

REPORT NUMBER: R&D – CAL – 11 – 015

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

**2011 TOYOTA YARIS
56 MPH, 15 DEGREE ANGLE, 35% OVERLAP**

**TEST DATE: AUGUST 16th 2011
NHTSA NO: RB5136**

**PREPARED BY;
CALSPAN CORPORATION
4455 GENESEE, BUFFALO NY**



FINAL REPORT SUBMITTED:

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**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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Division Chief, New Car Assessment Program
NHTSA, Office of Crashworthiness Standards

Date: _____

COTR, New Car Assessment Program
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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 2011 Toyota Yaris four door sedan. The struck vehicle was positioned 15 degrees relative to the moving barrier, and impacted 35% 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 August 16, 2011. The impact velocity of the vehicle was 90.2 km/h, and the ambient temperature at the barrier face at the time of impact was 32.2°C. The target vehicle post-test maximum crush was 495 mm at C1 of Vehicle. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD</th> <th colspan="3">Pass. ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>1563.43</td> <td>N/A</td> <td>700</td> <td>1088.13</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-54.94</td> <td>mm</td> <td>52</td> <td>31.72</td> </tr> <tr> <td>Nij</td> <td>N/A</td> <td>1</td> <td>0.39</td> <td>N/A</td> <td>1</td> <td>1.36</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>2149.33</td> <td>N</td> <td>2,620</td> <td>4912.10</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-393.76</td> <td>N</td> <td>2,520</td> <td>-524.37</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-4351.03</td> <td>N</td> <td>6,805</td> <td>3349.33</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-6220.99</td> <td>N</td> <td>6,805</td> <td>2515.97</td> </tr> </tbody> </table>							Measurement Description	Driver ATD			Pass. ATD			Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	1563.43	N/A	700	1088.13	Maximum Chest Compression	mm	63	-54.94	mm	52	31.72	Nij	N/A	1	0.39	N/A	1	1.36	Neck Tension	N	4,170	2149.33	N	2,620	4912.10	Neck Compression	N	4,000	-393.76	N	2,520	-524.37	Left Femur Force	N	10,008	-4351.03	N	6,805	3349.33	Right Femur Force	N	10,008	-6220.99	N	6,805	2515.97
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SECTION 1 PURPOSE

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

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

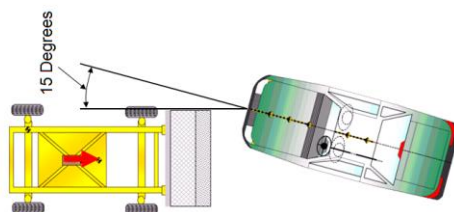
This test was conducted in accordance with the instructions set forth by NHTSA for a 15° angle, 35% offset moving barrier to vehicle impact, outlined in Task Order (TO-1) DTNH22-10-D-00155. Data was obtained indicant of Federal Motor Vehicle Safety Standard (FMVSS) 208-Occupant Crash Protection, FMVSS 212-Windshield Mounting, FMVSS 219 (partial)-Windshield Zone Intrusion, and FMVSS 301-Fuel System Integrity, in addition to the requirements of TO-1 DTNH22-10-D-00155.

SECTION 2

SUMMARY OF TEST

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

A 2011 Toyota Yaris 4-door sedan was impacted on the left front corner by a Research Moving Deformable Barrier (RMDB). This test vehicle was stationary and positioned at a target angle of 15° and at a target offset of 35% to the forward line of motion of the RMDB. The RMDB was towed down the test track in a full forward direction, without any crabbing, and the targeted impact velocity was 90.12 km/h (56 mph) into the test vehicle. The test vehicle mass was 1330.5 kg (2933 lbs), and the RMDB mass was 286.21 kg (5481 lbs). The test was conducted by Calspan Corporation on August 16, 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 exact procedure used is located in Appendix E of this report.

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

SECTION 2 (CONTINUED)

SUMMARY OF TEST

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

One hundred and ninety eight (198) channels of data from the two ATD's, test vehicle and RMDB were collected using Kayser-Threde and Slice data acquisition systems. 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. There appeared to be no intrusion into the protected zone of the windshield during any portion of the impact test. The maximum static crush of the vehicle was 495 mm at C1 to the left of the vehicle's centerline. The maximum crush of the lower bumper beam was 555 mm at C1, to the left of vehicle's centerline. Full vehicle measurements are presented in Section 3 of this report.

All four vehicle doors remained closed and latched during the test. The left front door was jammed shut, but was able to be opened. The left rear, right front, and right rear doors all remained operational after the test.

Structure observations include the following:

- A-Pillar and door sill buckled, causing separation at the top of the door from the vehicle.
- Hood also opened as a result of the impact of the crash.

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

- Head contacted the steering wheel airbag, as well as the A-pillar and Driver's side door.
- Torso contacted the steering wheel airbag, bottom of the steering wheel, and the Driver's side door.
- Knees contacted the knee bolster.

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

- Head contacted the headrest and seat back on the back of the head as well as the Passenger's side door
- Left and right tibia contacted the driver's seatback.

SECTION 2 (CONTINUED)
CRASH VEHICLE SUMMARY

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
RMDB Velocity at Impact	km/h	90.2
RMDB Test Weight	kg	2491
RMDB Maximum Static Crush	mm	259.8
Vehicle Test Weight	kg	1330.5
Actual Vehicle Angle	°	15
Vehicle Maximum Static Crush	mm	495
Vertical Offset from Target Point	mm	12
Lateral Offset from Target Point	mm	20
Number of Data Channels		198
Number of Real-Time Cameras		1
Number of High-Speed Cameras		14

DUMMY CONTACTS

	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	50% Male, Thor 007	N/A	5% HIII Female, 070	N/A
Head Contact	Steering wheel airbag, A-Pillar and head liner	A-37 A-48	Seat back, head rest, and side door	A-49 A-52 A-58
Upper Torso Contact	Steering wheel airbag and Driver's side door	-	No Contact	-
Lower Torso Contact	Steering wheel airbag and steering wheel	A-46 A-47	No Contact	-
Left Knee Contact	Knee bolster	A-45	No Contact – Tibia contacted seat back	A-59
Right Knee Contact	Knee Bolster	A-44	No Contact – Tibia contacted seat back	A-59

Data Anomalies:

V2P1 NECK LOWER MX	->	Questionable after 45 ms
V2P1 ABDOMEN LEFT RZ	->	Noise spikes on data
V2P1 RIGHT ILIAC FX	->	Questionable 131-197 ms.
V2P1 RIGHT ILIAC MY	->	Channel Failed
V2P1 LEFT FEMUR FX	->	Questionable 131-198 ms
V2P1 LEFT FEMUR MY	->	Values after 43ms questionable
V2P1 TIBIA LEFT y	->	Questionable magnitudes
V2P1 TIBIA LEFT LOWER FX	->	Questionable magnitudes
V2P1 FOOT LEFT x	->	Questionable magnitudes
V2P1 TIBIA RIGHT LOWER FX	->	Questionable 49-68ms -saturated
V2P4 LOWER NECK MY	->	Questionable 89-102 ms-saturated

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2011 Toyota Yaris 4-Door Sedan NHTSA No.: RB5136

Test Program: Research and Development Left Oblique Offset Test Date: 8/16/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Head	Head Rotational Acceleration X	rad/s ²	SIMon	455652.11	-396807.89
	Head Rotational Acceleration Y	rad/s ²	SIMon	155745.74	-123504.26
	Head Rotational Acceleration Z	rad/s ²	SIMon	142600.68	-194659.32
	Head Rotational Acceleration Resultant	rad/s ²	Compute	493160.32	
	Head Rotational Velocity X	rad/s	SIMon	22.82	-112.91
	Head Rotational Velocity Y	rad/s	SIMon	24.43	-72.88
	Head Rotational Velocity Z	rad/s	SIMon	25.83	-64.66
	Head Rotational Velocity Resultant	rad/s	Compute	138.26	
	36 ms HIC		Compute	1563.43	
	15 ms HIC		Compute	1563.43	
	Head Resultant CG Acceleration, 3 ms Clip	g	Compute	114.12	
	Skull fracture correlate	-	SIMon	194.85	
	Cumulative strain (Tolerance = 0.05)	-	SIMon	1.00	0.00
	Cumulative strain (Tolerance = 0.10)	-	SIMon	0.99	0.00
	Cumulative strain (Tolerance = 0.15)	-	SIMon	0.84	0.00
Neck	UNLC Transferred to OC, Neck System, FX	N	1000	222.24	-680.37
	UNLC Neck System Tension, FZ	N	1000	2149.33	
	UNLC Neck System Compression, FZ	N	1000		-393.76
	UNLC Transferred to OC, Neck System Flexion, MY	N-m	Thortest	2.27	
	UNLC Transferred to OC, Neck System Extension, MY	N-m	Thortest		-21.65
	NIJ		Compute	0.39	
	On head acting through total neck section, FX	N	Thortest	291.84	-919.97
	On head acting through total neck section, FY	N	Thortest	927.76	-171.20
	On head acting through total neck section, FZ	N	Thortest	2318.69	-409.84
	On head acting through total neck section, MX	N-m	Thortest	50.50	-30.44
	On head acting through total neck section, MY	N-m	Thortest	44.24	-19.50
	On head acting through total neck section, MZ	N-m	Thortest	10.83	-28.60
	On head acting through O.C. joint only, FX	N	Thortest	269.90	-1133.11
	On head acting through O.C. joint only, FZ	N	Thortest	1979.83	-406.33
	On head acting through O.C. joint only, MY	N-m	Thortest	2.27	-21.65
Chest	Upper Left Crux X – deflection	mm	Thortest	0.35	-14.85
	Upper Left Crux Y – deflection	mm	Thortest	5.88	-7.77
	Upper Left Crux Z – deflection	mm	Thortest	13.92	-20.20
	Upper Left Crux D – deflection	mm	Thortest	0.64	-17.30
	Upper Right Crux X – deflection	mm	Thortest	0.02	-49.92
	Upper Right Crux Y – deflection	mm	Thortest	3.96	-7.29
	Upper Right Crux Z – deflection	mm	Thortest	29.96	-16.75
	Upper Right Crux D – deflection	mm	Thortest	0.04	-42.39

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: 2011 Toyota Yaris 4-Door Sedan NHTSA No.: RB5136
Test Program: Research and Development Left Oblique Offset Test Date: 8/16/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Chest (Con't)	Lower Left Crux X – deflection	mm	Thortest	7.92	-6.96
	Lower Left Crux Y – deflection	mm	Thortest	4.03	-20.56
	Lower Left Crux Z – deflection	mm	Thortest	13.26	-2.12
	Lower Left Crux D – deflection	mm	Thortest	7.01	-7.77
	Lower Right Crux X – deflection	mm	Thortest	1.32	-55.38
	Lower Right Crux Y – deflection	mm	Thortest	5.39	-17.75
	Lower Right Crux Z – deflection	mm	Thortest	12.78	-4.44
	Lower Right Crux D – deflection	mm	Thortest	1.50	-54.94
	Chest CG Acceleration, 3 ms clip	g	Compute	54.33	
Abdomen	Upper Displacement	mm	Thortest	N/A	N/A
	Lower Left X – deflection	mm	Thortest	0.21	-48.79
	Lower Left Y – deflection	mm	Thortest	10.29	-5.00
	Lower Left Z – deflection	mm	Thortest	17.01 ⁽¹⁾	-0.10 ⁽¹⁾
	Left Viscous Criterion Based on X - deflection		Compute	0.57 ⁽¹⁾	
	Lower Right X – deflection	mm	Thortest	0.03	-62.73
	Lower Right Y – deflection	mm	Thortest	8.56	-4.08
	Lower Right Z – deflection	mm	Thortest	16.49	-0.01
	Right Viscous Criterion Based on X - deflection		Compute	1.51	
Spine	Upper Spine (T1) AX	g	180	15.70	-83.56
	Upper Spine (T1) AY	g	180	34.62	-16.35
	Upper Spine (T1) AZ	g	180	38.62	-14.09
	Upper Spine (T1) Resultant	g	Compute	86.41	
	Middle Spine (T6) AX	g	180	16.69	-53.74
	Middle Spine (T6) AY	g	180	39.89	-11.46
	Middle Spine (T6) AZ	g	180	15.02	-12.80
	Middle Spine (T6) Resultant	g	Compute	56.77	
Pelvis	Pelvis CG Resultant Acceleration	g	Compute	62.50	
Acetabulum	Left FX force	N	600	1567.49	-2267.43
	Left FY force	N	600	1223.83	-1087.78
	Left FZ force	N	600	1290.18	-784.72
	Left Acetabulum Resultant	N	Compute	2626.87	
	Right FX force	N	600	1220.24	-1294.93
	Right FY force	N	600	414.60	-2716.99
	Right FZ force	N	600	706.79	-871.68
	Right Acetabulum Resultant	N	Compute	2865.70	

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY: Driver Legs

Test Vehicle: 2011 Toyota Yaris 4-Door Sedan NHTSA No.: RB5136

Test Program: Research and Development Left Oblique Offset Test Date: 8/16/2011

Driver: Thor Serial No. 007 Injury Summary

	Nomenclature	Units	Source	Max	Min
Knee	Left Knee Displacement, DX	mm	180	1.53	-7.12
	Right Knee Displacement, DX	mm	180	1.65	-7.93
Femur	Left Femur Force, FZ	N	600	645.28	-4351.03
	Left Femur Moment, MX	N-m	600	48.25	-178.74
	Left Femur Moment, MY	N-m	600	106.39 ⁽²⁾	-591.23 ⁽²⁾
	Left Femur Res (MX / MY only, not MZ)	N-m	Compute	592.60 ⁽²⁾	
	Right Femur Force, FZ	N	600	1678.11	-6220.99
	Right Femur Moment, MX	N-m	600	38.44 ⁽³⁾	-227.88 ⁽³⁾
	Right Femur Moment, MY	N-m	600	114.91	-90.51
	Right Femur Res (MX / MY only, not MZ)	N-m	Compute	227.95 ⁽³⁾	
	Left Upper Tibia, FZ	N	600	8868.80 ⁽⁴⁾	-13834.72 ⁽⁴⁾
	Left Upper Tibia, MY	N-m	600	34.64	-182.49
Tibia	Left Upper Tibia, Index		Compute	1.69	
	Right Upper Tibia, FZ	N	600	130.08	-3027.09
	Right Upper Tibia, MY	N-m	600	190.84	-82.21
	Right Upper Tibia, Index		Compute	0.83	
	Left Lower Tibia, FZ	N	600	1.88	-1496.10
	Left Lower Tibia, MY	N-m	600	27.71	-147.63
	Left Lower Tibia, Index		Compute	0.69	
	Right Lower Tibia, FZ	N	600	31.28	-3773.64
	Right Lower Tibia, MY	N-m	600	88.10	-165.30
	Right Lower Tibia, Index		Compute	1.11	
Ankle	Left Ankle Rotation, RX	Deg	180	27.09	-4.79
	Left Ankle Rotation, RY	Deg	180	31.51	-0.06
	Right Ankle Rotation, RX	Deg	180	14.36	-27.43
	Right Ankle Rotation, RY	Deg	180	31.11	-1.90
Anomalies (1) Abdominal Rz has noise spikes throughout (2) Questionable data after 43 ms (3) Questionable data after 90 ms (4) Questionable data after 35 ms					

SECTION 2 (CONTINUED)
PRELIMINARY INJURY SUMMARY

Test Vehicle: 2011 Toyota Yaris 4-Door Sedan NHTSA No.: RB5136
Test Program: Research and Development Left Oblique Offset Test Date: 8/16/2011

Left Rear Passenger: H3 Serial No. 070 Injury Summary

	Nomenclature	Source	Max	Min
Head	Angular acceleration (rad/sec^2) - X	SIMon	2082.50	-1115.00
	Angular acceleration (rad/sec^2) - Y	SIMon	932.02	-465.62
	Angular acceleration (rad/sec^2) - Z	SIMon	269.17	-1603.60
	Angular acceleration - resultant (rad/sec^2)	SIMon	2217.49	
	Angular velocity (rad/sec) - X	SIMon	25.08	-20.70
	Angular velocity (rad/sec) - Y	SIMon	39.13	0.00
	Angular velocity (rad/sec) - Z	SIMon	0.00	-96.20
	Angular velocity - resultant (rad/sec)	SIMon	103.56	
	36 ms HIC	Compute	1766.72	
	15 ms HIC	Compute	1088.13	
	Skull fracture correlate	SIMon	87.95	
	Cumulative strain (Tolerance = 0.05)	SIMon	1.00	
	Cumulative strain (Tolerance = 0.10)	SIMon	0.94	
	Cumulative strain (Tolerance = 0.15)	SIMon	0.76	
	Head resultant CG acceleration, 3 ms clip (g's)	Compute	102.01	
Neck	Upper Neck Tension (N) Fz	1000	4912.10	
	Upper Neck Compression (N) Fz	1000		-524.37
	Upper Neck NTF	Compute	1.26	
	Upper Neck NTE	Compute	1.36	
	Upper Neck NCF	Compute	0.01	
	Upper Neck NCE	Compute	0.53	
Chest	Chest Deflection (mm)	600	0.00	-31.72
	Upper Left Chest X (mm)	Compute	0.01	-26.40
	Upper Left Chest Y (mm)	Compute	22.38	-4.25
	Upper Right Chest X (mm)	Compute	0.89	-6.90
	Upper Right Chest Y (mm)	Compute	0.02	-26.88
	Lower Left Chest X (mm)	Compute	0.01	-13.05
	Lower Left Chest Y (mm)	Compute	19.84	-1.38
	Lower Right Chest X (mm)	Compute	0.03	-37.72
	Lower Right Chest Y (mm)	Compute	22.33	-0.13
	Chest CG acceleration, 3 ms clip, (G's)	Compute	70.98	
Femur	Right Fz Force (N)	600	2515.97	-208.62
	Left Fz Force (N)	600	3349.33	-315.04
Anomalies None				

**SECTION 3
DATA SHEETS**

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

Data Sheet No.		Page No.
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3	Dummy Longitudinal Clearance Dimensions	3-9
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DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

TEST VEHICLE INFORMATION

NHTSA No.	RB5136
Make	Toyota
Model	Yaris
Body Style	4-Door Sedan
Year	2011
VIN	JTDBT4K36B1401340
Color	Black
Delivery Date	8/6/2011
Odometer Reading (mi)	44 mi
Odometer Reading (km)	70.8
Dealer	Basil Toyota
Transmission	4-Speed Automatic
Final Drive	Front Wheel Drive
Type/No. Cyl	I4
Engine Disp. (L)	1.5
Engine Placement	Lateral
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	No
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	No

TEST VEHICLE OPTIONS

Anti-Lock Brakes	Yes
All-Wheel Drive	No
Power Steering	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	Yes
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Pretensioners	Yes
Load Limiters	Yes
Bucket Seats	Yes
Air Cond.	Yes
AM/FM CD	Yes
Tilt Steering	Yes
Automatic Door Locks	Yes
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	Toyota
Date of Manufacture	7/2010

GVWR (kg)	1500
GAWR Front (kg)	835
GAWR Rear (kg)	826

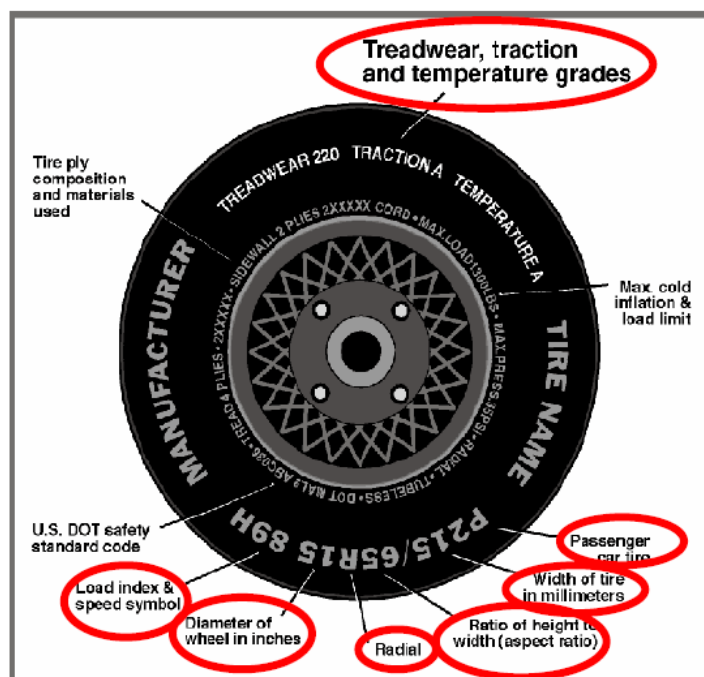
VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				383
Cargo Wt. (RCLW) (kg)				43

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P185/60R15	P185/60R15
Tire Size on Vehicle	P185/60R15	P185/60R15
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Potenza RE92	Potenza RE92
Treadwear	160	160
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	2 Polyester, 1 Steel, 1 Nylon	2 Polyester, 1 Steel, 1 Nylon
Load Index/Speed Symbol	84T	84T
Tire Material	Rubber	Rubber
DOT Safety Code Right	ELCACKM3510	ELCACKM3510
DOT Safety Code Left	ELCACKM3510	ELCACKM3510

DATA SHEET NO. 1 (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	332.5	224		389	321	
Right	kg	334	198.5		332	288.5	
Ratio	%	61.2	38.8		54.2	45.8	
Totals	kg	666.5	422.5	1089	721	609.5	1330.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1089
Weight of 1 P572E ATD & 1 P572O ATD	kg	153.54
Rated Cargo/Luggage Weight (RCLW)	kg	43
Calculated Vehicle Target Weight (TVTW)	kg	1281.04

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	673	684	685	694	989
As Tested	mm	389	332	321	288.5	1168
Post Test	mm	-	-	-	-	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2547
Total Vehicle Length at Left Side	mm	4161
Total Vehicle Length at Centerline	mm	4295
Total Vehicle Length at Right Side	mm	4161
Weight of Ballast in Cargo Area	kg	-
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	38.6

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: NONE

MASS OF BALLAST ADDED (kg) 0

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

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4295
2	Total Width	1697
3	Bumper Top Height	-18
4	Bumper Bottom Height	158
5	Longitudinal Member Top Height	14
6	Distance Between Longitudinal Members	975
7	Longitudinal Member Width	60
8	Engine Top Height	-287
9	Engine Bottom Height	328
10	Engine and Gearbox Width	482
11	Front Bumper-Engine Distance	429
12	Front Shock Absorber Fixing Height	-350
13	Bonnet Leading Edge Height	-298
14	Front Shock Absorber Fixing Width	1123
15	Front Bumper – Front Axle Distance	812
16	Front Axle – A Pillar Distance	391
17	A- Pillar – B-Pillar Distance	1096
18	B-Pillar – Rear Axle Distance	1064
19	B-Pillar – C-Pillar Distance	1008
20	Roof Sill Bottom Height	-793
21	Roof Sill Top Height	-886
22	Floor Sill Bottom Height	322
23	Floor Sill Top Height	164

DATA SHEET NO. 2

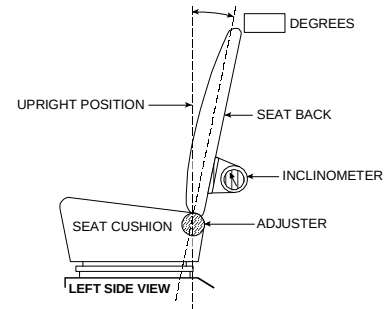
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

NOMINAL DESIGN RIDING POSITION

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

	Deg.
Driver seat back angle:	3
Passenger seat back angle:	FIXED



FRONT SEAT ASSEMBLY

SEAT FORE/AFT POSITIONS

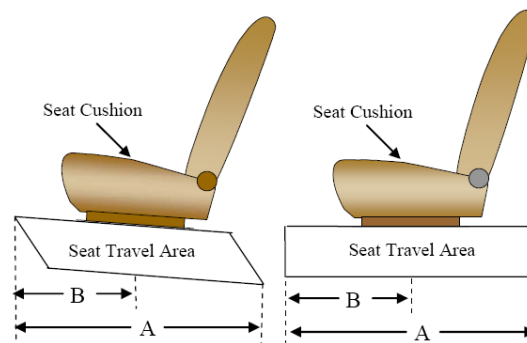
Seat was set to full forward, full up and marked. Then moved to the full rear, full down position, and marked. Mid point was measured, and seat was set to full down, mid position, as per form 1.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	280	8 – Mid position
Passenger Seat	FIXED	FIXED

SEAT BELT UPPER ANCHORAGE

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

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



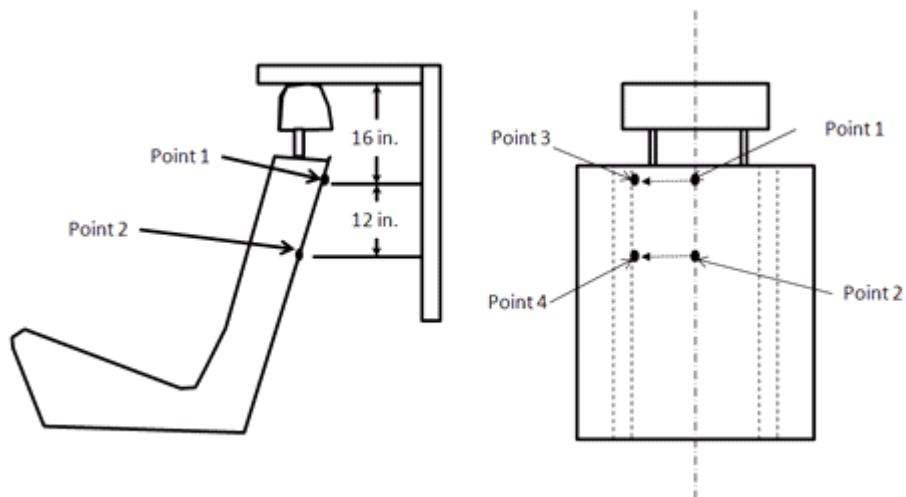
DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

SEAT BACK MEASUREMENT POINTS



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

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

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

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

	X	Y	Z
Point 3	1951.034	-496.861	-359.729
Point 4	2094.044	-500.162	-55.985

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

DATA SHEET NO. 2 (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

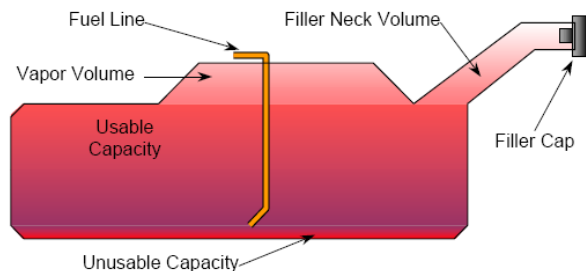
Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	42.01
Usable Capacity of "Optional Tank"	
92%-94% of Usable Capacity	38.6
Actual Amount of Solvent Used	38.6
1/3 of Usable Capacity	12.87

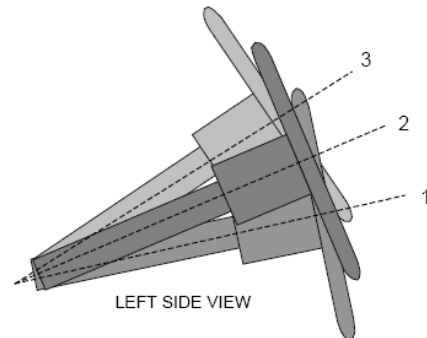
FUEL PUMP

Electric fuel pump under rear seat. 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

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



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONS

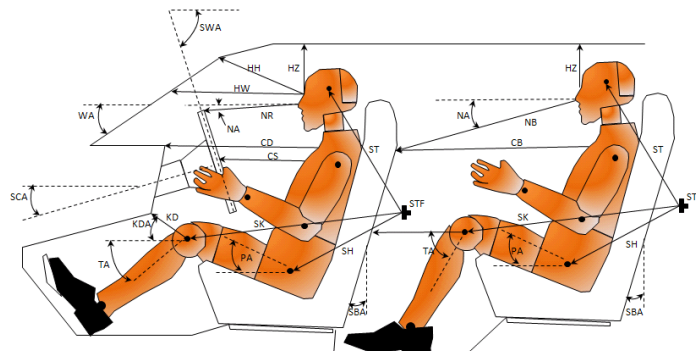
	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	65.2	
Geometric center position No. 2	63.8	
Uppermost position No. 3	62.4	
Telescoping Steering Wheel Travel		
Test Position	63.8	

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



Code	Measurement Description	Driver		Left Rear Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		25.3		
SWA°	Steering Wheel Angle		25.6		
SCA°	Steering Column Angle		23.7		
SA°	Seat Back Angle (on headrest post)		3.4		17.7
HZ	Head to Roof (Z)	141	90	251	90
HH	Head to Header	335	11.2		
HW	Head to Windshield	591	0		
NR/NB	Nose to Rim/Seat Back	485	25.1	527	12.7
CD/CB	Chest to Dash/Seat Back	651		550	
CS	Chest to Steering Hub	371	20.1		
RA	Rim to Abdomen	166	0		
KDL/KBL	Left Knee to Dash/Seat Back	115	15.2	294	12.5
KDR/KBR	Right Knee to Dash/Seat Back	75	21.2	294	12
PA°	Pelvic Angle		24.3		21.7
TA°	Tibia Angle		54.7		73.1
SK	Striker to Knee	612	1	642	18.8
ST	Striker to Head	537	80.5	338	59.9
SH	Striker to H-Point	277	24.1	276	54
HAX°	Head Angle X		.7		
HAY°	Head Angle Y		4.3		
NAX°	Neck Angle X		1.9		
NAY°	Neck Angle Y		0.8		
TAX°	T6 Angle X		14.6		
TAY°	T6 Angle Y		0.6		
LAX°	Lumbar Angle (X)		0.3		
LAY°	Lumbar Angle (Y)		21.7		

DATA SHEET NO. 3 (CONTINUED)

DUMMY CMM MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

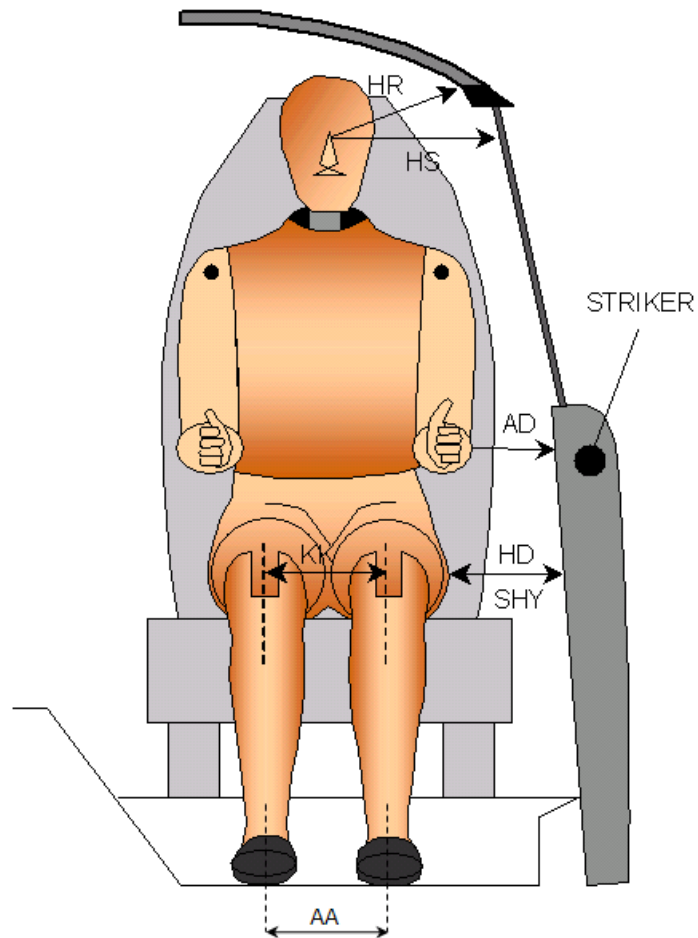
Description	Units	Driver			Left Rear Passenger		
		X	Y	Z	X	Y	Z
Striker (Driver/Passenger)	mm	2052.695	-742.17	-209.493	1100.519	-747.165	-318.166
Head CG	mm	2164.878	-412.787	-728.488	1259.813	-420.568	-644.525
Bridge of Nose	mm	2264.582	-334.281	-732.199	1345.386	-342.154	-641.514
Tip of Nose	mm	2261.451	-333.939	-680.328	1367.276	-341.304	-612.033
Shoulder Bolt	mm	2203.598	-517.138	-475.45	1248.651	-495.433	-405.267
Tip of Chin	mm	2256.11	-333.158	-603.956	1349.782	-342.928	-540.443
H-point	mm	2311.02	-530.484	-32.7692	1324.564	-453.838	-104.211
Left Knee	mm	2694.393	-559.711	-185.598	1742.393	-436.102	-127.422
Right Knee	mm	2721.041	-213.047	-201.019	1740.766	-270.377	-124.775
Left Ankle	mm	2963.745	-548.03	134.6526	1844.343	-444.068	195.1143
Right Ankle	mm	2982.201	-223.319	133.0255	1853.689	-259.428	184.8403
Left Heel	mm	2973.302	-535.87	276.0135	1776.432	-414.283	284.3748
Right Heel	mm	2967.38	-198.392	270.3424	1786.223	-243.565	281.757
Driver's Outboard Seat Anchor Bolt	mm	2546.07	-594.104	195.7038			
Outboard Head Restraint Post	mm	1930.455	-416.979	-519.976	1013.655	-419.018	-603.798
Top of Head Restraint*	mm	1969.713	-334.284	-765.183	1033.044	-340.824	-750.445
Center of Steering Wheel	mm	2622.861	-328.776	-367.286			

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

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

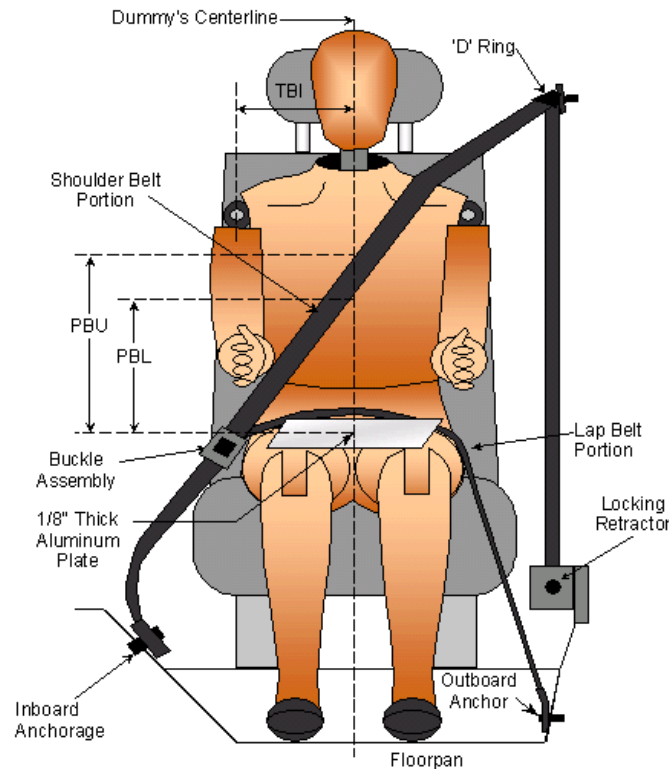


Code	Description	Units	Driver (P1)	Passenger (P4)
AD	Arm to Door	mm	95	90
HD	H-Point to Door	mm	108	179
HR	Head to Side Header	mm	200	219
HS	Head to Side Window	mm	335	328
KK	Knee to Knee	mm	350	165
SHY	Striker to H-Point (Y Direction)	mm	225	310
AA	Ankle to Ankle	mm	340	168

DATA SHEET NO. 5

SEAT BELT POSITIONING DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of aluminum plate to belt upper edge	mm	365	291
PBL — Top surface of aluminum plate to belt lower edge	mm	277	202

BELT LENGTH DATA

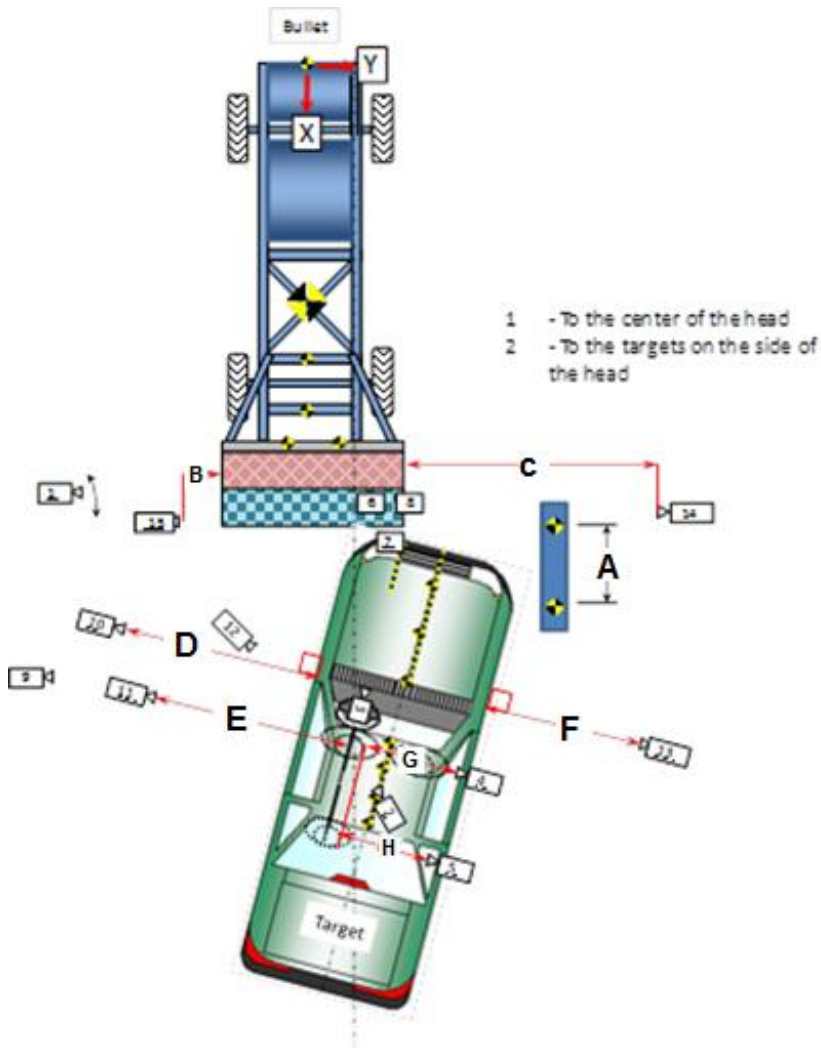
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	860	795
Lap Belt Length as measured on ATD	mm	900	525
Remainder of belt on reel	mm	740	1130
Total belt length for continuous webbing systems	mm	2500	2450

DATA SHEET NO. 6

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

Horizontal Location



A	mm	915
B	mm	7950
C	mm	8009
D	mm	9708
E	mm	9934
F	mm	
G	mm	787
H	mm	756

DATA SHEET NO. 6 (CONTINUED)

HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side View					
2	Onboard Driver Over Shoulder	2911	895	1225	12.5	500
3	Onboard Driver Lower Leg	1345	633	208	6.5	500
4	Onboard Driver Perpendicular	1739	1464	826	12.5	500
5	Onboard Left Rear Passenger Perpendicular	2595	1189	875	12.5	500
6	Overall Top View	1782	872	5156	14	500
7	Zoomed Top View	0	1251	3793	28	1000
8	Pit Front					
9	Overall Left Side	-1380	9031	2045	24	1000
10	Target Vehicle Left Side	787	9438	1356	24	1000
11	Driver's Motion	-46	9456	1494	50	1000
12	Look Down Driver's Motion	3039	2137	3156	24	1000
13	Target Vehicle Right Side					
14	Bullet Vehicle Left Side					
15	Bullet Vehicle Right Side	4692	9191	2146	24	1000
16	Onboard RMDB				13	1000

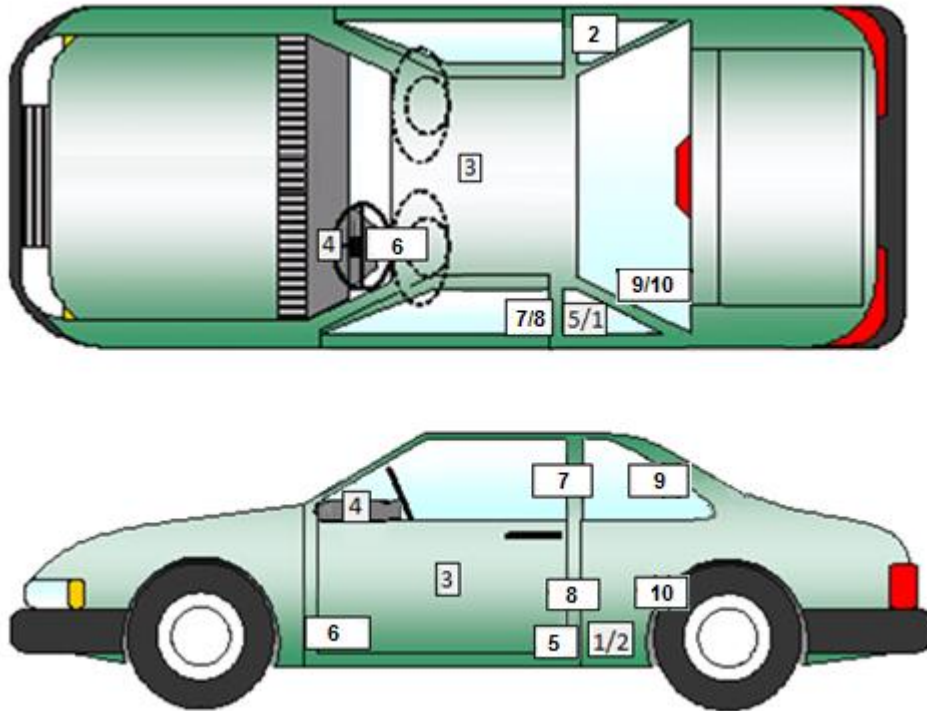
Reference point: center most rearward point of the RMDB when in contact with the Target Vehicle):

- +X = from back of RMDB to front of RMDB
- +Y = right of monorail center
- +Z = up from ground

DATA SHEET NO. 7

VEHICLE INSTRUMENTATION LOCATIONS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



Accelerometer Location	Axes	Units	Location		
			X	Y	Z
Left Rear Sill	X,Y	mm	1762	-611	299
Right Rear Sill	X,Y	mm	1773	620	291
Vehicle CG	X, Y, Z	mm	2747	94	196
Driver Seat Track	X	mm	2739	18	-86
Instrument Panel	X, Y, Z	mm	2166	-159	219
Behind Brake Pedal	X, Y, Z	mm	3302	-386	85

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

DATA SHEET NO. 7 (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

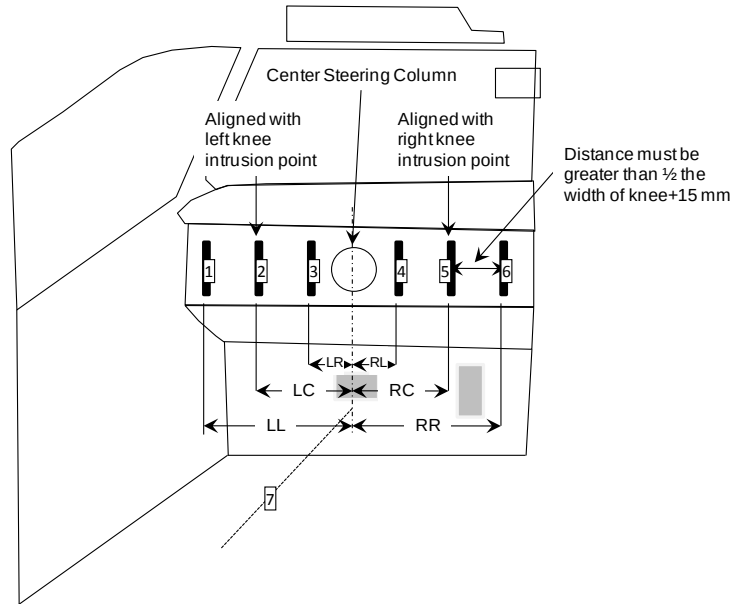
VEHICLE INSTRUMENTATION DATA

Loc.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Max	Time (ms)
1	Left Rear Cross Member	X	G	2.39	86.60	-53.85	35.15
		Y	G	46.45	39.05	-19.25	34.70
2	Right Rear Cross Member	X	G	1.02	85.70	-55.70	38.95
		Y	G	36.11	46.45	-6.48	94.55
3	Vehicle CG	X	G	3.24	83.85	-44.22	47.35
		Y	G	50.02	40.35	-5.13	100.65
		Z	G	26.63	34.40	-38.29	53.40
4	Instrument Panel	X	G	21.11	63.60	-119.40	44.25
5	Driver Seat Track	X	G	3.17	83.95	-36.34	29.20
		Y	G	37.46	27.10	-5.47	14.50
		Z	G	41.62	33.35	-19.92	18.80
6	Behind Brake Pedal	X	G	110.22	33.80	-181.75	29.25
		Y	G	43.02	33.35	-75.21	29.30
		Z	G	34.00	38.55	-66.41	27.45
7	Driver Shoulder Belt		N	4477.93	53.30	-63.45	151.50
8	Driver Lap Belt		N	7241.63	62.10	-2.30	0.30
9	Passenger Shoulder Belt		N	8347.17	61.20	-3.81	8.90
10	Passenger Lap Belt		N	8144.12	68.10	-44.82	228.30

DATA SHEET NO. 7 (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



Location	Distance (mm)	Location	Distance (mm)
LL	225	RL	75
LC	150	RC	150
LR	75	RR	225

VEHICLE INSTRUMENTATION DATA

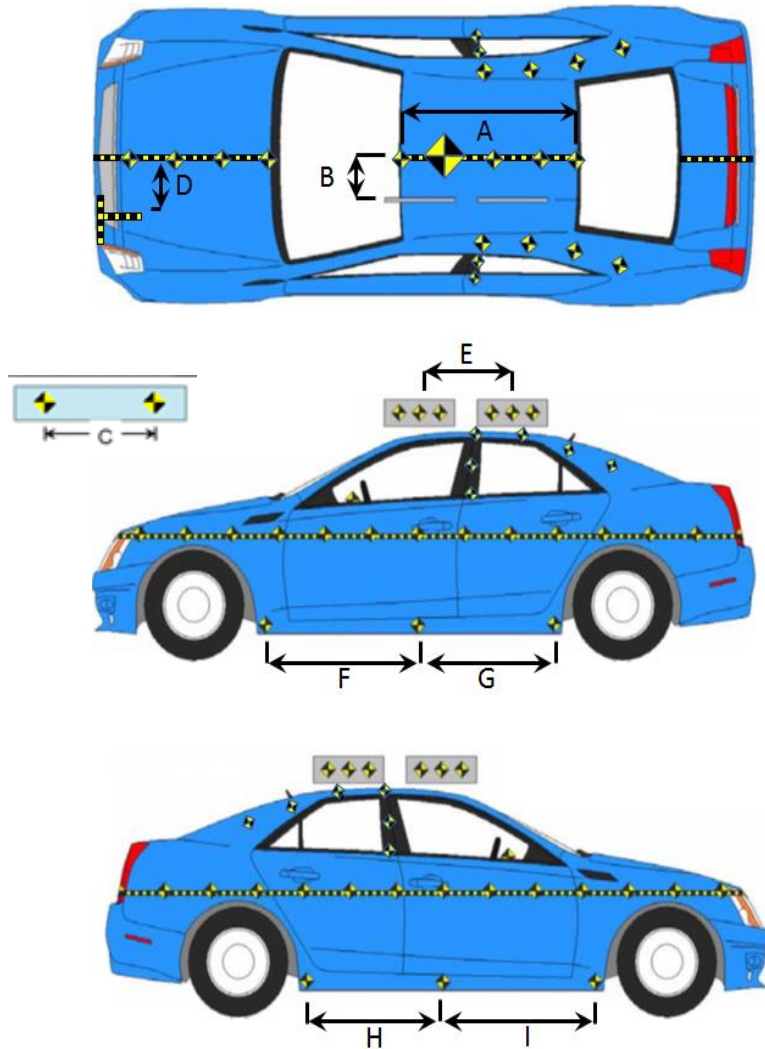
Loc.	Description		Positive Direction		Negative Direction	
			Max	Time (ms)	Max	Time (ms)
1	Left knee contact switch (LL) (ms)	*	0	-50	-1	28.95
2	Left knee contact switch (LC) (ms)	*	0	-50	-1	34.30
3	Left knee contact switch (LR) (ms)	*	0	-50	-1	52.70
4	Right knee contact switch (RL) (ms)	*	0	-50	-1	35.10
5	Right knee contact switch (RC) (ms)	*	0	-50	-1	35.55
6	Right knee contact switch (RR) (ms)	*	0	-50	-1	29.90
7	Toepan string pot (mm)		0.09	0.35	-198.61	52.65

* The measurement indicates the initial time the voltage changed

DATA SHEET NO. 8

VEHICLE PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

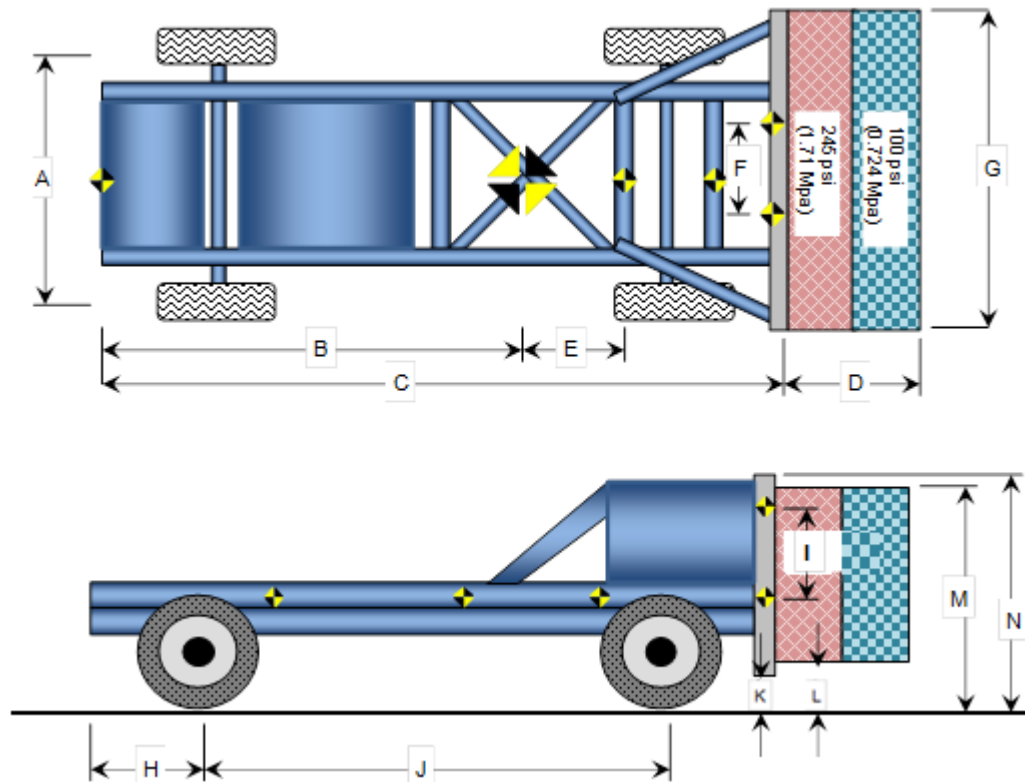


Item	Units	Value
A	mm	610
B	mm	348
C	mm	915
D	mm	255
E	mm	1217
F	mm	880
G	mm	882
H	mm	870
I	mm	1211

DATA SHEET NO. 8 (CONTINUED)

RMDB PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



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

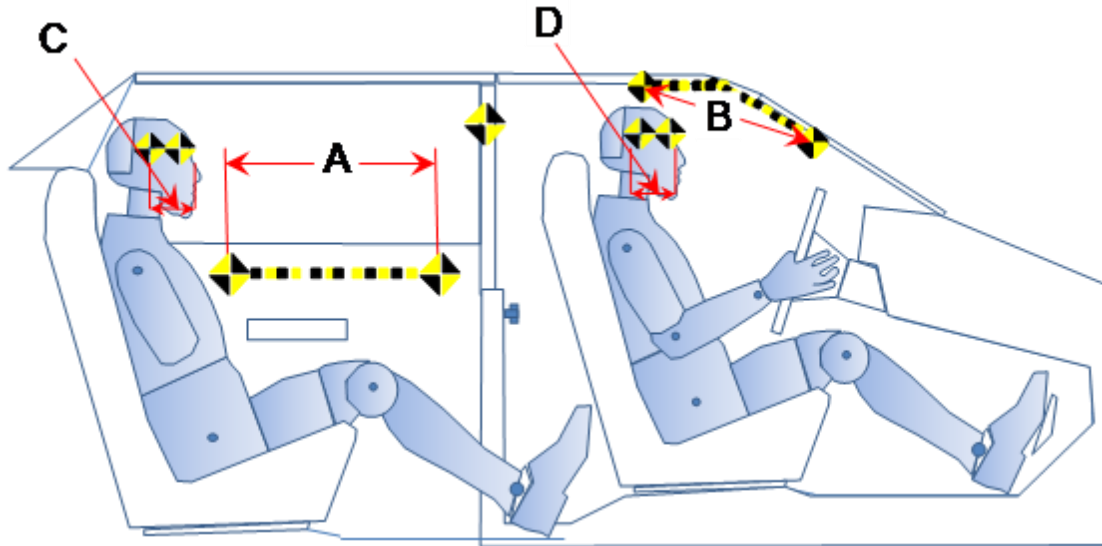
	Units	Front Axle	Rear Axle	Total
Left	kg	779.3	470.4	1249.7
Right	kg	749.3	487.2	1236.5
Ratio	%	61.5%	38.5%	100%
Total	kg	1528.6	957.6	2486.2
CG After of Front Axle	mm			1286

DATA SHEET NO. 8 (CONTINUED)

DUMMY PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



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

DATA SHEET NO. 9

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 10

POST TEST OBSERVATIONS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	THOR 50 th Male	N/A	HIII 5 th 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	N/A
Head Contact	Steering wheel airbag, A-Pillar and head liner	A-37 A-48	Seat back, head rest, and side door	A-49 A-52 A-58
Upper Torso Contact	Steering wheel airbag and Driver's side door	-	No Contact	-
Lower Torso Contact	Steering wheel airbag and steering wheel	A-46 A-47	No Contact	-
Left Knee Contact	Knee bolster	A-45	No Contact – Tibia contacted seat back	A-59
Right Knee Contact	Knee Bolster	A-44	No Contact – Tibia contacted seat back	A-59

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Opened	Opened
Rear Door Opening	Opened	Opened
Seat Track Shift (mm)	8mm Forwards	No Shift
Seat Back Failure	No Failure	No Failure
Glazing Damage	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions	Picture Ref
Pillar Performance	Slight A-Pillar deformation along drivers side	
Windshield Damage	Separation along left A-Pillar	A-21
Window Damage	None	A-36 / A-51
Other Notable Effects	None	-

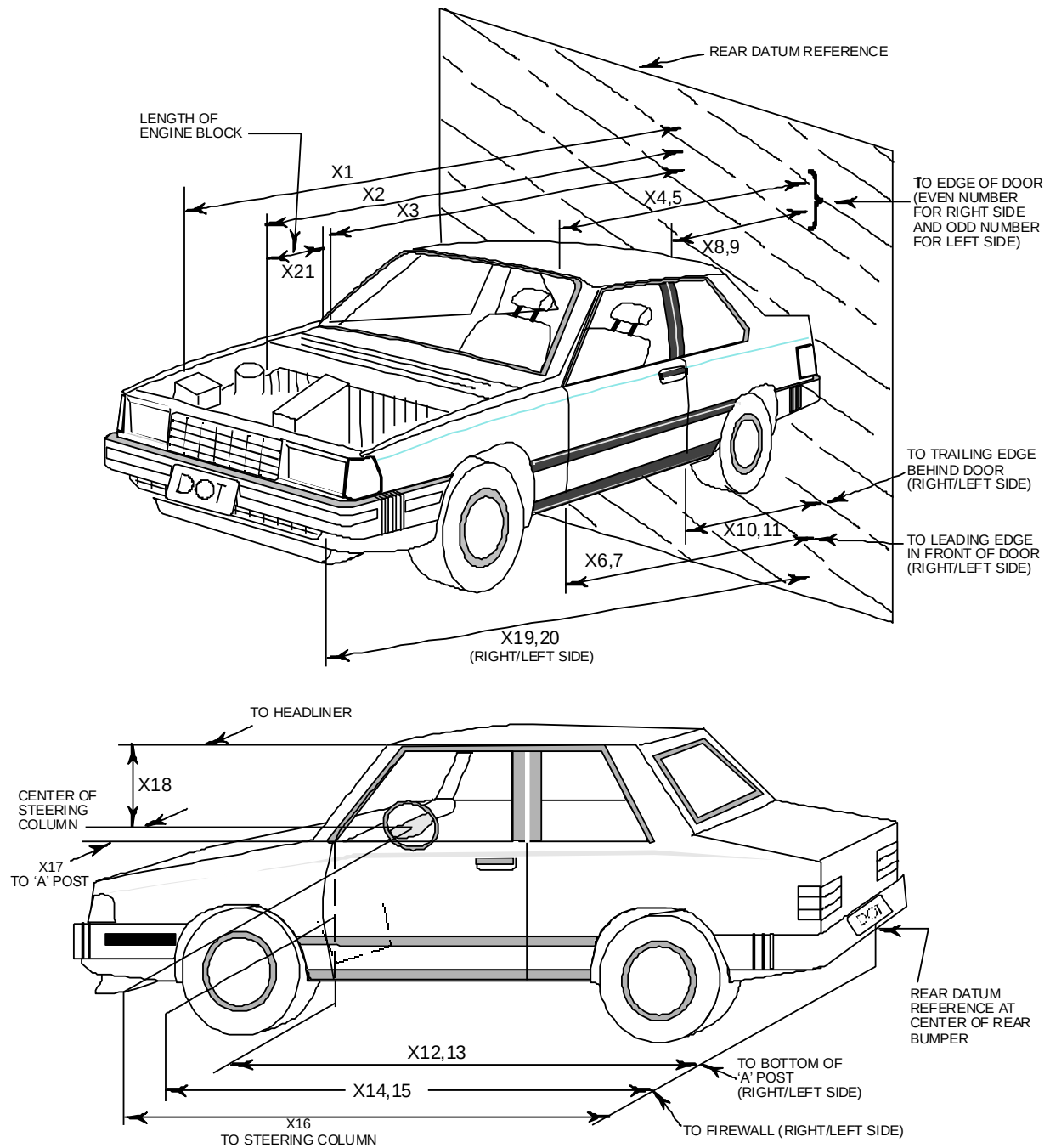
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 11

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



DATA SHEET NO. 11 (CONTINUED)**VEHICLE PROFILE MEASUREMENTS**Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4295	3948*	347*
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3866	3669	197
3	RSOV to Firewall	3442	3249	193
4	RSOV to Upper Leading Edge of Right Door	3092	3090	2
5	RSOV to Upper Leading Edge of Left Door	3094	3062	32
6	RSOV to Lower Leading Edge of Right Door	3038	3040	-2
7	RSOV to Lower Leading Edge of Left Door	3044	3003	41
8	RSOV to Upper Trailing Edge of Right Door	2002	2001	1
9	RSOV to Upper Trailing Edge of Left Door	2004	1970	34
10	RSOV to Lower Trailing Edge of Right Door	1990	1990	0
11	RSOV to Lower Trailing Edge of Left Door	1992	1977	15
12	RSOV to Bottom of "A" Post of Right Side	3160	3155	5
13	RSOV to Bottom of "A" Post of Left Side	3162	3123	40
14	RSOV to Firewall, Right Side	3495	3490	6
15	RSOV to Firewall, Left Side	3496	3205	290
16	RSOV to Steering Column	2623	2571	52
17	Center of Steering Column to "A" Post	281	261	19
18	Center of Steering Column to Headliner	445	384	61
19	RSOV to Right Side of Front Bumper	4202	4142*	59*
20	RSOV to Left Side of Front Bumper	4202	3716*	486*
21	Length of Engine Block	354	313	40
RD	RSOV to Right Side of Dash Panel	2837	2836	1
CD	RSOV to Center of Dash Panel	2895	2774	122
LD	RSOV to Left Side of Dash Panel	2808	2713	95

All Dimensions in mm

* Indicates that the measured value is approximate

DATA SHEET NO. 12

ACCIDENT INVESTIGATION DIVISION DATA

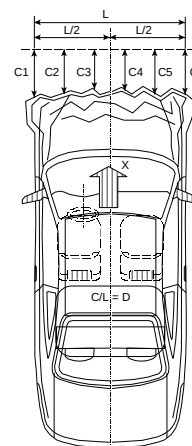
Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

VEHICLE INFORMATION

VIN: JTDBT4K36B1401340 Wheelbase: 2547
 Vehicle Size Category: Passenger Test Weight (kg): 1330.5

ACCELEROMETER DATA

Accelerometer Locations: Data Sheet No.7 Linearity: 99%
 Cal. Procedure/Interval: Calspan / 6 Months
 Integration Algorithm: Trapezoidal
 Impact Velocity (km/h): 90.2
 Velocity Change (km/h): _____
 Time of Separation (msec): _____



CRUSH PROFILE

Collision Deformation Classification : 12FYEW4
 Midpoint of Damage: C2
 Damage Region Length (mm): 1452
 Impact Mode: 35% offset, 15 Angle

CRUSH MEASUREMENTS: WITH BUMPER COVER

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4043	3548	495
C2	Crush zone 2 at left side	mm	4215	3741	474
C3	Crush zone 3 at left side	mm	4284	3852	432
C4	Crush zone 4 at right side	mm	4284	4032	252
C5	Crush zone 5 at right side	mm	4214	4146	68
C6	Crush zone 6 at right side	mm	4041	4158	-117
L	C1 to C6	mm	1452	1387	65

CRUSH MEASUREMENTS: WITH BUMPER COVER REMOVED

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4166	3611	555
C2	Crush zone 2 at left side	mm	4205	3716	489
C3	Crush zone 3 at left side	mm	4214	3818	396
C4	Crush zone 4 at right side	mm	4214	3928	286
C5	Crush zone 5 at right side	mm	4205	4030	174
C6	Crush zone 6 at right side	mm	4164	4104	60
L	C1 to C6	mm	858	693	165

DATA SHEET NO. 13

VEHICLE INTRUSION MEASUREMENTS

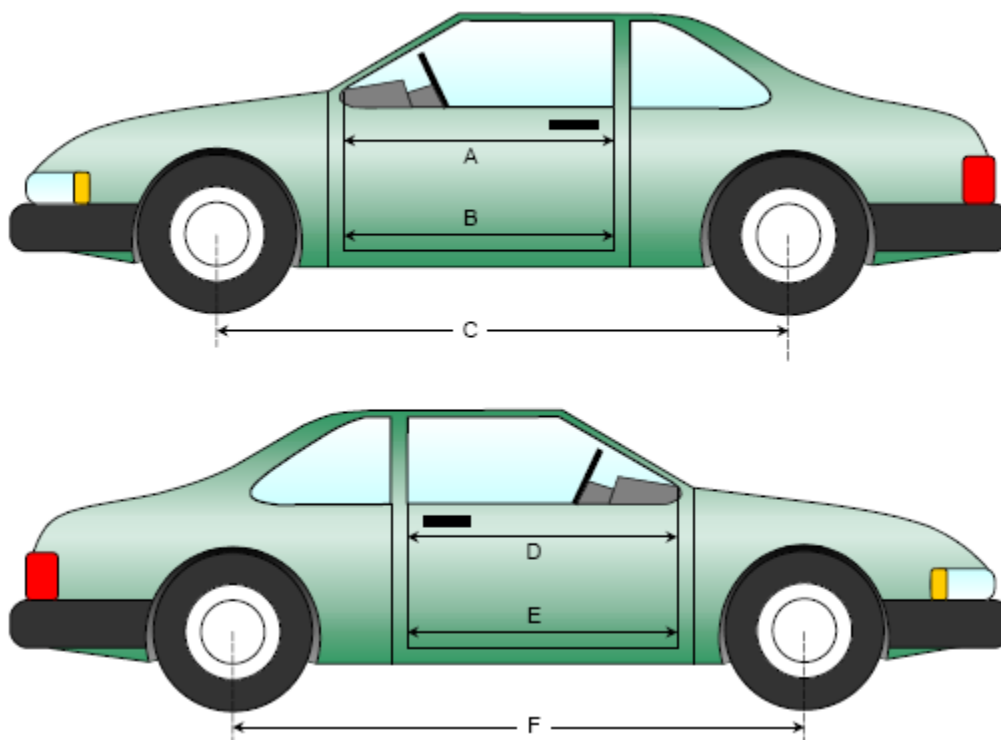
Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	992	945	-47
B	Left Side Lower	mm	872	830	-42
D	Right Side Upper	mm	989	987	-3
E	Right Side Lower	mm	887	887	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2550	2369	-182
F	Right Side Wheelbase	mm	2543	2610	66



DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

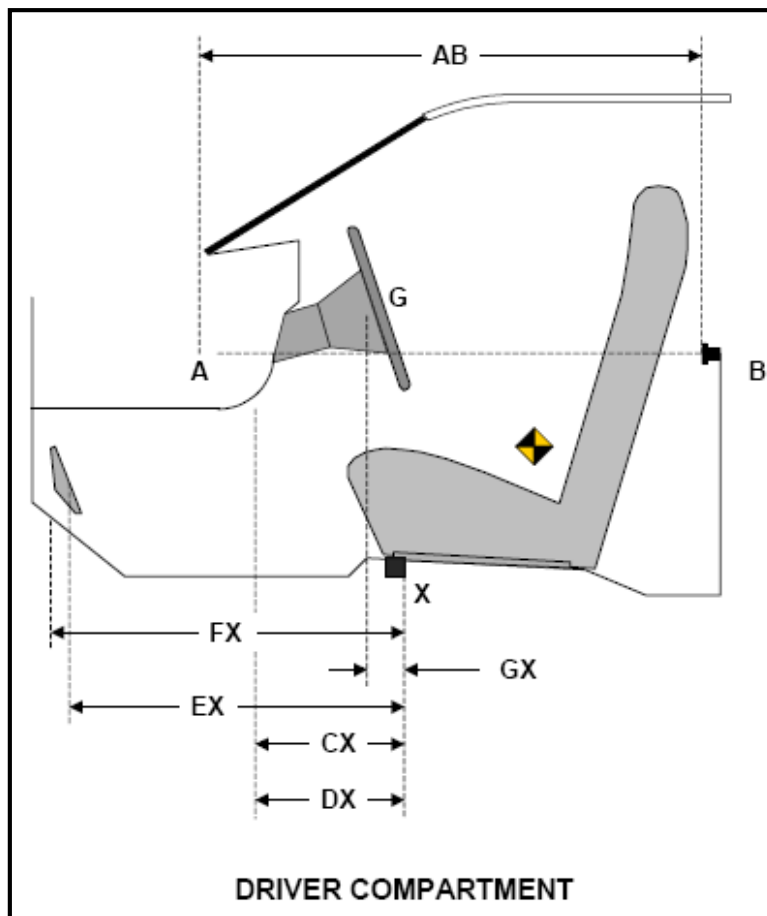
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	862	861	0
CX	Left Knee Bolster to X	mm	308	204*	-104*
DX	Right Knee Bolster to X	mm	307	275	-32
EX	Brake Pedal to X	mm	540	460	-80
FX	Foot Rest to X	mm	570	554	-16
GX	Center of Steering Column Wheel Hub to X	mm	77	38	-39

*Measurements are approximate

X = Front of Seat Track (Stationary)



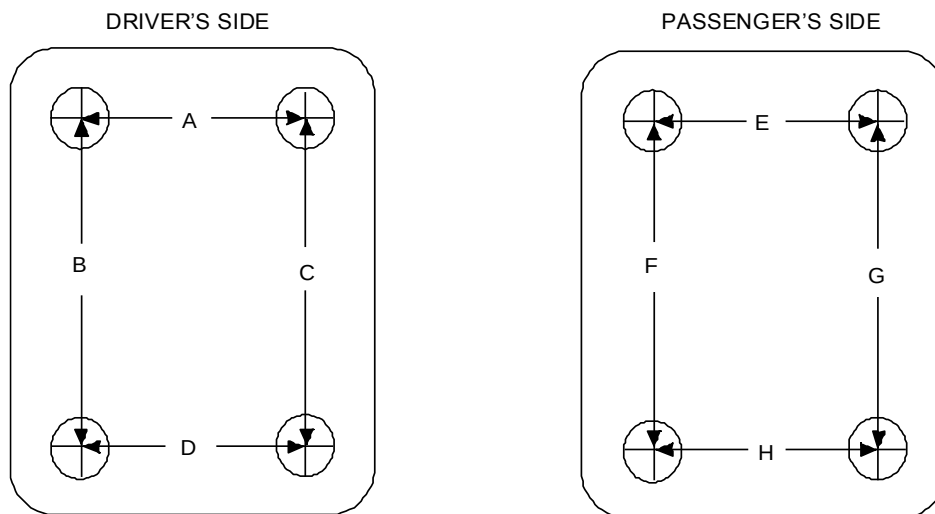
DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

TOP VIEW THROUGH FLOOR PAN



UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	496	487	9
B	266	262	3
C	267	221	46
D	510	472	38
E	480	479	0
F	321	318	2
G	311	311	0
H	473	471	1

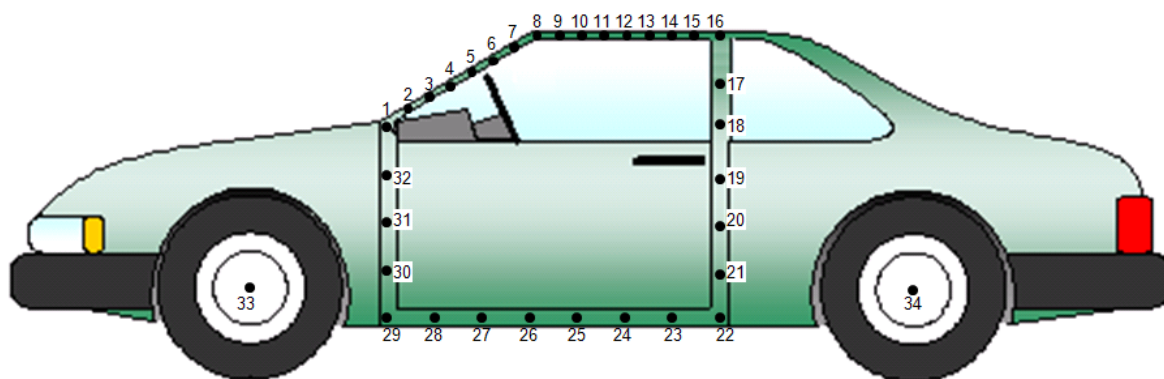
All units in millimeters

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

DRIVER SIDE DOOR SILL INTRUSIONS



Left Side View

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

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

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

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

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

DRIVER SIDE DOOR SILL INTRUSIONS

Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	3042.1	-686.2	-532.8	3007.8	-715.5	-554.9	-34.3	-29.3	-22.1
2	2981.1	-665.7	-577.8	2951.1	-702.7	-611.0	-29.9	-37.0	-33.2
3	2917.8	-651.5	-616.1	2894.1	-694.5	-658.7	-23.7	-43.0	-42.6
4	2853.8	-637.2	-651.6	2835.7	-687.0	-703.4	-18.1	-49.8	-51.8
5	2787.2	-622.9	-684.9	2772.9	-679.4	-746.1	-14.3	-56.5	-61.2
6	2718.0	-608.4	-717.7	2712.9	-644.3	-779.6	-5.1	-36.0	-62.0
7	2648.8	-594.5	-748.8	2650.3	-612.3	-795.2	1.4	-17.8	-46.4
8	2580.2	-583.6	-772.8	2583.8	-584.8	-807.0	3.6	-1.2	-34.3
9	2508.0	-574.8	-792.2	2511.4	-573.1	-820.1	3.4	1.6	-27.9
10	2432.9	-567.2	-809.4	2435.4	-568.5	-830.3	2.4	-1.2	-20.9
11	2359.8	-562.1	-822.0	2360.5	-563.1	-839.1	0.7	-1.0	-17.1
12	2284.9	-558.3	-833.0	2285.8	-558.8	-845.4	0.9	-0.4	-12.4
13	2208.1	-556.3	-840.0	2208.9	-557.0	-846.1	0.8	-0.7	-6.1
14	2132.3	-554.6	-845.6	2133.4	-556.0	-846.9	1.1	-1.4	-1.2
15	2055.0	-557.2	-847.7	2055.1	-558.6	-845.3	0.1	-1.4	2.5
16	1991.7	-560.7	-845.2	1991.1	-560.0	-842.6	-0.6	0.8	2.5
17	2013.5	-655.2	-695.7	2009.2	-656.9	-694.3	-4.3	-1.7	1.4
18	2027.8	-719.1	-530.6	2020.3	-722.7	-530.5	-7.6	-3.6	0.2
19	2039.0	-759.2	-360.1	2028.5	-766.0	-359.6	-10.5	-6.8	0.5
20	2042.2	-775.8	-181.3	2033.0	-781.1	-181.4	-9.2	-5.2	-0.1
21	2082.0	-763.4	-5.9	2075.5	-768.0	-5.7	-6.5	-4.7	0.2
22	2100.5	-771.6	164.7	2095.4	-776.2	163.9	-5.1	-4.5	-0.8
23	2219.1	-766.9	179.8	2214.8	-772.1	179.2	-4.2	-5.2	-0.6
24	2339.7	-772.4	205.9	2335.7	-775.9	204.4	-4.0	-3.5	-1.5
25	2459.4	-772.4	205.6	2455.4	-773.7	202.9	-4.0	-1.3	-2.7
26	2578.7	-772.3	205.6	2573.9	-770.4	203.5	-4.8	1.9	-2.1
27	2695.7	-771.2	202.6	2690.0	-764.3	204.6	-5.8	6.9	2.0
28	2814.7	-772.4	206.8	2809.2	-757.4	210.7	-5.5	15.0	3.9
29	2937.8	-747.5	183.1	2922.8	-741.2	179.1	-15.1	6.3	-4.0
30	3031.5	-728.6	-15.7	2965.9	-752.3	-41.7	-65.6	-23.8	-26.0
31	3042.9	-720.3	-163.4	2982.3	-752.0	-188.1	-60.6	-31.7	-24.7
32	3052.9	-718.2	-351.9	3002.4	-755.5	-375.2	-50.6	-37.2	-23.4

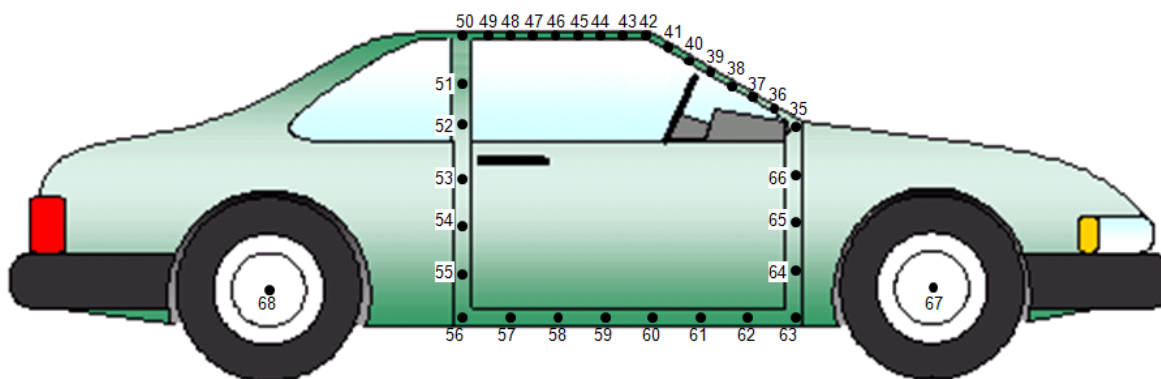
Note: See appendix F.2 for detailed procedure to measure required Door sill intrusion

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

PASSENGER SIDE DOOR SILL INTRUSIONS



Right Side View

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

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

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

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

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

PASSENGER SIDE DOOR SILL INTRUSION

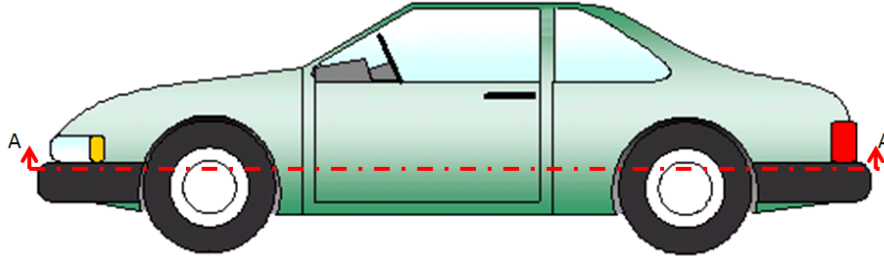
Pt.	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
33	3042.1	675.6	-541.5	3035.4	699.9	-546.5	-6.7	24.3	-5.0
34	2982.1	653.9	-588.5	2977.6	673.9	-593.7	-4.5	20.0	-5.2
35	2919.3	640.7	-623.0	2915.0	655.8	-627.2	-4.3	15.0	-4.2
36	2852.7	626.1	-658.9	2849.8	636.7	-661.4	-2.9	10.6	-2.6
37	2787.6	611.1	-693.6	2784.9	616.9	-695.9	-2.7	5.8	-2.3
38	2721.5	597.8	-722.4	2720.6	598.8	-723.7	-0.9	1.0	-1.3
39	2653.7	584.0	-753.1	2652.1	581.6	-753.5	-1.6	-2.4	-0.4
40	2581.4	573.2	-776.3	2581.3	570.4	-777.0	-0.2	-2.8	-0.7
41	2509.8	563.5	-797.8	2508.8	561.9	-796.8	-0.9	-1.6	1.0
42	2436.0	555.9	-815.1	2435.8	554.1	-814.7	-0.1	-1.7	0.4
43	2362.7	550.2	-828.9	2363.2	548.9	-828.2	0.5	-1.3	0.7
44	2290.7	547.1	-838.0	2290.9	545.8	-837.8	0.2	-1.3	0.2
45	2216.3	543.9	-847.9	2216.7	543.1	-846.8	0.3	-0.8	1.1
46	2146.0	542.5	-852.9	2145.8	541.8	-852.0	-0.2	-0.7	0.9
47	2074.3	541.0	-858.2	2074.1	540.4	-857.5	-0.2	-0.6	0.6
48	2000.2	549.3	-851.3	1998.8	548.3	-851.4	-1.4	-1.0	-0.1
49	2016.2	644.5	-704.1	2014.7	644.7	-704.1	-1.5	0.2	0.0
50	2031.6	710.5	-540.6	2030.8	711.6	-540.2	-0.7	1.1	0.4
51	2036.9	753.6	-369.0	2035.7	755.0	-370.7	-1.3	1.5	-1.7
52	2043.3	772.3	-191.8	2042.4	774.9	-192.6	-0.9	2.6	-0.9
53	2056.0	761.2	-26.2	2054.8	765.3	-25.1	-1.2	4.1	1.1
54	2079.3	772.7	154.7	2077.9	776.9	153.9	-1.4	4.2	-0.8
55	2216.1	766.2	160.2	2214.3	772.4	160.6	-1.8	6.2	0.4
56	2352.1	771.5	189.1	2351.7	778.3	187.2	-0.3	6.8	-1.9
57	2492.4	772.8	194.3	2491.6	780.6	191.9	-0.8	7.8	-2.4
58	2634.1	772.3	194.3	2632.2	780.7	191.2	-1.9	8.4	-3.0
59	2772.1	771.3	193.9	2771.0	781.5	192.5	-1.1	10.3	-1.4
60	2876.0	760.4	190.6	2874.5	770.9	187.8	-1.5	10.5	-2.7
61	2960.1	744.1	161.1	2958.4	754.9	156.9	-1.7	10.8	-4.1
62	3031.3	724.0	-12.2	3029.0	740.9	-16.7	-2.2	16.9	-4.5
63	3044.0	709.5	-186.7	3040.9	729.5	-191.4	-3.1	19.9	-4.7
64	3052.5	704.6	-359.1	3048.5	726.7	-364.4	-4.0	22.0	-5.4
46	2146.0	542.5	-852.9	2145.8	541.8	-852.0	-0.2	-0.7	0.9
47	2074.3	541.0	-858.2	2074.1	540.4	-857.5	-0.2	-0.6	0.6

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



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

VEHICLE EXTERIOR CRUSH PROFILE SECTION A-A

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
1	640.5	824.7	-7.1	1	660.8	-830.6	-15.0
2	555.0	813.3	-7.8	2	584.7	-823.6	-22.6
3	448.4	795.4	-8.0	3	353.7	-784.7	-20.5
4	299.6	768.6	-5.2	4	167.2	-733.5	-20.5
5	184.9	736.0	0.6	5	92.5	-664.6	-18.1
6	97.2	665.9	-3.2	6	51.9	-553.6	-13.7
7	64.7	591.7	-3.5	7	53.6	-560.4	-15.2
8	39.2	487.4	-7.2	8	20.2	-374.2	-8.3
9	18.0	349.0	-6.6	9	4.8	-193.2	-0.6
10	4.3	193.1	-8.3	10	1.1	-4.5	11.8
11	-0.1	82.4	-10.4	11	8.2	202.0	21.5
12	0.9	-113.8	-14.7	12	50.1	517.4	36.3
13	11.0	-285.9	-13.2	13	98.7	654.7	46.4
14	37.0	-477.9	-13.4	14	261.7	748.7	55.9
15	65.7	-596.7	-13.6	15	540.8	801.6	66.2
16	104.8	-678.5	-15.7	16	612.0	813.0	67.5
17	182.6	-737.0	-11.0	17	1270.6	838.6	88.6
18	404.3	-790.4	-16.9	18	1396.4	828.4	92.2
19	587.9	-820.7	-11.3	19	1652.1	820.0	95.2
20	643.1	-826.6	-6.1	20	1924.9	821.2	103.9
21	1221.1	-849.7	-6.8	21	2139.1	817.1	108.3
22	1361.4	-842.7	-14.8	22	2369.5	820.1	113.8
23	1607.9	-835.7	-12.5	23	2584.8	822.4	118.7
24	1903.1	-836.7	-10.2	24	3016.4	836.3	132.0

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

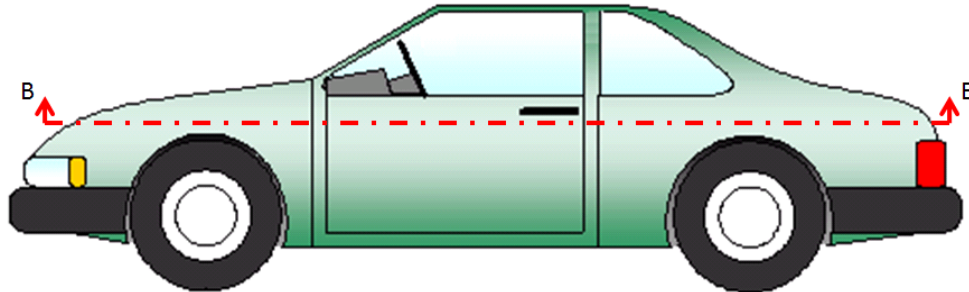
VEHICLE EXTERIOR CRUSH PROFILE SECTION A-A (CONTINUED)

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
25	2108.7	-836.6	-12.5	25	3143.3	835.8	134.9
26	2367.2	-834.0	-15.3	26	3798.7	897.0	152.2
27	2672.1	-828.9	-13.4	27	3866.7	763.4	145.3
28	3002.8	-828.9	-11.8	28	3703.1	454.9	126.7
29	3214.7	-841.2	-8.6	29	3919.2	456.3	132.3
30	3765.3	-837.3	-10.0	30	3884.3	389.5	129.3
31	3894.8	-805.4	-8.9	31	3950.6	345.1	125.8
32	4010.4	-753.1	-8.3	32	4038.2	324.5	127.4
33	4141.8	-594.7	-10.9	33	4026.0	290.0	128.7
34	4211.3	-434.0	-19.3	34	3991.4	233.1	130.3
35	4271.5	-172.3	-23.6	35	3848.6	237.3	127.9
36	4274.2	31.4	-21.7	36	3823.4	150.2	120.2
37	4252.1	299.3	-17.3	37	3900.3	73.4	118.0
38	4218.4	424.1	-9.9	38	3809.8	-33.2	108.0
39	4165.5	550.6	-11.5	39	3711.7	-146.4	100.8
40	4078.0	684.4	-13.7	40	3670.9	-276.4	97.5
41	3932.9	788.7	-18.1	41	3618.5	-383.3	89.9
42	3762.9	835.9	-12.5	42	3467.6	-420.0	84.1
43	3196.9	842.2	-6.6	43	3402.8	-425.0	82.6
44	3026.3	830.1	-11.0	44	3339.0	-475.3	77.4
45	2785.9	825.8	-8.9	45	3415.0	-639.2	71.7
46	2527.1	828.9	-10.9	46	3347.7	-636.1	71.9
47	2218.3	832.1	-13.3	47	3223.9	-715.3	65.3
48	1987.0	833.7	-13.0	48	3055.5	-696.5	62.1
49	1658.7	831.8	-15.2	49	3078.4	-810.7	56.5
50	1235.1	845.4	-7.2	50	3031.2	-820.5	56.7
51	640.5	824.7	-7.1	51	3067.4	-889.9	50.8
See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile.				52	2998.7	-859.6	46.1
				53	2839.1	-833.9	44.5
				54	2805.2	-846.6	38.7
				55	2634.6	-865.1	33.5
				56	2404.7	-862.2	28.2
				57	2215.3	-858.4	24.7
				58	2010.3	-853.2	19.5
				59	1989.7	-844.5	19.9
				60	1726.1	-839.4	14.1
				61	1383.7	-847.4	4.9
				62	1239.6	-848.4	3.0
				63	660.8	-830.6	-15.0

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



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

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

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

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

VEHICLE EXTERIOR CRUSH PROFILE SECTION B-B

Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
1	1108.3	844.9	-173.4	1	1003.3	-850.8	-174.3
2	864.5	839.8	-172.8	2	862.7	-844.9	-182.5
3	673.3	822.5	-179.6	3	608.8	-816.8	-185.8
4	460.9	789.2	-185.9	4	355.1	-771.9	-187.5
5	262.6	746.2	-182.3	5	193.7	-711.0	-188.2
6	143.5	653.9	-166.8	6	151.7	-654.8	-187.3
7	123.4	507.4	-180.7	7	120.8	-562.2	-182.2
8	117.4	364.8	-185.8	8	126.8	-435.1	-176.6
9	108.6	183.4	-189.3	9	98.9	-238.9	-165.4
10	105.1	37.0	-186.1	10	95.6	-23.1	-164.8
11	104.9	-141.7	-175.7	11	102.2	220.6	-143.0
12	102.2	-257.5	-173.9	12	63.2	413.5	-129.2
13	123.9	-404.2	-172.9	13	111.8	641.7	-121.9
14	128.2	-503.4	-185.3	14	169.2	717.4	-115.7
15	145.0	-628.5	-191.3	15	235.3	748.7	-112.7
16	215.7	-725.0	-186.1	16	381.9	781.3	-107.3
17	369.1	-772.4	-186.6	17	634.5	821.8	-99.9
18	541.0	-804.0	-186.2	18	761.9	832.4	-100.5
19	753.7	-831.7	-186.5	19	2186.1	854.7	-62.0
20	954.9	-844.9	-183.4	20	1414.1	840.0	-79.8
21	1088.6	-845.9	-181.4	21	1684.8	840.6	-72.2
22	1130.9	-849.6	-181.6	22	2005.9	842.9	-66.0

See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile
 RB5136 3-36 TR2518

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

VEHICLE EXTERIOR CRUSH PROFILE SECTION B-B (Continued)

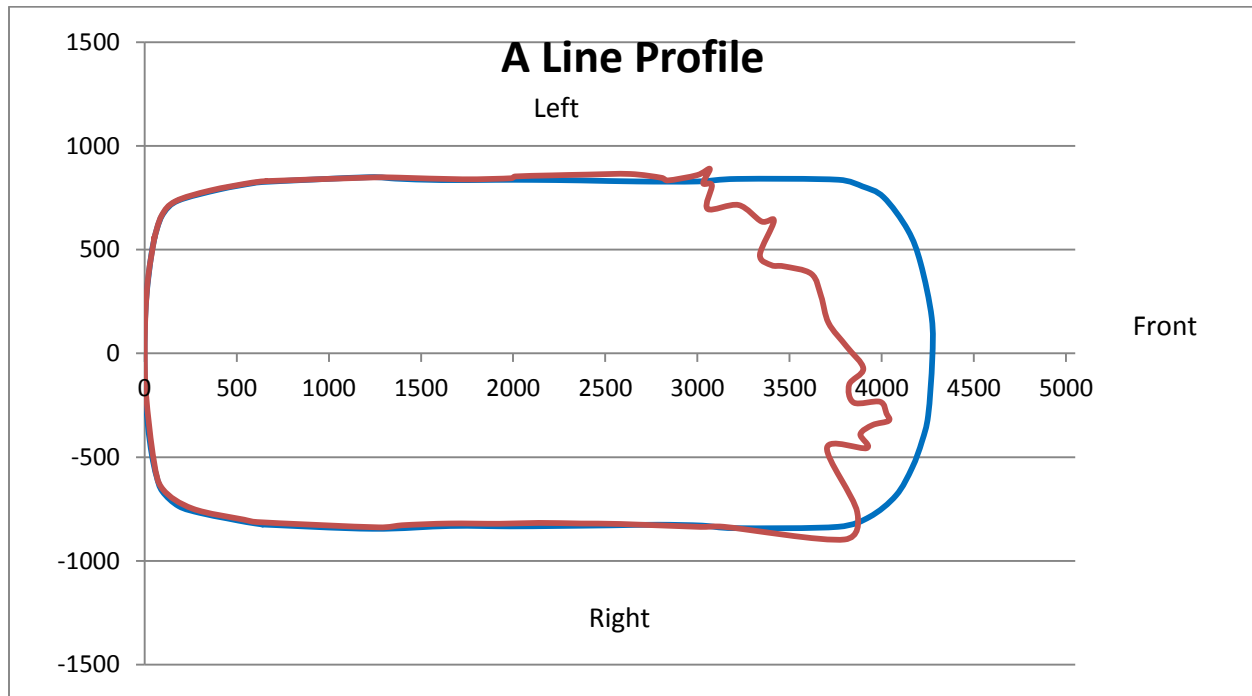
Pt.	Pre-Test			Pt.	Post-Test		
	X	Y	Z		X	Y	Z
23	1444.2	-849.5	-179.9	23	2387.5	846.8	-57.3
24	1767.7	-851.3	-183.4	24	2589.7	848.3	-52.4
25	2042.0	-850.9	-185.1	25	3019.0	852.7	-44.6
26	2377.0	-844.9	-187.1	26	3690.5	872.1	-20.4
27	2636.6	-837.5	-186.9	27	3804.3	747.4	-23.4
28	3068.8	-826.1	-186.3	28	3652.0	659.6	-32.8
29	3452.0	-840.2	-186.1	29	3628.9	522.9	-55.5
30	3703.7	-817.7	-181.0	30	3852.4	677.7	-26.5
31	3731.9	-817.2	-179.8	31	3968.7	599.5	-27.0
32	3866.2	-775.3	-170.0	32	4004.7	500.3	-32.7
33	3966.6	-677.9	-154.9	33	4147.6	547.1	-25.5
34	4034.2	-553.9	-153.4	34	4086.5	315.8	-41.2
35	4143.7	-435.2	-159.4	35	3964.0	114.5	-54.9
36	4212.6	-187.0	-161.4	36	3815.8	-70.7	-67.4
37	4253.9	-10.2	-162.9	37	3770.1	-130.1	-61.2
38	4208.0	200.4	-172.2	38	3732.0	-148.3	-64.8
39	4137.8	424.4	-180.7	39	3718.0	-194.3	-67.6
40	4022.9	566.5	-175.0	40	3665.2	-277.1	-71.2
41	3931.7	712.6	-187.4	41	3609.8	-340.3	-77.4
42	3804.1	794.3	-182.0	42	3464.4	-448.6	-84.0
43	3653.9	826.4	-188.7	43	3356.5	-415.8	-85.4
44	3509.9	840.0	-190.9	44	3363.7	-550.9	-96.1
45	3357.1	837.5	-189.7	45	3377.4	-602.5	-99.5
46	3118.7	825.8	-184.5	46	3175.2	-517.2	-96.7
47	3085.2	826.5	-183.0	47	3086.5	-591.2	-101.5
48	2871.7	829.3	-181.7	48	3061.2	-703.7	-108.8
49	2631.2	835.7	-182.9	49	3126.0	-796.4	-109.9
50	2322.3	842.9	-185.2	50	3094.3	-870.9	-114.8
51	2067.9	846.2	-186.4	51	2987.1	-861.9	-119.3
52	1620.7	844.5	-180.9	52	2831.0	-879.5	-123.8
53	1321.8	842.3	-175.0	53	2790.0	-885.7	-133.1
54	1125.2	844.8	-174.9	54	2718.6	-885.7	-135.3
55	1108.3	844.9	-173.4	55	2448.0	-886.2	-143.5
See appendix F.3 for a detailed procedure on how to measure vehicle exterior crush profile.				56	2092.3	-884.5	-149.9
				57	1987.2	-855.8	-157.0
				58	1701.8	-855.8	-157.1
				59	1423.9	-855.4	-163.2
				60	1130.0	-848.5	-168.4
				61	1003.3	-850.8	-174.3

DATA SHEET NO.13 (CONTINUED)

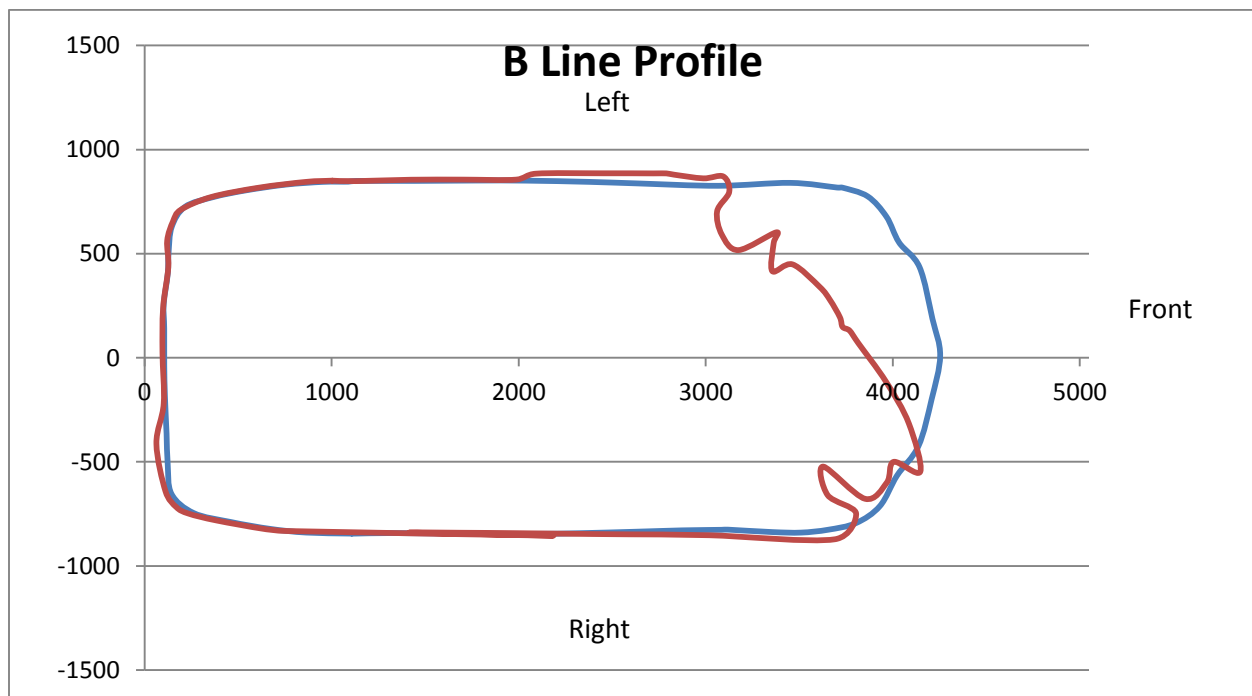
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

SECTION A-A



SECTION B-B



DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

LEFT PROFILE OF THE DASH



Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
LB3	2915.568	-483.432	-75.5402	2861.054	-170.463	-115.557	-54.5	313.0	-40.0
LB2	2885.629	-484.059	-115.571	2835.618	-165.165	-155.642	-50.0	318.9	-40.1
LB1	2853.632	-483.691	-156.371	2807.494	-158.459	-202.997	-46.1	325.2	-46.6
DIPL	2821.422	-482.673	-194.793	2782.587	-151.229	-244.545	-38.8	331.4	-49.8
LT1	2800.859	-481.932	-238.213	2763.489	-145.483	-293.022	-37.4	336.4	-54.8
LT2	2827.455	-482.626	-283.097	2687.345	-107.883	-387.284	-140.1	374.7	-104.2
LT3	2871.305	-484.272	-306.091	2691.547	-104.317	-434.723	-179.8	380.0	-128.6
LT4	2892.686	-483.418	-339.931	2713.857	-113.614	-474.993	-178.8	369.8	-135.1
LT5	2920.426	-483.59	-383.319	2741.304	-124.198	-508.69	-179.1	359.4	-125.4
LT6	2961.311	-482.995	-410.348	2780.657	-103.351	-548.459	-180.7	379.6	-138.1
LT7	3010.479	-482.686	-425.589	2823.925	-118.959	-563.937	-186.6	363.7	-138.3

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

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

RIGHT PROFILE OF THE DASH



Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
RB3	2913.56	-184.419	-77.3932	2786.859	-560.43	-94.9076	-126.7	-376.0	-17.5
RB2	2883.958	-184.973	-115.232	2761.579	-558.144	-139.067	-122.4	-373.2	-23.8
RB1	2852.99	-184.444	-155.862	2735.977	-558.757	-182.515	-117.0	-374.3	-26.7
DIPR	2821.471	-182.985	-194.289	2690.161	-551.564	-220.183	-131.3	-368.6	-25.9
RT1	2827.694	-182.198	-243.176	2668.484	-549.623	-253.146	-159.2	-367.4	-10.0
RT2	2825.707	-181.618	-292.397	2672.185	-527.49	-299.549	-153.5	-345.9	-7.2
RT3	2834.762	-186.277	-340.549	2699.479	-498.969	-331.805	-135.3	-312.7	8.7
RT4	2860.562	-186.151	-382.233	2737.357	-473.707	-356.983	-123.2	-287.6	25.2
RT5	2895.68	-185.428	-414.704	2720.785	-411.004	-506.856	-174.9	-225.6	-92.2
RT6	2941.852	-182.486	-435.46	2757.35	-415.417	-540.999	-184.5	-232.9	-105.5
RT7	2989.981	-181.283	-447.91	2802.654	-420.427	-560.438	-187.3	-239.1	-112.5

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

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

	Points	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Lower Bumper Beam	1	4166.01	-429.11	109.95	3611.33	-344.18	-69.67	-555	85	-180
	2	4204.50	-259.67	108.58	3715.93	-207.18	-51.10	-489	52	-160
	3	4213.58	-86.32	108.31	3817.47	-79.57	-30.05	-396	7	-138
	4	4213.62	87.92	104.93	3927.68	55.72	-13.75	-286	-32	-119
	5	4204.53	261.88	103.80	4030.16	196.08	5.70	-174	-66	-98
	6	4164.35	429.31	104.05	4103.87	348.94	32.07	-60	-80	-72
Upper Bumper Beam	1	4168.06	-429.32	37.48	3593.42	-320.17	-129.58	-575	109	-167
	2	4206.12	-259.85	33.76	3698.51	-197.21	-126.59	-508	63	-160
	3	4215.42	-86.07	32.10	3811.52	-63.15	-104.33	-404	23	-136
	4	4215.42	87.86	29.00	3922.57	71.44	-87.43	-293	-16	-116
	5	4205.94	262.01	27.71	4026.32	210.91	-67.10	-180	-51	-95
	6	4165.10	429.47	25.77	4101.24	362.92	-44.65	-64	-67	-70
Upper Radiator Support	1	4011.97	-314.67	-218.15	3451.43	-123.55	-313.86	-561	191	-96
	2	4009.09	-188.25	-240.17	3538.58	-38.90	-351.95	-471	149	-112
	3	4008.21	-59.96	-244.70	3639.53	33.42	-389.86	-369	93	-145
	4	4006.95	60.58	-279.84	3722.74	136.79	-416.62	-284	76	-137
	5	4006.91	187.55	-242.05	3801.11	219.61	-354.36	-206	32	-112
	6	4007.23	311.64	-220.73	3877.64	311.56	-305.17	-130	0	-84

*Points unrecoverable, support beam was destroyed in crash

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

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

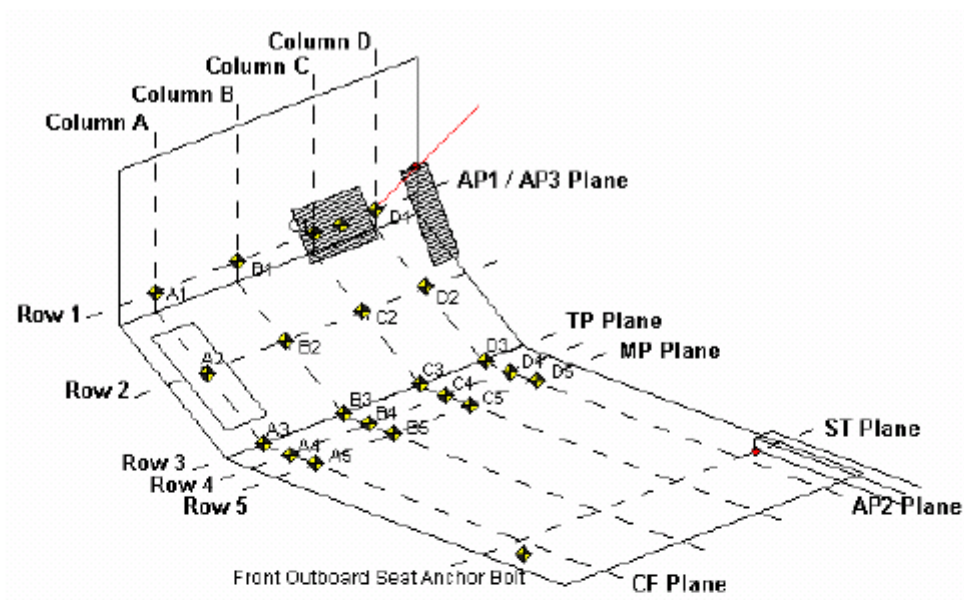
+Y - From left side of the vehicle to the right side of the vehicle

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

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



AP1: Y-Z Plane passing through D1

AP2: X-Z Plane passing through D1

AP3: X-Y plane passing through D1

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

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

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

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

Column A: intersection of vehicle and CF plane

Column D: Intersection of vehicle and AP2 plane

Row 1: intersection of the vehicle and the AP3 Plane

Row 3: intersection of the vehicle and TP plane

Row 5: intersection of the vehicle and MP plane

Row 2: evenly spaced between row 1 and 3

Row 4: evenly spaced between row 3 and 5

DATA SHEET NO.13 (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

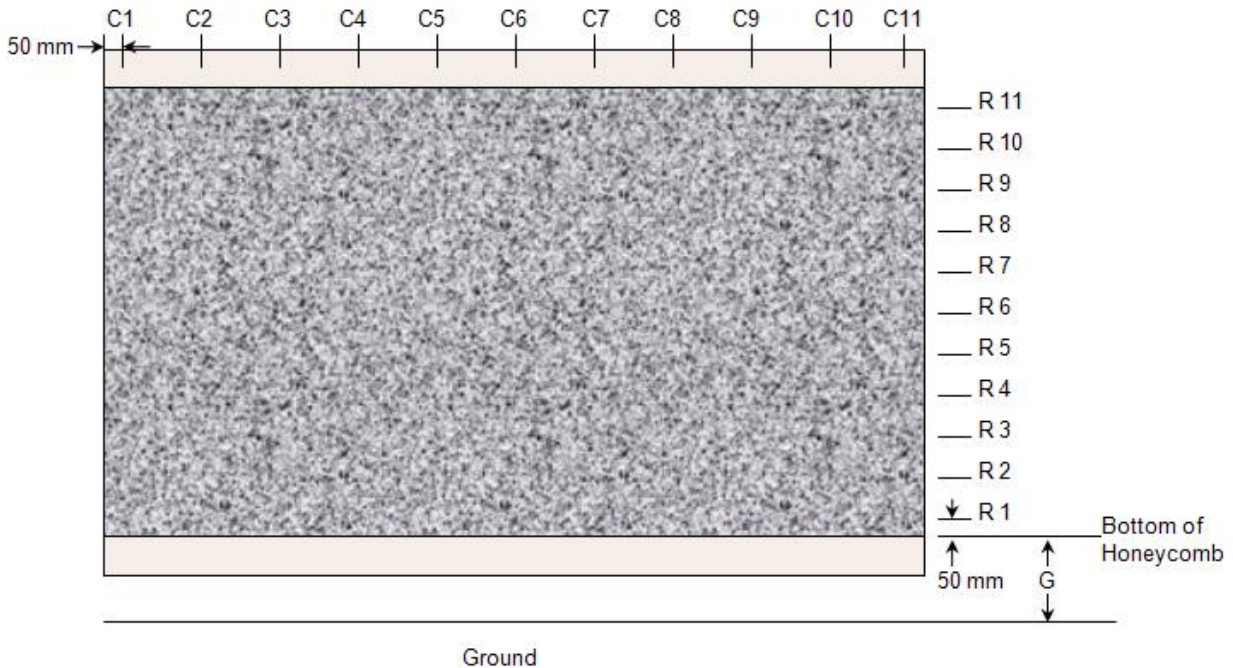
Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
A1	3143.17	-570.29	192.86	3076.78	-523.77	137.88	-66.39	46.52	-54.98
B1	3181.19	-437.54	191.82	3136.22	-427.28	148.91	-44.97	10.26	-42.91
C1	3195.22	-296.86	195.65	3107.31	-262.79	127.90	-87.92	34.06	-67.74
D1	3204.89	-172.51	193.21	3144.66	-142.98	159.48	-60.23	29.53	-33.74
A2	3115.92	-569.08	252.02	3086.07	-524.34	204.73	-29.85	44.74	-47.28
B2	3072.81	-440.11	248.10	3036.27	-402.23	213.57	-36.54	37.88	-34.53
C2	3154.48	-300.33	261.43	3063.52	-268.14	215.10	-90.96	32.19	-46.33
D2	3123.69	-169.11	250.46	3054.29	-139.48	205.88	-69.40	29.63	-44.58
A3	3021.72	-572.61	300.07	3000.92	-535.14	267.93	-20.80	37.47	-32.14
B3	3018.62	-439.78	272.06	2989.37	-404.03	244.82	-29.24	35.75	-27.24
C3	3025.16	-303.59	302.09	2987.51	-271.98	274.75	-37.65	31.61	-27.34
D3	3028.65	-170.79	300.17	2978.85	-148.44	259.13	-49.81	22.35	-41.04
A4	2952.00	-575.94	307.24	2938.05	-547.16	285.26	-13.95	28.79	-21.98
B4	2954.43	-436.48	285.73	2927.17	-409.12	262.39	-27.26	27.37	-23.34
C4	2955.47	-303.88	314.85	2926.77	-283.78	283.04	-28.70	20.10	-31.81
D4	2958.02	-171.45	302.92	2943.03	-195.25	270.31	-15.00	-23.80	-32.61
A5	2881.85	-574.53	310.49	2868.78	-552.17	294.85	-13.07	22.36	-15.64
B5	2880.87	-437.39	284.71	2853.70	-412.61	266.80	-27.18	24.78	-17.91
C5	2880.67	-304.97	313.98	2861.79	-286.41	284.30	-18.88	18.56	-29.68
D5	2874.45	-173.47	302.65	2870.41	-202.88	268.55	-4.04	-29.41	-34.10
Brake Pedal	3086.24	-309.79	107.08	2992.75	-291.66	114.04	-93.49	18.13	6.96
IP Left	2853.63	-483.69	-156.37	2735.98	-558.76	-182.51	-117.65	-75.07	-26.14
IP Right	2852.99	-184.44	-155.86	2807.49	-158.46	-203.00	-45.50	25.99	-47.14
Steering Column	2622.86	-328.78	-367.29	2570.59	-374.11	-440.26	-52.27	-45.33	-72.97
Front Outboard Bolt	2546.07	-594.10	195.70	2532.31	-595.86	202.40	-13.76	-1.76	6.69

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

DATA SHEET NO.14

RMDB CRUSH MEASUREMENTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



BARRIER X-CRUSH

		C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
		50 mm	260 mm	470 mm	680 mm	890 mm	1100 mm	1310 mm	1520 mm	1730 mm	1940 mm	2150 mm
R11	910mm	1.3	3.7	4.0	3.9	4.5	4.7	4.7	4.5	4.6	3.3	6.4
R10	824mm	1.0	1.3	1.6	1.6	1.9	2.1	2.5	6.3	4.8	4.9	23.2
R9	738mm	0.8	0.7	1.0	1.2	1.2	1.7	1.8	6.0	12.1	8.8	45.8
R8	652mm	0.9	0.3	0.6	1.0	1.0	1.3	1.7	2.6	23.7	13.3	72.8
R7	566mm	0.4	0.1	0.3	0.6	0.8	0.9	2.2	1.6	37.9	36.8	108.1
R6	480mm	0.1	-0.1	0.0	0.2	0.4	0.8	1.2	11.5	21.5	151.4	137.9
R5	384mm	-0.3	-0.5	-0.2	0.3	0.3	0.4	0.7	37.2	26.4	186.6	259.8
R4	308mm	-1.0	-0.8	-0.6	-0.2	0.2	0.1	0.6	63.0	28.0	196.0	252.1
R3	222mm	-1.3	-1.0	-0.7	-0.2	0.0	0.1	3.7	73.5	37.5	193.1	234.6
R2	136mm	-1.9	-1.4	-0.3	0.0	-0.1	0.2	10.5	88.3	65.4	177.3	236.1
R1	50mm	-1.8	-1.2	-0.4	0.0	*	*	23.5	112.5	75.5	126.4	174.4

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

DATA SHEET NO. 15

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

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
 Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

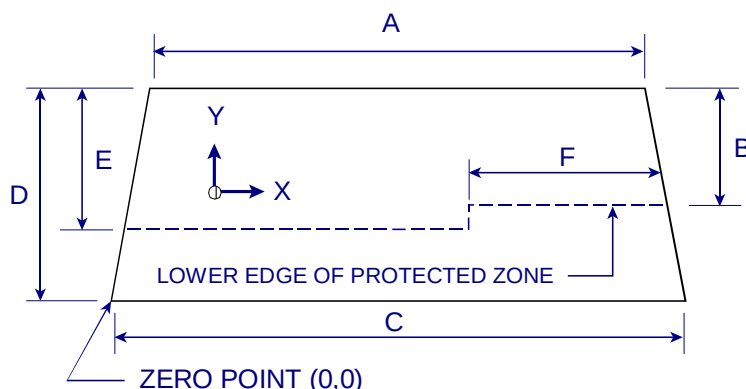
Please provide windshield mounting details. _____

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

Temperature of windshield molding during test: 32.2°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2058	2058	100
Right Side	2058	2058	100
Total	4115	4115	100



Item	Units	Value
A	mm	1145
B	mm	558
C	mm	1340
D	mm	815
E	mm	555
F	mm	530

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
1255	70

- Hood Penetration

DATA SHEET NO. 15 (CONTINUED)

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

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 32.2°C Test Time: 5:15 PM

Stoddard Solvent Spillage Measurements

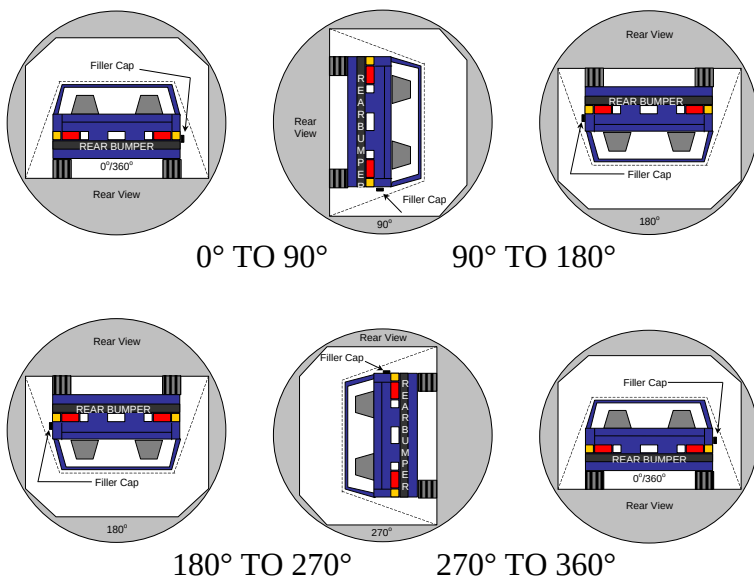
- | | | |
|----|---|---------------|
| A. | From impact until vehicle motion ceases:
(maximum allowable = 1 oz.) | <u>0</u> oz. |
| B. | For the 5-minute period after motion ceases:
(maximum allowable = 5 oz.) | <u>0</u> oz. |
| C. | For the following 25 minutes:
(maximum allowable = 1 oz./minute) |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

DATA SHEET NO. 16

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136

Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



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).

- 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°	67	300	367
180° to 270°	62	300	362
270° to 360°	69	300	369

FMVSS 301 SPILLAGE TABLE

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

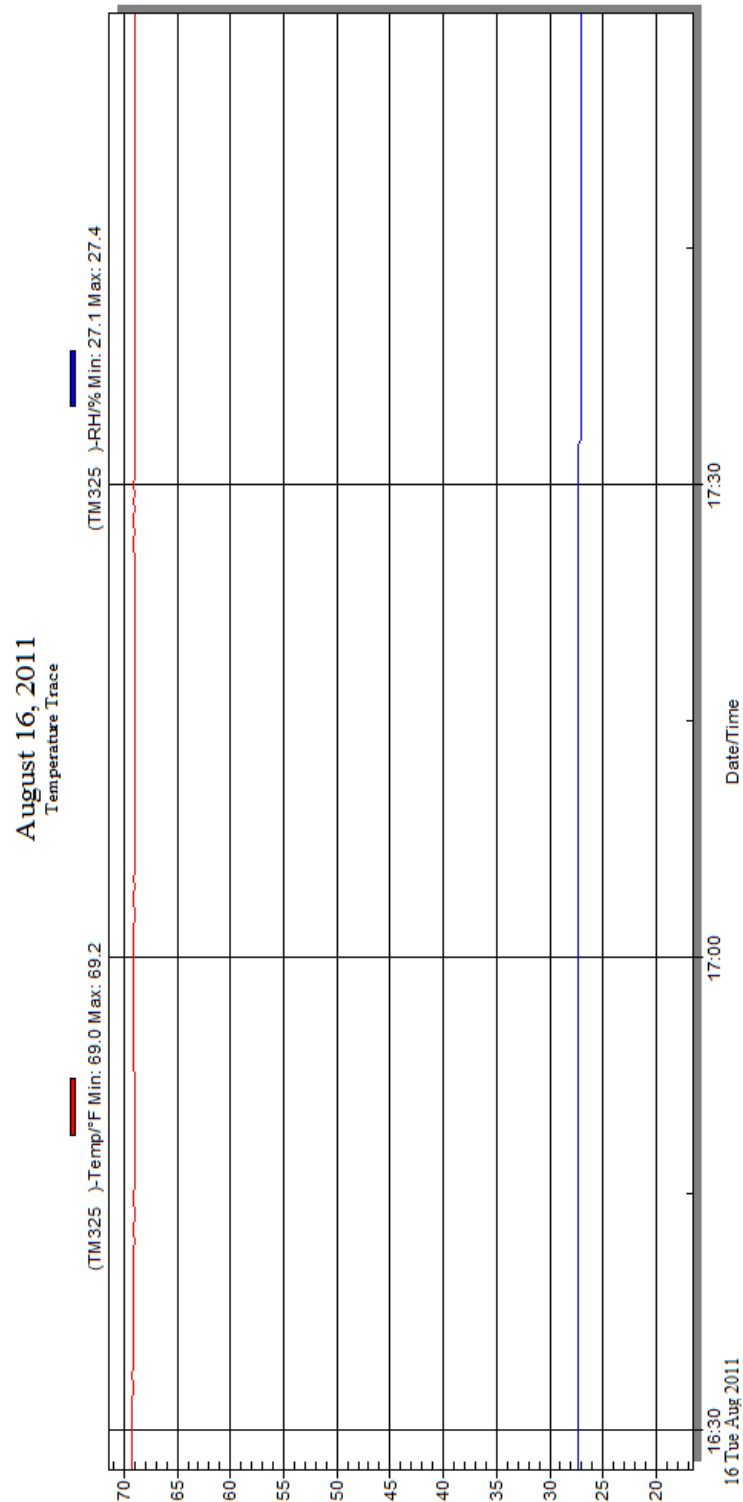
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17

DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Toyota Yaris NHTSA No.: RB5136
Test Program: R&D 56mph, 15° angle, 35% offset Test Date: 8/16/11



APPENDIX A
PHOTOGRAPHS

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140	Vehicle at 360 Degrees on Static Rollover Device	A-79



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



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

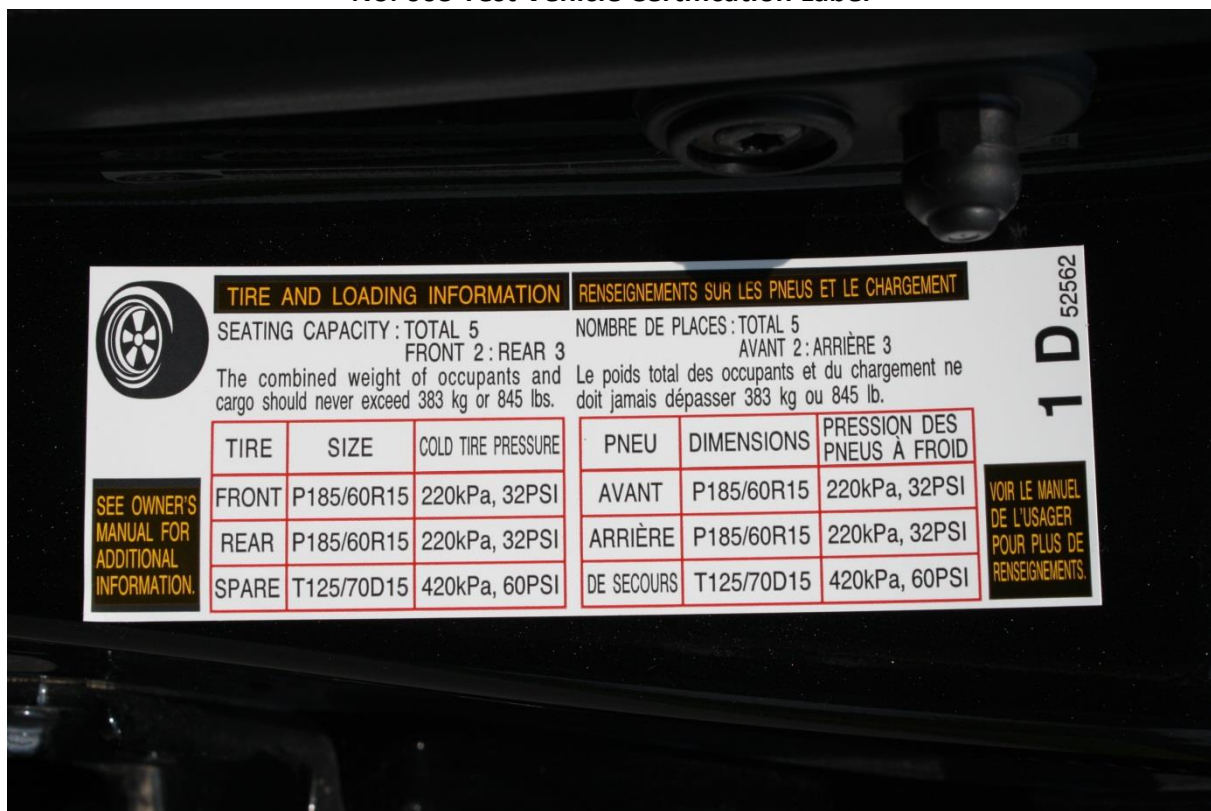
RB5136

A-7

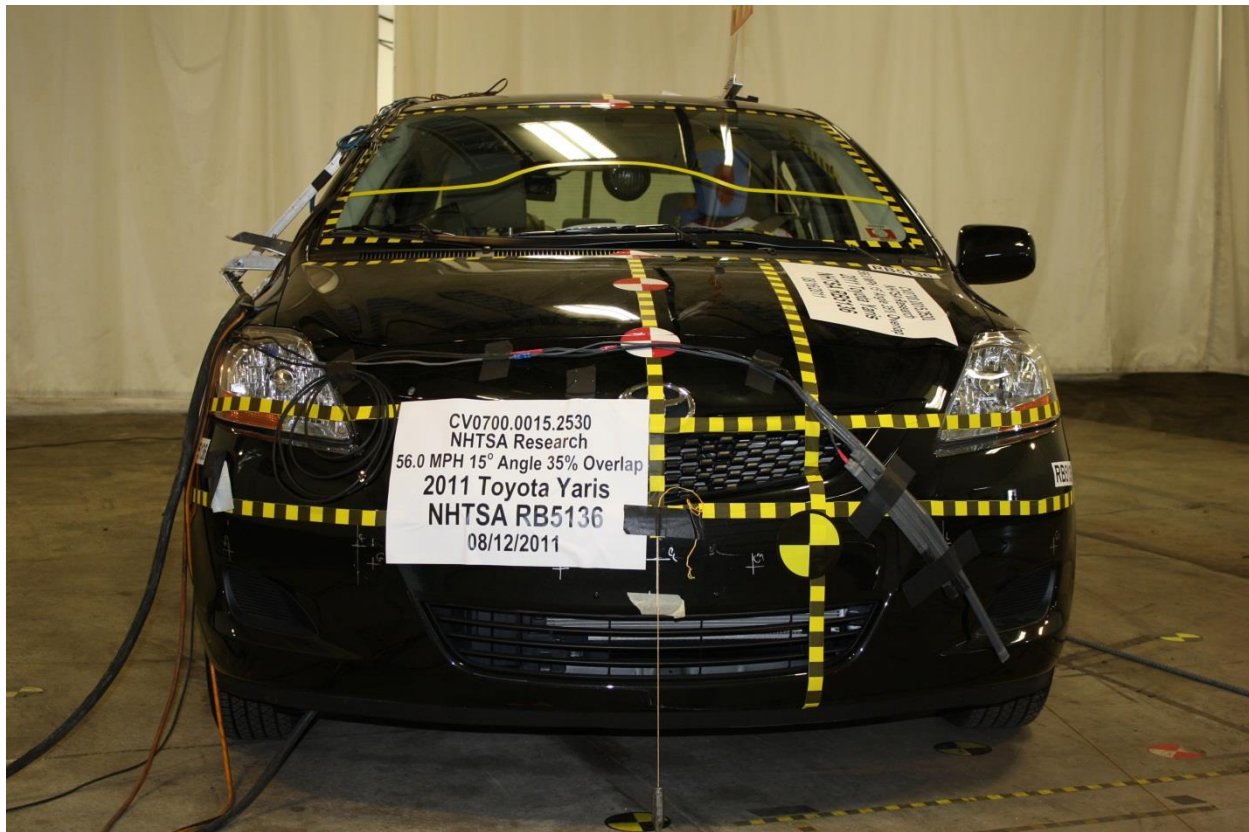
TR2518



No. 003 Test Vehicle Certification Label



No. 004 Test Vehicle Tire Placard



No. 005 Pre-Test Front View of Test Vehicle



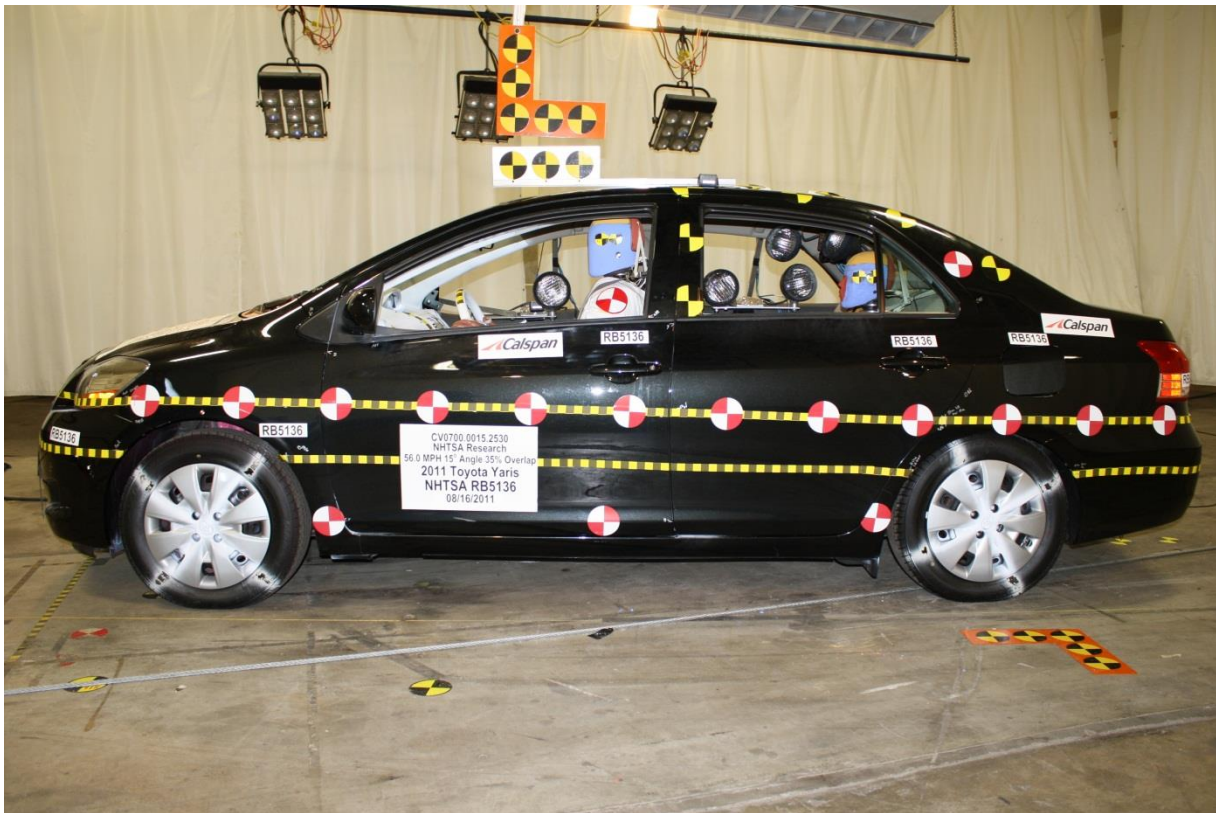
No. 006 Post-Test Front View of Test Vehicle



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



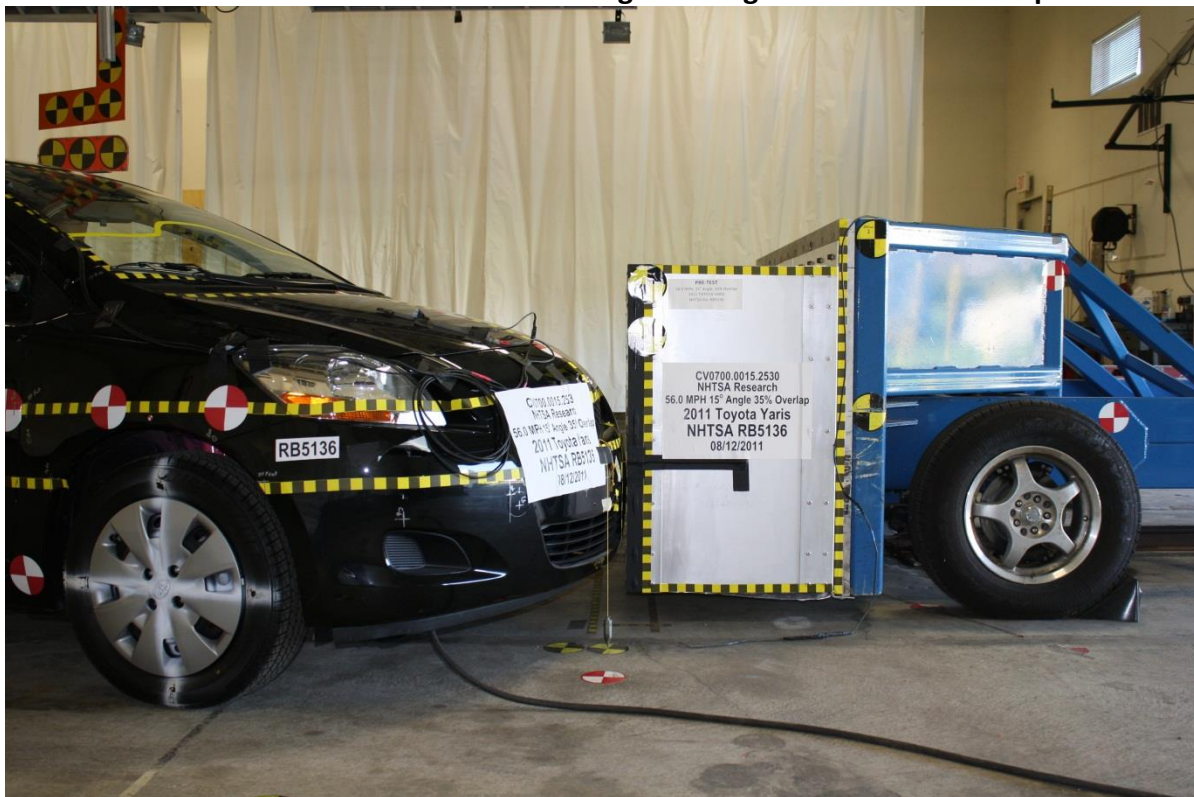
No. 017 Pre-Test Right Front 3-4 View of Test Vehicle



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



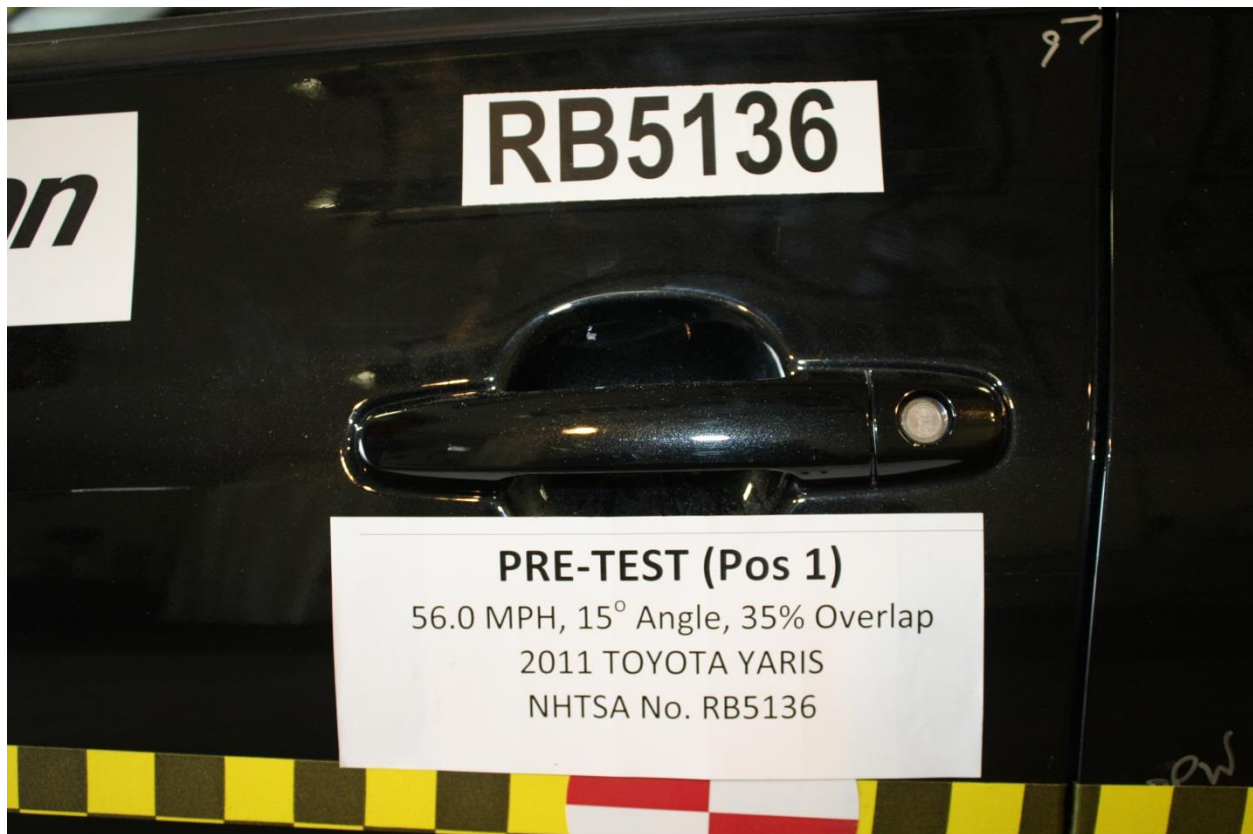
No. 021 Pre-Test Right Side View of RMDB against target vehicle at ideal Impact Point



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



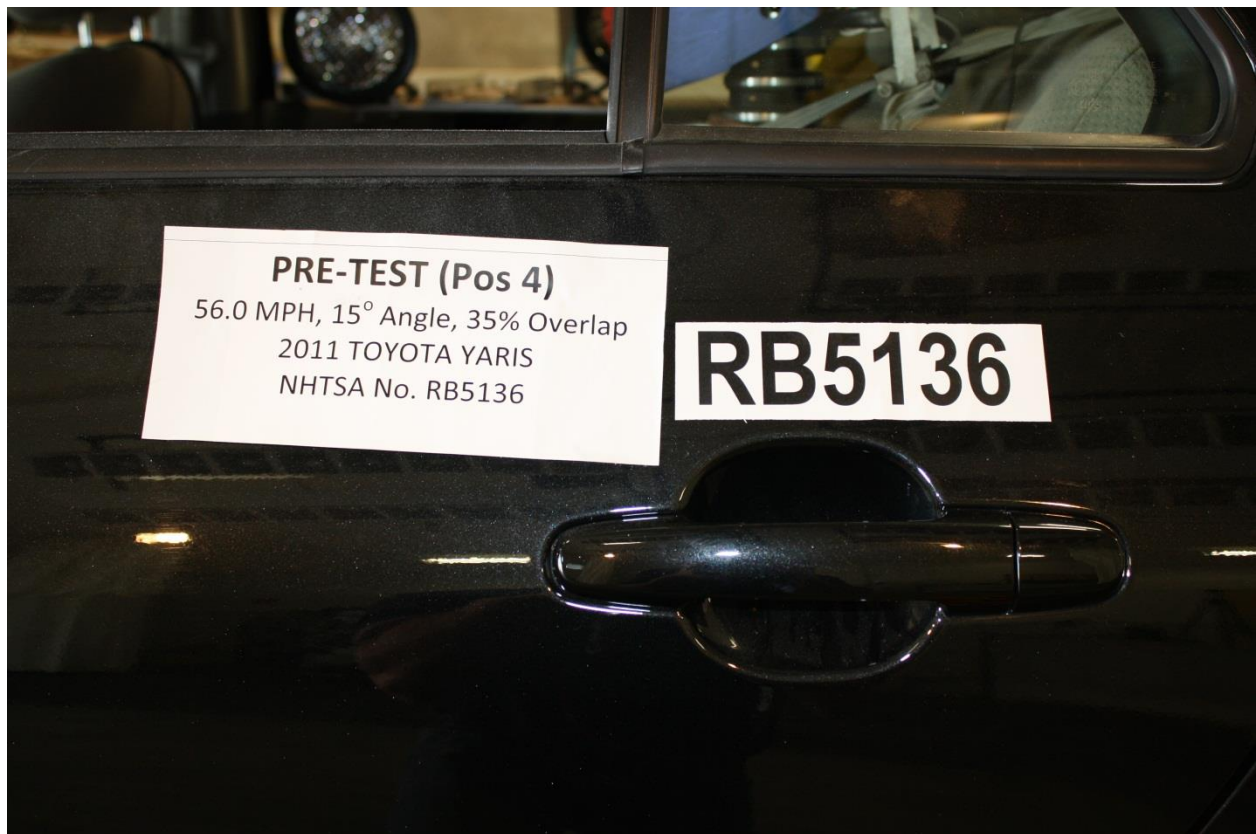
No. 023 Post-Test Close-up View of Impact Point



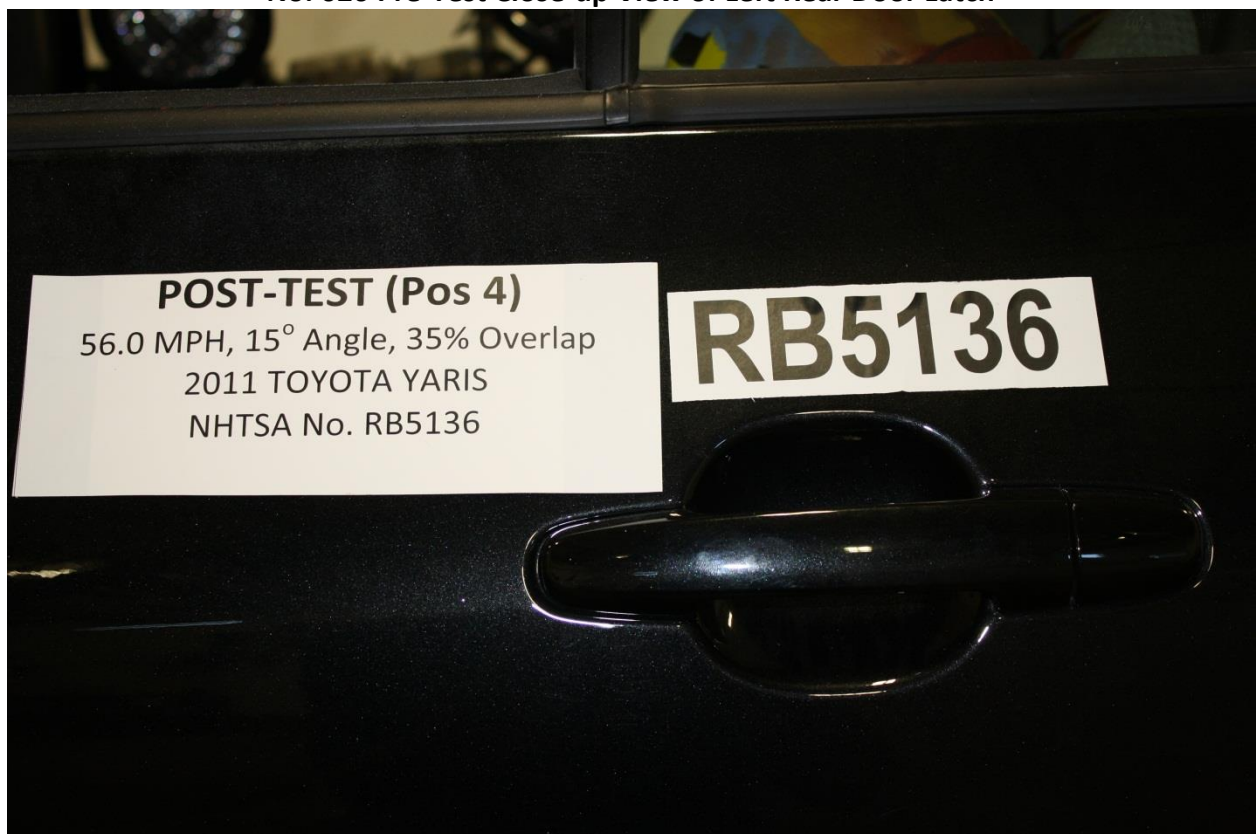
No. 024 Pre-Test Close-up View of Left Front Door Latch



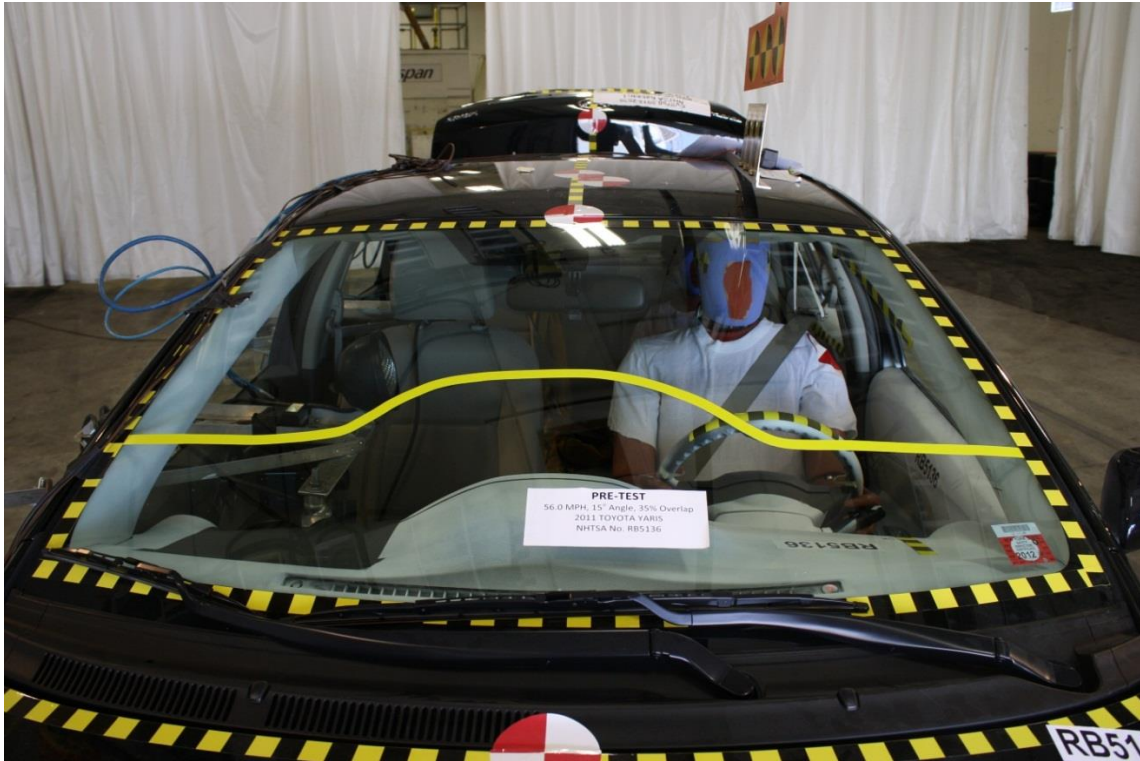
No. 025 Post-Test Close-up View of Left Front Door Latch



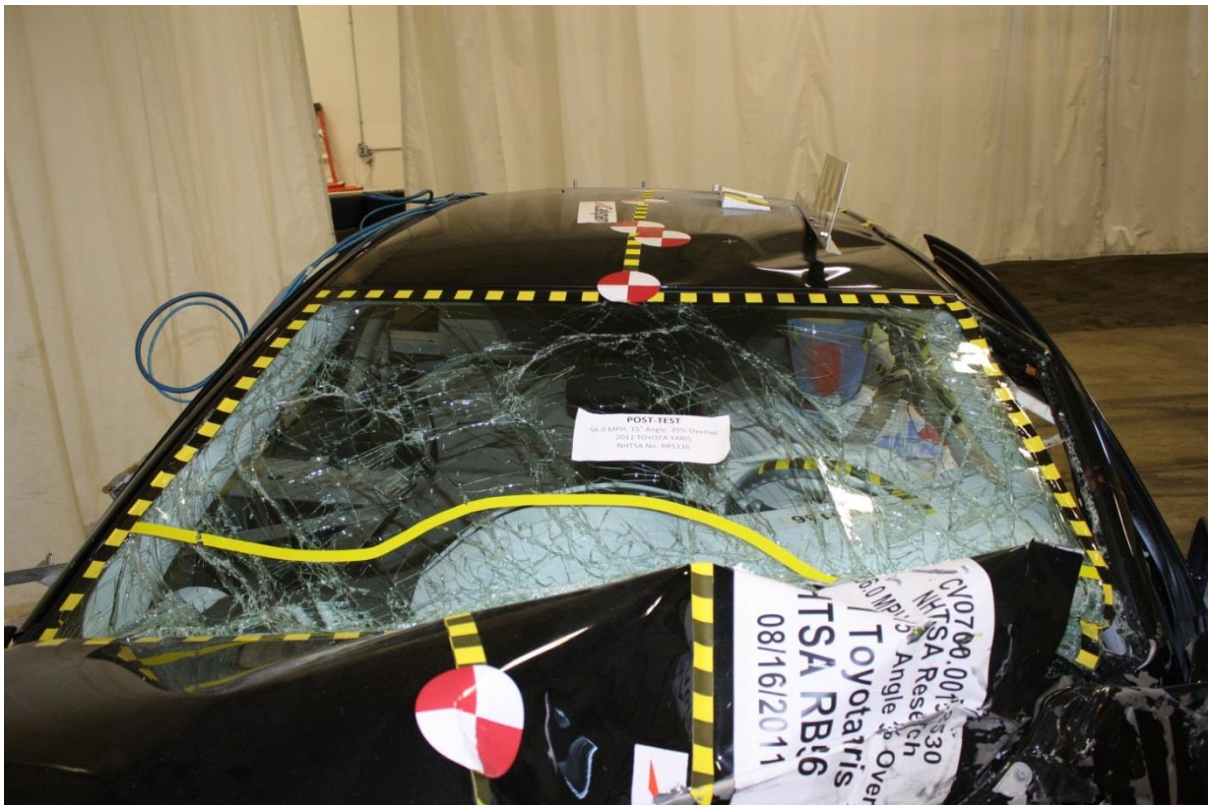
No. 026 Pre-Test Close-up View of Left Rear Door Latch



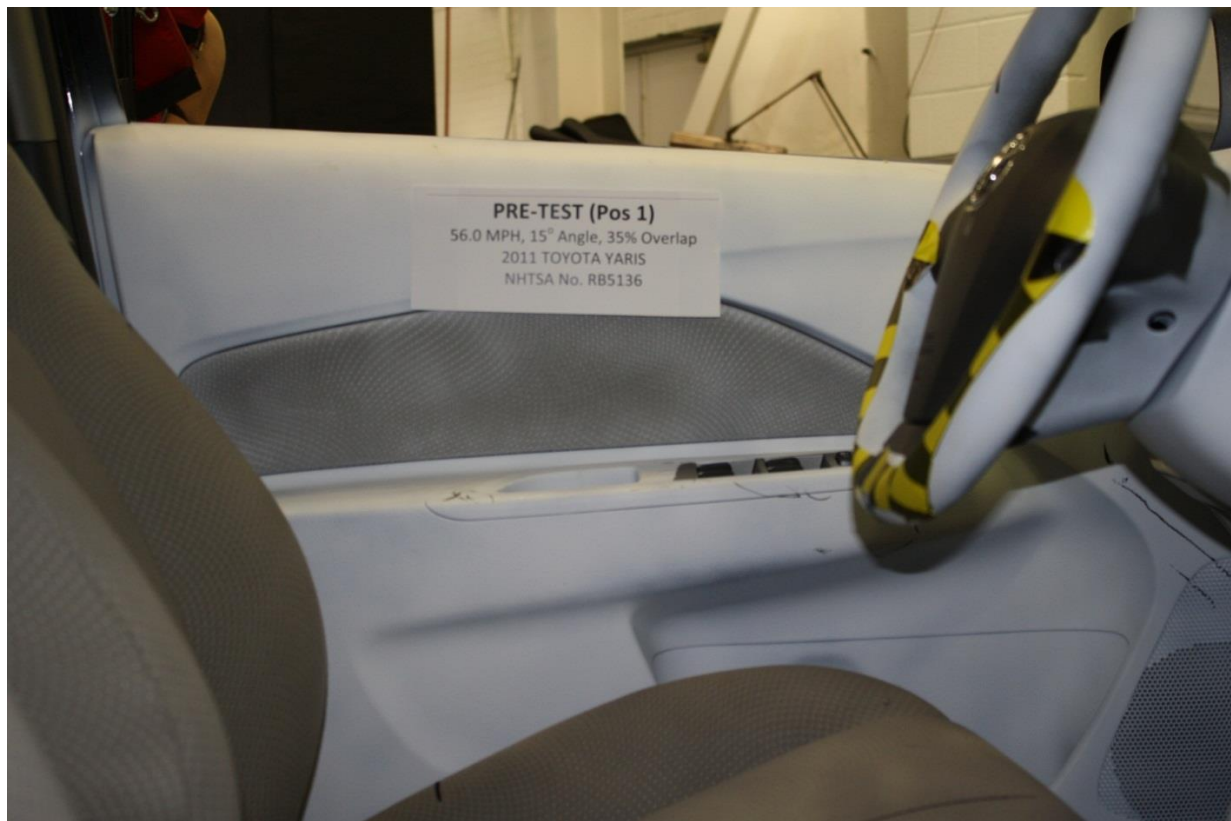
No. 027 Post-Test Close-up View of Left Rear Door Latch



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



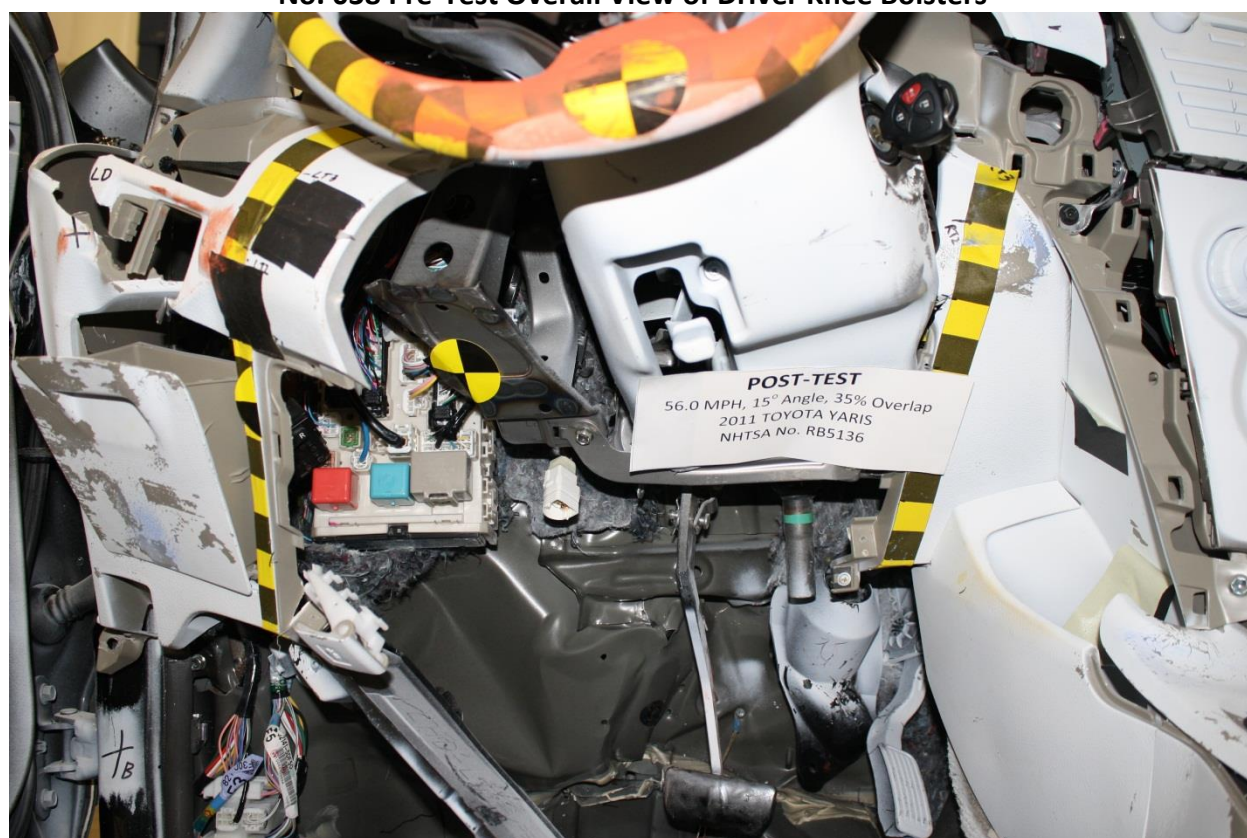
No. 035 Pre-Test Frontal View of Driver Seat back



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

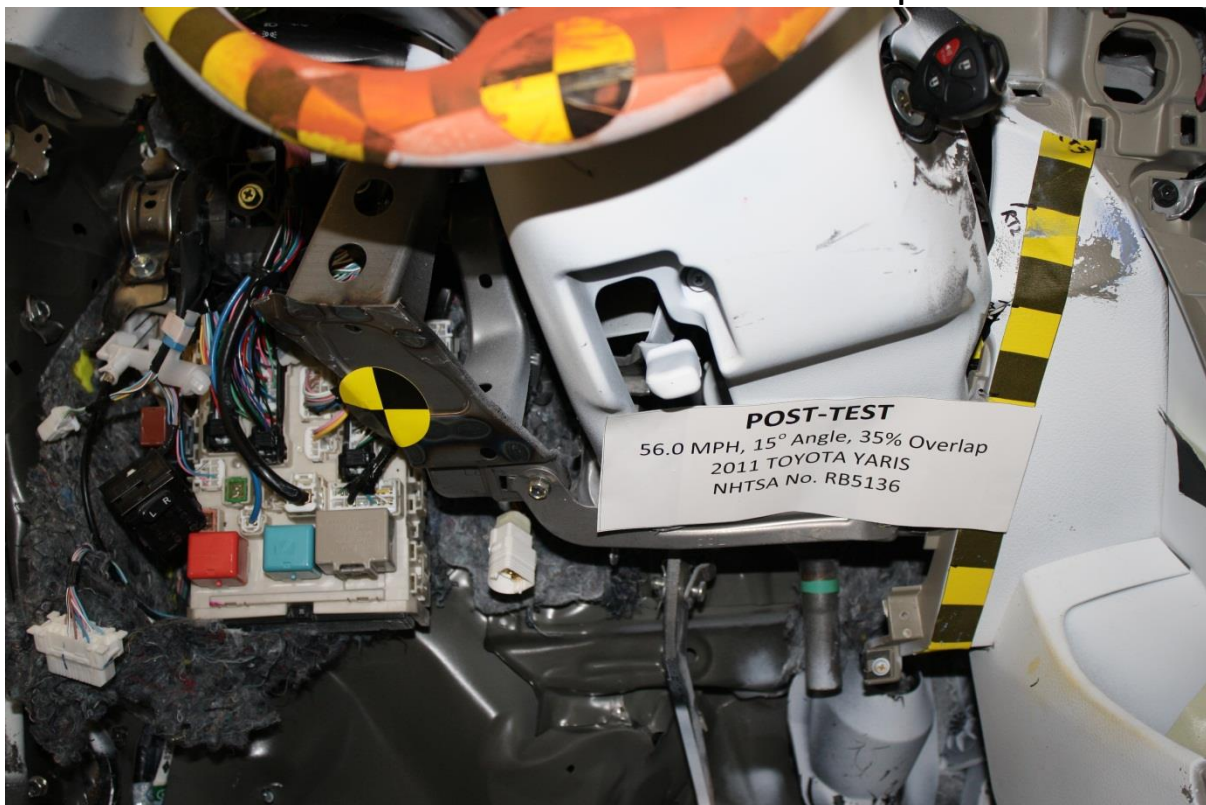


No. 037 Pre-Test Frontal View of Left Rear Seat back





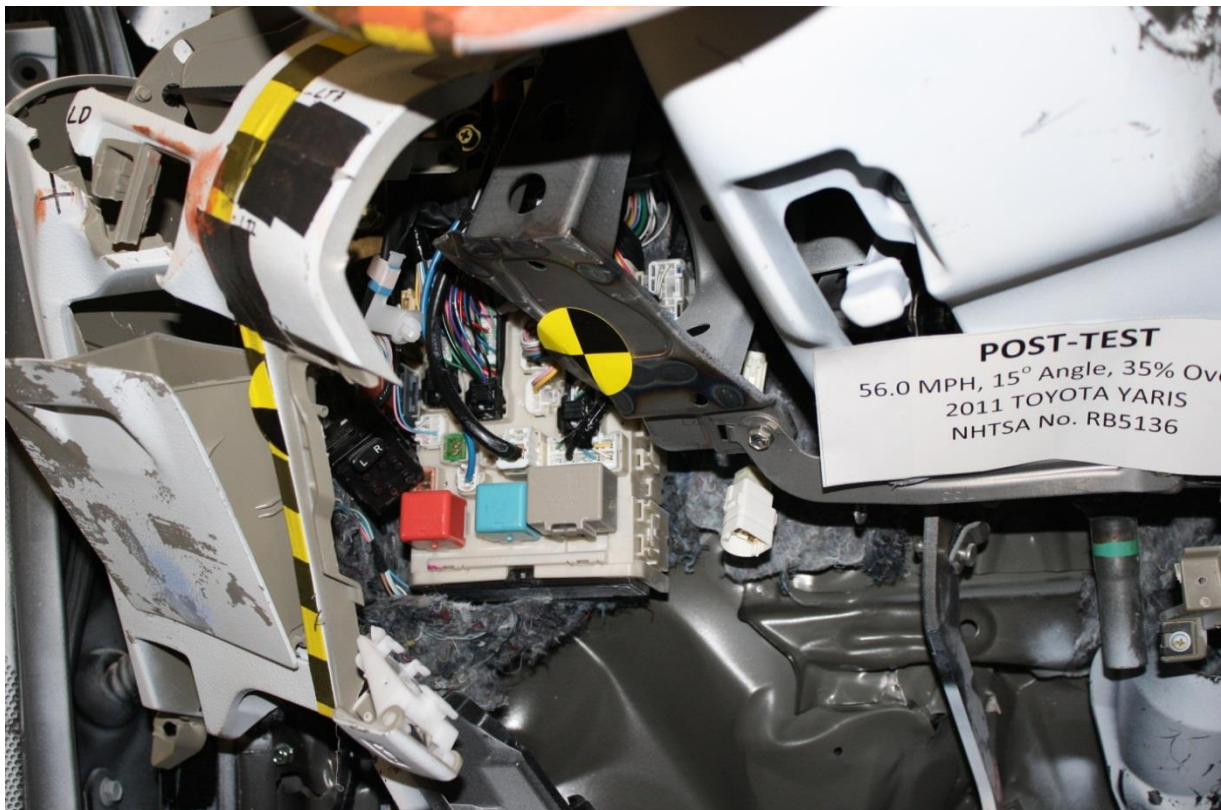
No. 040 Pre-Test Overall View of Driver Knee Bolsters with panel removed



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



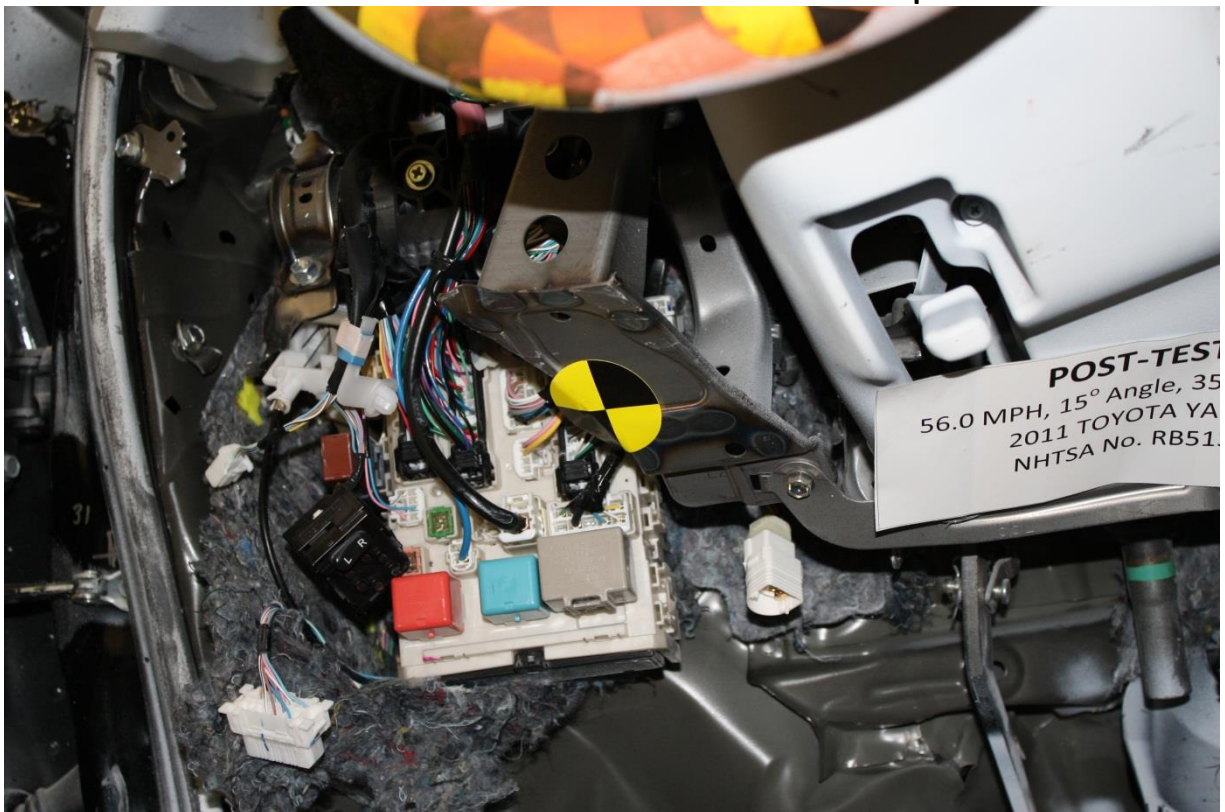
No. 042 Pre-Test Left Side View of Driver Knee Bolsters



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



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



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



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



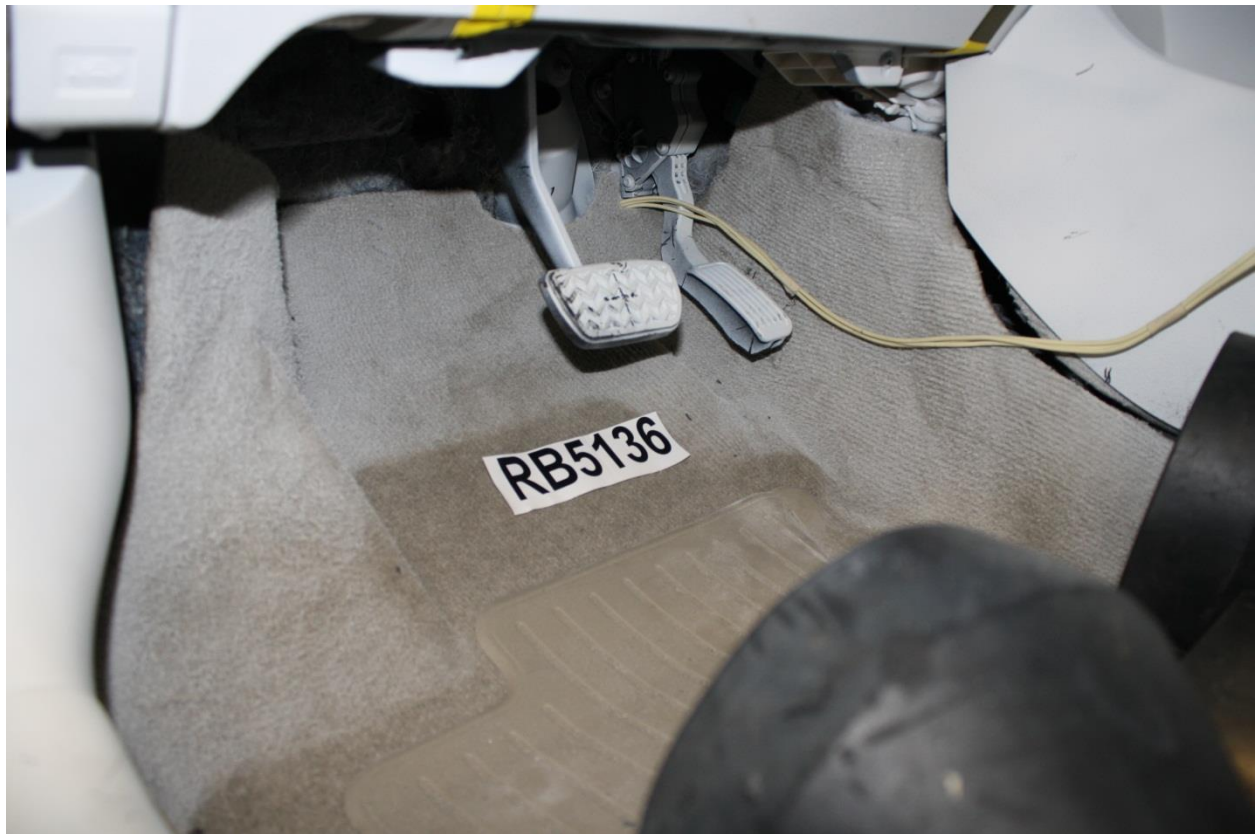
No. 047 Post-Test Right Side View of Driver Knee Bolsters



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



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



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



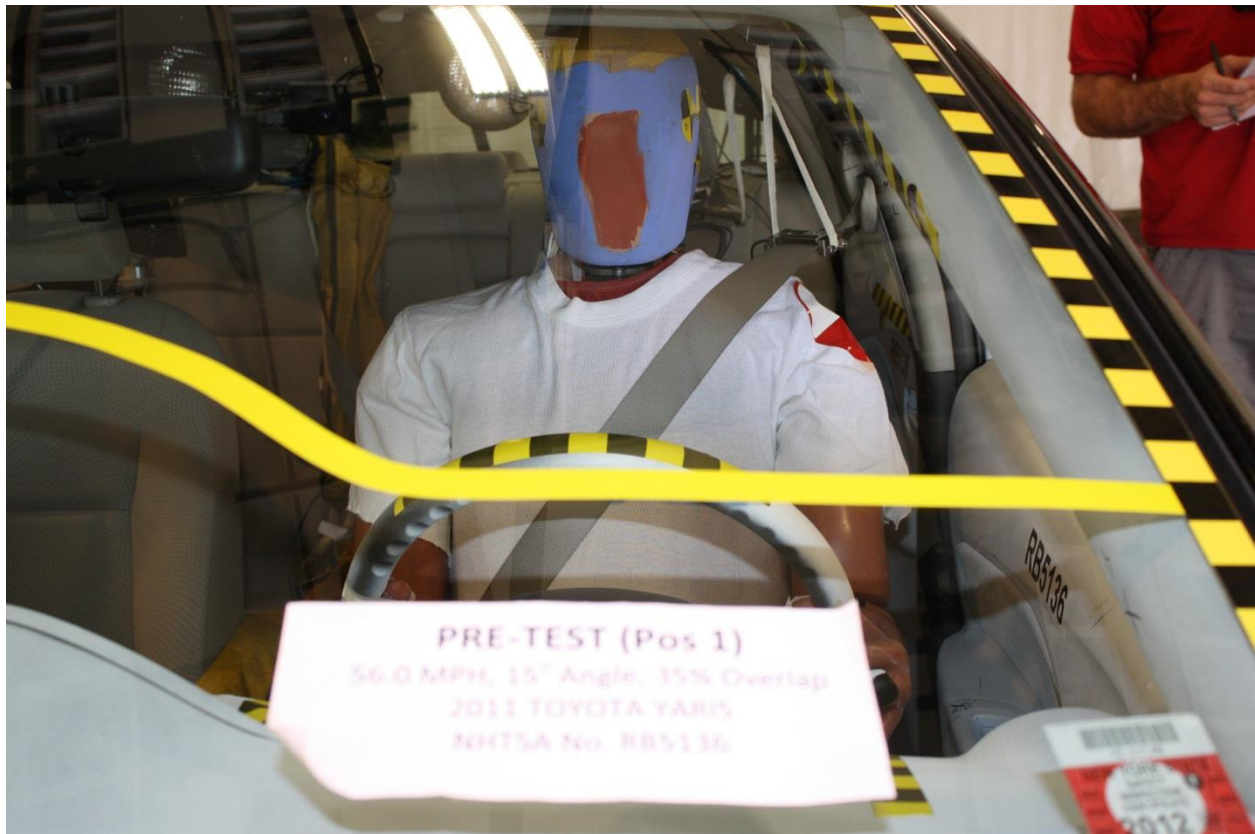
No. 051 Post-Test View of Driver Floor pan at Left sill level



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



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



No. 054 Pre-Test Driver Dummy Front Windshield View



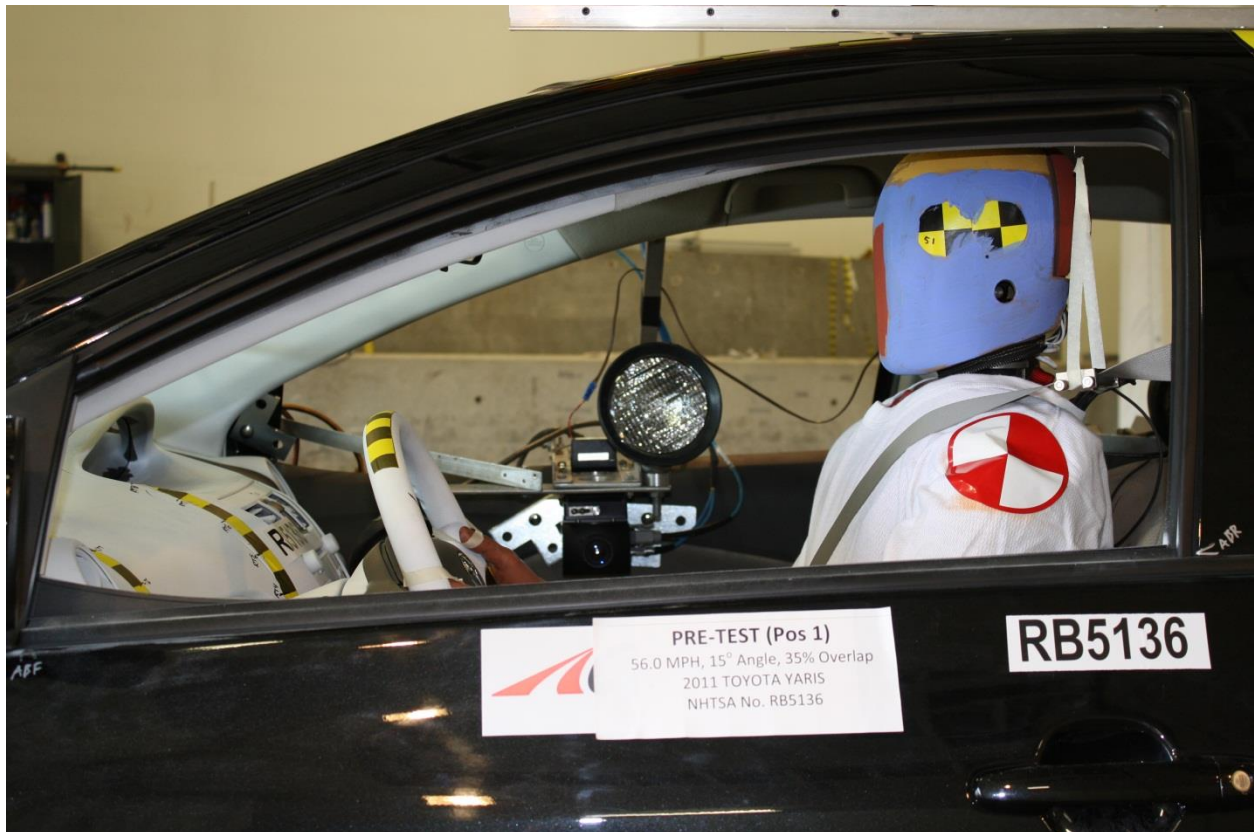
No. 055 Post-Test Driver Dummy Front Windshield View



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



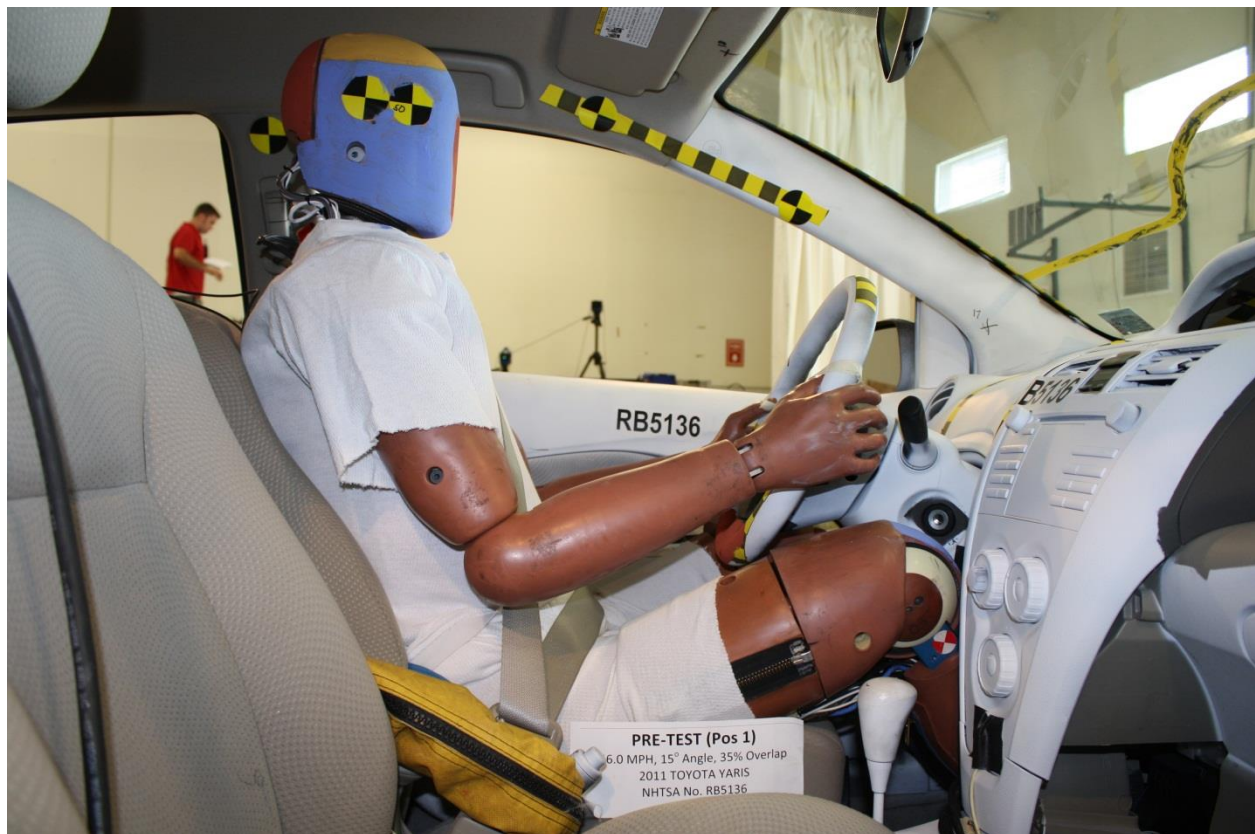
No. 057 Post-Test Left Side View of Driver Dummy and Interior



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



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



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



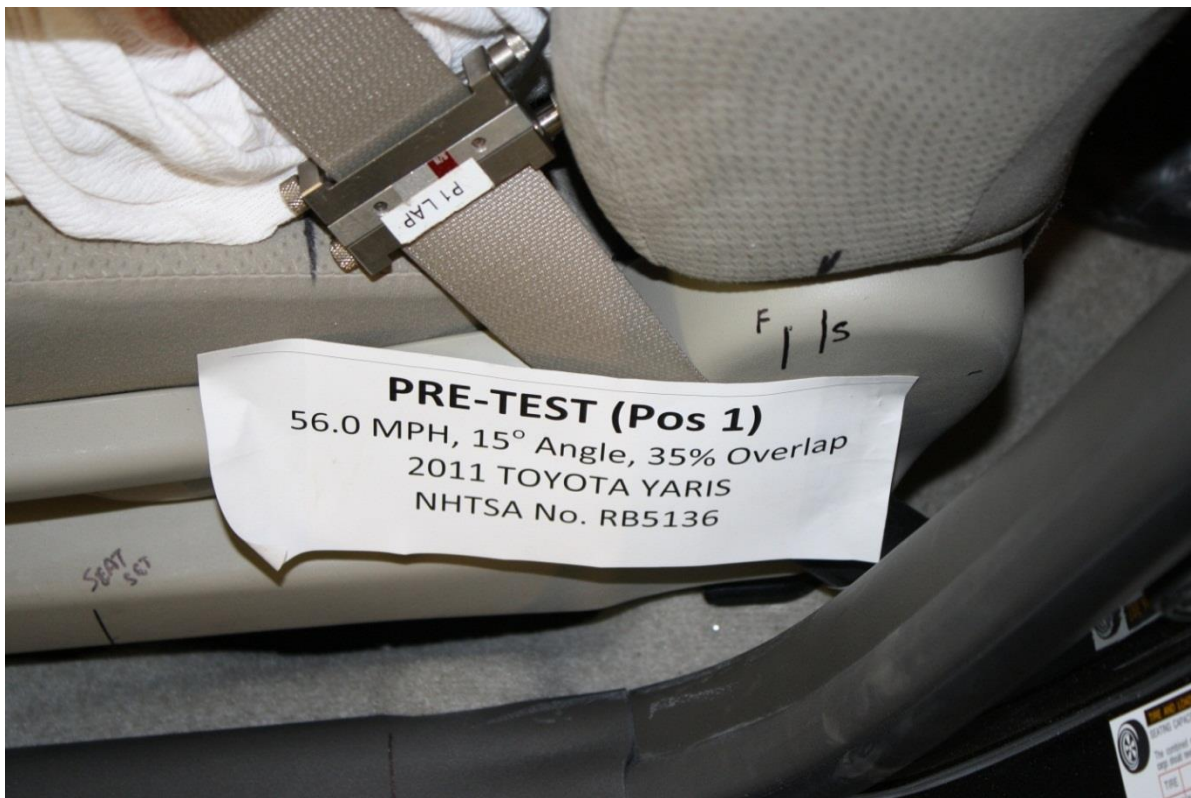
No. 061 Post-Test Right Side View of Driver Dummy and Interior



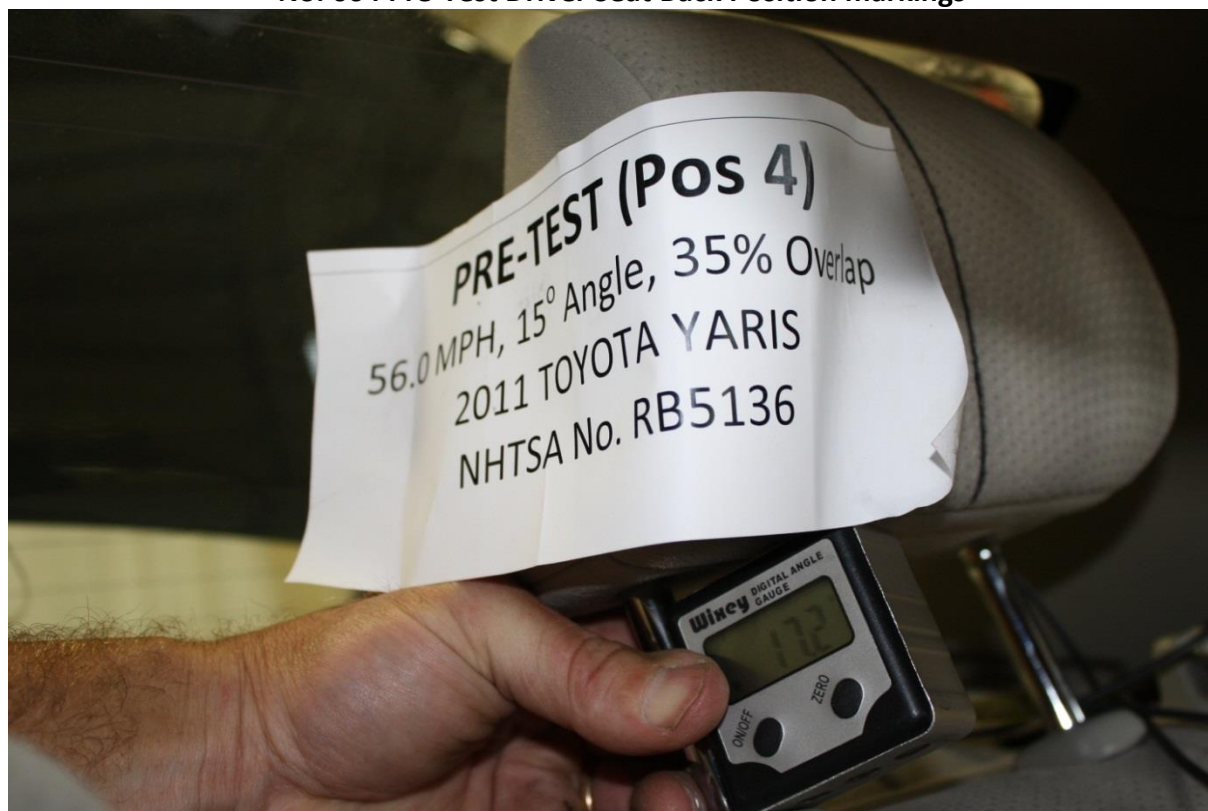
No. 062 Pre-Test View of Driver Dummy Door Clearance



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



No. 064 Pre-Test Driver Seat Back Position markings



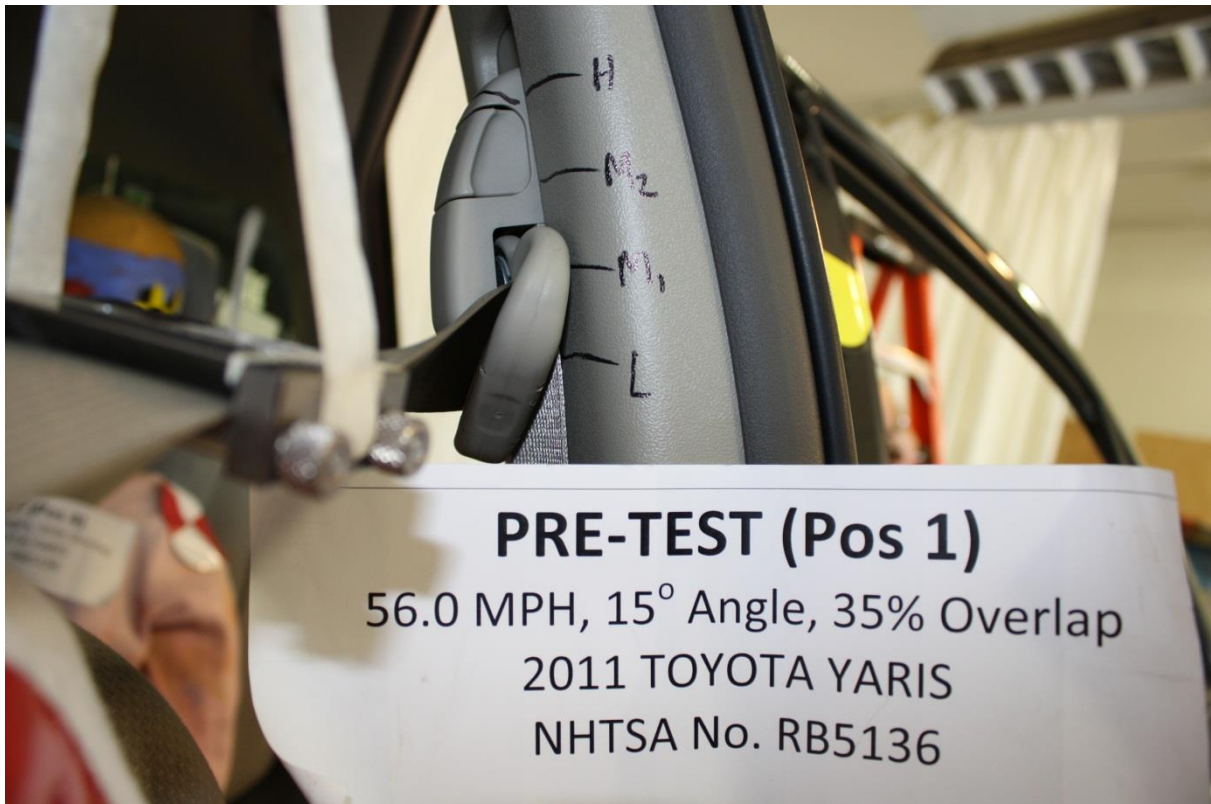
No. 065 Pre-Test Driver Seat Back Position with Level or Inclinator



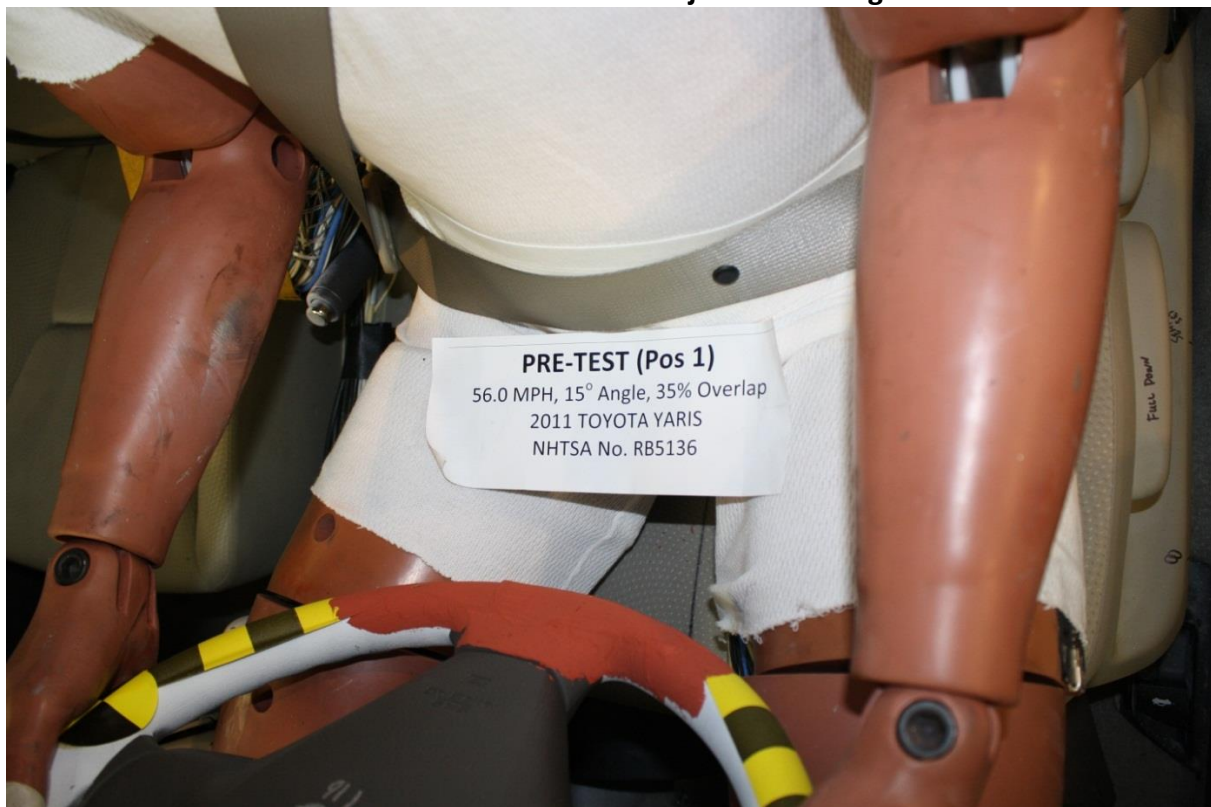
No. 066 Pre-Test Driver Seat Fore Aft Markings



No. 067 Post-Test Driver Seat Fore Aft Markings



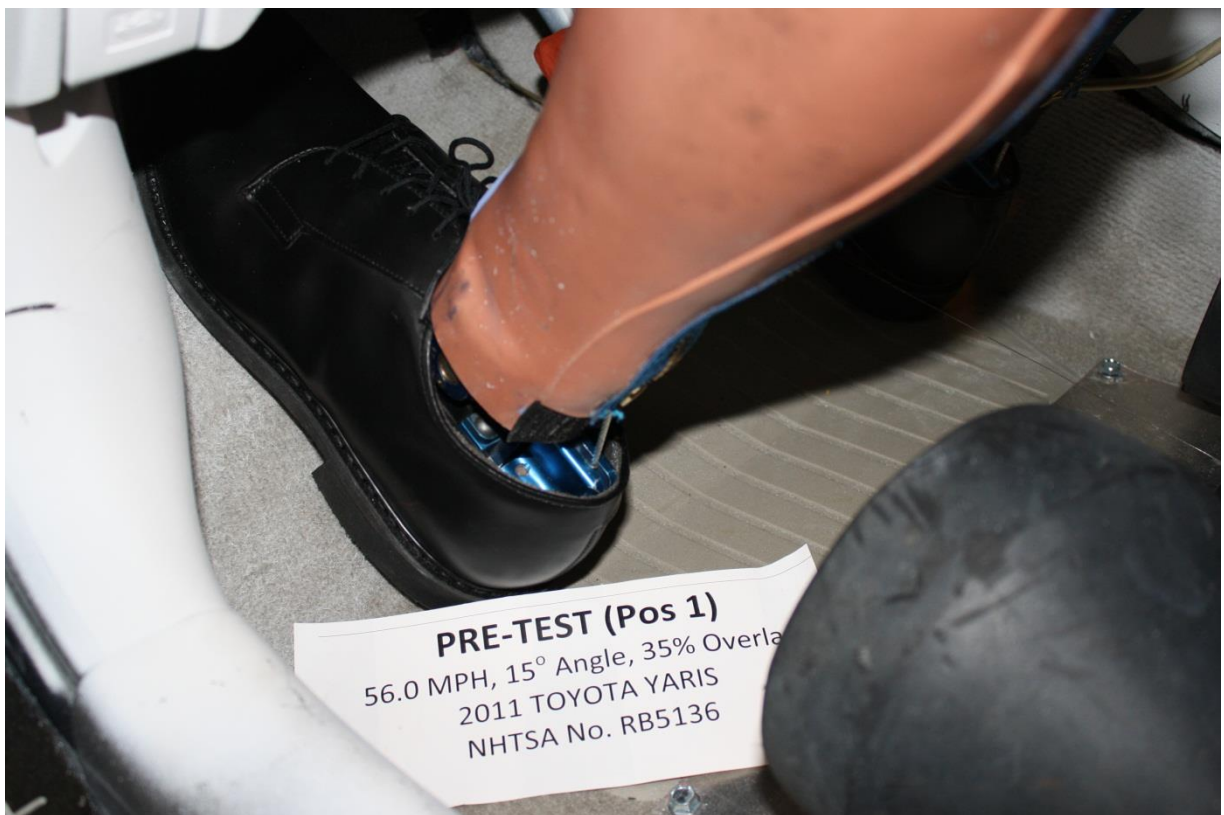
No. 068 Pre-Test Driver Adjustable D-ring



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



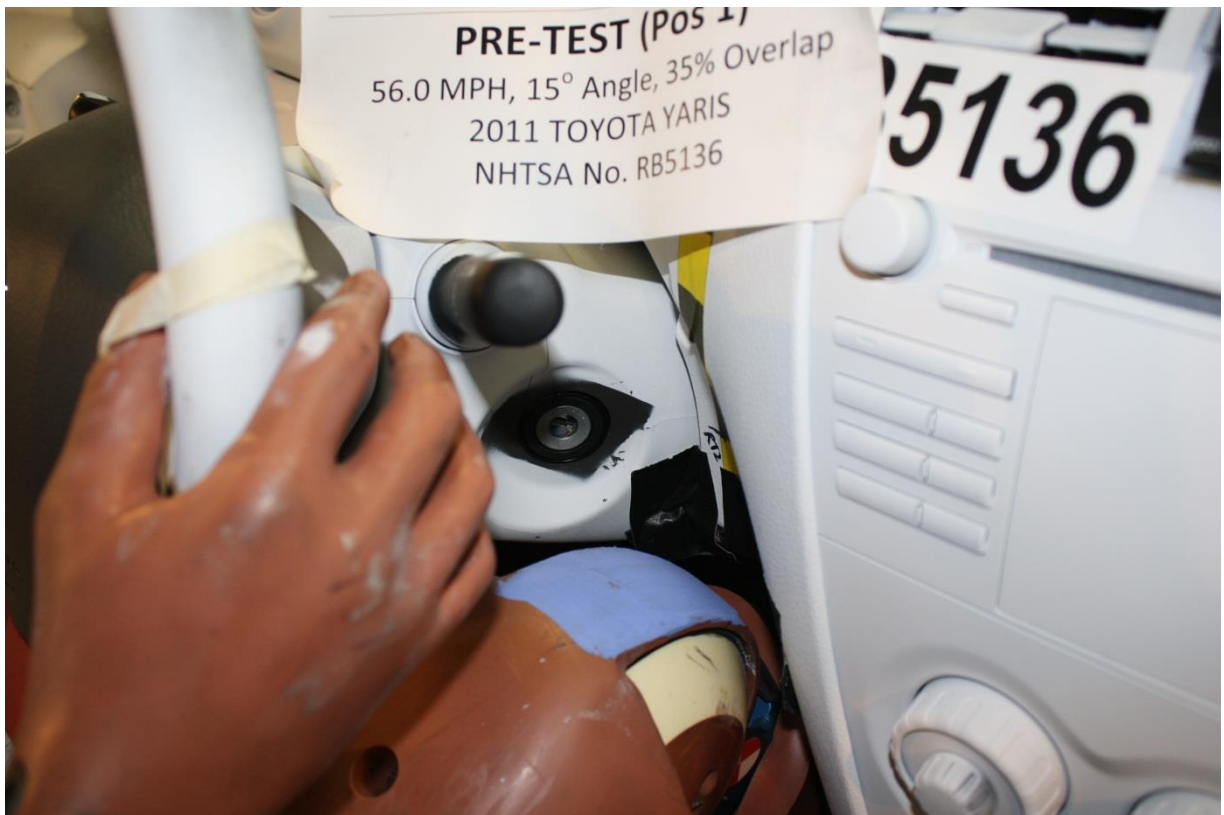
No. 070 Pre-Test View of Parking Brake



No. 071 Pre-Test Driver Dummy Feet



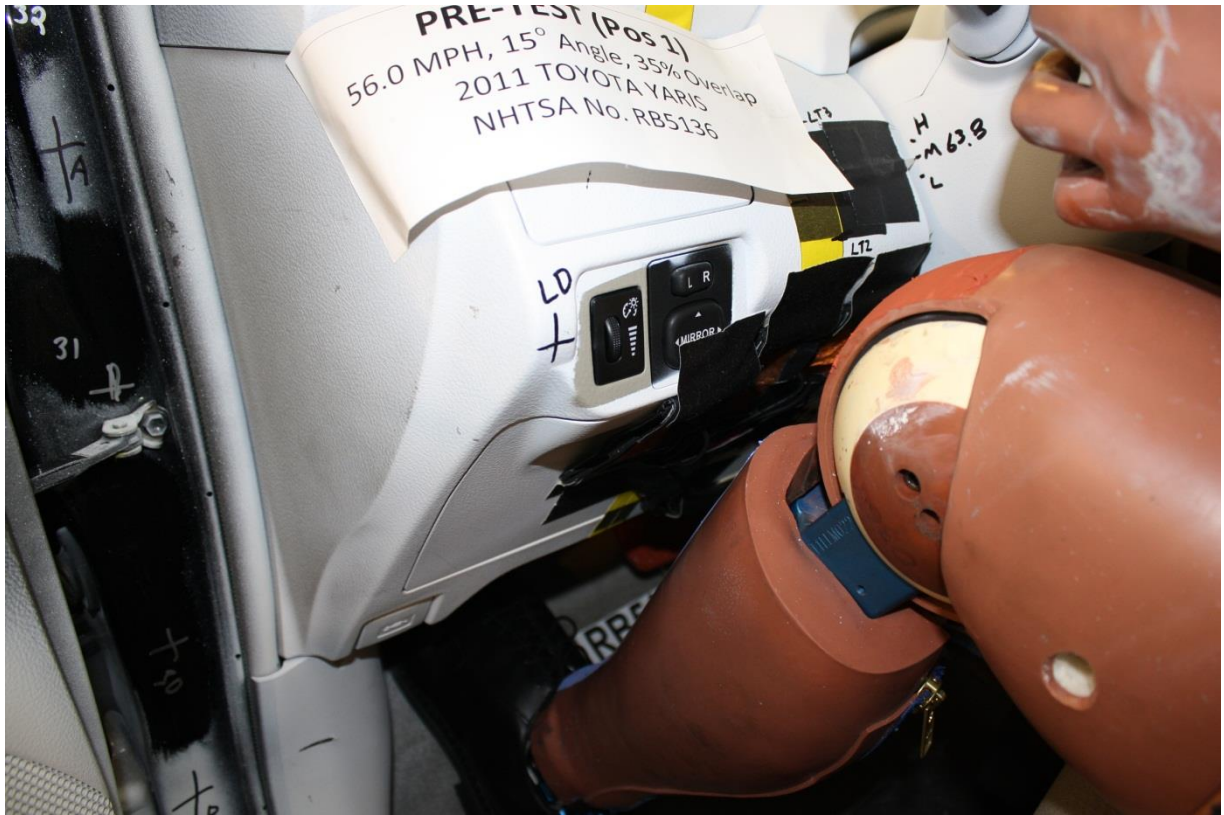
No. 072 Post-Test Driver Dummy Feet



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



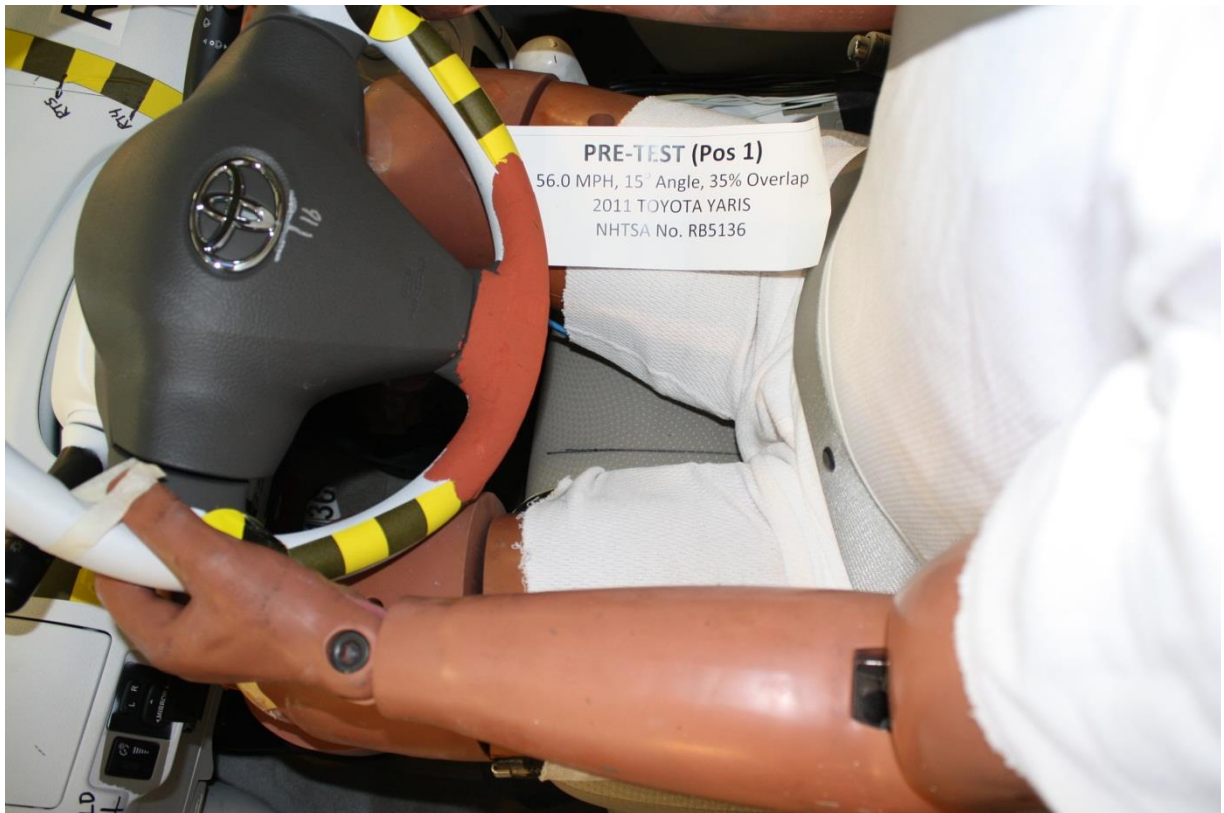
No. 074 Post-Test View of Driver Dummy Right Knee and Bolster



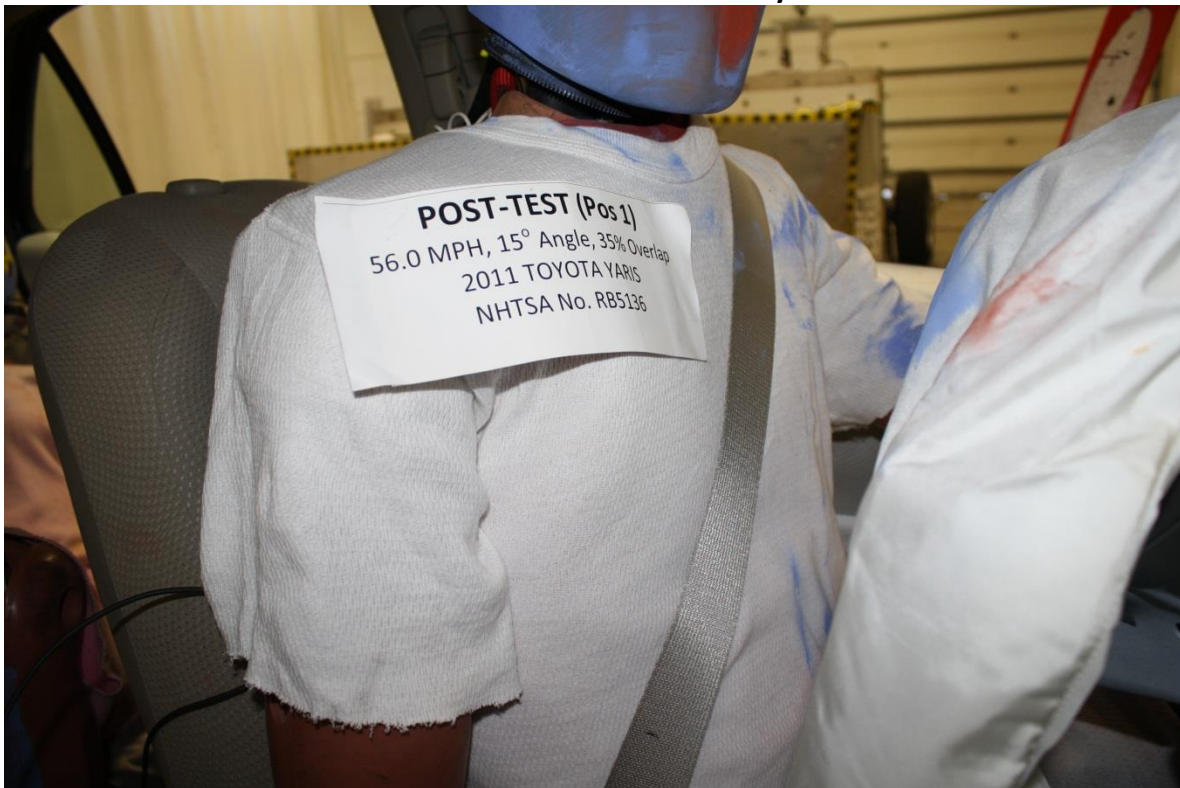
No. 075 Pre-Test View of Driver Dummy Left Knee and Bolster



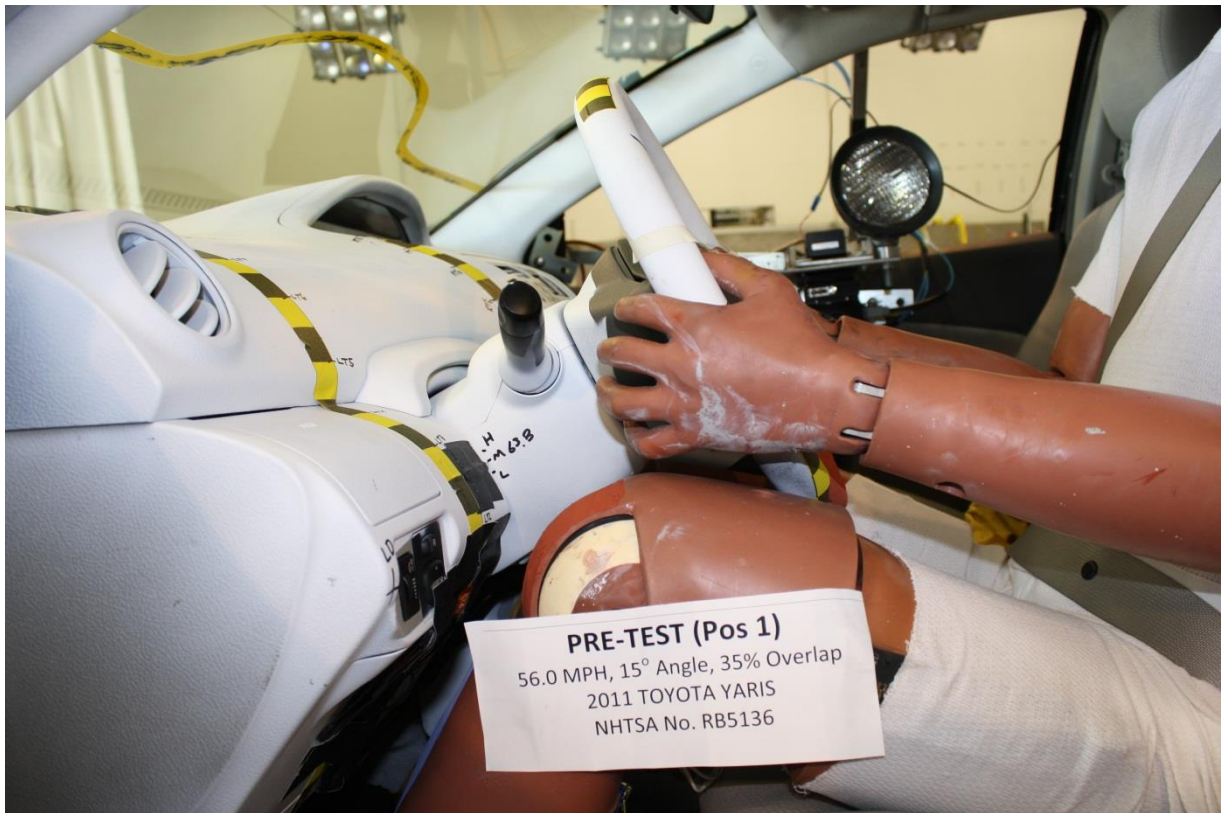
No. 076 Post-Test View of Driver Dummy Left Knee and Bolster



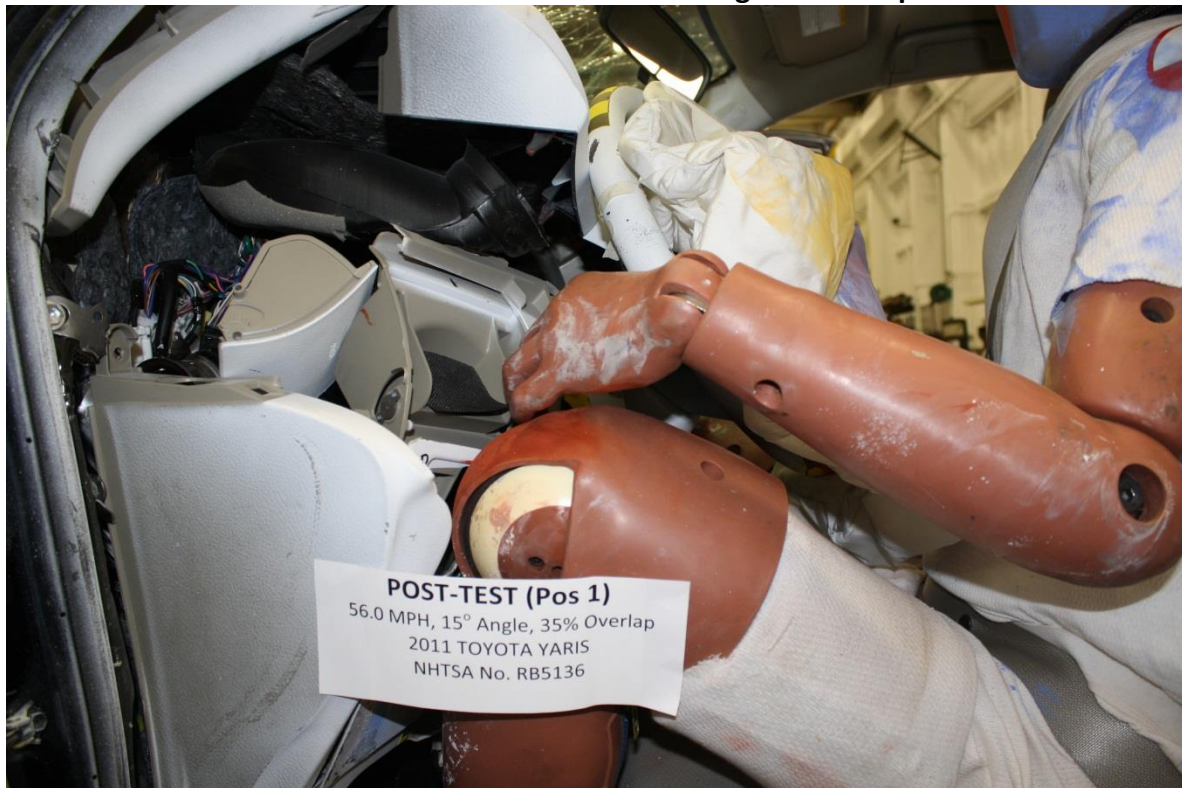
No. 077 Pre-Test View of Driver Dummy Abdomen



No. 078 Post-Test View of Driver Dummy Abdomen



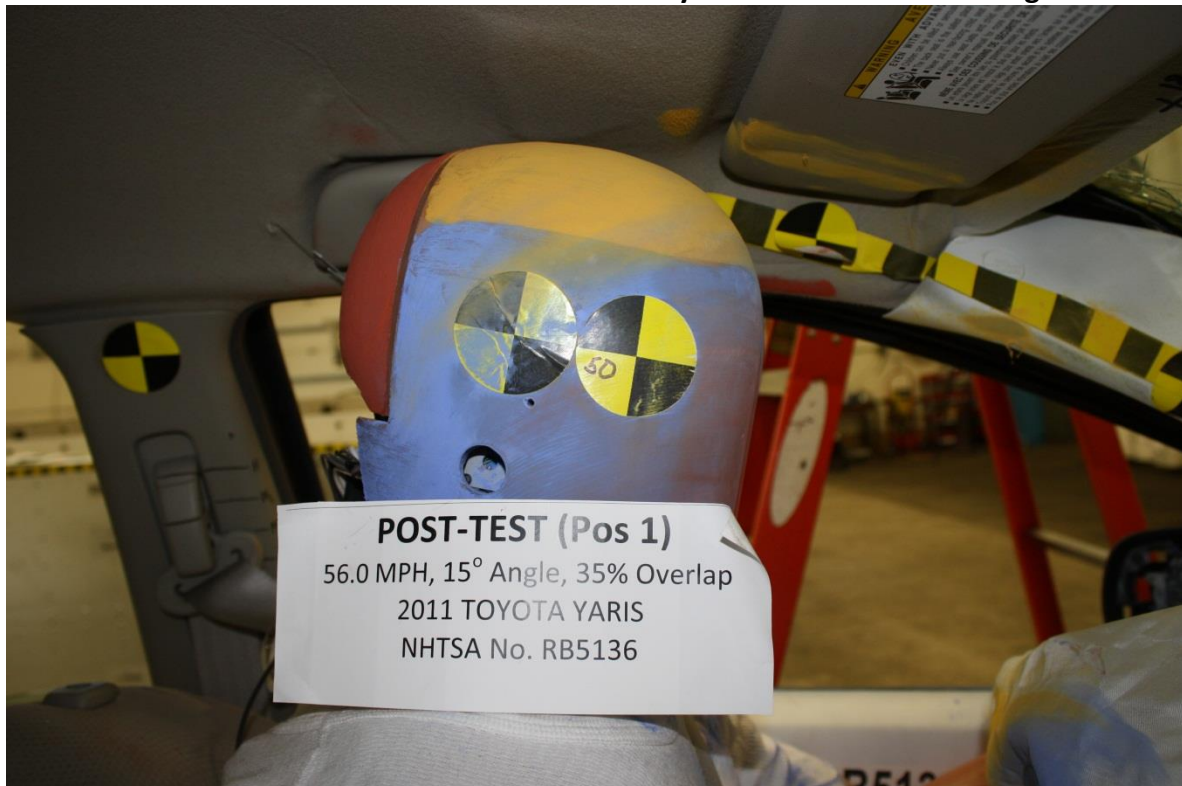
No. 079 Pre-Test Left Side View of Steering Wheel set position



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



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



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



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



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



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



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



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



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



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



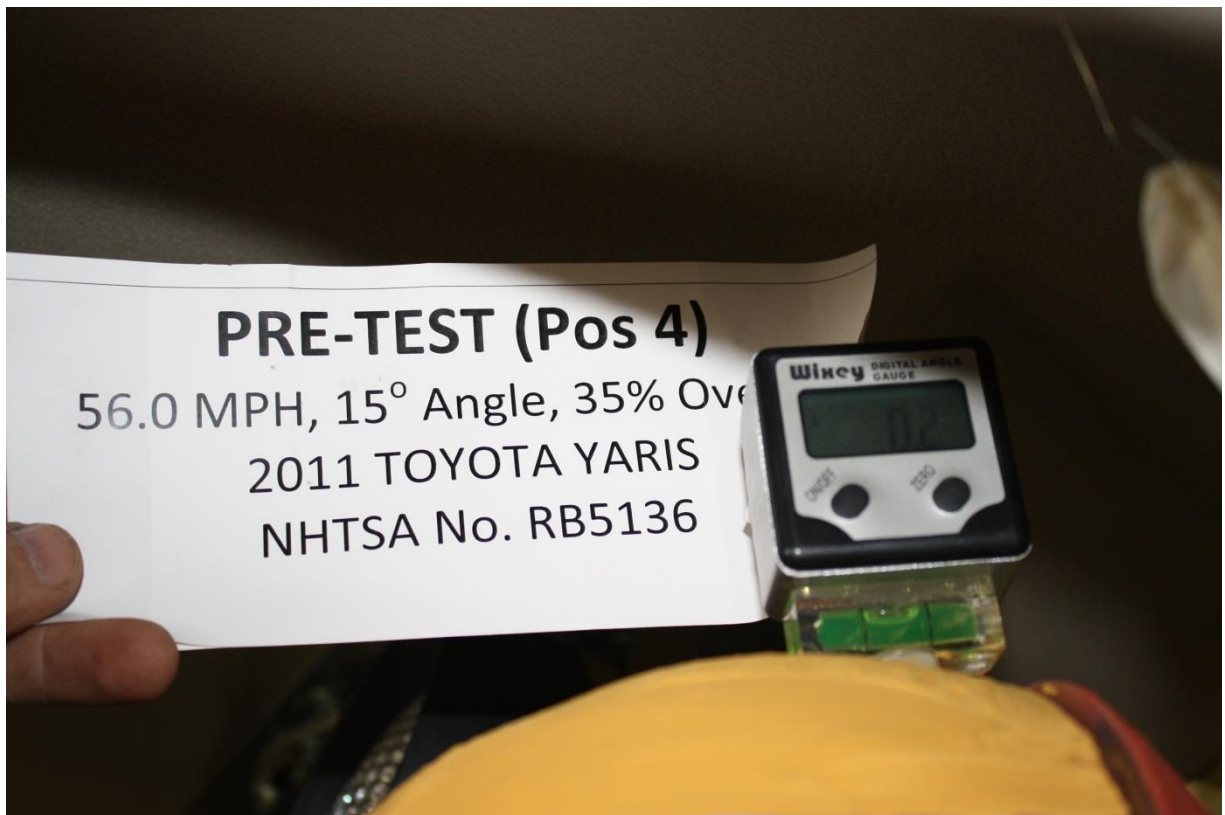
No. 090 Post-Test Right Side View of Passenger Dummy and Interior



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



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



No. 093 Pre-Test Passenger View Showing Head Level

Photo Not Applicable

P4 Seat not adjustable fore/aft

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

Photo Not Applicable

P4 Seat back angle not adjustable

No. 095 Pre-Test Passenger Seat Back Angle



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

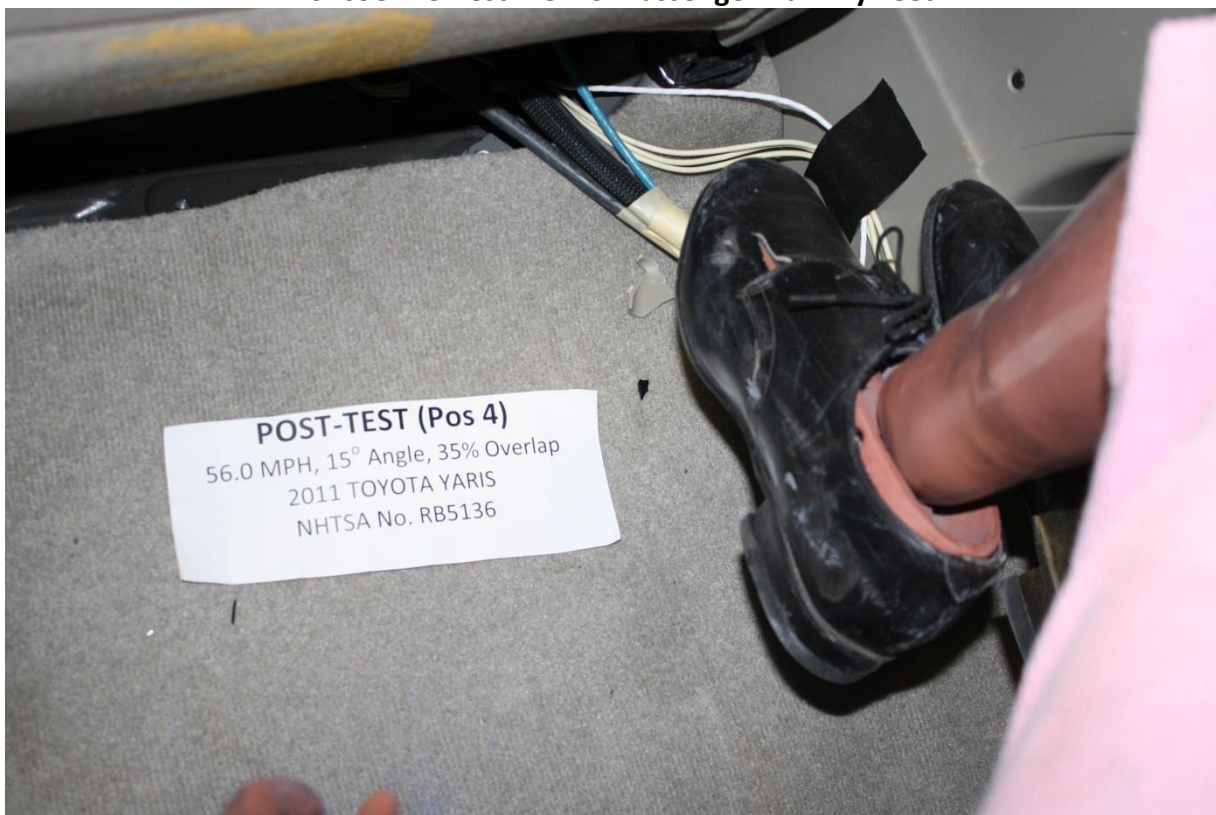
Photo Not Applicable

P4 D-ring not adjustable

No. 097 Pre-Test Passenger Adjustable D-ring



No. 098 Pre-Test View of Passenger Dummy Feet



No. 099 Post-Test View of Passenger Dummy Feet

Photo Not Applicable

No Rear Passenger 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)



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



No. 103 Pre-Test Ballast Locations



No. 104 Post-Test Speed Trap Readout



No. 105 Pre-Test View of Fuel Filler Cap



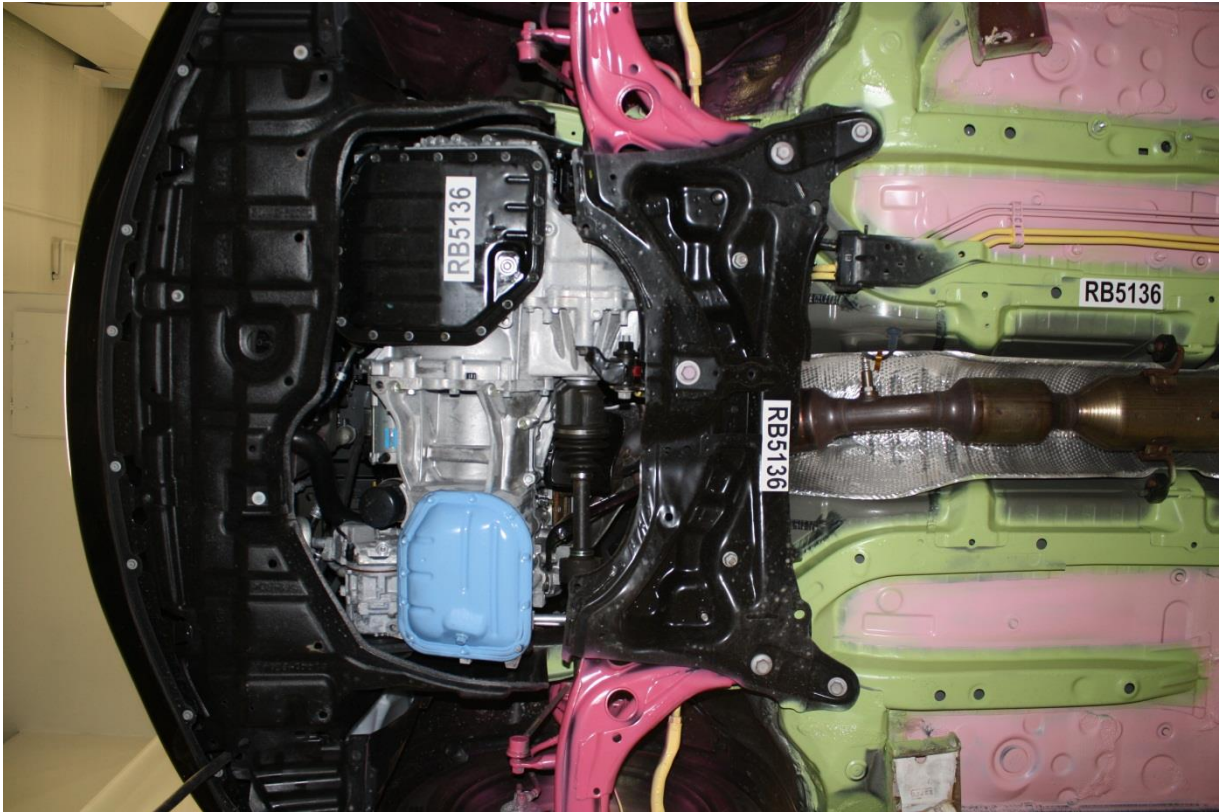
No. 106 Post-Test View of Fuel Filler Cap



No. 107 Pre-Test Engine Compartment View



No. 108 Post-Test Engine Compartment View



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



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



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



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



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



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



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



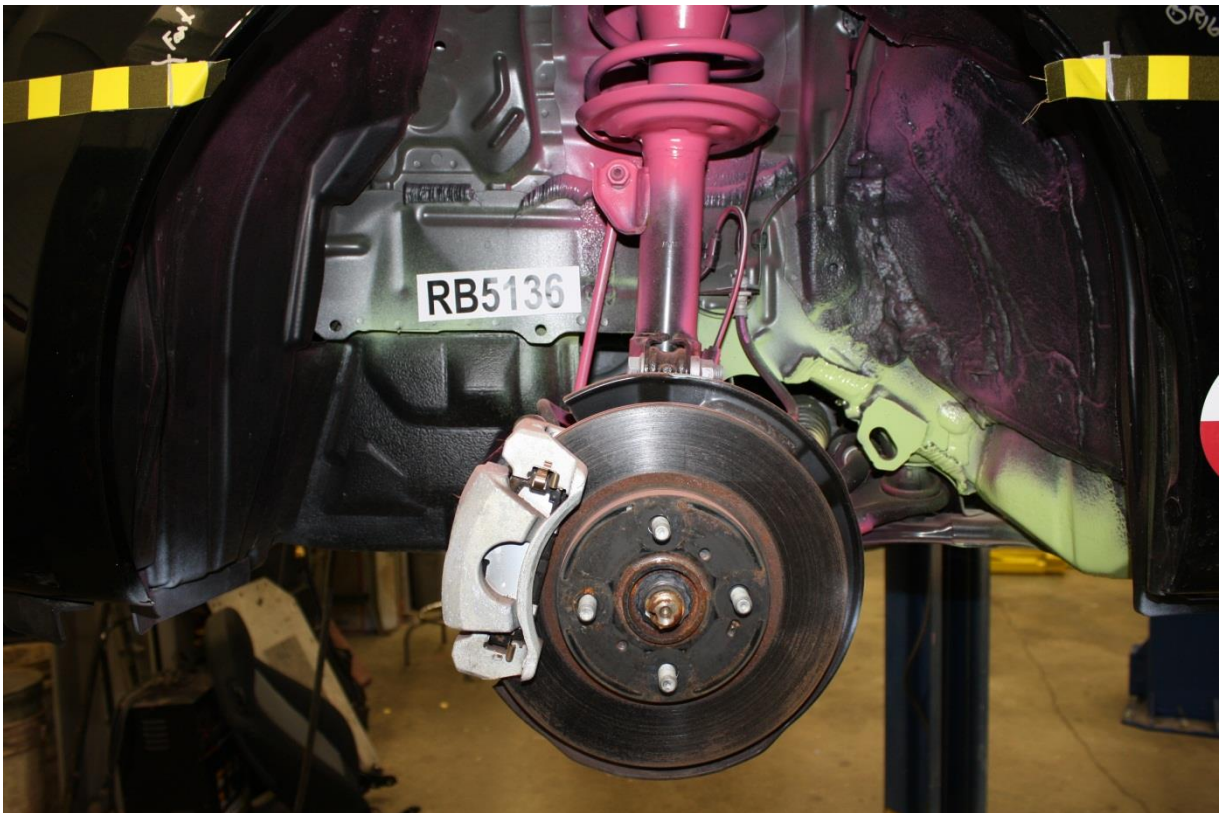
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No. 118 Post-Test Frame Rail with tire removed



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



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



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



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



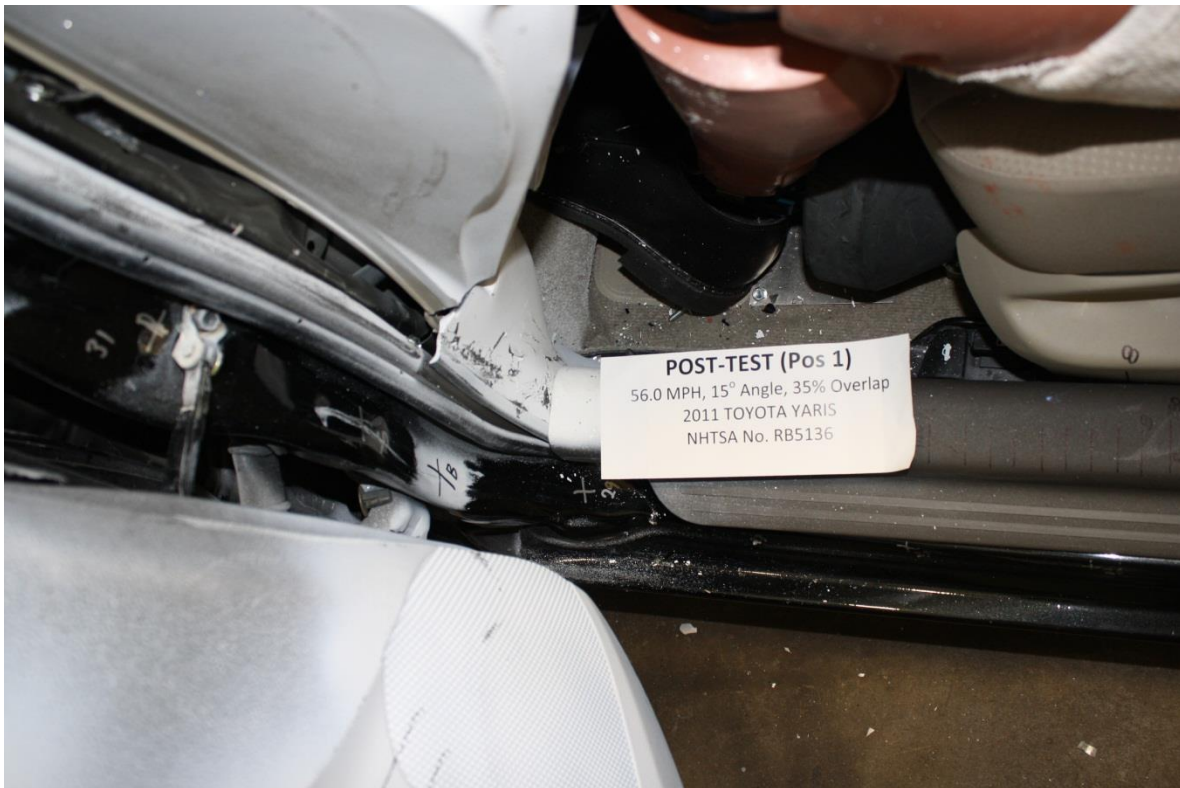
No. 123 Post-Test View of Deformation of B pillar



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



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



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



No. 127 Post-Test View of Windshield Separation



No. 128 Pre-Test Left Side View of RMDB



No. 129 Post-Test Left Side View of RMDB



No. 130 Pre-Test Right Side View of RMDB



No. 131 Post-Test Right Side View of RMDB



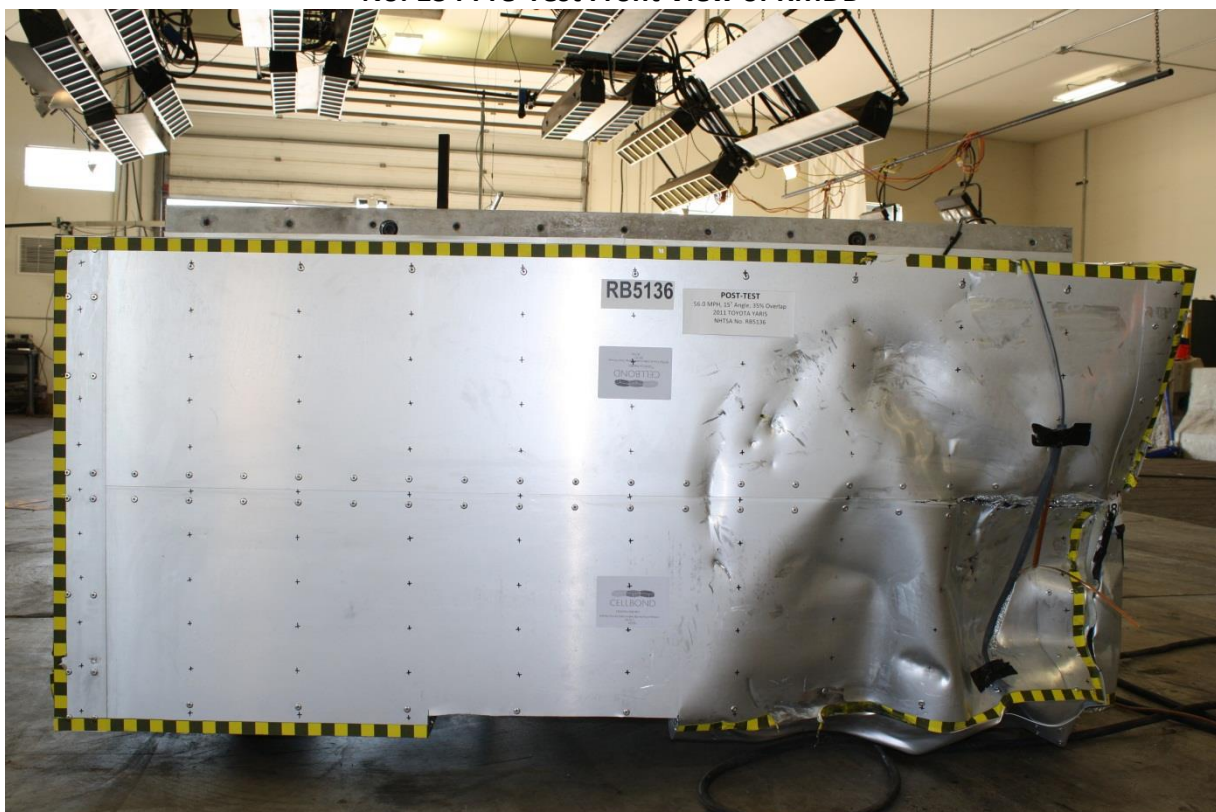
No. 132 Pre-Test Top View of RMDB



No. 133 Post-Test Top View of RMDB



No. 134 Pre-Test Front View of RMDB



No. 135 Post-Test Front View of RMDB



No. 136 Vehicle at 0 Degrees on Static Rollover Device



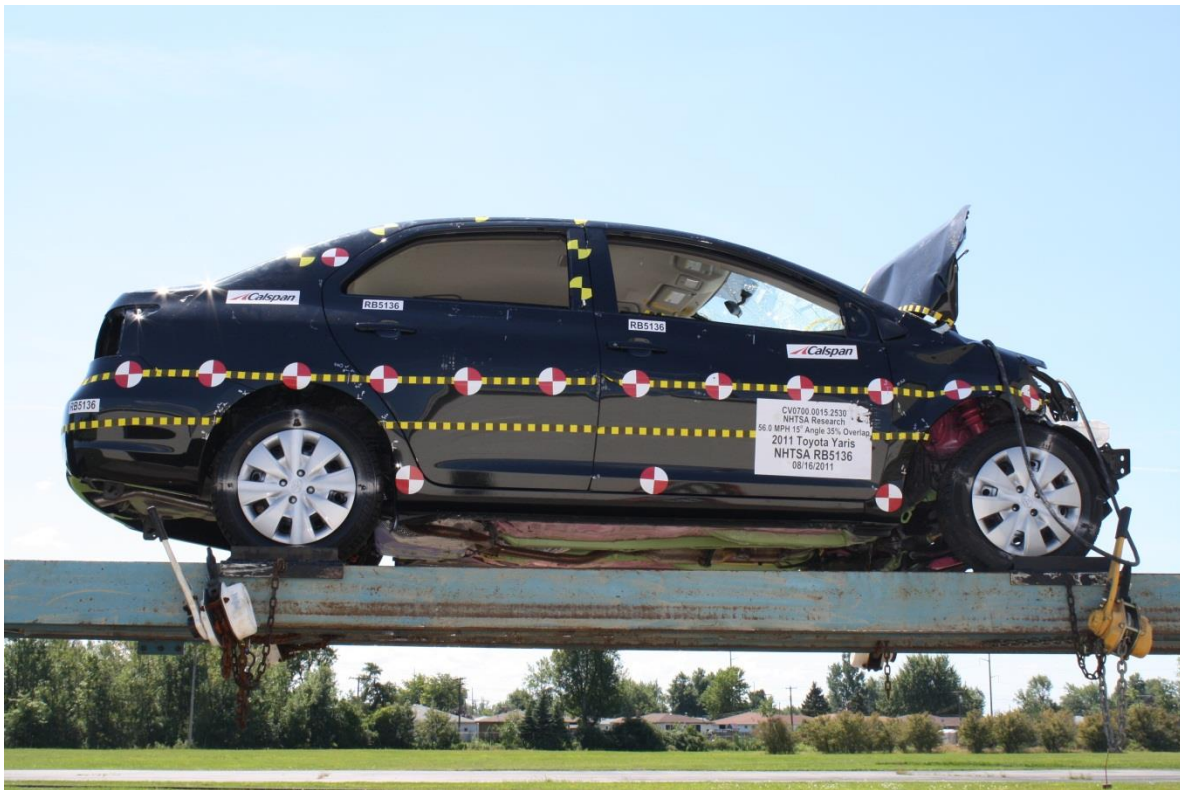
No. 137 Vehicle at 90 Degrees on Static Rollover Device



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No. 139 Vehicle at 270 Degrees on Static Rollover Device



No. 140 Vehicle at 360 Degrees on Static Rollover Device

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

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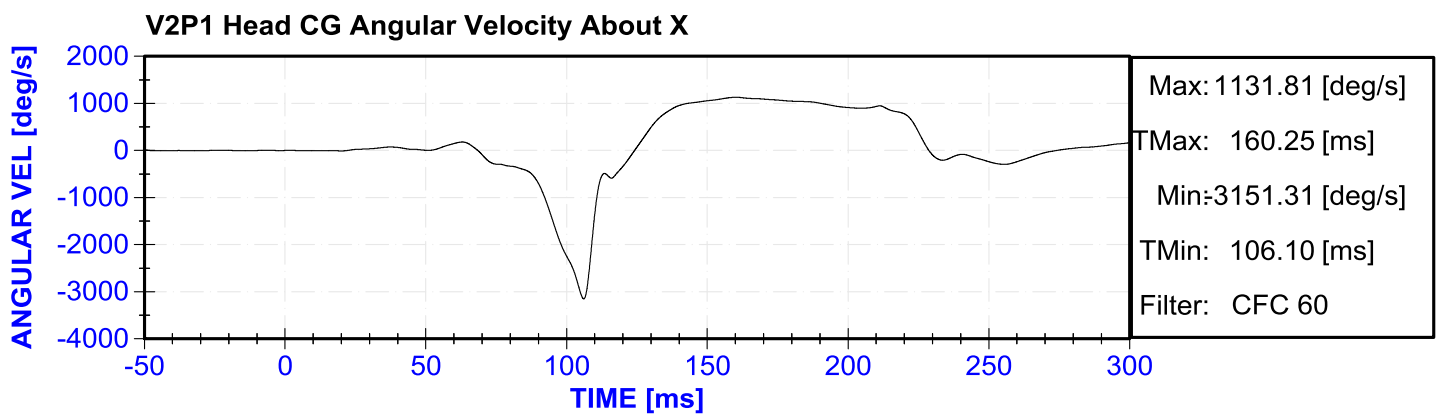
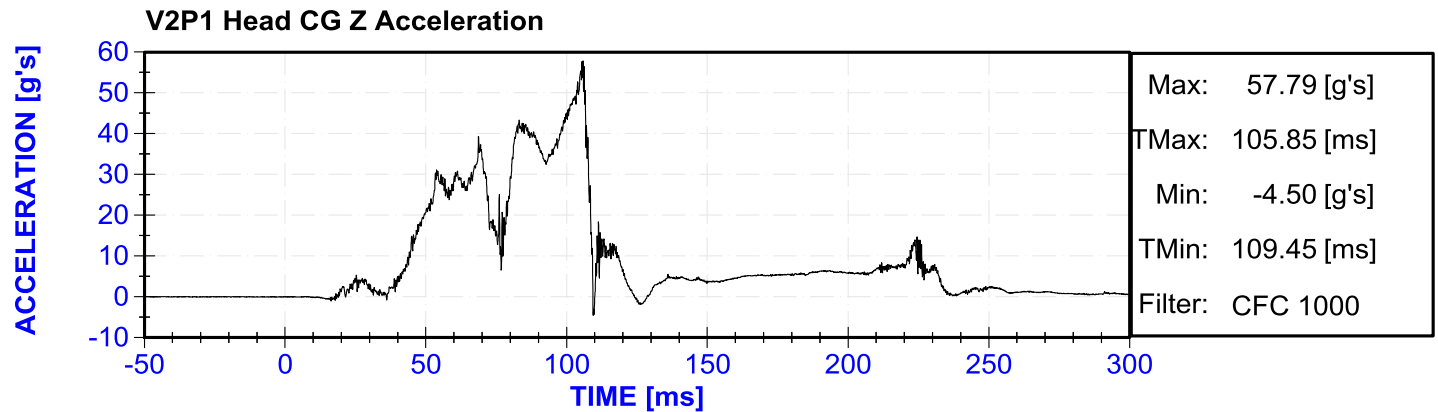
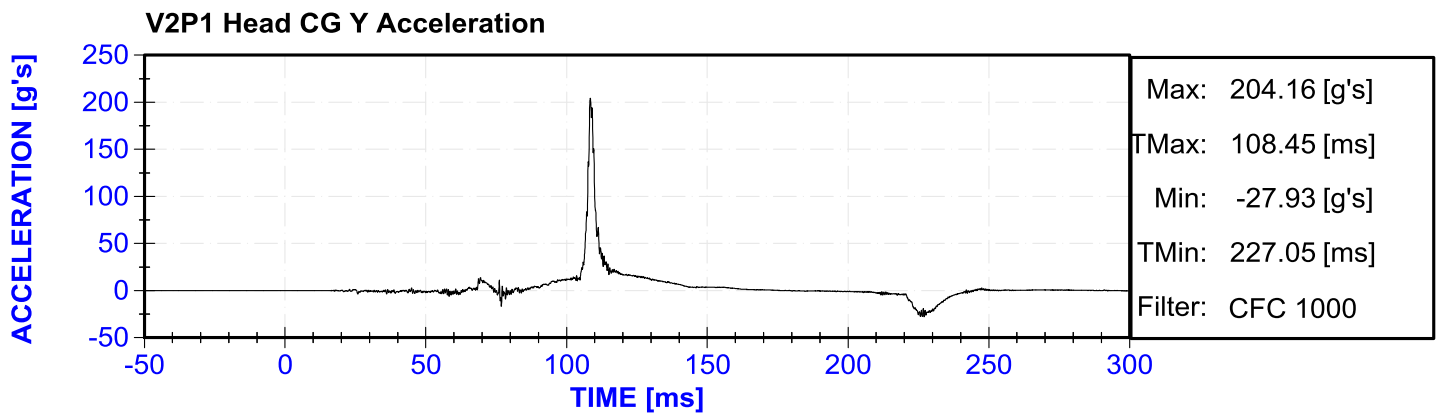
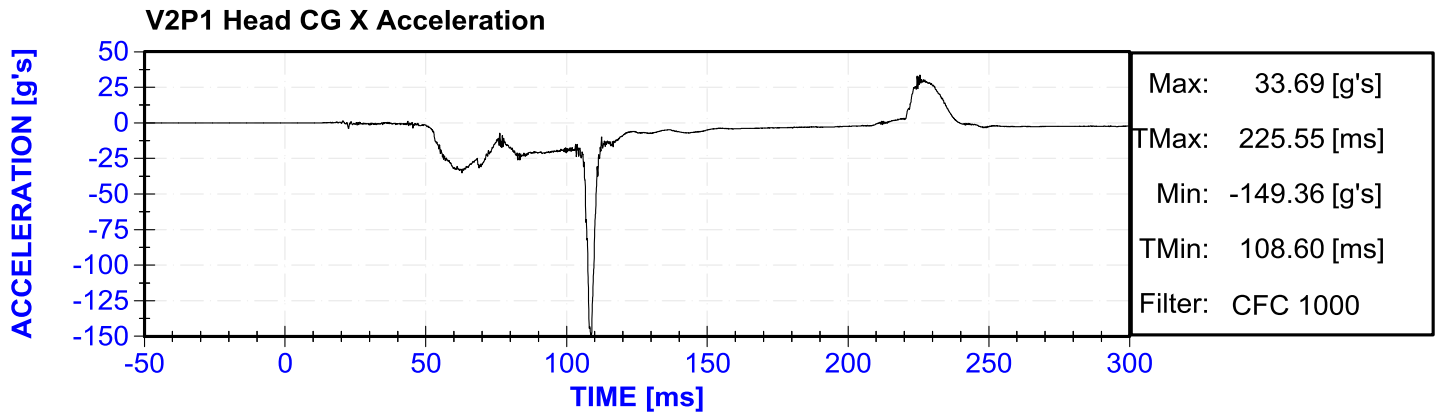
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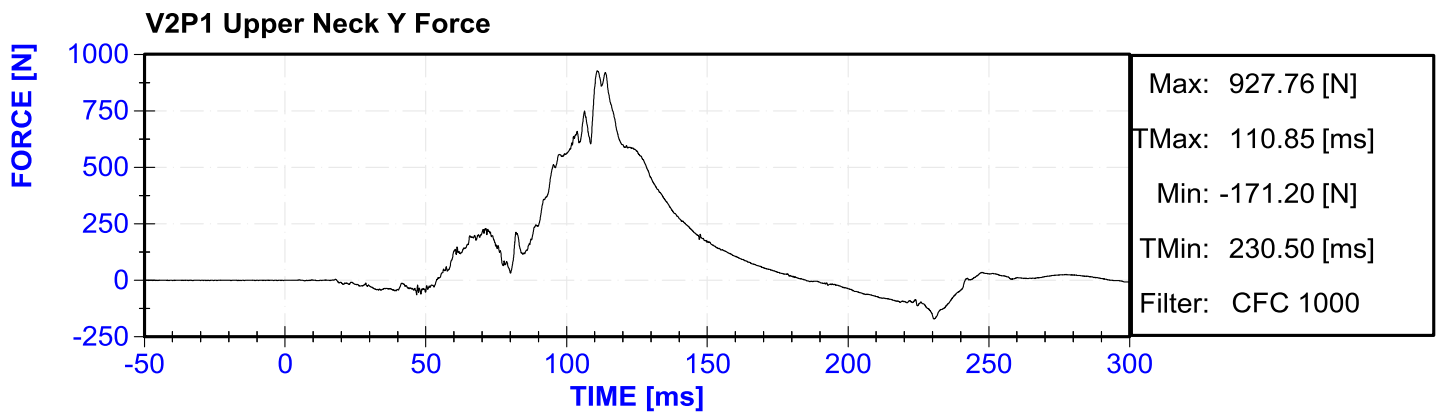
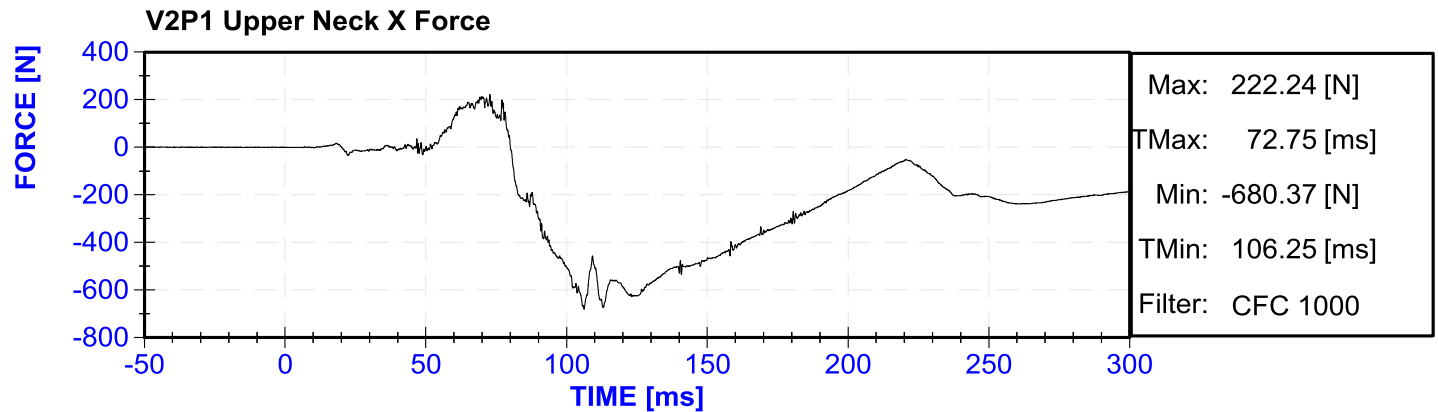
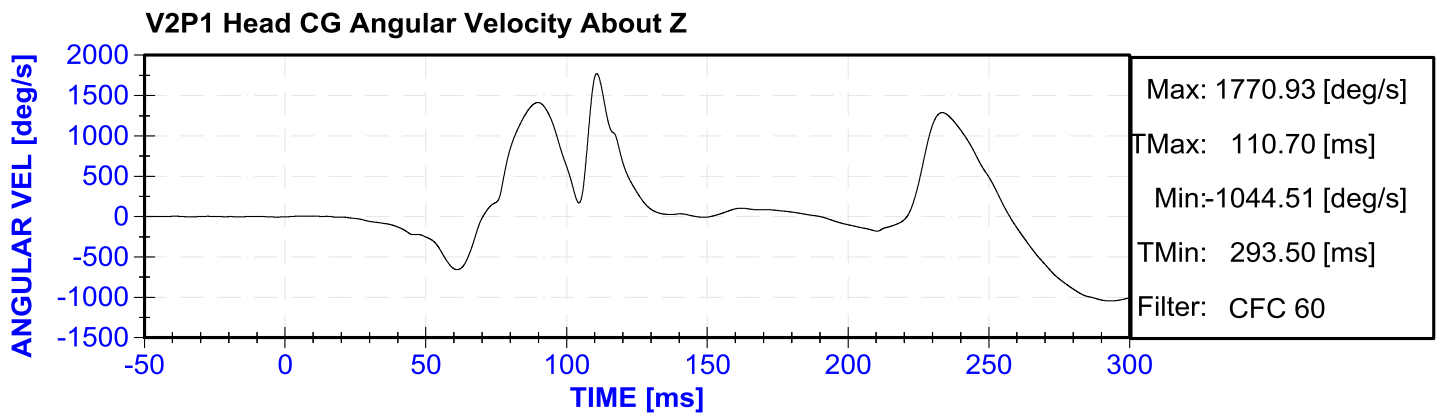
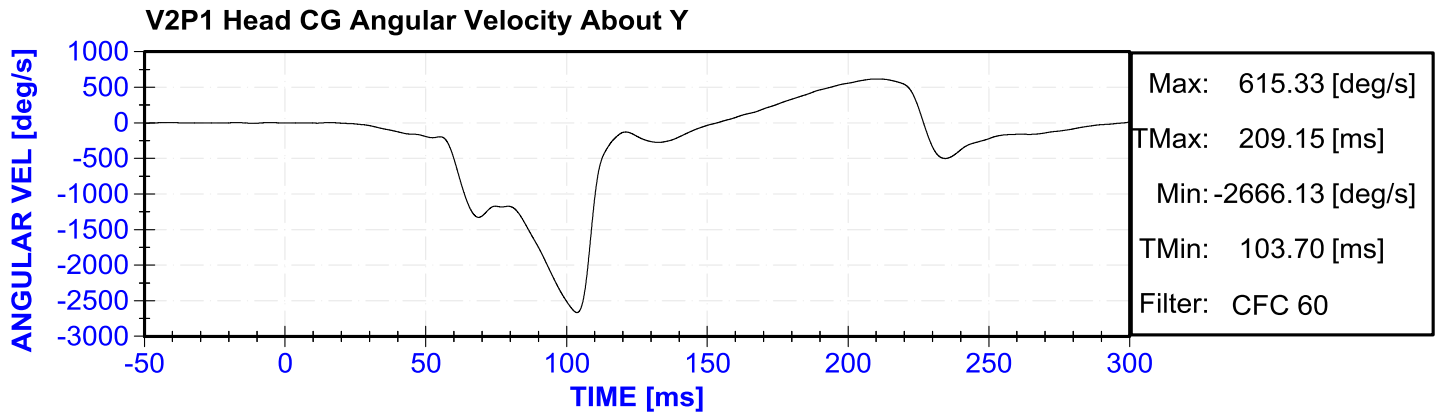
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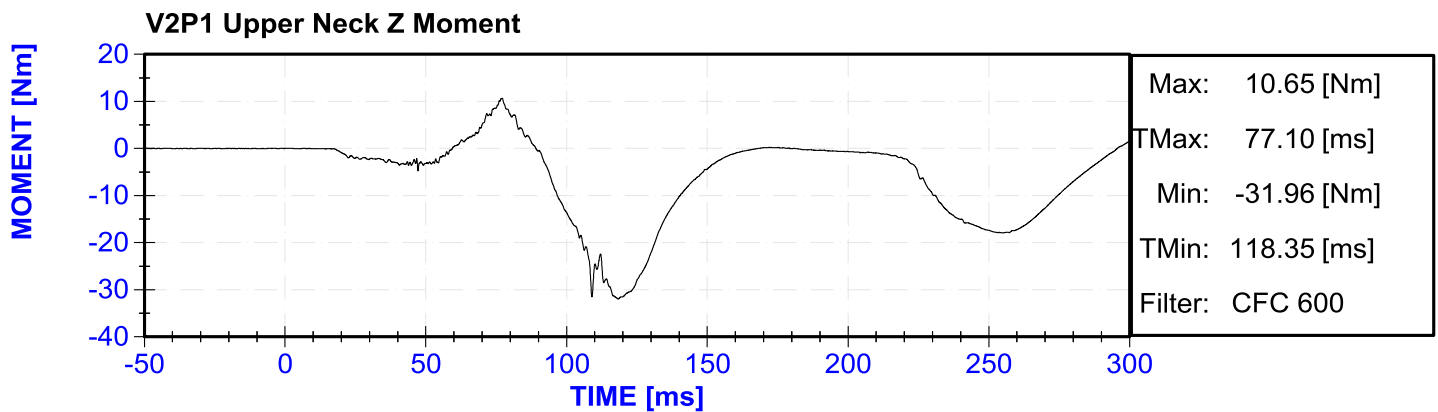
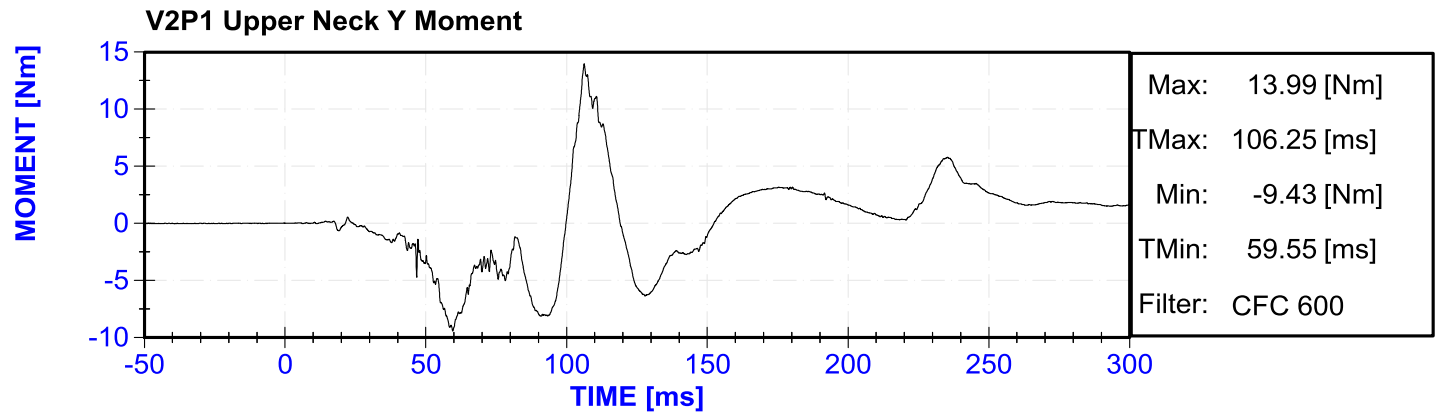
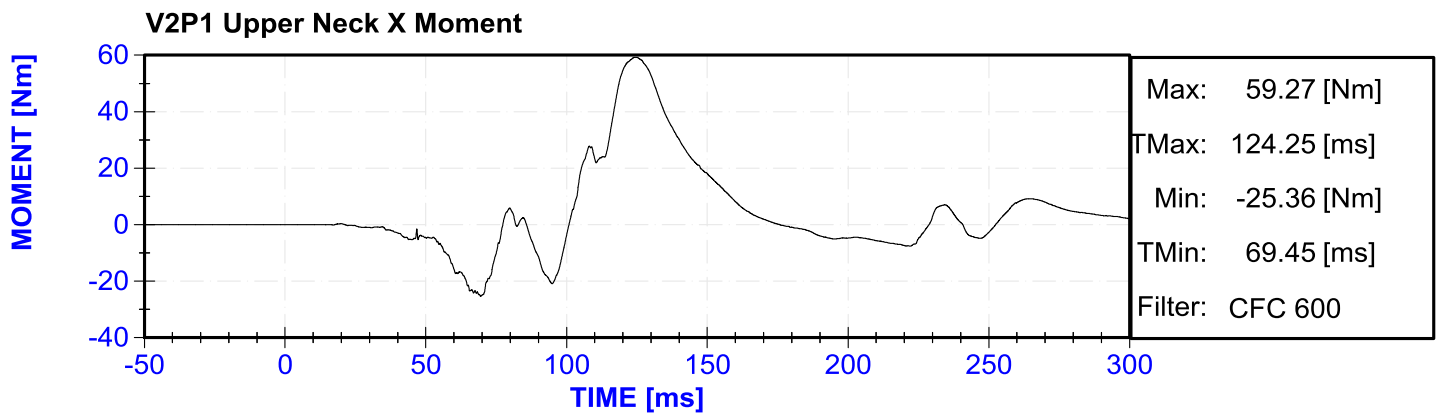
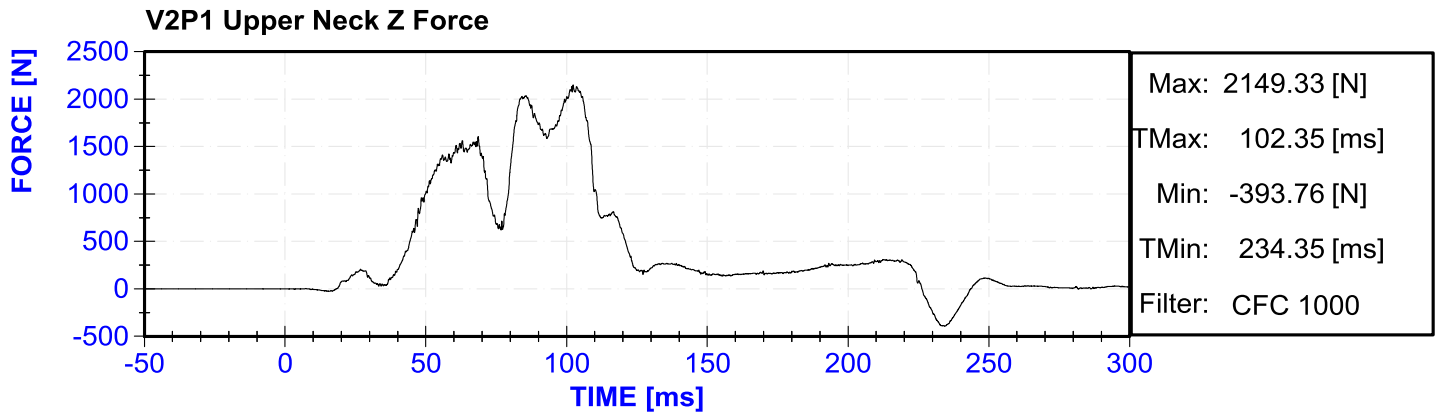
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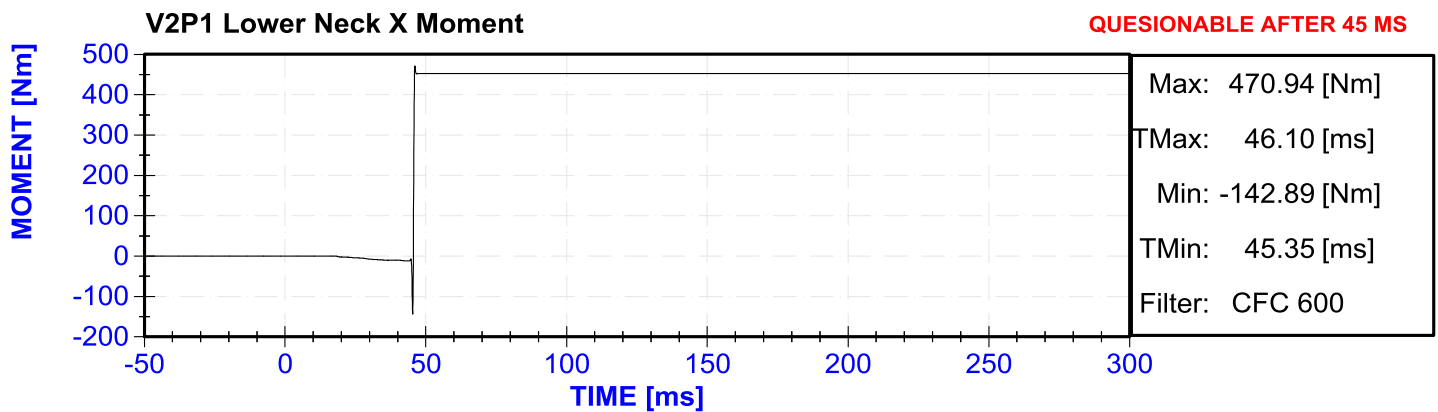
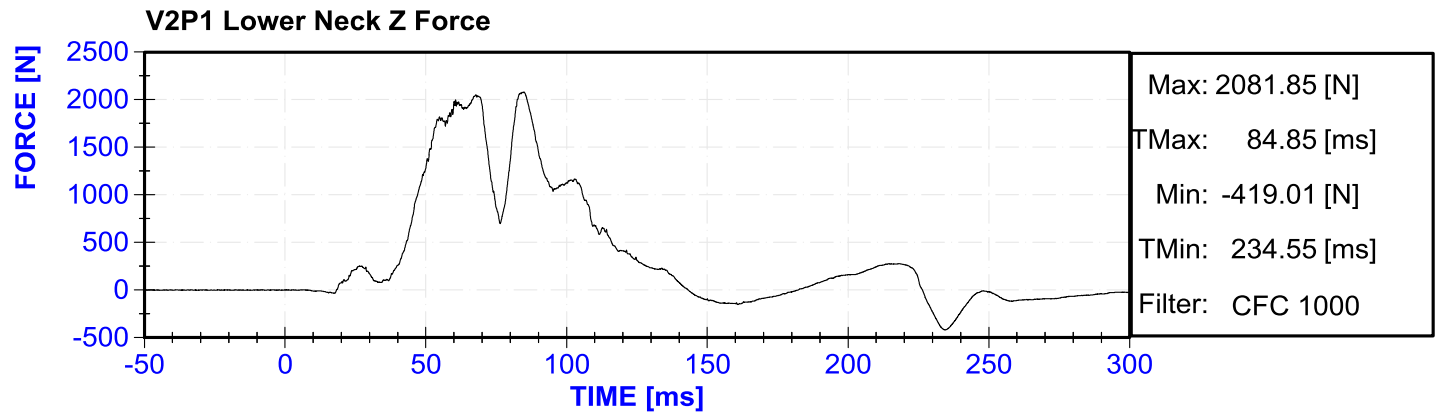
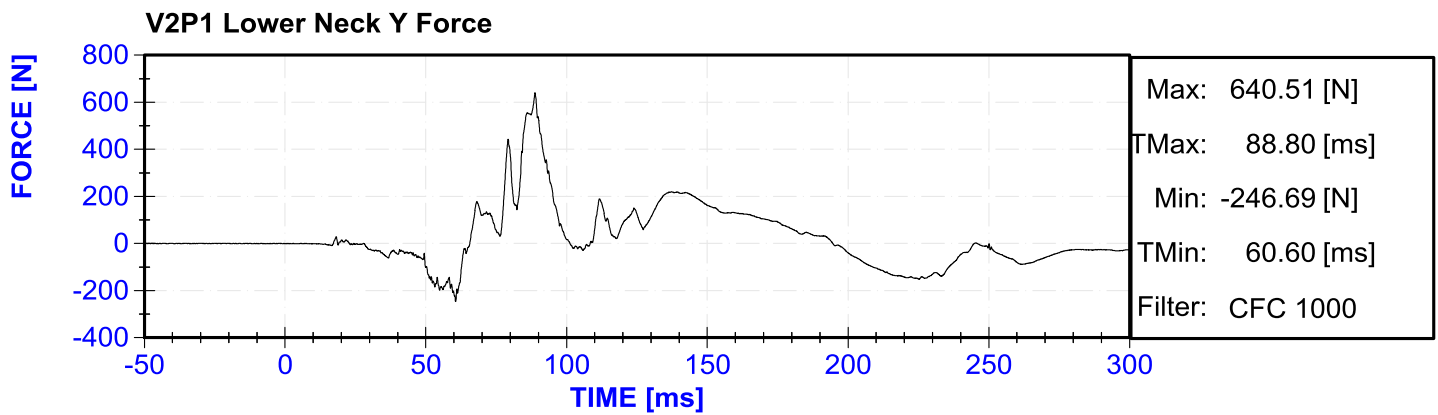
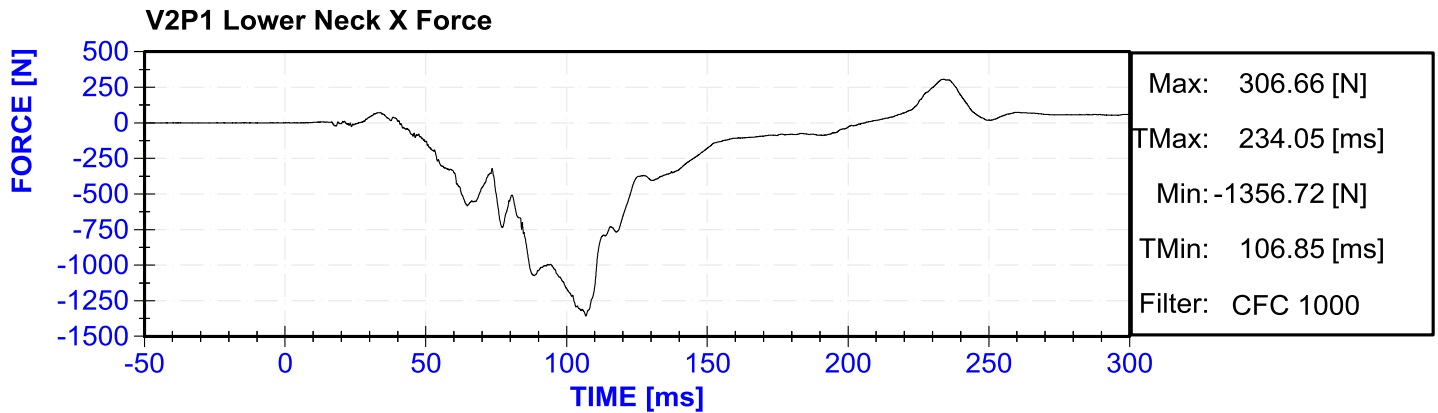
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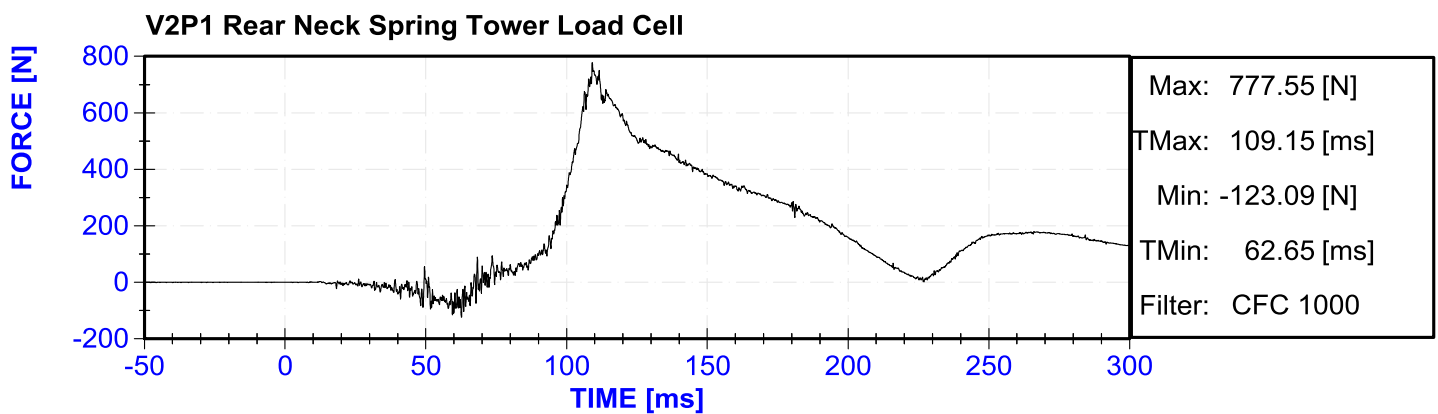
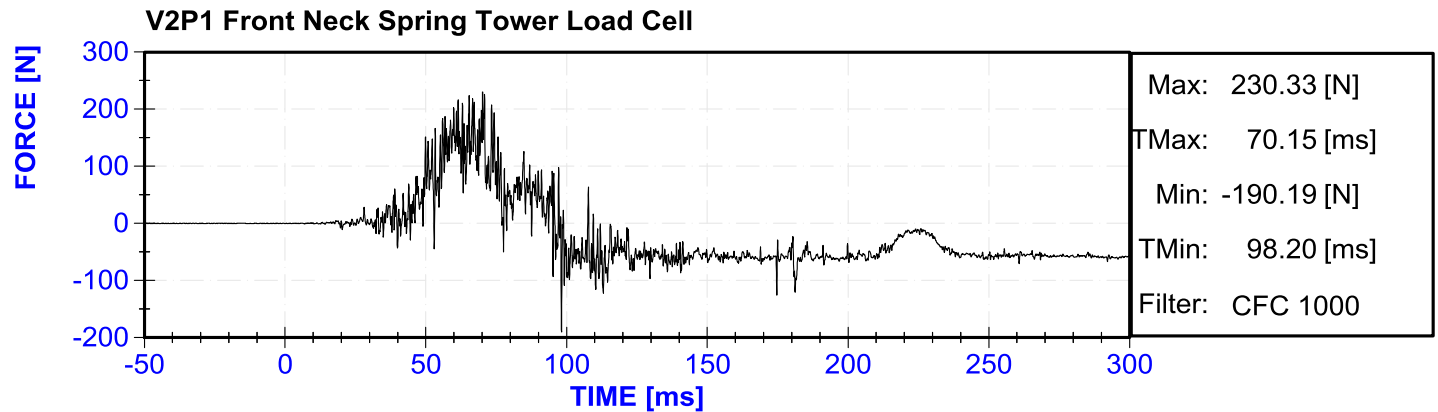
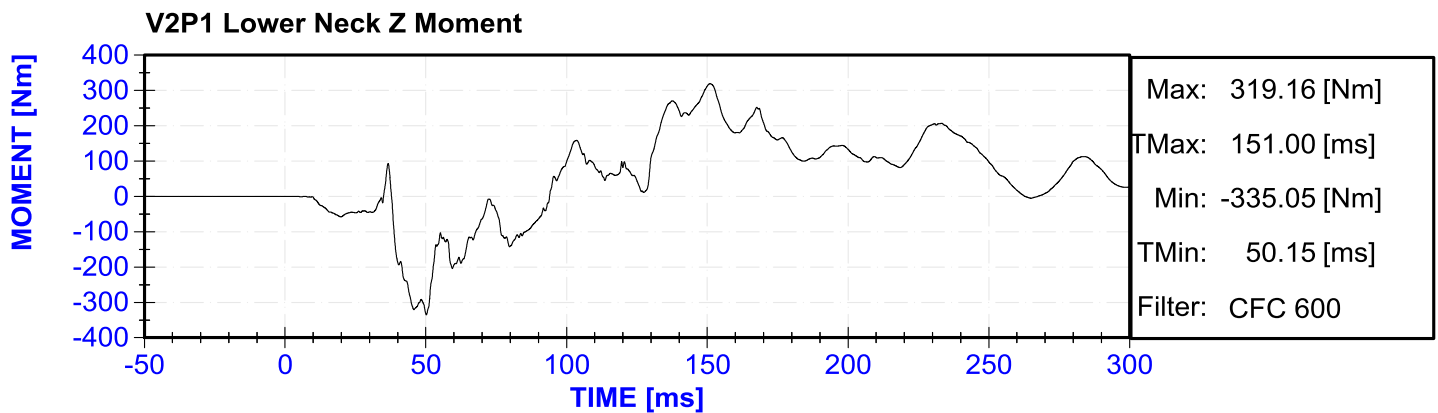
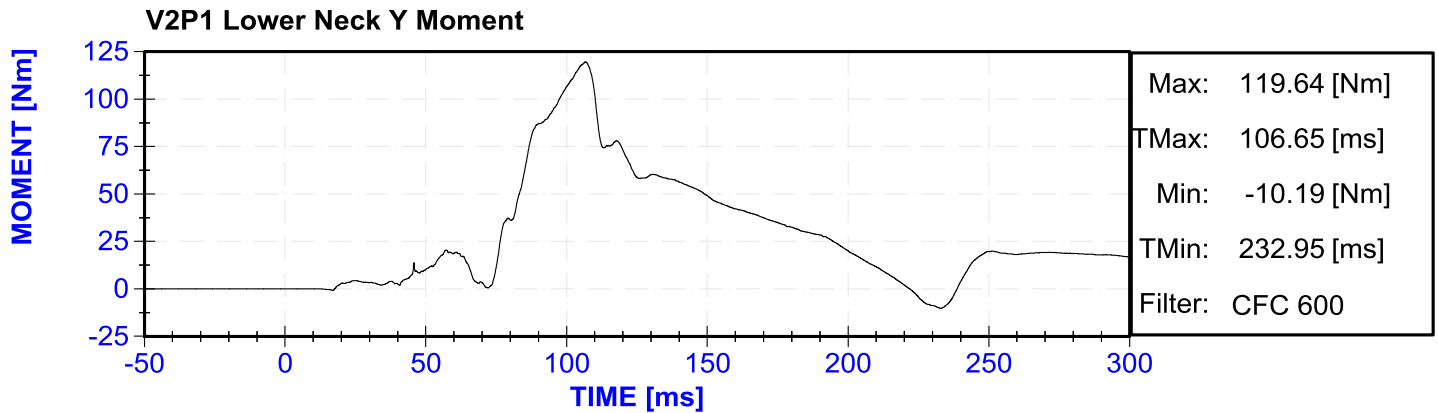
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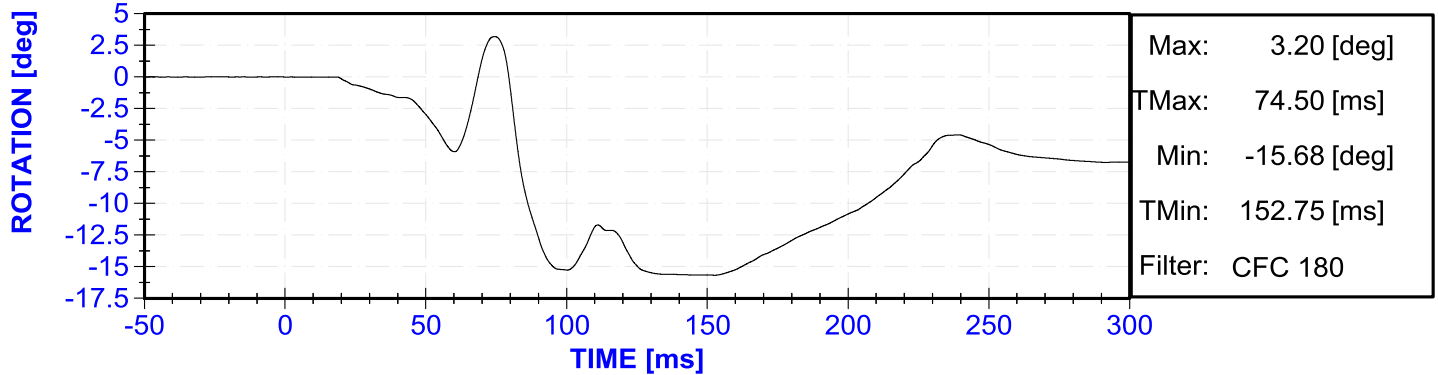




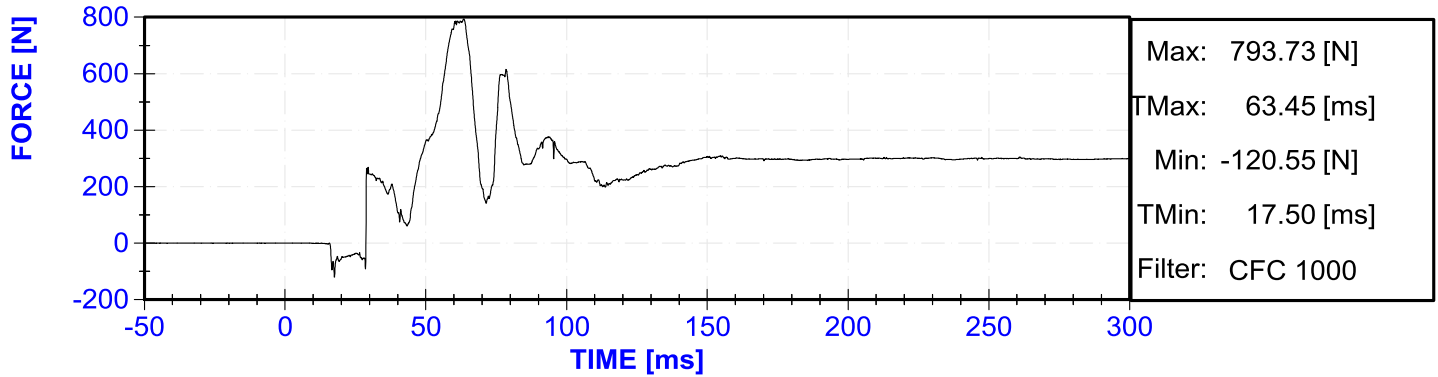




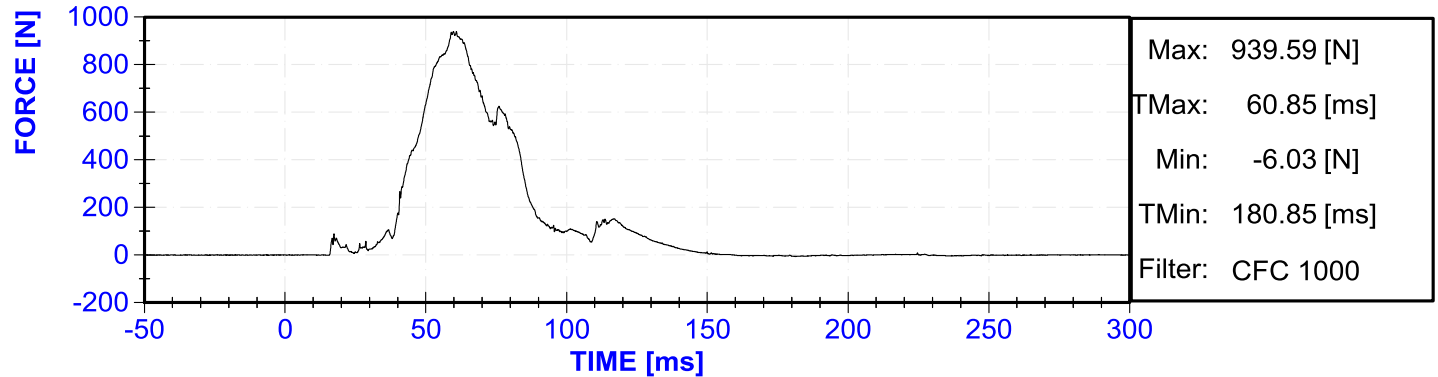
V2P1 Occipital Condyle Rotation Potentiometer



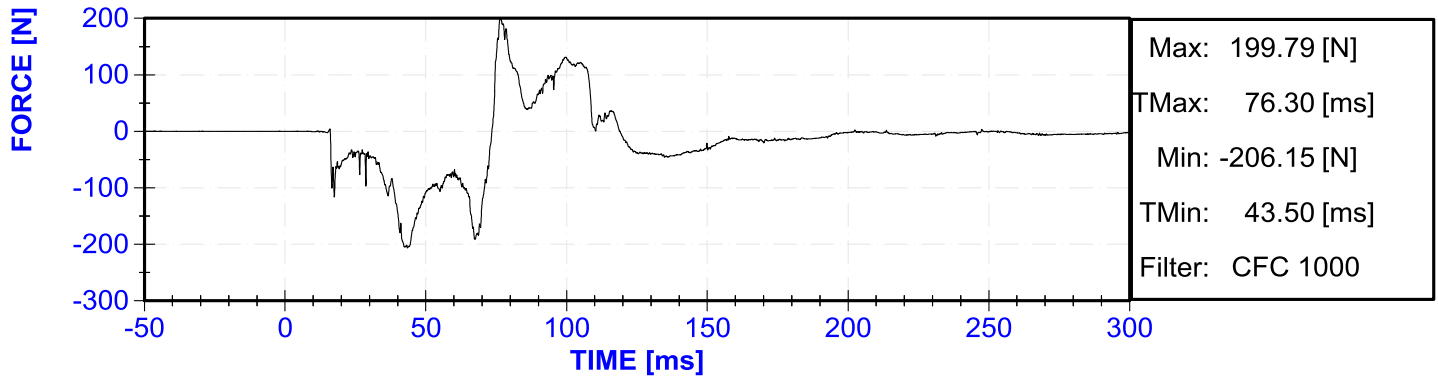
V2P1 CLAVICLE - LEFT OUTER LC FX



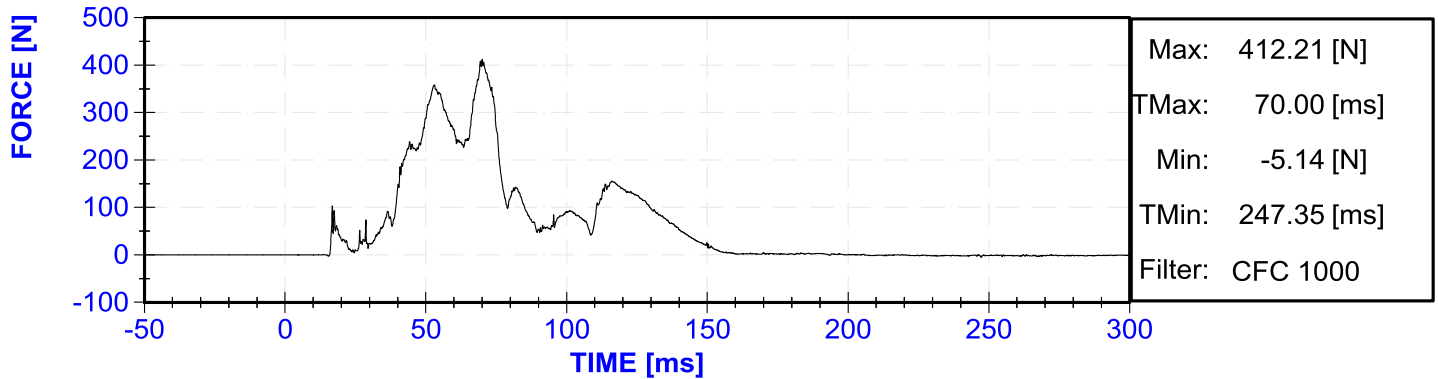
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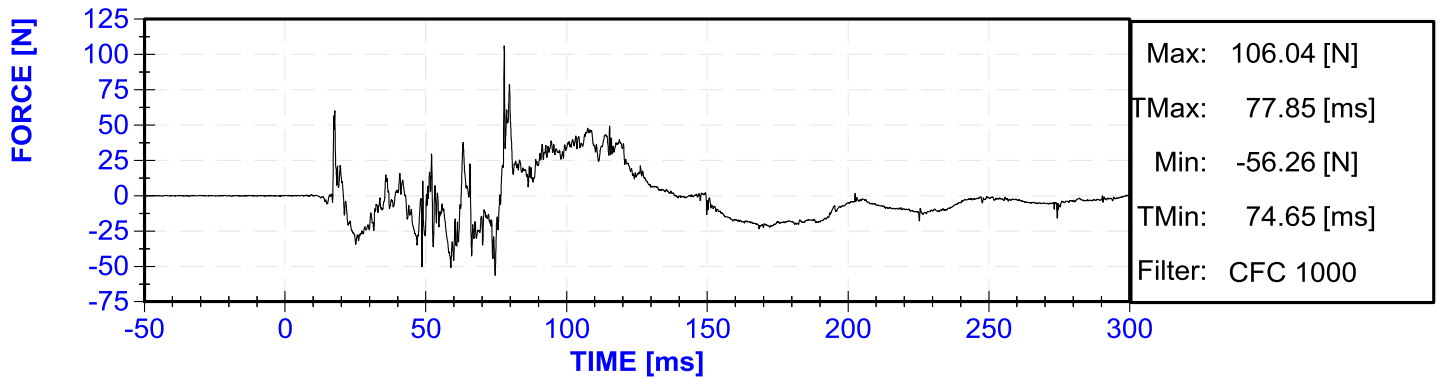
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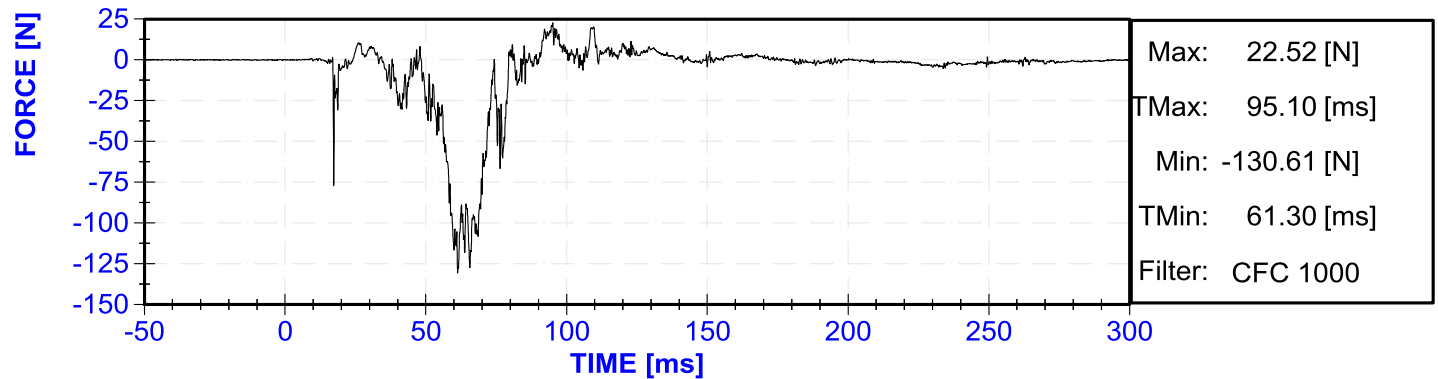
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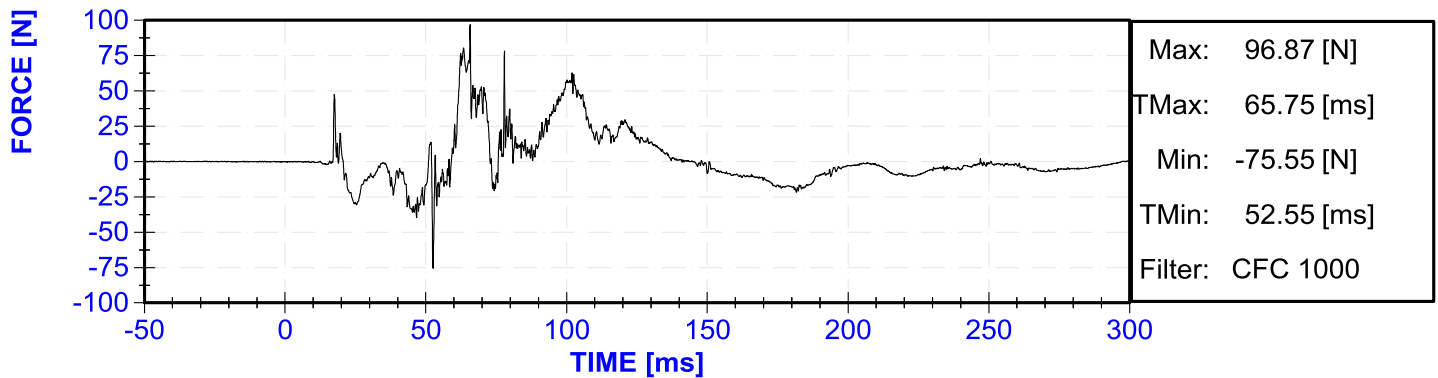
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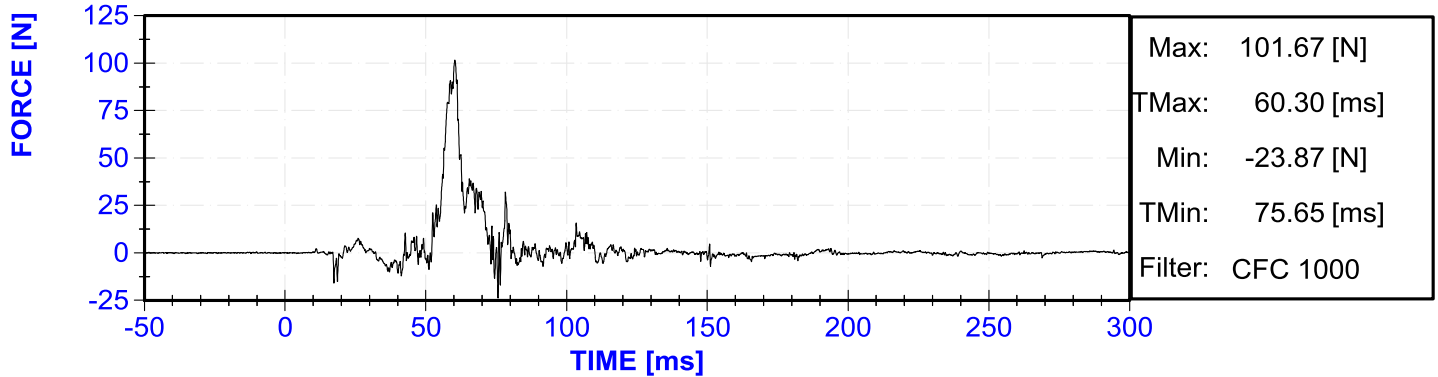
V2P1 CLAVICLE - RIGHT OUTER LC FZ



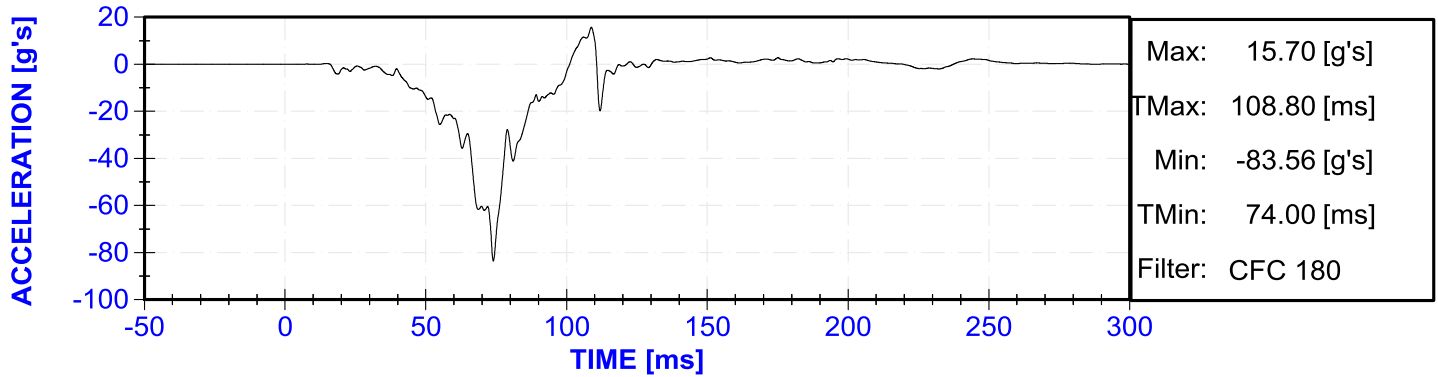
V2P1 CLAVICLE - RIGHT INNER LC FX



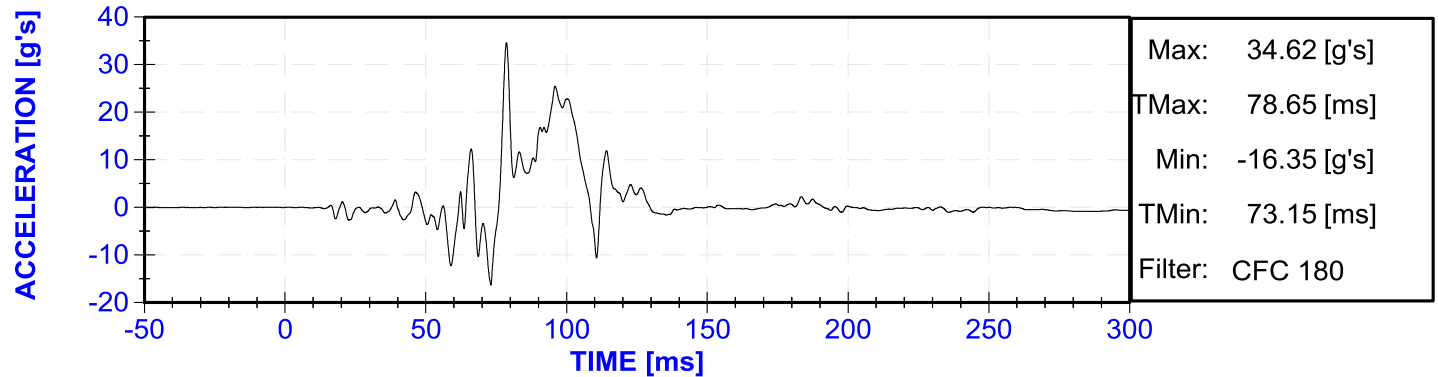
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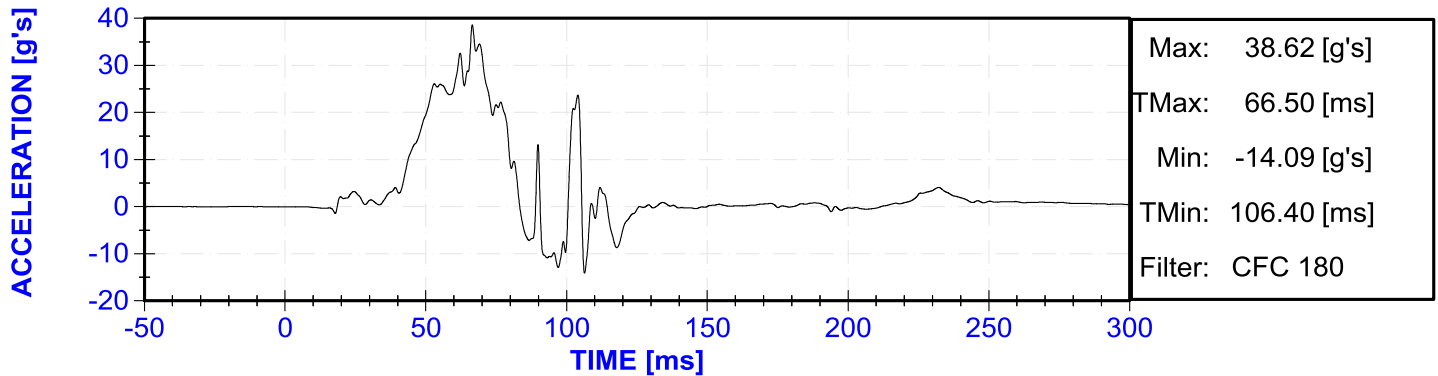
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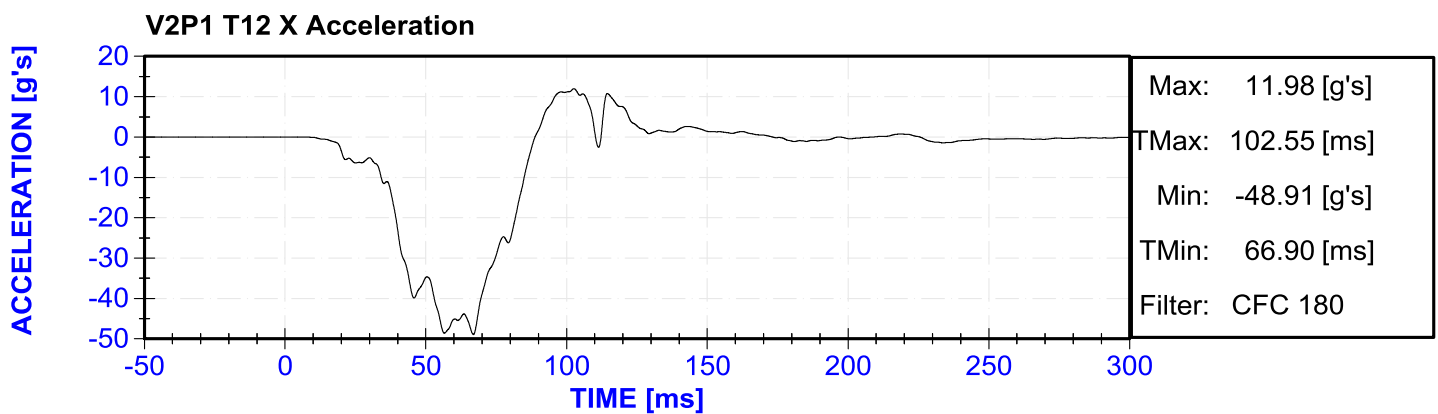
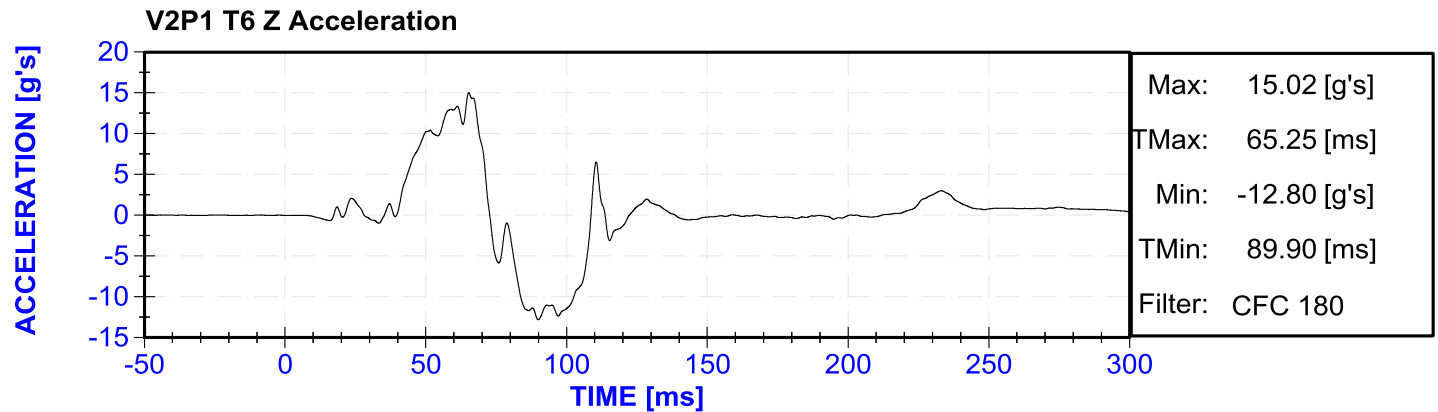
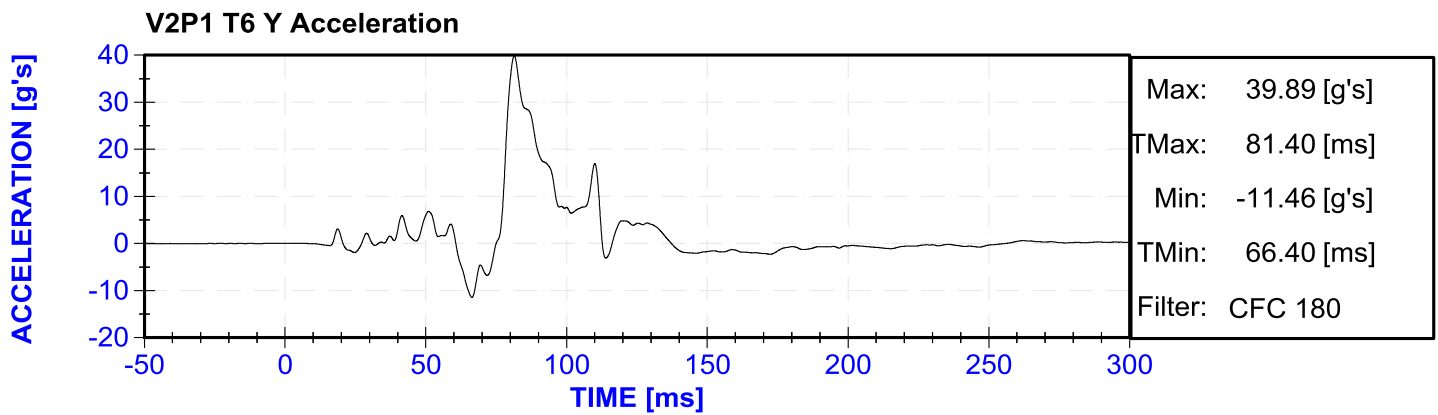
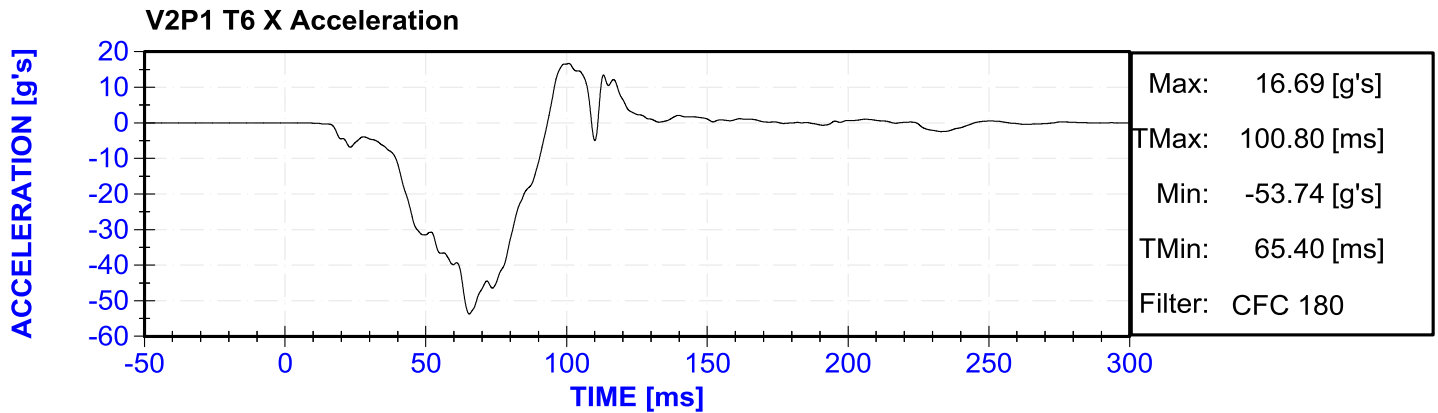


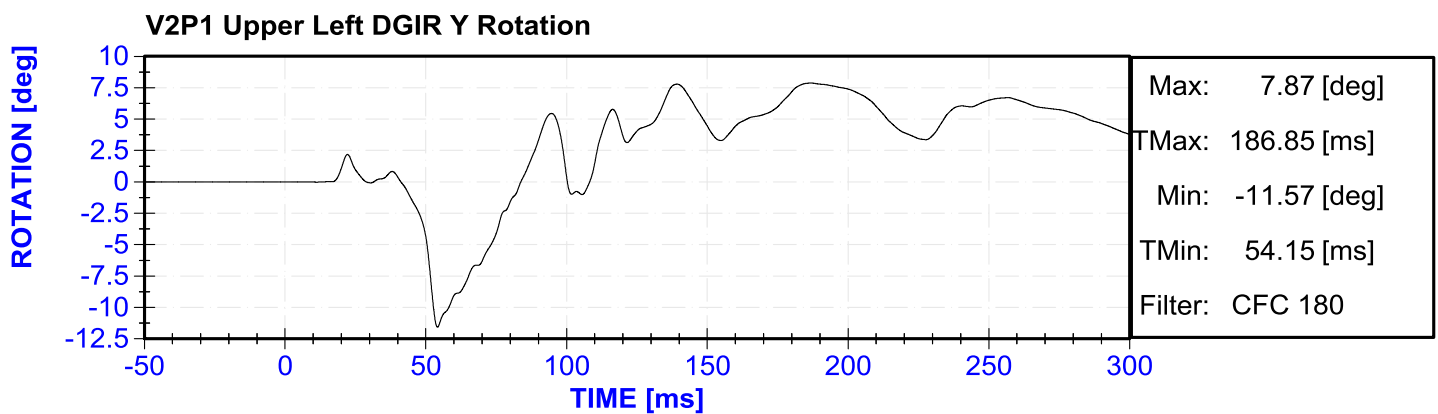
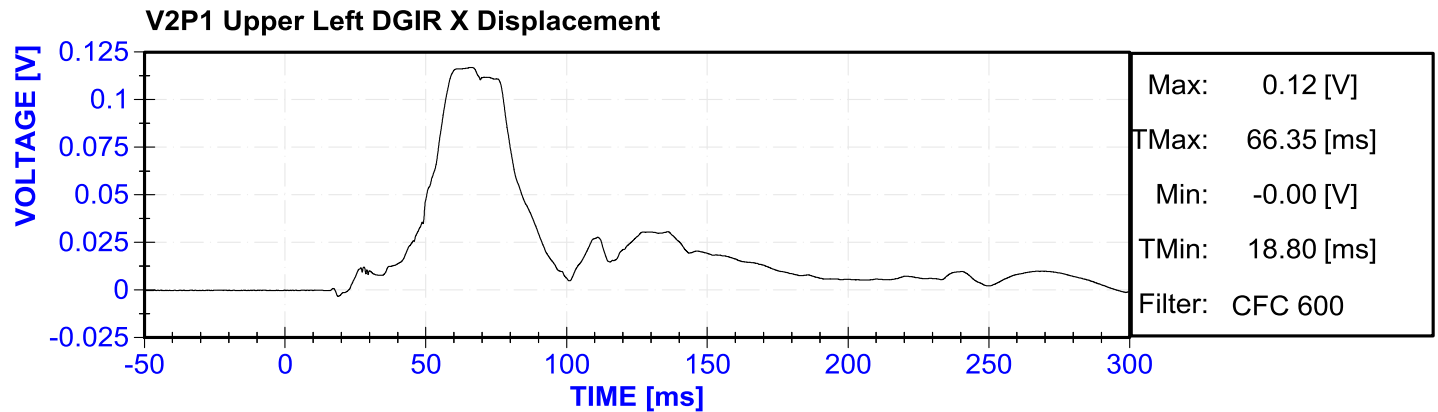
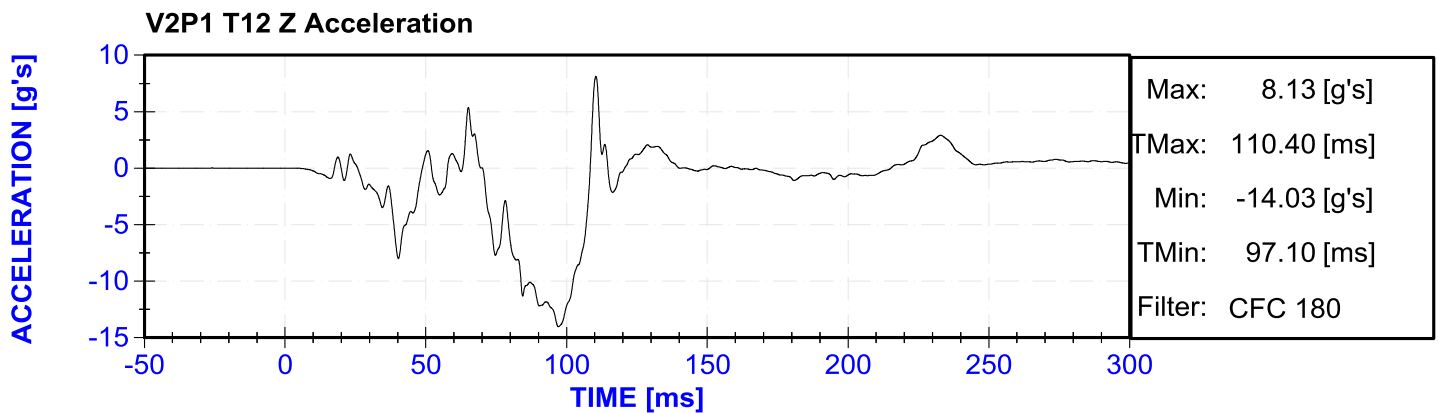
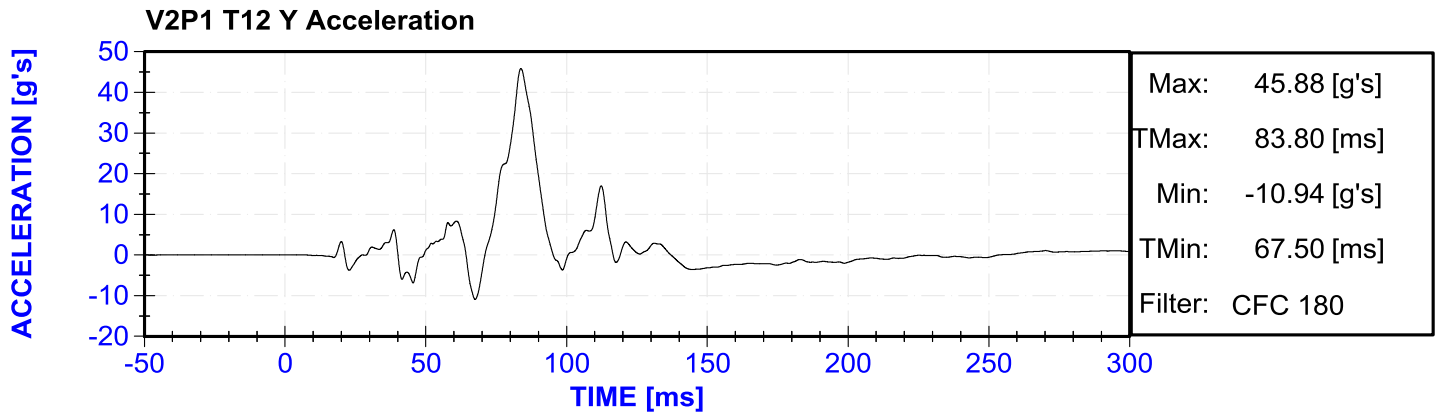
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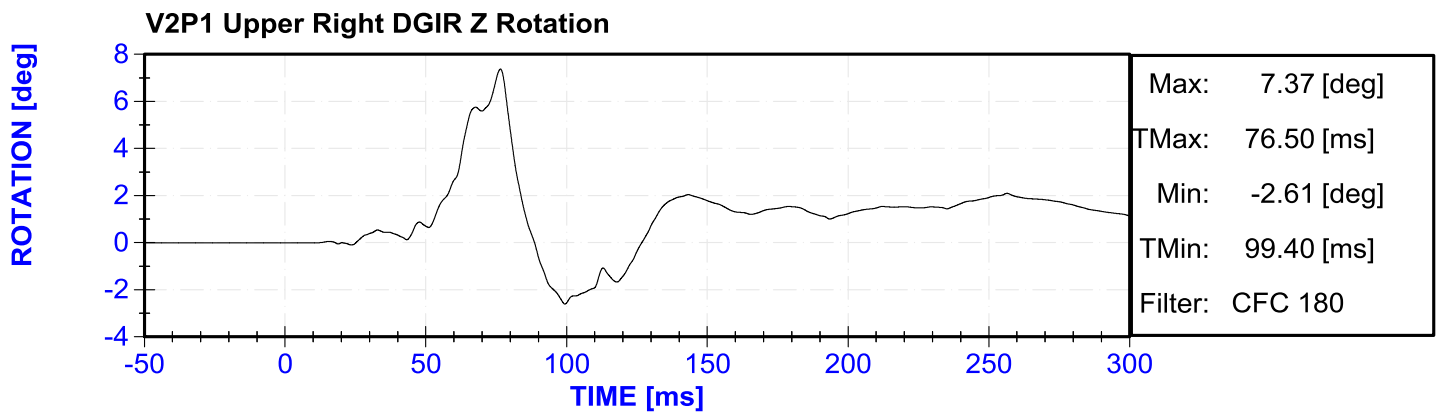
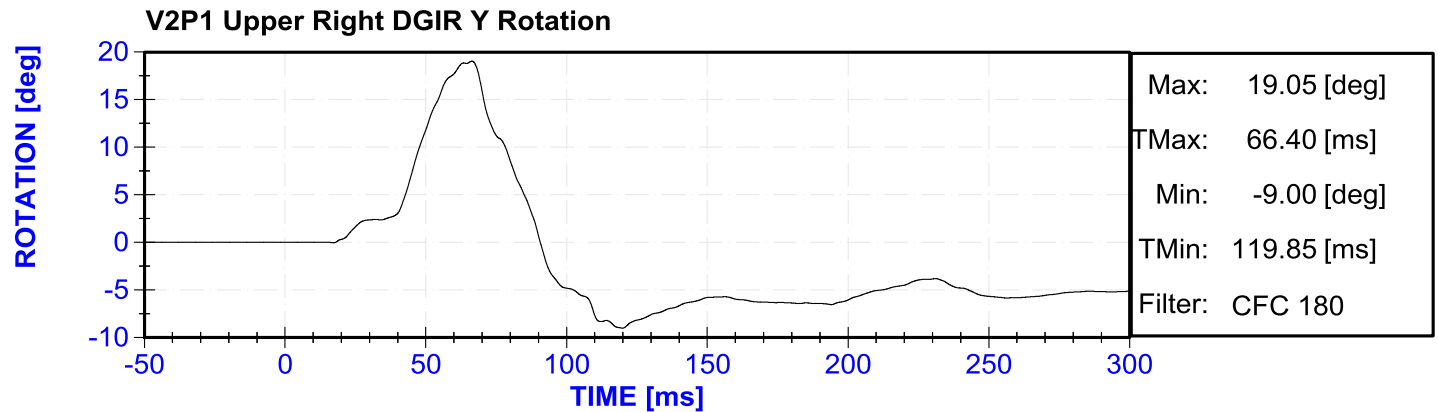
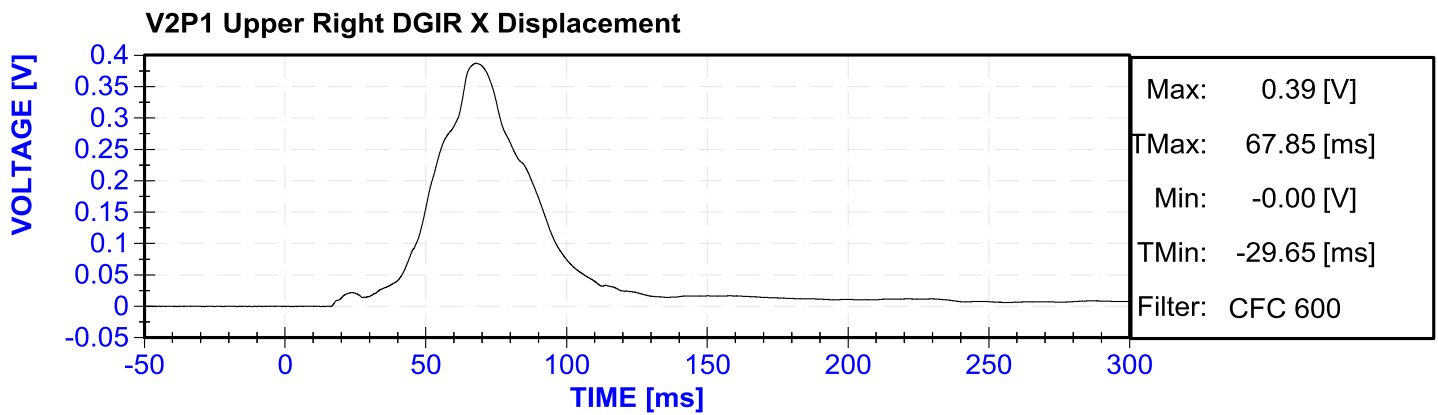
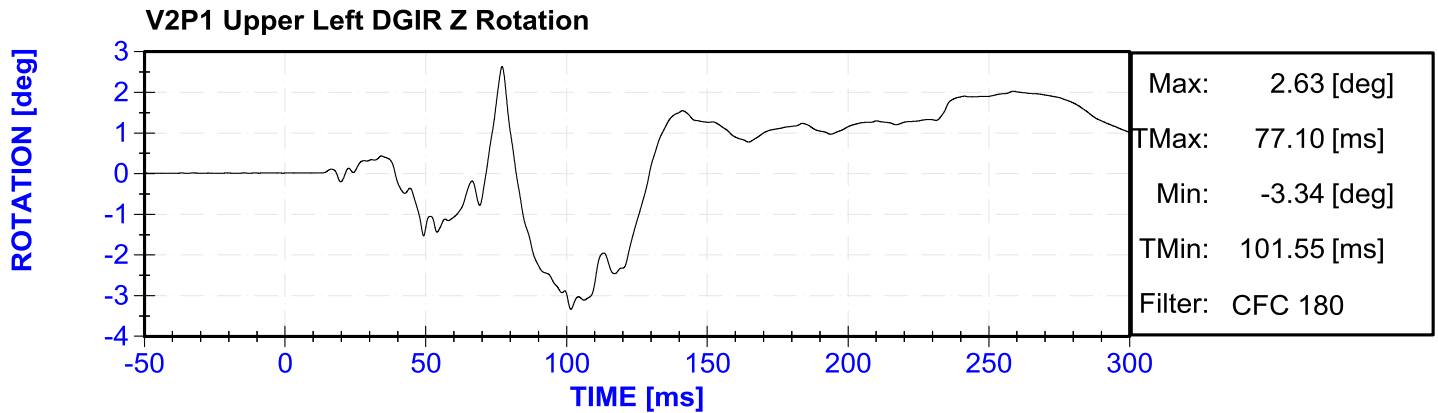


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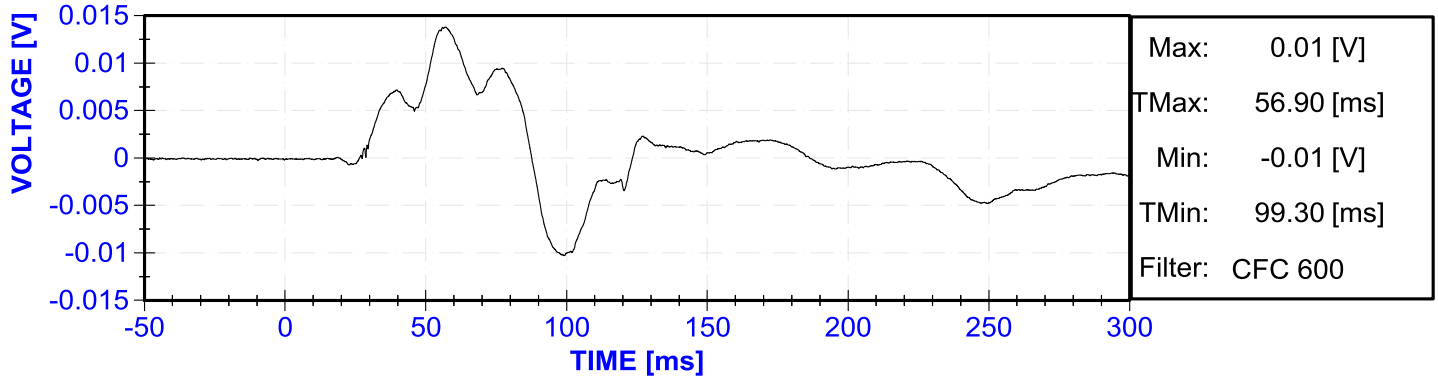




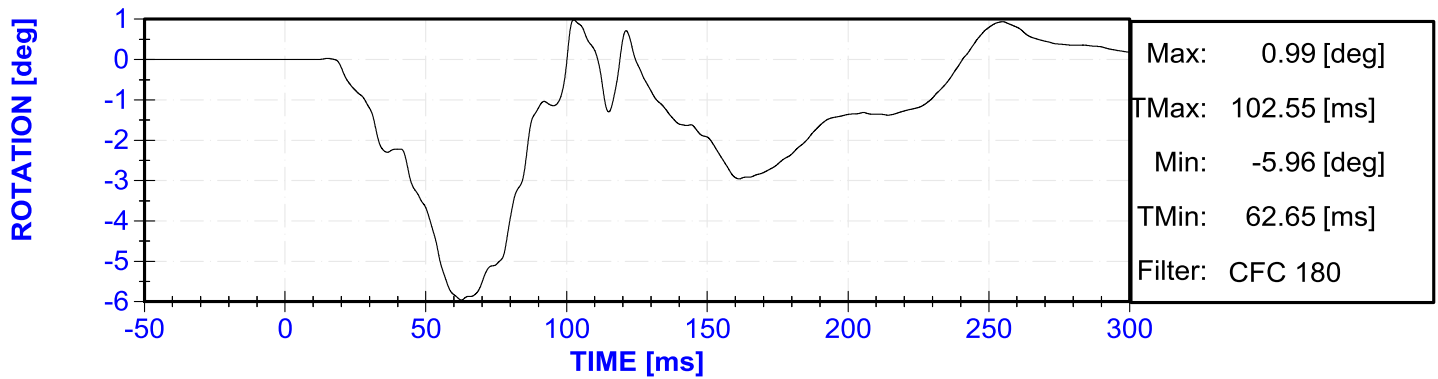




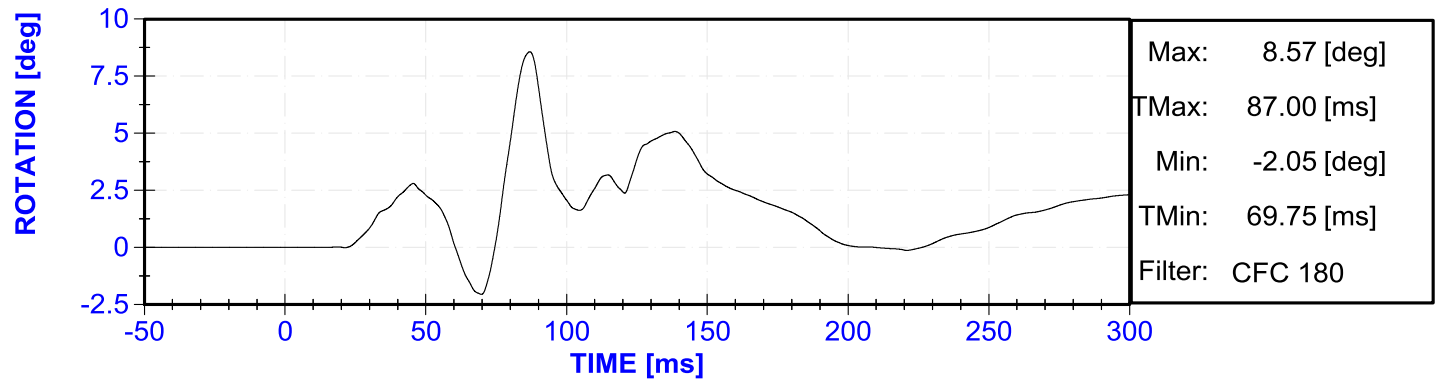
V2P1 Lower Left DGIR X Displacement



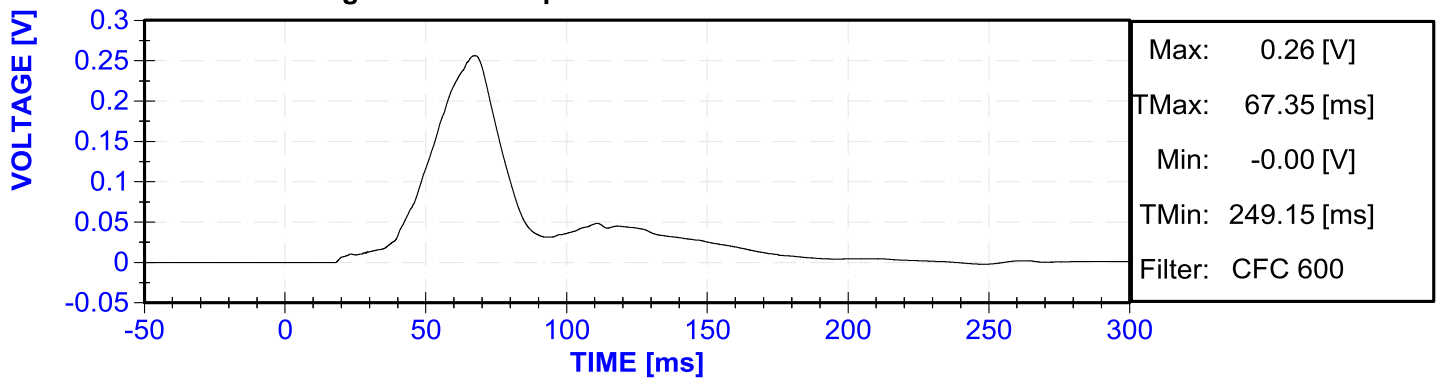
V2P1 Lower Left DGIR Y Rotation

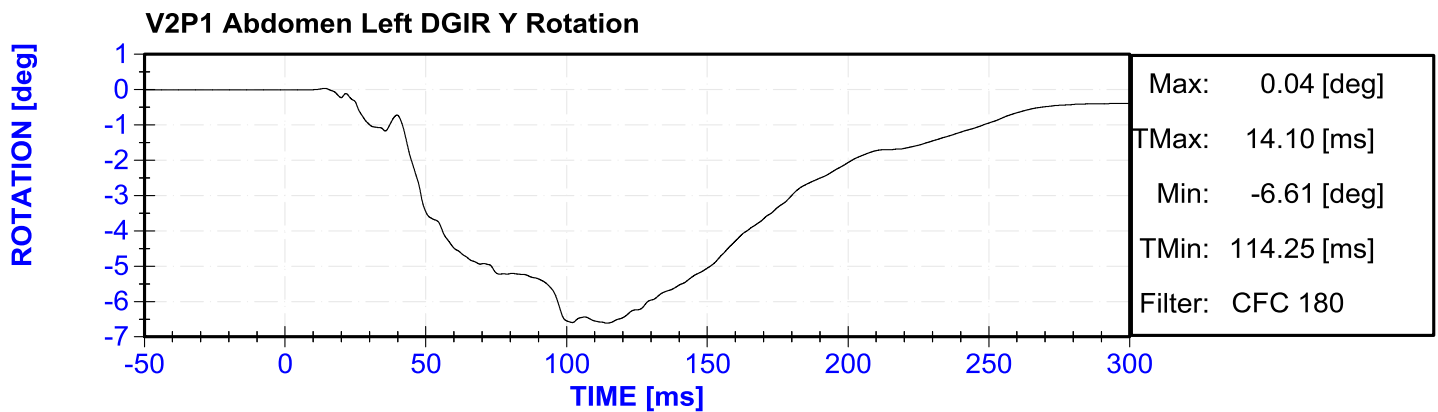
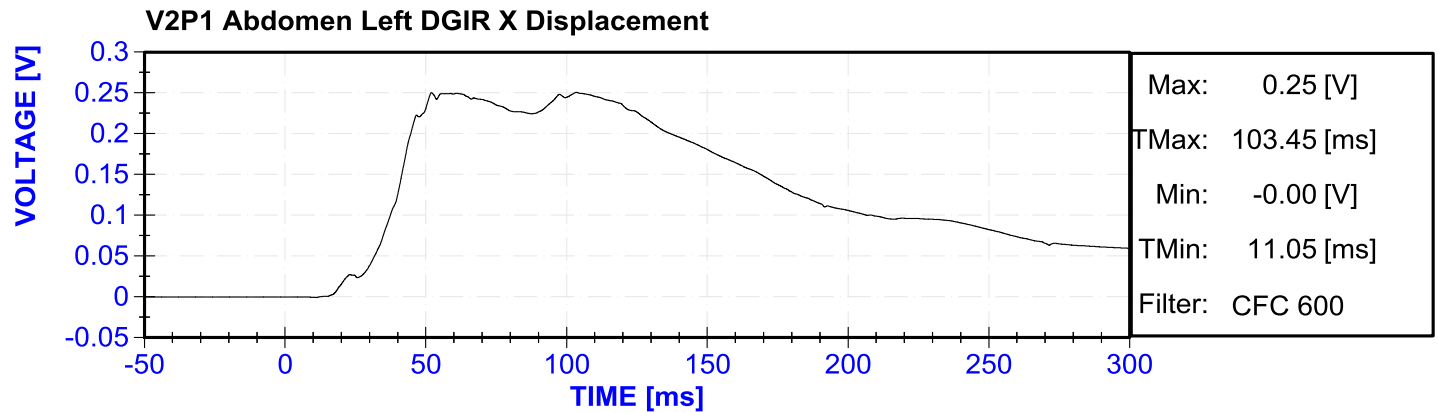
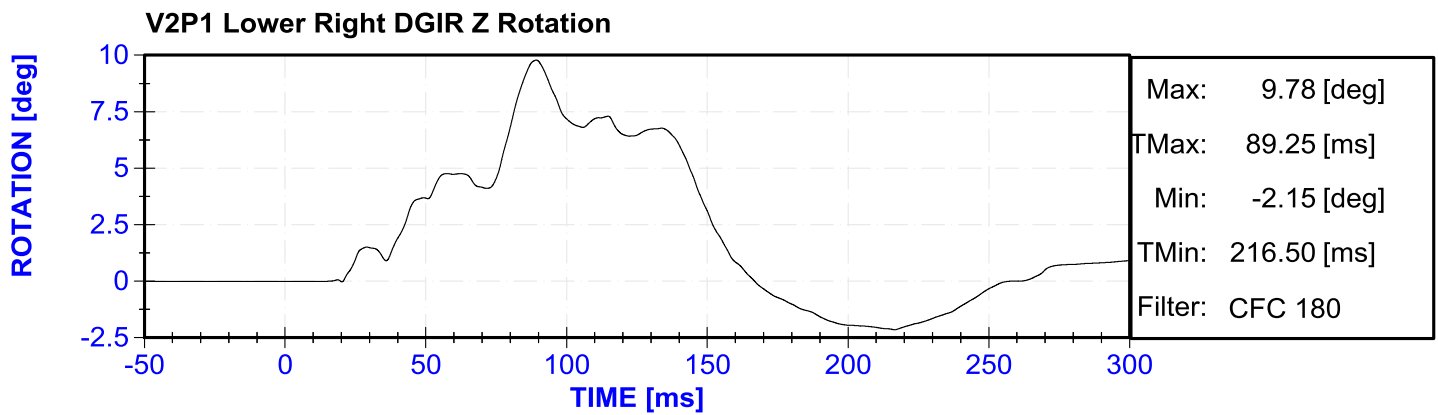
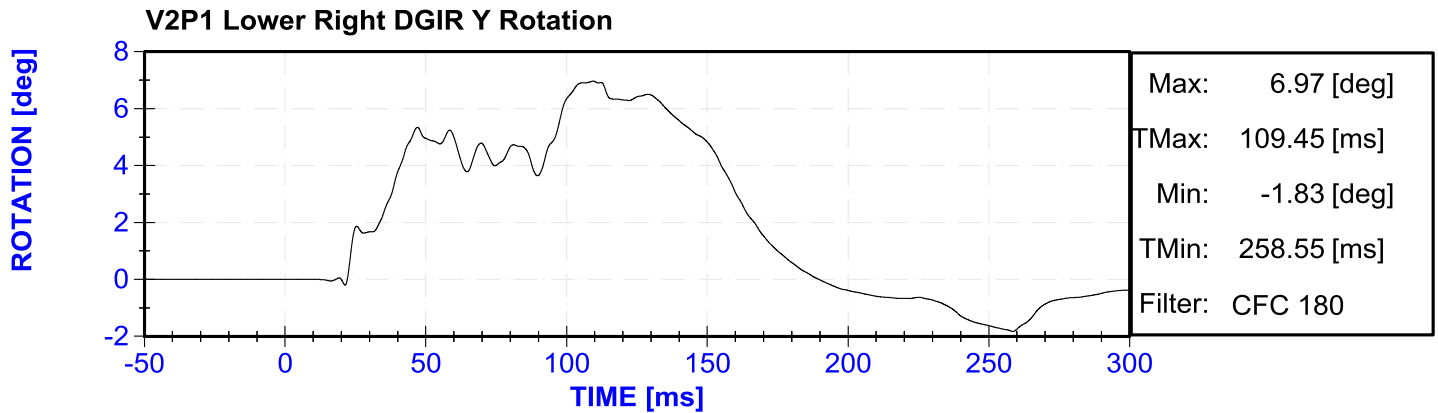


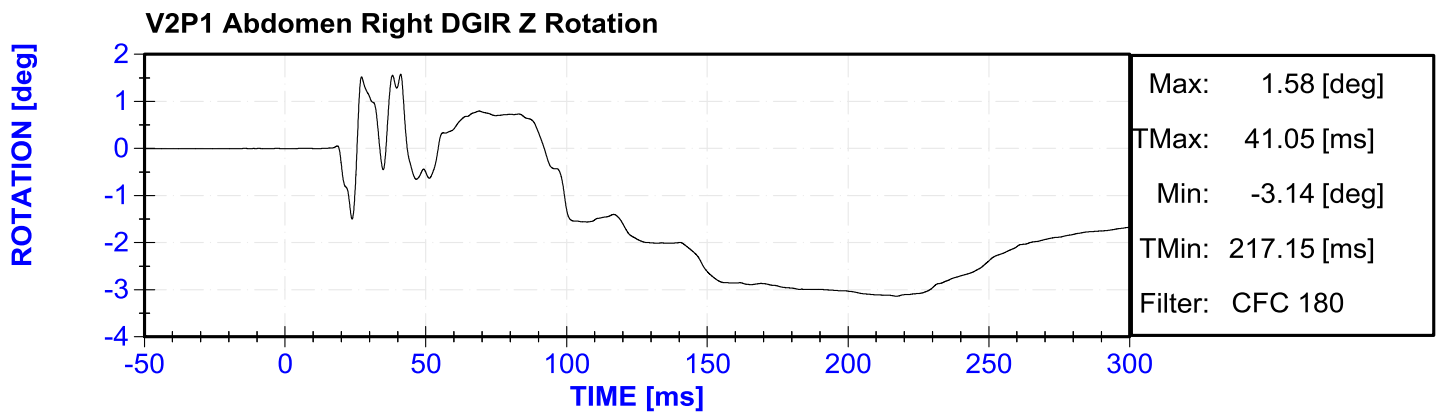
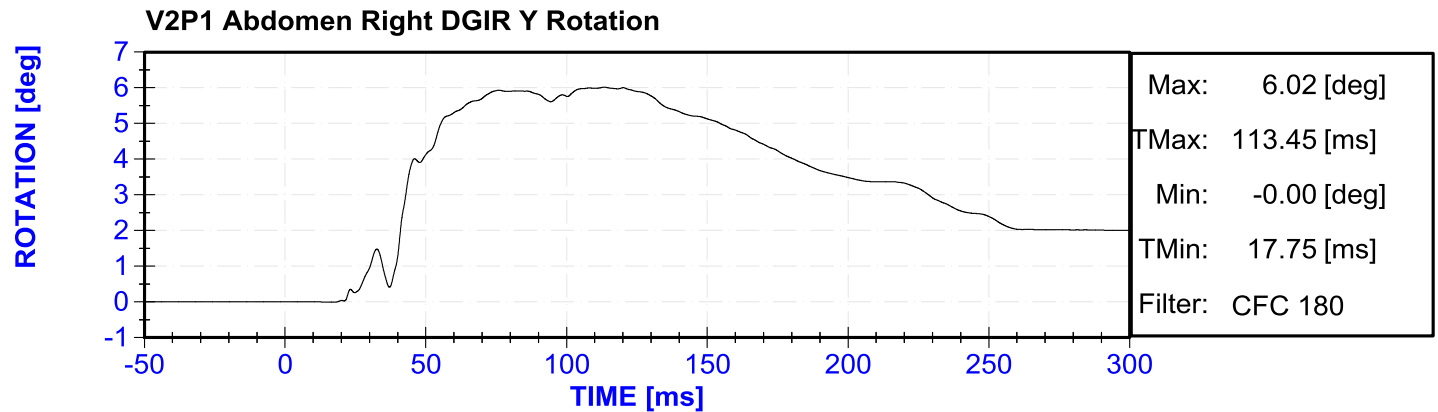
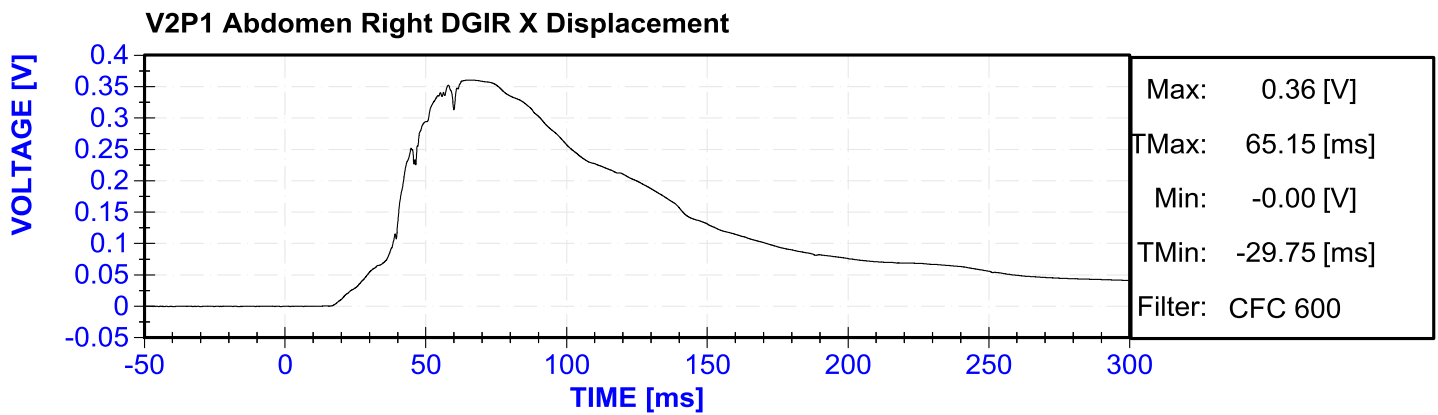
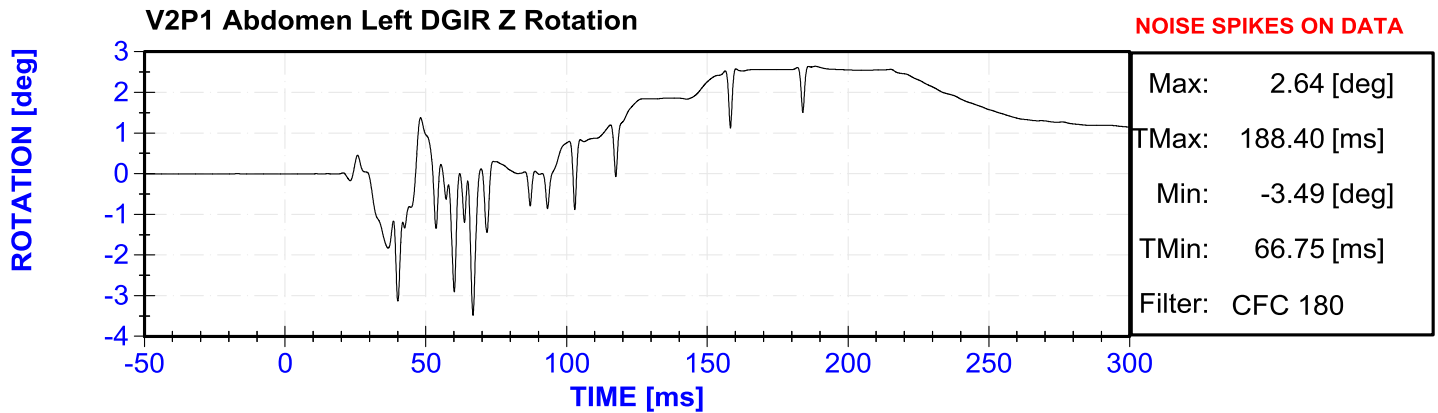
V2P1 Lower Left DGIR Z Rotation

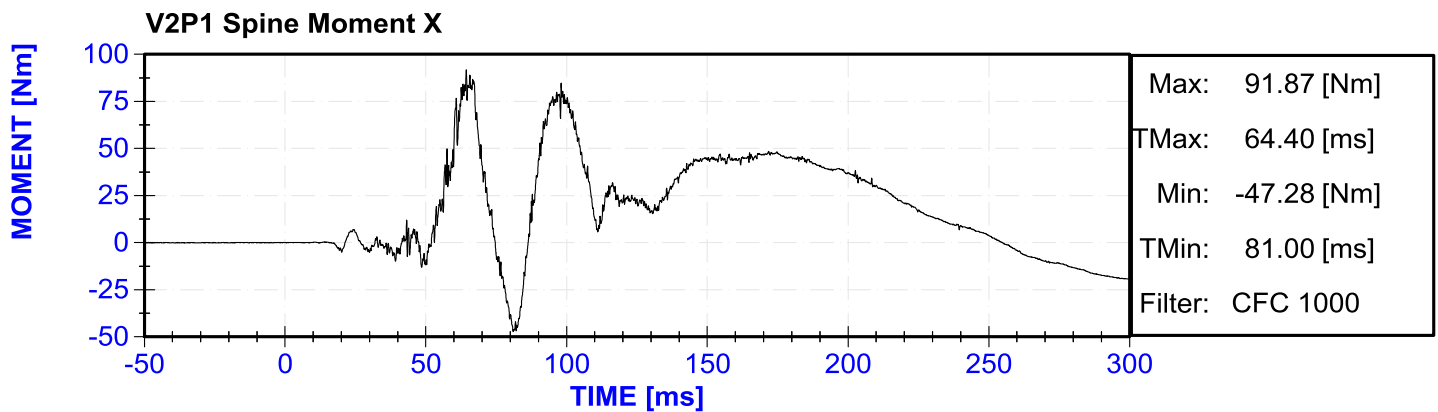
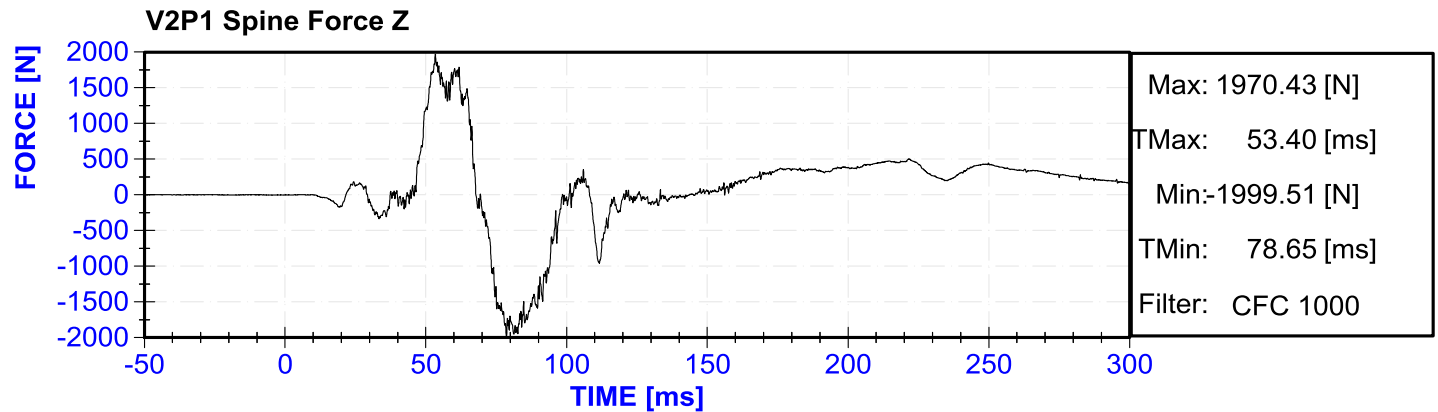
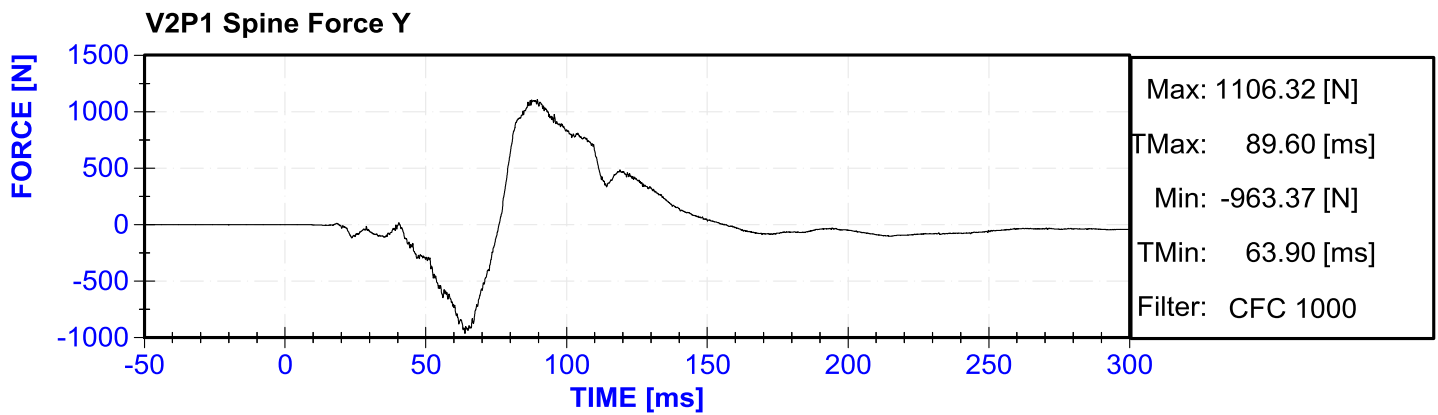
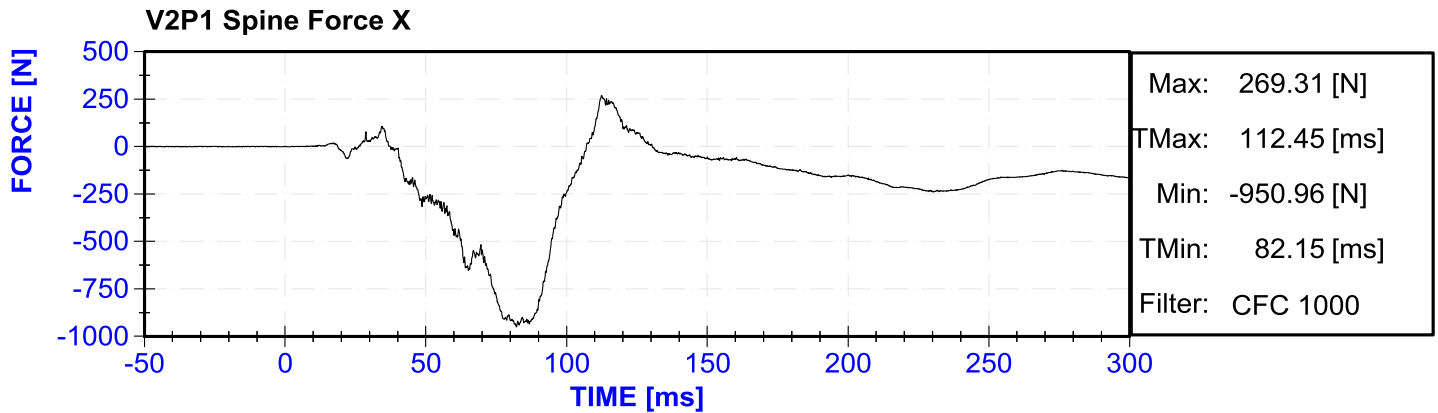


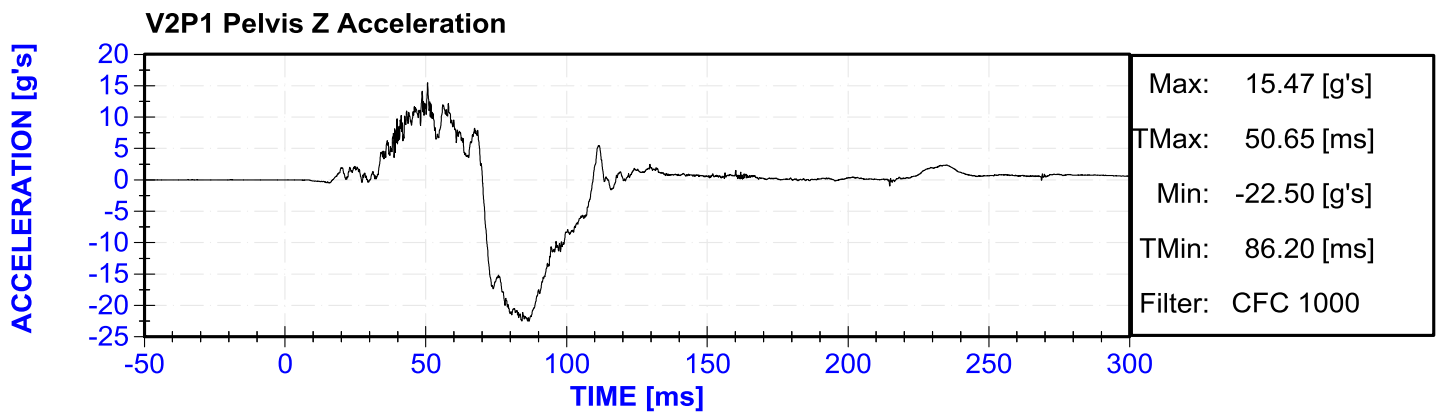
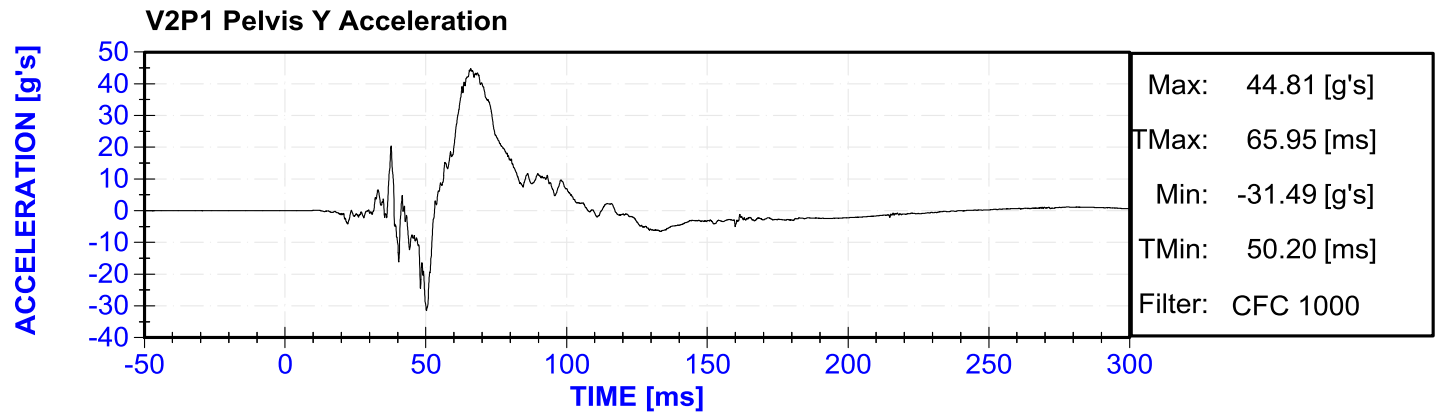
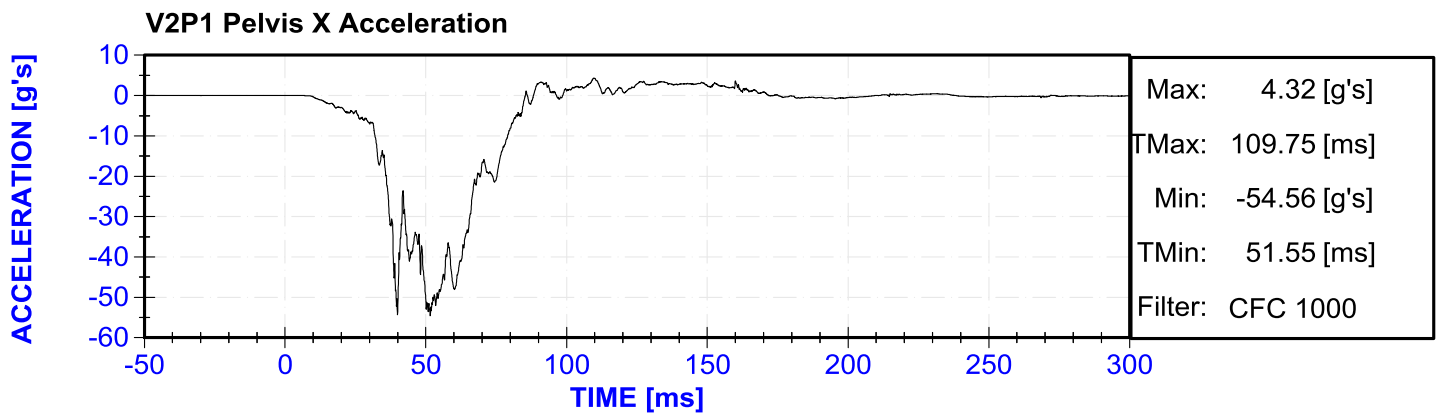
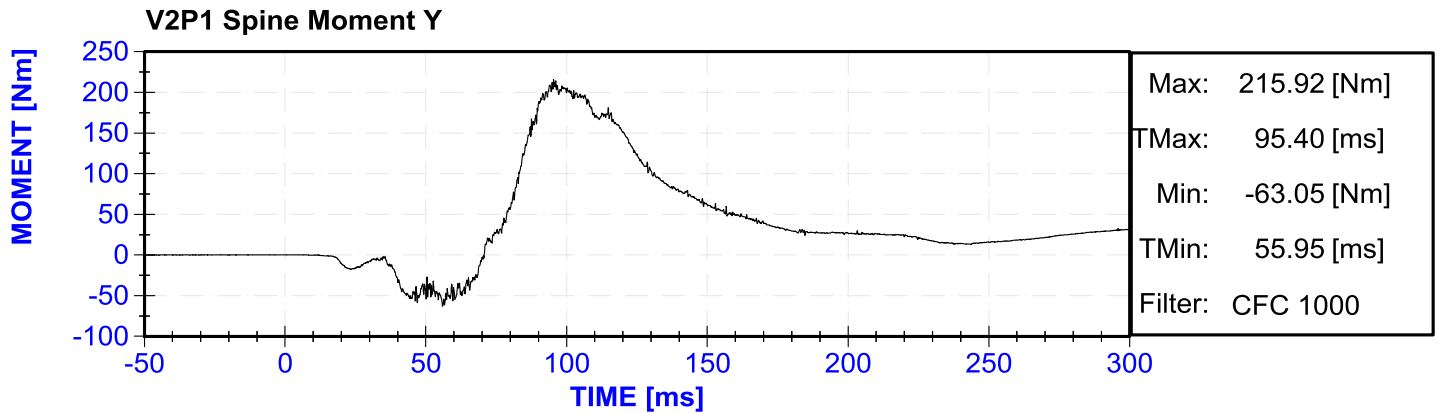
V2P1 Lower Right DGIR X Displacement

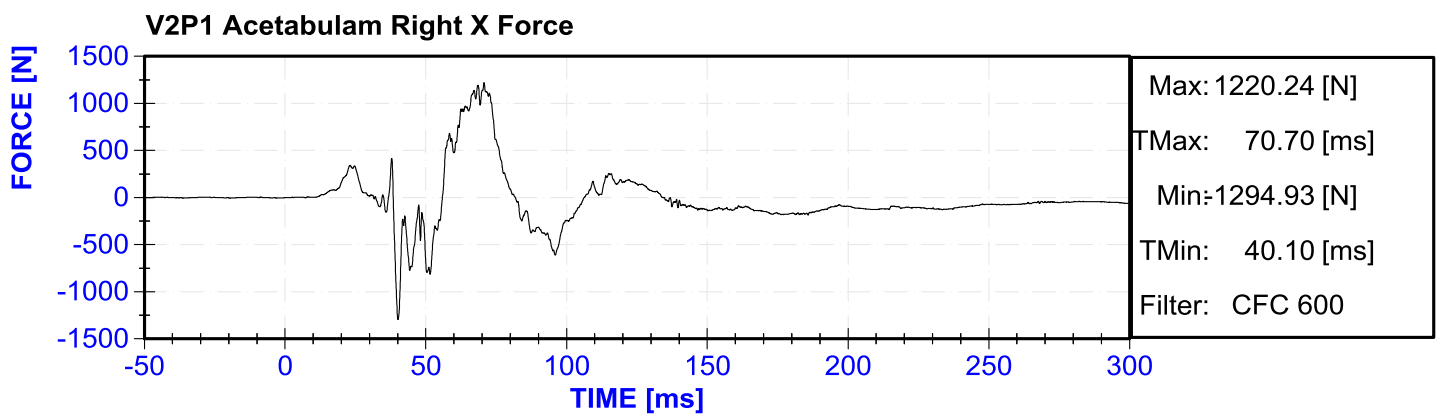
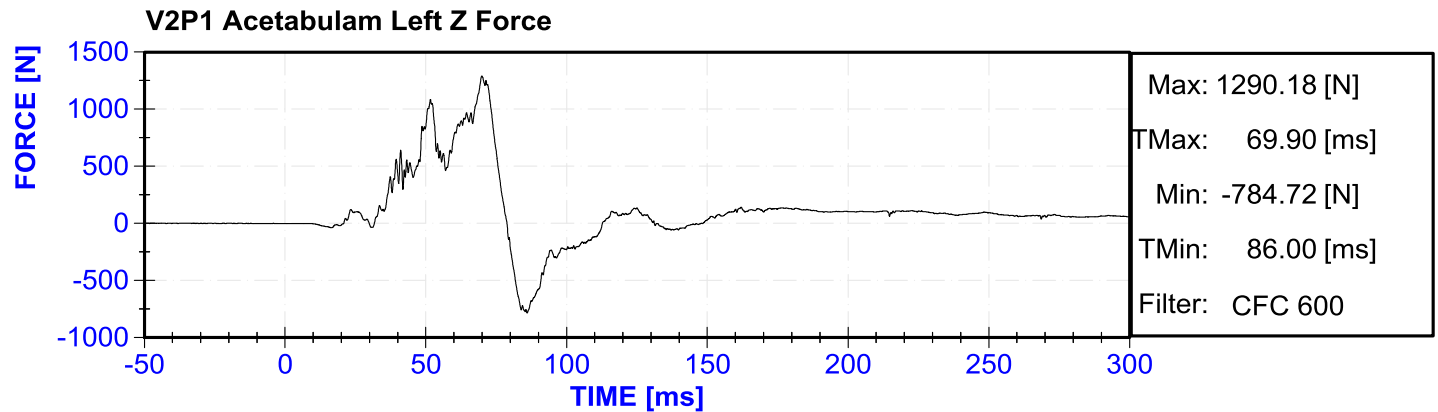
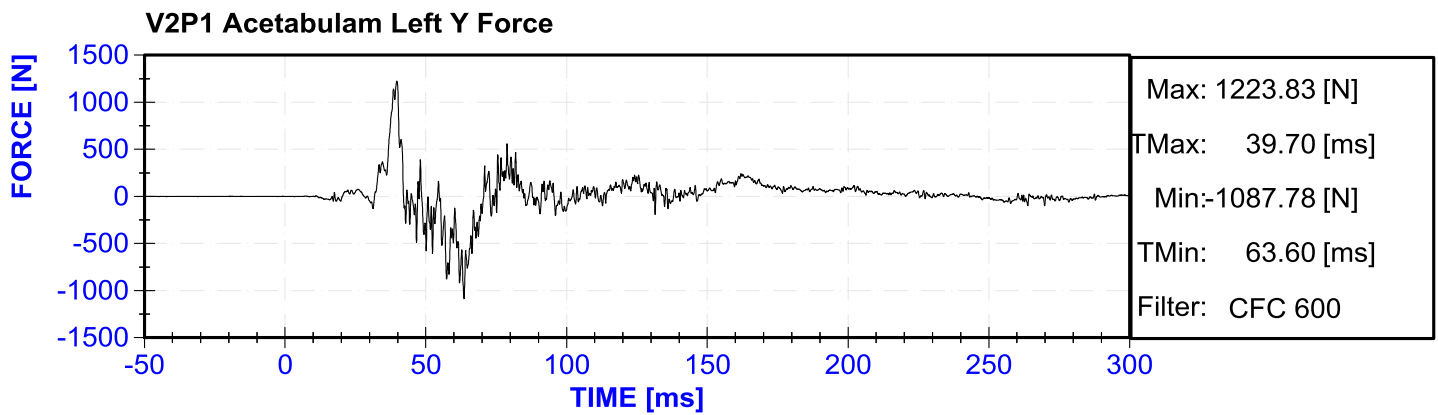
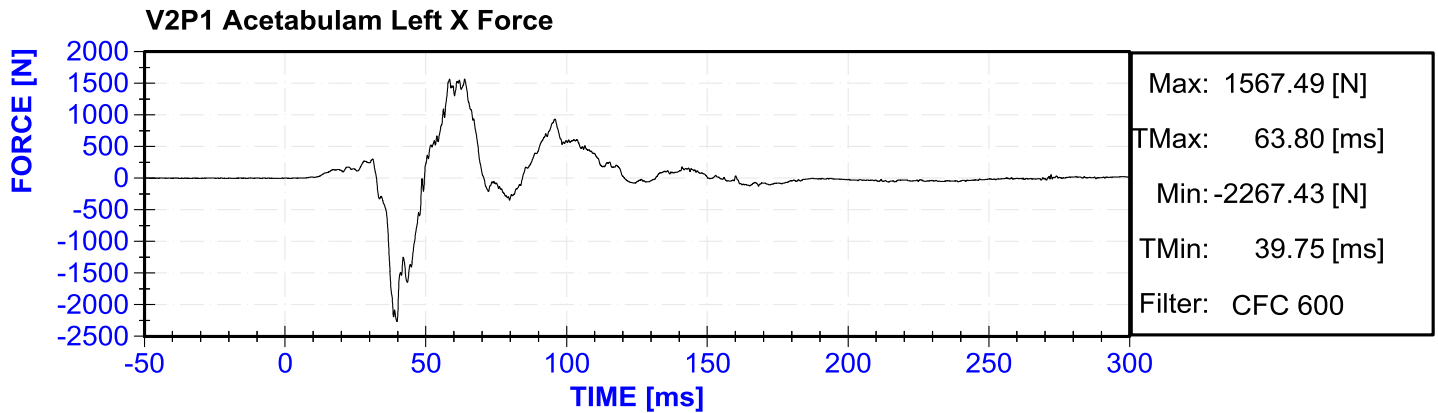


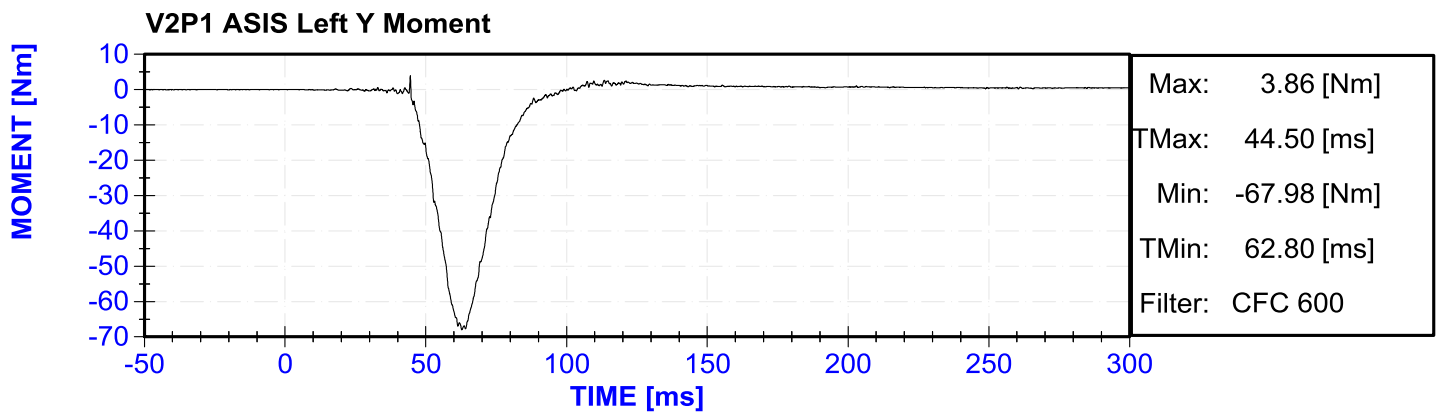
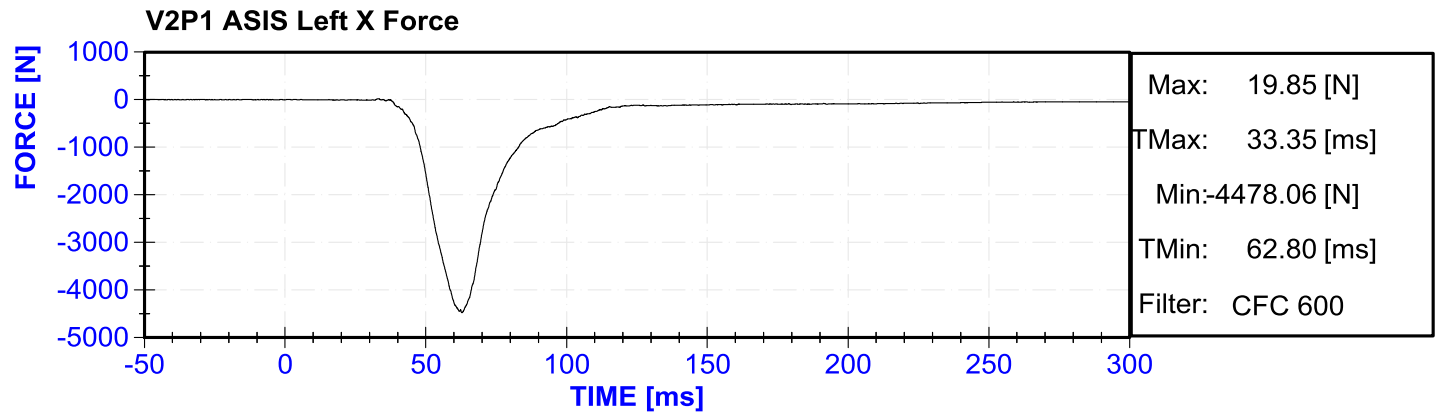
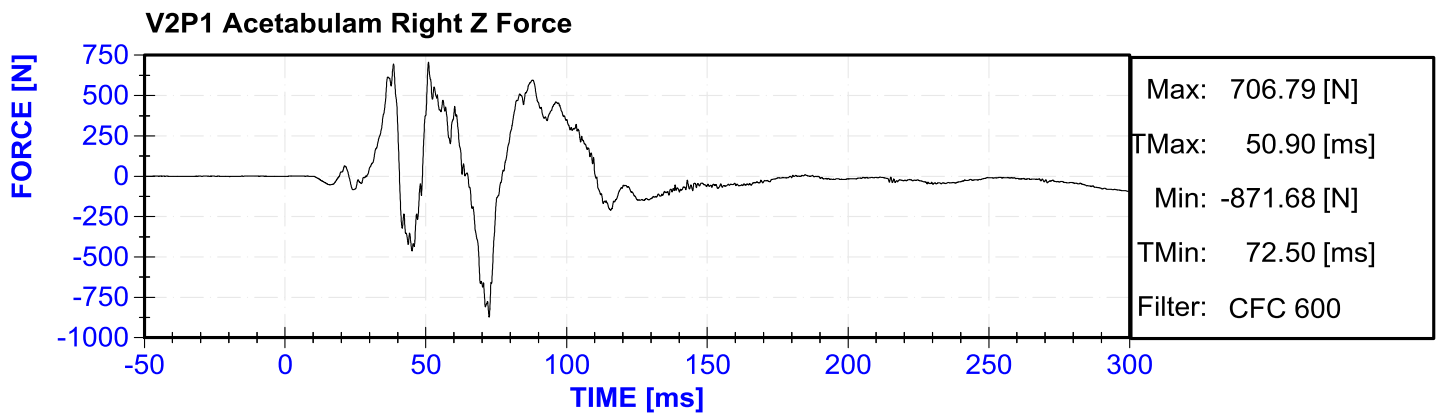
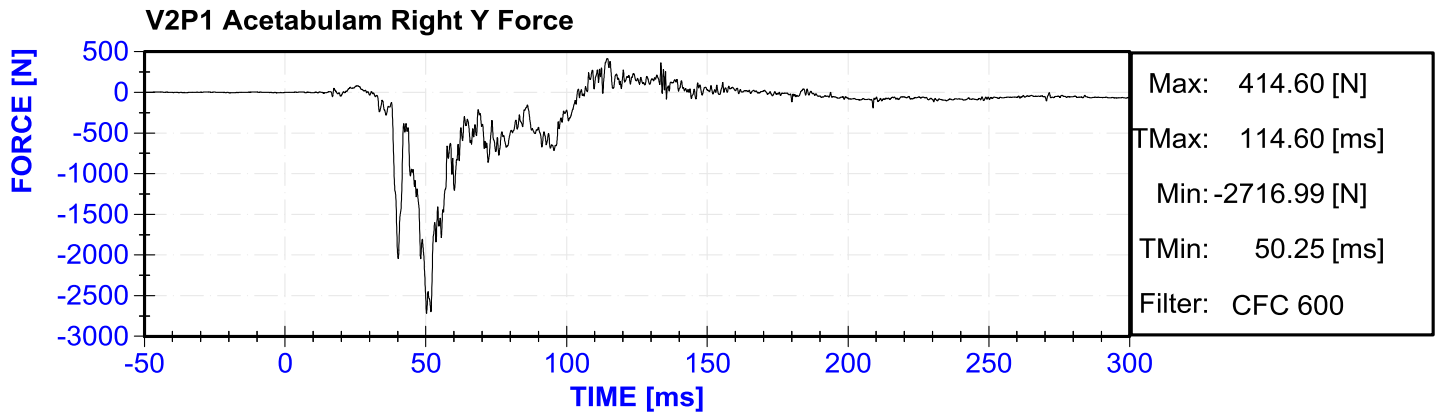


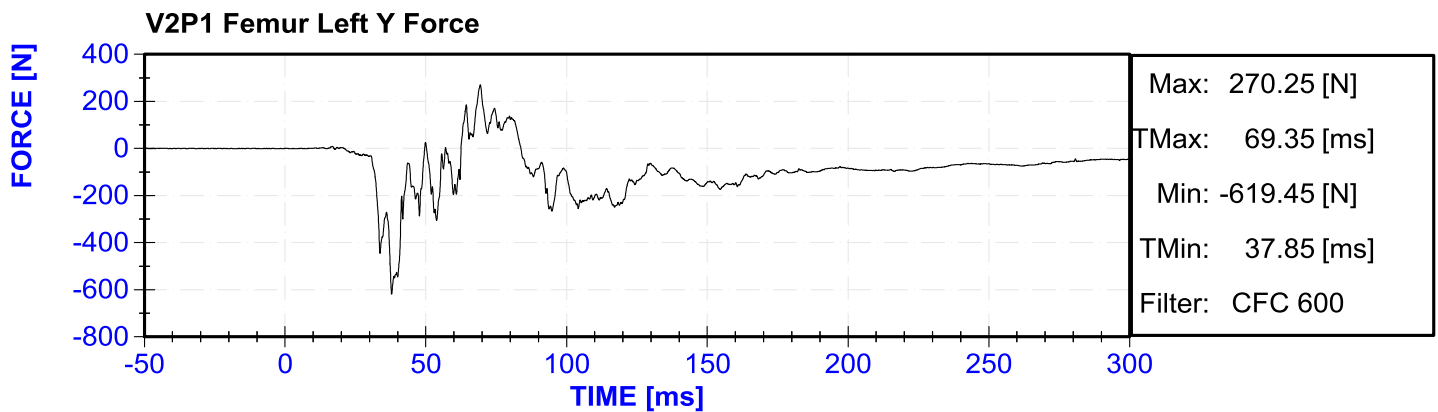
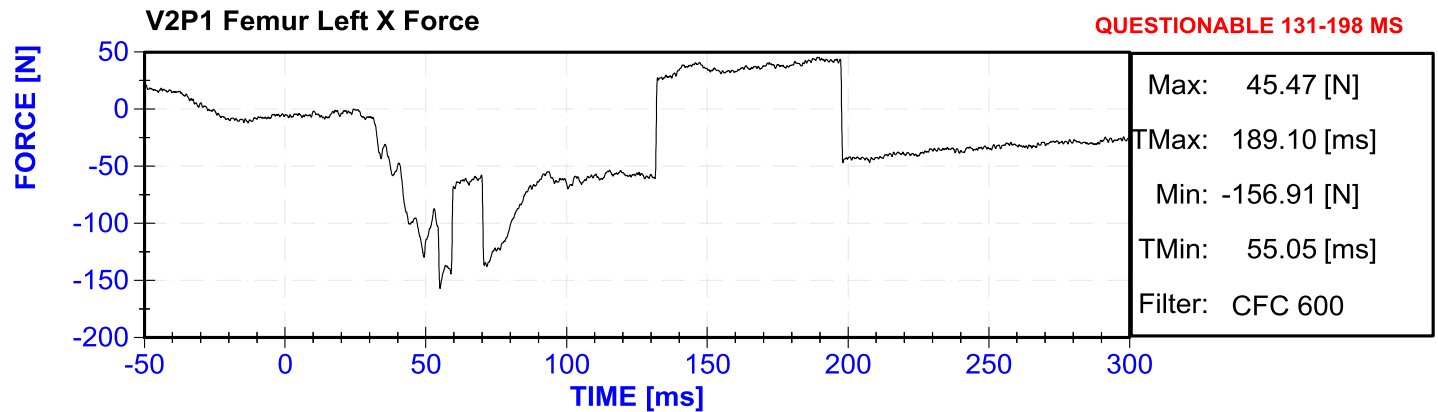
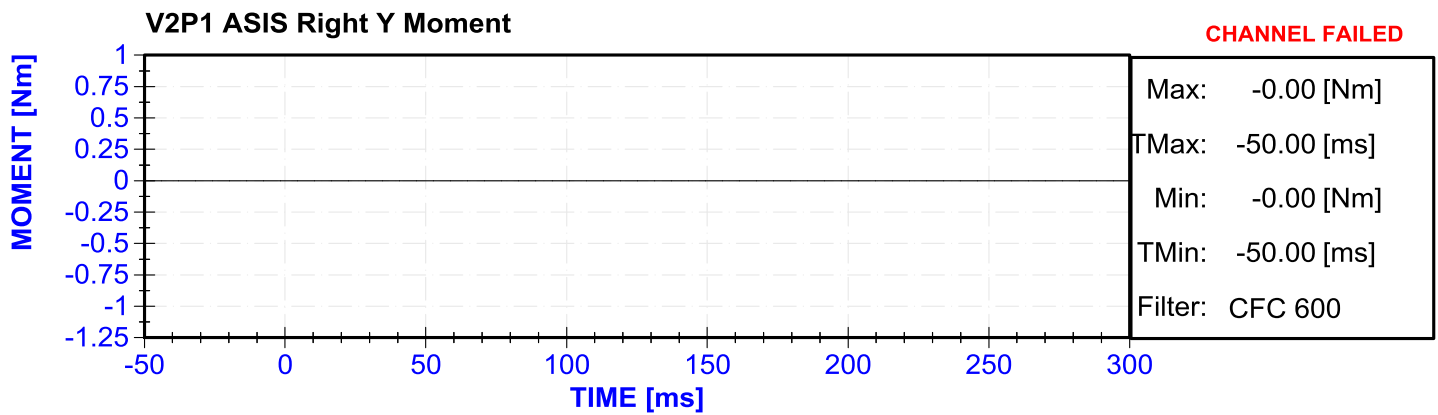
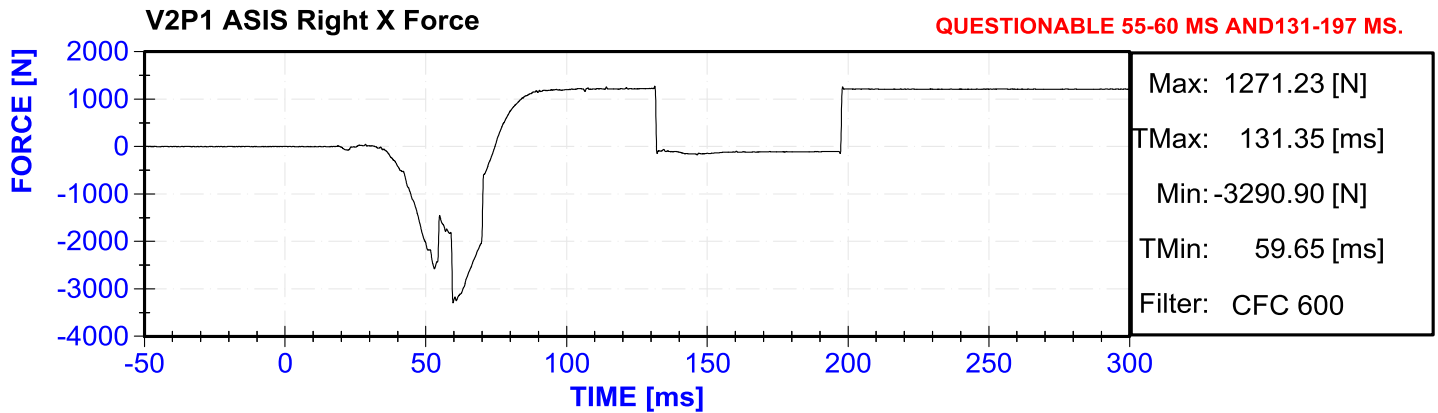


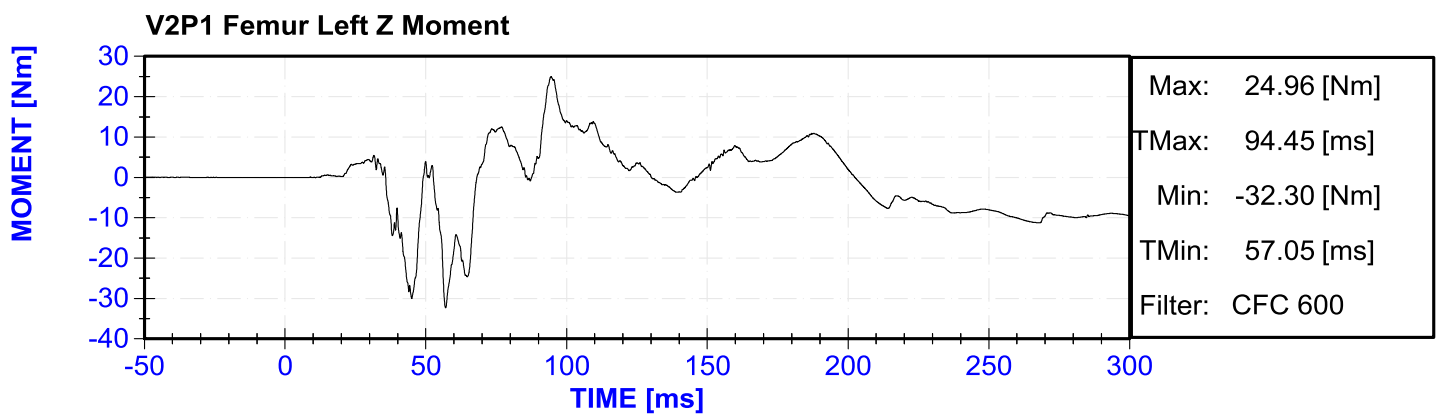
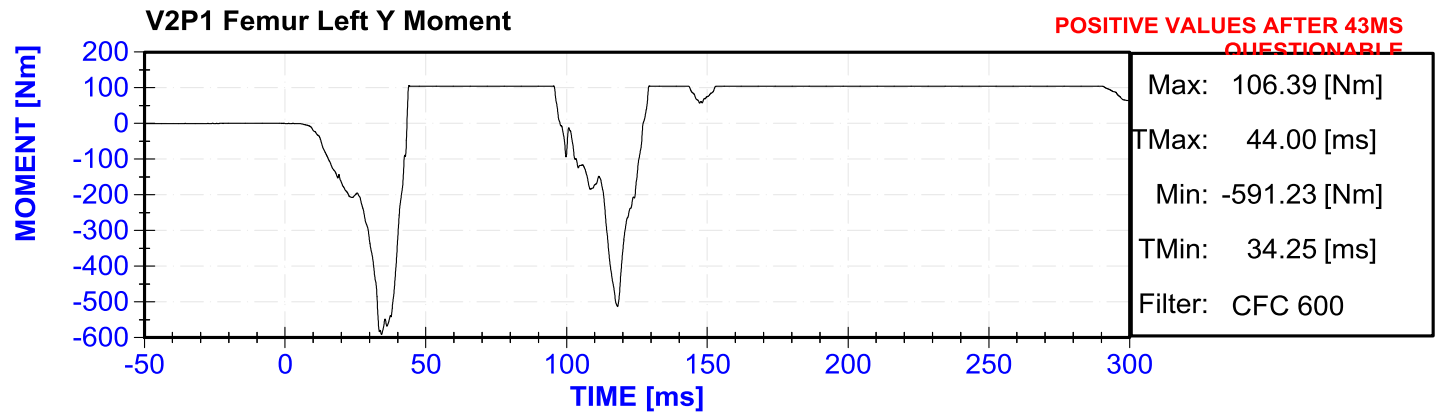
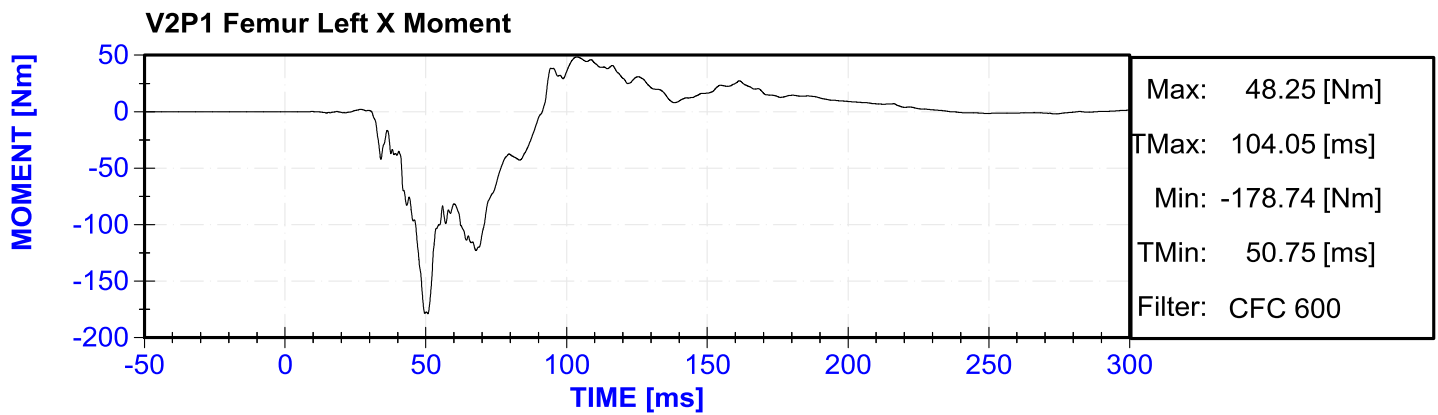
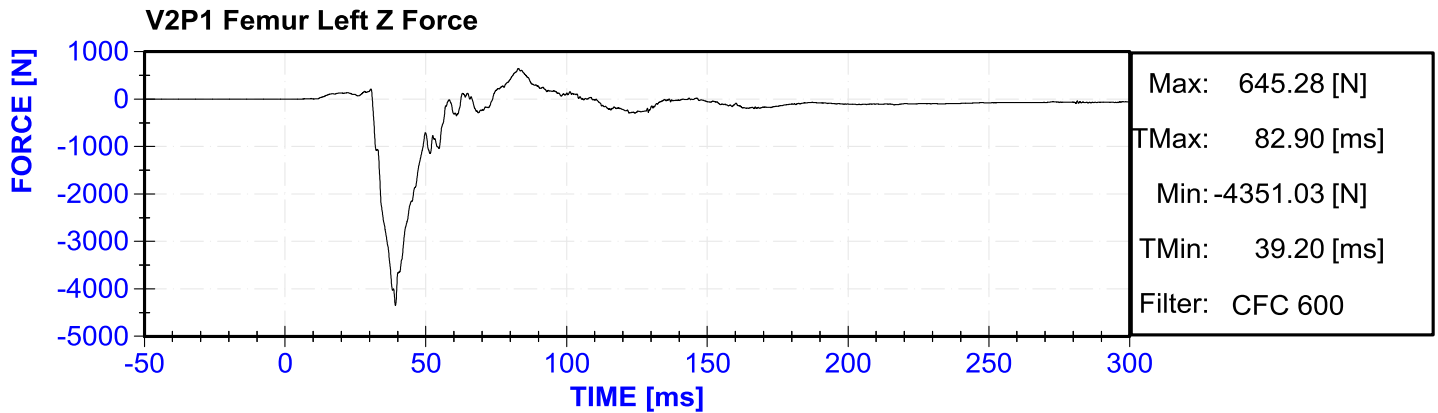


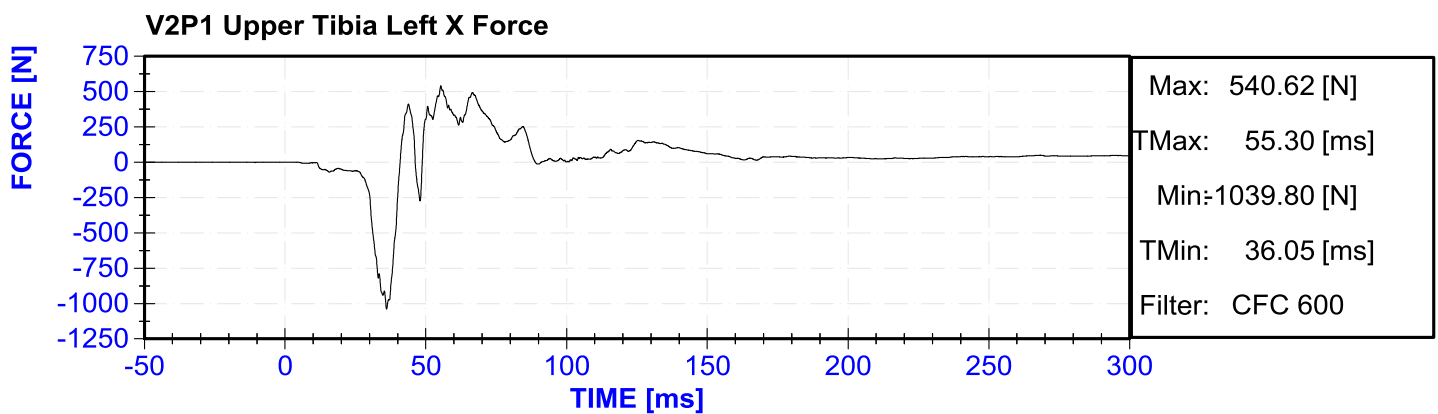
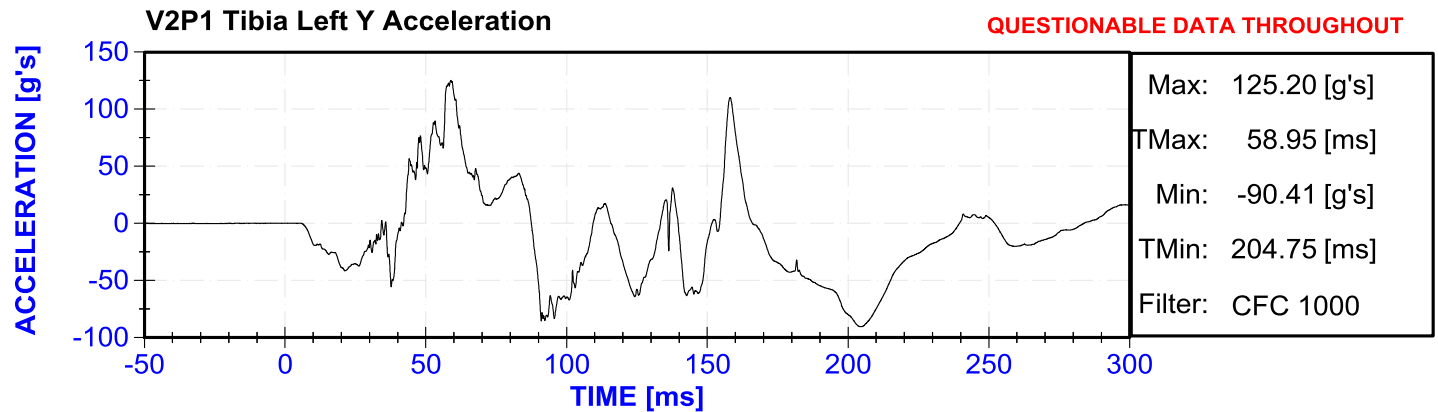
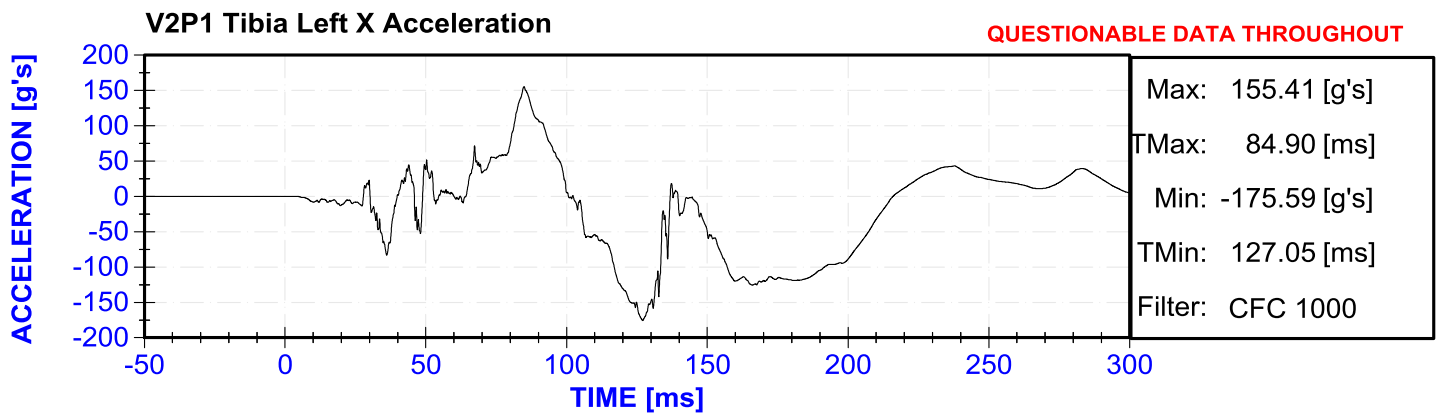
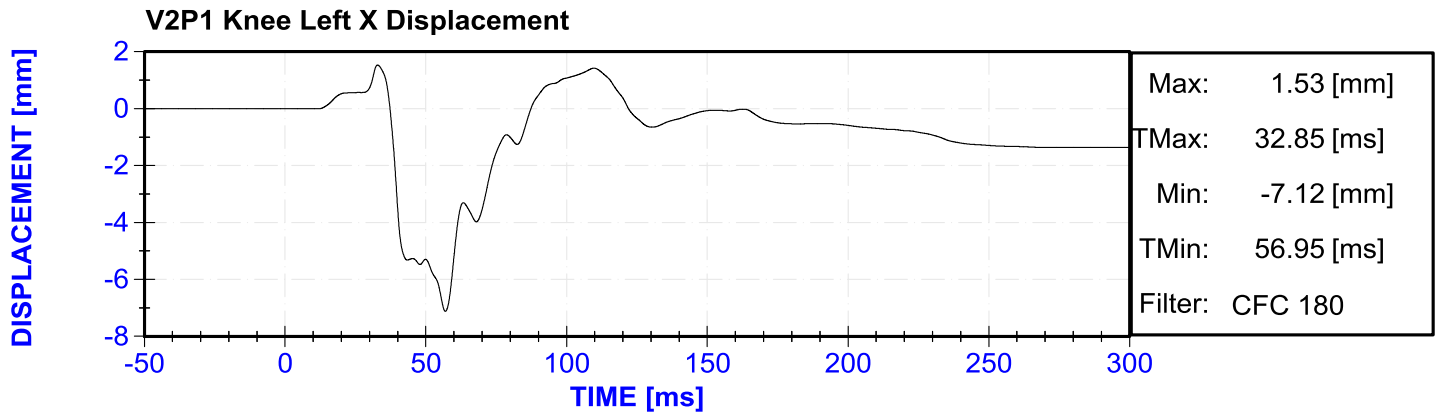


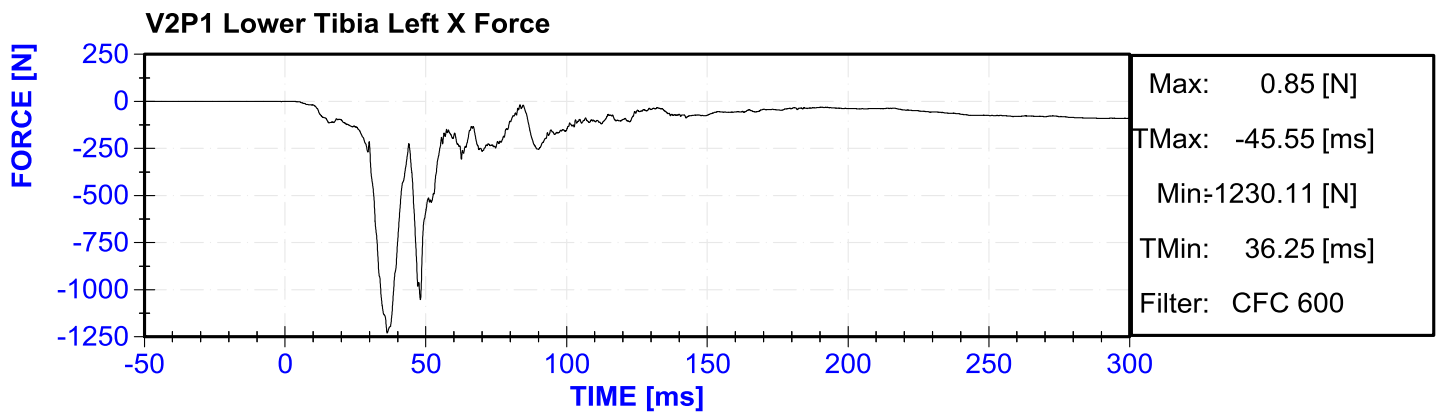
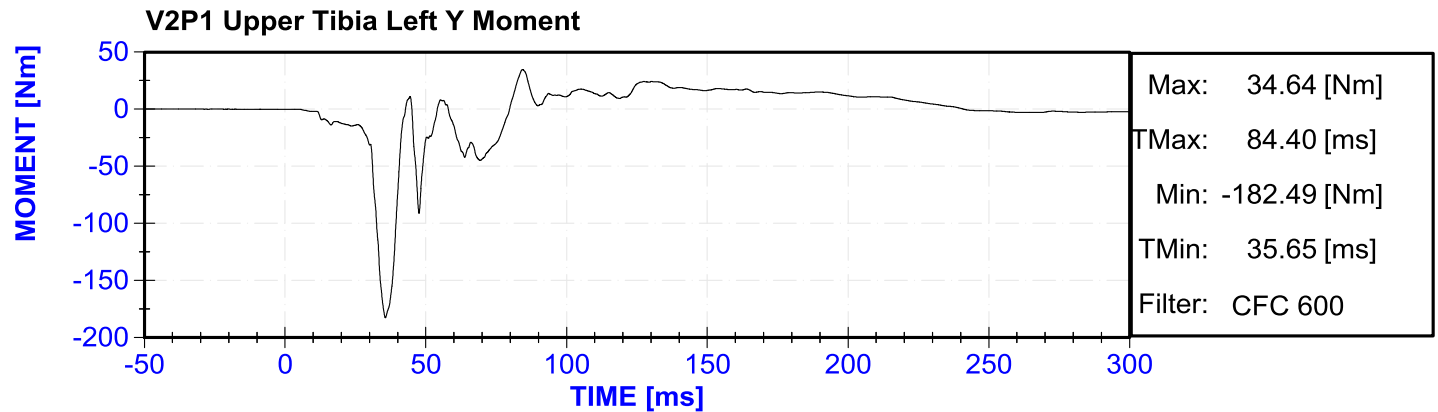
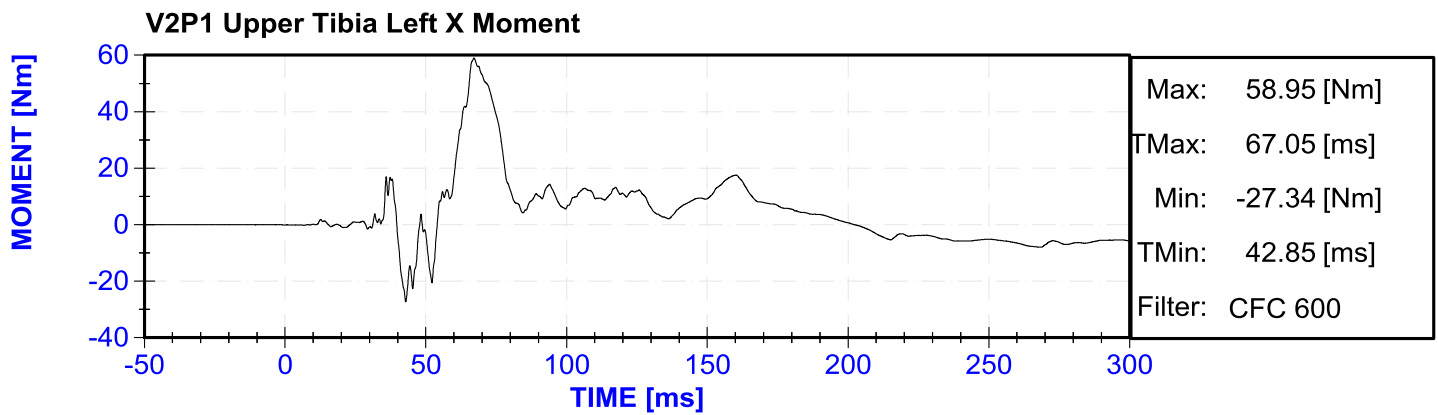
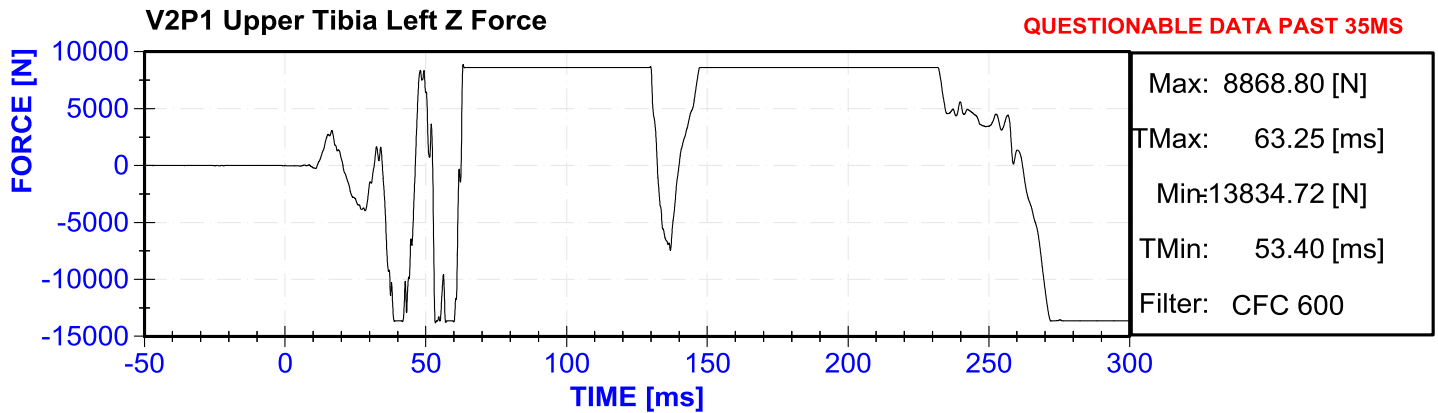


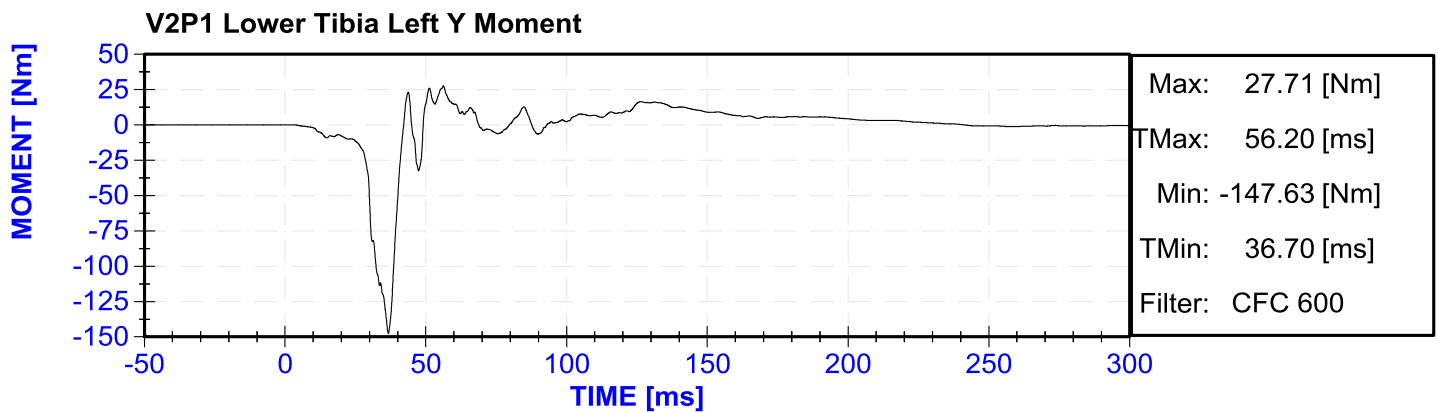
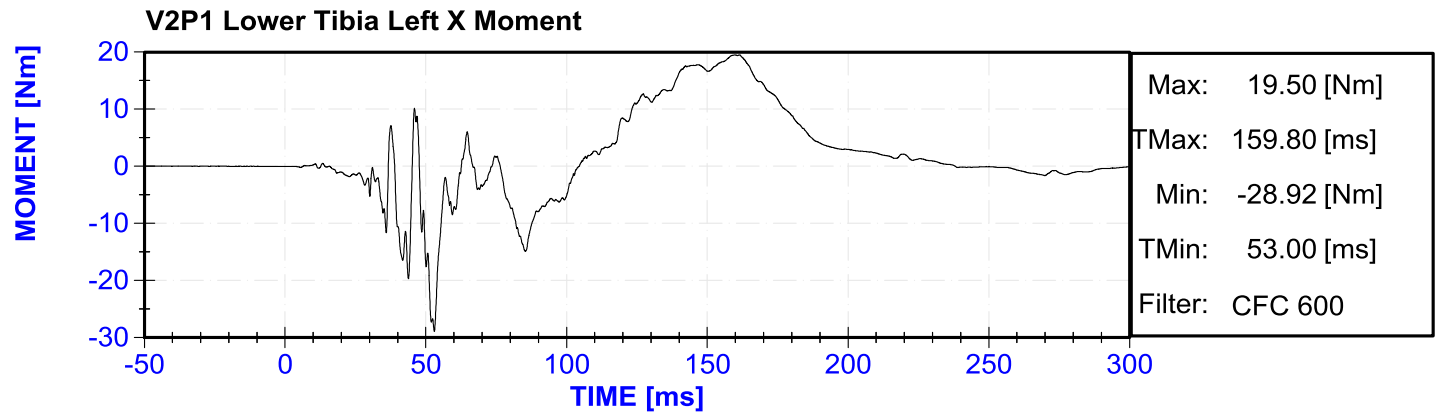
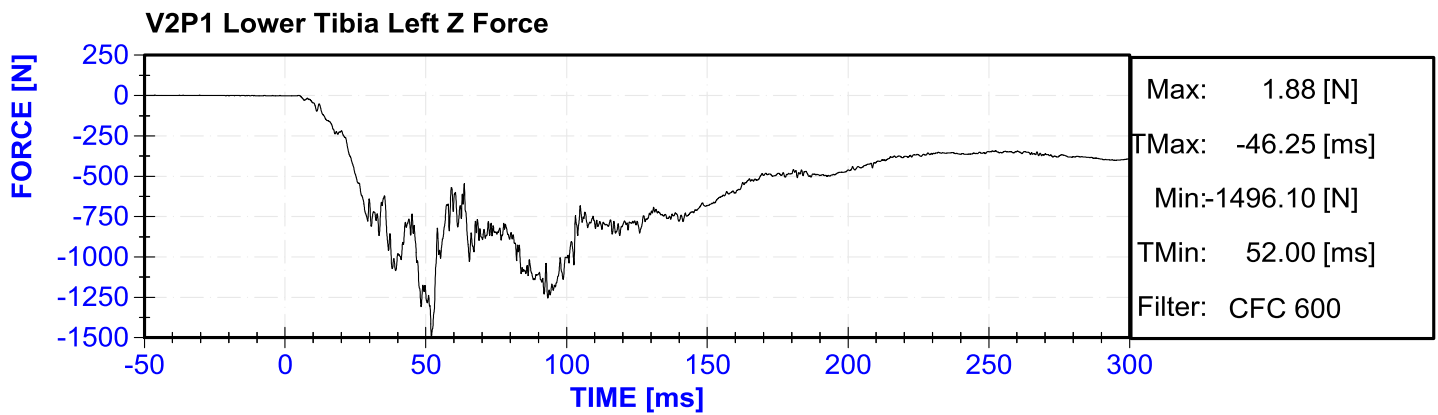
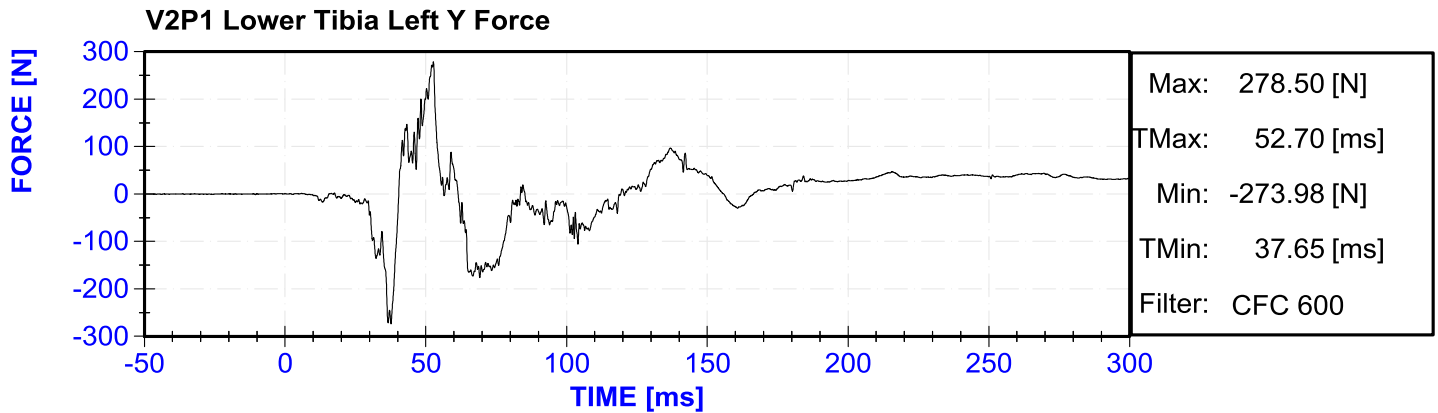


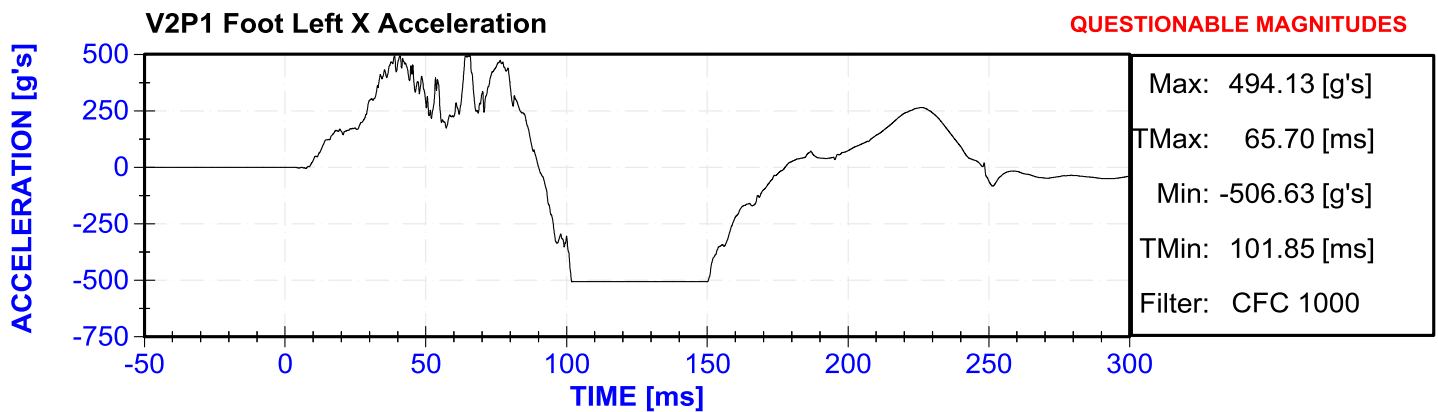
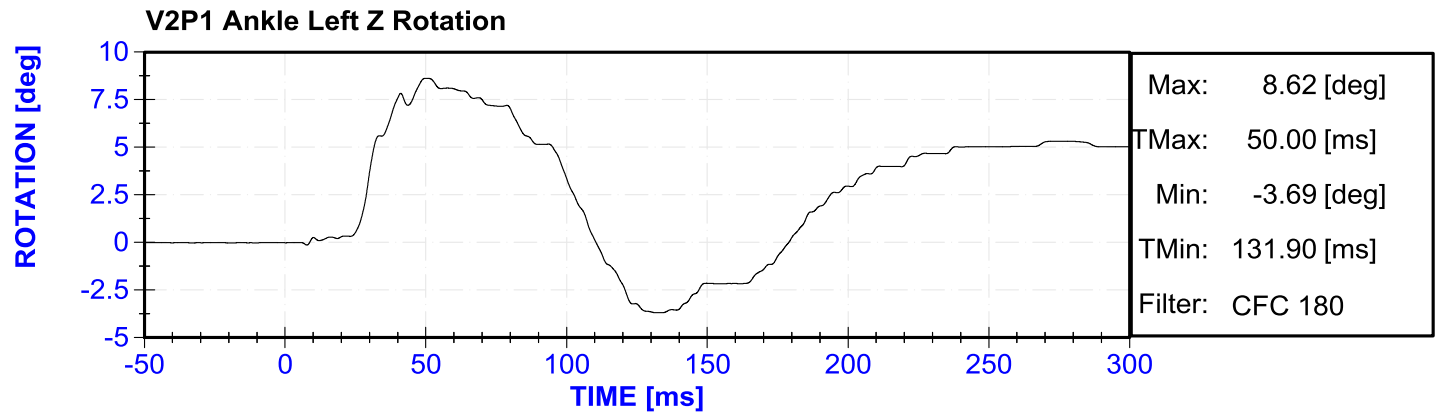
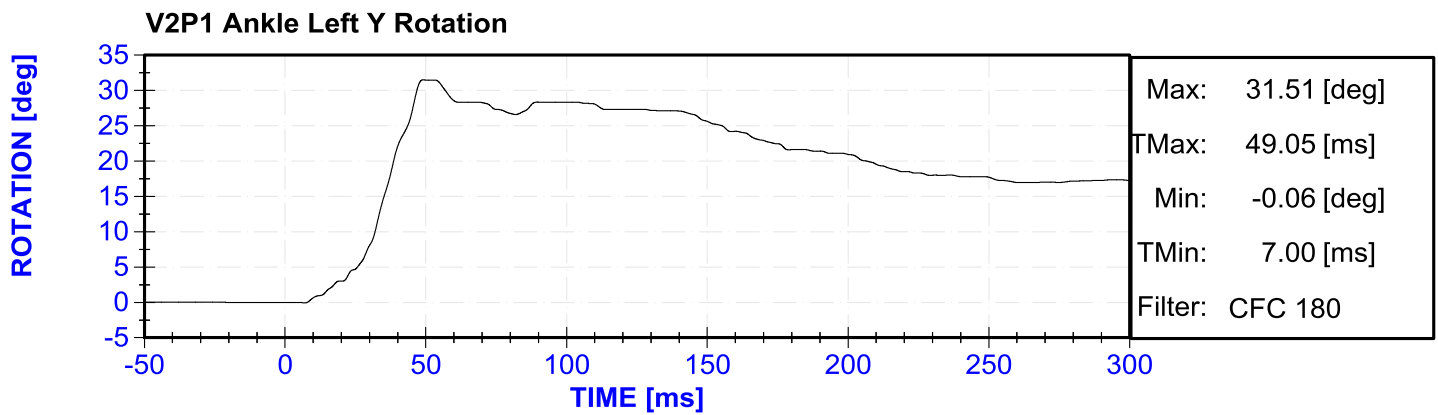
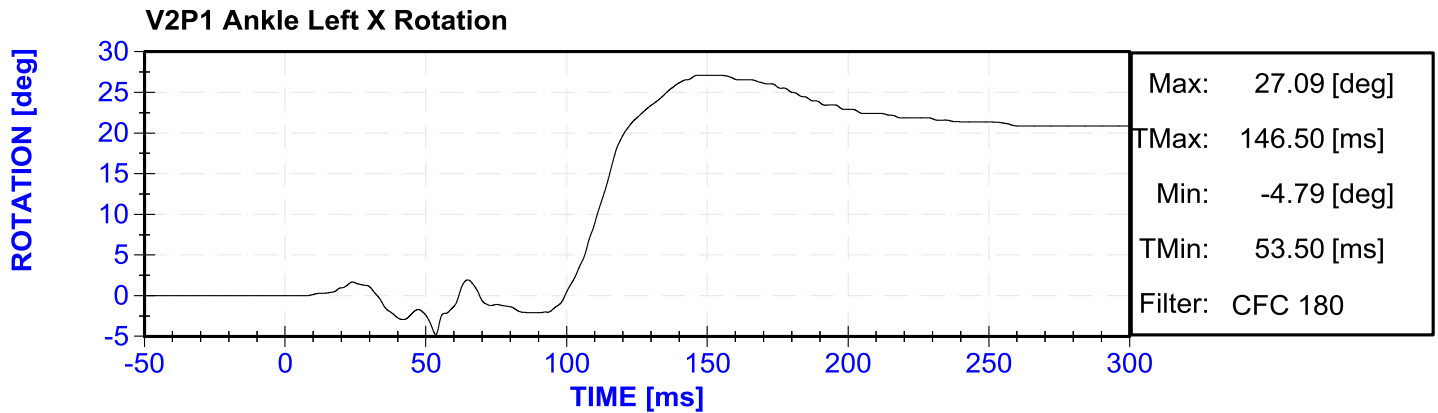


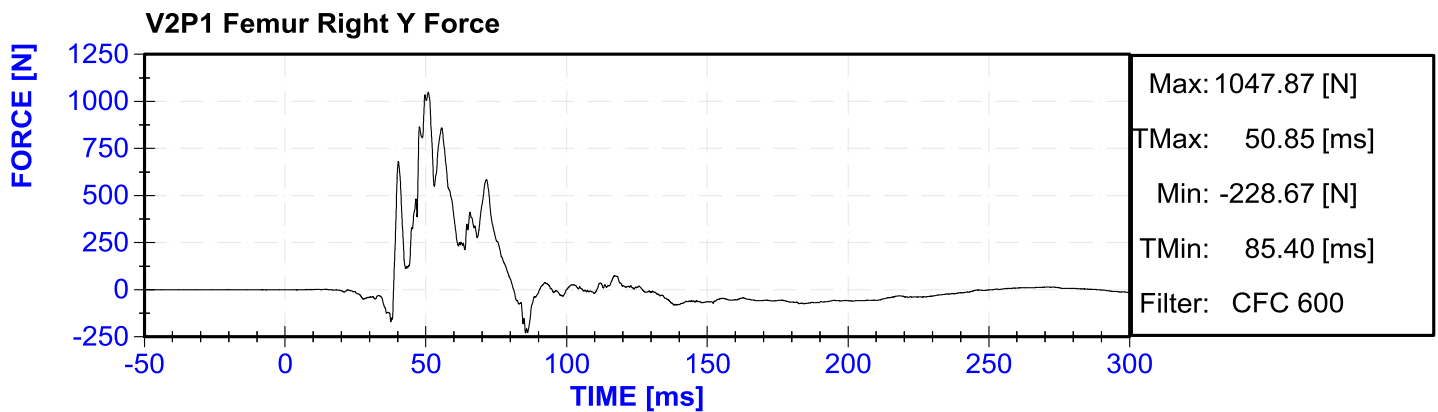
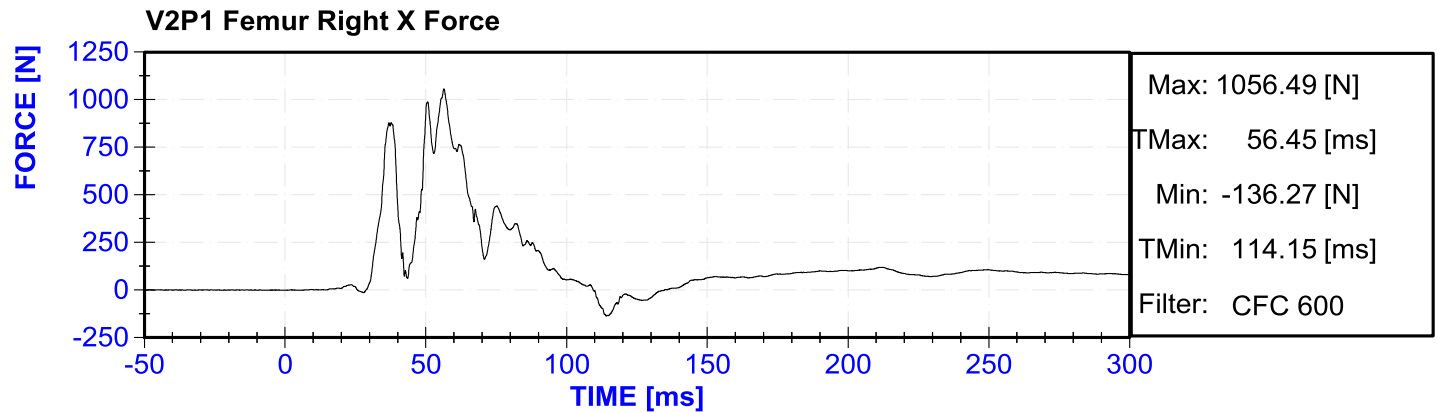
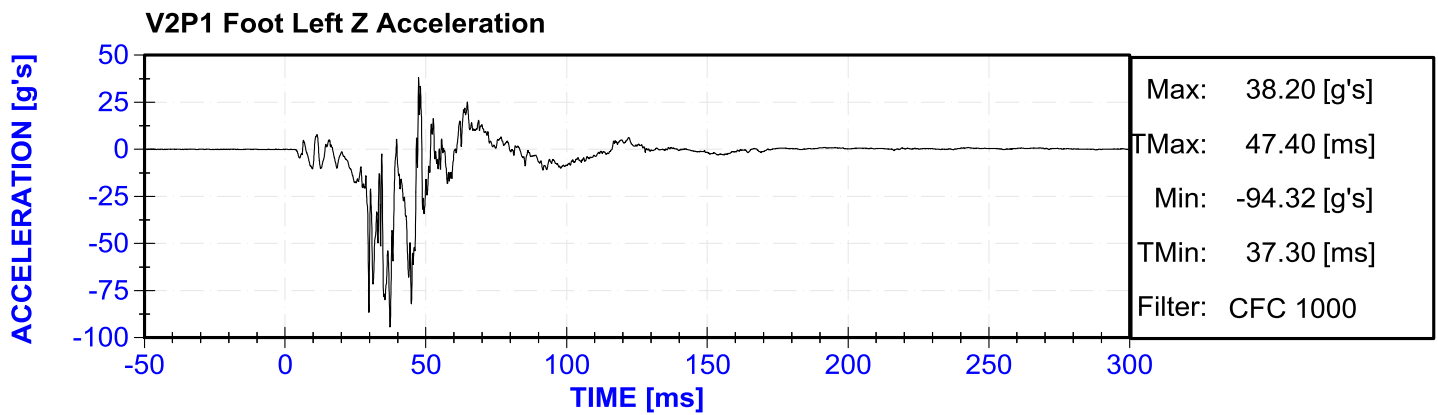
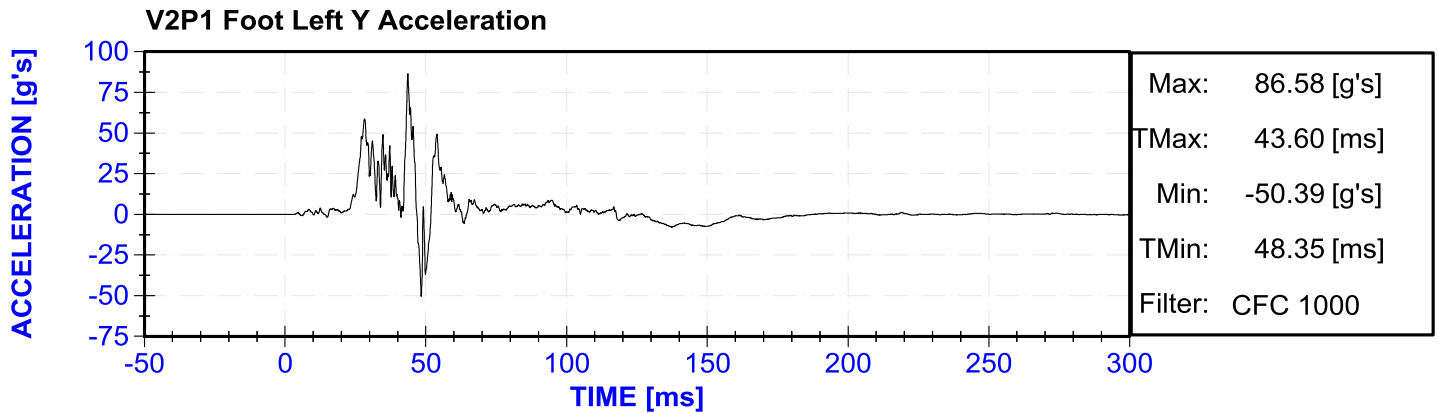


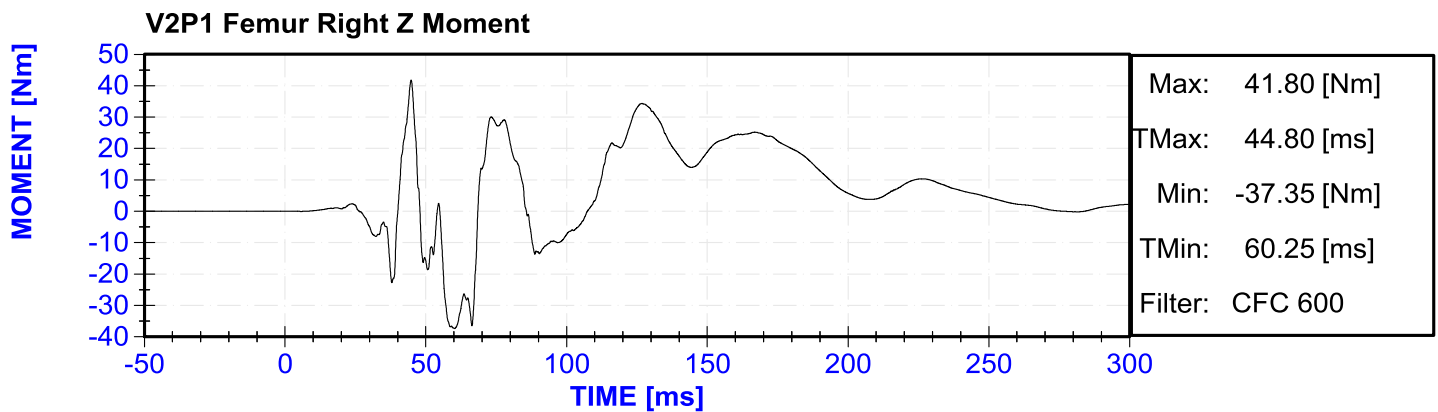
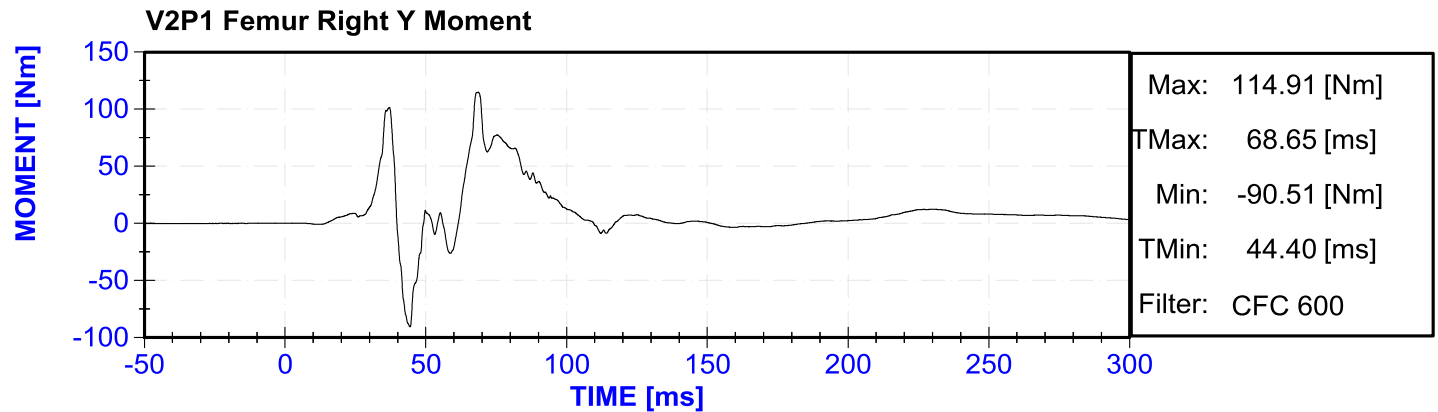
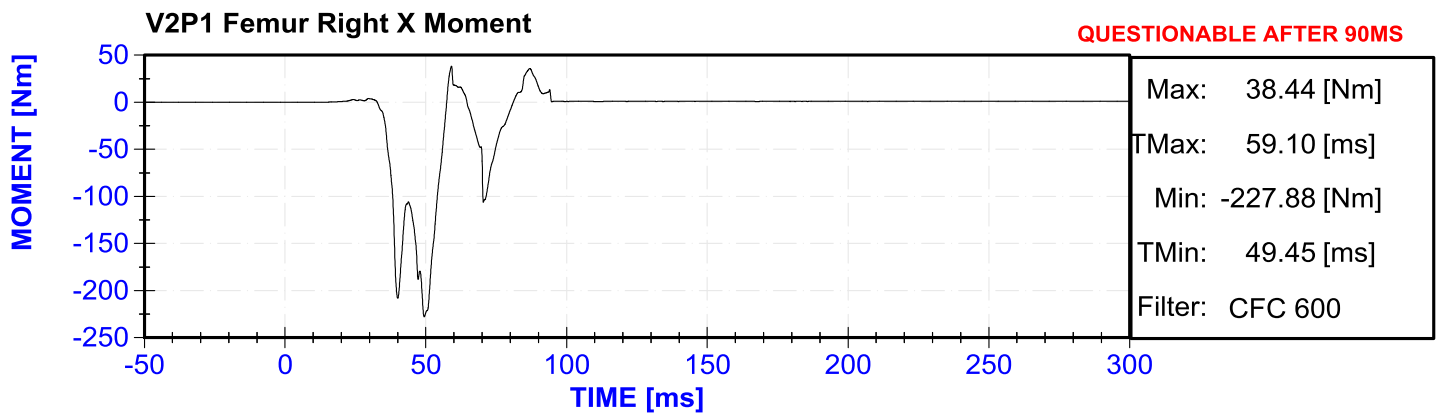
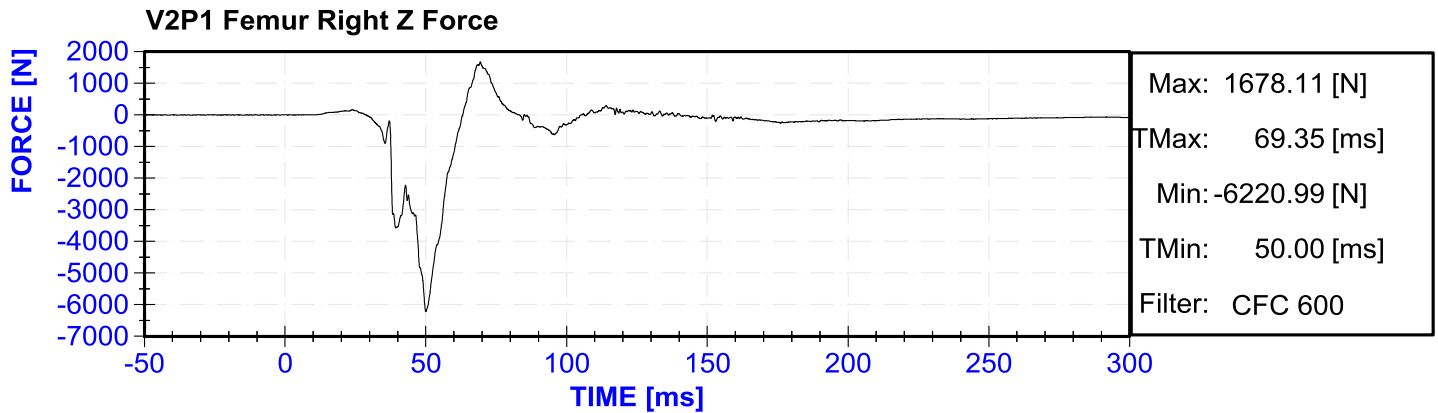


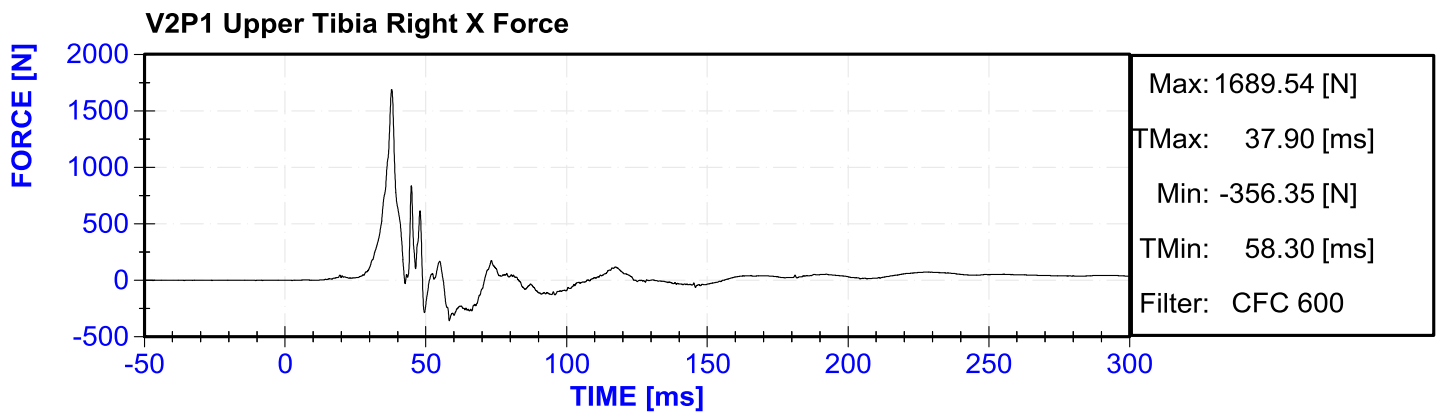
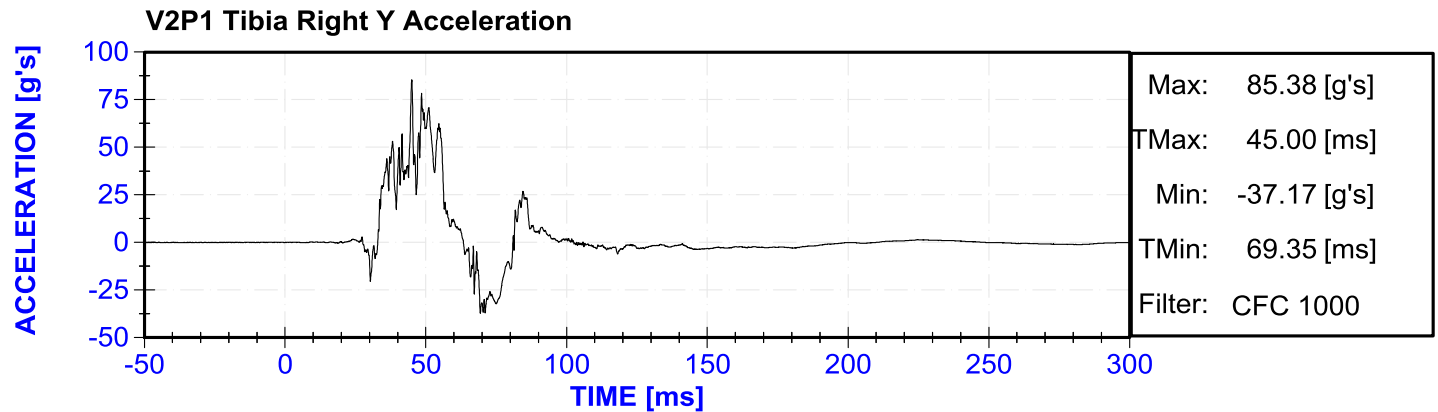
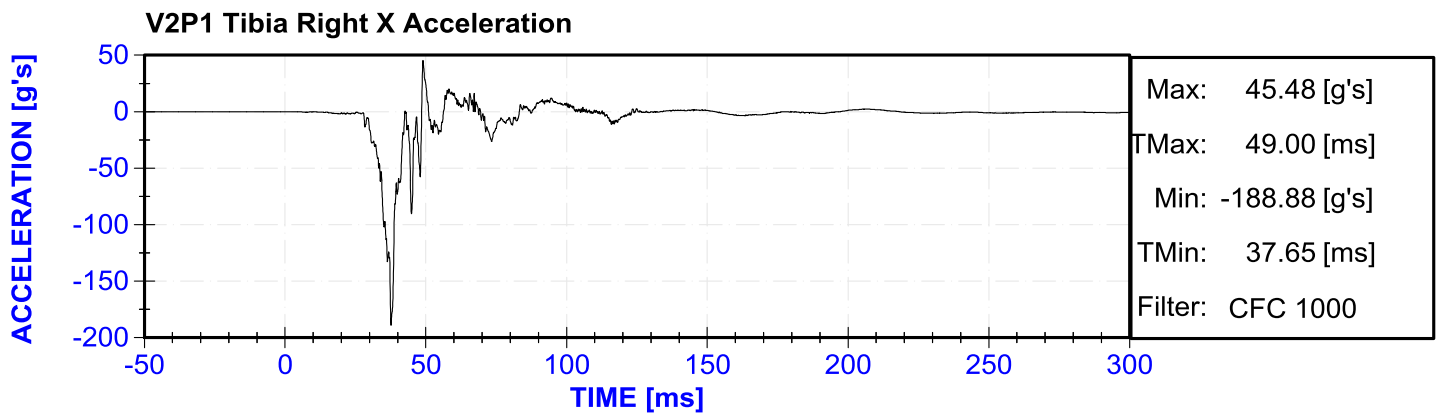
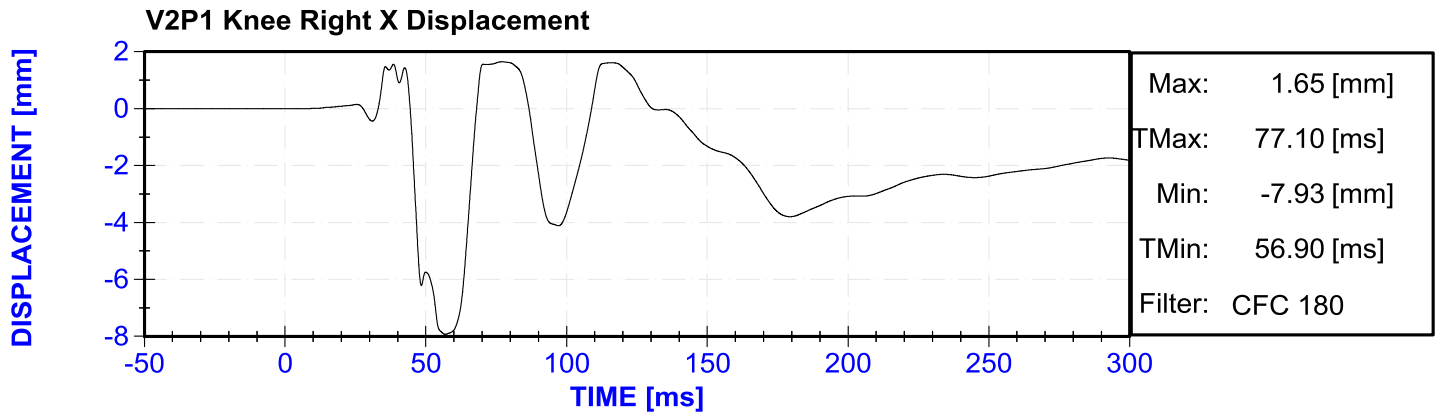




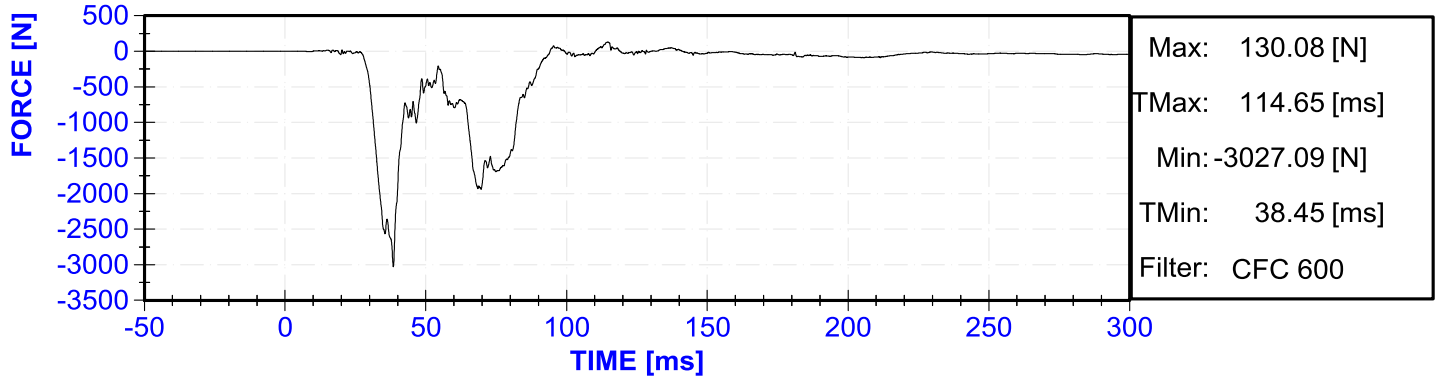




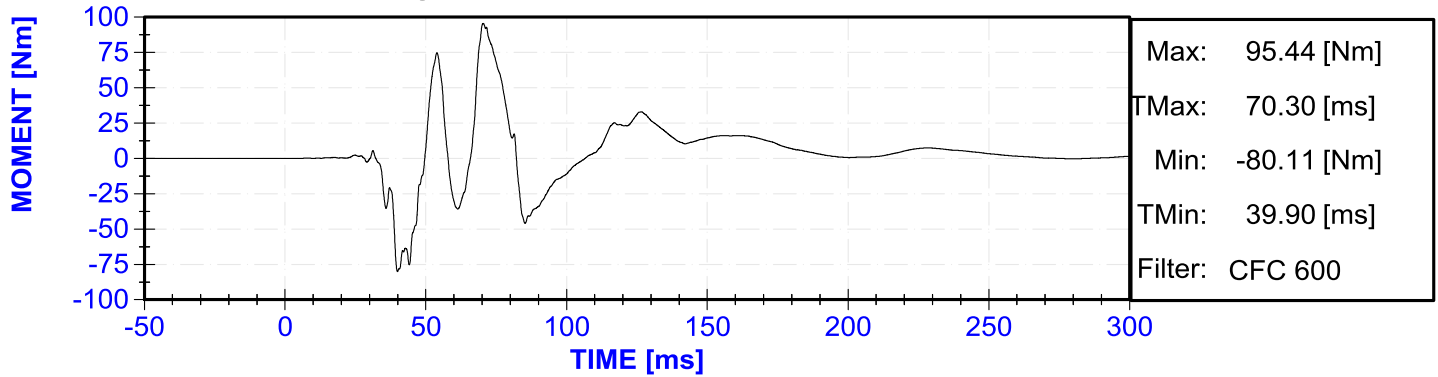




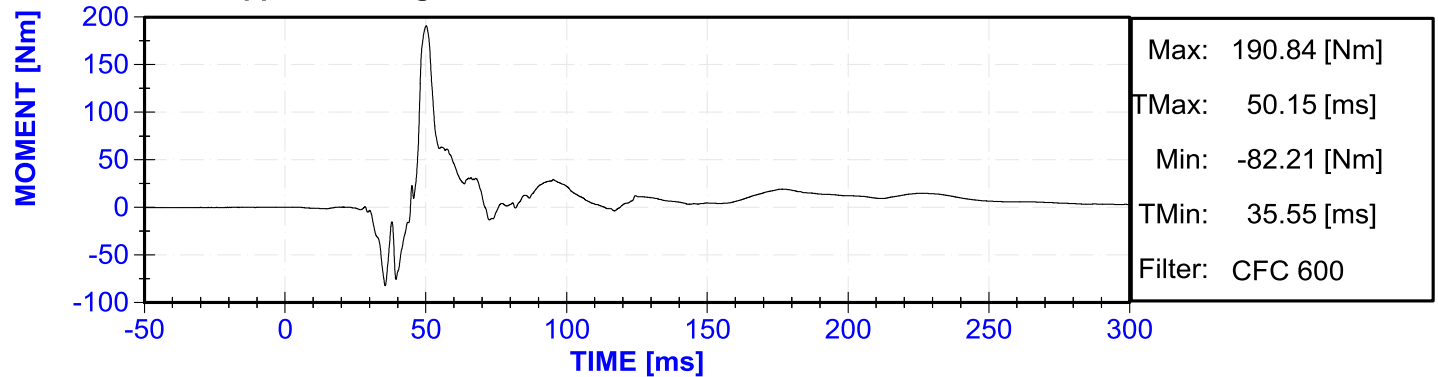
V2P1 Upper Tibia Right Z Force



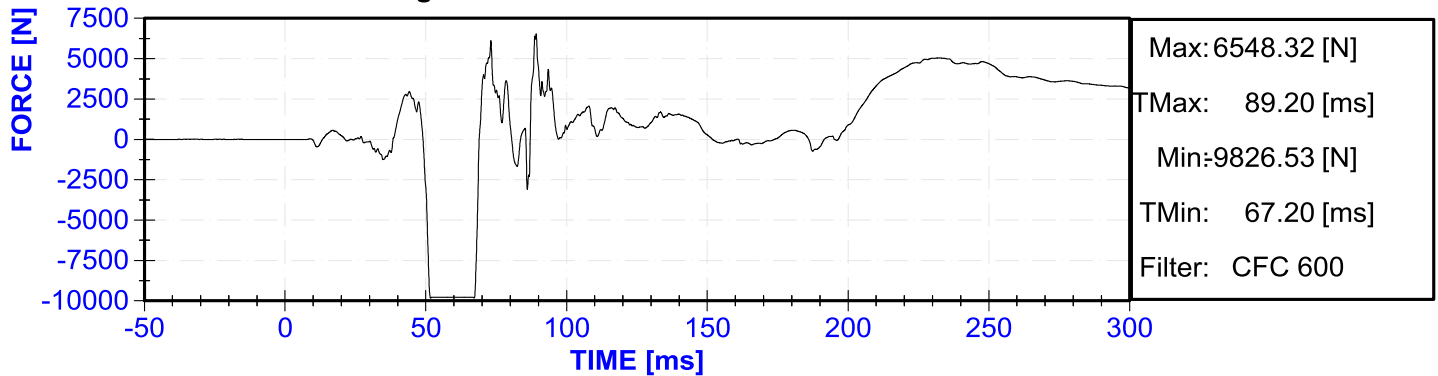
V2P1 Upper Tibia Right X Moment

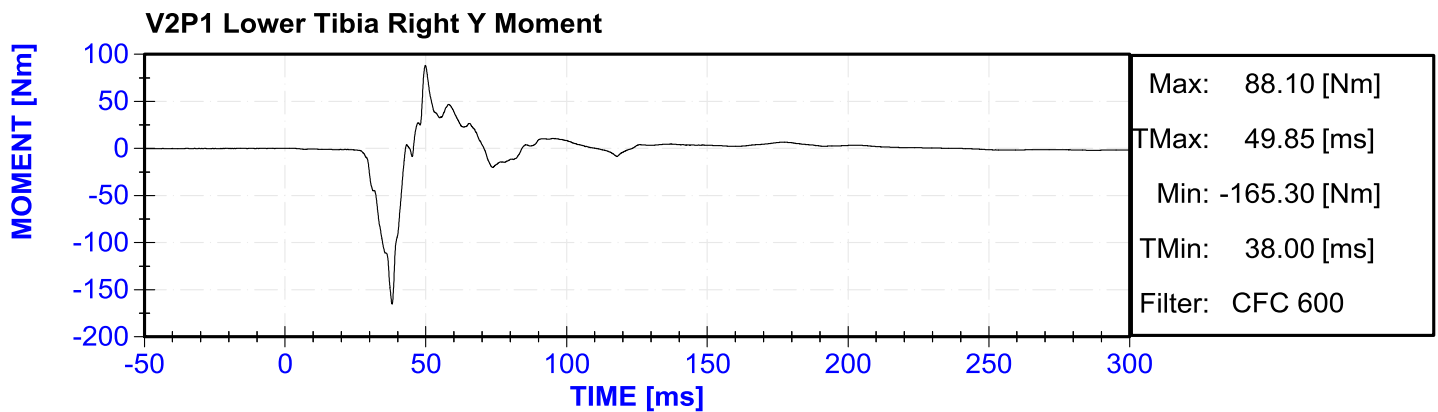
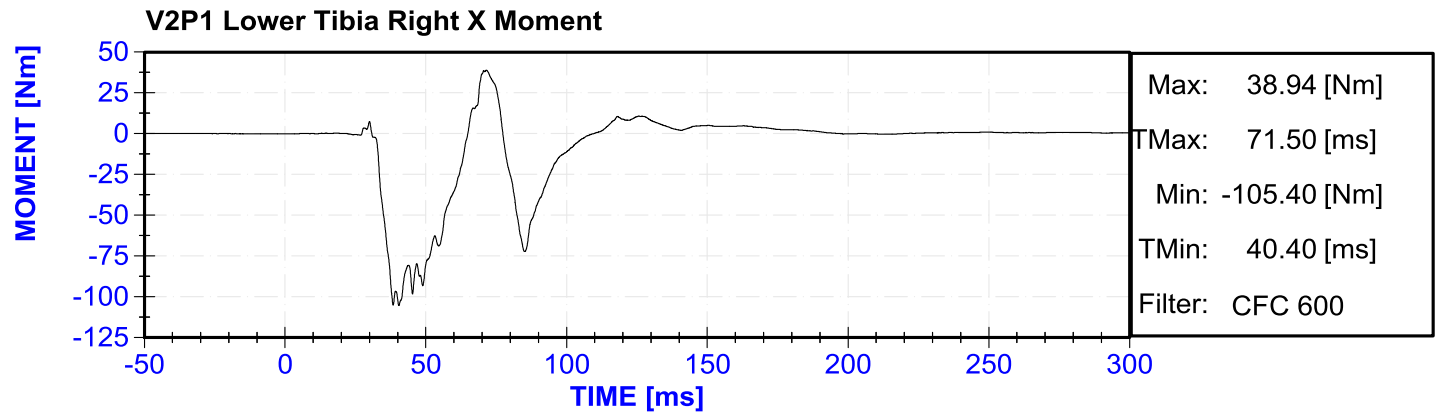
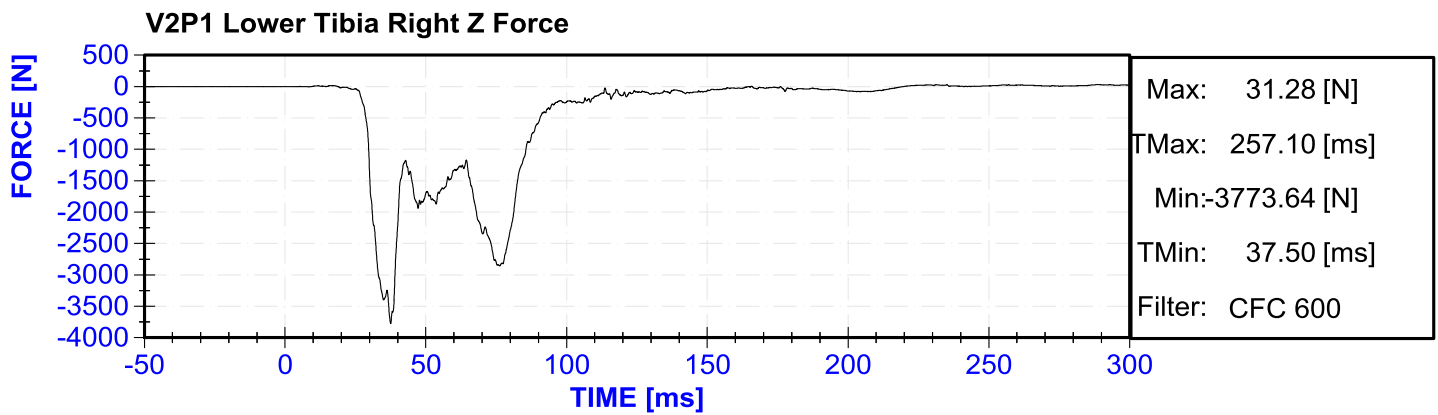
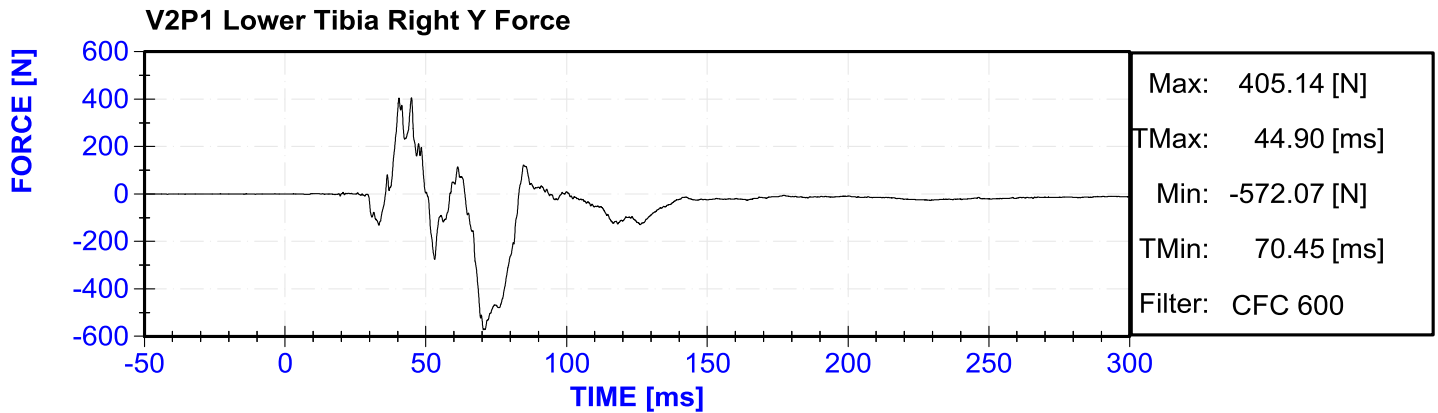


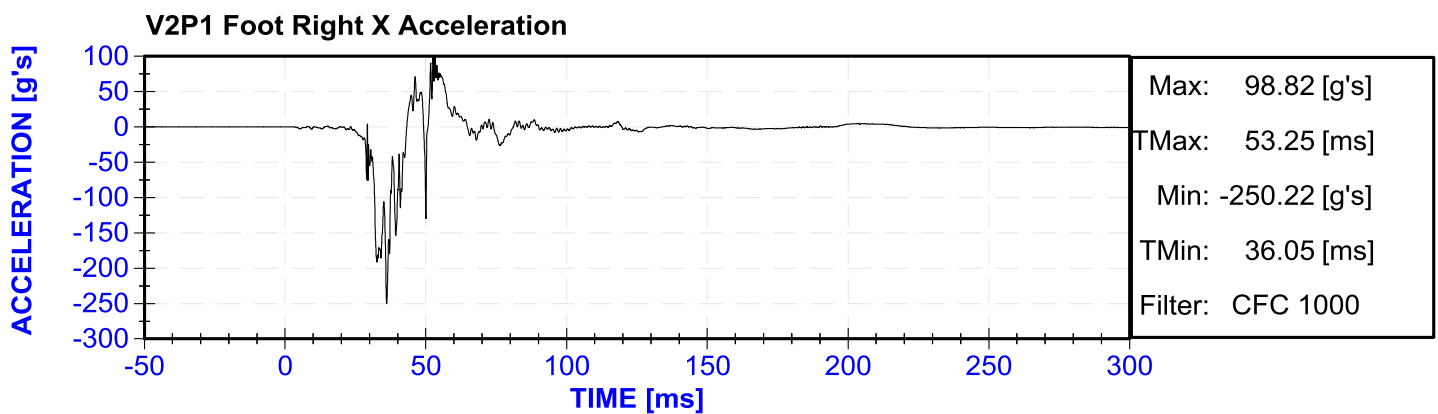
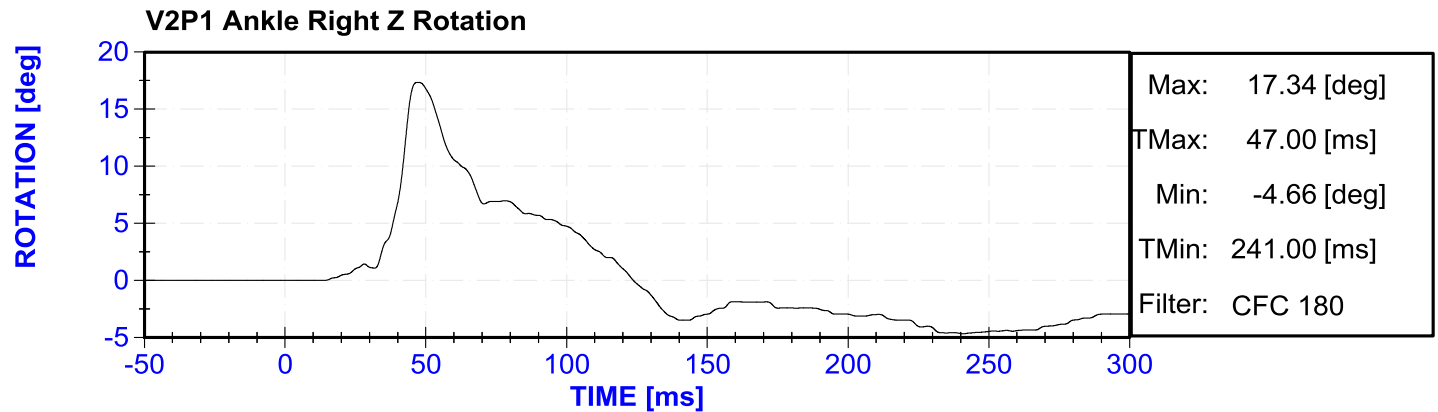
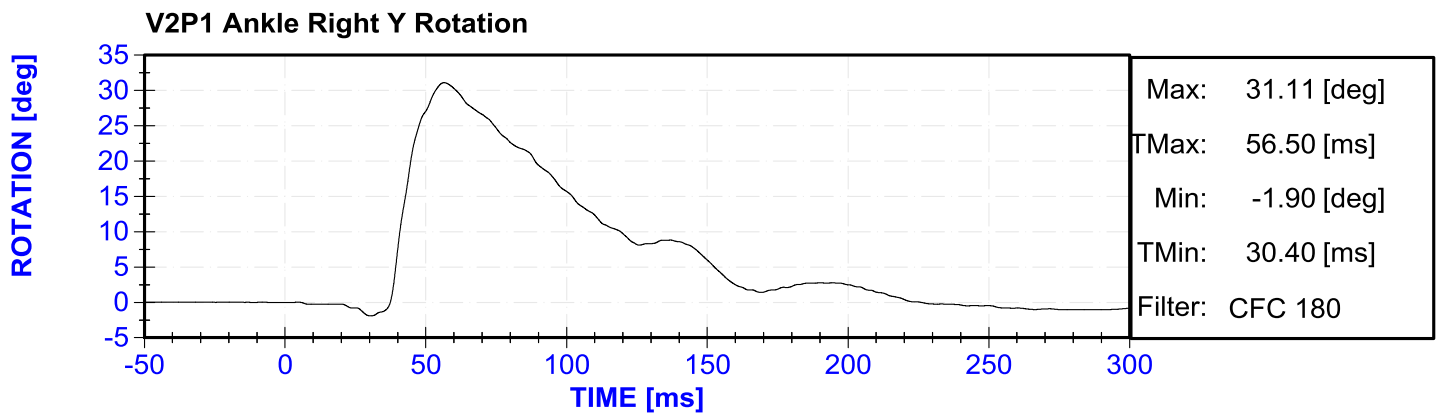
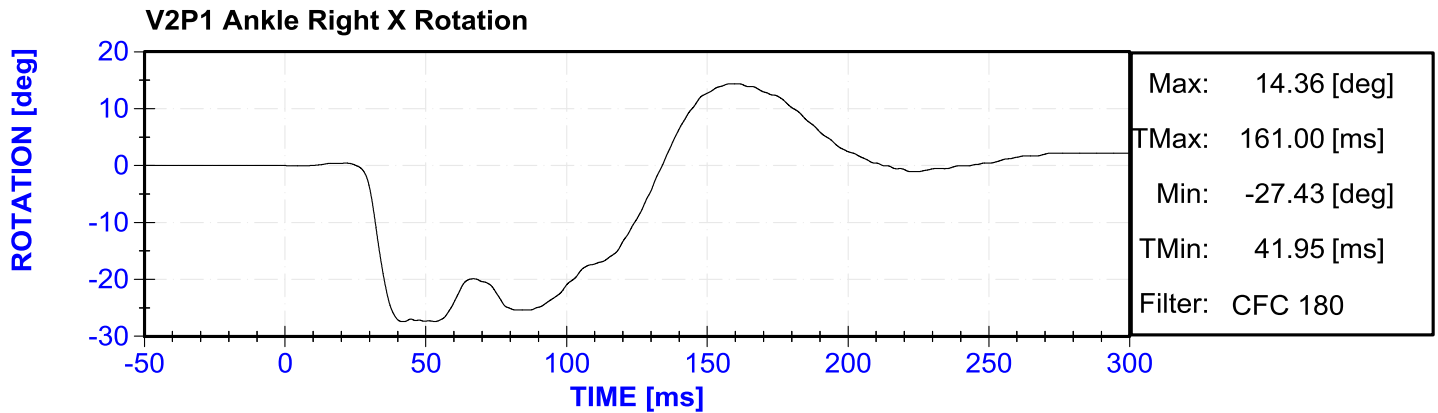
V2P1 Upper Tibia Right Y Moment

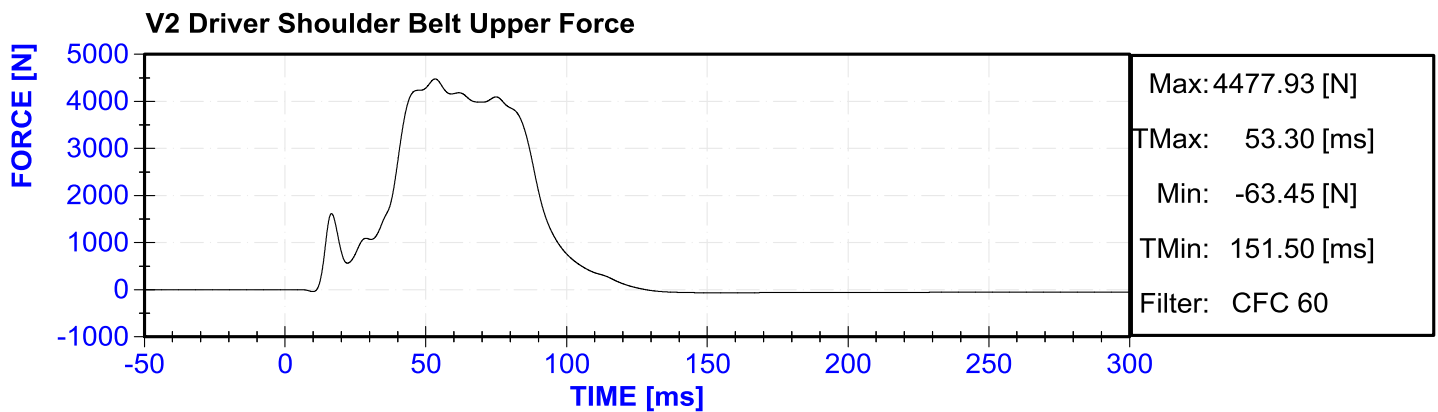
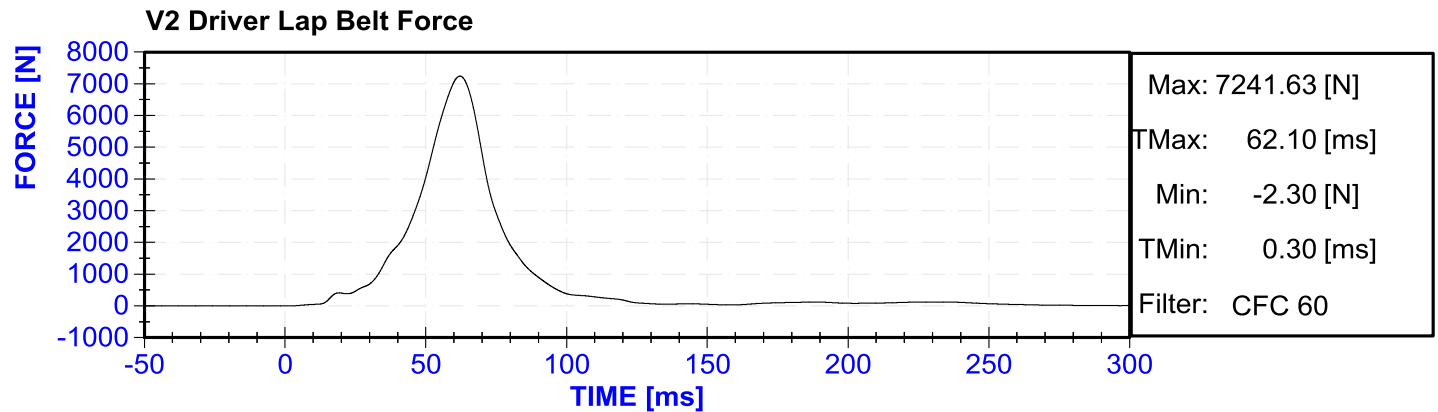
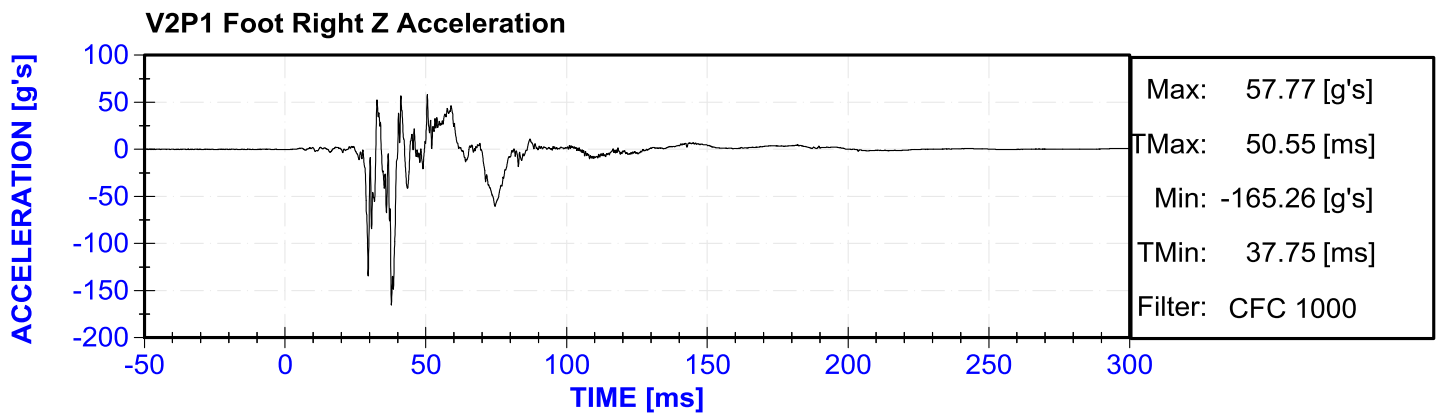
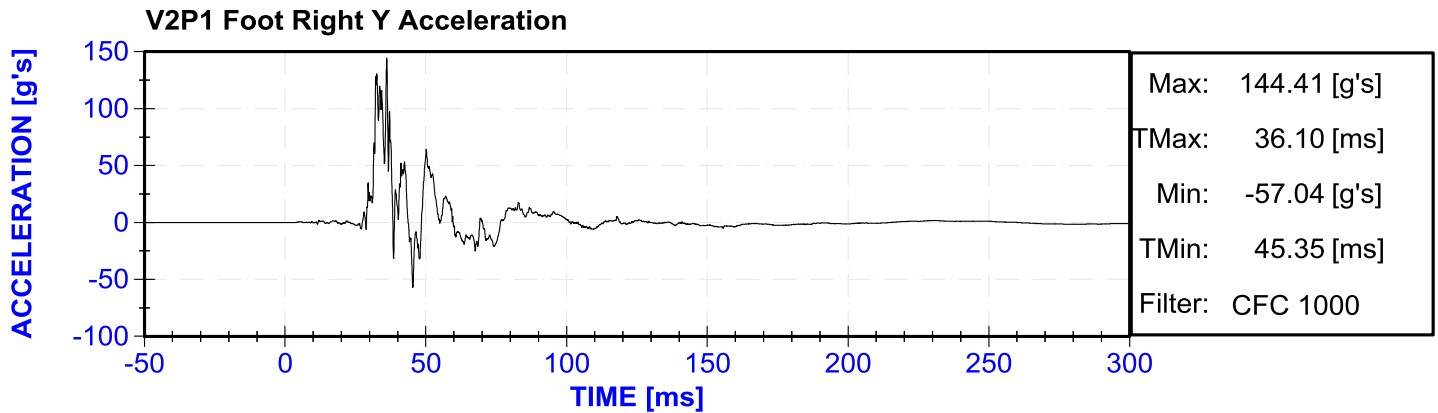


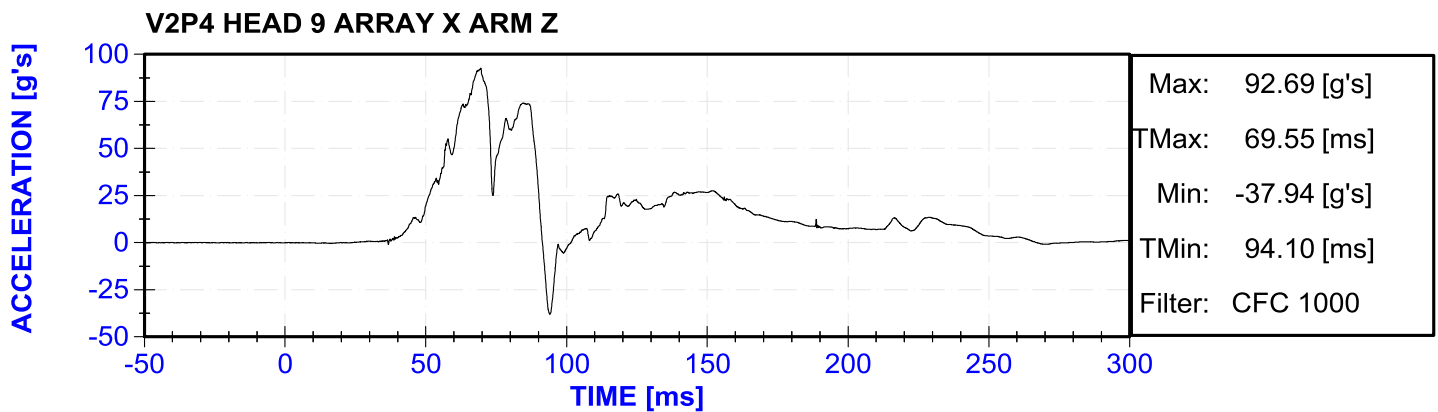
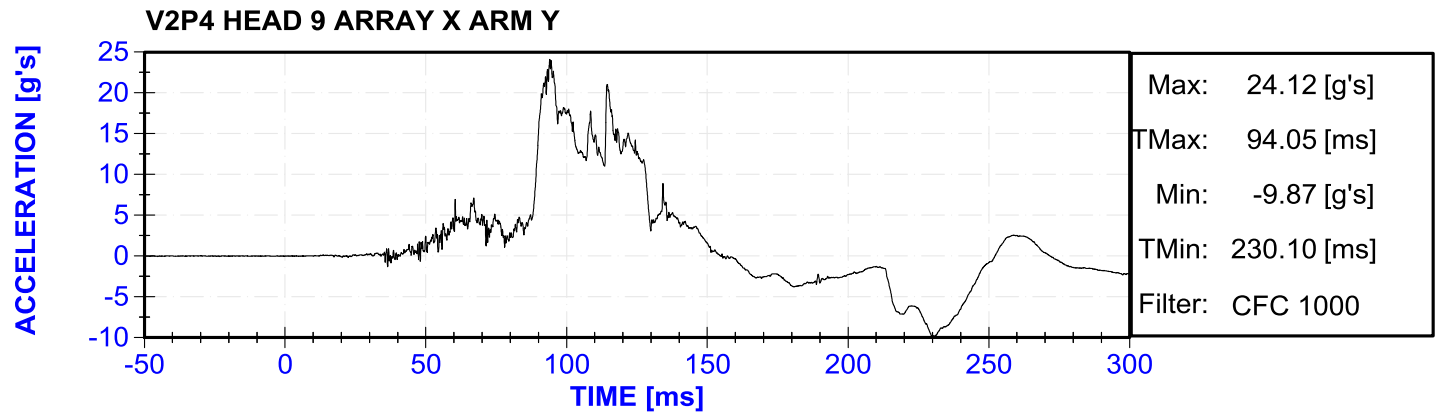
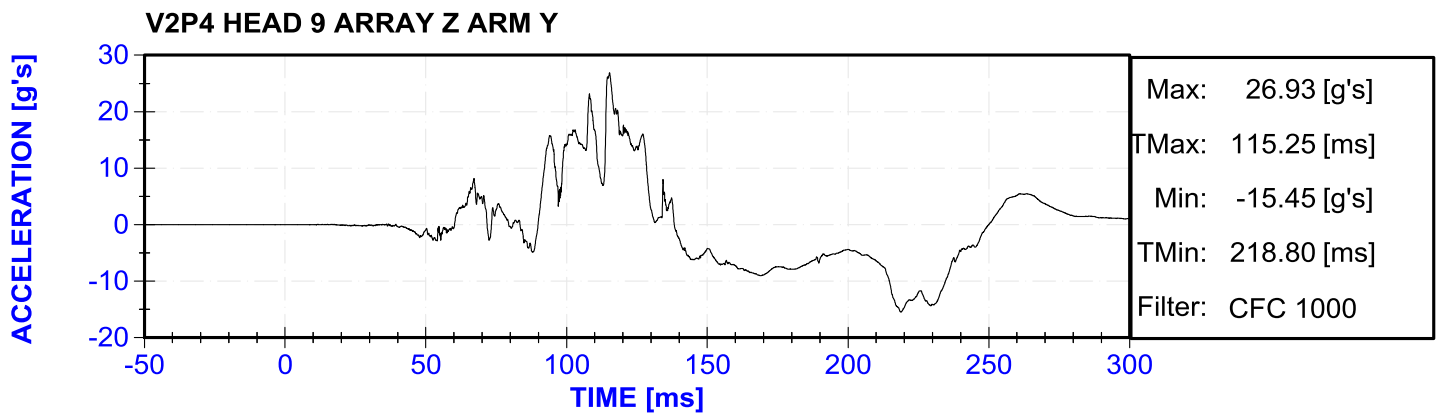
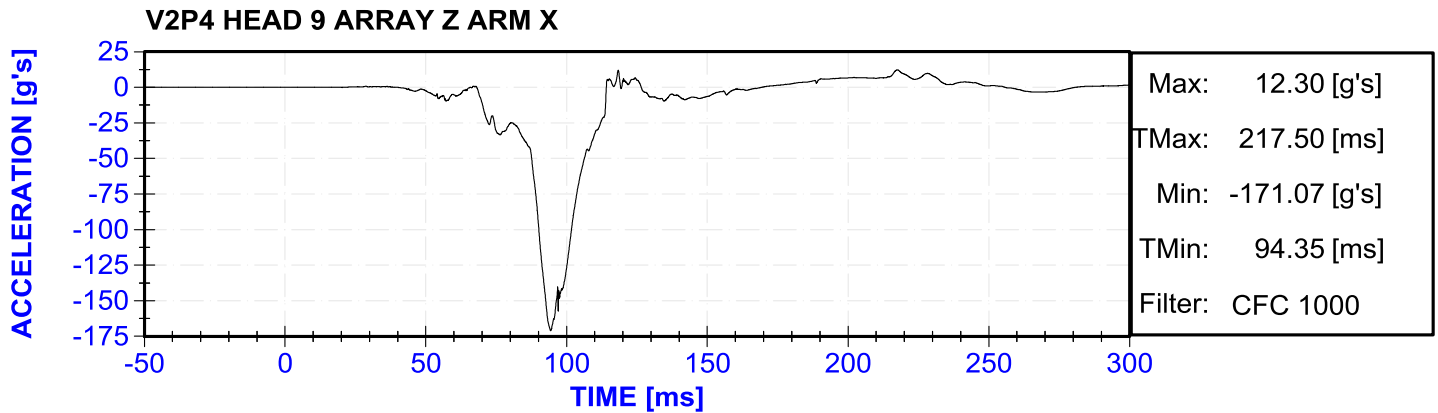
V2P1 Lower Tibia Right X Force

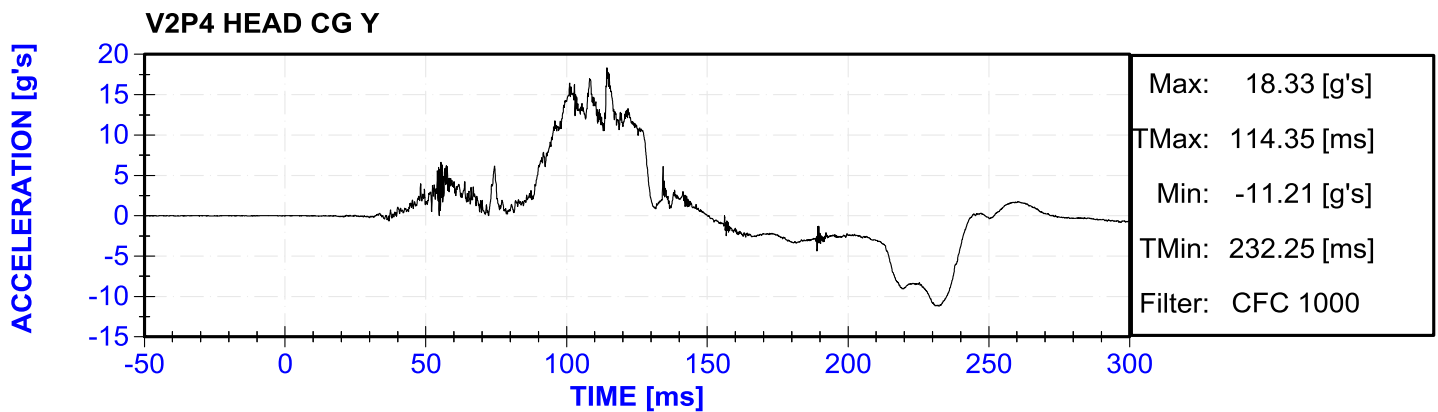
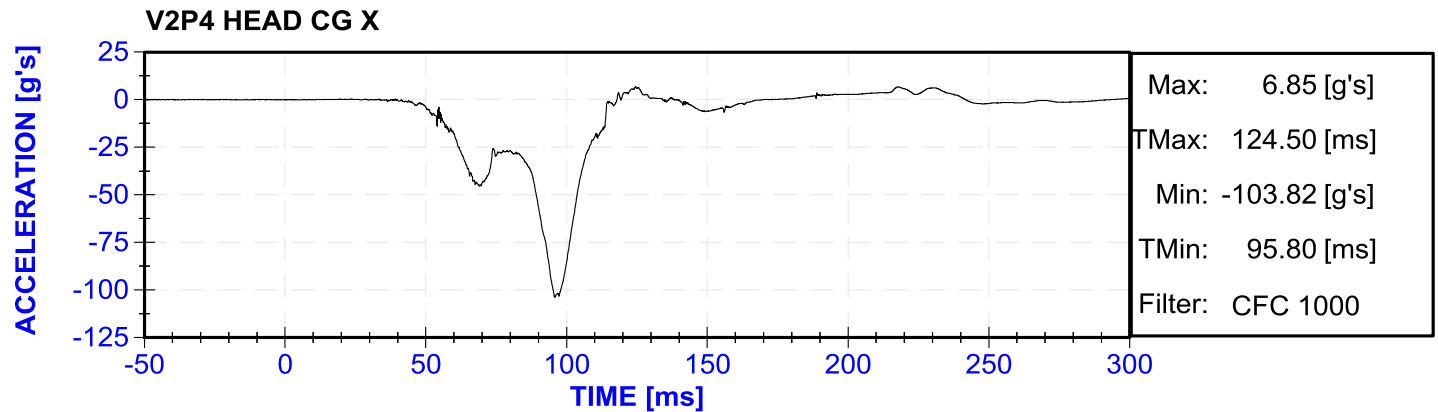
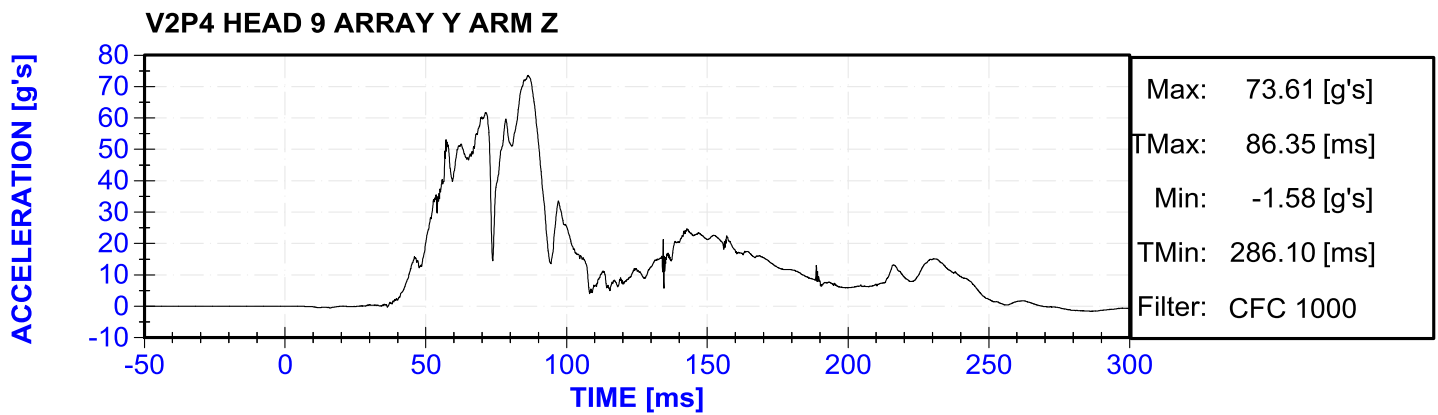
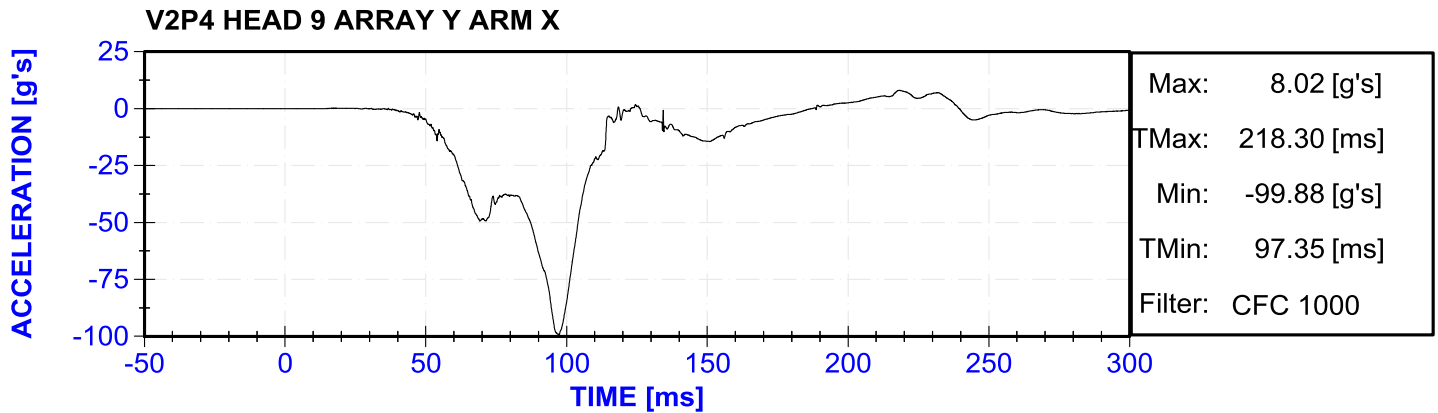


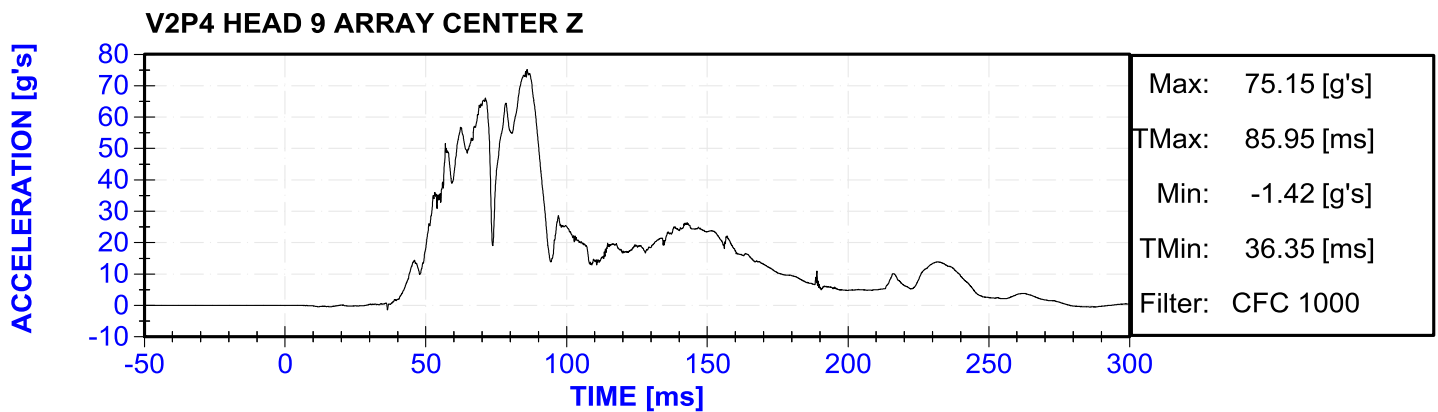
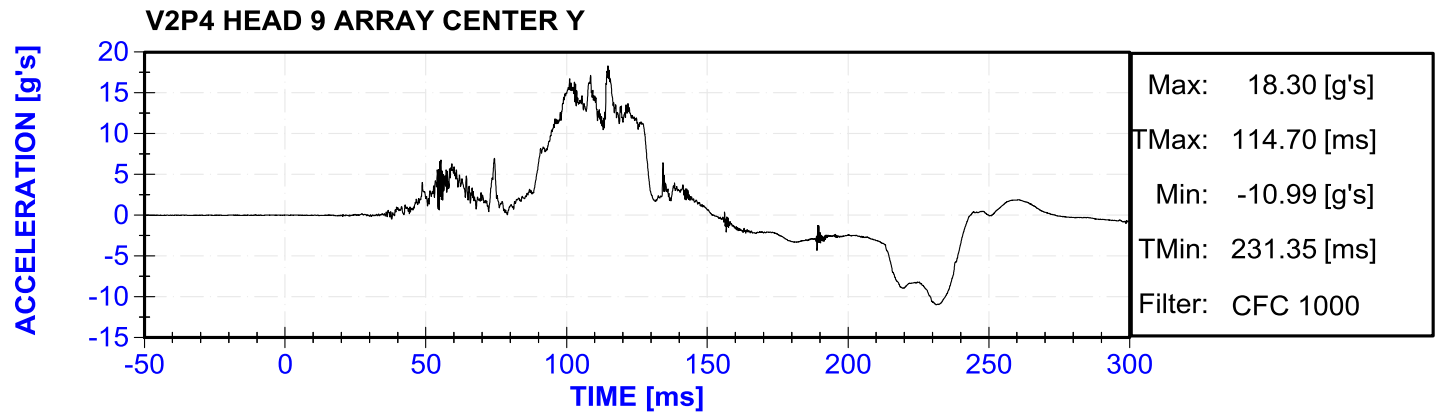
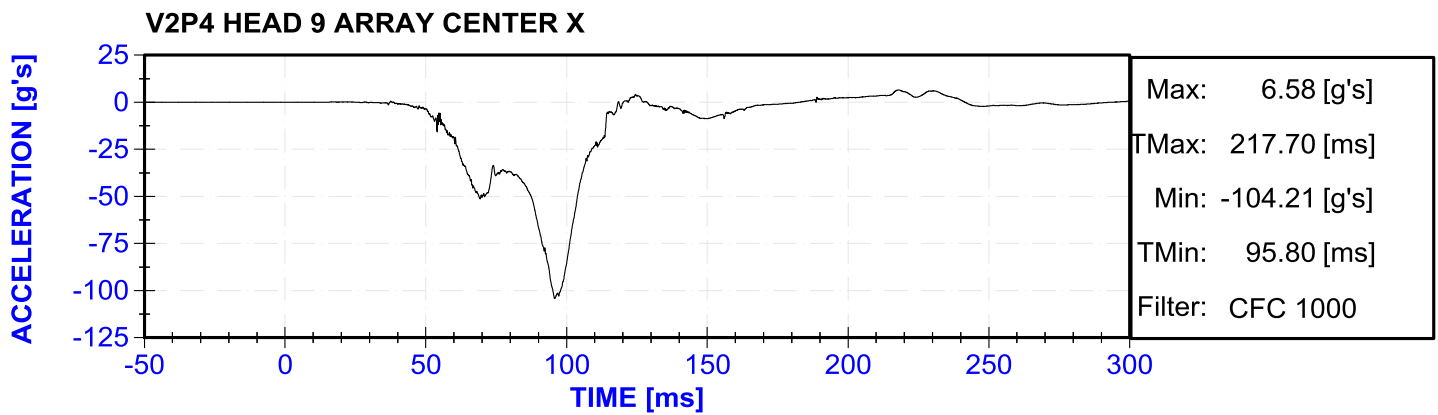
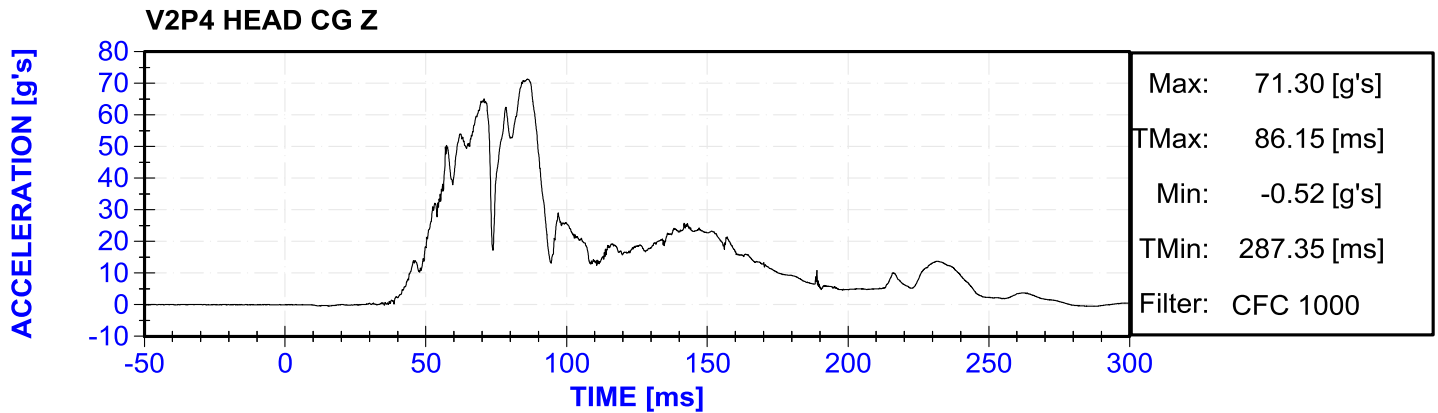


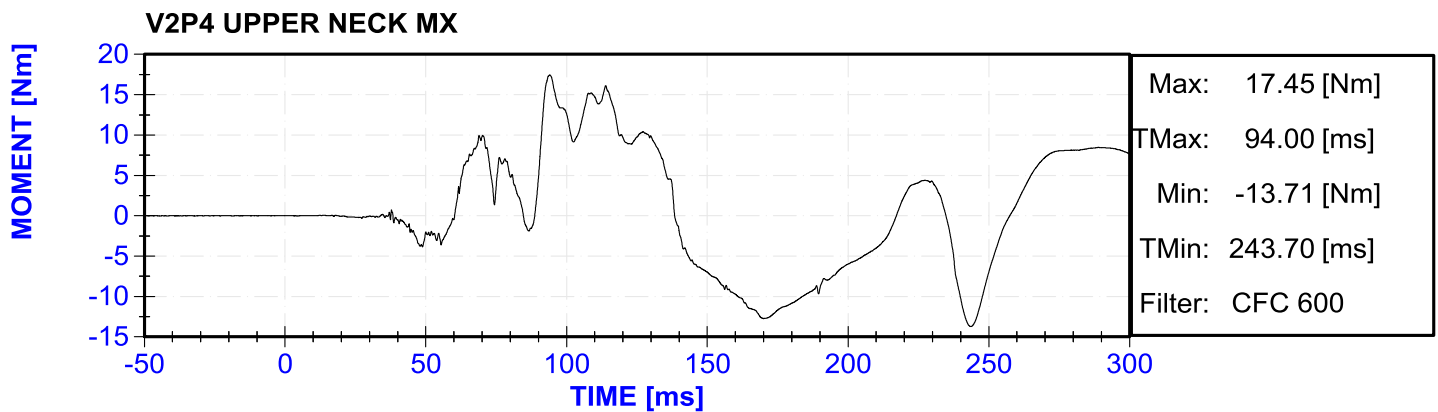
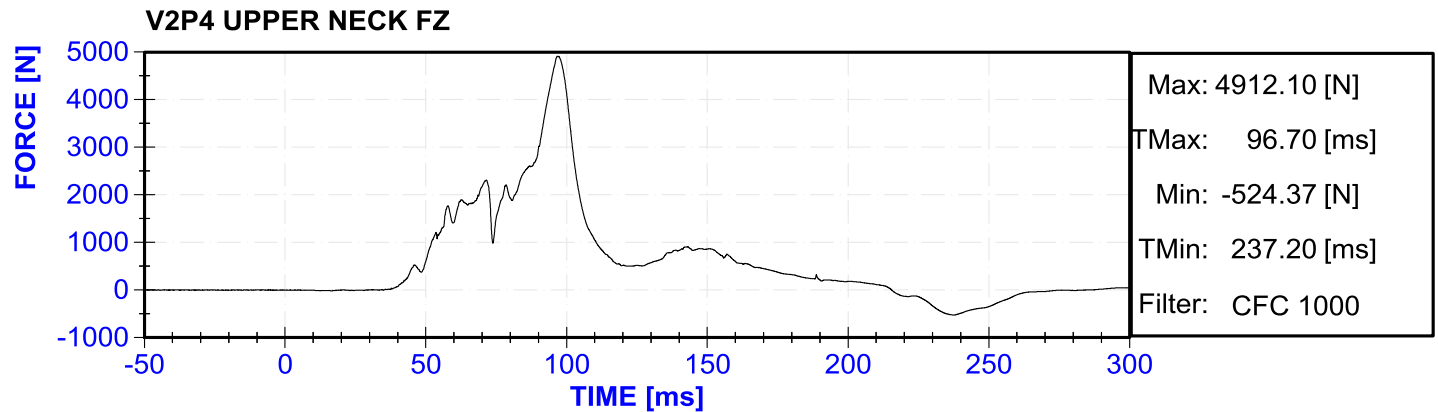
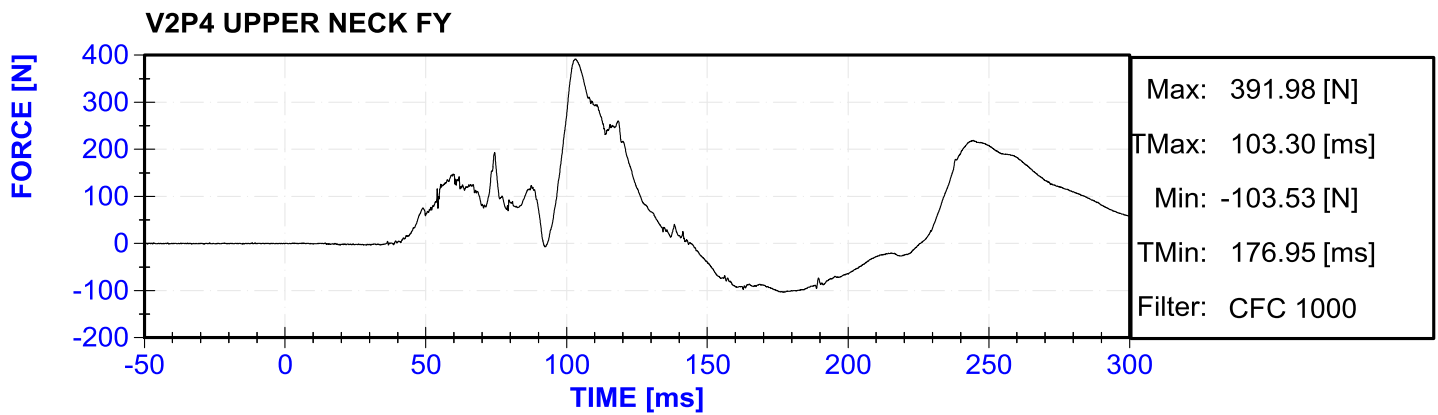
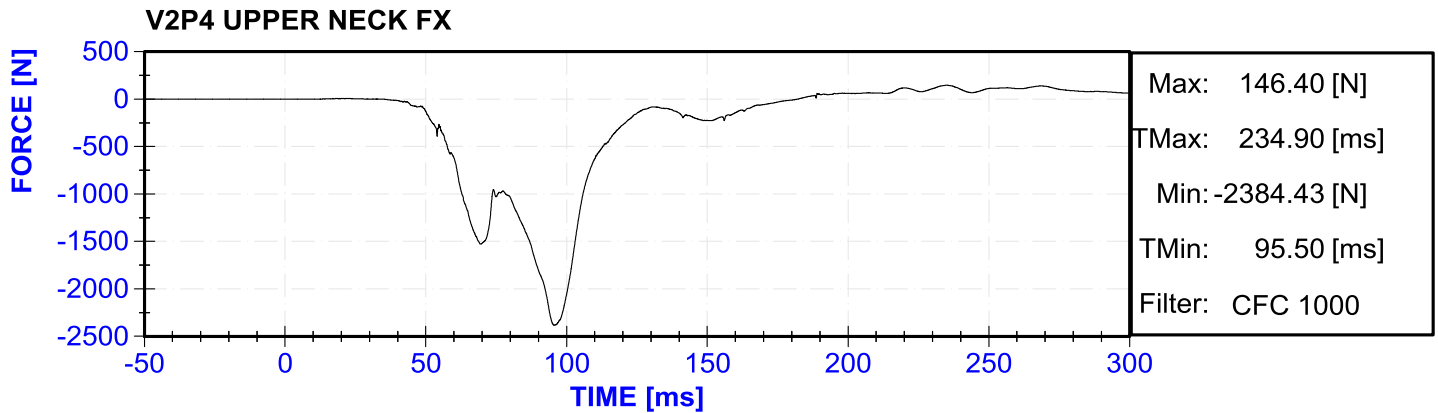


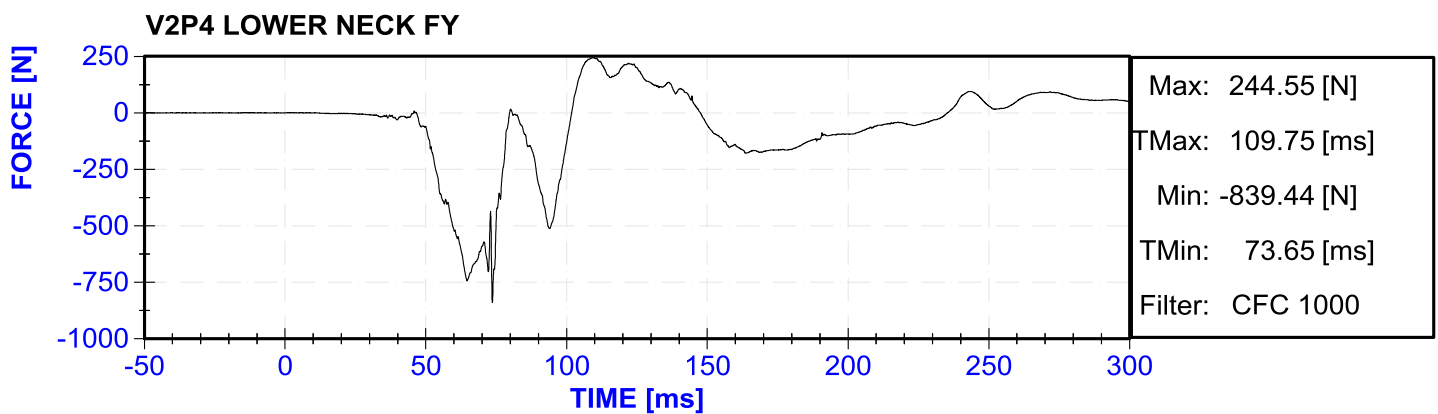
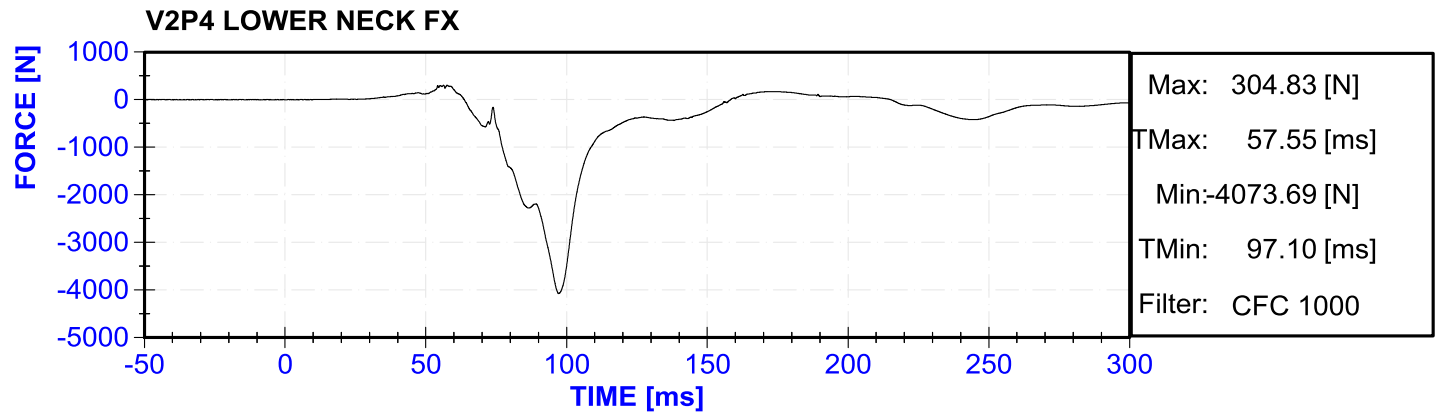
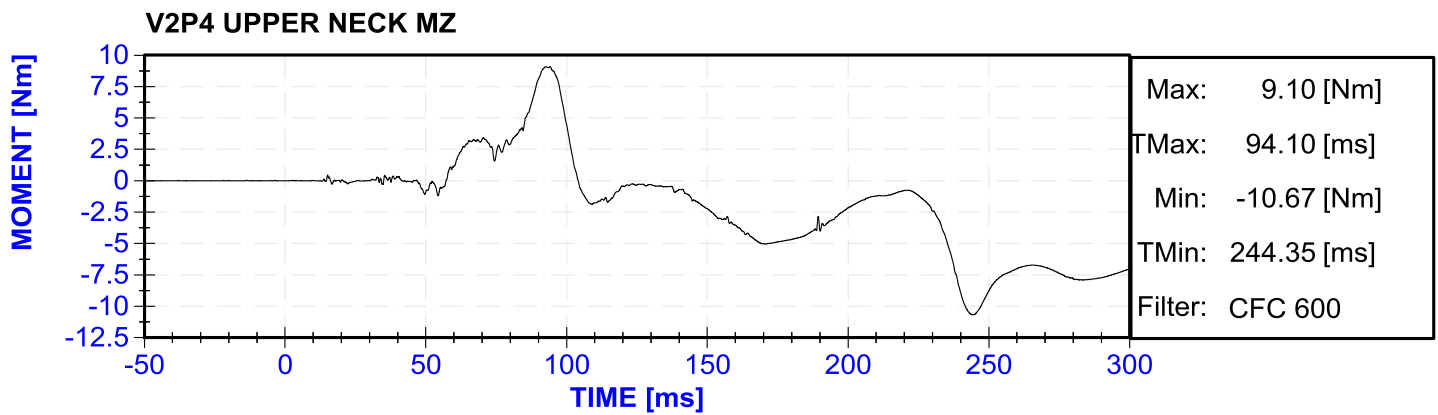
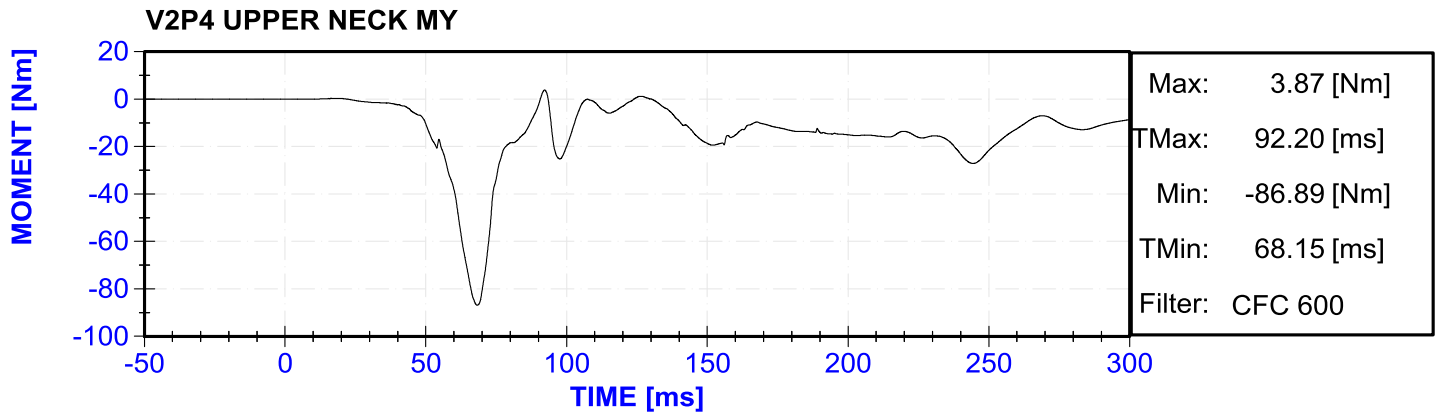


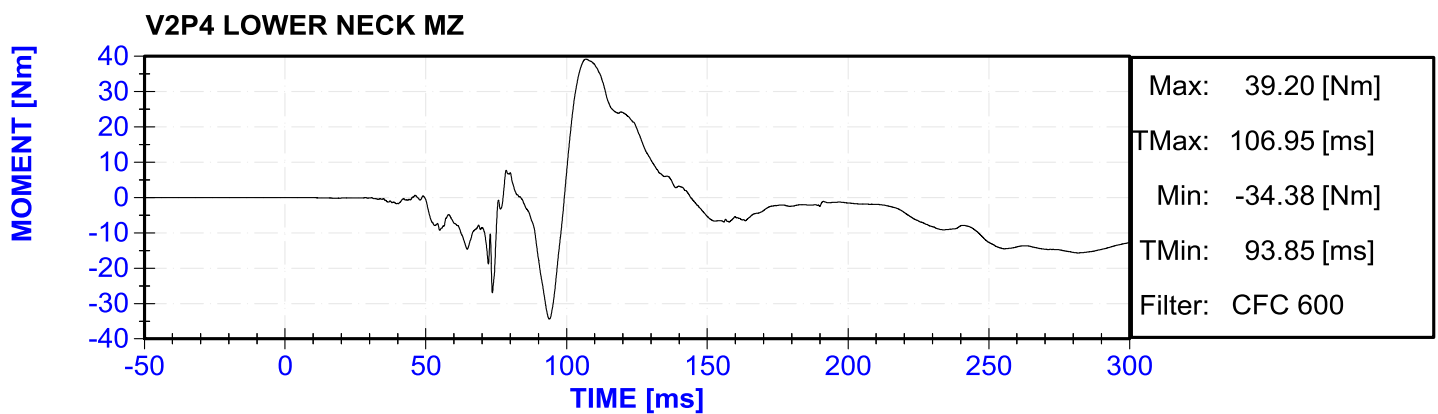
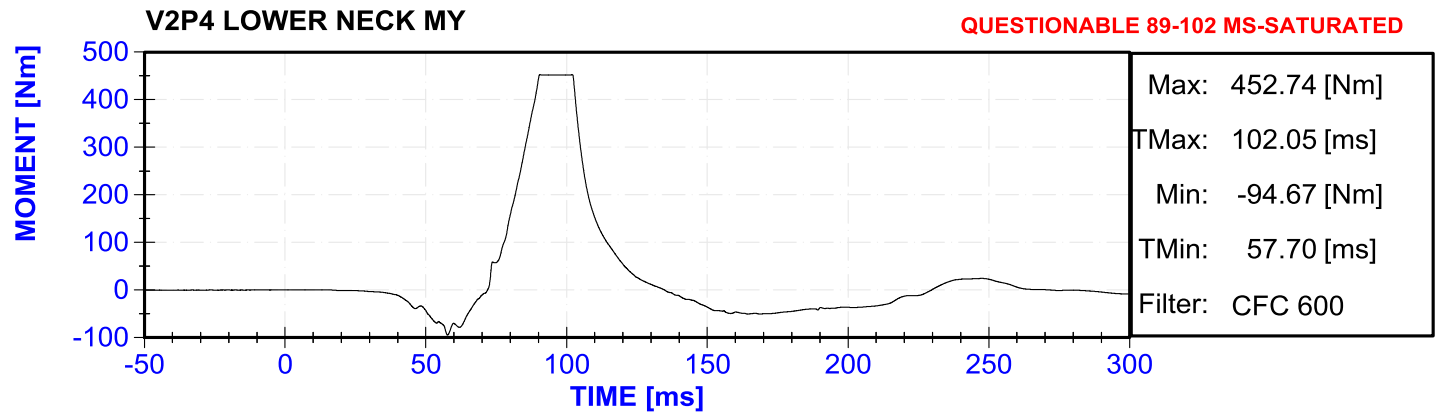
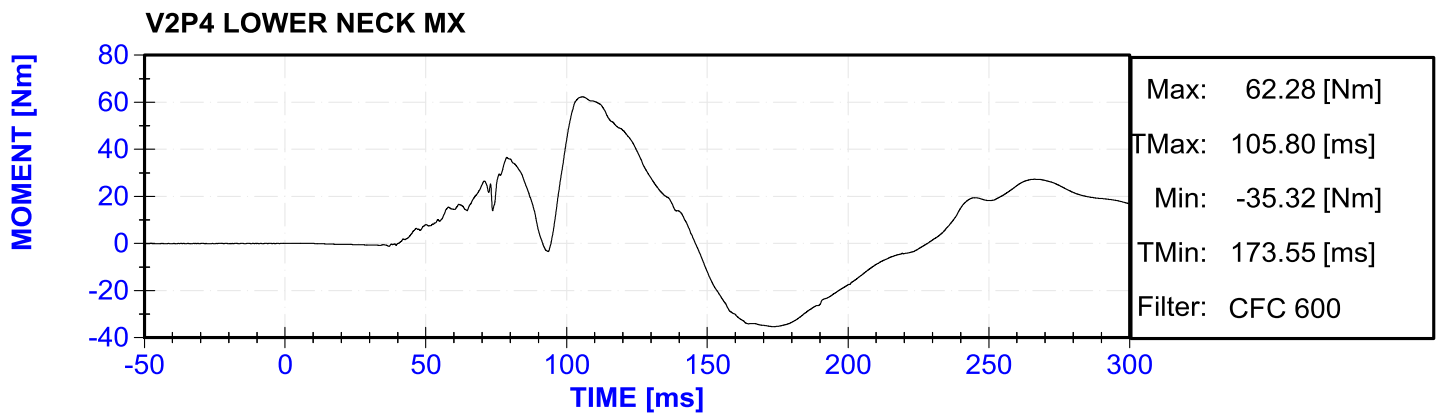
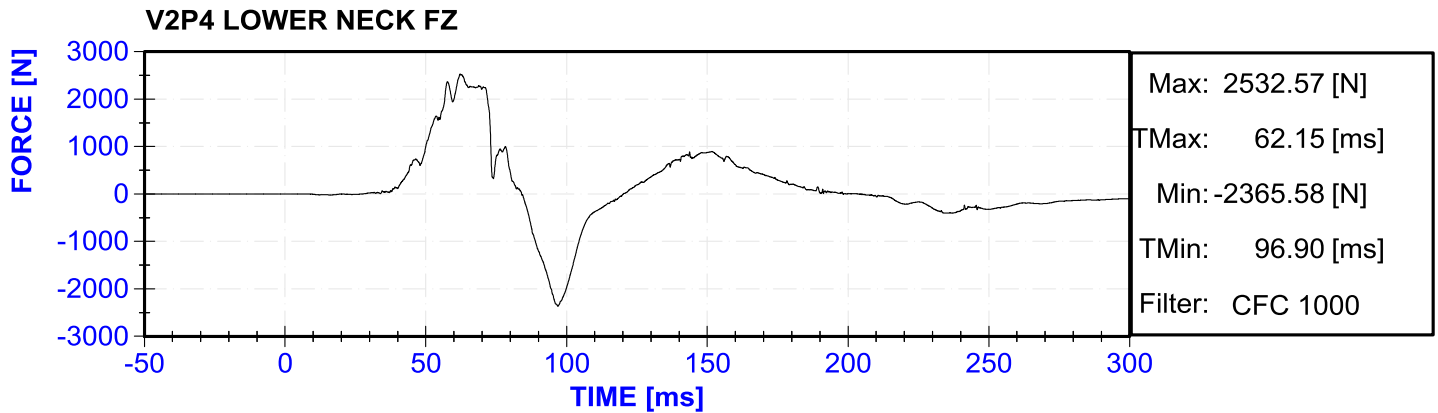


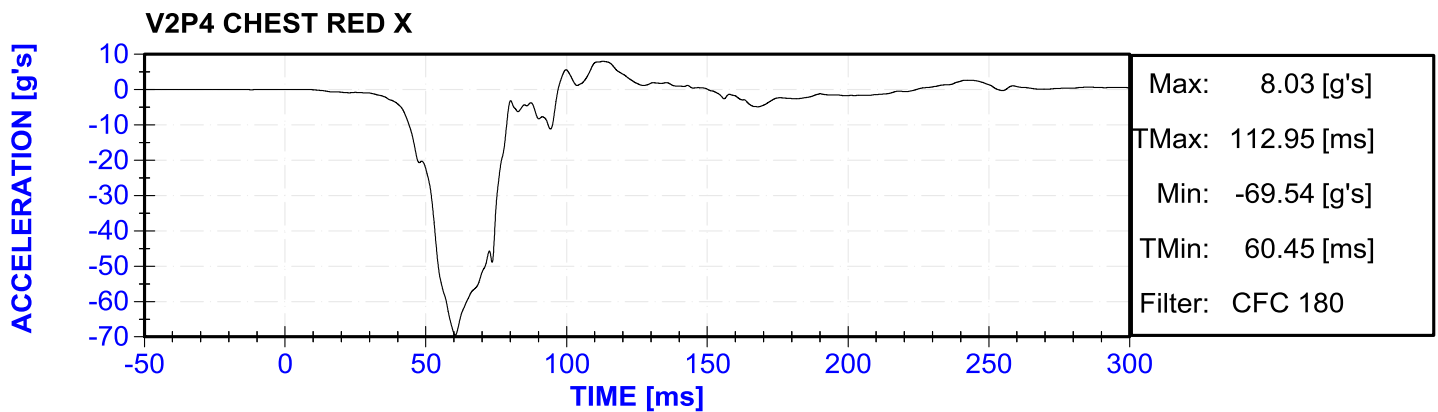
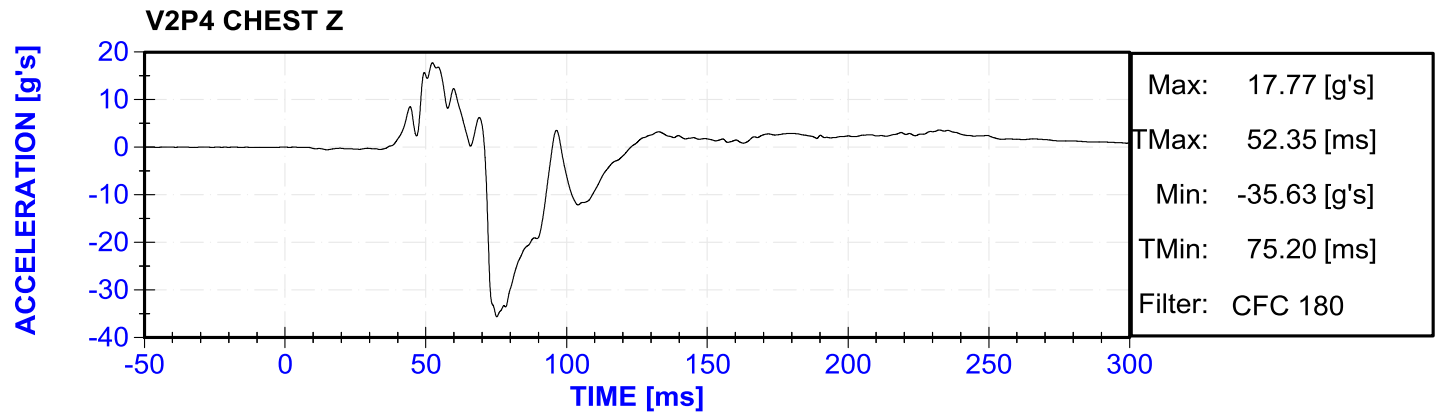
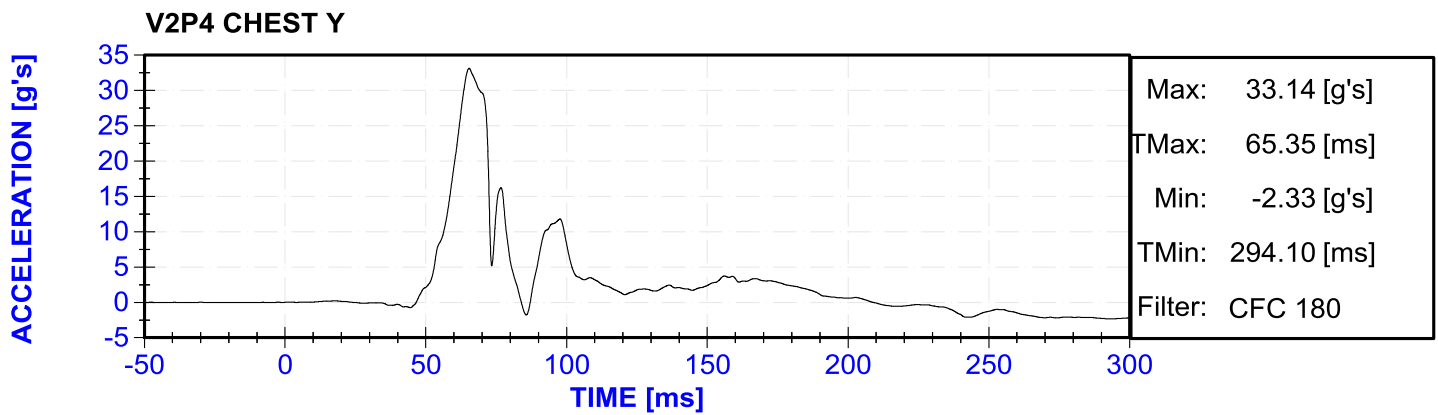
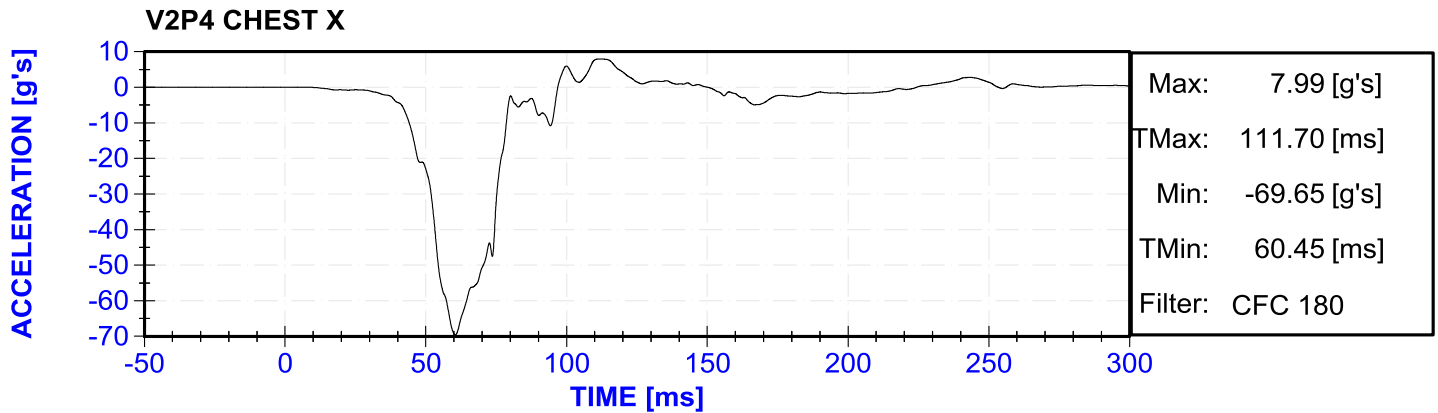


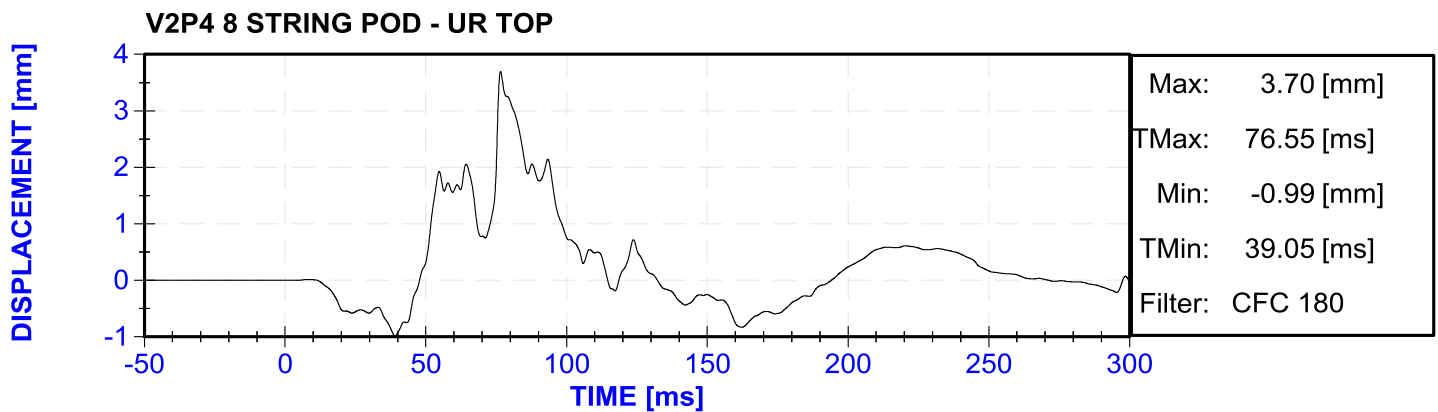
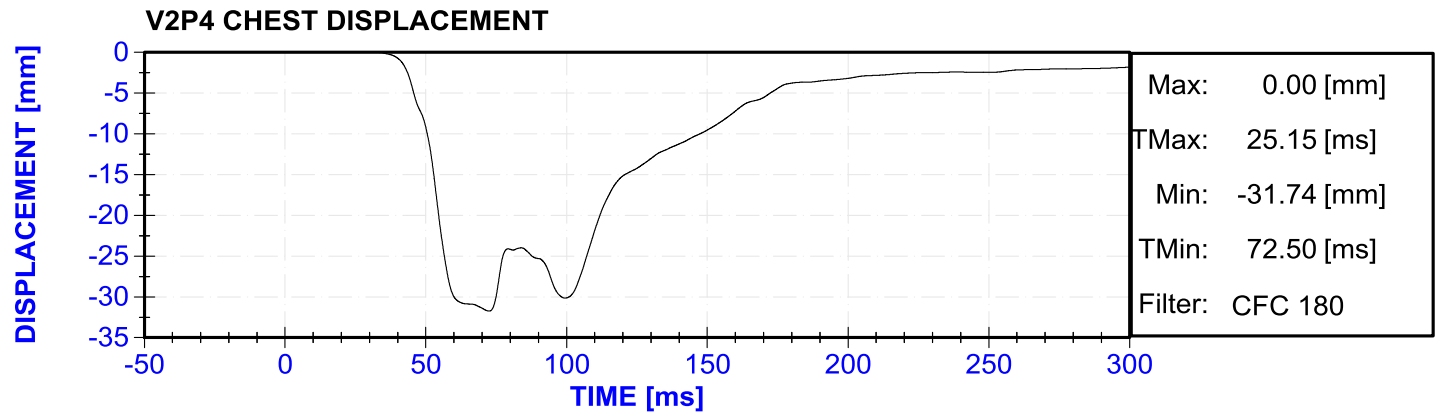
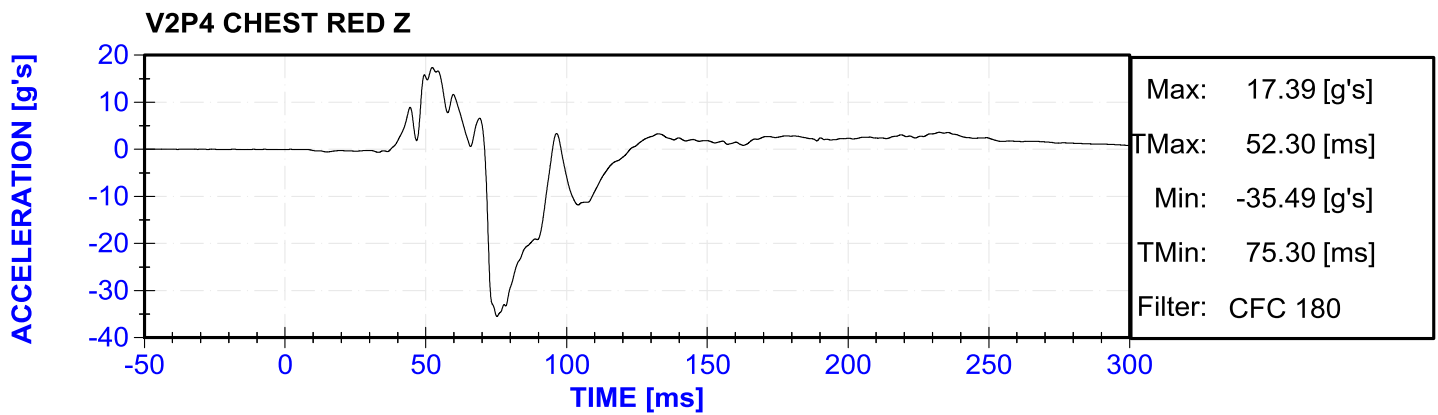
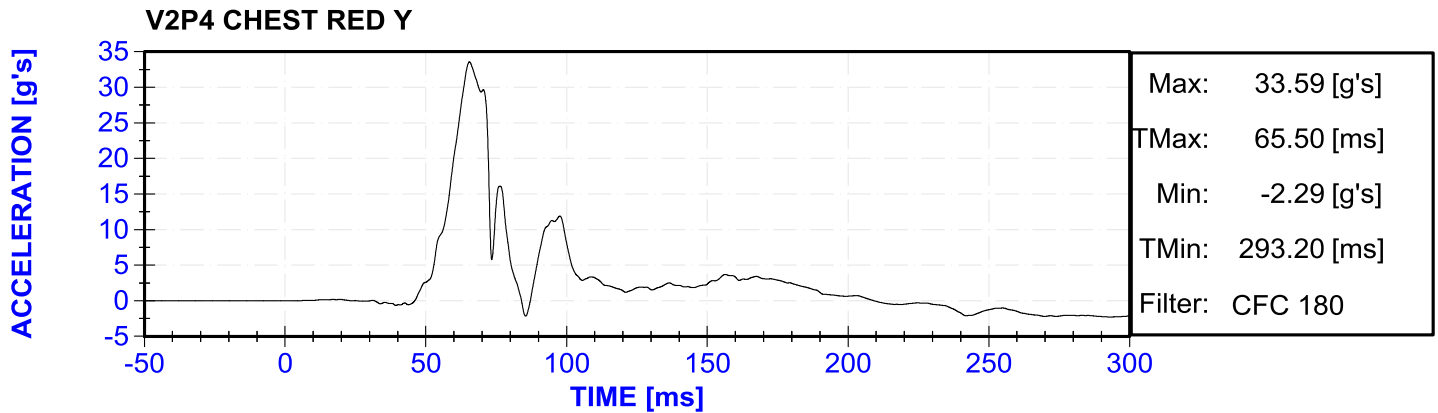




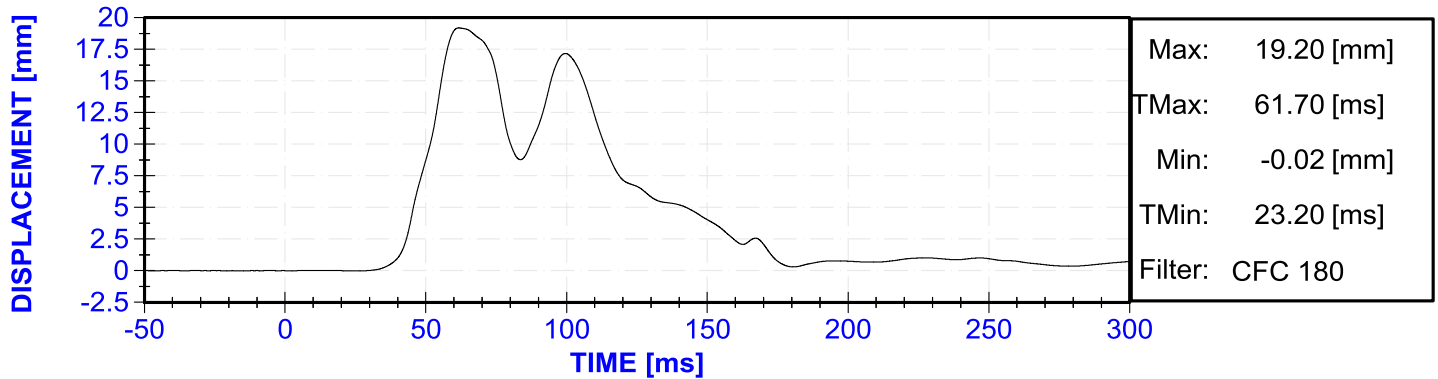




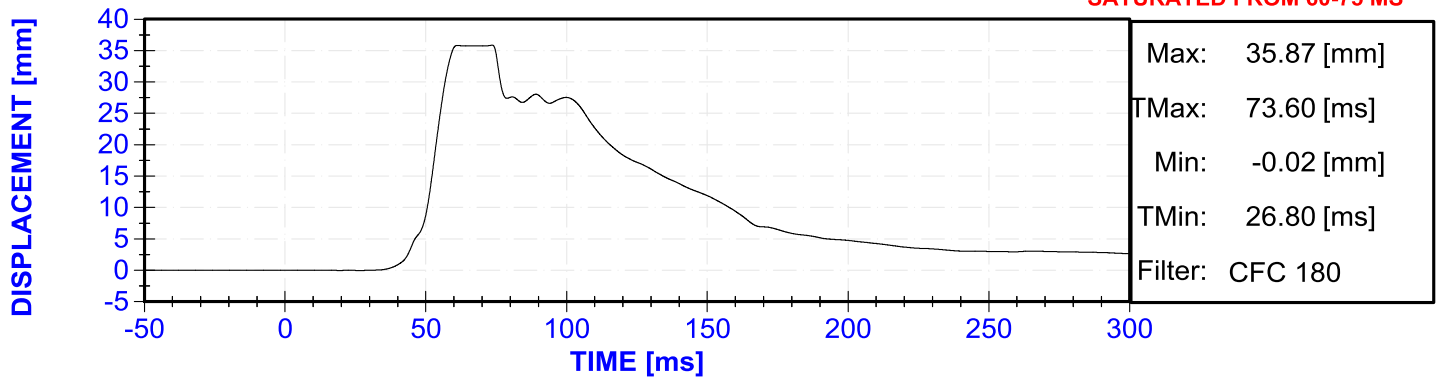




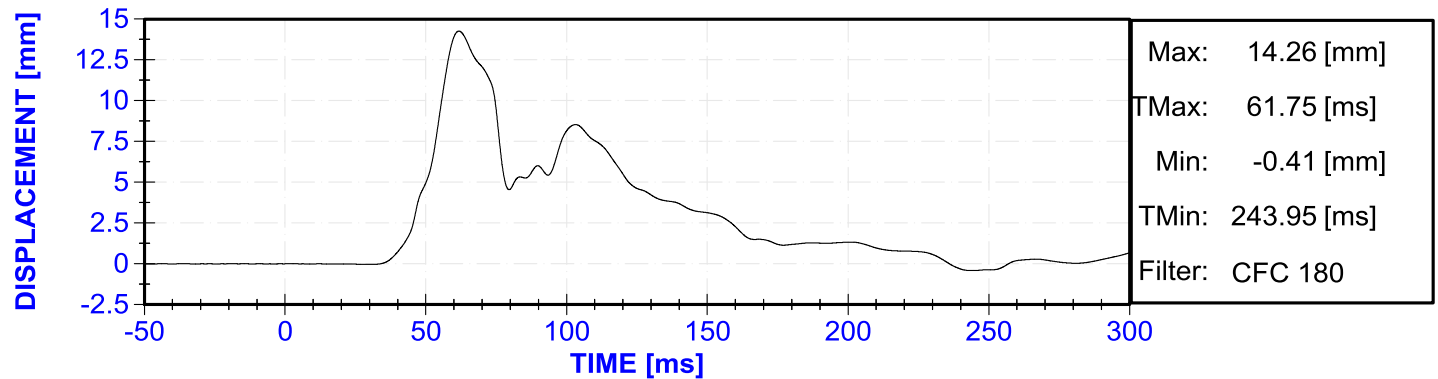
V2P4 8 STRING POD - UR MID



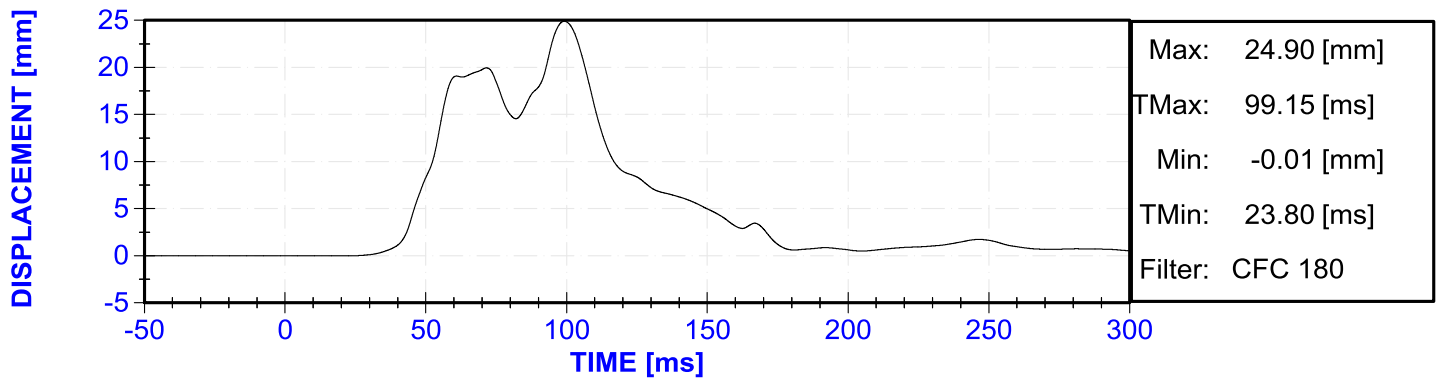
V2P4 8 STRING POD - LR MID



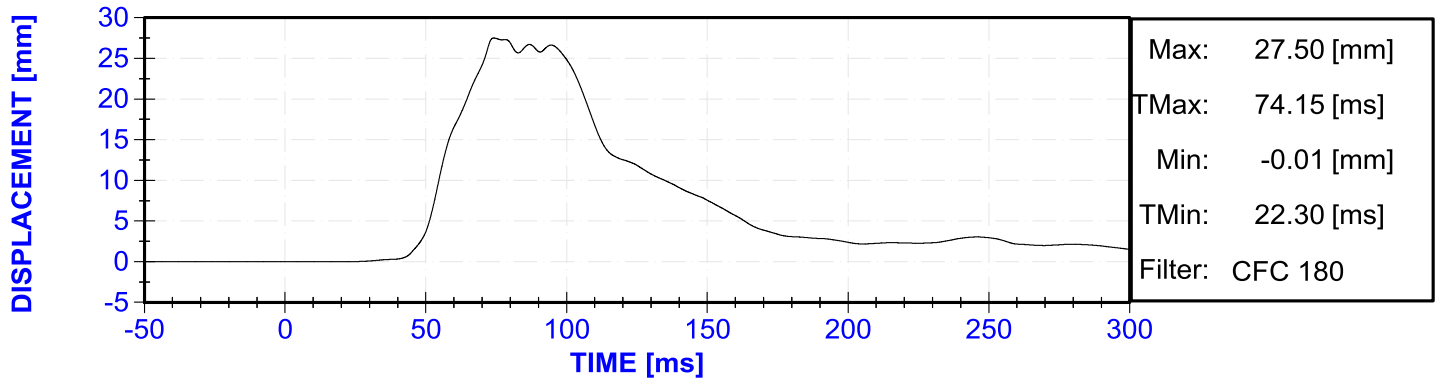
V2P4 8 STRING POD - LR BOTTOM



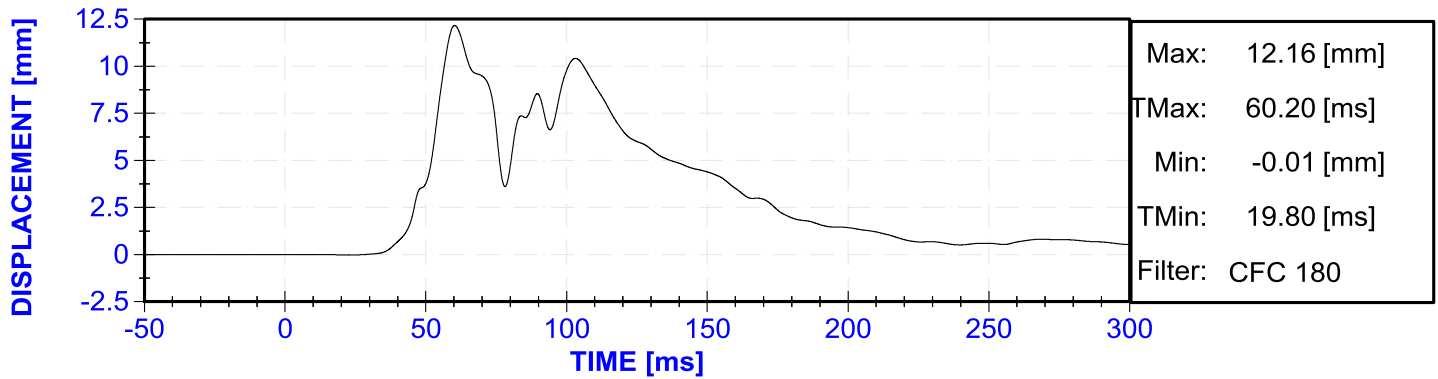
V2P4 8 STRING POD - UL TOP



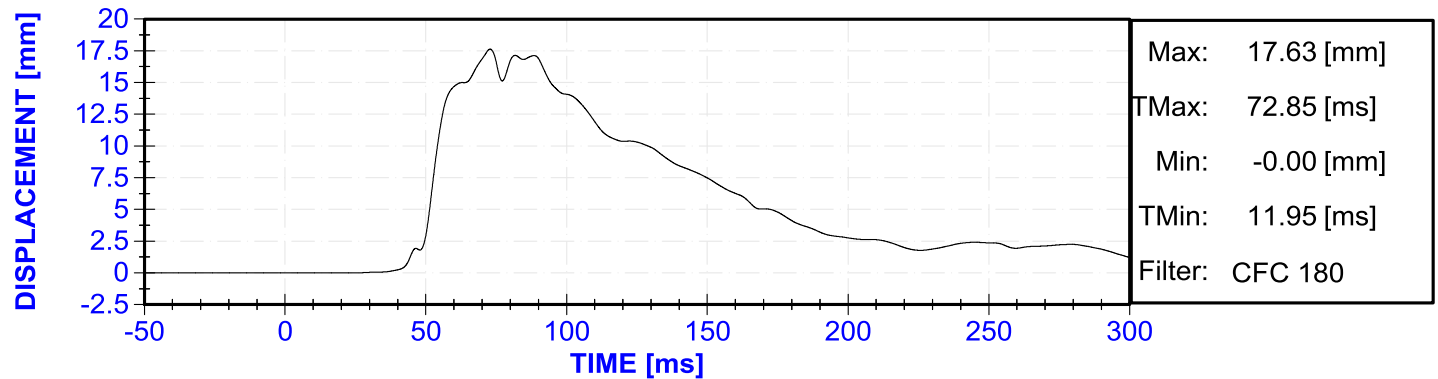
V2P4 8 STRING POD - UL MID



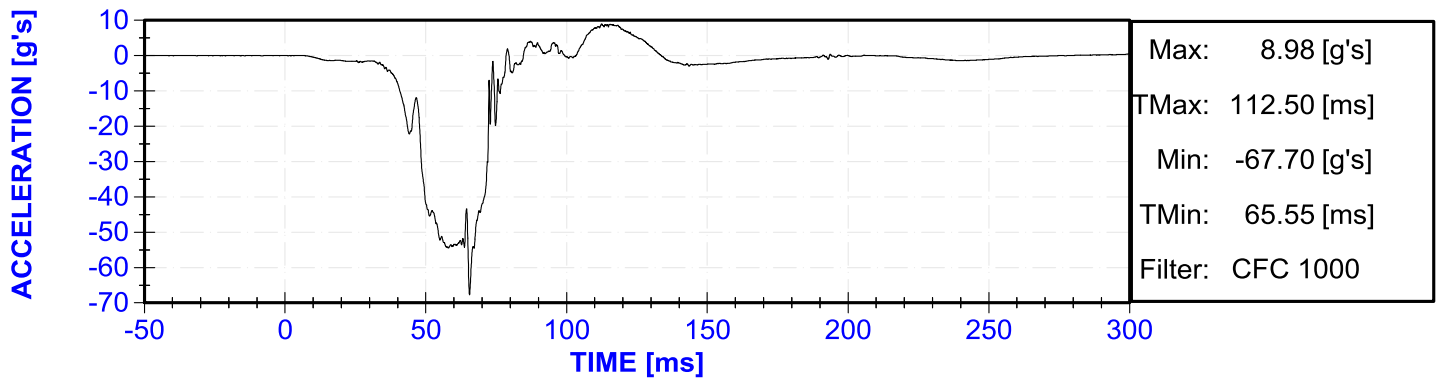
V2P4 8 STRING POD - LL MID

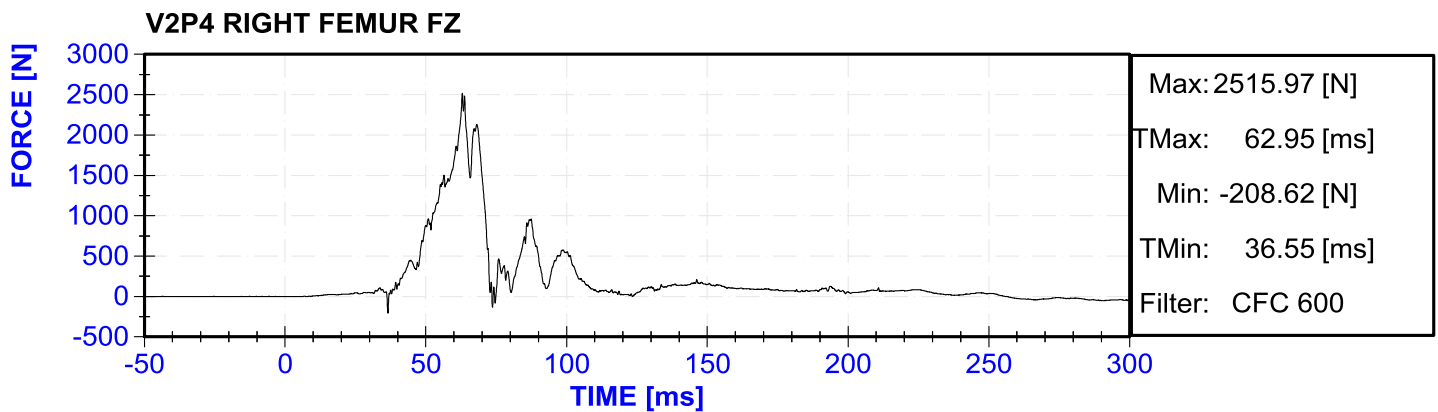
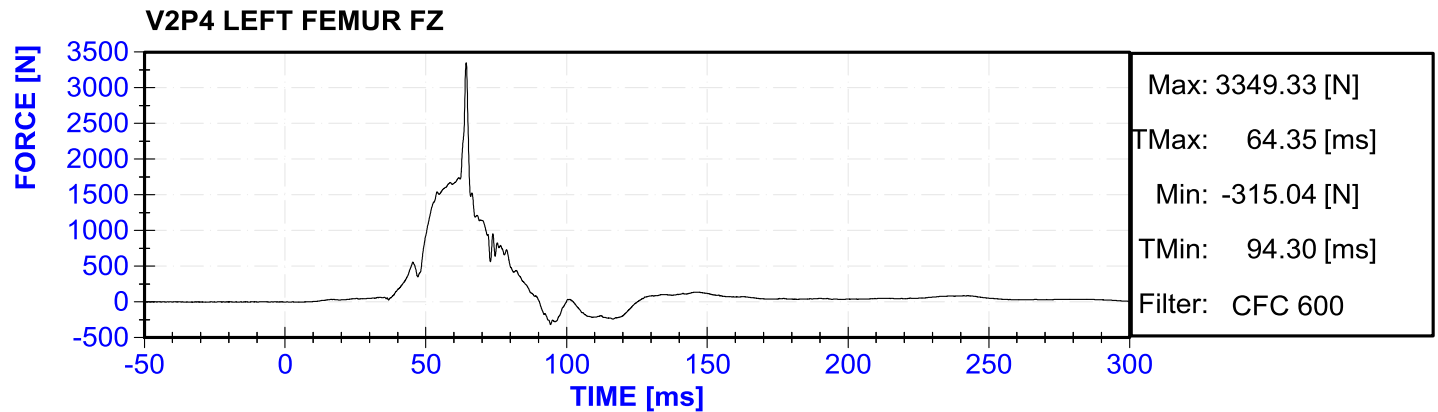
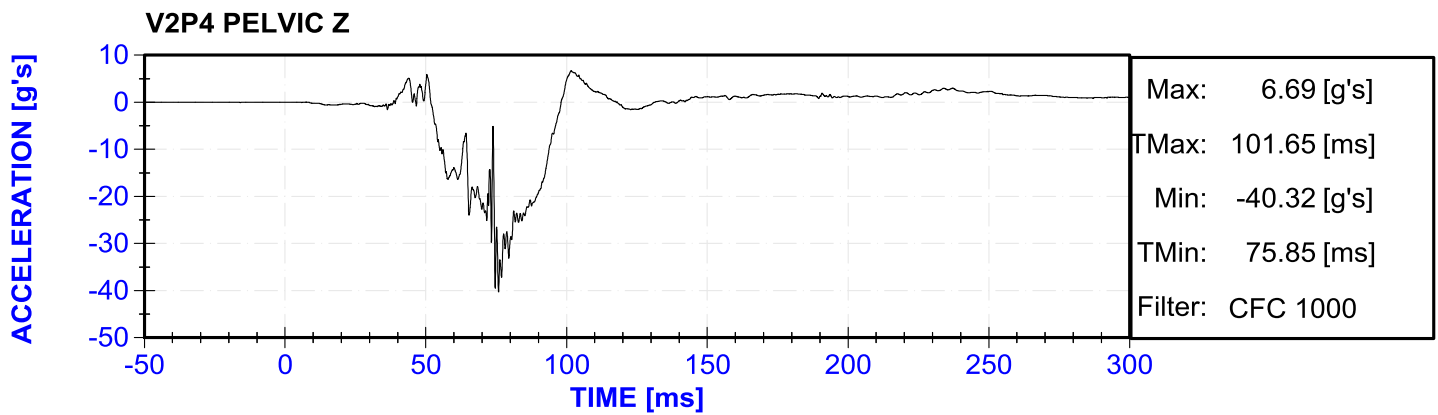
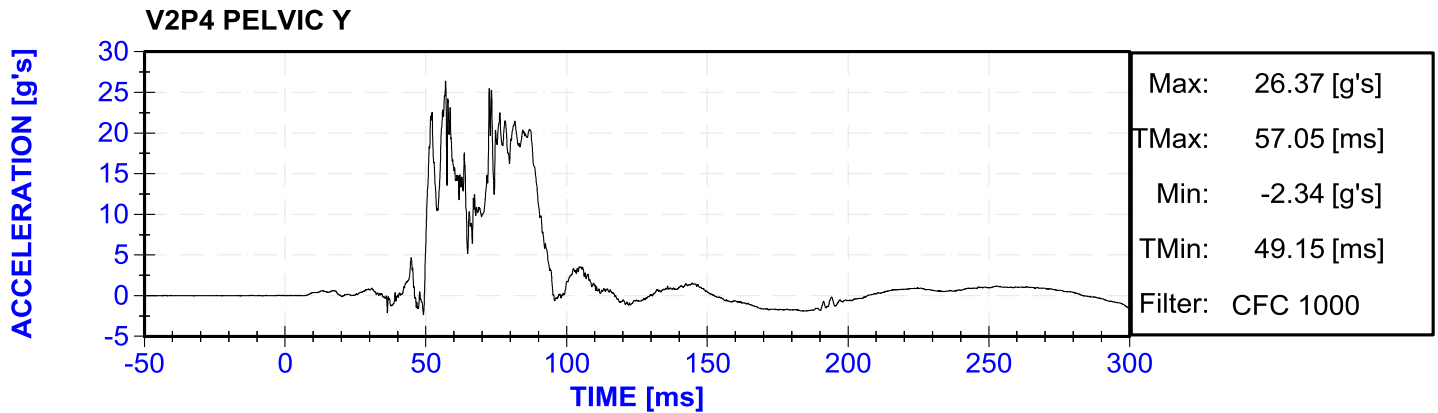


V2P4 8 STRING POD - LL BOTTOM

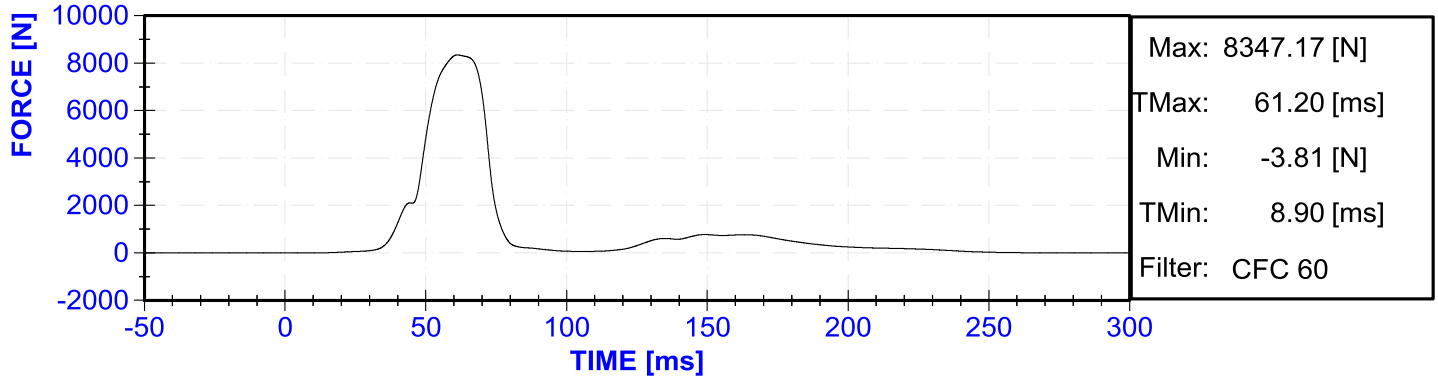


V2P4 PELVIC X

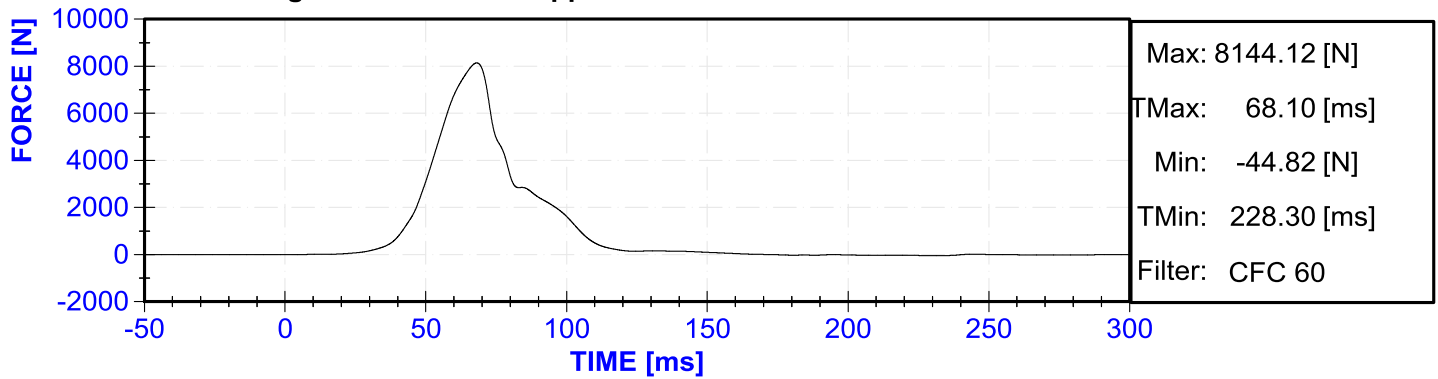




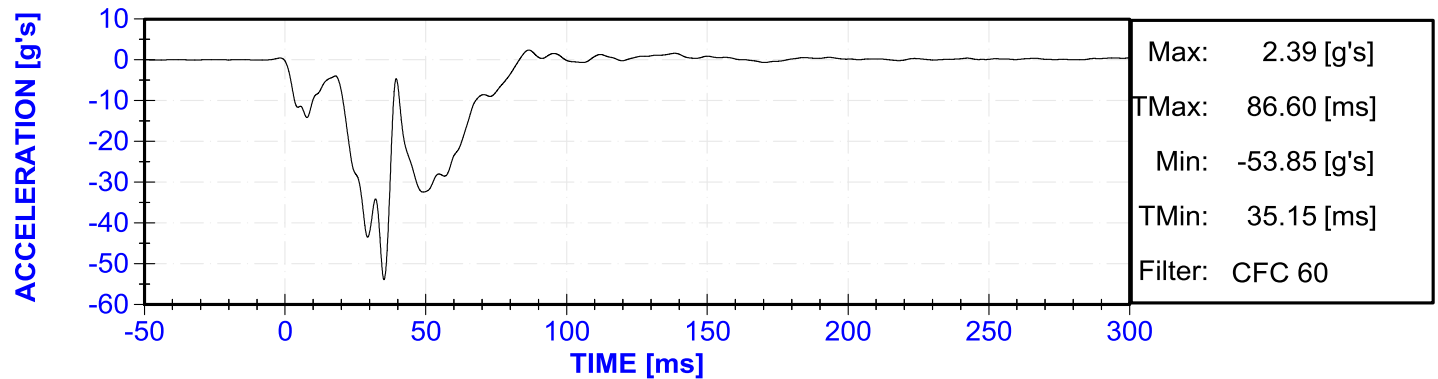
V2 Passenger Lap Belt Force



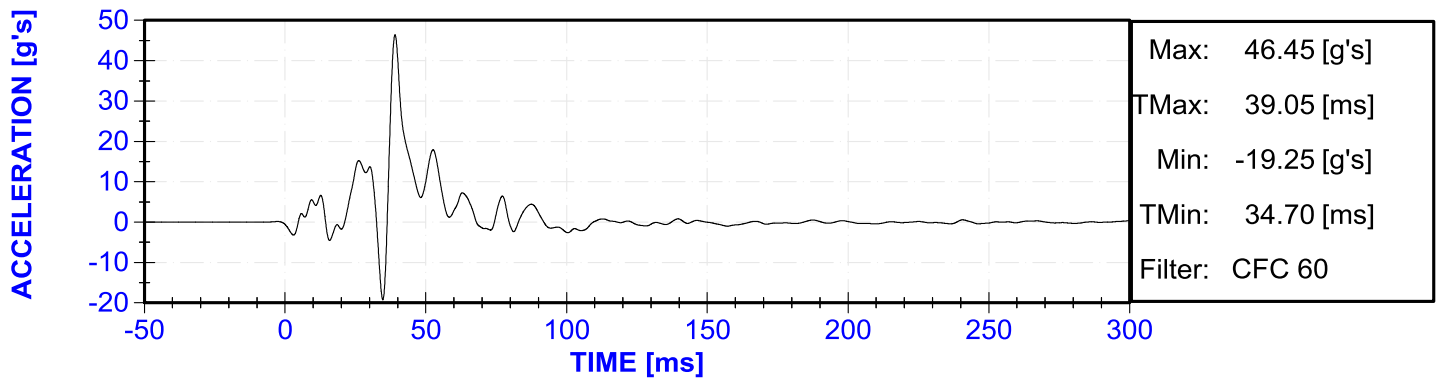
V2 Passenger Shoulder Belt Upper Force

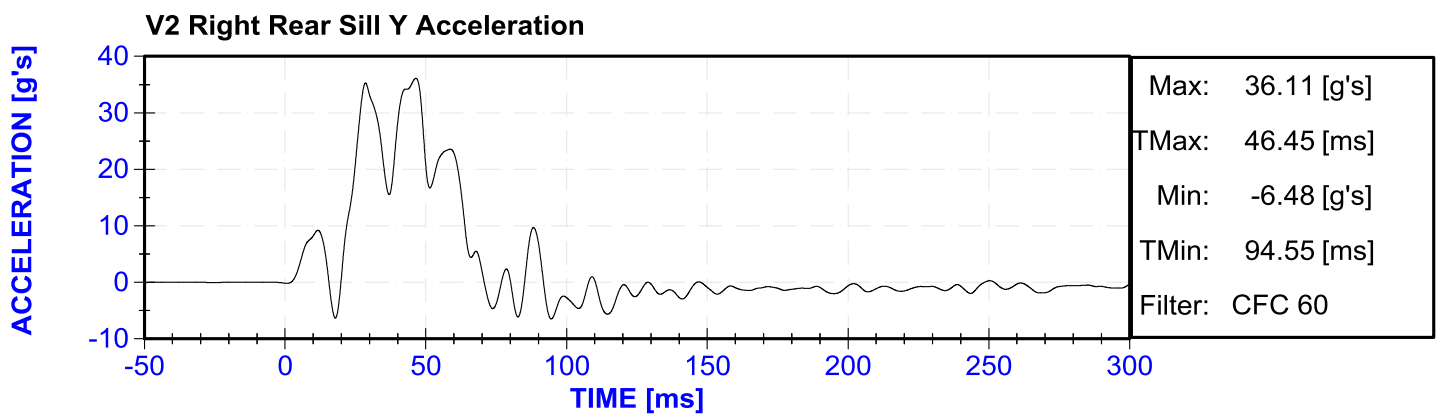
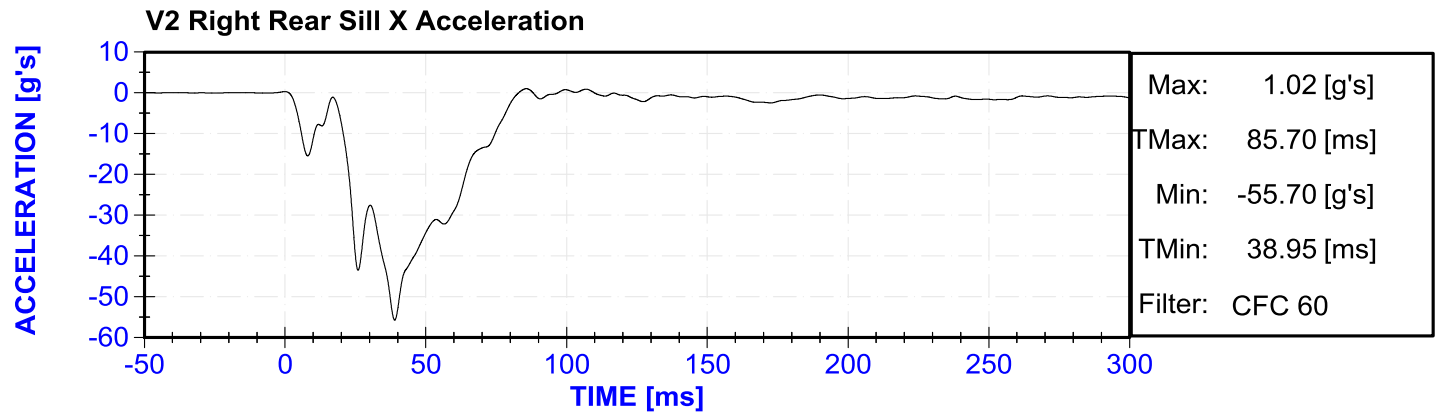
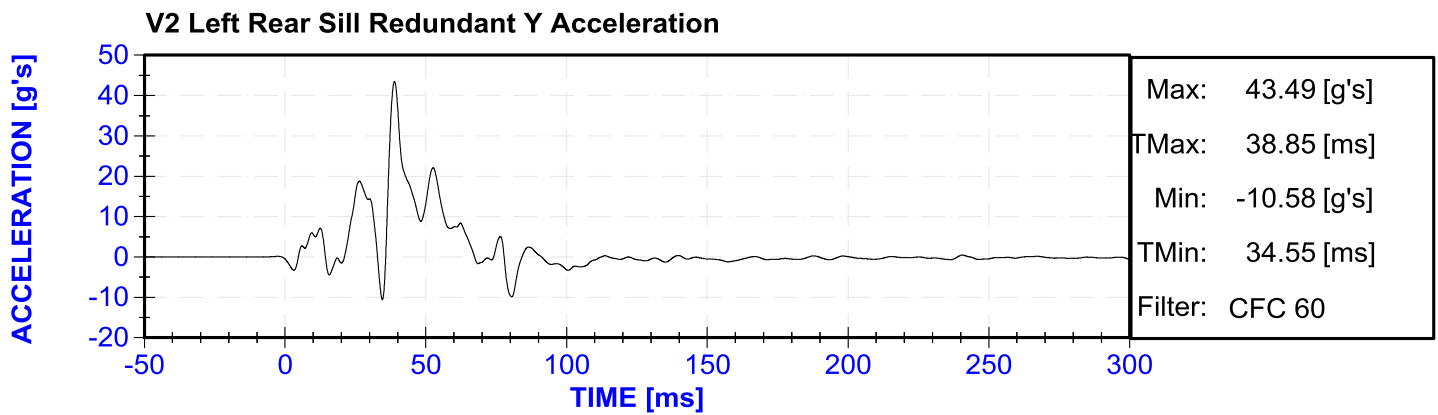
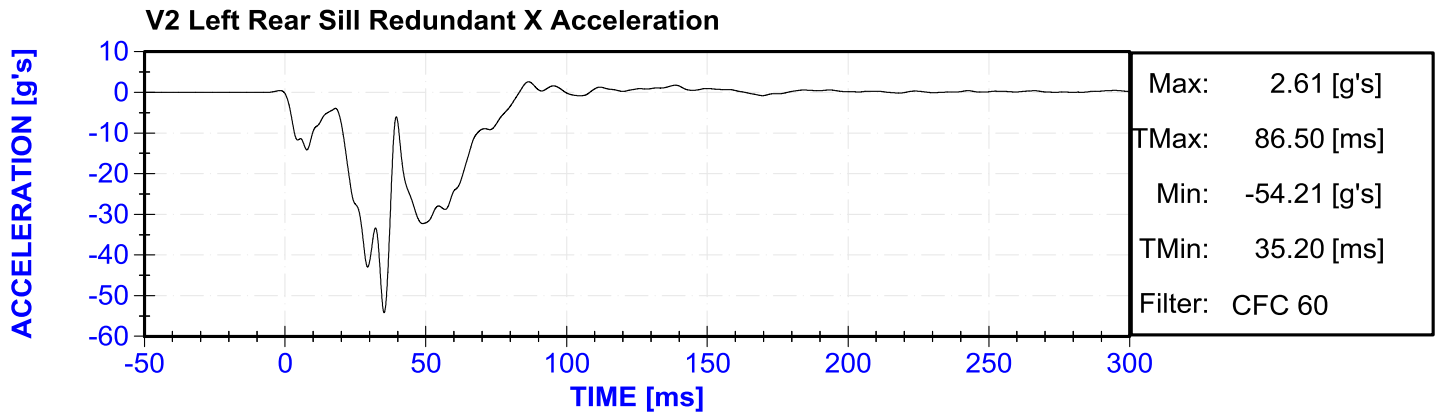


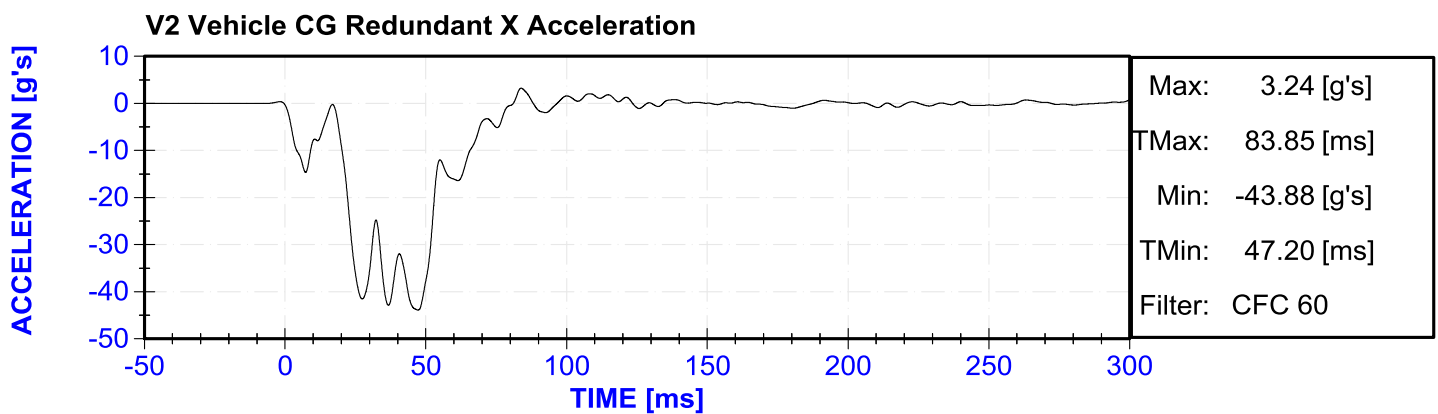
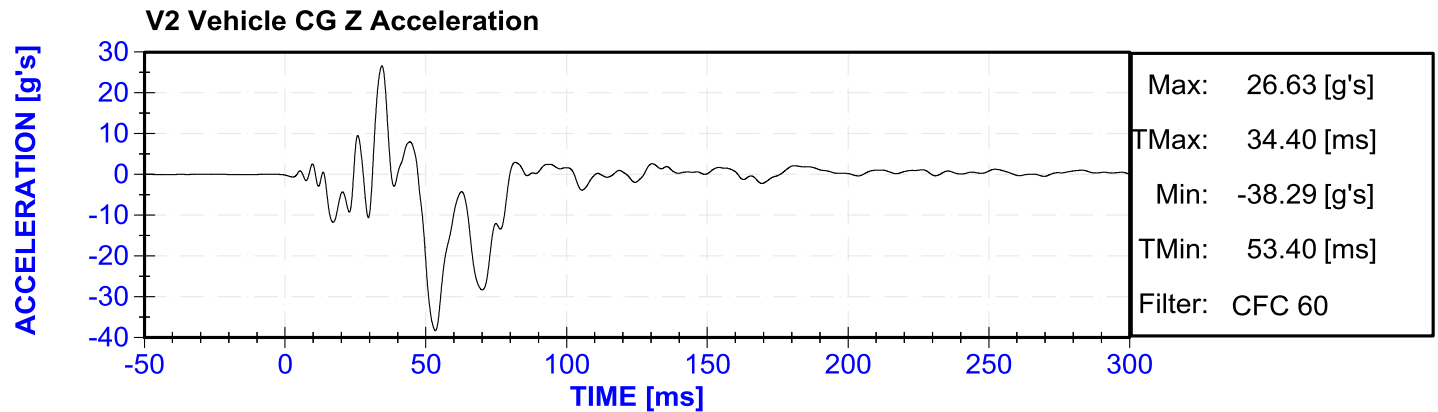
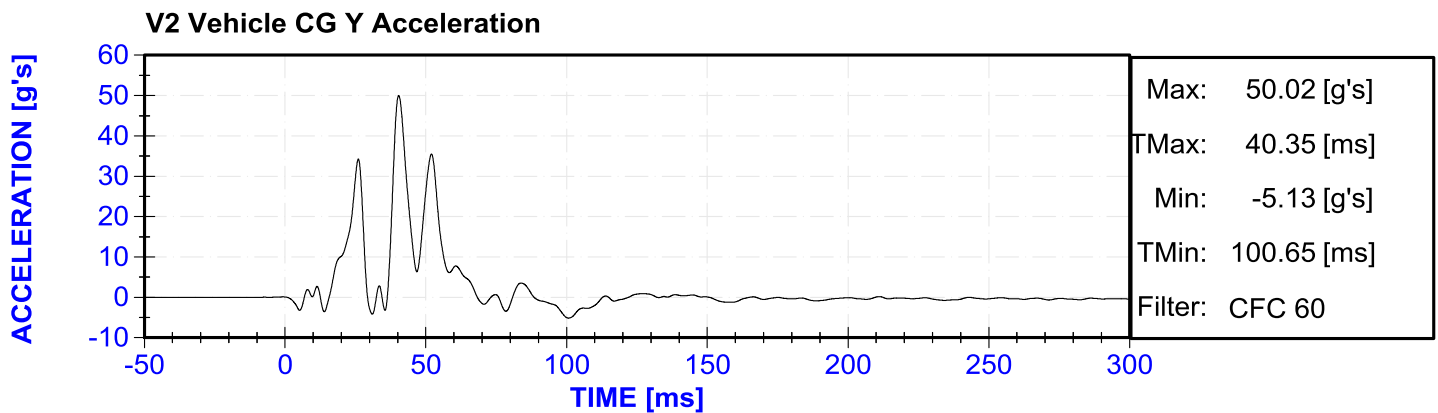
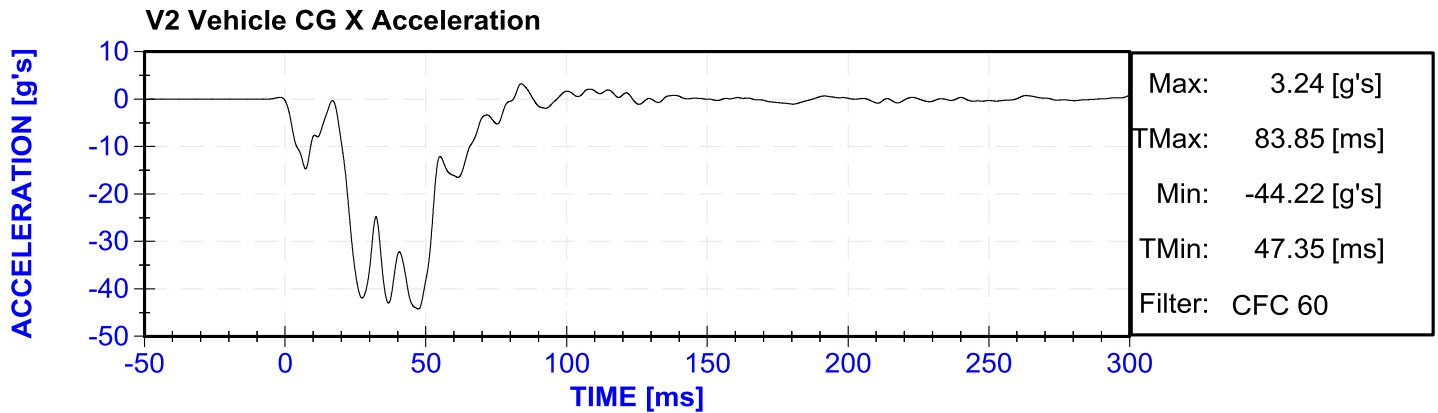
V2 Left Rear Sill X Acceleration



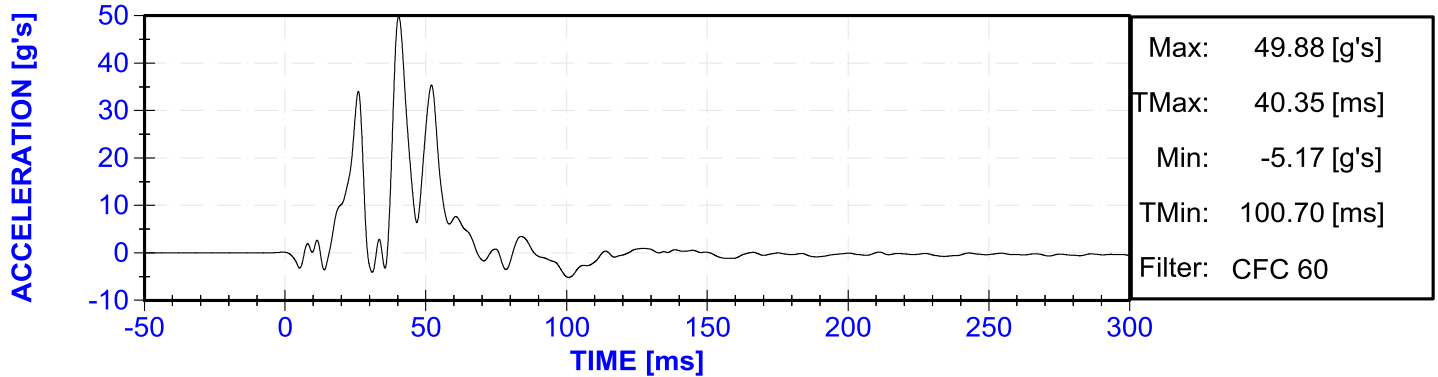
V2 Left Rear Sill Y Acceleration



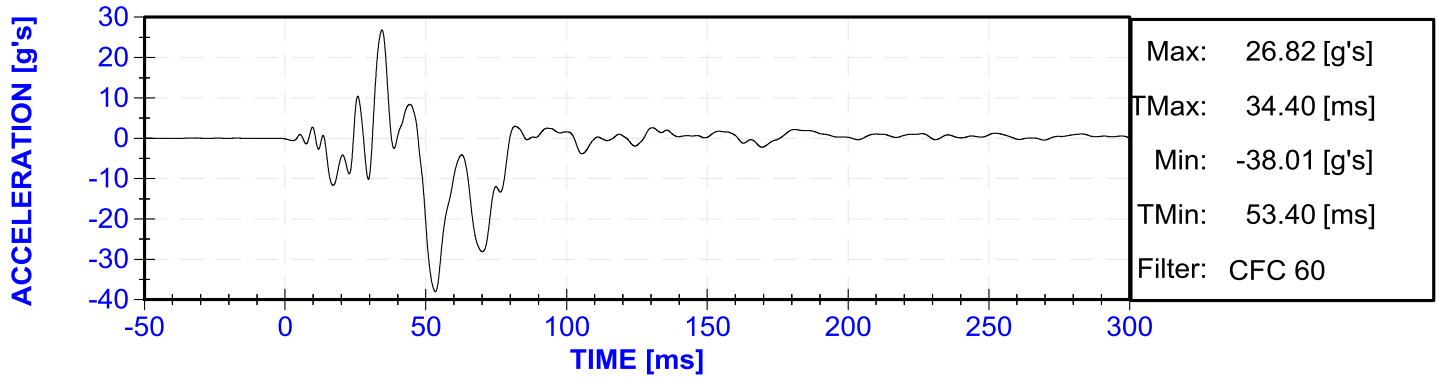




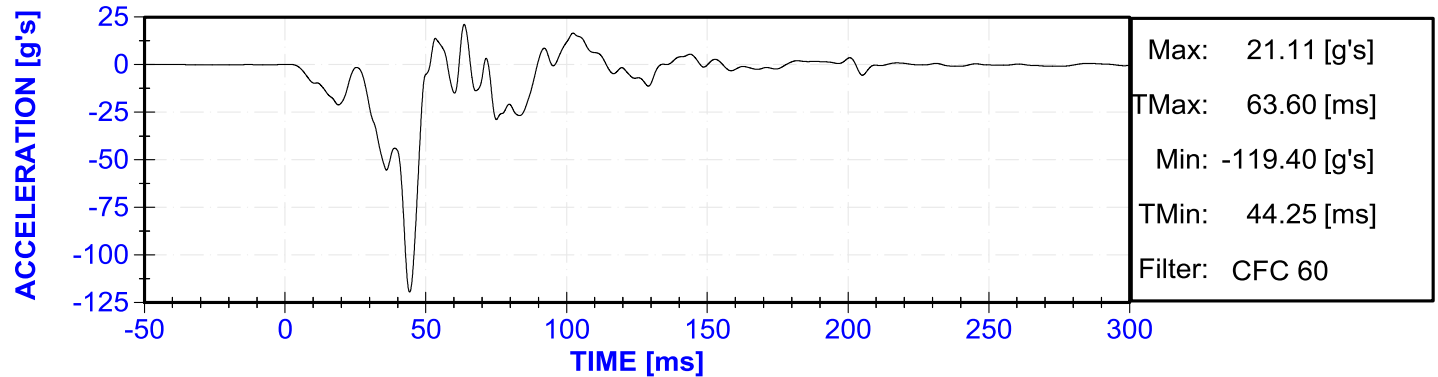
V2 Vehicle CG Redundant Y Acceleration



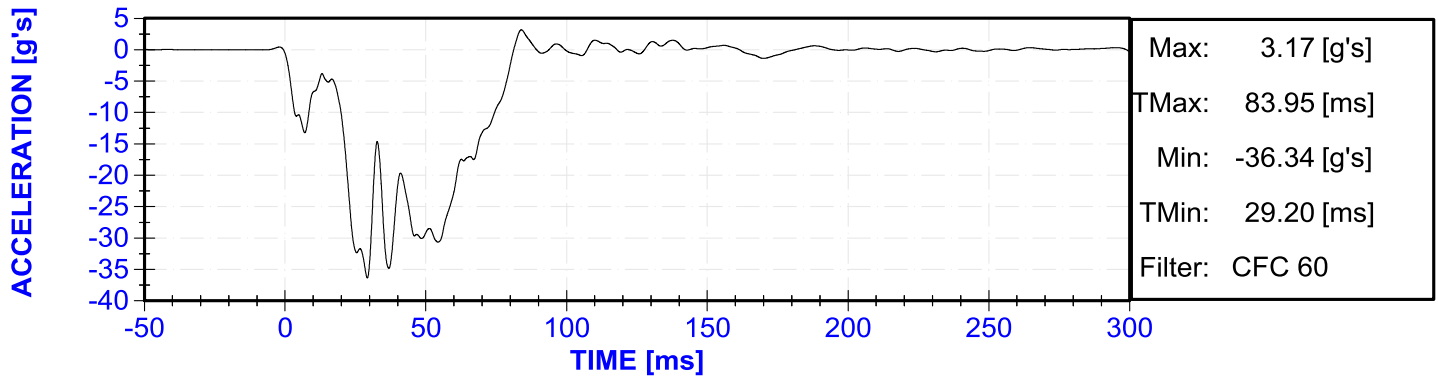
V2 Vehicle CG Redundant Z Acceleration



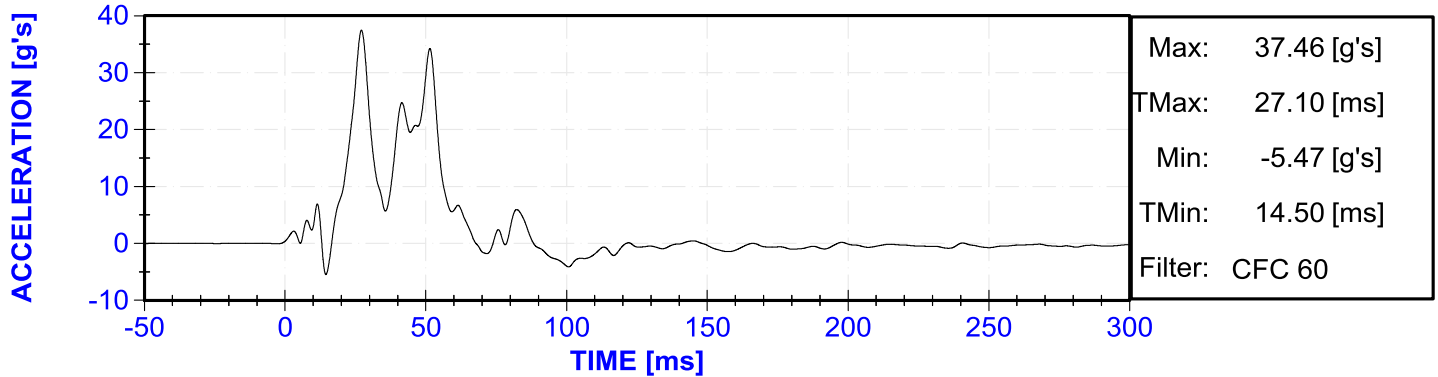
V2 Instrument Panel X Acceleration



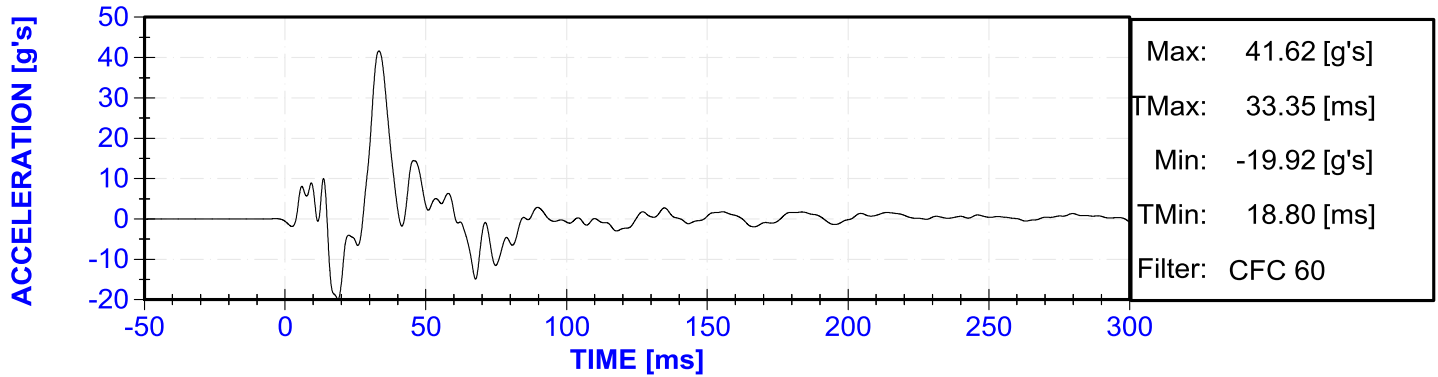
V2 Driver Seat Track X Acceleration



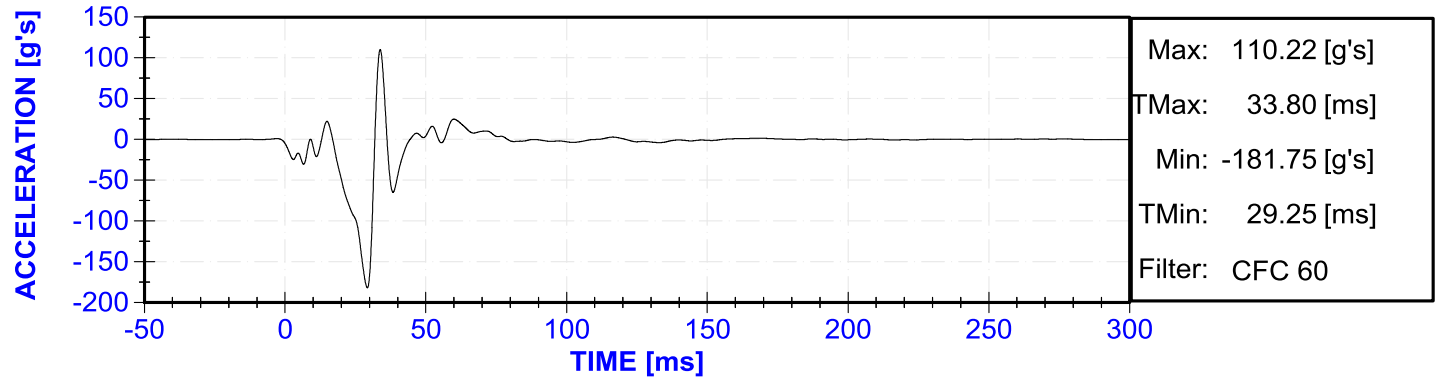
V2 Driver Seat Track Y Acceleration



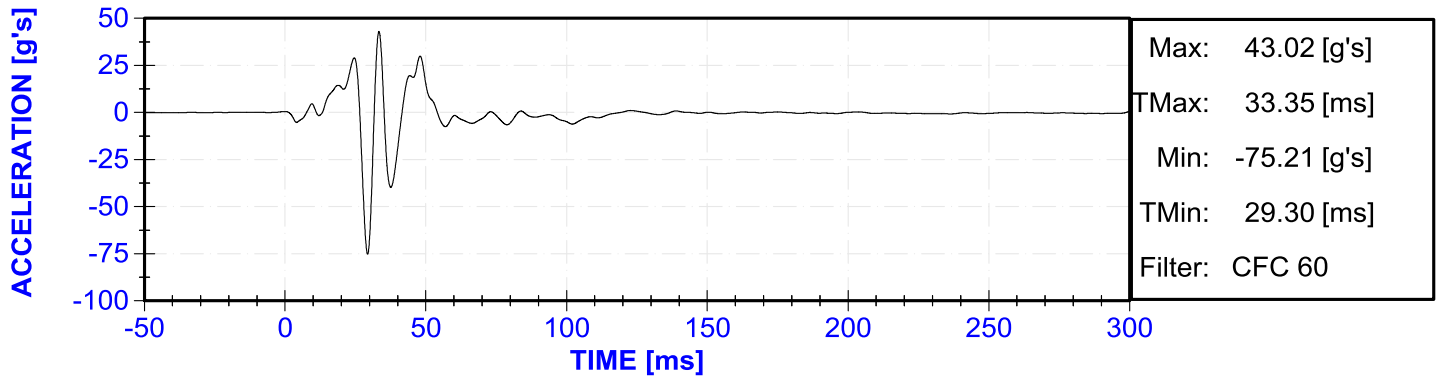
V2 Driver Seat Track Z Acceleration



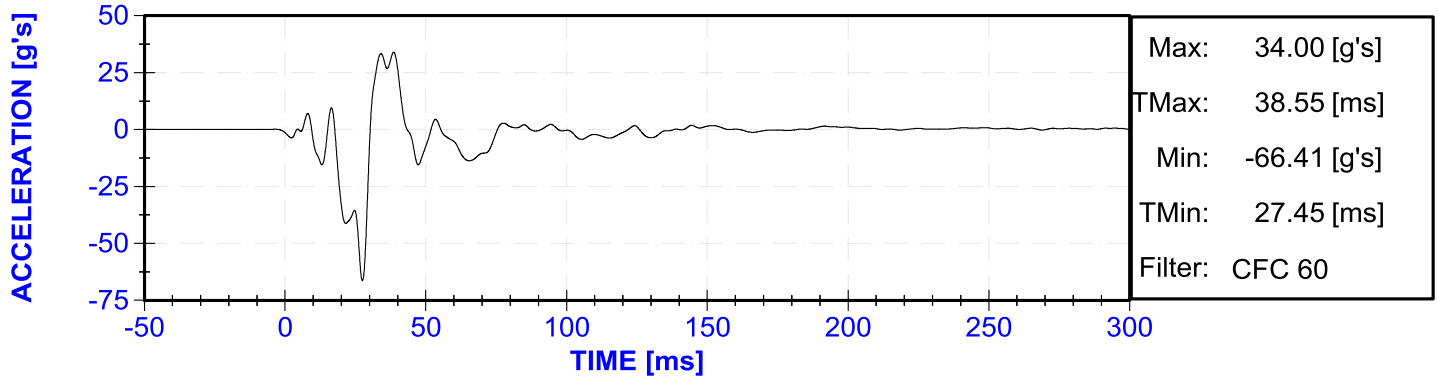
V2 Driver Floor Pan X Acceleration



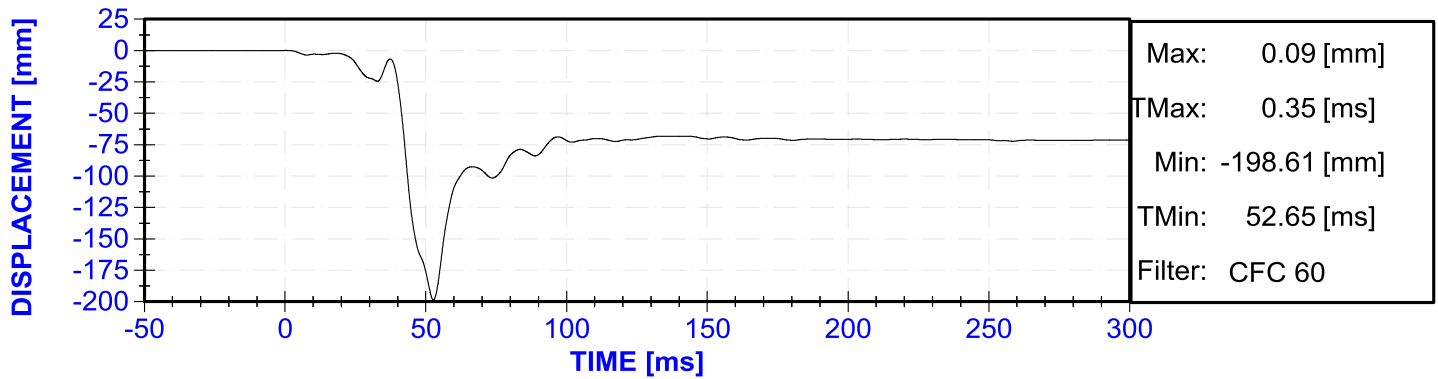
V2 Driver Floor Pan Y Acceleration



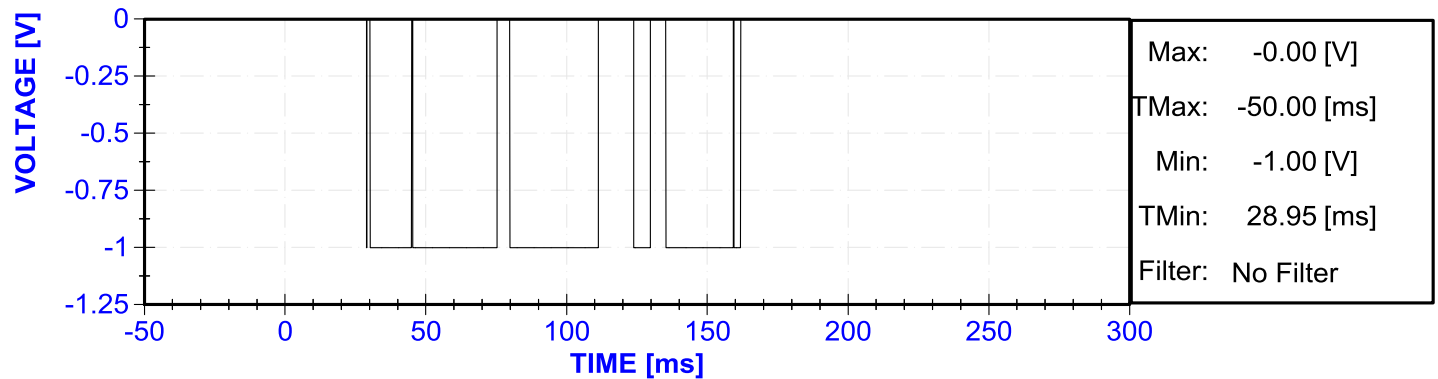
V2 Driver Floor Pan Z Acceleration



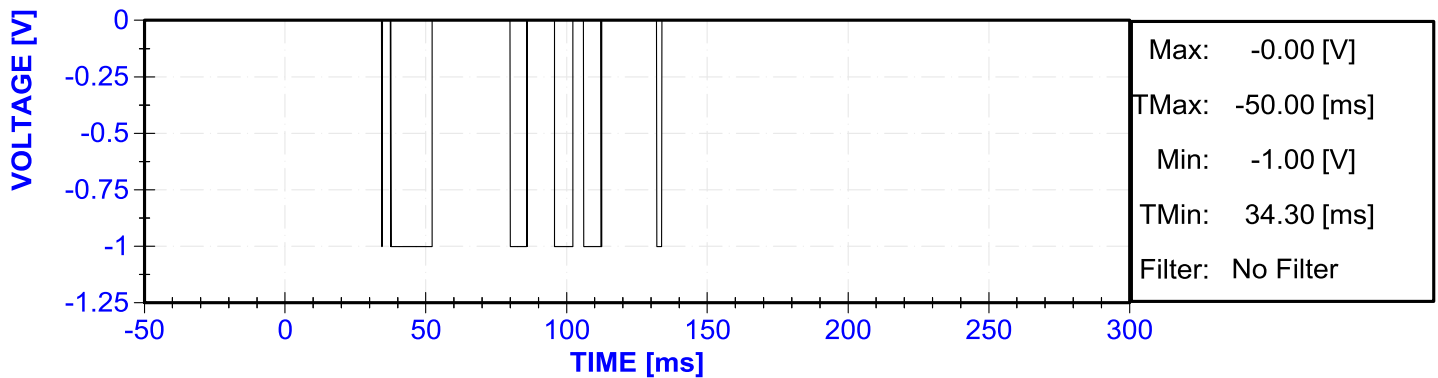
V2 Driver Floor Pan X Deflection

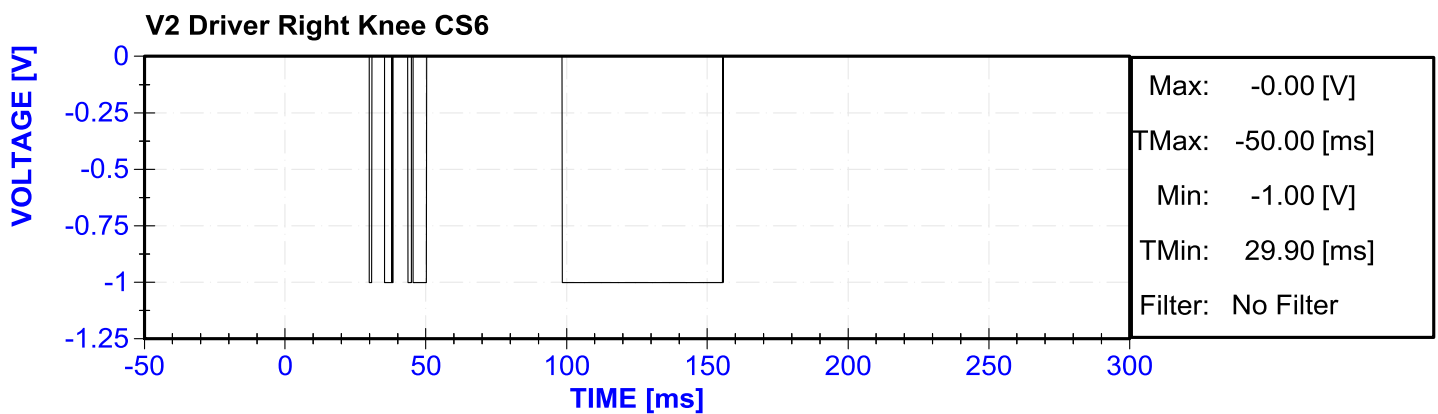
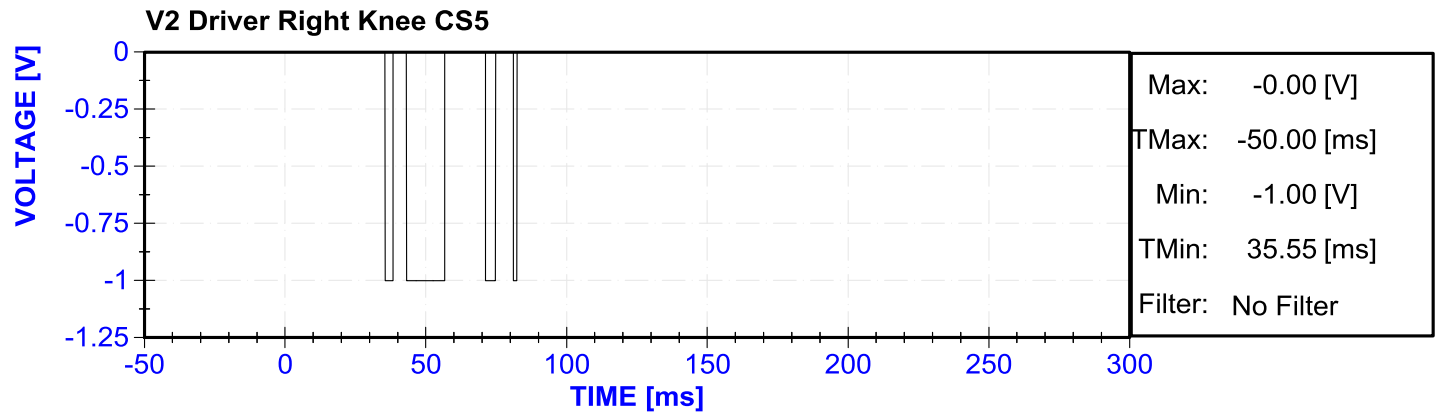
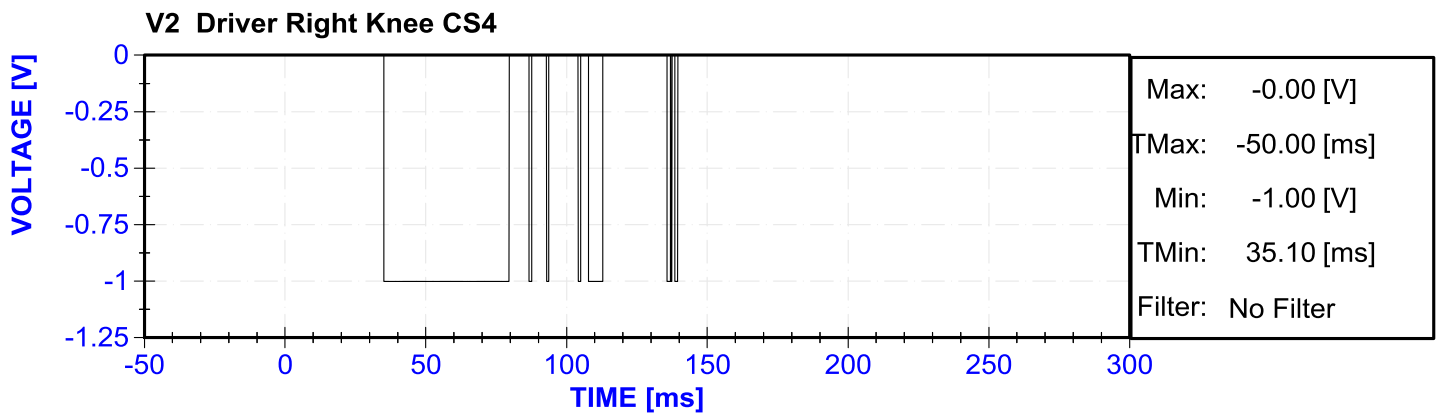
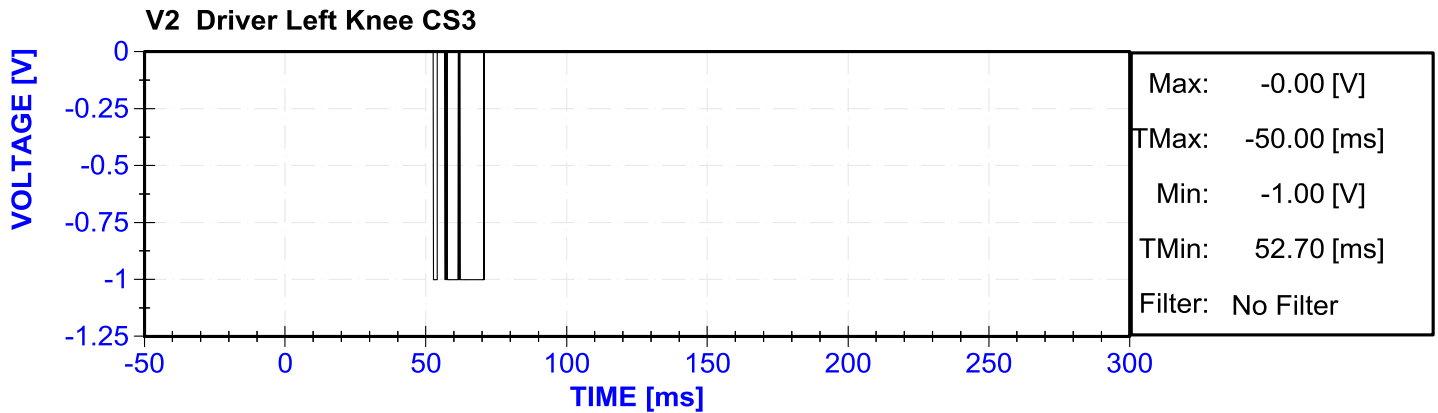


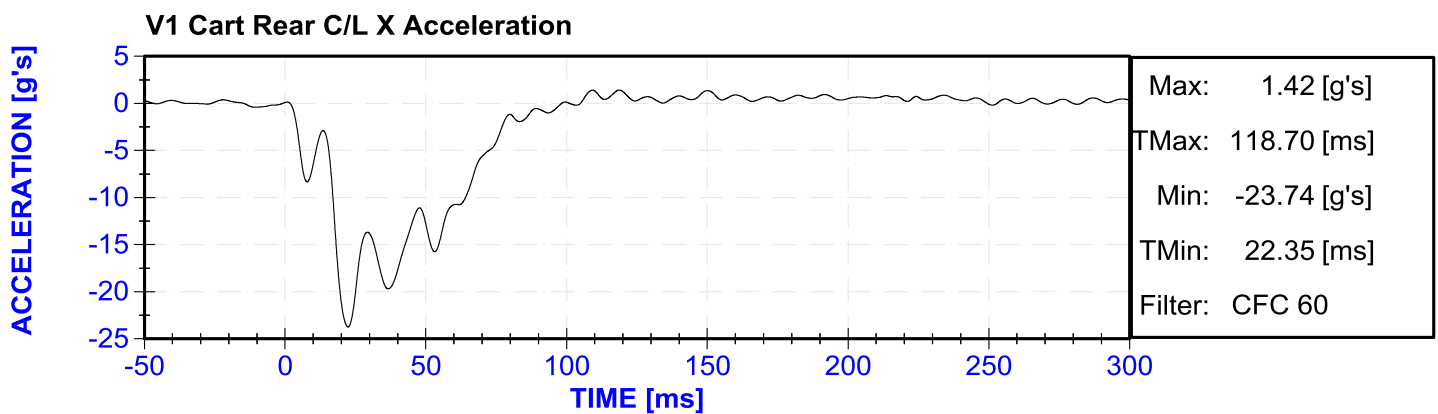
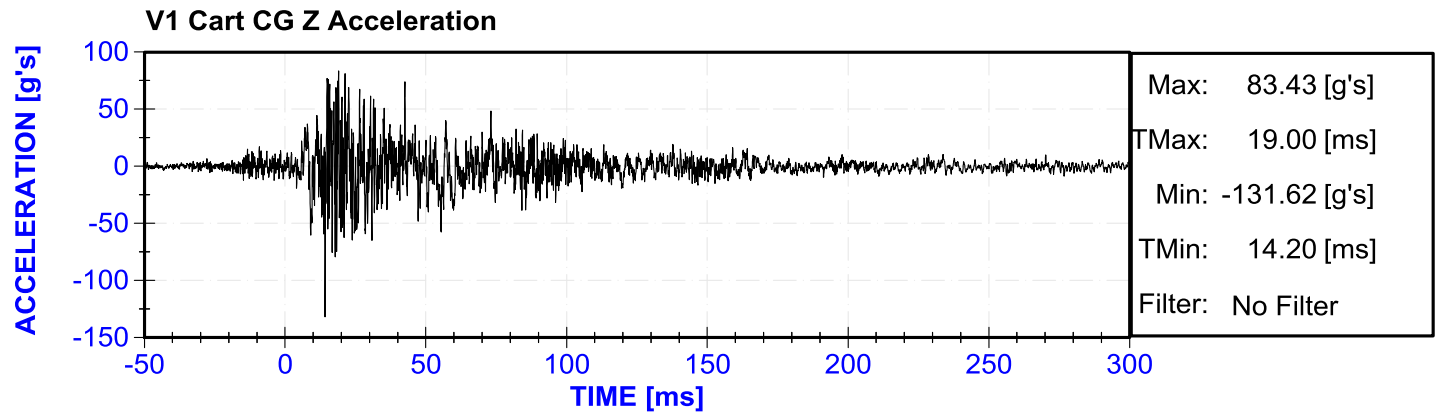
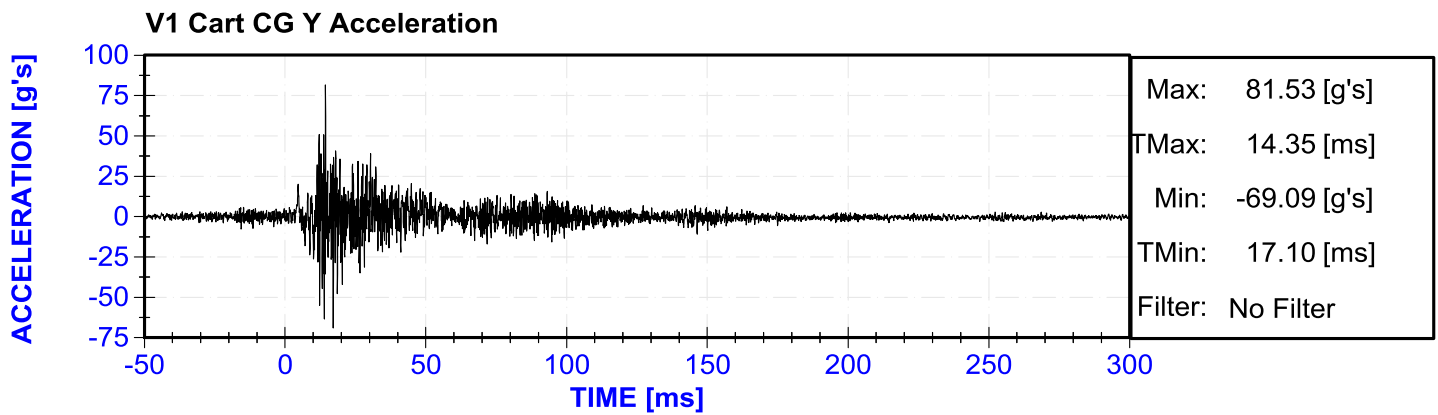
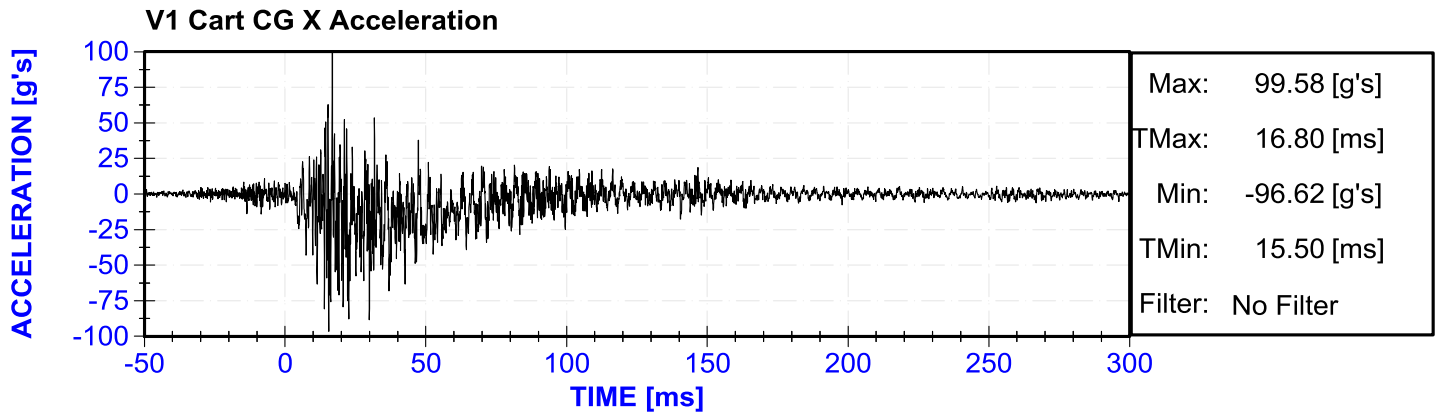
V2 Driver Left Knee CS1



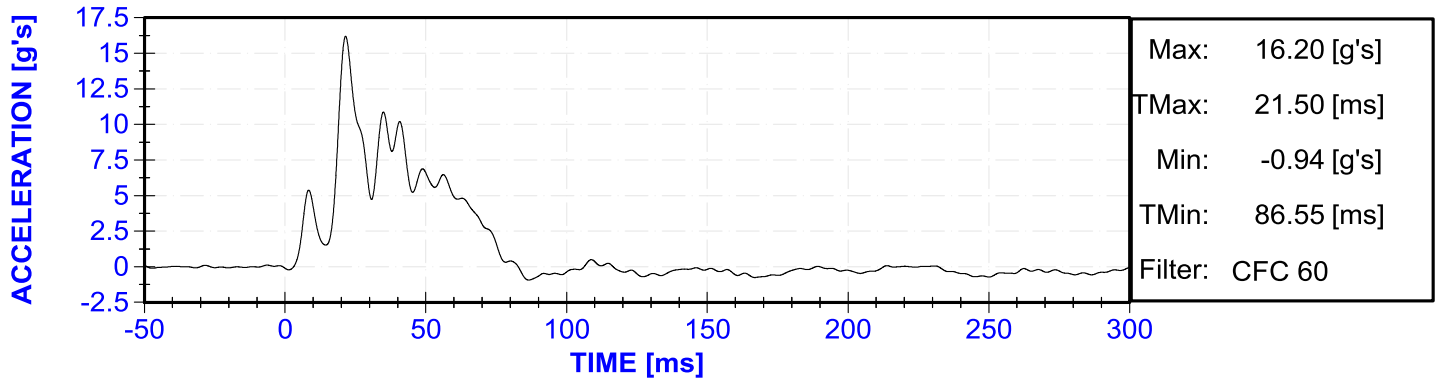
V2 Driver Left Knee CS2



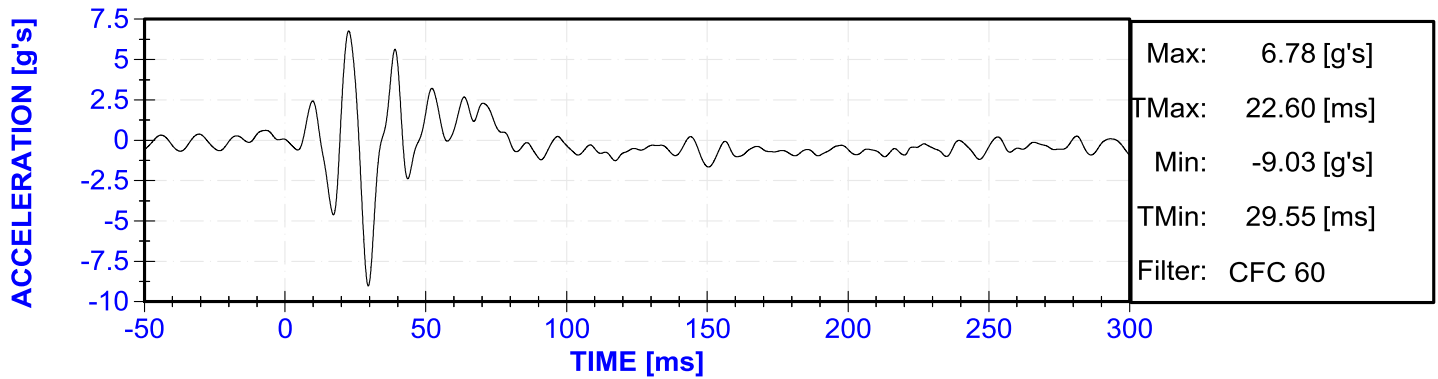




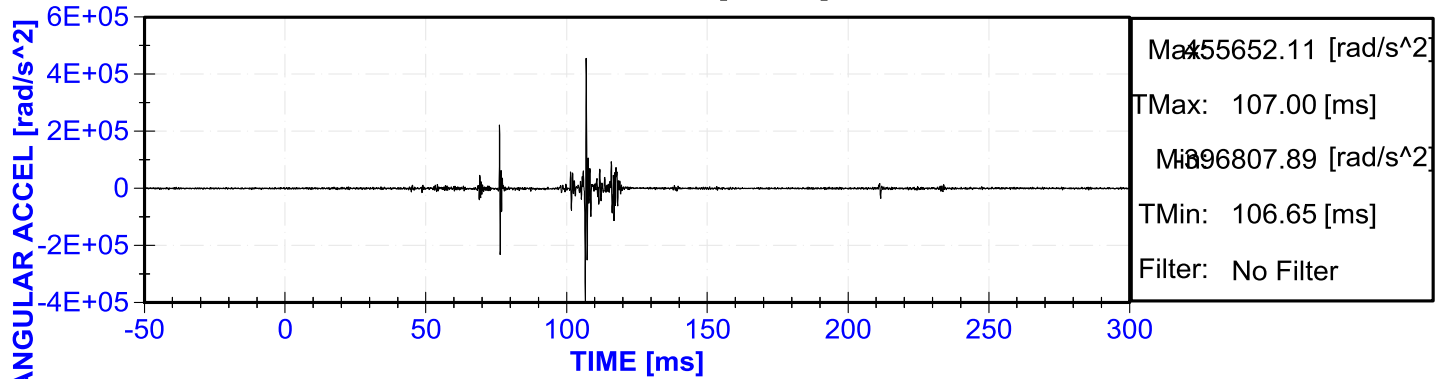
V1 Cart Rear C/L Y Acceleration



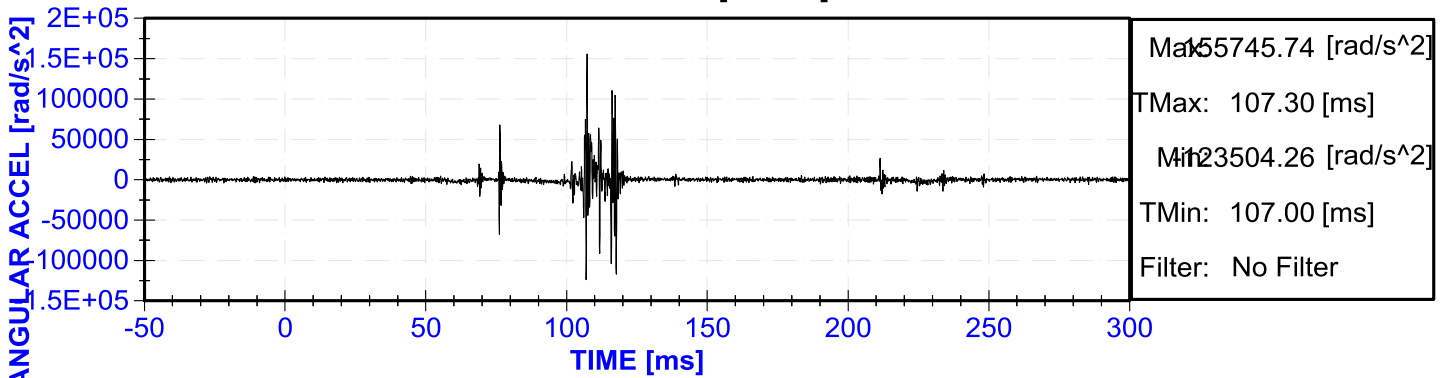
V1 Cart Rear C/L Z Acceleration



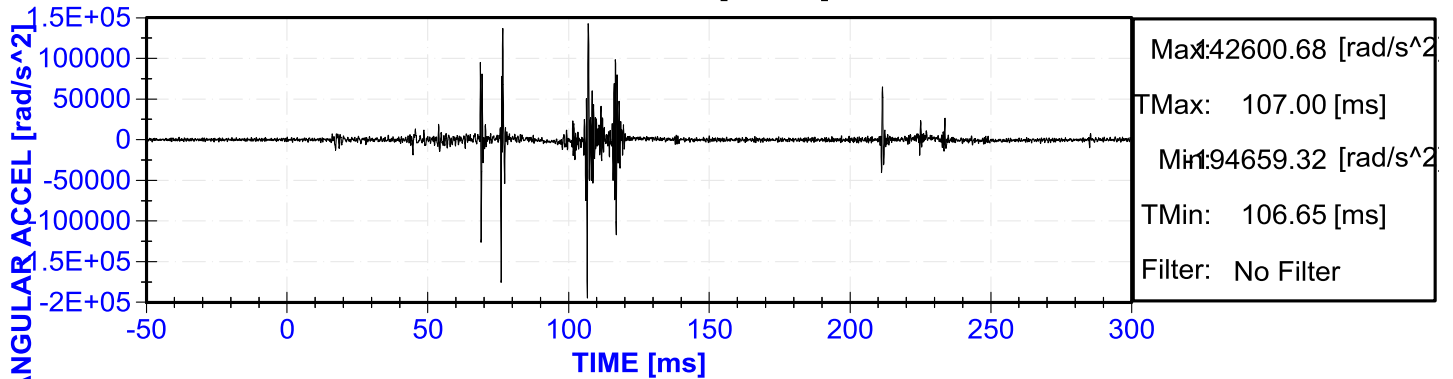
V2P1 HEAD ANGULAR ACCELERATION X [SIMON]



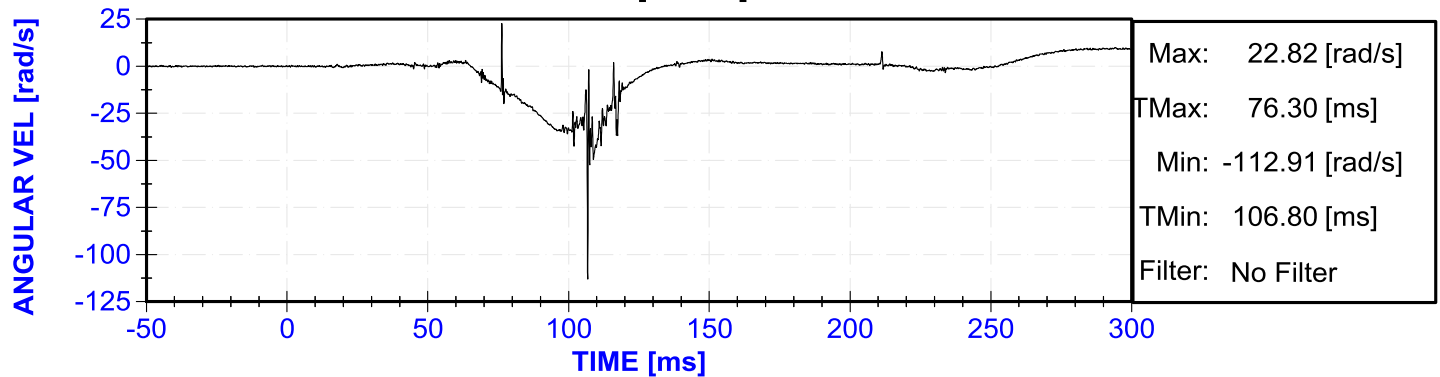
V2P1 HEAD ANGULAR ACCELERATION Y [SIMON]



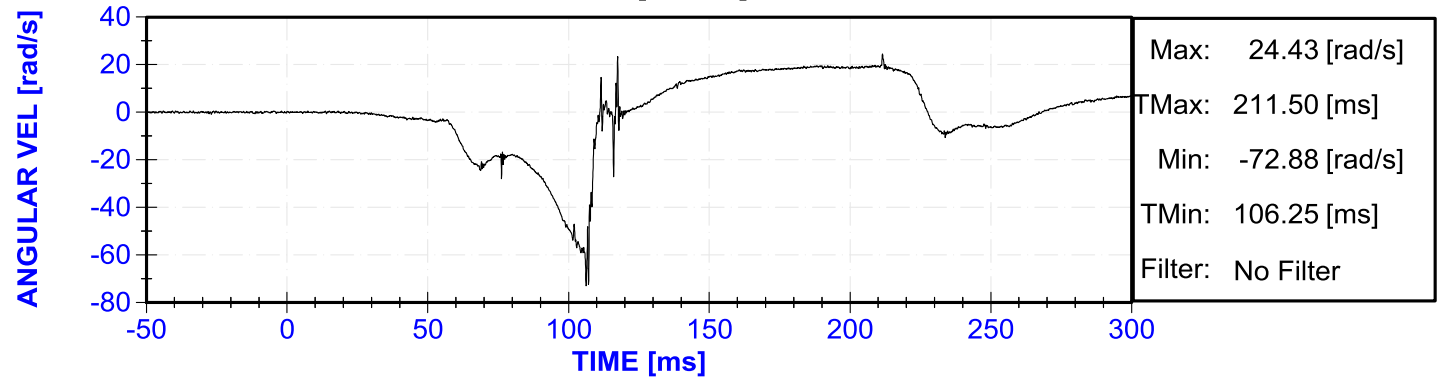
V2P1 HEAD ANGULAR ACCELERATION Z [SIMON]



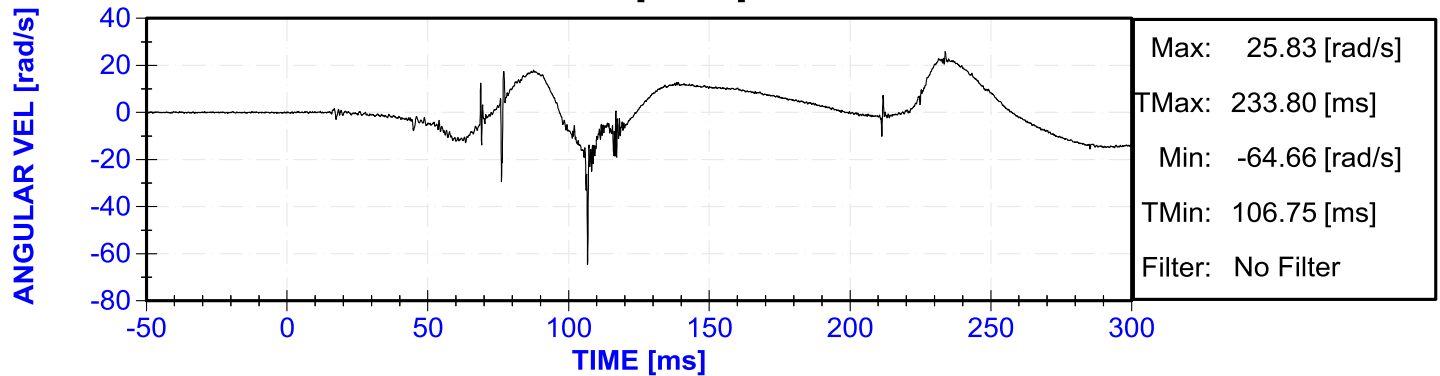
V2P1 HEAD ANGULAR VELOCITY X [SIMON]

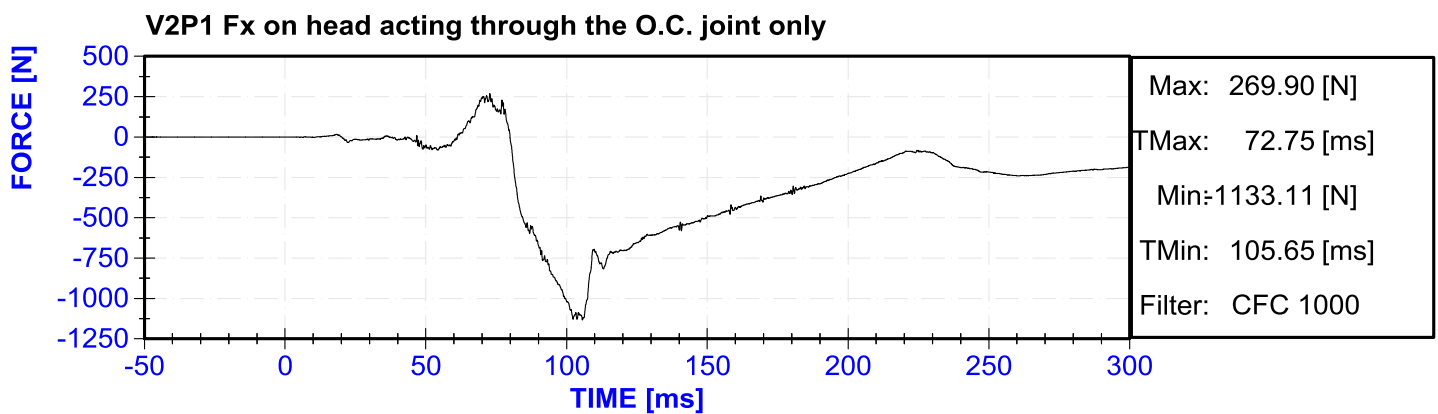
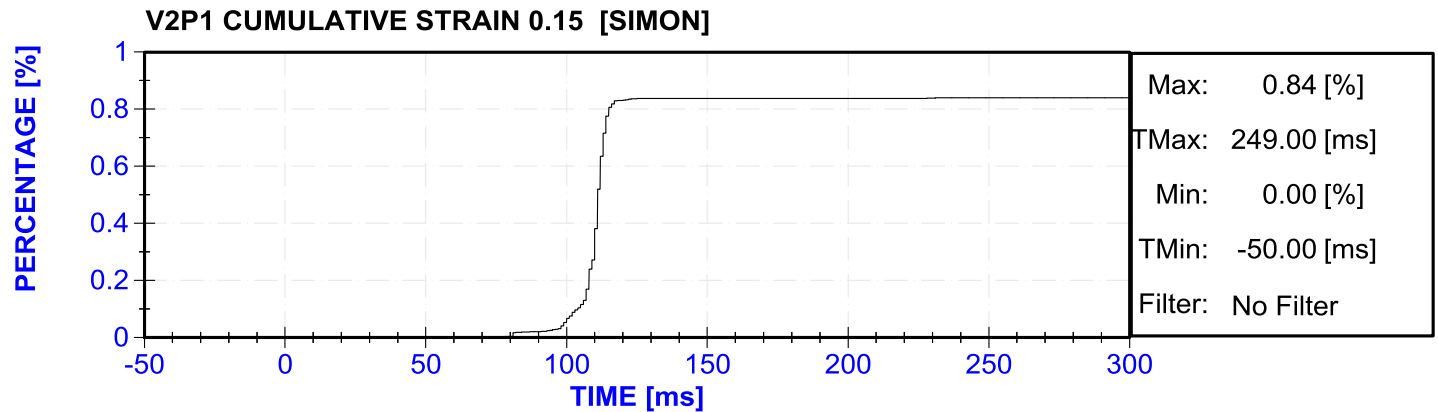
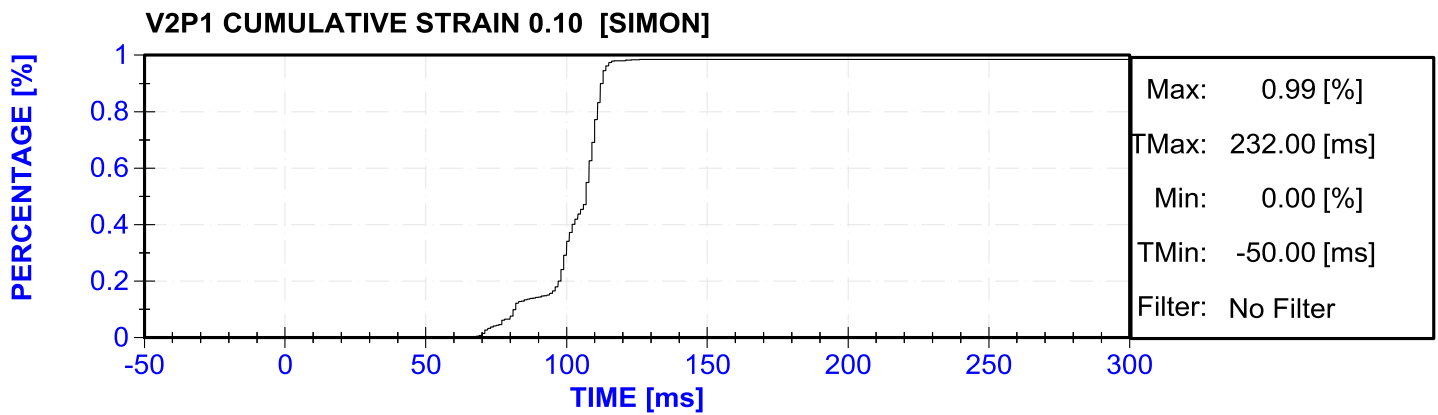
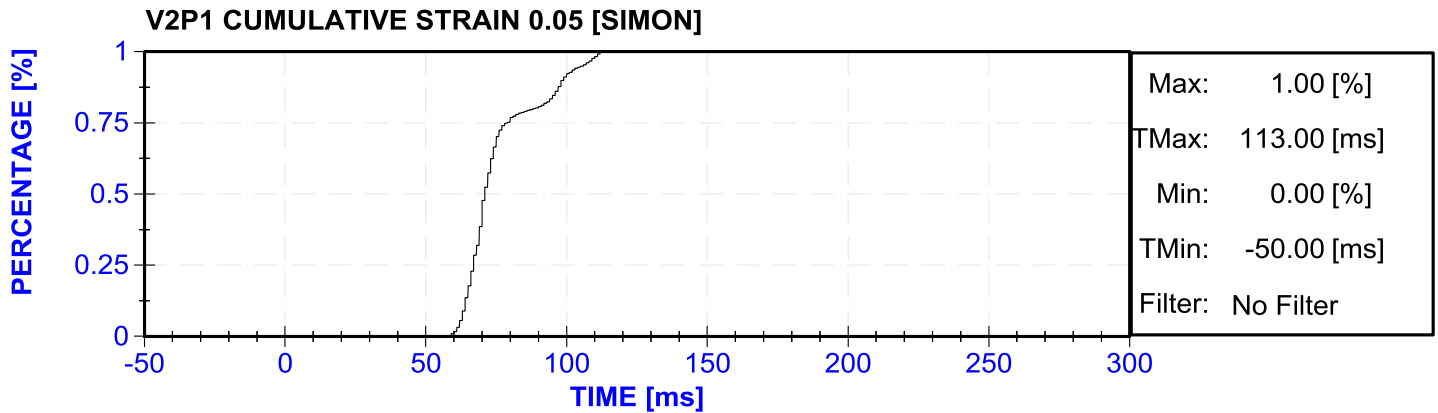


V2P1 HEAD ANGULAR VELOCITY Y [SIMON]

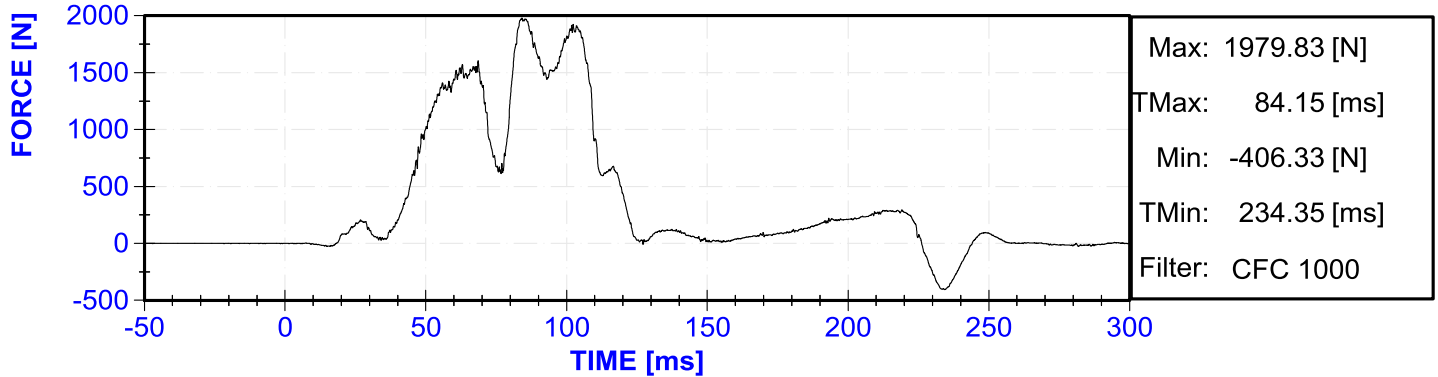


V2P1 HEAD ANGULAR VELOCITY Z [SIMON]

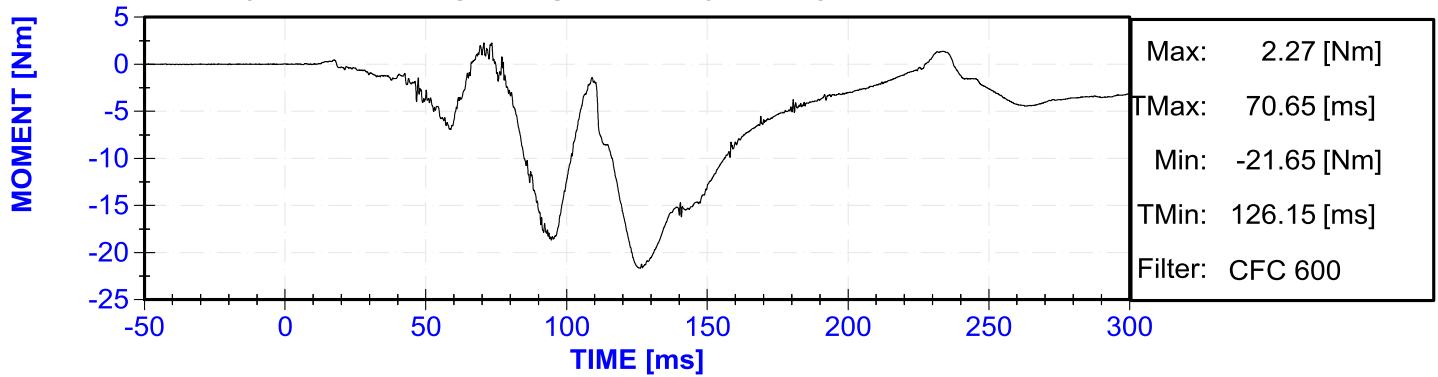




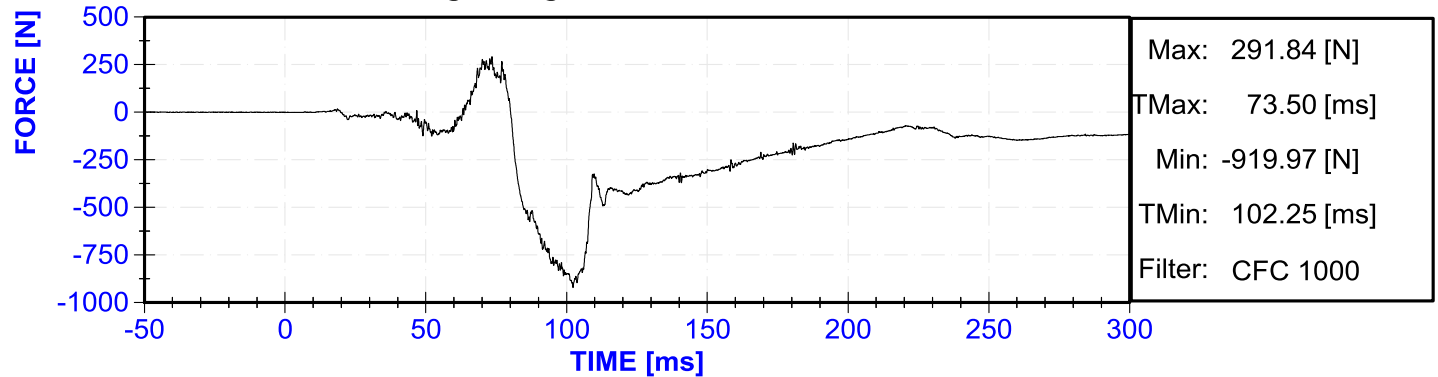
V2P1 Fz on head acting through the O.C. joint only



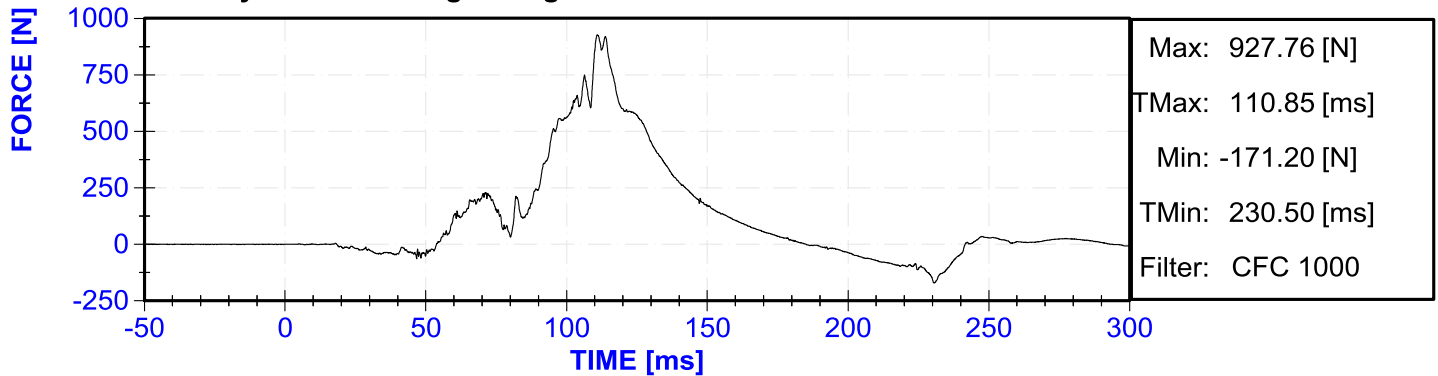
V2P1 My on head acting through the O.C. joint only



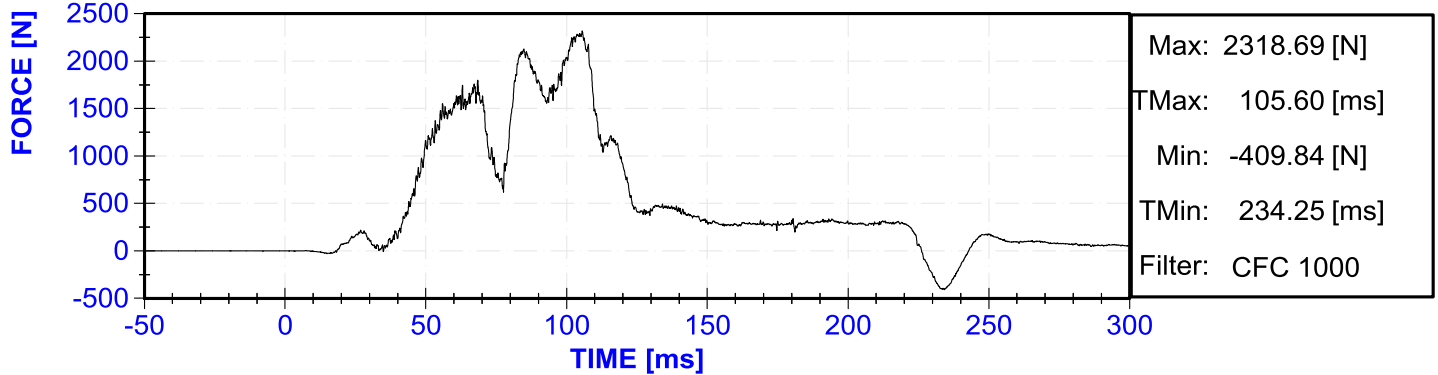
V2P1 Fx on head acting through the total neck section



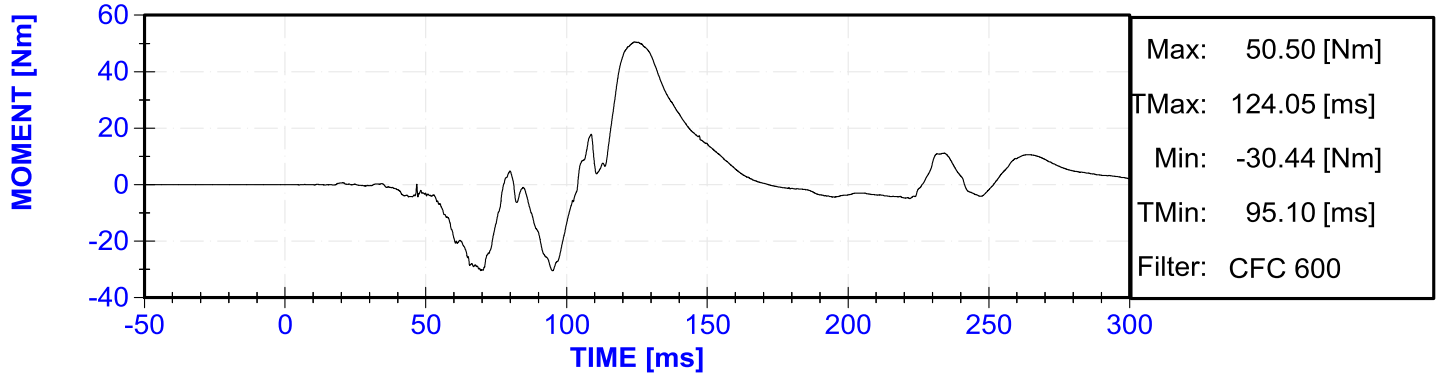
V2P1 Fy on head acting through the total neck section



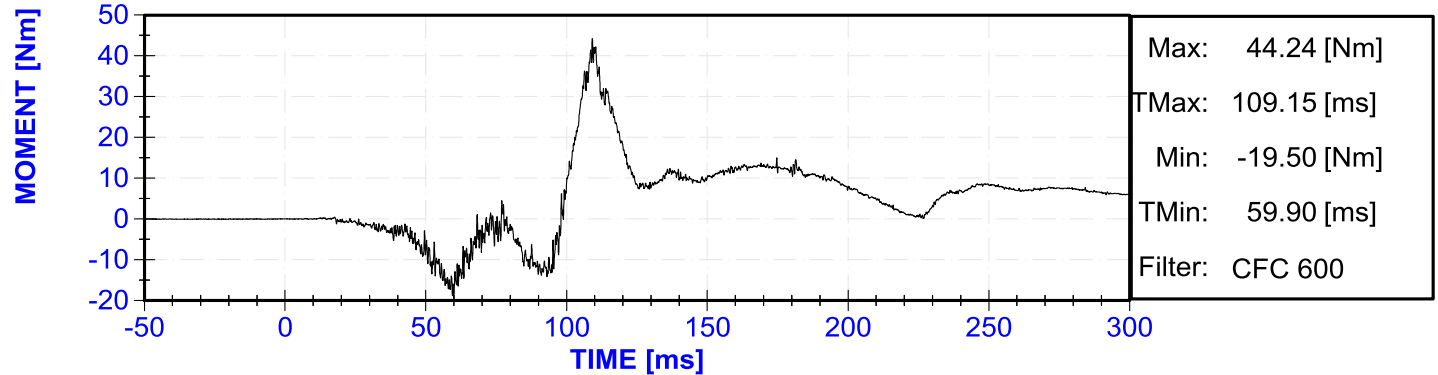
V2P1 Fz on head acting through the total neck section



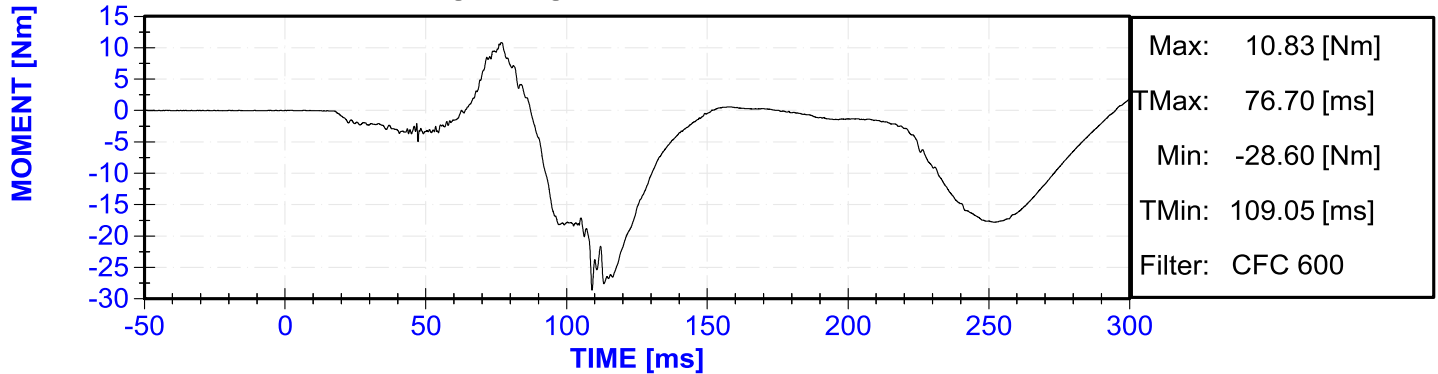
V2P1 Mx on head acting through the total neck section

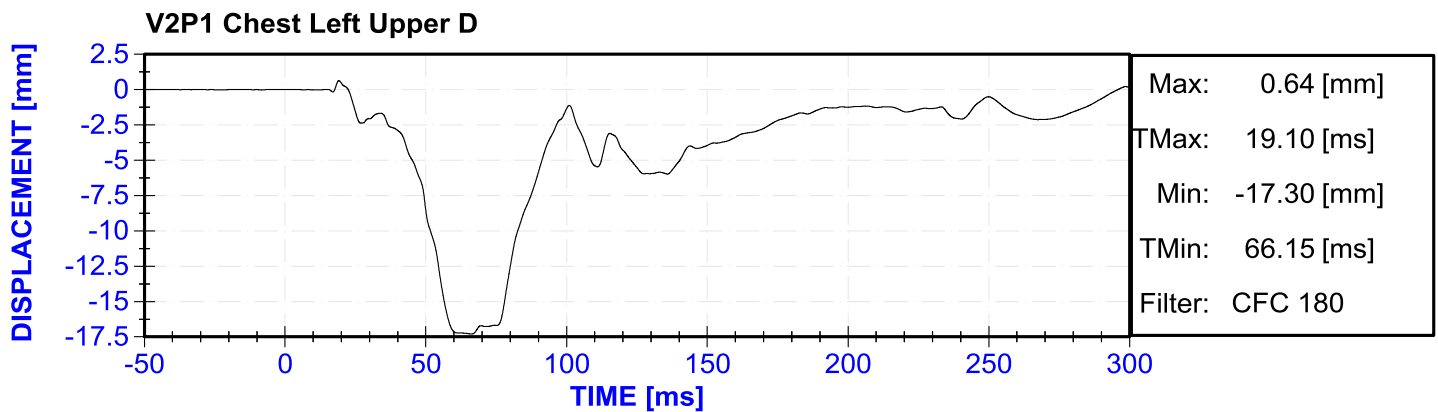
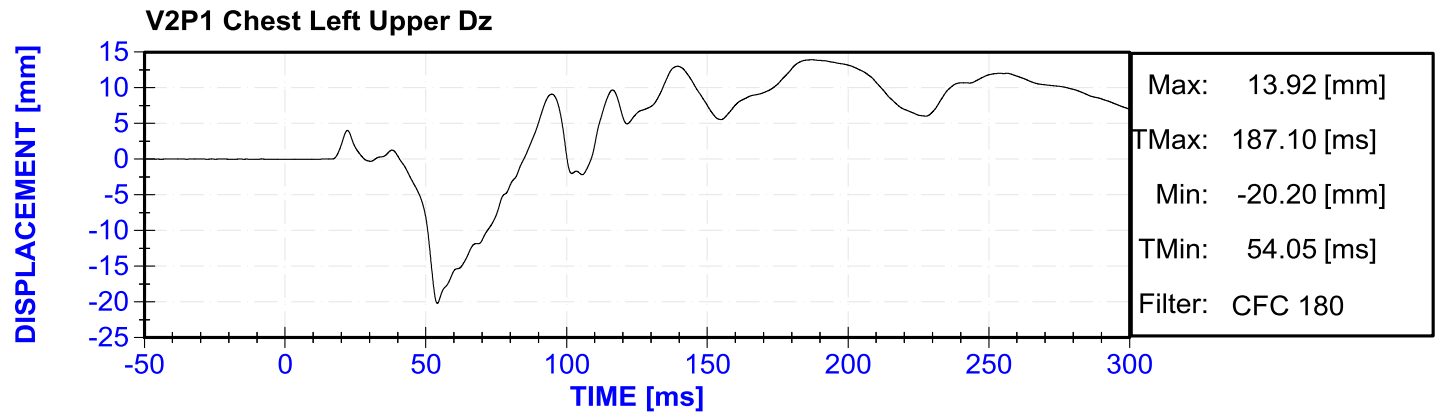
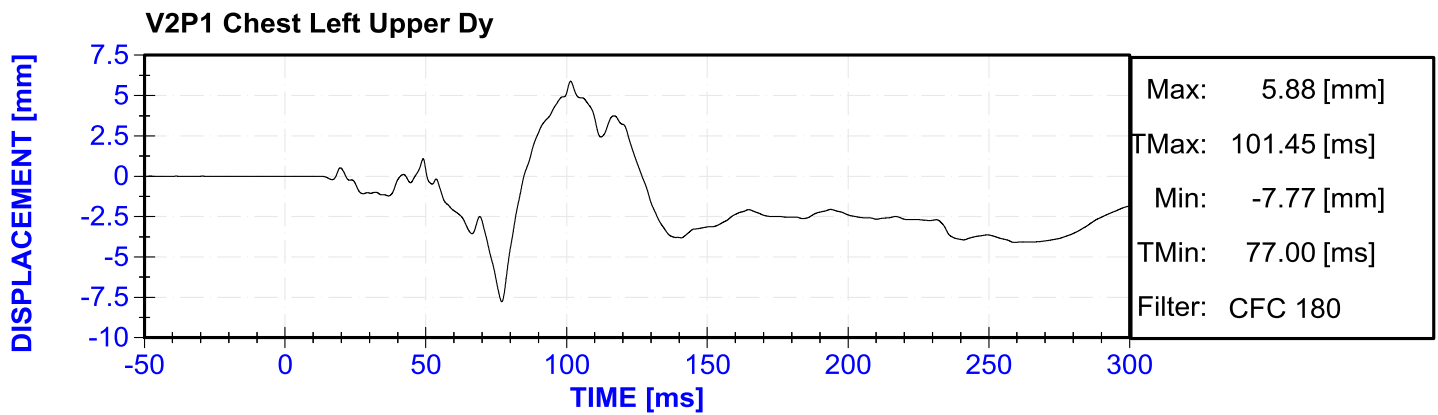
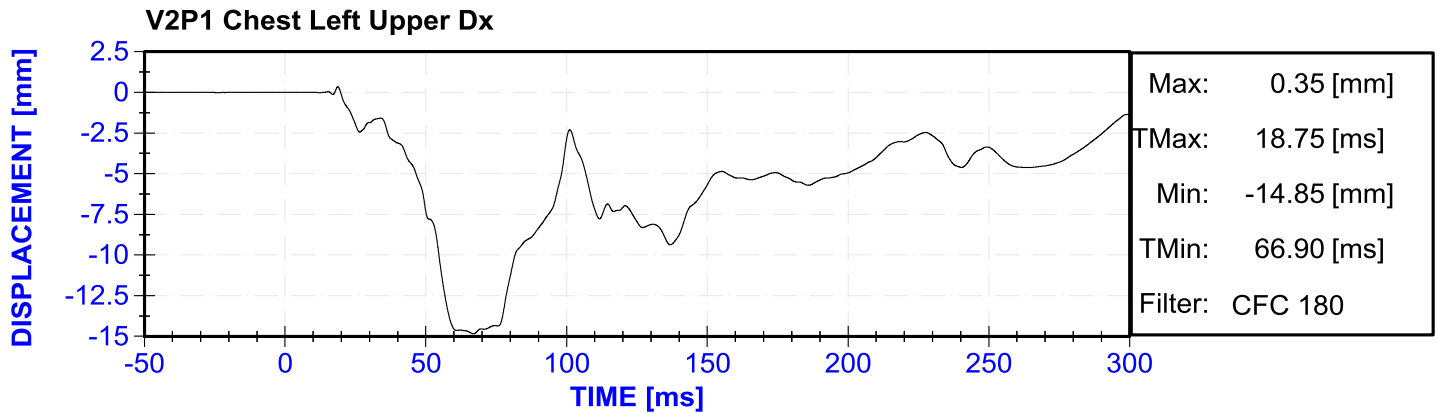


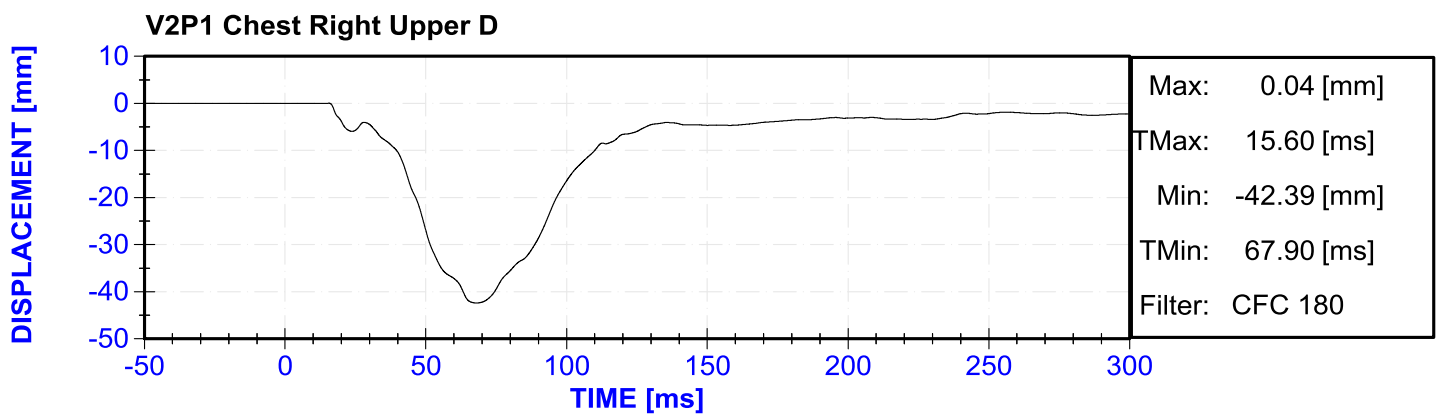
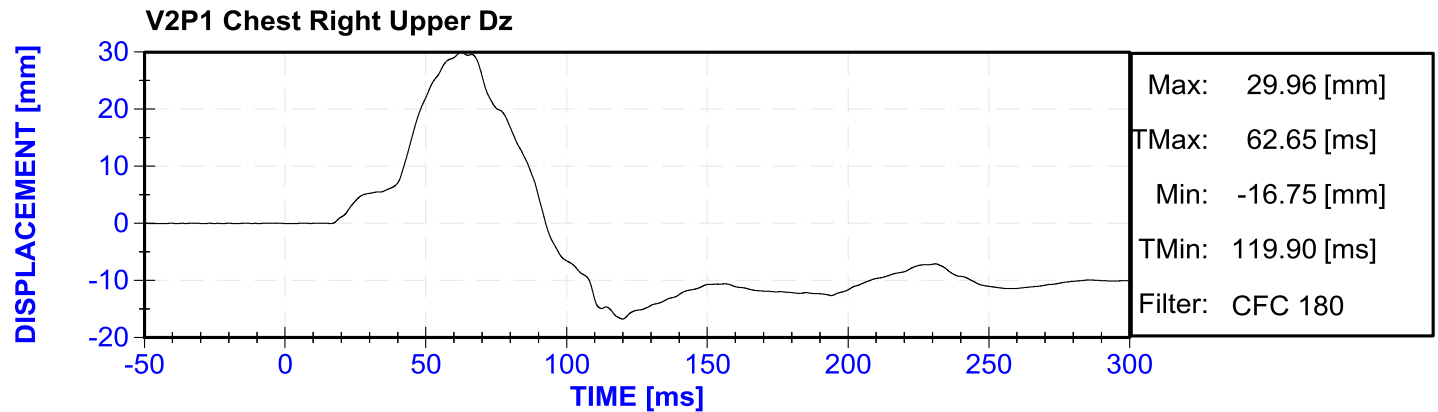
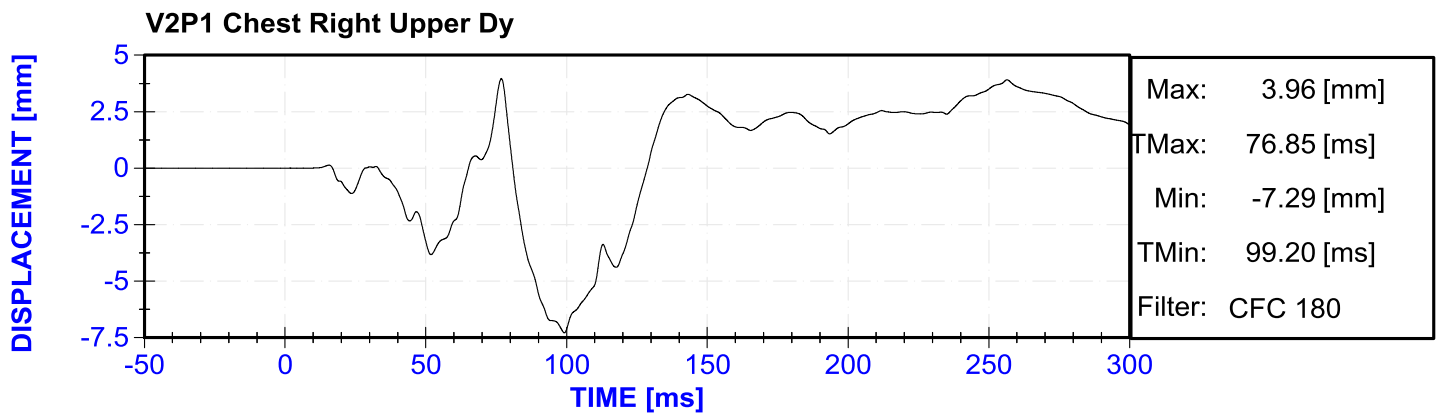
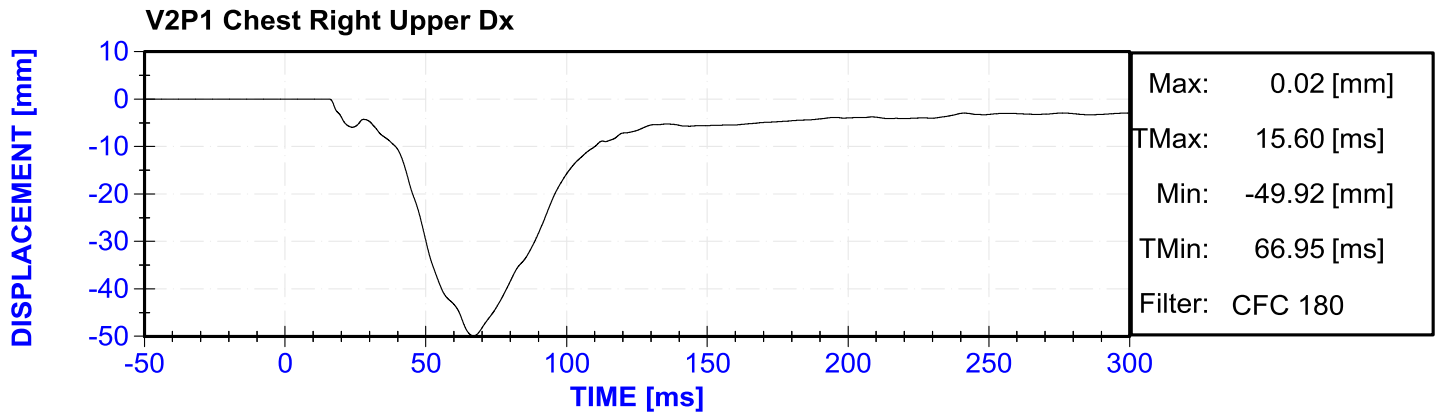
V2P1 My on head acting through the total neck section

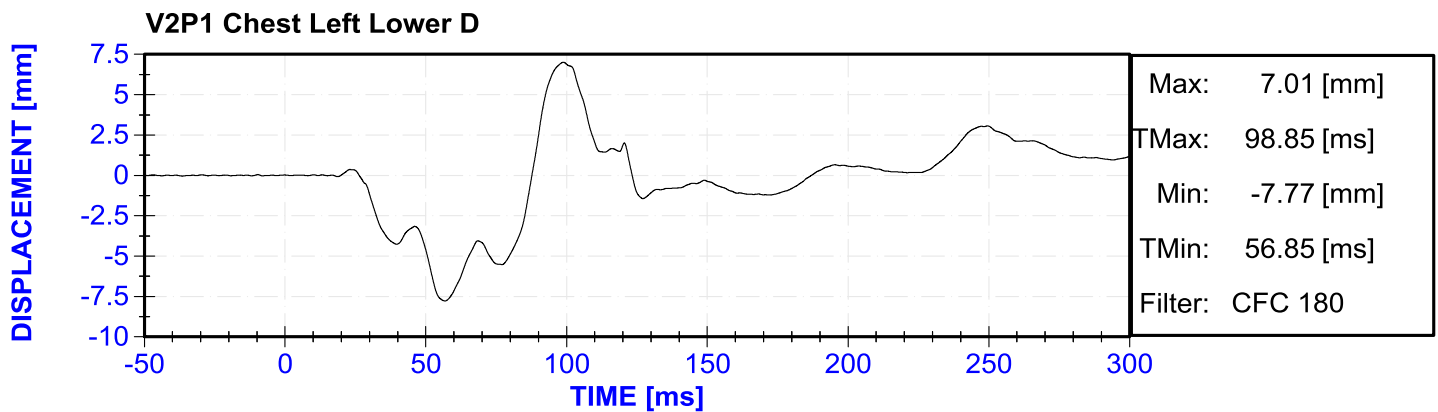
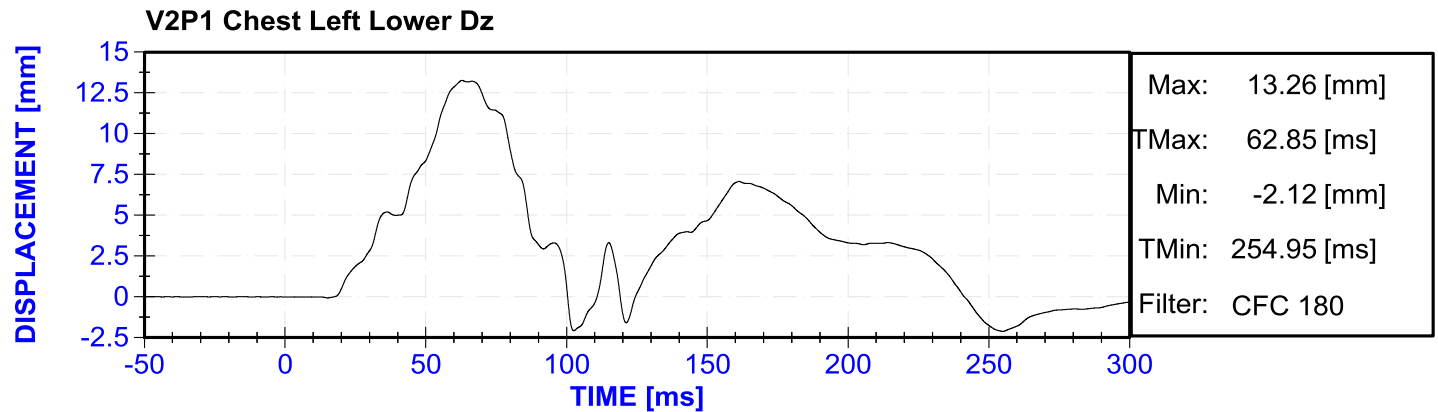
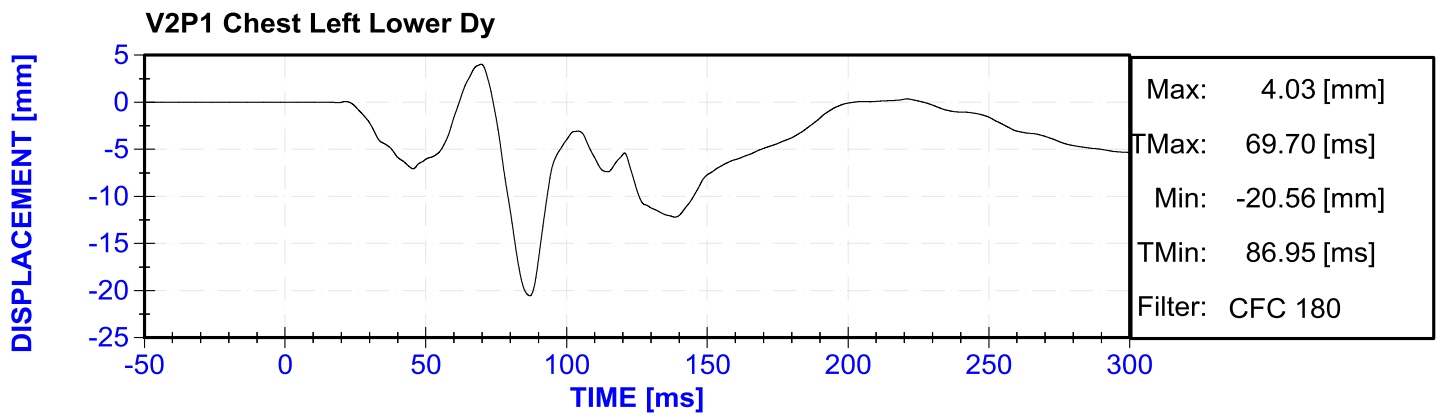
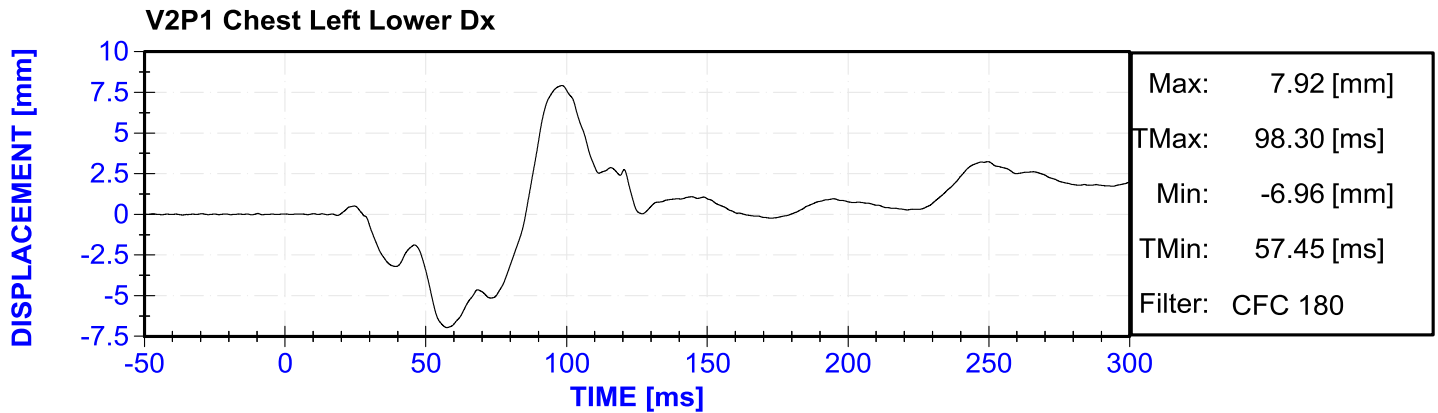


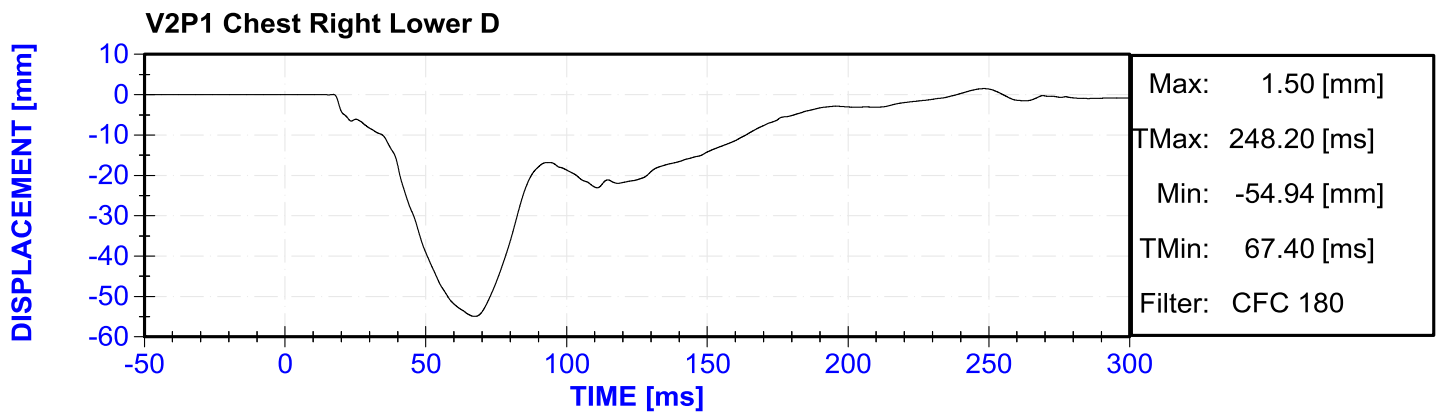
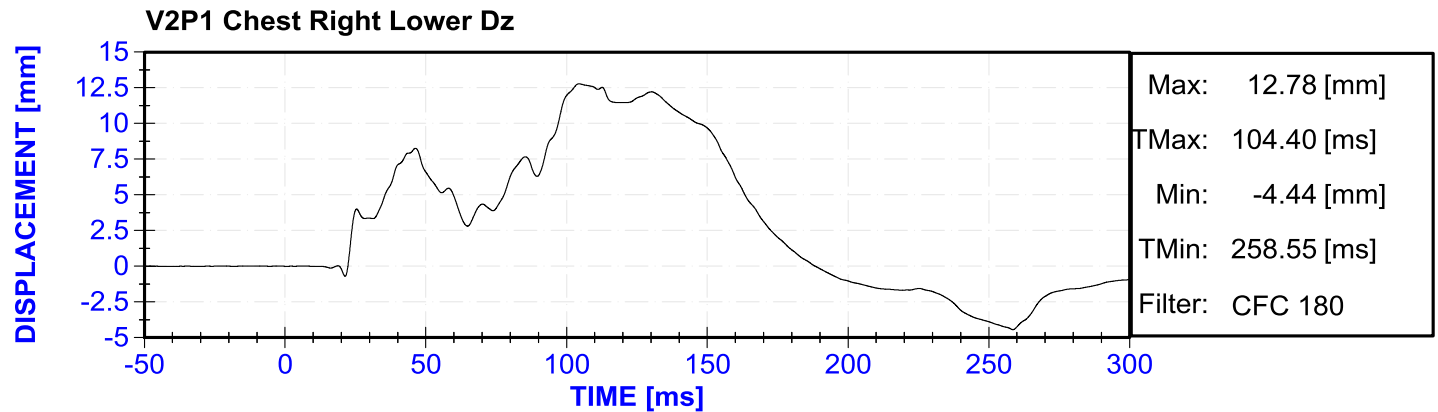
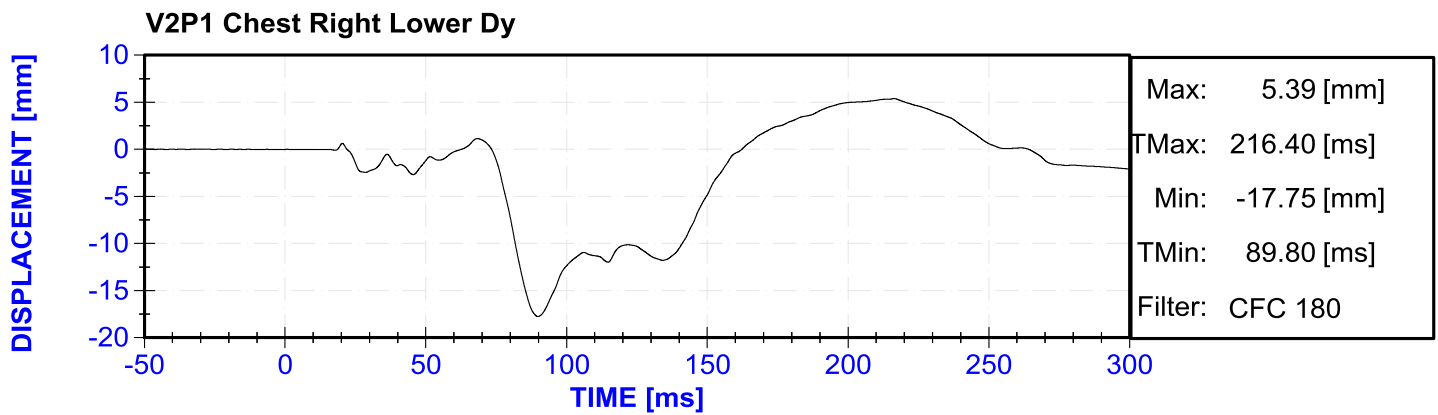
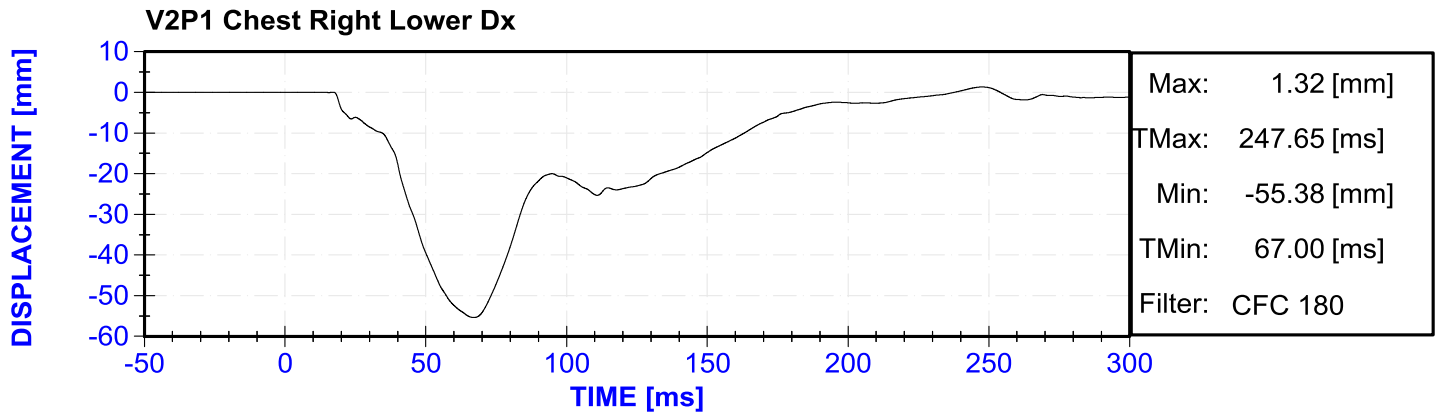
V2P1 Mz on head acting through the total neck section

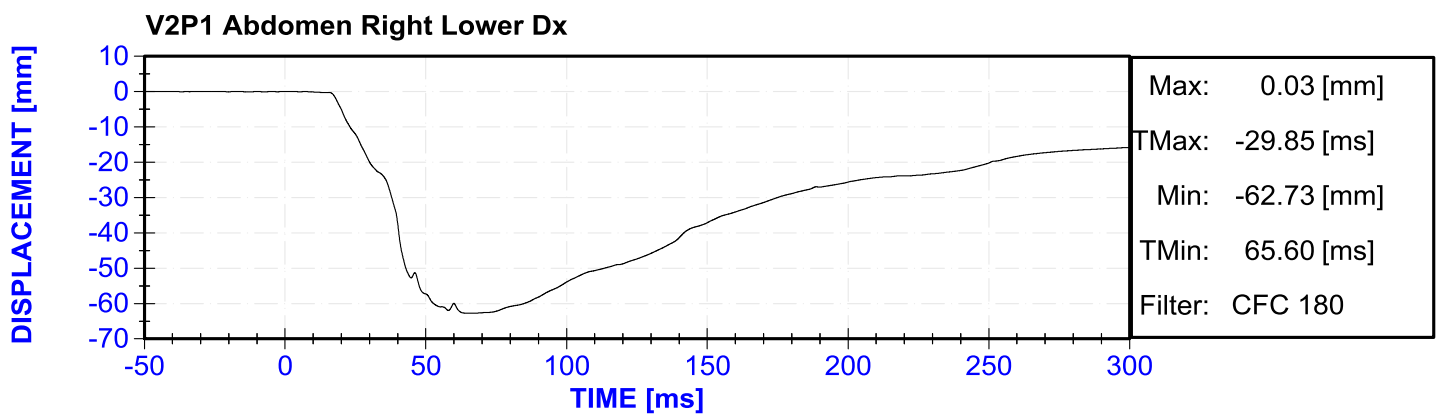
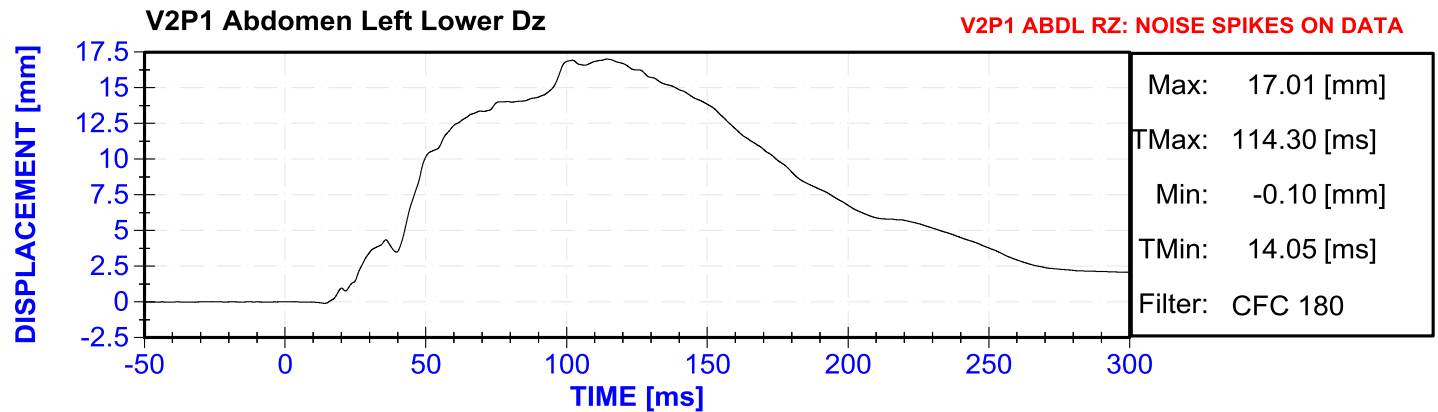
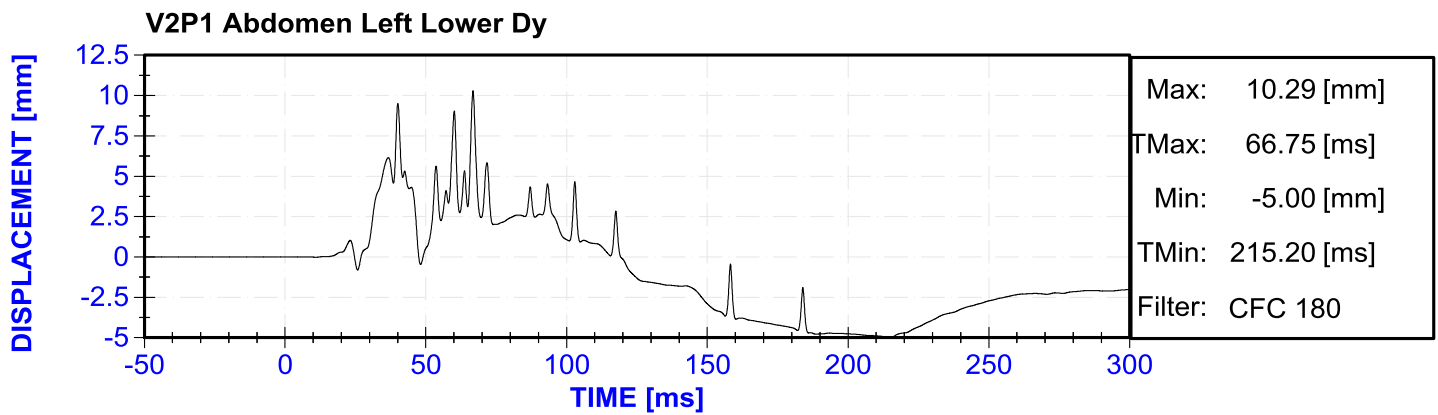
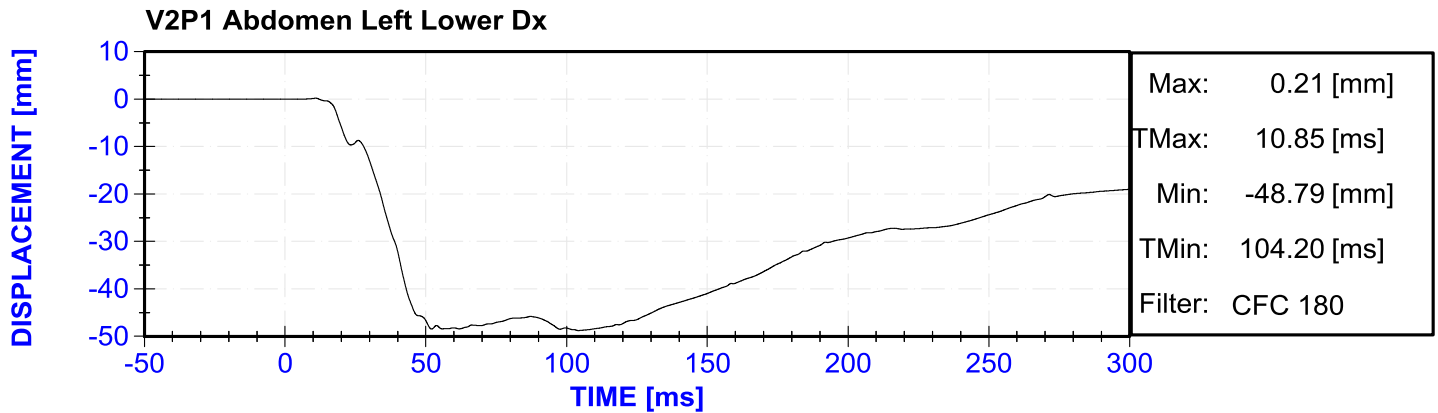


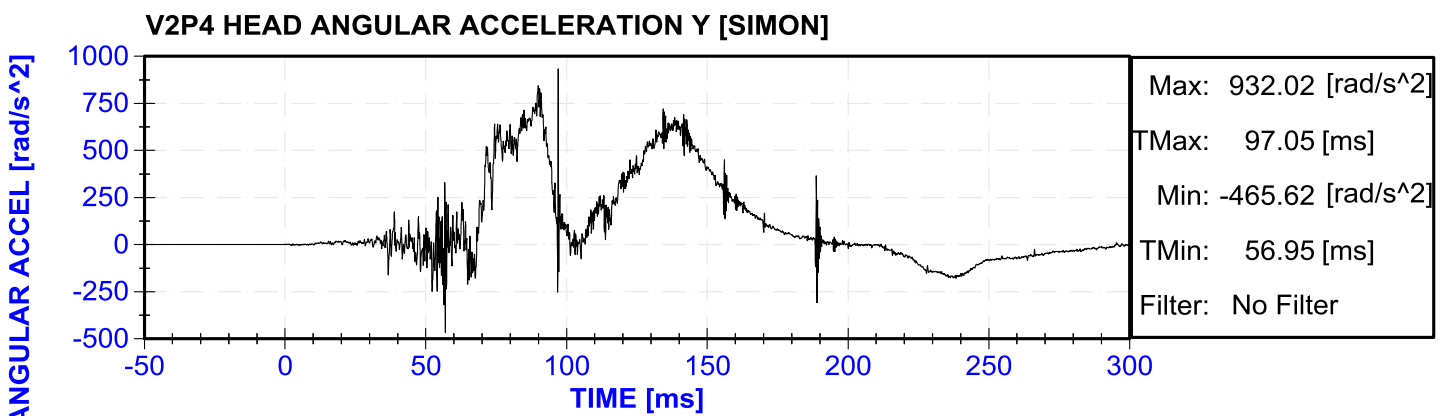
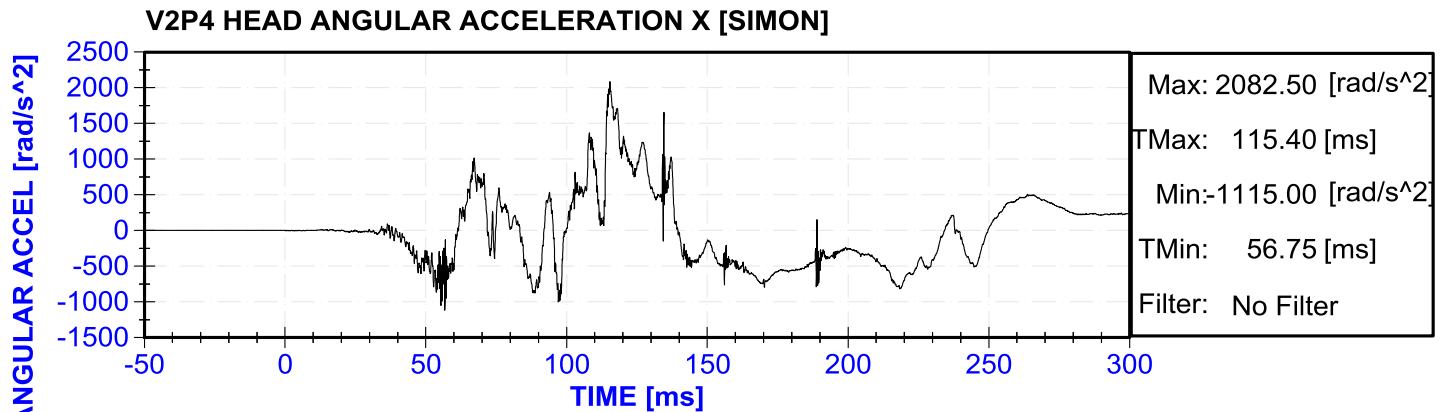
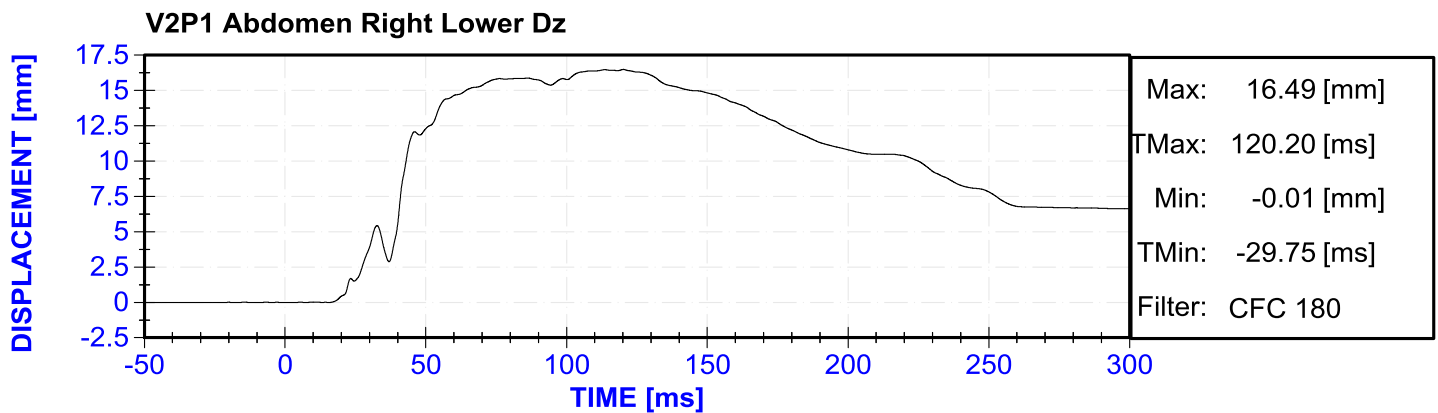
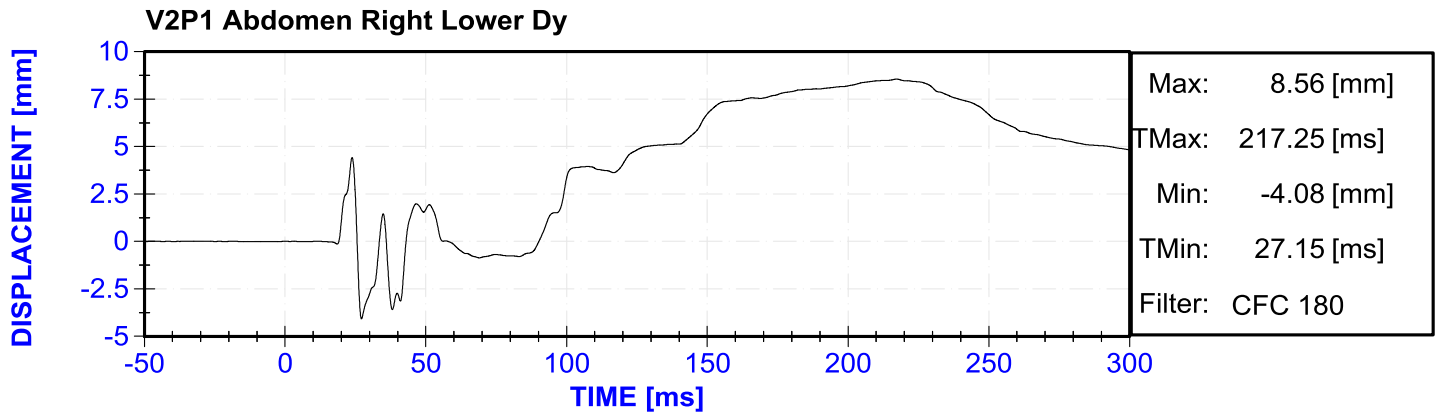




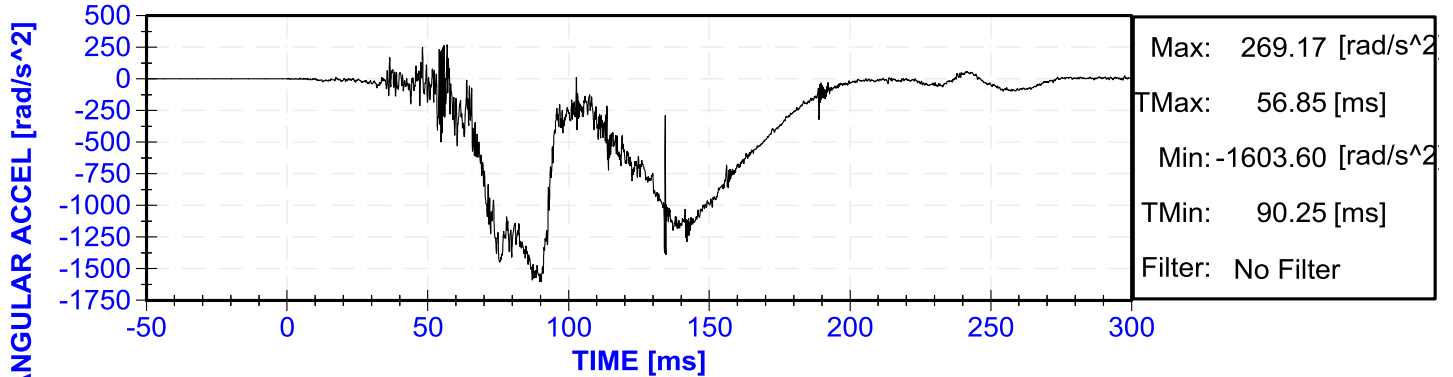




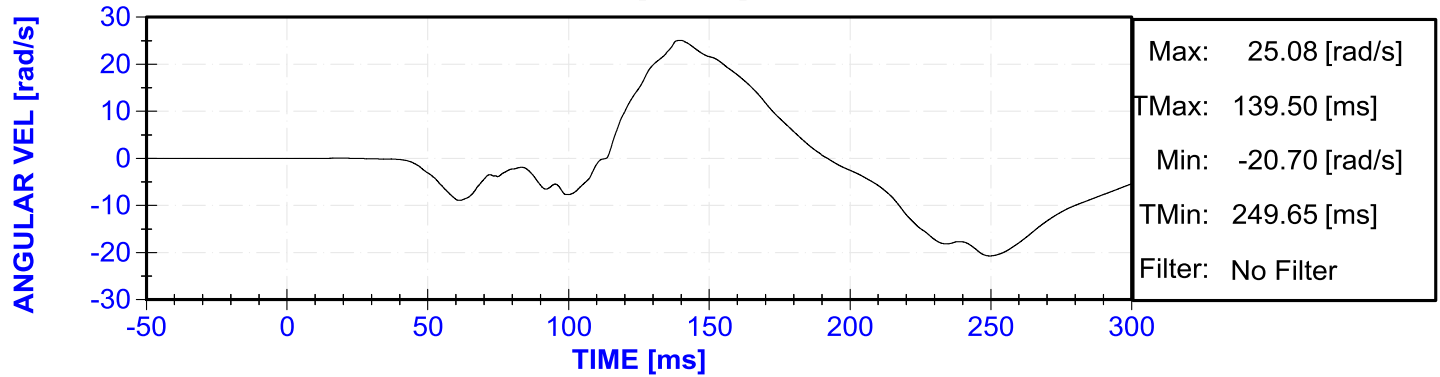




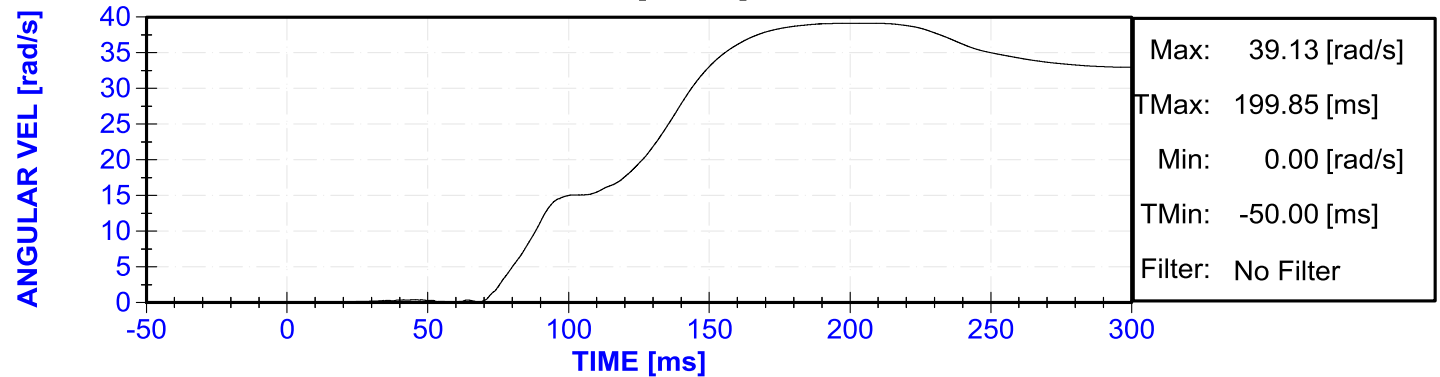
V2P4 HEAD ANGULAR ACCELERATION Z [SIMON]



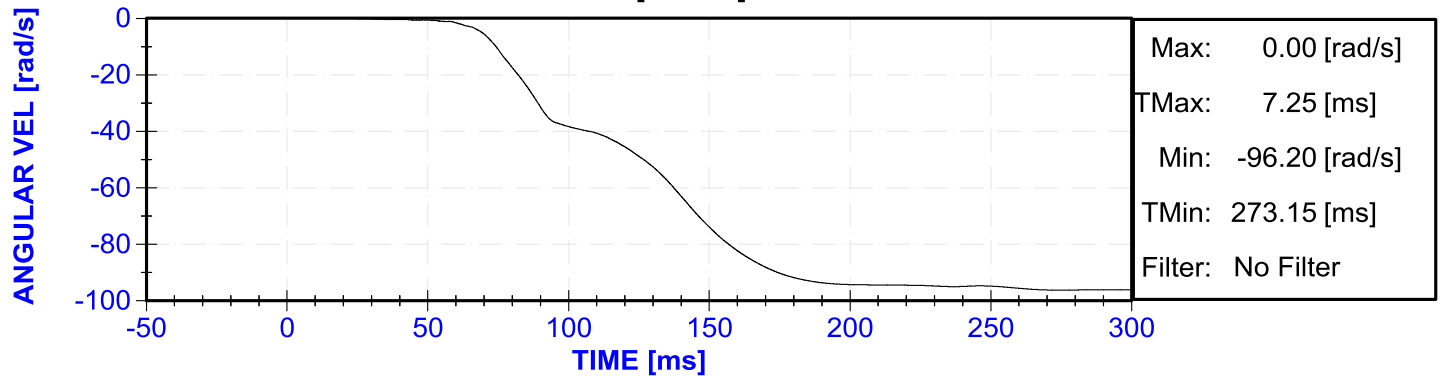
V2P4 HEAD ANGULAR VELOCITY X [SIMON]

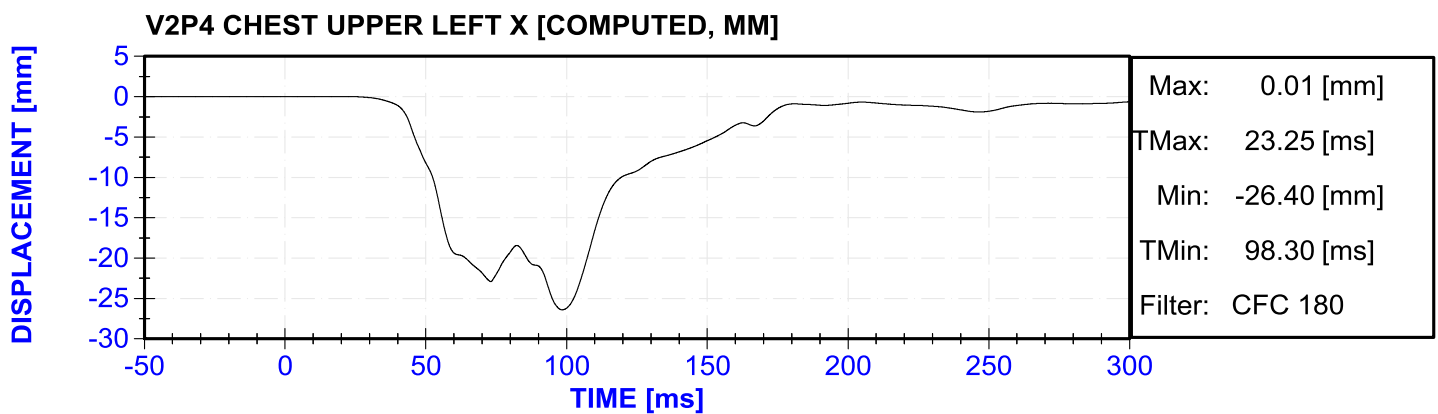
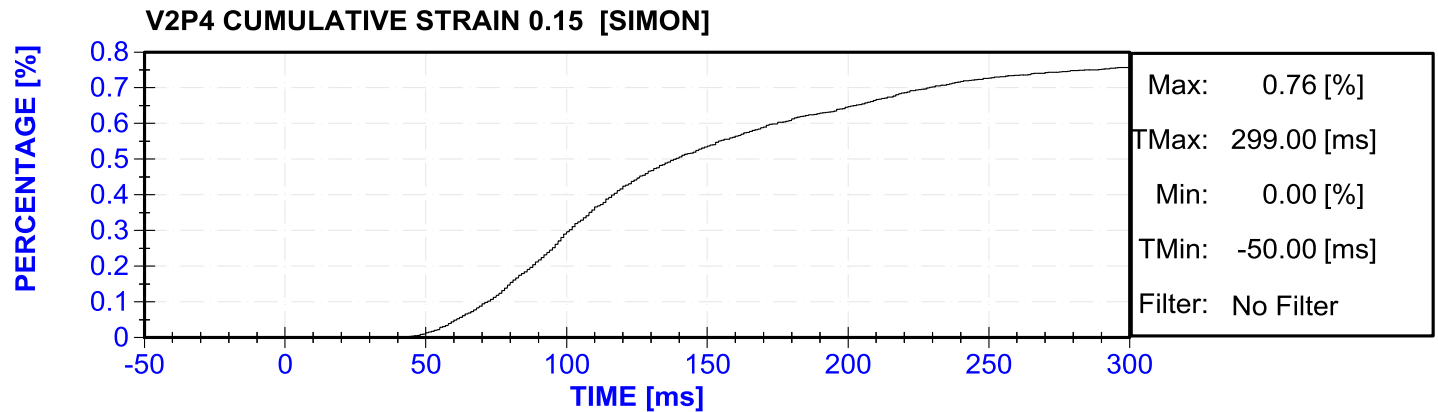
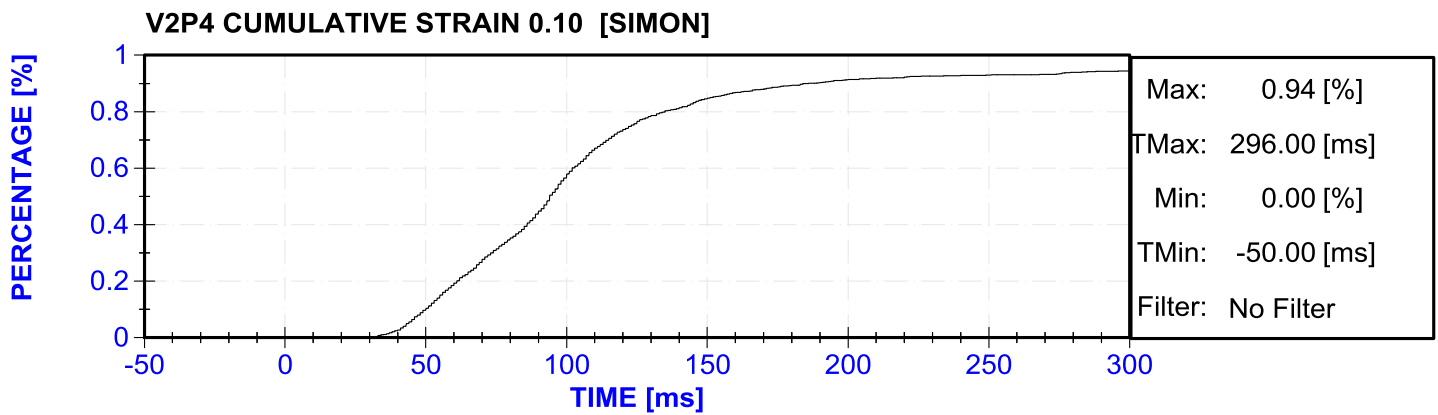
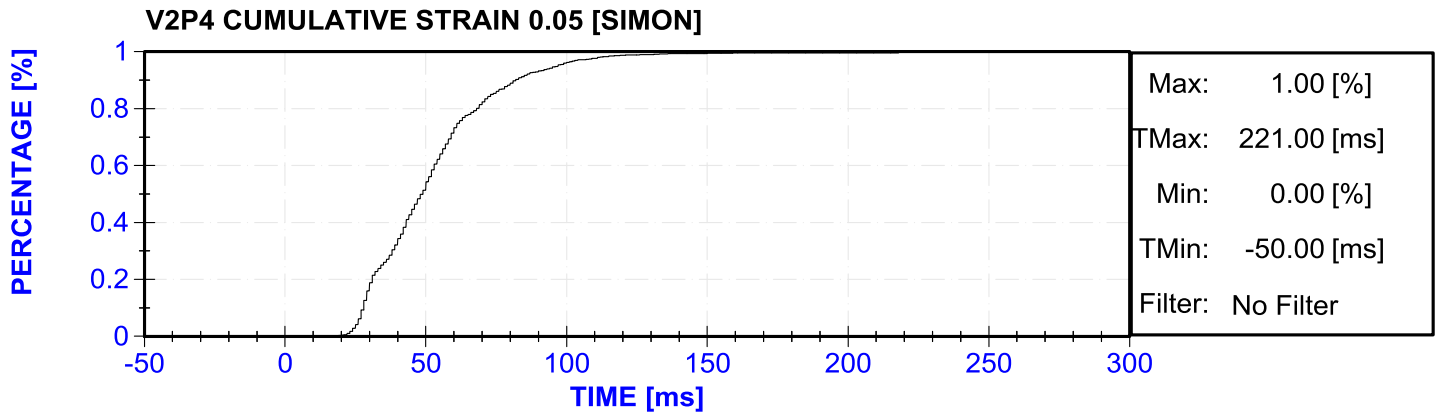


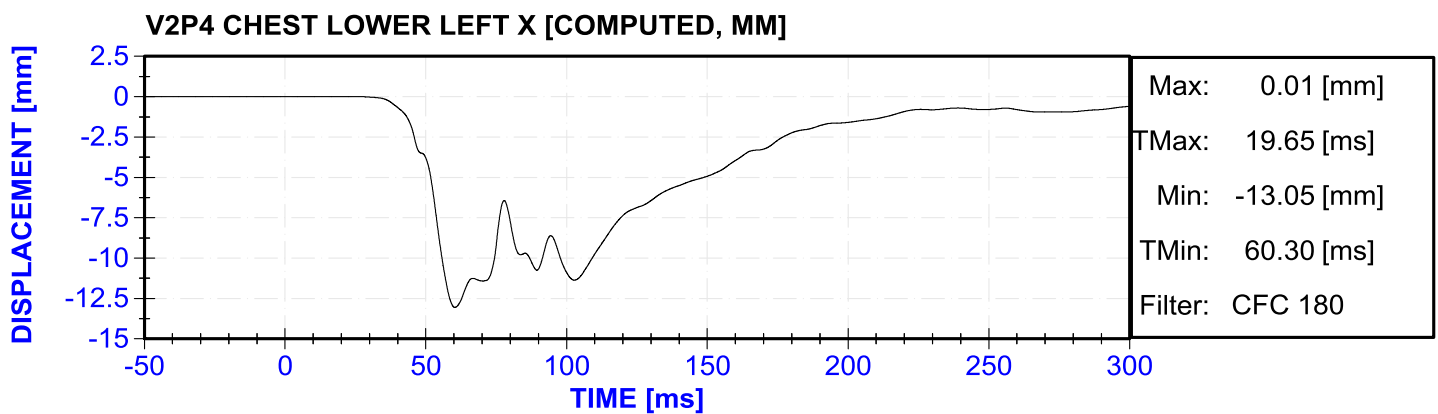
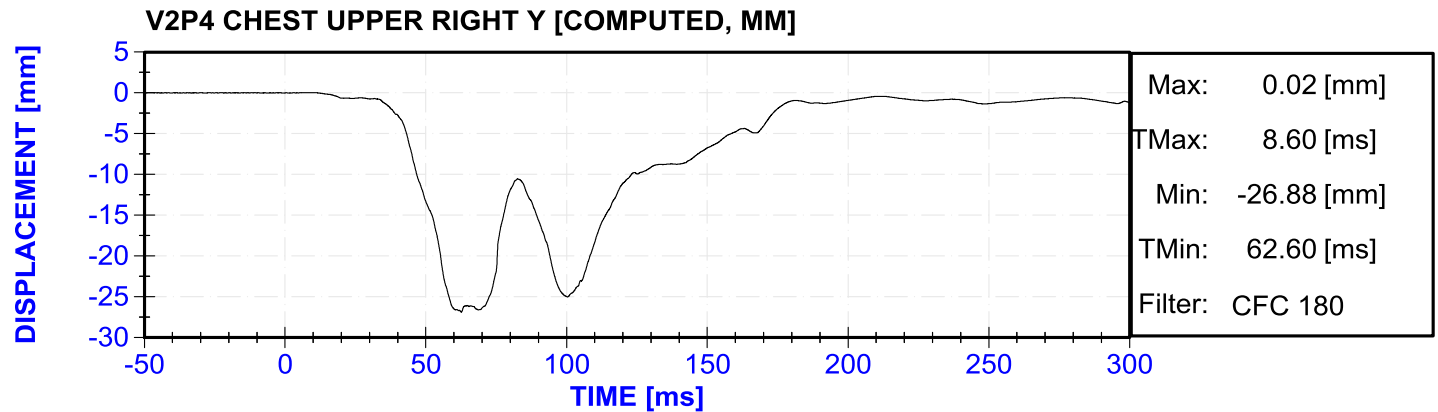
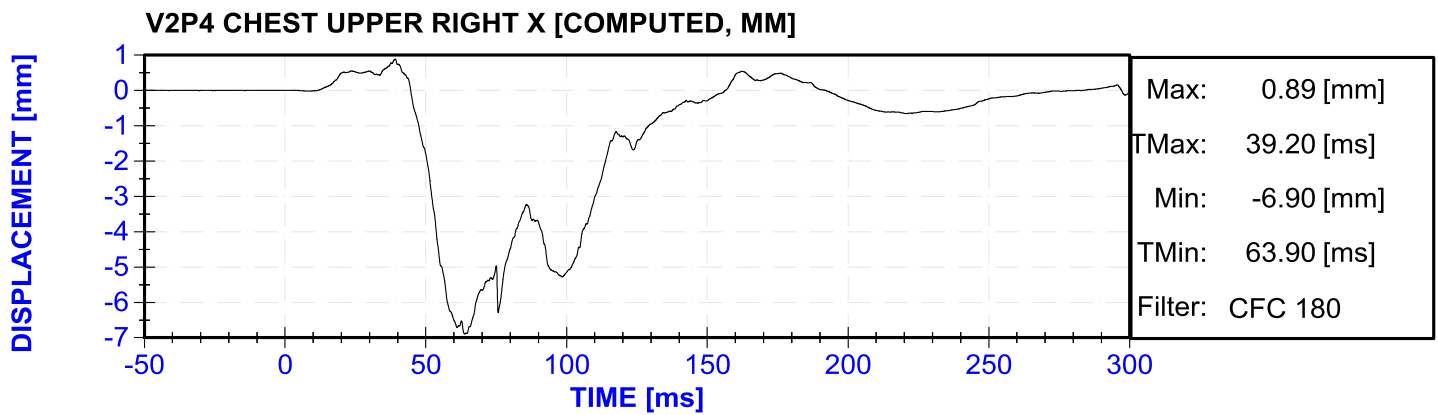
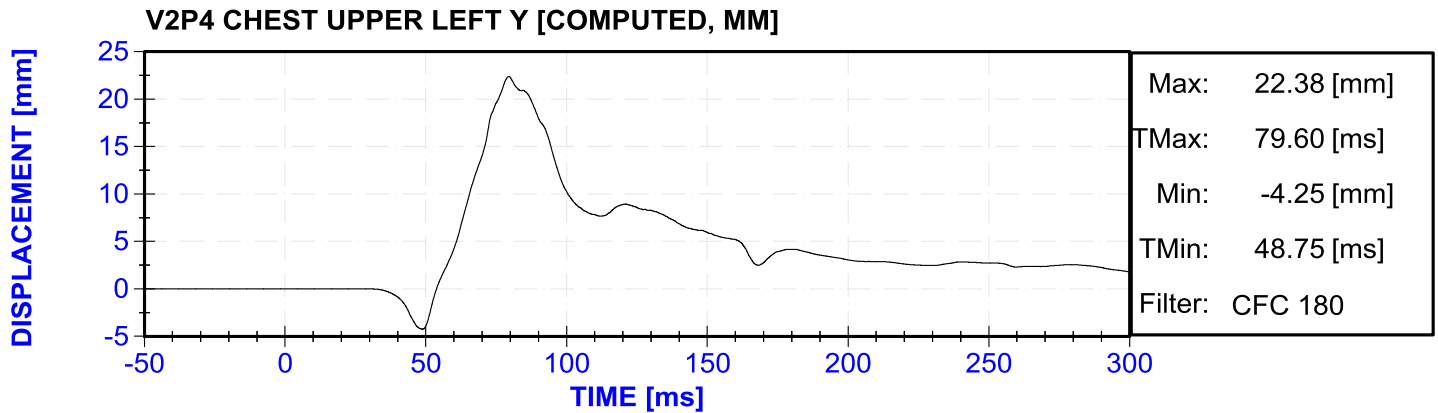
V2P4 HEAD ANGULAR VELOCITY Y [SIMON]

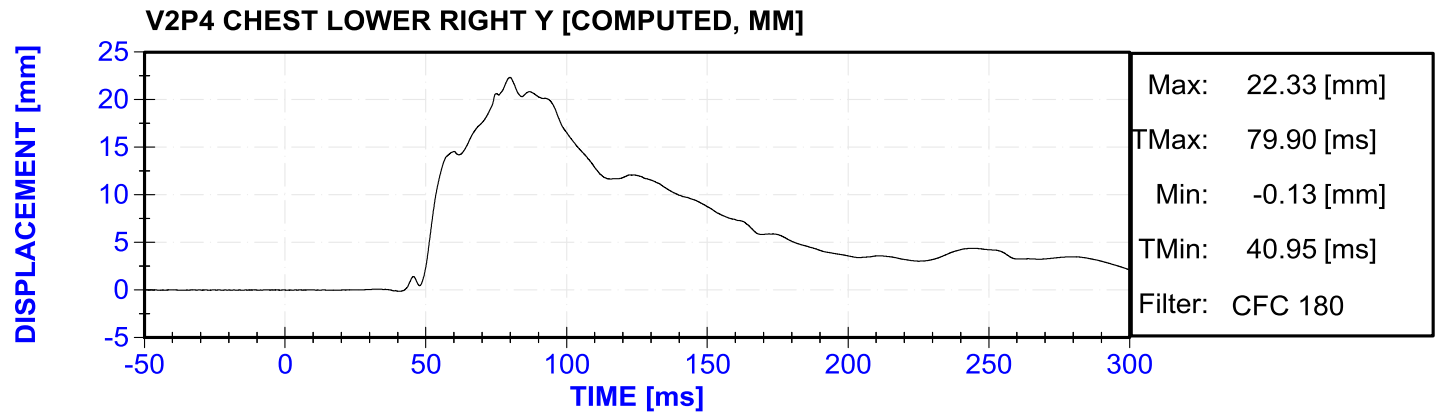
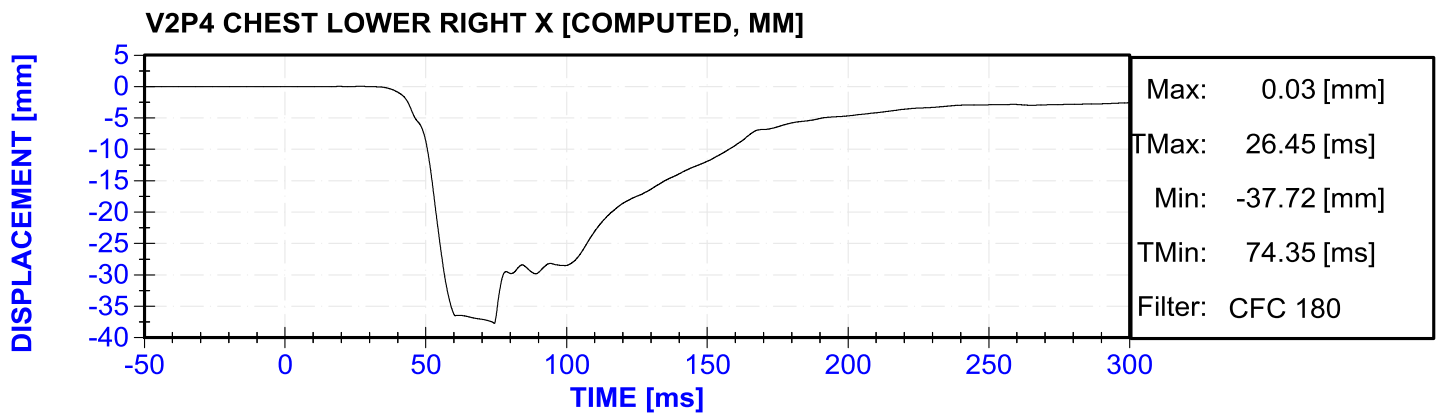
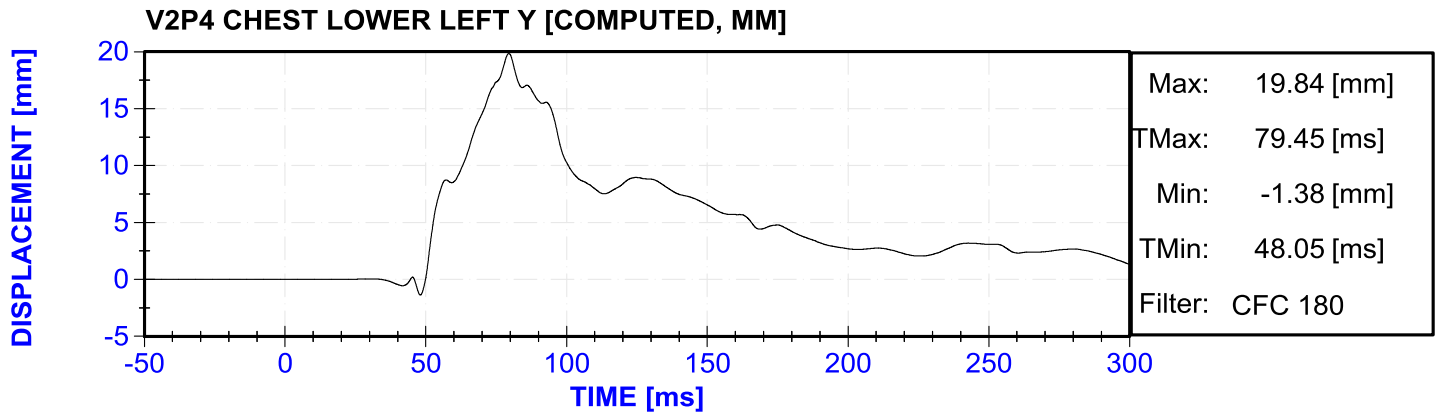


V2P4 HEAD ANGULAR VELOCITY Z [SIMON]









APPENDIX C

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

TABLE OF CONTENT		
No.		Page
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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	0007
Hybrid III	5 th Female	006

Table 2 – THOR6 Set File

LFTX	LFTY	LFTZ	RFTX	RFTY	RFTZ
Left Ankle X Rotation	Left Ankle Y Rotation	Left Ankle Z Rotation	Right Ankle X Rotation	Right Ankle X Rotation	Right Ankle X Rotation
3.98577	13.869	-34.481	0.30868	10.848	-58.84

Table 3 - THOR Dummy Initial SetUp Information

THOR – MK S/N: 0007									Sensitivit y (JARI)	Sensitivit y (GESAC)	Setup Angle (GESAC)
Sensor	Description/ Axis	MFG	Capacit y	Unit 1	Unit 2	Range	Direction	CF C	V/Unit -1	V/Unit-1	Degrees
NKCRP	Upper Right Base										
Thorax CRUX	Upper Right Mid										
Thorax CRUX	Upper Right Elbow										
Thorax CRUX	Upper Left Base										
Thorax CRUX	Upper Left Mid										
Thorax CRUX	Upper Left Elbow										
Thorax CRUX	Lower Right Base										
Thorax CRUX	Lower Right Mid										
Thorax CRUX	Lower Right Elbow										
Thorax CRUX	Lower Left Base										
Thorax CRUX	Lower Left Mid										
Thorax CRUX	Lower left Elbow										
Thorax CRUX	Right Abdomen X										
DGSP	Right Abdomen Y										
DGSP	Right Abdomen Z										
DGSP	Left Abdomen X										
DGSP	Left Abdomen Y										
DGSP	Left Abdomen Z										
DGSP	Upper Right Base										

Table 4: Inspection Sheet
THOR Inspection Checklist

Date: August 12, 2011
NHTSA Representative: James Saunders
Witness(es):
Inspection type (circle one): PRE POST
Dummy S/N: 007
Dummy Description: THOR
Date of last Certification or Inspection: 8/12/2011
<u>Tests conducted since last full certification or inspection:</u> RB0527 –Smart For Two – Test #14
<u>Known errors in data channels (no data, clipping, unexpected drops):</u>
<u>Physical evidence of damage:</u>
<u>Anecdotal evidence of damage:</u>
<u>Equipment delivered to Borrower:</u> Swapped out broken left tibia component and replaced with one from the legs delivered 9/13/11 (LX105/LX104)

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 Small gash on the left side of the forehead
☒ Y / ☐ N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / ☒ N	Head securely mounted to OC joint Slight wobble at OC joint, otherwise secure
OTHER	OC joint not stiff, no wobble, but securely mounted
NECK	
☒ Y / ☐ N	Neck cables slide freely through holes in neck plates
☒ Y / ☐ N	Neck cables show no sign of fraying, broken strands, or kinking
Y / ☒ N	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): Debonding between pucks 4-5 posterior (rear of neck)
Y / ☒ N	No evidence of debonding or permanent compression in neck soft stop assemblies Anterior soft stop loose
☒ Y / ☐ N	Neck securely attached to upper neck load cell
☒ Y / ☐ N	Neck securely attached to lower neck load cell
☒ Y / ☐ N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	

SPINE	
☒ Y / ☐ N	No evidence of debonding between thoracic spine flex joint and metal plates

Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
☒ Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
SHOULDER	
Y ☒ N	Urethane shoulder pads show no evidence of contact Scuffing on both sides
☒ Y / N	Clavicles securely attached to sternum and shoulder
Y ☒ N	No evidence of debonding, tearing, or permanent compression of posterior soft stops Left Shoulder soft stop slightly debonding
OTHER	
THORAX	
Y ☒ N	No evidence of contact at top, bottom, or interior faces of rib damping material Interior face of left / right rib #4 show contact
☒ Y / N	No evidence of debonding between rib damping material and ribs
☒ Y / N	anterior arms securely attached to anterior ribs IR-Trace
☒ Y / N	posterior arms securely attached to double gimbals, spine IR-Trace
☒ Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
☒ Y / N	Ribs securely attached to posterior spine
Y ☒ N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners) - Right side rib #5 - Left side rib #7
OTHER	

ABDOMEN	
☒ Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper
☒ Y / N	Upper abdomen insert securely attached to spine

Y / N	Upper abdomen insert shows no evidence of permanent set
Y / ☒ N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper Broken stitches on the top right side
☒ Y / N	Lower abdomen insert securely attached to spine
☒ Y / N	Lower abdomen insert shows no evidence of permanent set
OTHER	
PELVIS	
☒ Y / N	Pelvis flesh fits securely over pelvis bones
☒ Y / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	
FEMUR	
☒ Y / N	Acetabular load cells firmly attached
☒ Y / N	Femur load cells firmly attached
☒ Y / N	No evidence of deformation of knee slider bump stop
Y / ☒ N	No cuts, tears, or scuffing of knee flesh Left and Right knee skin is cut/ torn, loose
OTHER	Left upper femur flexes laterally; broken?

LOWER EXTREMITY (LX)	
☒ Y / N	Rotational potentiometers in ankle securely attached
☒ Y / N	Achilles tendon provides resistance to dorsiflexion Left tendon cable bent, maybe stretched. Still provides tension
☒ Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops

OTHER	Left upper femur (rubber portion) wobbles / loose, broken? Right side tibia twists, and left foot cover cracked at the heel
JACKET	
☒ Y / N	Rib stiffeners show no sign of permanent deformation
Y / ☒ N	No evidence of tears or holes in jacket fabric, velcro, or zippers • Tearing at the seams on the front interior neckline
OTHER	

Table 5: Inspection Sheet
THOR Inspection Checklist

Date: August 23, 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: 8/23/2011	
<u>Tests conducted since last full certification or inspection:</u>	
RB5136 - Toyota Yaris – Test #15	
<u>Known errors in data channels (no data, clipping, unexpected drops):</u>	
<u>Physical evidence of damage:</u>	
<u>Anecdotal evidence of damage:</u>	
<u>Equipment delivered to Borrower:</u>	

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	OC joint not stiff, no wobble, but securely mounted
NECK	
☒ Y / N	Neck cables slide freely through holes in neck plates
☒ Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / ☒ N	No evidence of debonding between neck pucks and plates If N – indicate which interface (where plate/puck 1 attach to upper neck load cell): • Debonding between pucks 4-5 posterior
Y / ☒ N	No evidence of debonding or permanent compression in neck soft stop assemblies • Anterior soft stop loose
☒ Y / N	Neck securely attached to upper neck load cell
☒ Y / N	Neck securely attached to lower neck load cell
☒ Y / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	

SPINE	
☒ Y / N	No evidence of debonding between thoracic spine flex joint and metal plates



Y / N	No evidence of debonding between lumbar spine flex joint and metal plates
☒ Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
SHOULDER	
Y ☒ N	Urethane shoulder pads show no evidence of contact Abrasions on both shoulder pads
☒ Y / N	Clavicles securely attached to sternum and shoulder
Y ☒ N	No evidence of debonding, tearing, or permanent compression of posterior soft stops Left Shoulder soft stop slightly debonding
OTHER	
THORAX	
Y ☒ N	No evidence of contact at top, bottom, or interior faces of rib damping material Contact on interior of rib #4, both sides
☒ Y / N	No evidence of debonding between rib damping material and ribs
☒ Y / N	anterior arms securely attached to anterior ribs IR-Trace
☒ Y / N	posterior arms securely attached to double gimbals, spine IR-Trace
☒ 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
☒ Y / N	Upper abdomen insert securely attached to spine
☒ Y / N	Upper abdomen insert shows no evidence of permanent set

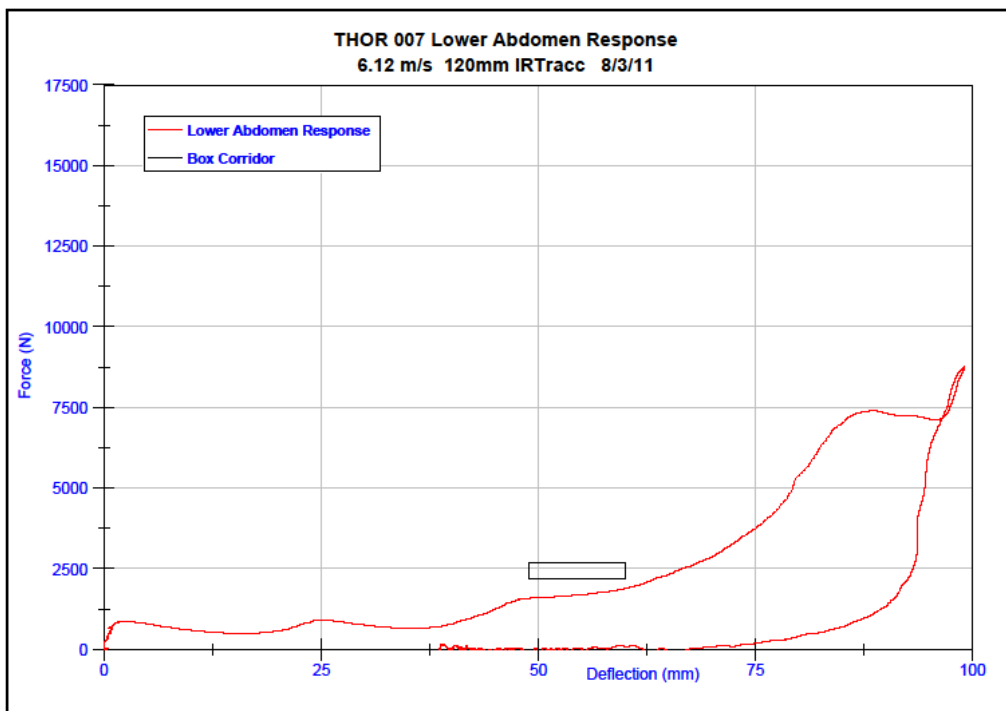
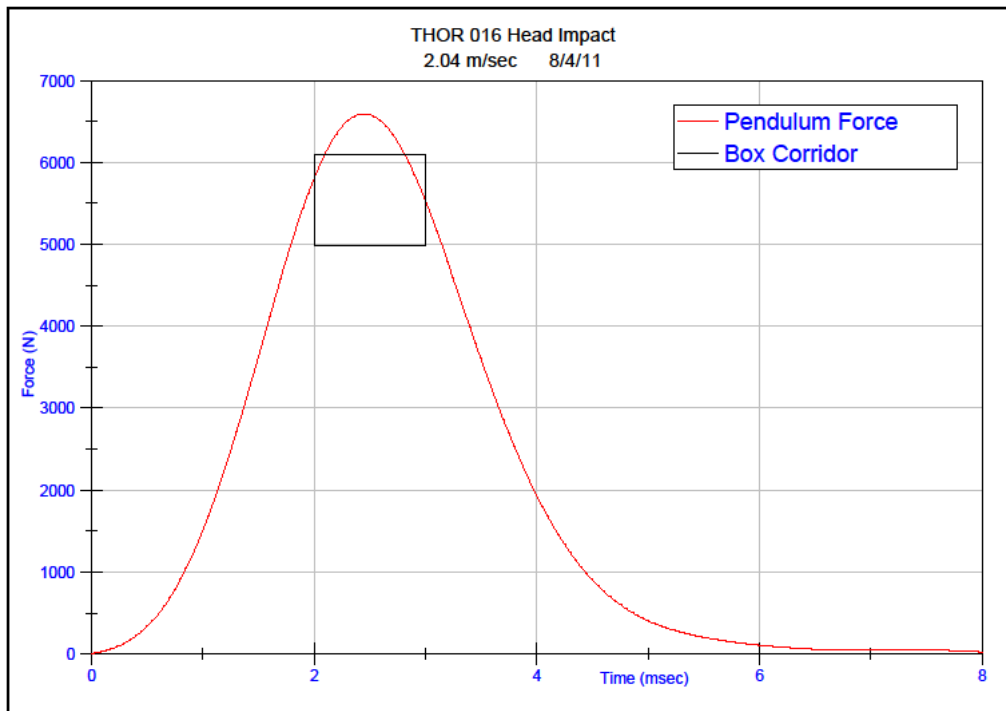


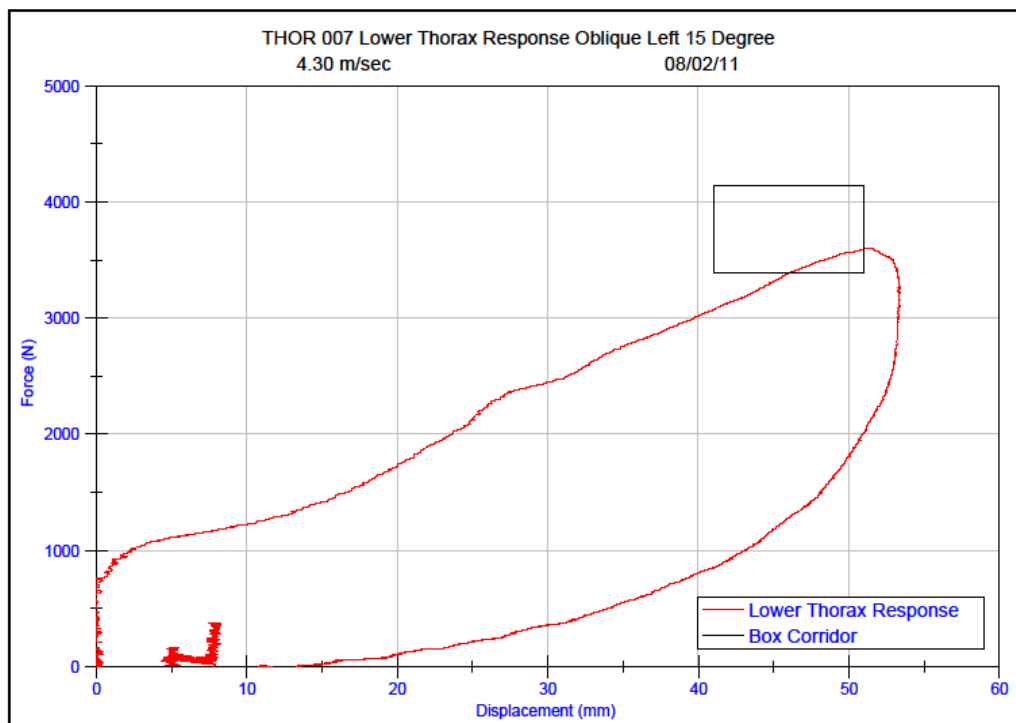
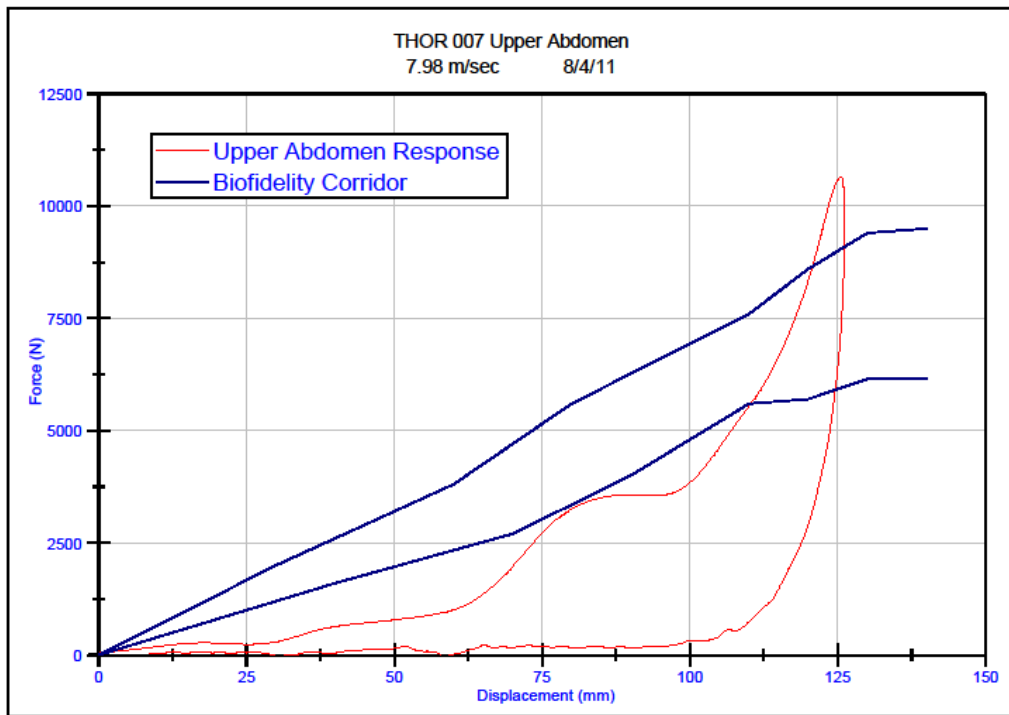
Y / N	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper Broken stitches on the top right side
☒ Y / N	Lower abdomen insert securely attached to spine
☒ Y / N	Lower abdomen insert shows no evidence of permanent set
OTHER	
PELVIS	
☒ Y / N	Pelvis flesh fits securely over pelvis bones
☒ Y / N	H-point tool fits securely into hole on both sides of pelvis
OTHER	
FEMUR	
☒ Y / N	Acetabular load cells firmly attached
☒ Y / N	Femur load cells firmly attached
☒ Y / N	No evidence of deformation of knee slider bump stop
Y / ☒ N	No cuts, tears, or scuffing of knee flesh Right knee flesh loose, cuts and scraps
OTHER	

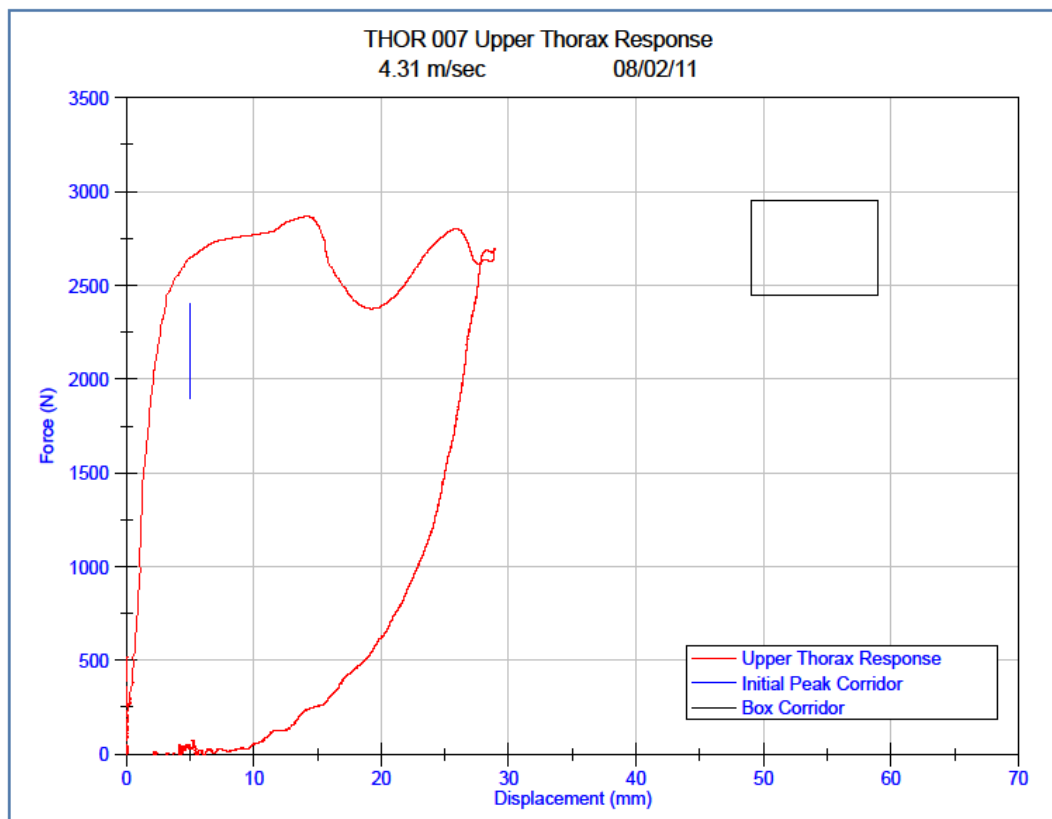
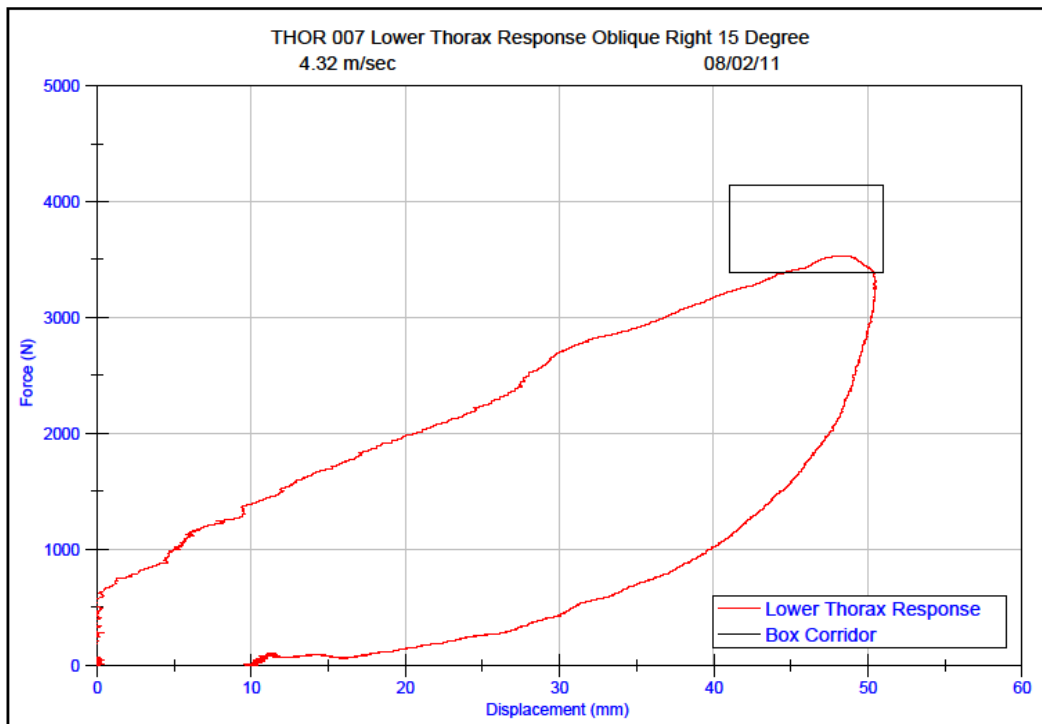
LOWER EXTREMITY (LX)	
☒ Y / N	Rotational potentiometers in ankle securely attached
☒ Y / N	Achilles tendon provides resistance to dorsiflexion
☒ Y / N	No evidence of debonding, tearing, or permanent compression of ankle soft stops
OTHER	

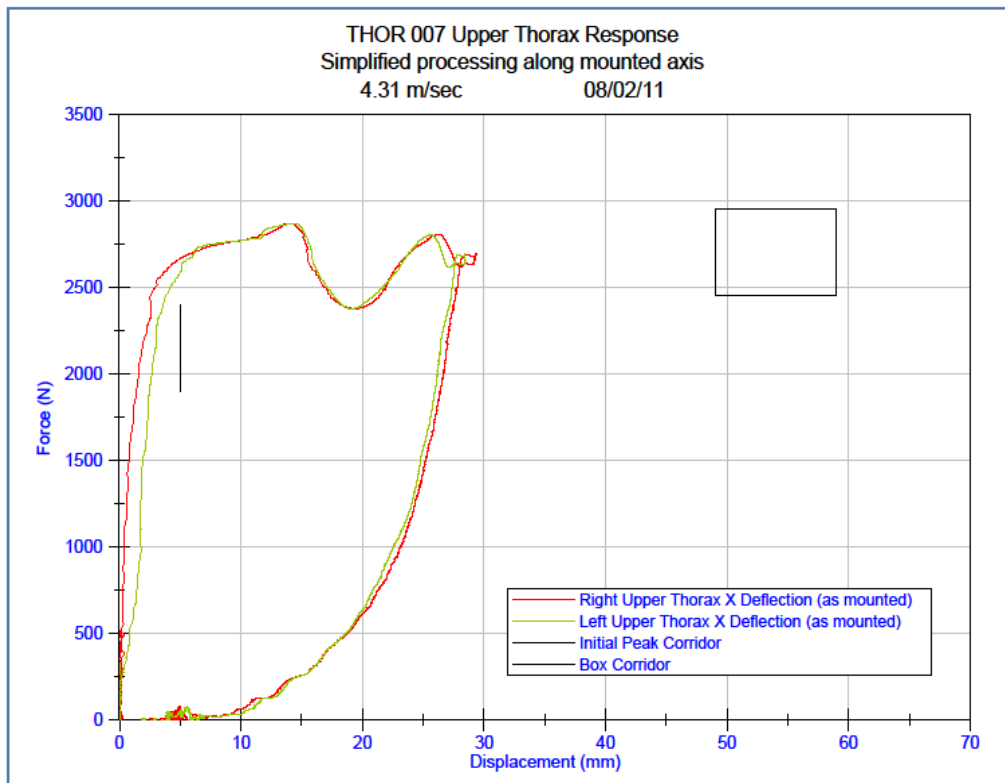
	Using intermediate tibia "bone" from LX-104
JACKET	
☒ Y / N	Rib stiffeners show no sign of permanent deformation
☒ Y / N	No evidence of tears or holes in jacket fabric, velcro, or zippers
OTHER	Rib stiffeners bent; straightened and re-installed

Dummy Calibration Plots

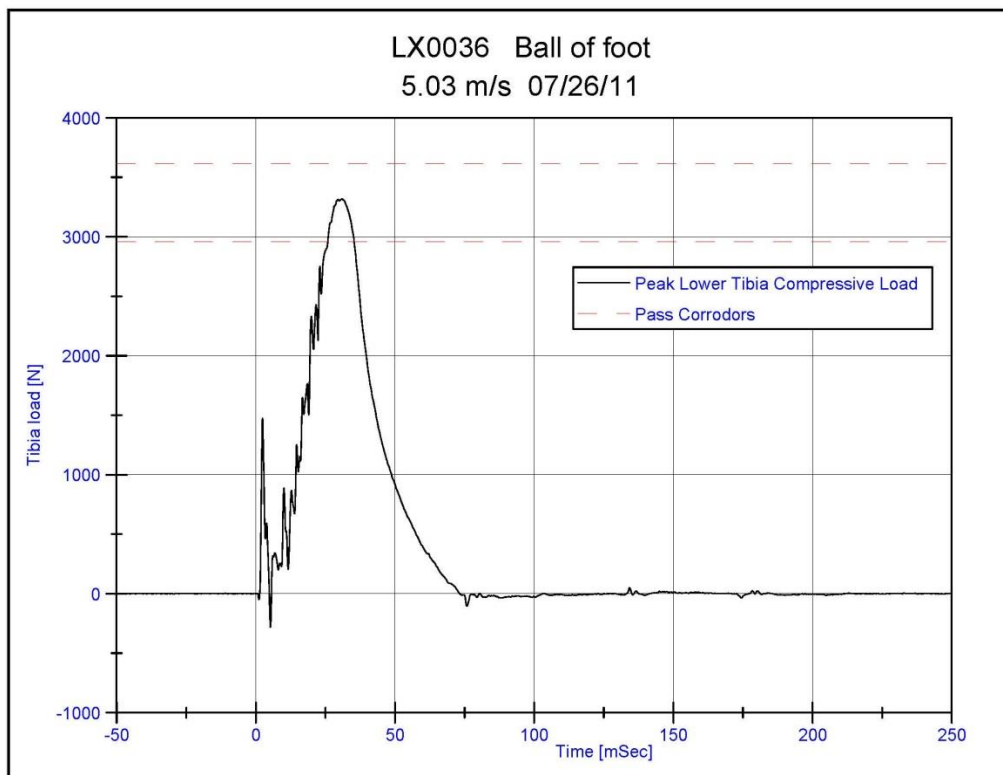


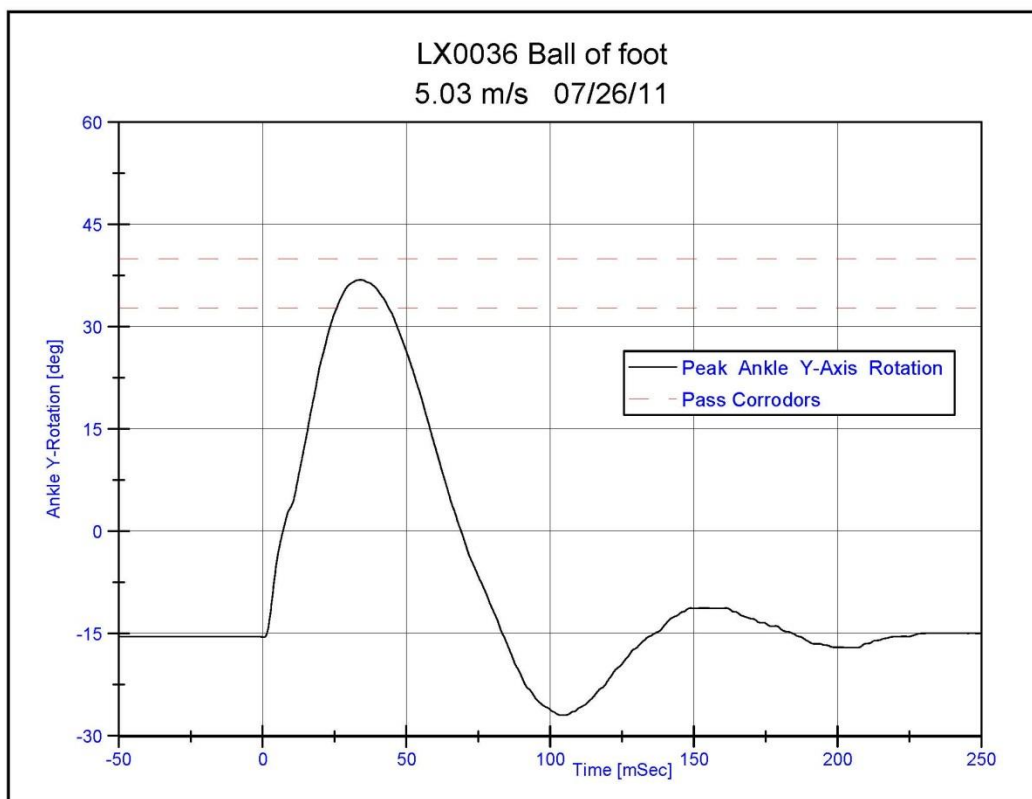
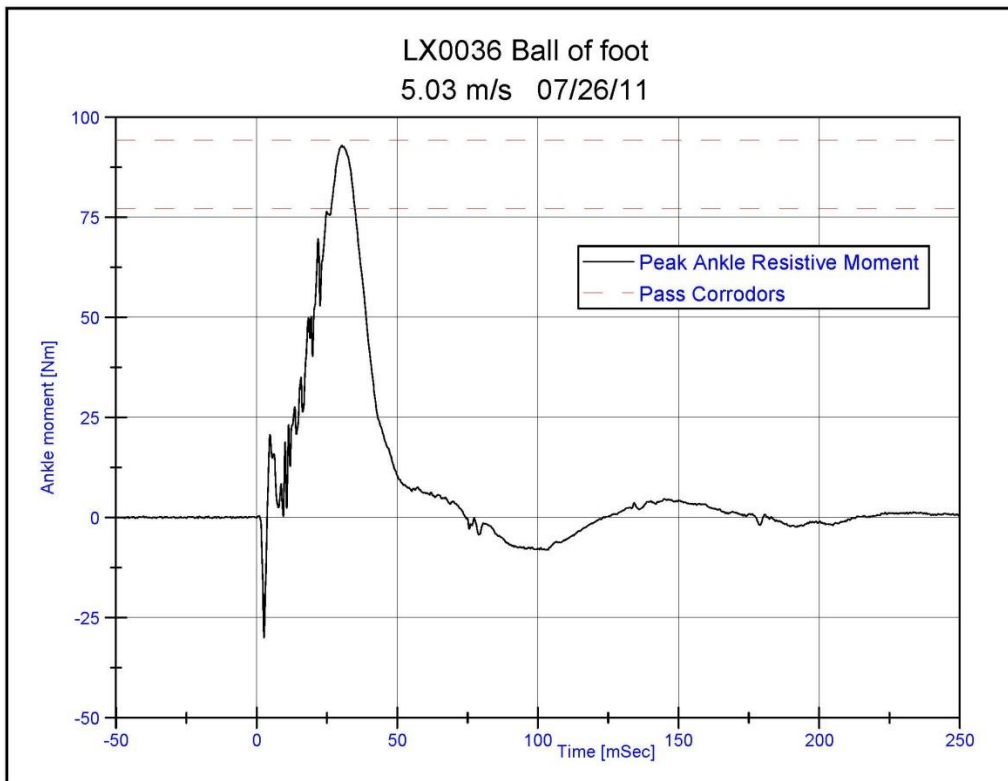


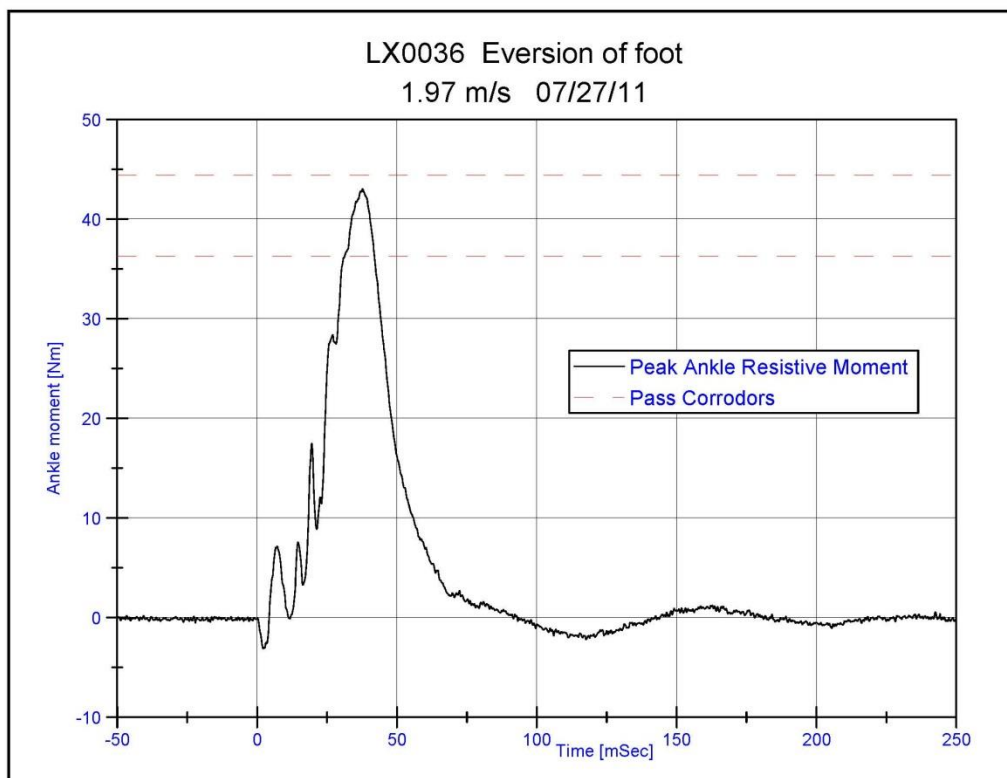
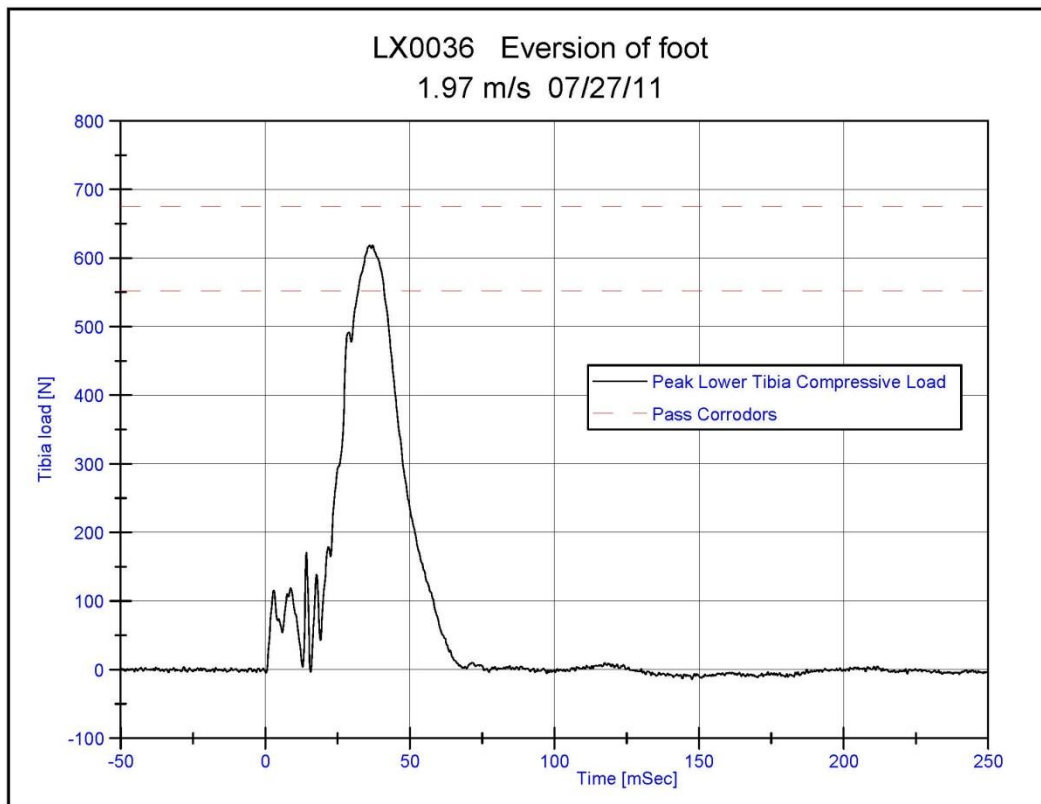


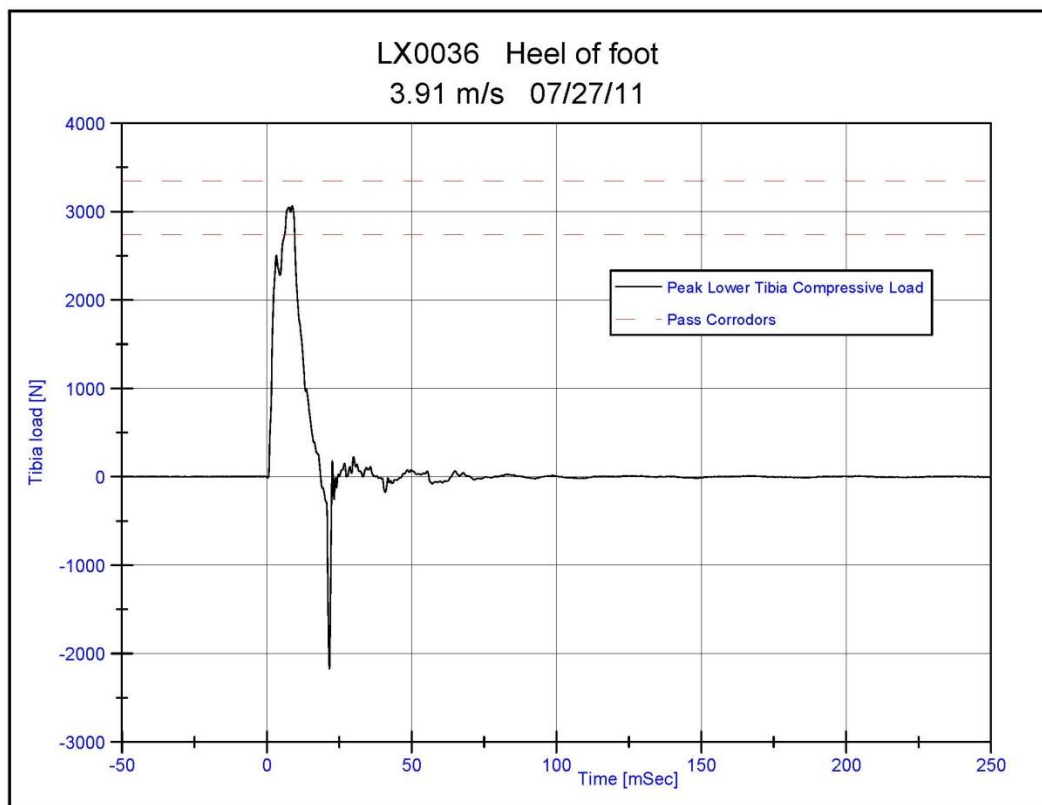
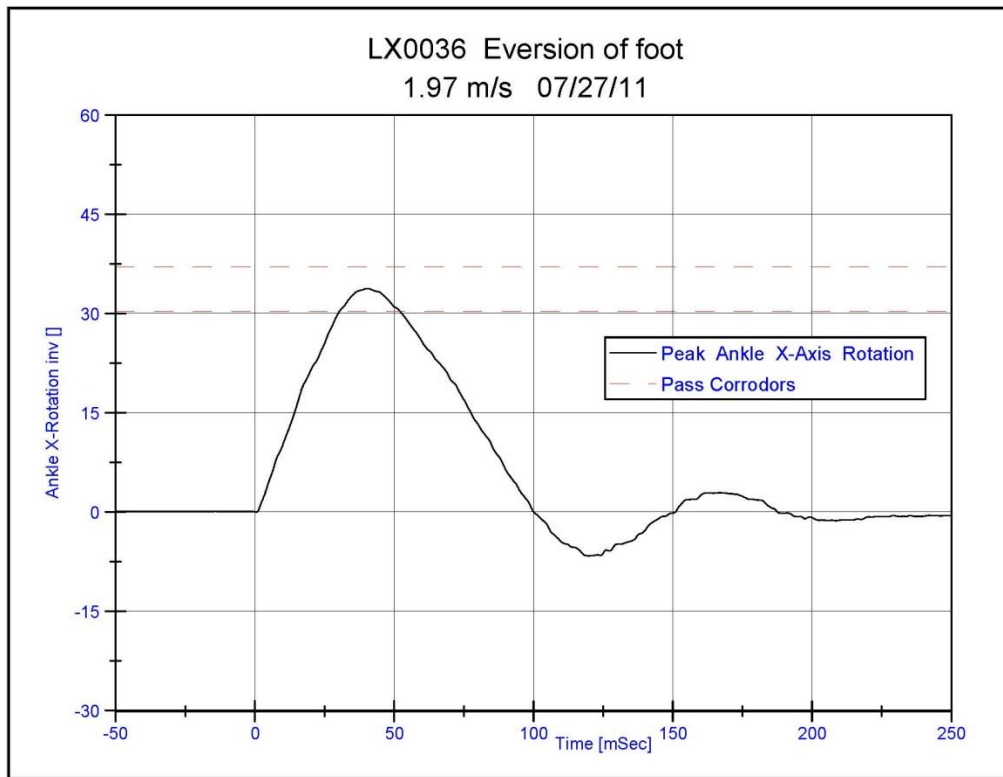


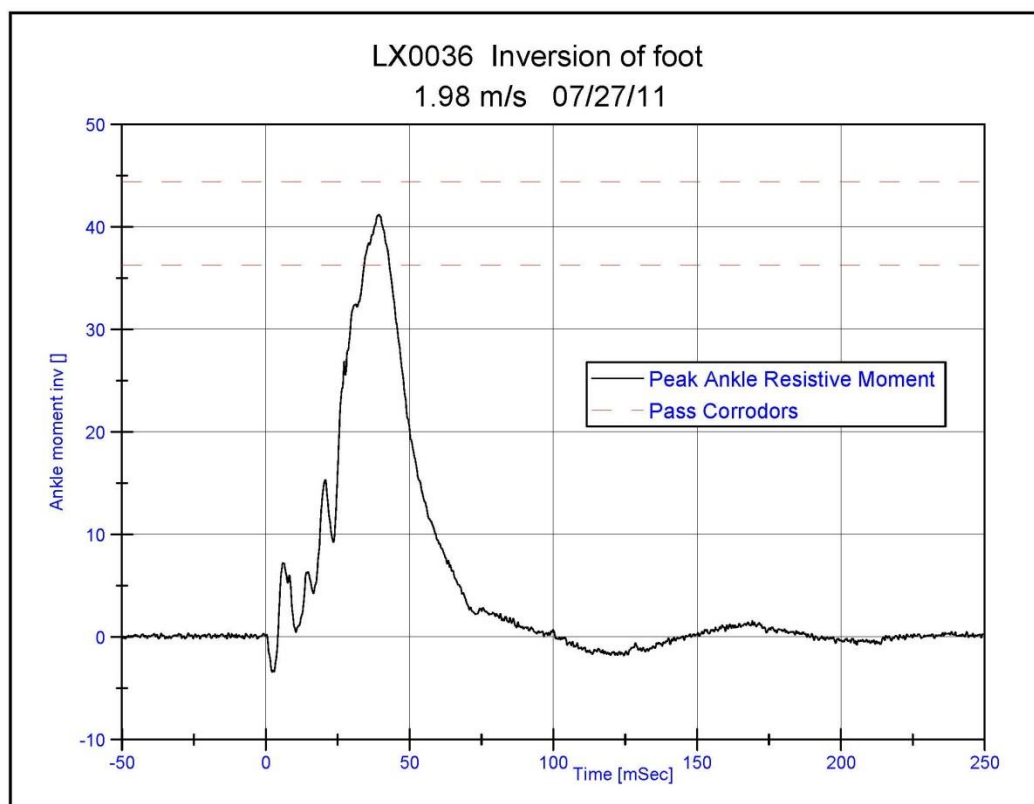
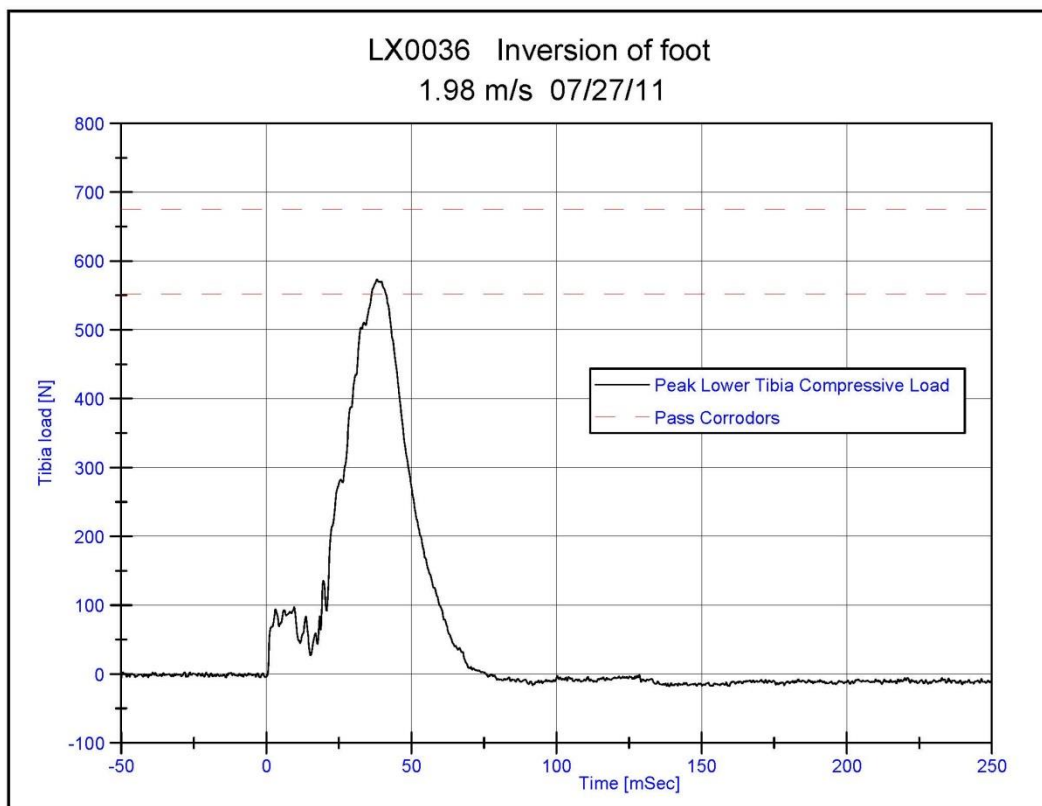
LEG S/N: LX036 / LX037

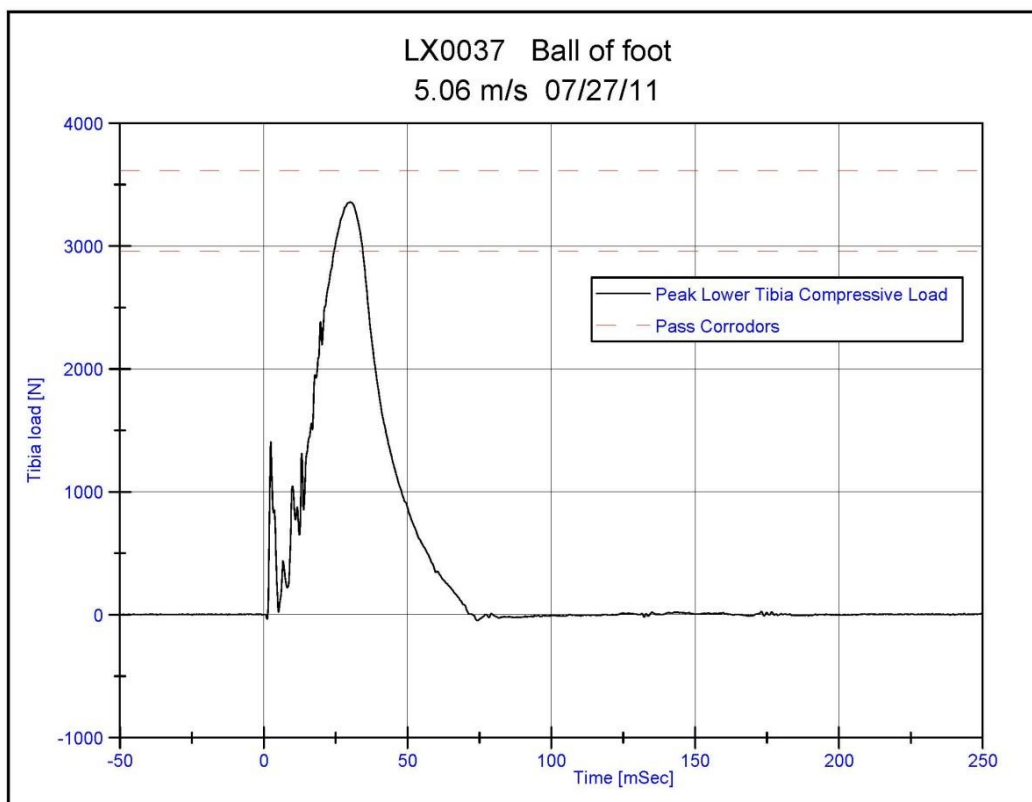
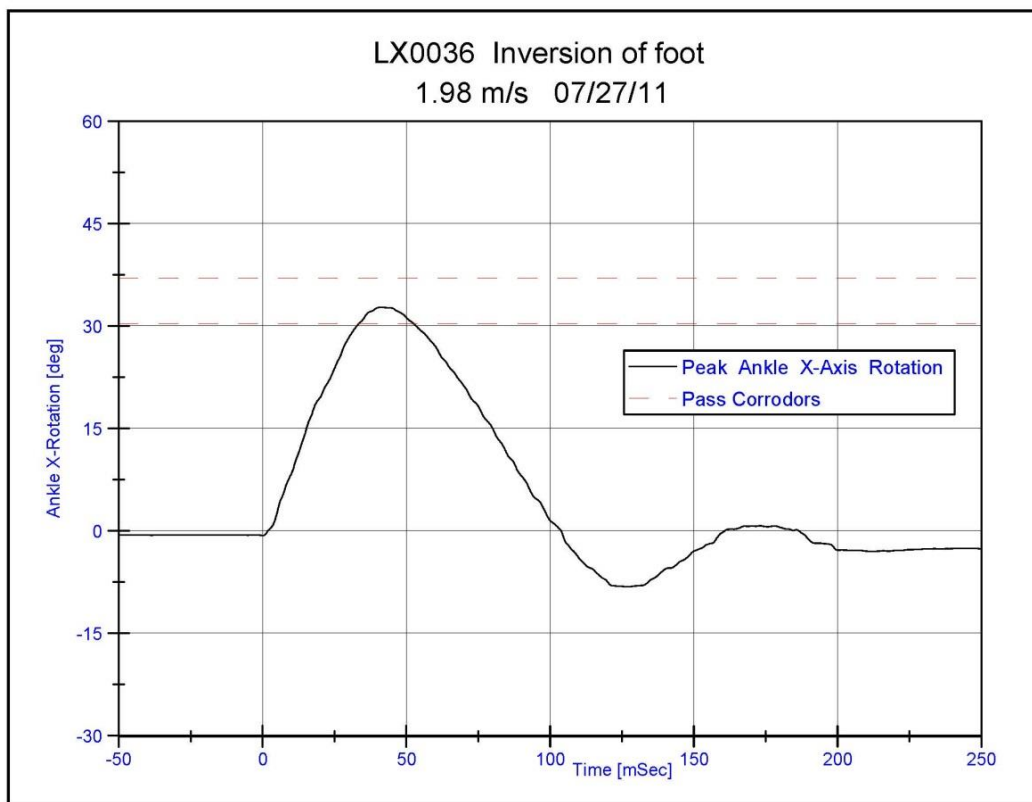


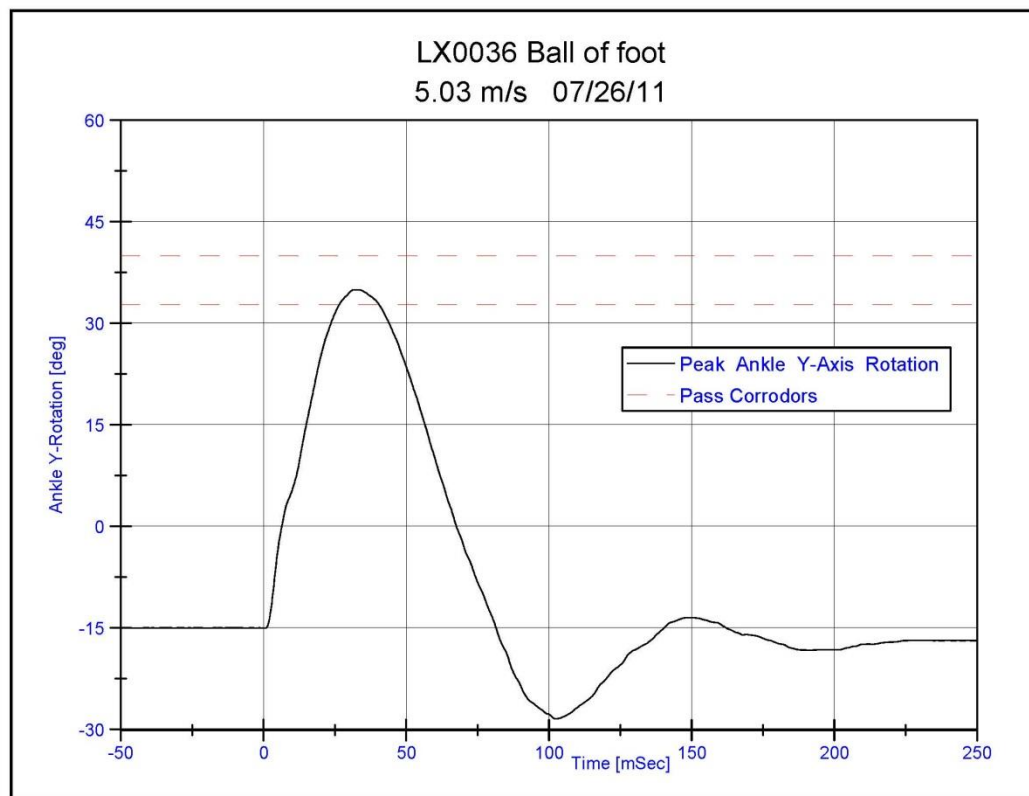
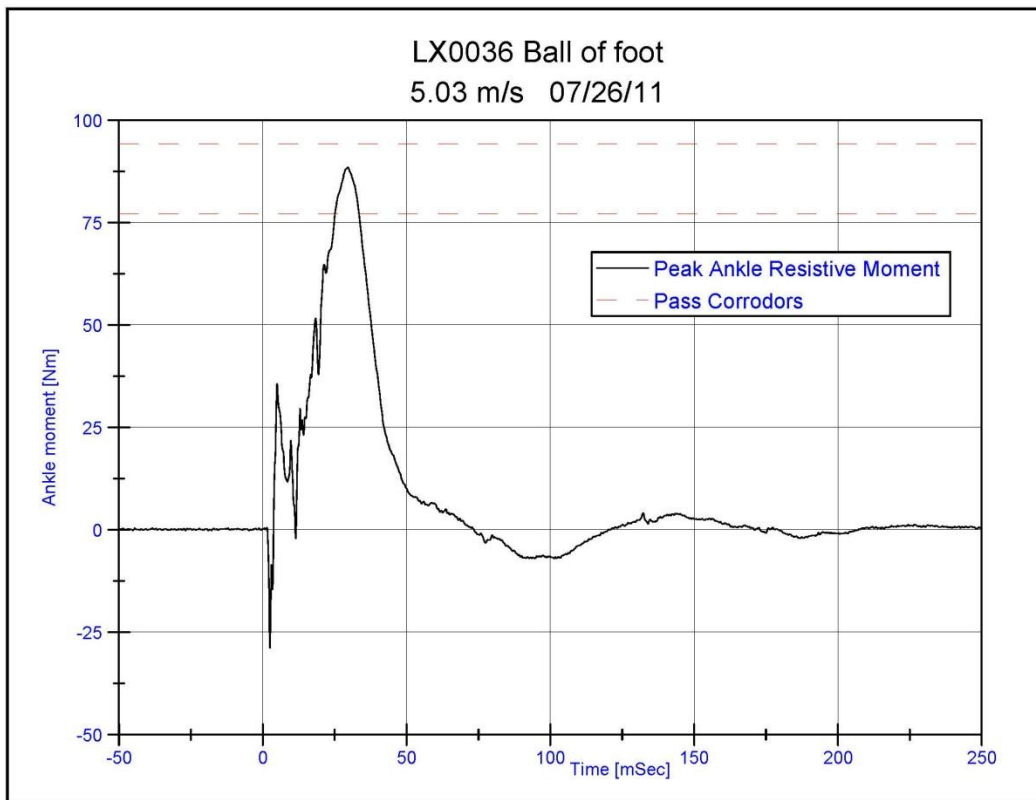


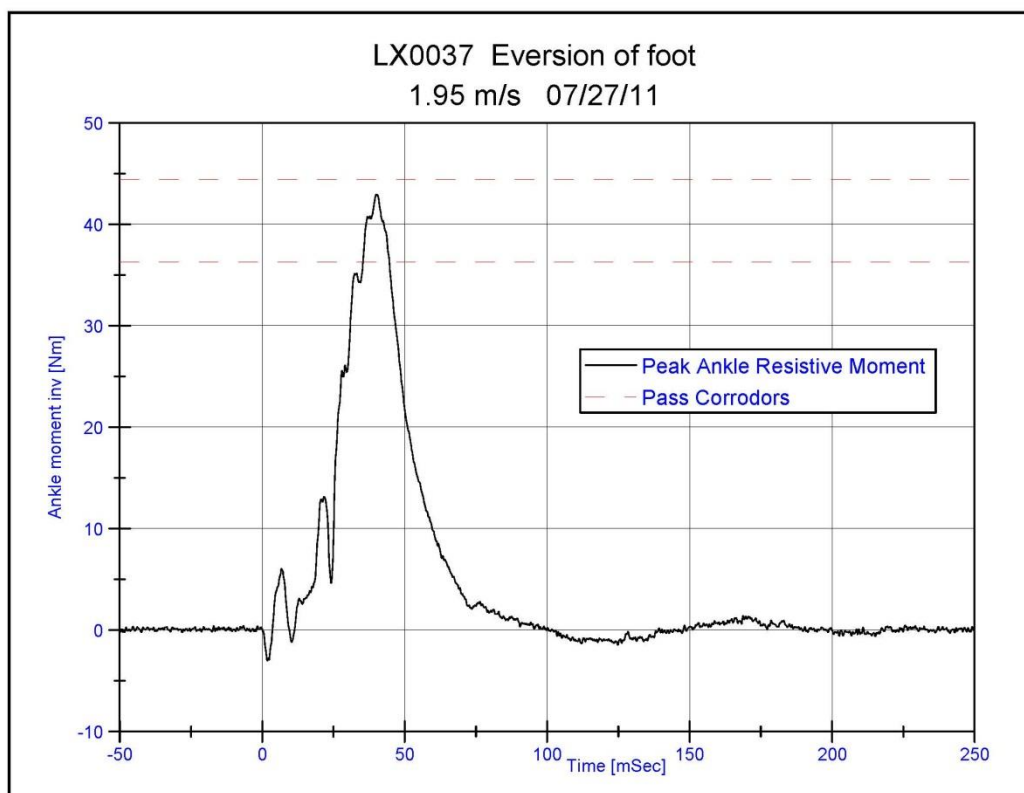
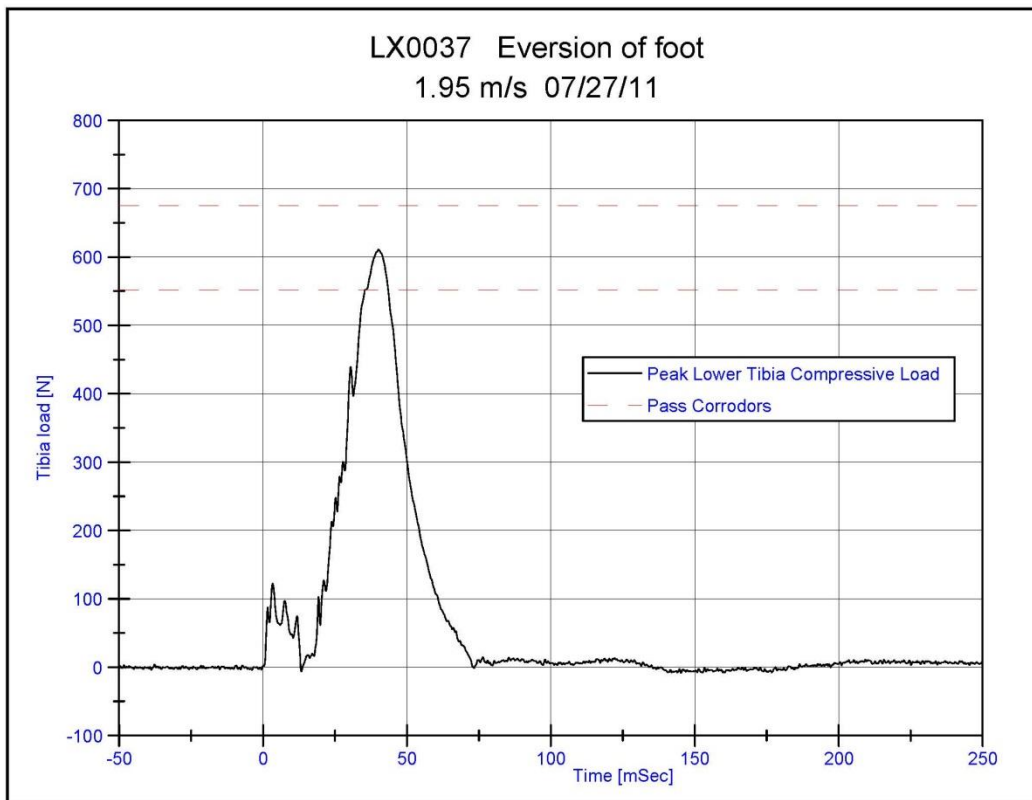


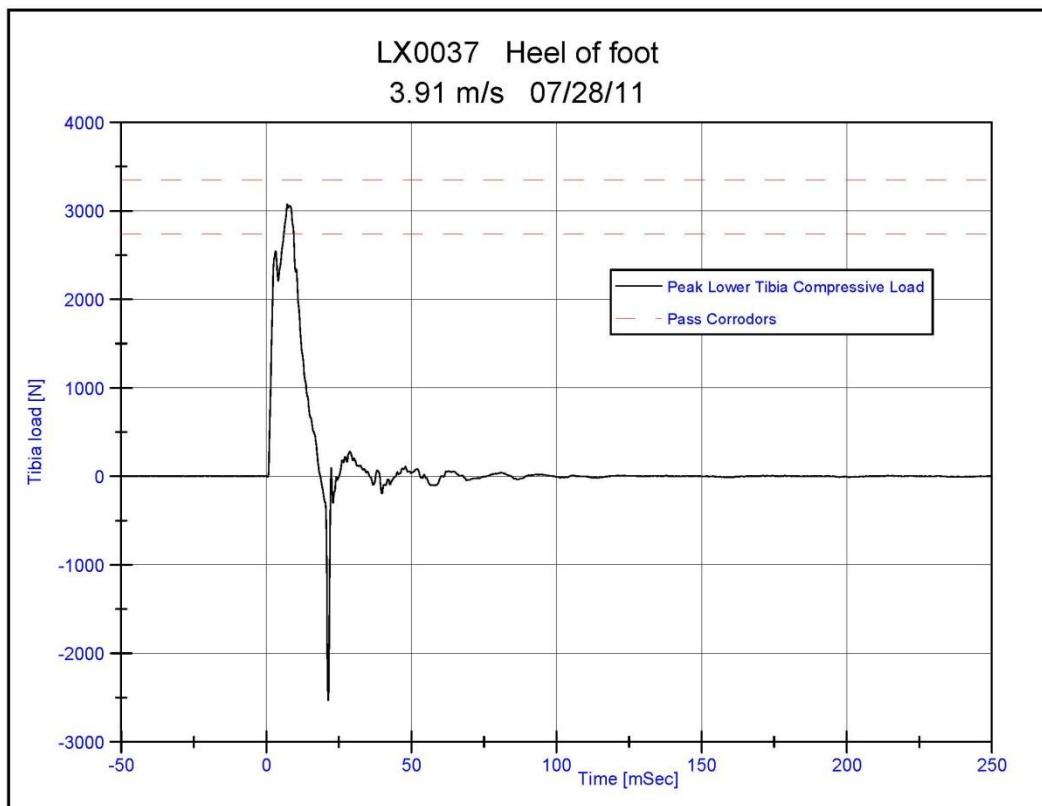
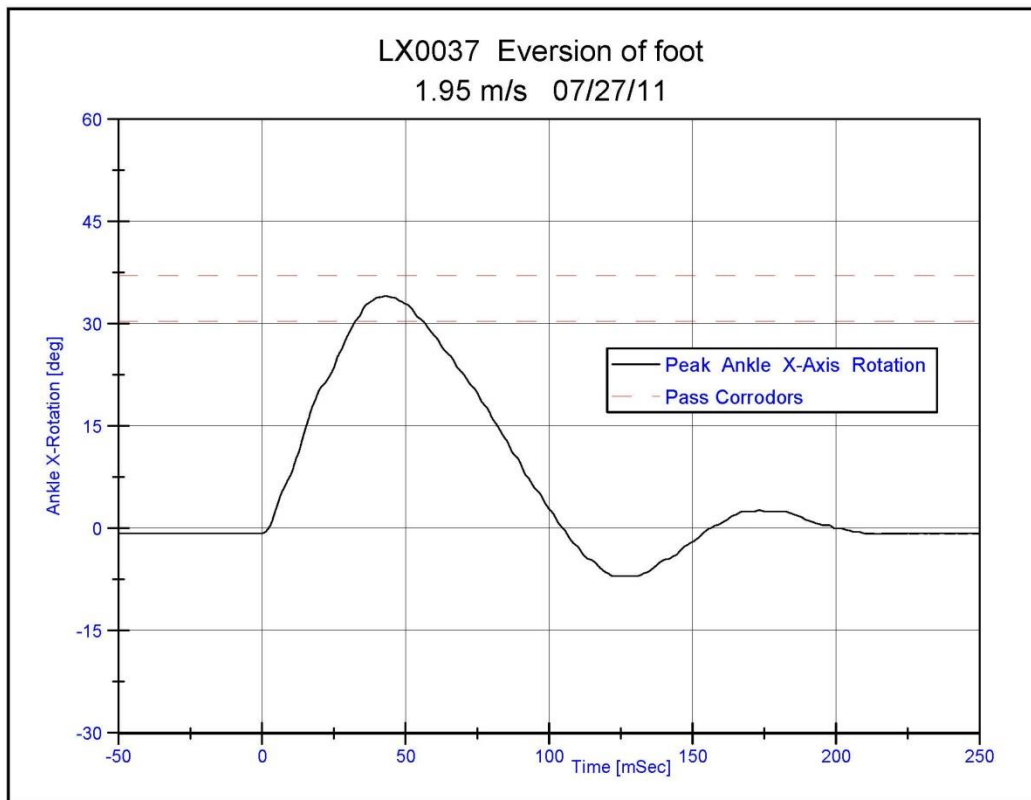


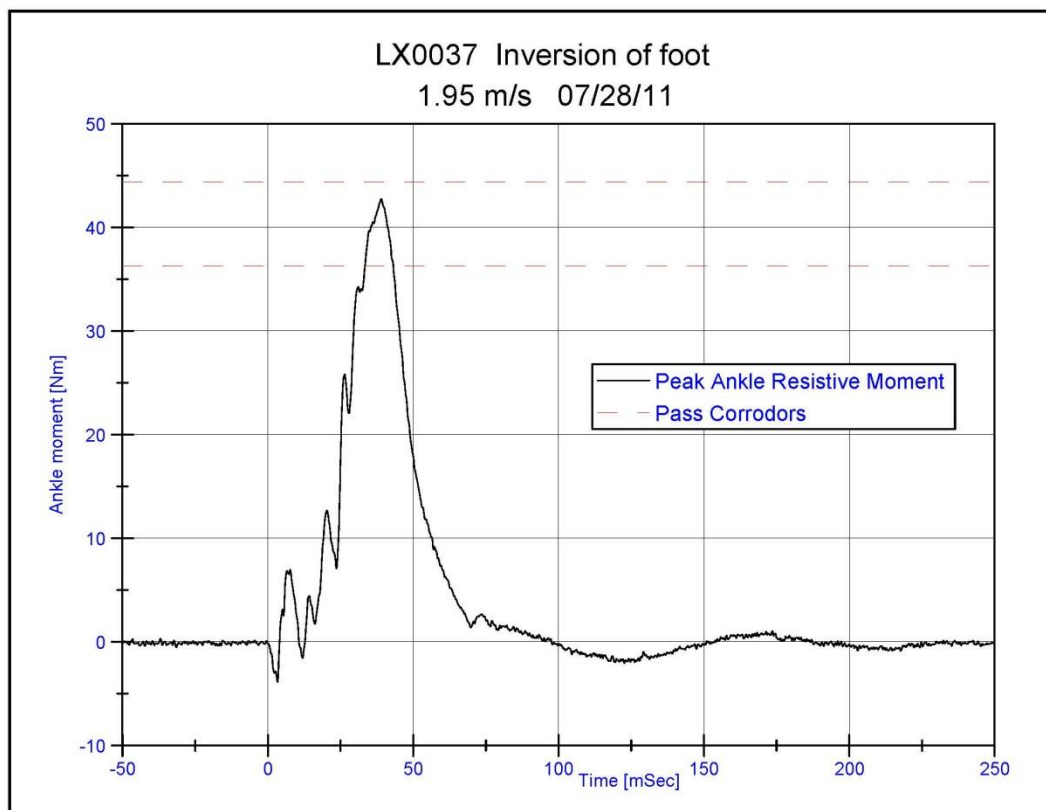
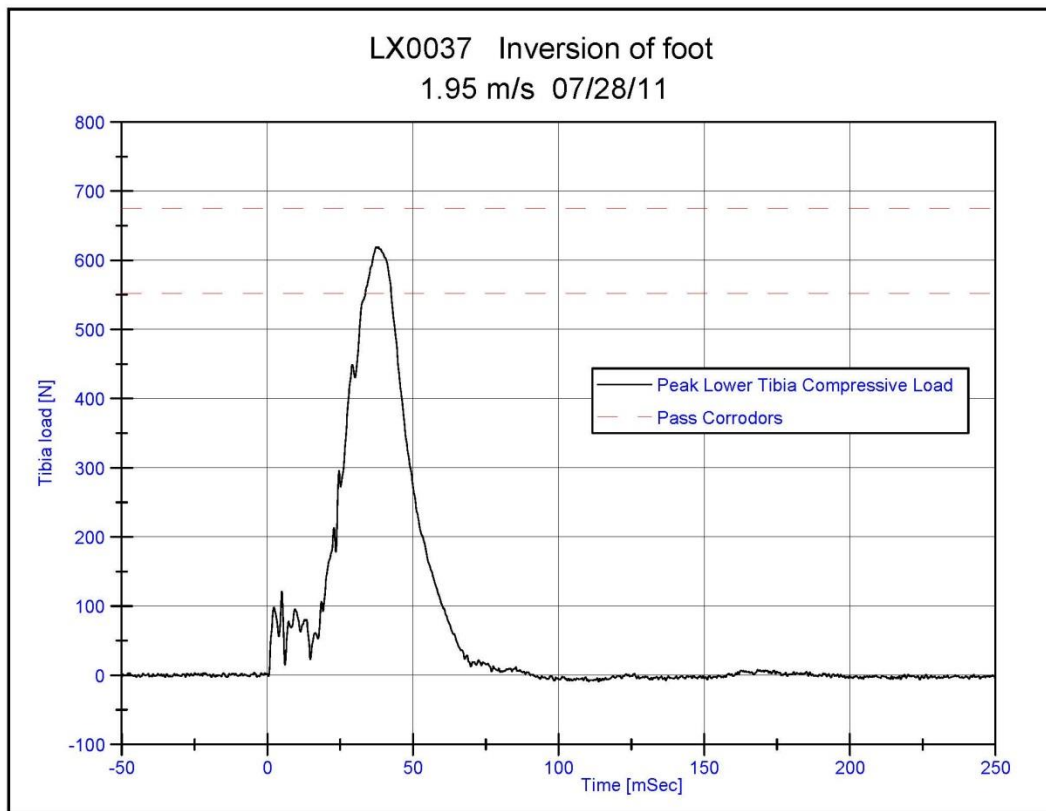


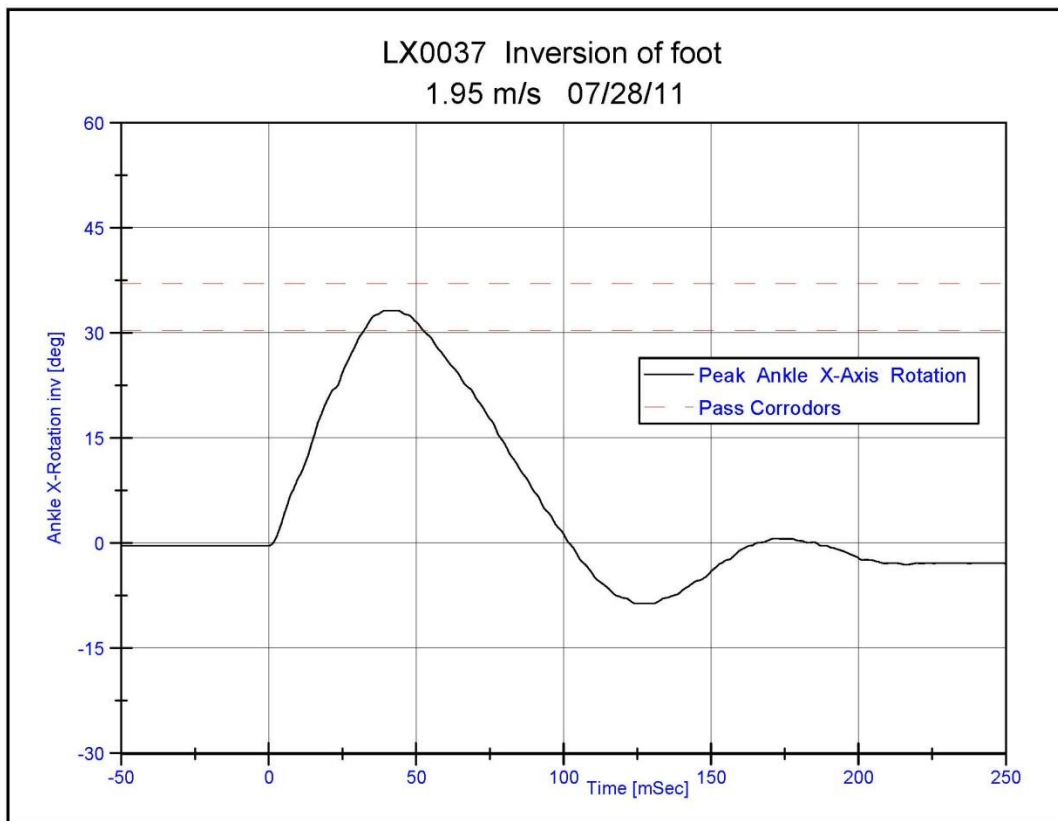












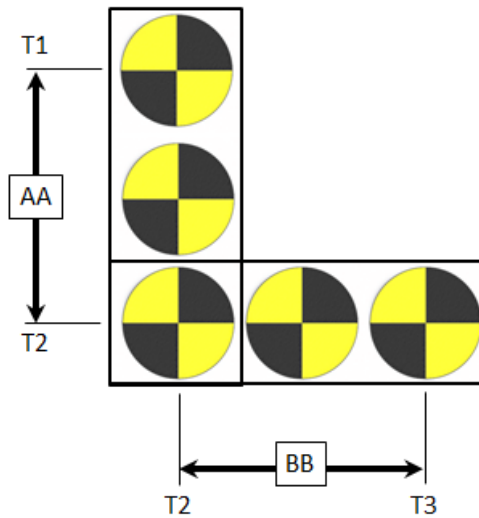
APPENDIX D

Additional Measurements & Data Calculations

ADDITIONAL TARGETS

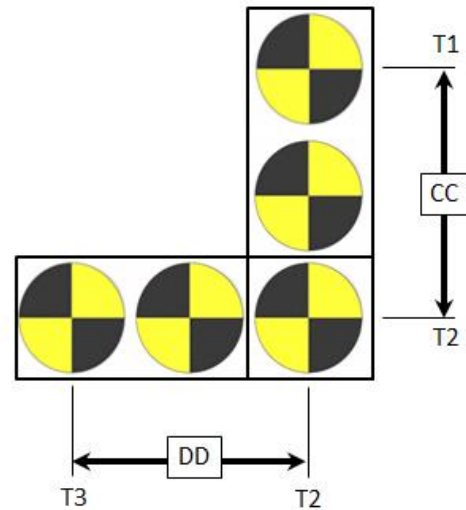
Overhead Reference Targets:

AA (T1 to T2)	<u>238</u>	mm
BB (T2 to T3)	<u>238</u>	mm



Ground Reference Targets:

CC (T1 to T2)	<u>238</u>	mm
DD (T2 to T3)	<u>238</u>	mm



APPENDIX E

POSITIONING PROCEDURE FOR REAR SEAT PART 572O 5TH FEMALE ATD

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

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

APPENDIX F

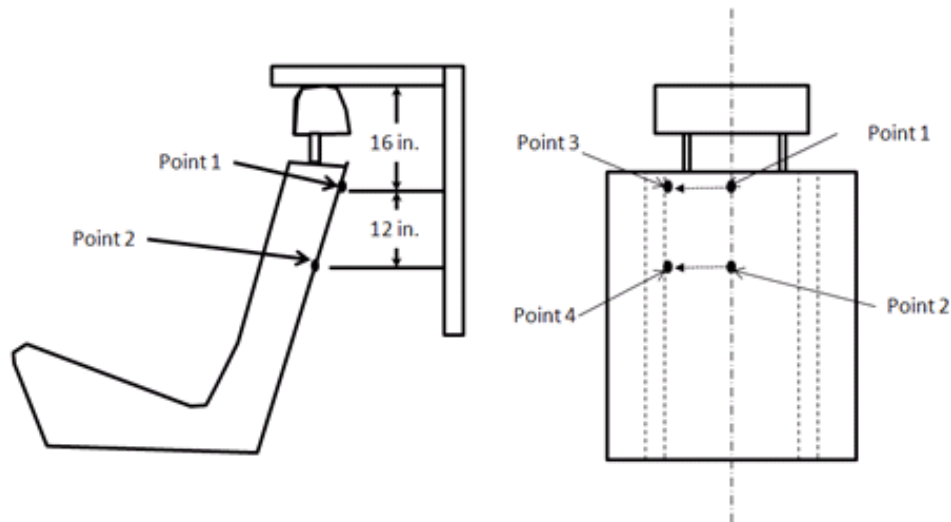
CMM MEASUREMENT PROCEDURES

SECTION F.1

SEAT BACK MEASUREMENT PROCEDURE

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

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



SECTION F.2

DOOR SILL INTRUSION MEASUREMENT PROCEDURE

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

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



SECTION F.3

VEHICLE EXTERIOR CRUSH PROFILE PROCEDURE

1. Expose the bumper beam and level the vehicle such that all attitudes are within 5 mm.
2. Cross section A-A is defined as a horizontal plane passing through the center of the front bumper beam at the centerline of the vehicle (Figure F.3.1). Record the height of this plane (d1) and take enough points at this height to create an exterior cross-section of the vehicle.
3. Perform the same procedure for cross-section B-B. Cross section B-B is defined as a plane passing through the top the upper radiator support.
4. Post-test put the vehicle back to its original coordinate system (Figure F.3.2). Take enough points at the height of d1 and d2 to create a post-test cross-section A-A and B-B. There can be more points measured posttest than pre-test (Figure F.3.3). Record these points in the appropriate data sheet.

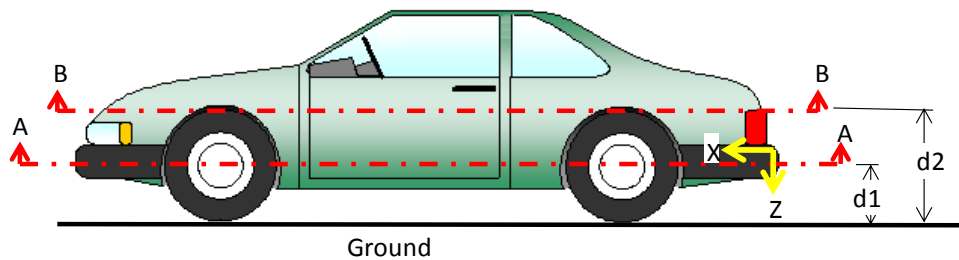


Figure F.3.1 - Pre-Test Cross-Sections

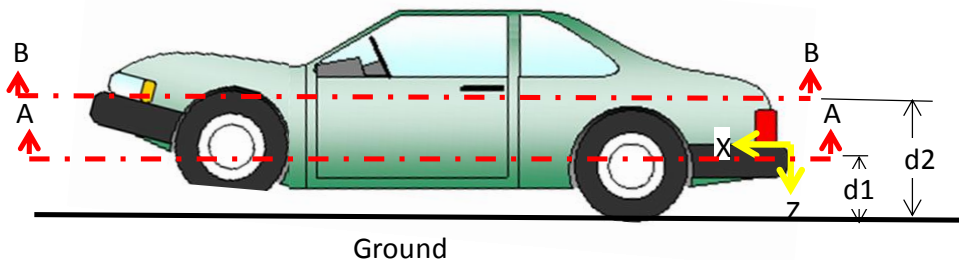


Figure F.3.2 - Post-Test Cross-Sections

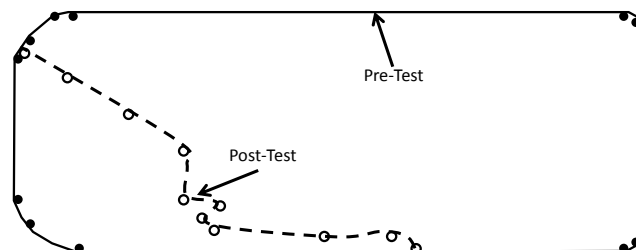


Figure F.3.3 - Plot of Cross-Section

SECTION F.4

DASH PROFILE MEASUREMENT PROCEDURE

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

1. Left Plane: create a vertical plane that is parallel to the longitudinal axis of the vehicle and is located 150mm to the left of the center of the steering wheel (Figure 31).
2. Left Line: create a line on the IP/Knee Bolster at the intersection of the Left Plane and the IP/KneeBolster
3. L1: create a point on the dash that is located on the Left Line and is 450 mm above the floorboard (with floor mats removed). Note this is the Left IP point for the IP5 file and IP Left in DATA SHEET NO.13 (CONTINUED) - VEHICLE INTRUSION MEASUREMENTS.
4. Lt1: From L1 move up the Left Line 50 mm
5. Lt2: From Lt1 move up the Left Line 50 mm
6. Ltn: Mark points at 50 mm increments along Left Line until the window sill is reached.
7. Lb1: From L1 move down the Left Line 50 mm
8. Lb2: From Lb1 move down the Left Line 50 mm
9. Lbn: Mark points at 50 mm increments along Left Line until the bottom of the IP/Knee Bolster is reached.
10. Right Plane: create a vertical plane that is parallel to the longitudinal axis of the vehicle and is located 150mm to the right of the center of the steering wheel (Figure 31).
11. Right Line: create a line on the IP/Knee Bolster at the intersection of the Right Plane and the IP/KneeBolster
12. R1: create a point on the dash that is located on the Right Line and is 450 mm above the floorboard (with floor mats removed). Note this is the Right IP point for the IP5 file and IP Right in DATA SHEET NO.13 (CONTINUED) - VEHICLE INTRUSION MEASUREMENTS.
13. Rt1: From R1 move up the Right Line 50 mm
14. Rt2: From Rt1 move up the Right Line 50 mm
15. Rtn: Mark points at 50 mm increments along Right Line until the window sill is reached.
16. Rb1: From R1 move down the Right Line 50 mm
17. Rb2: From Rb1 move down the Right Line 50 mm
18. Rbn: Mark points at 50 mm increments along Right Line until the bottom of the IP/Knee Bolster is reached.

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

