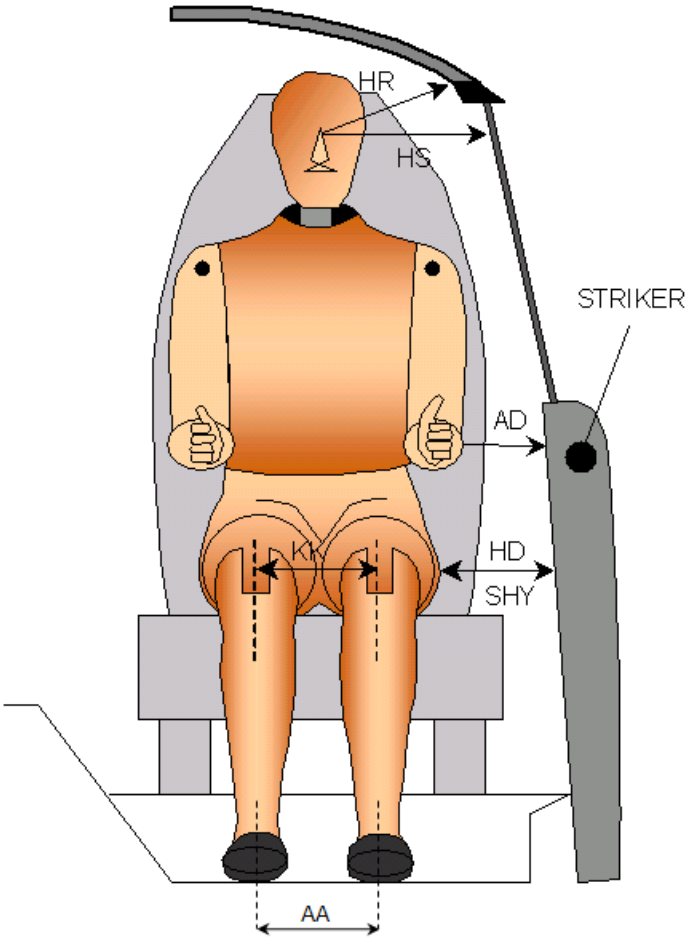
+Y - From left side of the vehicle to the right side of the vehicle

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

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

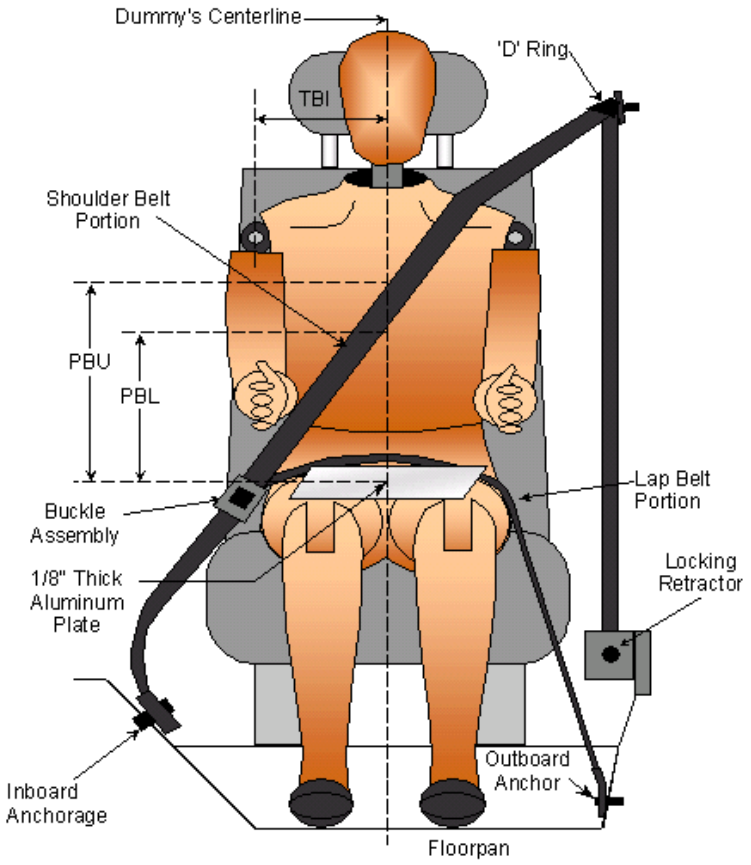


Code	Description	Units	Driver (P1)	Passenger (P4)
AD	Arm to Door	mm	125	79
HD	H-Point to Door	mm	124	182
HR	Head to Side Header	mm	189	273
HS	Head to Side Window	mm	310	363
KK	Knee to Knee	mm	270	170
SHY	Striker to H-Point (Y Direction)	mm	218	310
AA	Ankle to Ankle	mm	277	165

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of aluminum plate to belt upper edge	mm	378	325
PBL — Top surface of aluminum plate to belt lower edge	mm	292	245

BELT LENGTH DATA

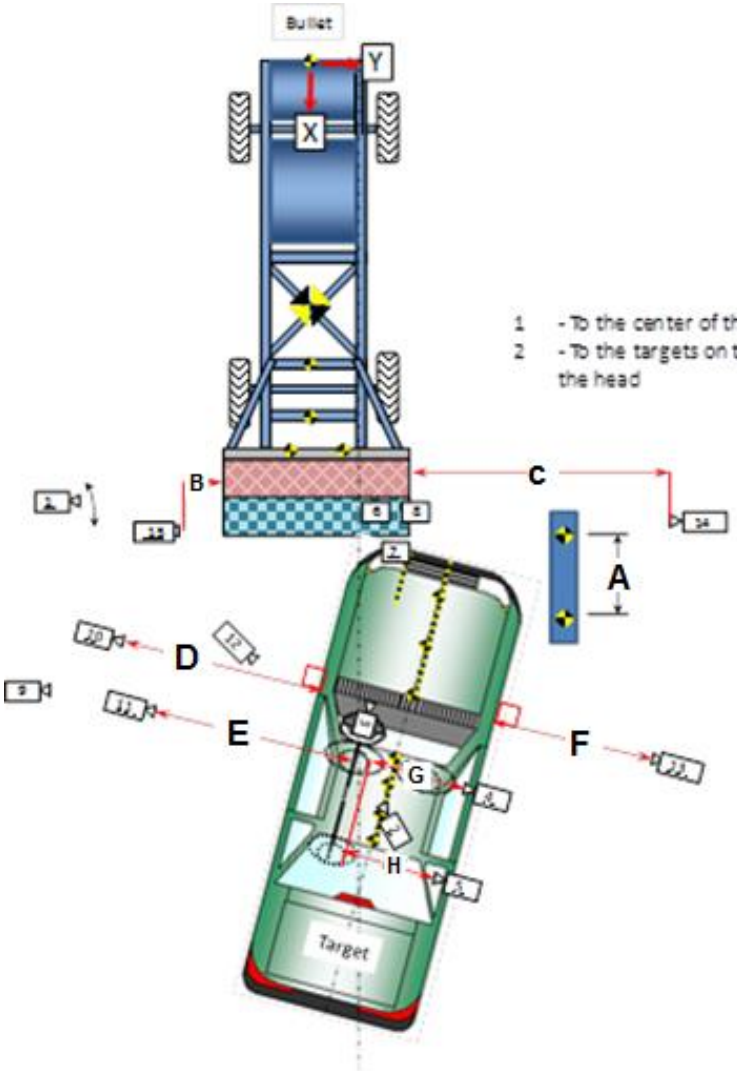
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	852	802
Lap Belt Length as measured on ATD	mm	947	770
Remainder of belt on reel	mm	1001	828
Total belt length for continuous webbing systems	mm	2800	2400

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

Horizontal Location



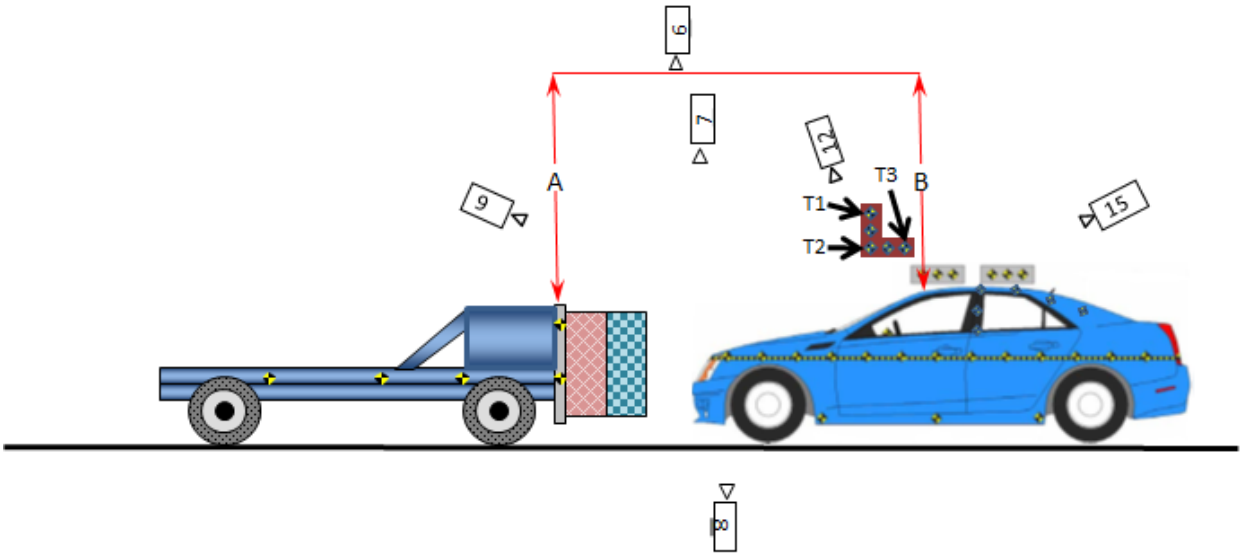
A	mm	915
B	mm	8820
C	mm	
D	mm	9560
E	mm	10390
F	mm	7260
G	mm	1090
H	mm	1100

DATA SHEET NO. 6 (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

Horizontal Location



	Units	Value
A	mm	3960
B	mm	3207

DATA SHEET NO. 6 (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View					
2	Onboard Driver Over Shoulder	3275	1260	1725	12.5	500
3	Onboard Driver Lower Leg	1850	940	520	6.5	500
4	Onboard Driver Perpendicular	2260	2280	1140	12.5	500
5	Onboard Left Rear Passenger Perpendicular	3150	2100	1200	12.5	500
6	Overall Top View	2023	850	4820	14	1000
7	Zoomed Top View	217	1090	3940	24	1000
8	Pit Front					
9	Overall Left Side Front Ladder	0	9890	2798	24	1000
10	Target Vehicle Left Side	1320	9070	1320	28	1000
11	Driver's Motion	1160	9500	1450	50	1000
12	Look Down Driver's Motion	2740	750	3600	13	1000
13	Target Vehicle Right Side	3500	8190	1550	24	1000
14	Bullet Vehicle Left Side					
15	Bullet Vehicle Right Side Rear Ladder	4070	9800	2980	24	1000
16	Above MDB	50	930	2050	13	1000

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

+X = from back of MDB to front of MDB

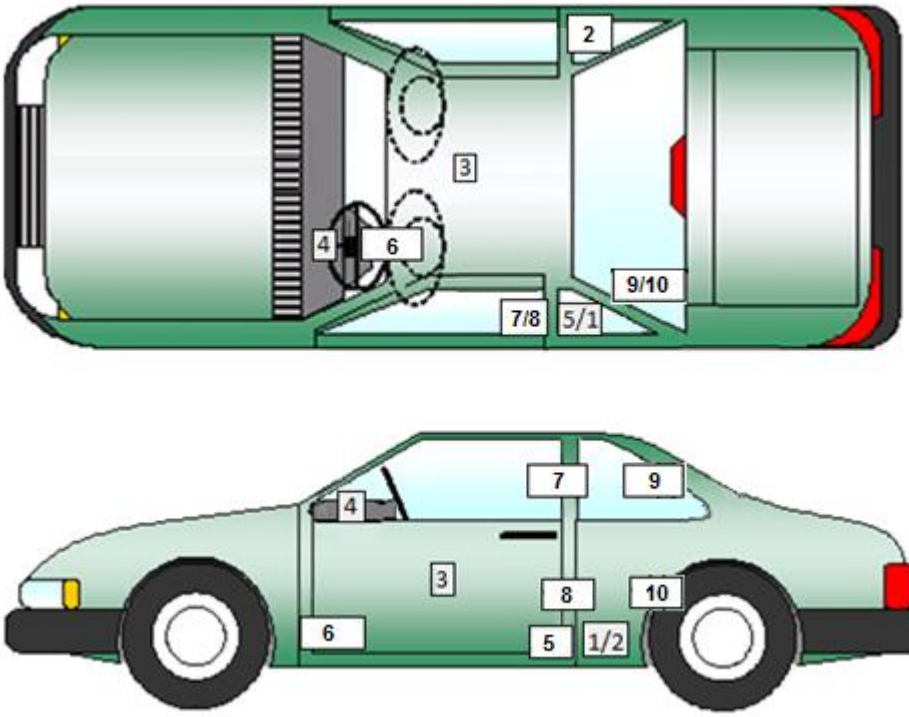
+Y = right of monorail center

+Z = up from ground

DATA SHEET NO. 7

VEHICLE INSTRUMENTATION LOCATIONS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



Accelerometer Location	Axes	Units	Location		
			X	Y	Z
Left Rear Sill	X,Y	mm	2779	-806	-3
Right Rear Sill	X,Y	mm	2895	798	-147
Vehicle CG	X, Y, Z	mm	3825	22	-179
Driver Seat Track	X	mm	3885	-1	-627
Instrument Panel	X, Y, Z	mm	3015	-360	-49
Behind Brake Pedal	X, Y, Z	mm	4496	-488	-190

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 Dodge Ram 1500 NHTSA No: RB0330
Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

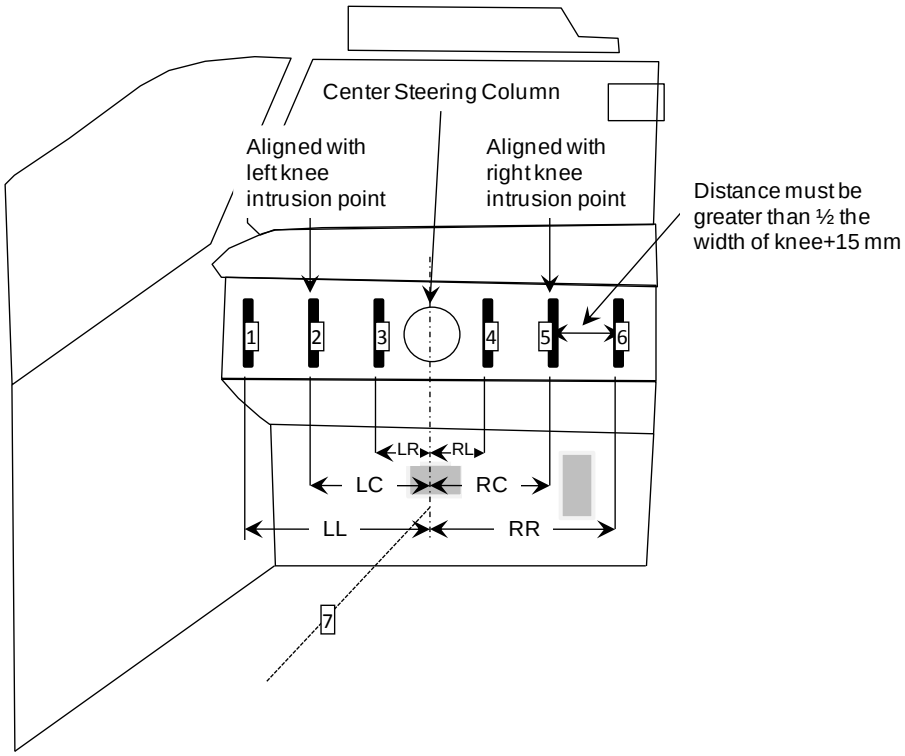
VEHICLE INSTRUMENTION DATA

Loc.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Max	Time (ms)
1	Left Rear Cross Member	X	G	4.72	33.90	-26.34	66.40
		Y	G	13.21	66.55	-3.01	55.80
2	Right Rear Cross Member	X	G	10.04	71.25	-10.84	52.25
		Y	G	13.97	67.90	-1.51	199.10
3	Vehicle CG	X	G	0.64	195.35	-19.22	66.45
		Y	G	15.36	67.15	-7.55	55.80
		Z	G	22.25	44.60	-32.76	49.80
4	Instrument Panel	X	G	30.49	60.30	-68.34	53.40
5	Driver Seat Track	X	G	7.65	78.45	-25.04	61.95
		Y	G	19.66	79.20	-3.25	54.65
		Z	G	19.43	105.70	-56.72	62.90
6	Behind Brake Pedal	X	G	64.24	32.00	-96.97	62.75
		Y	G	31.35	71.60	-6.92	76.10
		Z	G	178.71	70.50	-200.38	64.35
7	Driver Shoulder Belt		N	3482.58	71.55	-27.14	244.60
8	Driver Lap Belt		N	998.30	64.40	-1.43	-14.95
9	Passenger Shoulder Belt		N	5223.48	95.80	-14.92	235.35
10	Passenger Lap Belt		N	3425.05	78.35	-4.49	158.05

DATA SHEET NO. 7 (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



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

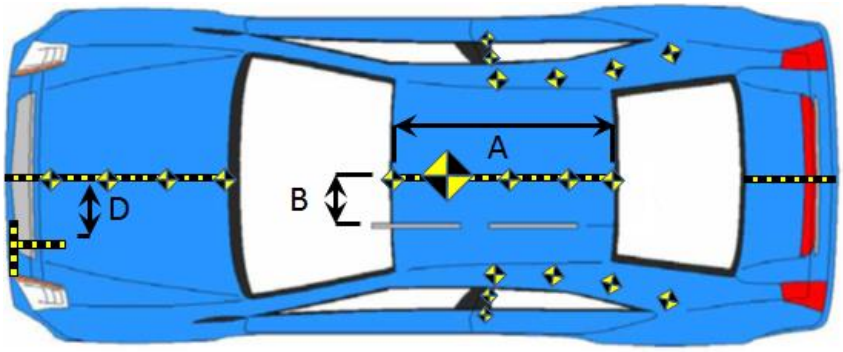
VEHICLE INSTRUMENTION DATA

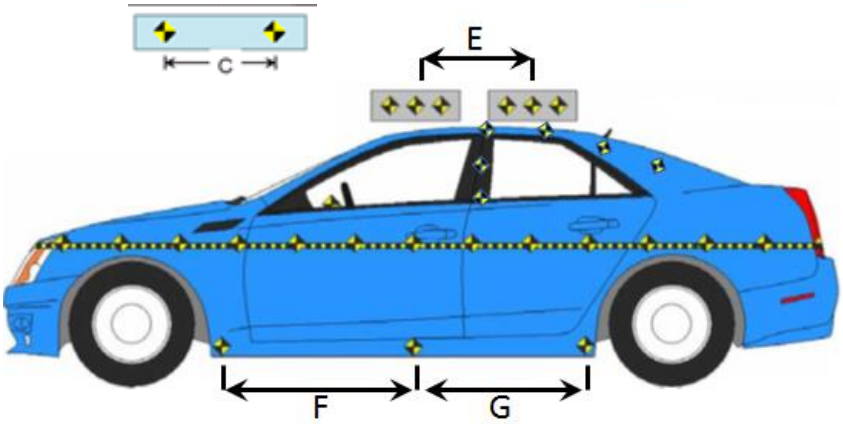
Loc.	Description		Positive Direction		Negative Direction	
			Max	Time (ms)	Max	Time (ms)
1	Left knee contact switch (LL) (ms)	*	0	-50	-1	75.05
2	Left knee contact switch (LC) (ms)	*	0	-50	-1	56.35
3	Left knee contact switch (LR) (ms)	*	0	-50	-1	64.90
4	Right knee contact switch (RL) (ms)	*	0	-50	-1	65.60
5	Right knee contact switch (RC) (ms)	*	0	-50	-1	50.65
6	Right knee contact switch (RR) (ms)	*	0	-50	-1	55.55
7	Toepan string pot (mm)		0.472	14.3	-223.594	80.85

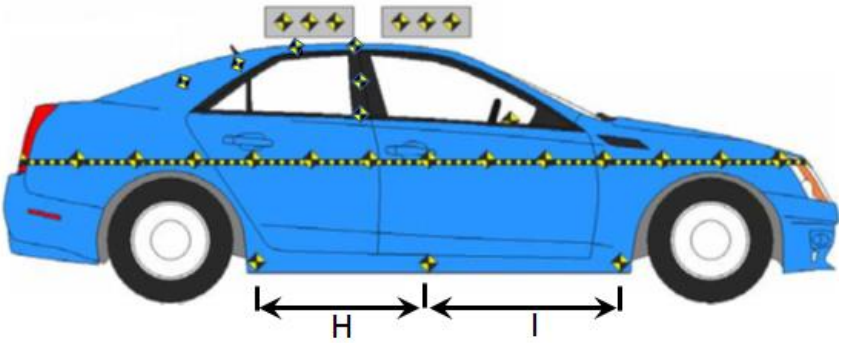
* The measurement indicates the initial time the voltage changed

DATA SHEET NO. 8
VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11





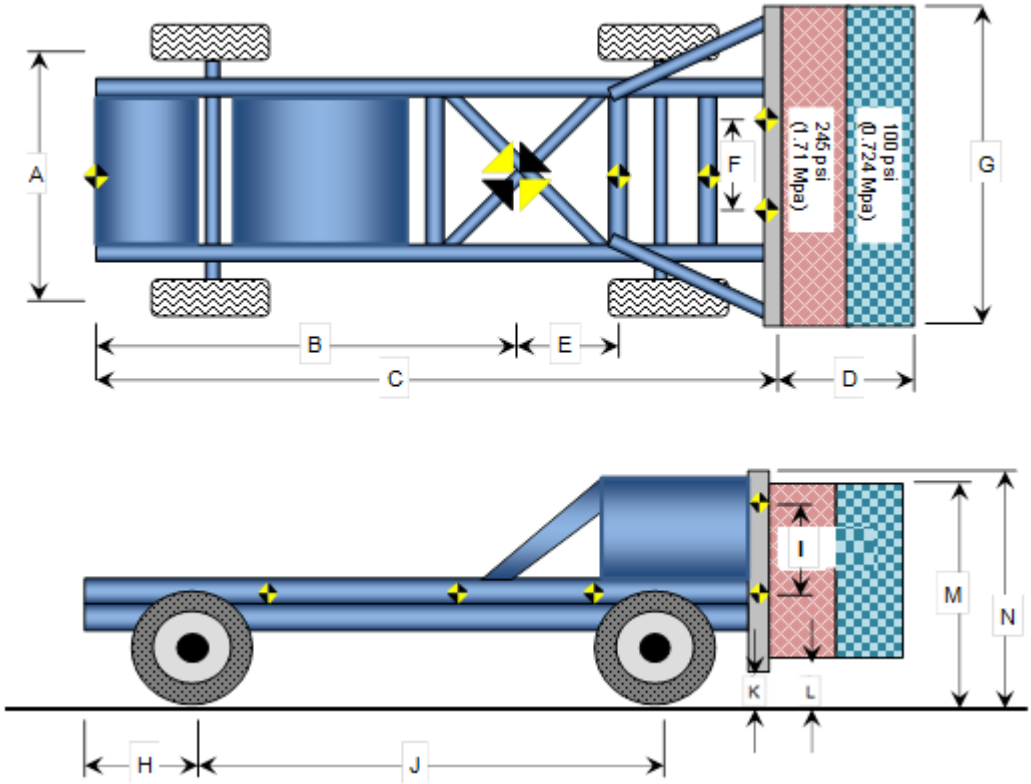


Item	Units	Value
A	mm	610
B	mm	450
C	mm	915
D	mm	1071
E	mm	3361
F	mm	1236
G	mm	1236
H	mm	1231
I	mm	1232

DATA SHEET NO. 8 (CONTINUED)

MDB PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



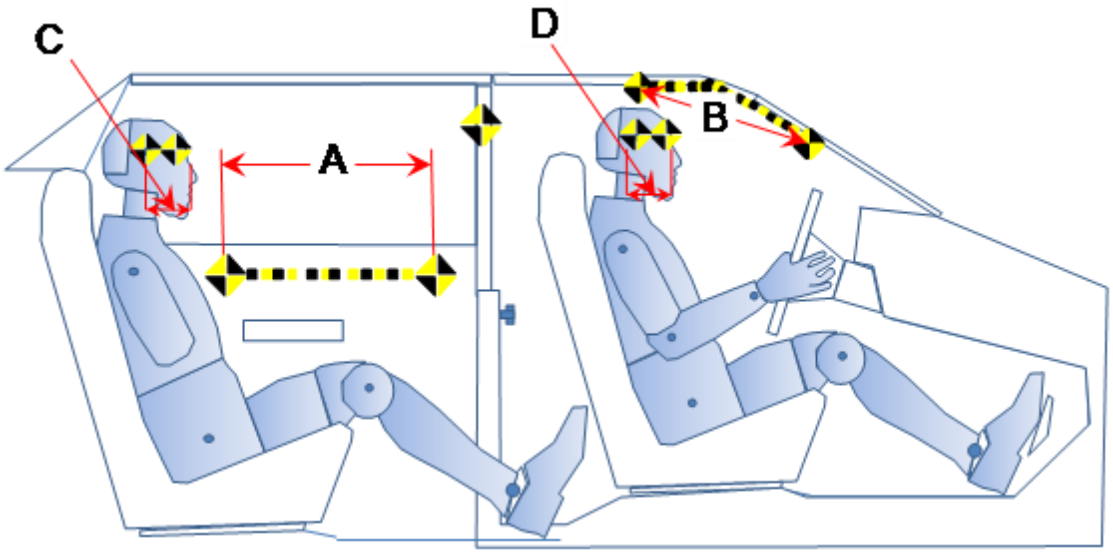
Item	Units	Value
A	mm	1550
B	mm	2215
C	mm	3940
D	mm	606
E	mm	1185
F	mm	1130
G	mm	2210
H	mm	795
I	mm	500
J	mm	2585
K	mm	90
L	mm	98
M	mm	1055
N	mm	1190

	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			1285.6

DATA SHEET NO. 8 (CONTINUED)

DUMMY PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



Item	Units	Value
A	mm	305
B	mm	305
C	mm	50
D	mm	52

DATA SHEET NO. 9

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

INSTRUMENTATION

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

CAMERA COVERAGE

High-Speed Vehicle Onboard	4
High-Speed Off board	10
Real-Time Panning	1
Total	15

DATA SHEET NO. 10

POST TEST OBSERVATIONS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

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.	LX0036/0037	N/A	-	N/A
Head Contact	Steering wheel airbag and B-Pillar window frame	A-37 A-48	Headrest and window frame	A-49 A-52 A-58
Upper Torso Contact	Steering wheel airbag	-	Door Frame	-
Lower Torso Contact	None	A-46 A-47	None	-
Left Knee Contact	Knee bolster	A-45	None	A-59
Right Knee Contact	Knee bolster	A-44	None	A-59

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Separation at A and B-Pillar at the window frame	Remained Closed and Operational
Rear Door Opening	Remained Closed and Operational	Remained Closed and Operational
Seat Track Shift (mm)	10	N/A
Seat Back Failure	No Failure	No Failure
Glazing Damage	-	-

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions	Picture Ref
Windshield Damage	Separation at the front left corner	A-21
Window Damage	None - Windows were open	A-36 / A-51
Other Notable Effects	Left front tire drove into the drivers floor pan	-

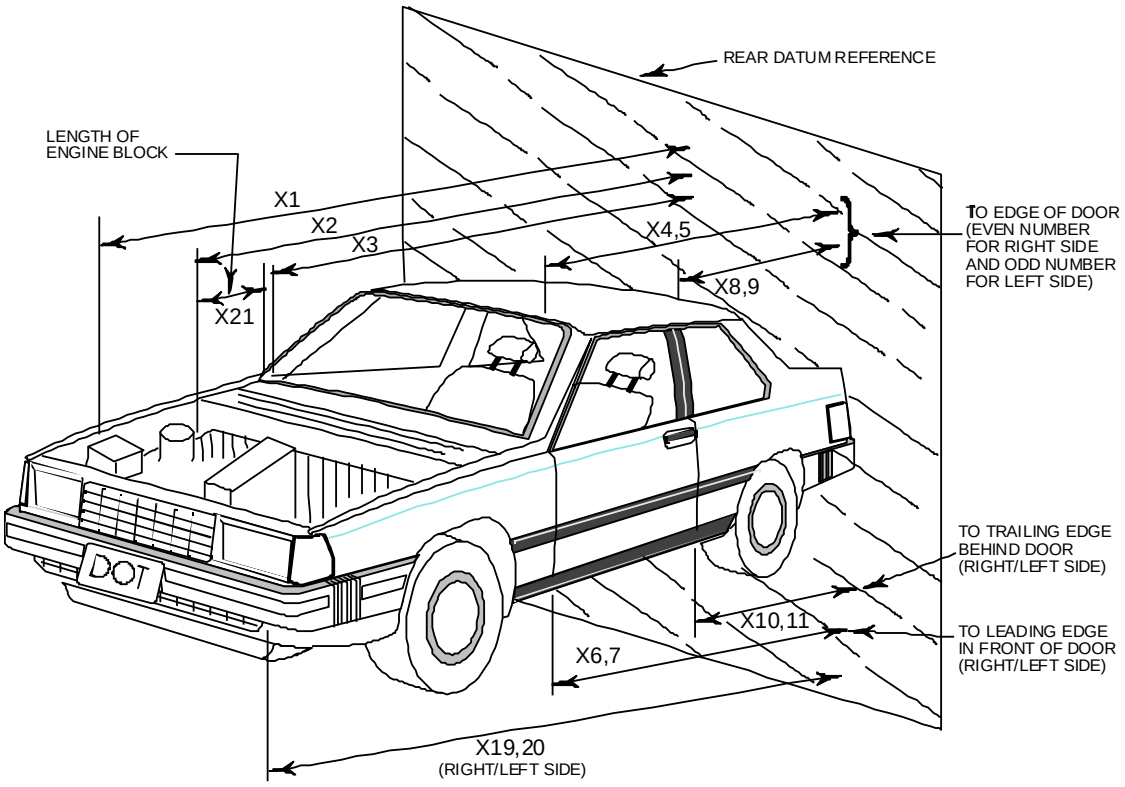
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

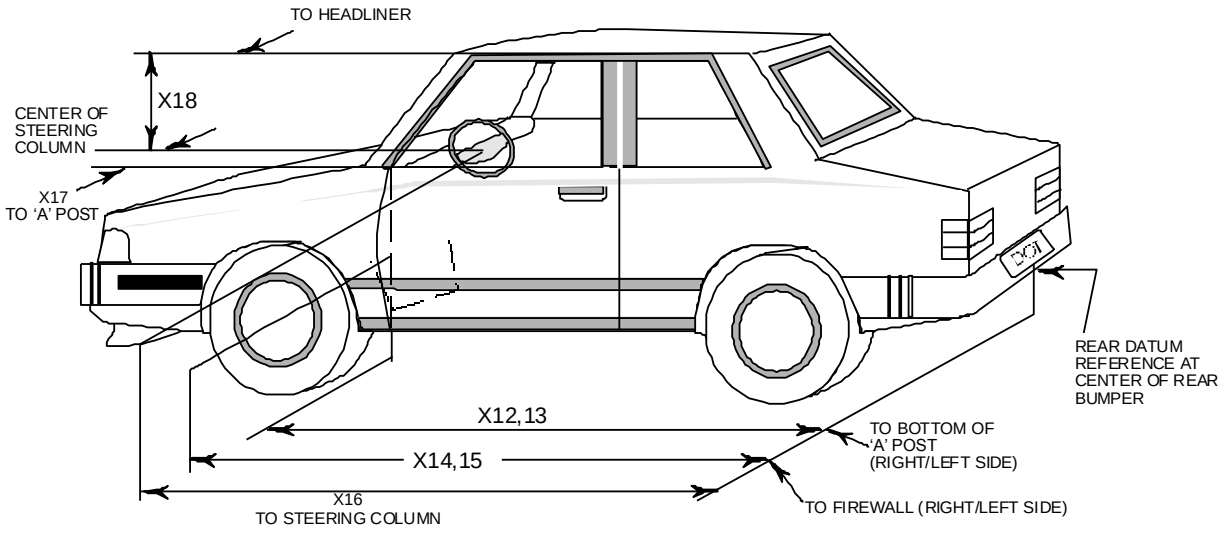
Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	No	N/A
Torso Airbag	No	N/A	No	N/A
Curtain Airbag	Yes	No	Yes	No
Knee Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	No	N/A	No	N/A

DATA SHEET NO. 11

VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11





DATA SHEET NO. 11 (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Dodge Ram 1500 NHTSA No: RB0330
Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5821	5705	116
2	Rear Surface of Vehicle (RSOV) to Front of Engine	5044	5013	31
3	RSOV to Firewall	4664	4561	103
4	RSOV to Upper Leading Edge of Right Door	4255	4236	19
5	RSOV to Upper Leading Edge of Left Door	4258	4151	107
6	RSOV to Lower Leading Edge of Right Door	4195	4183	12
7	RSOV to Lower Leading Edge of Left Door	4196	4129	67
8	RSOV to Upper Trailing Edge of Right Door	3126	3108	18
9	RSOV to Upper Trailing Edge of Left Door	3126	3080	46
10	RSOV to Lower Trailing Edge of Right Door	3127	3118	8
11	RSOV to Lower Trailing Edge of Left Door	3127	3067	60
12	RSOV to Bottom of “A” Post of Right Side	4257	4238	19
13	RSOV to Bottom of “A” Post of Left Side	4256	4134	123
14	RSOV to Firewall, Right Side	4645	4616	28
15	RSOV to Firewall, Left Side	4640	4515	125
16	RSOV to Steering Column	3737	3617	120
17	Center of Steering Column to “A” Post	266	331	-65
18	Center of Steering Column to Headliner	470	495	-25
19	RSOV to Right Side of Front Bumper	5764	5788	-24
20	RSOV to Left Side of Front Bumper	5765	5392	372
21	Length of Engine Block	319	310	9
RD	RSOV to Right Side of Dash Panel	3958	3942	16
CD	RSOV to Center of Dash Panel	3898	0	3898
LD	RSOV to Left Side of Dash Panel	3956	3804	152

All Dimensions in mm

DATA SHEET NO. 12

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

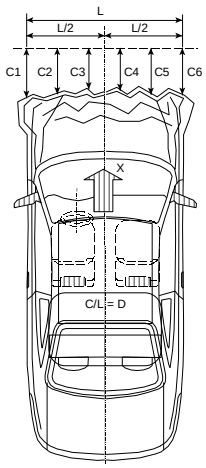
VEHICLE INFORMATION

VIN:	1D7RB1CP4BS560679	Wheelbase:	3570
Vehicle Size Category:	Passenger - Truck	Test Weight (kg):	2610.5

ACCELEROMETER DATA

Accelerometer Locations:	Data Sheet No.7
Cal. Procedure/Interval:	Calspan/6 Months
Integration Algorithm:	Trapezoidal
Impact Velocity (km/h):	90.6
Velocity Change (km/h):	90.6

Linearity: 99%



CRUSH PROFILE

Collision Deformation Classification :	12FLEE6
Midpoint of Damage:	C2
Damage Region Length (mm):	1448
Impact Mode:	20% offset, 7º Angle

CRUSH MEASUREMENTS: WITH BUMPER COVER REMOVED

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5688	5237	451
C2	Crush zone 2 at left side	mm	5771	5521	250
C3	Crush zone 3 at left side	mm	5799	5660	139
C4	Crush zone 4 at right side	mm	5800	5729	71
C5	Crush zone 5 at right side	mm	5771	5773	-2
C6	Crush zone 6 at right side	mm	5687	5760	-73
L	C1 to C6	mm	1448	1176	272

CRUSH MEASUREMENTS: WITH BUMPER COVER REMOVED

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	5701	5224	-477
C2	Crush zone 2 at left side	mm	5785	5476	-309
C3	Crush zone 3 at left side	mm	5813	5661	-152
C4	Crush zone 4 at right side	mm	5812	5734	-78
C5	Crush zone 5 at right side	mm	5784	5771	-13
C6	Crush zone 6 at right side	mm	5699	5751	52
L	C1 to C6	mm	5701	5224	-477

DATA SHEET NO. 13

VEHICLE INTRUSION MEASUREMENTS

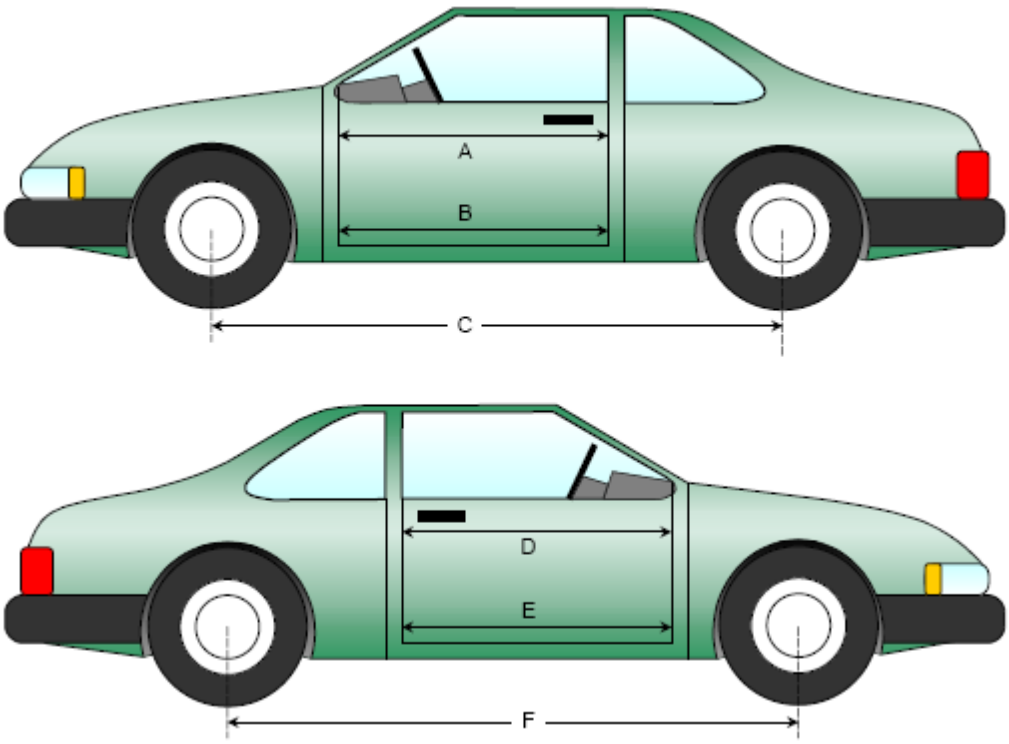
Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	970	862	-107
B	Left Side Lower	mm	939	863	-76
D	Right Side Upper	mm	971	974	3
E	Right Side Lower	mm	940	942	2

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3573	3124	-449
F	Right Side Wheelbase	mm	3567	3644	77



DATA SHEET NO.13 (CONTINUED)

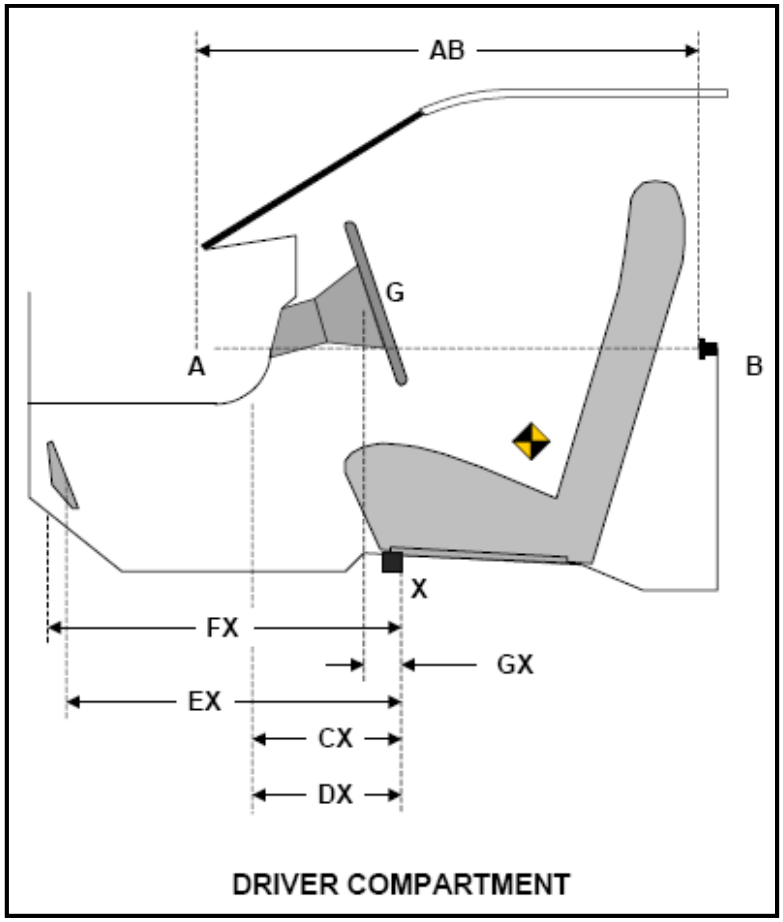
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	786	780	-7
CX	Left Knee Bolster to X	mm	276	163	-113
DX	Right Knee Bolster to X	mm	258	168	-90
EX	Brake Pedal to X	mm	507	345	-162
FX	Foot Rest to X	mm	623	382	-241
GX	Center of Steering Column Wheel Hub to X	mm	41	-66	-108

X = Front of Seat Track (Stationary)

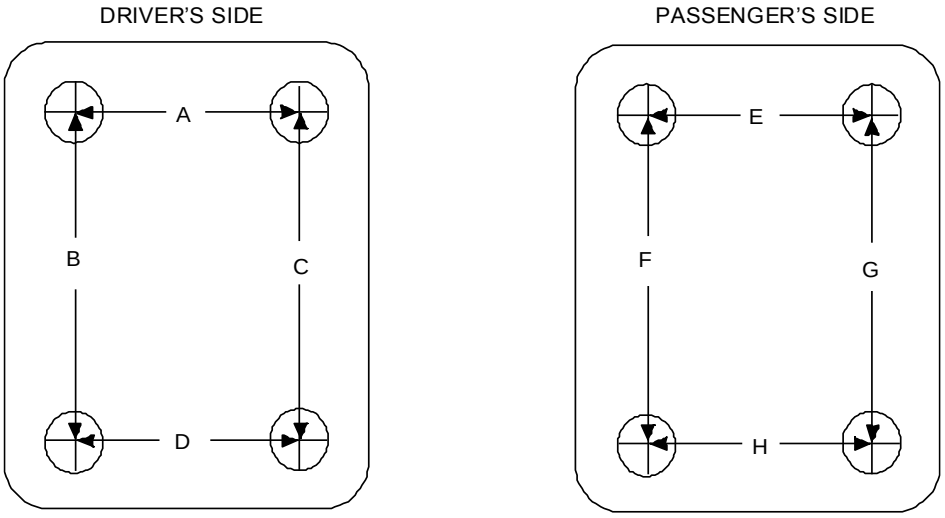


DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

TOP VIEW THROUGH FLOOR PAN



UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	457	377	81
B	208	82	126
C	242	210	32
D	440	424	16
E	317	317	0
F	305	304	1
G	311	308	2
H	481	479	2

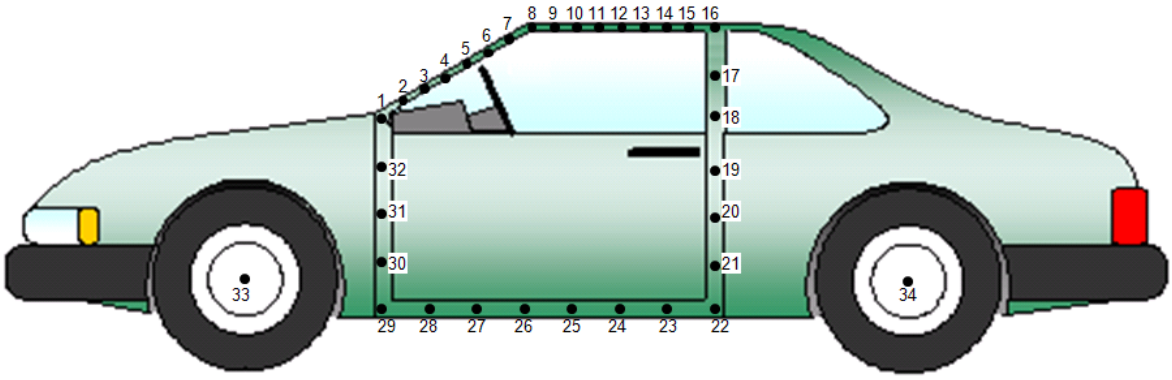
All units in millimeters

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

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 Dodge Ram 1500 NHTSA No: RB0330

Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

DRIVER SIDE DOOR SILL INTRUSIONS

Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	4158.1	-870.7	-760.8	4047.4	-897.6	-782.9	-110.7	-26.9	-22.1
2	4125.1	-849.9	-834.1	4029.6	-868.2	-859.2	-95.5	-18.3	-25.1
3	4077.7	-831.9	-899.2	3997.3	-842.6	-931.3	-80.3	-10.7	-32.1
4	4012.6	-815.8	-953.6	3946.0	-821.4	-996.8	-66.6	-5.6	-43.2
5	3948.5	-799.9	-1002.7	3892.6	-801.7	-1056.2	-55.9	-1.8	-53.6
6	3882.8	-783.2	-1050.0	3839.1	-782.1	-1114.8	-43.7	1.1	-64.9
7	3815.0	-764.3	-1091.4	3781.5	-762.1	-1169.3	-33.5	2.2	-77.9
8	3747.7	-749.2	-1137.7	3724.8	-741.7	-1226.6	-23.0	7.4	-88.9
9	3671.1	-732.4	-1181.1	3660.4	-718.0	-1283.3	-10.7	14.5	-102.2
10	3594.2	-720.0	-1209.0	3580.8	-710.4	-1290.9	-13.3	9.6	-81.9
11	3514.9	-712.8	-1223.7	3500.4	-699.6	-1288.1	-14.6	13.2	-64.4
12	3435.0	-709.7	-1232.6	3420.1	-695.1	-1281.3	-14.9	14.7	-48.7
13	3351.8	-709.0	-1238.8	3338.9	-692.8	-1268.0	-12.9	16.1	-29.2
14	3268.9	-708.7	-1243.3	3256.2	-691.7	-1255.1	-12.7	17.0	-11.9
15	3185.9	-709.2	-1249.3	3171.4	-693.6	-1255.1	-14.5	15.6	-5.8
16	3109.1	-710.4	-1247.8	3096.3	-693.6	-1250.0	-12.8	16.8	-2.1
17	3134.9	-802.6	-1049.5	3122.0	-784.1	-1050.7	-12.9	18.6	-1.2
18	3157.3	-871.7	-839.7	3146.3	-851.6	-841.3	-11.1	20.1	-1.6
19	3175.4	-897.0	-617.8	3166.2	-875.6	-620.7	-9.2	21.5	-2.9
20	3170.0	-934.1	-398.8	3161.2	-911.8	-398.7	-8.8	22.3	0.1
21	3201.4	-906.9	-178.8	3197.3	-881.7	-181.6	-4.1	25.2	-2.8
22	3228.3	-916.7	36.4	3223.4	-883.3	32.2	-4.9	33.4	-4.2
23	3358.8	-891.8	33.8	3354.1	-860.1	30.0	-4.7	31.7	-3.8
24	3490.7	-888.0	47.2	3486.4	-855.9	38.4	-4.3	32.0	-8.8
25	3621.7	-888.7	49.5	3619.4	-855.9	36.7	-2.3	32.8	-12.8
26	3755.0	-888.9	51.7	3750.4	-854.4	35.7	-4.7	34.5	-16.0
27	3885.6	-887.0	53.7	3881.5	-848.0	35.5	-4.1	39.0	-18.2
28	4017.3	-884.8	55.7	4014.7	-841.7	38.1	-2.6	43.1	-17.6
29	4137.0	-885.9	-4.1	4109.6	-859.4	-29.1	-27.4	26.6	-25.0
30	4157.3	-880.5	-192.7	4070.3	-888.8	-214.8	-87.0	-8.3	-22.0
31	4160.0	-880.3	-387.8	4053.8	-903.2	-408.3	-106.2	-22.9	-20.5
32	4162.4	-878.4	-574.6	4044.9	-909.1	-596.7	-117.5	-30.8	-22.1

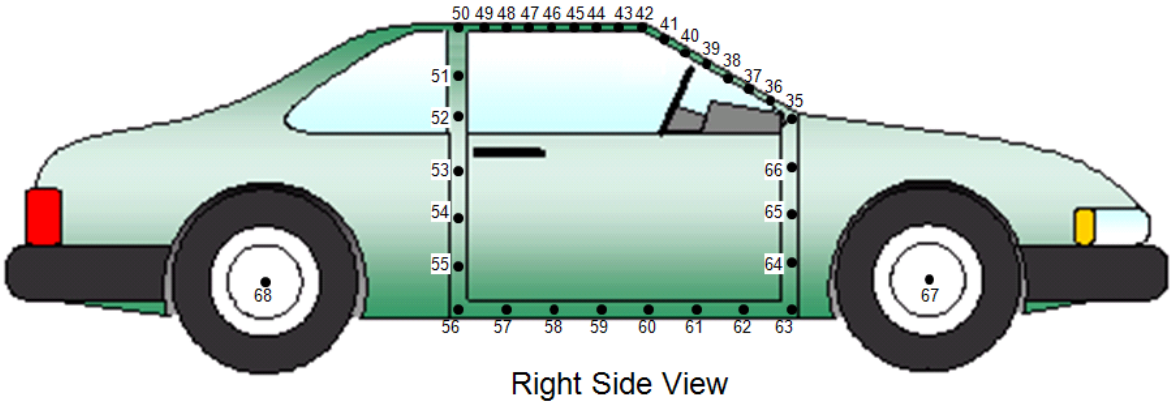
Note: Please see Appendix F.2 for a detailed procedure on how to measure the required door sill intrusions.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

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 Dodge Ram 1500 NHTSA No: RB0330

Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

PASSENGER SIDE DOOR SILL INTRUSION

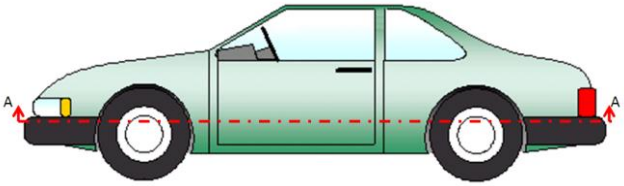
Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
35	4165.6	870.1	-759.2	4148.8	886.0	-783.4	-16.8	15.8	-24.2
36	4134.4	851.8	-829.6	4117.3	866.8	-853.0	-17.1	15.0	-23.4
37	4076.9	831.3	-893.1	4060.0	846.5	-914.5	-16.9	15.2	-21.3
38	4013.9	816.4	-947.7	3994.7	831.2	-968.7	-19.2	14.8	-21.0
39	3949.9	800.7	-996.2	3929.3	815.3	-1017.0	-20.6	14.6	-20.8
40	3884.2	784.4	-1045.6	3862.4	798.7	-1065.1	-21.8	14.4	-19.5
41	3816.8	767.4	-1092.1	3794.4	781.8	-1110.5	-22.4	14.4	-18.5
42	3747.4	750.5	-1135.8	3724.4	765.0	-1153.2	-23.0	14.5	-17.4
43	3674.6	734.8	-1172.8	3650.9	749.5	-1189.6	-23.7	14.8	-16.8
44	3597.0	723.0	-1202.3	3573.0	738.0	-1218.1	-24.0	15.0	-15.8
45	3514.5	715.7	-1219.3	3490.6	731.0	-1234.0	-23.9	15.3	-14.6
46	3432.6	713.0	-1229.6	3409.5	728.4	-1243.8	-23.2	15.4	-14.2
47	3350.3	712.8	-1235.9	3326.3	728.1	-1249.6	-24.0	15.4	-13.7
48	3268.2	712.6	-1240.1	3244.1	727.8	-1253.0	-24.1	15.2	-12.8
49	3189.9	712.2	-1242.8	3162.1	728.2	-1257.6	-27.8	16.0	-14.8
50	3111.4	713.2	-1243.6	3087.7	728.1	-1255.1	-23.8	14.9	-11.4
51	3133.9	806.5	-1043.4	3111.8	823.3	-1056.3	-22.2	16.7	-12.9
52	3158.9	874.8	-834.5	3138.2	893.6	-848.3	-20.7	18.7	-13.7
53	3177.4	899.8	-615.8	3158.7	920.6	-630.4	-18.7	20.9	-14.6
54	3172.5	935.4	-395.8	3154.0	958.5	-410.6	-18.5	23.1	-14.7
55	3187.7	907.8	-166.3	3171.2	932.9	-181.8	-16.5	25.1	-15.5
56	3194.2	917.2	50.7	3180.9	944.4	35.7	-13.3	27.2	-14.9
57	3329.6	884.6	26.4	3317.6	912.8	11.7	-12.0	28.2	-14.7
58	3462.2	886.4	51.9	3449.0	917.1	35.4	-13.2	30.6	-16.5
59	3595.4	886.5	54.0	3581.7	915.5	35.6	-13.6	29.1	-18.4
60	3727.8	885.3	56.2	3714.2	916.4	36.3	-13.6	31.0	-19.9
61	3858.5	884.8	59.2	3845.3	917.0	37.3	-13.2	32.2	-21.8
62	3991.1	881.8	61.5	3978.0	916.4	38.4	-13.1	34.6	-23.1
63	4117.8	883.4	27.5	4103.5	916.7	4.4	-14.2	33.2	-23.2
64	4157.9	882.9	-159.6	4144.4	911.0	-183.7	-13.5	28.1	-24.1
65	4160.7	882.4	-347.8	4146.2	906.6	-371.7	-14.5	24.2	-23.8
66	4162.6	875.4	-536.2	4147.3	897.5	-561.2	-15.3	22.1	-25.0

Note: Please see Appendix F.2 for a detailed procedure on how to measure the required door sill intrusions.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



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	702.0	-968.3	-82.4	1	699.9	-968.6	-82.8
2	417.0	-955.2	-91.6	2	514.1	-958.9	-78.6
3	363.9	-974.3	-94.3	3	409.7	-952.1	-78.8
4	135.5	-932.5	-94.3	4	330.2	-988.3	-79.8
5	75.5	-893.6	-95.9	5	123.0	-926.8	-75.3
6	50.1	-840.8	-100.8	6	52.5	-873.2	-81.4
7	23.4	-594.5	-104.6	7	36.6	-807.9	-78.0
8	8.9	-322.0	-105.4	8	40.3	-658.5	-76.0
9	132.6	-226.8	-83.2	9	64.0	-432.2	-73.7
10	139.7	-1.9	-84.9	10	50.1	-267.4	-73.2
11	137.1	216.2	-75.1	11	170.5	-203.6	-53.6
12	16.3	297.9	-89.1	12	160.5	1.6	-69.3
13	26.3	628.9	-98.1	13	177.7	213.0	-71.5
14	54.4	855.4	-105.6	14	65.8	285.4	-67.2
15	88.6	909.0	-105.2	15	68.4	312.5	-65.9
16	128.0	931.7	-104.1	16	87.7	510.7	-56.8
17	359.9	975.9	-98.5	17	99.2	760.5	-54.9
18	422.2	965.1	-94.5	18	119.5	900.3	-51.3
19	741.0	983.3	-85.4	19	174.2	937.1	-52.7
20	1726.0	975.2	-66.1	20	415.2	973.7	-43.7
21	1999.3	957.7	-71.2	21	433.1	954.3	-49.4
22	2020.5	921.4	-76.5	22	742.9	981.9	-54.2
23	2069.1	964.8	-69.0	23	1728.4	973.1	-57.4
24	2128.1	974.1	-65.0	24	1991.1	959.7	-62.6
25	2637.1	980.5	-64.7	25	2025.5	957.4	-60.7
26	3119.5	978.5	-54.0	26	2126.6	991.6	-53.8
27	3620.7	975.9	-53.1	27	2552.7	1000.3	-57.8
28	3652.1	977.7	-44.4	28	2884.3	1004.0	-57.6

Note: Please 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 Dodge Ram 1500 NHTSA No: RB0330

Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A (CONTINUED)

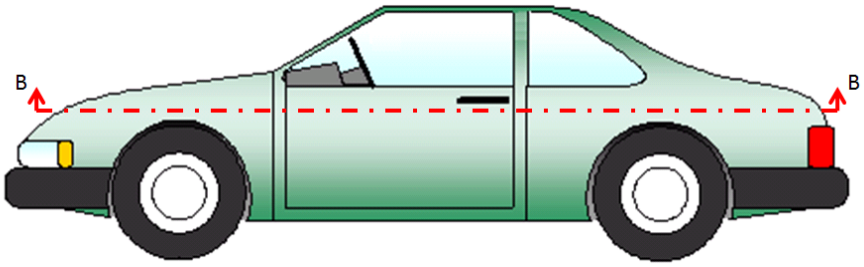
Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
29	3958.2	979.2	-44.6	29	3105.0	1005.7	-60.9
30	4322.8	977.4	-40.0	30	3402.8	1006.4	-61.4
31	5287.8	975.7	-35.8	31	3604.4	1006.2	-65.2
32	5481.3	939.1	-53.4	32	3639.5	1006.3	-61.0
33	5649.2	804.9	-51.8	33	3960.8	1008.0	-63.1
34	5737.1	674.9	-48.3	34	4193.9	1009.2	-63.5
35	5799.7	368.7	-42.2	35	4307.7	1006.3	-62.8
36	5820.4	-0.2	-39.3	36	5412.9	990.6	-63.7
37	5808.4	-275.9	-36.5	37	5601.0	896.9	-81.4
38	5759.3	-609.4	-34.9	38	5705.1	776.3	-77.2
39	5669.6	-783.1	-36.9	39	5770.4	627.0	-79.0
40	5518.4	-926.3	-44.9	40	5779.2	404.2	-83.9
41	5279.8	-974.4	-49.3	41	5762.0	231.0	-85.2
42	4318.6	-980.8	-49.6	42	5721.9	-15.0	-87.8
43	4083.3	-981.5	-51.2	43	5669.7	-233.4	-87.3
44	3673.1	-980.9	-49.7	44	5587.5	-453.6	-92.2
45	3435.3	-980.9	-48.1	45	5444.5	-520.6	-91.9
46	702.0	-968.3	-82.4	46	5362.9	-523.0	-90.1
				47	5176.6	-529.2	-91.1
				48	5022.7	-509.1	-84.9
				49	4905.4	-545.4	-85.1
				50	4842.5	-597.6	-88.4
				51	4790.0	-662.1	-86.6
				52	4692.2	-819.7	-92.2
				53	4501.7	-834.6	-61.2
				54	4442.6	-813.5	-80.0
				55	4242.9	-764.1	-88.6
				56	4202.4	-850.9	-84.4
				57	4156.6	-963.3	-84.4
				58	3902.4	-980.6	-85.4
				59	3482.8	-999.2	-83.6
				60	3261.5	-997.6	-82.6
				61	3148.6	-932.2	-83.7
				62	3118.2	-961.1	-79.4
				63	2693.3	-963.3	-77.0
				64	2265.9	-962.8	-80.3
				65	2069.4	-951.2	-75.8
				66	1987.9	-967.0	-79.0
				67	1854.6	-973.2	-75.7
				68	1718.8	-977.5	-73.5
				69	699.9	-968.6	-82.8

Note: Please 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 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



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	739.1	-992.8	-529.1	1	738.2	-994.6	-527.9
2	376.0	-974.6	-538.0	2	379.6	-977.2	-524.2
3	212.2	-958.5	-540.2	3	220.7	-963.6	-522.8
4	158.1	-920.3	-540.0	4	155.8	-919.9	-523.5
5	132.0	-853.7	-540.7	5	126.7	-805.6	-522.2
6	108.2	-525.7	-535.5	6	110.2	-570.7	-521.1
7	81.5	3.5	-529.1	7	99.4	-280.6	-515.4
8	109.6	474.6	-529.0	8	82.7	1.0	-512.3
9	132.2	817.9	-534.1	9	111.8	496.4	-496.7
10	176.4	942.7	-535.7	10	132.0	811.9	-488.8
11	252.7	974.8	-534.1	11	148.2	906.4	-500.2
12	371.0	982.1	-535.9	12	293.5	980.9	-493.1
13	674.1	997.3	-526.8	13	713.3	1005.1	-493.4
14	849.1	1003.4	-518.7	14	849.6	1008.4	-520.2
15	881.2	1004.5	-518.5	15	879.2	1011.3	-494.6
16	1287.0	1010.8	-516.5	16	1034.3	1018.8	-494.1
17	1591.5	1006.1	-515.1	17	1288.0	1016.3	-487.8
18	1978.1	982.6	-506.6	18	1596.8	1011.2	-496.7
19	2010.7	958.7	-513.9	19	1898.7	993.8	-497.6
20	2056.9	992.6	-514.8	20	1993.0	973.5	-493.7
21	2505.5	1001.2	-516.7	21	2041.1	1010.7	-497.9
22	2807.9	999.9	-510.1	22	2182.1	1016.3	-499.2
23	3111.8	994.4	-511.3	23	2446.3	1020.5	-503.2

Note: Please 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 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (CONTINUED)

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
24	3421.6	993.7	-508.3	24	2788.9	1022.3	-501.0
25	3718.8	994.2	-501.7	25	3097.0	1020.6	-501.0
26	3751.6	996.7	-493.7	26	3403.9	1019.5	-502.1
27	4033.9	999.9	-490.2	27	3703.0	1020.3	-499.4
28	4340.6	1004.1	-494.3	28	3733.6	1020.5	-500.9
29	4646.9	1001.7	-486.7	29	4019.6	1023.8	-500.9
30	4953.4	988.8	-482.7	30	4328.3	1026.9	-500.8
31	5257.4	954.6	-482.2	31	4636.6	1014.7	-501.7
32	5518.9	783.3	-474.2	32	4941.3	991.4	-506.1
33	5527.0	774.8	-475.5	33	5242.8	951.0	-507.6
34	5648.5	620.5	-473.1	34	5337.8	913.1	-508.7
35	5738.1	64.8	-482.7	35	5501.0	769.3	-505.8
36	5743.4	2.6	-481.4	36	5510.4	759.5	-504.7
37	5736.9	-66.9	-481.8	37	5622.8	574.0	-520.5
38	5672.9	-568.9	-479.6	38	5614.2	518.5	-520.6
39	5645.6	-616.8	-481.1	39	5583.8	479.3	-521.2
40	5491.1	-799.2	-484.7	40	5598.6	450.8	-523.1
41	5475.3	-819.2	-484.4	41	5595.6	374.7	-527.8
42	5364.9	-918.5	-480.2	42	5402.0	350.3	-522.9
43	5265.0	-954.4	-485.2	43	5373.8	168.6	-523.6
44	4959.8	-988.5	-488.6	44	5364.3	108.5	-521.7
45	4656.1	-1000.8	-495.3	45	5504.0	61.2	-526.3
46	4348.7	-1002.7	-502.3	46	5538.2	37.9	-526.2
47	4045.7	-998.0	-504.6	47	5511.3	-96.8	-530.9
48	3734.3	-993.8	-506.1	48	5335.5	-56.0	-524.5
49	3518.8	-993.1	-503.5	49	5299.5	-204.1	-525.2
50	739.1	-992.8	-529.1	50	5248.9	-289.4	-528.6
				51	5363.8	-334.0	-528.6
				52	5449.7	-391.2	-529.9
				53	5335.2	-531.1	-532.6
				54	5141.2	-460.9	-534.3
				55	4997.9	-471.9	-532.5
				56	4918.6	-526.9	-527.5
				57	4906.9	-768.0	-532.6
				58	4830.8	-844.1	-531.7

Note: Please 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 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (CONTINUED)

Pt.	Post-Test		
	X	Y	Z
59	4763.3	-916.7	-535.6
60	4747.2	-916.4	-534.0
61	4692.1	-822.9	-533.7
62	4644.8	-788.7	-527.6
63	4587.0	-868.3	-530.4
64	4520.0	-878.6	-528.4
65	4449.6	-671.5	-528.9
66	4305.8	-939.8	-528.2
67	4243.5	-983.5	-528.1
68	4201.9	-1093.0	-528.3
69	4128.5	-1092.3	-531.6
70	4114.9	-1073.6	-526.5
71	4130.2	-1018.8	-529.7
72	3962.7	-1029.3	-528.6
73	3655.1	-1041.3	-526.1
74	3351.6	-1043.3	-525.5
75	3145.8	-1035.0	-533.1
76	3109.8	-969.5	-515.0
77	2811.5	-973.9	-524.0
78	2502.1	-977.8	-520.3
79	2198.4	-979.7	-518.4
80	2044.7	-970.8	-520.2
81	1977.1	-981.4	-519.8
82	1602.6	-1004.5	-518.0
83	1292.3	-1006.6	-519.6
84	988.7	-1001.8	-517.2
85	771.5	-994.3	-517.6
86	738.2	-994.6	-527.9

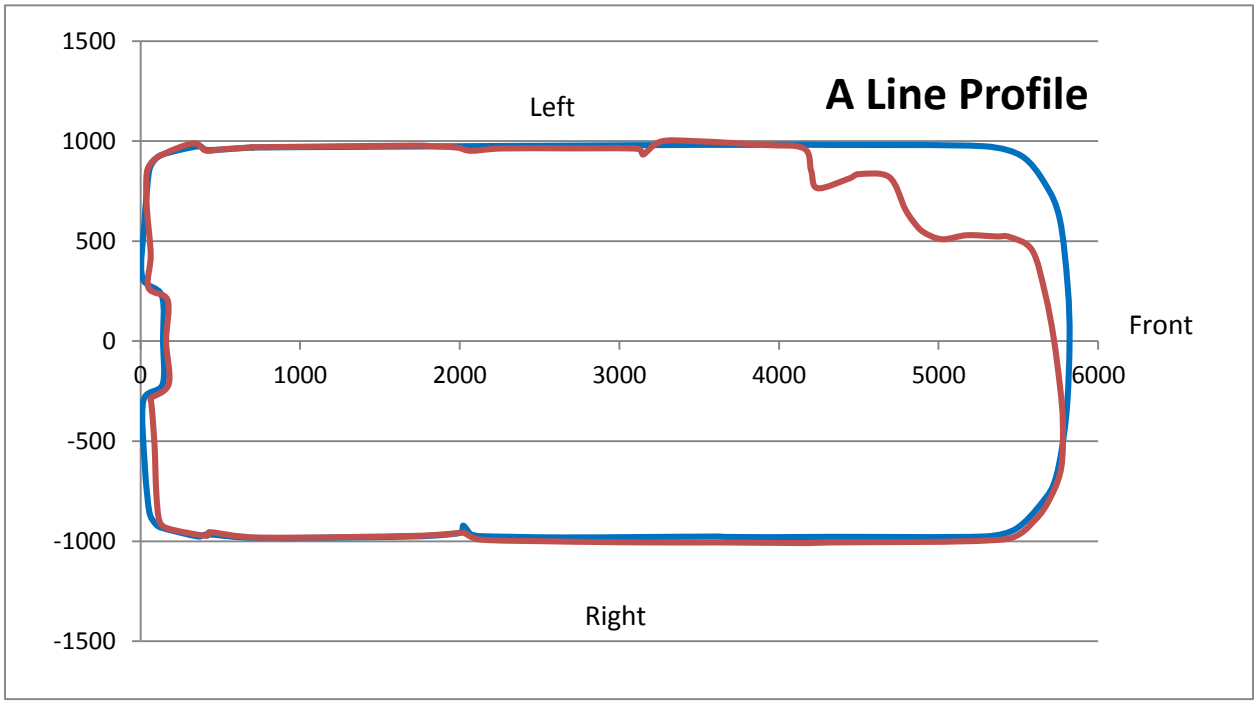
Note: Please see Appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile

DATA SHEET NO.13 (CONTINUED)

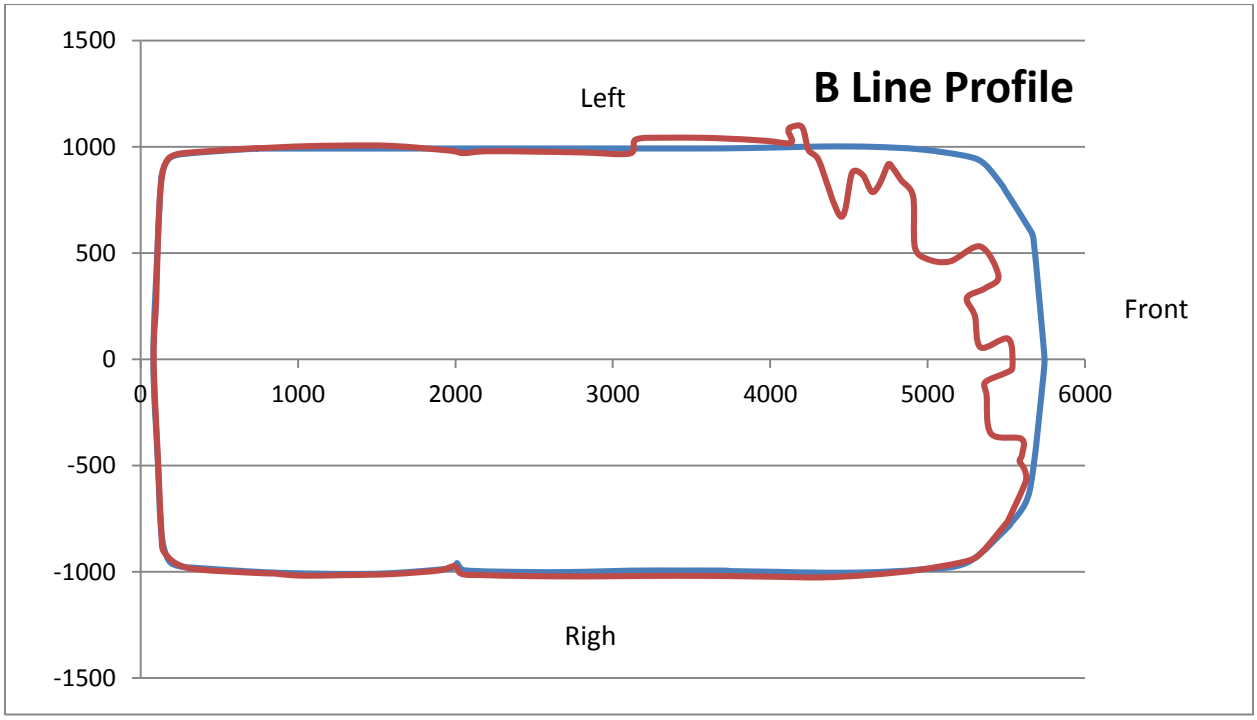
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

SECTION A-A



SECTION B-B



DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

Left Profile of the Dash

Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
LB3	4062.5	-631.3	-328.2	3930.0	-603.3	-346.4	-132.4	27.9	-18.2
LB2	4025.8	-631.4	-363.9	3894.3	-600.1	-386.4	-131.5	31.3	-22.5
LB1	3997.1	-630.4	-404.7	3869.6	-596.6	-425.7	-127.4	33.9	-21.1
DIPL	3971.2	-628.9	-446.4	3846.2	-592.9	-470.2	-125.0	36.0	-23.8
LT1	3947.1	-630.2	-493.1	3822.5	-592.7	-516.0	-124.5	37.5	-22.9
LT2	3943.6	-630.5	-541.1	3812.0	-590.8	-563.0	-131.6	39.7	-21.9
LT3	3975.6	-631.5	-578.7	3831.4	-591.2	-606.8	-144.2	40.3	-28.1
LT4	3987.3	-630.9	-622.5	3816.8	-604.6	-693.0	-170.4	26.3	-70.4
LT5	4008.7	-631.5	-664.2	3847.8	-606.6	-727.8	-160.9	24.9	-63.7
LT6	4057.5	-630.9	-660.7	3915.6	-600.2	-709.7	-141.9	30.7	-49.0
LT7	4073.5	-630.6	-710.7	3933.4	-601.5	-759.2	-140.1	29.1	-48.6
LT8	4082.4	-631.7	-758.5	3943.1	-604.9	-805.9	-139.3	26.8	-47.4

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: Please see Appendix F.4 for a detailed procedure for how to measure the required profile dash

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

Right Profile of the Dash

Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
RB3	4043.8	-331.6	-328.4	3938.5	-301.7	-349.8	-105.3	29.9	-21.4
RB2	4008.2	-332.0	-363.4	3904.3	-300.4	-385.0	-103.9	31.6	-21.6
RB1	3980.1	-332.0	-403.6	3876.6	-298.8	-426.3	-103.5	33.2	-22.7
DIPR	3953.0	-332.9	-449.0	3851.0	-296.2	-472.2	-102.0	36.7	-23.2
RT1	3931.2	-332.6	-492.1	3828.9	-295.2	-514.1	-102.3	37.4	-22.0
RT2	3932.0	-330.9	-541.3	3826.9	-295.7	-564.4	-105.1	35.2	-23.1
RT3	3963.5	-329.9	-577.2	3857.3	-296.8	-602.8	-106.2	33.2	-25.6
RT4	3974.1	-329.1	-628.1	3829.3	-306.5	-684.7	-144.8	22.6	-56.6
RT5	4000.0	-329.1	-662.9	3863.3	-302.4	-708.9	-136.8	26.7	-46.1
RT6	4053.2	-331.7	-656.2	3911.5	-309.6	-689.8	-141.7	22.1	-33.6
RT7	4072.3	-330.0	-698.5	3963.4	-312.3	-748.4	-108.9	17.7	-49.9
RT8	4083.4	-328.3	-747.0	3958.8	-304.6	-787.3	-124.5	23.7	-40.4

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: Please see Appendix F.4 for a detailed procedure for how to measure the required profile dash

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Dodge Ram 1500 NHTSA No: RB0330

Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

	Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Lower Bumper Beam	1	5701.0	-731.4	50.2	5223.7	-521.7	87.6	-477.3	209.7	37.4
	2	5784.9	-452.4	32.5	5475.8	-473.3	145.6	-309.1	-20.9	113.2
	3	5812.6	-148.4	35.7	5660.6	-235.4	174.0	-152.1	-86.9	138.3
	4	5812.2	153.1	36.6	5734.4	59.2	168.2	-77.9	-93.9	131.7
	5	5783.7	450.2	43.2	5771.0	356.8	164.1	-12.8	-93.4	120.9
	6	5699.3	731.2	56.3	5751.1	641.3	163.8	51.8	-89.9	107.5
Upper Bumper Beam	1	5706.3	-735.2	-42.0	5240.7	-545.1	-143.8	-465.6	190.1	-101.8
	2	5788.5	-452.3	-44.6	5530.8	-493.3	-114.2	-257.7	-41.0	-69.5
	3	5816.8	-146.6	-43.9	5670.8	-231.4	-96.5	-146.0	-84.8	-52.6
	4	5815.8	151.3	-45.2	5735.5	59.2	-89.1	-80.3	-92.1	-43.8
	5	5786.6	450.1	-46.9	5775.7	358.2	-84.9	-10.8	-91.9	-38.0
	6	5700.9	733.1	-50.8	5760.1	653.0	-81.9	59.2	-80.1	-31.1
Upper Radiator Support	1	5536.1	-460.4	-519.1	5315.3	-367.0	-624.1	-220.8	93.4	-105.0
	2	5554.4	-272.0	-558.8	5408.0	-254.1	-679.8	-146.4	18.0	-121.0
	3	5574.4	-102.1	-556.3	5462.2	-98.8	-656.8	-112.2	3.2	-100.5
	4	5570.0	112.7	-556.5	5497.4	115.9	-633.6	-72.6	3.2	-77.1
	5	5554.7	264.3	-557.9	5503.4	266.6	-619.8	-51.4	2.3	-61.9
	6	5535.0	466.3	-515.7	5510.9	463.0	-558.6	-24.0	-3.3	-42.8

*Points unrecoverable, support beam was destroyed in crash

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

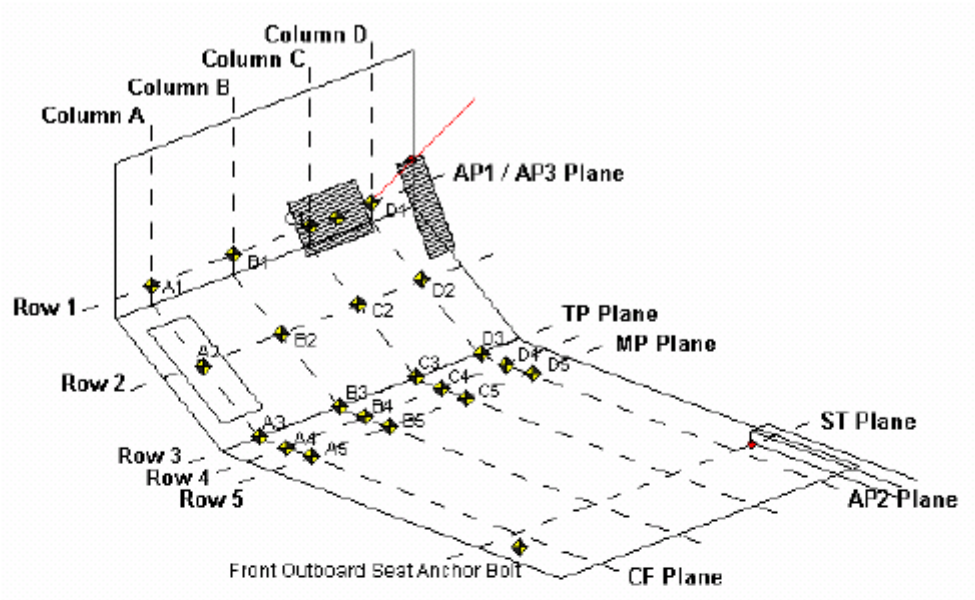
+Y - From left side of the vehicle to the right side of the vehicle

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



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 Dodge Ram 1500 NHTSA No: RB0330

Test Program: R&D 56mph, 7° angle, 20% offset Test Date 9/14/11

Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	4369.6	-714.9	-159.3	4130.9	-615.9	-268.4	-238.7	99.0	-109.2
B1	4458.5	-577.6	-157.1	4174.1	-478.8	-317.4	-284.4	98.8	-160.3
C1	4487.0	-443.0	-154.8	4285.9	-432.3	-258.3	-201.0	10.6	-103.5
D1	4378.9	-296.8	-148.4	4267.0	-304.9	-207.7	-111.9	-8.0	-59.3
A2	4318.8	-715.0	-69.9	4065.2	-606.8	-191.6	-253.6	108.1	-121.7
B2	4315.2	-578.6	-65.5	4058.3	-477.9	-195.5	-256.9	100.7	-130.0
C2	4312.8	-442.3	-64.0	4133.8	-368.5	-148.8	-179.0	73.8	-84.9
D2	4311.2	-302.5	-61.2	4217.8	-292.4	-107.6	-93.4	10.1	-46.3
A3	4225.8	-716.0	-19.7	4014.0	-602.4	-98.5	-211.8	113.6	-78.8
B3	4225.5	-580.2	-17.8	4003.0	-469.6	-108.0	-222.5	110.6	-90.2
C3	4226.5	-446.0	-18.3	4099.2	-396.7	-56.8	-127.3	49.3	-38.5
D3	4222.7	-307.8	-12.5	4162.2	-282.3	-32.5	-60.6	25.5	-20.0
A4	4135.4	-715.5	24.8	3987.3	-596.1	4.3	-148.1	119.4	-20.5
B4	4135.4	-579.4	23.2	3961.1	-472.7	-29.5	-174.3	106.7	-52.7
C4	4134.4	-447.4	23.5	4041.3	-385.7	19.8	-93.1	61.7	-3.7
D4	4131.7	-308.4	22.5	4085.9	-258.9	3.2	-45.8	49.5	-19.3
A5	4040.6	-712.0	23.2	3960.5	-584.9	-3.2	-80.1	127.1	-26.4
B5	4040.0	-579.6	22.0	3945.2	-478.5	-14.0	-94.8	101.2	-36.0
C5	4036.6	-450.6	22.5	4012.6	-378.8	-5.1	-24.0	71.8	-27.6
D5	4035.6	-312.0	22.2	4018.3	-272.9	0.2	-17.3	39.1	-22.0
Brake Pedal	4202.3	-467.6	-213.1	4028.5	-442.7	-261.3	-173.8	24.9	-48.3
IP Left	3971.2	-628.9	-446.4	3846.2	-592.9	-470.2	-125.0	36.0	-23.8
IP Right	3953.0	-332.9	-449.0	3851.0	-296.2	-472.2	-102.0	36.7	-23.2
Steering Column	3736.8	-476.9	-707.1	3616.9	-428.8	-743.6	-119.9	48.1	-36.5
Front Outboard Bolt	3695.4	-653.8	-58.3	3683.3	-624.3	-68.5	-12.2	29.6	-10.2

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

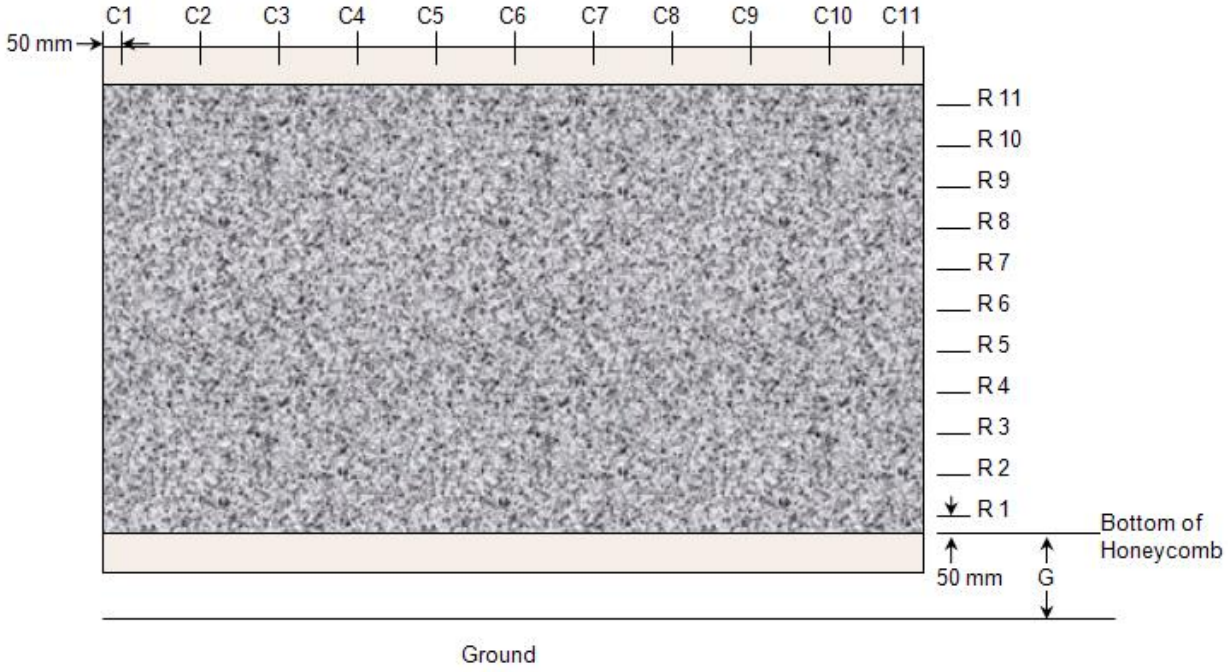
+Y - From left side of the vehicle to the right side of the vehicle

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

DATA SHEET NO.14

MDB CRUSH MEASUREMENTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



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	2.2	3.6	3.4	2.4	2.6	2.5	2.3	13.4	56.8	124.3	281.1
R10	824mm	2.0	1.5	0.9	0.3	0.2	0.0	0.2	11.5	50.2	64.9	157.8
R9	738mm	1.2	0.3	-0.1	-0.3	-0.6	-0.3	-0.3	11.2	28.9	38.9	143.9
R8	652mm	1.1	0.0	-0.3	-0.6	-0.8	-0.8	-0.8	4.4	15.3	46.1	162.5
R7	566mm	1.1	0.2	-0.2	-0.4	-0.5	-0.6	-0.6	-0.4	2.0	70.4	174.6
R6	480mm	1.2	0.2	0.0	-0.5	-0.4	-0.3	-0.4	-0.5	49.8	153.3	273.7
R5	384mm	1.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.2	-0.3	68.2	179.8	254.4
R4	308mm	0.9	0.2	-0.2	-0.1	0.0	0.2	0.0	0.0	76.2	202.0	228.3
R3	222mm	0.9	0.3	0.1	0.3	0.3	0.3	0.3	0.1	201.7	219.6	194.4
R2	136mm	0.7	0.4	0.6	0.9	0.7	0.7	0.5	0.3	187.0	232.3	161.2
R1	50mm	0.8	0.9	1.3	1.3	*	*	1.7	3.0	113.6	231.6	103.1

*Barrier was cut to clear rail and defined points were unmeasureable

DATA SHEET NO. 15

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

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

Please provide windshield mounting details. _____

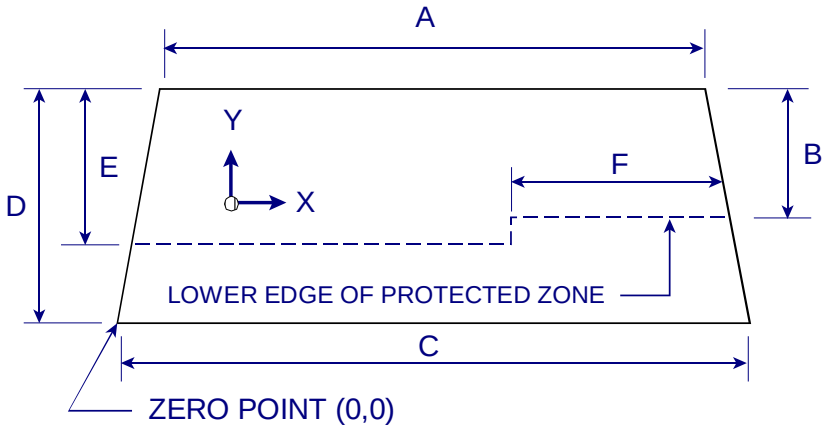
_____

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: _____

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2186	2186	100
Right Side	2186	2186	100
Total	4372	4372	100



Item	Units	Value
A	mm	1354
B	mm	402
C	mm	1618
D	mm	700
E	mm	466
F	mm	460

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.

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.

X	Y

DATA SHEET NO. 15 (CONTINUED)

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

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 22.78ºC Test Time: 5:50 PM

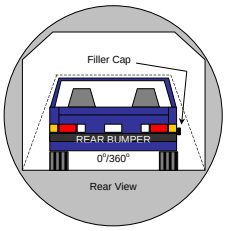
Stoddard Solvent Spillage Measurements

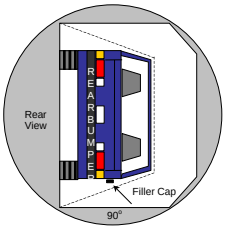
A.	From impact until vehicle motion ceases: (maximum allowable = 1 oz.)	0 oz.
B.	For the 5-minute period after motion ceases: (maximum allowable = 5 oz.)	0 oz.
C.	For the following 25 minutes: (maximum allowable = 1 oz./minute)	0 oz..
D.	Spillage:	0 oz.

DATA SHEET NO. 16

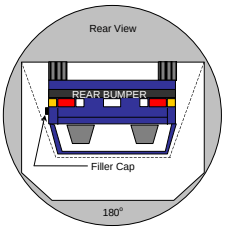
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle:	2011 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11



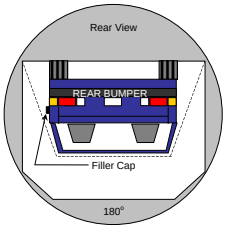


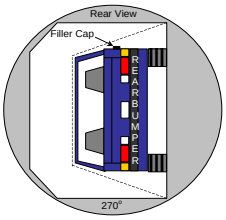
0° TO 90°



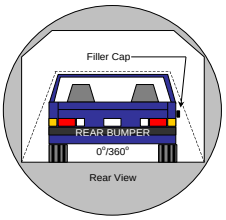
90° TO 180°

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: _____





180° TO 270°



270° TO 360°

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	67	300	367
90° to 180°	68	300	368
180° to 270°	58	300	358
270° to 360°	70	300	370

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 Dodge Ram 1500	NHTSA No:	RB0330
Test Program:	R&D 56mph, 7° angle, 20% offset	Test Date	9/14/11

Picture not available.

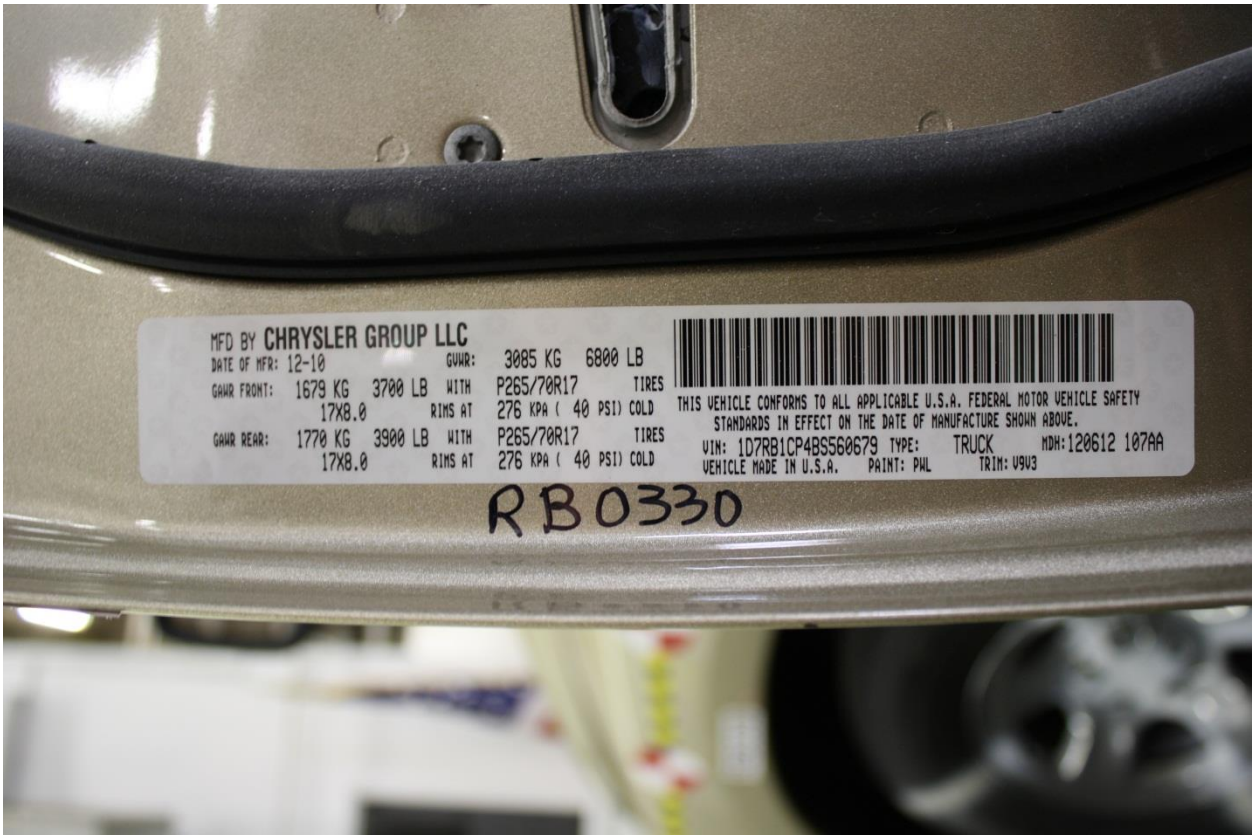
APPENDIX A

PHOTOGRAPHS

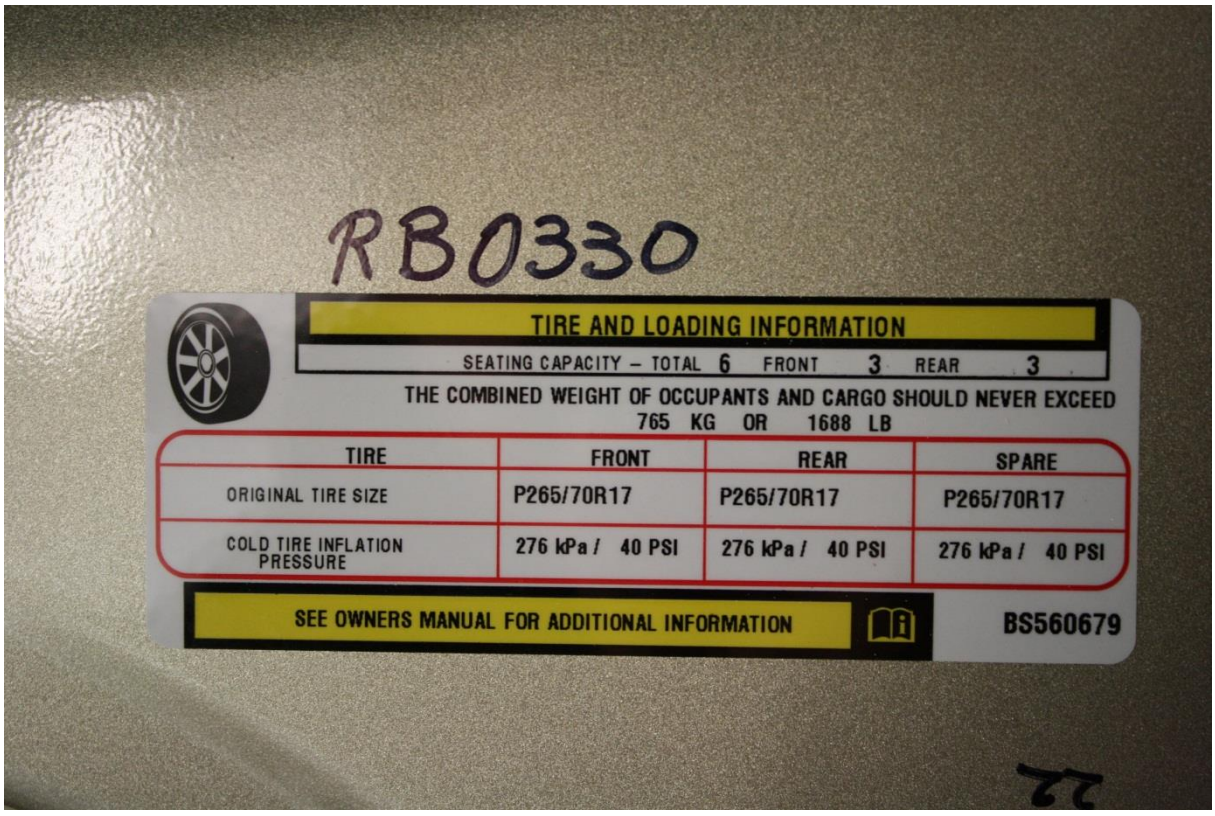
TABLE OF PHOTOGRAPHS

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



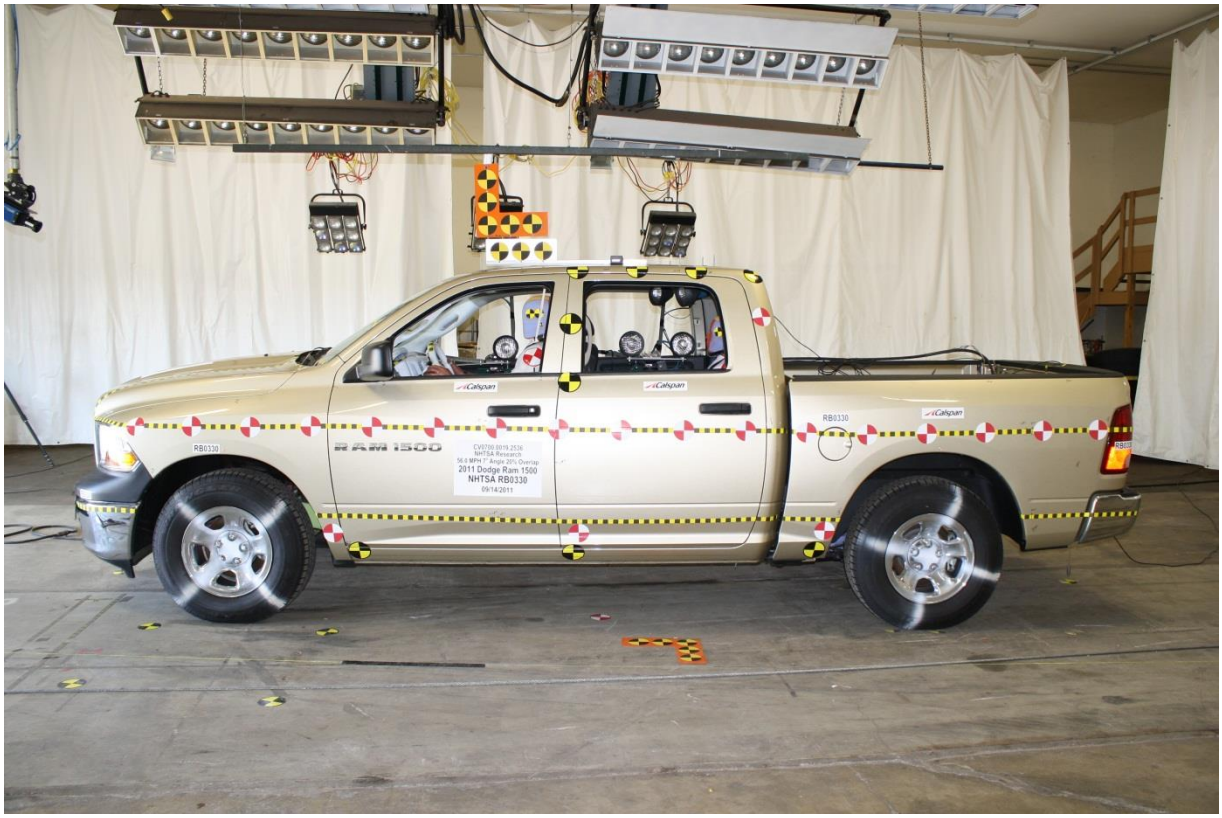
No. 004 Test Vehicle Tire Placard

No. 005 Pre-Test Front View of Test Vehicle

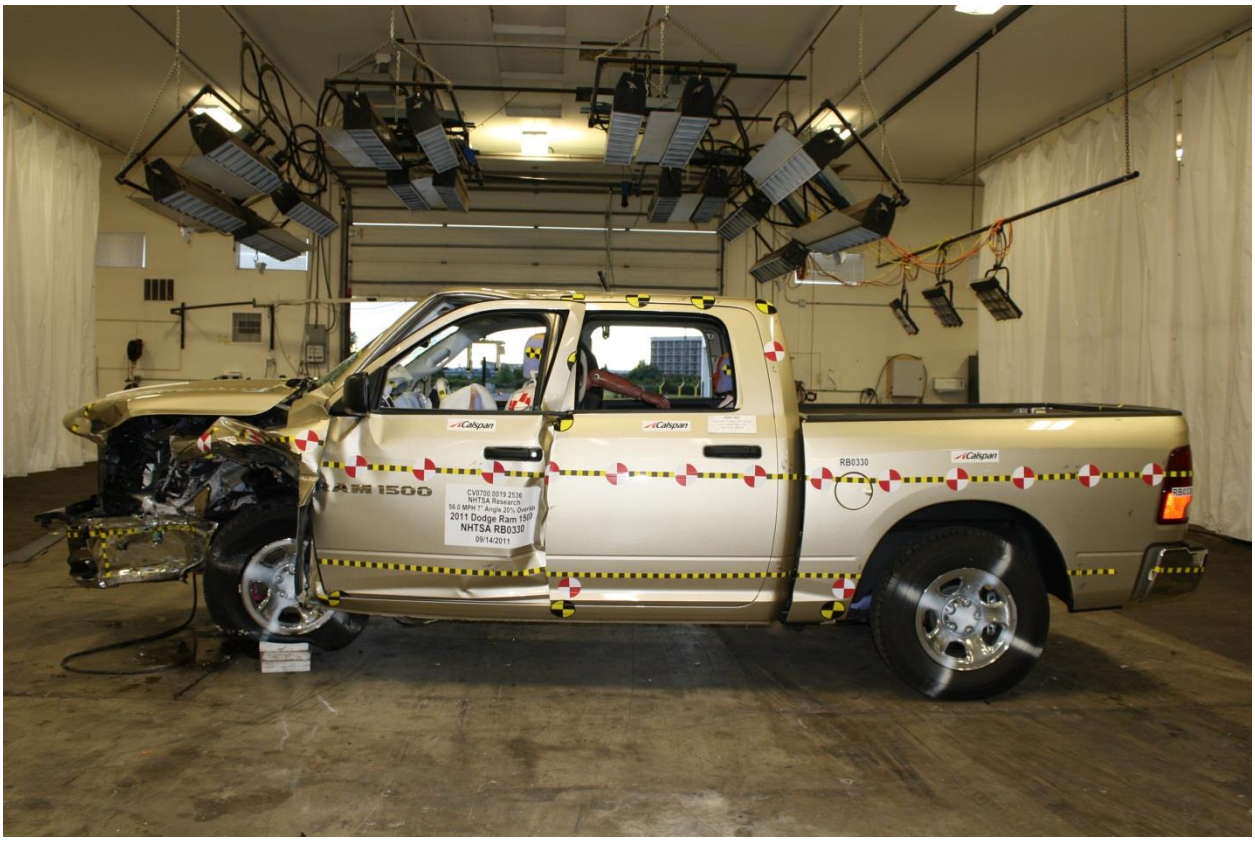
No. 006 Post-Test Front View of Test Vehicle

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

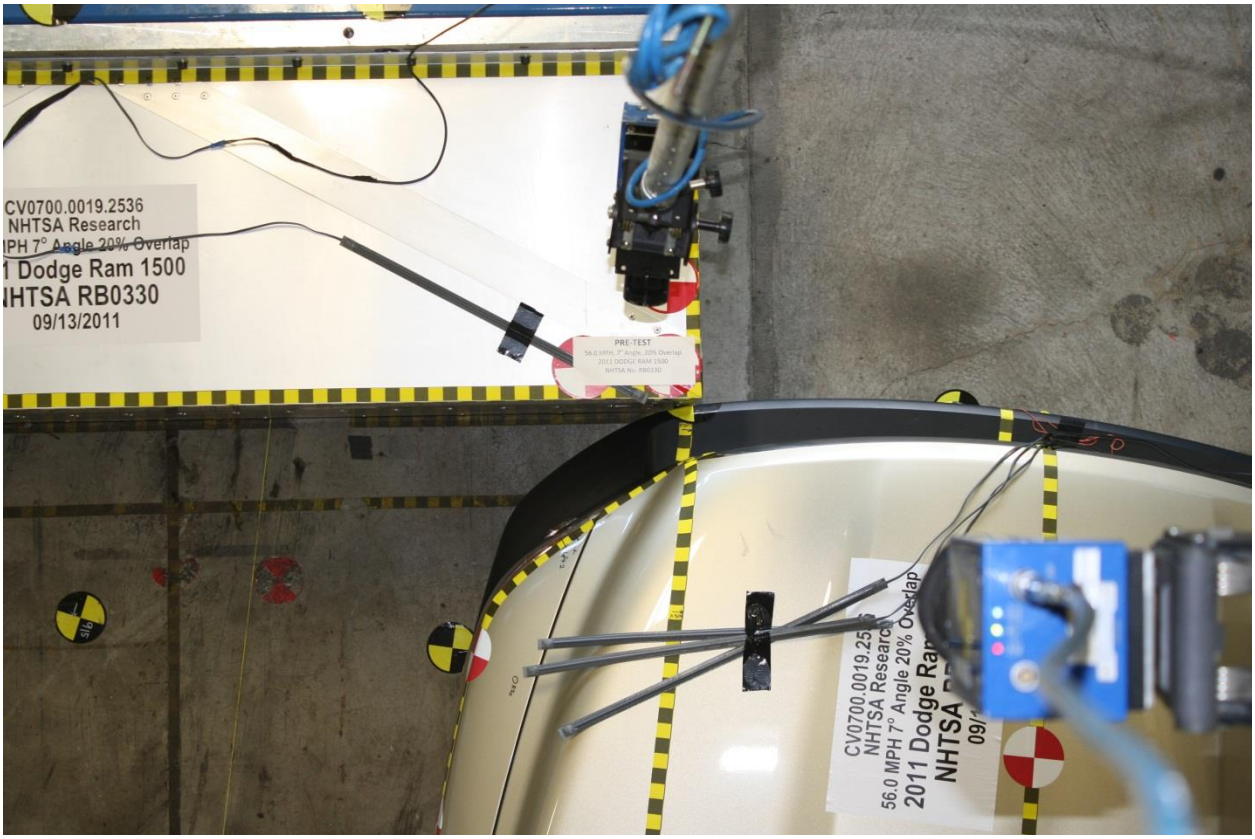
No. 014 Post-Test Rear View of Test Vehicle

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

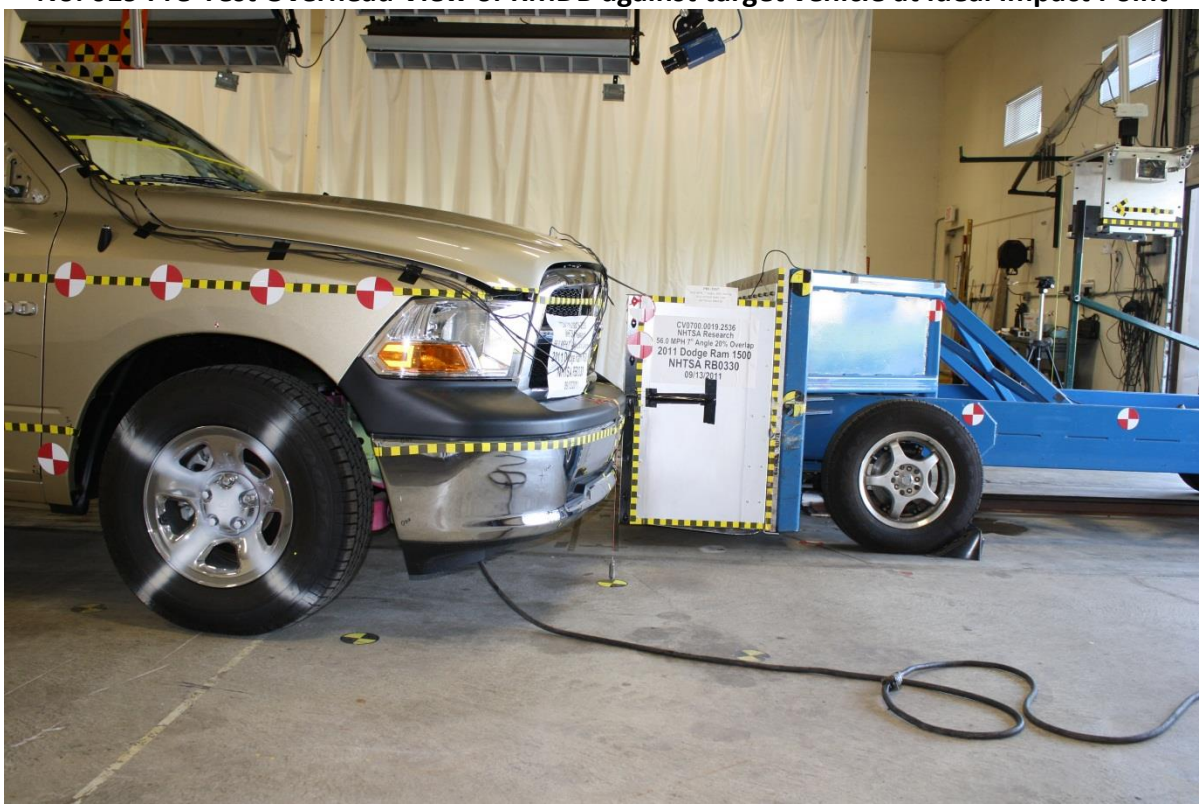
No. 016 Post-Test Right Side View of Test Vehicle

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

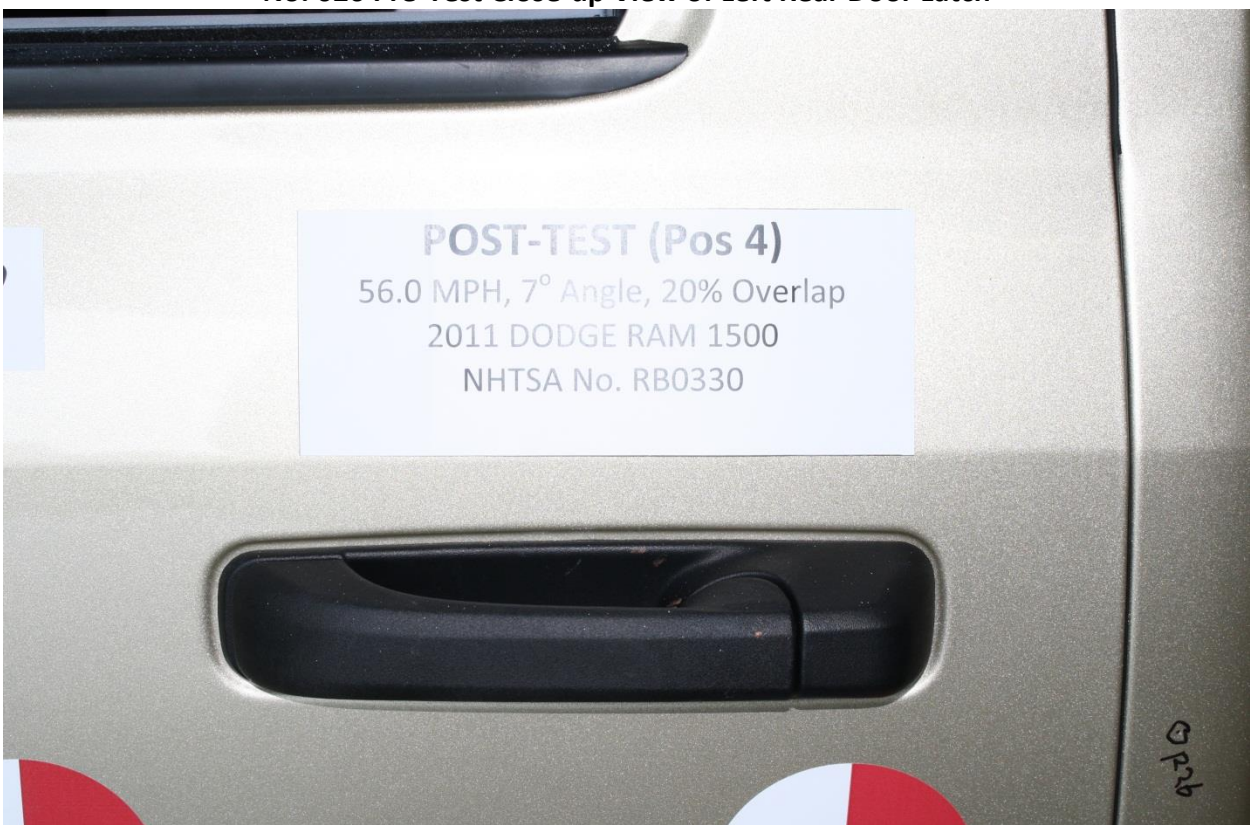
No. 022 Pre-Test Close-up View of Impact Point

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

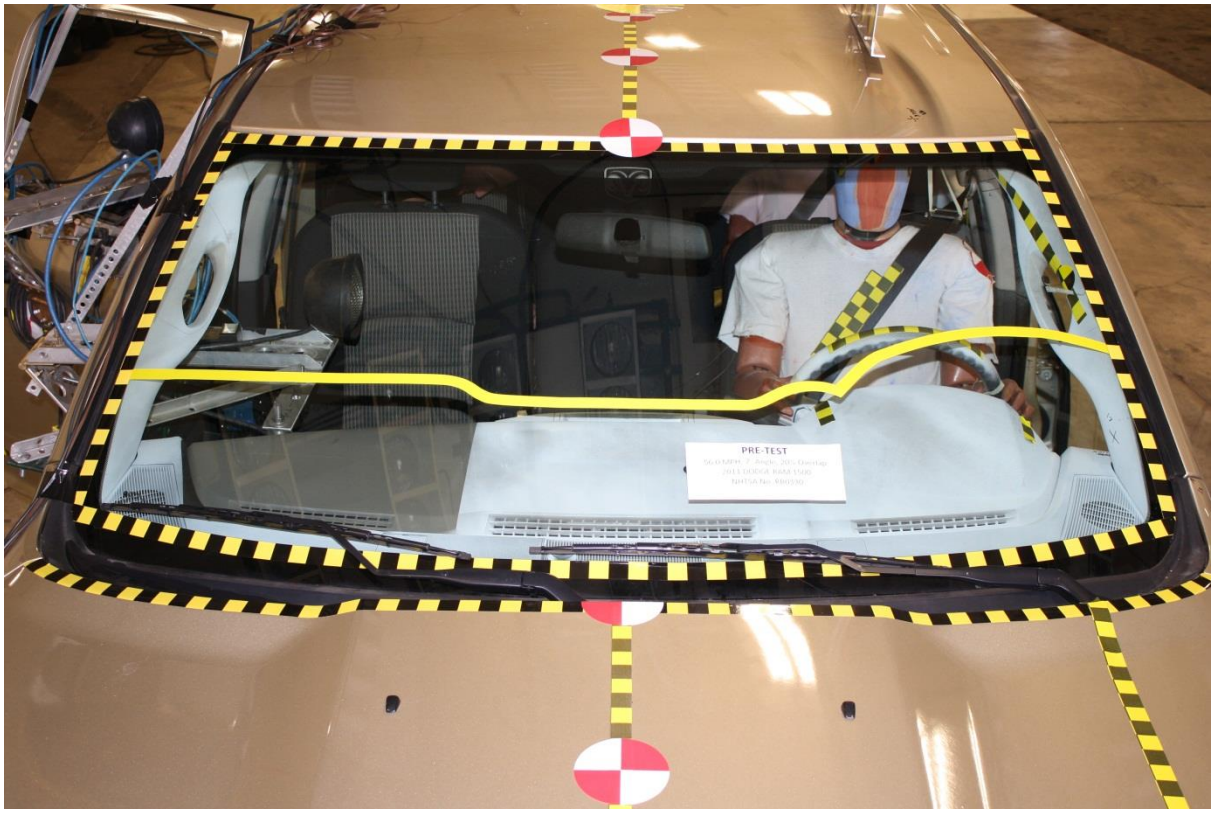
No. 024 Pre-Test Close-up View of Left Front Door Latch

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

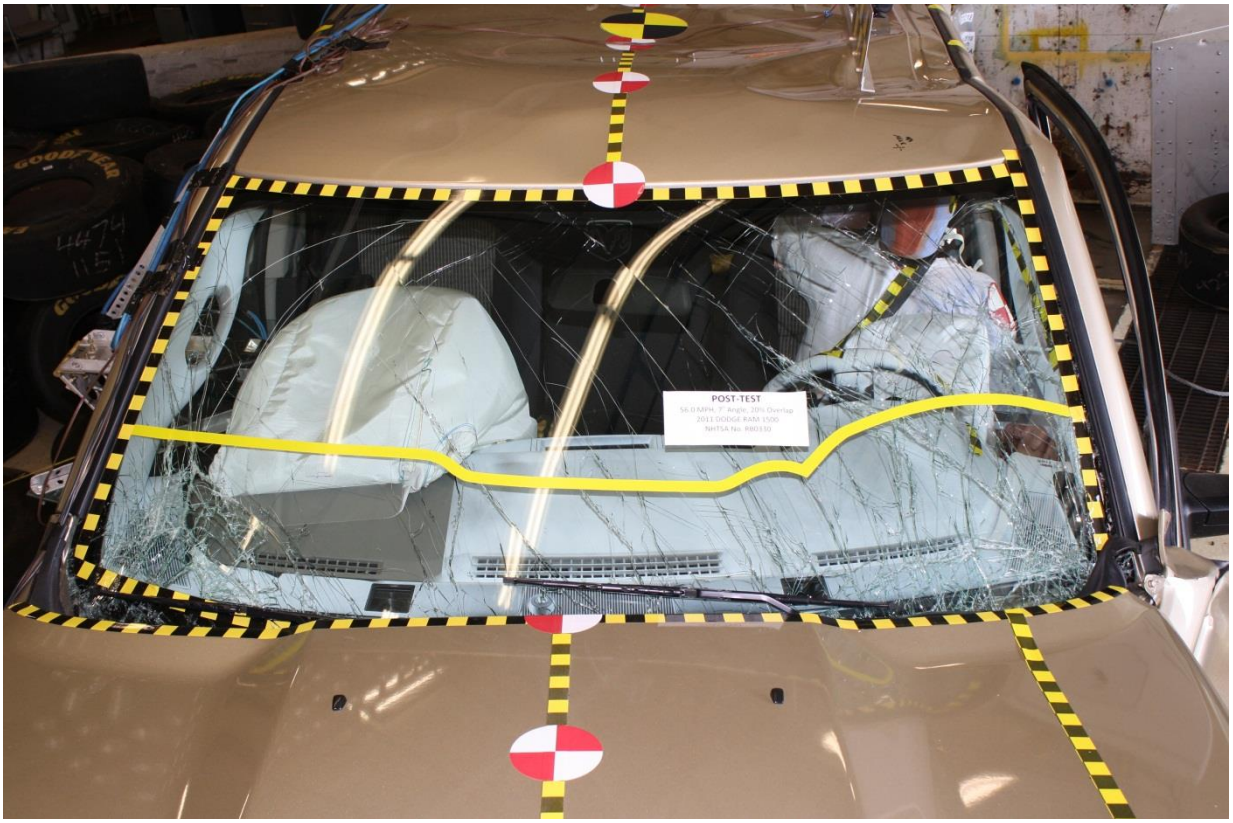
No. 026 Pre-Test Close-up View of Left Rear Door Latch



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

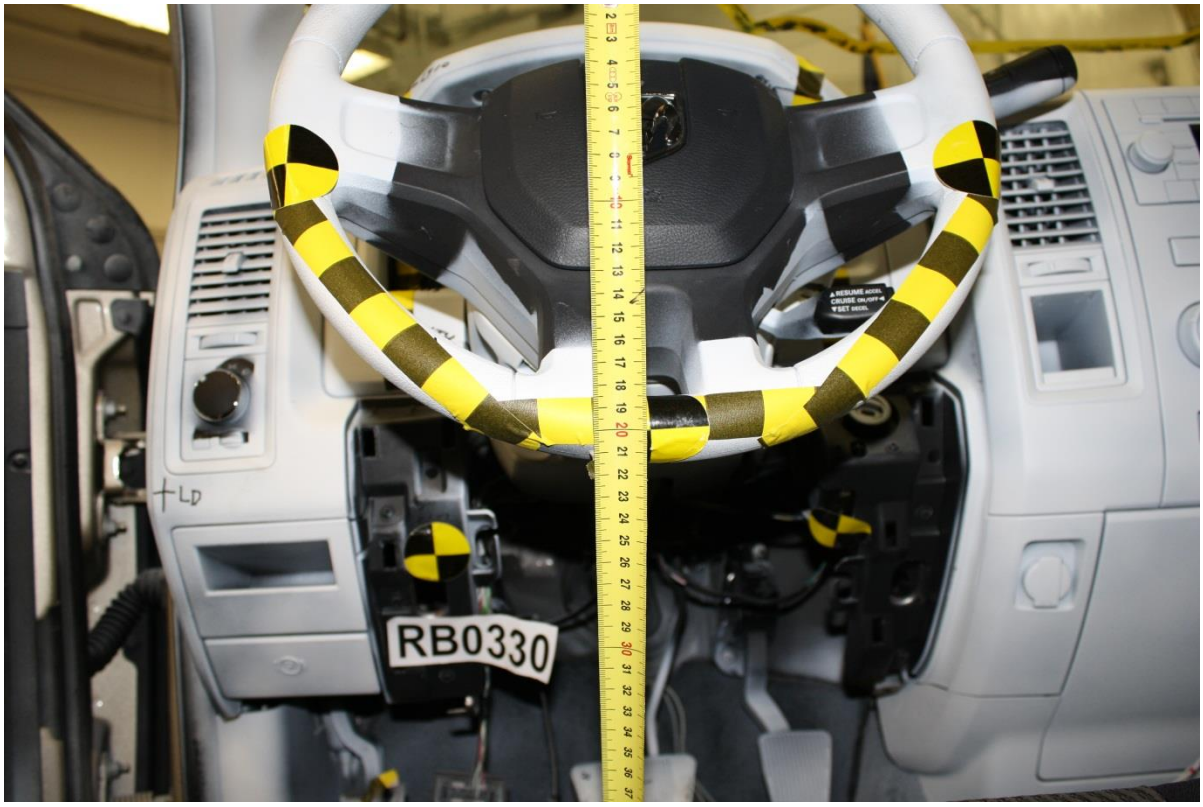
No. 035 Pre-Test Frontal View of Driver Seat back

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

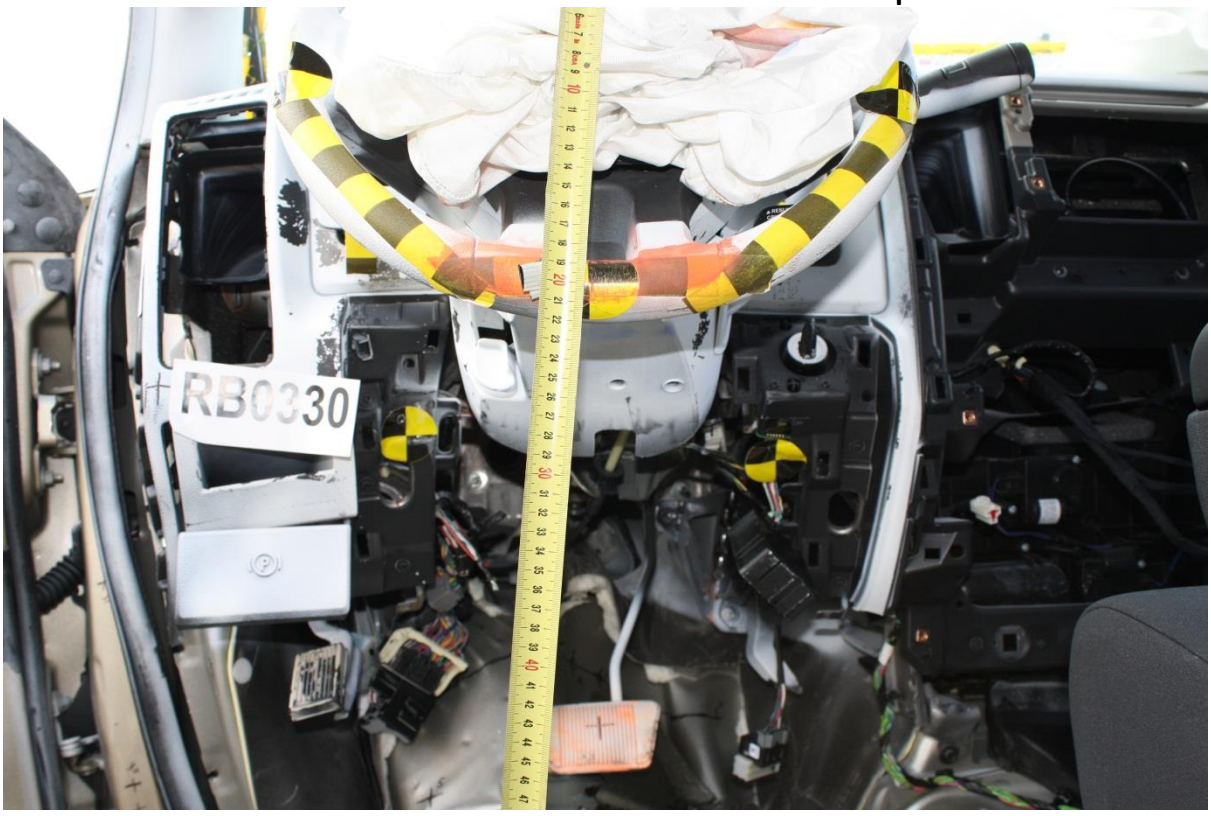
No. 037 Pre-Test Frontal View of Left Rear Seat back

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

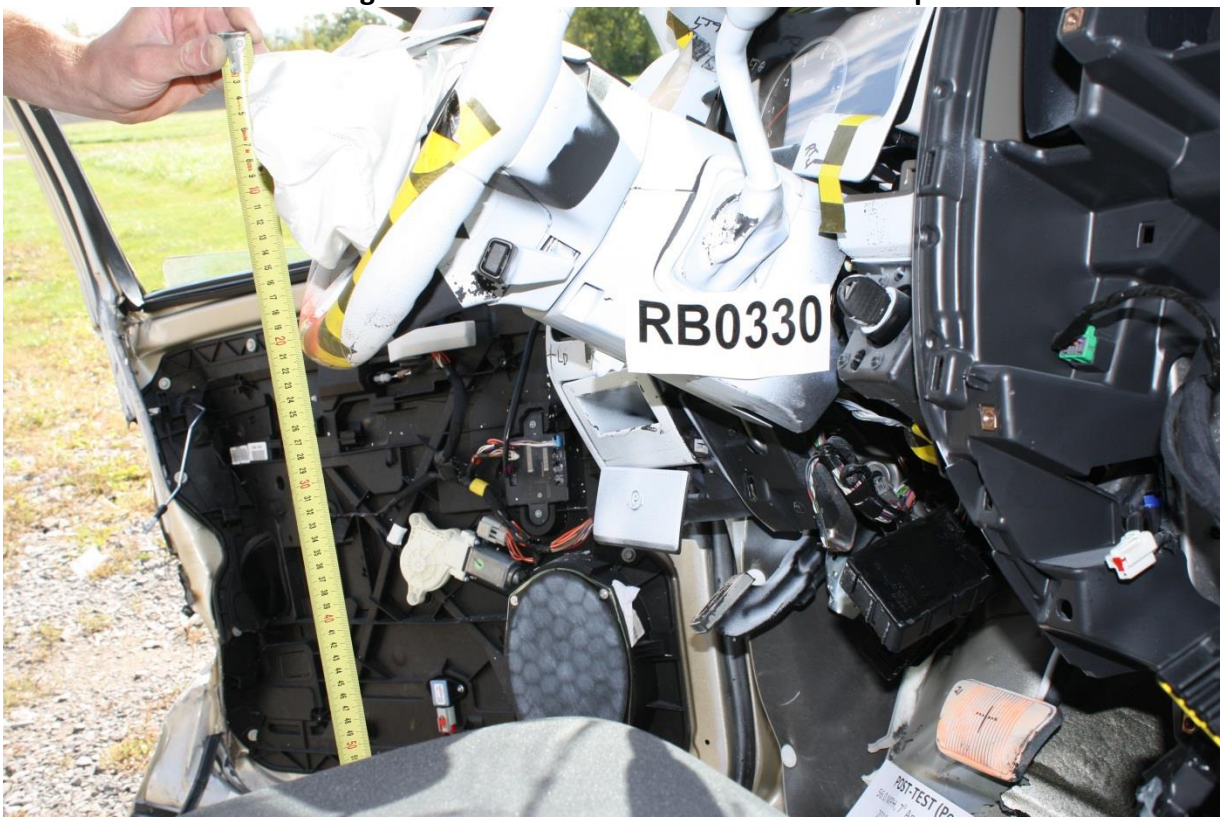
No. 044 Pre-Test Left Side View of Driver Knee Bolsters with panel removed

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

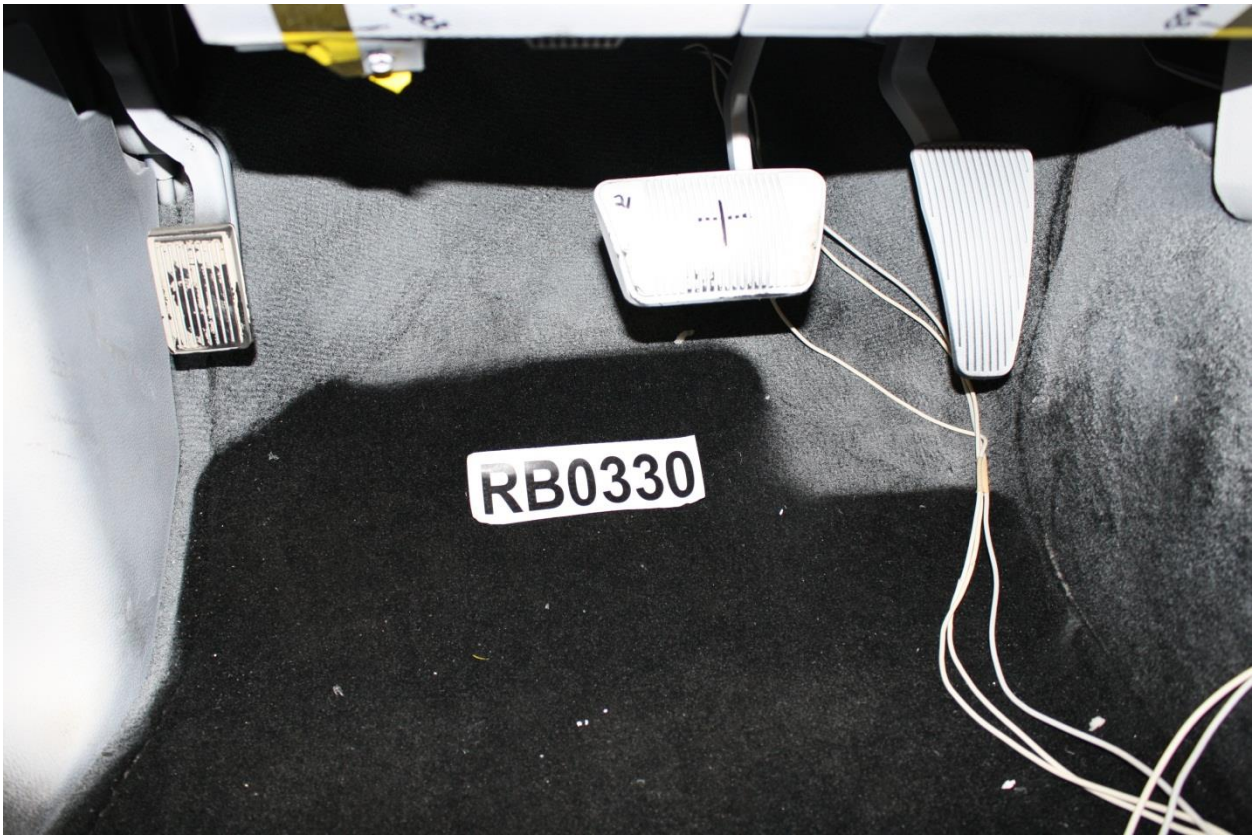
No. 048 Pre-Test Right Side View of Driver Knee Bolster with panel removed



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

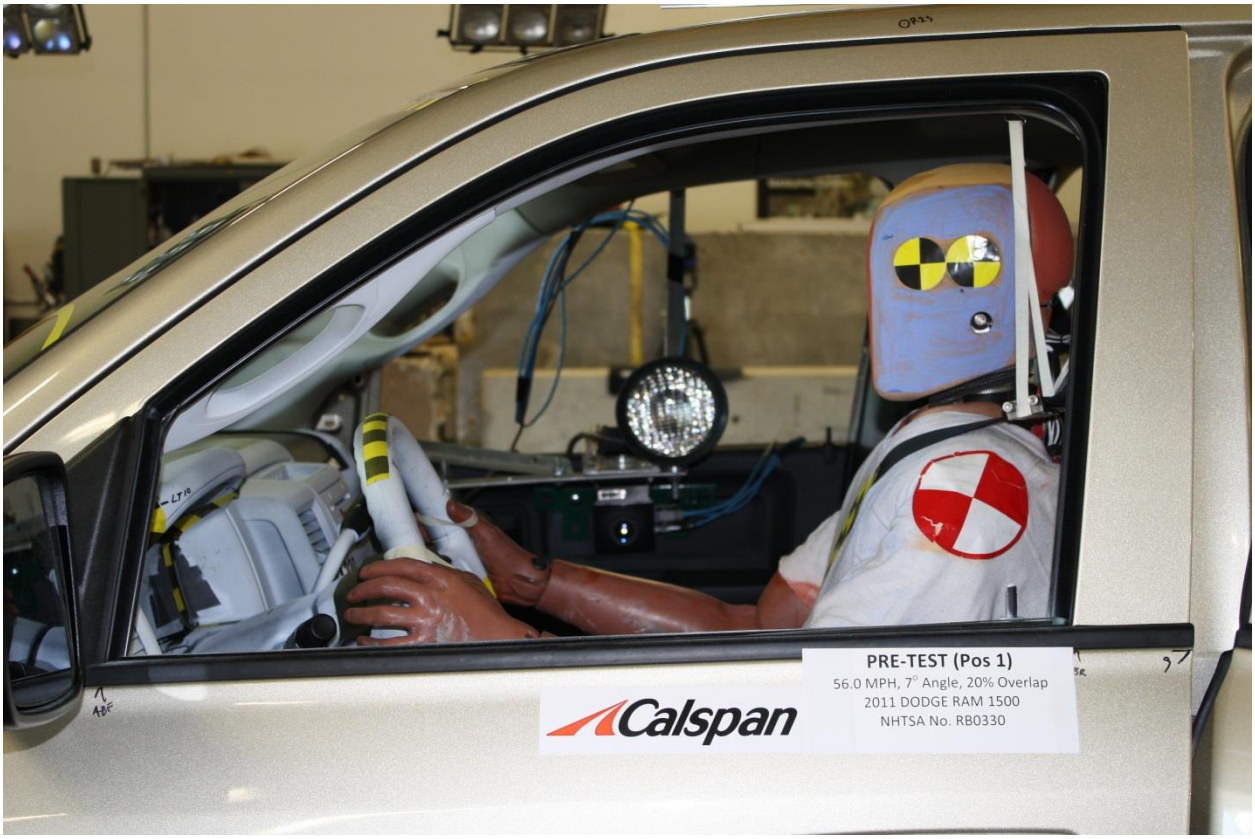
No. 053 Post-Test view of Driver Floor pan at Mid seat level

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

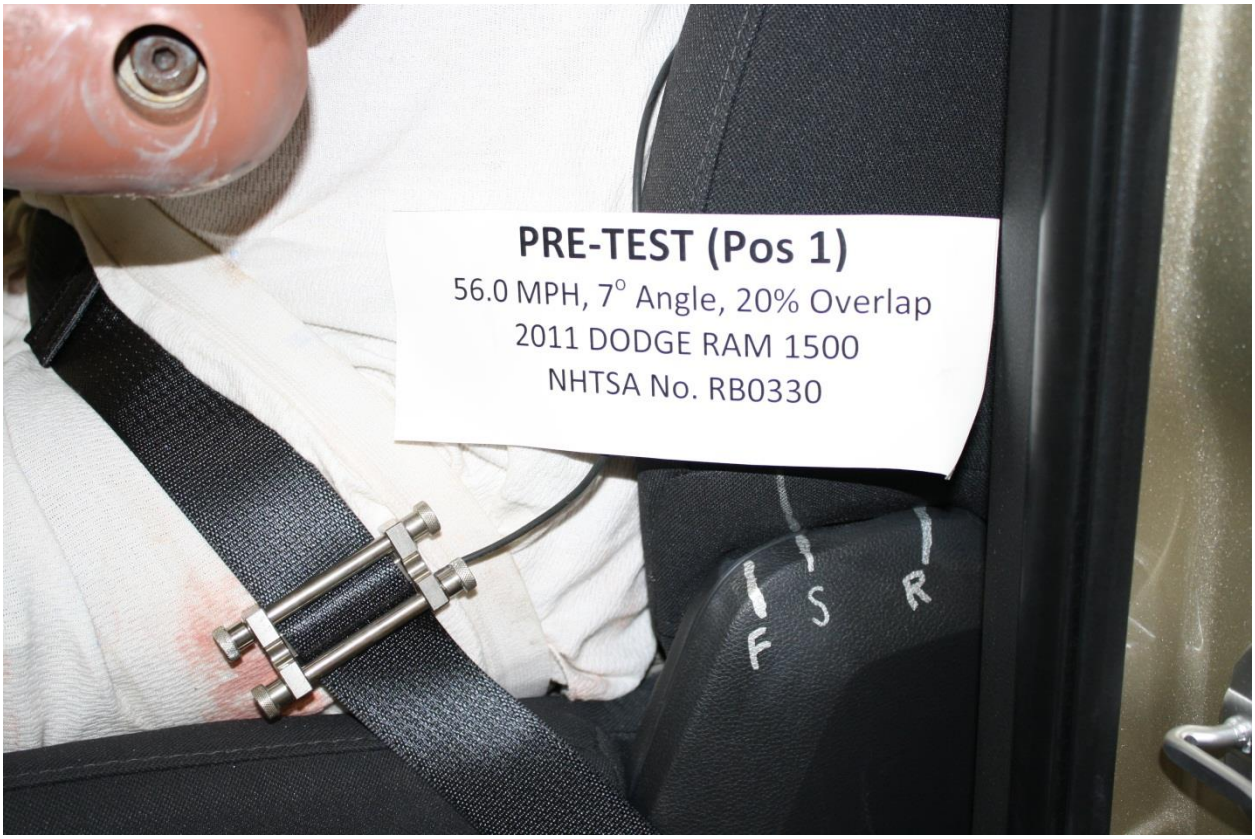
No. 059 Post-Test Left Side Driver Dummy Window View

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

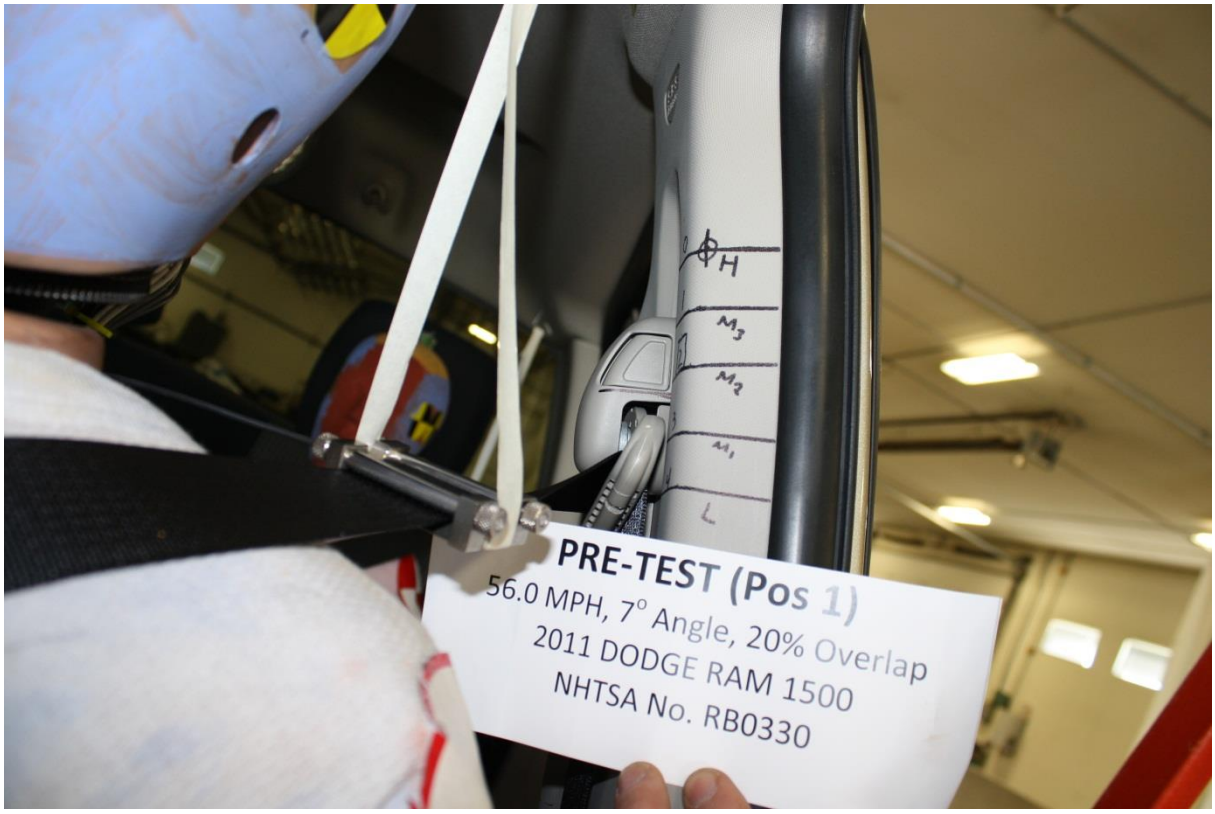


No. 064 Pre-Test Driver Seat Back Position markings

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



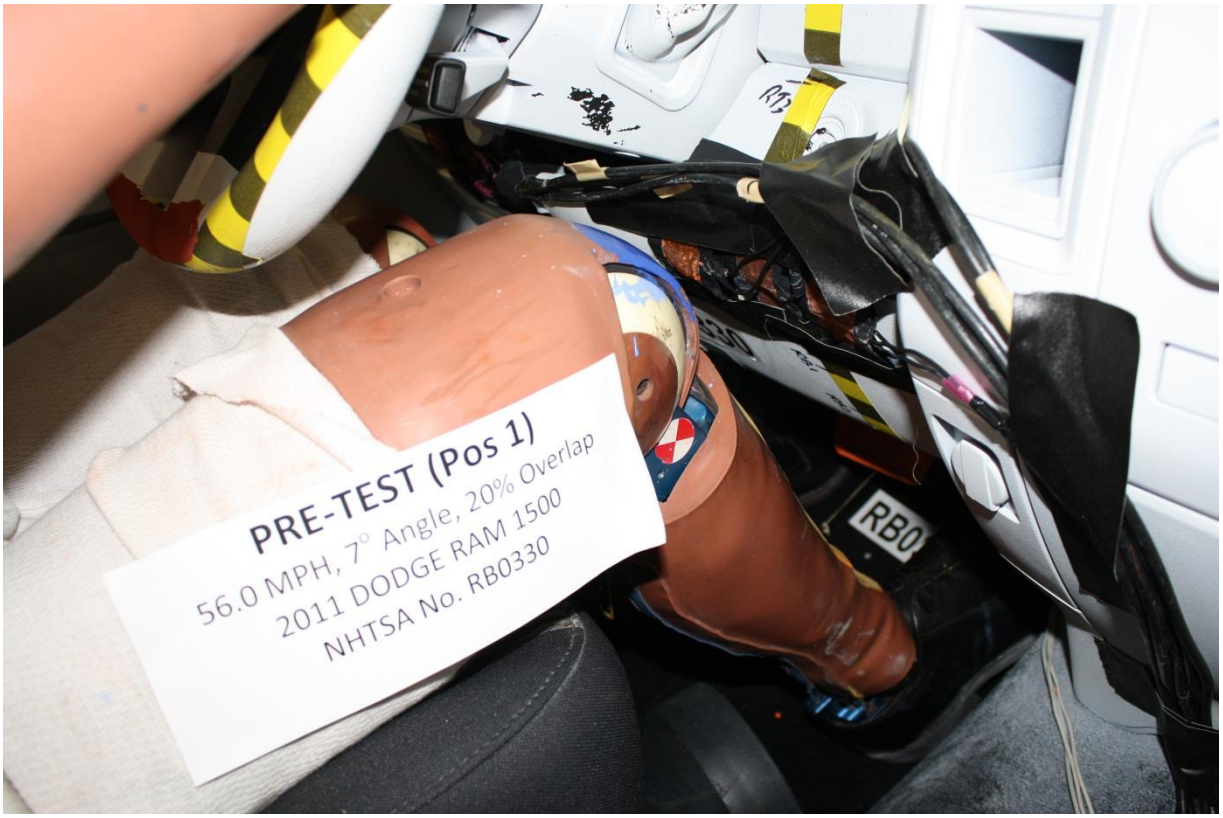
No. 068 Pre-Test Driver Adjustable D-ring

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

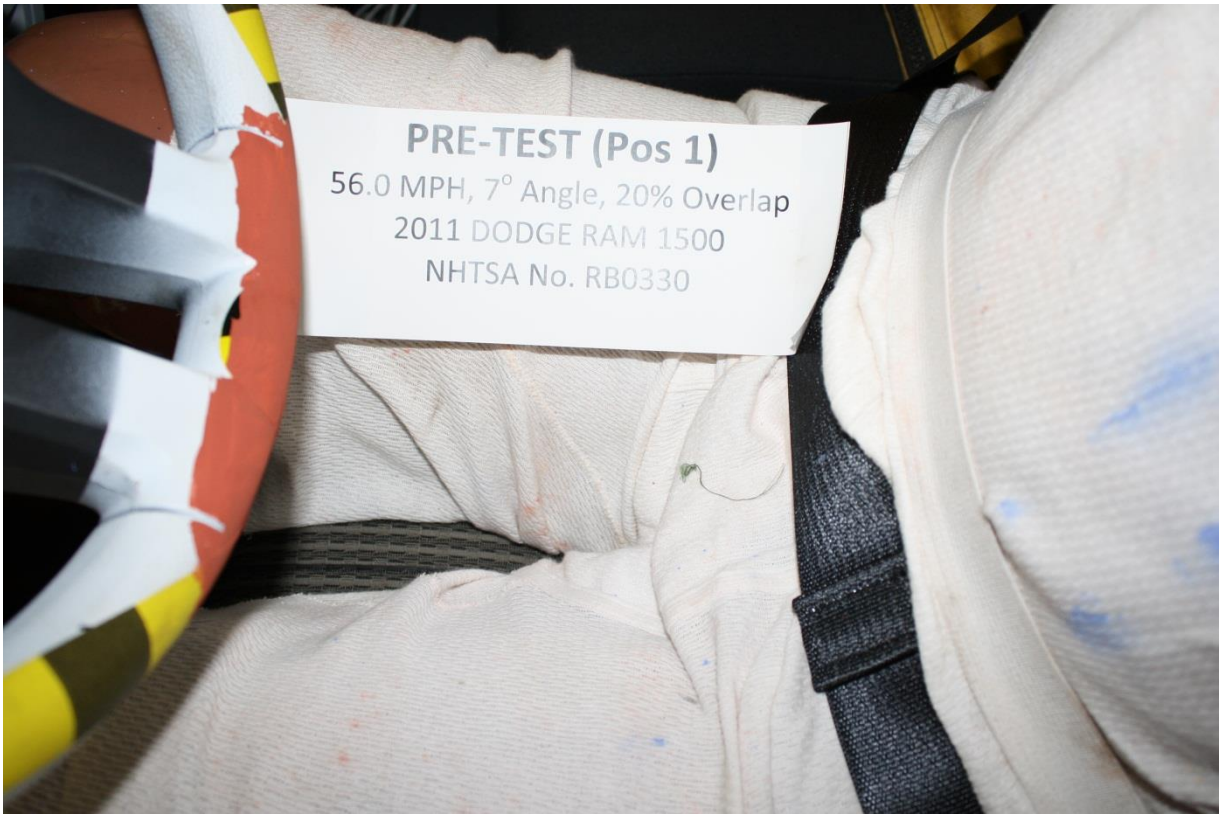


No. 073 Pre-Test View of Driver Dummy Right Knee and Bolster

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

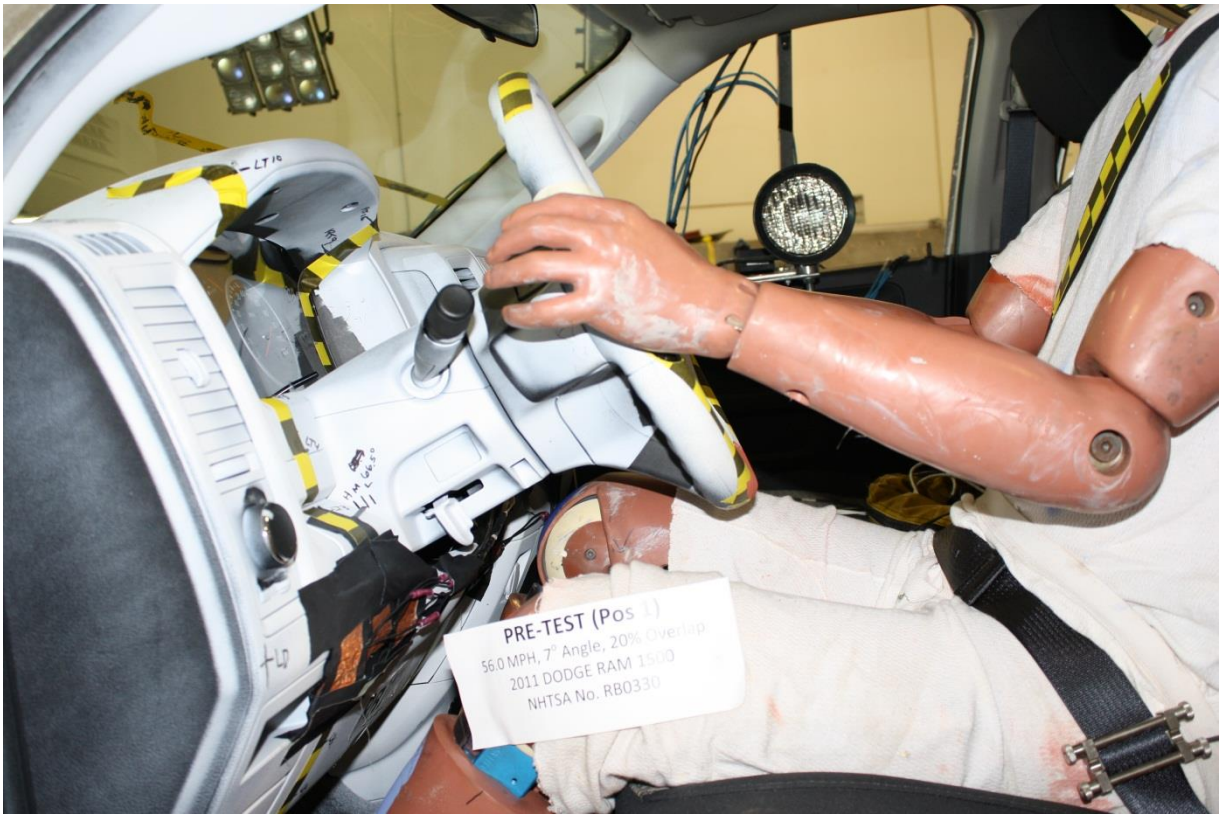
No. 075 Pre-Test View of Driver Dummy Left Knee and Bolster

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



No. 077 Pre-Test View of Driver Dummy Abdomen

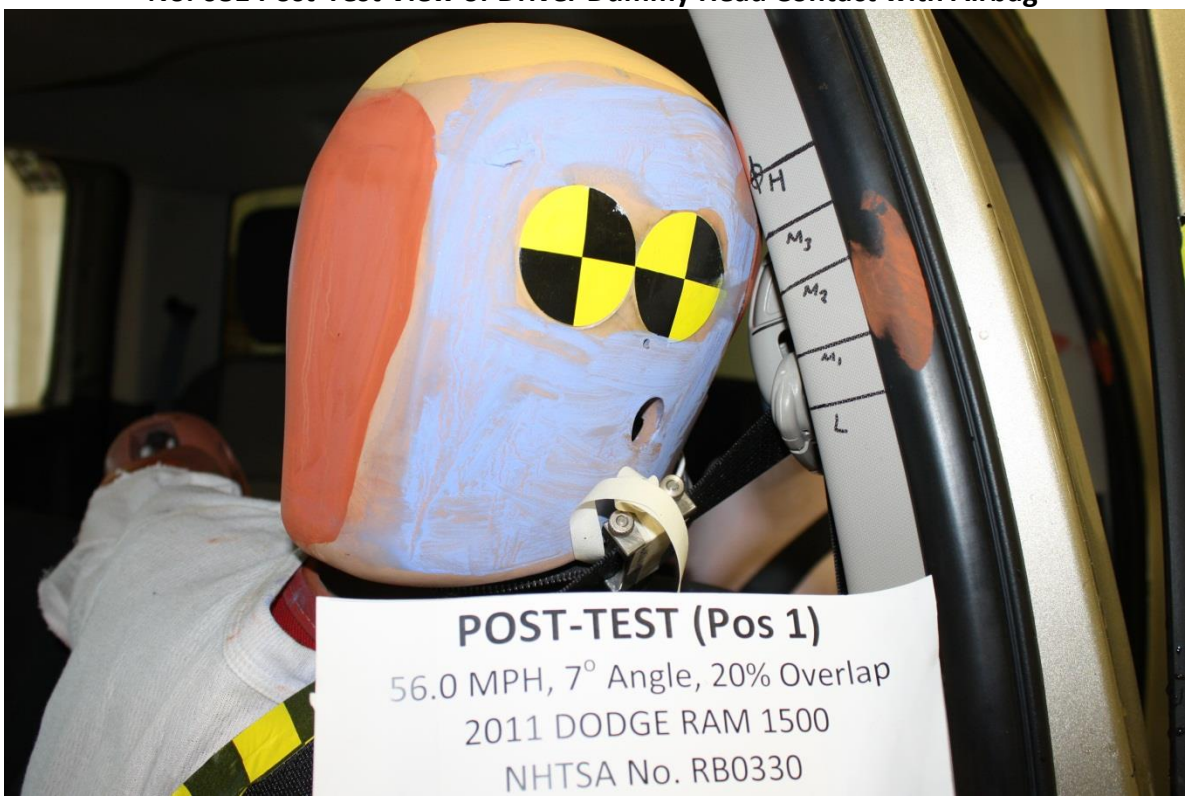
No. 078 Post-Test View of Driver Dummy Abdomen



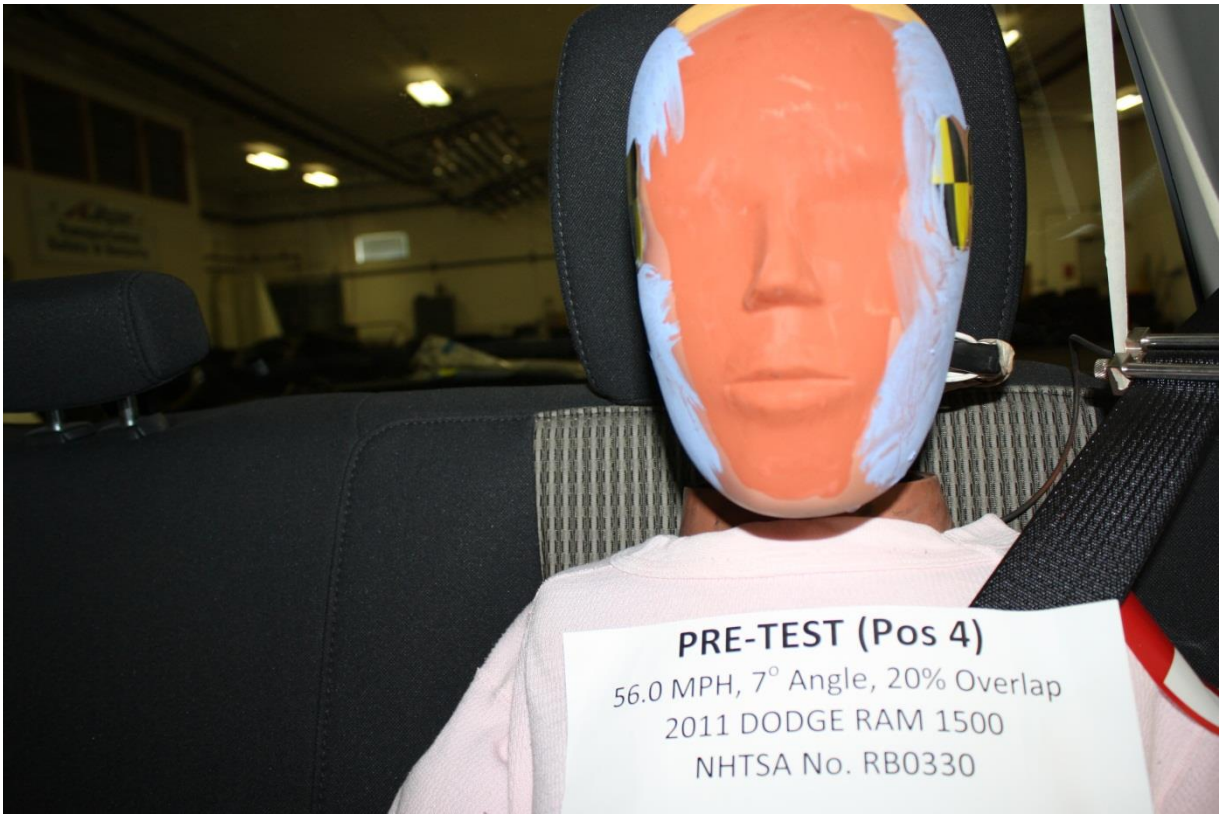
No. 079 Pre-Test Left Side View of Steering Wheel set position

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

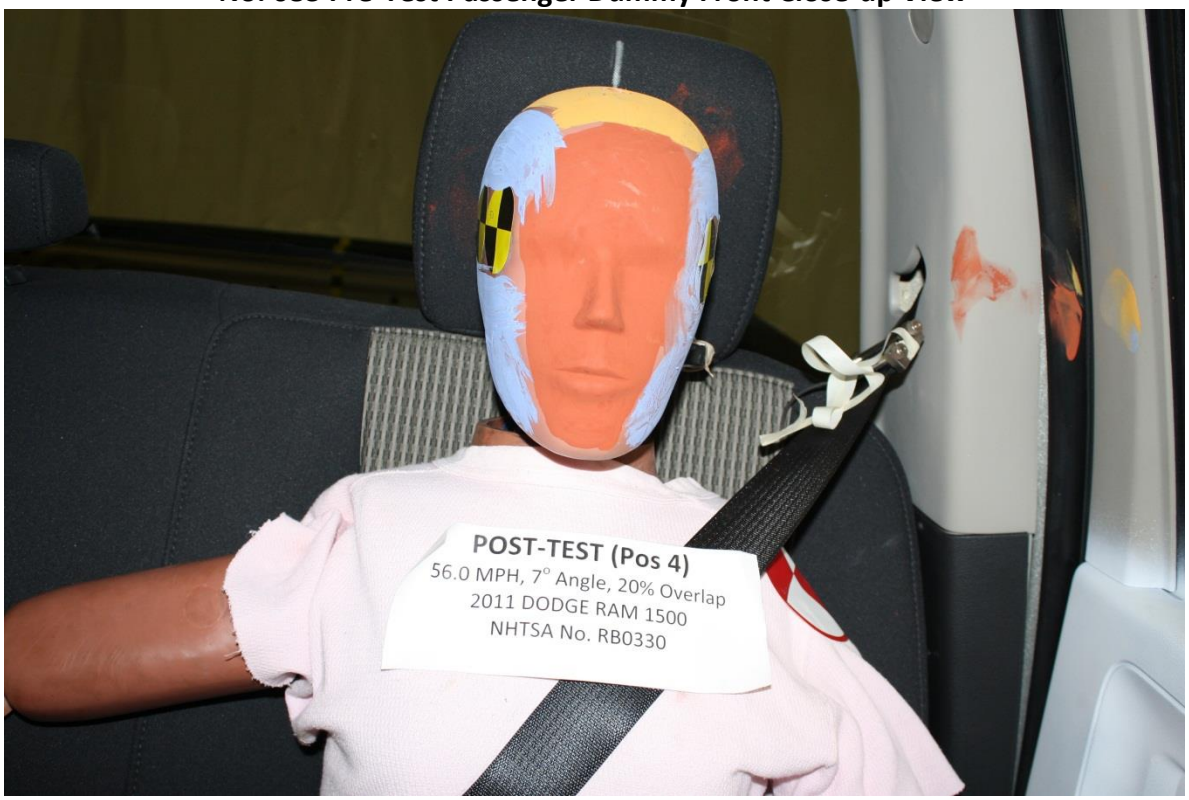
No. 081 Post-Test View of Driver Dummy Head Contact with Airbag



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

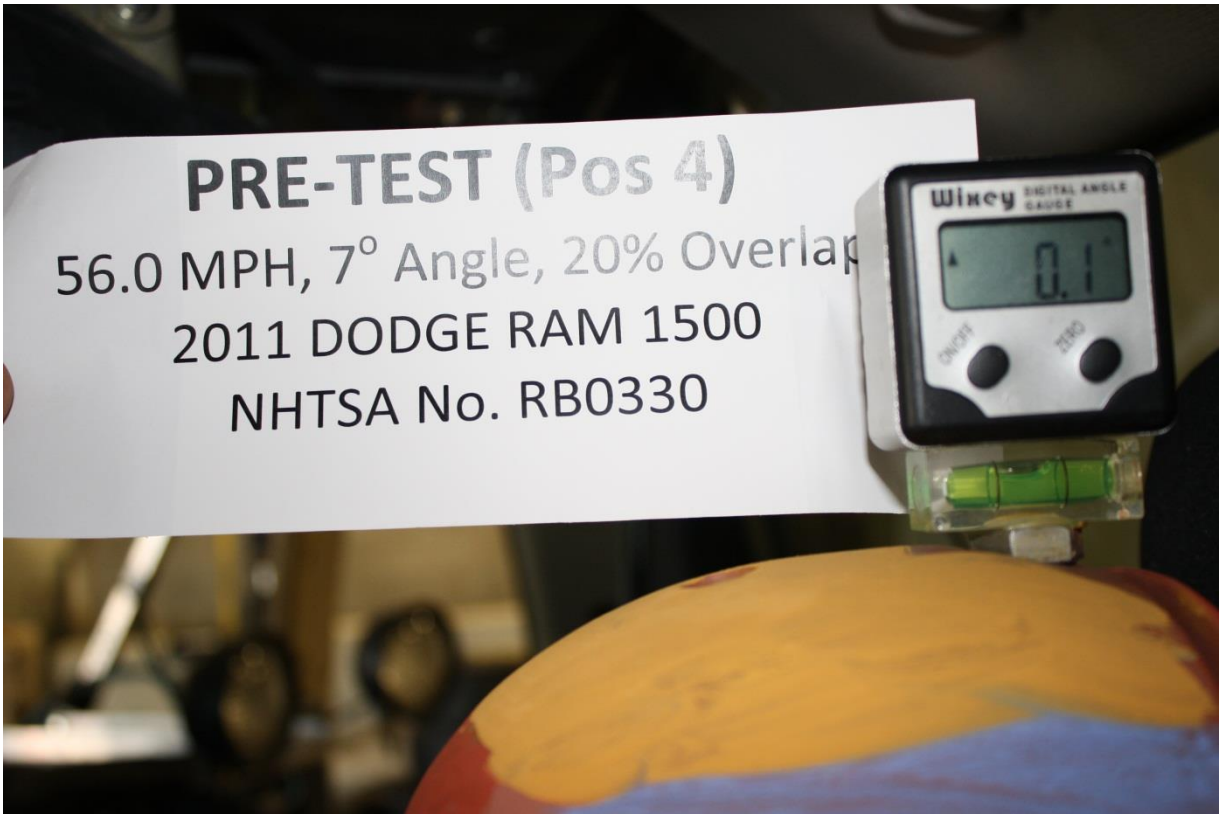
No. 088 Post-Test Left Side Passenger Dummy Window View

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



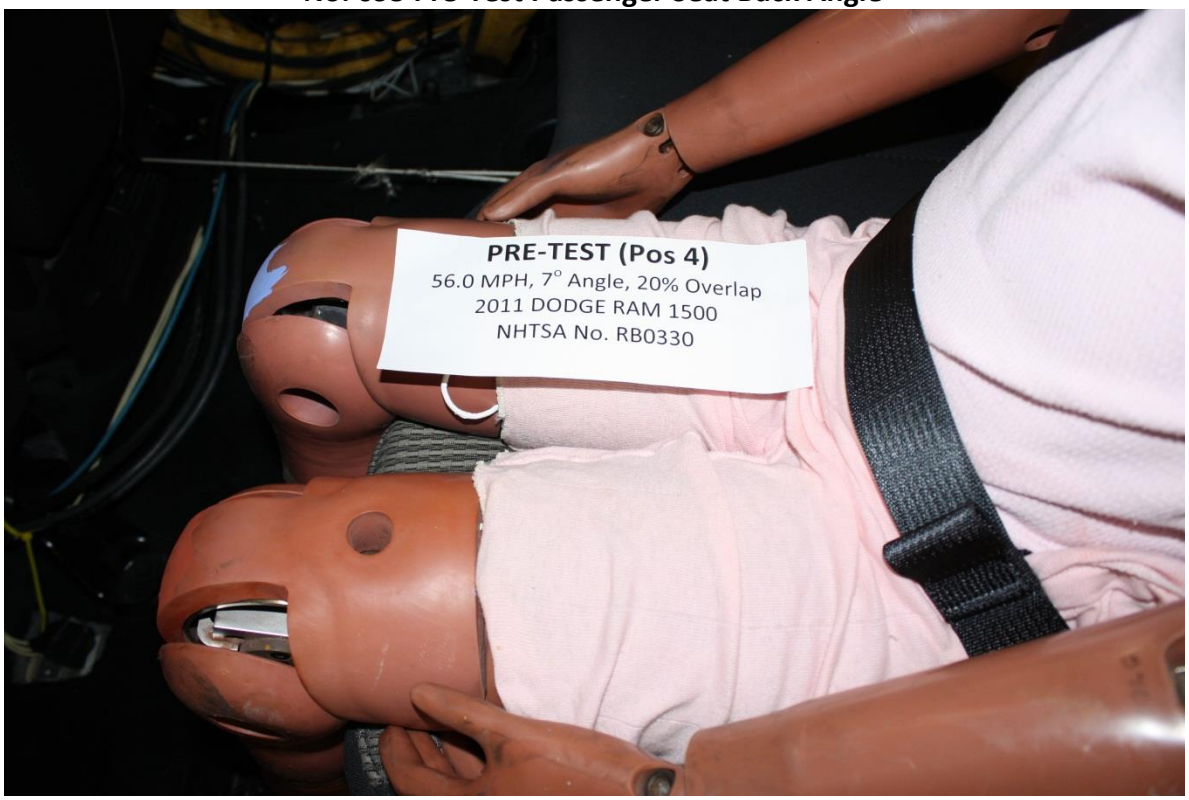
No. 093 Pre-Test Passenger View Showing Head Level

Photo Not Applicable

Passenger Seat is a Fixed Position

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

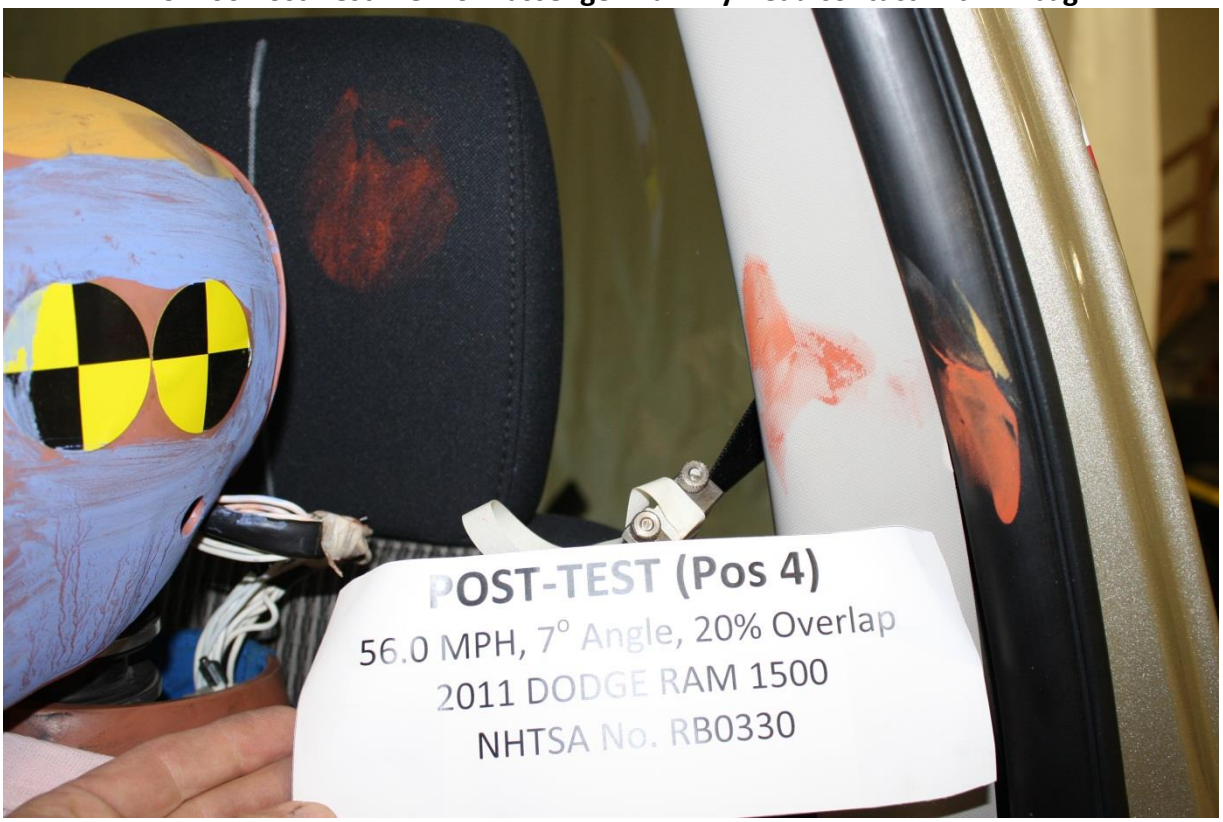
No. 097 Pre-Test Passenger Adjustable D-ring

No. 098 Pre-Test View of Passenger Dummy Feet

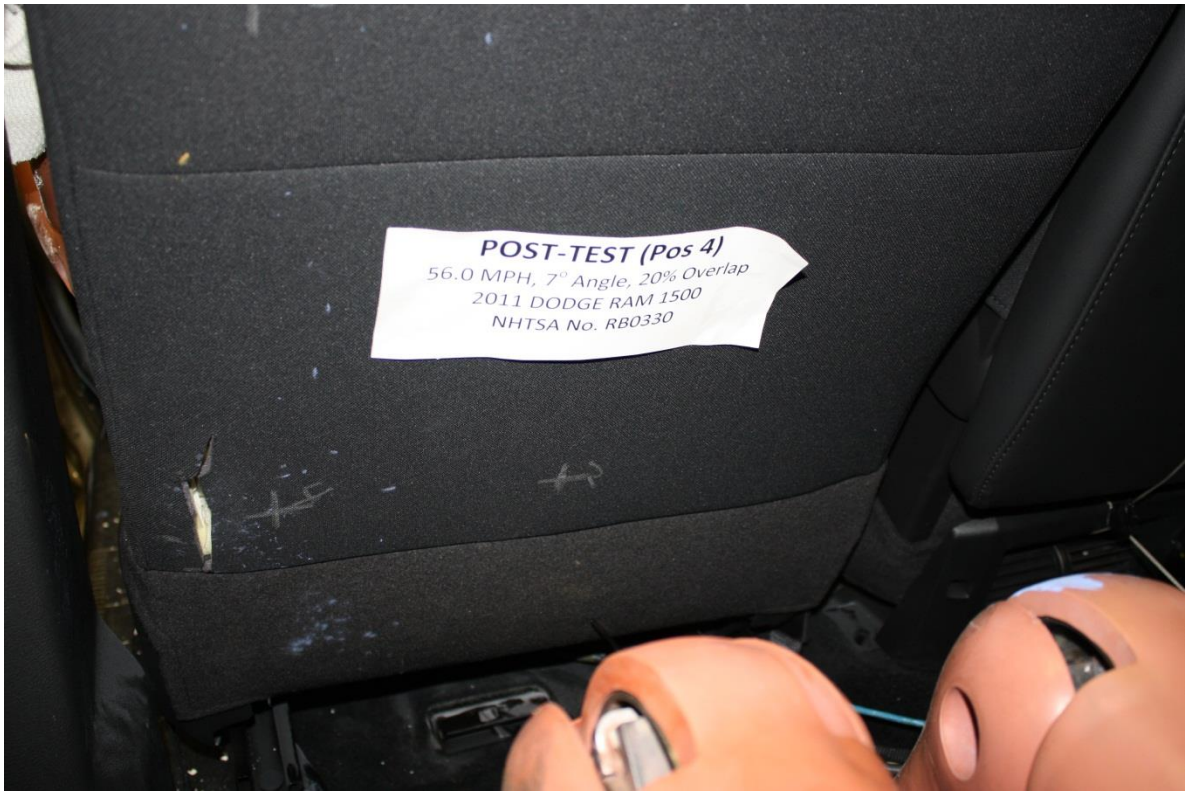
No. 099 Post-Test View of Passenger Dummy Feet

Photo Not Applicable

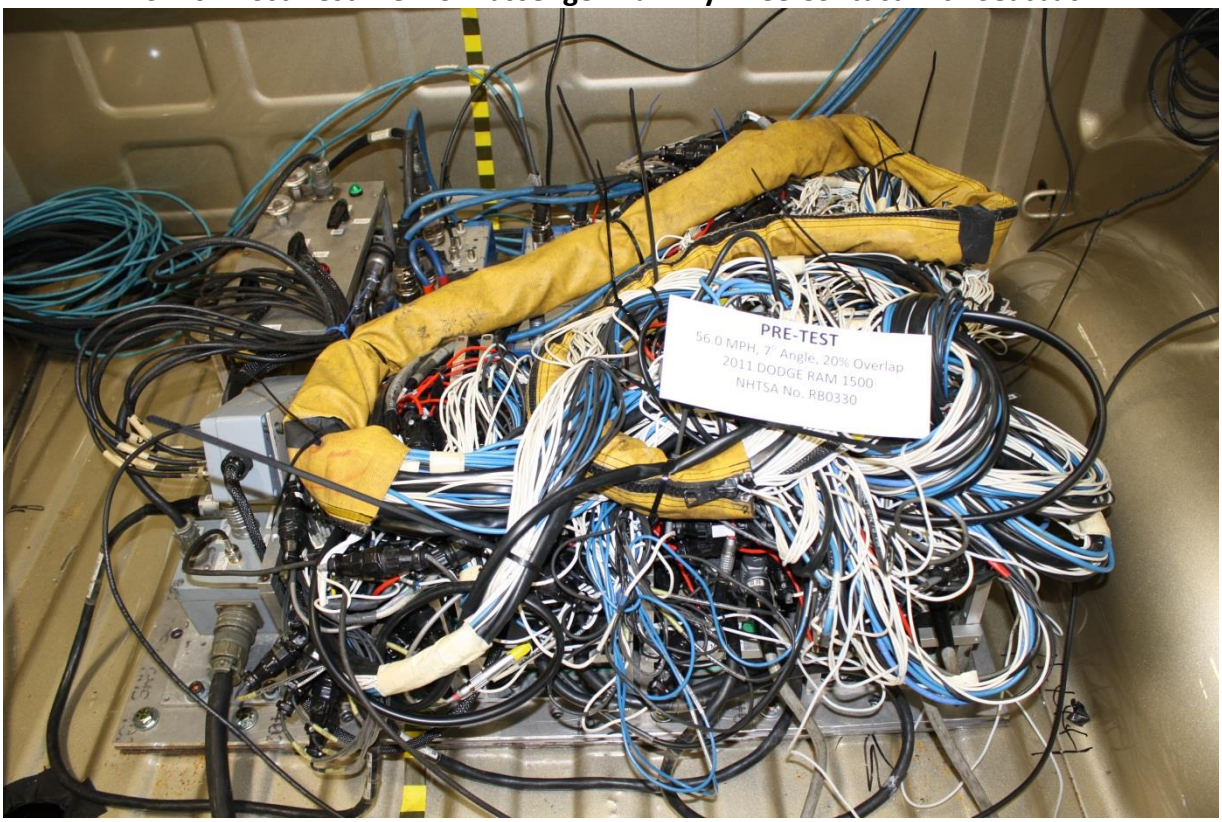
No. 100 Post-Test View of Passenger Dummy Head contact with Airbag



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

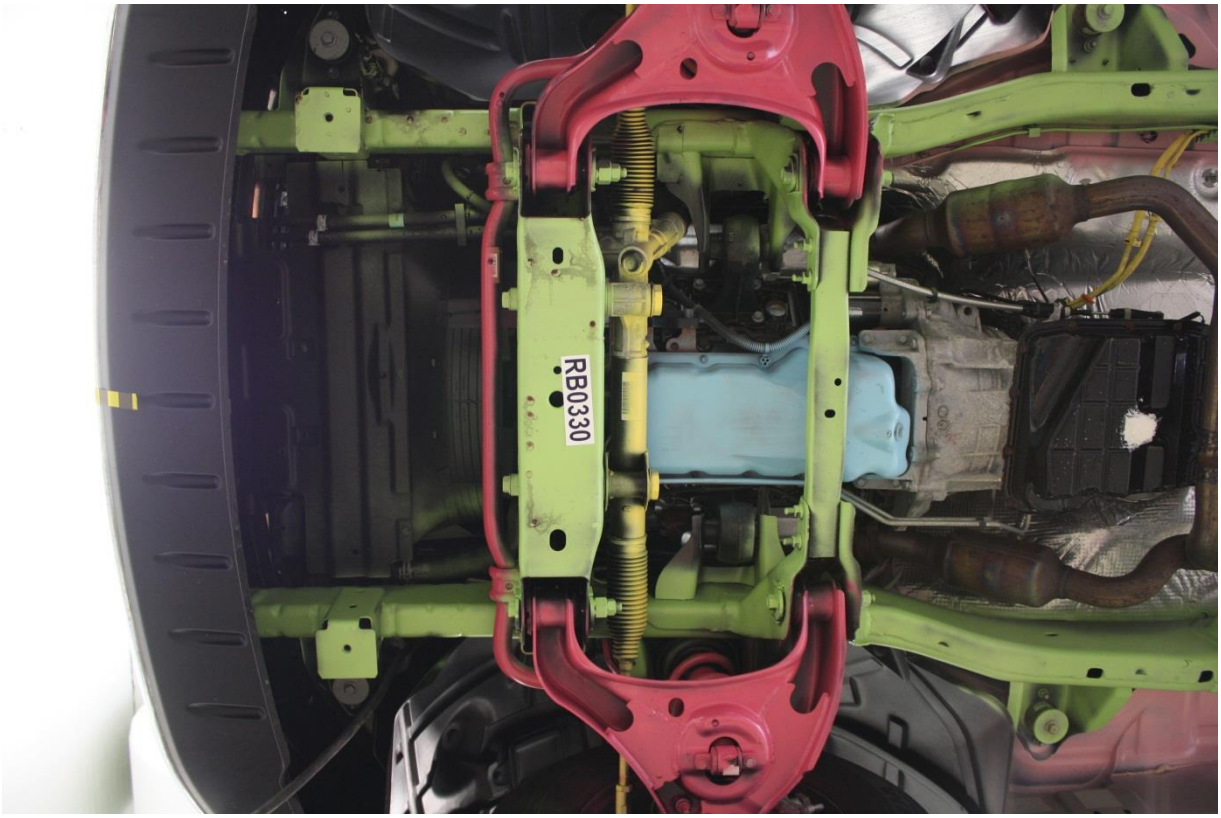
No. 104 Post-Test Speed Trap Readout

No. 105 Pre-Test View of Fuel Filler Cap

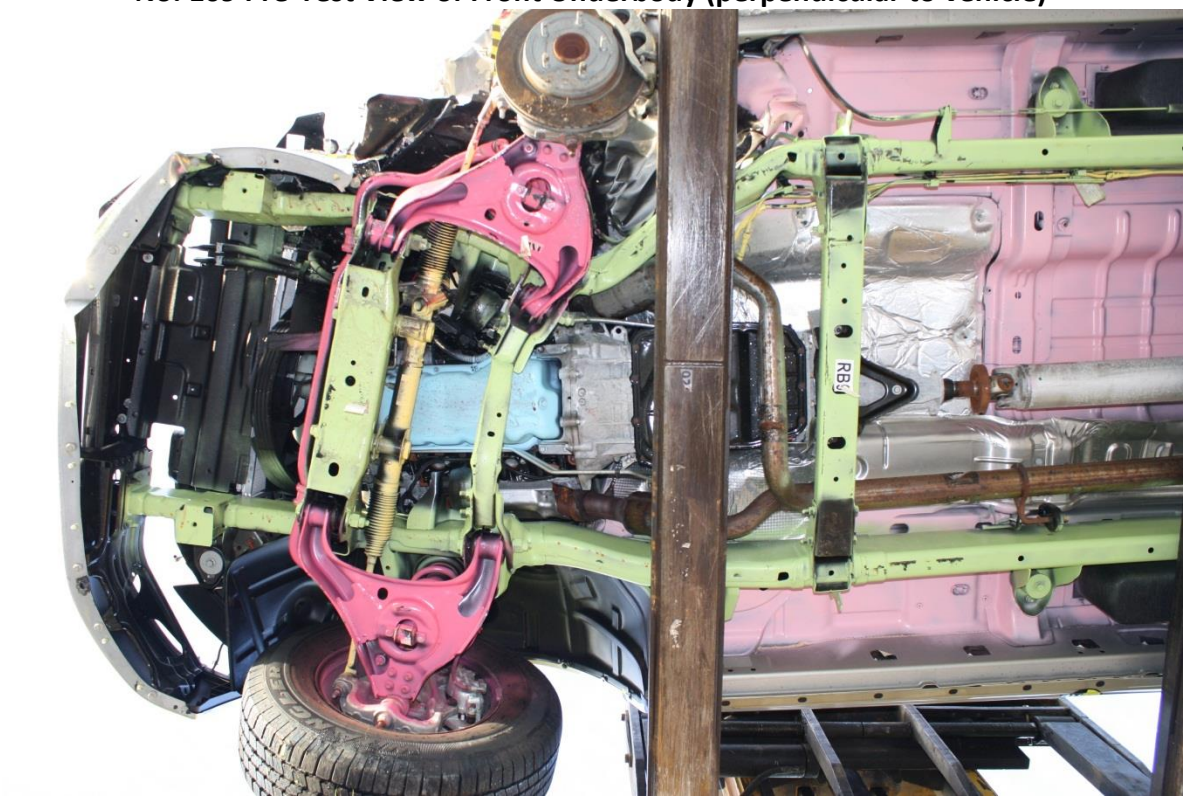
No. 106 Post-Test View of Fuel Filler Cap

No. 107 Pre-Test Engine Compartment View

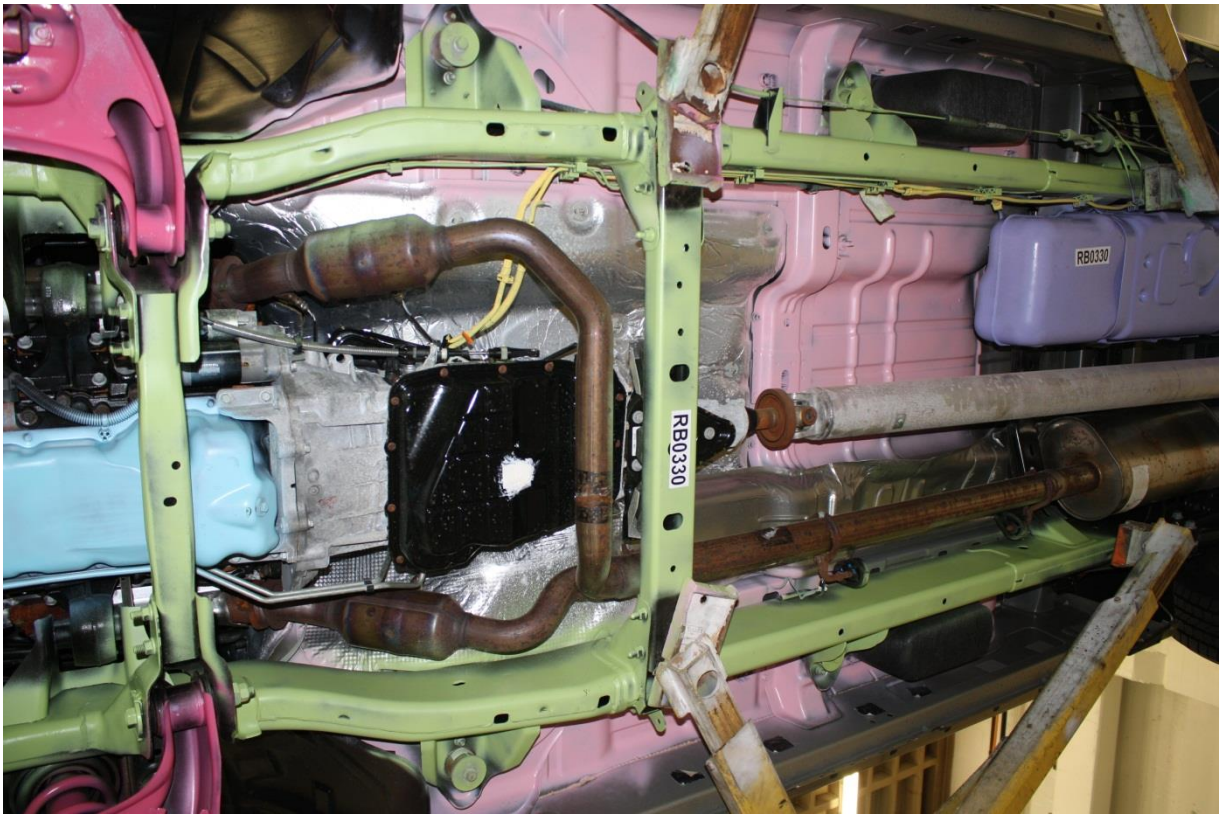
No. 108 Post-Test Engine Compartment View



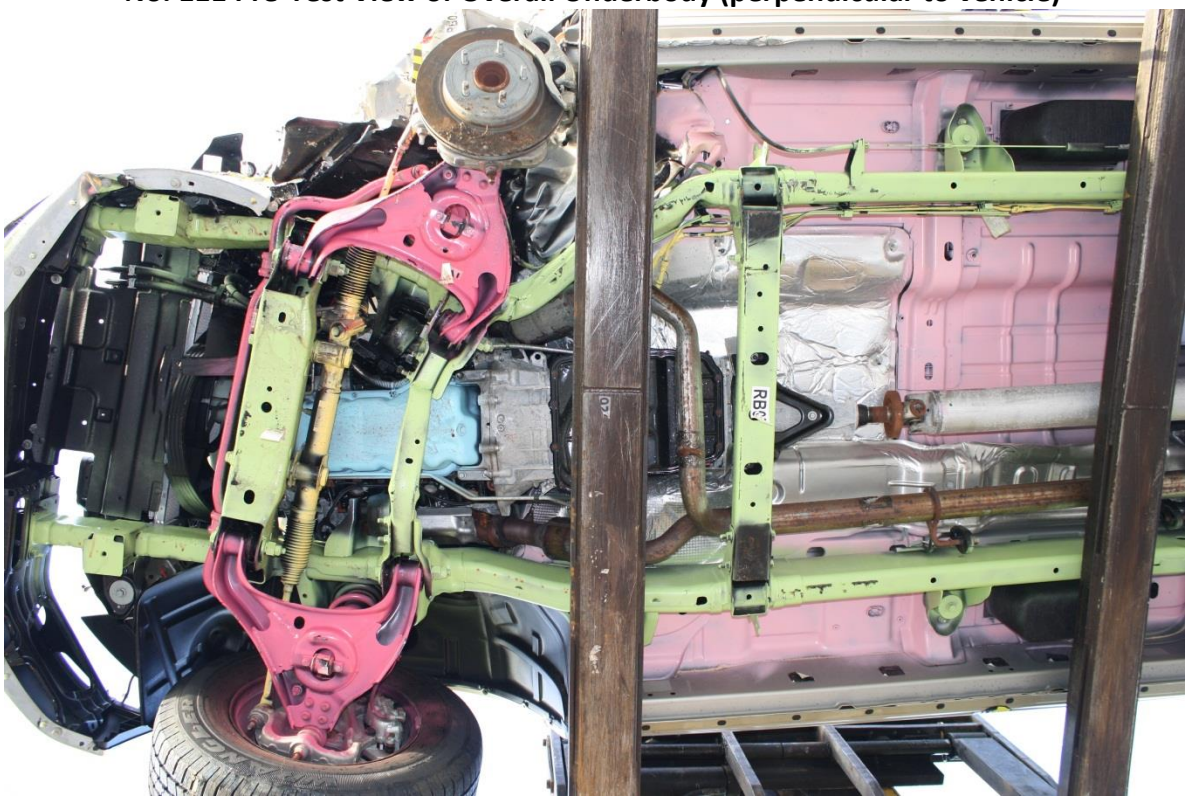
No. 109 Pre-Test View of Front Underbody (perpendicular to vehicle)



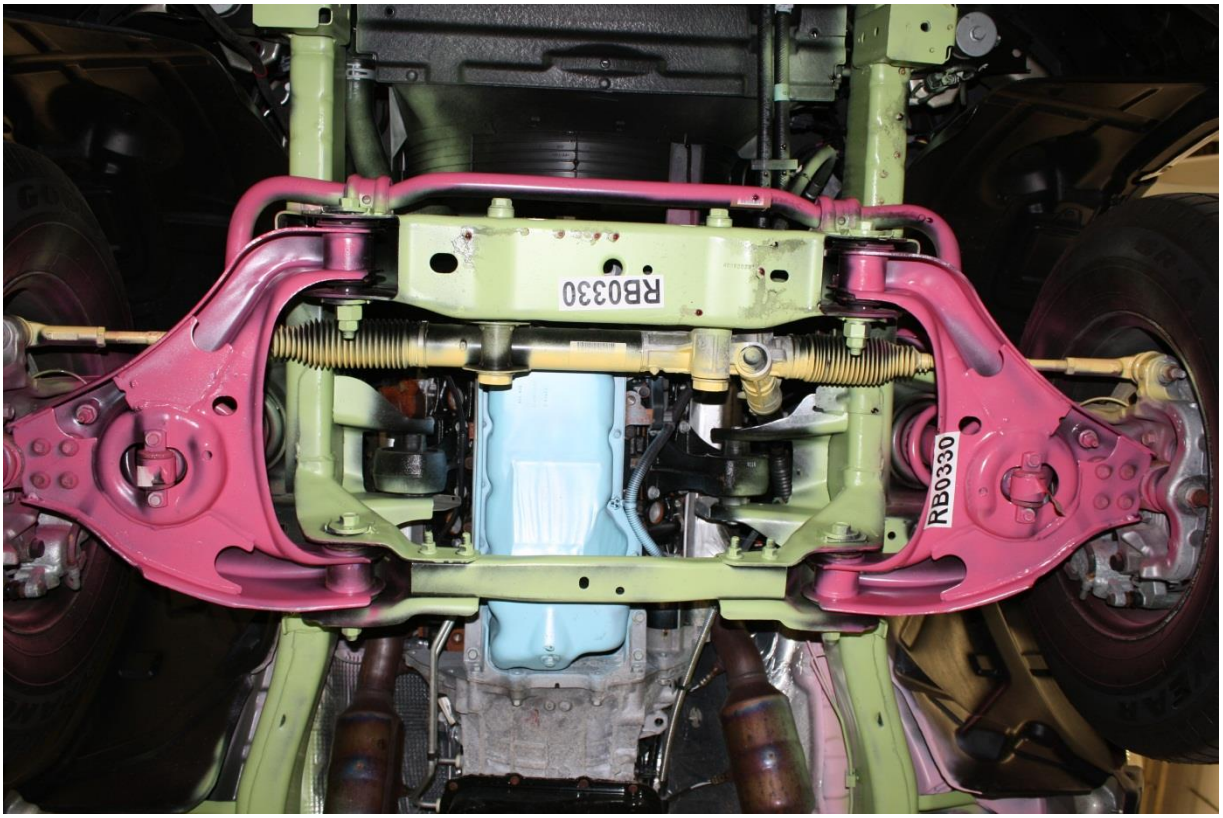
No. 110 Post-Test View of Front Underbody (perpendicular to vehicle)



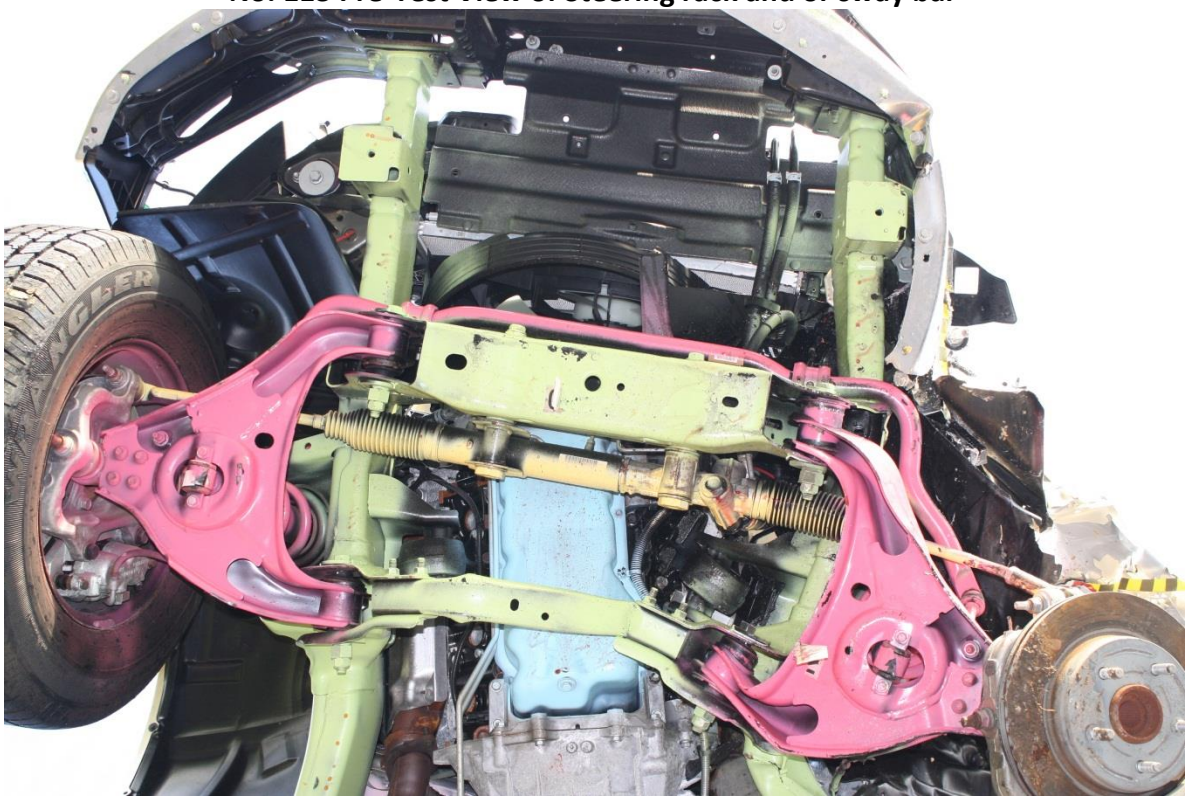
No. 111 Pre-Test View of Overall Underbody (perpendicular to vehicle)



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

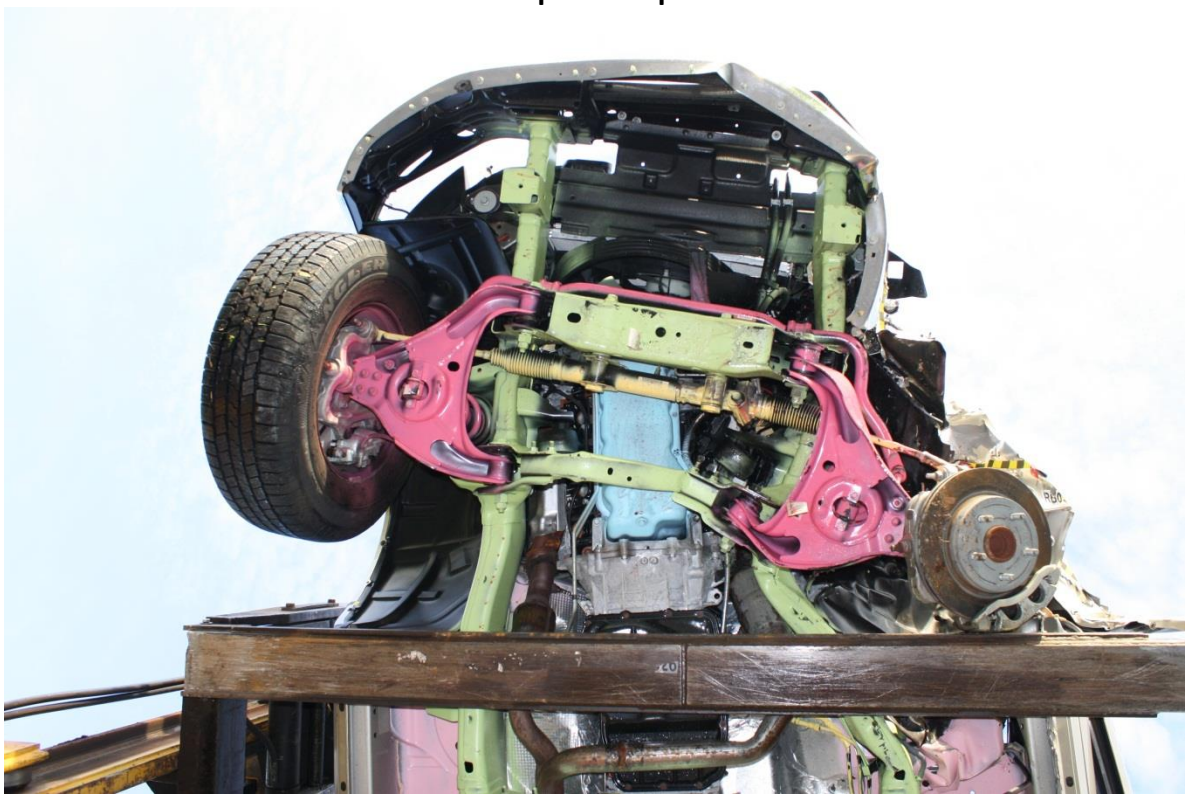


No. 113 Pre-Test View of Steering rack and or sway bar

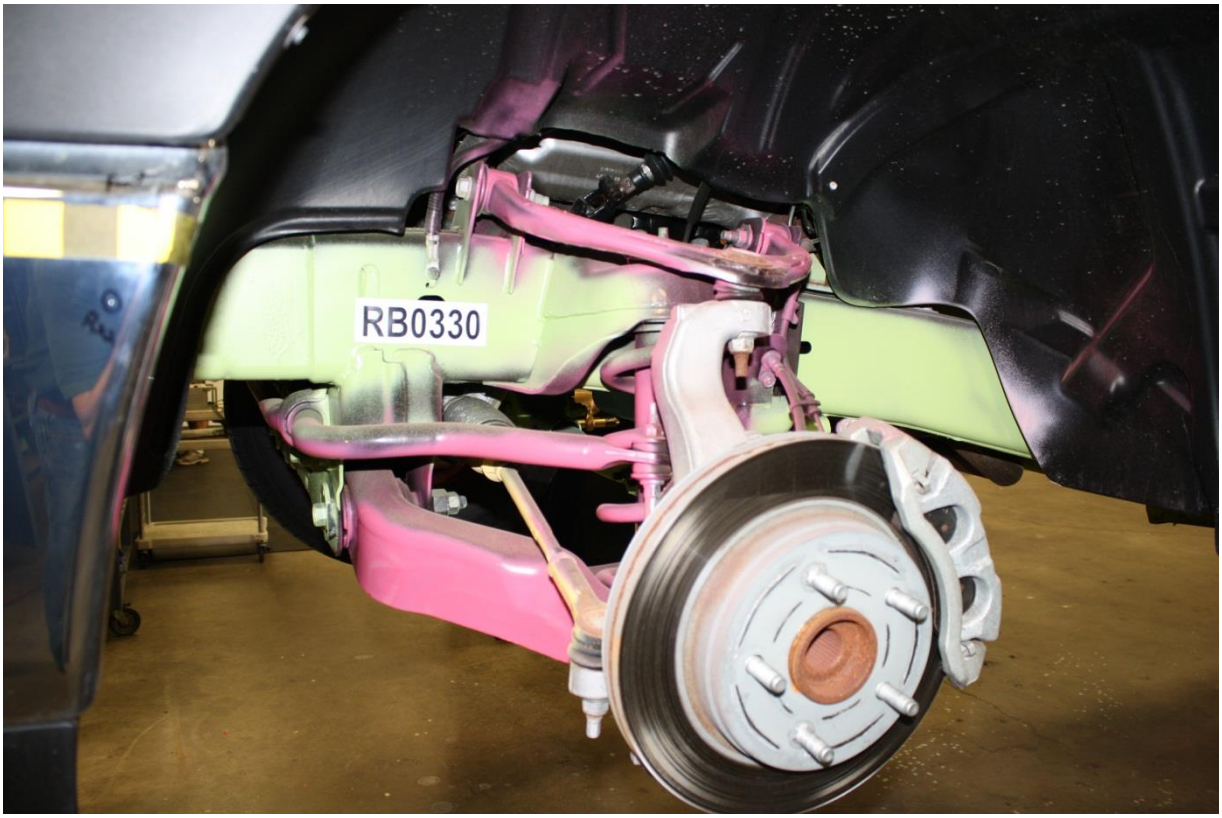


No. 114 Post-Test View of Steering rack and or sway bar

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

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

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

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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

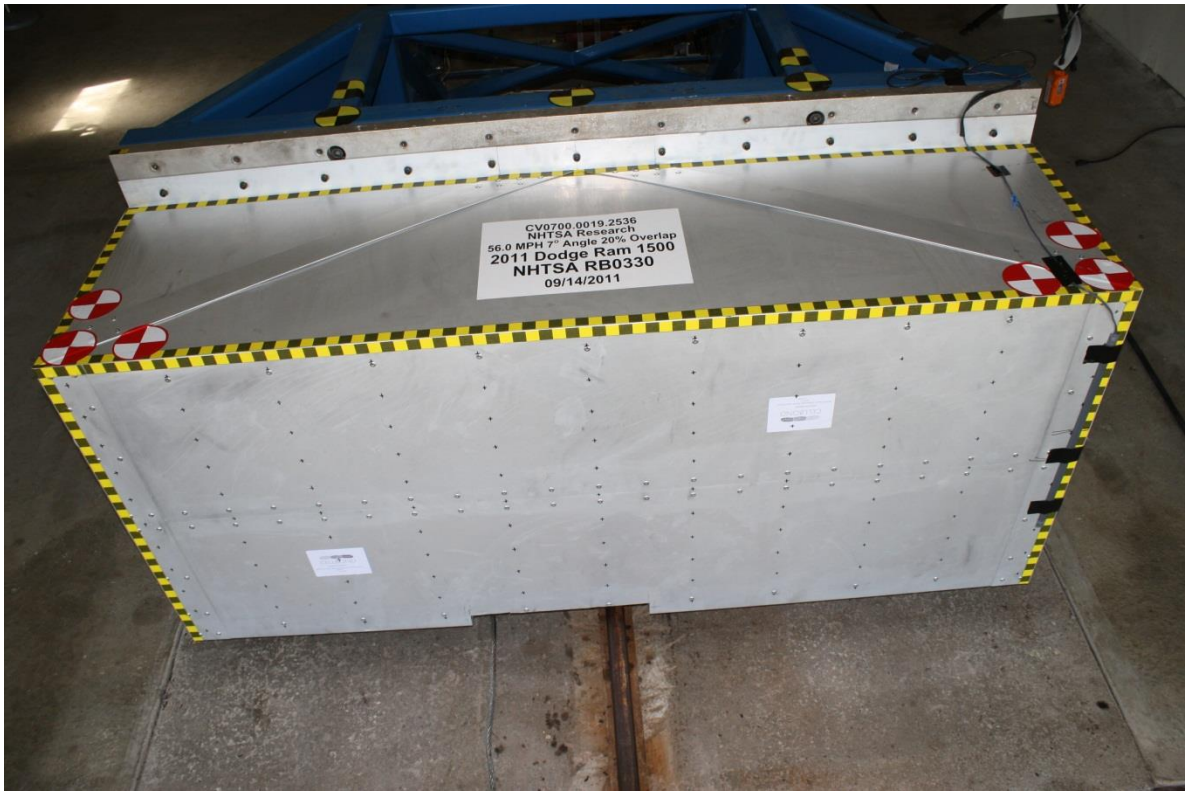
No. 127 Post-Test View of Windshield Separation

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

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APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

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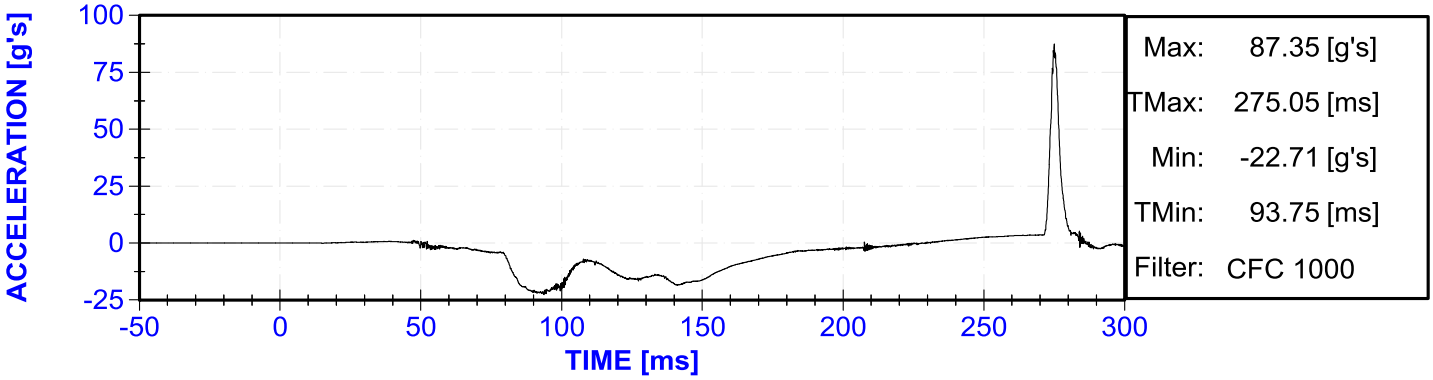
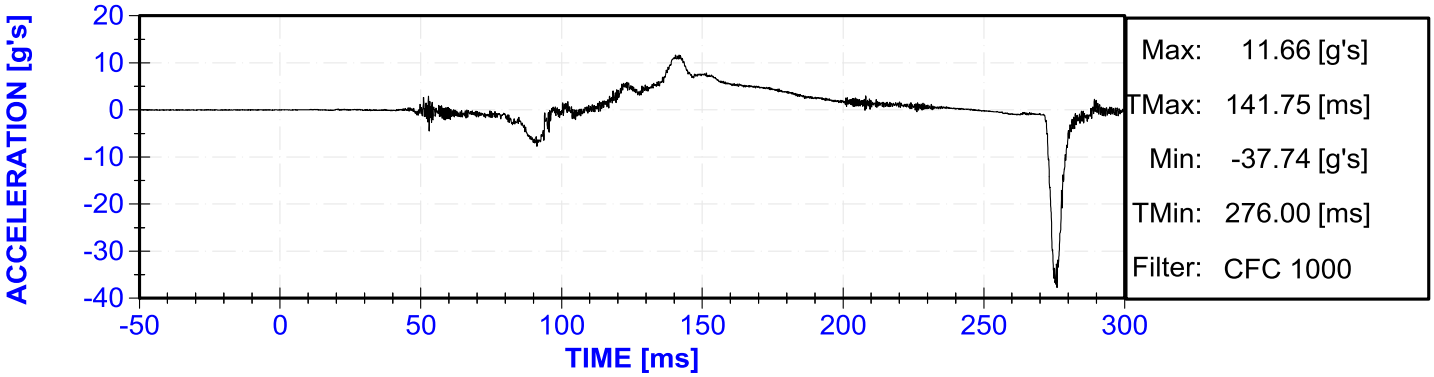
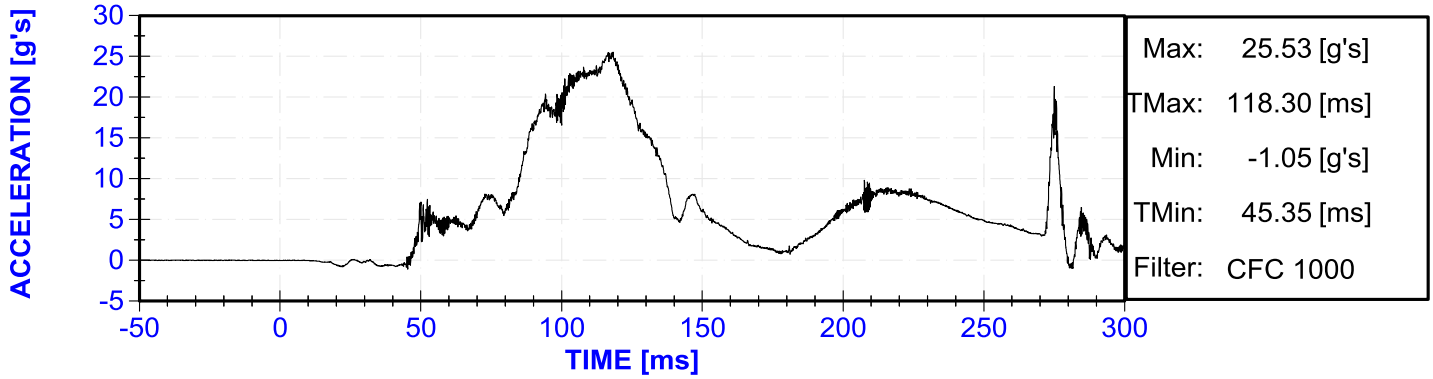
V2P1 Head CG X Acceleration



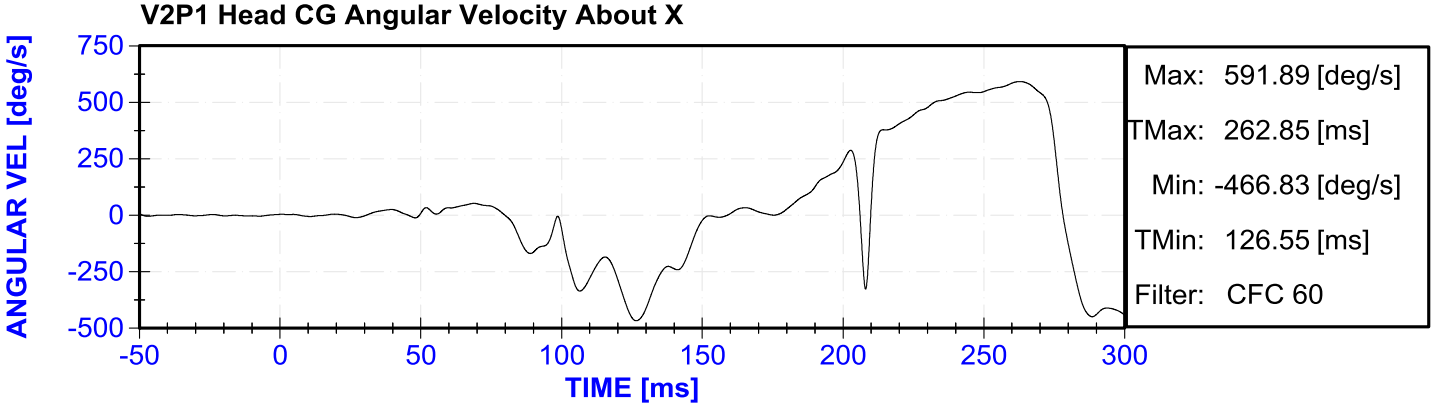
V2P1 Head CG Y Acceleration



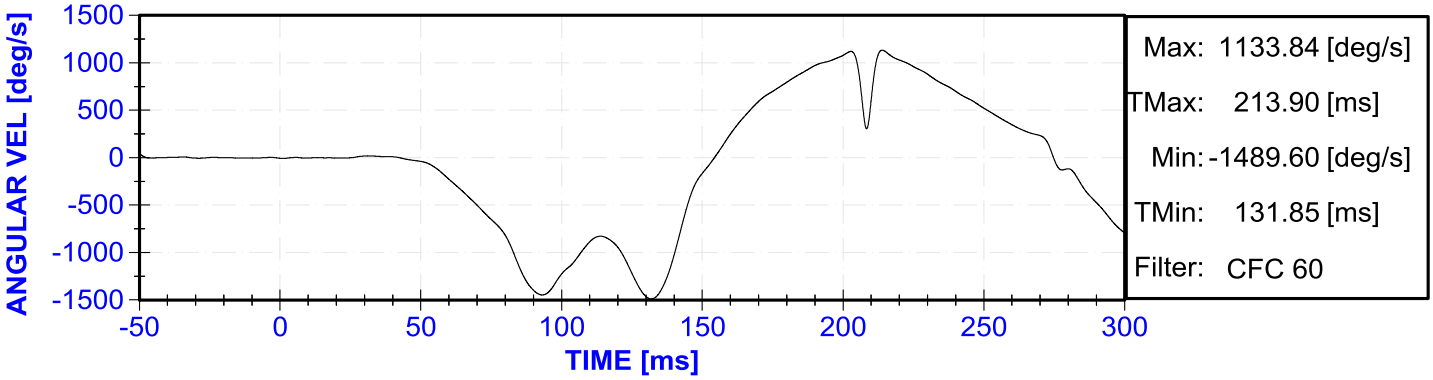
V2P1 Head CG Z Acceleration



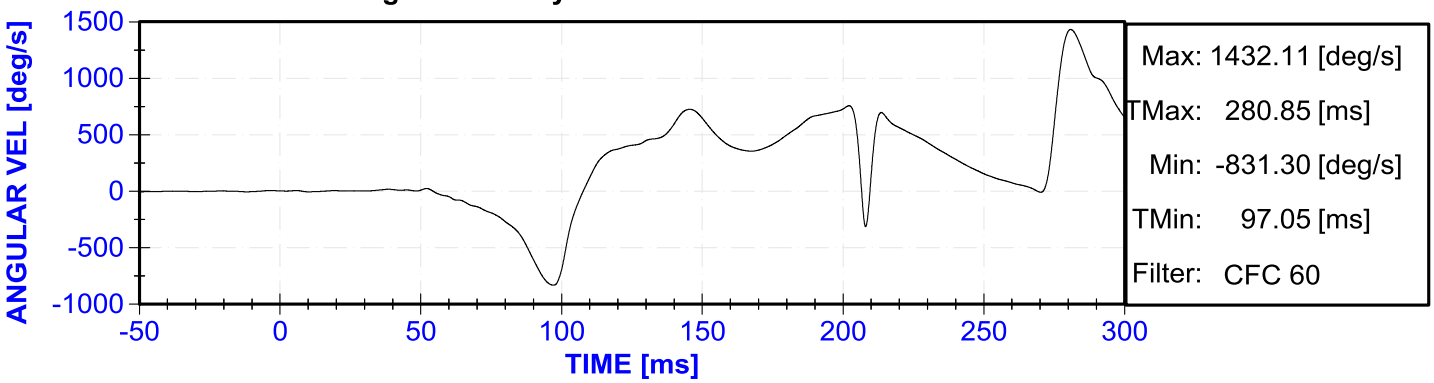
V2P1 Head CG Angular Velocity About X



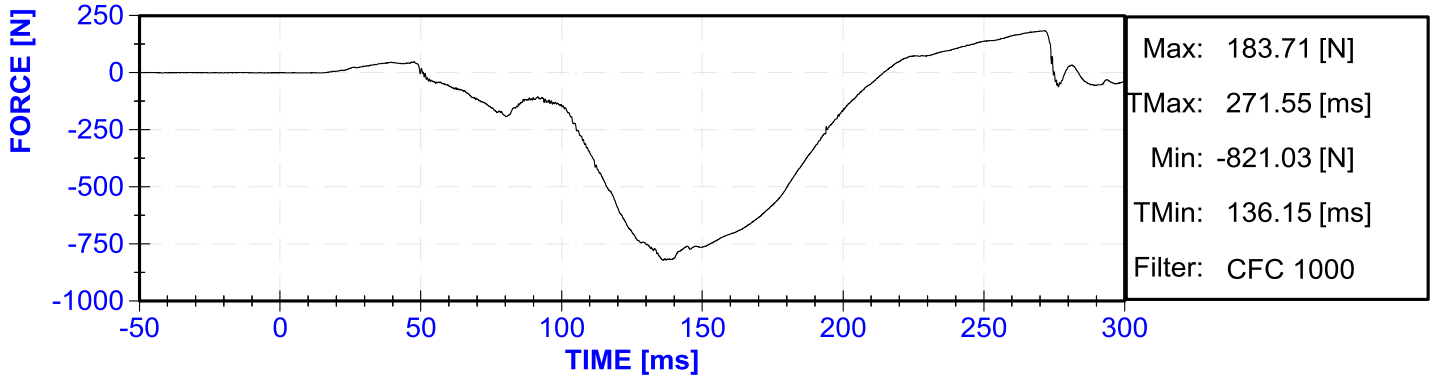
V2P1 Head CG Angular Velocity About Y



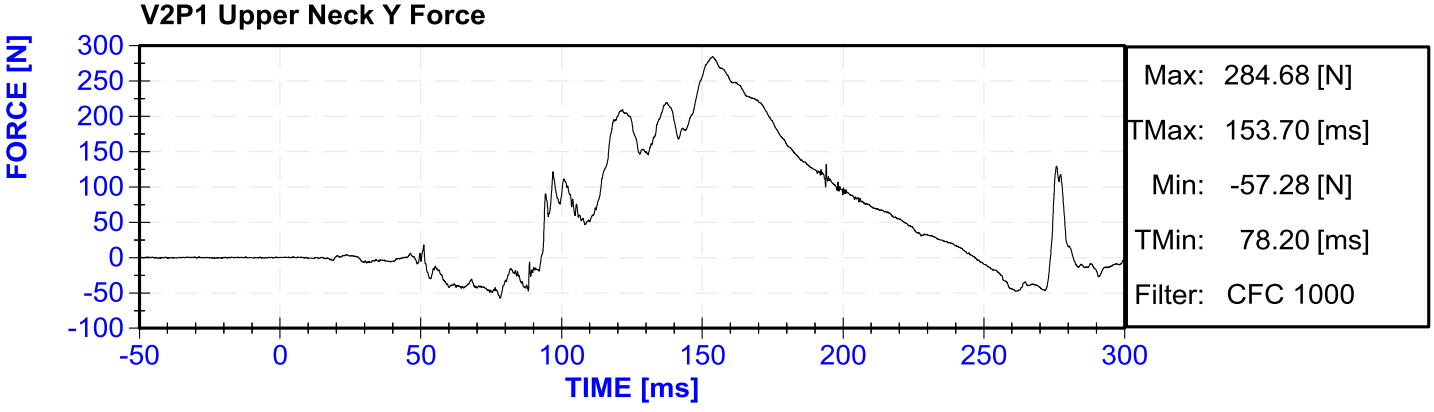
V2P1 Head CG Angular Velocity About Z

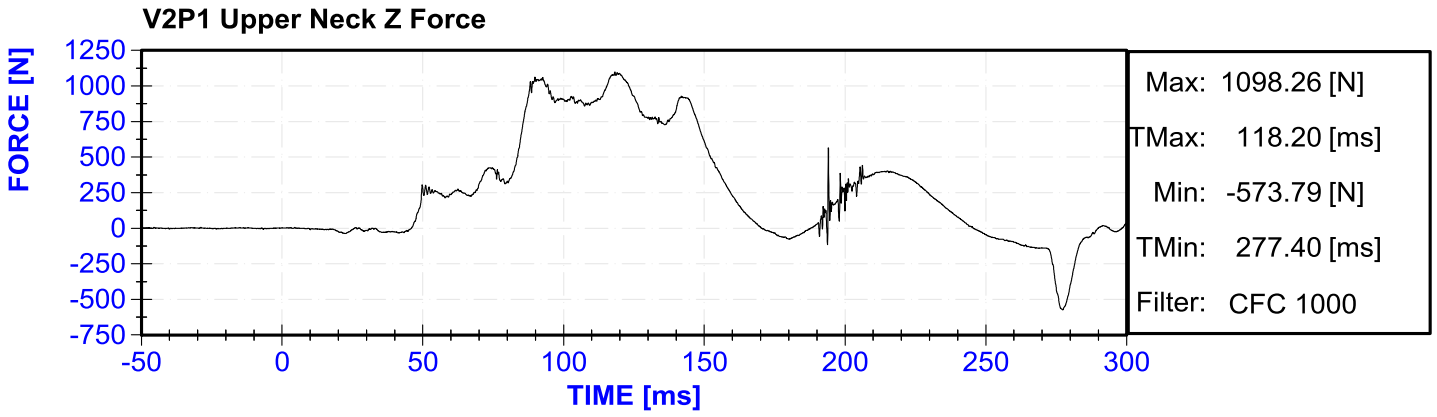


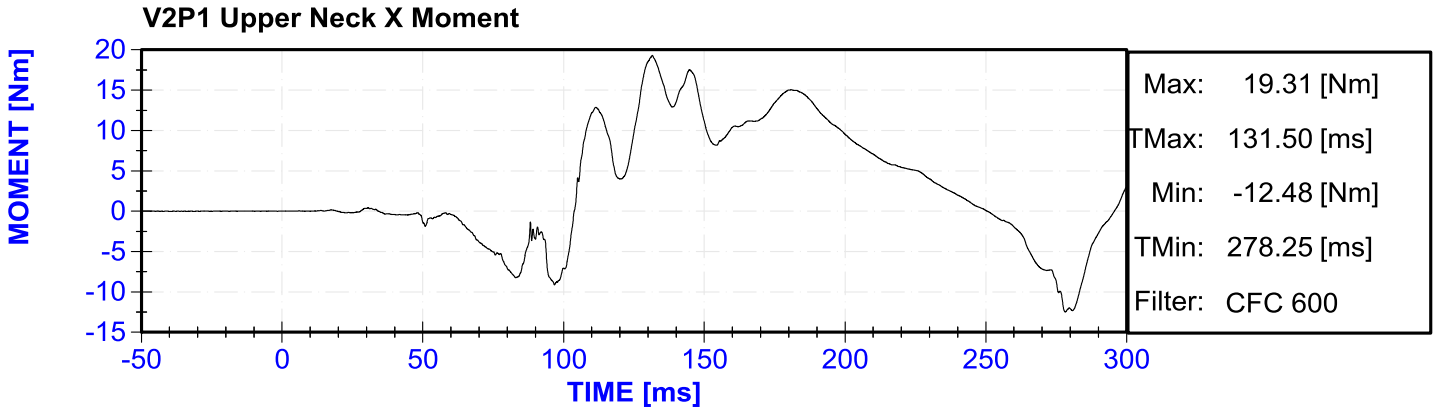
V2P1 Upper Neck X Force

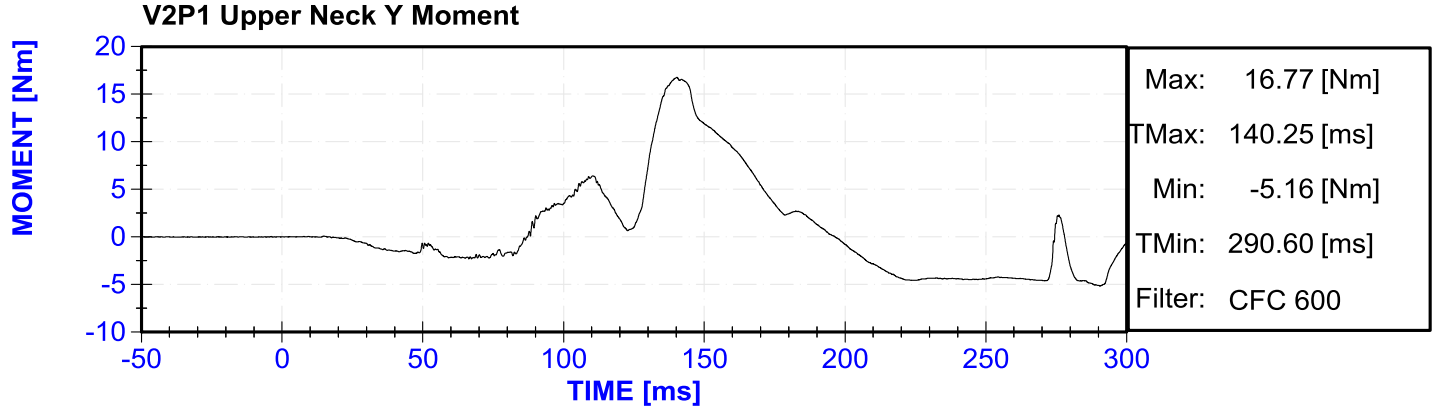


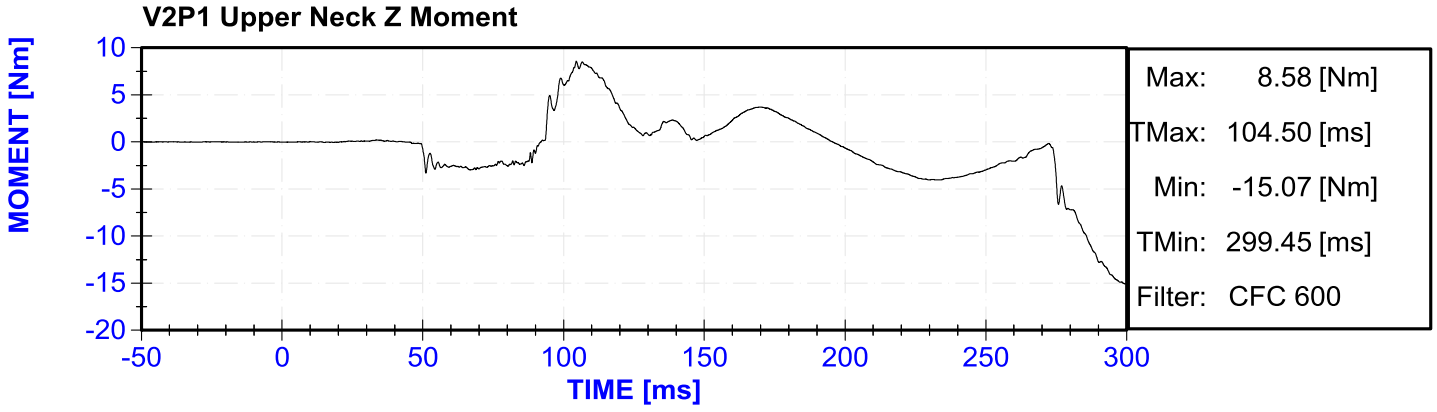
V2P1 Upper Neck Y Force

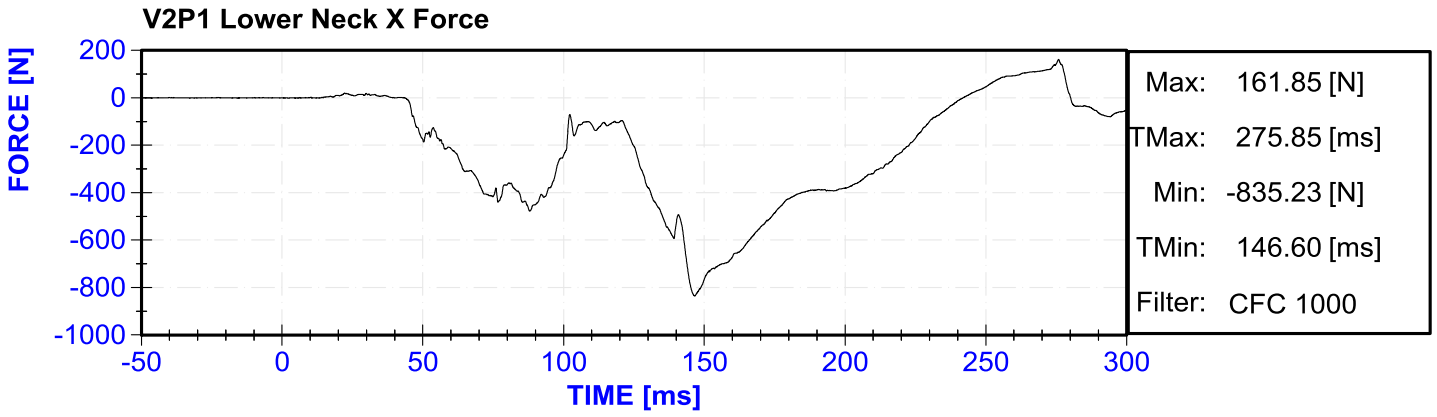


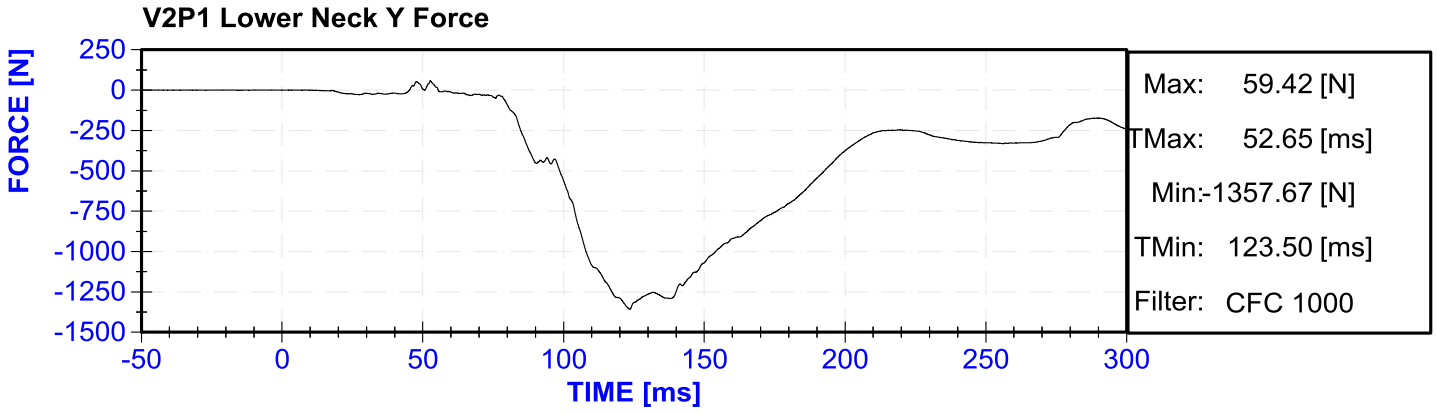

V2P1 Upper Neck Z Force
FORCE [N]
1250
1000
750
500
250
0
-250
-500
-750
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1098.26 [N]
TMax: 118.20 [ms]
Min: -573.79 [N]
TMin: 277.40 [ms]
Filter: CFC 1000

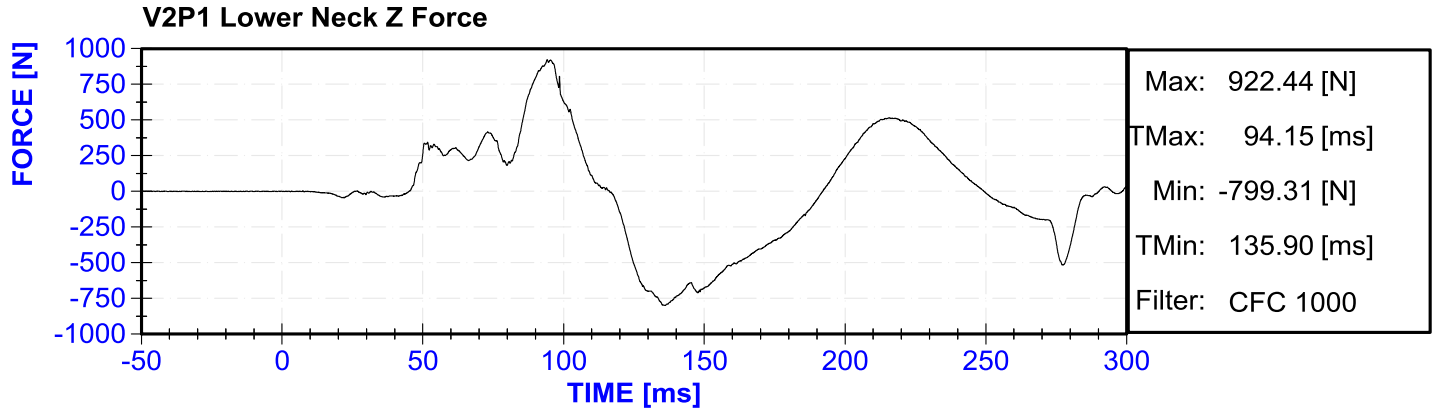

V2P1 Upper Neck X Moment
MOMENT [Nm]
20
15
10
5
0
-5
-10
-15
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 19.31 [Nm]
TMax: 131.50 [ms]
Min: -12.48 [Nm]
TMin: 278.25 [ms]
Filter: CFC 600

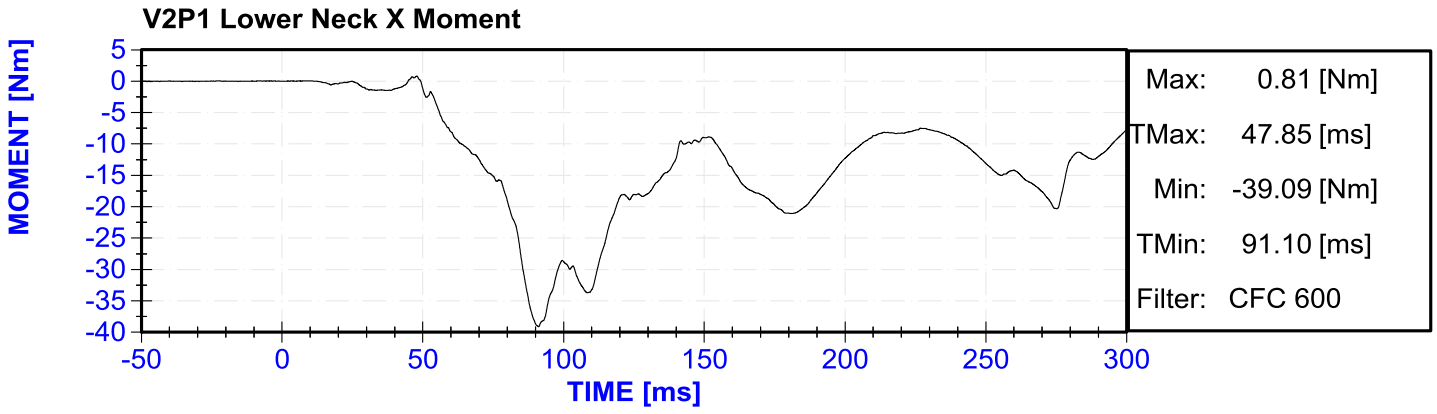

V2P1 Upper Neck Y Moment
MOMENT [Nm]
20
15
10
5
0
-5
-10
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 16.77 [Nm]
TMax: 140.25 [ms]
Min: -5.16 [Nm]
TMin: 290.60 [ms]
Filter: CFC 600


V2P1 Upper Neck Z Moment
MOMENT [Nm]
10
5
0
-5
-10
-15
-20
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 8.58 [Nm]
TMax: 104.50 [ms]
Min: -15.07 [Nm]
TMin: 299.45 [ms]
Filter: CFC 600

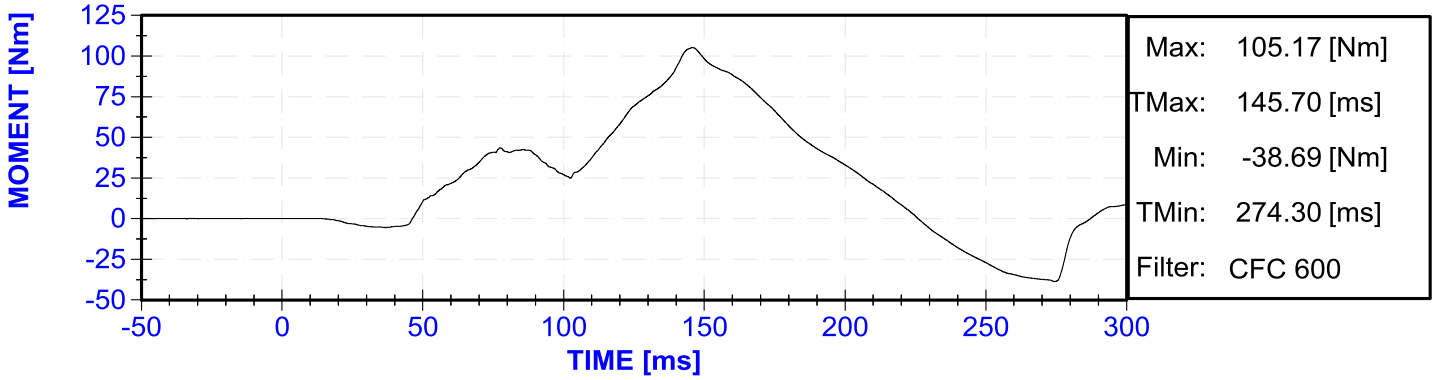

V2P1 Lower Neck X Force
FORCE [N]
200
0
-200
-400
-600
-800
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 161.85 [N]
TMax: 275.85 [ms]
Min: -835.23 [N]
TMin: 146.60 [ms]
Filter: CFC 1000


V2P1 Lower Neck Y Force
FORCE [N]
250
0
-250
-500
-750
-1000
-1250
-1500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 59.42 [N]
TMax: 52.65 [ms]
Min:-1357.67 [N]
TMin: 123.50 [ms]
Filter: CFC 1000

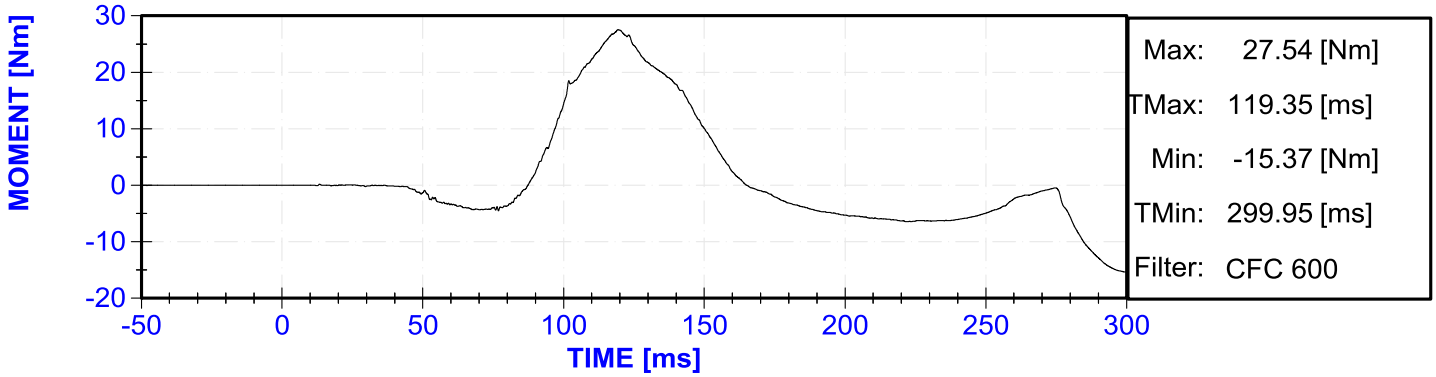

V2P1 Lower Neck Z Force
FORCE [N]
1000
750
500
250
0
-250
-500
-750
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 922.44 [N]
TMax: 94.15 [ms]
Min: -799.31 [N]
TMin: 135.90 [ms]
Filter: CFC 1000


V2P1 Lower Neck X Moment
MOMENT [Nm]
5
0
-5
-10
-15
-20
-25
-30
-35
-40
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 0.81 [Nm]
TMax: 47.85 [ms]
Min: -39.09 [Nm]
TMin: 91.10 [ms]
Filter: CFC 600

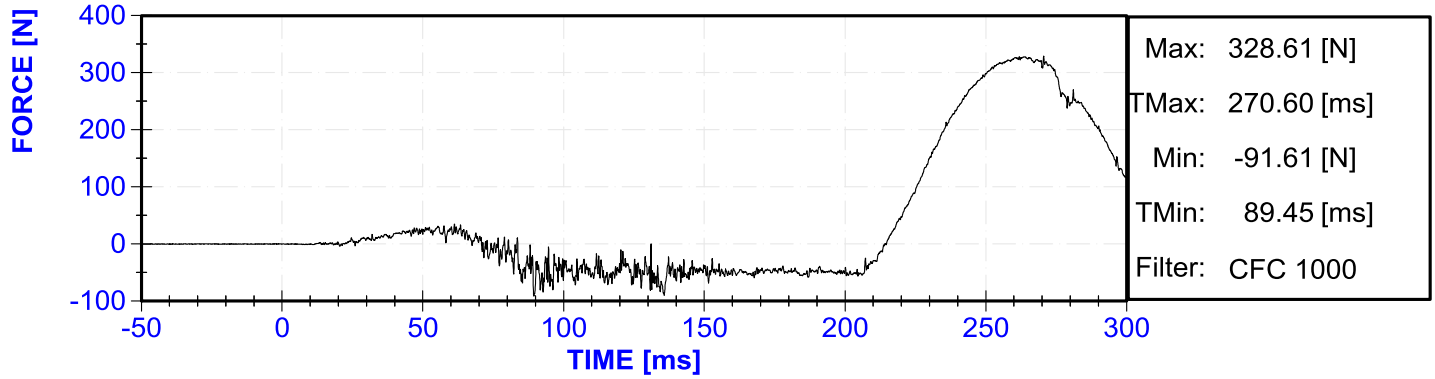
V2P1 Lower Neck Y Moment



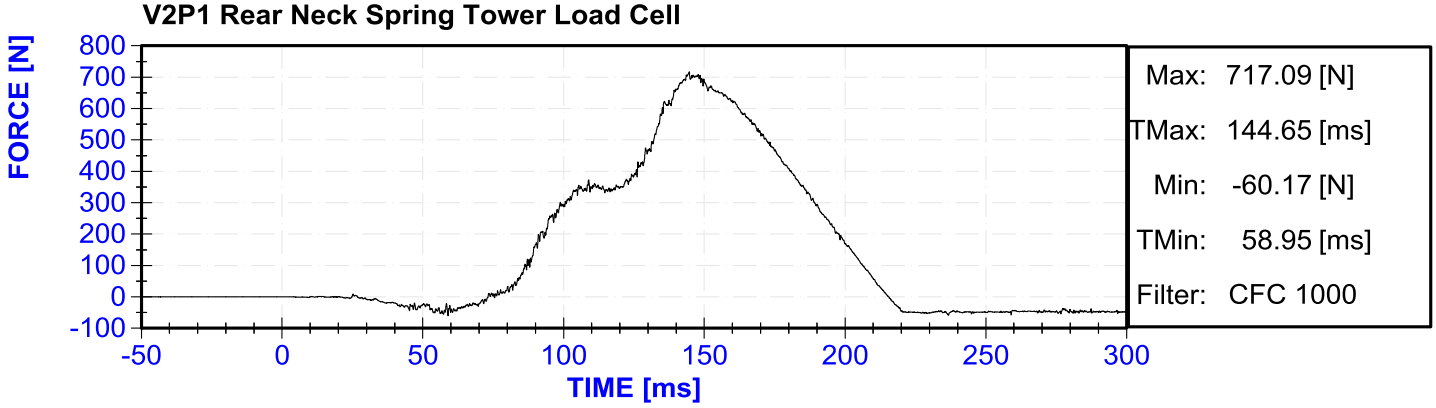
V2P1 Lower Neck Z Moment



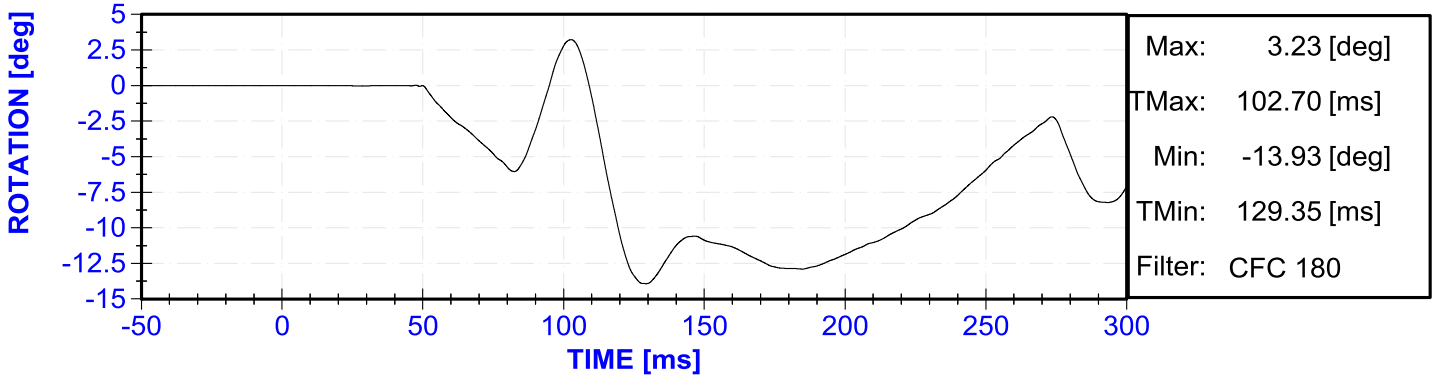
V2P1 Front Neck Spring Tower Load Cell



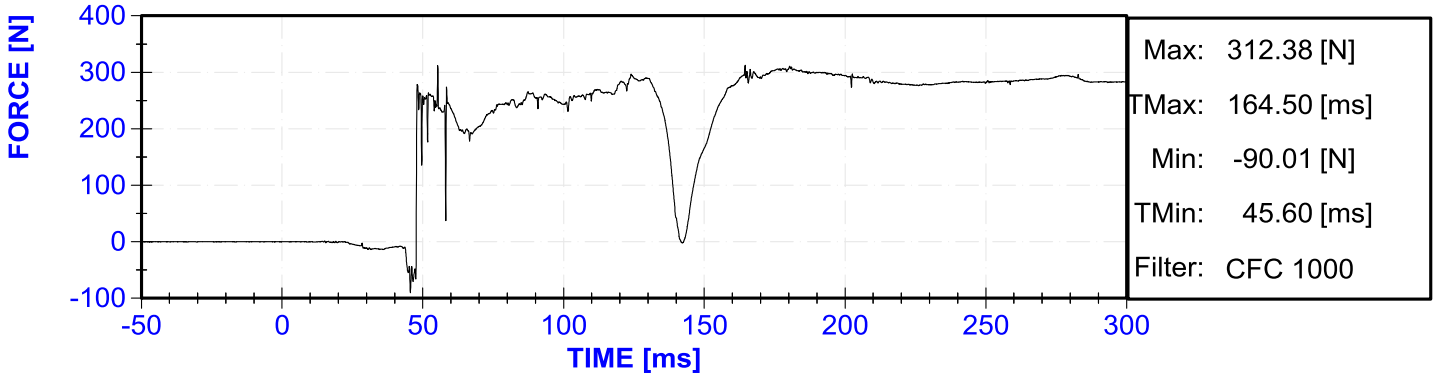
V2P1 Rear Neck Spring Tower Load Cell



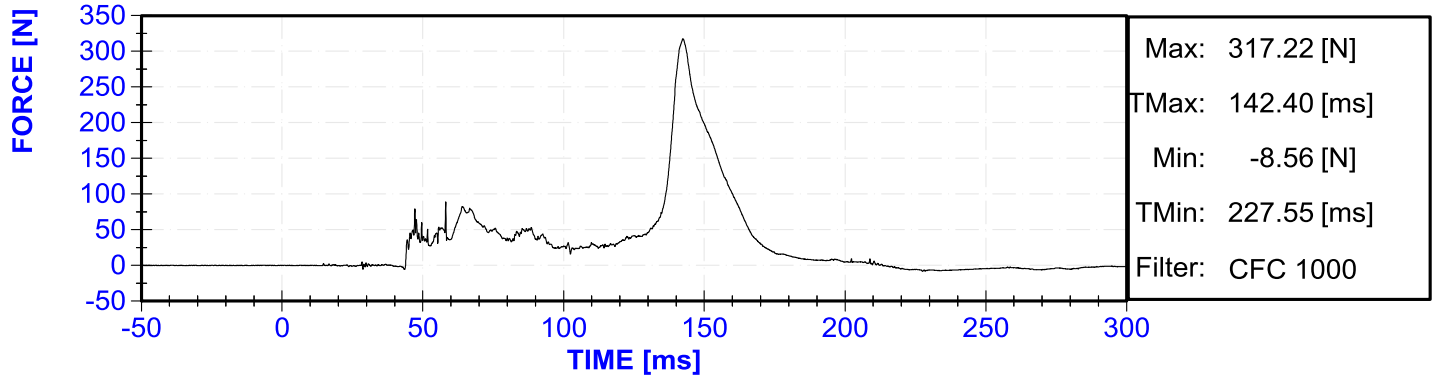
V2P1 Occipital Condyle Rotation Potentiometer



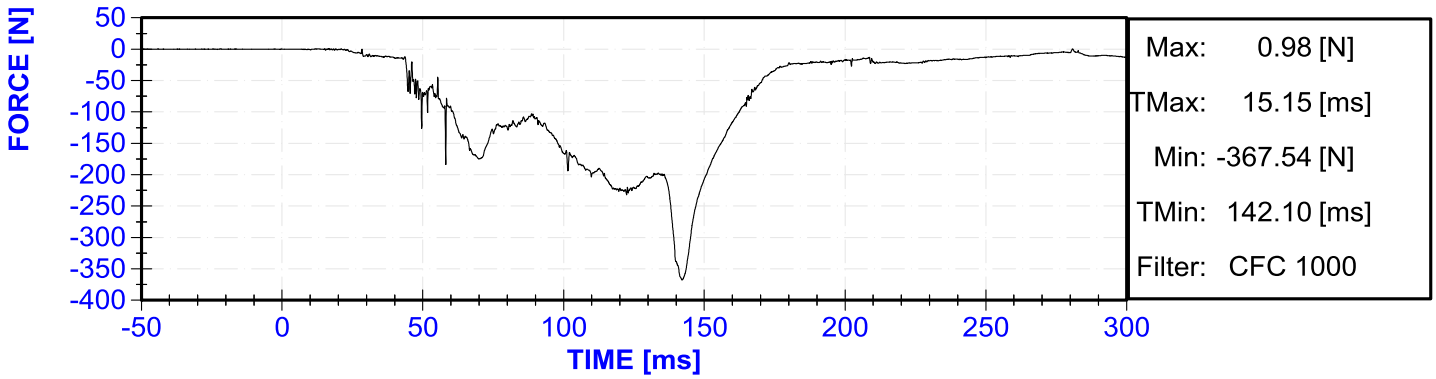
V2P1 CLAVICLE - LEFT OUTER LC FX



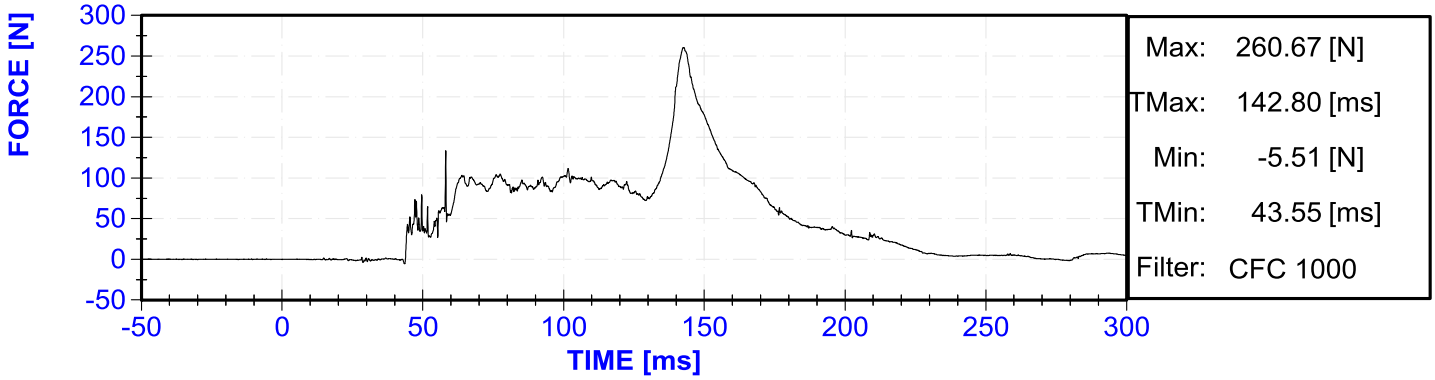
V2P1 CLAVICLE - LEFT OUTER LC FZ



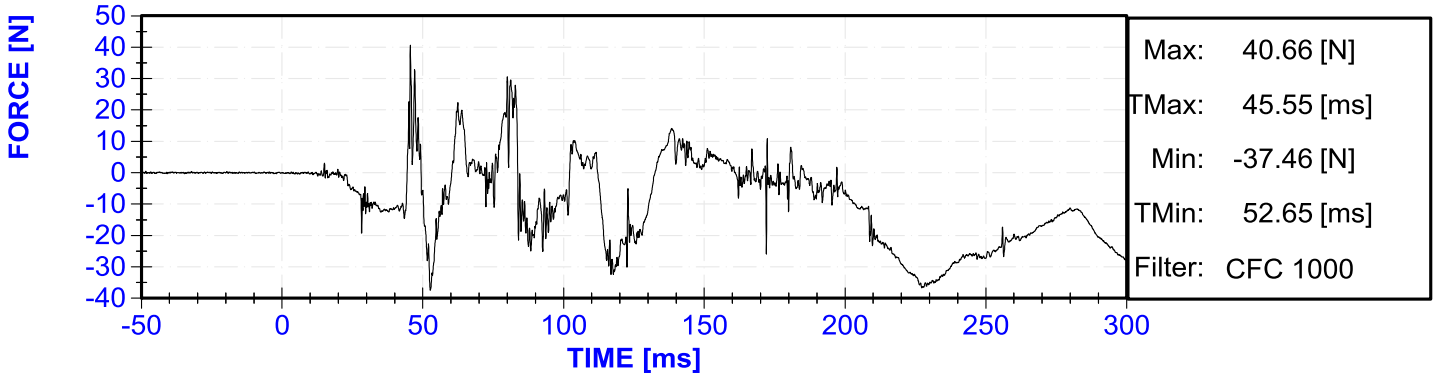
V2P1 CLAVICLE - LEFT INNER LC FX



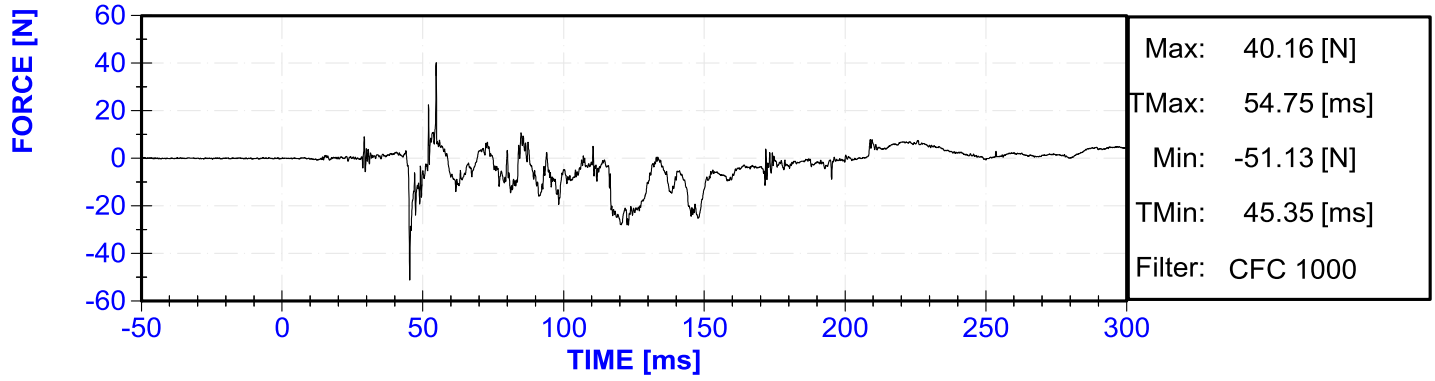
V2P1 CLAVICLE - LEFT INNER LC FZ



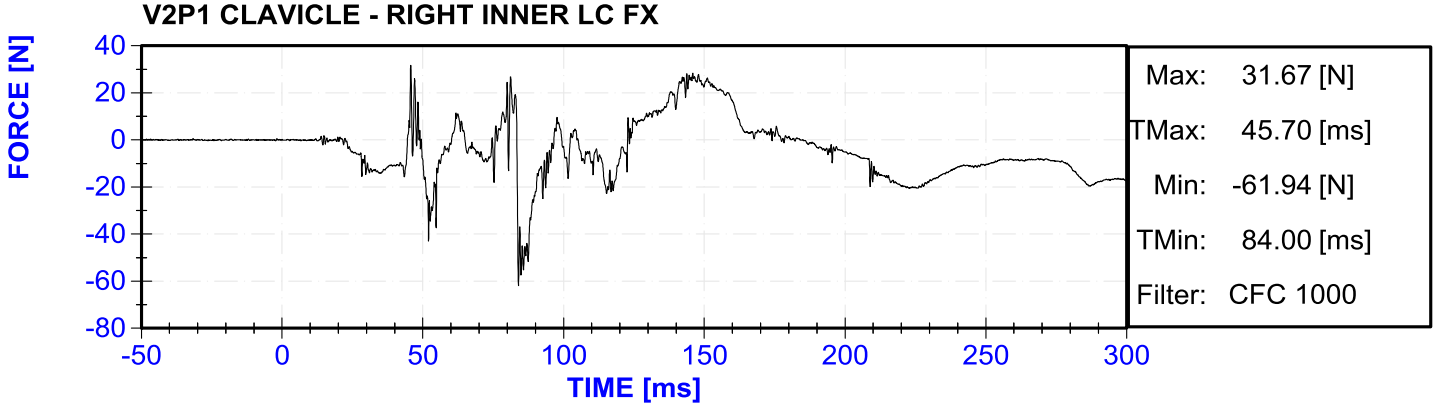
V2P1 CLAVICLE - RIGHT OUTER LC FX



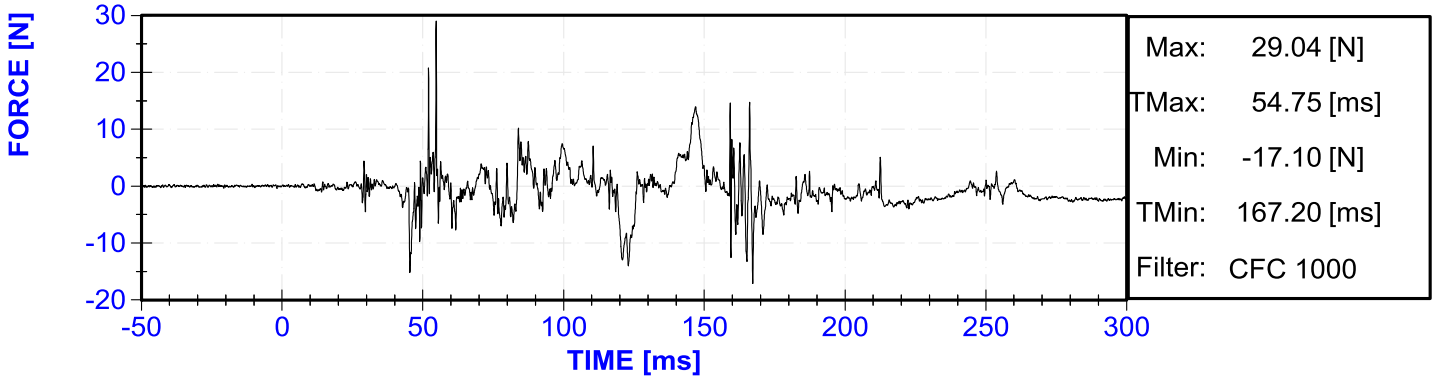
V2P1 CLAVICLE - RIGHT OUTER LC FZ



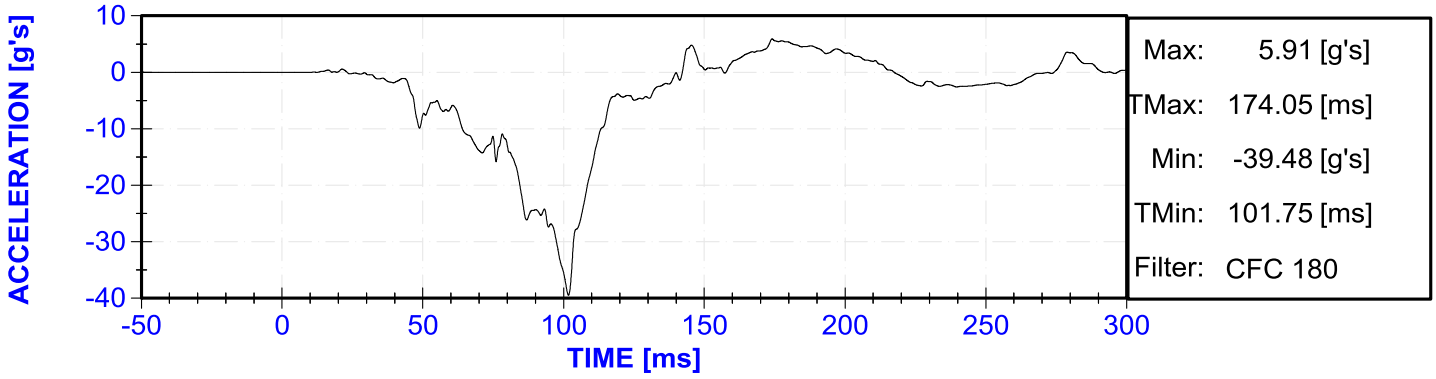
V2P1 CLAVICLE - RIGHT INNER LC FX



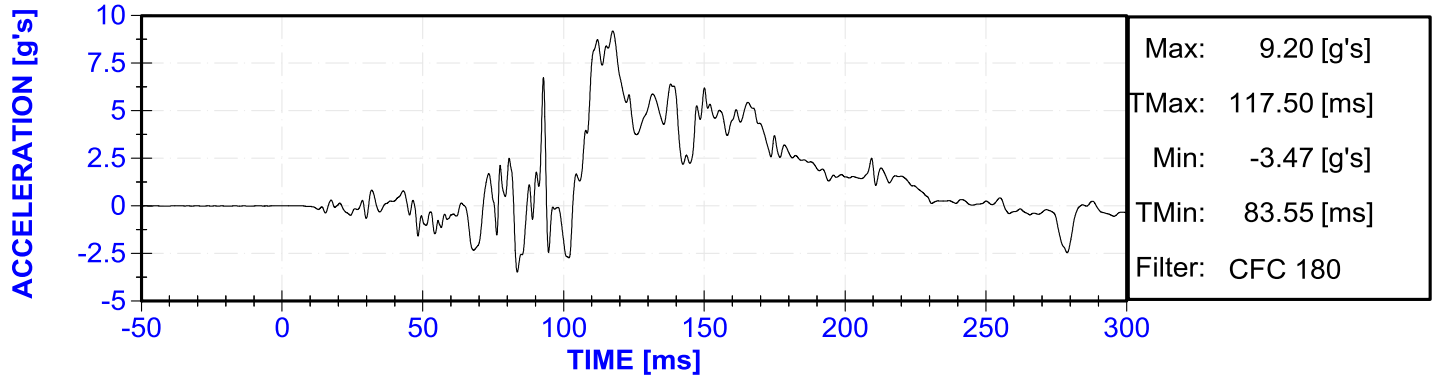
V2P1 CLAVICLE - RIGHT INNER LC FZ



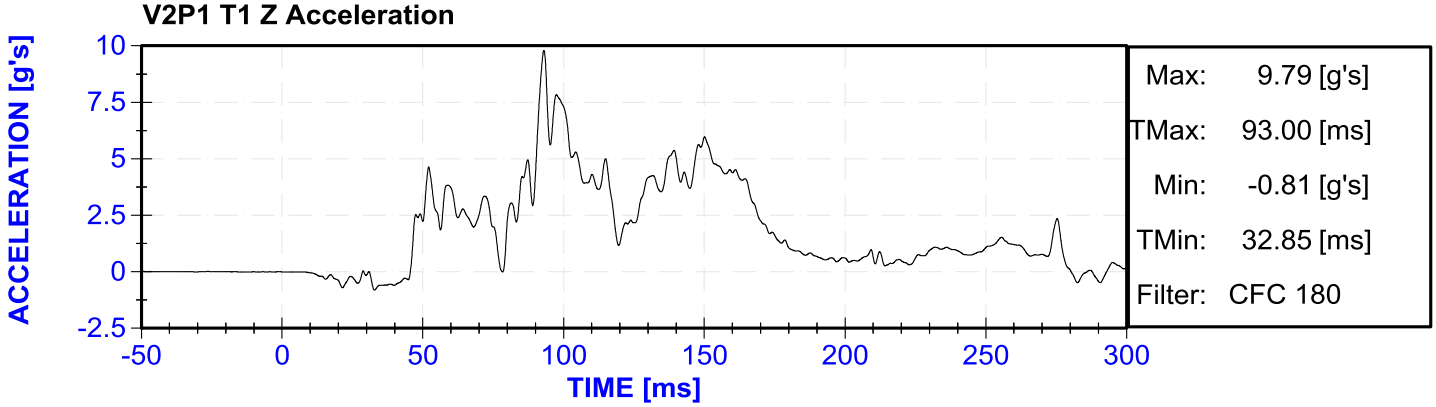
V2P1 T1 X Acceleration

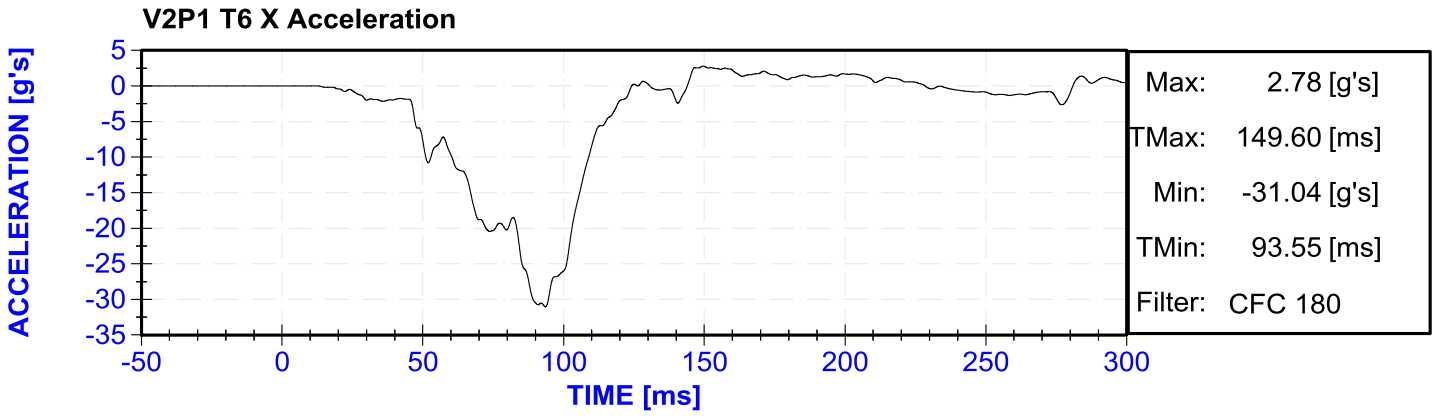


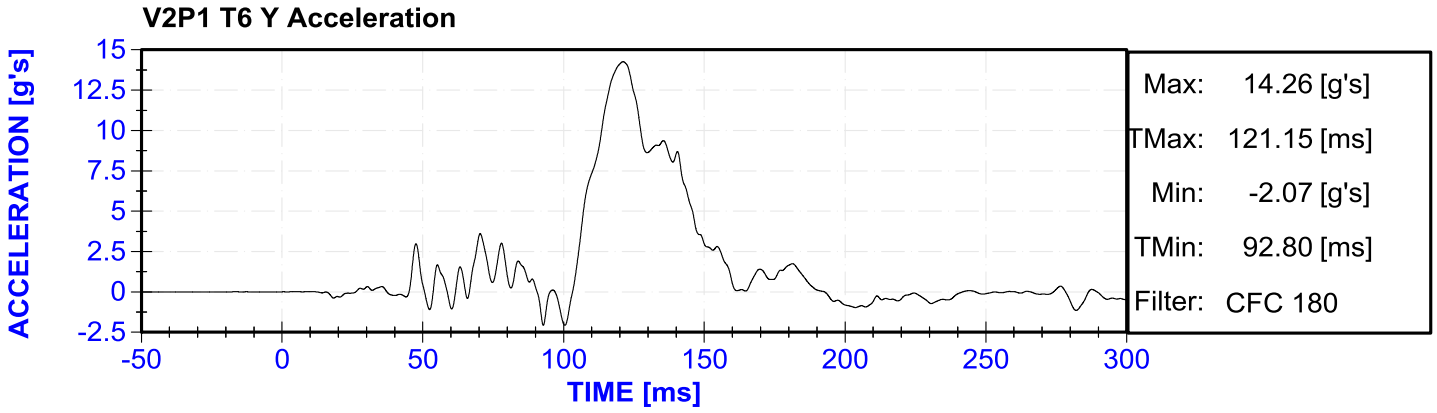
V2P1 T1 Y Acceleration

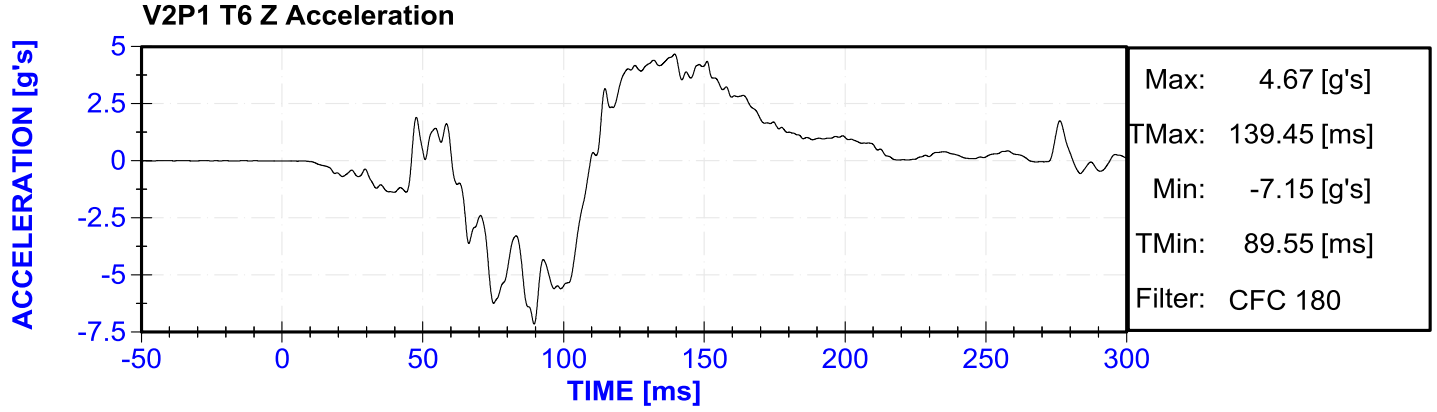


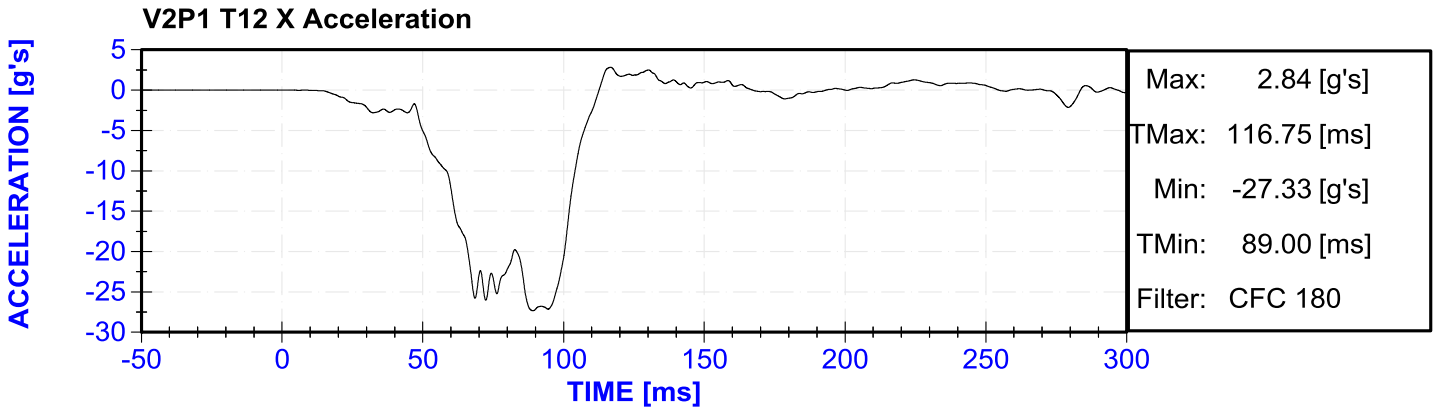
V2P1 T1 Z Acceleration



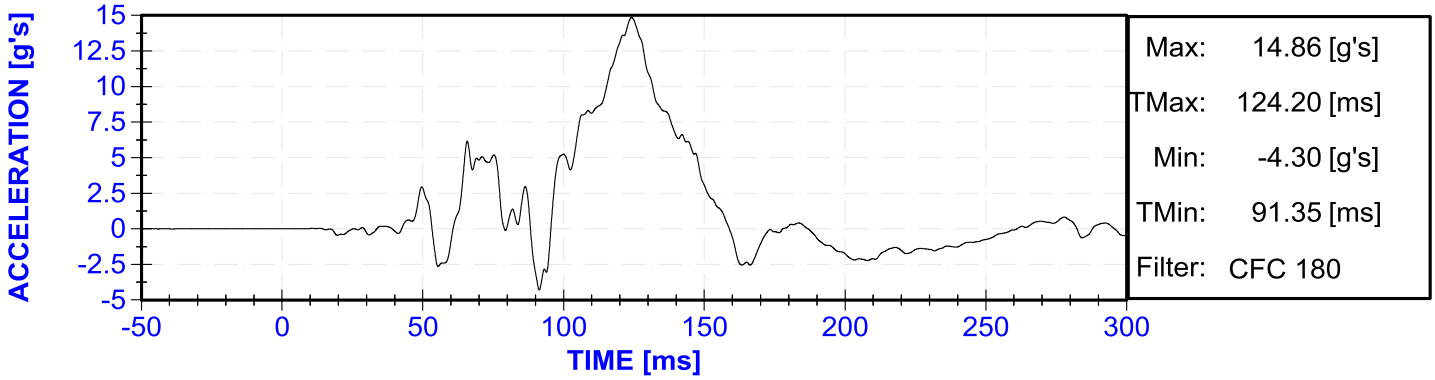

V2P1 T6 X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 2.78 [g's]
TMax: 149.60 [ms]
Min: -31.04 [g's]
TMin: 93.55 [ms]
Filter: CFC 180


V2P1 T6 Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 14.26 [g's]
TMax: 121.15 [ms]
Min: -2.07 [g's]
TMin: 92.80 [ms]
Filter: CFC 180

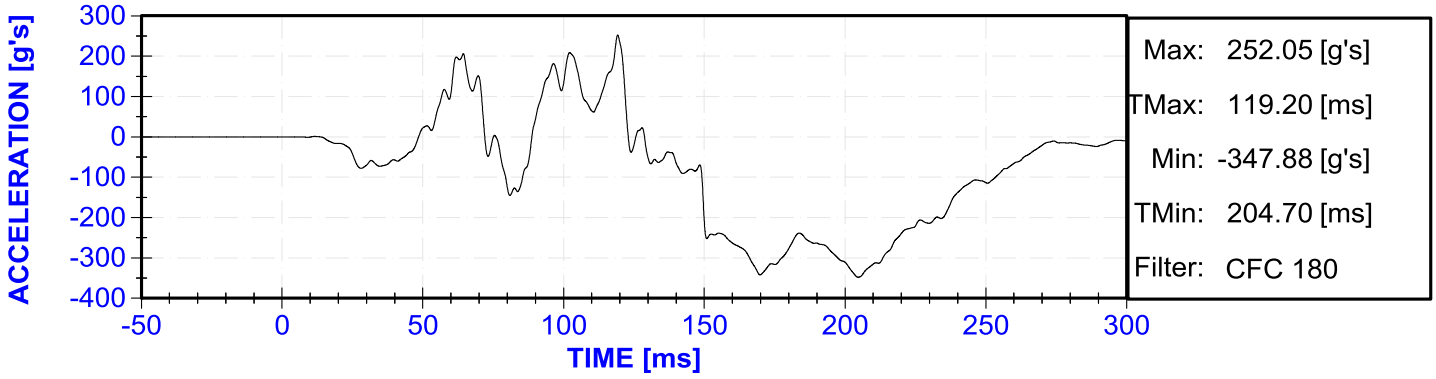

V2P1 T6 Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 4.67 [g's]
TMax: 139.45 [ms]
Min: -7.15 [g's]
TMin: 89.55 [ms]
Filter: CFC 180


V2P1 T12 X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 2.84 [g's]
TMax: 116.75 [ms]
Min: -27.33 [g's]
TMin: 89.00 [ms]
Filter: CFC 180

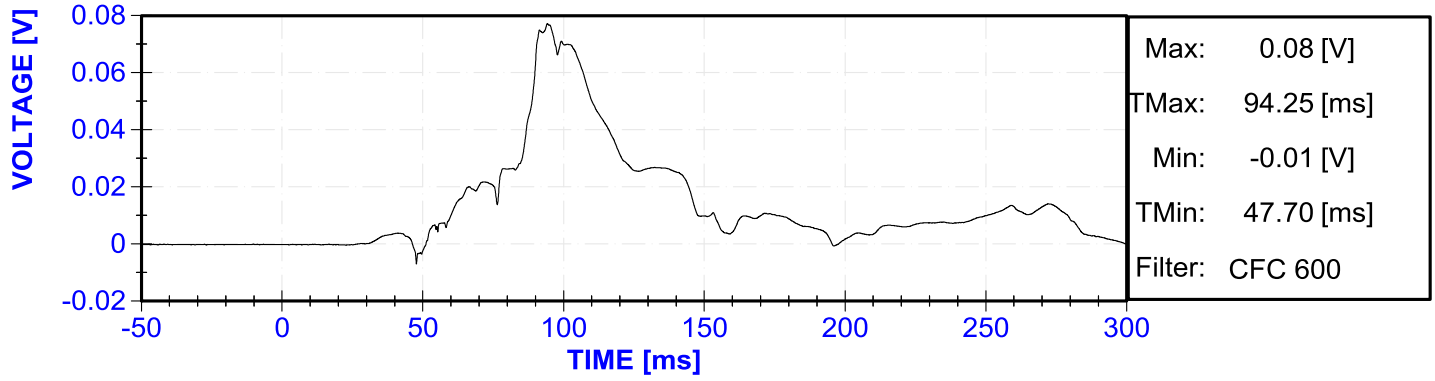
V2P1 T12 Y Acceleration



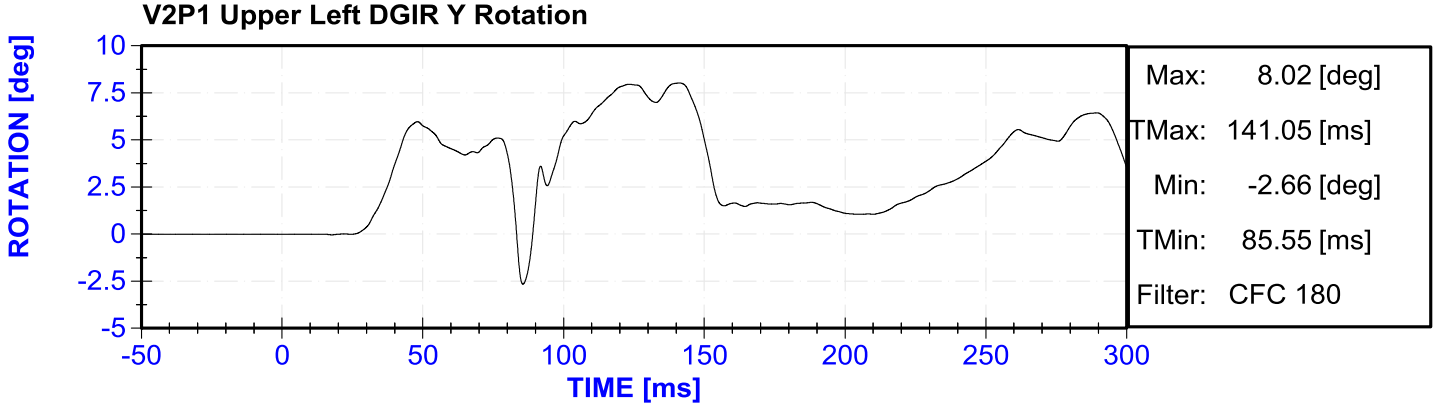
V2P1 T12 Z Acceleration



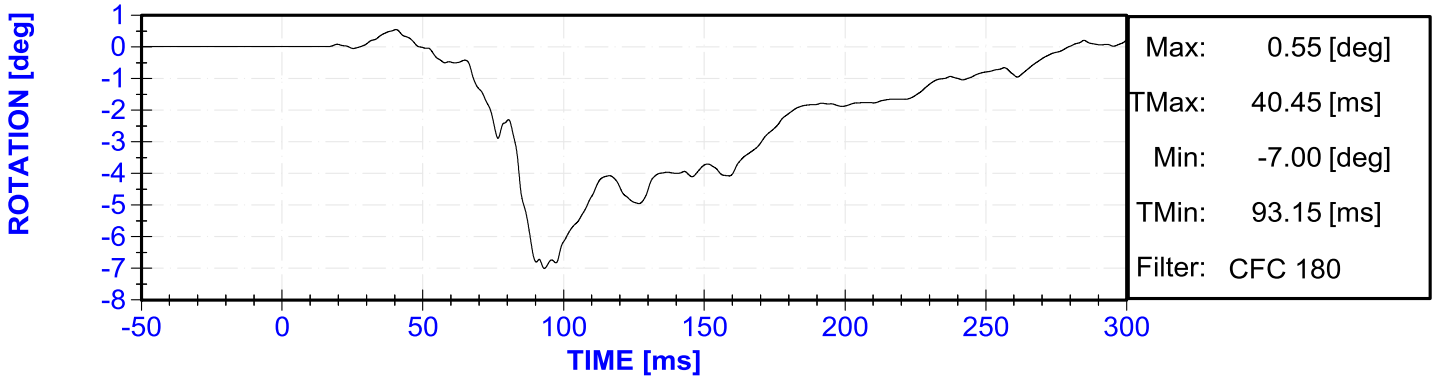
V2P1 Upper Left DGIR X Displacement



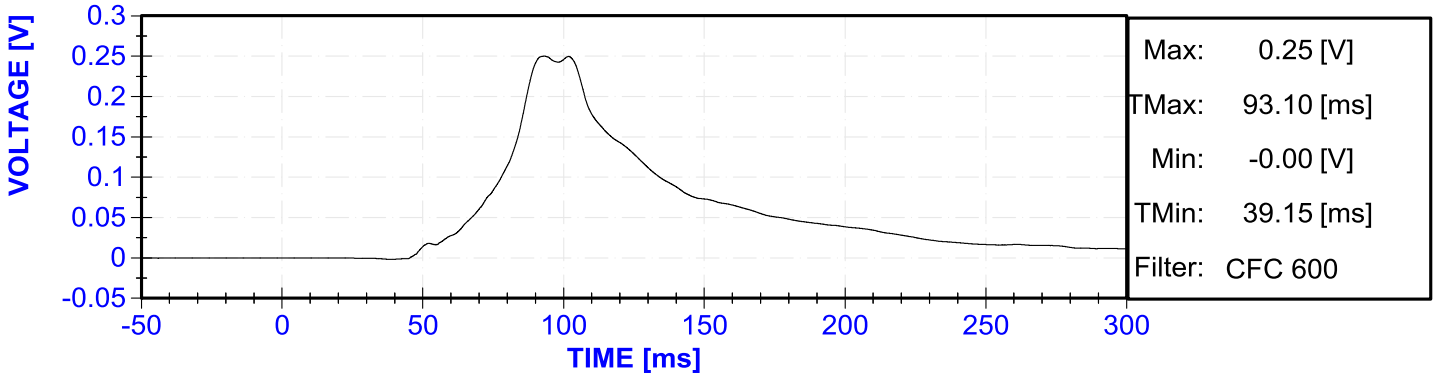
V2P1 Upper Left DGIR Y Rotation



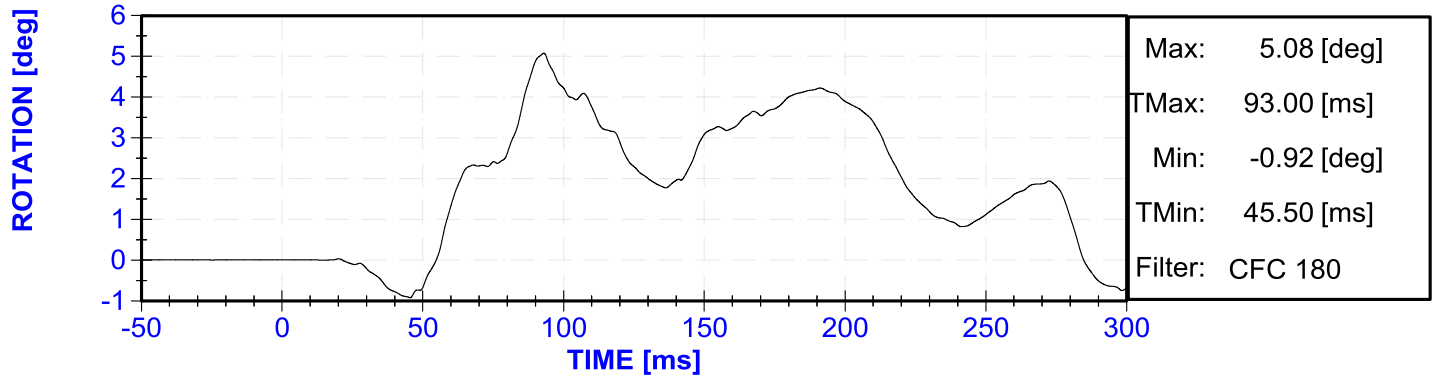
V2P1 Upper Left DGIR Z Rotation



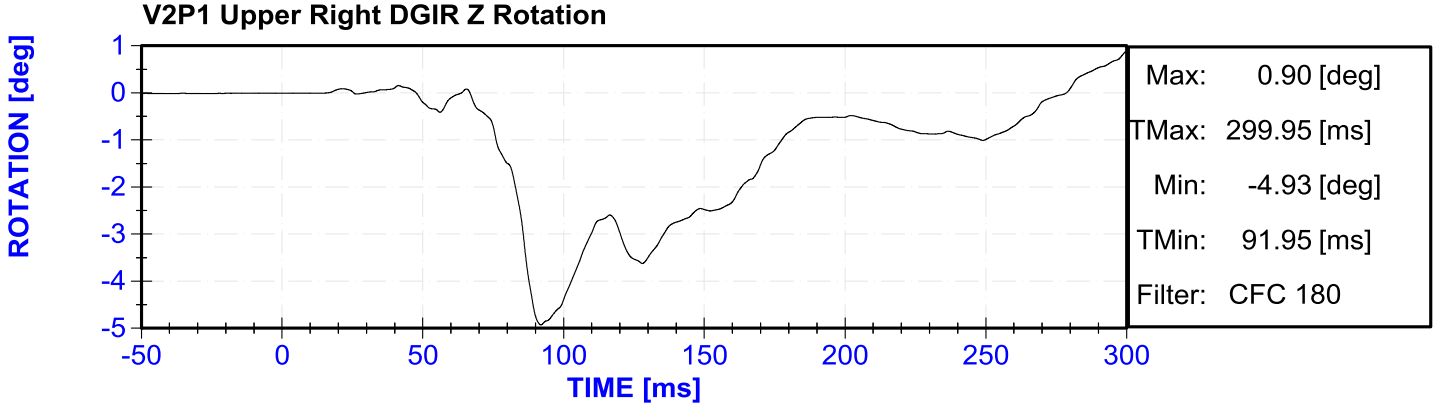
V2P1 Upper Right DGIR X Displacement



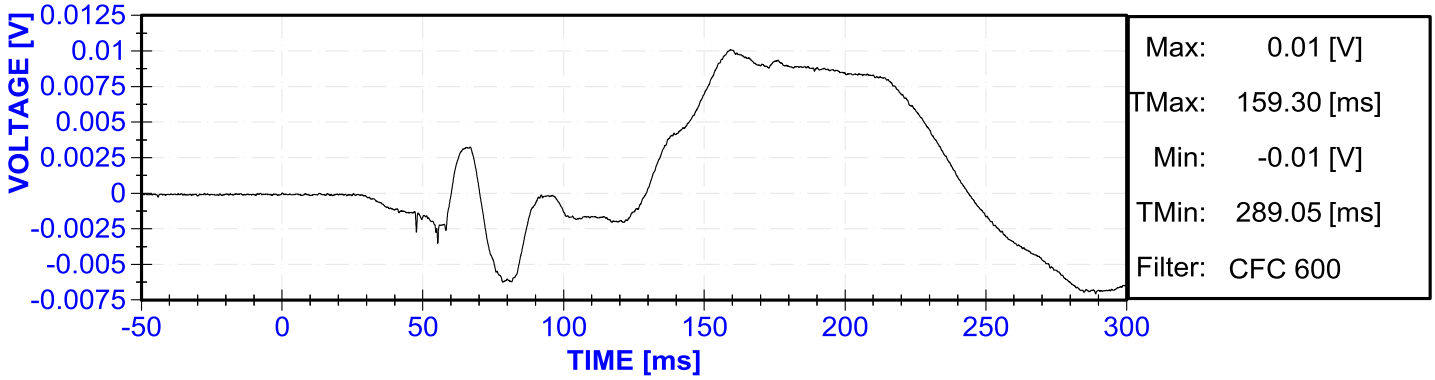
V2P1 Upper Right DGIR Y Rotation



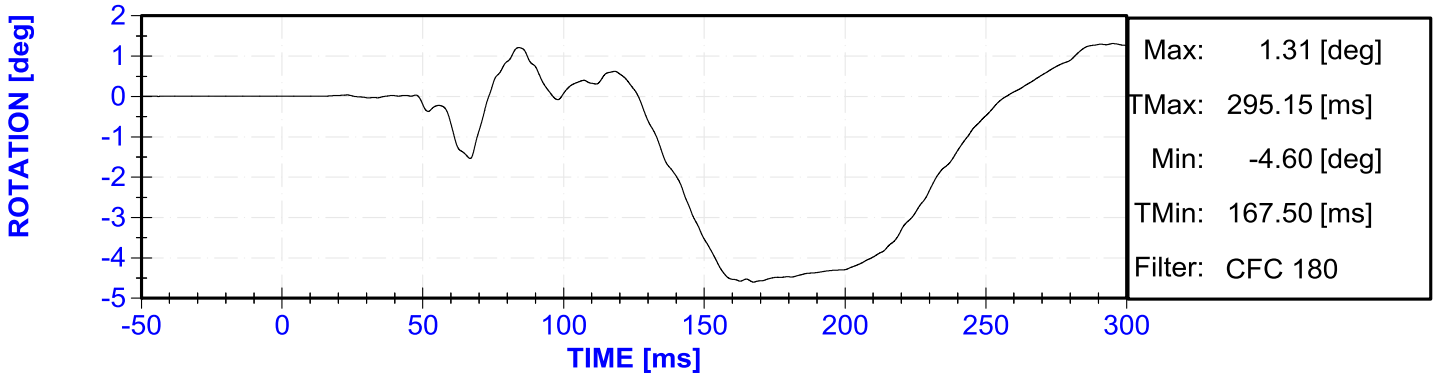
V2P1 Upper Right DGIR Z Rotation



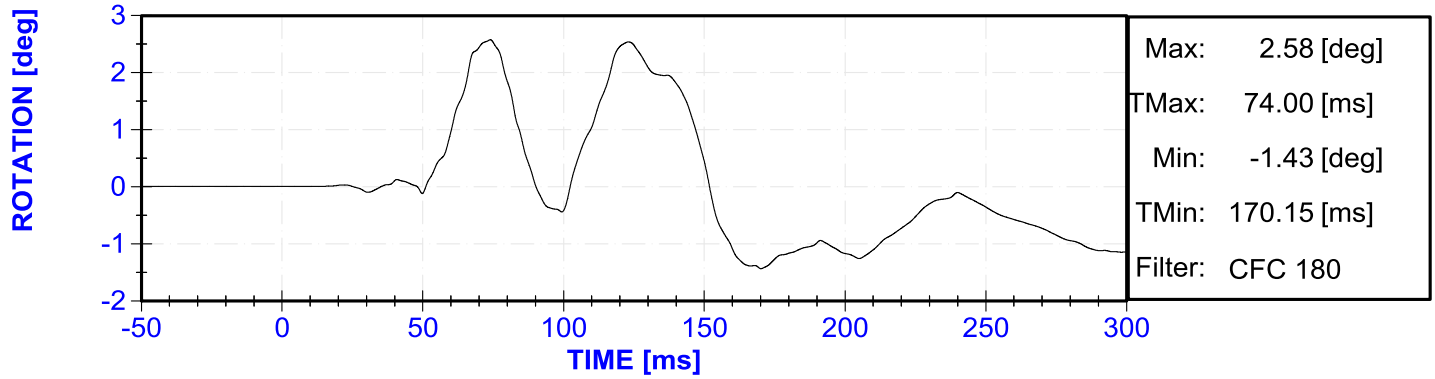
V2P1 Lower Left DGIR X Displacement



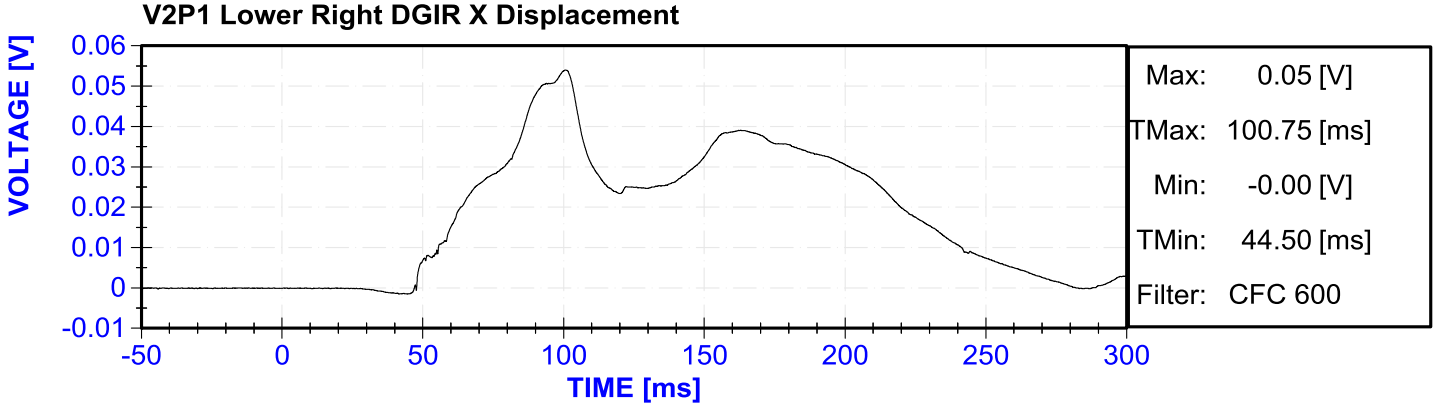
V2P1 Lower Left DGIR Y Rotation



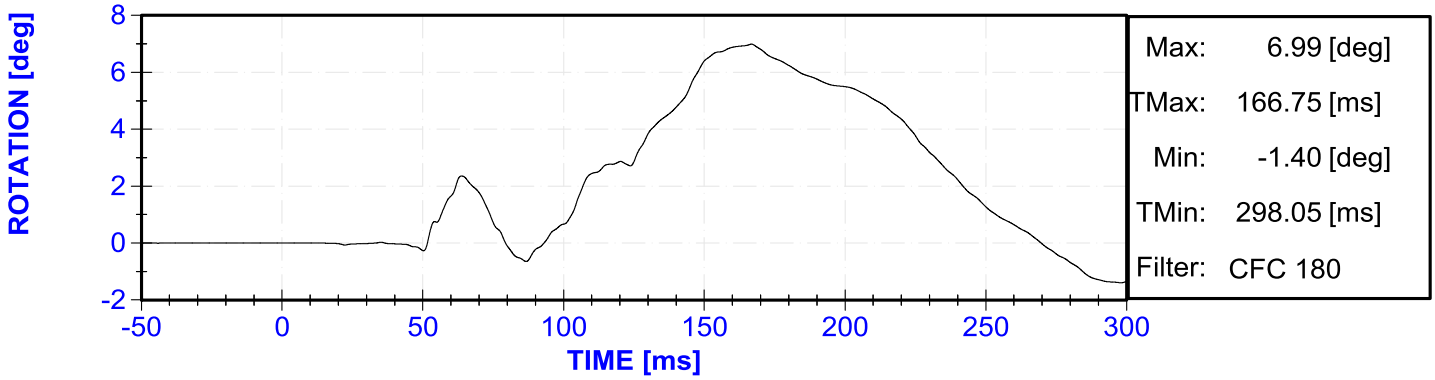
V2P1 Lower Left DGIR Z Rotation



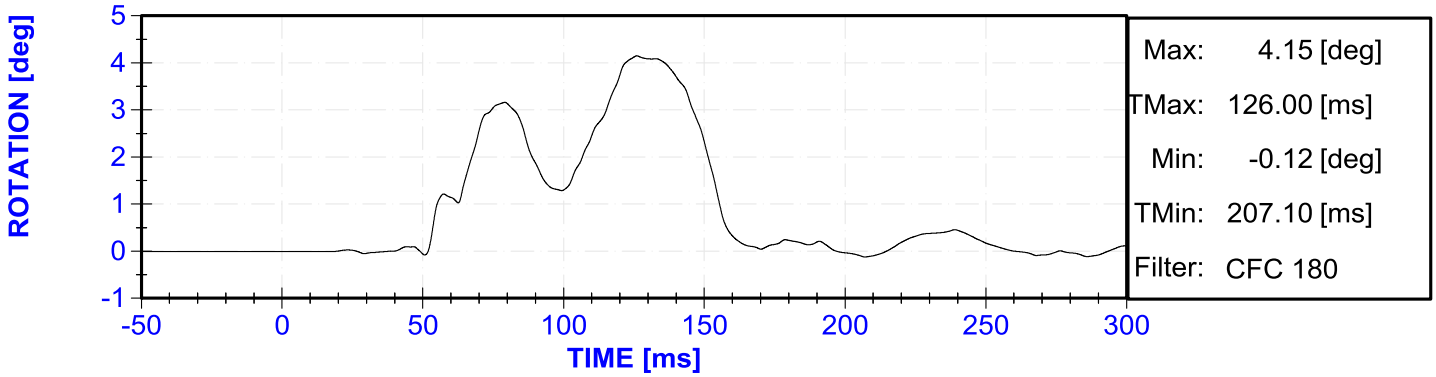
V2P1 Lower Right DGIR X Displacement



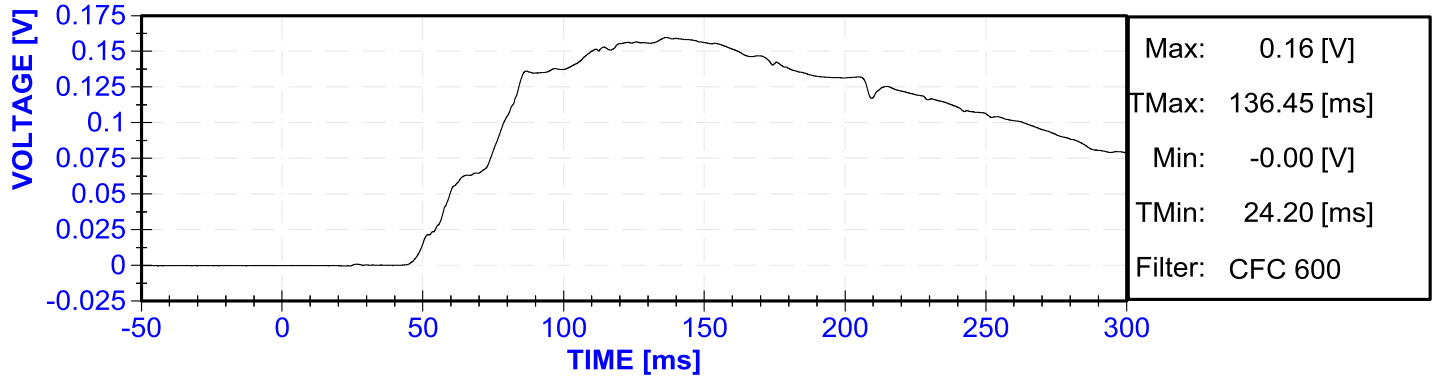
V2P1 Lower Right DGIR Y Rotation



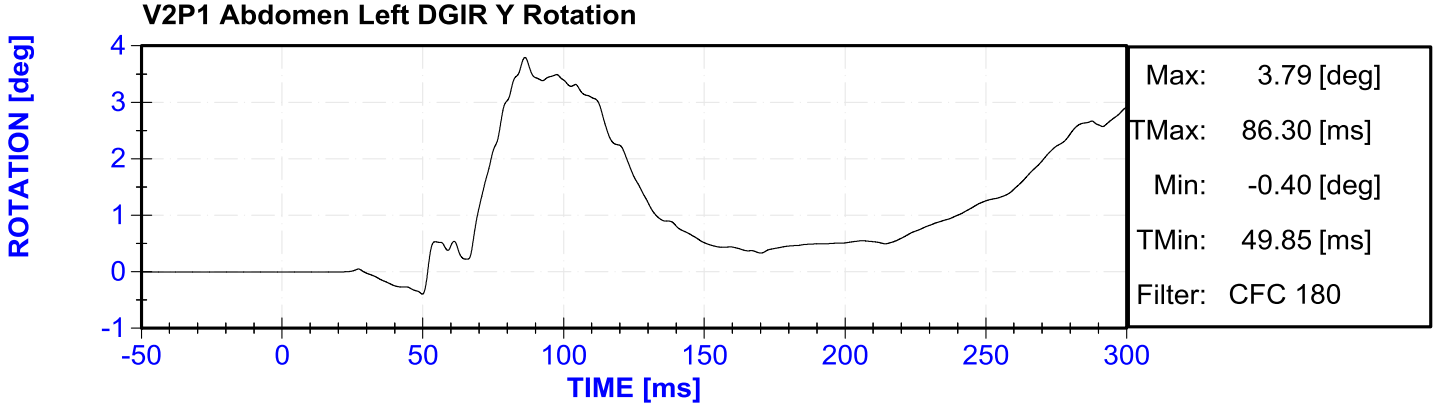
V2P1 Lower Right DGIR Z Rotation



V2P1 Abdomen Left DGIR X Displacement

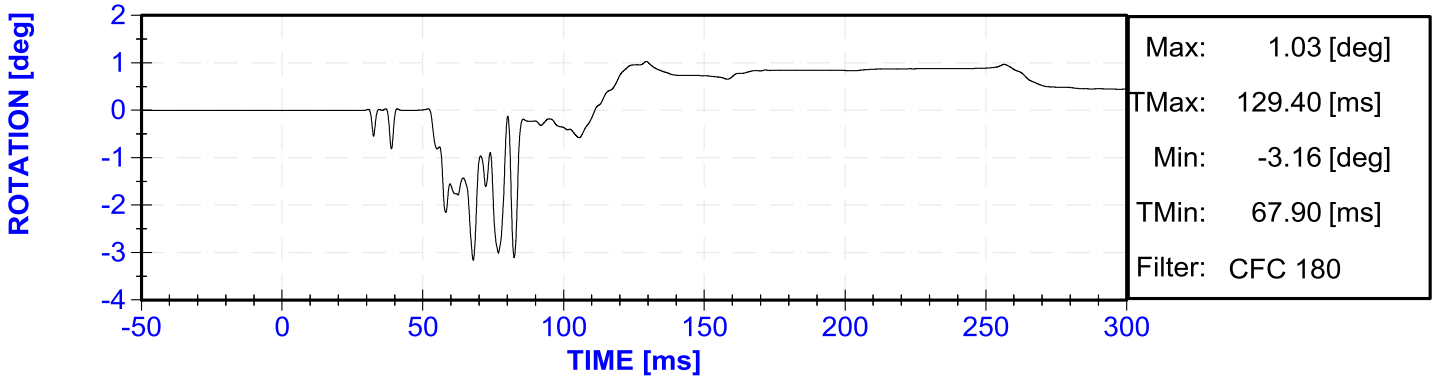


V2P1 Abdomen Left DGIR Y Rotation

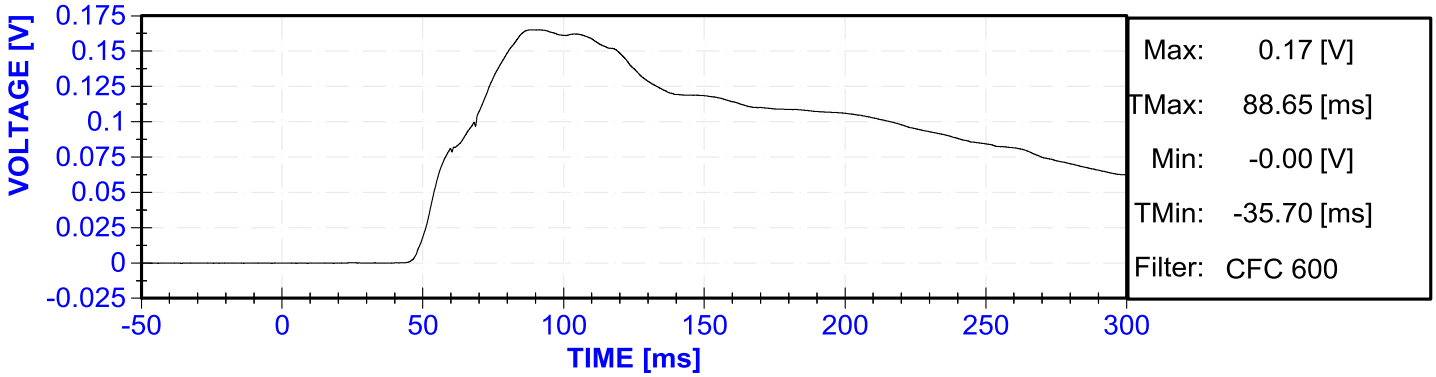


V2P1 Abdomen Left DGIR Z Rotation

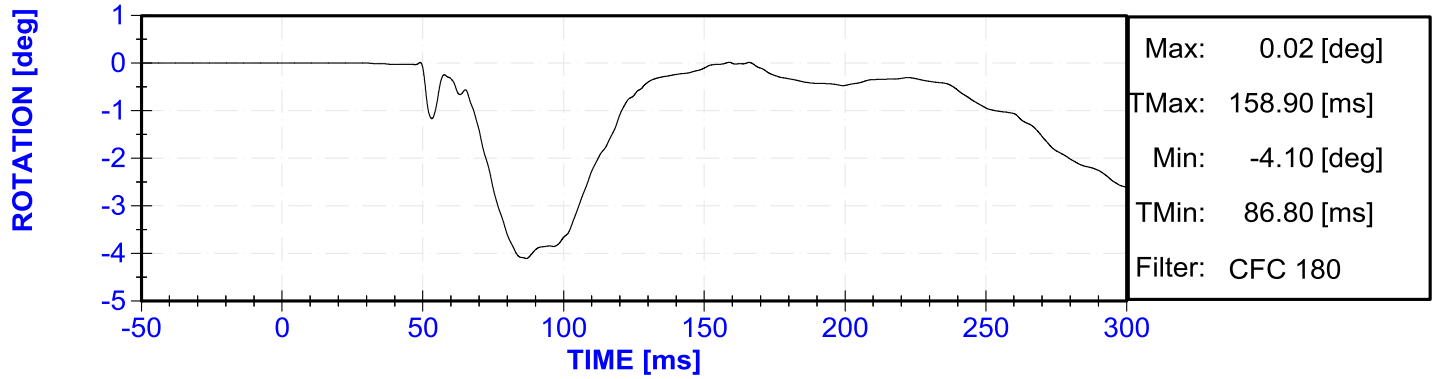
NOISE ON DATA 56-85 MS



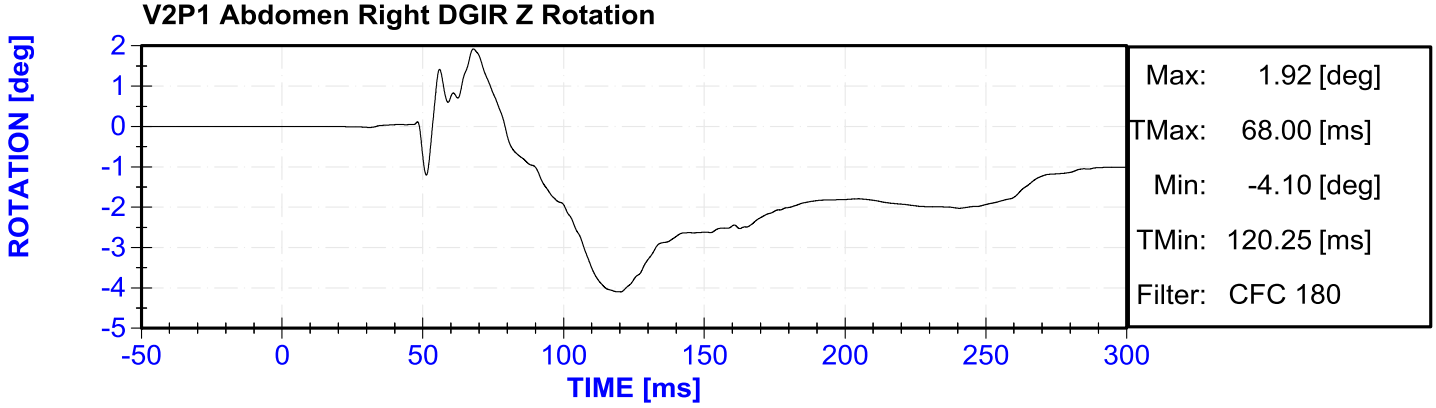
V2P1 Abdomen Right DGIR X Displacement



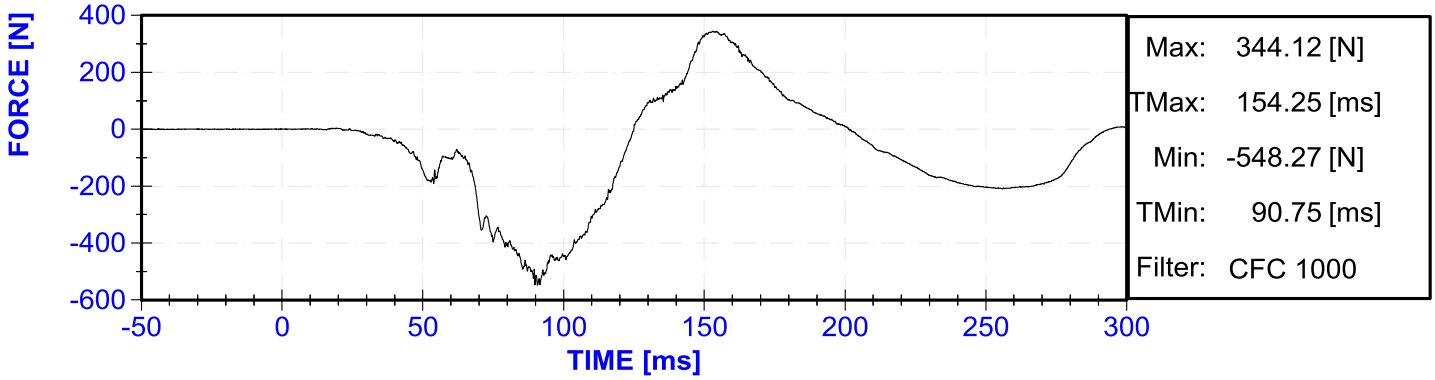
V2P1 Abdomen Right DGIR Y Rotation



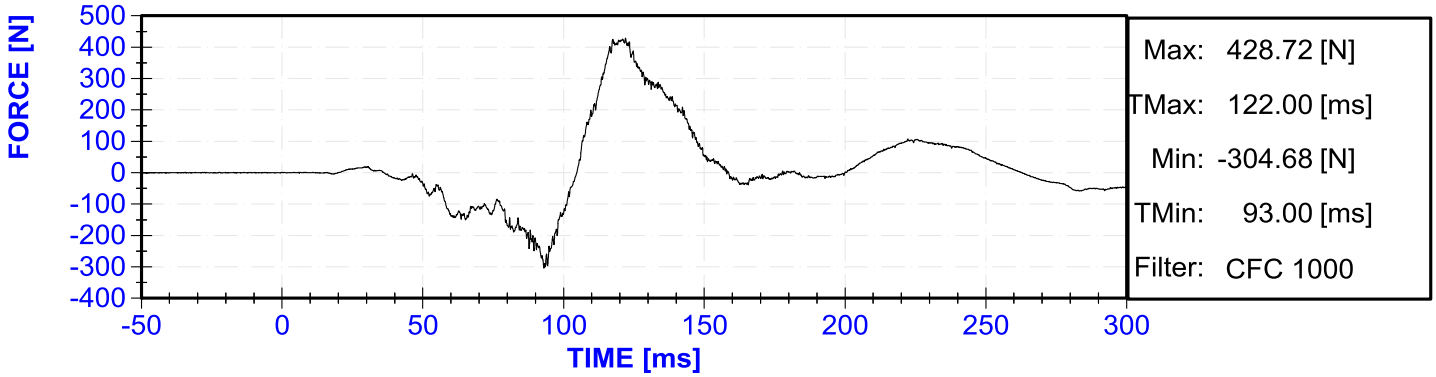
V2P1 Abdomen Right DGIR Z Rotation



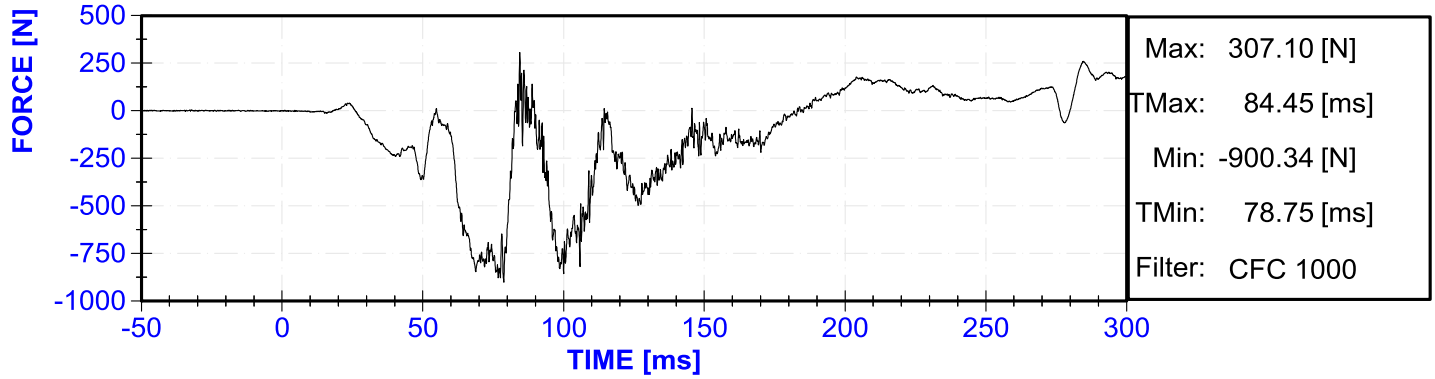
V2P1 Spine Force X



V2P1 Spine Force Y

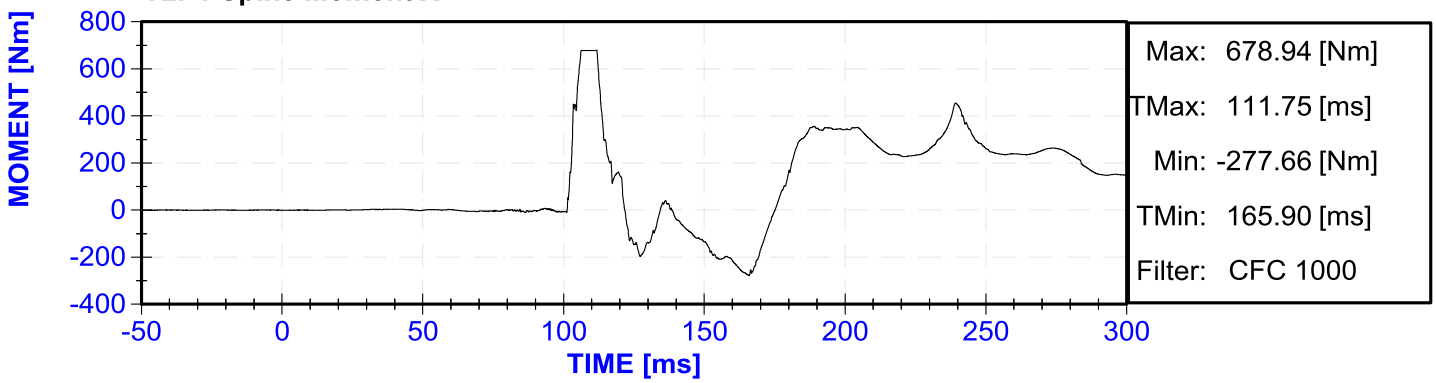


V2P1 Spine Force Z



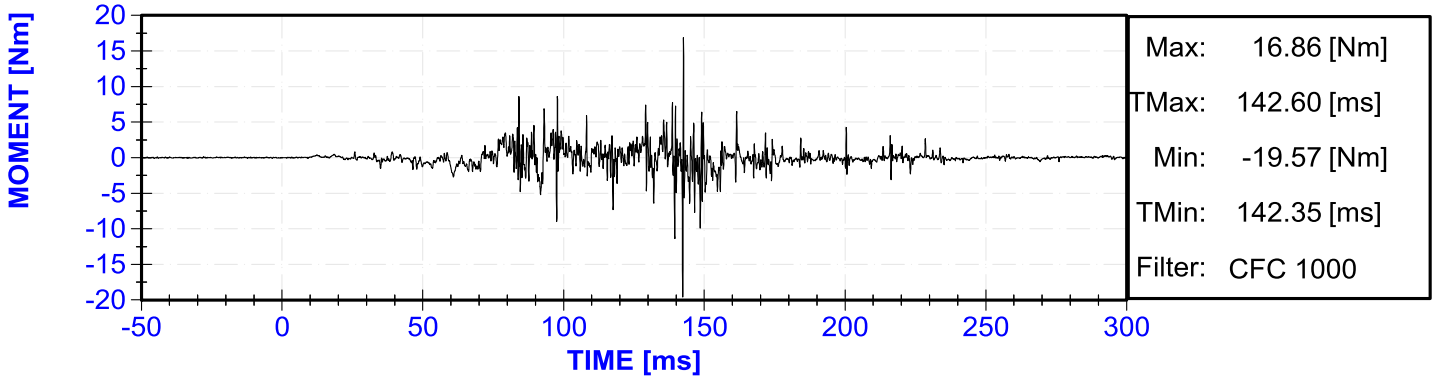
V2P1 Spine Moment X

SATURATED FROM 110 TO 115MS

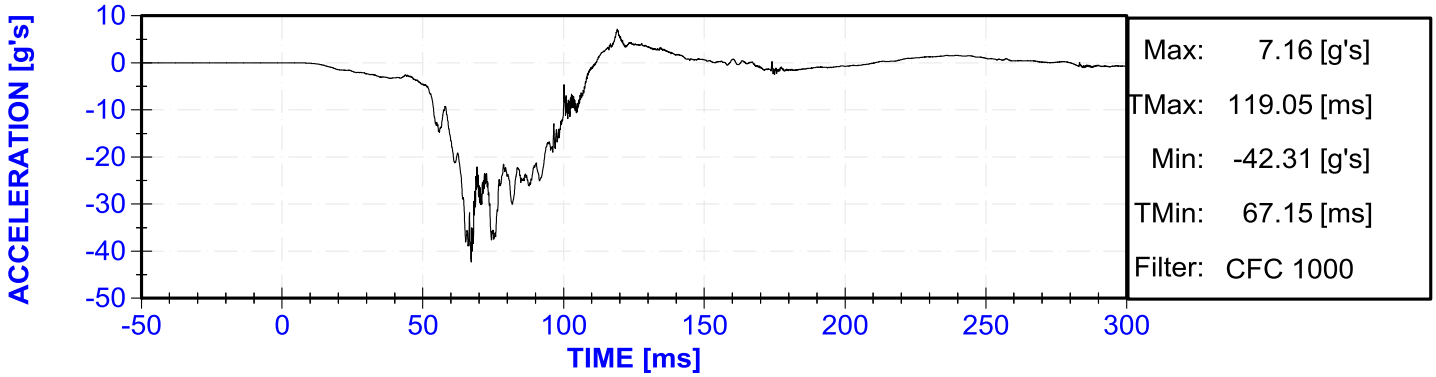


V2P1 Spine Moment Y

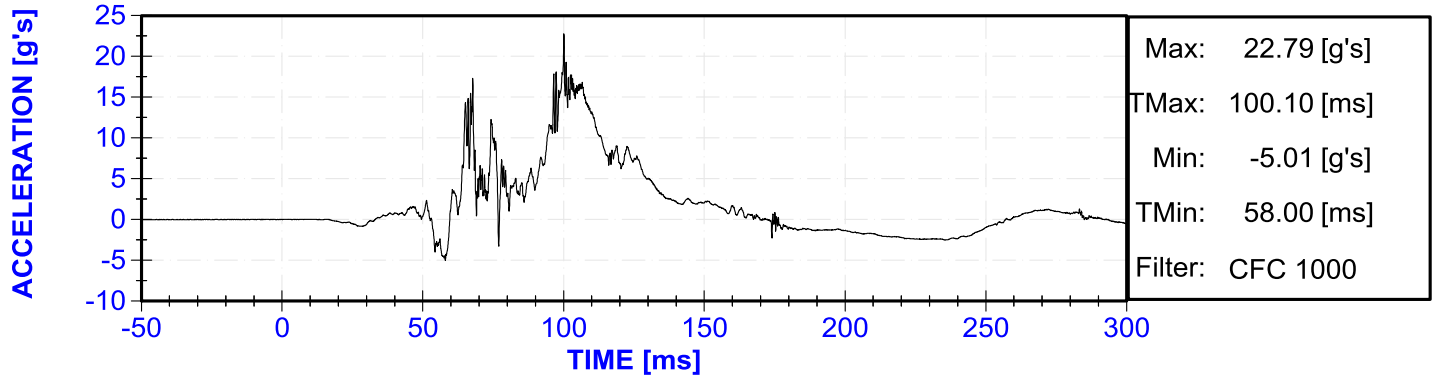
QUESTIONABLE DATA FROM THROUGHOUT



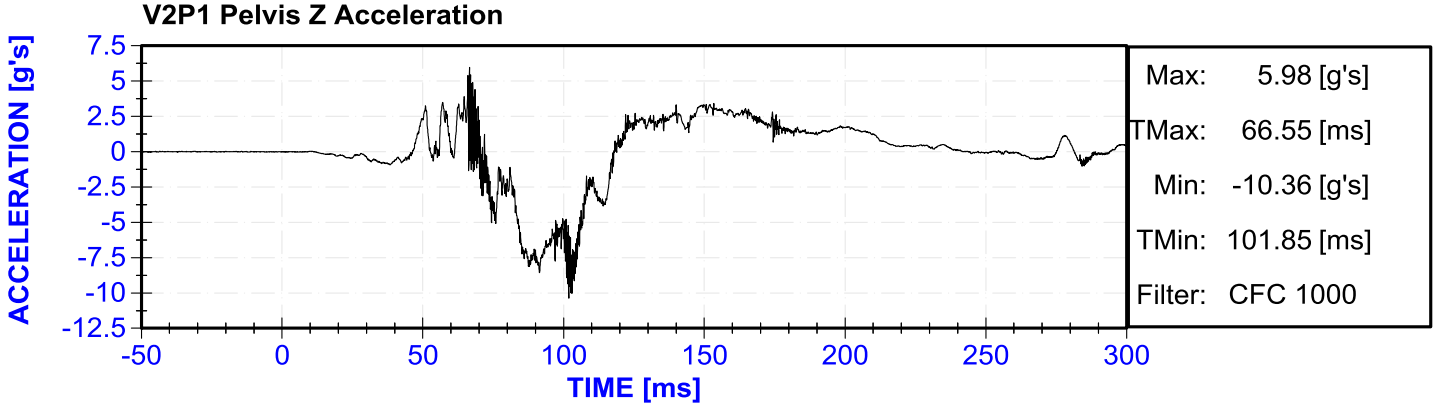
V2P1 Pelvis X Acceleration

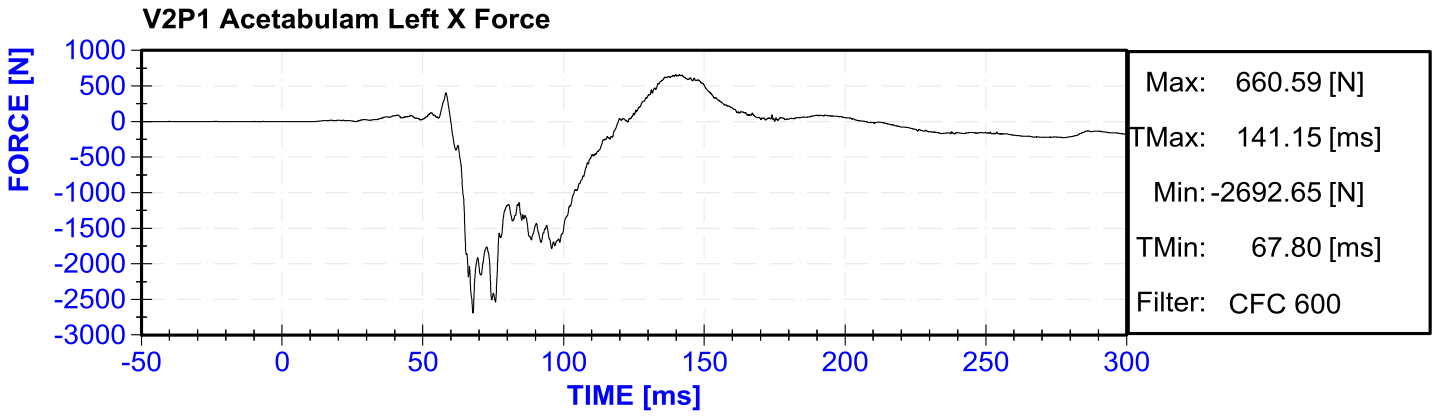


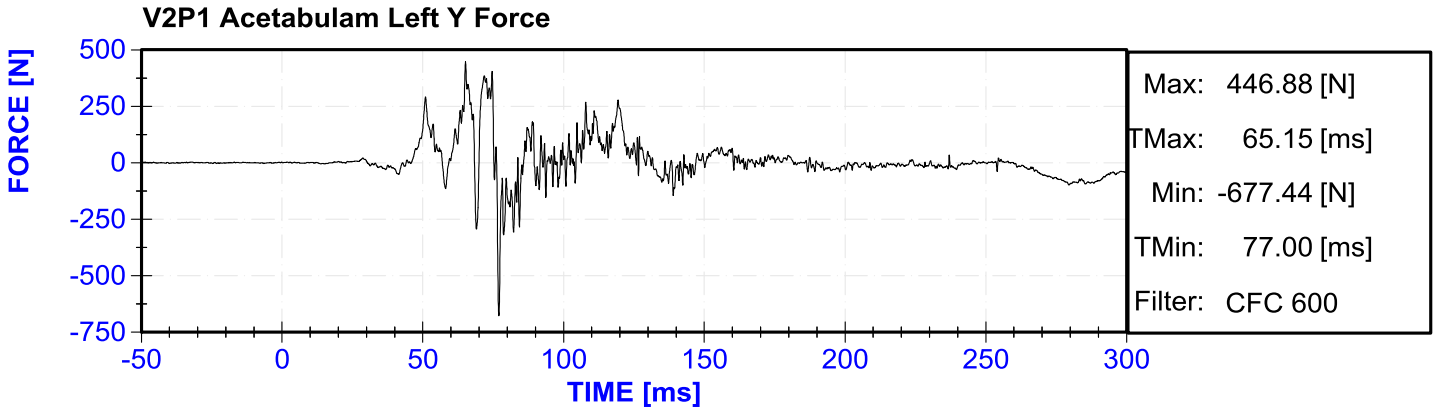
V2P1 Pelvis Y Acceleration

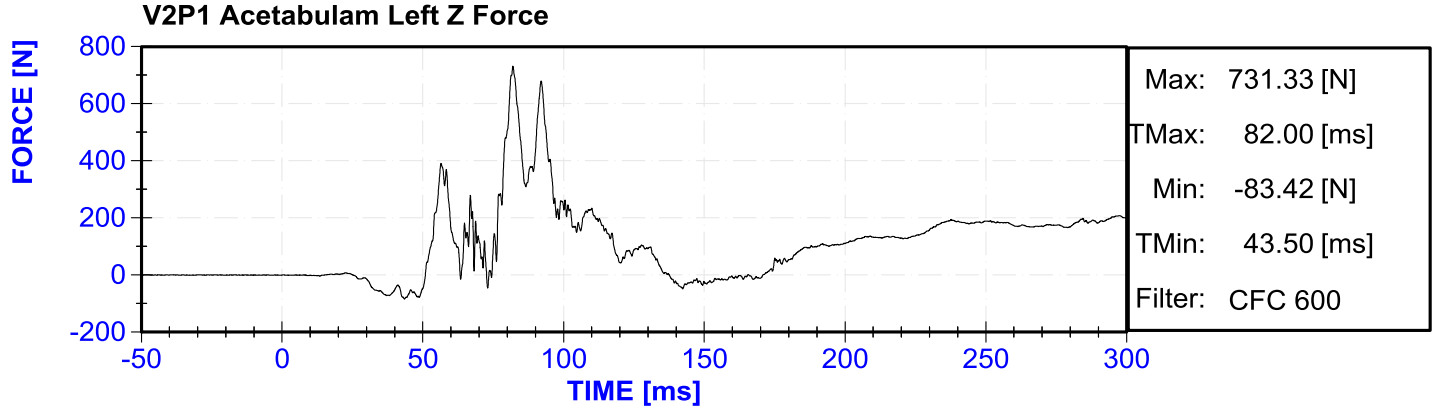


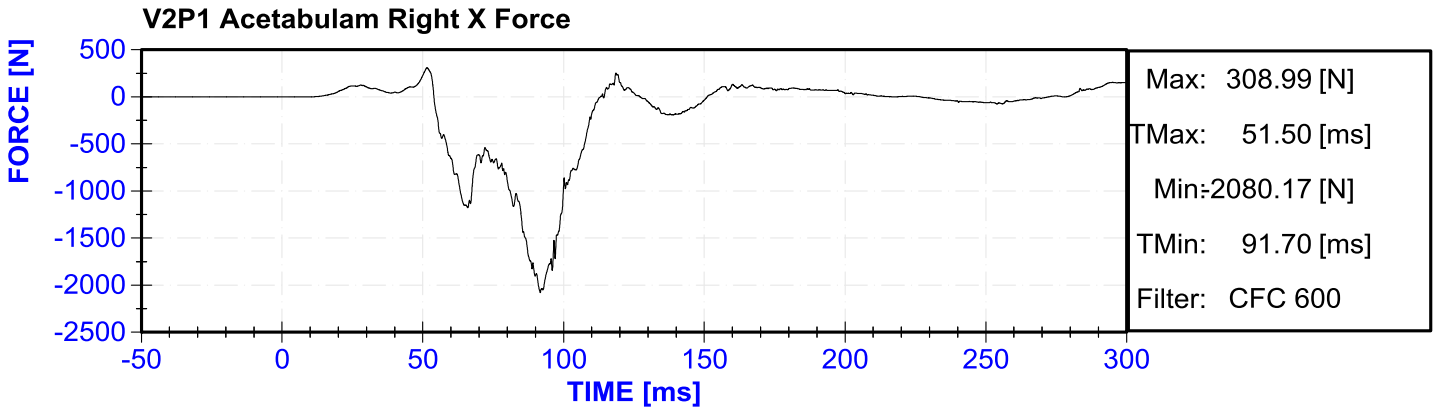
V2P1 Pelvis Z Acceleration



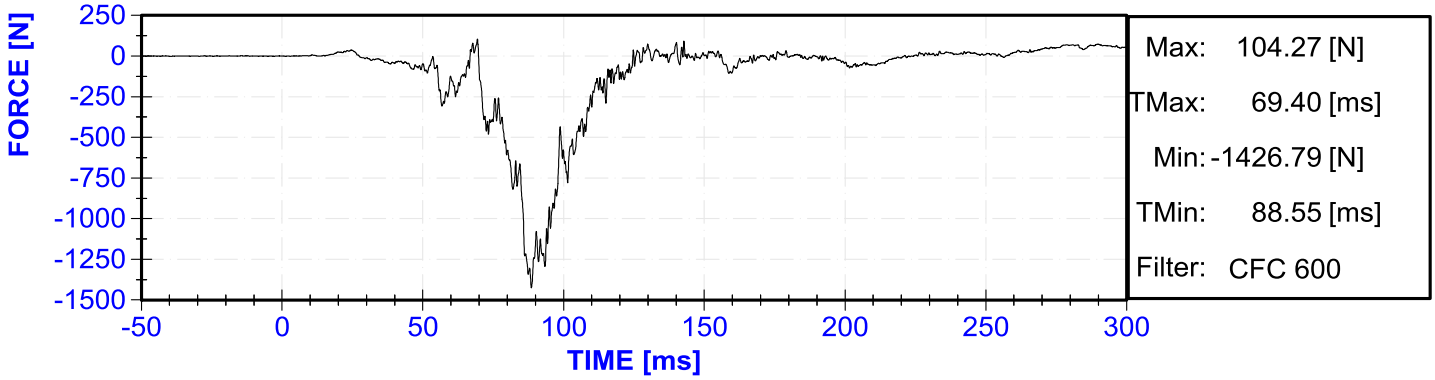

V2P1 Acetabulam Left X Force
FORCE [N]
1000
500
0
-500
-1000
-1500
-2000
-2500
-3000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 660.59 [N]
TMax: 141.15 [ms]
Min: -2692.65 [N]
TMin: 67.80 [ms]
Filter: CFC 600


V2P1 Acetabulam Left Y Force
FORCE [N]
500
250
0
-250
-500
-750
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 446.88 [N]
TMax: 65.15 [ms]
Min: -677.44 [N]
TMin: 77.00 [ms]
Filter: CFC 600

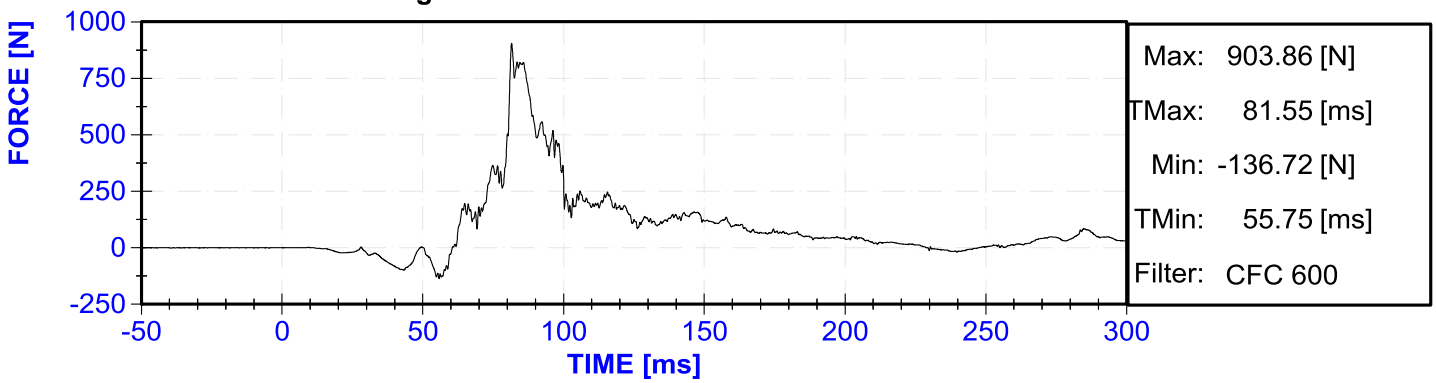

V2P1 Acetabulam Left Z Force
FORCE [N]
800
600
400
200
0
-200
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 731.33 [N]
TMax: 82.00 [ms]
Min: -83.42 [N]
TMin: 43.50 [ms]
Filter: CFC 600


V2P1 Acetabulam Right X Force
FORCE [N]
500
0
-500
-1000
-1500
-2000
-2500
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 308.99 [N]
TMax: 51.50 [ms]
Min: -2080.17 [N]
TMin: 91.70 [ms]
Filter: CFC 600

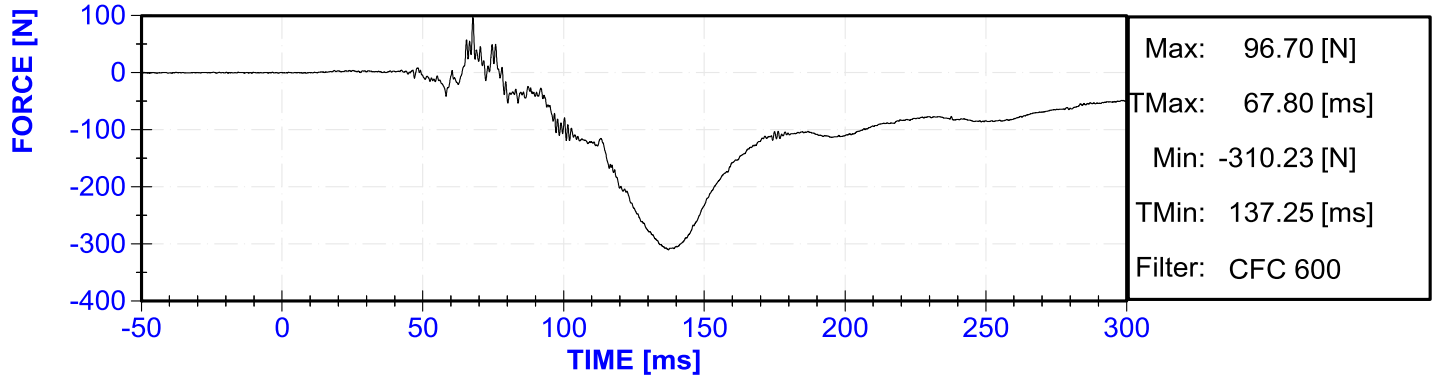
V2P1 Acetabulam Right Y Force



V2P1 Acetabulam Right Z Force

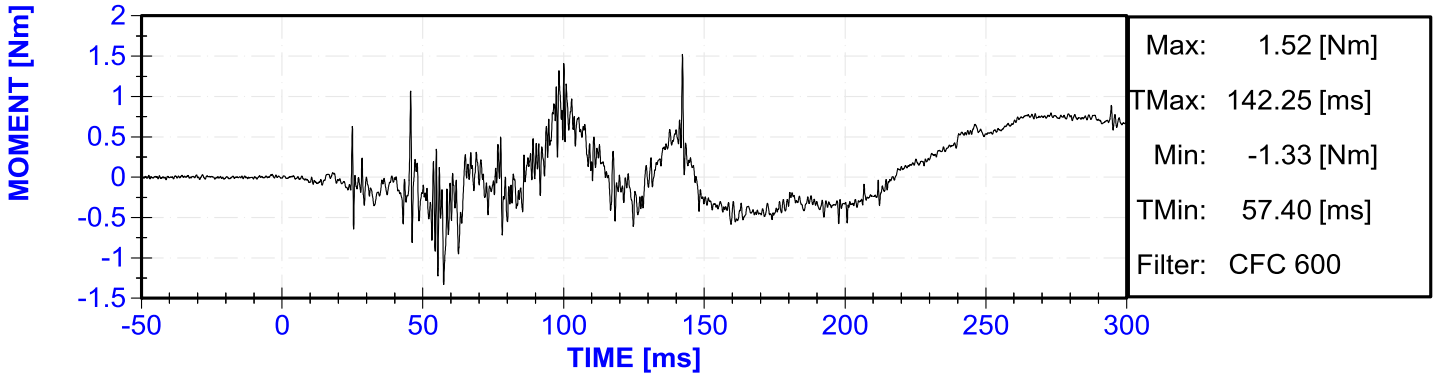


V2P1 ASIS Left X Force



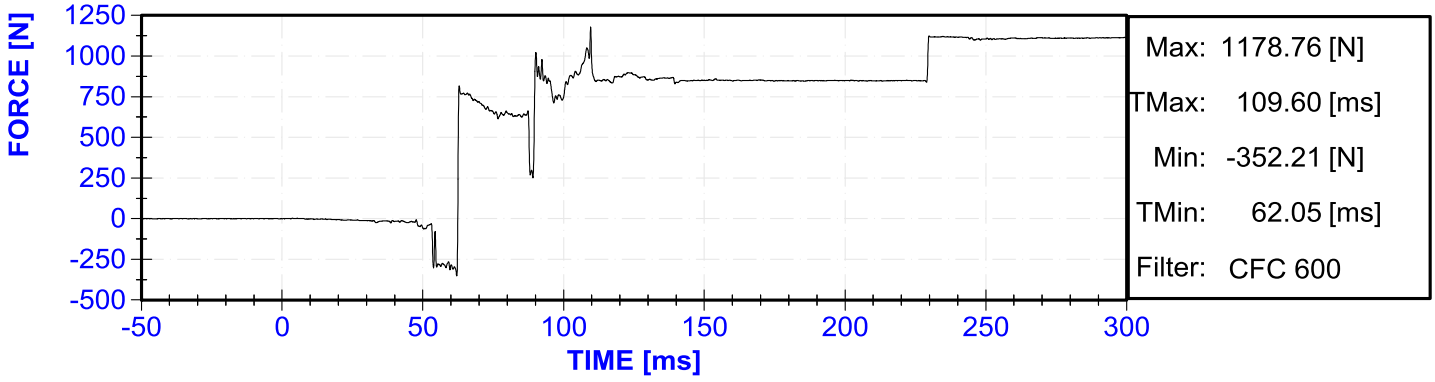
V2P1 ASIS Left Y Moment

QUESTIONABLE DATA THROUGHOUT



V2P1 ASIS Right X Force

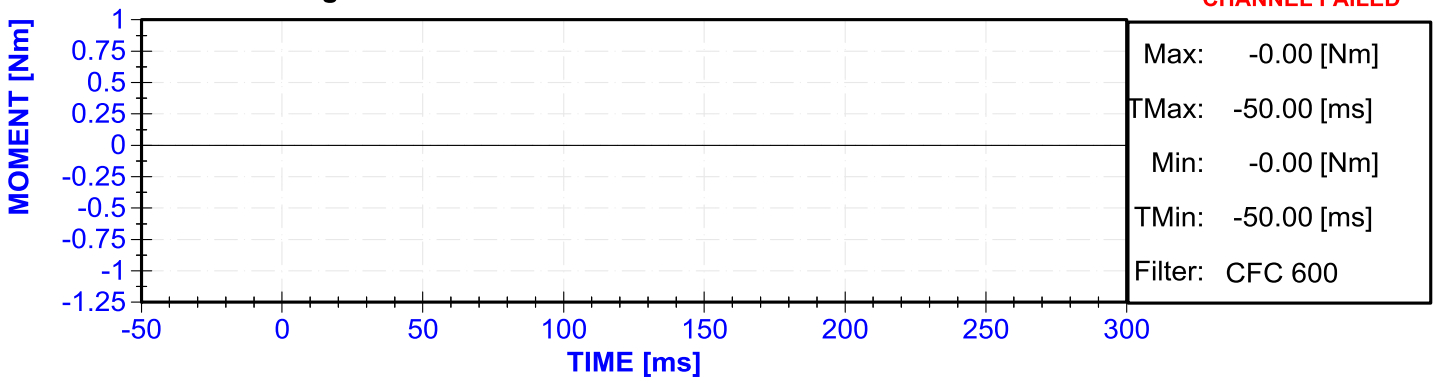
QUESTIONABLE AFTER 61 MS



Max: 1178.76 [N]
TMax: 109.60 [ms]
Min: -352.21 [N]
TMin: 62.05 [ms]
Filter: CFC 600

V2P1 ASIS Right Y Moment

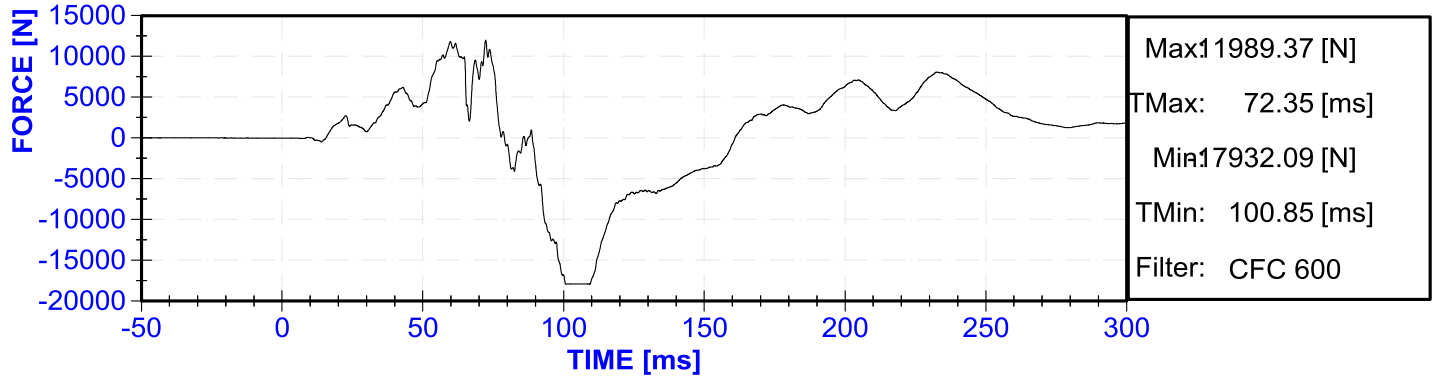
CHANNEL FAILED



Max: -0.00 [Nm]
TMax: -50.00 [ms]
Min: -0.00 [Nm]
TMin: -50.00 [ms]
Filter: CFC 600

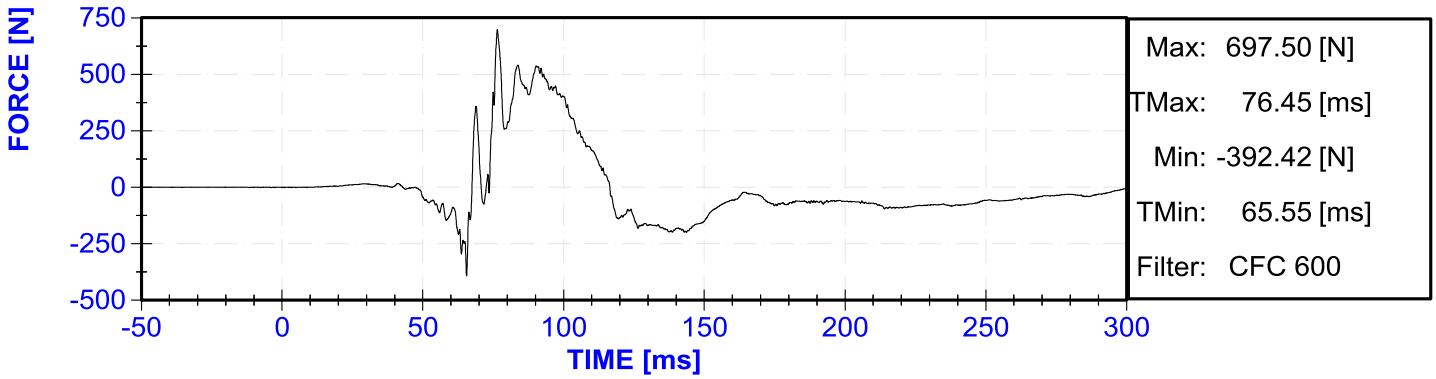
V2P1 Femur Left X Force

QUESTIONABLE 99-110 MS - SATURAT



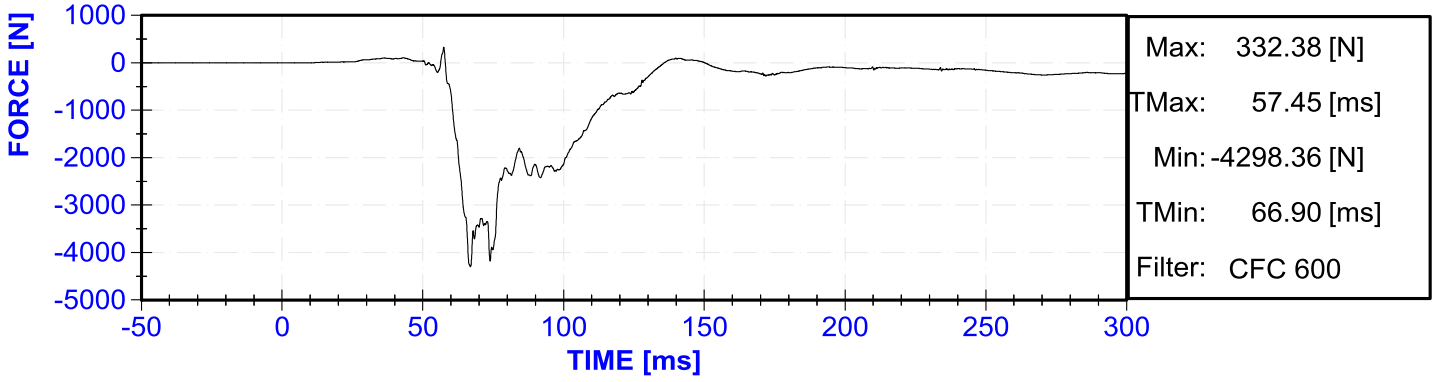
Max: 11989.37 [N]
TMax: 72.35 [ms]
Min: -17932.09 [N]
TMin: 100.85 [ms]
Filter: CFC 600

V2P1 Femur Left Y Force

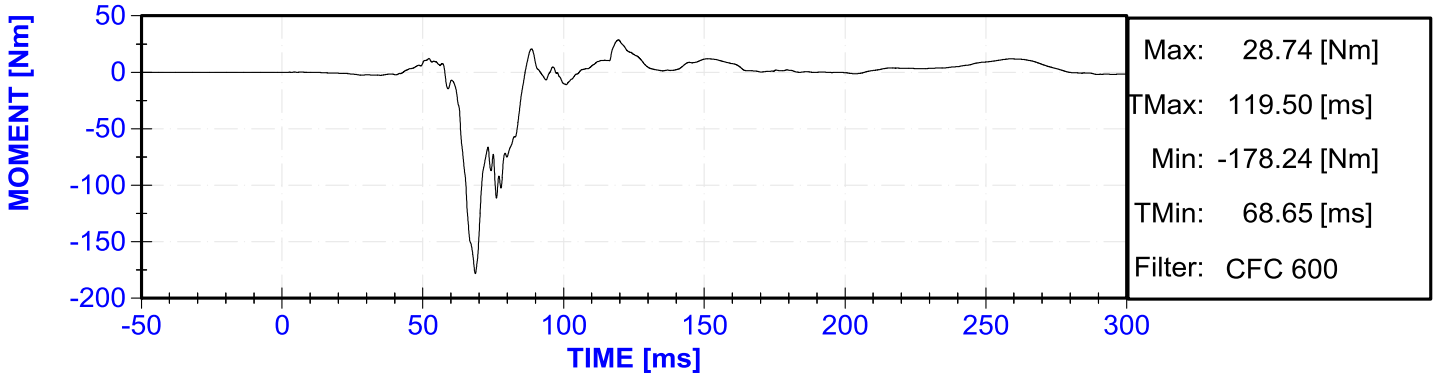


Max: 697.50 [N]
TMax: 76.45 [ms]
Min: -392.42 [N]
TMin: 65.55 [ms]
Filter: CFC 600

V2P1 Femur Left Z Force

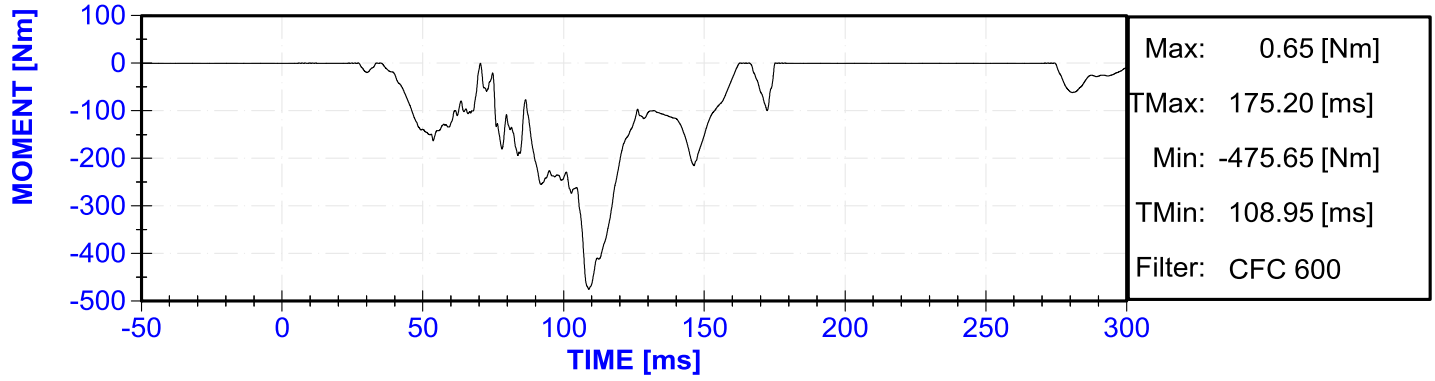


V2P1 Femur Left X Moment

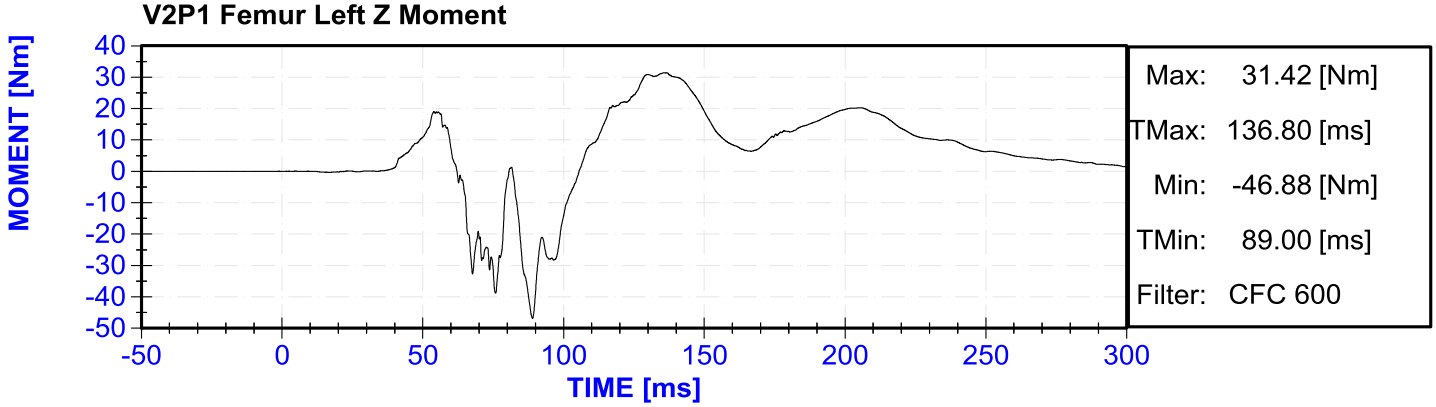


V2P1 Femur Left Y Moment

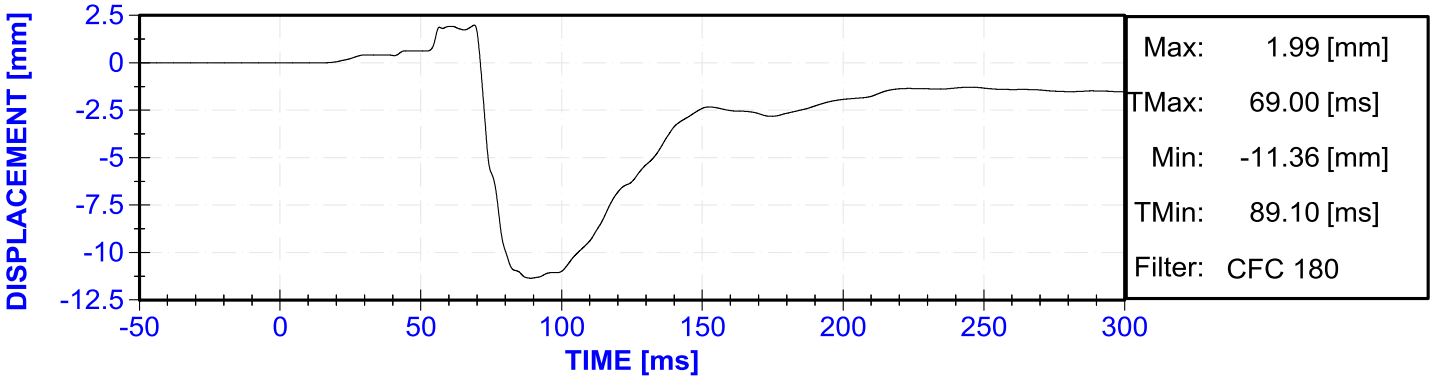
QUESTIONABLE MAXIMUM THROUGHOUT



V2P1 Femur Left Z Moment

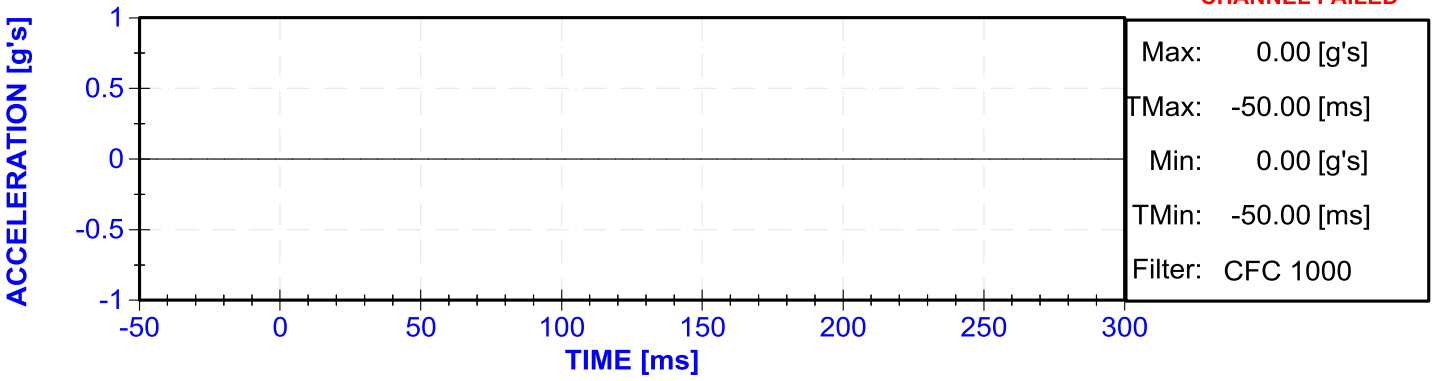


V2P1 Knee Left X Displacement

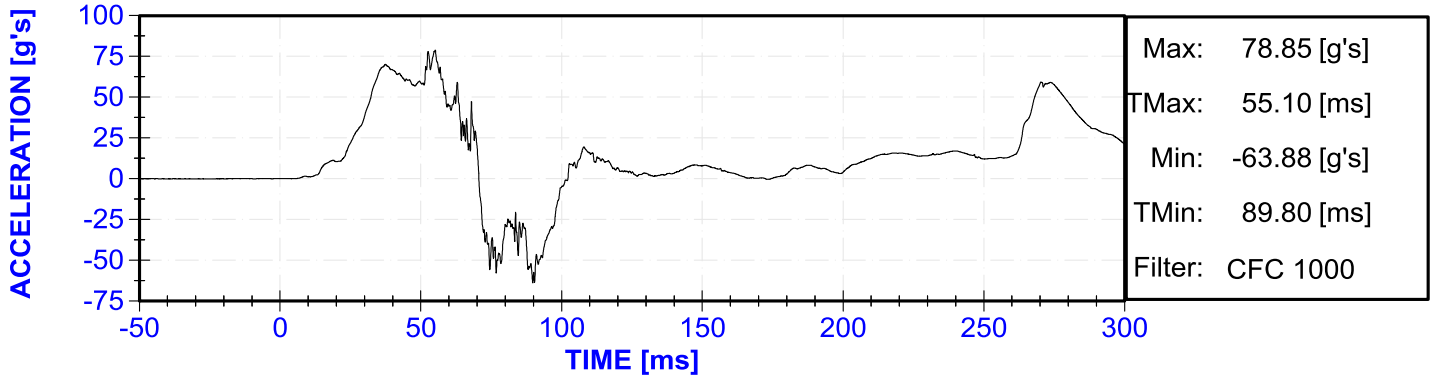


V2P1 Tibia Left X Acceleration

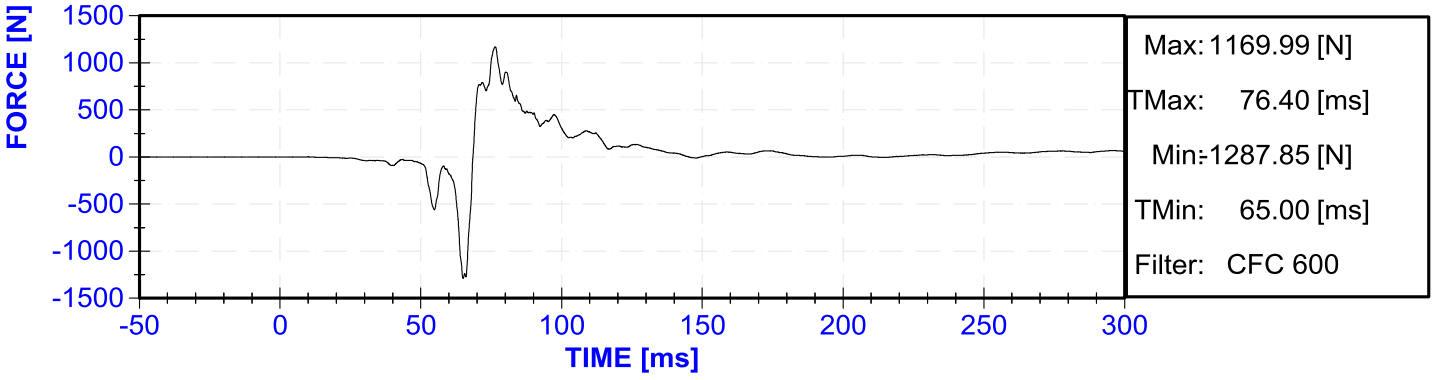
CHANNEL FAILED



V2P1 Tibia Left Y Acceleration

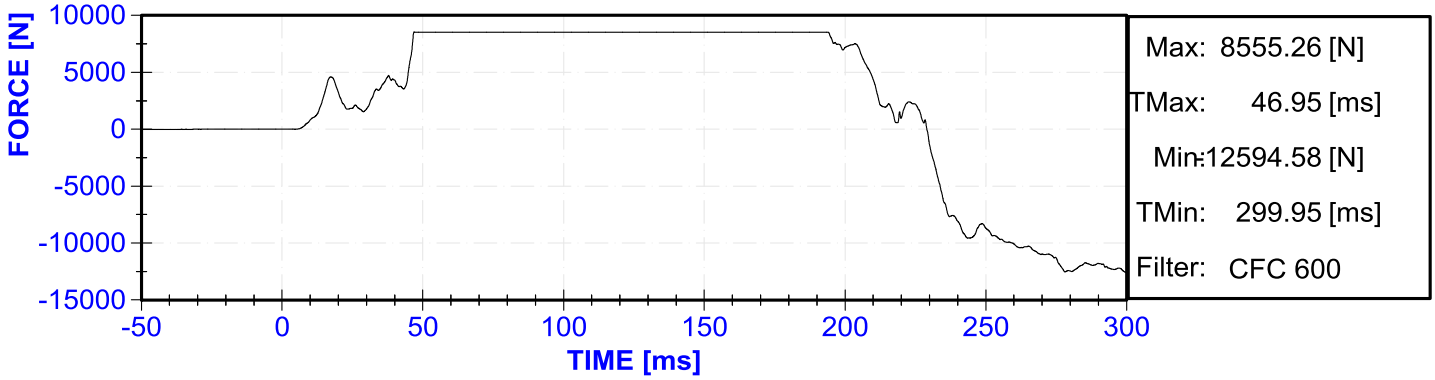


V2P1 Upper Tibia Left X Force

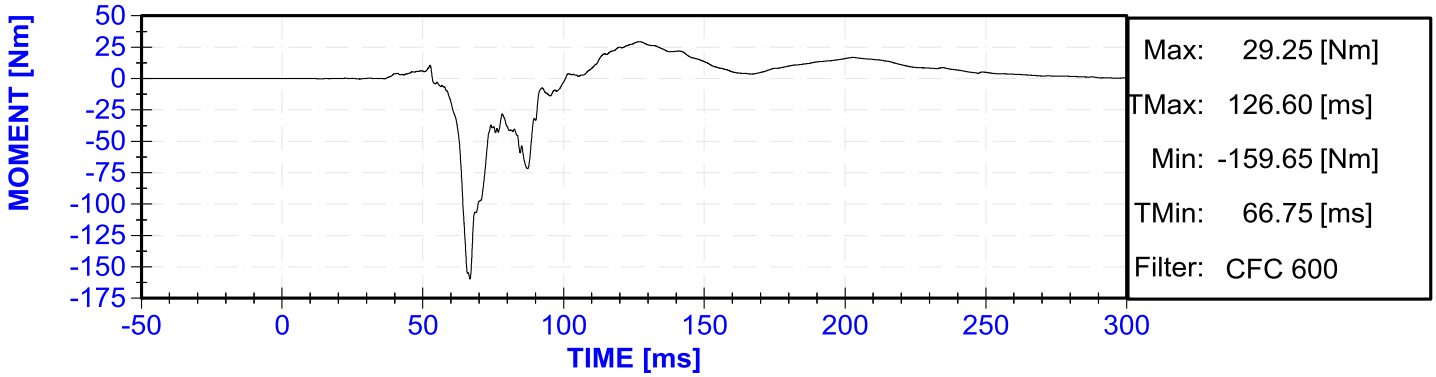


V2P1 Upper Tibia Left Z Force

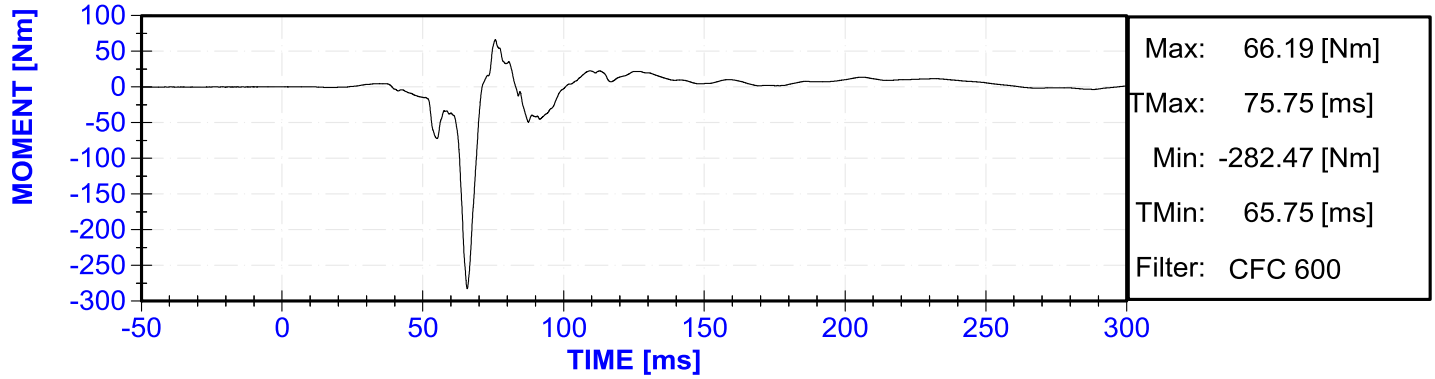
QUESTIONABLE AFTER 45 MS



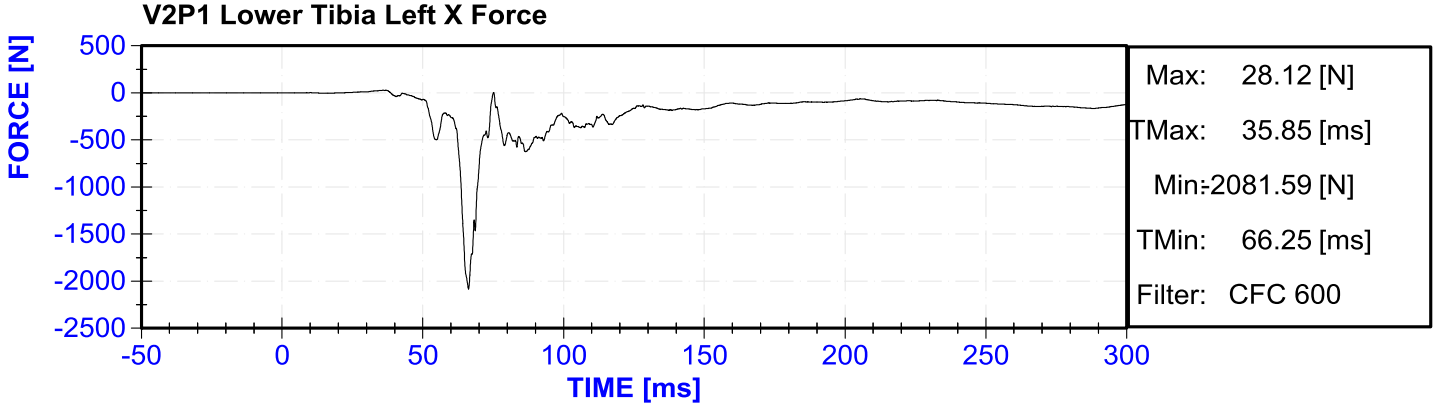
V2P1 Upper Tibia Left X Moment



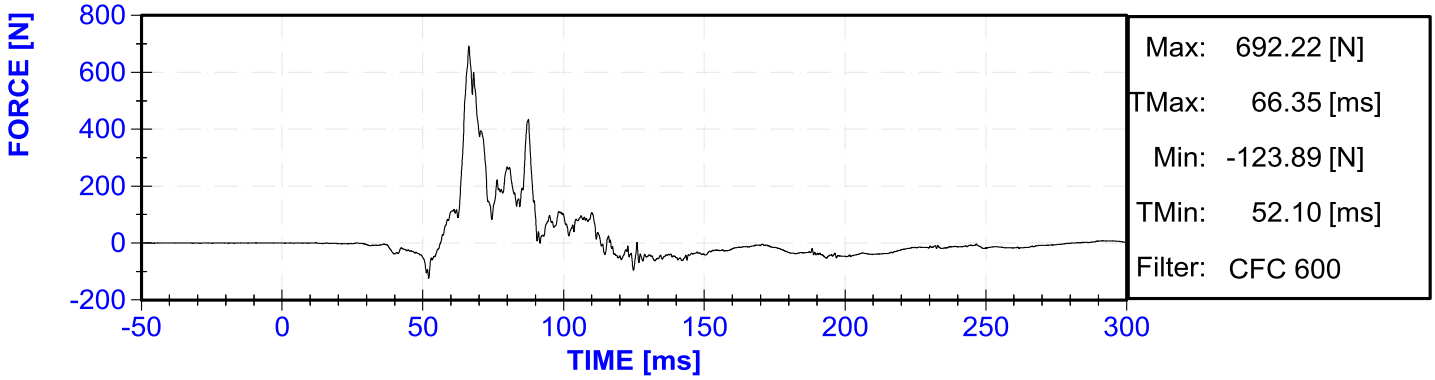
V2P1 Upper Tibia Left Y Moment



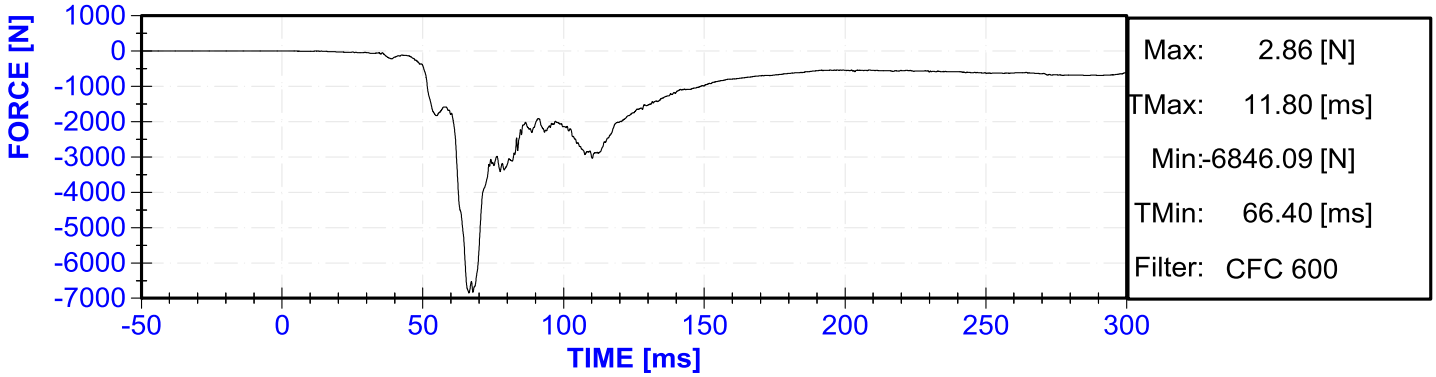
V2P1 Lower Tibia Left X Force



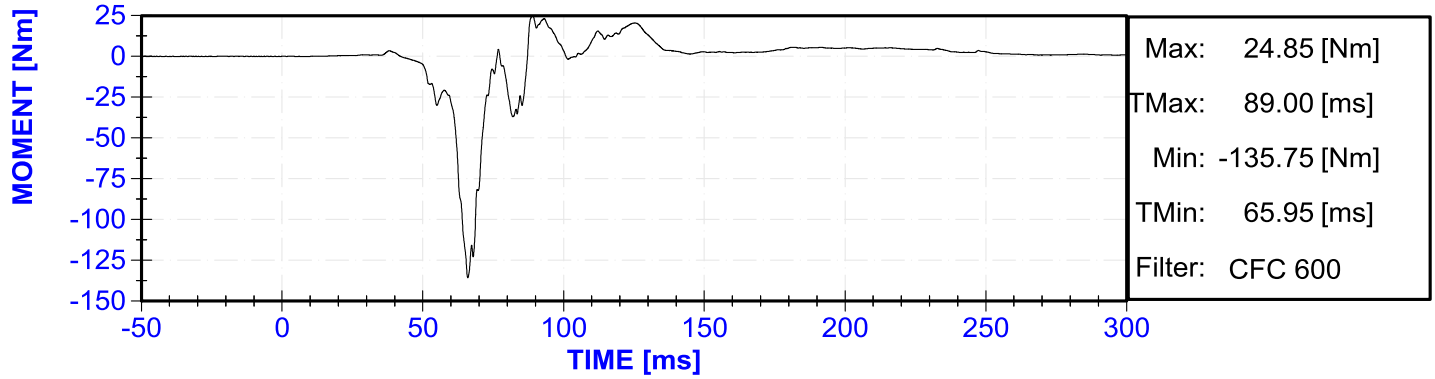
V2P1 Lower Tibia Left Y Force



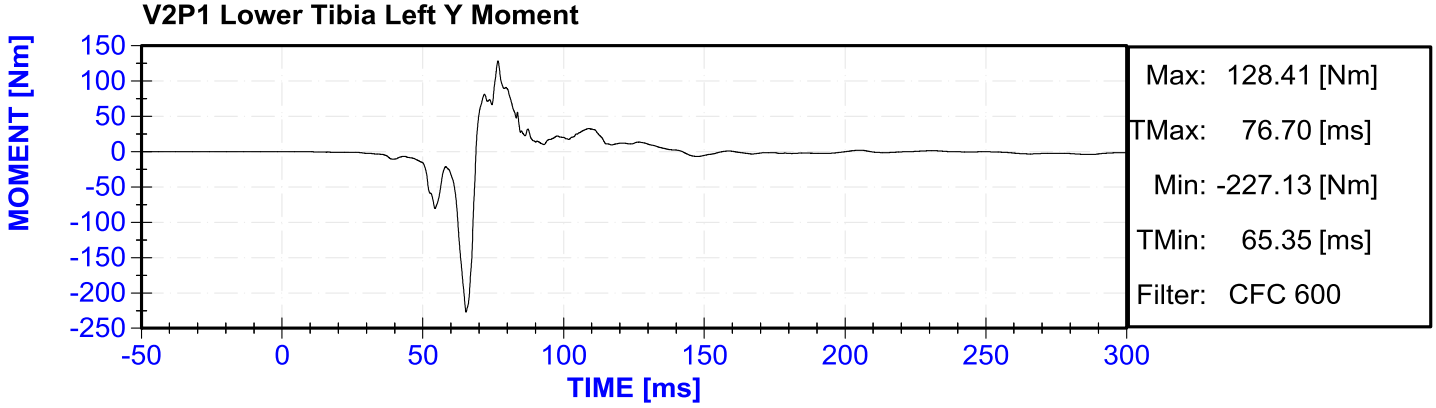
V2P1 Lower Tibia Left Z Force



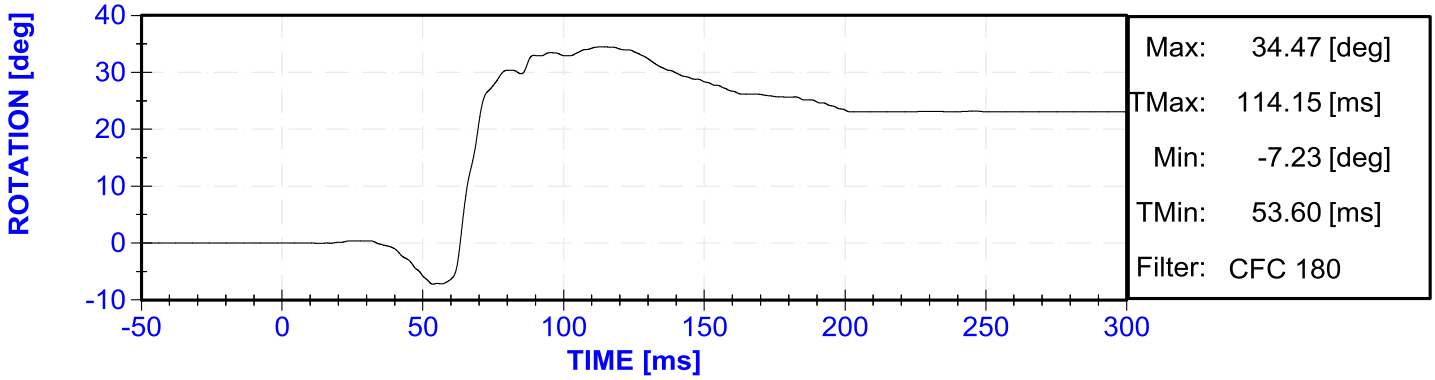
V2P1 Lower Tibia Left X Moment



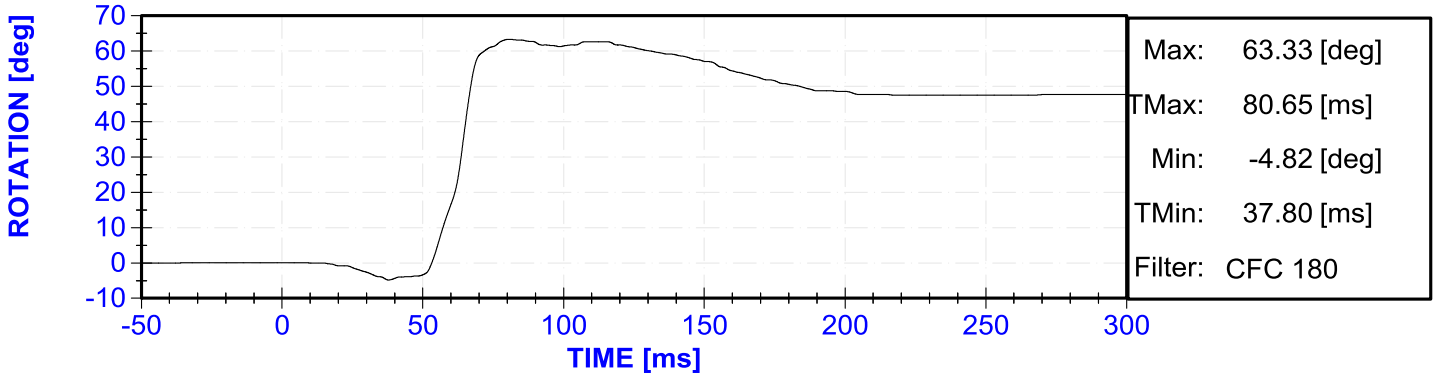
V2P1 Lower Tibia Left Y Moment



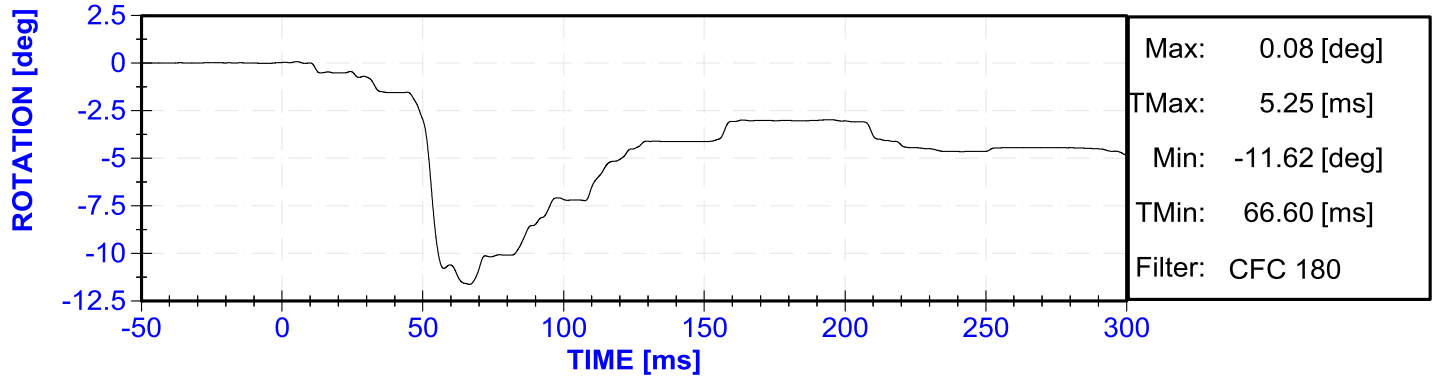
V2P1 Ankle Left X Rotation



V2P1 Ankle Left Y Rotation

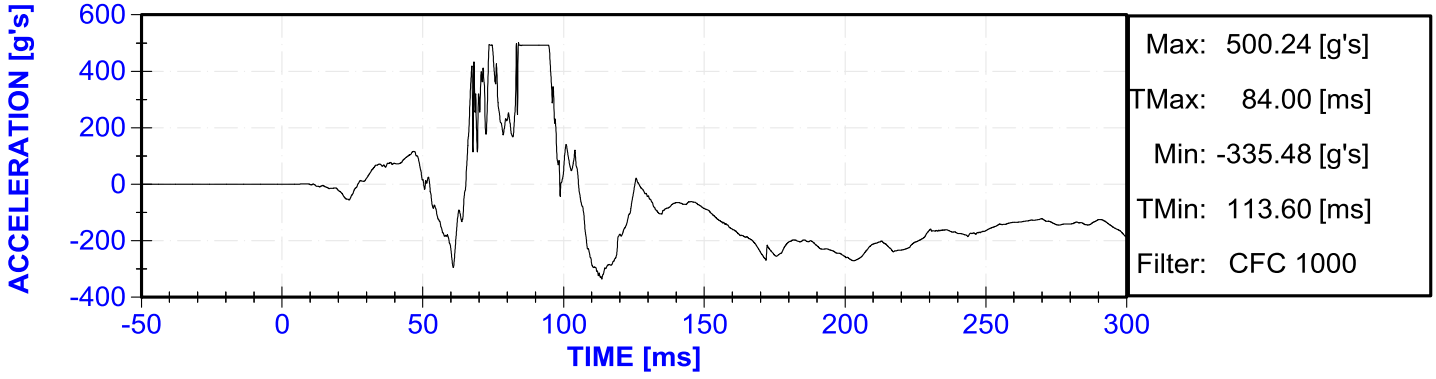


V2P1 Ankle Left Z Rotation

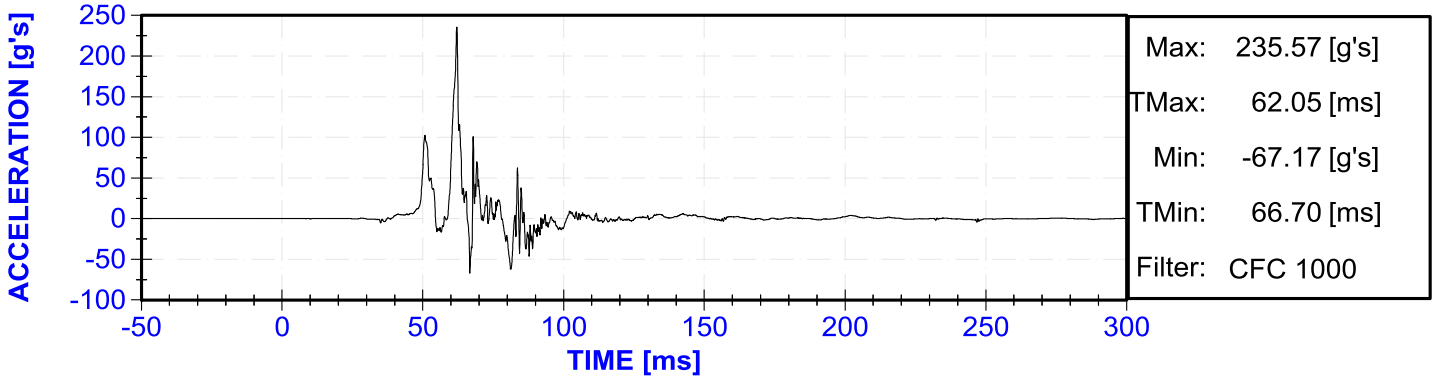


V2P1 Foot Left X Acceleration

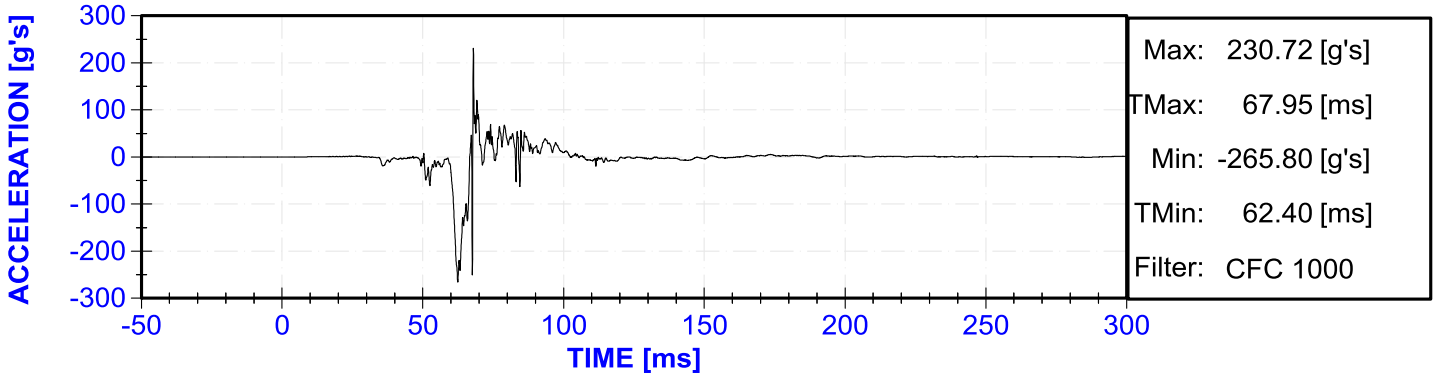
QUESTIONABLE DATA THROUGHOUT



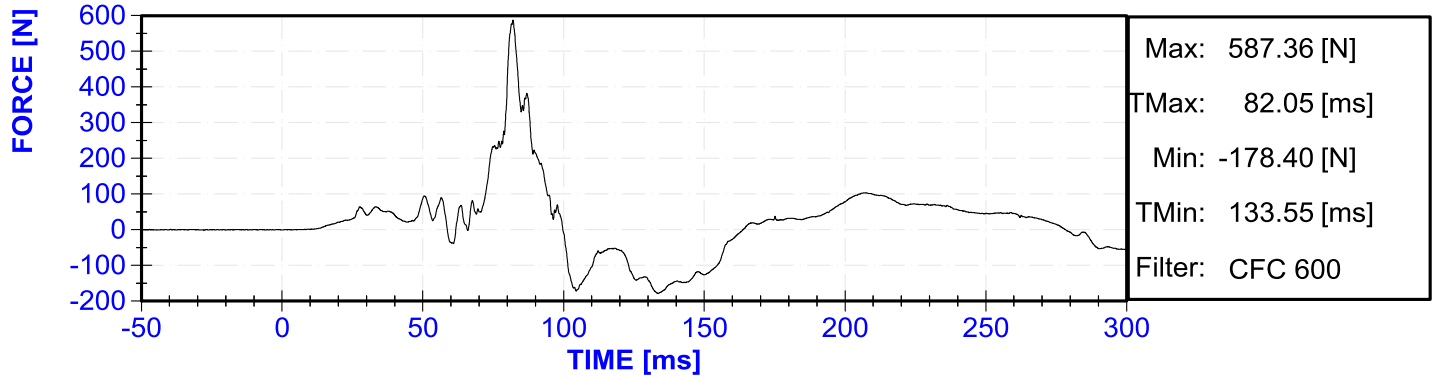
V2P1 Foot Left Y Acceleration



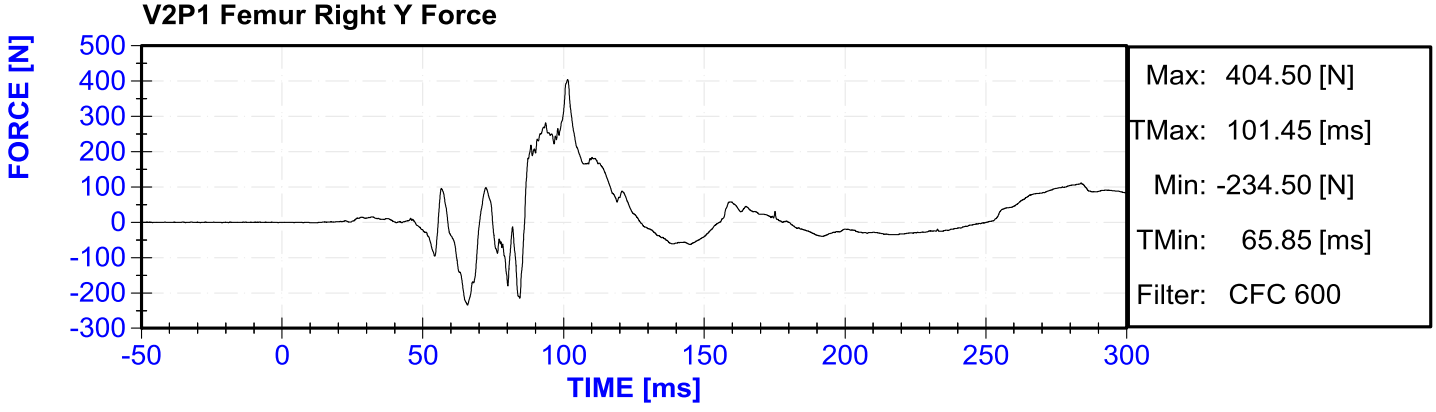
V2P1 Foot Left Z Acceleration

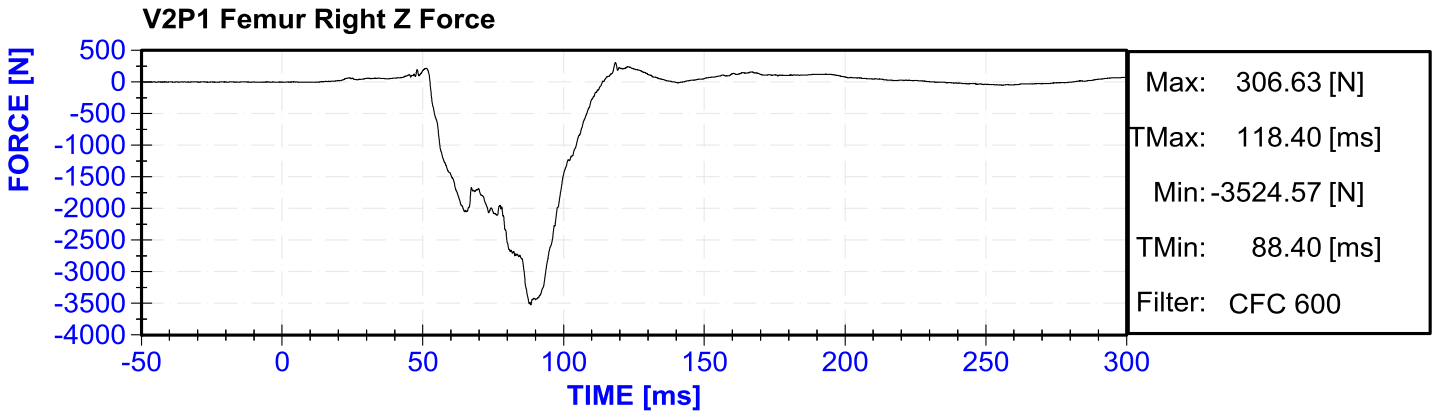


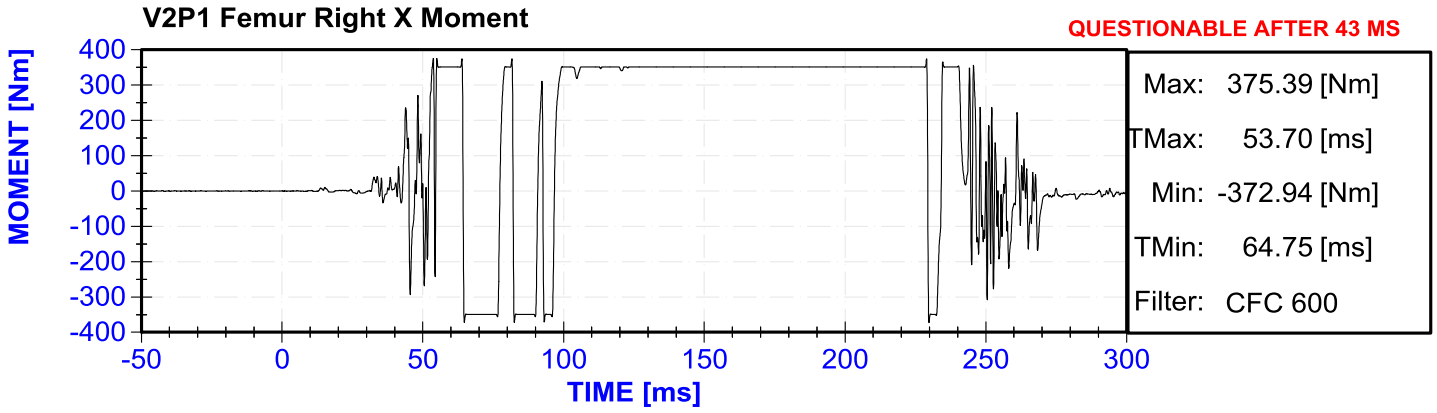
V2P1 Femur Right X Force

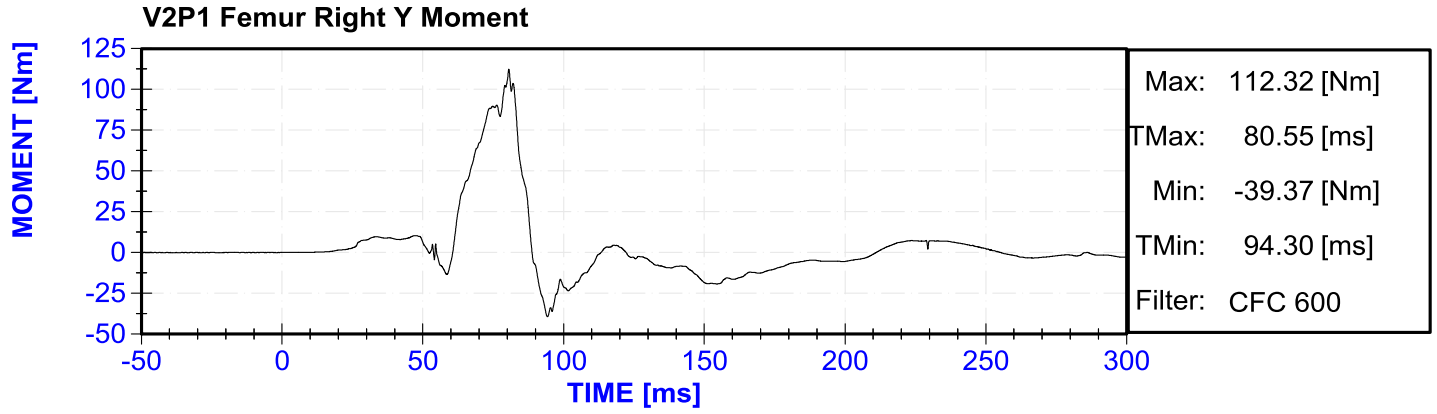


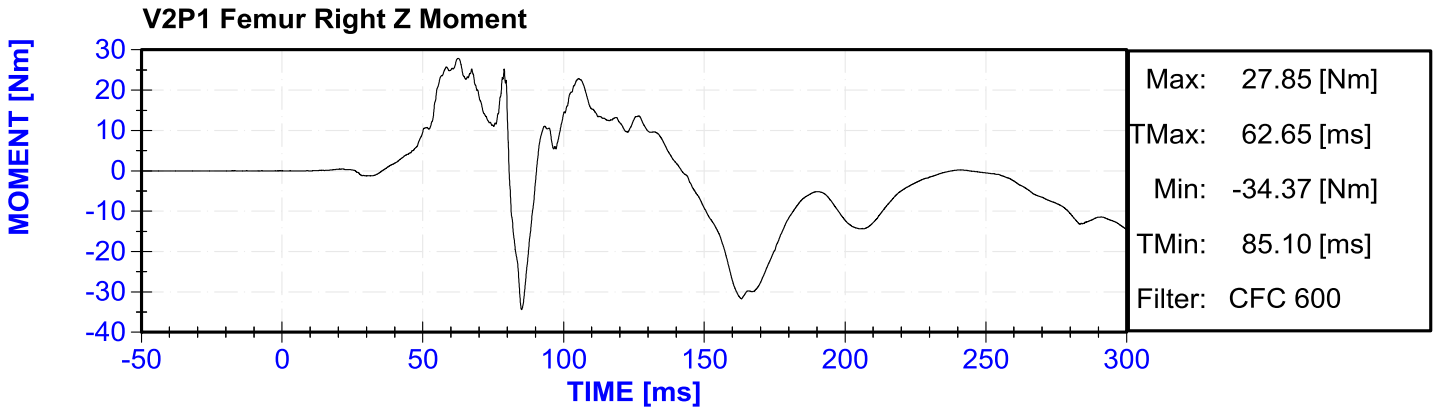
V2P1 Femur Right Y Force



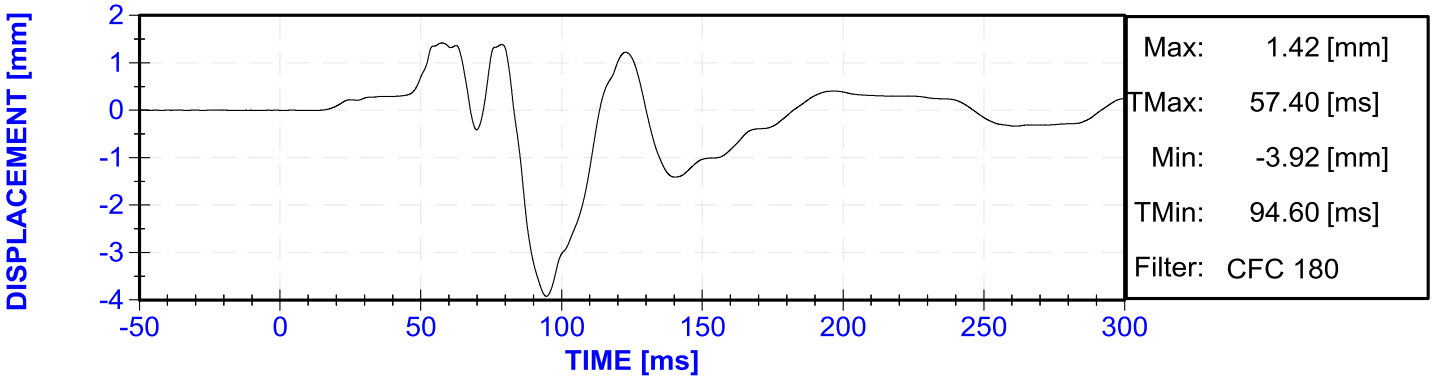

V2P1 Femur Right Z Force
FORCE [N]
500
0
-500
-1000
-1500
-2000
-2500
-3000
-3500
-4000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 306.63 [N]
TMax: 118.40 [ms]
Min: -3524.57 [N]
TMin: 88.40 [ms]
Filter: CFC 600


V2P1 Femur Right X Moment
QUESTIONABLE AFTER 43 MS
MOMENT [Nm]
400
300
200
100
0
-100
-200
-300
-400
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 375.39 [Nm]
TMax: 53.70 [ms]
Min: -372.94 [Nm]
TMin: 64.75 [ms]
Filter: CFC 600

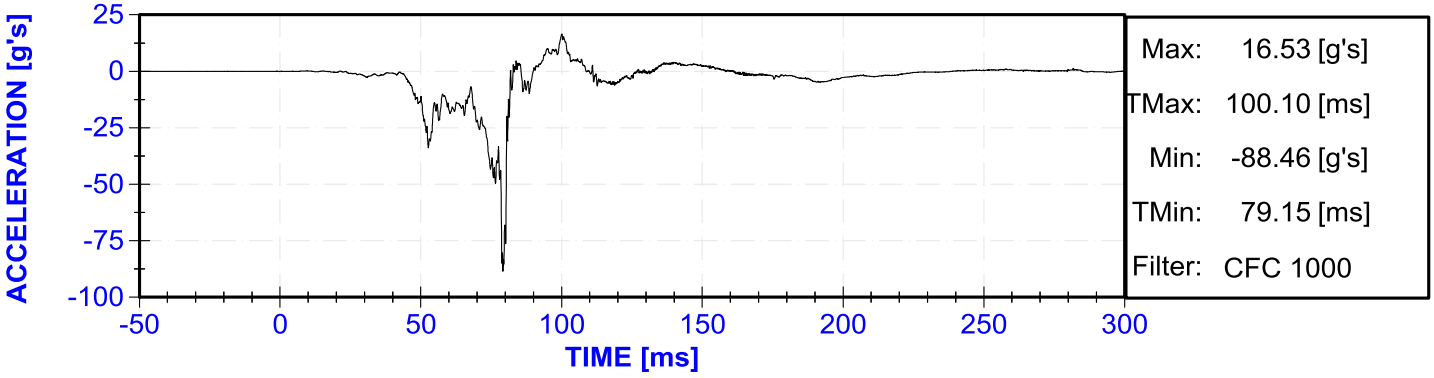

V2P1 Femur Right Y Moment
MOMENT [Nm]
125
100
75
50
25
0
-25
-50
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 112.32 [Nm]
TMax: 80.55 [ms]
Min: -39.37 [Nm]
TMin: 94.30 [ms]
Filter: CFC 600


V2P1 Femur Right Z Moment
MOMENT [Nm]
30
20
10
0
-10
-20
-30
-40
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 27.85 [Nm]
TMax: 62.65 [ms]
Min: -34.37 [Nm]
TMin: 85.10 [ms]
Filter: CFC 600

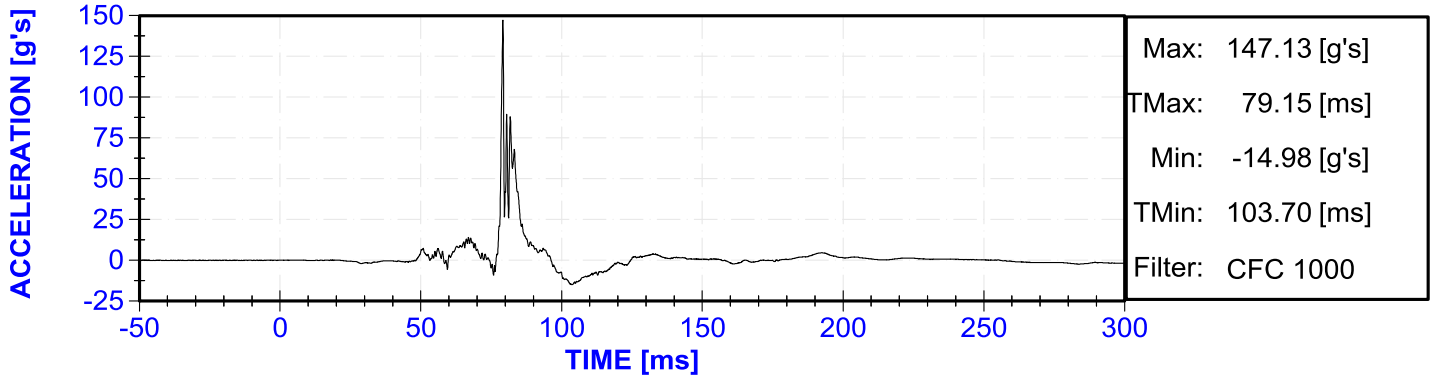
V2P1 Knee Right X Displacement



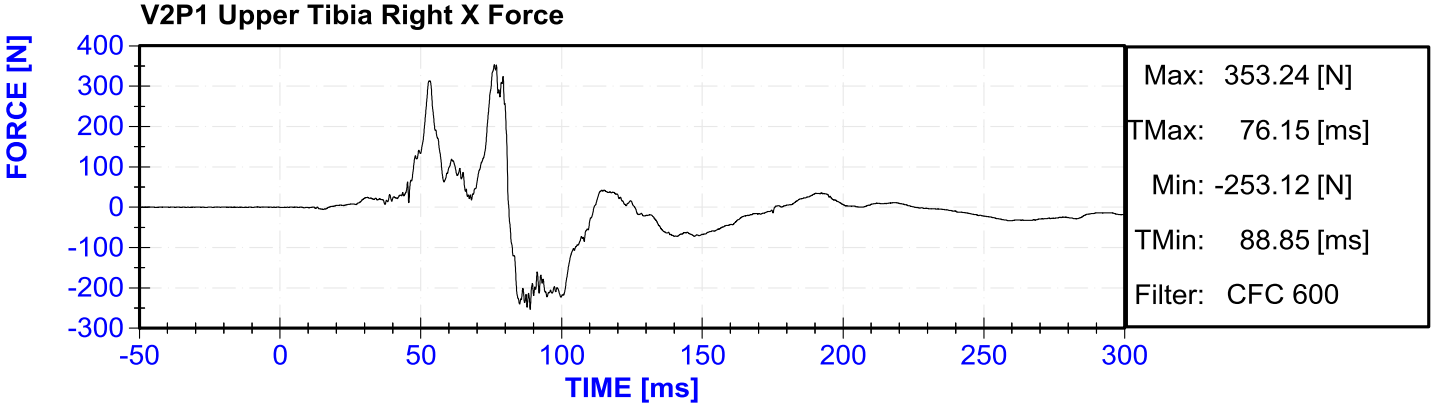
V2P1 Tibia Right X Acceleration



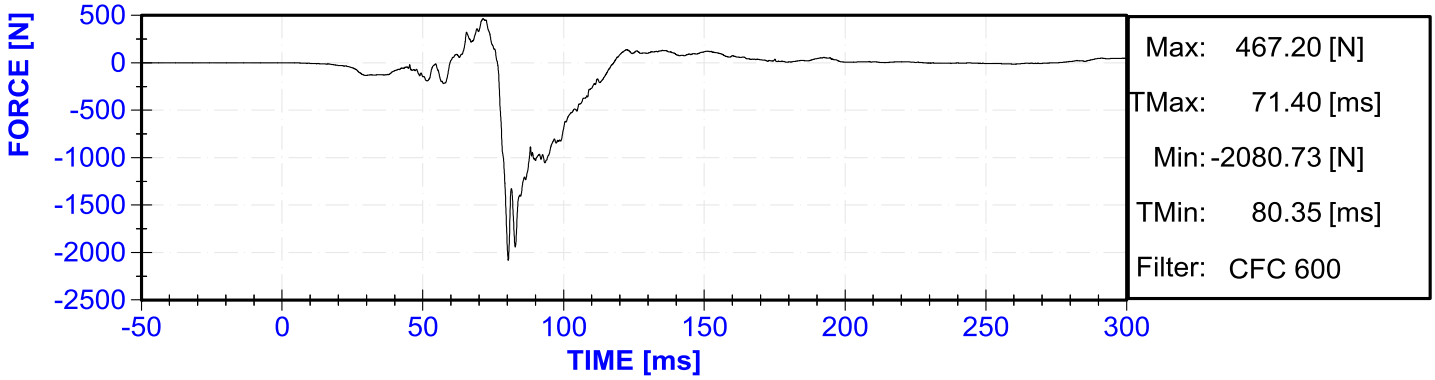
V2P1 Tibia Right Y Acceleration



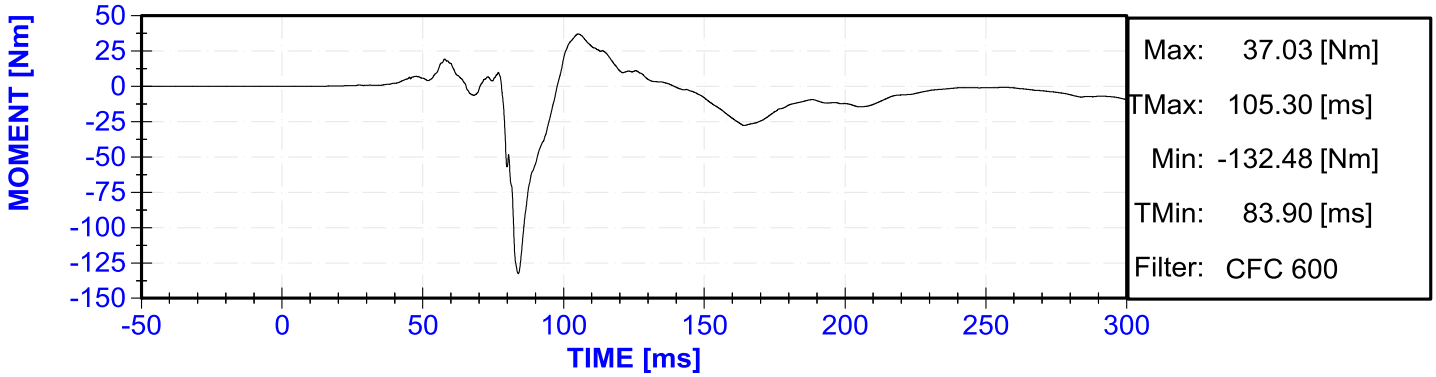
V2P1 Upper Tibia Right X Force



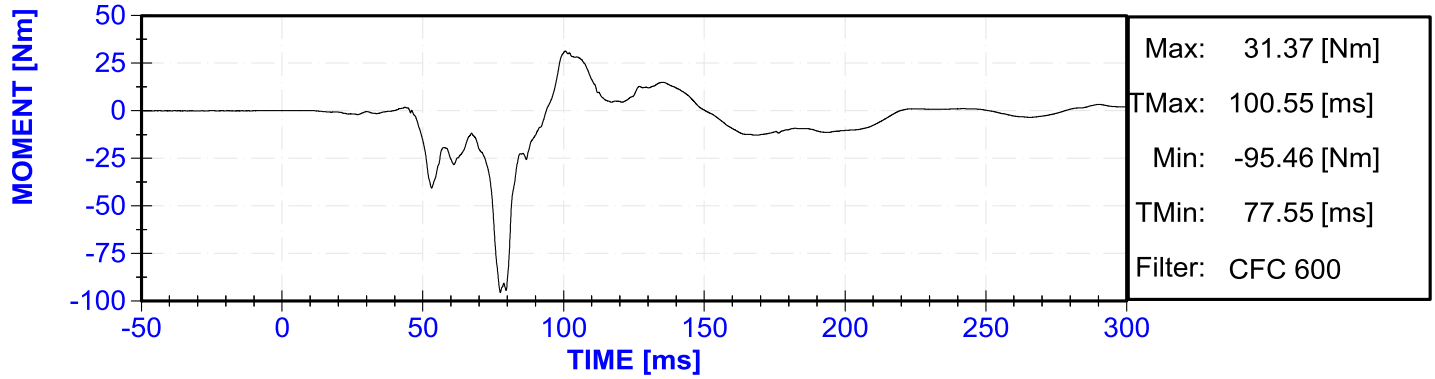
V2P1 Upper Tibia Right Z Force



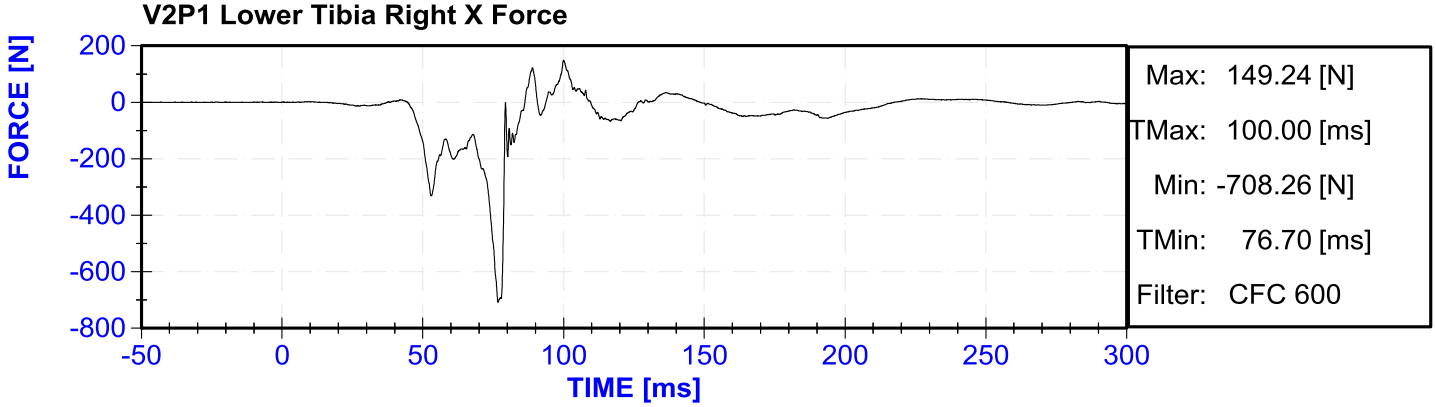
V2P1 Upper Tibia Right X Moment



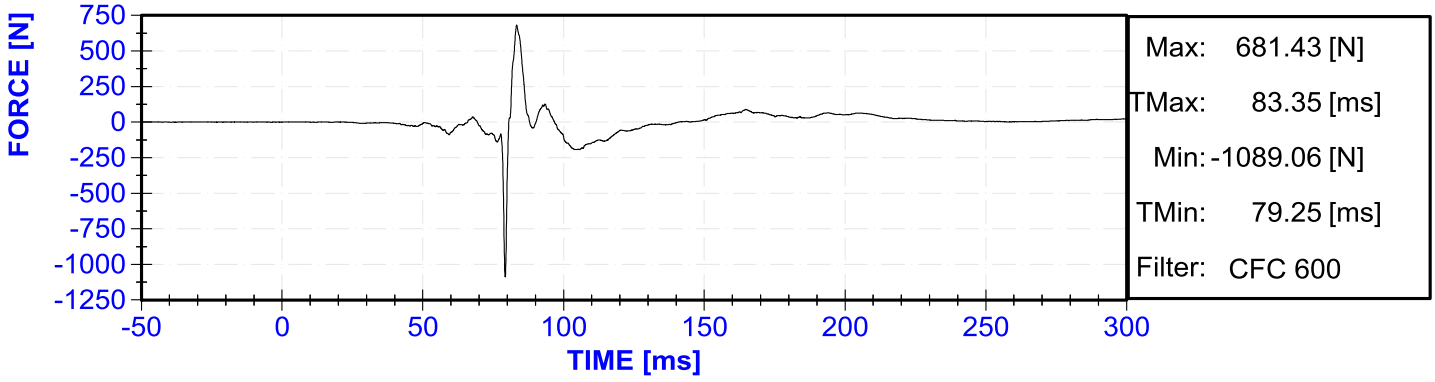
V2P1 Upper Tibia Right Y Moment



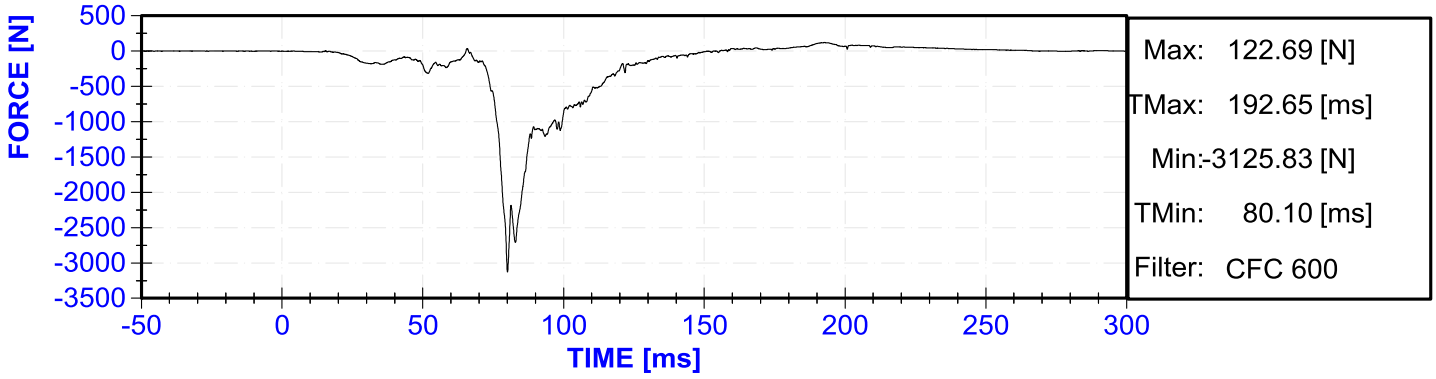
V2P1 Lower Tibia Right X Force



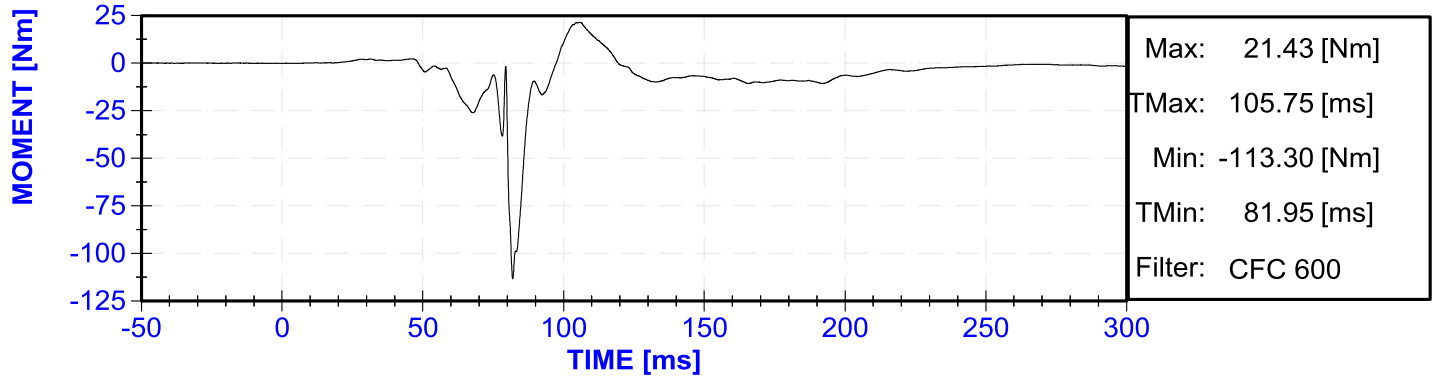
V2P1 Lower Tibia Right Y Force



V2P1 Lower Tibia Right Z Force

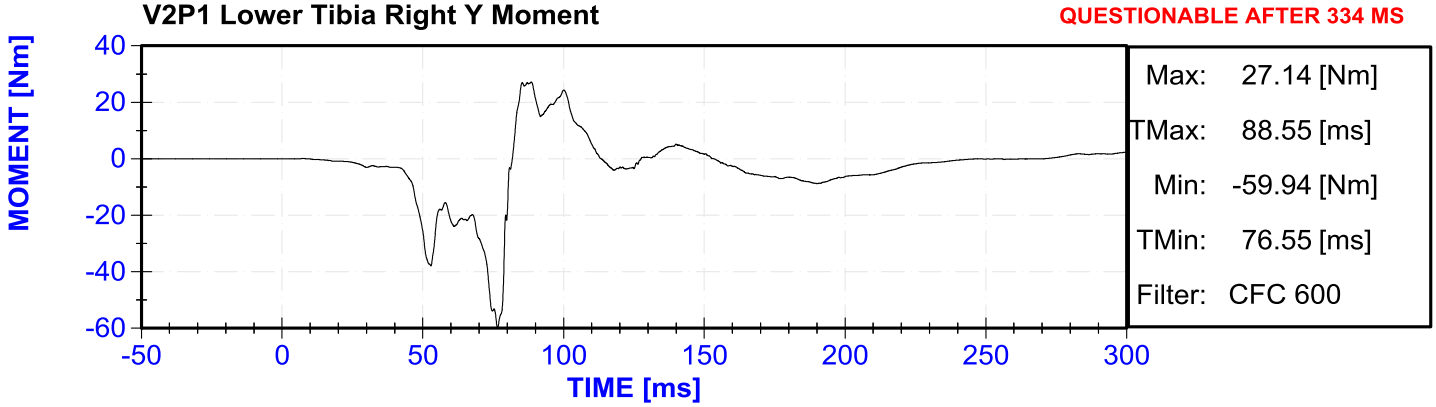


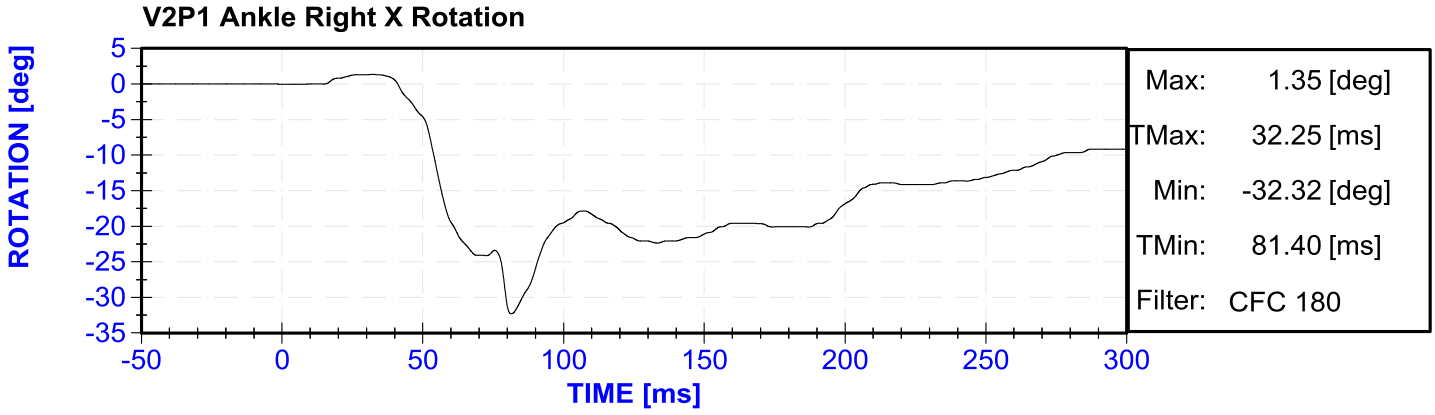
V2P1 Lower Tibia Right X Moment

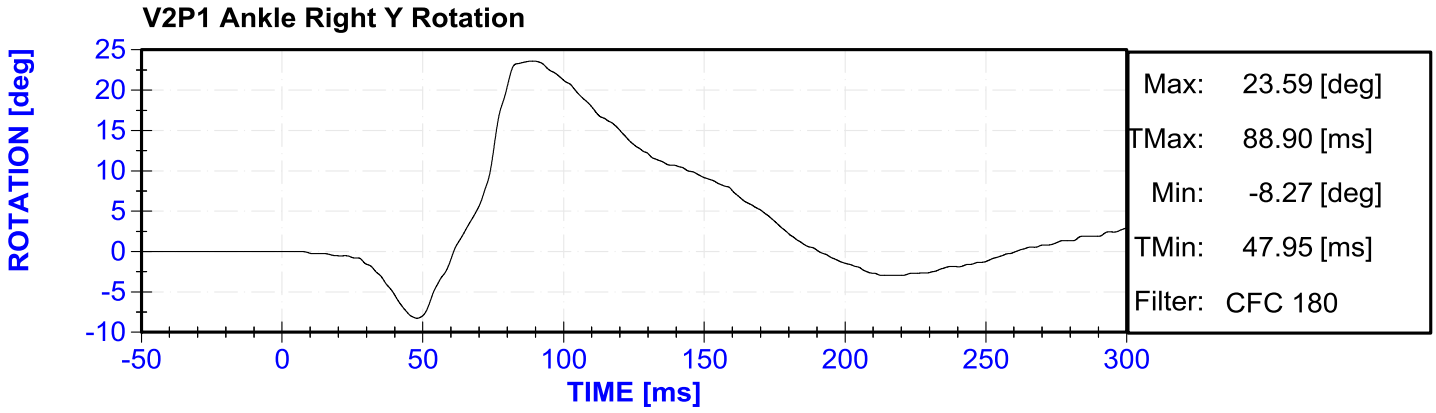


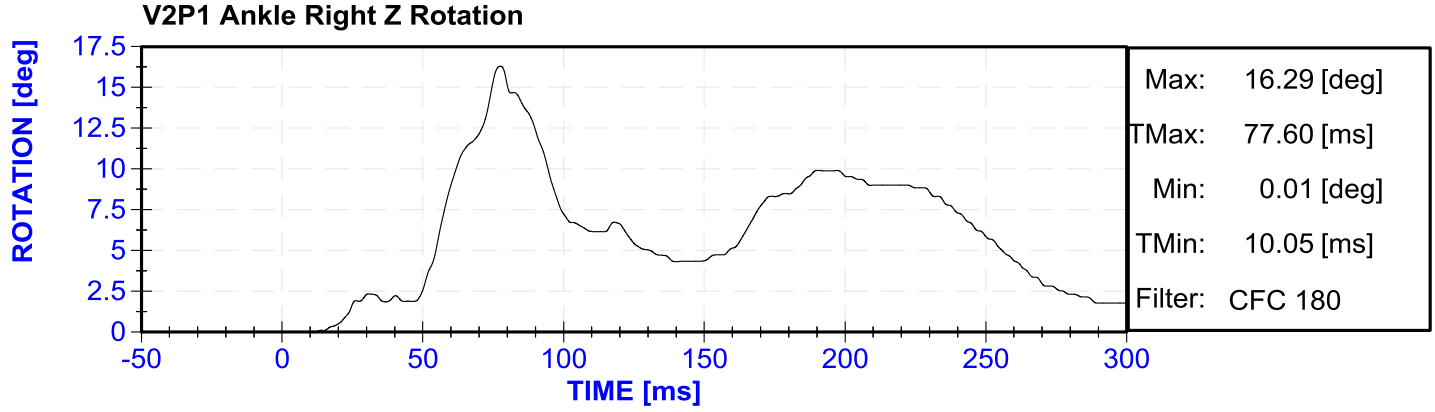
V2P1 Lower Tibia Right Y Moment

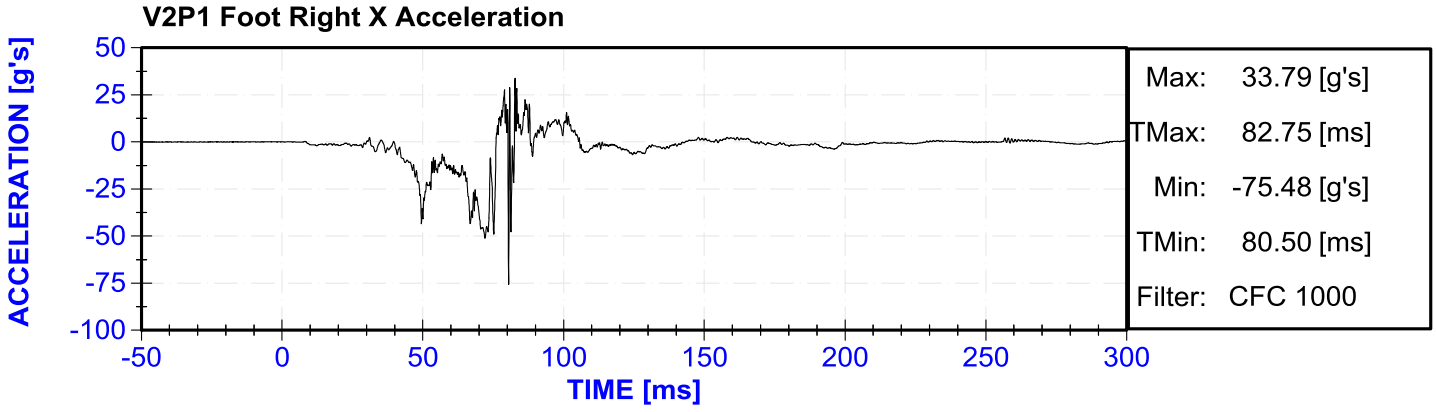
QUESTIONABLE AFTER 334 MS



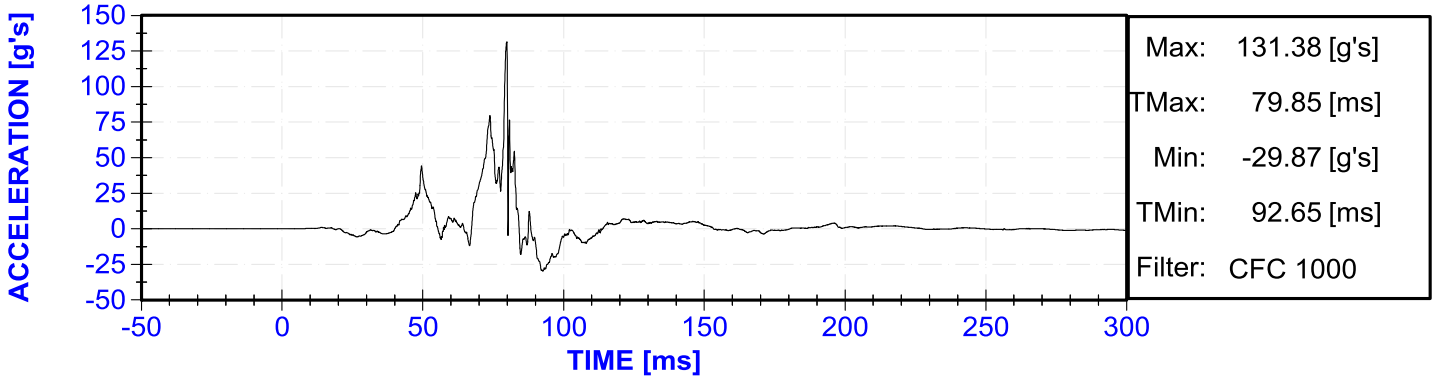

V2P1 Ankle Right X Rotation
ROTATION [deg]
TIME [ms]
Max: 1.35 [deg]
TMax: 32.25 [ms]
Min: -32.32 [deg]
TMin: 81.40 [ms]
Filter: CFC 180


V2P1 Ankle Right Y Rotation
ROTATION [deg]
TIME [ms]
Max: 23.59 [deg]
TMax: 88.90 [ms]
Min: -8.27 [deg]
TMin: 47.95 [ms]
Filter: CFC 180

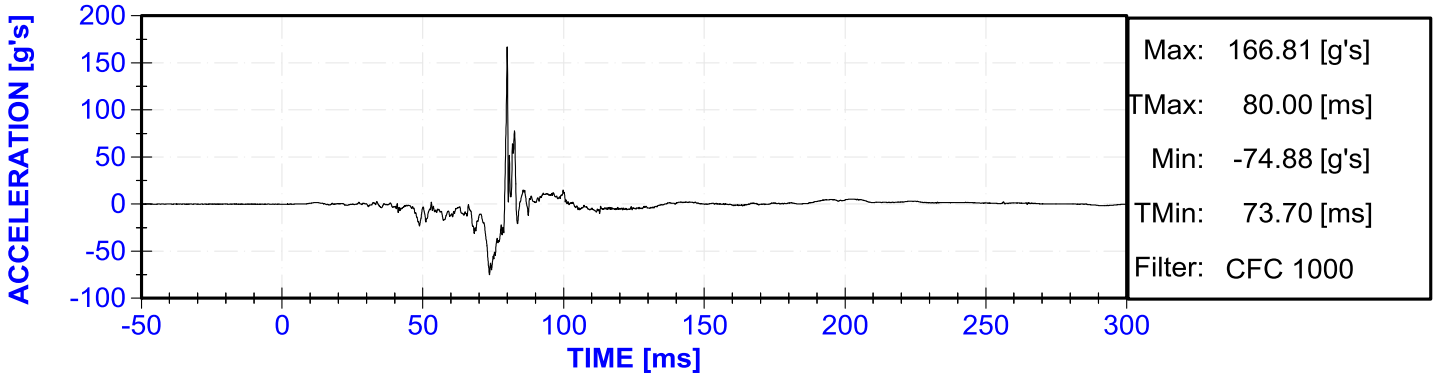

V2P1 Ankle Right Z Rotation
ROTATION [deg]
TIME [ms]
Max: 16.29 [deg]
TMax: 77.60 [ms]
Min: 0.01 [deg]
TMin: 10.05 [ms]
Filter: CFC 180


V2P1 Foot Right X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 33.79 [g's]
TMax: 82.75 [ms]
Min: -75.48 [g's]
TMin: 80.50 [ms]
Filter: CFC 1000

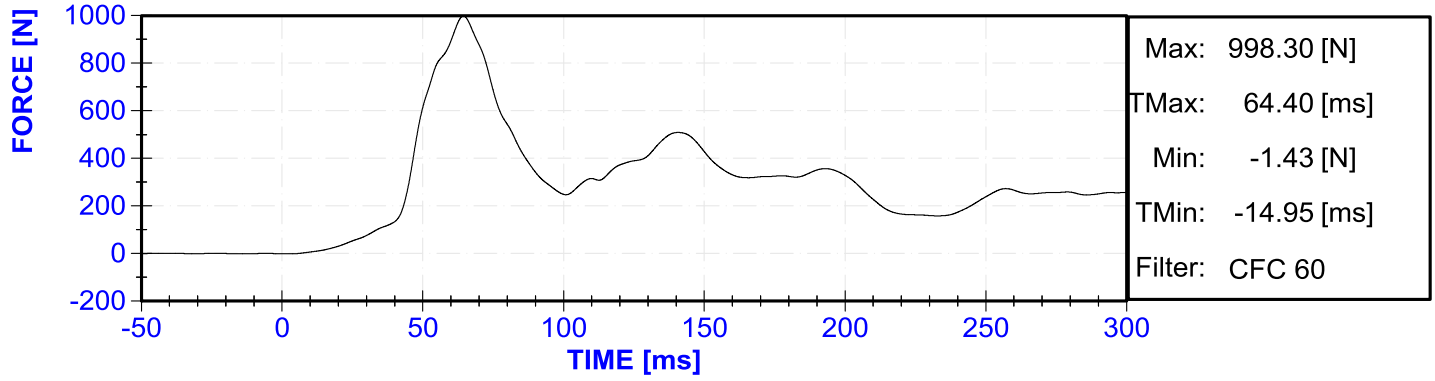
V2P1 Foot Right Y Acceleration



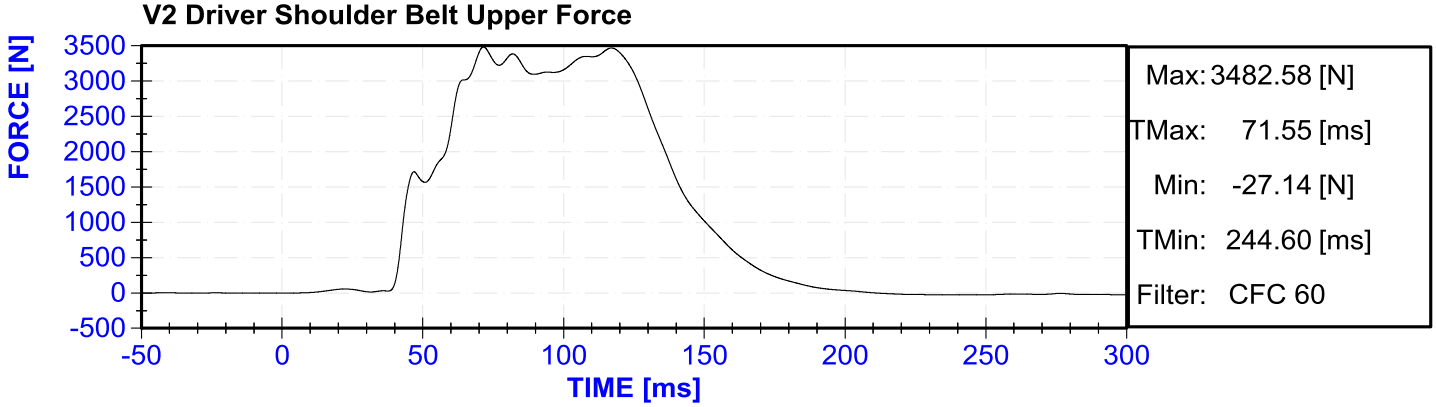
V2P1 Foot Right Z Acceleration



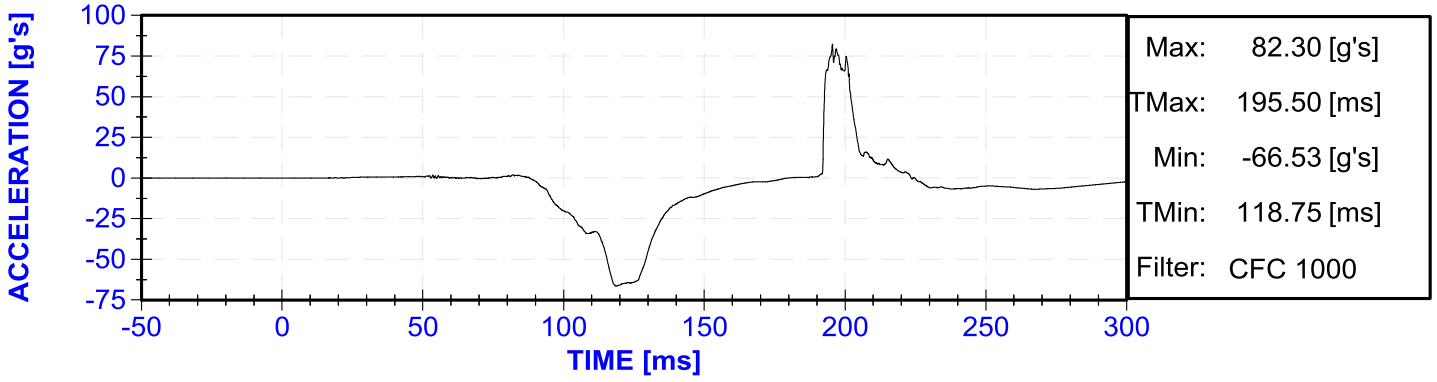
V2 Driver Lap Belt Force



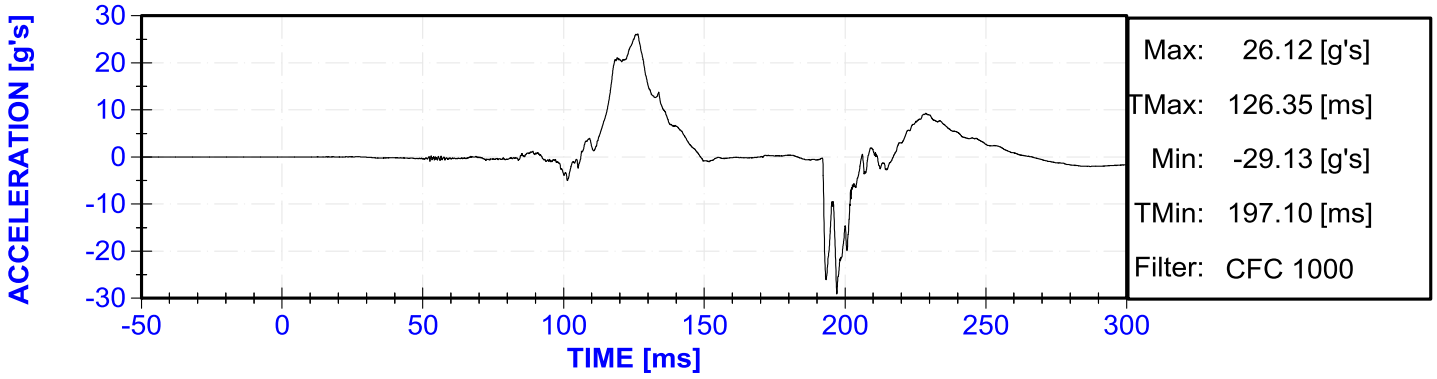
V2 Driver Shoulder Belt Upper Force



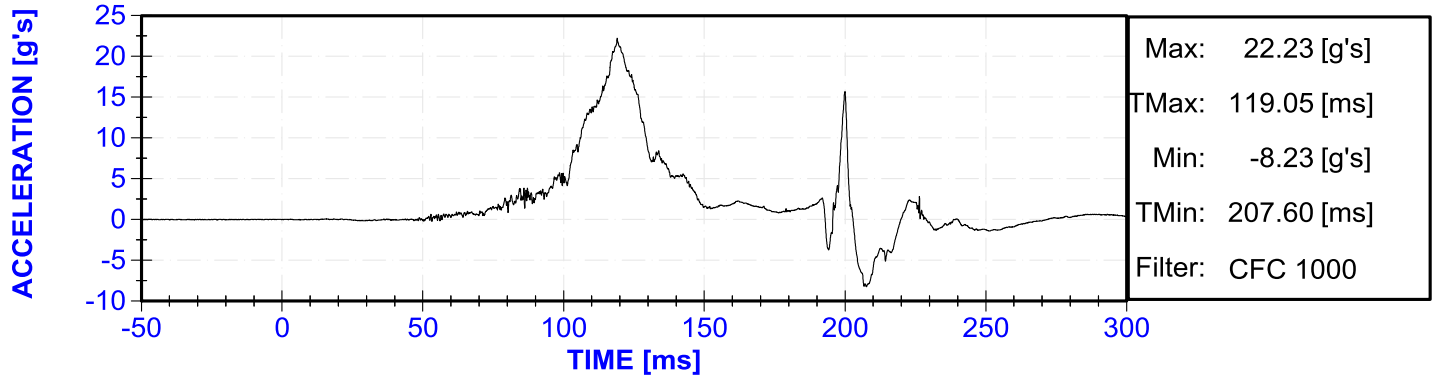
V2P4 HEAD 9 ARRAY Z ARM X



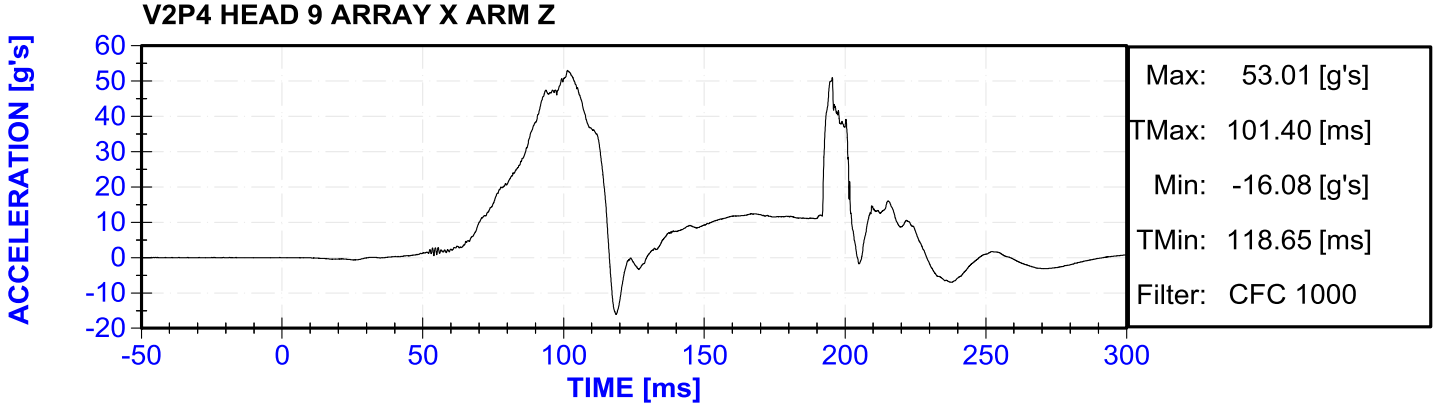
V2P4 HEAD 9 ARRAY Z ARM Y



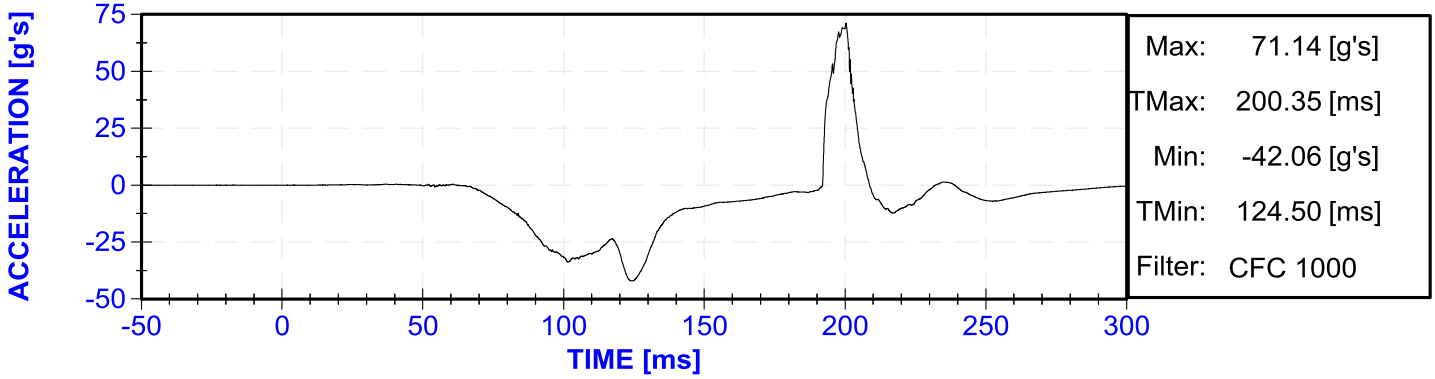
V2P4 HEAD 9 ARRAY X ARM Y



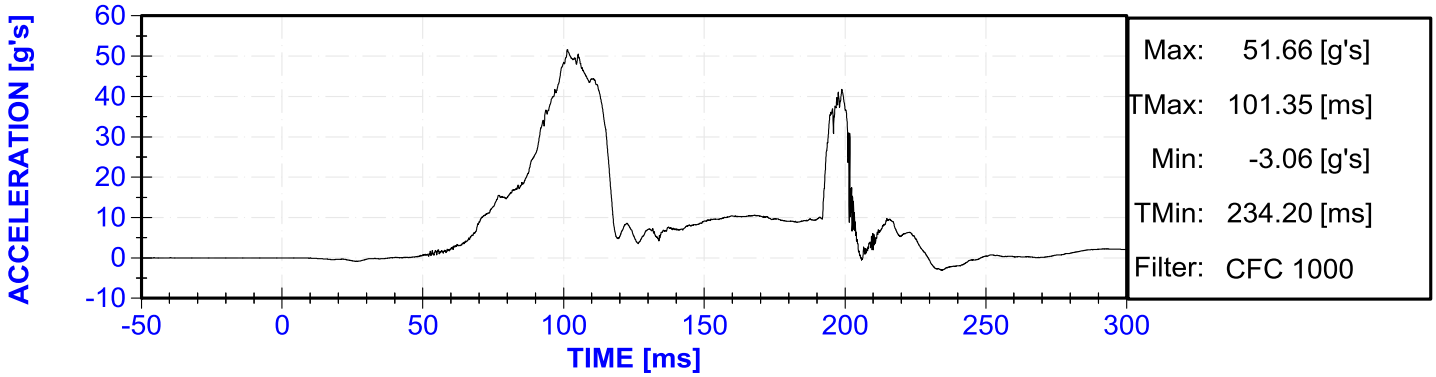
V2P4 HEAD 9 ARRAY X ARM Z



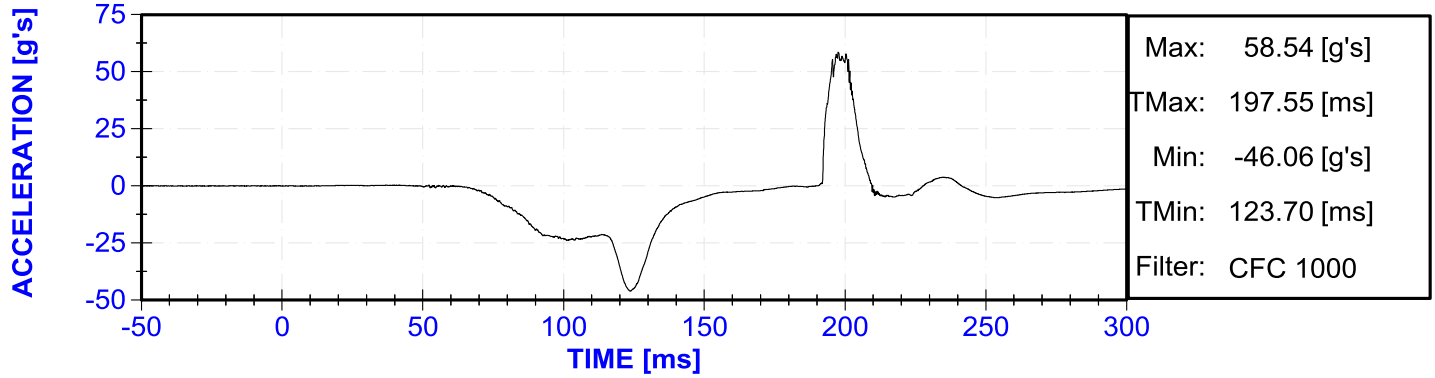
V2P4 HEAD 9 ARRAY Y ARM X



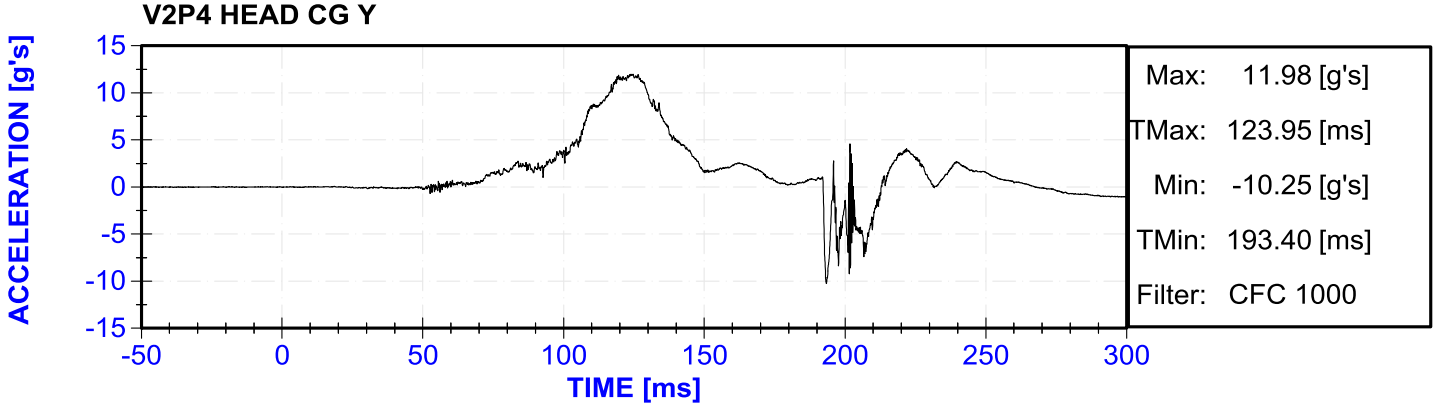
V2P4 HEAD 9 ARRAY Y ARM Z



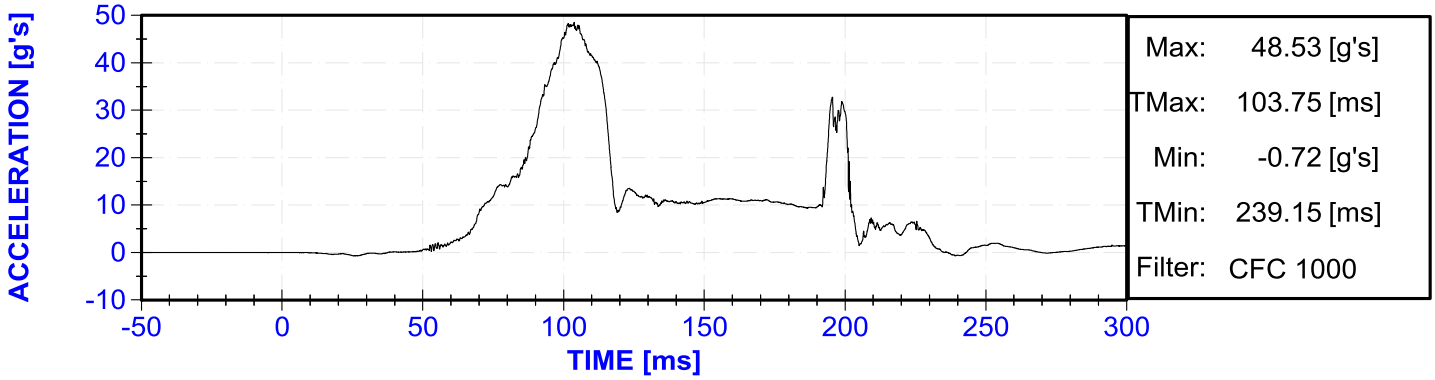
V2P4 HEAD CG X



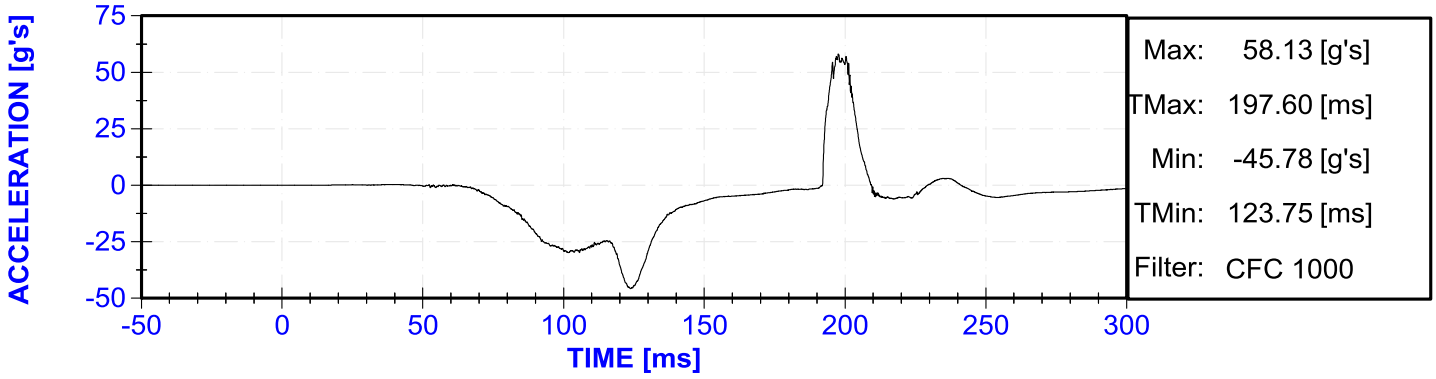
V2P4 HEAD CG Y



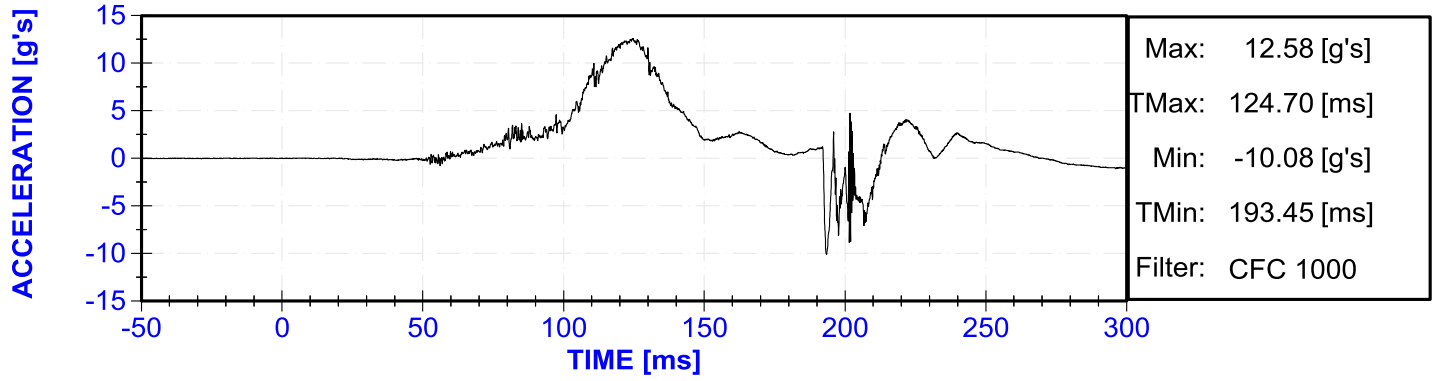
V2P4 HEAD CG Z



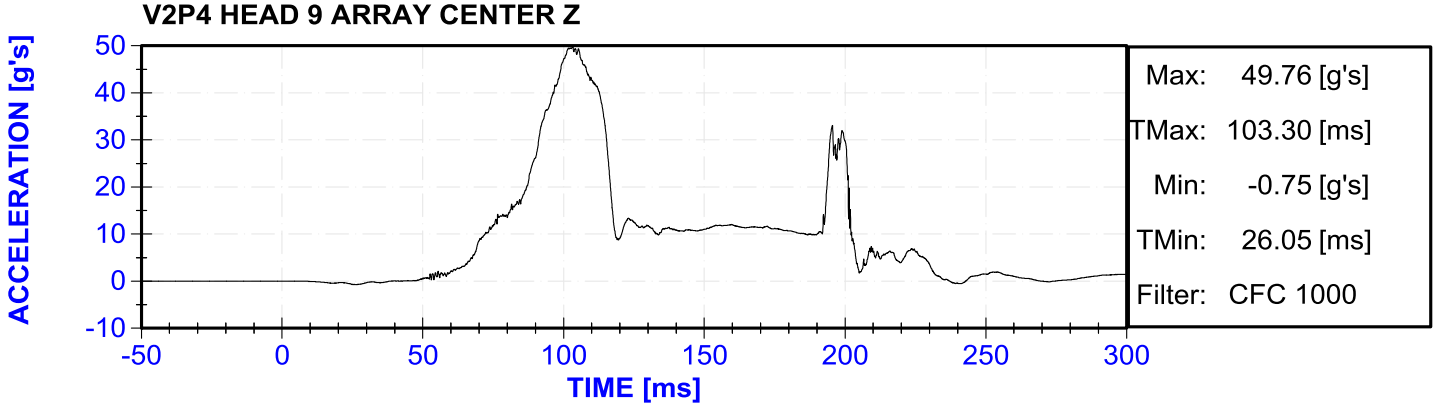
V2P4 HEAD 9 ARRAY CENTER X



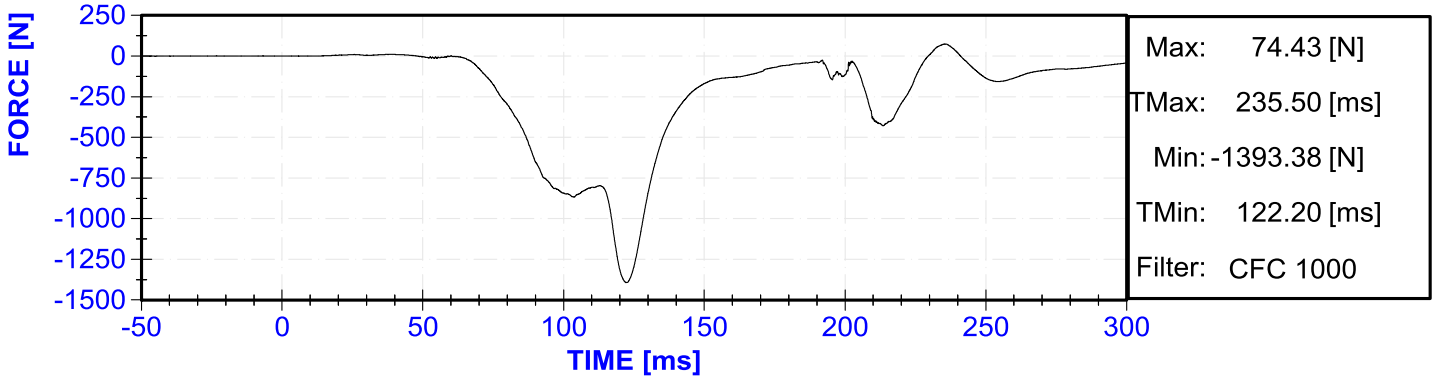
V2P4 HEAD 9 ARRAY CENTER Y



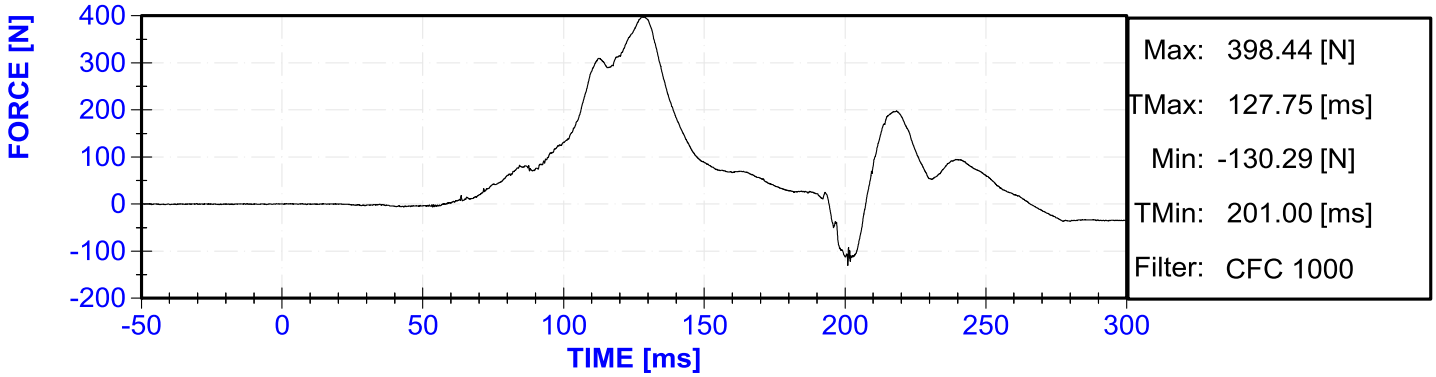
V2P4 HEAD 9 ARRAY CENTER Z



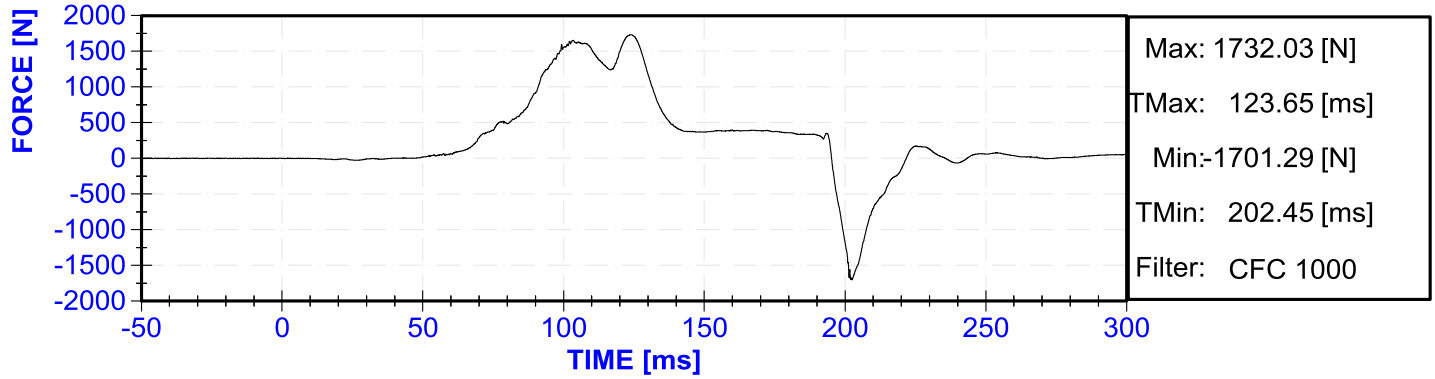
V2P4 UPPER NECK FX



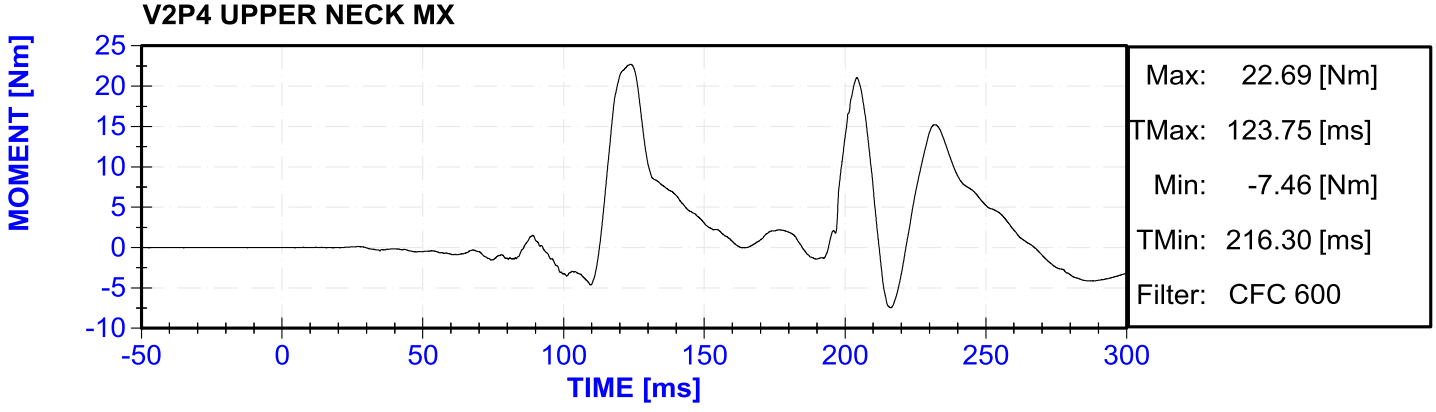
V2P4 UPPER NECK FY



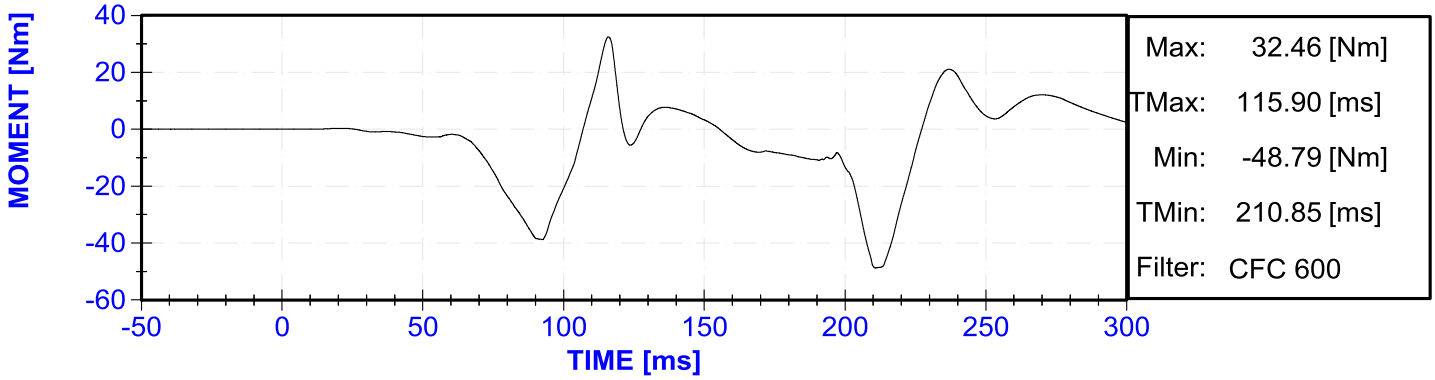
V2P4 UPPER NECK FZ



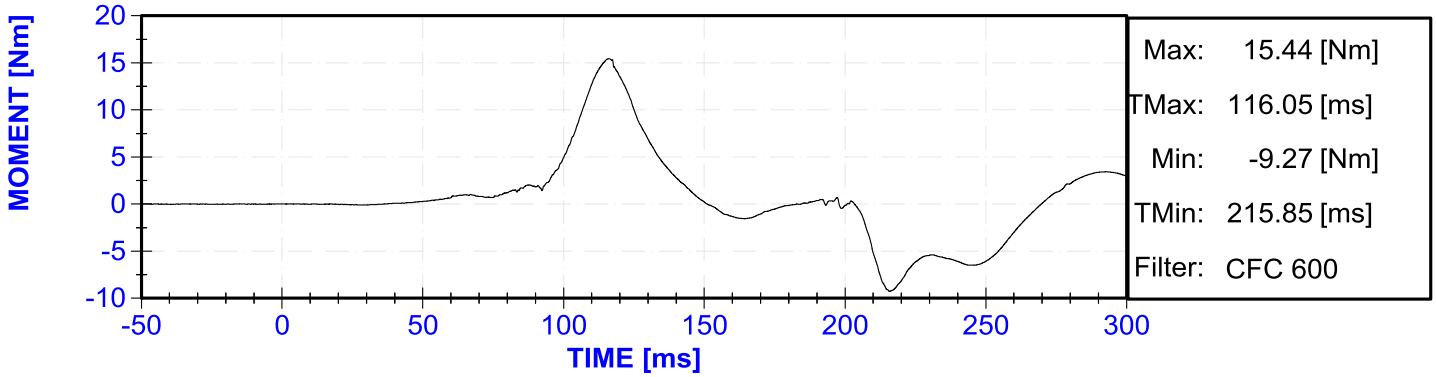
V2P4 UPPER NECK MX



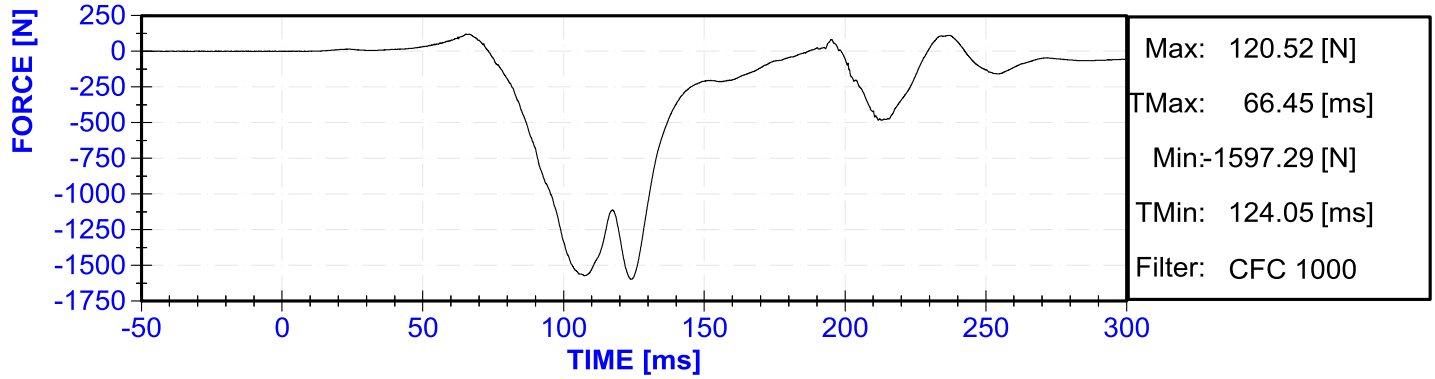
V2P4 UPPER NECK MY



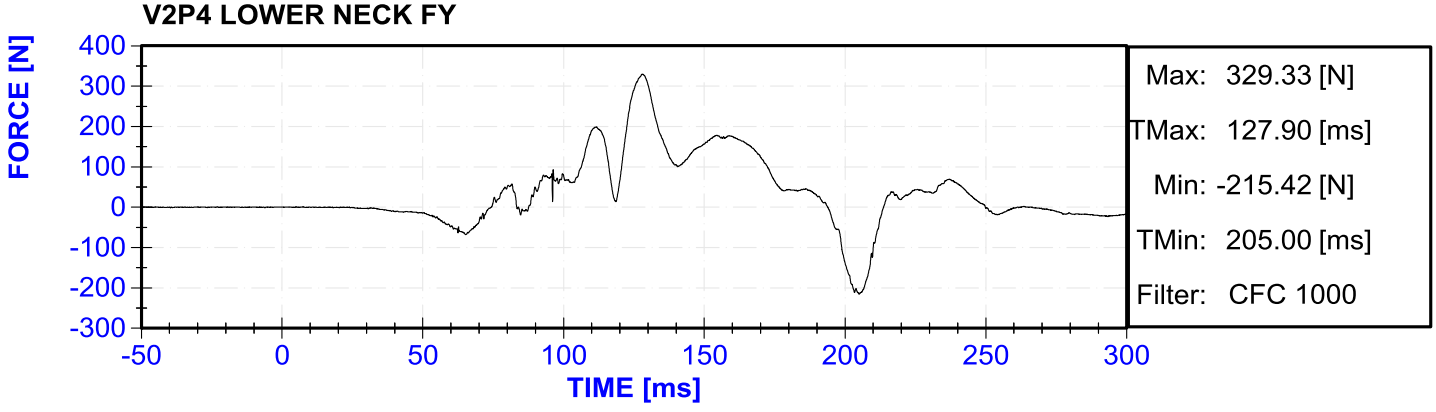
V2P4 UPPER NECK MZ



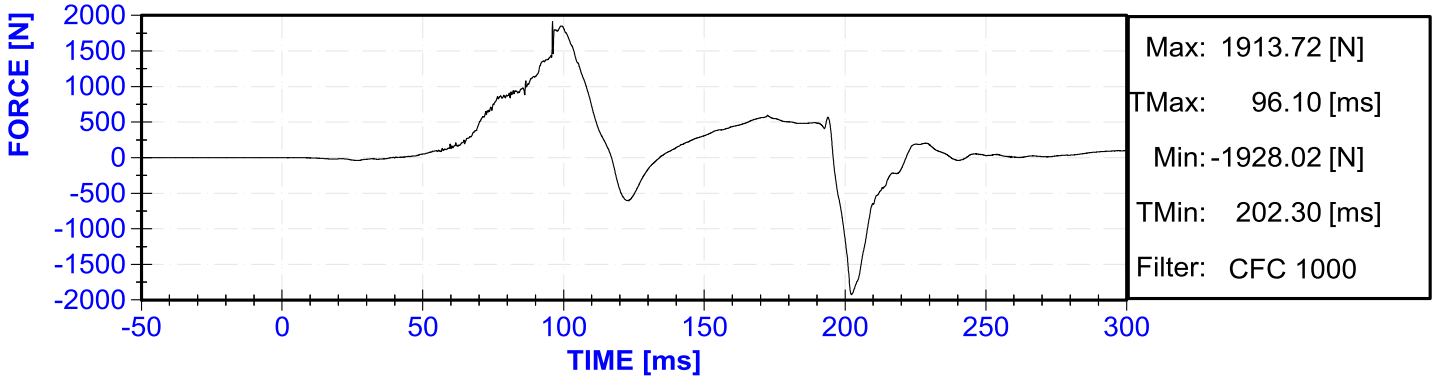
V2P4 LOWER NECK FX



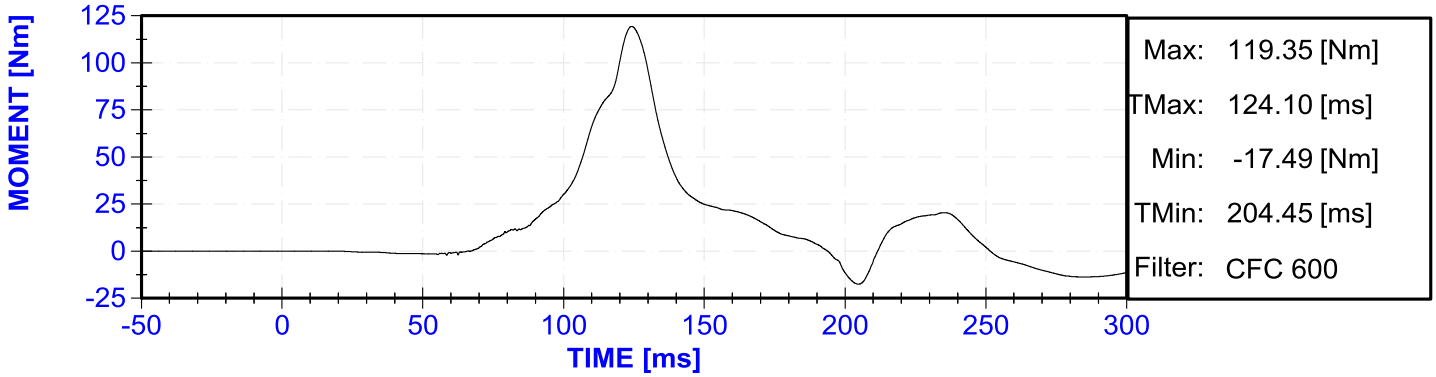
V2P4 LOWER NECK FY



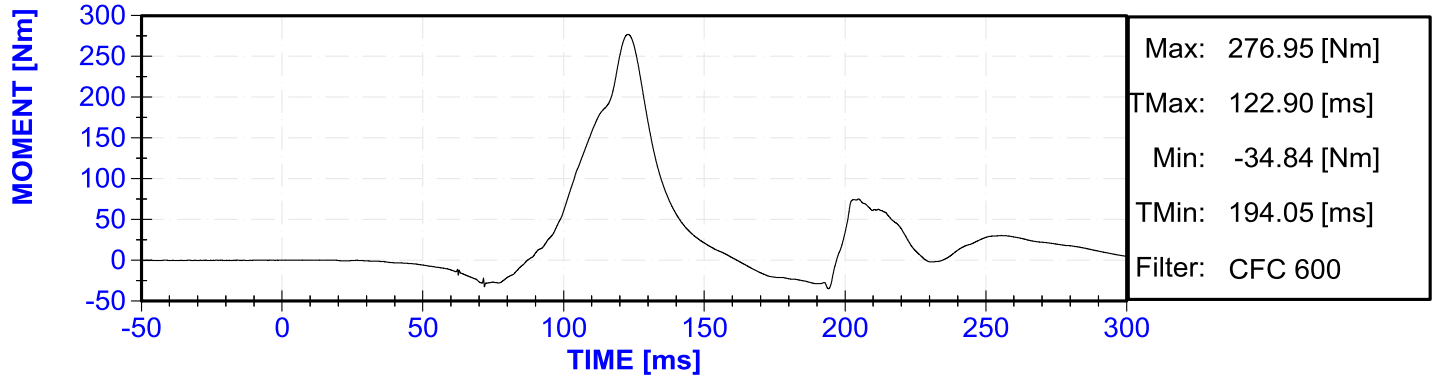
V2P4 LOWER NECK FZ



V2P4 LOWER NECK MX

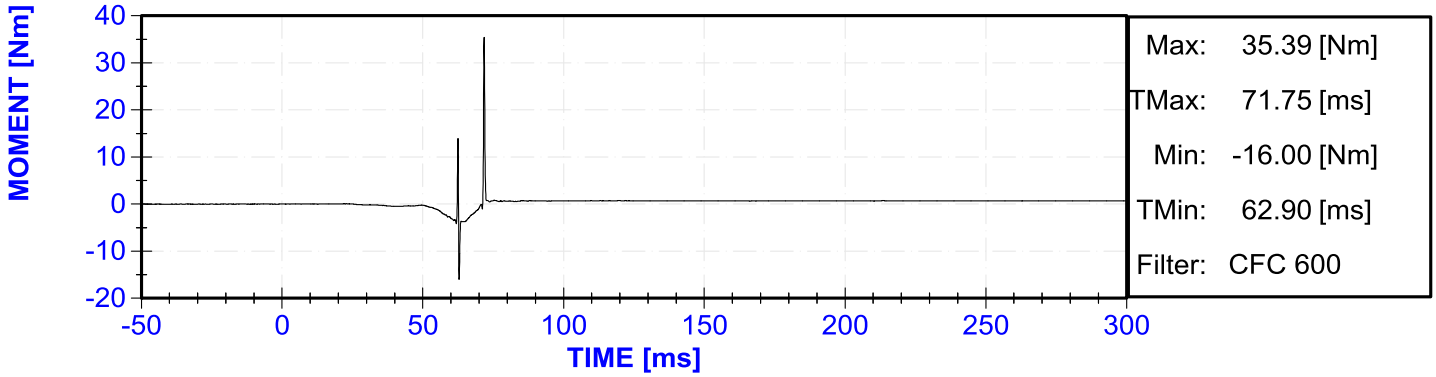


V2P4 LOWER NECK MY

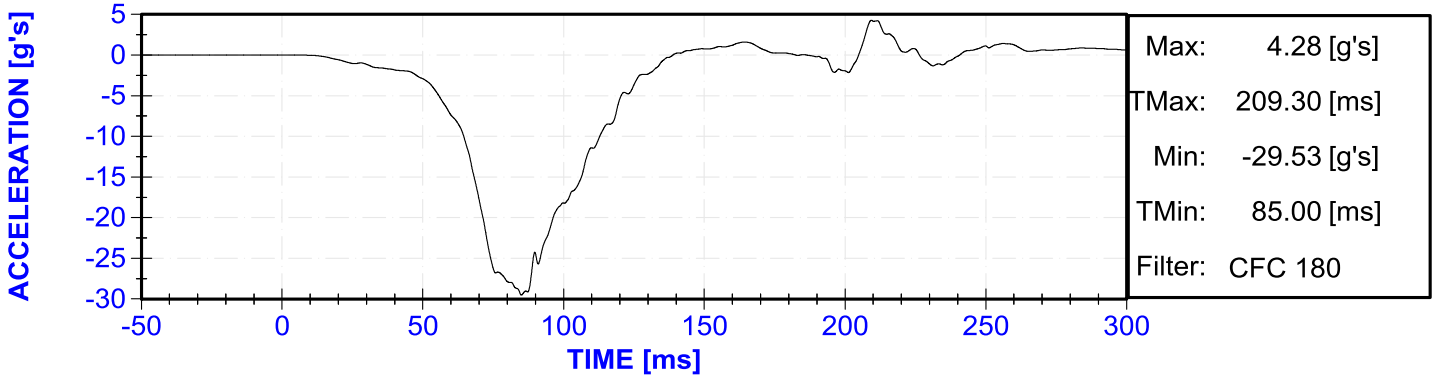


V2P4 LOWER NECK MZ

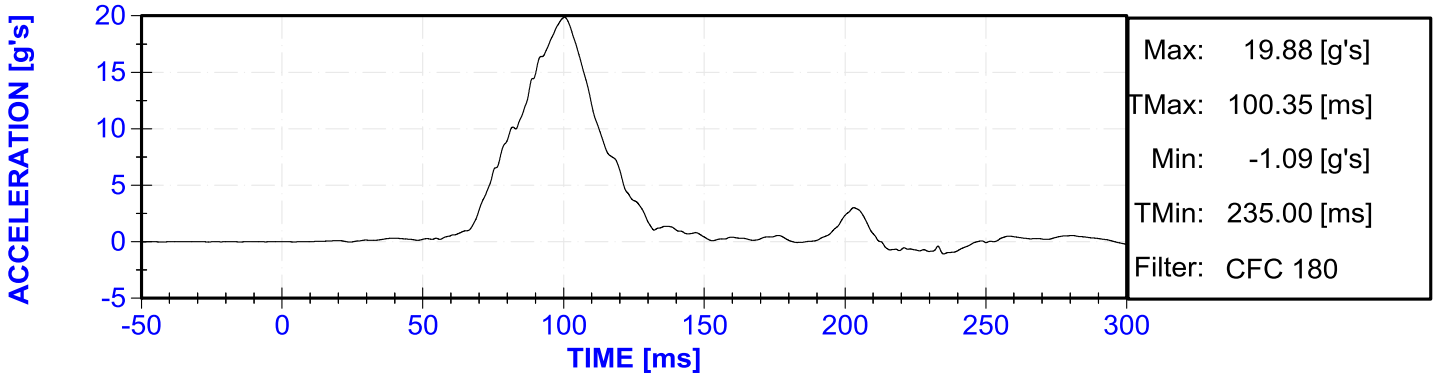
QUESTIONABLE AFTER 72 MS



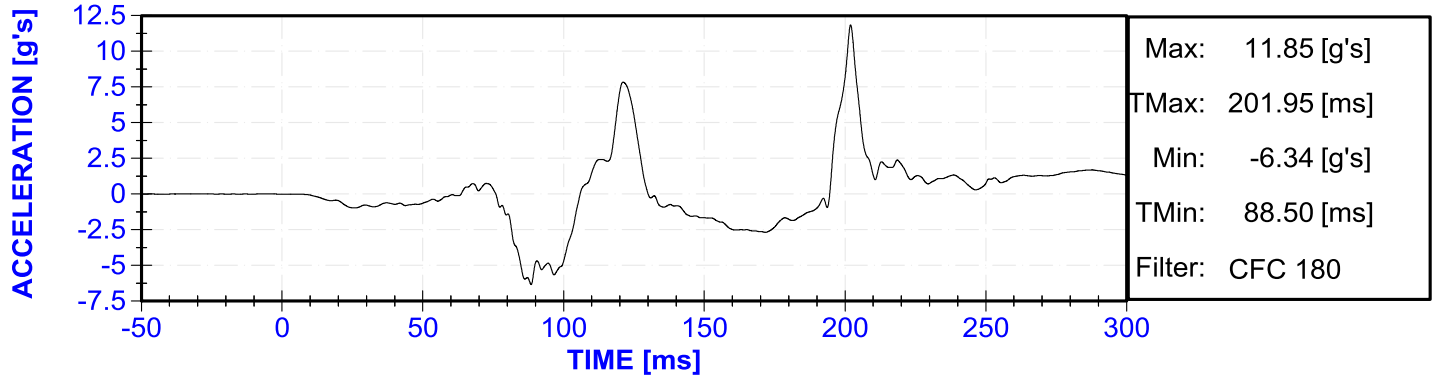
V2P4 CHEST X



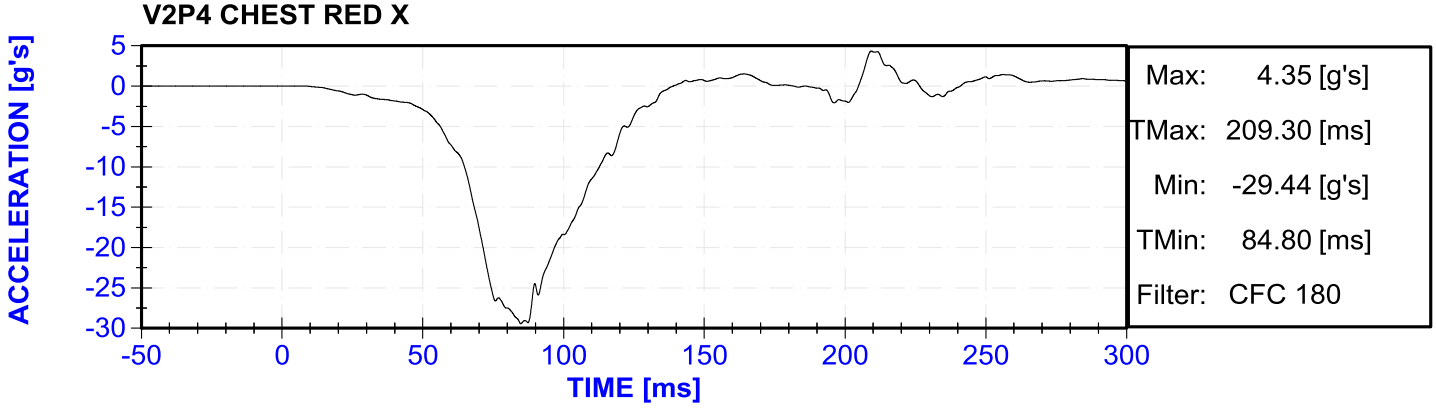
V2P4 CHEST Y



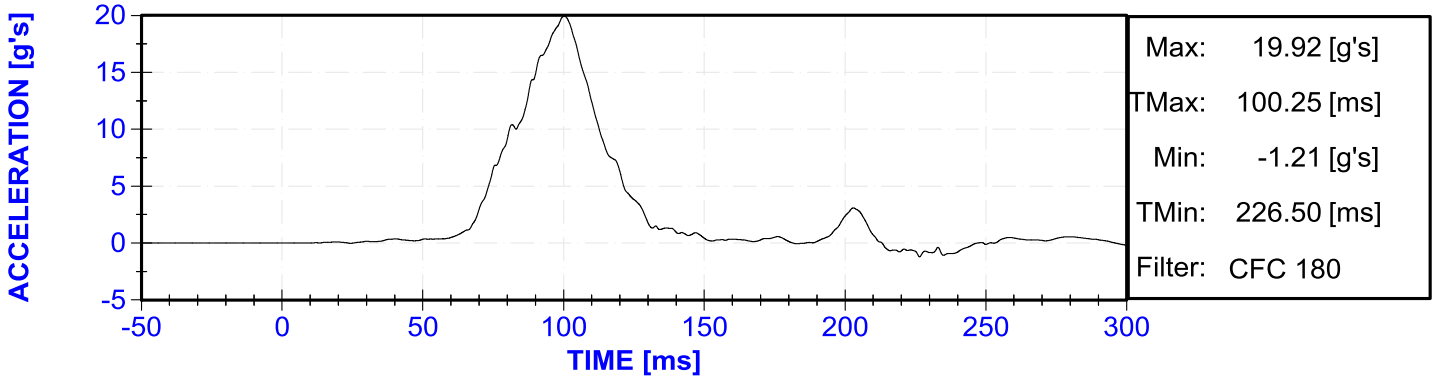
V2P4 CHEST Z



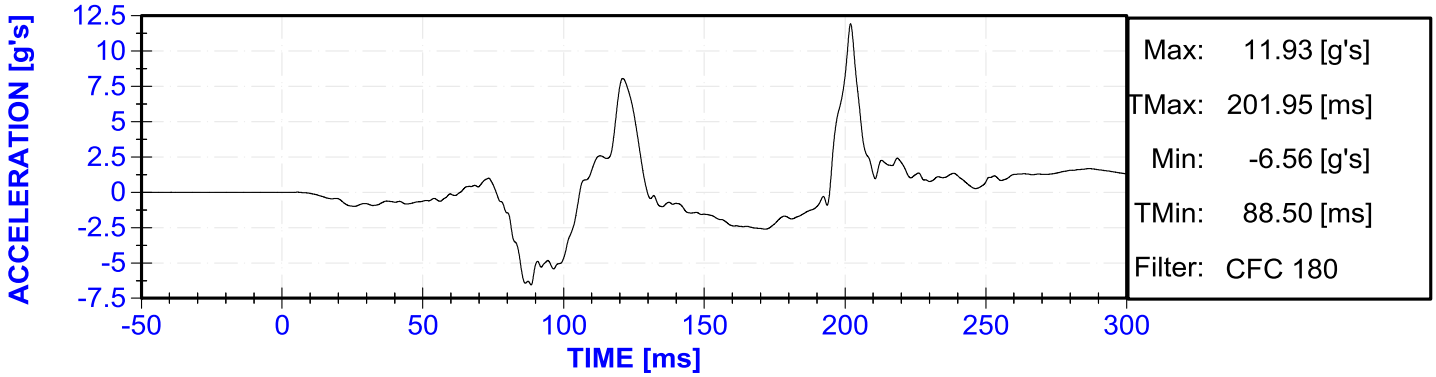
V2P4 CHEST RED X



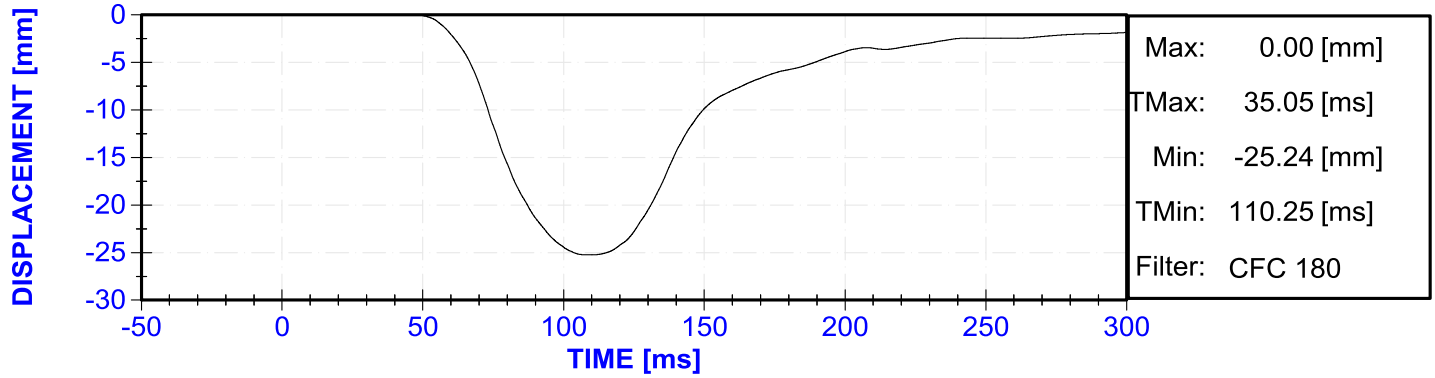
V2P4 CHEST RED Y



V2P4 CHEST RED Z

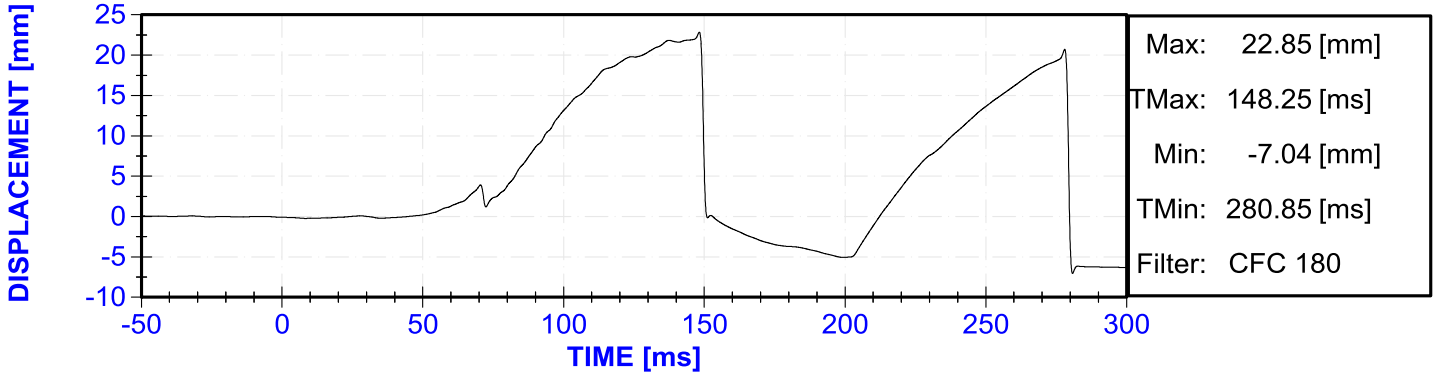


V2P4 CHEST DISPLACEMENT

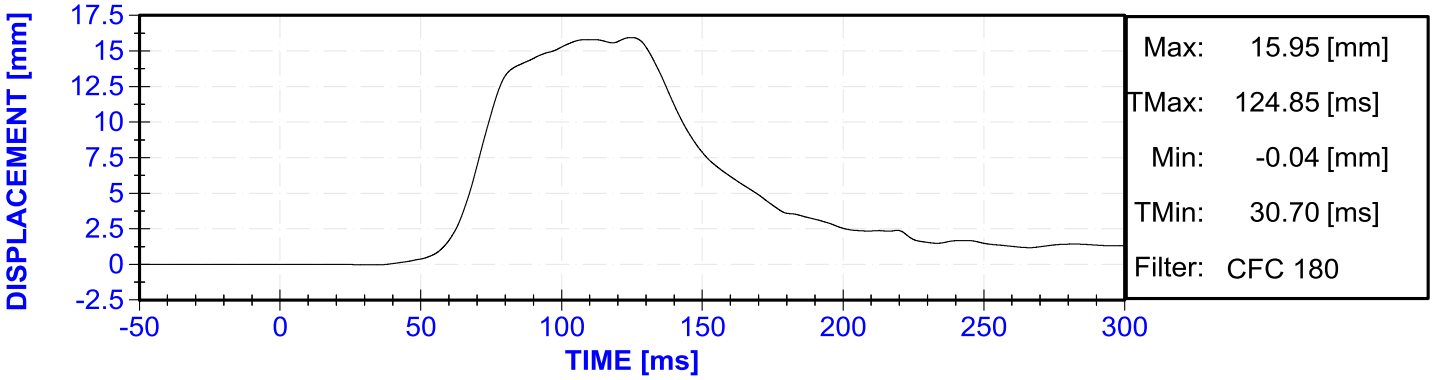


V2P4 8 STRING POD - UR TOP

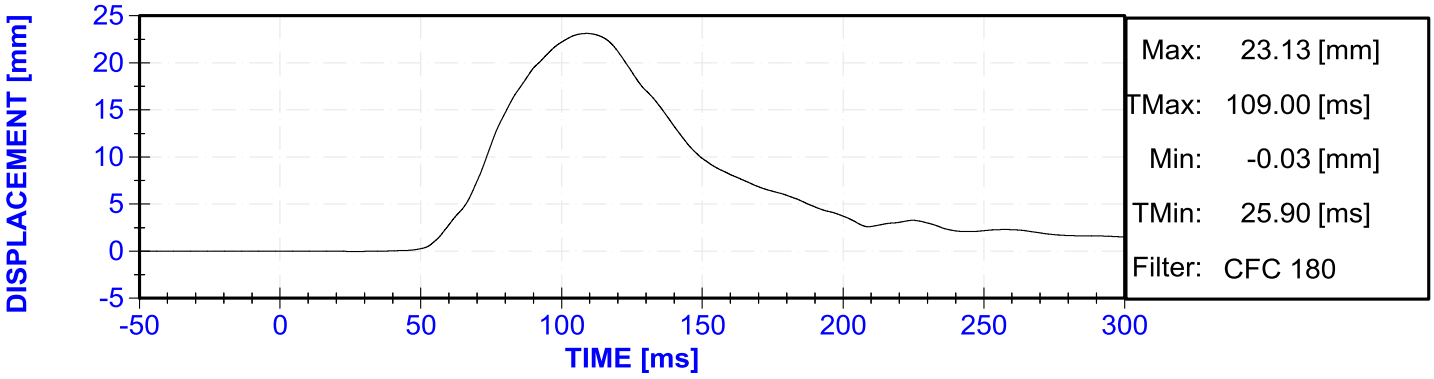
QUESTIONABLE AFTER 148 MS



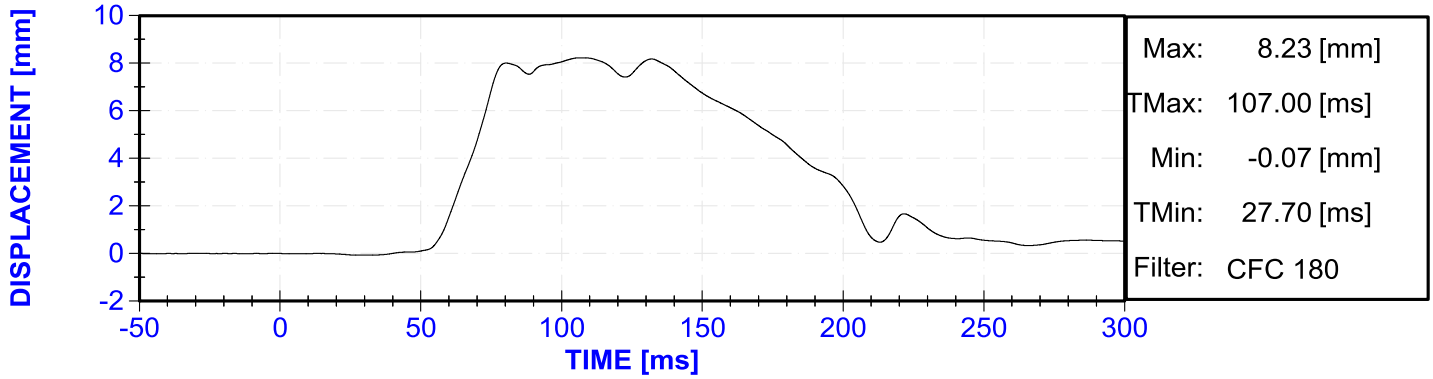
V2P4 8 STRING POD - UR MID



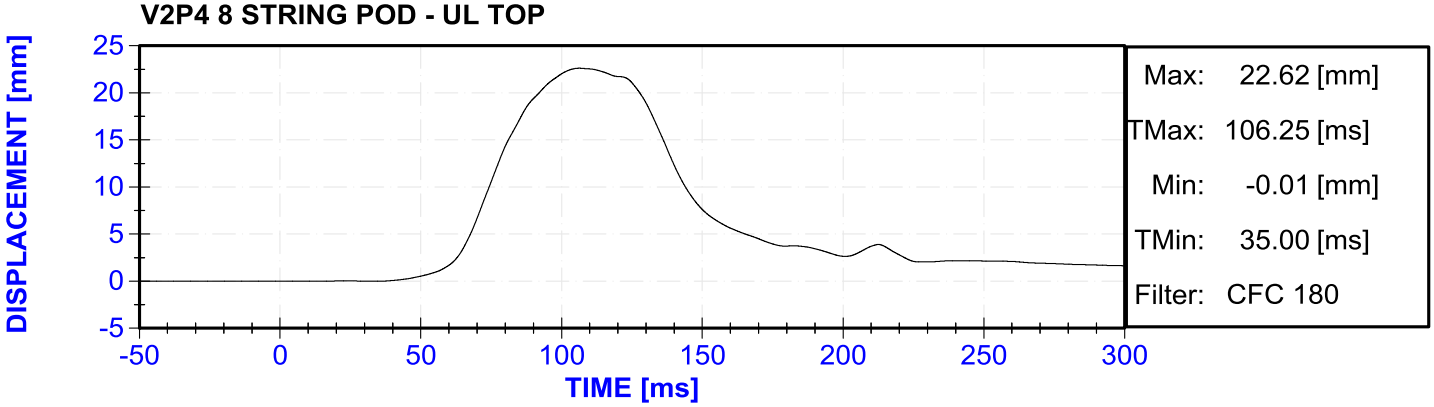
V2P4 8 STRING POD - LR MID



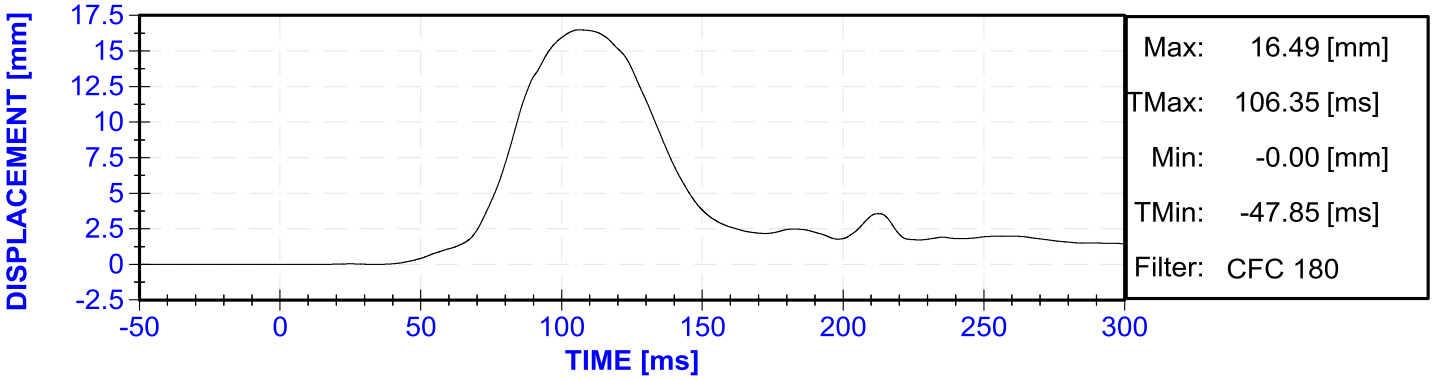
V2P4 8 STRING POD - LR BOTTOM



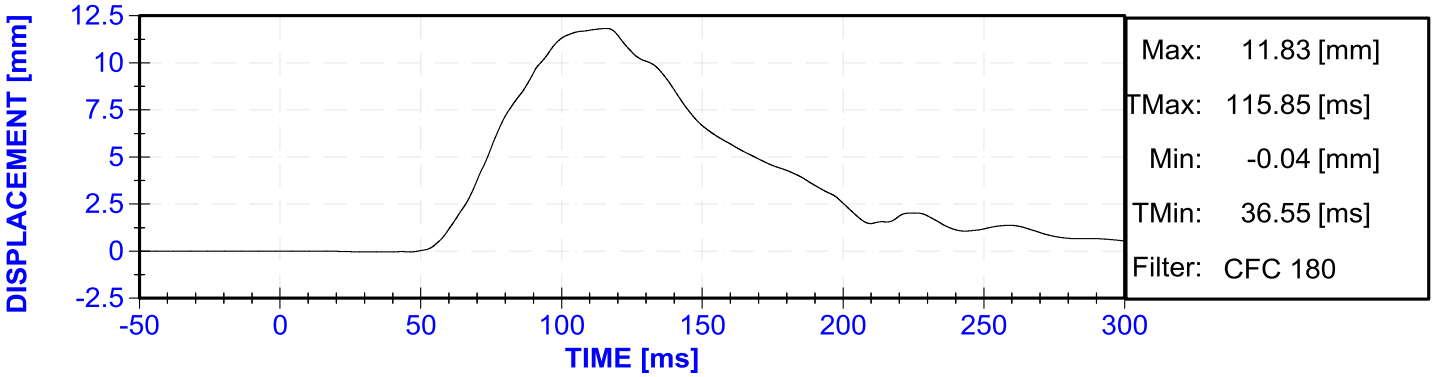
V2P4 8 STRING POD - UL TOP



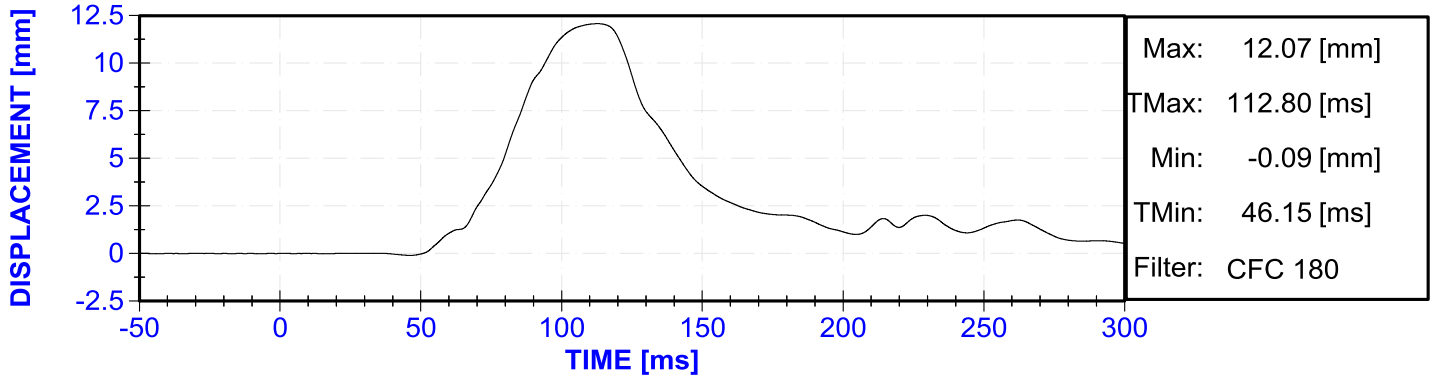
V2P4 8 STRING POD - UL MID



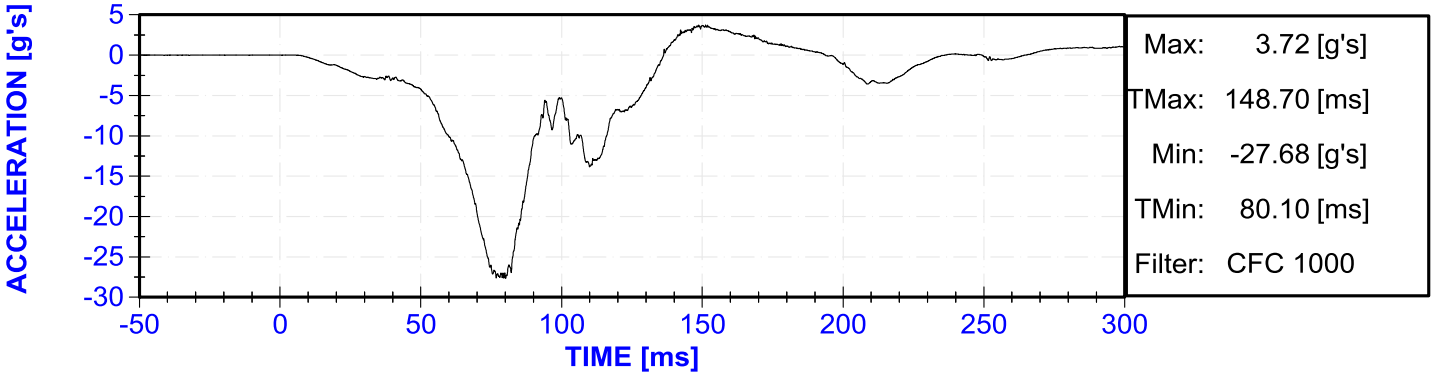
V2P4 8 STRING POD - LL MID



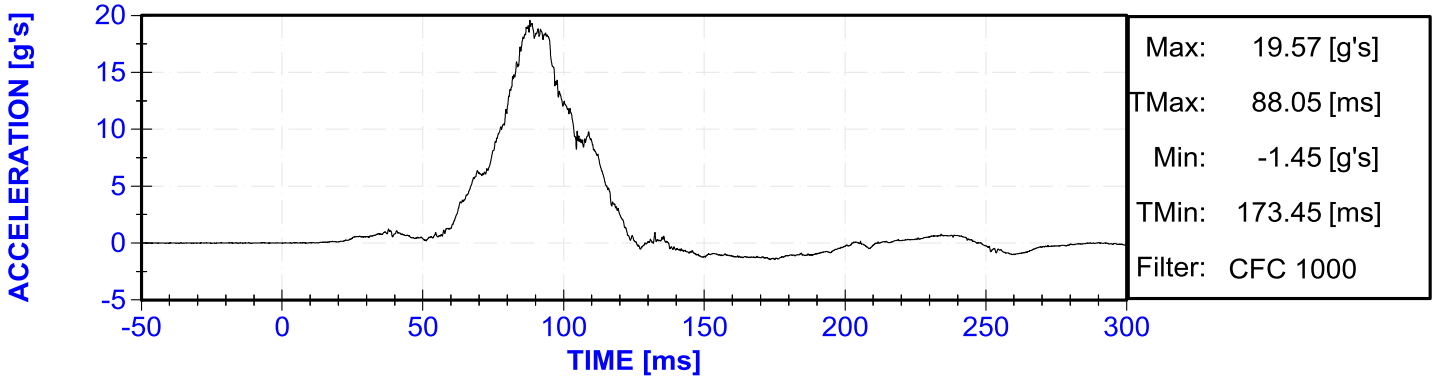
V2P4 8 STRING POD - LL BOTTOM



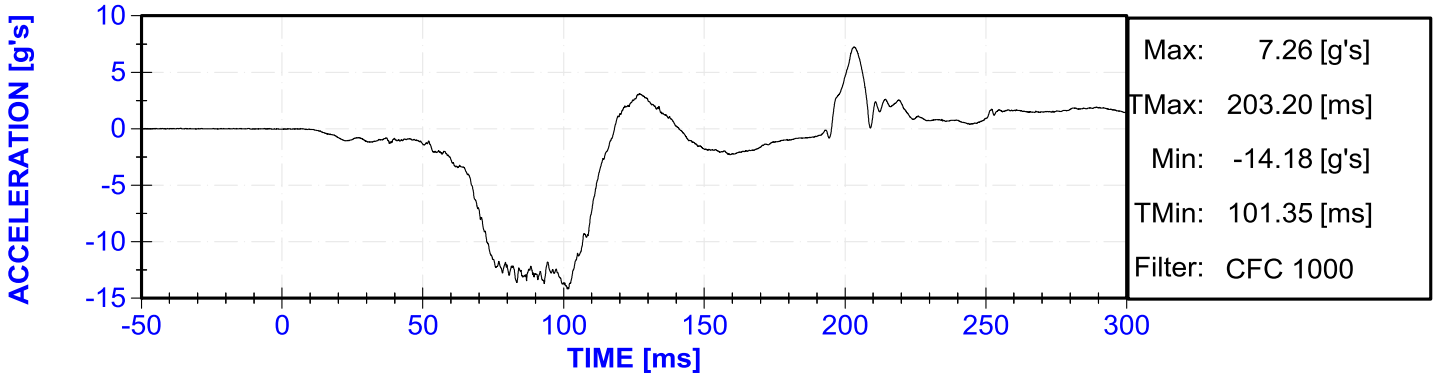
V2P4 PELVIC X



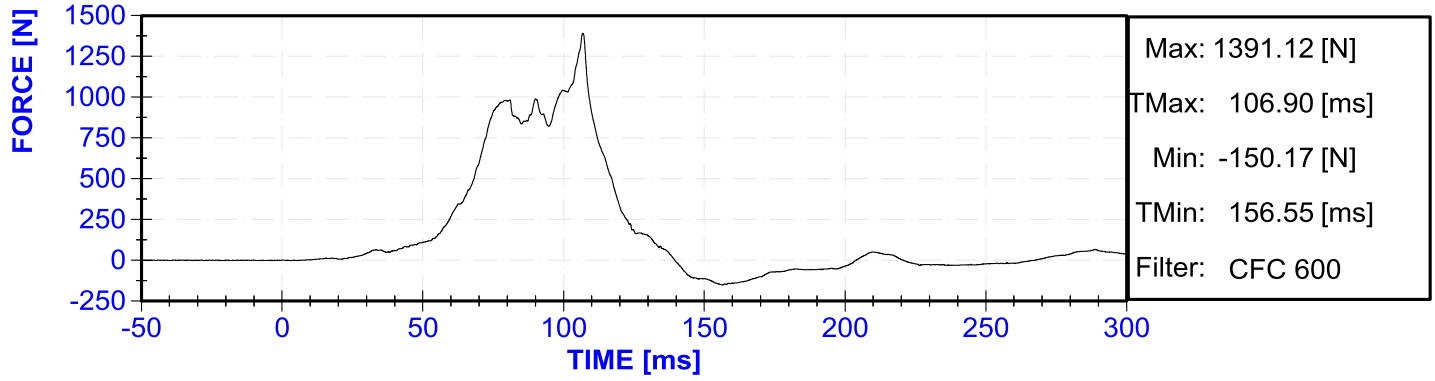
V2P4 PELVIC Y



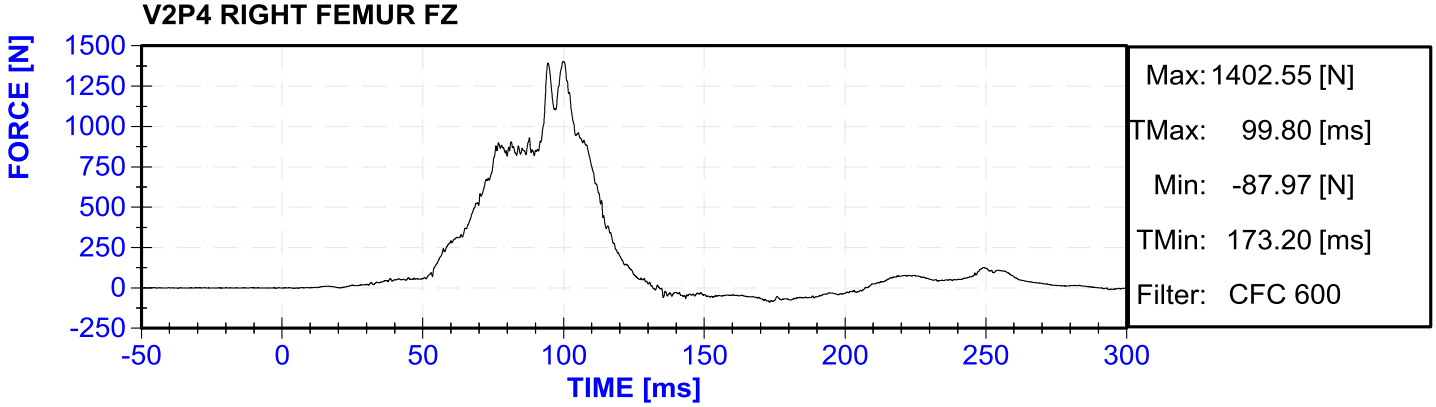
V2P4 PELVIC Z



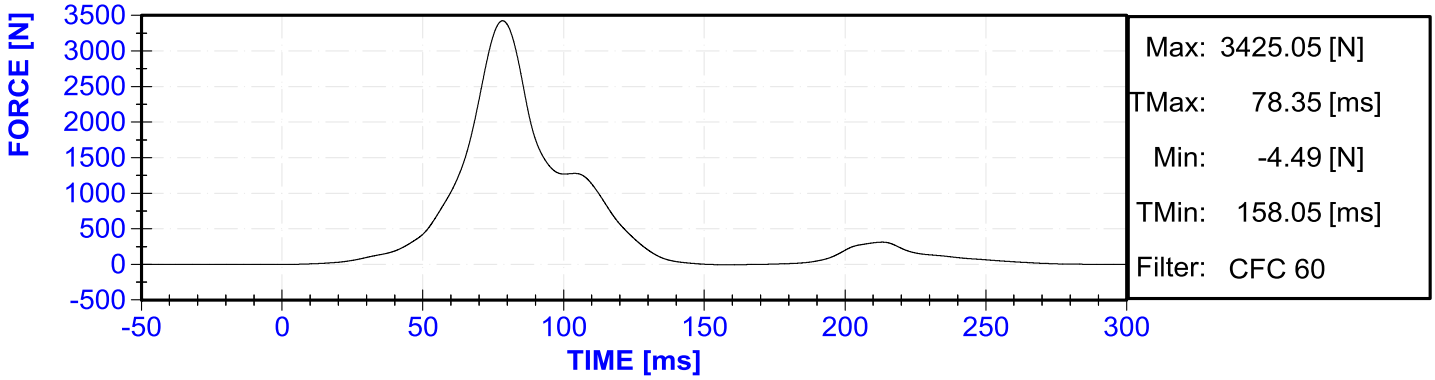
V2P4 LEFT FEMUR FZ



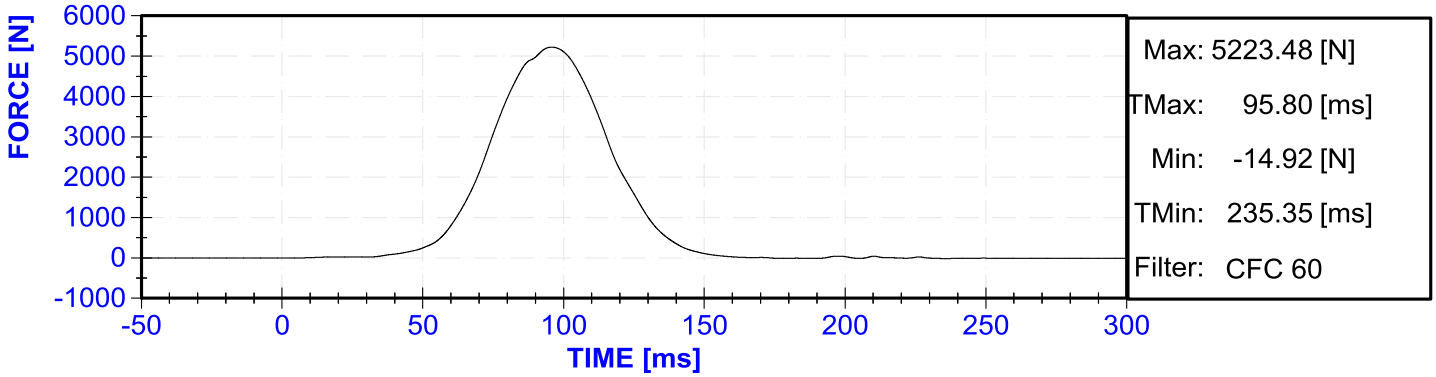
V2P4 RIGHT FEMUR FZ



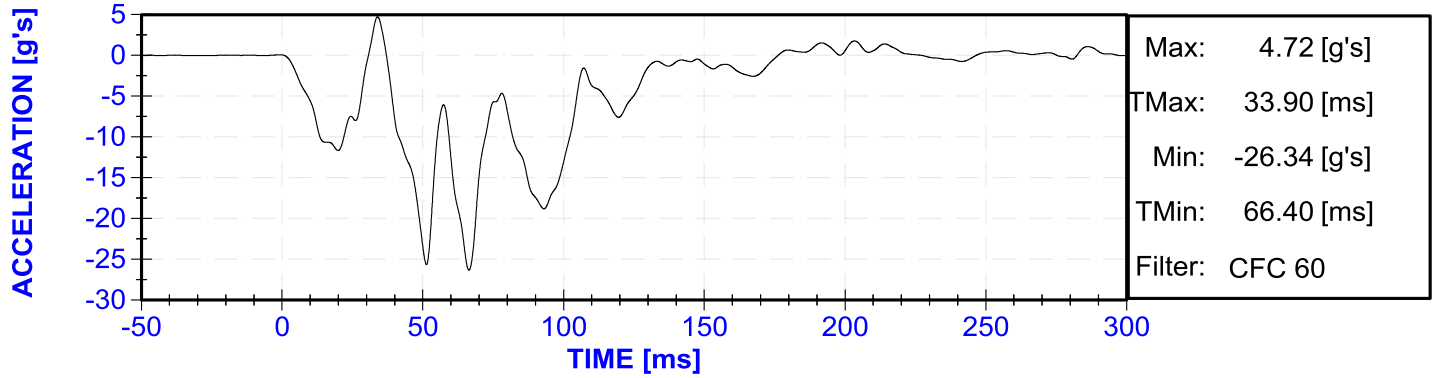
V2 Passenger Lap Belt Force



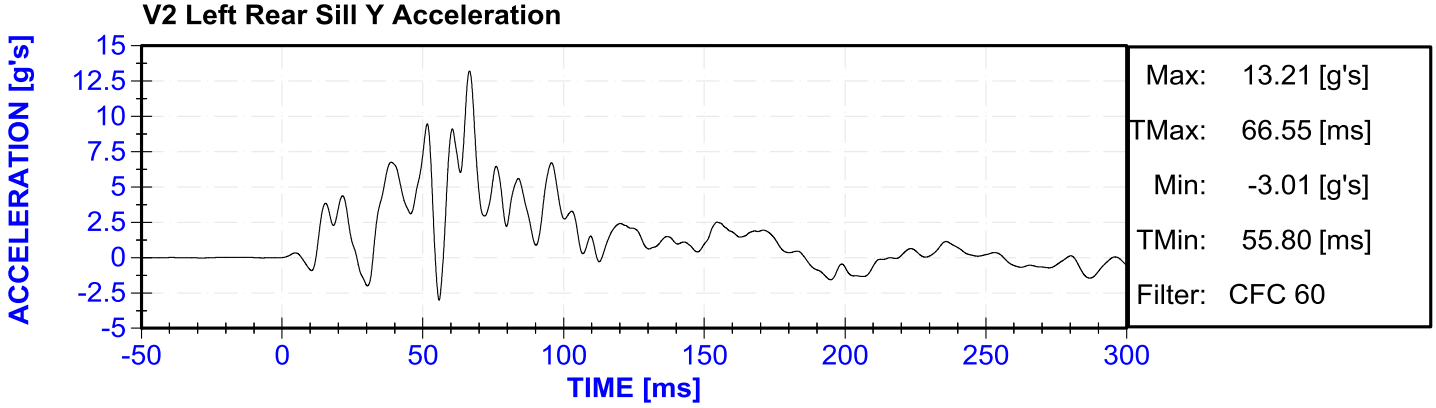
V2 Passenger Shoulder Belt Upper Force



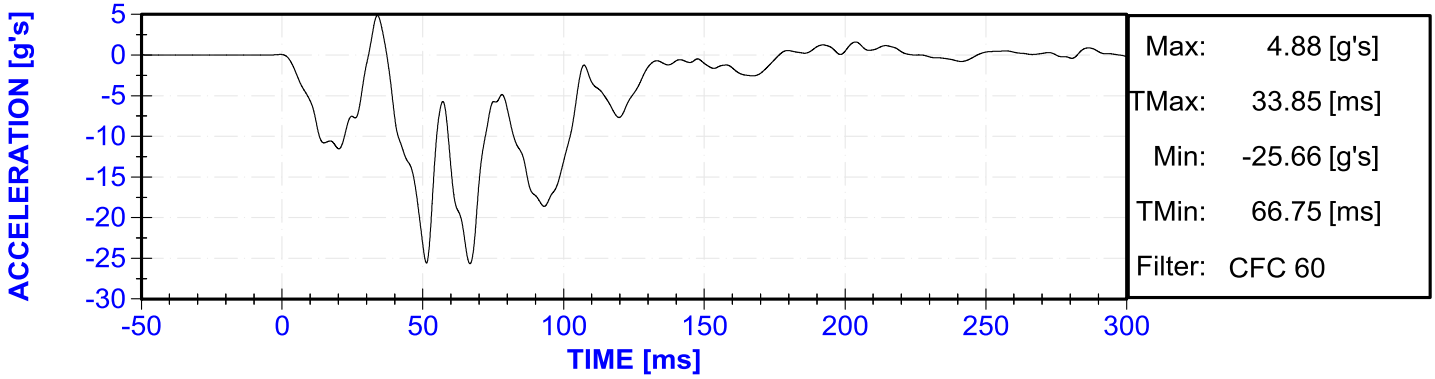
V2 Left Rear Sill X Acceleration



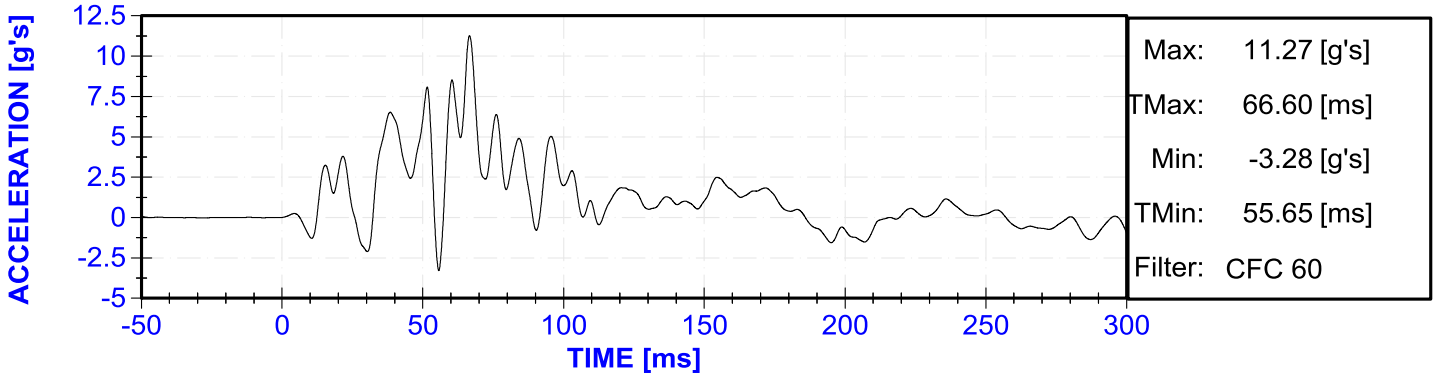
V2 Left Rear Sill Y Acceleration



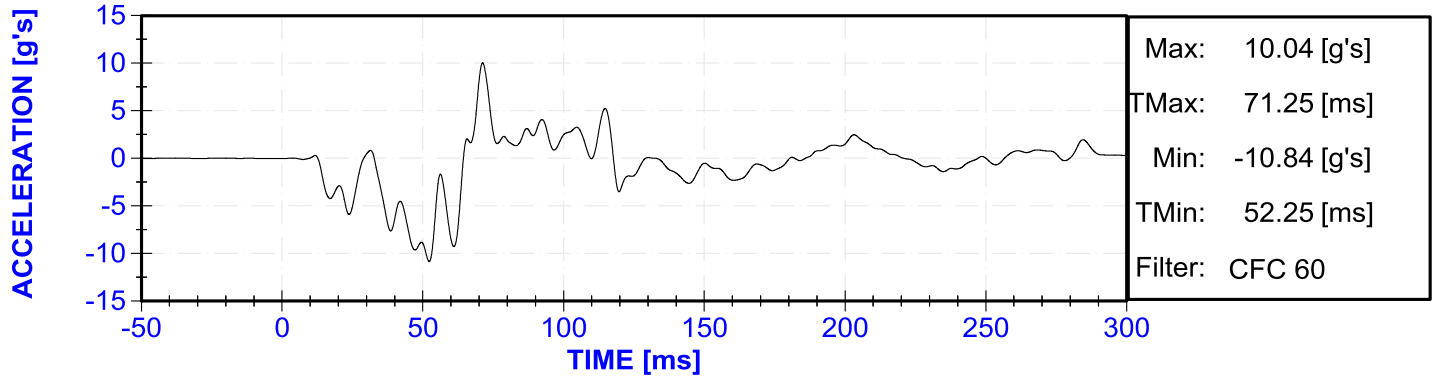
V2 Left Rear Sill Redundant X Acceleration



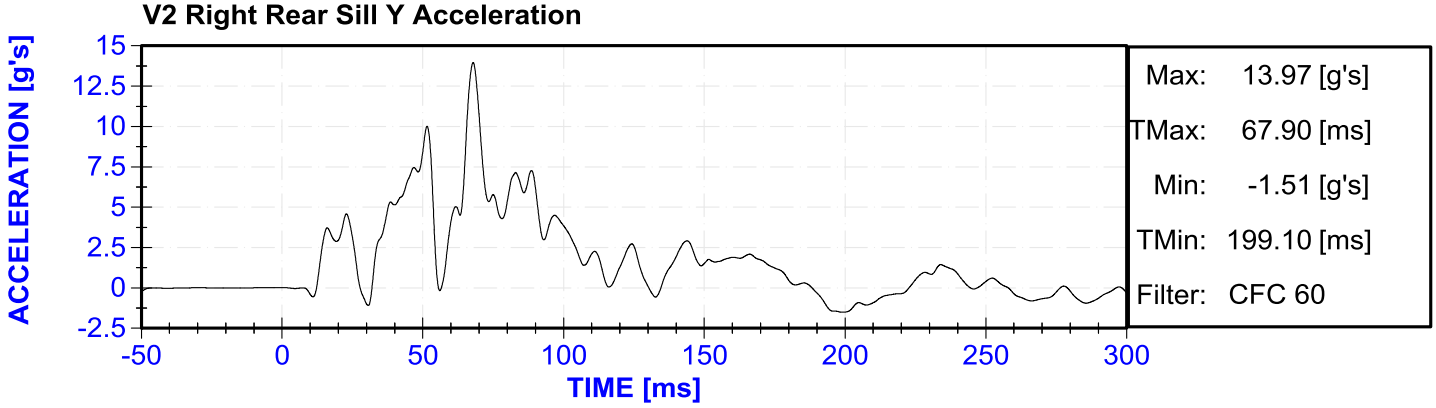
V2 Left Rear Sill Redundant Y Acceleration



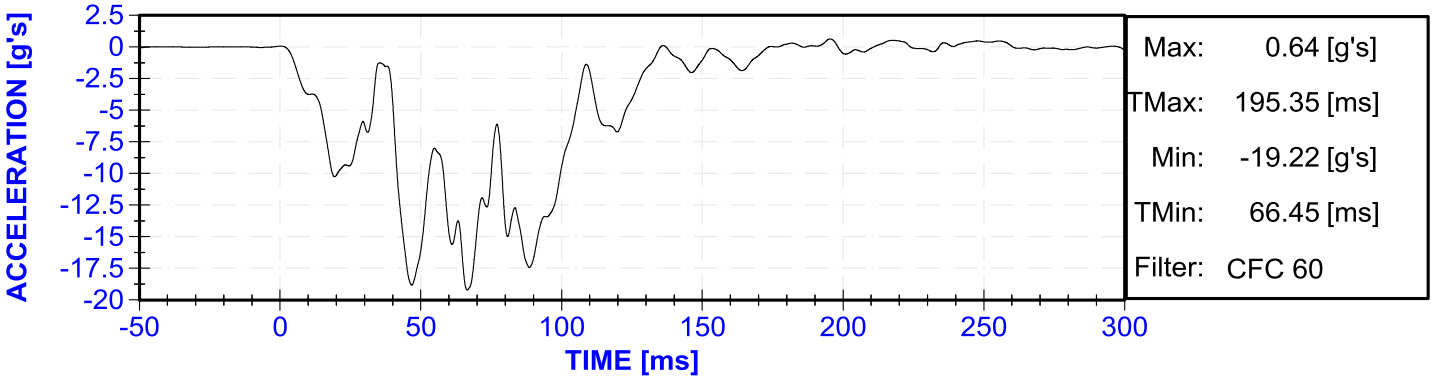
V2 Right Rear Sill X Acceleration



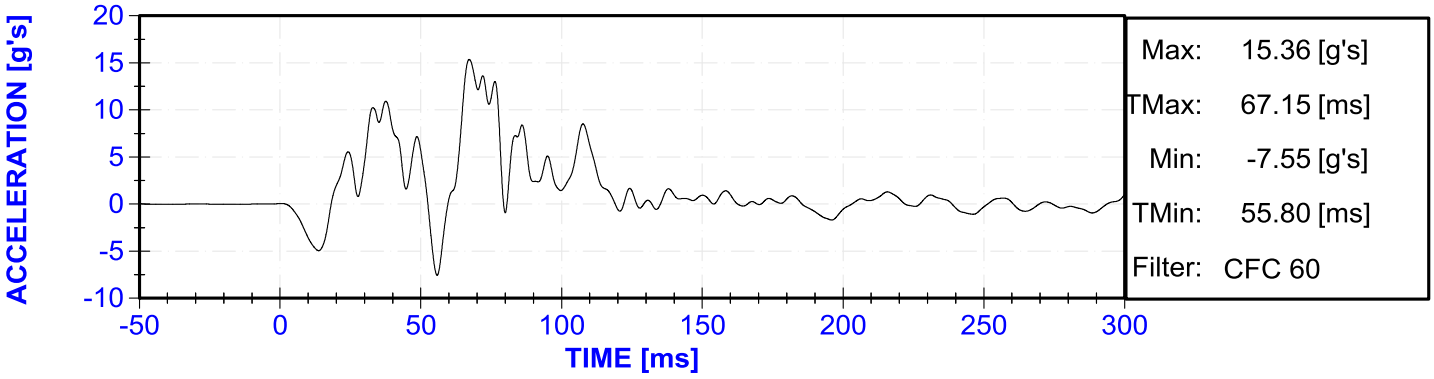
V2 Right Rear Sill Y Acceleration



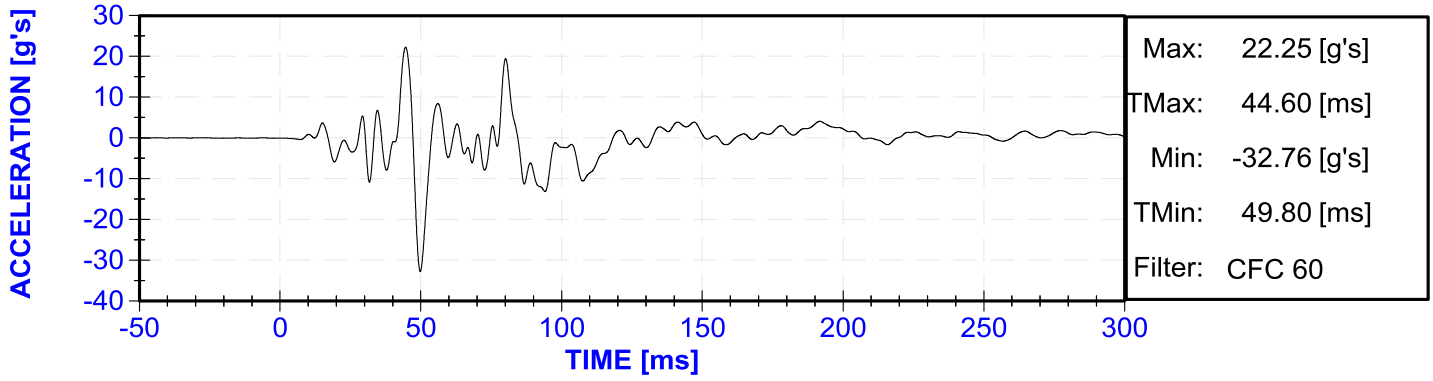
V2 Vehicle CG X Acceleration



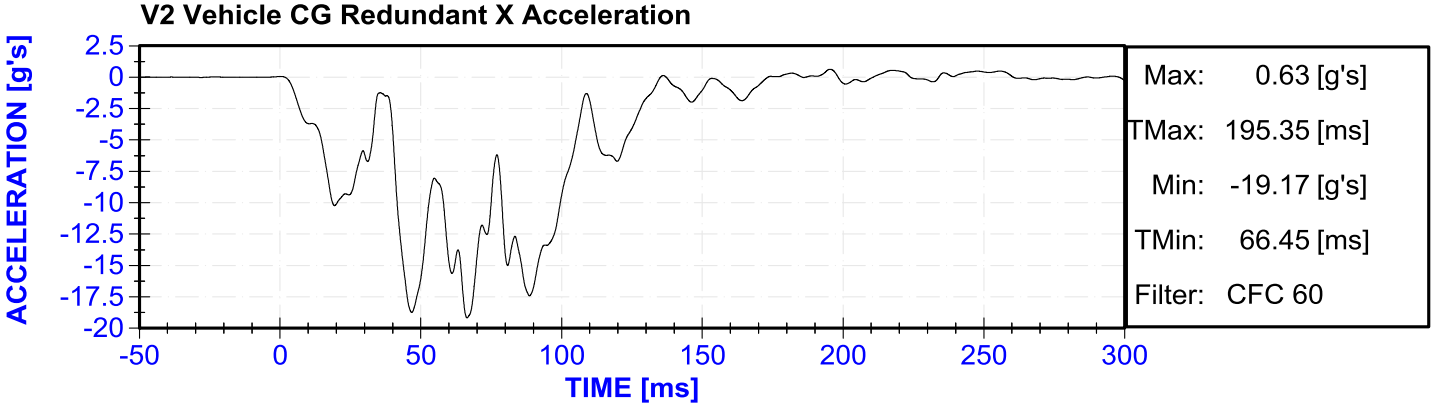
V2 Vehicle CG Y Acceleration



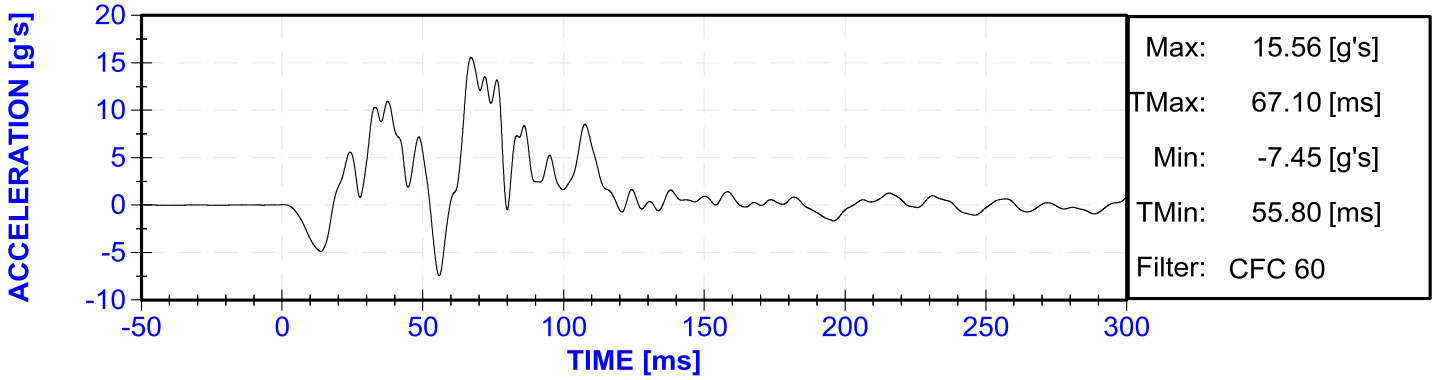
V2 Vehicle CG Z Acceleration



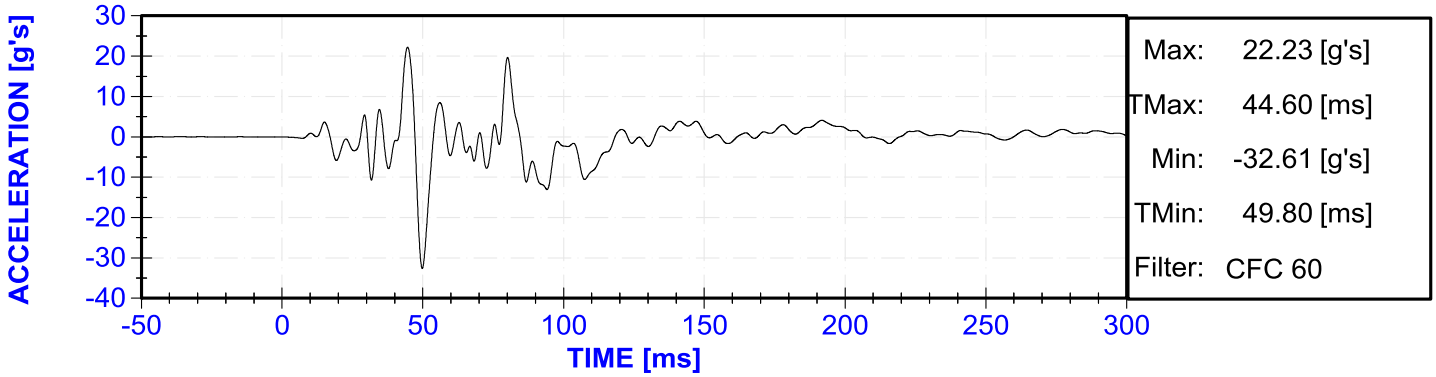
V2 Vehicle CG Redundant X Acceleration



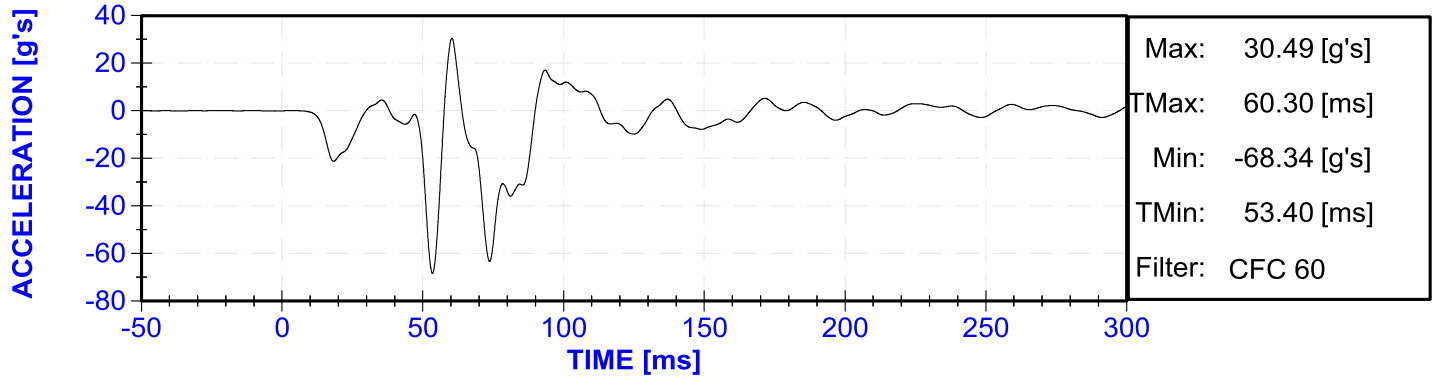
V2 Vehicle CG Redundant Y Acceleration



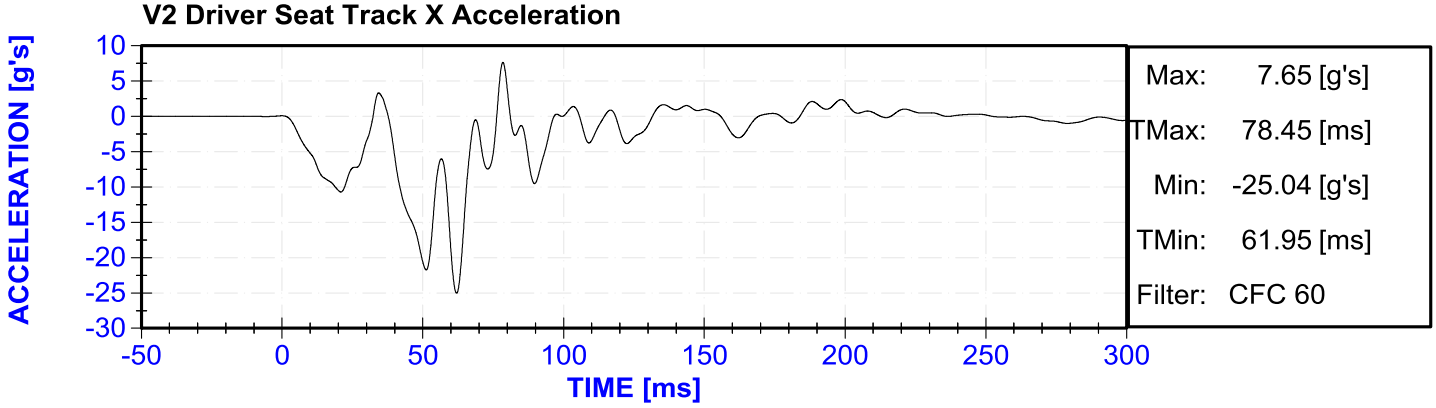
V2 Vehicle CG Redundant Z Acceleration



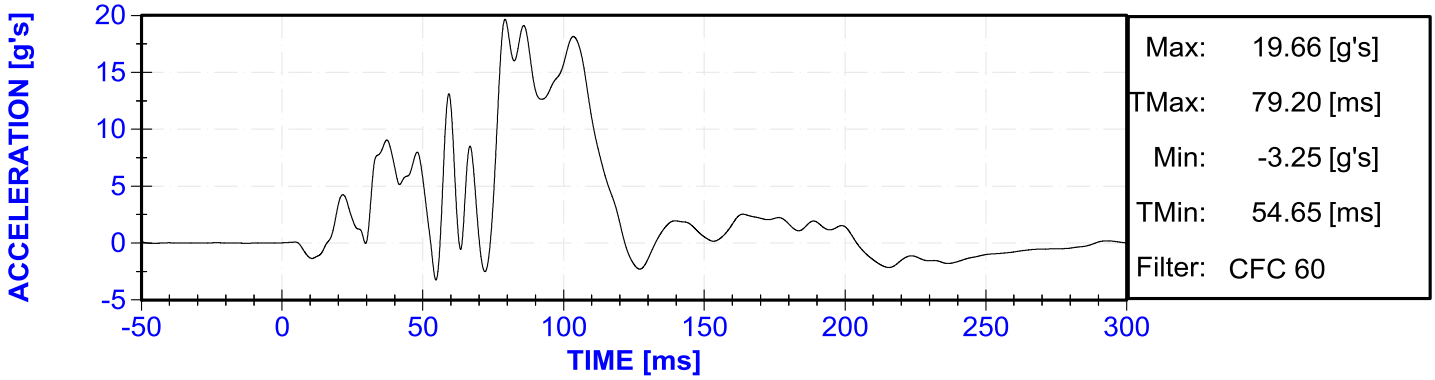
V2 Instrument Panel X Acceleration



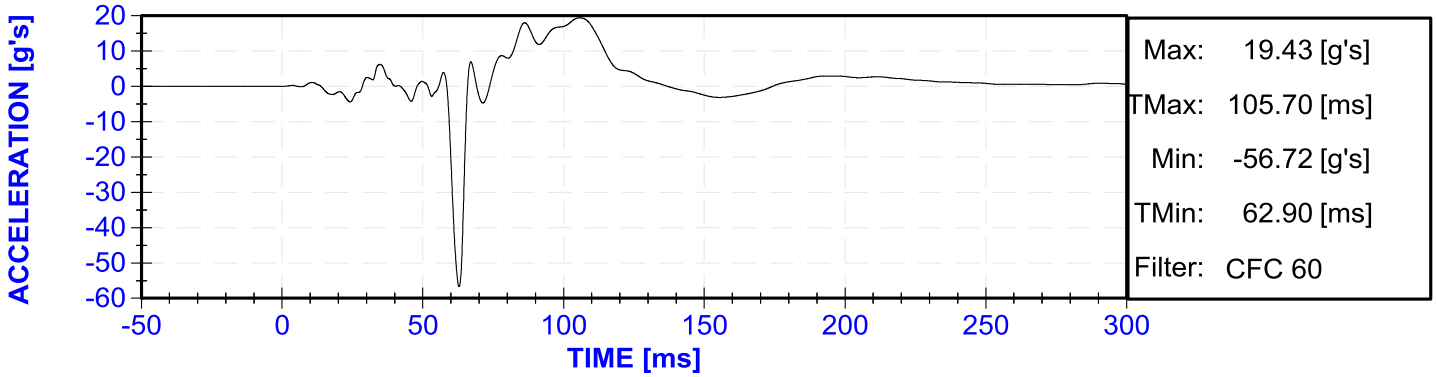
V2 Driver Seat Track X Acceleration



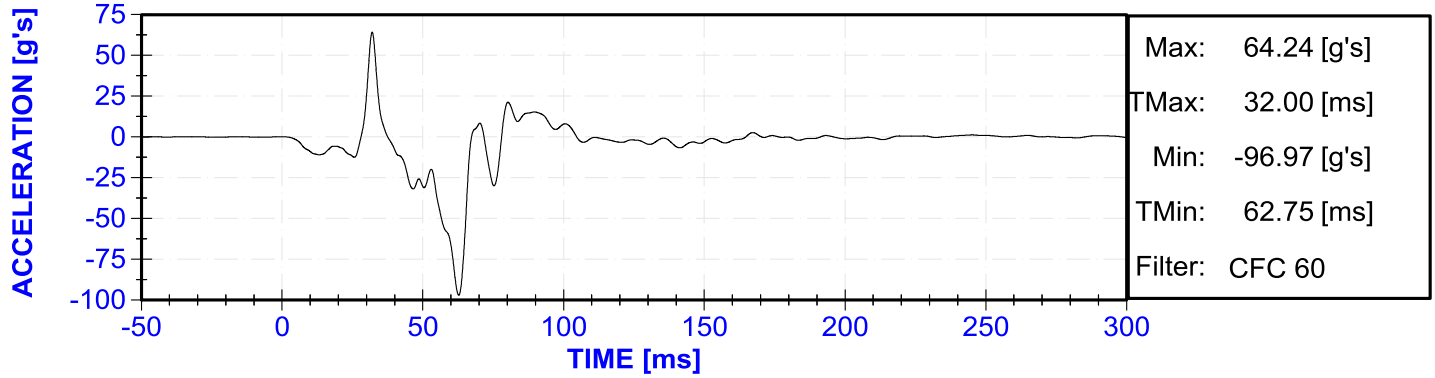
V2 Driver Seat Track Y Acceleration



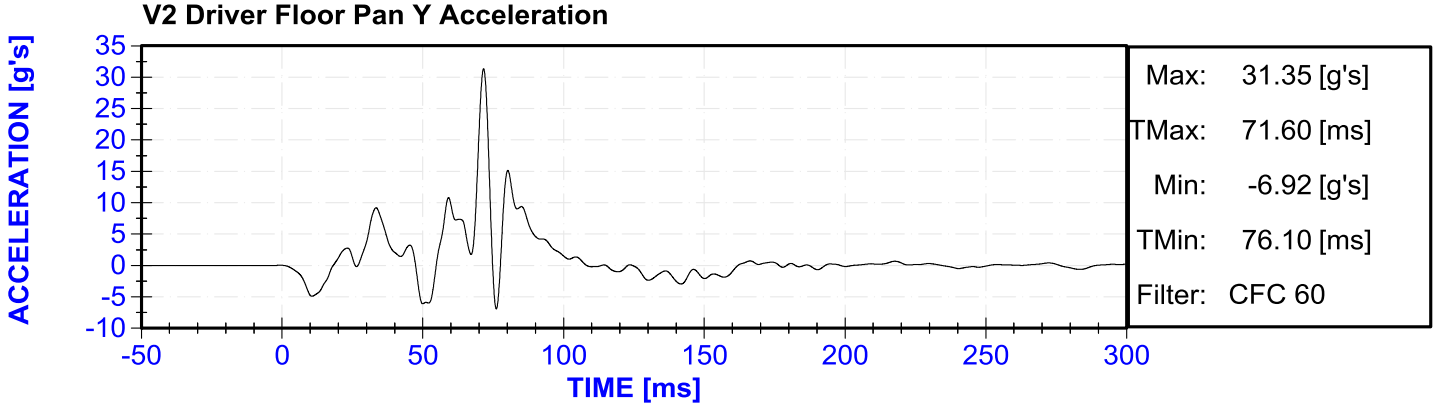
V2 Driver Seat Track Z Acceleration



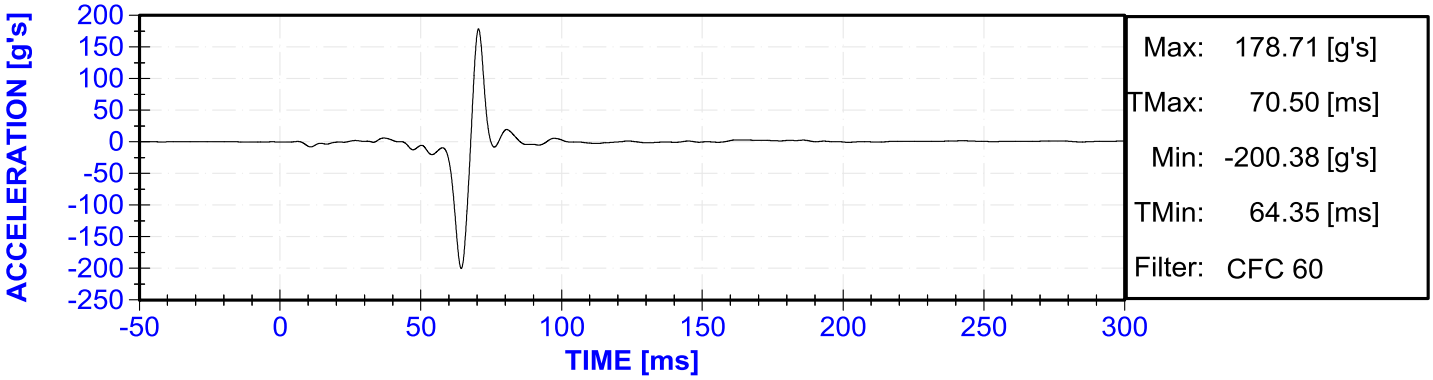
V2 Driver Floor Pan X Acceleration



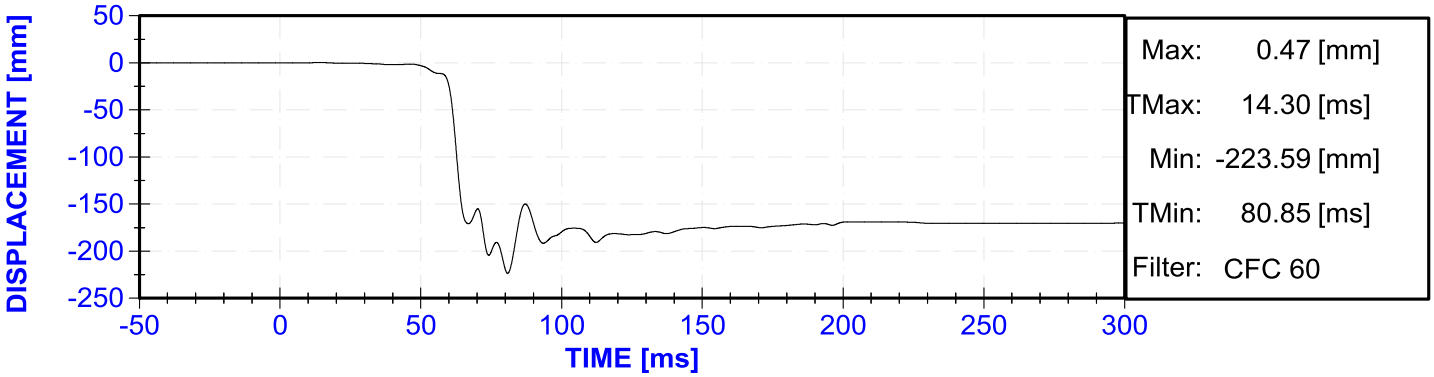
V2 Driver Floor Pan Y Acceleration



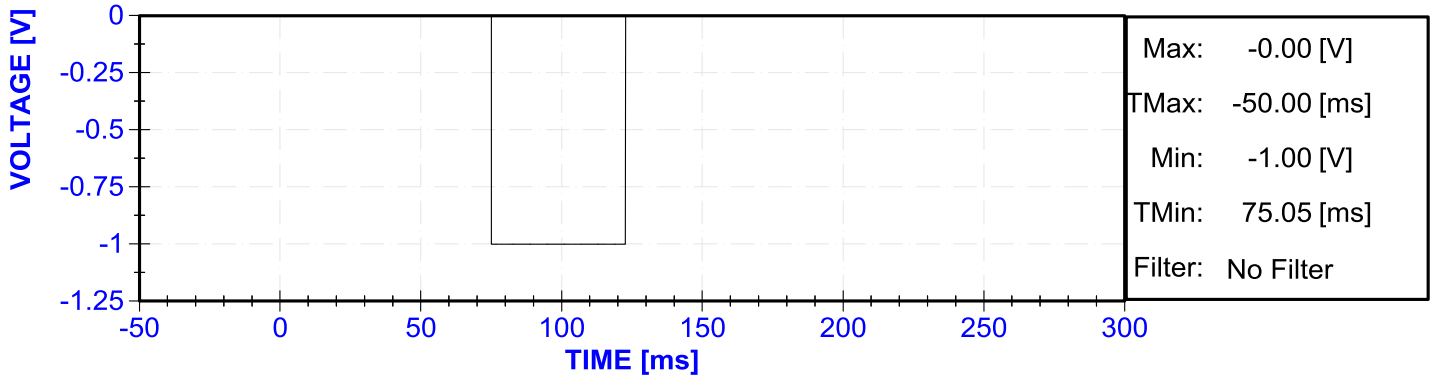
V2 Driver Floor Pan Z Acceleration



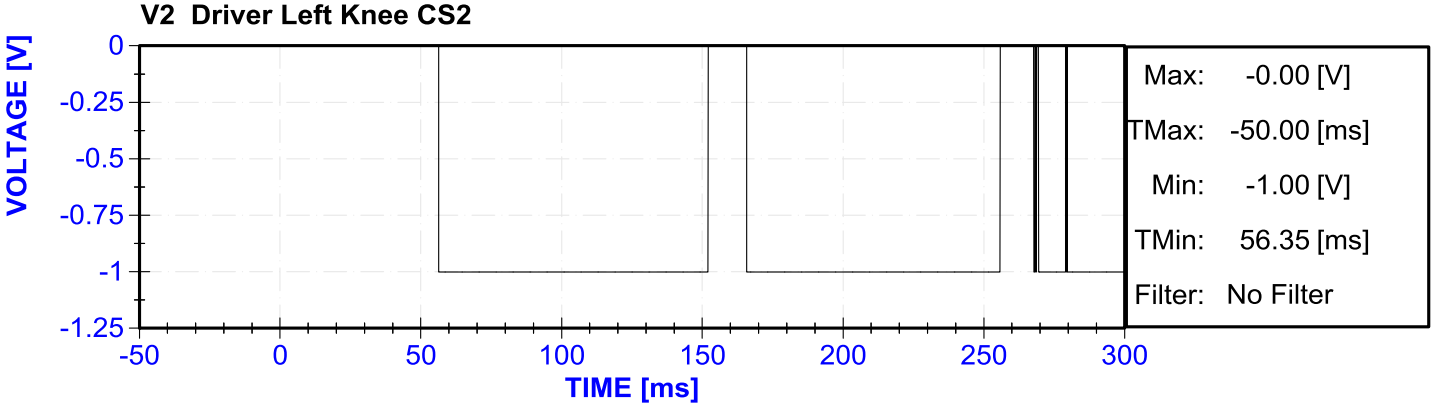
V2 Driver Floor Pan X Deflection

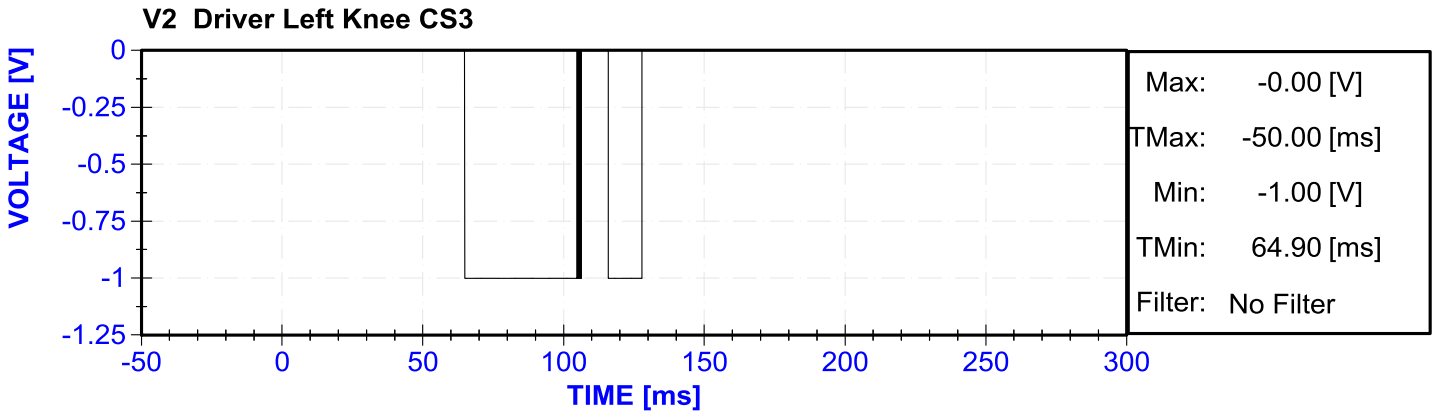


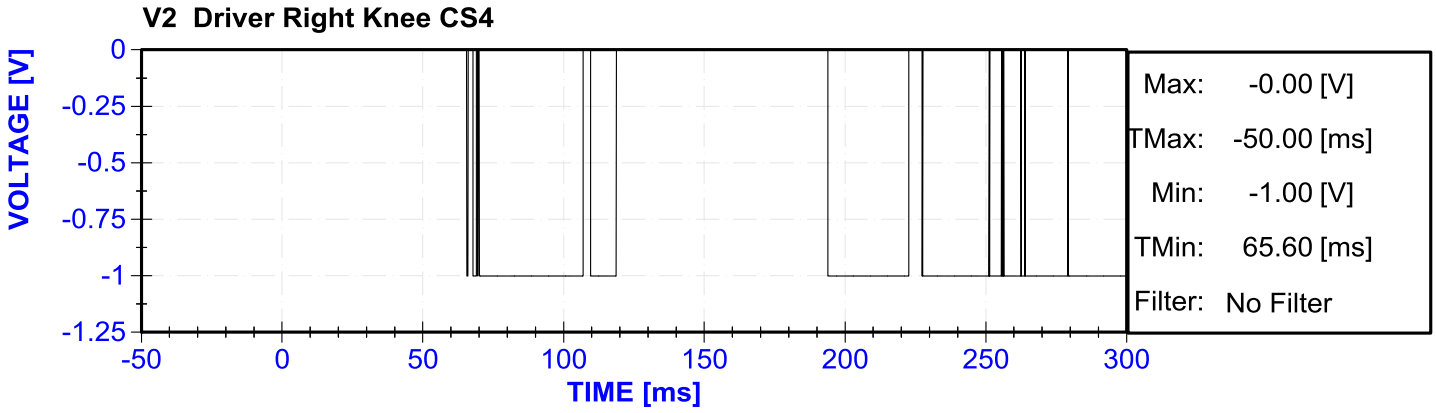
V2 Driver Left Knee CS1

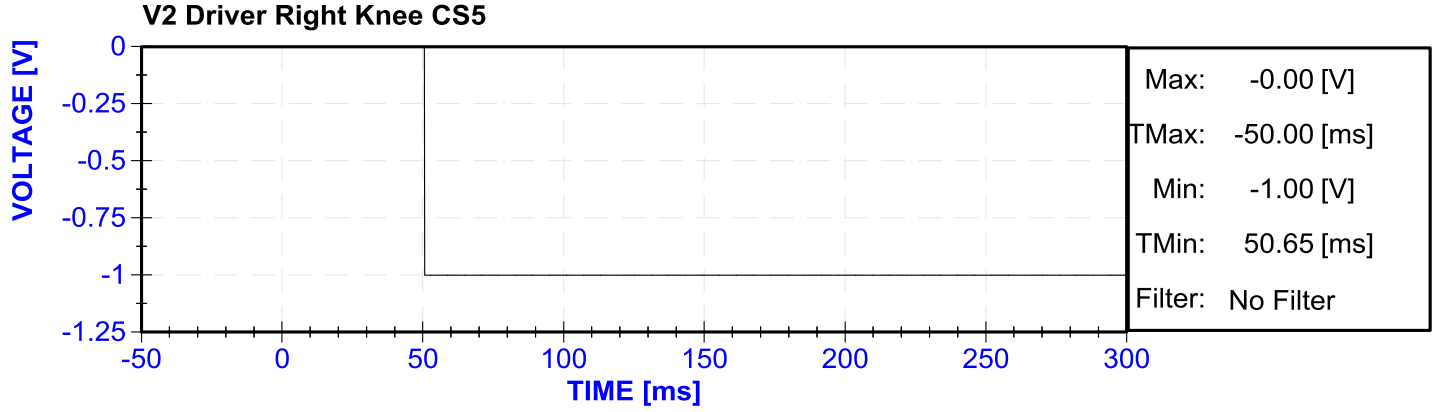


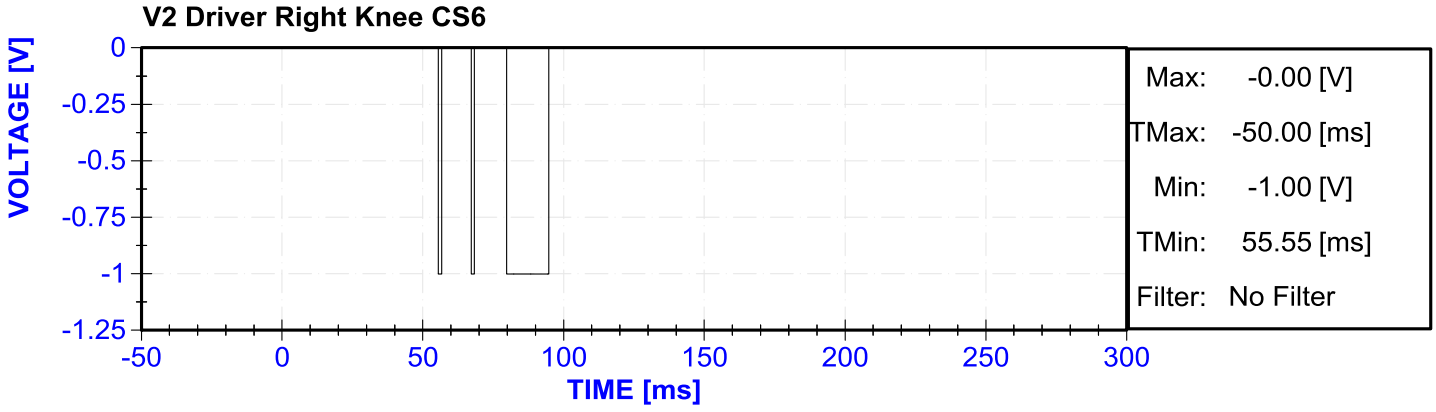
V2 Driver Left Knee CS2

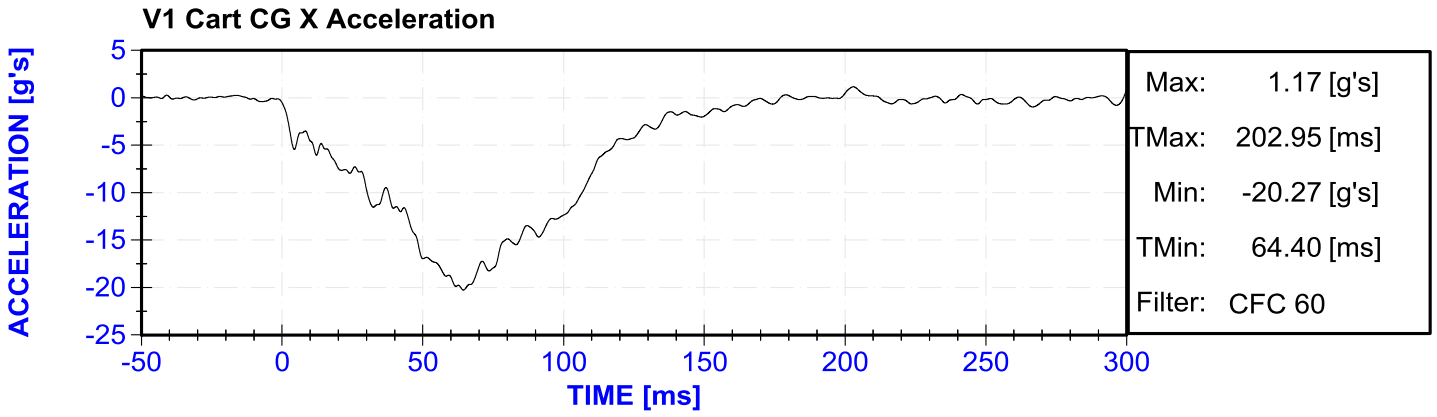


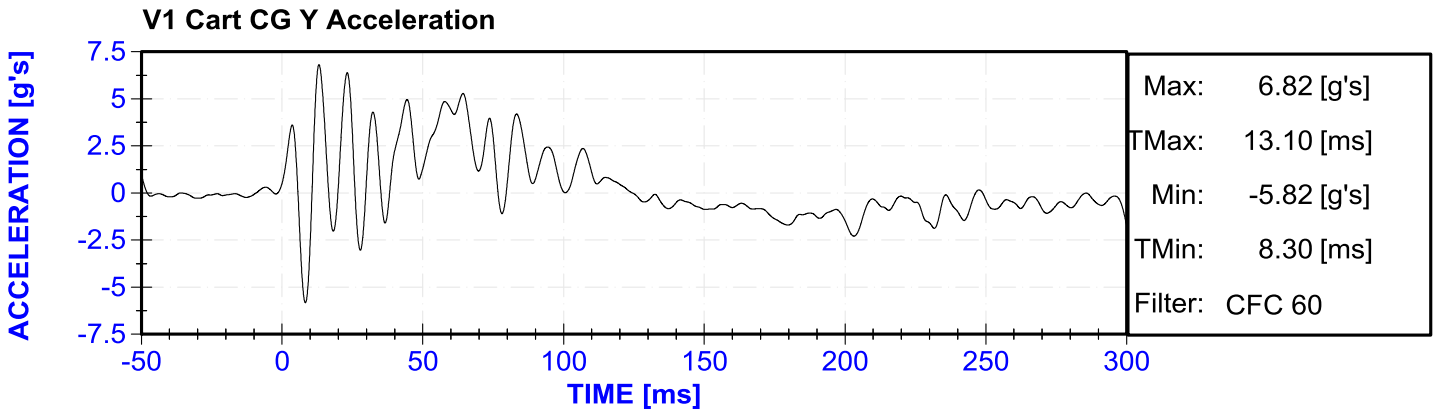

V2 Driver Left Knee CS3
VOLTAGE [V]
0
-0.25
-0.5
-0.75
-1
-1.25
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -0.00 [V]
TMax: -50.00 [ms]
Min: -1.00 [V]
TMin: 64.90 [ms]
Filter: No Filter

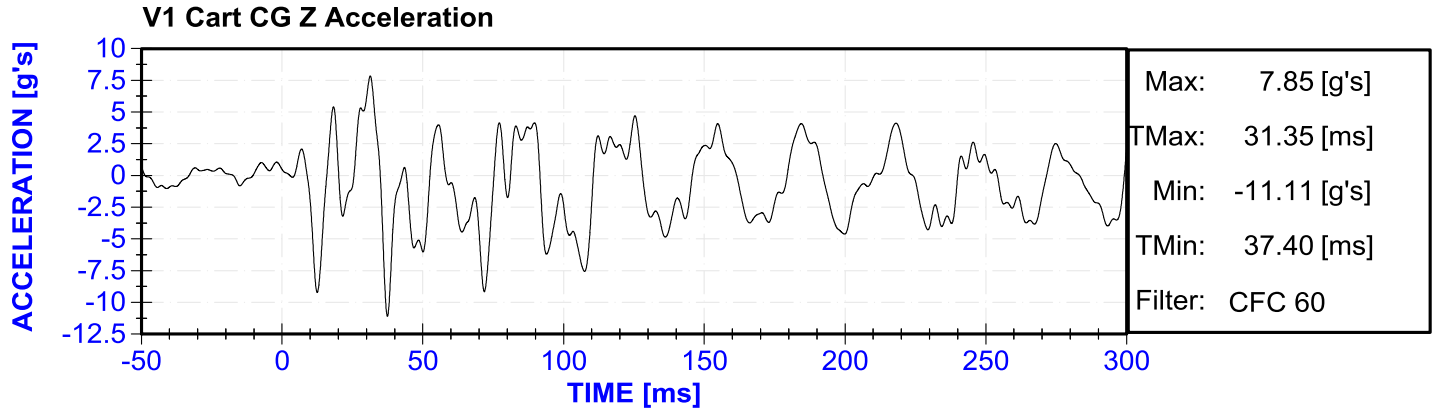

V2 Driver Right Knee CS4
VOLTAGE [V]
0
-0.25
-0.5
-0.75
-1
-1.25
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -0.00 [V]
TMax: -50.00 [ms]
Min: -1.00 [V]
TMin: 65.60 [ms]
Filter: No Filter

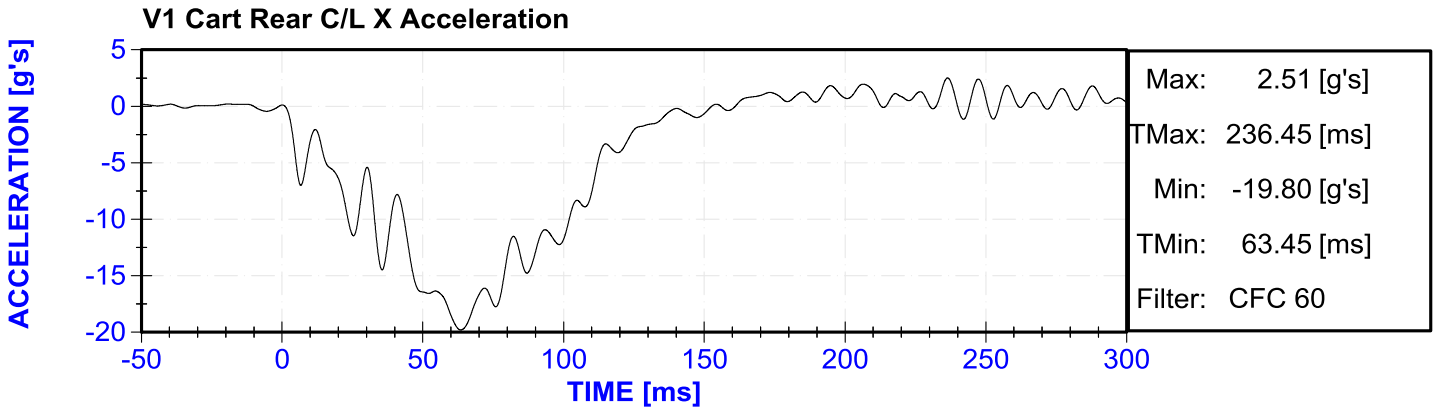

V2 Driver Right Knee CS5
VOLTAGE [V]
0
-0.25
-0.5
-0.75
-1
-1.25
-50
0
50
100
150
200
250
300
TIME [ms]
Max: -0.00 [V]
TMax: -50.00 [ms]
Min: -1.00 [V]
TMin: 50.65 [ms]
Filter: No Filter


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: 55.55 [ms]
Filter: No Filter

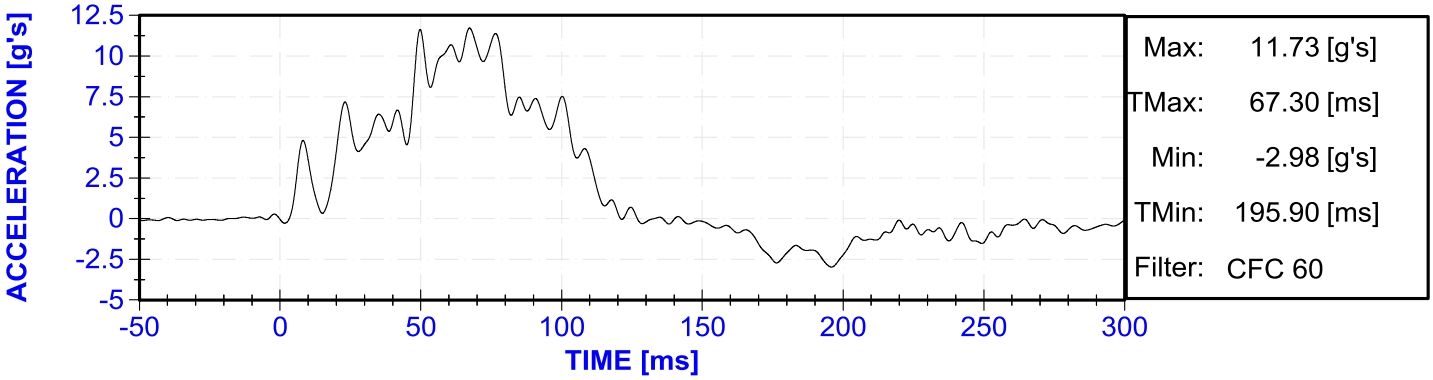

V1 Cart CG X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 1.17 [g's]
TMax: 202.95 [ms]
Min: -20.27 [g's]
TMin: 64.40 [ms]
Filter: CFC 60


V1 Cart CG Y Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 6.82 [g's]
TMax: 13.10 [ms]
Min: -5.82 [g's]
TMin: 8.30 [ms]
Filter: CFC 60

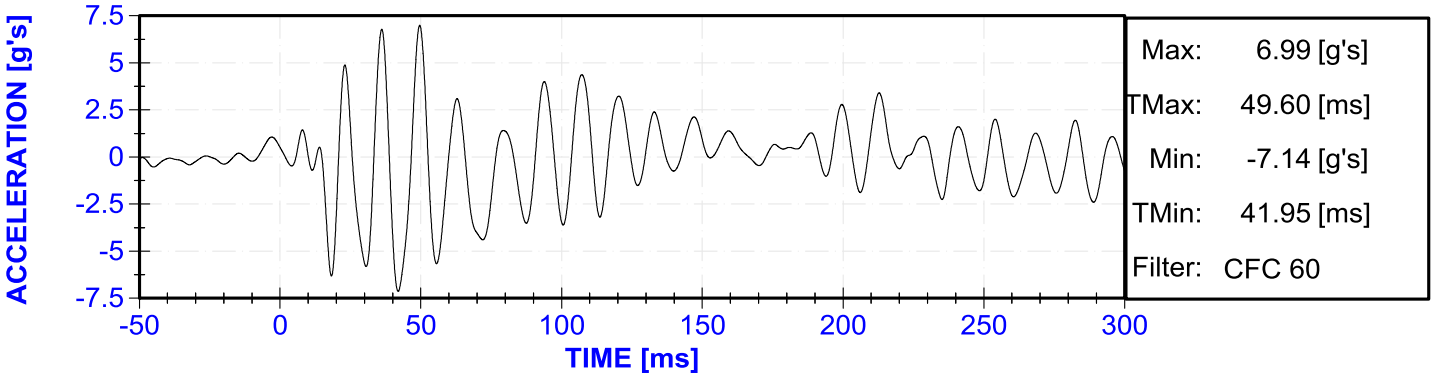

V1 Cart CG Z Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 7.85 [g's]
TMax: 31.35 [ms]
Min: -11.11 [g's]
TMin: 37.40 [ms]
Filter: CFC 60


V1 Cart Rear C/L X Acceleration
ACCELERATION [g's]
TIME [ms]
Max: 2.51 [g's]
TMax: 236.45 [ms]
Min: -19.80 [g's]
TMin: 63.45 [ms]
Filter: CFC 60

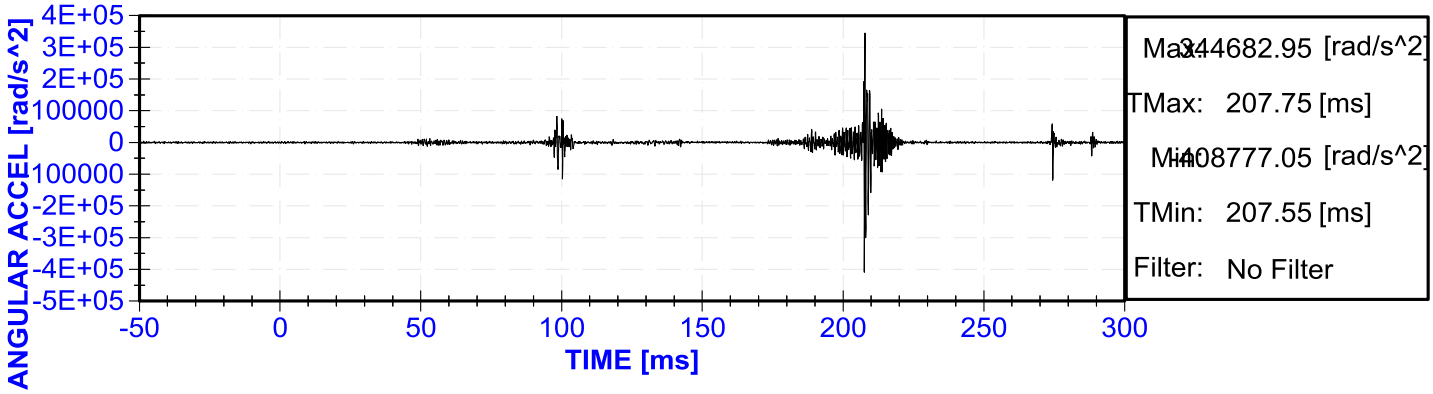
V1 Cart Rear C/L Y Acceleration



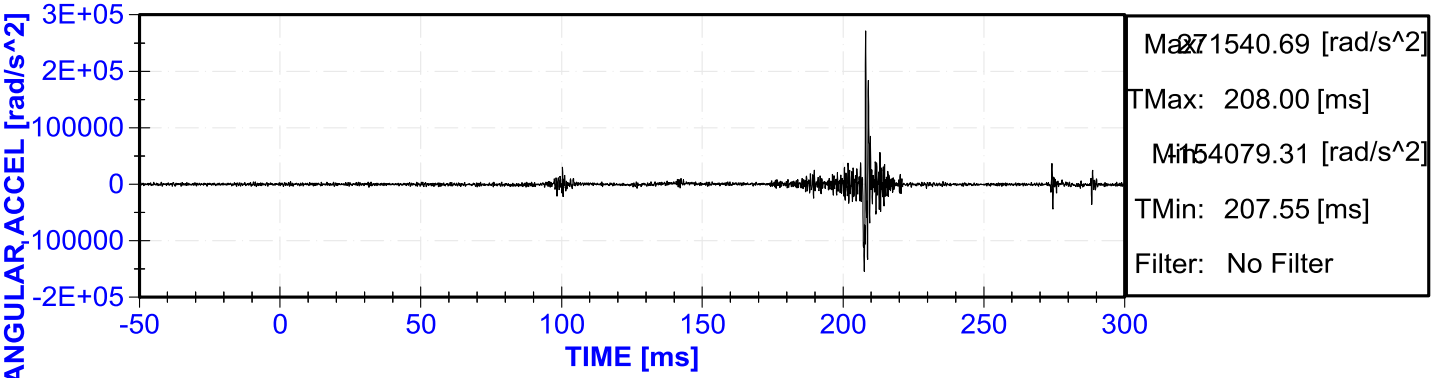
V1 Cart Rear C/L Z Acceleration



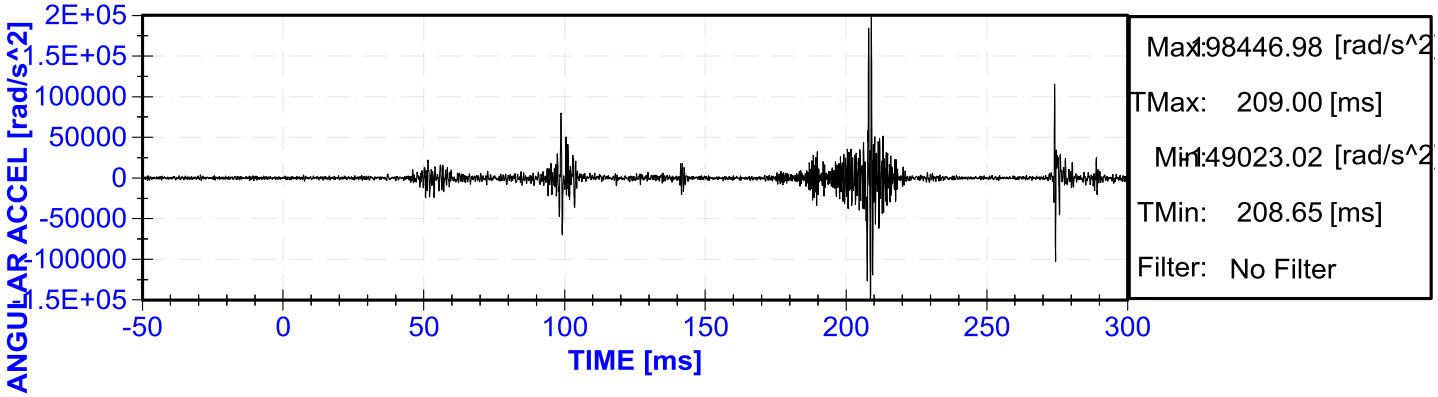
V2P1 HEAD ANGULAR ACCELERATION X [SIMON]



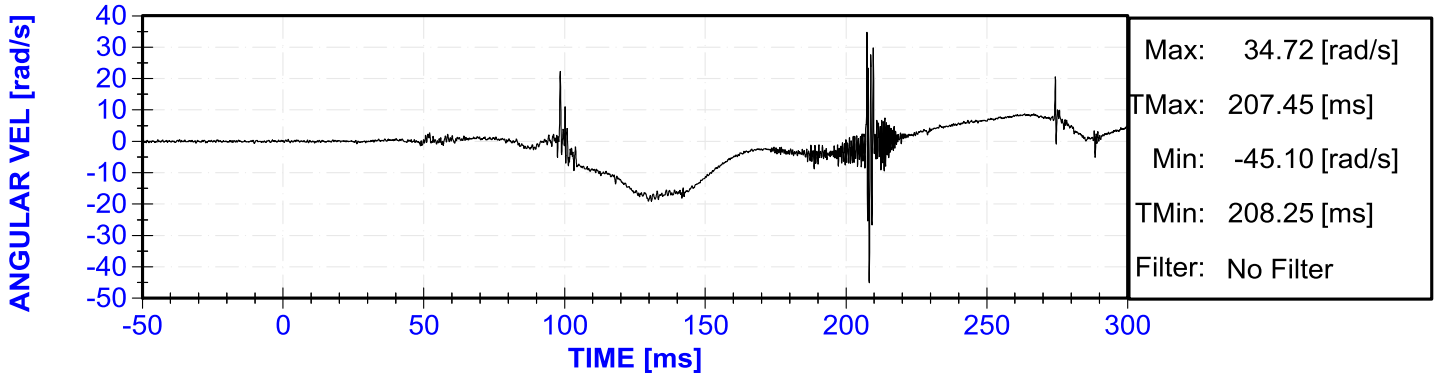
V2P1 HEAD ANGULAR ACCELERATION Y [SIMON]



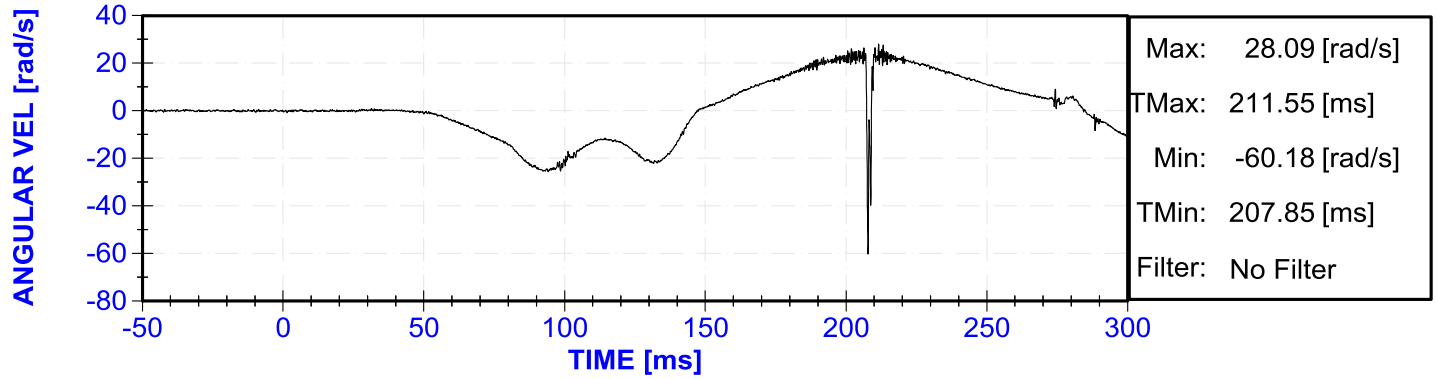
V2P1 HEAD ANGULAR ACCELERATION Z [SIMON]



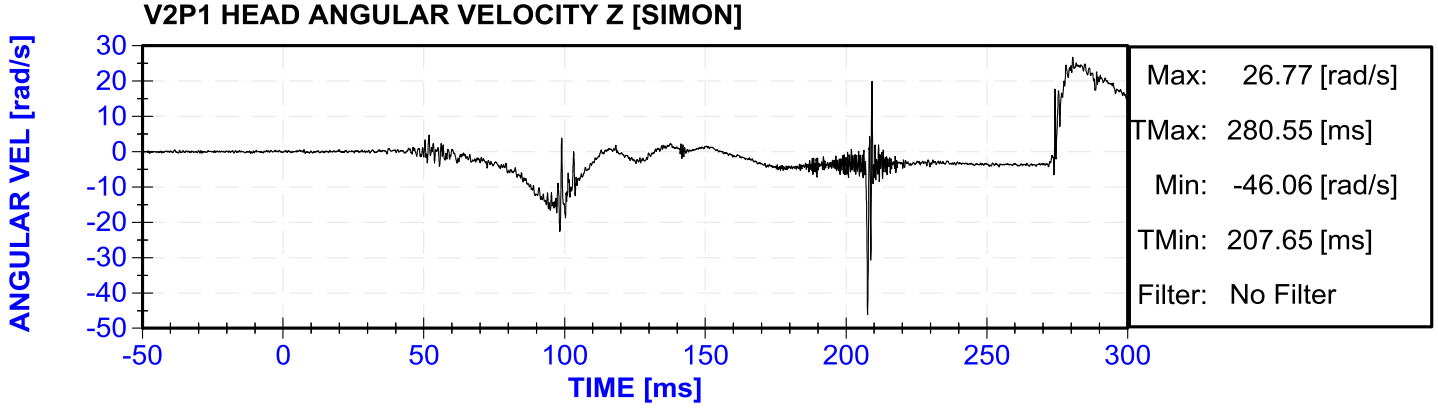
V2P1 HEAD ANGULAR VELOCITY X [SIMON]



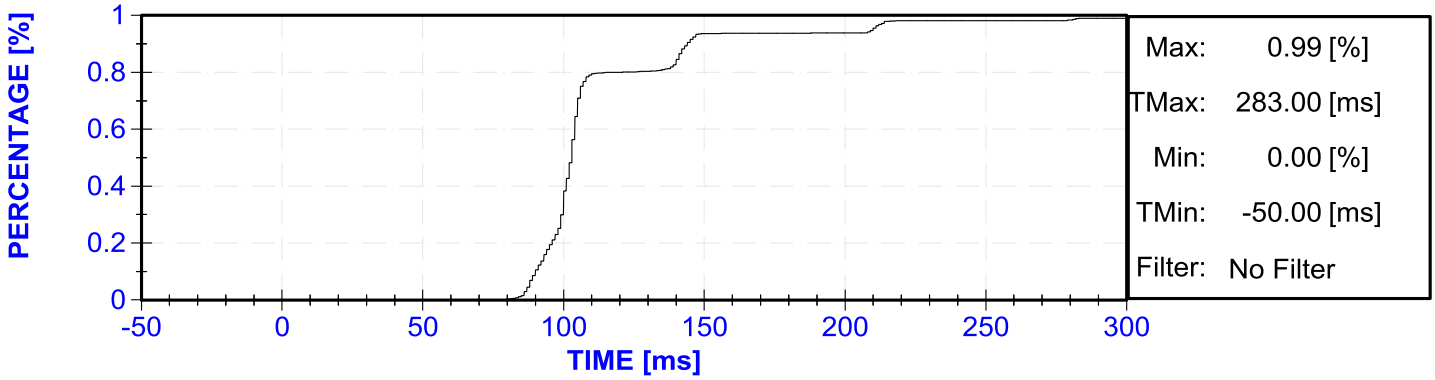
V2P1 HEAD ANGULAR VELOCITY Y [SIMON]



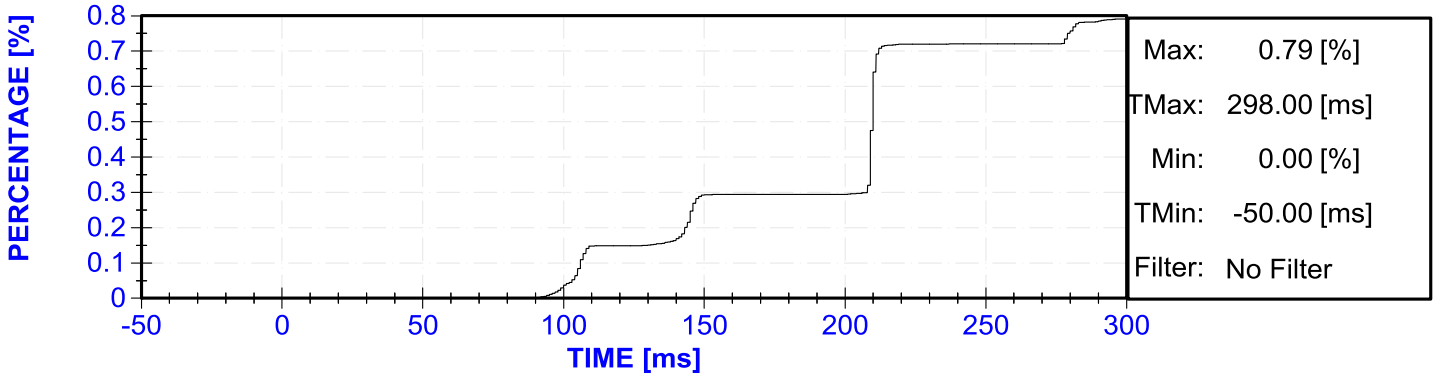
V2P1 HEAD ANGULAR VELOCITY Z [SIMON]



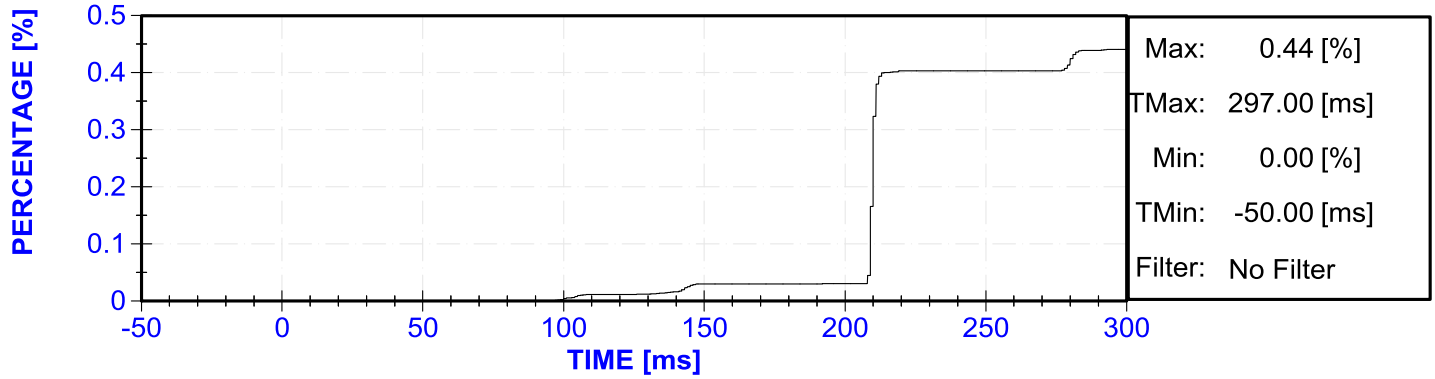
V2P1 CUMULATIVE STRAIN 0.05 [SIMON]



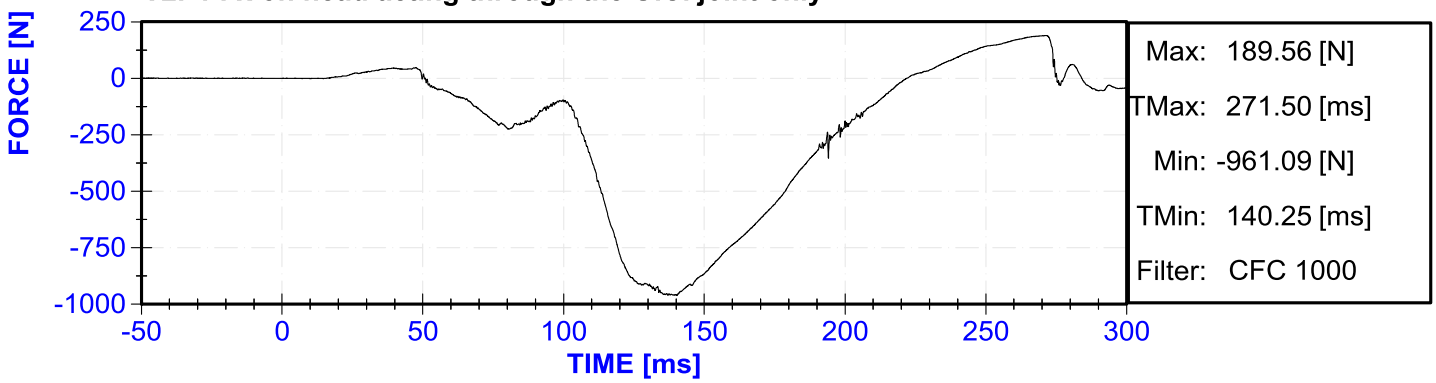
V2P1 CUMULATIVE STRAIN 0.10 [SIMON]



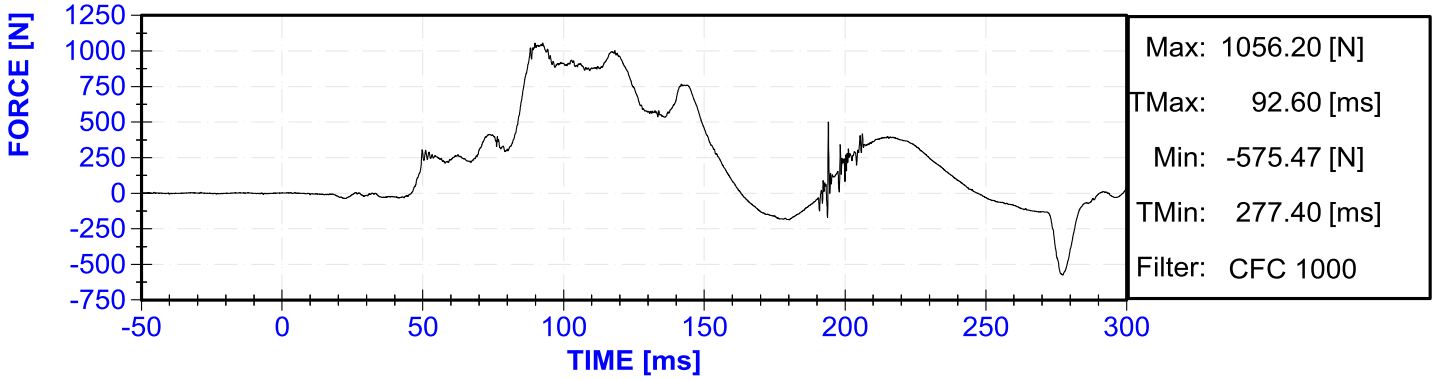
V2P1 CUMULATIVE STRAIN 0.15 [SIMON]



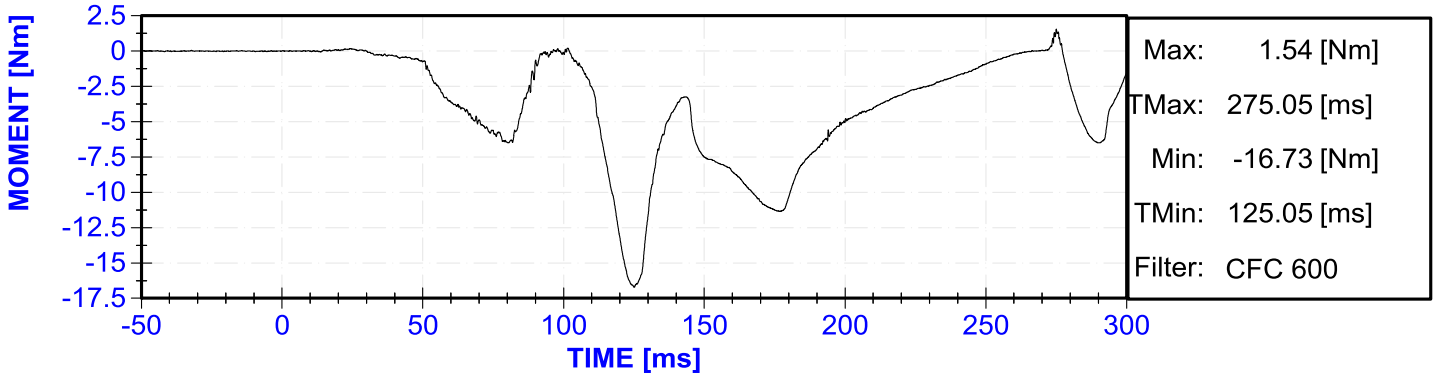
V2P1 Fx on head acting through the O.C. joint only



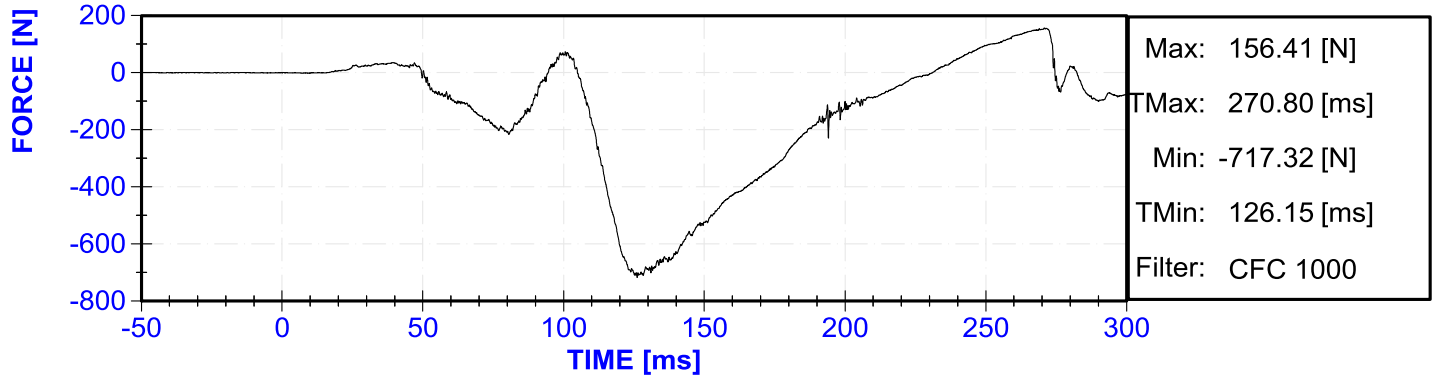
V2P1 Fz on head acting through the O.C. joint only



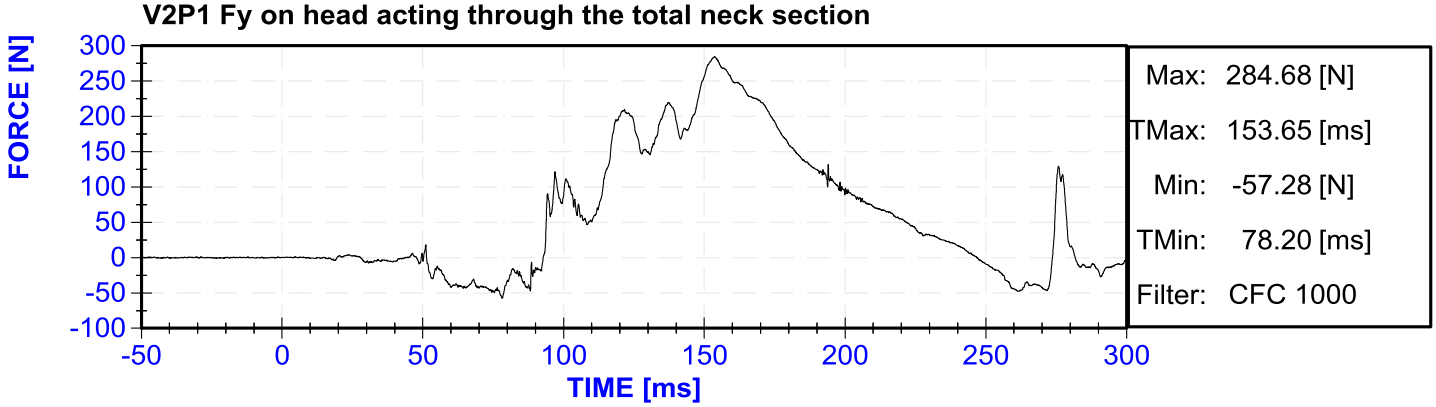
V2P1 My on head acting through the O.C. joint only



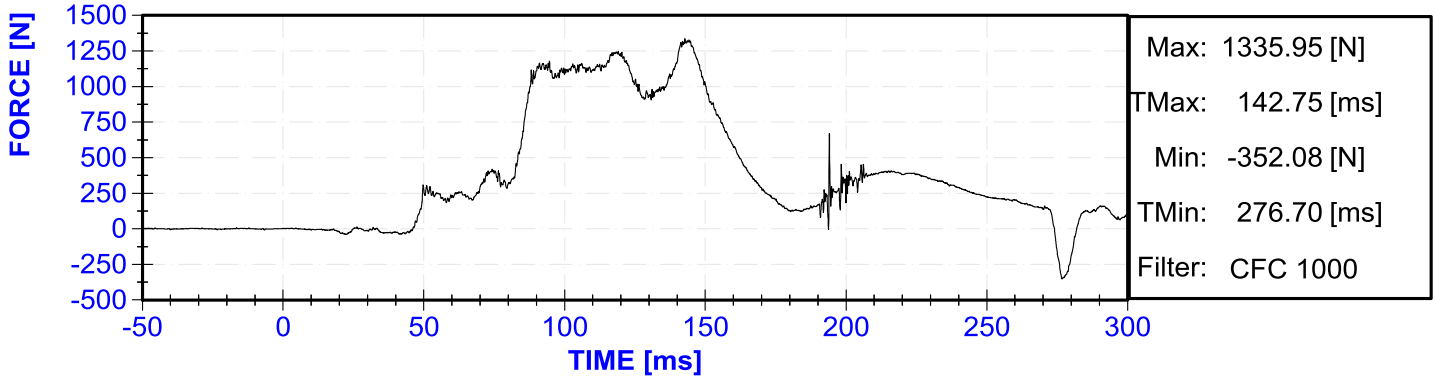
V2P1 Fx on head acting through the total neck section



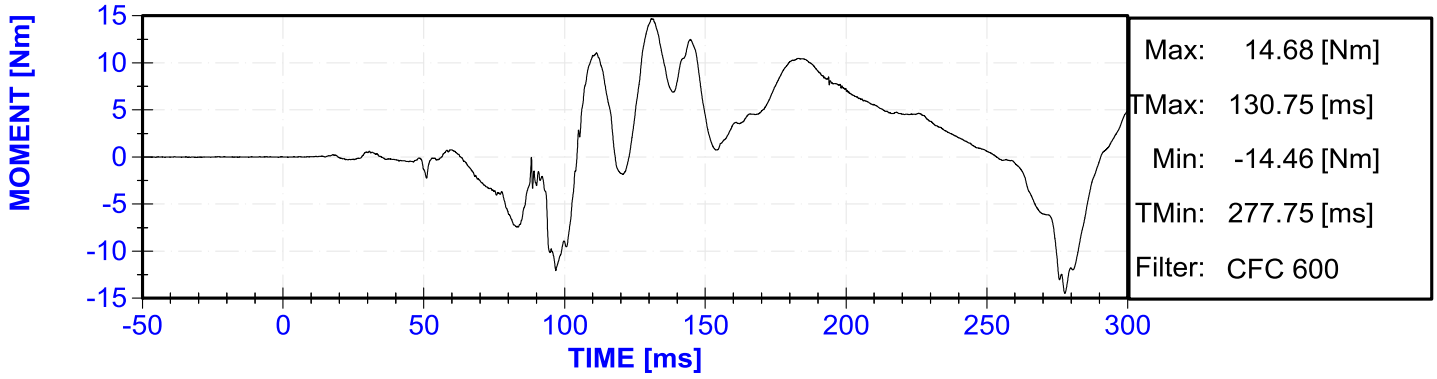
V2P1 Fy on head acting through the total neck section



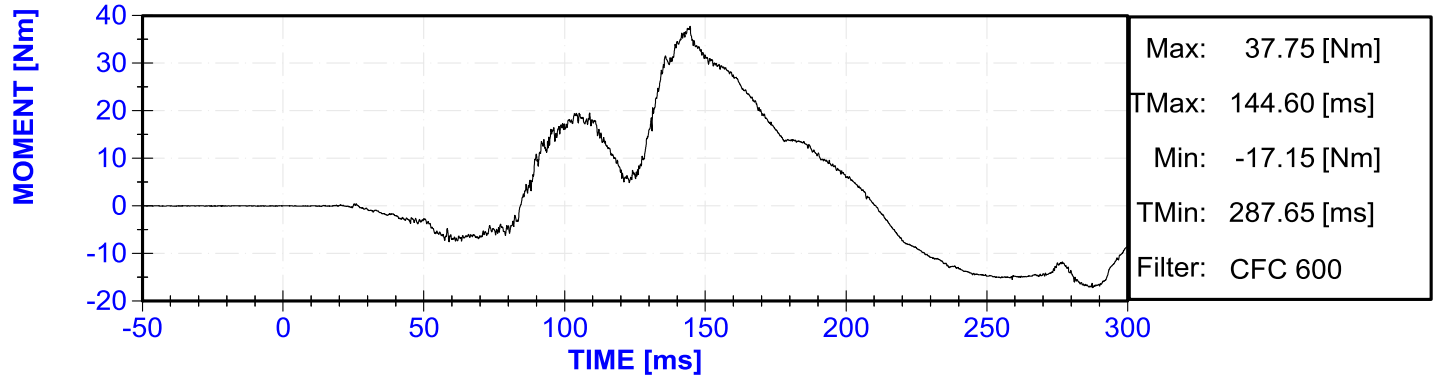
V2P1 Fz on head acting through the total neck section



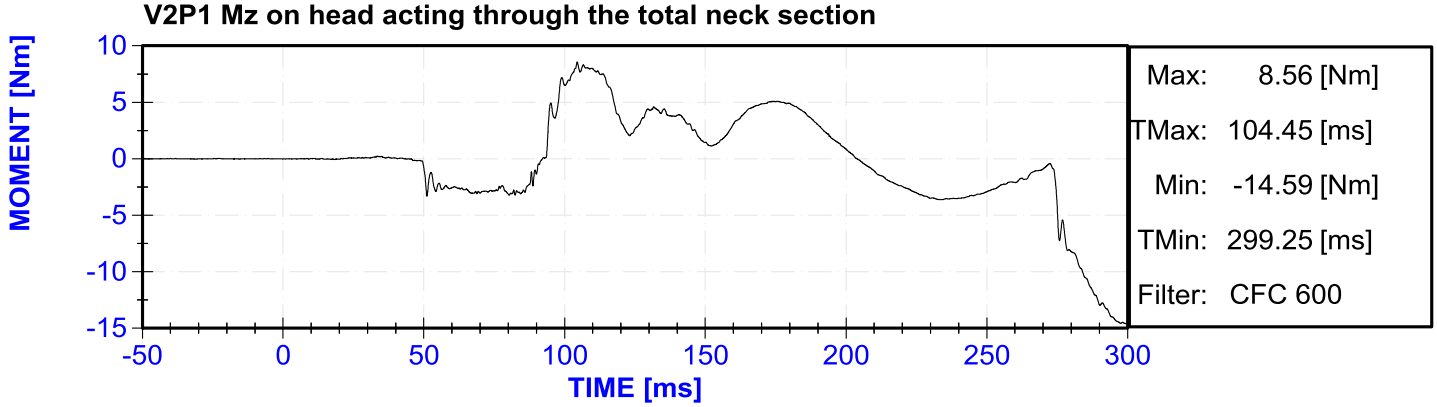
V2P1 Mx on head acting through the total neck section

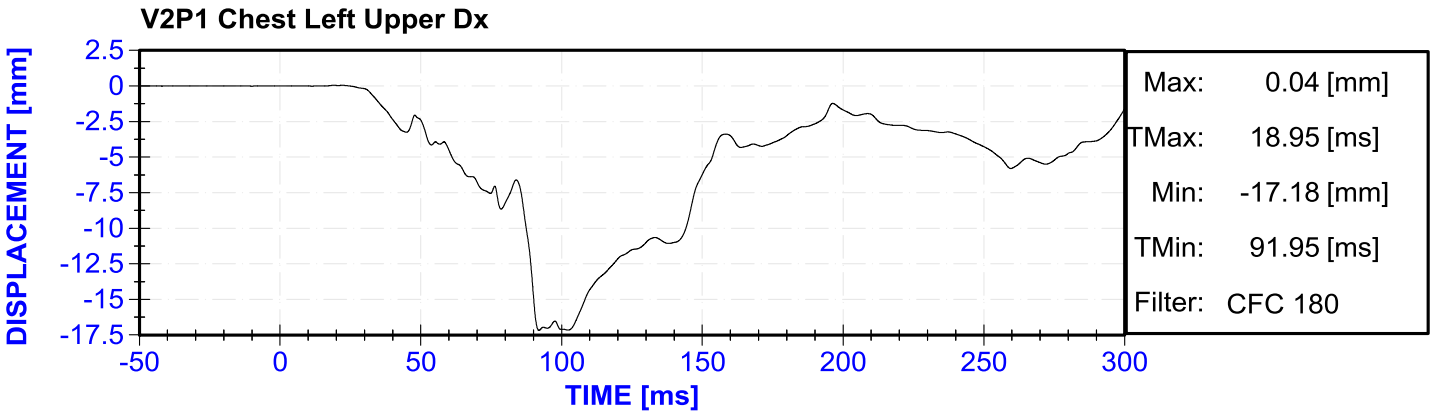


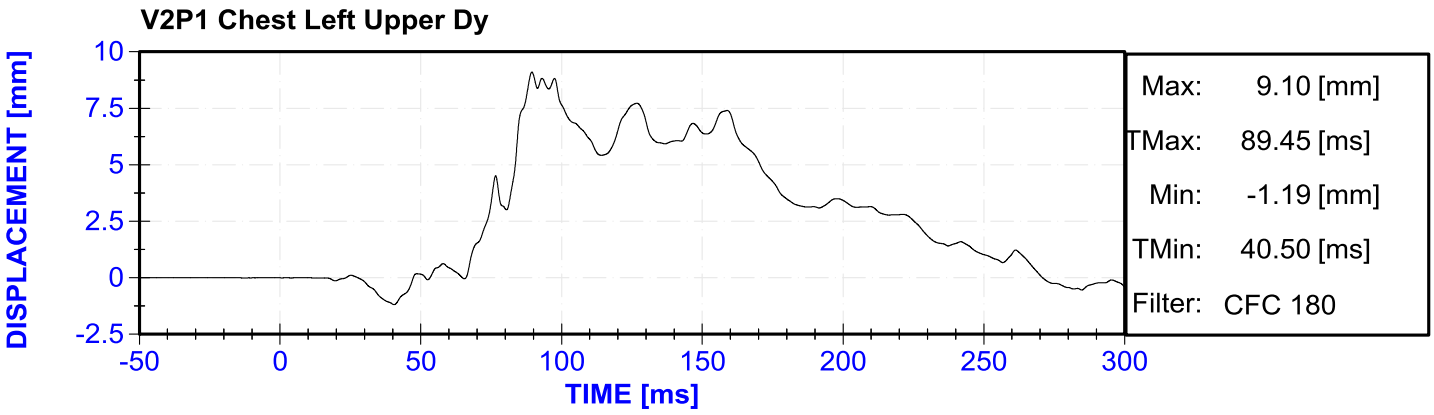
V2P1 My on head acting through the total neck section

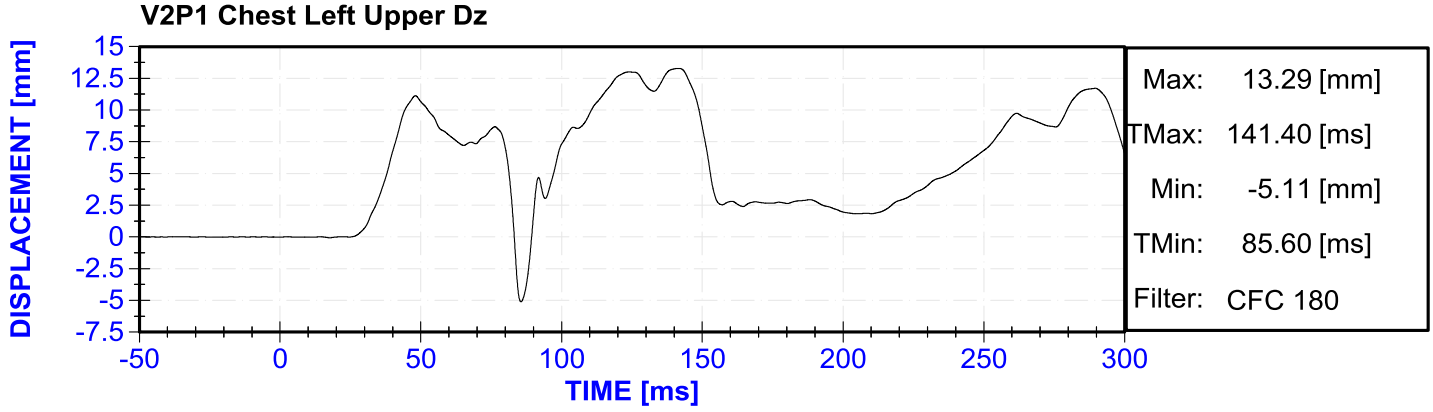


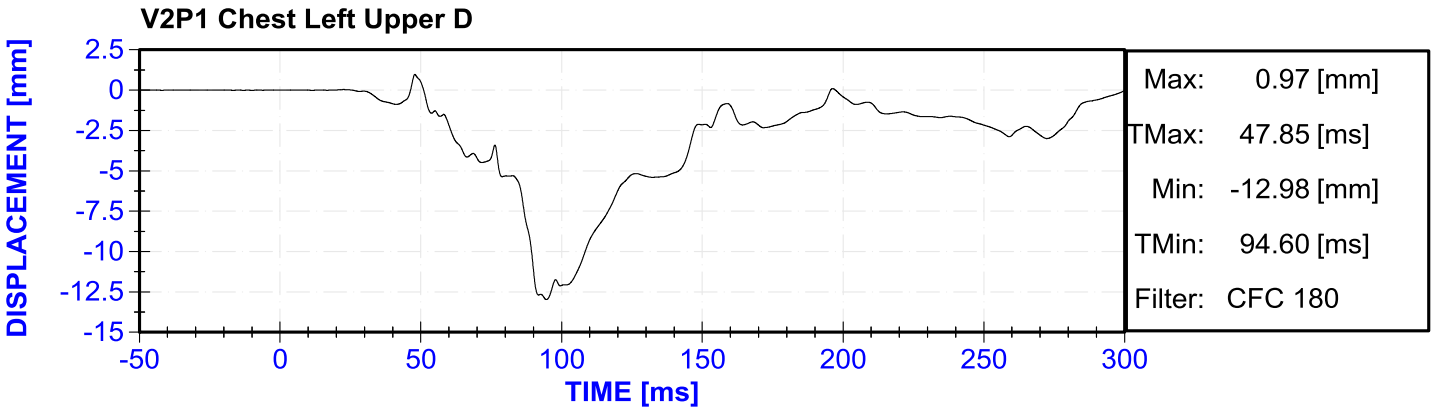
V2P1 Mz on head acting through the total neck section

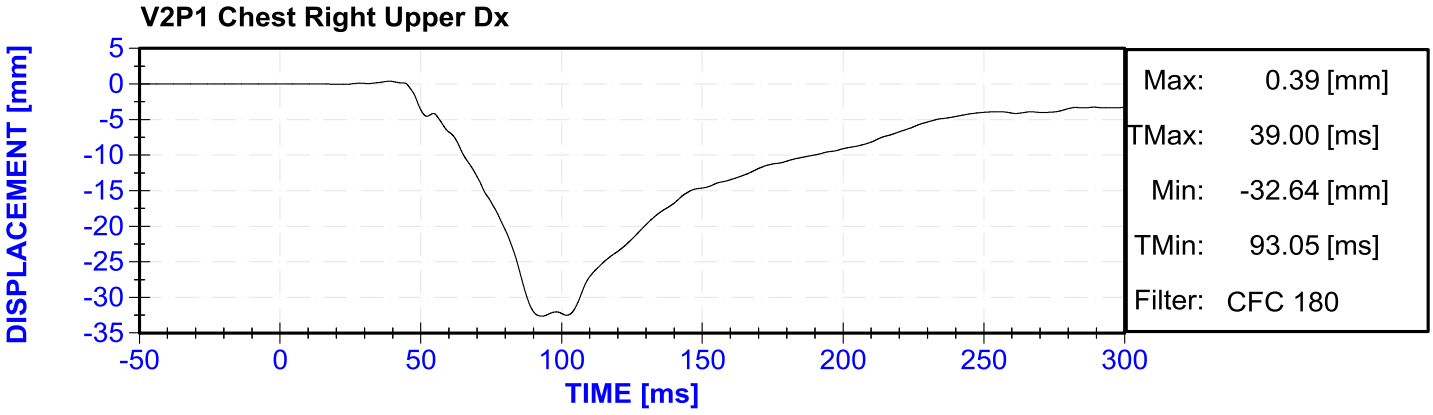


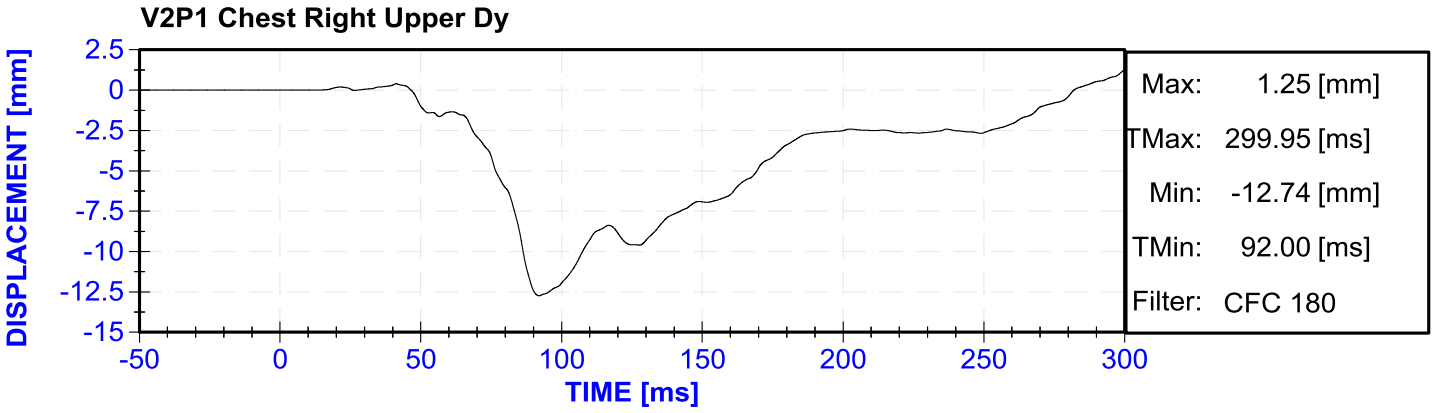

V2P1 Chest Left Upper Dx
DISPLACEMENT [mm]
TIME [ms]
Max: 0.04 [mm]
TMax: 18.95 [ms]
Min: -17.18 [mm]
TMin: 91.95 [ms]
Filter: CFC 180

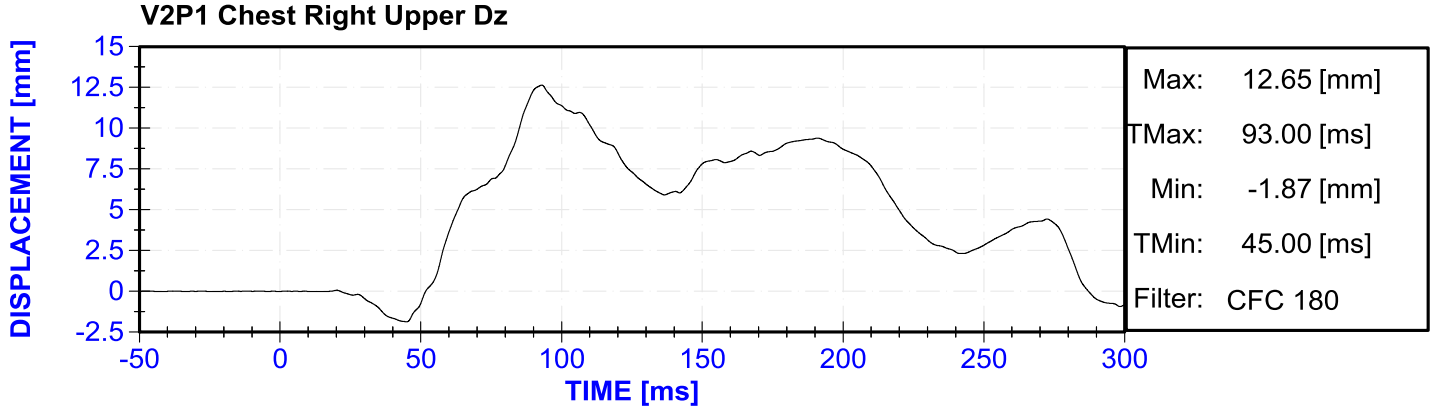

V2P1 Chest Left Upper Dy
DISPLACEMENT [mm]
TIME [ms]
Max: 9.10 [mm]
TMax: 89.45 [ms]
Min: -1.19 [mm]
TMin: 40.50 [ms]
Filter: CFC 180

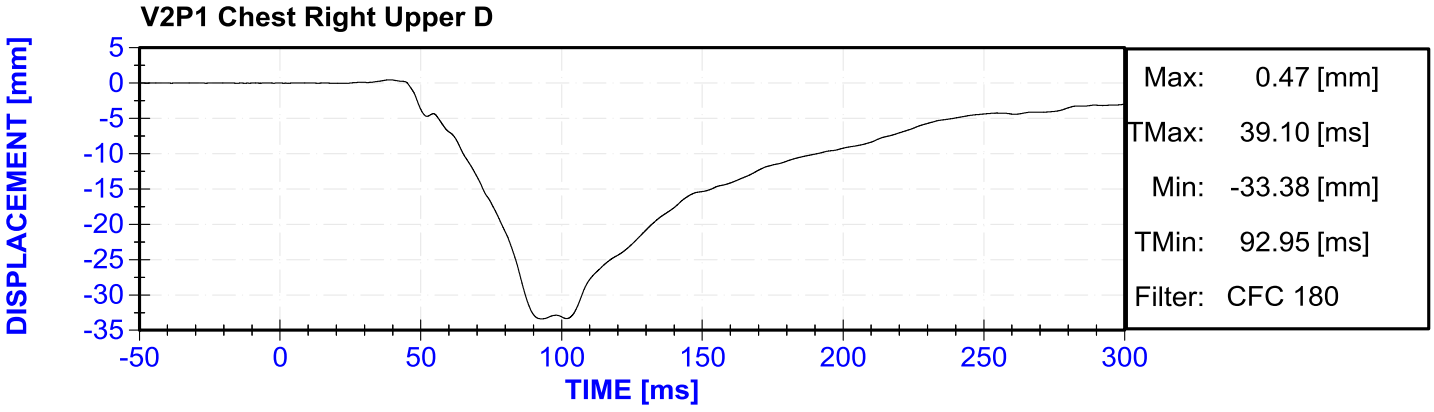

V2P1 Chest Left Upper Dz
DISPLACEMENT [mm]
TIME [ms]
Max: 13.29 [mm]
TMax: 141.40 [ms]
Min: -5.11 [mm]
TMin: 85.60 [ms]
Filter: CFC 180


V2P1 Chest Left Upper D
DISPLACEMENT [mm]
TIME [ms]
Max: 0.97 [mm]
TMax: 47.85 [ms]
Min: -12.98 [mm]
TMin: 94.60 [ms]
Filter: CFC 180

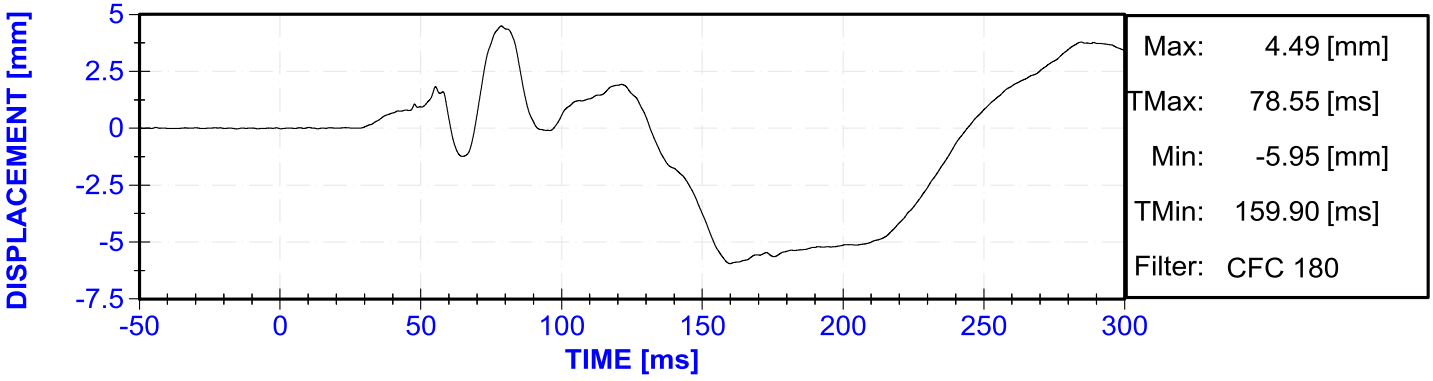

V2P1 Chest Right Upper Dx
DISPLACEMENT [mm]
TIME [ms]
Max: 0.39 [mm]
TMax: 39.00 [ms]
Min: -32.64 [mm]
TMin: 93.05 [ms]
Filter: CFC 180


V2P1 Chest Right Upper Dy
DISPLACEMENT [mm]
TIME [ms]
Max: 1.25 [mm]
TMax: 299.95 [ms]
Min: -12.74 [mm]
TMin: 92.00 [ms]
Filter: CFC 180

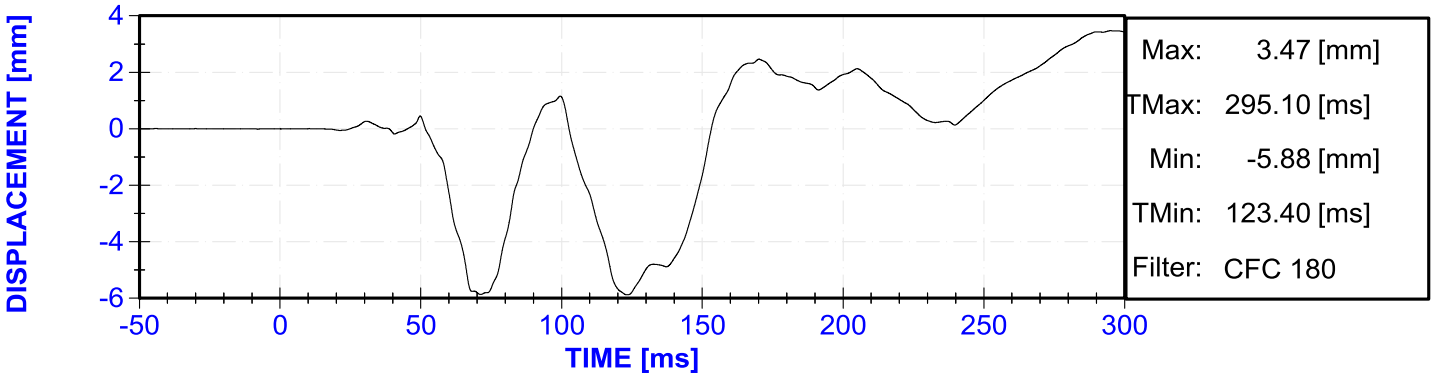

V2P1 Chest Right Upper Dz
DISPLACEMENT [mm]
TIME [ms]
Max: 12.65 [mm]
TMax: 93.00 [ms]
Min: -1.87 [mm]
TMin: 45.00 [ms]
Filter: CFC 180


V2P1 Chest Right Upper D
DISPLACEMENT [mm]
TIME [ms]
Max: 0.47 [mm]
TMax: 39.10 [ms]
Min: -33.38 [mm]
TMin: 92.95 [ms]
Filter: CFC 180

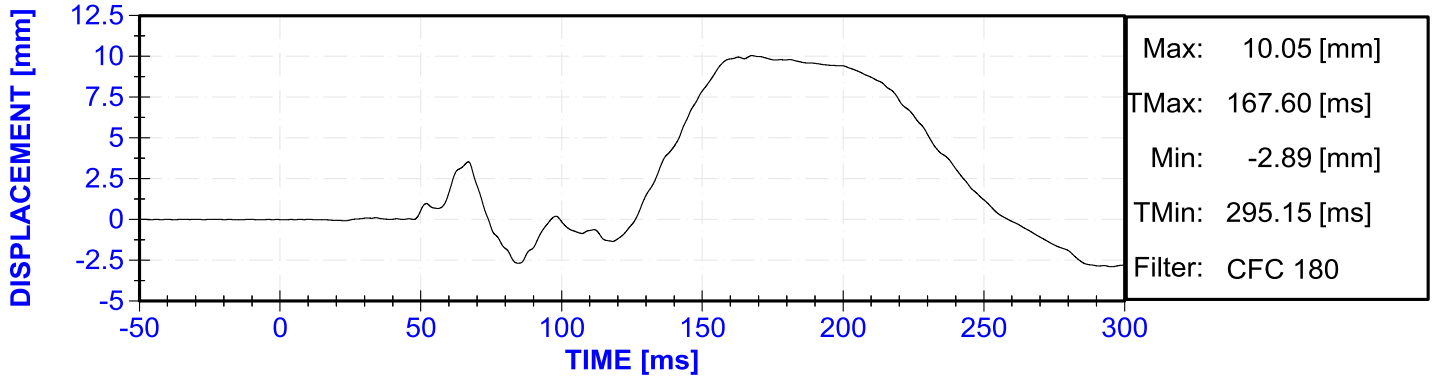
V2P1 Chest Left Lower Dx



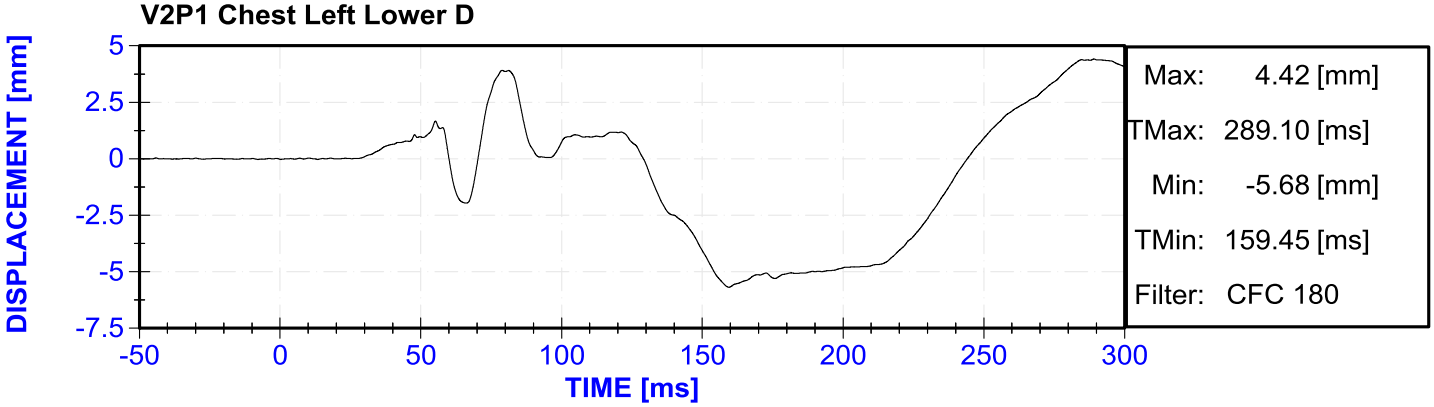
V2P1 Chest Left Lower Dy

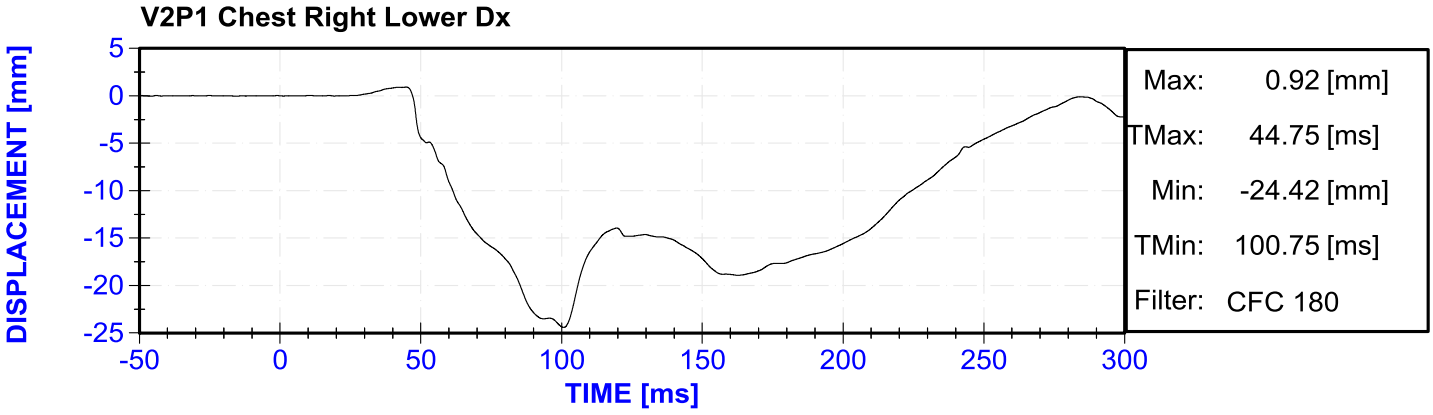


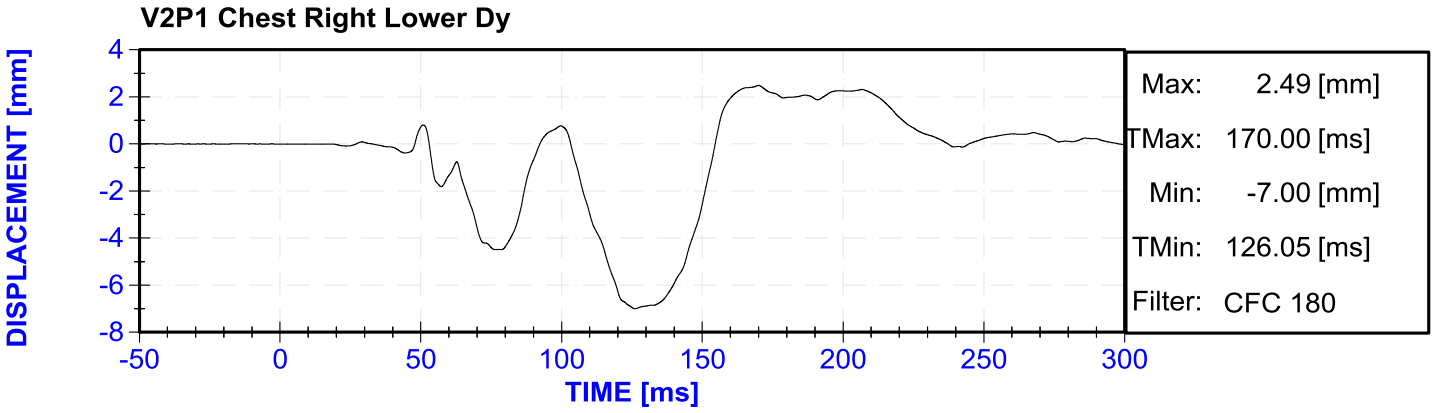
V2P1 Chest Left Lower Dz

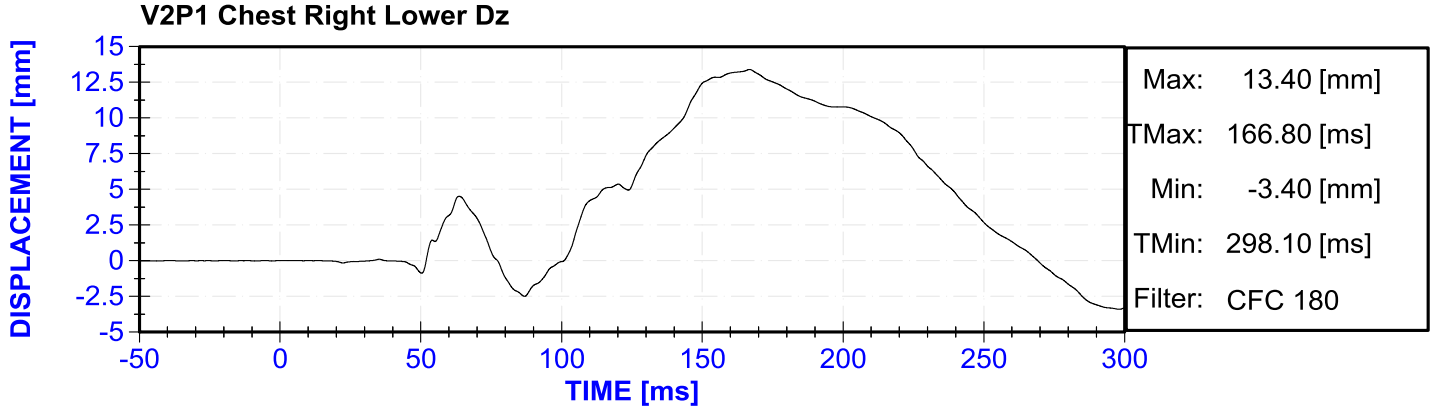


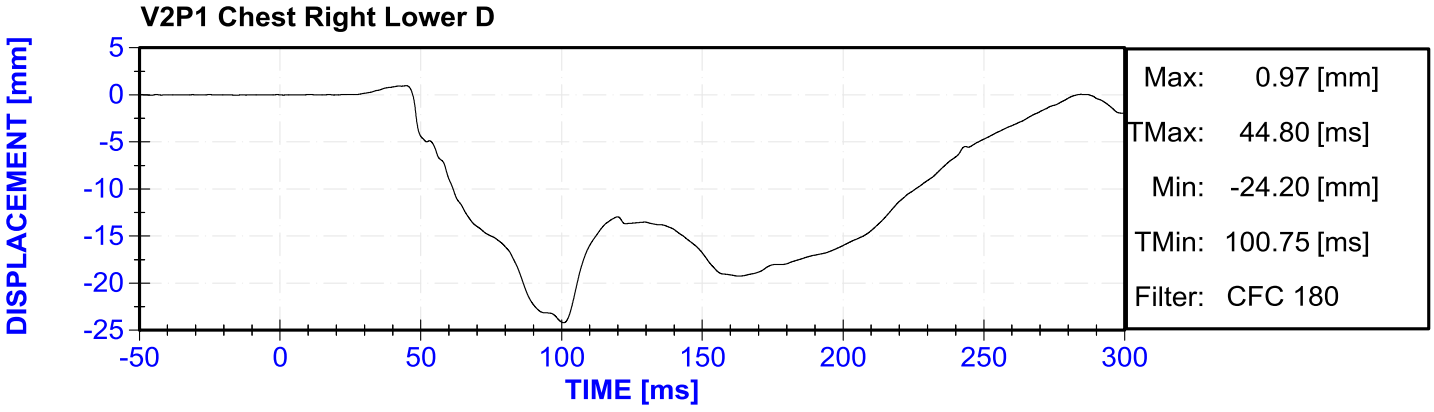
V2P1 Chest Left Lower D



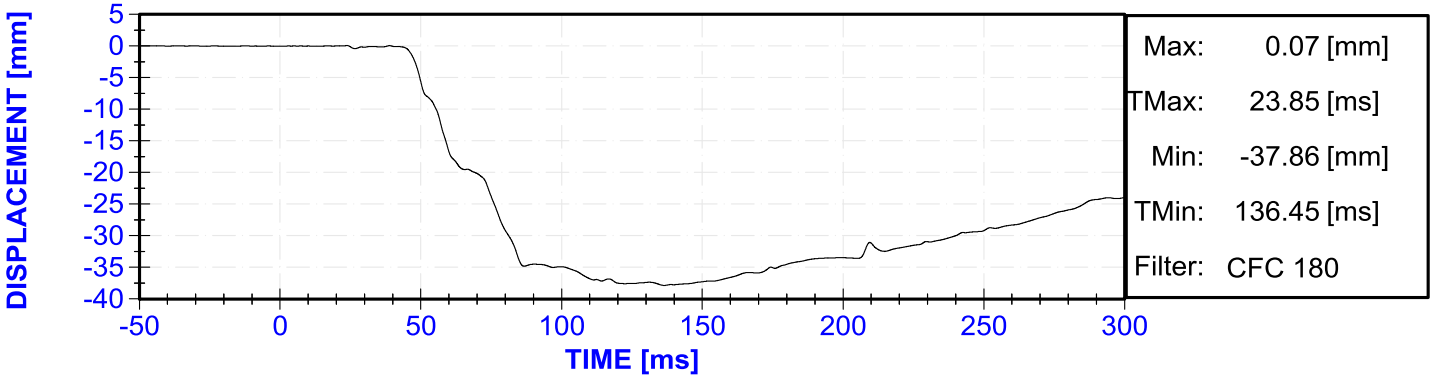

V2P1 Chest Right Lower Dx
DISPLACEMENT [mm]
TIME [ms]
Max: 0.92 [mm]
TMax: 44.75 [ms]
Min: -24.42 [mm]
TMin: 100.75 [ms]
Filter: CFC 180


V2P1 Chest Right Lower Dy
DISPLACEMENT [mm]
TIME [ms]
Max: 2.49 [mm]
TMax: 170.00 [ms]
Min: -7.00 [mm]
TMin: 126.05 [ms]
Filter: CFC 180

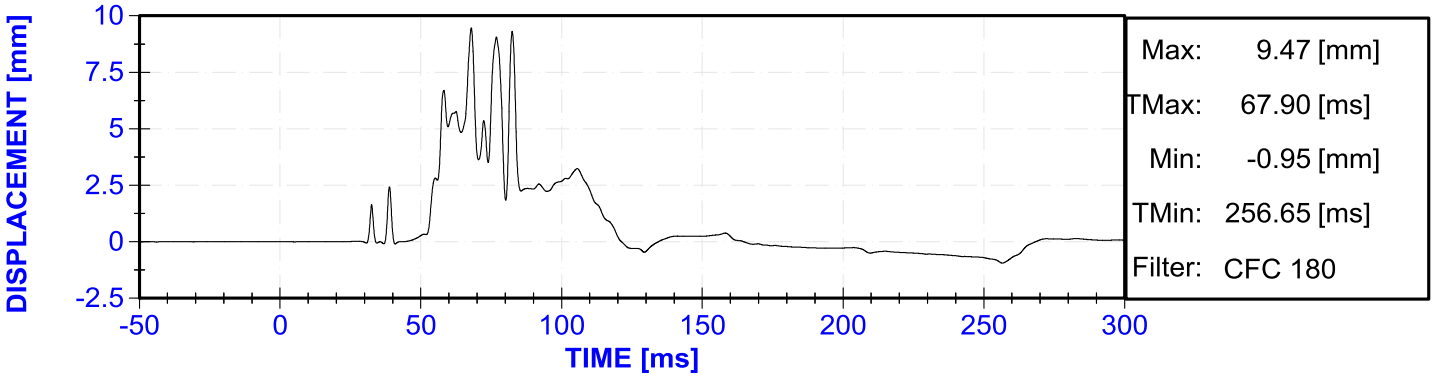

V2P1 Chest Right Lower Dz
DISPLACEMENT [mm]
TIME [ms]
Max: 13.40 [mm]
TMax: 166.80 [ms]
Min: -3.40 [mm]
TMin: 298.10 [ms]
Filter: CFC 180


V2P1 Chest Right Lower D
DISPLACEMENT [mm]
TIME [ms]
Max: 0.97 [mm]
TMax: 44.80 [ms]
Min: -24.20 [mm]
TMin: 100.75 [ms]
Filter: CFC 180

V2P1 Abdomen Left Lower Dx

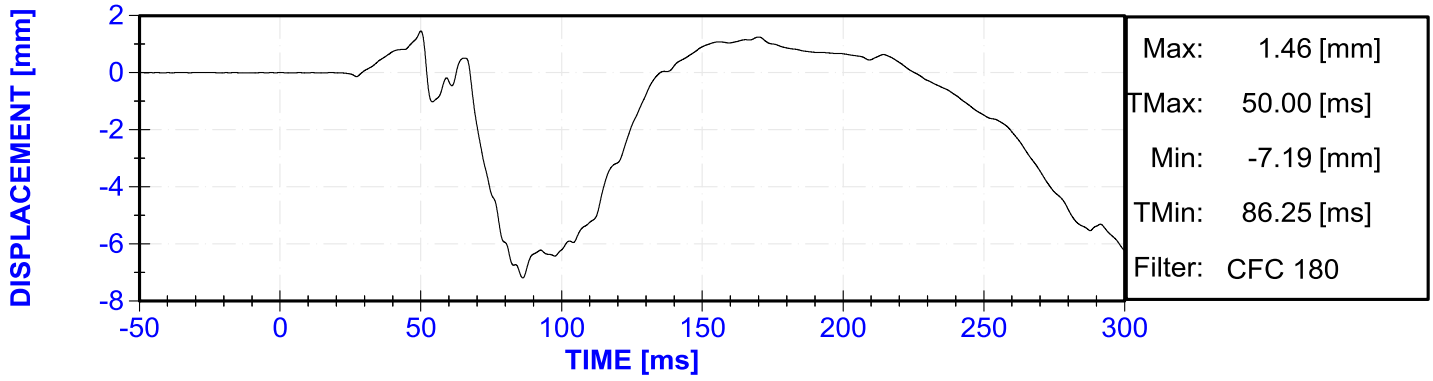


V2P1 Abdomen Left Lower Dy

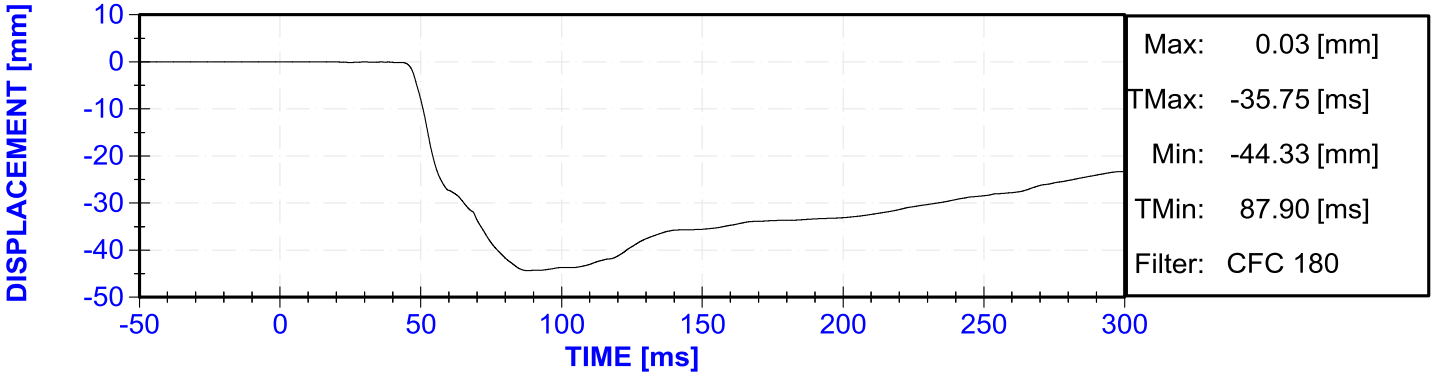


V2P1 Abdomen Left Lower Dz

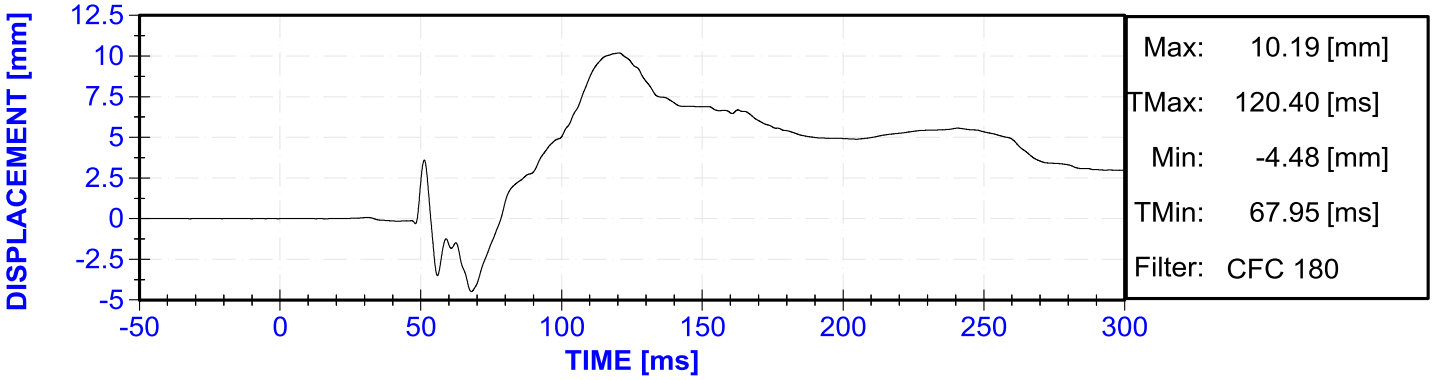
V2P1 ABDL RZ - NOISE AT 56-85 MS



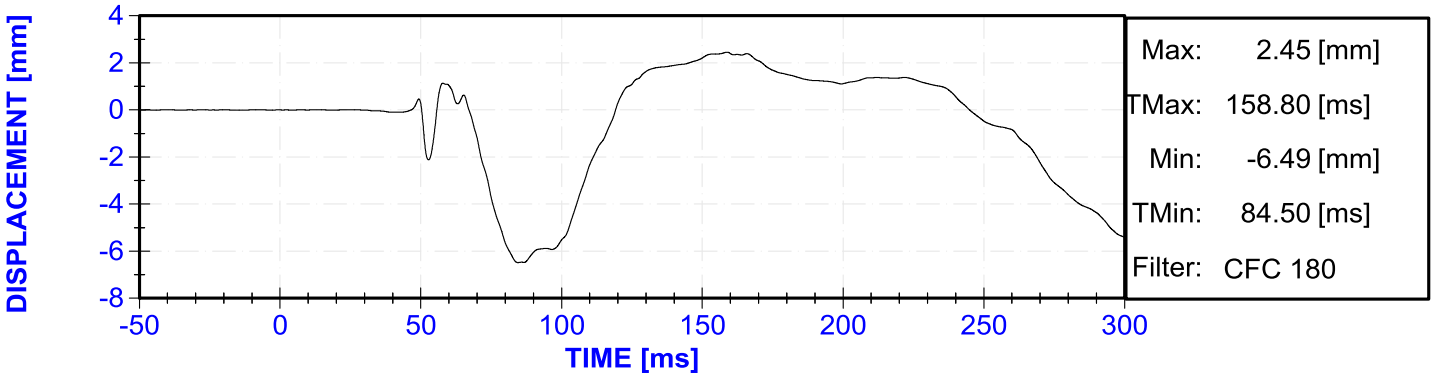
V2P1 Abdomen Right Lower Dx



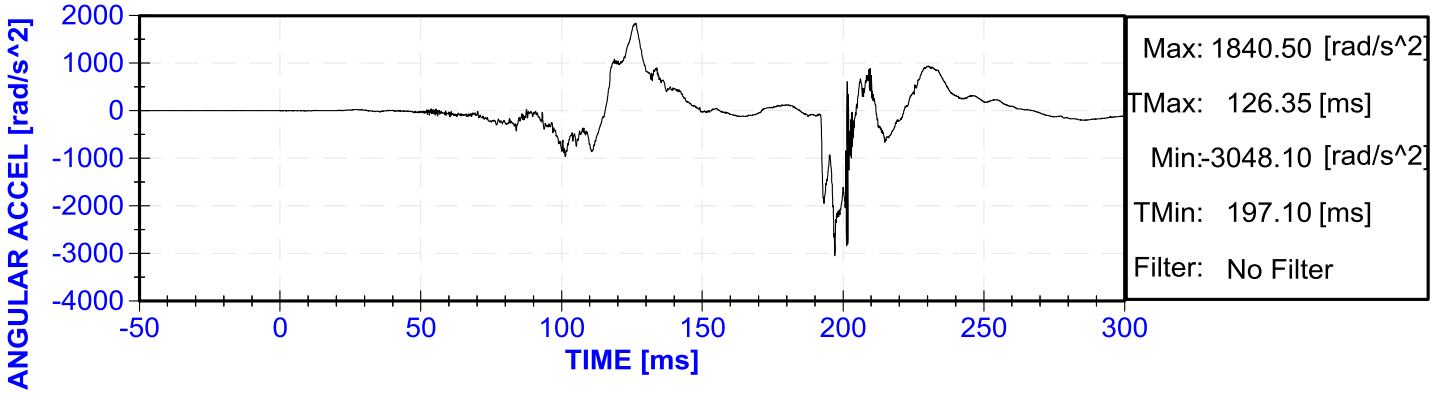
V2P1 Abdomen Right Lower Dy



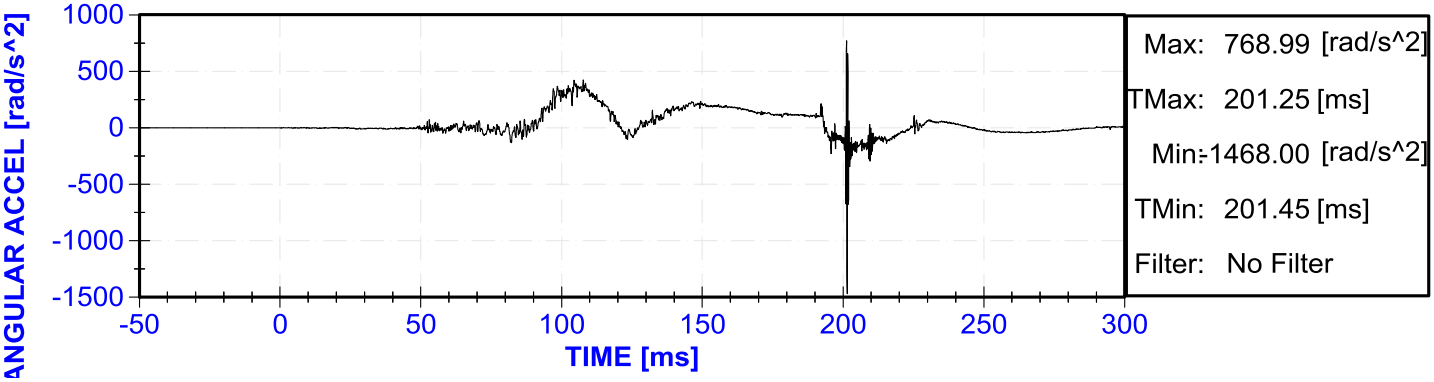
V2P1 Abdomen Right Lower Dz



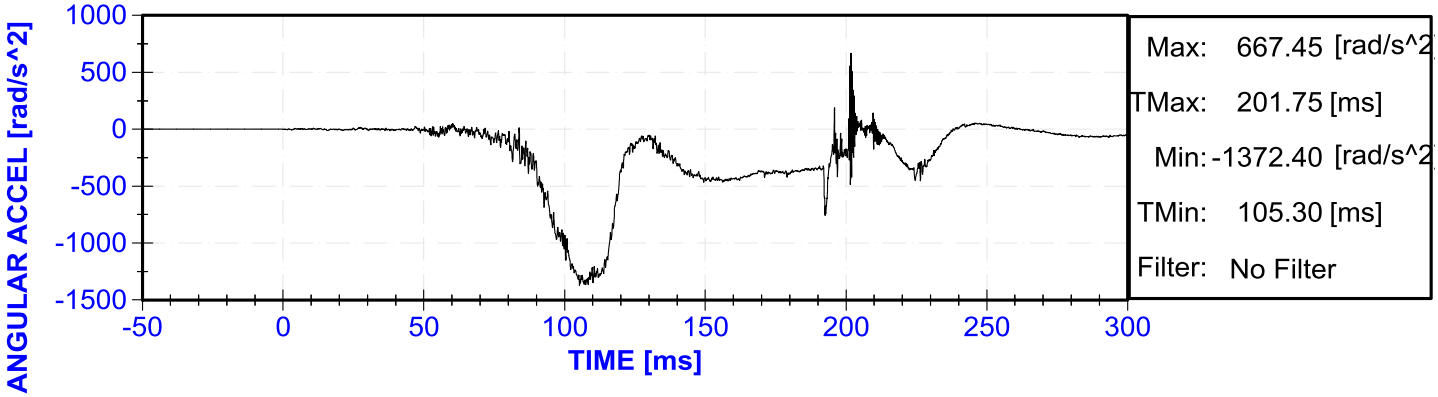
V2P4 HEAD ANGULAR ACCELERATION X [SIMON]



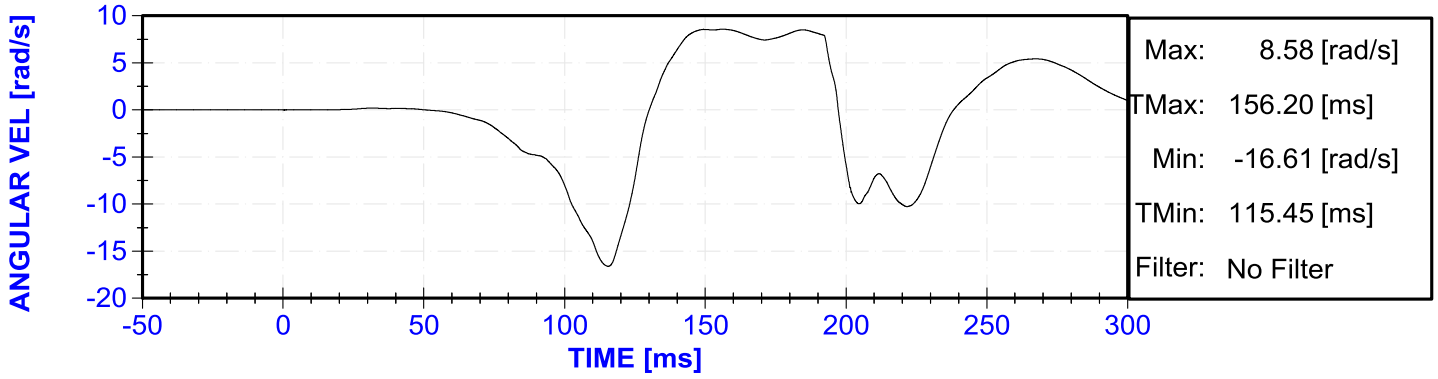
V2P4 HEAD ANGULAR ACCELERATION Y [SIMON]



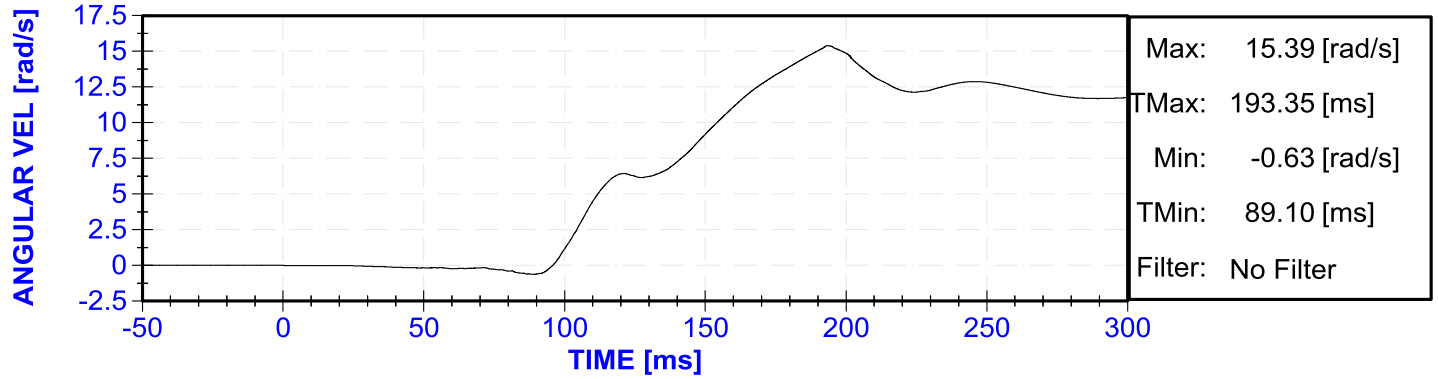
V2P4 HEAD ANGULAR ACCELERATION Z [SIMON]



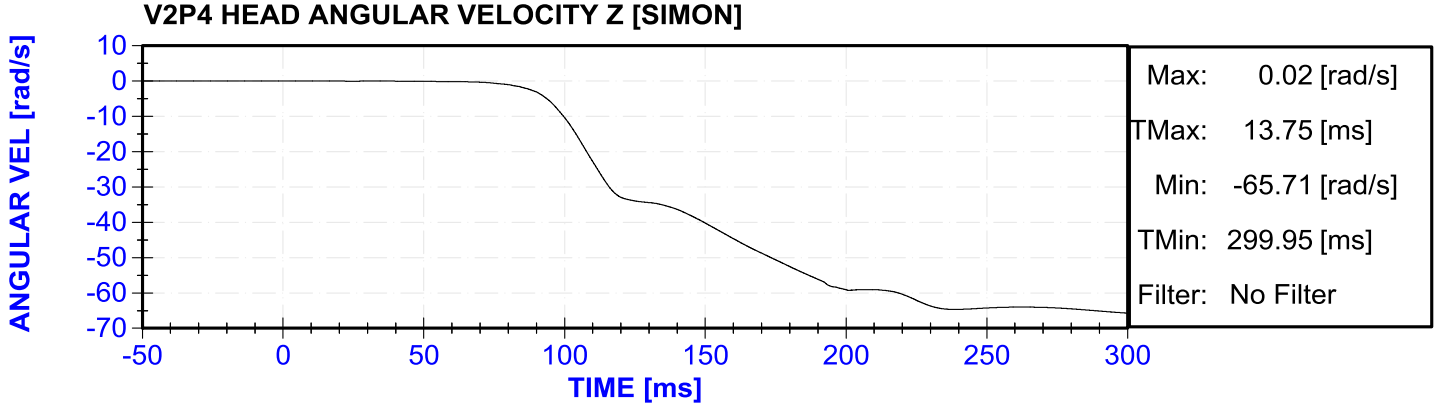
V2P4 HEAD ANGULAR VELOCITY X [SIMON]



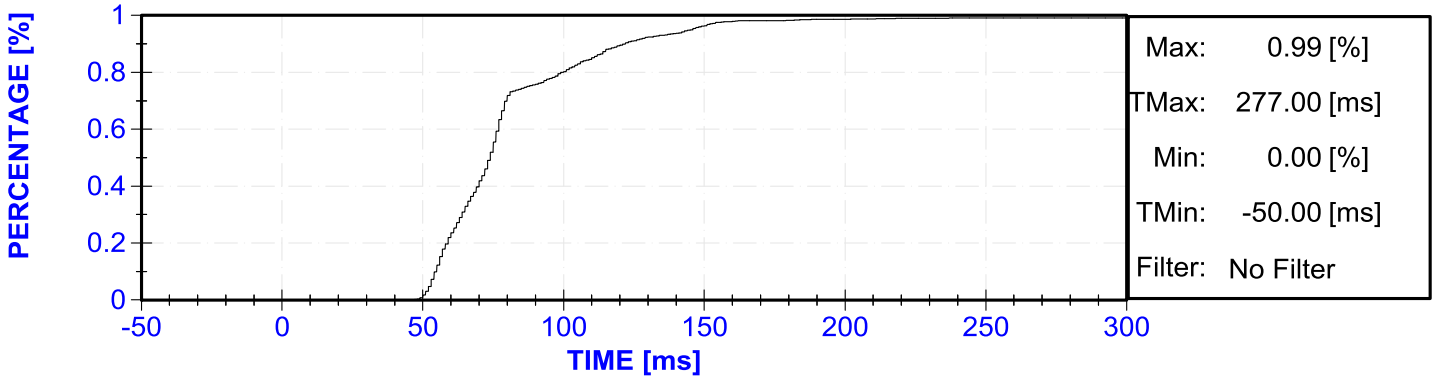
V2P4 HEAD ANGULAR VELOCITY Y [SIMON]



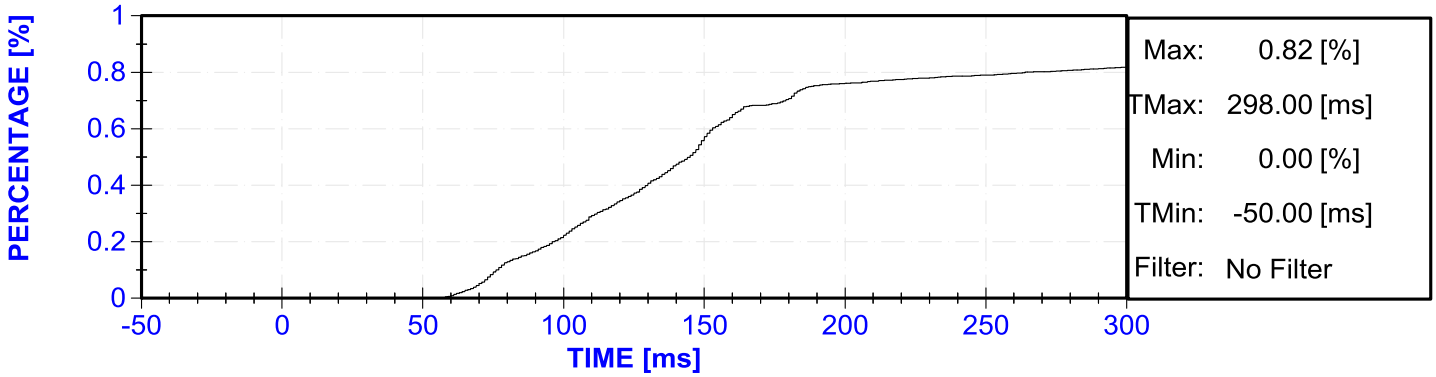
V2P4 HEAD ANGULAR VELOCITY Z [SIMON]



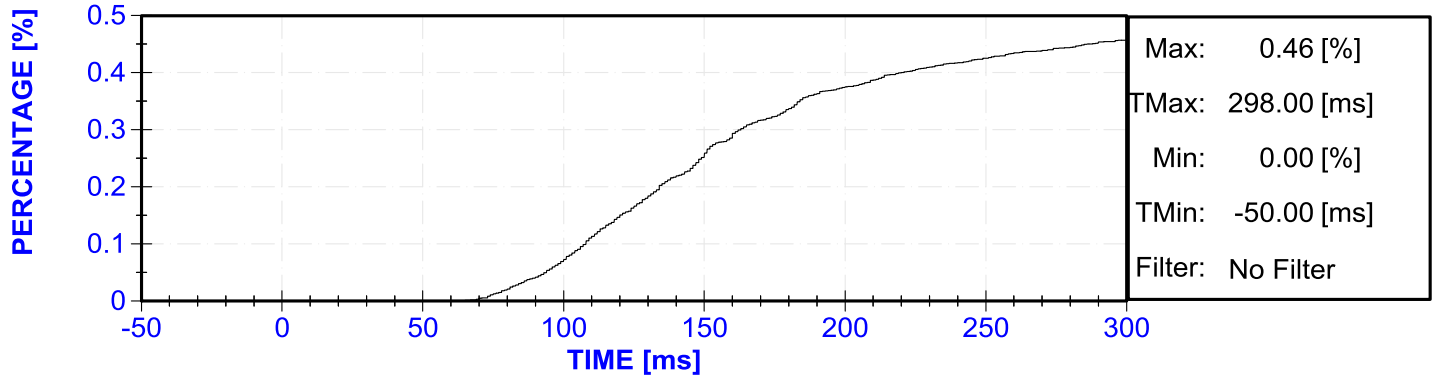
V2P4 CUMULATIVE STRAIN 0.05 [SIMON]



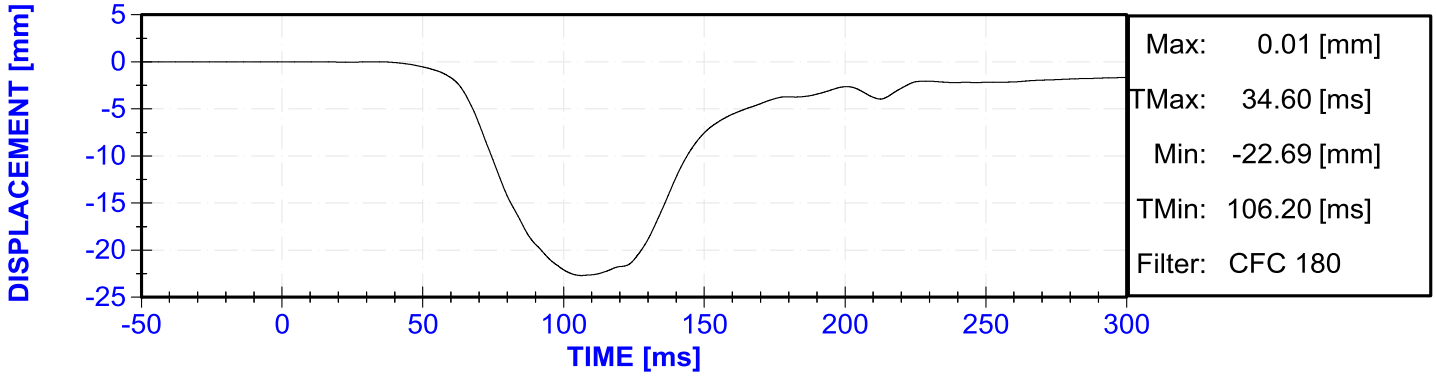
V2P4 CUMULATIVE STRAIN 0.10 [SIMON]



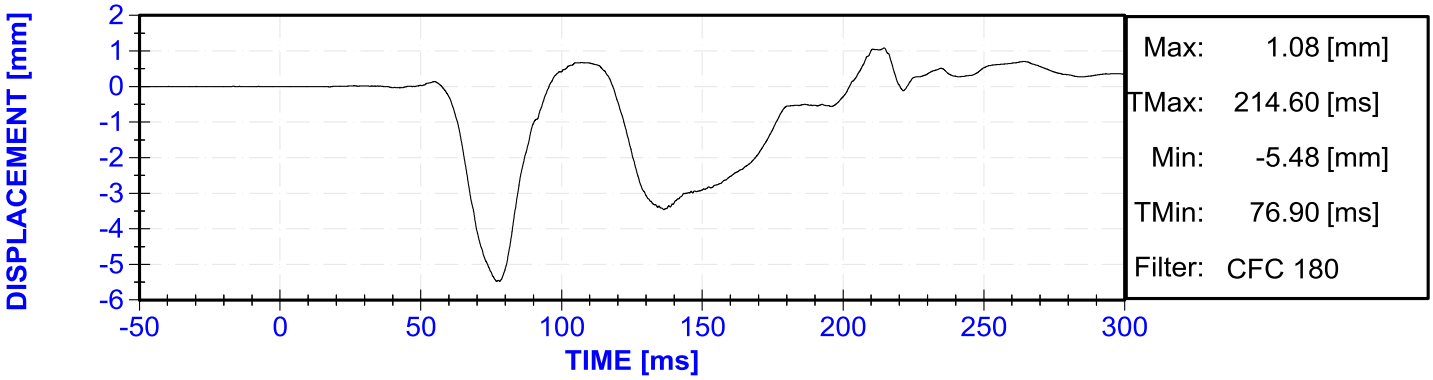
V2P4 CUMULATIVE STRAIN 0.15 [SIMON]



V2P4 CHEST UPPER LEFT X [COMPUTED, MM]

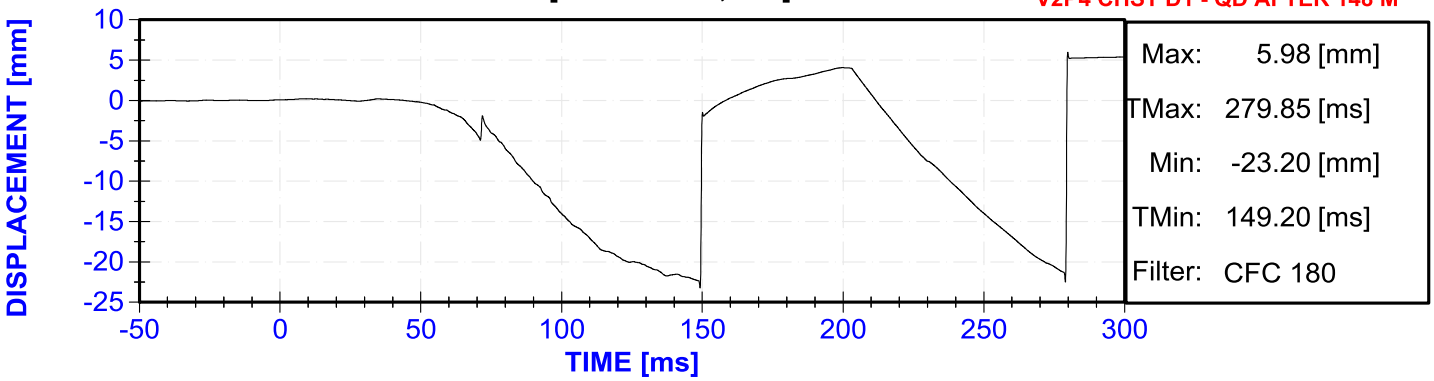


V2P4 CHEST UPPER LEFT Y [COMPUTED, MM]



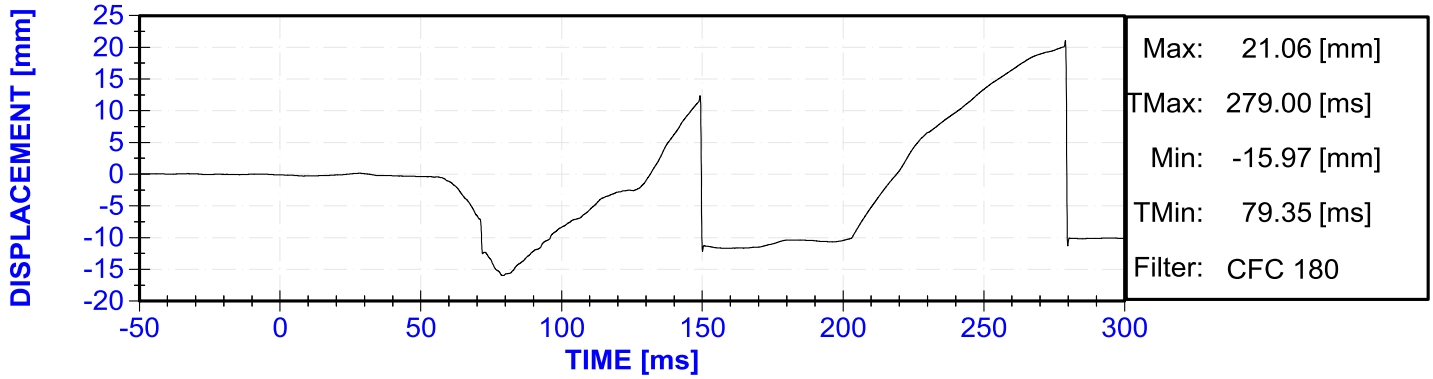
V2P4 CHEST UPPER RIGHT X [COMPUTED, MM]

V2P4 CHST D1 - QD AFTER 148 M

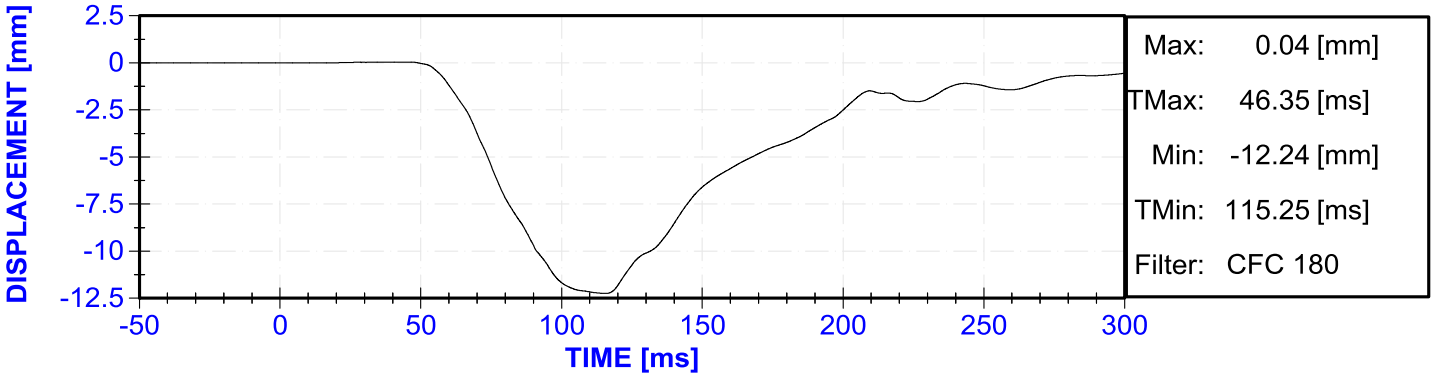


V2P4 CHEST UPPER RIGHT Y [COMPUTED, MM]

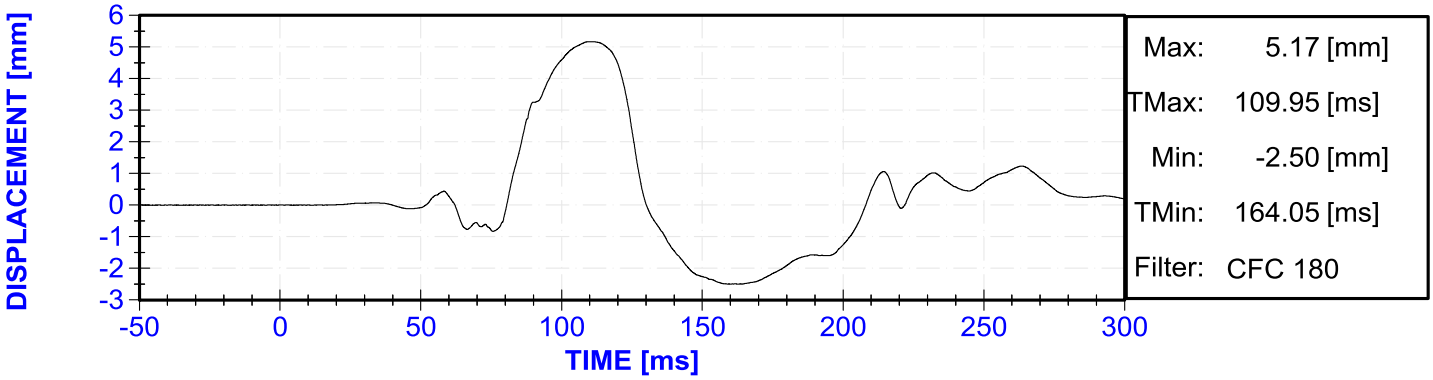
V2P4 CHST D1 - QD AFTER 148 MS



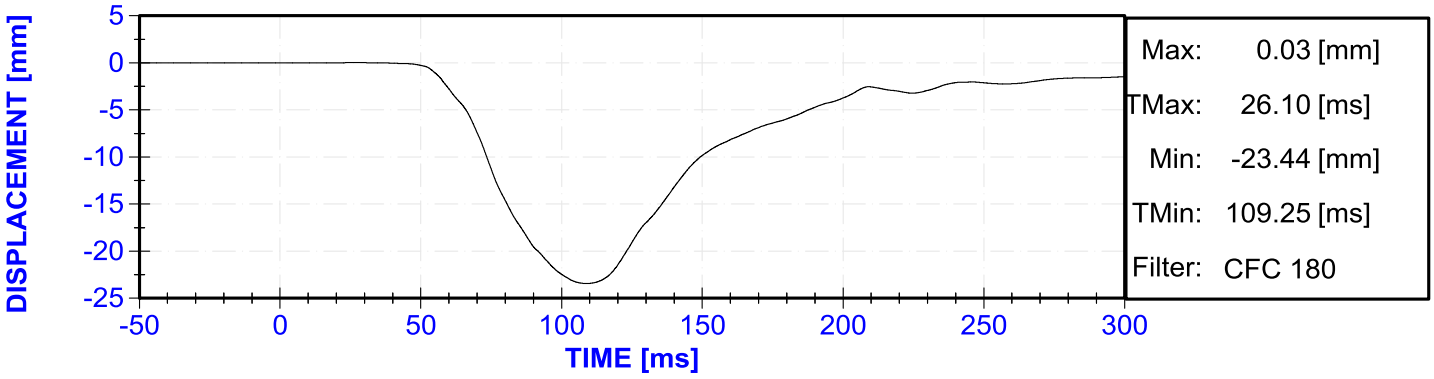
V2P4 CHEST LOWER LEFT X [COMPUTED, MM]



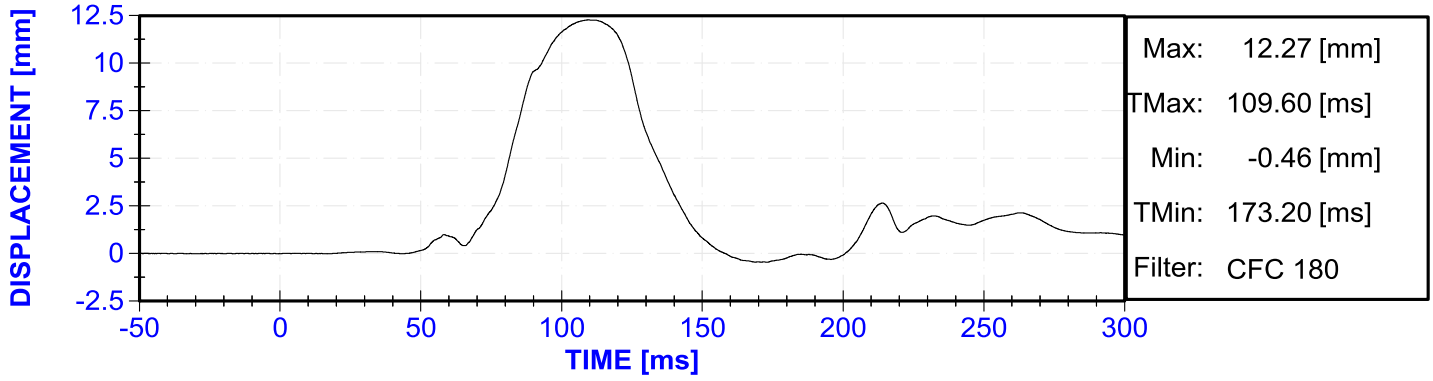
V2P4 CHEST LOWER LEFT Y [COMPUTED, MM]



V2P4 CHEST LOWER RIGHT X [COMPUTED, MM]



V2P4 CHEST LOWER RIGHT Y [COMPUTED, MM]



APPENDIX C

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

Table 1 – Dummy Information

TYPE	DESCRIPTION	SERIAL NUMBER
THOR	50^{TH} Male	0007
Hybrid III	5^{th} Female	070

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
3.98577	13.869	-34.481	0.30868	10.848	-58.84

Table 3 - THOR Dummy Initial SetUp Information

THOR – NT S/N: 0007									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 4: Pre-Test Inspection Checklist

THOR Inspection Checklist

Date: September 12, 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: 9/12/2011
Tests conducted since last full certification or inspection: RB0527 Smart For Two
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 • Gouge left side of the forehead
(Y) / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / (N)	Head securely mounted to OC joint • OC Joint wobbles, otherwise firmly attached
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): • Debonding between pecks 4-5, rear surface
Y / (N)	No evidence of debonding or permanent compression in neck soft stop assemblies • Front soft stop debonding
(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 • Scuffing 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 Shoulder soft stop slightly debonding
OTHER	
THORAX	
Y / (N)	No evidence of contact at top, bottom, or interior faces of rib damping material • Contact on interior of rib #4, both sides
(Y) / N	No evidence of debonding between rib damping material and ribs
(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) • Right side rib #5 • Left side rib #4
OTHER	

ABDOMEN	
Y / (N)	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper • Small tear in the top left corner
(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 • Broken stitches on the top right side
(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 • Both knees show cuts and scuffs, loose fitting
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	Puncture upper left shin
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 Checklist

THOR Inspection Checklist

Date: September 15, 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: 9/15/2011
Tests conducted since last full certification or inspection: RB0330 Dodge Ram 1500
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 • Gouge left side of the forehead
(Y) / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / (N)	Head securely mounted to OC joint • OC Joint wobbles, otherwise firmly attached
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): • Debonding between pecks 4-5, rear surface
Y / (N)	No evidence of debonding or permanent compression in neck soft stop assemblies • Front soft stop debonding
(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 • Scuffing 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 Shoulder soft stop slightly debonding
OTHER	
THORAX	
Y / (N)	No evidence of contact at top, bottom, or interior faces of rib damping material • Contact on interior of rib #4, both sides
(Y) / N	No evidence of debonding between rib damping material and ribs
(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) • Right side rib #5 • Left rib #7
OTHER	

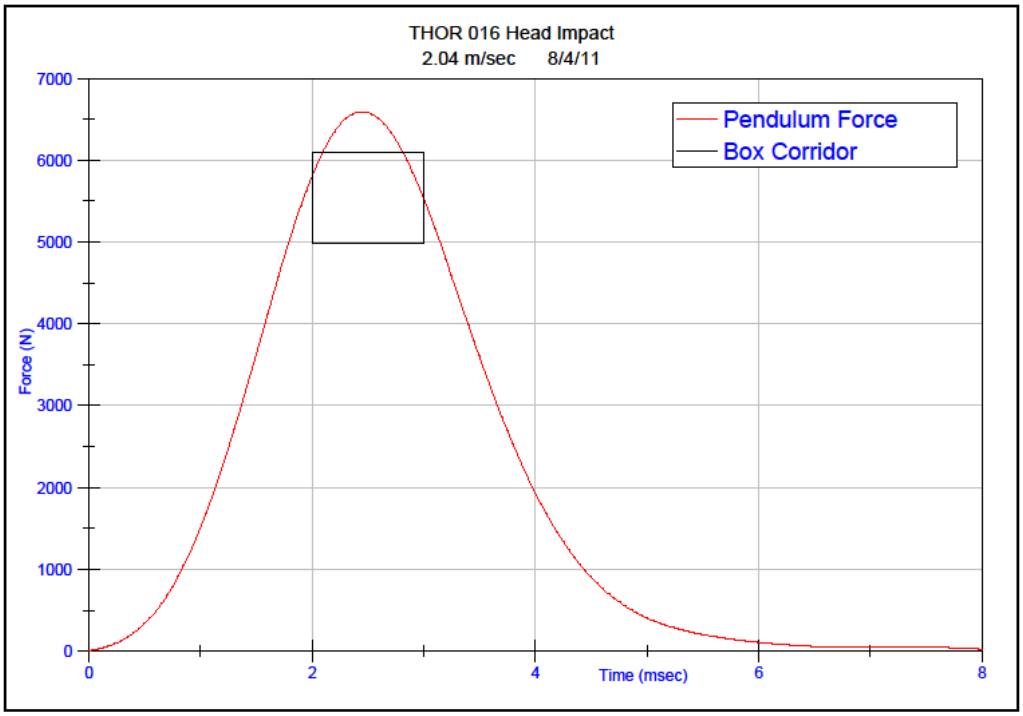
ABDOMEN	
Y / (N)	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper • Small tear in the top left corner
(Y) / N	Upper abdomen insert securely attached to spine

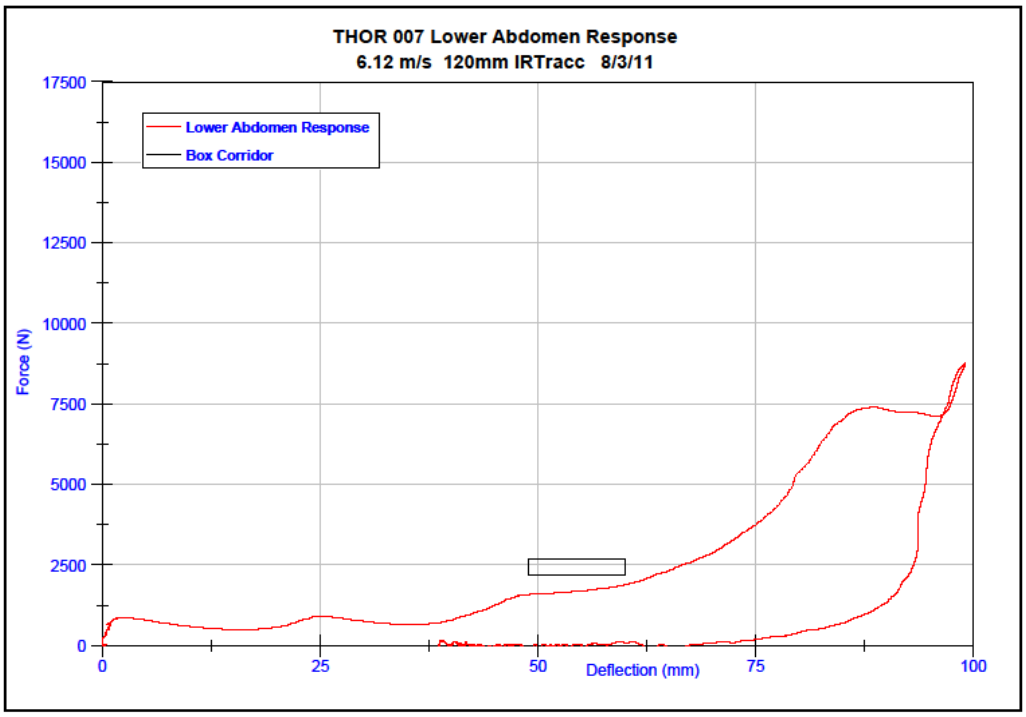
Y / N	Upper abdomen insert shows no evidence of permanent set
Y / (N)	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper • Broken stitches on the top right side
(Y) / N	Lower abdomen insert securely attached to spine
(Y) / N	Lower abdomen insert shows no evidence of permanent 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 • Both knees show cuts and scuffs, loose fitting
OTHER	Left Femur is still wobbly

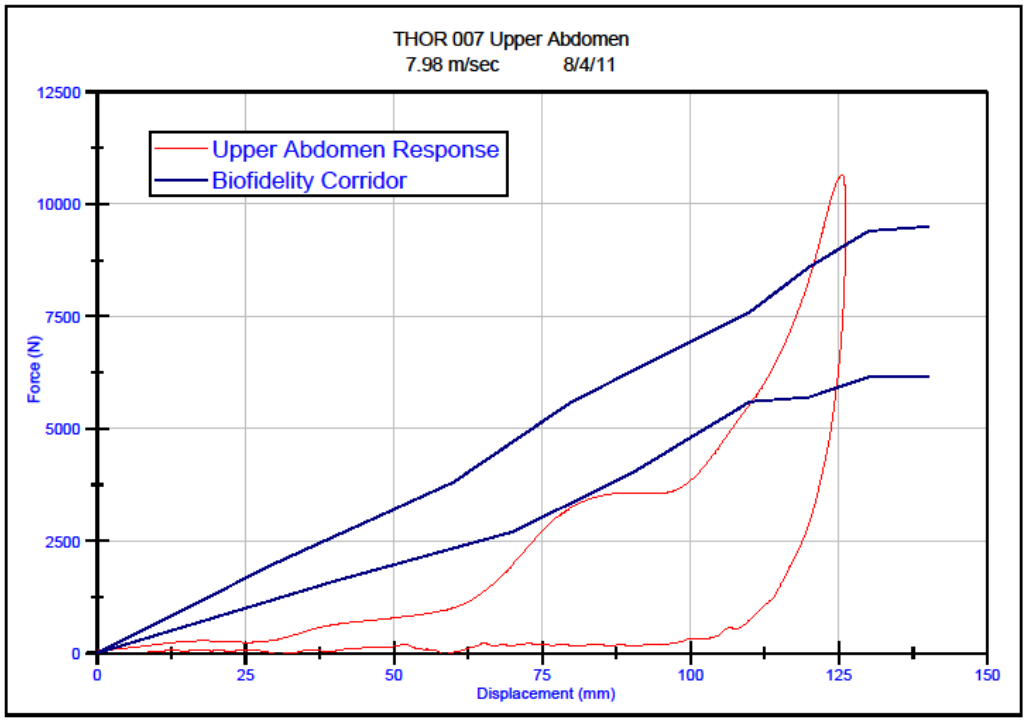
LOWER EXTREMITY (LX)	
(Y) / N	Rotational potentiometers in ankle securely attached
(Y) / N	Achilles tendon provides resistance to dorsiflexion

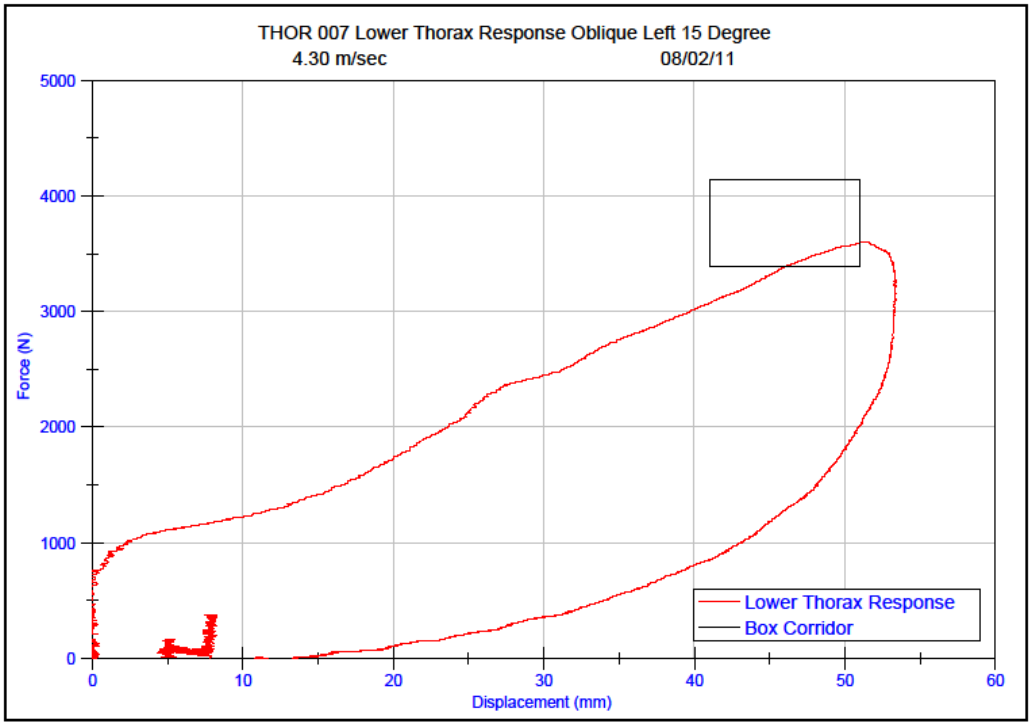
Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops
OTHER	
JACKET	
(Y) / N	Rib stiffeners show no sign of permanent deformation
Y / (N)	No evidence of tears or holes in jacket fabric, velcro, or zippers • Tearing of stitches around front collar
OTHER	

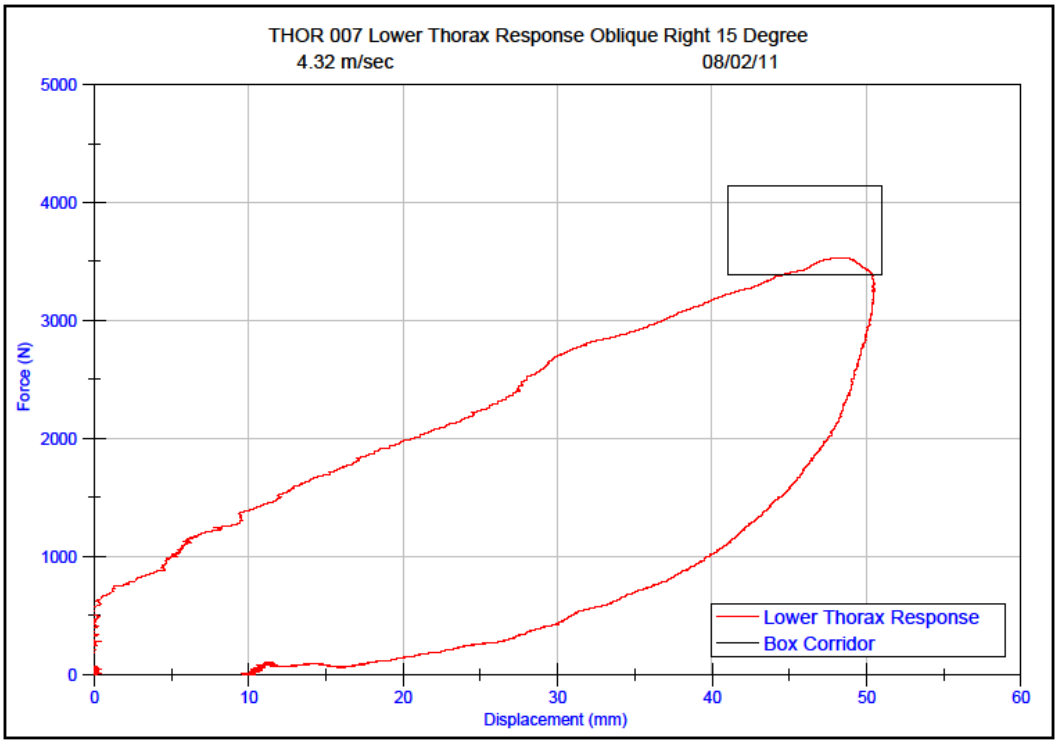
Dummy Calibration Plots

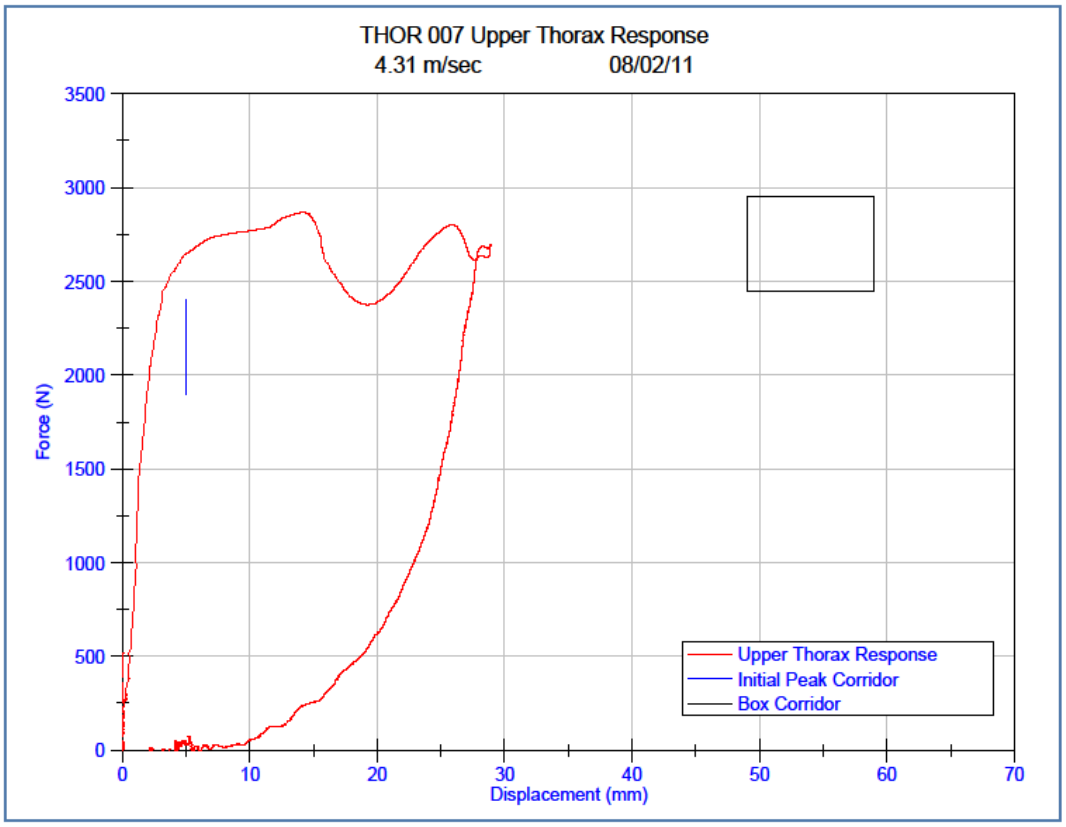

THOR 016 Head Impact
2.04 m/sec 8/4/11
Pendulum Force
Box Corridor
Force (N)
Time (msec)
7000
6000
5000
4000
3000
2000
1000
0
0
2
4
6
8

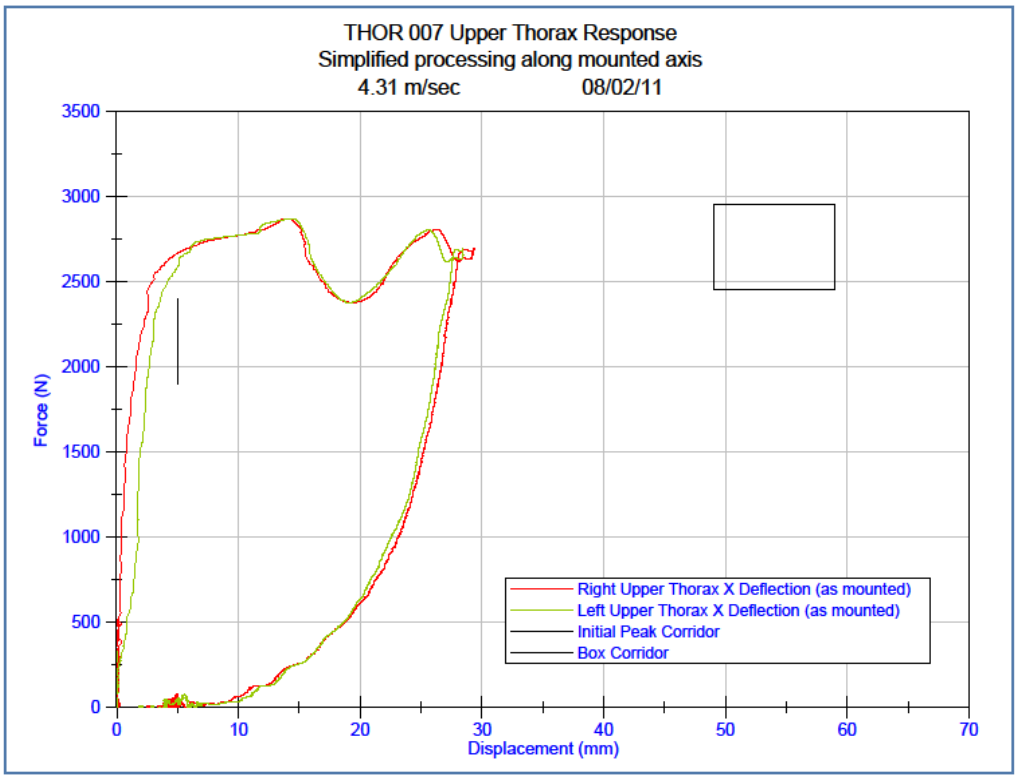

THOR 007 Lower Abdomen Response
6.12 m/s 120mm IRTracc 8/3/11
Lower Abdomen Response
Box Corridor
Force (N)
Deflection (mm)
17500
15000
12500
10000
7500
5000
2500
0
0
25
50
75
100


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

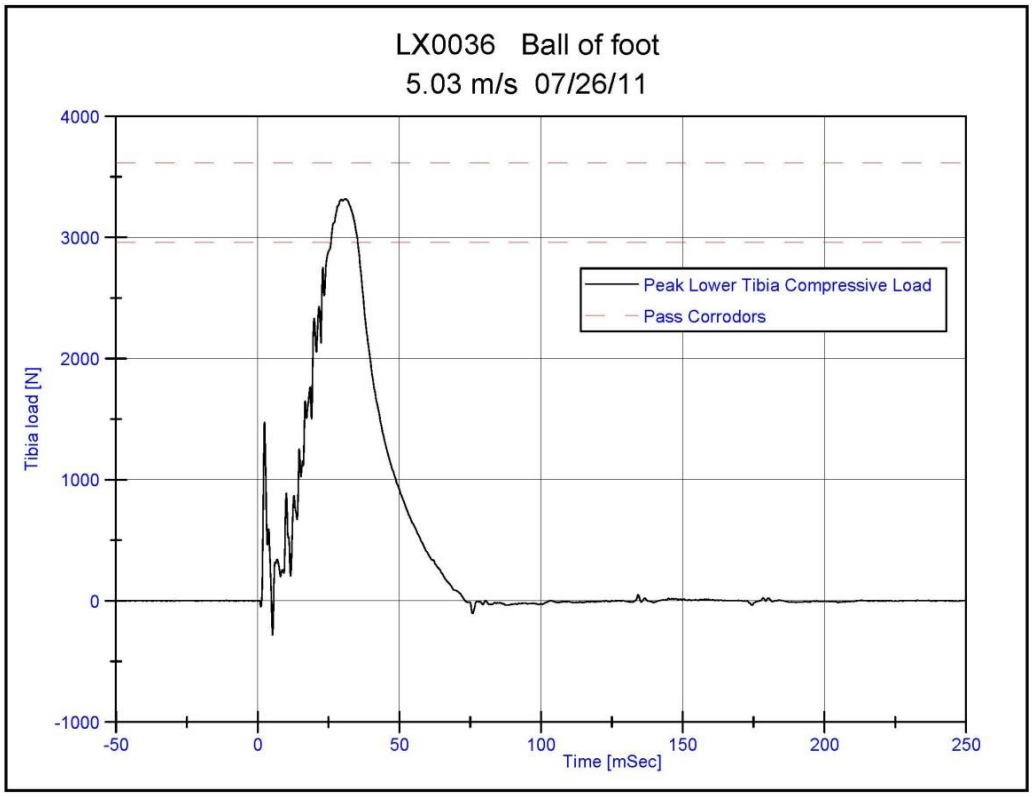

THOR 007 Lower Thorax Response Oblique Left 15 Degree
4.30 m/sec 08/02/11
Lower Thorax Response
Box Corridor
Force (N)
Displacement (mm)
5000
4000
3000
2000
1000
0
0
10
20
30
40
50
60

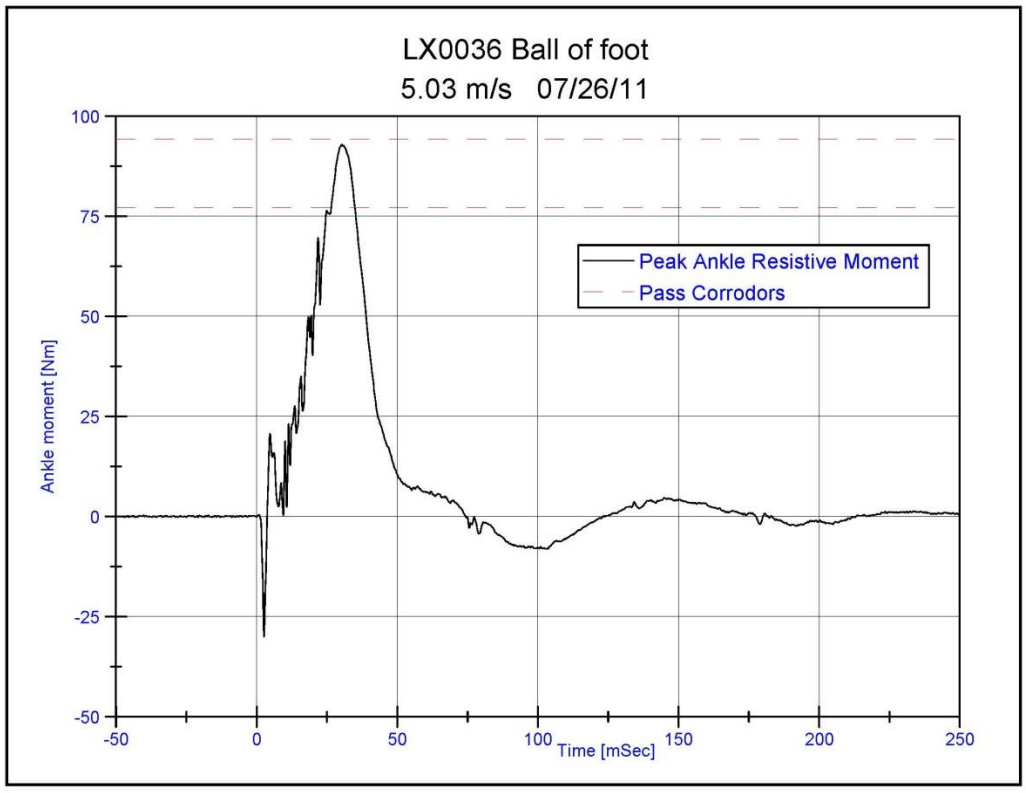

THOR 007 Lower Thorax Response Oblique Right 15 Degree
4.32 m/sec
08/02/11
Force (N)
Displacement (mm)
Lower Thorax Response
Box Corridor

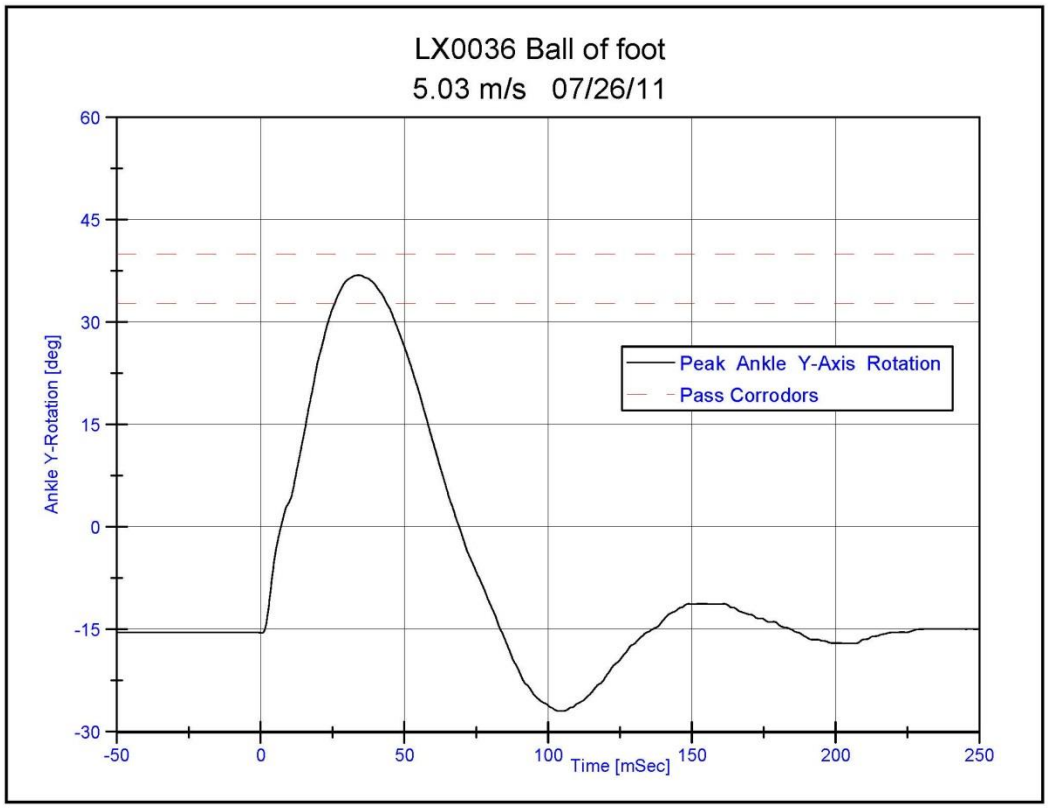

THOR 007 Upper Thorax Response
4.31 m/sec
08/02/11
Force (N)
Displacement (mm)
Upper Thorax Response
Initial Peak Corridor
Box Corridor

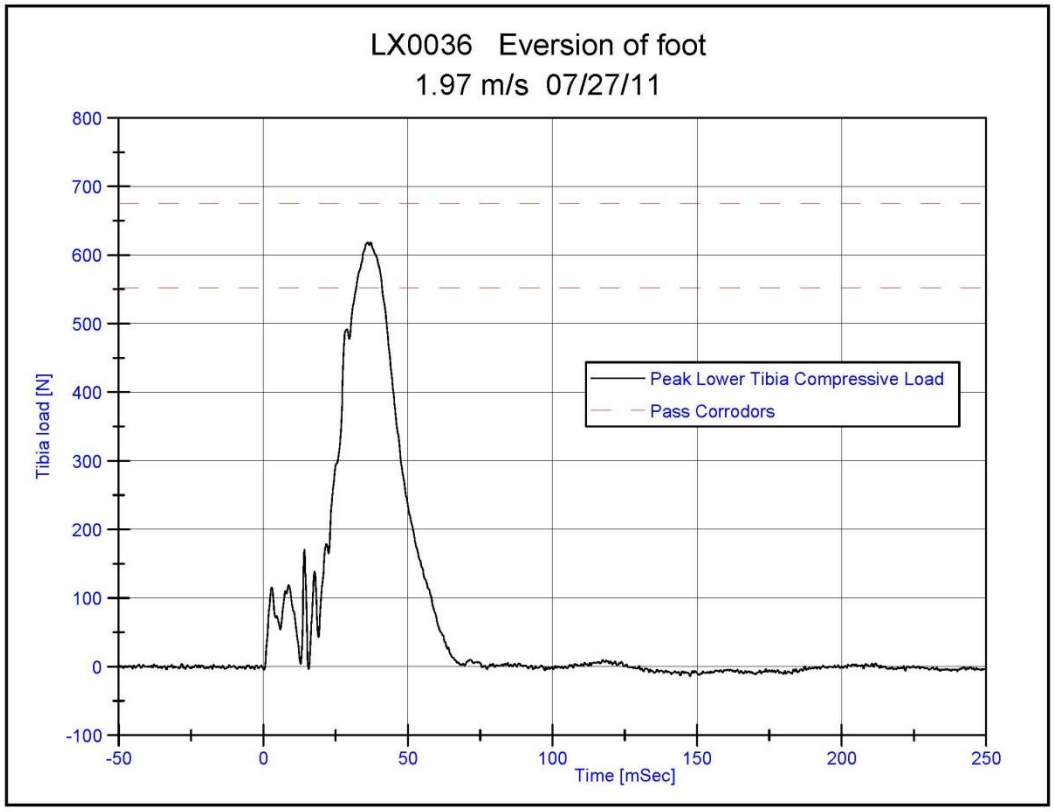


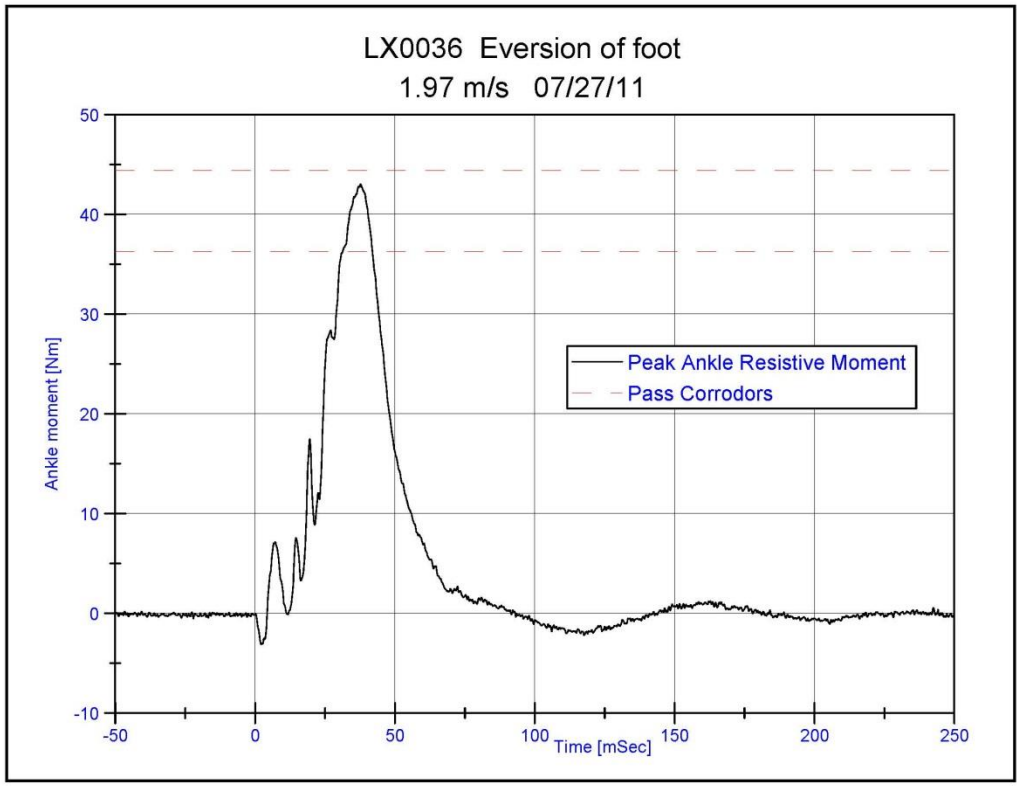
LEG S/N: LX0036/ LX0037

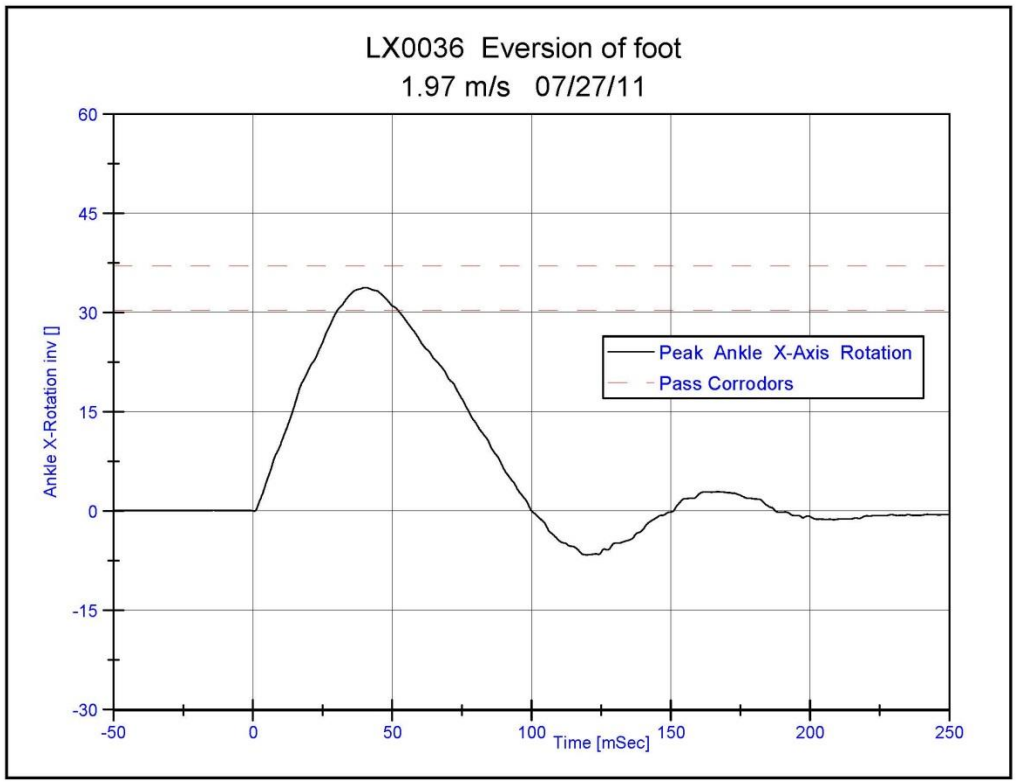


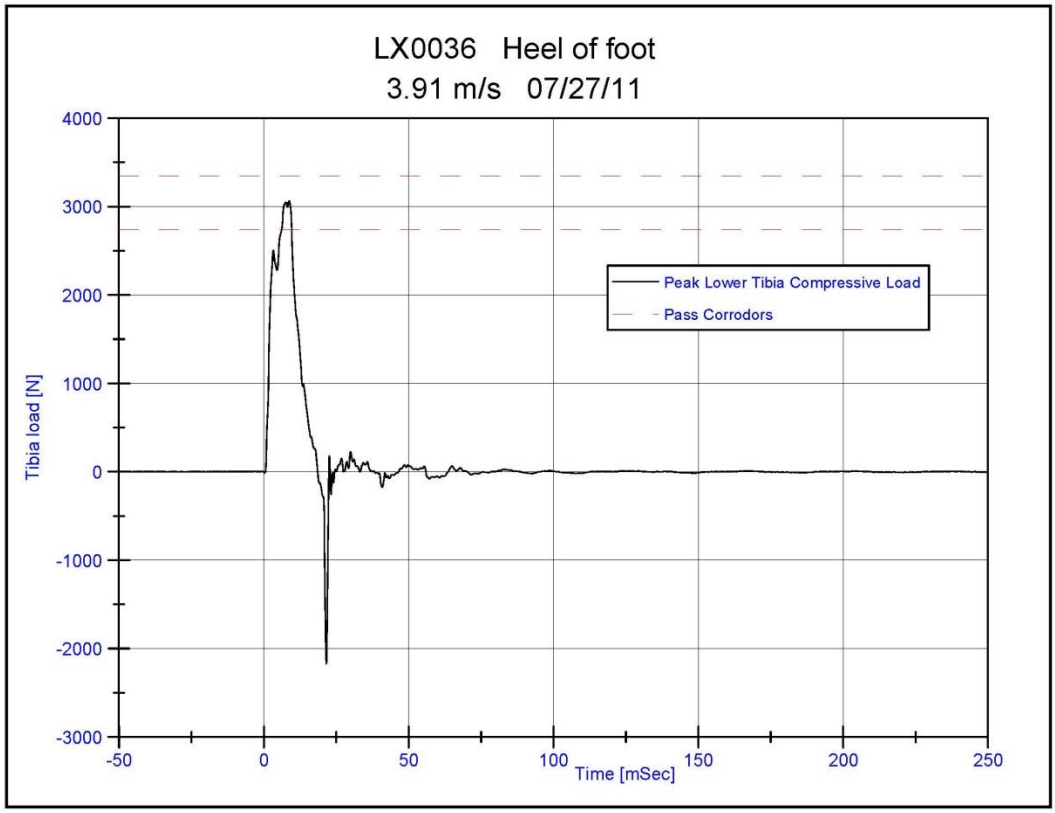

LX0036 Ball of foot
5.03 m/s 07/26/11
Peak Ankle Resistive Moment
Pass Corrodors
Ankle moment [Nm]
Time [mSec]
100
75
50
25
0
-25
-50
-50
0
50
100
150
200
250

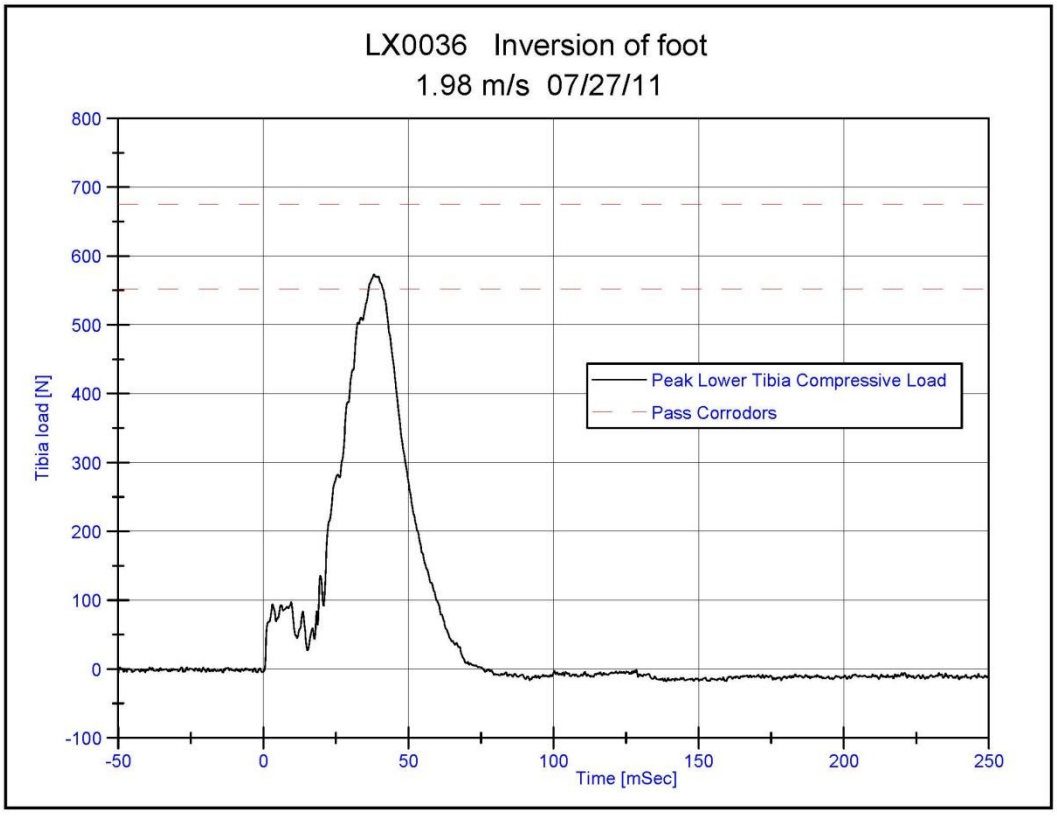

LX0036 Ball of foot
5.03 m/s 07/26/11
Peak Ankle Y-Axis Rotation
Pass Corrodors
Ankle Y-Rotation [deg]
Time [mSec]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250

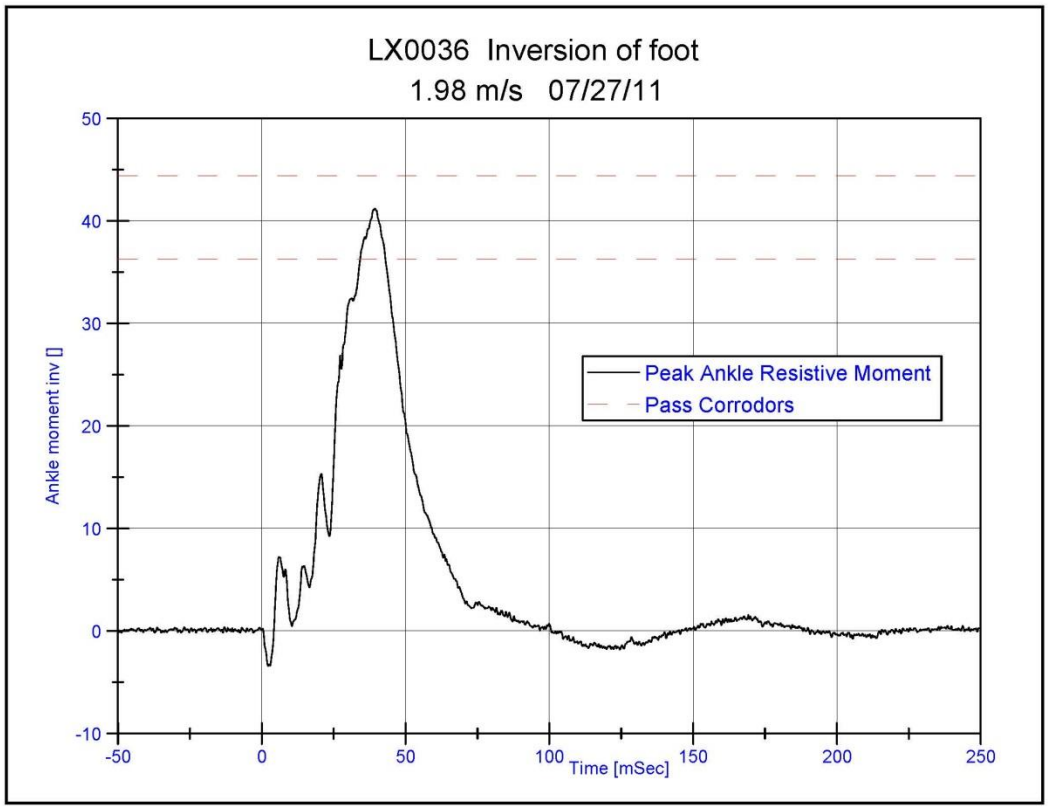

LX0036 Eversion of foot
1.97 m/s 07/27/11
Tibia load [N]
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors

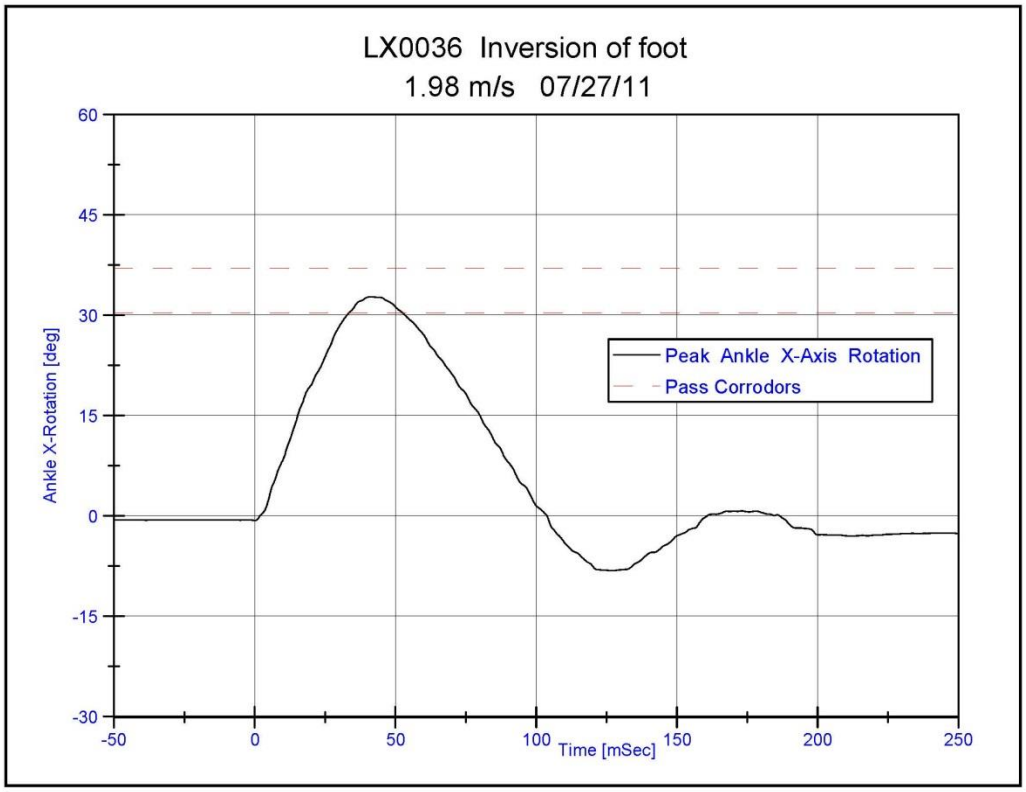

LX0036 Eversion of foot
1.97 m/s 07/27/11
Ankle moment [Nm]
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors

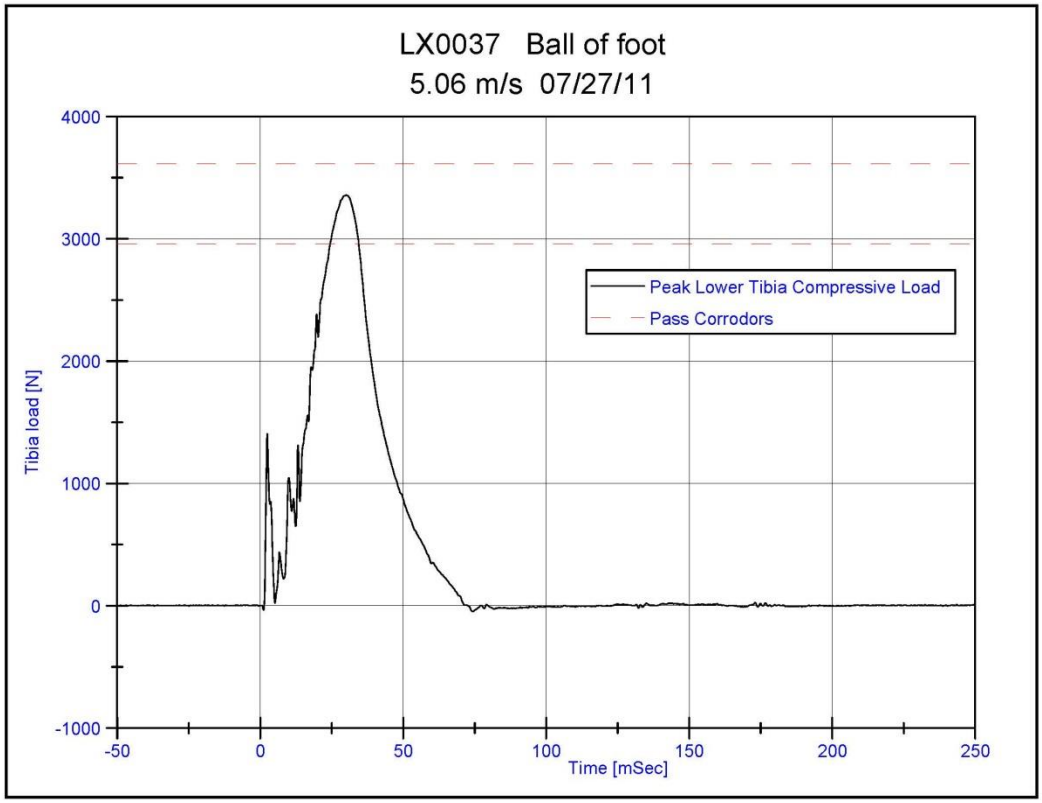

LX0036 Eversion of foot
1.97 m/s 07/27/11
Ankle X-Rotation inv []
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors

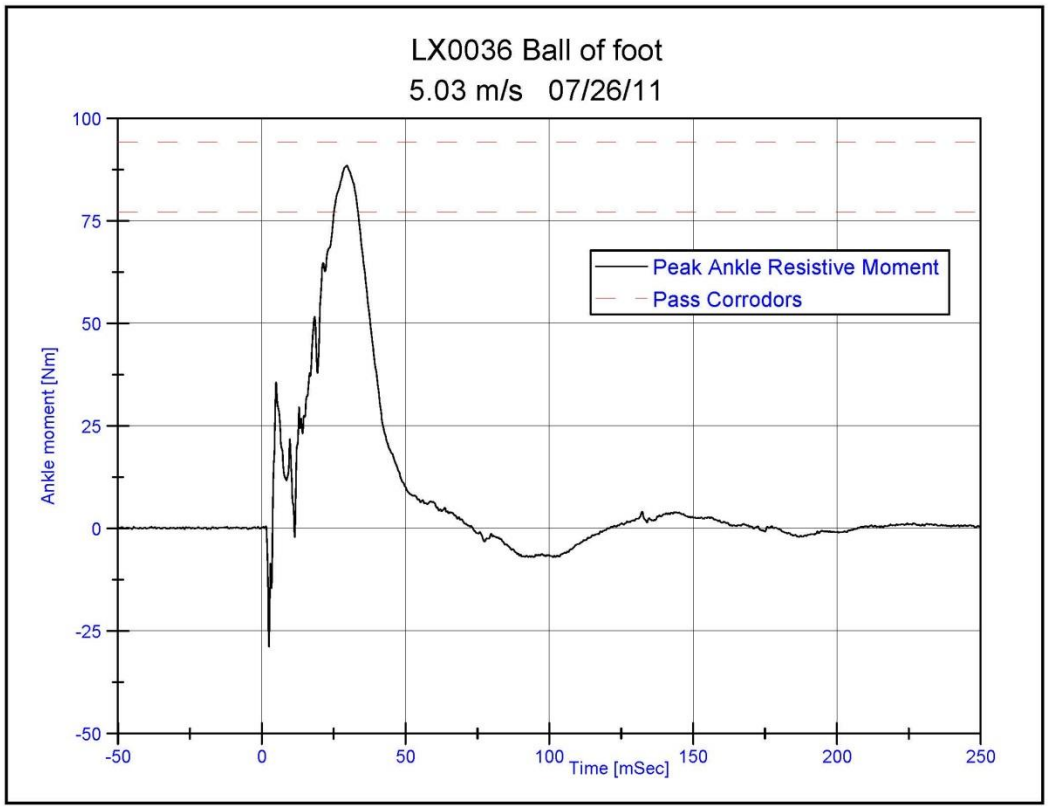

LX0036 Heel of foot
3.91 m/s 07/27/11
Tibia load [N]
4000
3000
2000
1000
0
-1000
-2000
-3000
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors

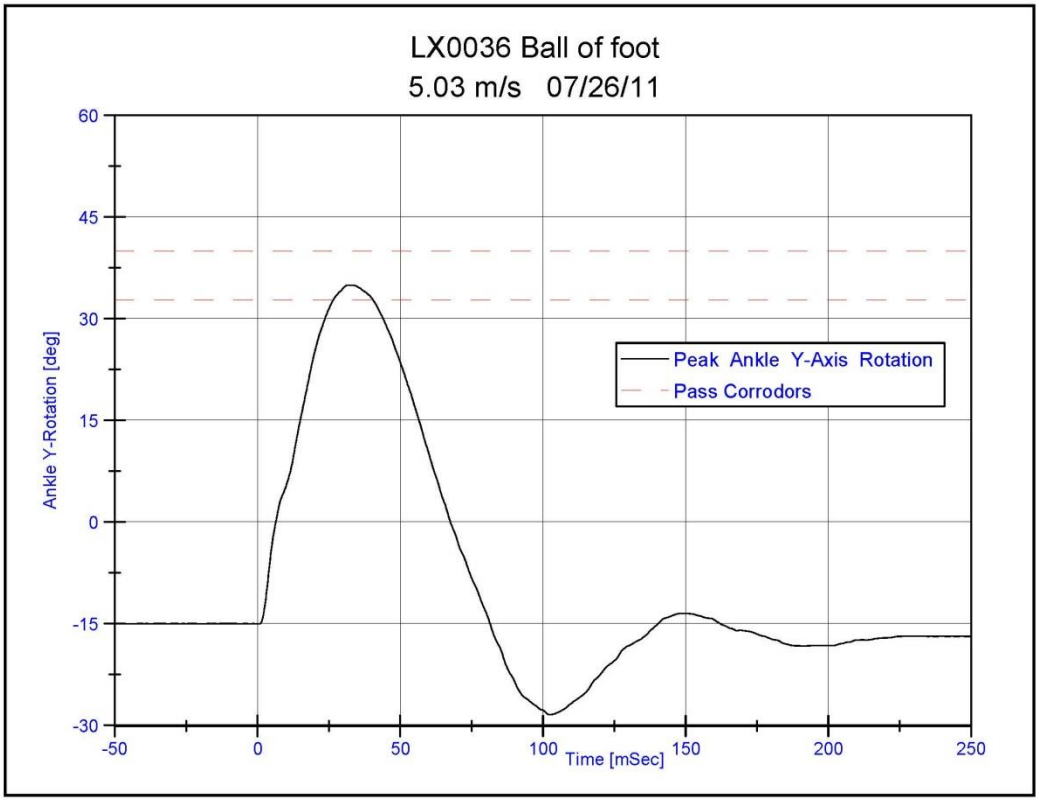

LX0036 Inversion of foot
1.98 m/s 07/27/11
Tibia load [N]
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors

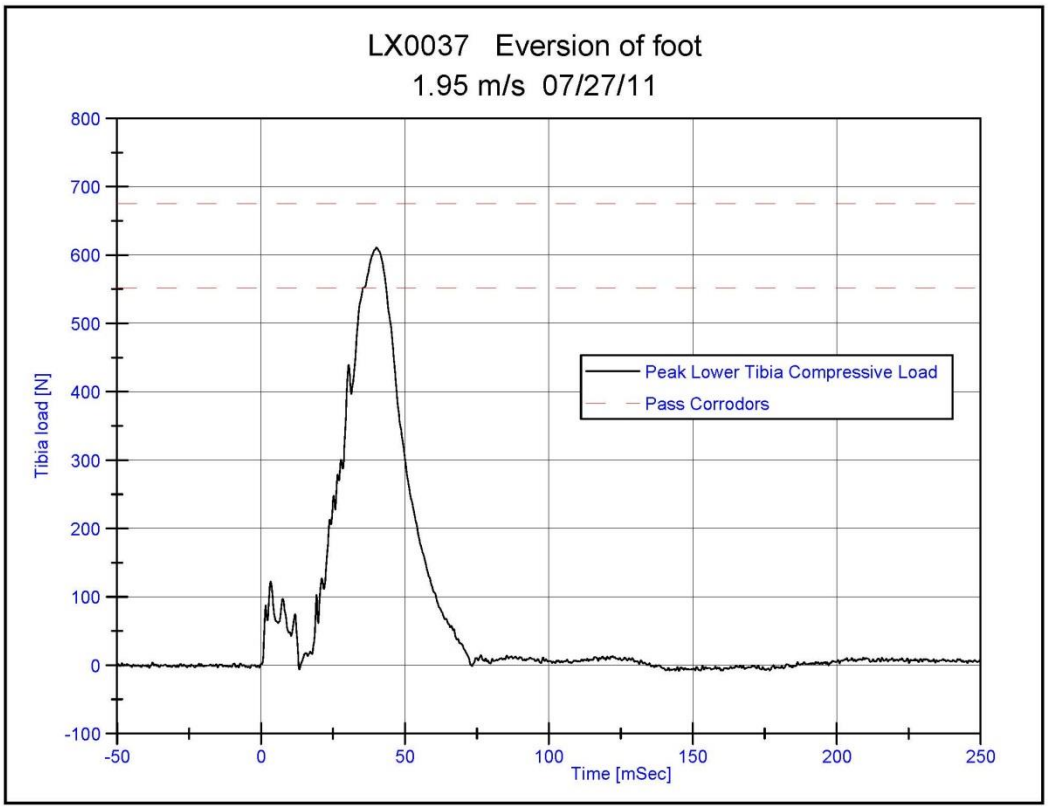

LX0036 Inversion of foot
1.98 m/s 07/27/11
Ankle moment inv []
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors

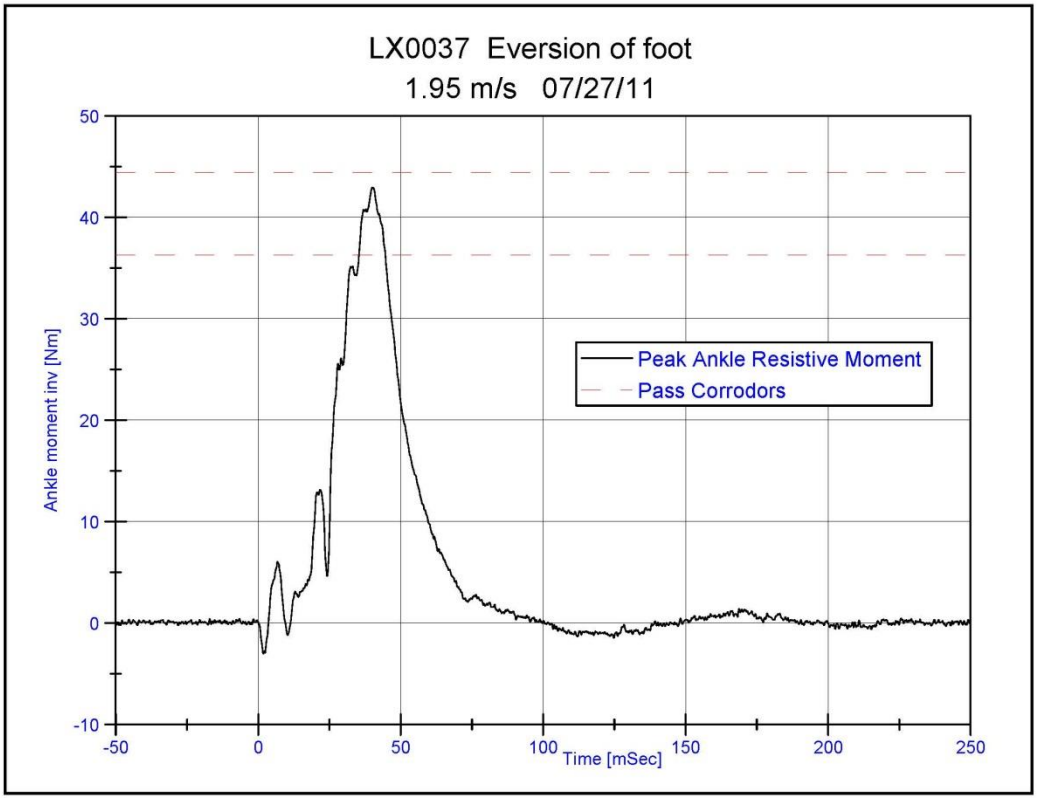

LX0036 Inversion of foot
1.98 m/s 07/27/11
Ankle X-Rotation [deg]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors

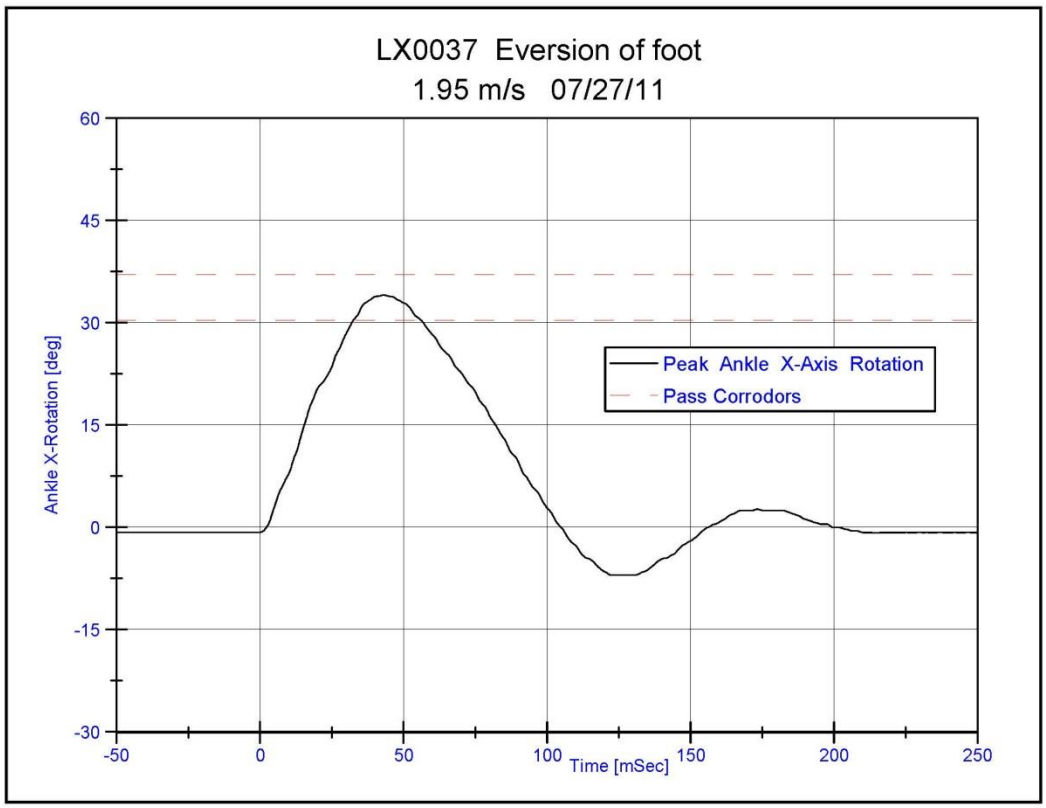

LX0037 Ball of foot
5.06 m/s 07/27/11
Tibia load [N]
4000
3000
2000
1000
0
-1000
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors

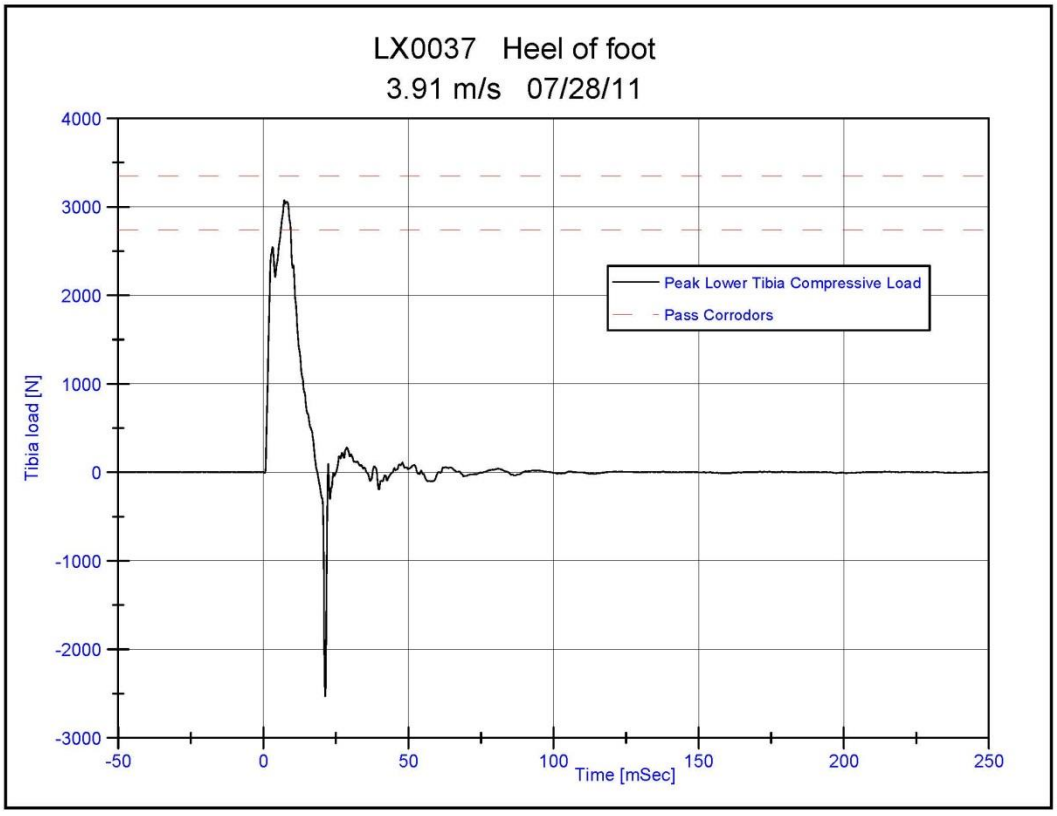

LX0036 Ball of foot
5.03 m/s 07/26/11
Ankle moment [Nm]
100
75
50
25
0
-25
-50
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors

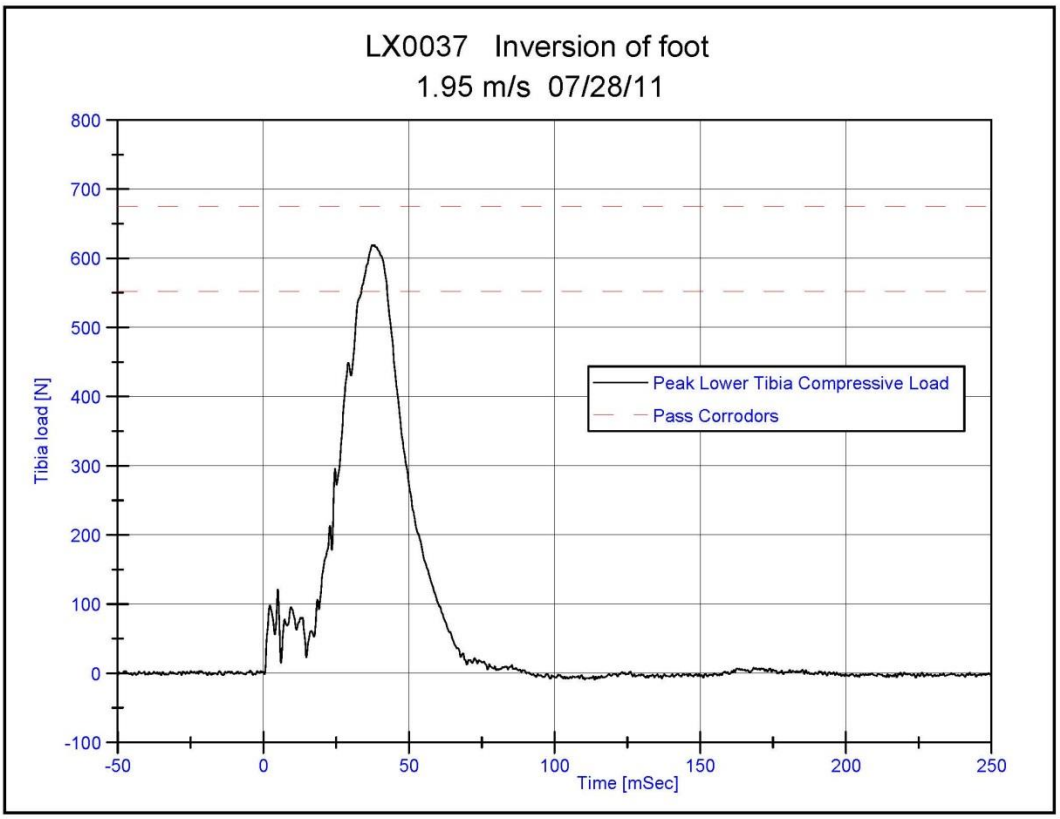

LX0036 Ball of foot
5.03 m/s 07/26/11
Ankle Y-Rotation [deg]
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250
Time [mSec]
Peak Ankle Y-Axis Rotation
Pass Corrodors

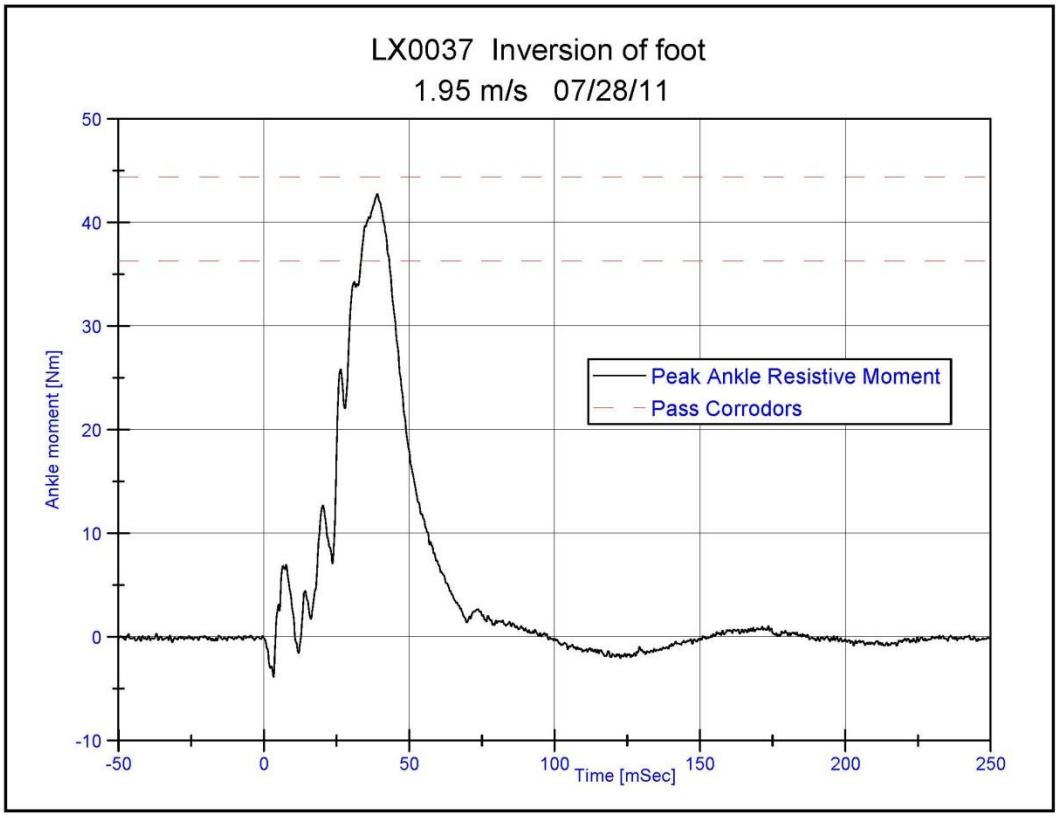

LX0037 Eversion of foot
1.95 m/s 07/27/11
Tibia load [N]
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors

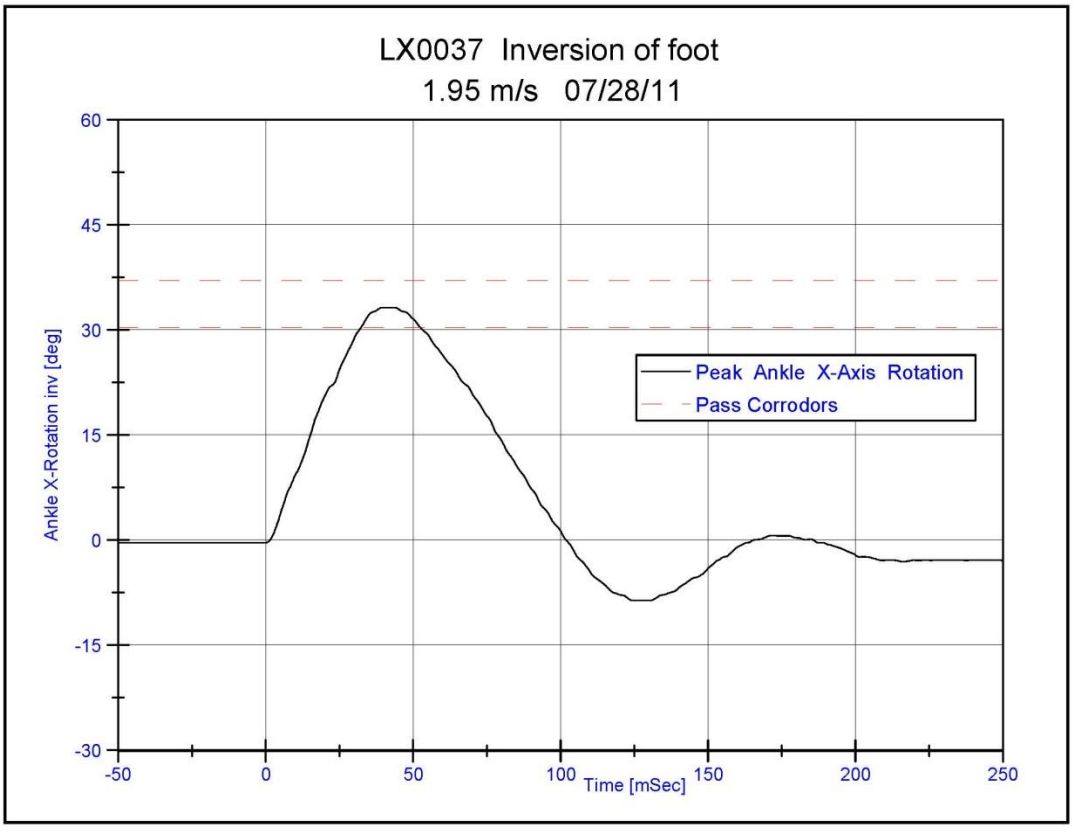

LX0037 Eversion of foot
1.95 m/s 07/27/11
Ankle moment inv [Nm]
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250


LX0037 Eversion of foot
1.95 m/s 07/27/11
Ankle X-Rotation [deg]
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250


LX0037 Heel of foot
3.91 m/s 07/28/11
Tibia load [N]
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors
4000
3000
2000
1000
0
-1000
-2000
-3000
-50
0
50
100
150
200
250


LX0037 Inversion of foot
1.95 m/s 07/28/11
Tibia load [N]
Time [mSec]
Peak Lower Tibia Compressive Load
Pass Corrodors
800
700
600
500
400
300
200
100
0
-100
-50
0
50
100
150
200
250


LX0037 Inversion of foot
1.95 m/s 07/28/11
Ankle moment [Nm]
Time [mSec]
Peak Ankle Resistive Moment
Pass Corrodors
50
40
30
20
10
0
-10
-50
0
50
100
150
200
250


LX0037 Inversion of foot
1.95 m/s 07/28/11
Ankle X-Rotation inv [deg]
Time [mSec]
Peak Ankle X-Axis Rotation
Pass Corrodors
60
45
30
15
0
-15
-30
-50
0
50
100
150
200
250

APPENDIX D

ADDITIONAL MEASUREMENTS & DATA CALCULATIONS

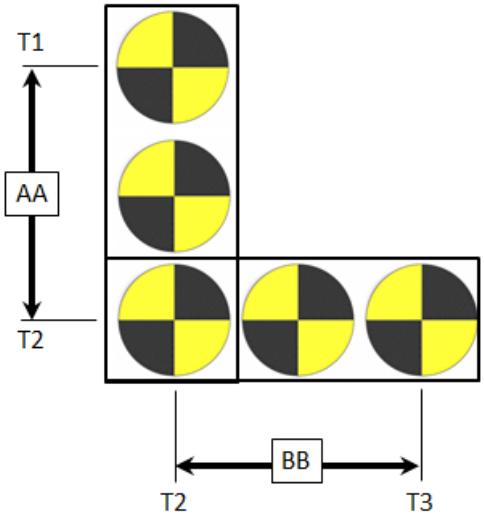
ADDITIONAL TARGETS

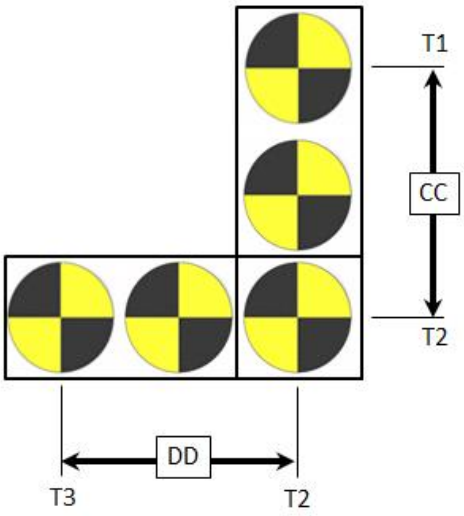
Overhead Reference Targets:

AA (T1 to T2)	236	mm
BB (T2 to T3)	234	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.

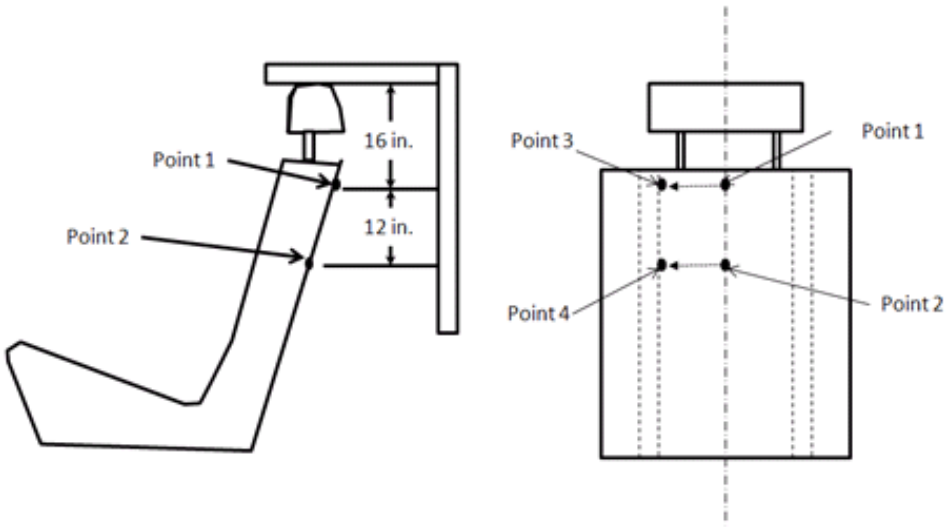
The lateral seat centerline was determined by following the FMVSS 214D seating procedures for the rear seat.. Once the Part 572O 5th female dummy was located on the lateral centerline, the dummy was positioned following FMVSS 208 as if would be if it were in the front seating position. The legs would 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.

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.

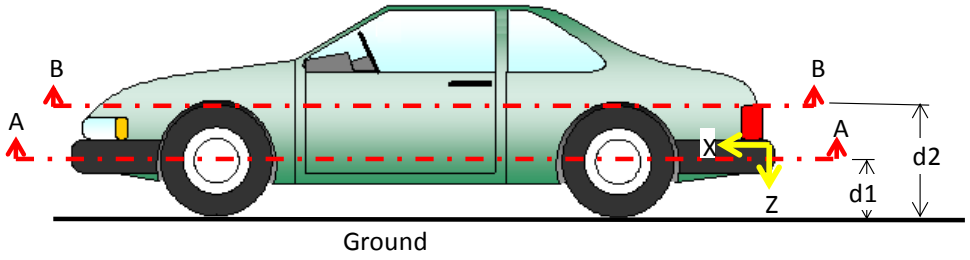


Figure F.3.1 - Pre-Test Cross-Sections

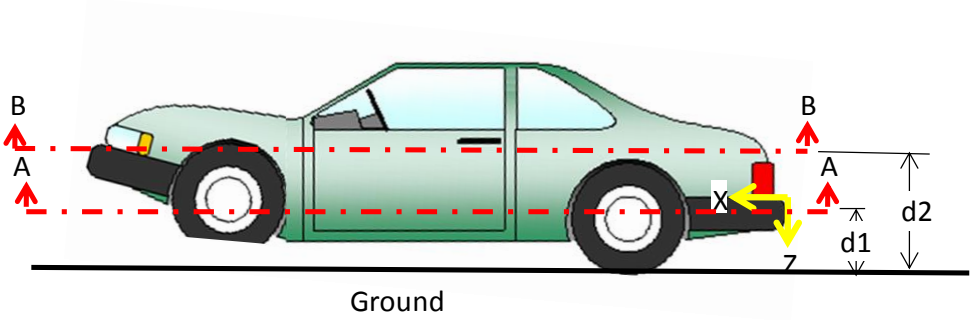


Figure F.3.2 - Post-Test Cross-Sections

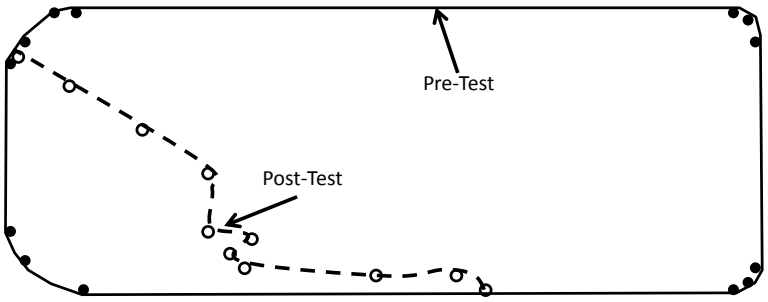


Figure F.3.3 - Plot of Cross-Section

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.