REPORT NUMBER: R&D-CAL-11-006

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

2010 FORD FUSION
56 MPH, 7 DEGREE ANGLE, 20% OVERLAP

TEST DATE: JULY 27, 2011
NHTSA NO: RA0220

PREPARED BY;
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FINAL REPORT SUBMITTED:

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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: _____

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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 2010 Ford Fusion four door sedan. 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 June 28, 2011.

The impact velocity of the vehicle was 90.8 km/h, and the ambient temperature at the barrier face at the time of impact was 43.6°C. The target vehicle post-test maximum crush was 634 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	255.71	N/A	700	573.60
Maximum Chest Compression	mm	63	-45.63	mm	52	-25.09
Nij	N/A	1	0.34	N/A	1	1.03
Neck Tension	N	4,170	2237.61	N	2,620	2822.42
Neck Compression	N	4,000	-376.21	N	2,520	-715.73
Left Femur Force	N	10,008	-15055.99	N	6,805	-116.76
Right Femur Force	N	10,008	-3388.56	N	6,805	-116.97

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SECTION 1
PURPOSE

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

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

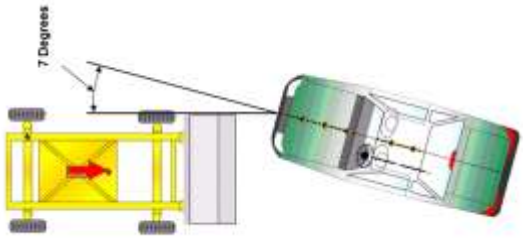
This test was conducted in accordance with the instructions set forth by NHTSA for a 7º, 20% offset moving barrier to vehicle impact, outlined in Task Order (TO) DTNH22-10-D-00155. Data was obtained indicant of Federal Motor Vehicle Safety Standard (FMVSS) 208-Occupant Crash Protection, FMVSS 212-Windshield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

SECTION 2

SUMMARY OF TEST

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

A 2010 Ford Fusion four door sedan 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 7^{o} and a target offset of 20% to the line of forward motion of the RMDB. The RMDB was towed down the test track in a full forward direction, without any crabbing, and the targeted impact velocity of 90.12 km/h (56 mph) into the test vehicle. The test vehicle mass was 1700 kg (3748 lbs), and the RMDB mass was 2491 kg (5481 lbs). The test was conducted by Calspan Corporation on June 6, 2011.



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 RMDB and the test setup were taken using a digital still camera. Photographic documentation of the test is presented in Appendix A of this report.

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

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

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.:RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date:6/28/2011

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

There was 100% total windshield retention, with 100% and 100% retention on the left and right sides respectively. The left hood hinge caused intrusion under the protected zone of the windshield for 200 mm along bottom left hand corner. The maximum static crush of the vehicle was 634 mm at C1 to the left of the vehicle's centerline. The maximum crush of the lower bumper beam was 167 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 as a result of the impact. The left rear door, and both right side doors remained operational.

Structure observations include the following:

- A-Pillar and the door sill buckled
- Windshield shattered
- Left front door almost opened but remained shut through the buckling

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

- Head contacted the curtain airbag and front airbag
- Knees contacted the knee bolster.

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

- Head contacted the back of the head restraint and passenger's chest

SECTION 2(CONTINUED)

CRASH VEHICLE SUMMARY

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
RMDB Velocity at Impact	km/h	90.86
RMDB Test Weight	kg	2491
RMDB Maximum Static Crush	mm	323.4
Vehicle Test Weight	kg	1700
Actual Vehicle Angle	°	7
Vehicle Maximum Static Crush	mm	634 mm to left centerline
Vertical Offset from Target Point	mm	25mm Below
Lateral Offset from Target Point	mm	2mm Right
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	Thor 007, 50% Male	N/A	5% Female, HIII 070	N/A
Head Contact	Front airbag, curtain airbag	A-37 A-48	Back of head rest and passenger's chest	A-49, A-52, A-58
Upper Torso Contact	Front airbag	-	None	-
Lower Torso Contact	Steering wheel rim	A-46/47	None	-
Left Knee Contact	Knee bolster	A-45	None	A-59
Right Knee Contact	Knee bolster	A-44	None	A-59

Data Anamolies:

V2P1 CLAVICLE - LEFT OUTER LC FX -> Questionable data after 94ms
V2P1 RIGHT ILIAC FX -> Questionable data 55-122ms; LC signal shift
V2P1 RIGHT ILIAC MY -> Channel failed
V2P1 TIBIA LEFT UPPER FY -> Questionable data after 36ms
V2P1 TIBIA LEFT UPPER FZ -> Questionable data after 36ms
V2P1 LEFT ANKLE RX -> Questionable data 86-93,133-123ms;data shift
V2P1 RIGHT FEMUR MX -> Questionable Data
V2P1 RIGHT FOOT AZ -> Questionable data after 79ms
V2P4 HEAD 9 ARRAY Z ARM X -> Questionable data after 100ms
V2P4 LOWER NECK FZ -> Questionable data after 135ms
V2 DRIVER FLOOR PAN STRING POT -> Channel Failed
V2 LEFT REAR SILL REDUNDANT X -> Channel Failed (primary good)
V2 LEFT REAR SILL REDUNDANT Y -> Channel Failed (primary good)
V1 CG X -> No Data
V1 CG Y -> No Data
V1 CG Z -> No Data
V1 REAR C/L X -> No Data
V1 REAR C/L Y -> No Data
V1 REAR C/L Z -> No Data

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: Research and Development Left Oblique Offset Test Date: 6/28/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Head	Head Rotational Acceleration X	rad/s^2	SIMon	292124.30	-555735.70
	Head Rotational Acceleration Y	rad/s^2	SIMon	331555.00	-265925.00
	Head Rotational Acceleration Z	rad/s^2	SIMon	383625.89	-400604.11
	Head Rotational Acceleration Resultant	rad/s^2	Compute	559983.17	
	Head Rotational Velocity X	rad/s	SIMon	27.34	-71.97
	Head Rotational Velocity Y	rad/s	SIMon	32.51	-44.83
	Head Rotational Velocity Z	rad/s	SIMon	74.07	-57.79
	Head Rotational Velocity Resultant	rad/s	Compute	89.61	
	36 ms HIC		Compute	290.68	
	15 ms HIC		Compute	255.71	
	Head Resultant CG Acceleration, 3 ms Clip	g	Compute	53.45	
	Skull fracture correlate	-	SIMon	49.28	
	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	0.36	0.00
Neck	UNLC Transferred to OC, Neck System, FX	N	1000	271.20	-252.32
	UNLC Neck System Tension, FZ	N	1000	2237.61	
	UNLC Neck System Compression, FZ	N	1000		-376.21
	UNLC Transferred to OC, Neck System Flexion, MY	N-m	Thortest	1.19	
	UNLC Transferred to OC, Neck System Extension, MY	N-m	Thortest		-13.09
	NIJ		Compute	0.34	
	On head acting through total neck section, FX	N	Thortest	273.21	-251.05
	On head acting through total neck section, FY	N	Thortest	401.76	-58.73
	On head acting through total neck section, FZ	N	Thortest	2495.88	-773.46
	On head acting through total neck section, MX	N-m	Thortest	28.92	-9.16
	On head acting through total neck section, MY	N-m	Thortest	23.53	-10.92
	On head acting through total neck section, MZ	N-m	Thortest	11.62	-21.05
	On head acting through O.C. joint only, FX	N	Thortest	276.71	-271.72
	On head acting through O.C. joint only, FZ	N	Thortest	2236.27	-374.34
	On head acting through O.C. joint only, MY	N-m	Thortest	1.19	-13.09
Chest	Upper Left Crux X – deflection	mm	Thortest	1.44	-26.23
	Upper Left Crux Y – deflection	mm	Thortest	4.69	-11.18
	Upper Left Crux Z – deflection	mm	Thortest	9.30	-10.25
	Upper Left Crux D – deflection	mm	Thortest	1.29	-23.92
	Upper Right Crux X – deflection	mm	Thortest	0.03	-44.03
	Upper Right Crux Y – deflection	mm	Thortest	3.68	-14.22
	Upper Right Crux Z – deflection	mm	Thortest	18.19	-0.33
	Upper Right Crux D – deflection	mm	Thortest	0.03	-40.10

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: Research and Development Left Oblique Offset Test Date: 6/28/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Chest (Con't)	Lower Left Crux X – deflection	mm	Thortest	7.38	-5.95
	Lower Left Crux Y – deflection	mm	Thortest	3.79	-23.80
	Lower Left Crux Z – deflection	mm	Thortest	8.07	-11.99
	Lower Left Crux D – deflection	mm	Thortest	7.24	-6.75
	Lower Right Crux X – deflection	mm	Thortest	0.23	-47.29
	Lower Right Crux Y – deflection	mm	Thortest	0.20	-32.56
	Lower Right Crux Z – deflection	mm	Thortest	15.05	-2.67
	Lower Right Crux D – deflection	mm	Thortest	1.47	-45.63
	Chest CG Acceleration, 3 ms clip	g	Compute	52.42	
Abdomen	Lower Left X – deflection	mm	Thortest	0.43	-57.59
	Lower Left Y – deflection	mm	Thortest	6.20	-11.99
	Lower Left Z – deflection	mm	Thortest	8.19	-12.90
	Left Viscous Criterion Based on X - deflection		Compute	0.57	
	Lower Right X – deflection	mm	Thortest	0.05	-74.42
	Lower Right Y – deflection	mm	Thortest	7.08	-3.86
	Lower Right Z – deflection	mm	Thortest	8.25	-3.72
	Right Viscous Criterion Based on X - deflection		Compute	0.74	
Spine	Upper Spine (T1) AX	g	180	8.61	-48.99
	Upper Spine (T1) AY	g	180	12.96	-17.13
	Upper Spine (T1) AZ	g	180	26.63	-17.91
	Upper Spine (T1) Resultant	g	Compute	53.30	
	Middle Spine (T6) AX	g	180	12.82	-48.74
	Middle Spine (T6) AY	g	180	22.31	-12.97
	Middle Spine (T6) AZ	g	180	7.22	-23.53
	Middle Spine (T6) Resultant	g	Compute	54.77	
Pelvis	Pelvis CG Resultant Acceleration	g	Compute	150.36	
Acetabulum	Left FX force	N	600	434.75	-8260.15
	Left FY force	N	600	1173.35	-1984.79
	Left FZ force	N	600	4155.24	-73.20
	Left Acetabulum Resultant	N	Compute	9248.53	
	Right FX force	N	600	1186.65	-1138.22
	Right FY force	N	600	1159.04	-1826.82
	Right FZ force	N	600	1081.75	-312.44
	Right Acetabulum Resultant	N	Compute	2077.36	

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver Legs

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: Research and Development Left Oblique Offset Test Date: 6/28/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Knee	Left Knee Displacement, DX	mm	180	1.40	-20.06
	Right Knee Displacement, DX	mm	180	0.35	-14.21
Femur	Left Femur Force, FZ	N	600	312.74	-15055.99
	Left Femur Moment, MX	N-m	600	115.14	-123.26
	Left Femur Moment, MY	N-m	600	81.89	-125.60
	Left Femur Res (MX / MY only, not MZ)	N-m	Compute	163.98	
	Right Femur Force, FZ	N	600	235.94	-3388.56
	Right Femur Moment, MX	N-m	600	0.31(1)	-0.17(1)
	Right Femur Moment, MY	N-m	600	72.15	-1.37
	Right Femur Res (MX / MY only, not MZ)	N-m	Compute	72.15(1)	
Tibia	Left Upper Tibia, FZ	N	600	4092.66(2)	-5287.87(2)
	Left Upper Tibia, MY	N-m	600	159.37	-74.79
	Left Upper Tibia, Index		Compute	0.74(2)	
	Right Upper Tibia, FZ	N	600	33.41	-1645.14
	Right Upper Tibia, MY	N-m	600	49.71	-160.76
	Right Upper Tibia, Index		Compute	1.01	
	Left Lower Tibia, FZ	N	600	1.38	-2120.30
	Left Lower Tibia, MY	N-m	600	115.87	-71.27
	Left Lower Tibia, Index		Compute	0.80	
	Right Lower Tibia, FZ	N	600	45.80	-2145.77
	Right Lower Tibia, MY	N-m	600	21.50	-127.33
	Right Lower Tibia, Index		Compute	0.94	
Ankle	Left Ankle Rotation, RX	Deg	180	14.36(3)	-19.73(3)
	Left Ankle Rotation, RY	Deg	180	40.05	-0.27
	Right Ankle Rotation, RX	Deg	180	26.21	-27.93
	Right Ankle Rotation, RY	Deg	180	10.34	-19.54

Anomalies
(1) Questionable Data
(2) Questionable data after 36ms
(3) Questionable data between 86-93,133-123ms;data shift

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: Research and Development Left Oblique Offset Test Date: 6/28/2011

Left Rear Passenger: H3 Serial No. 421 Injury Summary

	Nomenclature	Source	Max	Min
Head	Angular acceleration (rad/sec^2) - X	SIMon	2758.50(4)	-3838.70(4)
	Angular acceleration (rad/sec^2) - Y	SIMon	33285.00	-42327.00
	Angular acceleration (rad/sec^2) - Z	SIMon	163.94	-1537.00
	Angular acceleration - resultant (rad/sec^2)	SIMon	42338.06(4)	
	Angular velocity (rad/sec) - X	SIMon	14.48(4)	-16.43(4)
	Angular velocity (rad/sec) - Y	SIMon	112.24	-6619.80
	Angular velocity (rad/sec) - Z	SIMon	0.12	-72.25
	Angular velocity - resultant (rad/sec)	SIMon	6620.19(4)	
	36 ms HIC	Compute	1081.53	
	15 ms HIC	Compute	573.60	
	Skull fracture correlate	SIMon	68.08	
	Cumulative strain (Tolerance = 0.05)	SIMon	1.00(4)	
	Cumulative strain (Tolerance = 0.10)	SIMon	1.00(4)	
	Cumulative strain (Tolerance = 0.15)	SIMon	1.00(4)	
	Head resultant CG acceleration, 3 ms clip (g's)	Compute	76.27	
Neck	Upper Neck Tension (N) Fz	1000	2822.42	
	Upper Neck Compression (N) Fz	1000		-715.73
	Upper Neck NTF	Compute	1.03	
	Upper Neck NTE	Compute	0.14	
	Upper Neck NCF	Compute	0.52	
	Upper Neck NCE	Compute	0.01	
Chest	Chest Deflection (mm)	600	0.00	-25.09
	Upper Left Chest X (mm)	Compute	0.01	-23.40
	Upper Left Chest Y (mm)	Compute	23.53	-3.57
	Upper Right Chest X (mm)	Compute	2.18	-6.65
	Upper Right Chest Y (mm)	Compute	0.50	-16.58
	Lower Left Chest X (mm)	Compute	0.01	-9.47
	Lower Left Chest Y (mm)	Compute	21.56	-0.10
	Lower Right Chest X (mm)	Compute	0.00	-29.00
	Lower Right Chest Y (mm)	Compute	26.03	-0.00
	Chest CG acceleration, 3 ms clip, (G's)	Compute	58.30	
Femur	Right Fz Force (N)	600	2995.23	-116.97
	Left Fz Force (N)	600	1653.21	-116.76

Anomalies
(4) Questionable data after 100ms

SECTION 3

DATA SHEETS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

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DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

TEST VEHICLE INFORMATION

NHTSA No.	RA0220
Make	Ford
Model	Fusion
Body Style	4-door sedan
Year	2010
VIN	3FAHP0GA0AR384267
Color	Silver
Delivery Date	1/31/2011
Odometer Reading (mi)	68
Odometer Reading (km)	109
Dealer	Larson Ford INC
Transmission	6-Speed Manual
Final Drive	Front Wheel Drive
Type/No. Cyl	I4
Engine Disp. (L)	2.5L
Engine Placement	Lateral
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	No
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

TEST VEHICLE OPTIONS

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co
Date of Manufacture	5/10

GVWR (kg)	1965
GAWR Front (kg)	1034
GAWR Rear (kg)	931

VEHICLE SEATING AND WEIGHT CAPACITY

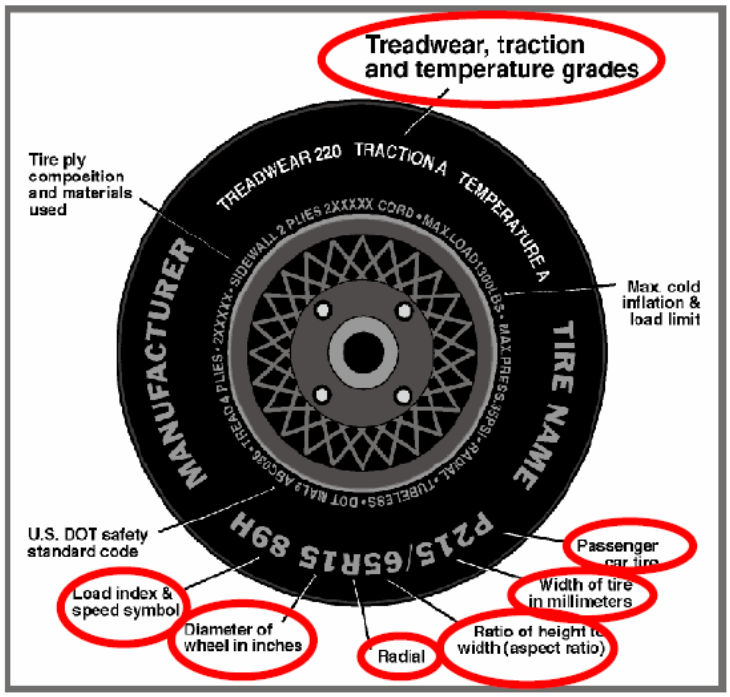
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	-	
Number of Occupants	2	3	-	5
Capacity Wt. (VCW) (kg)				385
Cargo Wt. (RCLW) (kg)				45

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



Measured Parameter	Front	Rear
Maximum Tire Pressure	350	350
Cold Pressure (kPa)	235	235
Recommended Tire Size	P205/60R16	P205/60R16
Tire Size on Vehicle	P205/60R16	P205/60R16
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Assurance	Assurance
Treadwear	580	580
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	91H	91H
Tire Material	Rubber	Rubber
DOT Safety Code Right	4BXVJT2R1610	4BXVJT2R1610
DOT Safety Code Left	4BXVJT2R1610	4BXVJT2R1610

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	427	308.5		392	492	
Right	kg	443.5	292.5		436.5	379.5	
Ratio	%	59	41		49	51	
Totals	kg	870.5	601	1471.5	828.5	871.5	1700

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1471.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	153.54
Rated Cargo/Luggage Weight (RCLW)	kg	45
Calculated Vehicle Target Weight (TVTW)	kg	1670.04

TEST VEHICLE ATTITUDES AND CG

	Units	LF	LR	RF	RR	CG (aft of front axle)
As Delivered	mm	722	716	723	718	1113
As Tested	mm	712	666	718	674	1399
Post Test	mm	683	720	725	706	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2729
Total Vehicle Length at Left Side	mm	4623
Total Vehicle Length at Centerline	mm	4851
Total Vehicle Length at Right Side	mm	4623
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	60.9

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: _____

MASS OF BALLAST ADDED (kg) _____

DATA SHEET NO.1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4851
2	Total Width	1815
3	Bumper Top Height	-75
4	Bumper Bottom Height	209
5	Longitudinal Member Top Height	-123
6	Distance Between Longitudinal Members	1097
7	Longitudinal Member Width	85
8	Engine Top Height	-394
9	Engine Bottom Height	211
10	Engine and Gearbox Width	631
11	Front Bumper-Engine Distance	530
12	Front Shock Absorber Fixing Height	-454
13	Bonnet Leading Edge Height	-321
14	Front Shock Absorber Fixing Width	1038
15	Front Bumper – Front Axle Distance	1025
16	Front Axle – A Pillar Distance	515
17	A- Pillar – B-Pillar Distance	1087
18	B-Pillar – Rear Axle Distance	1123
19	B-Pillar – C-Pillar Distance	1042
20	Roof Sill Bottom Height	-887
21	Roof Sill Top Height	-957
22	Floor Sill Bottom Height	172
23	Floor Sill Top Height	45

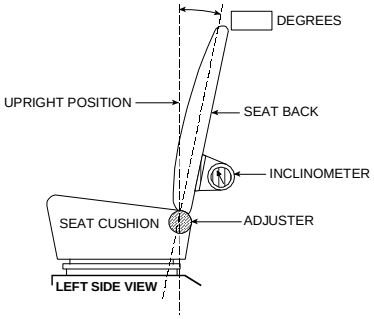
DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

NOMINAL DESIGN RIDING POSITION

Inclinometer zeroed on the door sill, then used on the head rest post across the full range of motion to find the possible angles. Set to angle defined on form 1, or as close as possible.



FRONT SEAT ASSEMBLY

	Deg.
Driver seat back angle:	10.8
Passenger seat back angle:	FIXED

SEAT FORE/AFT POSITIONS

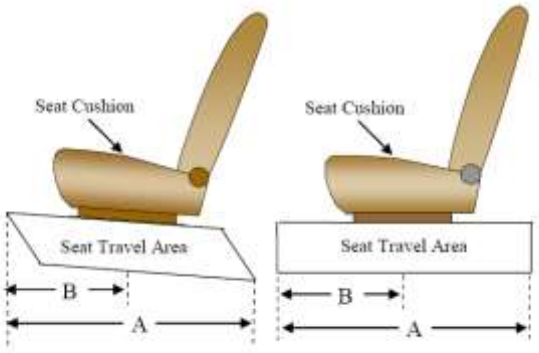
A Plumb bob is hung from center line of the front of the seat, and a square is used on the door sill to mark out the distance. Positions are marked from full up, full forward to full rear, full down. The seat is set to the mid point.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	0-24 detents	10
Passenger Seat	FIXED	FIXED

SEAT BELT UPPER ANCHORAGE

Belt anchorage is adjusted to every position, and marked on the B-Pillar so show possible positions. Then set to the highest position as defined by form 1 and NHTSA procedure.

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

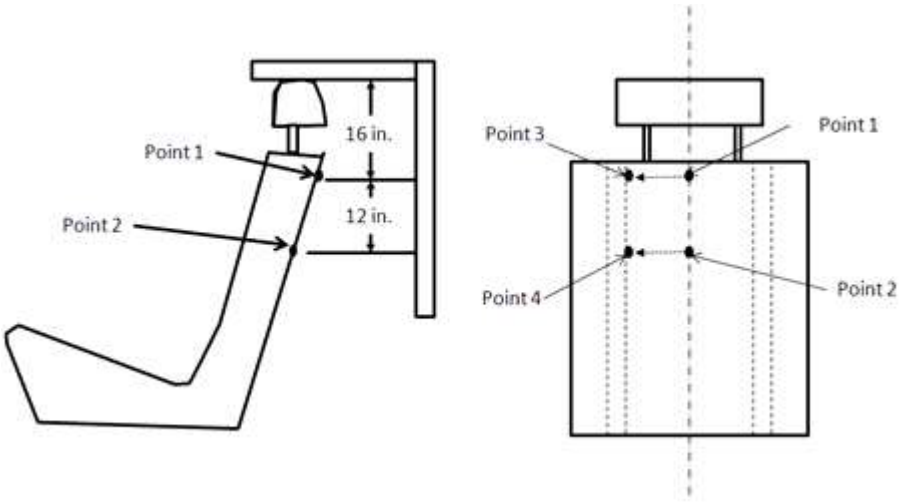


DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

SEAT BACK MEASUREMENT POINTS



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

	X	Y	Z
Point 3	2155.0	-534.7	-463.4
Point 4	2275.2	-573.6	-154.5

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

DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

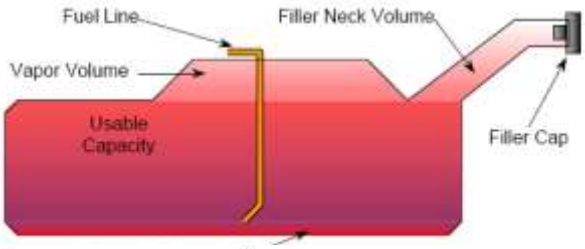
Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	66.2
Usable Capacity of "Optional Tank"	
92%-94% of Usable Capacity	60.9
Actual Amount of Solvent Used	60.9
1/3 of Usable Capacity	20.3

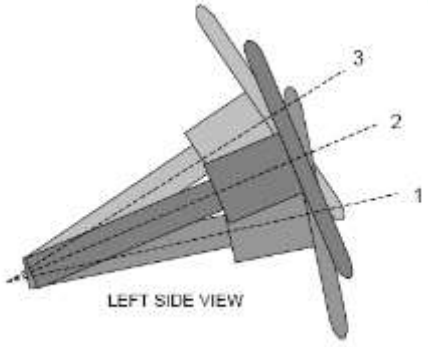
FUEL PUMP

Electric fuel pump under the rear seat operates when ignition is placed in the on position. The fuel filler neck is located above the left rear wheel.



STEERING COLUMN ADJUSTMENT

An Inclinometer is zeroed on the door sill. A plumb line is drawn on the steering wheel, and a level is used to measure the angles of possible motion. When applicable, the column is yoked in and out, marked for position, measured and set according to form 1.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

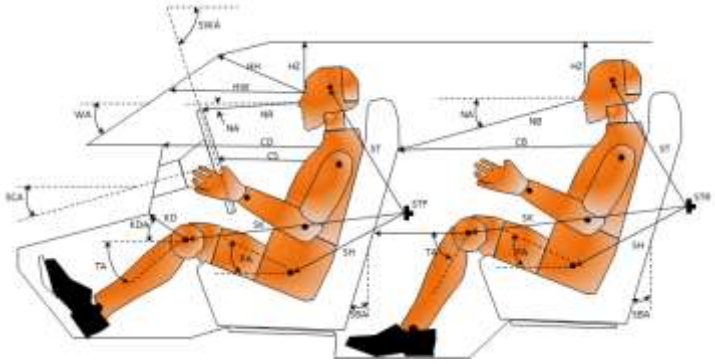
	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	63.6	
Geometric center position No. 2	66.4	
Uppermost position No. 3	69.2	
Telescoping Steering Wheel Travel		30
Test Position	66.4	15

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



Code	Measurement Description	Driver		Left Rear Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WAº	Windshield Angle		-26.9		
SWAº	Steering Wheel Angle		66.4		
SCAº	Steering Column Angle		20.3		
SAº	Seat Back Angle (on headrest post)		11.8		15.3
HZ	Head to Roof (Z)	138	90	291	90
HH	Head to Header	313	21.2		
HW	Head to Windshield	622	0		
NR/NB	Nose to Rim/Seat Back	432	-19.1	596	-9.1
CD/CB	Chest to Dash/Seat Back	650		623	
CS	Chest to Steering Hub	327	0		
RA	Rim to Abdomen	163	0		
KDL/KBL	Left Knee to Dash/Seat Back	136	24.2	308	15.2
KDR/KBR	Right Knee to Dash/Seat Back	137	24.6	308	14.1
PAº	Pelvic Angle		20.4		20.3
TAº	Tibia Angle		46.0		60.3
SK	Striker to Knee	598	-1.5	702	-23.1
ST	Striker to Head	538	89	225	48.9
SH	Striker to H-Point	235	-35.1	363	-50.9
HAXº	Head Angle X		0.2		
HAYº	Head Angle Y		-0.9		
NAXº	Neck Angle X		2.6		
NAYº	Neck Angle Y		0.2		
TAXº	T Angle X		23.7		
TAYº	T Angle Y		24.1		
LAXº	Lumbar Angle (X)		0.1		
LAYº	Lumbar Angle (Y)		0.7		

DATA SHEET NO. 3 (CONTINUED)

DUMMY CMM MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

Description	Units	Driver			Left Rear Passenger		
		X	Y	Z	X	Y	Z
Striker (Driver/Passenger)	mm	2318	-781	-256	1260.1	-784.3	-461.9
Head CG	mm	2371.5	-430.4	-796.3	1425.2	-435.7	-686.8
Bridge of Nose	mm	-	-	-	1510.3	-358.6	-696.2
Tip of Nose	mm	-	-	-	1534.9	-355.2	-666.1
Shoulder Bolt	mm	2427.5	-543.5	-543.0	1428.3	-522.4	-463.4
Tip of Chin	mm	2460.7	-352.9	-667.2	1522.0	-357.2	-592.6
H-point	mm	2541.2	-550.1	-98.9	1509.2	-499.8	-160.6
Left Knee	mm	2932.6	-551.3	-236.5	1928.4	-470.5	-183.0
Right Knee	mm	2929.4	-282.5	-243.9	1921.9	-311.0	-184.2
Left Ankle	mm	3248.1	-585.5	38.4	2111.4	-470.2	115.8
Right Ankle	mm	3242.0	-252.3	49.1	2100.0	-295.5	114.1
Left Heel	mm	3273.1	-572.4	170.5	2049.0	-466.1	189.1
Right Heel	mm	3243.4	-224.9	163.3	2036.2	-299.2	191.2
Driver's Outboard Seat Anchor Bolt	mm	2772	-573	80			
Outboard Head Restraint Post	mm	2164.9	-438.4	-610.2	1165.4	-420.6	-673.2
Top of Head Restraint*	mm	2270.6	-351.7	-872.7	1225.7	-356.2	-735.4
Center of Steering Wheel	mm						

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

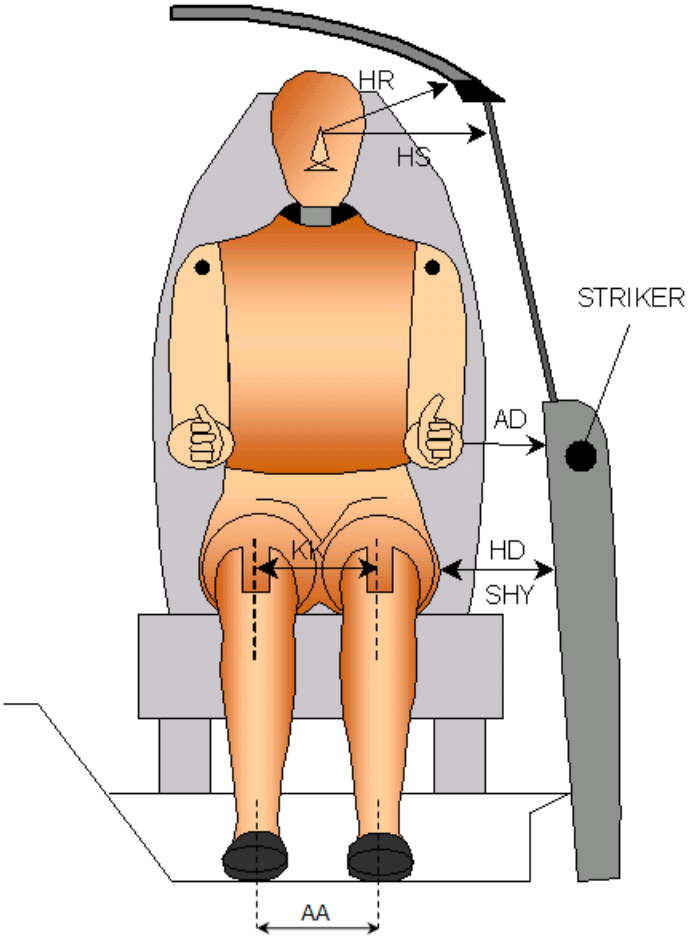
+Z - From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



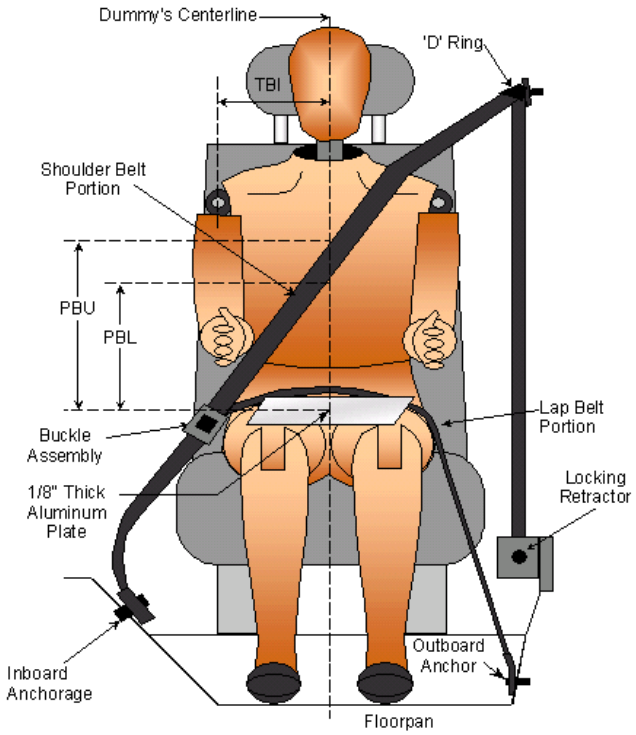
Code	Description	Units	Driver (P1)	Passenger (P4)
AD	Arm to Door	mm	124	85
HD	H-Point to Door	mm	118	171
HR	Head to Side Header	mm	194	252
HS	Head to Side Window	mm	420	402
KK	Knee to Knee	mm	260	162
SHY	Striker to H-Point (Y Direction)	mm	248	318
AA	Ankle to Ankle	mm	330	165

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of aluminum plate to belt upper edge	mm	328	311
PBL — Top surface of aluminum plate to belt lower edge	mm	253	218

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	875	952
Lap Belt Length as measured on ATD	mm	855	544
Remainder of belt on reel	mm	720	954
Total belt length for continuous webbing systems	mm	2450	2450

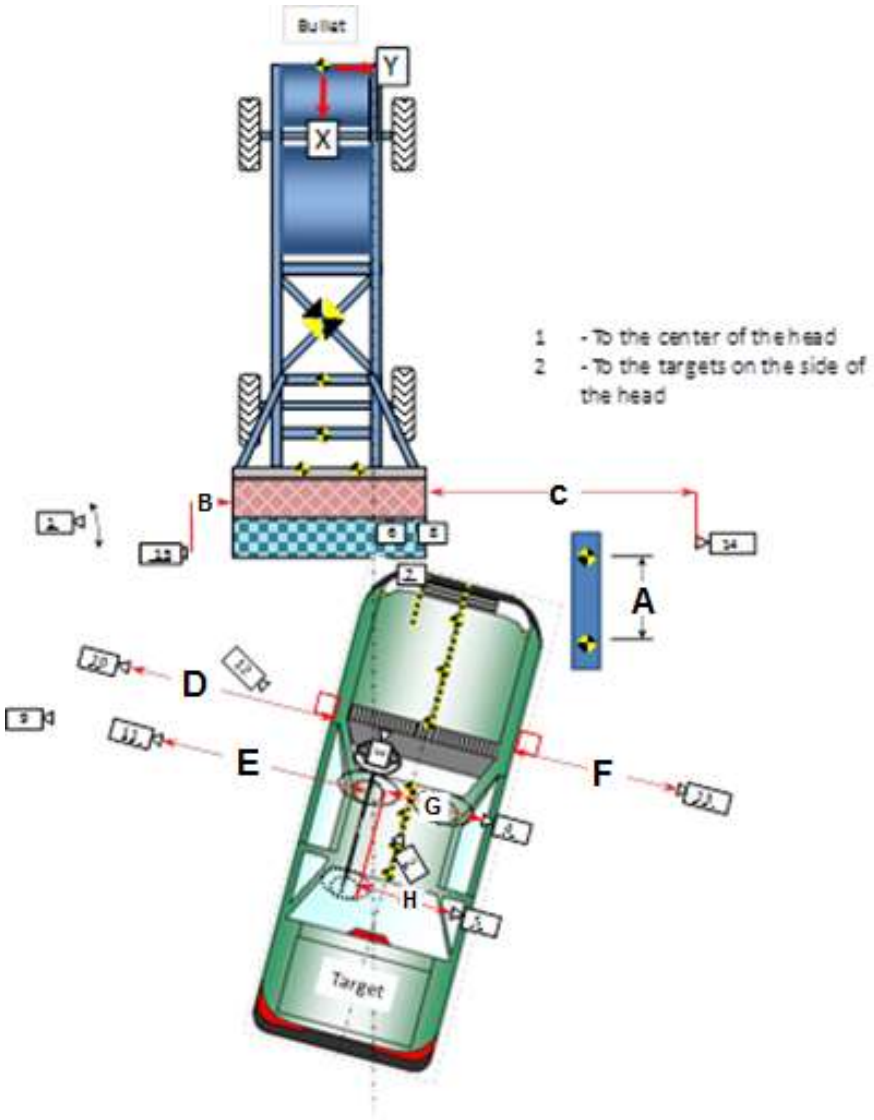
DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

Horizontal Location



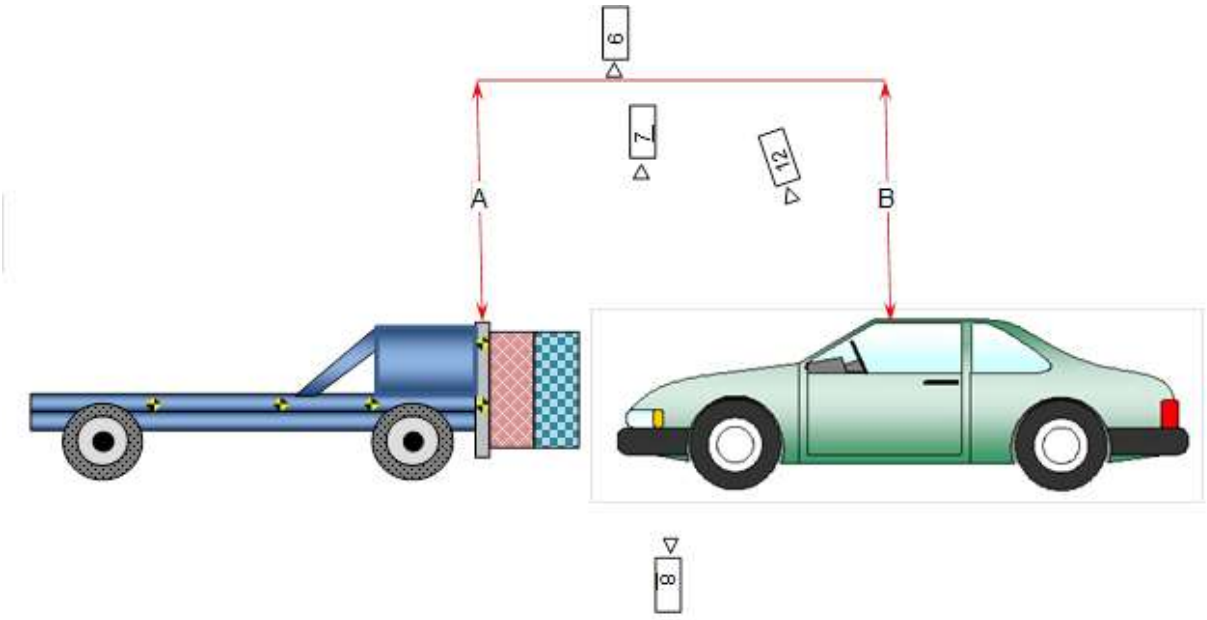
A	mm	915
B	mm	7973
C	mm	9158
D	mm	10673
E	mm	9600
F	mm	6904
G	mm	786
H	mm	788

DATA SHEET NO. 6 (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

Horizontal Location



	Units	Value
A	mm	3942
B	mm	3606

DATA SHEET NO. 6 (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

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	7403	-668	1216	12.5	500
3	Onboard Driver Lower Leg	5831	-570	343	6.5	500
4	Onboard Driver Perpendicular	6387	-1268	933	12.5	500
5	Onboard Left Rear Passenger Perpendicular	7312	-1137	938	12.5	500
6	Overall Top View	5952	-870	5132	14	1000
7	Zoomed Top View	4115	1135	3846	28	1000
8	Pit Front	-	-	-	-	-
9	Overall Left Side	5462	9395	1389	24	1000
10	Target Vehicle Left Side	4478	8822	1274	24	1000
11	Driver's Motion	4455	9644	1281	50	1000
12	Look Down Driver's Motion	6911	1560	3450	24	1000
13	Target Vehicle Right Side	8069	-8890	1385	20	1000
14	Bullet Vehicle Left Side	4115	9160	1357	28	1000
15	Bullet Vehicle Right Side	4115	10283	1398	24	1000
16	Onboard RMDB	-	-	-	-	-

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

+X = from back of RMDB to front of RMDB

+Y = right of monorail center

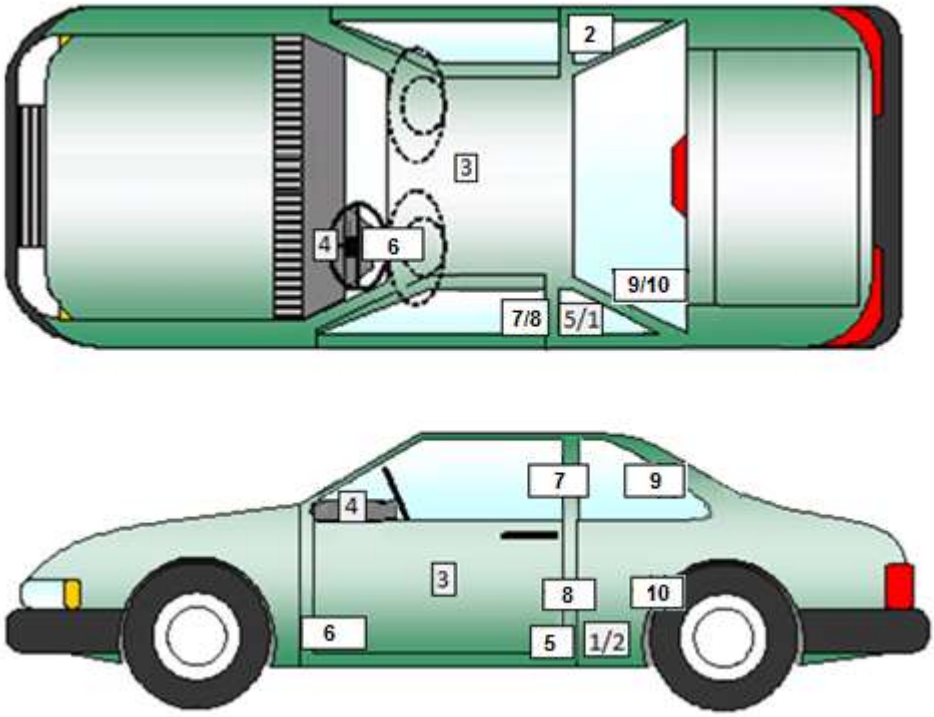
+Z = up from ground

DATA SHEET NO. 7

VEHICLE INSTRUMENTATION LOCATIONS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



Accelerometer Location	Axes	Units	Location		
			X	Y	Z
Left Rear Sill	X,Y	mm	1964.8369	-626.6389	176
Right Rear Sill	X,Y	mm	1976.8965	641.4663	181
Vehicle CG	X, Y, Z	mm	2450.711	19.7792	-271
Driver Seat Track	X	mm	2337.6157	-545.2416	151
Instrument Panel	X, Y, Z	mm	3009.796	0.9804	-387
Behind Brake Pedal	X, Y, Z	mm	3522.1282	-371.0536	56

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: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

VEHICLE INSTRUMENTION DATA

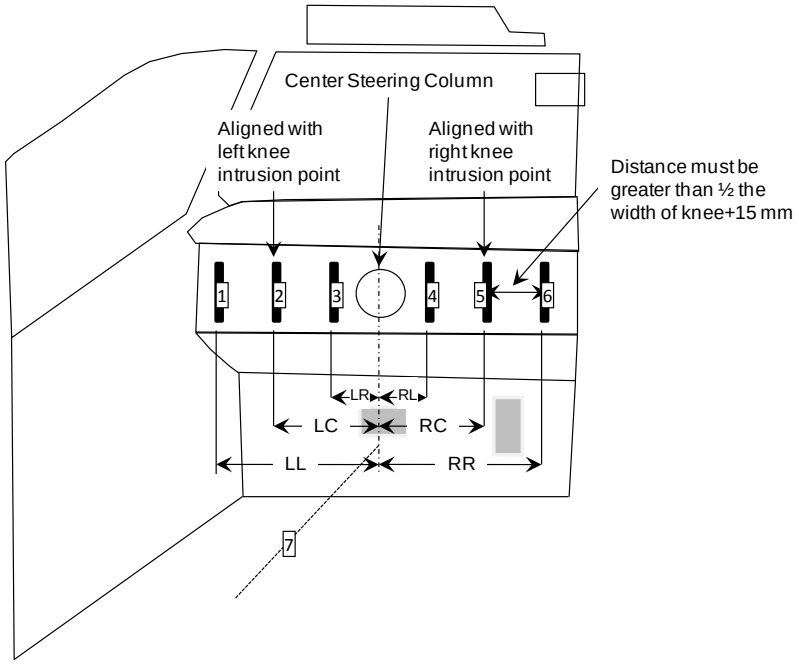
Loc.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Max	Time (ms)
1	Left Rear Cross Member	X	G	2.70	6.40	-36.47	55.40
		Y	G	23.94	44.15	-4.18	299.95
2	Right Rear Cross Member	X	G	1.28	176.70	-22.81	59.60
		Y	G	14.81	68.05	-6.78	37.70
3	Vehicle CG	X	G	2.94	6.35	-40.31	62.70
		Y	G	39.06	78.70	-23.87	84.80
		Z	G	14.96	80.85	-16.68	74.75
4	Instrument Panel	X	G	30.92	93.25	-68.25	64.40
5	Driver Seat Track	X	G	87.55	59.05	-65.14	64.00
		Y	G	50.24	70.90	-36.44	55.20
		Z	G	74.52	61.15	-109.14	41.85
6	Behind Brake Pedal	X	G	24.04	78.20	-82.63	45.40
		Y	G	20.10	47.60	-16.02	37.50
		Z	G	24.50	49.70	-41.29	45.50
7	Driver Shoulder Belt		N	5251.84	75.80	-33.49	31.55
8	Driver Lap Belt		N	2322.37	72.45	-1.24	-1.25
9	Passenger Shoulder Belt		N	7094.16	84.30	-13.91	235.80
10	Passenger Lap Belt		N	6520.81	83.10	-0.69	-16.05

DATA SHEET NO. 7 (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



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	50.50
2	Left knee contact switch (LC) (ms)	*	0	-50	-1	44.90
3	Left knee contact switch (LR) (ms)	*	0	-50	-1	53.25
4	Right knee contact switch (RL) (ms)	*	0	-50	-1	44.65
5	Right knee contact switch (RC) (ms)	*	0	-50	-1	64.25
6	Right knee contact switch (RR) (ms)	*	0	-50	-1	53.75
7	Toepan string pot (mm)		0.14	95.35	-0.22	15.45

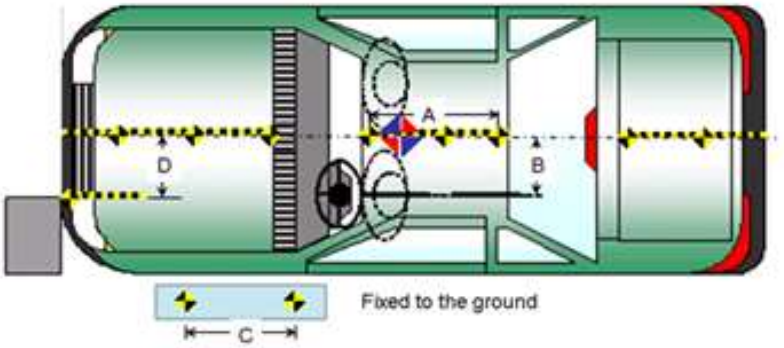
* The measurement indicates the initial time the voltage changed

DATA SHEET NO. 8

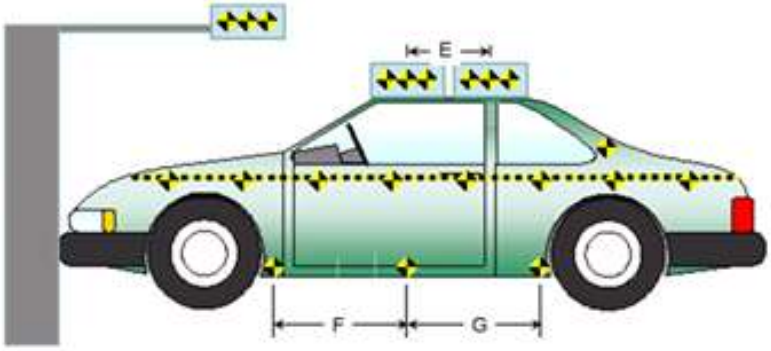
VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

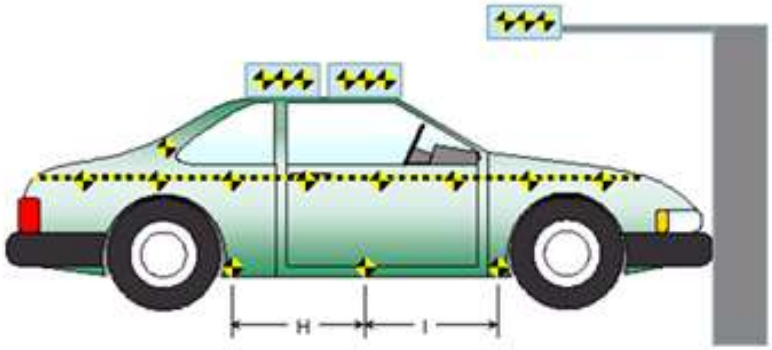
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



Top View



Left Side View



Right Side View

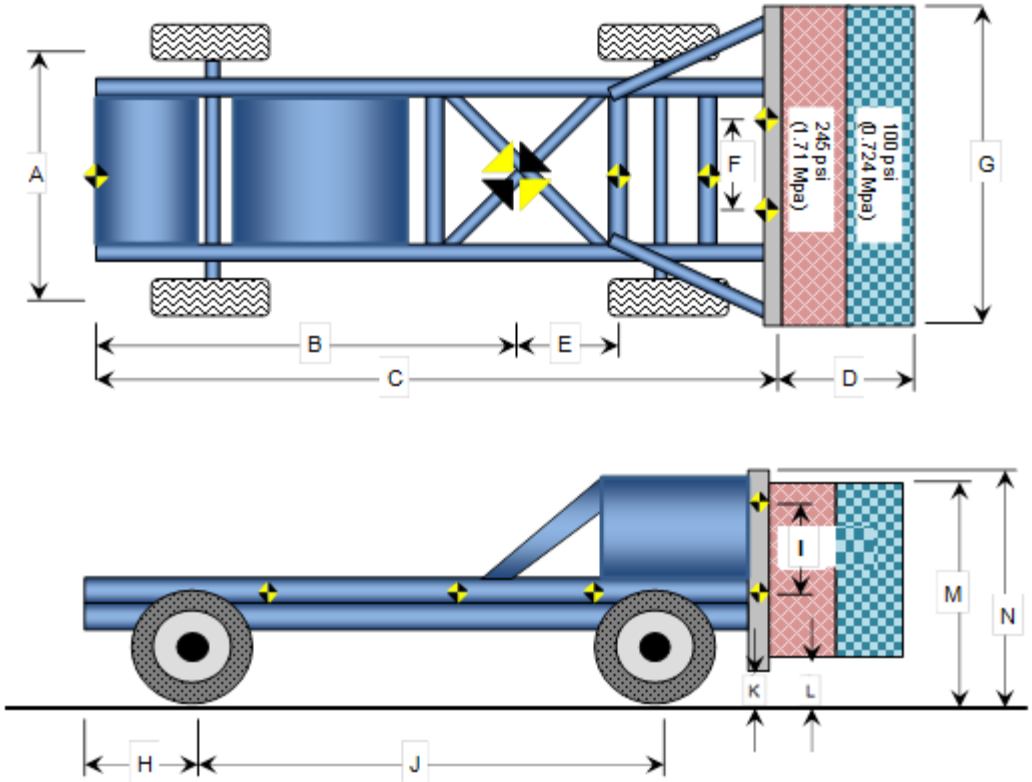
Item	Units	Value
A	mm	615
B	mm	372
C	mm	915
D	mm	547
E	mm	1220
F	mm	925
G	mm	895
H	mm	910
I	mm	919

DATA SHEET NO. 8 (CONTINUED)

RMDB PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



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

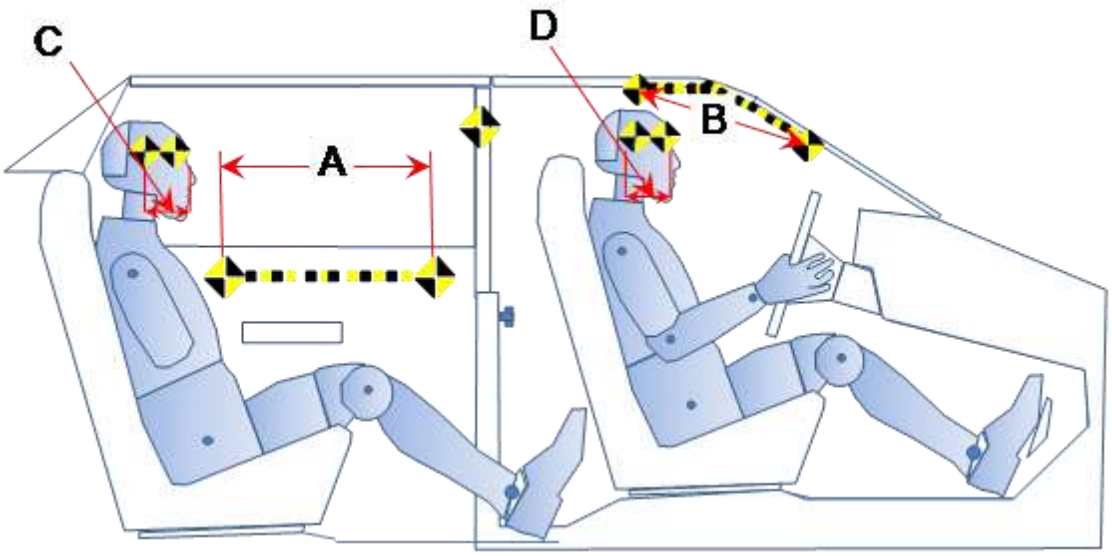
	Units	Front Axle	Rear Axle	Total
Left	kg	779.3	470.4	1249.7
Right	kg	749.3	487.2	1236.5
Ratio	%	61.5%	38.5%	100%
Total	kg	1528.6	957.6	2486.2
CG After of Front Axle	mm			1285

DATA SHEET NO. 8 (CONTINUED)

DUMMY PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



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

DATA SHEET NO. 9

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 10

POST TEST OBSERVATIONS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	THOR 50th Male	N/A	HIII 5th Female	N/A
Dummy Serial No.	0007	N/A	070	N/A
Lower Leg Type	THOR-FLX Lower Leg	N/A	HIII Lower Leg	N/A
Lower Leg Serial No.	LX0036/0037	N/A		N/A
Head Contact	Front and Curtain Airbags	A-37 A-48	Side curtain Airbag and seat back	A-49 A-52 A-58
Upper Torso Contact	Front and Torso Airbag	-	None	-
Lower Torso Contact	Steering wheel Rim	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	Closed, Jammed Shut	Closed, Operational
Rear Door Opening	Closed, Operational	Closed, Operational
Seat Track Shift (mm)	None	None
Seat Back Failure	No	No
Glazing Damage	Shattered, rolled down	Shattered, rolled down

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions	Picture Ref
Windshield Damage	No separation	A-21
Window Damage	Rolled down, small tears	A-36 / A-51
Other Notable Effects	Some window separation from tears	-

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

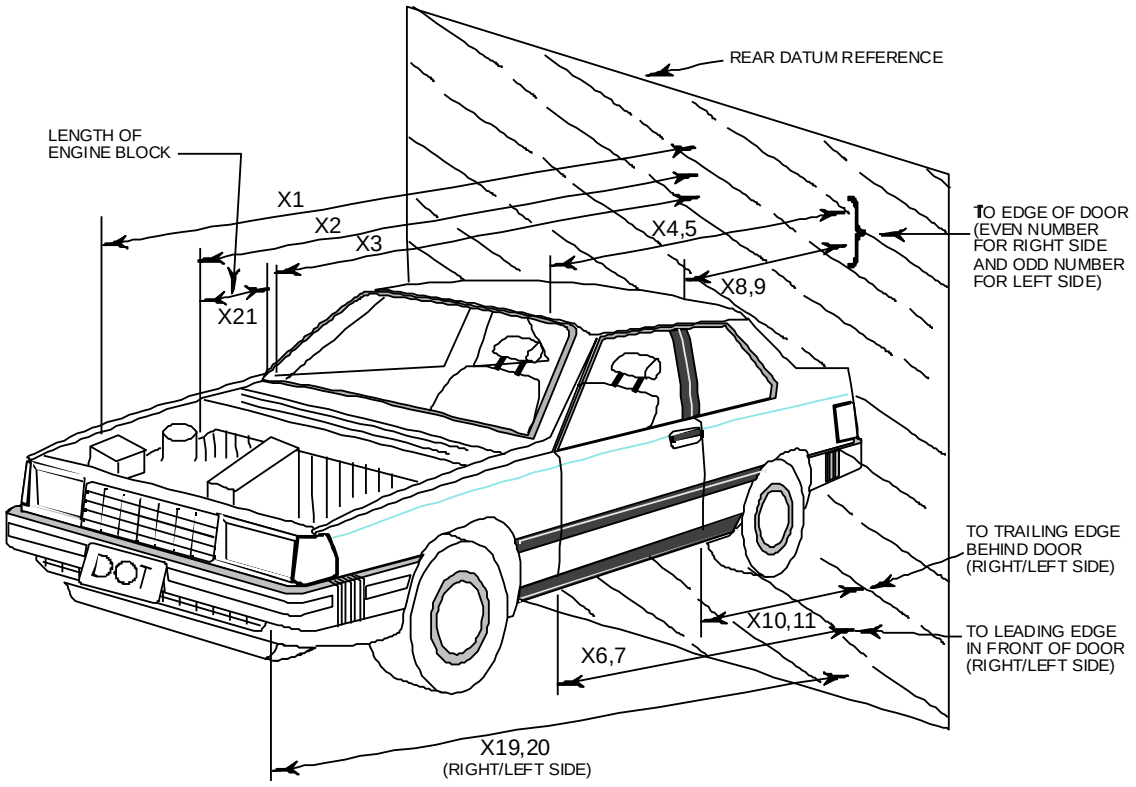
Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	No	N/A
Combination Head/Torso Airbag	Yes	Yes	No	N/A
Curtain (or other Head) Airbag	Yes	Yes	Yes	Yes
Knee Airbag	No	No	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter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

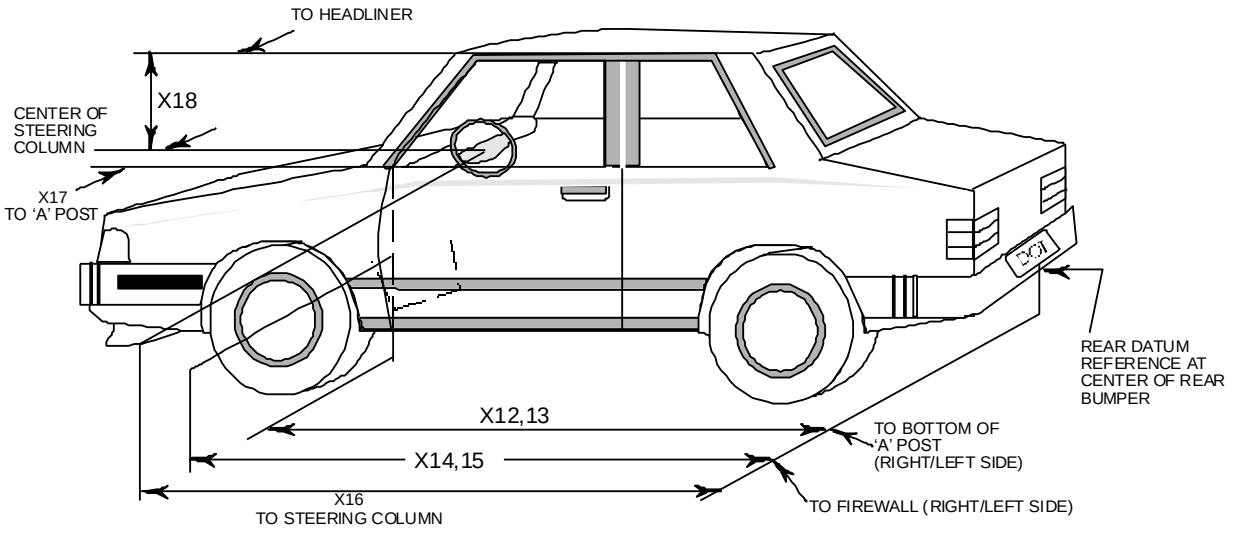
DATA SHEET NO. 11

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.:RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date:6/28/2011





DATA SHEET NO. 11 (CONTINUED)

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4851	4839	12
2	Rear Surface of Vehicle (RSOV) to Front of Engine	mm	4321	4303	18
3	RSOV to Firewall	mm	3715	3560	155
4	RSOV to Upper Leading Edge of Right Door	mm	3361	3357	3
5	RSOV to Upper Leading Edge of Left Door	mm	3354	3206	148
6	RSOV to Lower Leading Edge of Right Door	mm	3357	3353	3
7	RSOV to Lower Leading Edge of Left Door	mm	3348	3163	185
8	RSOV to Upper Trailing Edge of Right Door	mm	2240	2237	3
9	RSOV to Upper Trailing Edge of Left Door	mm	2235	2181	53
10	RSOV to Lower Trailing Edge of Right Door	mm	2289	2285	4
11	RSOV to Lower Trailing Edge of Left Door	mm	2281	2270	11
12	RSOV to Bottom of “A” Post of Right Side	mm	3309	3303	6
13	RSOV to Bottom of “A” Post of Left Side	mm	3306	3170	135
14	RSOV to Firewall, Right Side	mm	3801	3796	5
15	RSOV to Firewall, Left Side	mm	3798	3260	538
16	RSOV to Steering Column	mm	2833	2718	115
17	Center of Steering Column to “A” Post	mm	298	338	-40
18	Center of Steering Column to Headliner	mm	407	452	-45
19	RSOV to Right Side of Front Bumper	mm	4714	4723	-10
20	RSOV to Left Side of Front Bumper	mm	4708	4662	46
21	Length of Engine Block	mm	354	353	2
RD	RSOV to Right Side of Dash Panel	mm	3065	3067	-2
CD	RSOV to Center of Dash Panel	mm	3051	2920	130
LD	RSOV to Left Side of Dash Panel	mm	3053	2797	257

DATA SHEET NO. 12

ACCIDENT INVESTIGATION DIVISION DATA

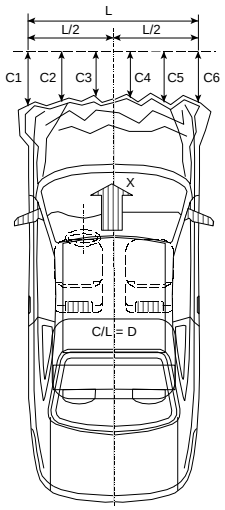
Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

VEHICLE INFORMATION

VIN: 3FAHP0FA0AR384267 Wheelbase: 2729
Vehicle Size Category: Passenger Test Weight (kg): 1700

ACCELEROMETER DATA

Accelerometer Locations: Data Sheet No.7 Linearity: >99%
Cal. Procedure/Interval: Shaker table 180 days
Integration Algorithm: Trapezoidal
Impact Velocity (km/h): 90.8
Velocity Change (km/h): 90.8



CRUSH PROFILE

Collision Deformation Classification : 12FLAE6
Midpoint of Damage: C2
Damage Region Length (mm): 1373
Impact Mode: 20%offset, 7º Angle

Crush Measurements: With Bumper Cover

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4608	3974*	634*
C2	Crush zone 2 at left side	mm	4772	4743	29
C3	Crush zone 3 at left side	mm	4853	4836	17
C4	Crush zone 4 at right side	mm	4852	4848	4
C5	Crush zone 5 at right side	mm	4778	4785	-7
C6	Crush zone 6 at right side	mm	4618	4631	-13
L	C1 to C6	mm	1373	1324*	48*

*C1 point was on plastic that fell off, values are approximate

Crush Measurements: With Bumper Cover Removed

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4669.2	4502.6	-167
C2	Crush zone 2 at left side	mm	4696.1	4569.2	-127
C3	Crush zone 3 at left side	mm	4711.5	4619.9	-92
C4	Crush zone 4 at right side	mm	4712.4	4655.7	-57
C5	Crush zone 5 at right side	mm	4699.4	4678.1	-21
C6	Crush zone 6 at right side	mm	4673.3	4688.0	15
L	C1 to C6	mm	1104	1082	22

DATA SHEET NO. 13

VEHICLE INTRUSION MEASUREMENTS

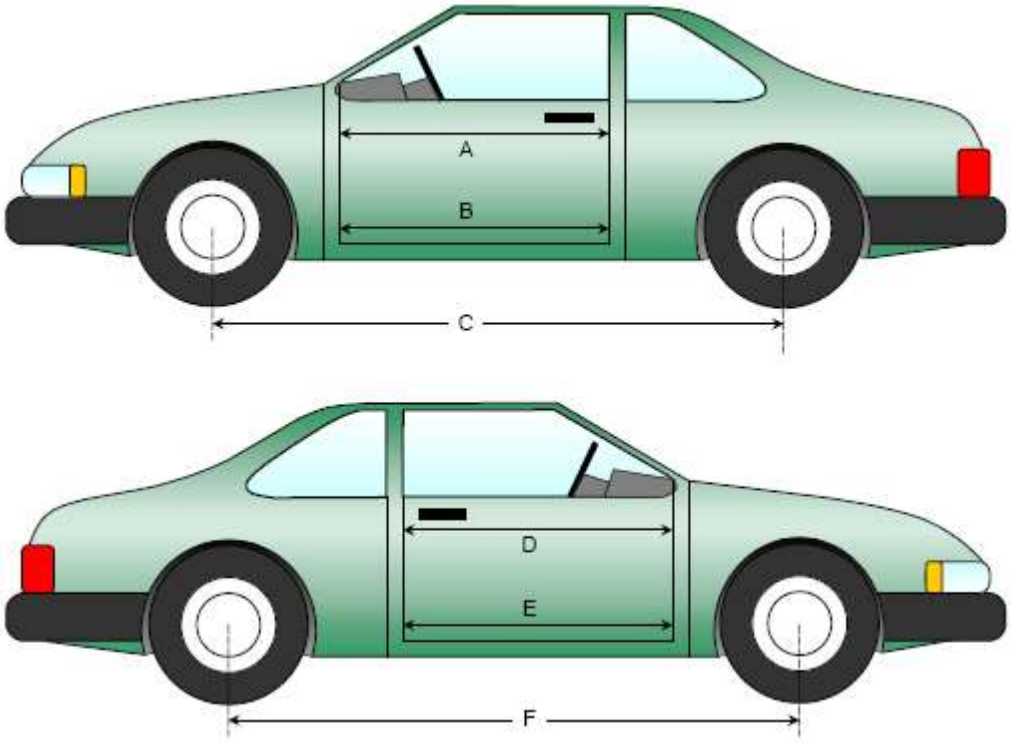
Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	986	809	-177
B	Left Side Lower	mm	949	736	-213
D	Right Side Upper	mm	984	981	-3
E	Right Side Lower	mm	943	942	-1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2725	2353	-372
F	Right Side Wheelbase	mm	2734	2788	54



DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

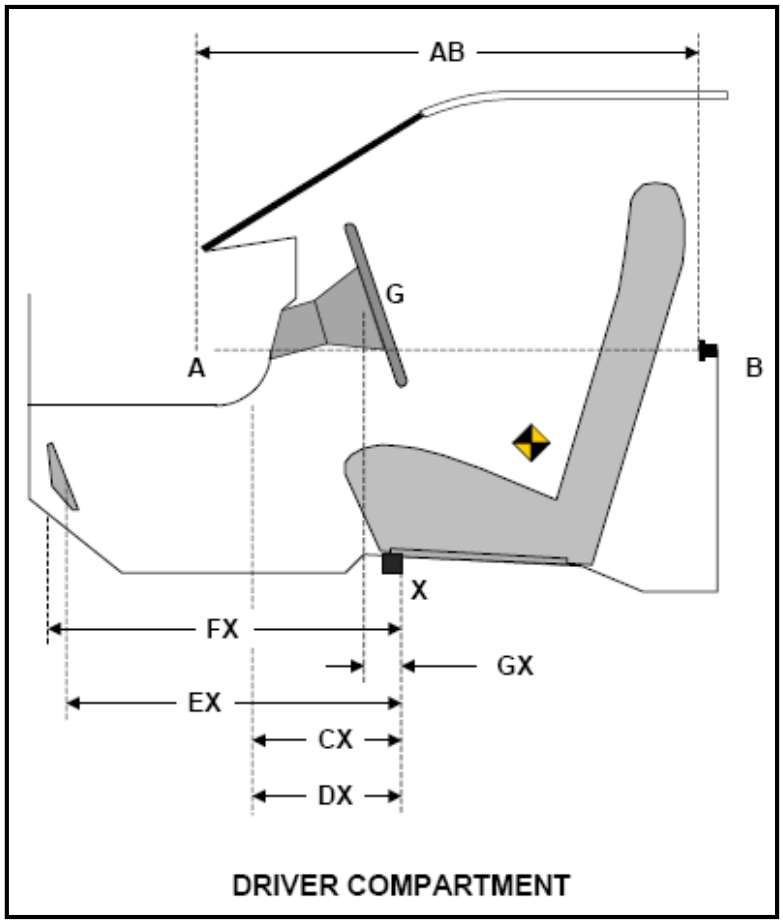
Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	769	717	-52
CX	Left Knee Bolster to X	mm	318	226*	-92*
DX	Right Knee Bolster to X	mm	299	183*	-116*
EX	Brake Pedal to X	mm	574	498	-77
FX	Foot Rest to X	mm	627	587	-40
GX	Center of Steering Column Wheel Hub to X	mm	61	25	-36

X = Front of Seat Track (Stationary)

*Plastic fell off, values are approximate

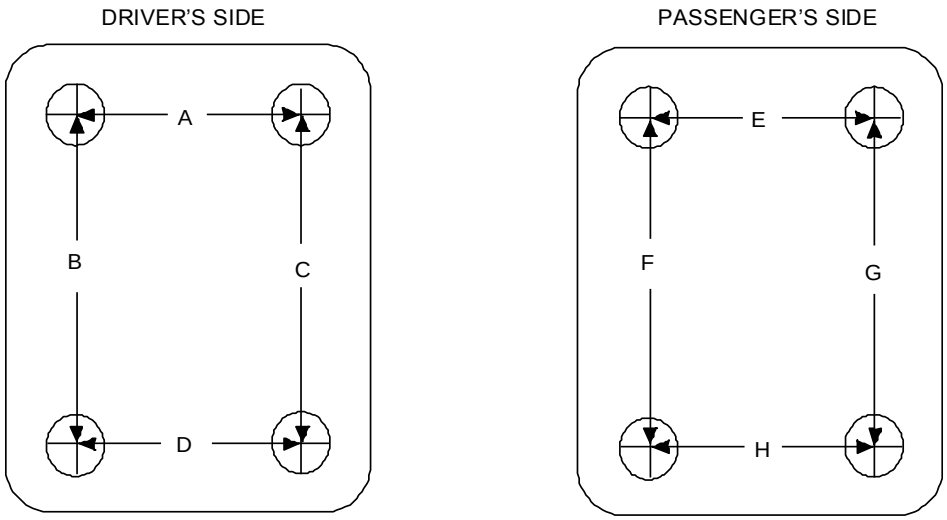


DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

TOP VIEW THROUGH FLOOR PAN



UNDERBODY FLOORBOARD DEFORMATION

Measurement	Units	Pre-Test	Post-Test	Difference
A	mm	447	430	17
B	mm	315	266	49
C	mm	321	319	2
D	mm	396	382	14
E	mm	414	430	-16
F	mm	355	360	-5
G	mm	288	284	4
H	mm	443	413	30

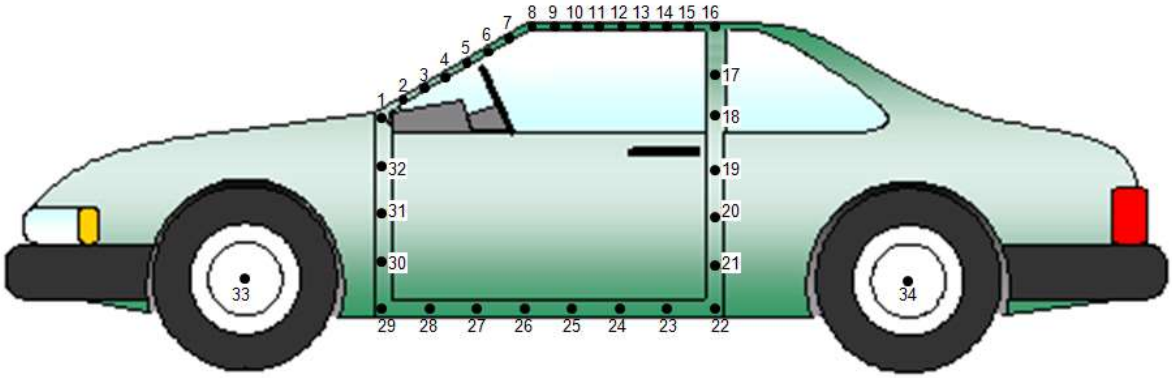
DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

DRIVER SIDE DOOR SILL INTRUSIONS



Left Side View

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

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

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

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

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

DRIVER SIDE DOOR SILL INTRUSIONS

Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3282.0	-762.9	-521.1	3140.3	-711.4	-433.2	-142	51	88
2	3243.6	-750.9	-568.2	3113.9	-714.3	-488.0	-130	37	80
3	3185.2	-734.5	-615.2	3073.4	-708.0	-553.6	-112	26	62
4	3112.4	-713.2	-663.4	3023.1	-693.9	-627.7	-89	19	36
5	3034.8	-693.2	-713.0	2970.6	-682.0	-701.5	-64	11	11
6	2956.9	-672.5	-758.0	2912.8	-668.7	-774.4	-44	4	-16
7	2879.7	-652.0	-800.1	2855.5	-656.9	-841.7	-24	-5	-42
8	2802.2	-632.0	-837.5	2804.1	-634.1	-905.2	2	-2	-68
9	2723.5	-613.9	-868.9	2726.8	-616.8	-932.9	3	-3	-64
10	2644.5	-600.5	-894.8	2646.5	-602.4	-949.7	2	-2	-55
11	2556.1	-590.1	-913.7	2556.0	-591.6	-957.1	0	-2	-43
12	2469.8	-584.7	-926.4	2468.7	-585.5	-957.6	-1	-1	-31
13	2381.1	-581.8	-934.8	2381.7	-581.1	-956.3	1	1	-21
14	2293.9	-580.8	-939.6	2294.0	-579.1	-954.0	0	2	-14
15	2203.3	-581.1	-943.0	2201.8	-580.8	-949.7	-1	0	-7
16	2148.6	-583.0	-938.2	2148.3	-580.4	-942.6	0	3	-4
17	2183.3	-674.4	-798.3	2186.8	-668.3	-800.1	4	6	-2
18	2229.0	-753.6	-621.8	2232.0	-743.5	-623.6	3	10	-2
19	2275.8	-805.5	-445.8	2281.2	-792.9	-444.9	5	13	1
20	2300.5	-826.7	-242.7	2300.0	-810.7	-238.2	0	16	5
21	2297.9	-814.2	-29.8	2301.8	-793.9	-30.1	4	20	0
22	2305.7	-854.8	134.8	2309.5	-834.2	135.7	4	21	1
23	2459.4	-858.7	138.6	2461.1	-829.0	139.8	2	30	1
24	2612.1	-858.9	141.1	2611.0	-799.3	158.7	-1	60	18
25	2753.3	-857.9	143.2	2739.3	-763.1	184.3	-14	95	41
26	2908.6	-856.9	146.0	2890.6	-755.0	221.7	-18	102	76
27	3055.7	-855.4	148.3	3031.5	-739.2	257.5	-24	116	109
28	3137.2	-853.6	149.1	3080.7	-728.4	279.0	-56	125	130
29	3214.3	-853.5	150.8	3132.9	-685.1	261.1	-81	168	110
30	3305.8	-777.6	-51.9	3097.2	-690.4	30.7	-209	87	83
31	3297.9	-774.5	-203.7	3089.5	-705.6	-121.2	-208	69	82
32	3281.8	-760.0	-405.1	3102.7	-704.5	-323.5	-179	55	82
33	3826.1	-861.2	128.8	3450.3	-766.1	72.6	-376	95	-56
34	1101.2	-848.2	108.5	1097.8	-863.0	92.0	-3	-15	-16

Note: Please see Appendix E.2 for a detailed procedure used to measure the required door sill intrusions

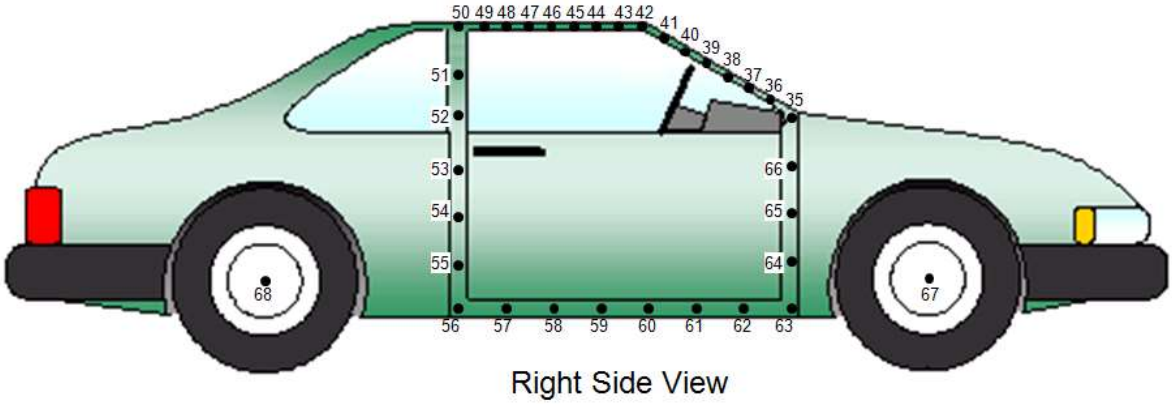
DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

PASSENGER SIDE DOOR SILL INTRUSIONS



Right Side View

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

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

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

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

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

PASSENGER SIDE DOOR SILL INTRUSION

Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
35	3293.5	783.1	-508.7	3288.4	814.4	-508.9	-5	31	0
36	3253.5	770.5	-561.1	3247.5	799.2	-559.9	-6	29	1
37	3193.8	753.2	-608.6	3189.6	777.3	-608.1	-4	24	0
38	3134.3	735.5	-650.2	3131.0	755.1	-648.2	-3	20	2
39	3067.9	717.1	-691.6	3064.6	732.3	-688.7	-3	15	3
40	2988.3	696.4	-738.7	2987.6	707.5	-736.3	-1	11	2
41	2914.1	676.6	-780.0	2912.0	682.3	-776.7	-2	6	3
42	2837.4	655.8	-819.6	2837.5	656.6	-815.0	0	1	5
43	2759.0	636.4	-853.5	2760.4	632.2	-848.3	1	-4	5
44	2678.3	620.5	-881.8	2679.9	618.3	-874.5	2	-2	7
45	2592.9	608.8	-902.8	2594.2	607.4	-896.2	1	-1	7
46	2509.8	602.0	-916.6	2509.9	600.8	-910.8	0	-1	6
47	2421.8	598.0	-928.0	2422.4	597.2	-922.6	1	-1	5
48	2328.7	595.9	-934.1	2328.7	595.5	-929.6	0	0	4
49	2249.9	595.4	-937.4	2251.9	595.2	-932.7	2	0	5
50	2158.9	597.8	-933.6	2160.6	598.0	-929.9	2	0	4
51	2200.5	709.9	-754.7	2200.7	712.4	-753.4	0	3	1
52	2238.6	769.2	-615.4	2237.0	774.5	-614.1	-2	5	1
53	2281.8	819.3	-452.0	2279.4	827.3	-453.8	-2	8	-2
54	2307.7	836.2	-309.2	2304.4	846.6	-308.1	-3	10	1
55	2324.2	844.0	-129.6	2320.5	856.7	-135.2	-4	13	-6
56	2284.3	874.3	162.8	2281.9	891.2	159.0	-2	17	-4
57	2456.5	875.4	166.7	2453.1	897.4	161.6	-3	22	-5
58	2598.4	877.7	164.4	2594.0	902.6	161.6	-4	25	-3
59	2756.5	878.0	166.8	2751.2	907.4	163.8	-5	29	-3
60	2907.6	877.7	169.0	2902.9	911.4	165.8	-5	34	-3
61	3061.6	877.4	170.7	3059.2	915.4	168.4	-2	38	-2
62	3214.5	876.1	173.9	3211.4	918.6	170.7	-3	42	-3
63	3272.0	814.4	62.6	3271.3	857.0	60.2	-1	43	-2
64	3310.4	788.4	-105.8	3308.2	829.6	-106.9	-2	41	-1
65	3304.1	785.8	-234.8	3300.9	820.3	-233.2	-3	35	2
66	3290.7	777.5	-406.5	3286.9	814.2	-409.6	-4	37	-3
67	3838.3	872.4	125.7	3893.3	890.3	120.0	55.0	17.9	-5.6
68	1104.4	864.4	116.0	1105.0	860.7	128.0	0.6	-3.7	12.0

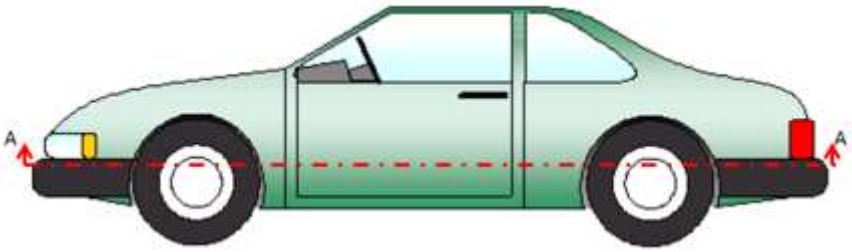
Note: Please see Appendix E.2 for a detailed procedure used to measure the required door sill intrusions

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



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

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
1	3502.7	913.8	-108.5	1	784.1	-897.4	-138.9
2	3391.4	907.0	-108.3	2	660.2	-865.7	-138.3
3	3180.2	905.1	-111.5	3	445.8	-827.3	-135.0
4	2976.3	906.7	-110.2	4	222.3	-763.1	-133.2
5	2714.2	908.4	-111.7	5	161.0	-730.9	-130.9
6	2527.9	909.3	-118.2	6	116.5	-673.4	-126.8
7	2296.2	908.1	-106.0	7	83.4	-578.4	-124.3
8	2064.1	904.2	-113.6	8	63.2	-484.3	-122.5
9	1855.9	900.6	-113.6	9	38.0	-322.2	-118.0
10	1633.7	895.7	-112.1	10	25.4	-189.2	-113.2
11	1444.7	898.2	-104.4	11	20.5	-52.5	-110.9
12	777.9	902.7	-120.7	12	25.3	145.2	-104.7
13	640.6	861.1	-121.6	13	46.7	381.4	-99.4
14	356.2	801.1	-116.2	14	107.1	652.1	-94.4
15	187.9	742.5	-110.3	15	130.7	698.8	-111.6
16	160.0	719.3	-109.0	16	251.7	768.0	-111.5
17	131.6	678.6	-105.0	17	460.3	827.8	-112.9
18	97.7	591.7	-118.3	18	682.8	880.3	-112.4
19	64.9	421.1	-117.0	19	758.9	898.5	-109.9
20	42.0	211.8	-122.2	20	1443.5	898.3	-105.1
21	32.6	6.8	-130.1	21	1619.6	899.6	-106.3
22	39.2	-177.4	-116.3	22	1872.3	908.7	-109.7
23	58.6	-372.0	-119.2	23	2103.5	914.9	-110.1

Note: See Appendix E.3 for a detailed procedure on how to measure the required vehicle exterior crush profile.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
24	106.0	-607.4	-117.3	24	2273.2	918.7	-111.4
25	174.2	-722.3	-115.5	25	2479.6	926.7	-111.6
25	225.1	-750.9	-109.8	25	2633.9	930.3	-112.8
26	1424.0	-889.0	-122.1	26	2733.8	932.5	-114.2
27	1611.2	-883.5	-125.0	27	2953.6	937.6	-116.9
28	1989.5	-889.8	-118.7	28	3168.5	942.1	-118.6
29	2270.2	-894.1	-119.1	29	3518.2	950.2	-124.3
30	2524.9	-891.6	-112.1	30	4169.0	926.4	-122.5
31	2701.5	-889.5	-112.9	31	4438.7	824.5	-129.9
32	2941.0	-887.4	-114.0	32	4605.7	710.3	-134.3
33	3163.6	-885.1	-110.1	33	4707.0	589.5	-139.7
34	3375.8	-886.6	-112.8	34	4781.2	417.2	-140.5
35	3496.7	-892.1	-112.2	35	4776.9	373.7	-146.5
36	4608.1	-689.0	-41.3	36	4798.8	228.8	-157.7
37	4772.5	-441.2	-32.4	37	4804.7	31.1	-164.6
38	4852.5	-153.8	-18.9	38	4782.1	-162.2	-166.8
39	4852.3	144.5	-6.0	39	4749.6	-311.6	-175.3
40	4778.4	437.6	-4.6	40	4679.7	-506.7	-179.4
41	4618.5	683.7	-35.6	41	4657.9	-533.8	-178.9
42	3502.7	913.8	-108.5	42	4564.9	-528.8	-178.0
43	3502.7	913.8	-108.5	43	4531.5	-561.4	-178.8
				44	4421.0	-538.7	-178.9
				45	4320.5	-514.4	-173.4
				46	4238.2	-475.8	-174.8
				47	4073.0	-460.6	-173.5
				48	3960.1	-456.2	-171.3
				49	3934.7	-440.2	-169.8
				50	3806.0	-426.0	-166.0
				51	3702.3	-588.3	-165.0
				52	3820.6	-737.4	-174.8
				53	3621.3	-752.3	-175.6
				54	3342.7	-740.6	-170.4
				55	3244.2	-697.2	-166.4
				56	3256.1	-811.2	-171.0
				57	3229.2	-847.8	-171.1

Note: See Appendix E.3 for a detailed procedure on how to measure the required vehicle exterior crush profile.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A

Pt.	Post-Test		
	X	Y	Z
58	3191.4	-840.4	-169.8
59	3147.6	-832.0	-171.5
60	3102.0	-869.5	-170.9
61	3036.3	-894.8	-170.9
62	2951.4	-923.2	-171.9
63	2721.5	-996.6	-172.4
64	2542.9	-1004.5	-171.3
65	2234.8	-1028.0	-170.2
66	2200.8	-883.3	-164.3
67	1949.7	-882.7	-157.9
68	1678.0	-881.5	-160.1
69	1413.3	-890.8	-151.7
70	784.1	-897.4	-138.9

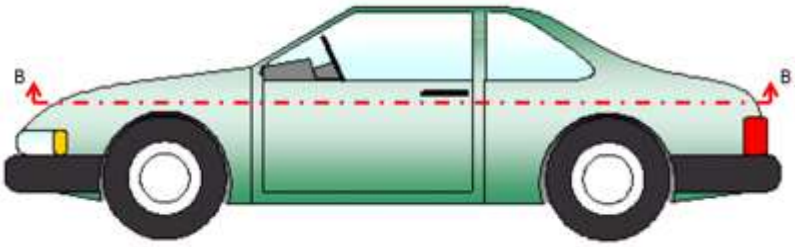
Note: See Appendix E.3 for a detailed procedure on how to measure the required vehicle exterior crush profile.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



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

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
1	4118.7	838.8	-351.9	1	718.2	-846.5	-388.6
2	3969.8	872.6	-356.1	2	606.4	-835.2	-388.5
3	3774.2	890.0	-359.4	3	401.0	-800.4	-385.6
4	3519.7	888.6	-358.2	4	186.7	-699.1	-383.3
5	3176.0	898.9	-361.4	5	107.5	-369.8	-364.7
6	2917.6	904.4	-368.6	6	99.8	-253.7	-370.6
7	2676.0	909.7	-364.8	7	92.3	-139.5	-364.7
8	2537.0	911.4	-363.5	8	89.4	1.7	-364.4
9	2287.8	913.2	-360.9	9	91.9	209.8	-355.4
10	2059.9	911.1	-359.5	10	116.3	470.1	-348.2
11	1817.7	907.6	-361.5	11	122.0	509.1	-348.0
12	1562.0	902.2	-359.6	12	155.9	650.3	-332.3
13	1296.1	897.0	-359.2	13	285.1	777.9	-333.2
14	1238.1	897.3	-359.2	14	481.3	817.2	-331.8
15	1043.9	892.1	-365.7	15	766.5	855.8	-333.9
16	776.0	860.6	-357.2	16	1050.3	902.3	-331.9
17	556.6	832.8	-362.4	17	1229.4	901.1	-333.7
18	353.8	790.9	-361.7	18	1268.9	903.4	-331.8
19	235.5	743.8	-360.6	19	1601.3	910.1	-333.5
20	178.7	669.6	-360.9	20	1853.4	916.8	-336.3
21	164.7	627.7	-363.0	21	2070.6	921.5	-337.5
22	133.7	478.0	-361.6	22	2342.3	926.6	-340.2
23	116.9	333.0	-358.9	23	2468.4	929.9	-341.9
24	107.2	163.5	-357.2	24	2705.6	934.1	-340.8

Note: See Appendix E.3 for a detailed procedure on how to measure the required vehicle exterior crush profile.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (Continued)

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
25	104.5	-3.3	-357.4	25	2975.0	936.3	-342.8
26	109.9	-187.6	-361.1	26	3282.1	936.2	-346.6
27	118.5	-338.4	-362.0	27	3591.4	922.8	-348.4
28	138.4	-493.7	-364.8	28	3906.2	921.0	-351.4
29	178.0	-651.6	-363.0	29	4127.0	868.0	-354.4
30	217.1	-715.5	-362.3	30	4296.9	832.0	-356.0
31	296.5	-763.6	-360.7	31	4381.1	794.0	-355.4
32	386.4	-791.2	-361.9	32	4410.8	767.3	-353.9
33	774.7	-854.8	-370.4	33	4506.7	617.9	-360.3
34	1009.6	-884.5	-369.1	34	4573.2	508.1	-361.2
35	1255.7	-886.0	-368.2	35	4620.4	496.8	-363.9
36	1558.0	-891.1	-362.7	36	4631.2	460.5	-366.4
37	1838.2	-896.3	-362.4	37	4664.6	351.6	-369.8
38	2144.4	-898.2	-367.4	38	4690.6	252.7	-370.4
39	2399.6	-897.7	-364.7	39	4702.7	35.3	-377.9
40	2648.3	-893.6	-361.4	40	4698.8	-82.6	-380.9
41	2951.1	-887.5	-356.7	41	4689.1	-183.3	-385.5
42	3260.1	-878.0	-356.7	42	4678.0	-242.9	-387.4
43	3565.8	-864.3	-357.4	43	4643.0	-393.3	-389.4
44	3872.1	-854.0	-366.1	44	4543.4	-427.2	-390.2
45	4114.1	-811.5	-350.8	45	4457.8	-445.1	-387.7
46	4344.5	-569.5	-351.0	46	4385.6	-333.2	-384.5
47	4547.7	-343.7	-328.6	47	4260.4	-273.3	-380.8
48	4545.1	-109.7	-344.8	48	4162.3	-338.3	-384.4
49	4542.8	111.4	-345.8	49	3925.3	-166.6	-378.0
50	4551.0	331.6	-329.9	50	3841.2	-264.5	-377.7
51	4364.8	562.4	-346.4	51	3783.7	-305.6	-378.1
52	4118.7	838.8	-351.9	52	3608.6	-341.3	-380.5
53	4118.7	838.8	-351.9	53	3569.5	-479.9	-384.6
				54	3501.2	-523.3	-378.8
				55	3437.4	-562.6	-388.1
				56	3369.4	-643.7	-379.7
				57	3304.6	-690.9	-378.9
				58	3252.7	-826.4	-385.6
				59	3208.2	-841.6	-386.9

Note: See Appendix E.3 for a detailed procedure on how to measure the required vehicle exterior crush profile.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (Continued)

Pt.	Post-Test		
	X	Y	Z
60	3127.0	-785.2	-381.7
61	3033.6	-879.8	-382.7
62	2940.5	-939.0	-384.5
63	2789.9	-977.9	-378.9
64	2533.7	-990.0	-377.0
65	2299.2	-1003.8	-376.1
66	2190.3	-953.9	-373.2
67	2176.5	-882.8	-365.1
68	1820.7	-886.8	-367.1
69	1455.9	-886.4	-363.5
70	1261.9	-887.2	-364.5
71	1194.5	-886.9	-361.7
72	718.2	-846.5	-388.6

Note: See Appendix E.3 for a detailed procedure on how to measure the required vehicle exterior crush profile.

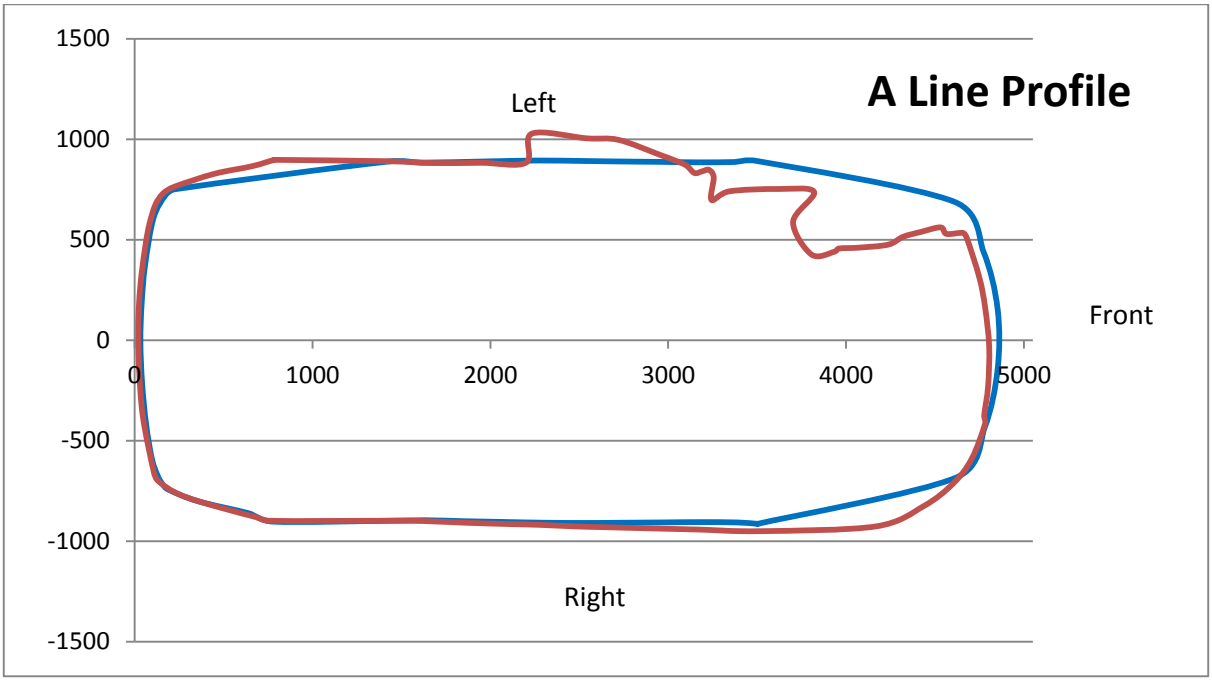
DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

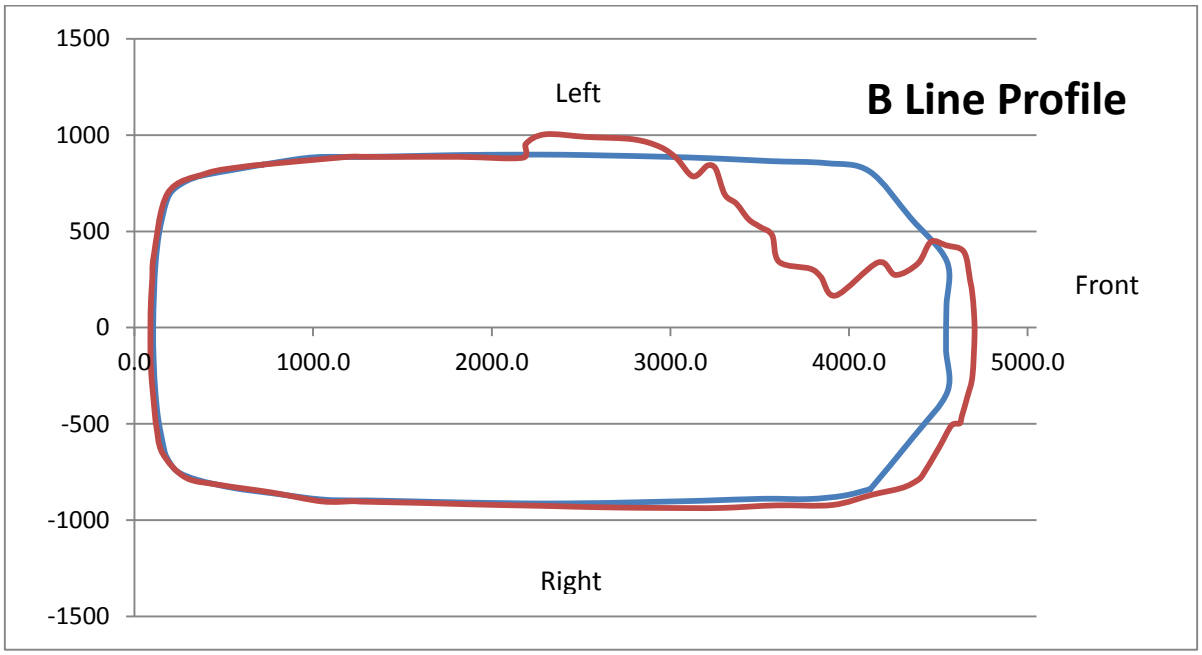
Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

SECTION A-A



SECTION B-B



DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

Left Profile of the Dash

Dash profiles were not taken for this test (SOW was updated post test)

Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
Ltn									
.									
.									
.									
Lt2									
Lt1									
L1									
Lb1									
Lb2									
.									
.									
.									
Lbn									

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 E.4 for a detailed procedure on how to measure the required profile dash.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

Right Profile of the Dash

Dash profiles were not taken for this test (SOW was updated post test)

Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
Rtn									
.									
.									
.									
Rt2									
Rt1									
R1									
Rb1									
Rb2									
.									
.									
.									
Rbn									

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 E.4 for a detailed procedure on how to measure the required profile dash.

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

	Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Lower Bumper Beam	1	4344.5	-569.5	-351.0	4371.4	-488.0	-535.5	27	82	-184
	2	4547.7	-343.7	-328.6	4543.8	-310.9	-457.9	-4	33	-129
	3	4545.1	-109.7	-344.8	4544.4	-76.4	-454.7	-1	33	-110
	4	4542.8	111.4	-345.8	4532.9	148.2	-429.2	-10	37	-83
	5	4551.0	331.6	-329.9	4546.5	365.8	-390.2	-5	34	-60
	6	4364.8	562.4	-346.4	4363.0	599.1	-382.3	-2	37	-36
Upper Bumper Beam	1	4669.9	-552.4	-75.9	4499.7	-540.2	-253.0	-170	12	-177
	2	4696.8	-332.8	-79.8	4563.4	-331.0	-232.5	-133	2	-153
	3	4712.1	-112.7	-78.5	4614.7	-115.7	-208.2	-97	-3	-130
	4	4713.0	107.7	-78.9	4651.9	100.9	-180.6	-61	-7	-102
	5	4699.8	326.7	-77.3	4674.2	318.2	-154.0	-26	-9	-77
	6	4673.9	553.0	-73.1	4684.4	541.9	-120.5	11	-11	-47
Upper Radiator Support	1	4669.2	-552.7	-18.5	4502.6	-546.6	-195.3	-167	6	-177
	2	4696.1	-334.0	-14.2	4569.2	-339.1	-167.9	-127	-5	-154
	3	4711.5	-112.7	-13.0	4619.9	-124.8	-142.8	-92	-12	-130
	4	4712.4	107.7	-14.8	4655.7	91.9	-121.4	-57	-16	-107
	5	4699.4	327.2	-10.8	4678.1	308.5	-90.4	-21	-19	-80
	6	4673.3	551.9	-18.3	4688.0	534.5	-66.3	15	-17	-48

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

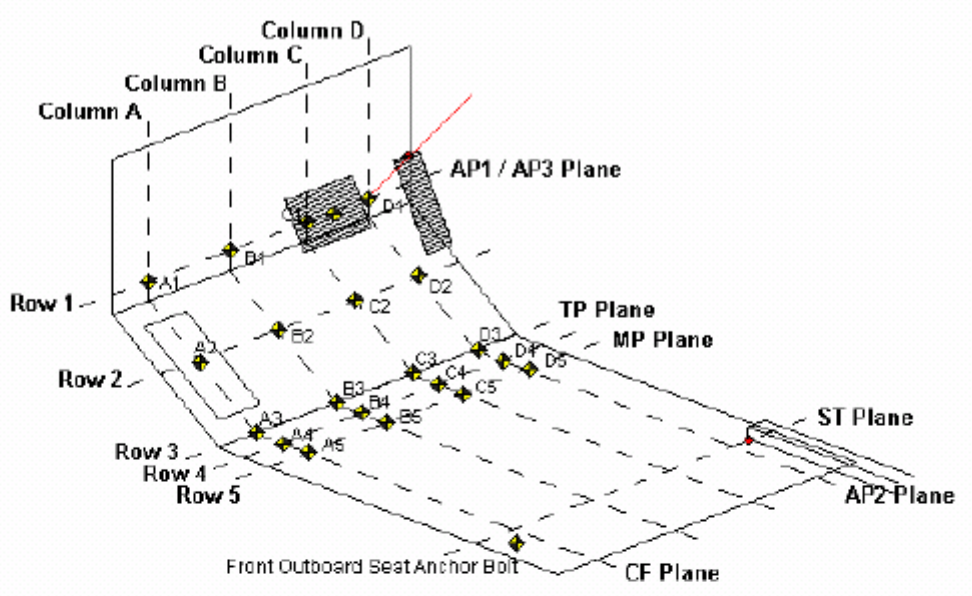
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

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

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

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

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

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3455.4	-586.4	88.9	3305.0	-486.0	128.3	-150.4	100.4	39.5
B1	3481.4	-444.2	93.5	3369.9	-359.6	113.6	-111.5	84.5	20.1
C1	3477.2	-313.4	95.9	3384.0	-233.4	118.1	-93.1	79.9	22.2
D1	3477.2	-180.1	93.9	3407.6	-102.9	120.4	-69.6	77.2	26.5
A2	3398.5	-590.5	140.2	3280.5	-487.7	188.8	-118.0	102.8	48.5
B2	3415.7	-452.1	146.7	3317.5	-363.5	175.2	-98.3	88.7	28.4
C2	3408.2	-311.1	146.8	3323.5	-225.0	177.0	-84.7	86.1	30.2
D2	3400.0	-179.9	143.9	3326.9	-95.3	169.5	-73.1	84.7	25.6
A3	3293.2	-590.9	179.0	3189.6	-489.6	256.0	-103.6	101.3	77.0
B3	3294.9	-454.8	179.2	3206.8	-354.3	226.4	-88.2	100.4	47.2
C3	3292.5	-317.1	178.9	3214.1	-220.7	226.9	-78.3	96.4	47.9
D3	3292.7	-182.4	174.1	3225.3	-96.8	201.4	-67.4	85.6	27.3
A4	3208.1	-593.1	180.1	3115.8	-476.4	287.4	-92.3	116.7	107.3
B4	3207.8	-459.7	178.5	3134.4	-361.5	215.2	-73.4	98.2	36.7
C4	3208.2	-327.5	181.0	3131.9	-228.4	231.1	-76.3	99.1	50.1
D4	3209.2	-197.0	176.9	3138.6	-112.7	197.3	-70.5	84.3	20.4
A5	3124.4	-591.5	190.6	3043.1	-465.5	311.8	-81.2	126.1	121.2
B5	3131.5	-463.5	179.9	3066.8	-368.2	248.7	-64.8	95.3	68.9
C5	3134.4	-330.9	183.6	3063.5	-237.2	242.1	-70.9	93.7	58.4
D5	3131.4	-205.7	182.9	3064.1	-119.9	195.8	-67.4	85.8	12.9
Brake Pedal	3345.7	-292.5	-15.6	3190.7	-199.6	18.2	-155.1	93.0	33.7
IP Left	3089.8	-500.1	-258.5	2918.9	-401.9	-235.2	-170.8	98.2	23.4
IP Right	3070.4	-201.0	-262.8	2875.9	-100.7	-251.9	-194.5	100.2	10.9
Steering Column	2832.9	-358.0	-481.8	2718.0	-286.1	-492.6	-114.8	71.9	-10.9
Front Outboard Bolt	2771.6	-572.5	80.1	2693.1	-519.5	140.3	-78.5	53.0	60.2

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

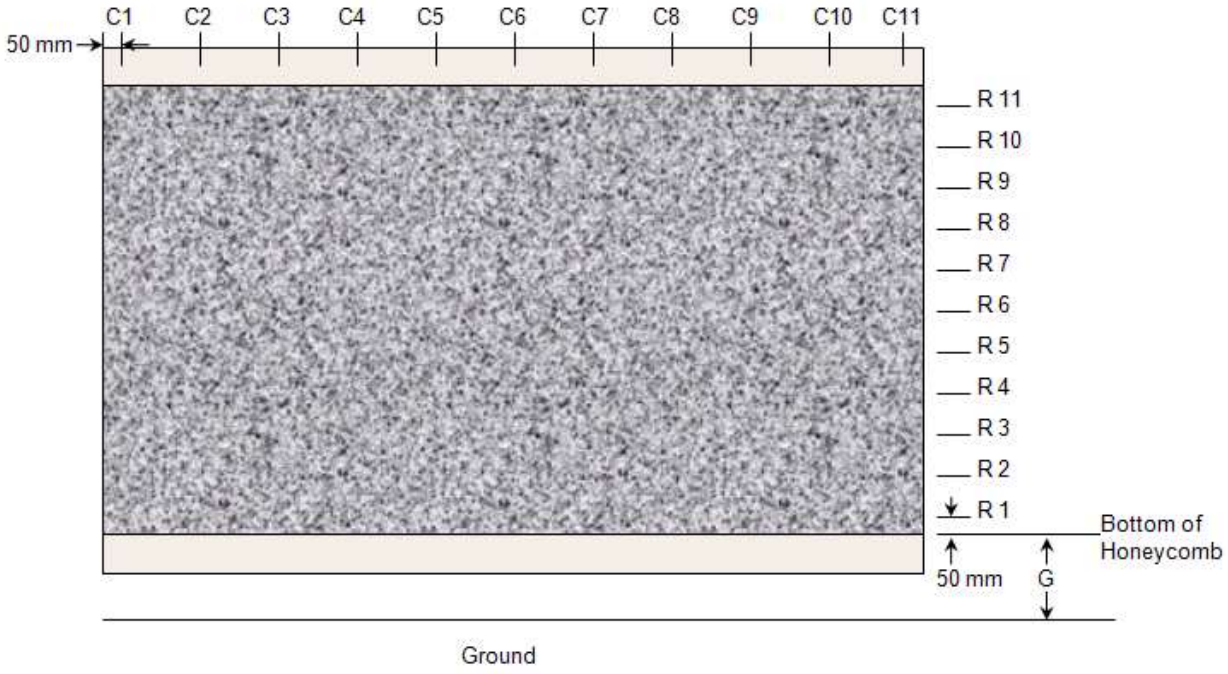
+Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.14

RMDB CRUSH MEASUREMENTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



BARRIER X-CRUSH

		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
		50mm	260 mm	470 mm	680 mm	890 mm	1100 mm	1310 mm	1520 mm	1730 mm	1940 mm	2150 mm
R11	910mm	-0.8	1.4	2.1	2.0	2.7	2.9	3.0	3.1	3.3	6.4	52.1
R10	824mm	-2.4	-2.1	-1.5	-1.5	-1.1	-1.0	-0.4	-0.3	0.2	16.7	78.3
R9	738mm	-3.8	-3.9	-3.3	-3.1	-2.9	-2.6	-2.3	-1.9	0.9	62.3	123.9
R8	652mm	-5.2	-5.3	-4.9	-4.6	-4.5	-4.2	-3.8	-3.5	4.9	59.4	170.3
R7	566mm	-6.7	-7.0	-6.5	-6.3	-5.9	-5.6	-5.3	-4.9	0.3	49.0	176.3
R6	480mm	-8.3	-8.4	-7.9	-7.8	-7.4	-7.1	-6.7	-6.2	-2.1	110.8	189.0
R5	384mm	-9.6	-9.6	-9.4	-8.7	-8.7	-8.5	-8.1	-7.6	-2.7	175.0	186.8
R4	308mm	-11.3	-11.0	-10.9	-10.4	-10.1	-9.9	-9.5	-8.9	3.3	231.6	201.7
R3	222mm	-12.9	-12.3	-12.2	-11.6	-11.5	-11.3	-10.8	-10.2	7.3	276.8	212.5
R2	136mm	-14.5	-13.9	-13.3	-12.7	-12.6	-12.5	-12.1	-11.7	5.7	308.1	245.2
R1	50mm	-15.9	-15.0	-14.3	-13.9	-12.3	-12.3	-12.9	-12.9	15.1	323.4	247.8

DATA SHEET NO. 15

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

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

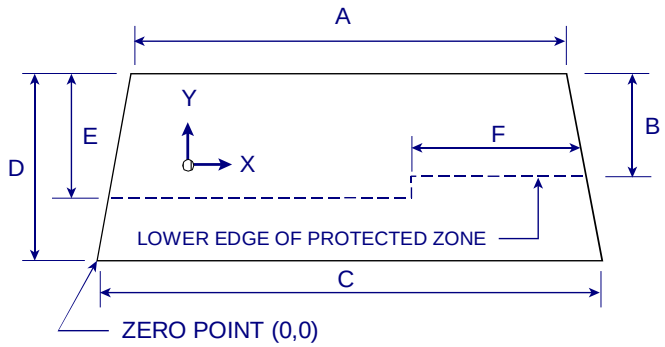
Windshield is mounted on the left and right sides with a rubber molding. It is open at the top, and flush mounted into the plastic in front of the hood.

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: 22°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2114	2114	100.0%
Right Side	2114	2114	100.0%
Total	4227	4227	100.0%



Item	Units	Value
A	mm	1150
B	mm	502
C	mm	1495
D	mm	791
E	mm	530
F	mm	520

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
1295	0
1495	0

DATA SHEET NO. 15 (CONTINUED)

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

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220
Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 22°C Test Time: 7:45 P.M.

Stoddard Solvent Spillage Measurements

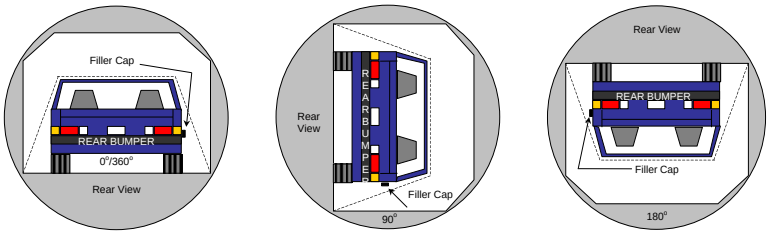
A.	From impact until vehicle motion ceases: (maximum allowable = 1 oz.)	0 oz.
B.	For the 5-minute period after motion ceases: (maximum allowable = 5 oz.)	0 oz.
C.	For the following 25 minutes: (maximum allowable = 1 oz./minute)	0 oz.
D.	Spillage:	0 oz.

DATA SHEET NO. 16

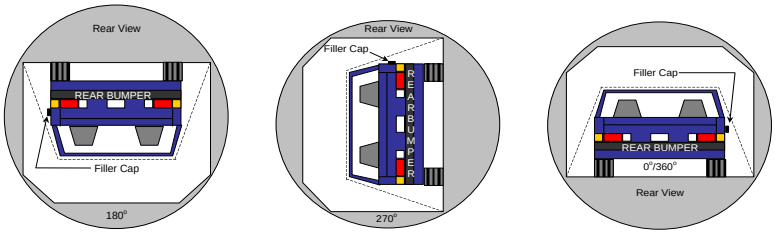
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



0° TO 90° 90° TO 180°



180° TO 270° 270° TO 360°

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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	70	300	370
90° to 180°	68	300	368
180° to 270°	63	300	363
270° to 360°	71	300	371

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

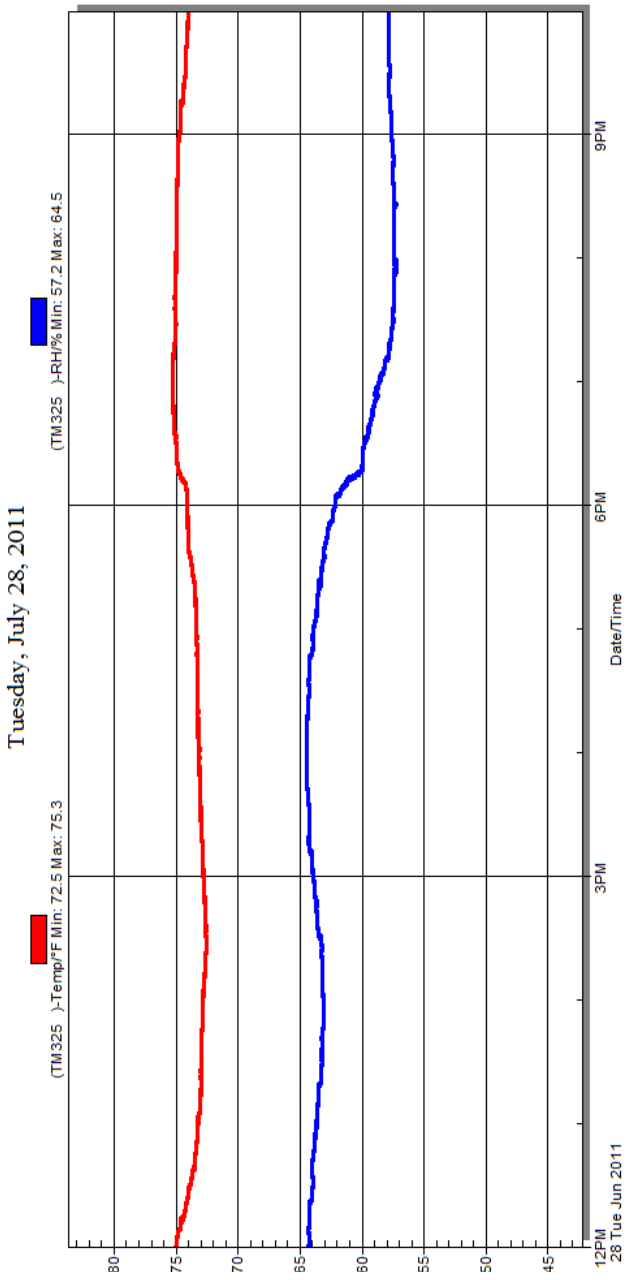
Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2010 Ford Fusion Four Door Sedan NHTSA No.: RA0220

Test Program: R&D Frontal Offset, 7° angle 20% Offset Test Date: 6/28/2011



APPENDIX A

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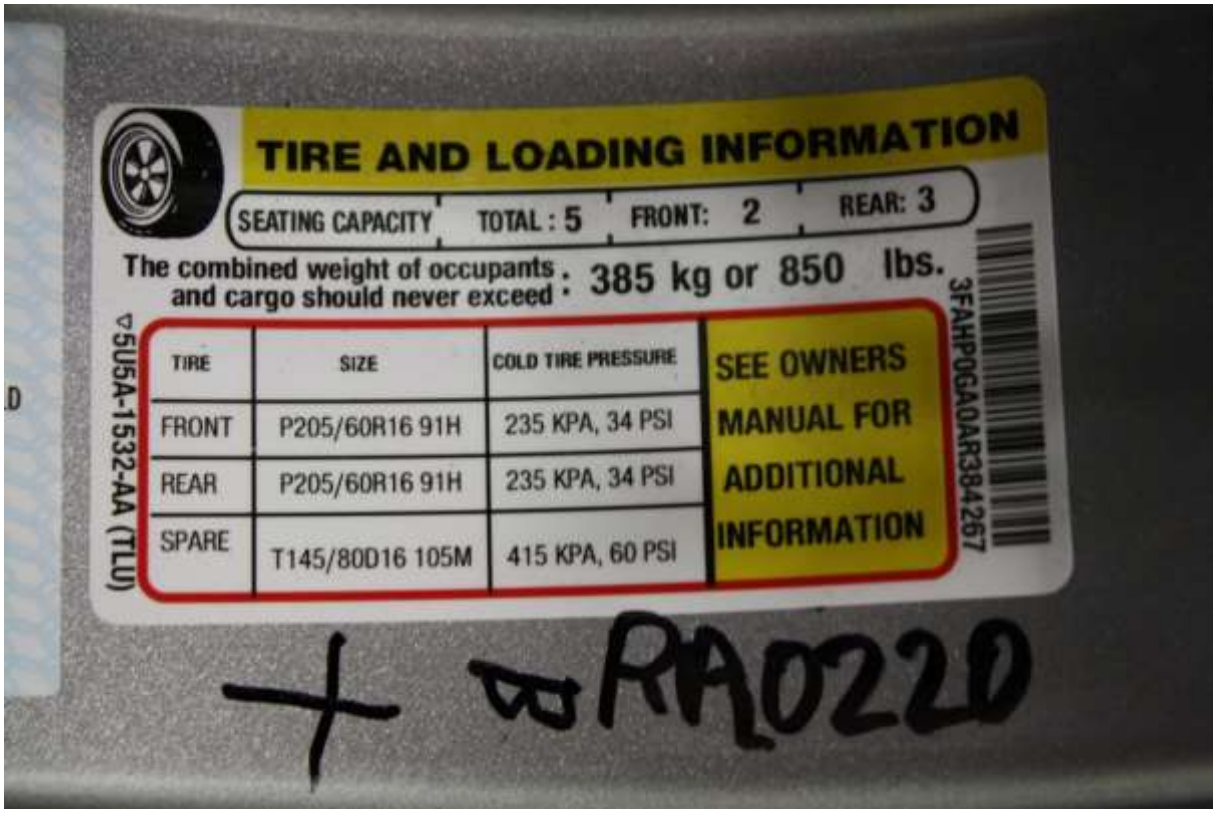
No. 001 As Delivered Right Front 3-4 View of Test Vehicle

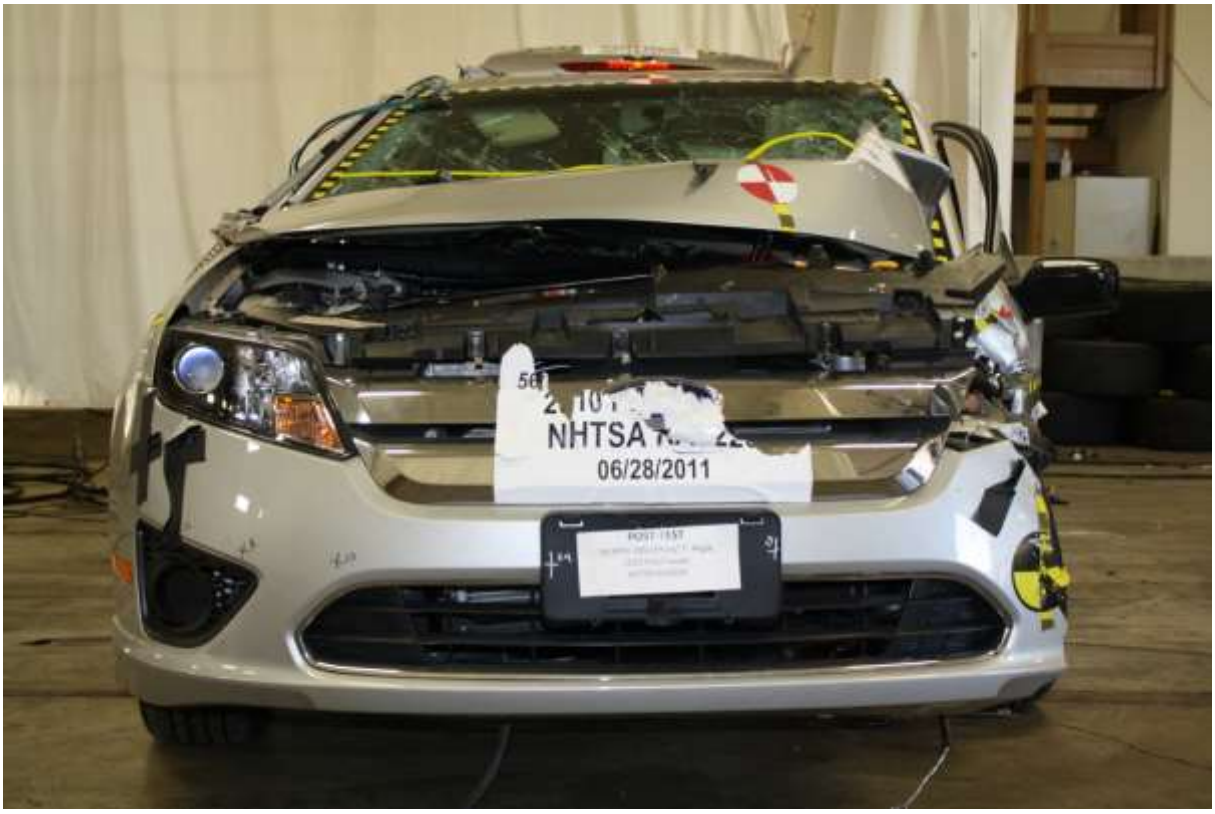
No. 002 As Delivered Left Rear 3-4 View of Test Vehicle

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

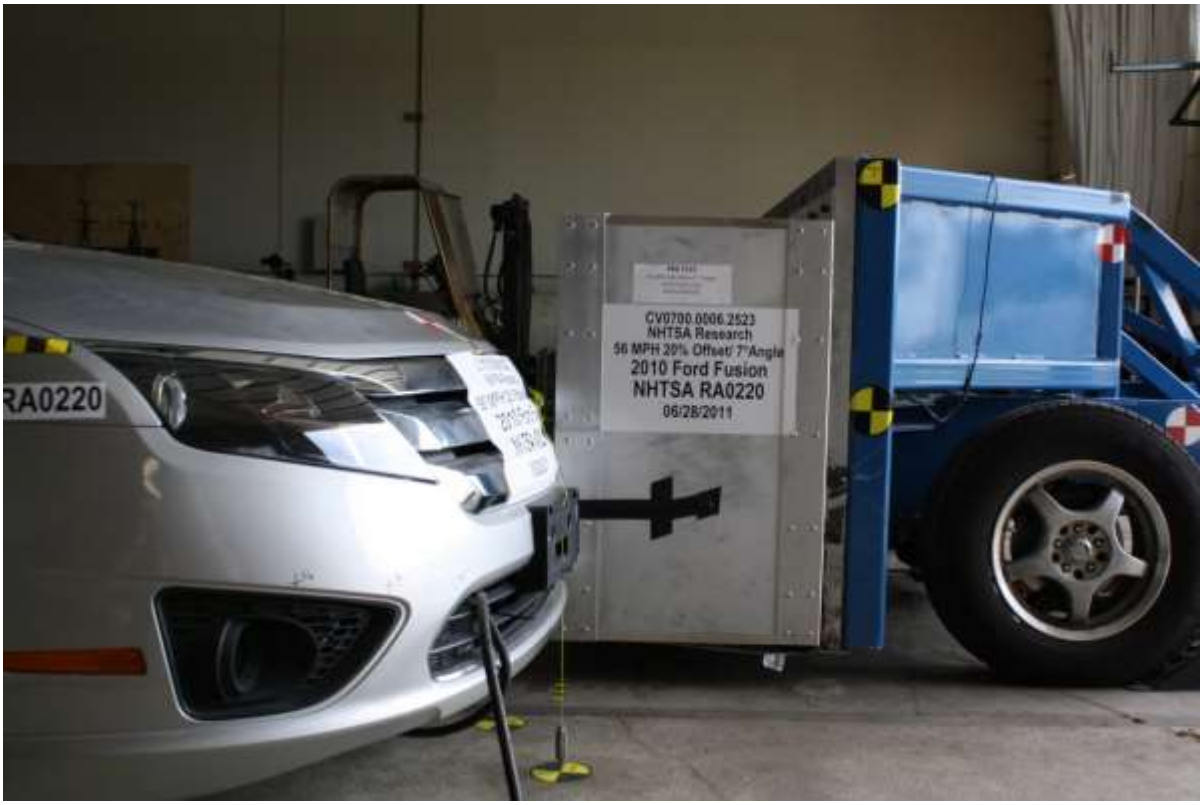
No. 015 Pre-Test Right Side View of Test Vehicle

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

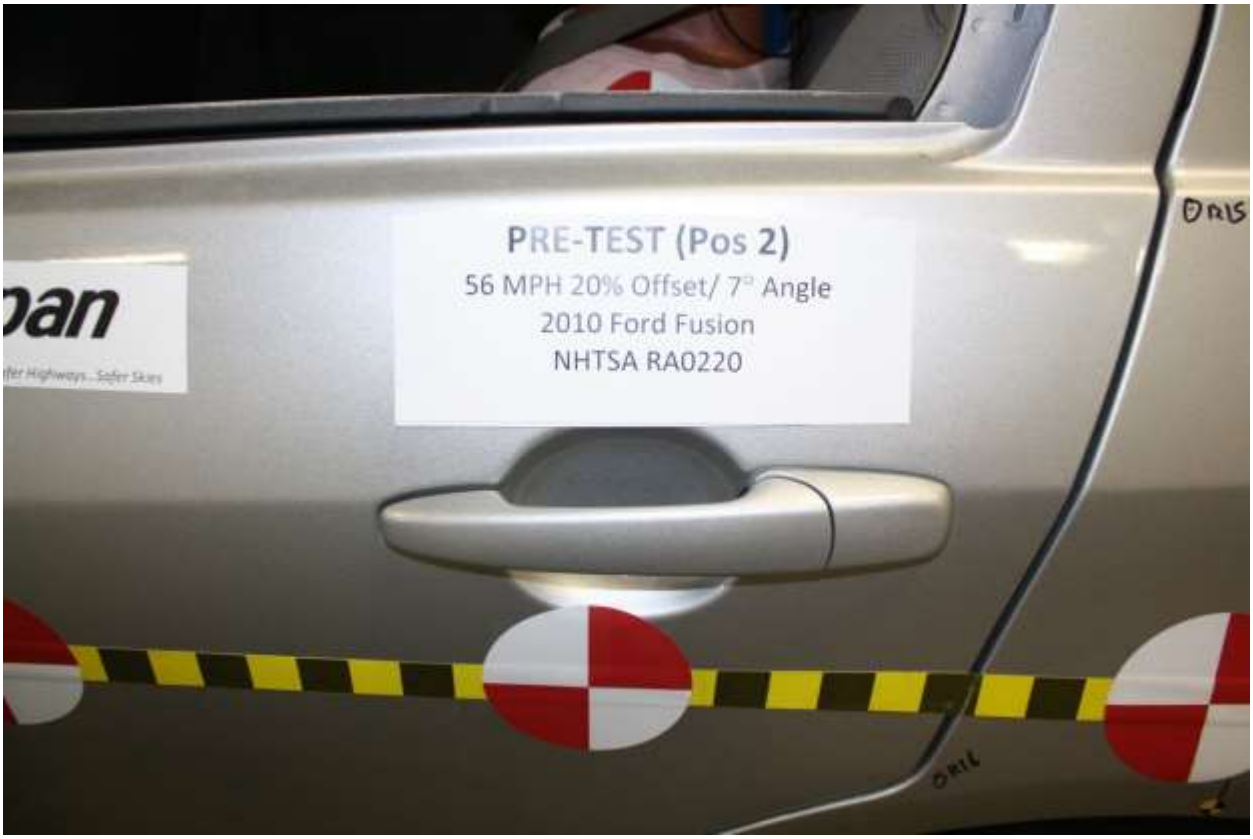
No. 021 Pre-Test Right Side View of RMDB against target vehicle at ideal Impact Point

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

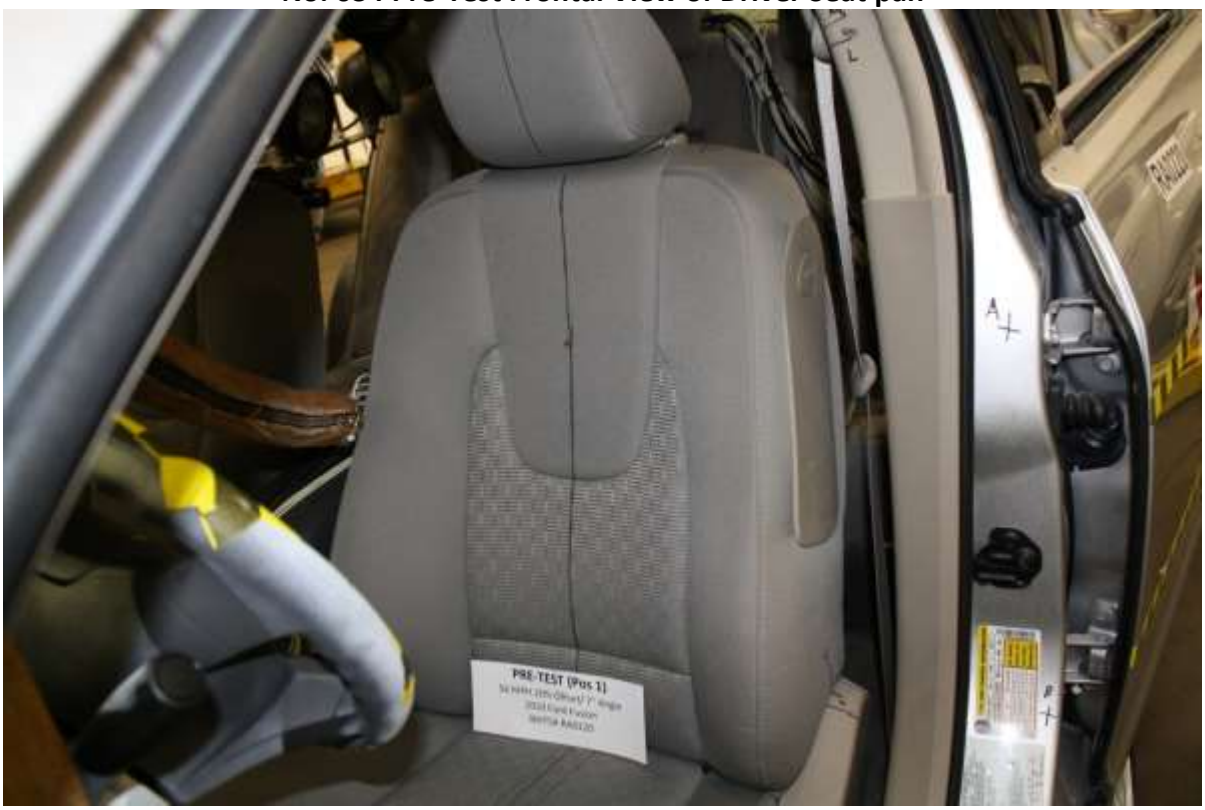
No. 030 Pre-Test View of Driver Inner Door Panel

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

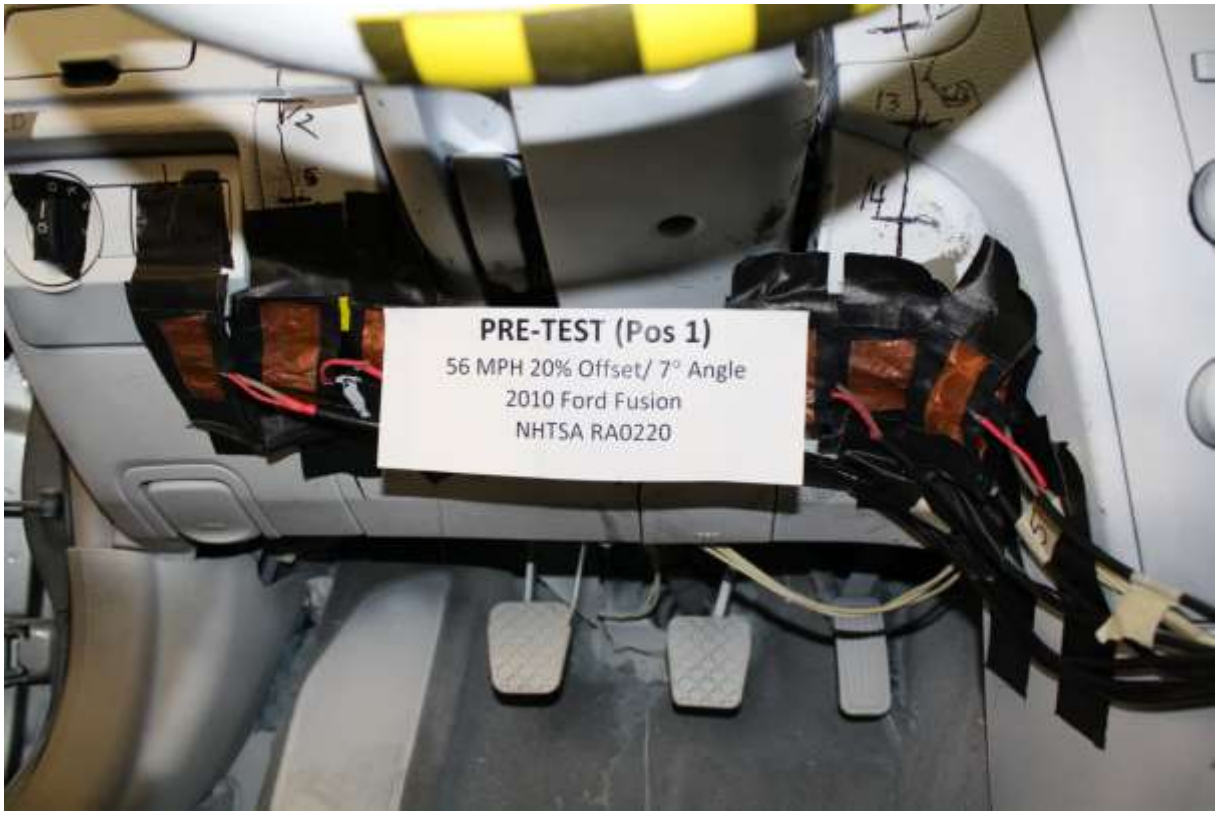
No. 034 Pre-Test Frontal View of Driver Seat pan



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

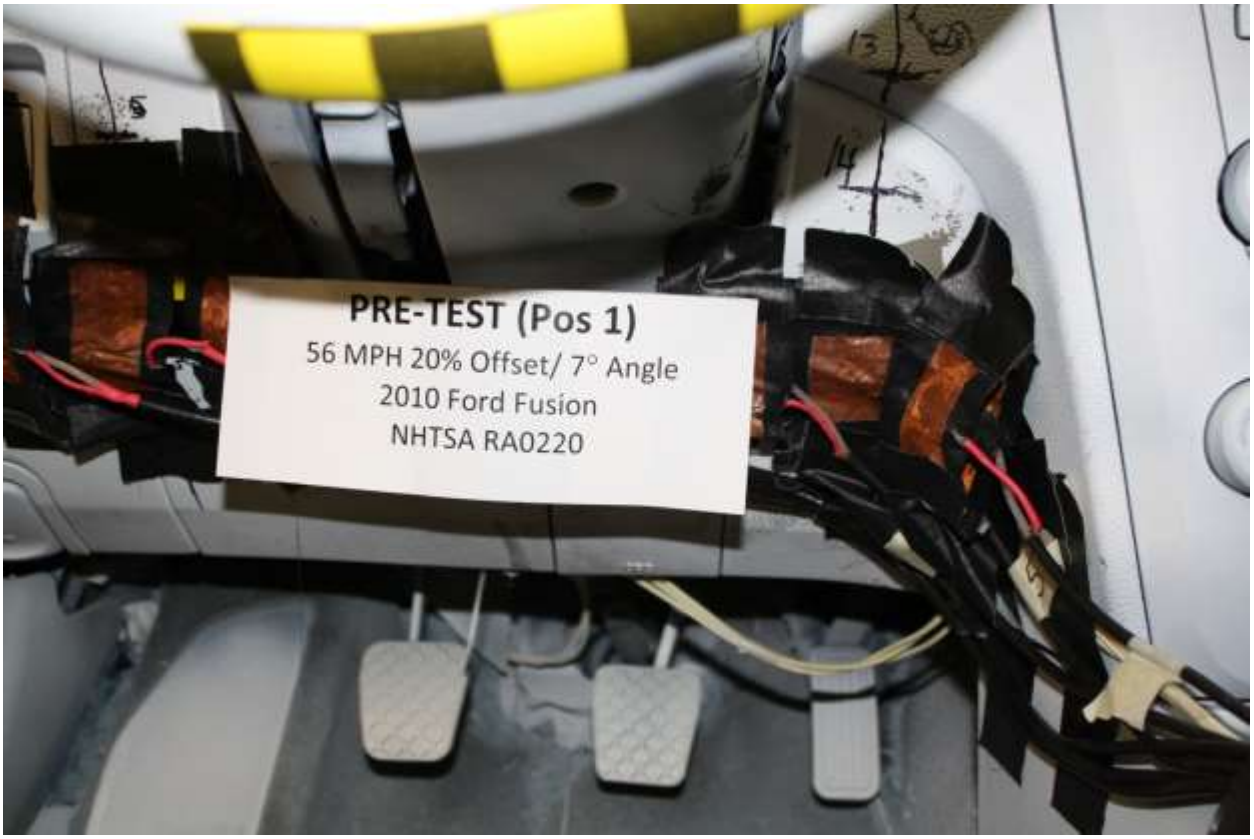
No. 041 Post-Test Overall View of Driver Knee Bolsters with panel removed

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

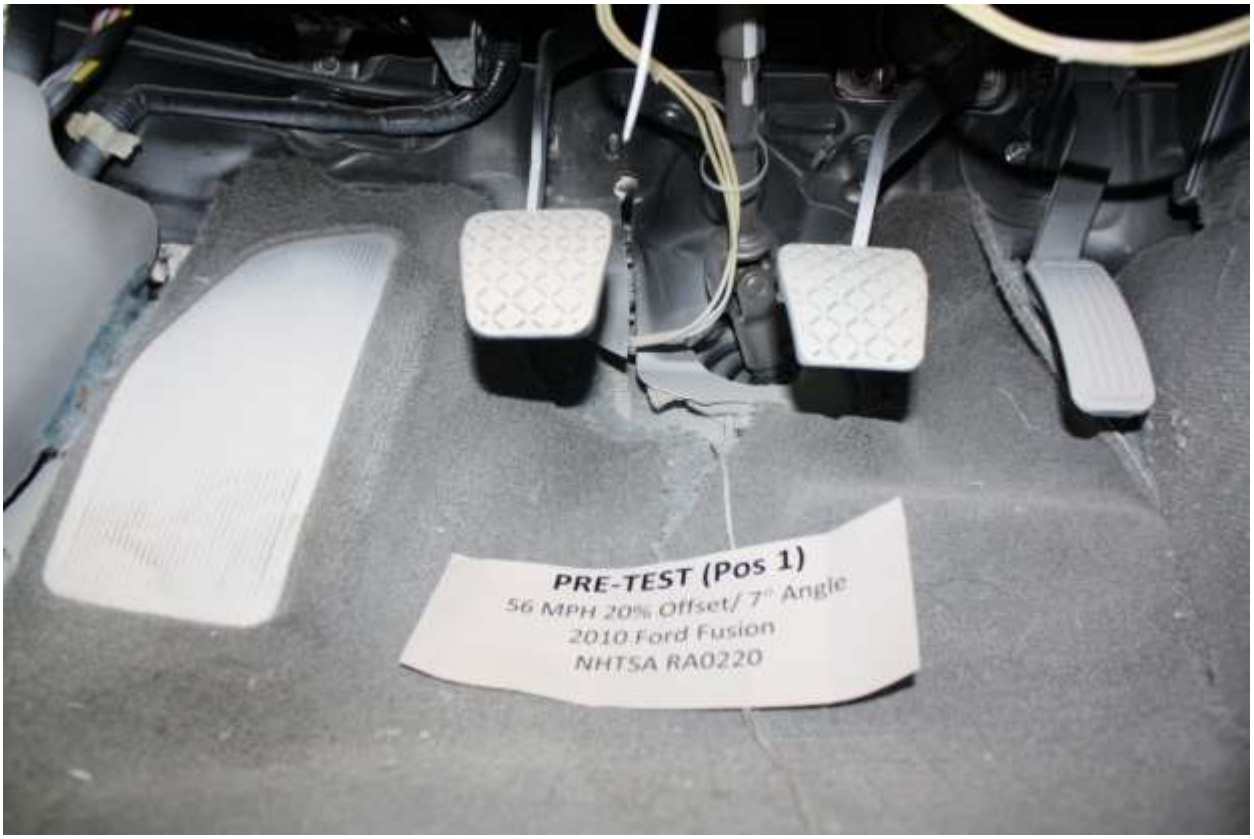
No. 047 Post-Test Right Side View of Driver Knee Bolsters

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

Photo Not Available

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

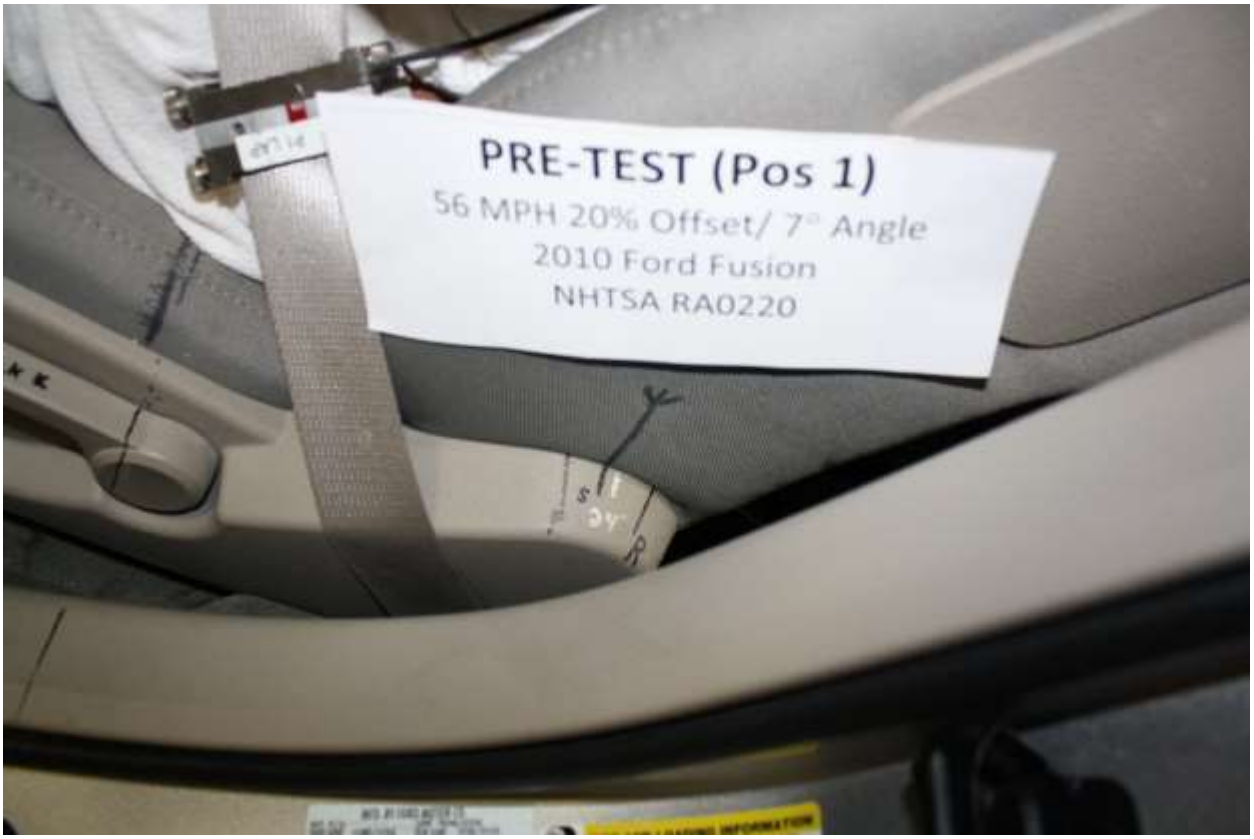
No. 059 Post-Test Left Side Driver Dummy Window View

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

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

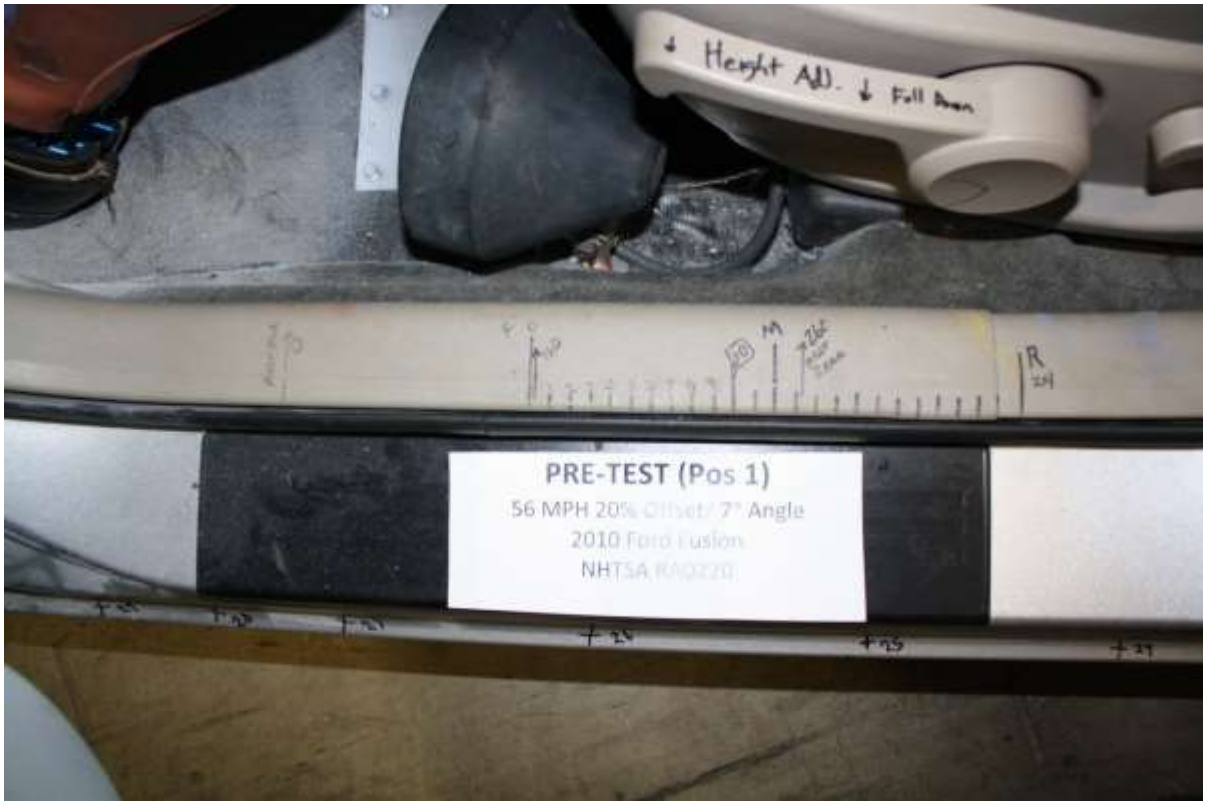
No. 062 Pre-Test View of Driver Dummy Door Clearance

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

Photo Not Available

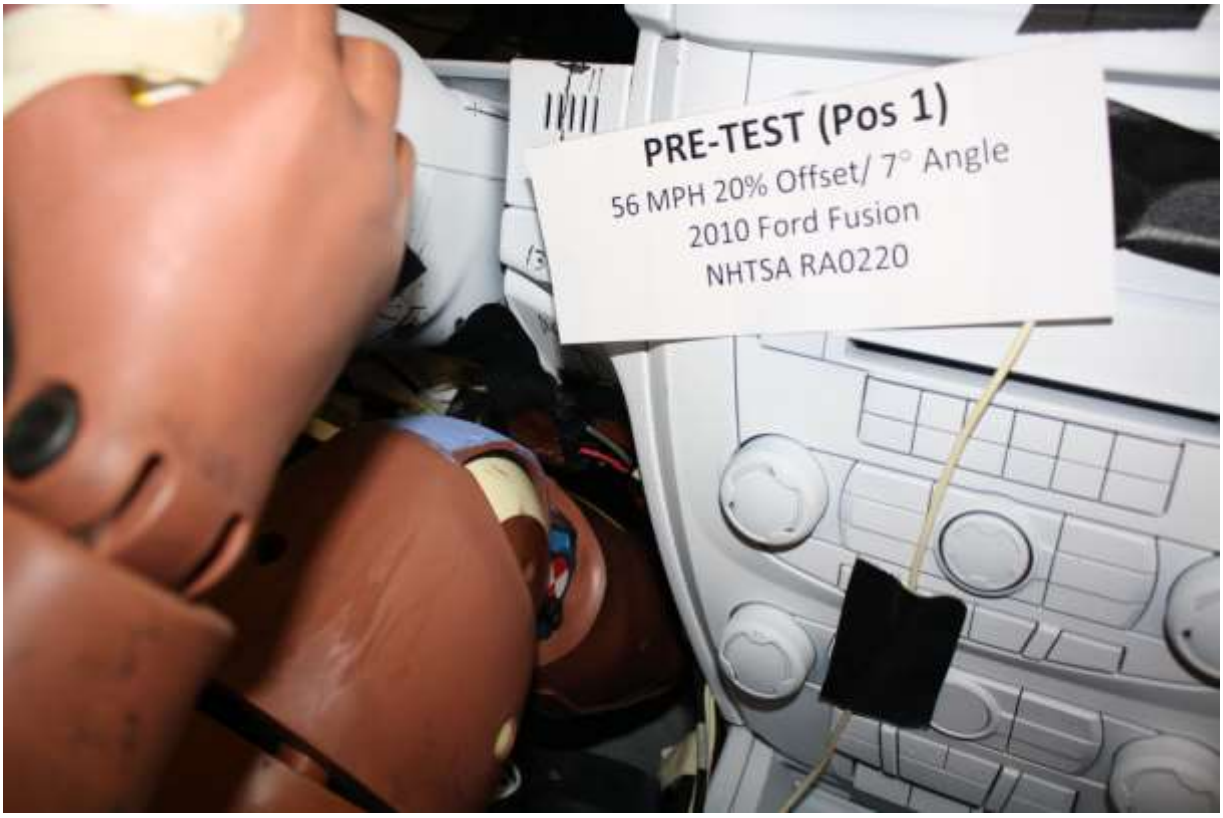
No. 068 Pre-Test Driver Adjustable D-ring

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

No. 070 Pre-Test View of Parking Brake

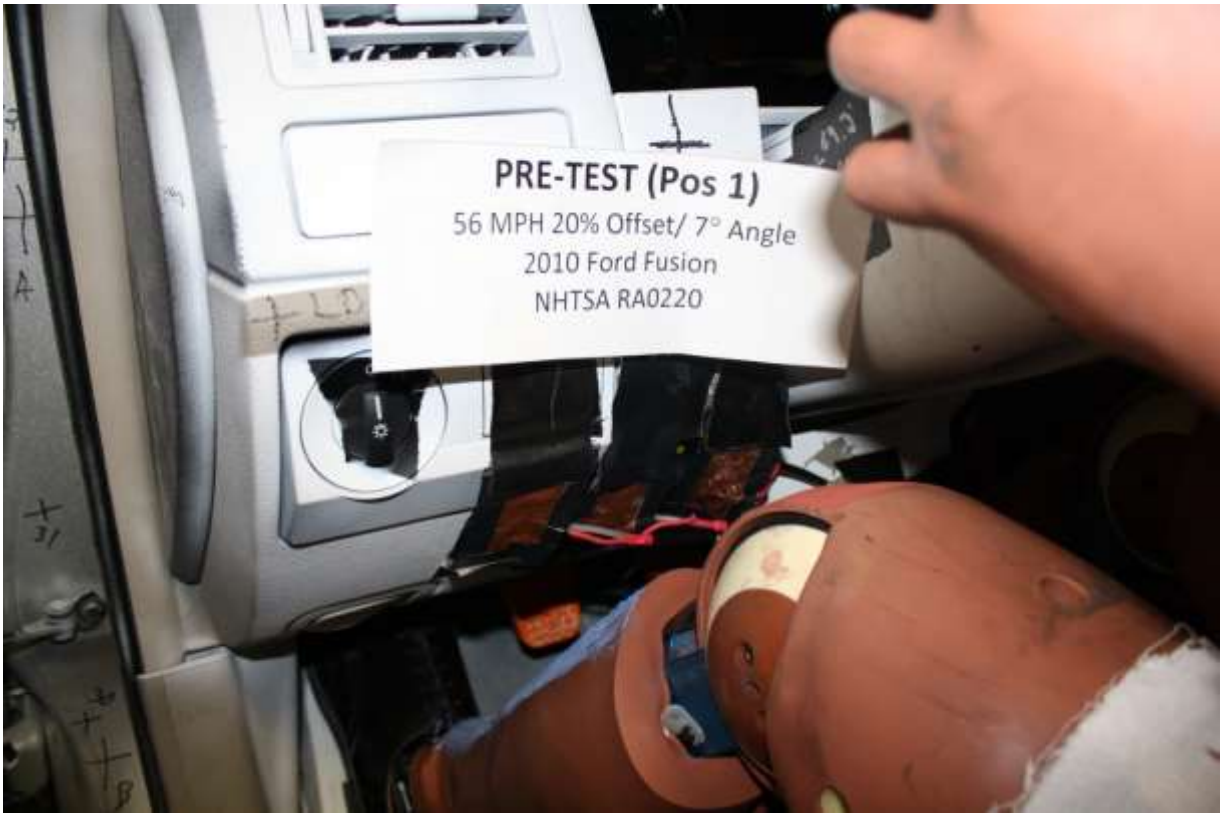
No. 071 Pre-Test Driver Dummy Feet

No. 072 Post-Test Driver Dummy Feet



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

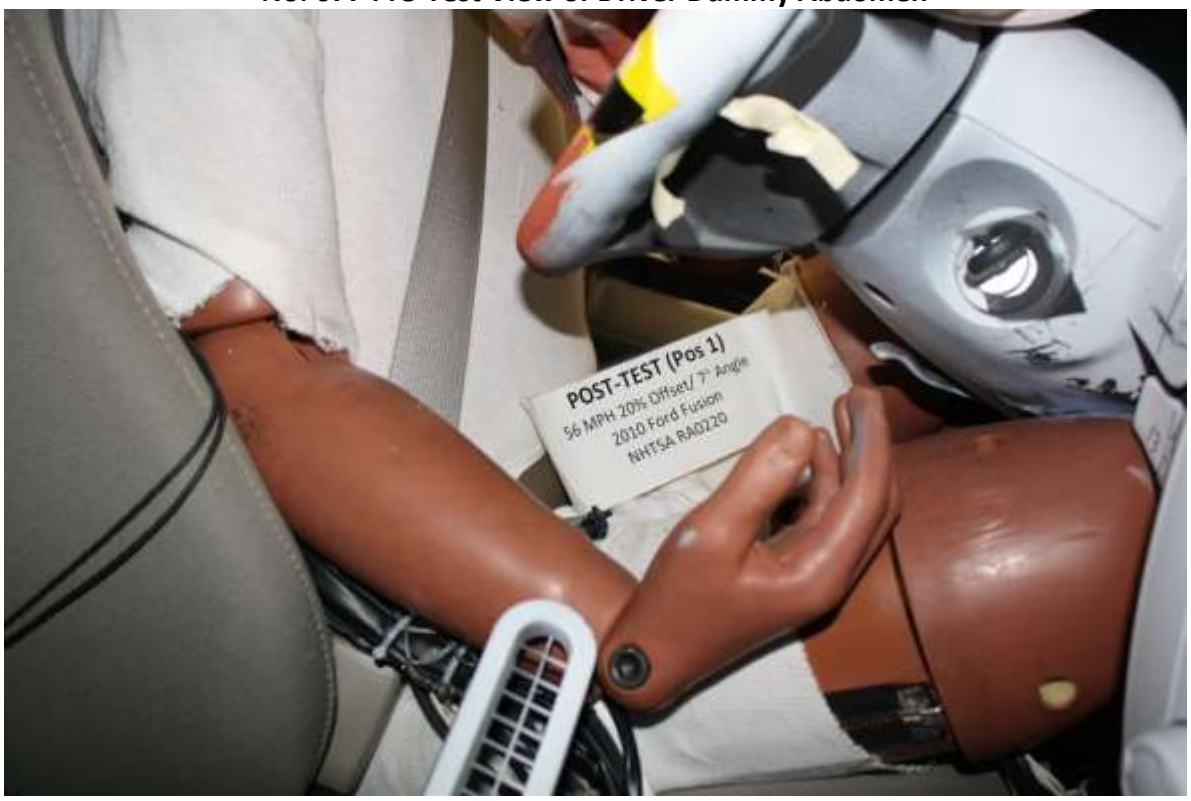
No. 074 Post-Test View of Driver Dummy Right Knee and Bolster



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

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

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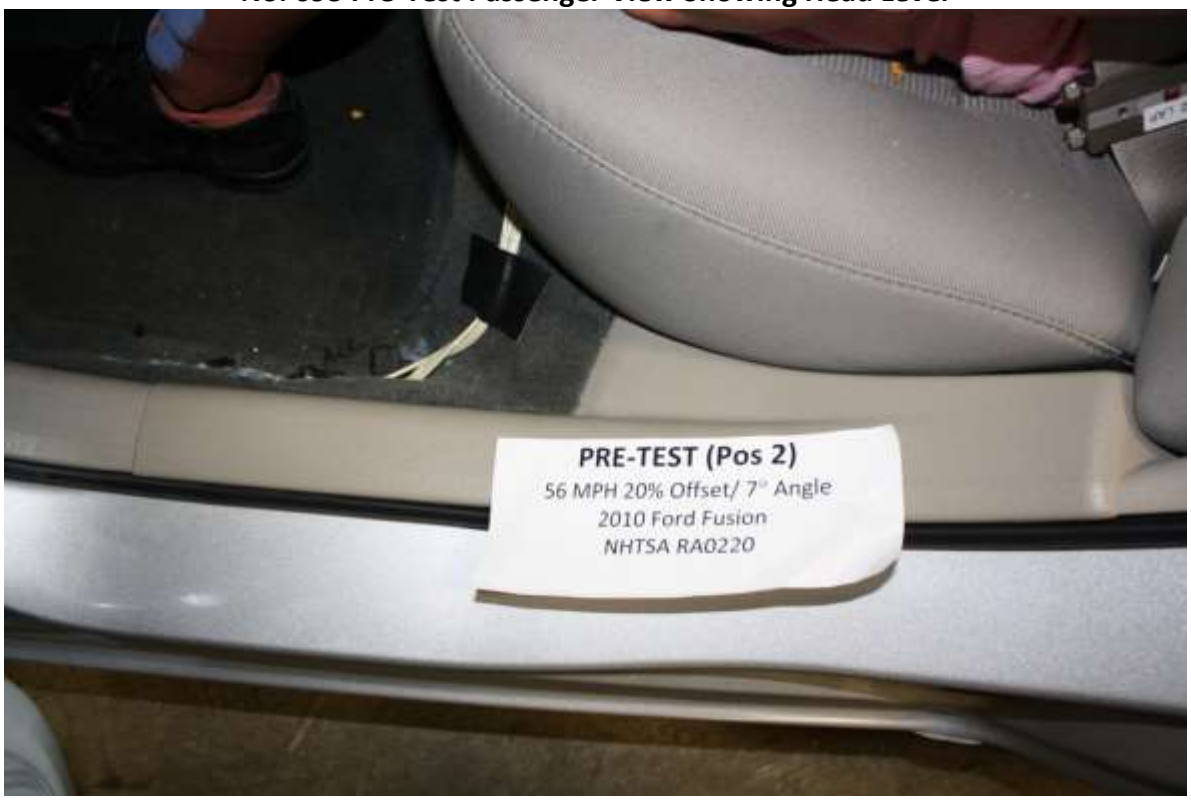
No. 091 Pre-Test View of Passenger Dummy Door Clearance

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

No. 093 Pre-Test Passenger View Showing Head Level



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

Photo Not Applicable

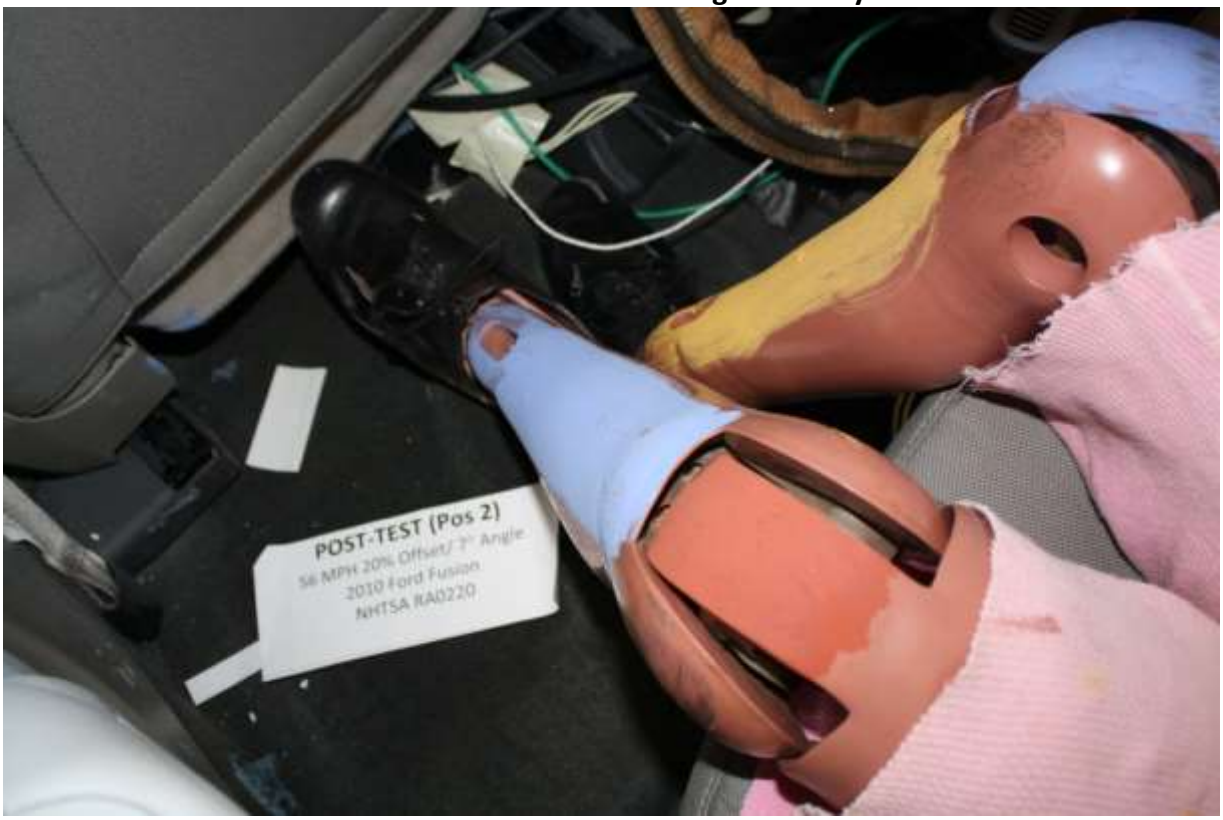
P4 Angle not adjustable

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 contact with airbag

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)

Photo Not Applicable

No knee contact with seat back

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

Photo Not Applicable

No ballast added

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No. 104 Post-Test Speed Trap Readout

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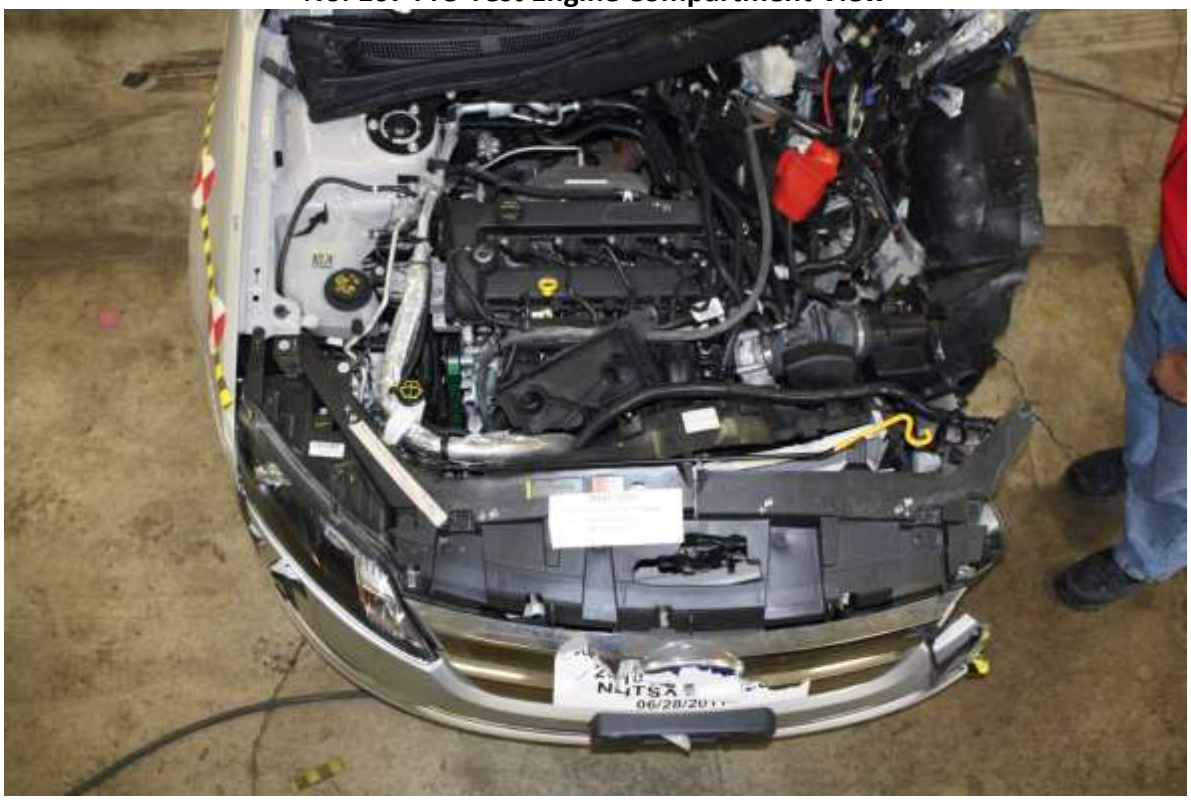
No. 106 Post-Test View of Fuel Filler Cap

No. 107 Pre-Test Engine Compartment View



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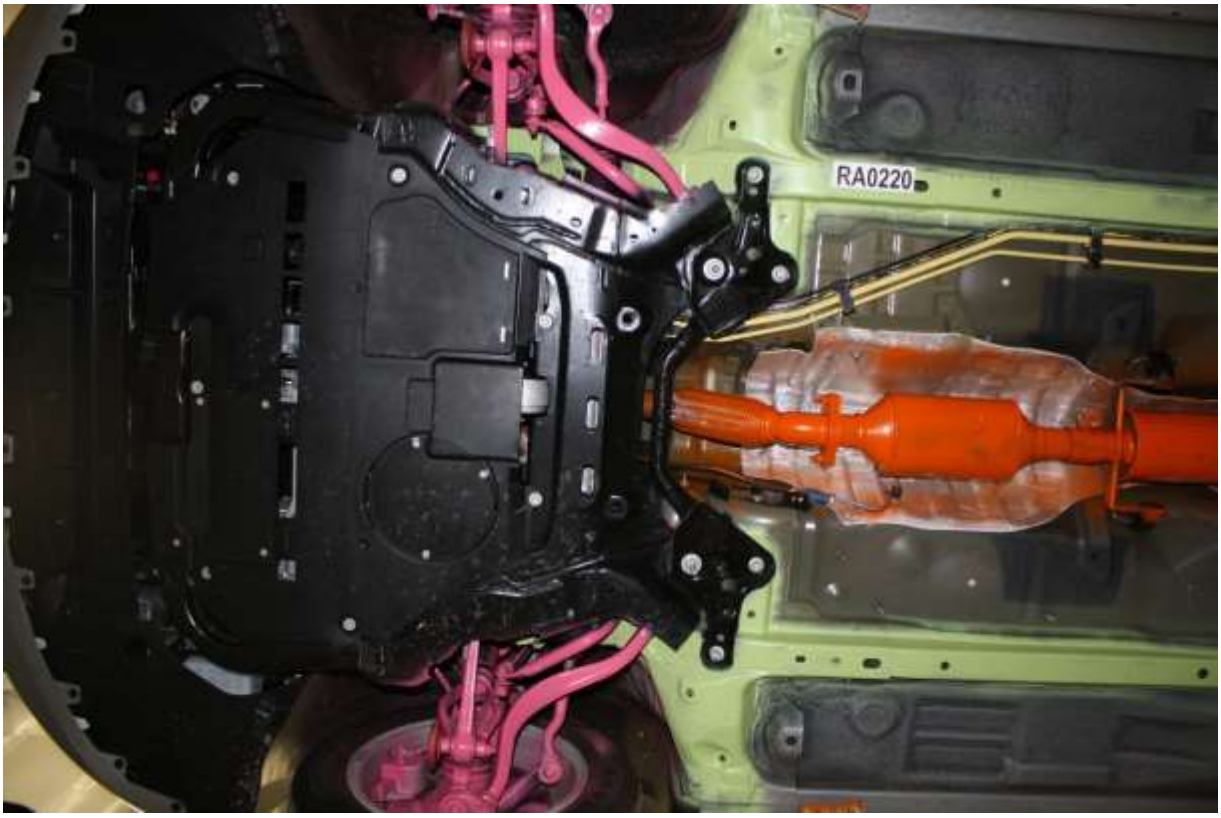

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No. 110 Post-Test View of Front Underbody (perpendicular to vehicle)

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

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

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

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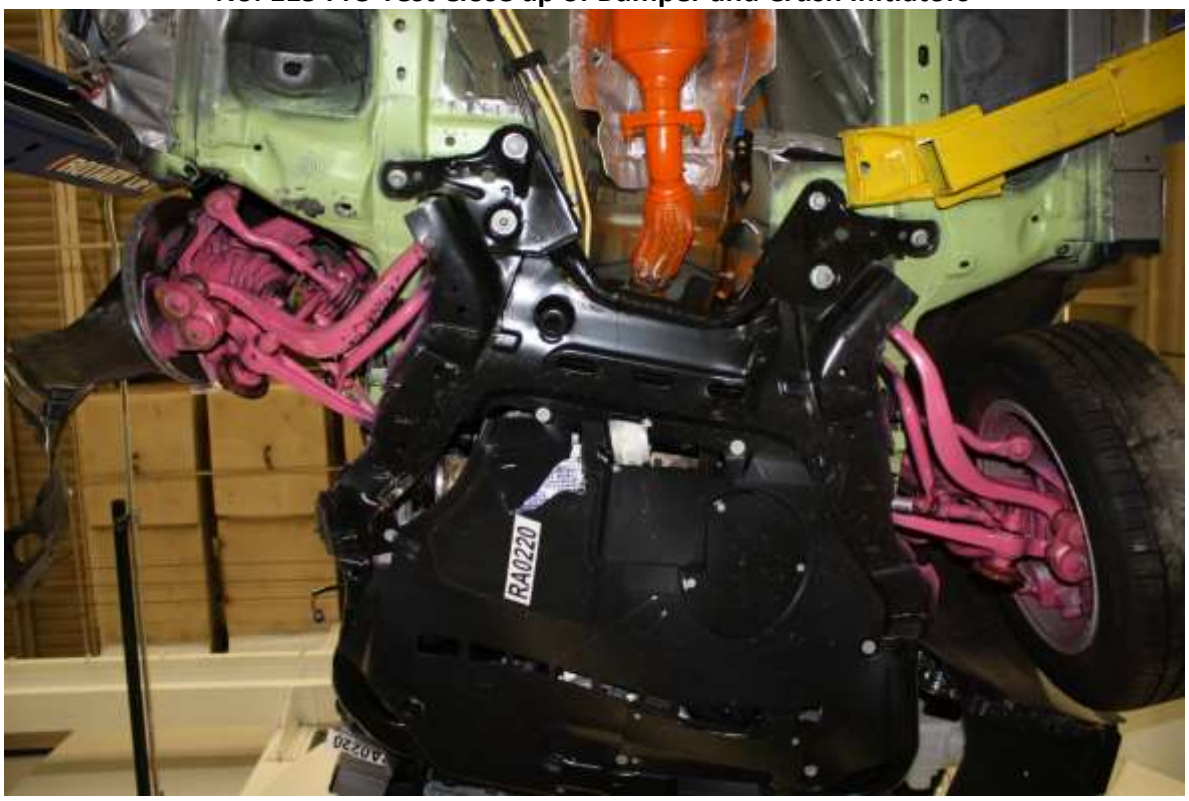

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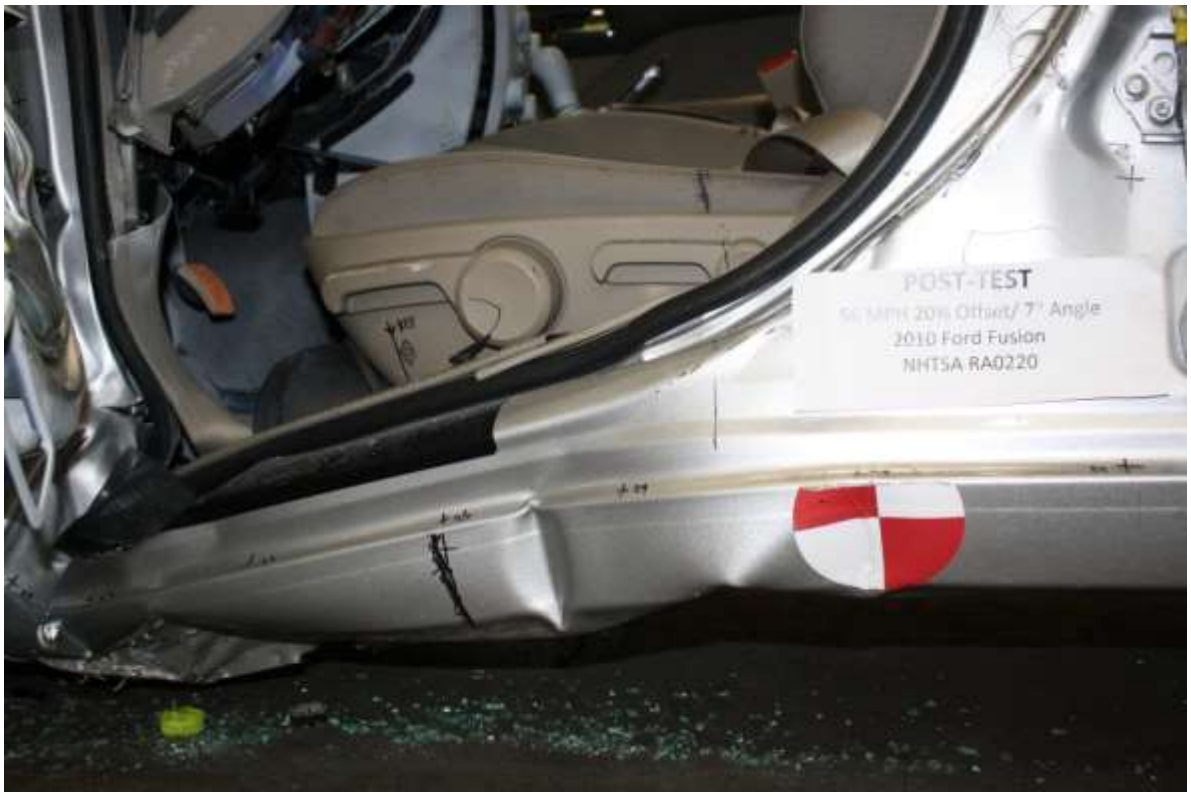
No. 124 Post-Test View of Deformation of C pillar

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



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

Photo Not Applicable

No Windshield Seperation

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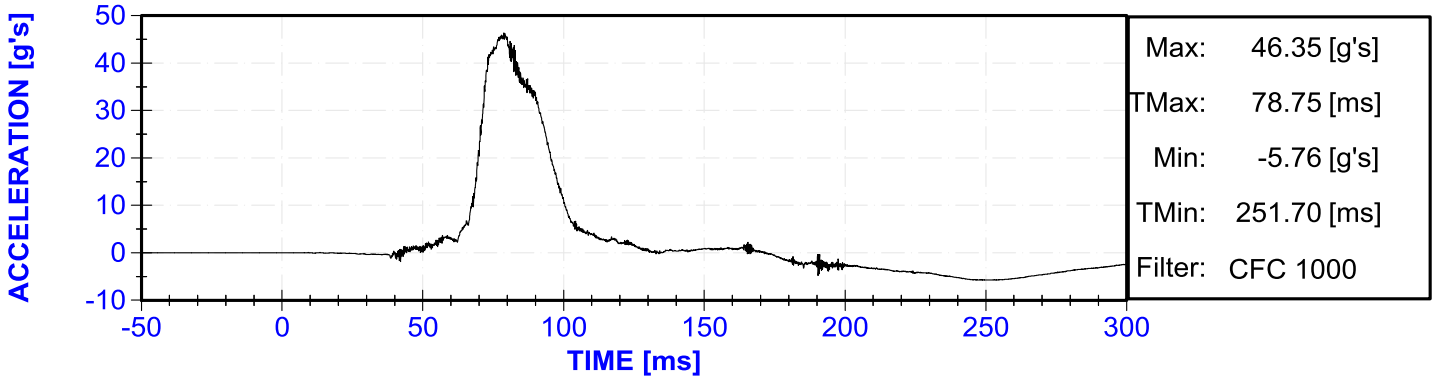
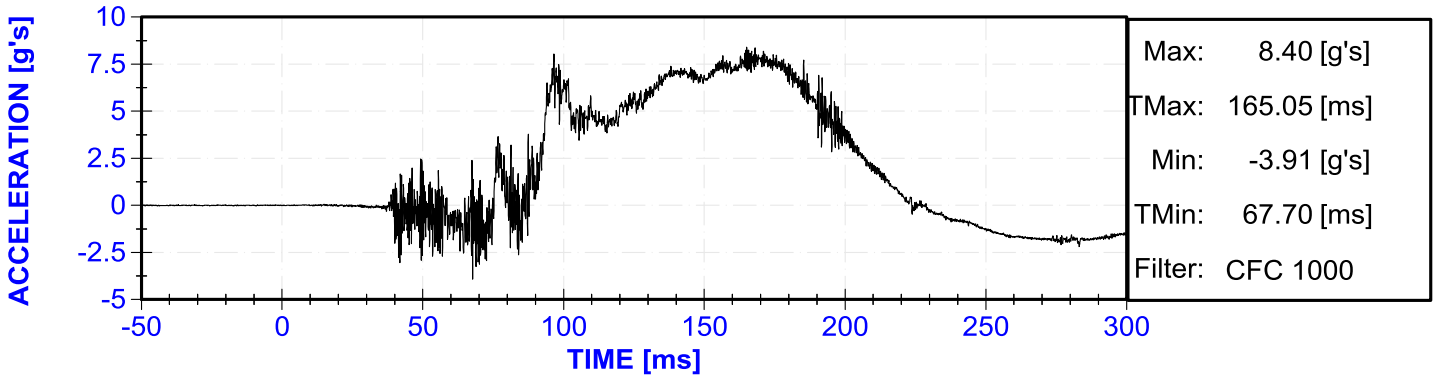
Plot 255	V2P4 CHEST UPPER LEFT Y [COMPUTED, MM]	B-70
Plot 256	V2P4 CHEST UPPER RIGHT X [COMPUTED, MM]	B-70
Plot 257	V2P4 CHEST UPPER RIGHT Y [COMPUTED, MM]	B-71
Plot 258	V2P4 CHEST LOWER LEFT X [COMPUTED, MM]	B-71
Plot 259	V2P4 CHEST LOWER LEFT Y [COMPUTED, MM]	B-71
Plot 260	V2P4 CHEST LOWER RIGHT X [COMPUTED, MM]	B-71
Plot 261	V2P4 CHEST LOWER RIGHT Y [COMPUTED, MM]	B-72

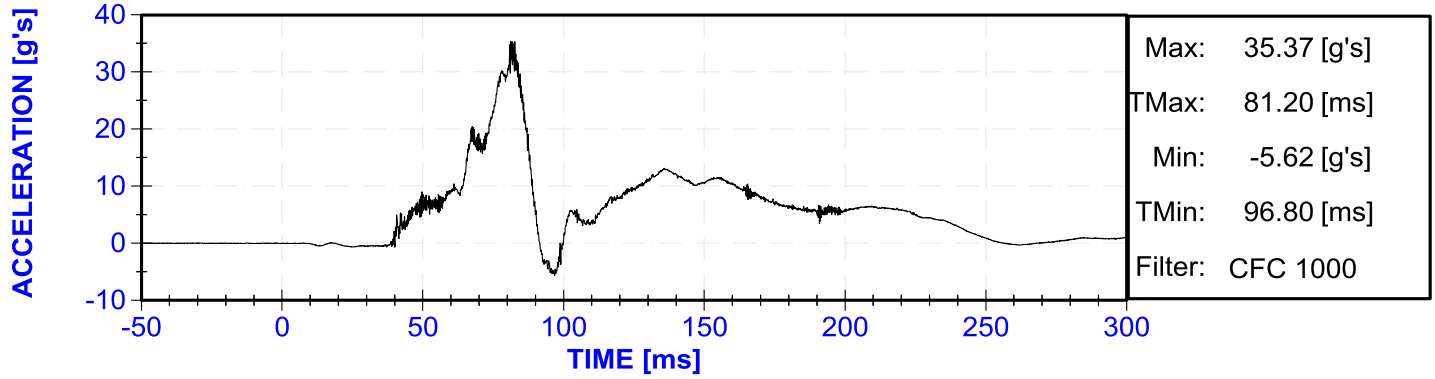
V2P1 Head CG X Acceleration



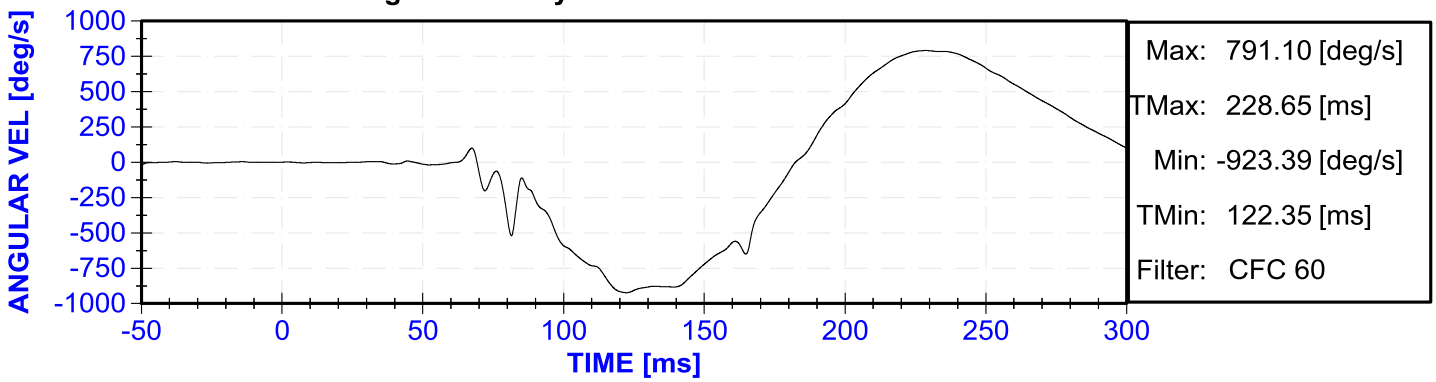
V2P1 Head CG Y Acceleration



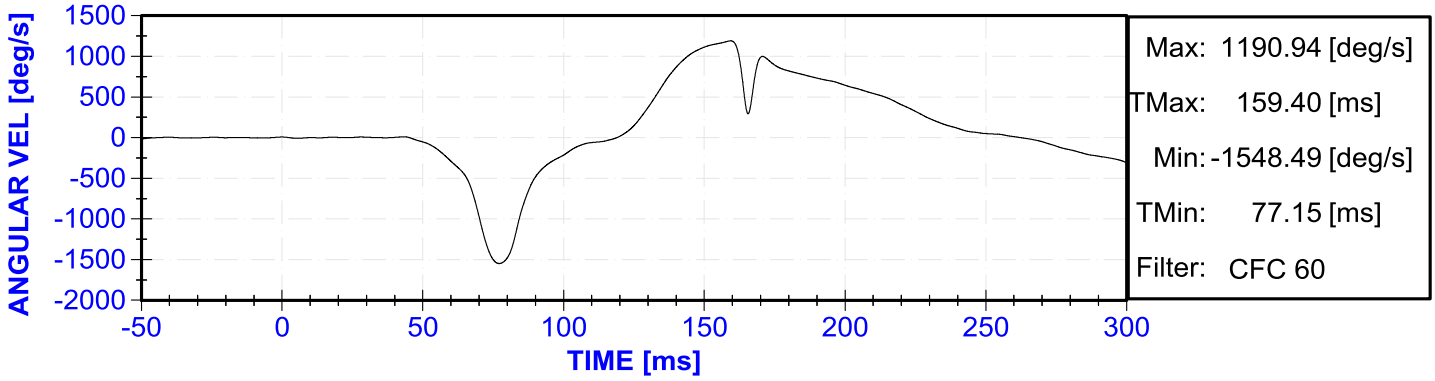
V2P1 Head CG Z Acceleration



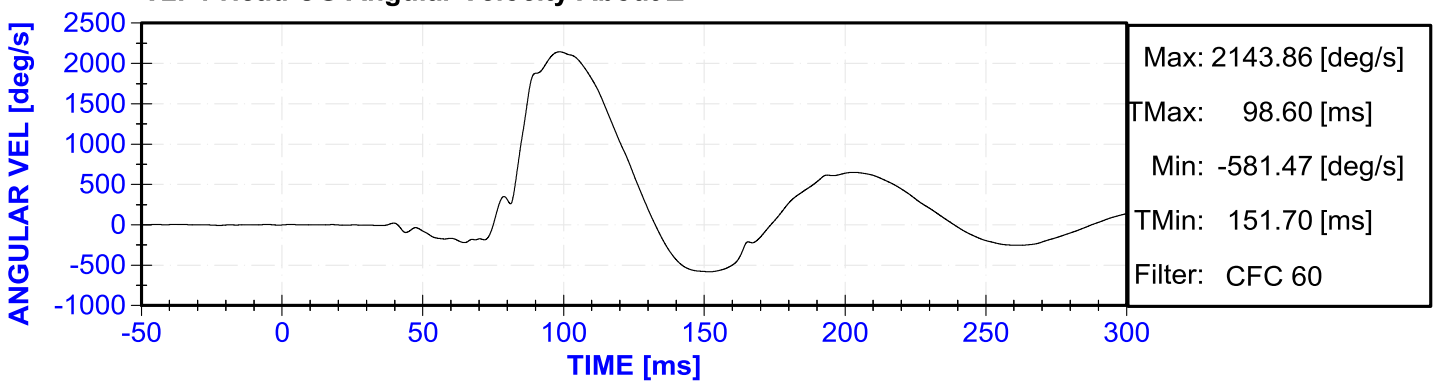
V2P1 Head CG Angular Velocity About X



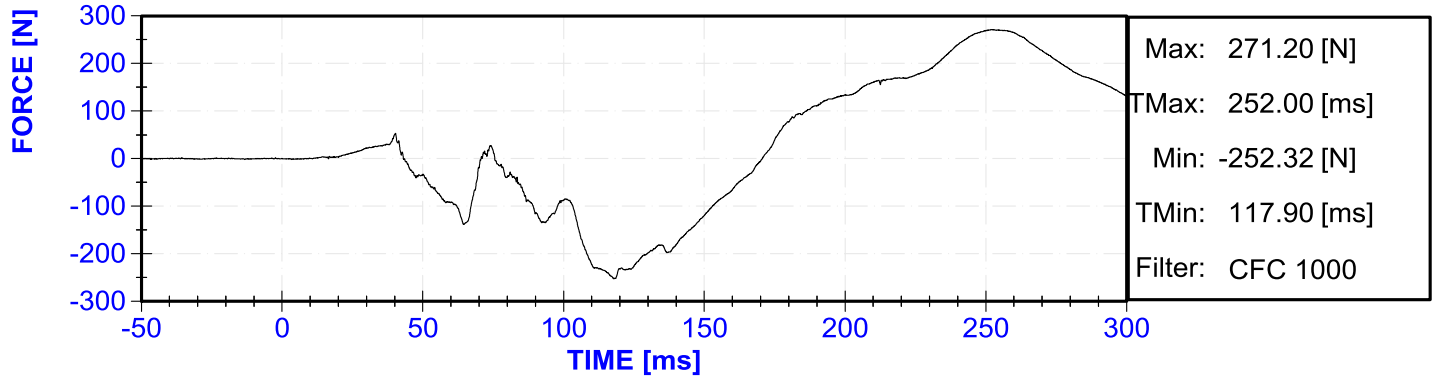
V2P1 Head CG Angular Velocity About Y



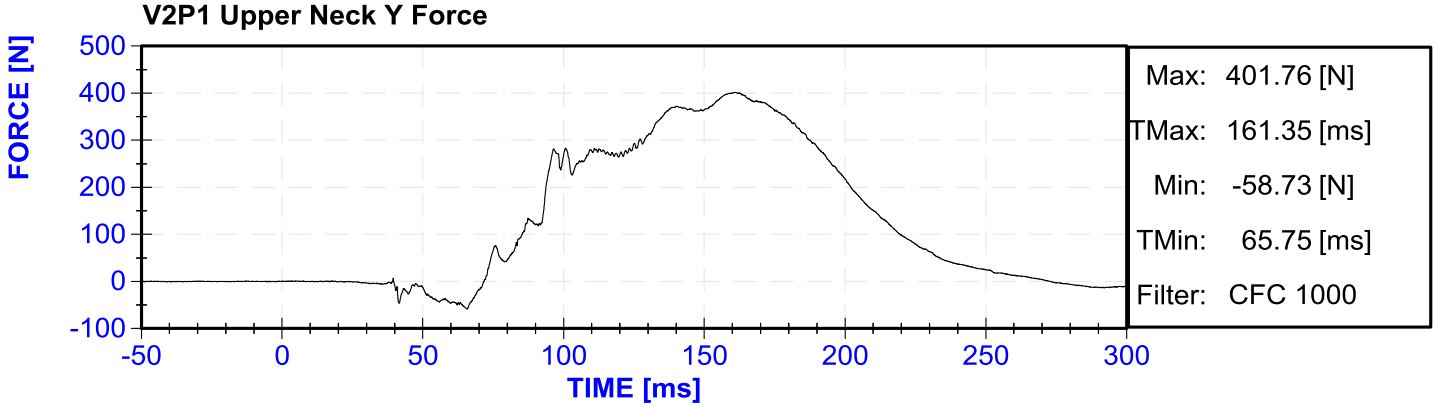
V2P1 Head CG Angular Velocity About Z



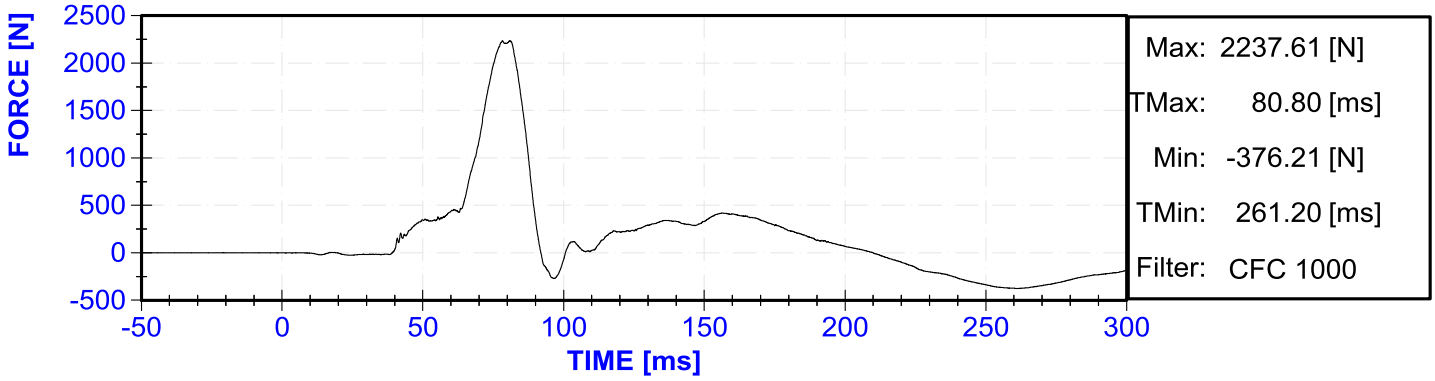
V2P1 Upper Neck X Force



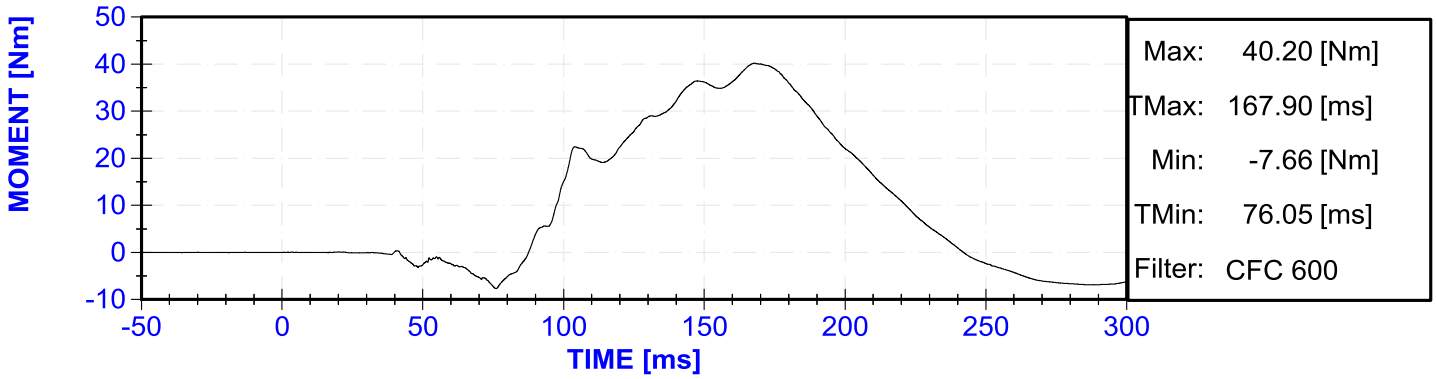
V2P1 Upper Neck Y Force



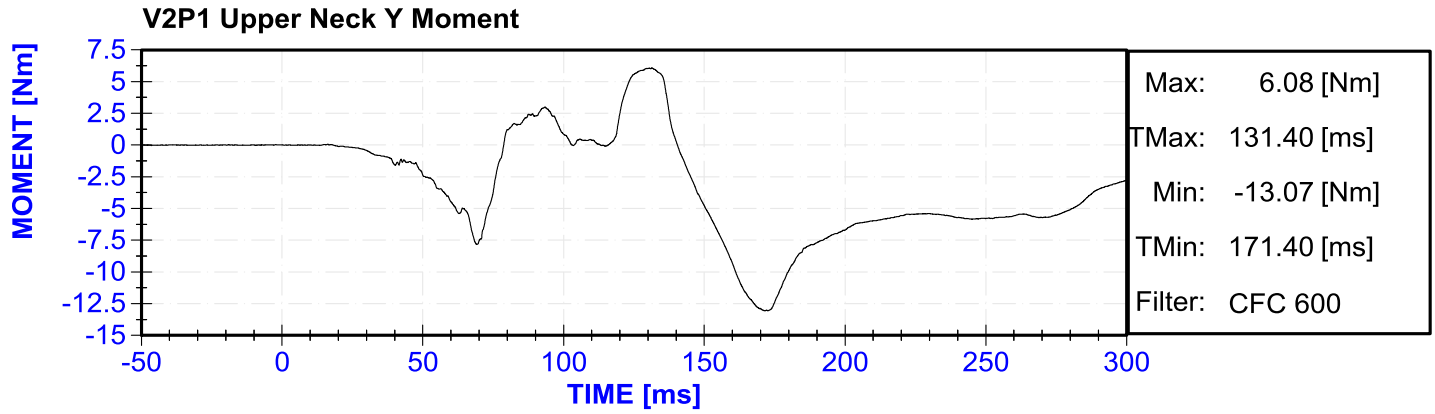
V2P1 Upper Neck Z Force



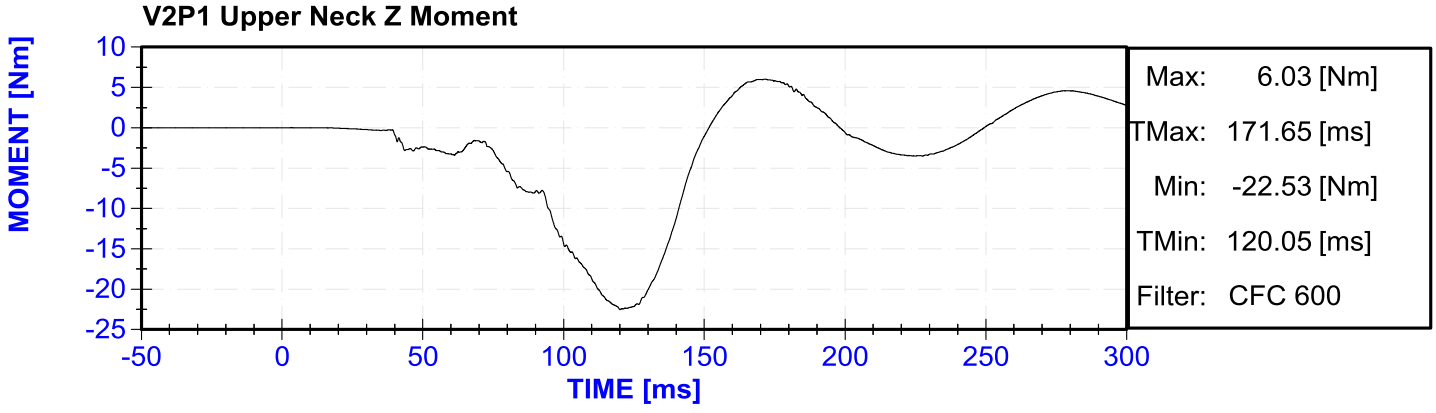
V2P1 Upper Neck X Moment



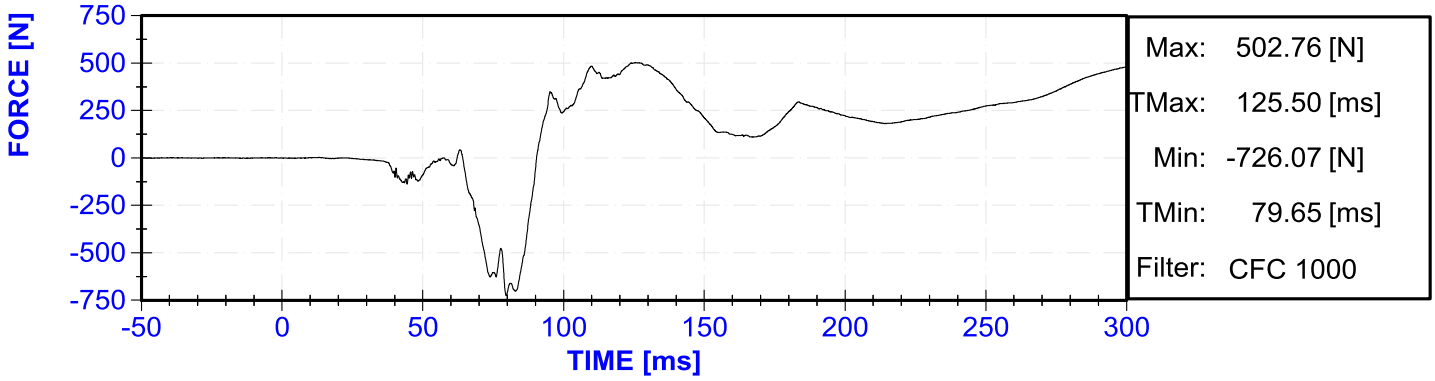
V2P1 Upper Neck Y Moment



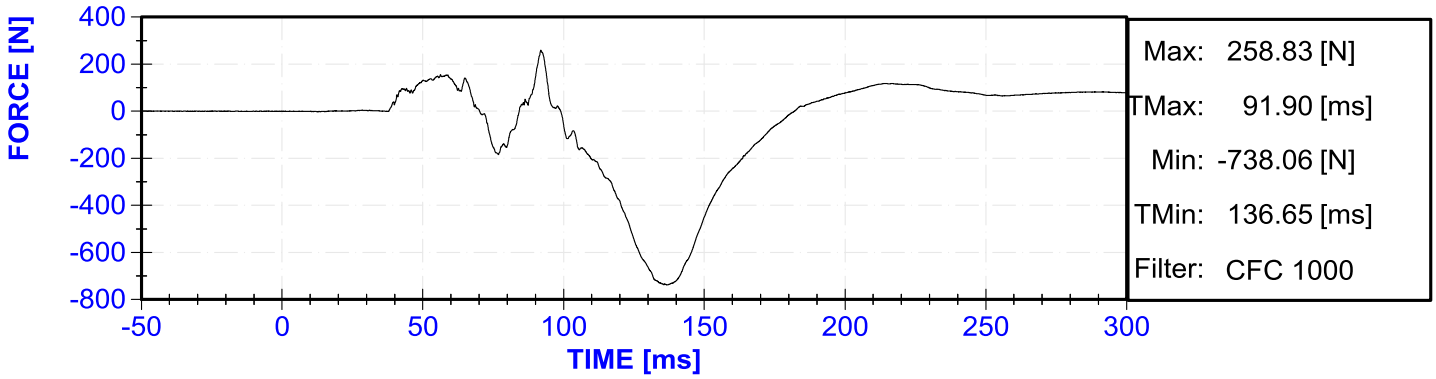
V2P1 Upper Neck Z Moment



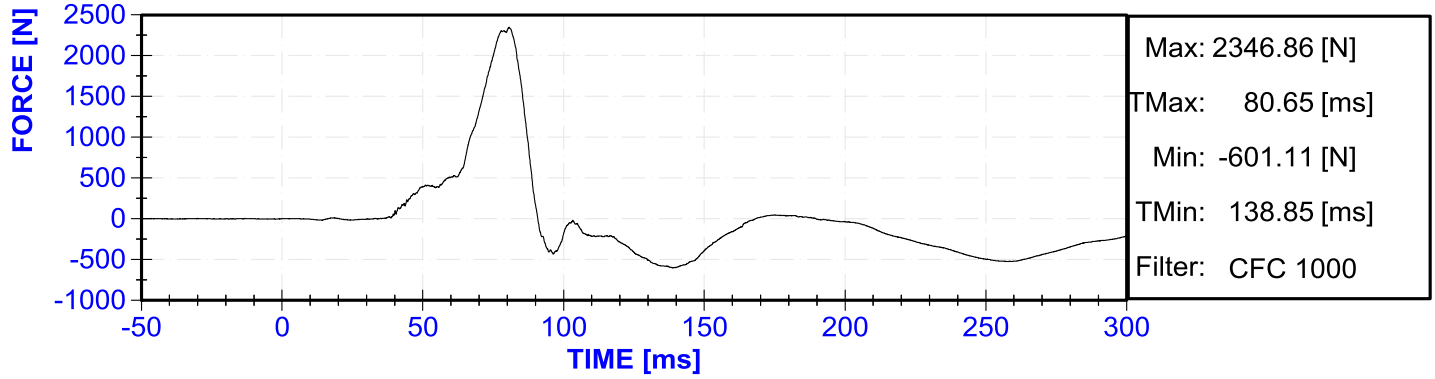
V2P1 Lower Neck X Force



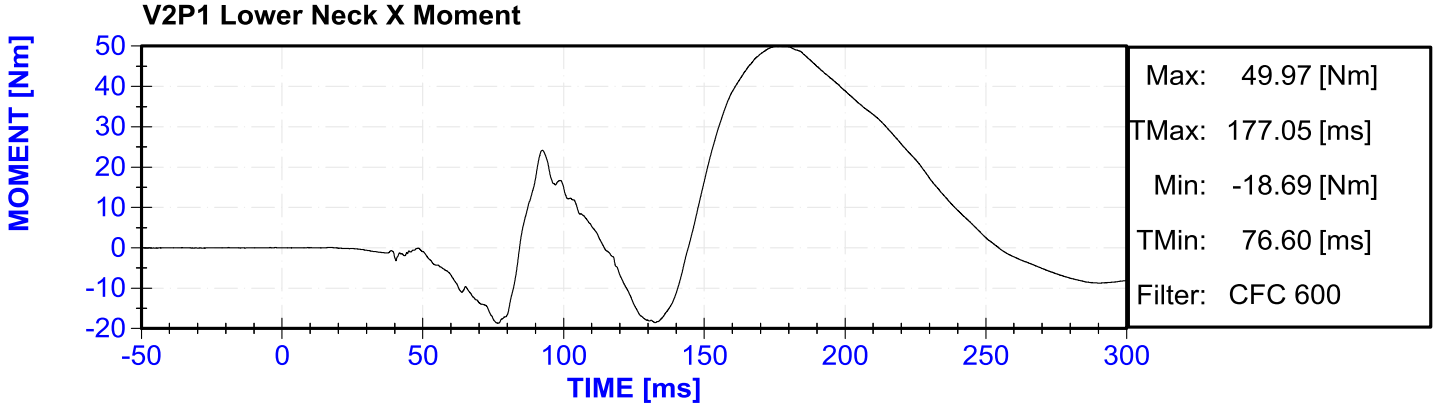
V2P1 Lower Neck Y Force



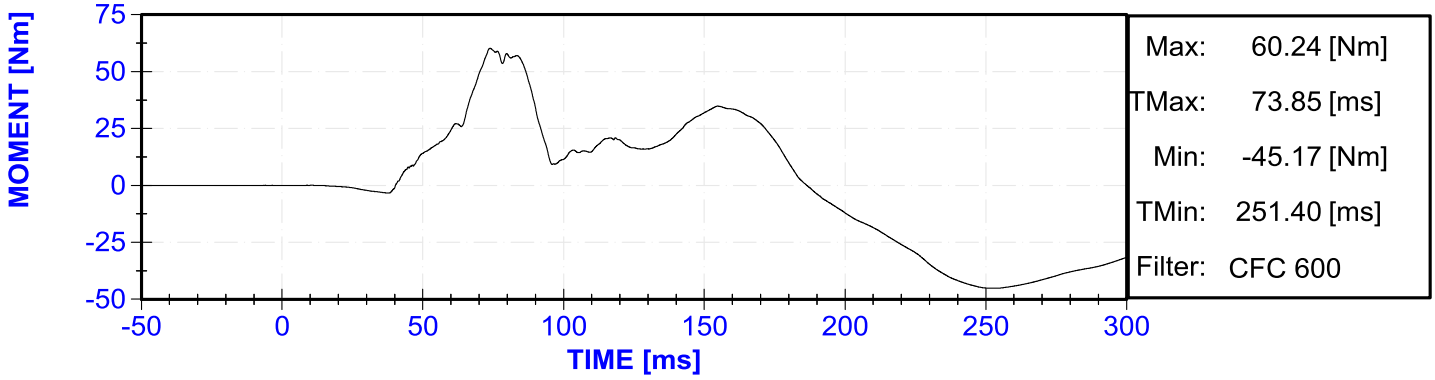
V2P1 Lower Neck Z Force



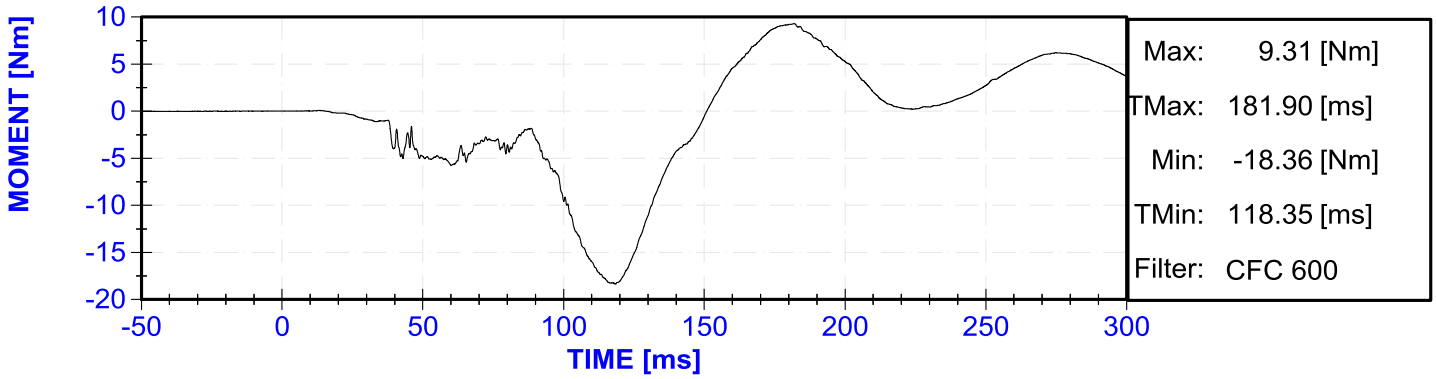
V2P1 Lower Neck X Moment



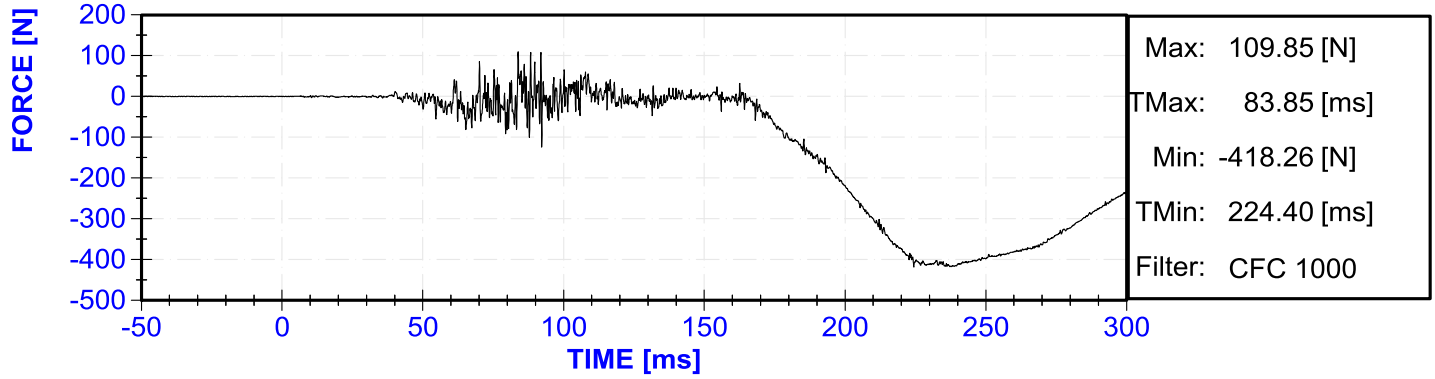
V2P1 Lower Neck Y Moment



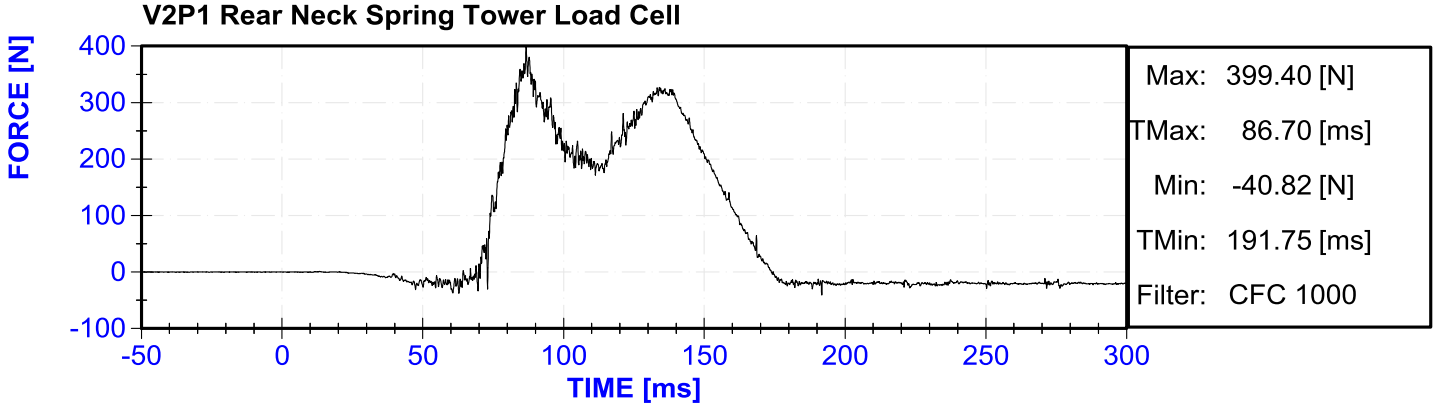
V2P1 Lower Neck Z Moment



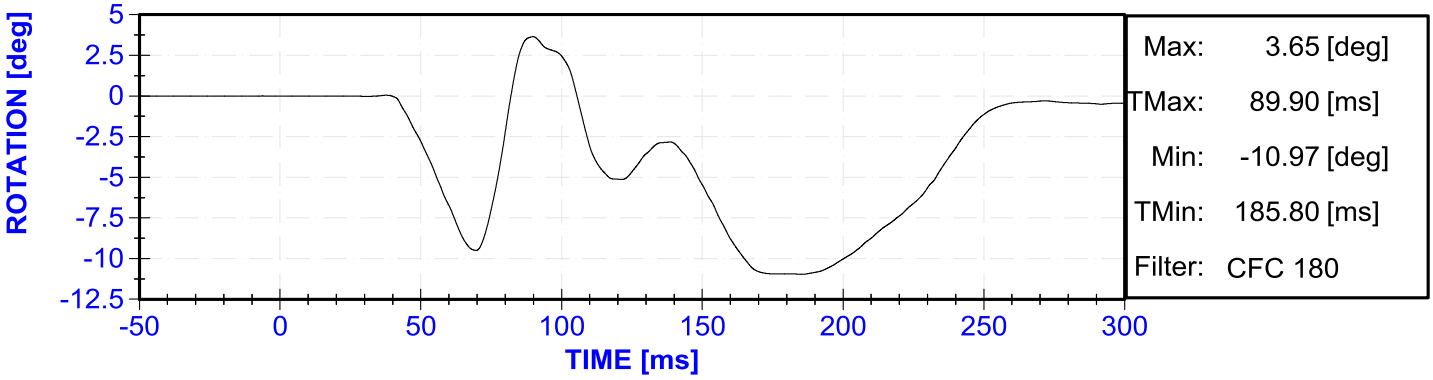
V2P1 Front Neck Spring Tower Load Cell



V2P1 Rear Neck Spring Tower Load Cell

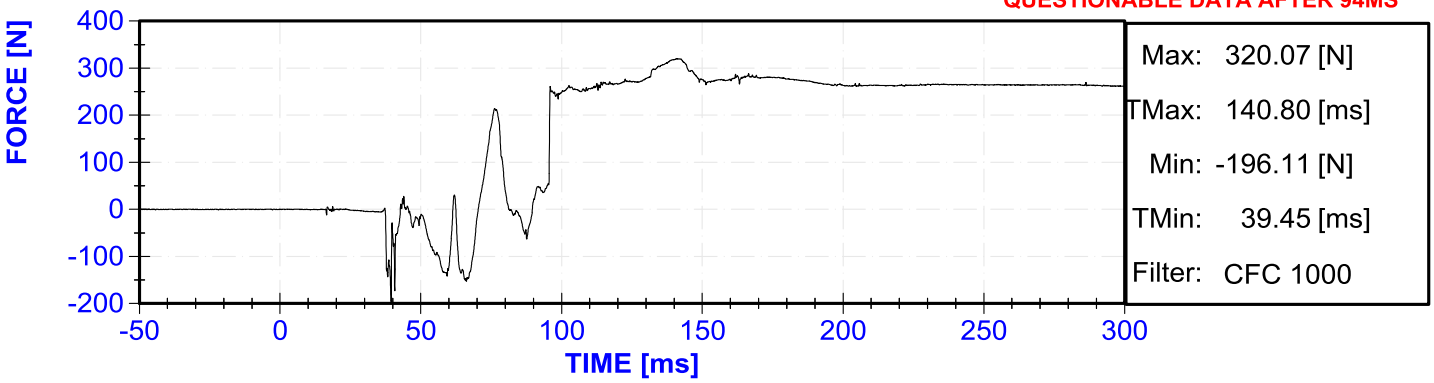


V2P1 Occipital Condyle Rotation Potentiometer

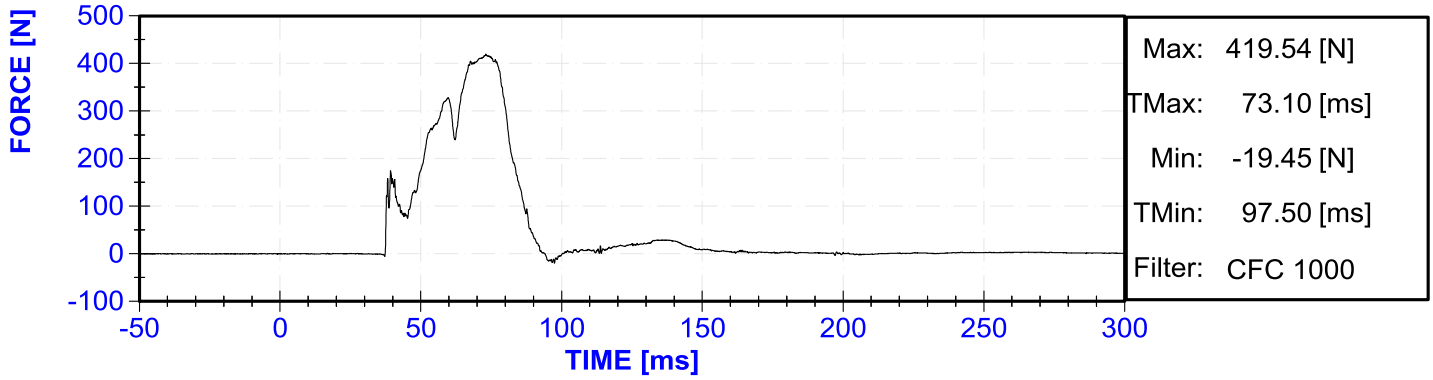


V2P1 CLAVICLE - LEFT OUTER LC FX

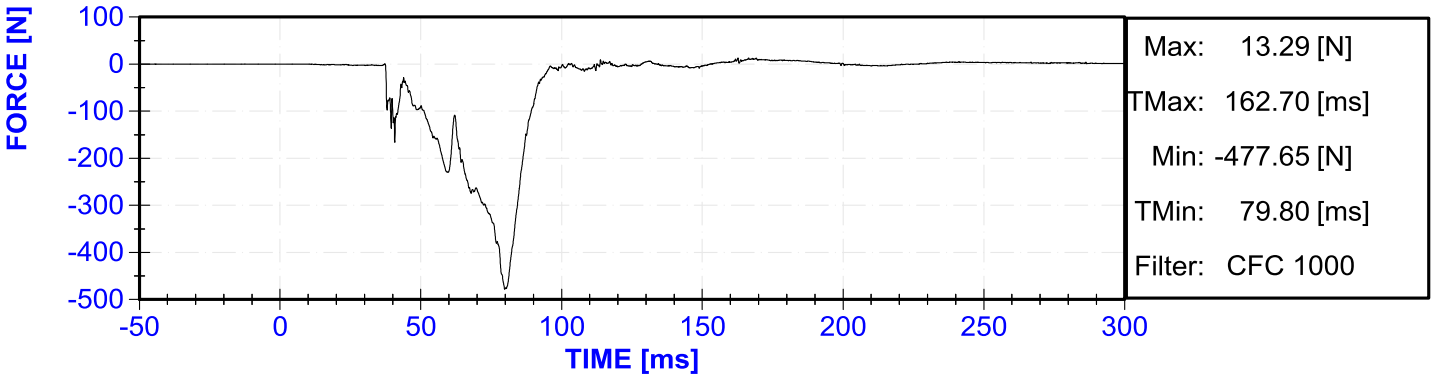
QUESTIONABLE DATA AFTER 94MS



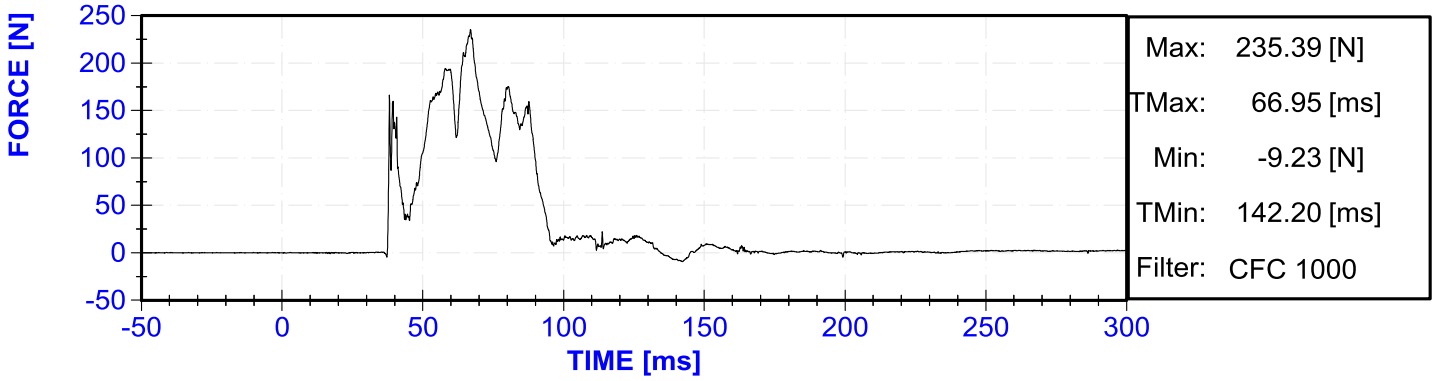
V2P1 CLAVICLE - LEFT OUTER LC FZ



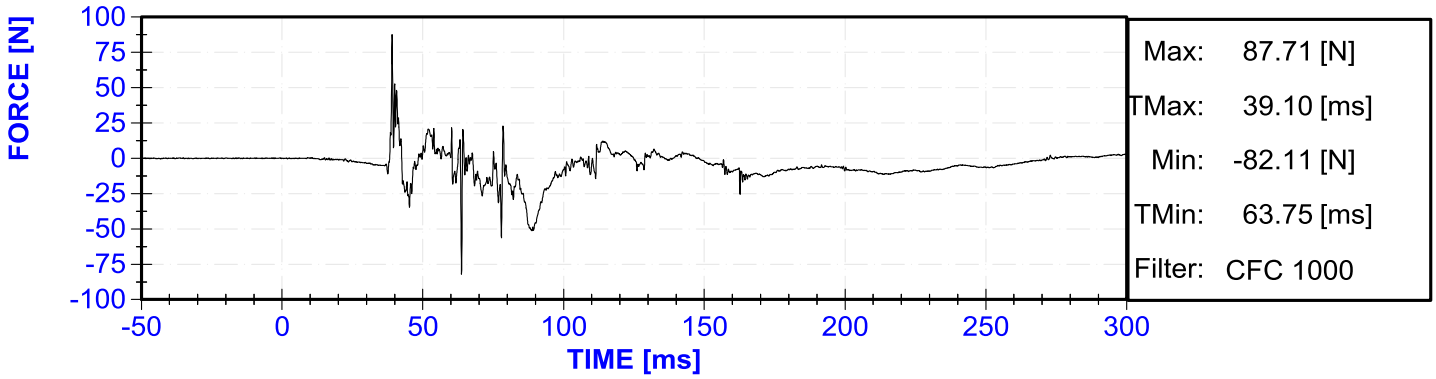
V2P1 CLAVICLE - LEFT INNER LC FX



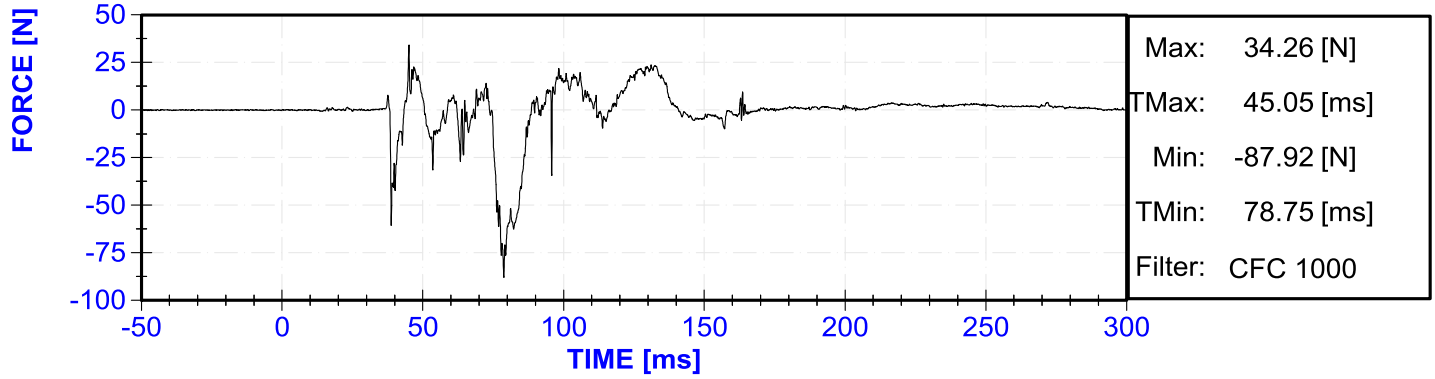
V2P1 CLAVICLE - LEFT INNER LC FZ



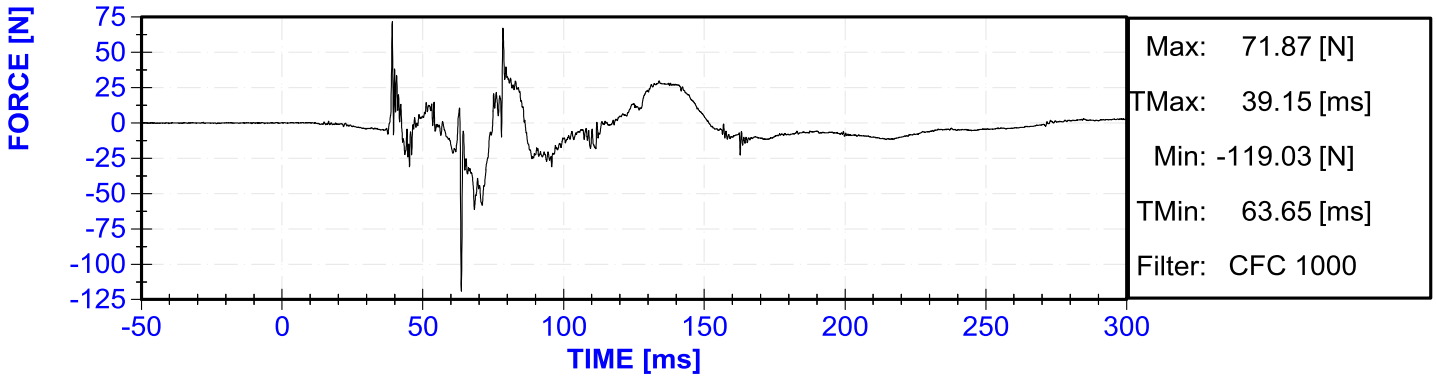
V2P1 CLAVICLE - RIGHT OUTER LC FX



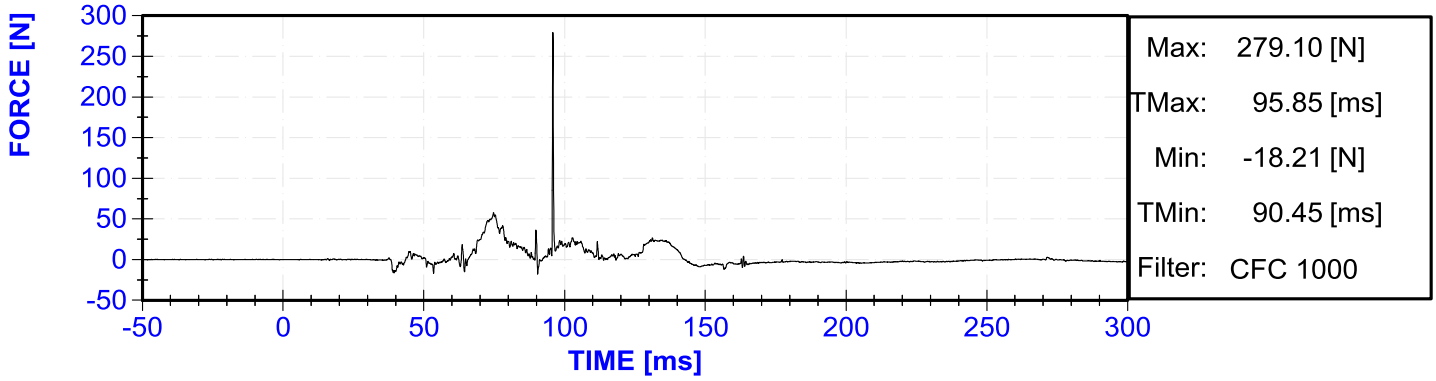
V2P1 CLAVICLE - RIGHT OUTER LC FZ



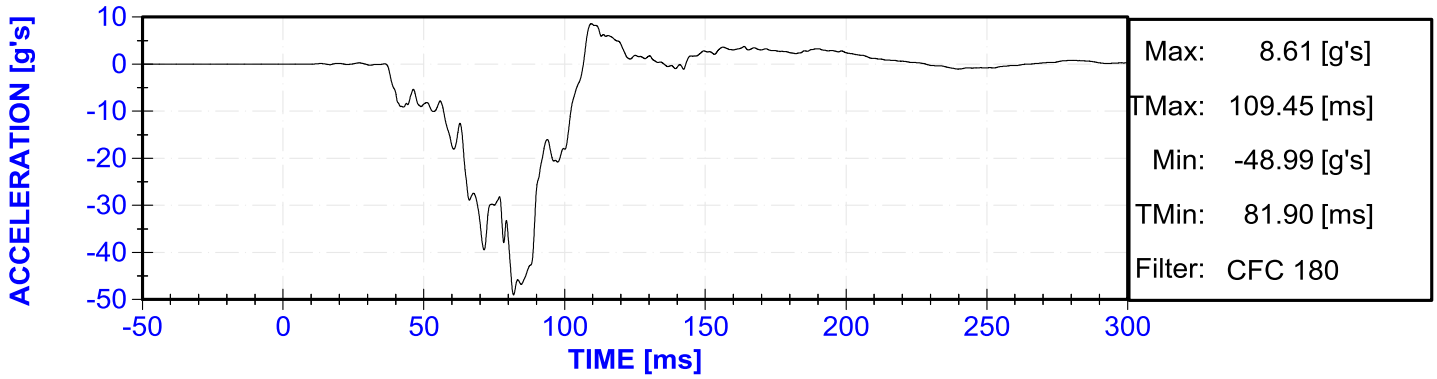
V2P1 CLAVICLE - RIGHT INNER LC FX



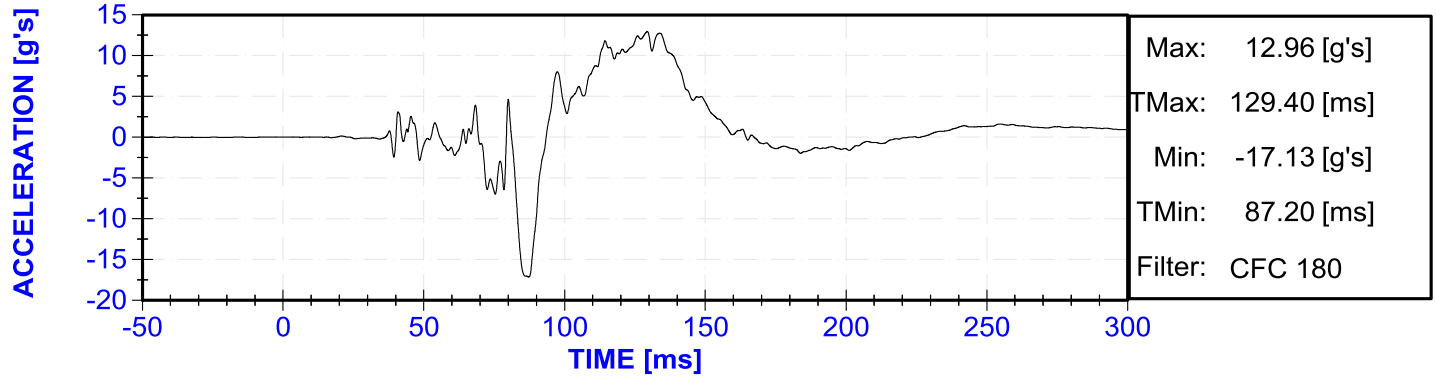
V2P1 CLAVICLE - RIGHT INNER LC FZ



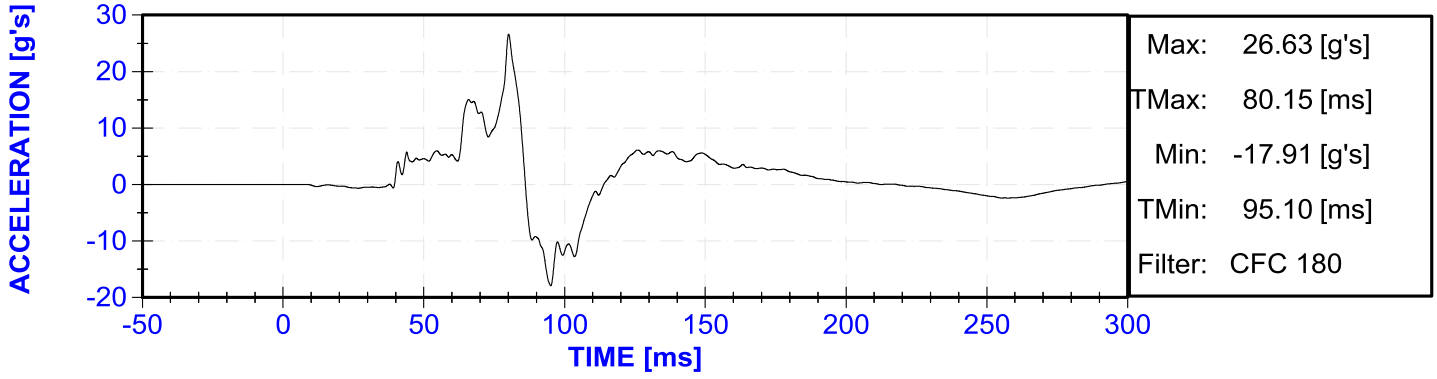
V2P1 T1 X Acceleration



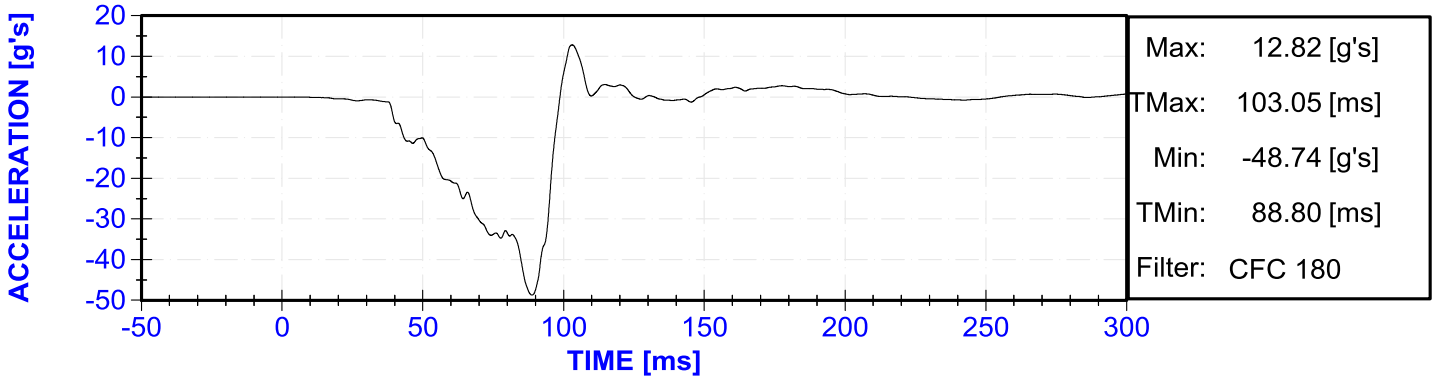
V2P1 T1 Y Acceleration



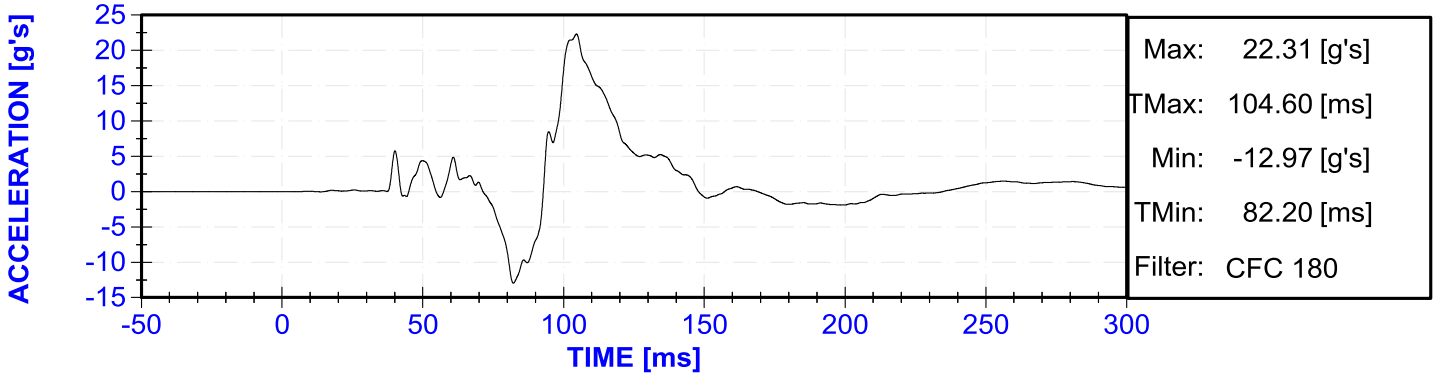
V2P1 T1 Z Acceleration



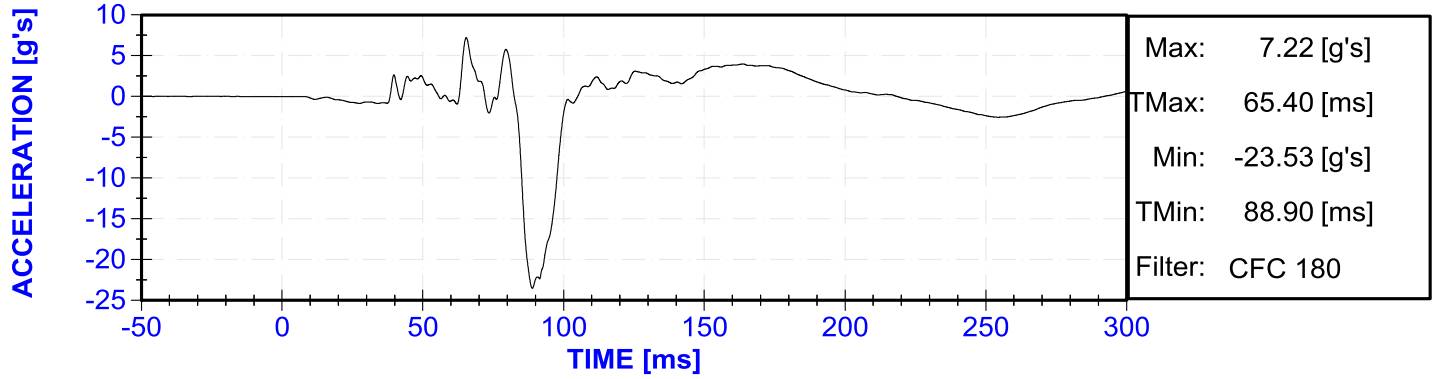
V2P1 T6 X Acceleration



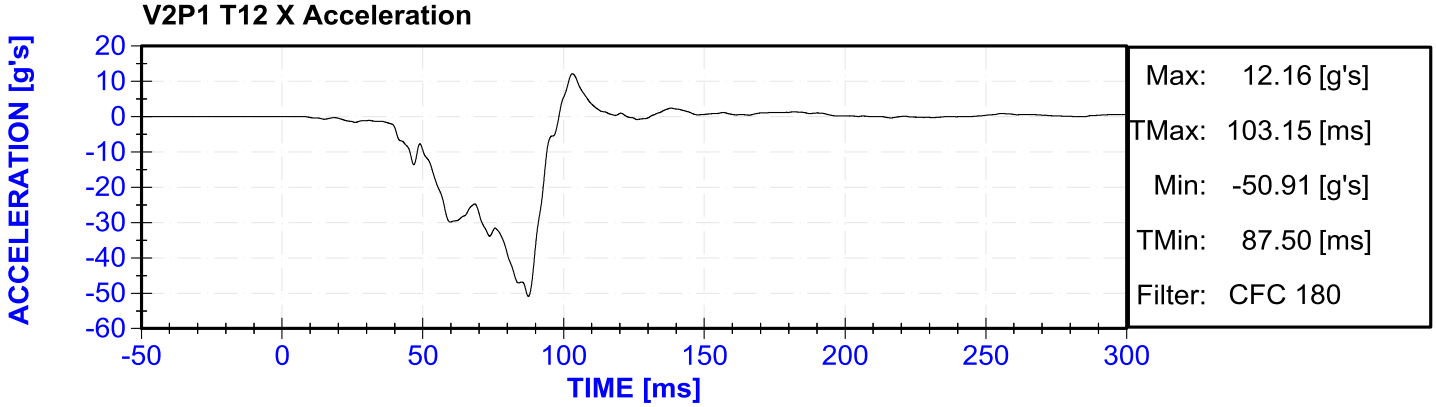
V2P1 T6 Y Acceleration



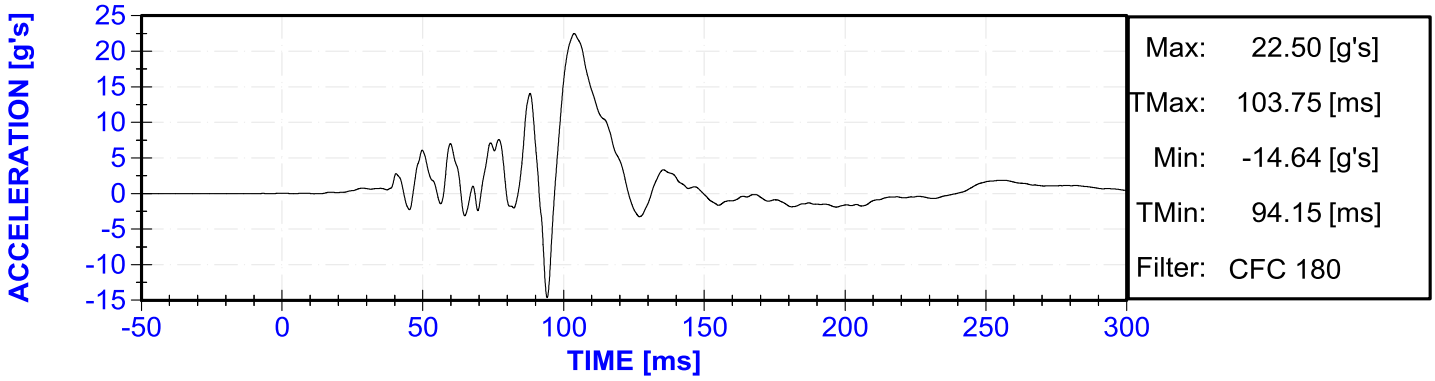
V2P1 T6 Z Acceleration



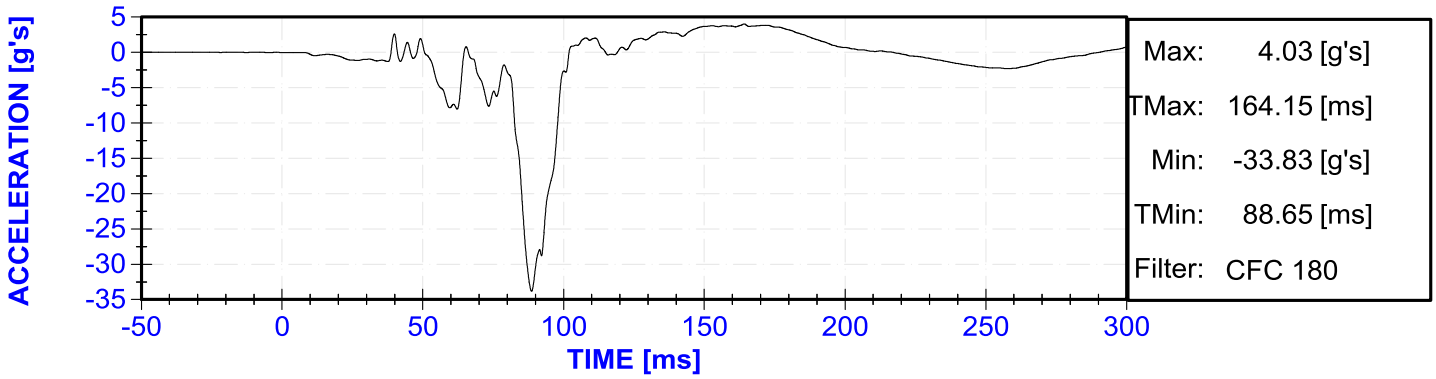
V2P1 T12 X Acceleration



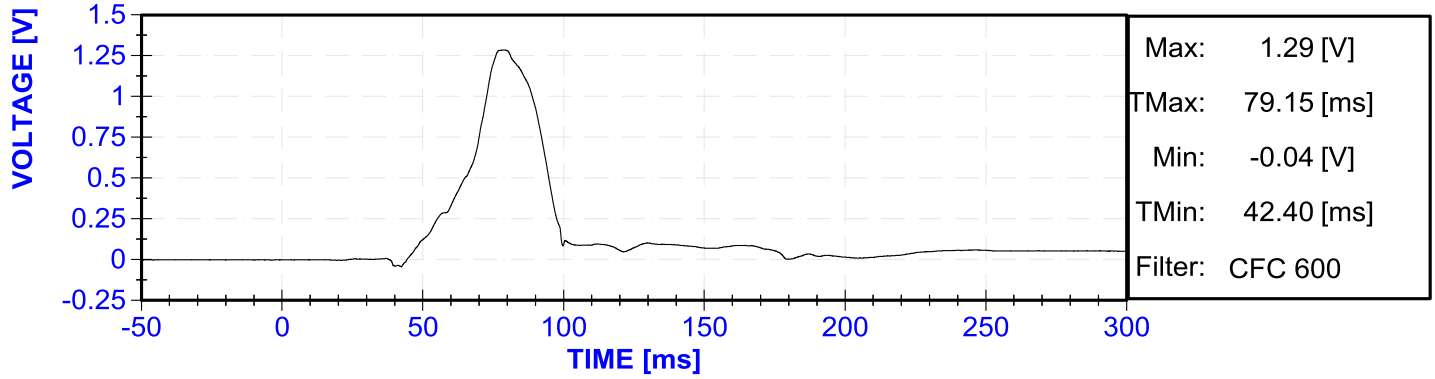
V2P1 T12 Y Acceleration



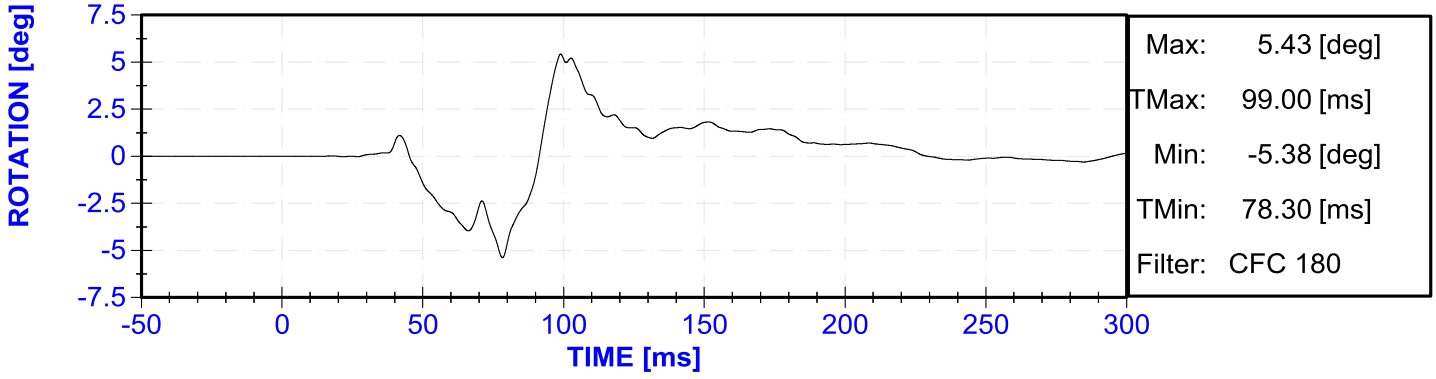
V2P1 T12 Z Acceleration



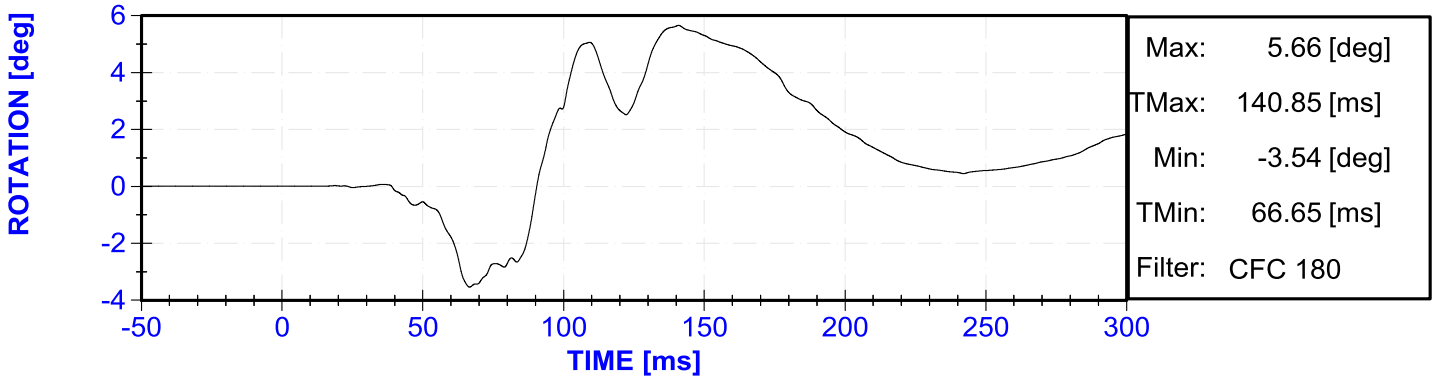
V2P1 Upper Left DGIR X Displacement



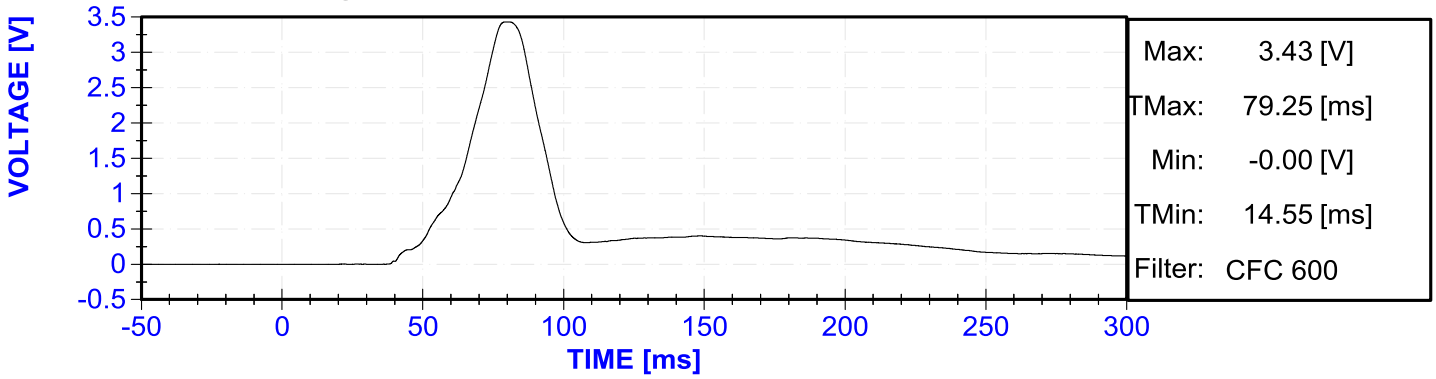
V2P1 Upper Left DGIR Y Rotation



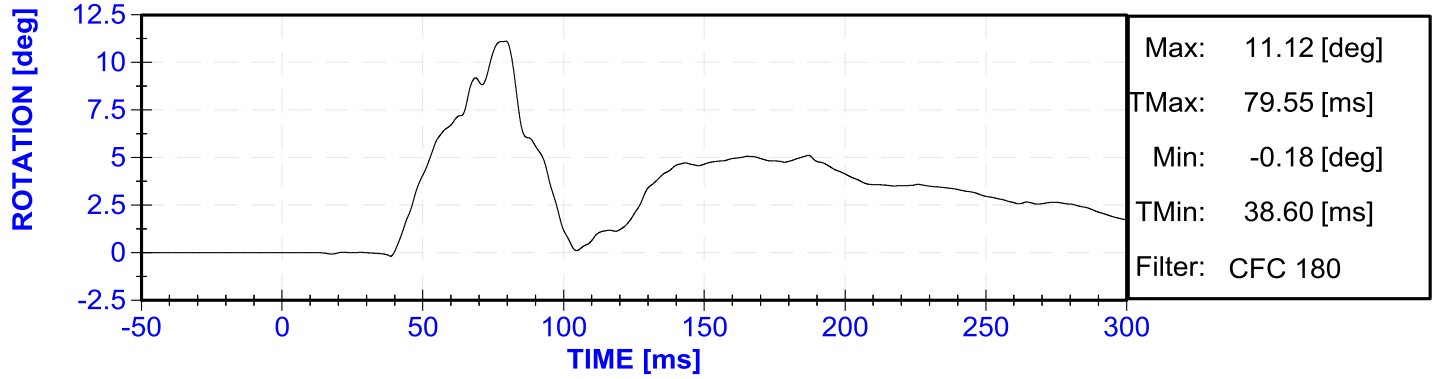
V2P1 Upper Left DGIR Z Rotation



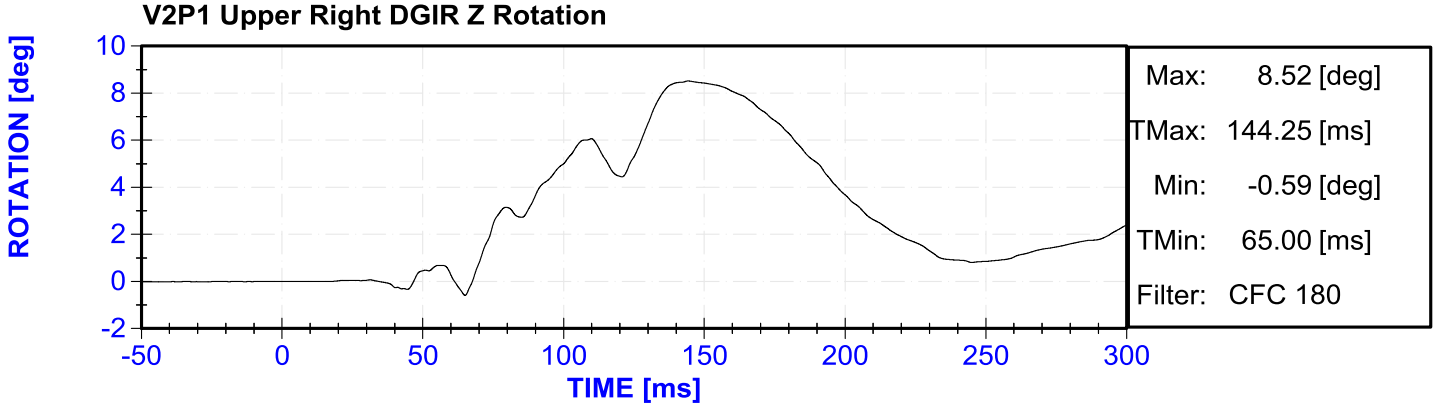
V2P1 Upper Right DGIR X Displacement



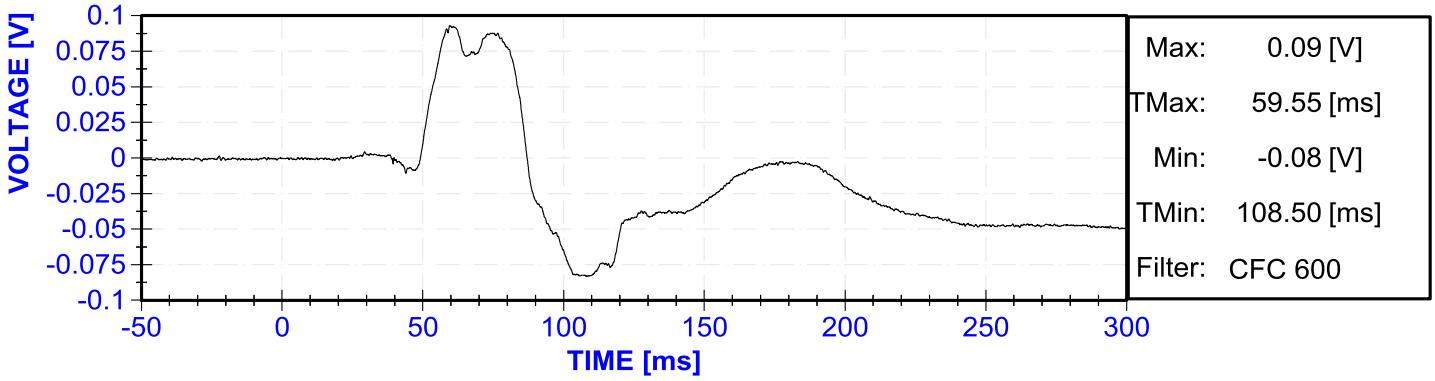
V2P1 Upper Right DGIR Y Rotation



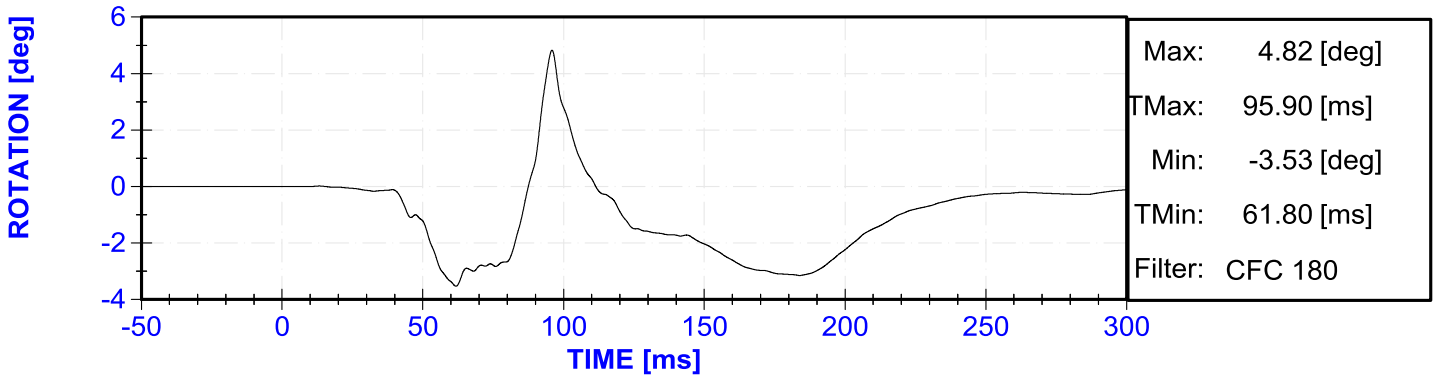
V2P1 Upper Right DGIR Z Rotation



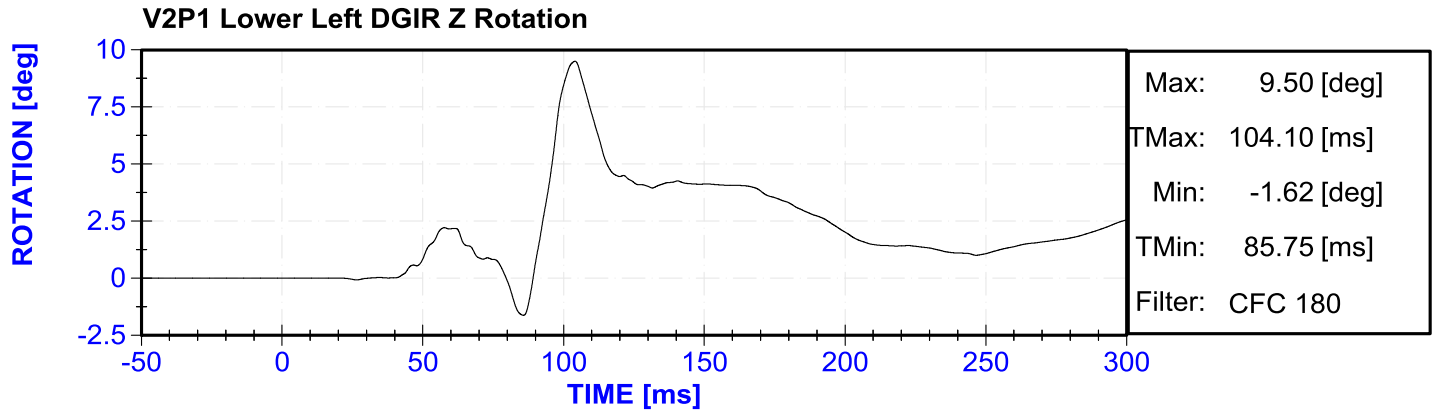
V2P1 Lower Left DGIR X Displacement



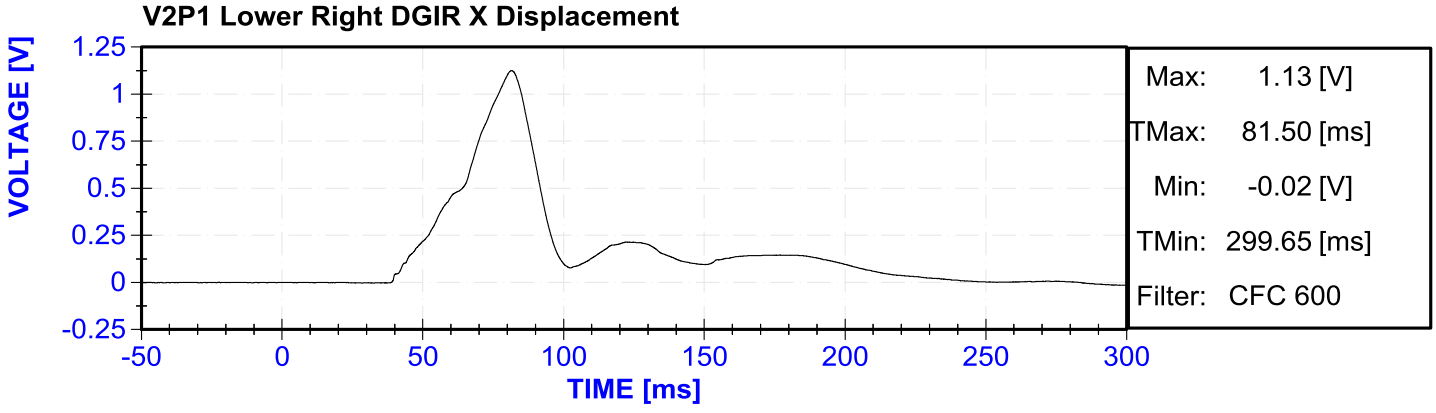
V2P1 Lower Left DGIR Y Rotation



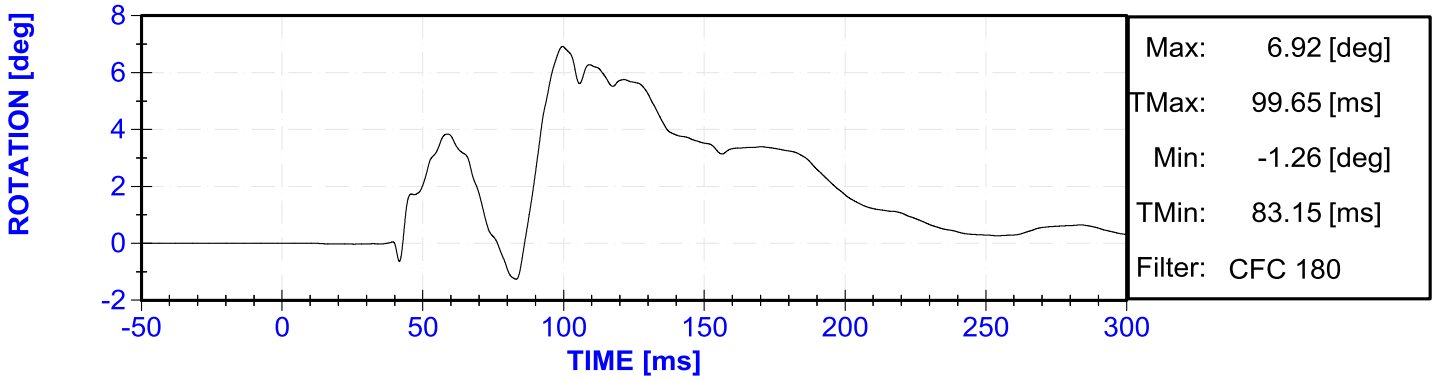
V2P1 Lower Left DGIR Z Rotation



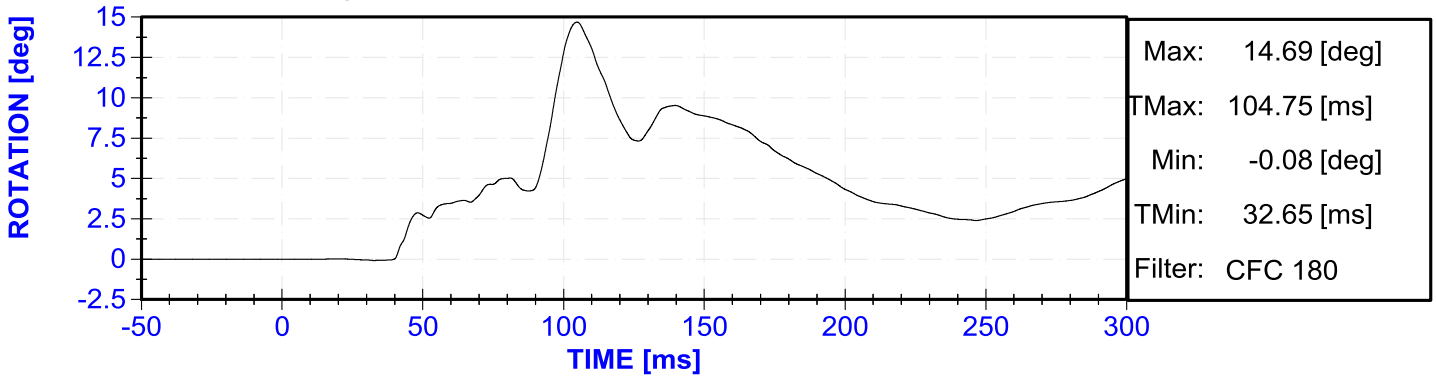
V2P1 Lower Right DGIR X Displacement



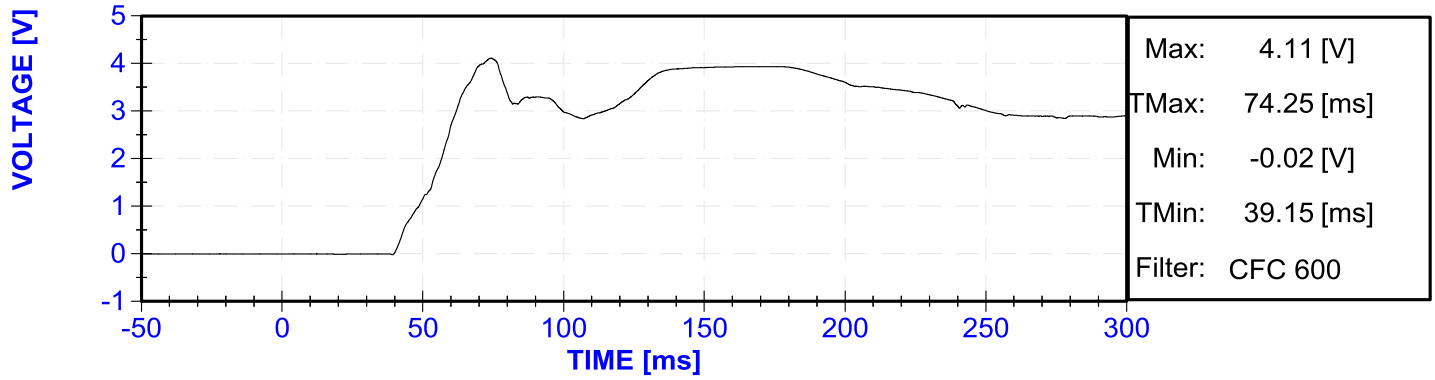
V2P1 Lower Right DGIR Y Rotation



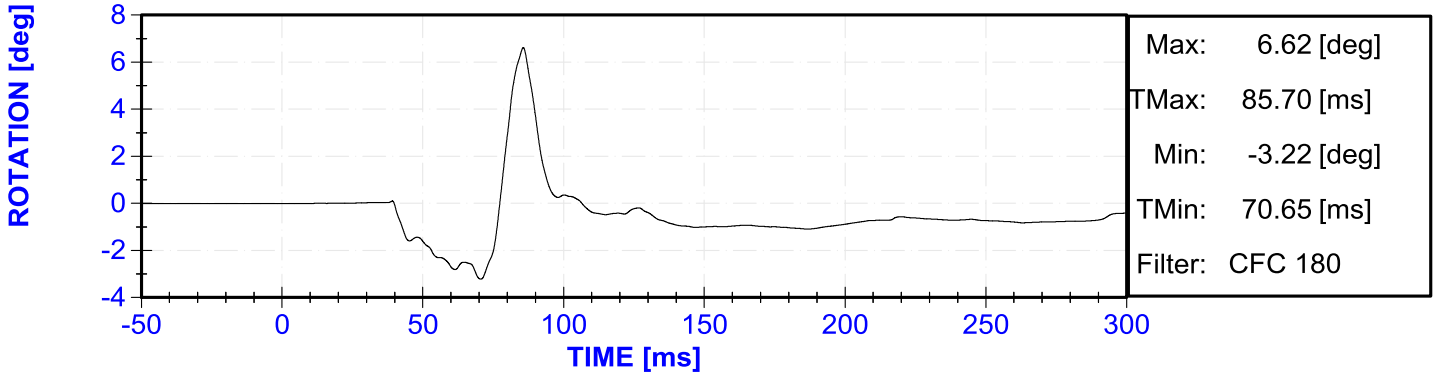
V2P1 Lower Right DGIR Z Rotation



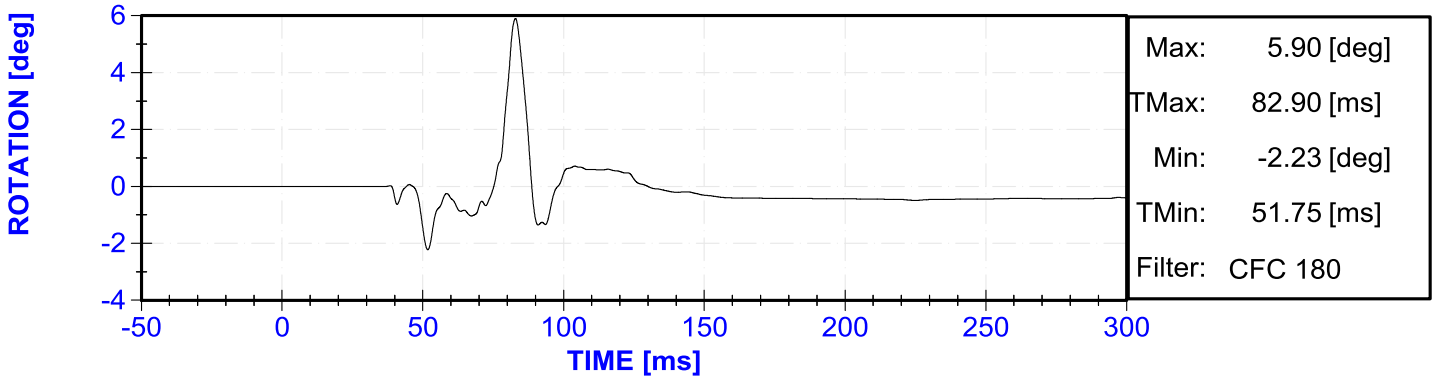
V2P1 Abdomen Left DGIR X Displacement



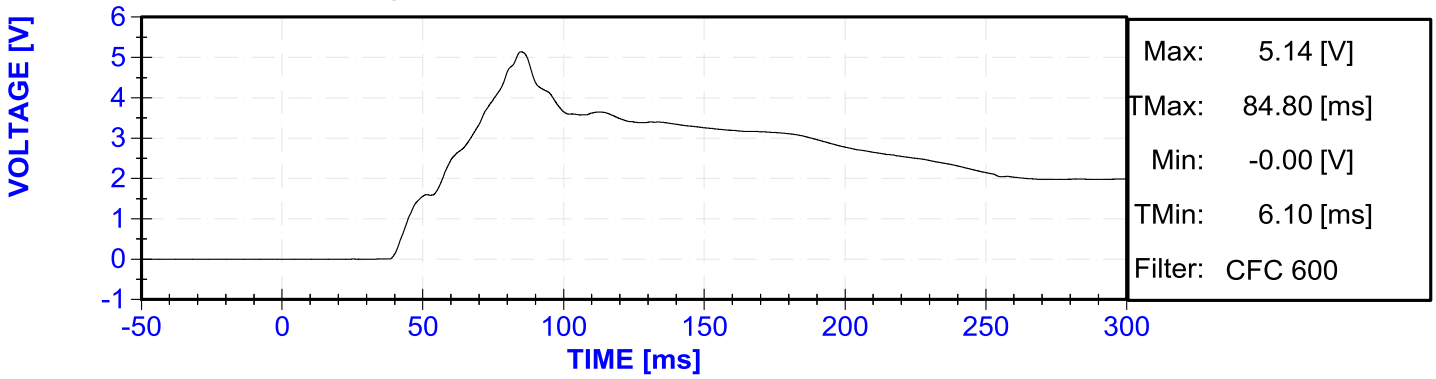
V2P1 Abdomen Left DGIR Y Rotation



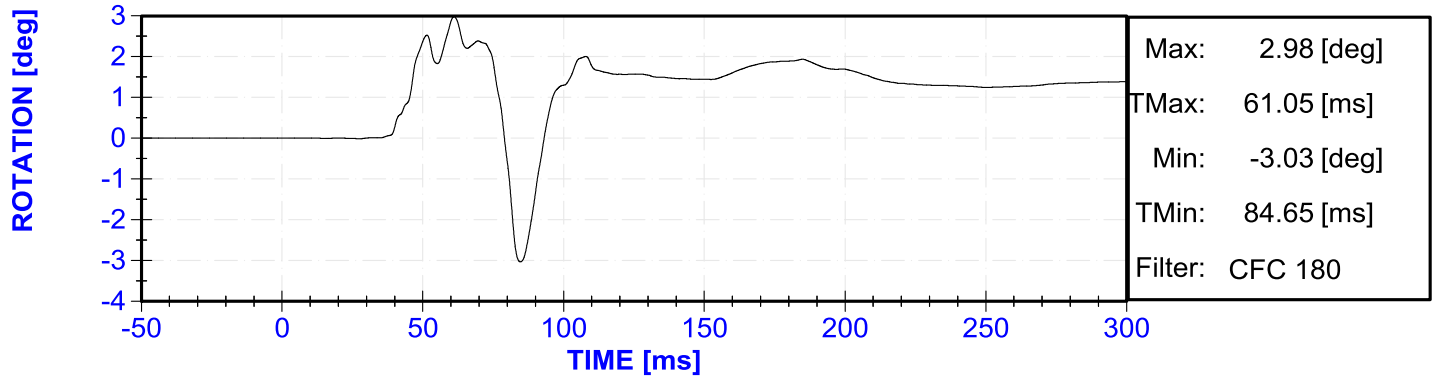
V2P1 Abdomen Left DGIR Z Rotation



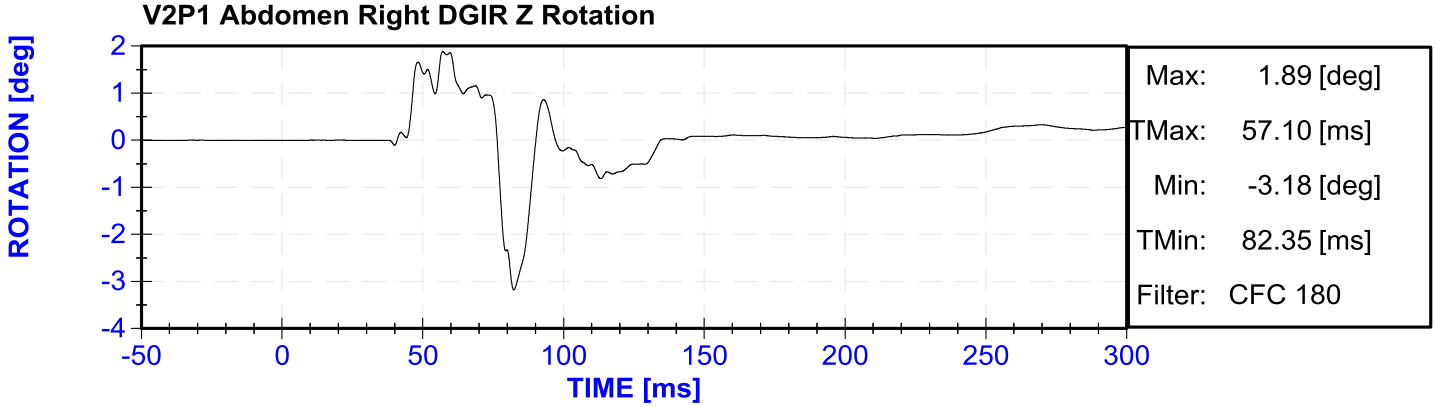
V2P1 Abdomen Right DGIR X Displacement

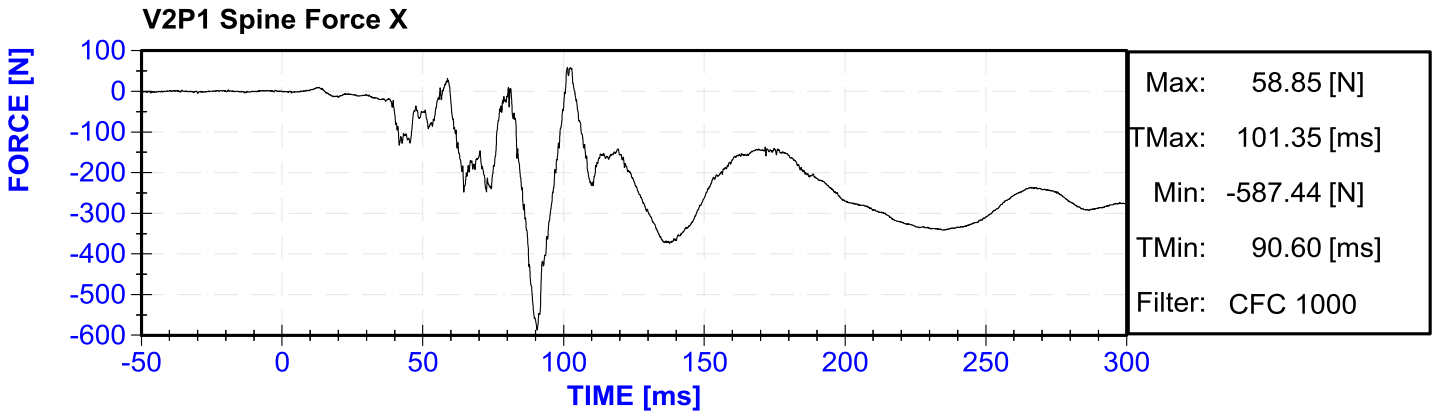


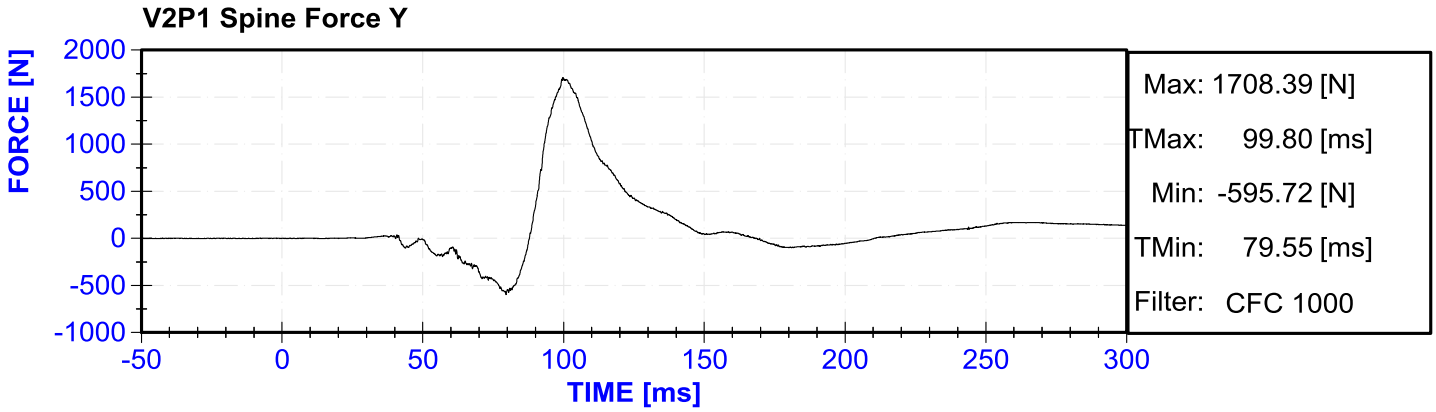
V2P1 Abdomen Right DGIR Y Rotation

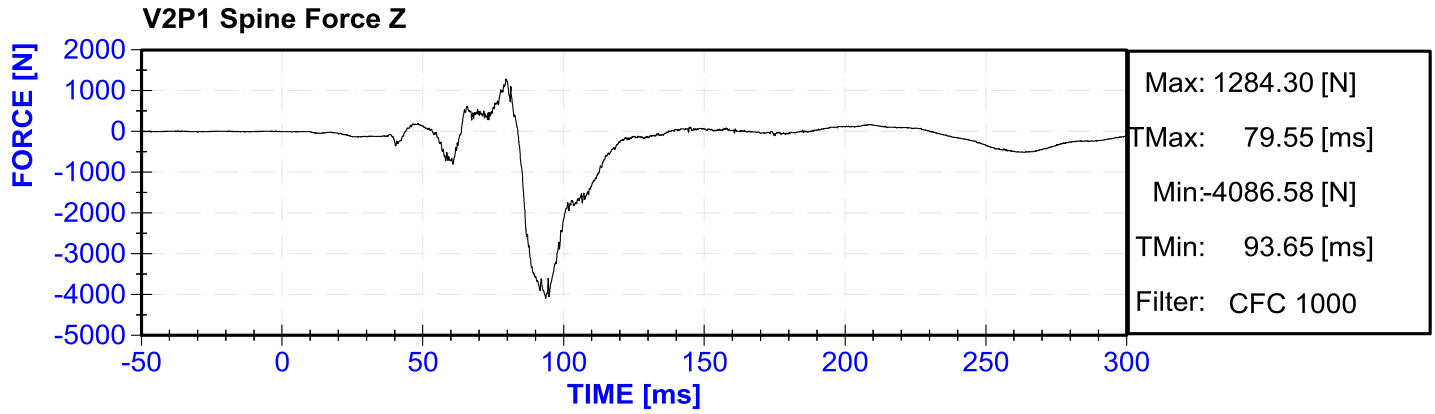


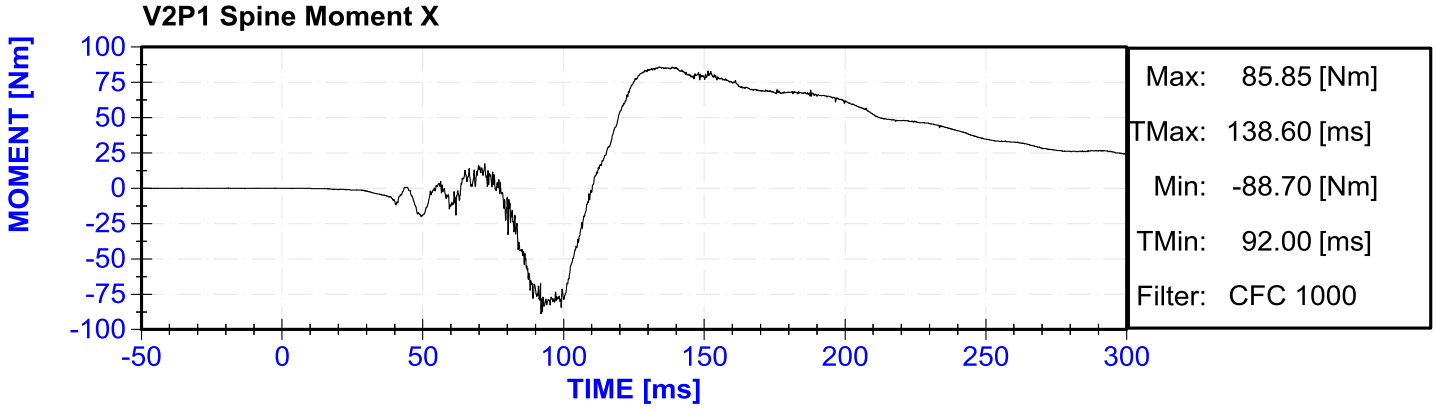
V2P1 Abdomen Right DGIR Z Rotation



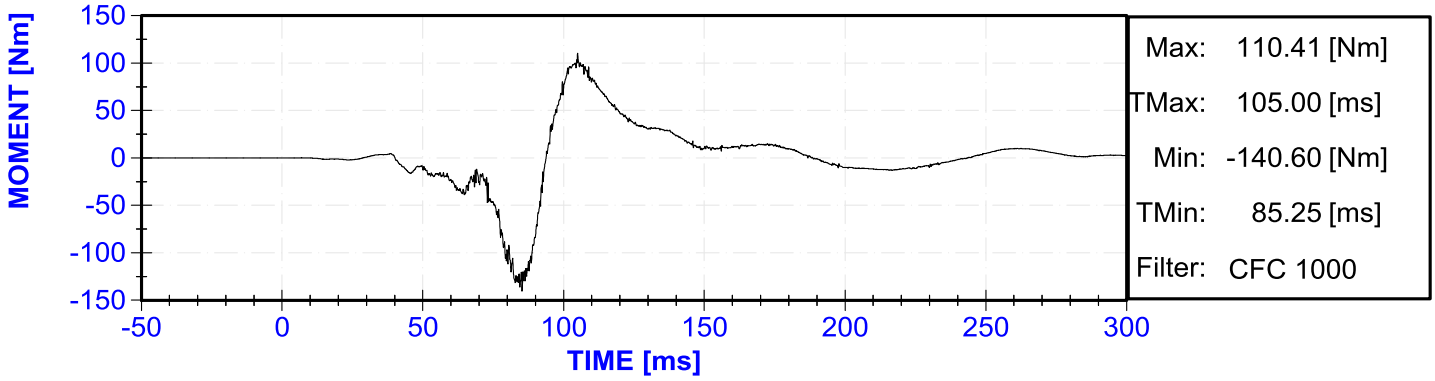

V2P1 Spine Force X
FORCE [N]
100
0
-100
-200
-300
-400
-500
-600
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 58.85 [N]
TMax: 101.35 [ms]
Min: -587.44 [N]
TMin: 90.60 [ms]
Filter: CFC 1000


V2P1 Spine Force Y
FORCE [N]
2000
1500
1000
500
0
-500
-1000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1708.39 [N]
TMax: 99.80 [ms]
Min: -595.72 [N]
TMin: 79.55 [ms]
Filter: CFC 1000

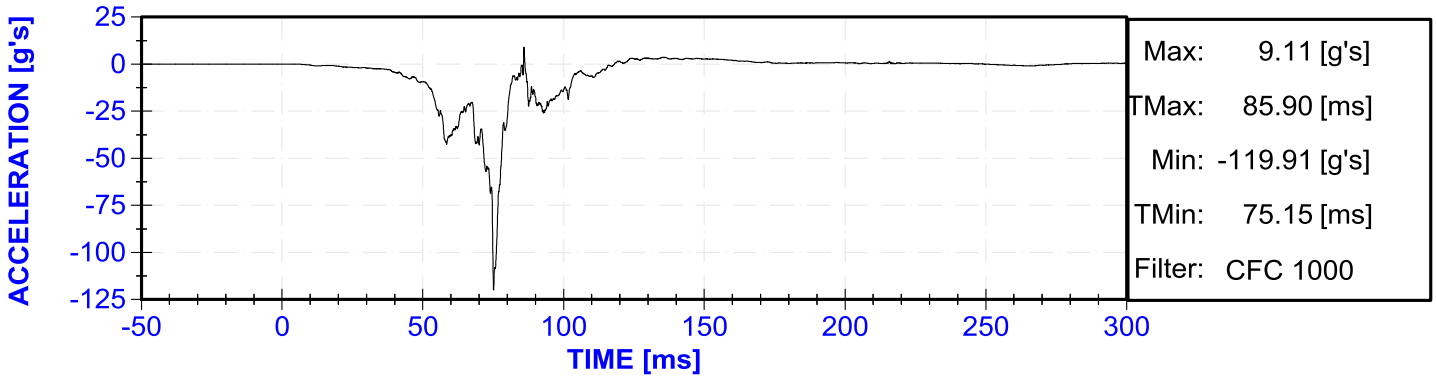

V2P1 Spine Force Z
FORCE [N]
2000
1000
0
-1000
-2000
-3000
-4000
-5000
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 1284.30 [N]
TMax: 79.55 [ms]
Min:-4086.58 [N]
TMin: 93.65 [ms]
Filter: CFC 1000


V2P1 Spine Moment X
MOMENT [Nm]
100
75
50
25
0
-25
-50
-75
-100
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 85.85 [Nm]
TMax: 138.60 [ms]
Min: -88.70 [Nm]
TMin: 92.00 [ms]
Filter: CFC 1000

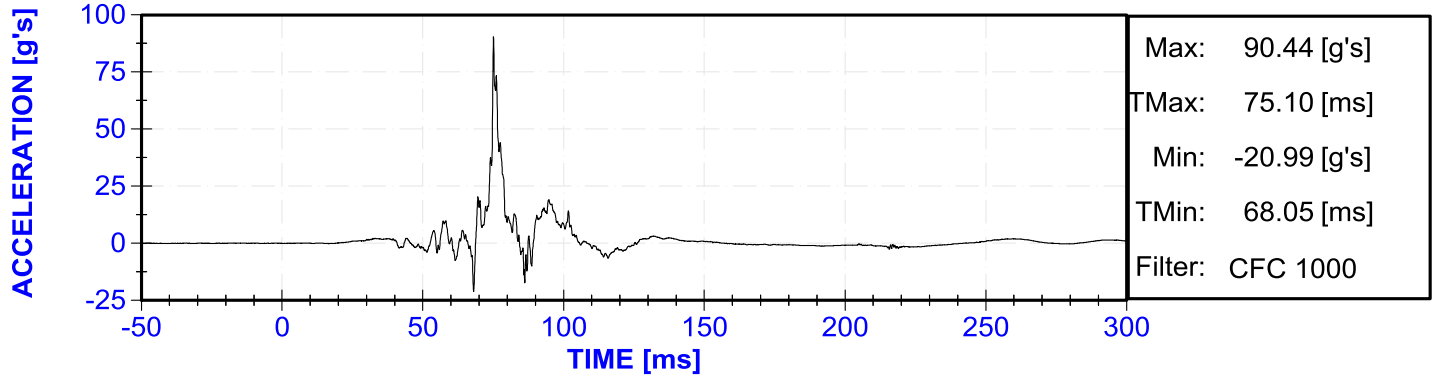
V2P1 Spine Moment Y



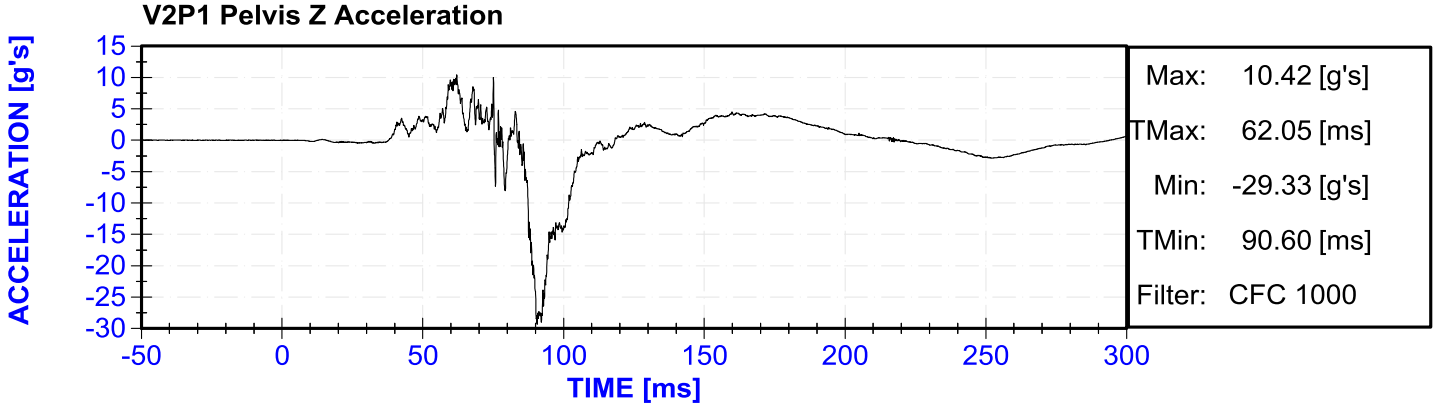
V2P1 Pelvis X Acceleration



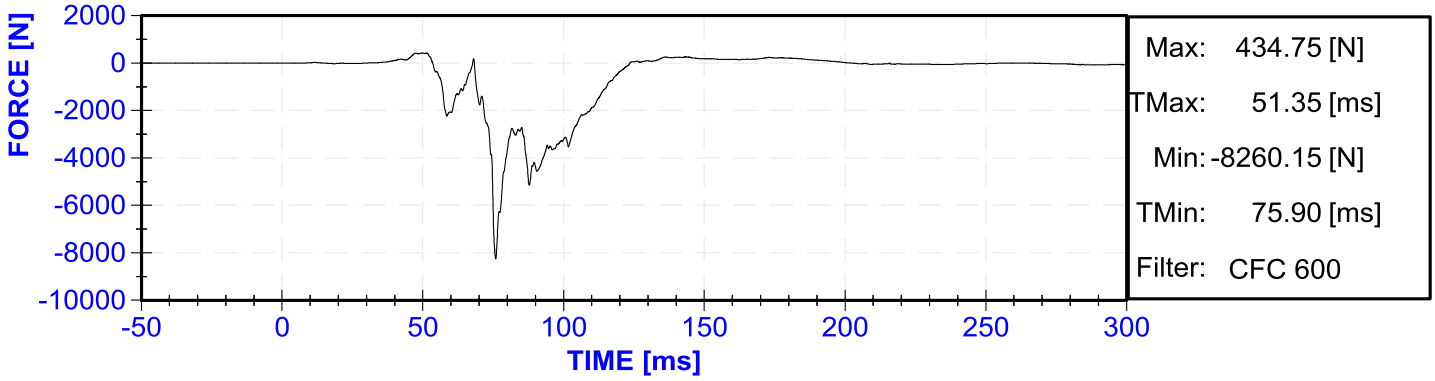
V2P1 Pelvis Y Acceleration



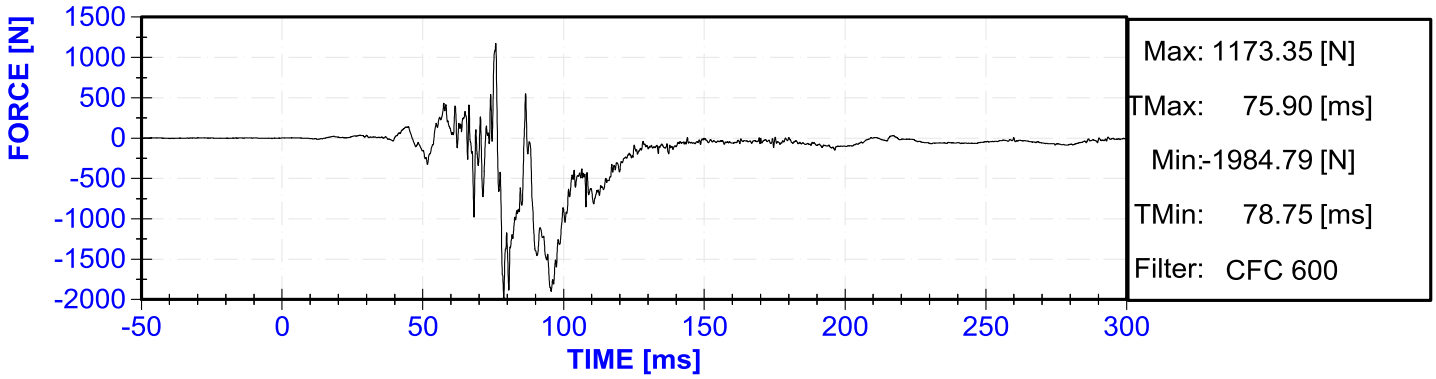
V2P1 Pelvis Z Acceleration



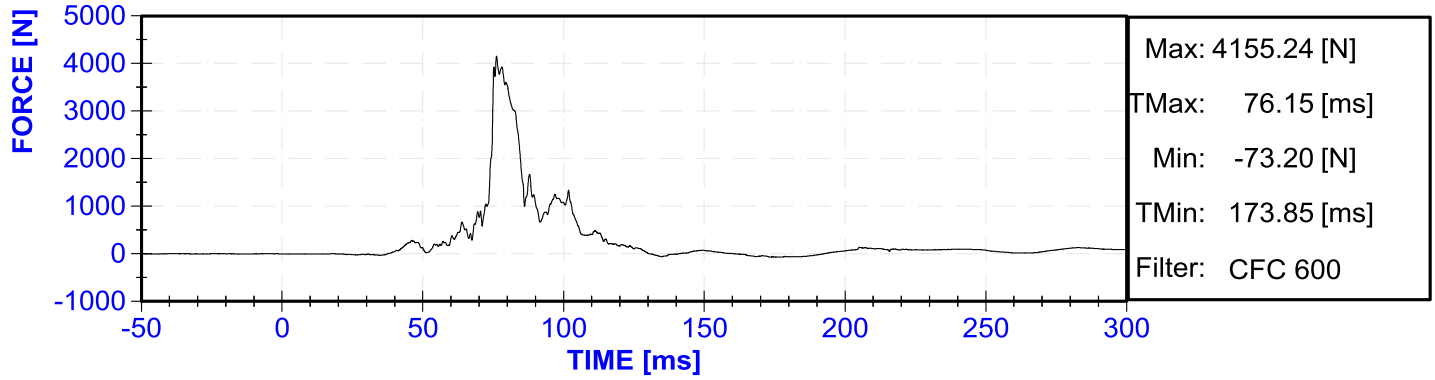
V2P1 Acetabulam Left X Force



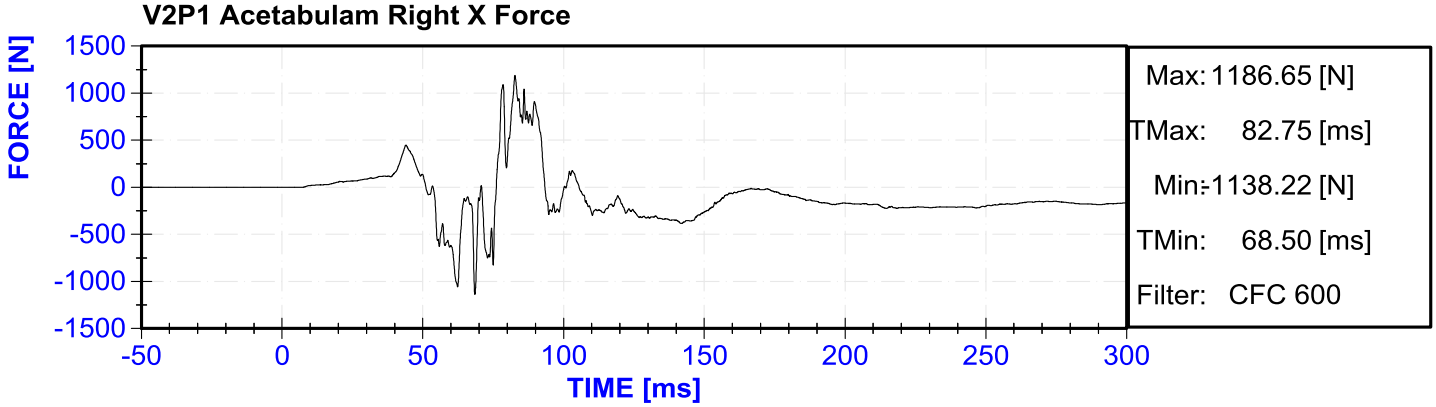
V2P1 Acetabulam Left Y Force



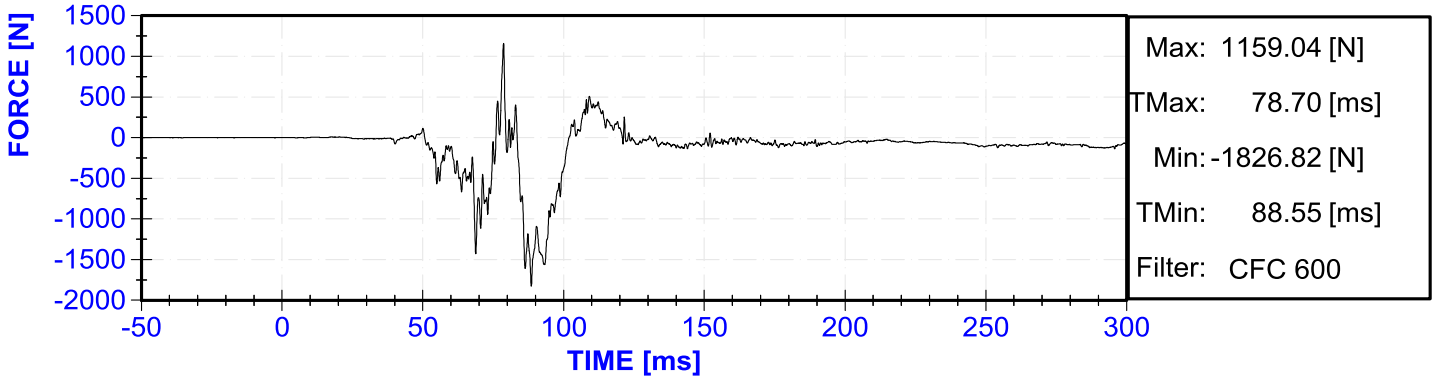
V2P1 Acetabulam Left Z Force



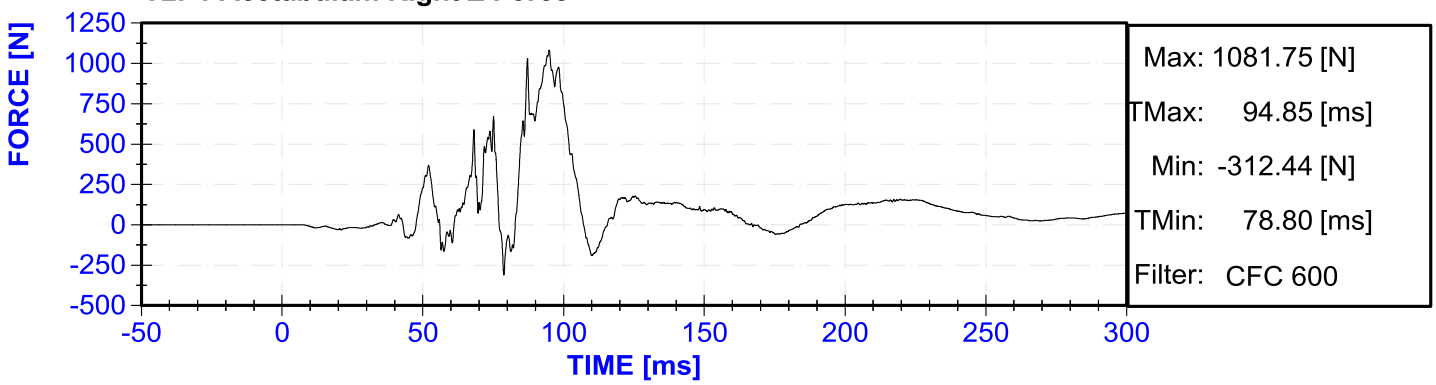
V2P1 Acetabulam Right X Force



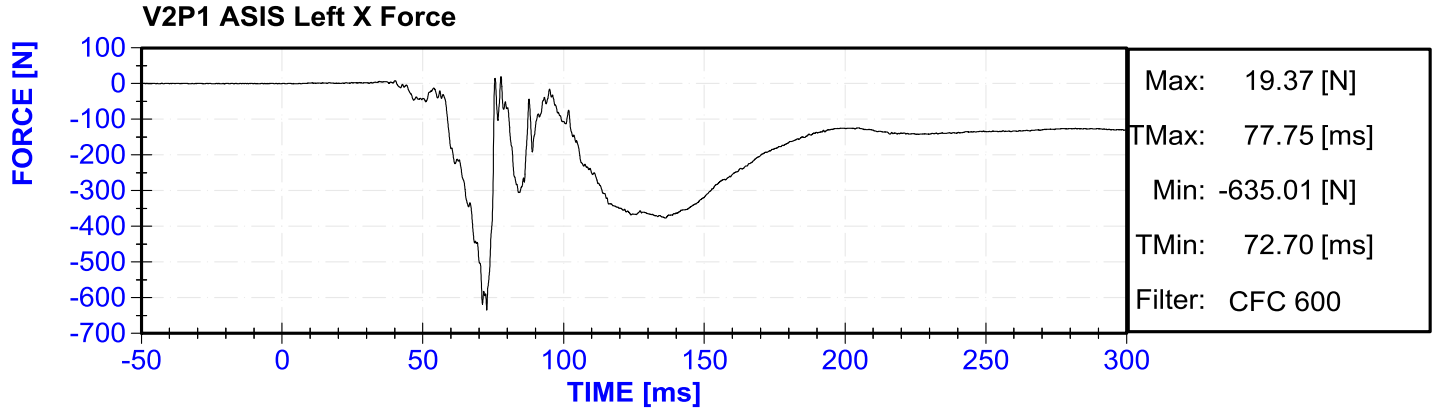
V2P1 Acetabulam Right Y Force



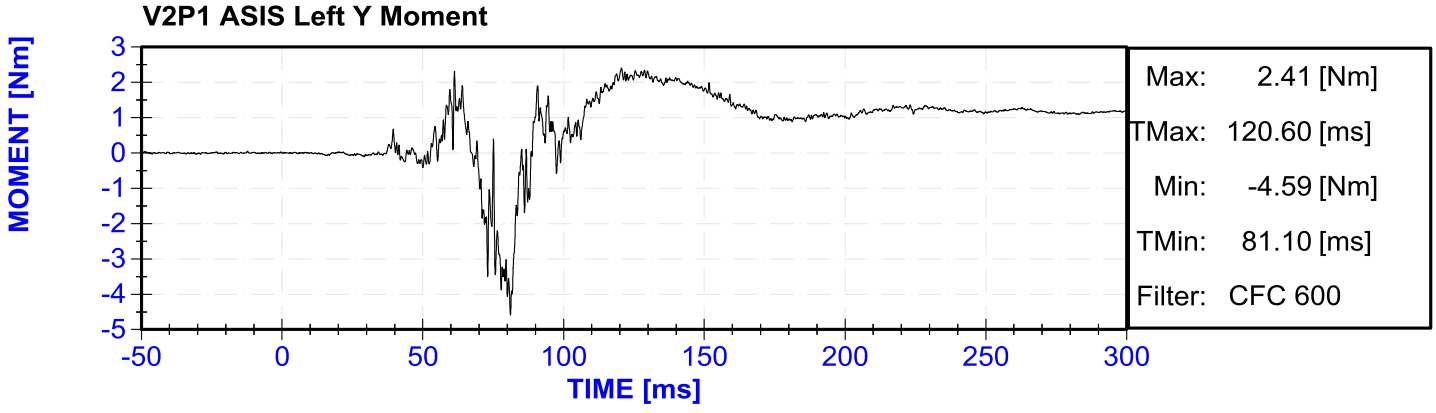
V2P1 Acetabulam Right Z Force



V2P1 ASIS Left X Force

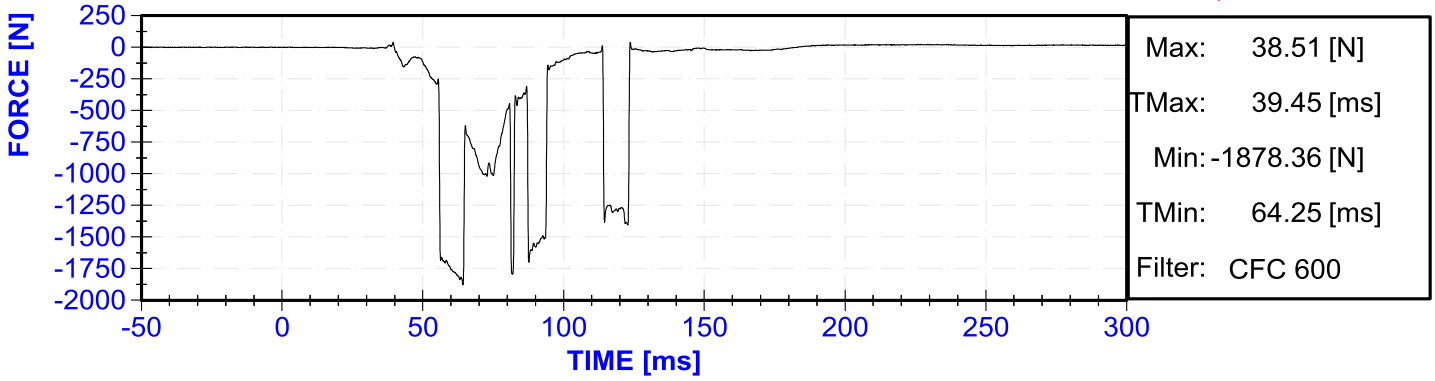


V2P1 ASIS Left Y Moment



V2P1 ASIS Right X Force

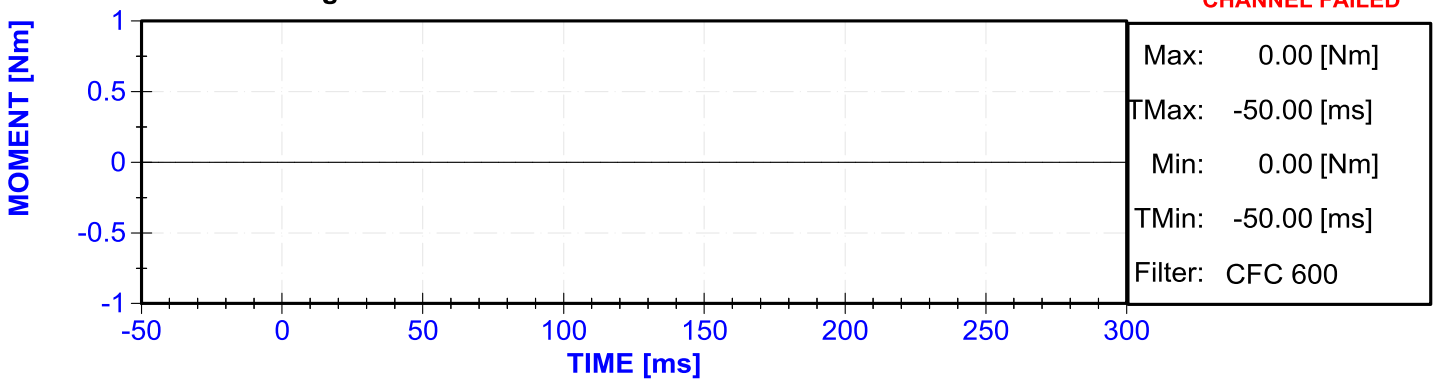
QD DATA 55-122MS; LC SGNL SHIFT



Max:	38.51 [N]
TMax:	39.45 [ms]
Min:	-1878.36 [N]
TMin:	64.25 [ms]
Filter:	CFC 600

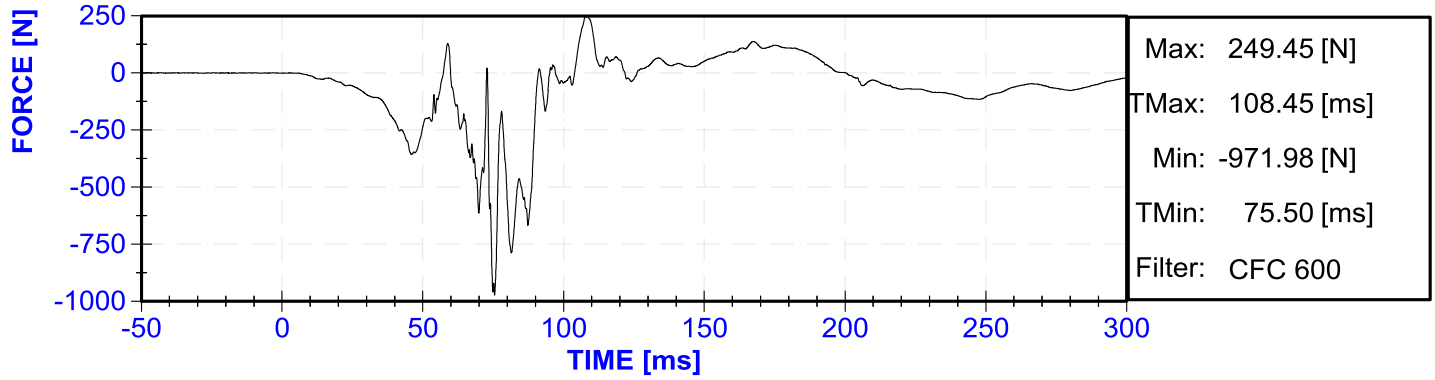
V2P1 ASIS Right Y Moment

CHANNEL FAILED



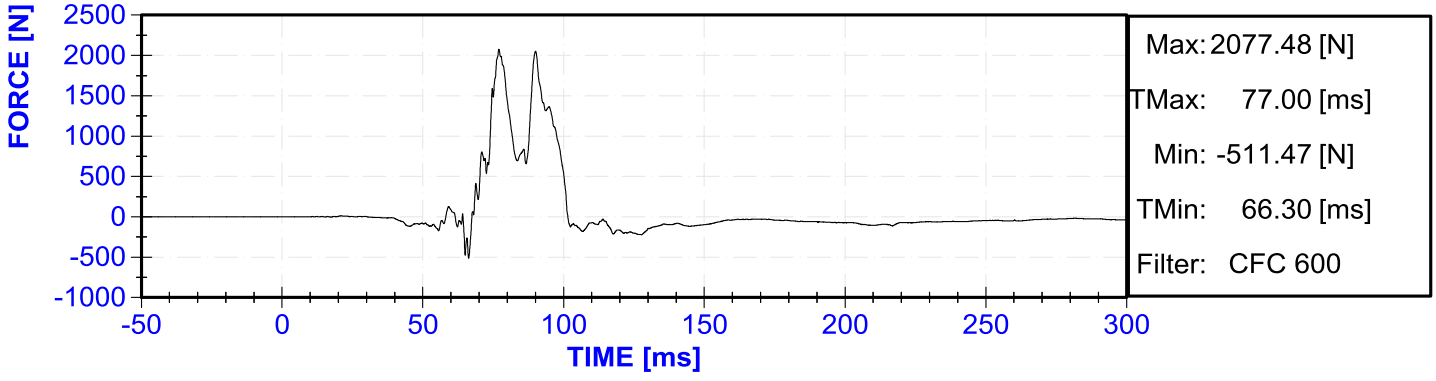
Max:	0.00 [Nm]
TMax:	-50.00 [ms]
Min:	0.00 [Nm]
TMin:	-50.00 [ms]
Filter:	CFC 600

V2P1 Femur Left X Force



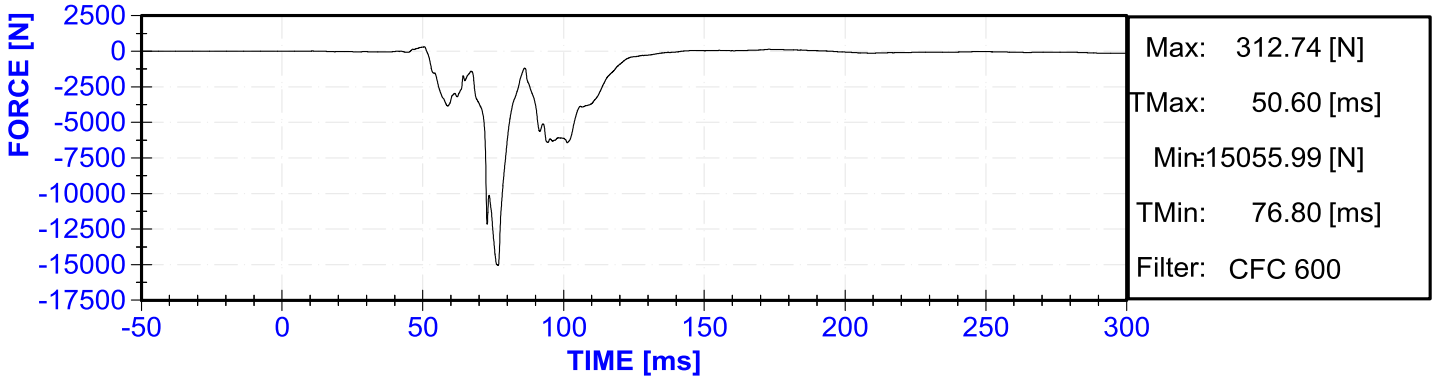
Max:	249.45 [N]
TMax:	108.45 [ms]
Min:	-971.98 [N]
TMin:	75.50 [ms]
Filter:	CFC 600

V2P1 Femur Left Y Force

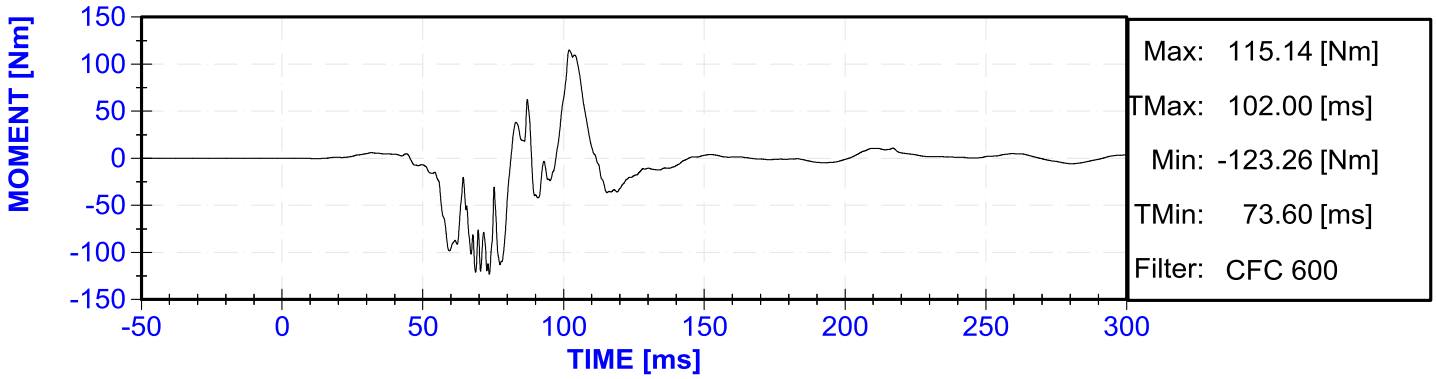


Max:	2077.48 [N]
TMax:	77.00 [ms]
Min:	-511.47 [N]
TMin:	66.30 [ms]
Filter:	CFC 600

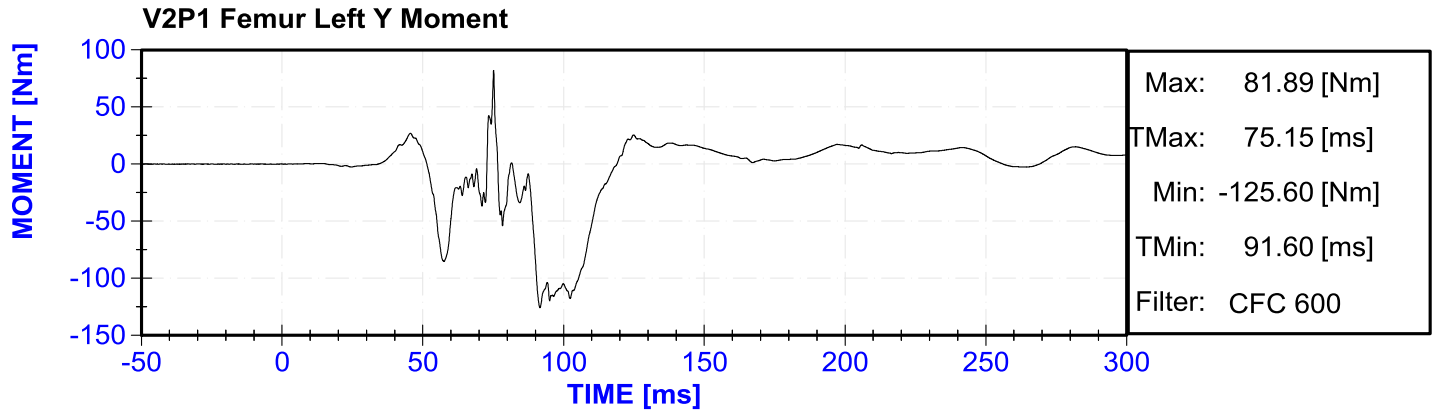
V2P1 Femur Left Z Force



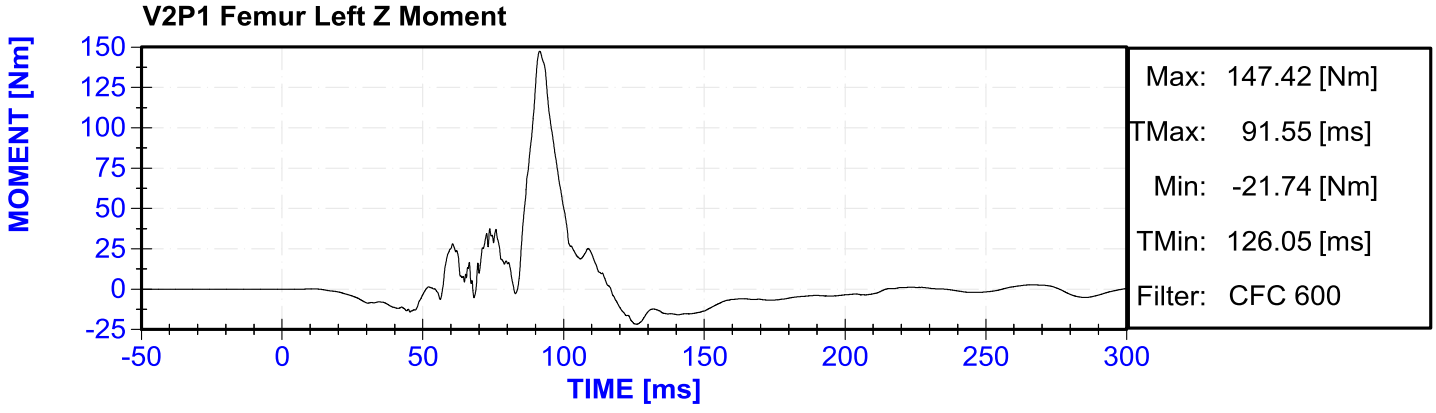
V2P1 Femur Left X Moment



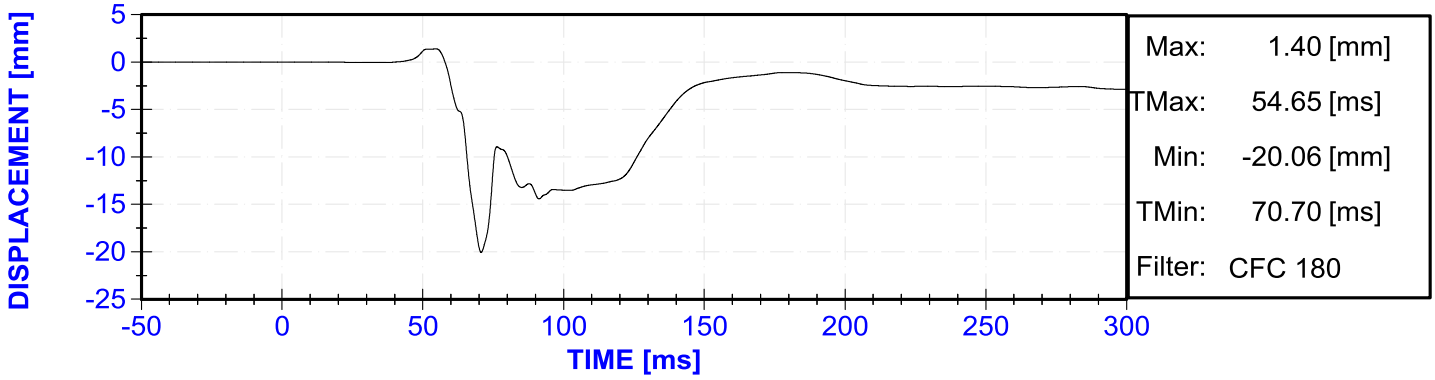
V2P1 Femur Left Y Moment



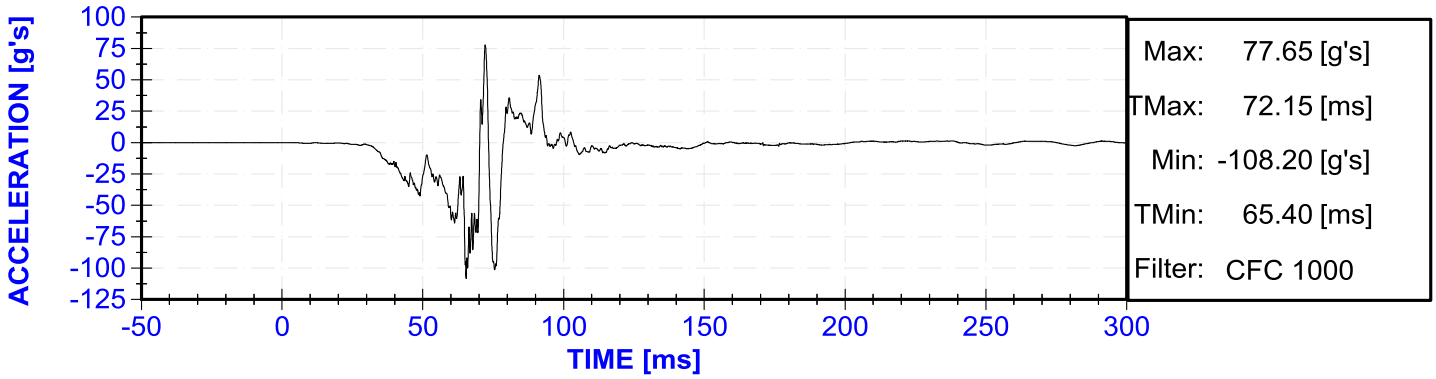
V2P1 Femur Left Z Moment



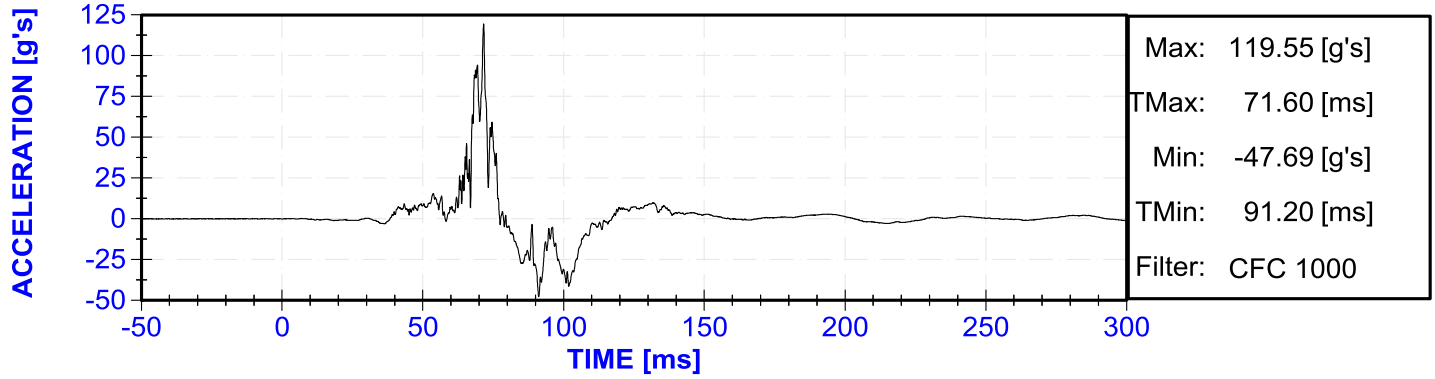
V2P1 Knee Left X Displacement



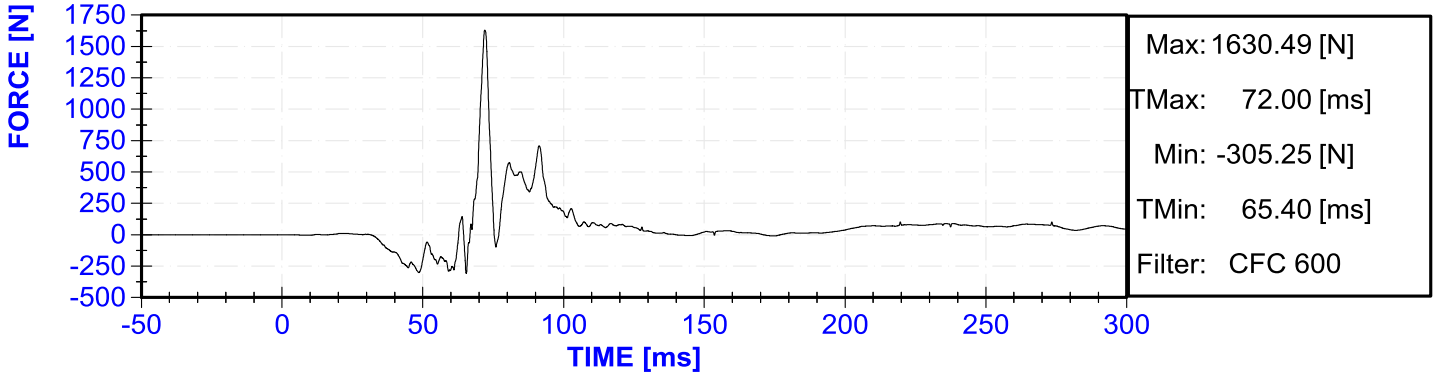
V2P1 Tibia Left X Acceleration



V2P1 Tibia Left Y Acceleration

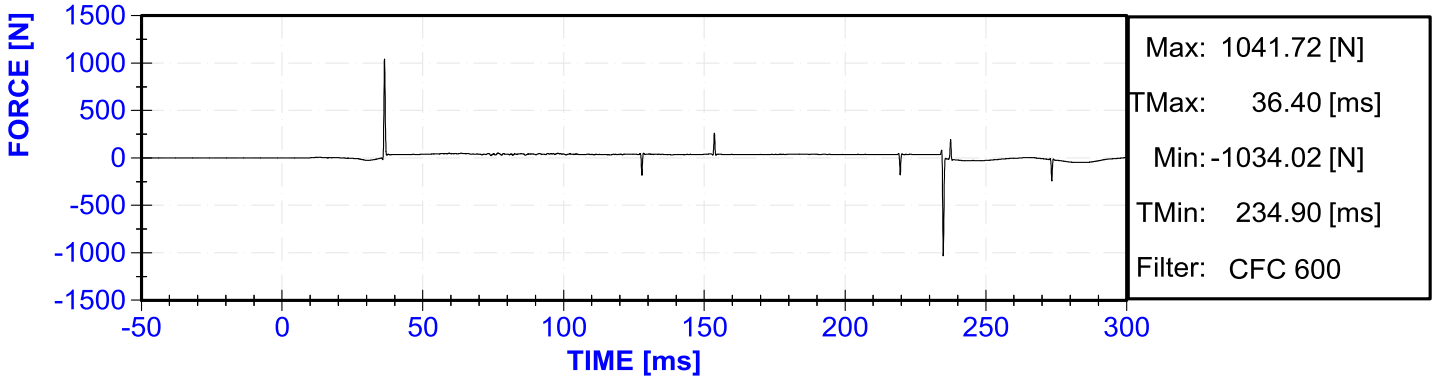


V2P1 Upper Tibia Left X Force



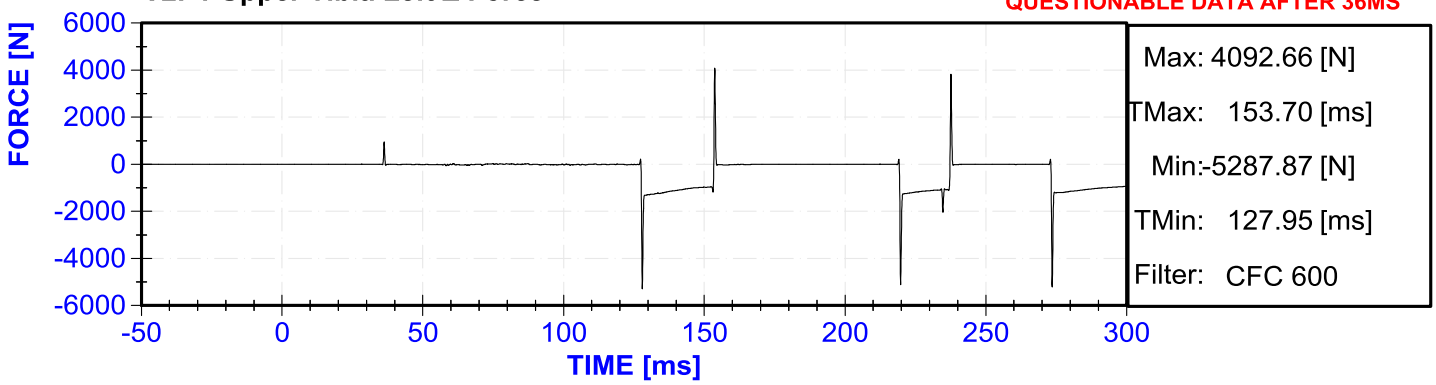
V2P1 Upper Tibia Left Y Force

QUESTIONABLE DATA AFTER 36MS

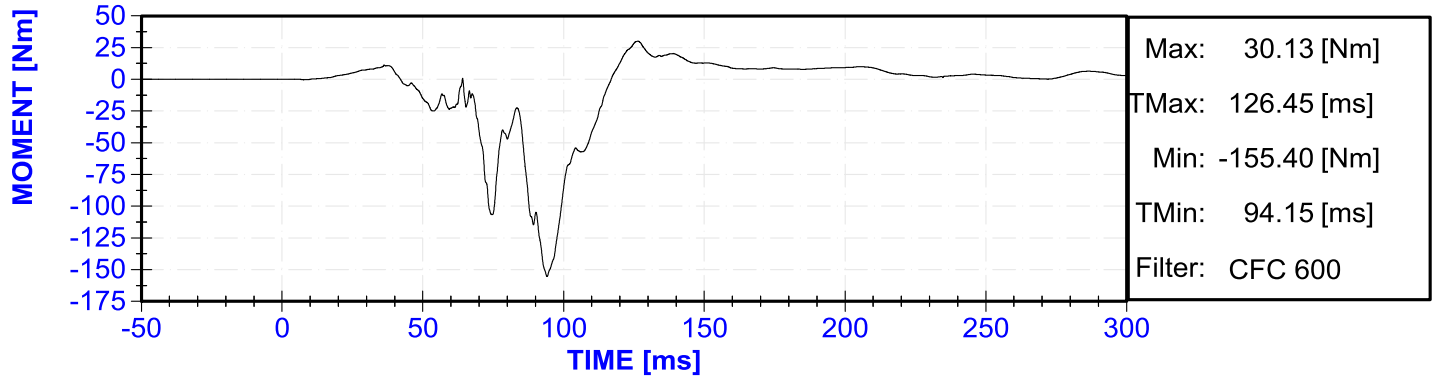


V2P1 Upper Tibia Left Z Force

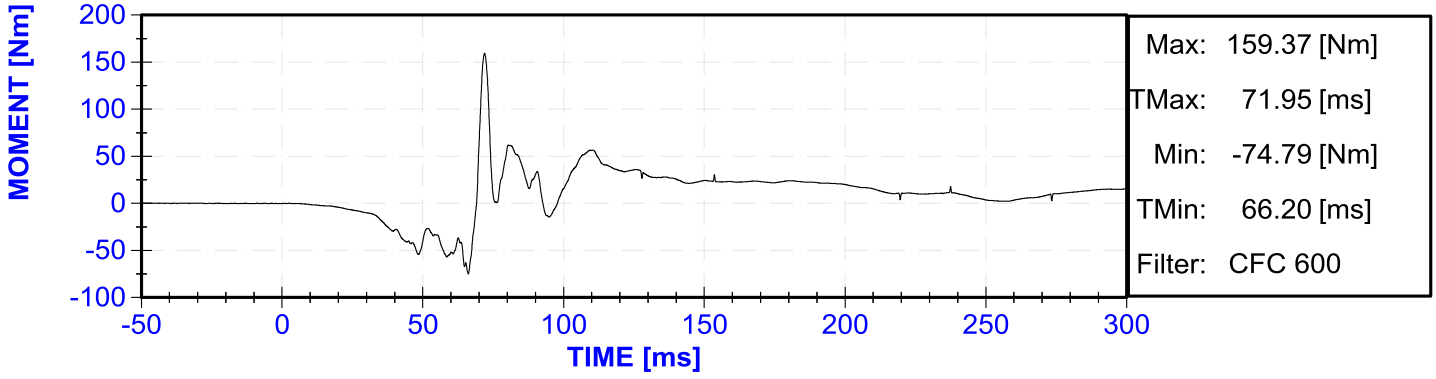
QUESTIONABLE DATA AFTER 36MS



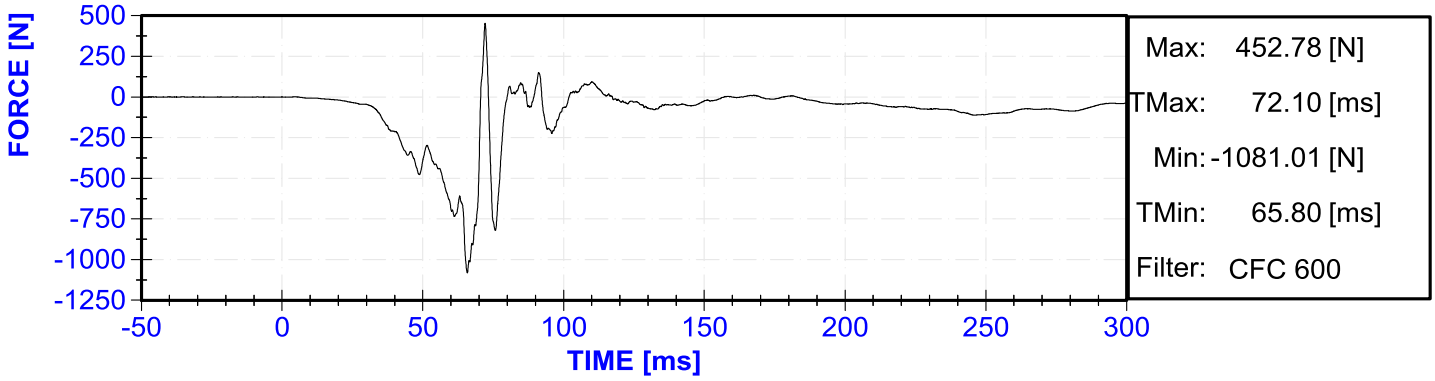
V2P1 Upper Tibia Left X Moment



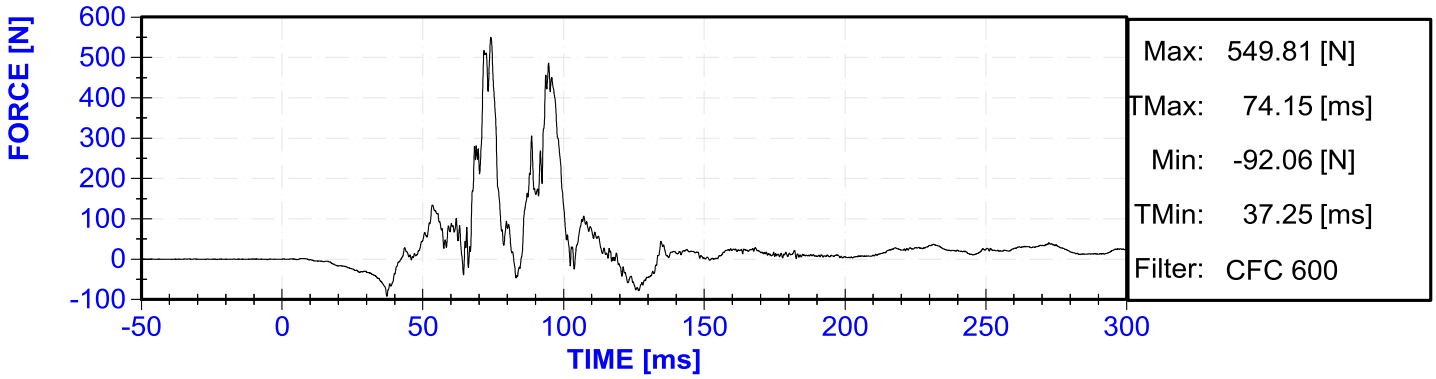
V2P1 Upper Tibia Left Y Moment



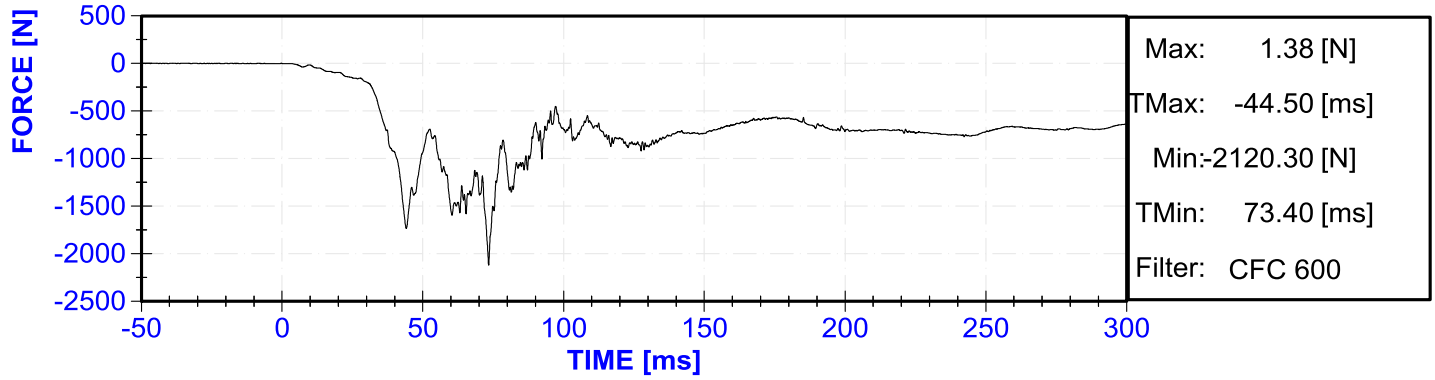
V2P1 Lower Tibia Left X Force



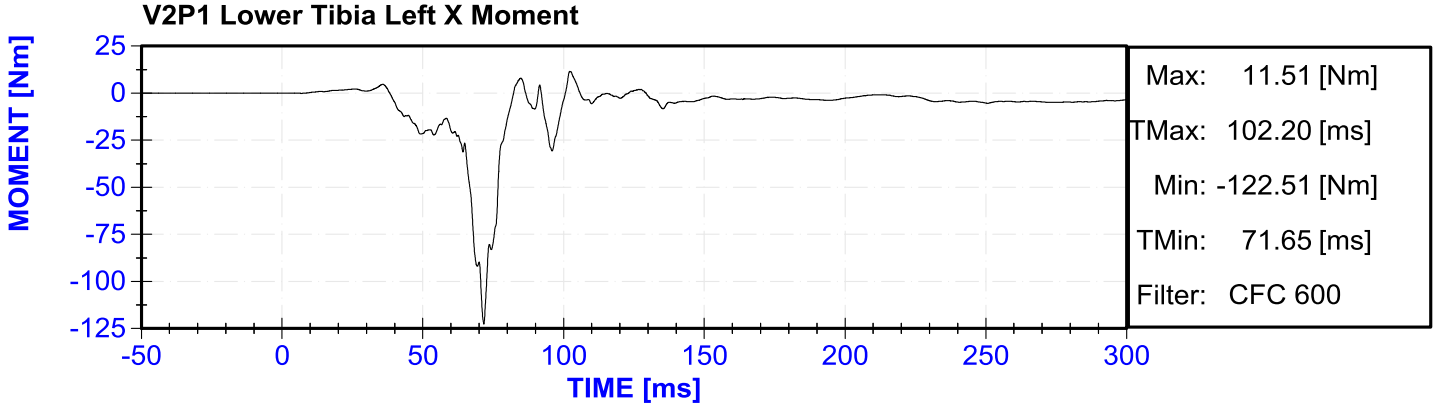
V2P1 Lower Tibia Left Y Force



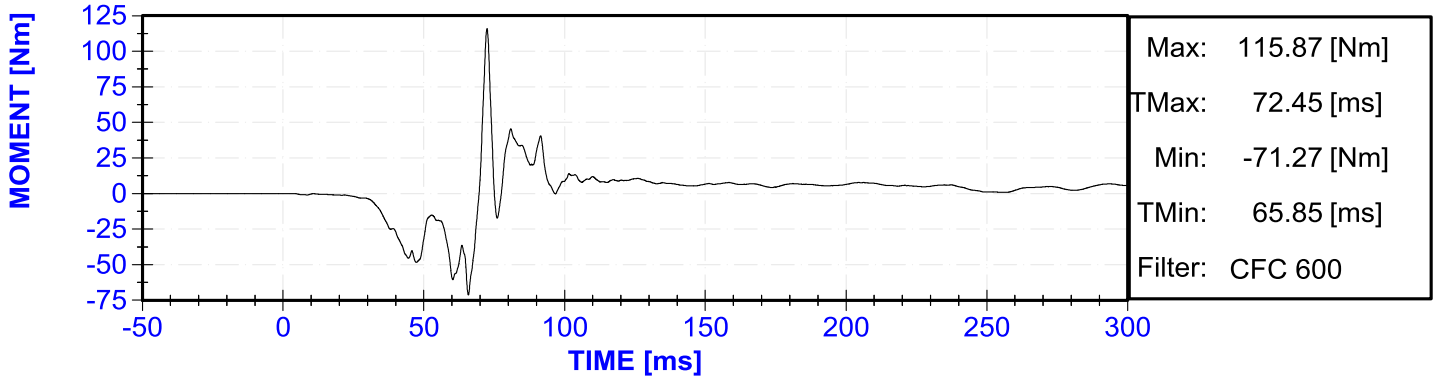
V2P1 Lower Tibia Left Z Force



V2P1 Lower Tibia Left X Moment

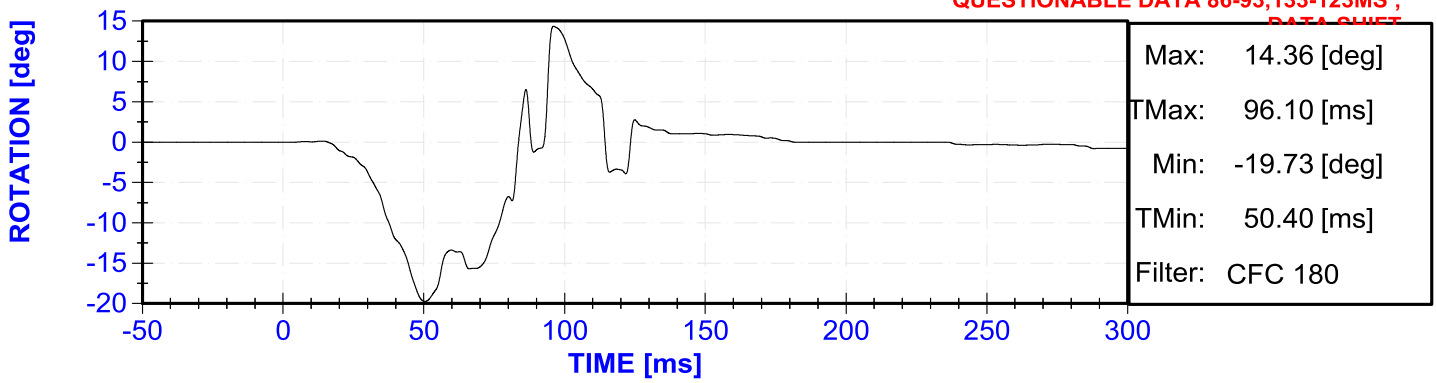


V2P1 Lower Tibia Left Y Moment

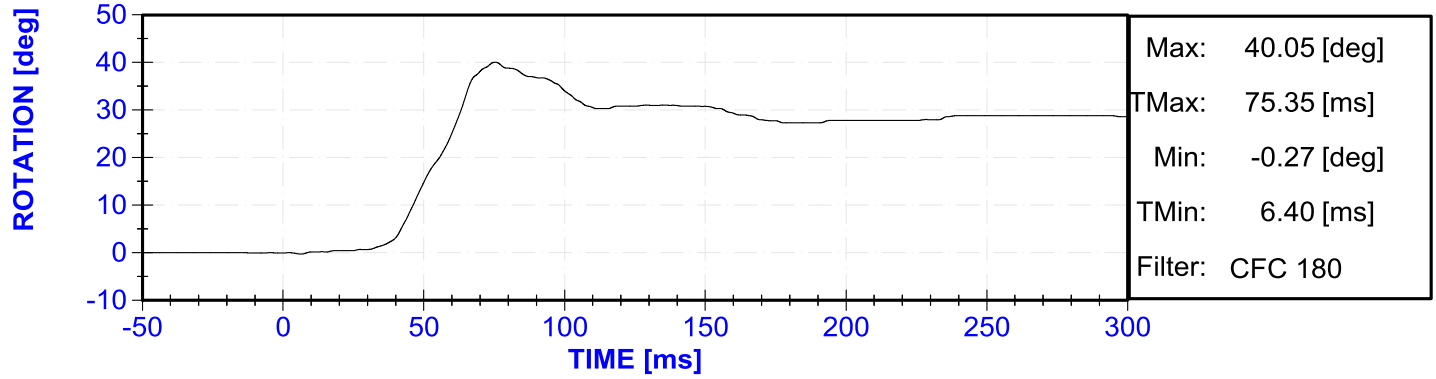


V2P1 Ankle Left X Rotation

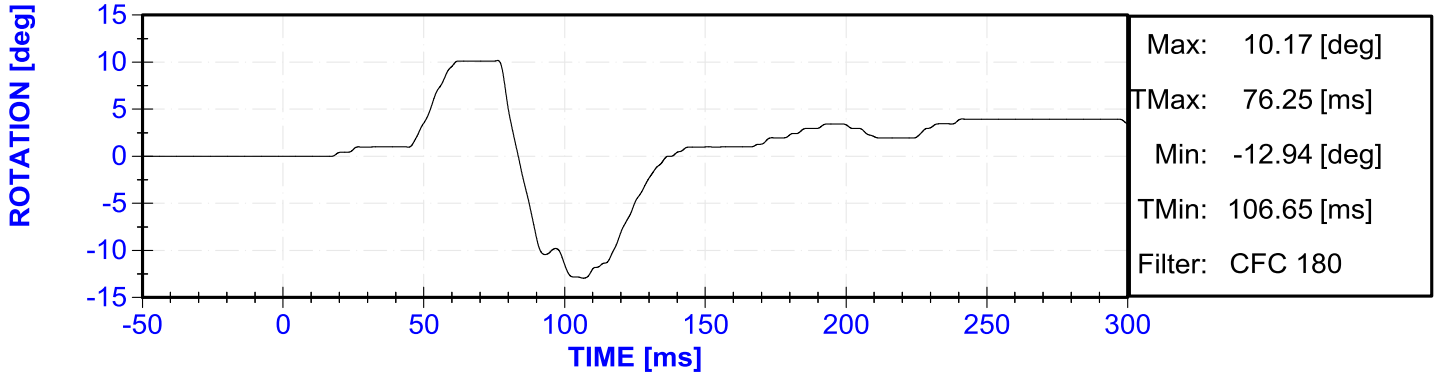
QUESTIONABLE DATA 86-93,133-123MS ;



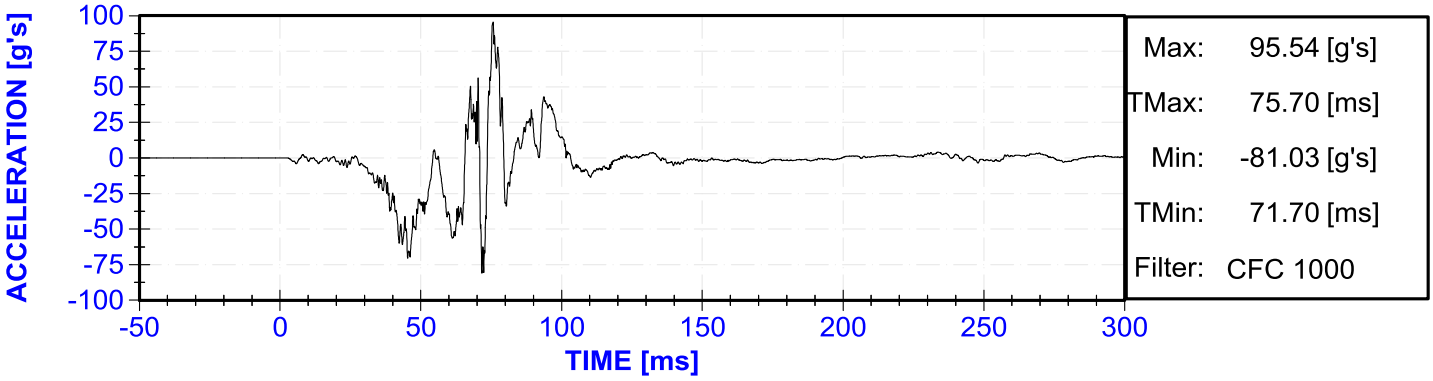
V2P1 Ankle Left Y Rotation



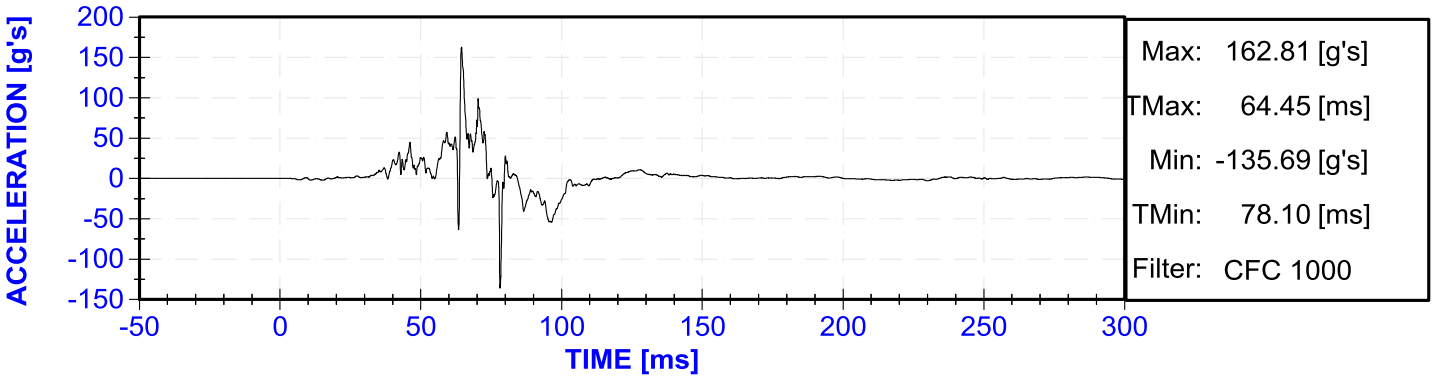
V2P1 Ankle Left Z Rotation



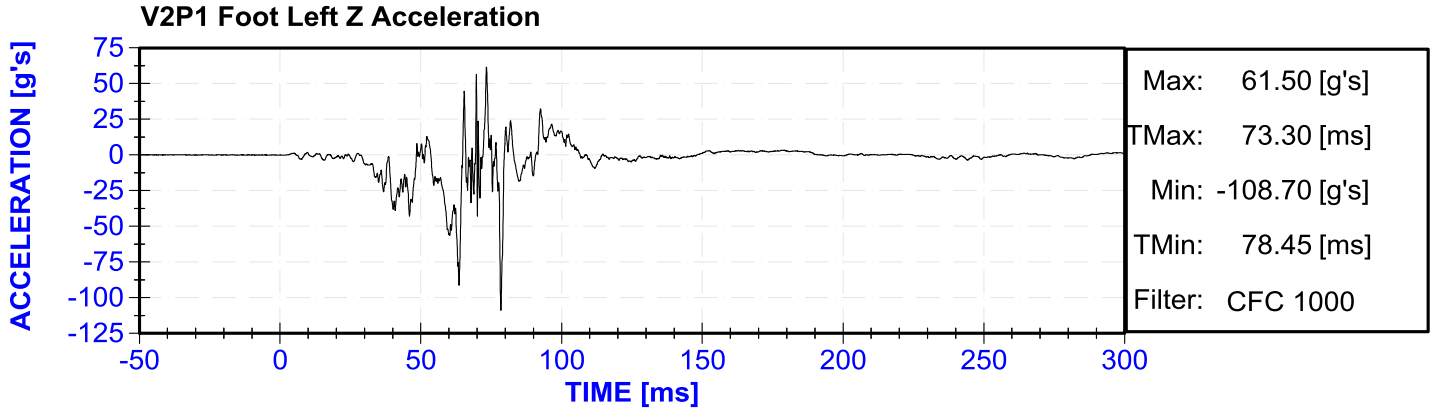
V2P1 Foot Left X Acceleration



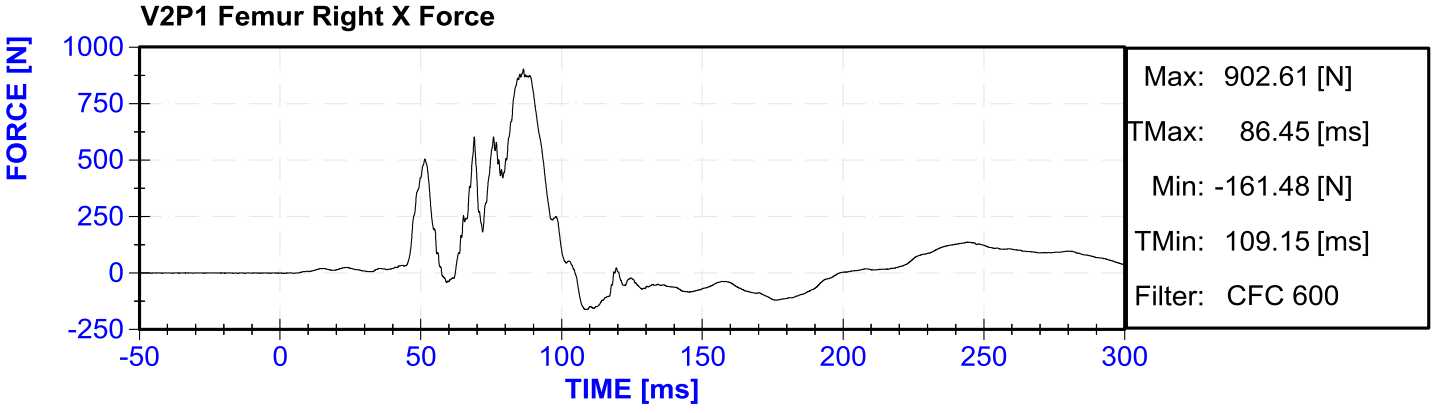
V2P1 Foot Left Y Acceleration



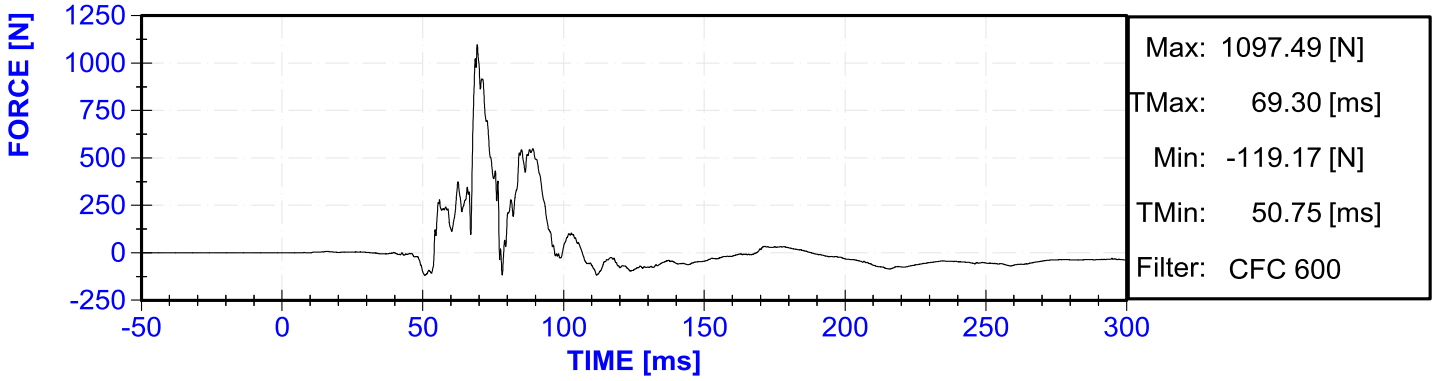
V2P1 Foot Left Z Acceleration



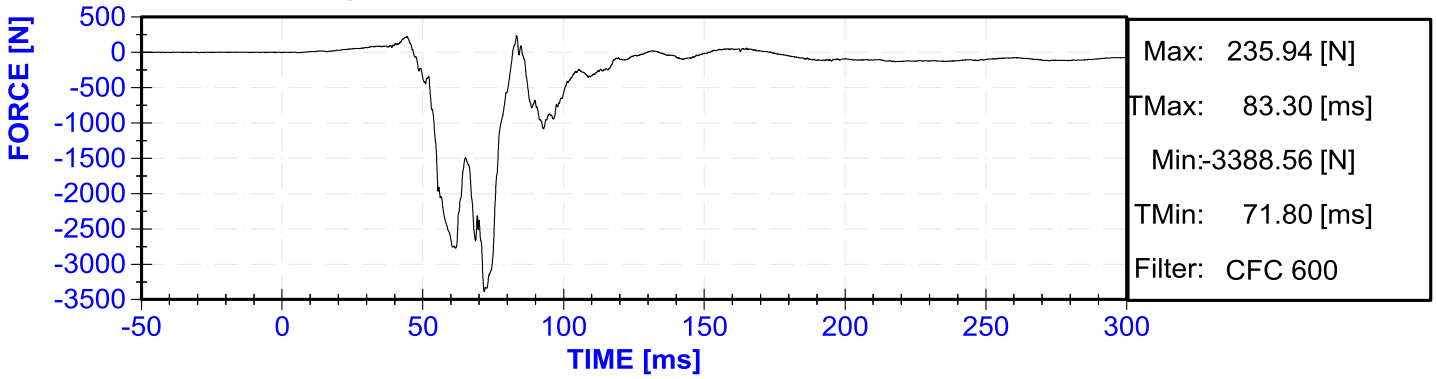
V2P1 Femur Right X Force



V2P1 Femur Right Y Force

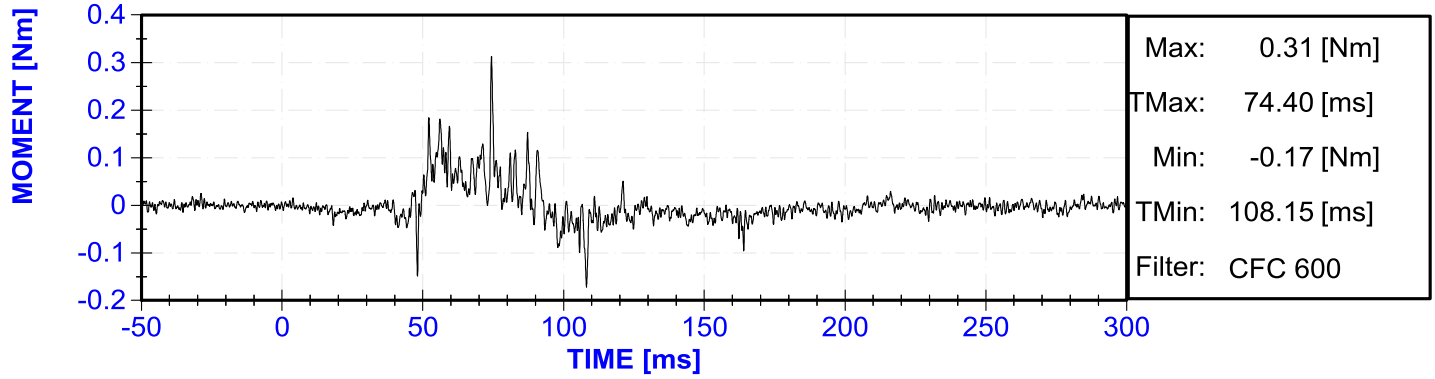


V2P1 Femur Right Z Force

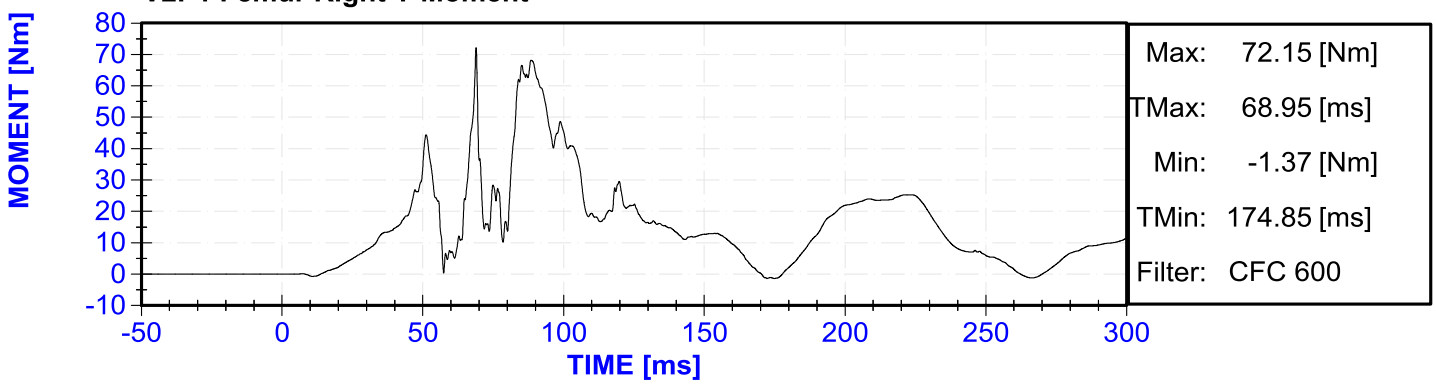


V2P1 Femur Right X Moment

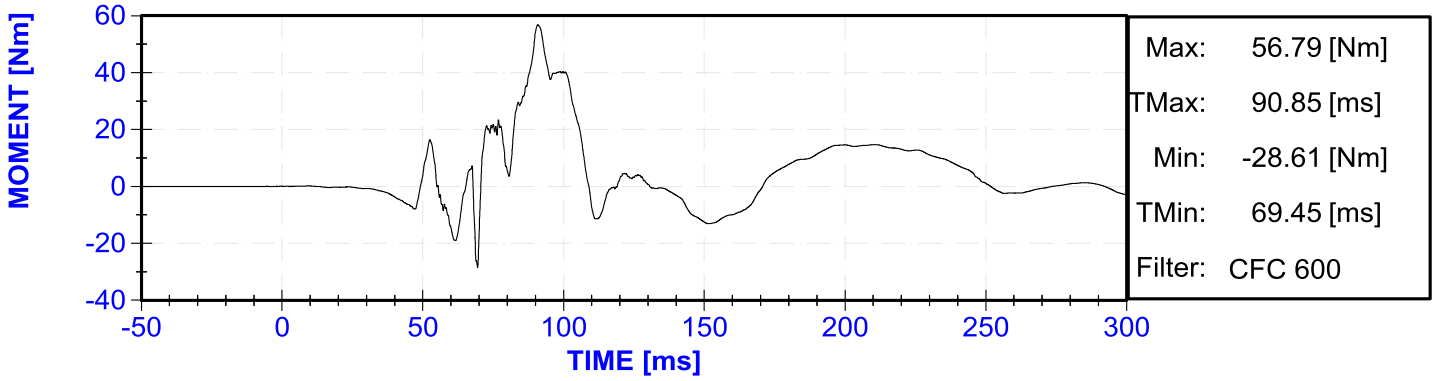
CHANNEL FAILED



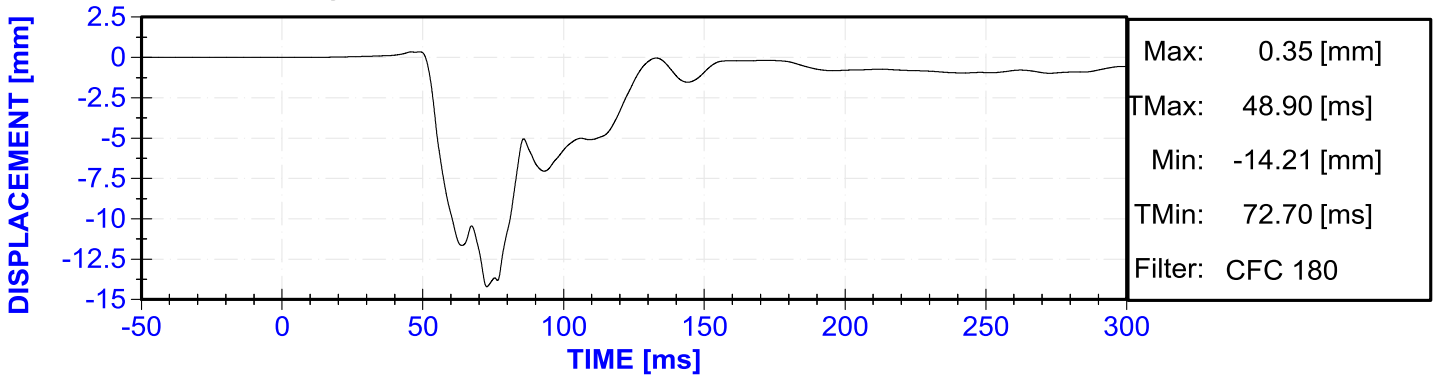
V2P1 Femur Right Y Moment



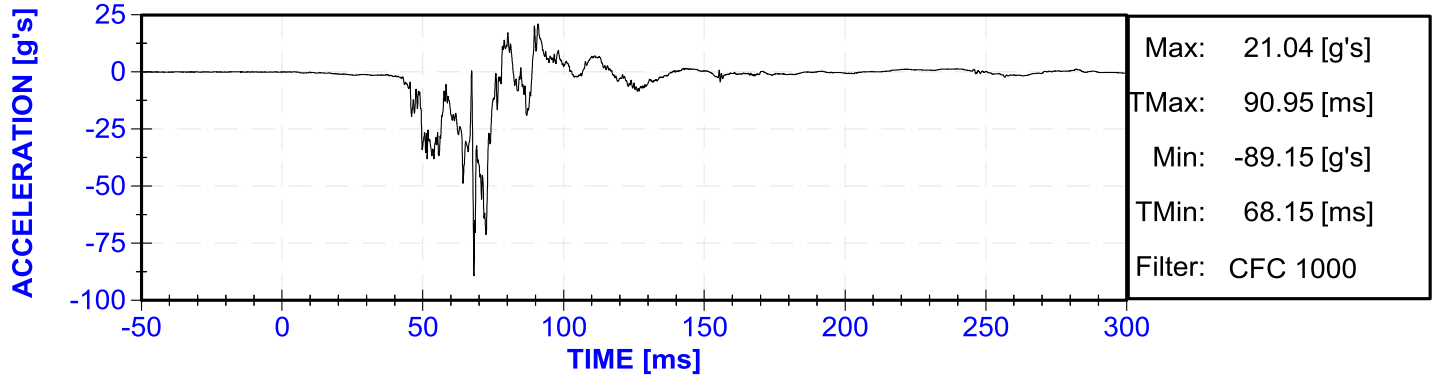
V2P1 Femur Right Z Moment



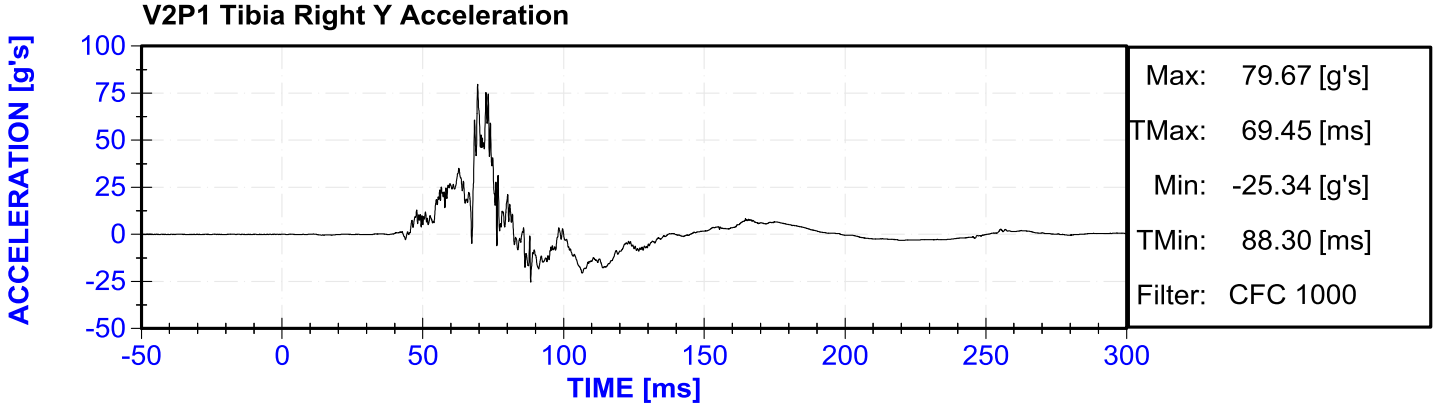
V2P1 Knee Right X Displacement



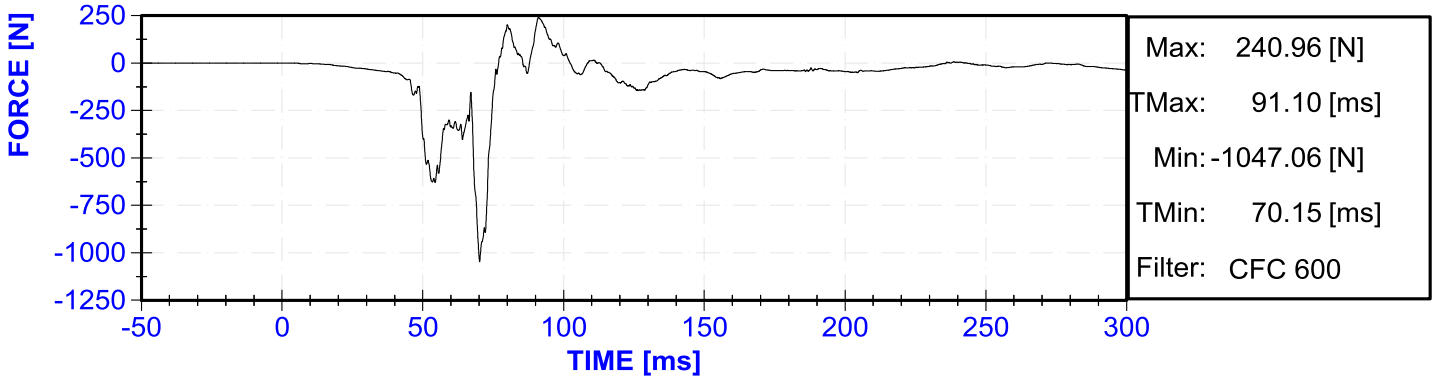
V2P1 Tibia Right X Acceleration



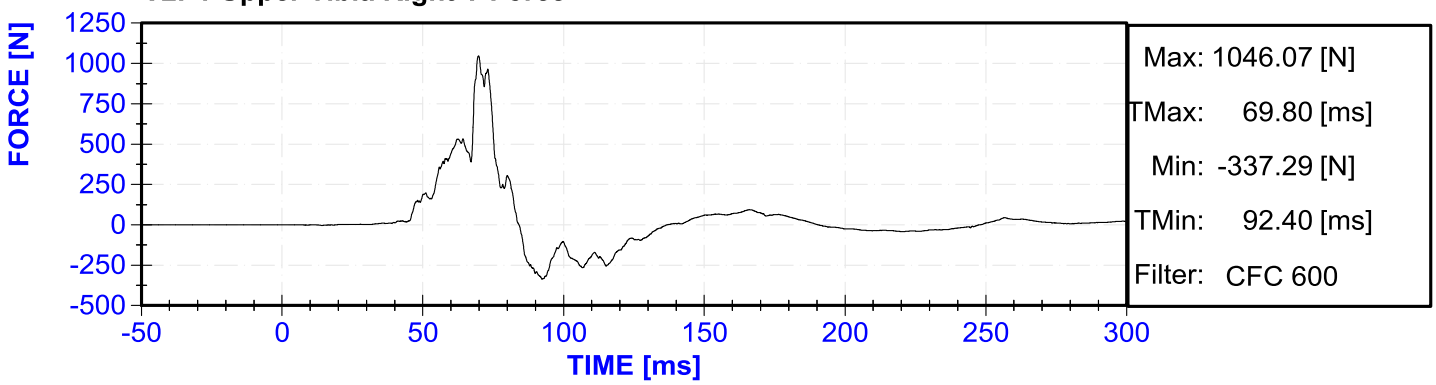
V2P1 Tibia Right Y Acceleration



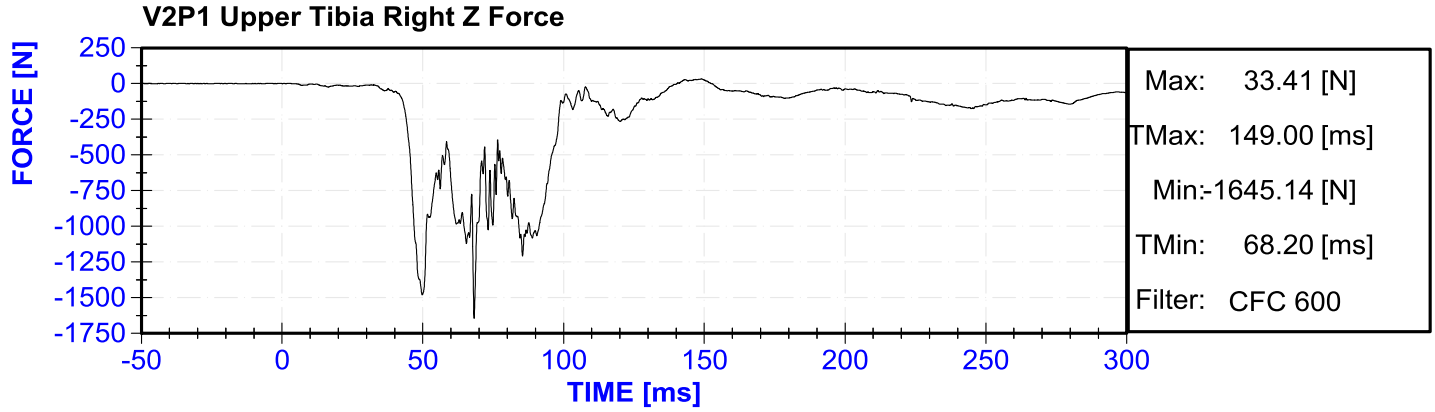
V2P1 Upper Tibia Right X Force



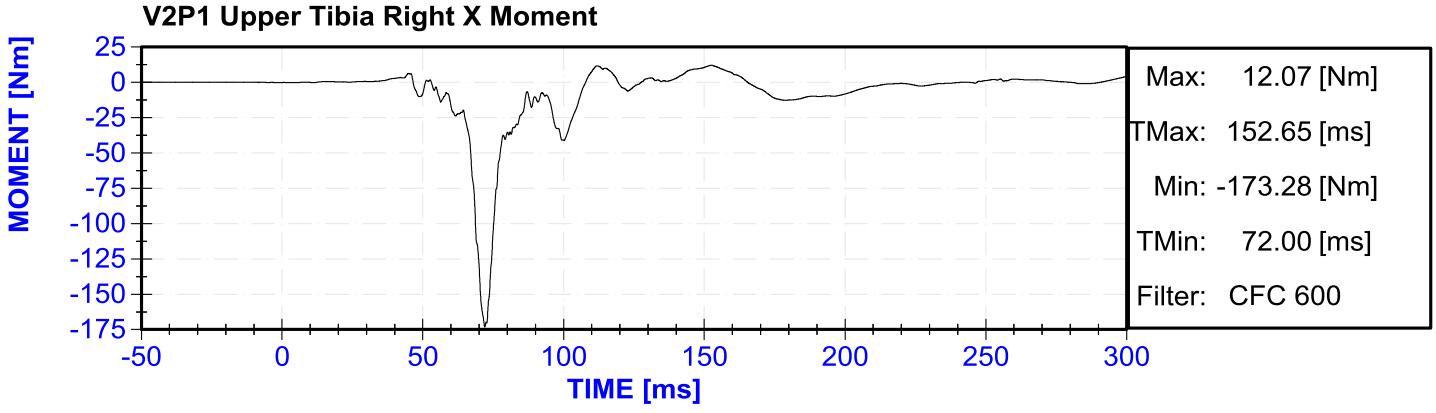
V2P1 Upper Tibia Right Y Force



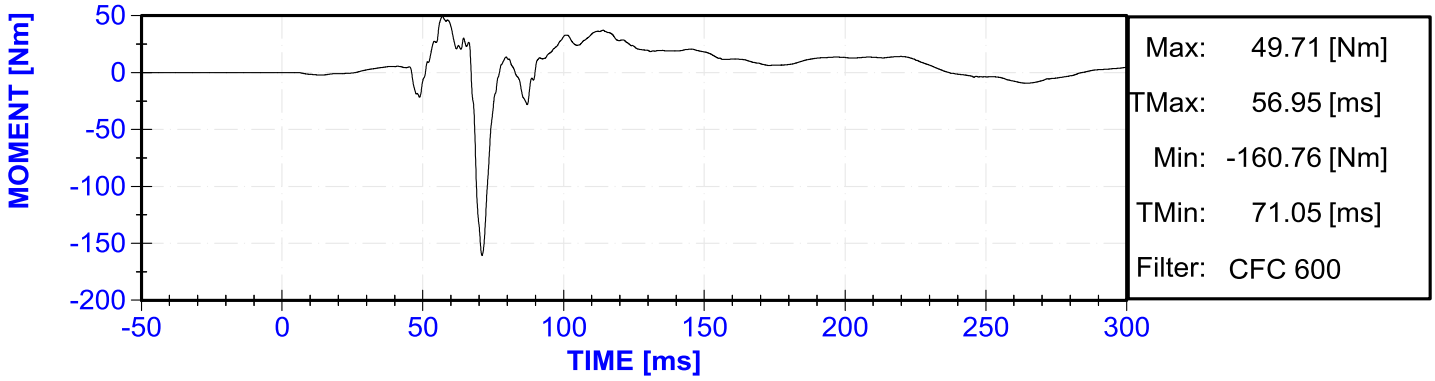
V2P1 Upper Tibia Right Z Force



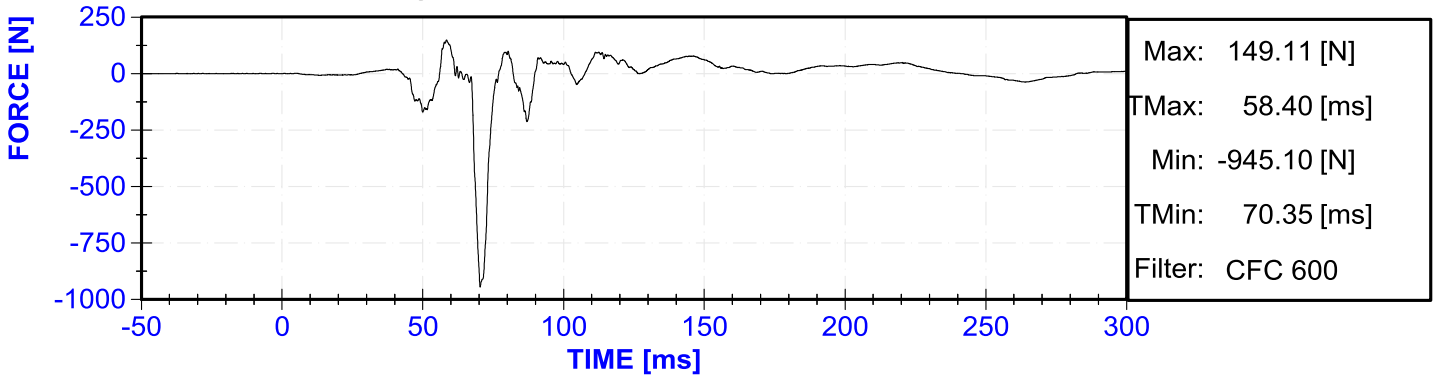
V2P1 Upper Tibia Right X Moment



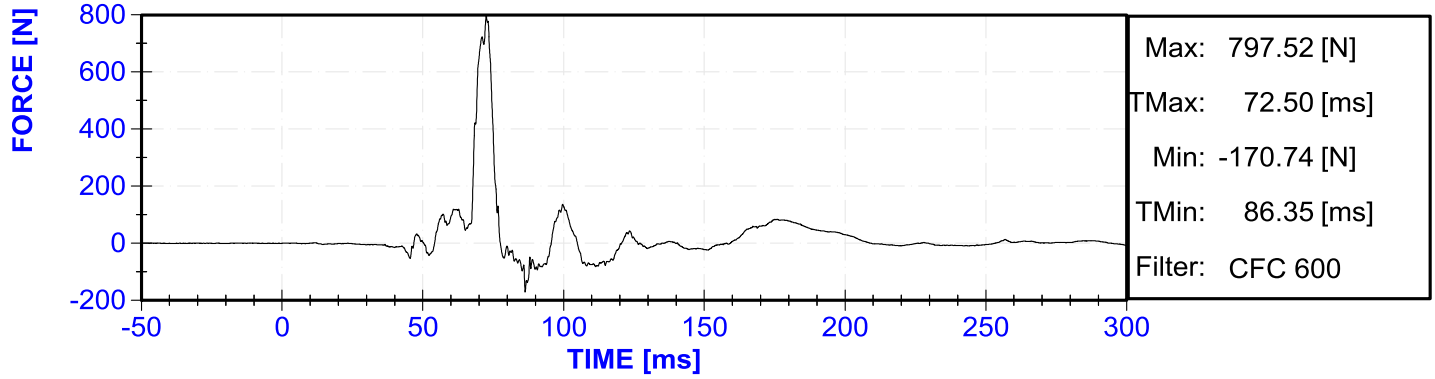
V2P1 Upper Tibia Right Y Moment



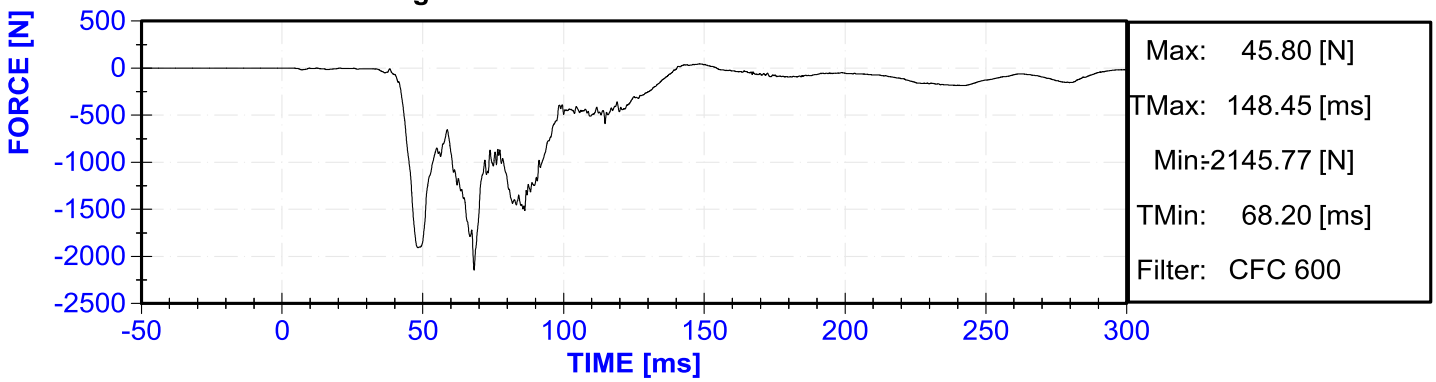
V2P1 Lower Tibia Right X Force



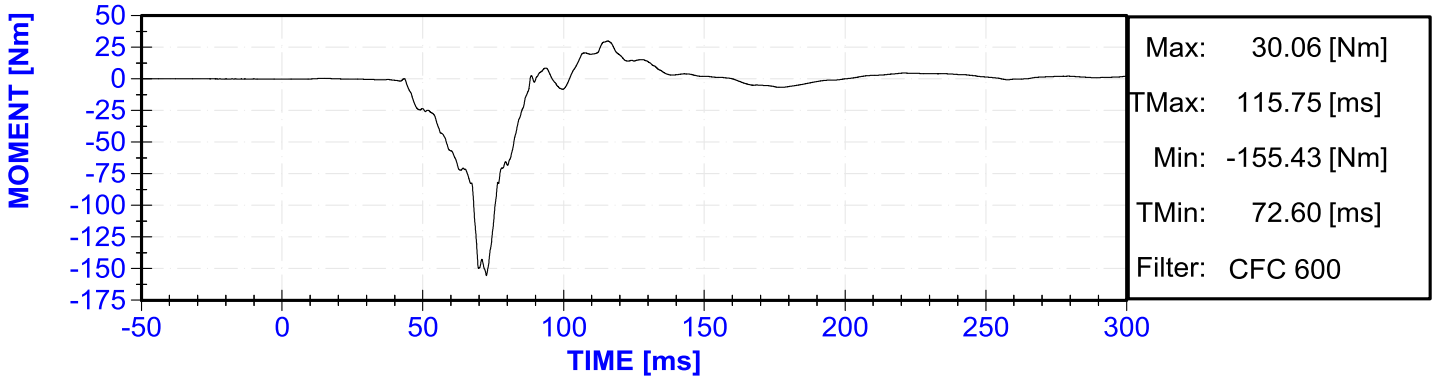
V2P1 Lower Tibia Right Y Force



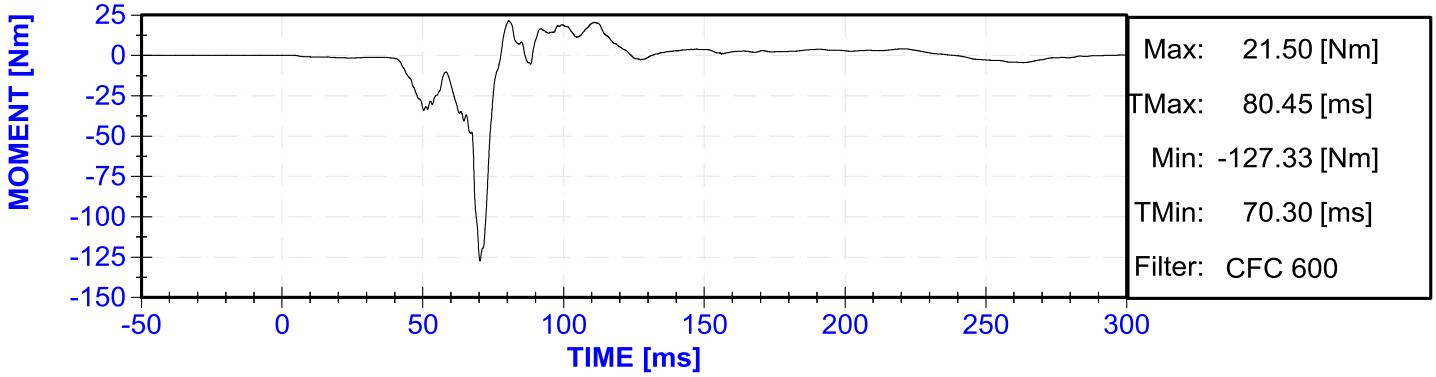
V2P1 Lower Tibia Right Z Force



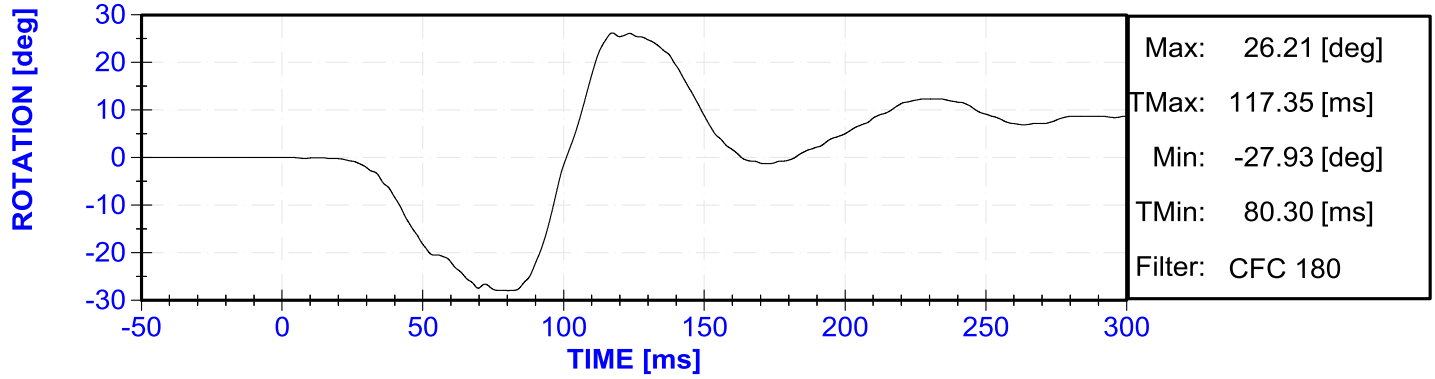
V2P1 Lower Tibia Right X Moment



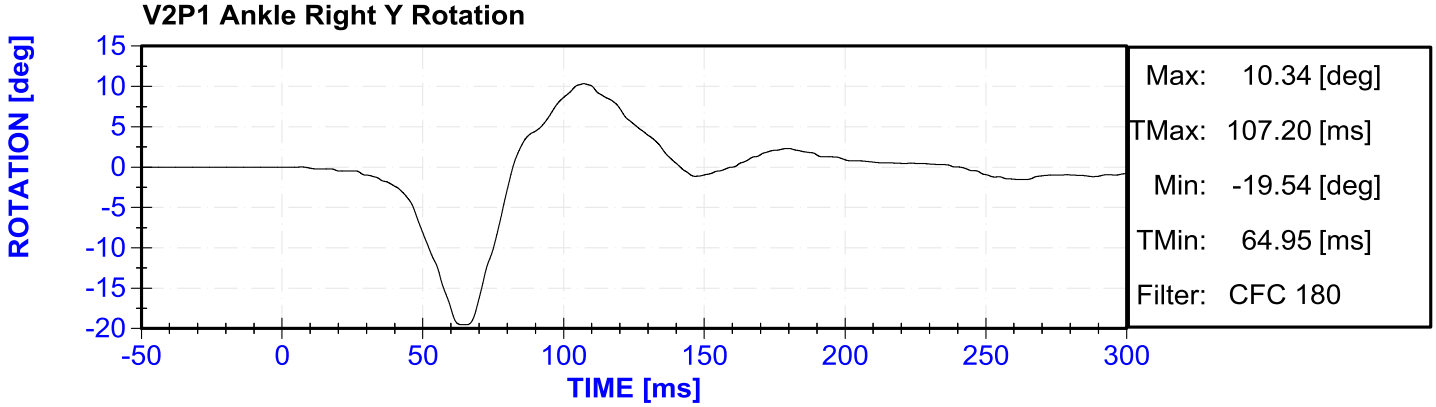
V2P1 Lower Tibia Right Y Moment



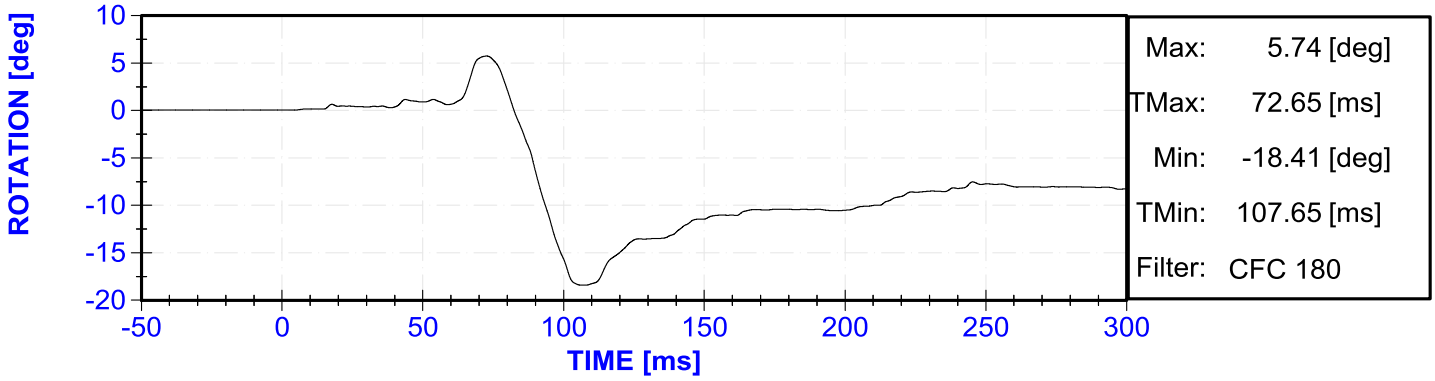
V2P1 Ankle Right X Rotation



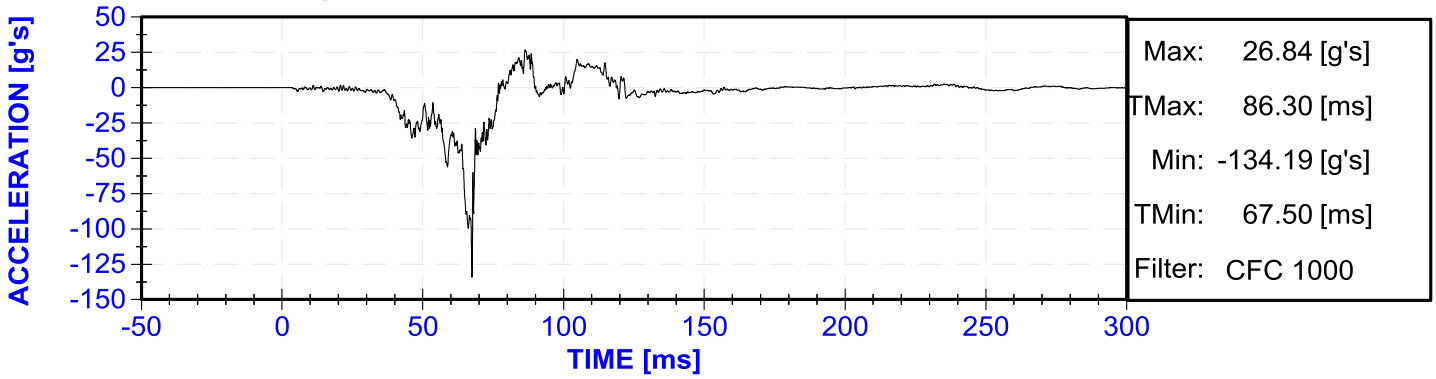
V2P1 Ankle Right Y Rotation



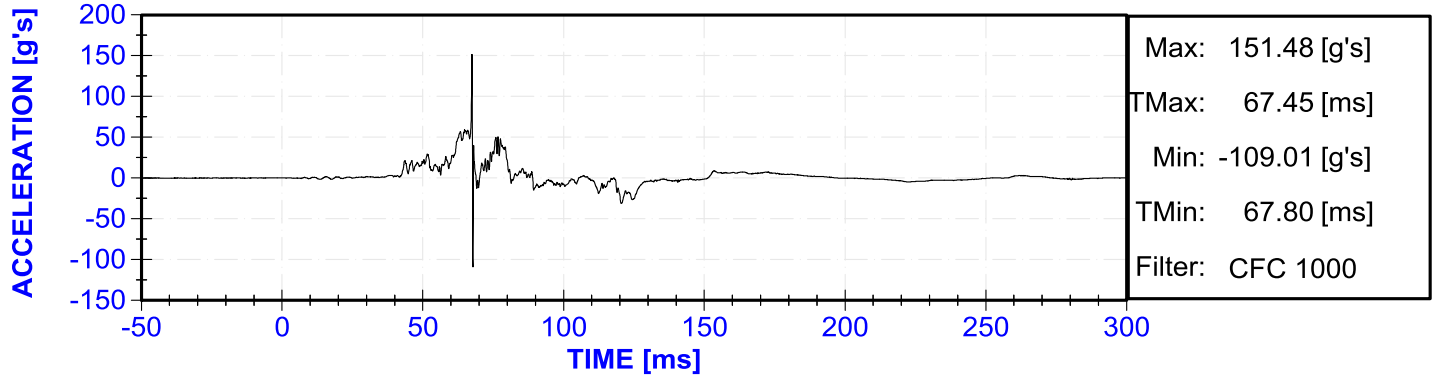
V2P1 Ankle Right Z Rotation



V2P1 Foot Right X Acceleration

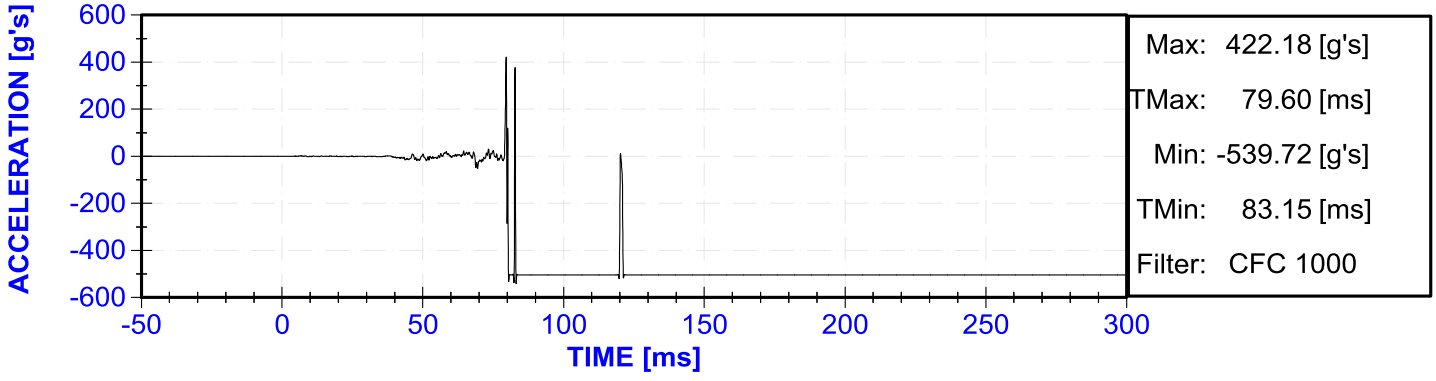


V2P1 Foot Right Y Acceleration

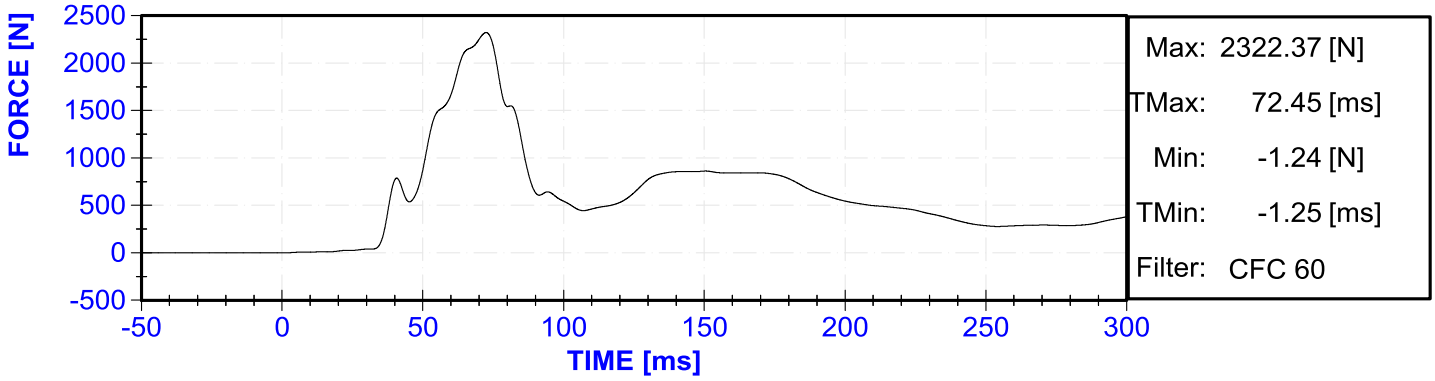


V2P1 Foot Right Z Acceleration

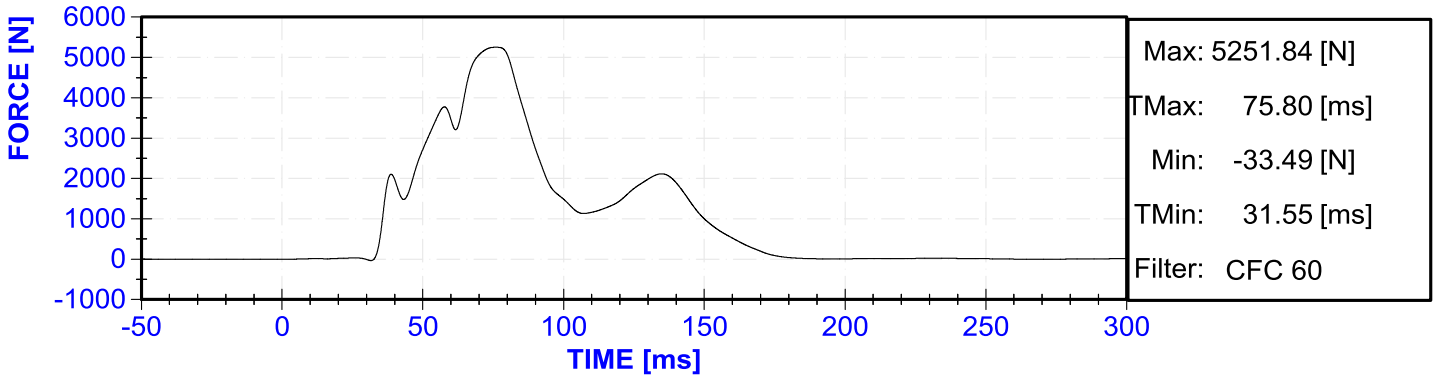
QUESTIONABLE DATA AFTER 79MS



V2 Driver Lap Belt Force

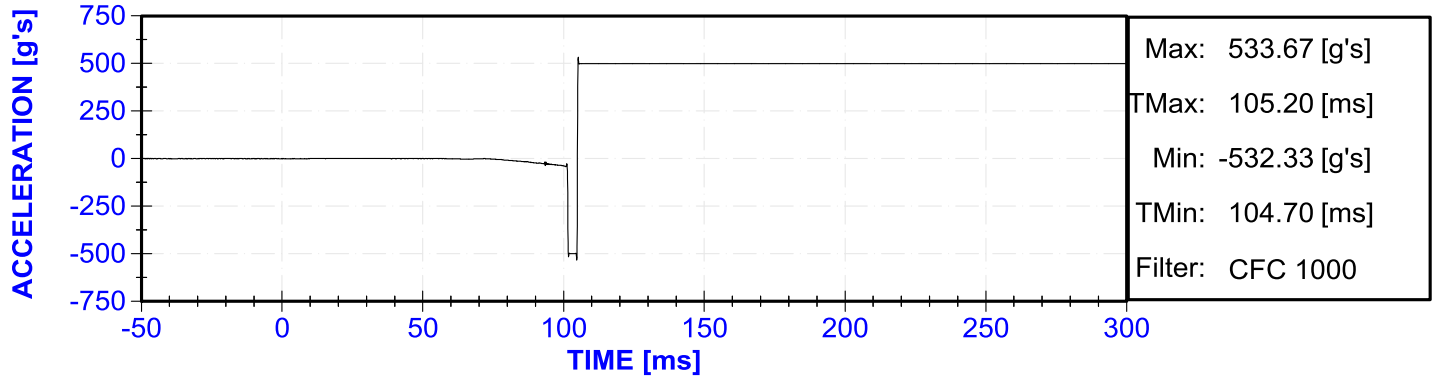


V2 Driver Shoulder Belt Upper Force

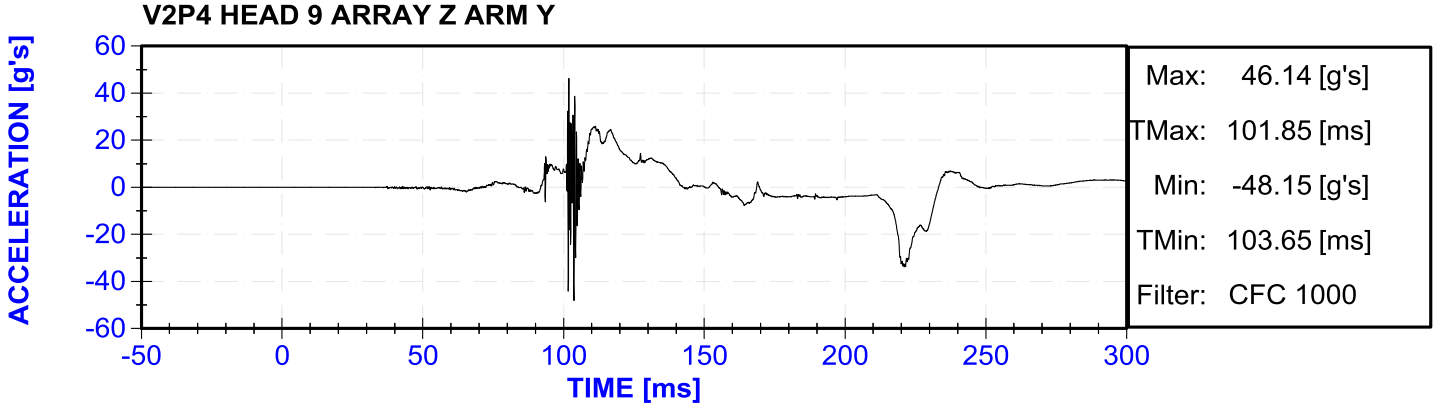


V2P4 HEAD 9 ARRAY Z ARM X

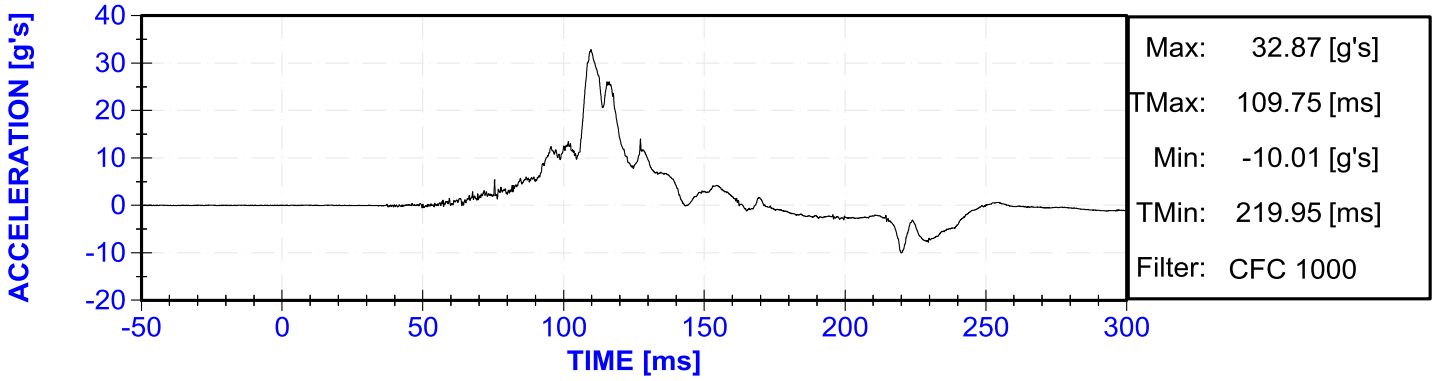
QUESTIONABLE DATA AFTER 100MS



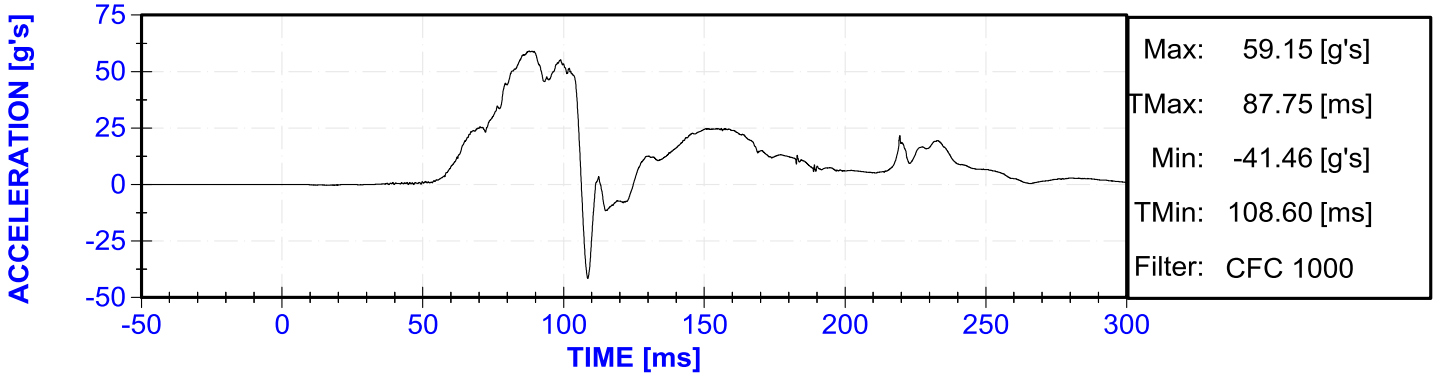
V2P4 HEAD 9 ARRAY Z ARM Y



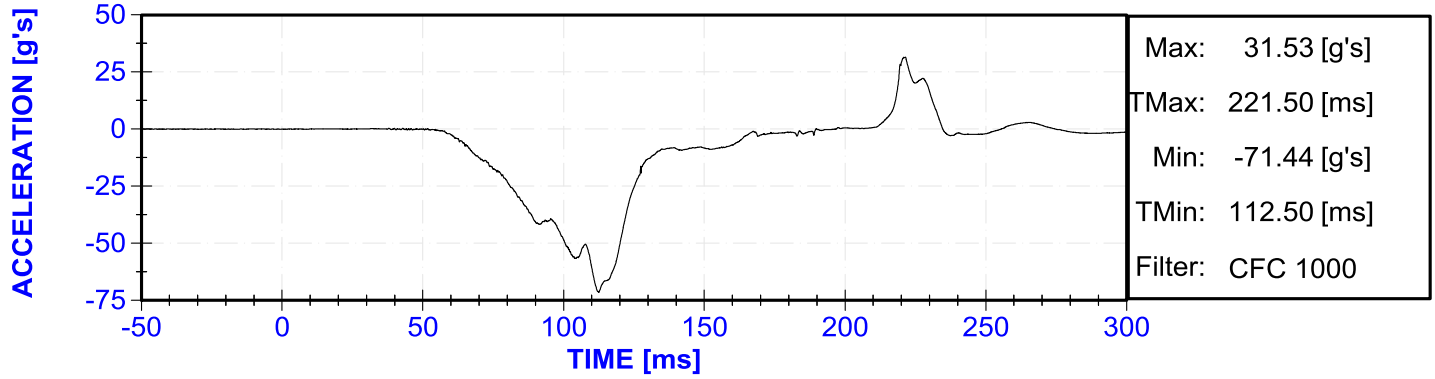
V2P4 HEAD 9 ARRAY X ARM Y



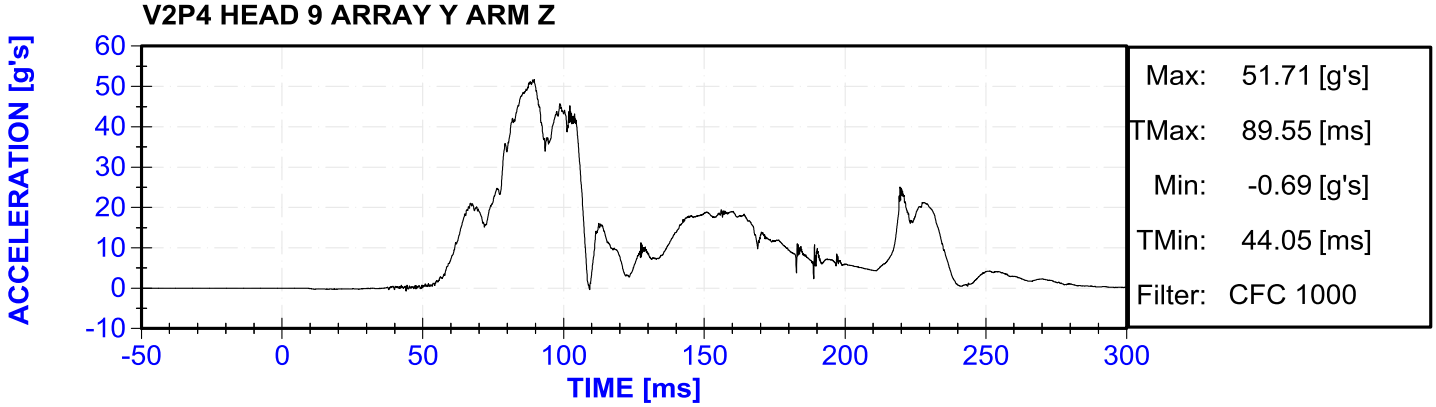
V2P4 HEAD 9 ARRAY X ARM Z



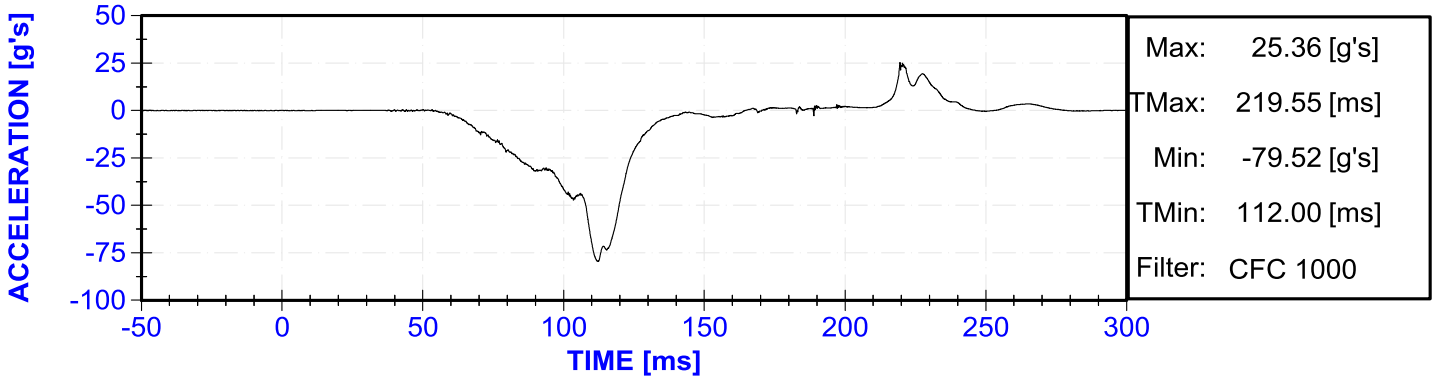
V2P4 HEAD 9 ARRAY Y ARM X



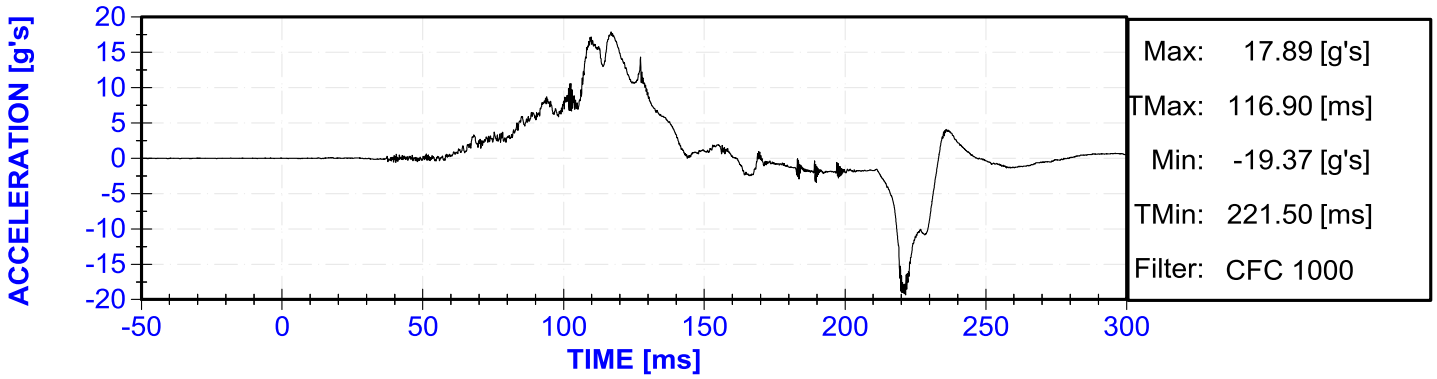
V2P4 HEAD 9 ARRAY Y ARM Z



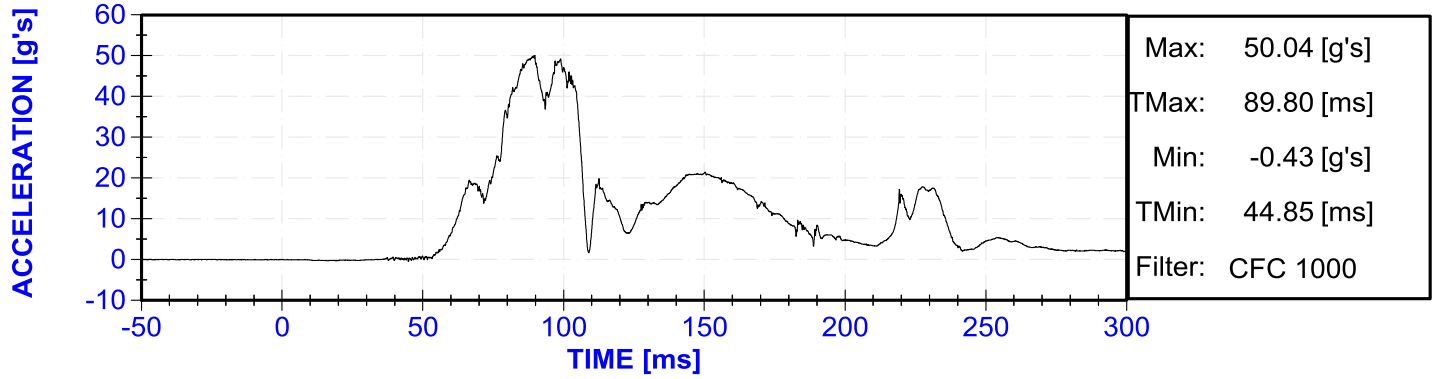
V2P4 HEAD CG X



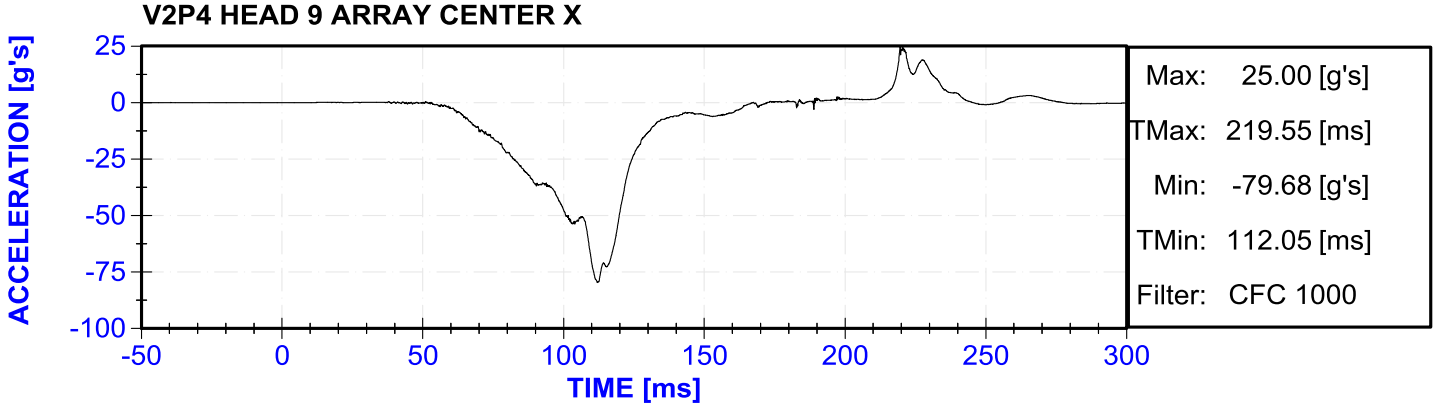
V2P4 HEAD CG Y



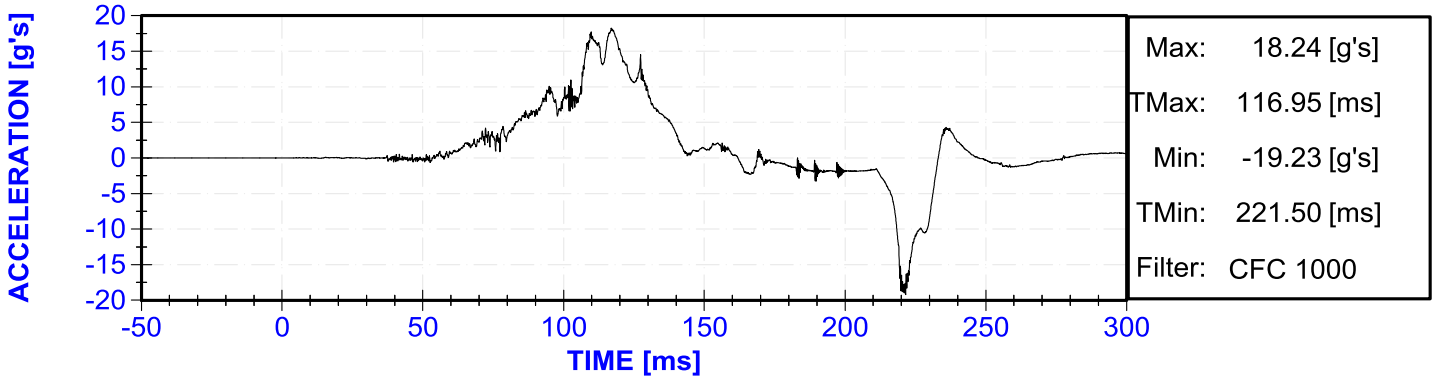
V2P4 HEAD CG Z



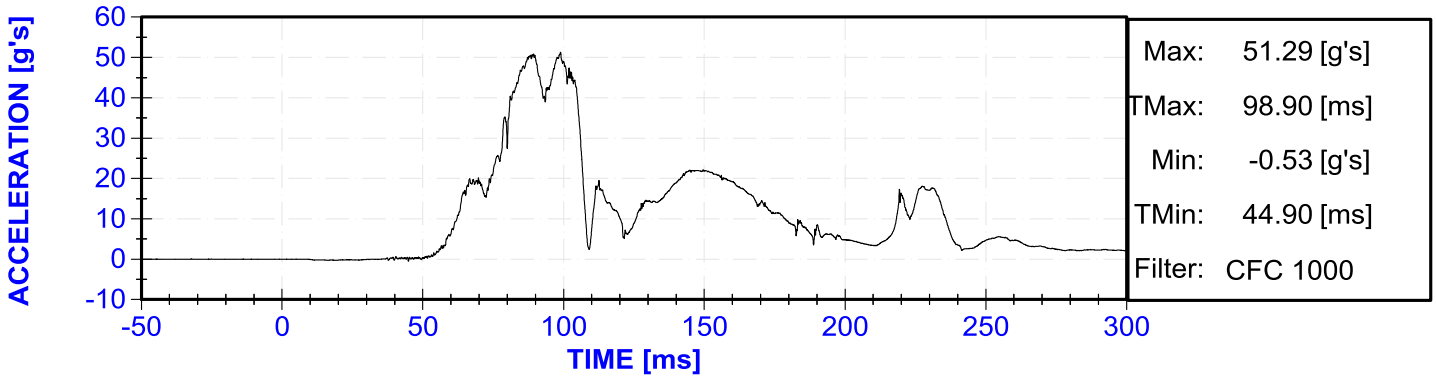
V2P4 HEAD 9 ARRAY CENTER X



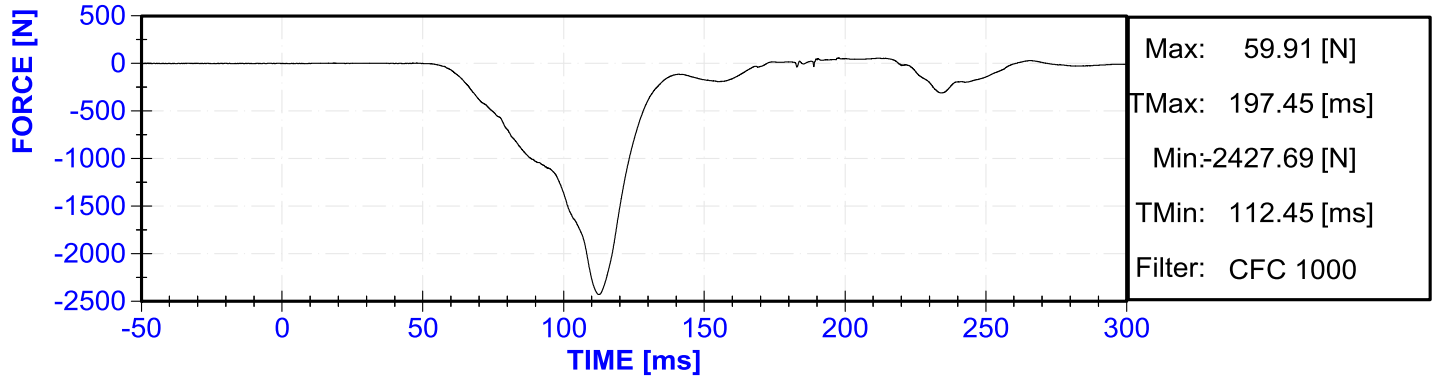
V2P4 HEAD 9 ARRAY CENTER Y



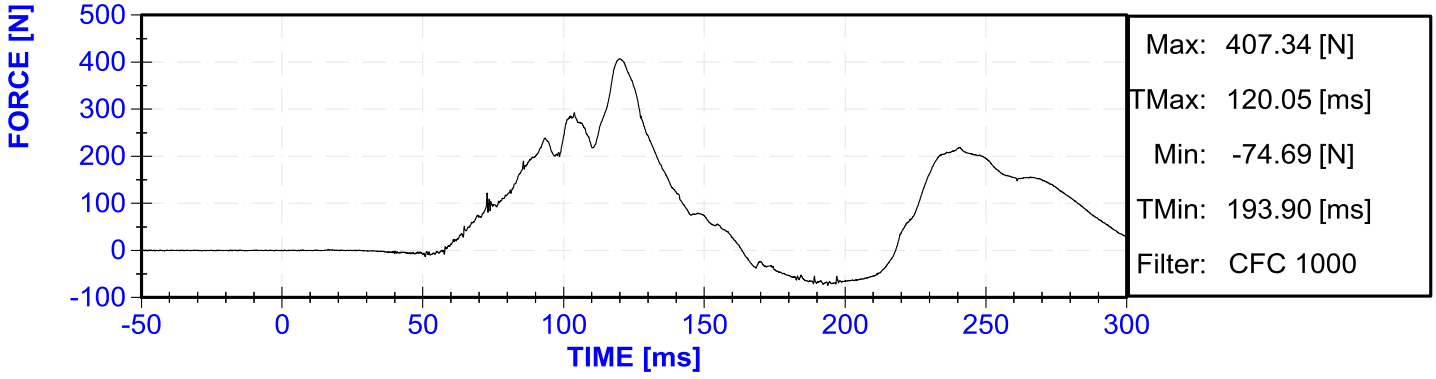
V2P4 HEAD 9 ARRAY CENTER Z



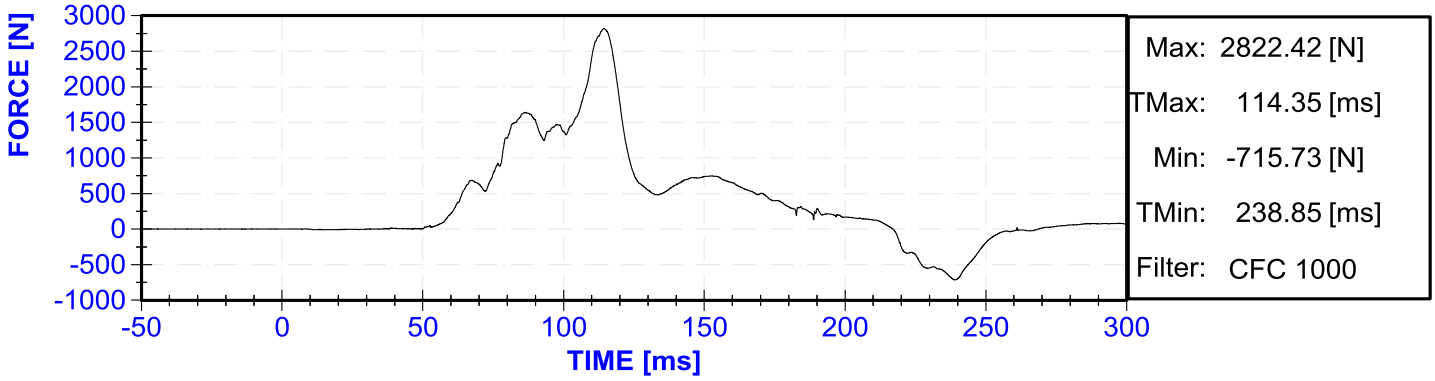
V2P4 UPPER NECK FX



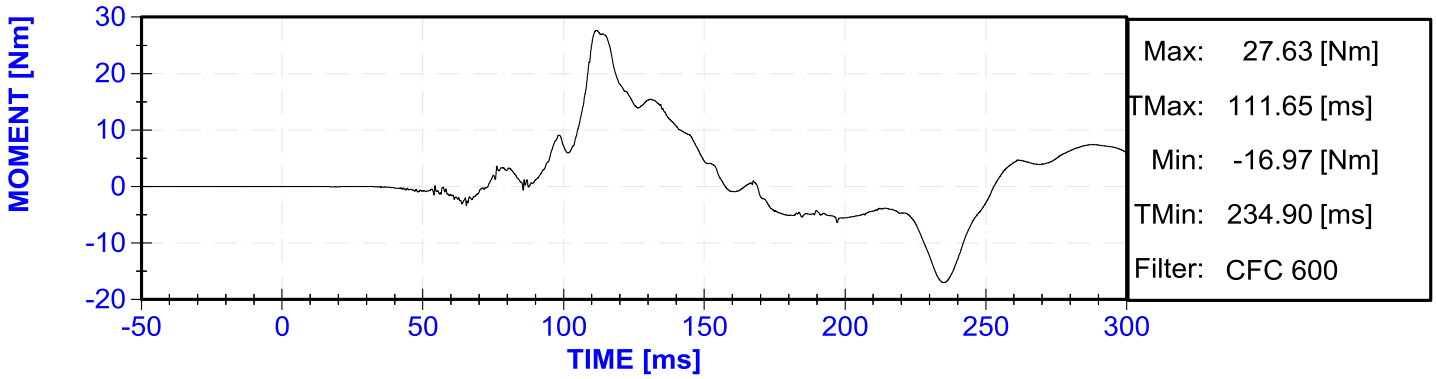
V2P4 UPPER NECK FY



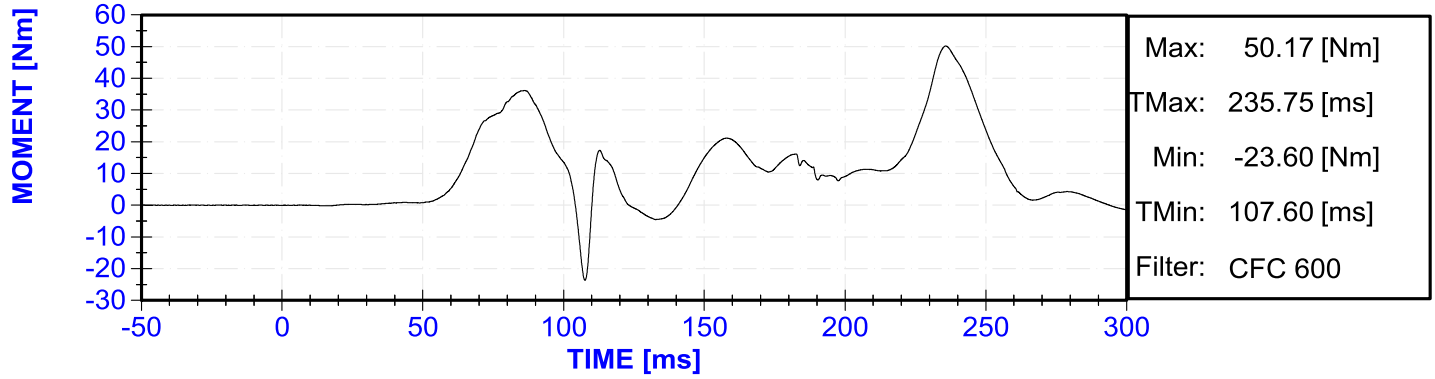
V2P4 UPPER NECK FZ



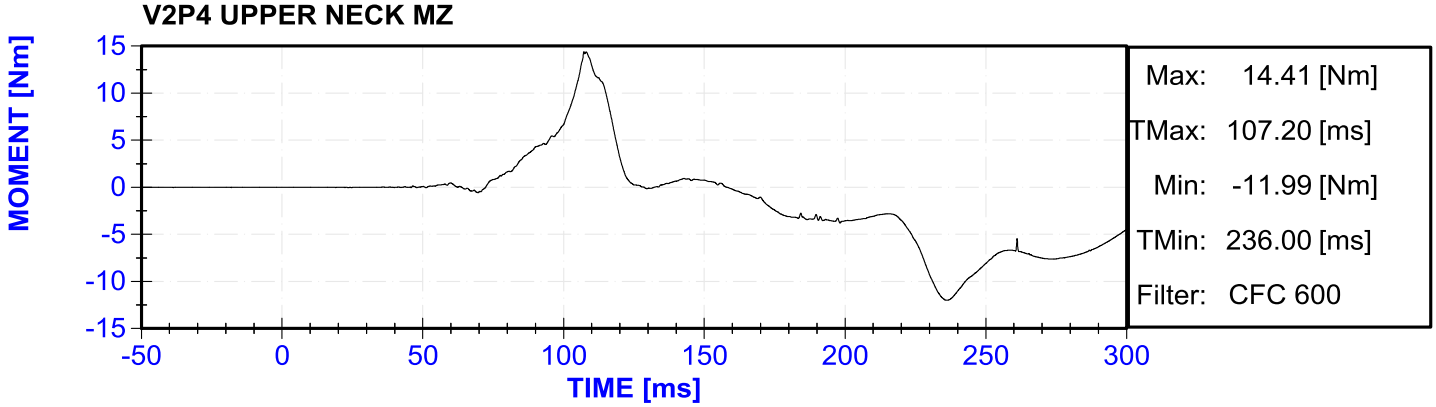
V2P4 UPPER NECK MX



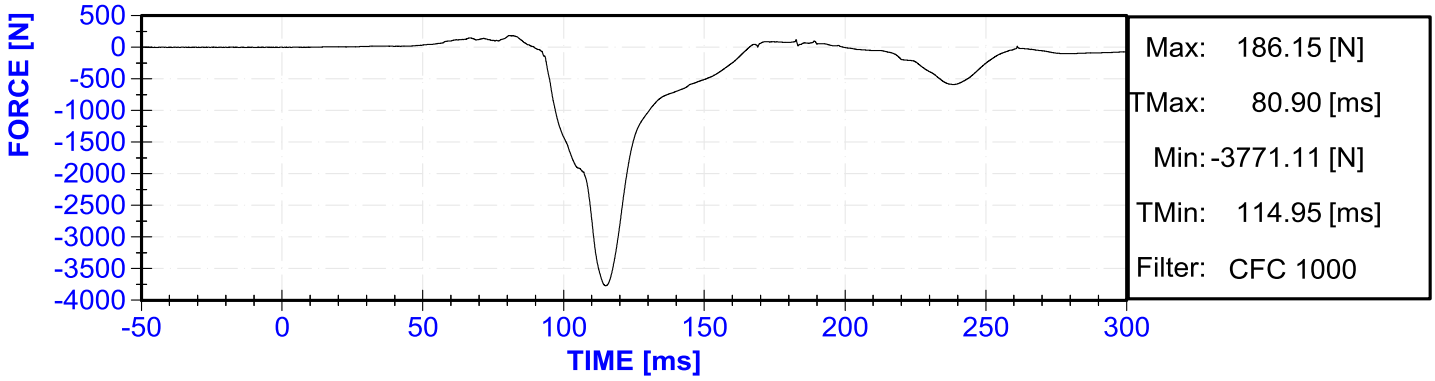
V2P4 UPPER NECK MY



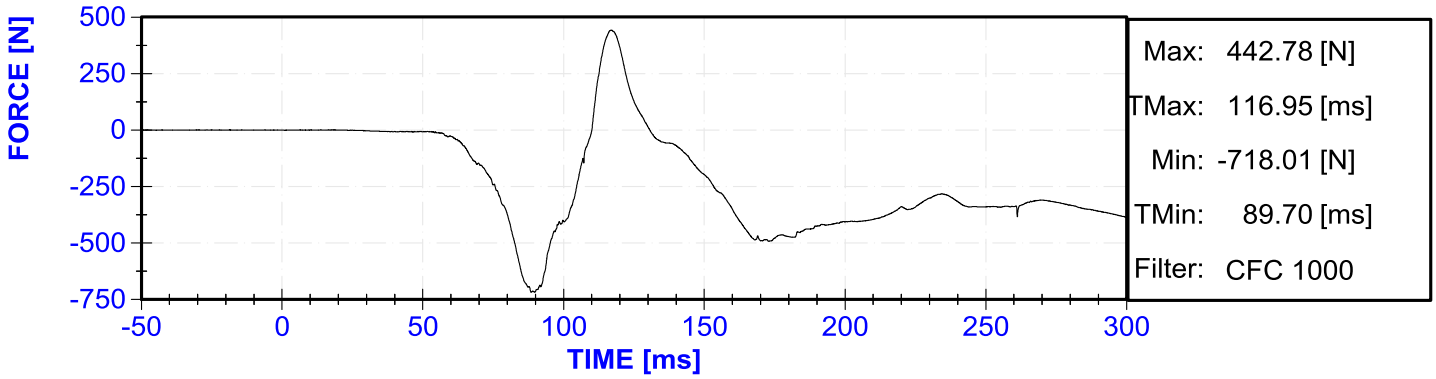
V2P4 UPPER NECK MZ



V2P4 LOWER NECK FX

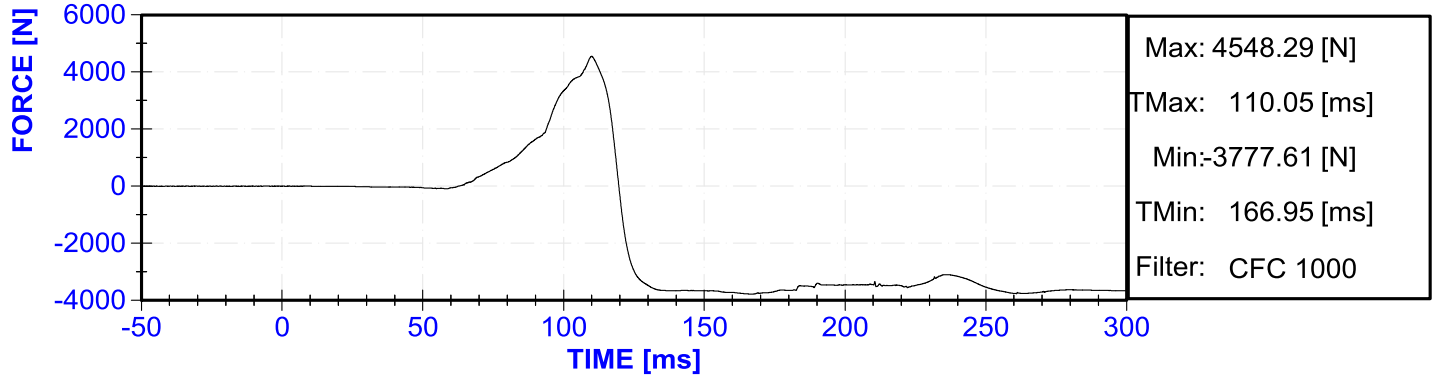


V2P4 LOWER NECK FY

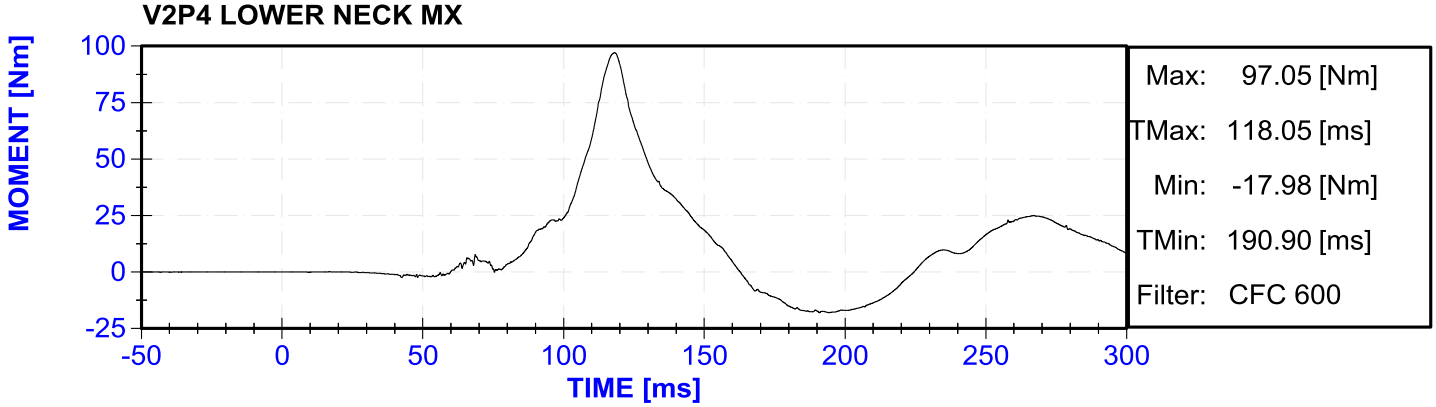


V2P4 LOWER NECK FZ

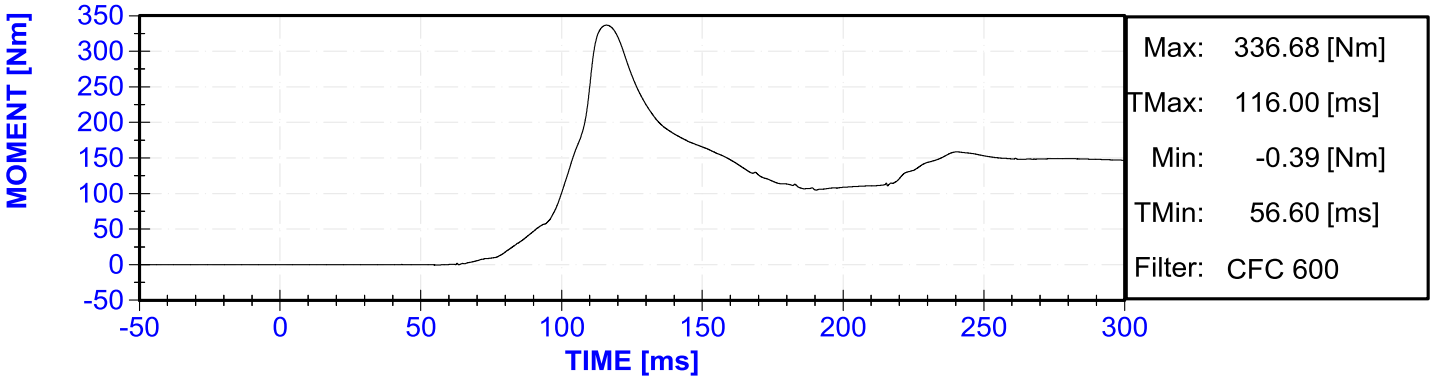
QUESTIONABLE DATA AFTER 135MS



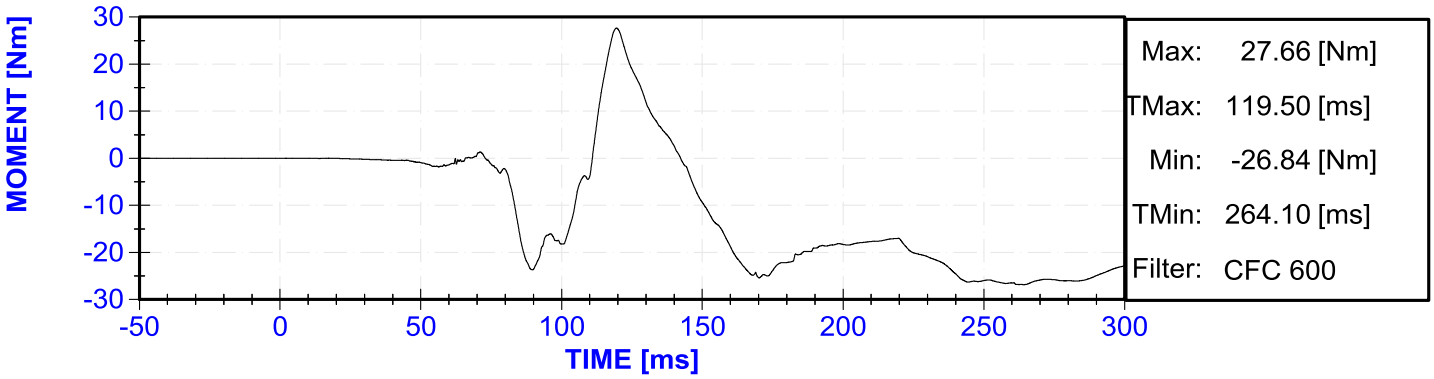
V2P4 LOWER NECK MX



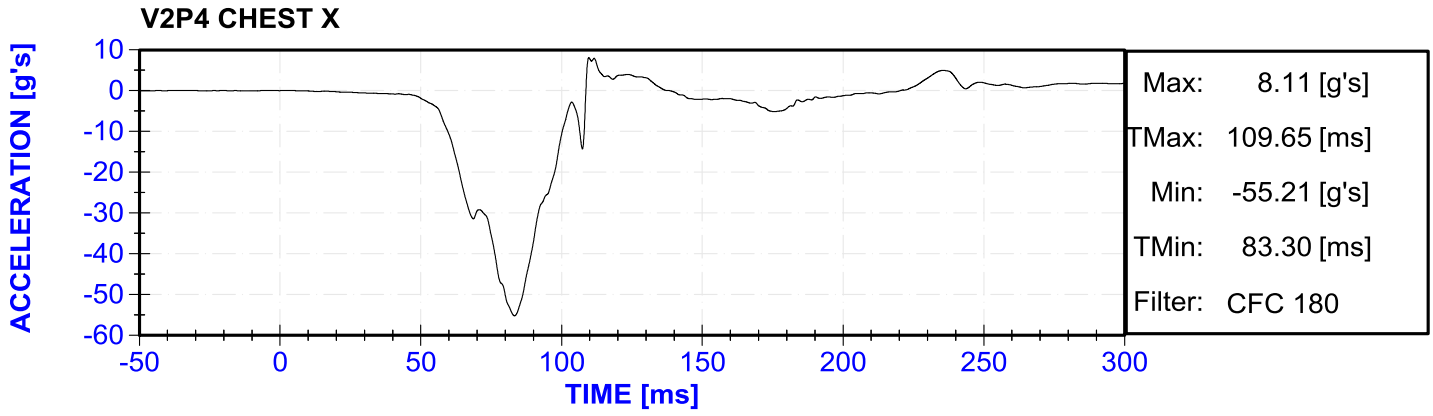
V2P4 LOWER NECK MY



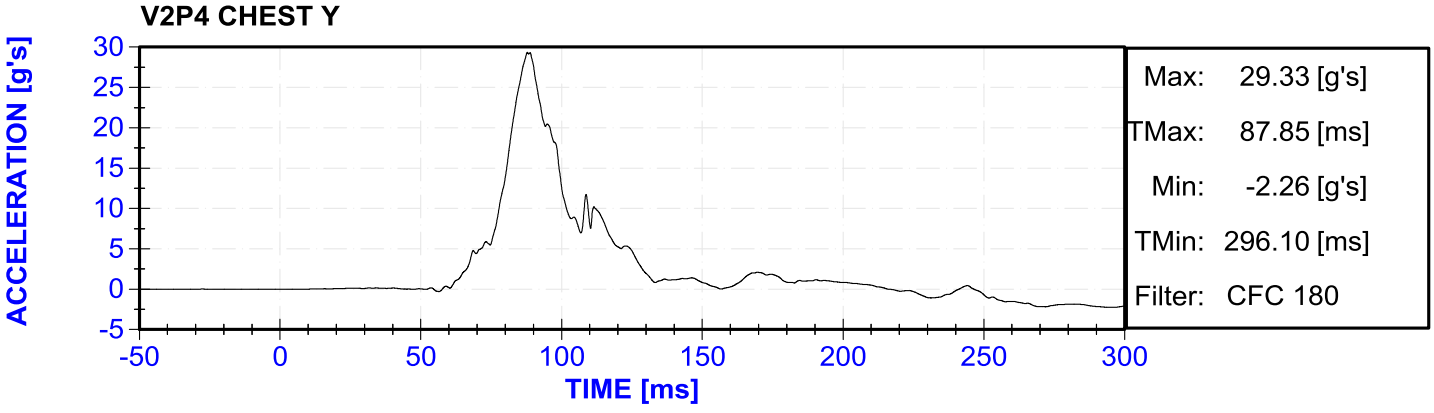
V2P4 LOWER NECK MZ



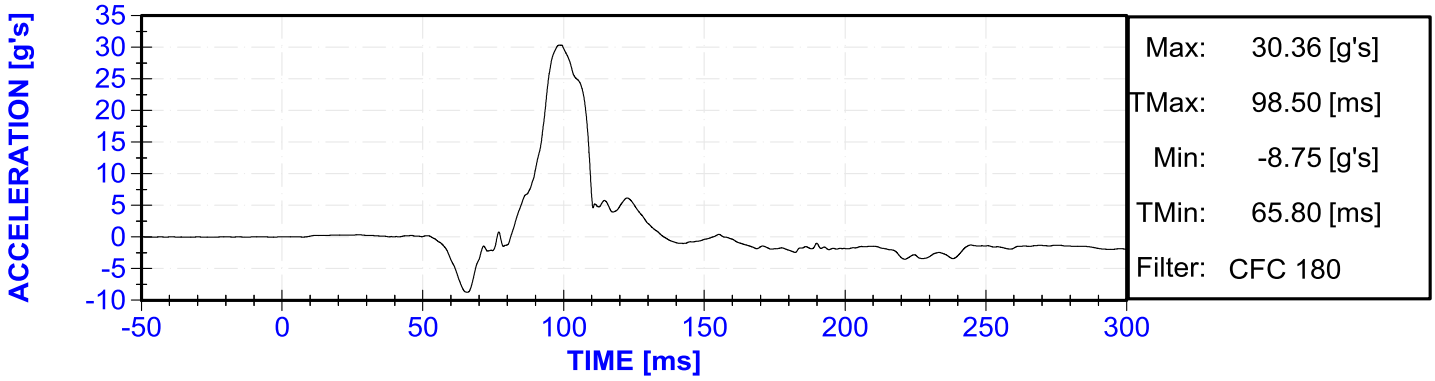
V2P4 CHEST X



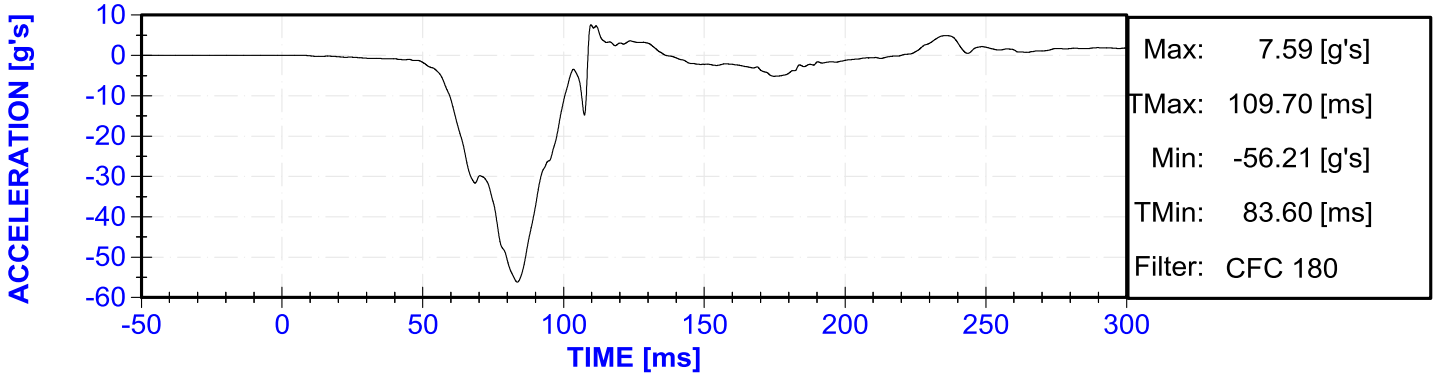
V2P4 CHEST Y



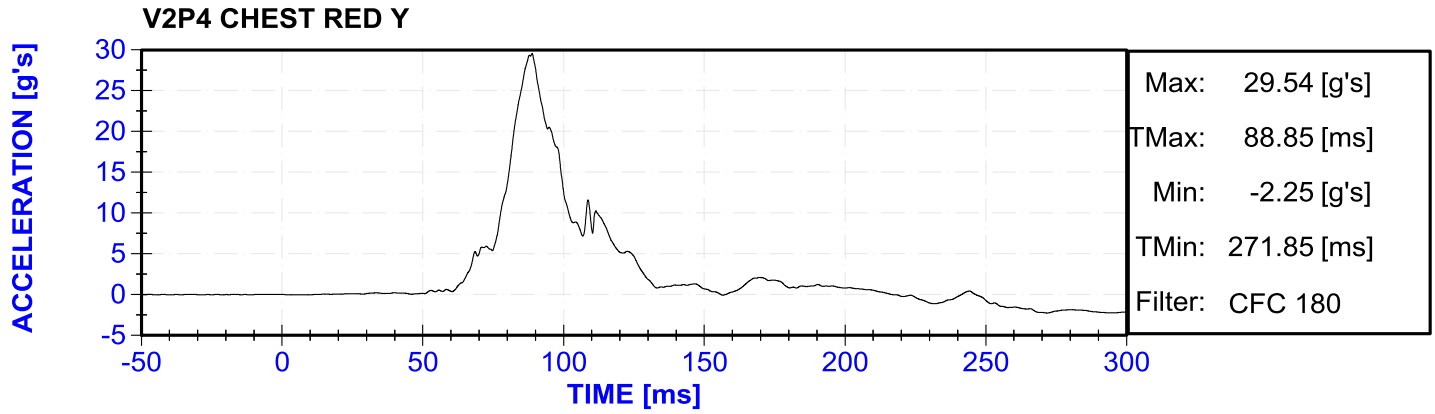
V2P4 CHEST Z



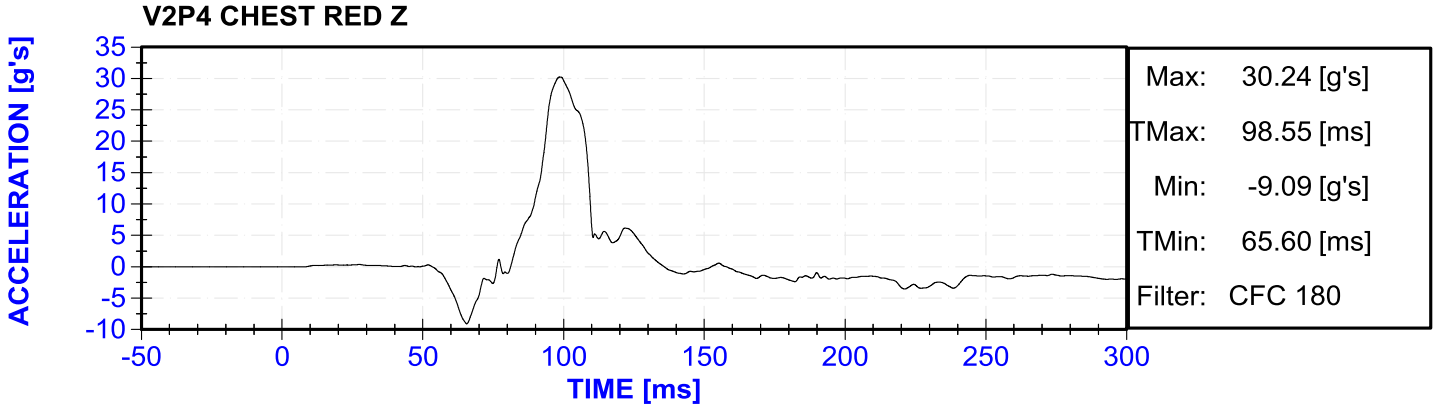
V2P4 CHEST RED X



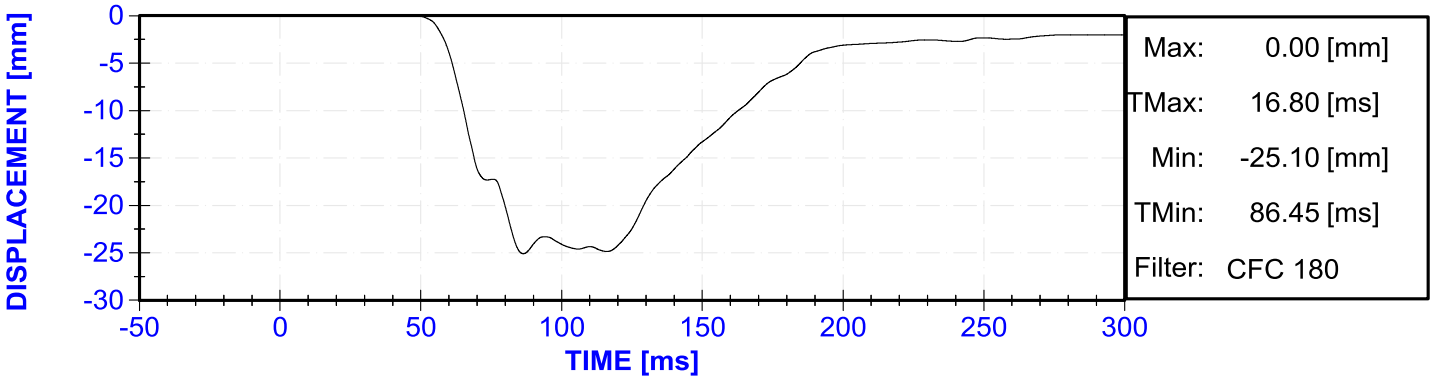
V2P4 CHEST RED Y



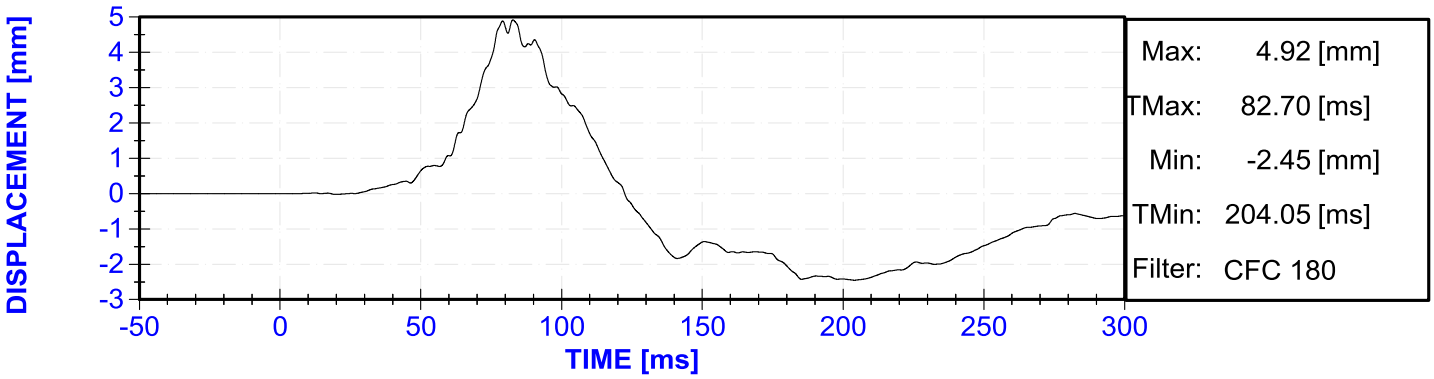
V2P4 CHEST RED Z



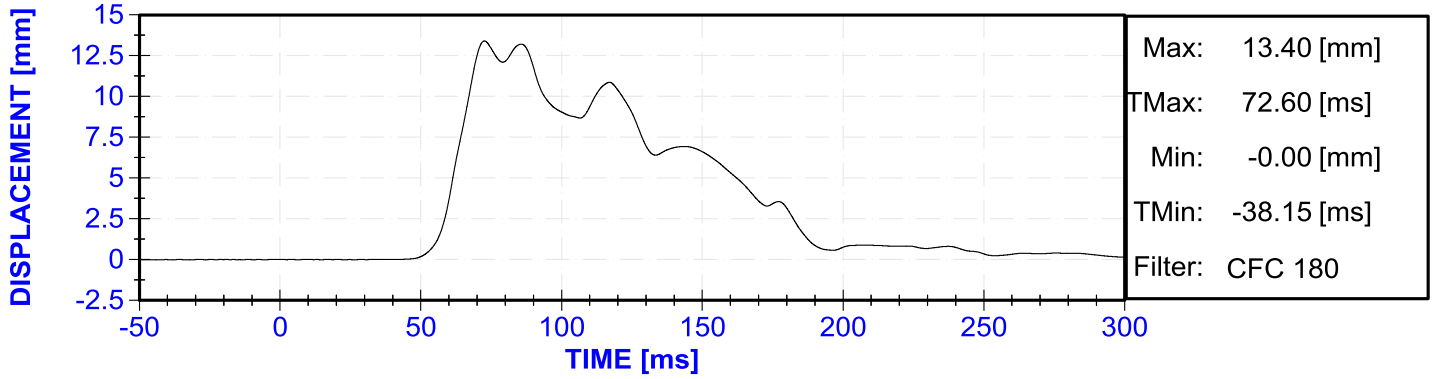
V2P4 CHEST DISPLACEMENT



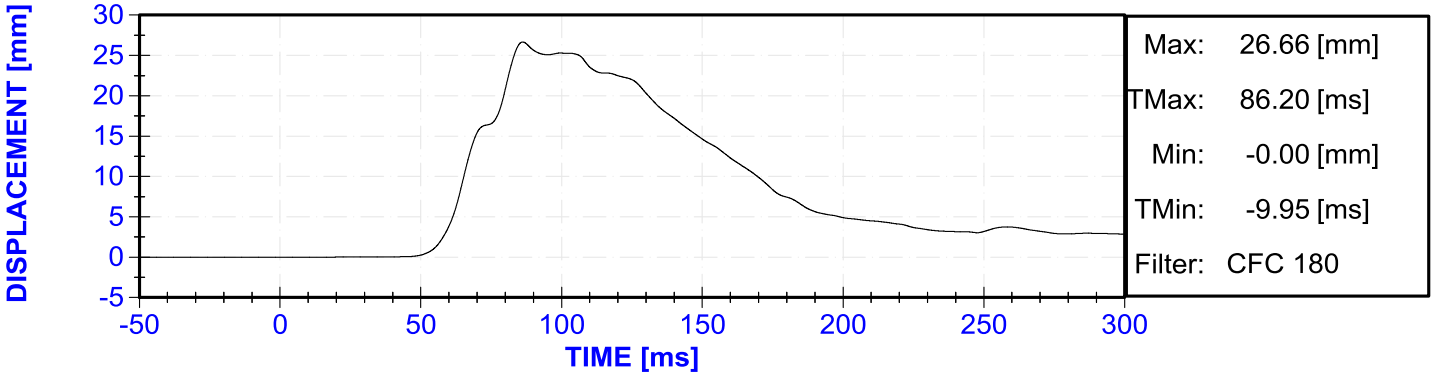
V2P4 8 STRING POD - UR TOP



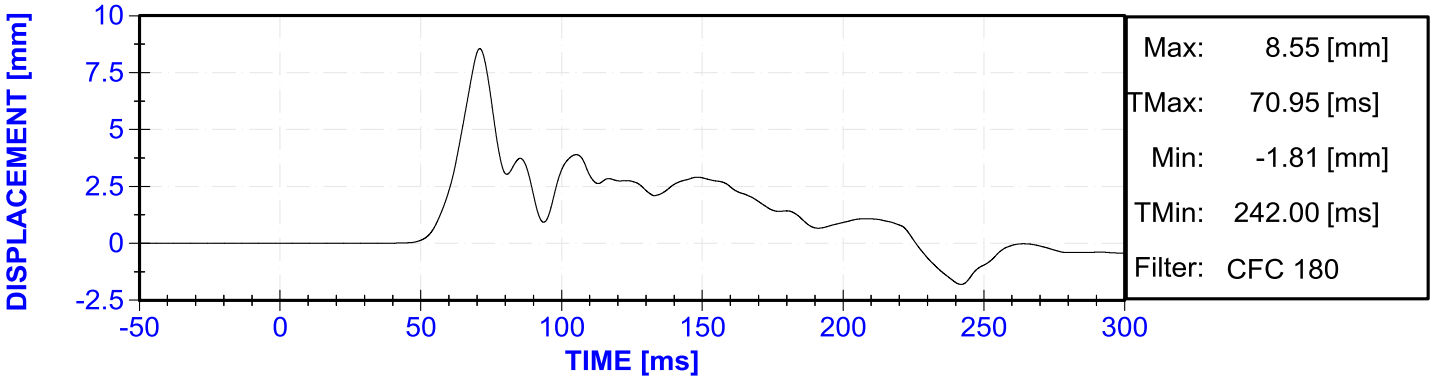
V2P4 8 STRING POD - UR MID



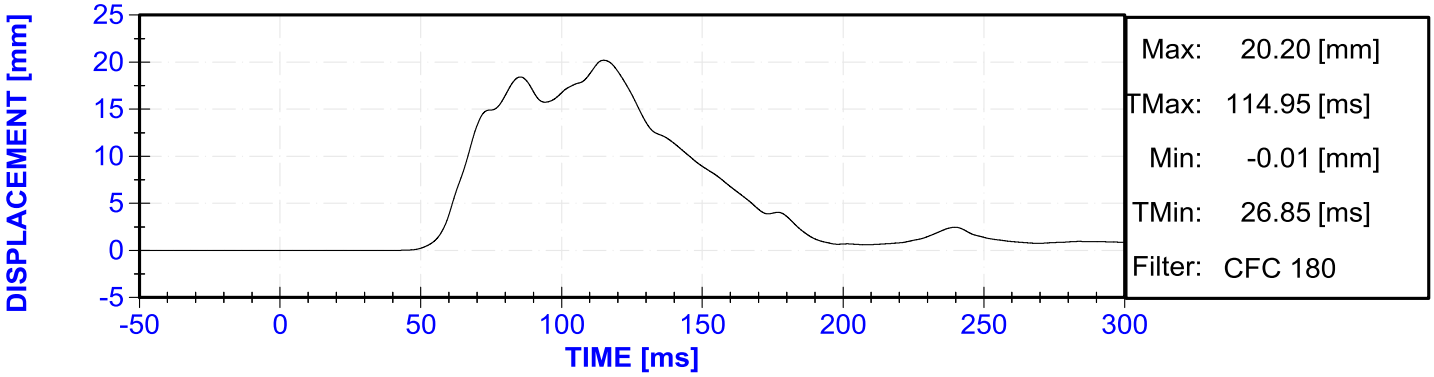
V2P4 8 STRING POD - LR MID



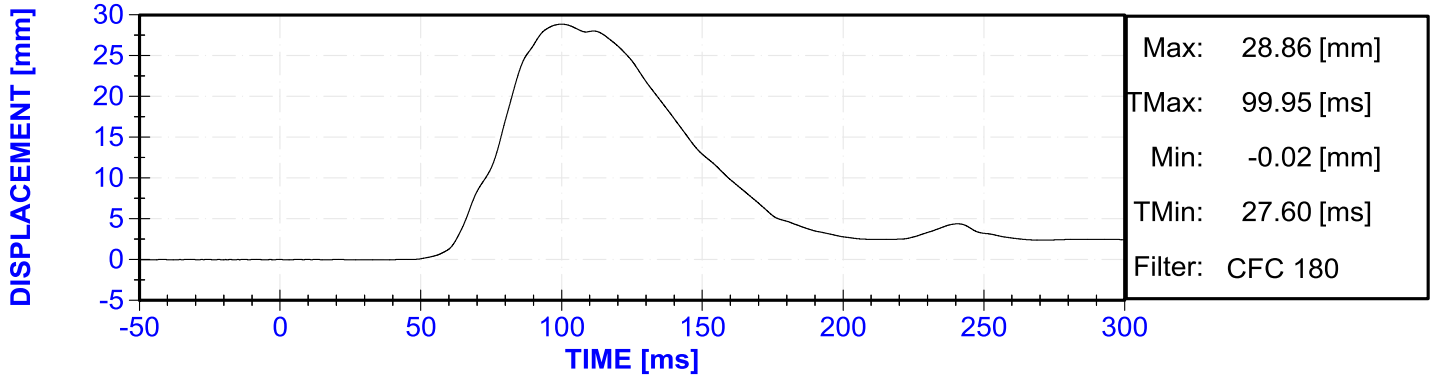
V2P4 8 STRING POD - LR BOTTOM



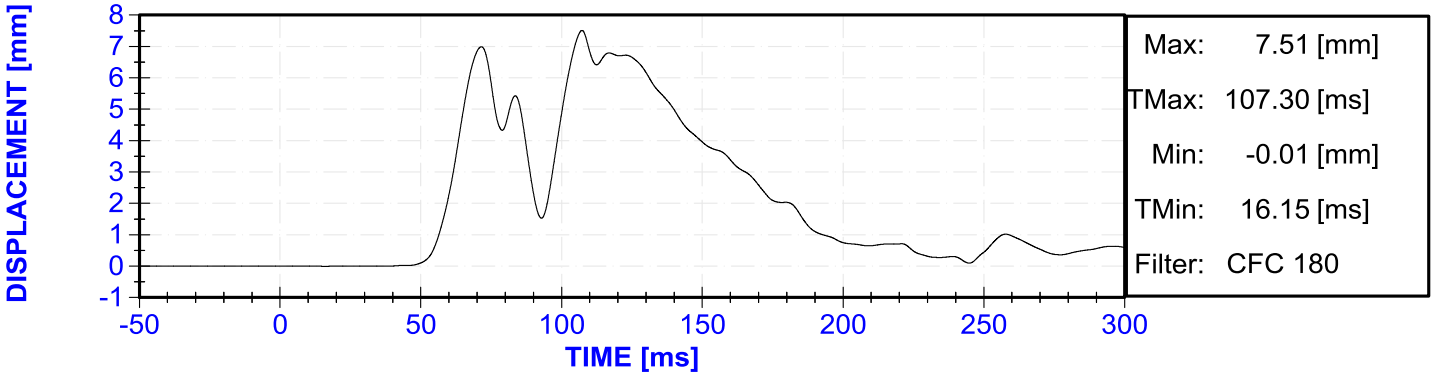
V2P4 8 STRING POD - UL TOP



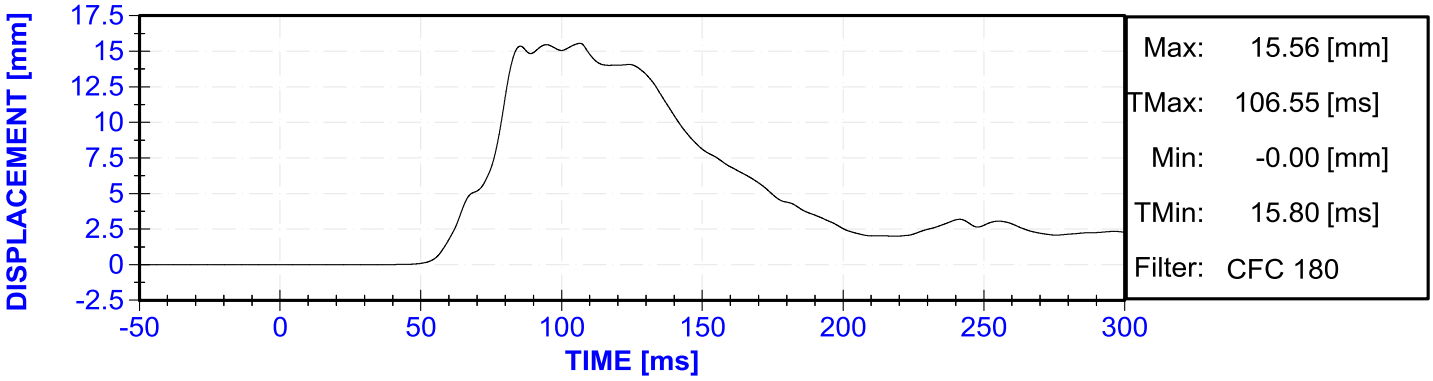
V2P4 8 STRING POD - UL MID



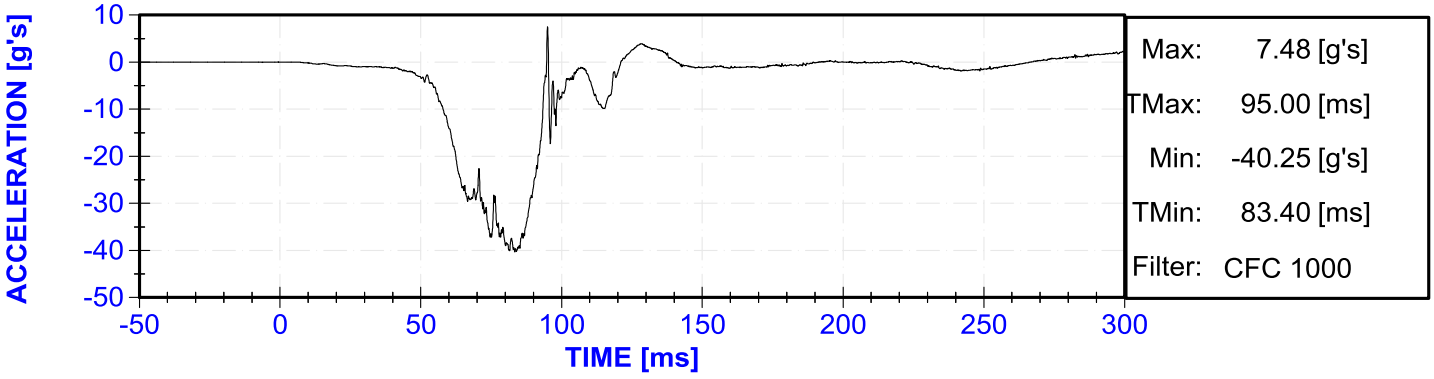
V2P4 8 STRING POD - LL MID



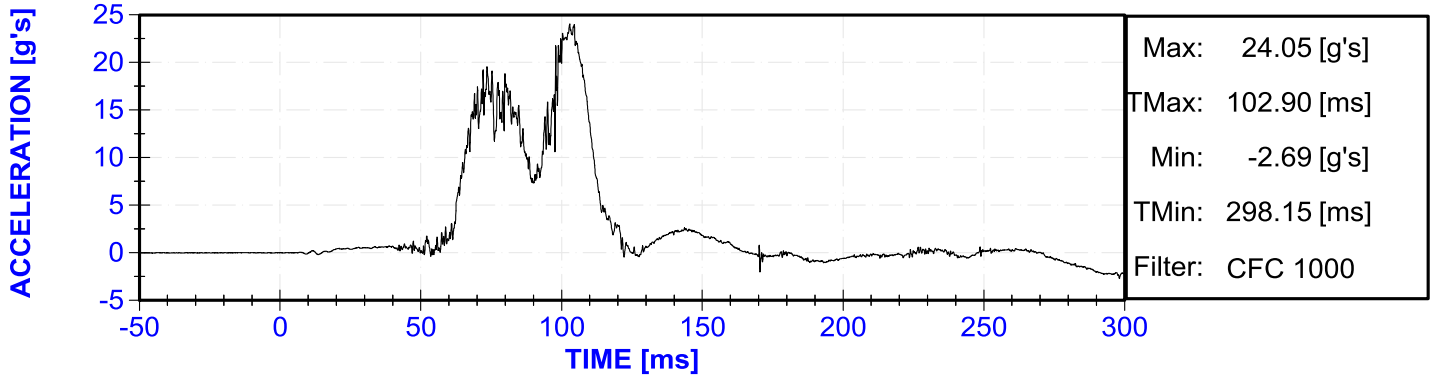
V2P4 8 STRING POD - LL BOTTOM



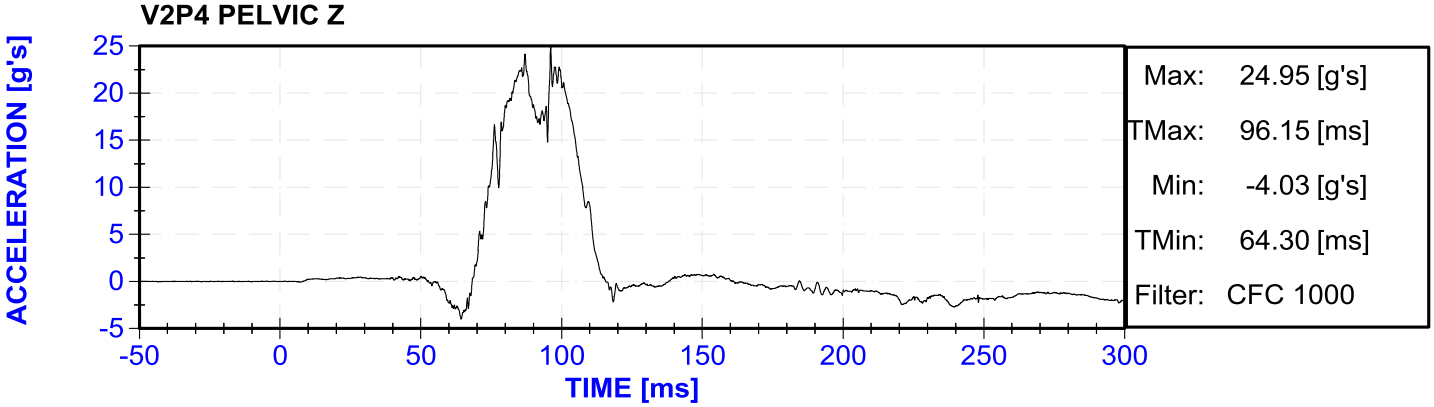
V2P4 PELVIC X



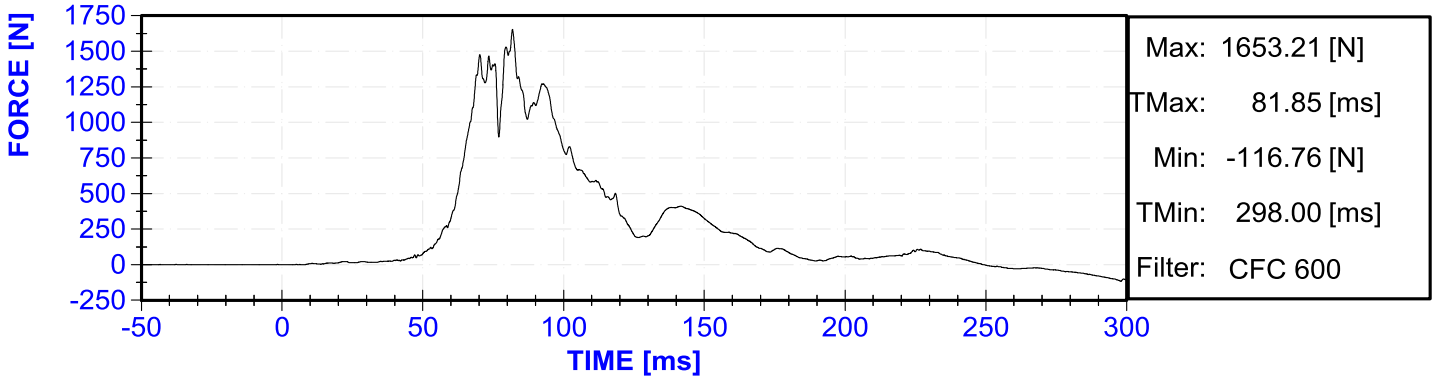
V2P4 PELVIC Y



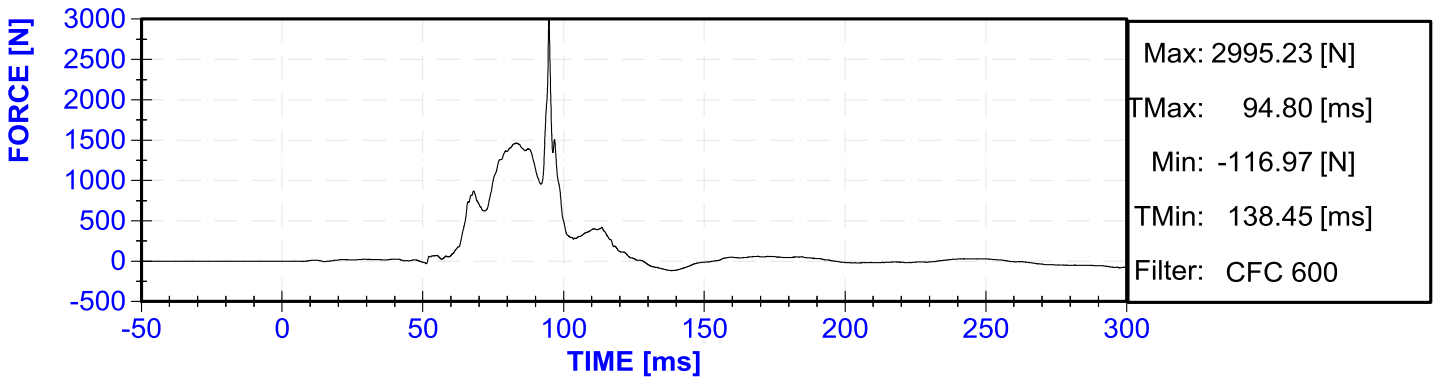
V2P4 PELVIC Z



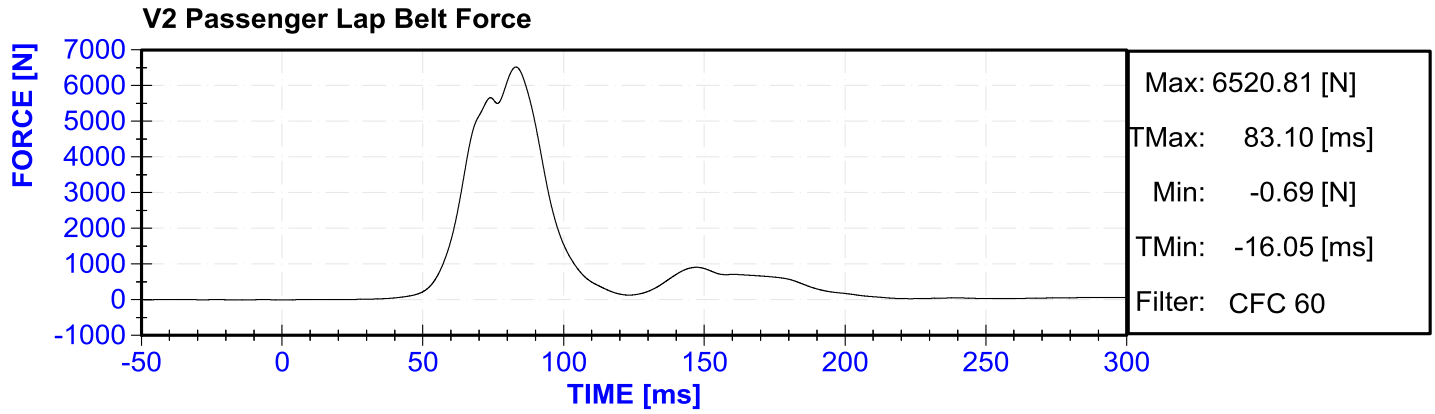
V2P4 LEFT FEMUR FZ



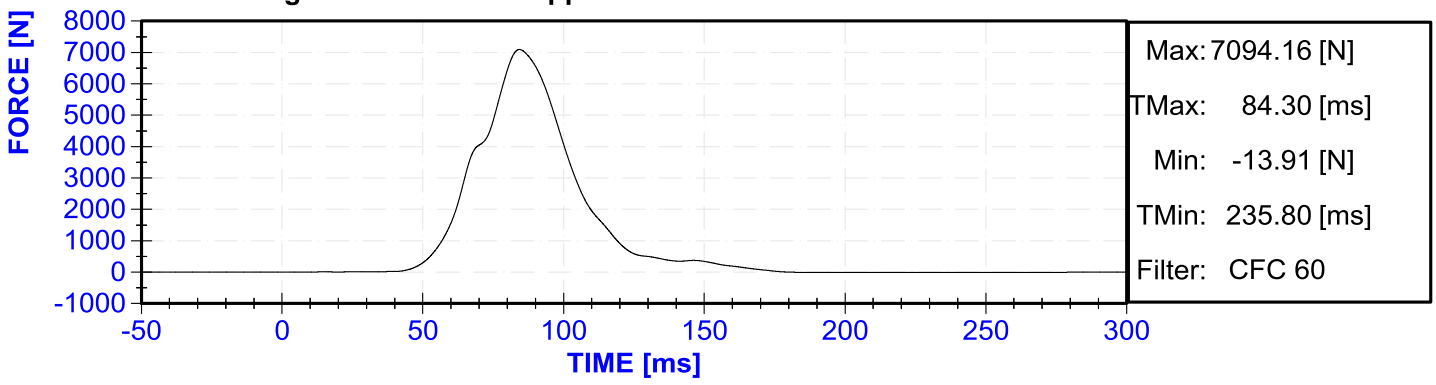
V2P4 RIGHT FEMUR FZ



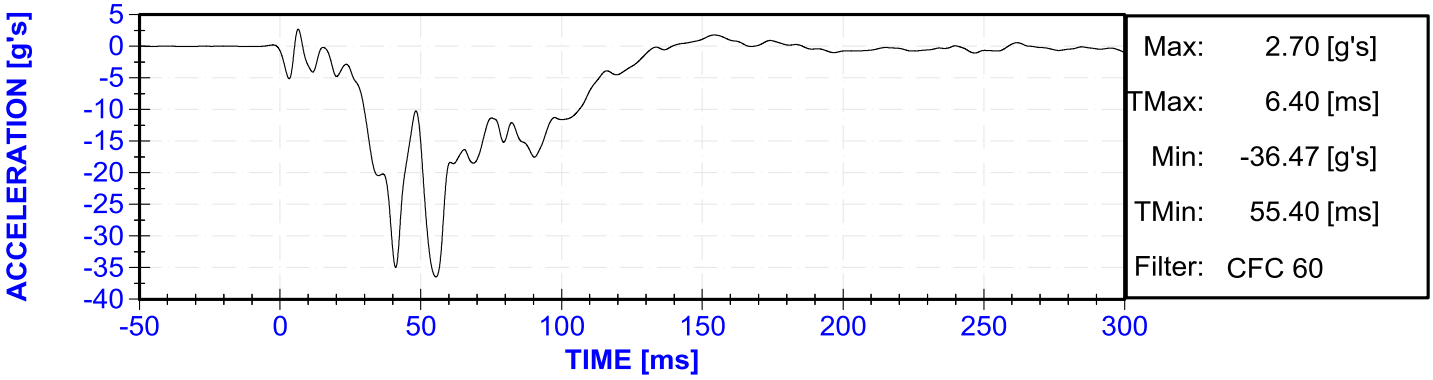
V2 Passenger Lap Belt Force



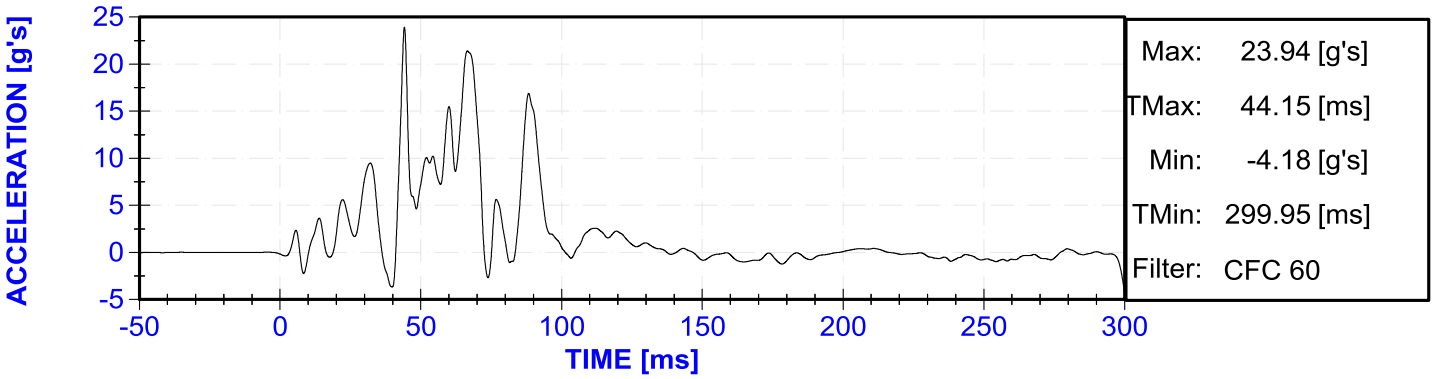
V2 Passenger Shoulder Belt Upper Force



V2 Left Rear Sill X Acceleration

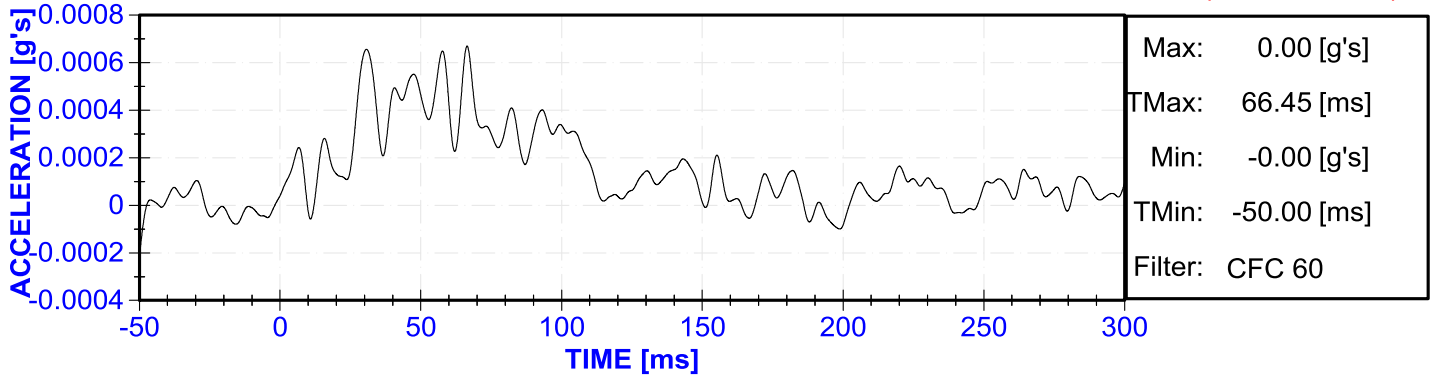


V2 Left Rear Sill Y Acceleration



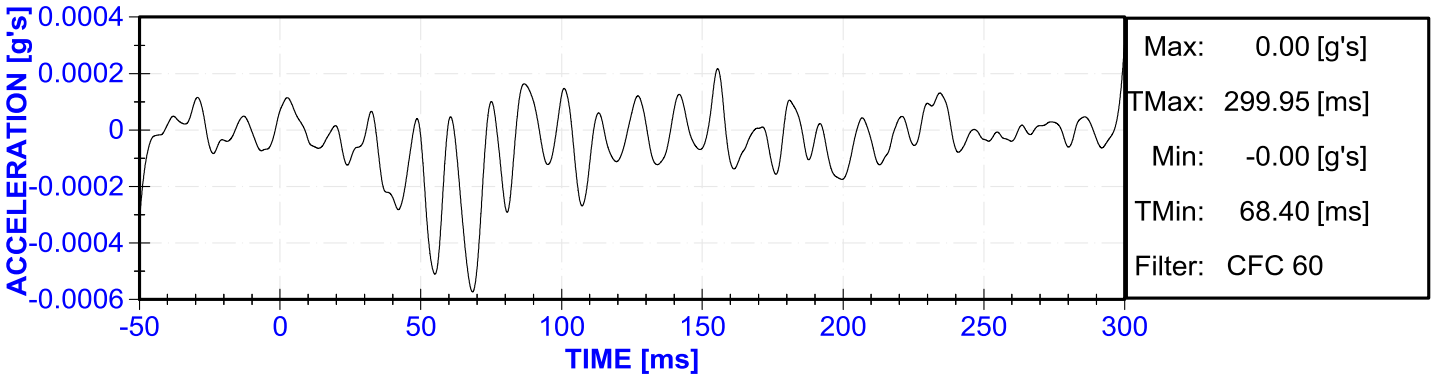
V2 Left Rear Sill Redundant X Acceleration

CHANNEL FAILED (PRIMARY GOOD)

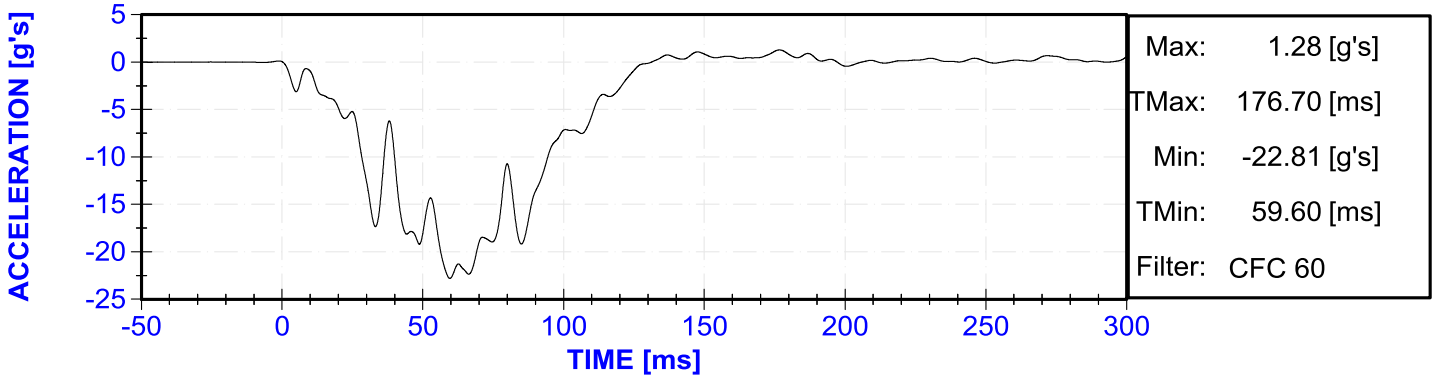


V2 Left Rear Sill Redundant Y Acceleration

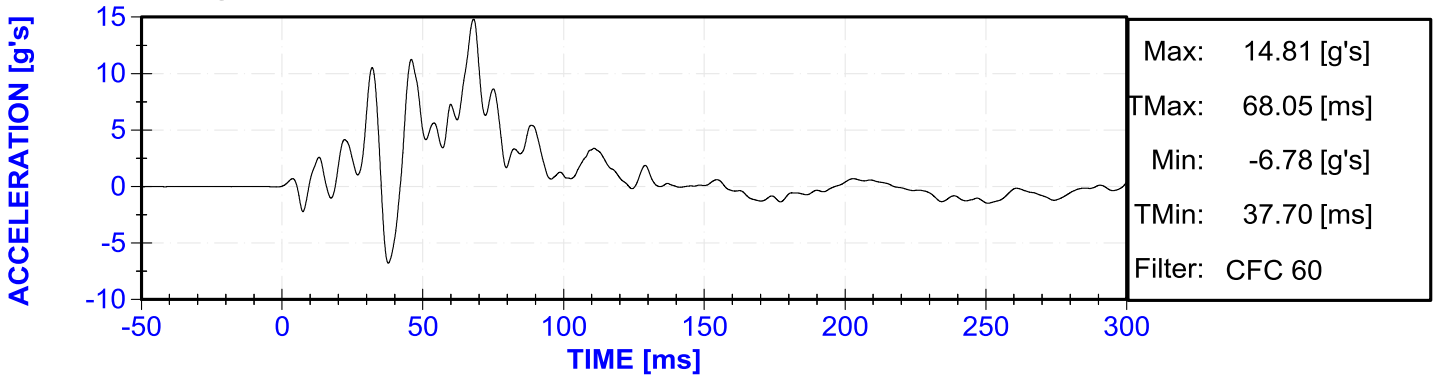
CHANNEL FAILED (PRIMARY GOOD)



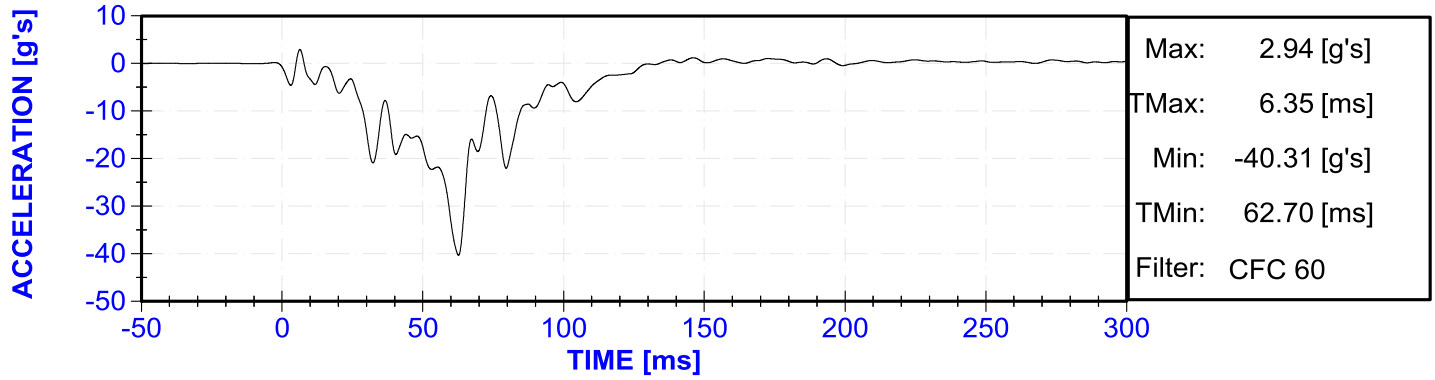
V2 Right Rear Sill X Acceleration



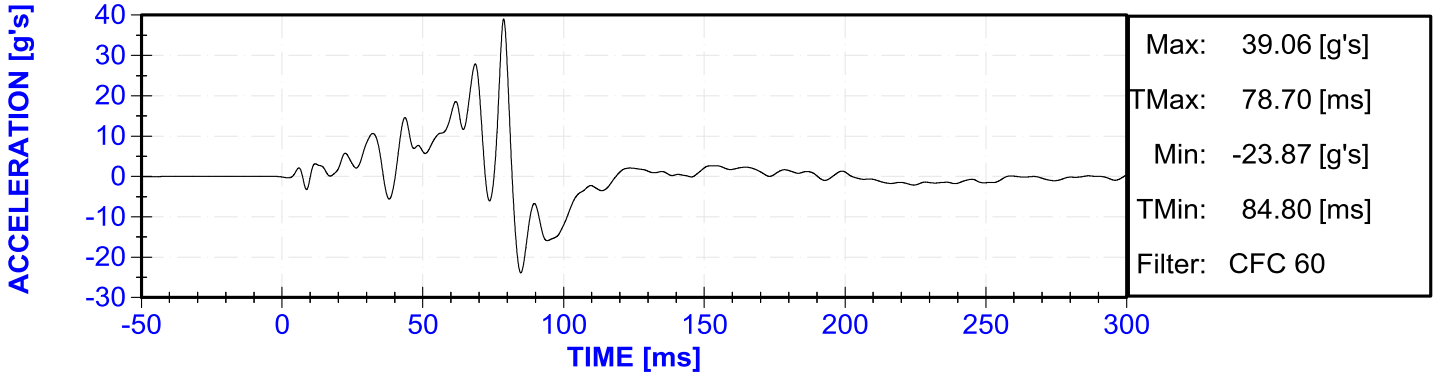
V2 Right Rear Sill Y Acceleration



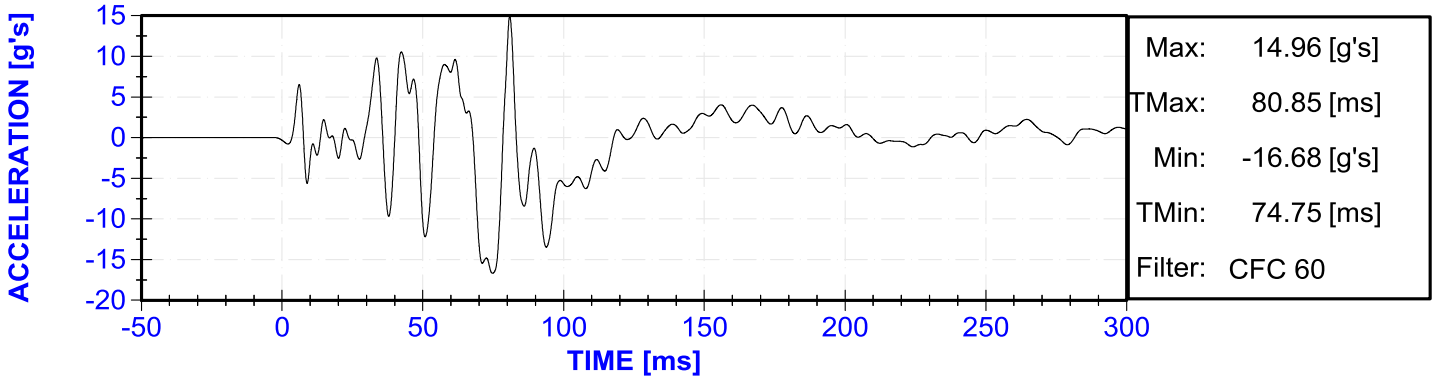
V2 Vehicle CG X Acceleration



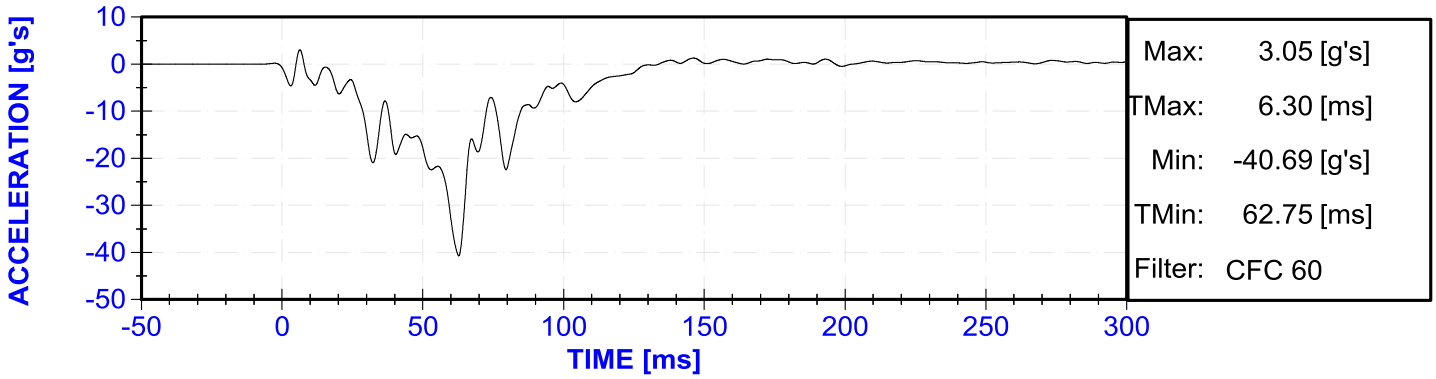
V2 Vehicle CG Y Acceleration



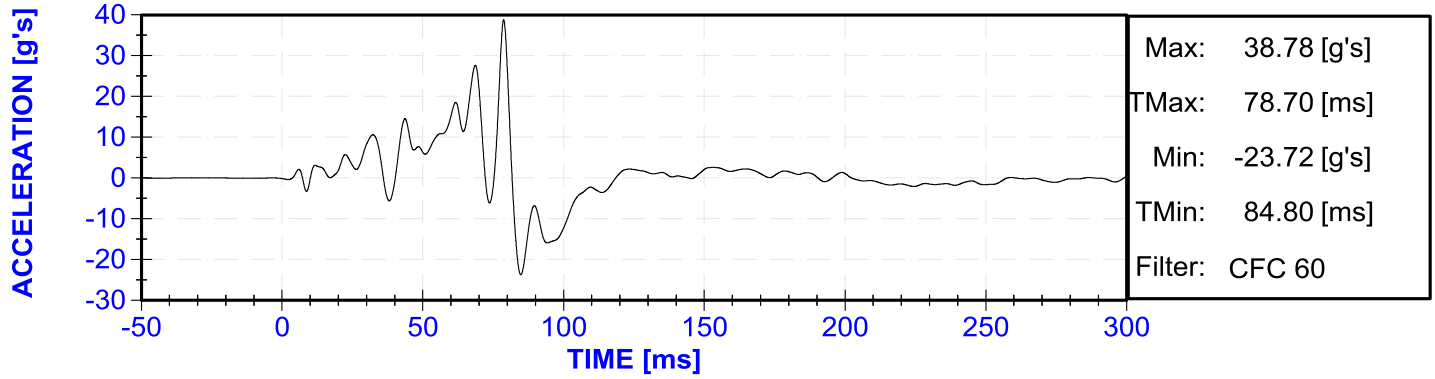
V2 Vehicle CG Z Acceleration



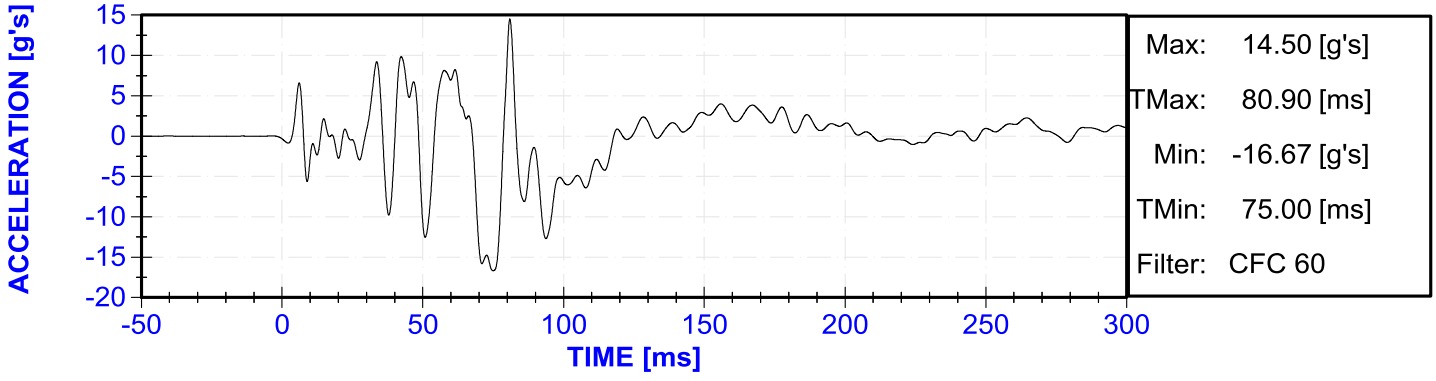
V2 Vehicle CG Redundant X Acceleration



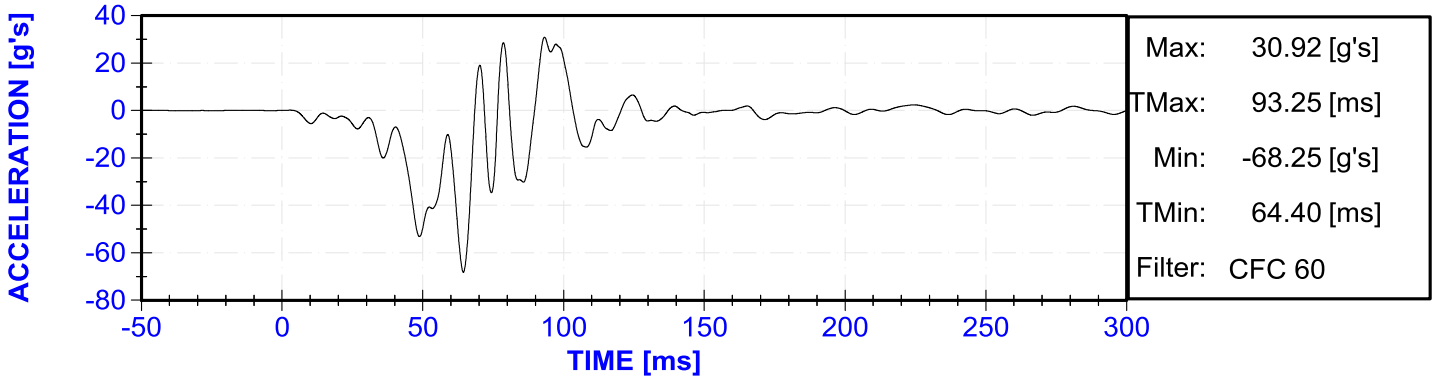
V2 Vehicle CG Redundant Y Acceleration



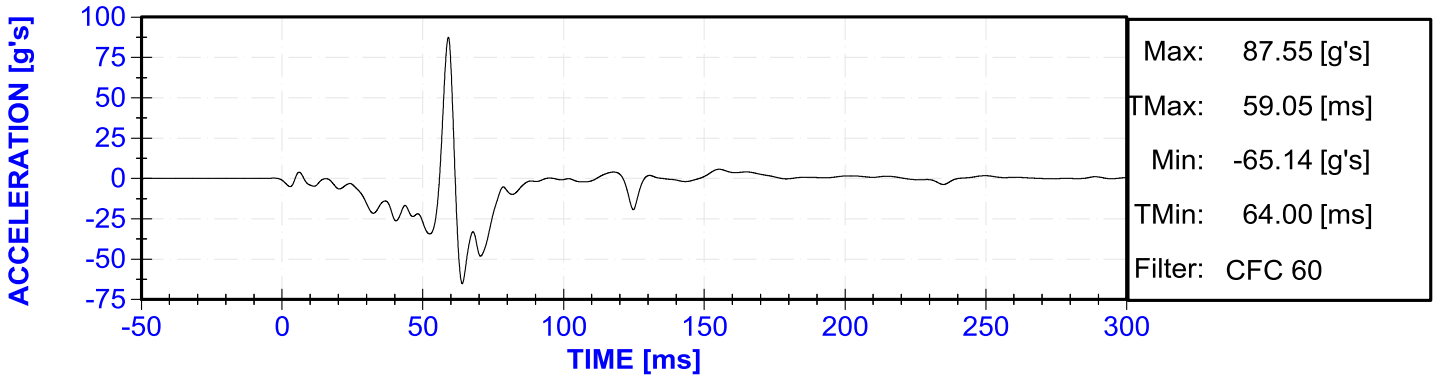
V2 Vehicle CG Redundant Z Acceleration



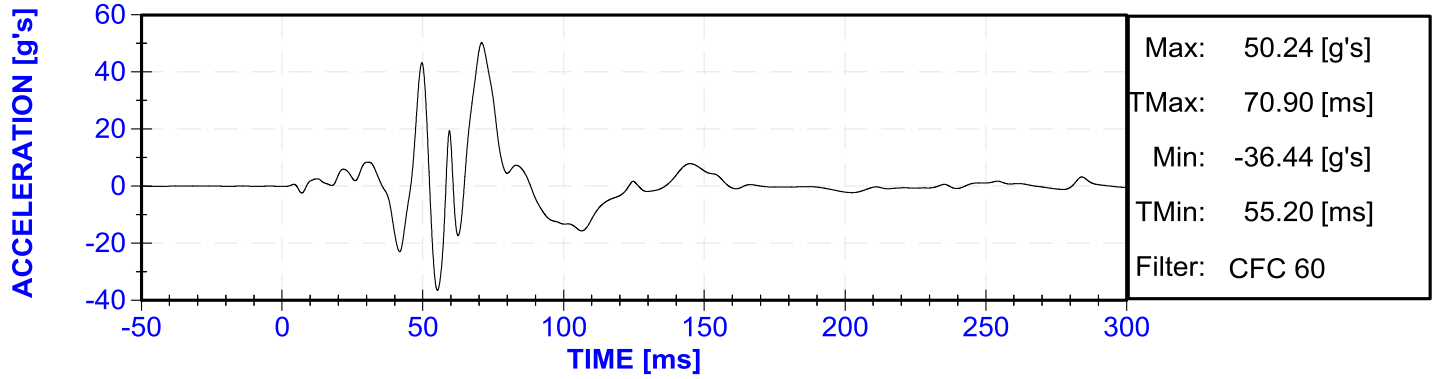
V2 Instrument Panel X Acceleration



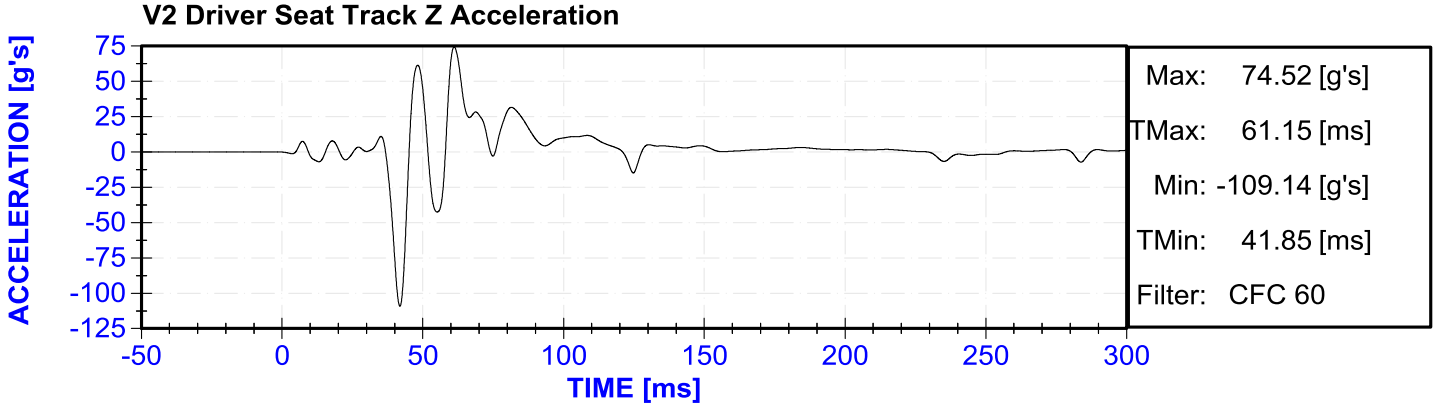
V2 Driver Seat Track X Acceleration



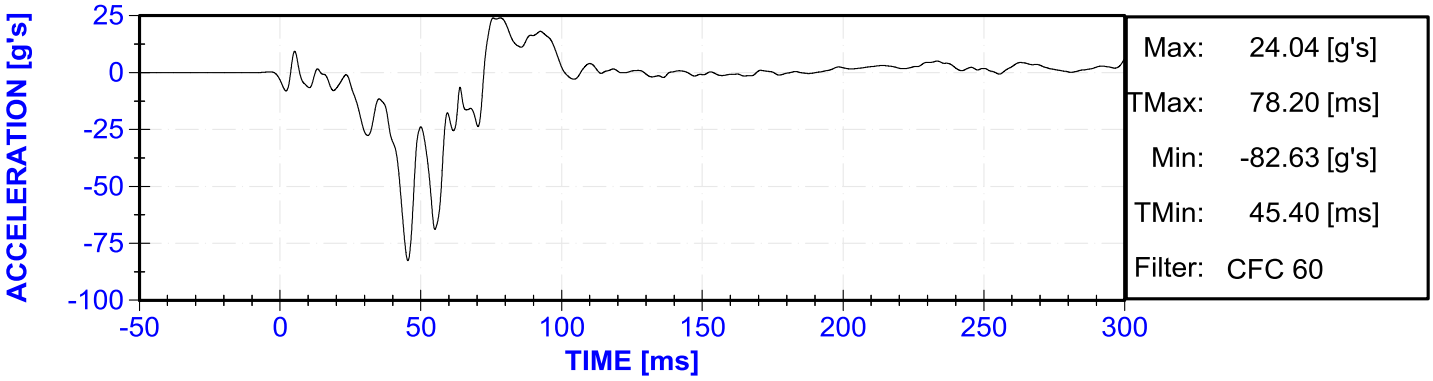
V2 Driver Seat Track Y Acceleration



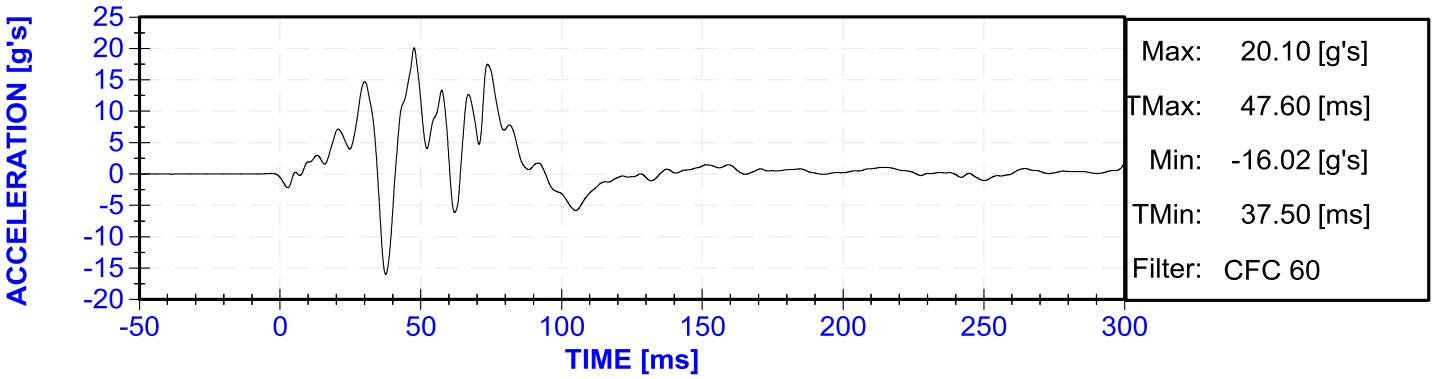
V2 Driver Seat Track Z Acceleration



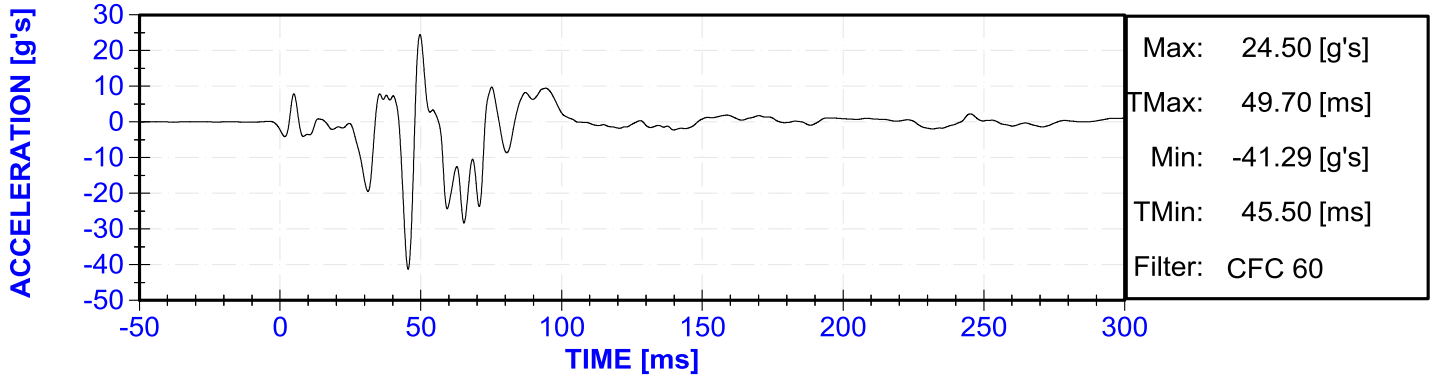
V2 Driver Floor Pan X Acceleration



V2 Driver Floor Pan Y Acceleration

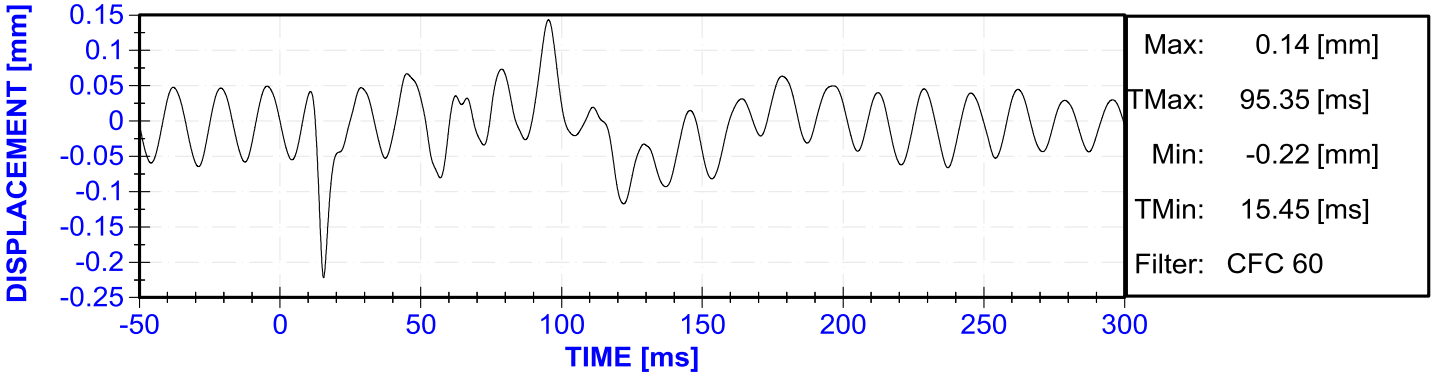


V2 Driver Floor Pan Z Acceleration

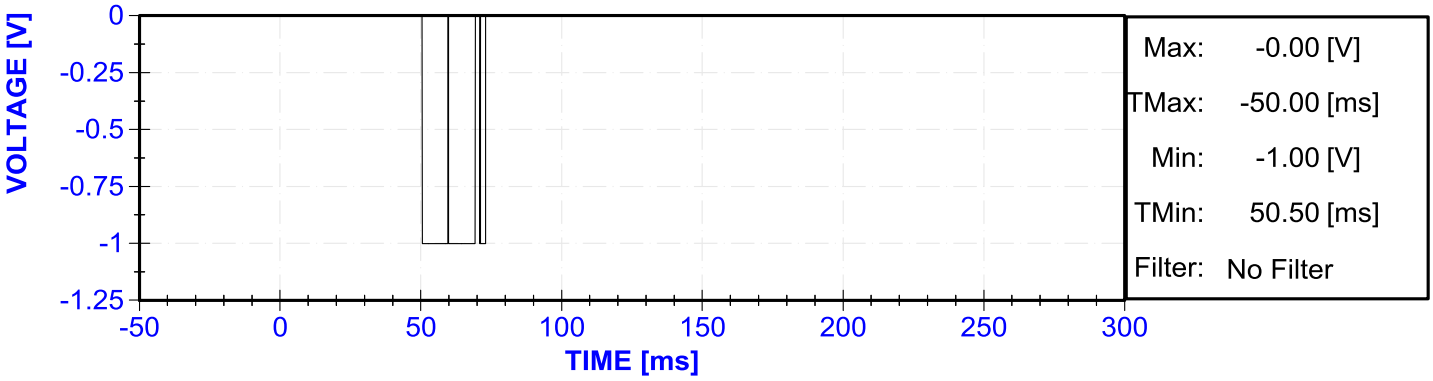


V2 Driver Floor Pan X Deflection

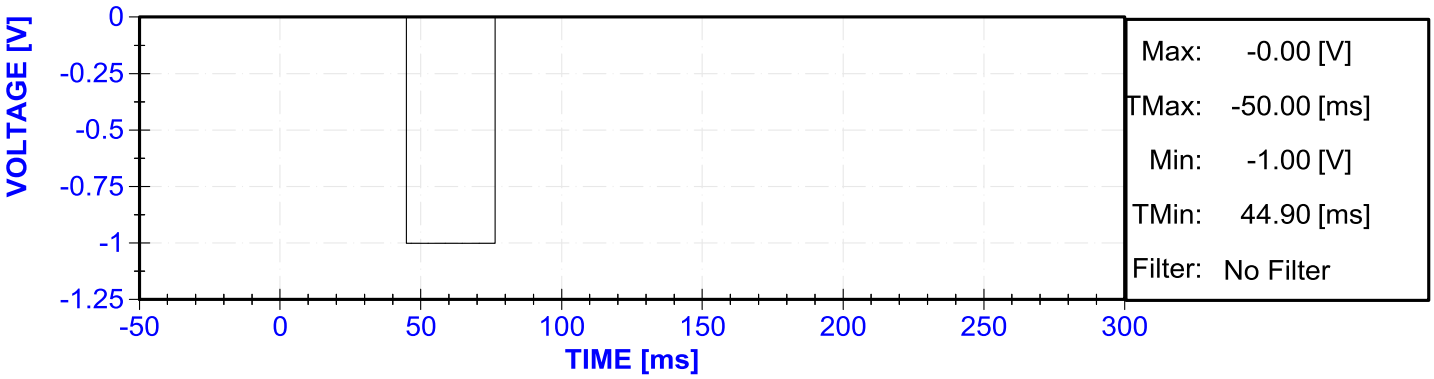
CHANNEL FAILED



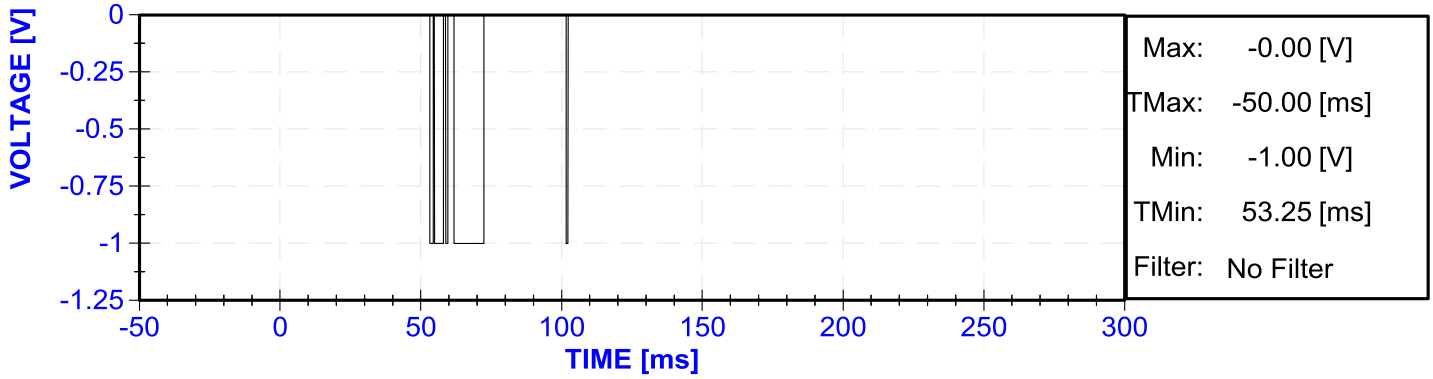
V2 Driver Left Knee CS1



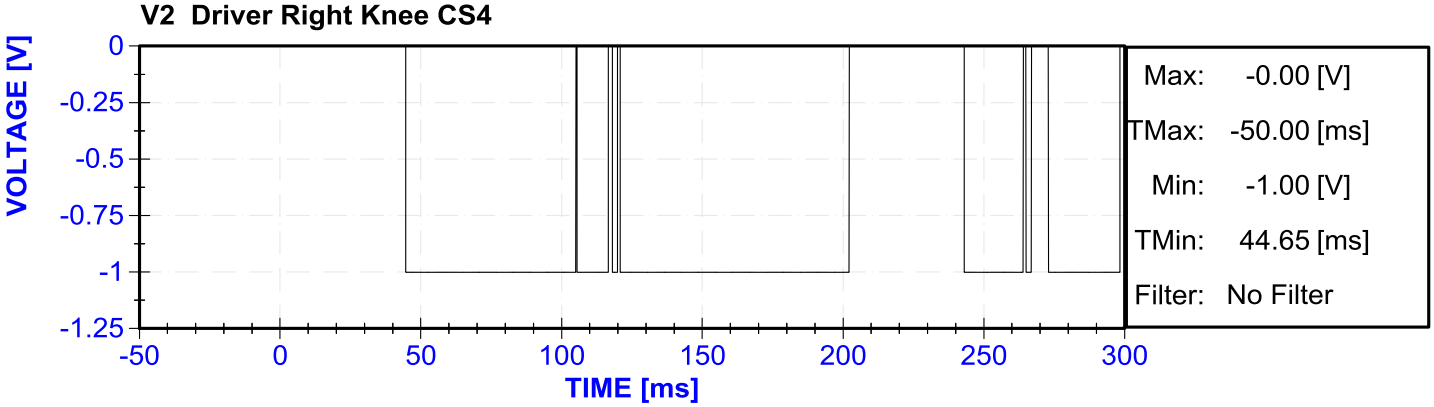
V2 Driver Left Knee CS2



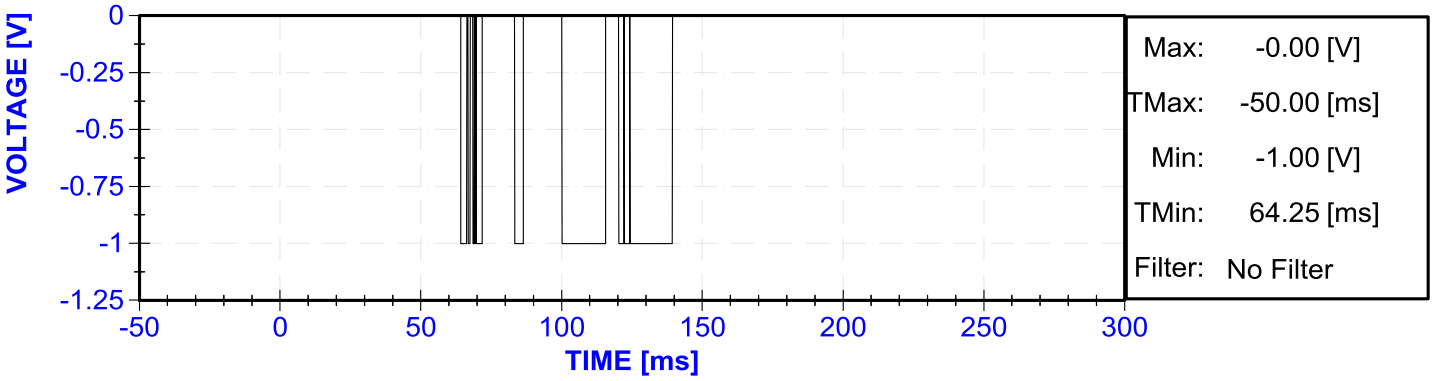
V2 Driver Left Knee CS3



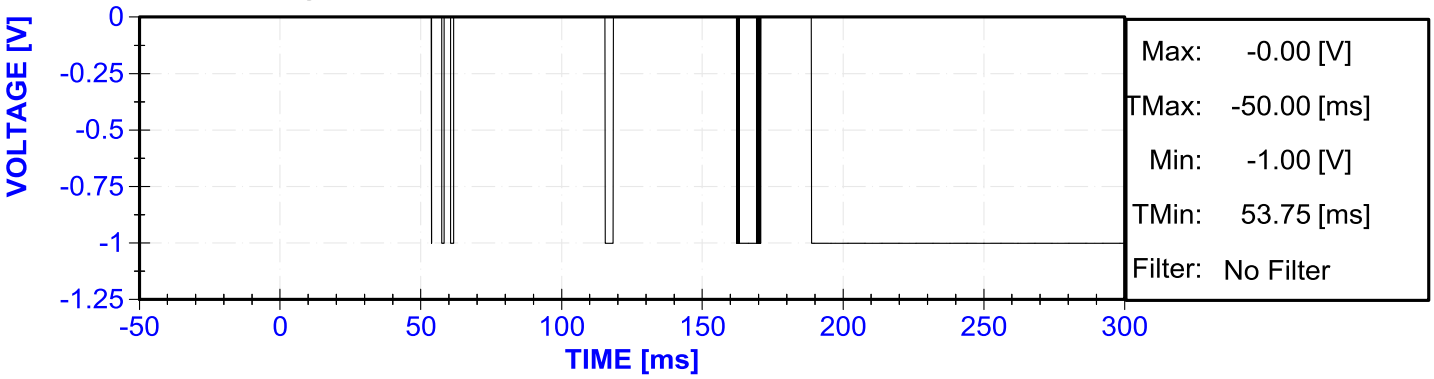
V2 Driver Right Knee CS4



V2 Driver Right Knee CS5

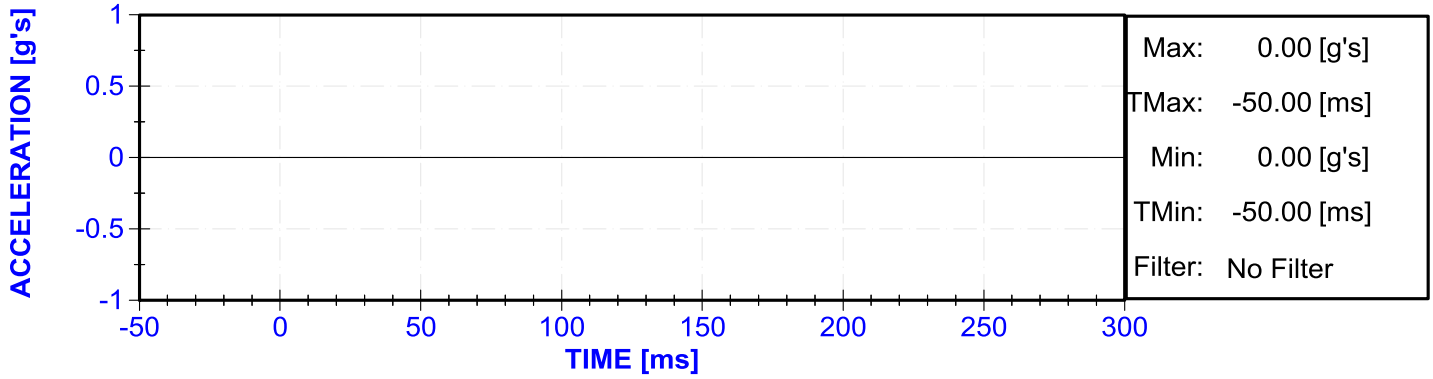


V2 Driver Right Knee CS6



V1 Cart CG X Acceleration

NO DATA



V1 Cart CG Y Acceleration

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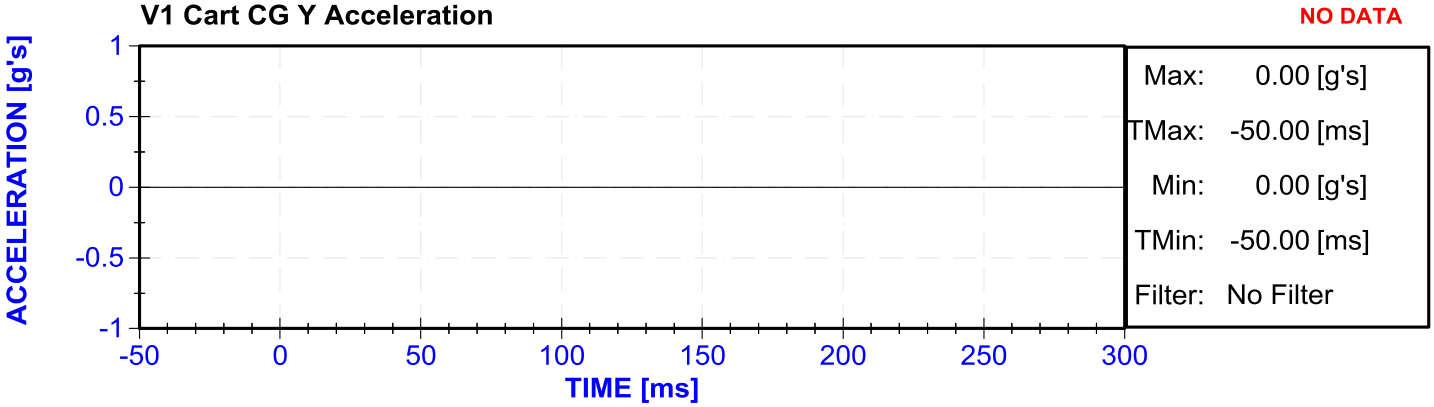
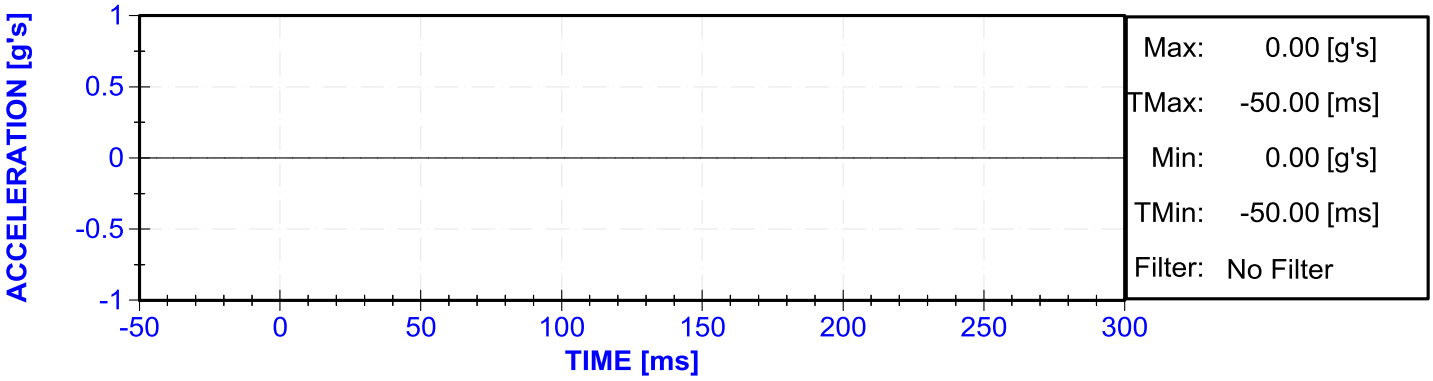


V1 Cart CG Z Acceleration

NO DATA



V1 Cart Rear C/L X Acceleration

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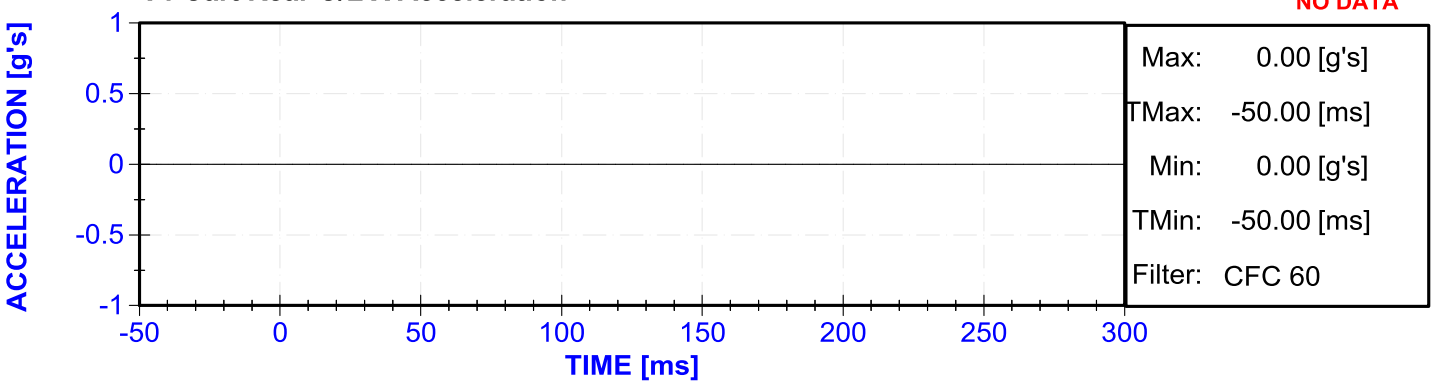
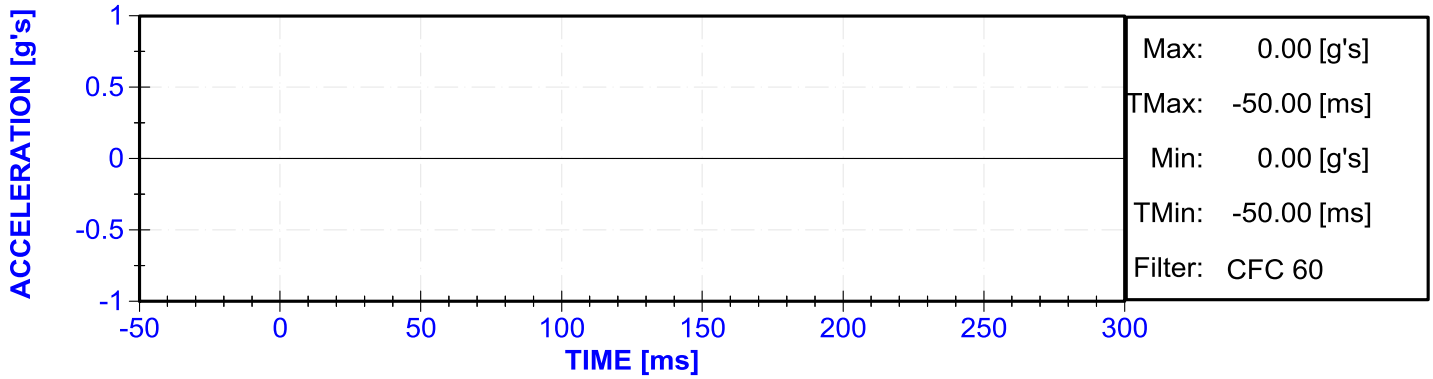


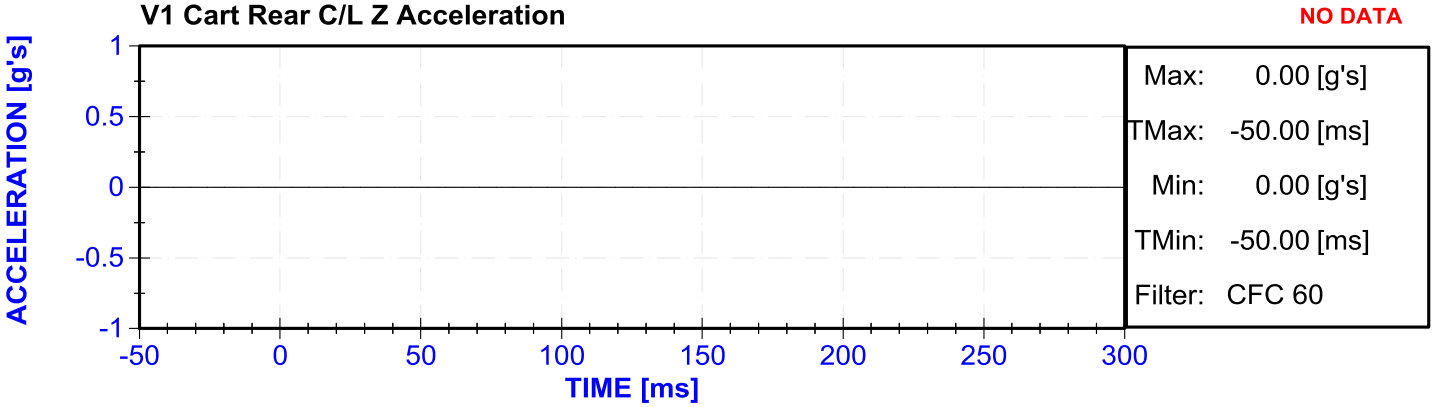
V1 Cart Rear C/L Y Acceleration

NO DATA

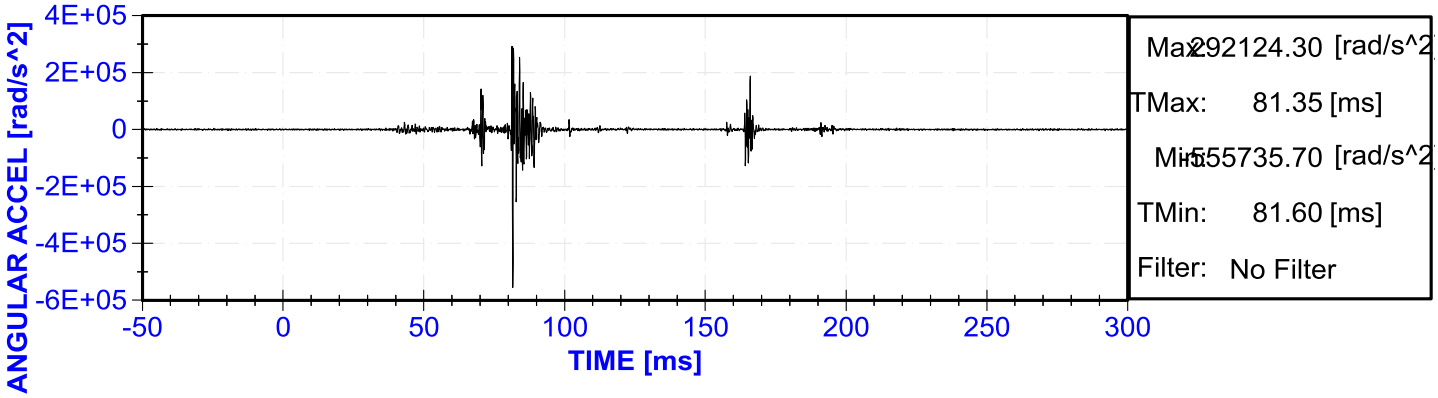


V1 Cart Rear C/L Z Acceleration

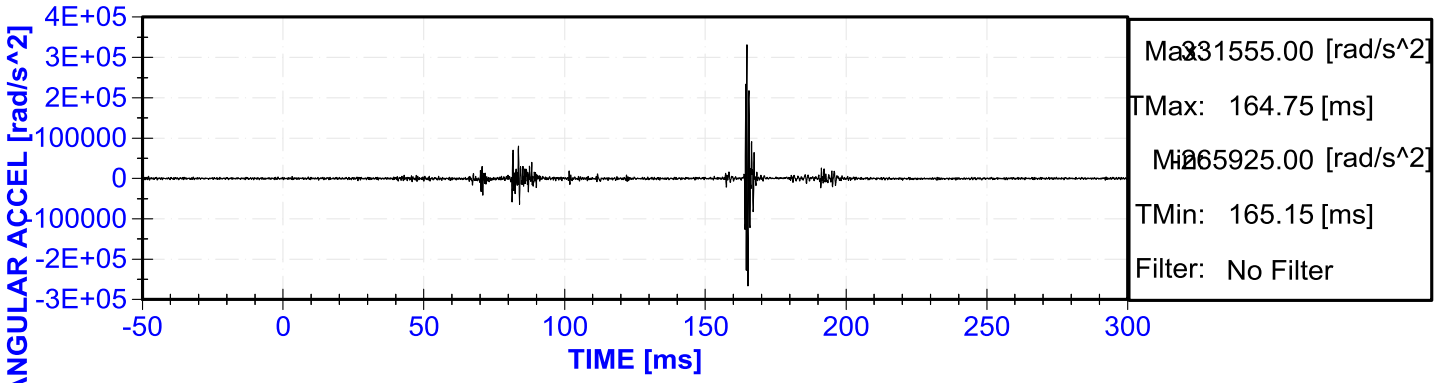
NO DATA



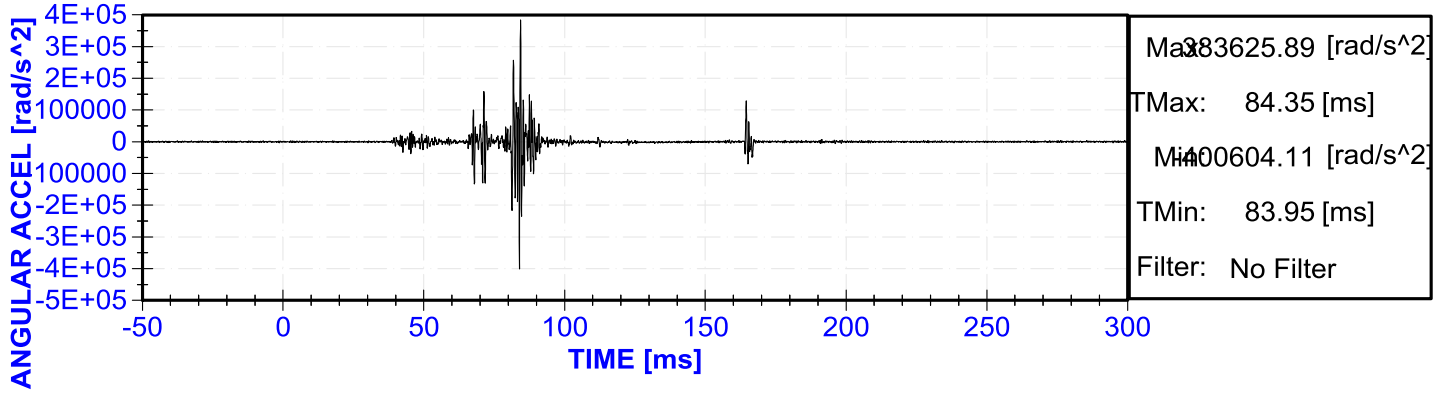
V2P1 HEAD ANGULAR ACCELERATION X [SIMON]



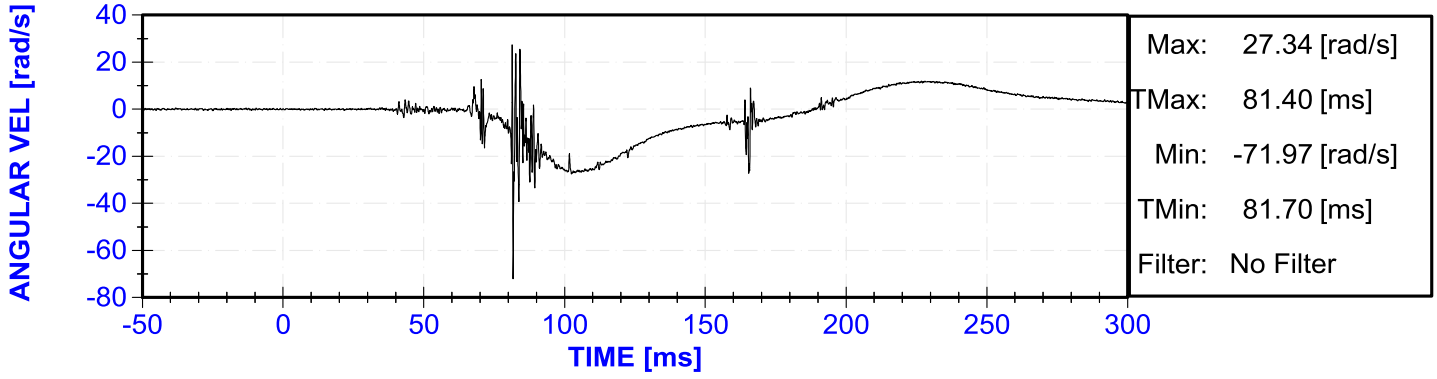
V2P1 HEAD ANGULAR ACCELERATION Y [SIMON]



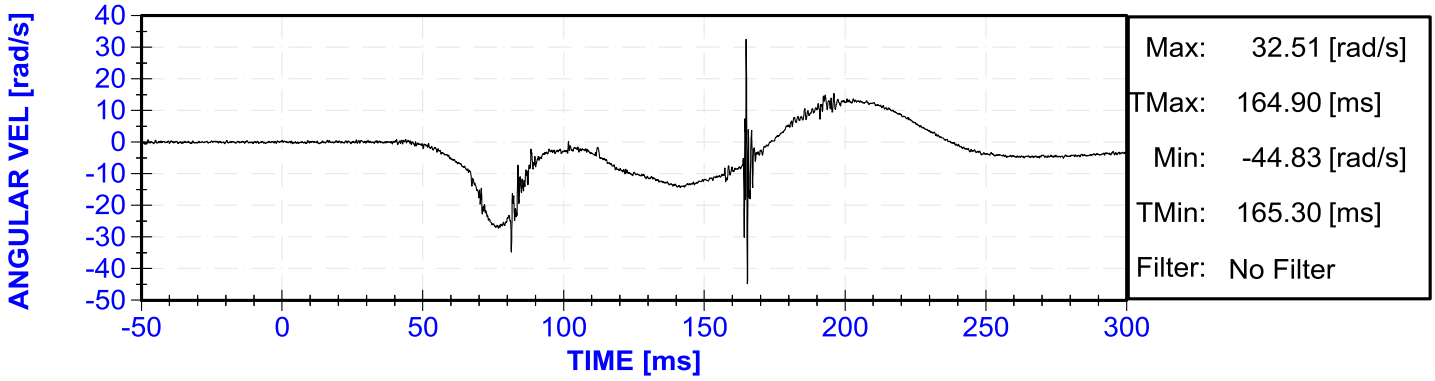
V2P1 HEAD ANGULAR ACCELERATION Z [SIMON]



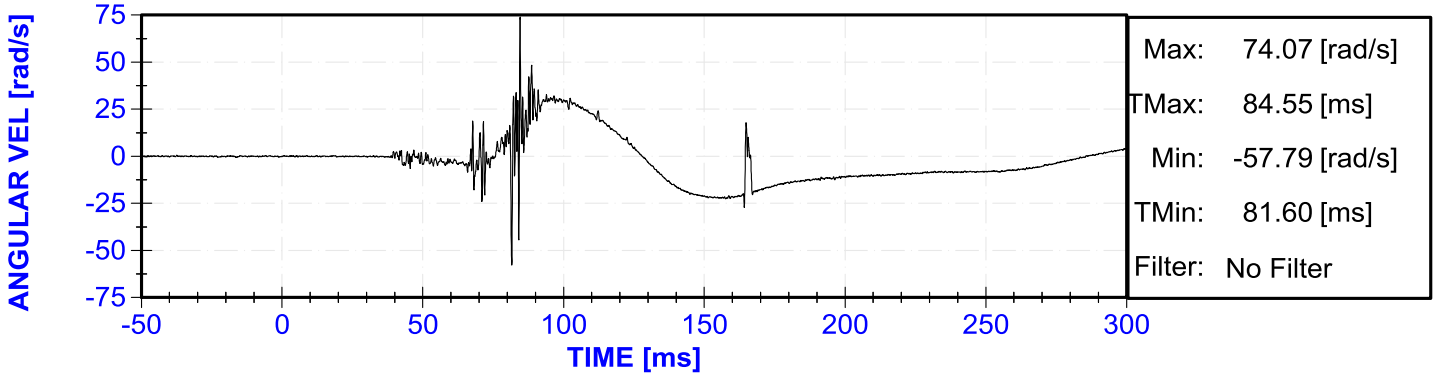
V2P1 HEAD ANGULAR VELOCITY X [SIMON]



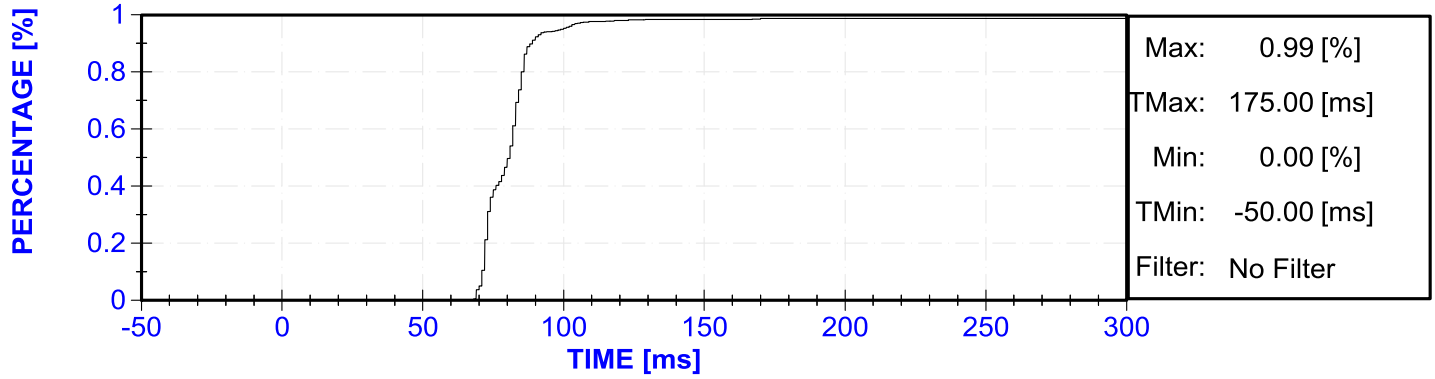
V2P1 HEAD ANGULAR VELOCITY Y [SIMON]



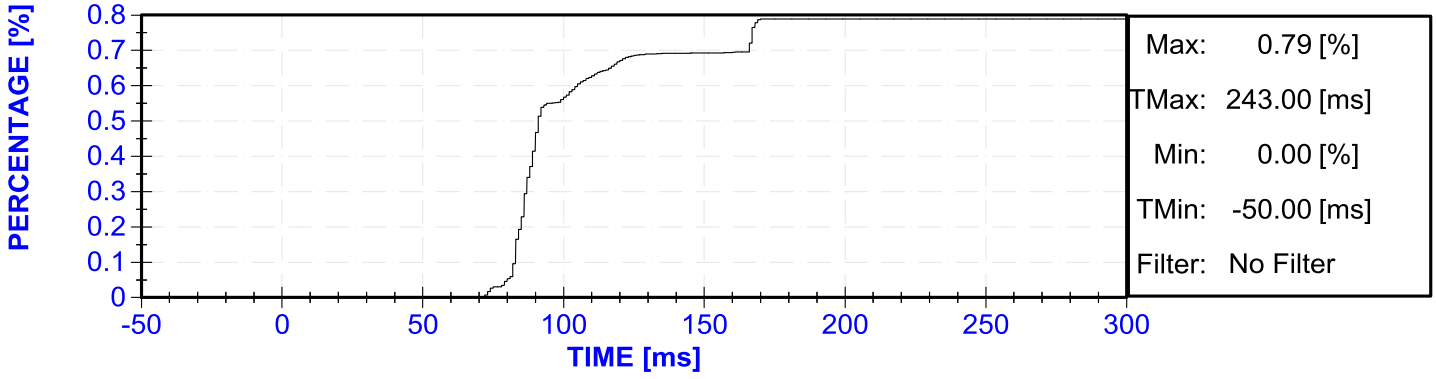
V2P1 HEAD ANGULAR VELOCITY Z [SIMON]



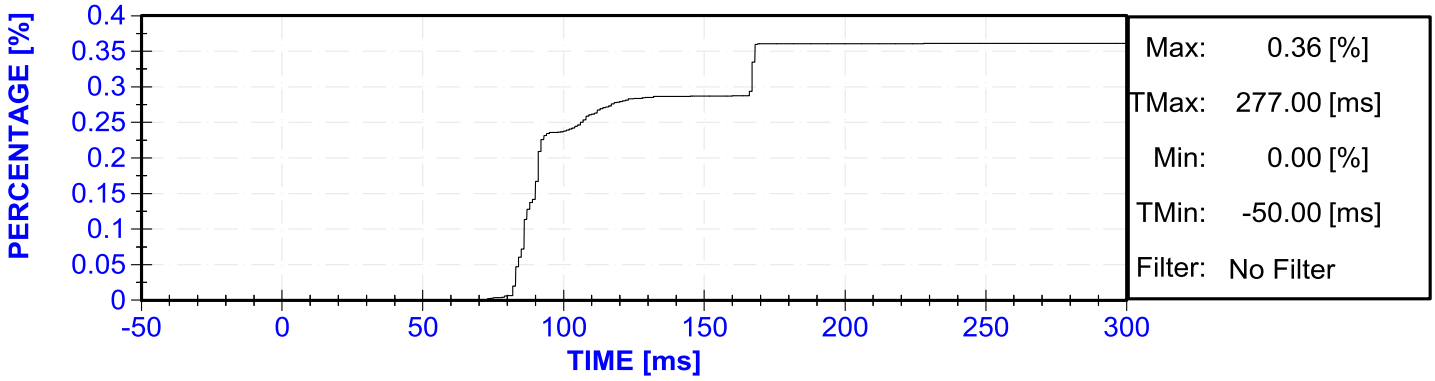
V2P1 CUMULATIVE STRAIN 0.05 [SIMON]



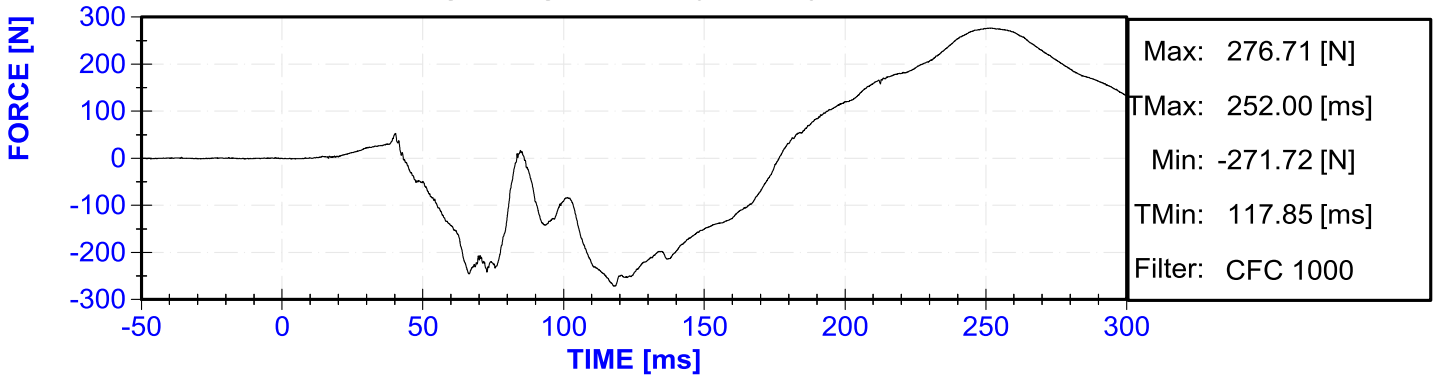
V2P1 CUMULATIVE STRAIN 0.10 [SIMON]



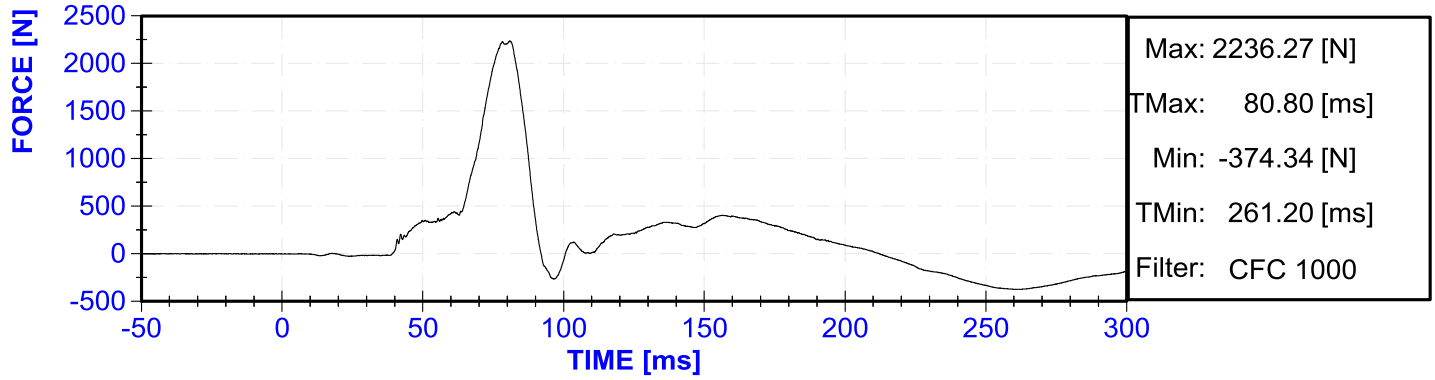
V2P1 CUMULATIVE STRAIN 0.15 [SIMON]



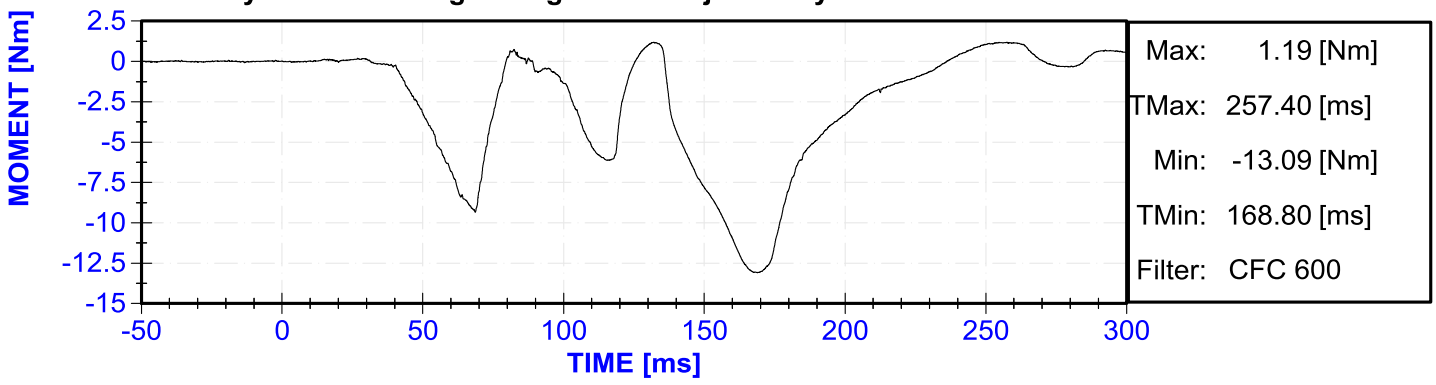
V2P1 Fx on head acting through the O.C. joint only



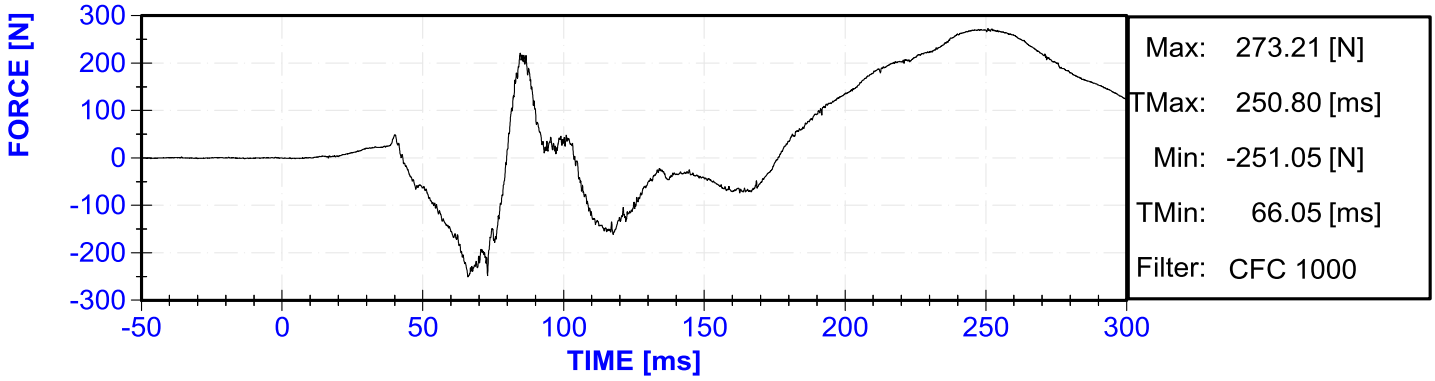
V2P1 Fz on head acting through the O.C. joint only



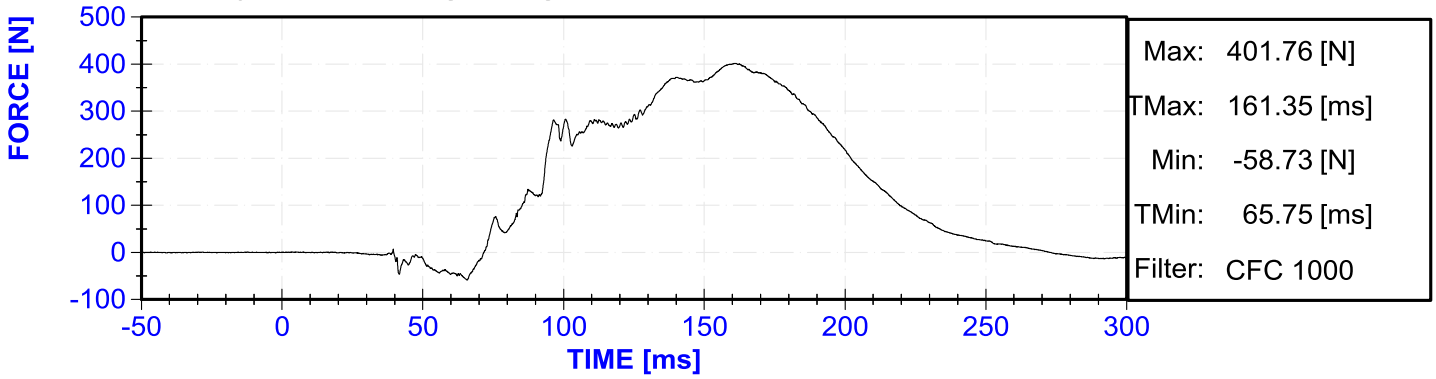
V2P1 My on head acting through the O.C. joint only



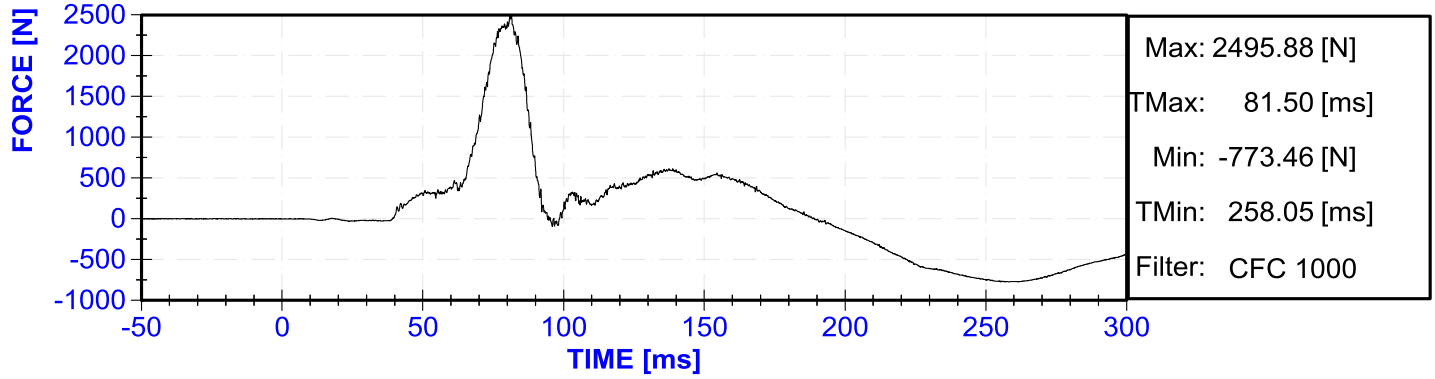
V2P1 Fx on head acting through the total neck section



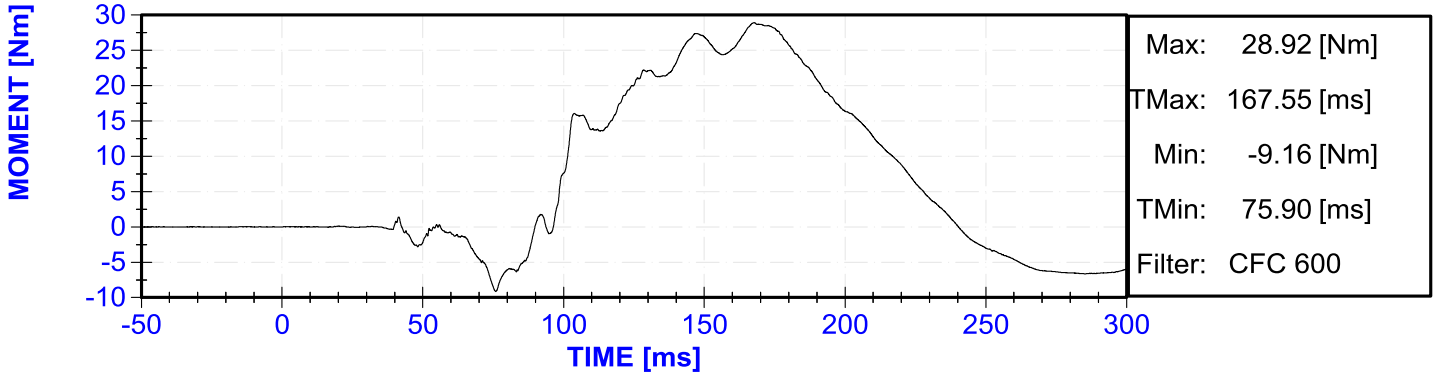
V2P1 Fy on head acting through the total neck section



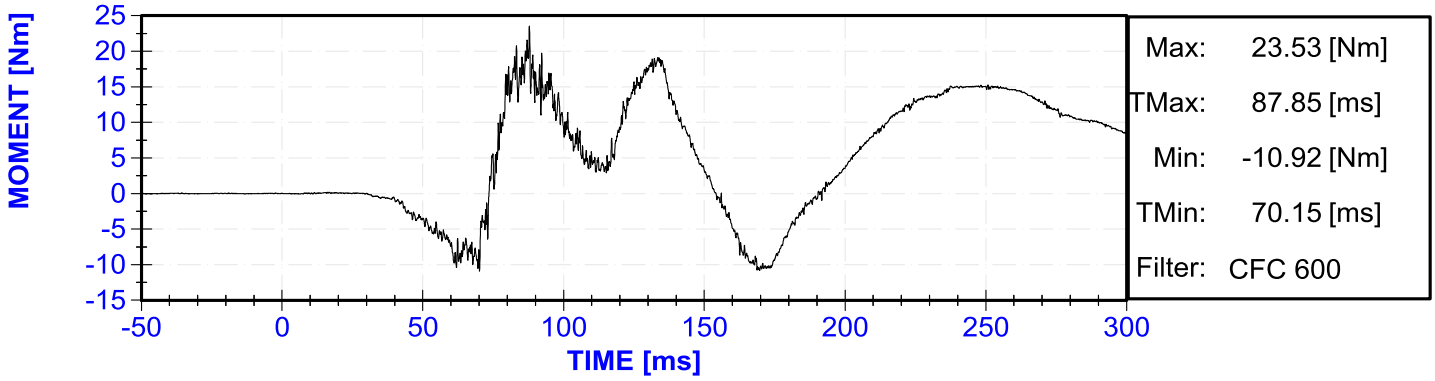
V2P1 Fz on head acting through the total neck section



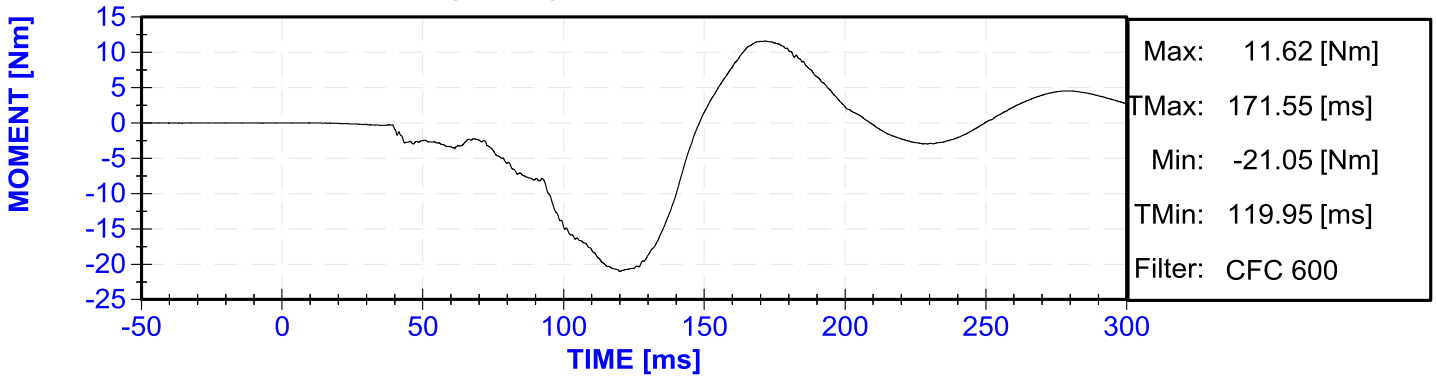
V2P1 Mx on head acting through the total neck section



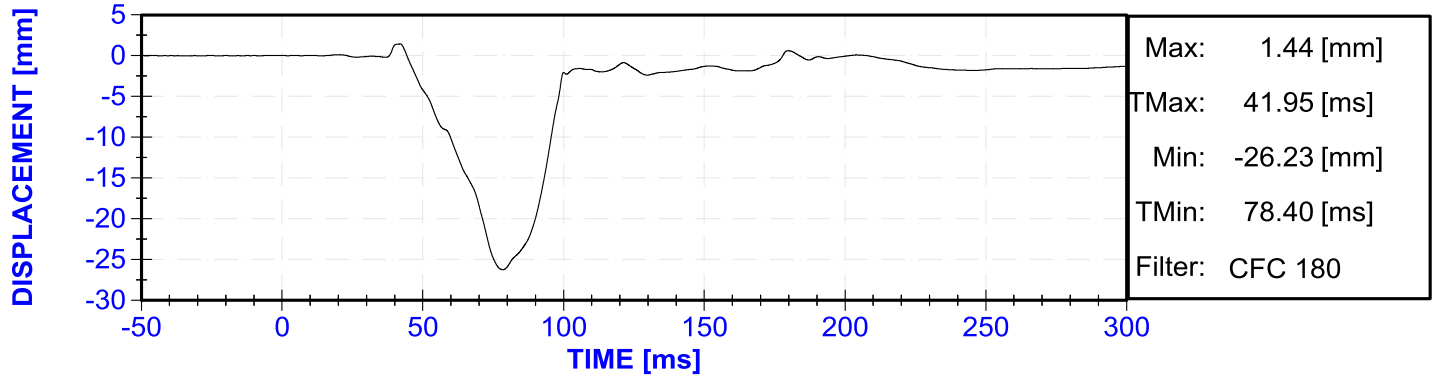
V2P1 My on head acting through the total neck section



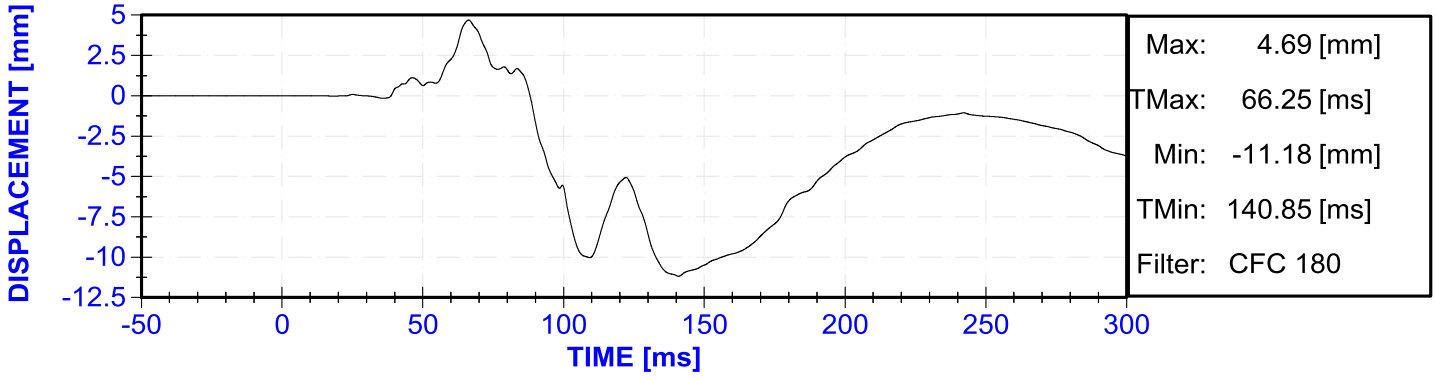
V2P1 Mz on head acting through the total neck section



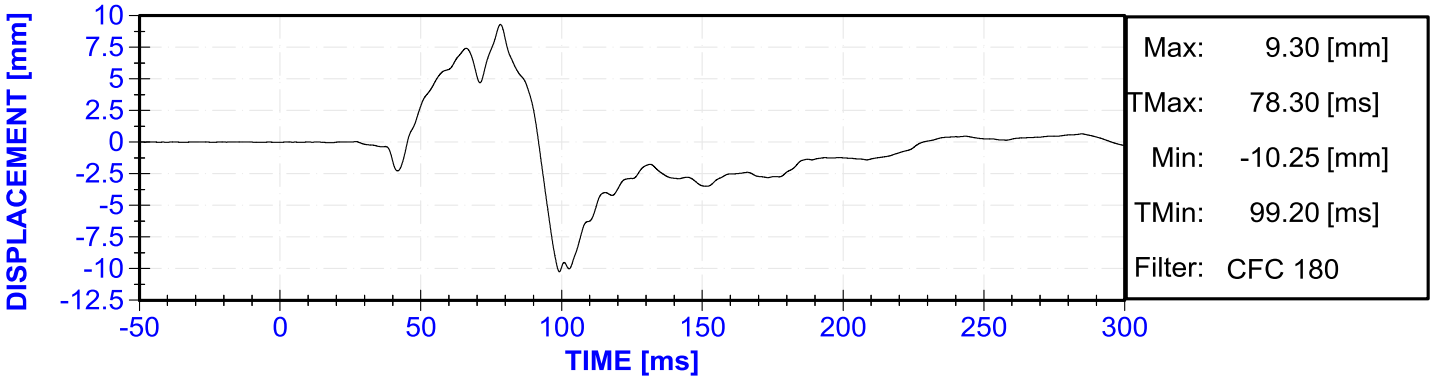
V2P1 Chest Left Upper Dx



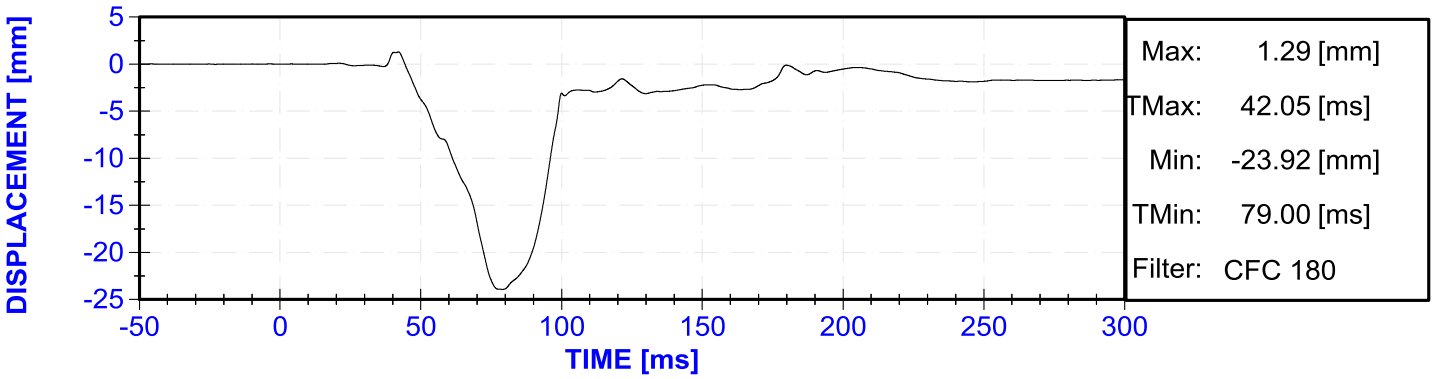
V2P1 Chest Left Upper Dy



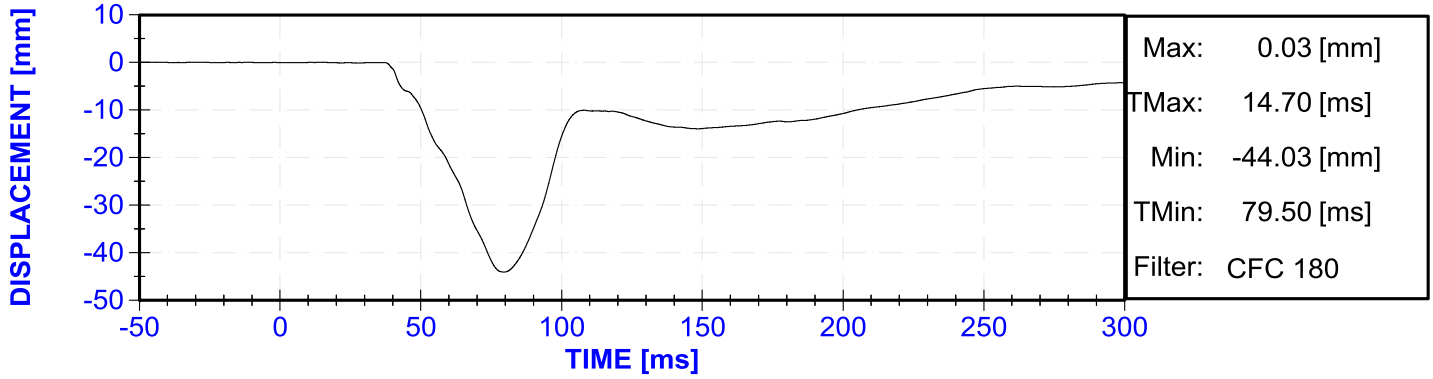
V2P1 Chest Left Upper Dz



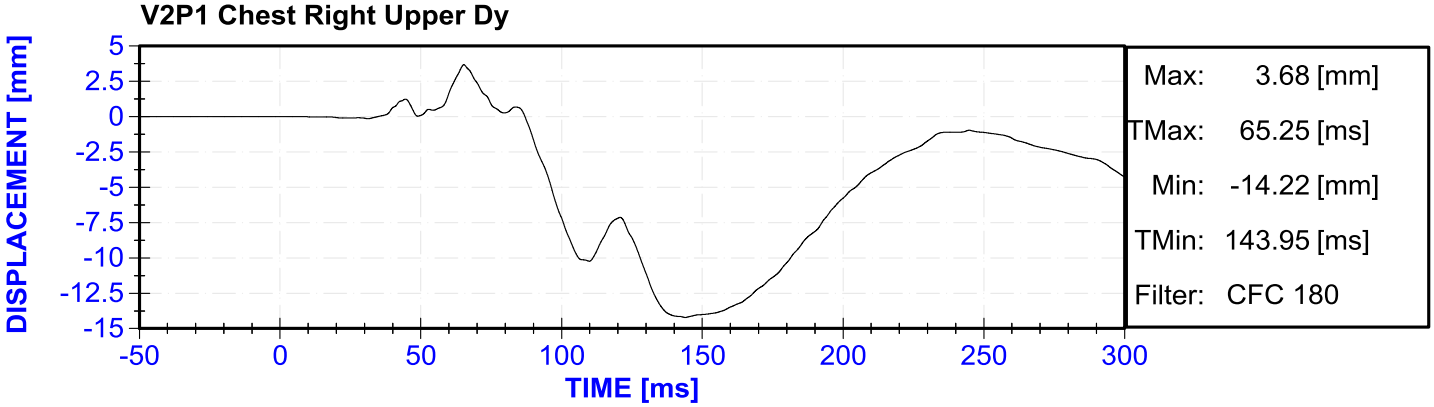
V2P1 Chest Left Upper D



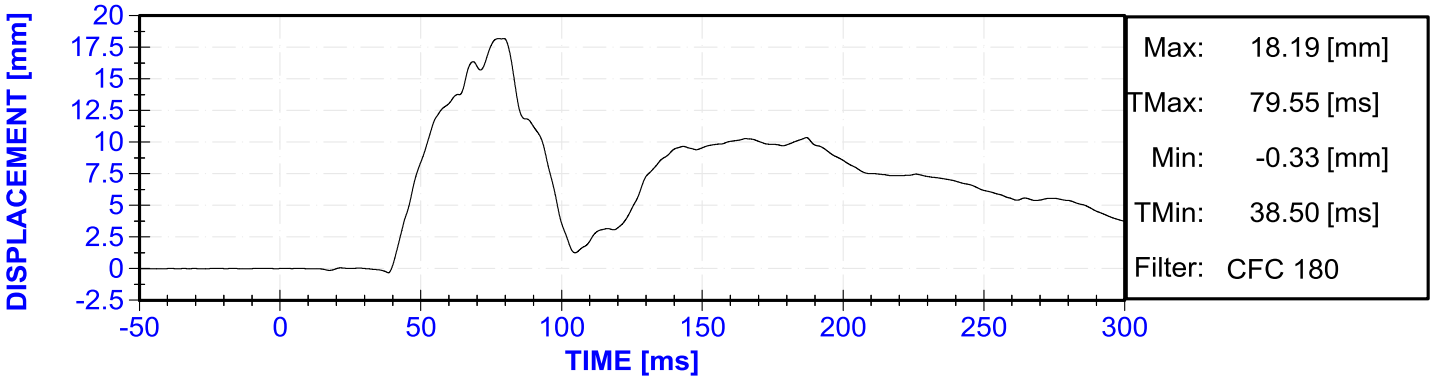
V2P1 Chest Right Upper Dx



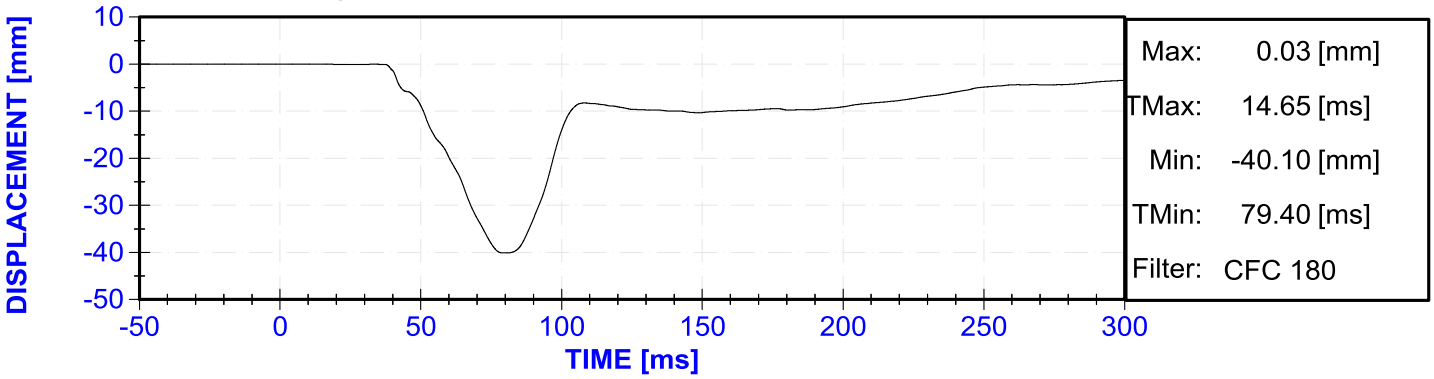
V2P1 Chest Right Upper Dy



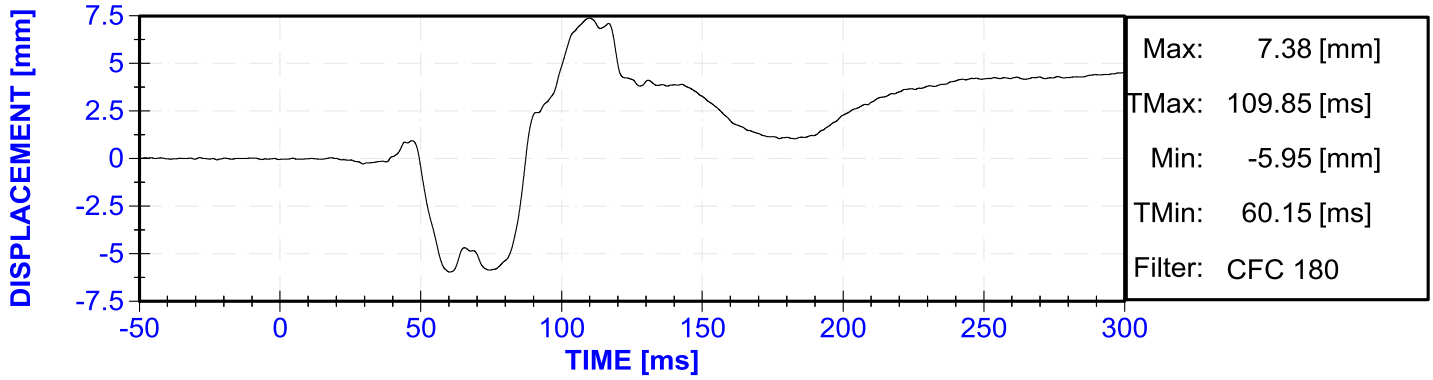
V2P1 Chest Right Upper Dz



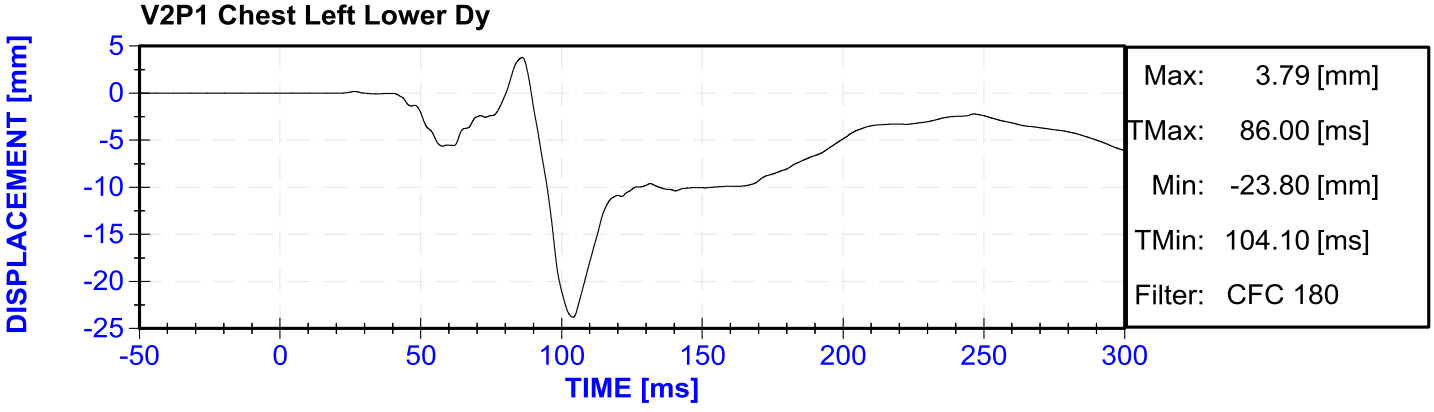
V2P1 Chest Right Upper D



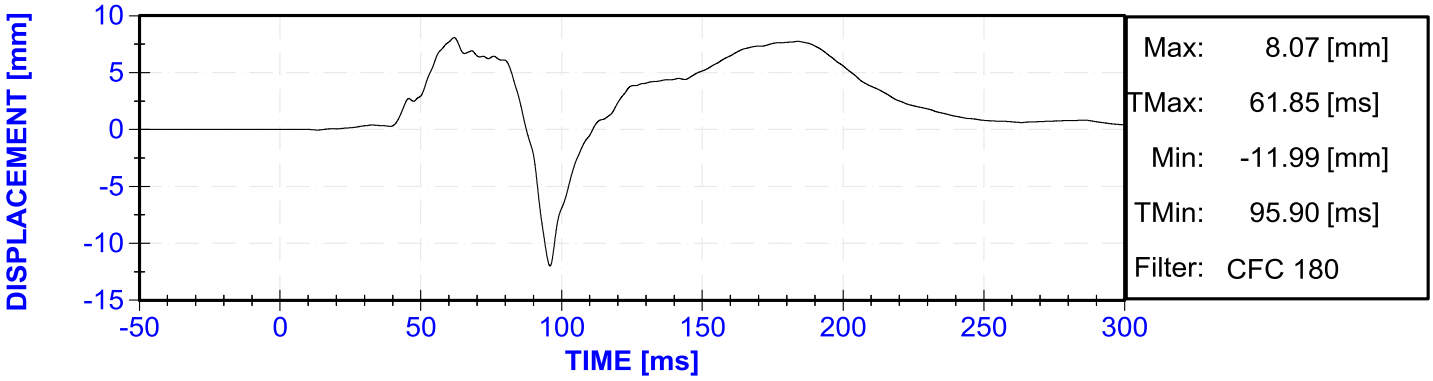
V2P1 Chest Left Lower Dx



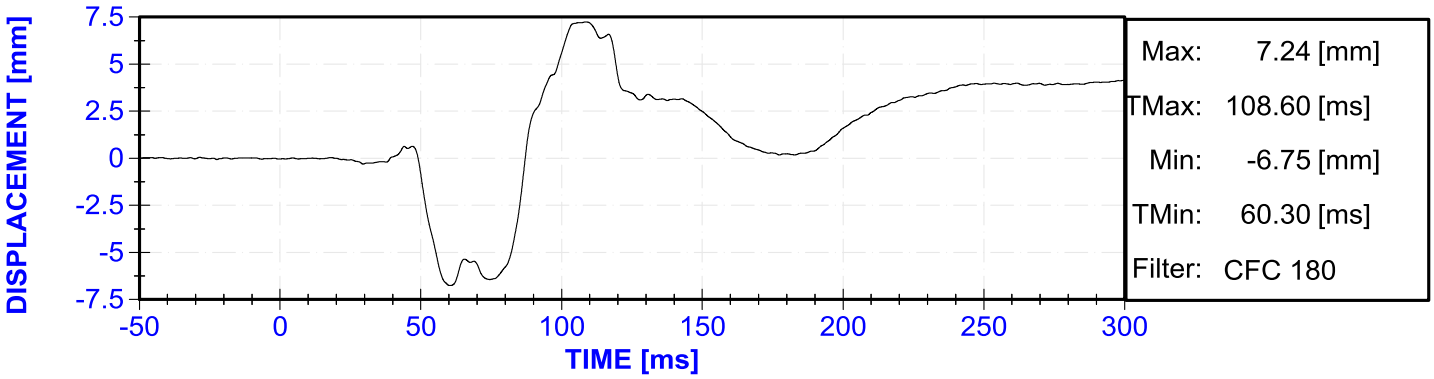
V2P1 Chest Left Lower Dy



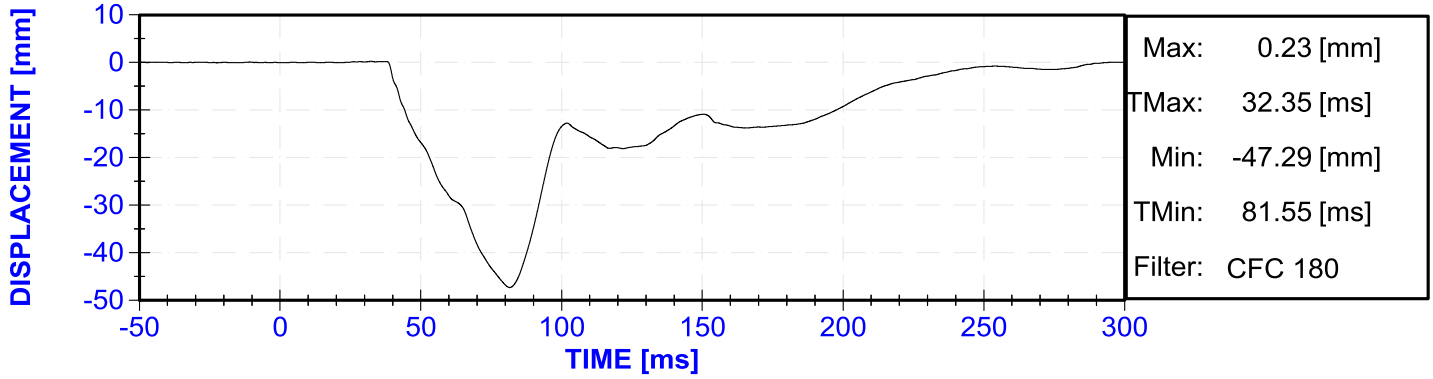
V2P1 Chest Left Lower Dz



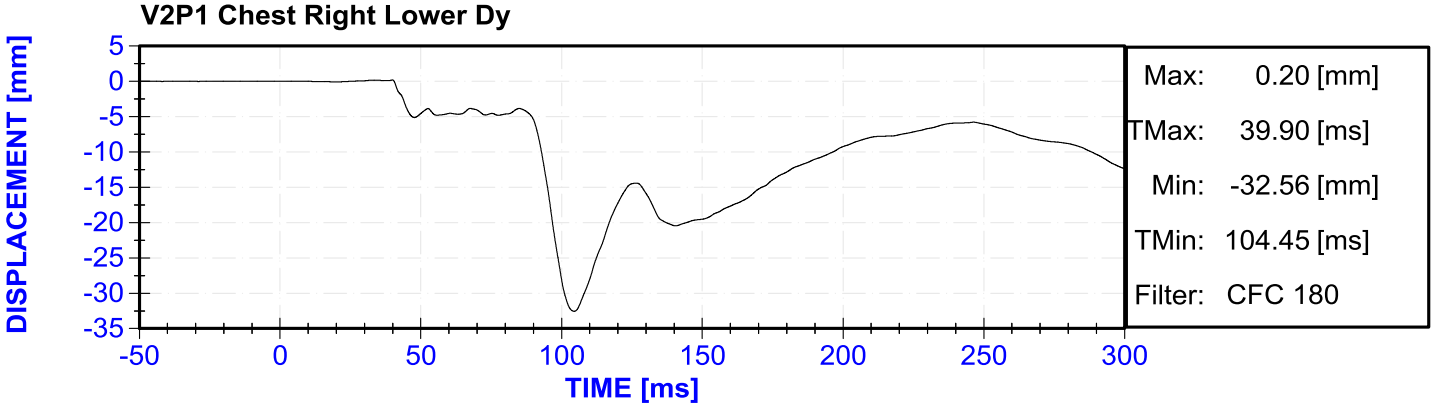
V2P1 Chest Left Lower D



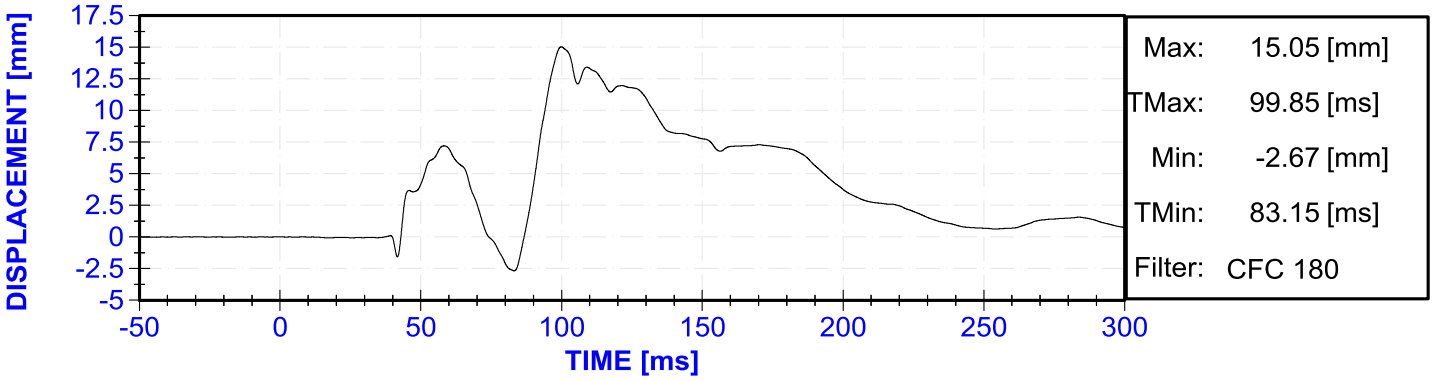
V2P1 Chest Right Lower Dx



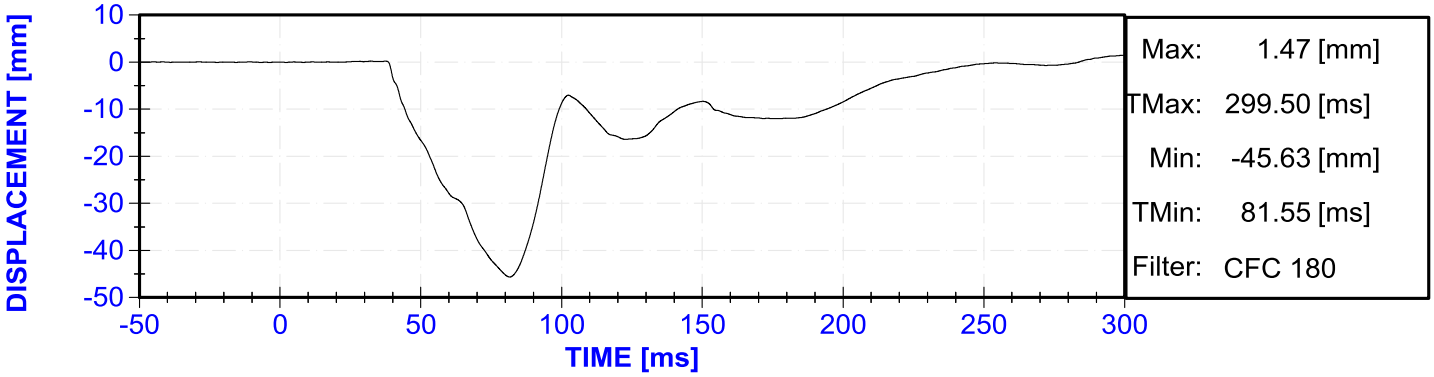
V2P1 Chest Right Lower Dy



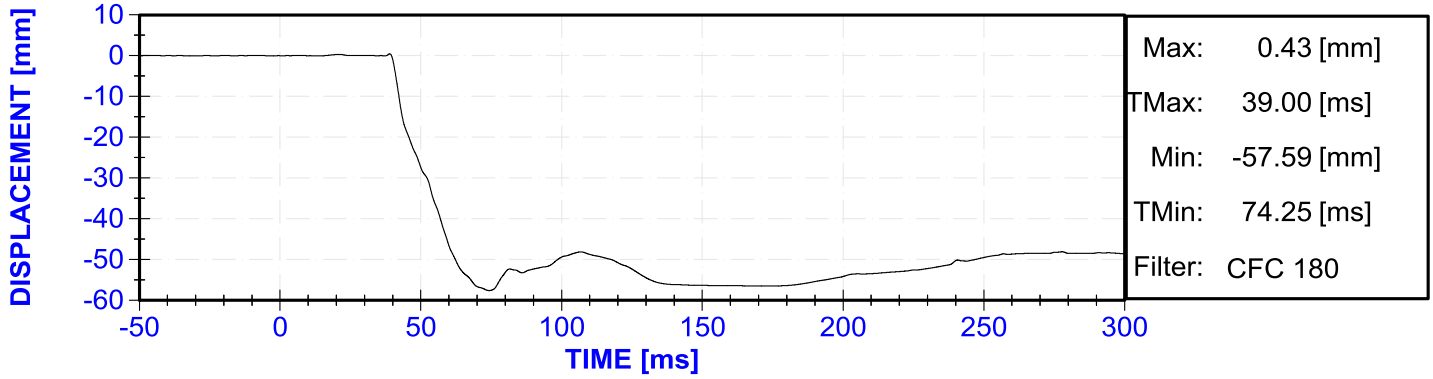
V2P1 Chest Right Lower Dz



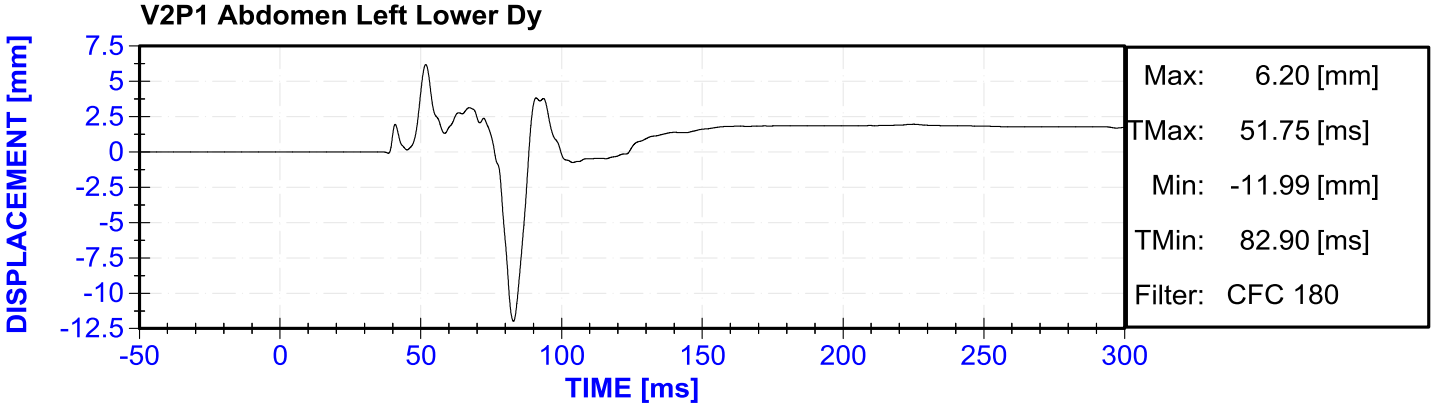
V2P1 Chest Right Lower D



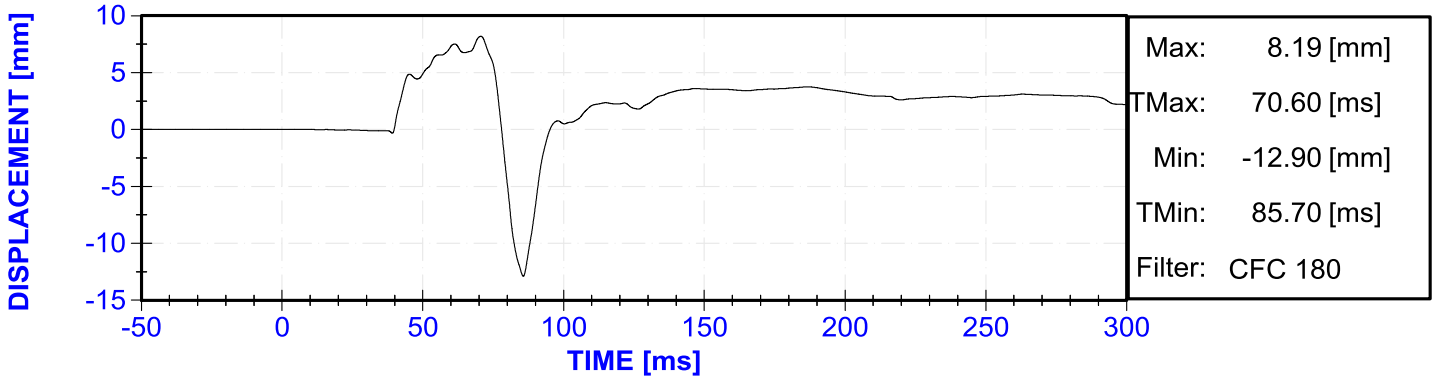
V2P1 Abdomen Left Lower Dx



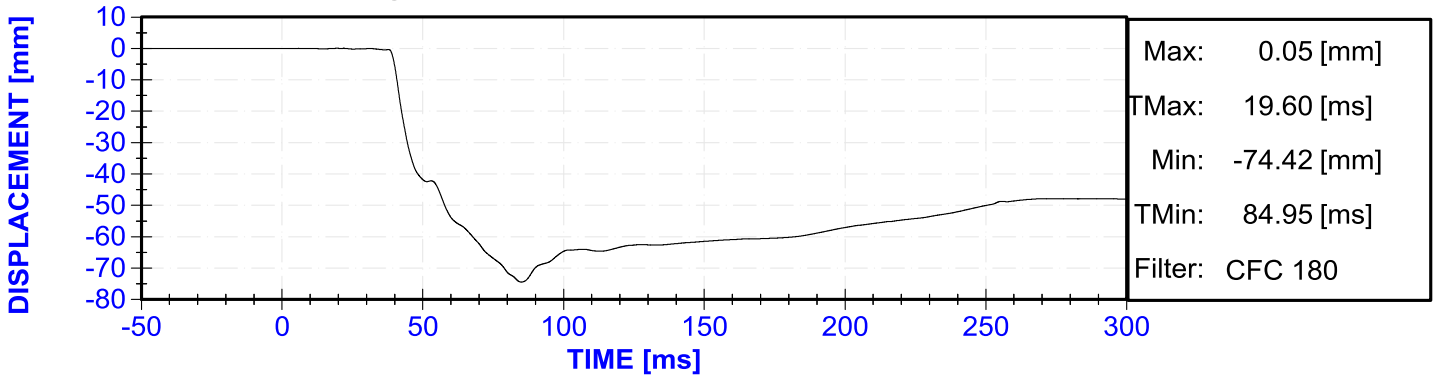
V2P1 Abdomen Left Lower Dy



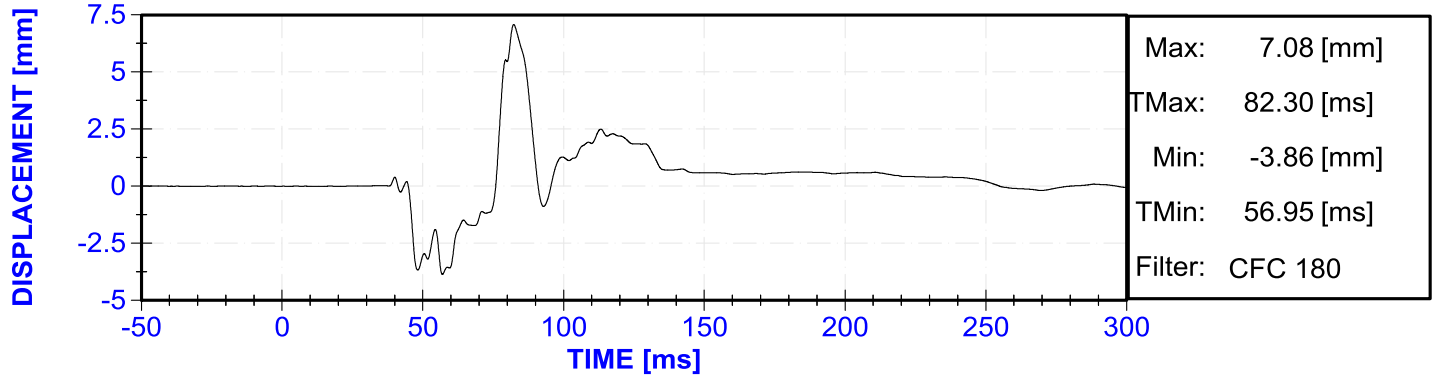
V2P1 Abdomen Left Lower Dz



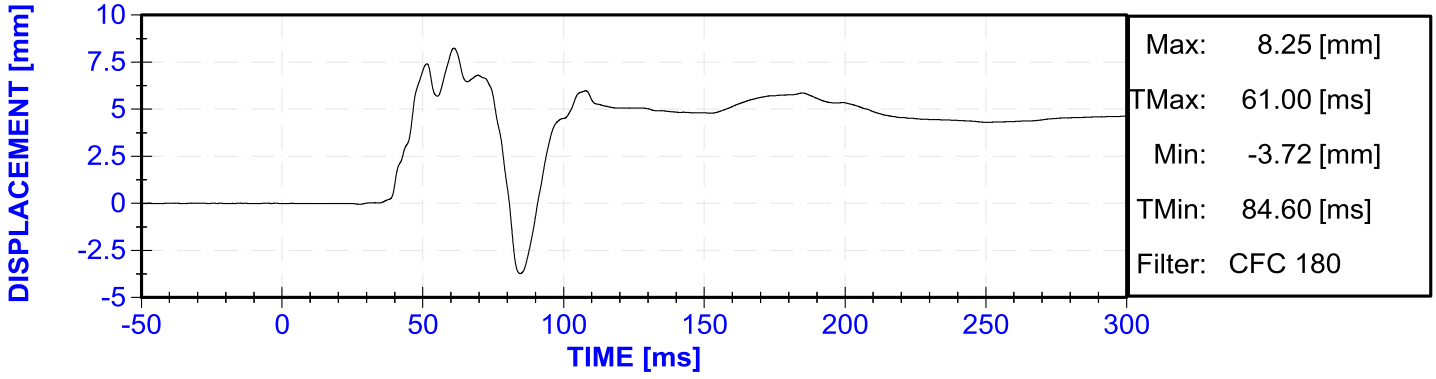
V2P1 Abdomen Right Lower Dx



V2P1 Abdomen Right Lower Dy

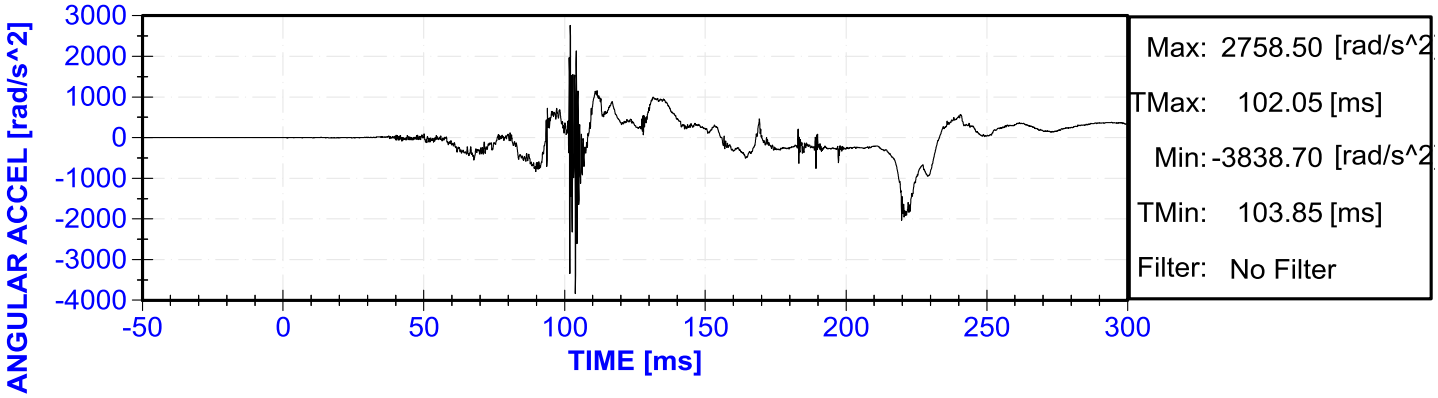


V2P1 Abdomen Right Lower Dz

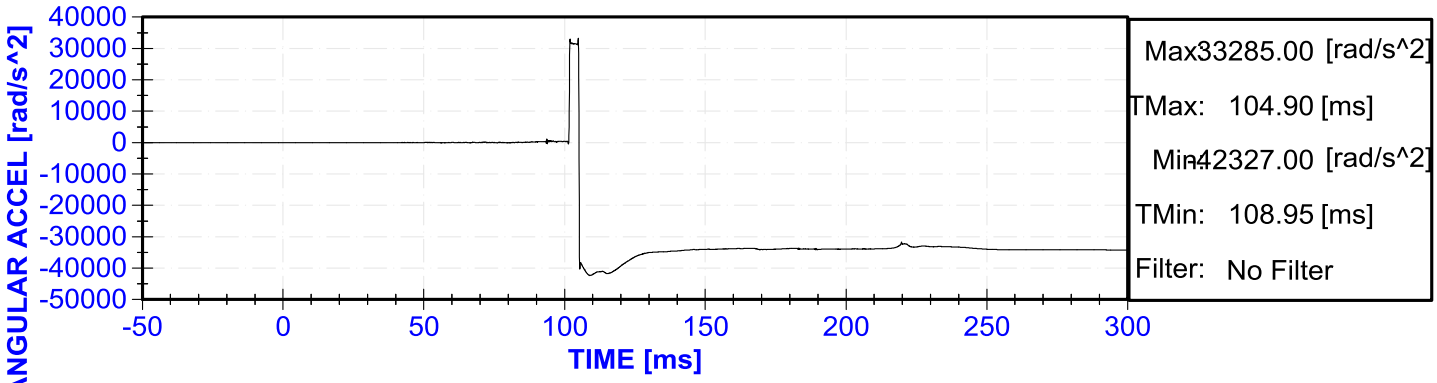


V2P4 HEAD ANGULAR ACCELERATION X [SIMON]

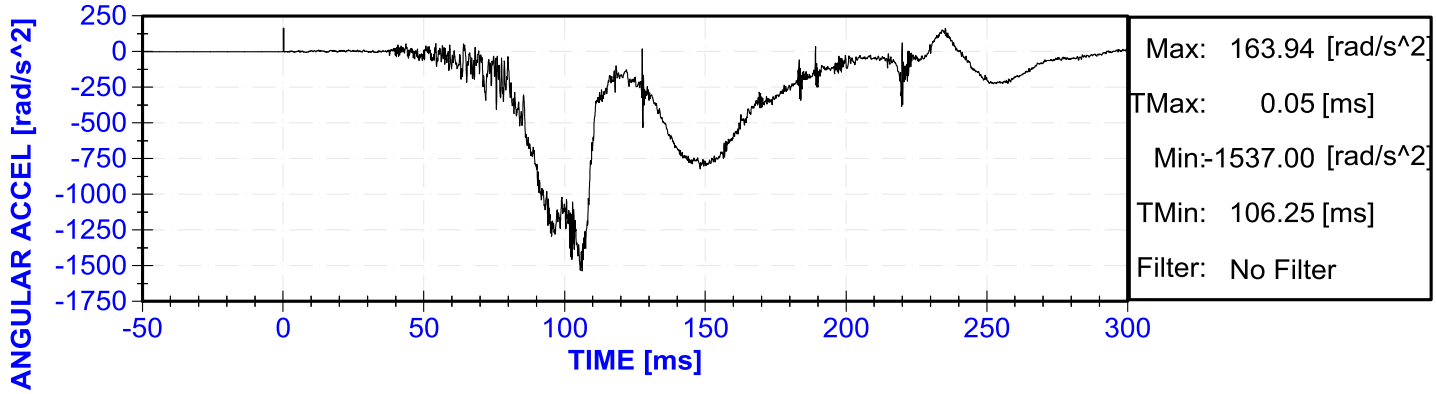
V2P4 HD9Z AX QUESTIONABLE



V2P4 HEAD ANGULAR ACCELERATION Y [SIMON]

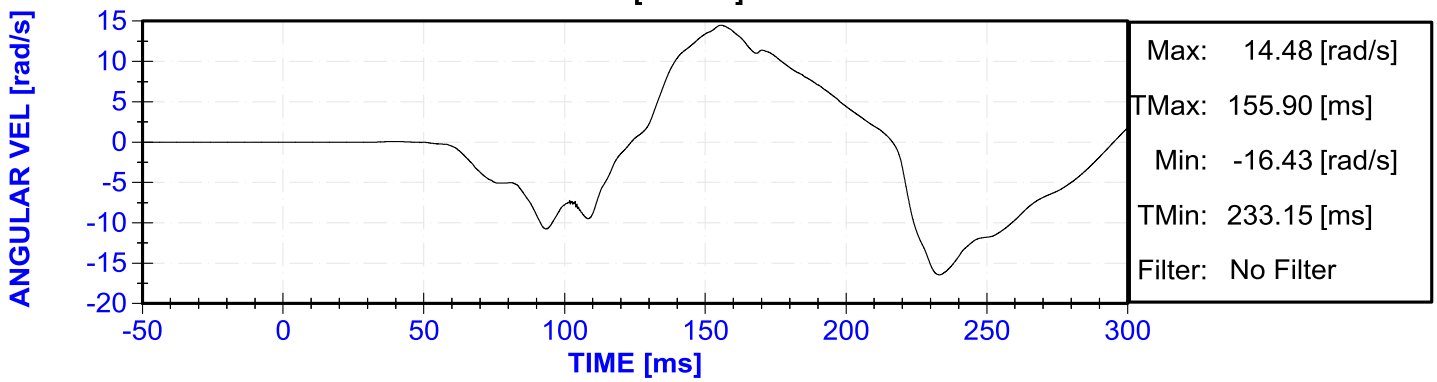


V2P4 HEAD ANGULAR ACCELERATION Z [SIMON]

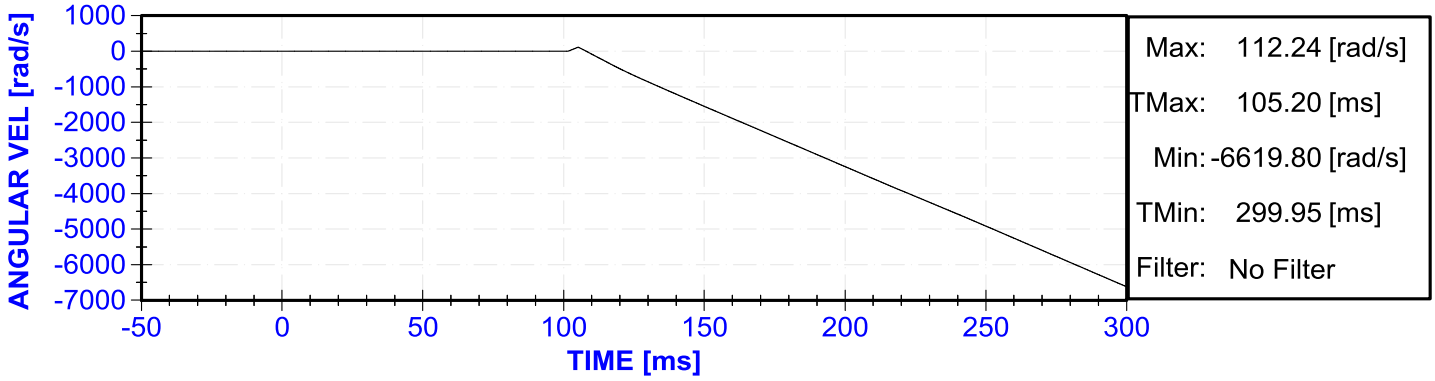


V2P4 HEAD ANGULAR VELOCITY X [SIMON]

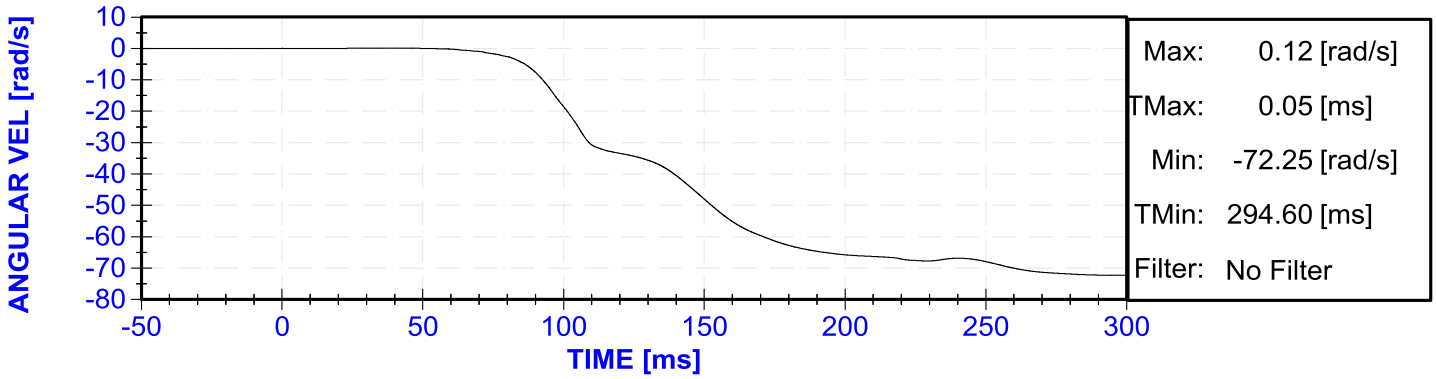
V2P4 HD9Z AX QUESTIONABLE



V2P4 HEAD ANGULAR VELOCITY Y [SIMON]

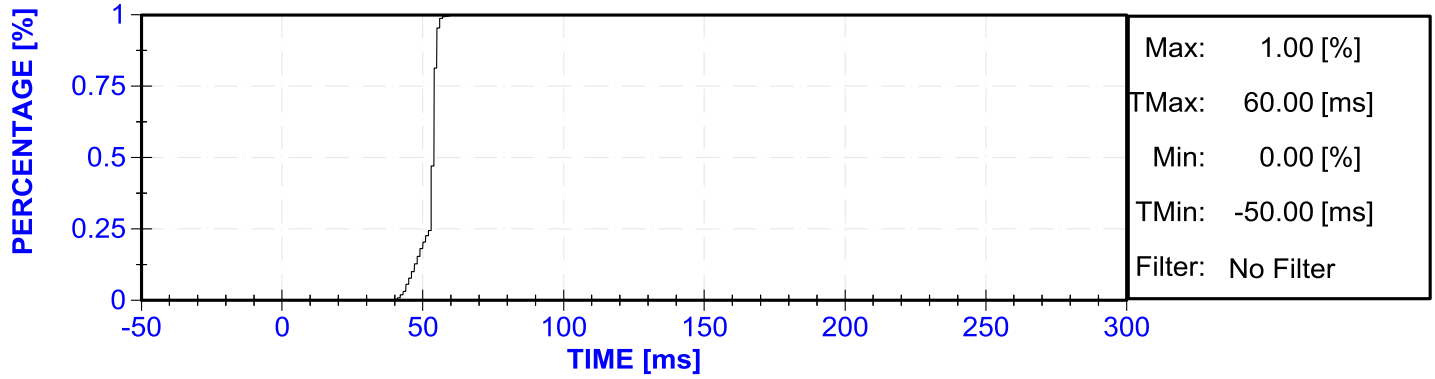


V2P4 HEAD ANGULAR VELOCITY Z [SIMON]



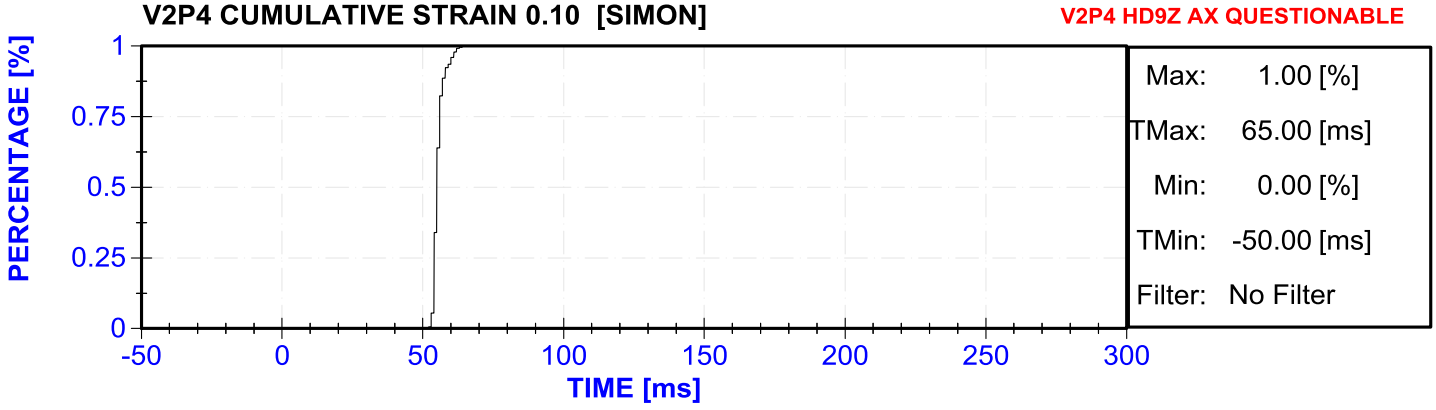
V2P4 CUMULATIVE STRAIN 0.05 [SIMON]

V2P4 HD9Z AX QUESTIONABLE



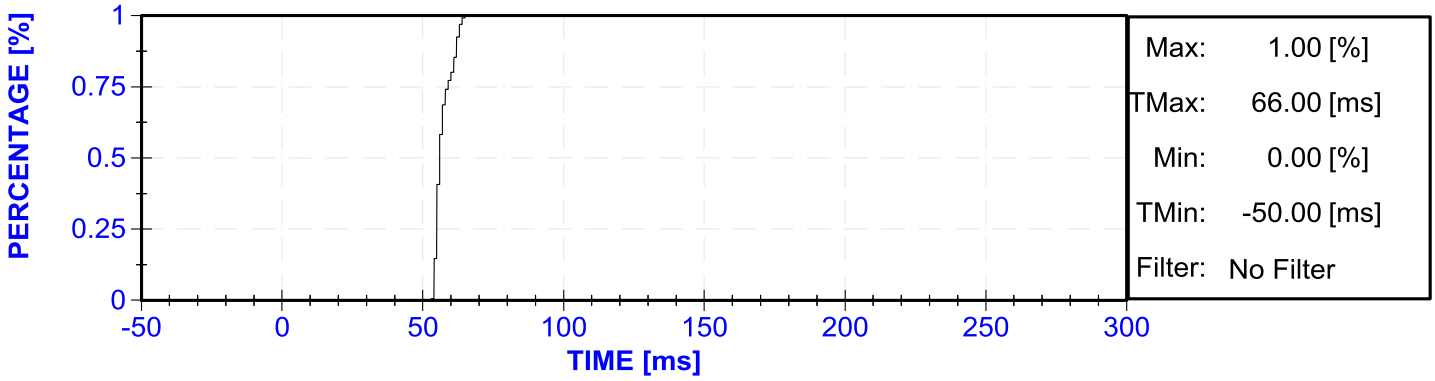
V2P4 CUMULATIVE STRAIN 0.10 [SIMON]

V2P4 HD9Z AX QUESTIONABLE

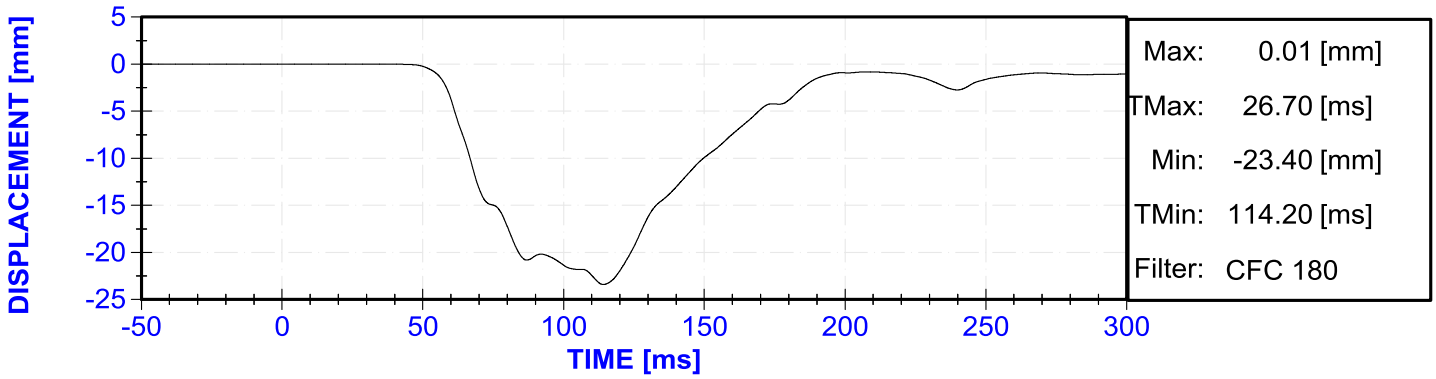


V2P4 CUMULATIVE STRAIN 0.15 [SIMON]

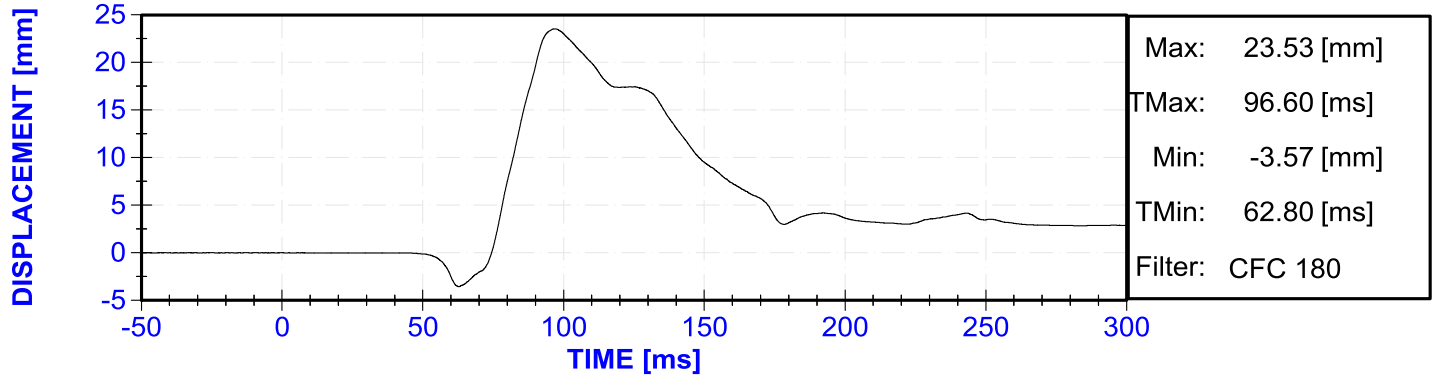
V2P4 HD9Z AX QUESTIONABLE



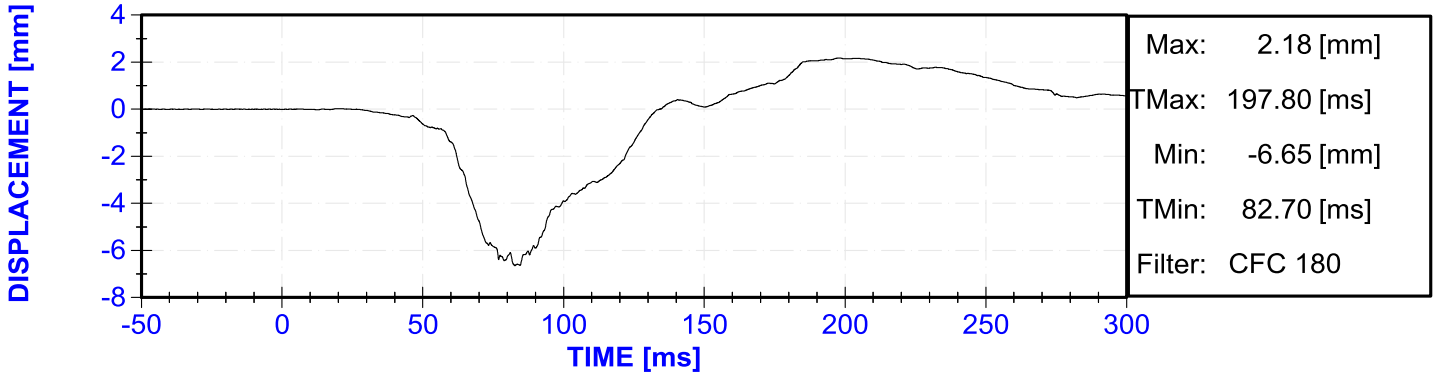
V2P4 CHEST UPPER LEFT X [COMPUTED, MM]



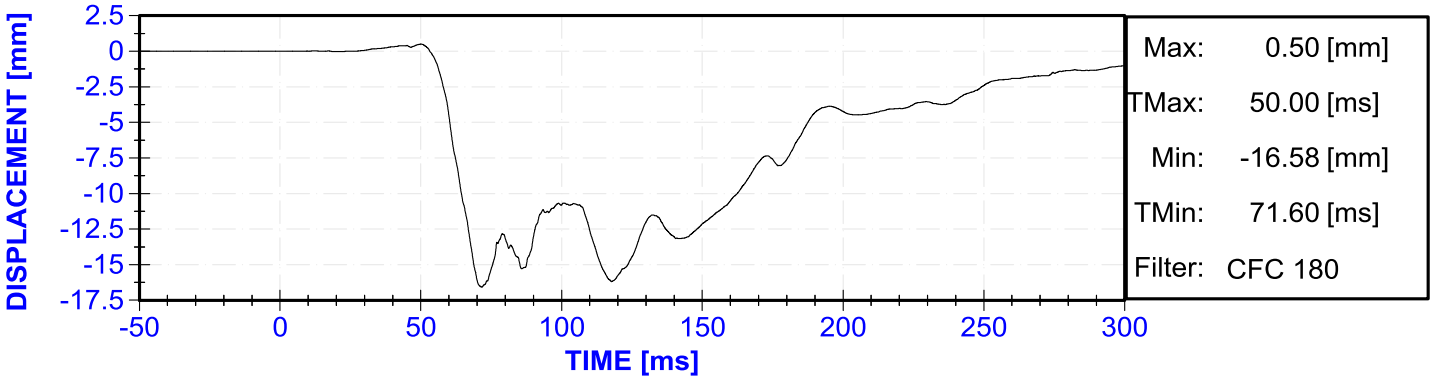
V2P4 CHEST UPPER LEFT Y [COMPUTED, MM]



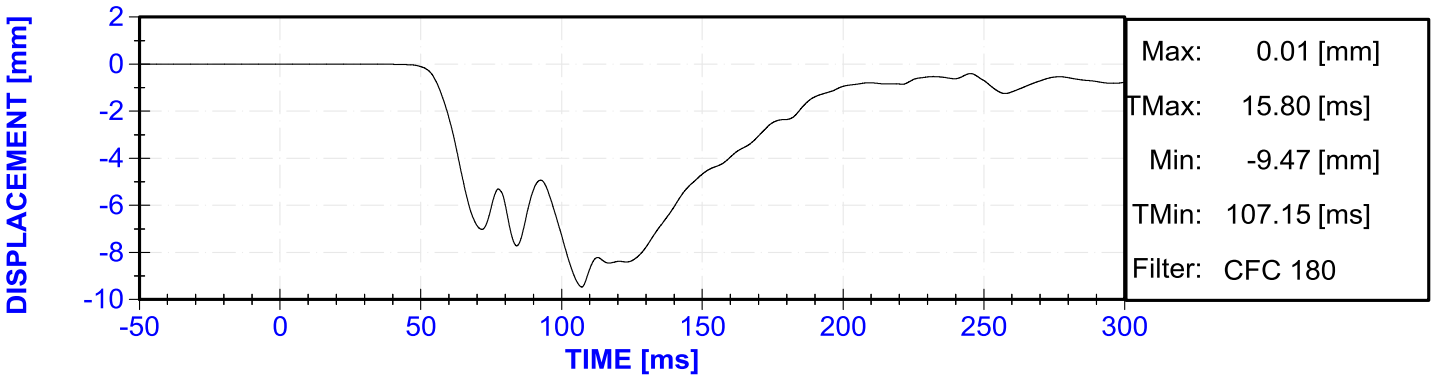
V2P4 CHEST UPPER RIGHT X [COMPUTED, MM]



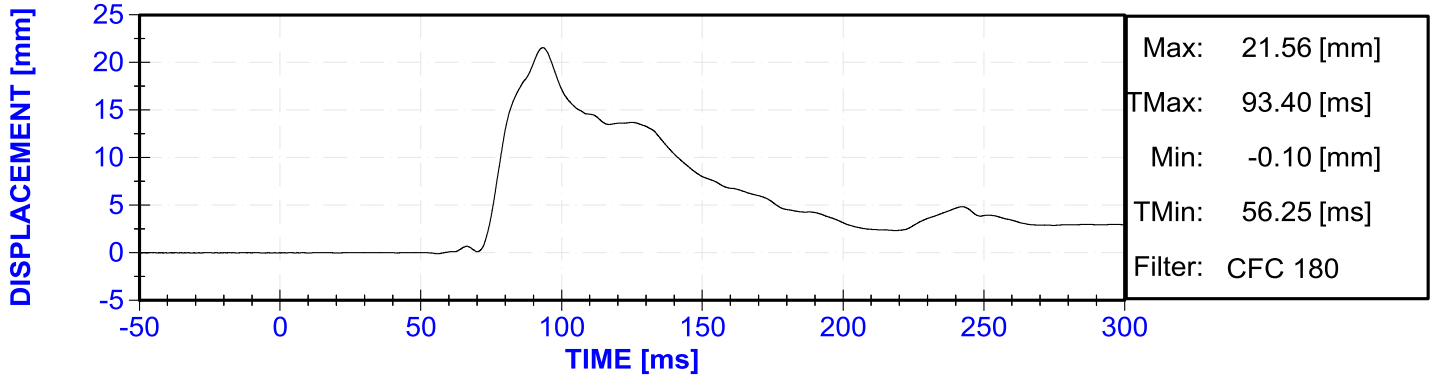
V2P4 CHEST UPPER RIGHT Y [COMPUTED, MM]



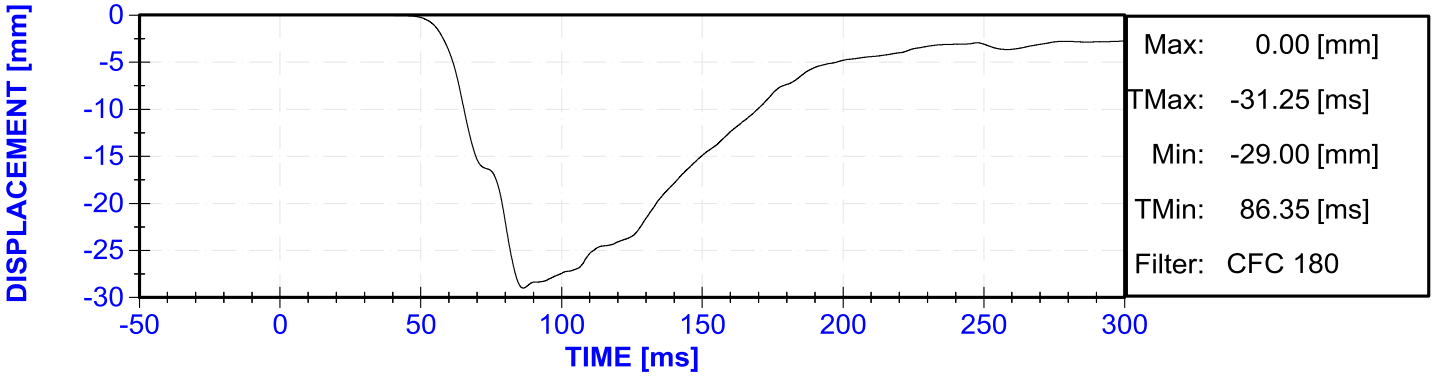
V2P4 CHEST LOWER LEFT X [COMPUTED, MM]

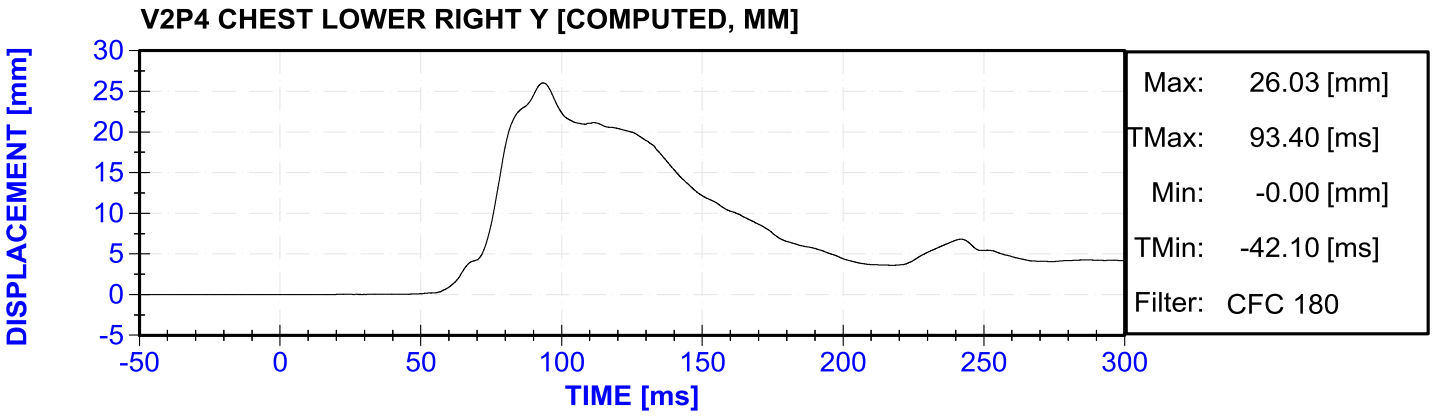


V2P4 CHEST LOWER LEFT Y [COMPUTED, MM]



V2P4 CHEST LOWER RIGHT X [COMPUTED, MM]




V2P4 CHEST LOWER RIGHT Y [COMPUTED, MM]
DISPLACEMENT [mm]
30
25
20
15
10
5
0
-5
-50
0
50
100
150
200
250
300
TIME [ms]
Max: 26.03 [mm]
TMax: 93.40 [ms]
Min: -0.00 [mm]
TMin: -42.10 [ms]
Filter: CFC 180

APPENDIX C

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

TABLE OF CONTENT		
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Table 2	THOR 6 File Set	C-3
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Table 5	THOR Post-Test Inspection Checklist	C-9
	Dummy Calibration Plots	C-14

Table 1 – Dummy Information

TYPE	DESCRIPTION	SERIAL NUMBER
THOR	50^{TH} Male	006
Hybrid III	5^{th} Female	421

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
1.47553	13.11333	2.986433	3.001167	8.345867	36.7335

Table 3 - THOR Dummy Initial SetUp Information

THOR – MK S/N: 0006									Sensitivity (JARI)	Sensitivity (GESAC)	Setup Angle (GESAC)
Sensor	**Description/ Axis**	**MFG**	**Capacity**	**Unit 1**	**Unit 2**	**Range**	**Direction**	**CFC**	**V/Unit -1**	**V/Unit-1**	**Degrees**
NKCRP	Upper Right Base	Contelec S/N 001	318	deg	mV	2000	Rear +	180	3.18451	3.18451	-1.462
Thorax CRUX	Upper Right Mid	Contelec S/N 307	318	deg	mV	2000	Rear +	180	3.1923	3.1923	-88.721
Thorax CRUX	Upper Right Elbow	Contelec S/N 003	318	deg	mV	2000	Rear +	180	3.15174	3.15174	85.449
Thorax CRUX	Upper Left Base	Contelec S/N 040	318	deg	mV	2000	Rear +	180	3.14021	3.14021	-4.697
Thorax CRUX	Upper Left Mid	Contelec S/N 041	318	deg	mV	2000	Rear +	180	3.13326	3.13326	99.189
Thorax CRUX	Upper Left Elbow	Contelec S/N 529	318	deg	mV	2000	Rear +	180	3.14537	3.14537	-91.362
Thorax CRUX	Lower Right Base	Contelec S/N 043	318	deg	mV	2000	Rear +	180	3.1615	3.1615	2.0640
Thorax CRUX	Lower Right Mid	Contelec S/N 706	318	deg	mV	2000	Rear +	180	3.04839	3.04839	70.639
Thorax CRUX	Lower Right Elbow	Contelec S/N 559	318	deg	mV	2000	Rear +	180	3.19115	3.19115	15.895
Thorax CRUX	Lower Left Base	Contelec S/N 023	318	deg	mV	2000	Rear +	180	3.12781	3.12781	6.628
Thorax CRUX	Lower Left Mid	Contelec S/N 357	318	deg	mV	2000	Rear +	180	3.12211	3.12211	-87.755
Thorax CRUX	Lower left Elbow	Contelec S/N 317	318	deg	mV	2000	Rear +	180	3.15098	3.15098	46.700
Thorax CRUX	Right Abdomen X	Space-Age S/N 14486	101.6	mm	mV		Rear +	180	9.4366	9.4366	132.99
DGSP	Right Abdomen Y	Contelec S/N 104	318	deg	mV	1000	Rear +	180	2.915	2.915	2.70
DGSP	Right Abdomen Z	Contelec S/N 361	318	deg	mV	1000	Rear +	180	3.12438	3.12438	-20.03
DGSP	Left Abdomen X	Space-Age S/N 256	101.6	mm	mV	10000	Rear +	180	9.37504	9.37504	135.16
DGSP	Left Abdomen Y	Contelec S/N 107	318	deg	mV	1000	Rear +	180	2.922	2.922	-3.48
DGSP	Left Abdomen Z	Contelec S/N 410	318	deg	mV	1000	Rear +	180	3.19551	3.19551	-3.27
DGSP	Upper Right Base	Contelec S/N 001	318	deg	mV	2000	Rear +	180	3.18451	3.18451	-1.462

Table 5 – Post-Test Inspection Report

THOR Inspection Checklist

Date: June 6, 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: 1st Inspection since calibration
Tests conducted since last full certification or inspection:
Known errors in data channels (no data, clipping, unexpected drops):
Physical evidence of damage:
Anecdotal evidence of damage:
Equipment delivered to Borrower:

HEAD	
(Y) / N	Rear head cap mounts securely to head
(Y) / N	Head skin fits securely over skull
(Y) / N	Head skin shows no sign of tears or damage
(Y) / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
(Y) / N	Head securely mounted to OC joint
OTHER	
NECK	
(Y) / N	Neck cables slide freely through holes in neck plates
(Y) / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / (N)	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): - Top rear of puck #5 has slight debonding
Y / (N)	No evidence of debonding or permanent compression in neck soft stop assemblies - Debonding / permanent compression of front neck soft stop
(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

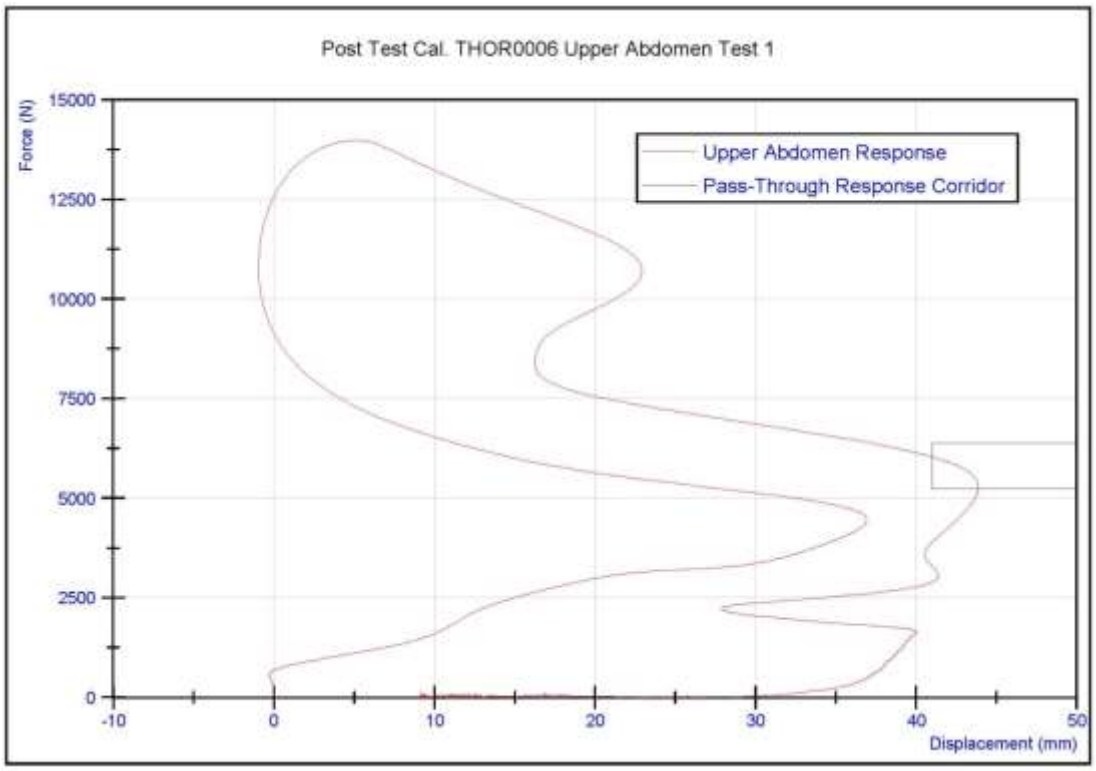
Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
(Y) / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
SHOULDER	
(Y) / N	Urethane shoulder pads show no evidence of contact
(Y) / N	Clavicles securely attached to sternum and shoulder
Y / (N)	No evidence of debonding, tearing, or permanent compression of posterior soft stops - Slight debonding on rear of left soft stop
OTHER	
THORAX	
Y / (N)	No evidence of contact at top, bottom, or interior faces of rib damping material - Rib 3 left side top - Rib 4 right side top
Y / (N)	No evidence of debonding between rib damping material and ribs - Left side Rib #5 left side
(Y) / N	CRUX anterior arms securely attached to anterior ribs
(Y) / N	CRUX posterior arms securely attached to double gimbals, spine
(Y) / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
(Y) / N	Ribs securely attached to posterior spine
(Y) / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	

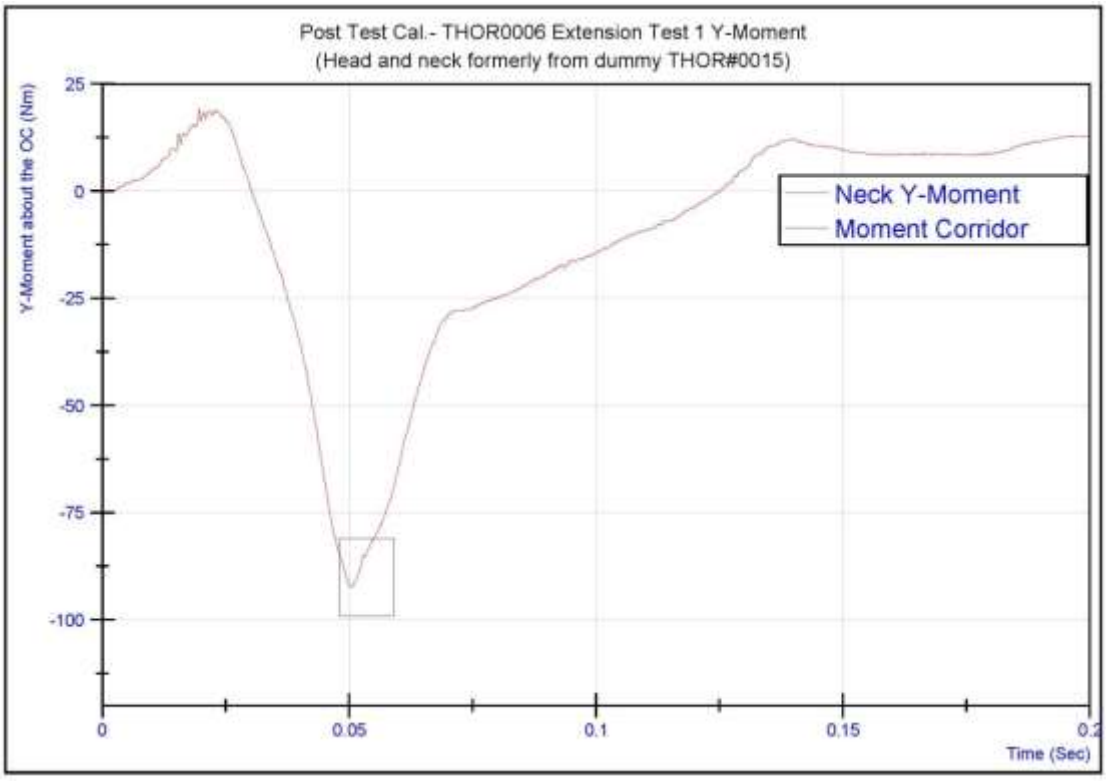
ABDOMEN	
Y / (N)	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper - There is a small tear top left side

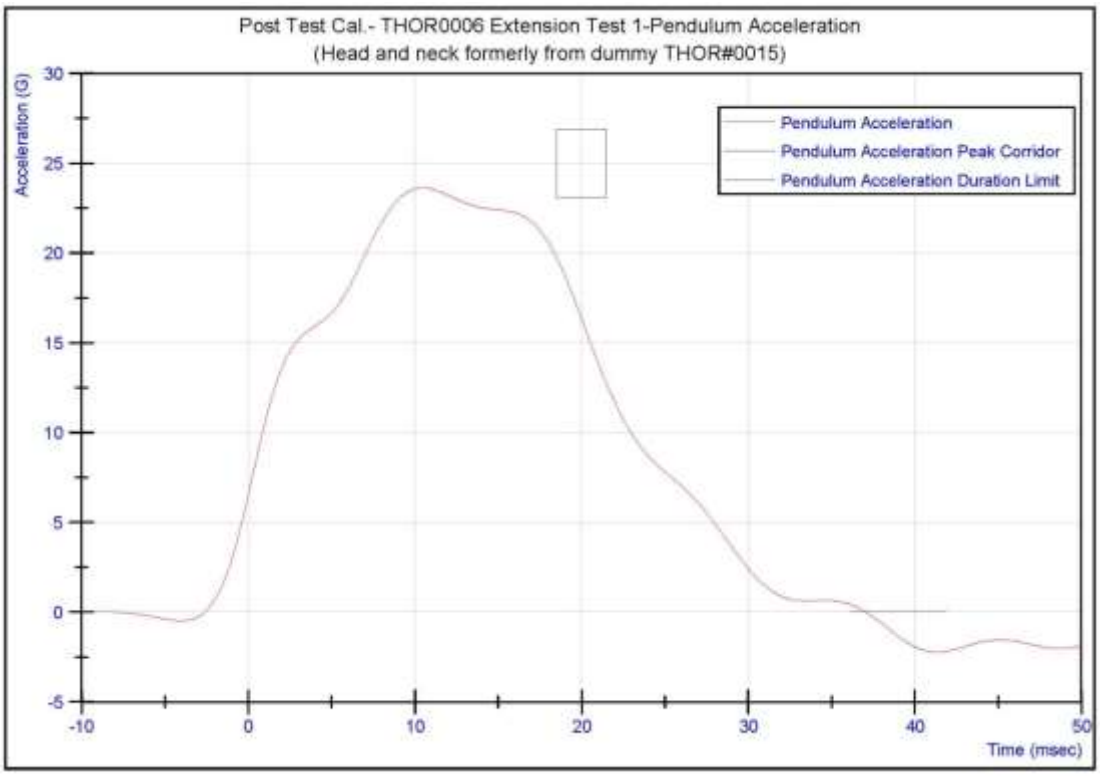
Y / N	Upper abdomen insert securely attached to spine
Y / (N)	Upper abdomen insert shows no evidence of permanent set
Y / (N)	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper - Topleft front, broken stitches
(Y) / N	Lower abdomen insert securely attached to spine
(Y) / N	Lower abdomen insert shows no evidence of permanent set
OTHER	
PELVIS	
(Y) / N	Pelvis flesh fits securely over pelvis bones
(Y) / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	
FEMUR	
(Y) / N	Acetabular load cells firmly attached
(Y) / N	Femur load cells firmly attached
(Y) / N	No evidence of deformation of knee slider bump stop
Y / (N)	No cuts, tears, or suffing of knee flesh - Left knee flesh severed (replacement ordered)
OTHER	Left interior/exterior joint covers scuffed/damaged/small chunks missing on the right interior
LOWER EXTREMITY (LX)	
(Y) / N	Rotational potentiometers in ankle securely attached
(Y) / N	Achilles tendon provides resistance to dorsiflexion

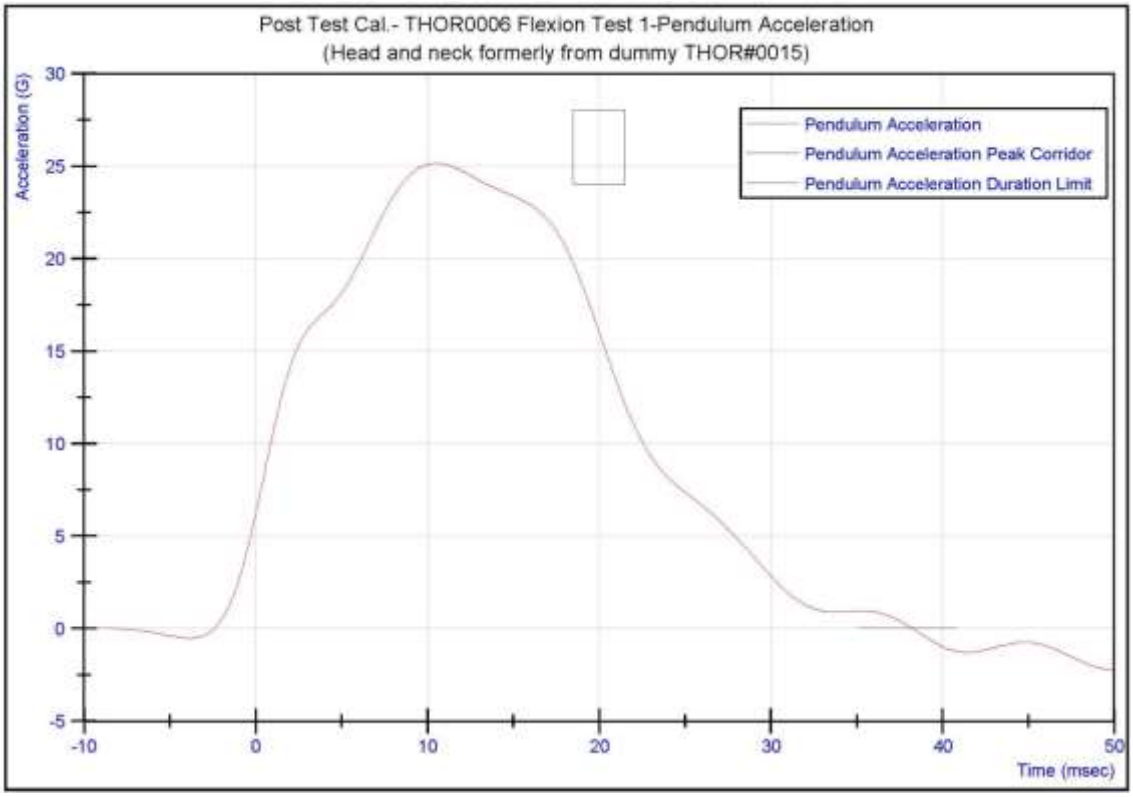
Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops
OTHER	Left knee skin separated – ordered new part
JACKET	
(Y) / N	Rib stiffeners show no sign of permanent deformation
Y / (N)	No evidence of tears or holes in jacket fabric, velcro, or zippers - Tearing at seams of the neckline, front at jacket
OTHER	

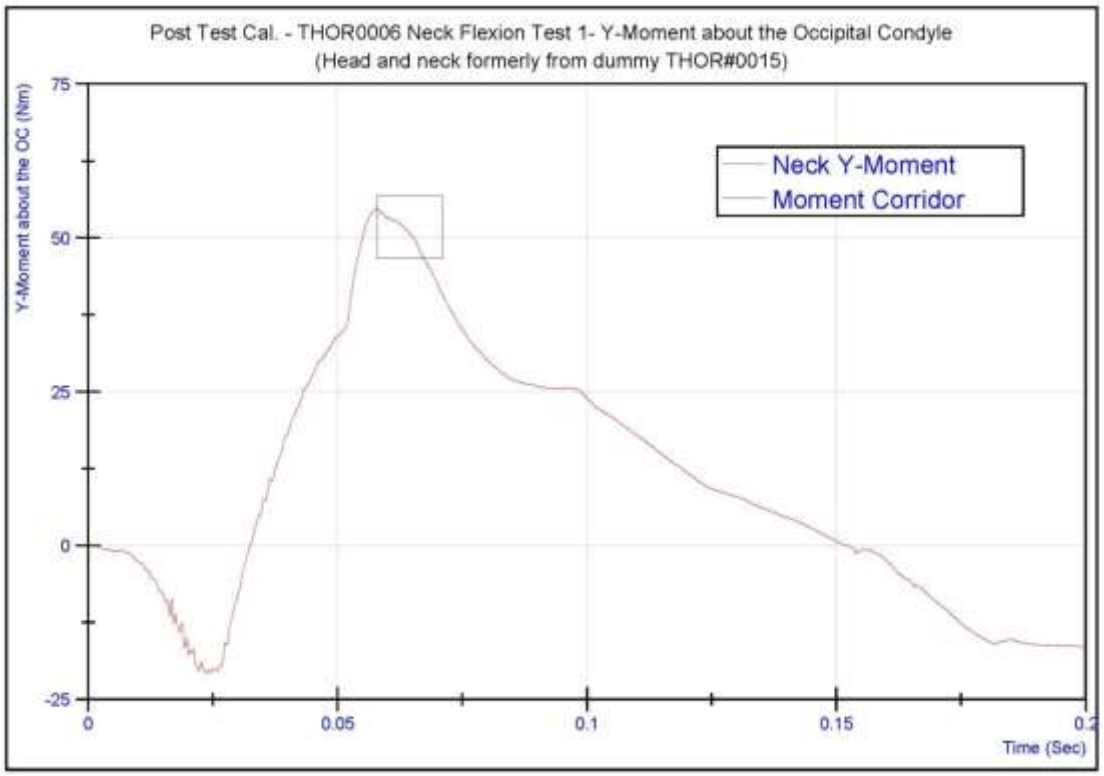
Dummy Calibration Plots

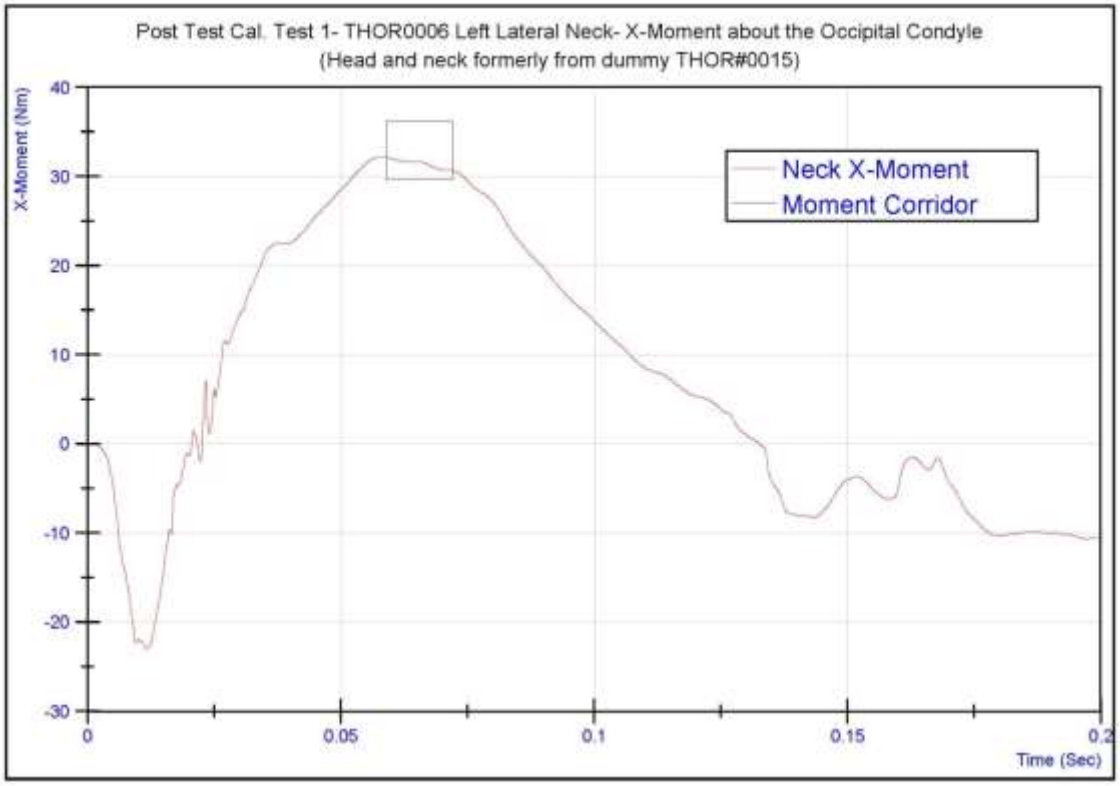

Post Test Cal. THOR0006 Upper Abdomen Test 1
Force (N)
15000
12500
10000
7500
5000
2500
0
-10
0
10
20
30
40
50
Displacement (mm)
Upper Abdomen Response
Pass-Through Response Corridor

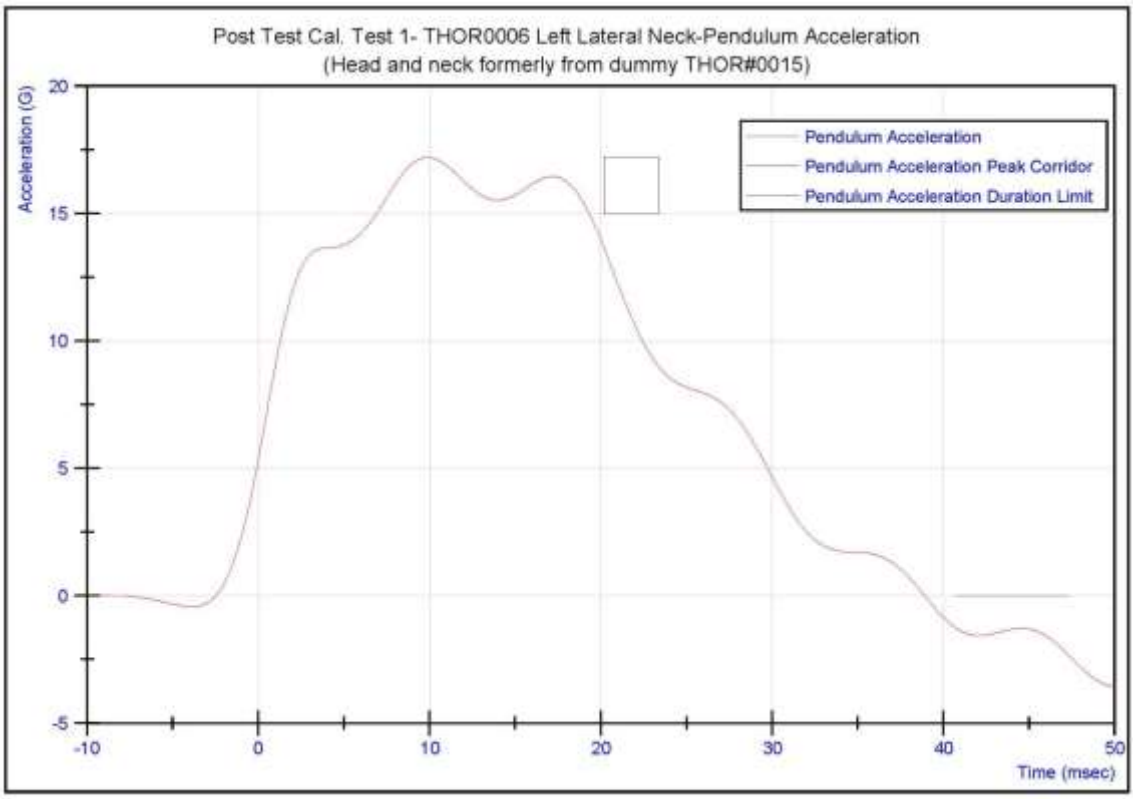

Post Test Cal.- THOR0006 Extension Test 1 Y-Moment
(Head and neck formerly from dummy THOR#0015)
Y-Moment about the OC (Nm)
25
0
-25
-50
-75
-100
0
0.05
0.1
0.15
0.2
Time (Sec)
Neck Y-Moment
Moment Corridor

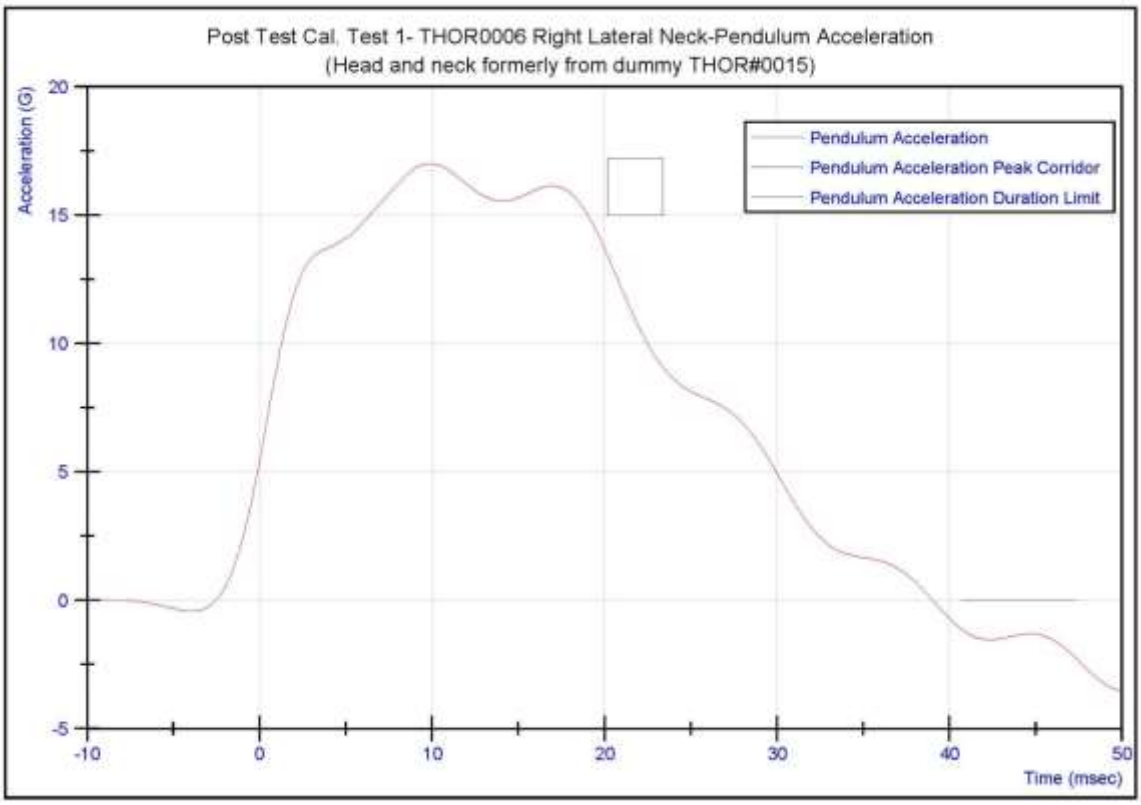

Post Test Cal.- THOR0006 Extension Test 1-Pendulum Acceleration
(Head and neck formerly from dummy THOR#0015)
Acceleration (G)
30
25
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time (msec)
Pendulum Acceleration
Pendulum Acceleration Peak Corridor
Pendulum Acceleration Duration Limit

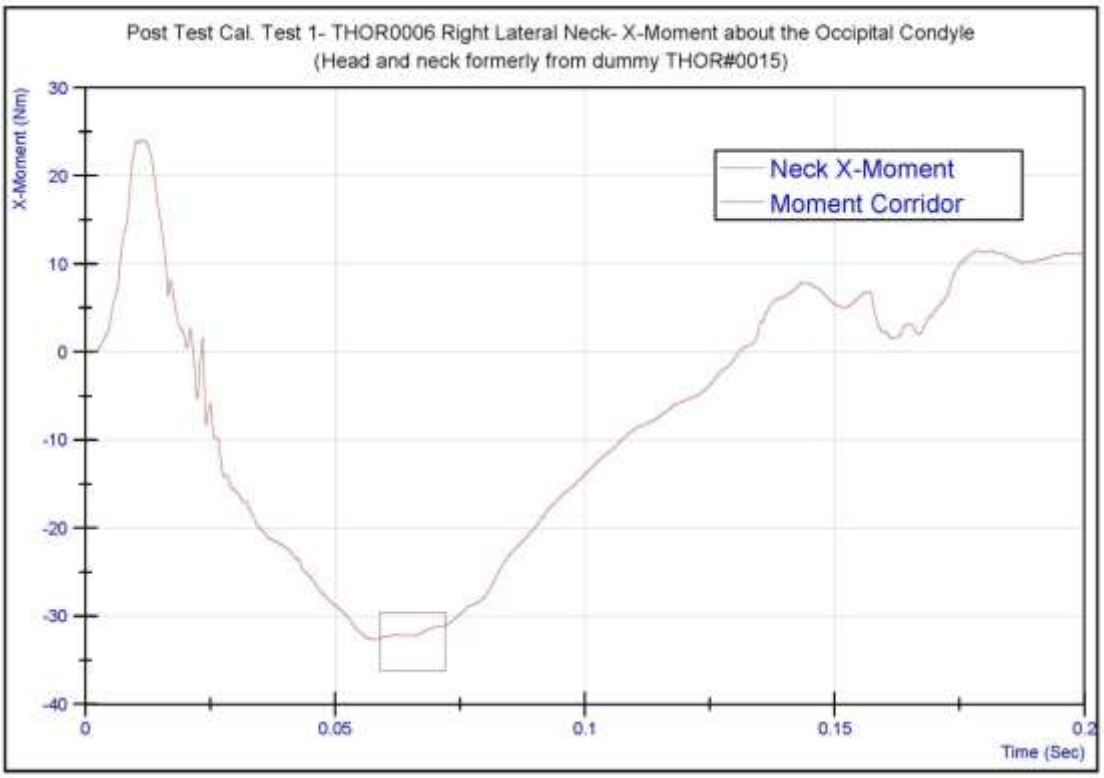

Post Test Cal.- THOR0006 Flexion Test 1-Pendulum Acceleration
(Head and neck formerly from dummy THOR#0015)
Acceleration (G)
30
25
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time (msec)
Pendulum Acceleration
Pendulum Acceleration Peak Corridor
Pendulum Acceleration Duration Limit

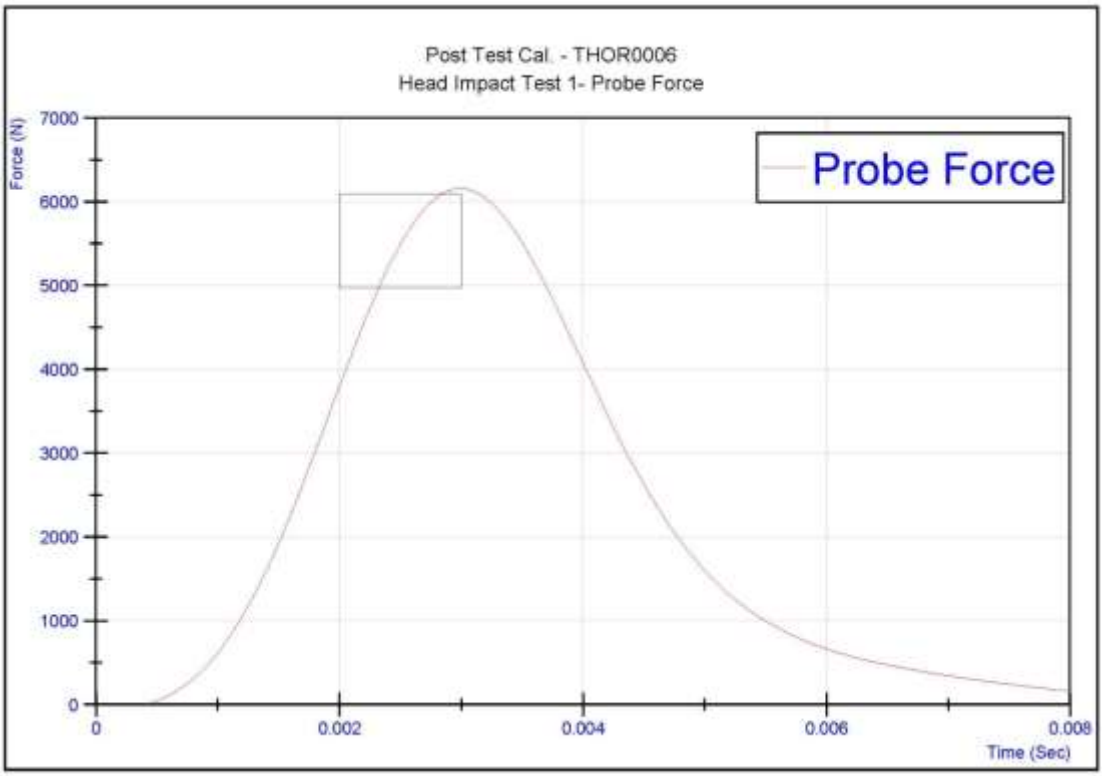

Post Test Cal. - THOR0006 Neck Flexion Test 1- Y-Moment about the Occipital Condyle
(Head and neck formerly from dummy THOR#0015)
Y-Moment about the OC (Nm)
75
50
25
0
-25
0
0.05
0.1
0.15
0.2
Time (Sec)
Neck Y-Moment
Moment Corridor

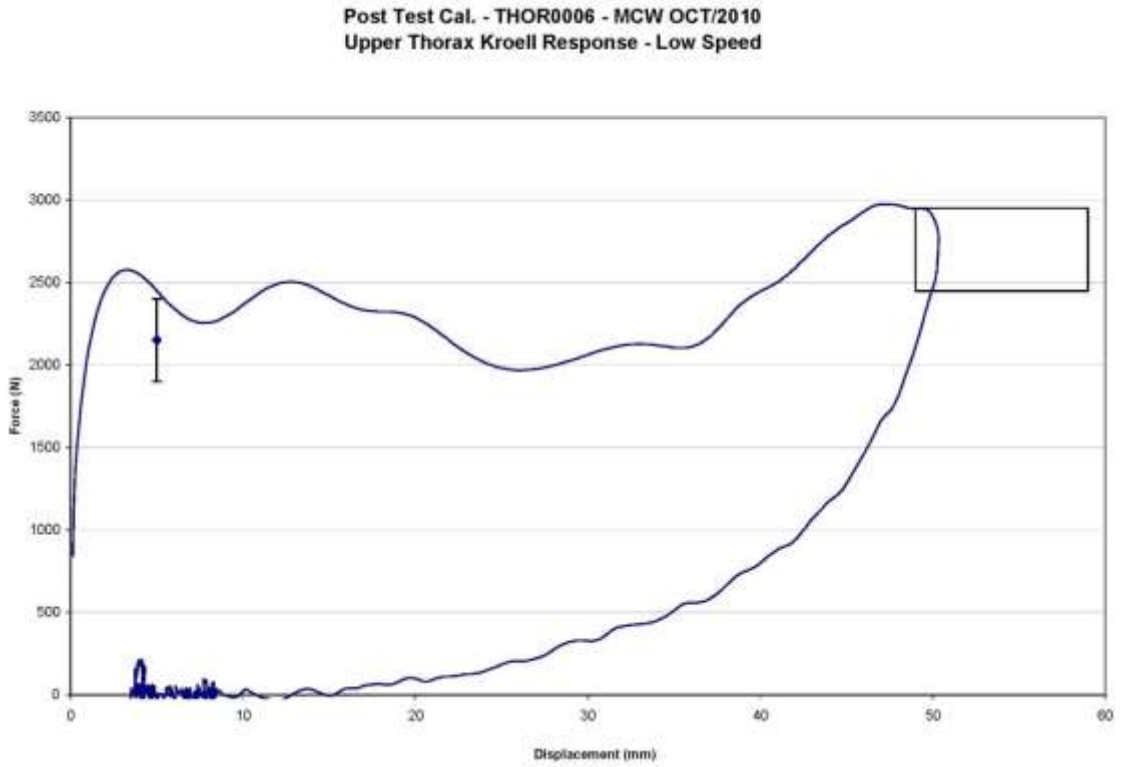

Post Test Cal. Test 1- THOR0006 Left Lateral Neck- X-Moment about the Occipital Condyle
(Head and neck formerly from dummy THOR#0015)
X-Moment (Nm)
40
30
20
10
0
-10
-20
-30
0
0.05
0.1
0.15
0.2
Time (Sec)
Neck X-Moment
Moment Corridor

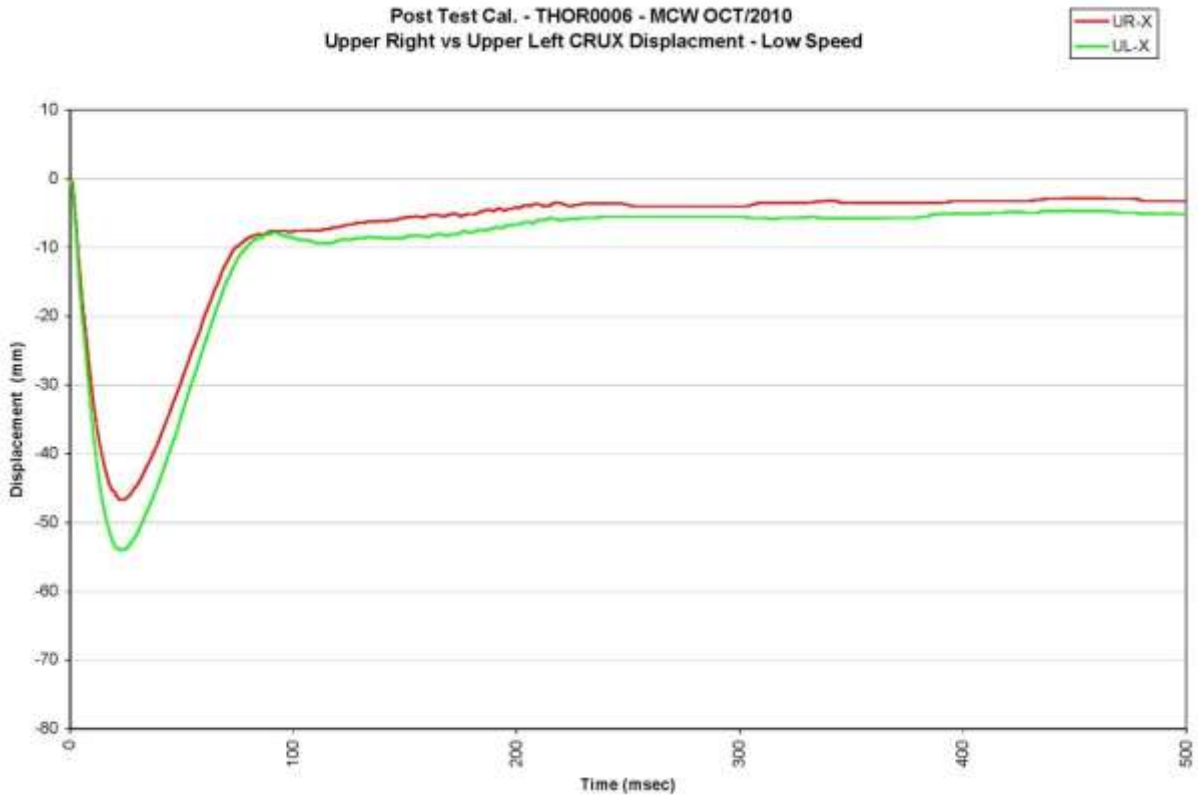

Post Test Cal. Test 1- THOR0006 Left Lateral Neck-Pendulum Acceleration
(Head and neck formerly from dummy THOR#0015)
Acceleration (G)
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time (msec)
Pendulum Acceleration
Pendulum Acceleration Peak Corridor
Pendulum Acceleration Duration Limit

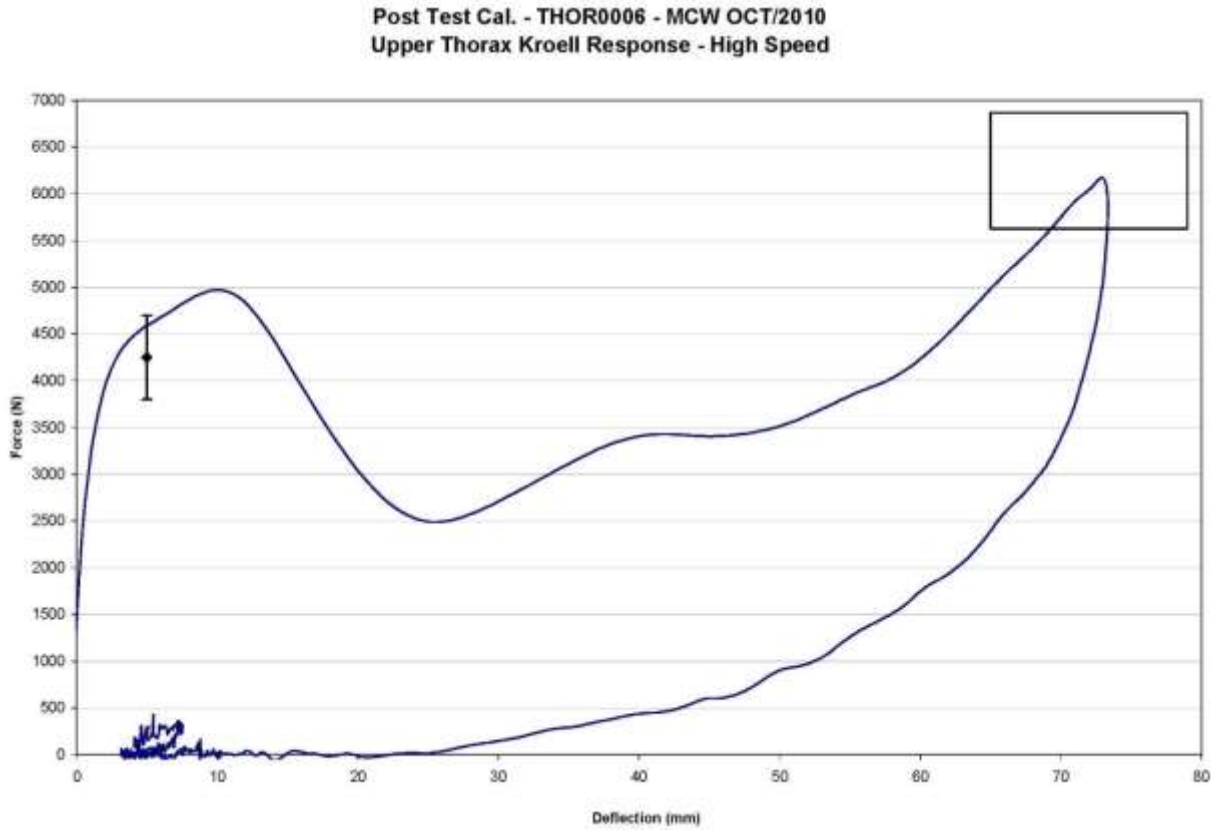

Post Test Cal. Test 1- THOR0006 Right Lateral Neck-Pendulum Acceleration
(Head and neck formerly from dummy THOR#0015)
Acceleration (G)
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time (msec)
Pendulum Acceleration
Pendulum Acceleration Peak Corridor
Pendulum Acceleration Duration Limit

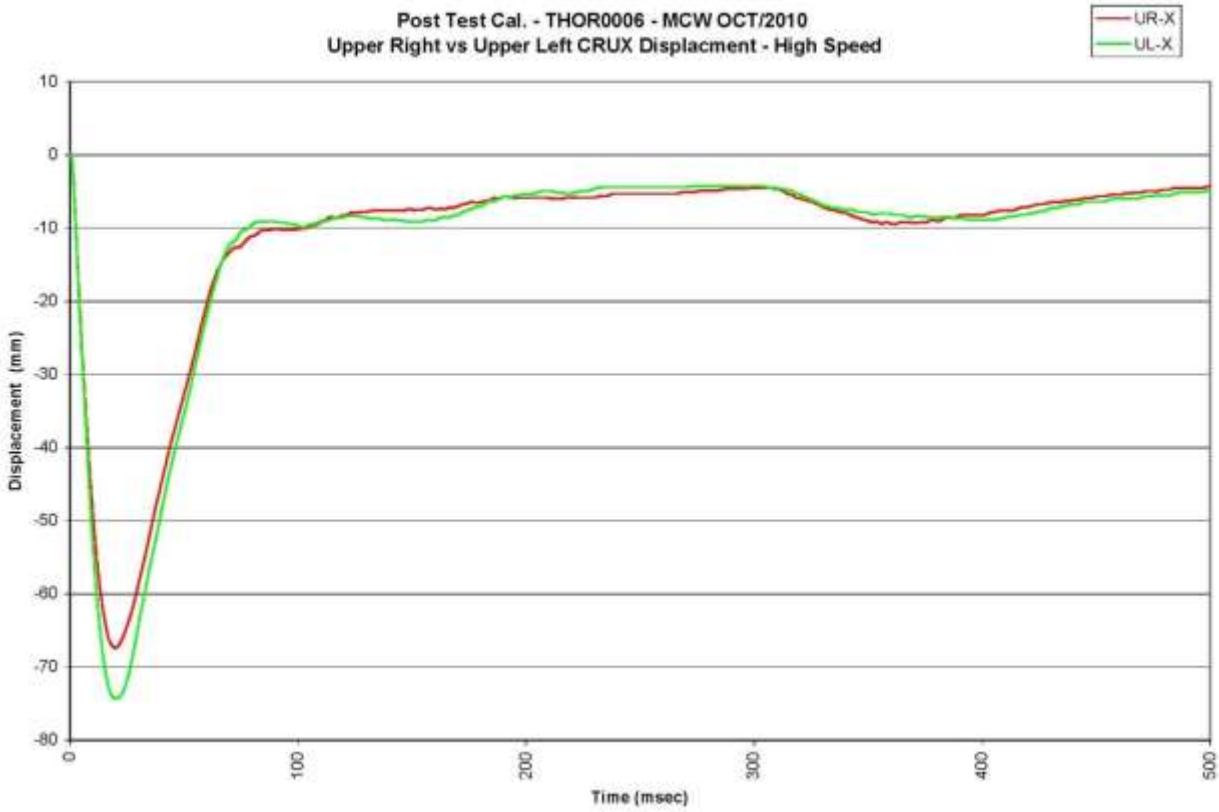

Post Test Cal. Test 1- THOR0006 Right Lateral Neck- X-Moment about the Occipital Condyle
(Head and neck formerly from dummy THOR#0015)
X-Moment (Nm)
30
20
10
0
-10
-20
-30
-40
0
0.05
0.1
0.15
0.2
Time (Sec)
Neck X-Moment
Moment Corridor


Post Test Cal. - THOR0006
Head Impact Test 1- Probe Force
Force (N)
7000
6000
5000
4000
3000
2000
1000
0
0
0.002
0.004
0.006
0.008
Time (Sec)
Probe Force

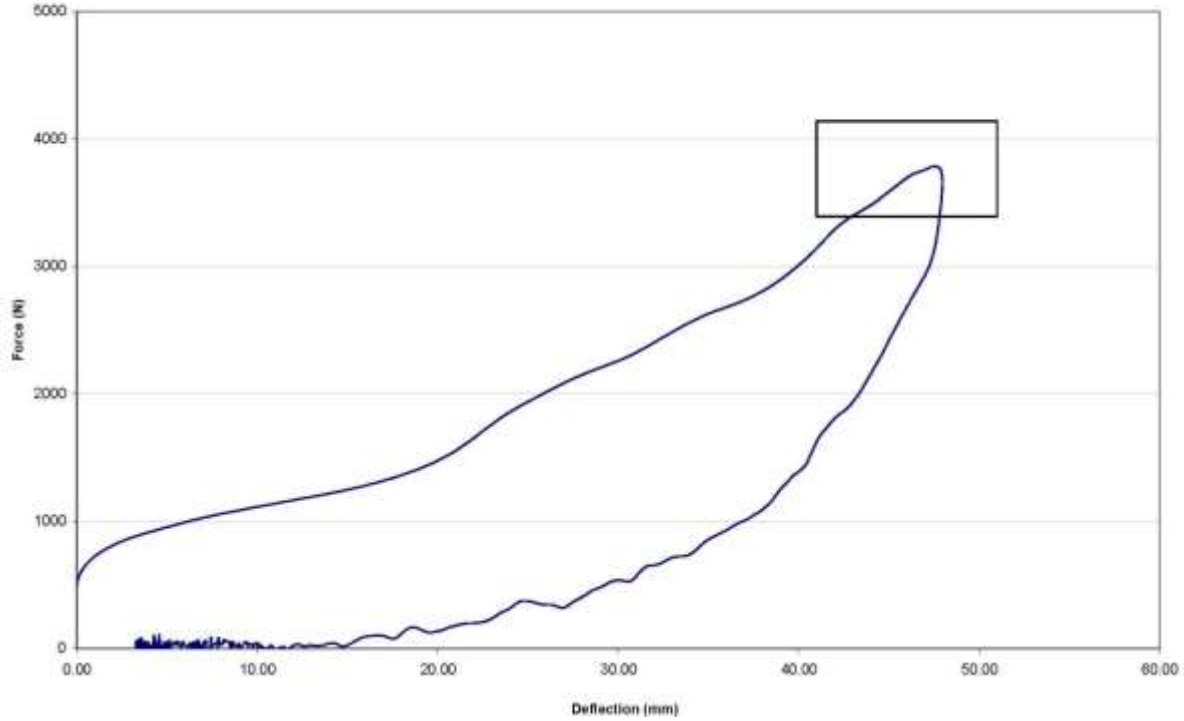

Post Test Cal. - THOR0006 - MCW OCT/2010
Upper Thorax Kroell Response - Low Speed
Force (N)
Displacement (mm)
3500
3000
2500
2000
1500
1000
500
0
0
10
20
30
40
50
60


Post Test Cal. - THOR0006 - MCW OCT/2010
Upper Right vs Upper Left CRUX Displacment - Low Speed
UR-X
UL-X
Displacement (mm)
Time (msec)
10
0
-10
-20
-30
-40
-50
-60
-70
-80
0
100
200
300
400
500

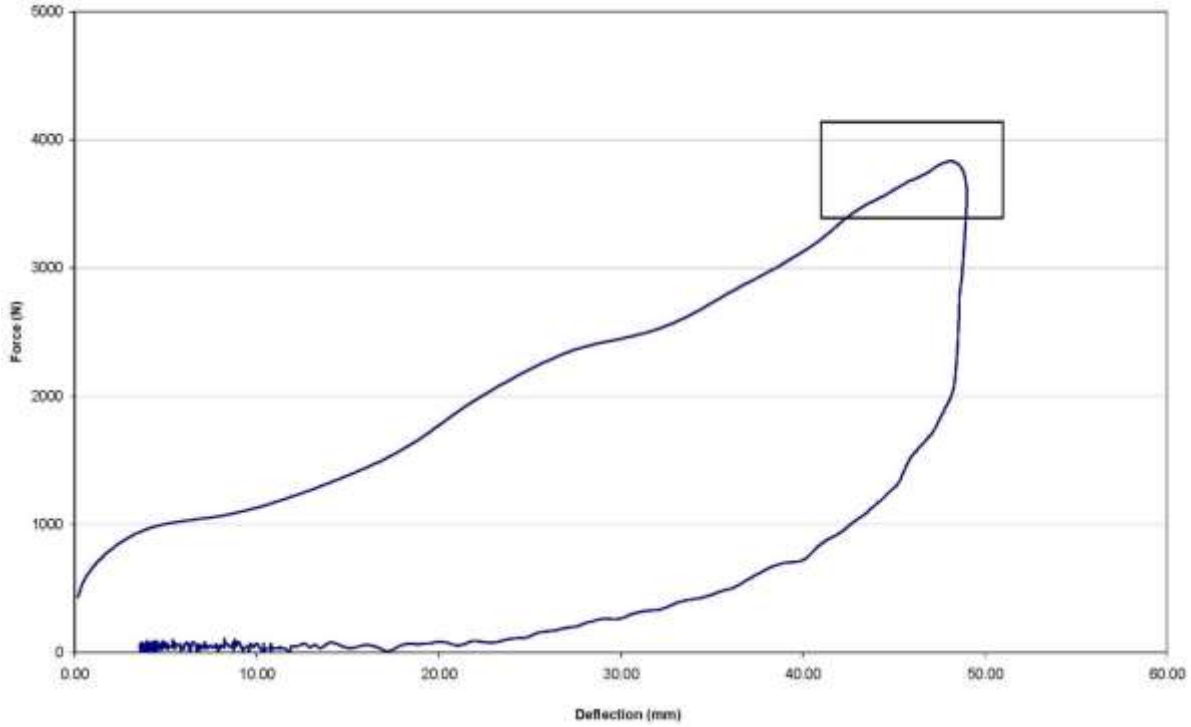

Post Test Cal. - THOR0006 - MCW OCT/2010
Upper Thorax Kroell Response - High Speed
Force (N)
Deflection (mm)

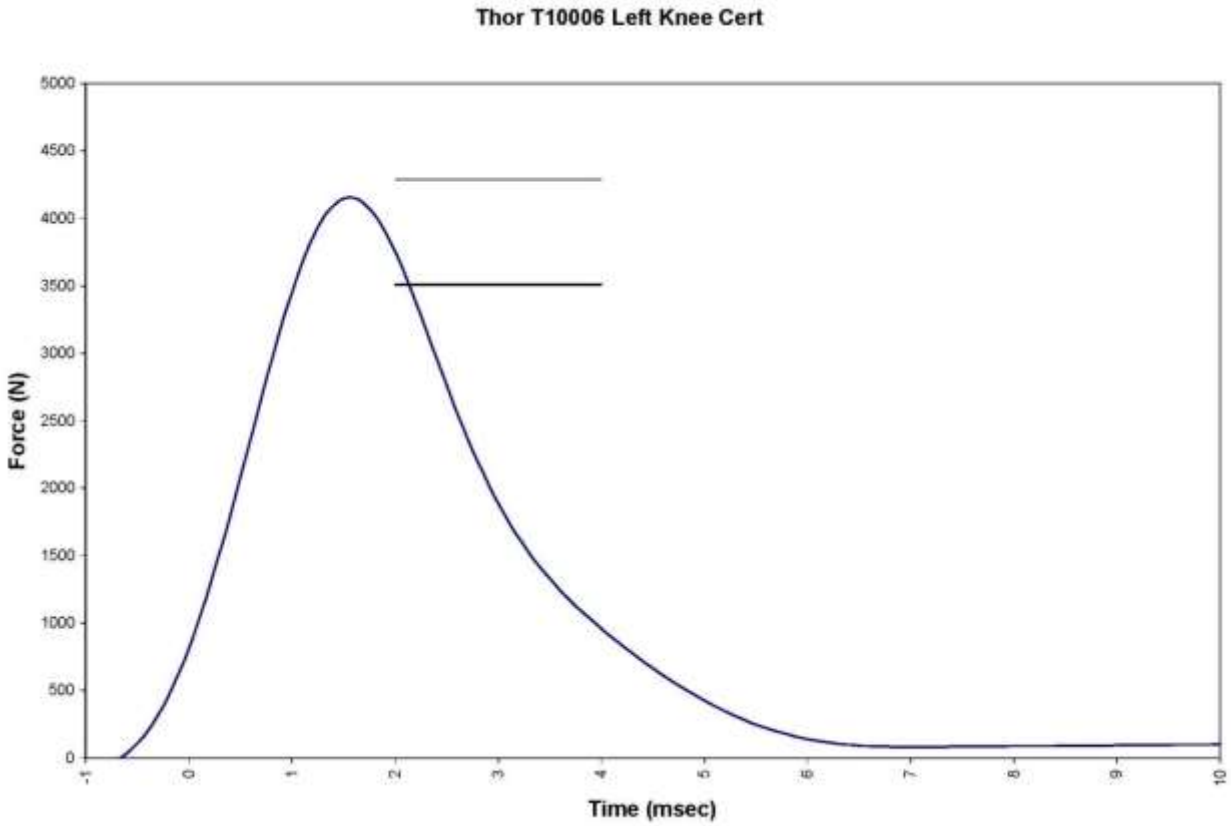

Post Test Cal. - THOR0006 - MCW OCT/2010
Upper Right vs Upper Left CRUX Displacment - High Speed
UR-X
UL-X
Displacement (mm)
Time (msec)

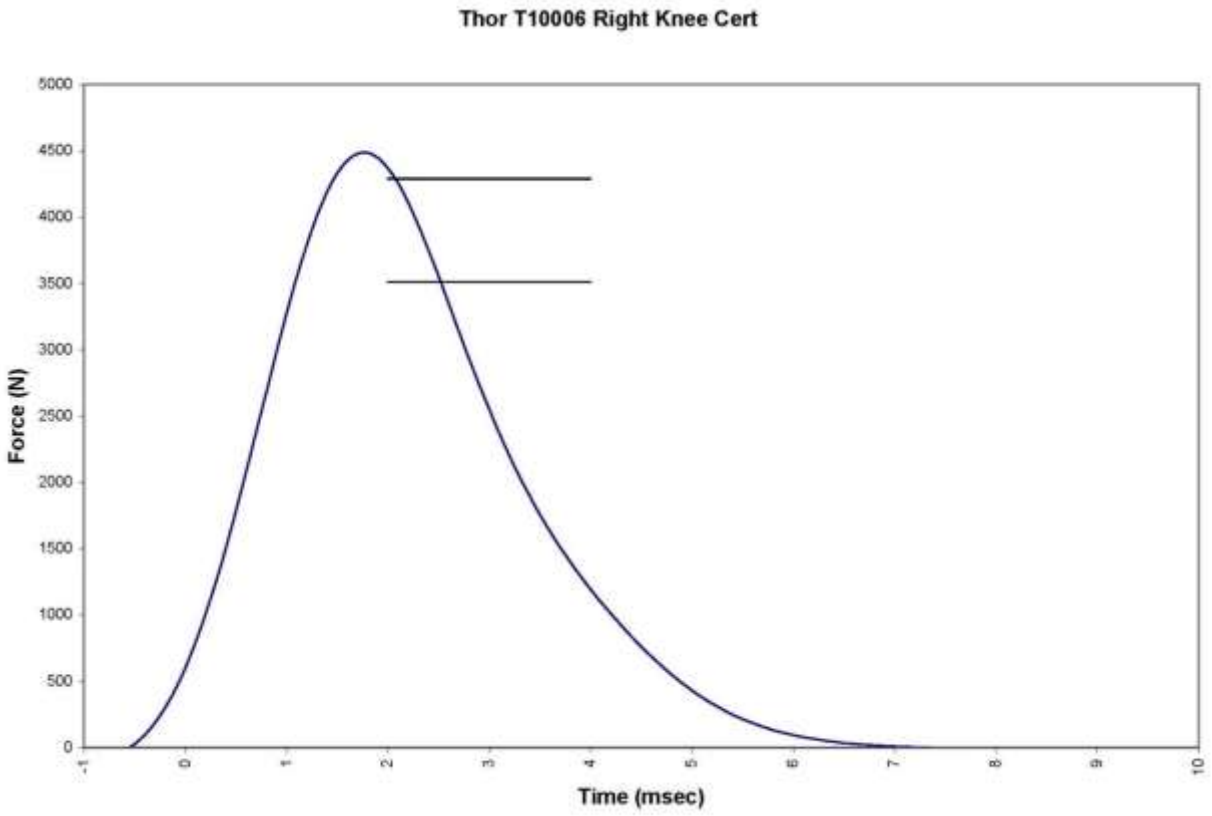
Post Test Cal. - THOR0006
Lower Left 15 Degree Oblique Thorax Response- MCW - OCT2010



Post Test Cal. - THOR0006
Lower Right 15 Degree Oblique Thorax Response- MCW - OCT2010

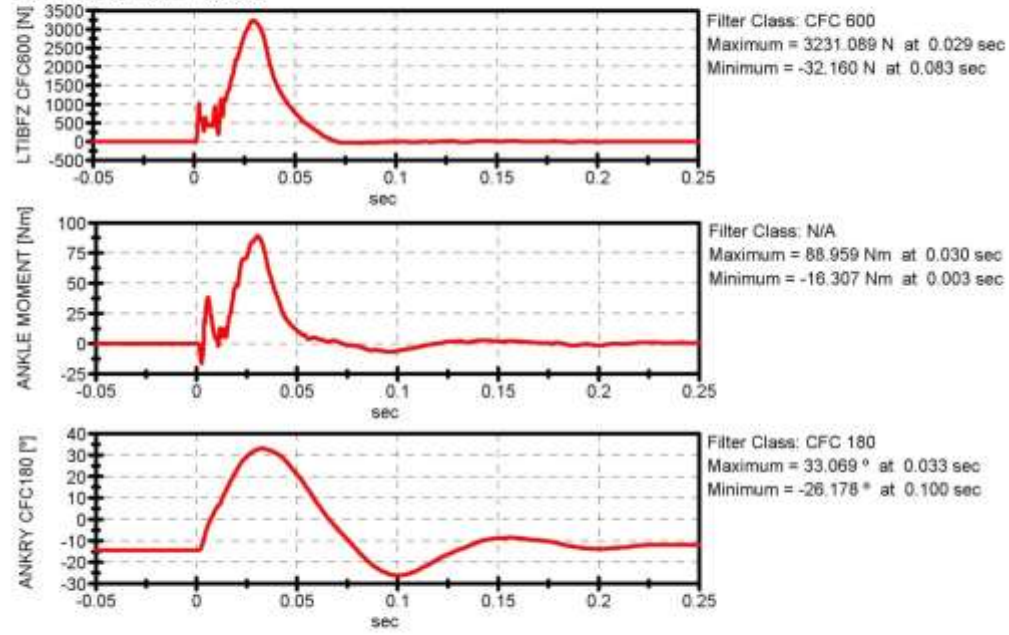




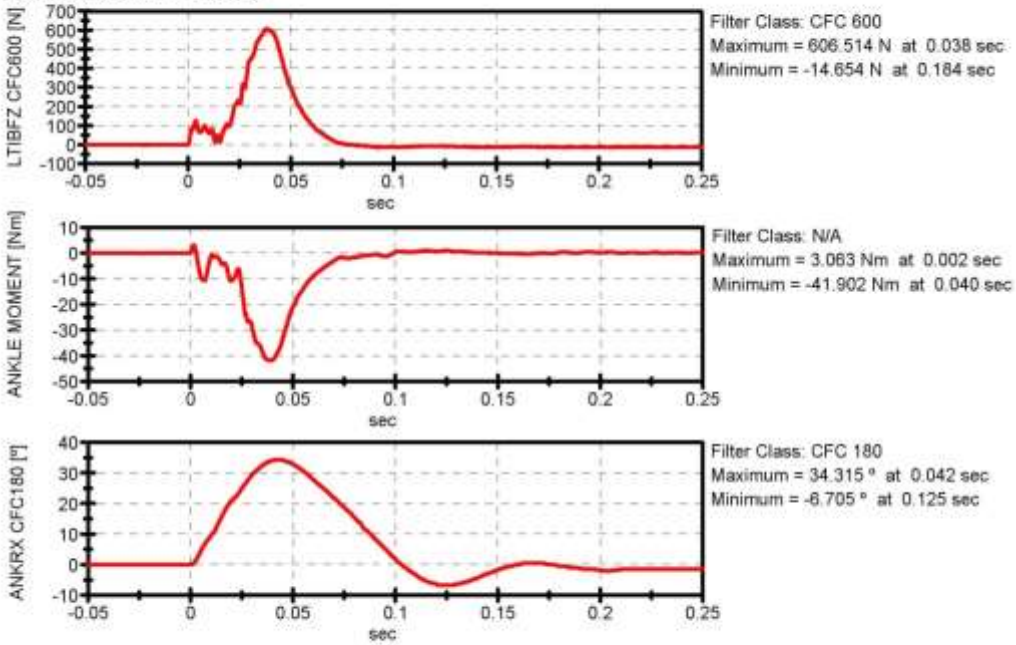


LEG S/N: LX103 / LX104

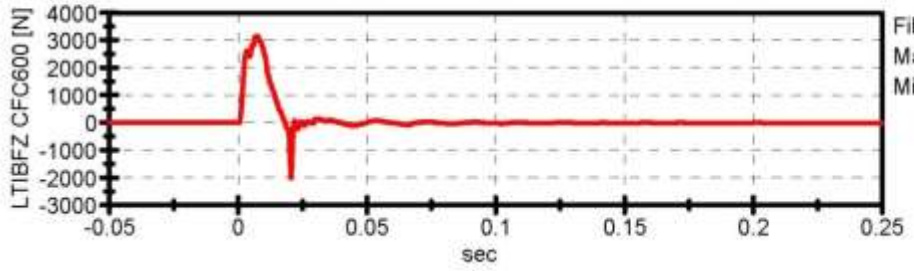
Test Performer: Vehicle Research and Test Center
Test Type: Dorsiflexion/Ball of Foot
Test Name: LX103R_2011_07_12_DORSI_01
Test Date: 12.07.2011 13:03:52



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

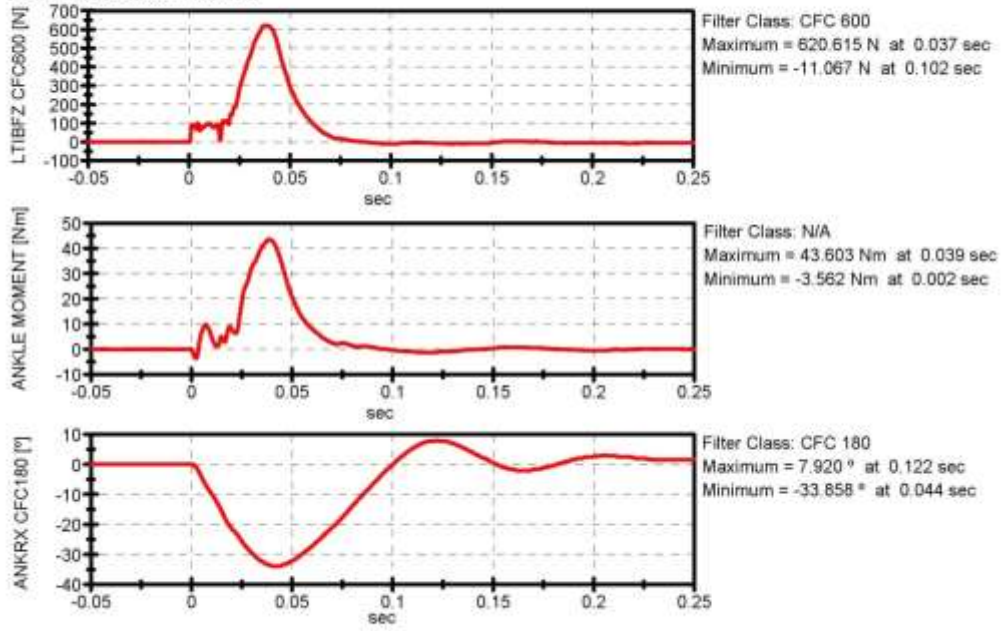


Test Performer: Vehicle Research and Test Center
Test Type: Heel of Foot
Test Name: LX103R_2011_07_12_HEEL_01
Test Date: 12.07.2011 12:23:32

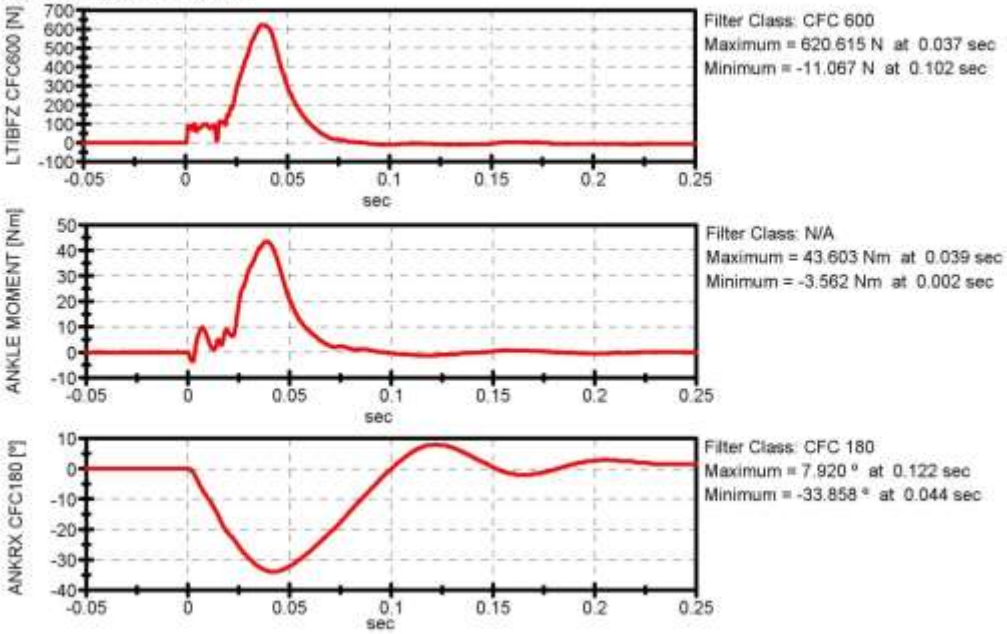


Filter Class: CFC 600
Maximum = 3140.967 N at 0.008 sec
Minimum = -2014.830 N at 0.021 sec

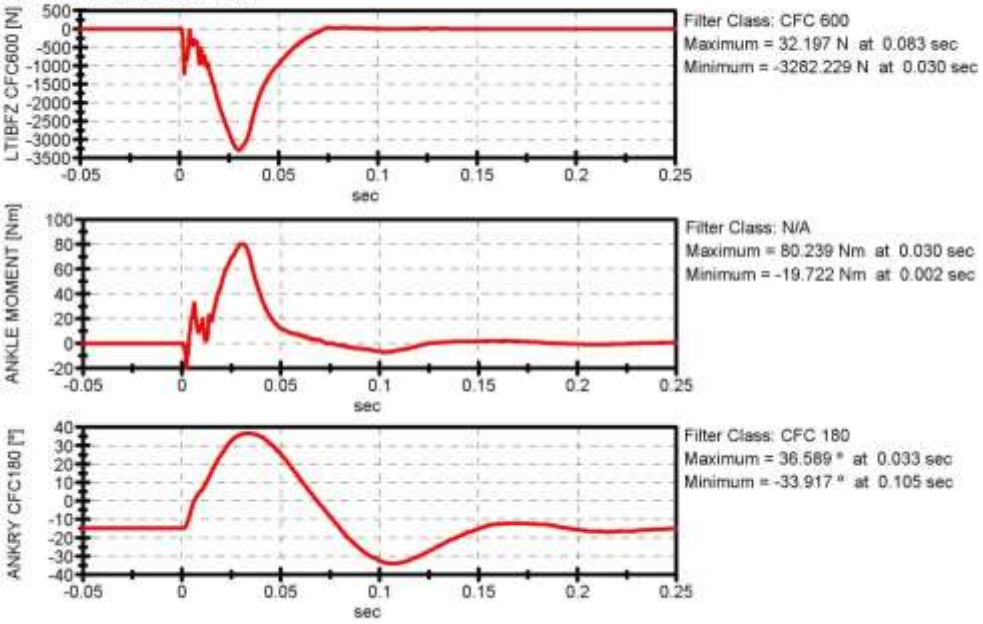
Test Performer: Vehicle Research and Test Center
Test Type: Inversion
Test Name: LX103R_2011_07_12_INVER_01
Test Date: 12.07.2011 13:33:12



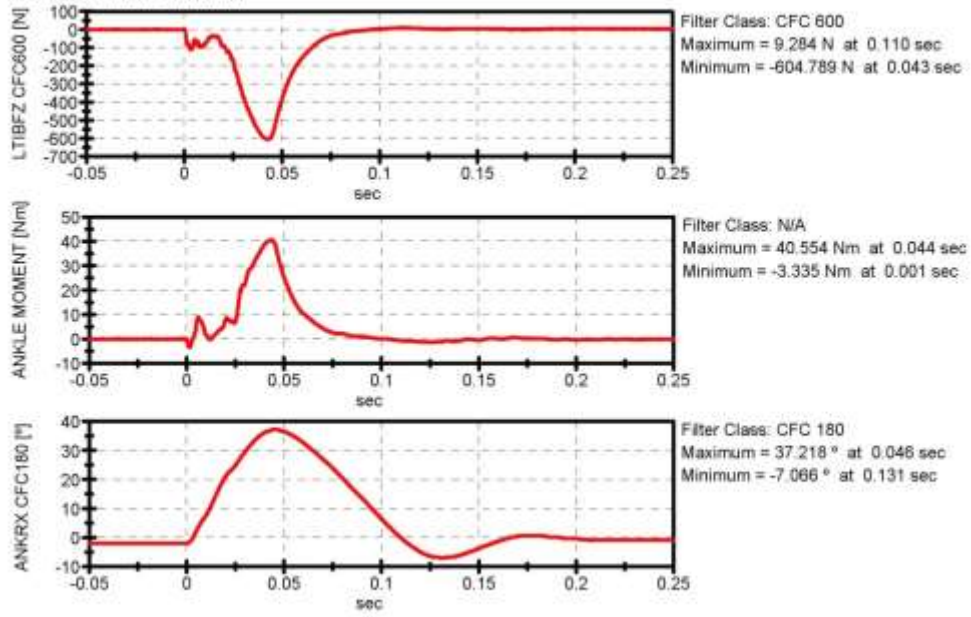
Test Performer: Vehicle Research and Test Center
Test Type: Inversion
Test Name: LX103R_2011_07_12_INVER_01
Test Date: 12.07.2011 13:33:12



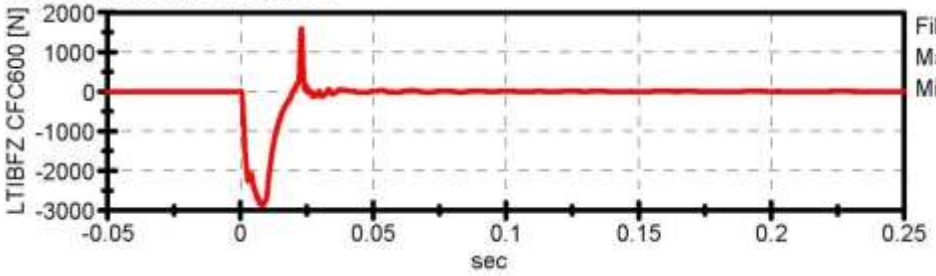
Test Performer: Vehicle Research and Test Center
Test Type: Dorsiflexion/Ball of Foot
Test Name: LX104L_2011_07_11_DORSI_02
Test Date: 12.07.2011 07:30:24



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

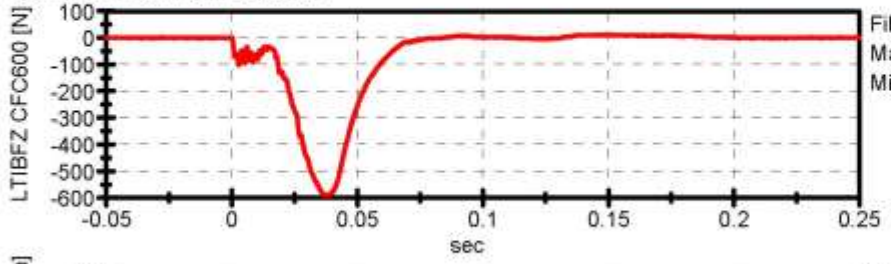


Test Performer: Vehicle Research and Test Center
Test Type: Heel of Foot
Test Name: LX104L_2011_07_12_HEEL_01
Test Date: 12.07.2011 10:26:09

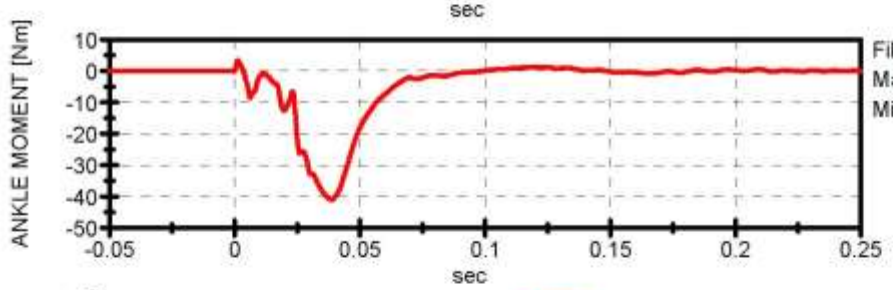


Filter Class: CFC 600
Maximum = 1590.985 N at 0.023 sec
Minimum = -2861.040 N at 0.008 sec

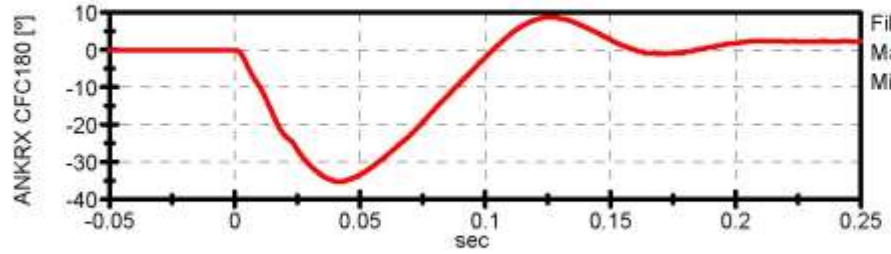
Test Performer: Vehicle Research and Test Center
Test Type: Inversion
Test Name: LX104L_2011_07_12_INVER_01
Test Date: 12.07.2011 08:18:46



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



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



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

APPENDIX D

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

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

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

APPENDIX E

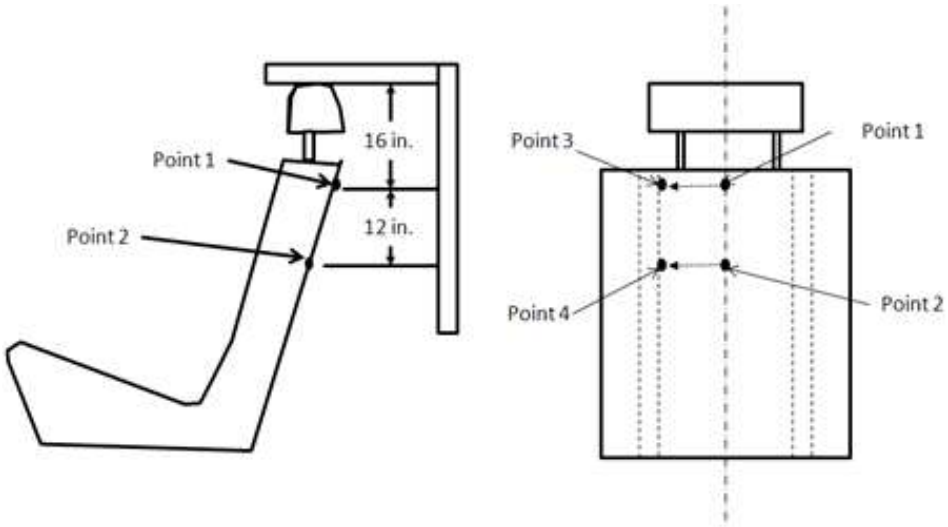
CMM MEASUREMENT PROCEDURES

SECTION E.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 E.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 E.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.

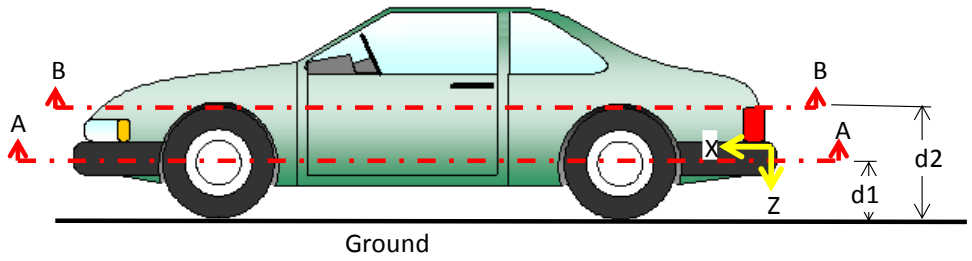


Figure F.3.1 - Pre-Test Cross-Sections

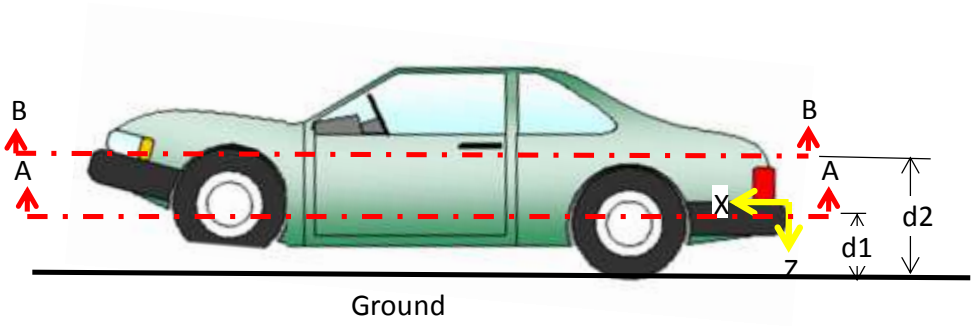


Figure F.3.2 - Post-Test Cross-Sections

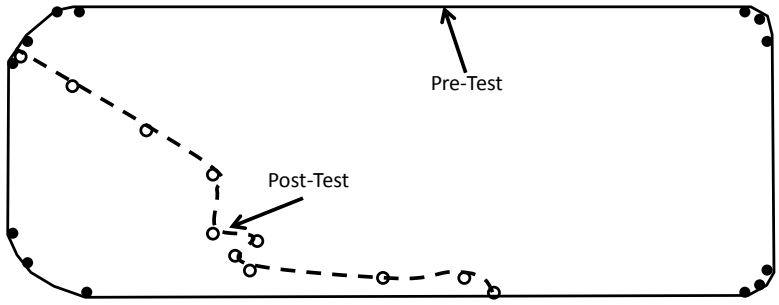


Figure F.3.3 - Plot of Cross-Section