

REPORT NUMBER: R&D-CAL-15-012

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

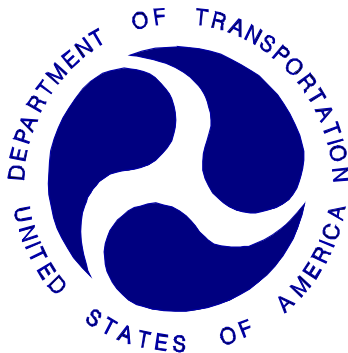
2016 Mazda CX-5

90.1KPH, 15 DEGREE ANGLE, 35% OVERLAP

TEST DATE: 11/17/2015

NHTSA No: R20165410

**CALSPAN CORPORATION
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FINAL REPORT SUBMITTED:

April 15, 2016

PREPARED FOR:

**U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Vehicle safety Research
1200 New Jersey Ave, SE
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Washington, DC 20590**

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Vanessa Hansen, Test Engineer

Date: April 15, 2016

Approved by: Edward J. Dutton
Edward J. Dutton, Operations Manager
Transportation Test Operations

Date: April 15, 2016

FINAL REPORT ACCEPTANCE BY VEHICLE SAFETY RESEARCH, OFFICE OF
STRUCTURAL AND RESTRAINTS RESEARCH DIVISION:

Date: _____

TOM, Vehicle Crash Testing
NHTSA, Office of Structures and Restraints Research

Date: _____

TECHNICAL REPORT STANDARD TITLE PAGE

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16. Abstract A test was conducted in accordance with Contract DTNH22-14-D-00359, Task Order #003. The Test consisted of a Oblique Moving Deformable Barrier (OMDB) traveling at a target speed of 90.12 kph into a stationary 2016 Mazda CX-5 SUV. 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 Transportation Test Operation's facility in Buffalo, New York on November 17, 2015. The OMDB impact velocity was 90.10 kph and the ambient temperature at the test vehicle at the time of impact was 21°C. The target vehicle post-test maximum crush was 714 mm. The test vehicle's performance was as follows: <table border="1"> <thead> <tr> <th>Measurement Description</th> <th>Units</th> <th>Driver THOR</th> <th>Pass. THOR</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>208.51</td> <td>145.03</td> </tr> <tr> <td>Brain Injury Criteria (BrIC)</td> <td>N/A</td> <td>0.66</td> <td>0.86</td> </tr> <tr> <td>Peak Neck Tension</td> <td>mm</td> <td>1955.48</td> <td>830.32</td> </tr> <tr> <td>Peak Resultant Chest Deflection</td> <td>N/A</td> <td>52.18</td> <td>35.53</td> </tr> <tr> <td>Peak Abdomen Deflection</td> <td>N</td> <td>-51.39</td> <td>-45.08</td> </tr> <tr> <td>Peak Resultant Acetabulum force</td> <td>N</td> <td>1506.76</td> <td>2910.35</td> </tr> <tr> <td>Peak Femur Force</td> <td>N</td> <td>-3631.55</td> <td>-3483.01</td> </tr> <tr> <td>Right Tibia Index</td> <td>N</td> <td>0.51</td> <td>0.62</td> </tr> </tbody> </table>					Measurement Description	Units	Driver THOR	Pass. THOR	Head Injury Criteria (HIC ₁₅)	N/A	208.51	145.03	Brain Injury Criteria (BrIC)	N/A	0.66	0.86	Peak Neck Tension	mm	1955.48	830.32	Peak Resultant Chest Deflection	N/A	52.18	35.53	Peak Abdomen Deflection	N	-51.39	-45.08	Peak Resultant Acetabulum force	N	1506.76	2910.35	Peak Femur Force	N	-3631.55	-3483.01	Right Tibia Index	N	0.51	0.62
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DISCLAIMER

The contents of this report relate only to the specific product evaluated under the specific test conditions, as defined within this report. The findings and conclusions are those of the author(s) and not necessarily those of Calspan Corporation. For the purposes of this report, Calspan Corporation provided test services only and was not involved with the consulting, design or manufacture of any product. Calspan Corporation does not endorse products or manufacturers. Further, Calspan Corporation (to include: any of its affiliates, parent companies or subsidiaries) assumes no liability associated with the contents of this report or the use of this report.

Prepared by: Vanessa Hansen
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Date: April 15, 2016

Approved by: Edward J. Dutton
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Transportation Test Operations

Date: April 15, 2016

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SECTION 1
PURPOSE OF TEST

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

This 90.12 kph (56 mph) Moving Barrier into a test vehicle is part of the Frontal Offset Test outlined in Contract No. DTNH22-14-D-00359, Task Order 0003. The purpose of this test is to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

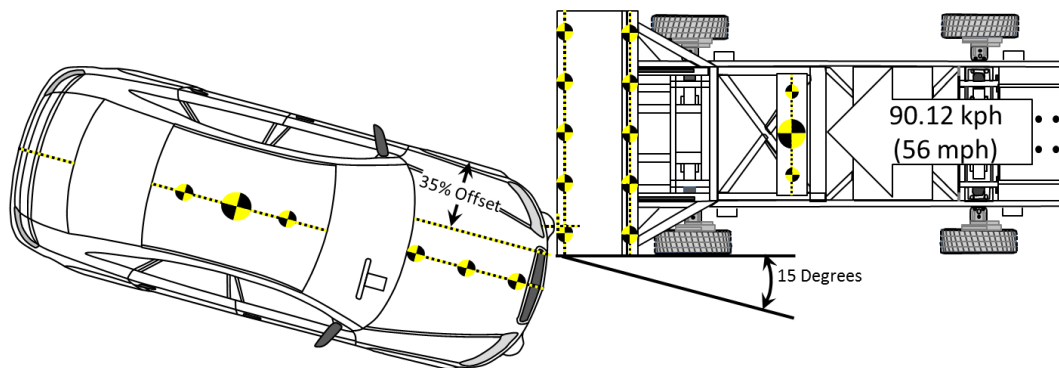
This test was conducted in accordance with the instructions set forth for a 15° angle, 35% offset moving barrier to vehicle impact, outlined in Contract No. DTNH22-14-D-00359, Task Order 0003. Data was obtained indicant of Federal Motor Vehicle Safety Standard FMVSS 208- Occupant Crash Protection, FMVSS 212 – Windshield Mounting, FMVSS 219 (partial) – Windshield Zone Intrusion, and FMVSS 301 – Fuel System Integrity, in addition to the requirements of Contract No. DTNH22-14-D-00359, Task Order 0003.

SECTION 2 SUMMARY OF TEST

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

A 2016 Mazda CX-5 SUV was impacted on the left front corner by an Oblique Moving Deformable Barrier (OMDB). 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 OMDB. The OMDB was towed down the test track in a full forward direction, without any crabbing, and at the targeted impact velocity of 90.12 kph (56.0 mph) into the test vehicle. The test vehicle's mass was 1,772 kg (3,906.6 lbs), and the OMDB's mass was 2519 kg (5,552 lbs). The test was conducted by Calspan Corporation on November 17, 2015.



The test was documented by two (2) real time and fifteen (15) high-speed video cameras. Camera locations and other pertinent data are located in Data Sheet No. 6 of this report. Pre and post – test photographs of the test vehicle, OMDB, and 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-NT anthropomorphic test device (ATD) (Serial No. DO9798) was seated in the left, front (P1 -Driver's) seating position and one 50% adult male THOR-NT adult male ATD (Serial No. DL9207) was seated in the right front passenger seating position (P2). The driver and passenger were positioned according to instructions specified in the THOR seating procedures.

The driver was restrained with a 3 – point seat belt, frontal, curtain, and torso airbag. The passenger was restrained with a 3 – point seat belt, frontal, curtain, and torso airbag.

SECTION 2 (CONTINUED)

SUMMARY OF TEST

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
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Two hundred and fifty eight (258) channels of data from the two ATD's, test vehicle and OMDB were collected using Kayser – Threde data acquisition systems. Appendix B contains dummy data plots, as well as vehicle and OMDB response data plots.

There was 87.4% total windshield retention, with 74.8% 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 event. The maximum static crush of the vehicle was 714 mm at C1 to the left of the vehicle's centerline. The maximum crush of the structural bumper beam was 330 mm at B1, to the left of the 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. All doors remained operational after the impact event.

Structure observations include the following:

- Windshield had cracks throughout with minor separation along the driver side.
- The C-Pillar Buckled during impact
- Hood bent inwards and exposed part of the engine compartment

The driver ATD's visible contact points were:

- Head contacted the frontal and curtain airbags
- Torso contacted the frontal and torso airbag, shoulder/arm contacted the door
- Left Knee contacted the knee bolster
- Right Knee contacted the knee bolster

The right front passenger ATD's visible contact points were:

- Head contacted the frontal airbag
- Torso contacted the frontal airbag
- Shoulder contacted the center instrument panel
- Knees contacted the glove box

SECTION 2 (CONTINUED)
CRASH VEHICLE SUMMARY

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

Primary Impact Data

Measured Parameter	Units	Value
OMDB Velocity at Impact	kph	90.07
OMDB Test Weight	kg	2519
OMDB Maximum Static Crush	mm	394
Vehicle Test Weight	kg	1772
Actual Vehicle Angle	degrees	15
Vehicle Maximum Static Crush	mm	714
Vertical Offset from Target Point (+ down / - up)*	mm	-14
Lateral Offset from Target Point (+ left / - right)*	mm	+4
Number of Data Channels		258
Number of Real-Time Cameras		2
Number of High-Speed Cameras		15

*Offsets are in relation to the vehicle coordinate system.

Dummy Contacts

	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	THOR, S/N: DO9798		THOR, S/N: DL9207	
Head Contact	Front & Curtain Airbags	A49-A51	Front Airbag	A70-A72
Upper Torso Contact	Front Airbag	N/A	Front Airbag	N/A
Lower Torso Contact	None	N/A	None	N/A
Side Torso Contact	Torso Airbag, Arm contacted door	N/A	Shoulder contacted door	N/A
Left Knee Contact	Knee Bolster	A28	Glove Box	A52
Right Knee Contact	Knee Bolster	A28	Glove Box	A52

Data Anamolies

CHANNEL DESCRIPTION	EXPLANATION
Driver Thorax Lower Left X Displacement, Questionable spikes 16.8ms to 20.4ms & 58.2ms to 74.3ms	Could not reproduce, Possible internal grounding issue
Driver Abdomen Left X Displacement, Questionable spike 22.3ms	Could not reproduce, Possible internal grounding issue
Front Passenger Thorax Upper Right X Displacement, Questionable spikes throughout	Could not reproduce, Possible internal grounding issue
Front Passenger Abdomen Right X Displacement, Questionable spikes 80.6ms to 109ms	Could not reproduce, Possible internal grounding issue

PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: R20165410 - 2016 Mazda CX-5 NHTSA No.: R20165410
 Test Program: NHTSA R&D Left Oblique Offset 15deg/35% Test Date: 11/17/2015

Driver: THOR Serial No. DO9798 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	HIC 15ms		Compute	208.51	
	Brain Injury Criteria (BrIC)		Compute	0.66	
	Head Rotational Velocity X	Deg/s	60	734.02	-550.86
	Head Rotational Velocity Y	Deg/s	60	807.80	-1687.86
	Head Rotational Velocity Z	Deg/s	60	886.06	-833.01
Neck	Upper Neck Z-axis Force	N	1000	1955.48	-61.94
	Upper Neck Y-axis Moment	Nm	Thortest	32.80	-16.41
Chest	Upper Left Resultant Chest Deflection	mm	Thortest	20.18	
	Upper Right Resultant Chest Deflection	mm	Thortest	52.18	
	Lower Left Resultant Chest Deflection	mm	Thortest	17.40 ⁽¹⁾	
	Lower Right Resultant Chest Deflection	mm	Thortest	37.88	
Abdomen	Lower Left X-axis Deflection	mm	Thortest	0.12 ⁽²⁾	-44.61 ⁽²⁾
	Lower Right X-axis Deflection	mm	Thortest	2.78	-51.39
Acetabulum	Left Acetabulum Resultant Force	N	Compute	1724.44	0.06
	Right Acetabulum Resultant Force	N	Compute	1506.76	0.08
Femur	Left Femur Force, FZ	N	600	214.84	-3631.55
	Right Femur Force, FZ	N	600	293.85	-2675.11
Tibia	Left Upper Tibia, FZ	N	600	63.16	-1478.89
	Left Upper Tibia Index		Compute	0.41	
	Right Upper Tibia, FZ	N	600	446.21	-1618.74
	Right Upper Tibia Index		Compute	0.46	
	Left Lower Tibia, FZ	N	600	252.18	-2376.74
	Left Lower Tibia Index		Compute	0.42	
	Right Lower Tibia, FZ	N	600	178.84	-2958.62
	Right Lower Tibia Index		Compute	0.51	
Ankle	Left Ankle Rotation, RX	Deg	180	19.88	-5.78
	Left Ankle Rotation, RY	Deg	180	31.31	-21.47
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	40.38	-13.31
	Left Ankle In/Eversion Moment, MX	Nm	Compute	8.97	-86.71
	Right Ankle Rotation, RX	Deg	180	1.78	-39.14
	Right Ankle Rotation, RY	Deg	180	15.02	-15.53
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	40.60	-68.62
	Right Ankle In/Eversion Moment, MX	Nm	Compute	16.73	-77.40

Anomalies: (1) Thorax Lower Left X Displacement, Questionable spikes 16.8ms to 20.4ms & 58.2ms to 74.3ms
 (2) Questionable spike 22.3ms

PRELIMINARY INJURY SUMMARY: Right Front Passenger

Test Vehicle: R20165410 - 2016 Mazda CX-5 NHTSA No.: R20165410
 Test Program: NHTSA R&D Left Oblique Offset 15deg/35% Test Date: 11/17/2015

Right Front Passenger: THOR Serial No. DL9207 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	HIC 15ms		Compute	145.03	
	Brain Injury Criteria (BrIC)		Compute	0.86	
	Head Rotational Velocity X	Deg/s	60	917.47	-1473.64
	Head Rotational Velocity Y	Deg/s	60	474.39	-957.59
	Head Rotational Velocity Z	Deg/s	60	1730.20	-619.87
Neck	Upper Neck Z-axis Force	N	1000	830.32	-36.58
	Upper Neck Y-axis Moment	Nm	Thortest	3.76	-31.50
Chest	Upper Left Resultant Chest Deflection	mm	Thortest	35.53	
	Upper Right Resultant Chest Deflection	mm	Thortest	28.38 ⁽³⁾	
	Lower Left Resultant Chest Deflection	mm	Thortest	29.18	
	Lower Right Resultant Chest Deflection	mm	Thortest	12.96	
Abdomen	Lower Left X-axis Deflection	mm	Thortest	0.01	-45.08
	Lower Right X-axis Deflection	mm	Thortest	0.15 ⁽³⁾	-39.65 ⁽³⁾
Acetabulum	Left Acetabulum Resultant Force	N	Compute	2910.35	0.04
	Right Acetabulum Resultant Force	N	Compute	1584.90	0.08
Femur	Left Femur Force, FZ	N	600	149.92	-3483.01
	Right Femur Force, FZ	N	600	1240.64	-1095.93
Tibia	Left Upper Tibia, FZ	N	600	90.33	-2586.01
	Left Upper Tibia Index		Compute	0.62	
	Right Upper Tibia, FZ	N	600	159.26	-1914.58
	Right Upper Tibia Index		Compute	0.62	
	Left Lower Tibia, FZ	N	600	91.64	-3392.36
	Left Lower Tibia Index		Compute	0.56	
	Right Lower Tibia, FZ	N	600	126.01	-2430.65
	Right Lower Tibia Index		Compute	0.59	
Ankle	Left Ankle Rotation, RX	Deg	180	22.27	-27.07
	Left Ankle Rotation, RY	Deg	180	4.99	-26.81
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	21.34	-41.24
	Left Ankle In/Eversion Moment, MX	Nm	Compute	58.98	-85.43
	Right Ankle Rotation, RX	Deg	180	26.92	-32.51
	Right Ankle Rotation, RY	Deg	180	-5.22	-23.98
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	9.15	-52.78
	Right Ankle In/Eversion Moment, MX	Nm	Compute	124.48	-127.16
Anomalies: (3) Thorax Upper Right X Displacement, Questionable spikes throughout (4) Questionable spikes 80.6ms to 109ms					

SECTION 3 DATA SHEETS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
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DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

VEHICLE INFORMATION

NHTSA No.	R20165410
Model Year	2016
Make	Mazda
Model	CX-5
Body Style	SUV
VIN	JM3KE4BY5G0669192
Body Color	Charcoal Gray
Odometer Reading (km/mi)	445 km / 277 mi
Engine Displacement. (L)	2.5
Type/No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6-Speed
Overdrive	Yes
Final Drive	AWD
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
All-Wheel Drive (AWD)	Yes
Traction Control System (TCS)	Yes

VEHICLE OPTIONS

Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	No
Other Optional Feature	-
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso/Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Pass. Front Airbag	Yes
Pass. Curtain Airbag	Yes
Pass. Head/Torso Airbag	No
Pass. Torso Airbag	No
Pass. Torso/Pelvis Airbag	Yes
Pass. Pelvis Airbag	No
Pass. Knee Airbag	No
Driver Seat Belt Pretensioner	Yes
Pass. Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Pass. Load Limiter	Yes
Other Safety Restraint	-

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

Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Mazda Motor Corporation
Date of Manufacture	05/15

GVWR (kg)	2071
GAWR Front (kg)	1056
GAWR Rear (kg)	1018

VEHICLE SEATING AND WEIGHT CAPACITY

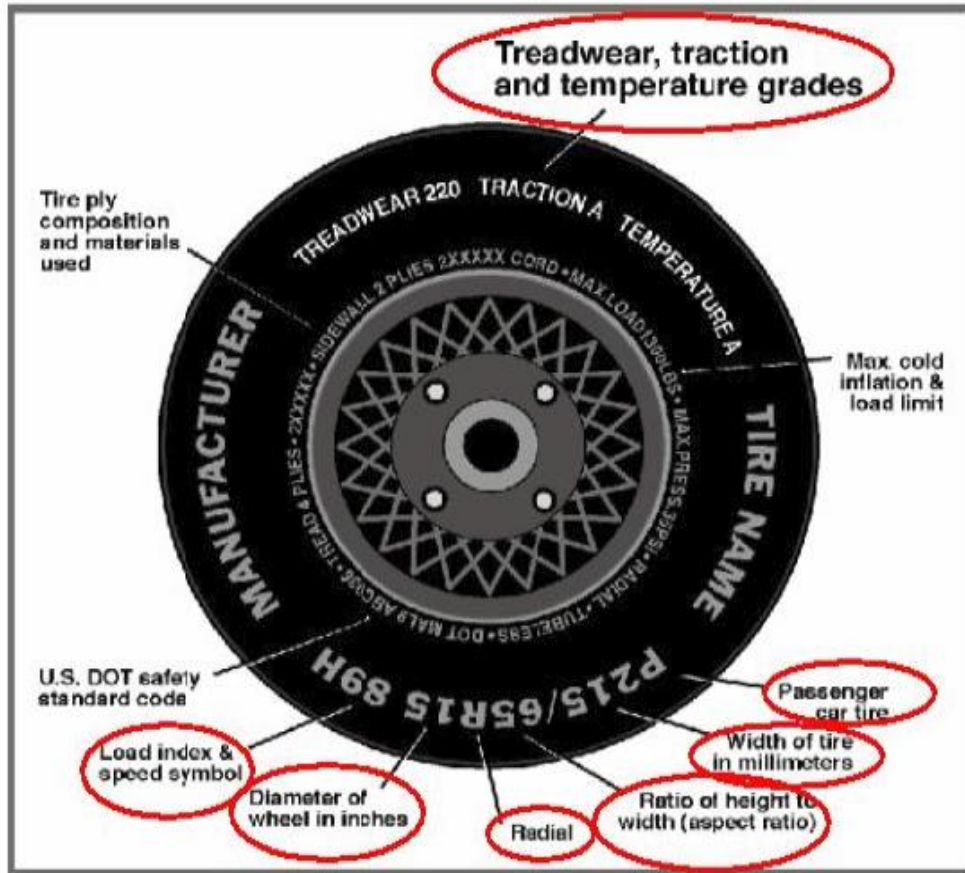
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	-	
Number of Occupants	2	3	-	5
Capacity Wt. (VCW) (kg)				385
Cargo Wt. (RCLW) (kg)				44.8

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

Test Vehicle:	2016 Mazda CX-5 SUV
Test Program:	R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
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Collect items circled in red, tire manufacturer, and tire name.



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P225/65R17	P225/65R17
Tire Size on Vehicle	P225/65R17	P225/65R17
Tire Manufacturer	Yokohama	Yokohama
Tire Model	Geolander G91	Geolander G91
Treadwear	280	280
Traction	B	B
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	100H	100H
Tire Material	Rubber	Rubber
DOT Safety Code Right	FDFSPC5201520	FDFSPC5201520
DOT Safety Code Left	FDFSPC5201520	FDFSPC5201520

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

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	467	320		511	393	
Right	kg	427	335		477	391	
Ratio	%	57.7	42.3		55.8	44.2	
Totals	kg	894	655	1549	988	784	1772

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1549
Weight of 2 THOR ATDs	kg	184
Rated Cargo/Luggage Weight (RCLW)	kg	44.8
Calculated Vehicle Target Weight (TVTW)	kg	1777.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	876	880	895	897	1140
As Tested	mm	860	861	868	868	1193
Post Test	mm	842	842	826	961	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2696
Total Vehicle Length at Left Side	mm	4412
Total Vehicle Length at Centerline	mm	4542
Total Vehicle Length at Right Side	mm	4412
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	31
Amount of Stoddard Solvent in Fuel Tank	L	102

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk carpeting, spare tire, jack, tail light, rear seats, rear door panels and windows,
Rear bumper skin and beam, muffler, side view mirrors, rear seat belts and brackets.

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

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Units	Pre-Test
1	Total Length	mm	4542
2	Total Width	mm	1830
3*	Bumper Top Height	mm	639
4*	Bumper Bottom Height	mm	554
5*	Longitudinal Member Top Height	mm	654
6	Distance Between Longitudinal Members	mm	1005
7	Longitudinal Member Width	mm	59
8*	Engine Top Height	mm	935
9*	Engine Bottom Height	mm	268
10	Engine and Gearbox Width	mm	568
11	Front Bumper-Engine Distance	mm	497
12*	Front Shock Absorber Fixing Height	mm	1021
13*	Bonnet Leading Edge Height	mm	916
14	Front Shock Absorber Fixing Width	mm	1185
15	Front Bumper – Front Axle Distance	mm	934
16	Front Axle – A Pillar Distance	mm	558
17	A-Pillar – B-Pillar Distance	mm	1082
18	B-Pillar – Rear Axle Distance	mm	1058
19	B-Pillar – C-Pillar Distance	mm	917
20*	Roof Sill Bottom Height	mm	1550
21*	Roof Sill Top Height	mm	1610
22*	Floor Sill Bottom Height	mm	456
23*	Floor Sill Top Height	mm	502

*Note: Height measurements are in reference to the ground.

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

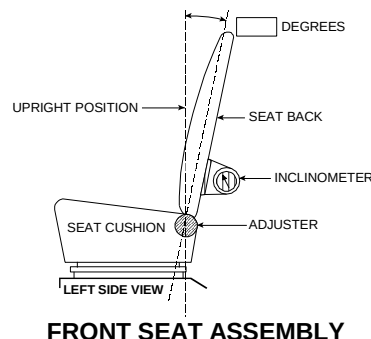
NHTSA No.: R20165410
 Test Date: 11/17/2015

NORMAL DESIGN RIDING POSITION

For adjustable driver and passenger seat backs. Please describe how to position the inclinometer to measure the seat back angle. Include description of the location of the adjustment latch detent, if applicable.

Driver seat: The driver seat back was positioned according to the Nominal Design Riding position listed in FORM 1

Passenger Seat: The passenger seat back was positioned according to the Nominal Design Riding position listed in FORM 1



	UNIT	FORM 1 POSITION	AFTER ATD POSITIONING
Driver Seat Back Angle	deg	5.2	7.0
Passenger Seat Back Angle	deg	4.0	5.9

SEAT FORE/AFT POSITIONS

Describe the method used of determining seat fore/aft positions.

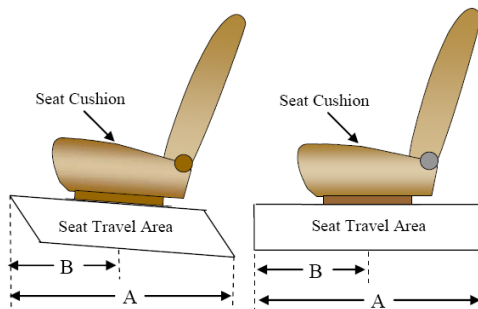
The driver's seat was positioned at its mid angle position and at the mid-point of fore/aft travel. The passenger's seat was positioned at the mid-point of fore/aft travel.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	27 (0-26)	13
Passenger Seat	27 (0-26)	15

SEAT BELT UPPER ANCHORAGES

Describe the method of positioning seat belt upper anchorages. 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. Zero is defined as the upper-most position.

	Total # of Positions	Placed in Position #
Driver Seat	4	0
Passenger Seat	4	0



DATA SHEET NO. 2 (CONTINUED)
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

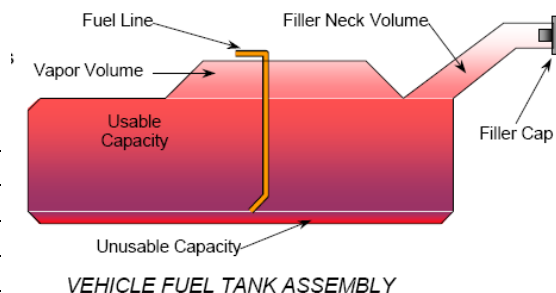
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	58
Usable Capacity of "Optional Tank"	
93% of Usable Capacity	53.94
Actual Amount of Solvent Used	53.94
1/3 of Usable Capacity	19.33

FUEL PUMP

Describe the fuel system - what type of fuel pump, details about how it operates, etc.

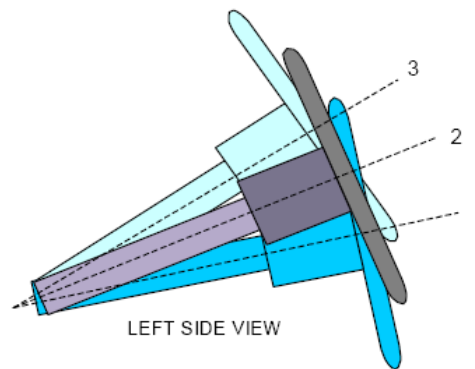
Fuel evacuated according to the specifications provided by the manufacturer in Form 1. Electric fuel pump operates when the ignition is in the 'on' position and the engine is running. The fuel filler neck is located above the left rear wheel.



STEERING COLUMN ADJUSTMENT

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

The steering wheel was adjusted to the midpoint of tilt angle range and the midpoint of the telescoping travel



STEERING COLUMN ASSEMBLY

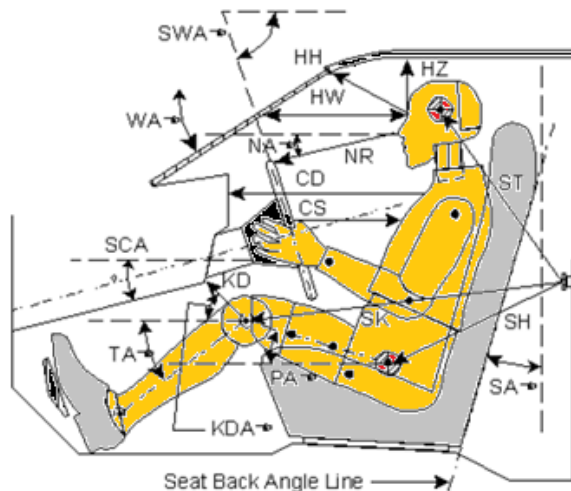
STEERING COLUMN POSITIONS

	Tilt (degrees)	Fore/Aft Position (mm)
Lowermost position No. 1	24.5	
Geometric center position No. 2	26.95	
Uppermost position No. 3	29.4	
Telescoping Steering Wheel Travel		50
Test Position	26.95	25

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

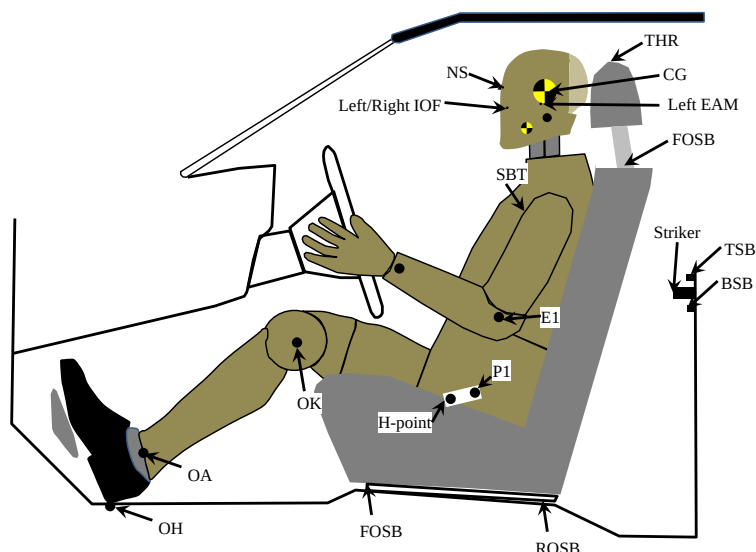


Code	Measurement Description	Driver (Serial#THOR DO9798)		Passenger (Serial#THOR DL9207)	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		31.9		
SWA°	Steering Wheel Angle		26.2		
SCA°	Steering Column Angle		63.8		
SA°	Seat Back Angle (on headrest post)		7.0		5.9
SA°	Seat Back Angle		20.6		19.3
HZ	Head to Roof (Z)	219	90	210	90
HH	Head to Header	422	20.2	425	19.2
HW	Head to Windshield	715	0	692	0
NR	Nose to Rim	507	18.4	674	34.7
CD	Chest to Dash	577		546	
CS	Chest to Steering Hub	358	10.2		
RA	Rim to Abdomen	177	0		
KDL	Left Knee to Dash	102	21.5	80	28.9
KDR	Right Knee to Dash	75	27.3	112	25
PA°	Pelvic Angle		33.4		32.3
TA°	Tibia Angle		53.8		47.2
SK	Striker to Knee	640	2.3	655	5.2
ST	Striker to Head	517	87.2	526	87.2
SH	Striker to H-Point	276	29.7	262	30.0
HAX°	Head Angle (X)		0.4		0.1
HAY°	Head Angle (Y)		-4.9		-6.7
TAX°	T6 Angle (X)		0.6		-1.1
TAY°	T6 Angle (Y)		22.2		22.1
TAX°	T1 (X)		0.7		-1.3
TAY°	T1 (Y)		2.0		2.0
TAX°	T12 (X)		0.4		-1.1
TAY°	T12 (Y)		31.8		31.1
PAX			-0.8		-0.1
PAY			33.4		32.3

DATA SHEET NO.3 (CONTINUED) DUMMY CMM MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015



Description	Units	Driver			Passenger		
		X	Y	Z	X	Y	Z
Head CG	mm	2100	-440	-762	2102	448	-771
Nasion	mm	2201	-368	-765	2198	369	-773
Tip of Nose	mm	2199	-368	-726	2195	369	-736
Tip of Chin	mm	2186	-368	-628	2181	368	-637
Left EAM	mm	2105	-437	-735	2105	295	-742
Right EAM	mm	2114	-288	-731	2108	445	-746
Left IOF	mm	2192	-400	-728	2191	337	-737
Right IOF	mm	2197	-337	-725	2191	402	-736
Outboard Elbow	mm	2321	-622	-318	2230	633	-248
H-Point	mm	2315	-616	-109	2303	623	-114
H-Point Tool	mm	2241	-612	-139	2231	619	-150
Outboard Knee Bolt	mm	2715	-581	-220	2728	538	-186
Inboard Knee Bolt	mm	2725	-282	-236	2725	309	-193
Outboard Ankle Bolt	mm	2961	-576	120	3020	517	110
Outer Heel Point	mm	2972	-558	254	2992	475	243
Inboard Heel Point	mm	2928	-217	252	2991	266	239
Striker Top Bolt	mm	2042	-801	-261	2044	801	-260
Striker Bottom Bolt	mm	2044	-803	-225	2046	803	-224
Center Tip of Striker	mm	2075	-800	-246	2076	800	-245
Front Outboard Seat Anchor Bolt	mm	2545	-611	157	2550	611	157
Rear Outboard Seat Anchor Bolt	mm	2103	-608	179	2107	612	180
Outboard Head Restraint Post	mm	1900	-451	-629	1897	457	-636
Top of Head Restraint	mm	1950	-370	-896	1945	369	-904
Center of Steering Wheel	mm	2,590	-371	-455			

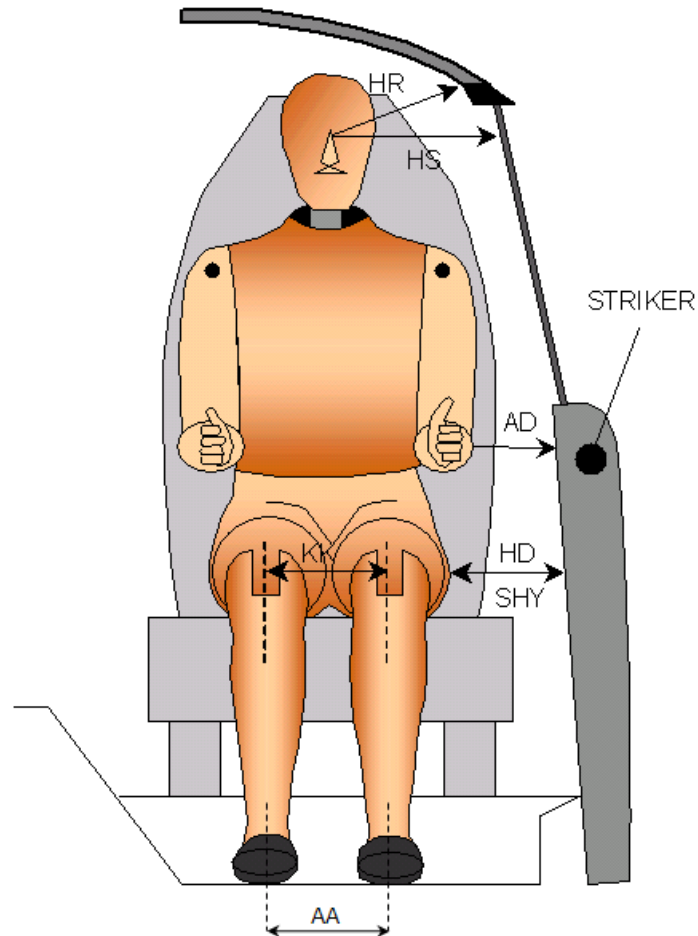
Reference point:

- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the 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: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

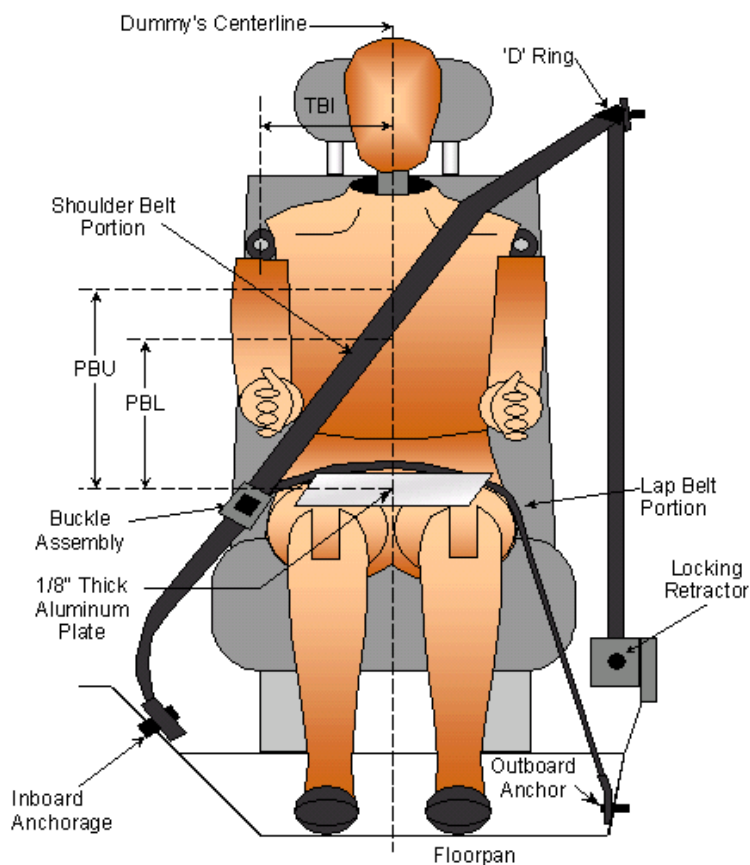


Code	Description	Units	Driver	Passenger
AD	Arm to Door	mm	138	56
HD	H-Point to Door	mm	200	192
HR	Head to Side Header	mm	240	235
HS	Head to Side Window	mm	350	347
KK	Knee to Knee	mm	345	270
SHY	Striker to H-Point (Y Direction)	mm	240	235
AA	Ankle to Ankle	mm	325	210

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	370	370
PBL — Top surface of reference to belt lower edge	mm	295	295

BELT LENGTH DATA

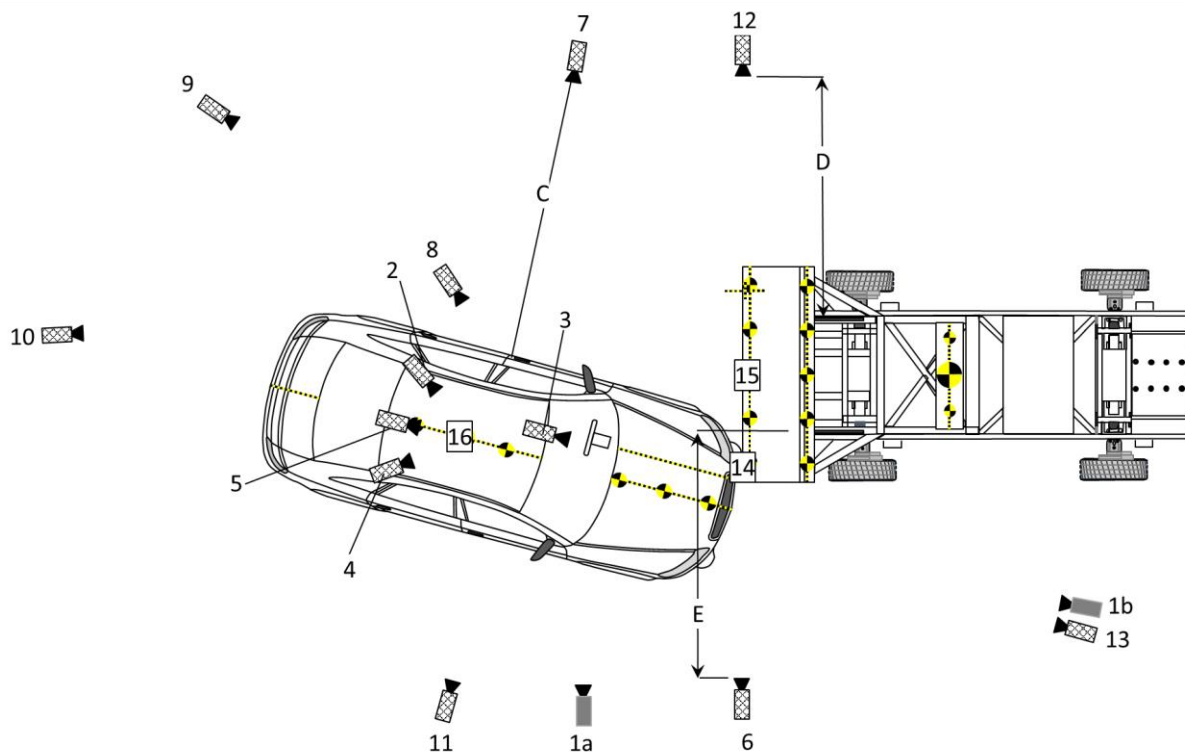
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	875	895
Lap Belt Length as measured on ATD	mm	825	840
Remainder of belt on reel	mm	920	885
Total belt length for continuous webbing systems	mm	2620	2620

DATA SHEET NO. 6 **HIGH-SPEED CAMERA LOCATIONS AND DATA**

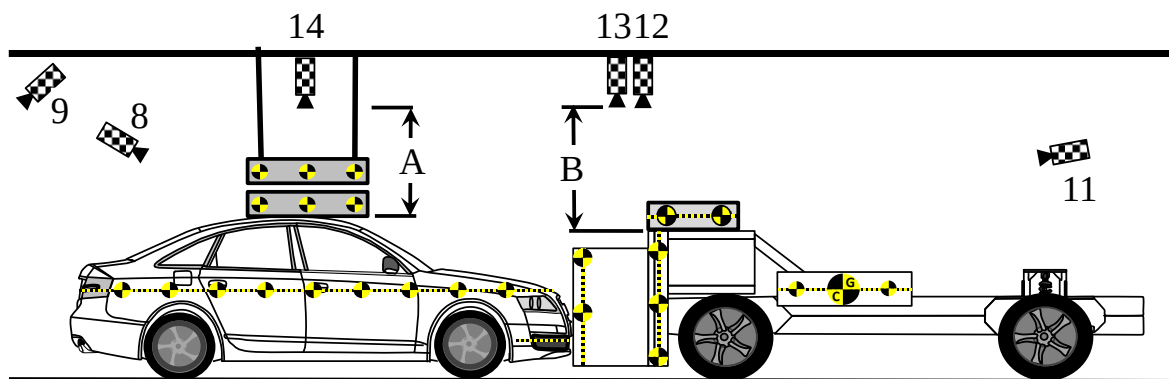
Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

HORIZONTAL LOCATION



VERTICAL LOCATION



A	mm	3697
B	mm	4135
C	mm	7833
D	mm	8690
E	mm	9237

DATA SHEET NO. 6 (CONTINUED)
HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side	--	--	--	Zoom	60
2	Onboard Passenger Movement	7516	-438	1440	8	1000
3	Onboard Passenger Lower Leg	6570	-517	321	6.5	1000
4	Onboard Driver Movement	7542	-949	1440	8	1000
5	Onboard Centerline	7797	-633	1422	8	1000
6	Passenger Interaction	4972	9282	1131	24	1000
7	Driver Interaction	6987	8211	1403	24	1000
8	Target Vehicle Left Side Perpendicular (High)	8426	-2150	3725	24	1000
9	Target Vehicle Driver Motion	13579	6835	2731	24	1000
10	Rear View of Vehicle and OMDB	28750	0	3421	10	1000
11	Right Side Target Vehicle and OMDB	10873	-9721	2575	28	1000
12	Front of Vehicle and OMDB	4910	9825	1212	20	1000
13	Close-Up Impact Point	645	-3100	1308	24	1000
14	Overhead Impact Point View	4937	-1166	4563	28	1000
15	Overhead Vehicle View	7369	0	5327	15	1000
16	Overhead OMDB View	4678	0	5327	15	1000

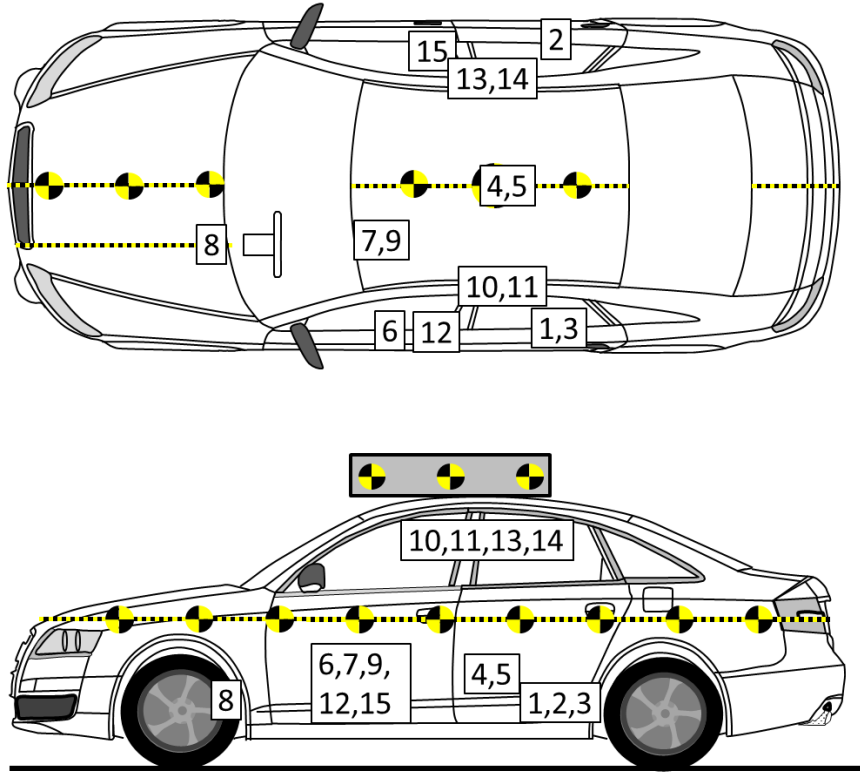
Reference Point:

- +X – From back of OMDB to front of OMDB
- +Y – Right of monorail center
- +Z – Up from ground

DATA SHEET NO. 7
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS RELATIVE TO VCS

No.	Accelerometer Location	Axes	Units	Measurements (mm)		
				X	Y	Z
1	Left Rear Sill	X,Y	mm	1775	-694	179
2	Right Rear Sill	X,Y	mm	1776	696	176
3	Left Rear Sill Redundant	X,Y	mm	1759	-692	179
4	Vehicle CG	X,Y,Z	mm	1857	0	85
5	Vehicle CG Angular Displacement	X	mm	1867	-1	90
		Y	mm	1855	10	88
		Z	mm	1856	1	85
6	Left Side Seat Track	X,Y,Z	mm	2254	-595	189
8	Left Side Toe Pan	X,Y,Z	mm	3372	-374	68
7	Left Side String Pot	N/A	mm	3281	-329	162

Reference point:

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

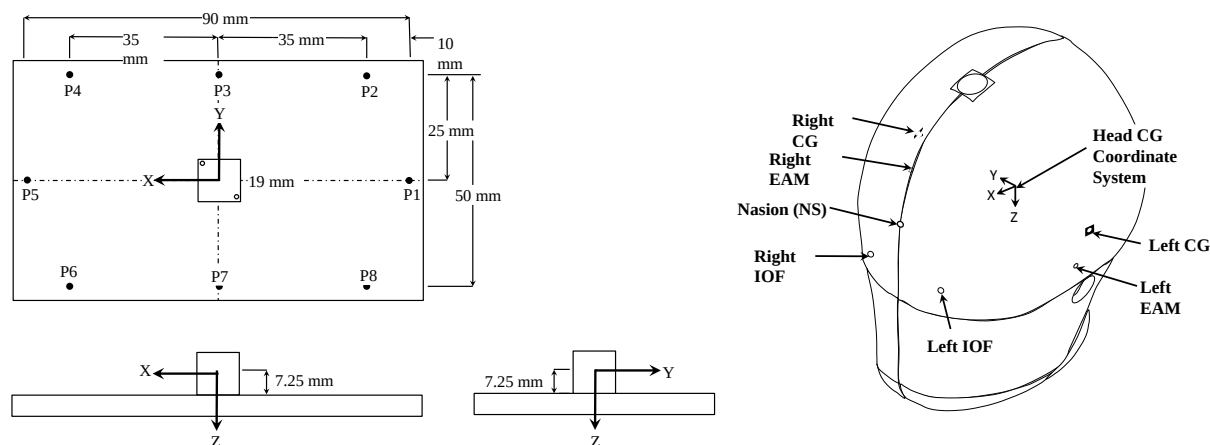
DATA SHEET NO. 7 (Continued)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

ANGULAR RATE SENSOR MOUNTING PLATE & THOR HEAT POINT DEFINITIONS



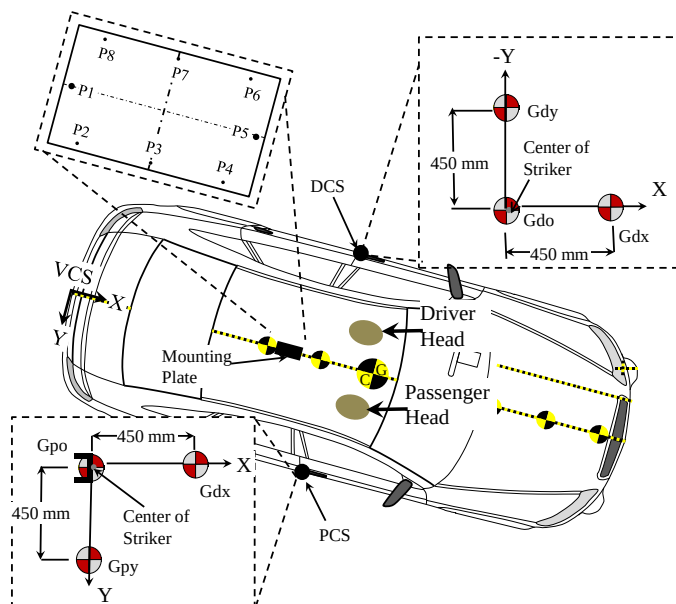
ARS MOUNTING PLATE - VEHICLE COORDINATE SYSTEM					
No.	Description	Units	Measurements (mm)		
			X	Y	Z
P1	Plate Point 1	mm	1812	0	100
P2	Plate Point 2	mm	1821	25	99
P3	Plate Point 3	mm	1857	25	99
P4	Plate Point 4	mm	1892	25	99
P5	Plate Point 5	mm	1902	0	100
P6	Plate Point 6	mm	1892	-25	100
P7	Plate Point 7	mm	1857	-25	99
P8	Plate Point 8	mm	1822	-25	100

HEAD POINTS IN RELATION TO HEAD CG COORDINATE SYSTEM					
Description	Units	X	Y	Z	
CG	mm	0	0	0	
Left CG	mm	0	-77	0	
Right CG	mm	0	77	0	
Left EAM	mm	7	-72	27	
Right EAM	mm	7	72	27	
Left IOF	mm	89	-32	28	
Right IOF	mm	89	32	28	
Nasion	mm	92	0	-10	

DATA SHEET NO. 7 (Continued) **VEHICLE INSTRUMENTATION DATA**

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015



ARS MOUNTING PLATE & ATD'S HEAD POINTS RELATIVE TO GLOBAL COORDINATE SYSTEMS

DESCRIPTION	DRIVER DCS			PASS. PCS		
	X	Y	Z	X	Y	Z
G ₀	0	0	0	0	0	0
G _x	451	0	-2	450	0	-1
G _y	-1	-450	2	-2	452	-7
P1	-440	707	-499	-20	-836	-494
P2	-437	734	-499	-17	-809	-494
P3	-403	744	-499	17	-800	-494
P4	-370	753	-499	51	-790	-494
P5	-353	732	-499	67	-812	-494
P6	-356	705	-499	64	-838	-493
P7	-390	695	-499	30	-848	-494
P8	-424	686	-499	-4	-857	-494
Left CG	-47	359	-1360			
Right CG				144	-327	-1364
Left EAM	-42	363	-1333			
Right EAM				149	-329	-1339
Left IOF	32	421	-1326	258	-411	-1330
Right IOF	20	484	-1324	241	-348	-1329
Nasion	32	455	-1363	256	-378	-1366

DATA SHEET NO. 7 (CONTINUED)
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

No.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Max	Time (ms)
1	Left Rear Sill	X	g	1.74	125.20	-39.33	42.85
		Y	g	19.32	60.10	-6.88	74.55
2	Right Rear Sill	X	g	2.20	147.70	-43.72	43.30
		Y	g	20.90	45.10	-2.31	10.65
3	Impact Side Rear Sill Redundant	X	g	1.82	142.55	-39.26	43.00
		Y	g	17.30	60.05	-9.31	74.35
4	Vehicle CG Acceleration	X	g	4.20	18.35	-36.74	42.00
		Y	g	32.81	42.55	-3.35	10.05
		Z	g	14.35	7.05	-14.43	69.20
5	Impact Side Seat Track	X	g	1.94	121.80	-36.24	42.70
		Y	g	34.14	59.90	-2.82	10.70
		Z	g	18.52	55.45	-21.12	71.80
6	Impact Side Seat Crossmember	X	g	7.15	78.35	-43.27	41.60
		Z	g	22.99	61.50	-24.09	72.05
7	Impact Side Toeplan	X	g	14.44	71.55	-126.30	40.95
		Y	g	25.41	49.25	-53.27	41.10
		Z	g	8.71	34.85	-63.29	41.35
8	Angular Rate Sensors	X	Deg/s	535.93	45.40	-95.94	88.65
		Y	Deg/s	129.22	42.80	-257.42	55.70
		Z	Deg/s	103.17	62.05	-17.85	18.10
9	Driver Shoulder Displacement		mm	101.16	23.50	-51.59	86.90
10	Driver Shoulder Belt		N	4194.88	72.40	-32.92	8.70
11	Driver Lap Belt		N	3252.04	52.70	-34.28	12.40
12	Passenger Shoulder Displacement		mm	78.49	23.55	-210.03	99.00
13	Passenger Shoulder Belt		N	3825.43	47.00	-42.36	179.95
14	Passenger Lap Belt		N	6700.47	63.90	-43.58	227.30
15	Impact Side Floor String Pot		mm	45.26	288.60	-17.16	64.30

Note: See Appendix B for all vehicle data plots.

TIME TO FIRE RESTRAINT TIMING

No.	Description	Axes	Units	Time to Fire (ms)
1	Driver Air Bag Squib 1	*	A	9.00
2	Driver Air Bag Squib 2	*	A	14.00
3	Driver Curtain Airbag	*	A	41.00
4	Driver Torso Airbag	*	A	41.00
5	Driver Knee Airbag	*	A	N/A
6	Driver Pretensioner	*	A	9.00
7	Passenger Air Bag Squib 1	*	A	9.00
8	Passenger Air Bag Squib 2	*	A	14.00
9	Passenger Curtain Airbag	*	A	Did not fire
10	Passenger Torso Airbag	*	A	Did not fire
11	Passenger Knee Airbag	*	A	N/A
12	Passenger Pretensioner	*	A	9.00

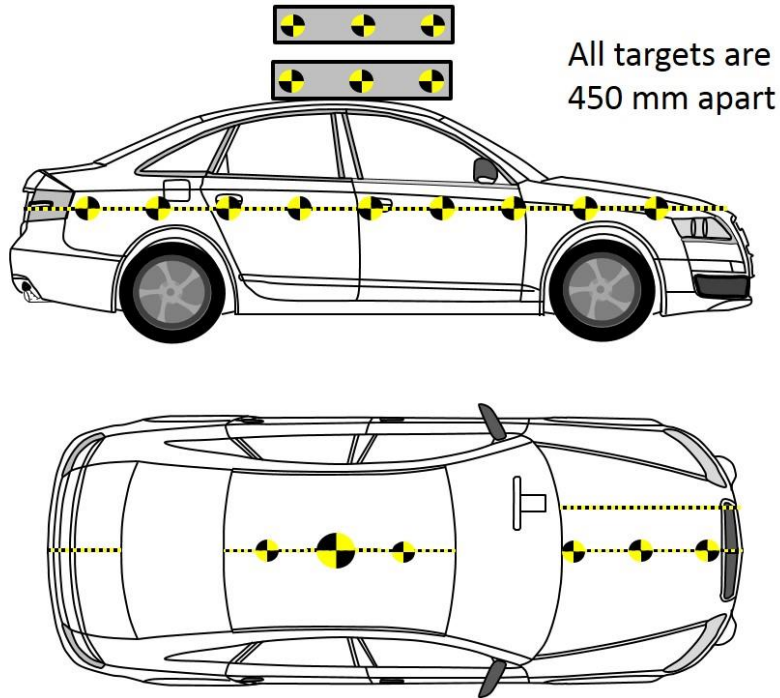
* The measurement indicates the time the voltage changed

DATA SHEET NO. 8 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

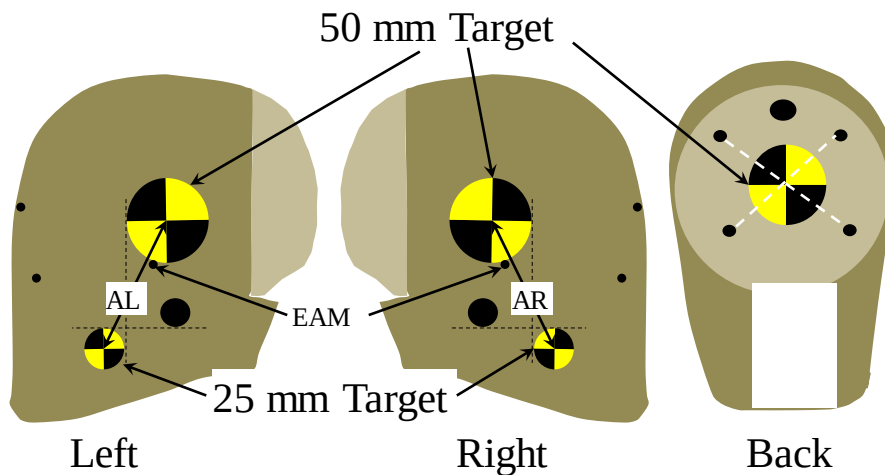
Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

VEHICLE TARGETS



ATD HEAD TARGETS



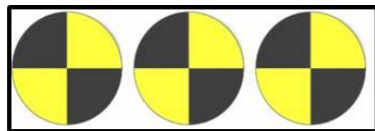
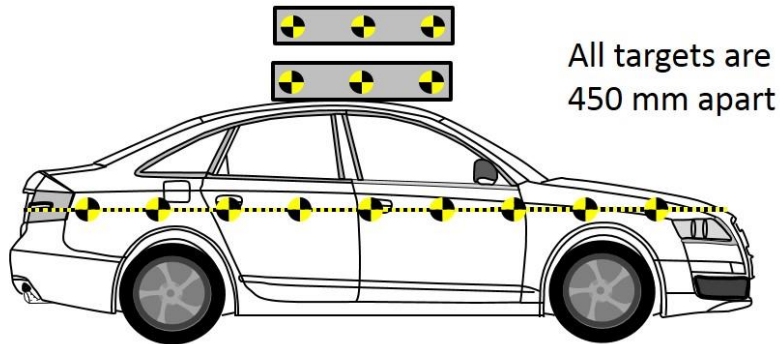
Target	Measurement
AL	91 mm
AR	91 mm

DATA SHEET NO. 8 (CONTINUED)
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

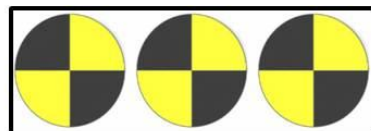
NHTSA No.: R20165410
 Test Date: 11/17/2015

OVERHEAD TARGET BARS



1 2 3

Vertical Target
Plane 1
(Driver's Side)



4 5 6

Vertical Target
Plane 2
(Passenger Side)

Target	Units	X	Y	Z
1	mm	2479	-403	-1384
2	mm	2025	-398	-1380
3	mm	1572	-396	-1377
4	mm	2494	385	-1388
5	mm	2043	386	-1389
6	mm	1588	387	-1383

Reference point:

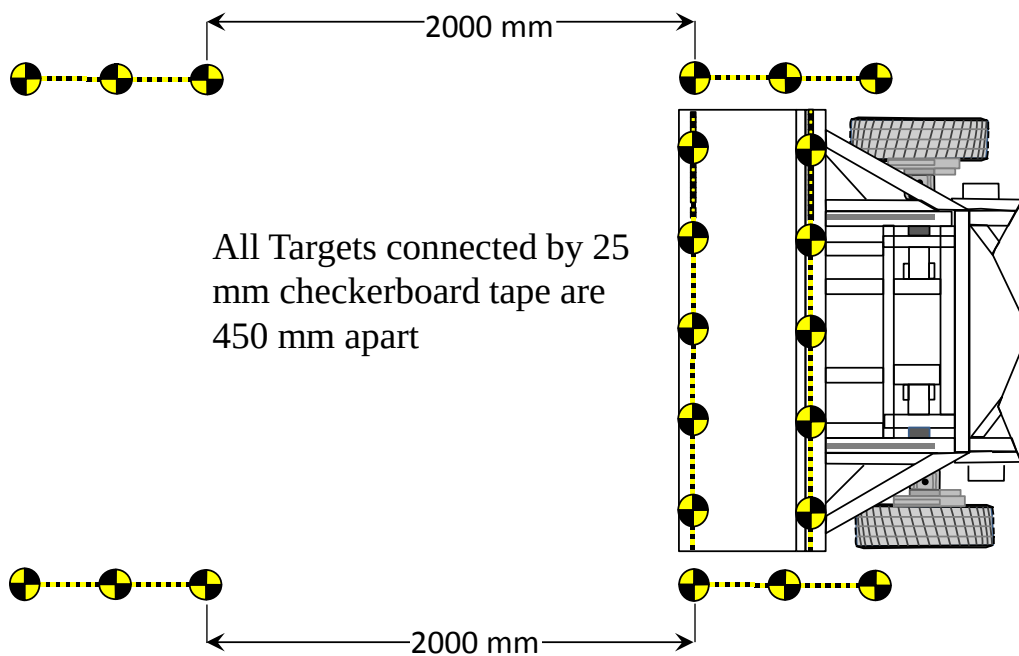
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 8 (CONTINUED)
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

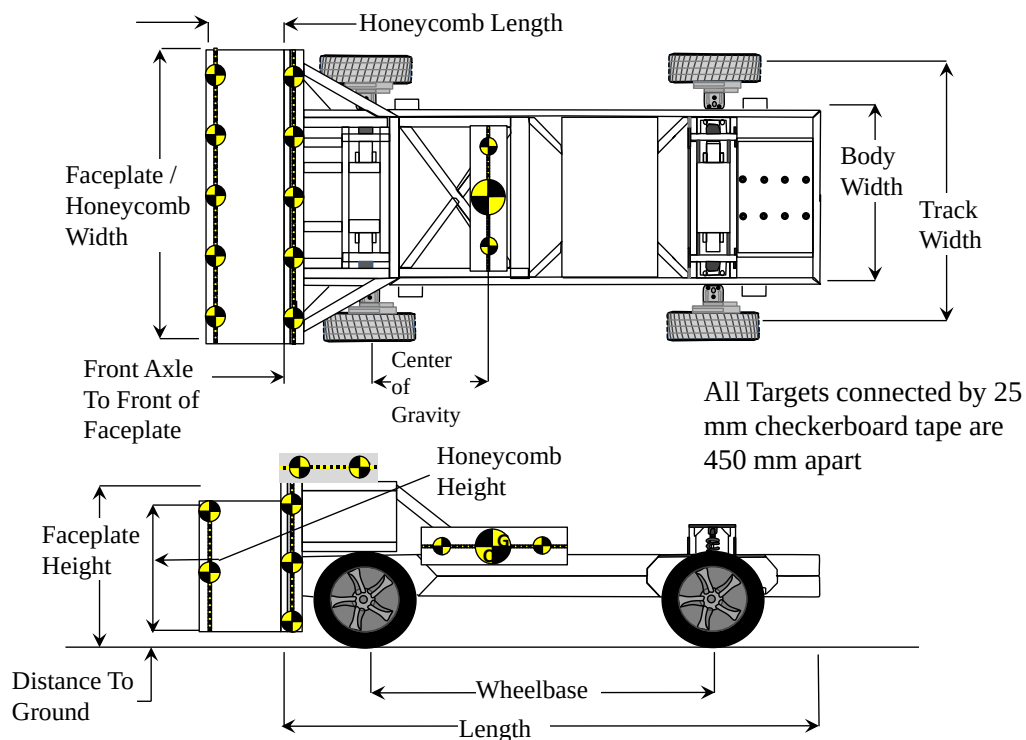
GROUND TARGETS LOCATED IN REFERENCE TO OMDB



DATA SHEET NO. 8 (CONTINUED)
OMDB PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015



Item	Units	Value	Item	Units	Value
Honeycomb Width	mm	2205	Faceplate Height	mm	1183
Honeycomb Length	mm	605	Faceplate to Ground	mm	83
Honeycomb Height	mm	947	Wheelbase	mm	2589
Left Front Axle to Front Faceplate	mm	600	Cart Length	mm	3993
Right Front Axle to Front Faceplate	mm	601	Body Width	mm	1301
Front Axle to CG	mm	926	Track Width	mm	1884

	Units	Front Axle	Rear Axle	Total
Left	kg	826	434	1260
Right	kg	792	467	1259
Ratio	%	64%	36%	
Total	kg	1618	901	2519
CG Aft of Front Axle	mm			926

Note: All targets on the OMDB honeycomb are 450mm apart

DATA SHEET NO. 9
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	105
Passenger Dummy Accelerometers	105
Vehicle Structure Accelerometers	27
SRS Inductive Pickups	12
OMDB Cart Accelerometers	9
Total	258

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	4
High-Speed Off-board	11
Real-Time Panning	2
Total	17

DATA SHEET NO. 10
POST TEST OBSERVATIONS

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Right Front Passenger
Dummy Type/Serial No.	THOR DO9798	THOR DL9207
Lower Leg Type	LX	LX
Lower Leg Serial No.	LX655/LX654	LX0045/ LX0046
Head Contact	Front & Curtain Airbag	Front Airbag
Upper Torso Contact	Front & Torso Airbag, Arm contacted door	Front Airbag, shoulder contacted center instrument panel
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Right Front Passenger
Locked/Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Closed & Operational	Closed & Operational
Rear Door Opening	Closed & Operational	Closed & Operational
Seat Track Shift (mm)	0	0
Seat Back Failure	No	No
Glazing Damage	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions	Photo Taken (Y/N)
Pillar Performance	C-Pillar Buckled	Y
Windshield Damage	Cracks throughout with minor separation	Y
Window Damage	None	Y
Other Notable Effects	None	--

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 11 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4542	4241	301
2	Rear Surface of Vehicle (RSOV) to Front of Engine	mm	4045	3937	108
3	RSOV to Firewall	mm	3565	3471	93
4	RSOV to Upper Leading Edge of Right Door	mm	3054	3051	3
5	RSOV to Upper Leading Edge of Left Door	mm	3054	3048	6
6	RSOV to Lower Leading Edge of Right Door	mm	3080	3072	9
7	RSOV to Lower Leading Edge of Left Door	mm	3079	3075	4
8	RSOV to Upper Trailing Edge of Right Door	mm	1975	1973	2
9	RSOV to Upper Trailing Edge of Left Door	mm	1973	1968	5
10	RSOV to Lower Trailing Edge of Right Door	mm	2030	2025	5
11	RSOV to Lower Trailing Edge of Left Door	mm	2027	2024	3
12	RSOV to Bottom of "A" Post of Right Side	mm	3097	3095	2
13	RSOV to Bottom of "A" Post of Left Side	mm	3097	3091	5
14	RSOV to Firewall, Right Side	mm	3560	3562	-2
15	RSOV to Firewall, Left Side	mm	3561	3283	278
16	RSOV to Steering Column	mm	2598	2603	-5
17	Center of Steering Column to "A" Post	mm	305	286	19
18	Center of Steering Column to Headliner	mm	448	410	38
19	RSOV to Right Side of Front Bumper	mm	4481	4437	44
20	RSOV to Left Side of Front Bumper	mm	4481	3922	558
21	Length of Engine Block	mm	437	394	43
RD	RSOV to Right Side of Dash Panel	mm	2822	2823	-1
CD	RSOV to Center of Dash Panel	mm	2718	2696	22
LD	RSOV to Left Side of Dash Panel	mm	2819	2808	11

UR* = Unrecoverable Data Point

DATA SHEET NO. 12
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

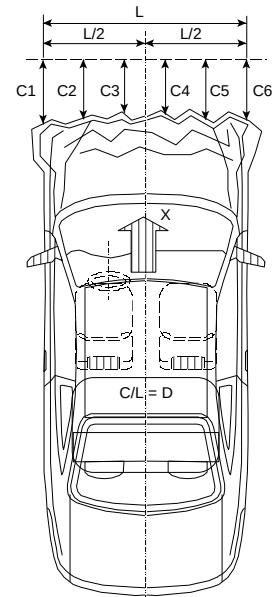
NHTSA No.: R20165410
Test Date: 11/17/2015

VEHICLE INFORMATION

VIN: JM3KE4BY5G0669192 Wheelbase (mm): 2696
Vehicle Size Category: Passenger Test Weight (kg): 1772

ACCELEROMETER DATA

Accelerometer Locations: As Described in Data Sheet No. 7
Cal. Procedure/Interval: Calspan Procedure / 6 month
Integration Algorithm: Trapezoidal
Linearity: > 99%
Impact Velocity (kph): 90.10
Velocity Change (kph): 90.10



CRUSH PROFILE

Collision Deformation Classification: 11FLEE5
Midpoint of Damage: C2
Damage Region Length (mm): 1360
Impact Mode: Frontal 15° Angle, 35% Left Offset

Crush Measurements: Bumper Cover

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4292	3578	714
C2	Crush zone 2 at left side	mm	4456	4016	440
C3	Crush zone 3 at left side	mm	4516	4155	361
C4	Crush zone 4 at right side	mm	4516	4288	228
C5	Crush zone 5 at right side	mm	4458	4354	104
C6	Crush zone 6 at right side	mm	4292	4382	-90
L	C1 to C6	mm	1360	1268	92

Crush Measurements: Bumper Cover Removed

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
B1	Bumper Beam 1 at left side	mm	4346	4016	-330
B2	Bumper Beam 2 at left side	mm	4374	4077	-297
B3	Bumper Beam 3 at left side	mm	4402	4139	-263
B4	Bumper Beam 4 at left side	mm	4414	4201	-213
B5	Bumper Beam 5 at right side	mm	4418	4253	-165
B6	Bumper Beam 6 at right side	mm	4415	4295	-120
B7	Bumper Beam 7 at right side	mm	4401	4329	-72
B8	Bumper Beam 8 at right side	mm	4374	4351	-23
B9	Bumper Beam 9 at right side	mm	4346	4364	18
L	B1 to B9	mm	1010	940	70

DATA SHEET NO. 13
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

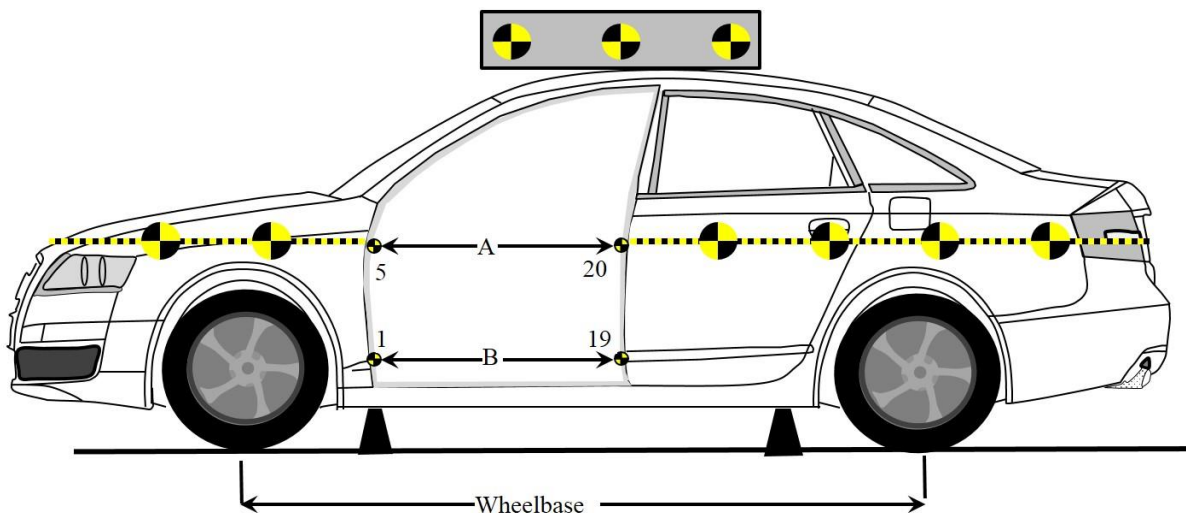
NHTSA No.: R20165410
Test Date: 11/17/2015

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	851	846	-5
B	Left Side Lower	mm	699	698	0
D	Right Side Upper	mm	853	852	-1
E	Right Side Lower	mm	700	700	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2696	2499	-197
F	Right Side Wheelbase	mm	2696	2672	-24



DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

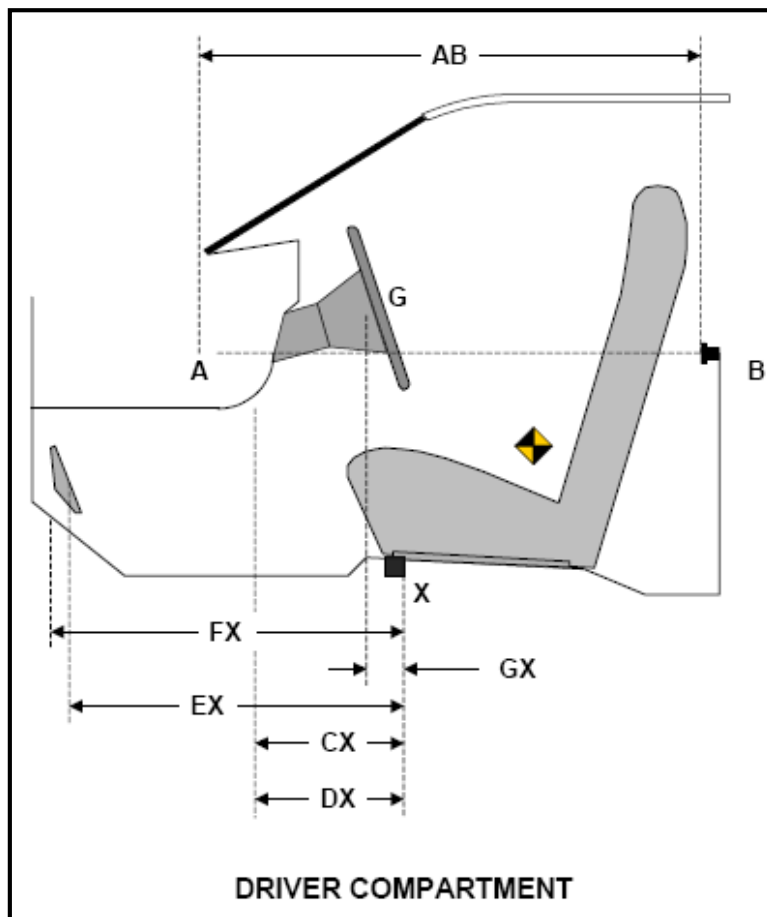
Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	787	788	1
CX	Left Knee Bolster to X	mm	289	287	-2
DX	Right Knee Bolster to X	mm	288	287	-1
EX	Brake Pedal to X	mm	528	582	54
FX	Foot Rest to X	mm	671	645	-26
GX	Center of Steering Column Wheel Hub to X	mm	45	49	4

X = Front of Seat Track (Stationary)

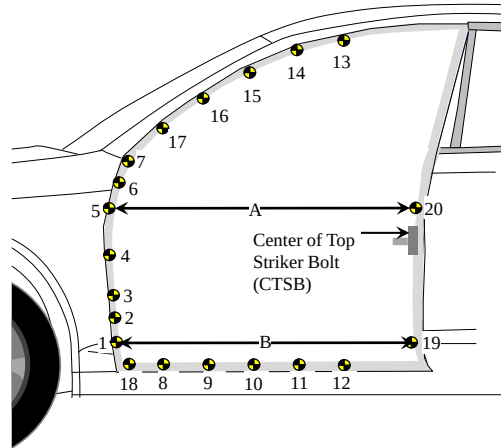


DATA SHEET NO.13 (CONTINUED) **VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

DRIVER SIDE DOOR SILL INTRUSIONS



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

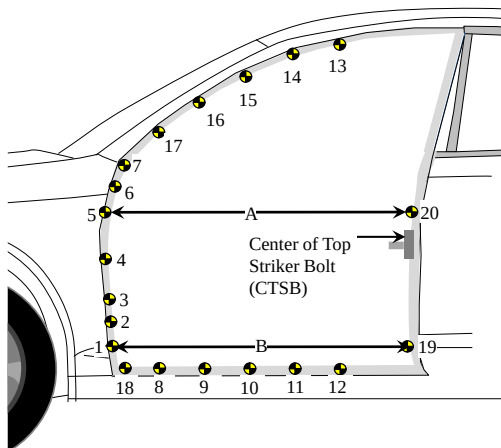
Point	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	2947	-752	89	2945	-760	86	-2	-8	-3
2	2957	-747	13	2954	-757	9	-3	-10	-4
3	2952	-745	-62	2948	-758	-66	-4	-13	-4
4	2941	-740	-212	2936	-760	-216	-5	-20	-4
5	2930	-744	-362	2925	-769	-366	-5	-25	-4
6	2925	-750	-437	2920	-773	-442	-5	-23	-5
7	2916	-752	-512	2912	-777	-517	-4	-25	-5
17	2835	-731	-611	2833	-754	-615	-2	-23	-4
16	2722	-706	-690	2720	-726	-693	-2	-20	-3
15	2600	-679	-763	2600	-696	-766	0	-17	-3
14	2475	-652	-823	2476	-667	-827	1	-15	-4
13	2346	-630	-867	2347	-643	-871	1	-13	-4
20	2078	-744	-362	2079	-751	-361	1	-7	1
19	2245	-755	89	2247	-761	89	2	-6	0
12	2196	-757	27	2196	-759	25	0	-2	-2
11	2347	-756	144	2349	-761	143	2	-5	-1
10	2496	-756	154	2496	-763	153	0	-7	-1
9	2646	-755	154	2647	-762	152	1	-7	-2
8	2798	-755	156	2798	-761	152	0	-6	-4
18	2872	-755	149	2870	-760	148	-2	-5	-1

DATA SHEET NO.13 (CONTINUED) **VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

PASSENGER SIDE DOOR SILL INTRUSIONS



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

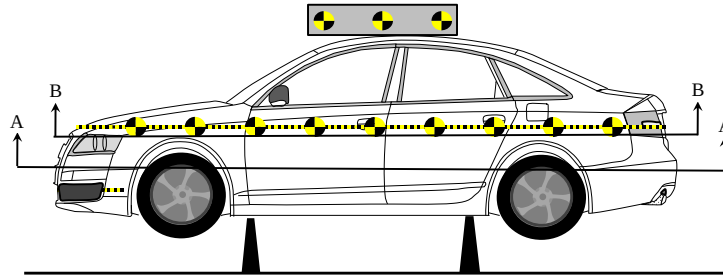
Point	Pre-Test			Post-Test			Difference		
	X	Y	Z	X	Y	Z	X	Y	Z
1	2949	757	88	2947	766	92	-2	9	4
2	2961	751	13	2958	762	18	-3	11	5
3	2956	747	-63	2954	757	-59	-2	10	4
4	2943	742	-212	2942	751	-208	-1	9	4
5	2933	747	-363	2931	752	-358	-2	5	5
6	2927	748	-437	2925	754	-433	-2	6	4
7	2919	750	-512	2916	754	-509	-3	4	3
17	2832	729	-618	2830	730	-612	-2	1	6
16	2725	704	-691	2724	704	-685	-1	0	6
15	2603	676	-764	2602	673	-758	-1	-3	6
14	2478	649	-825	2477	644	-820	-1	-5	5
13	2349	627	-869	2349	621	-862	0	-6	7
20	2080	742	-363	2079	742	-361	-1	0	2
19	2250	758	88	2247	761	89	-3	3	1
12	2198	755	23	2197	757	25	-1	2	2
11	2348	760	142	2348	764	143	0	4	1
10	2498	758	152	2497	766	155	-1	8	3
9	2648	758	152	2648	766	155	0	8	3
8	2798	758	152	2797	767	155	-1	9	3
18	2873	758	147	2872	768	151	-1	10	4

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A



Reference point:

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

Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
1	2016	-912	47	1	2013	-910	46
2	2259	-912	46	2	2152	-912	46
3	2556	-908	47	3	2315	-912	46
4	2860	-905	47	4	2511	-913	46
5	3075	-906	47	5	2714	-912	47
6	3191	-915	46	6	2993	-910	47
7	4006	-913	46	7	3070	-930	46
8	4207	-840	47	8	3081	-952	47
9	4325	-643	47	9	3122	-994	46
10	4408	-559	46	10	3202	-990	46
11	4467	-392	47	11	3524	-757	47
12	4504	-214	47	12	3641	-723	47
13	4531	2	46	13	3673	-684	46
14	4527	72	47	14	3620	-586	47
15	4496	278	46	15	3579	-538	47
16	4433	511	46	16	3572	-477	47
17	4322	643	47	17	3643	-469	46
18	4211	835	46	18	3746	-473	46
19	4127	881	47	19	3817	-458	46
20	4008	910	46	20	3895	-463	47
21	3195	915	46	21	3881	-377	46
22	2948	905	47	22	3938	-287	46
23	2643	908	46	23	3999	-199	46
24	2386	912	46	24	4069	-37	47
25	2168	915	46	25	4207	1	46

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A (Continued)

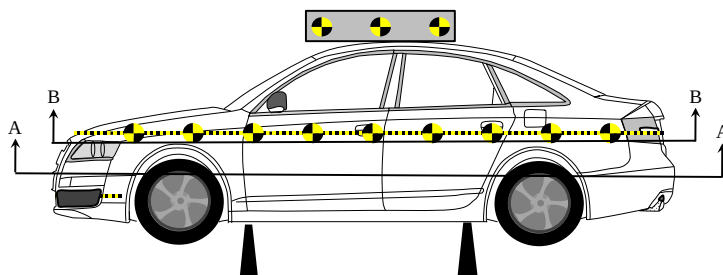
Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
26	2020	914	46	26	4275	170	46
				27	4327	342	46
				28	4360	488	47
				29	4377	629	46
				30	4299	582	46
				31	4144	559	46
				32	4139	702	46
				33	4127	804	46
				34	3992	814	46
				35	3977	907	46
				36	3969	924	47
				37	3191	920	46
				38	3113	910	46
				39	3071	919	47
				40	2811	901	47
				41	2531	905	46
				42	2328	909	47
				43	2122	911	46
				44	2014	911	46

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B



Reference point:

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

Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
1	2012	-910	-241	1	2001	-914	-241
2	2196	-910	-241	2	2156	-918	-240
3	2415	-910	-240	3	2321	-921	-240
4	2622	-909	-240	4	2448	-922	-240
5	2852	-907	-240	5	2681	-925	-241
6	3088	-908	-240	6	2926	-930	-240
7	3326	-917	-241	7	3081	-932	-240
8	3644	-917	-240	8	3095	-997	-240
9	3820	-907	-240	9	3144	-1017	-240
10	4025	-871	-240	10	3190	-1013	-240
11	4201	-794	-241	11	3304	-866	-240
12	4306	-643	-240	12	3350	-755	-240
13	4392	-488	-241	13	3411	-721	-240
14	4471	-289	-241	14	3420	-629	-240
15	4496	-79	-241	15	3438	-561	-246
16	4507	2	-241	16	3517	-481	-241
17	4486	187	-240	17	3585	-415	-241
18	4466	324	-240	18	3626	-329	-241
19	4443	403	-240	19	3673	-310	-240
20	4368	526	-240	20	3765	-271	-240
21	4249	741	-240	21	3871	-188	-241
22	4068	862	-241	22	3965	-90	-241
23	3800	908	-241	23	4042	-29	-240
24	3631	918	-240	24	4121	125	-240
25	3389	913	-240	25	4229	292	-240

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

VEHICLE EXTERIOR CRUSH PROFILE
SECTION B-B (Continued)

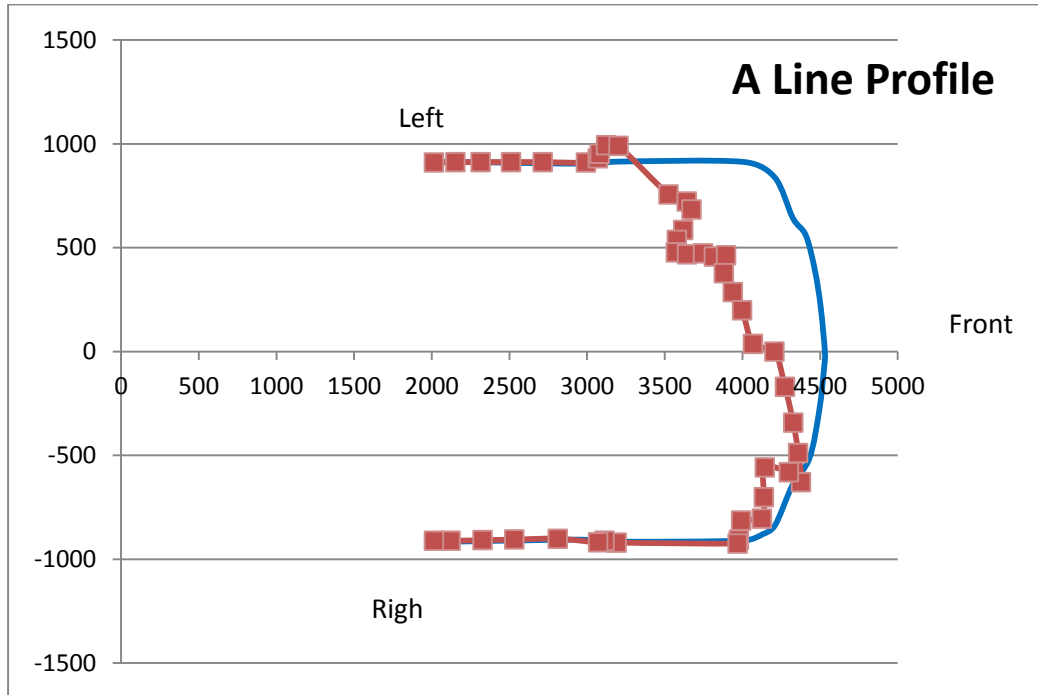
Point	Pre-Test			Point	Post-Test		
	X	Y	Z		X	Y	Z
26	3098	909	-240	26	4311	364	-240
27	2789	908	-240	27	4292	505	-241
28	2353	910	-241	28	4300	650	-240
29	2077	911	-240	29	4188	817	-241
30	2011	910	-241	30	4053	878	-241
				31	3837	918	-241
				32	3645	926	-240
				33	3381	929	-241
				34	3241	924	-240
				35	3089	918	-241
				36	2868	914	-241
				37	2582	912	-240
				38	2338	912	-240
				39	2127	911	-241
				40	2005	909	-241

DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

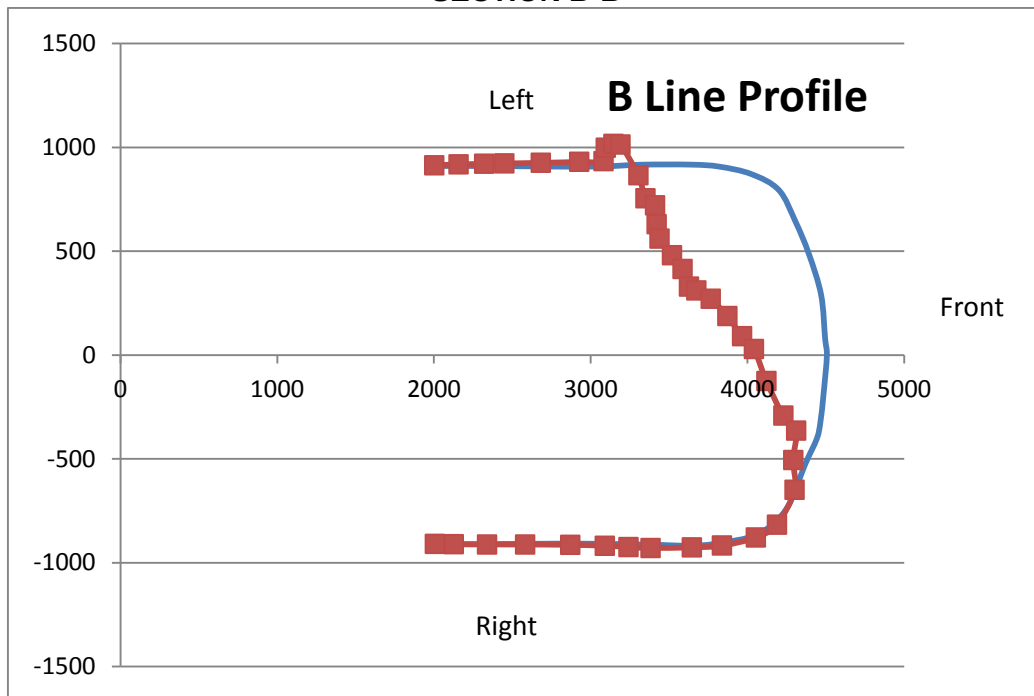
Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

VEHICLE EXTERIOR CRUSH PROFILE
SECTION A-A



SECTION B-B



DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

STRUCTURAL BUMPER BEAM POINTS

	Point	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
		X	Y	Z	X	Y	Z	X	Y	Z
Structural Bumper Beam	B1	4346	-504	48	4016	-356	-73	-330	148	-121
	B2	4374	-377	47	4077	-243	-55	-297	134	-102
	B3	4402	-252	48	4139	-133	-31	-263	119	-79
	B4	4414	-121	47	4201	-22	-13	-213	99	-60
	B5	4418	9	47	4253	98	6	-165	89	-41
	B6	4415	138	47	4295	218	24	-120	80	-23
	B7	4401	264	47	4329	340	42	-72	76	-5
	B8	4374	389	48	4351	465	57	-23	76	9
	B9	4346	506	48	4364	584	72	18	78	24

Reference point:

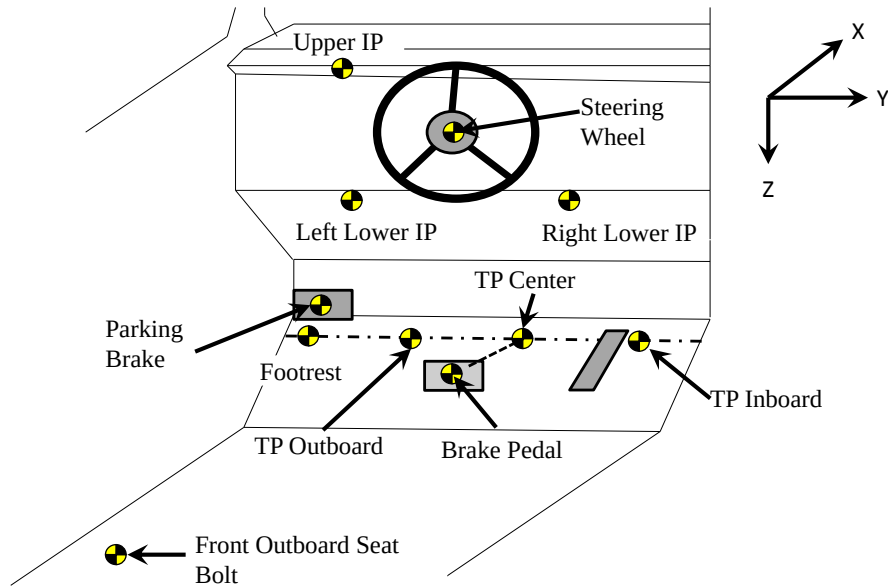
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.13 (CONTINUED) **VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

DRIVER FLOOR PAN MEASUREMENTS



Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
TP Inboard	3347	-177	88	3309	-175	76	-38	2	-12
TP Center	3360	-327	88	3281	-319	67	-79	8	-21
TP Outboard	3306	-478	87	3252	-450	69	-54	28	-18
TP Footrest	3215	-578	88	3191	-564	77	-24	14	-11
Brake Pedal	3073	-327	88	3128	-349	139	55	-22	51
Left Lower IP	2833	-521	-201	2833	-537	-213	0	-16	-12
Right Lower IP	2833	-221	-201	2832	-239	-205	-1	-18	-4
Upper IP	2795	-621	-337	2786	-637	-345	-9	-16	-8
Steering Column	2590	-371	-455	2595	-412	-486	5	-41	-31
Front Outboard Bolt	2545	-611	157	2545	-611	157	0	0	0
Emergency Brake									

Reference point:

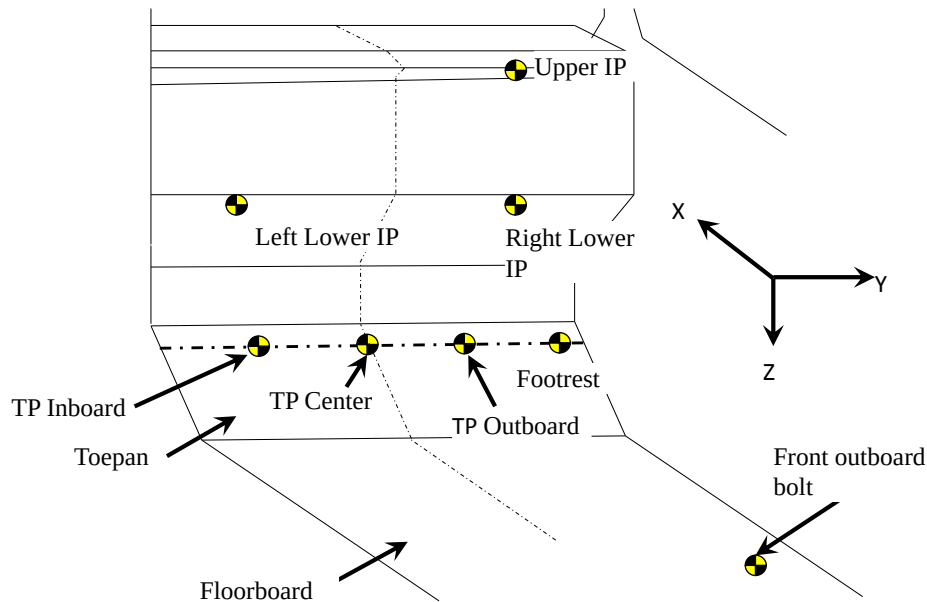
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.13 (CONTINUED) **VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

PASSENGER FLOOR PAN MEASUREMENTS



Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	X	Y	Z	X	Y	Z	X	Y	Z
TP Inboard	3345	221	89	3281	274	51	-64	53	-38
TP Center	3361	372	89	3359	383	90	-2	11	1
TP Outboard	3254	522	88	3254	534	93	0	12	5
TP Footrest	3200	622	89	3200	635	93	0	13	4
Left Lower IP	2803	221	-203	2842	199	-208	39	-22	-5
Right Lower IP	2844	522	-204	2864	502	-198	20	-20	6
Upper IP	2798	622	-391	2801	608	-388	3	-14	3
Front Outboard Bolt	2550	611	157	2550	616	158	0	5	1

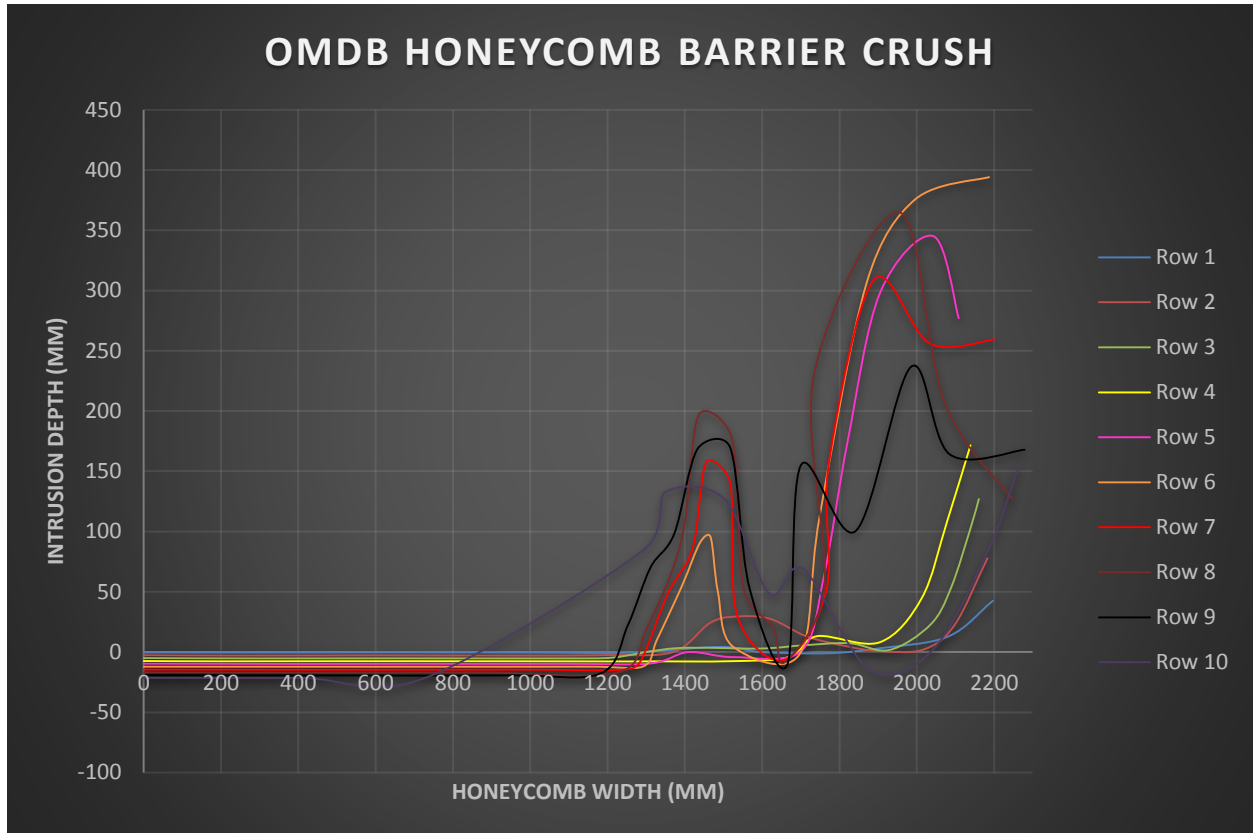
Reference point:

- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the 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
OMDB CRUSH MEASUREMENTS

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015



DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015

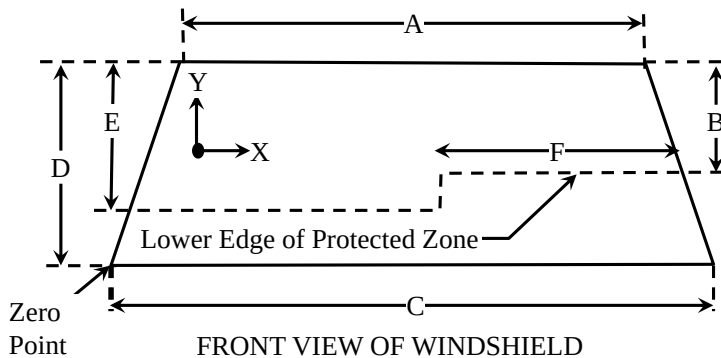
Please provide windshield mounting details. A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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

Temperature of windshield molding during test: 21°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2329	1741	74.8
Right Side	2329	2329	100
Total	4658	4070	87.4



Item	Units	Value
A	mm	1426
B	mm	530
C	mm	1502
D	mm	865
E	mm	540
F	mm	495

AREAS OF PROTECTED ZONE FAILURES

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

- No penetration

X	Y

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

- No Penetration

X	Y

DATA SHEET NO. 15 (CONTINUED)
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2016 Mazda CX-5 SUV
Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
Test Date: 11/17/2015

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Ambient Temperature at Test Vehicle Time of Impact: 21.1° C

Test Time: 11:13 AM

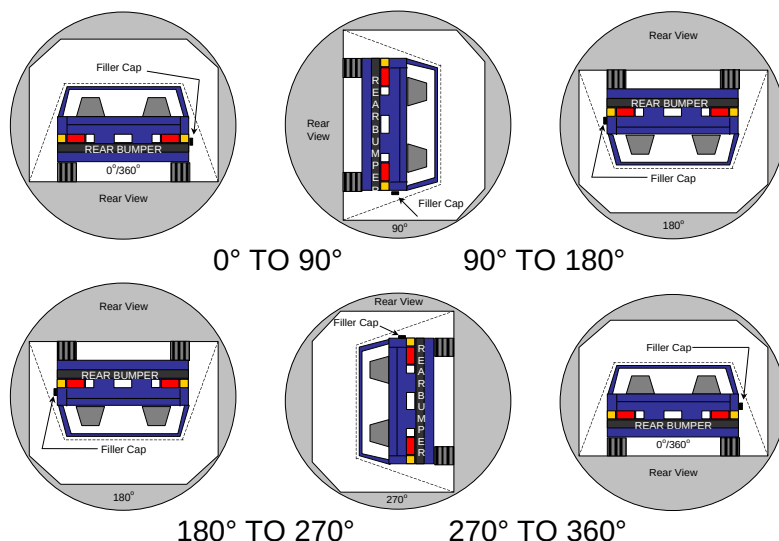
Stoddard Solvent Spillage Measurements

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: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015



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).

3. Details of Stoddard Solvent spillage: None

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	74	300	374
90° to 180°	63	300	363
180° to 270°	61	300	361
270° to 360°	66	300	366

FMVSS 301 SPILLAGE TABLE

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

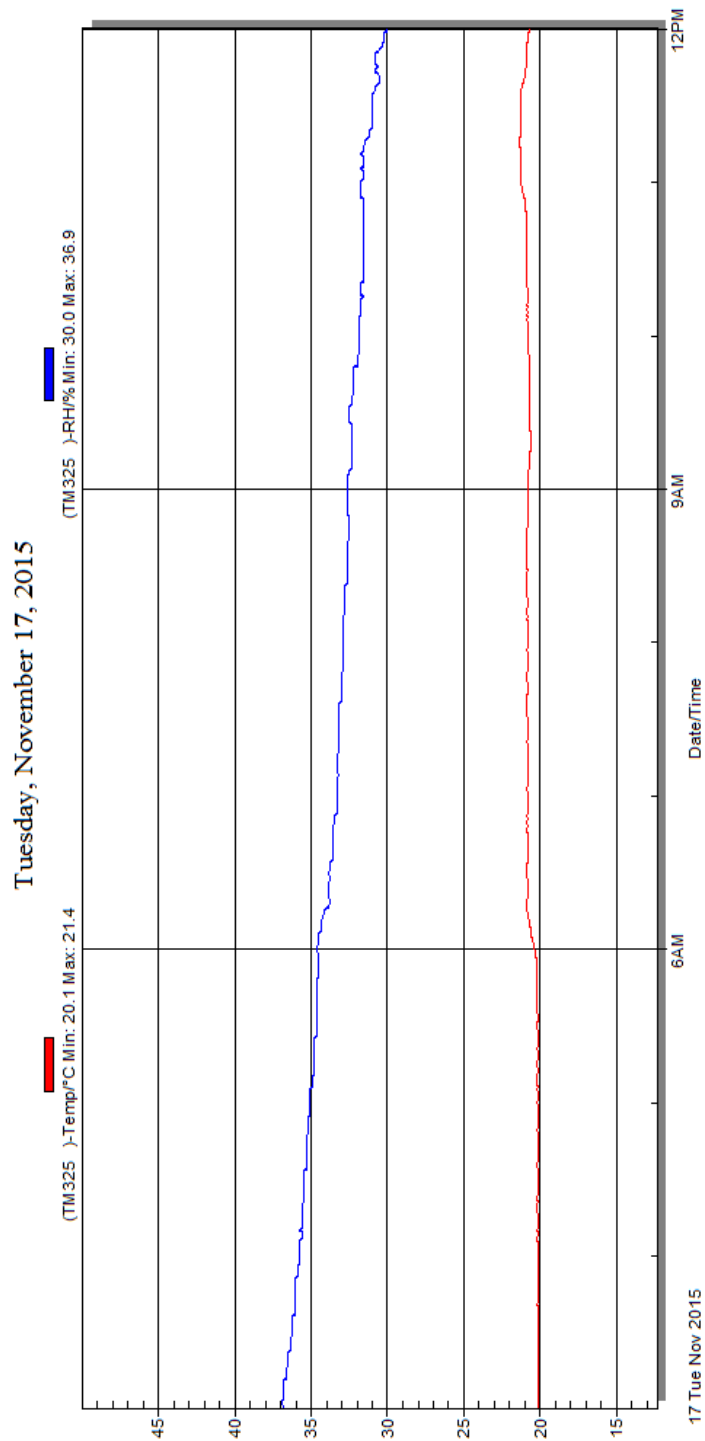
SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 17 **DUMMY/VEHICLE TEMPERATURE STABILIZATION**

Test Vehicle: 2016 Mazda CX-5 SUV
 Test Program: R&D 90.1kph, 15° / 35% Left Oblique Offset

NHTSA No.: R20165410
 Test Date: 11/17/2015



Temperature Stabilization Chart/Data

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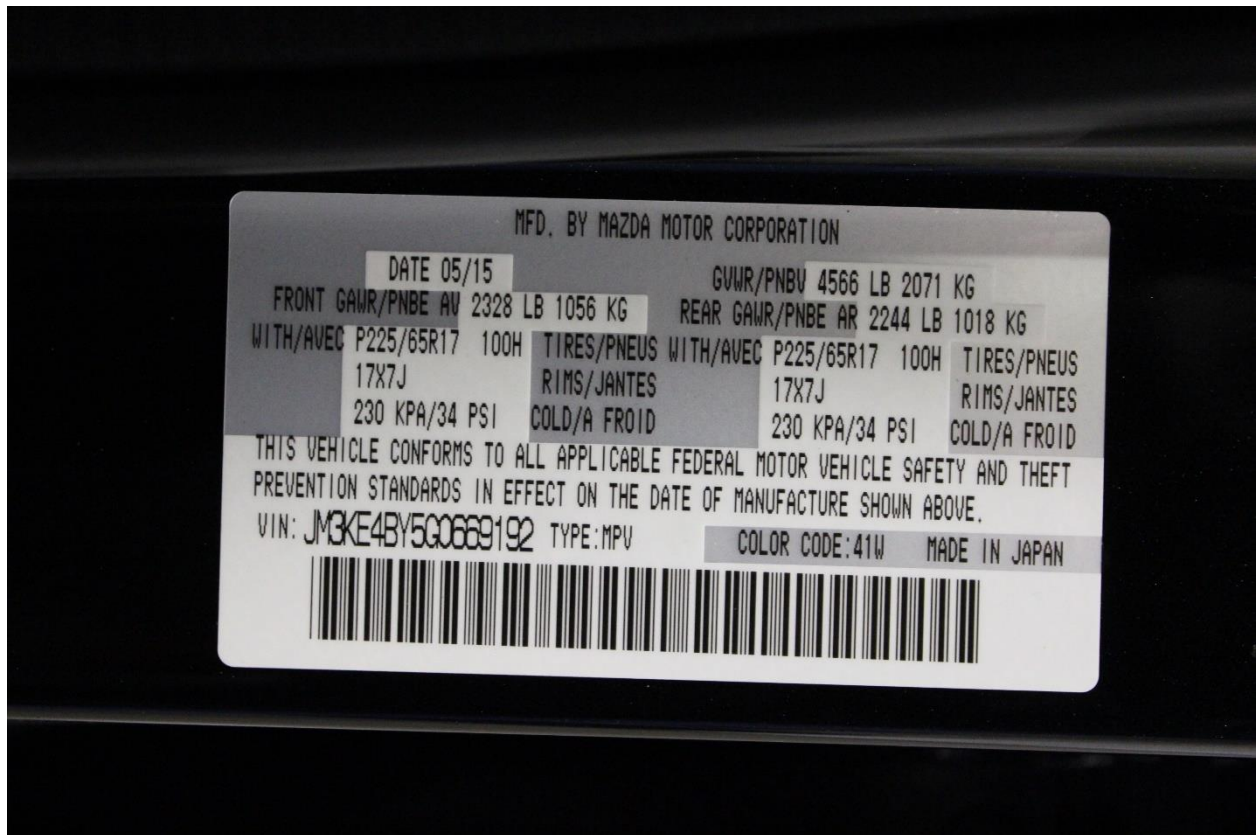
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No. 001 As Delivered Right Front 3-4 View of Test Vehicle



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



No. 003 Test Vehicle Certification Label



No. 004 Test Vehicle Tire Placard



No. 005 Pre-Test Front View of Test Vehicle



No. 006 Post-Test Front View of Test Vehicle



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



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



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



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



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



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



No. 013 Pre-Test Rear View of Test Vehicle



No. 014 Post-Test Rear View of Test Vehicle



No. 015 Pre-Test Right Rear 3-4 View of Test Vehicle



No. 016 Post-Test Right Rear 3-4 View of Test Vehicle



No. 017 Pre-Test Right Side View of Test Vehicle



No. 018 Post-Test Right Side View of Test Vehicle



No. 019 Pre-Test Right Front 3-4 View of Test Vehicle



No. 020 Post-Test Right Front 3-4 View of Test Vehicle


mazda

SKYACTIV TECHNOLOGY

Scan for Vehicle Info and offers


2016 CX-5
 Model: 2016 CX-5 SPORT ALL WHEEL DRIVE
 Exterior Color: JET BLACK MICA
 Interior Color: BLACK

Fuel Economy and Environment
 EPA DOT
Fuel Economy
26 MPG
combined city highway
 24 30
 3.8 gallons per 100 miles

You save \$250
 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,750

Fuel Economy & Greenhouse Gas Rating (EPA est.)
 1 6 10
This vehicle emits 337 grams CO₂ per mile. The best emits 0 grams per mile (battery only). Producing and distributing fuel also create emissions, learn more at fueleconomy.gov.

Smog Rating (EPA est.)
 1 5 10
Best

Actual results may vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs \$8,900 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.
fueleconomy.gov
calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated		
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.		
Frontal Crash	Driver Passenger	Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
Side Crash	Front seat ★★★★★	
	Rear seat ★★★★★	
Based on the risk of injury in a side impact.		
Rollover	★★★★★	
Based on the risk of rollover in a single vehicle crash.		

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
 Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

SALES INFORMATION
 SOLD TO: 61591
 DAHL MAZDA
 711 S 3RD ST
 LA CROSSE, WI 54601

SHIP TO: 61591 DY
 DAHL MAZDA
 711 S 3RD ST
 LA CROSSE, WI 54601

JM3KE4BY5G0669192

CX5-SP-XA-KAGPHAN-TA-20150616

MAZDAUSA.COM

PARTS CONTENT INFORMATION:
 FOR VEHICLES IN THIS COUNTRY, U.S./CANADIAN PARTS CONTENT: 0%
 MAJOR SOURCES OF FOREIGN PARTS CONTENT: JAPAN 95%
 NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.
 FOR THIS VEHICLE:
 FINAL ASSEMBLY POINT: HIROSHIMA, JAPAN
 COUNTRY OF ORIGIN: JAPAN
 TRANSMISSION: JAPAN
 This label is affixed pursuant to the Federal Automobile Disclosure Act. Guidelines and Title fees, State and Local taxes, and Dealer installed options are not included.

STANDARD EQUIPMENT
ENGINE/MECHANICAL FEATURES

- SKYACTIV G-2.5L ENGINE
- SKYACTIV DRIVE 6SPD SPORT MODE AT 194 HORSEPOWER, 185 LB-FT TORQUE
- ALL-WHEEL DRIVE

EXTERIOR FEATURES

- 17" TUNIC-ALLOY WHEELS
- P225/55 R17 ALL-SEASON TIRES
- VARIABLE INTERMITTENT WIPERS
- FIXED-INTERMITTENT REAR WIPER
- POWER MIRRORS W/TURN LAMPS

INTERIOR FEATURES

- 6-PASSENGER SEATING
- TILT & TELESCOPIC STEERING COLUMN
- STEERING WHEEL W/AUDIO/CRUISE CONTROLS
- POWER AUTOMATIC DOOR LOCKS
- POWER WINDOWS W/DRIVER ONE-TOUCH
- CLOTH TRIMMED SPORT SEATS
- 6-WAY MANUAL DRIVER'S SEAT
- MID W/TRIP COMPUTER
- ELECTRONIC PARKING BRAKE

SAFETY AND SECURITY FEATURES

- 60MO/OK MI POWERTRAIN & 36MO/36K MI BUMPER-TO-BUMPER WARRANTY
- 24-HOUR ROADSIDE ASSISTANCE
- 5-PASSENGER 3-POINT SAFETY BELTS
- LATCH CHILD SAFETY SEAT ANCHORS
- ANTI-THEFT ENGINE IMMOBILIZER
- TIRE PRESSURE MONITORING SYSTEM
- SKYACTIV BODY - RING STRUCTURE

4-WHEEL DISC BRAKES

- ELECTRIC POWER ASSISTED STEERING
- INDEPENDENT FRONT/REAR SUSPENSION
- FRONT & REAR STABILIZER BARS

HALOGEN HEADLIGHTS

- DAYTIME RUNNING LIGHTS
- BRIGHT FINISH EXHAUST OUTLETS
- REAR ROOF SPOILER
- ROOF MOUNTED SHARK FIN ANTENNA

REMOTE KEYLESS ENTRY

- PUSH BUTTON ENGINE START
- AIR CONDITIONING W/ FOLLEN FILTER
- AM/FM/CD/MP3 4-SPEAKER AUDIO
- AUXILIARY JACK & USB AUDIO INPUT
- BLUETOOTH HANDS FREE PHONE/AUDIO
- DUAL VANITY MIRRORS
- CENTER ARMREST W/COVERED STORAGE
- 60/40 SPLIT FOLD-DOWN REAR SEAT
- CARPETED FLOOR MATS

ANTI-LOCK BRAKE SYSTEM (ABS)

- WITH EBD & BRAKE ASSIST
- DYNAMIC STABILITY CONTROL (DSC)
- TRACTION CONTROL SYSTEM (TCS)
- HILL LAUNCH ASSIST
- ADVANCED DUAL FRONT AIRBAGS
- FRONT SIDE IMPACT AIR BAGS
- FRONT & REAR SIDE AIR CURTAINS

OPTIONAL EQUIPMENT

18V REAR CAMERA PACKAGE	\$400
REARVIEW CAMERA	
7" COLOR TOUCH-SCREEN DISPLAY	
MULTI-FUNCTION COMMANDER CONTROL	
HD RADIO	\$24,845
Total Vehicle and Options	\$24,845
Delivery, Processing and Handling Fee	\$895
Total MSRP	\$25,725

MSRP \$24,445

No. 021 Monroney Label Photograph



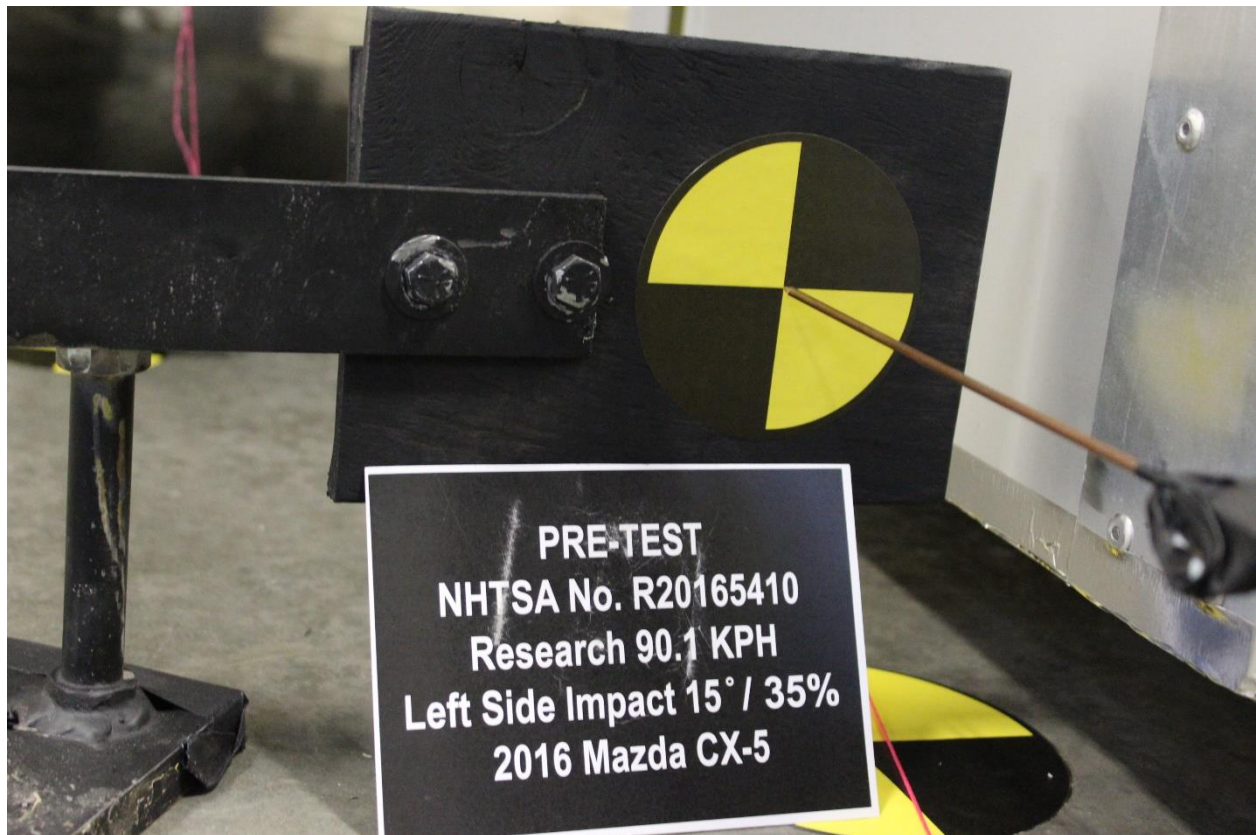
No. 022 Pre-Test Overhead View of OMDB against target vehicle at ideal Impact Point



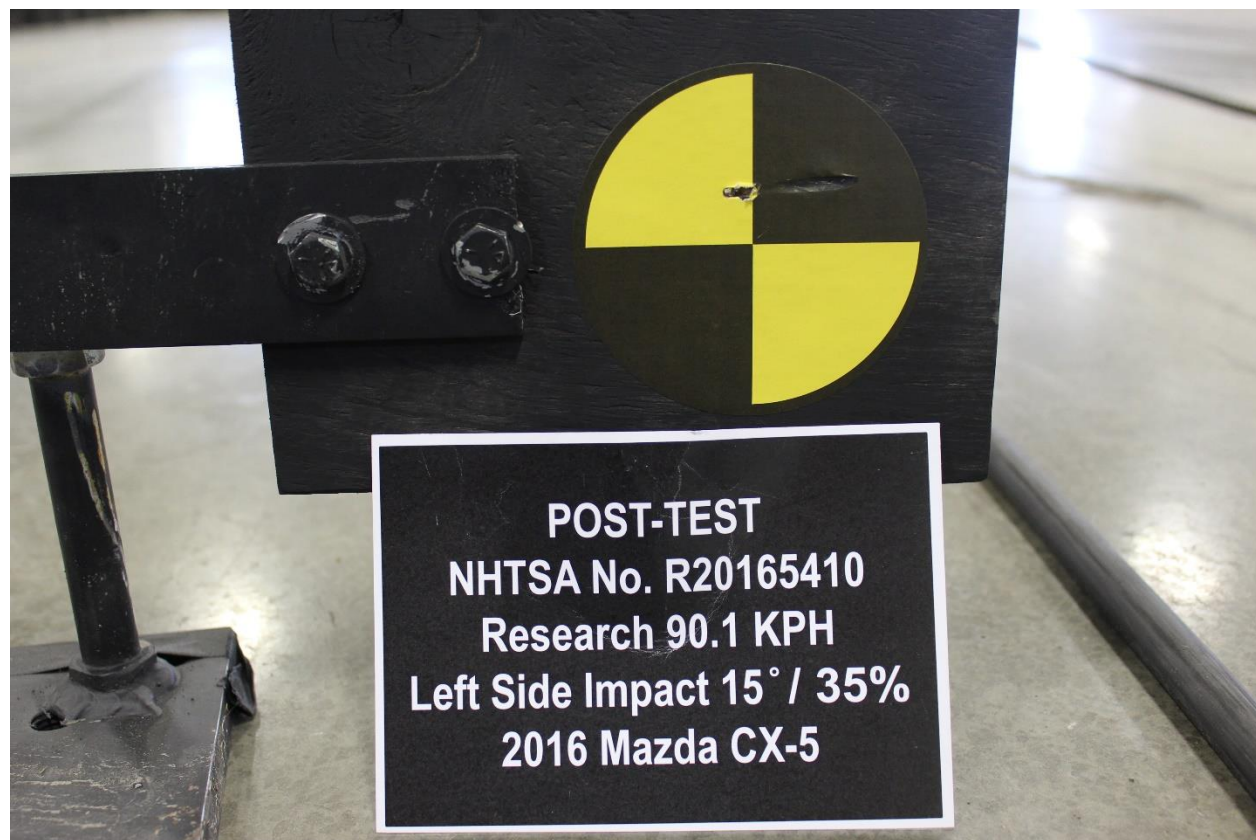
No. 023 Pre-Test Left Side View of OMDB against target vehicle at ideal Impact Point



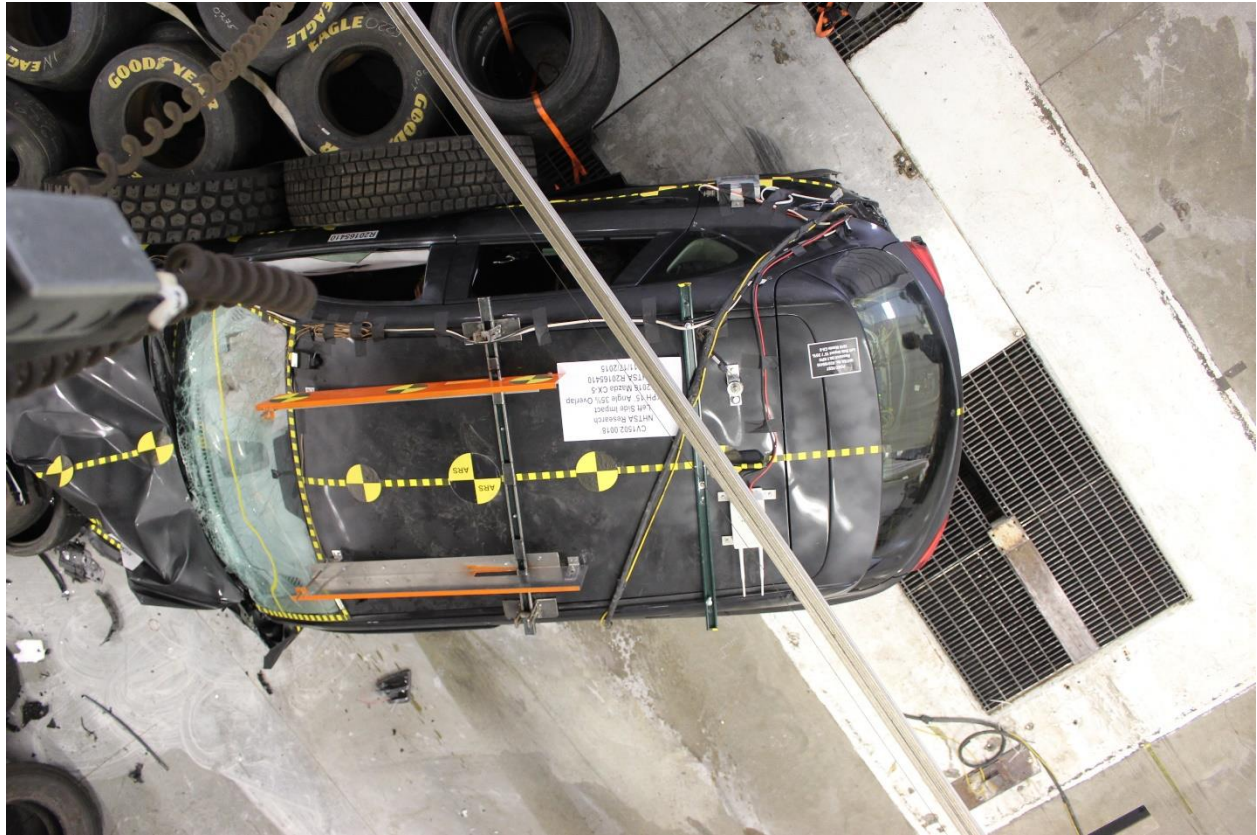
No. 024 Pre-Test Right Side View of OMDB against target vehicle at ideal Impact Point

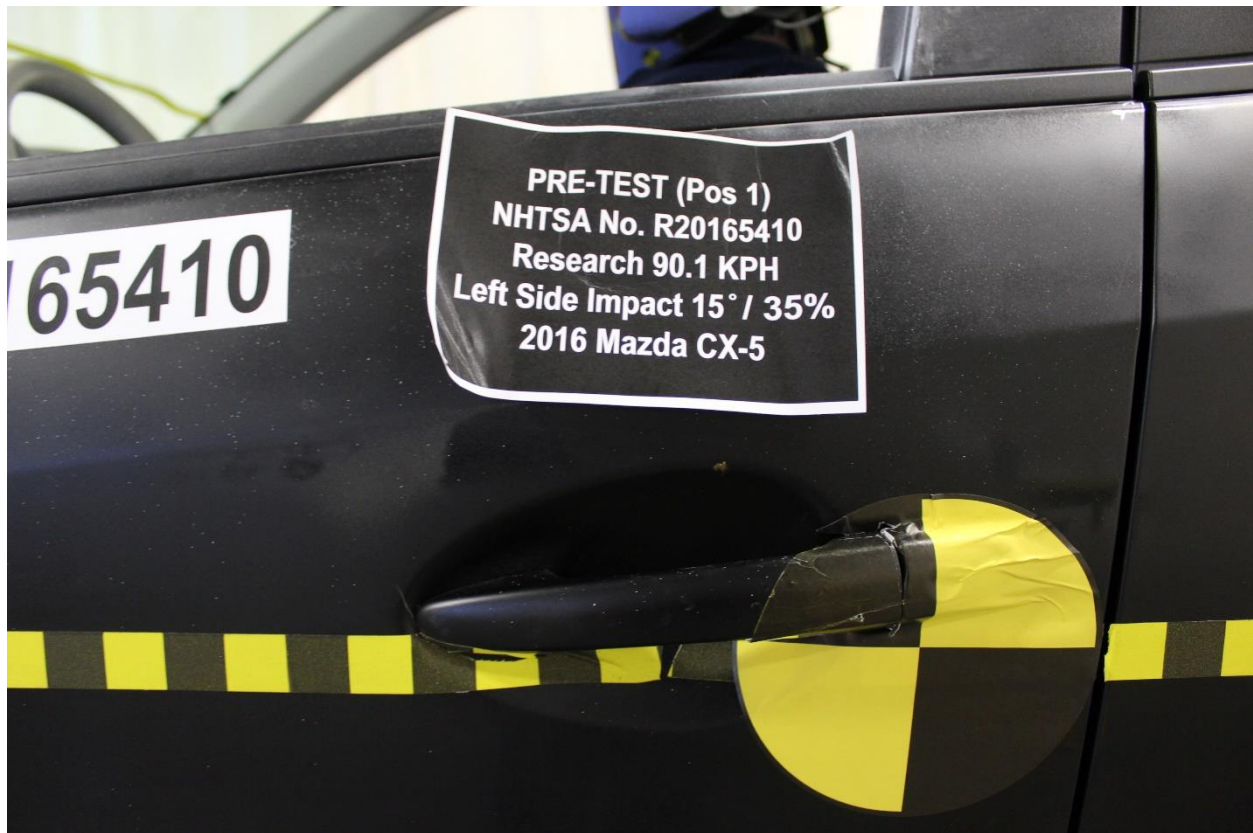


No. 025 Pre-Test Close-up View of Impact Point



No. 026 Post-Test Close-up View of Impact Point

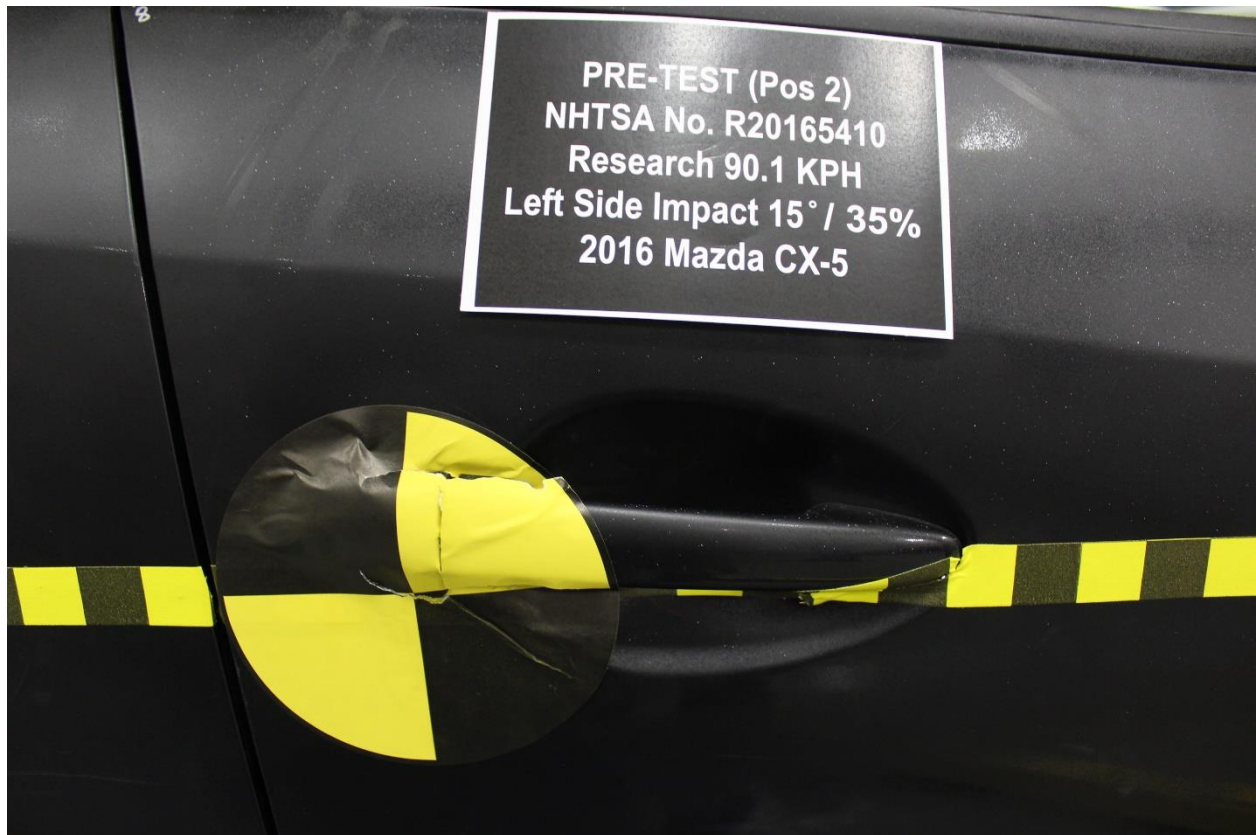




No. 028 Pre-Test Close-up View of Driver Door Latch



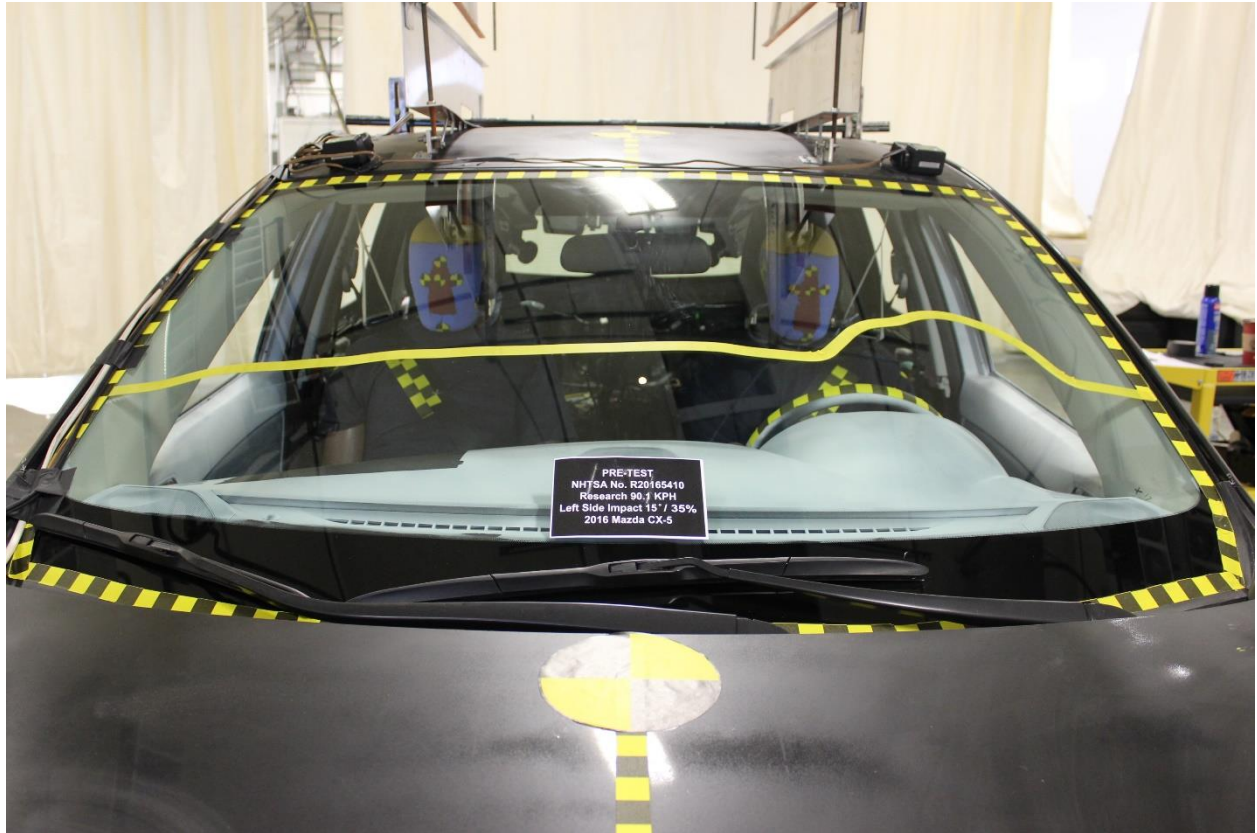
No. 029 Post-Test Close-up View of Driver Door Latch



No. 030 Pre-Test Close-up View of Passenger Door Latch



No. 031 Post-Test Close-up View of Passenger Door Latch



No. 032 Pre-Test Windshield View



No. 033 Post-Test Windshield View



No. 034 Pre-Test View of Driver Inner Door Panel



No. 035 Post-Test View of Driver Inner Door Panel



No. 036 Pre-Test View of Passenger Inner Door Panel



No. 037 Post-Test View of Passenger Inner Door Panel

Photo Not Available

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



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



No. 040 Pre-Test Left Side View of Driver Knee Bolsters



No. 041 Post-Test Left Side View of Driver Knee Bolsters



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



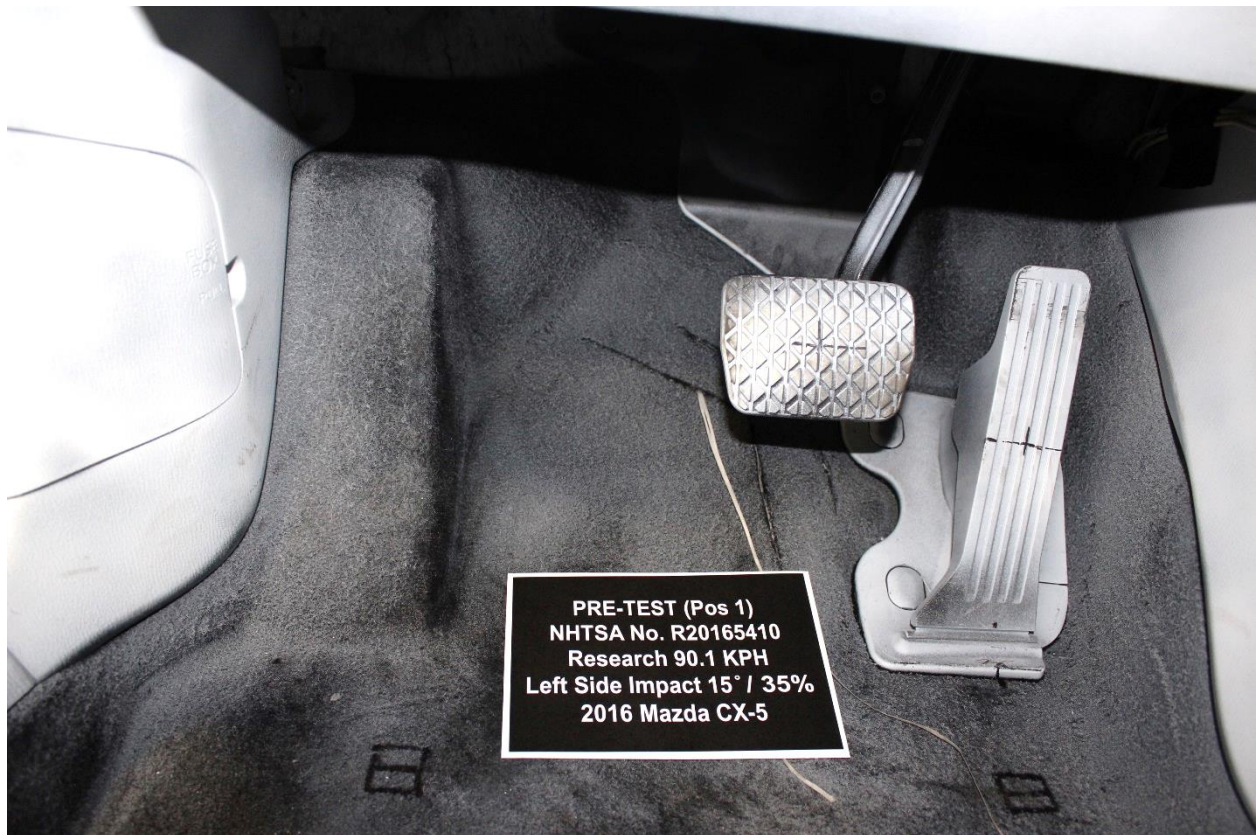
No. 043 Post-Test Right Side View of Driver Knee Bolsters



No. 044 Pre-Test View of Driver Floor pan at Left sill level, w/carpet



No. 045 Post-Test View of Driver Floor pan at Left sill level, w/carpet



No. 046 Pre-Test View of Driver Floor pan at Mid seat level, w/carpet



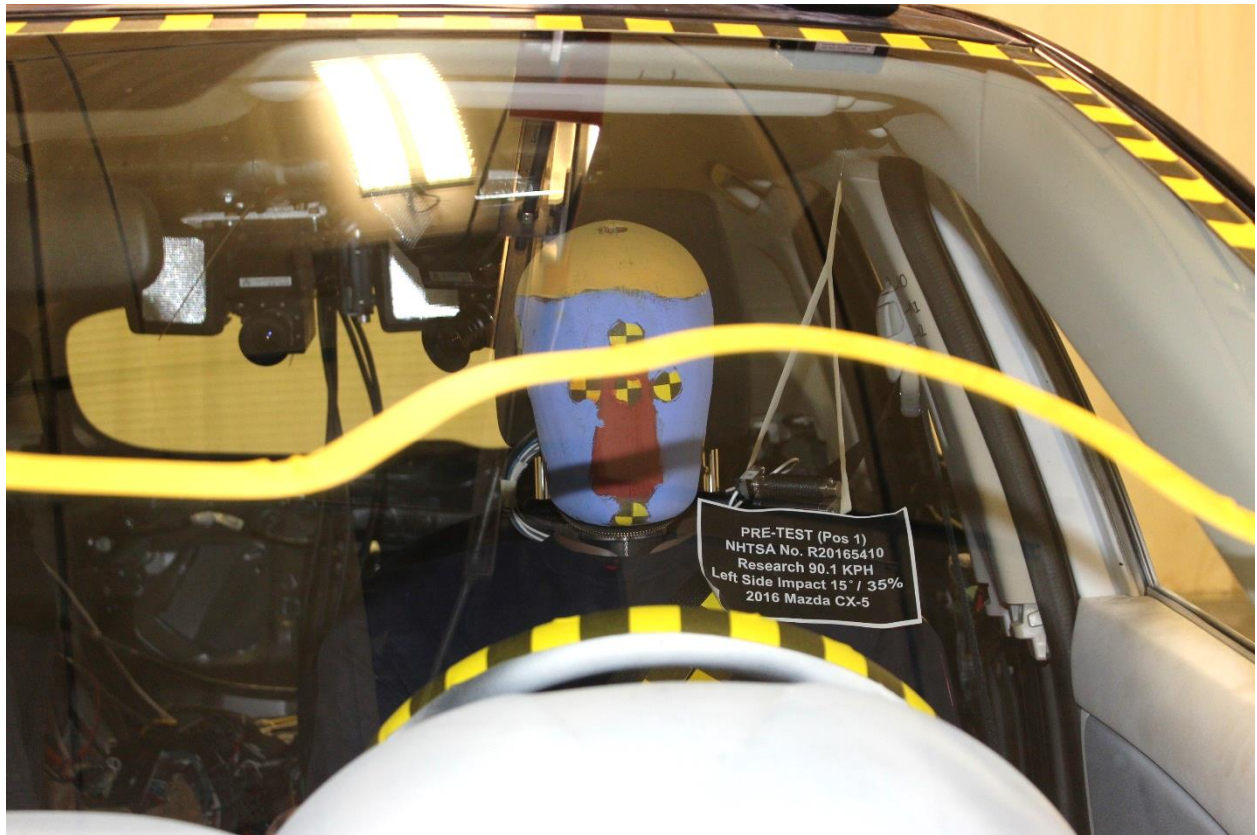
No. 047 Post-Test view of Driver Floor pan at Mid seat level, w/carpet



No. 048 Pre-Test View of Driver Floor pan at Right Side



No. 049 Post-Test View of Driver Floor pan at Right Side



No. 050 Pre-Test Driver Front Windshield View



No. 051 Post-Test Driver Front Windshield View



No. 052 Pre-Test Left Side View of Driver and Interior



No. 053 Post-Test Left Side View of Driver and Interior



No. 054 Pre-Test Left Side Driver Window View



No. 055 Post-Test Left Side Driver Window View



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



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



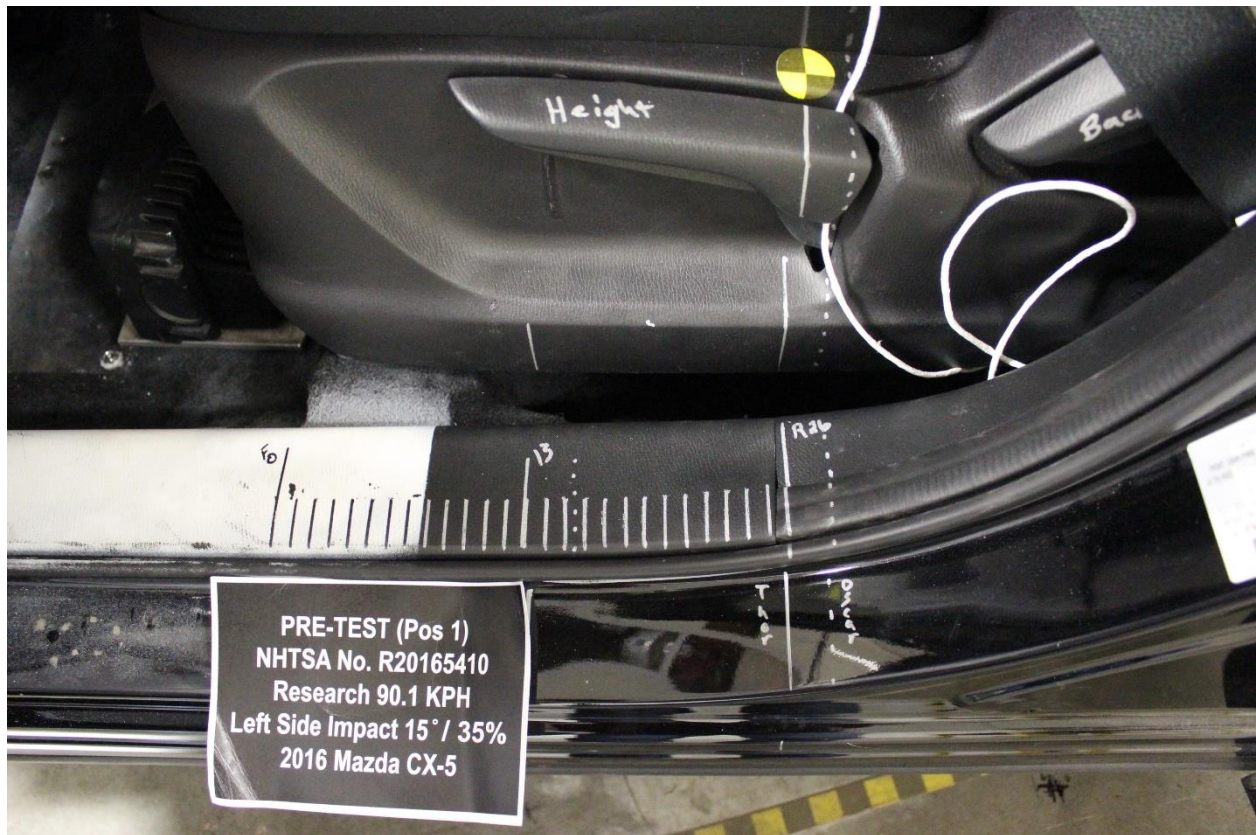
No. 058 Pre-Test View of Driver Door Clearance



No. 059 Post-Test View of Driver Door Clearance



No. 060 Pre-Test View of Parking Brake



No. 061 Pre-Test Driver Seat Fore Aft Markings



No. 062 Post-Test Driver Seat Fore Aft Markings



No. 063 Pre-Test Driver Seat Back Markings



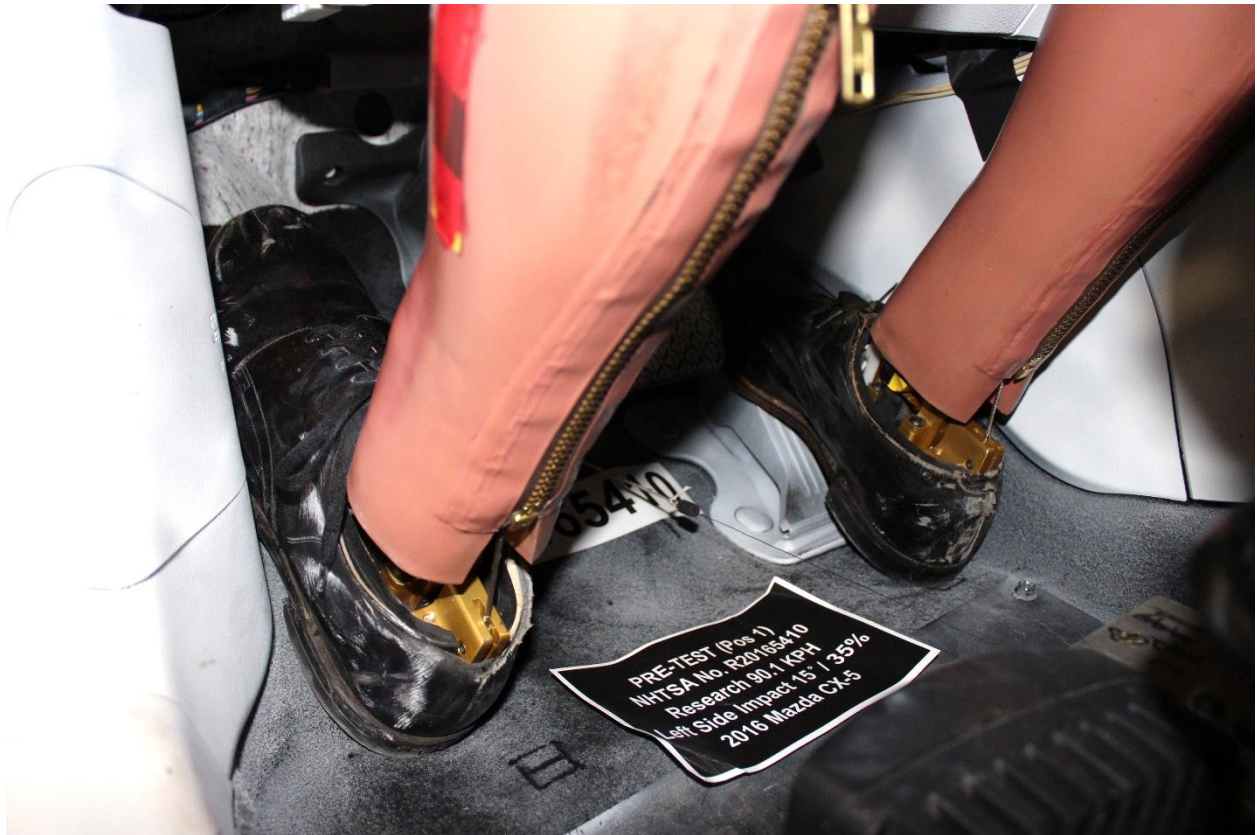
No. 064 Pre-Test Overhead View of Driver Thighs on Seat



No. 065 Pre-Test Driver Adjustable D-Ring



No. 066 Post-Test Driver Adjustable D-Ring



No. 067 Pre-Test Driver Feet



No. 068 Post-Test Driver Feet



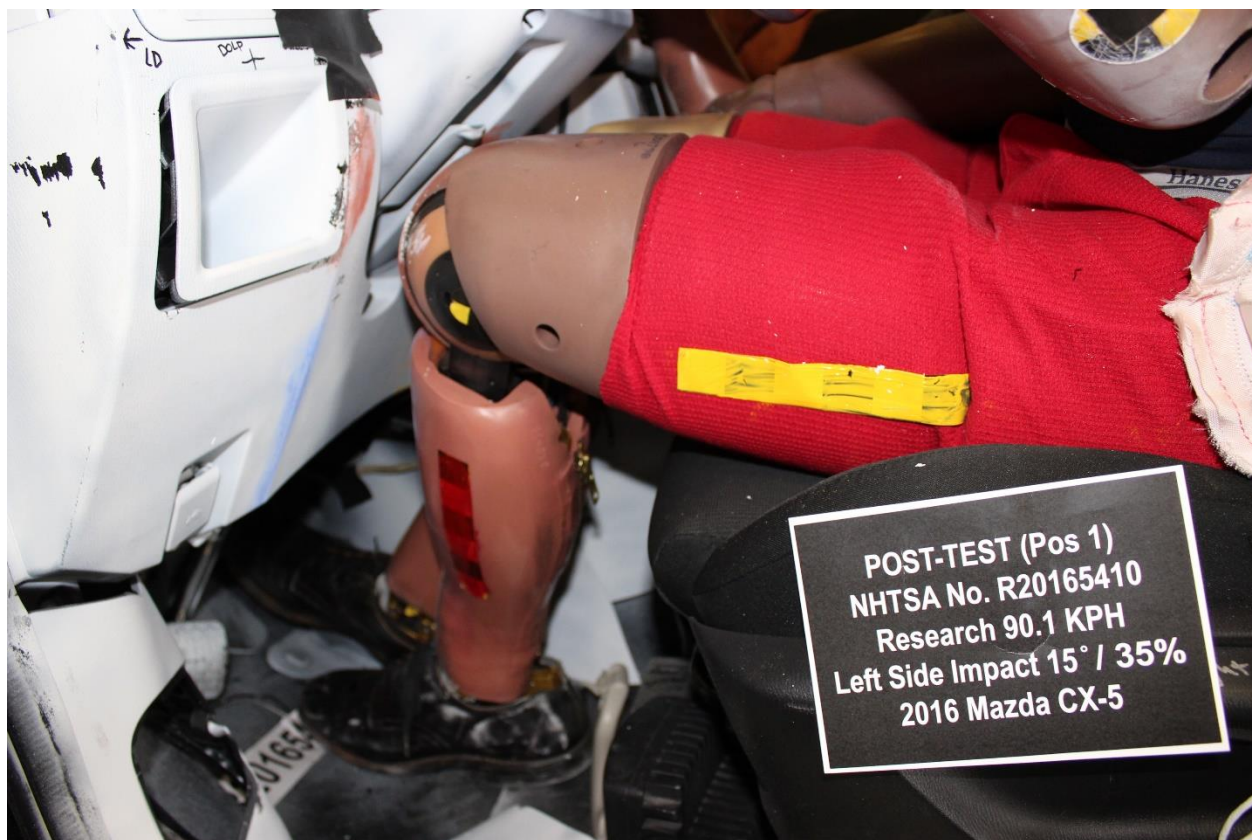
No. 069 Pre-Test View of Driver Right Knee and Bolster



No. 070 Post-Test View of Driver Right Knee and Bolster



No. 071 Pre-Test View of Driver Left Knee and Bolster



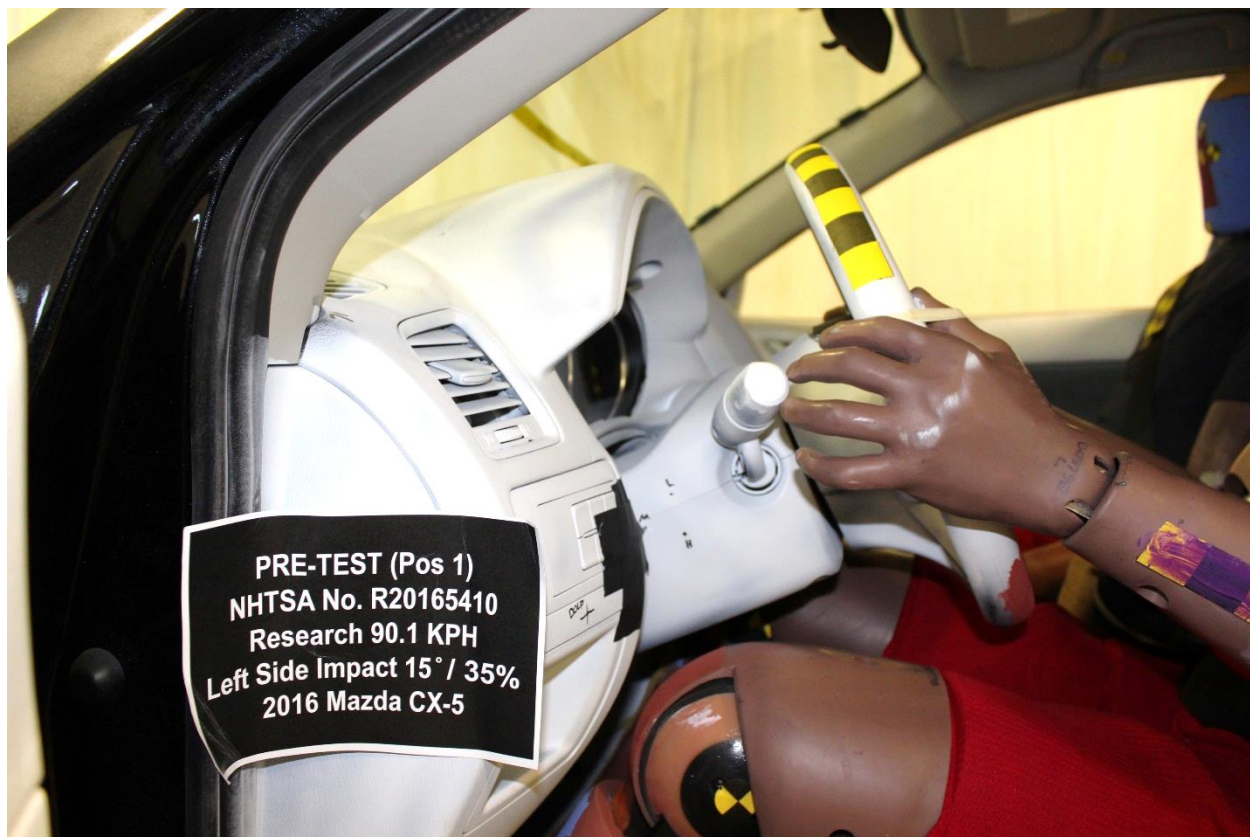
No. 072 Post-Test View of Driver Left Knee and Bolster



No. 073 Pre-Test View of Driver Abdomen



No. 074 Post-Test View of Driver Abdomen



No. 075 Pre-Test Left Side View of Steering Wheel set position



No. 076 Post-Test Left Side View of Steering Wheel set position



No. 077 Post-Test View of Driver Head Contact with Front Airbag



No. 078 Post-Test View of Driver Head Contact with Curtain Airbag

Photo Not Applicable

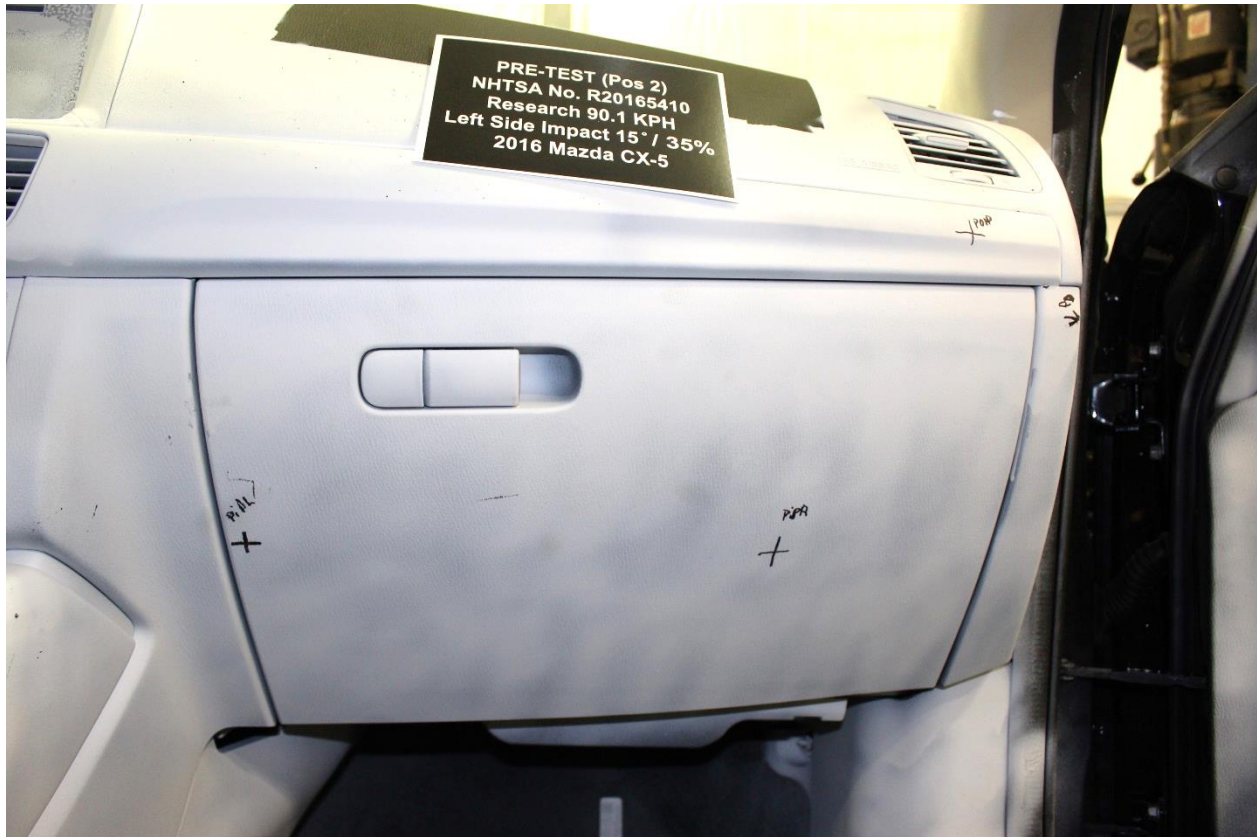
No. 079 Post-Test View of Driver Head Contact with Vehicle Interior – A



No. 080: Post-Test View of Driver Body Contact with Vehicle Interior - B

Photo Not Applicable

No. 081: Post-Test View of Driver Body Contact with Vehicle Interior - C



No. 082: Pre-Test Overall View of Passenger Knee Bolsters



No. 083: Post-Test Overall View of Passenger Knee Bolsters



No. 084: Pre-Test Left Side View of Passenger Knee Bolsters



No. 085: Post-Test Left Side View of Passenger Knee Bolsters



No. 086: Pre-Test Right Side View of Passenger Knee Bolsters



No. 087: Post-Test Right Side View of Passenger Knee Bolsters



No. 088: Pre-Test View of Passenger Floor pan at Right sill level, w/carpet



No. 089: Post-Test View of Passenger Floor pan at Right sill level, w/carpet



No. 090: Pre-Test View of Passenger Floor pan at Mid seat level, w/carpet



No. 091: Post-Test view of Passenger Floor pan at Mid seat level, w/carpet



No. 092: Pre-Test View of Passenger Floor pan at Left view



No. 093: Post-Test View of Passenger Floor pan at Left View



No. 094: Pre-Test Passenger Front Close-up View, Windshield



No. 095: Post-Test Passenger Front Close-up View, Windshield



No. 096: Pre-Test Left Side Passenger and Interior View



No. 097: Post-Test Left Side Passenger and Interior View



No. 98: Pre-Test Right Side Passenger Window View



No. 99: Post-Test Right Side Passenger Window View



No. 100: Pre-Test Right Side Passenger and Interior View



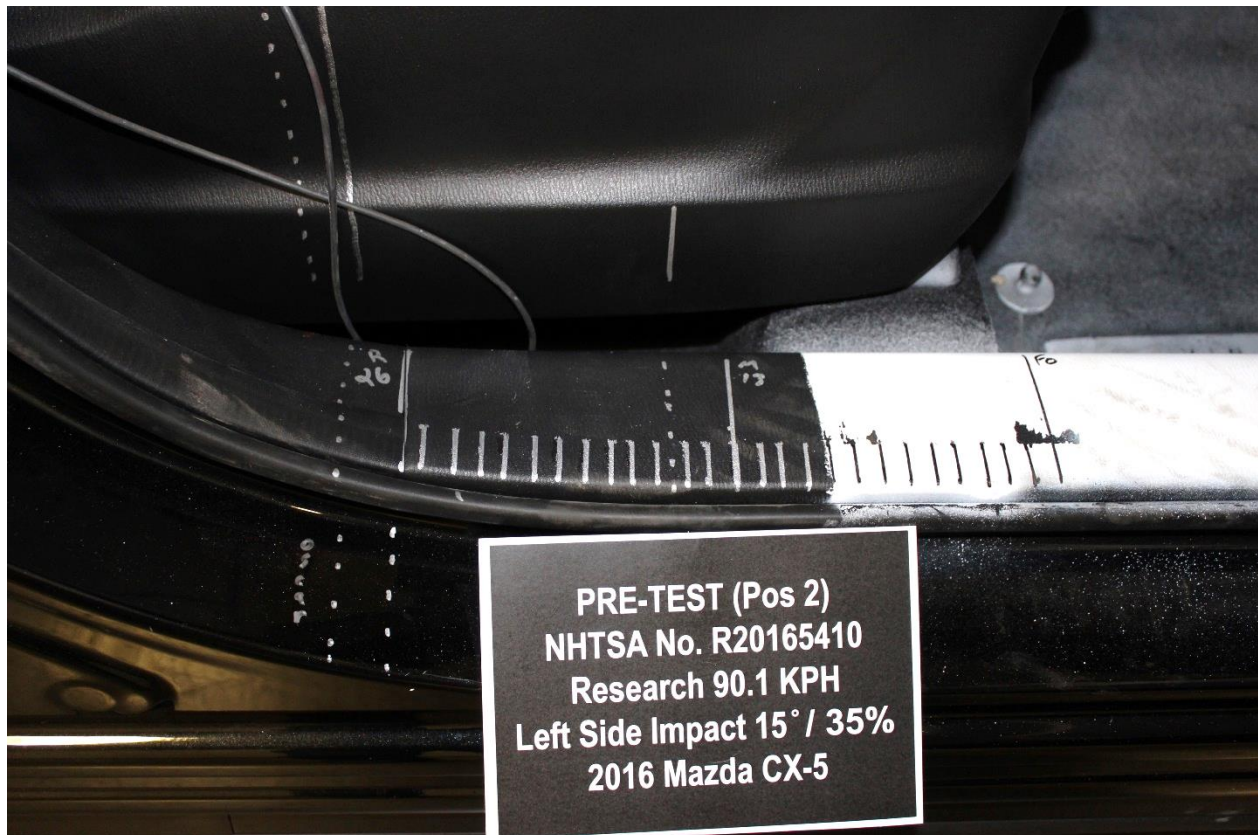
No. 101: Post-Test Right Side Passenger and Interior View



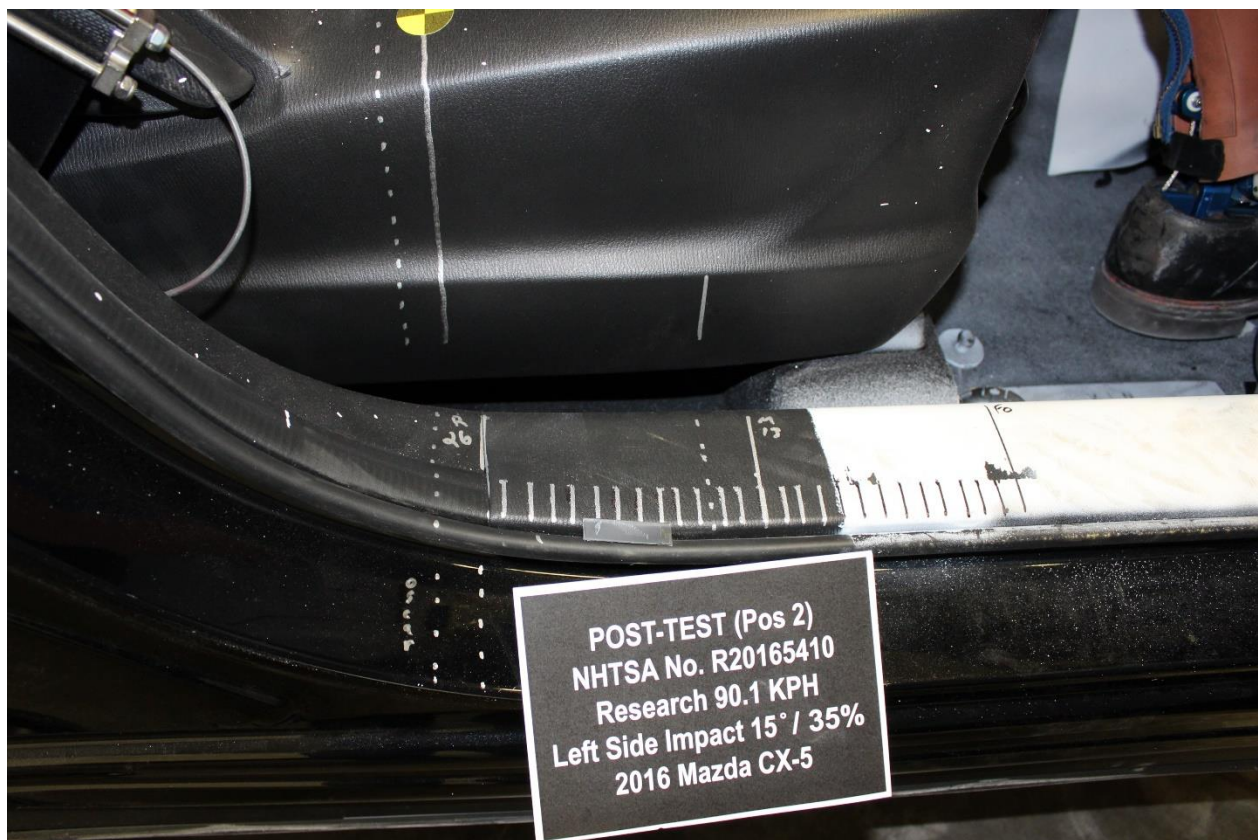
No. 102: Pre-Test View of Passenger Door Clearance



No. 103: Post-Test View of Passenger Door Clearance



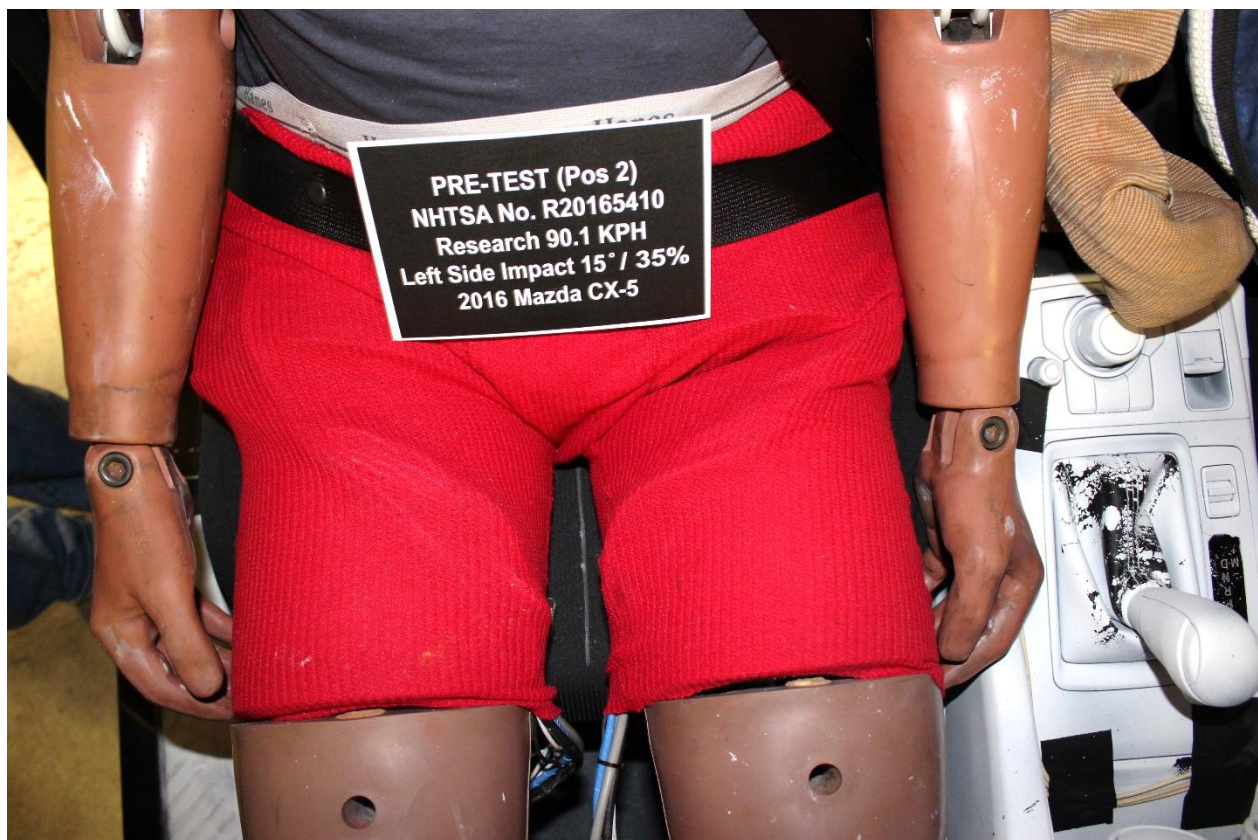
No. 104: Pre-Test Passenger Seat Fore-Aft Markings



No. 105: Post-Test Passenger Seat Fore-Aft Markings (plastic moved not seat)



No. 106: Pre-Test Passenger Seat Back Markings



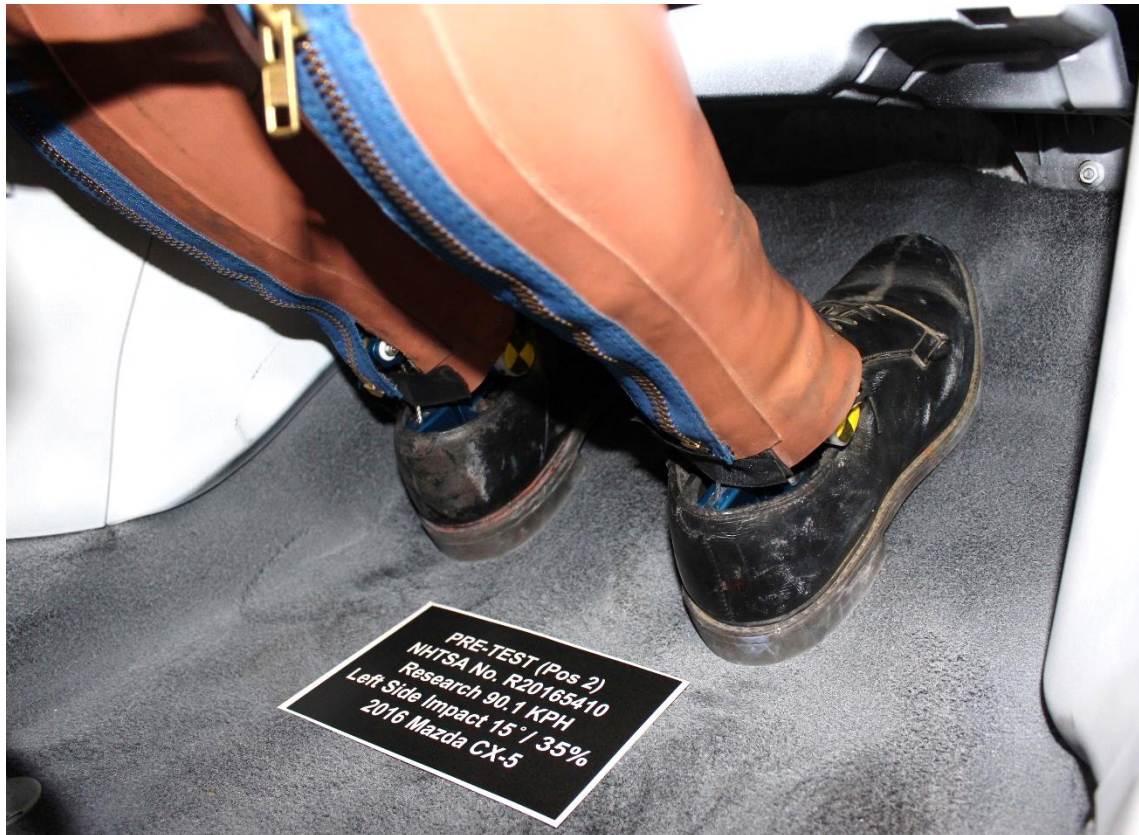
No. 107: Pre-Test Overhead View of Passenger Thighs on seat



No. 108: Pre-Test Passenger Adjustable D-ring



No. 109: Post-Test Passenger Adjustable D-ring



No. 110: Pre-Test View of Passenger Feet



No. 111: Post-Test View of Passenger Feet



No. 112: Pre-Test View of Passenger Right Knee and Bolster



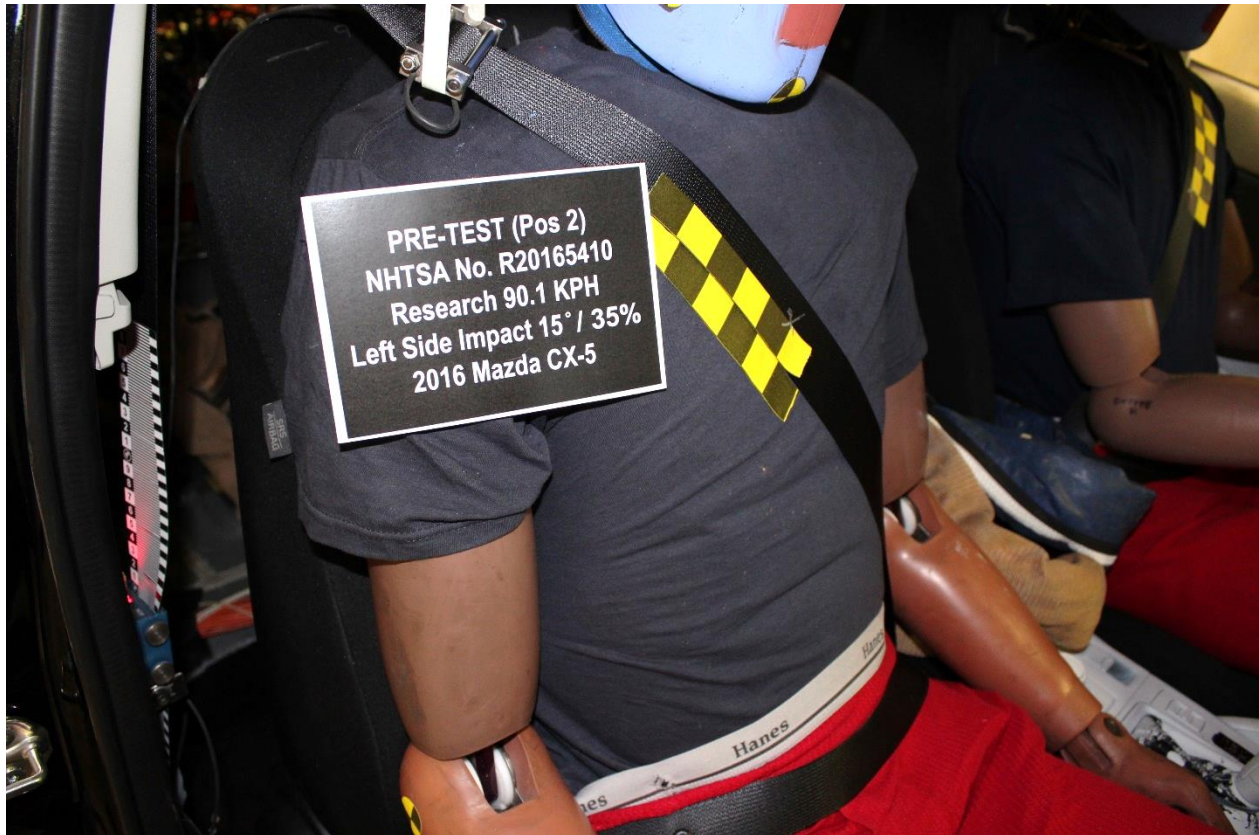
No. 113: Post-Test View of Passenger Right Knee and Bolster



No. 114: Pre-Test View of Passenger Left Knee and Bolster



No. 115: Post-Test View of Passenger Left Knee and Bolster



No. 116: Pre-Test View of Passenger Abdomen



No. 117: Post-Test View of Passenger Abdomen



No. 118: Post-Test View of Passenger Head contact with Airbag – Front

Photo Not Applicable

No. 119: Post-Test View of Passenger Head contact with Airbag - Curtain



No. 120: Post-Test View of Passenger Head contact with Interior

Photo Not Applicable

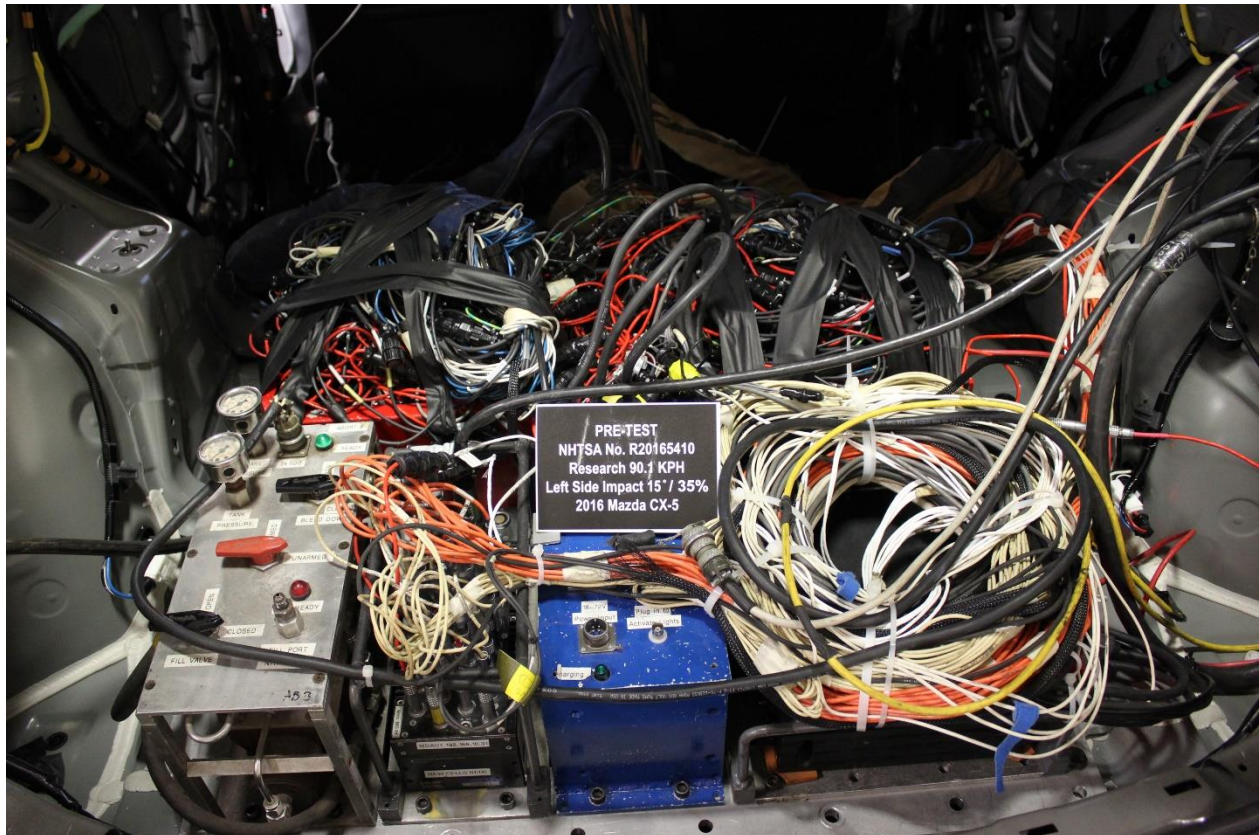
No. 121: Post-Test View of Passenger Body contact with Interior

Photo Not Applicable

No. 122: Post-Test View of Passenger Head contact with Interior



No. 123: Post-Test Passenger Contact With Glovebox



No. 124: Pre-Test Ballast Locations



No. 125: Post-Test Speed Trap Readout



No. 126: Pre-Test View of Fuel Filler Cap



No. 127: Post-Test View of Fuel Filler Cap



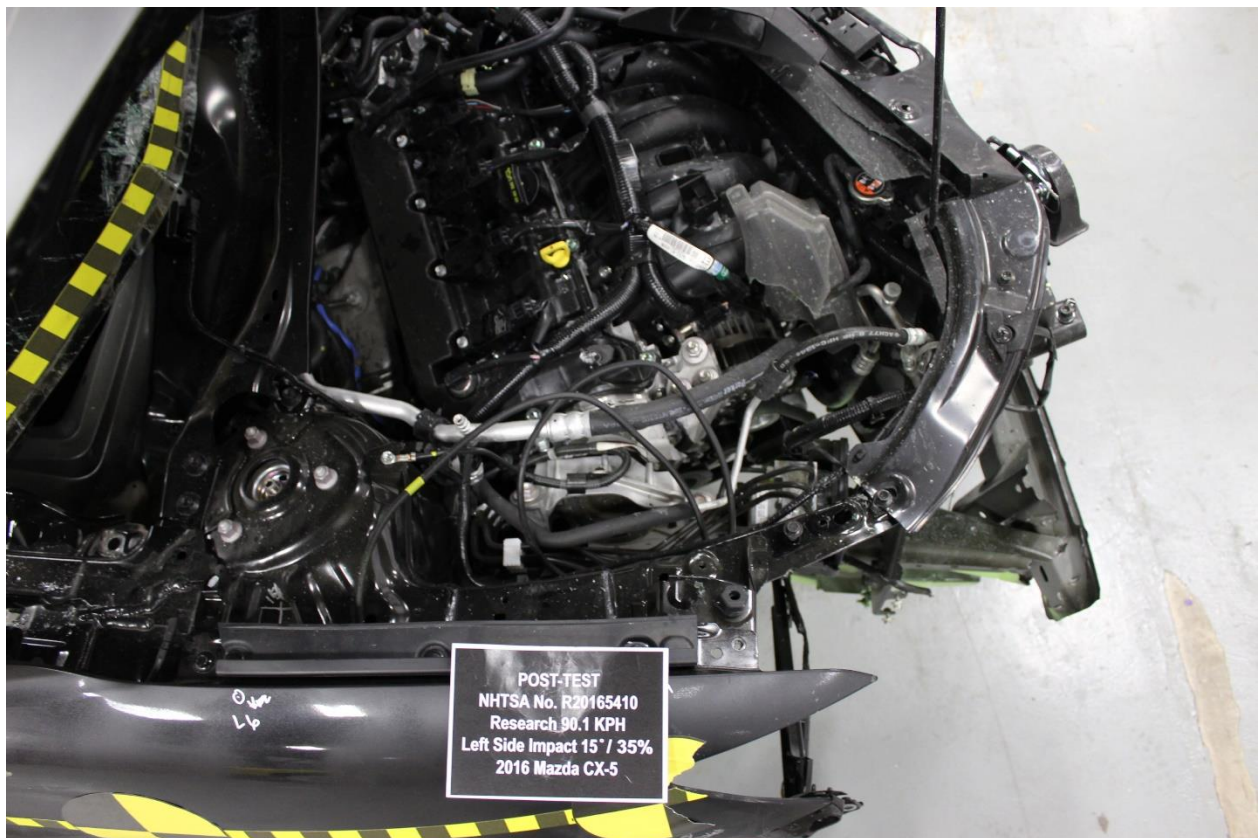
No. 128: Pre-Test Engine Compartment View



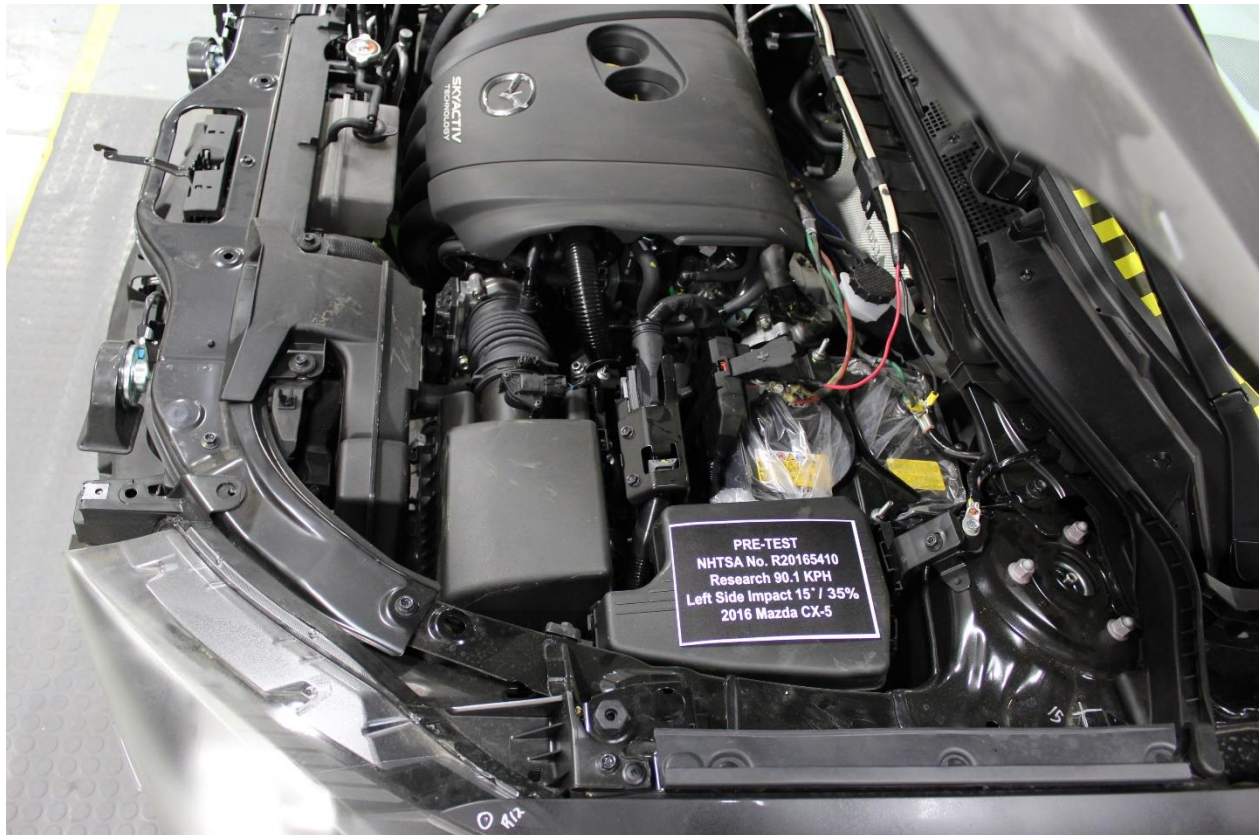
No. 129: Post-Test Engine Compartment View



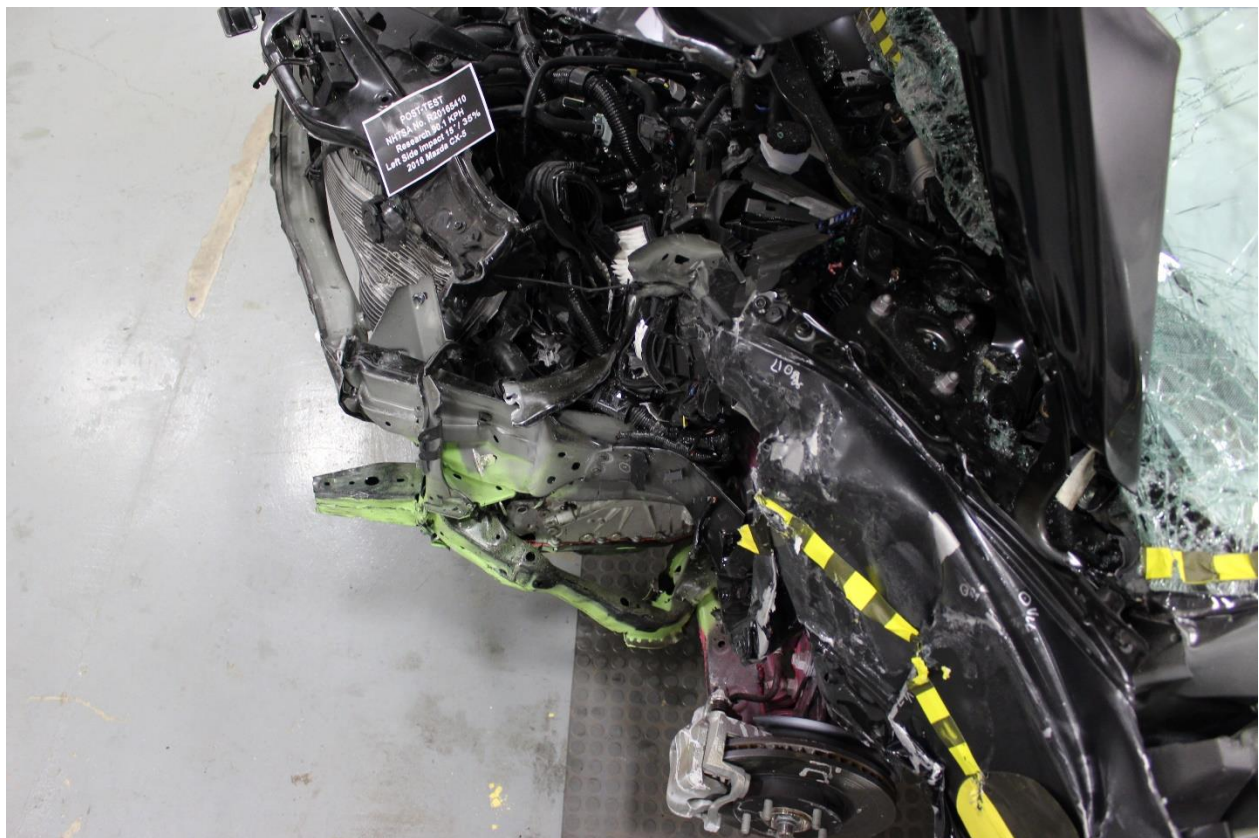
No. 130: Pre-Test Right Side Engine Compartment View



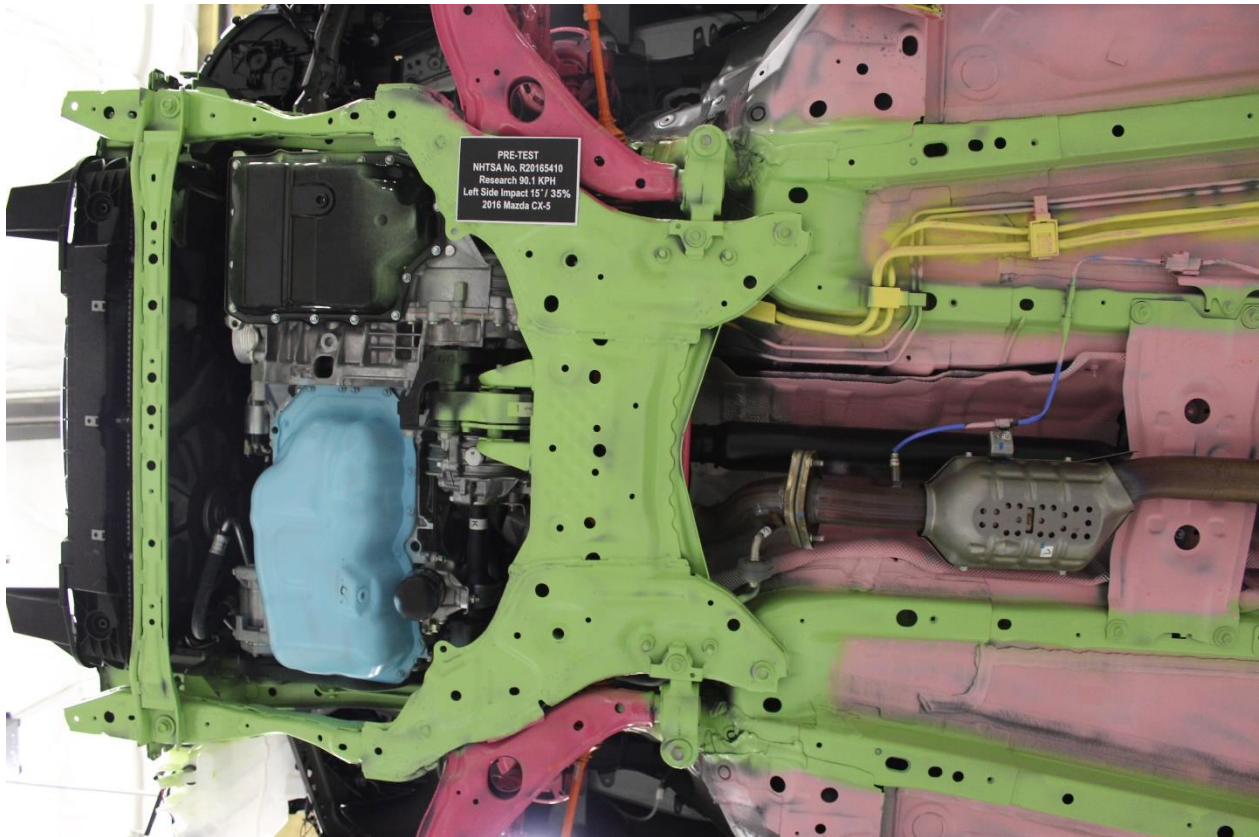
No. 131: Post-Test Right Side Engine Compartment View



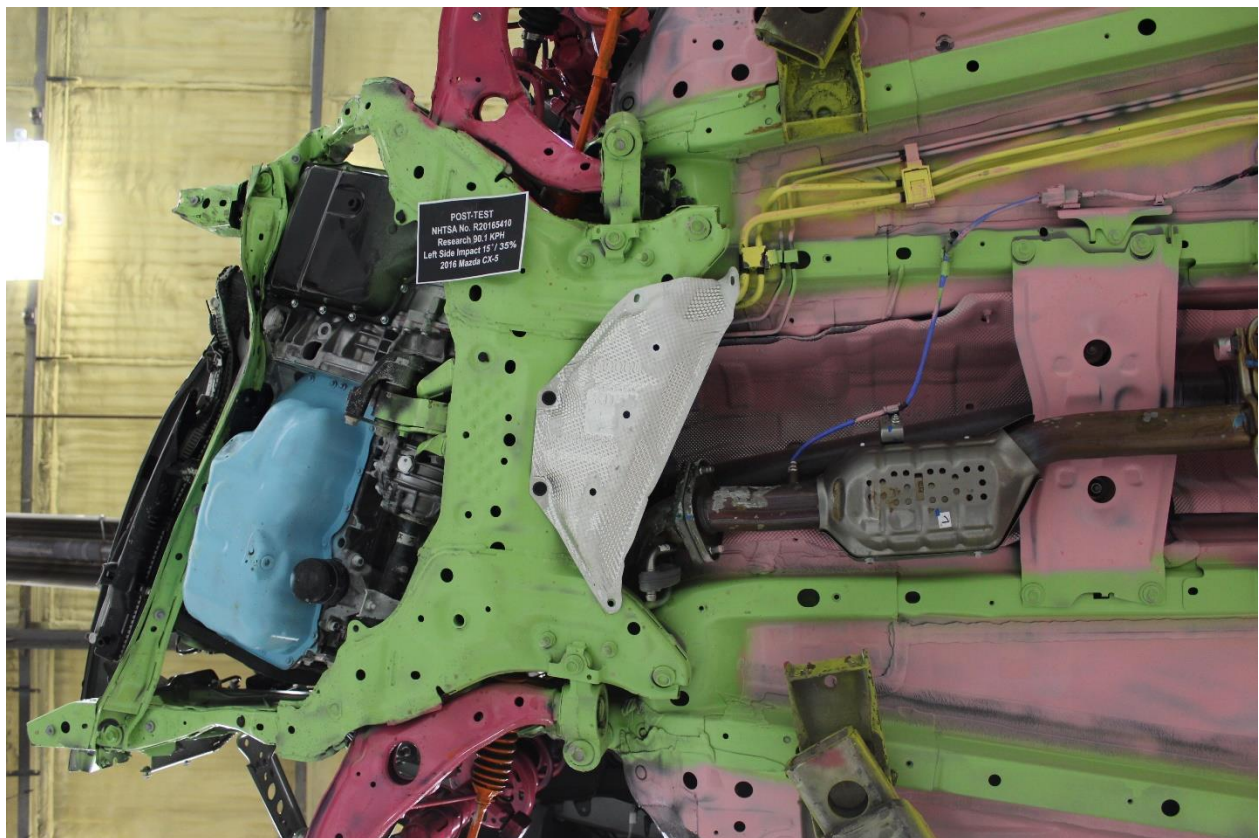
No. 132: Pre-Test Left Side Engine Compartment View



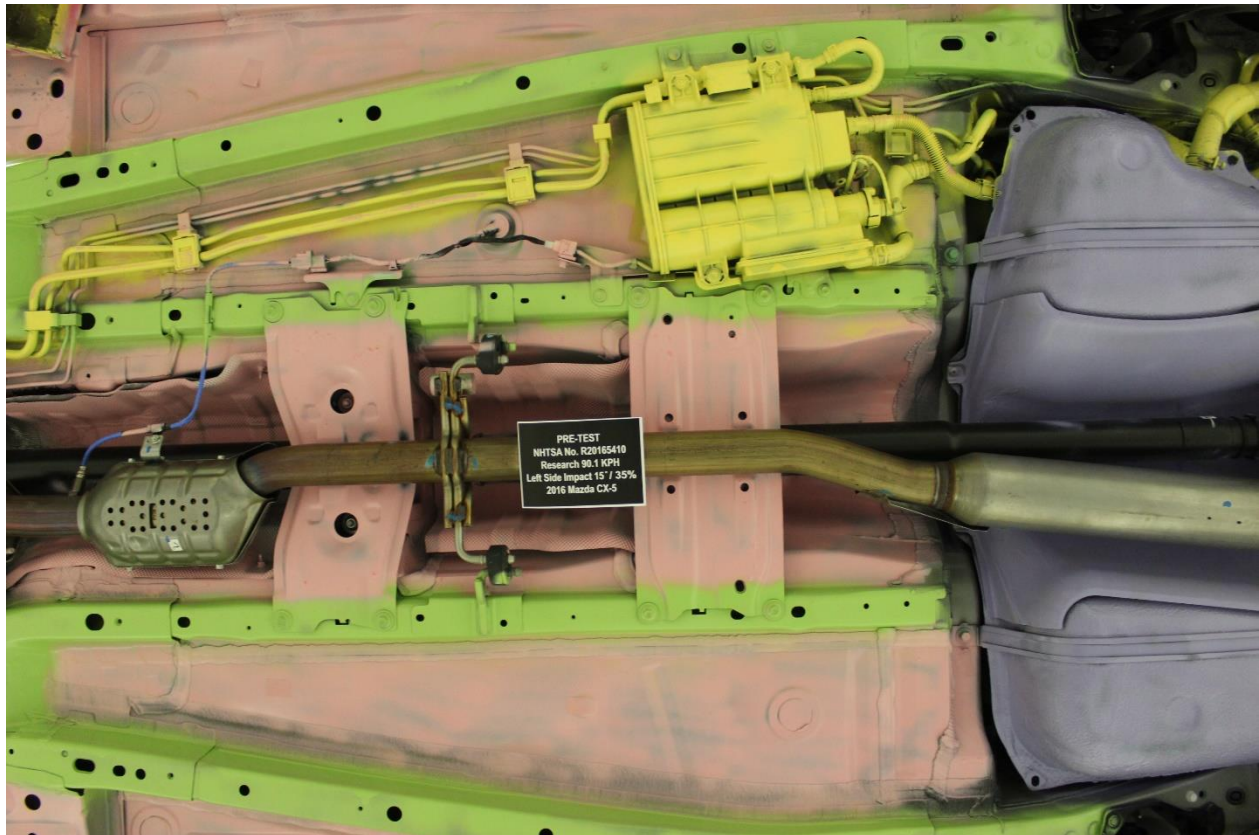
No. 133: Post-Test Left Side Engine Compartment View



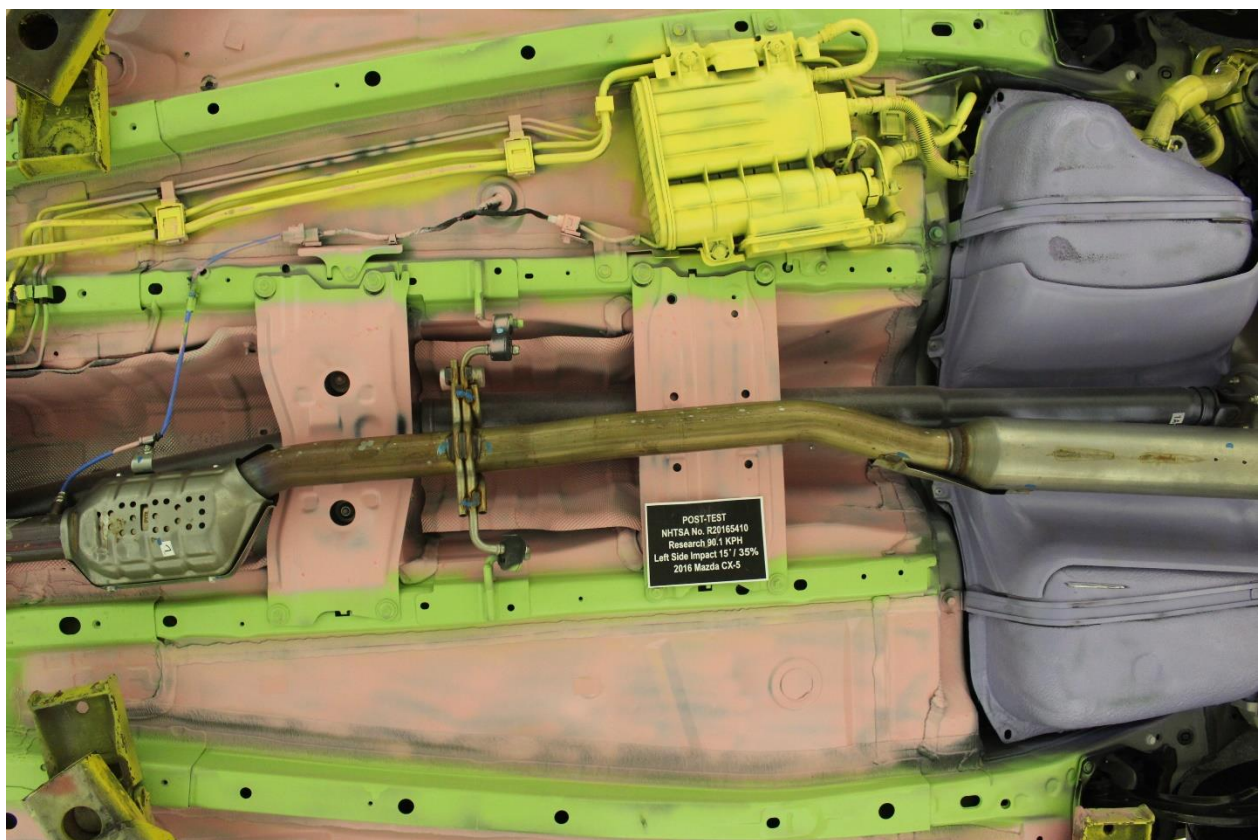
No. 134: Pre-Test View of Front Underbody (perpendicular to vehicle)



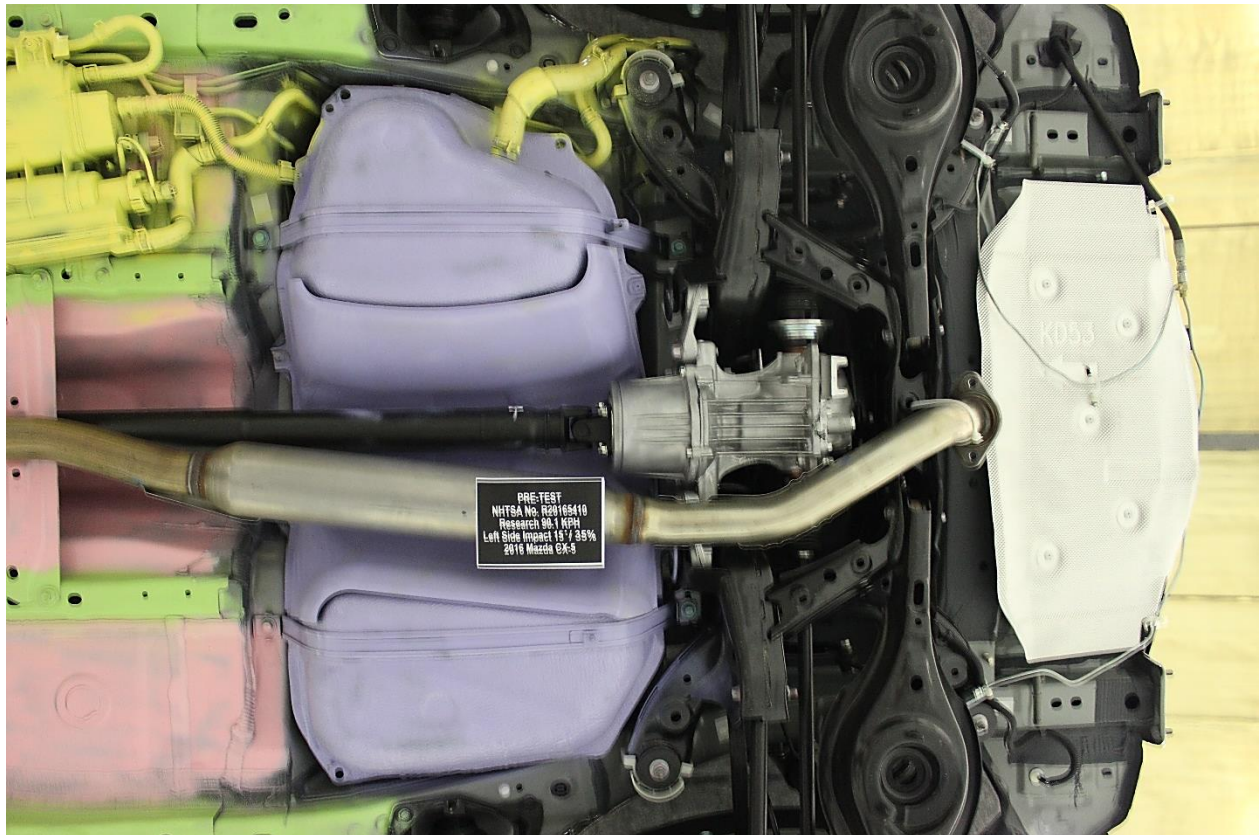
No. 135: Post-Test View of Front Underbody (perpendicular to vehicle)



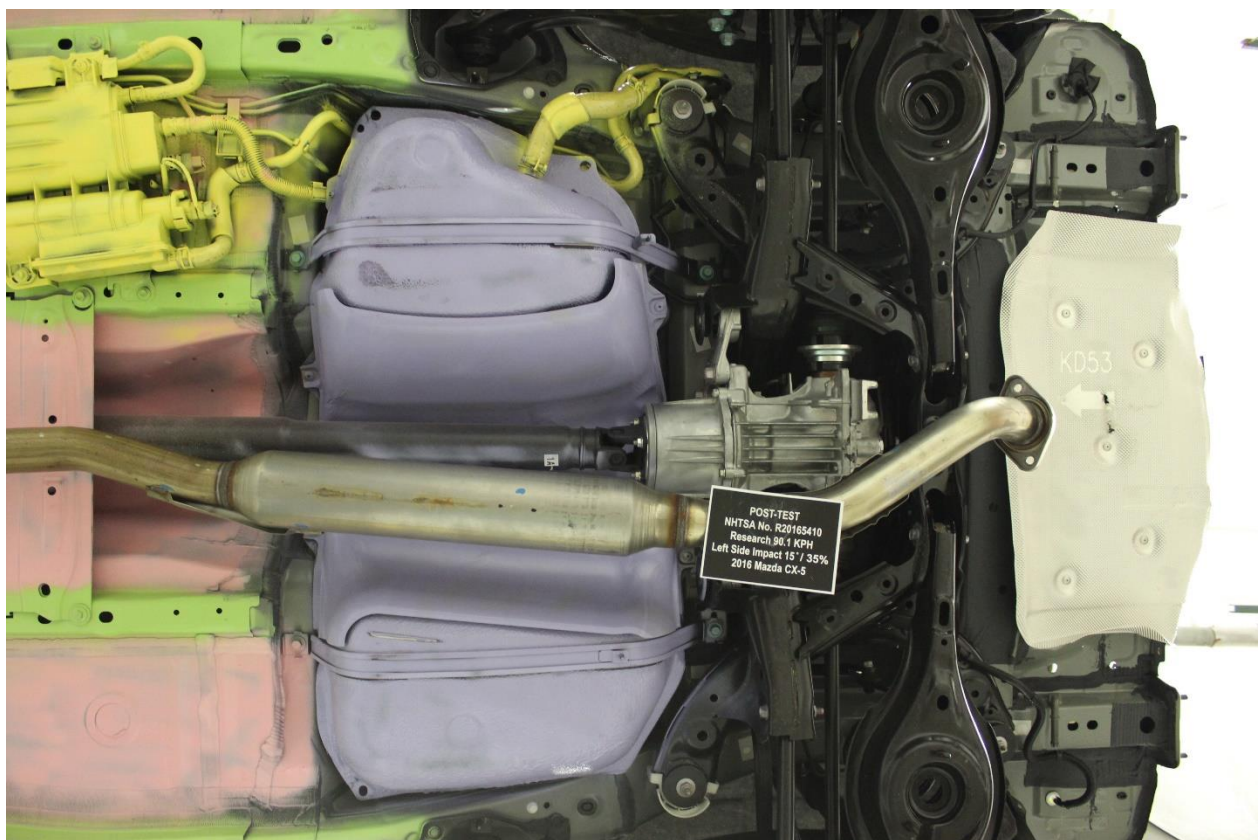
No. 136: Pre-Test View of Mid Underbody (perpendicular to vehicle)



No. 137: Post-Test View of Mid Underbody (perpendicular to vehicle)



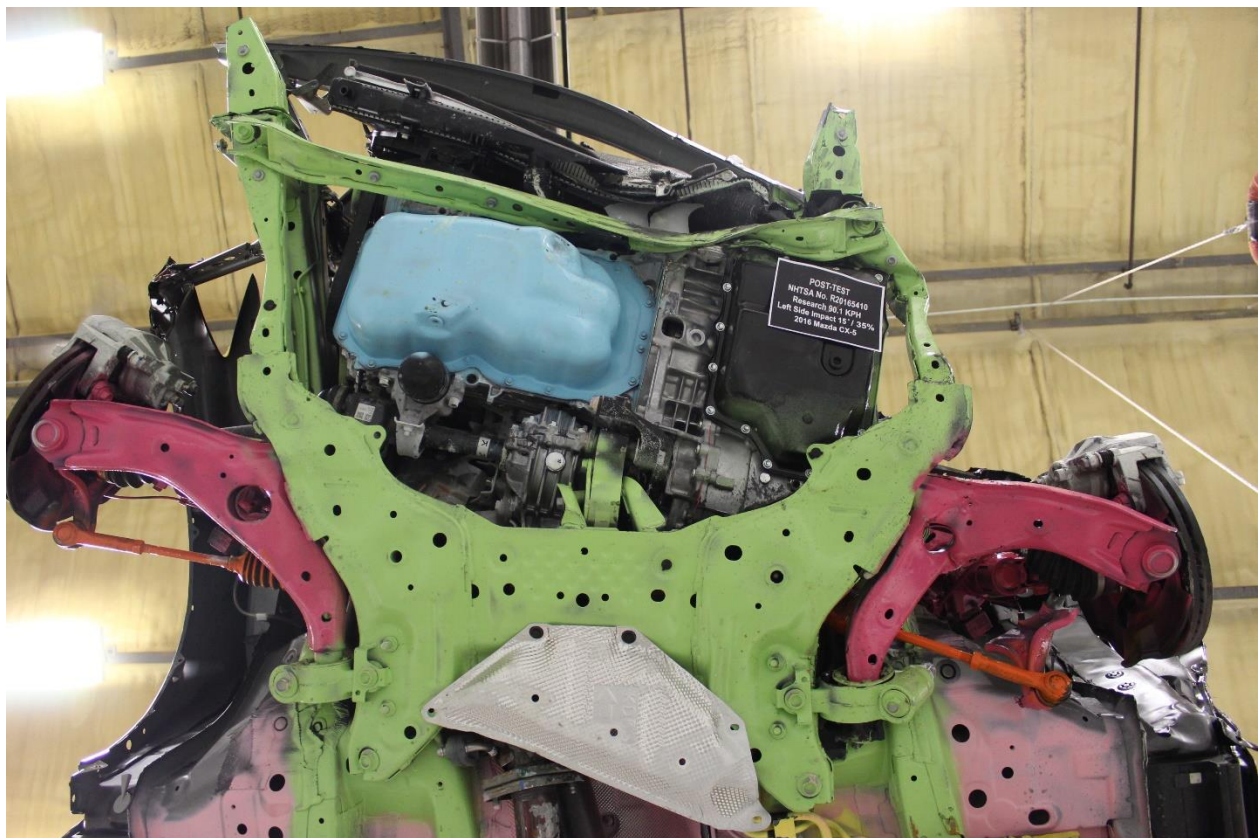
No. 138: Pre-Test View of Rear Underbody (perpendicular to vehicle)



No. 139: Post-Test View of Rear Underbody (perpendicular to vehicle)



No. 140: Pre-Test View of Steering rack and or sway bar



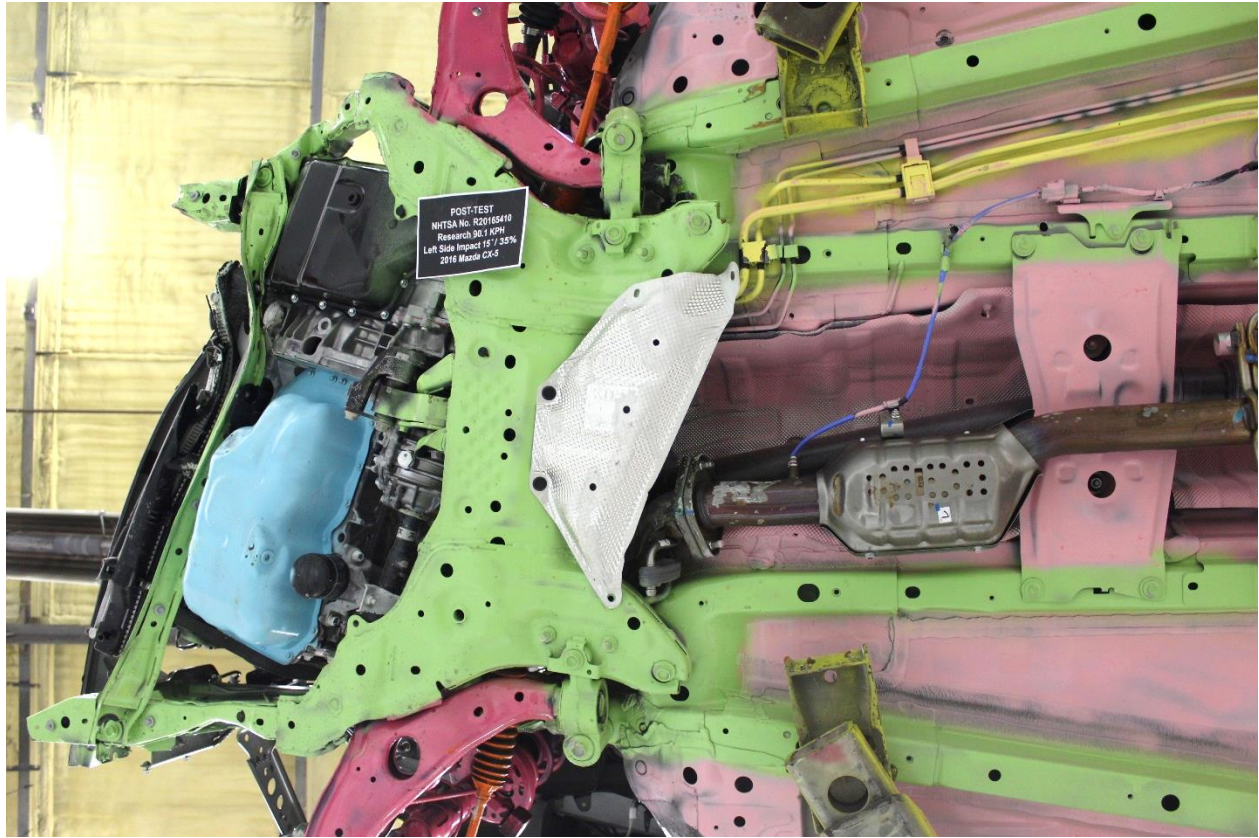
No. 141: Post-Test View of Steering rack and or sway bar



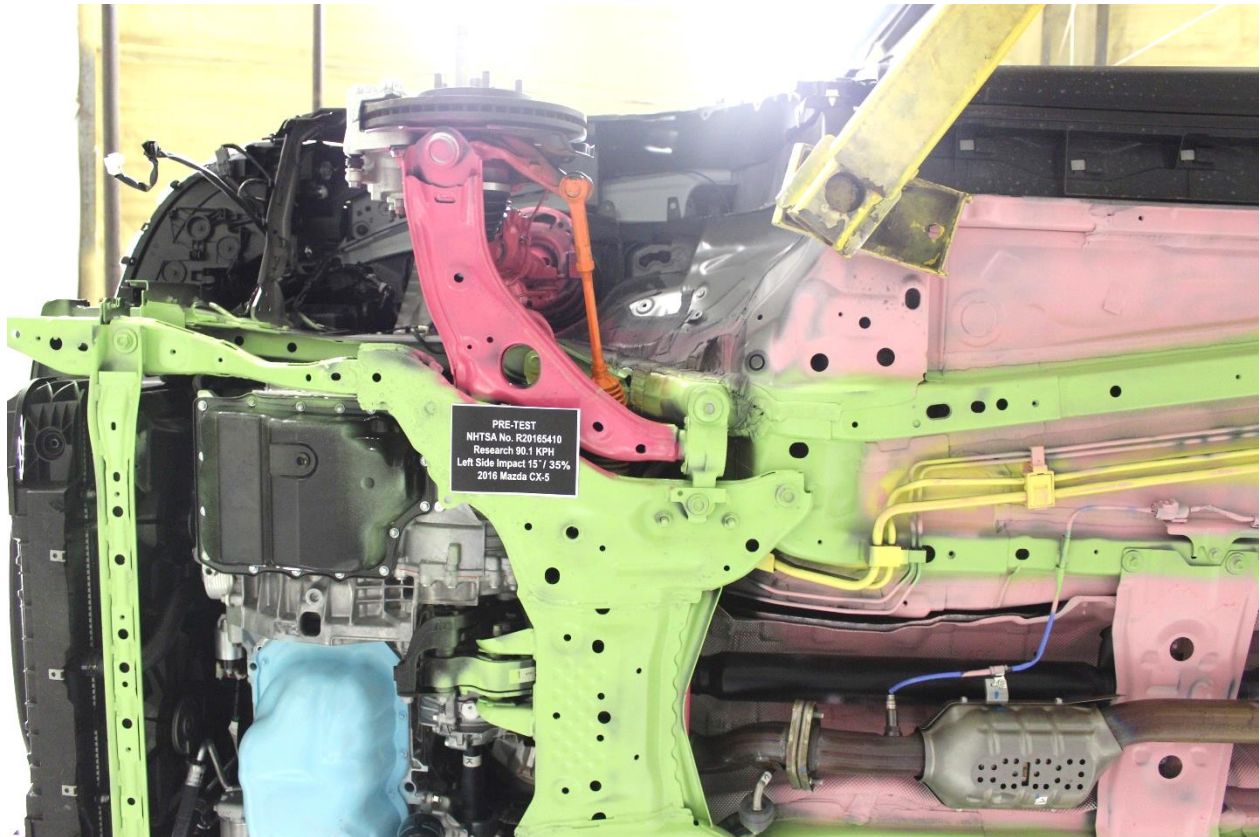
No. 142: Pre-Test Bumper to Rail Attachments and Crush Initiators



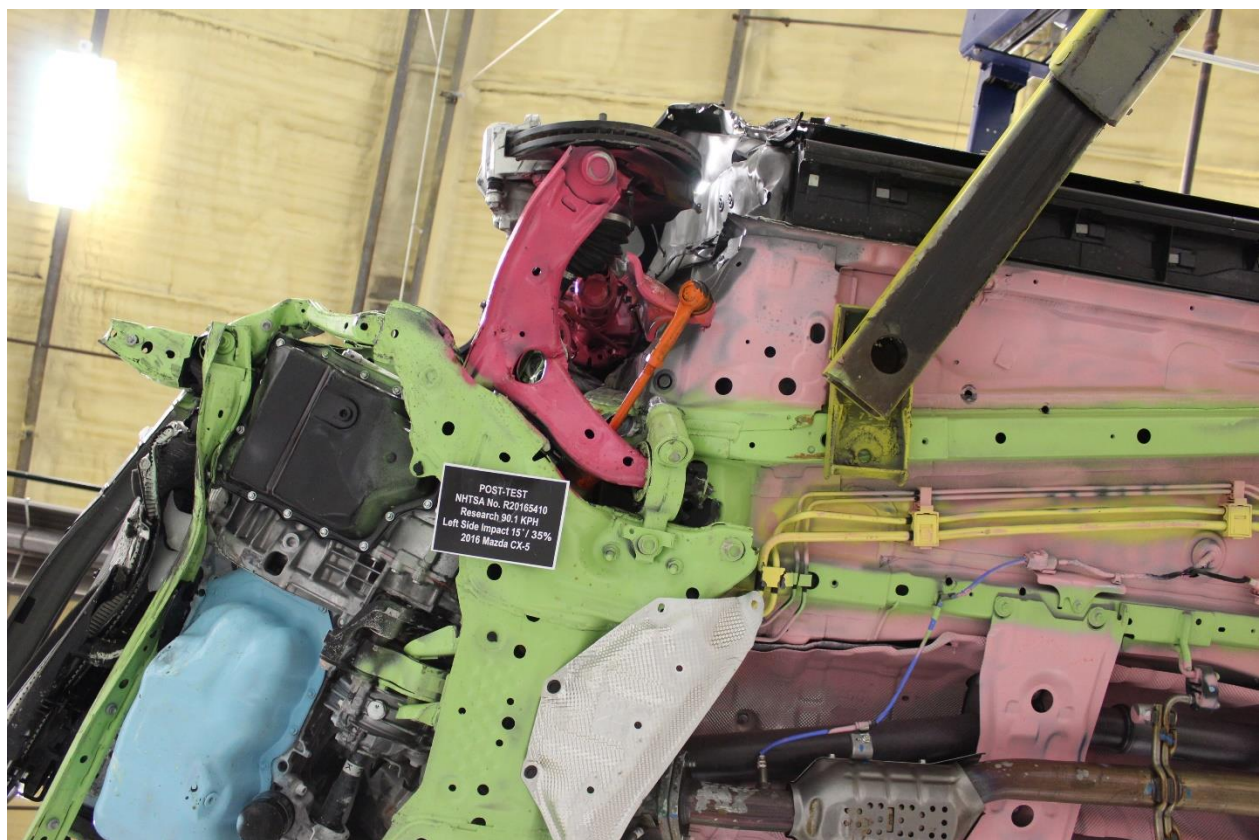
No. 143: Post-Test Bumper to Rail Attachments and Crush Initiators



No. 144: Post-Test View of Front Sub-Frame Deformation



No. 145: Pre-Test Frame Rail with tire removed



No. 146: Post-Test Frame Rail with tire removed



No. 147: Pre-Test View of Front Driver Wheel Well w/ Tire Removed



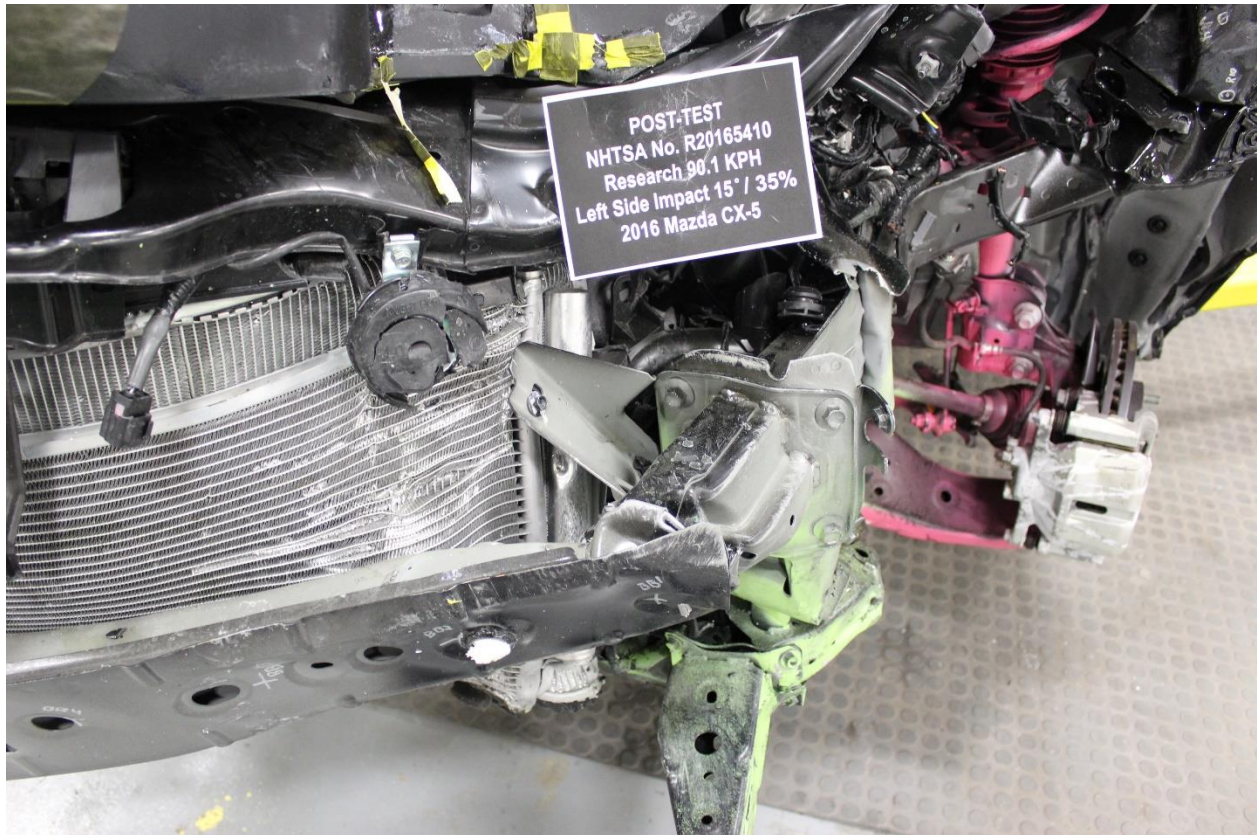
No. 148: Post-Test ¾ View of Front Driver Wheel Well w/ Tire Removed



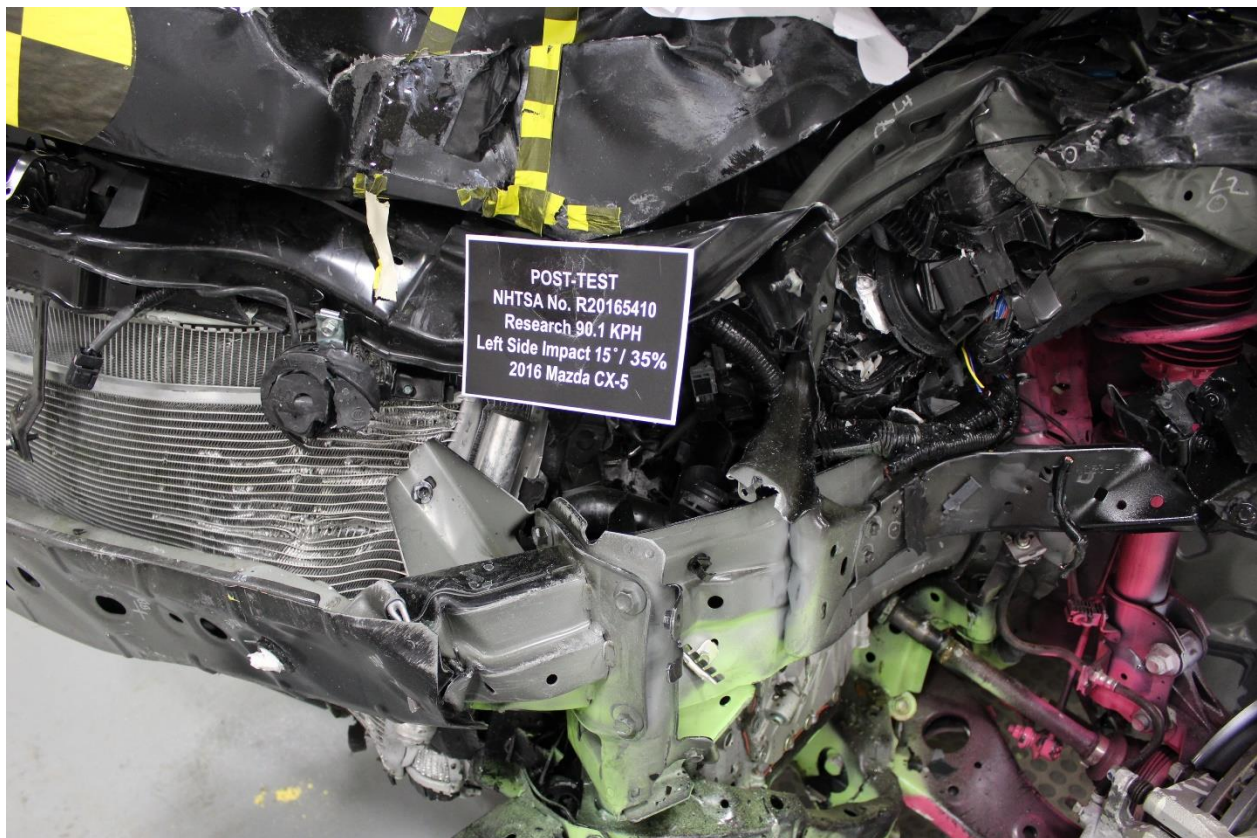
No. 149: Post-Test Side View of Front Driver Wheel Well w/ Tire Removed



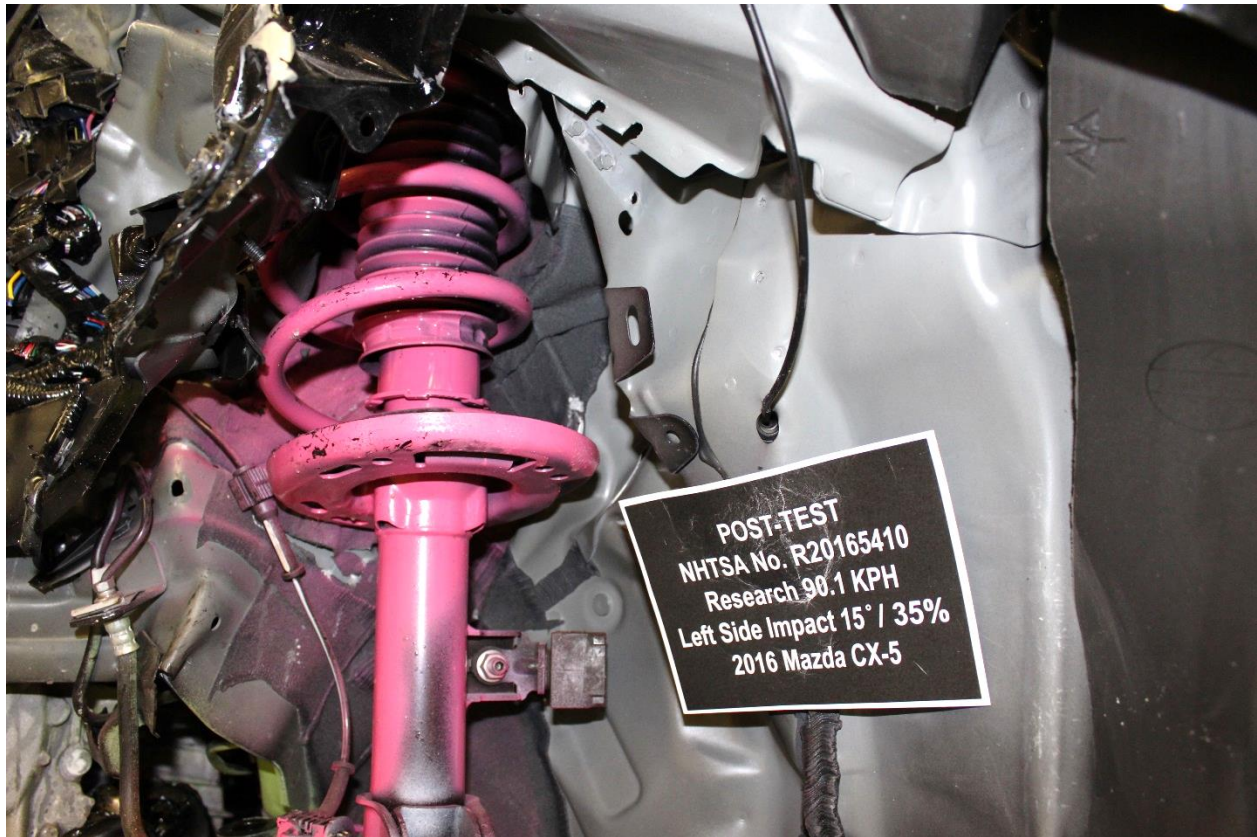
No. 150: Post-Test Right Side 3/4 Rear View of the Front Driver Wheel Well w/ Tire Removed



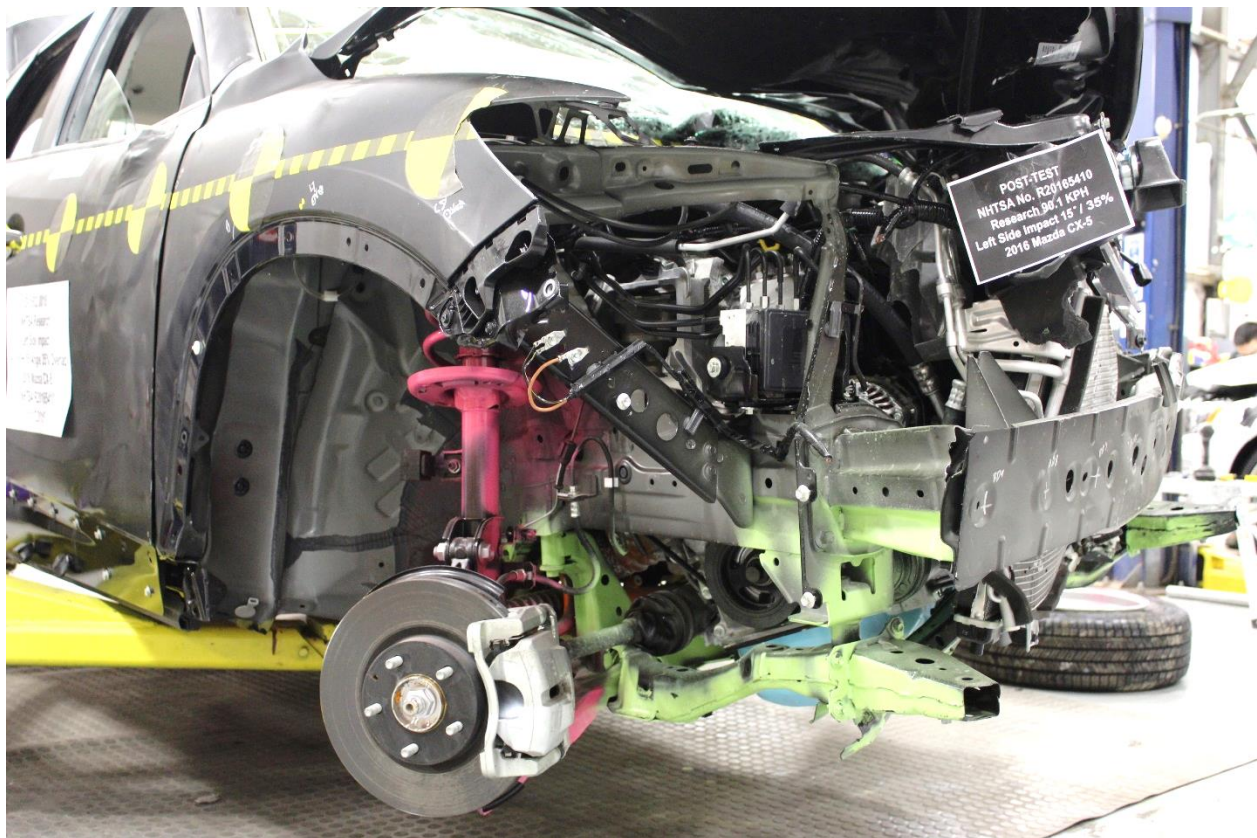
No. 151: Post-Test Looking Down at the Front Driver Shotgun



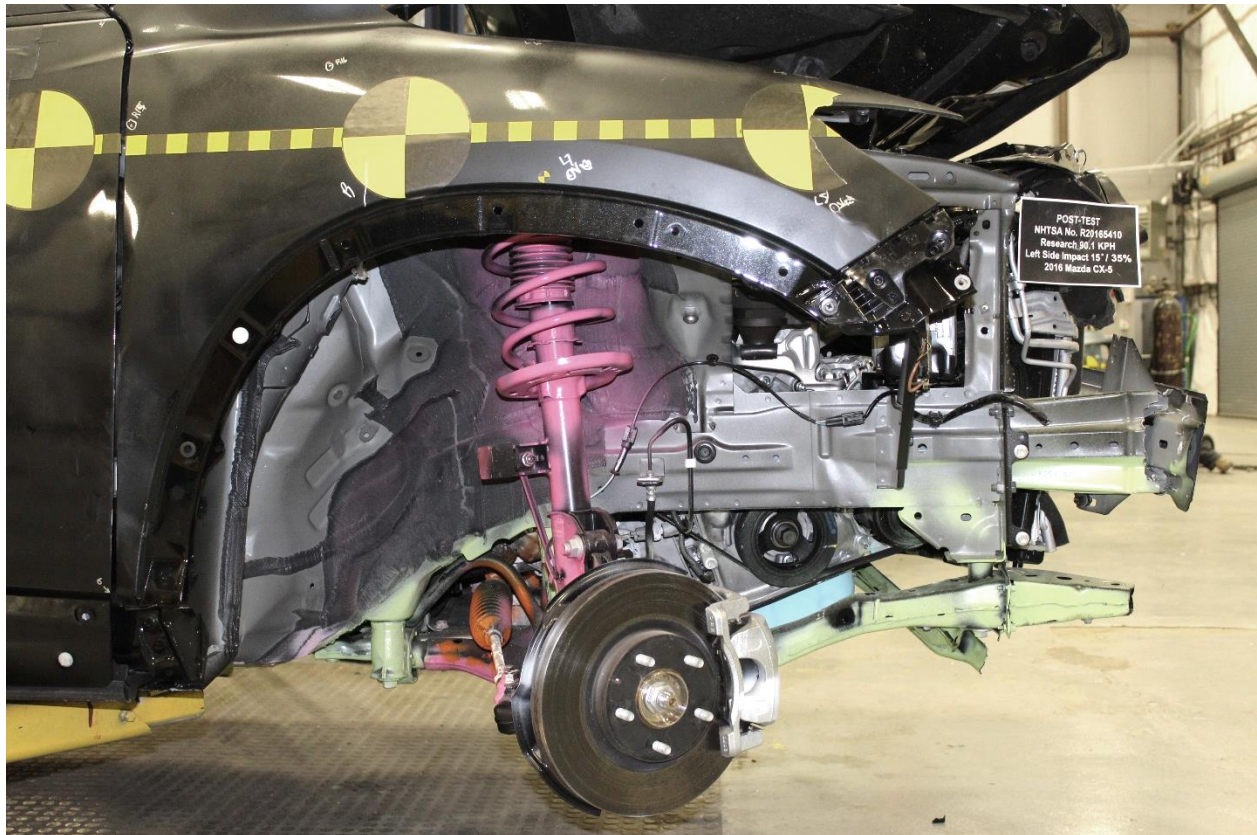
No. 152: Post-Test Right Side $\frac{3}{4}$ View of Front Driver Shotgun



No. 153: Post-Test Front Driver Close up View of Suspension w/ Tire Removed



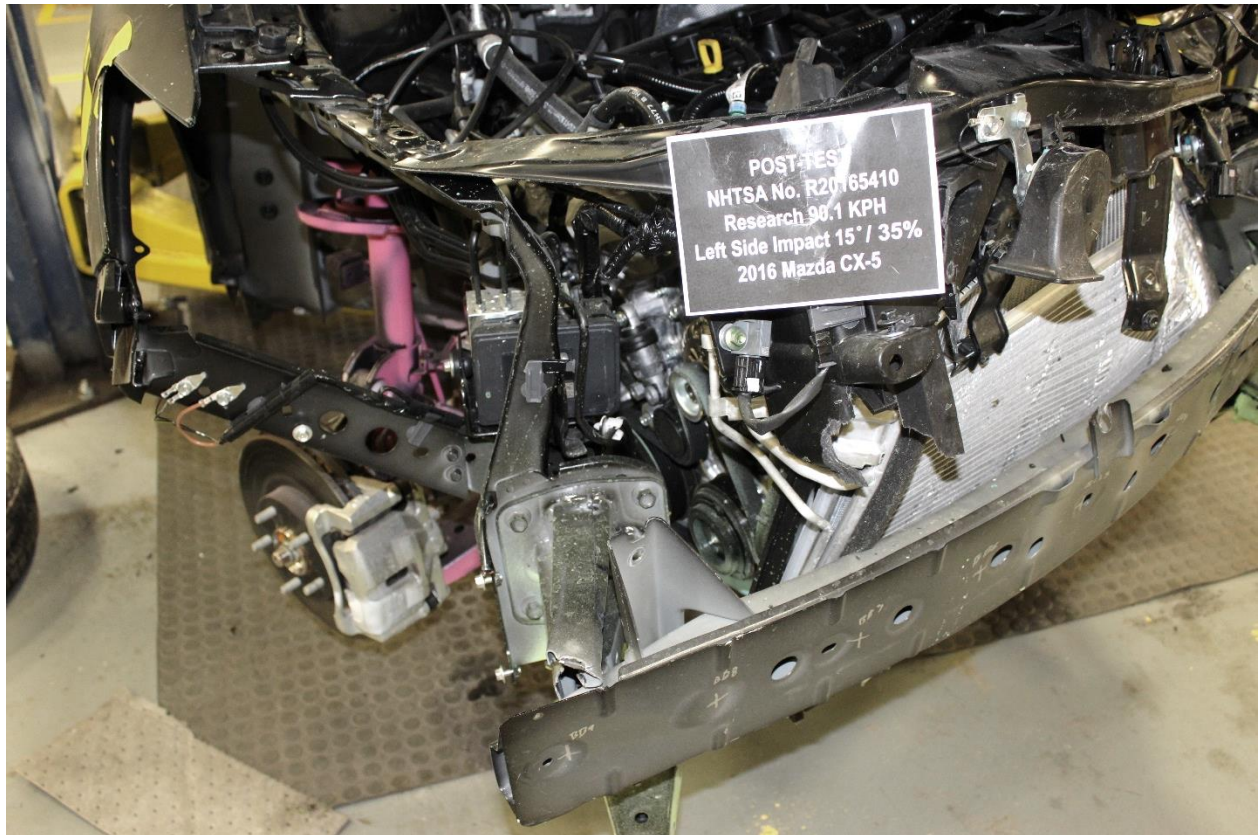
No. 154: Post-Test $\frac{3}{4}$ View of Front Passenger Wheel Well w/ Tire Removed



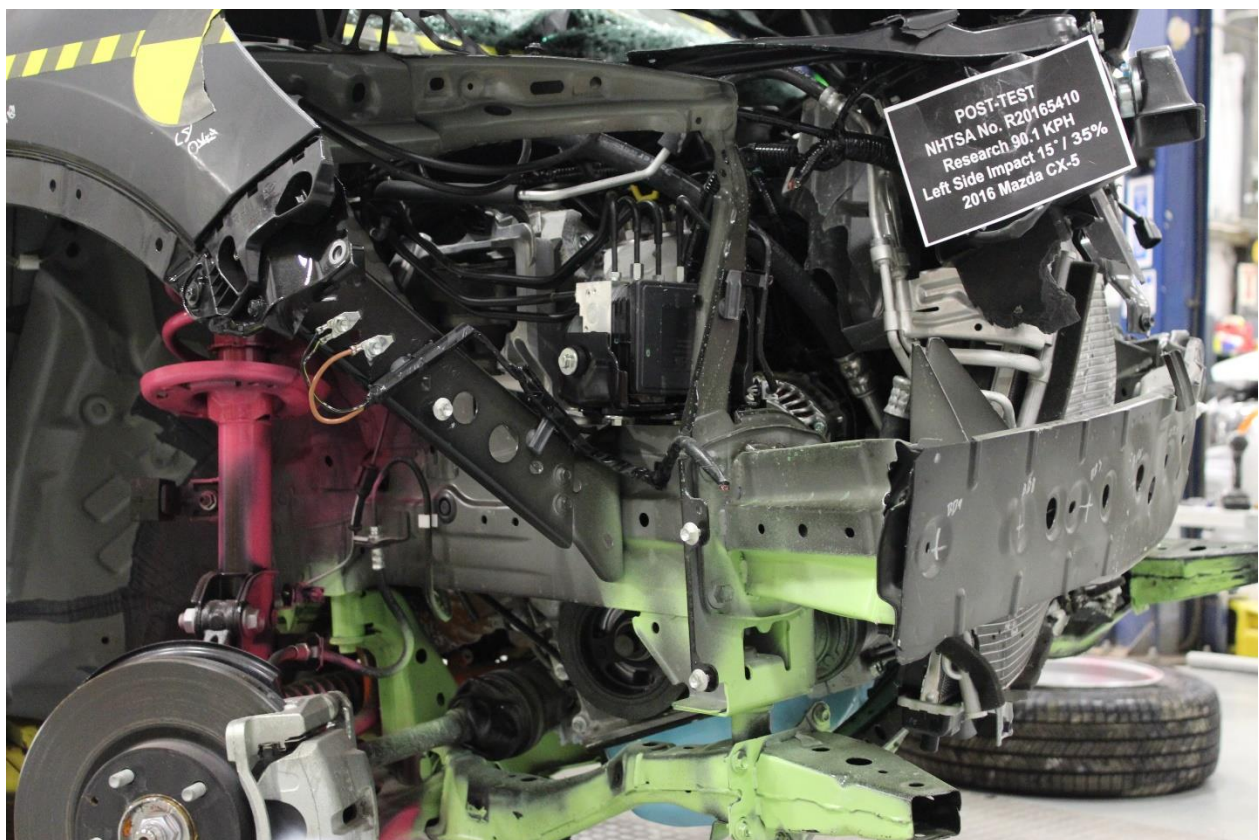
No. 155: Post-Test Side View of Front Passenger Wheel Well w/ Tire Removed



No. 156: Post-Test Right Side 3/4 Rear View of the Front Passenger Wheel Well w/ Tire Removed



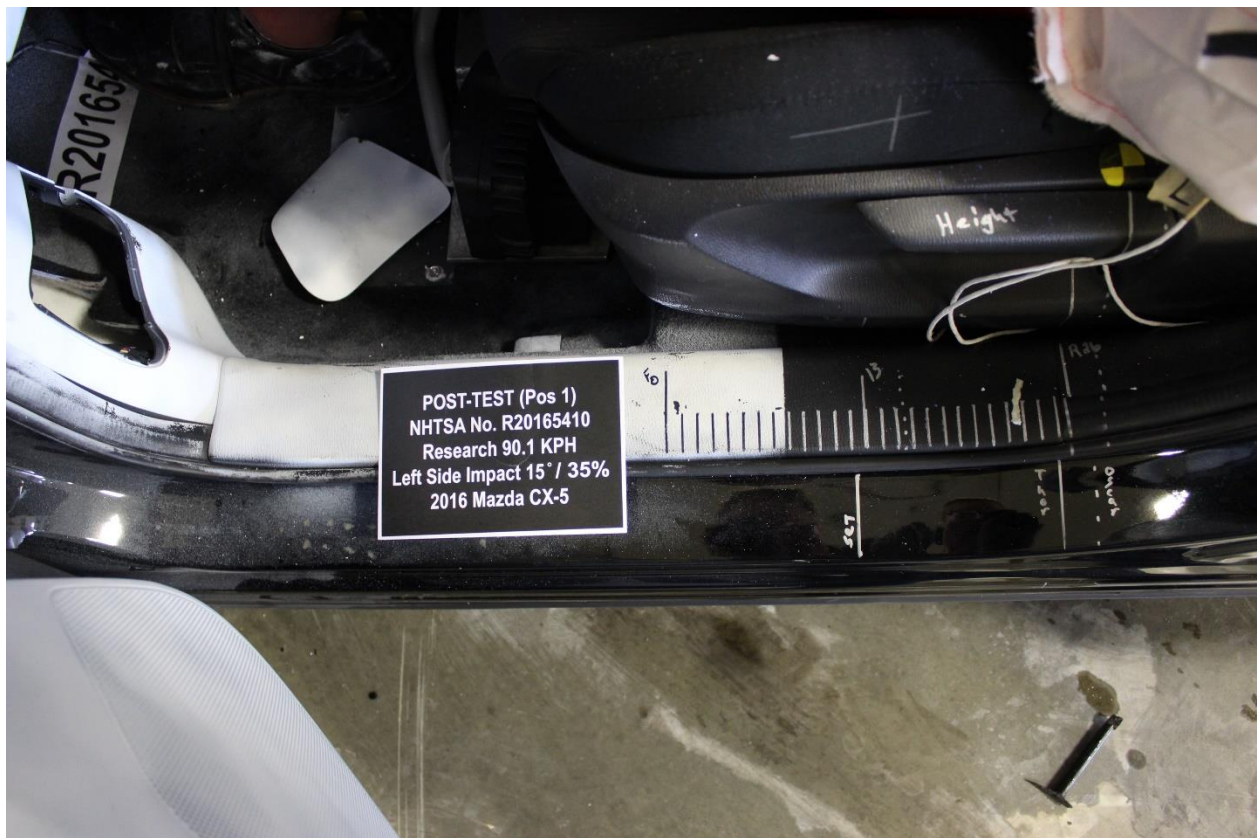
No. 157: Post-Test Looking Down at the Front Passenger Shotgun



No. 158: Post-Test Right Side $\frac{3}{4}$ View of Front Passenger Shotgun



No. 159: Post-Test Front Passenger Close up View of Suspension w/ Tire Removed



No. 160: Post-Test View of Door Sill with Door Open- Struck Side



No. 161: Post-Test View of Deformation of A pillar-Struck Side



No. 162: Post-Test View of Deformation of B pillar-Struck Side



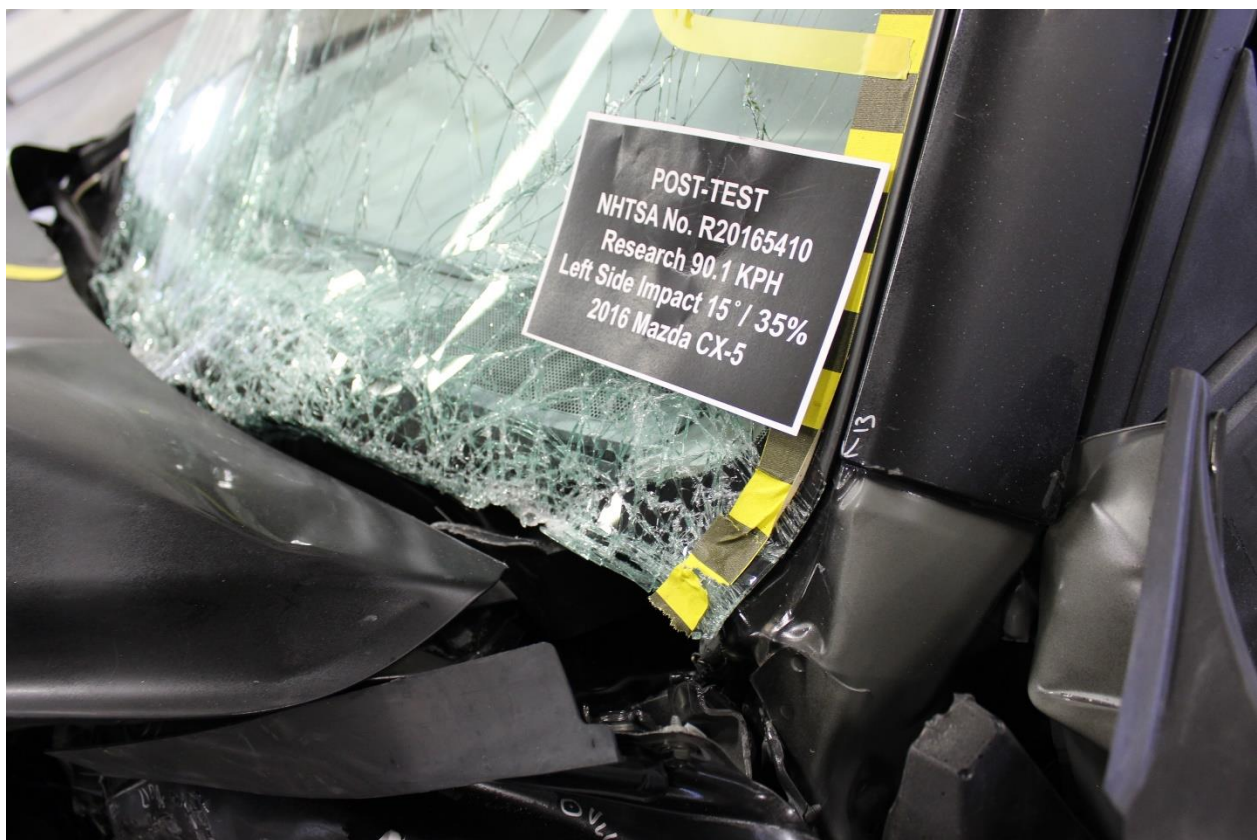
No. 163: Post-Test View of Deformation of C pillar-Struck Side



No. 164: Post-Test View of Wheel and/or Tire Deformation-Struck Side



No. 165: Post-Test View of Deformation of Rocker or Post-Struck Side



No. 166: Post-Test View of Windshield Separation



No. 167: Pre-Test Left Side View of OMDB



No. 168: Post-Test Left Side View of OMDB



No. 169: Pre-Test Right Side View of OMDB



No. 170: Post-Test Right Side View of OMDB



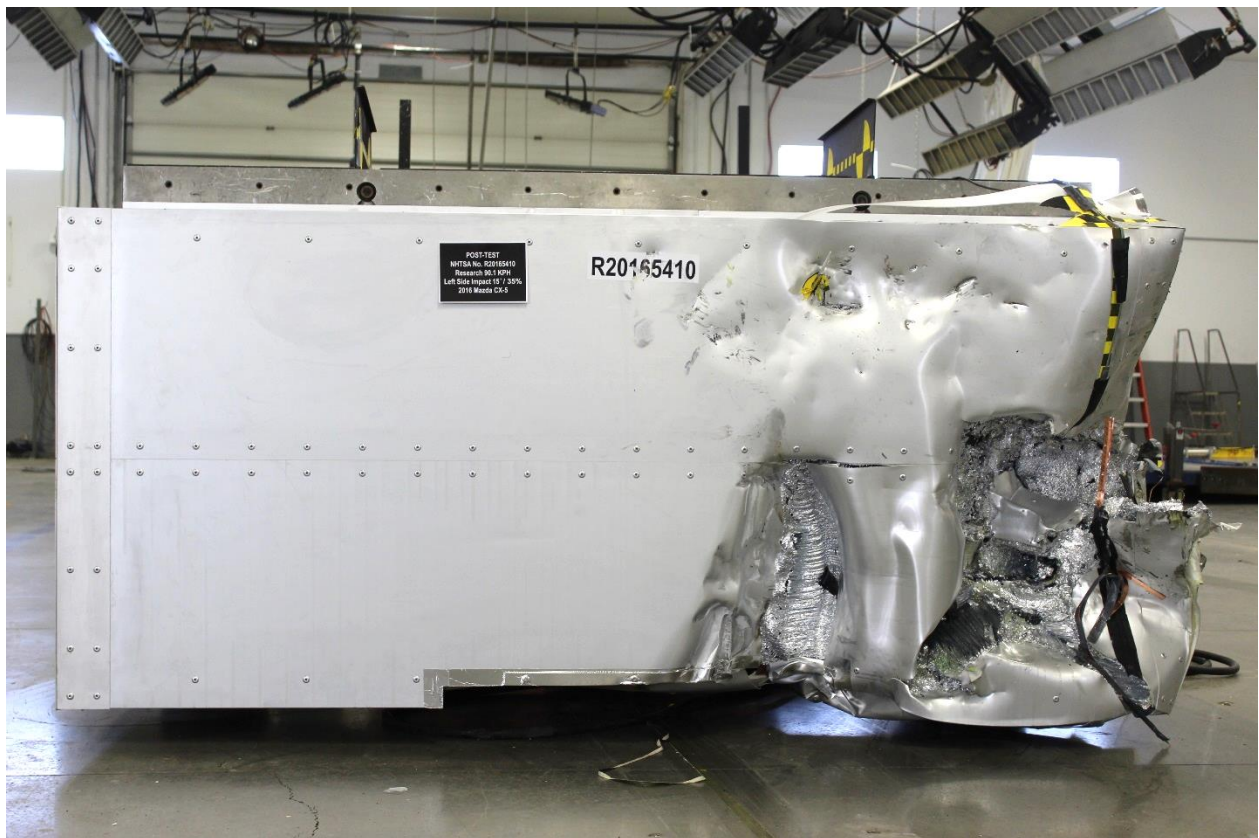
No. 171: Pre-Test Top View of OMDB



No. 172: Post-Test Top View of OMDB



No. 173: Pre-Test Front View of OMDB



No. 174: Post-Test Front View of OMDB



No. 175: Pre-Test Left Front $\frac{3}{4}$ View of OMDB



No. 176: Post-Test Left Front $\frac{3}{4}$ View of OMDB



No. 177: Pre-Test Right Front $\frac{3}{4}$ View of OMDB



No. 178: Post-Test Right Front $\frac{3}{4}$ View of OMDB



No. 179: Pre-Test Right Side View of OMDB



No. 180: Post-Test Right Side View of OMDB



No. 181: Pre-Test Left Side View of OMDB



No. 182: Post-Test Left Side View of OMDB



No. 183: Pre-Test OMDB & Vehicle, Right Side



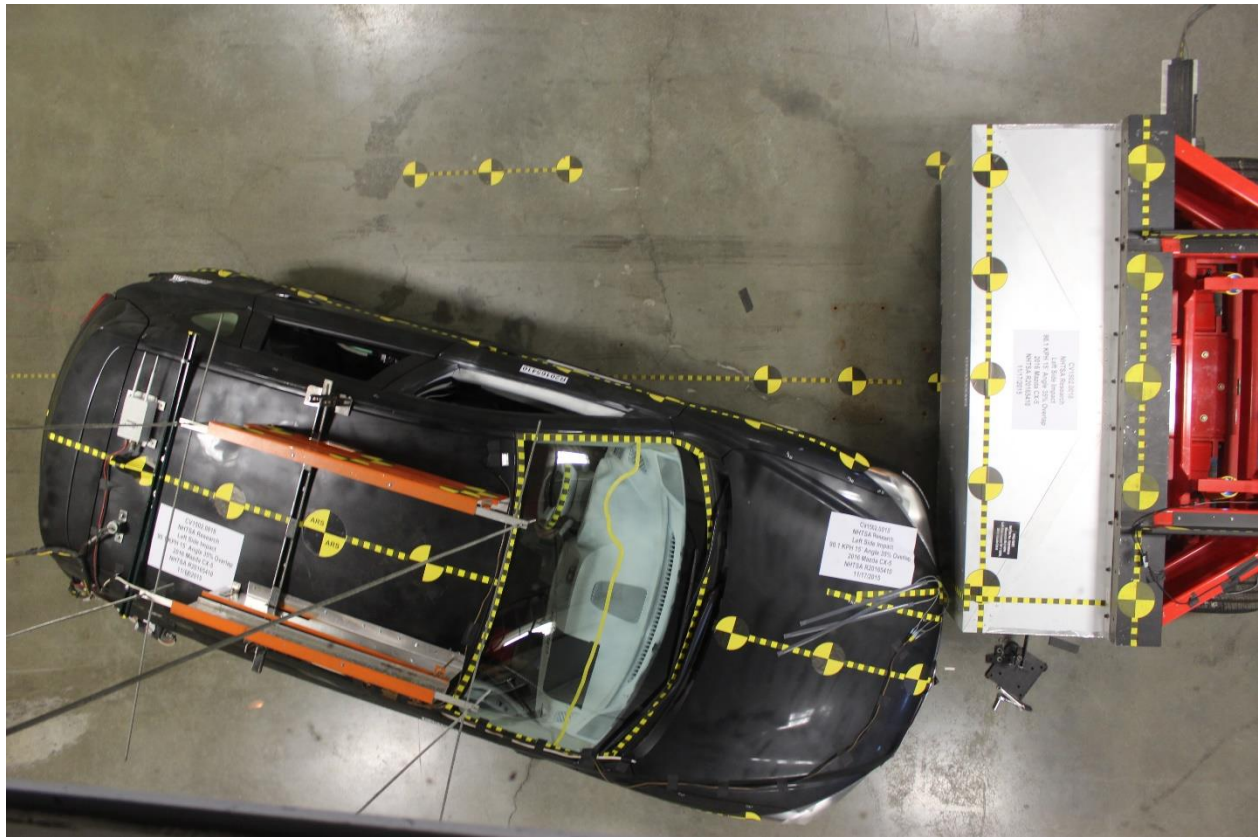
No. 184: Post-Test OMDB & Vehicle, Right Side



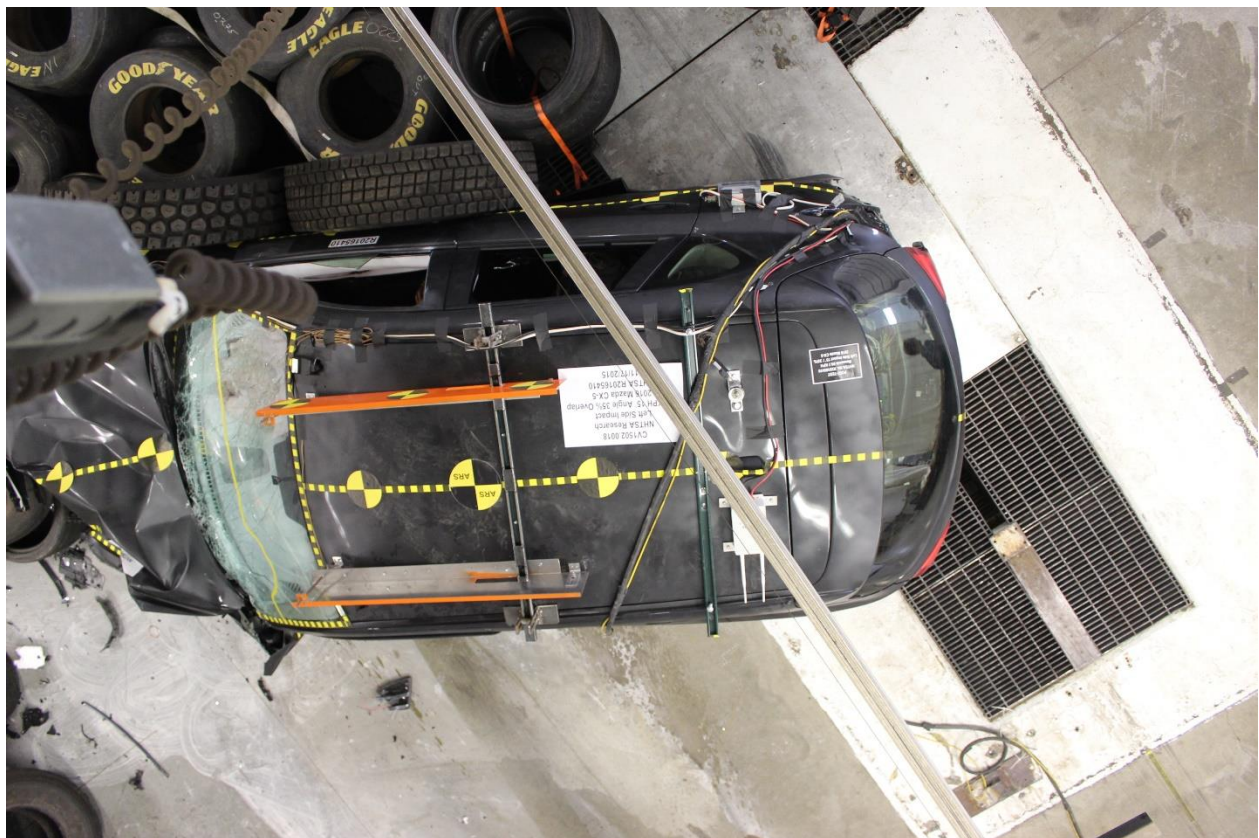
No. 185: Pre-Test OMDB & Vehicle, Left Side



No. 186: Post-Test OMDB & Vehicle, Left Side



No. 187: Pre-Test OMDB & Vehicle, Top View



No. 188: Post-Test OMDB & Vehicle, Top View



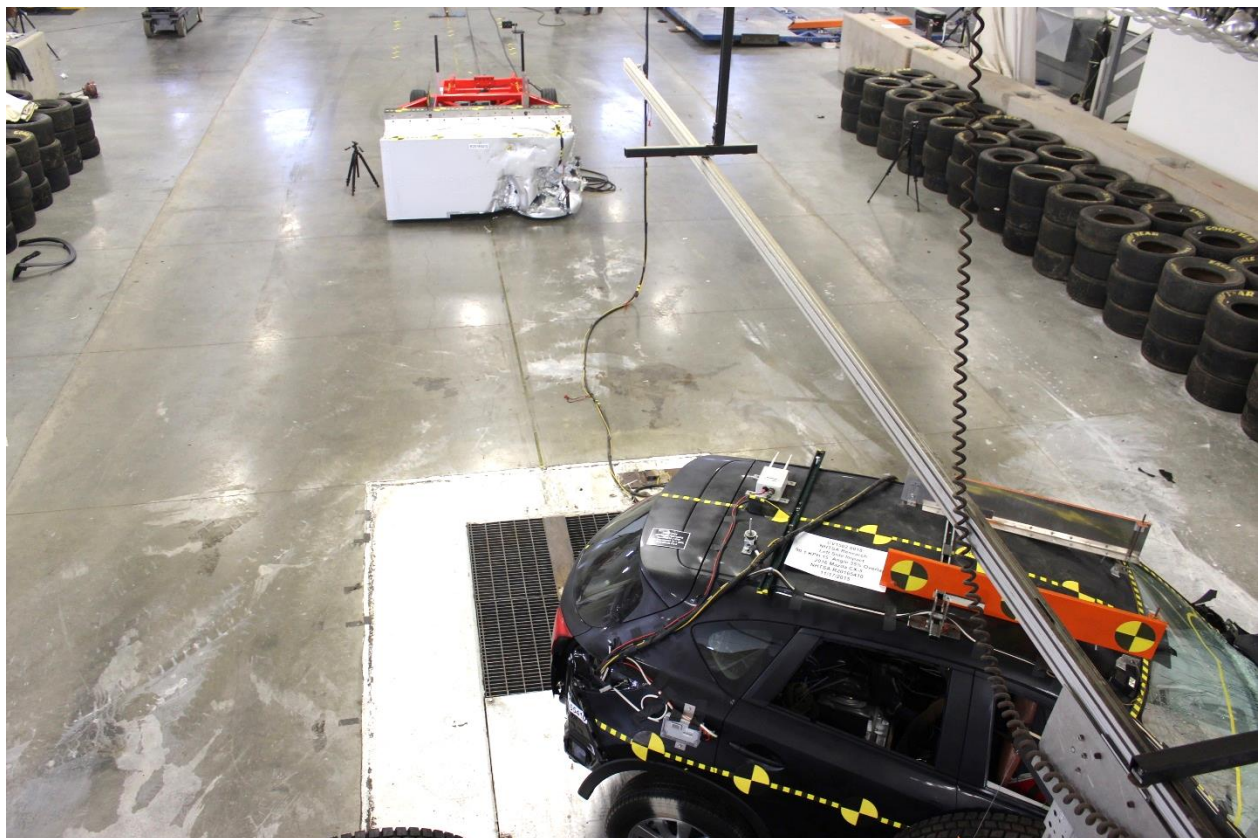
No. 189: Pre-Test OMDB & Vehicle, Rear View



No. 190: Post-Test OMDB & Vehicle, Rear View



No. 191: Pre-Test OMDB & Vehicle, Front View



No. 192: Post-Test OMDB & Vehicle, Front View



No. 193: Pre-Test OMDB & Vehicle Alignment



No. 194: Vehicle at 0 Degrees on Static Rollover Device



No. 195: Vehicle at 90 Degrees on Static Rollover Device



No. 196: Vehicle at 180 Degrees on Static Rollover Device



No. 197: Vehicle at 270 Degrees on Static Rollover Device



No. 198: Vehicle at 360 Degrees on Static Rollover Device



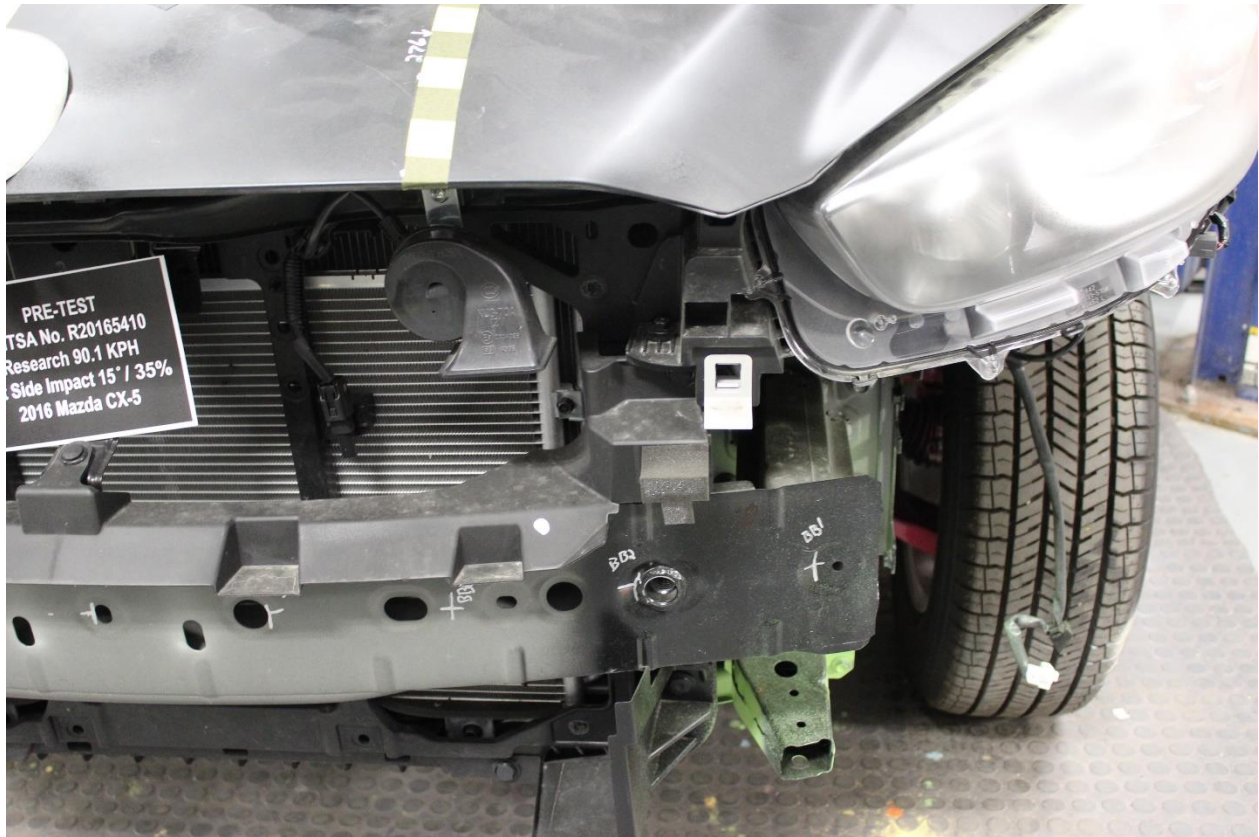
No. 199: Impact Photo



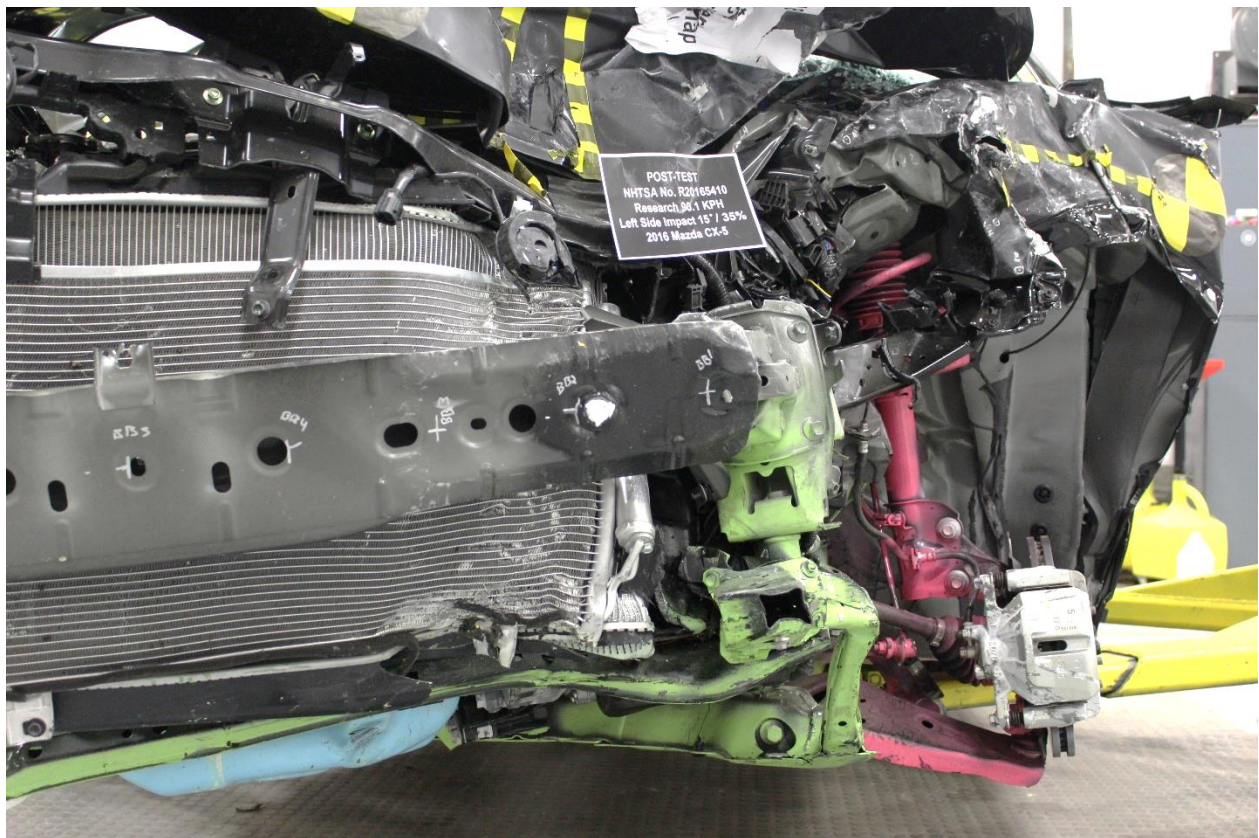
No. 200: Pre-Test Vehicle Bumper Left Side View



No. 201 Post-Test Vehicle Bumper Left View



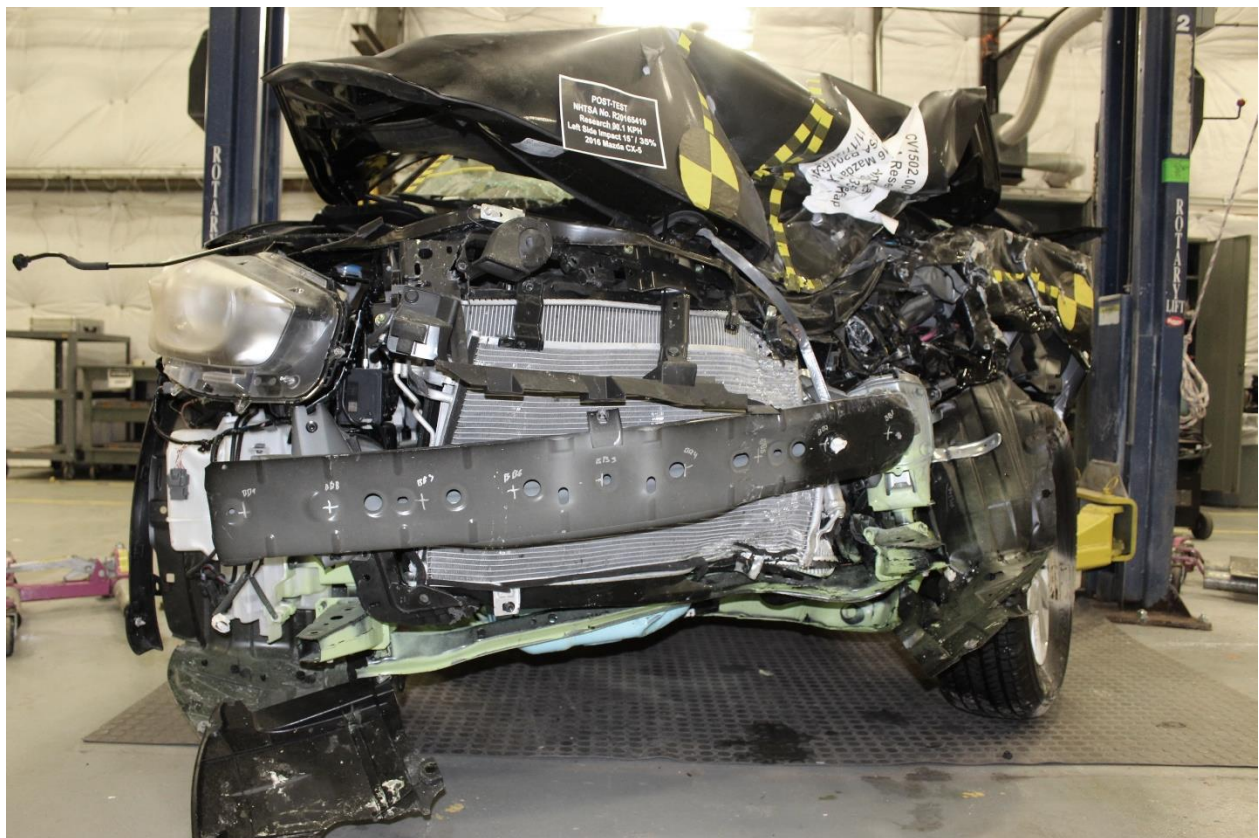
No. 202 Pre-Test Vehicle Bumper Left Front View



No. 203 Post-Test Vehicle Bumper Left Front View



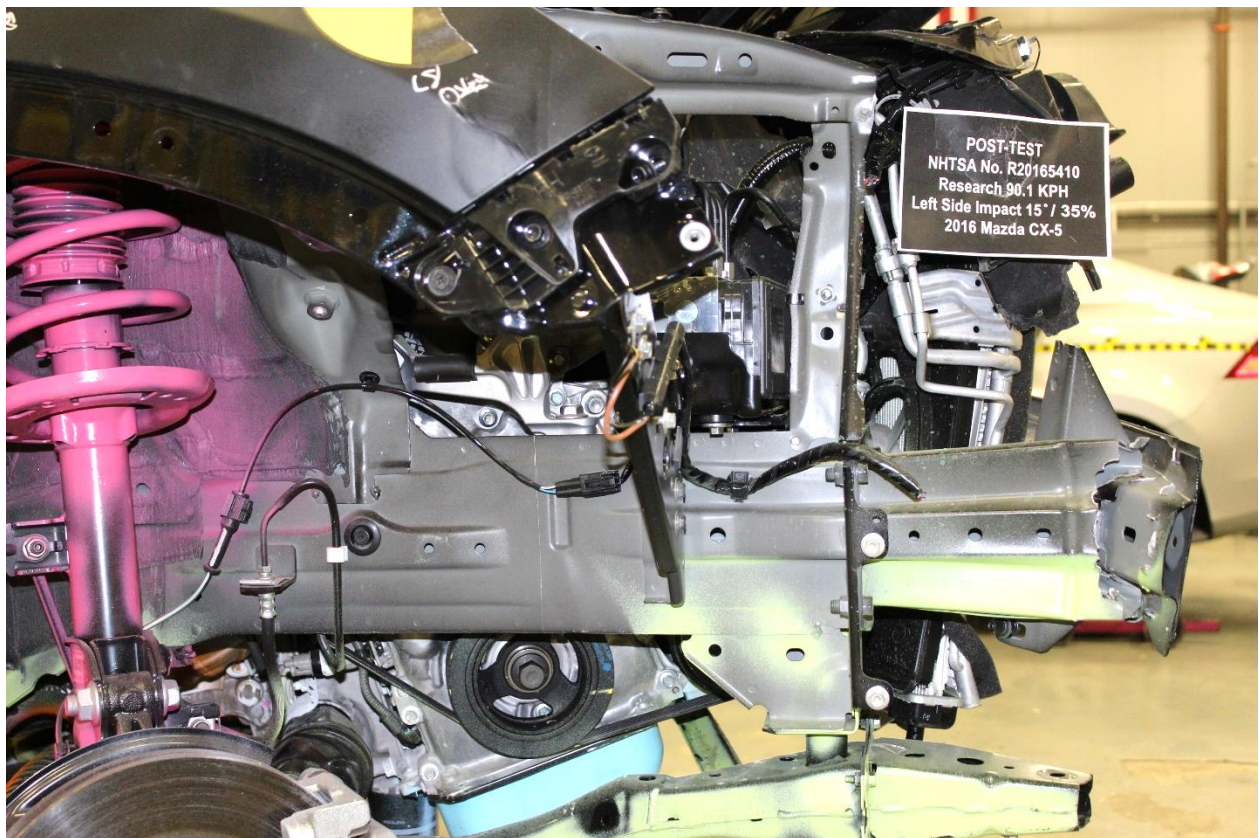
No. 204 Pre-Test Vehicle Bumper Front View



No. 205 Post-Test Vehicle Bumper Front View



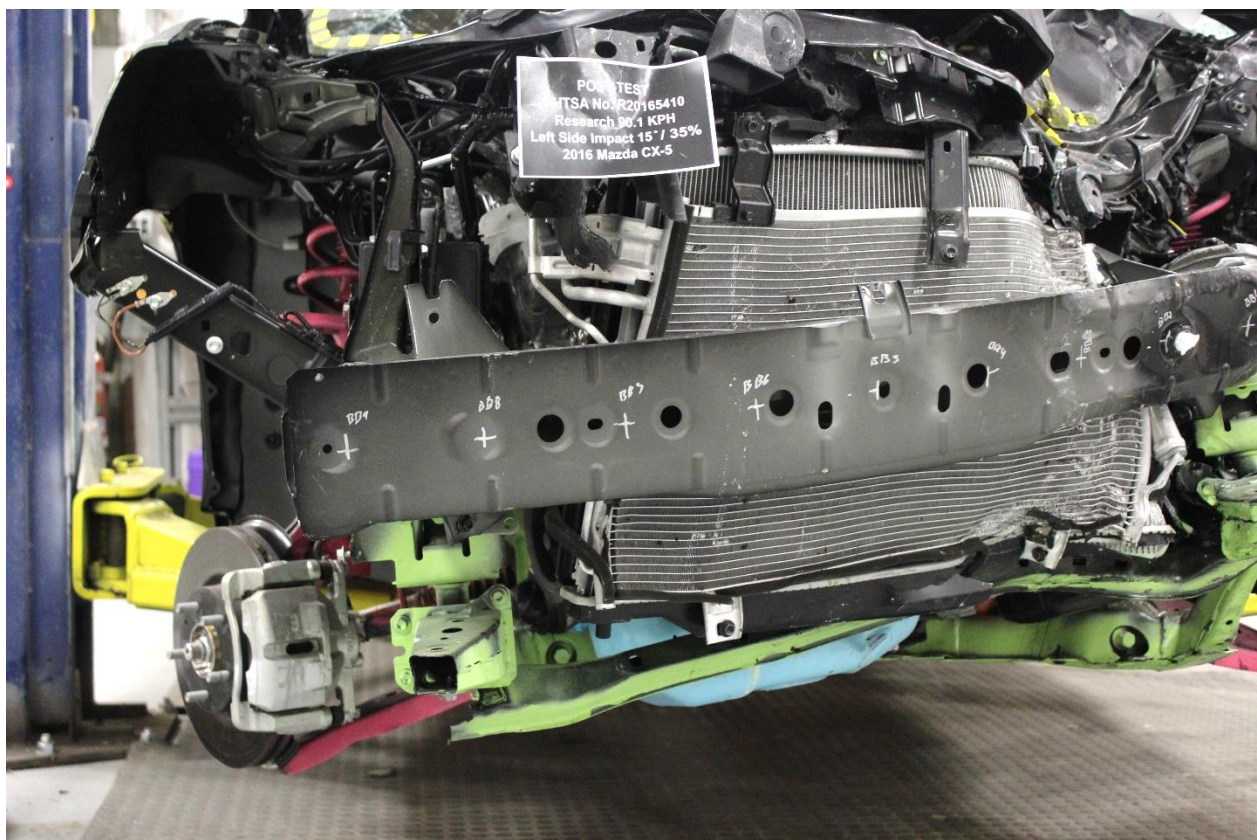
No. 206 Pre-Test Vehicle Bumper Right Side View



No. 207 Post-Test Vehicle Bumper Right View



No. 208 Pre-Test Vehicle Bumper Right Front View



No. 209 Post-Test Vehicle Bumper Right Front View

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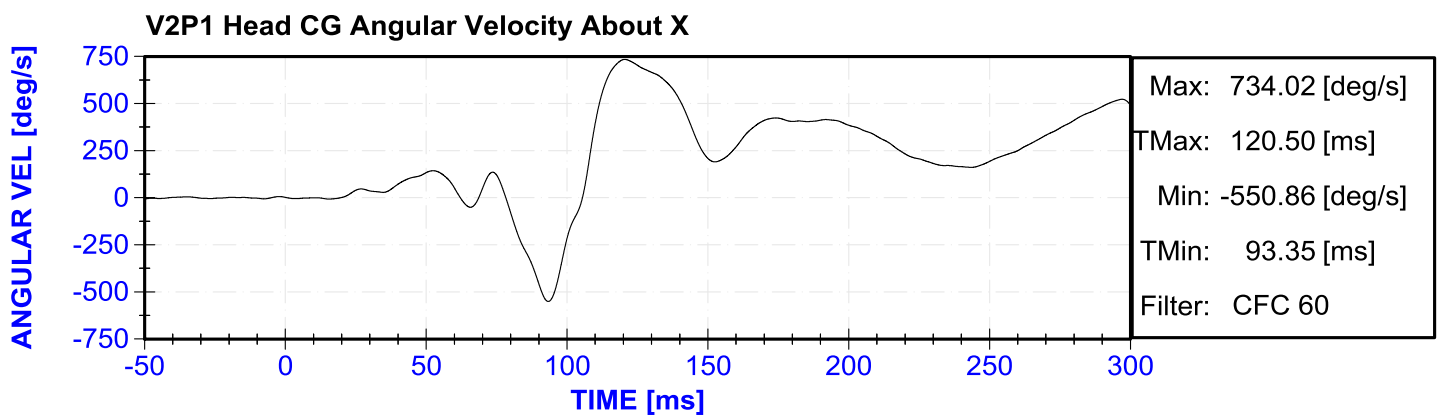
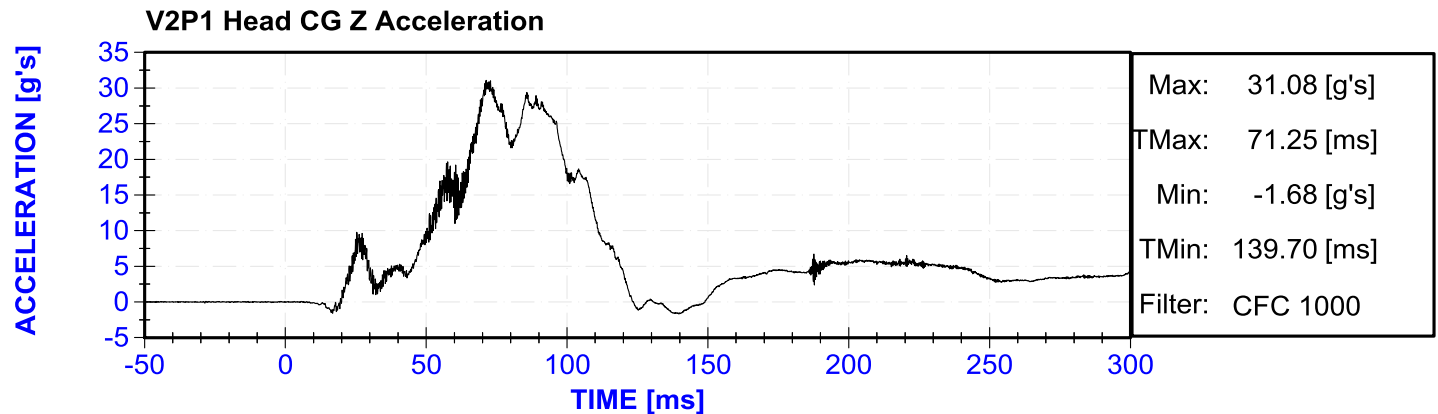
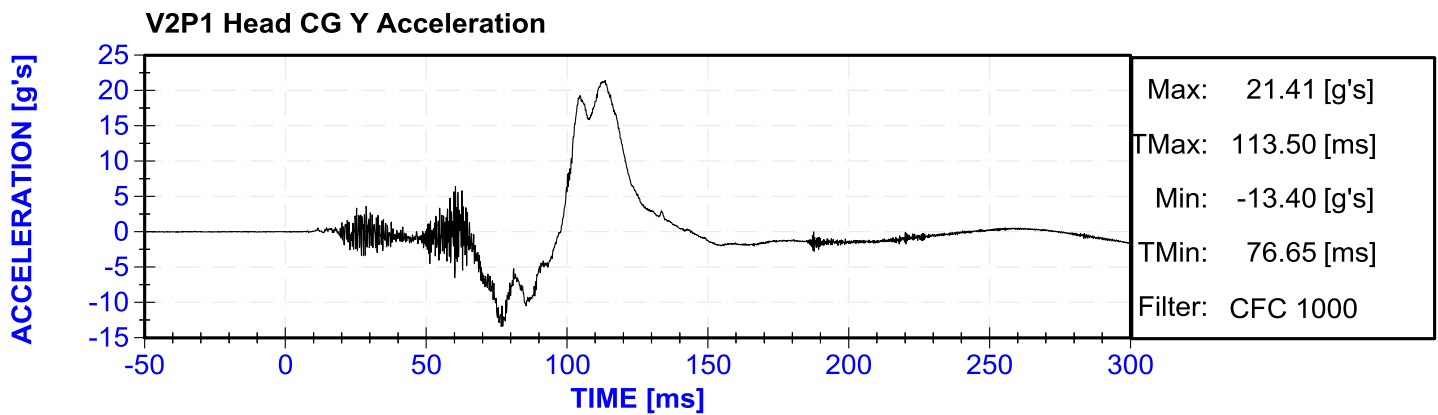
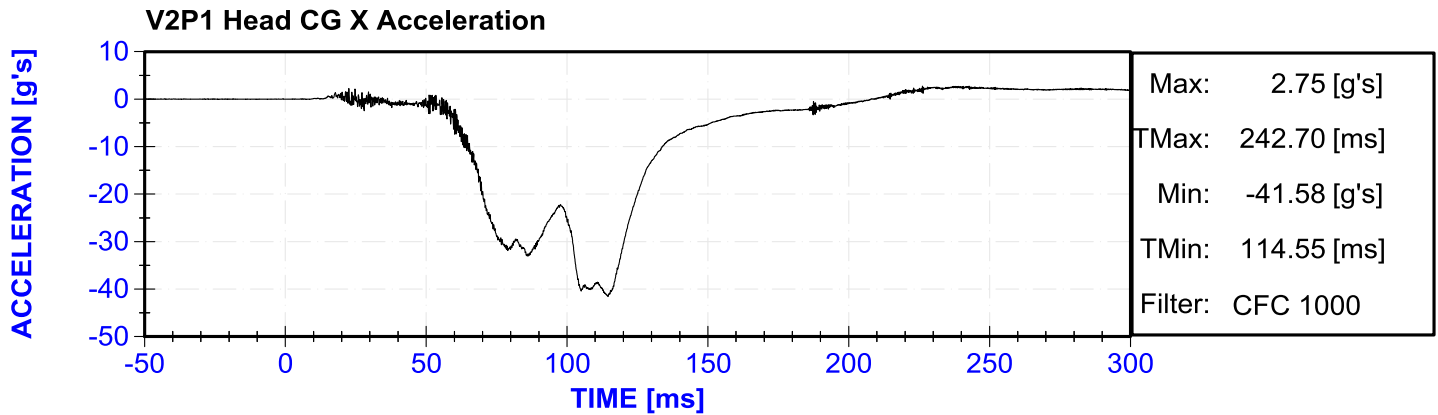
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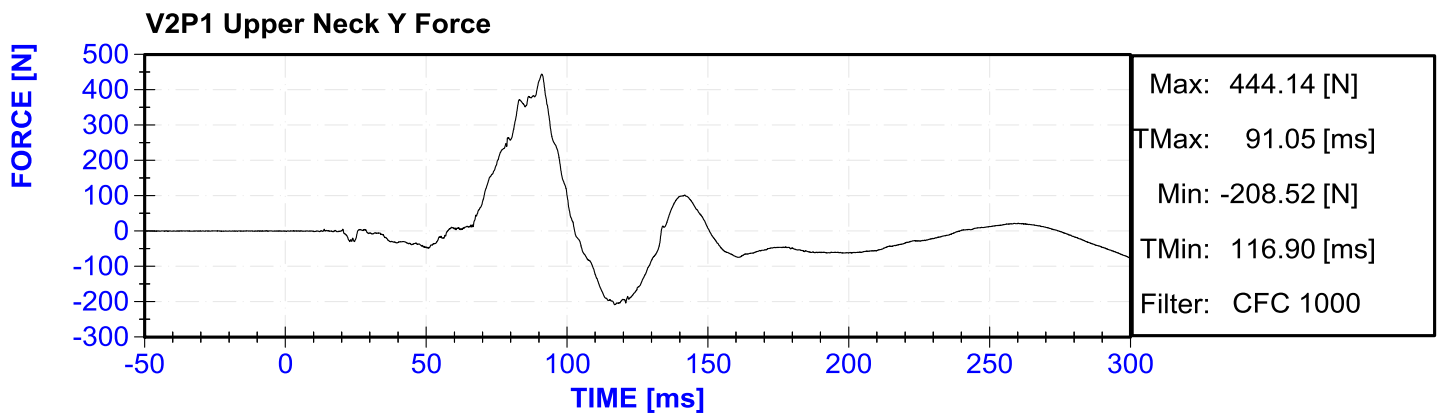
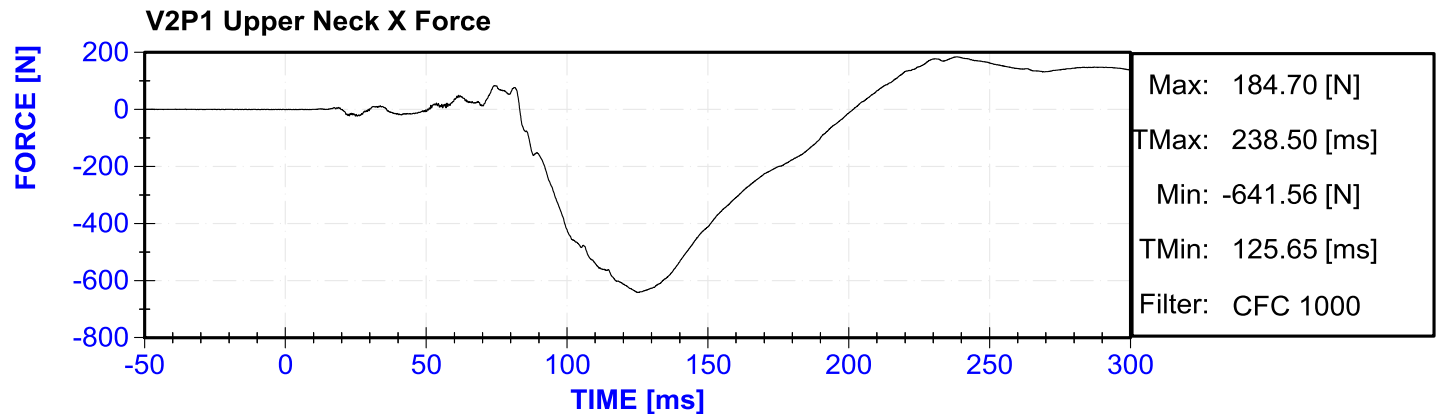
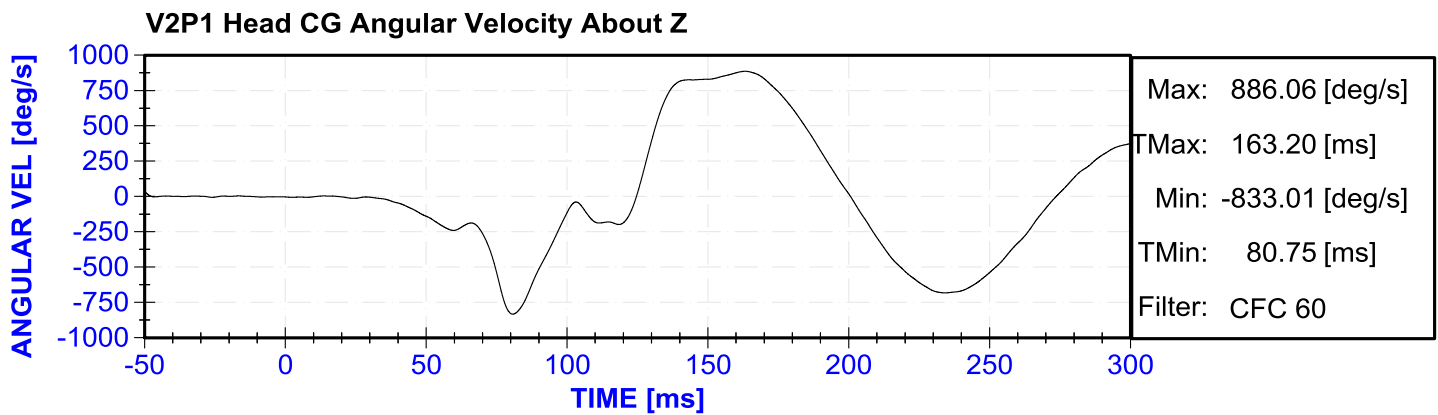
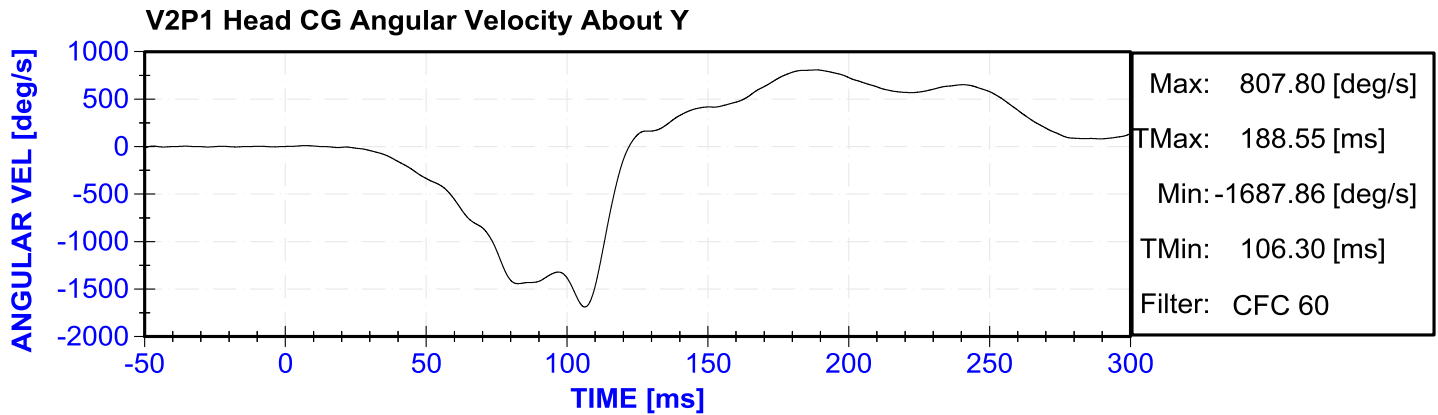
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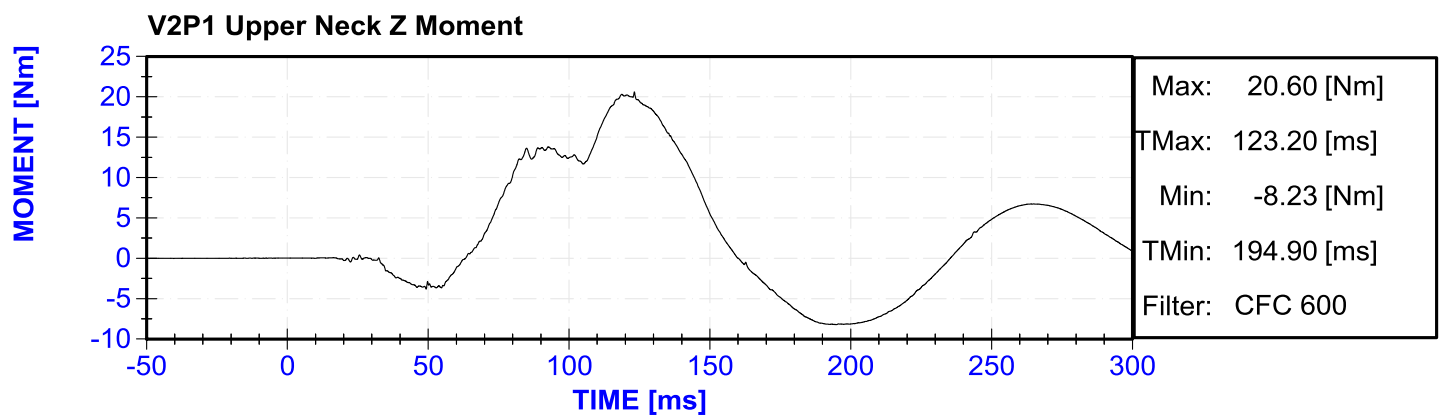
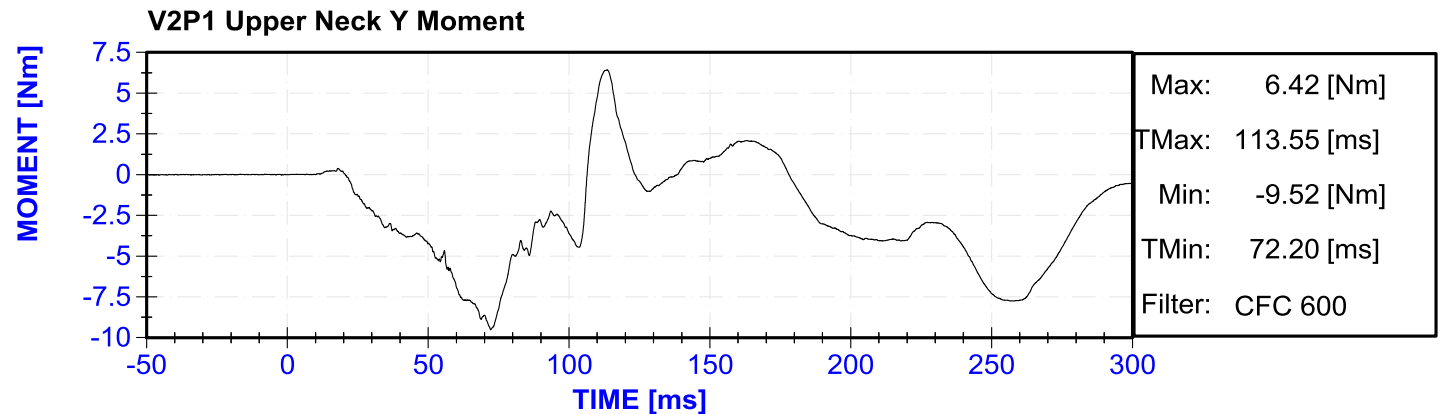
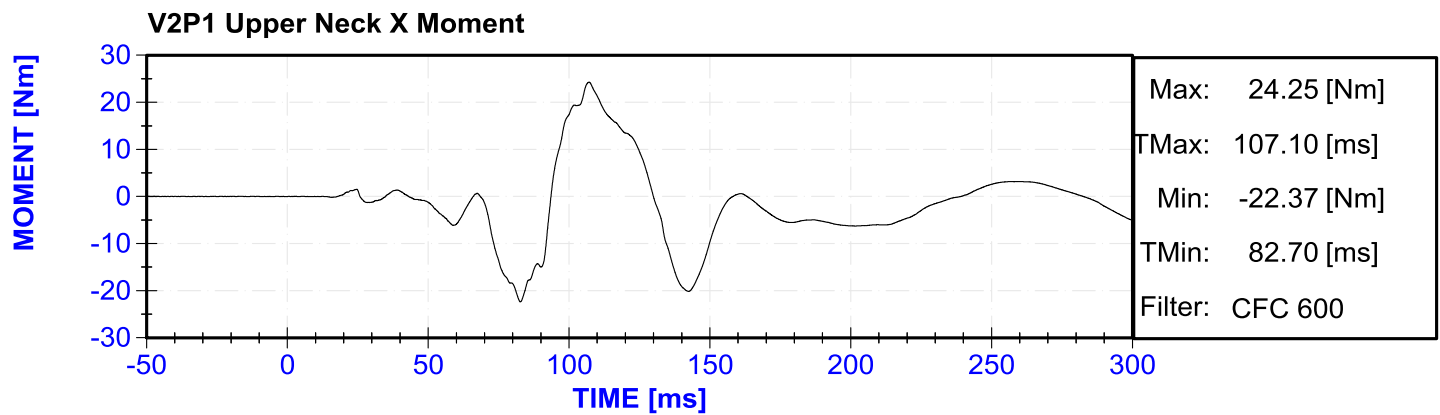
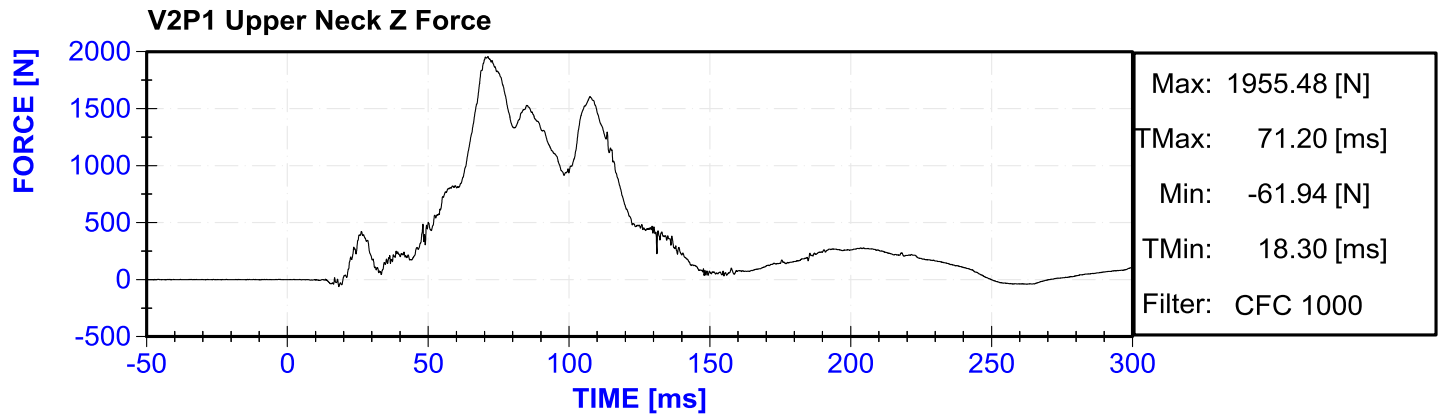
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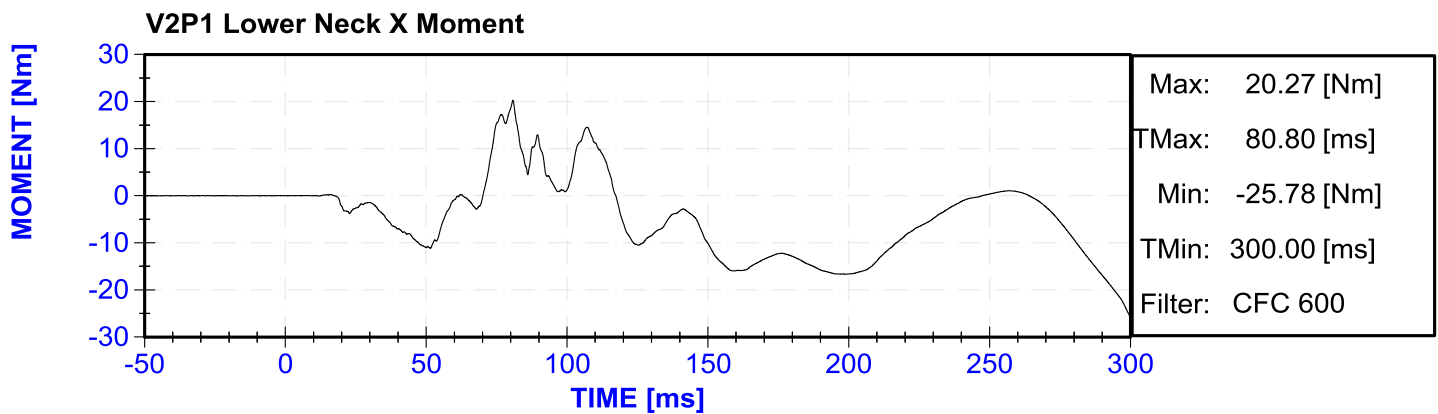
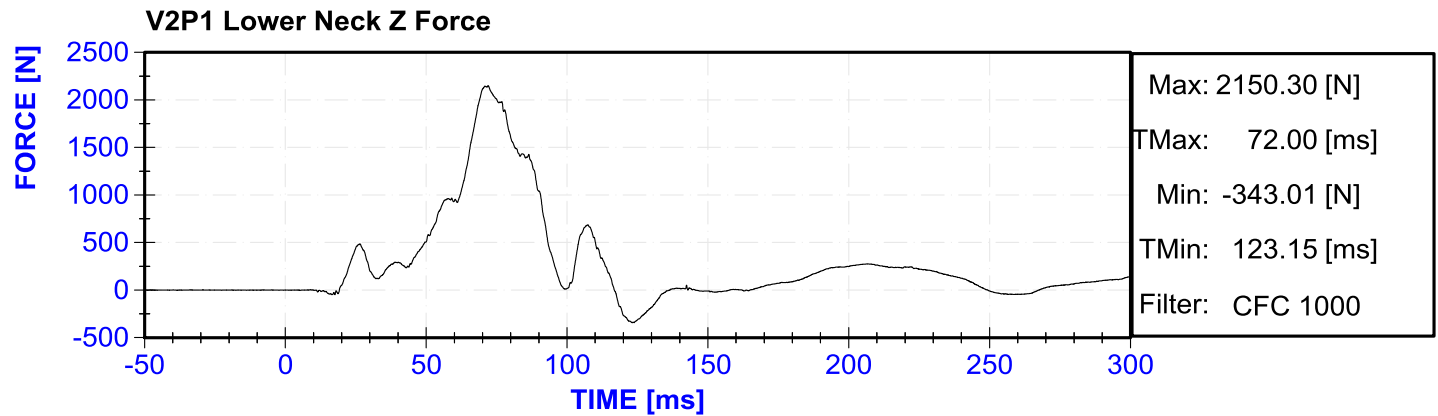
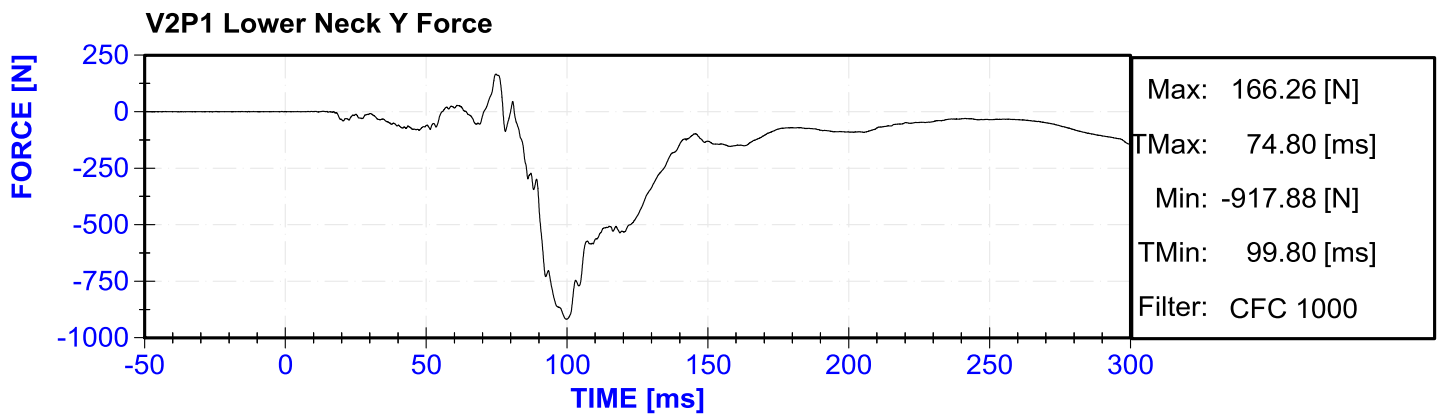
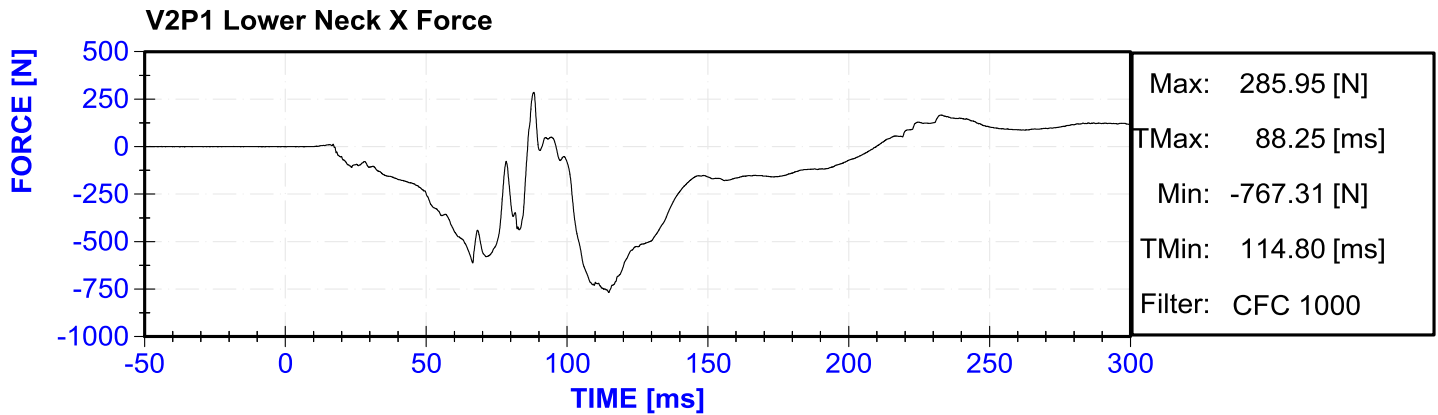
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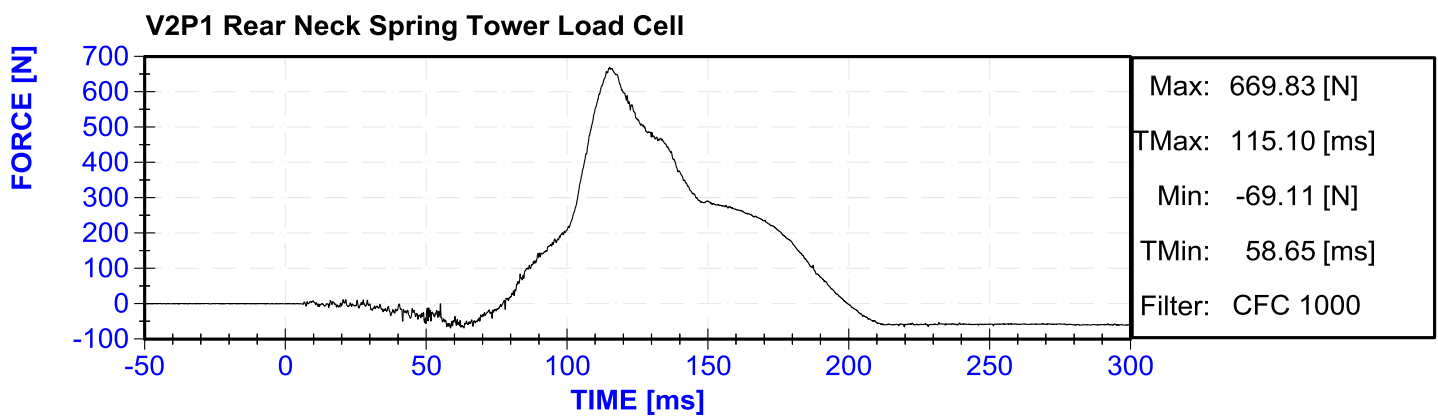
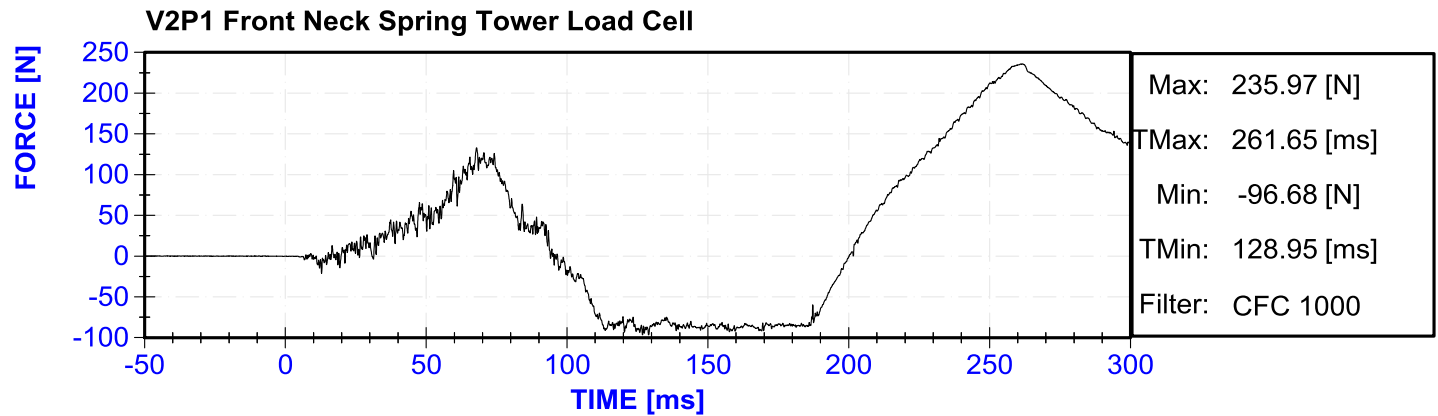
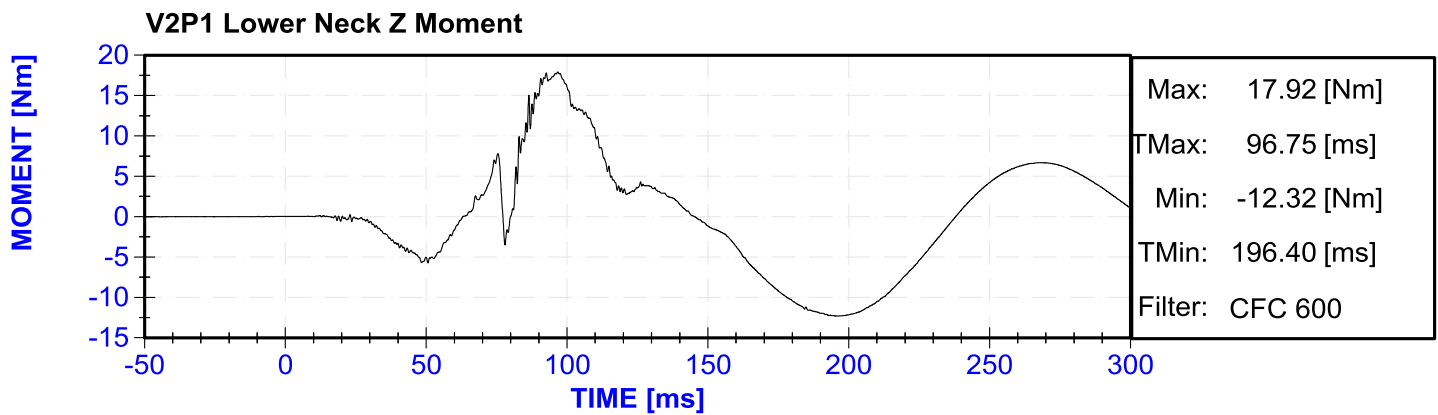
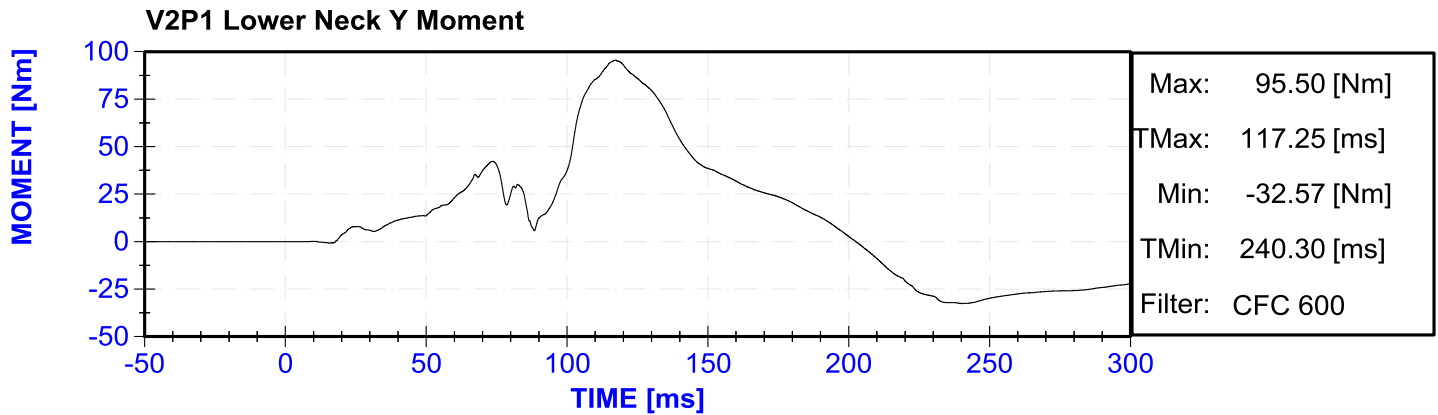
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Plot 320	V2P2 Abdomen Left Lower Resultant	B-88
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Plot 322	V2P2 Abdomen Right Lower Dy	B-89
Plot 323	V2P2 Abdomen Right Lower Dz	B-89
Plot 324	V2P2 Abdomen Right Lower Resultant	B-89



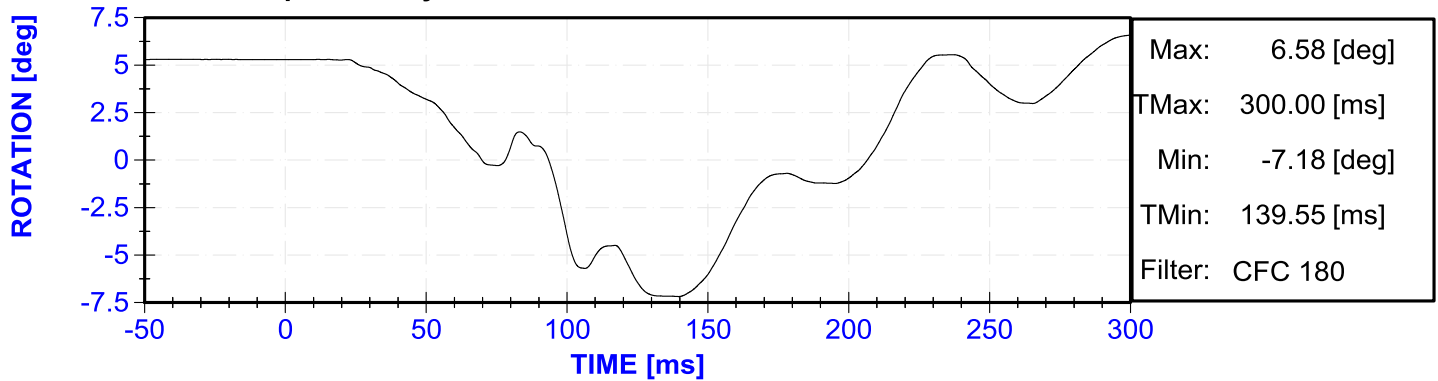




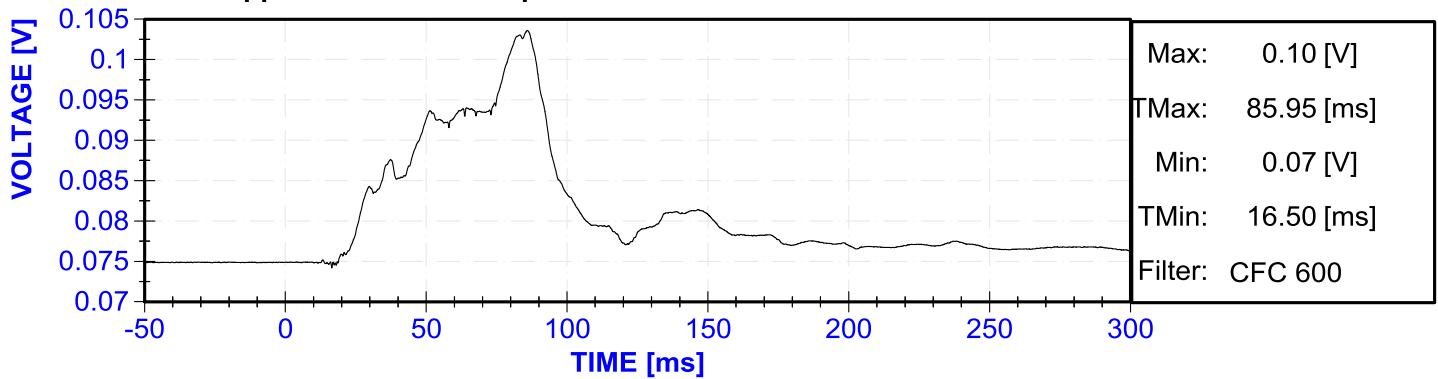




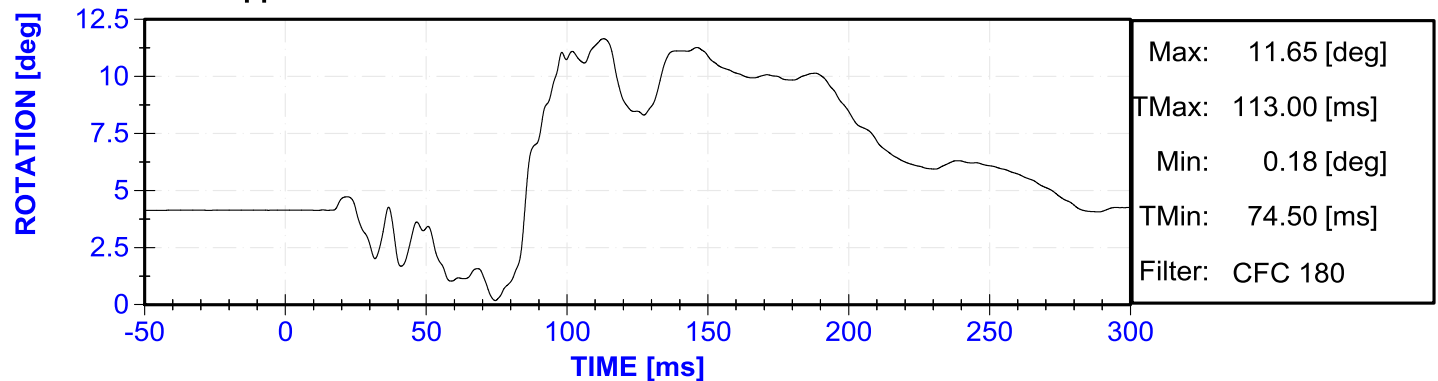
V2P1 Occipital Condyle Rotation Potentiometer



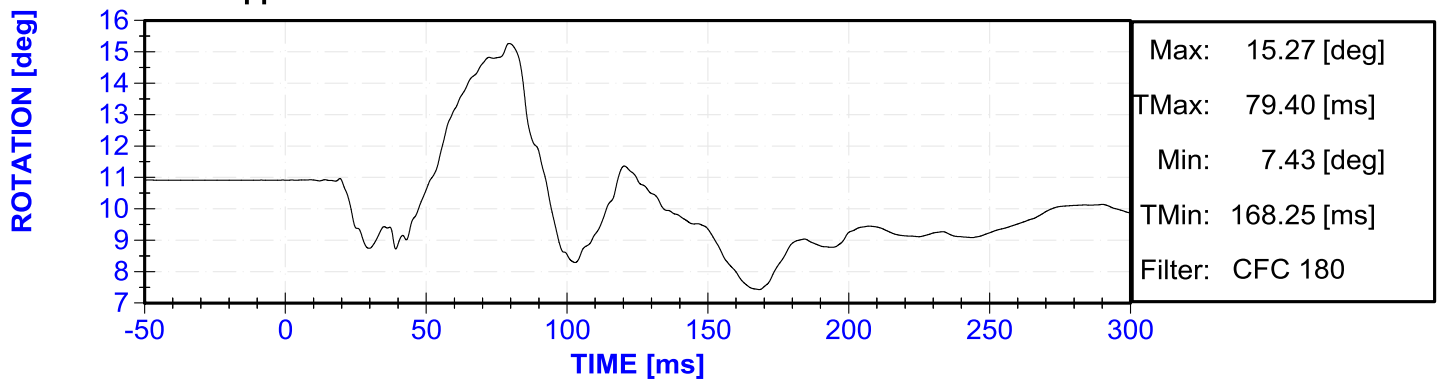
V2P1 Upper Left DGIR X Displacement



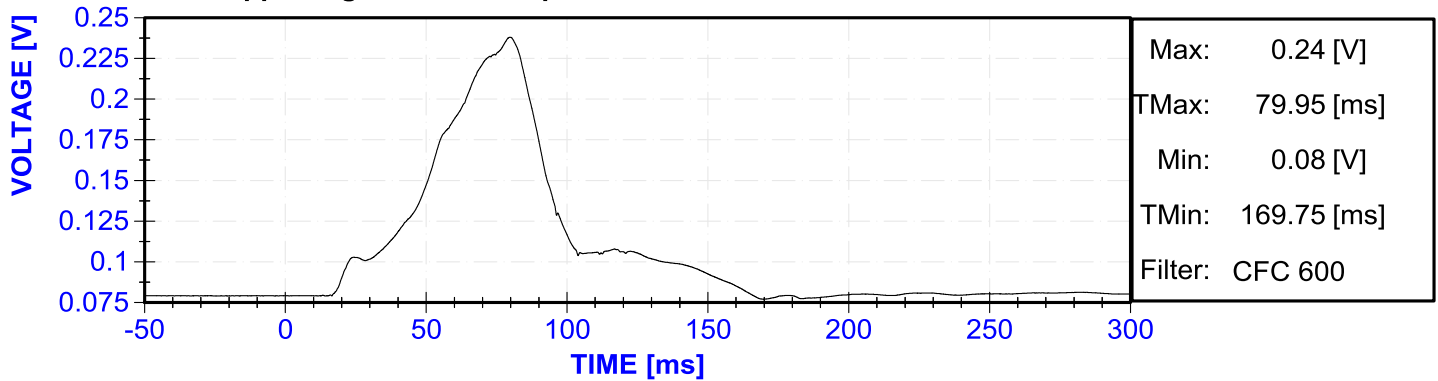
V2P1 Upper Left DGIR Y Rotation



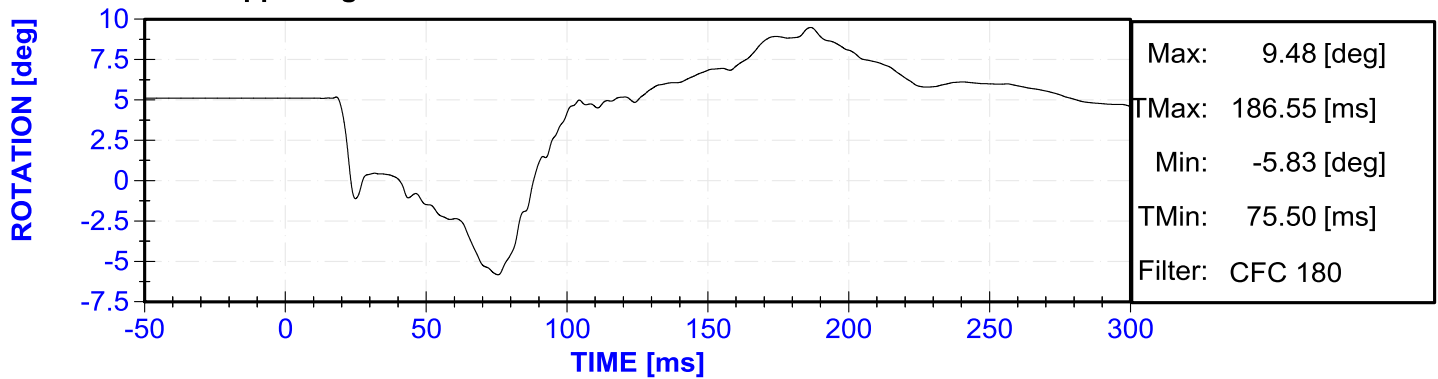
V2P1 Upper Left DGIR Z Rotation



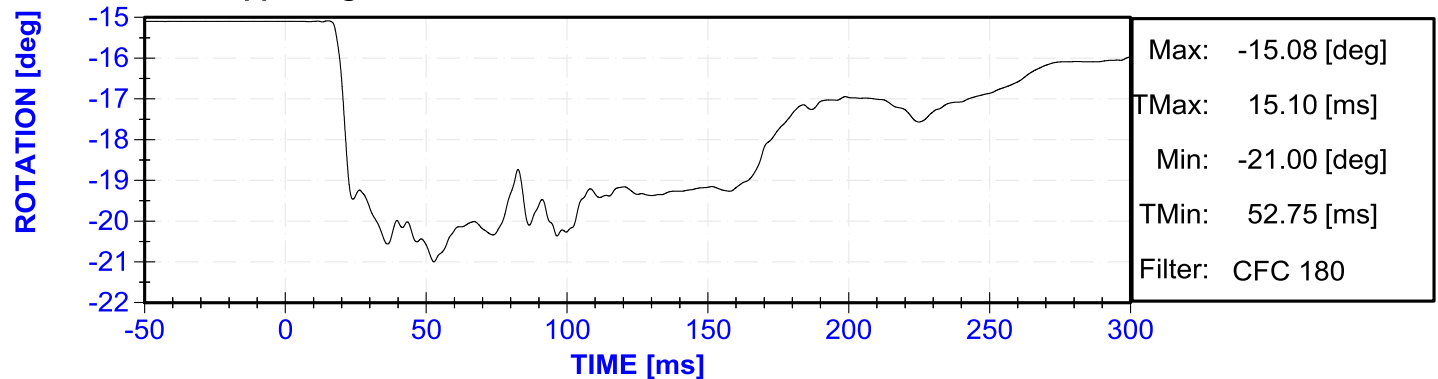
V2P1 Upper Right DGIR X Displacement



V2P1 Upper Right DGIR Y Rotation

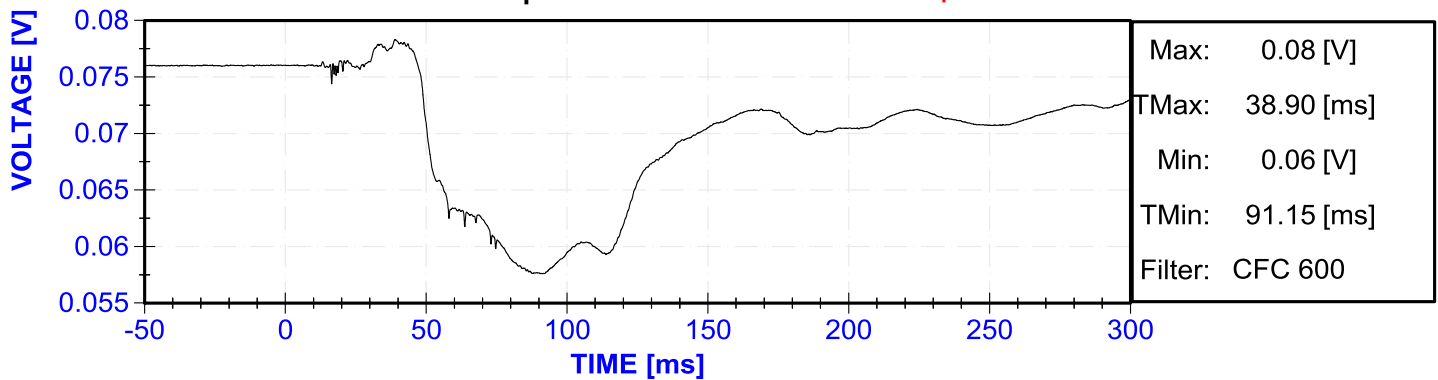


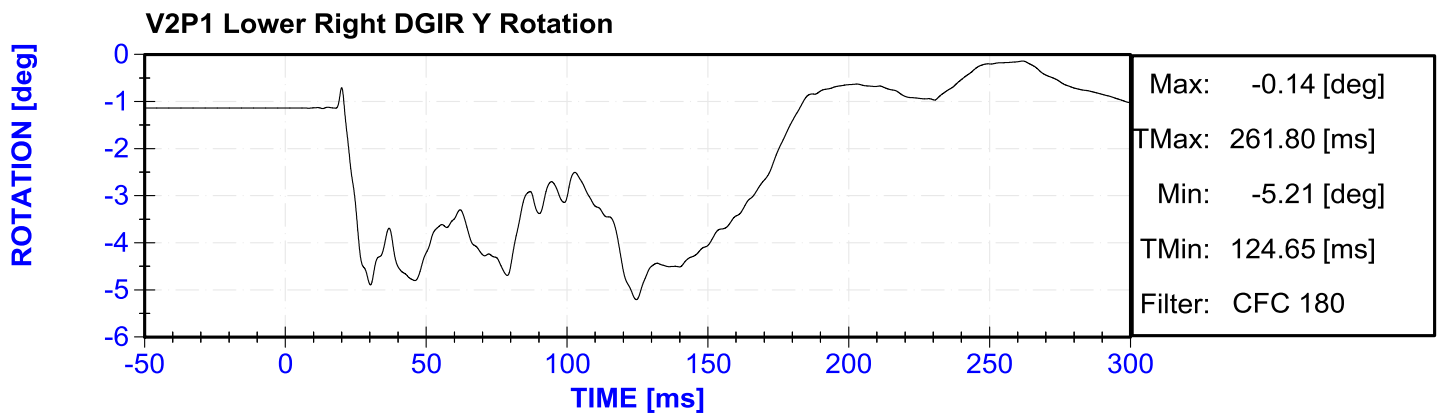
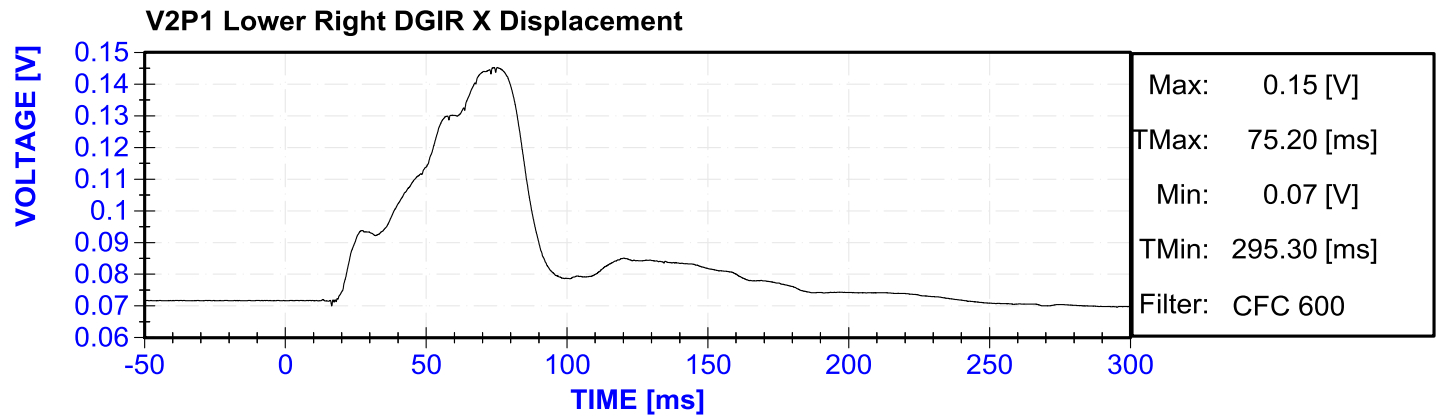
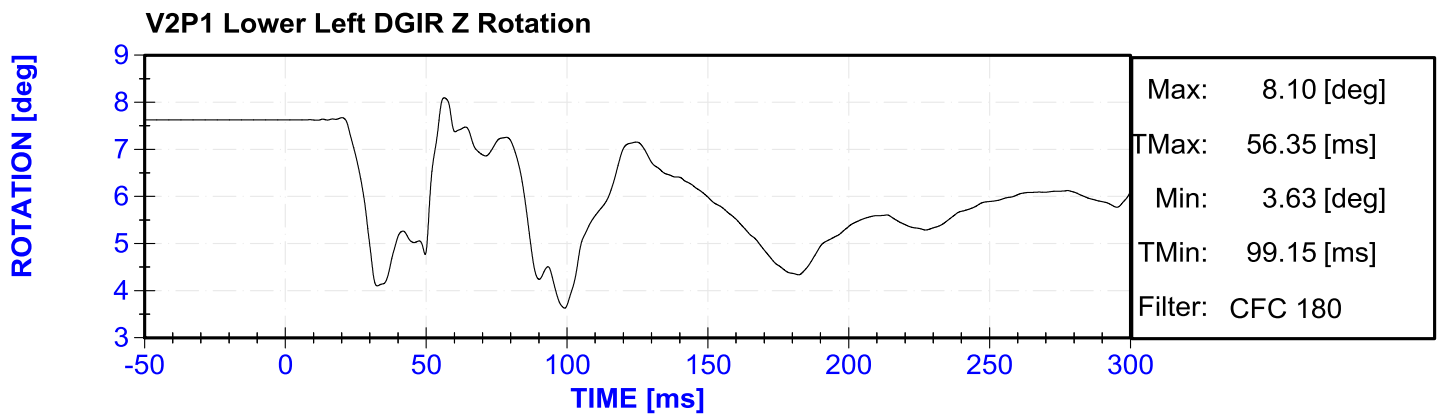
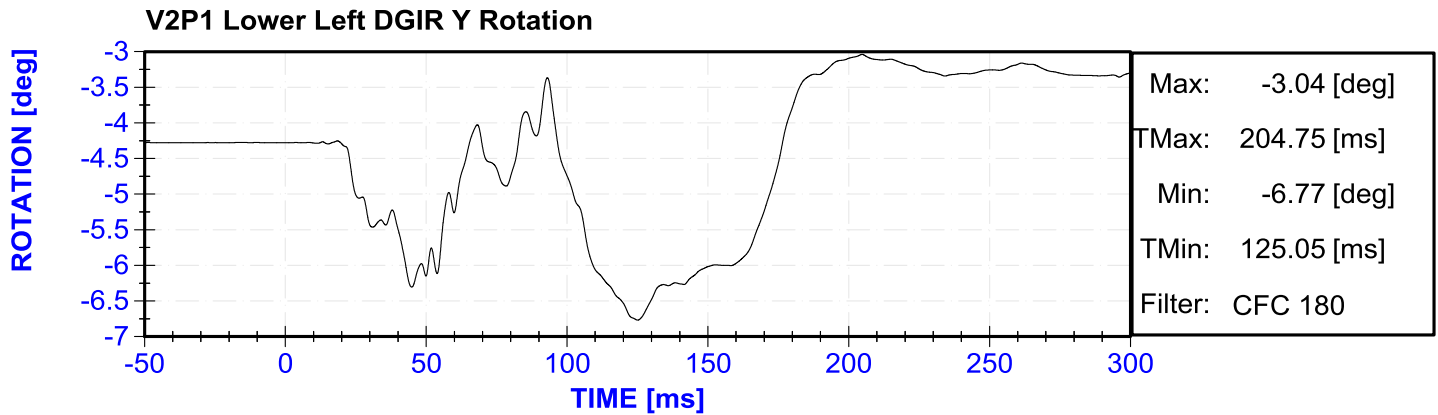
V2P1 Upper Right DGIR Z Rotation

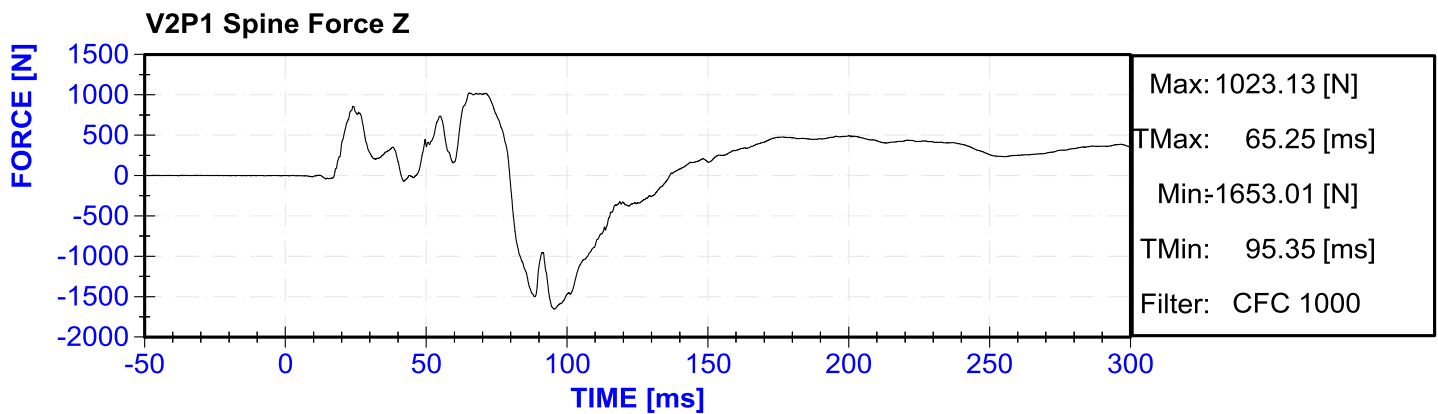
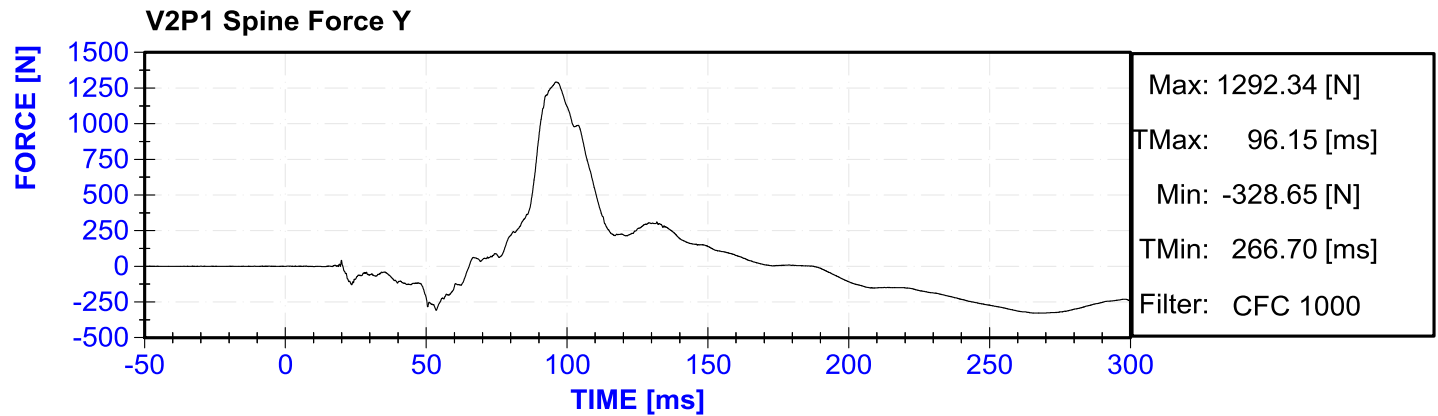
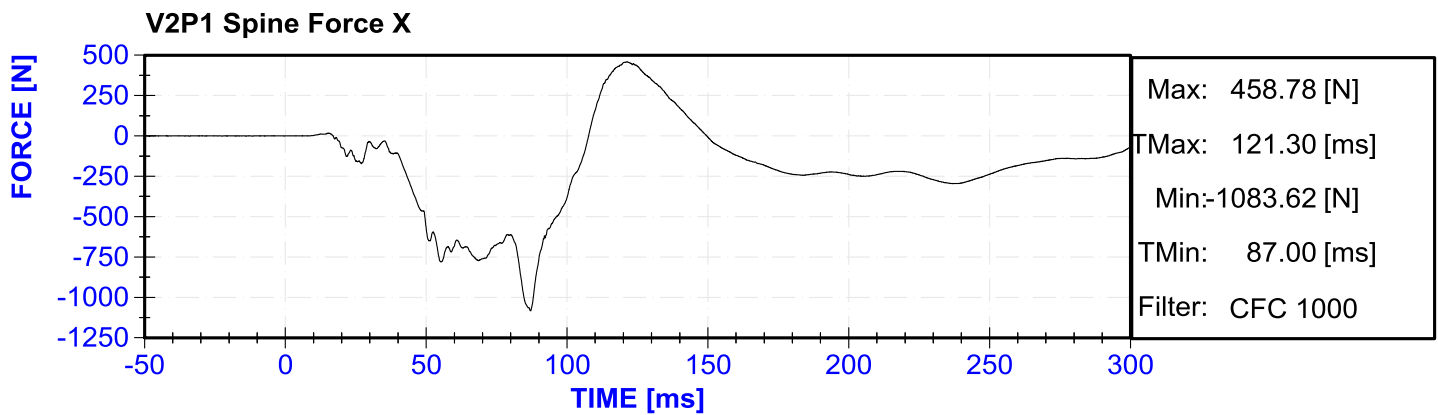
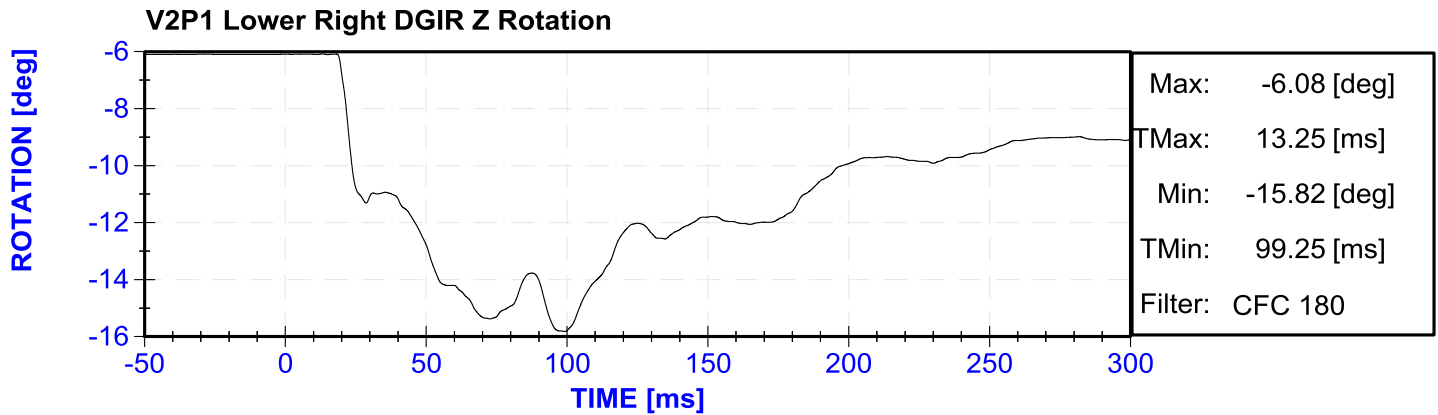


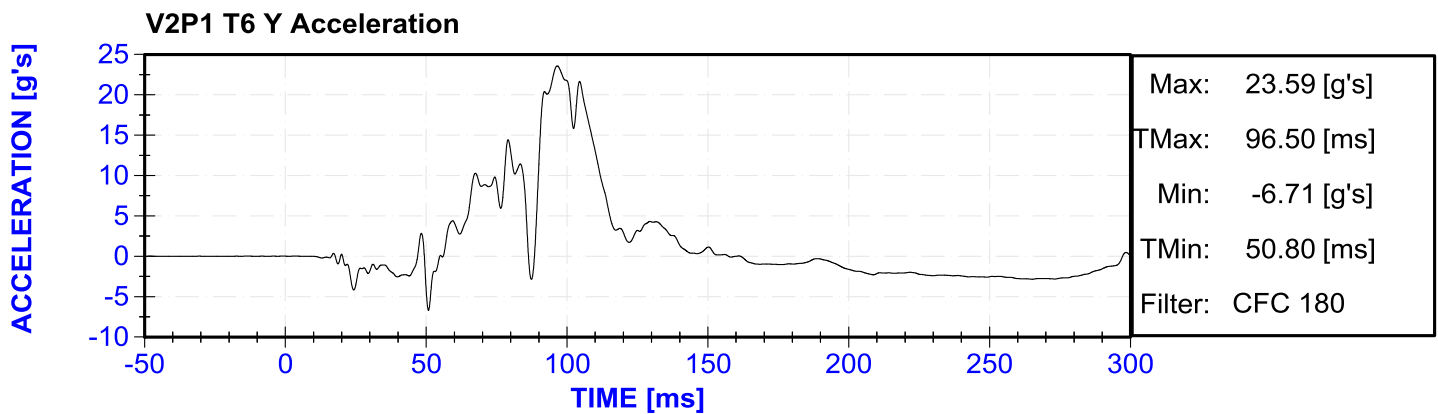
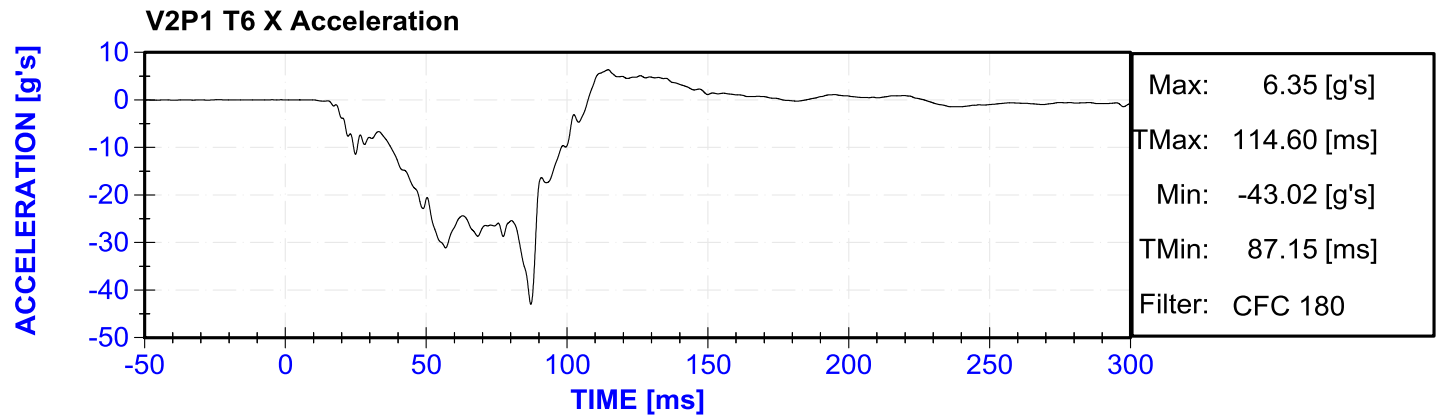
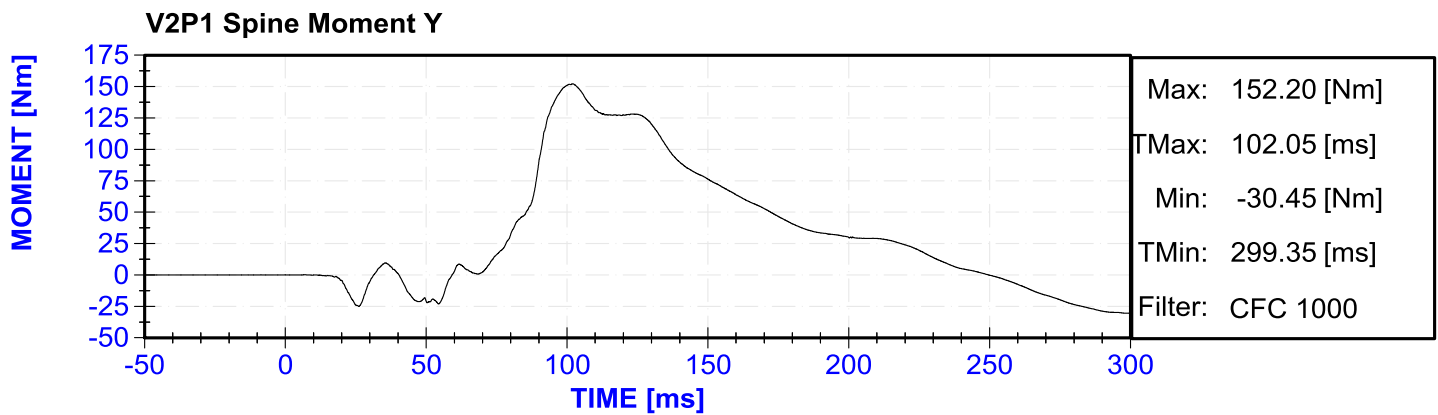
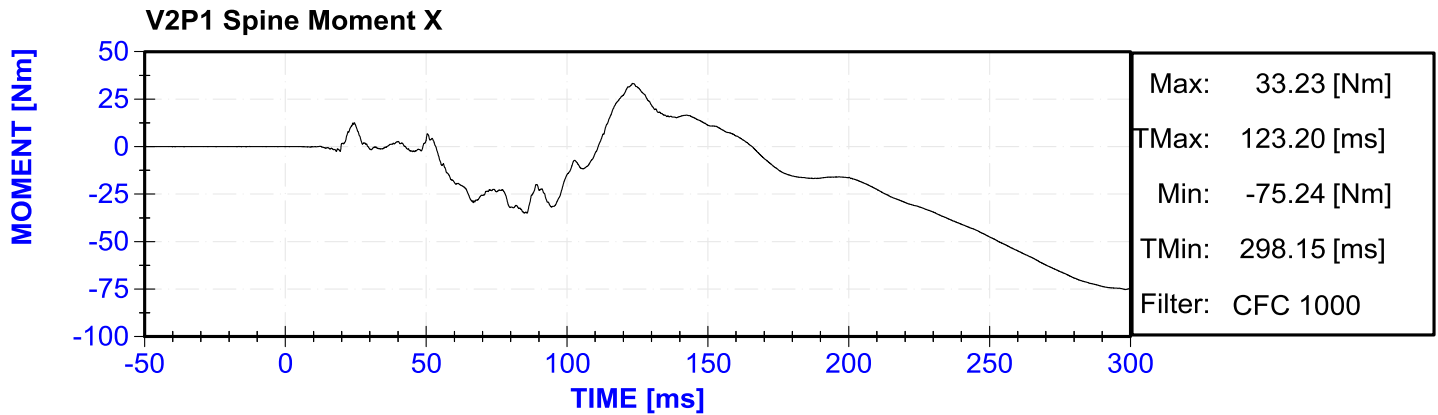
V2P1 Lower Left DGIR X Displacement

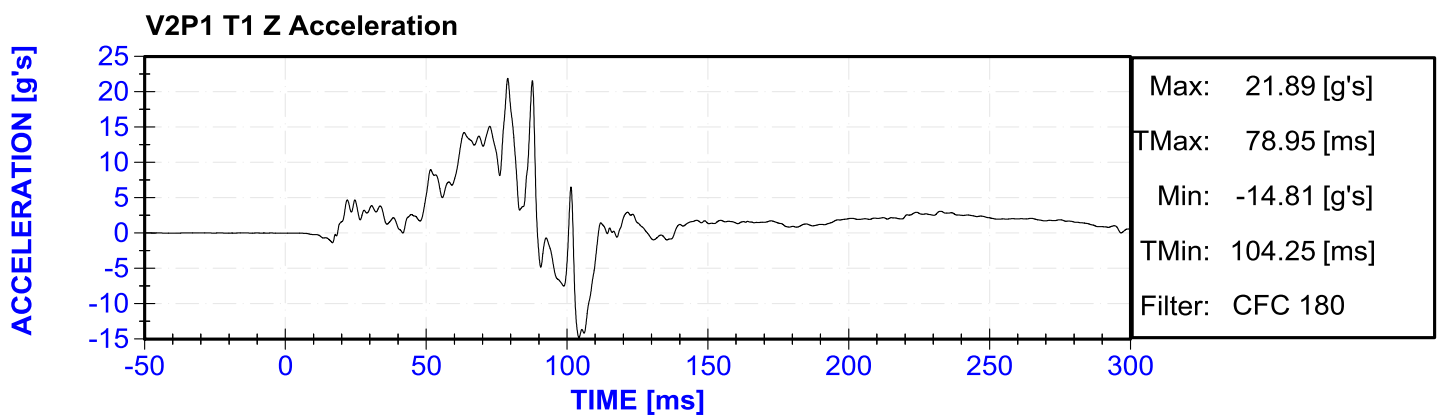
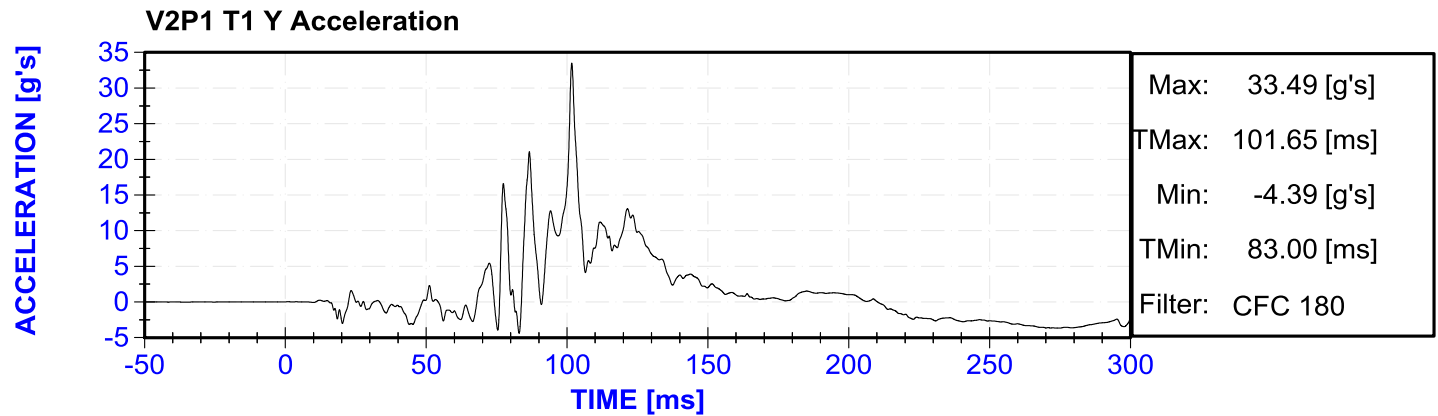
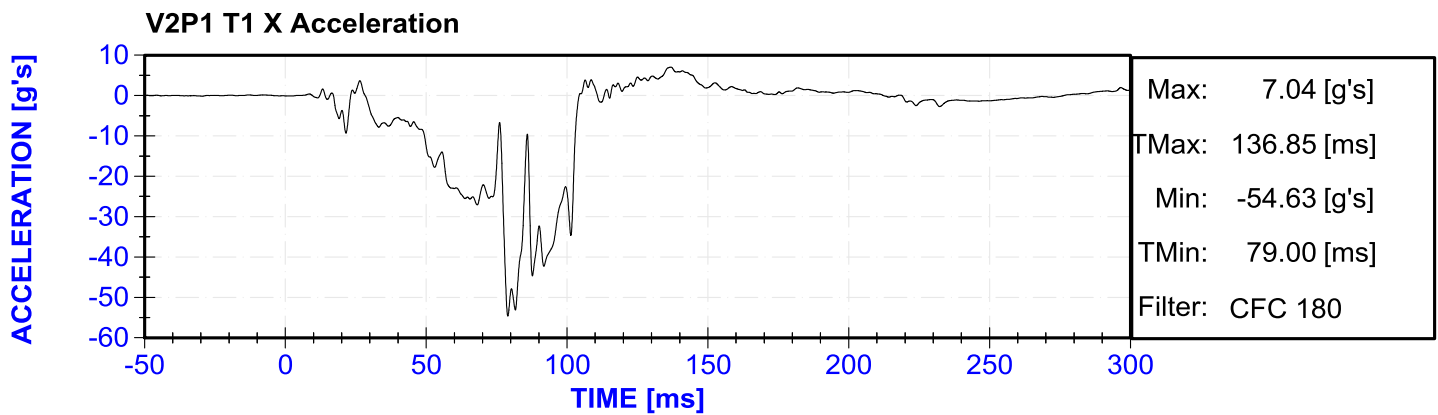
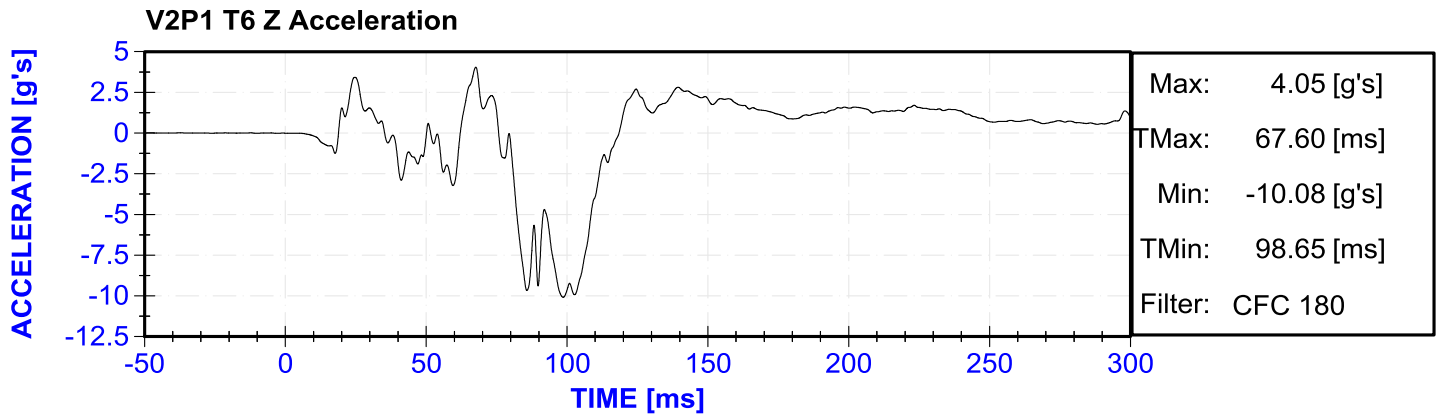
QD spikes 16.8ms to 20.4ms & 58.2ms to 74.3ms

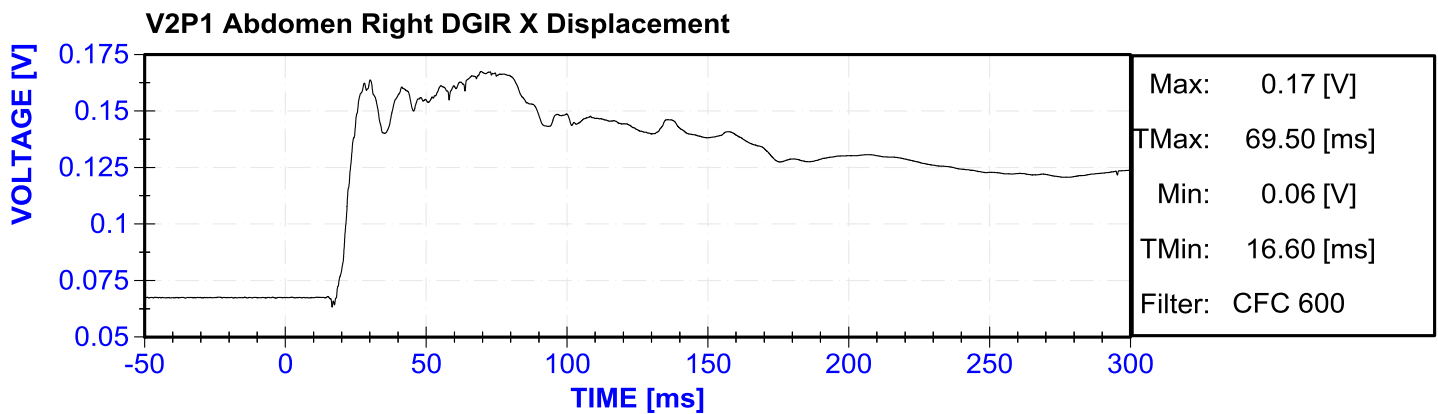
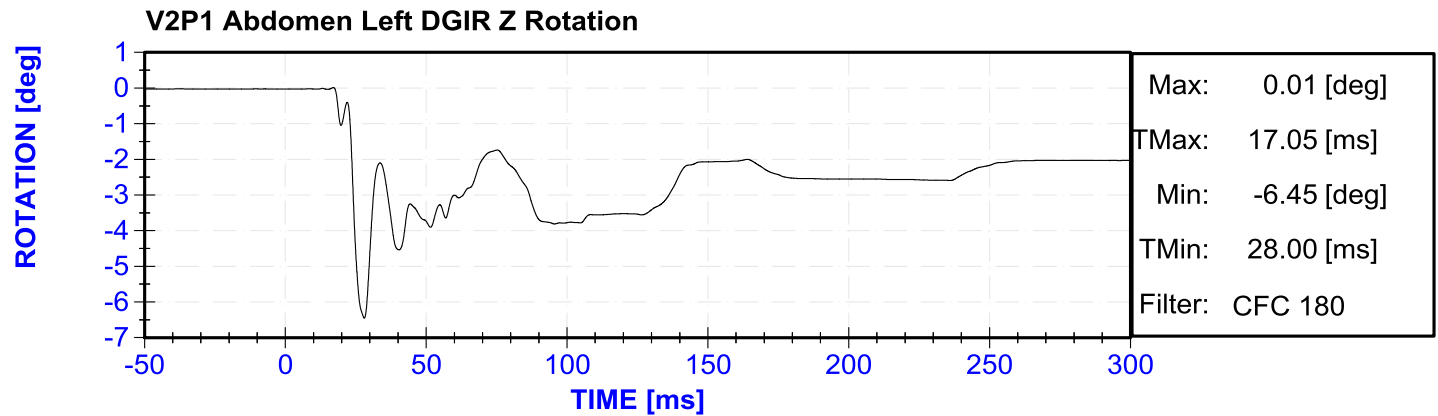
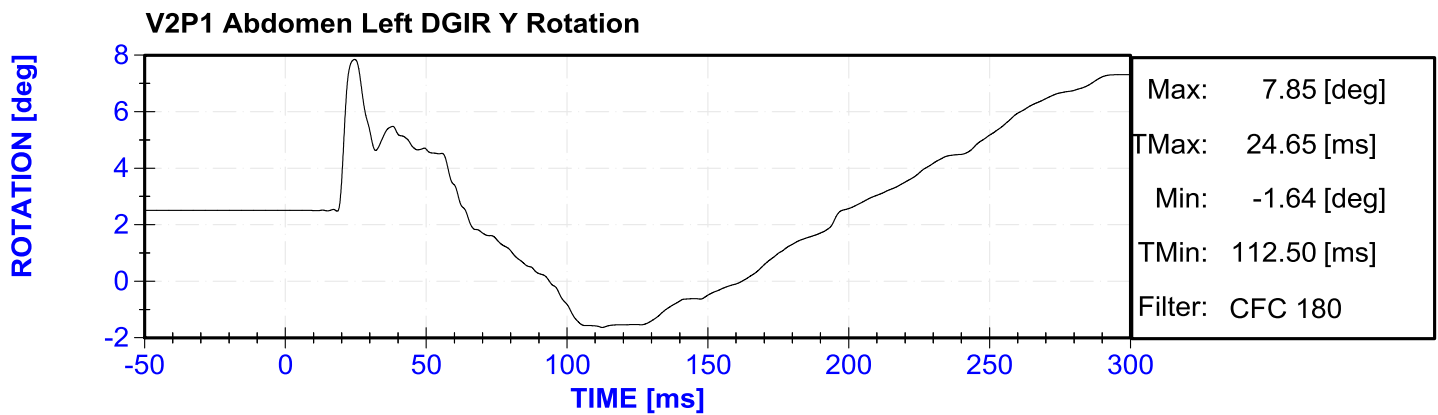
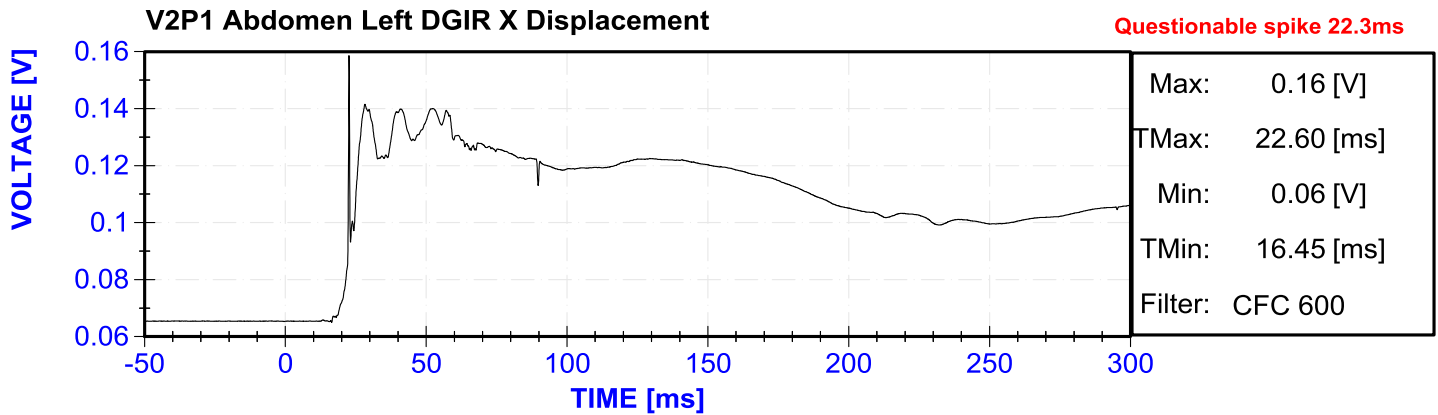


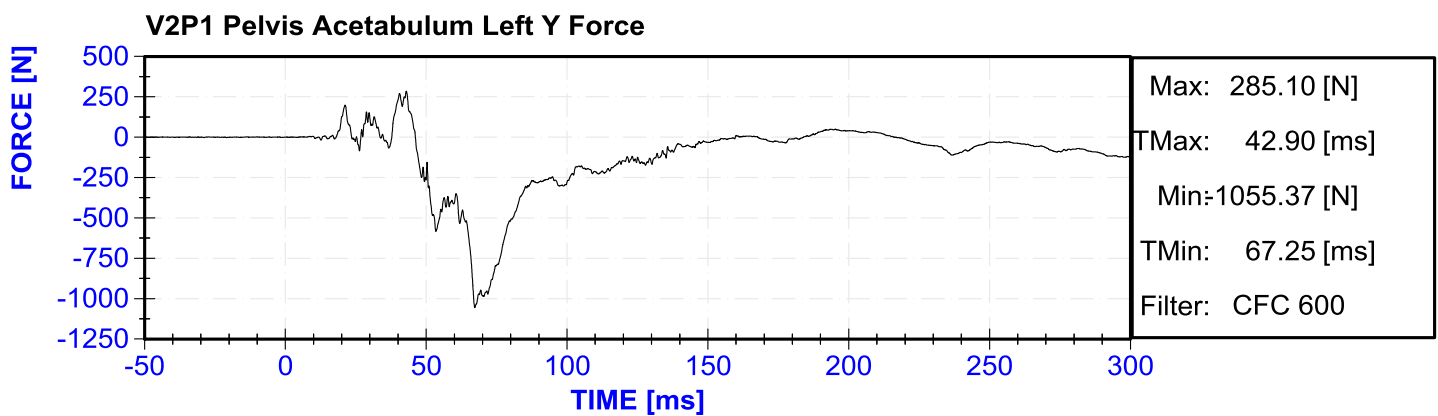
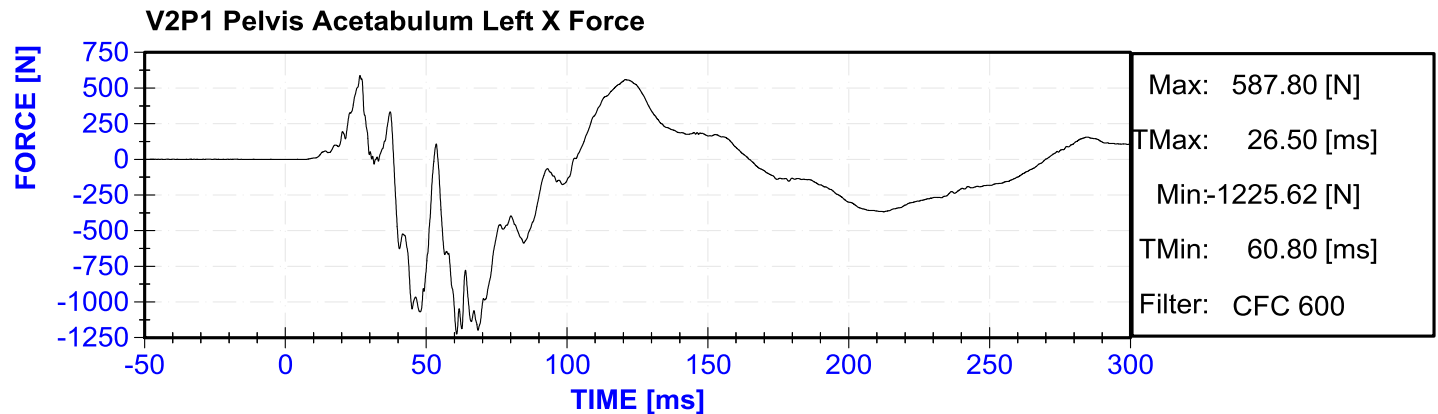
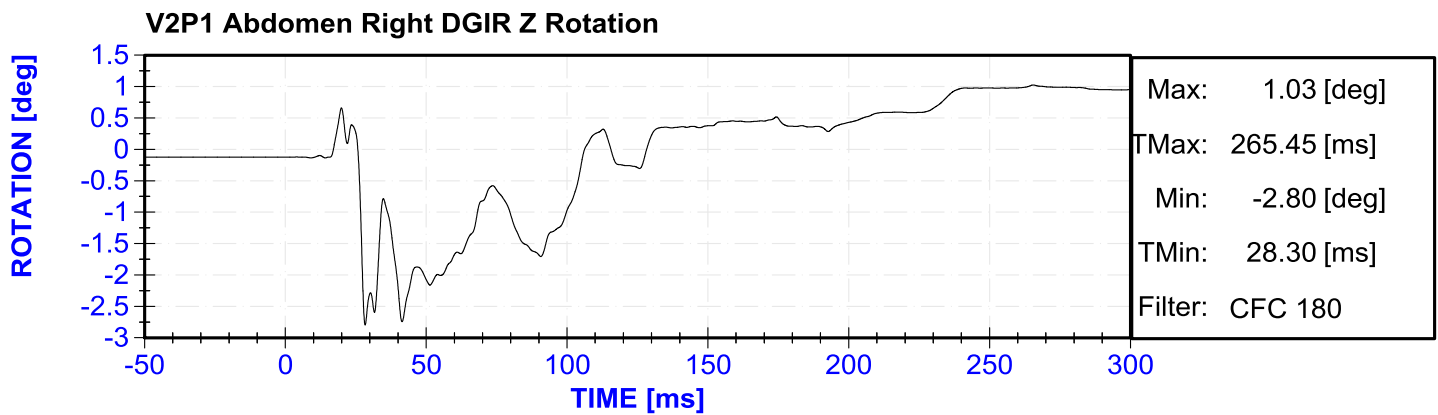
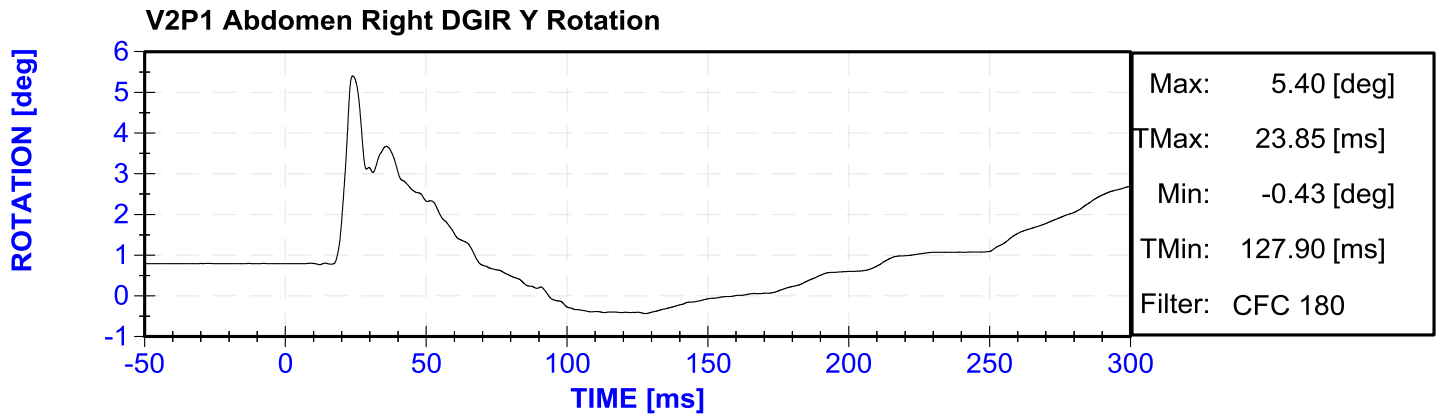


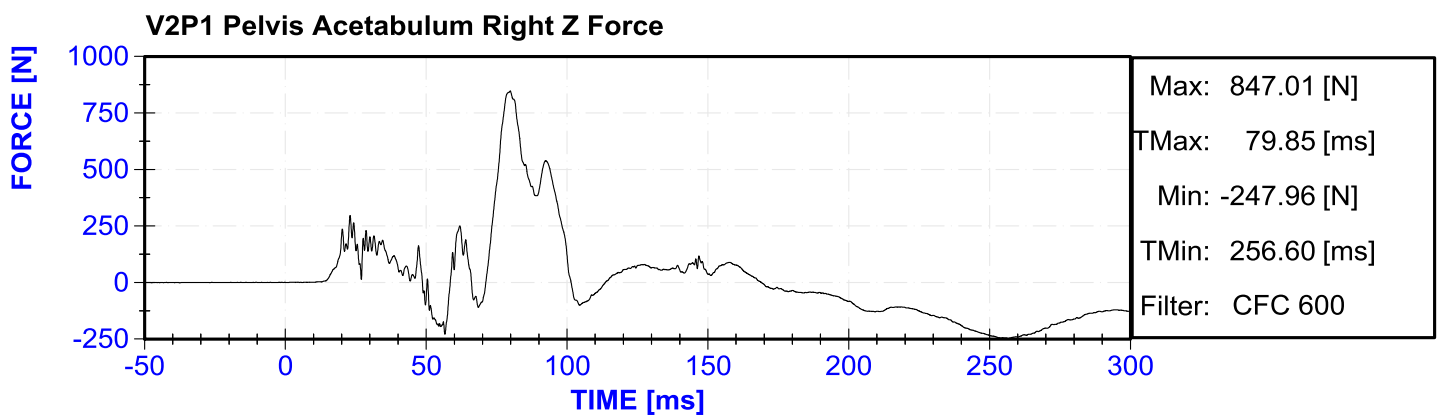
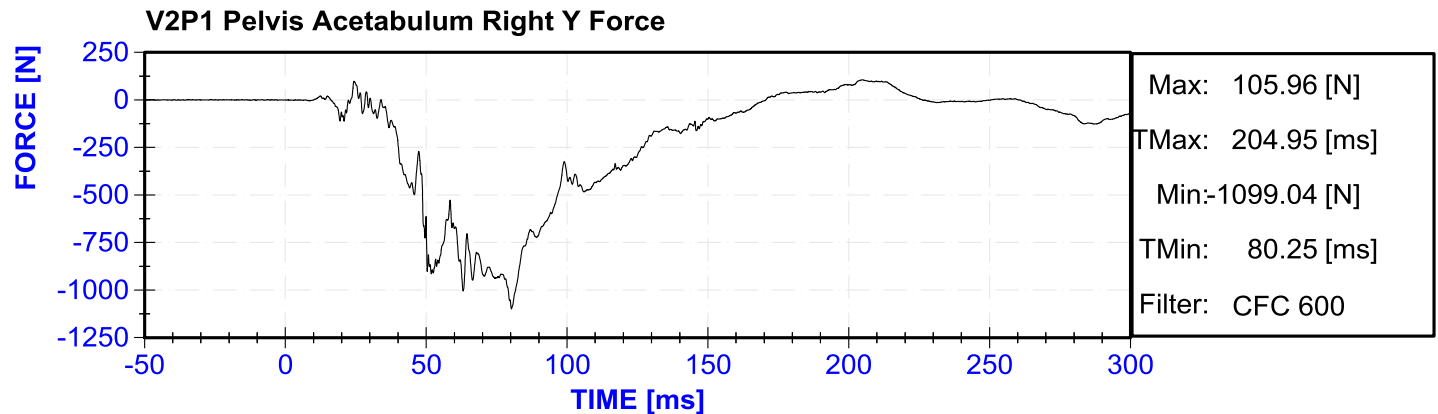
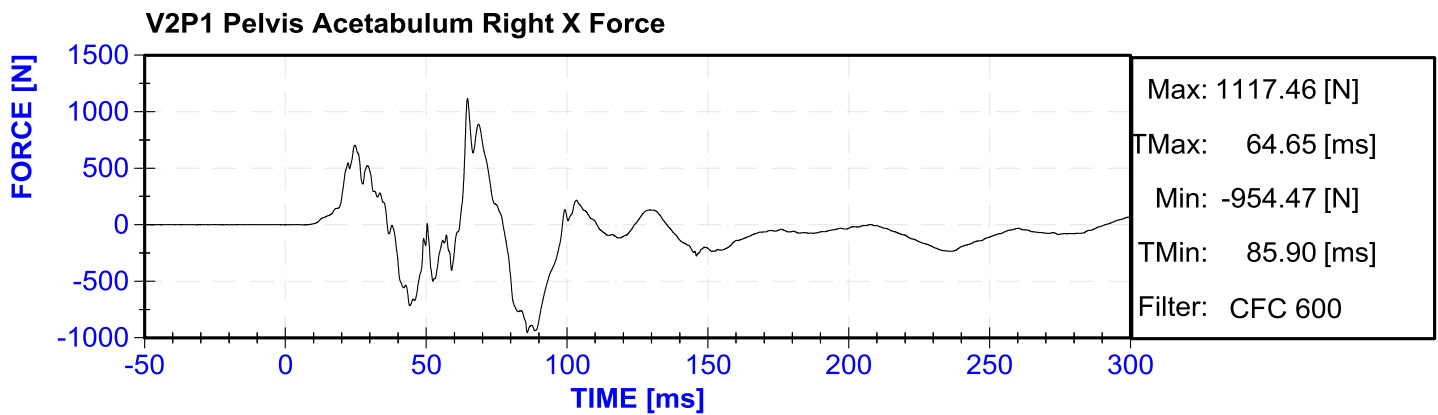
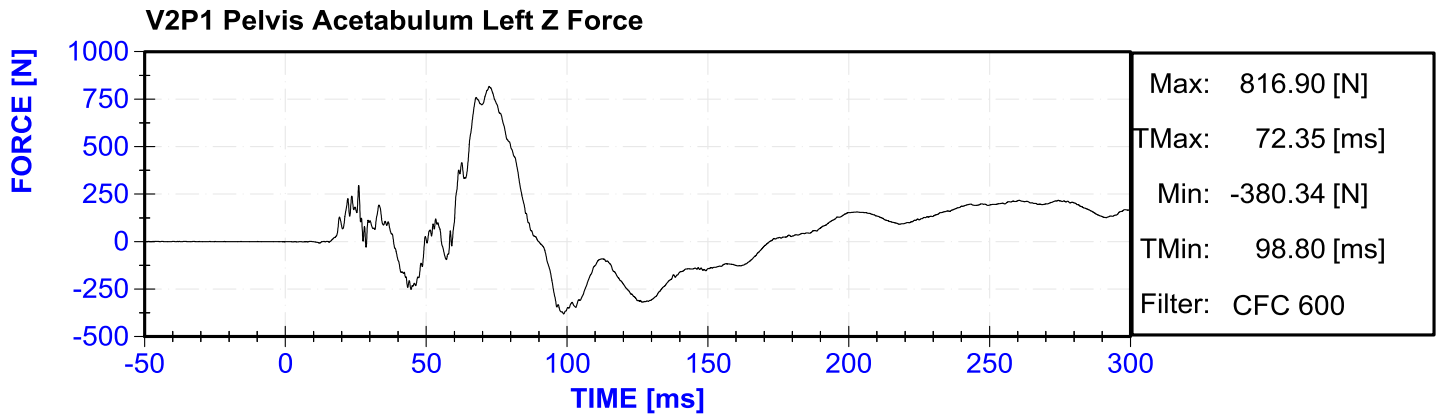


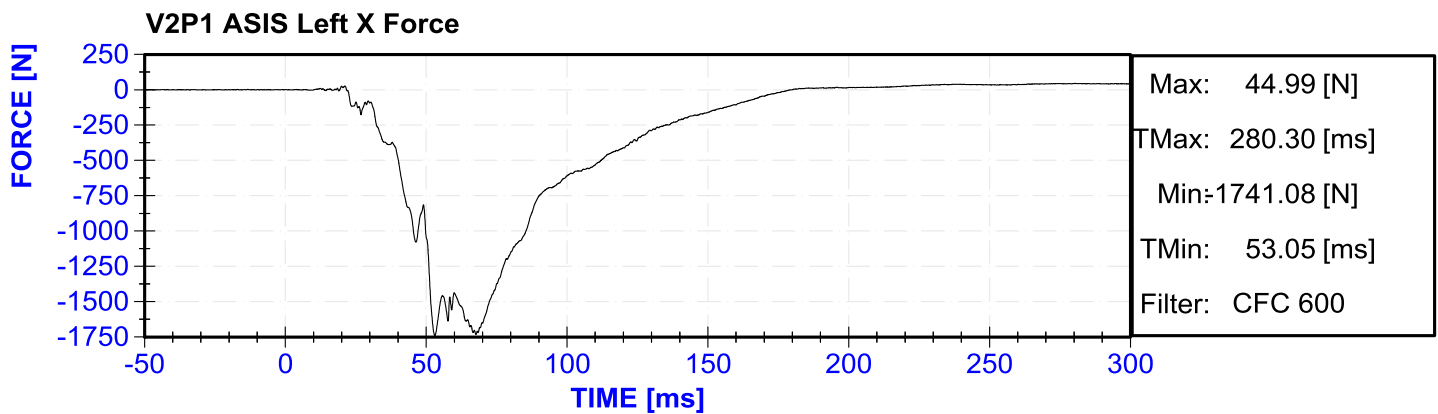
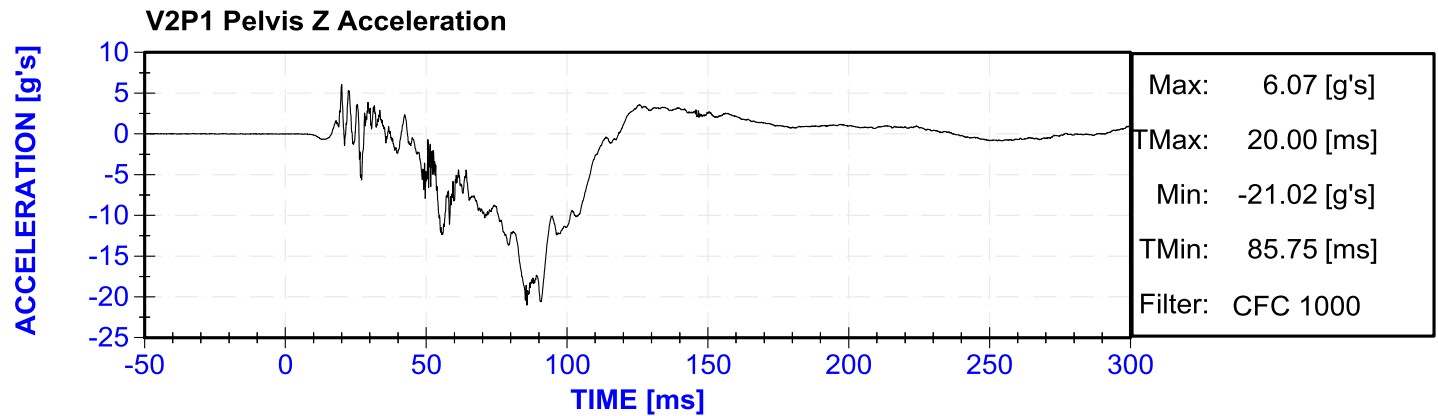
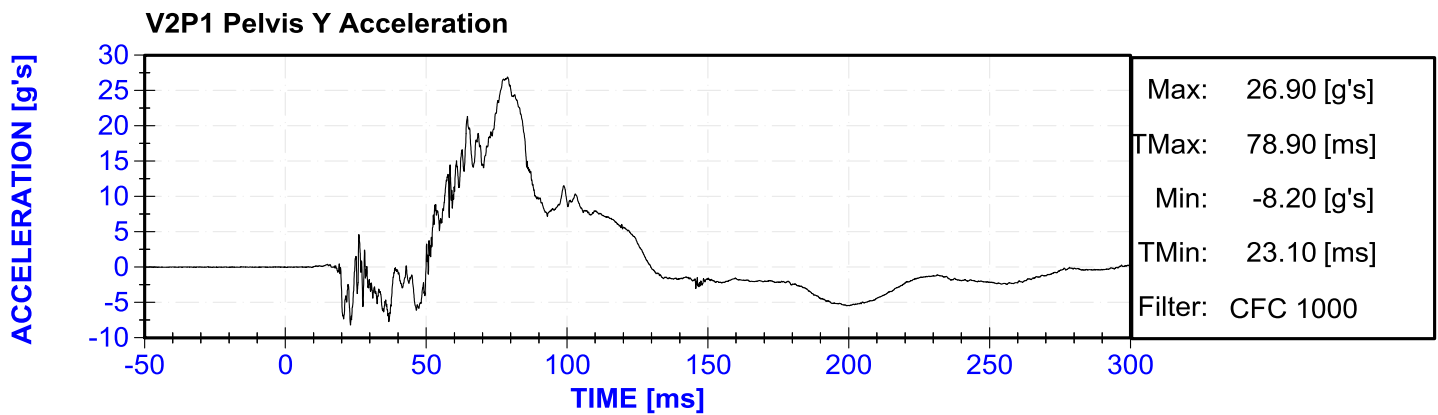
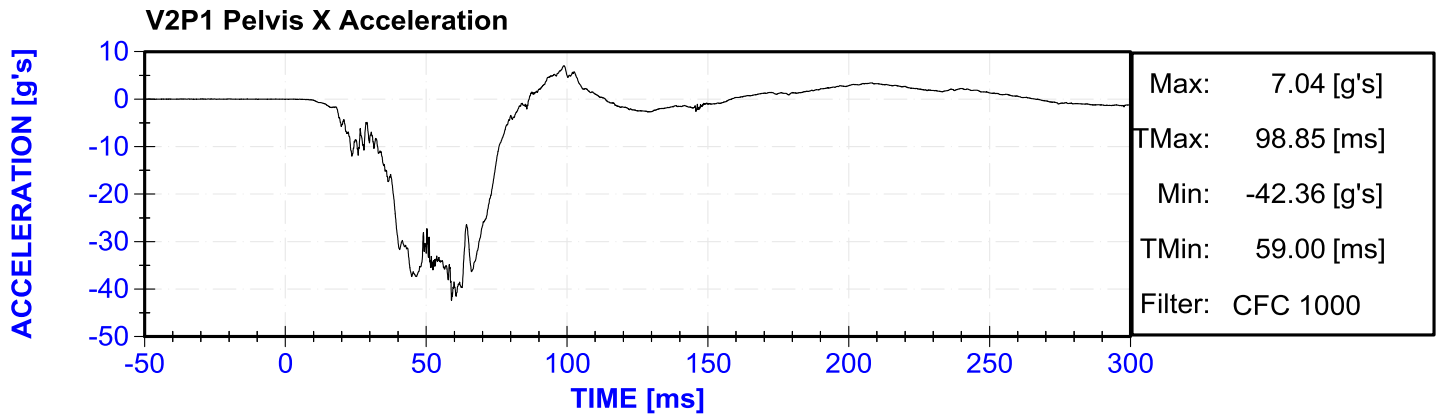


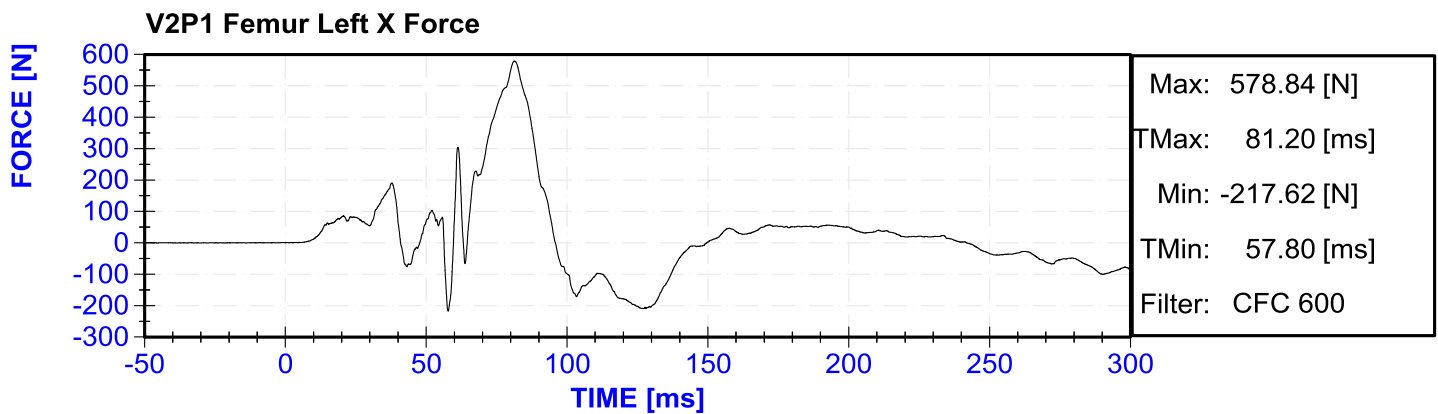
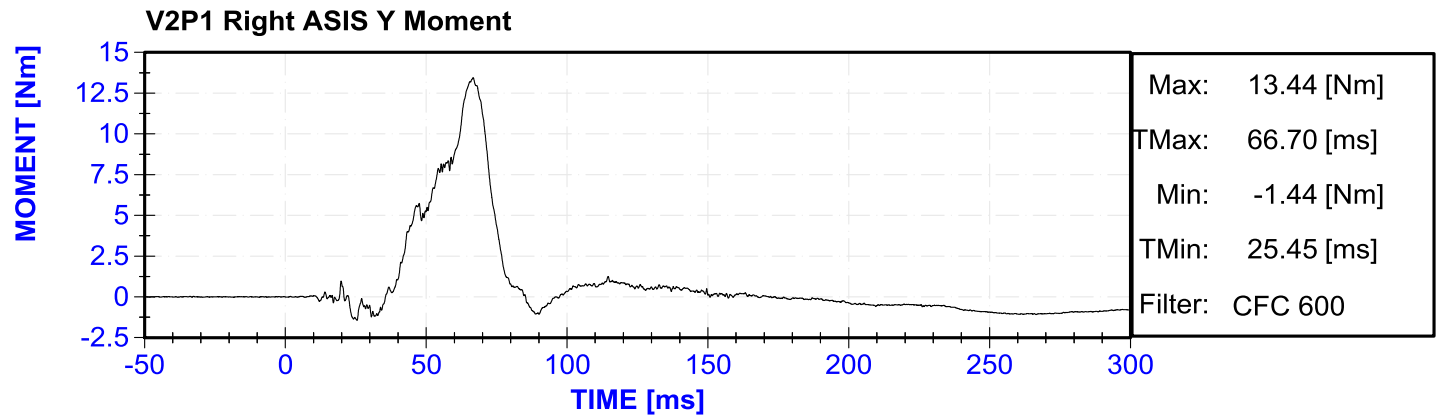
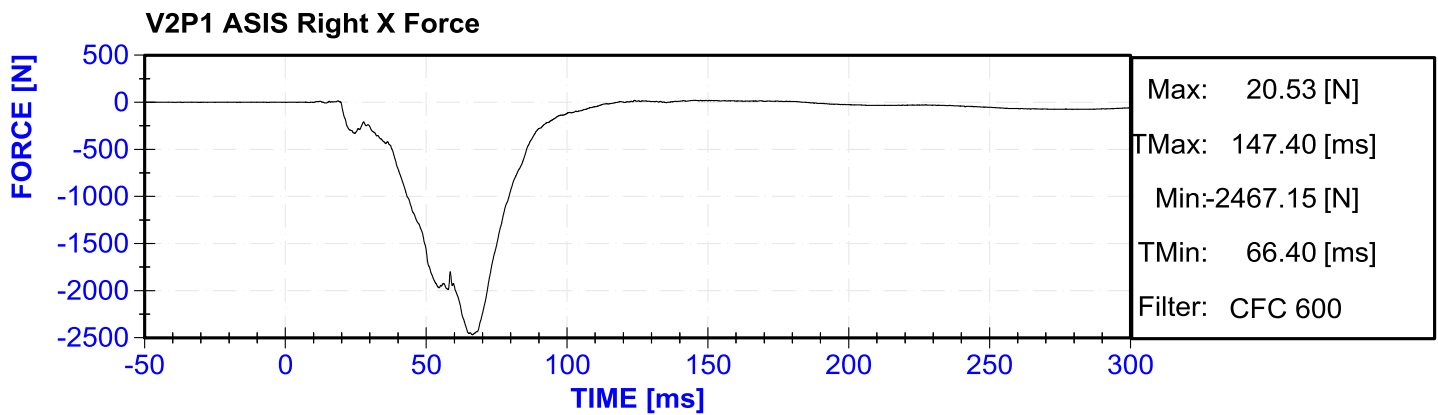
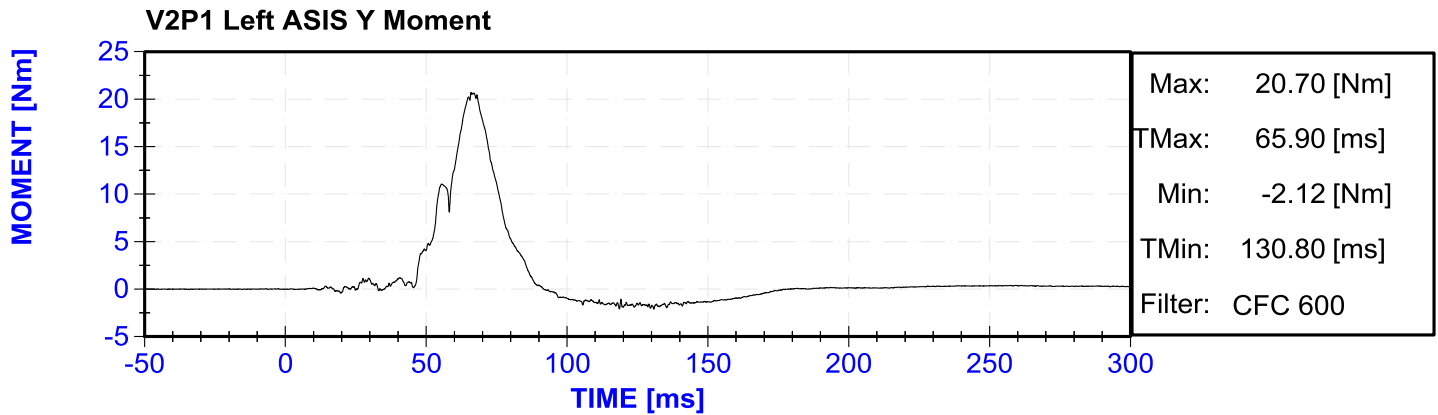


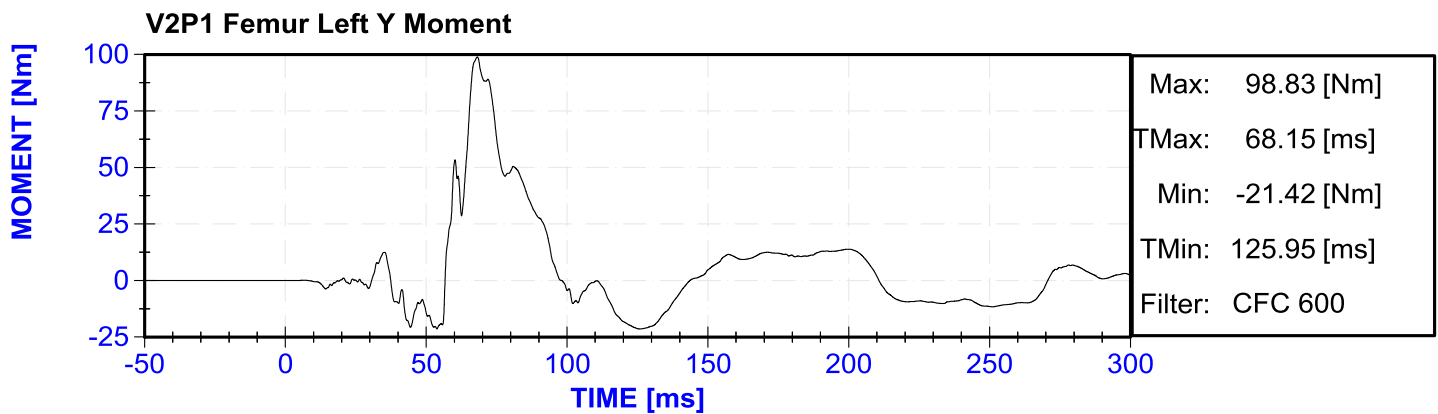
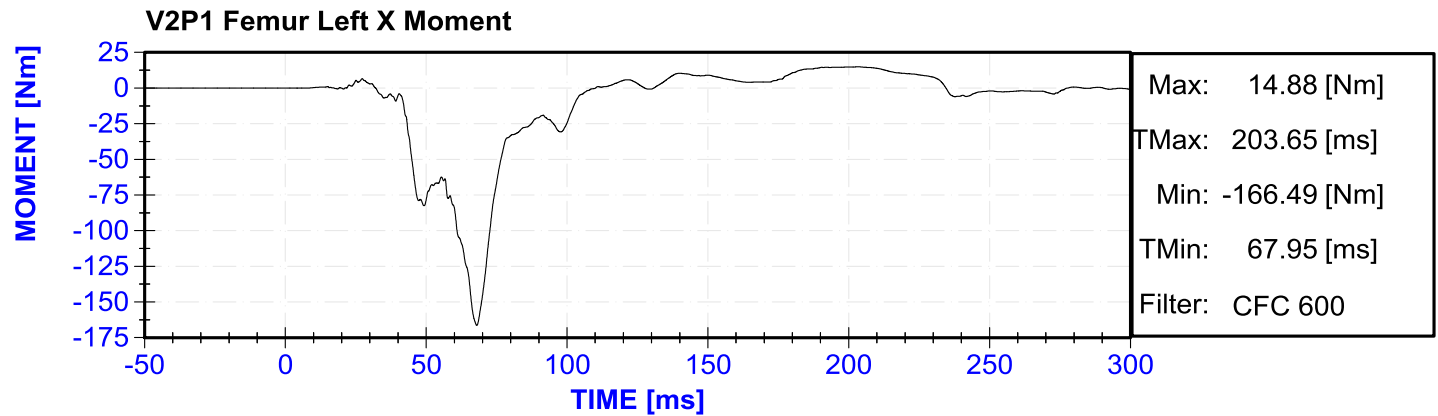
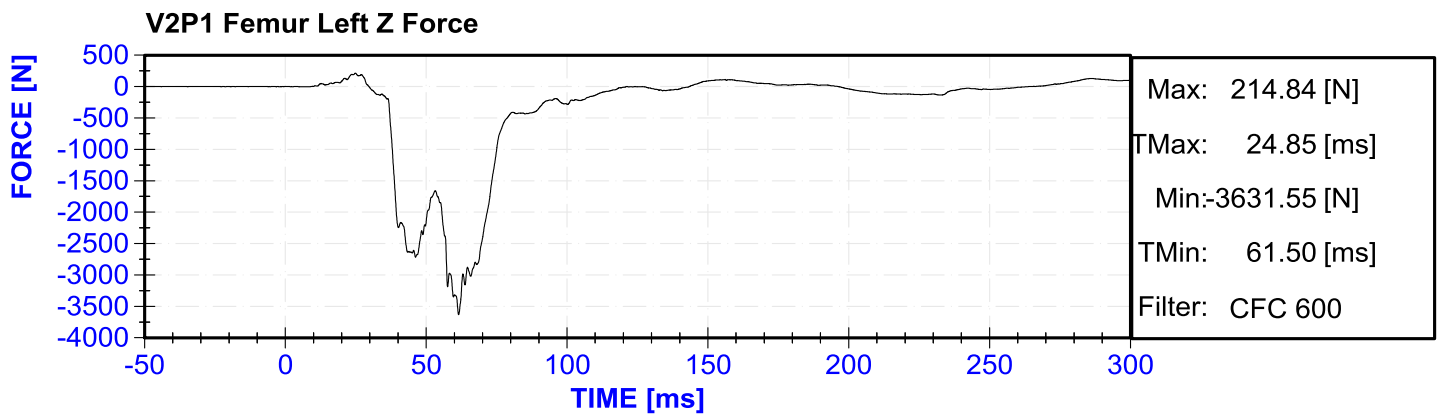
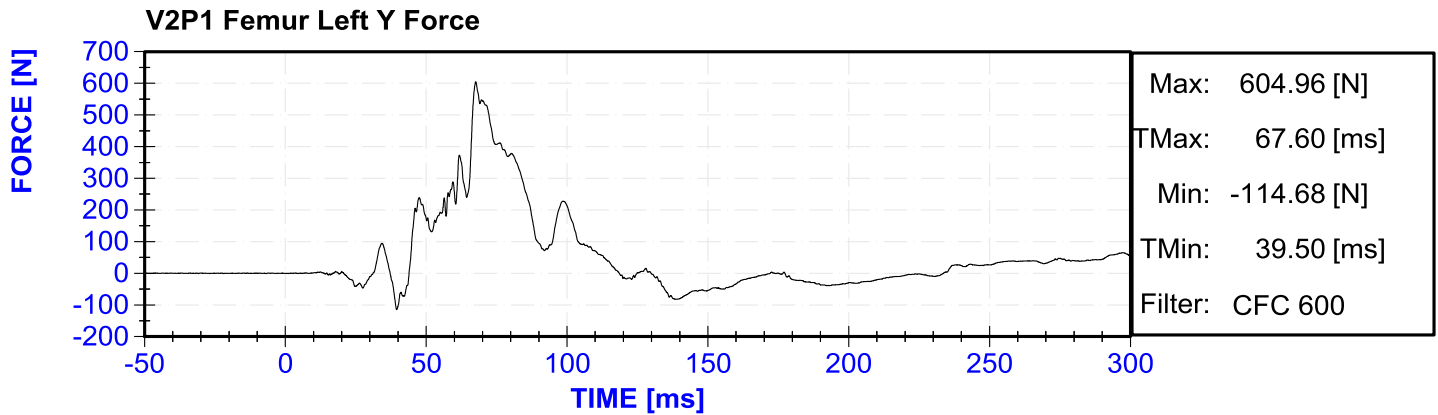


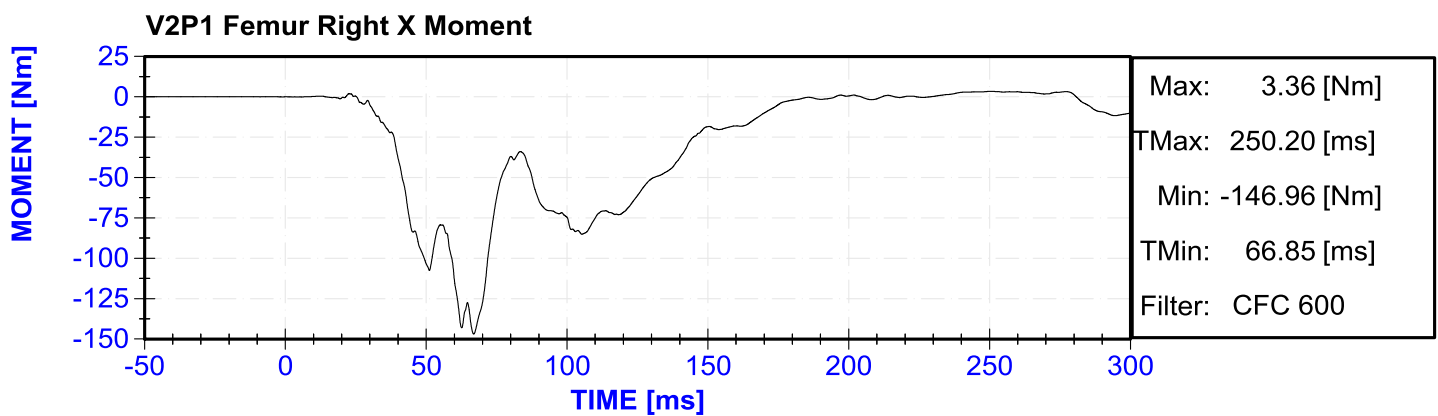
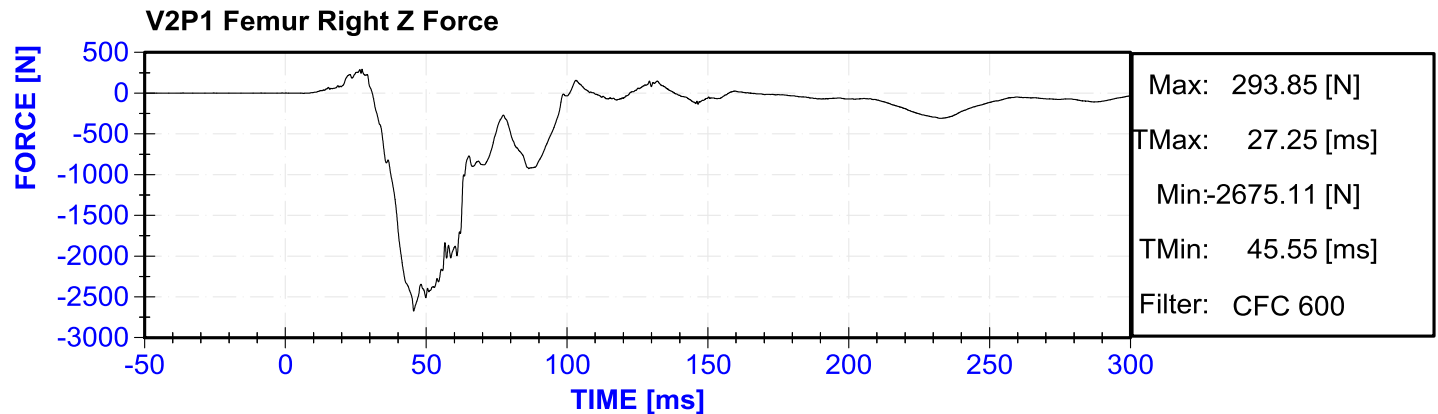
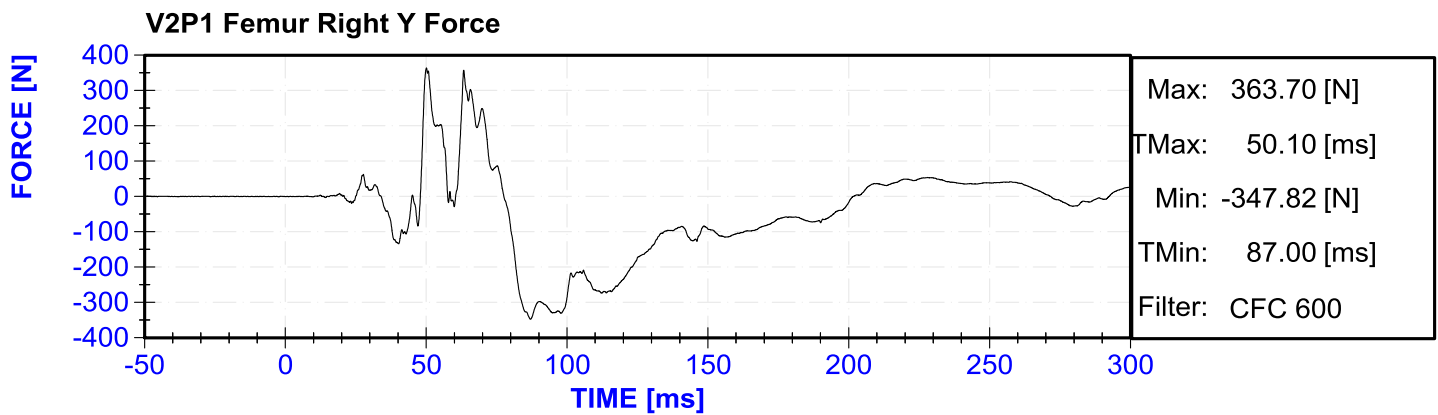
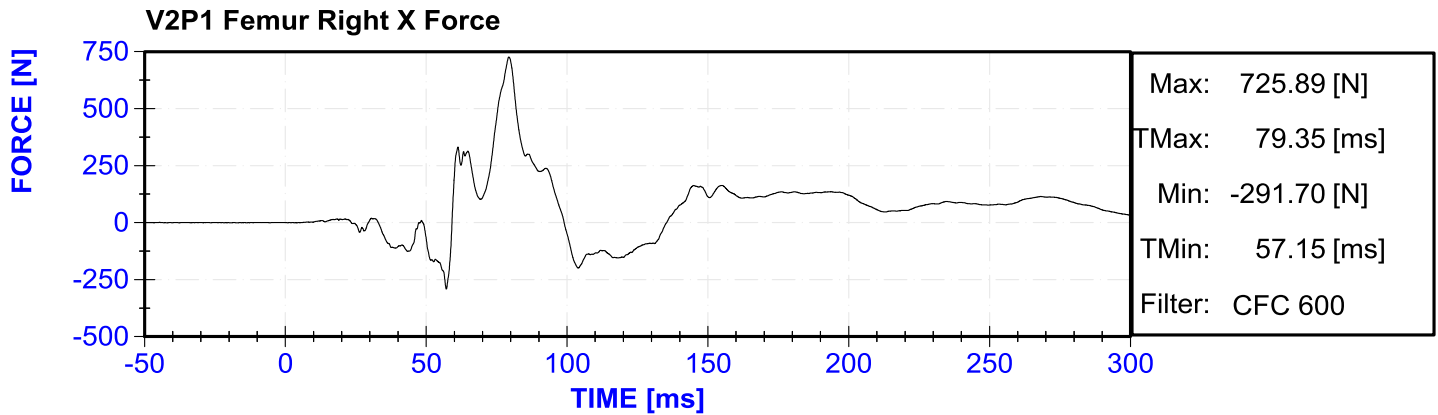


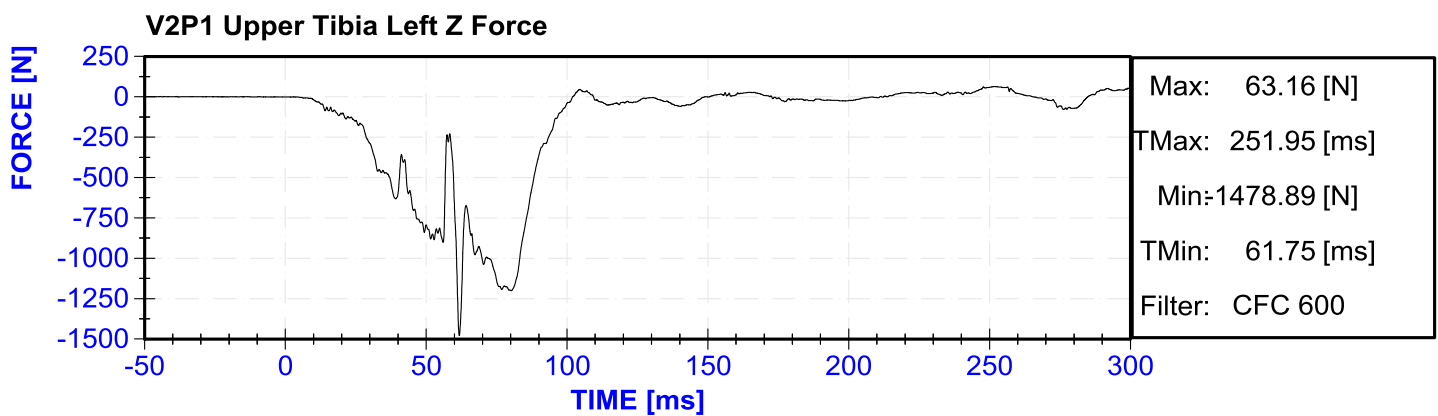
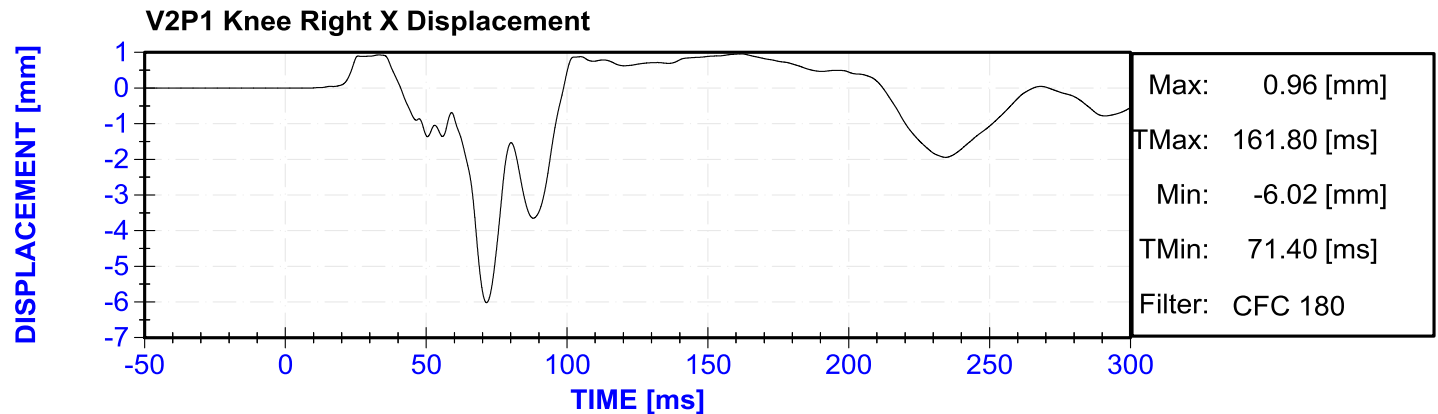
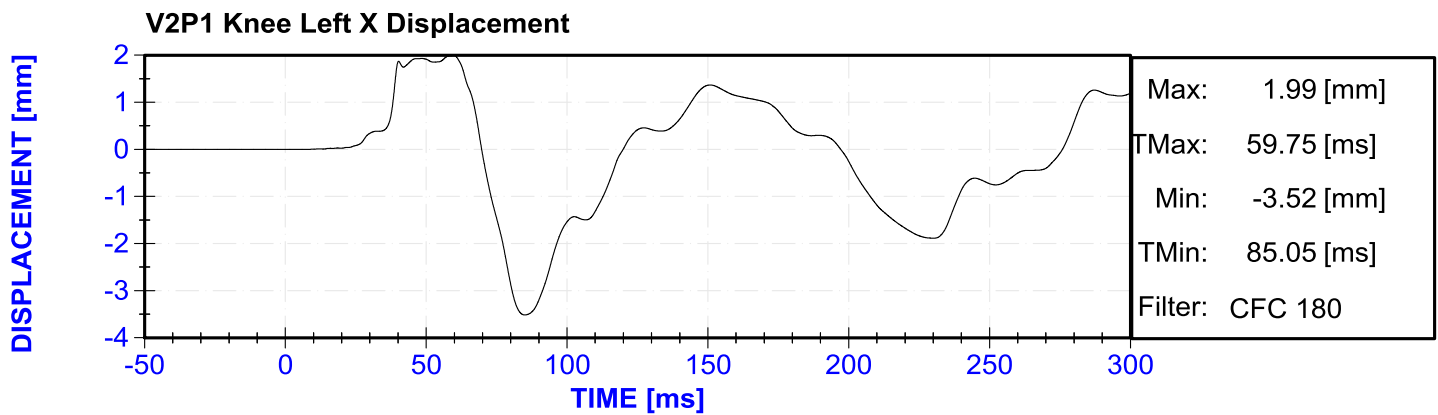
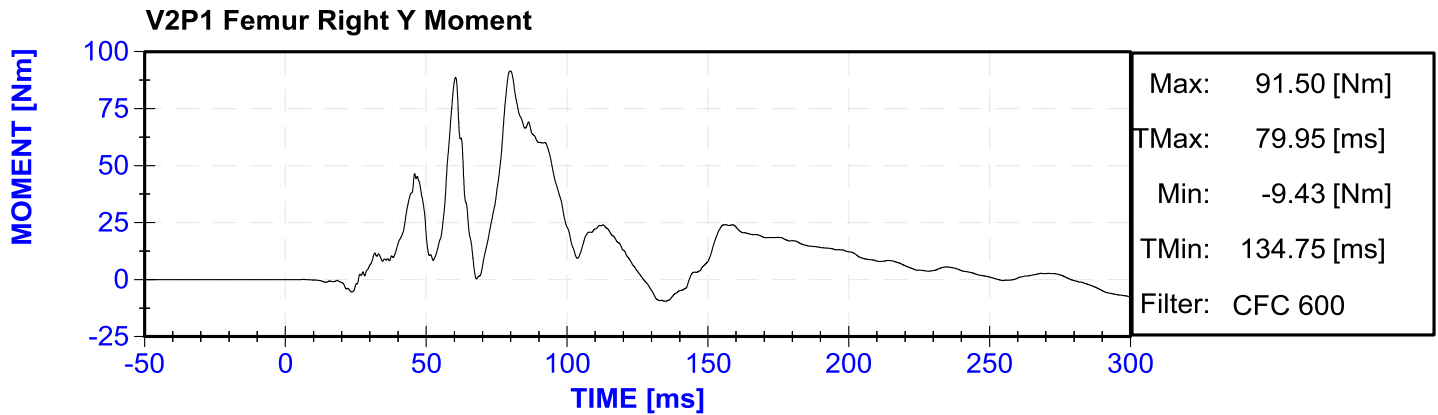


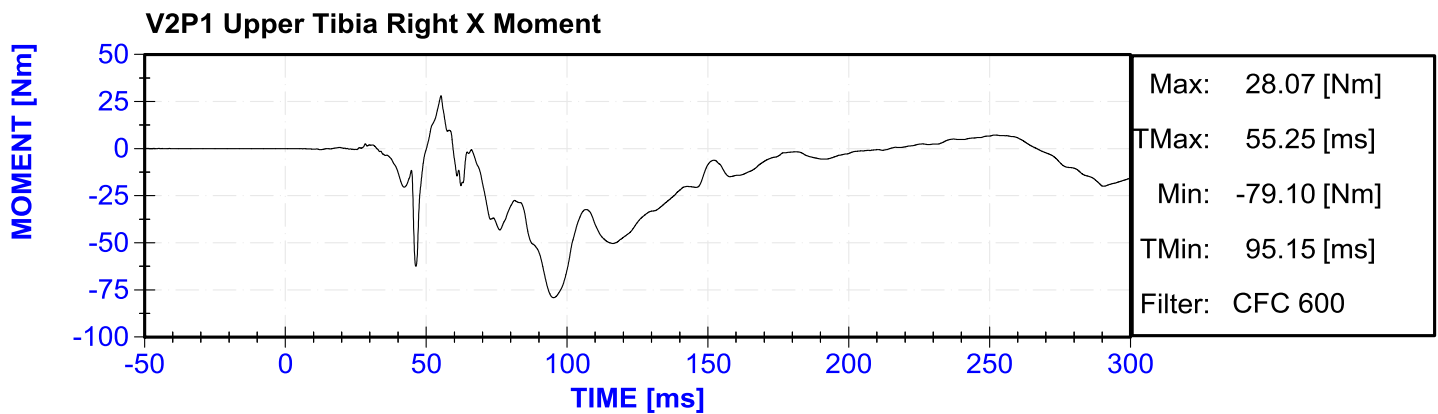
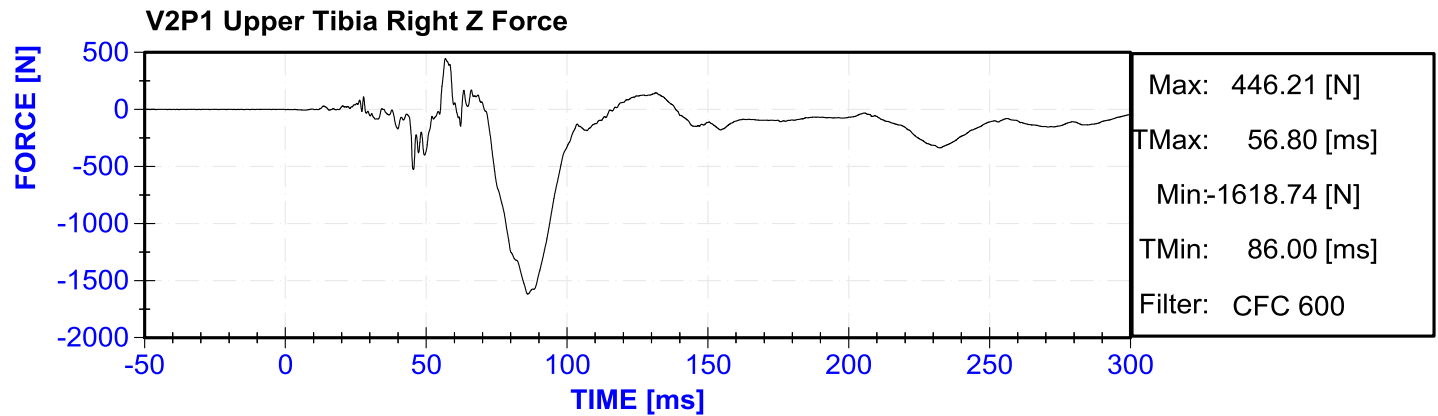
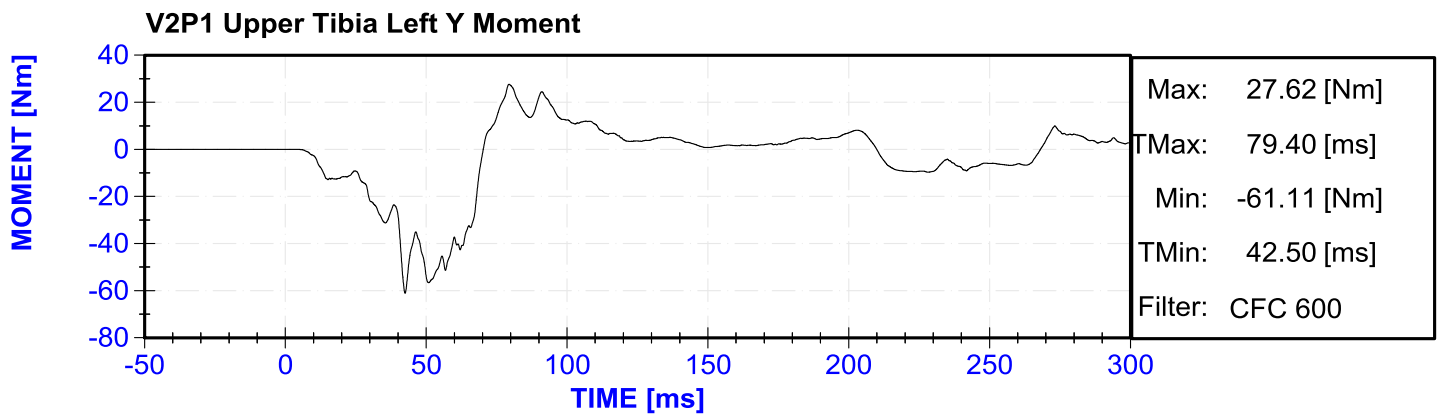
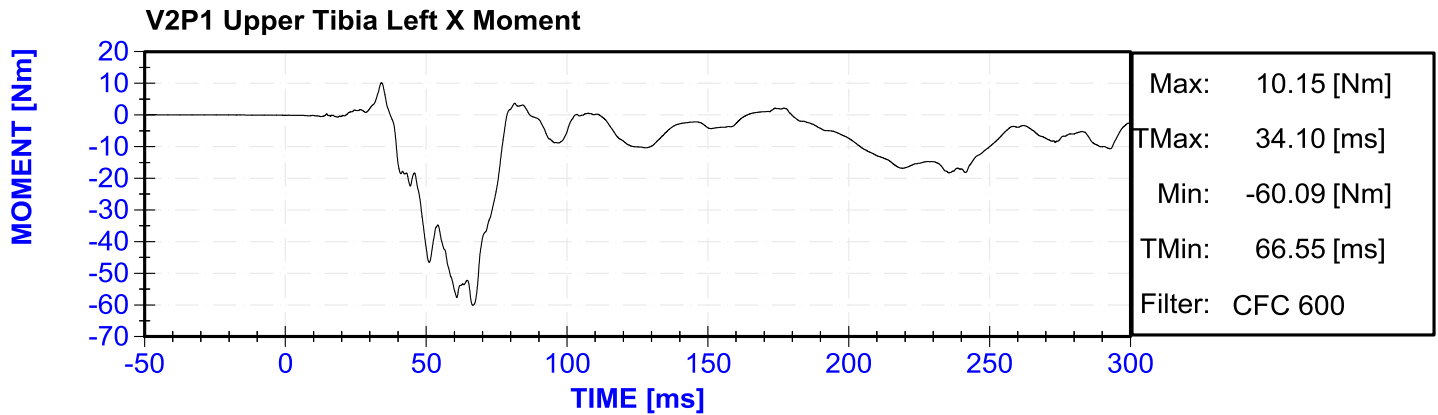


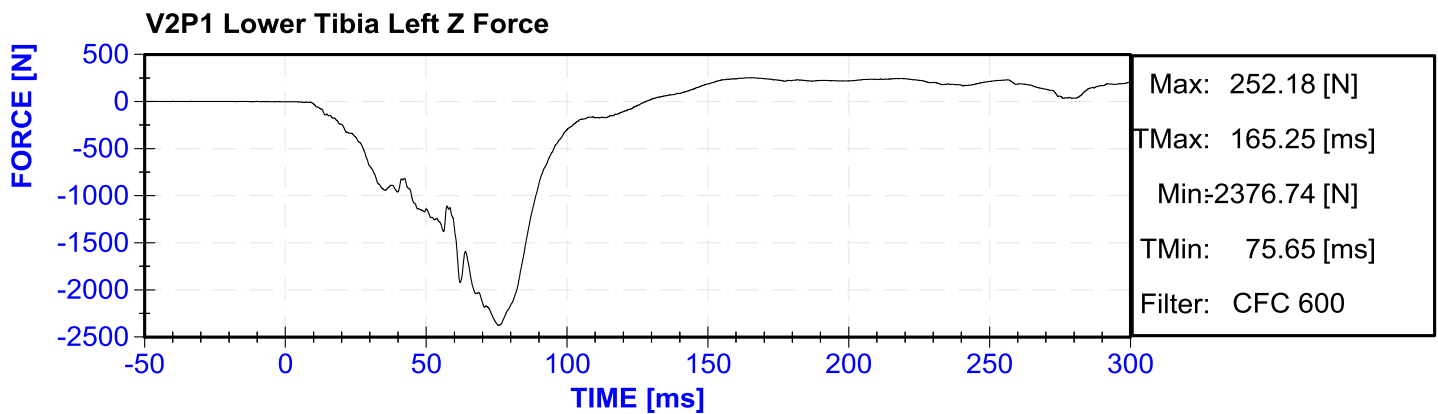
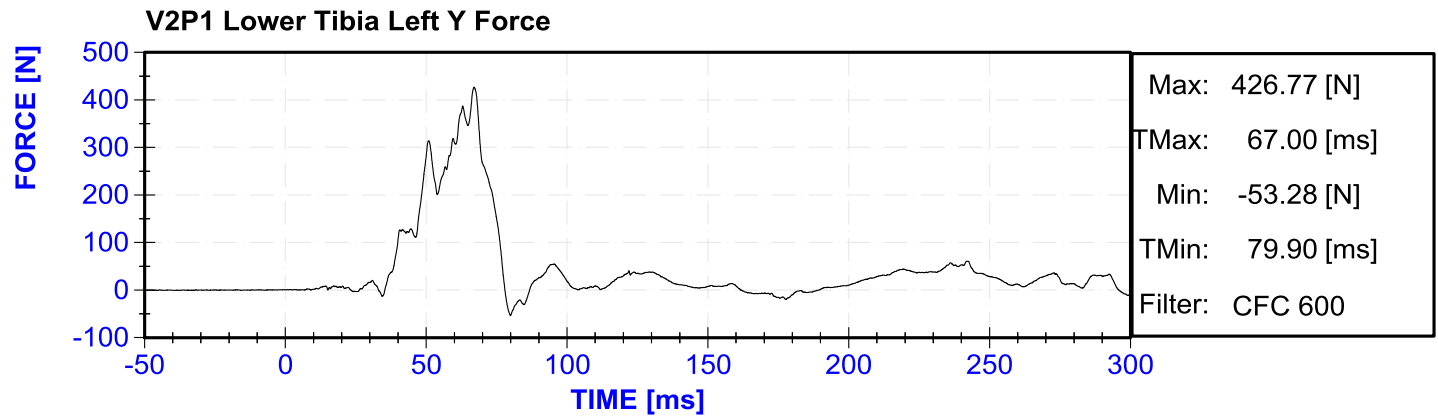
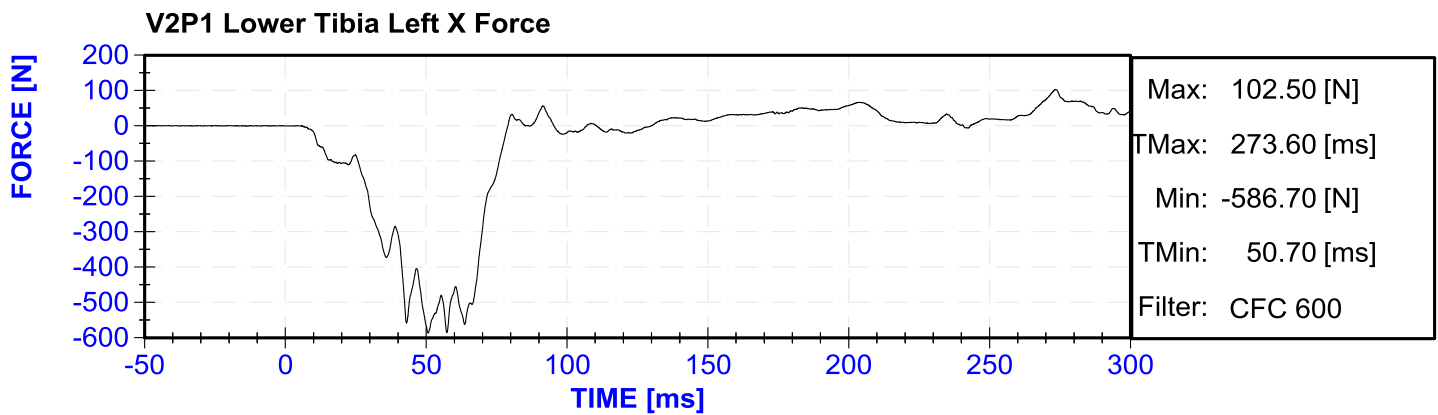
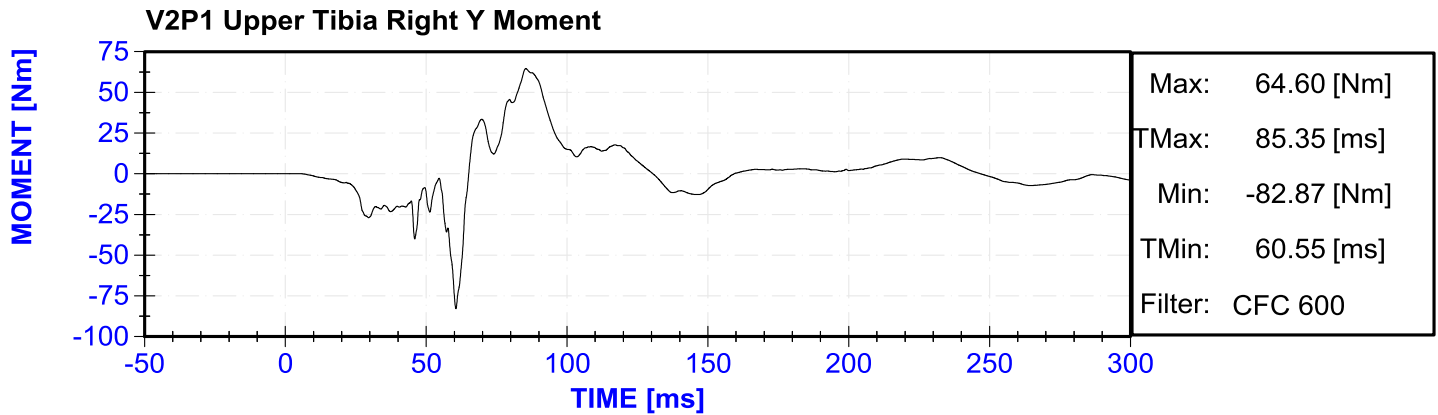


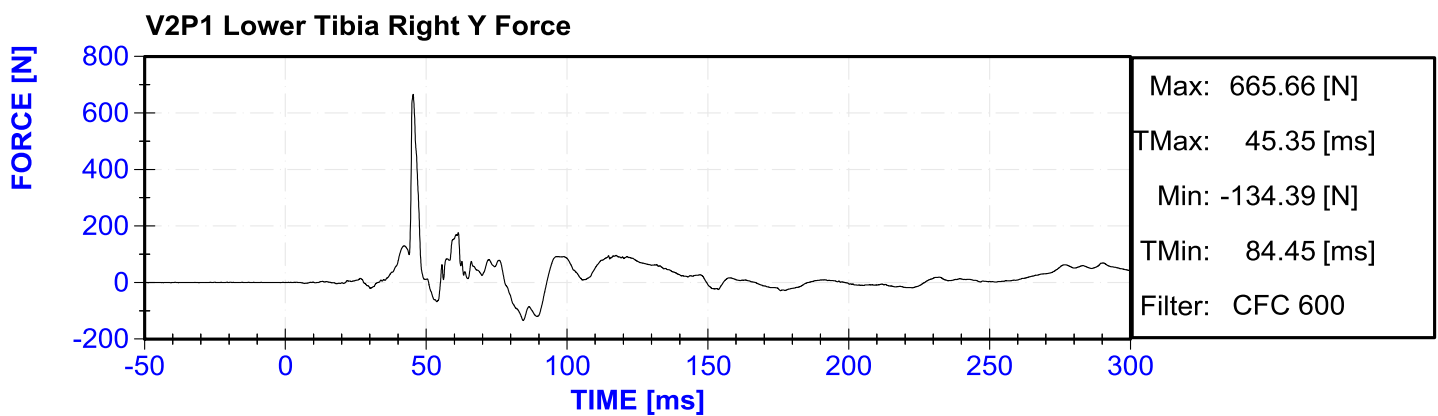
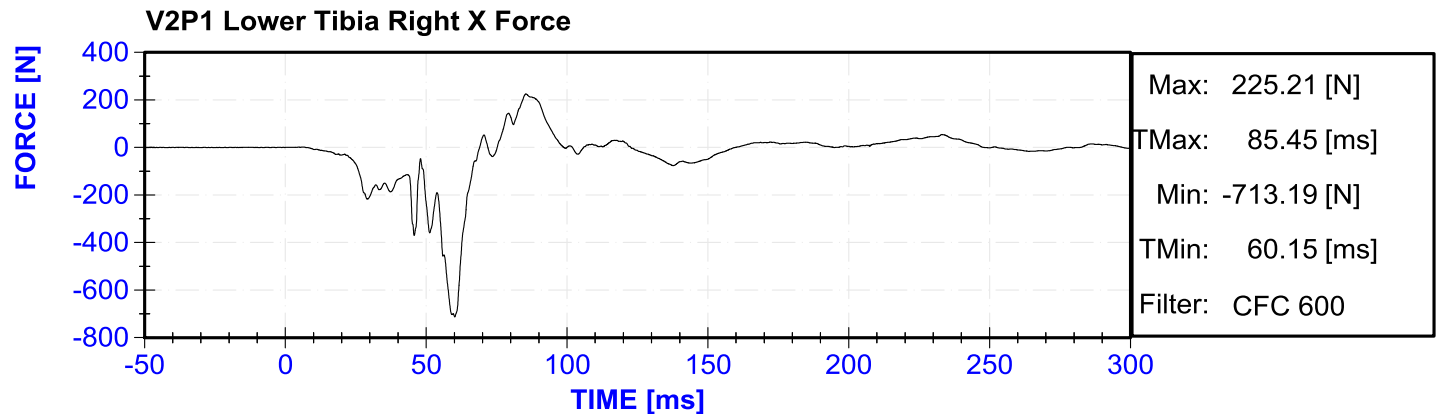
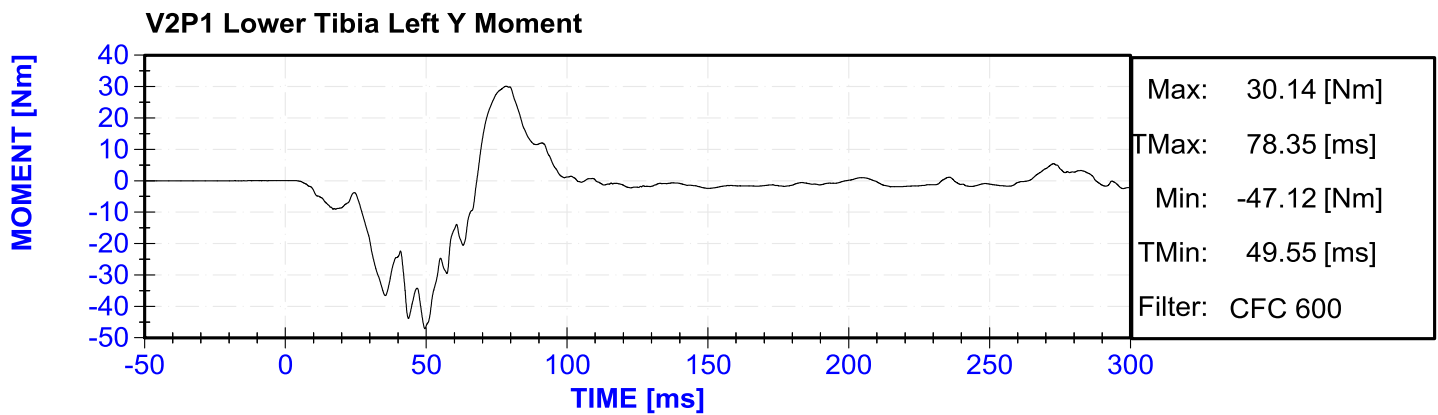
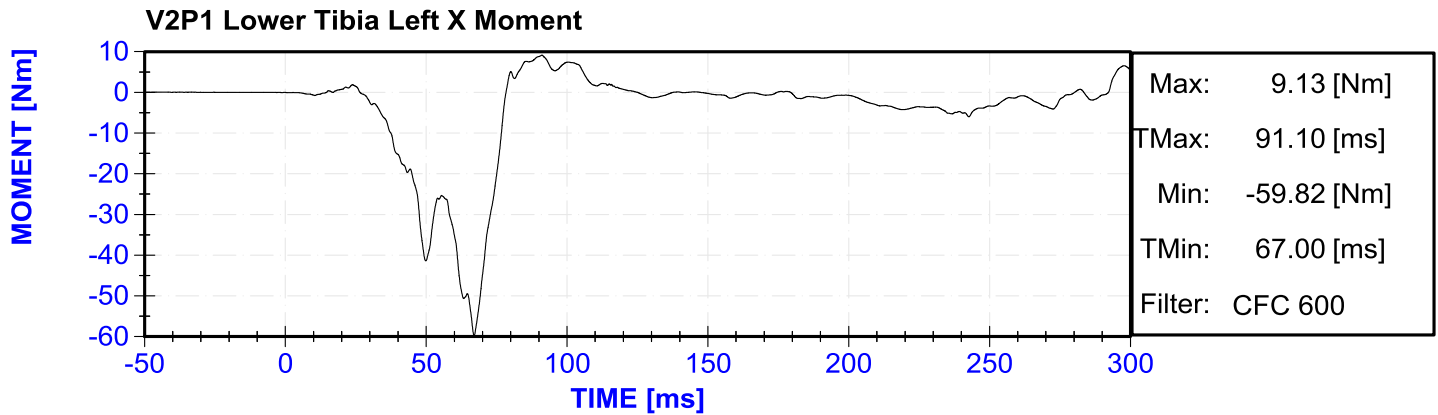


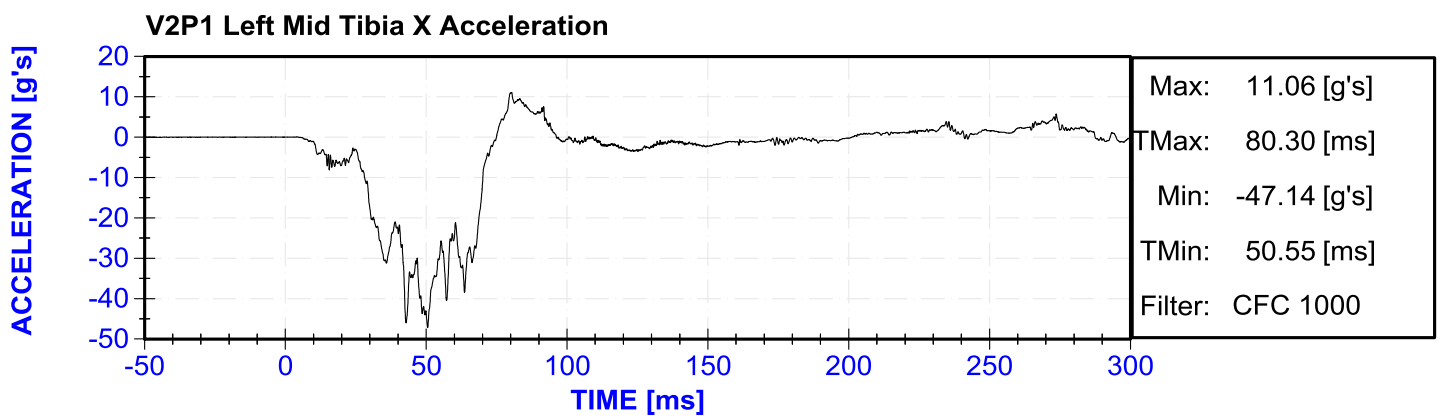
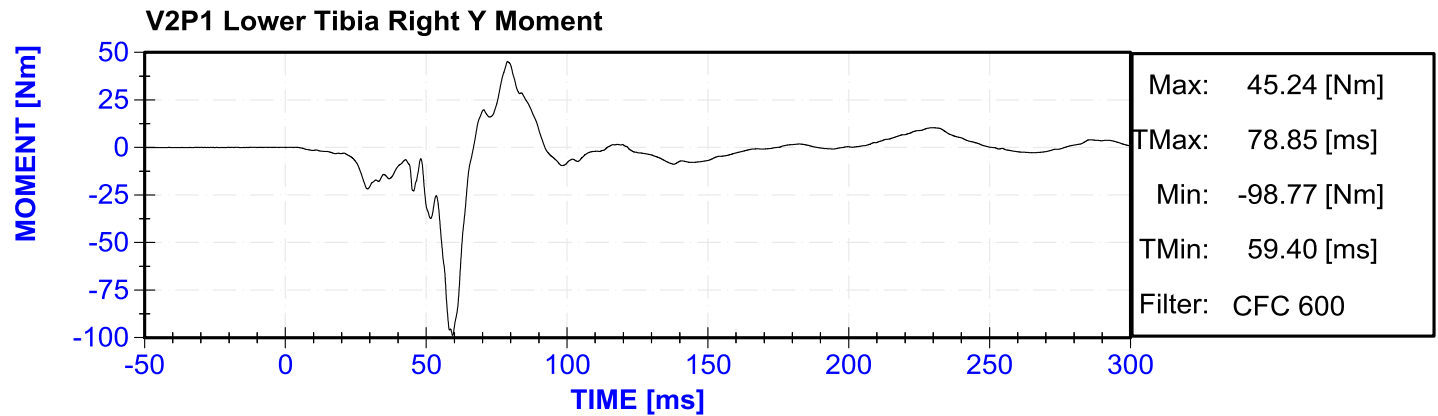
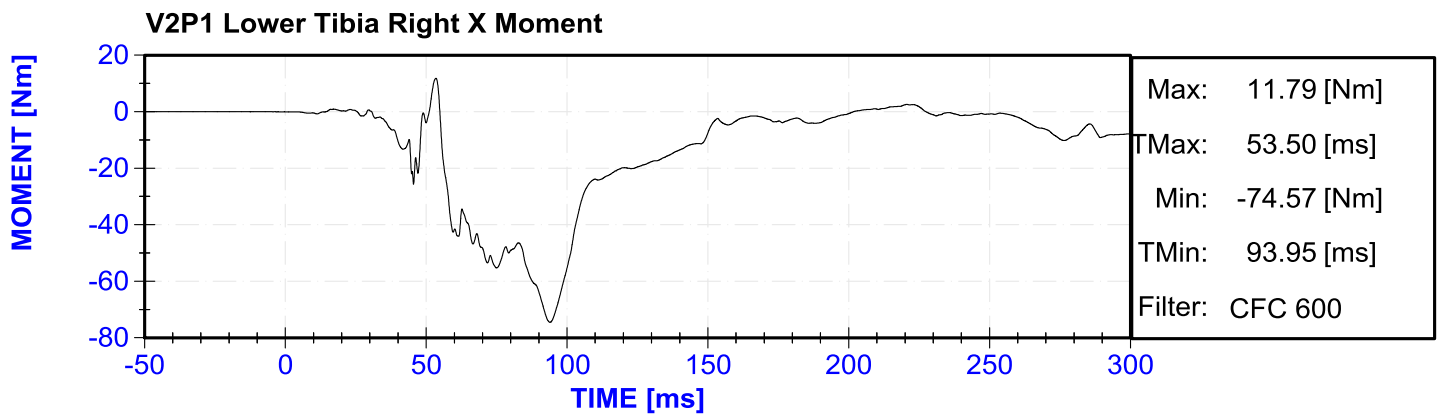
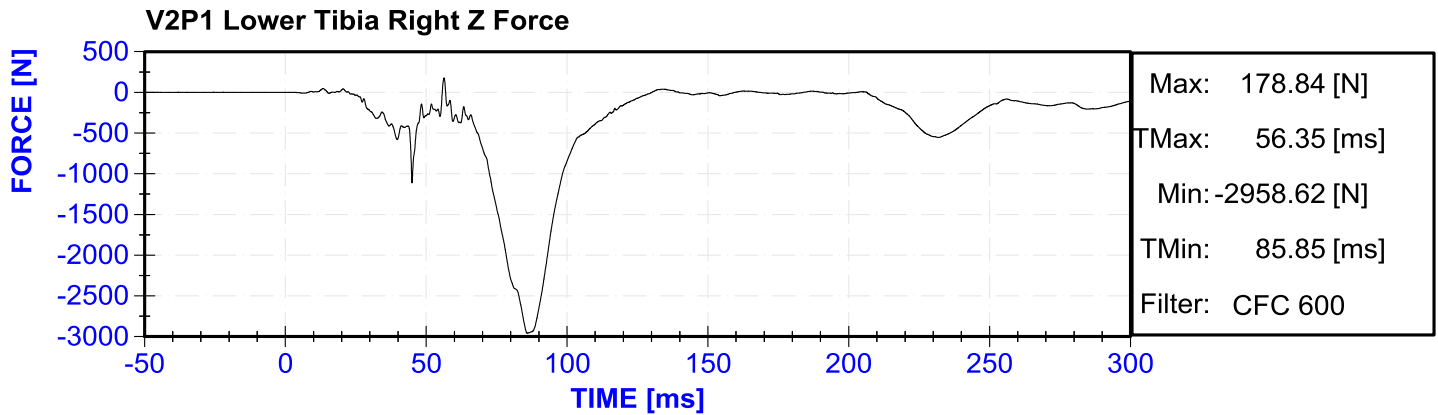


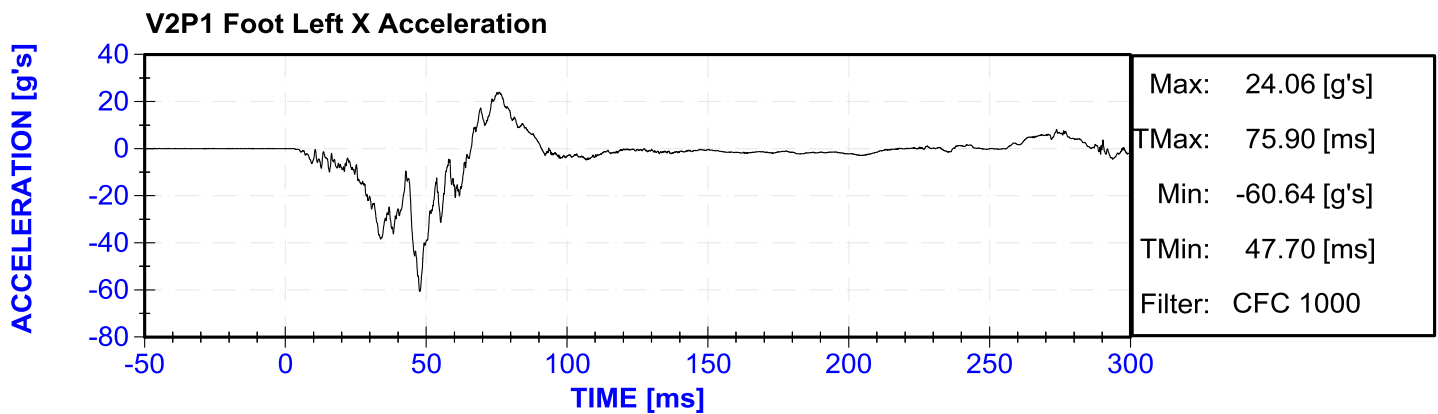
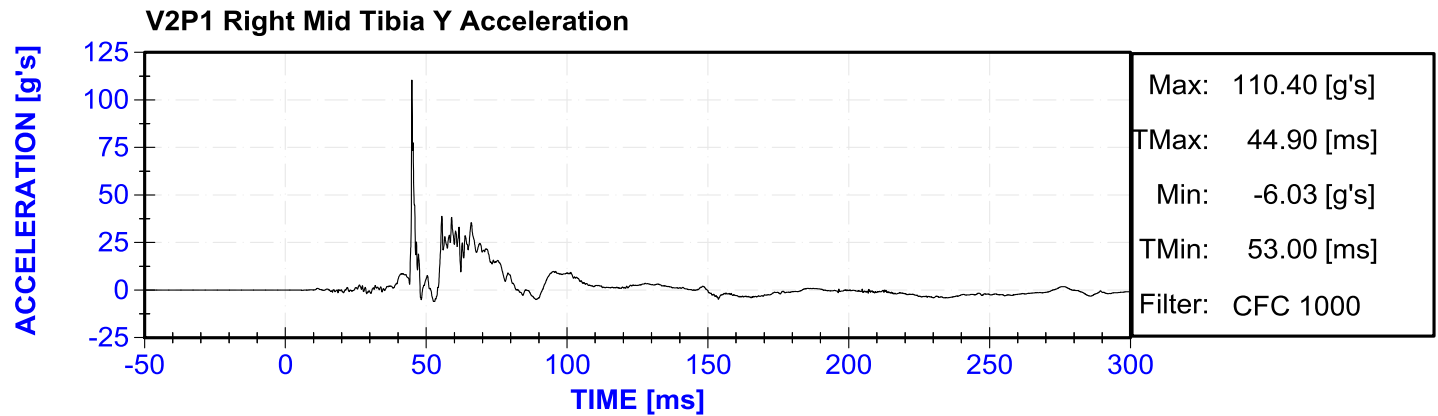
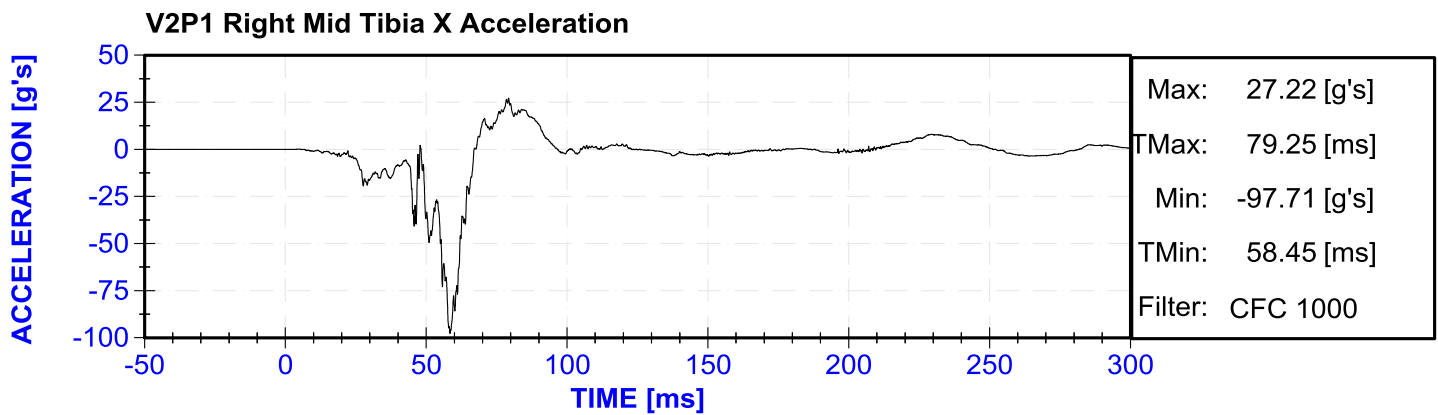
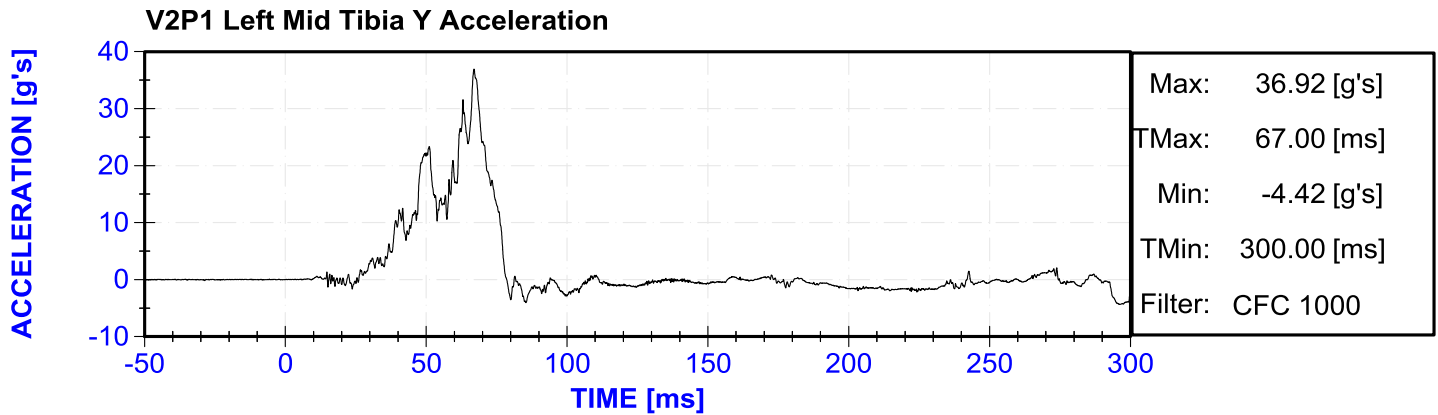


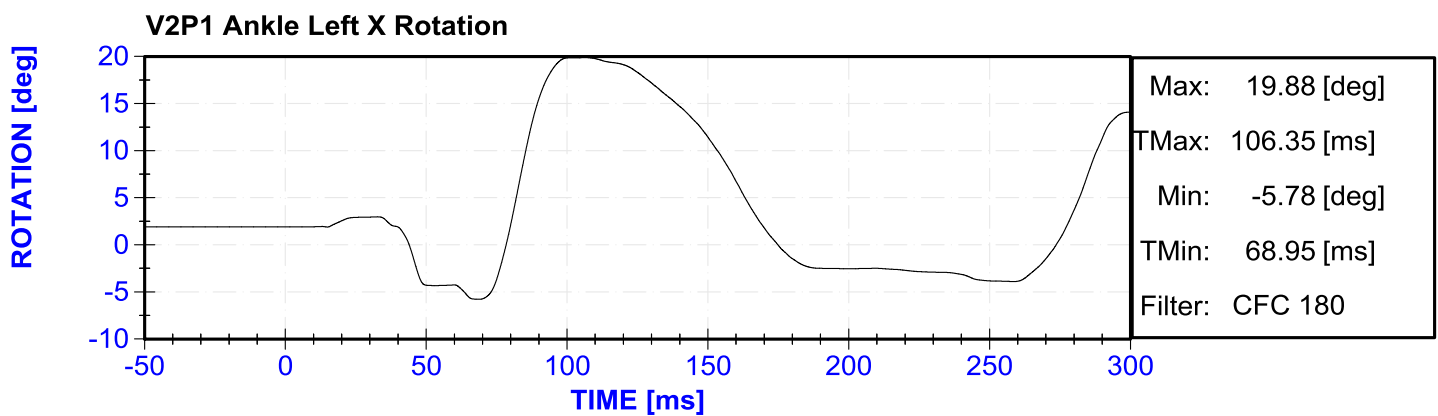
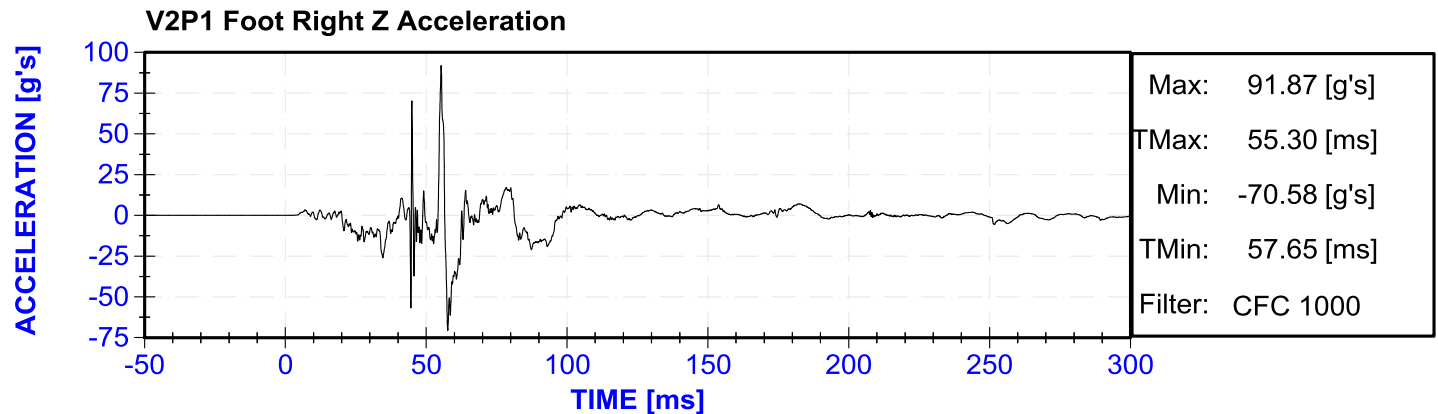
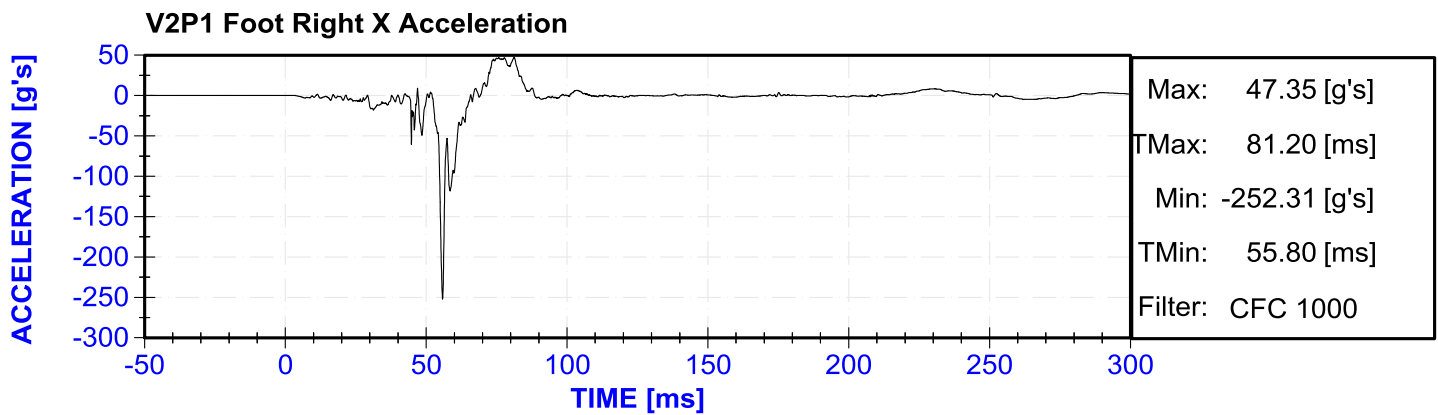
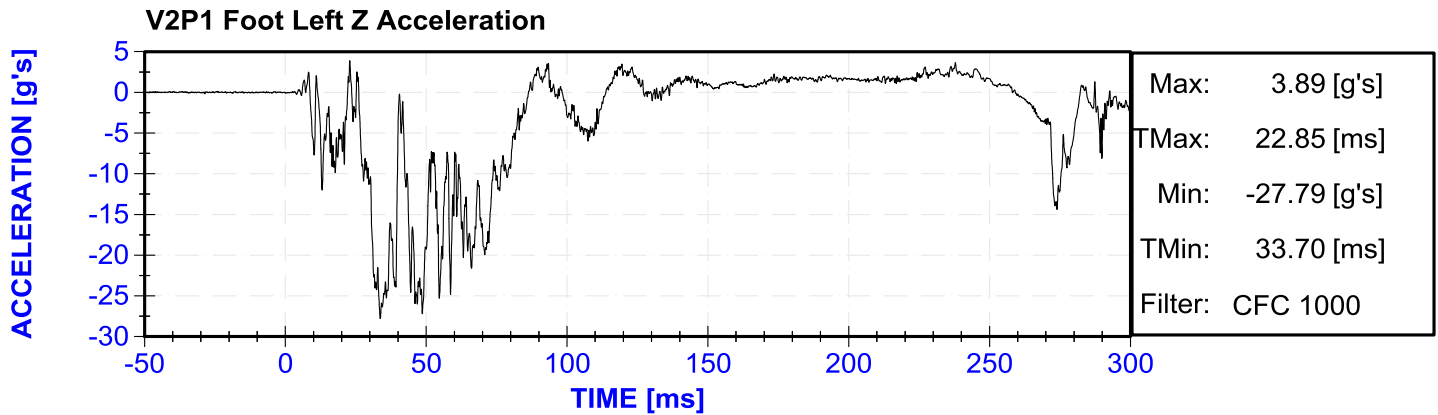


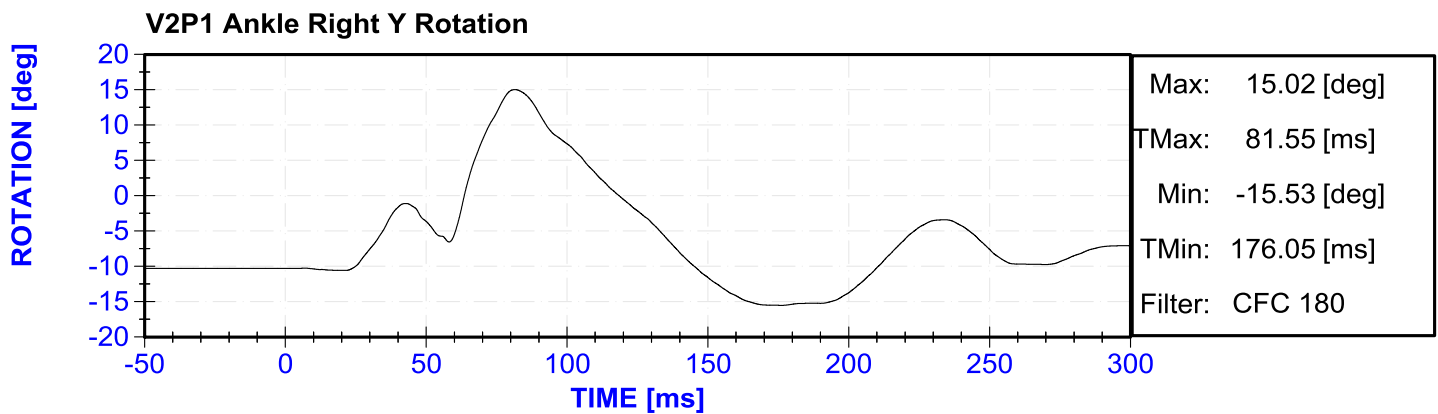
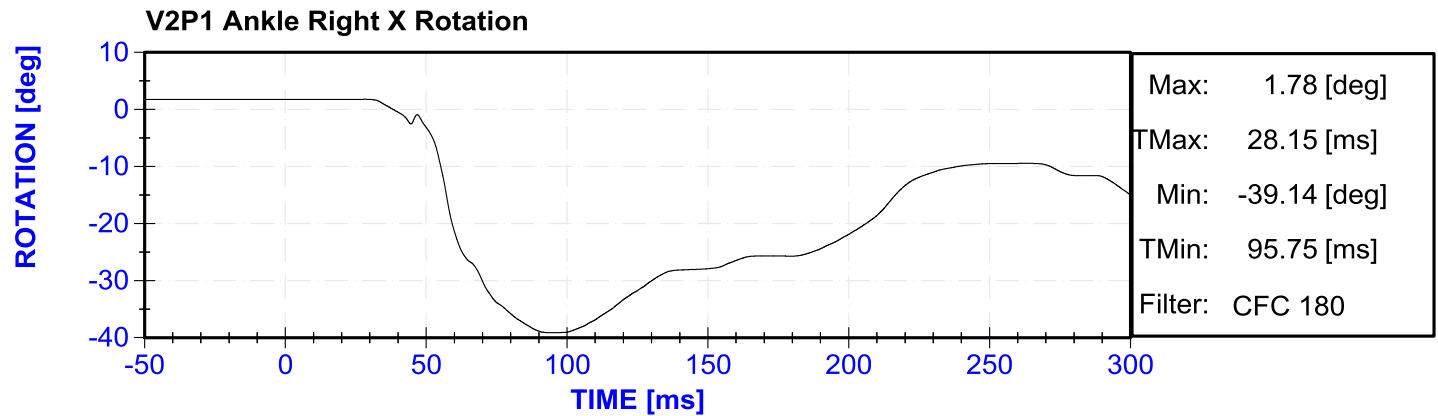
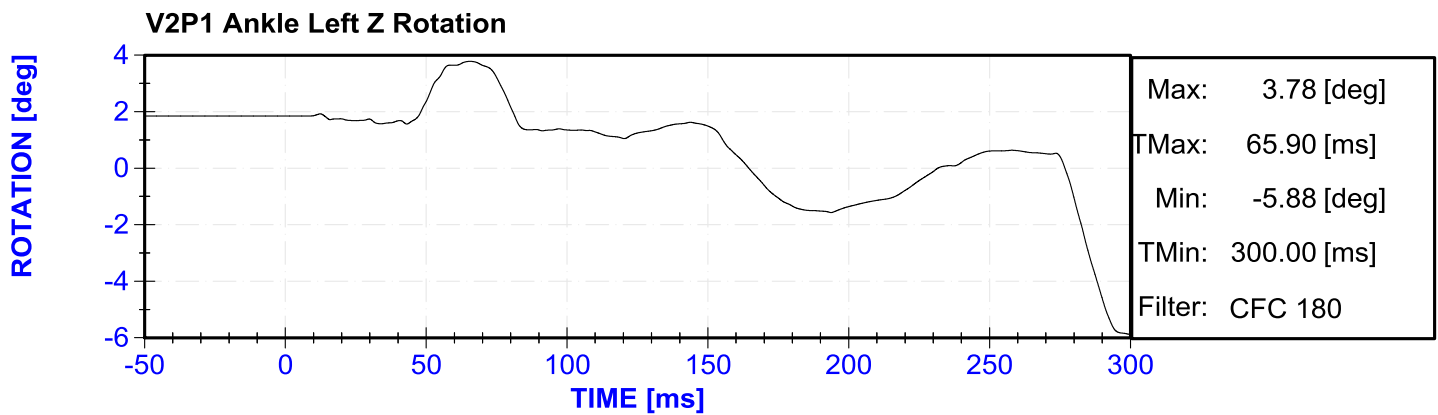
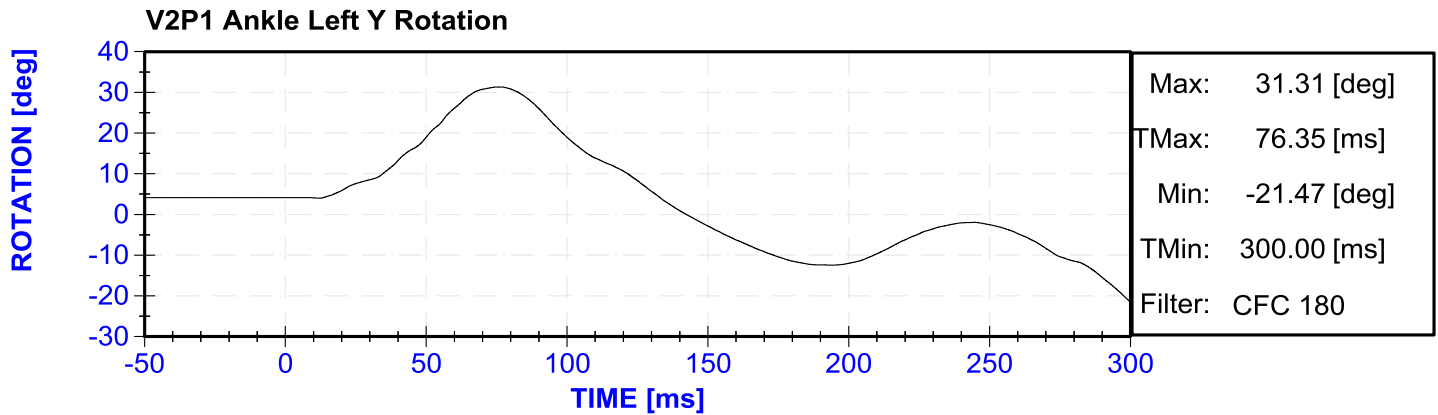


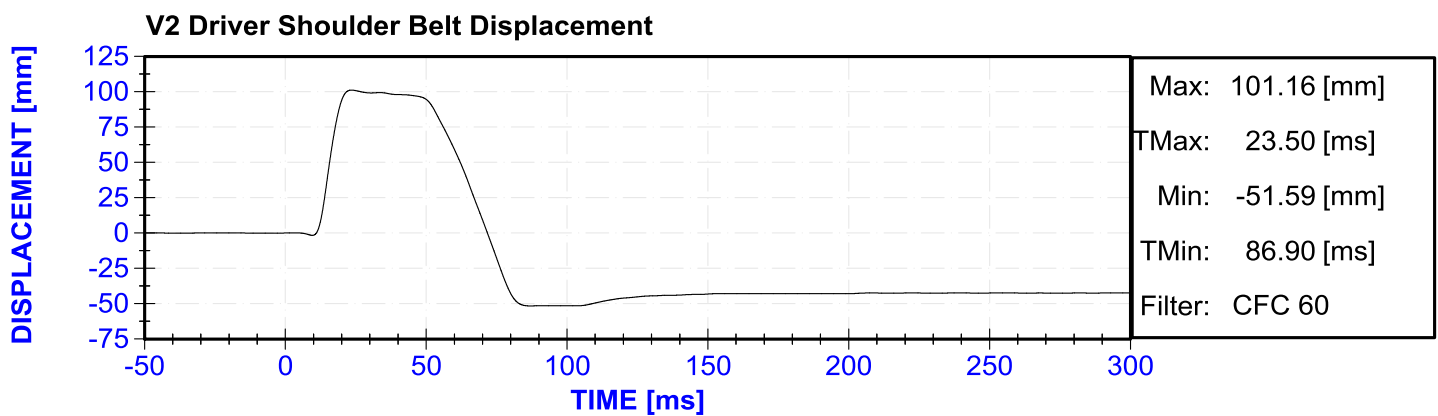
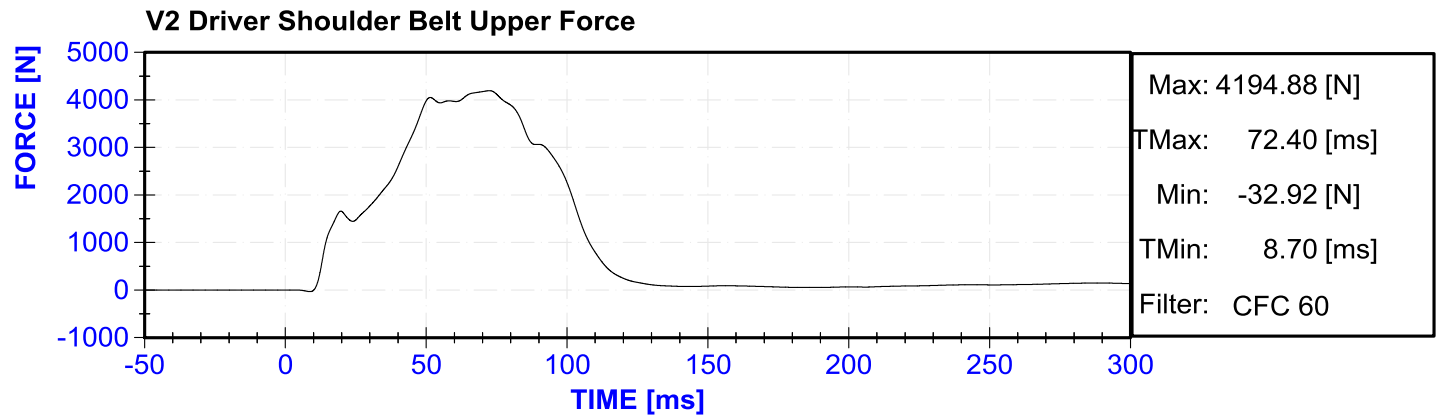
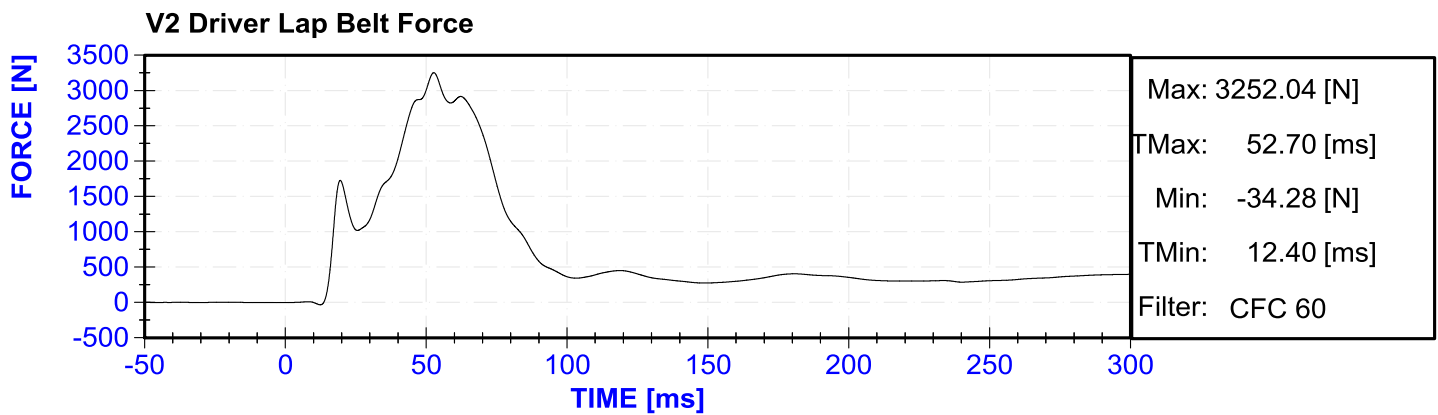
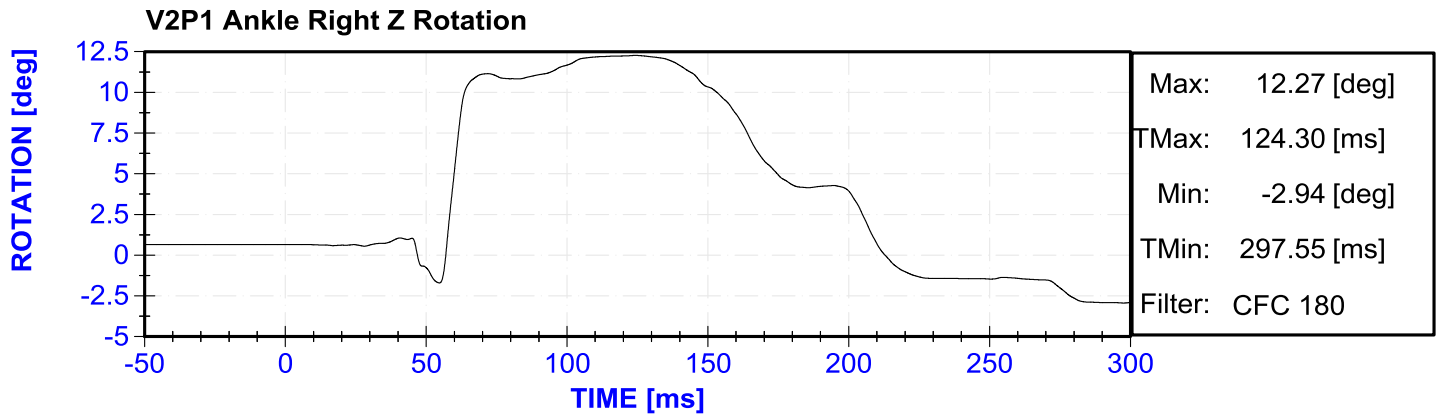


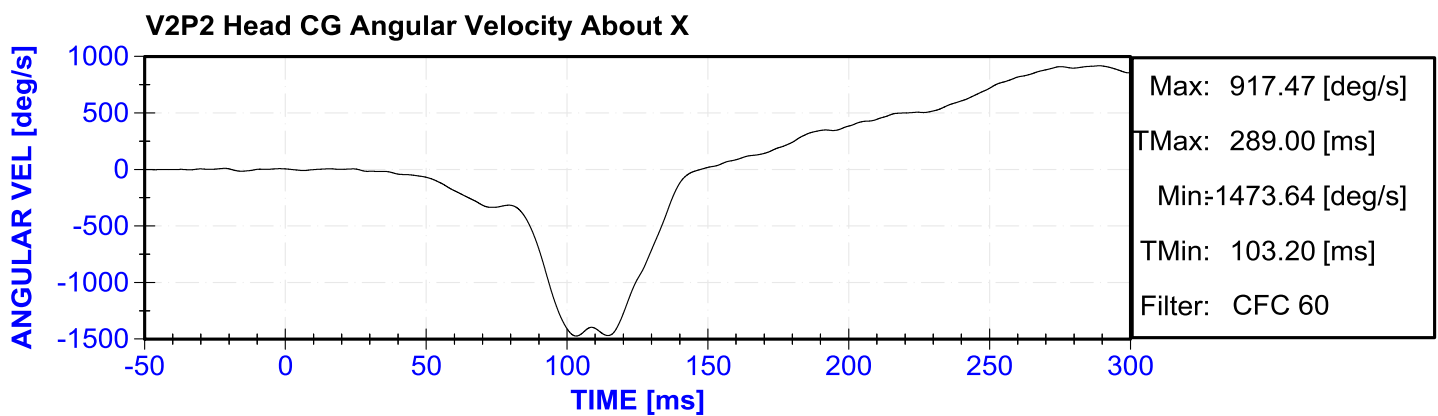
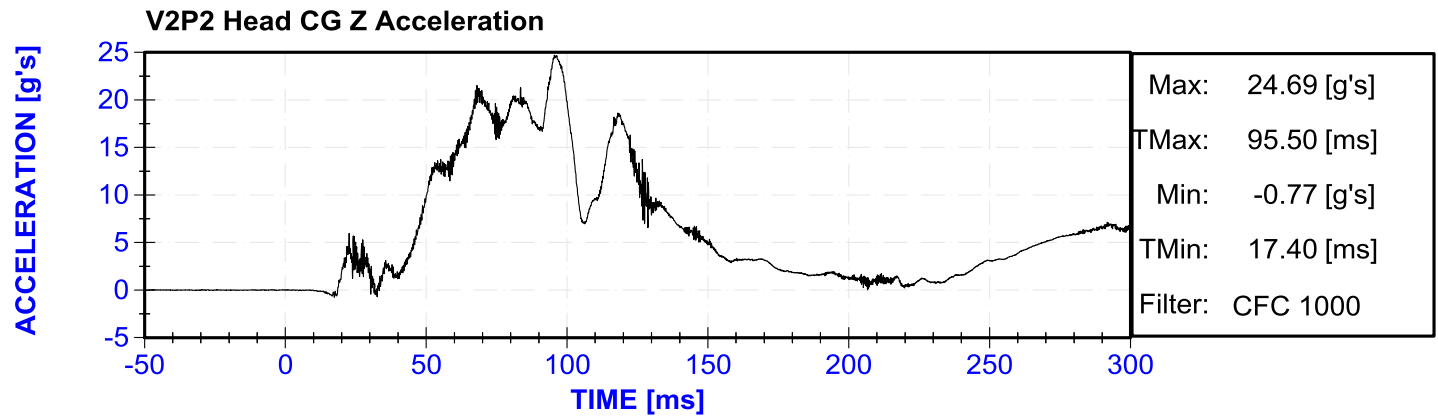
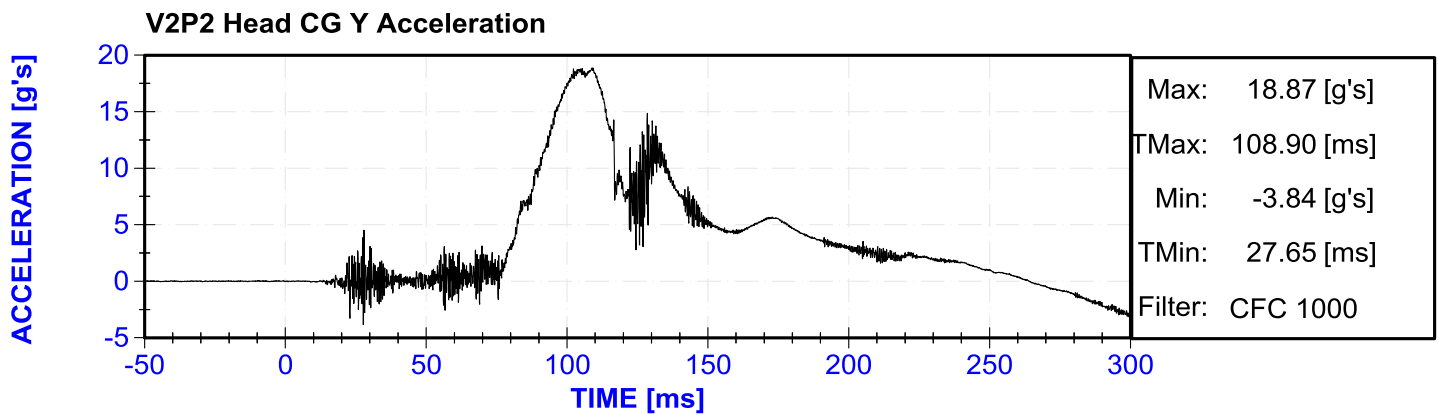
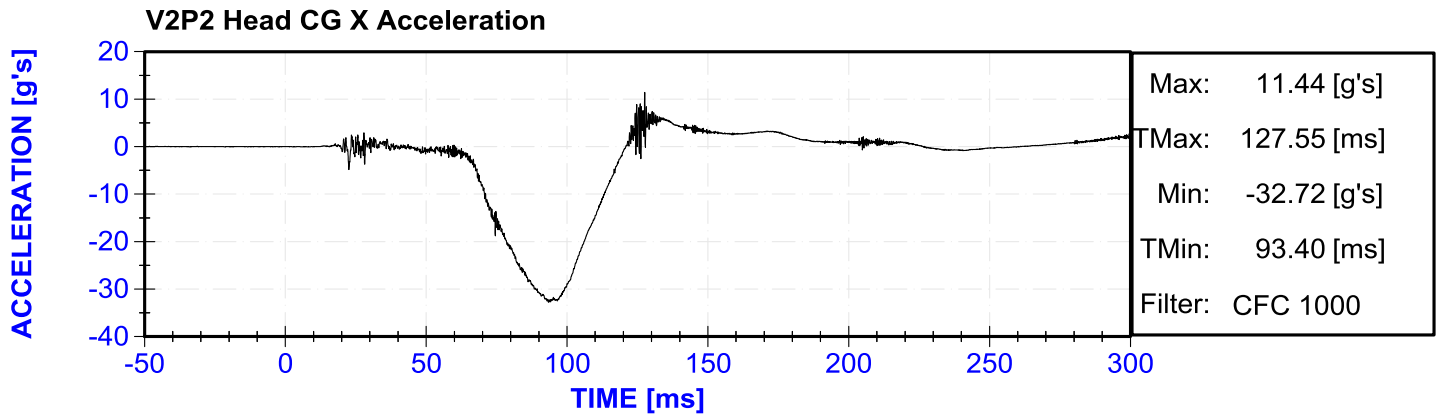


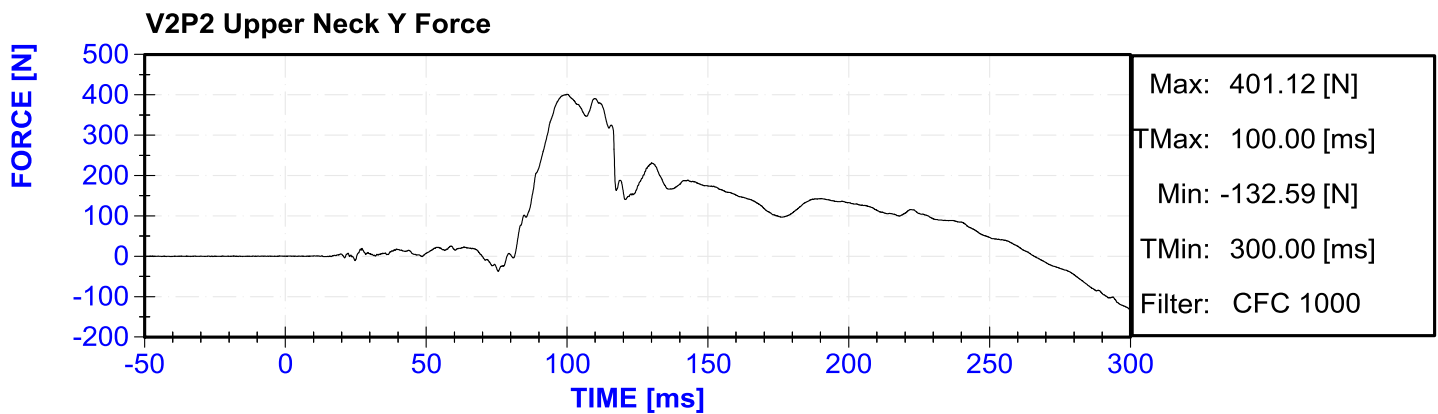
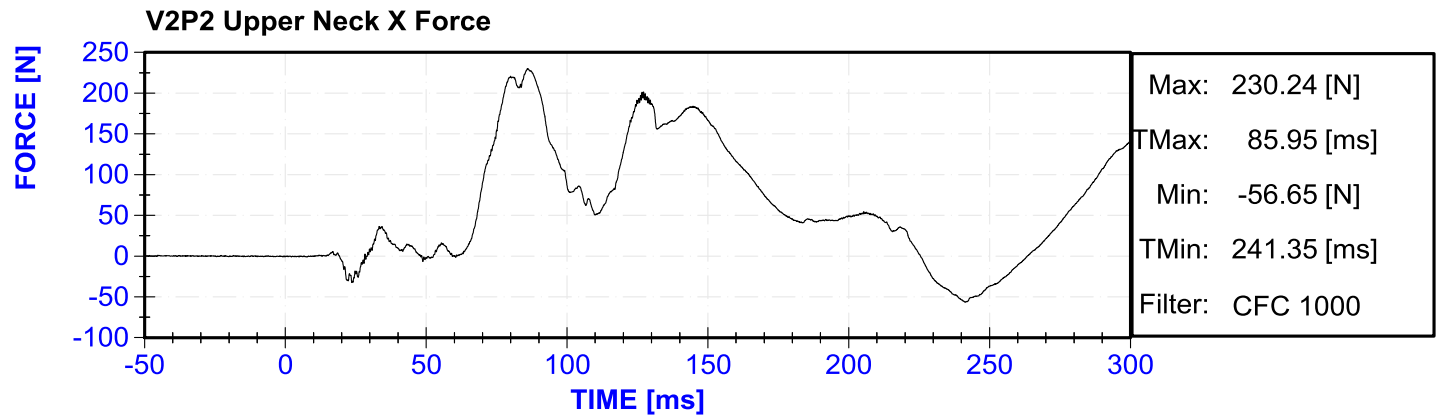
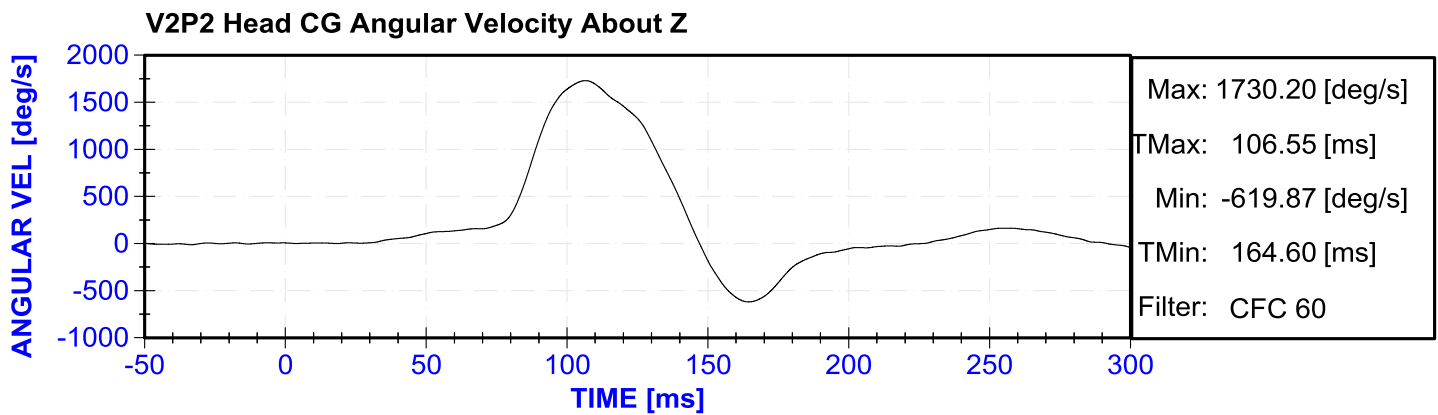
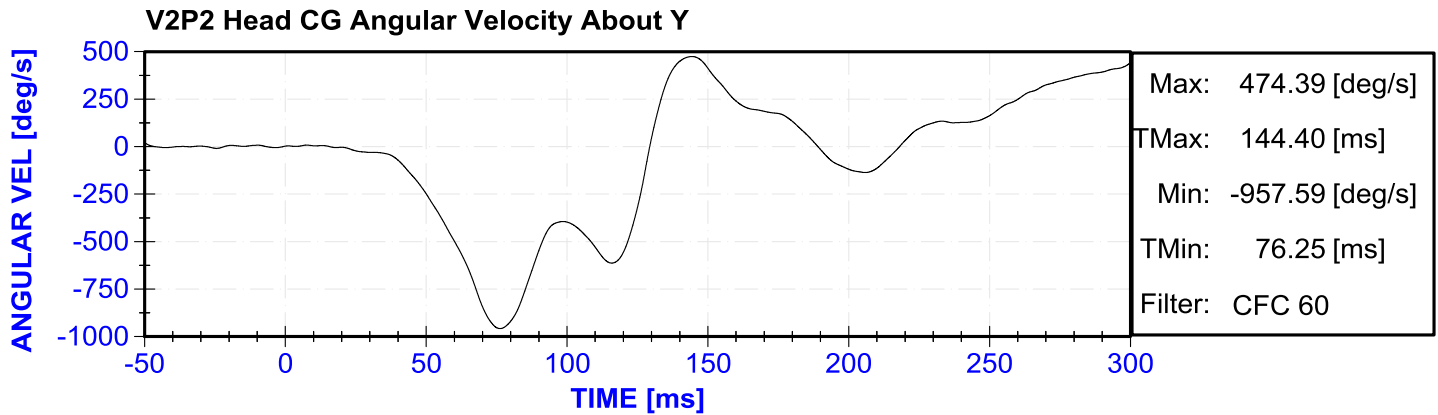


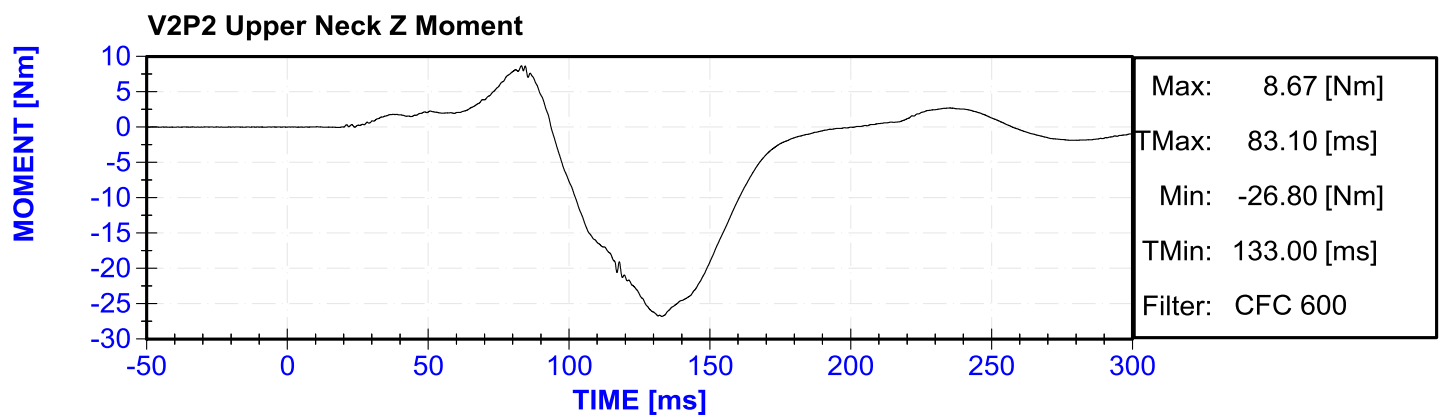
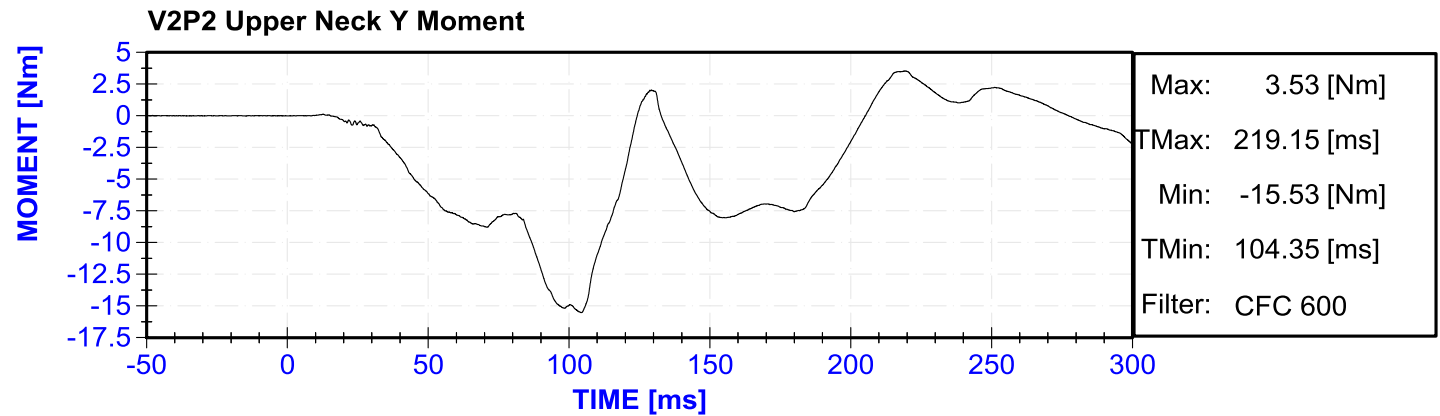
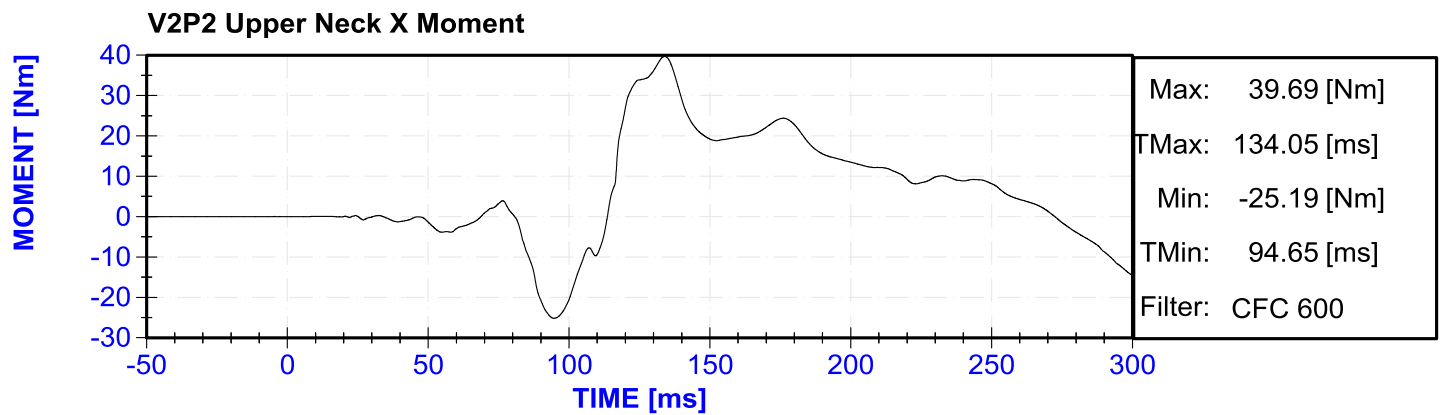
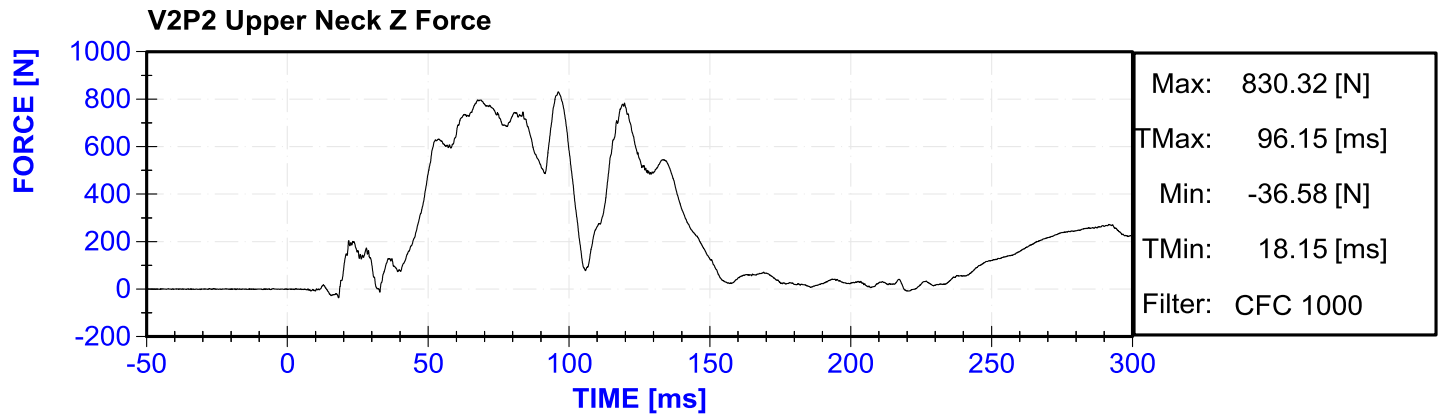


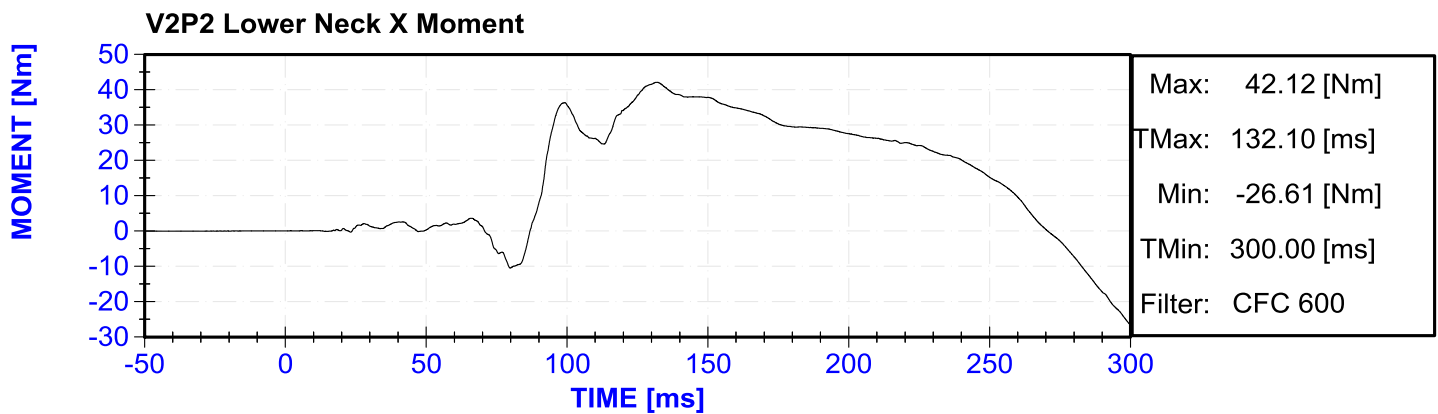
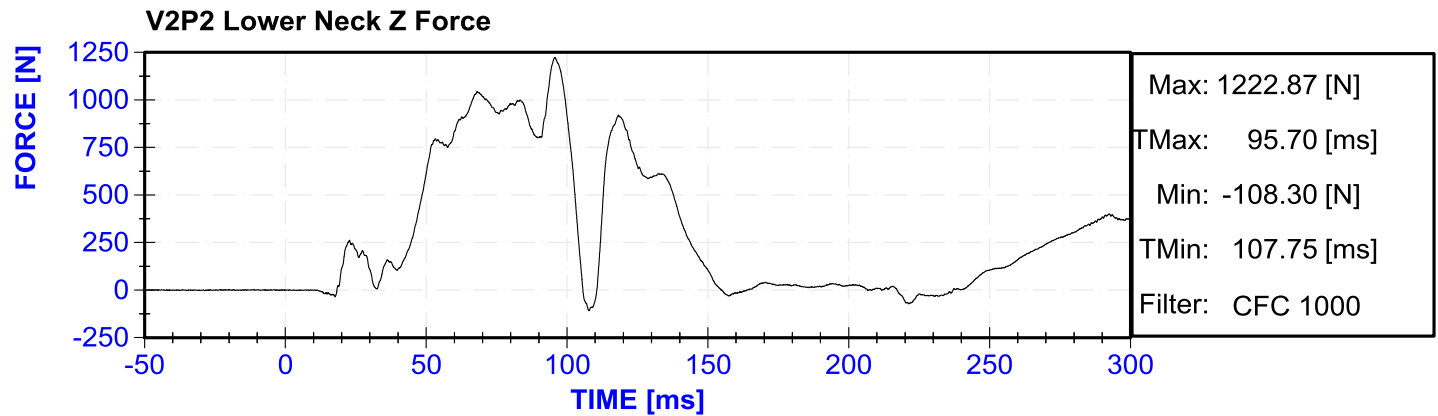
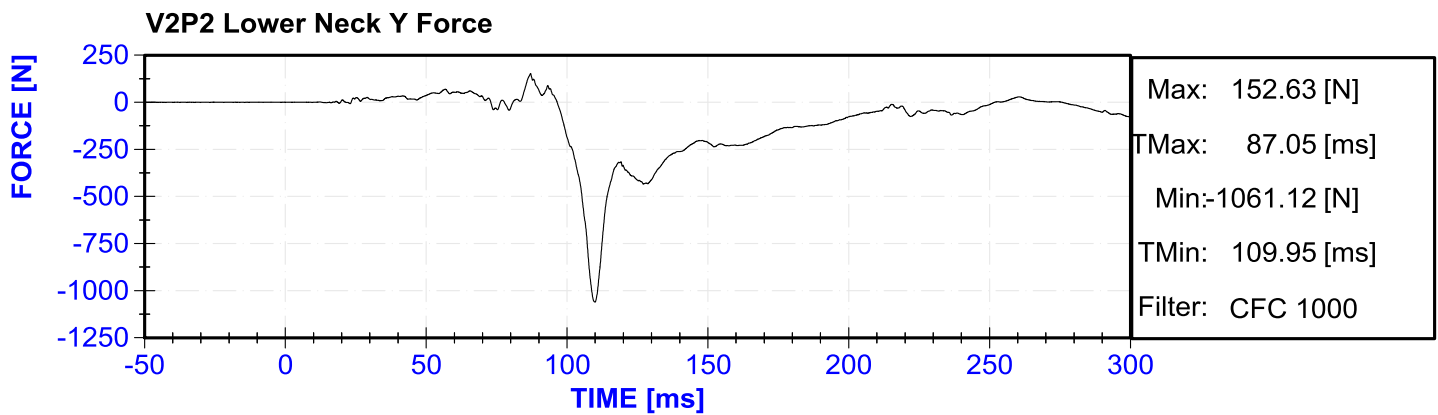
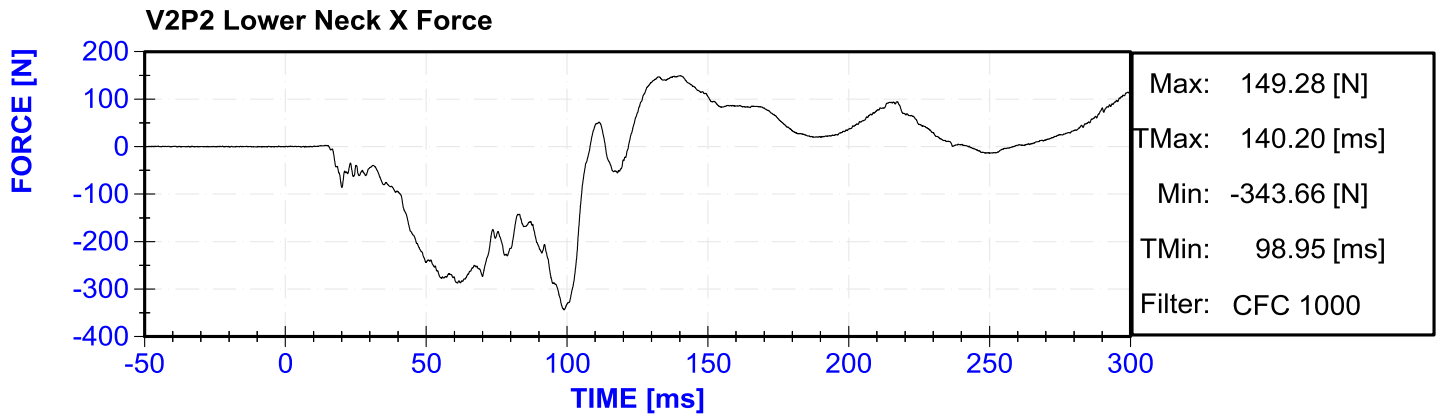


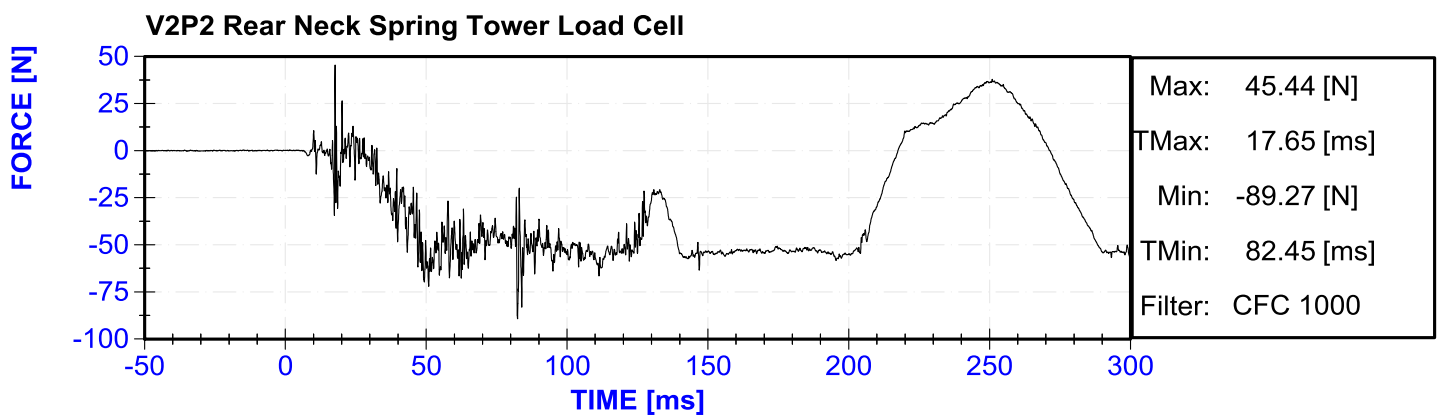
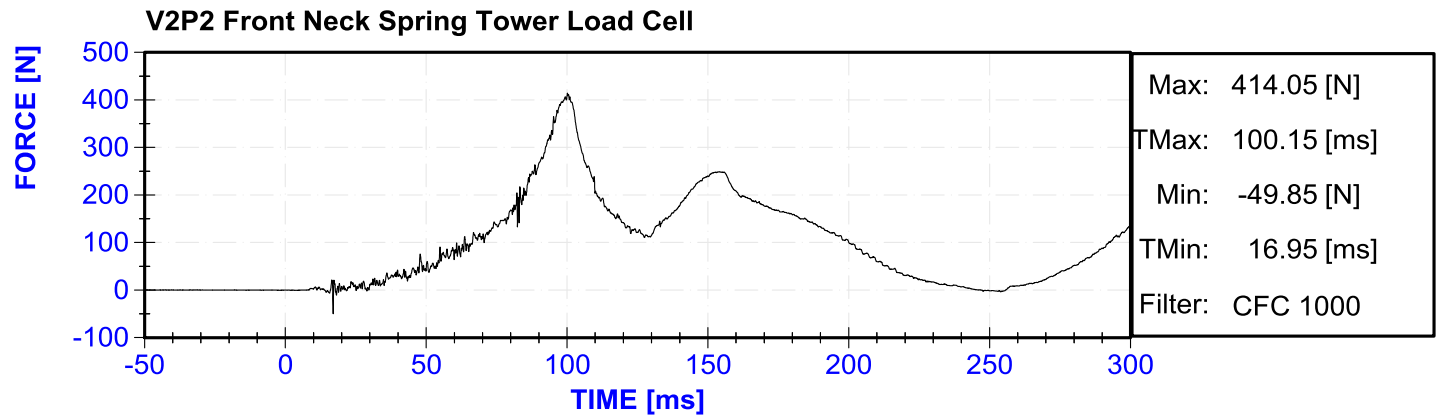
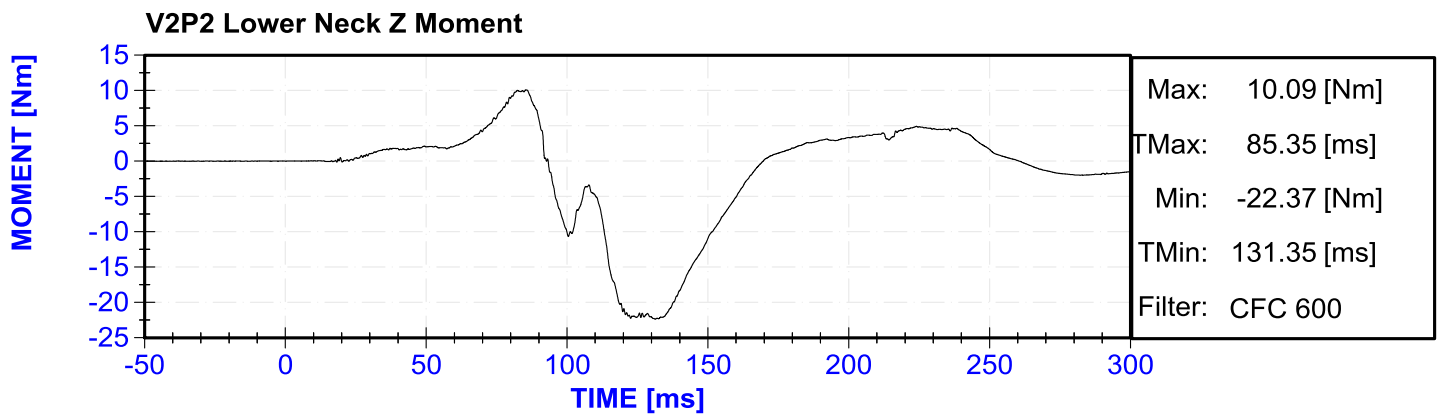
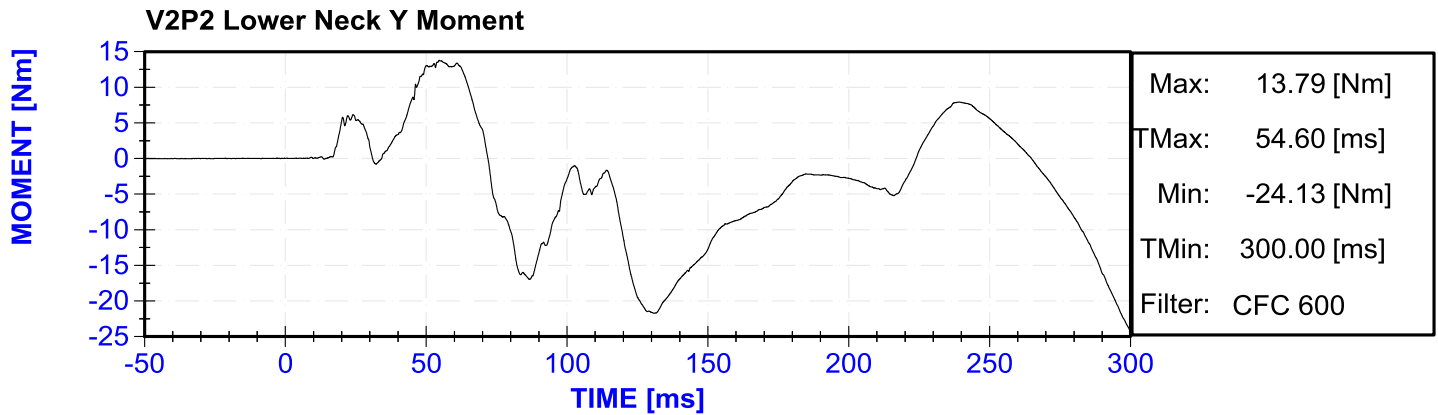




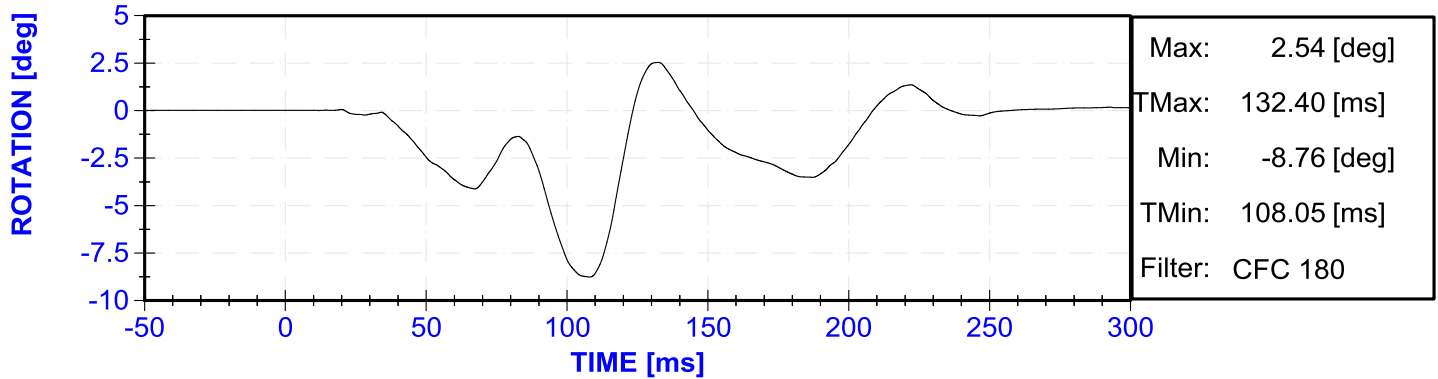




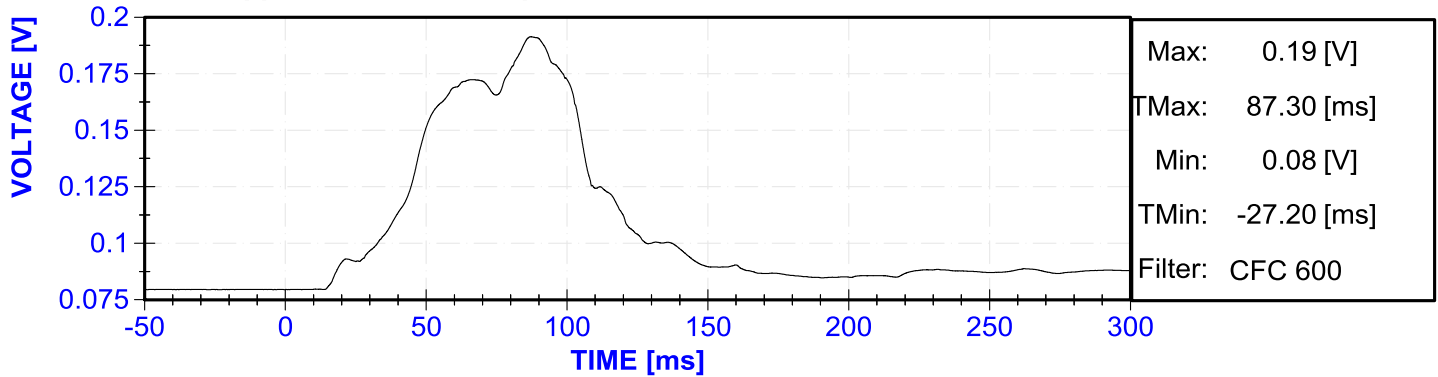




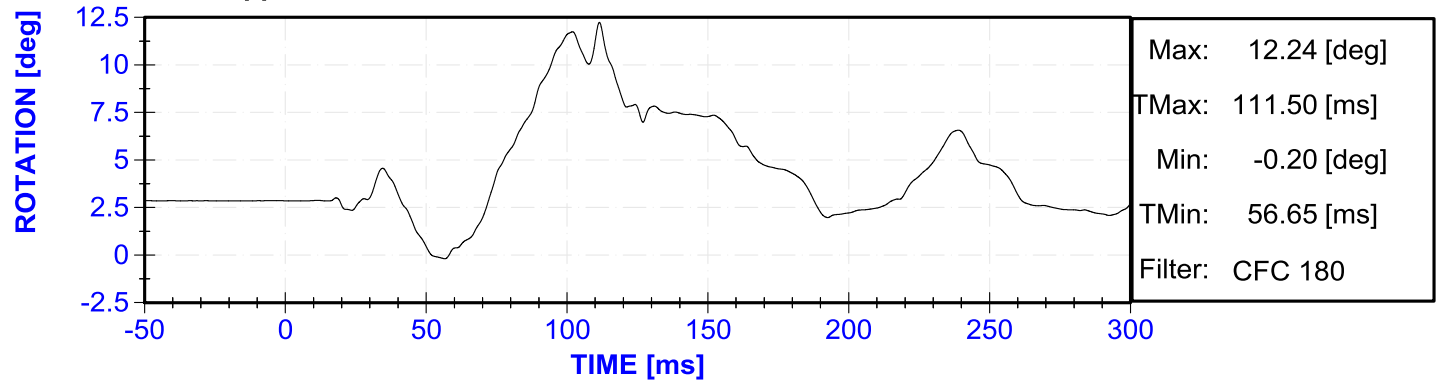
V2P2 Occipital Condyle Rotation Potentiometer



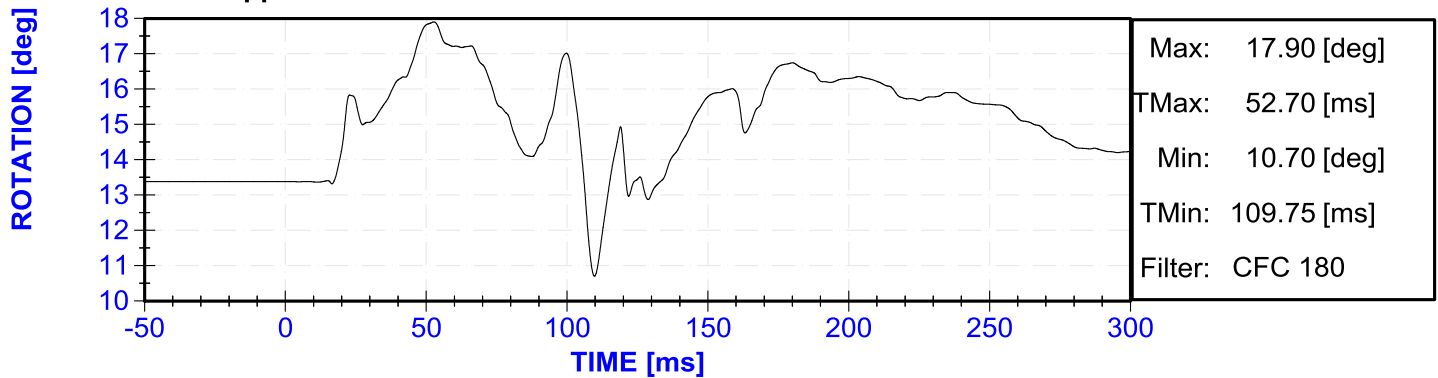
V2P2 Upper Left DGIR X Displacement



V2P2 Upper Left DGIR Y Rotation

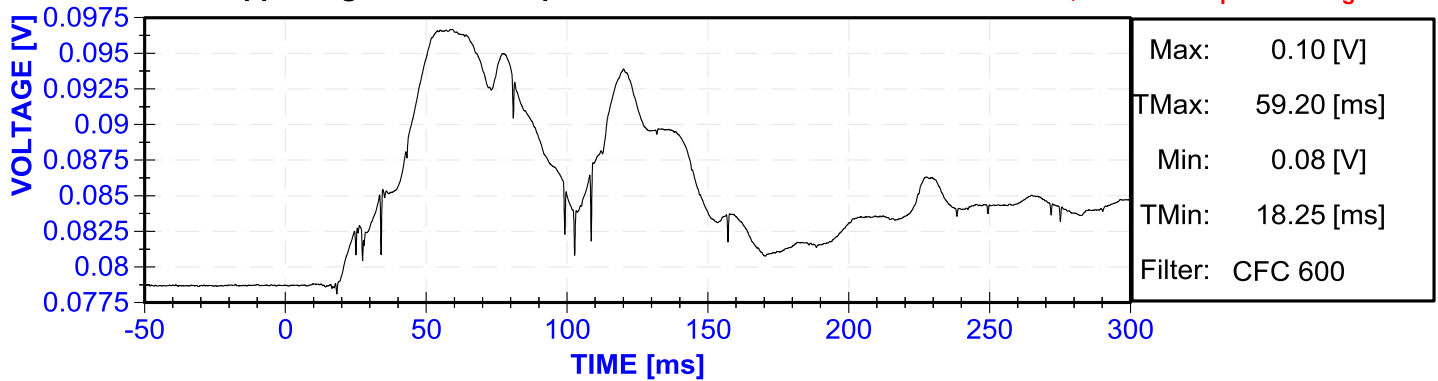


V2P2 Upper Left DGIR Z Rotation

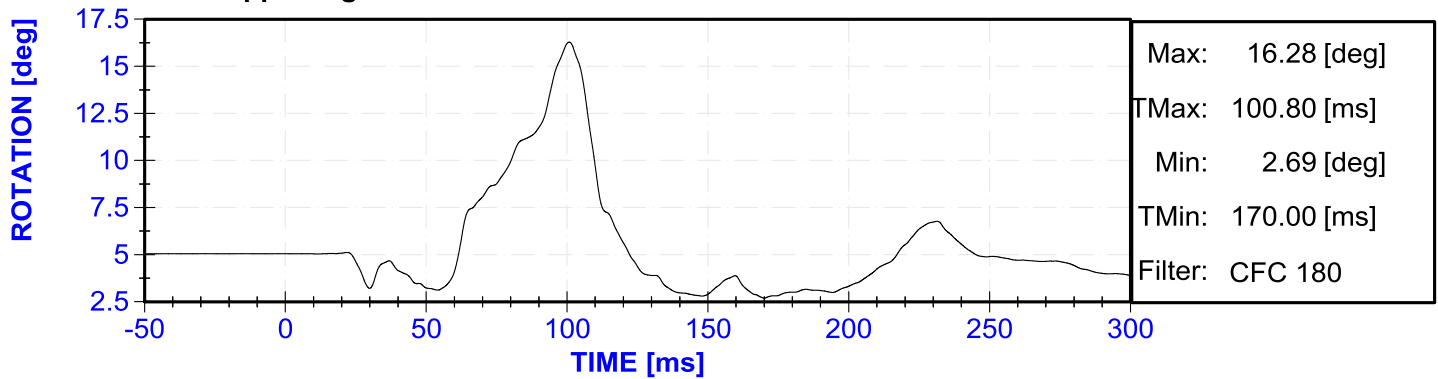


V2P2 Upper Right DGIR X Displacement

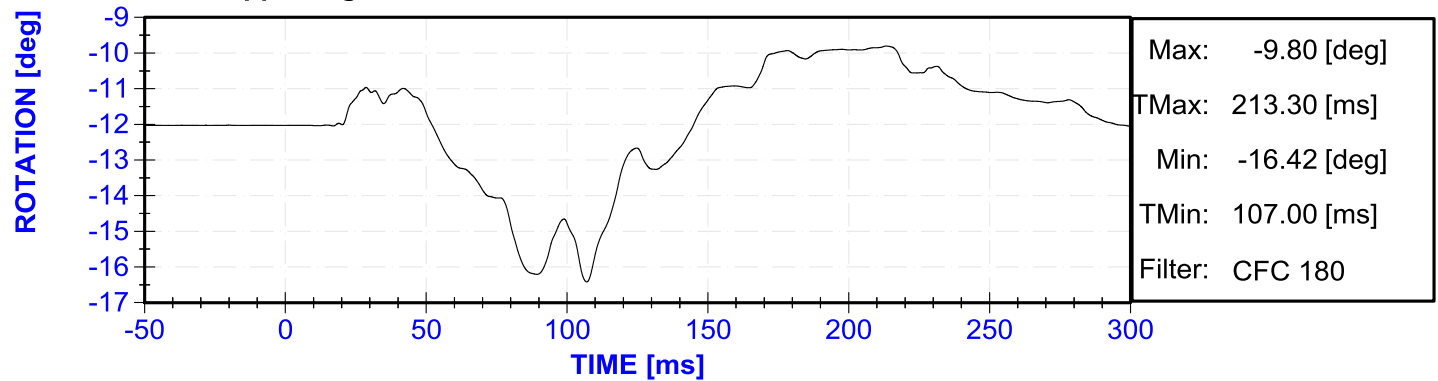
Questionable spikes throughout



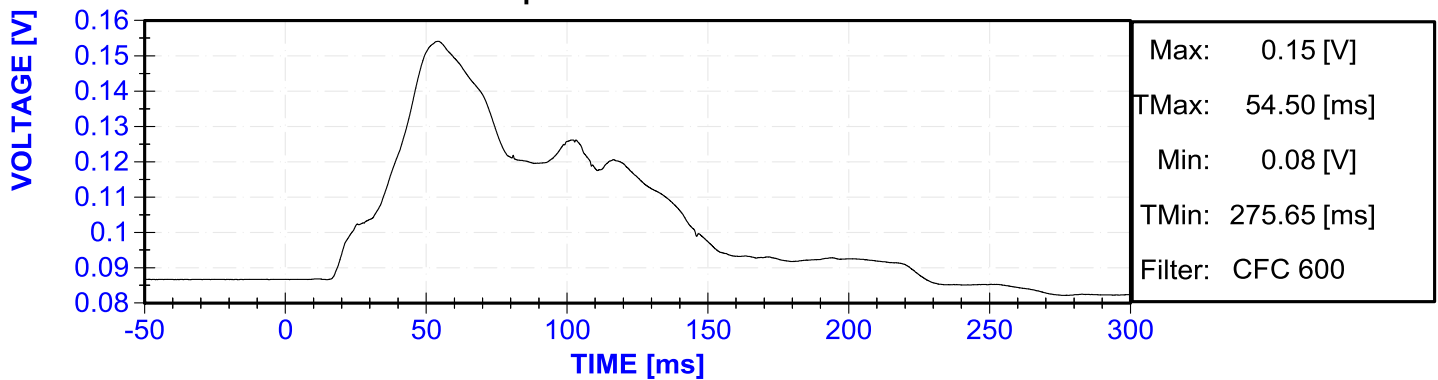
V2P2 Upper Right DGIR Y Rotation

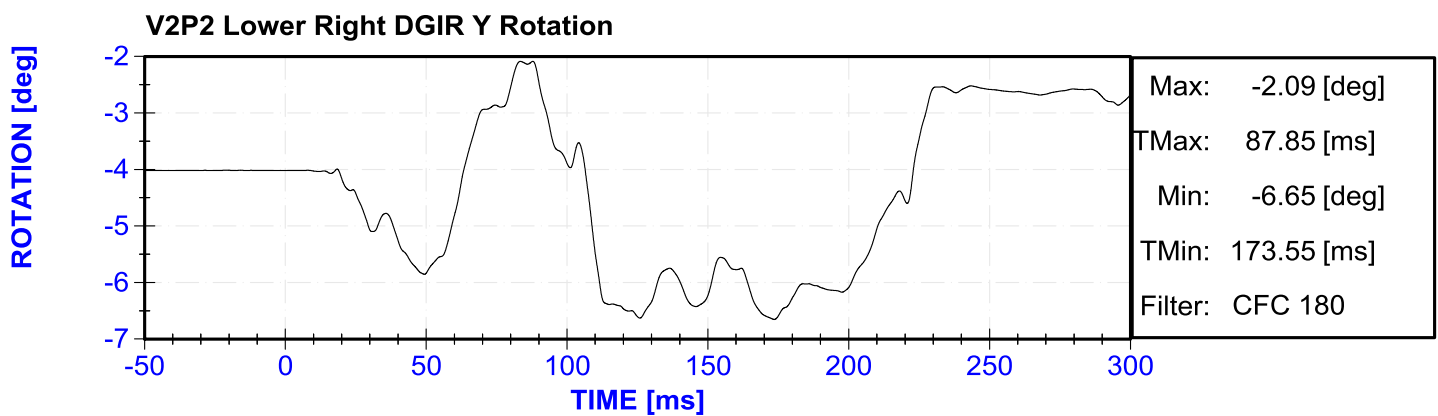
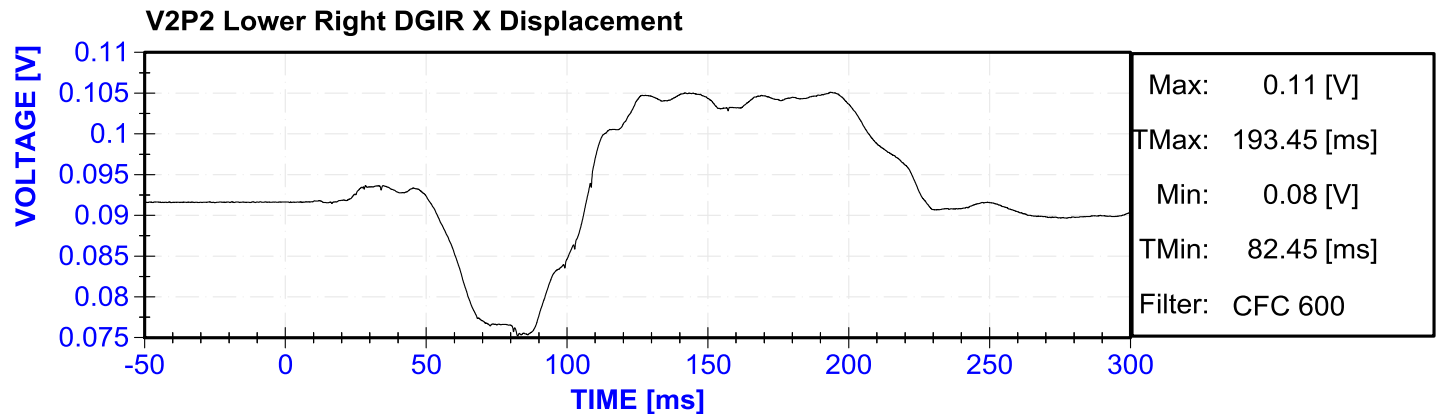
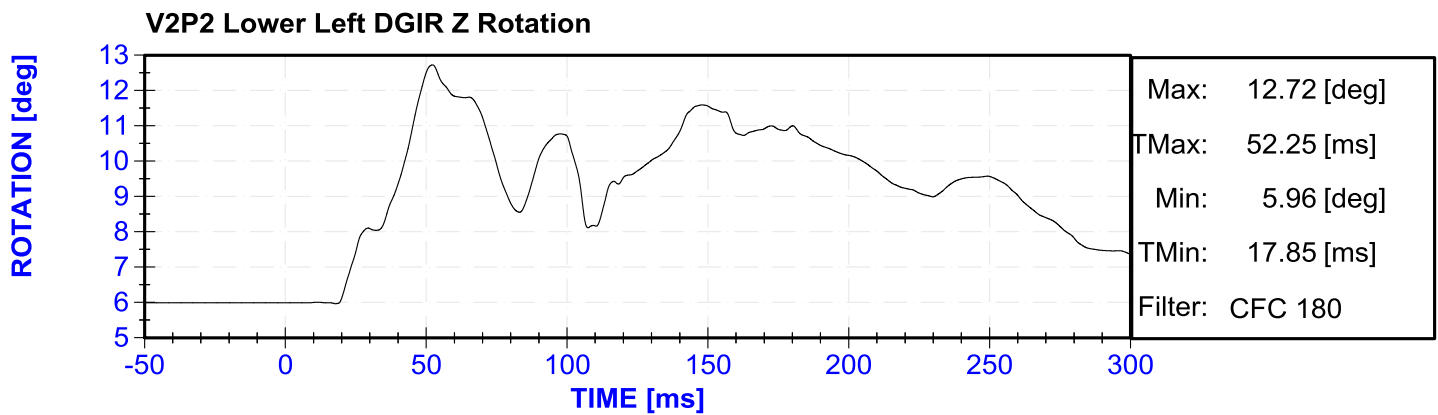
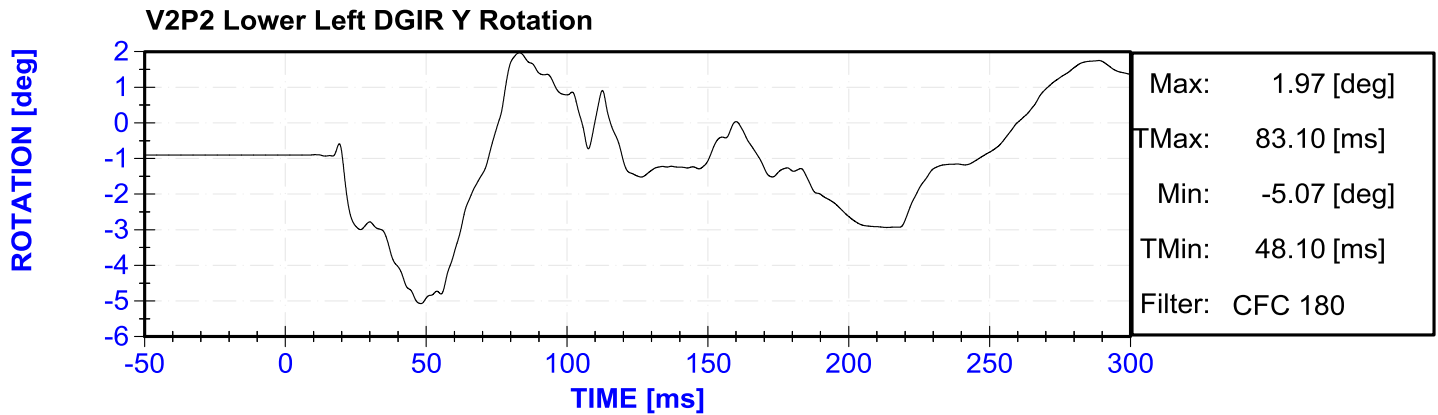


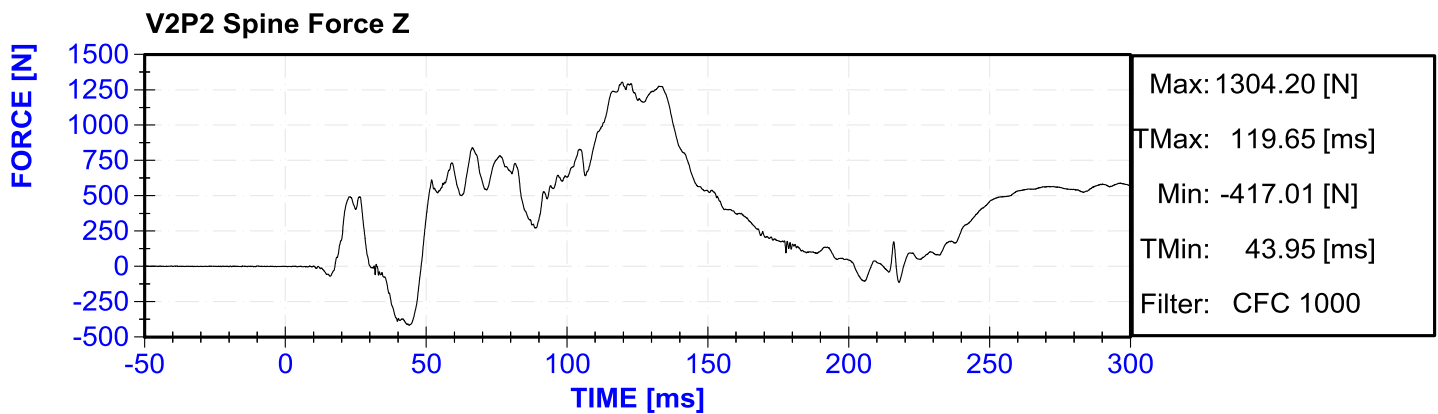
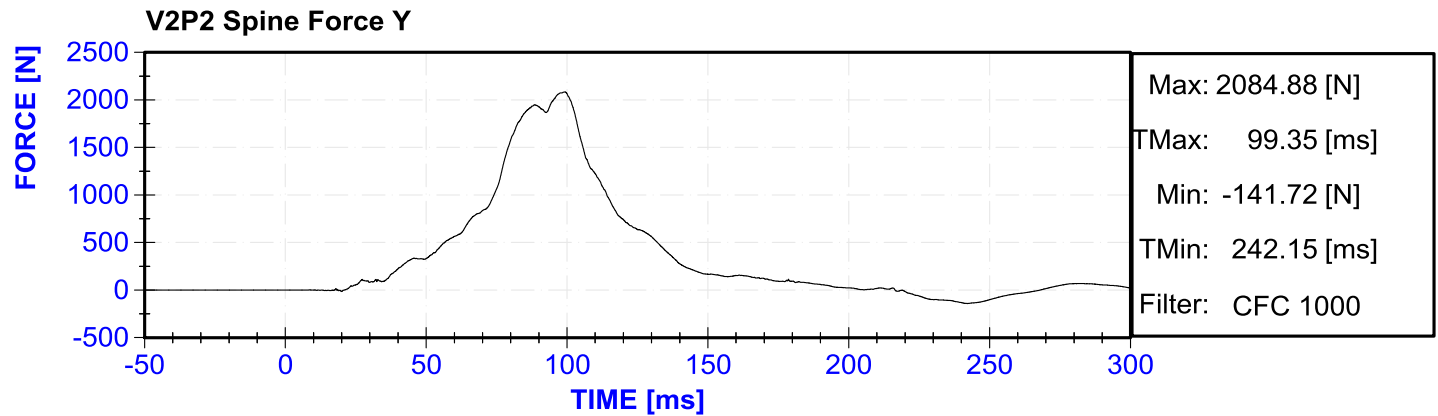
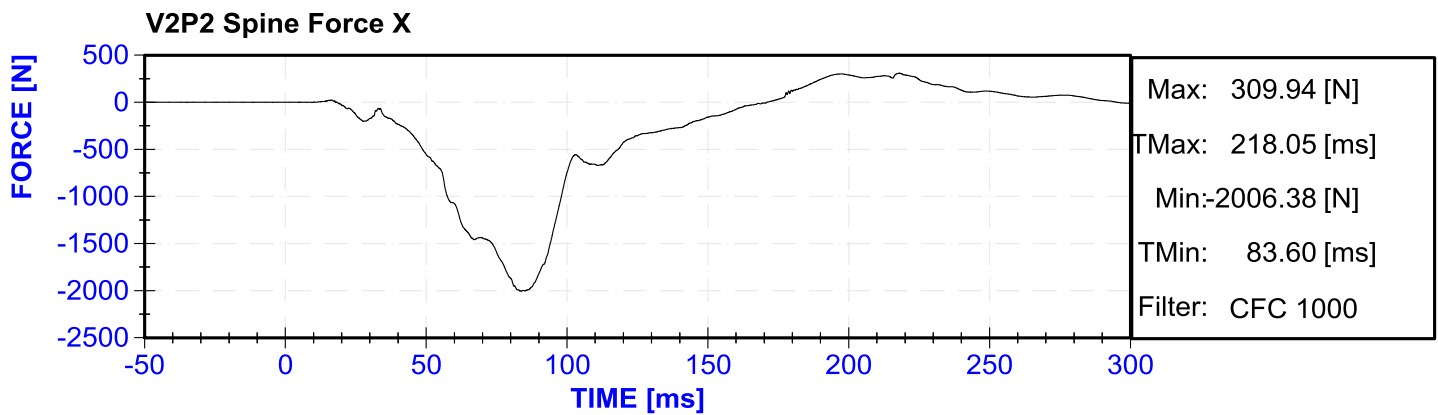
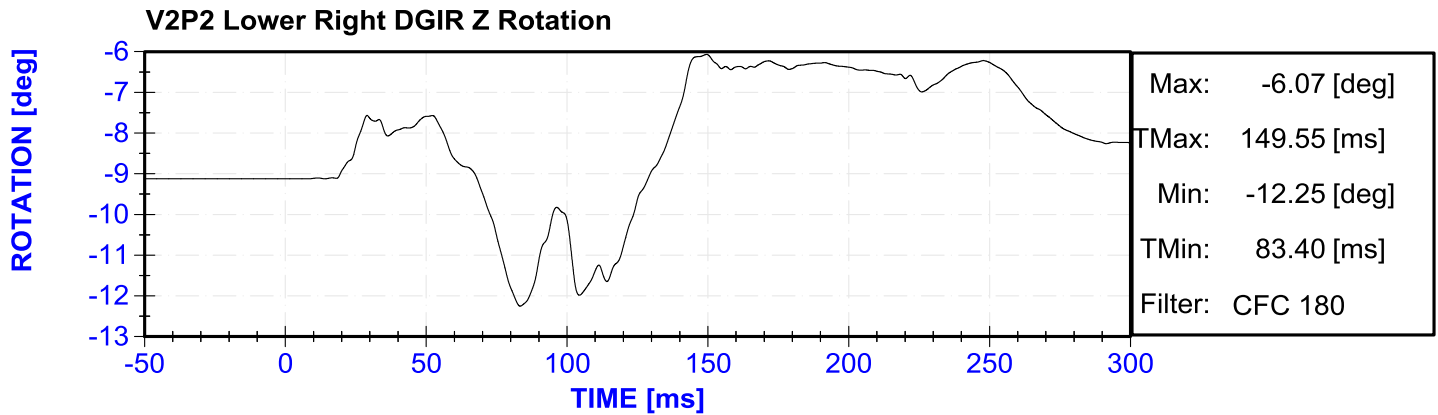
V2P2 Upper Right DGIR Z Rotation

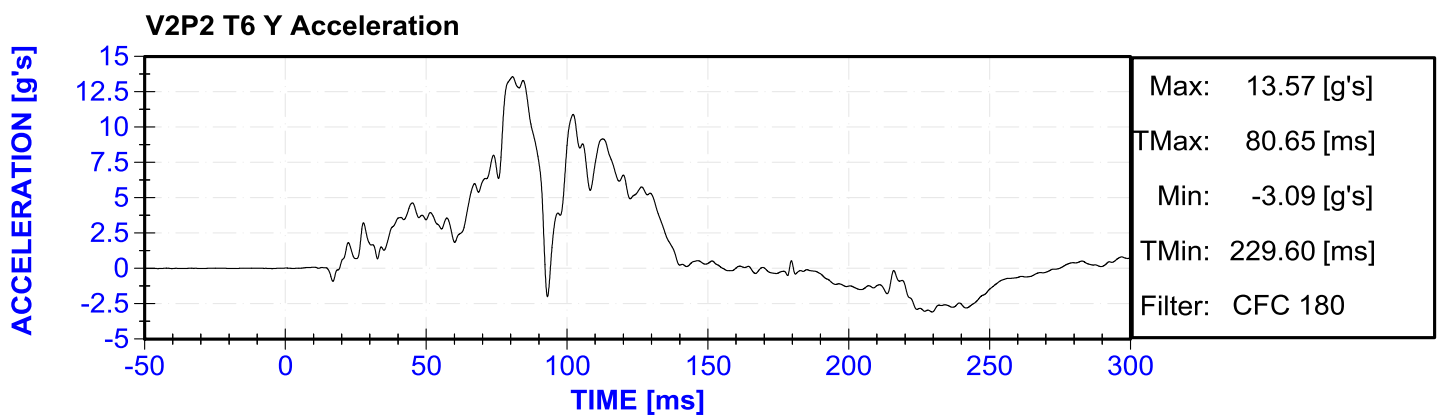
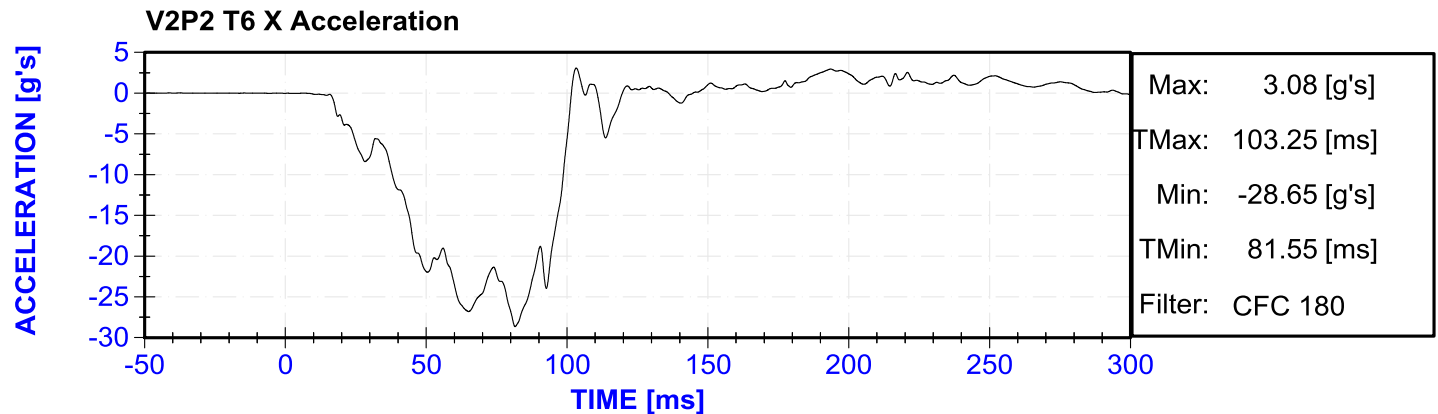
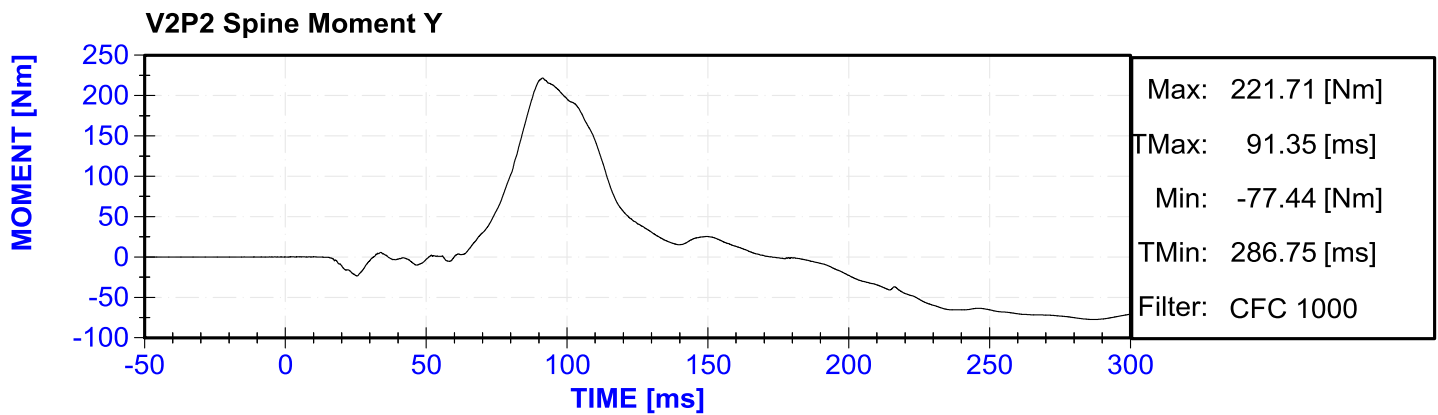
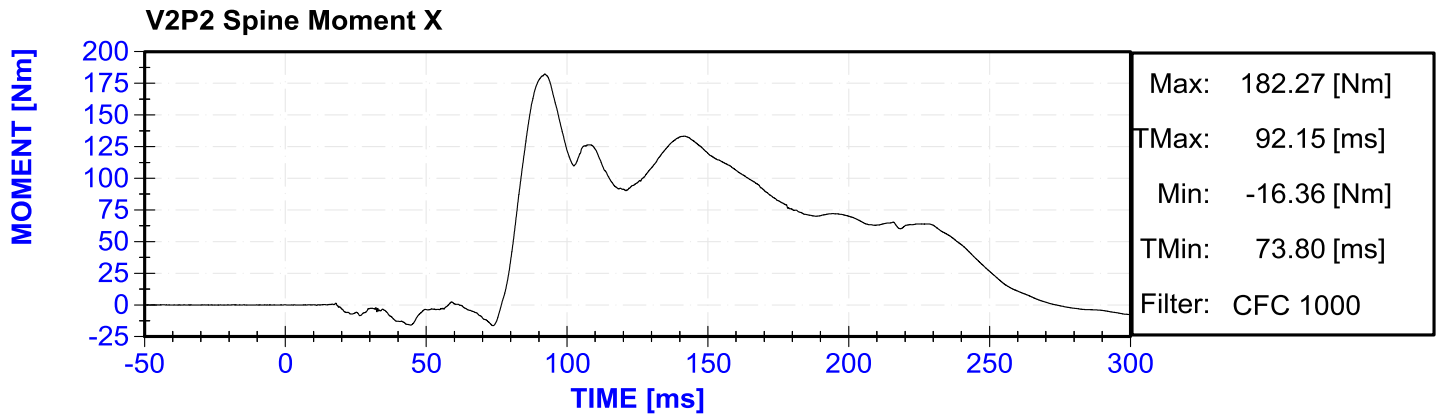


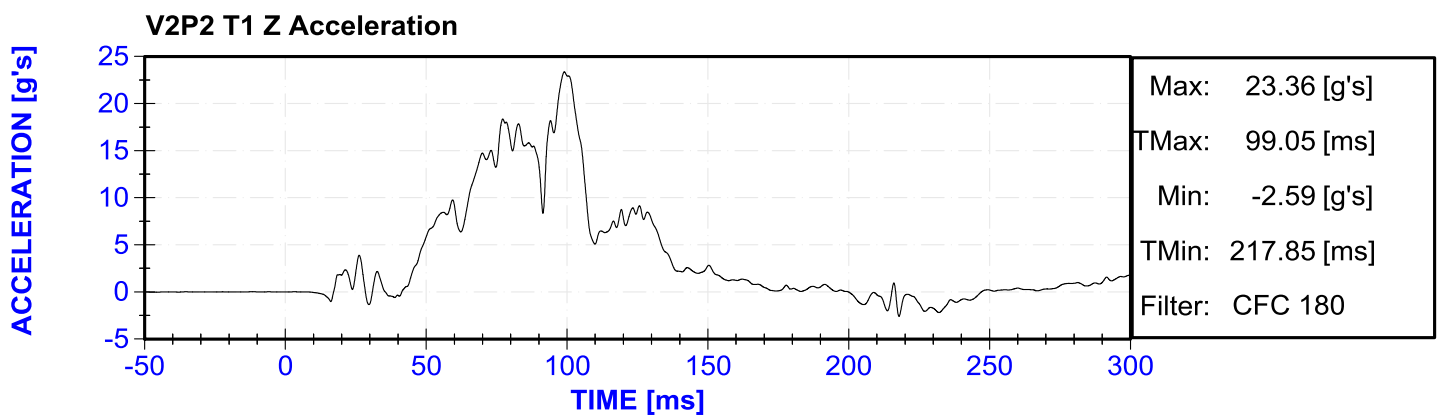
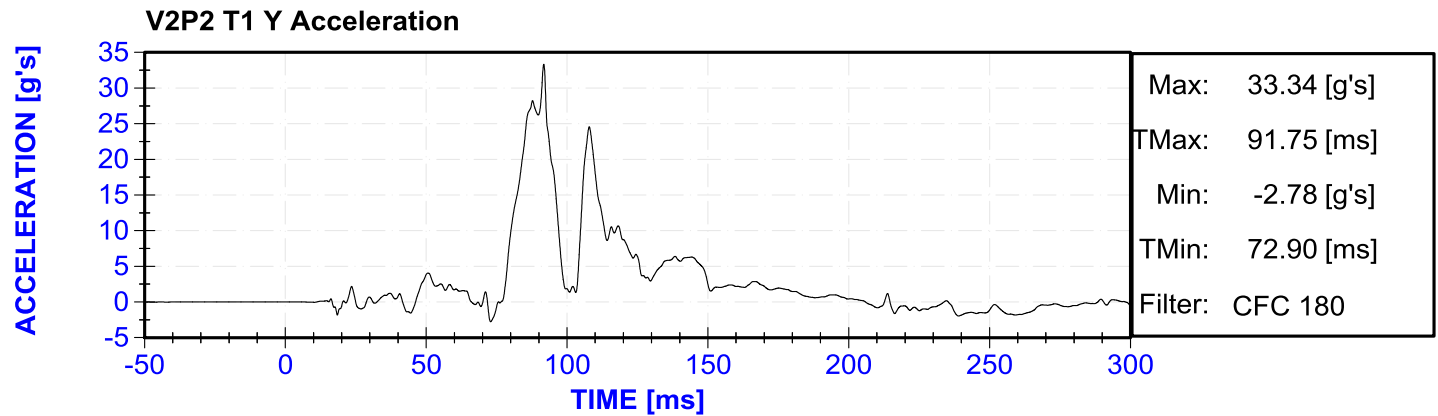
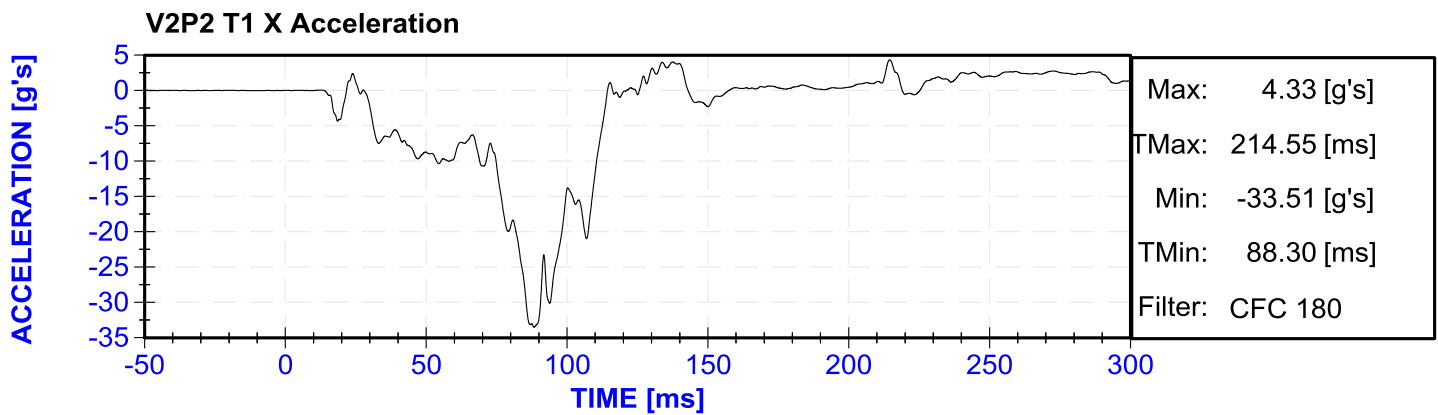
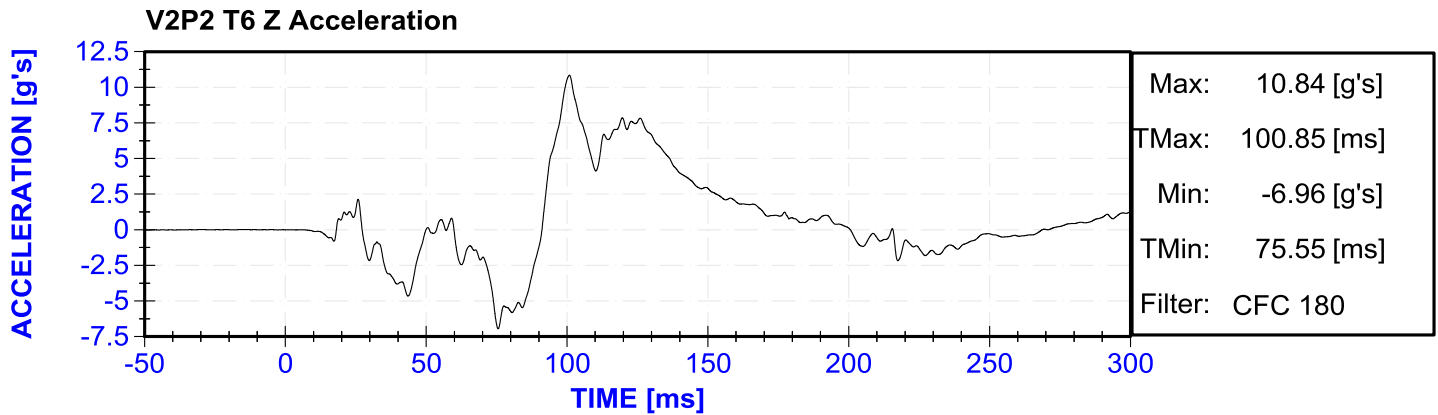
V2P2 Lower Left DGIR X Displacement



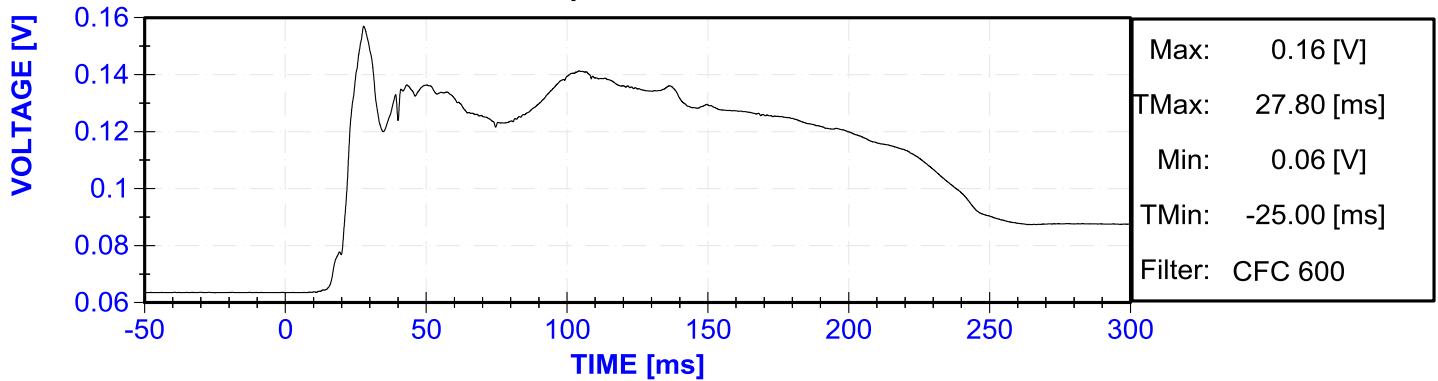




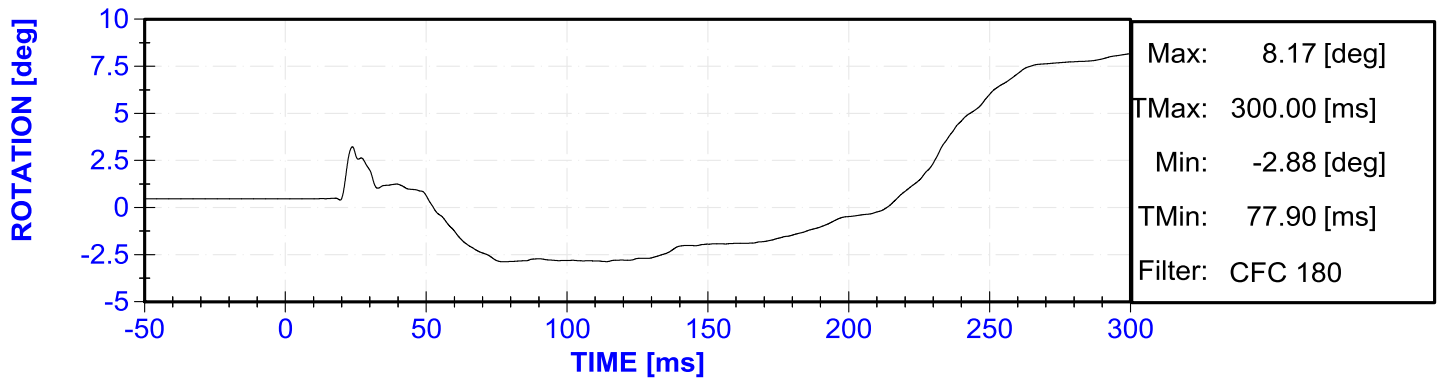




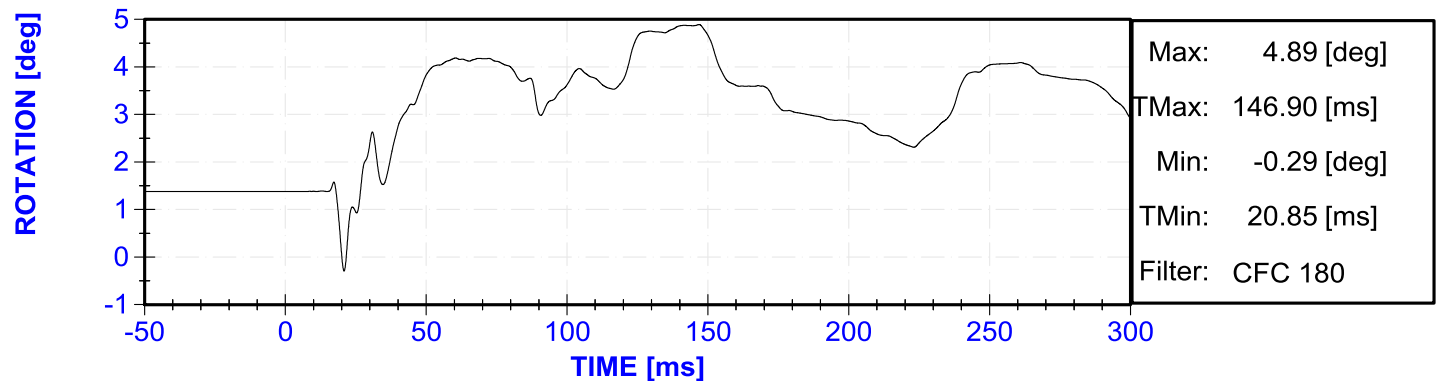
V2P2 Abdomen Left DGIR X Displacement



V2P2 Abdomen Left DGIR Y Rotation

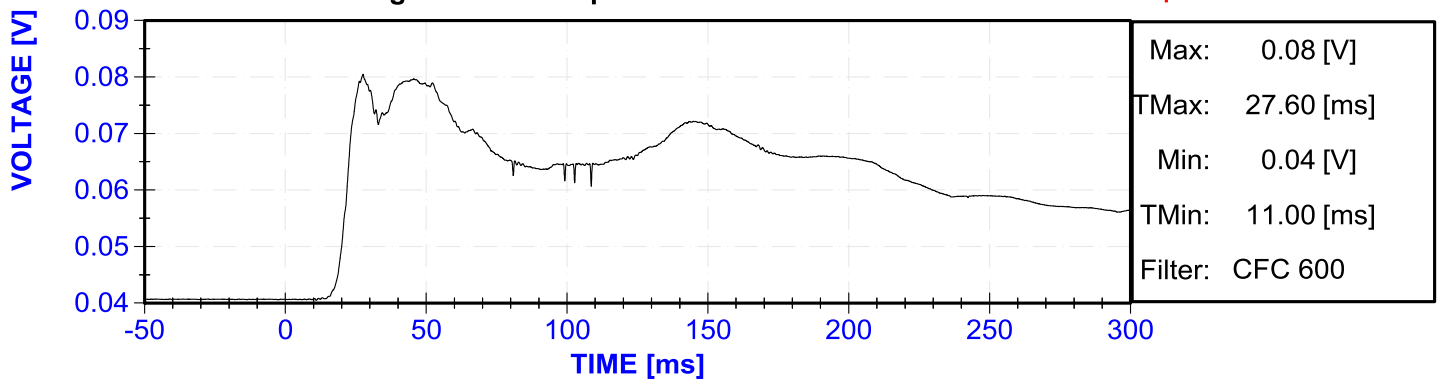


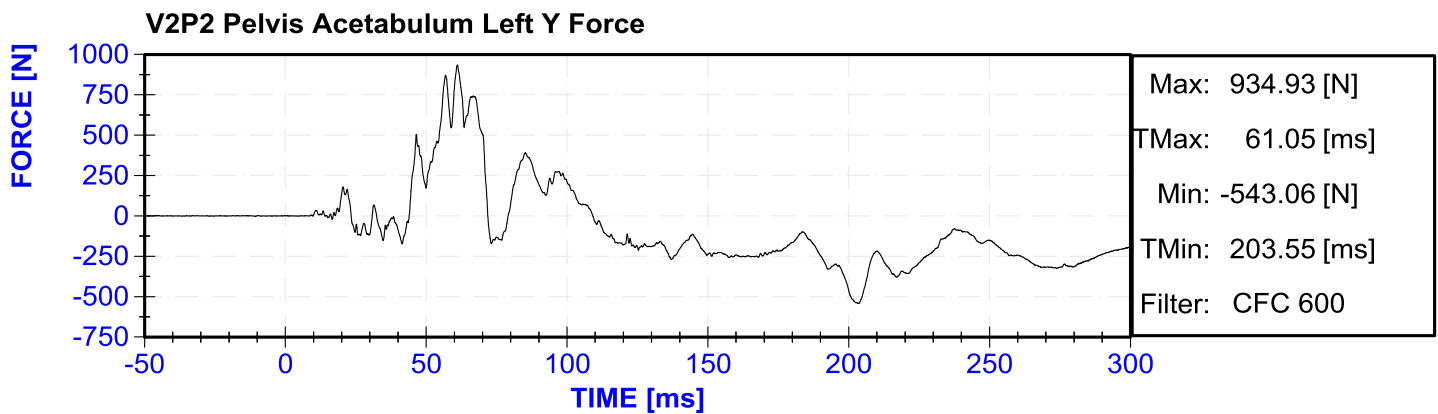
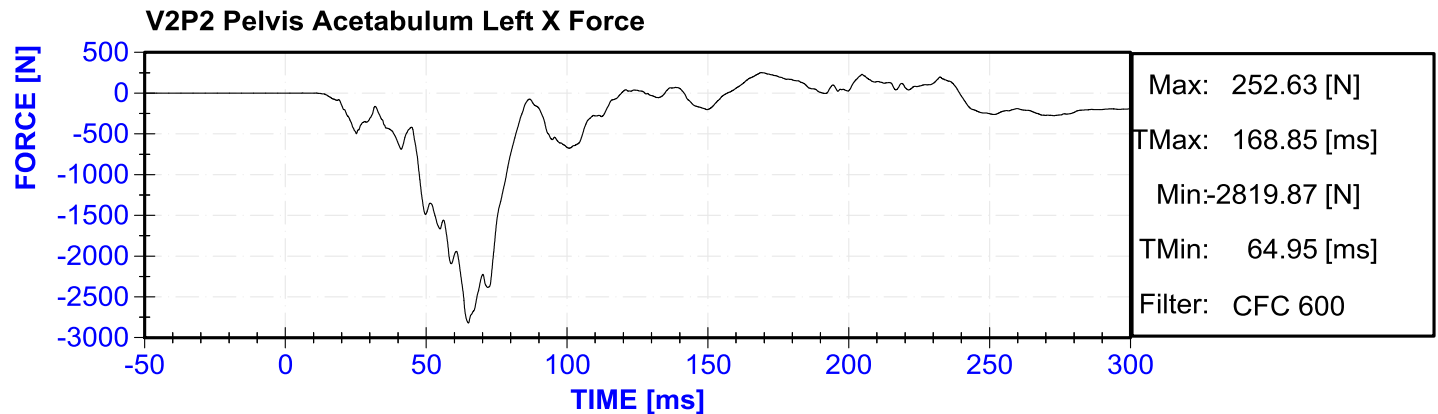
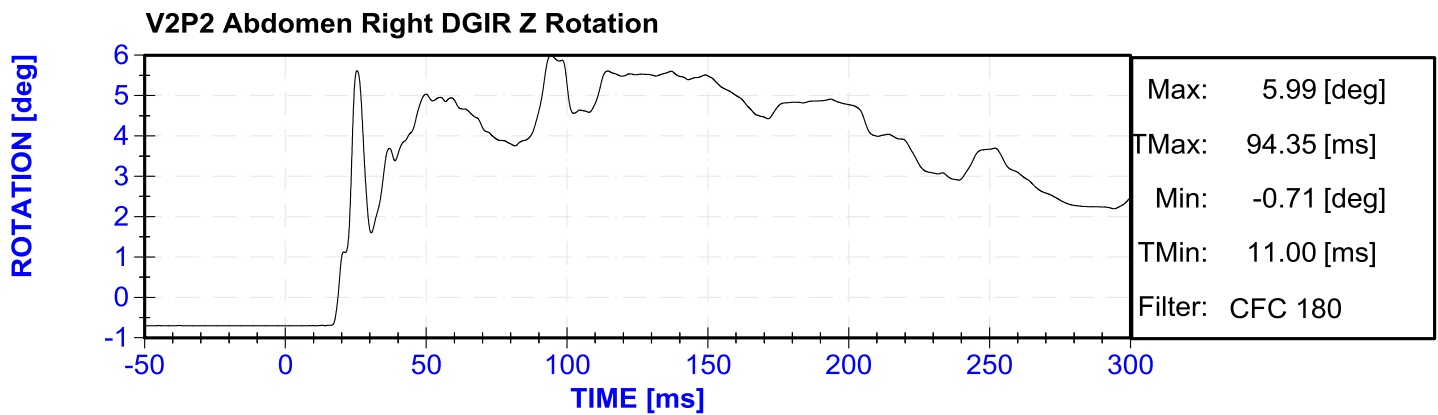
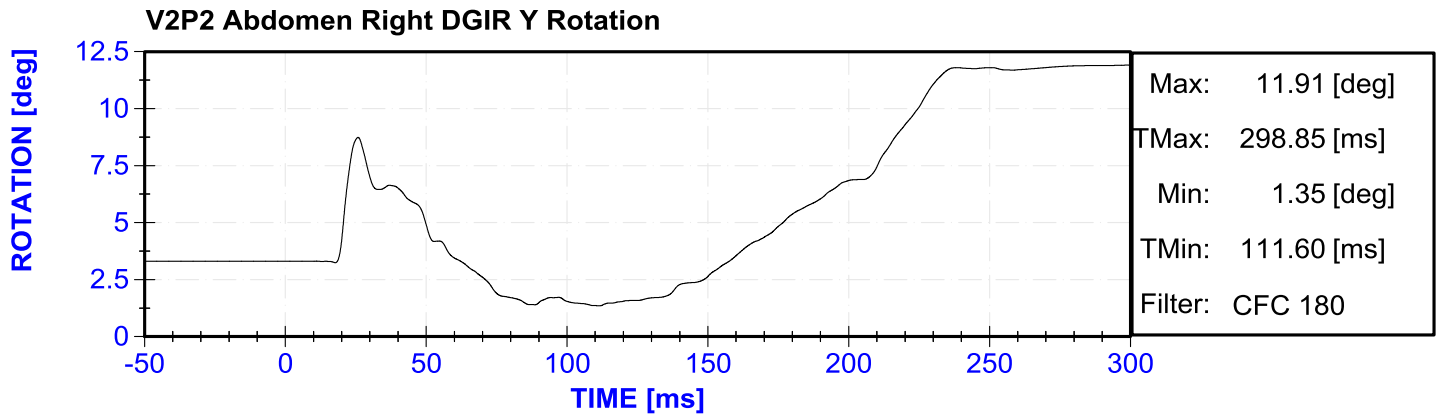
V2P2 Abdomen Left DGIR Z Rotation

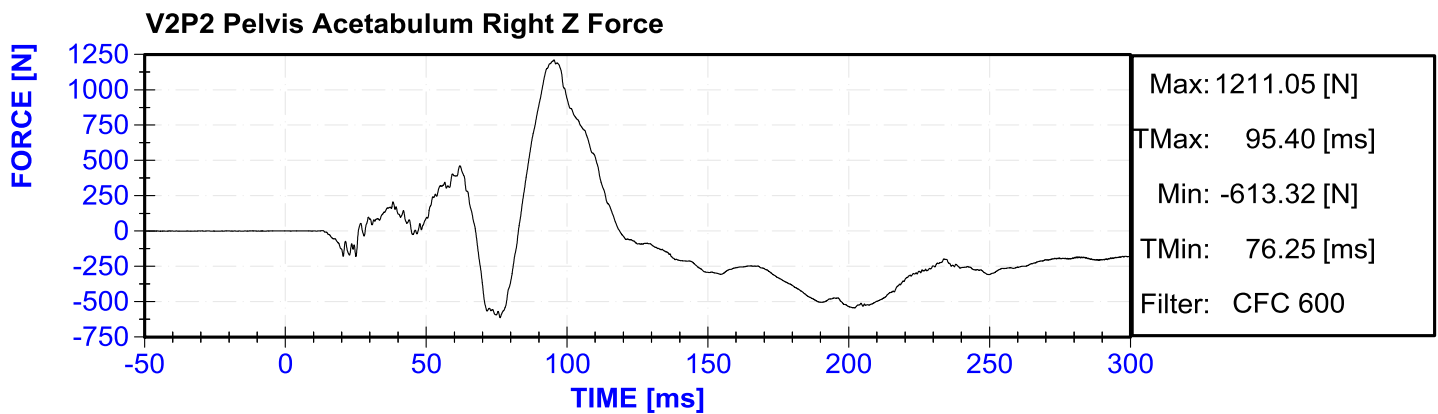
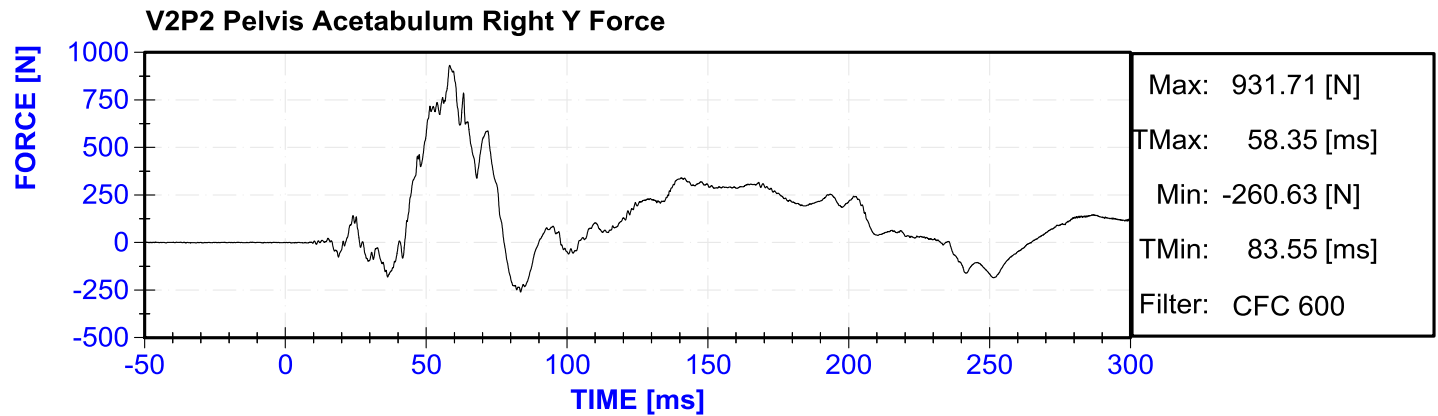
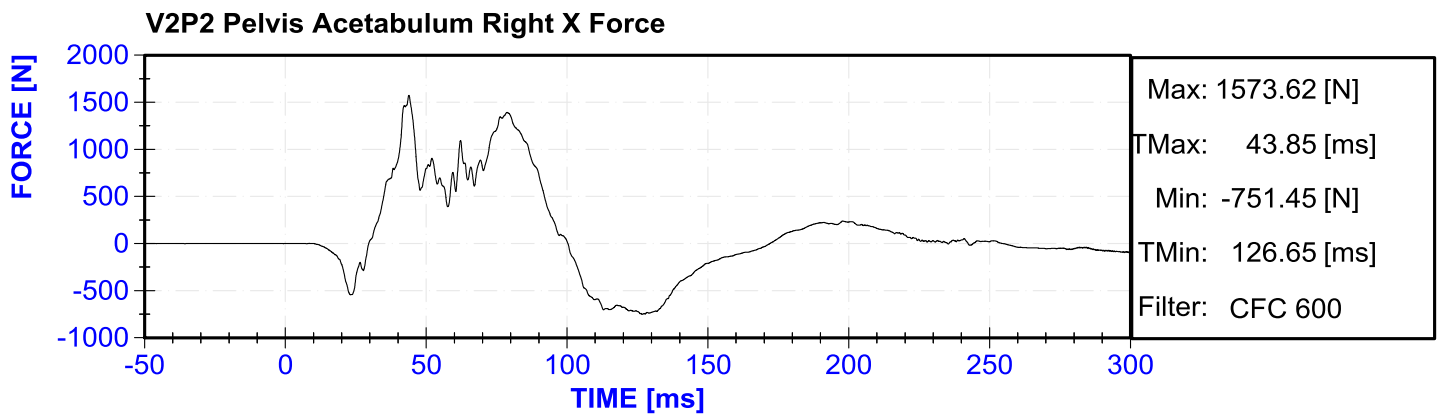
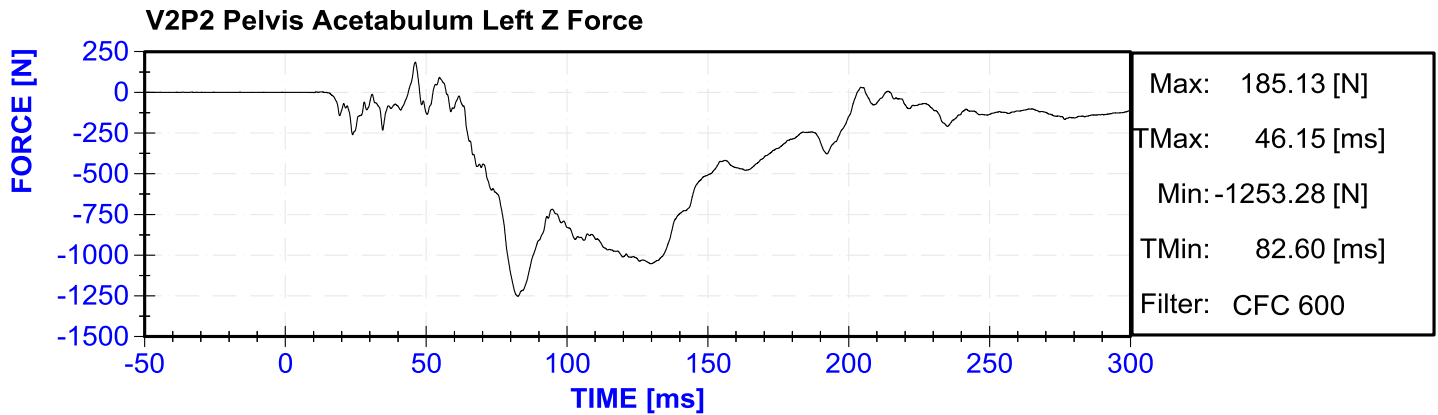


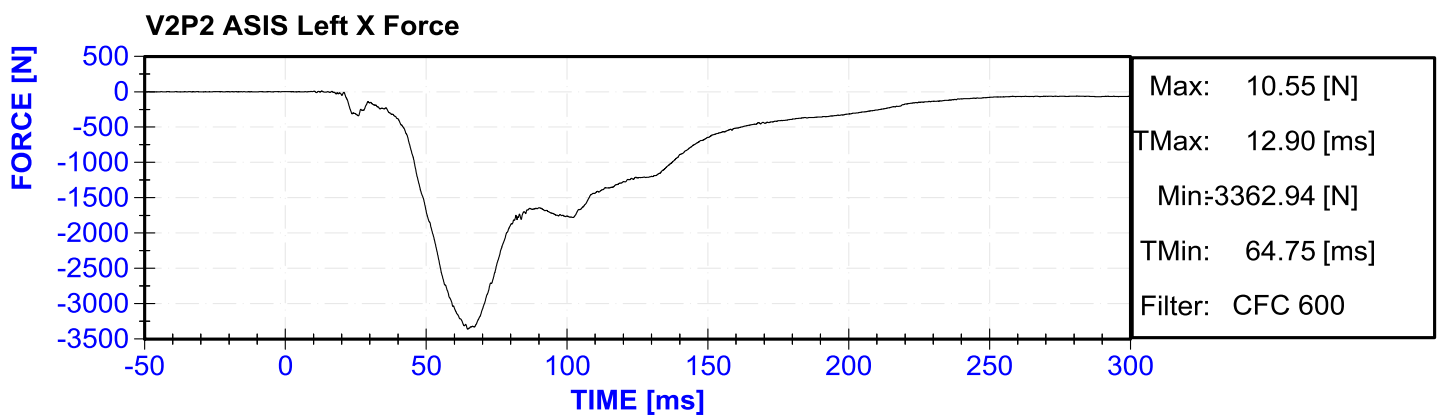
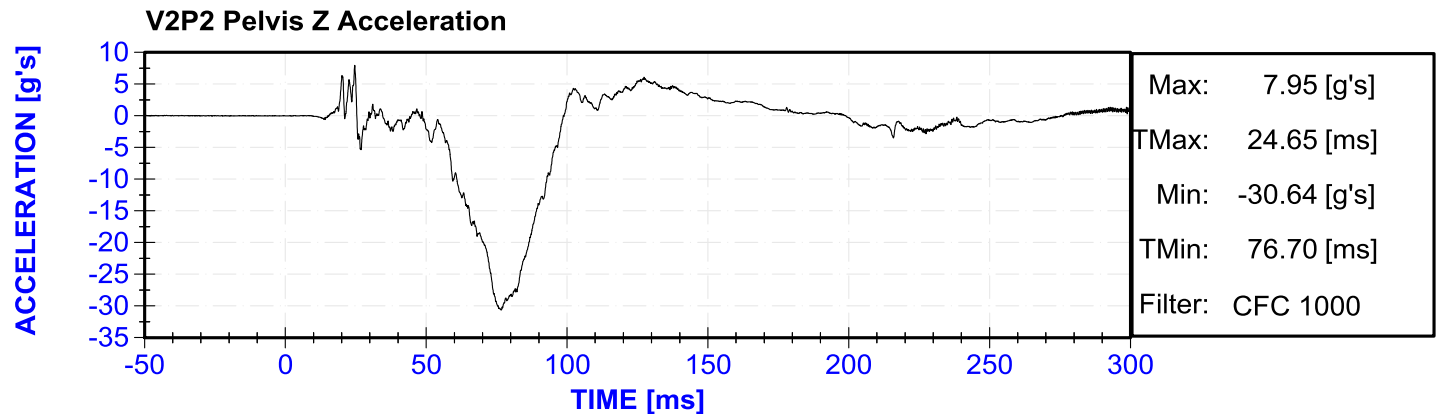
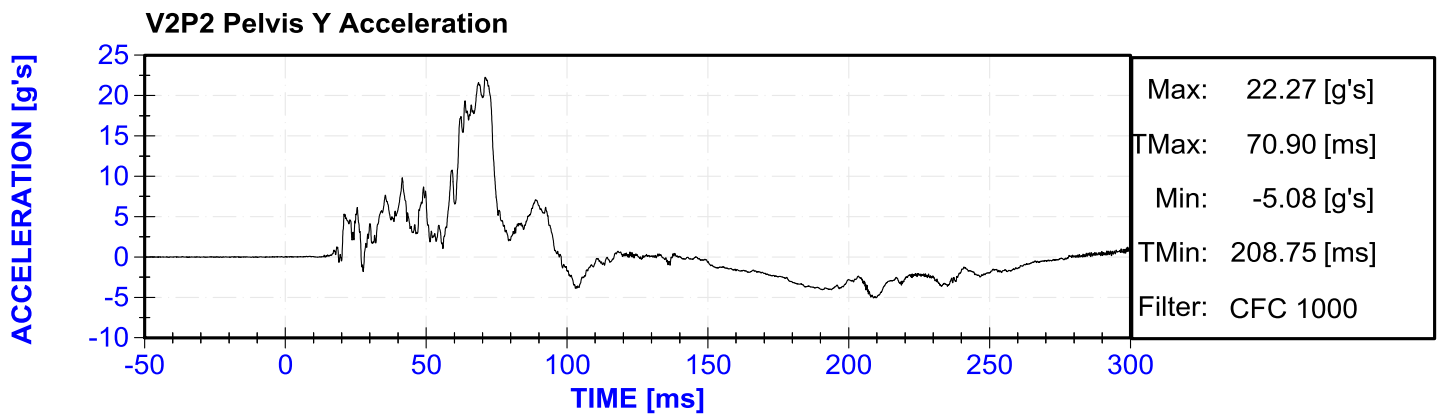
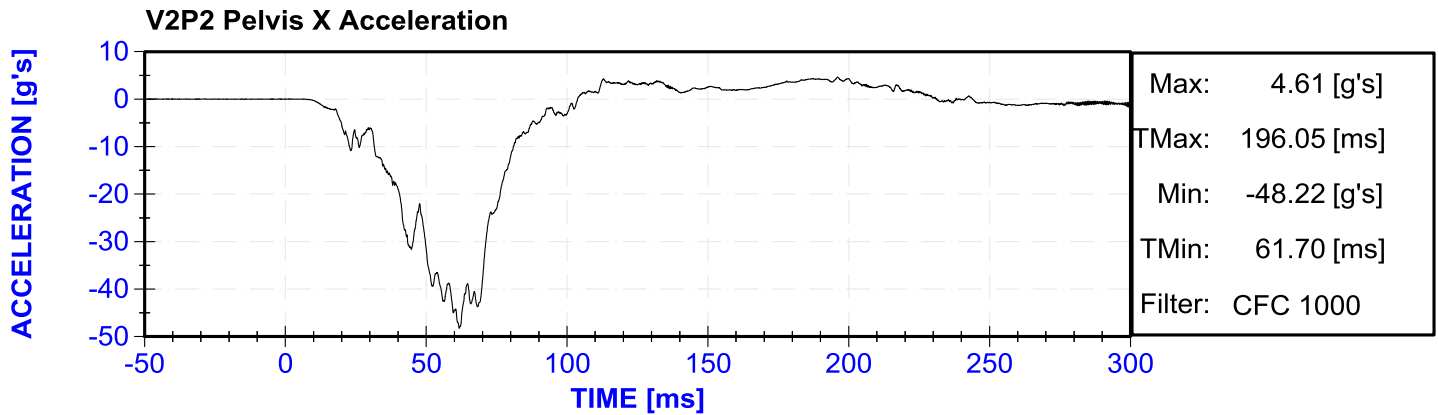
V2P2 Abdomen Right DGIR X Displacement

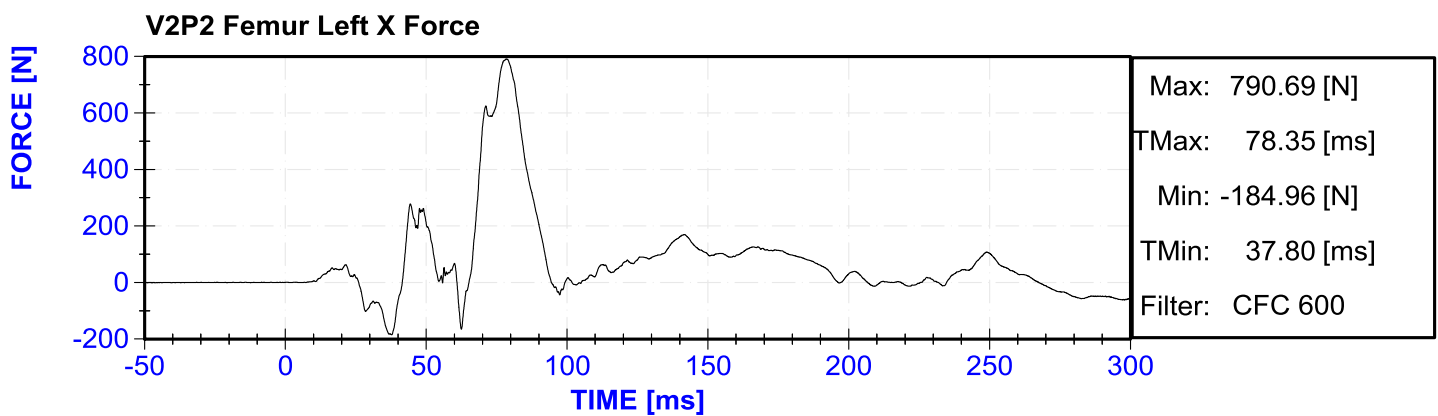
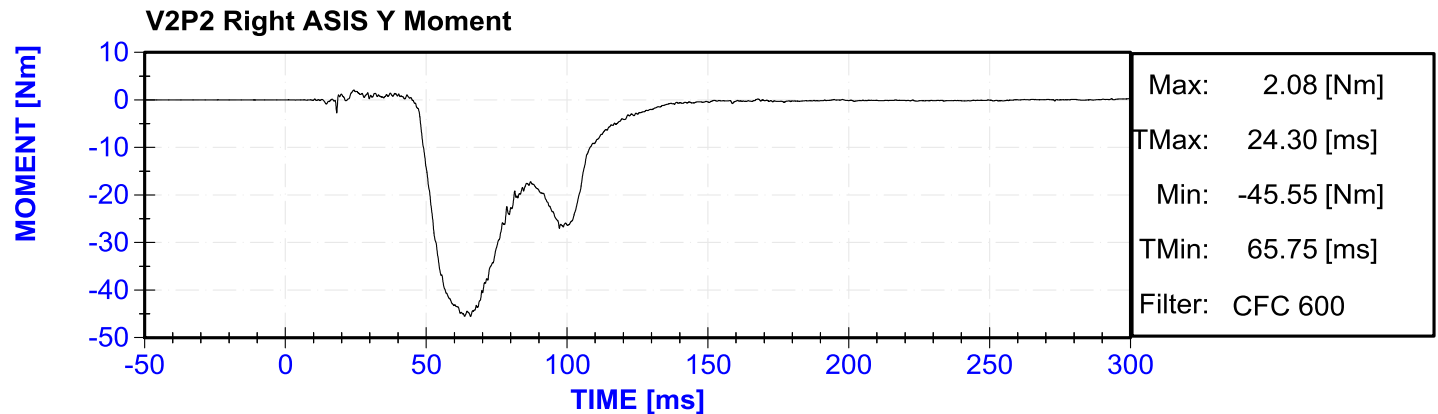
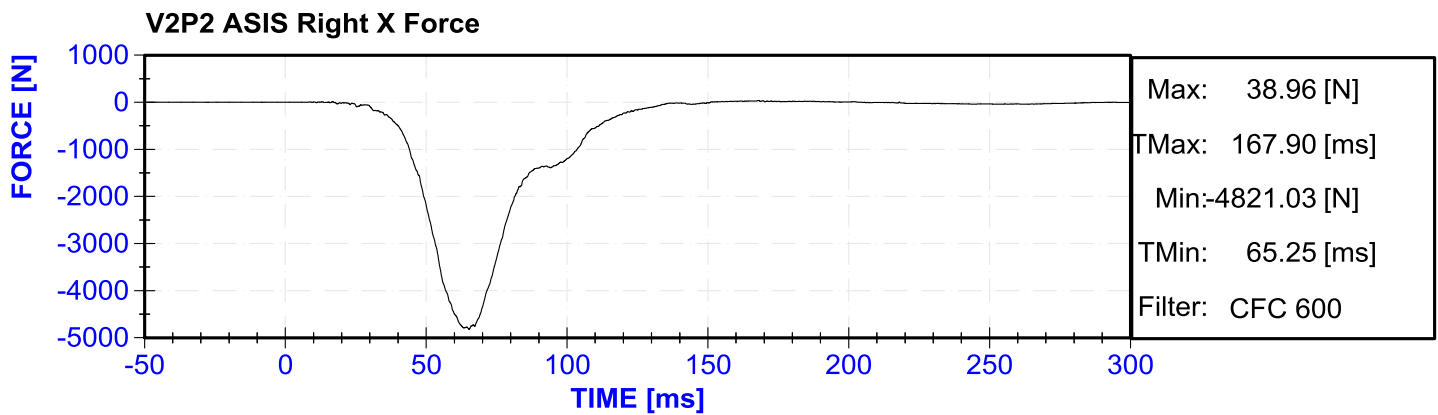
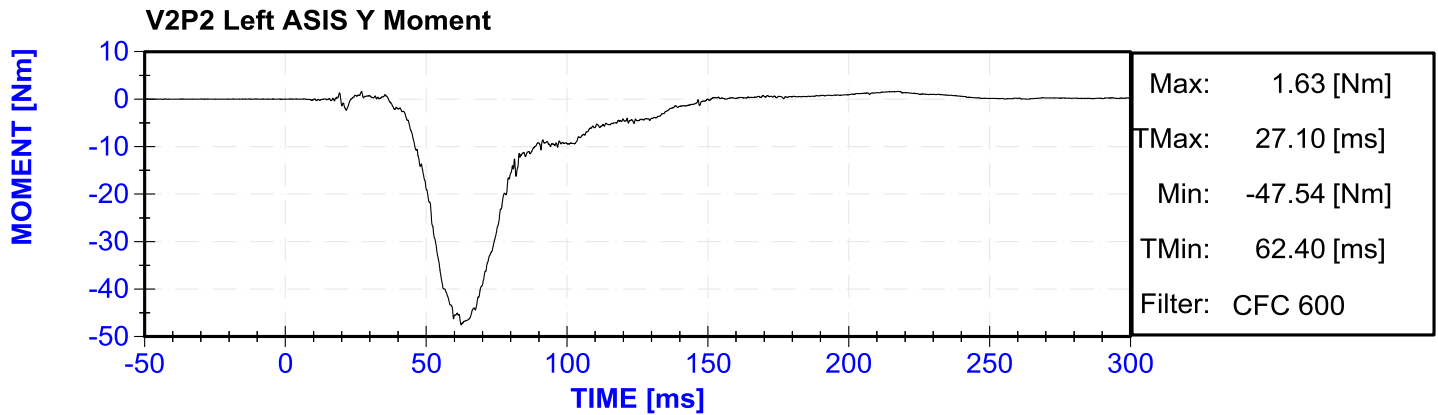
Questionable spikes 80.6ms to 109ms

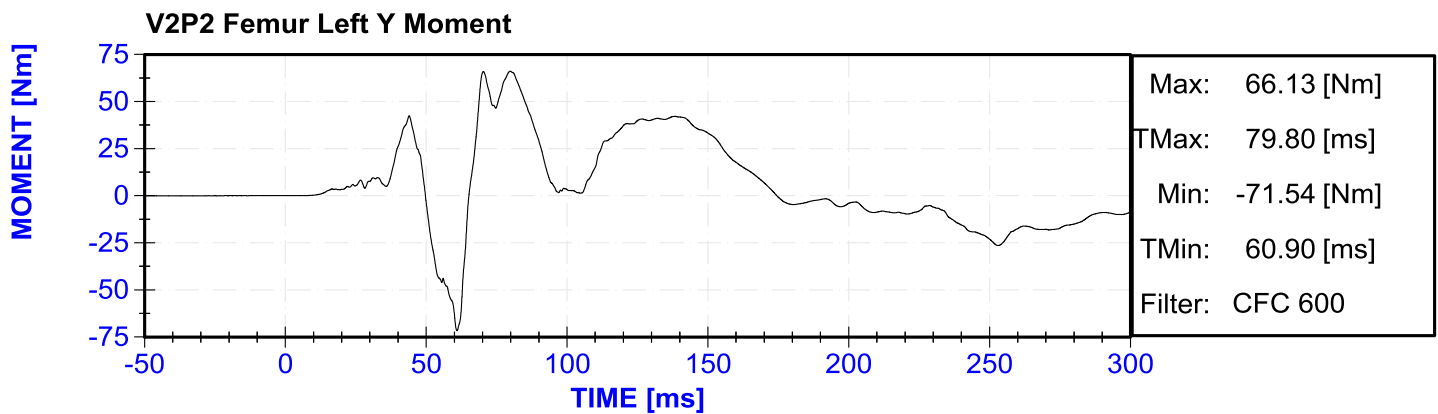
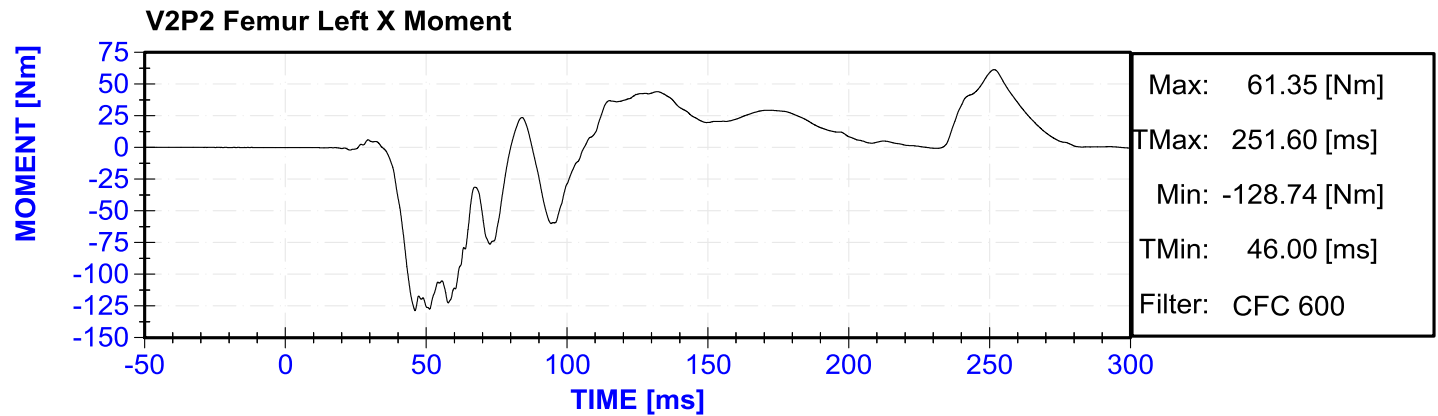
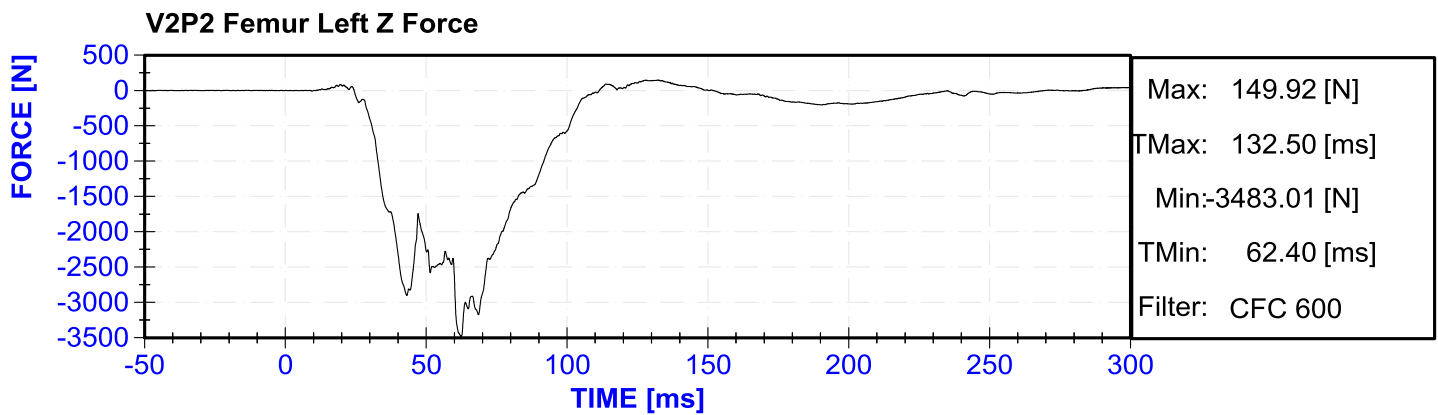
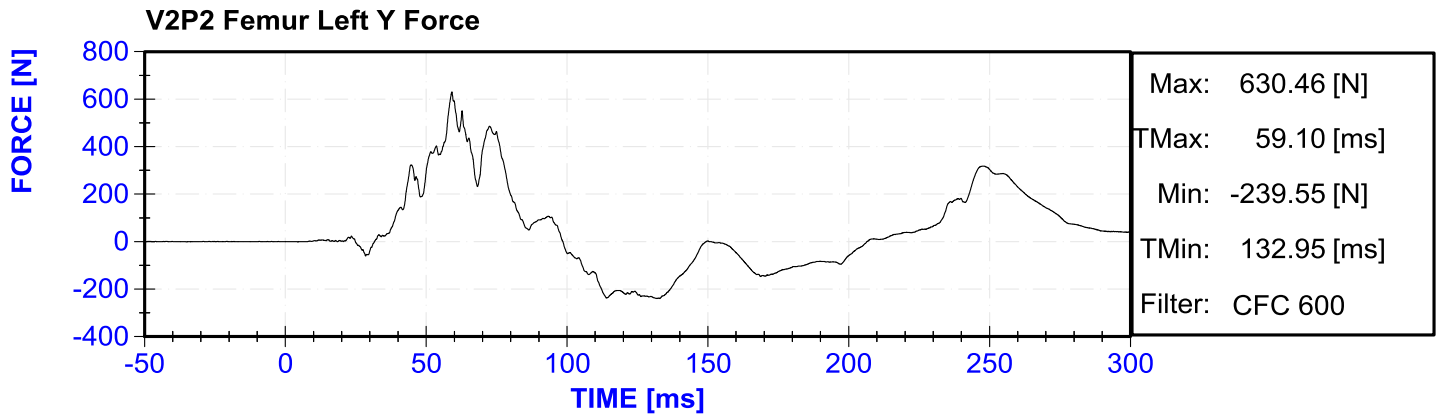


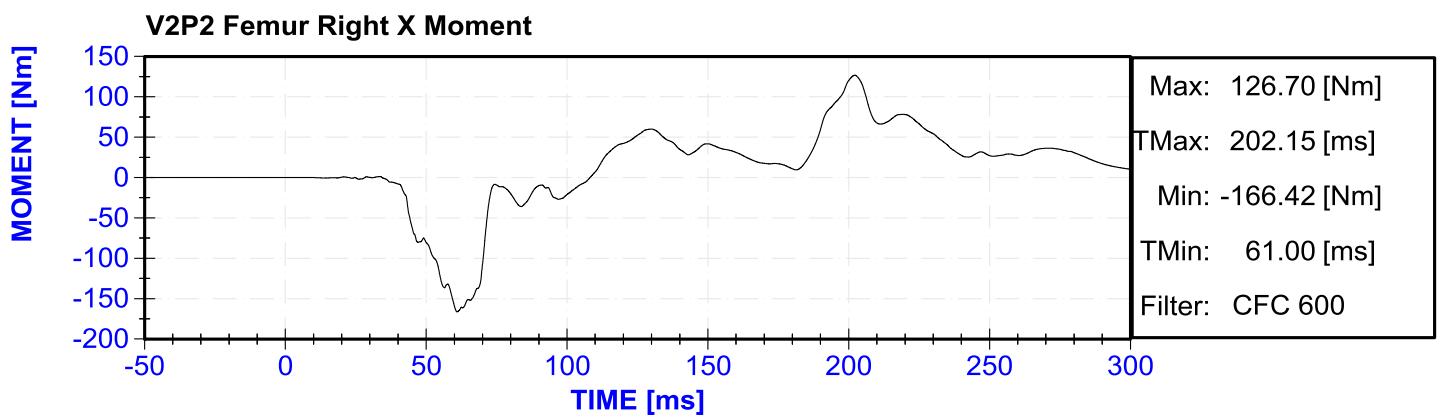
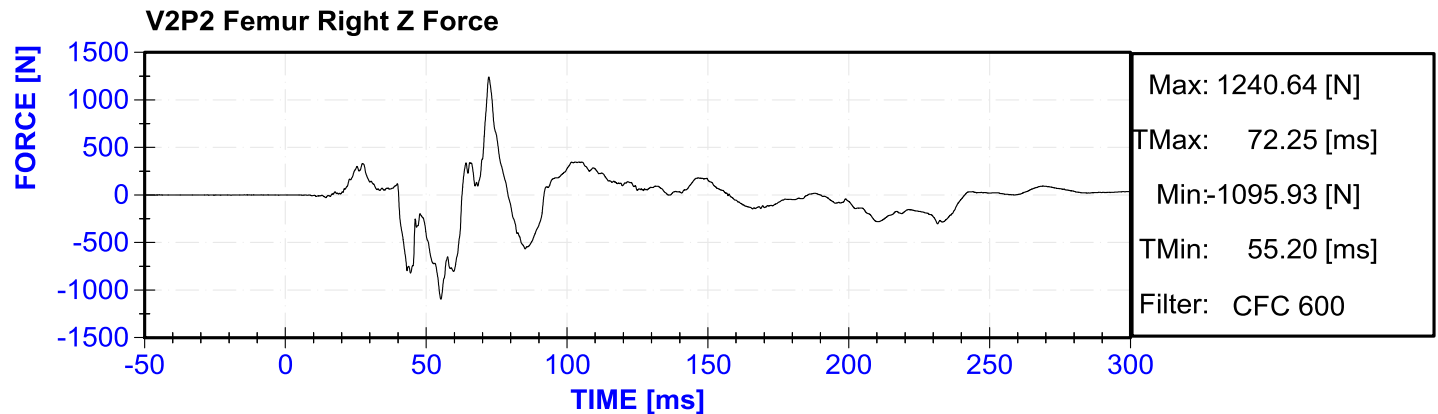
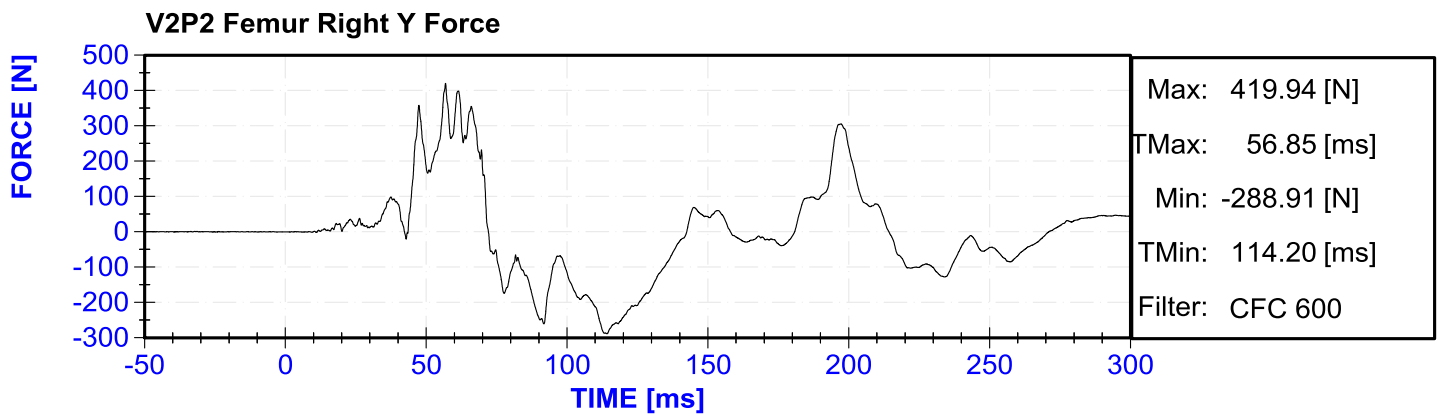
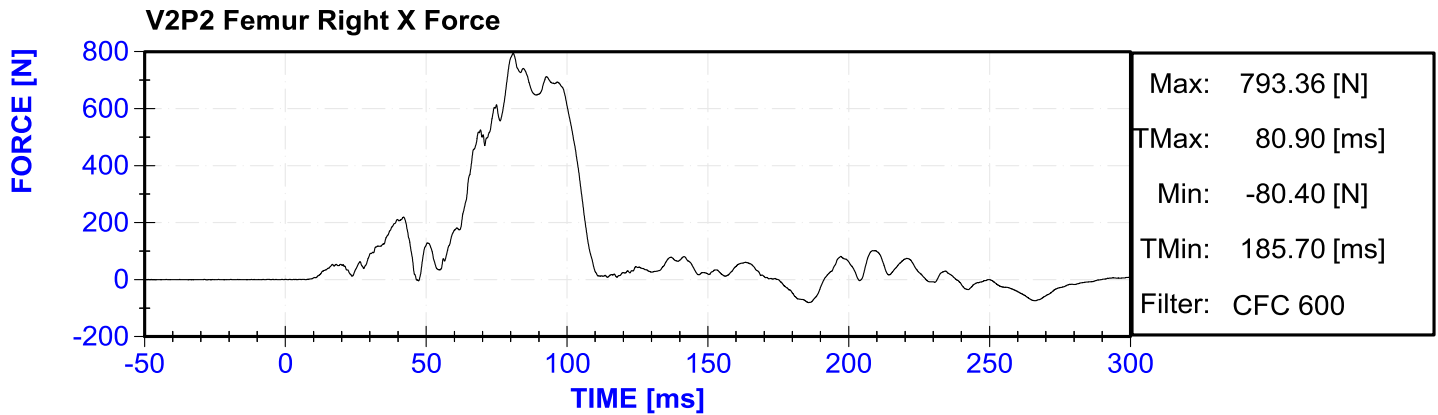


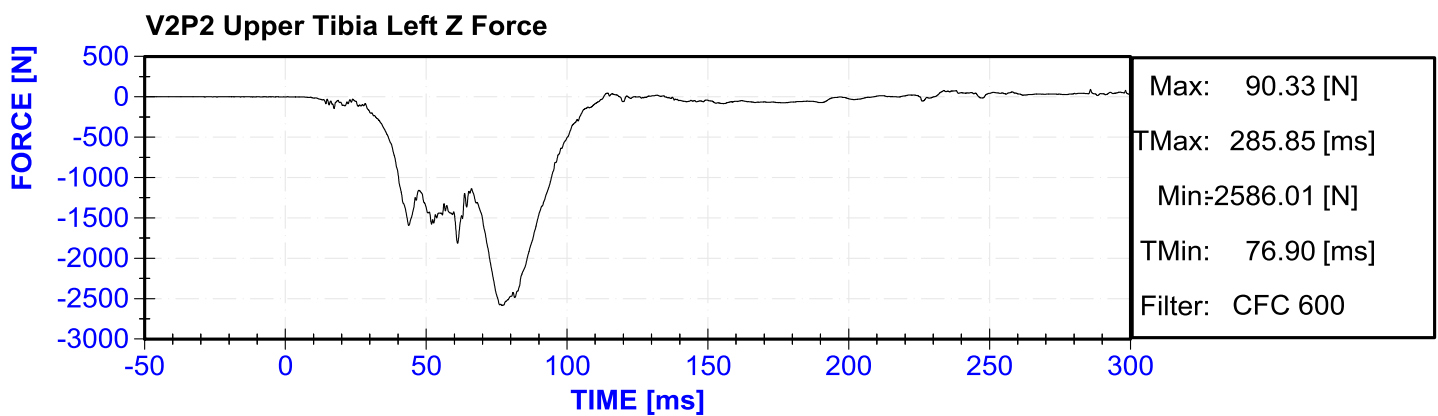
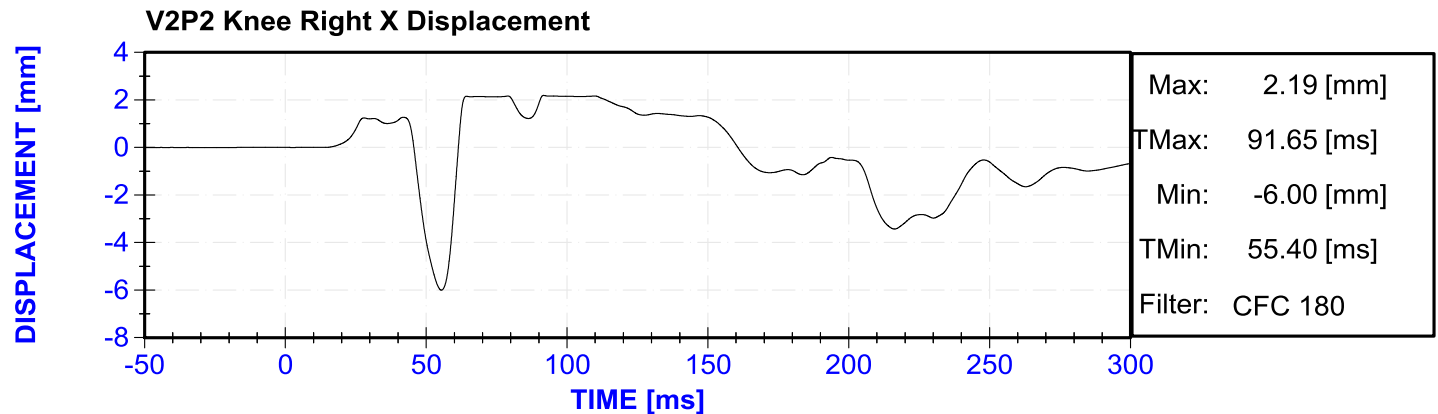
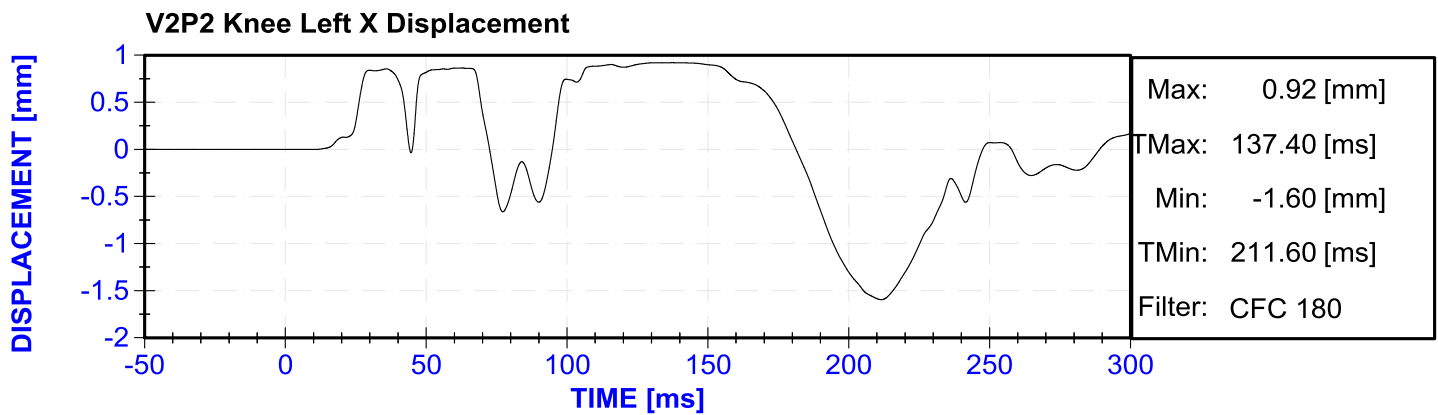
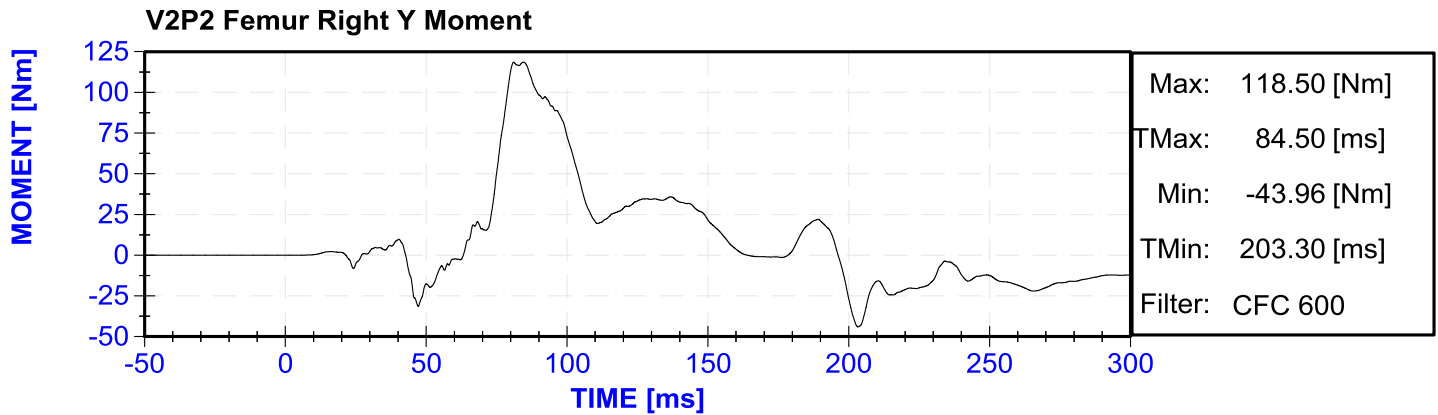


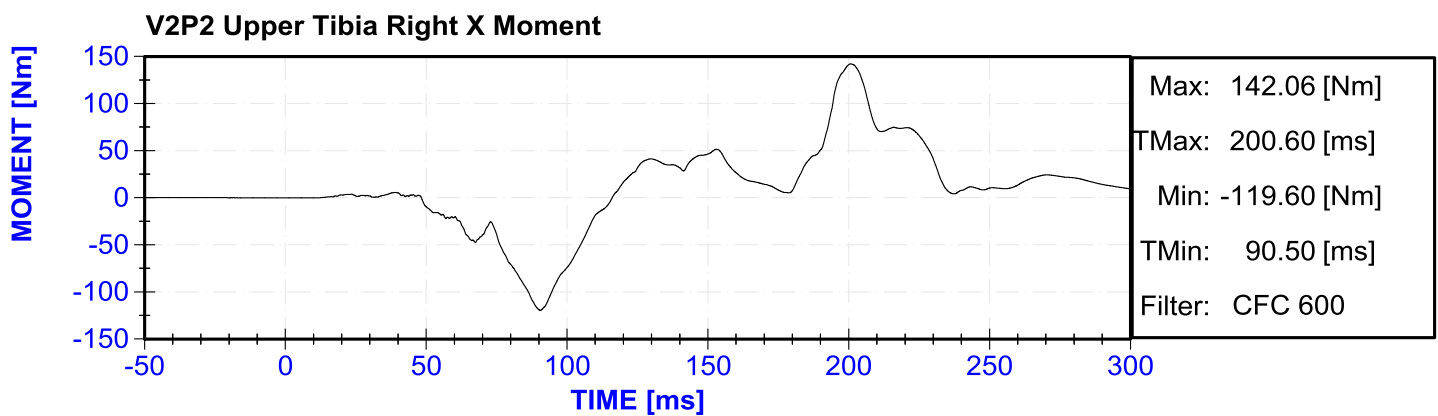
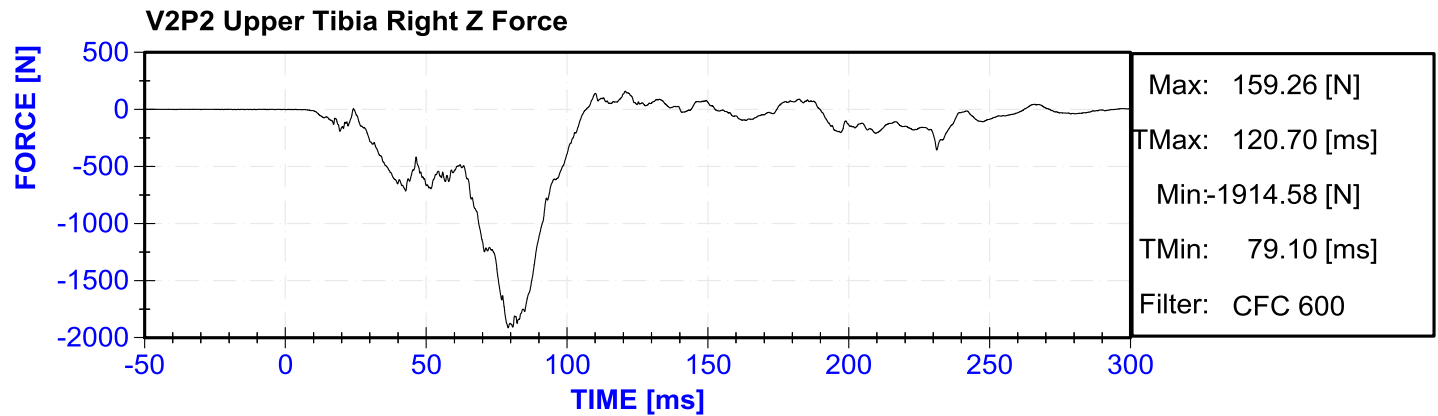
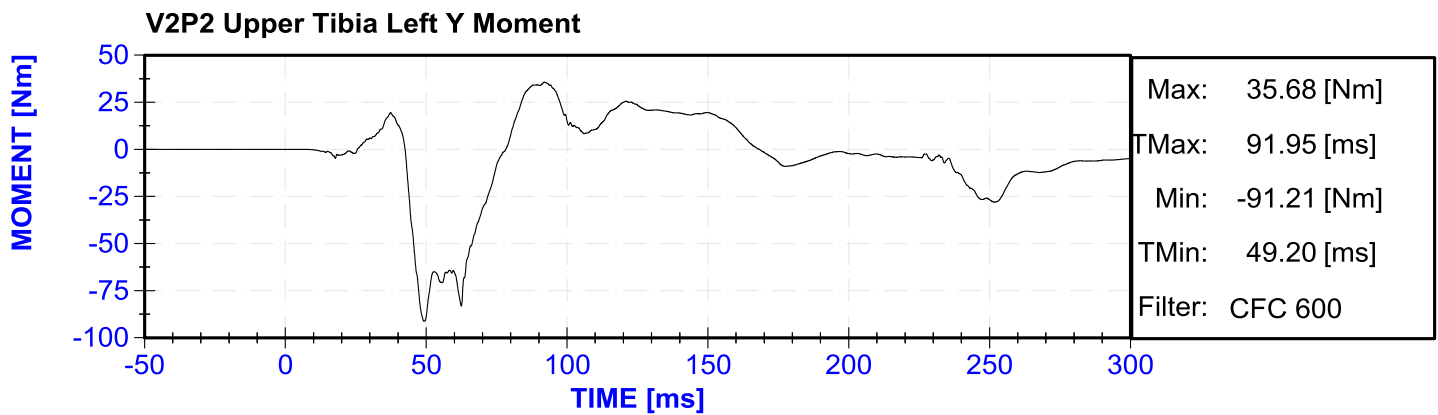
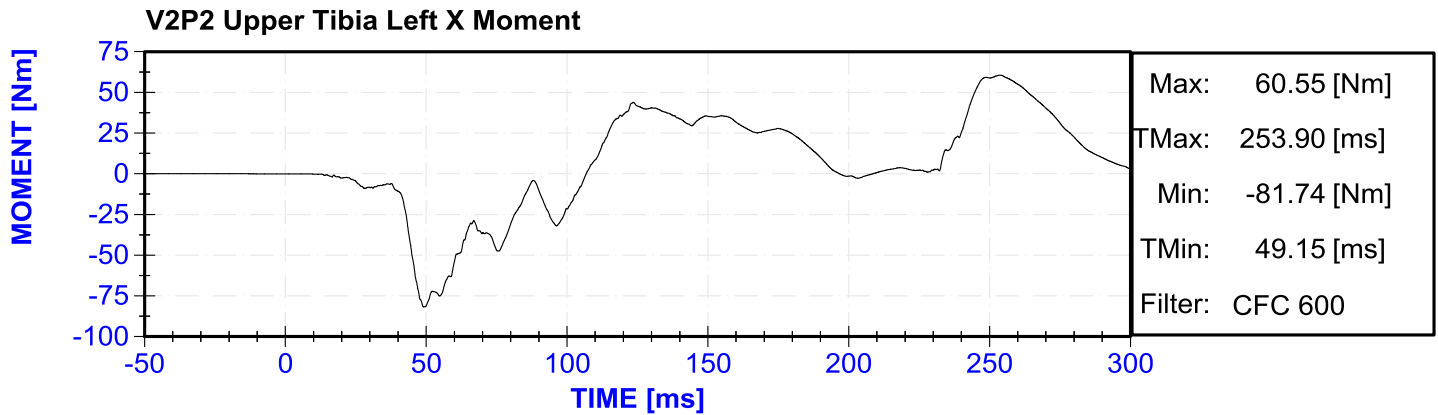


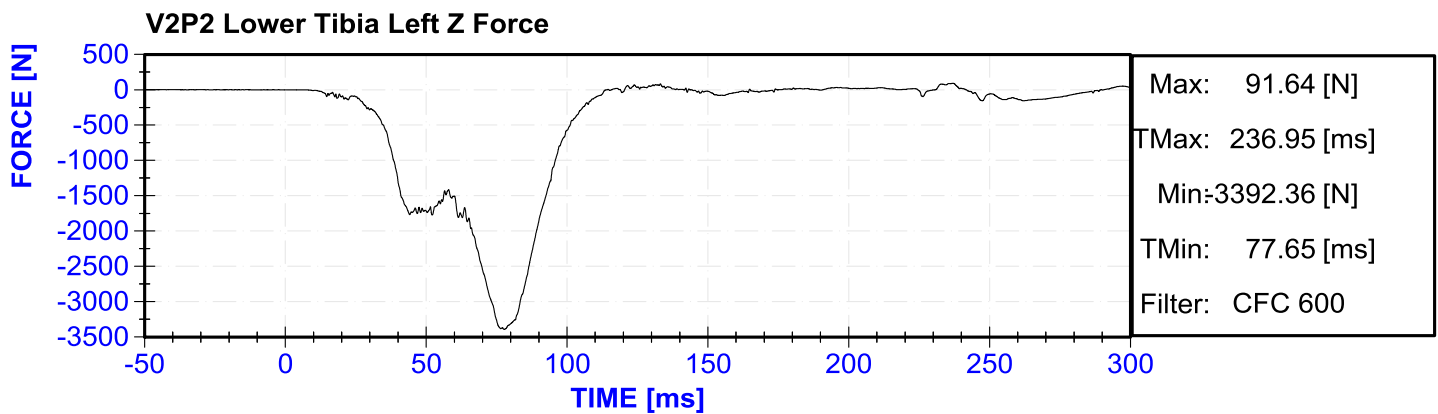
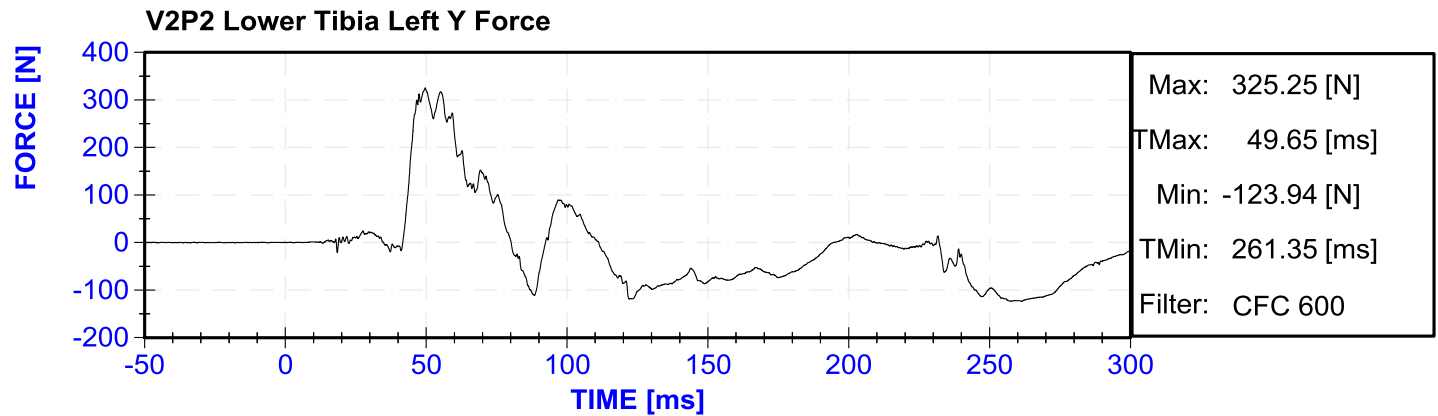
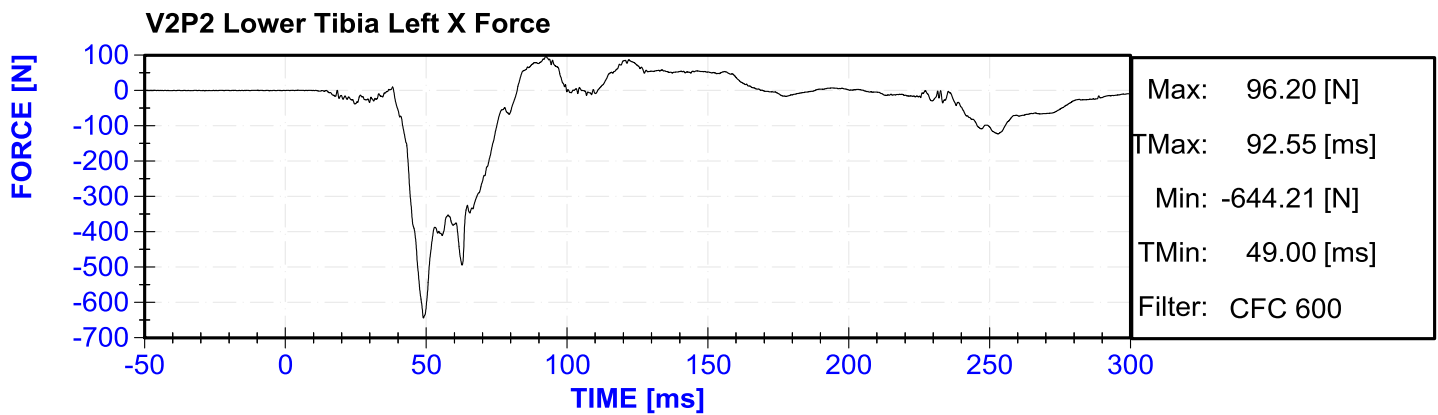
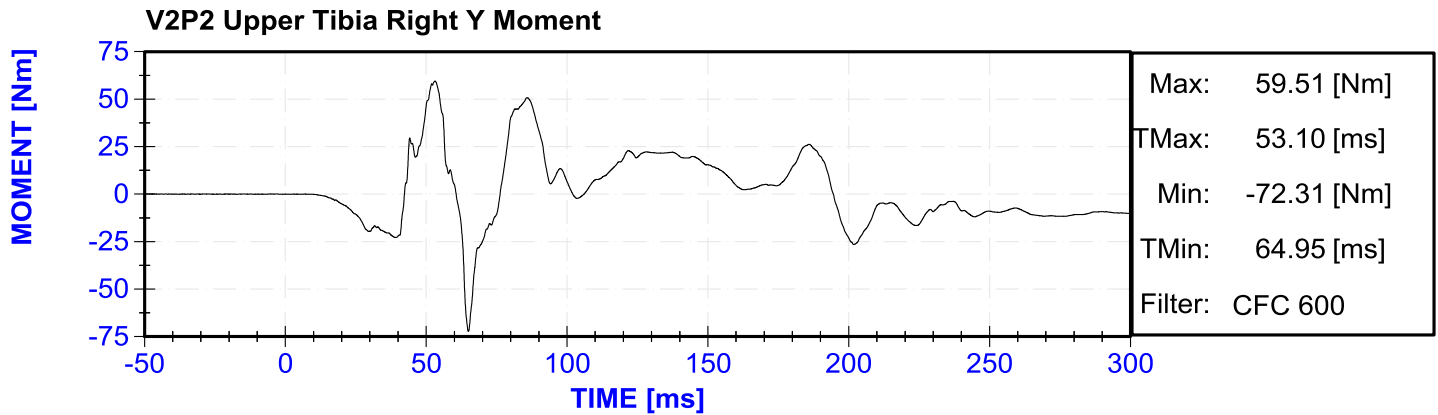


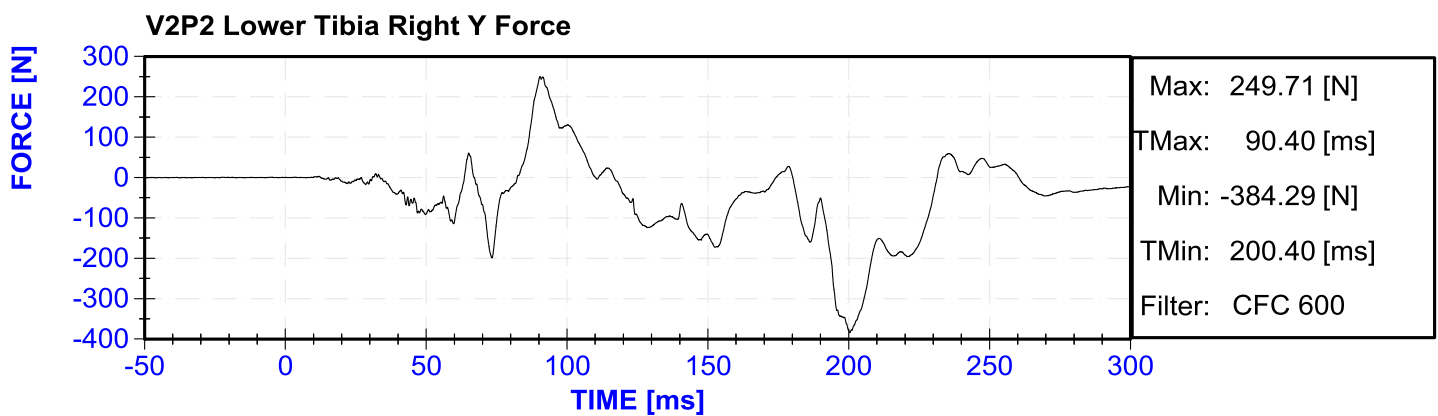
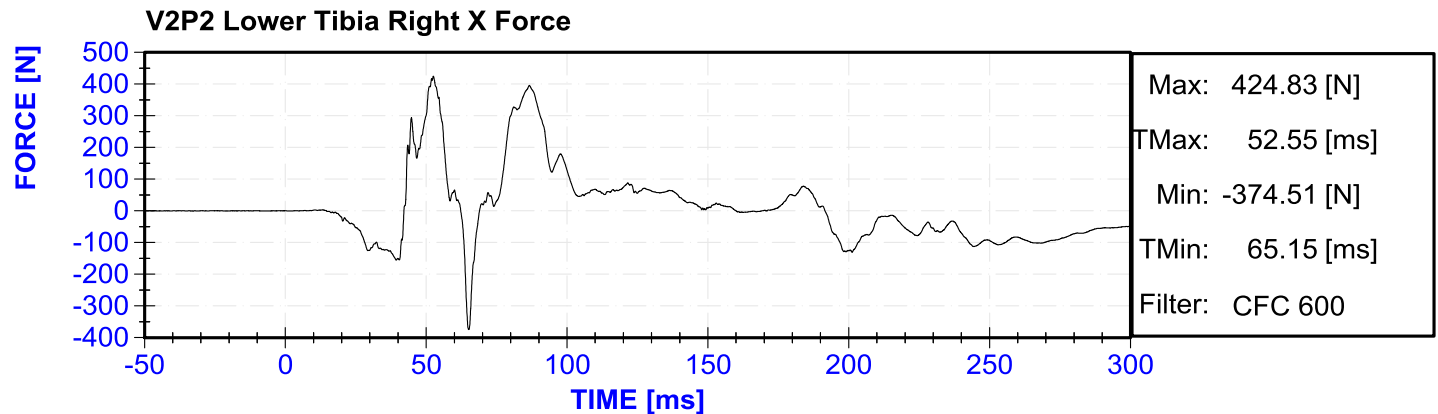
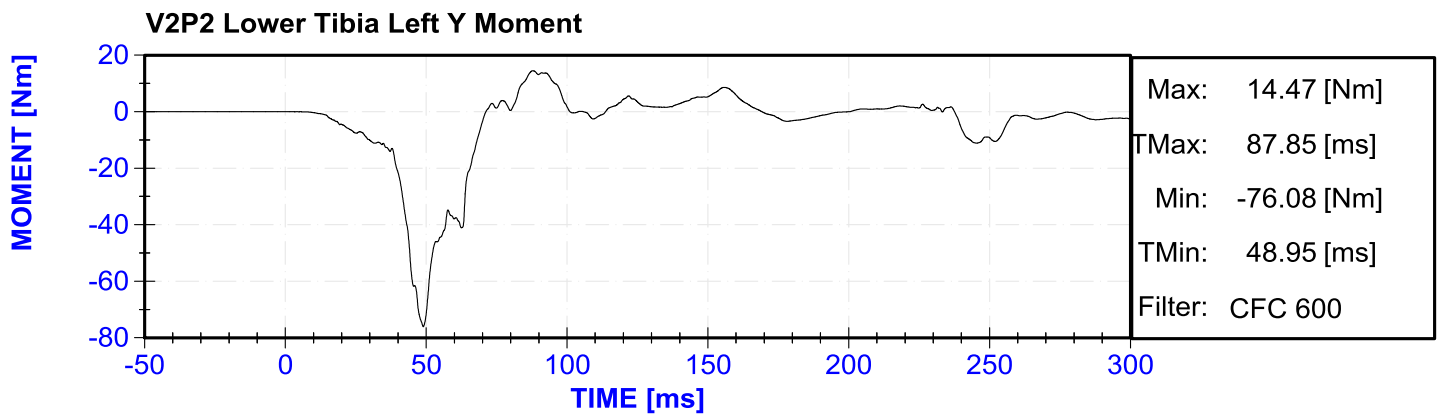
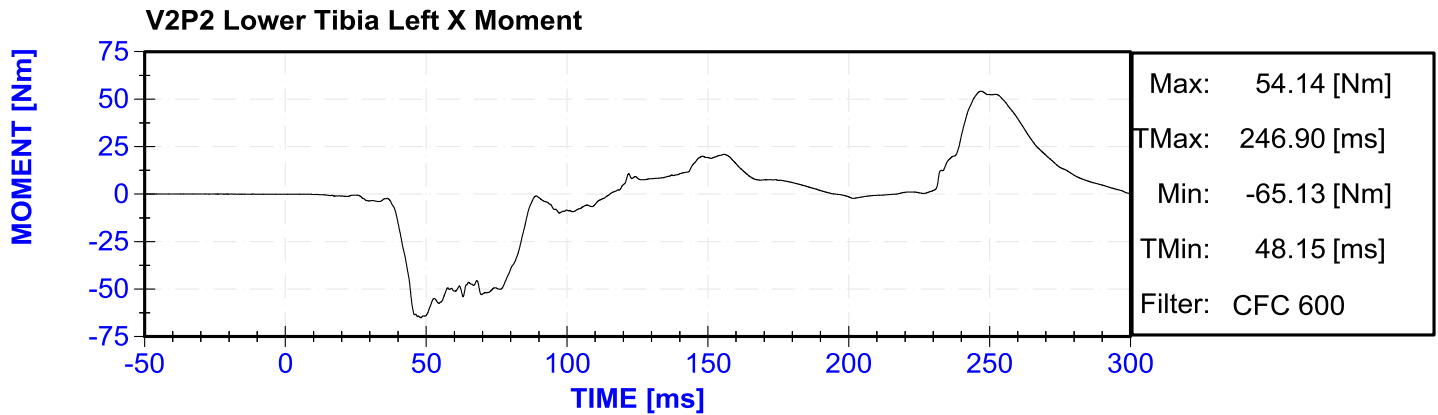


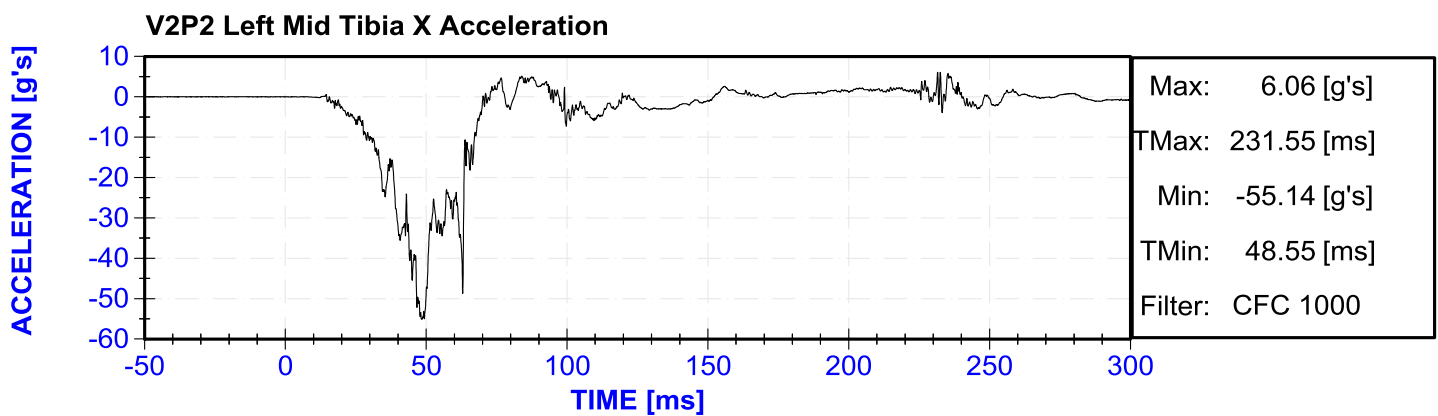
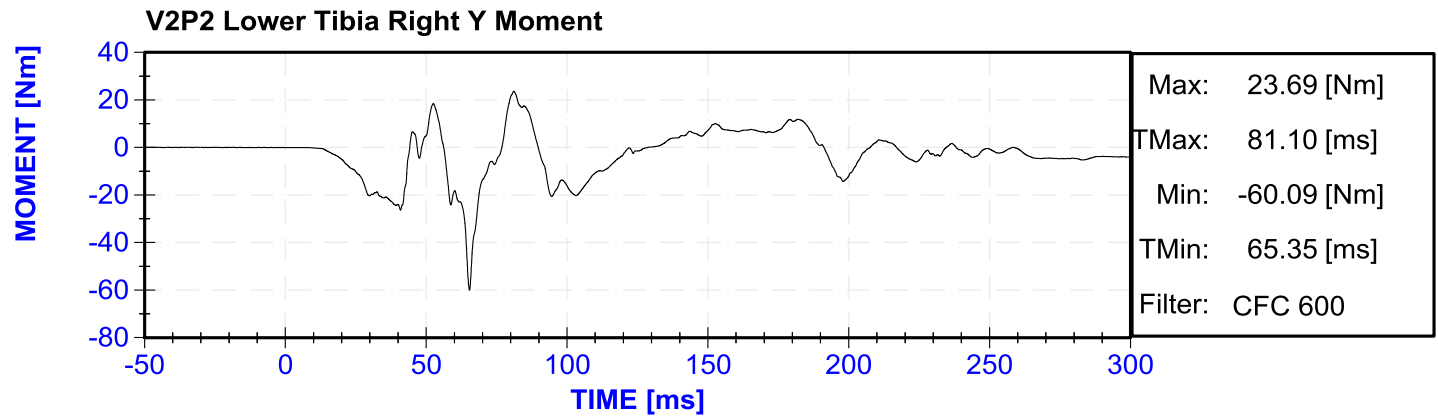
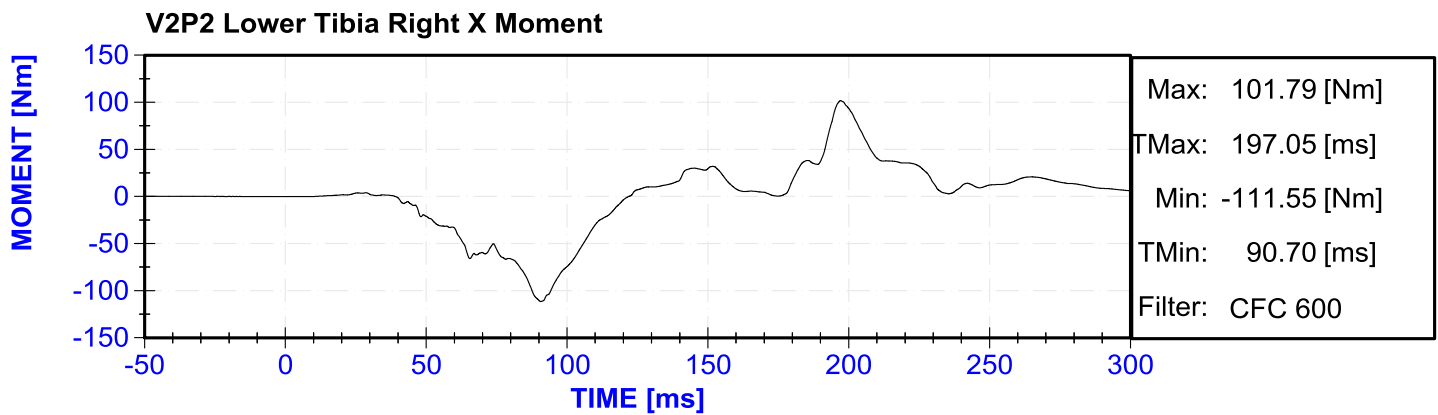
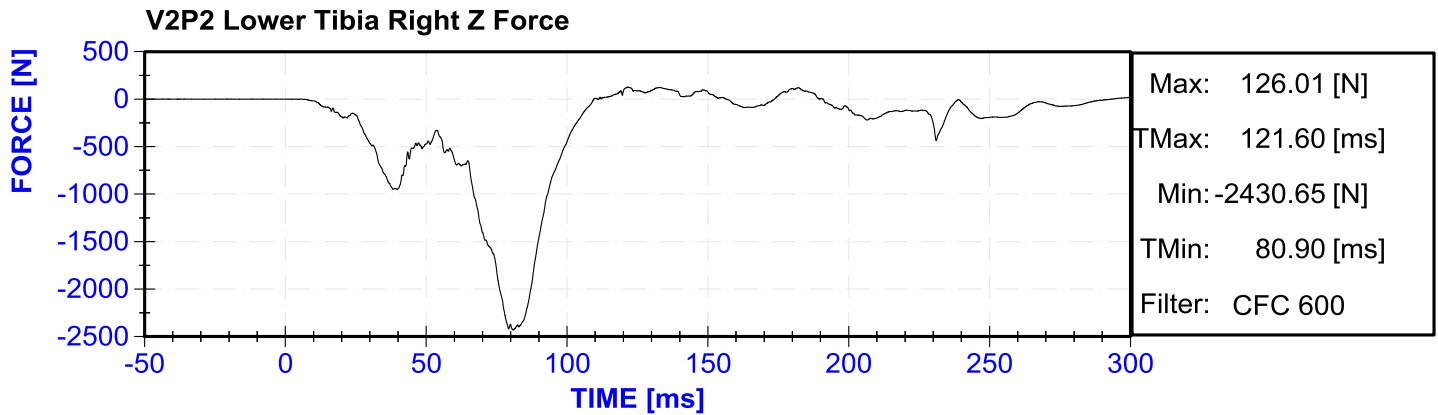


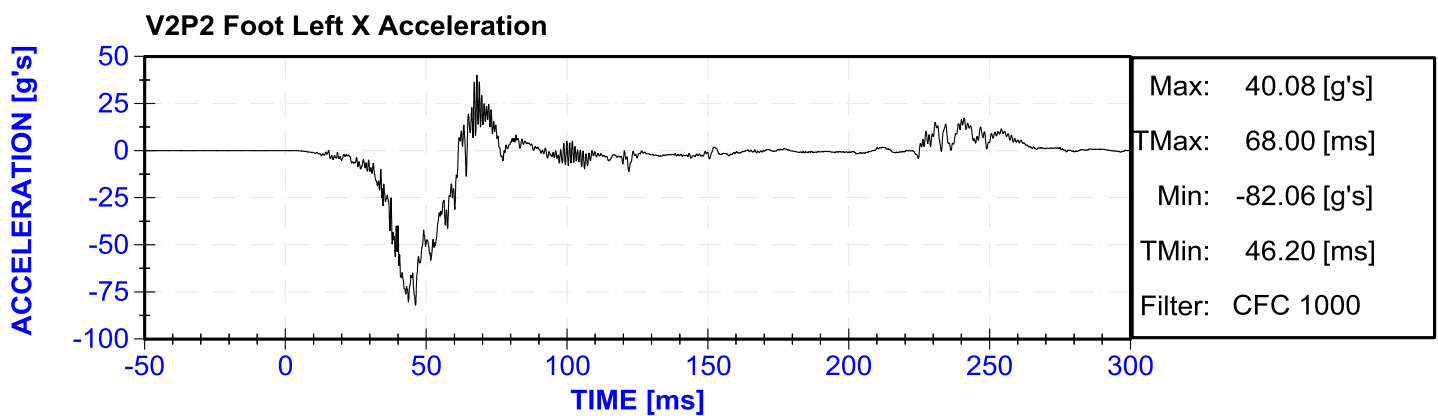
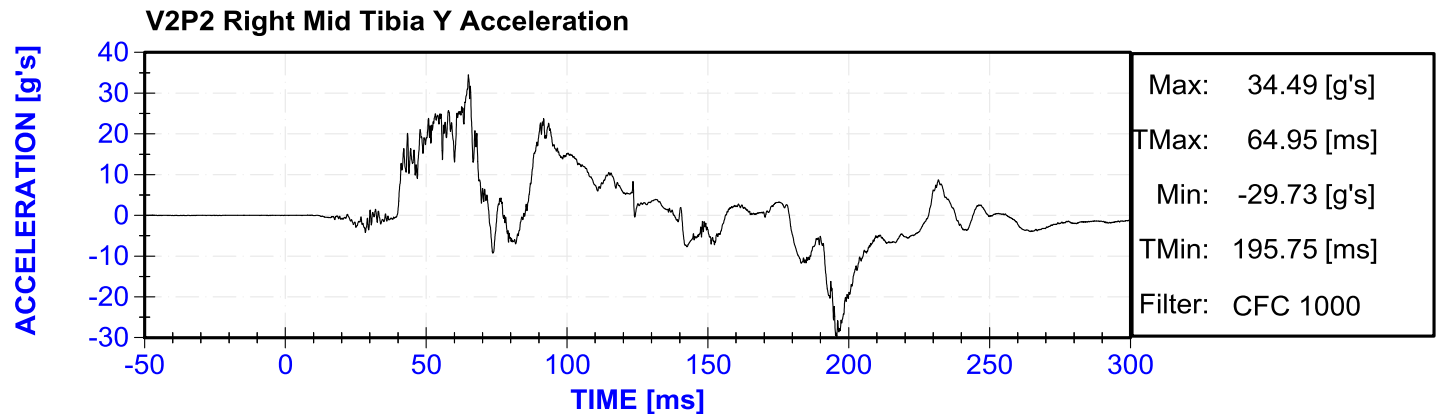
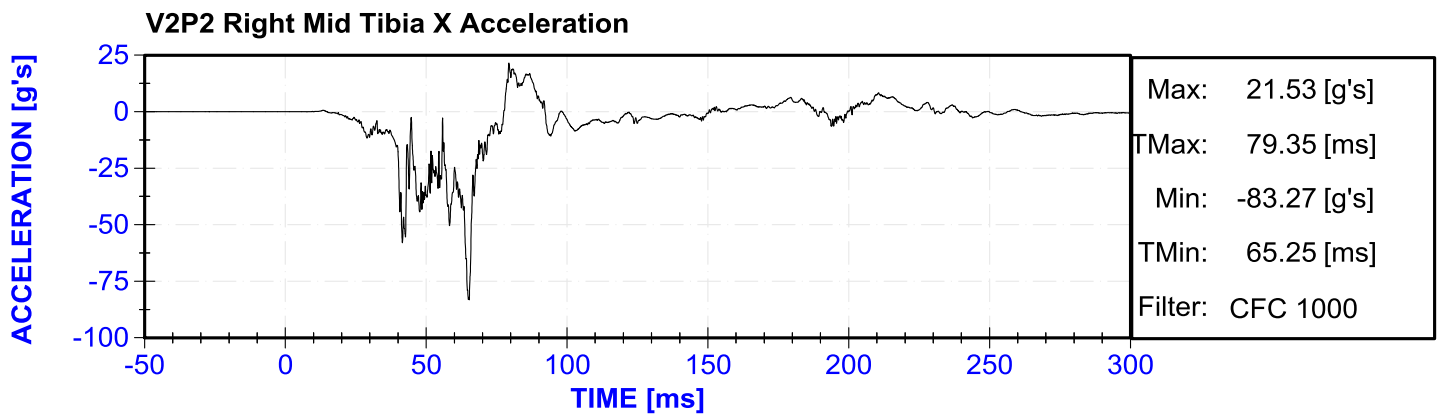
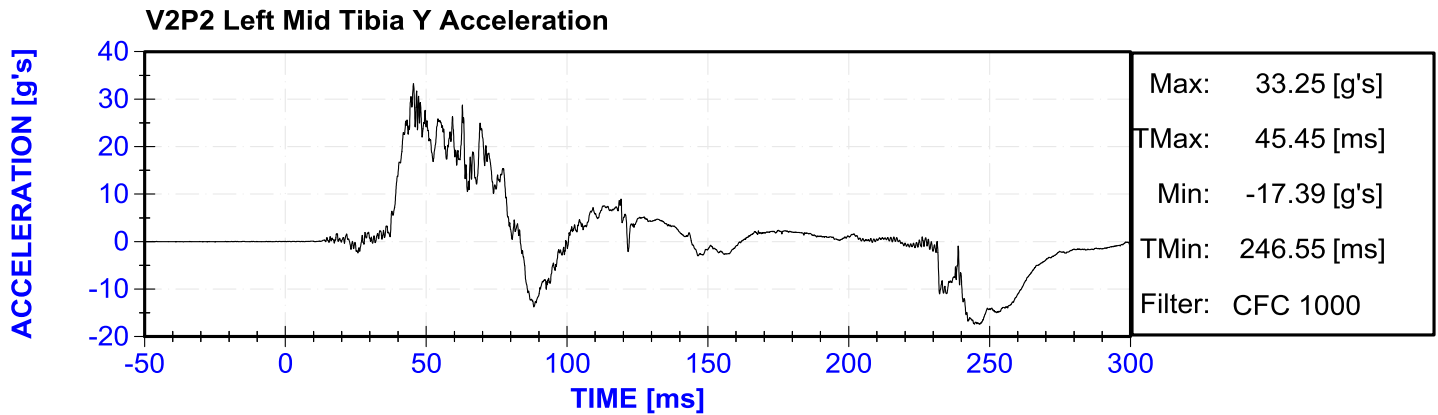


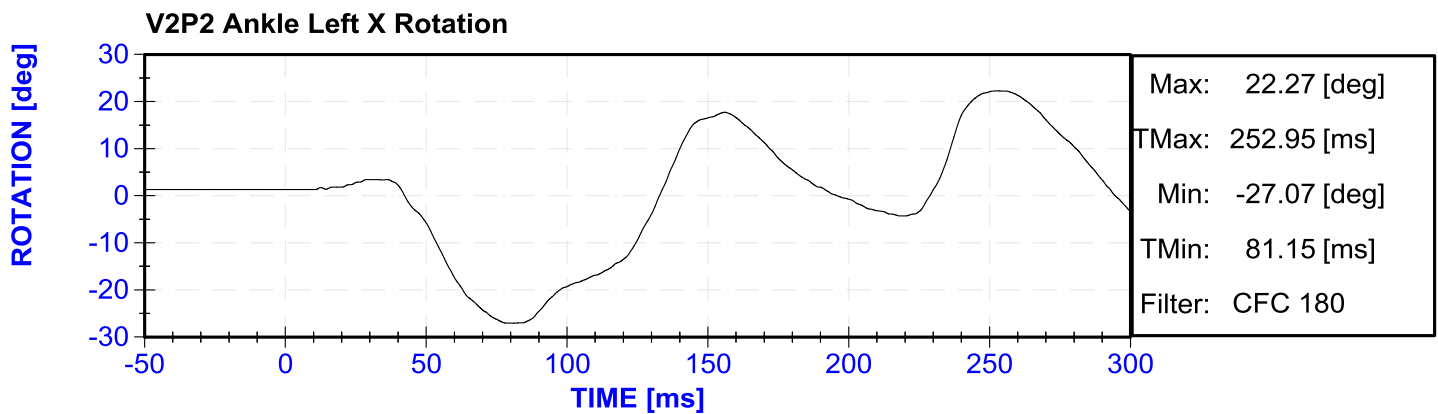
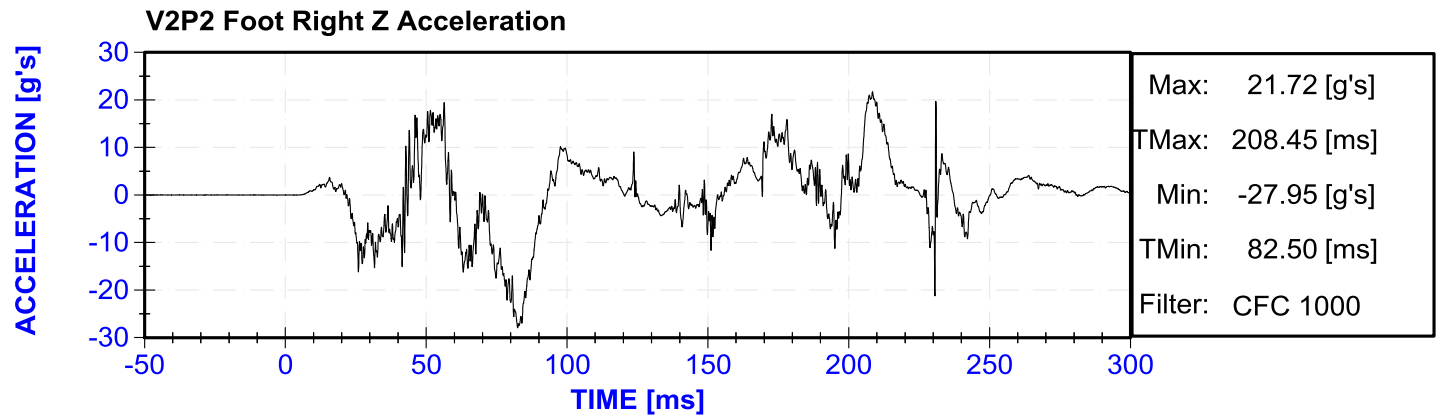
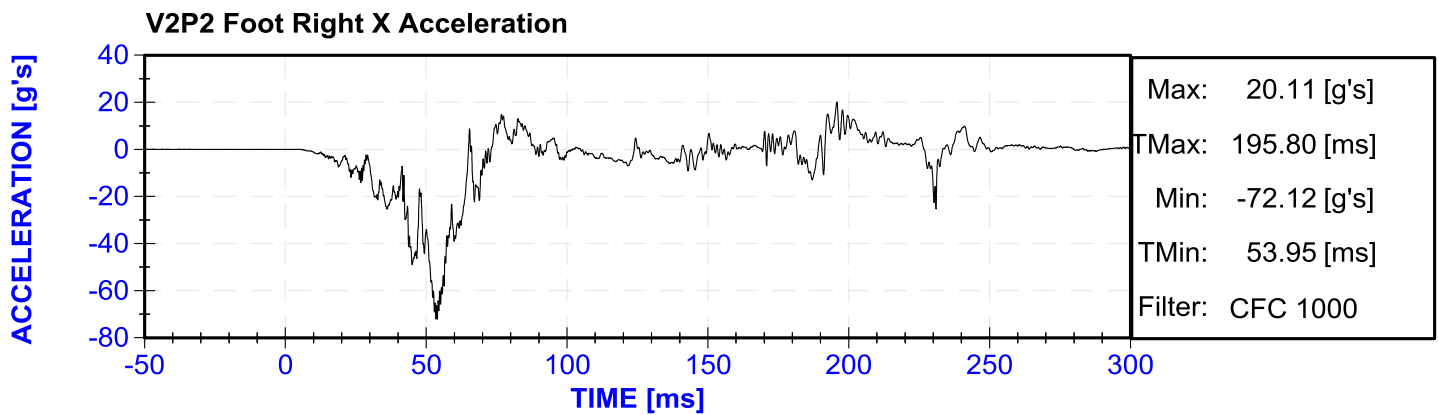
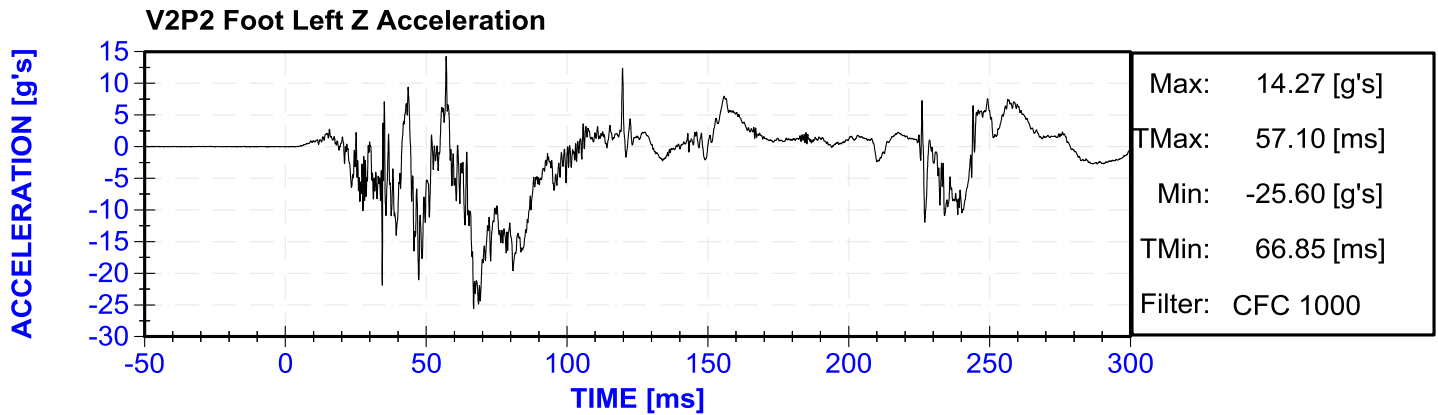


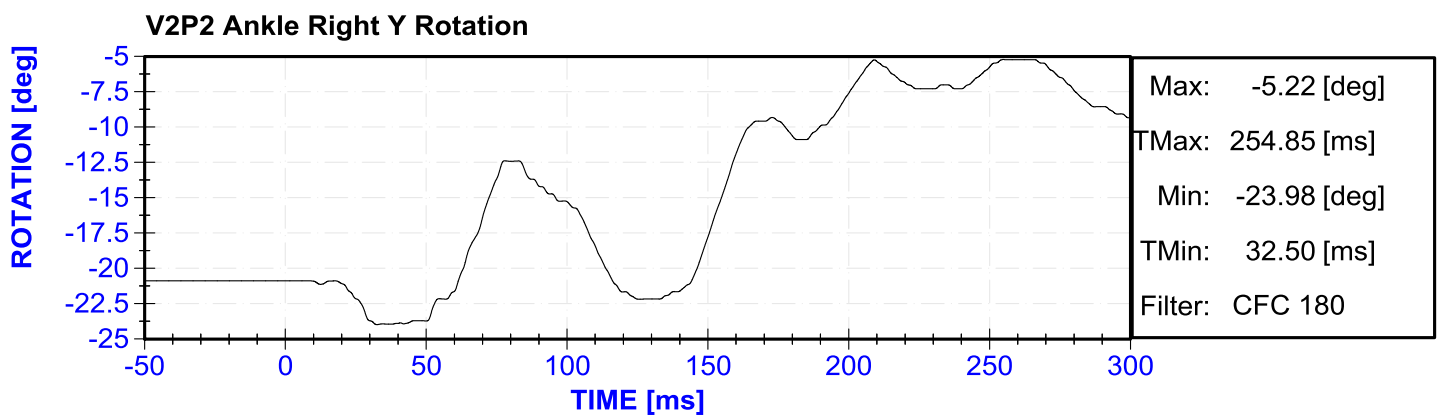
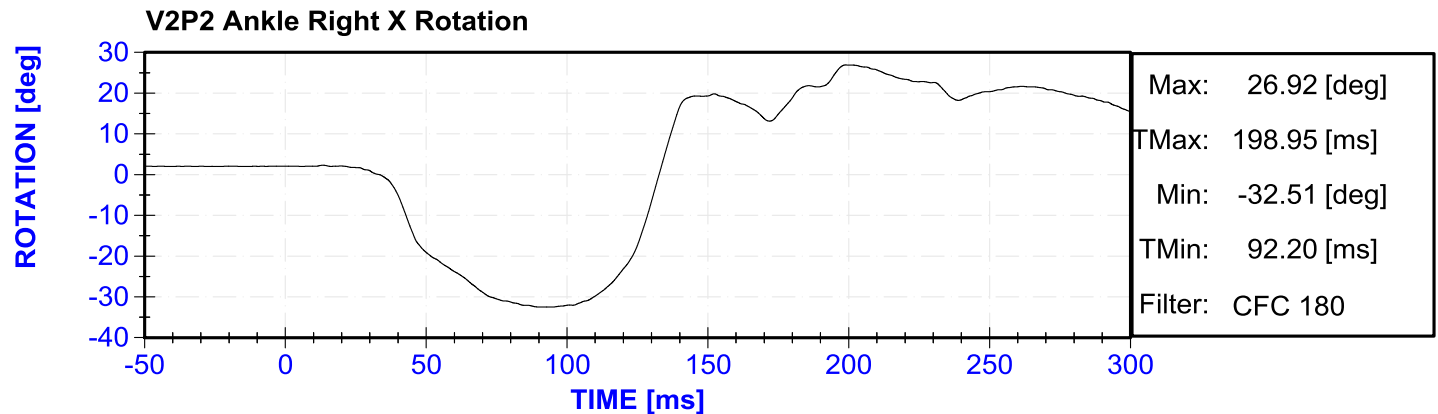
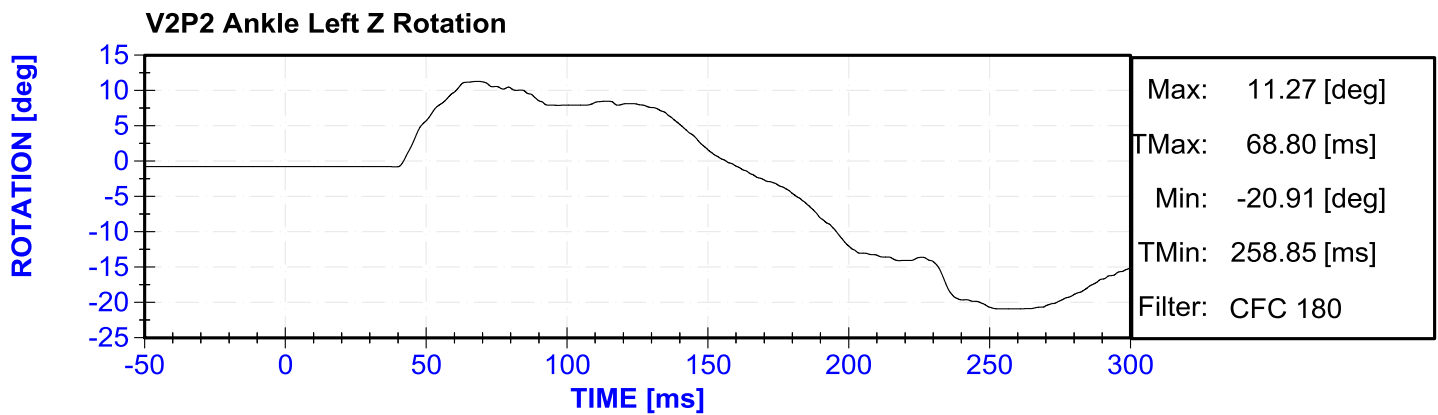
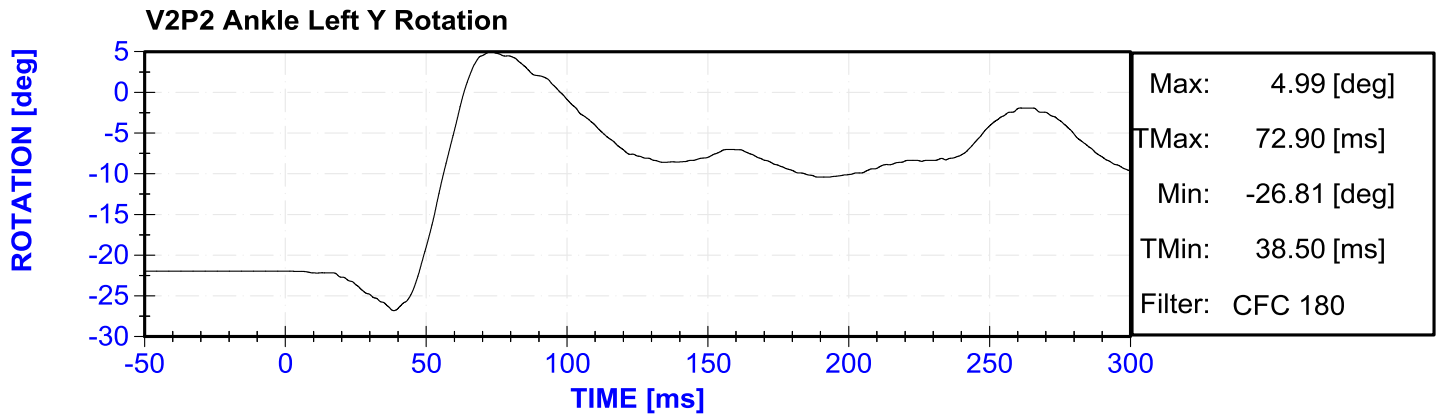


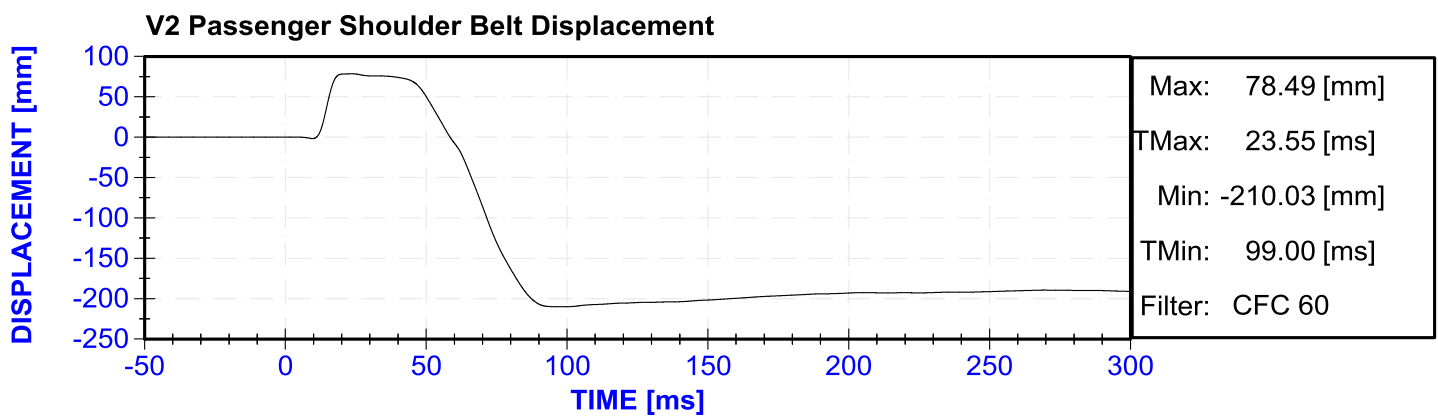
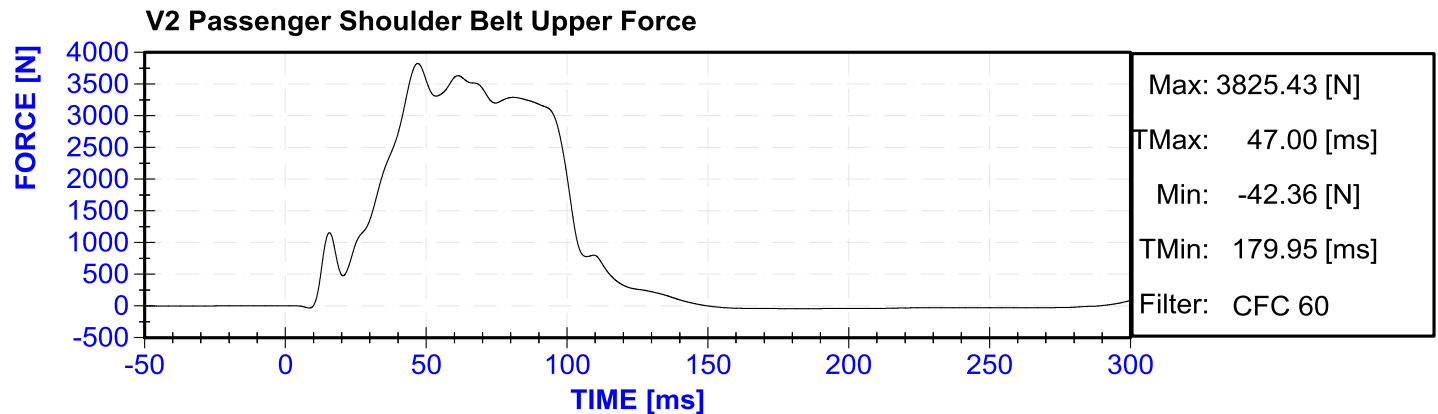
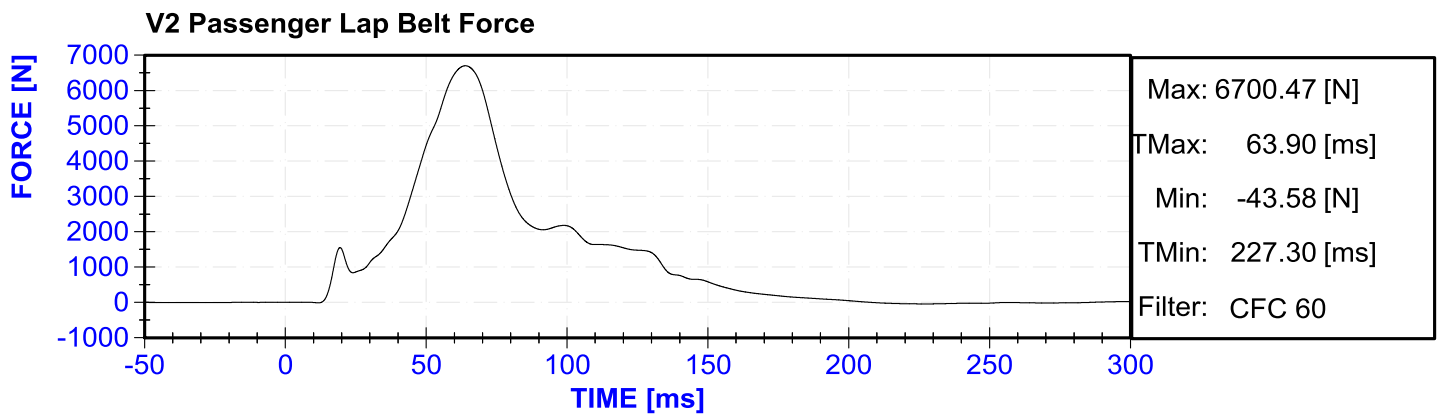
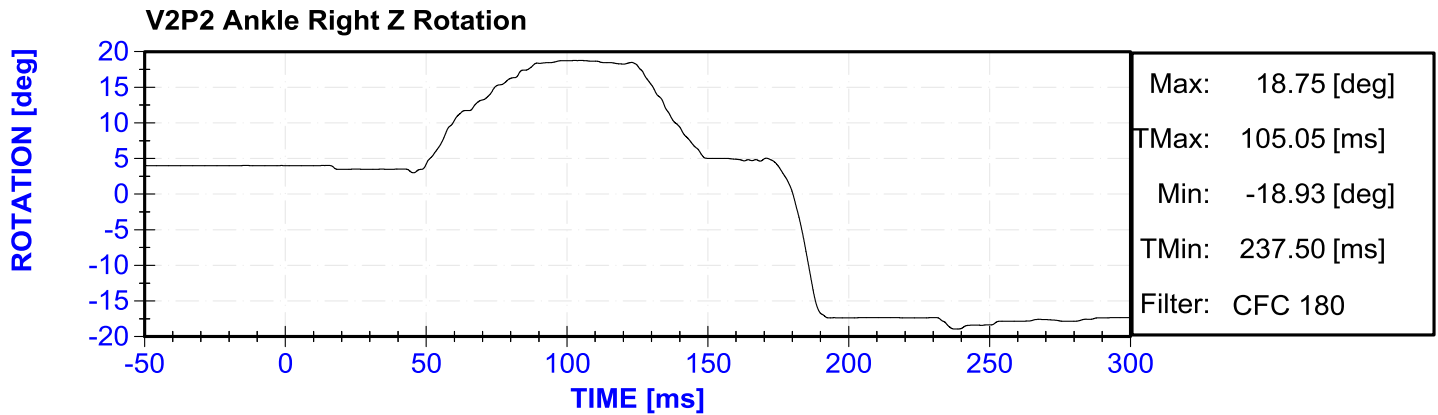


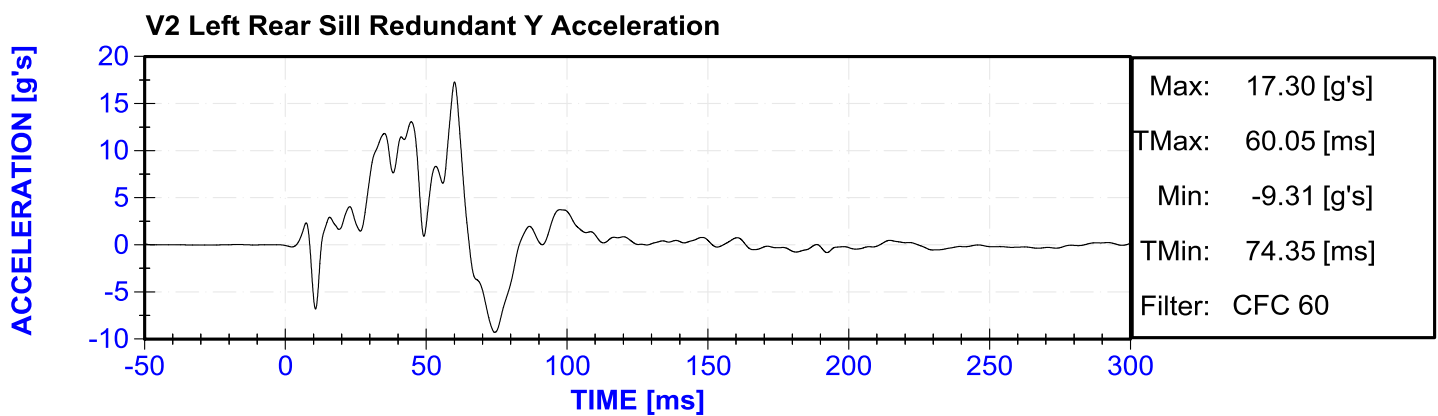
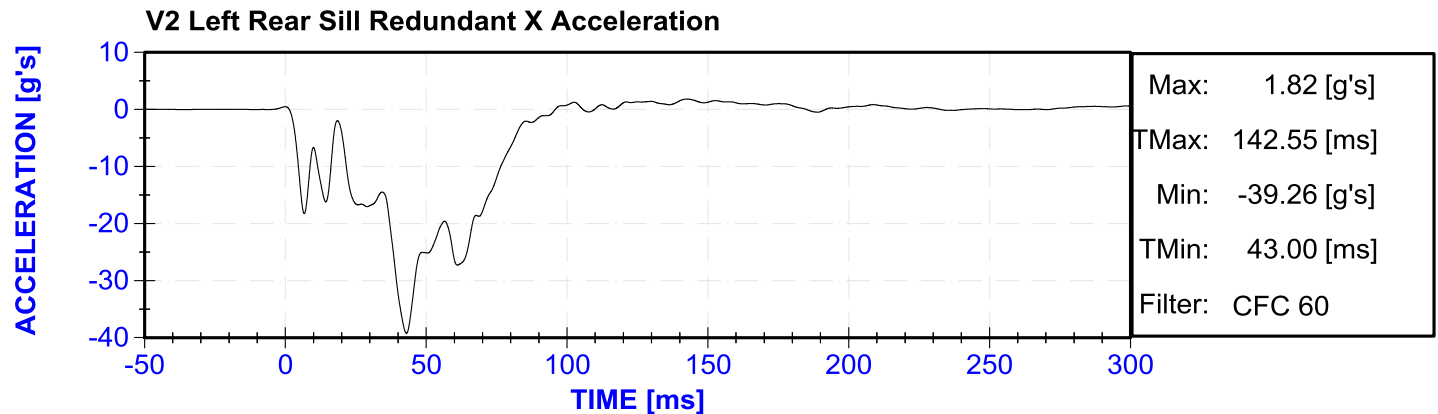
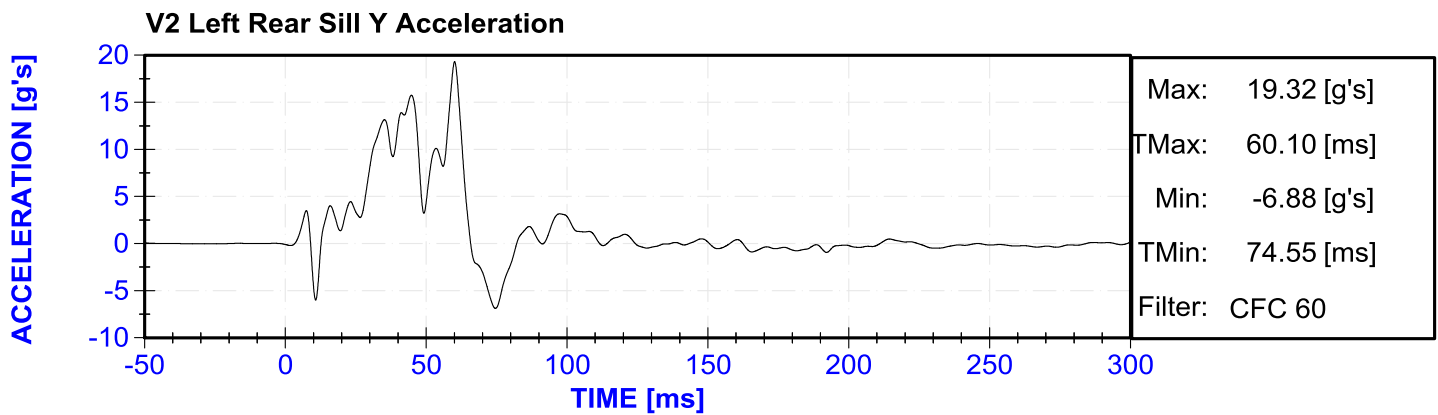
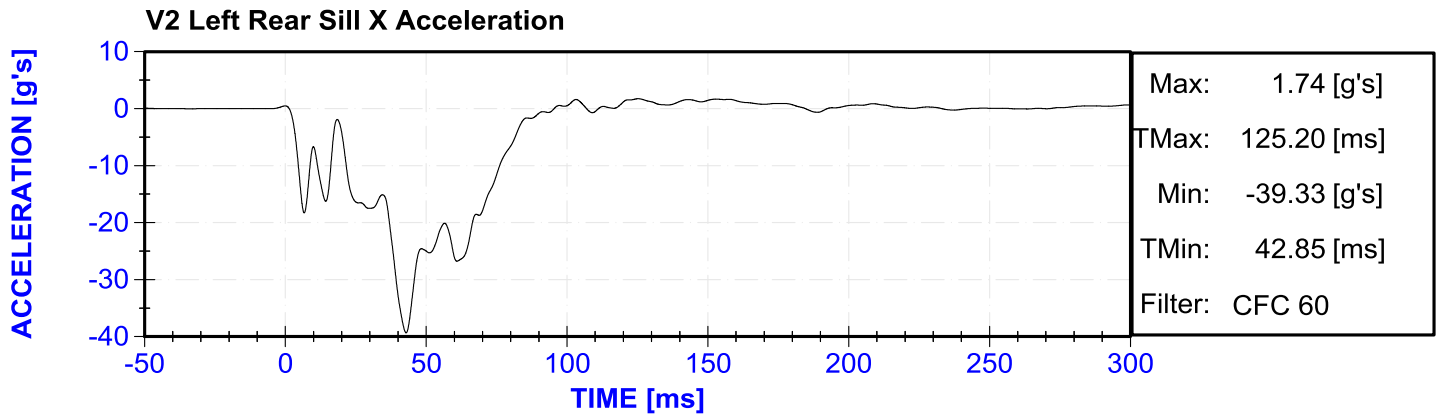


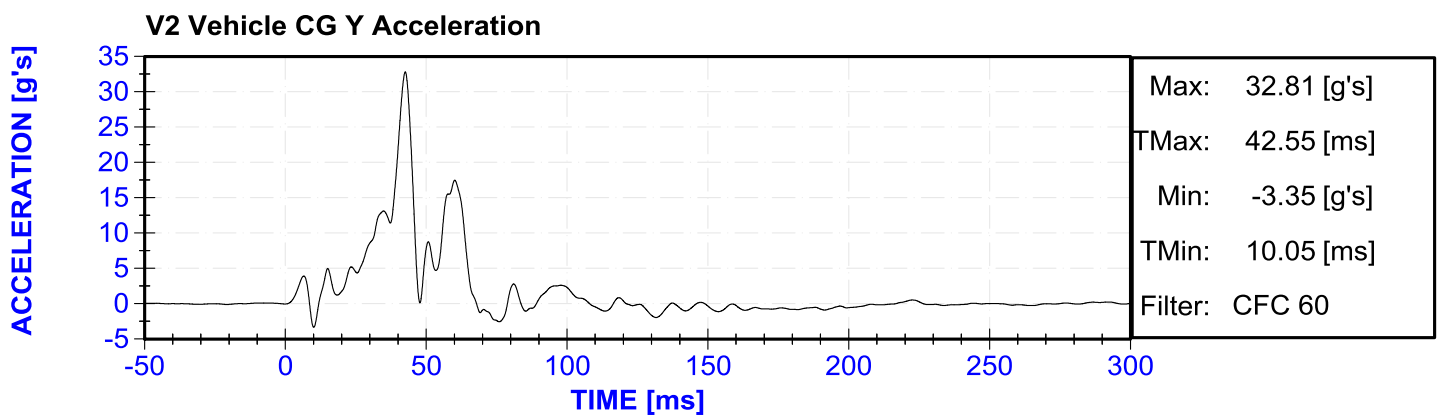
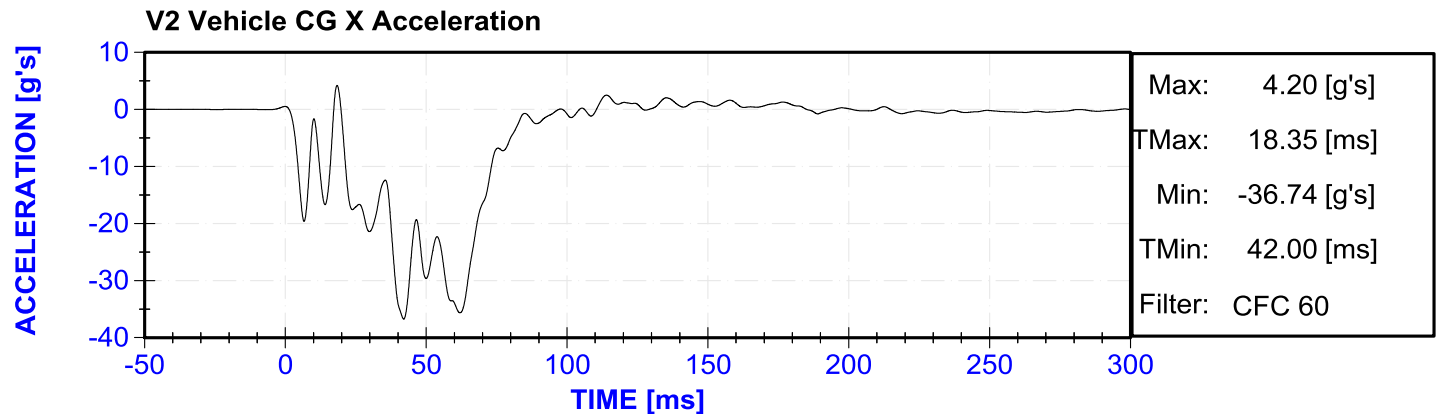
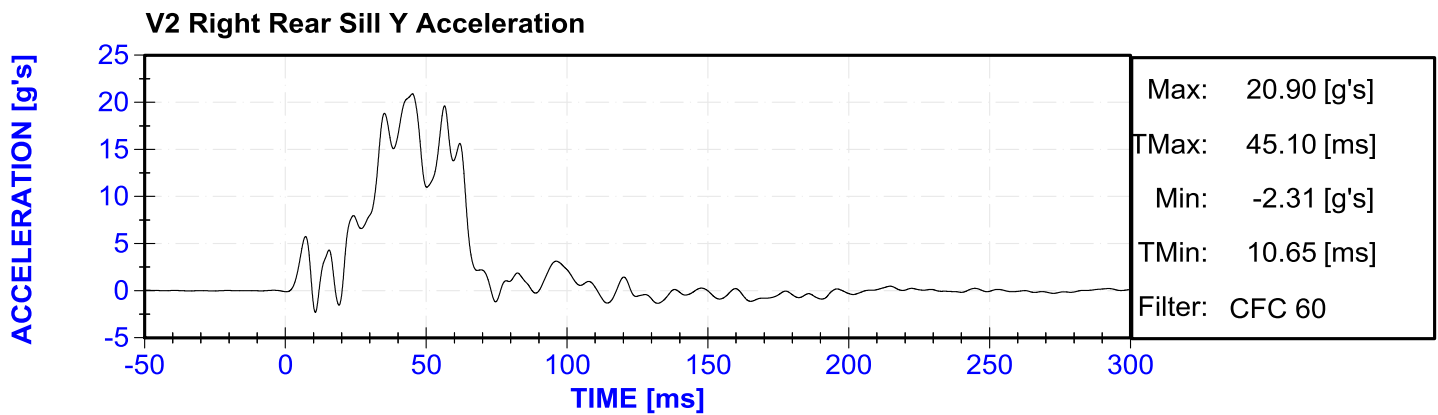
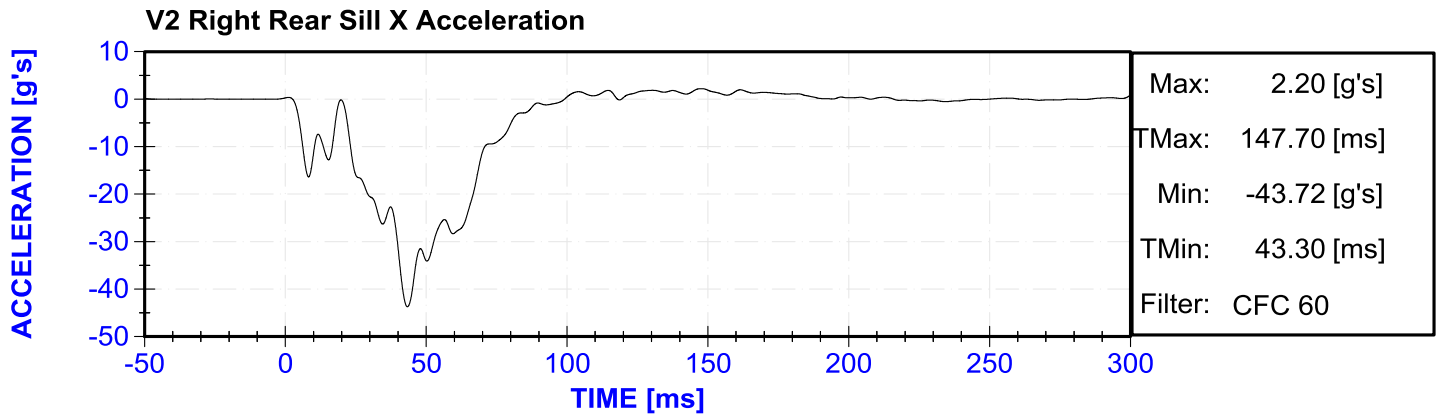


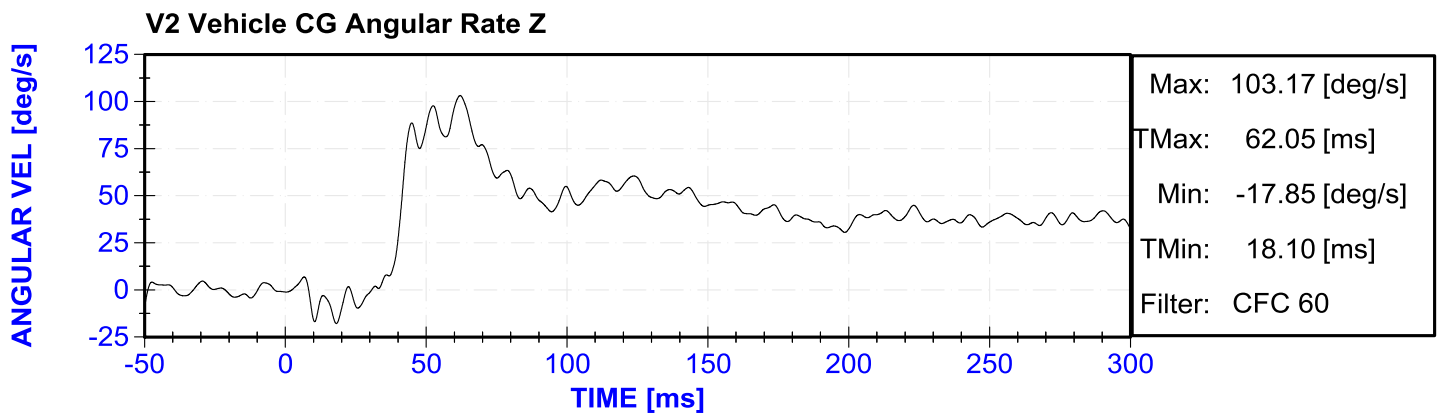
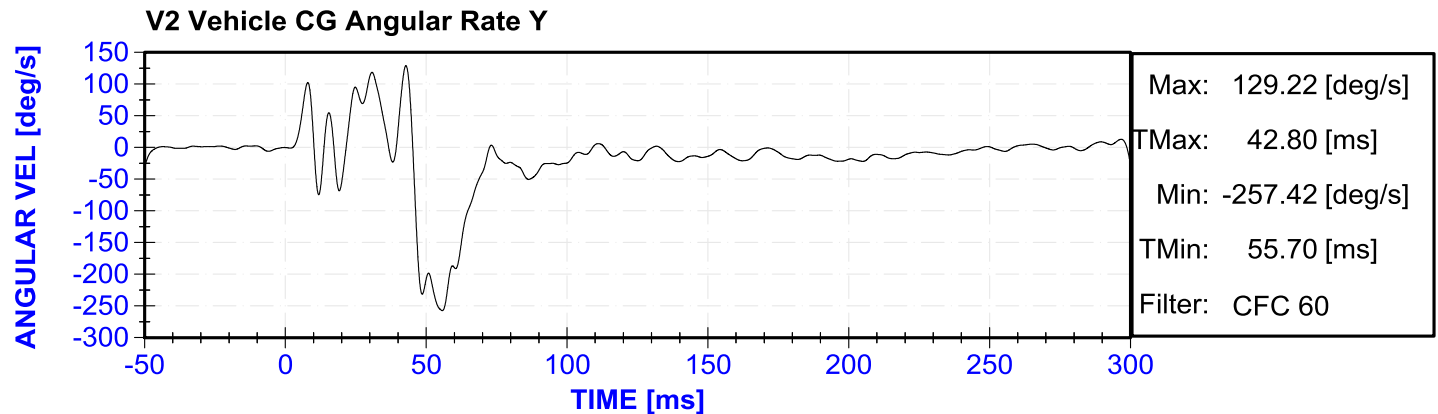
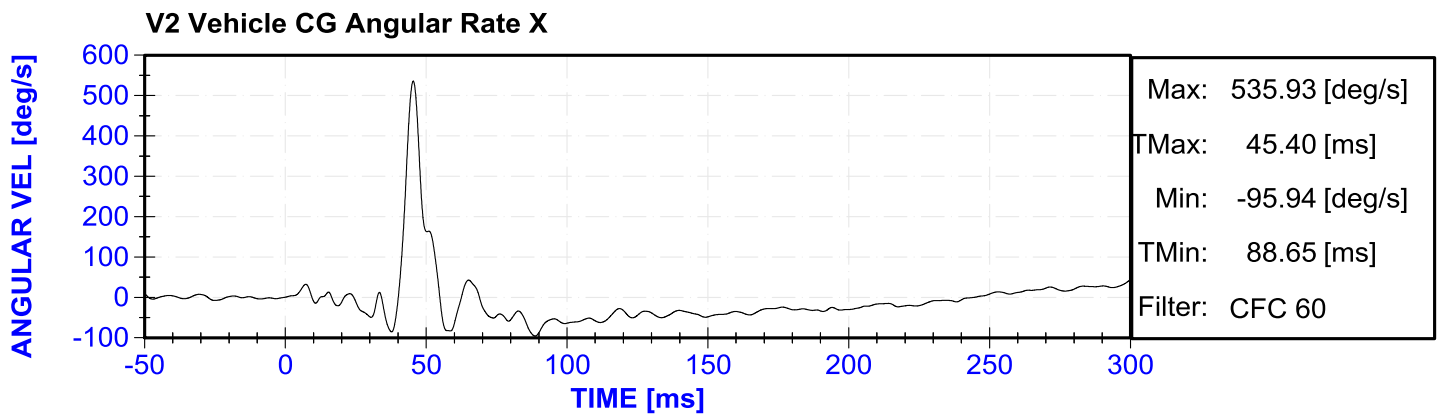
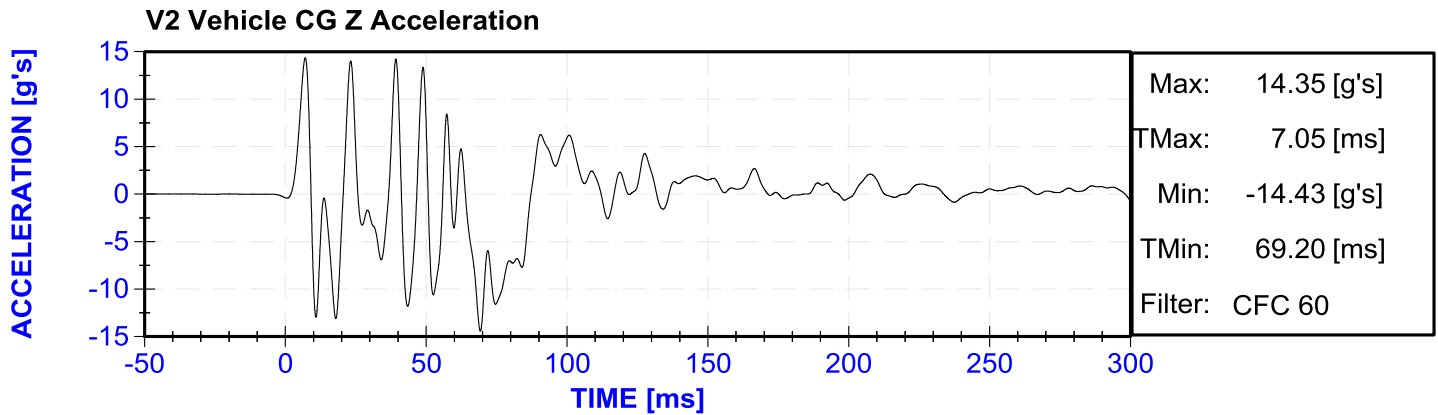


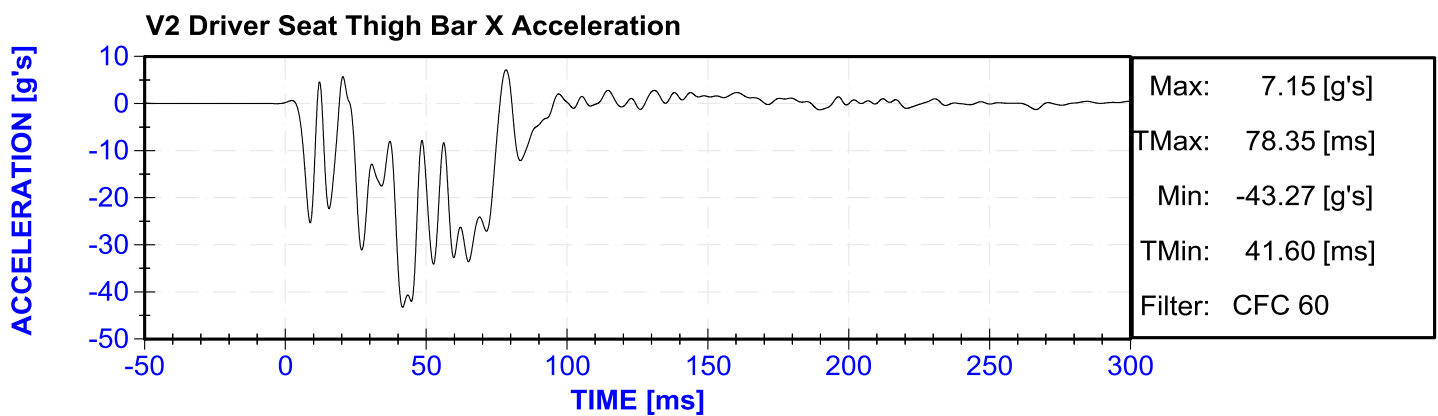
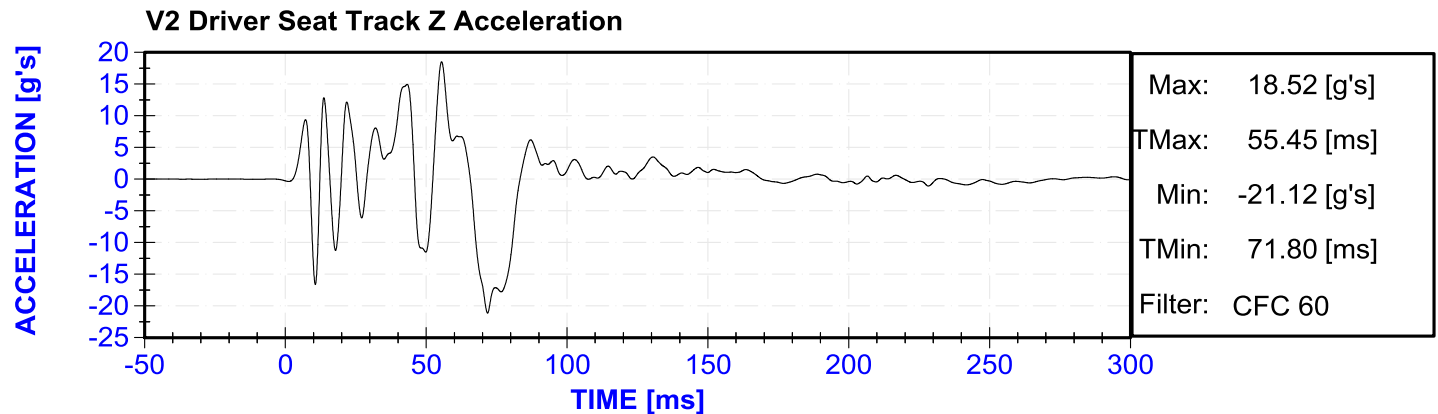
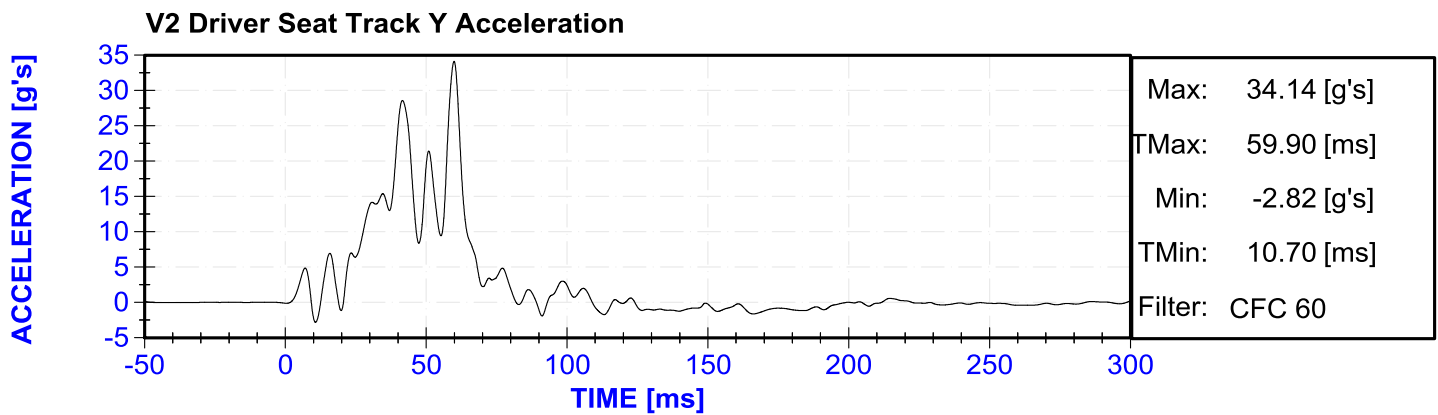
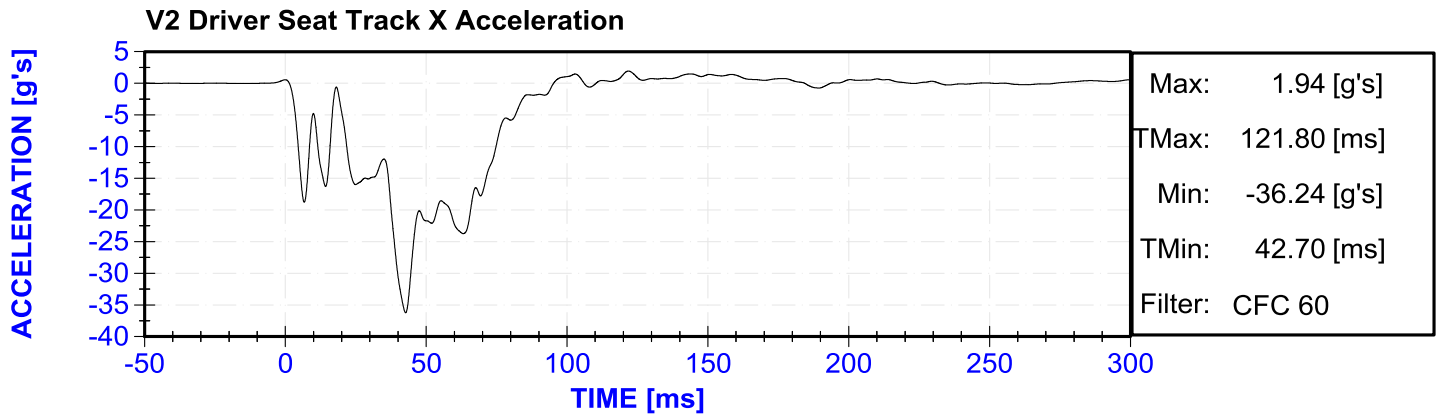


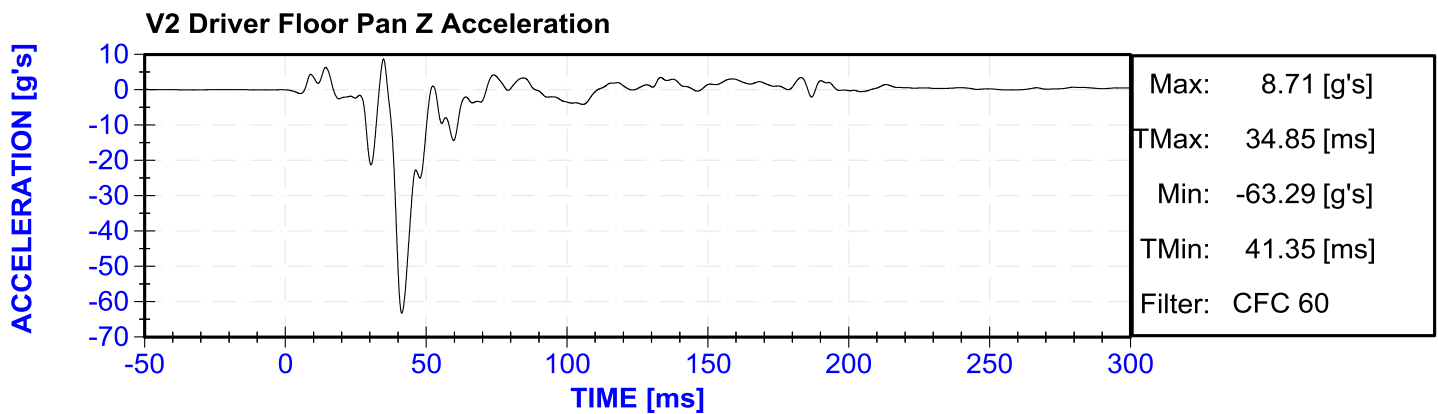
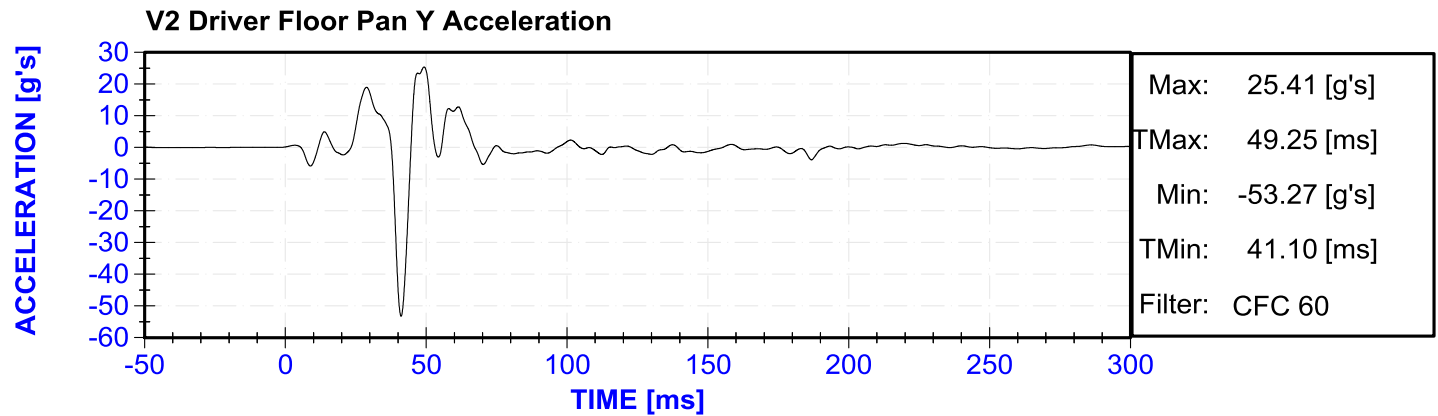
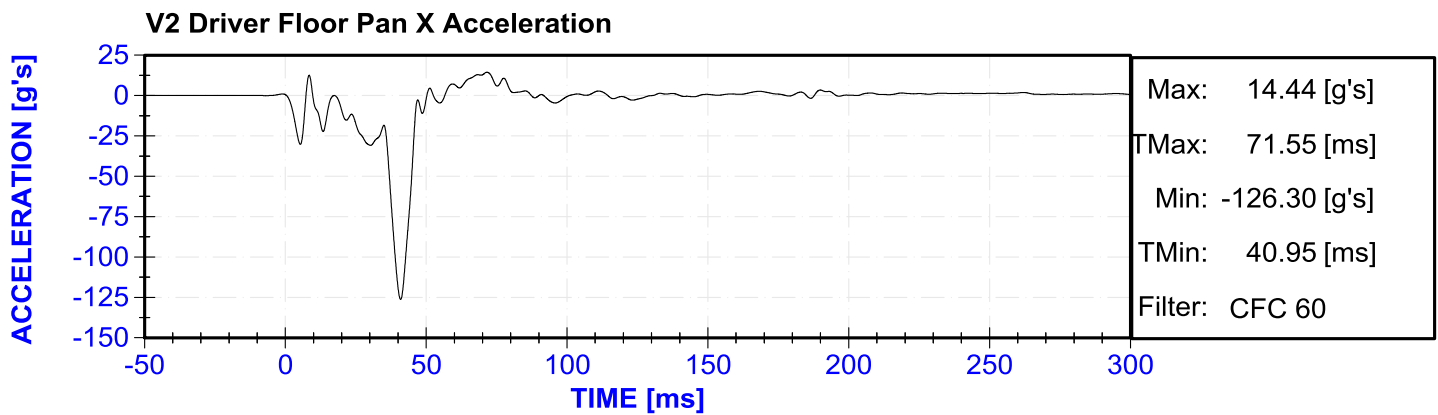
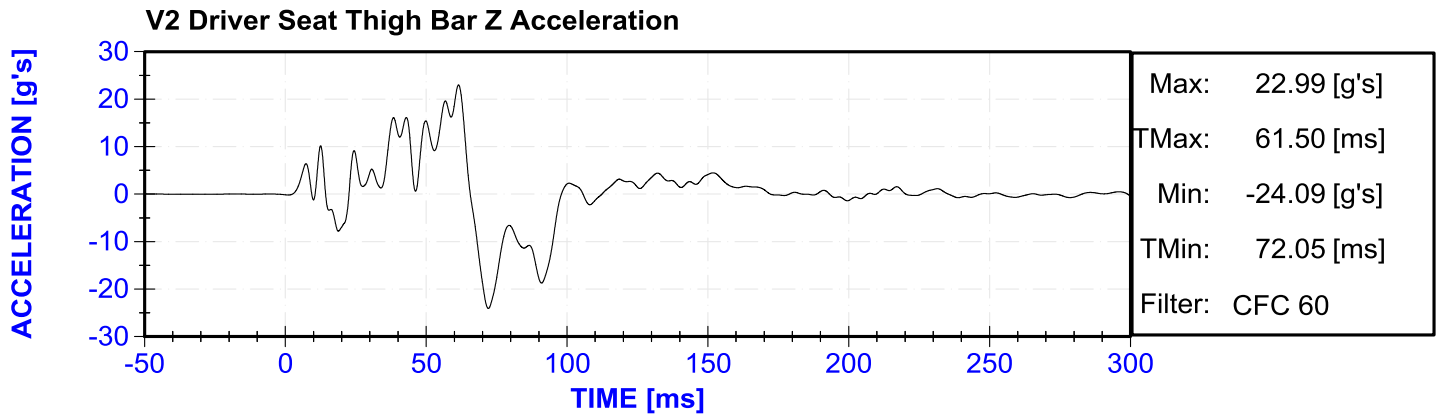


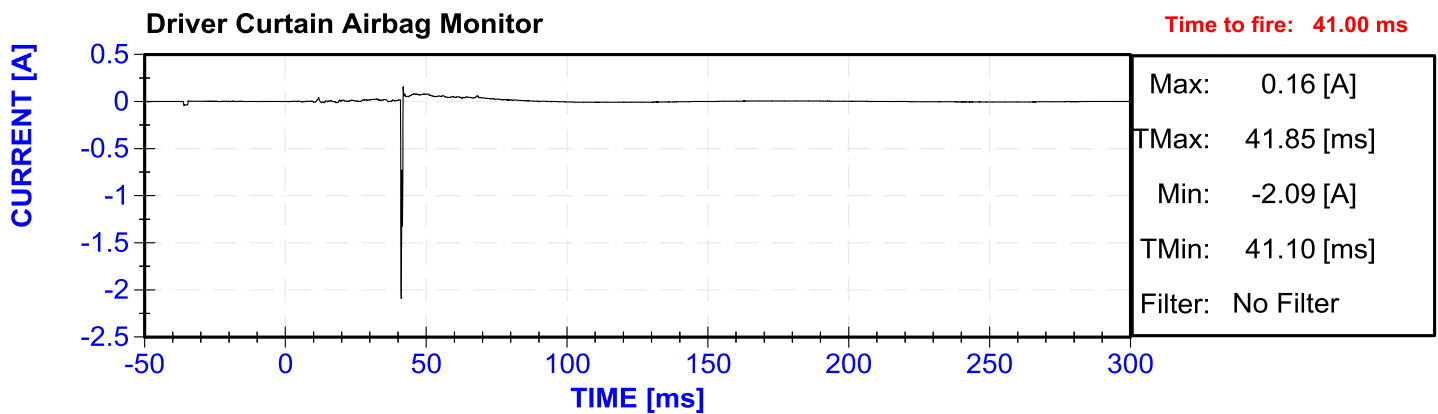
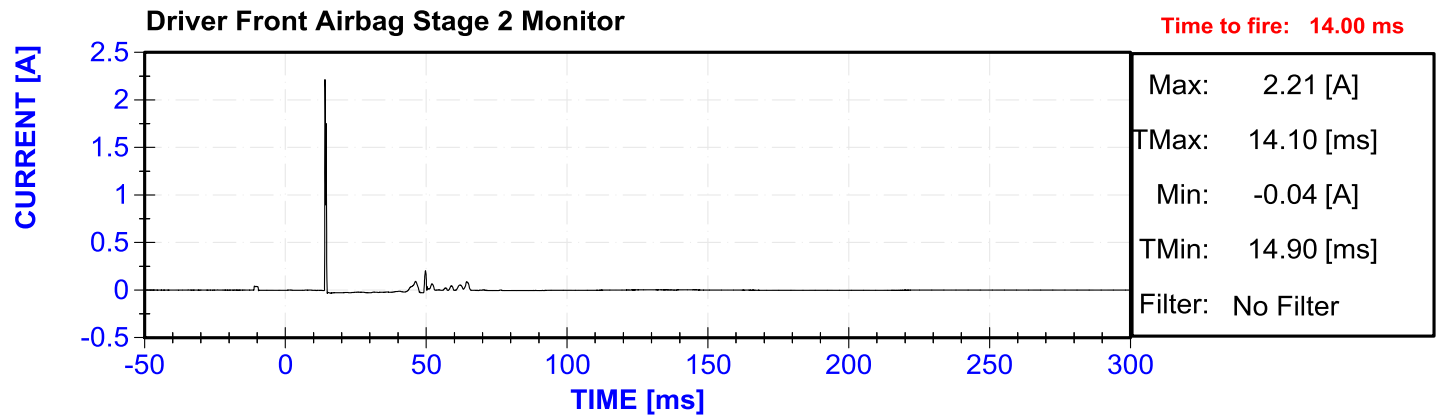
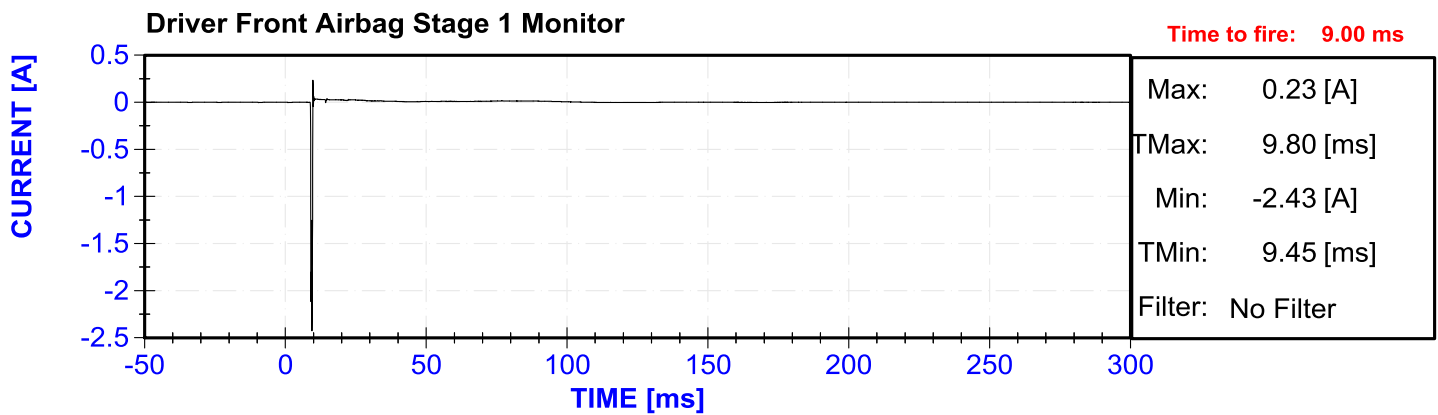
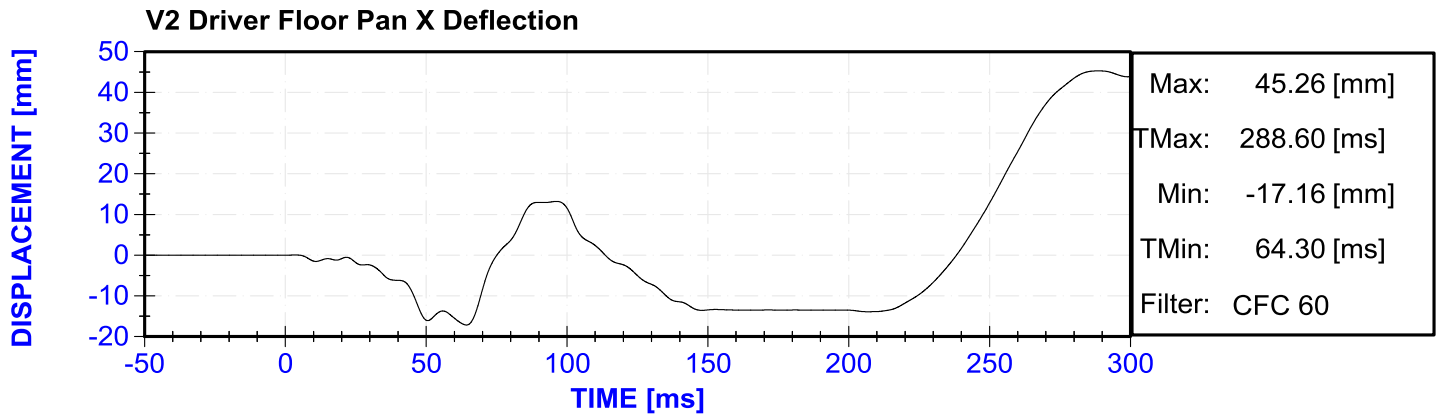


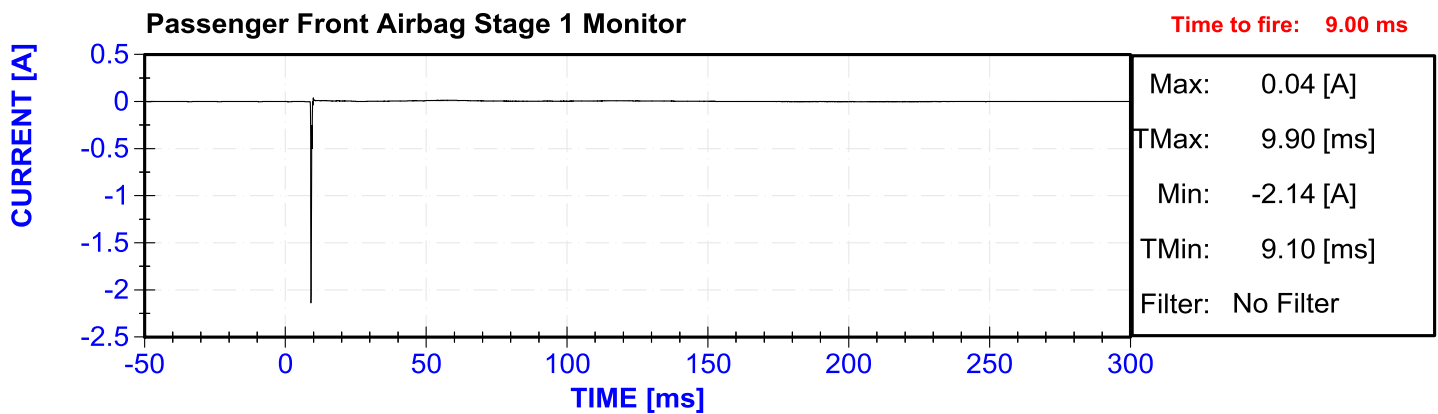
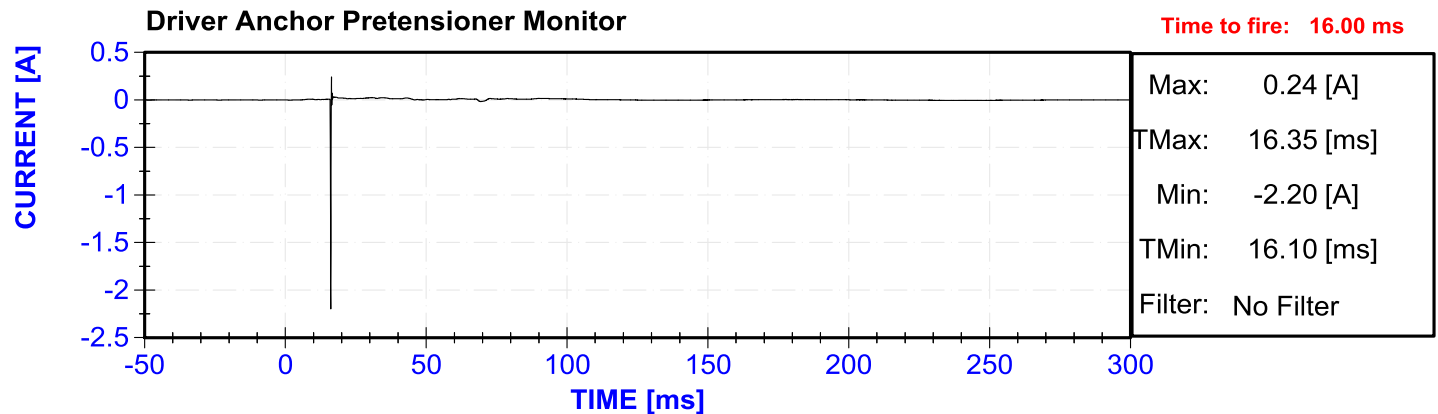
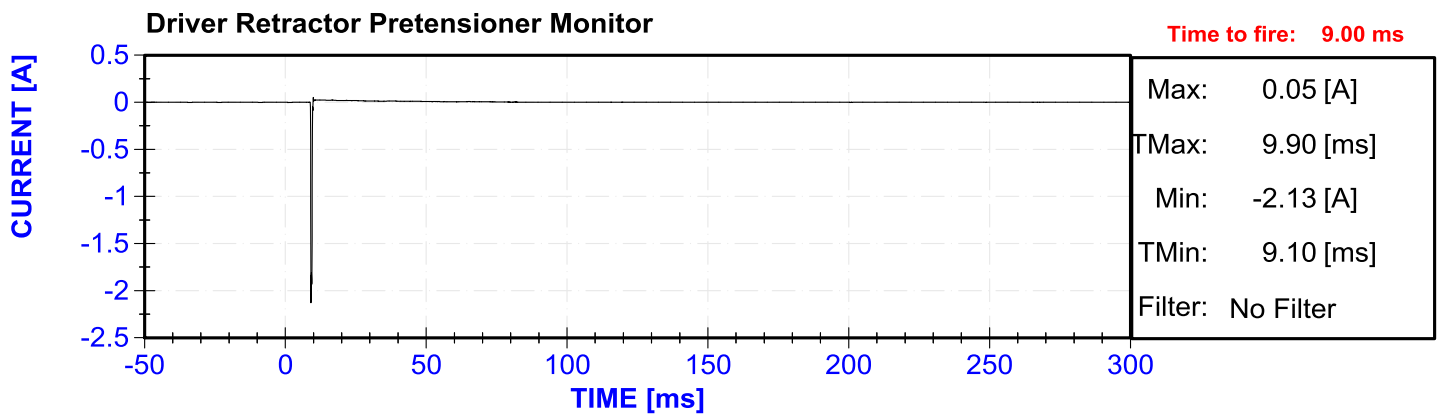
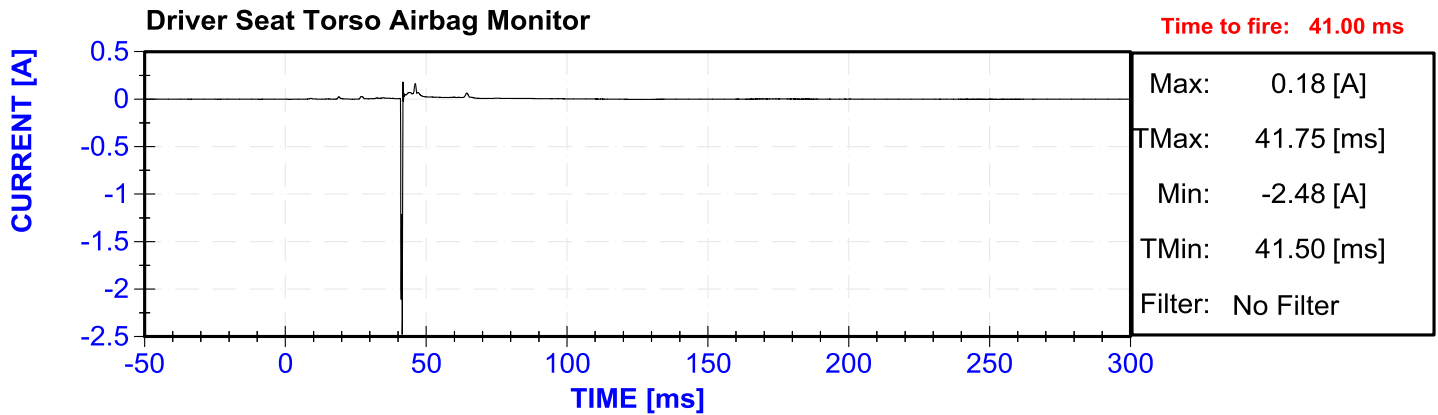


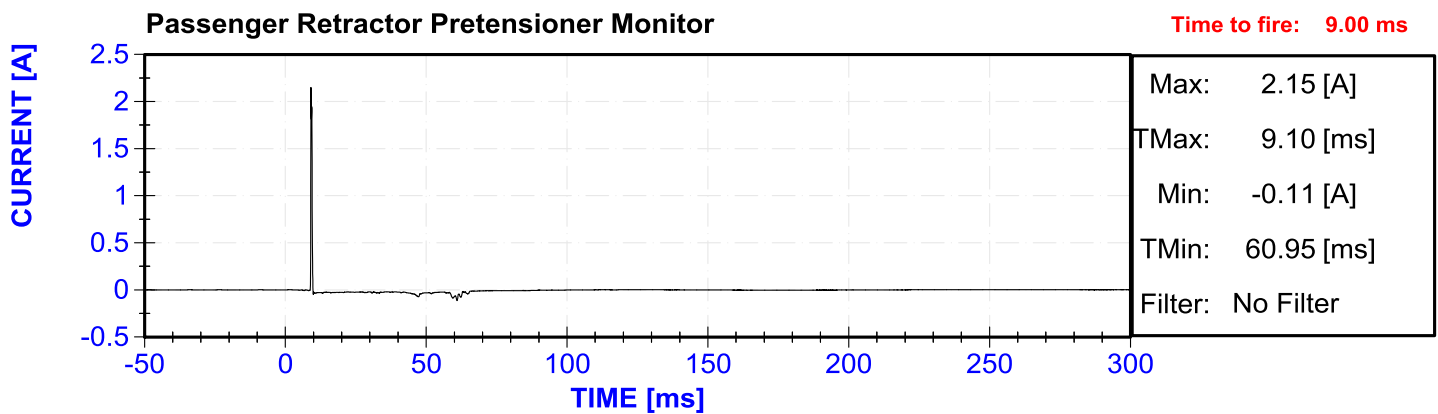
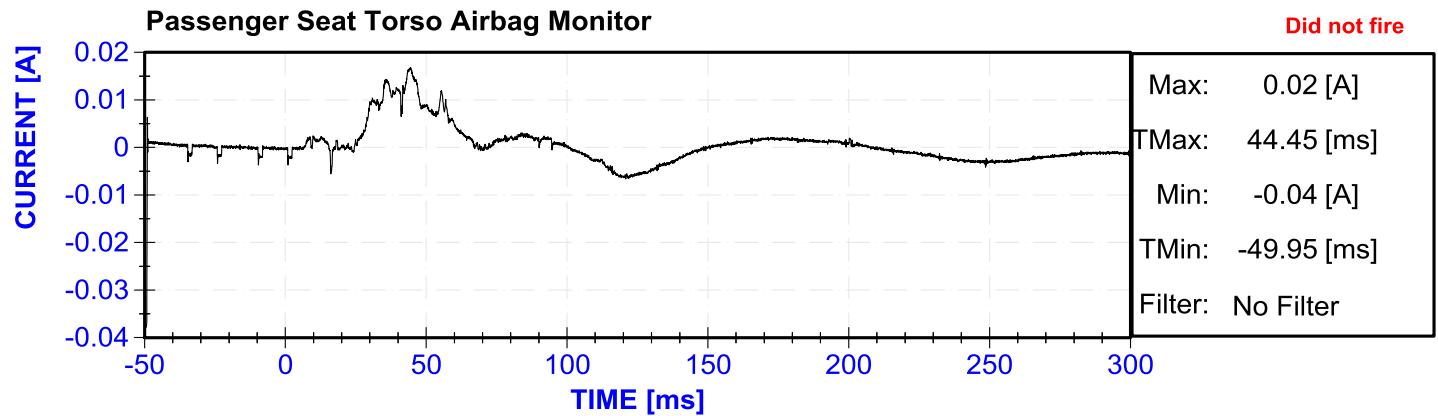
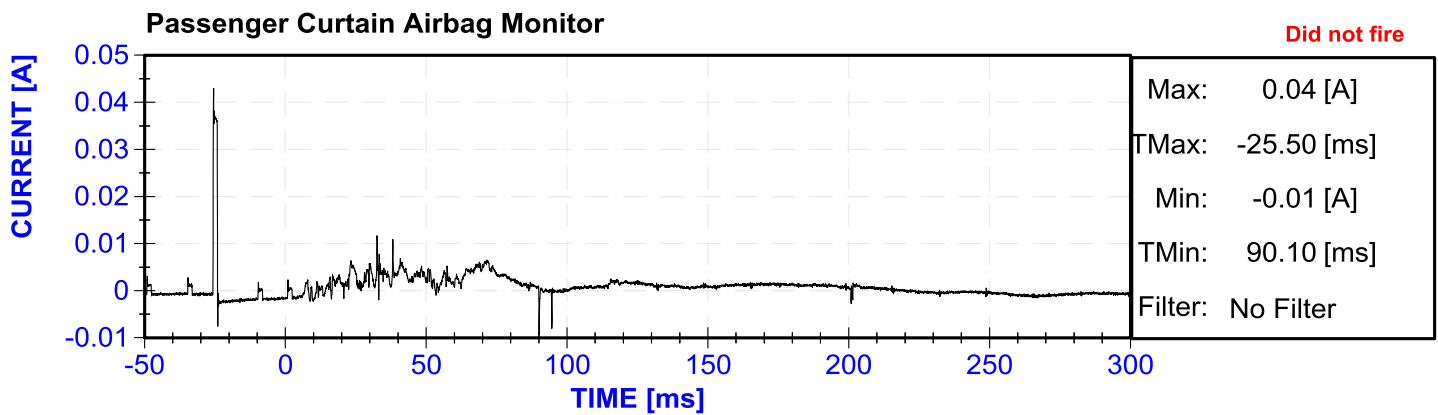
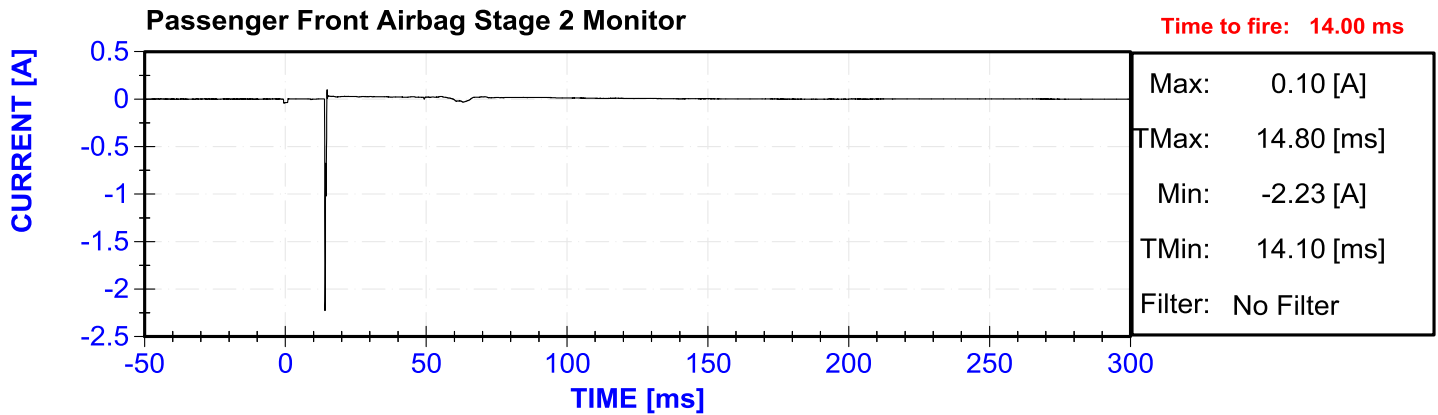






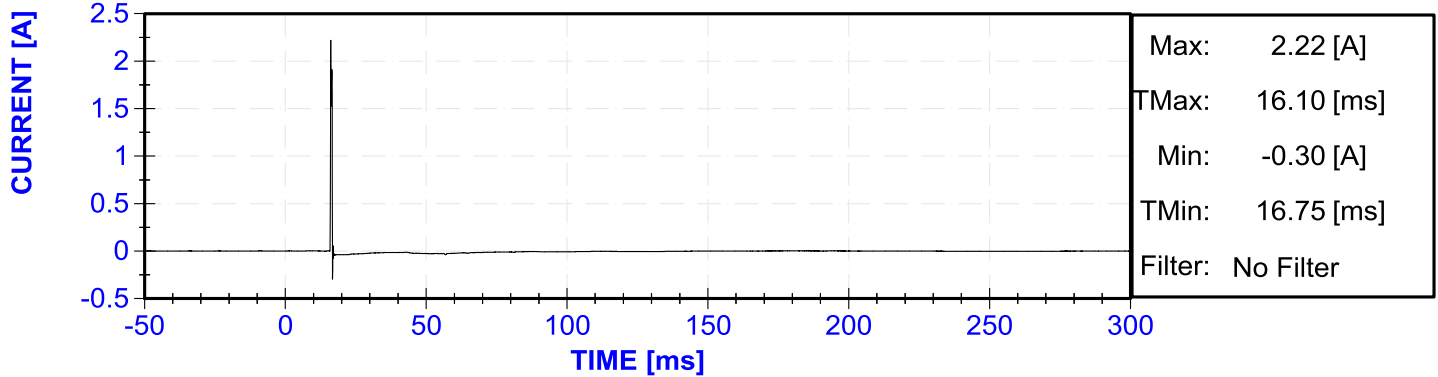




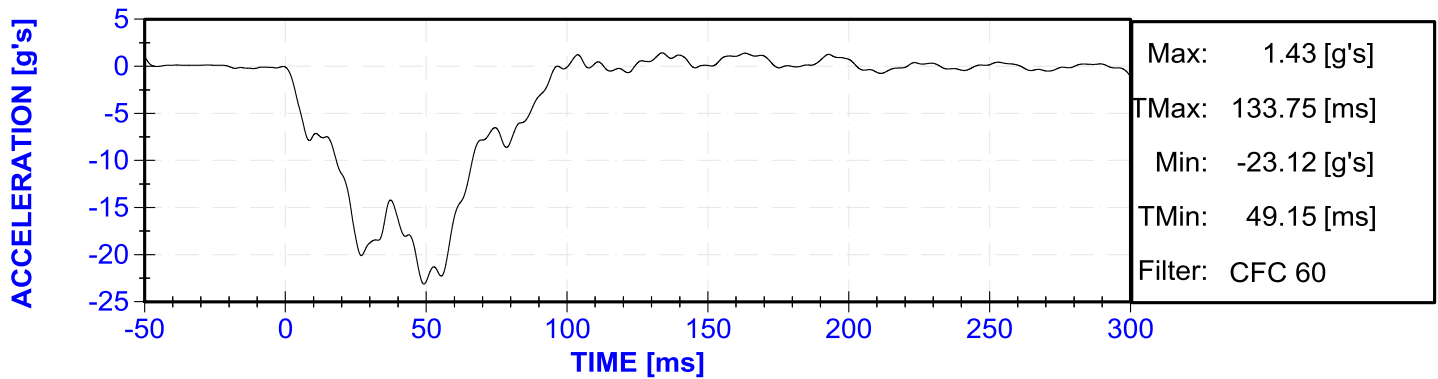


Passenger Anchor Pretensioner Monitor

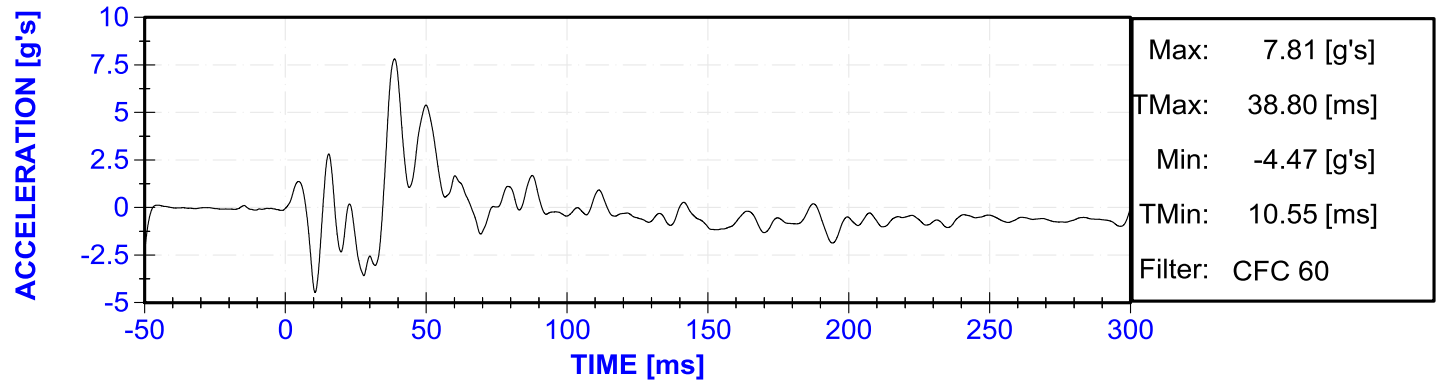
Time to fire: 16.00 ms



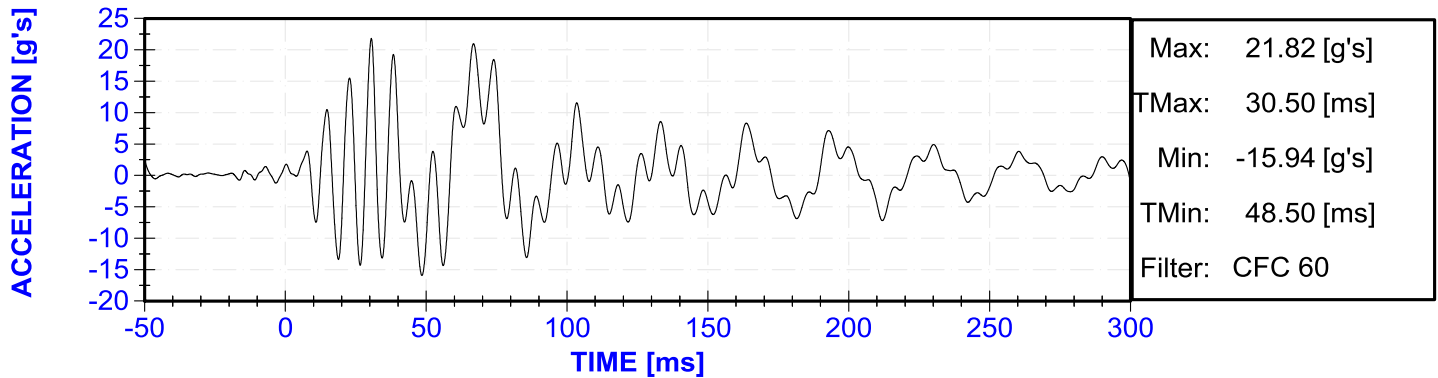
V1 OMDB CG X Acceleration

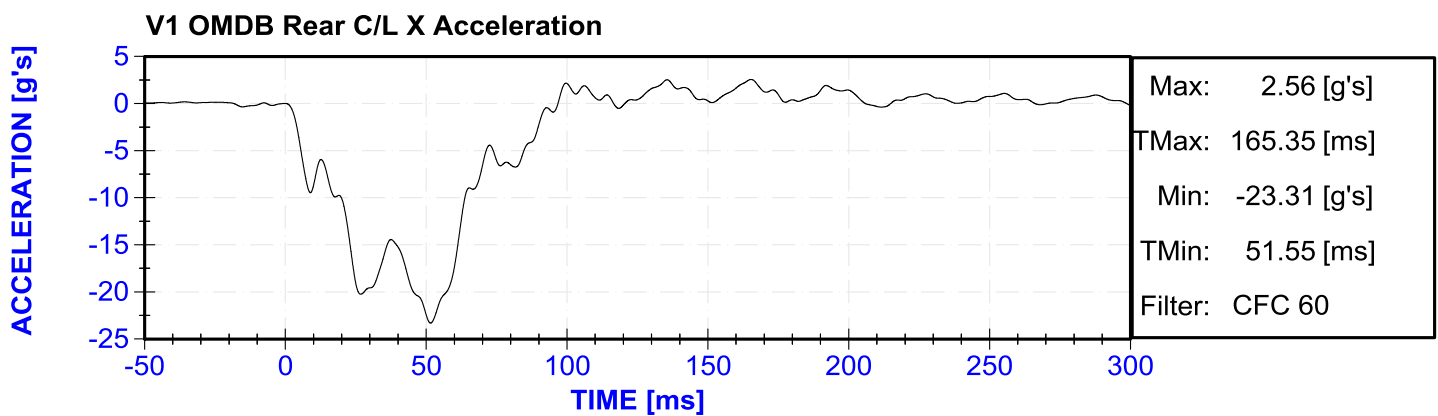
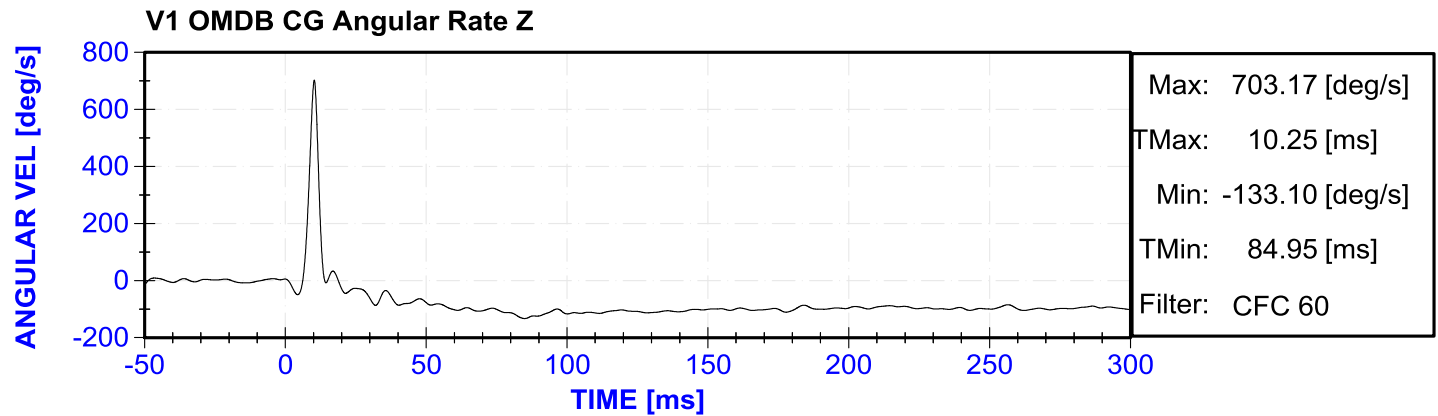
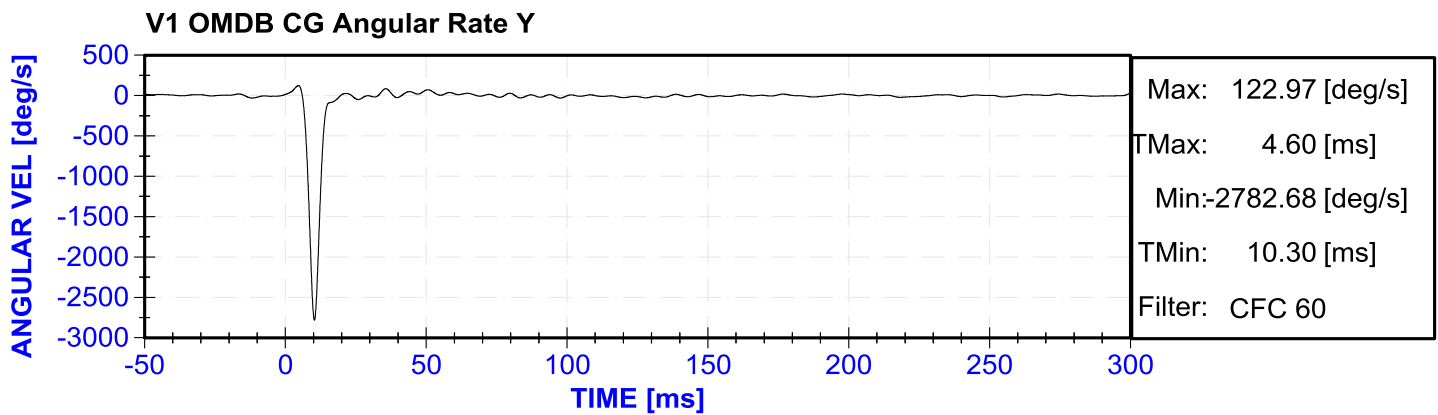
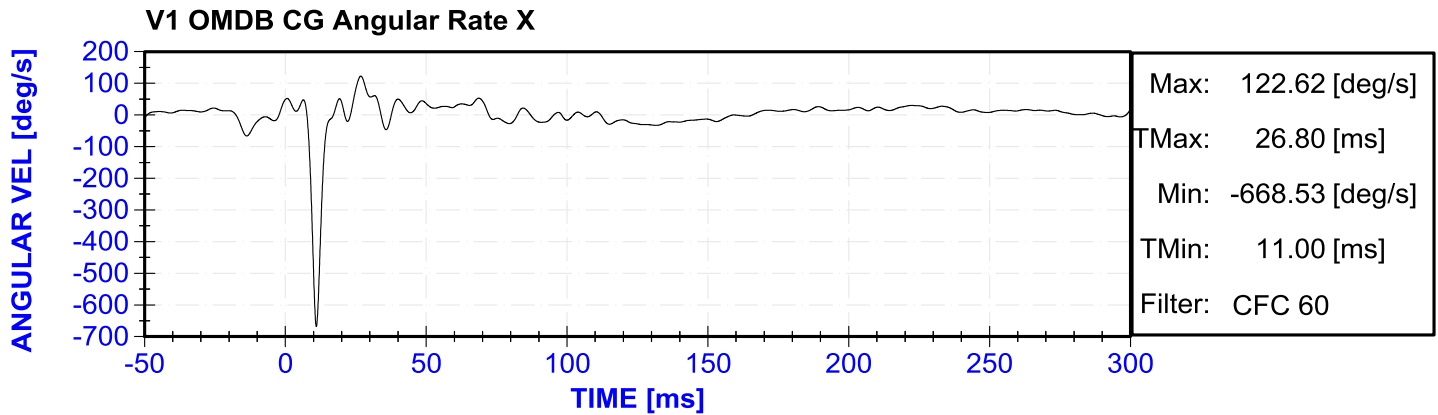


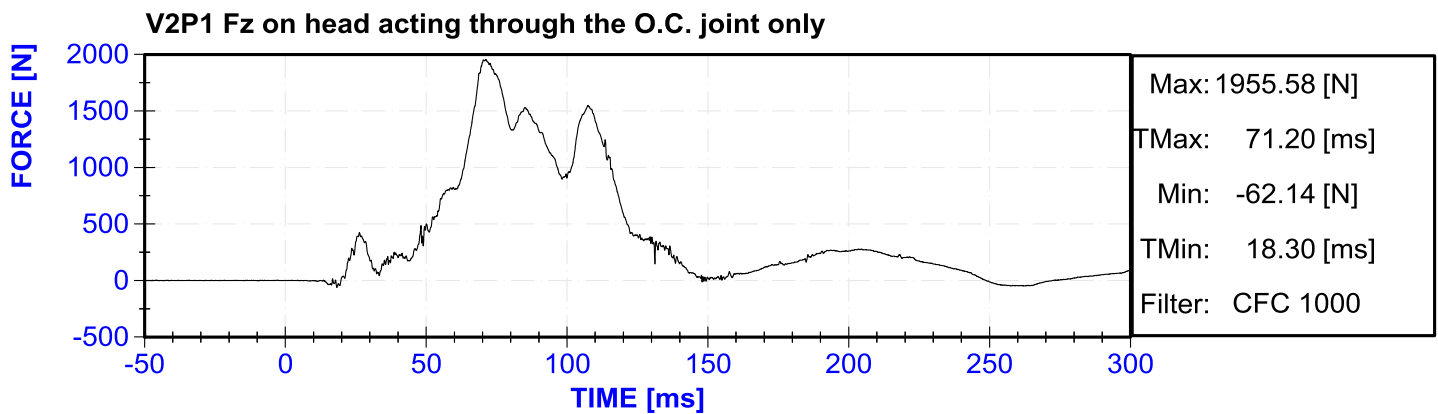
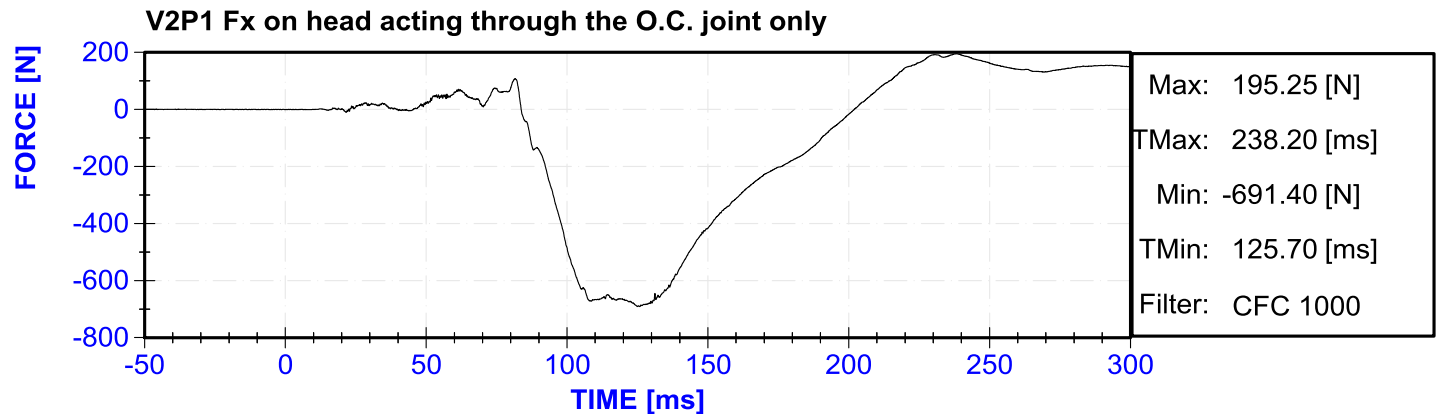
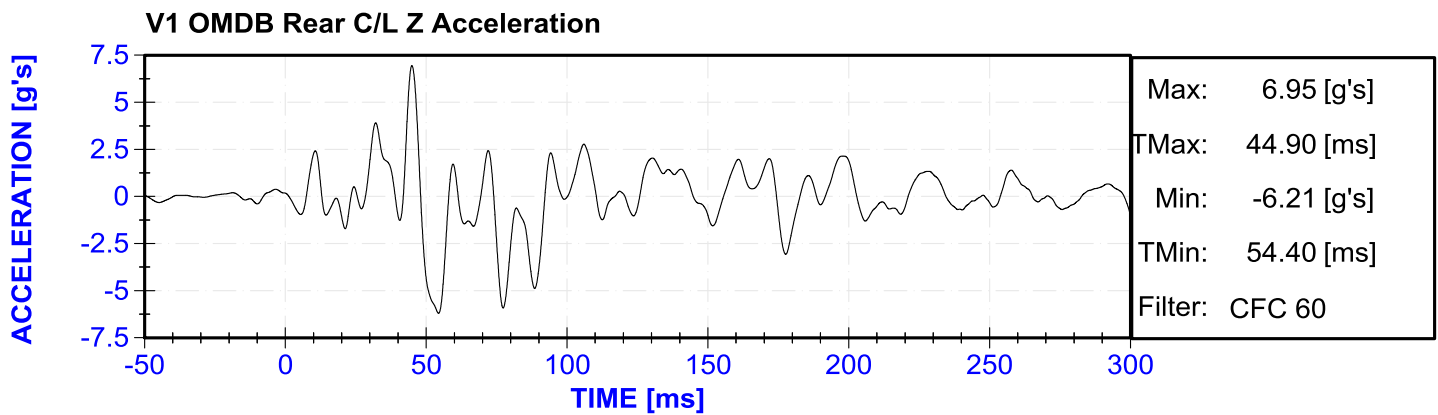
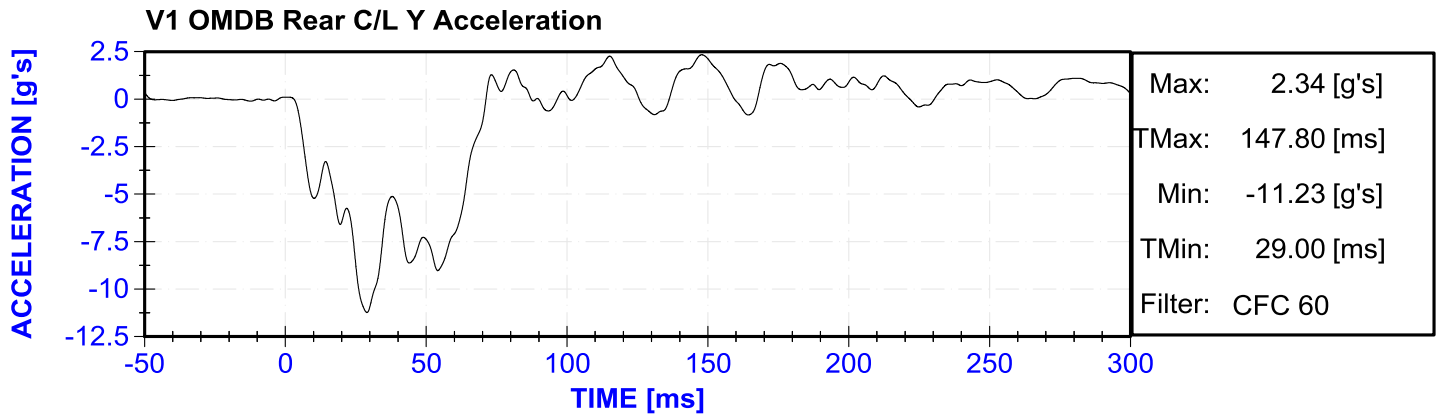
V1 OMDB CG Y Acceleration

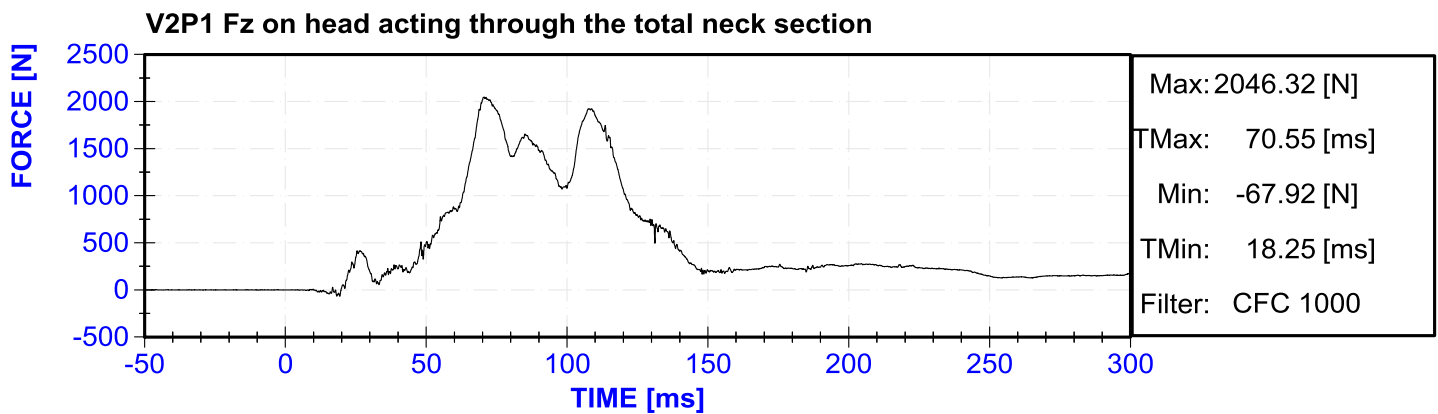
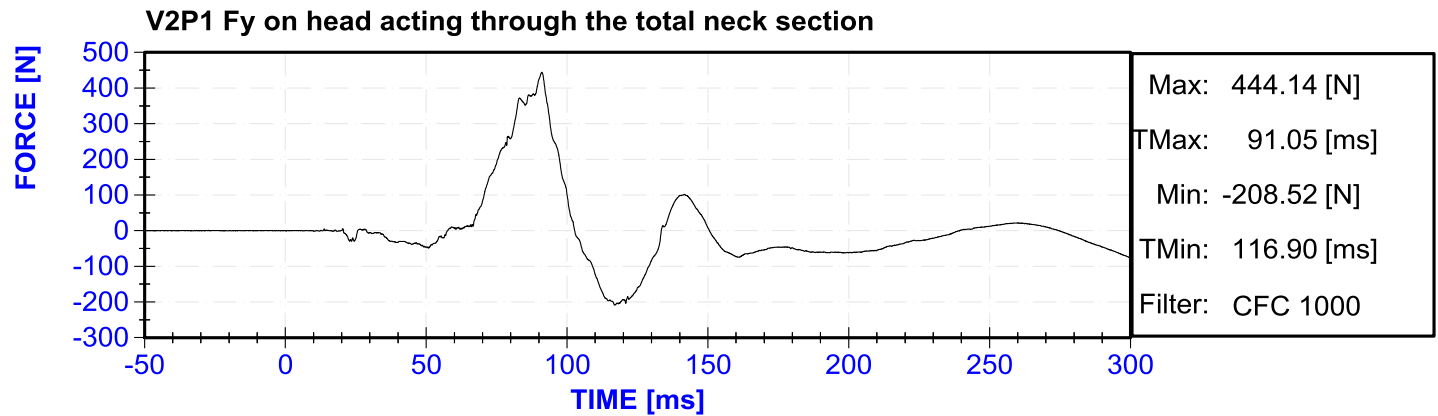
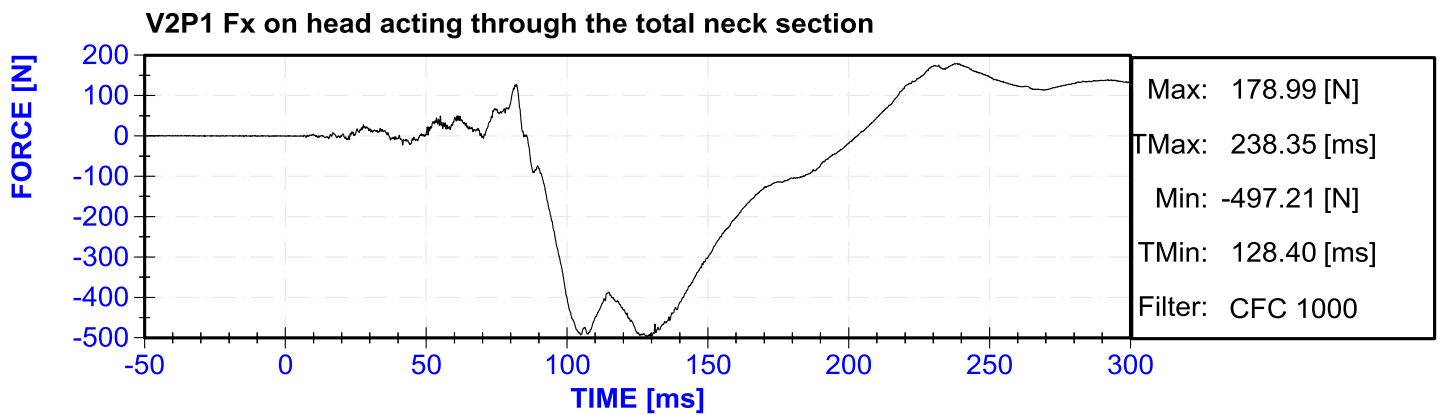
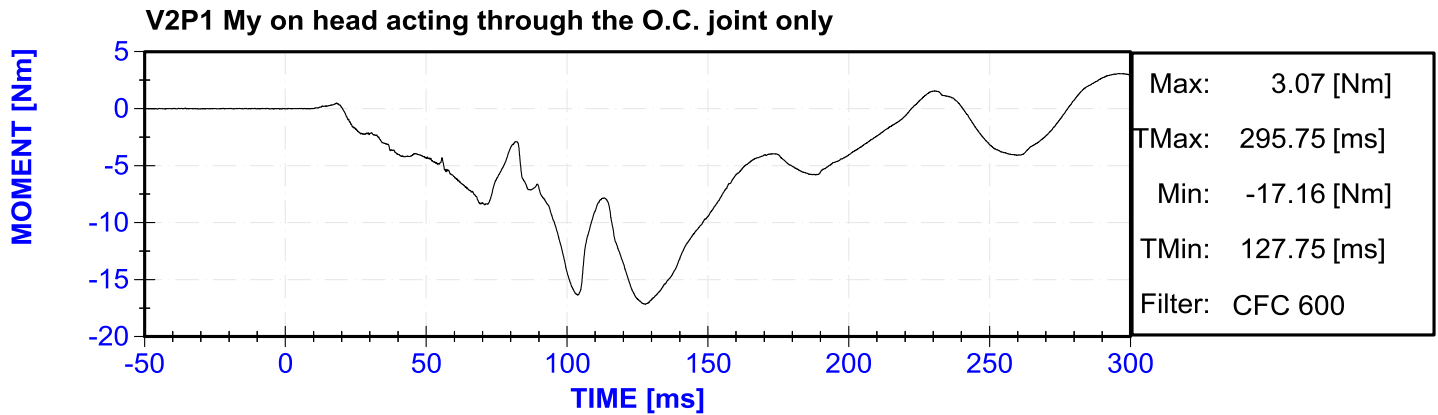


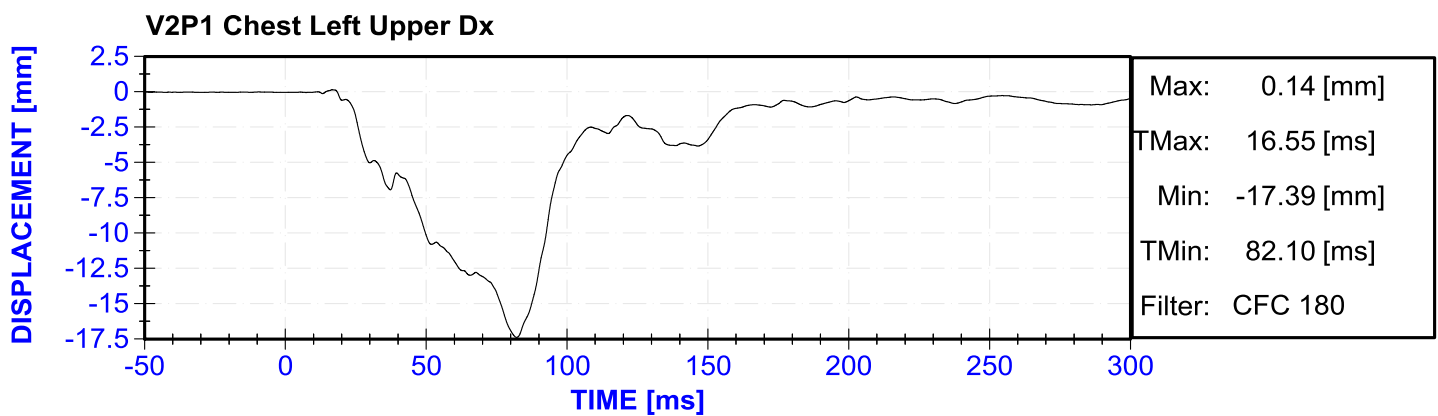
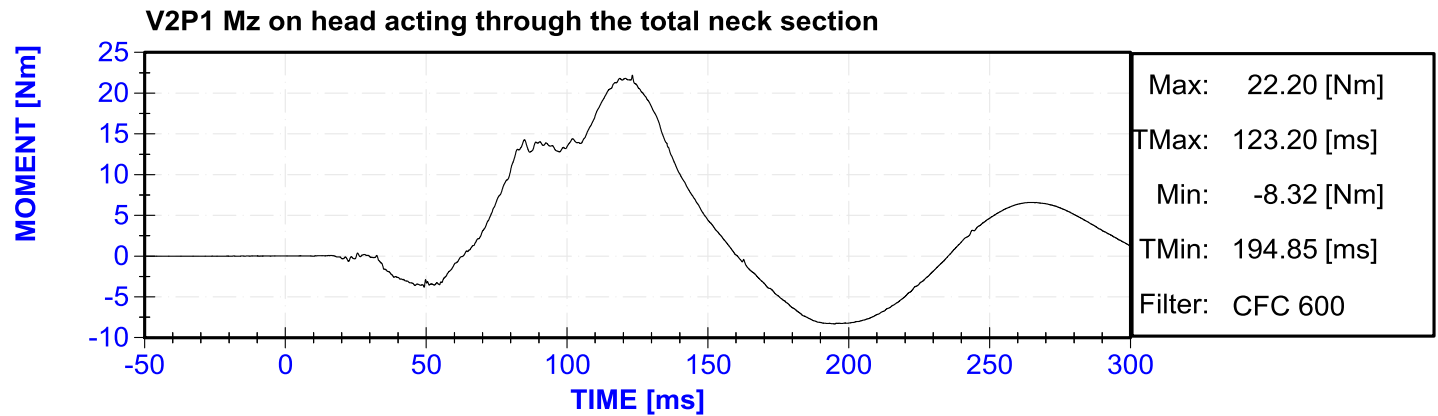
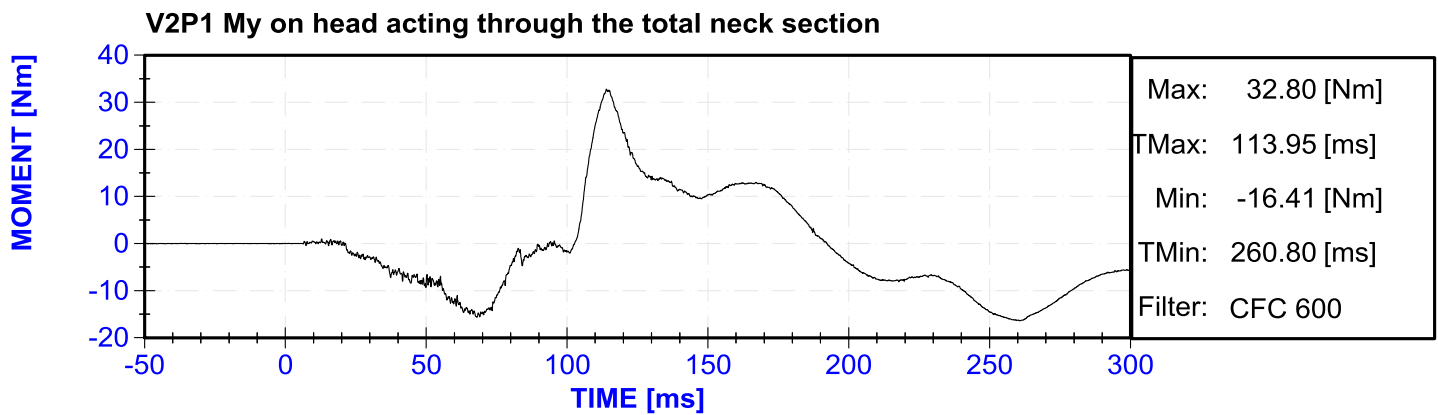
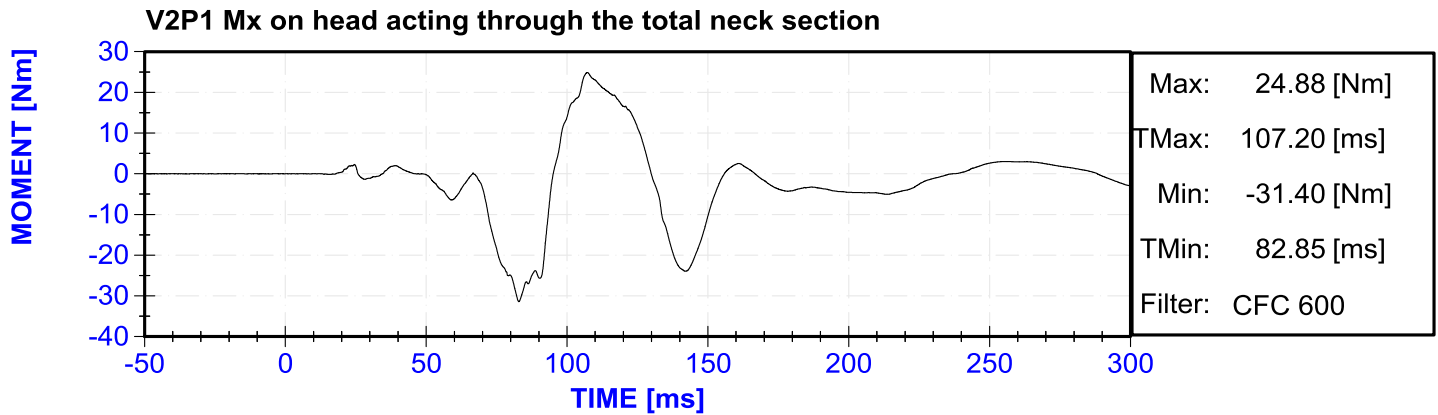
V1 OMDB CG Z Acceleration

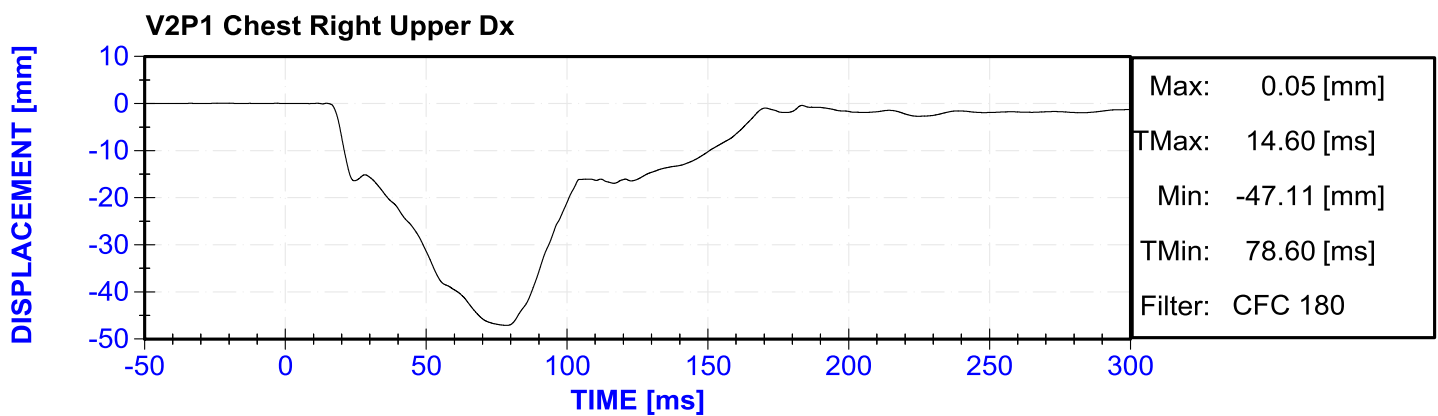
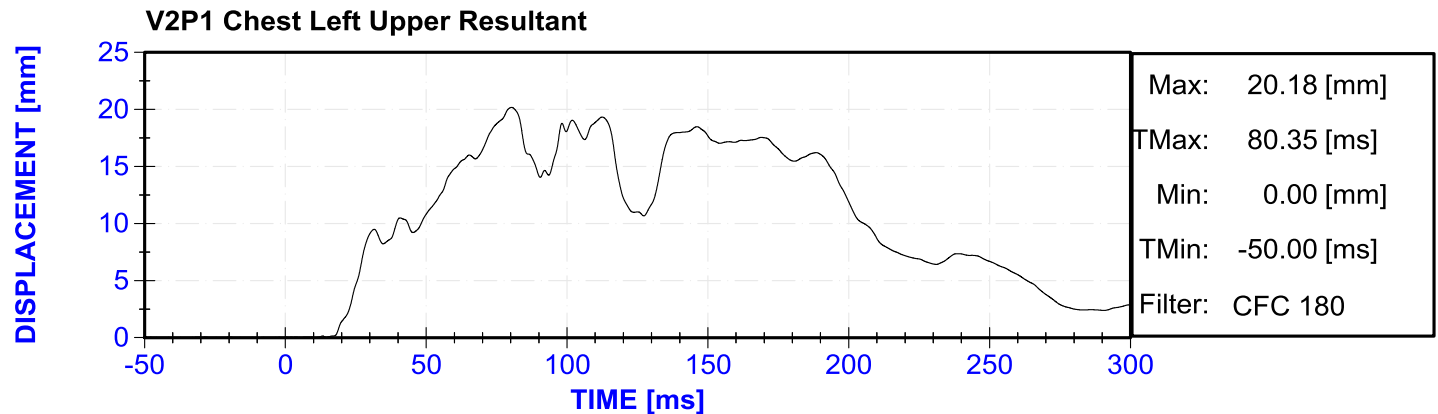
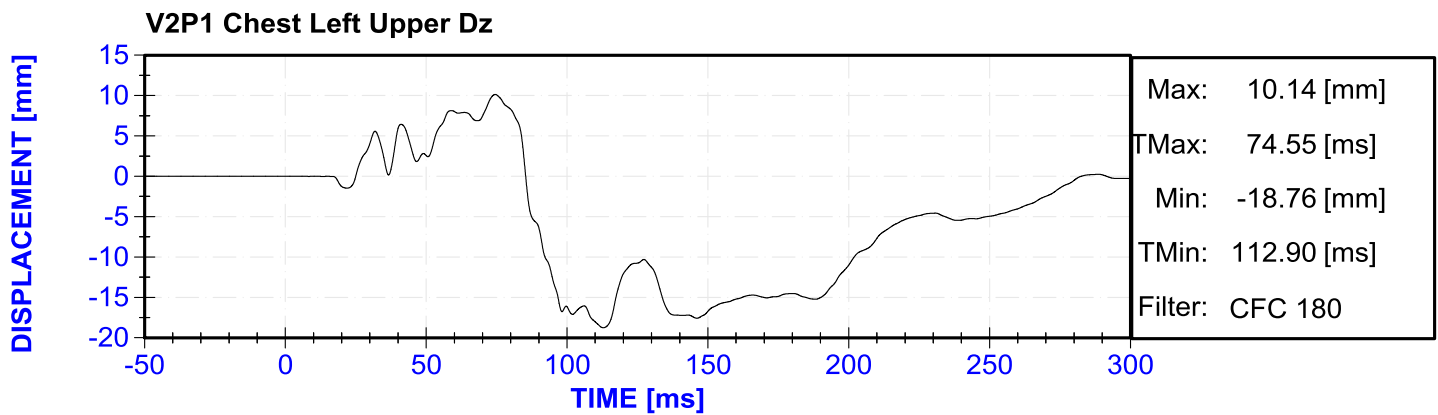
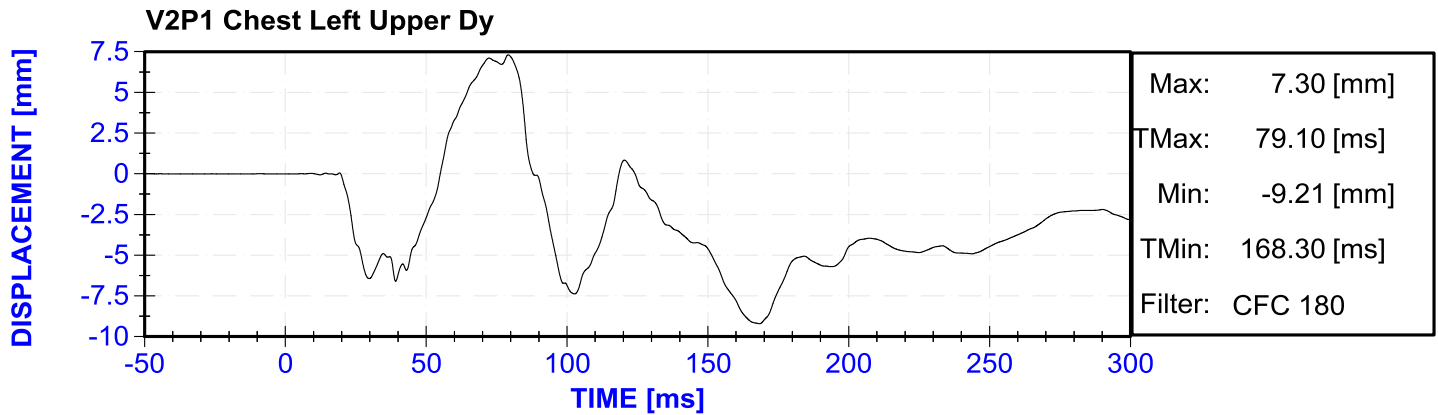


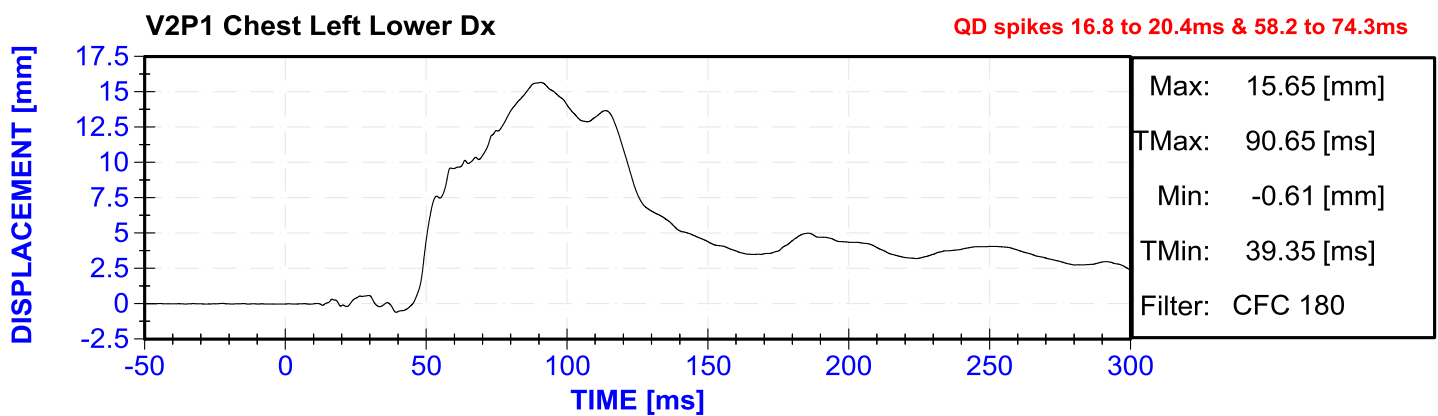
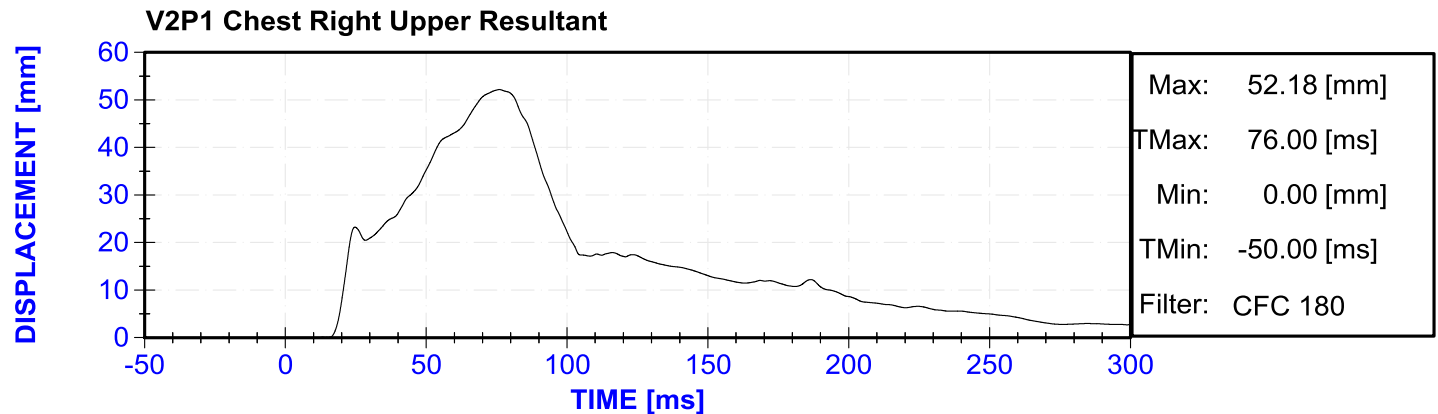
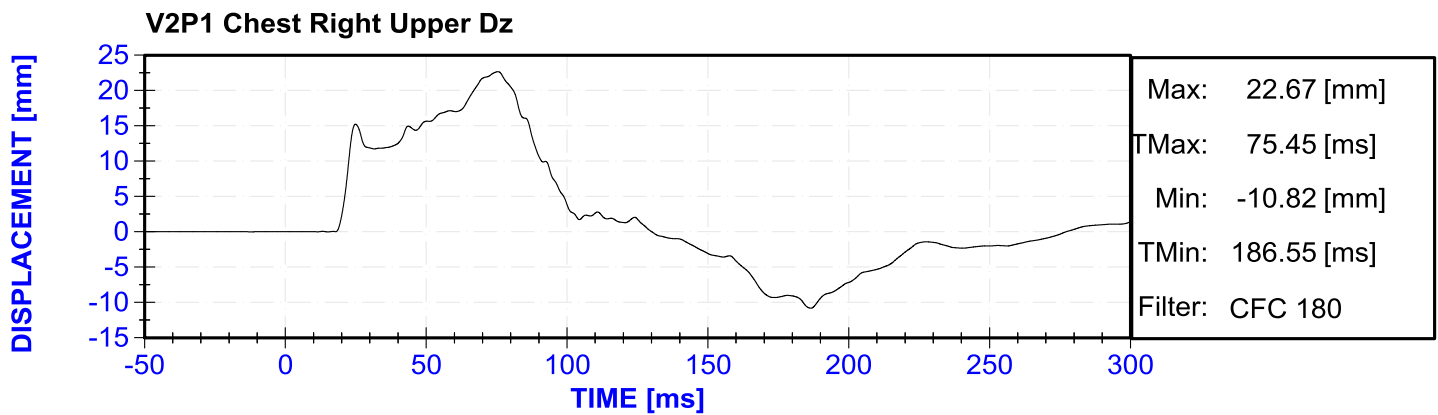
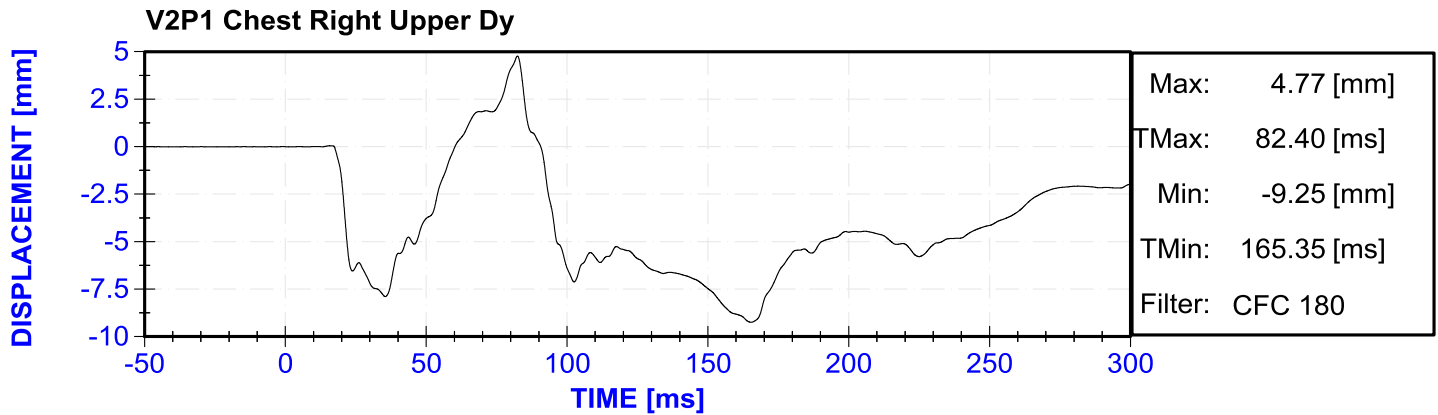


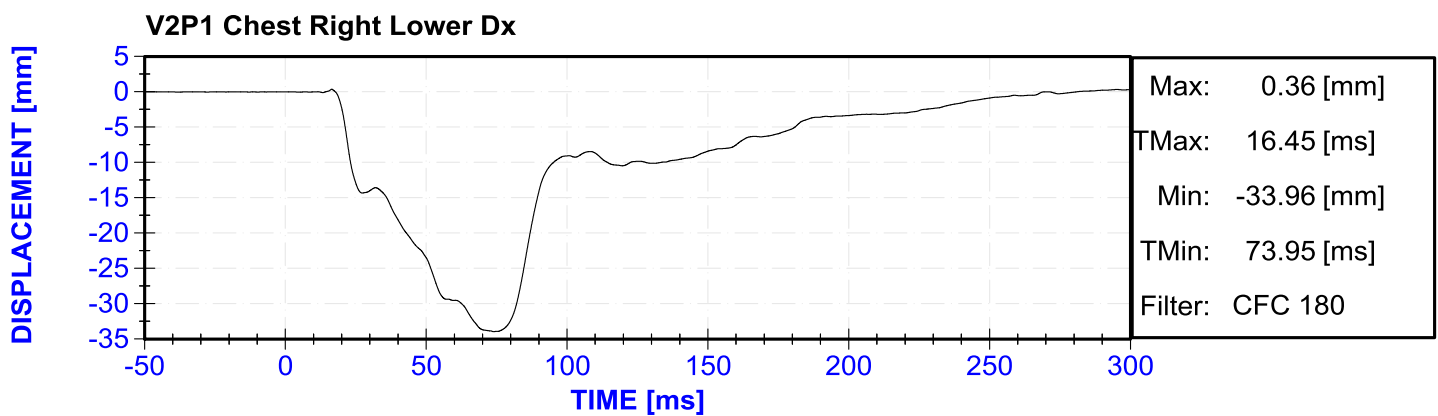
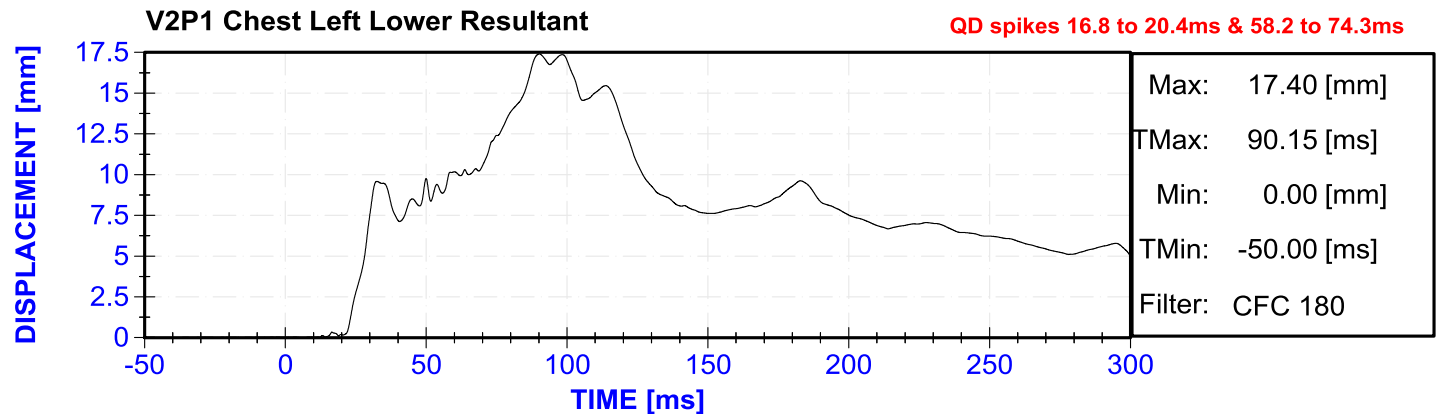
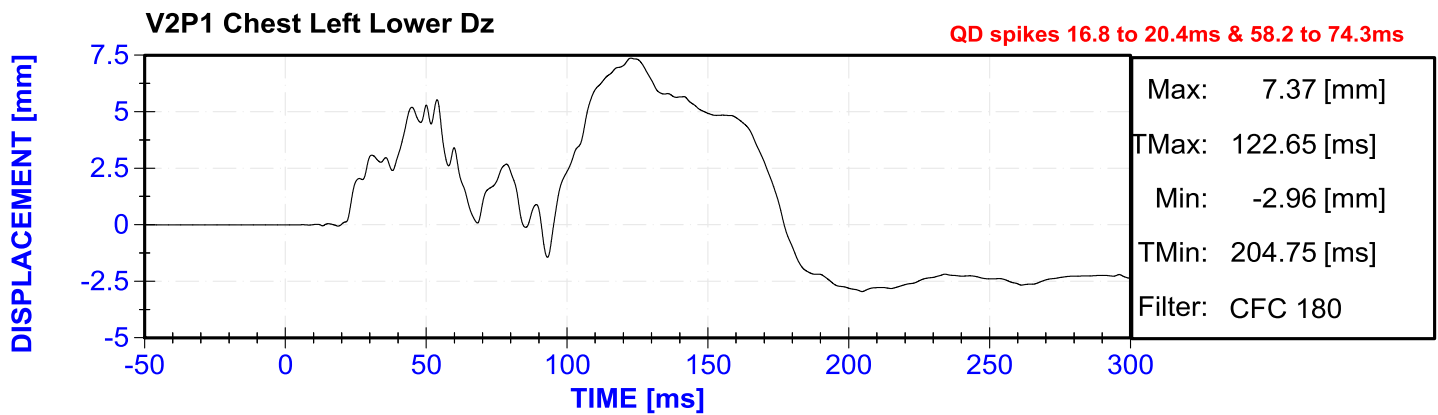
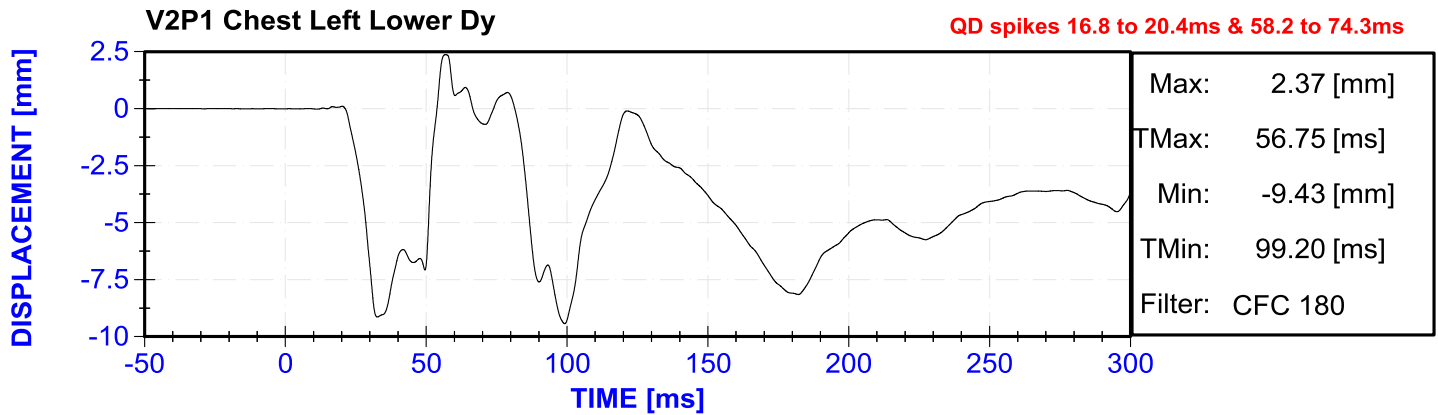


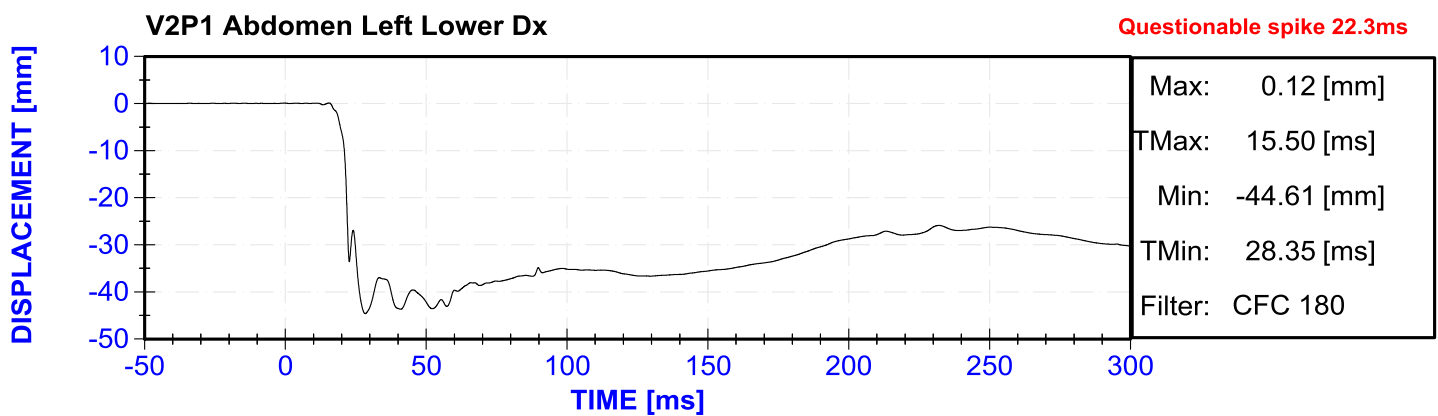
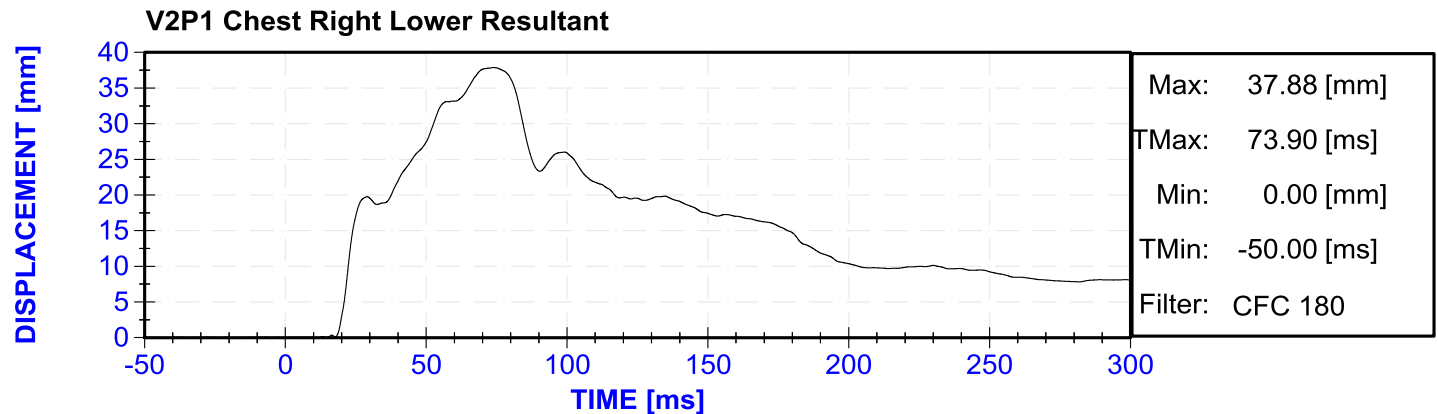
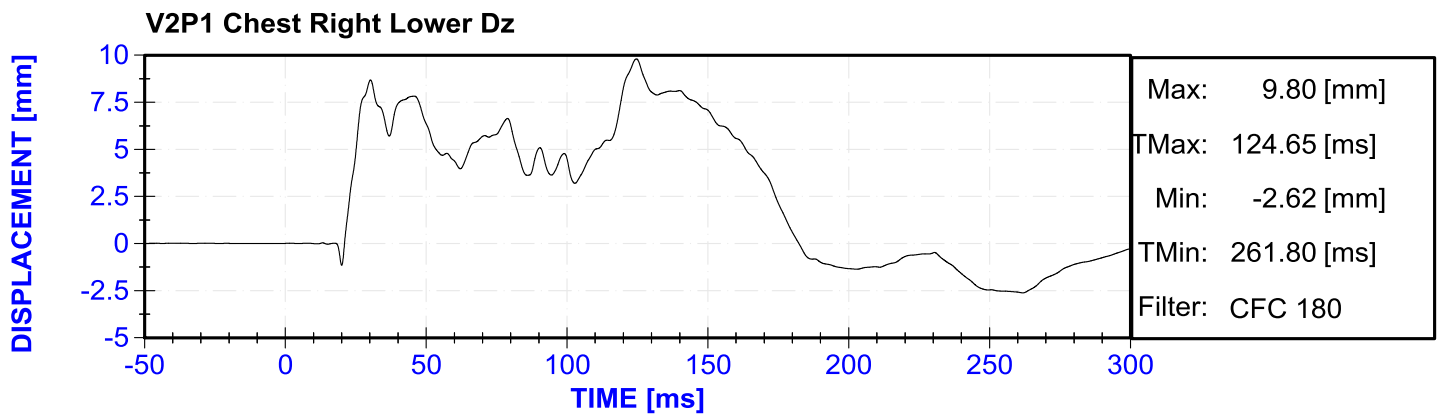
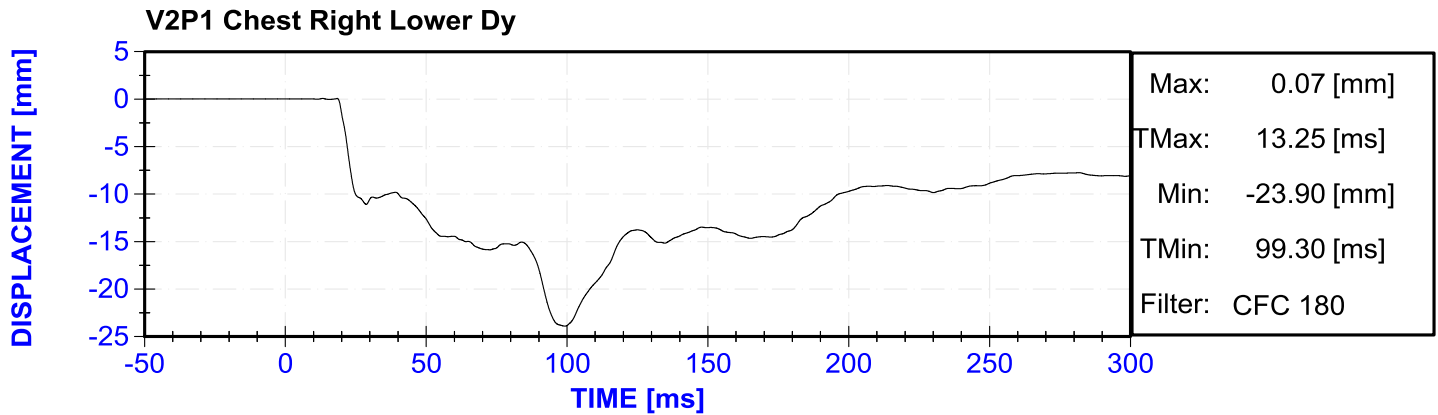


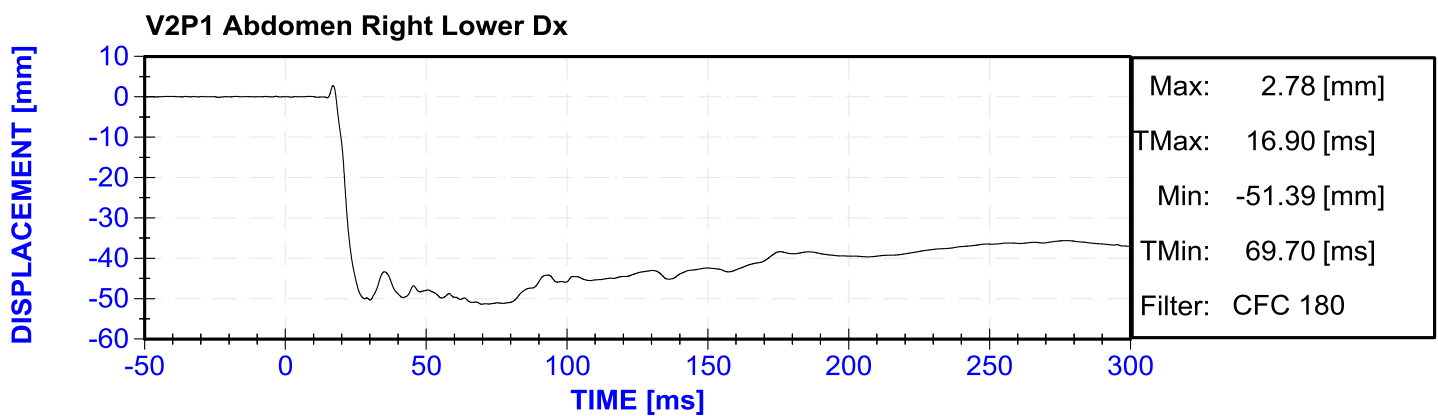
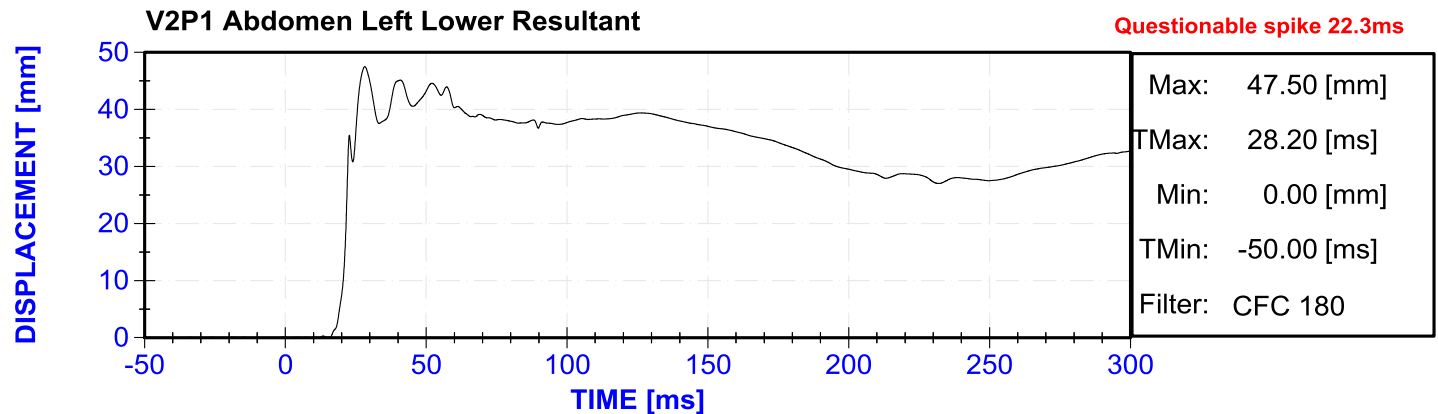
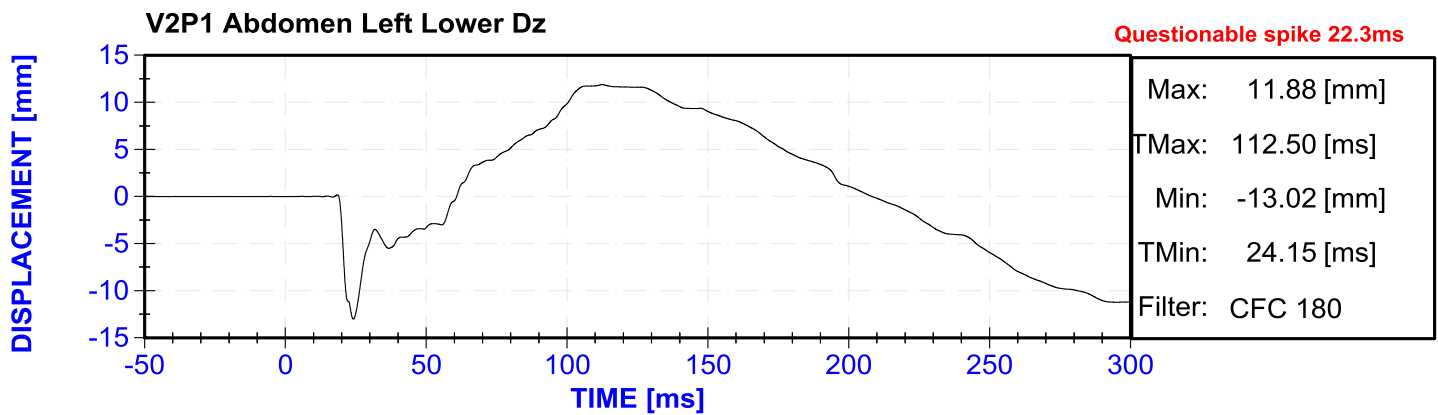
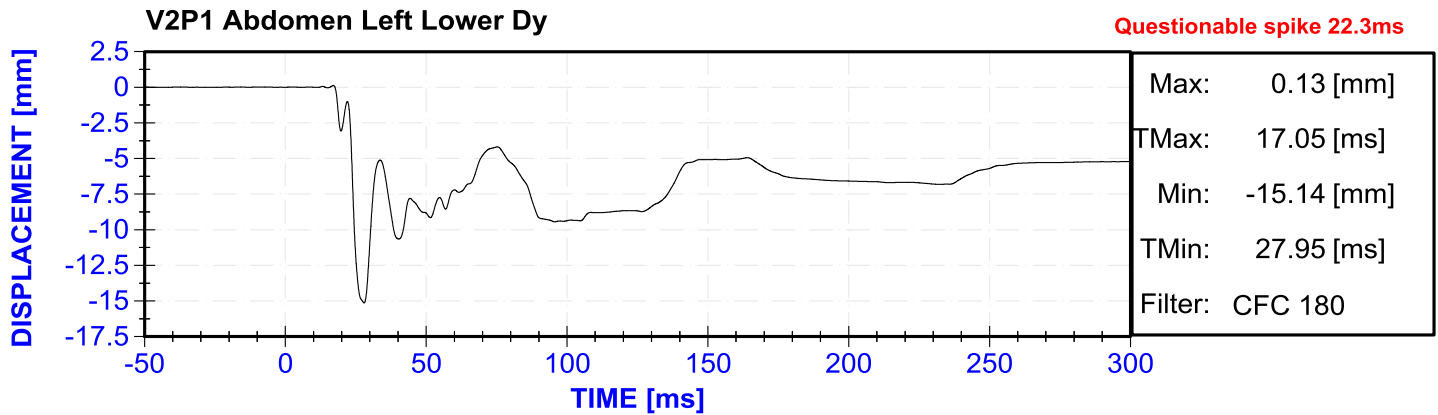


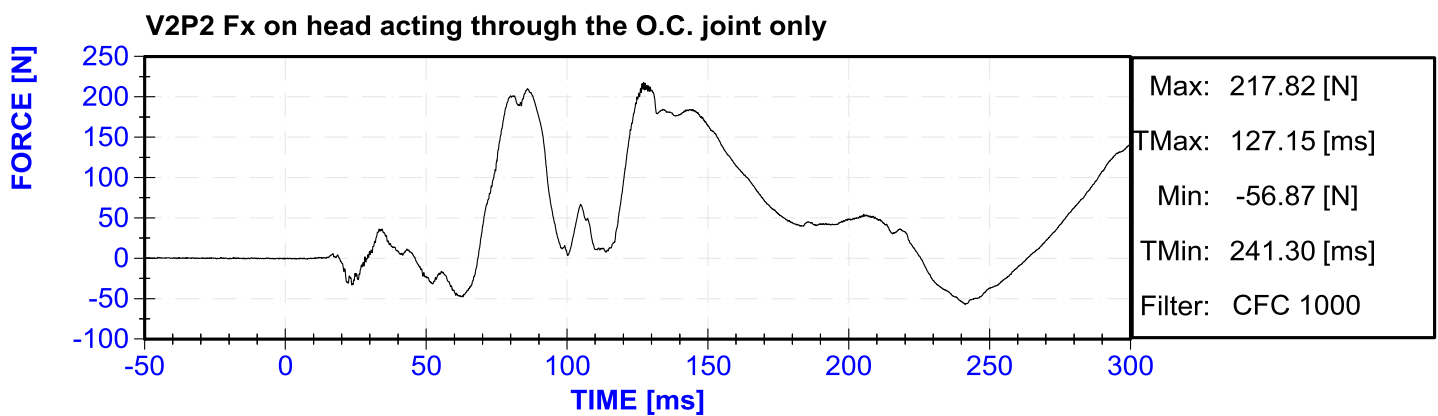
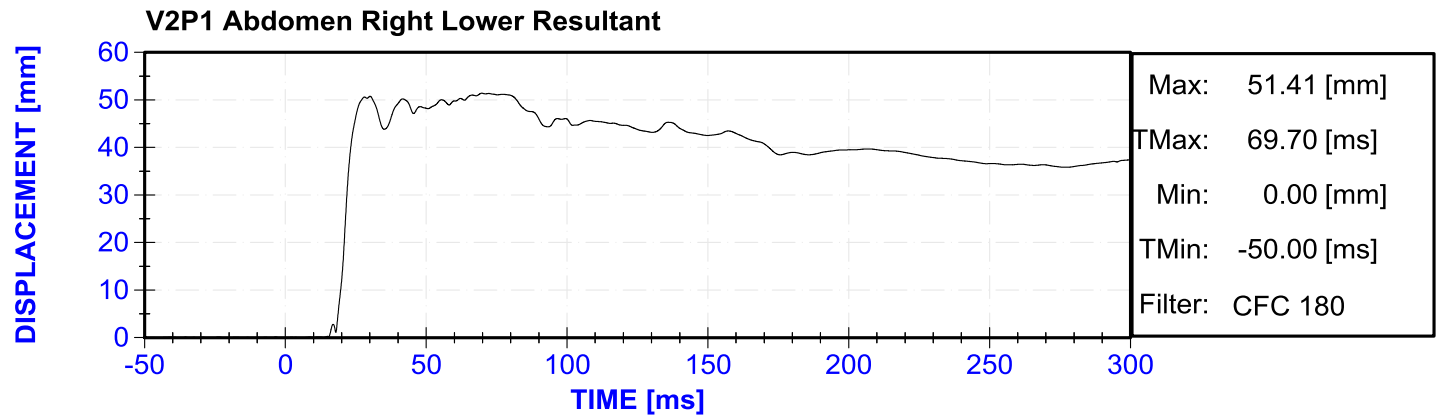
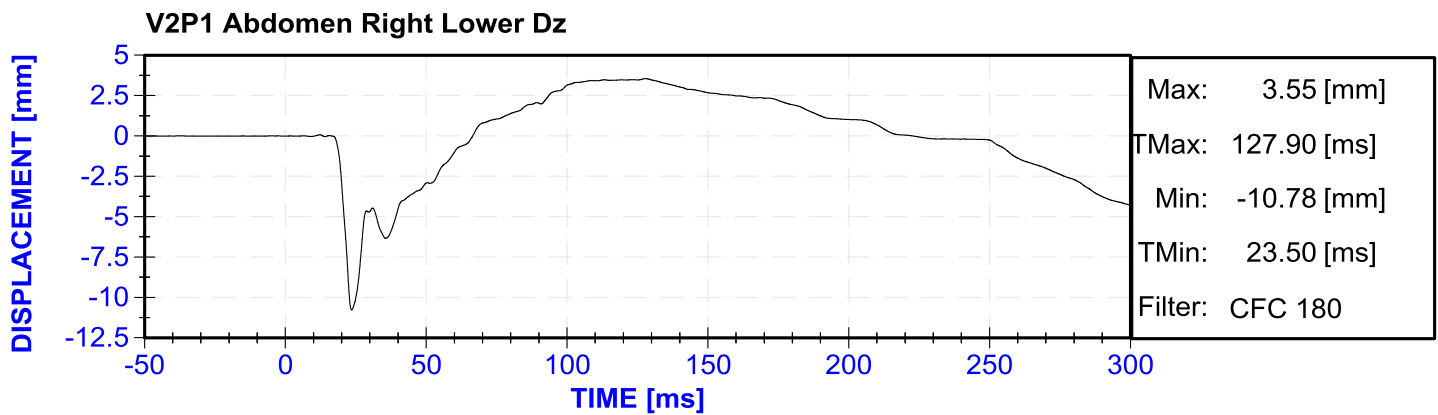
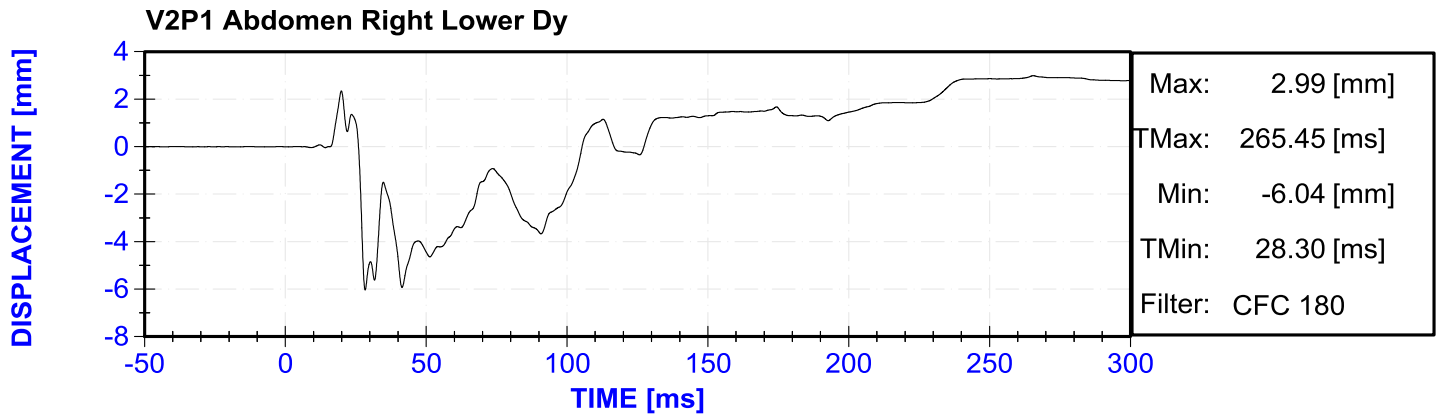


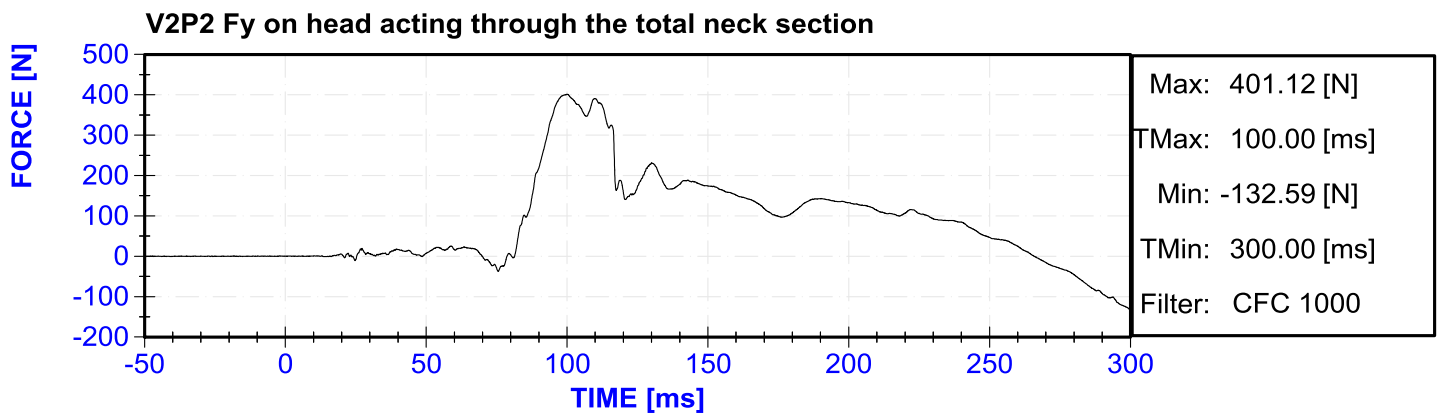
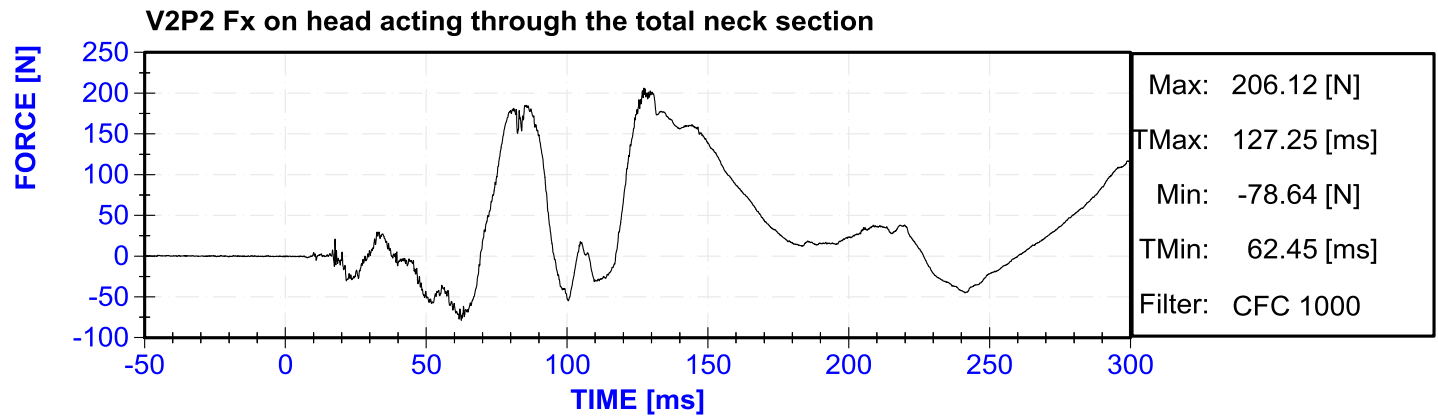
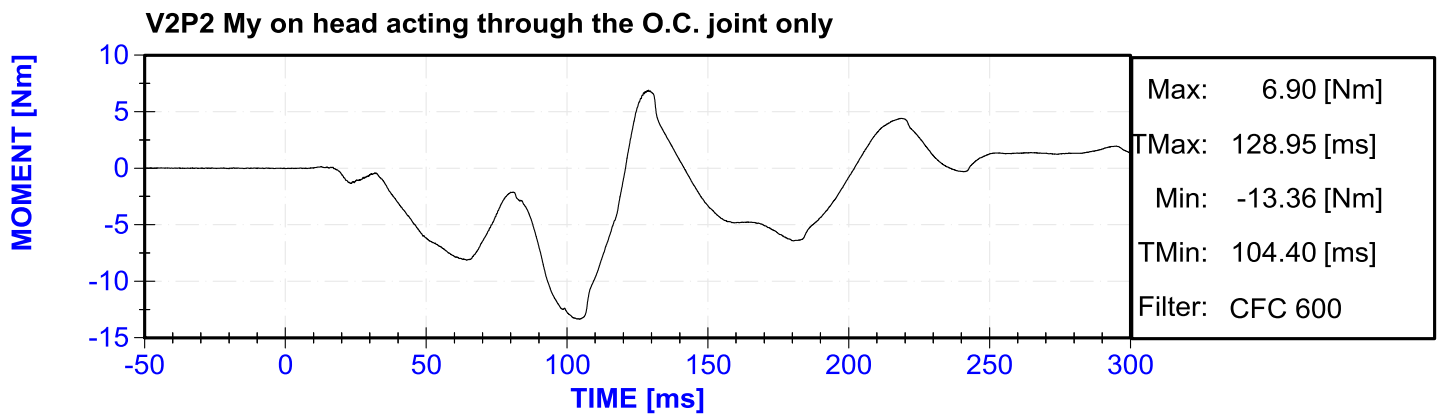
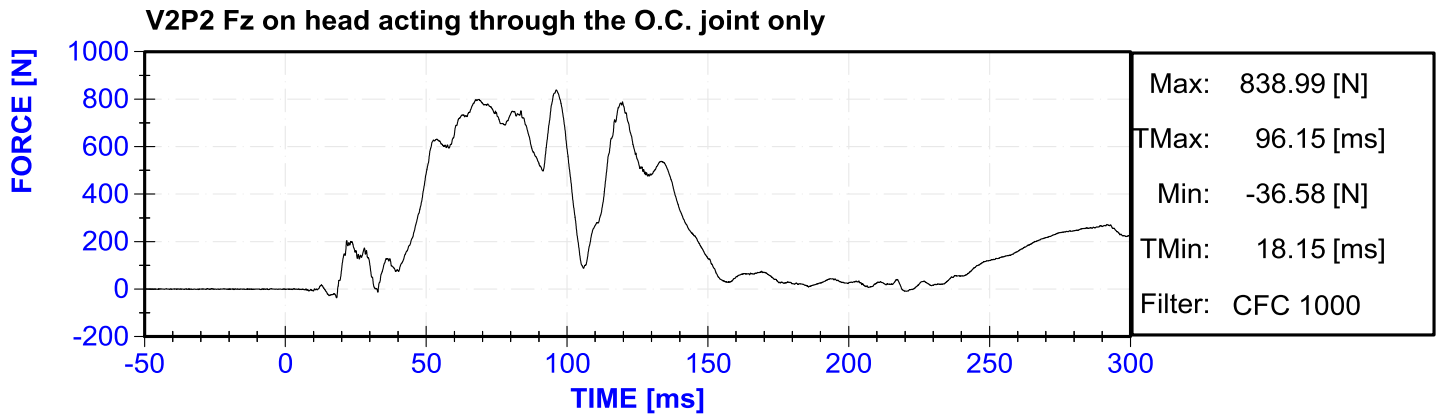




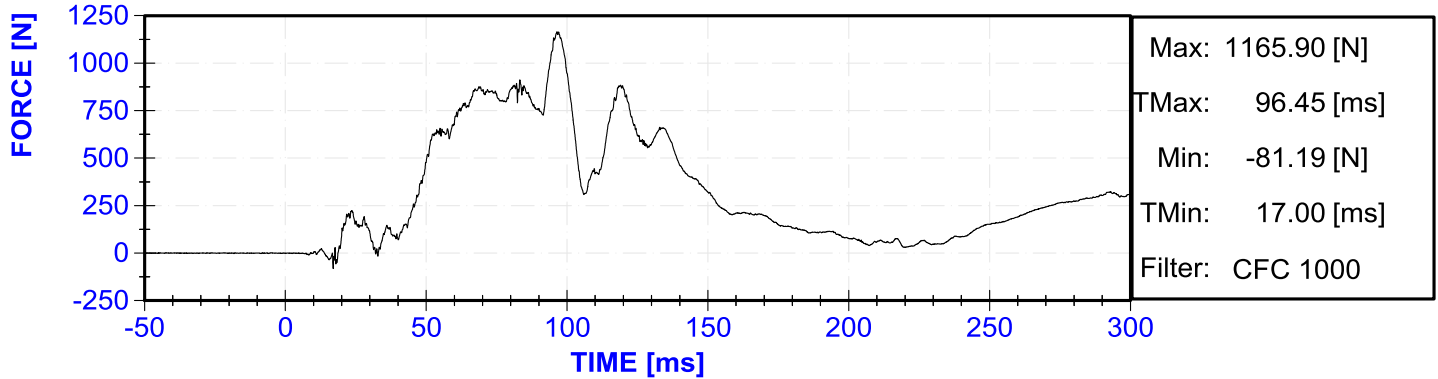




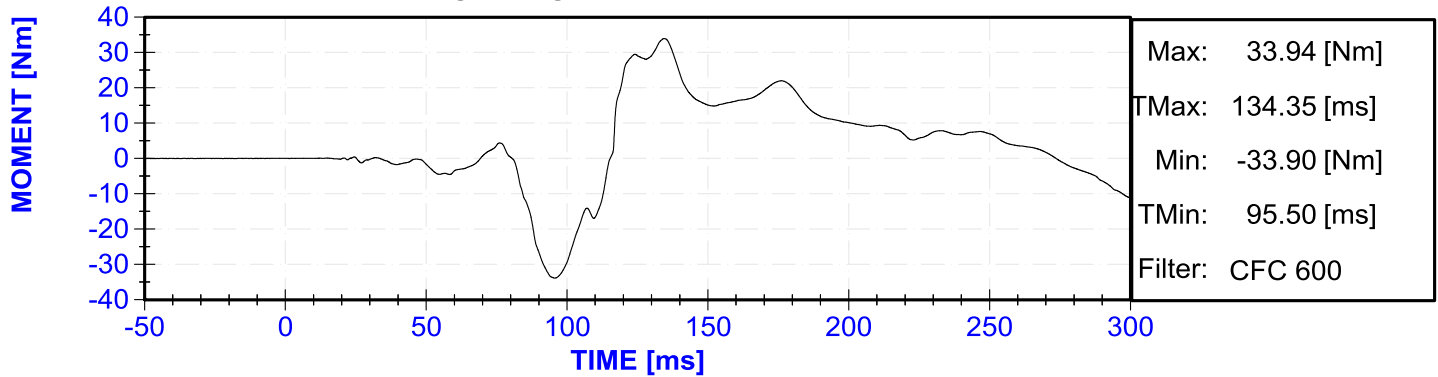




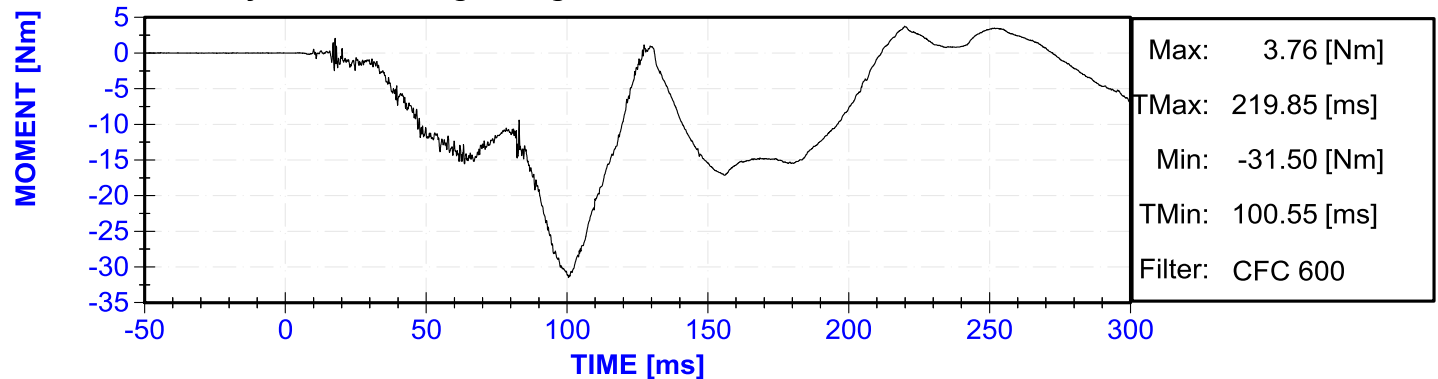
V2P2 Fz on head acting through the total neck section



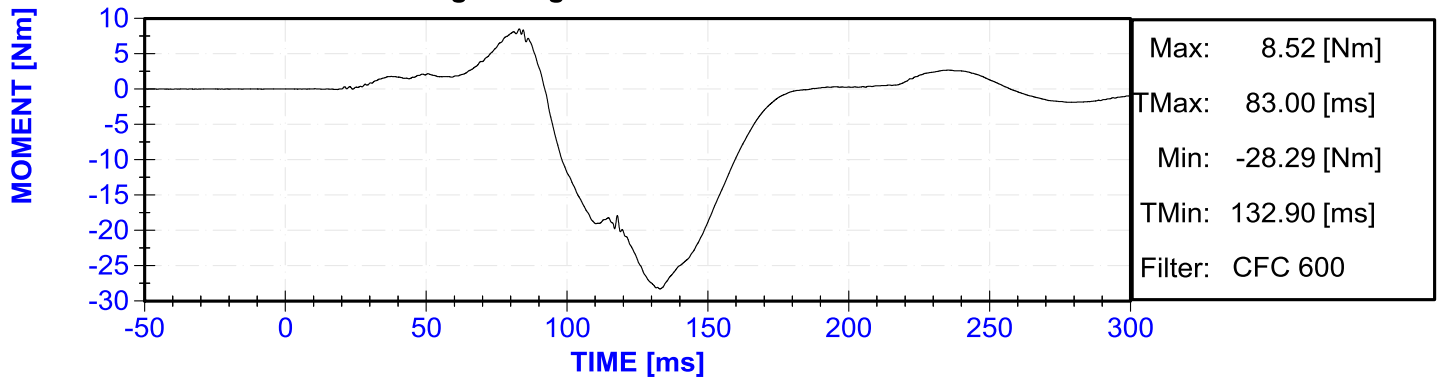
V2P2 Mx on head acting through the total neck section

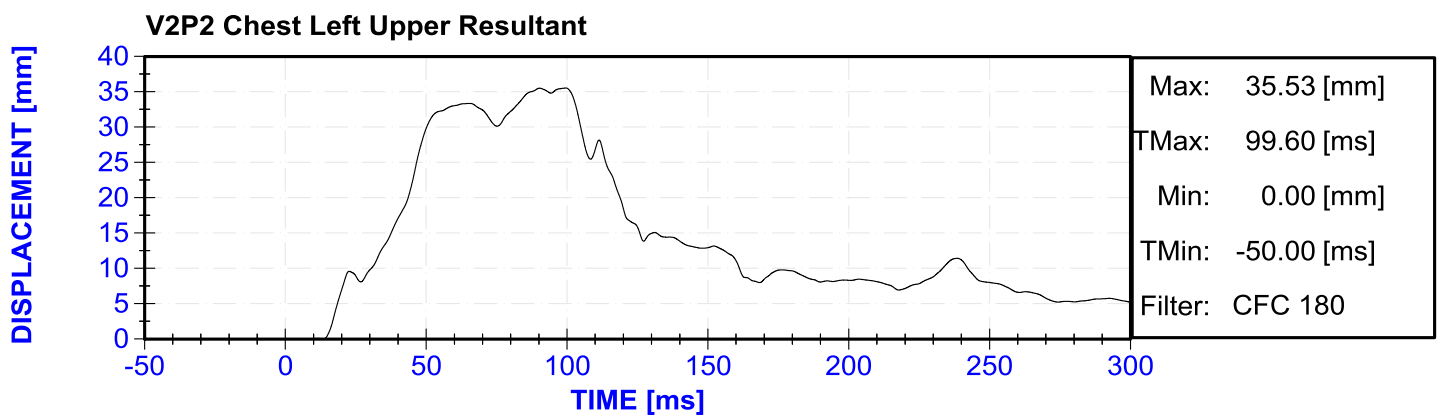
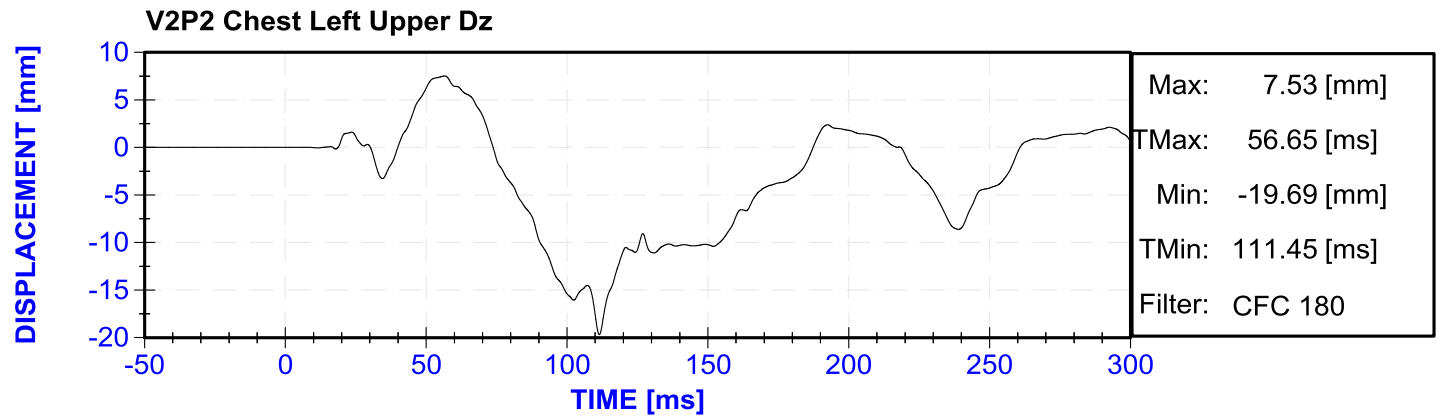
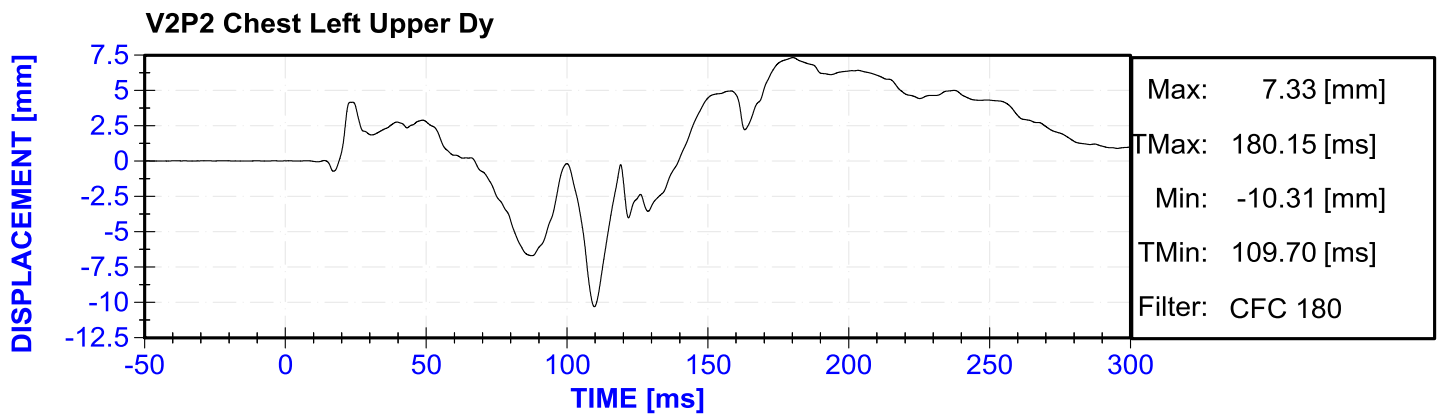
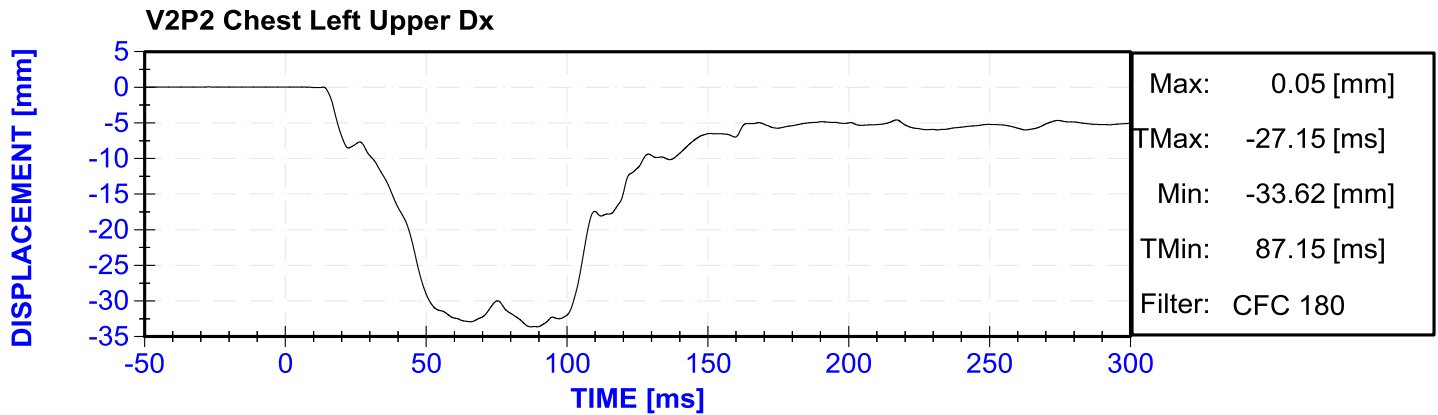


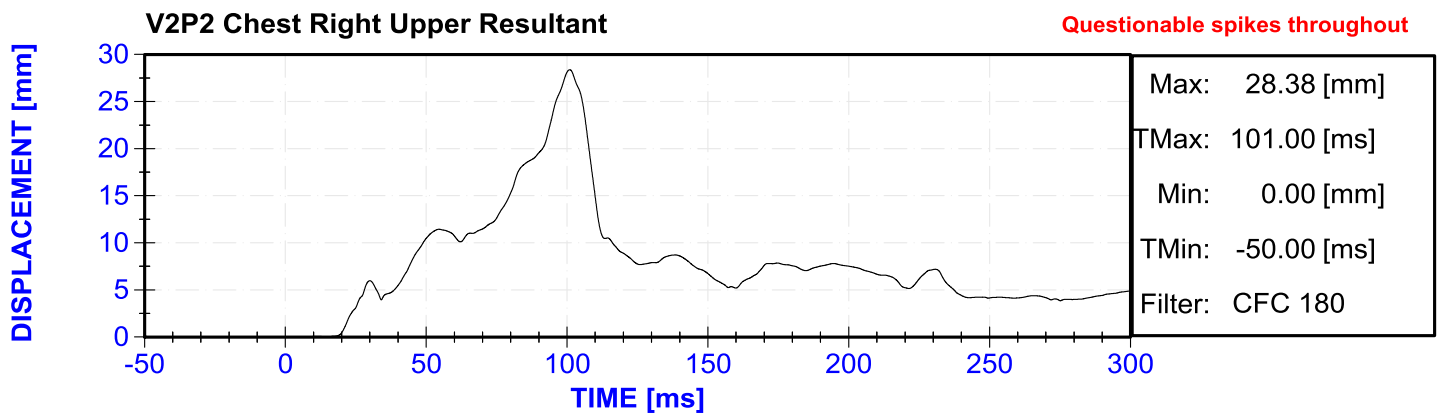
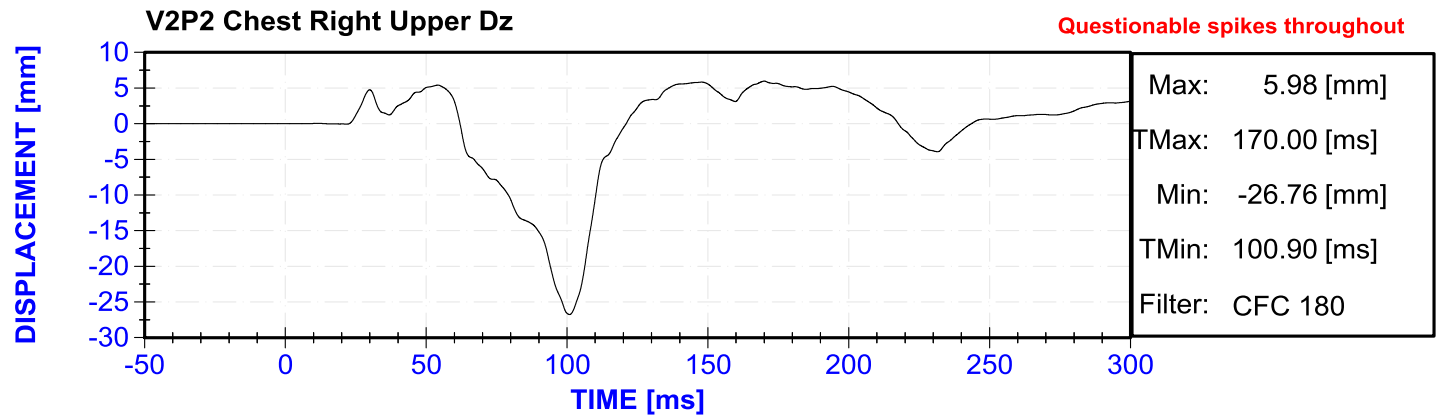
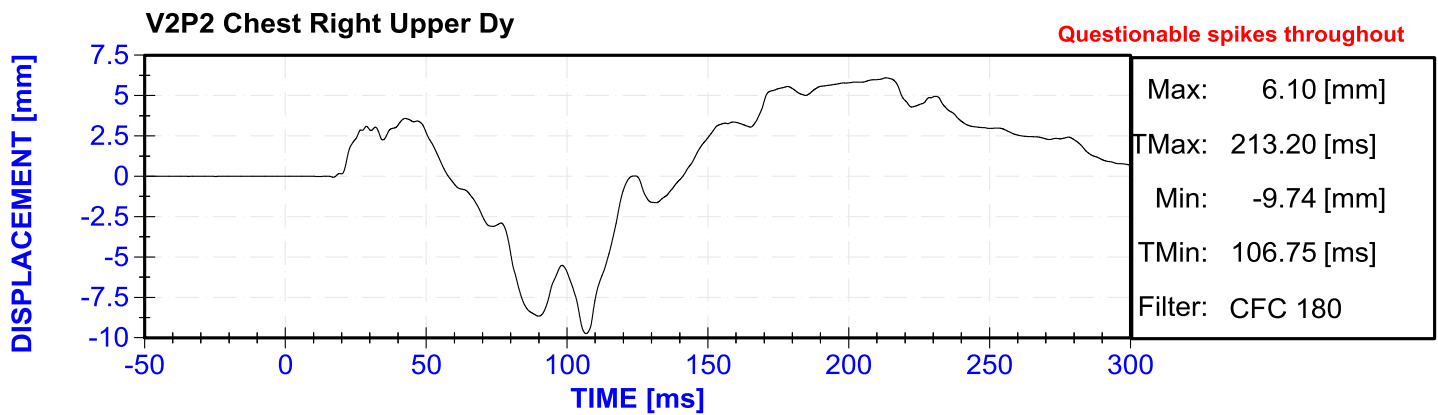
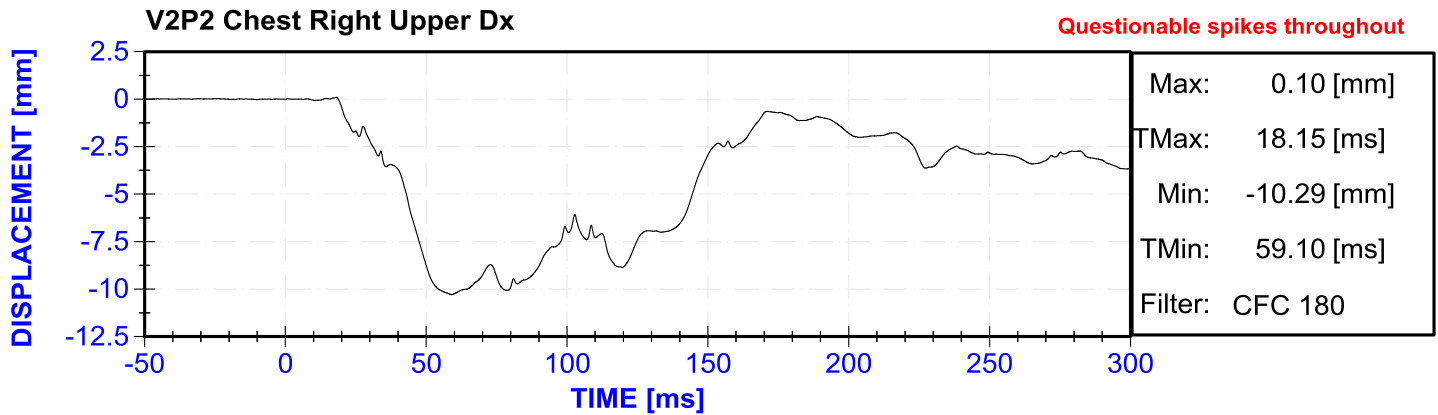
V2P2 My on head acting through the total neck section

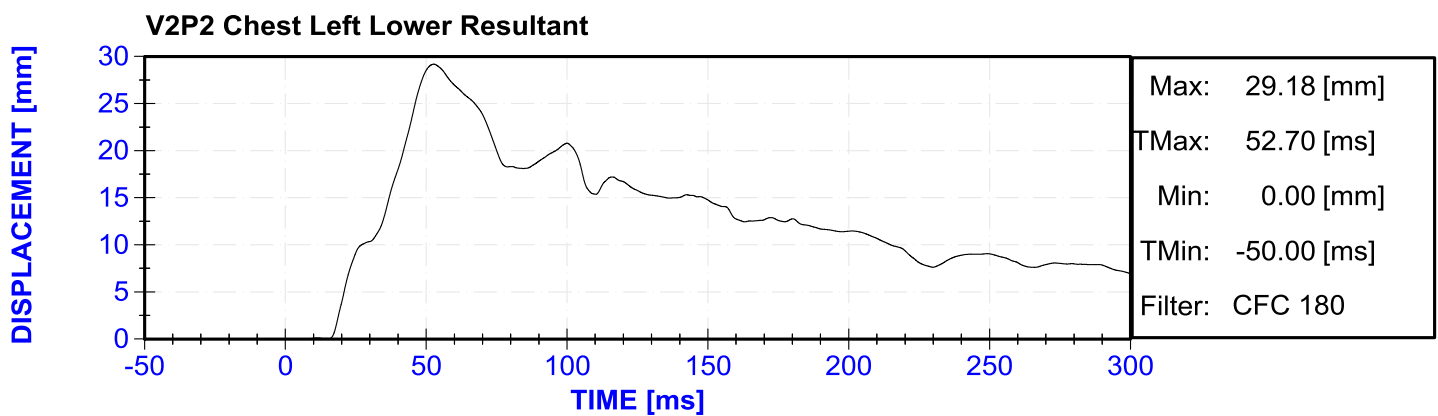
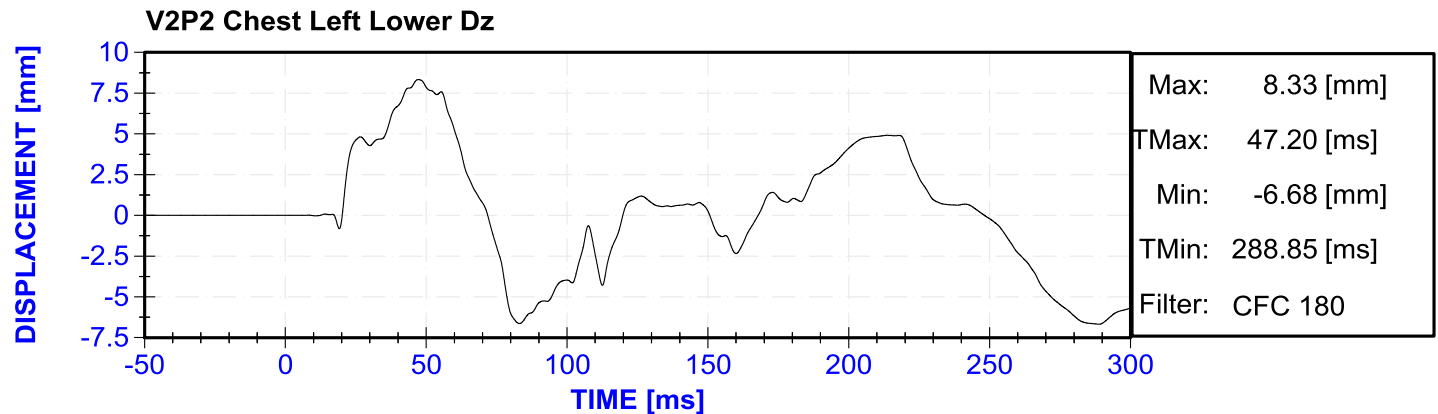
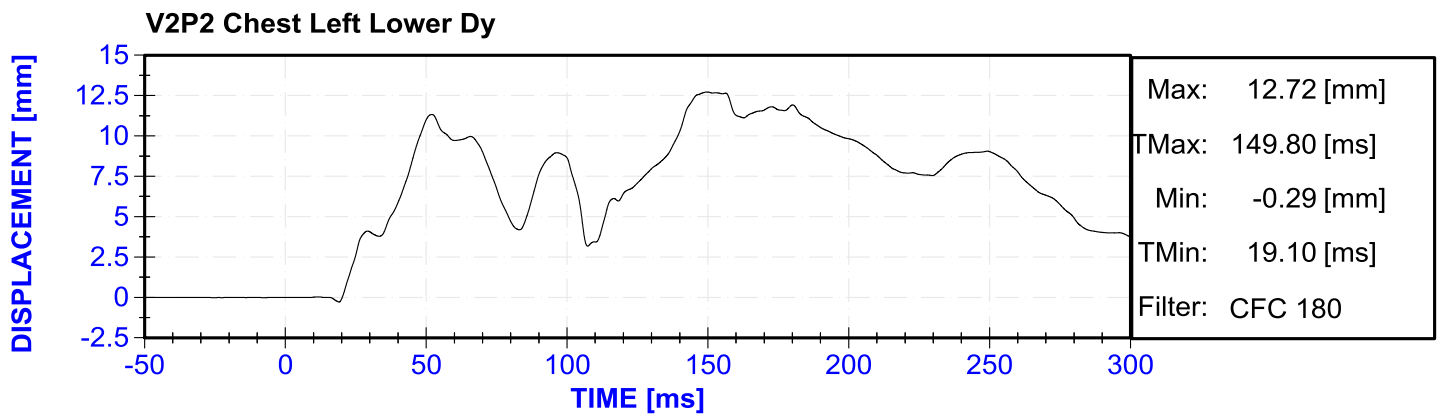
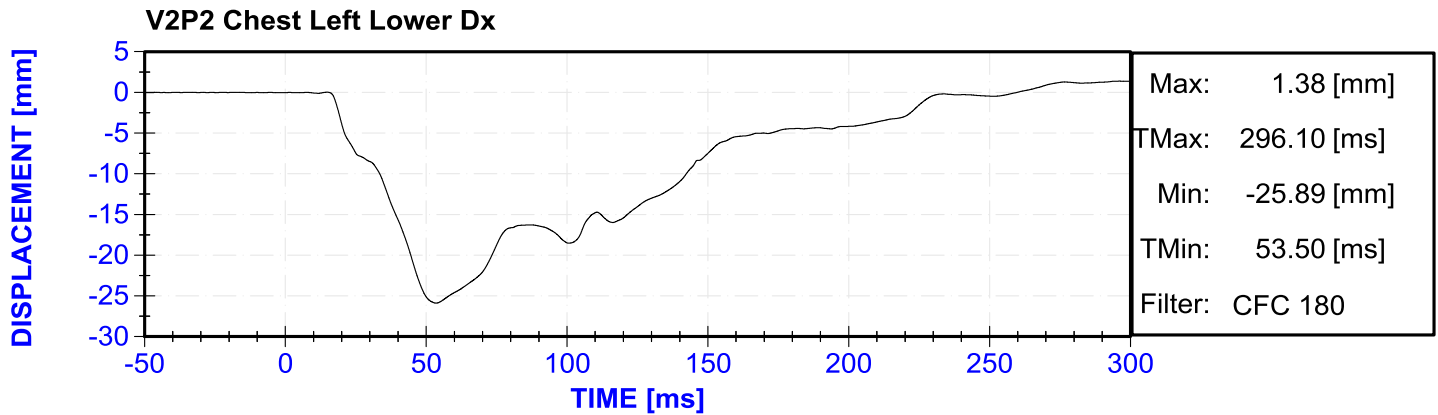


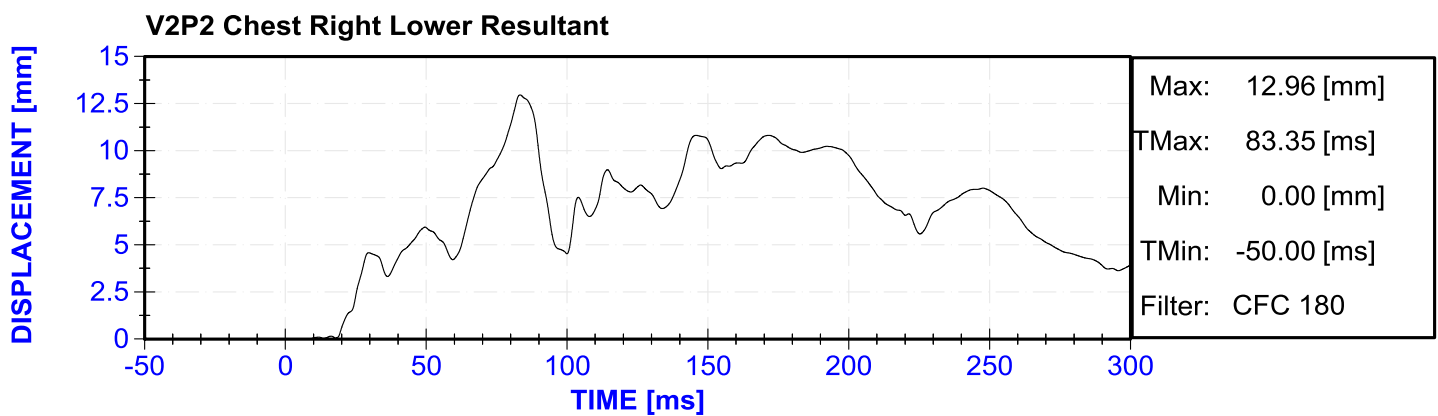
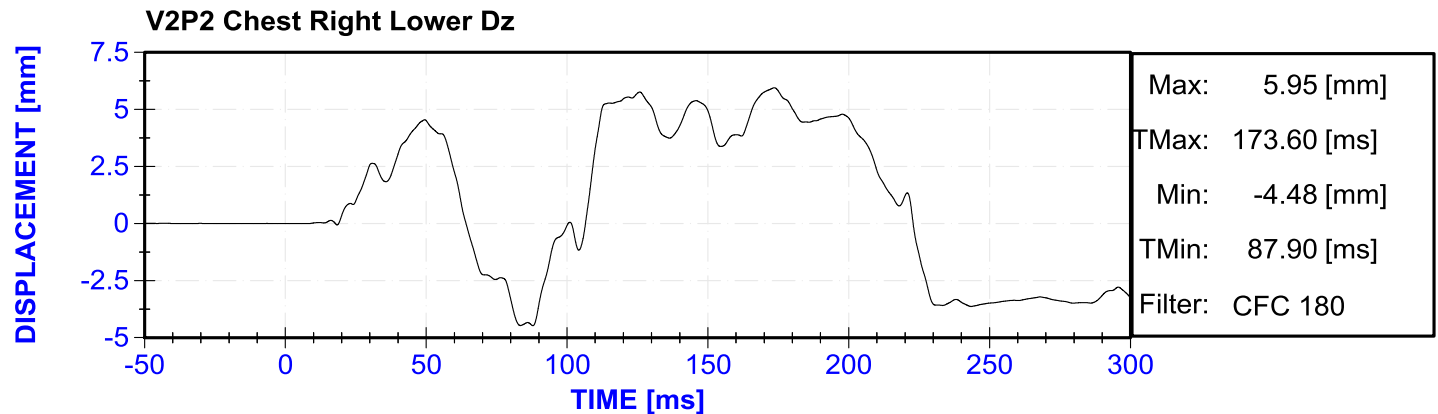
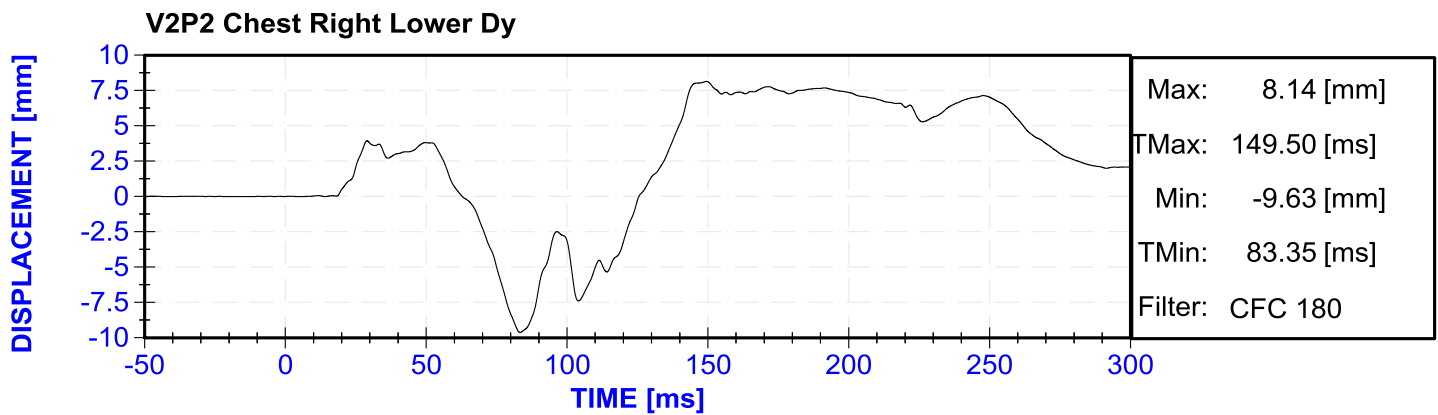
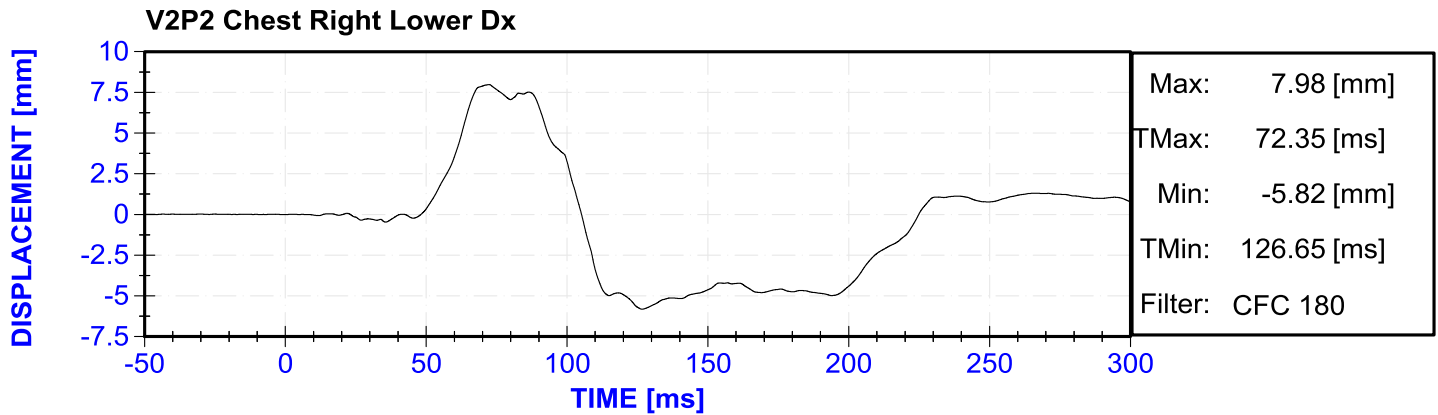
V2P2 Mz on head acting through the total neck section

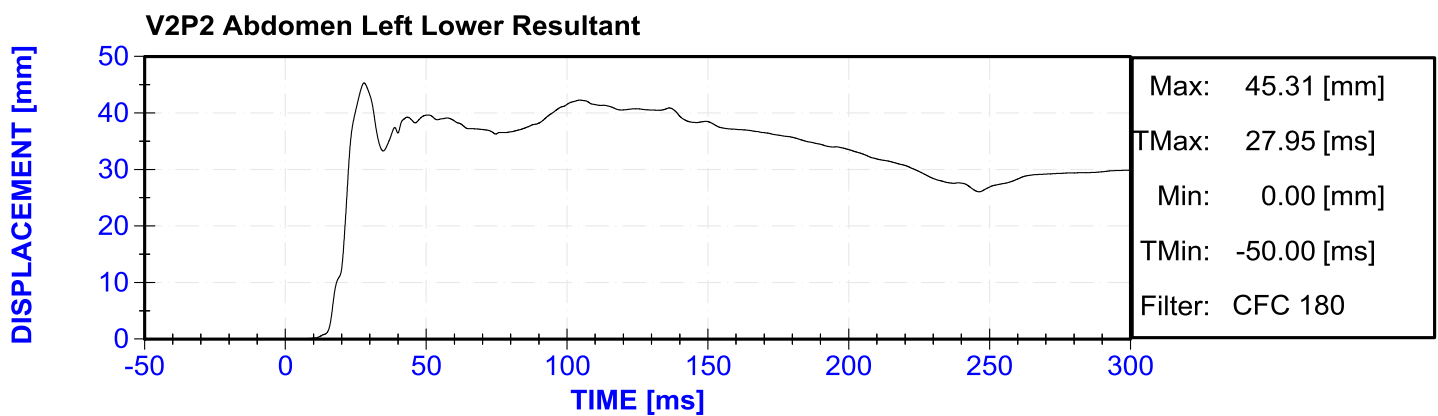
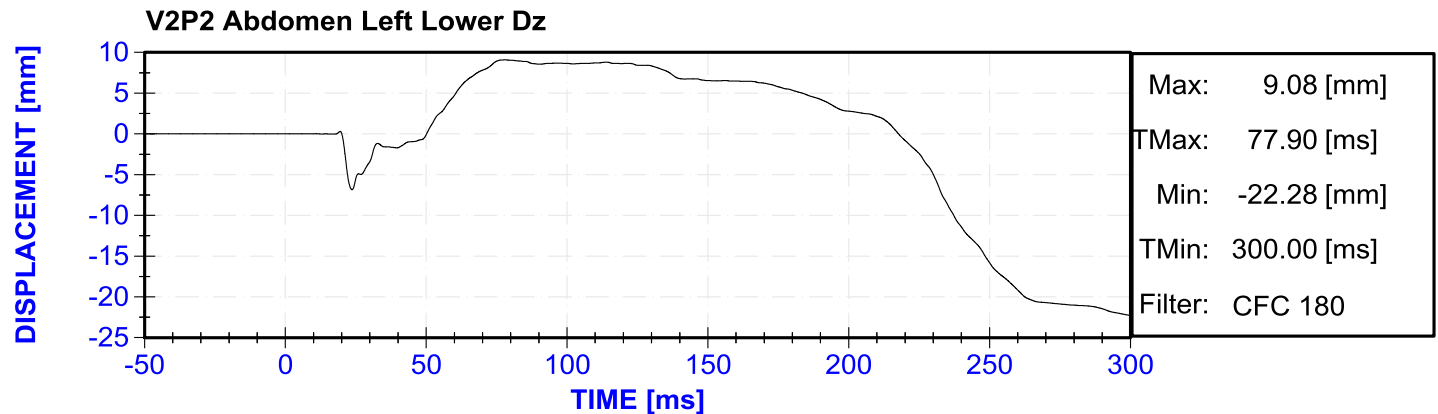
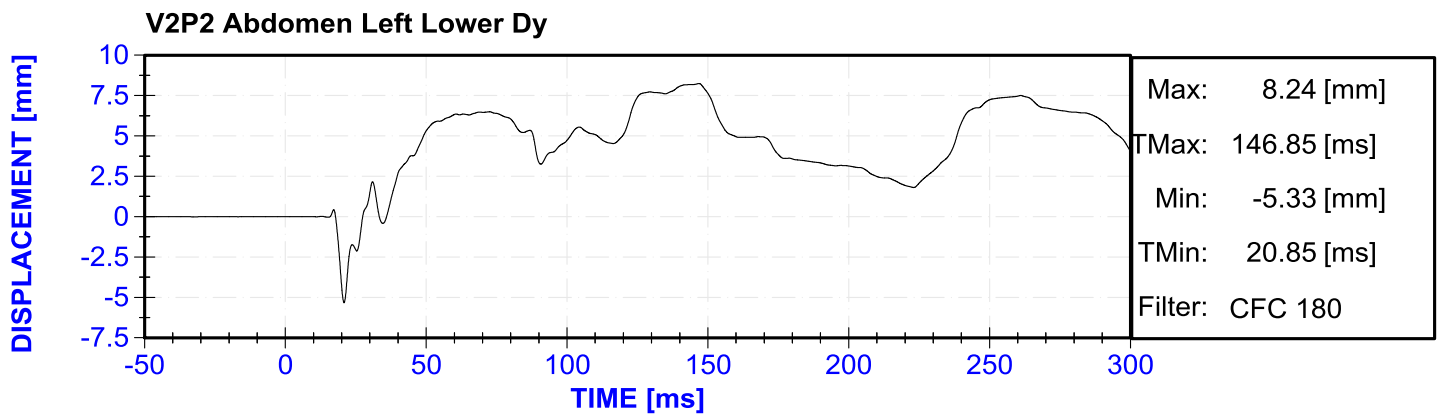
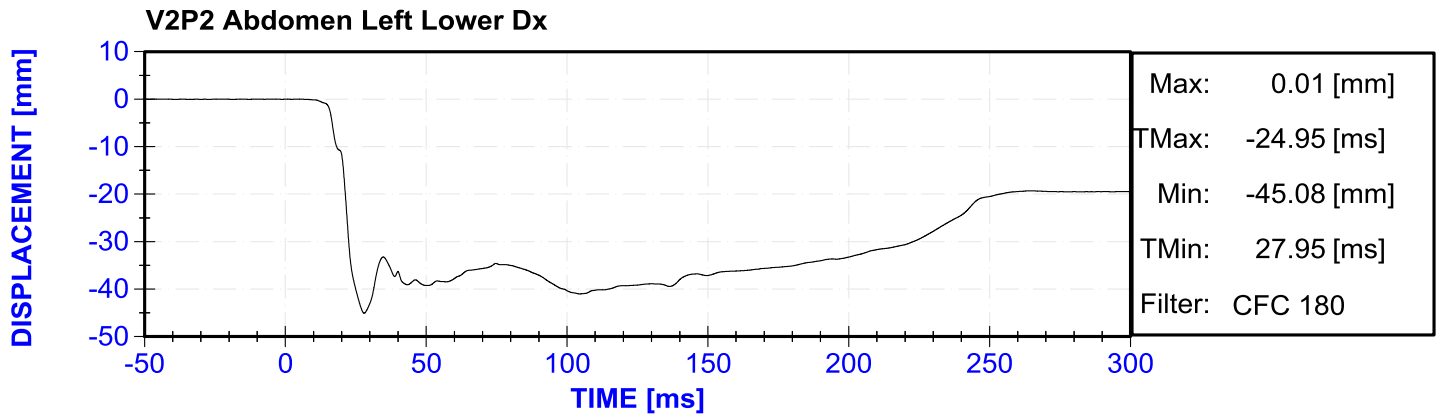


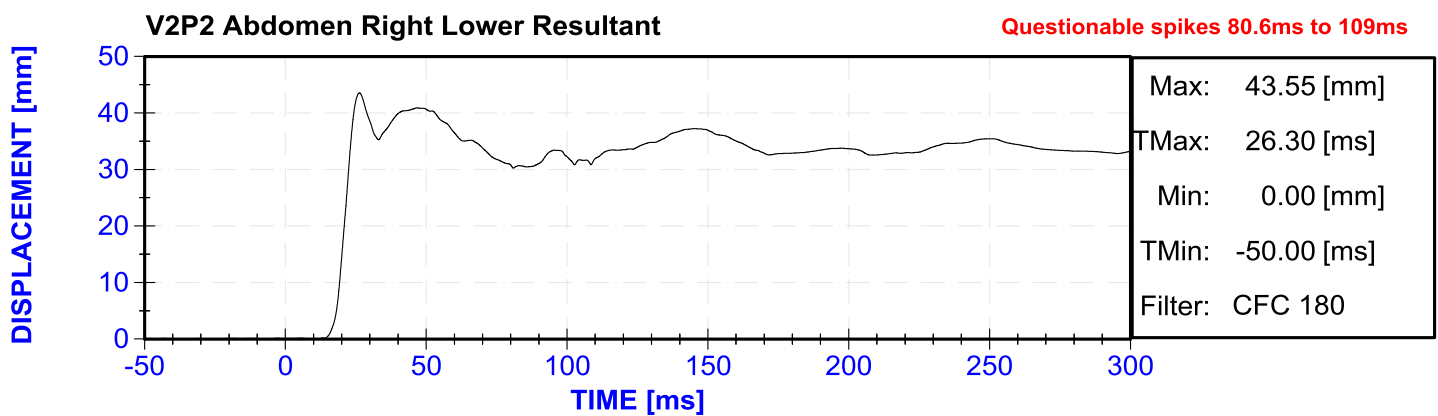
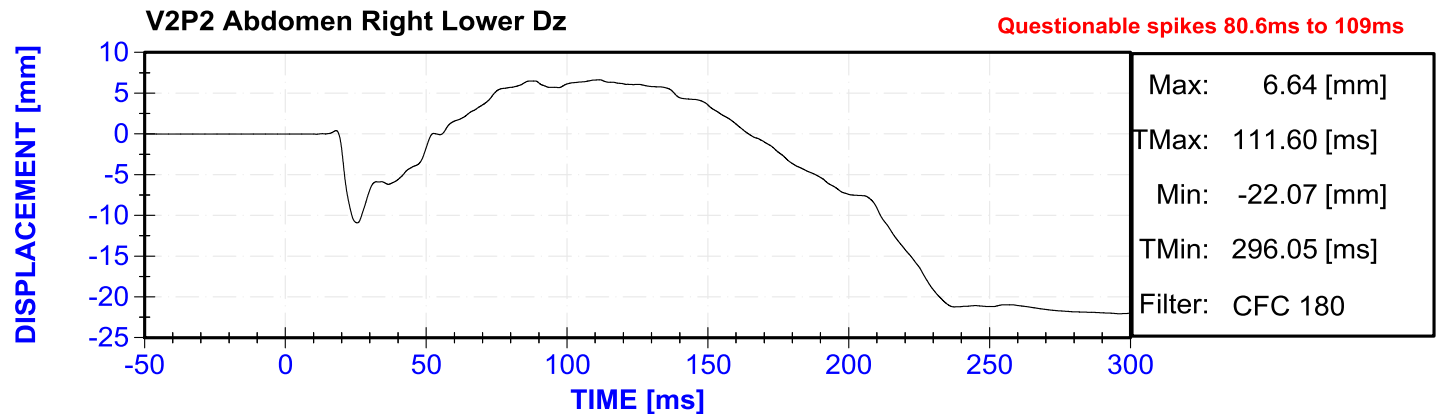
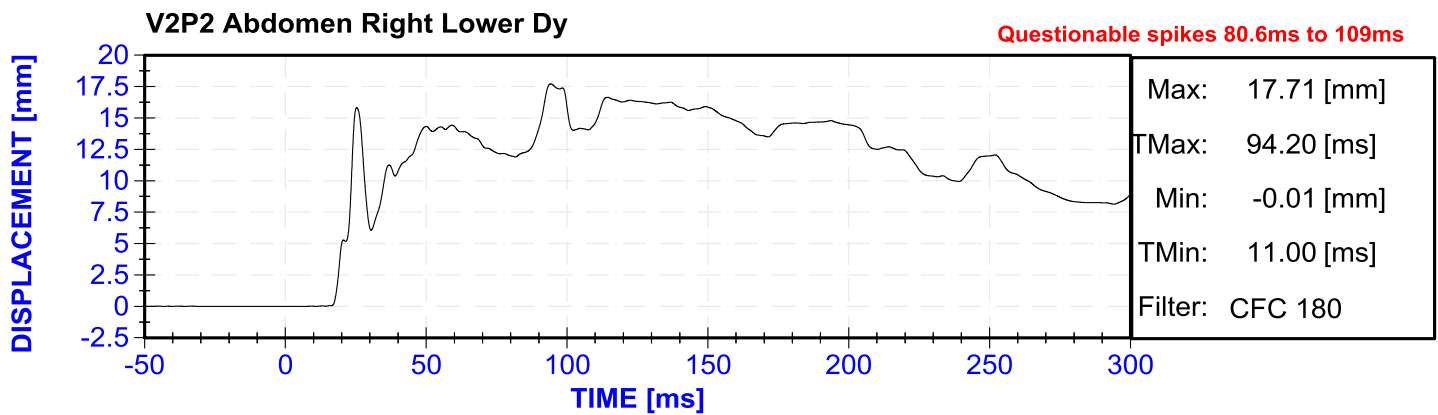
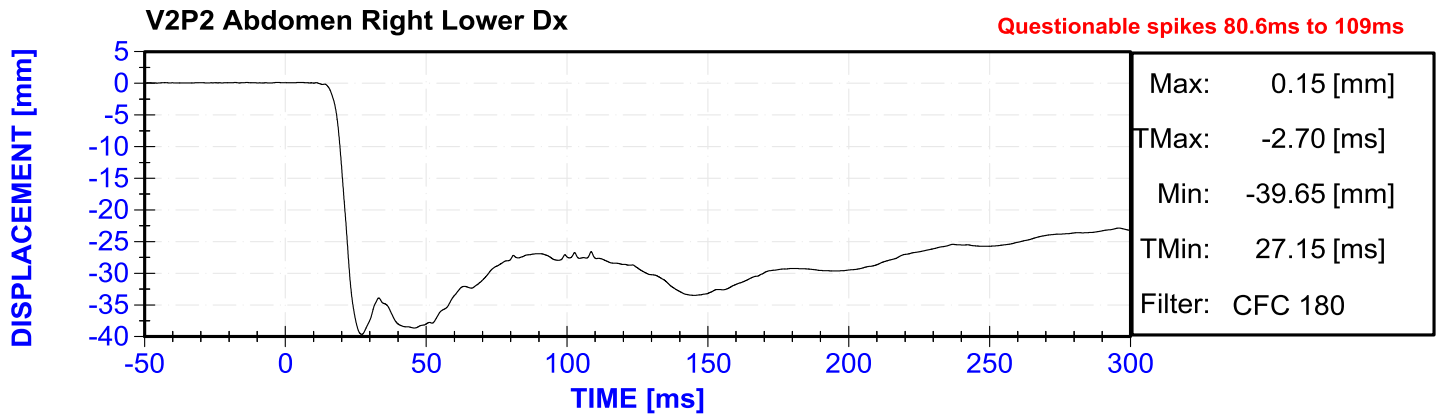












APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA SHEETS

Table C-1: Dummy Information

TYPE	SERIAL NUMBER
THOR-M 50 TH Male	DO9798
THOR-M 50 TH Male	DL9207

Table C- 2: THOR Dummy Initial Set-Up Information

THOR – M S/N: DO9798					
Sensor	Manufacturer	Serial Number	Range	Sensitivity	Sensitivity Units
Head CG X Acceleration	Endevco 7264	AC-P52001	2003	0.019659999	mV/V/g
Head CG Y Acceleration	Endevco 7264	AC-P51697	2029	0.022130000	mV/V/g
Head CG Z Acceleration	Endevco 7264	AC-P75155	2039	0.017939999	mV/V/g
Head CG Angular Velocity About X	DTS ARS 18k	ARS-6733	18098	0.094299998	mV/deg/s
Head CG Angular Velocity About Y	DTS ARS 18k	ARS-4071	18334	0.093089999	mV/deg/s
Head CG Angular Velocity About Z	DTS ARS 18k	ARS-4719	18343	0.093039998	mV/deg/s
Front Neck Spring Tower Load Cell	Humanetics 6005JFL	LC-93	4480	0.000524200	mV/V/N
Rear Neck Spring Tower Load Cell	Humanetics 6005JFL	LC-132	4480	0.000484300	mV/V/N
Occipital Condyle Rotation Potentiometer	Sfernice 9945	DS-DK5913	120	3.045160091	mV/V/deg
Upper Neck X Force	Humanetics 10380J14	LC-DS9758 Fx	8900	0.000232900	mV/V/N
Upper Neck Y Force	Humanetics 10380J14	LC-DS9758 Fy	8925	0.000230400	mV/V/N
Upper Neck Z Force	Humanetics 10380J14	LC-DS9758 Fz	13345	0.000087000	mV/V/N
Upper Neck X Moment	Humanetics 10380J14	LC-DS9758 Mx	283	0.005890300	mV/V/Nm
Upper Neck Y Moment	Humanetics 10380J14	LC-DS9758 My	283	0.005963400	mV/V/Nm
Upper Neck Z Moment	Humanetics 10380J14	LC-DS9758 Mz	283	0.009479200	mV/V/Nm
Lower Neck X Force	Humanetics 10381J14	LC-DK3607 Fx	13445	0.000168500	mV/V/N
Lower Neck Y Force	Humanetics 10381J14	LC-DK3607 Fy	13429	0.000168700	mV/V/N
Lower Neck Z Force	Humanetics 10381J14	LC-DK3607 Fz	13385	0.000068800	mV/V/N
Lower Neck X Moment	Humanetics 10381J14	LC-DK3607 Mx	452	0.004012500	mV/V/Nm
Lower Neck Y Moment	Humanetics 10381J14	LC-DK3607 My	452	0.004072100	mV/V/Nm
Lower Neck Z Moment	Humanetics 10381J14	LC-DK3607 Mz	227	0.006723800	mV/V/Nm
Thorax Upper Left X Displacement	Humanetics IF-364-C-R3	DS-DQ2255	2	1000.000000000	mV/V
Thorax Upper Left Y Rotation	Sfernice 9945	DS-DM4779	94	3.039699979	mV/V/deg
Thorax Upper Left Z Rotation	Sfernice 9945	DS-DM4778	93	3.046999918	mV/V/deg
Thorax Upper Right X Displacement	Humanetics IF-364-C-R3	DS-DQ2254	2	1000.000000000	mV/V
Thorax Upper Right Y Rotation	Sfernice 9945	DS-DM4774	94	3.041200107	mV/V/deg
Thorax Upper Right Z Rotation	Sfernice 9945	DS-DM4775	93	3.062600037	mV/V/deg
Thorax Lower Left X Displacement	Humanetics IF-364-C-R3	DS-DK3866	2	1000.000000000	mV/V
Thorax Lower Left Y Rotation	Sfernice 9945	DS-DJ5455	93	3.046999918	mV/V/deg
Thorax Lower Left Z Rotation	Sfernice 9945	DS-DJ5454	93	3.051300067	mV/V/deg
Thorax Lower Right X Displacement	Humanetics IF-364-C-R3	DS-DK3865	2	1000.000000000	mV/V

Thorax Lower Right Y Rotation	Sfernice 9945	DS-DJ5453	93	3.059299896	mV/V/deg
Thorax Lower Right Z Rotation	Sfernice 9945	DS-DJ5452	93	3.050599946	mV/V/deg
Abdomen Left X Displacement	Humanetics 9910	DS-183	2	1000.000000000	mV/V
Abdomen Left Y Rotation	Sfernice 9945	DS-DJ5443	94	3.029499901	mV/V/deg
Abdomen Left Z Rotation	Sfernice 9945	DS-DJ5444	90	2.990900073	mV/V/deg
Abdomen Right X Displacement	Humanetics 9910	DS-DI4779	2	1000.000000000	mV/V
Abdomen Right Y Rotation	Sfernice 9945	DS-DJ5445	93	3.059600014	mV/V/deg
Abdomen Right Z Rotation	Sfernice 9945	DS-DJ5446	93	3.072099993	mV/V/deg
T1 X Acceleration	Endevco 7264	AC-P63843	2012	0.023560000	mV/V/g
T1 Y Acceleration	Endevco 7264	AC-P52008	2017	0.018940000	mV/V/g
T1 Z Acceleration	Endevco 7264	AC-P51636	2032	0.021719999	mV/V/g
T4 X Acceleration	Endevco 7264	AC-P75156	2009	0.018200000	mV/V/g
T4 Y Acceleration	Endevco 7264	AC-P84363	2019	0.019810001	mV/V/g
T4 Z Acceleration	Endevco 7264	AC-P51715	2012	0.017920000	mV/V/g
Pelvis X Acceleration	Endevco 7264	AC-P58747	2004	0.018510000	mV/V/g
Pelvis Y Acceleration	Endevco 7264	AC-P52004	2031	0.021010001	mV/V/g
Pelvis Z Acceleration	Endevco 7264	AC-P71875	2029	0.020680000	mV/V/g
Spine Force X	Humanetics 10415JI4	LC-DQ5600 Fx	13376	0.000146100	mV/V/N
Spine Force Y	Humanetics 10415JI4	LC-DQ5600 Fy	13412	0.000145700	mV/V/N
Spine Force Z	Humanetics 10415JI4	LC-DQ5600 Fz	17795	0.000060700	mV/V/N
Spine Moment X	Humanetics 10415JI4	LC-DQ5600 Mx	680	0.002202000	mV/V/Nm
Spine Moment Y	Humanetics 10415JI4	LC-DQ5600 My	906	0.001909600	mV/V/Nm
Acetabular Left X Force	Humanetics 10530JI4	LC-DM1945 Fx	22315	0.000119500	mV/V/N
Acetabular Left Y Force	Humanetics 10530JI4	LC-DM1945 Fy	13348	0.000060500	mV/V/N
Acetabular Left Z Force	Humanetics 10530JI4	LC-DM1945 Fz	13358	0.000163800	mV/V/N
Acetabular Right X Force	Humanetics 10670JI4	LC-DL9552 Fx	22309	0.000118300	mV/V/N
Acetabular Right Y Force	Humanetics 10670JI4	LC-DL9552 Fy	13375	0.000060000	mV/V/N
Acetabular Right Z Force	Humanetics 10670JI4	LC-DL9552 Fz	13378	0.000160800	mV/V/N
Iliac Left X Force	Humanetics 9490JFL	LC-77 Fx	13022	0.000068500	mV/V/N
Iliac Left Y Moment	Humanetics 9490JFL	LC-77 My	326	0.003816600	mV/V/Nm
Iliac Right X Force	Humanetics 9490JFL	LC-DJ5524 Fx	13027	0.000071200	mV/V/N
Iliac Right Y Moment	Humanetics 9490JFL	LC-DJ5524 My	326	0.003790700	mV/V/Nm
Femur Left X Force	Humanetics W50-71010	LC-DK0842 Fx	15118	0.000143500	mV/V/N
Femur Left Y Force	Humanetics W50-71010	LC-DK0842 Fy	15118	0.000143500	mV/V/N
Femur Left Z Force	Humanetics W50-71010	LC-DK0842 Fz	15005	0.000072600	mV/V/N
Femur Left X Moment	Humanetics W50-71010	LC-DK0842 Mx	351	0.006399600	mV/V/Nm
Femur Left Y Moment	Humanetics W50-71010	LC-DK0842 My	352	0.006497300	mV/V/Nm
Knee Left X Displacement	Space Age 150-0121V	DS-13073811	26	23.231299594	mV/V/mm
Tibia Upper Left Z Force	Denton 10390J14	LC-DQ5598 Fz	11100	0.000095300	mV/V/N
Tibia Upper Left X Moment	Denton 10390J14	LC-DQ5598 Mx	399	0.007466800	mV/V/Nm
Tibia Upper Left Y Moment	Denton 10390J14	LC-DQ5598 My	398	0.007471200	mV/V/Nm
Tibia Lower Left X Force	Denton 9329J	LC-DQ9685 Fx	11204	0.000173100	mV/V/N
Tibia Lower Left Y Force	Denton 9329J	LC-DQ9685 Fy	11128	0.000170400	mV/V/N
Tibia Lower Left Z Force	Denton 9329J	LC-DQ9685 Fz	11134	0.000096200	mV/V/N
Tibia Lower Left X Moment	Denton 9329J	LC-DQ9685 Mx	400	0.007535600	mV/V/Nm

Tibia Lower Left Y Moment	Denton 9329J	LC-DQ9685 My	397	0.007595100	mV/V/Nm
Tibia Left X Acceleration	Endevco 7264C	AC-P81386	2003	0.017750001	mV/V/g
Tibia Left Y Acceleration	Endevco 7264C	AC-P52069	2066	0.019060000	mV/V/g
Foot Left X Acceleration	Endevco 7264C	AC-P64131	2050	0.019210000	mV/V/g
Foot Left Z Acceleration	Endevco 7264C	AC-P51725	2175	0.021399999	mV/V/g
Ankle Left X Rotation	SFERNICE ECO50ESC10	DS-ANKL004	127	3.058000002	mV/V/deg
Ankle Left Y Rotation	SFERNICE ECO50ESC10	DS-ANKL005	126	3.040000098	mV/V/deg
Ankle Left Z Rotation	SFERNICE ECO50ESC10	DS-ANKL006	120	3.036200069	mV/V/deg
Femur Right X Force	Humanetics W50-71010	LC-DK3608 Fx	15055	0.000144100	mV/V/N
Femur Right Y Force	Humanetics W50-71010	LC-DK3608 Fy	15055	0.000144100	mV/V/N
Femur Right Z Force	Humanetics W50-71010	LC-DK3608 Fz	15007	0.000072900	mV/V/N
Femur Right X Moment	Humanetics W50-71010	LC-DK3608 Mx	351	0.006456800	mV/V/Nm
Femur Right Y Moment	Humanetics W50-71010	LC-DK3608 My	353	0.006419100	mV/V/Nm
Knee Right X Displacement	Space Age 150-0121V	DS-13073814	26	23.322600871	mV/V/mm
Tibia Upper Right Z Force	Denton 10390J14	LC-DQ5734 Fz	11135	0.000095400	mV/V/N
Tibia Upper Tibia Right X Moment	Denton 10390J14	LC-DQ5734 Mx	399	0.007462700	mV/V/Nm
Tibia Upper Tibia Right Y Moment	Denton 10390J14	LC-DQ5734 My	397	0.007502400	mV/V/Nm
Tibia Lower Right X Force	Denton 9329J	LC-DQ9684 Fx	11193	0.000177300	mV/V/N
Tibia Lower Right Y Force	Denton 9329J	LC-DQ9684 Fy	11173	0.000174900	mV/V/N
Tibia Lower Right Z Force	Denton 9329J	LC-DQ9684 Fz	11161	0.000097600	mV/V/N
Tibia Lower Right X Moment	Denton 9329J	LC-DQ9684 Mx	396	0.007698000	mV/V/Nm
Tibia Lower Right Y Moment	Denton 9329J	LC-DQ9684 My	398	0.007654700	mV/V/Nm
Tibia Right X Acceleration	Endevco 7264C	AC-P79626	2026	0.021059999	mV/V/g
Tibia Right Y Acceleration	Endevco 7264C	AC-P74953	2020	0.017849999	mV/V/g
Foot Right X Acceleration	Endevco 7264C	AC-P49441	2015	0.017890001	mV/V/g
Foot Right Z Acceleration	Endevco 7264C	AC-P80272	2015	0.019550000	mV/V/g
Ankle Right X Rotation	SFERNICE ECO50ESC10	DS-ANKL001	127	3.040099982	mV/V/deg
Ankle Right Y Rotation	SFERNICE ECO50ESC10	DS-ANKL002	124	3.036200069	mV/V/deg
Ankle Right Z Rotation	SFERNICE ECO50ESC10	DS-ANKL003	120	3.044900019	mV/V/deg

Table C- 3: Initial Set-Up Information

THOR-M S/N: DL9207					
Sensor	Manufacturer	Serial Number	Range	Sensitivity	Sensitivity Units
Head CG X Acceleration	Endevco 7264	AC-P82183	2010	0.017689999	mV/V/G's
Head CG Y Acceleration	Endevco 7264	AC-P81384	2020	0.017599999	mV/V/G's
Head CG Z Acceleration	Endevco 7264	AC-P81797	2005	0.019350000	mV/V/G's
Head CG Angular Velocity About X	DTS ARS-18K	ARS-4740	18666	0.091430004	mV/Deg/s
Head CG Angular Velocity About Y	DTS ARS-18K	ARS-4737	19119	0.095640004	mV/Deg/s
Head CG Angular Velocity About Z	DTS ARS-18K	ARS-4073	18203	0.093759998	mV/Deg/s
Front Neck Spring Tower Load Cell	Humanetics 10386JI4	LC-DO9740	4457	0.000512814	mV/V/N
Rear Neck Spring Tower Load Cell	Humanetics 10386JI4	LC-DO9741	4458	0.000508183	mV/V/N
Occipital Condyle Rotation Potentiometer	Humanetics 9945	DS-DK5911	121	3.020999953	mV/V/Deg
Upper Neck X Force	Humanetics 10380JI4	LC-DP3956 Fx	8922	0.000224158	mV/V/N

Upper Neck Y Force	Humanetics 10380JI4	LC-DP3956 Fy	8921	0.000227755	mV/V/N
Upper Neck Z Force	Humanetics 10380JI4	LC-DP3956 Fz	13346	0.000085255	mV/V/N
Upper Neck X Moment	Humanetics 10380JI4	LC-DP3956 Mx	284	0.005819469	mV/V/Nm
Upper Neck Y Moment	Humanetics 10380JI4	LC-DP3956 My	283	0.005983009	mV/V/Nm
Upper Neck Z Moment	Humanetics 10380JI4	LC-DP3956 Mz	283	0.009425133	mV/V/Nm
Lower Neck X Force	Humanetics 10381JI4	LC-DP4780 Fx	13398	0.000173709	mV/V/N
Lower Neck Y Force	Humanetics 10381JI4	LC-DP4780 Fy	13460	0.000174489	mV/V/N
Lower Neck Z Force	Humanetics 10381JI4	LC-DP4780 Fz	13385	0.000070575	mV/V/N
Lower Neck X Moment	Humanetics 10381JI4	LC-DP4780 Mx	455	0.004108210	mV/V/Nm
Lower Neck Y Moment	Humanetics 10381JI4	LC-DP4780 My	454	0.004147000	mV/V/Nm
Lower Neck Z Moment	Humanetics 10381JI4	LC-DP4780 Mz	226	0.006740000	mV/V/Nm
Thorax Upper Left X Displacement	Humanetics IF-364-C-R3	DS-DS6355	3	1000.000000000	mV/V
Thorax Upper Left Y Rotation	Humanetics 9945	DS-DI2382	123	2.978800097	mV/V/deg
Thorax Upper Left Z Rotation	Humanetics 9945	DS-DI2383	122	3.007299965	mV/V/deg
Thorax Upper Right X Displacement	Humanetics IF-364-C-R3	DS-DJ2613	3	1000.000000000	mV/V
Thorax Upper Right Y Rotation	Humanetics 9945	DS-DI7753	120	3.035899950	mV/V/deg
Thorax Upper Right Z Rotation	Humanetics 9945	DS-DI7752	129	3.052399959	mV/V/deg
Thorax Lower Left X Displacement	Humanetics IF-364-C-R3	DS-DS6353	3	1000.000000000	mV/V
Thorax Lower Left Y Rotation	Humanetics 9945	DS-DM4781	122	3.001400037	mV/V/deg
Thorax Lower Left Z Rotation	Humanetics 9945	DS-DS4092	128	3.072499996	mV/V/deg
Thorax Lower Right X Displacement	Humanetics IF-364-C-R3	DS-DS6354	3	1000.000000000	mV/V
Thorax Lower Right Y Rotation	Humanetics 9945	DS-DM4776	122	3.004899947	mV/V/deg
Thorax Lower Right Z Rotation	Humanetics 9945	DS-DM4777	122	2.994700102	mV/V/deg
Abdomen Left X Displacement	Humanetics 9910	DS-DQ2303	3	1000.000000000	mV/V
Abdomen Left Y Rotation	Humanetics 9945	DS-DS8363	121	3.024100093	mV/V/deg
Abdomen Left Z Rotation	Humanetics 9945	DS-DS8361	120	3.047399921	mV/V/deg
Abdomen Right X Displacement	Humanetics 9910	DS-DM2641	3	1000.000000000	mV/V
Abdomen Right Y Rotation	Humanetics 9945	DS-DS4094	121	3.012300003	mV/V/deg
Abdomen Right Z Rotation	Humanetics 9945	DS-DS4121	121	3.021799959	mV/V/deg
T1 X Acceleration	Endevco 7264	AC-P79630	2011	0.020870000	mV/V/G's
T1 Y Acceleration	Endevco 7264	AC-P78880	2018	0.019820000	mV/V/G's
T1 Z Acceleration	Endevco 7264	AC-P82758	2023	0.018610001	mV/V/G's
T4 X Acceleration	Endevco 7264	AC-P49229	2002	0.018010000	mV/V/G's
T4 Y Acceleration	Endevco 7264	AC-P49215	2014	0.016950000	mV/V/G's
T4 Z Acceleration	Endevco 7264	AC-P52122	2002	0.017050001	mV/V/G's
Pelvis X Acceleration	Endevco 7264	AC-P83434	2027	0.017540000	mV/V/G's
Pelvis Y Acceleration	Endevco 7264	AC-P82752	2026	0.018310000	mV/V/G's
Pelvis Z Acceleration	Endevco 7264	AC-P80296	2029	0.019409999	mV/V/G's
Spine Force Y	Humanetics 10415JI4	LC-DP2984 Fy	13386	0.000147107	mV/V/N
Spine Force X	Humanetics 10415JI4	LC-DP2984 Fx	13352	0.000146365	mV/V/N
Spine Force Z	Humanetics 10415JI4	LC-DP2984 Fz	17795	0.000060193	mV/V/N
Spine Moment X	Humanetics 10415JI4	LC-DP2984 Mx	682	0.002146039	mV/V/Nm
Spine Moment Y	Humanetics 10415JI4	LC-DP2984 My	910	0.001914371	mV/V/Nm
Acetabular Left X Force	Humanetics 10670JI4	LC-DP3835 Fx	22270	0.000118506	mV/V/N
Acetabular Left Y Force	Humanetics 10670JI4	LC-DP3835 Fy	13356	0.000059342	mV/V/N

Acetabular Left Z Force	Humanetics 10670JI4	LC-DP3835 Fz	13348	0.000161173	mV/V/N
Acetabular Right X Force	Humanetics 10530JI4	LC-DP4639 Fx	22456	0.000121280	mV/V/N
Acetabular Right Y Force	Humanetics 10530JI4	LC-DP4639 Fy	13377	0.000059432	mV/V/N
Acetabular Right Z Force	Humanetics 10530JI4	LC-DP4639 Fz	13421	0.000165871	mV/V/N
Iliac Left X Force	Humanetics 10387JI4	LC-DP5092 Fx	13022	0.000067323	mV/V/N
Iliac Left Y Moment	Humanetics 10387JI4	LC-DP5092 My	326	0.003688923	mV/V/Nm
Iliac Right X Force	Humanetics 10387JI4	LC-DP5091 Fx	13041	0.000065215	mV/V/N
Iliac Right Y Moment	Humanetics 10387JI4	LC-DP5091 My	325	0.003697538	mV/V/Nm
Femur Left X Force	Denton W50-7101051	LC-DM4975 Fx	15097	0.000143700	mV/V/N
Femur Left Y Force	Denton W50-7101051	LC-DM4975 Fy	15108	0.000143600	mV/V/N
Femur Left Z Force	Denton W50-7101051	LC-DM4975 Fz	15048	0.000072700	mV/V/N
Femur Left X Moment	Denton W50-7101051	LC-DM4975 Mx	353	0.006601400	mV/V/Nm
Femur Left Y Moment	Denton W50-7101051	LC-DM4975 My	350	0.006642000	mV/V/Nm
Knee Left X Displacement	Space Age 150-0121V	DS-C2102639B	20	24.094099179	mV/V/mm
Upper Tibia Left Z Force	Denton 4353J	LC-97 Fz	11131	0.000093300	mV/V/N
Upper Tibia Left X Moment	Denton 4353J	LC-97 Mx	397	0.007333200	mV/V/Nm
Upper Tibia Left Y Moment	Denton 4353J	LC-97 My	395	0.007398000	mV/V/Nm
Lower Tibia Left X Force	Denton 4929J	LC-121 Fx	11118	0.000175100	mV/V/N
Lower Tibia Left Y Force	Denton 4929J	LC-121 Fy	11120	0.000171800	mV/V/N
Lower Tibia Left Z Force	Denton 4929J	LC-121 Fz	11111	0.000095800	mV/V/N
Lower Tibia Left X Moment	Denton 4929J	LC-121 Mx	396	0.007396500	mV/V/Nm
Lower Tibia Left Y Moment	Denton 4929J	LC-121 My	395	0.007447200	mV/V/Nm
Left Tibia X Acceleration	Endevco 7264C	AC-P77996	2028	0.018029999	mV/V/G's
Left Tibia Y Acceleration	Endevco 7264C	AC-P64094	2029	0.022140001	mV/V/G's
Foot Left X Acceleration	Endevco 7264C	AC-P80271	2032	0.021000000	mV/V/G's
Foot Left Z Acceleration	Endevco 7264C	AC-P51684	2017	0.019530000	mV/V/G's
Ankle Left X Rotation	Contelec PD210-4B	DS-0525	145	3.187899943	mV/V/deg
Ankle Left Y Rotation	Contelec PD210-4B	DS-0524	148	3.190600080	mV/V/deg
Ankle Left Z Rotation	Contelec PD210-4B	DS-0523	157	3.178599989	mV/V/deg
Femur Right X Force	Denton W50-7101051	LC-DM4976 Fx	15086	0.000142600	mV/V/N
Femur Right Y Force	Denton W50-7101051	LC-DM4976 Fy	15054	0.000142900	mV/V/N
Femur Right Z Force	Denton W50-7101051	LC-DM4976 Fz	15024	0.000072200	mV/V/N
Femur Right X Moment	Denton W50-7101051	LC-DM4976 Mx	351	0.006505700	mV/V/Nm
Femur Right Y Moment	Denton W50-7101051	LC-DM4976 My	352	0.006488900	mV/V/Nm
Knee Right X Displacement	Space Age 150-0121VL	DS-021033	20	23.250799626	mV/V/mm
Upper Tibia Right Z Force	Denton 4353J	LC-75 Fz	11158	0.000095200	mV/V/N
Upper Tibia Right X Moment	Denton 4353J	LC-75 Mx	397	0.007490000	mV/V/Nm
Upper Tibia Right Y Moment	Denton 4353J	LC-75 My	398	0.007475800	mV/V/Nm
Lower Tibia Right X Force	Denton 4929J	LC-166 Fx	11129	0.000175600	mV/V/N
Lower Tibia Right Y Force	Denton 4929J	LC-166 Fy	11153	0.000171300	mV/V/N
Lower Tibia Right Z Force	Denton 4929J	LC-166 Fz	11138	0.000099500	mV/V/N
Lower Tibia Right X Moment	Denton 4929J	LC-166 Mx	396	0.007424800	mV/V/Nm
Lower Tibia Right Y Moment	Denton 4929J	LC-166 My	399	0.007372600	mV/V/Nm
Right Tibia X Acceleration	Endevco 7264C	AC-P82744	2002	0.018270001	mV/V/G's
Right Tibia Y Acceleration	Endevco 7264C	AC-P82322	2004	0.017259999	mV/V/G's

Foot Right X Acceleration	Endevco 7264C	AC-P74976	2021	0.017840001	mV/V/G's
Foot Right Z Acceleration	Endevco 7264C	AC-P83339	2010	0.019900001	mV/V/G's
Ankle Right X Rotation	Contelec PD210-4B	DS-0528	144	3.202199936	mV/V/deg
Ankle Right Y Rotation	Contelec PD210-4B	DS-0526	146	3.155299928	mV/V/deg
Ankle Right Z Rotation	Contelec PD210-4B	DS-0527-1	157	3.160600085	mV/V/deg

Table 4 – THOR IR-TRACC Polarity

In order to reduce the risk of damage to instrumentation, it is recommended that the 3D IR-TRACC units are not disconnected from the rib cage to conduct the polarity test. An alternate procedure for checking the IR-TRACC polarity is described below.

1. Using the data acquisition system control software, open a live view of each channel. If possible, view the DX, RY, and RZ components of a given quadrant simultaneously.
2. Record the initial reading of each channel
3. Perform the following motions on each of the four rib attachment locations and two abdomen attachment locations (specified by the hexagonal bolt attaching the blue ribs).
 - a. DX: Push inward (front-to-back). The IR-TRACC tube voltage should increase.
 - b. RY: Push downward (head-to-pelvis). The Y-axis potentiometer reading should decrease.
 - c. RZ: Push rightward (left-to-right). The Z-axis potentiometer should increase.
4. Record the final reading of each channel
5. If the “Measured” value (increase or decrease) does not match the “Expected” value, the polarity of the channel must be inverted.

THOR 50th Male DO9798

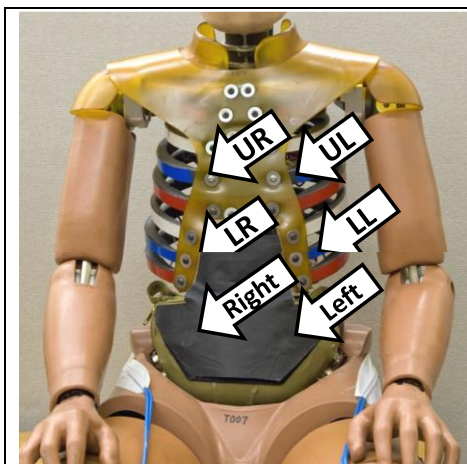


Figure 1. Manipulation to determine thoracic and abdominal IR-TRACC polarity.

Channel	Motion
DX	Push inward
RY	Push upward
RZ	Push rightward

Upper Right Thorax				Upper Left Thorax			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.11203	+	+	DX (V)	0.10139	+	+
RY (Deg)	10.5792	+	+	RY (Deg)	11.7954	+	+
RZ (Deg)	-12.961	+	+	RZ (Deg)	13.0209	+	+
Lower Right Thorax				Lower Left Thorax			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.09578	+	+	DX (V)	0.08445	+	+
RY (Deg)	-3.4367	+	+	RY (Deg)	-2.3055	+	+
RZ (Deg)	-5.1227	+	+	RZ (Deg)	5.23523	+	+
Abdomen Right				Abdomen Left			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.06672	+	+	DX (V)	0.06328	+	+
RY (Deg)	2.86058	+	+	RY (Deg)	1.87899	+	+
RZ (Deg)	-0.8069	+	+	RZ (Deg)	1.53933	+	+

THOR 50th Male DL9207

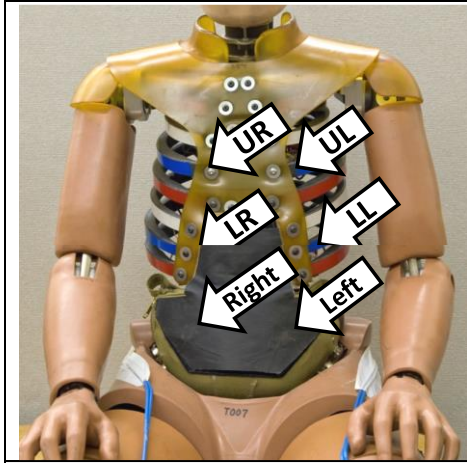


Figure 2. Manipulation to determine thoracic and abdominal IR-TRACC polarity.

Channel	Motion
DX	Push inward
RY	Push upward
RZ	Push rightward

Upper Right Thorax				Upper Left Thorax			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.08380	+	+	DX (V)	0.85751	+	+
RY (Deg)	10.0137	+	+	RY (Deg)	4.55342	+	+
RZ (Deg)	-11.962	+	+	RZ (Deg)	11.7694	+	+
Lower Right Thorax				Lower Left Thorax			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.08025	+	+	DX (V)	0.08125	+	+
RY (Deg)	-6.1346	+	+	RY (Deg)	-4.0026	+	+
RZ (Deg)	-2.2819	+	+	RZ (Deg)	7.84761	+	+
Abdomen Right				Abdomen Left			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.07470	+	+	DX (V)	0.07571	+	+
RY (Deg)	3.52947	+	+	RY (Deg)	3.10074	+	+
RZ (Deg)	1.27844	+	+	RZ (Deg)	5.10226	+	+

Test Data/Sensor Repair Notes

THOR Inspection Checklist

Date: 11/16/2015		
NHTSA Representative: James Saunders		
Inspection Reporter: Matt Goehle		
Inspection type (check one): ☒ Pre-Test ☐ Post-Test		
Dummy S/N: DO9798		Legs S/N: LX655/LX654
Dummy Description: THOR-M 50th Male		
Date of last Certification: 11/4/2015		
<u>Tests conducted:</u> <u>Since last inspection:</u> R20165409 2016 Mazda CX-5	<u>Since last certification:</u> R20165408 - 2016 Mazda CX-5 R20165409 2016 Mazda CX-5	
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> - 11CHSTLELOTHVO0P,Thorax Lower Left X Displacement, Questionable spikes - 11ABDOLE00THVO0P,Abdomen Left X Displacement, Questionable spike		
<u>Physical evidence of damage:</u> None New		
<u>Anecdotal evidence of damage:</u> None		
<u>Equipment delivered to Borrower:</u> THOR DO9798 ATD 26 Accelerometers 3 Angular Rate Sensors 2 Skull Spring LC 1 Condyle Pot 1 Upper Neck LC 6 IRTraccs 12 Rotational Pots 1 Spine LC 2 Acetabulum LC 2 ASIS LC 2 Femur LC	<i>Continued</i> 2 LX Leg Assemblies 2 Upper Tibia LC 2 Lower Tibia LC 6 Ank1e Potentiometers 2 Knee Sliders 1 Neck Skin 1 Neck Foam 1 Tiltview Interface Cable with 3 channel hub 4 Tilt Sensors 1 H-Point Tool 1 Tool Box 1 Laptop	

Note: New Damage is Noted in Red

HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull
Y / N	Head skin shows no sign of tears or damage
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	
NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of de-bonding between neck pucks and plates
Y / N	No evidence of de-bonding or permanent compression in neck soft stop assemblies
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	
SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of de-bonding, tearing, or permanent compression of posterior soft stops
OTHER	
SPINE	
Y / N	No evidence of de-bonding between thoracic spine flex joint and metal plates
Y / N	No evidence of de-bonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material
Y / N	No evidence of de-bonding between rib damping material and ribs
Y / N	IRTRACCs securely attached to anterior ribs
Y / N	IRTRACCs securely attached to double gimbals, spine
Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper
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 Tear in center of bag.
	
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
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 de-bonding, tearing, or permanent compression of ankle soft stops
Y / N	No cuts, tears, or scuffing of leg flesh
OTHER	
JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers
OTHER	

THOR Inspection Checklist

Date: 11/18/2015		
NHTSA Representative: James Saunders		
Inspection Reporter: Mary Geesey		
Inspection type (check one): ☐ Pre-Test ☒ Post-Test		
Dummy S/N: DO9798		Legs S/N: LX655/LX654
Dummy Description: THOR-M 50th Male		
Date of last Certification: 11/4/2015		
Tests conducted since last inspection: R20165410 - 2016 Mazda CX-5	Since last certification: R20165408 - 2016 Mazda CX-5 R20165409 - 2016 Mazda CX-5 R20165410 - 2016 Mazda CX-5	
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> - 13CHSTRIUPTHVO0P,Thorax Upper Right X Displacement, Questionable spikes - 13ABDORI00THVO0P,Abdomen Right X Displacement, Questionable spikes		
<u>Physical evidence of damage:</u> None New		
<u>Anecdotal evidence of damage:</u> None		
<u>Equipment delivered to Borrower:</u> THOR DO9798 ATD 26 Accelerometers 3 Angular Rate Sensors 2 Skull Spring LC 1 Condyle Pot 1 Upper Neck LC 6 IRTraccs 12 Rotational Pots 1 Spine LC 2 Acetabulum LC 2 ASIS LC 2 Femur LC	<i>Continued</i> 2 LX Leg Assemblies 2 Upper Tibia LC 2 Lower Tibia LC 6 Ank1e Potentiometers 2 Knee Sliders 1 Neck Skin 1 Neck Foam 1 Tiltview Interface Cable with 3 channel hub 4 Tilt Sensors 1 H-Point Tool 1 Tool Box 1 Laptop	

Note: New Damage is Noted in Red

HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull
Y / N	Head skin shows no sign of tears or damage
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	
NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of de-bonding between neck pucks and plates
Y / N	No evidence of de-bonding or permanent compression in neck soft stop assemblies
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	
SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of de-bonding, tearing, or permanent compression of posterior soft stops
OTHER	
SPINE	
Y / N	No evidence of de-bonding between thoracic spine flex joint and metal plates
Y / N	No evidence of de-bonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material
Y / N	No evidence of de-bonding between rib damping material and ribs
Y / N	IRTRACCs securely attached to anterior ribs
Y / N	IRTRACCs securely attached to double gimbals, spine
Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper
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 Tear in center of bag.
	
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
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 de-bonding, tearing, or permanent compression of ankle soft stops
Y / N	No cuts, tears, or scuffing of leg flesh
OTHER	
JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers
OTHER	

THOR Inspection Checklist

Date: 11/16/2015		
NHTSA Representative: James Saunders		
Inspection Reporter: Matt Goehle		
Inspection type (check one): ☒ Pre-Test ☐ Post-Test		
Dummy S/N: DL9207		Legs S/N: LX0045/LX0046
Dummy Description: THOR-M 50th Male		
Date of last Certification: 10/14/2015		
<u>Tests conducted:</u> R20165409 - 2016 Mazda CX-5	<u>Since last inspection:</u> R20165408 - 2016 Mazda CX-5 R20165409 - 2016 Mazda CX-5	
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> - 13CHSTRIUPTHVO0P,Thorax Upper Right X Displacement, Questionable spike - 13ABDORI00THVO0P,Abdomen Right X Displacement, Questionable spike		
<u>Physical evidence of damage:</u> None New		
<u>Anecdotal evidence of damage:</u> None		
<u>Equipment delivered to Borrower:</u> THOR DL9207 ATD 26 Accelerometers 3 Angular Rate Sensors 2 Skull Spring LC 1 Condyle Pot 1 Upper Neck LC 6 IRTraccs 12 Rotational Pots 1 Spine LC 2 Acetabulum LC 2 ASIS LC 2 Femur LC	<i>Continued</i> 2 LX Leg Assemblies 2 Upper Tibia LC 2 Lower Tibia LC 6 Ank1e Potentiometers 2 Knee Sliders 1 Neck Skin 1 Neck Foam 1 Tiltview Interface Cable 4 Tilt Sensors 1 H-Point Tool 1 Tool Box 1 Laptop	

Note: New Damage is Noted in Red

HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull
Y / N	Head skin shows no sign of tears or damage
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	
NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of de-bonding between neck pucks and plates
Y / N	No evidence of de-bonding or permanent compression in neck soft stop assemblies
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	
SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of de-bonding, tearing, or permanent compression of posterior soft stops
OTHER	
SPINE	
Y / N	No evidence of de-bonding between thoracic spine flex joint and metal plates
Y / N	No evidence of de-bonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	
THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material
Y / N	No evidence of de-bonding between rib damping material and ribs
Y / N	IRTRACCs securely attached to anterior ribs
Y / N	IRTRACCs securely attached to double gimbals, spine
Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper
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
	Multiple tears and broken stitches in lower abdomen bag. The upper and lower abdomen bags appear to be from THOR SN007
	

	
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 torn
	
OTHER	Left femur flesh is separating from zipper. We placed gaffer's tape across zipper to prevent further damage. 

LOWER EXTREMITY (LX)	
Y / N	Rotational potentiometers in ankle securely attached
Y / N	Achilles tendon provides resistance to dorsiflexion
Y / N	No evidence of de-bonding, tearing, or permanent compression of ankle soft stops
Y / N	No cuts, tears, or scuffing of leg flesh Left lower leg flesh is torn near zipper. We placed gaffer's tape around the flesh to prevent further damage.
	
OTHER	
JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers
OTHER	

THOR Inspection Checklist

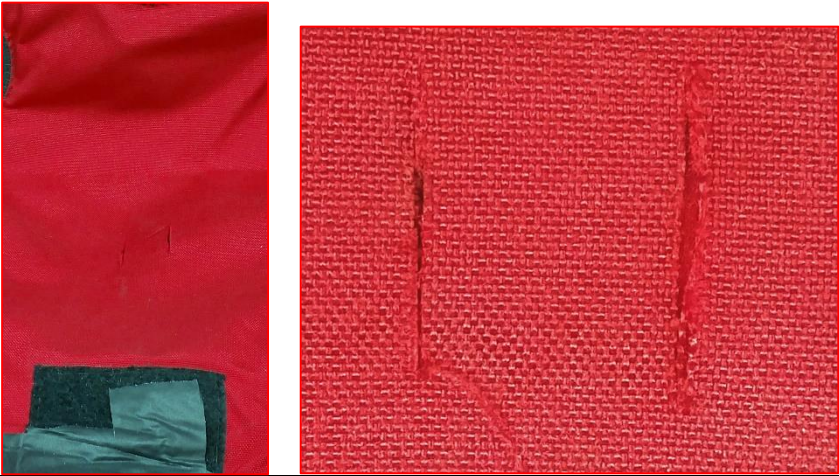
Date: 11/18/2015		
NHTSA Representative: James Saunders		
Inspection Reporter: Mary Geesey		
Inspection type (check one): ☐ Pre-Test ☒ Post-Test		
Dummy S/N: DL9207		Legs S/N: LX0045/LX0046
Dummy Description: THOR-M 50th Male		
Date of last Certification: 10/14/2015		
Tests conducted since last inspection: R20165410 - 2016 Mazda CX-5	Since last certification: R20165408 - 2016 Mazda CX-5 R20165409 - 2016 Mazda CX-5 R20165410 - 2016 Mazda CX-5	
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> • 11CHSTLELOTHVO0P,Thorax Lower Left X Displacement, Questionable spikes • 11ABDOLE00THVO0P,Abdomen Left X Displacement, Questionable spike		
<u>Physical evidence of damage:</u> Neck/Shoulder Stops – See Report		
<u>Anecdotal evidence of damage:</u> None		
<u>Equipment delivered to Borrower:</u> THOR DL9207 ATD 26 Accelerometers 3 Angular Rate Sensors 2 Skull Spring LC 1 Condyle Pot 1 Upper Neck LC 6 IRTraccs 12 Rotational Pots 1 Spine LC 2 Acetabulum LC 2 ASIS LC 2 Femur LC	<i>Continued</i> 2 LX Leg Assemblies 2 Upper Tibia LC 2 Lower Tibia LC 6 Ank1e Potentiometers 2 Knee Sliders 1 Neck Skin 1 Neck Foam 1 Tiltview Interface Cable 4 Tilt Sensors 1 H-Point Tool 1 Tool Box 1 Laptop	

Note: New Damage is Noted in Red

HEAD	
Y / N	Rear head cap mounts securely to head
Y / N	Head skin fits securely over skull
Y / N	Head skin shows no sign of tears or damage
Y / N	Interior components of skull cavity (ballast, accelerometer mount, accelerometers) securely attached
Y / N	Head securely mounted to OC joint
OTHER	
NECK	
Y / N	Neck cables slide freely through holes in neck plates
Y / N	Neck cables show no sign of fraying, broken strands, or kinking
Y / N	No evidence of de-bonding between neck pucks and plates
Y / N	No evidence of de-bonding or permanent compression in neck soft stop assemblies Front of the neck is missing the soft stop
	
Y / N	Neck securely attached to upper neck load cell
Y / N	Neck securely attached to lower neck load cell
Y / N	Neck pitch change joint mechanism mating teeth are engaged
OTHER	
SHOULDER	
Y / N	Urethane shoulder pads show no evidence of contact
Y / N	Clavicles securely attached to sternum and shoulder
Y / N	No evidence of de-bonding, tearing, or permanent compression of posterior soft stops Damage to both the left and right shoulder soft stops. The left shoulder is missing one entirely. Left: Right:
	 
OTHER	
SPINE	
Y / N	No evidence of de-bonding between thoracic spine flex joint and metal plates
Y / N	No evidence of de-bonding between lumbar spine flex joint and metal plates
Y / N	Lumbar spine pitch change joint mechanism mating teeth are engaged
OTHER	

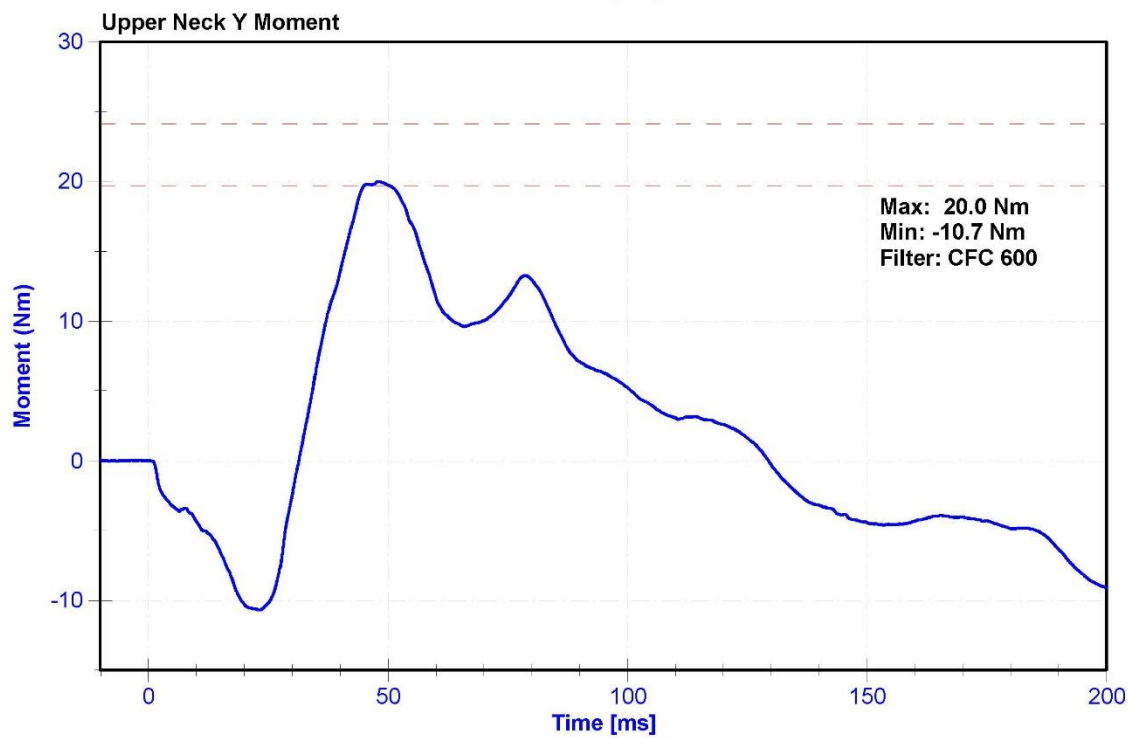
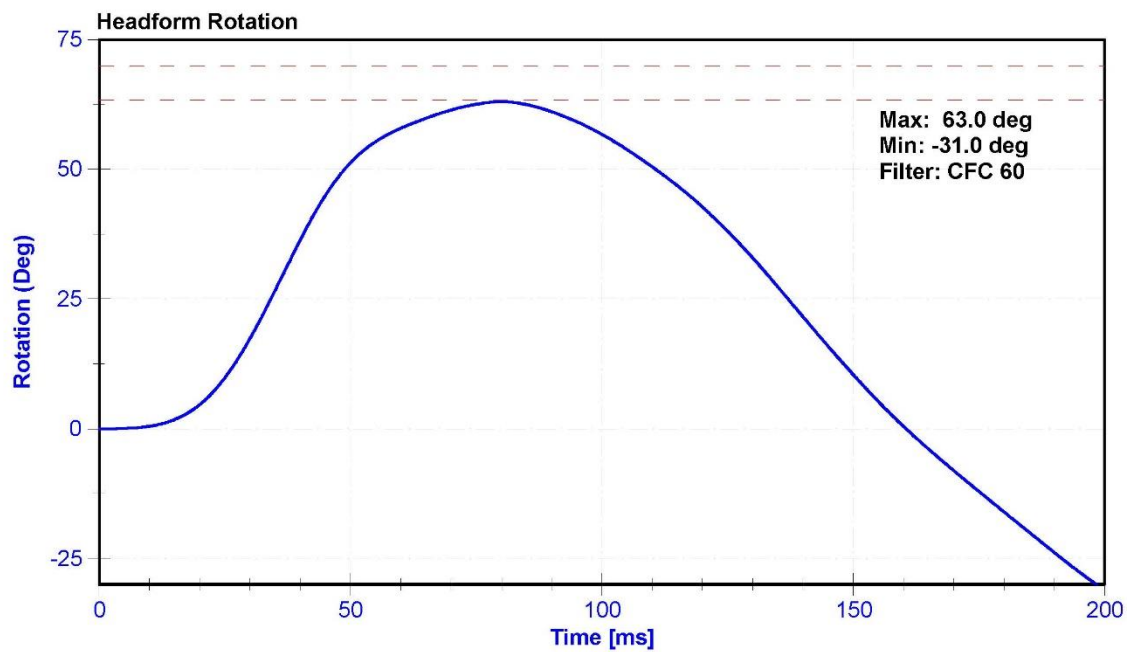
THORAX	
Y / N	No evidence of contact at top, bottom, or interior faces of rib damping material
Y / N	No evidence of de-bonding between rib damping material and ribs
Y / N	IRTRACCs securely attached to anterior ribs
Y / N	IRTRACCs securely attached to double gimbals, spine
Y / N	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration
Y / N	Ribs securely attached to posterior spine
Y / N	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners)
OTHER	
ABDOMEN	
Y / N	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper
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 Multiple tears and broken stitches in lower abdomen bag. The upper and lower abdomen bags appear to be from THOR SN007
	
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 torn

		
OTHER	Left femur flesh is separating from zipper. We placed gaffer's tape across zipper to prevent further damage. 	
LOWER EXTREMITY (LX)		
Y / N	Rotational potentiometers in ankle securely attached	
Y / N	Achilles tendon provides resistance to dorsiflexion	
Y / N	No evidence of de-bonding, tearing, or permanent compression of ankle soft stops	
Y / N	No cuts, tears, or scuffing of leg flesh Left lower leg flesh is torn near zipper. We placed gaffer's tape around the flesh to prevent further damage. 	
OTHER		

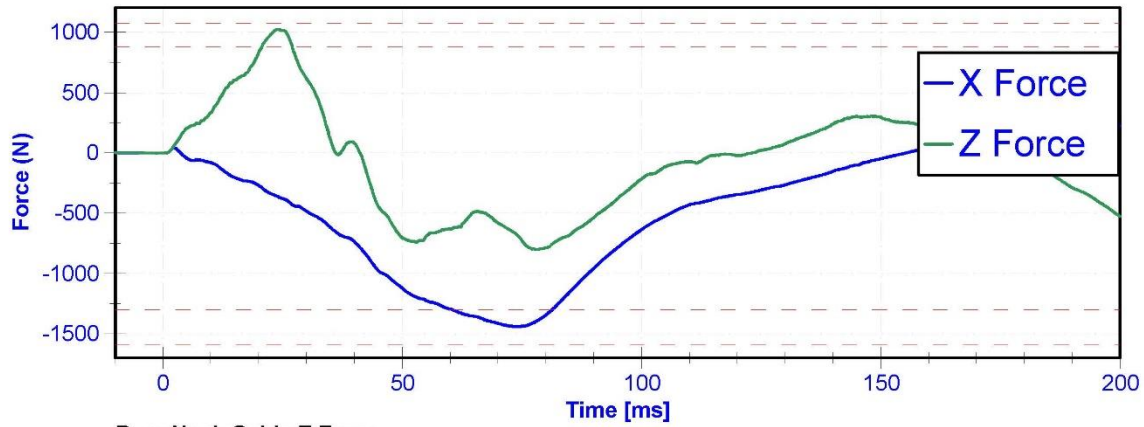
JACKET	
Y / N	Rib stiffeners show no sign of permanent deformation
Y / N	No evidence of tears or holes in jacket fabric, Velcro, or zippers The chest jacket has two tears near the middle: 
OTHER	

DUMMY CALIBRATIONS

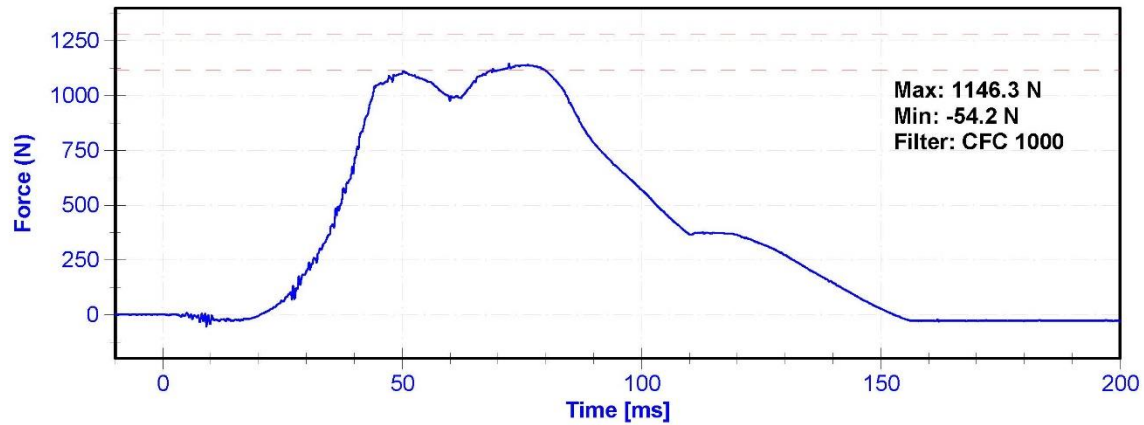
50% ADULT MALE THOR DO9798 DUMMY CALIBRATIONS



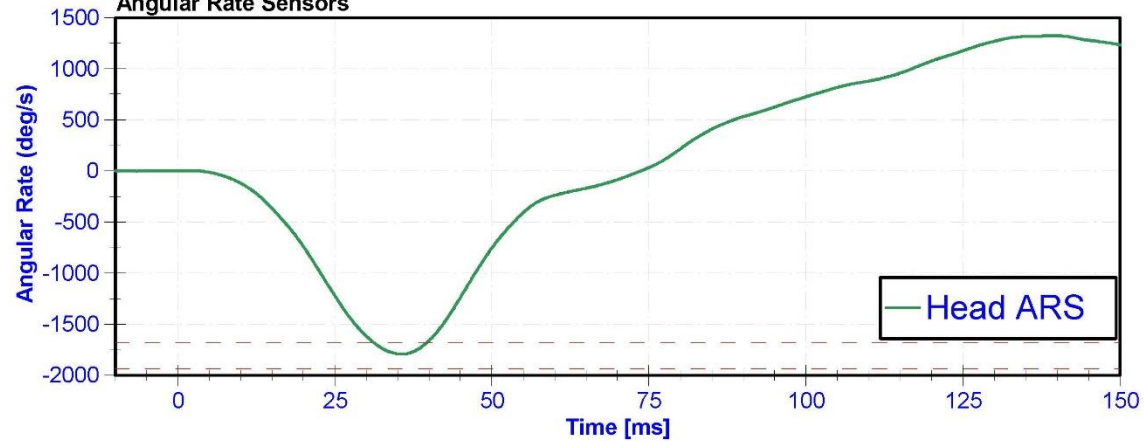
Upper Neck Force



Rear Neck Cable Z Force



Angular Rate Sensors



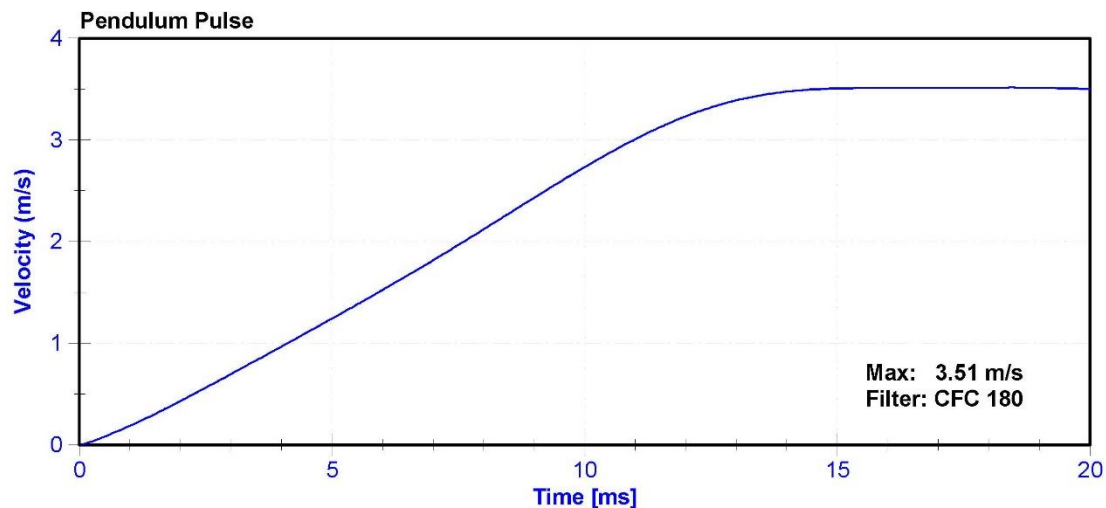
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

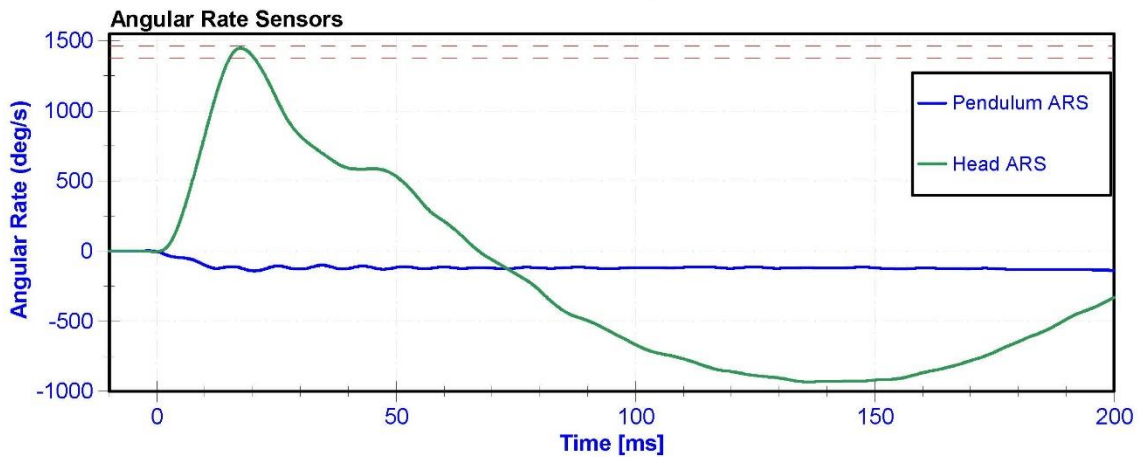
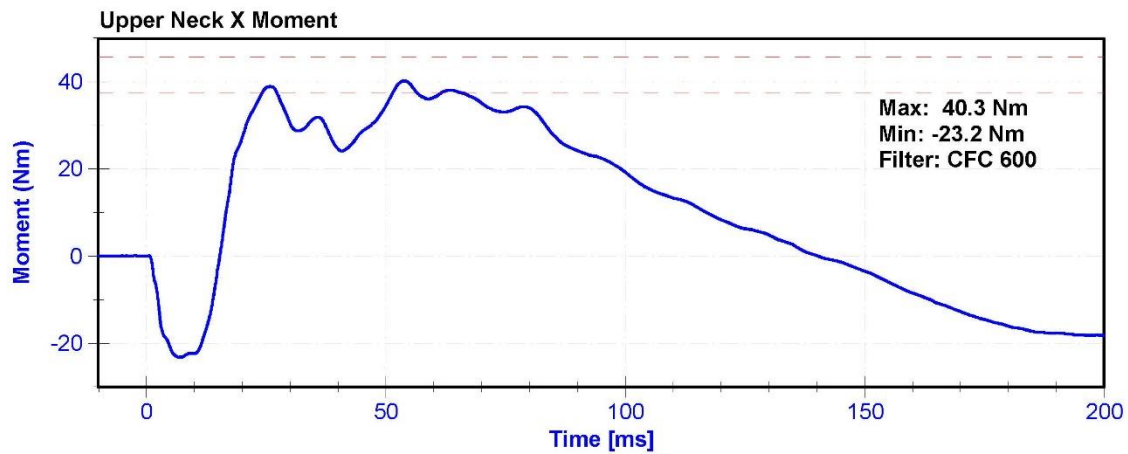
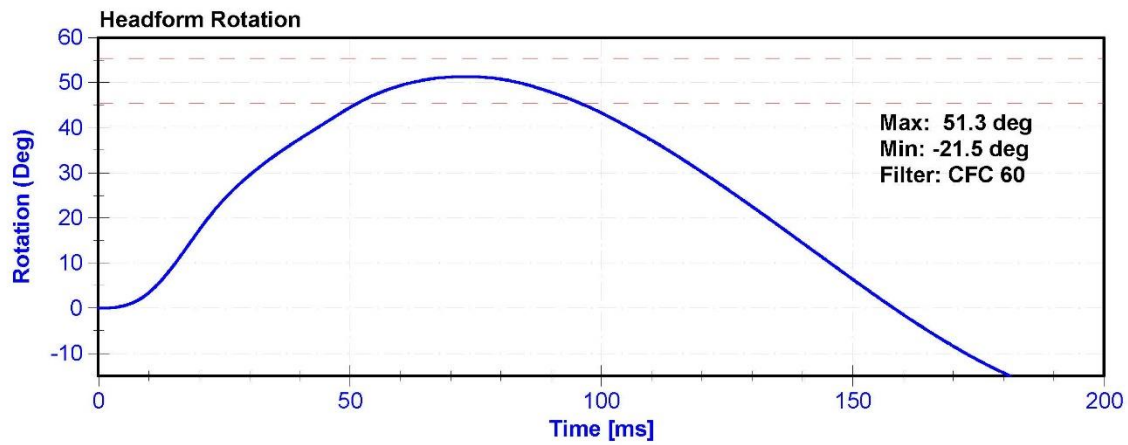
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	46.2	Pass
Velocity	3.35	3.45	m/s	3.42	Pass
Pendulum Impulse at 4ms	0.89	1.08	m/s	0.968	Pass
Pendulum Impulse at 8ms	2.04	2.36	m/s	2.120	Pass
Pendulum Impulse at 12ms	3.21	3.46	m/s	3.232	Pass
Peak Upper Neck X Moment 40-300ms	37.4	45.7	Nm	40.25	Pass
Peak Head X Angular Rate	1375	1462	deg/s	1447.0	Pass
Peak Head Rotation	45.4	55.3	deg	51.33	Pass
Rotation Decay to Zero	83.7	90.9	ms	85.10	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380J14	LC-DS9758 Mx	12/3/2014	12/3/2015
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS 18k	ARS-6733	4/27/2015	4/26/2016





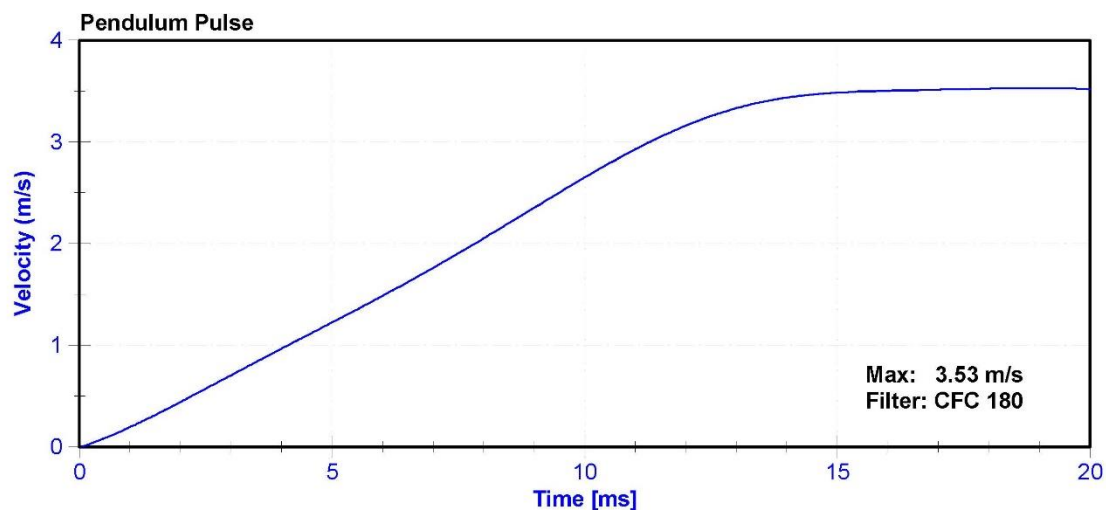
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	46.5	Pass
Velocity	3.35	3.45	m/s	3.43	Pass
Pendulum Impulse at 4ms	0.89	1.08	m/s	0.966	Pass
Pendulum Impulse at 8ms	2.04	2.36	m/s	2.051	Pass
Pendulum Impulse at 12ms	3.21	3.46	m/s	3.160	Fail
Peak Upper Neck X Moment 40-300ms	-45.7	-37.4	Nm	-42.00	Pass
Peak Head X Angular Rate	-1462	-1375	deg/s	-1437.2	Pass
Peak Head Rotation	-55.3	-45.4	deg	-51.08	Pass
Rotation Decay to Zero	83.7	90.9	ms	84.80	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380J14	LC-DS9758 Mx	12/3/2014	12/3/2015
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS 18k	ARS-6733	4/27/2015	4/26/2016



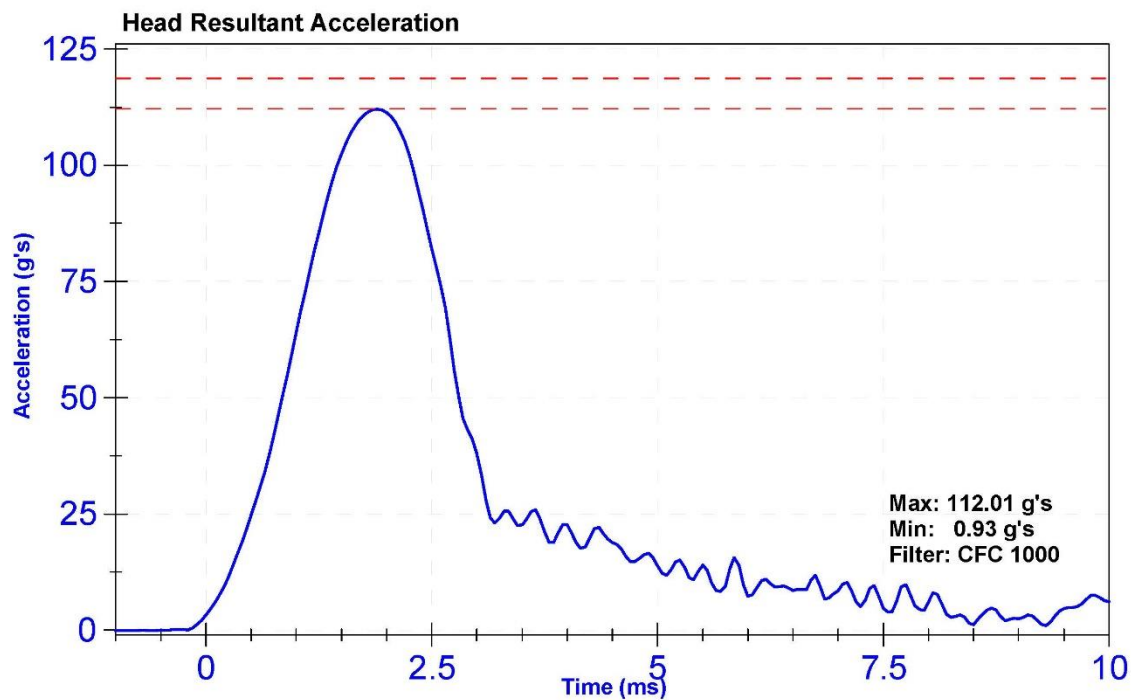
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

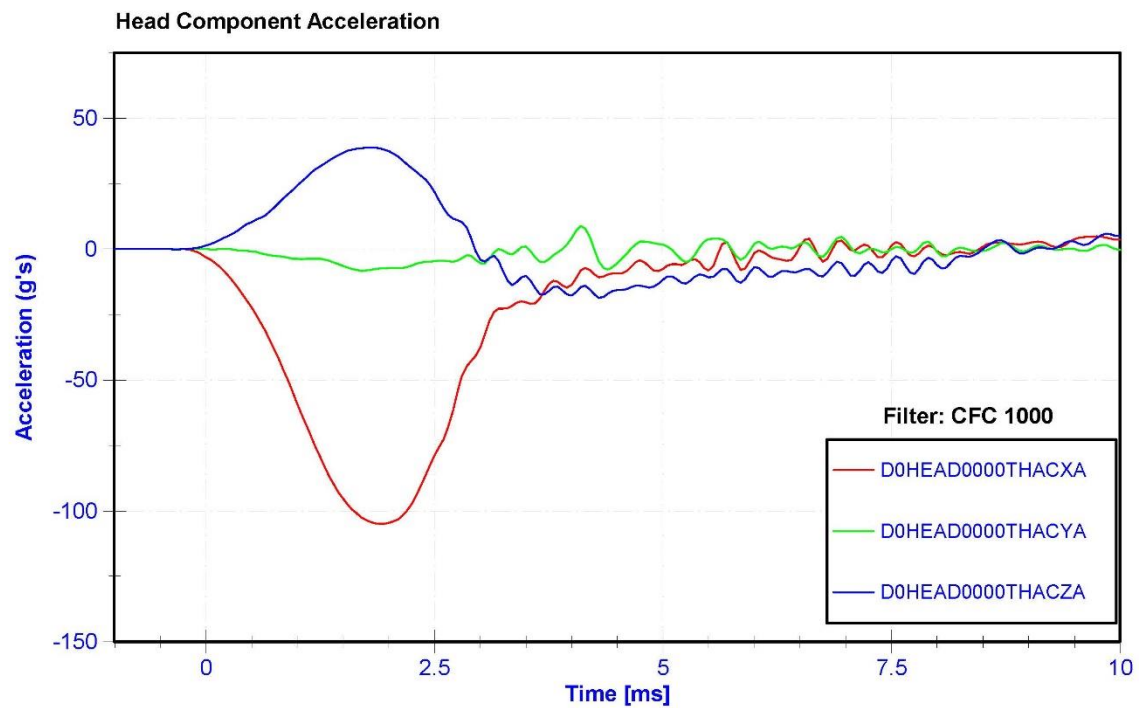
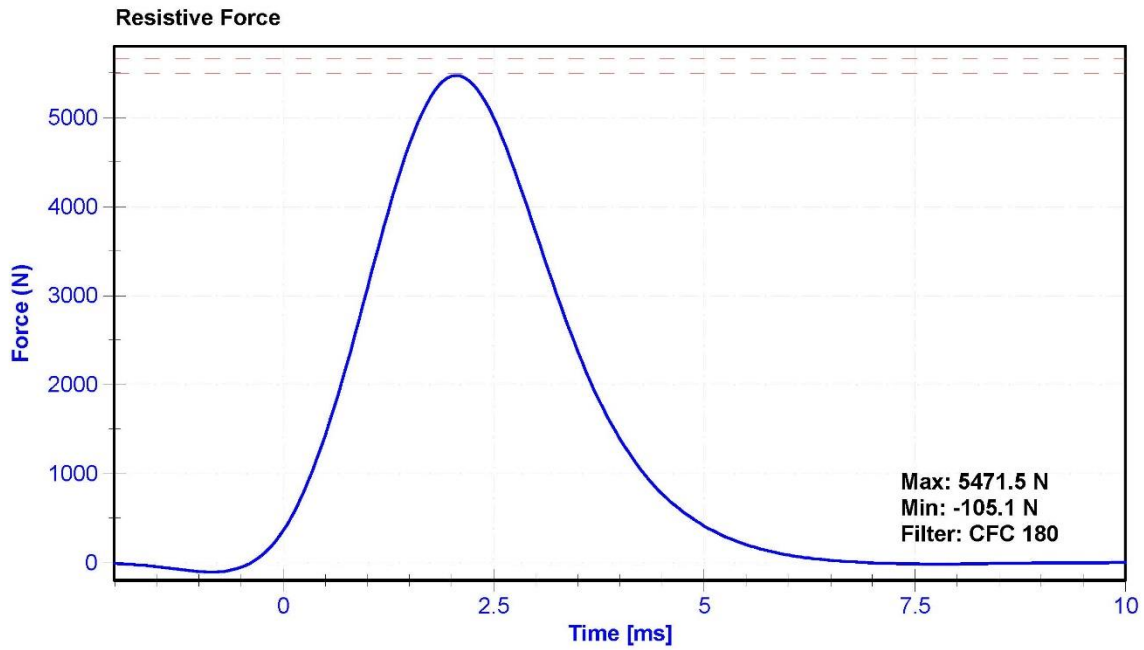
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	30.8	Pass
Impact Velocity	1.95	2.05	m/s	1.958	Pass
Probe Force	5,498	5,660	N	5471.5	Fail
Resultant Acceleration	112.2	118.7	g's	112.01	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Head X Accel	Endevco 7264	AC-P52001	9/24/2015	3/24/2016
Head Y Accel	Endevco 7264	AC-P51697	9/28/2015	3/28/2016
Head Z Accel	Endevco 7264	AC-P75155	9/24/2015	3/24/2016
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





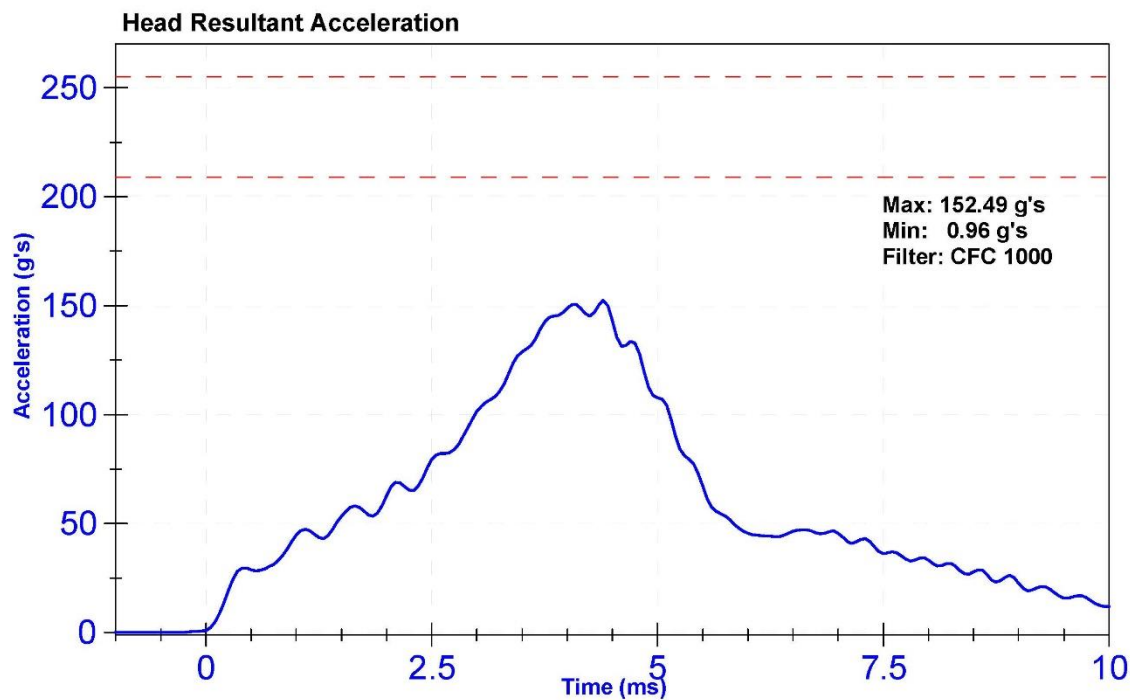
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

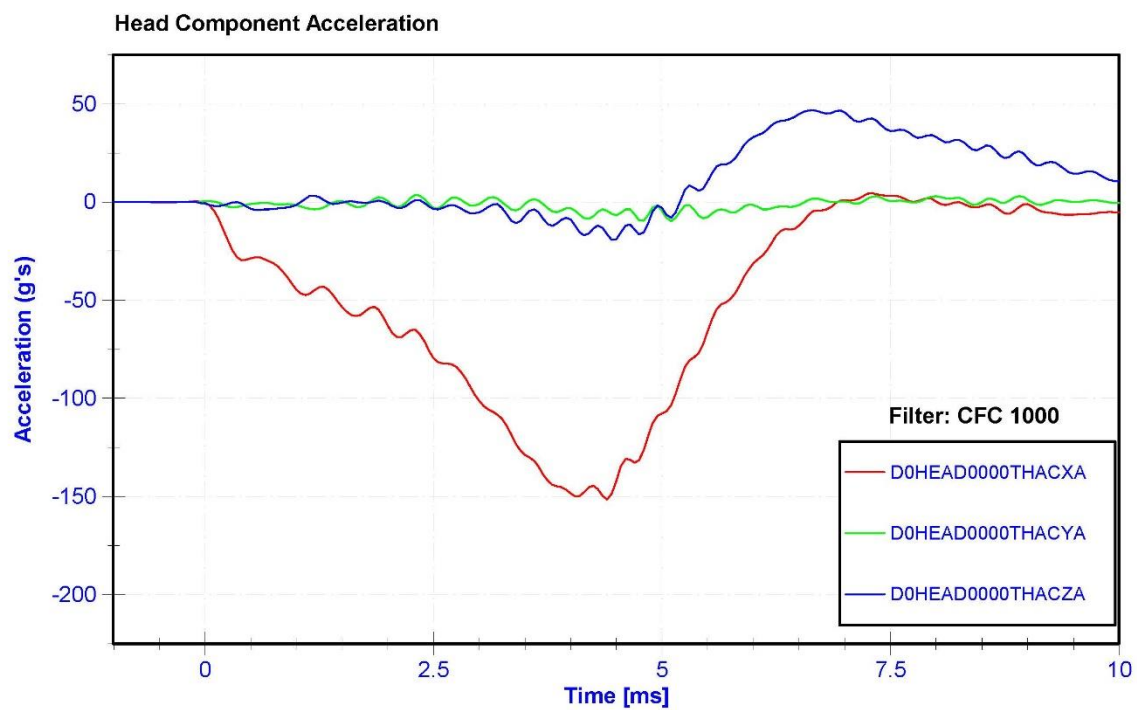
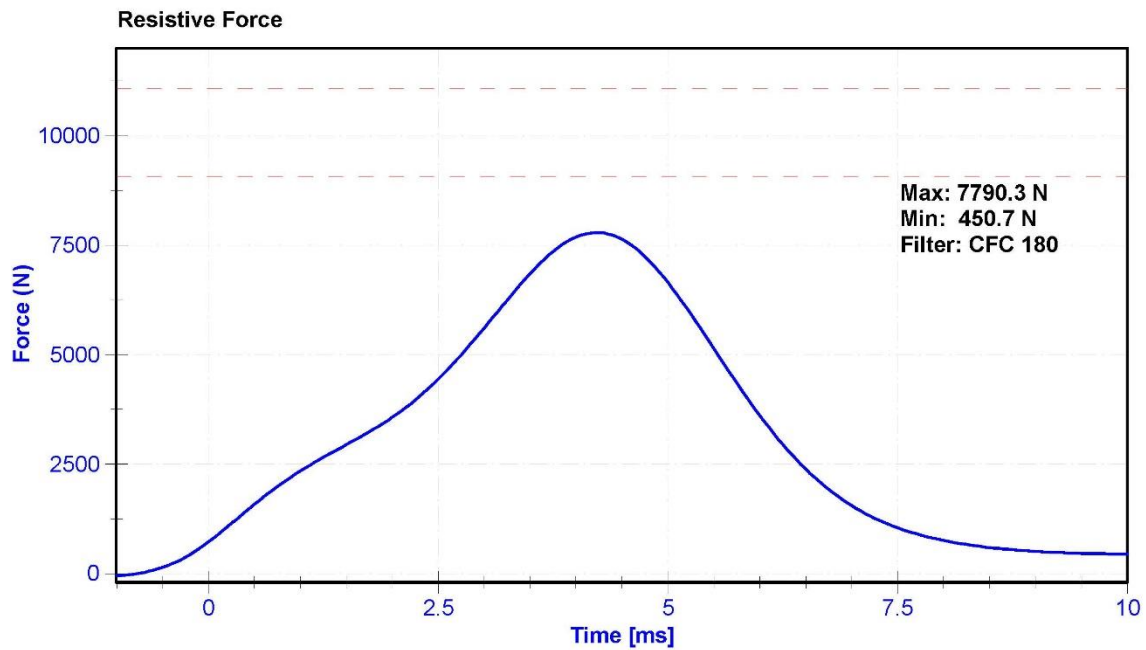
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	26.5	Pass
Impact Velocity	6.68	6.78	m/s	6.773	Pass
Probe Force	9067	11082	N	7790.3	Fail
Resultant Acceleration	209	255	g's	152.5	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Head X Accel	Endevco 7264	AC-P52001	9/24/2015	3/24/2016
Head Y Accel	Endevco 7264	AC-P51697	9/28/2015	3/28/2016
Head Z Accel	Endevco 7264	AC-P75155	9/24/2015	3/24/2016
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





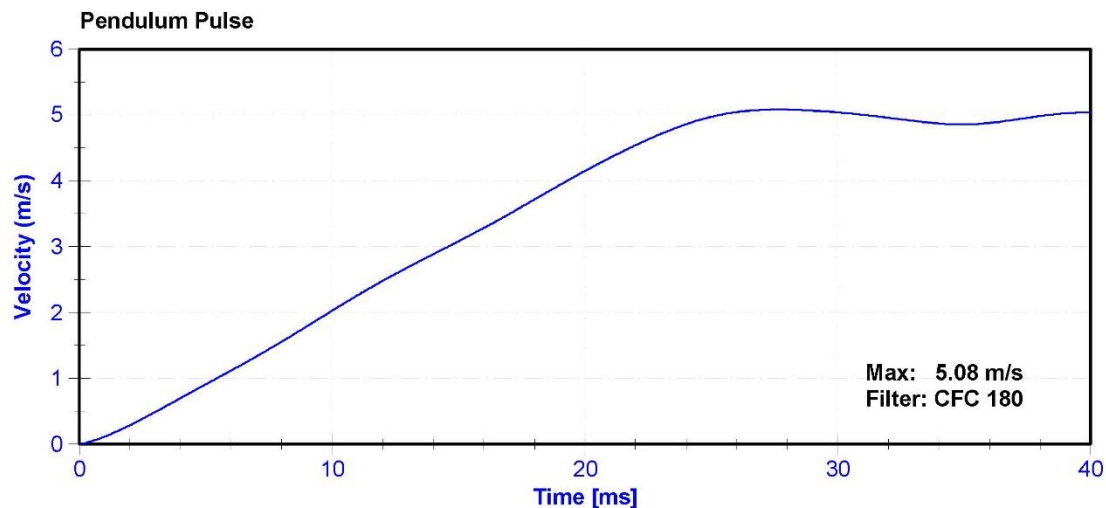
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

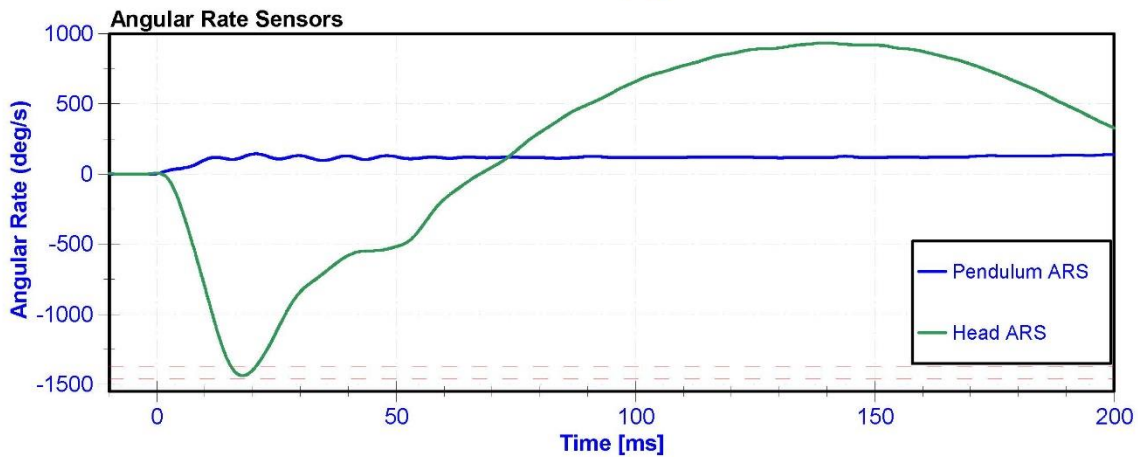
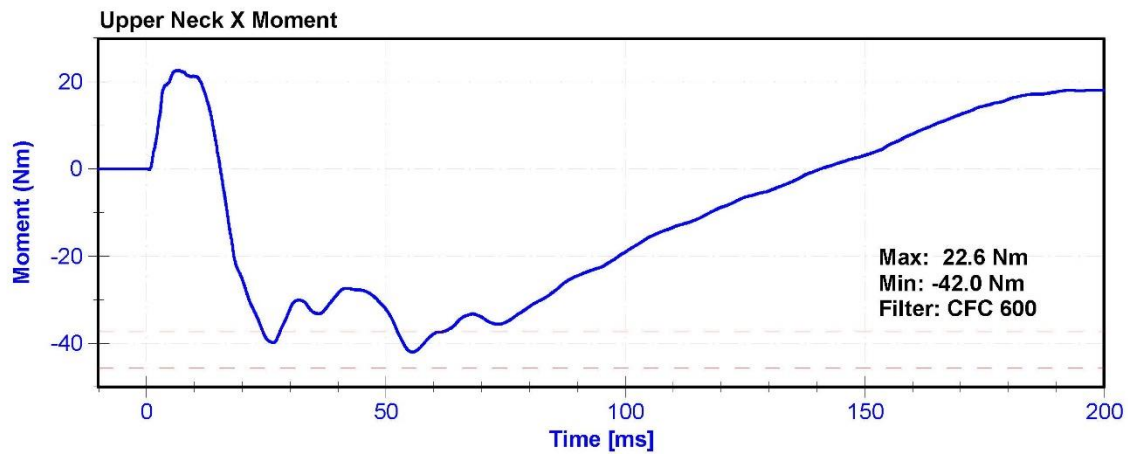
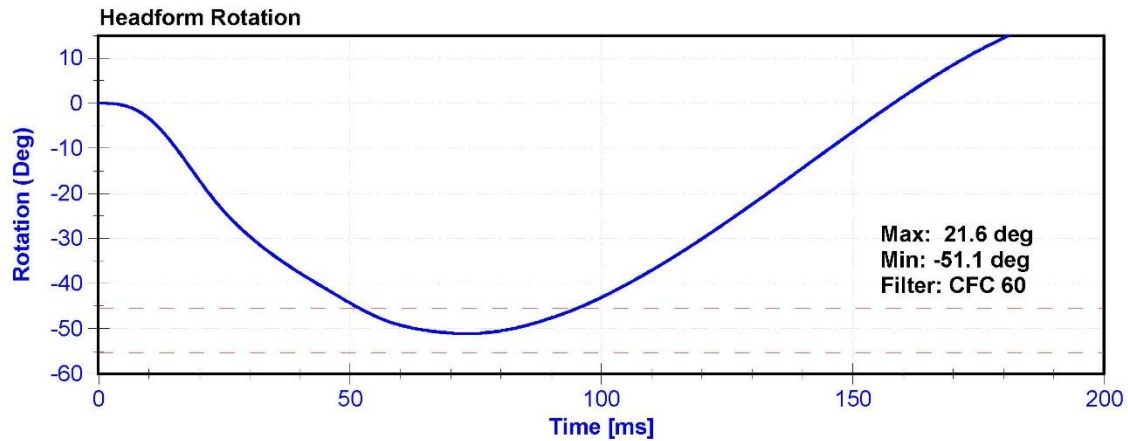
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	39.4	Pass
Velocity	4.95	5.05	m/s	4.93	Pass
Pendulum Impulse at 8ms	1.49	1.85	m/s	1.556	Pass
Pendulum Impulse at 16ms	3.08	3.86	m/s	3.283	Pass
Pendulum Impulse at 24ms	4.48	5.26	m/s	4.858	Pass
Peak Upper Neck Y Moment	19.7	24.1	Nm	20.00	Pass
Peak Upper Neck X Force	-1592	-1302	N	-1440.4	Pass
Maximum Upper Neck Z Force	877	1072	N	1021.6	Pass
First Peak Rear Neck Cable Force	1115	1282	N	1146.3	Pass
Peak Head Y Angular Rate	-1935	-1675	deg/s	-1790.1	Pass
Peak Head Angle	63.3	69.9	deg	63.01	Fail
Rotation Decay to Zero	83.0	86.2	ms	80.0	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380J14	LC-DS9758 Fx	12/3/2014	12/3/2015
Rear Neck Cable Load Cell	Humanetics 6005JFL	LC-132	9/17/2015	9/16/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS 18k	ARS-4071	3/31/2015	3/30/2016





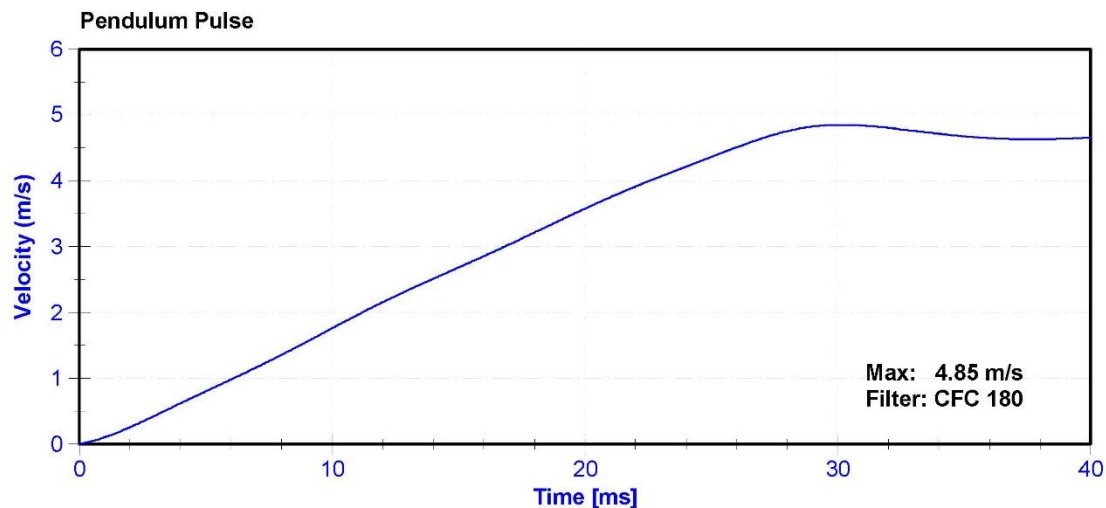
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

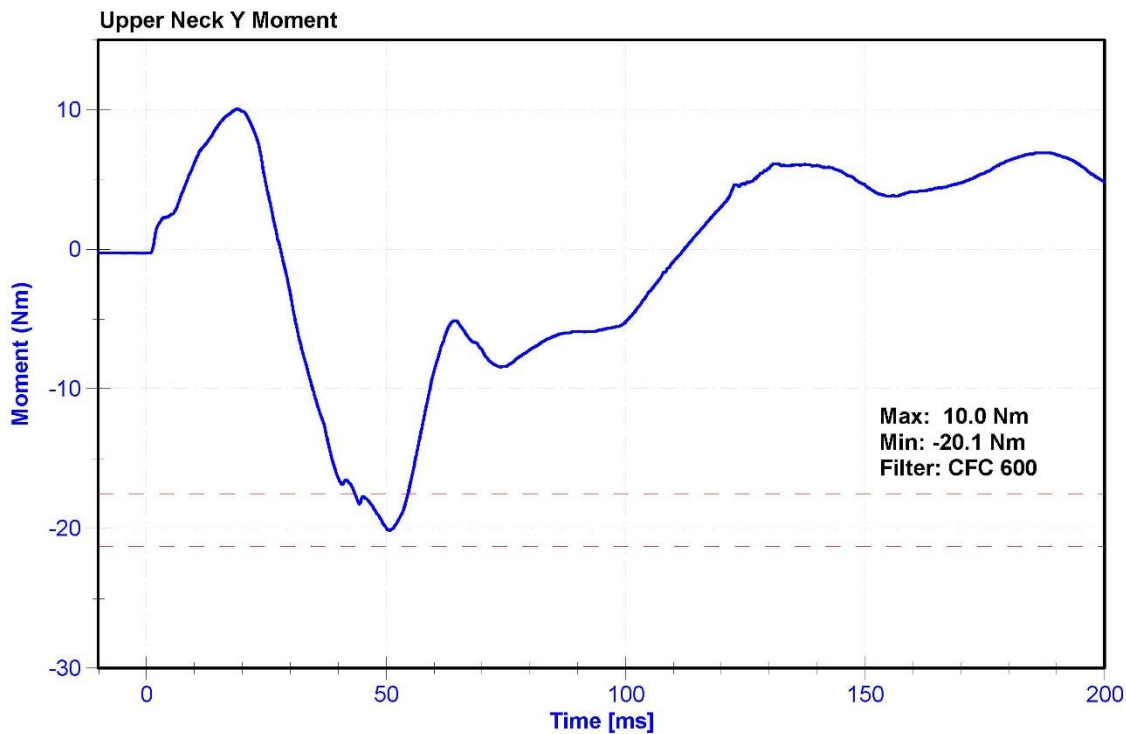
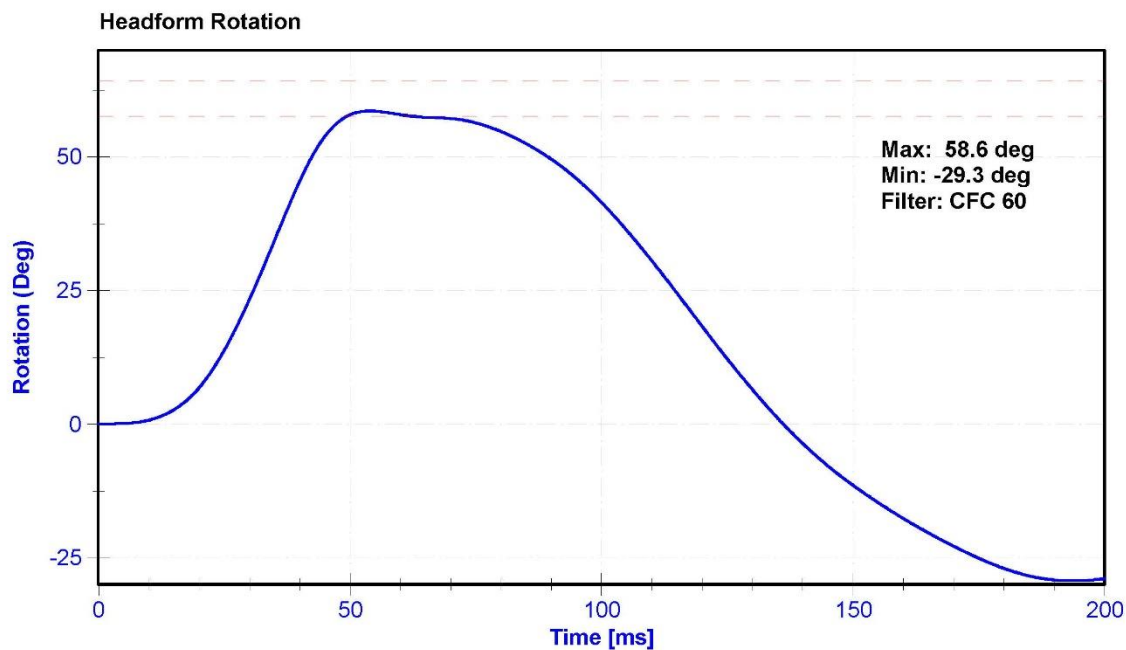
Results

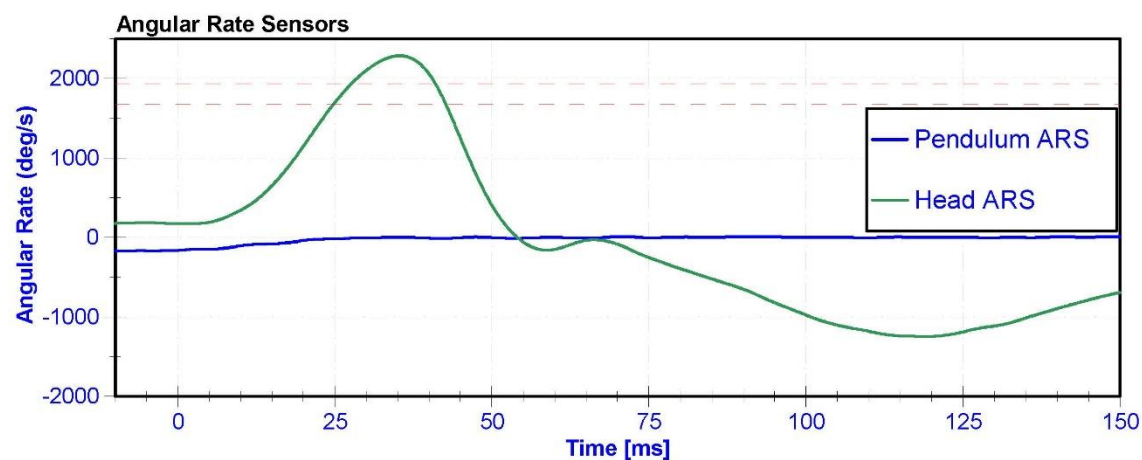
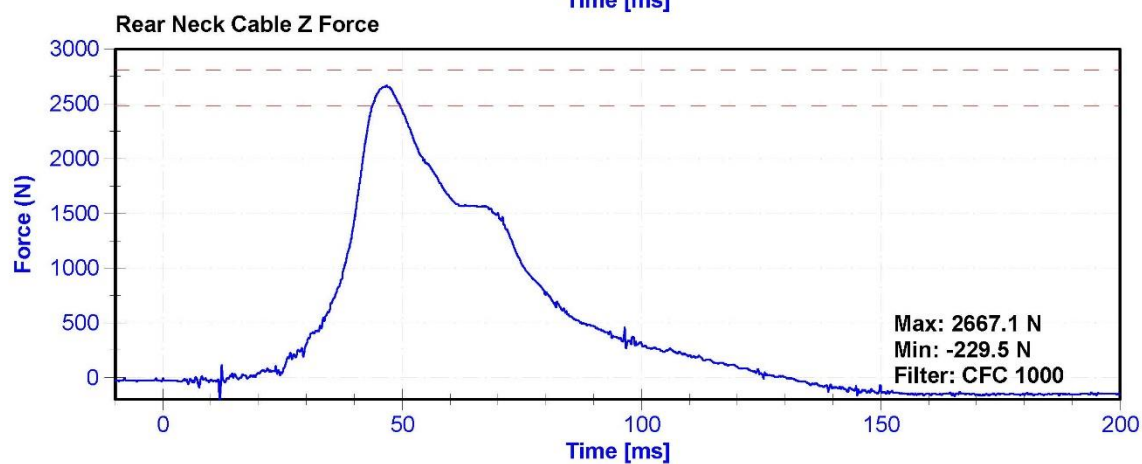
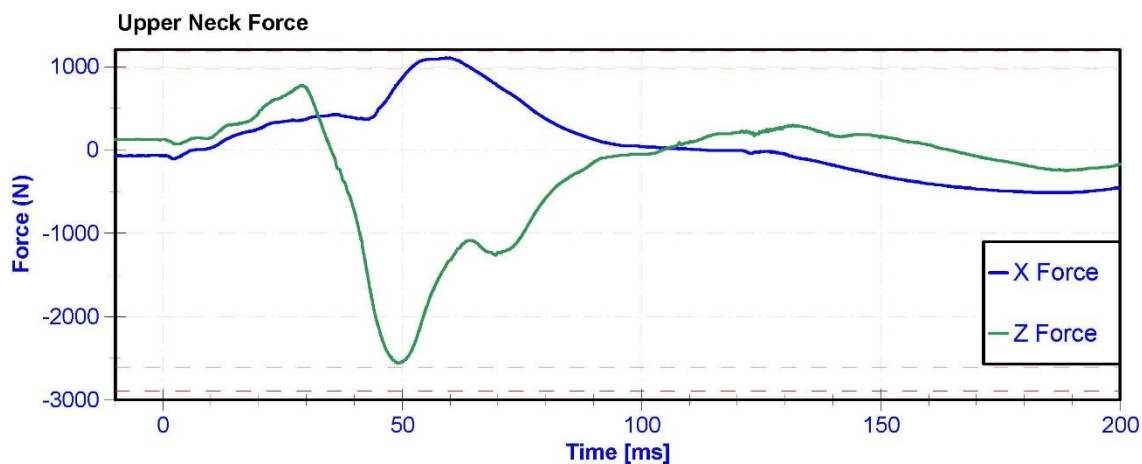
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	45.0	Pass
Velocity	4.95	5.05	m/s	4.98	Pass
Pendulum Impulse at 10ms	1.76	1.91	m/s	1.762	Pass
Pendulum Impulse at 20ms	3.50	3.75	m/s	3.577	Pass
Pendulum Impulse at 30ms	4.88	5.20	m/s	4.850	Fail
Peak Upper Neck Y Moment	-21.3	-17.5	Nm	-20.12	Pass
Peak Upper Neck X Force	967	1182	N	1101.7	Pass
Peak Upper Neck Z Force	-2893	-2603	N	-2558.9	Fail
Peak Front Neck Cable Force	2482	2809	N	2667.1	Pass
Peak Head Y Angular Rate	1907	2043	deg/s	2285.0	Fail
Peak Head Rotation	57.6	64.2	deg	58.64	Pass
Rotation Decay to Zero	79.3	82.5	ms	82.20	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380J14	LC-DS9758 Fx	12/3/2014	12/3/2015
Front Neck Cable Load Cell	Humanetics 6005JFL	LC-93	9/3/2015	9/2/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS 18k	ARS-4071	3/31/2015	3/30/2016







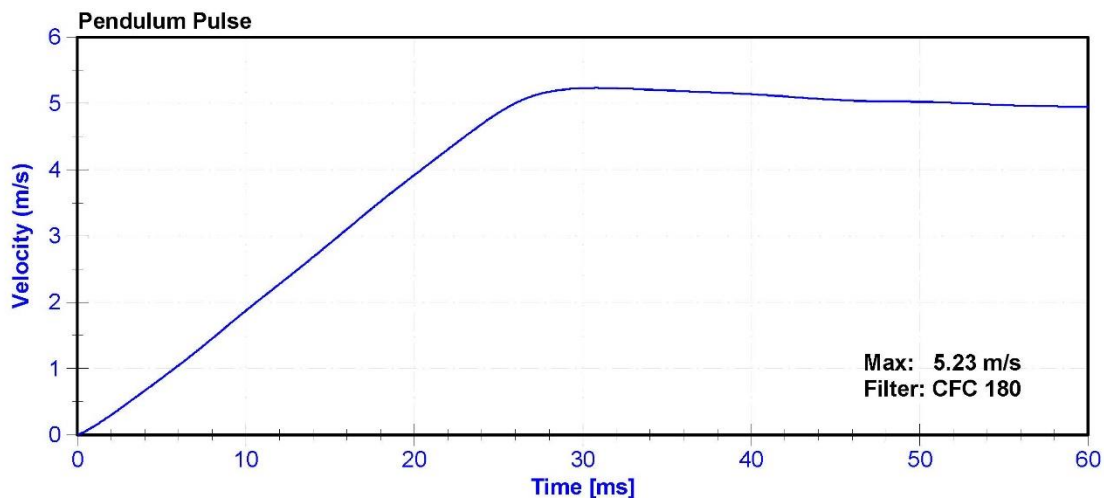
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

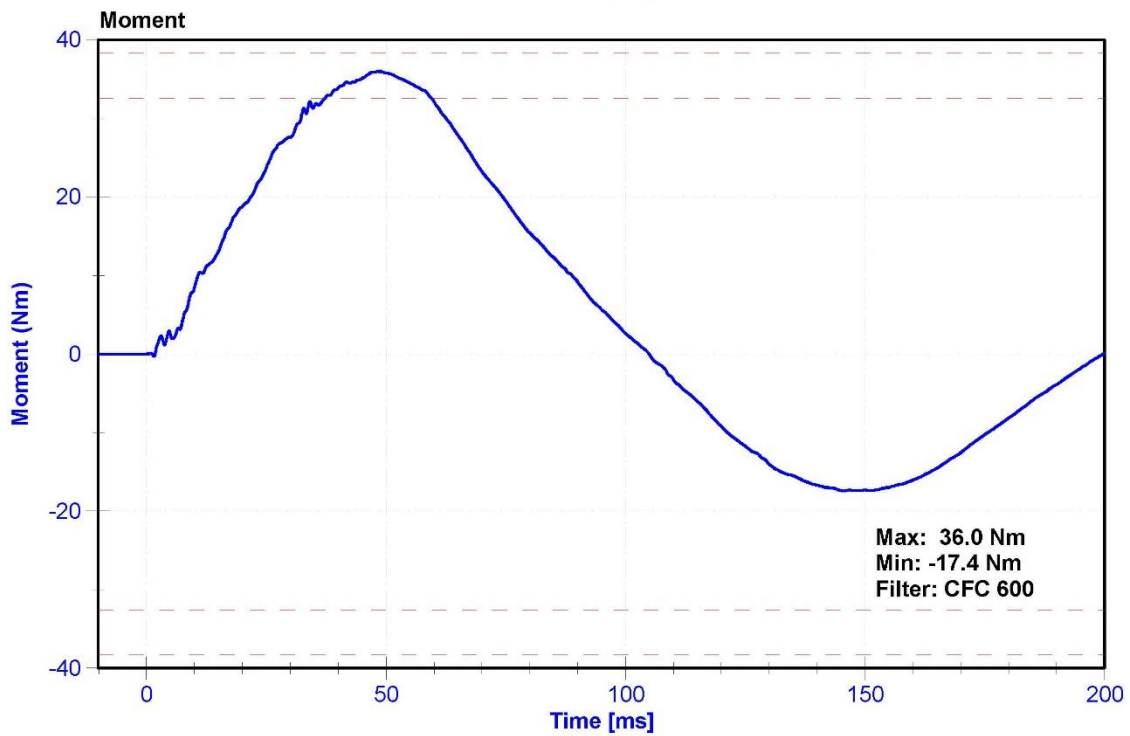
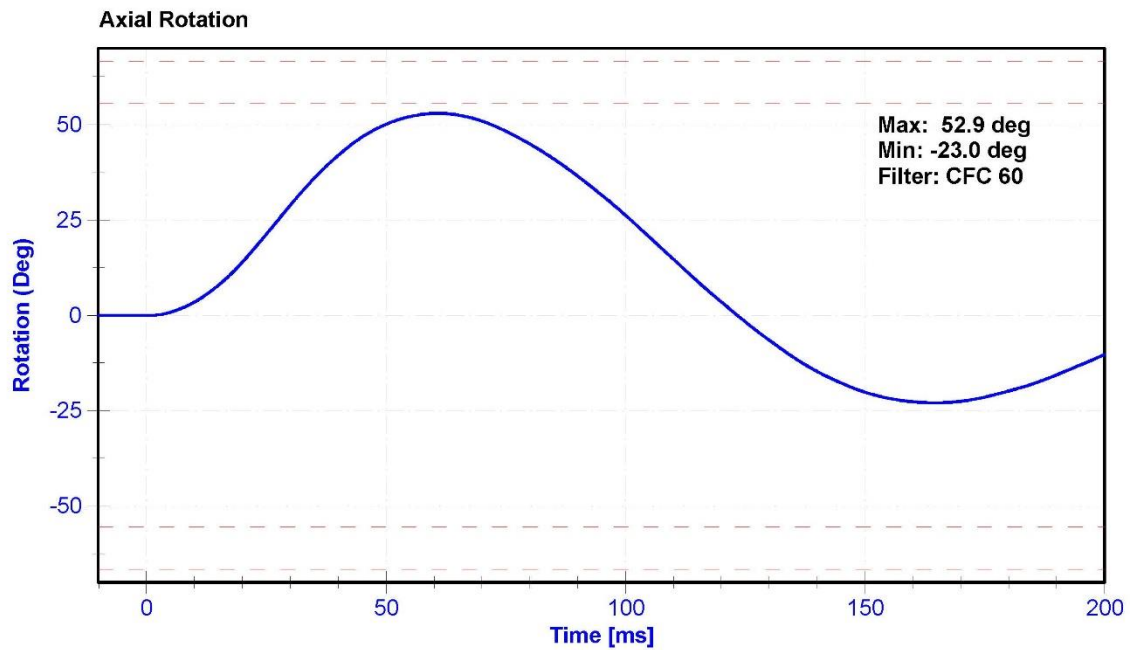
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	38.7	Pass
Velocity	4.95	5.05	m/s	5.01	Pass
Pendulum Impulse at 10ms	1.72	1.98	m/s	1.873	Pass
Pendulum Impulse at 15ms	2.67	2.97	m/s	2.891	Pass
Pendulum Impulse at 20ms	3.59	3.98	m/s	3.920	Pass
Pendulum Impulse at 25ms	4.43	4.92	m/s	4.860	Pass
Maximum Upper Neck Moment	32.6	38.3	Nm	35.97	Pass
Peak Axial Rotation	55.6	66.6	deg	52.95	Fail
Rotation Decay to Zero	58.0	61.6	ms	62.45	Fail
Peak Upper Neck Angular Velocity	1559	1709	deg/s	1622.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Upper Neck Load Cell	Humanetics 10380J14	LC-DS9758 Mz	12/3/2014	12/3/2015
Upper Neck ARS	DTS ARS PRO-18K	ARS-9112	9/30/2015	9/29/2016





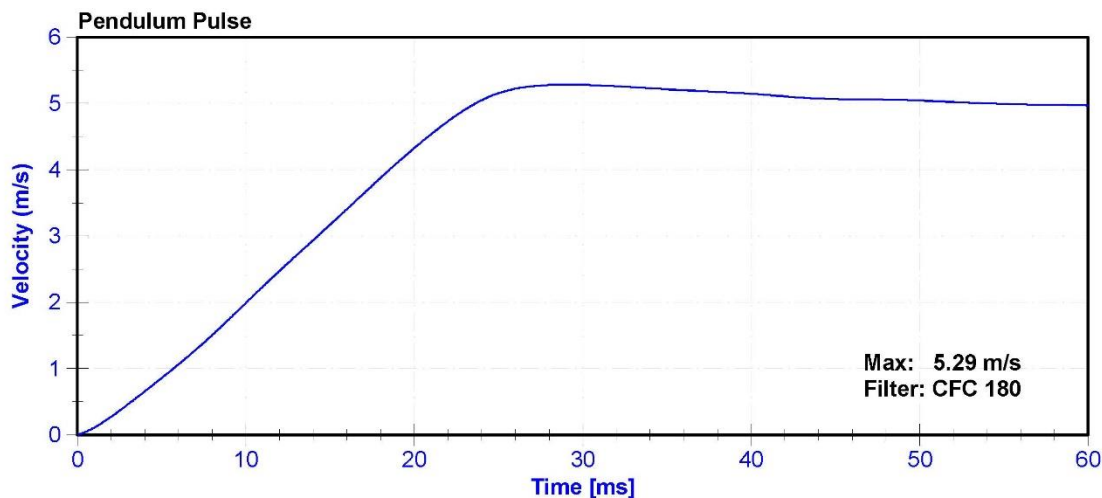
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

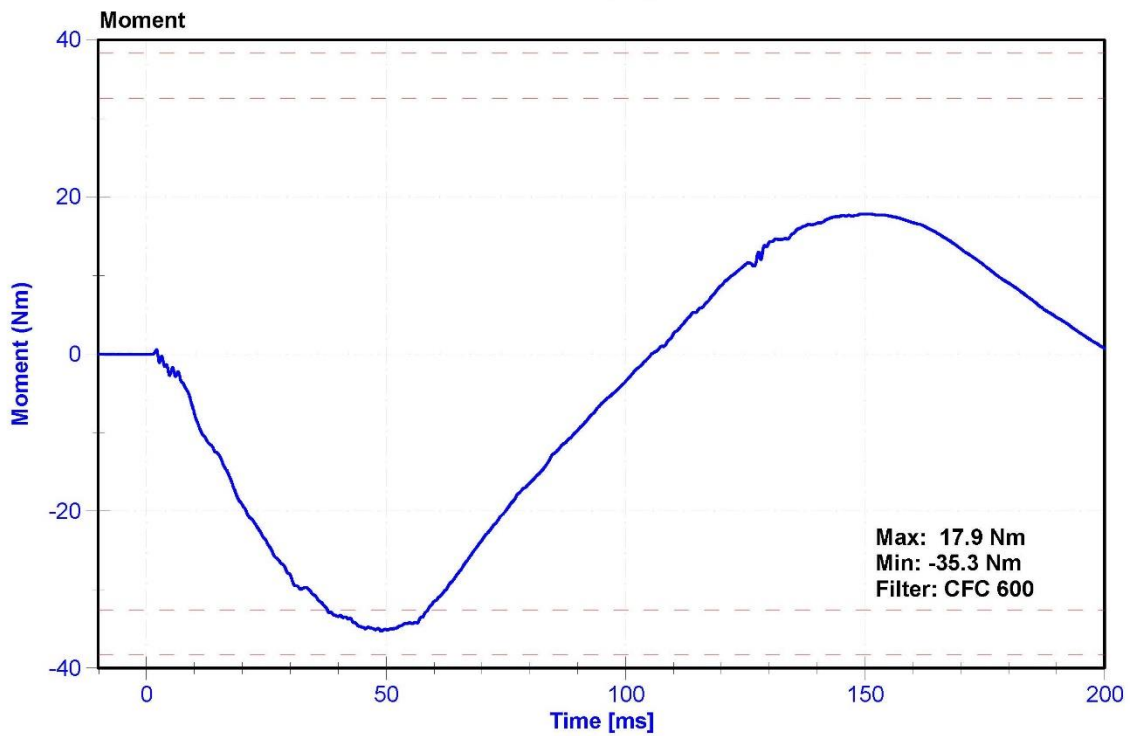
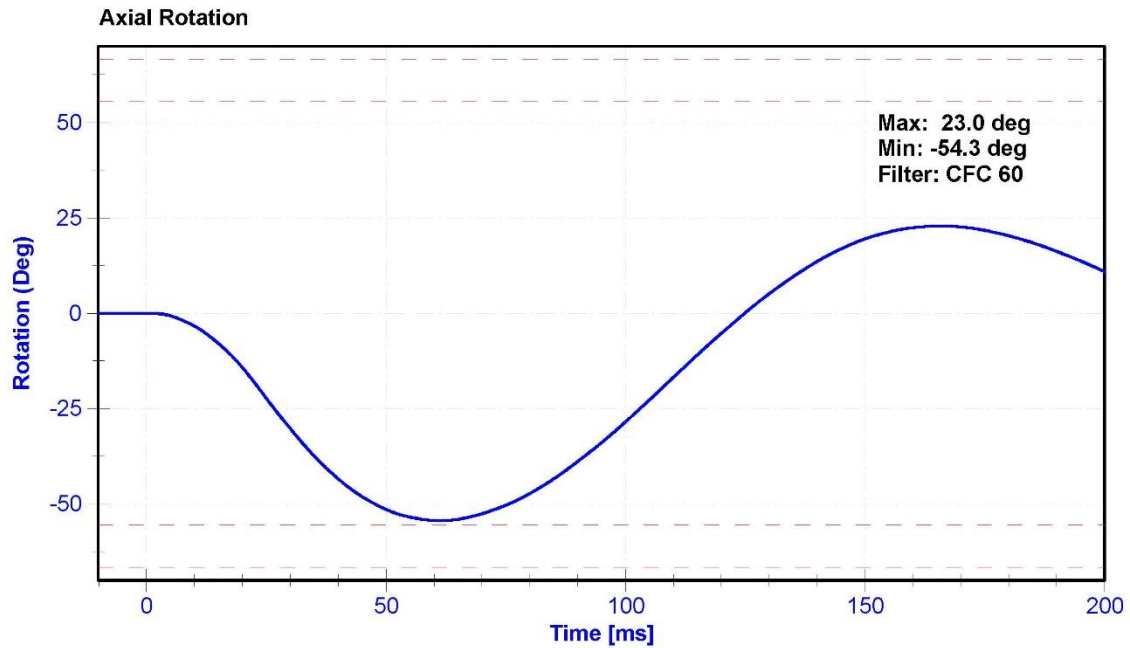
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	37.4	Pass
Velocity	4.95	5.05	m/s	4.98	Pass
Pendulum Impulse at 10ms	1.72	1.98	m/s	1.990	Pass
Pendulum Impulse at 15ms	2.67	2.97	m/s	3.170	Pass
Pendulum Impulse at 20ms	3.59	3.98	m/s	4.328	Pass
Pendulum Impulse at 25ms	4.43	4.92	m/s	5.155	Pass
Maximum Upper Neck Moment	32.6	38.3	Nm	35.26	Pass
Peak Axial Rotation	55.6	66.6	deg	54.32	Fail
Rotation Decay to Zero	58.0	61.6	ms	53.75	Fail
Peak Upper Neck Angular Velocity	1559	1709	deg/s	1765.26	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Rotation	Servo 14CB1-3615	DS-0001	10/21/2015	10/20/2016
Upper Neck Load Cell	Humanetics 10380J14	LC-DS9758 Mz	12/3/2014	12/3/2015
Upper Neck ARS	DTS ARS PRO-18K	ARS-9112	9/30/2015	9/29/2016





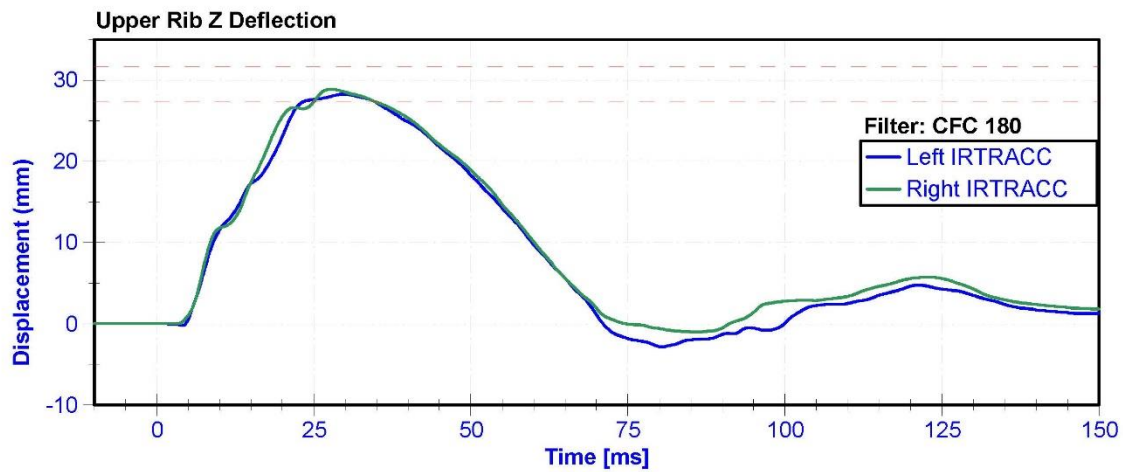
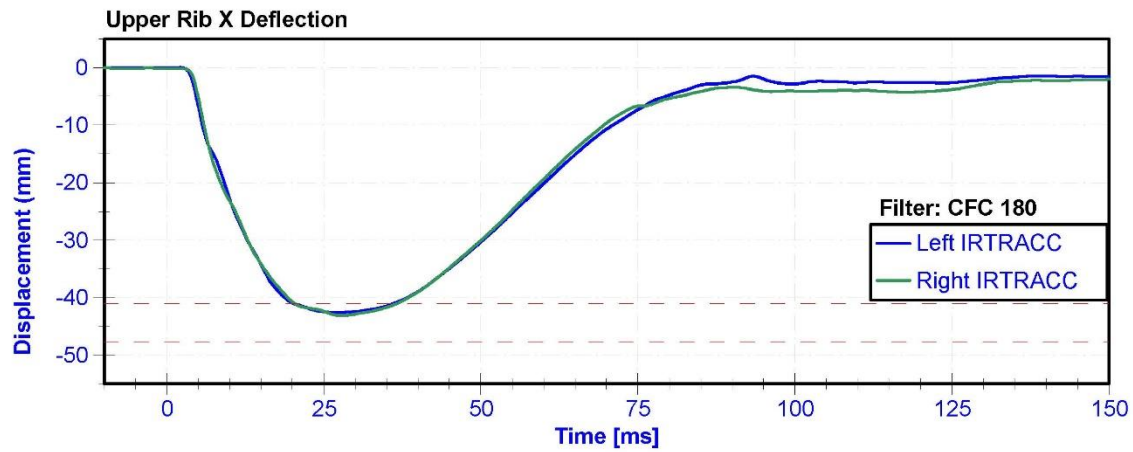
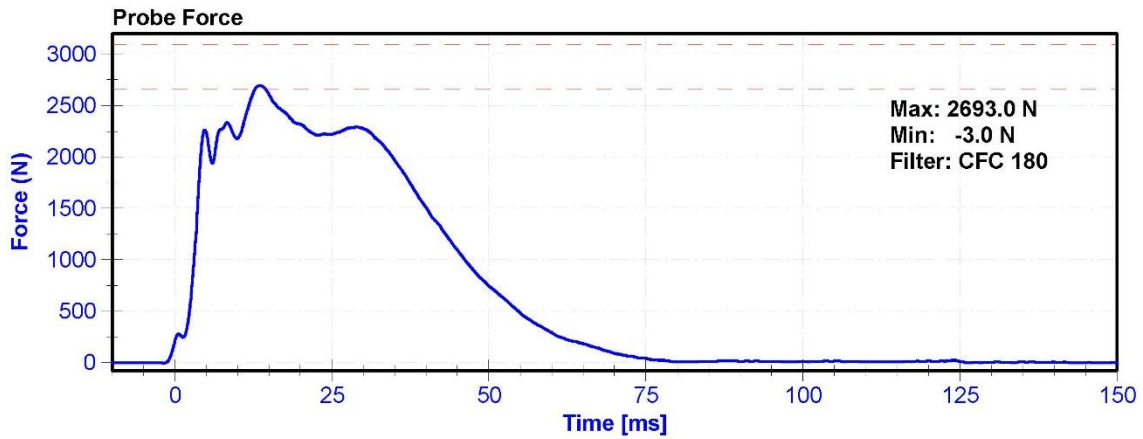
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	D09798	Laboratory Supervisor	M. Goehle

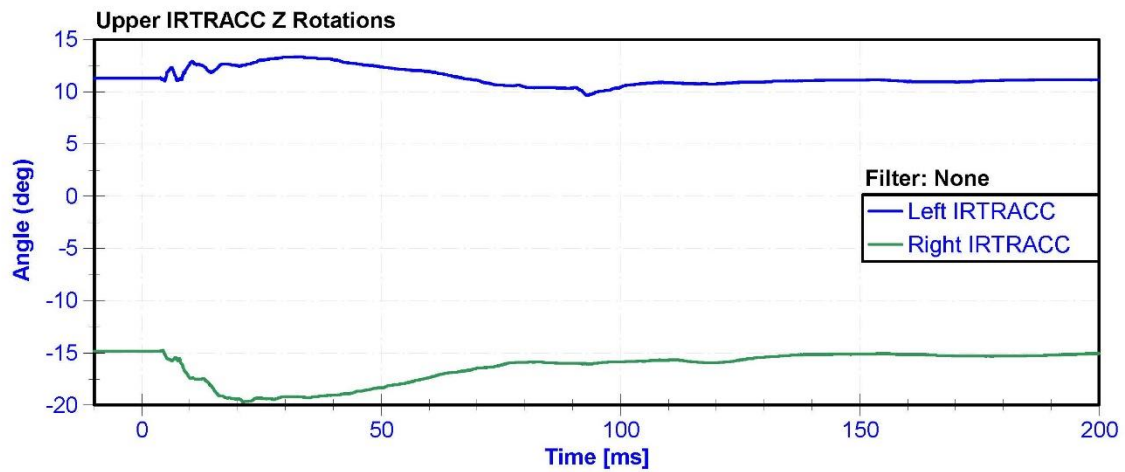
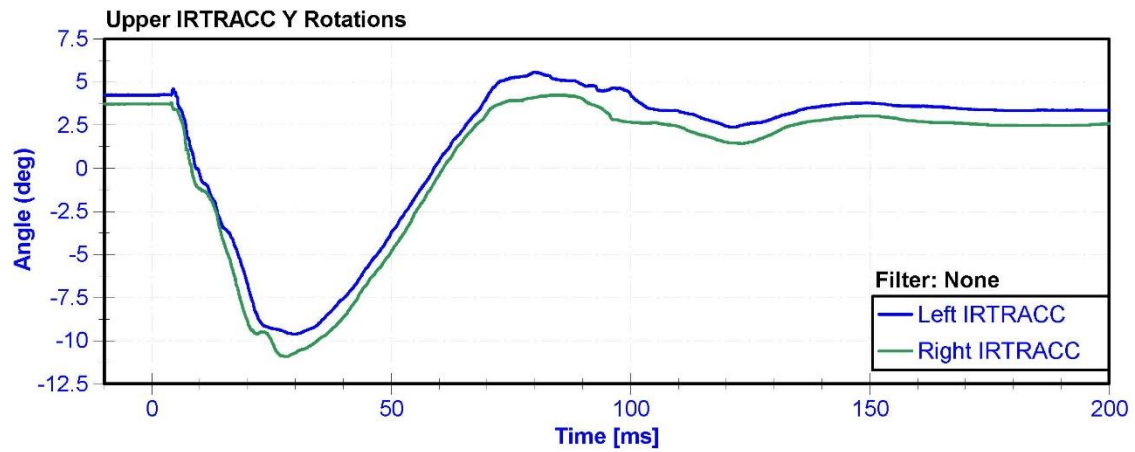
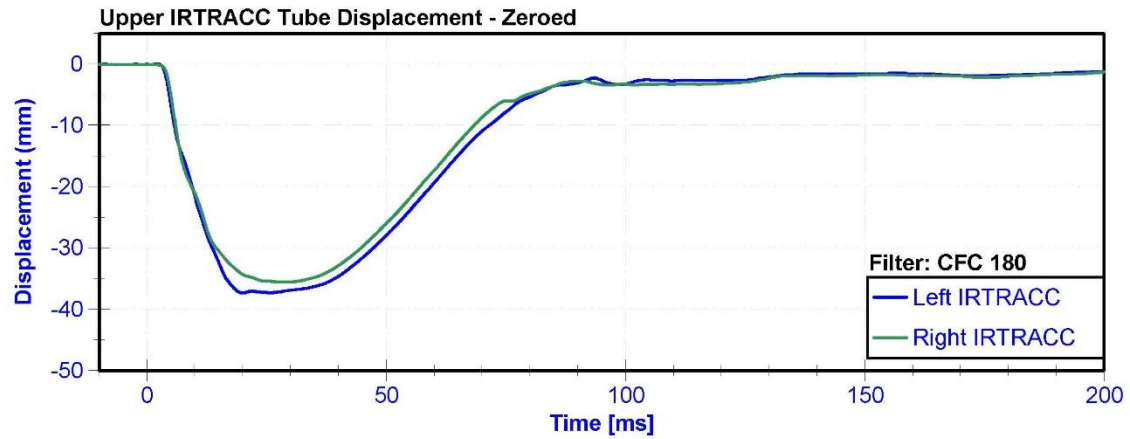
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	56.2	Pass
Impact Velocity	4.25	4.35	m/s	4.299	Pass
Probe Force	2,654	3,092	N	2693.0	Pass
Upper Left X Rib Deflection	-47.6	-41.0	mm	-42.54	Pass
Upper Right X Rib Deflection	-47.6	-41.0	mm	-43.09	Pass
Left/Right X Rib Deviation	-7.00	7.00	mm	0.559	Pass
Upper Left Z Rib Deflection	27.3	31.7	mm	28.26	Pass
Upper Right Z Rib Deflection	27.3	31.7	mm	28.88	Pass
Left/Right Z Rib Deviation	-7.00	7.00	mm	-0.628	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Upper Left IRTRACC	Humanetics IF-364-C-R3	DS-DQ2255	4/8/2015	4/7/2016
Upper Left Y Potentiometer	Sfernice 9945	DS-DM4779	4/8/2015	4/7/2016
Upper Left Z Potentiometer	Sfernice 9945	DS-DM4778	4/8/2015	4/7/2016
Upper Right IRTRACC	Humanetics IF-364-C-R3	DS-DQ2254	4/8/2015	4/7/2016
Upper Right Y Potentiometer	Sfernice 9945	DS-DM4774	4/8/2015	4/7/2016
Upper Right Z Potentiometer	Sfernice 9945	DS-DM4775	4/8/2015	4/7/2016





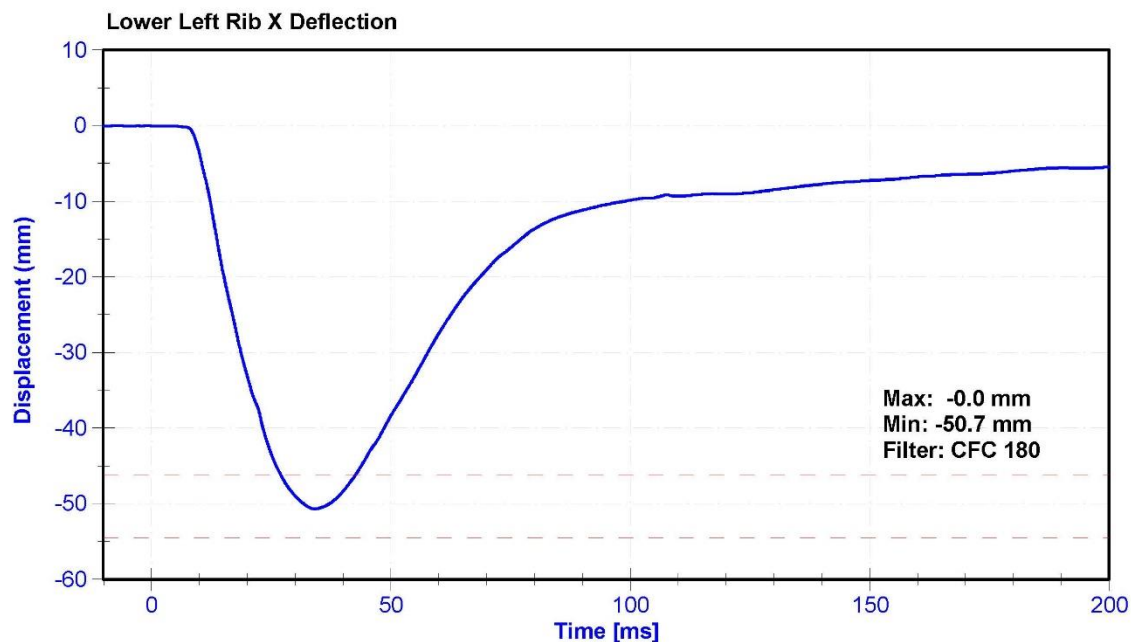
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

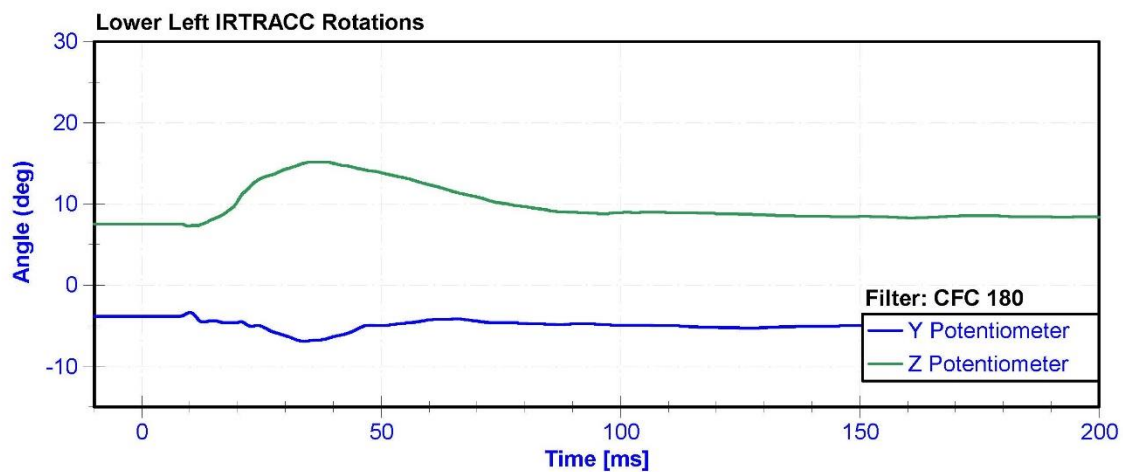
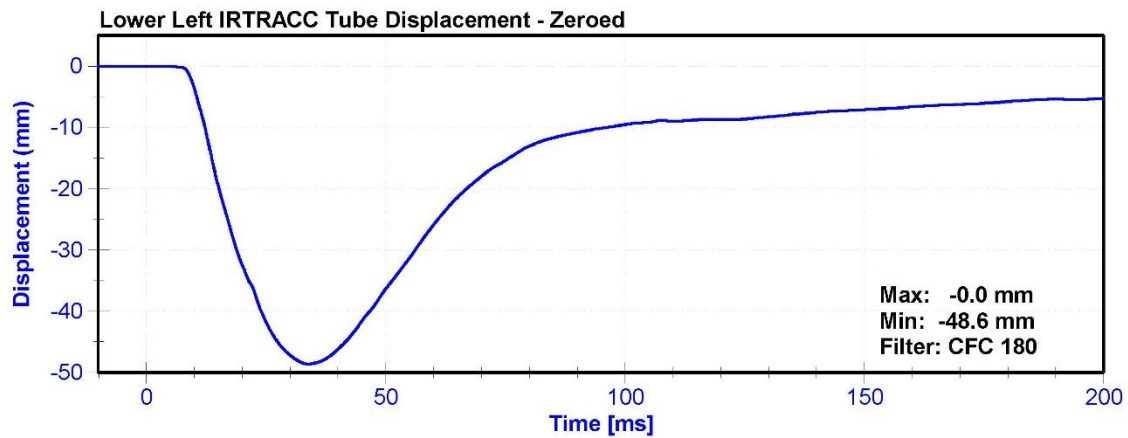
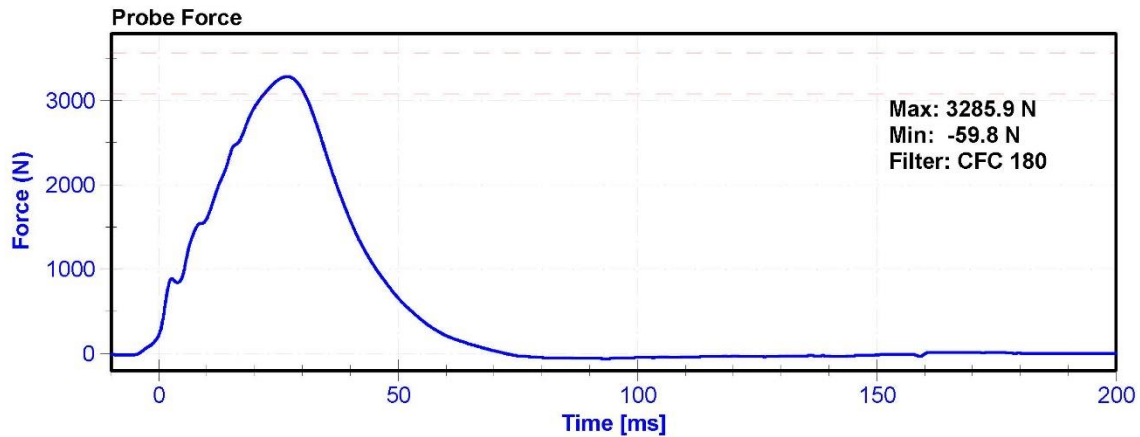
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	55.6	Pass
Impact Velocity	4.25	4.35	m/s	4.278	Pass
Peak Left X Rib Deflection	-54.5	-46.2	mm	-50.70	Pass
Probe Force during Peak Deflection	3083	3571	N	3285.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Lower Left IRTACC	Humanetics IF-364-C-R3	DS-DK3866	4/8/2015	4/7/2016
Lower Left Y Potentiometer	Sfernice 9945	DS-DJ5455	4/8/2015	4/7/2016
Lower Left Z Potentiometer	Sfernice 9945	DS-DJ5454	4/8/2015	4/7/2016





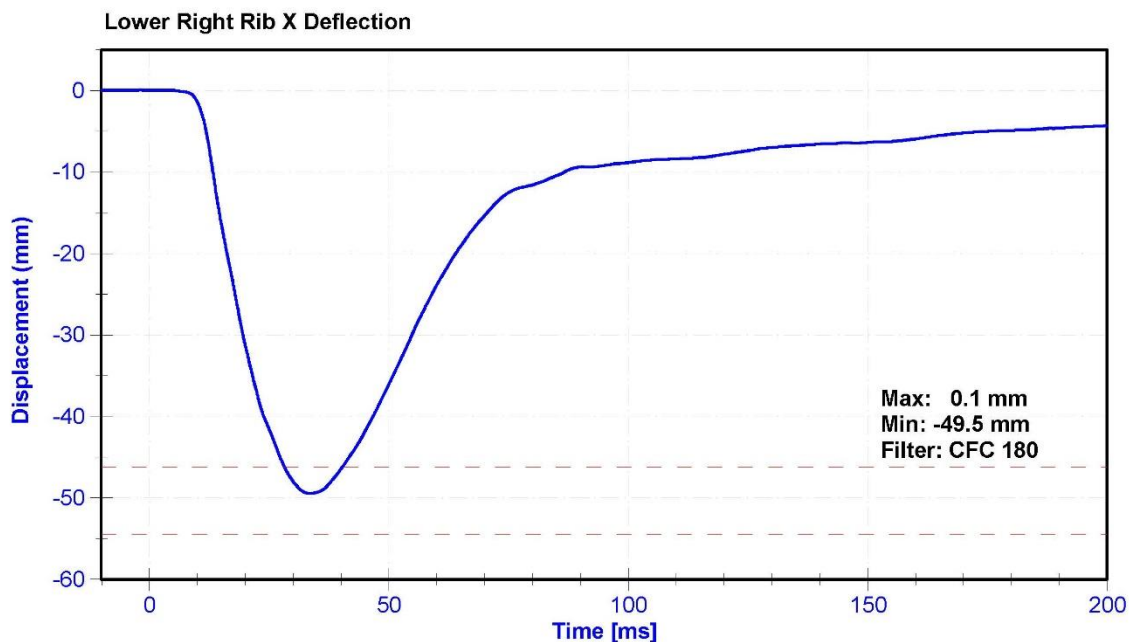
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

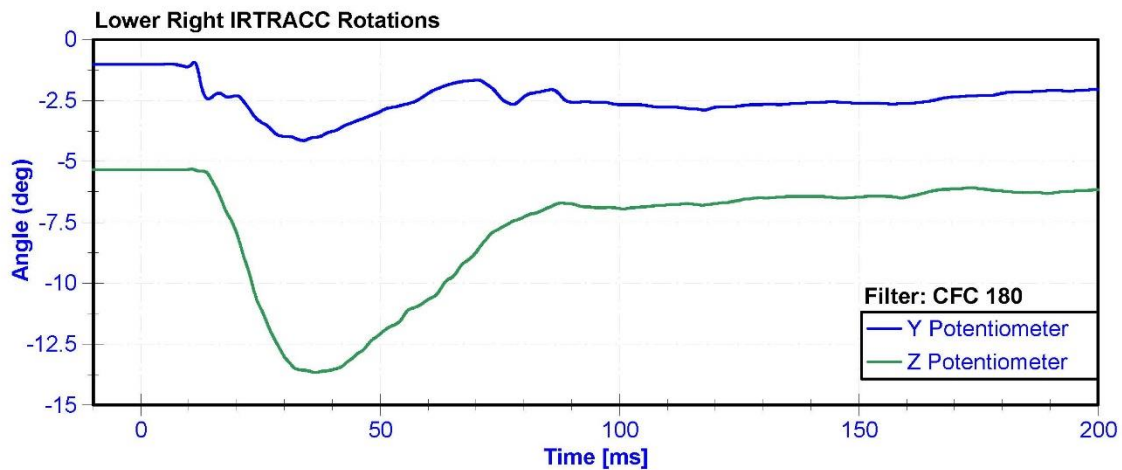
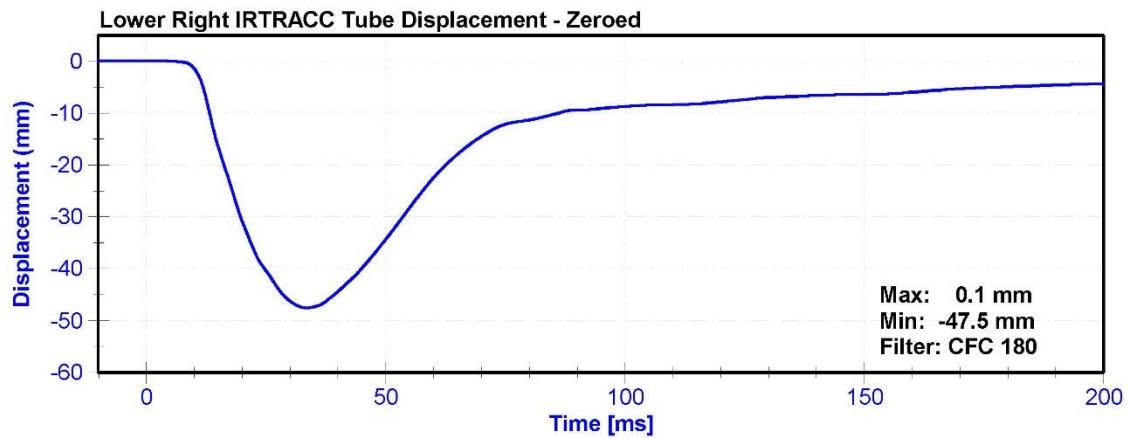
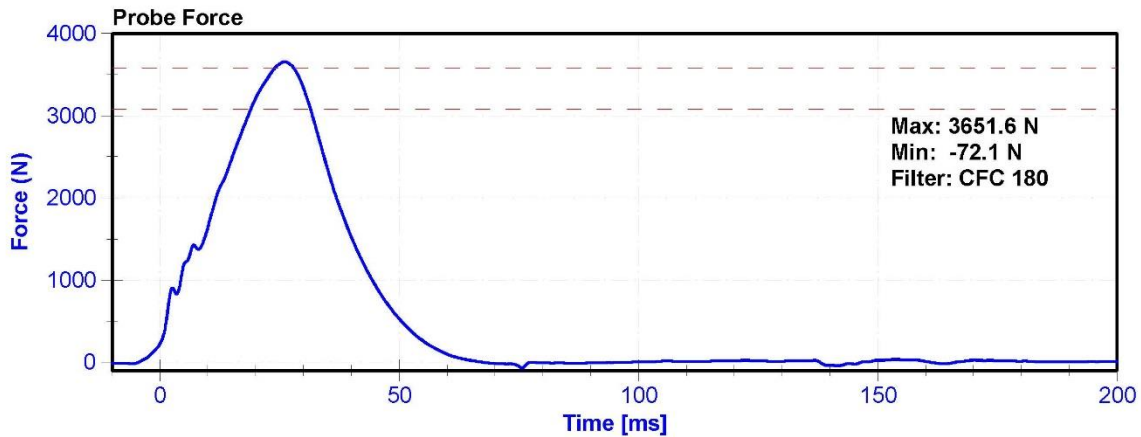
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	60.6	Pass
Impact Velocity	4.25	4.35	m/s	4.269	Pass
Peak Right X Rib Deflection	-54.5	-46.2	mm	-49.47	Pass
Probe Force during Peak Deflection	3083	3571	N	3560.93	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Lower Right IRTRACC	Humanetics IF-364-C-R3	DS-DK3865	4/8/2015	4/7/2016
Lower Right Y Potentiometer	Sfernice 9945	DS-DJ5453	4/8/2015	4/7/2016
Lower Right Z Potentiometer	Sfernice 9945	DS-DJ5452	4/8/2015	4/7/2016





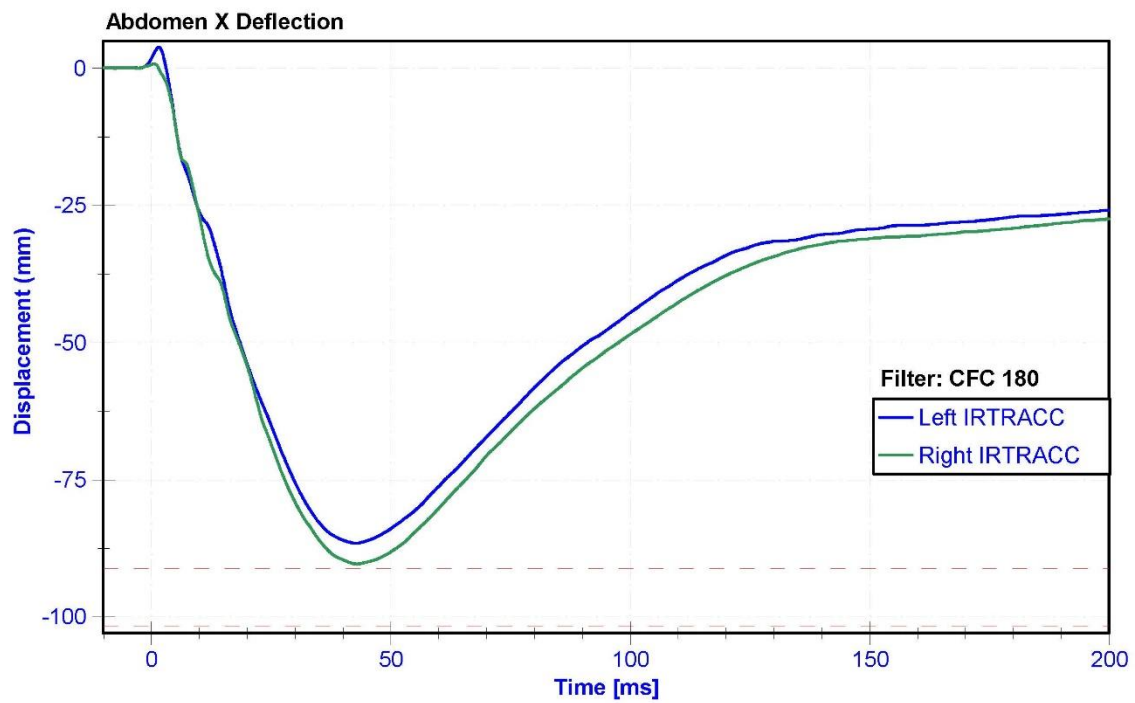
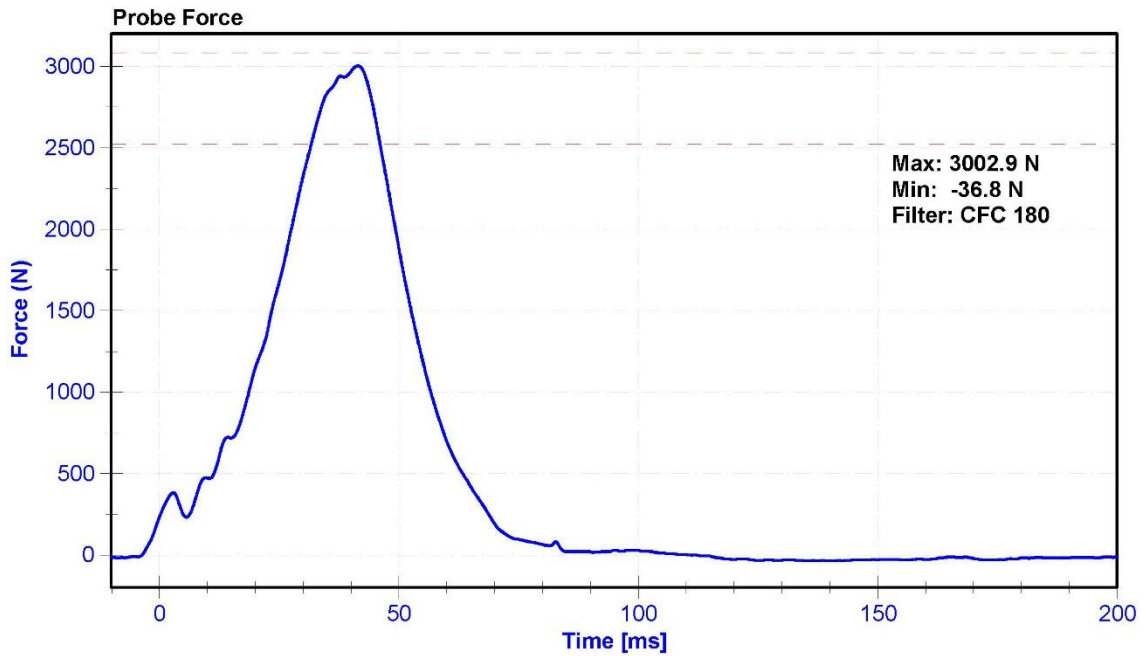
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

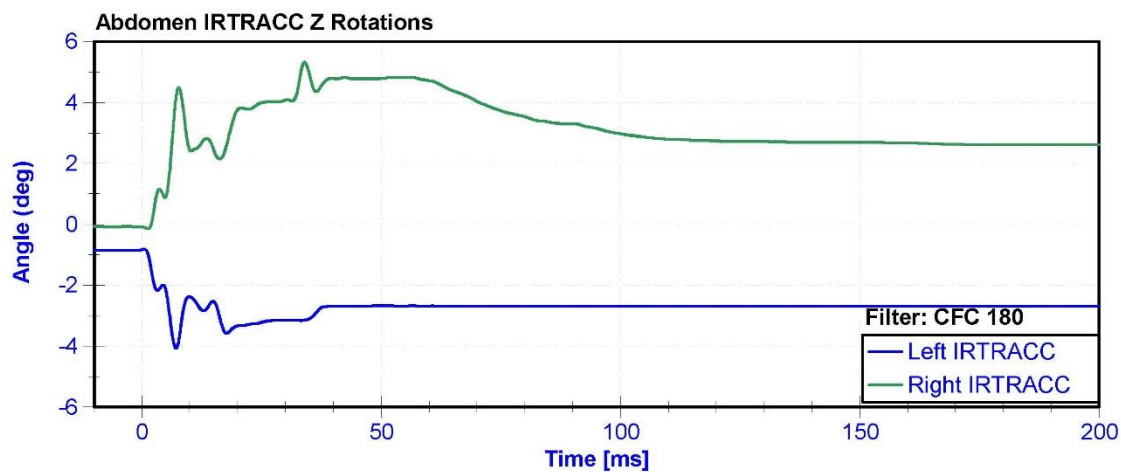
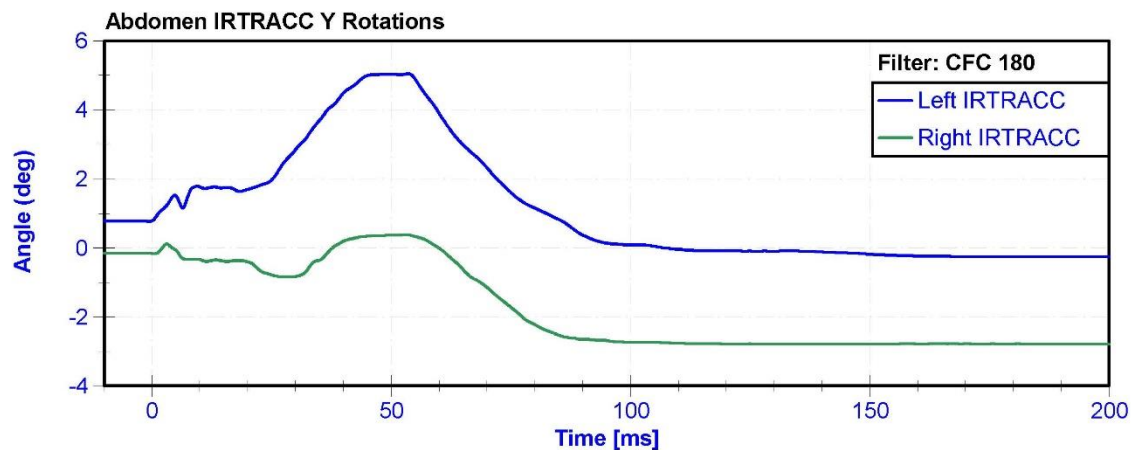
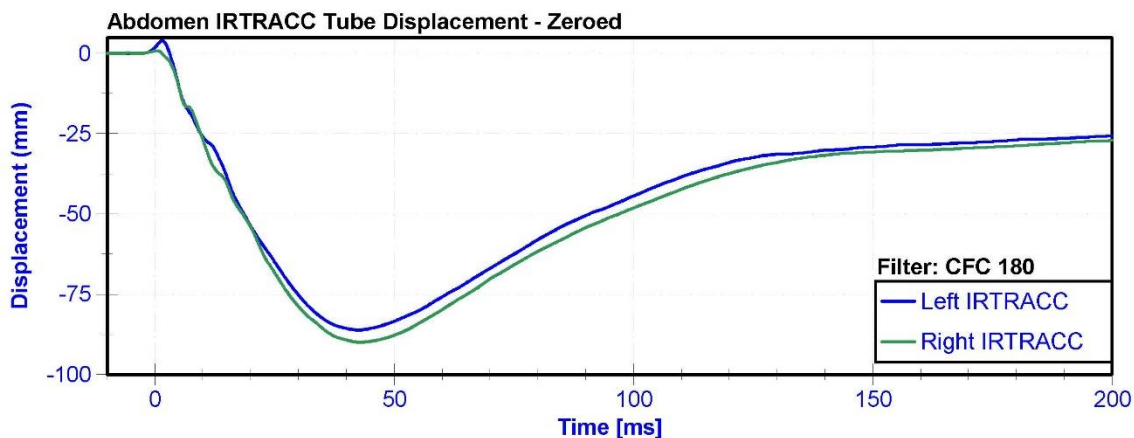
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	31.1	Pass
Impact Velocity	3.25	3.35	m/s	3.304	Pass
Probe Force	2,523	3,083	N	3002.9	Pass
Left Abdomen X Deflection	-101.6	-91.2	mm	-86.54	Fail
Right Abdomen X Deflection	-101.6	-91.2	mm	-90.32	Fail
Left/Right X Deviation	-7.00	7.00	mm	3.781	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Abdomen Left IRTRACC	Humanetics 9910	DS-183	3/9/2015	3/8/2016
Abdomen Left Y Potentiometer	Sfernice 9945	DS-DJ5443	5/18/2015	5/17/2016
Abdomen Left Z Potentiometer	Sfernice 9945	DS-DJ5444	5/18/2015	5/17/2016





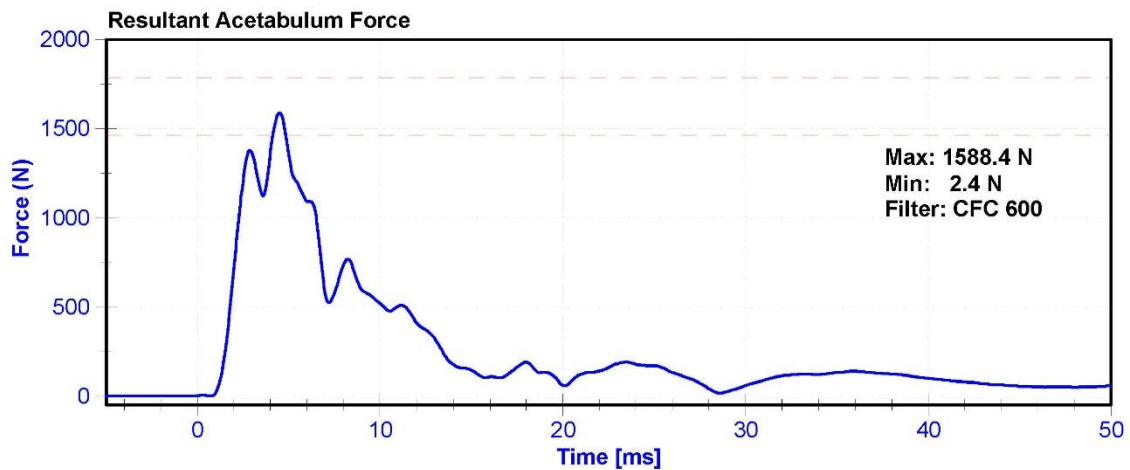
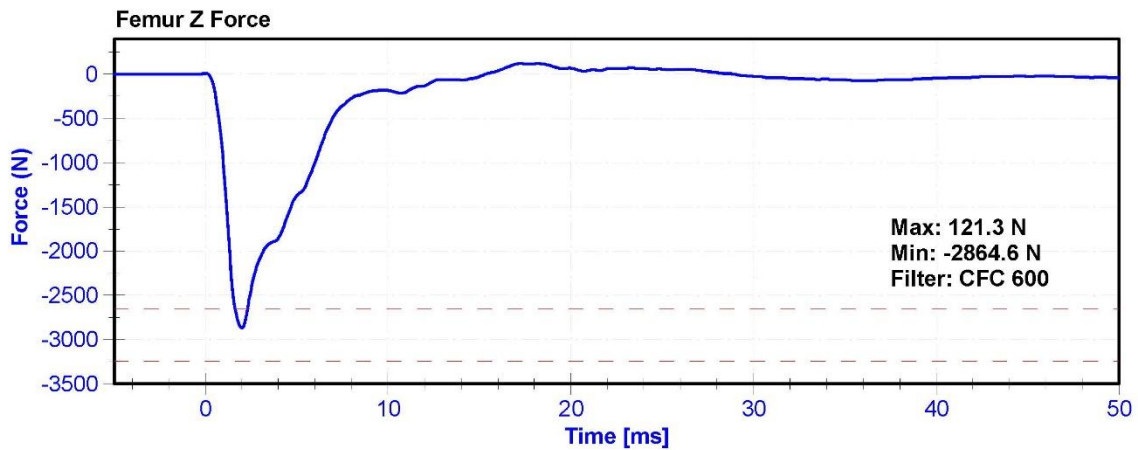
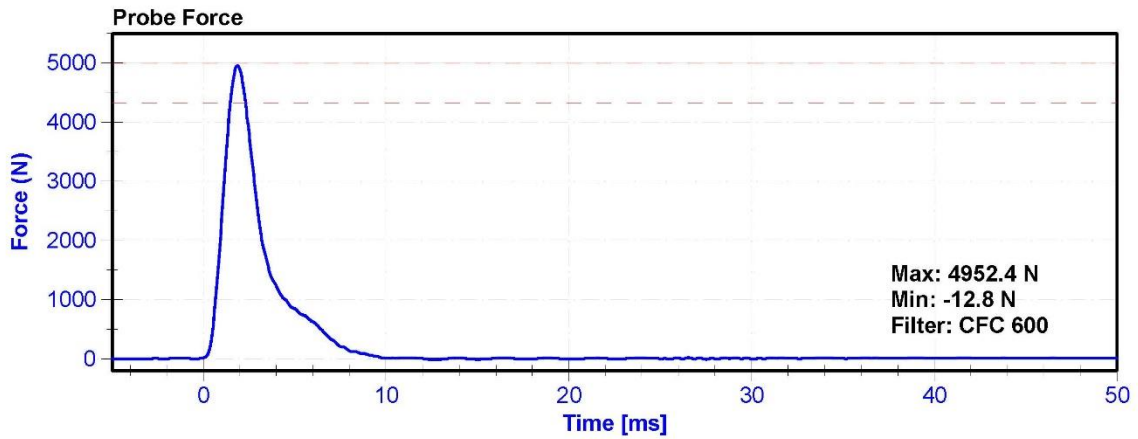
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	26.9	Pass
Impact Velocity	2.55	2.65	m/s	2.592	Pass
Probe Force	4,318	4,989	N	4952.4	Pass
Peak Femur Z Force	-3,241	-2,652	N	-2864.63	Pass
Peak Resultant Acetabulum Force	1,462	1,787	N	1588.39	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Left Femur Load Cell	Humanetics W50-71010	LC-DK0842 Fz	2/11/2015	2/11/2016
Left Acetabulum Load Cell	Humanetics 10530JL4	LC-DM1945 Fx	3/7/2015	3/6/2016



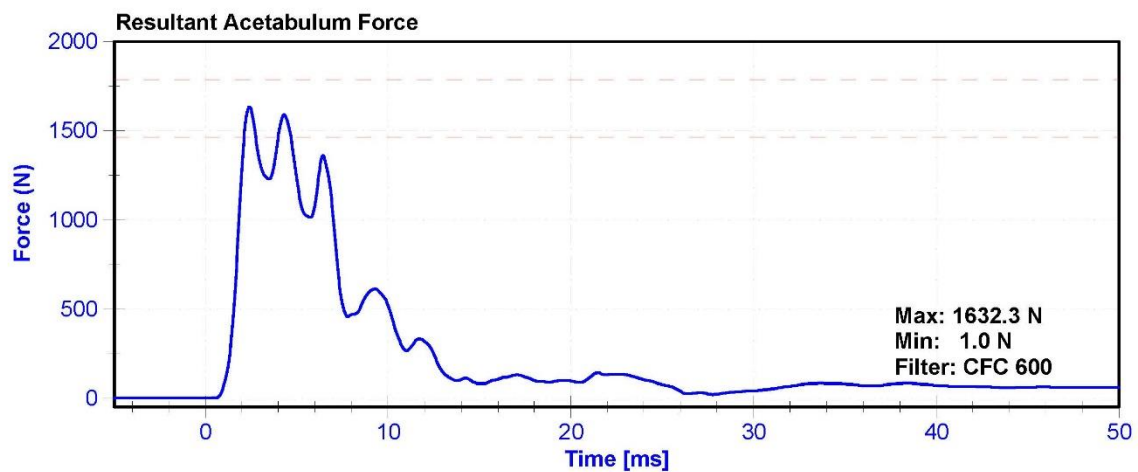
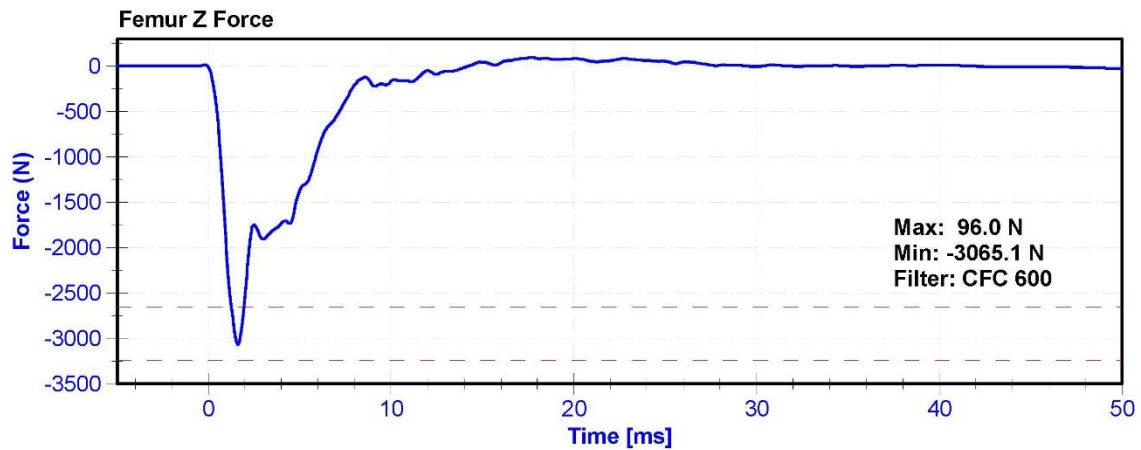
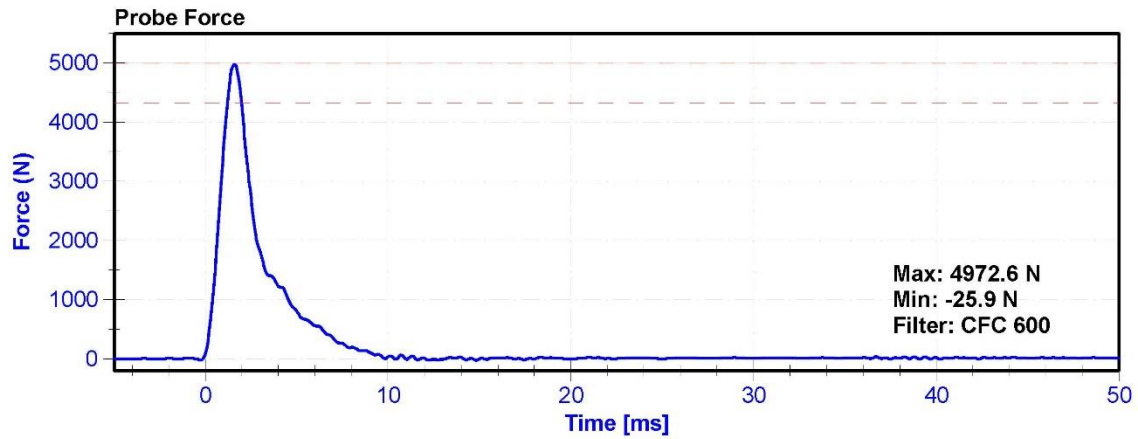
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	28.1	Pass
Impact Velocity	2.55	2.65	m/s	2.572	Pass
Probe Force	4,318	4,989	N	4972.6	Pass
Peak Femur Z Force	-3,241	-2,652	N	-3065.07	Pass
Peak Resultant Acetabulum Force	1,462	1,787	N	1632.26	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Left Femur Load Cell	Humanetics W50-71010	LC-DK3608 Fz	3/3/2015	3/2/2016
Left Acetabulum Load Cell	Humanetics 10670JI4	LC-DL9552 Fx	3/7/2015	3/6/2016



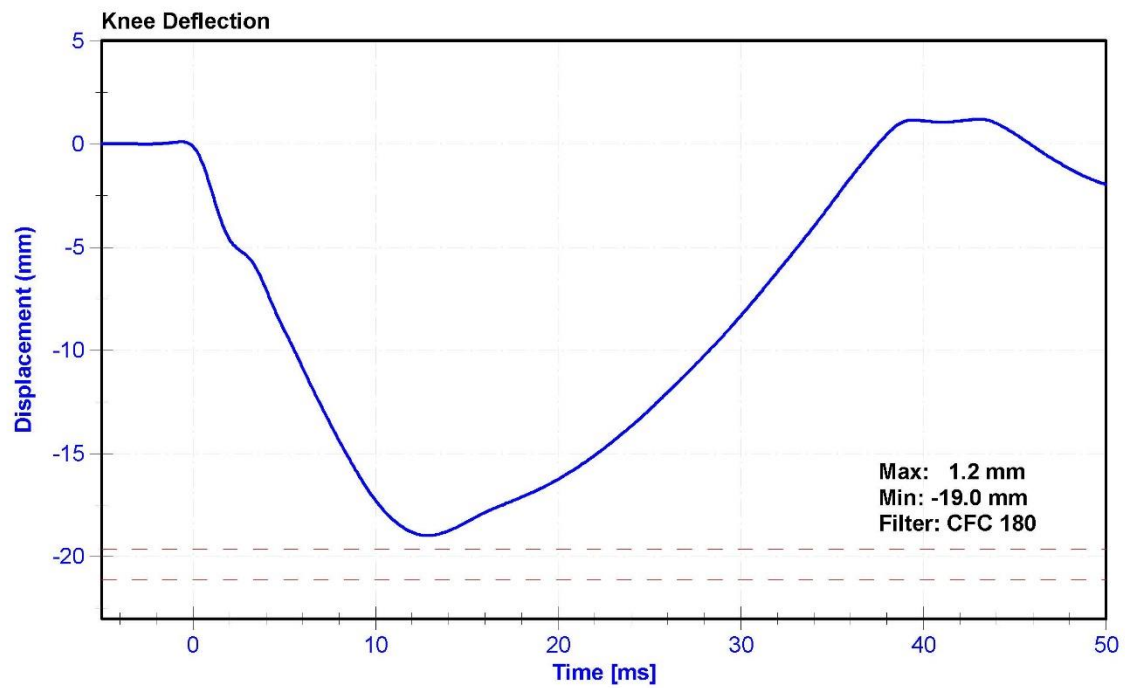
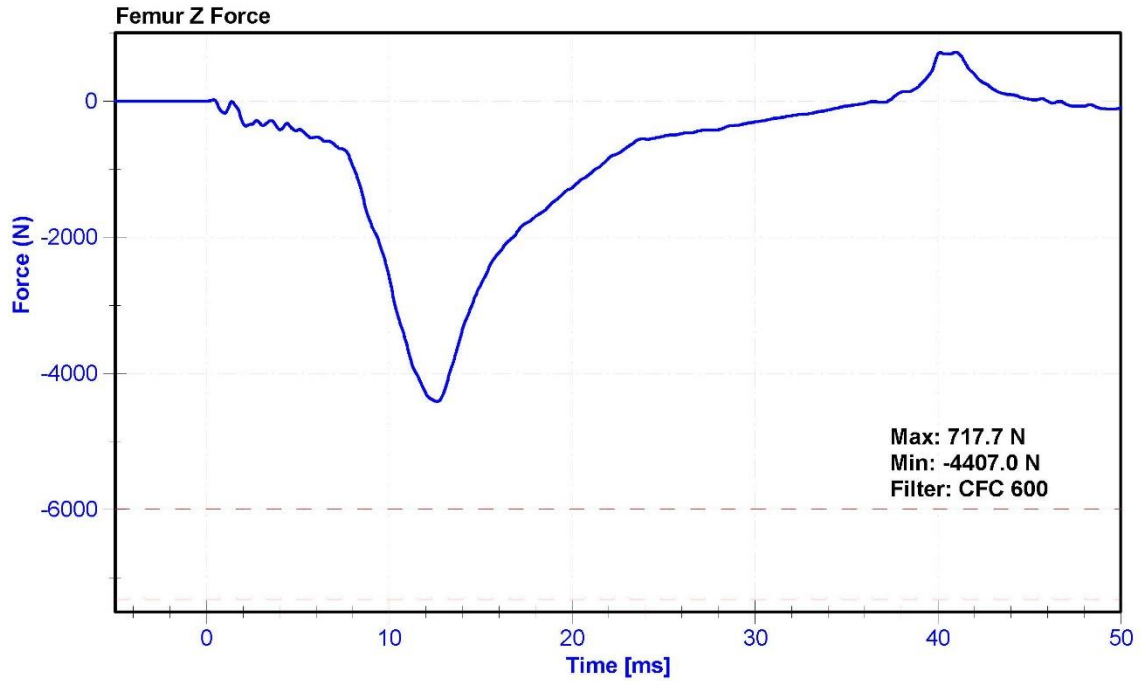
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	36.4	Pass
Impact Velocity	2.15	2.25	m/s	2.223	Pass
Peak Femur Z Force	-7,317	-5,987	N	-4407.0	Fail
Knee Deflection at Peak Force	-21.12	-19.62	mm	-18.97	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Femur Load Cell	Humanetics W50-71010	LC-DK0842 Fz	2/11/2015	2/11/2016
Knee Potentiometer	Space Age 150-0121V	DS-13073811	6/24/2015	6/23/2016





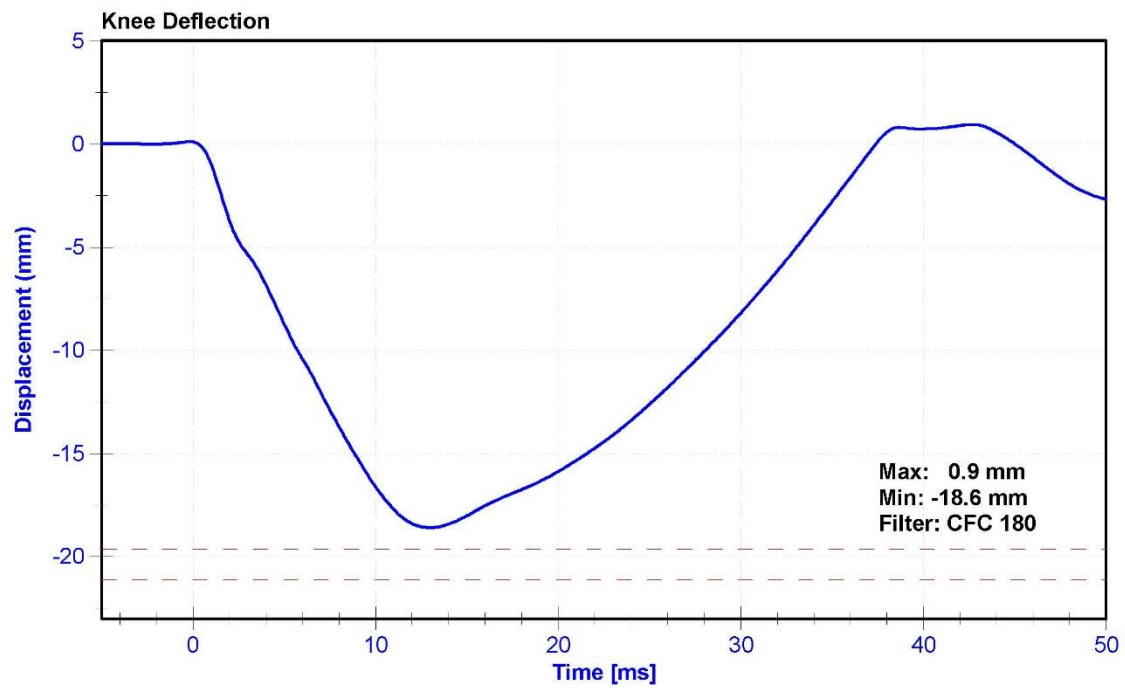
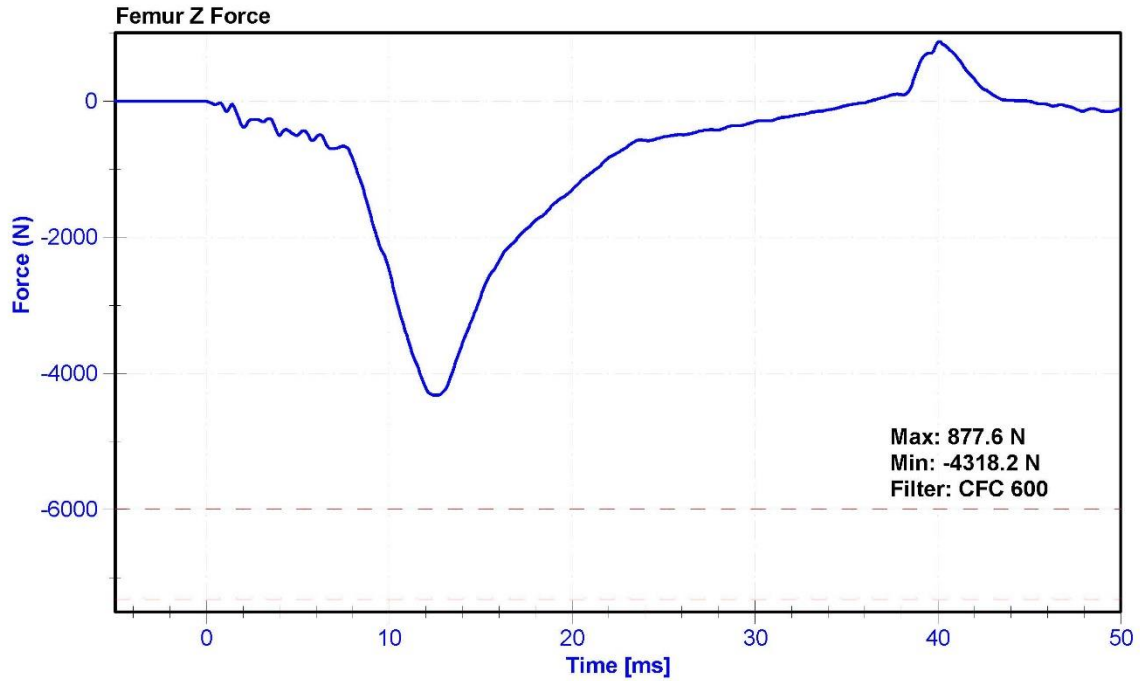
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	39.3	Pass
Impact Velocity	2.15	2.25	m/s	2.210	Pass
Peak Femur Z Force	-7,317	-5,987	N	-4318.2	Fail
Knee Deflection at Peak Force	-21.12	-19.62	mm	-18.59	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Femur Load Cell	Humanetics W50-71010	LC-DK3608 Fz	3/3/2015	3/2/2016
Knee Potentiometer	Space Age 150-0121V	DS-13073814	6/24/2015	6/23/2016





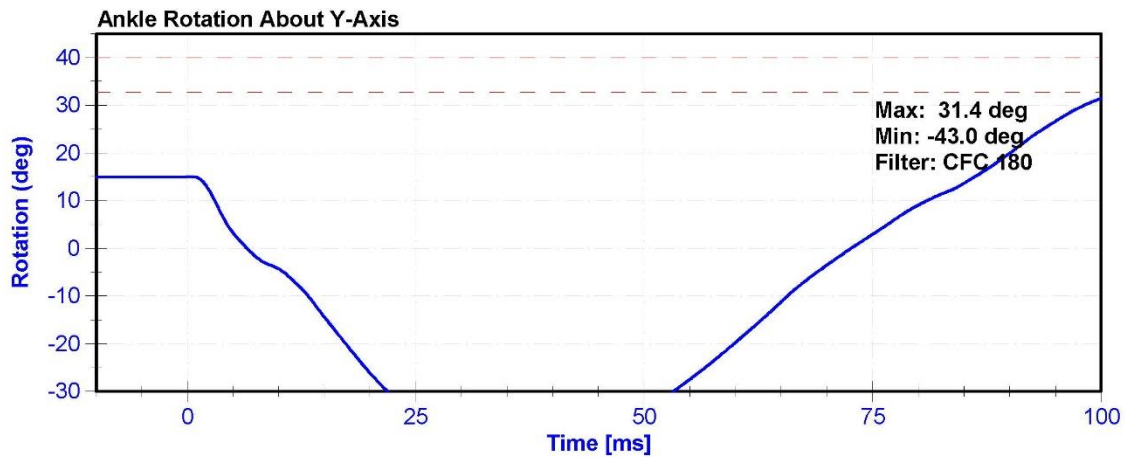
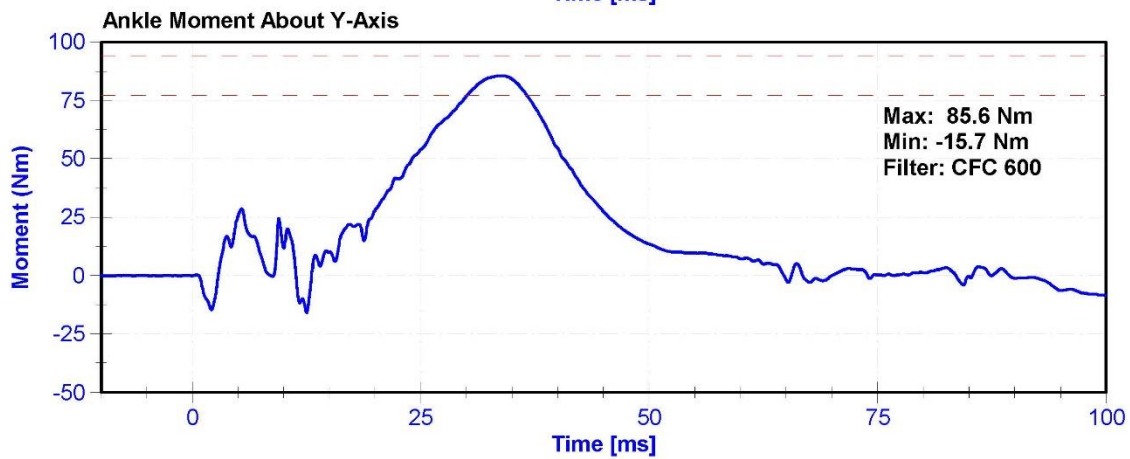
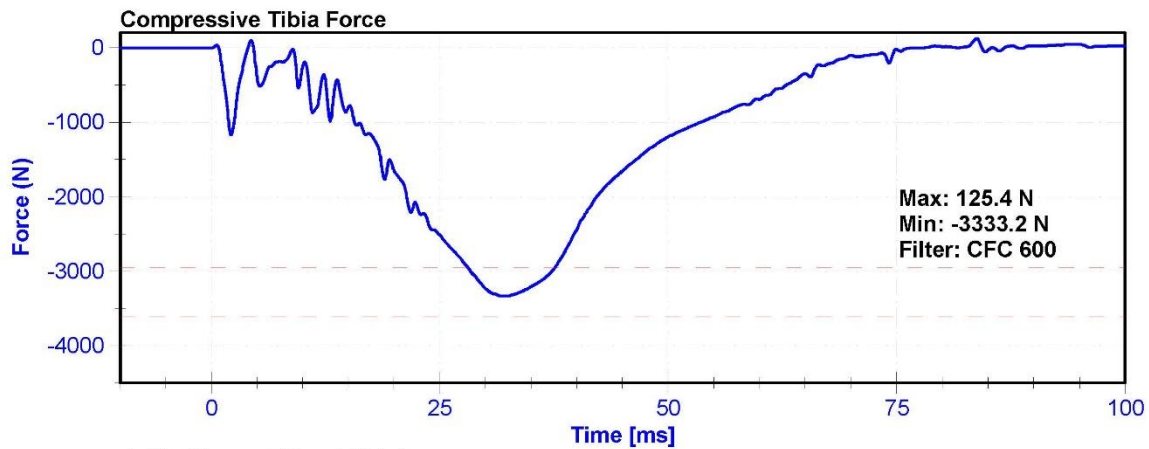
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	53.7	Pass
Velocity	4.9	5.1	m/s	4.885	Pass
Lower Tibia Compressive Force	-3,613	-2,956	N	-3333.2	Pass
Peak Moment about Y-Axis	77.1	94.2	Nm	85.56	Pass
Peak Rotation about Y-Axis	32.7	39.9	deg	35.62	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9685 Fz	5/5/2015	5/4/2016
Ankle Y Potentiometer	SFERNICE ECO50ESC10	DS-ANKL005	5/27/2015	5/26/2016



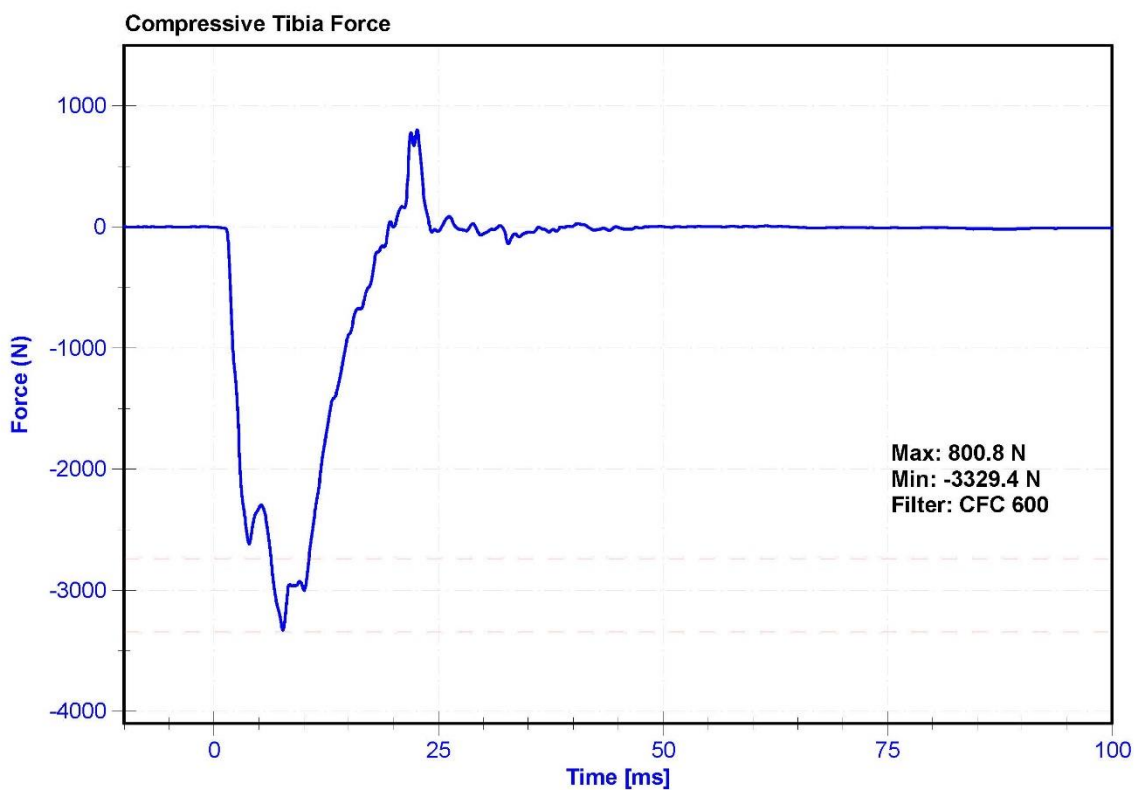
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	50.4	Pass
Velocity	3.9	4.1	m/s	3.990	Pass
Lower Tibia Compressive Force	-3,346	-2,738	N	-3329.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9685 Fz	5/5/2015	5/4/2016





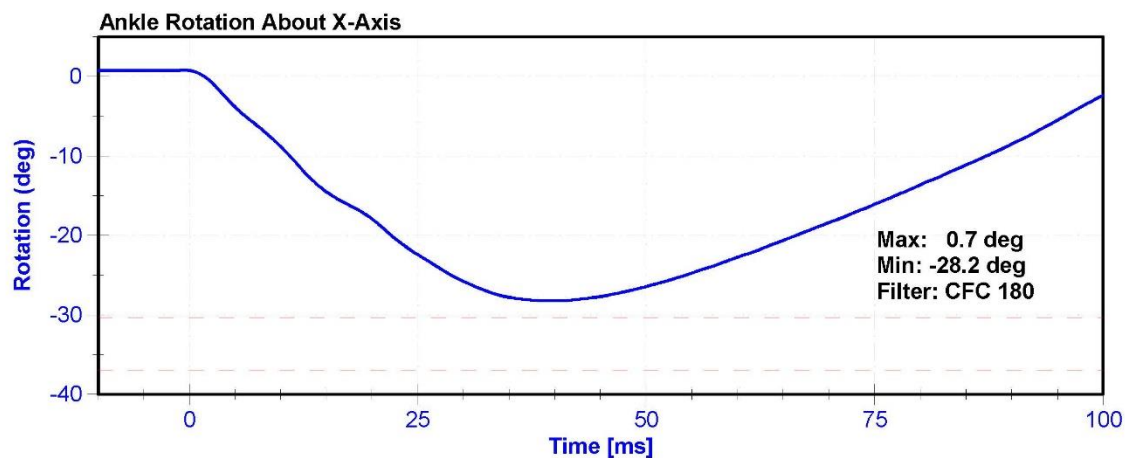
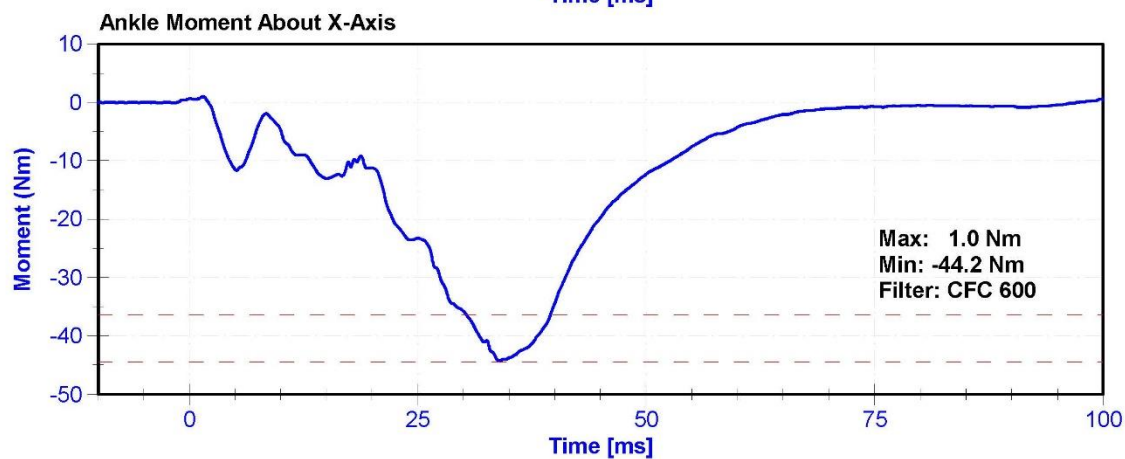
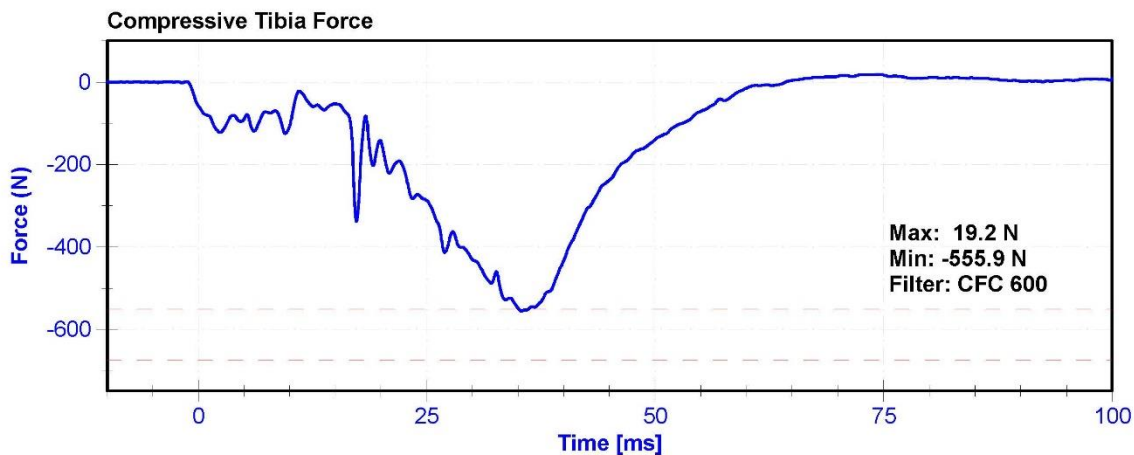
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	D09798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	50.4	Pass
Velocity	1.9	2.1	m/s	1.934	Pass
Lower Tibia Compressive Force	-675	-552	N	-555.9	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-44.23	Pass
Peak Rotation about X-Axis	-37.0	-30.3	deg	-28.24	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9685 Fz	5/5/2015	5/4/2016
Ankle Y Potentiometer	SFERNICE ECO50ESC10	DS-ANKL004	5/27/2015	5/26/2016





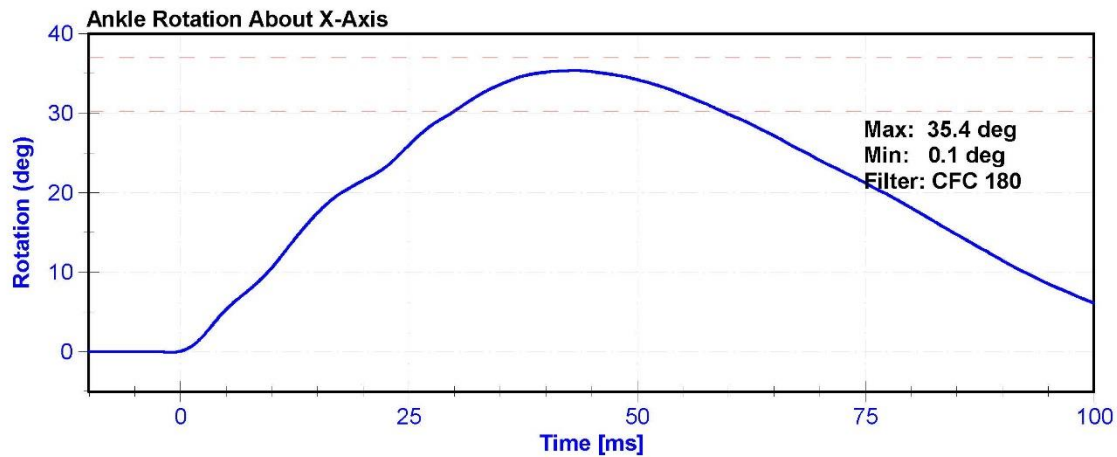
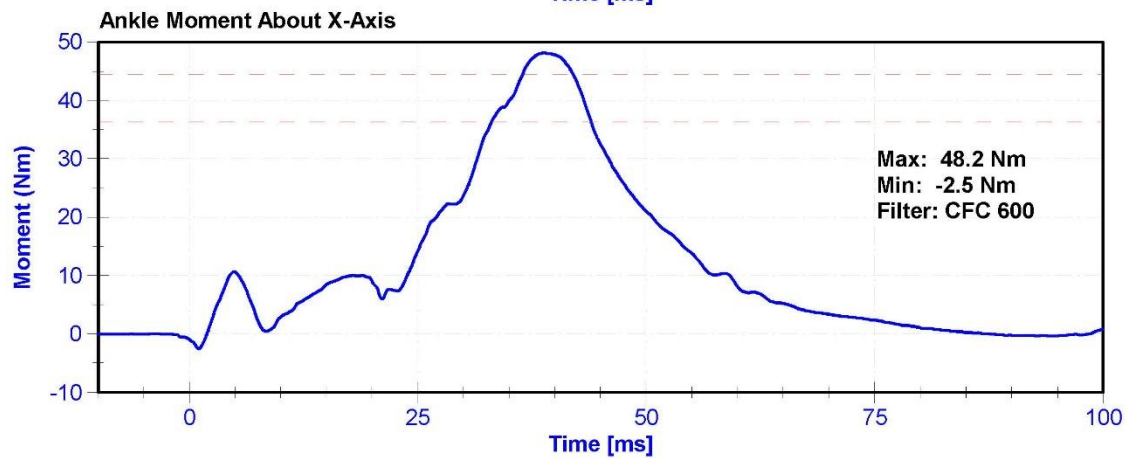
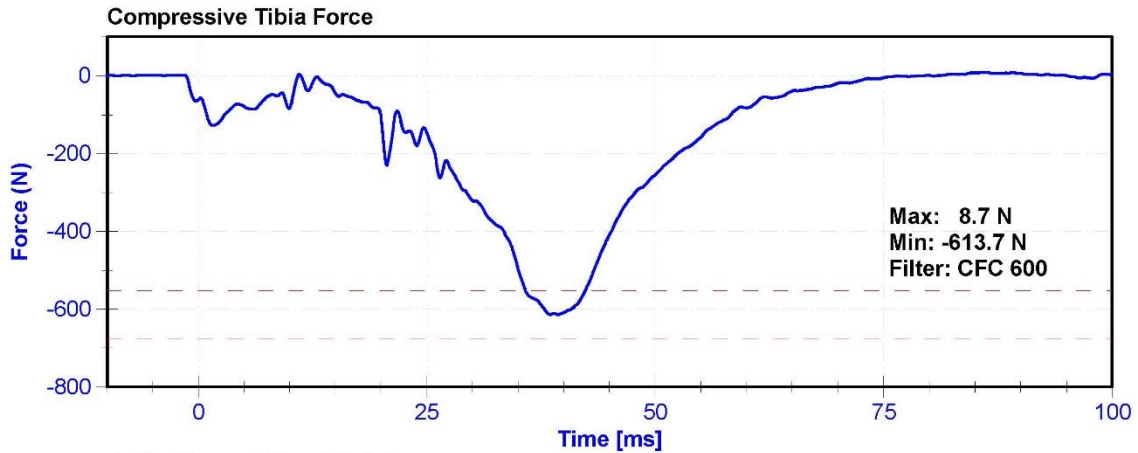
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	50.7	Pass
Velocity	1.9	2.1	m/s	1.959	Pass
Lower Tibia Compressive Force	-675	-552	N	-613.7	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	48.15	Fail
Peak Rotation about X-Axis	30.3	37.0	deg	35.35	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9685 Fz	5/5/2015	5/4/2016
Ankle Y Potentiometer	SFERNICE ECO50ESC10	DS-ANKL004	5/27/2015	5/26/2016





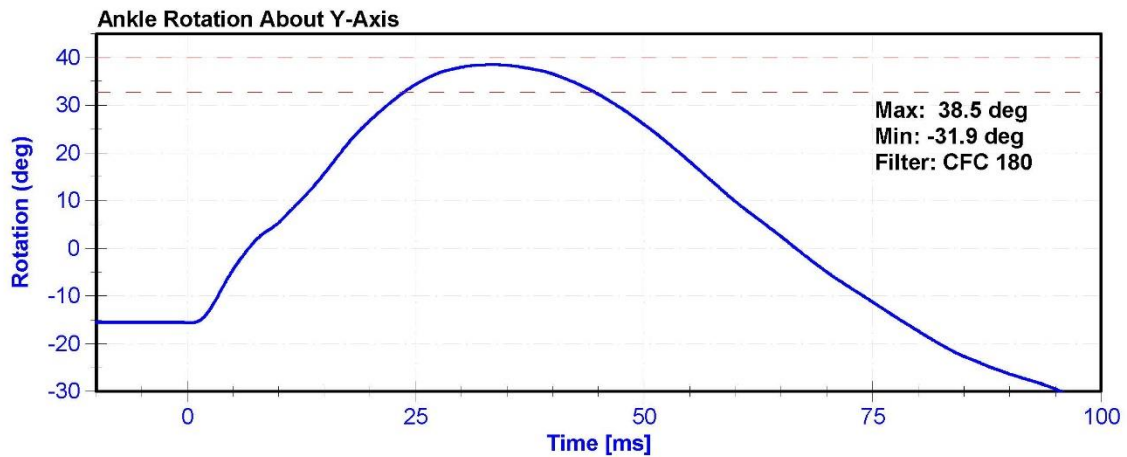
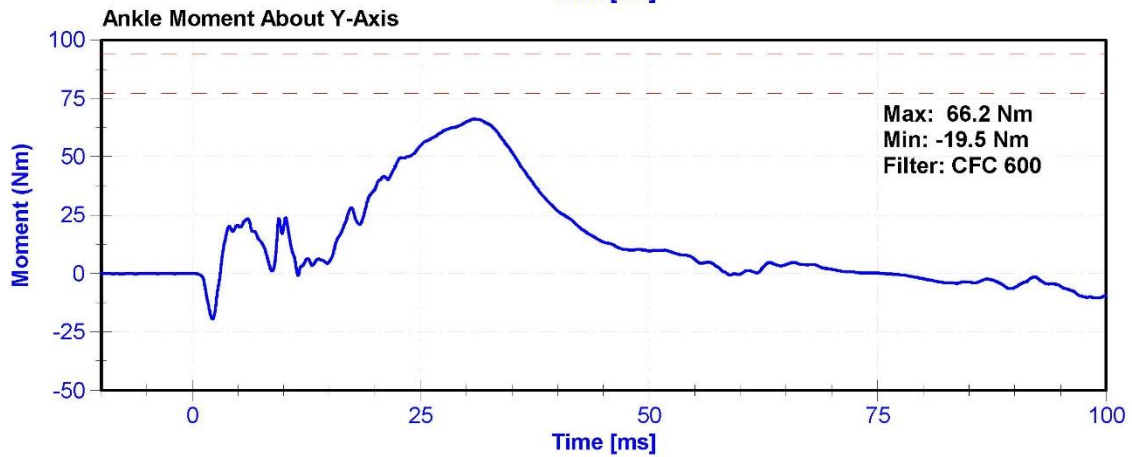
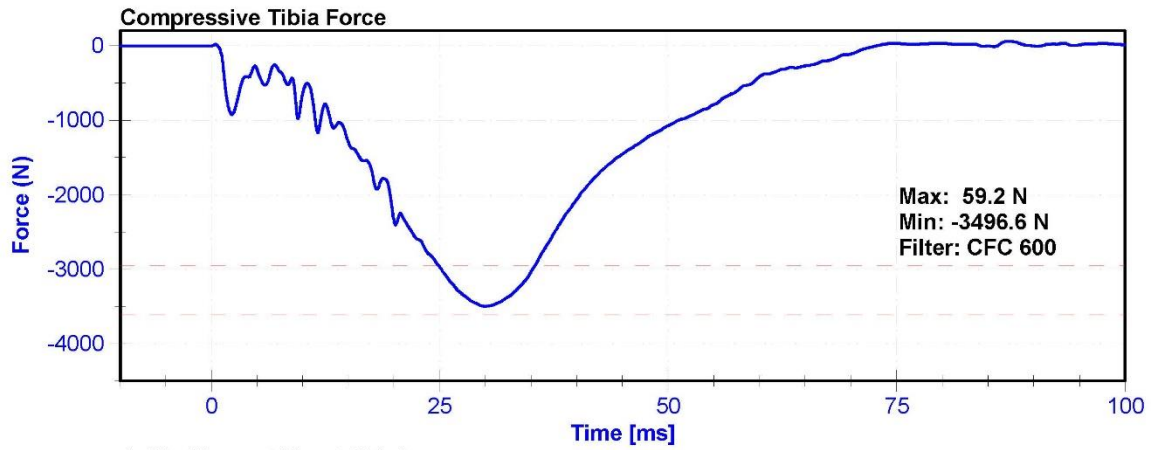
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	D09798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	29.9	Pass
Velocity	4.9	5.1	m/s	4.948	Pass
Lower Tibia Compressive Force	-3,613	-2,956	N	-3496.6	Pass
Peak Moment about Y-Axis	77.1	94.2	Nm	66.15	Fail
Peak Rotation about Y-Axis	32.7	39.9	deg	38.51	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9684 Fz	4/13/2015	4/12/2016
Ankle Y Potentiometer	SFERNICE ECO50ESC10	DS-ANKL002	4/2/2015	4/1/2016



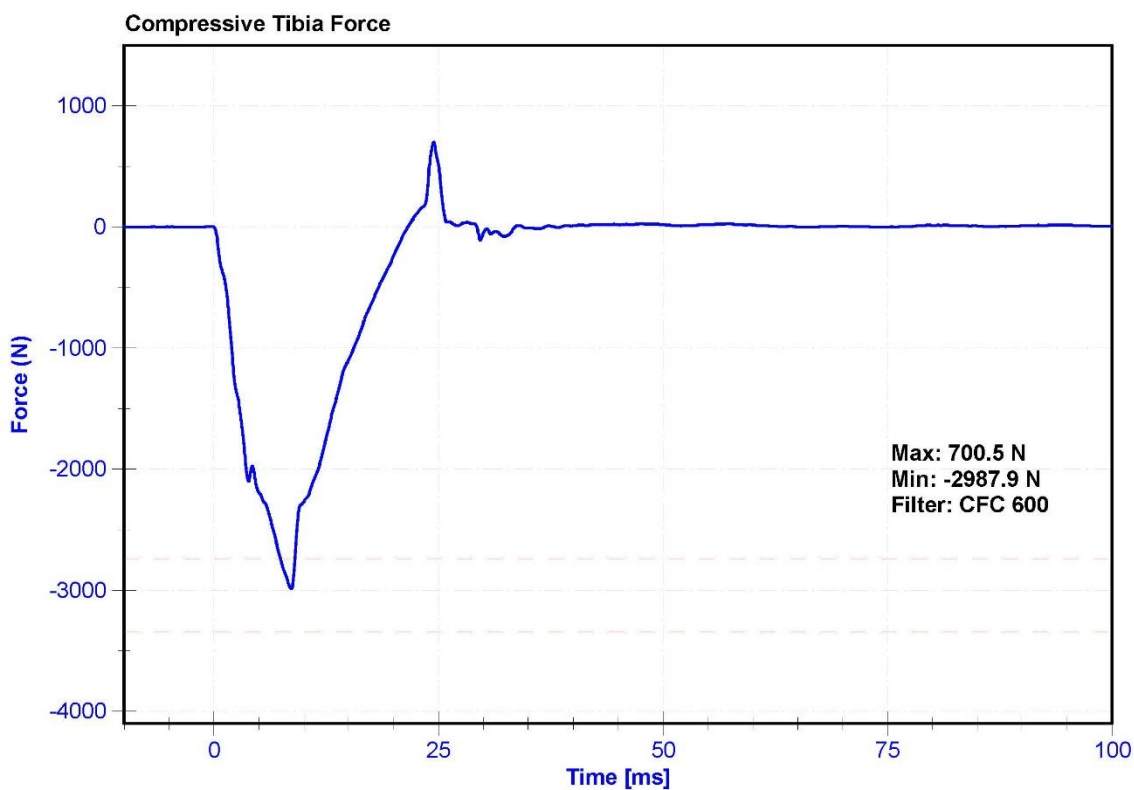
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	28.2	Pass
Velocity	3.9	4.1	m/s	3.990	Pass
Lower Tibia Compressive Force	-3,346	-2,738	N	-2987.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9684 Fz	4/13/2015	4/12/2016





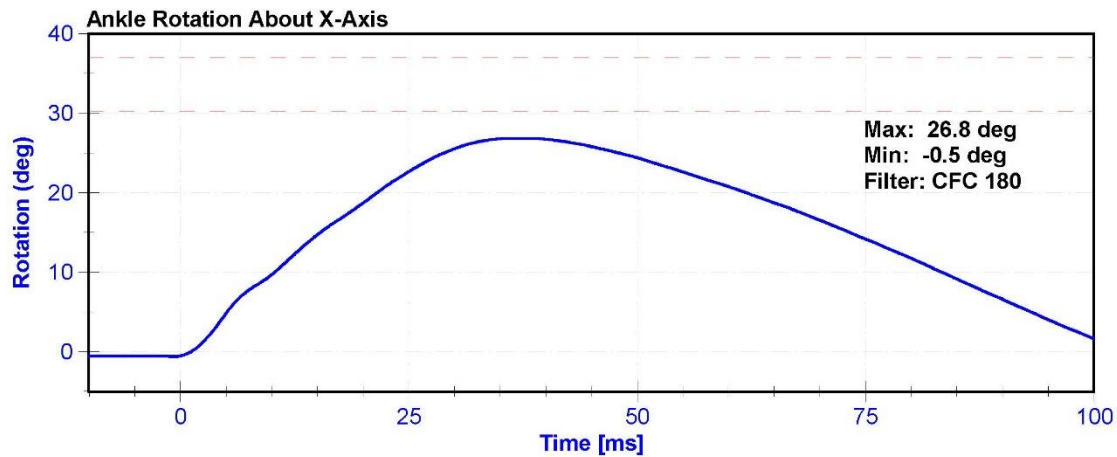
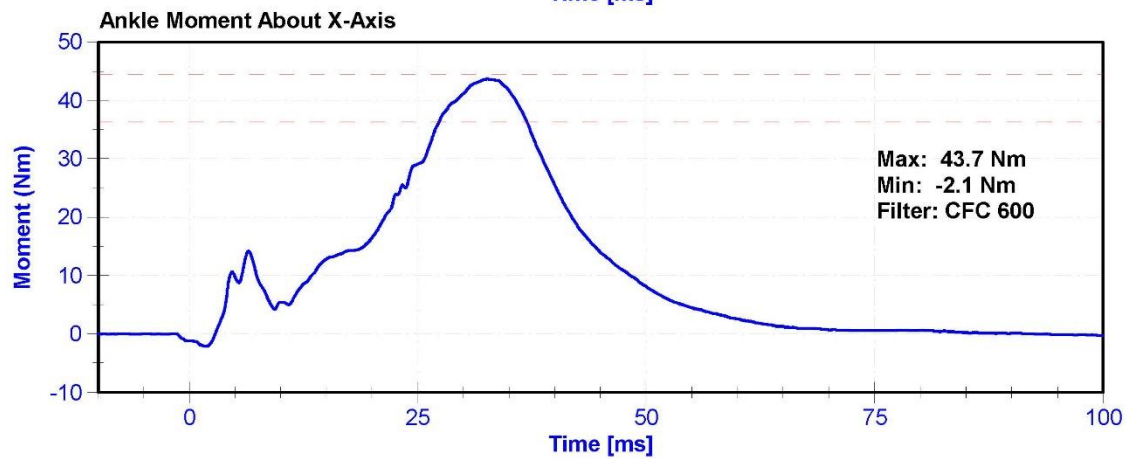
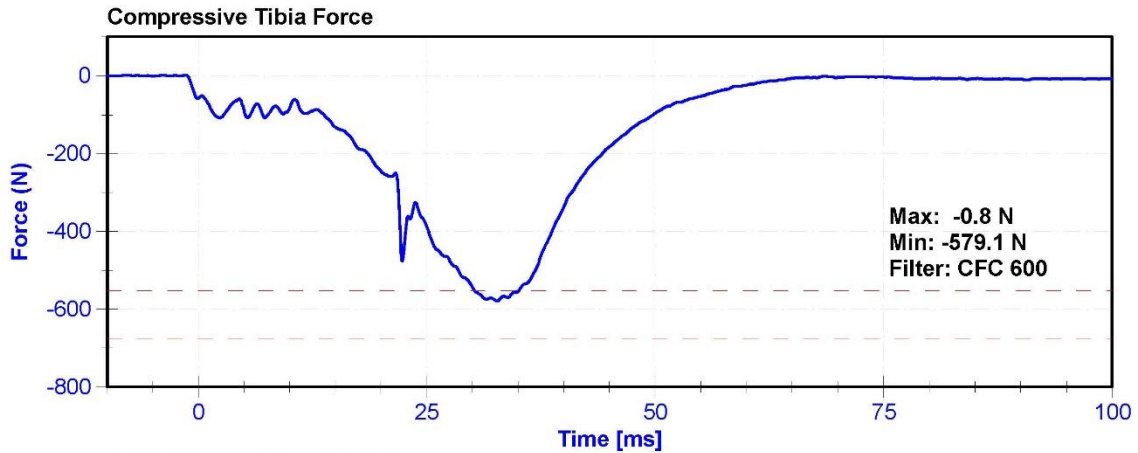
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	30.1	Pass
Velocity	1.9	2.1	m/s	1.924	Pass
Lower Tibia Compressive Force	-675	-552	N	-579.1	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	43.69	Pass
Peak Rotation about X-Axis	30.3	37.0	deg	26.85	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9684 Fz	4/13/2015	4/12/2016
Ankle Y Potentiometer	SFERNICE ECO50ESC10	DS-ANKL001	4/2/2015	4/1/2016





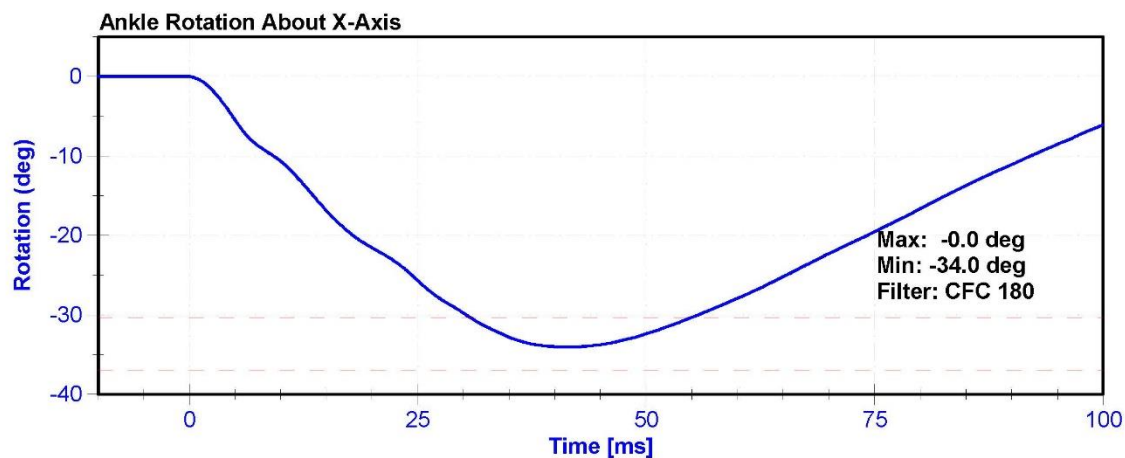
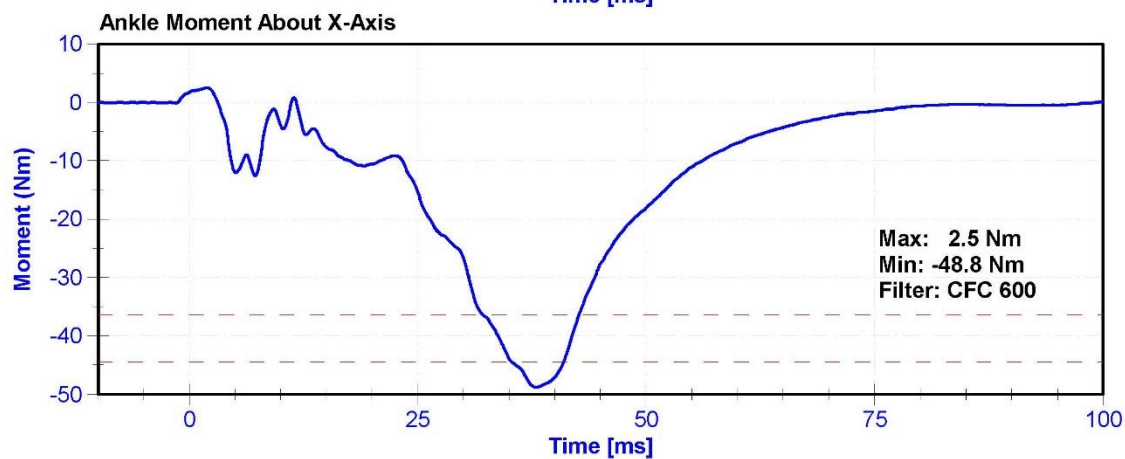
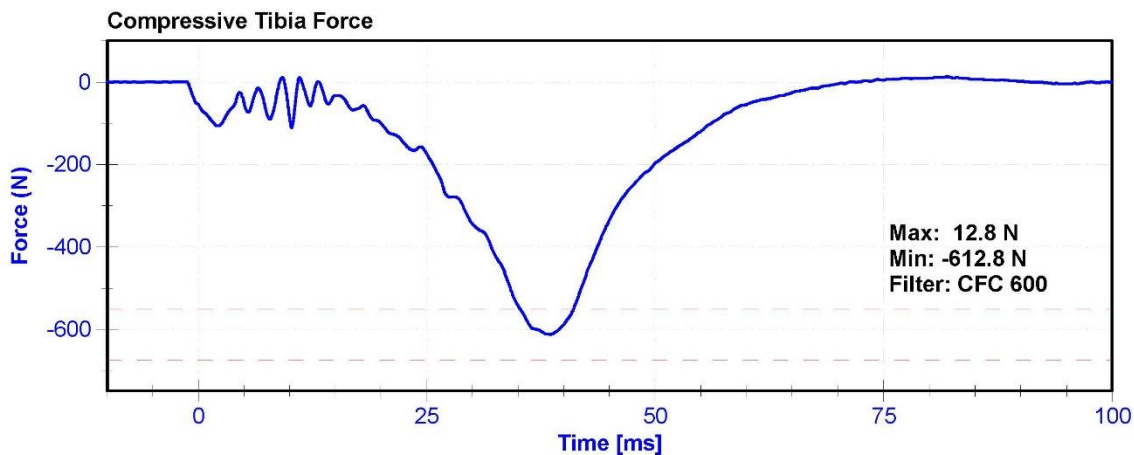
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DO9798	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	29.4	Pass
Velocity	1.9	2.1	m/s	1.934	Pass
Lower Tibia Compressive Force	-675	-552	N	-612.8	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-48.80	Fail
Peak Rotation about X-Axis	-37.0	-30.3	deg	-33.99	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 9329J	LC-DQ9684 Fz	4/13/2015	4/12/2016
Ankle Y Potentiometer	SFERNICE ECO50ESC10	DS-ANKL001	4/2/2015	4/1/2016



50% ADULT MALE THOR DL9207 DUMMY CALIBRATIONS

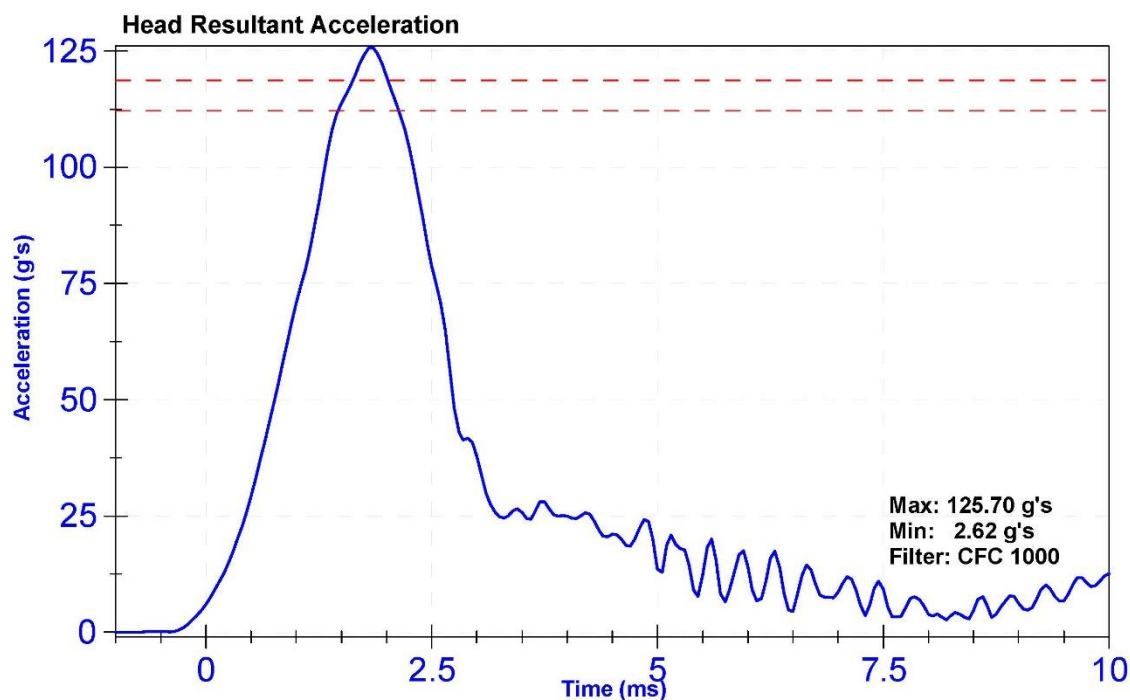
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

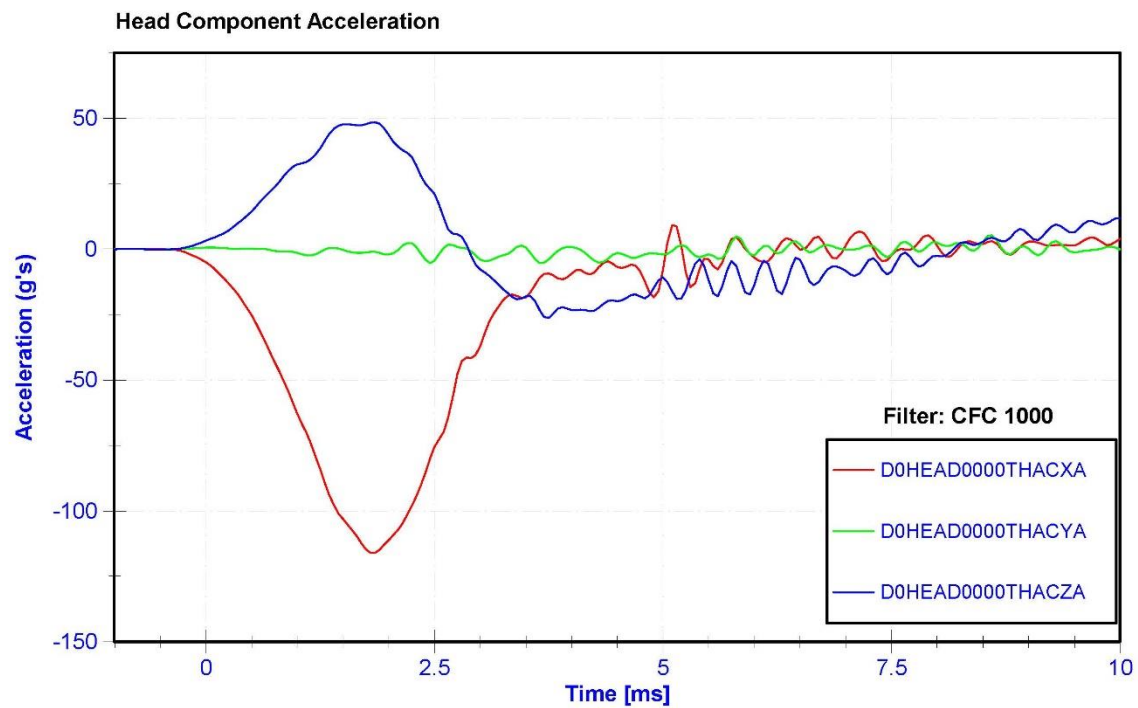
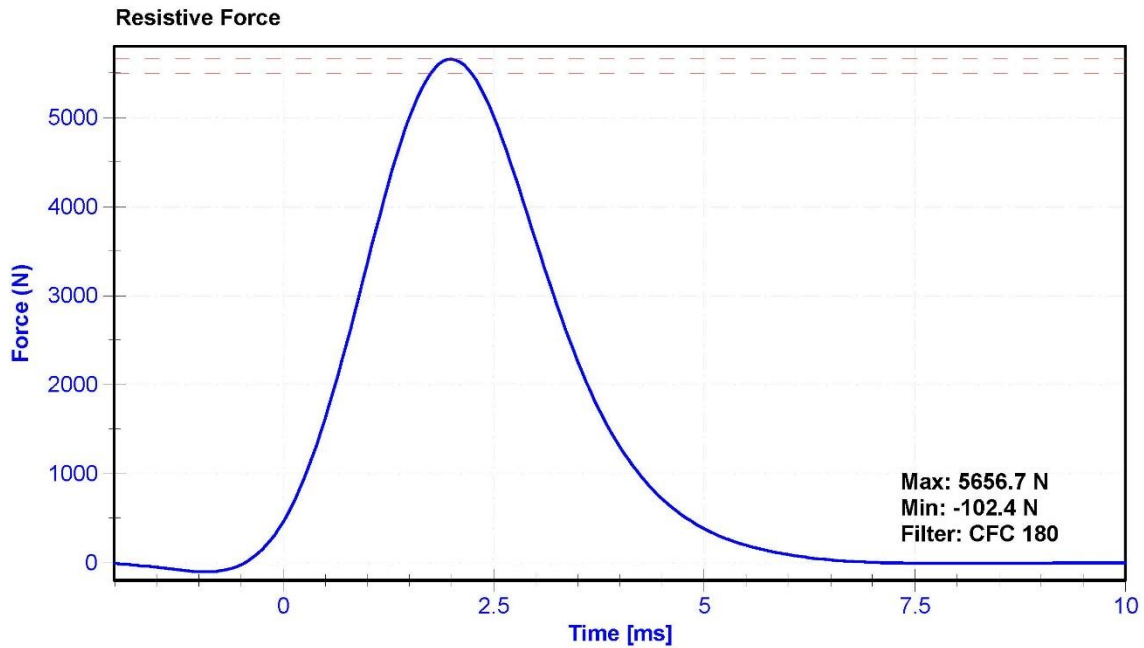
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	37.1	Pass
Impact Velocity	1.95	2.05	m/s	1.988	Pass
Probe Force	5,498	5,660	N	5656.7	Pass
Resultant Acceleration	112.2	118.7	g's	125.70	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Head X Accel	Endevco 7264	AC-P82183	4/3/2015	4/2/2016
Head Y Accel	Endevco 7264	AC-P81384	4/3/2015	4/2/2016
Head Z Accel	Endevco 7264	AC-P81797	4/3/2015	4/2/2016
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





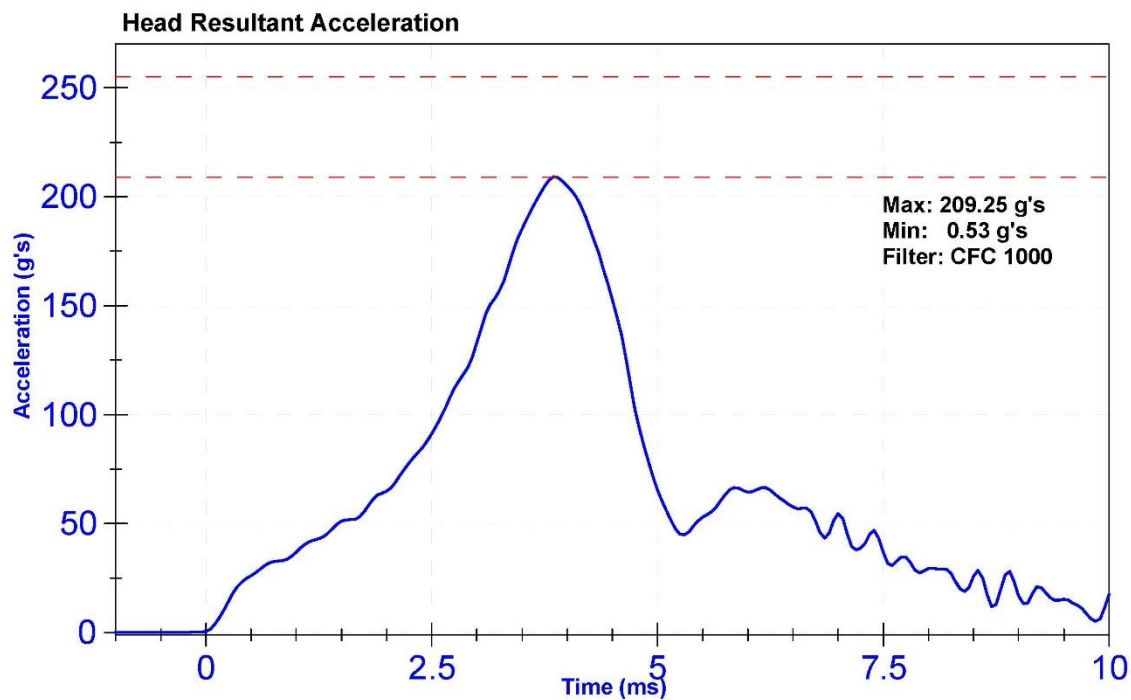
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

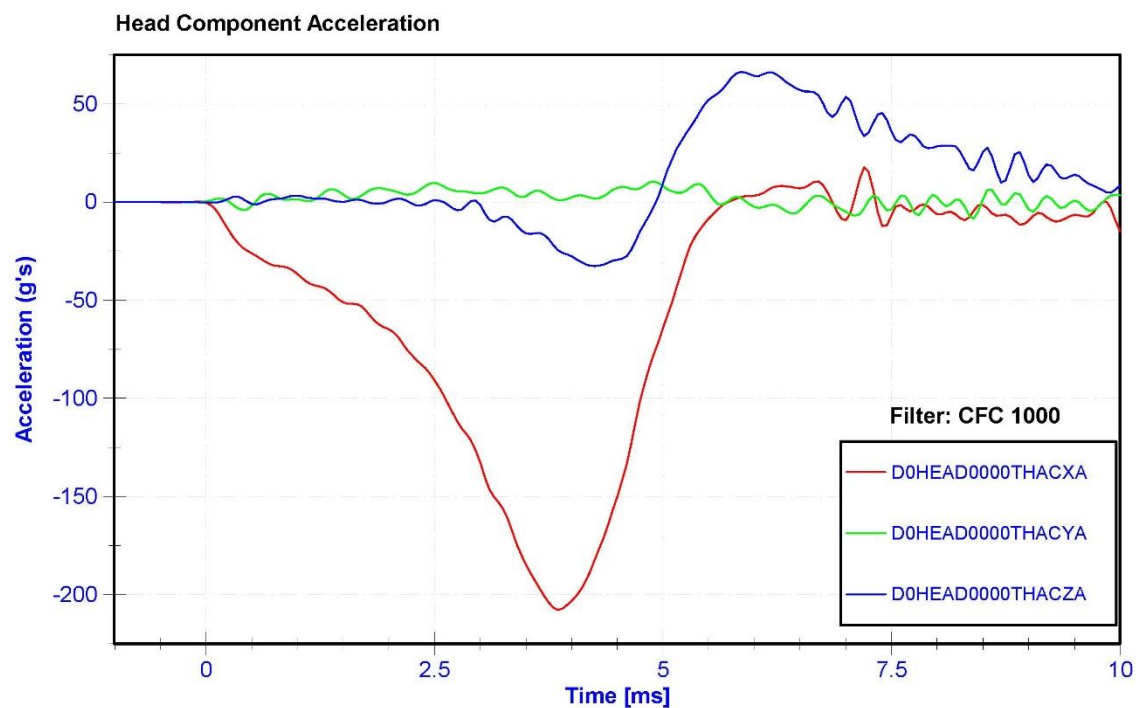
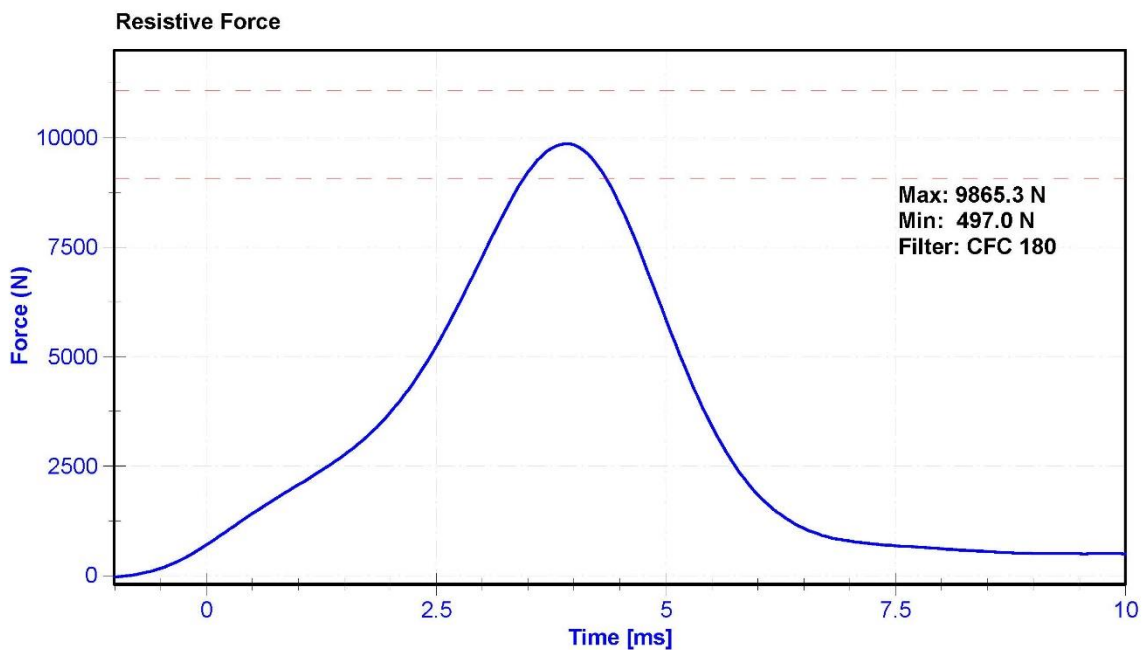
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	42.3	Pass
Impact Velocity	6.68	6.78	m/s	6.728	Pass
Probe Force	9067	11082	N	9865.3	Pass
Resultant Acceleration	209	255	g's	209.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Head X Accel	Endevco 7264	AC-P82183	4/3/2015	4/2/2016
Head Y Accel	Endevco 7264	AC-P81384	4/3/2015	4/2/2016
Head Z Accel	Endevco 7264	AC-P81797	4/3/2015	4/2/2016
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





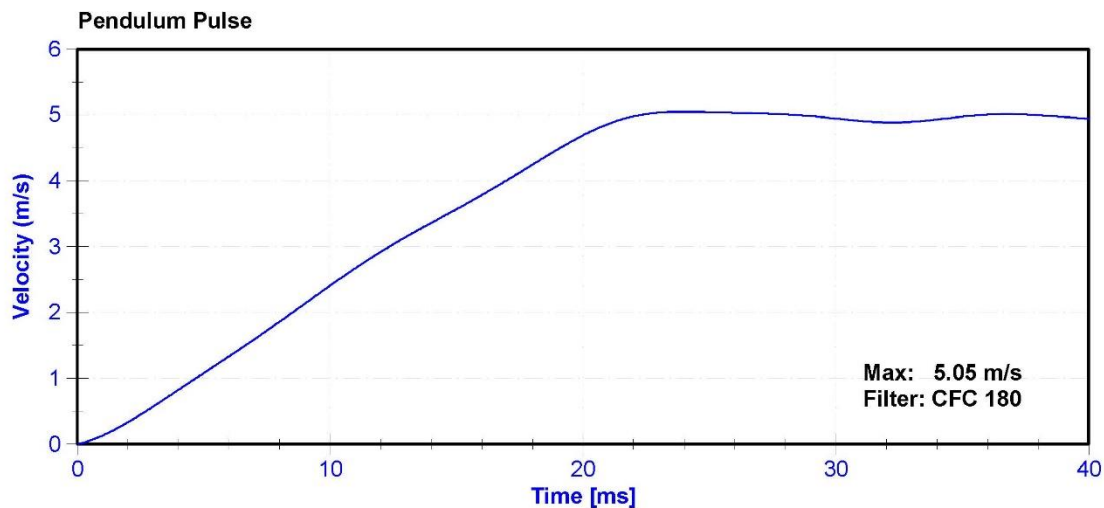
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

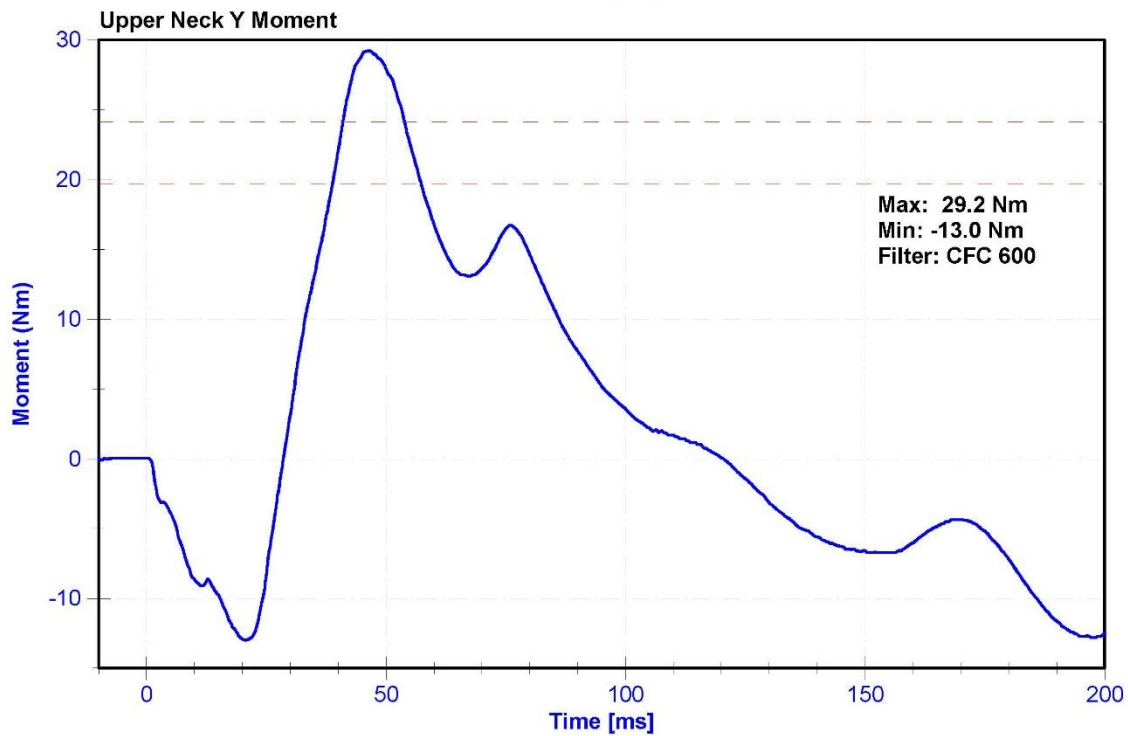
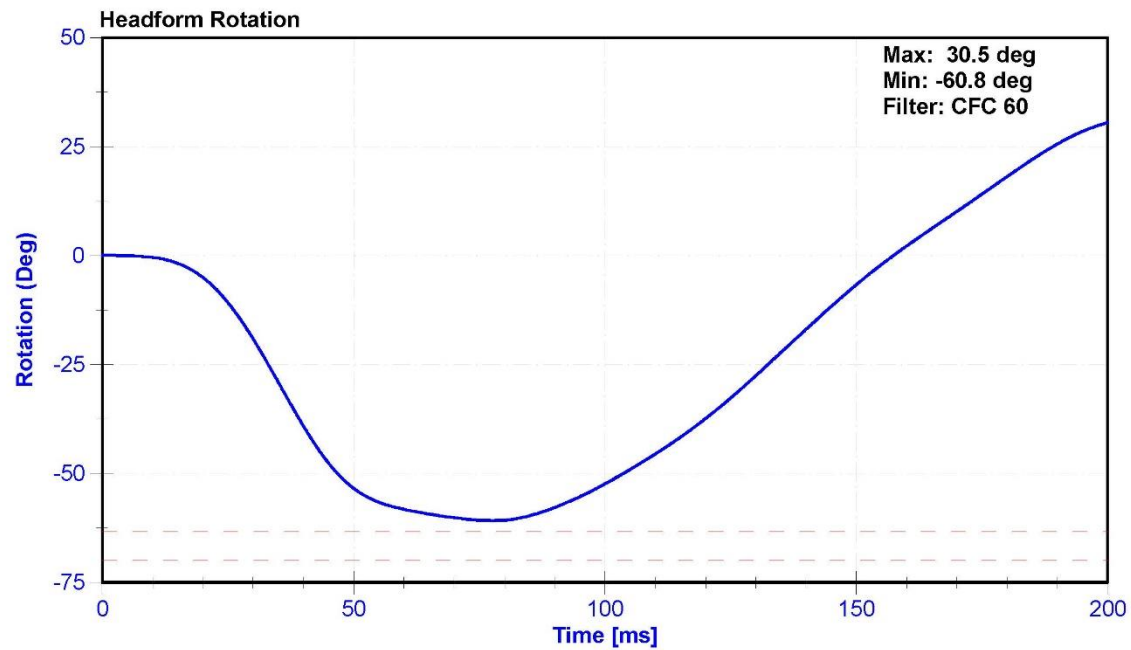
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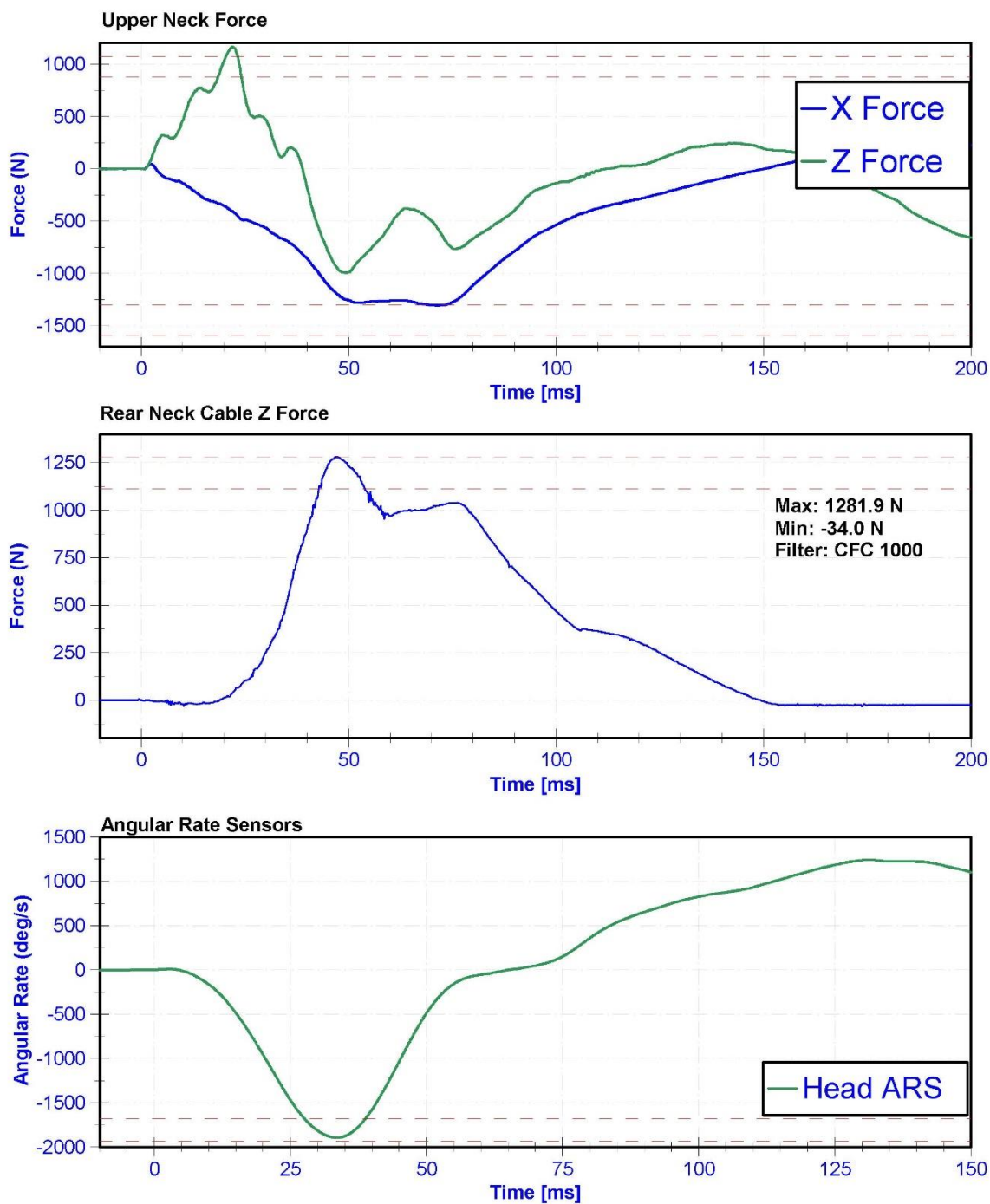
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	46.7	Pass
Velocity	4.95	5.05	m/s	4.96	Pass
Pendulum Impulse at 8ms	1.49	1.85	m/s	1.861	Fail
Pendulum Impulse at 16ms	3.08	3.86	m/s	3.784	Pass
Pendulum Impulse at 24ms	4.48	5.26	m/s	5.048	Pass
Peak Upper Neck Y Moment	19.7	24.1	Nm	29.22	Fail
Peak Upper Neck X Force	-1592	-1302	N	-1306.6	Pass
Maximum Upper Neck Z Force	877	1072	N	1166.0	Pass
First Peak Rear Neck Cable Force	1115	1282	N	1281.9	Pass
Peak Head Y Angular Rate	-1935	-1675	deg/s	-1891.6	Pass
Peak Head Angle	-69.9	-63.3	deg	-60.81	Fail
Rotation Decay to Zero	83.0	86.2	ms	77.7	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380J14	LC-DP3956 Fx	3/5/2015	3/4/2016
Rear Neck Cable Load Cell	Humanetics 10386J14	LC-DO9741	3/6/2015	3/5/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9121	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS-18K	ARS-4737	3/30/2015	3/29/2016







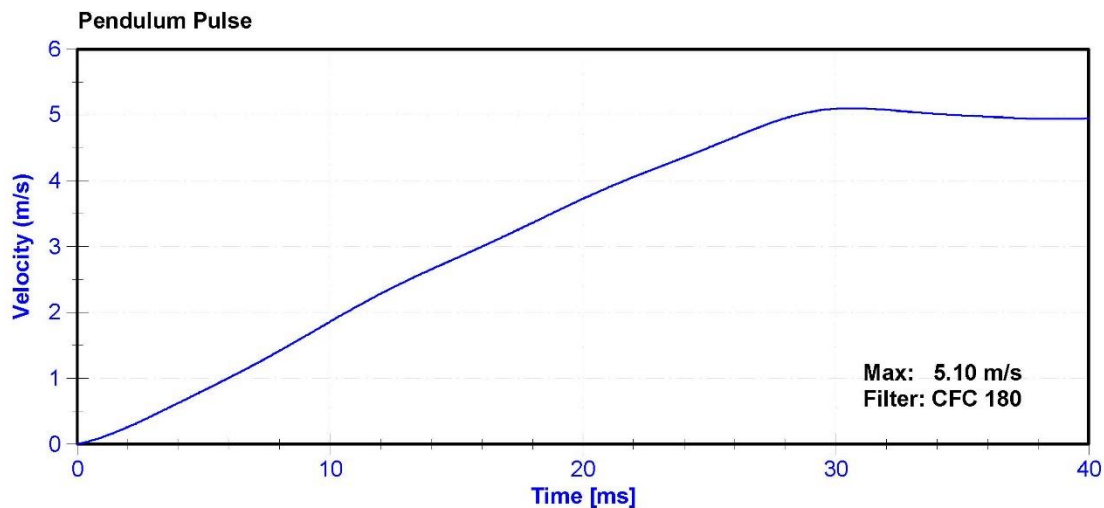
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

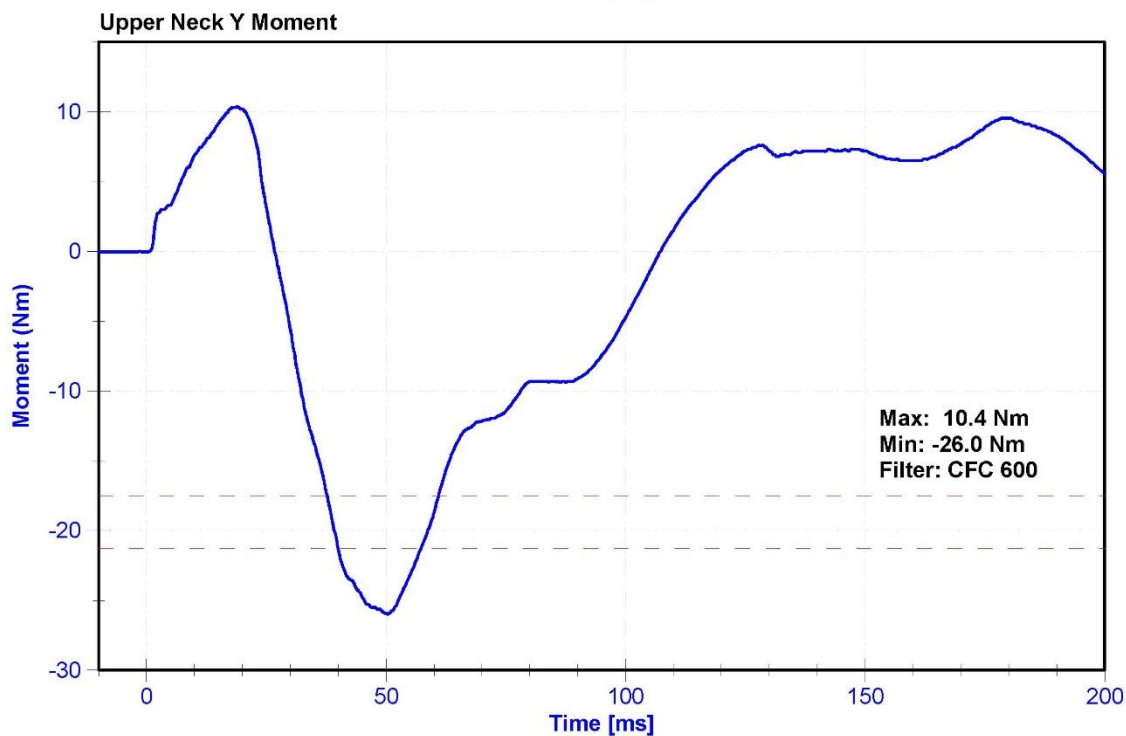
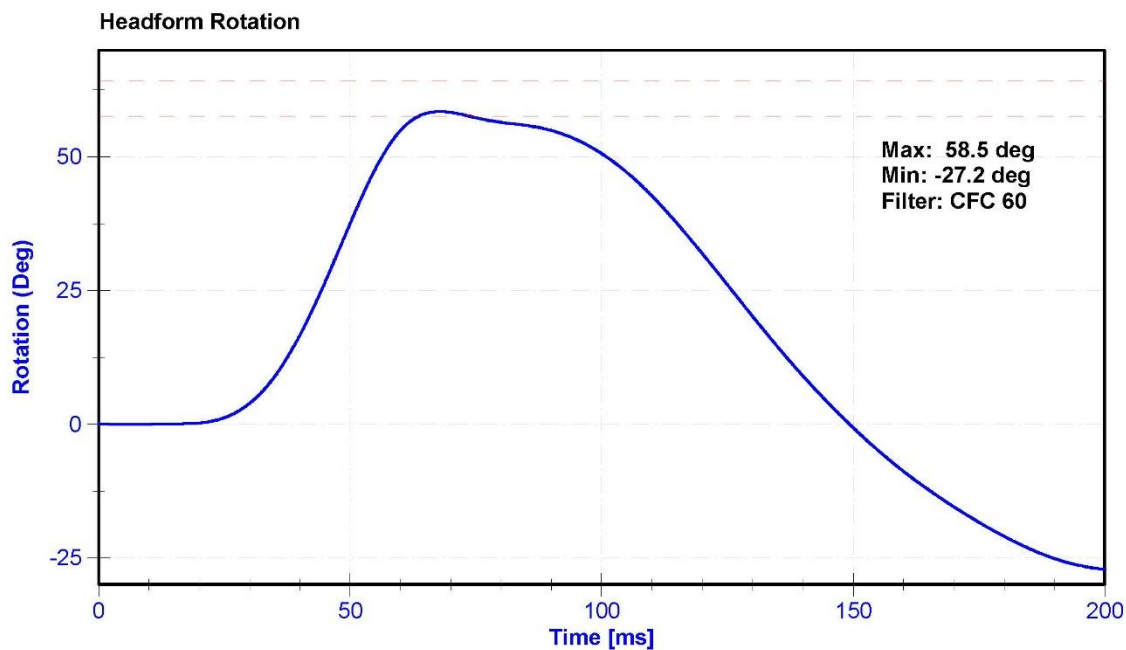
Results

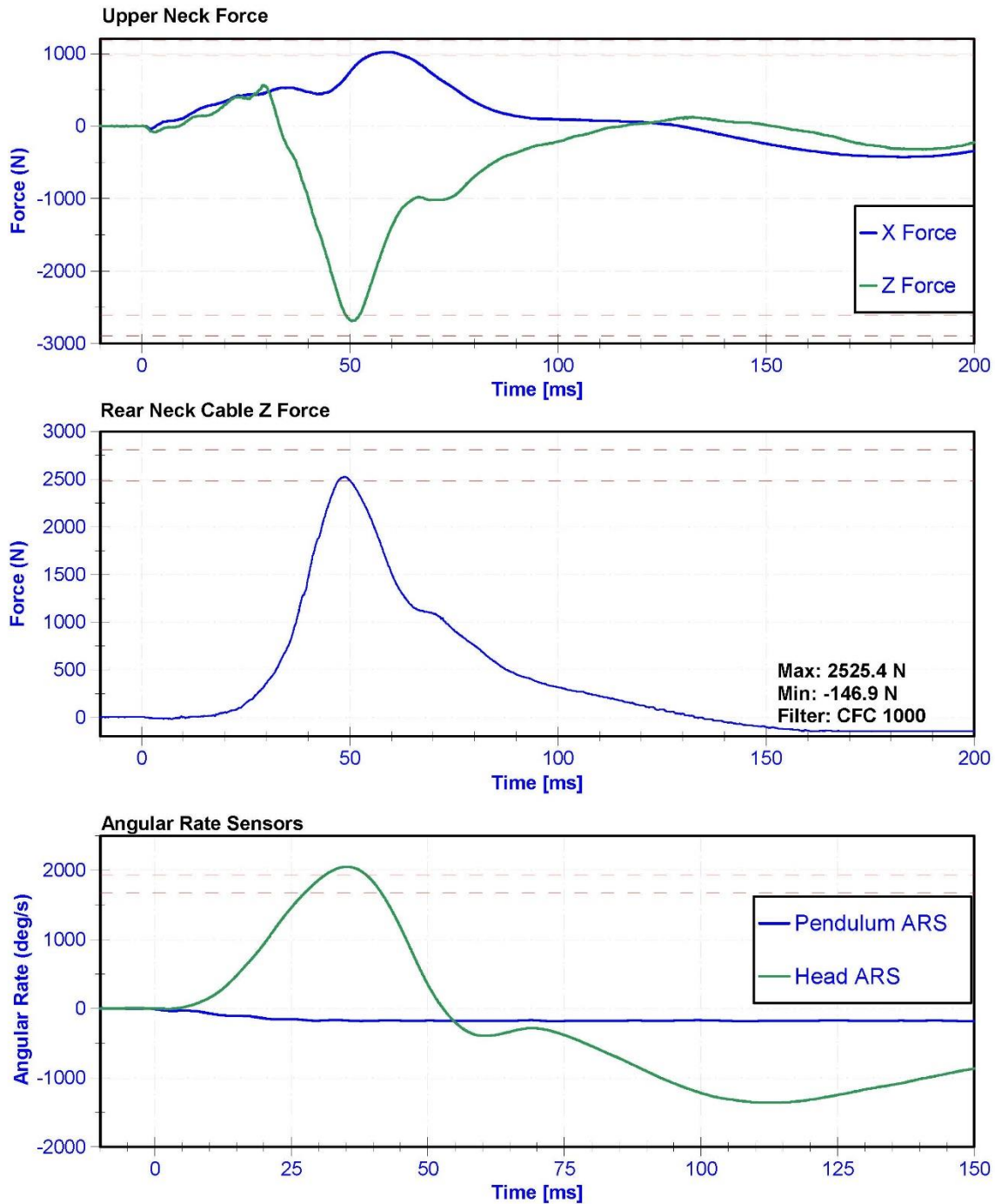
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	44.3	Pass
Velocity	4.95	5.05	m/s	4.96	Pass
Pendulum Impulse at 10ms	1.76	1.91	m/s	1.861	Pass
Pendulum Impulse at 20ms	3.50	3.75	m/s	3.728	Pass
Pendulum Impulse at 30ms	4.88	5.20	m/s	5.094	Pass
Peak Upper Neck Y Moment	-21.3	-17.5	Nm	-25.98	Fail
Peak Upper Neck X Force	967	1182	N	1025.8	Pass
Peak Upper Neck Z Force	-2893	-2603	N	-2692.3	Pass
Peak Front Neck Cable Force	2482	2809	N	2525.4	Pass
Peak Head Y Angular Rate	1907	2043	deg/s	2052.1	Fail
Peak Head Rotation	57.6	64.2	deg	58.51	Pass
Rotation Decay to Zero	79.3	82.5	ms	81.45	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380Jl4	LC-DP3956 Fx	3/5/2015	3/4/2016
Front Neck Cable Load Cell	Humanetics 10386Jl4	LC-DO9740	3/6/2015	3/5/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9121	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS-18K	ARS-4737	3/30/2015	3/29/2016







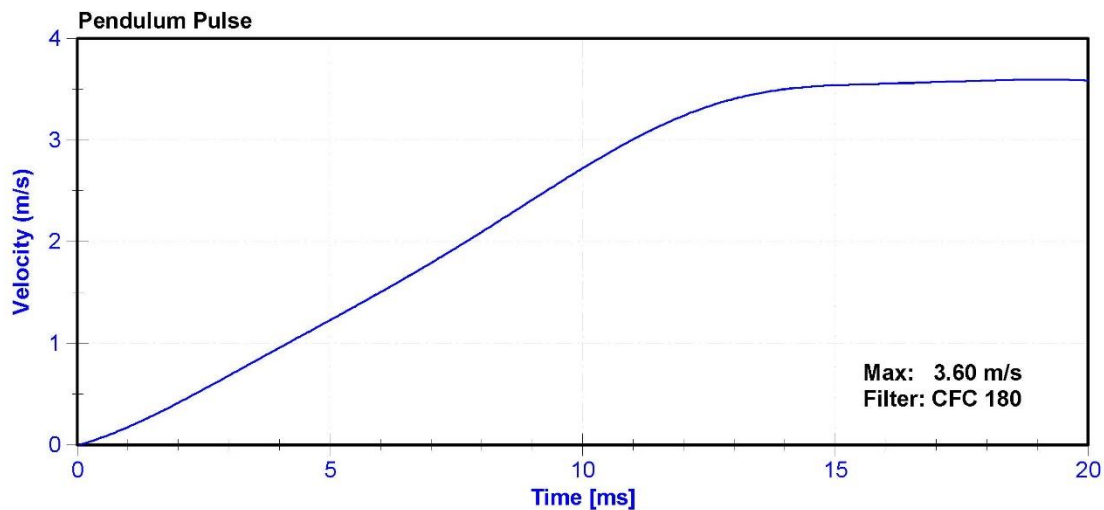
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

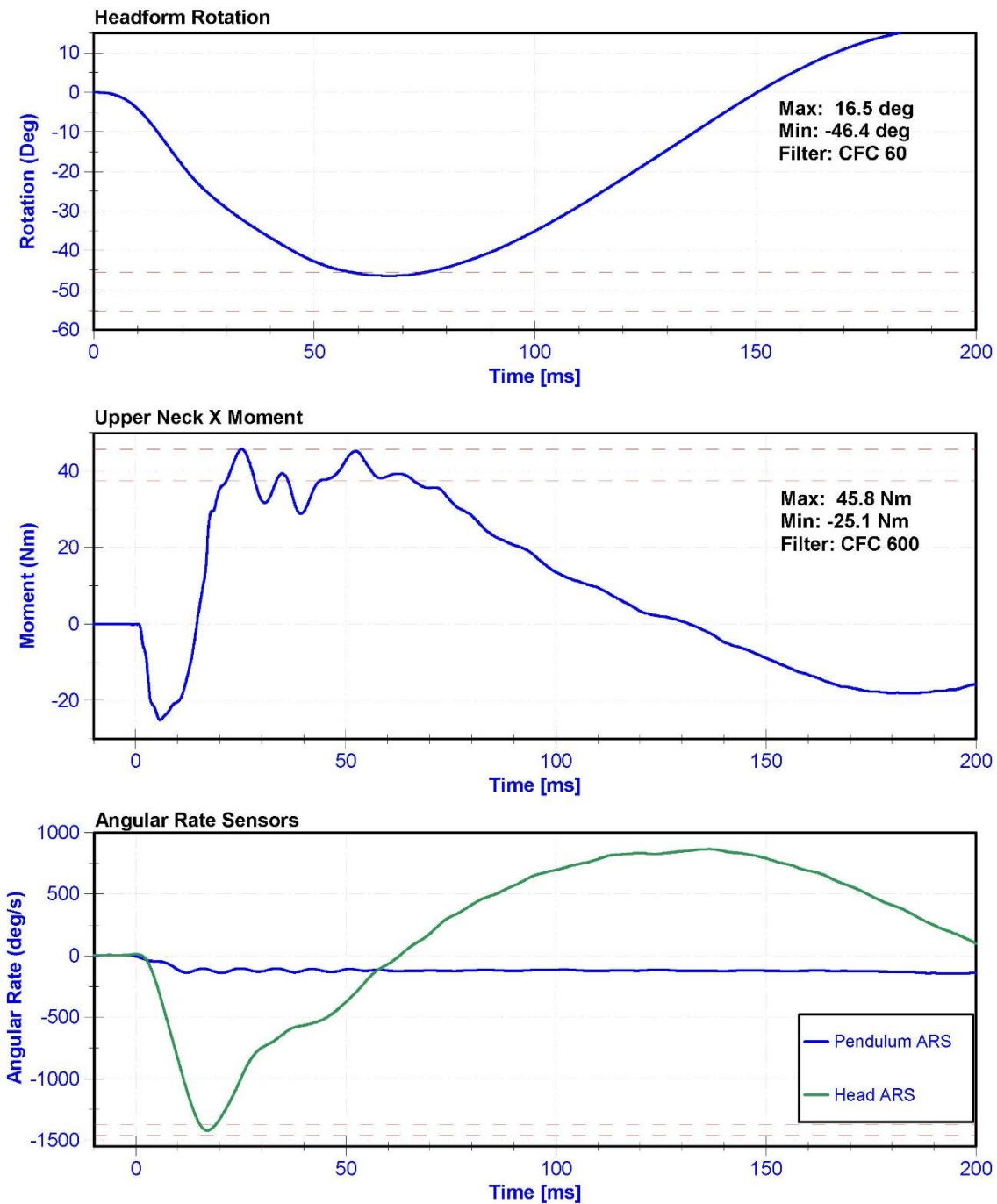
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	43.5	Pass
Velocity	3.35	3.45	m/s	3.42	Pass
Pendulum Impulse at 4ms	0.89	1.08	m/s	0.956	Pass
Pendulum Impulse at 8ms	2.04	2.36	m/s	2.095	Pass
Pendulum Impulse at 12ms	3.21	3.46	m/s	3.378	Pass
Peak Upper Neck X Moment 40-300ms	37.4	45.7	Nm	39.37	Pass
Peak Head X Angular Rate	-1462	-1375	deg/s	-1419.7	Pass
Peak Head Rotation	45.4	55.3	deg	-46.37	Pass
Rotation Decay to Zero	83.7	90.9	ms	83.45	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380J14	LC-DP3956 Mx	3/5/2015	3/4/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9121	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS-18K	ARS-4740	3/30/2015	3/29/2016





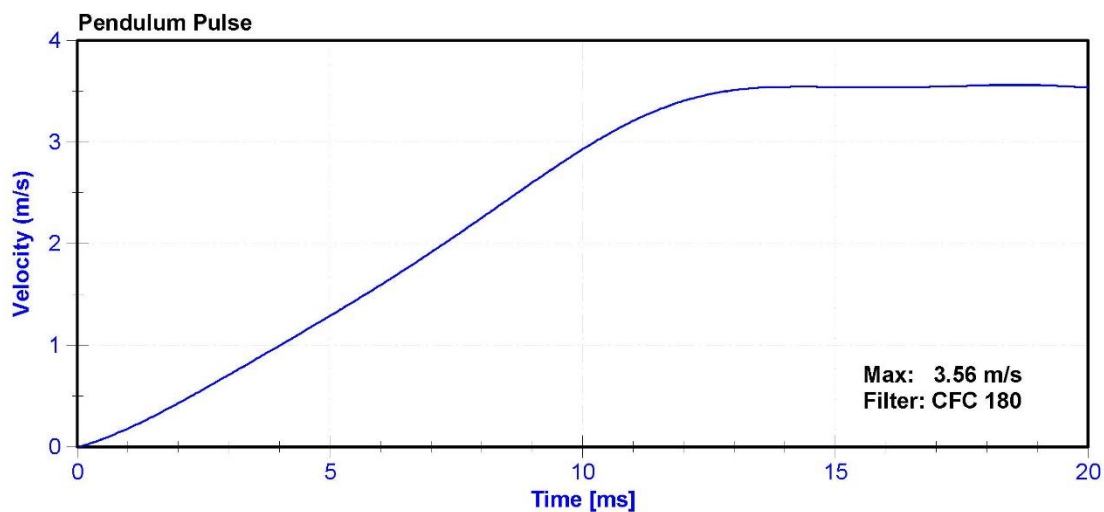
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

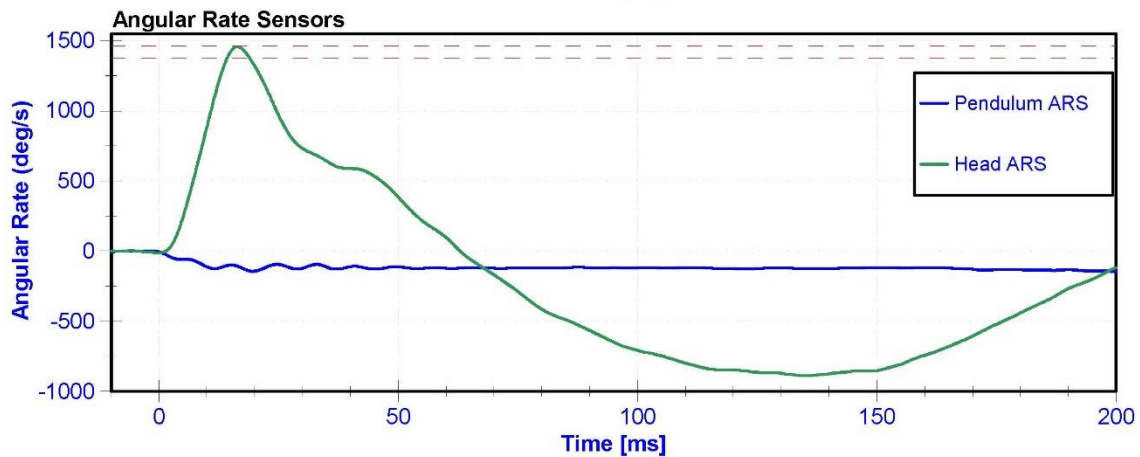
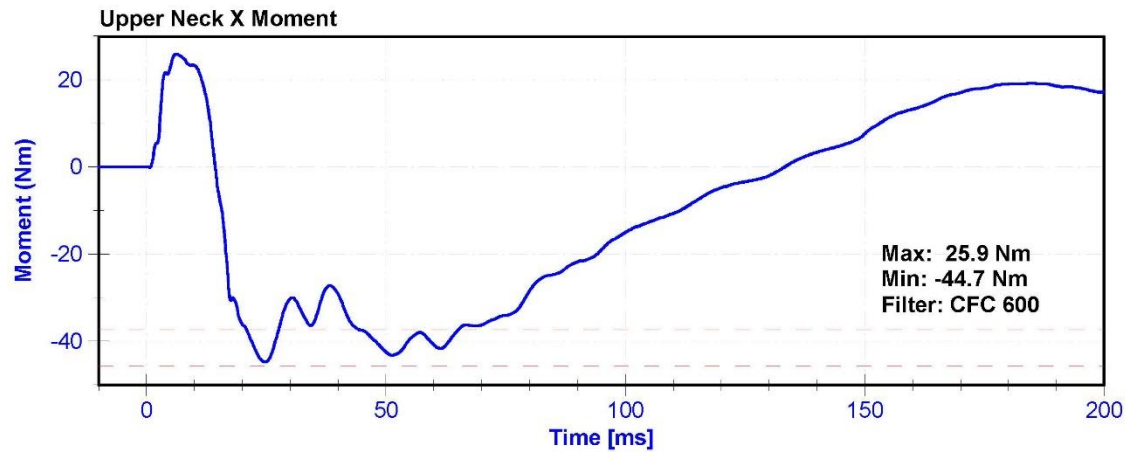
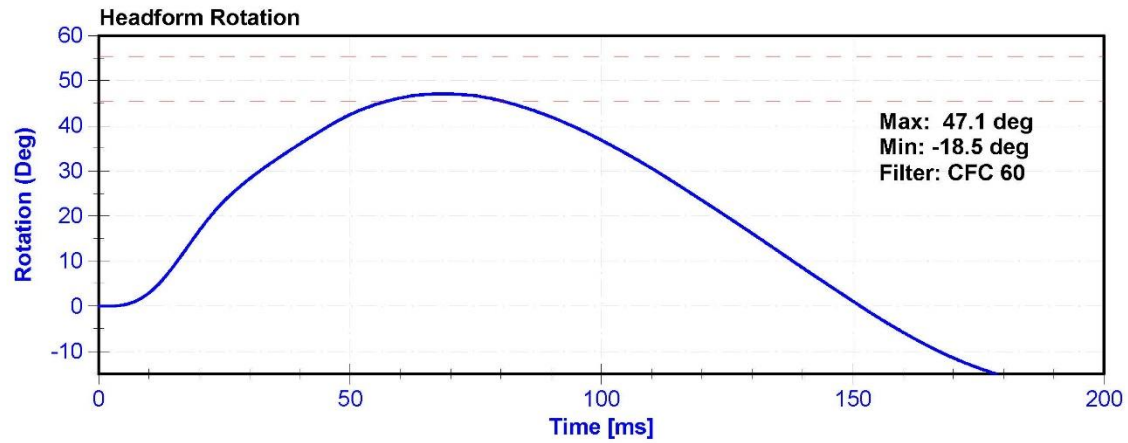
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	43.1	Pass
Velocity	3.35	3.45	m/s	3.43	Pass
Pendulum Impulse at 4ms	0.89	1.08	m/s	0.998	Pass
Pendulum Impulse at 8ms	2.04	2.36	m/s	2.254	Pass
Pendulum Impulse at 12ms	3.21	3.46	m/s	3.347	Pass
Peak Upper Neck X Moment 40-300ms	-45.7	-37.4	Nm	-44.67	Pass
Peak Head X Angular Rate	1375	1462	deg/s	1456.8	Pass
Peak Head Rotation	45.4	55.3	deg	47.09	Pass
Rotation Decay to Zero	83.7	90.9	ms	83.05	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Upper Neck Load Cell	Humanetics 10380J14	LC-DP3956 Mx	3/5/2015	3/4/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9121	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS-18K	ARS-4740	3/30/2015	3/29/2016





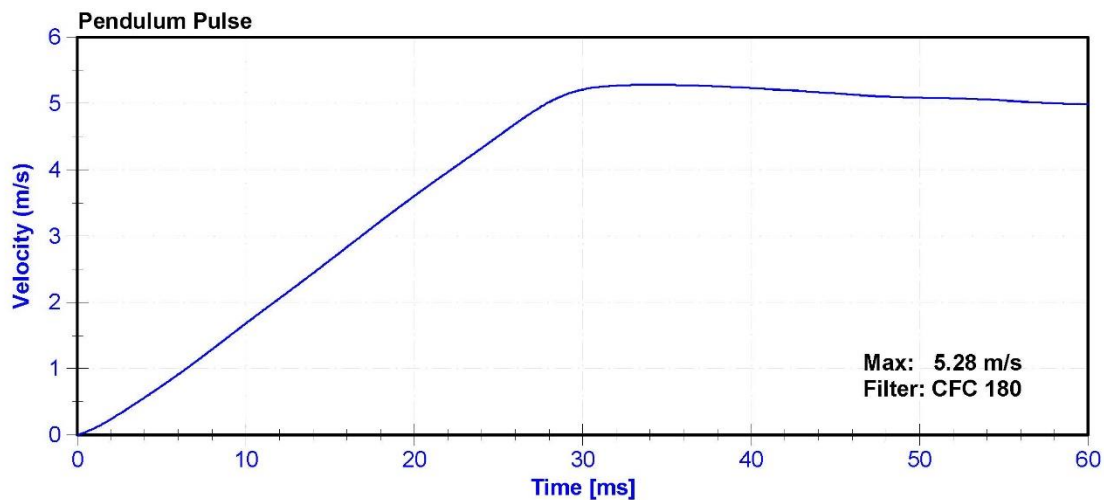
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

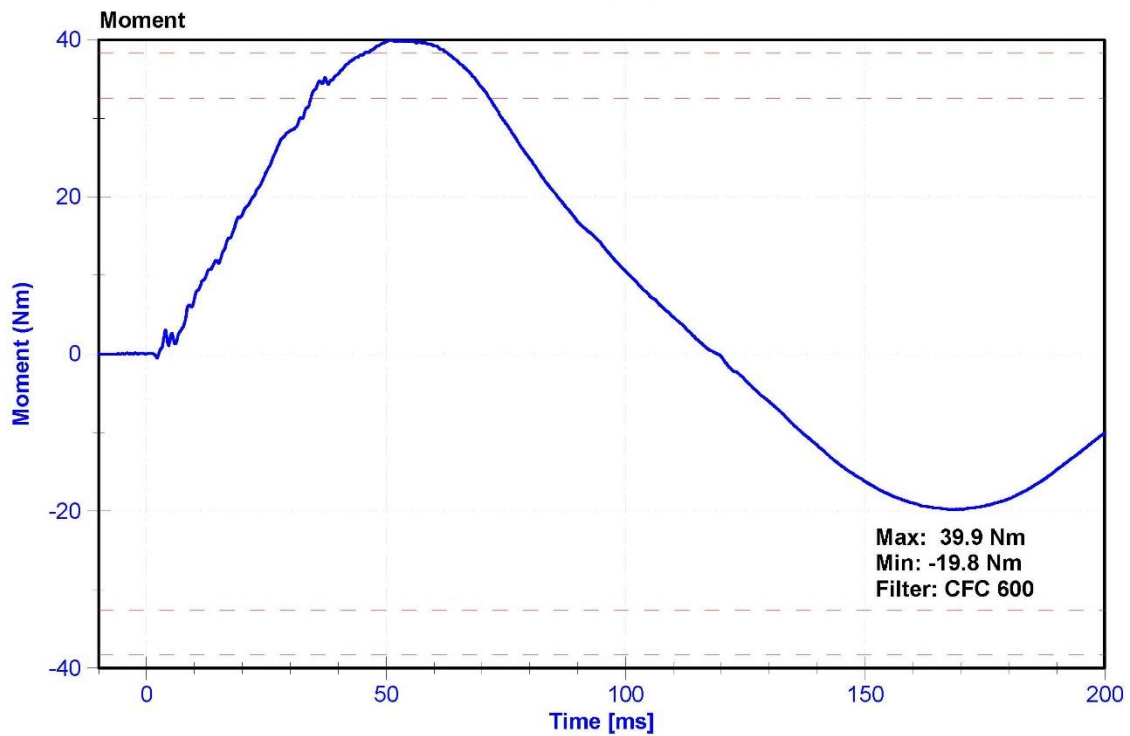
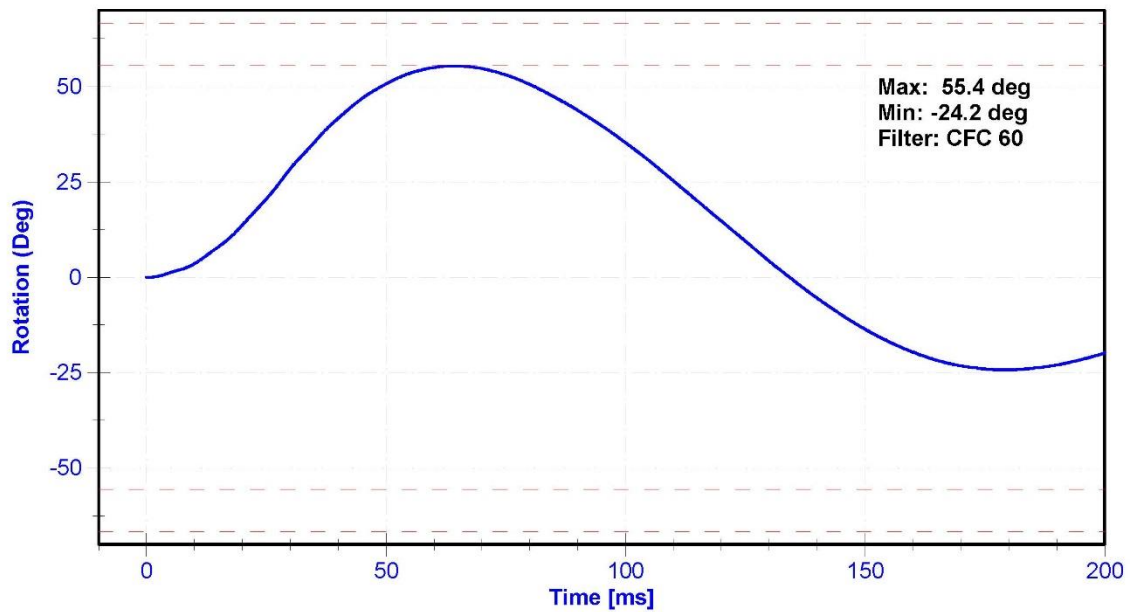
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	44.2	Pass
Velocity	4.95	5.05	m/s	5.04	Pass
Pendulum Impulse at 10ms	1.72	1.98	m/s	1.681	Fail
Pendulum Impulse at 15ms	2.67	2.97	m/s	2.636	Fail
Pendulum Impulse at 20ms	3.59	3.98	m/s	3.605	Pass
Pendulum Impulse at 25ms	4.43	4.92	m/s	4.510	Pass
Maximum Upper Neck Moment	32.6	38.3	Nm	39.9	Fail
Peak Axial Rotation	55.6	66.6	deg	55.37	Fail
Rotation Decay to Zero	58.0	61.6	ms	70.20	Fail
Peak Upper Neck Angular Velocity	1559	1709	deg/s	1427.3	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Pendulum ARS	DTS ARS PRO-18K	ARS-9121	9/30/2015	9/29/2016
Upper Neck Load Cell	Humanetics 10380J14	LC-DP3956 Mz	3/5/2015	3/4/2016
Upper Neck ARS	DTS ARS PRO-18K	ARS-9141	9/30/2015	9/29/2016



Axial Rotation - Derived from Angular Rate Sensors



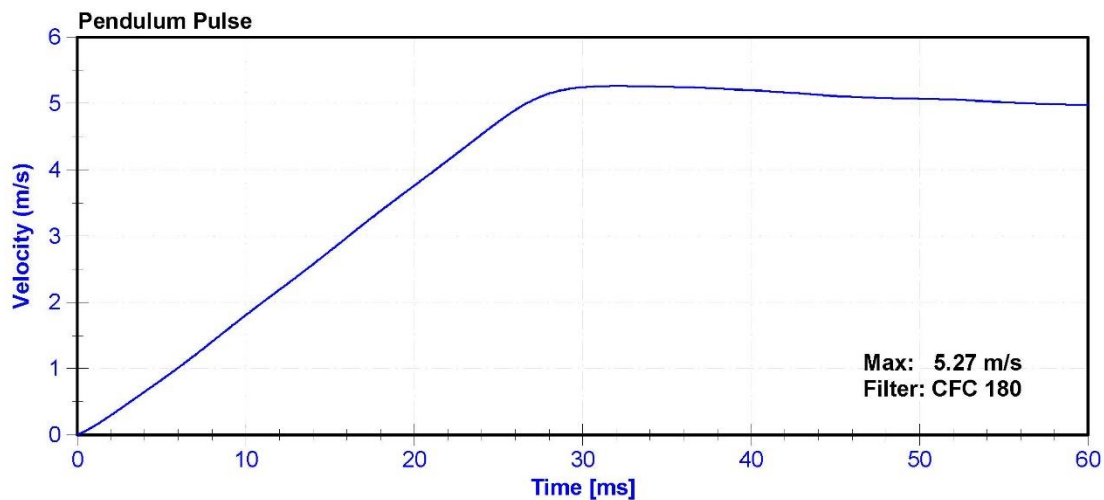
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

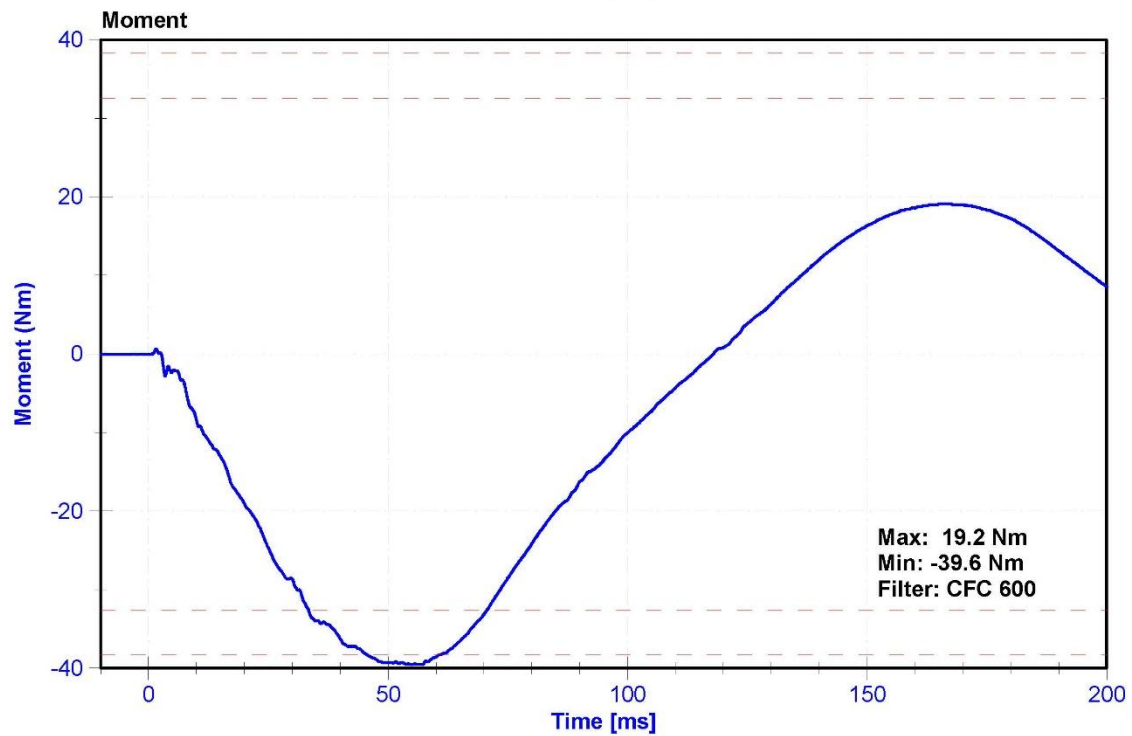
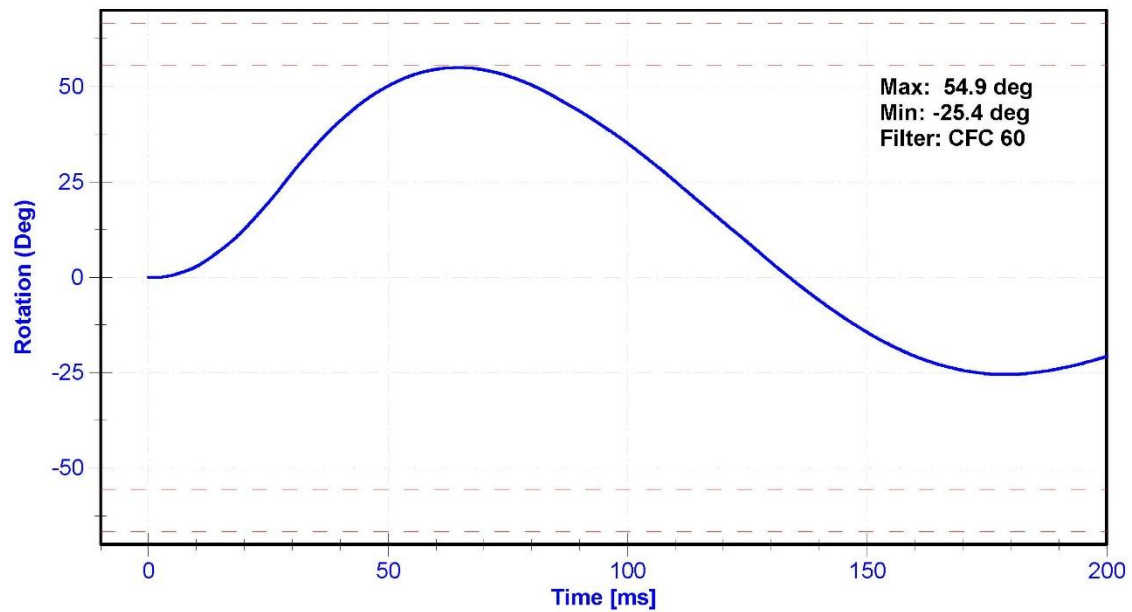
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	45.4	Pass
Velocity	4.95	5.05	m/s	5.01	Pass
Pendulum Impulse at 10ms	1.72	1.98	m/s	1.807	Pass
Pendulum Impulse at 15ms	2.67	2.97	m/s	2.777	Pass
Pendulum Impulse at 20ms	3.59	3.98	m/s	3.761	Pass
Pendulum Impulse at 25ms	4.43	4.92	m/s	4.727	Pass
Maximum Upper Neck Moment	32.6	38.3	Nm	-39.6	Fail
Peak Axial Rotation	55.6	66.6	deg	54.95	Fail
Rotation Decay to Zero	58.0	61.6	ms	68.85	Fail
Peak Upper Neck Angular Velocity	1559	1709	deg/s	1426.4	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	11/7/2015
Pendulum ARS	DTS ARS PRO-18K	ARS-9121	9/30/2015	9/29/2016
Upper Neck Load Cell	Humanetics 10380J14	LC-DP3956 Mz	3/5/2015	3/4/2016
Upper Neck ARS	DTS ARS PRO-18K	ARS-9141	9/30/2015	9/29/2016



Axial Rotation - Derived from Angular Rate Sensors



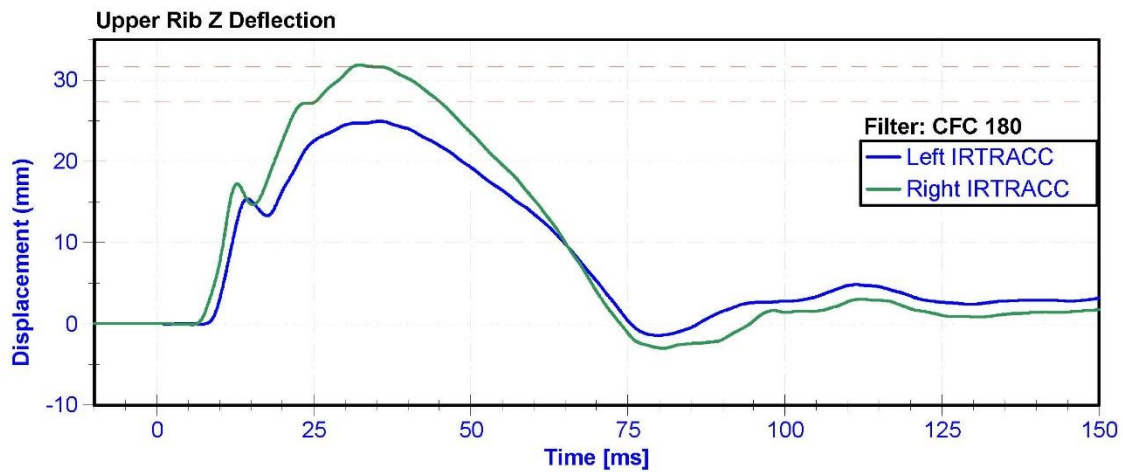
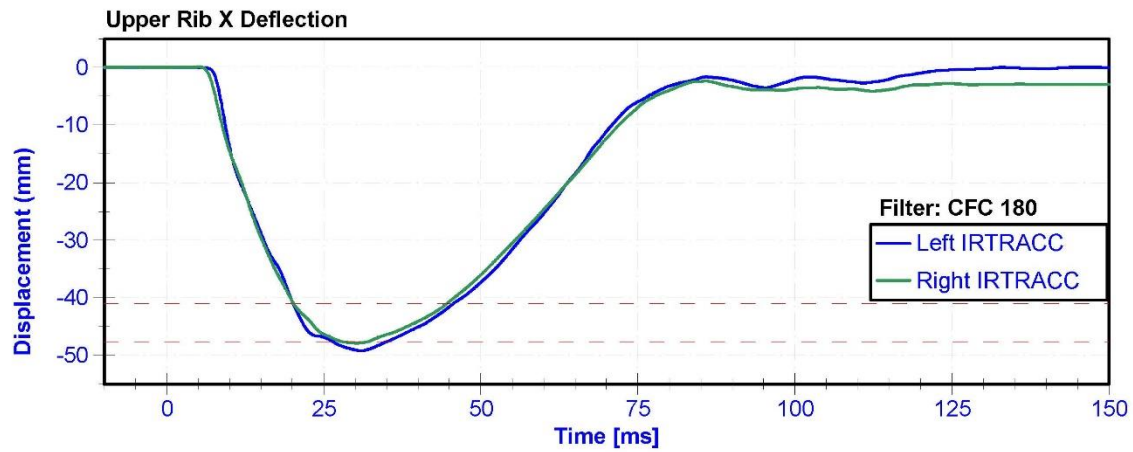
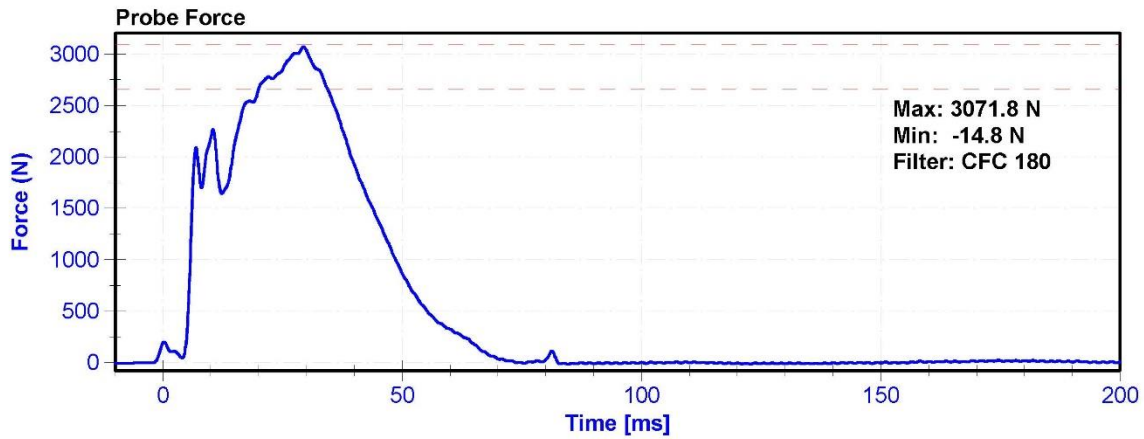
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

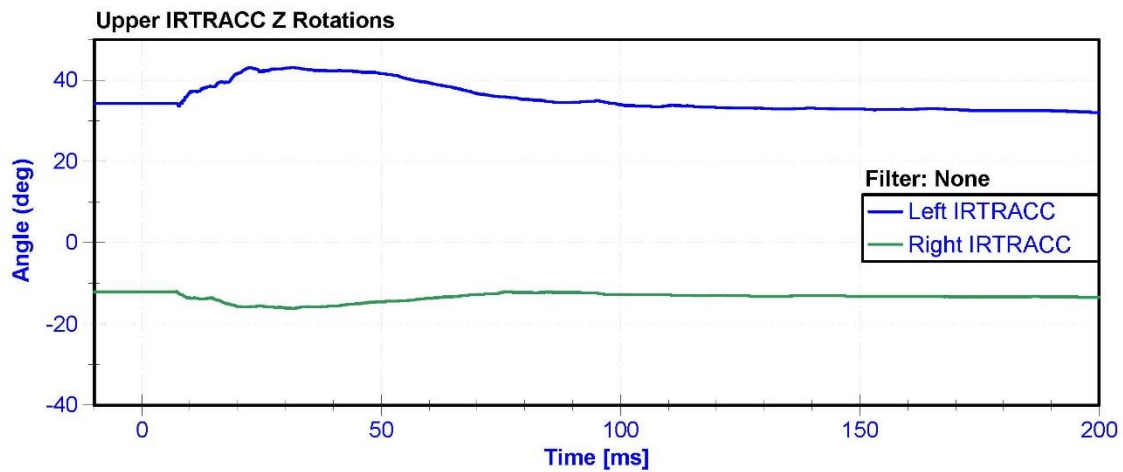
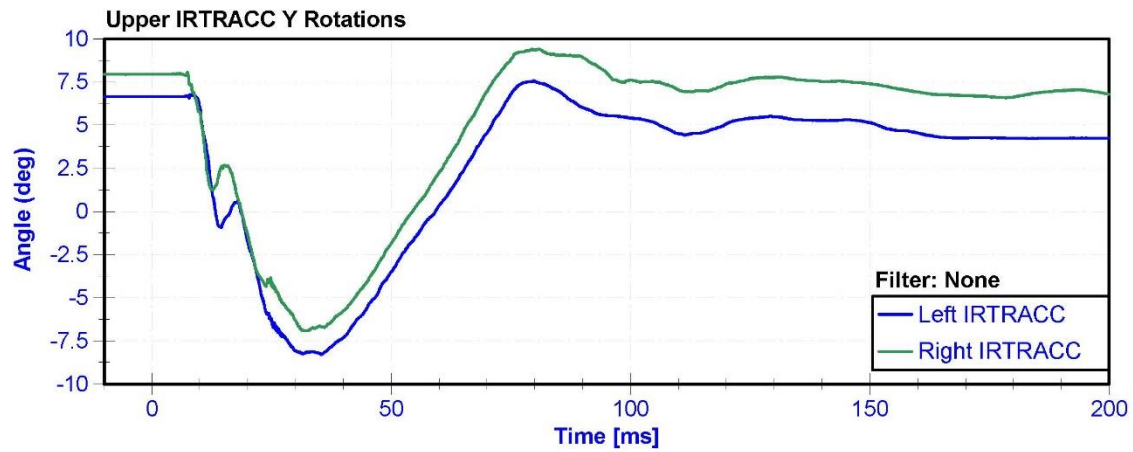
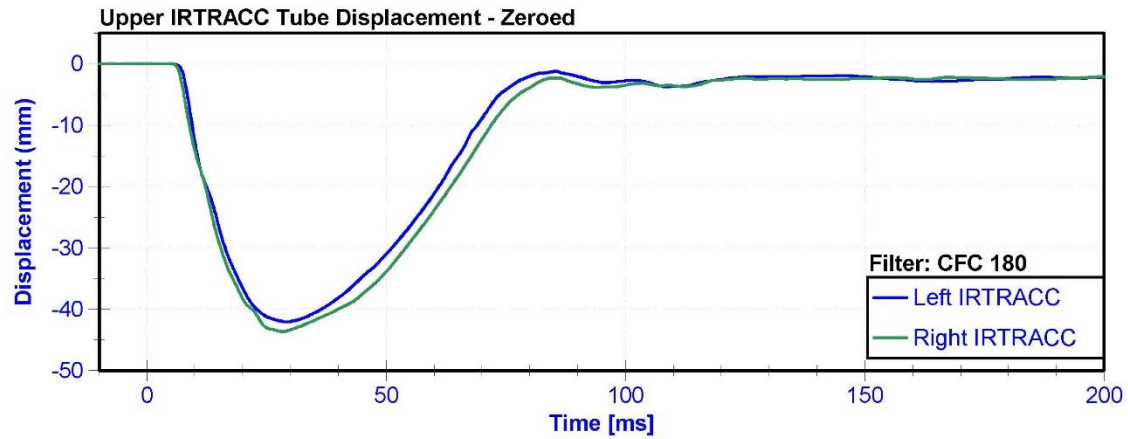
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	39.6	Pass
Impact Velocity	4.25	4.35	m/s	4.311	Pass
Probe Force	2,654	3,092	N	3071.8	Pass
Upper Left X Rib Deflection	-47.6	-41.0	mm	-49.18	Fail
Upper Right X Rib Deflection	-47.6	-41.0	mm	-47.87	Fail
Left/Right X Rib Deviation	-7.00	7.00	mm	-1.306	Pass
Upper Left Z Rib Deflection	27.3	31.7	mm	24.97	Fail
Upper Right Z Rib Deflection	27.3	31.7	mm	31.89	Fail
Left/Right Z Rib Deviation	-7.00	7.00	mm	-6.918	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Upper Left IRTRACC	Humanetics IF-364-C-R3	DS-DS6355	11/10/2014	11/10/2015
Upper Left Y Potentiometer	Humanetics 9945	DS-DI2382	4/8/2015	4/7/2016
Upper Left Z Potentiometer	Humanetics 9945	DS-DI2383	4/8/2015	4/7/2016
Upper Right IRTRACC	Humanetics IF-364-C-R3	DS-DJ2613	4/8/2015	4/7/2016
Upper Right Y Potentiometer	Humanetics 9945	DS-DI7753	4/9/2015	4/8/2016
Upper Right Z Potentiometer	Humanetics 9945	DS-DI7752	4/9/2015	4/8/2016





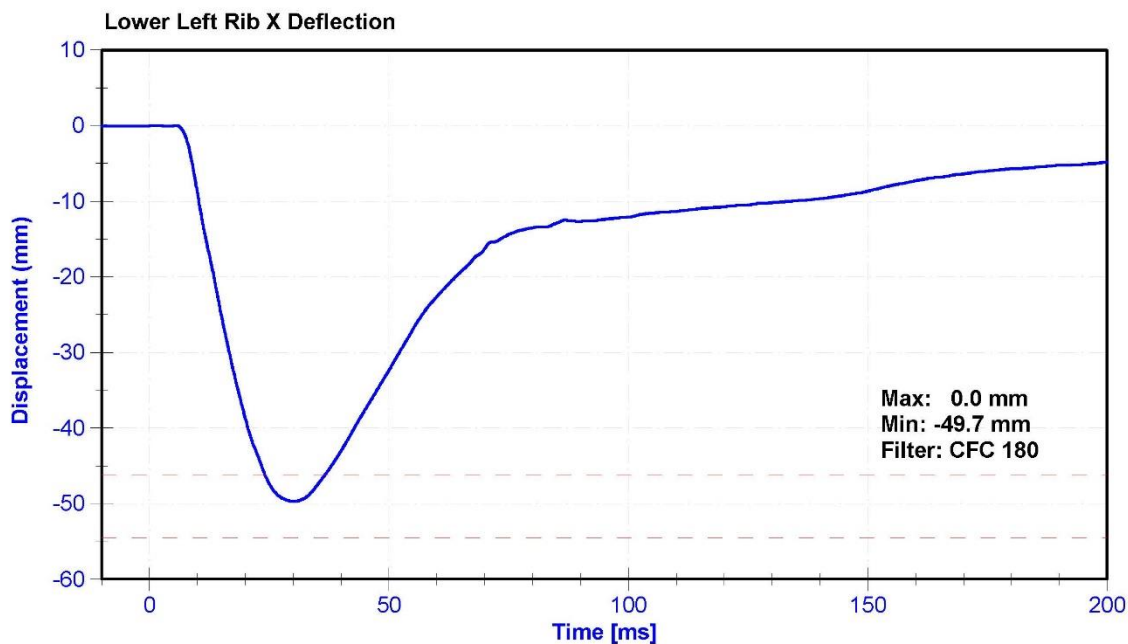
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

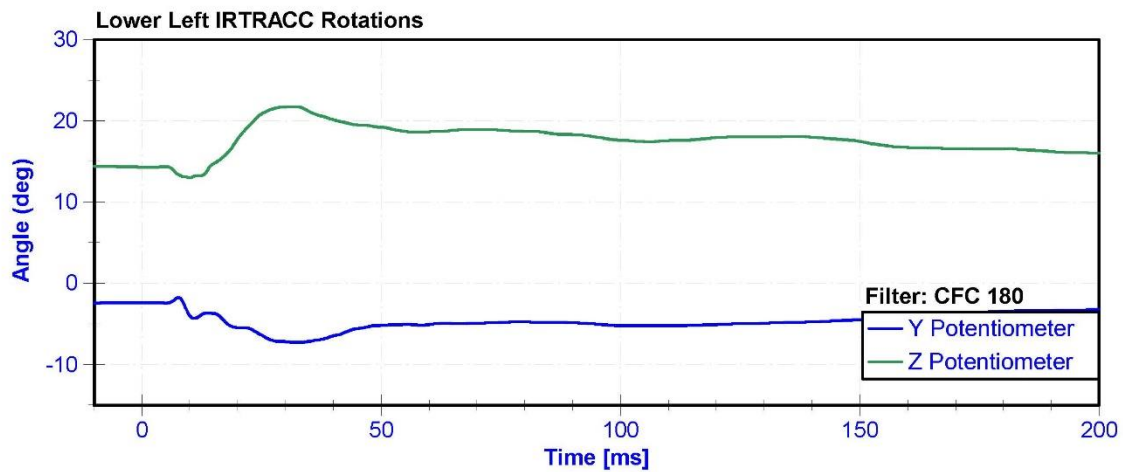
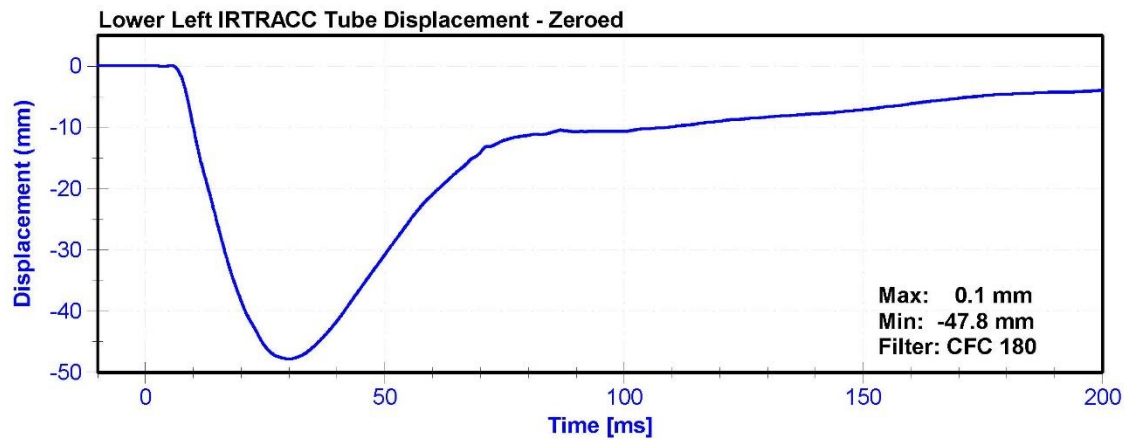
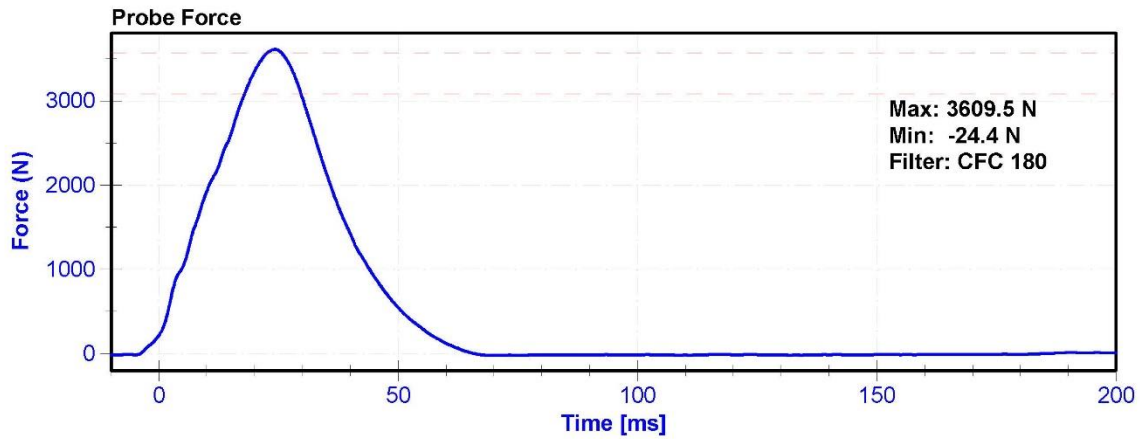
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	27.5	Pass
Impact Velocity	4.25	4.35	m/s	4.269	Pass
Peak Left X Rib Deflection	-54.5	-46.2	mm	-49.68	Pass
Probe Force during Peak Deflection	3083	3571	N	3609.5	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Lower Left IRTRACC	Humanetics IF-364-C-R3	DS-DS6353	11/10/2014	11/10/2015
Lower Left Y Potentiometer	Humanetics 9945	DS-DM4781	4/7/2015	4/6/2016
Lower Left Z Potentiometer	Humanetics 9945	DS-DS4092	4/7/2015	4/6/2016





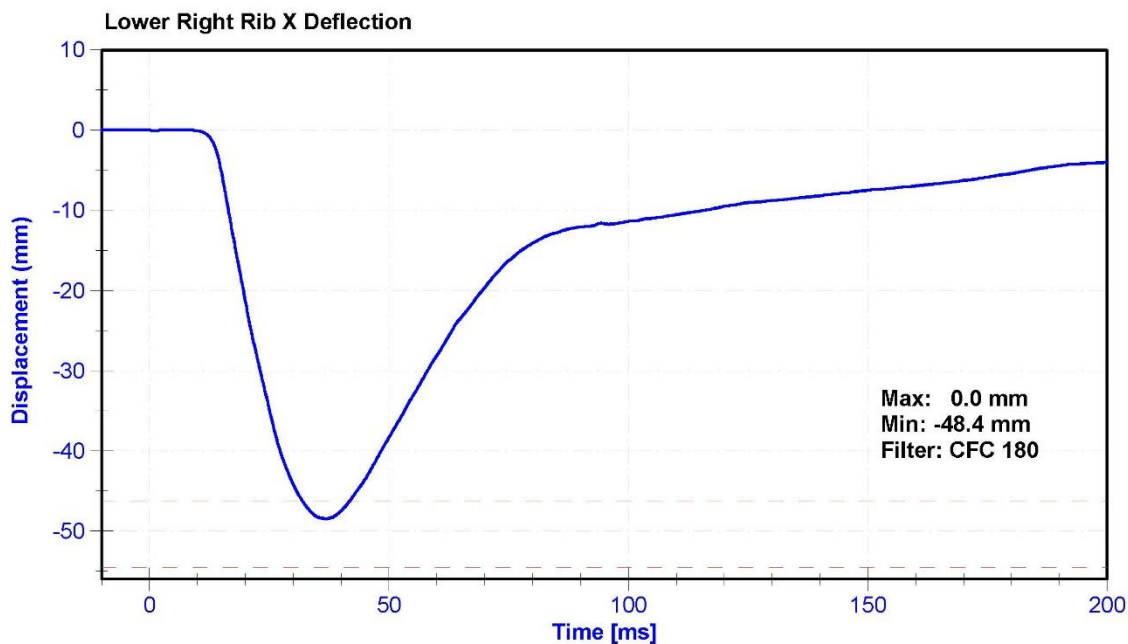
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

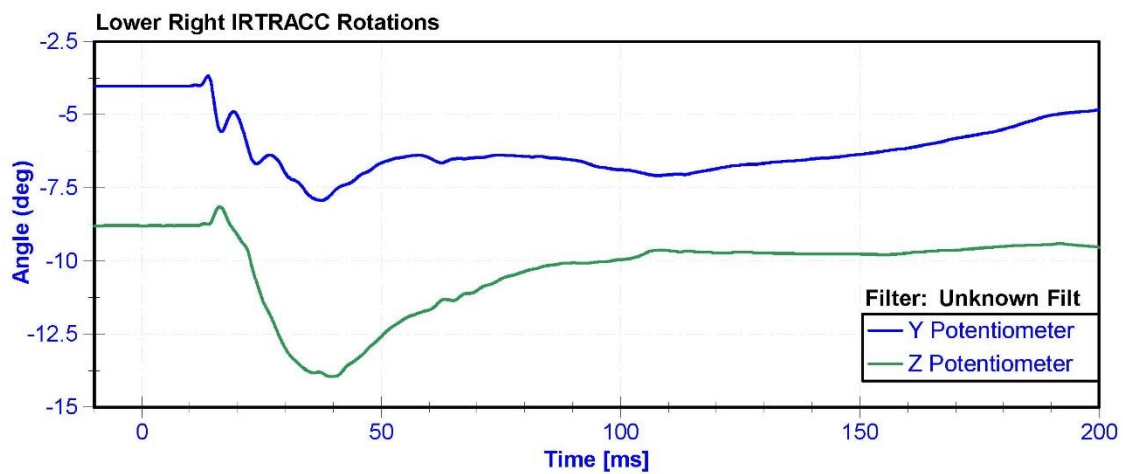
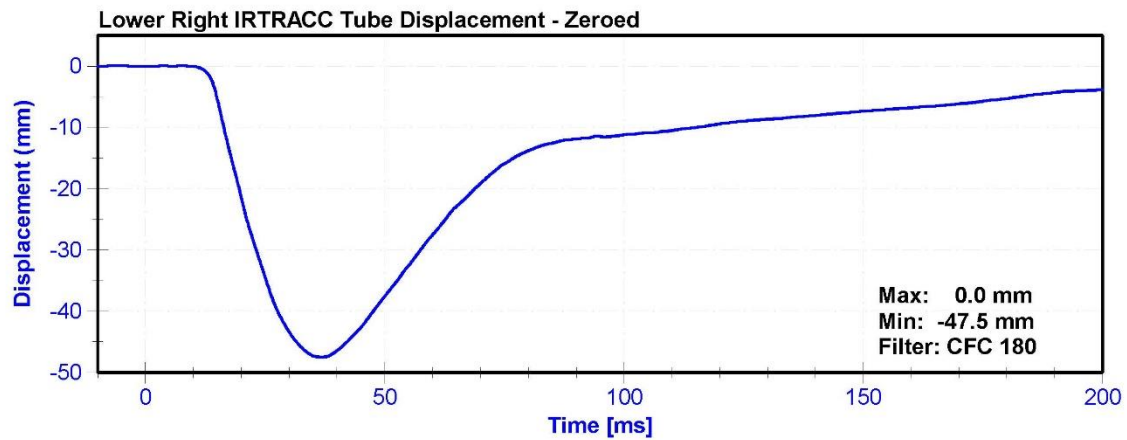
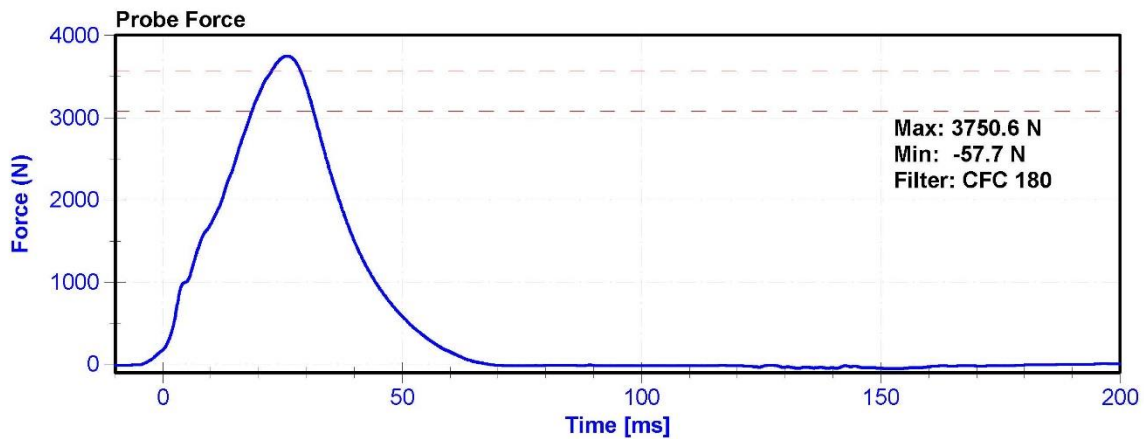
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	26.3	Pass
Impact Velocity	4.25	4.35	m/s	4.275	Pass
Peak Right X Rib Deflection	-54.5	-46.2	mm	-48.44	Pass
Probe Force during Peak Deflection	3083	3571	N	3750.6	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Lower Right IRTRACC	Humanetics IF-364-C-R3	DS-DS6354	11/10/2014	11/10/2015
Lower Right Y Potentiometer	Humanetics 9945	DS-DM4776	4/7/2015	4/6/2016
Lower Right Z Potentiometer	Humanetics 9945	DS-DM4777	4/7/2015	4/6/2016







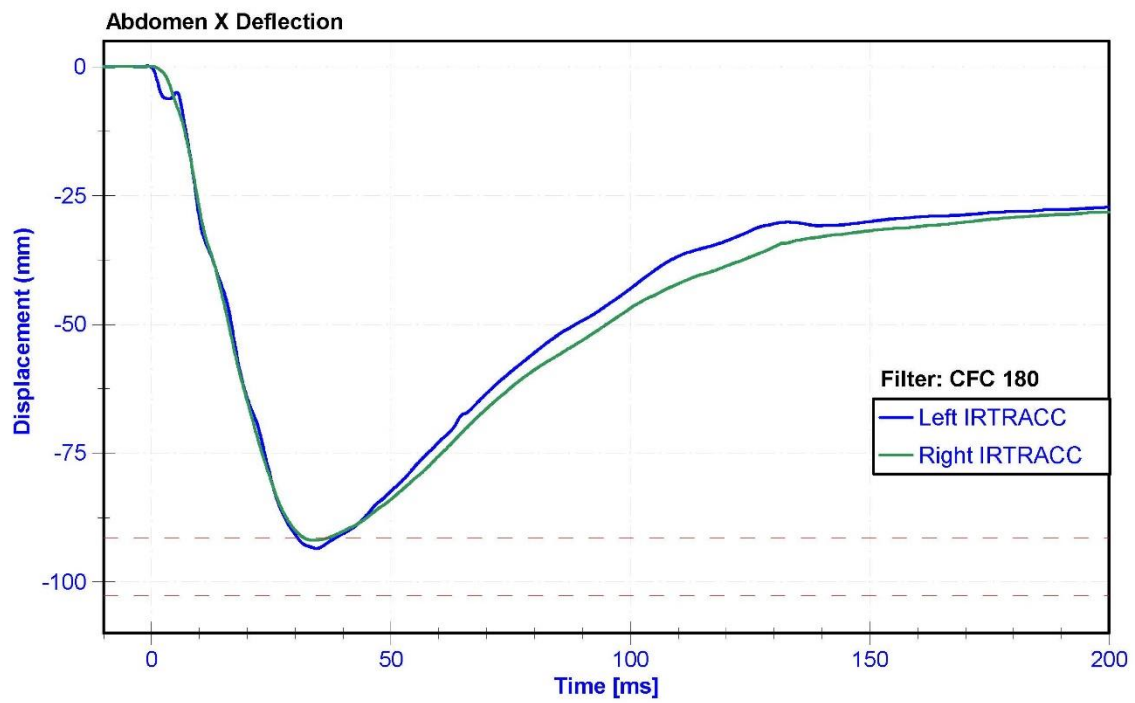
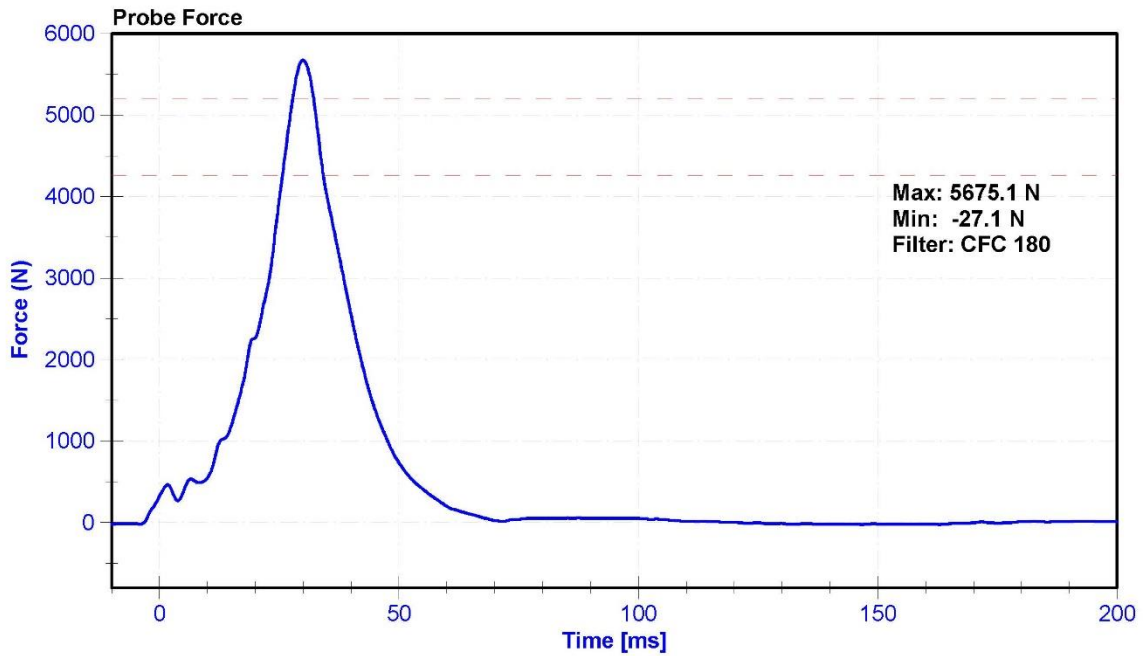
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

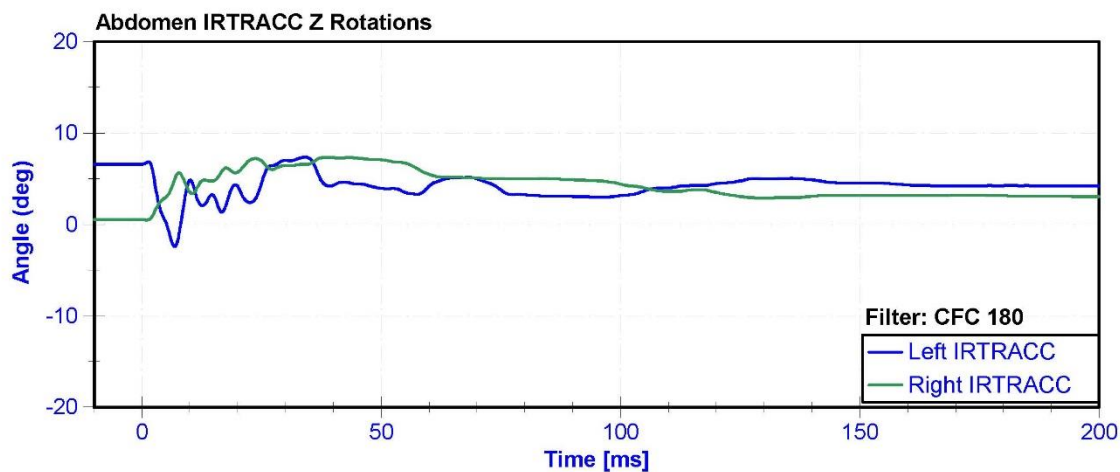
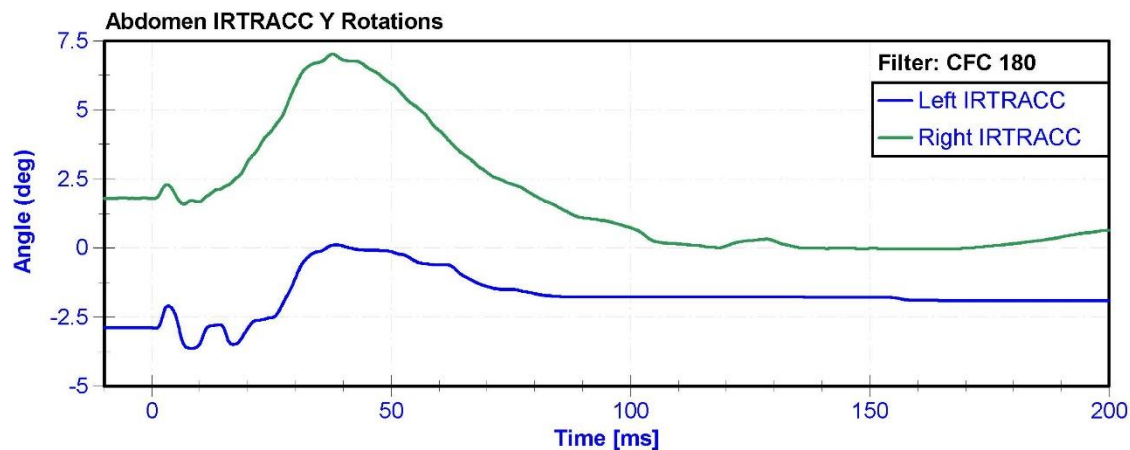
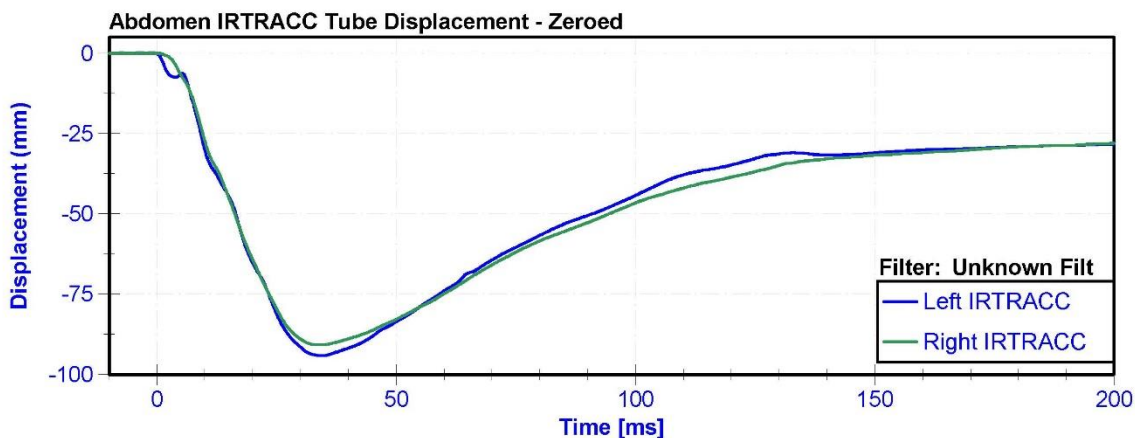
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.8	Pass
Humidity	10	70	%	27.9	Pass
Impact Velocity	4.25	4.35	m/s	4.317	Pass
Probe Force	4,263	5,211	N	5675.1	Fail
Left Abdomen X Deflection	-102.69	-91.50	mm	-93.48	Pass
Right Abdomen X Deflection	-102.69	-91.50	mm	-91.88	Pass
Left/Right X Deviation	-7.00	7.00	mm	-1.600	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Abdomen Left IRTRACC	Humanetics 9910	DS-DQ2303	4/13/2015	4/12/2016
Abdomen Left Y Potentiometer	Humanetics 9945	DS-DS8363	12/16/2014	12/16/2015
Abdomen Left Z Potentiometer	Humanetics 9945	DS-DS8361	12/16/2014	12/16/2015







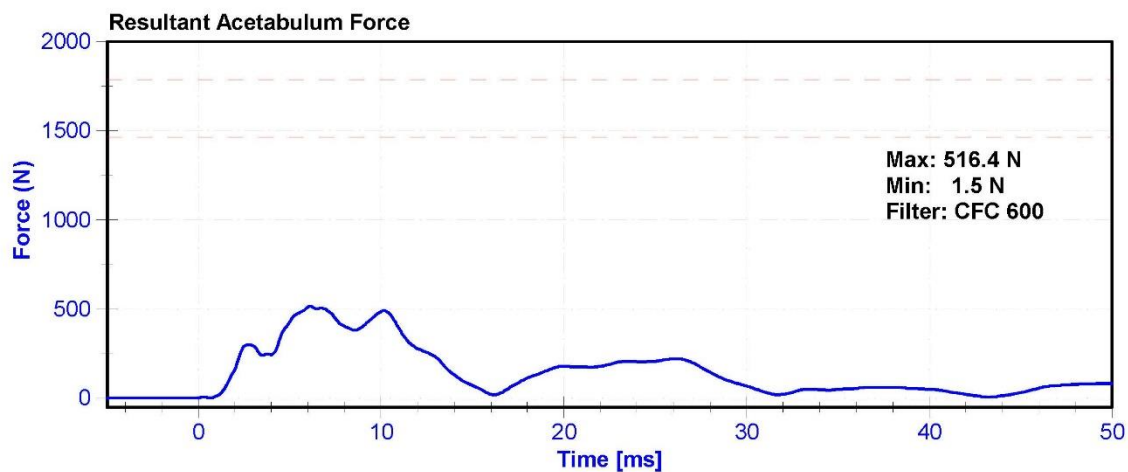
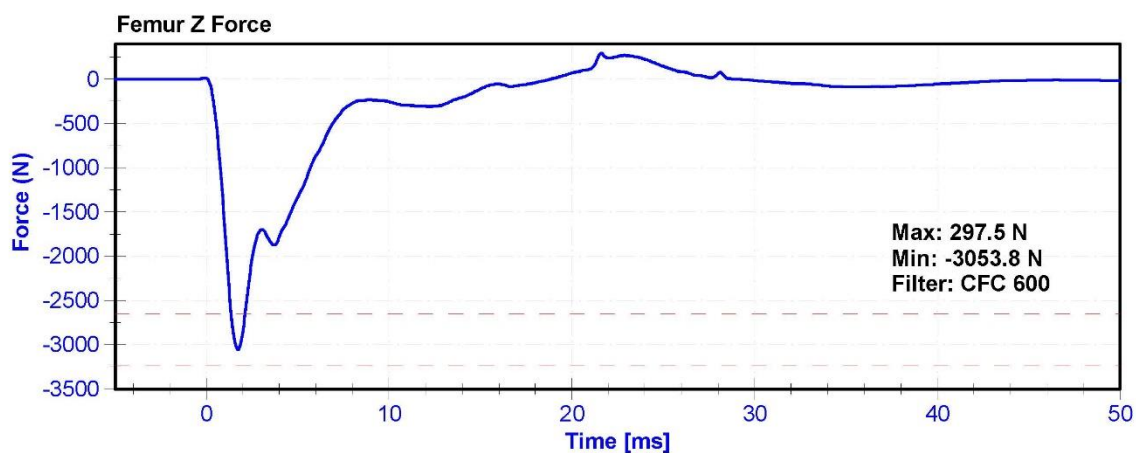
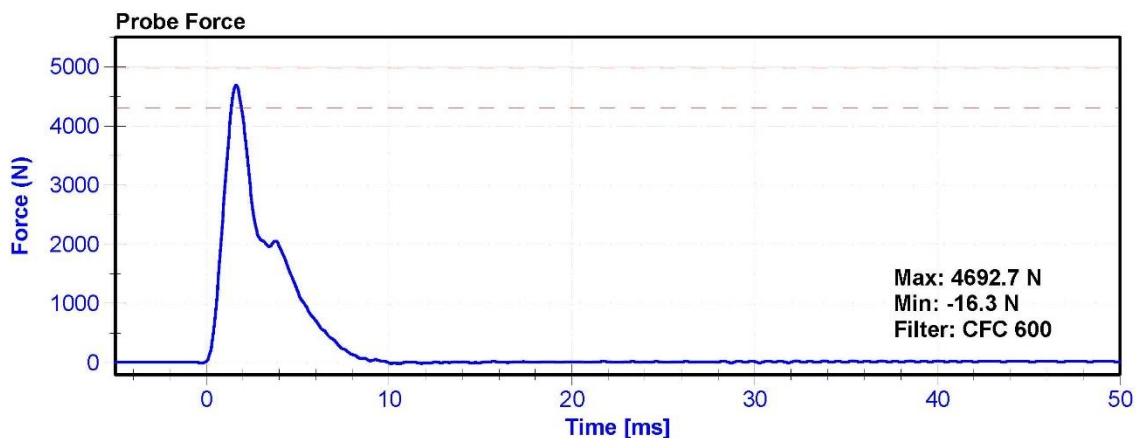
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	38.5	Pass
Impact Velocity	2.55	2.65	m/s	2.616	Pass
Probe Force	4,318	4,989	N	4692.7	Pass
Peak Femur Z Force	-3,241	-2,652	N	-3053.80	Pass
Peak Resultant Acetabulum Force	1,462	1,787	N	516.43	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Left Femur Load Cell	Denton W50-7101051	LC-DM4975 Fz	2/20/2015	2/20/2016
Left Acetabulum Load Cell	Humanetics 10670J14	LC-DP3835 Fx	3/7/2015	3/6/2016





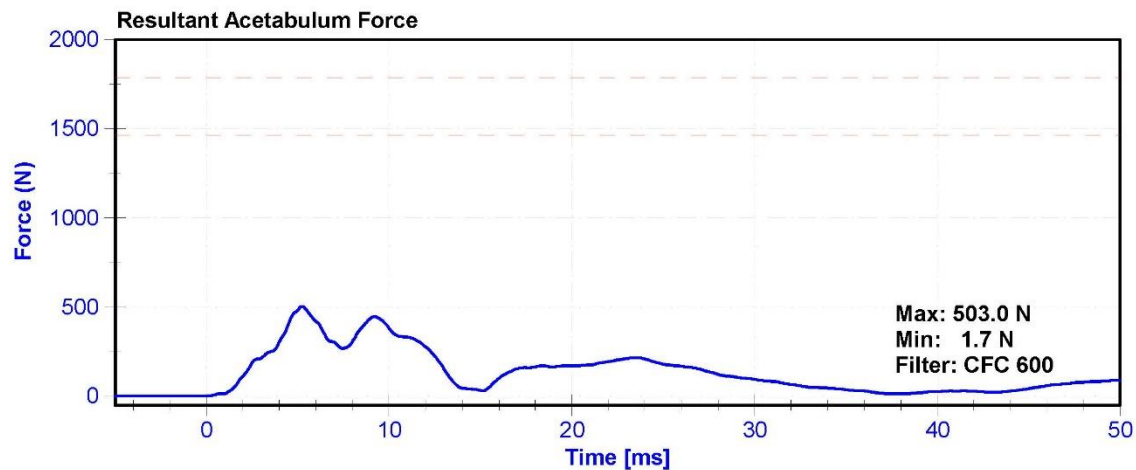
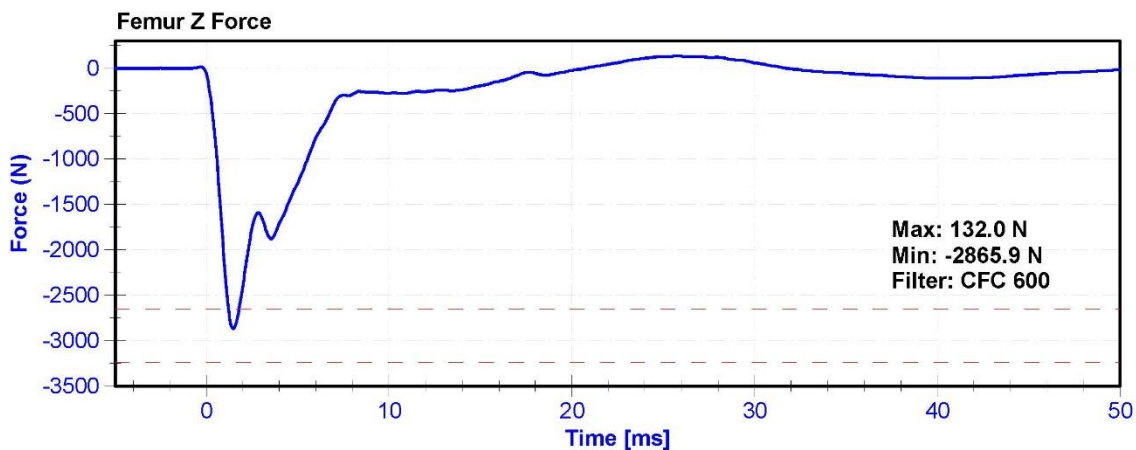
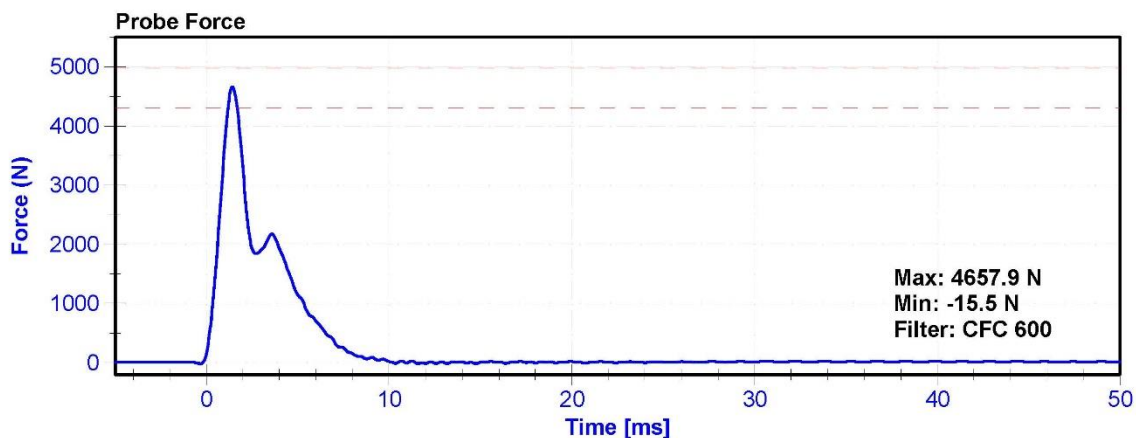
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	39.7	Pass
Impact Velocity	2.55	2.65	m/s	2.621	Pass
Probe Force	4,318	4,989	N	4657.9	Pass
Peak Femur Z Force	-3,241	-2,652	N	-2865.88	Pass
Peak Resultant Acetabulum Force	1,462	1,787	N	502.96	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Left Femur Load Cell	Denton W50-7101051	LC-DM4976 Fz	2/23/2015	2/23/2016
Left Acetabulum Load Cell	Humanetics 10530JI4	LC-DP4639 Fx	3/6/2015	3/5/2016



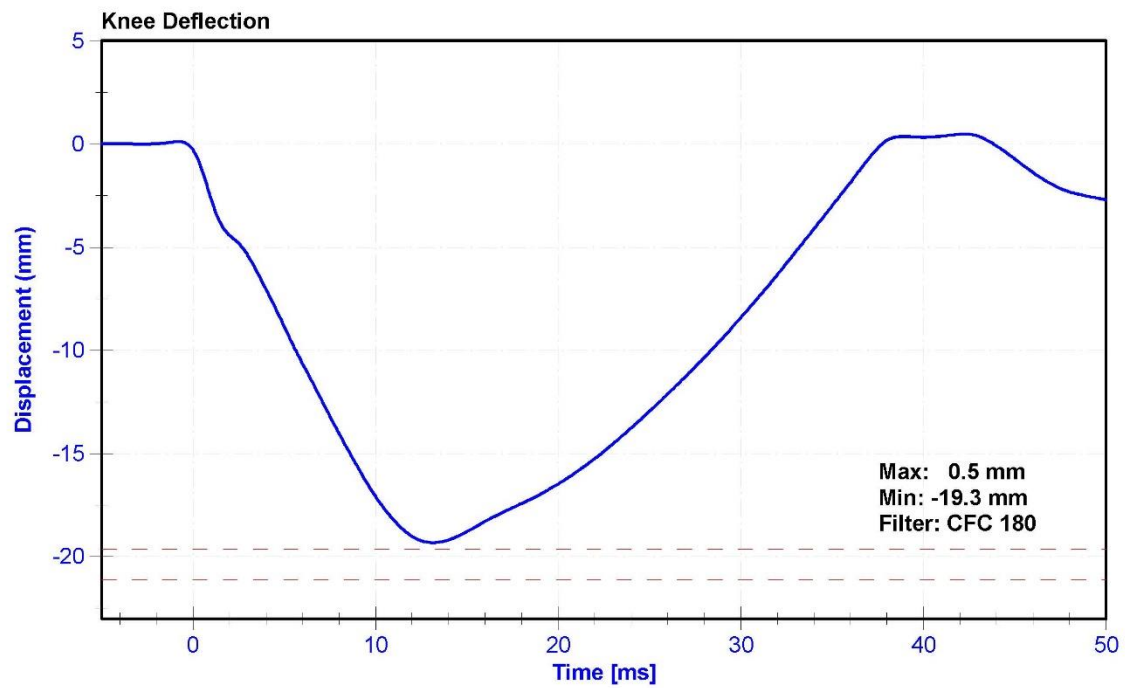
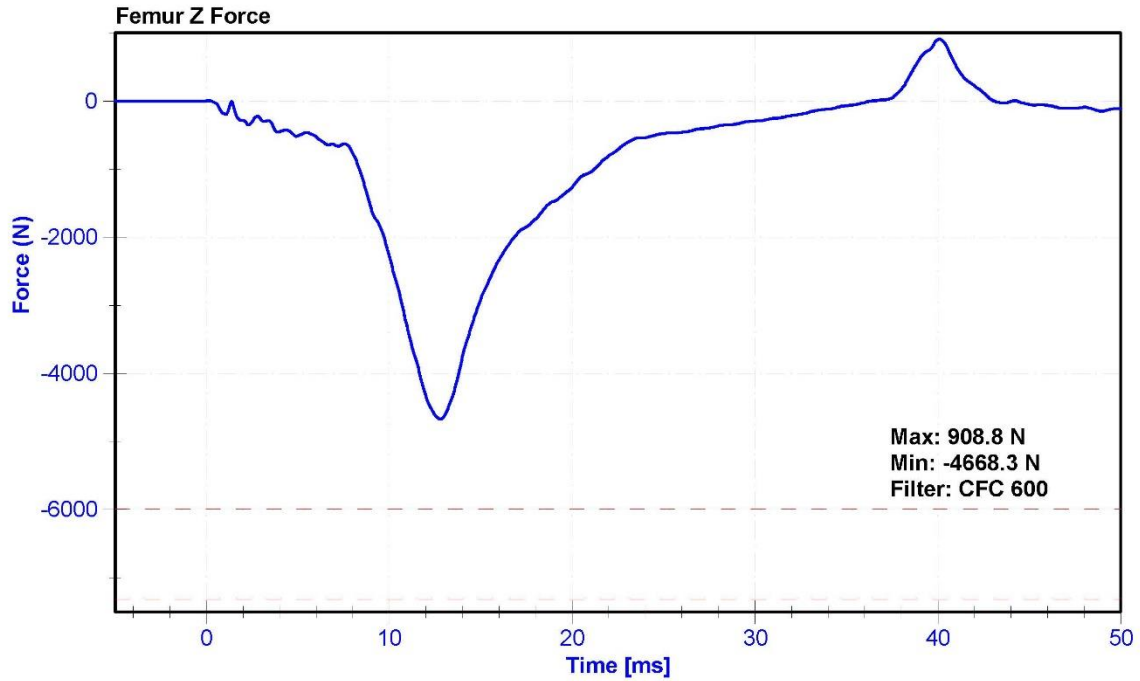
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	40.9	Pass
Impact Velocity	2.15	2.25	m/s	2.205	Pass
Peak Femur Z Force	-7,317	-5,987	N	-4668.3	Fail
Knee Deflection at Peak Force	-21.12	-19.62	mm	-19.31	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Femur Load Cell	Denton W50-7101051	LC-DM4975 Fz	2/20/2015	2/20/2016
Knee Potentiometer	Space Age 150-0121V	DS-C2102639B	2/17/2015	2/17/2016





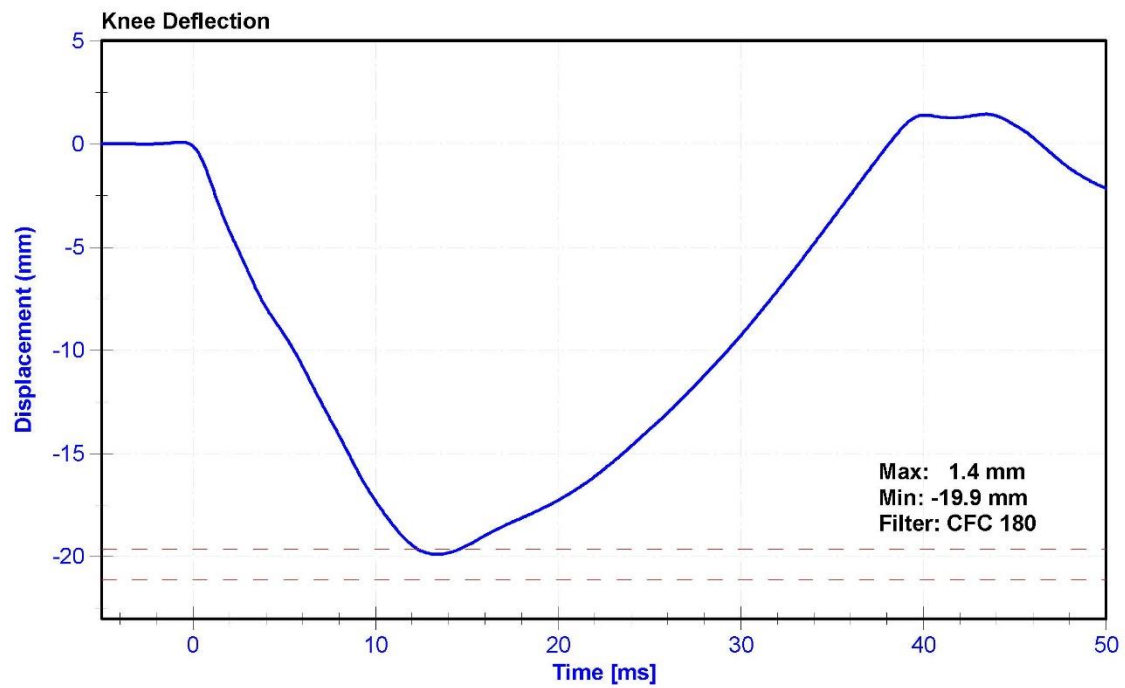
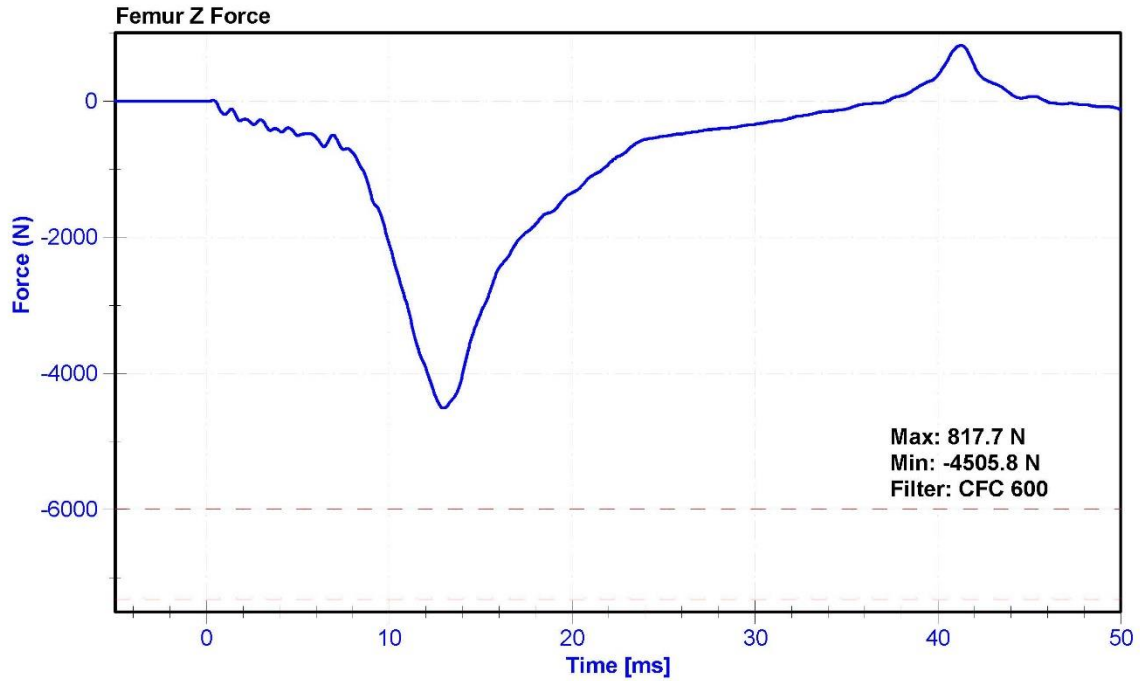
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	44.4	Pass
Impact Velocity	2.15	2.25	m/s	2.214	Pass
Peak Femur Z Force	-7,317	-5,987	N	-4505.8	Fail
Knee Deflection at Peak Force	-21.12	-19.62	mm	-19.88	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Femur Load Cell	Denton W50-7101051	LC-DM4976 Fz	2/23/2015	2/23/2016
Knee Potentiometer	Space Age 150-0121VL	DS-021033	3/18/2015	3/17/2016



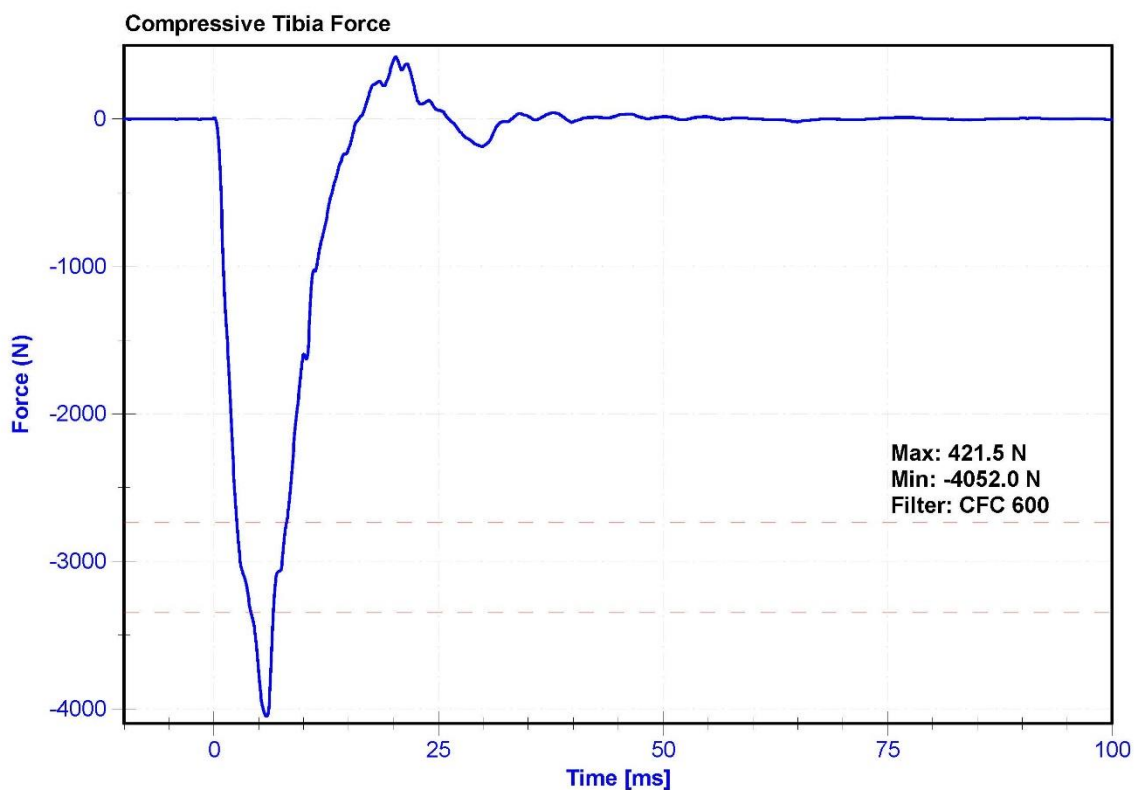
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	55.2	Pass
Velocity	3.9	4.1	m/s	3.948	Pass
Lower Tibia Compressive Force	2,738	3,346	N	-4052.0	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016



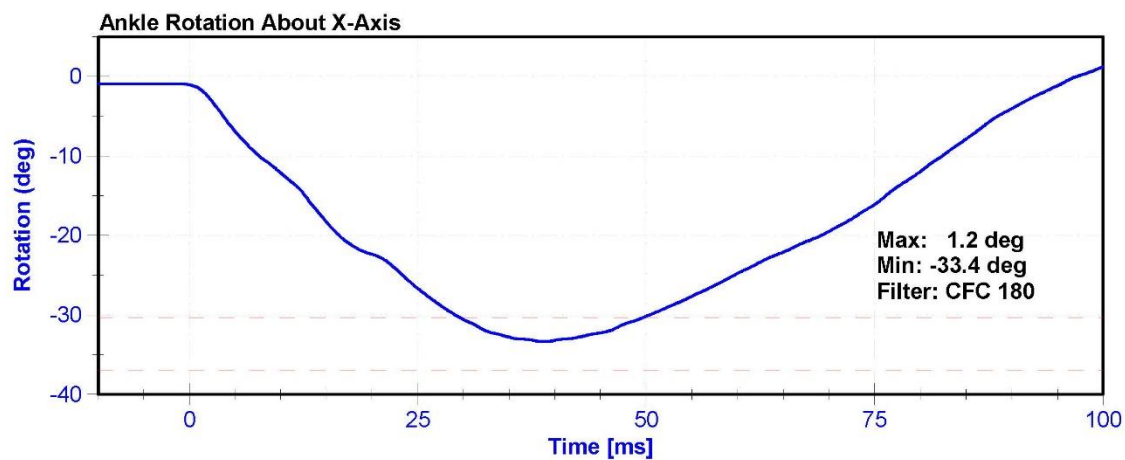
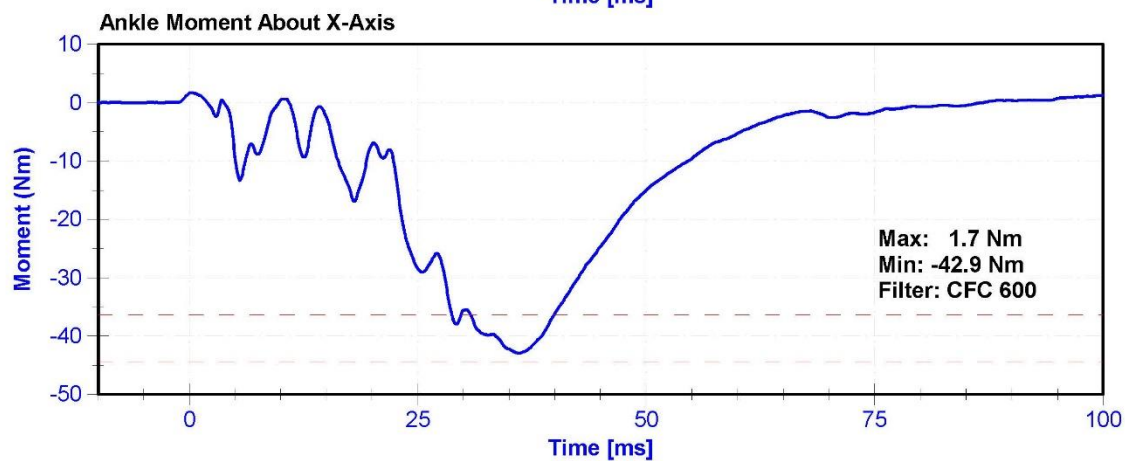
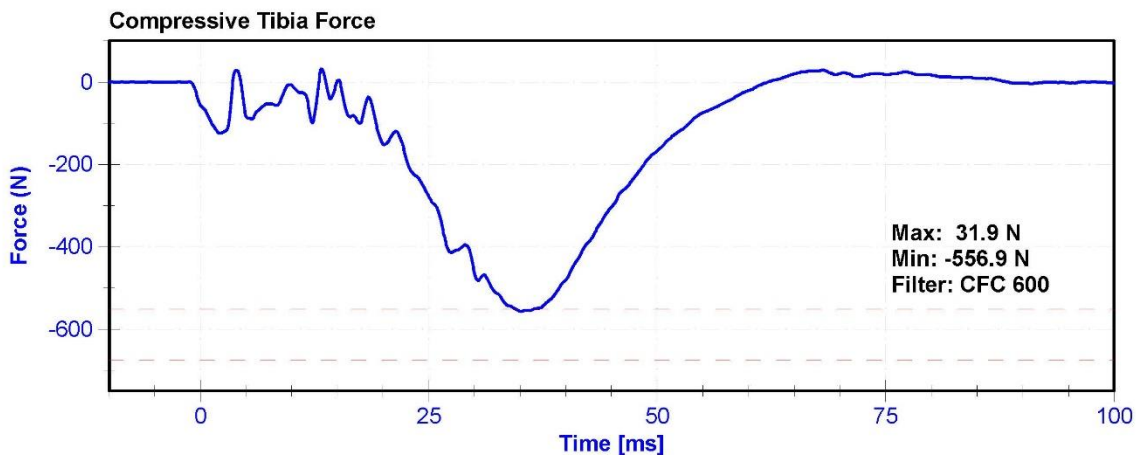
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	60.4	Pass
Velocity	1.9	2.1	m/s	1.934	Pass
Lower Tibia Compressive Force	-675	-552	N	-556.9	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-42.92	Pass
Peak Rotation about X-Axis	-37.0	-30.3	deg	-33.36	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0528	2/19/2015	2/19/2016





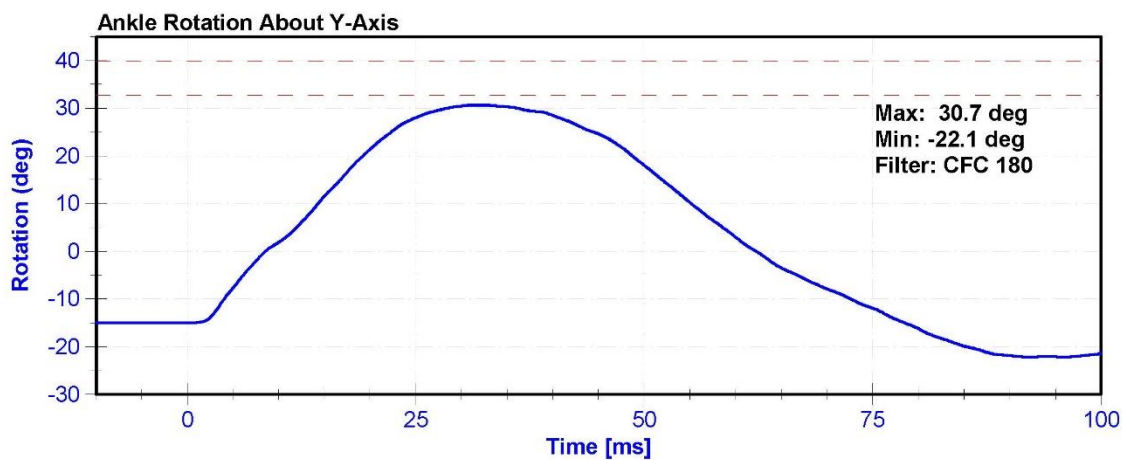
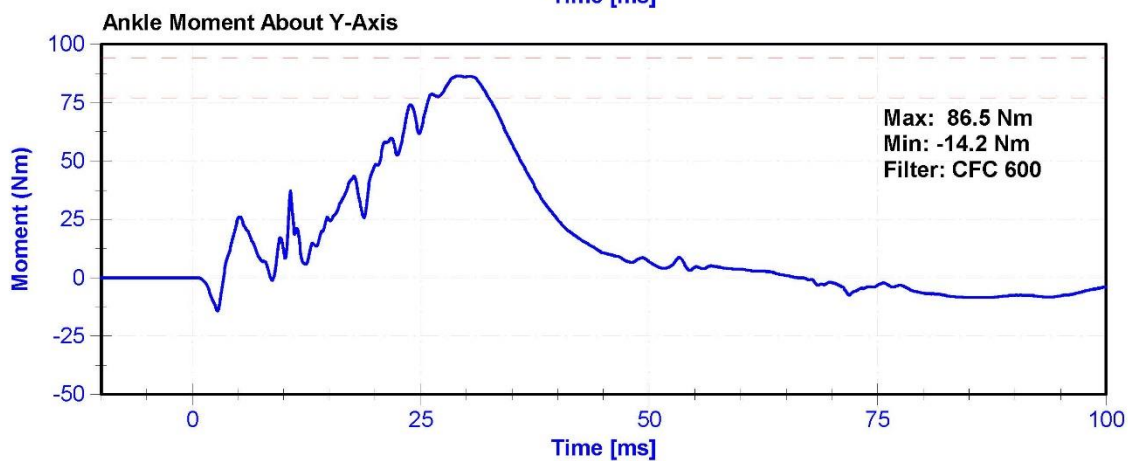
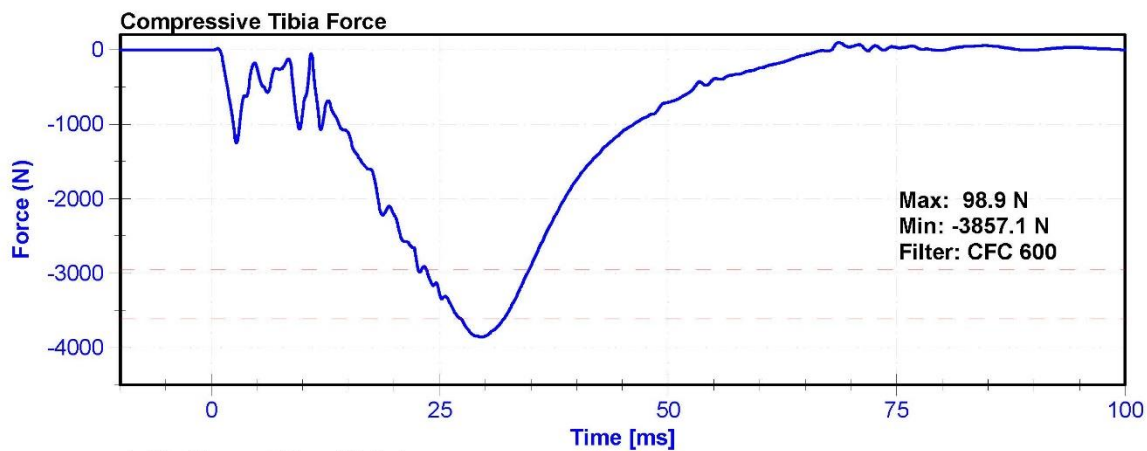
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	53.9	Pass
Velocity	4.9	5.1	m/s	4.916	Pass
Lower Tibia Compressive Force	-3,613	-2,956	N	-3857.1	Fail
Peak Moment about Y-Axis	77.1	94.2	Nm	86.48	Pass
Peak Rotation about Y-Axis	32.7	39.9	deg	30.69	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0526	2/19/2015	2/19/2016





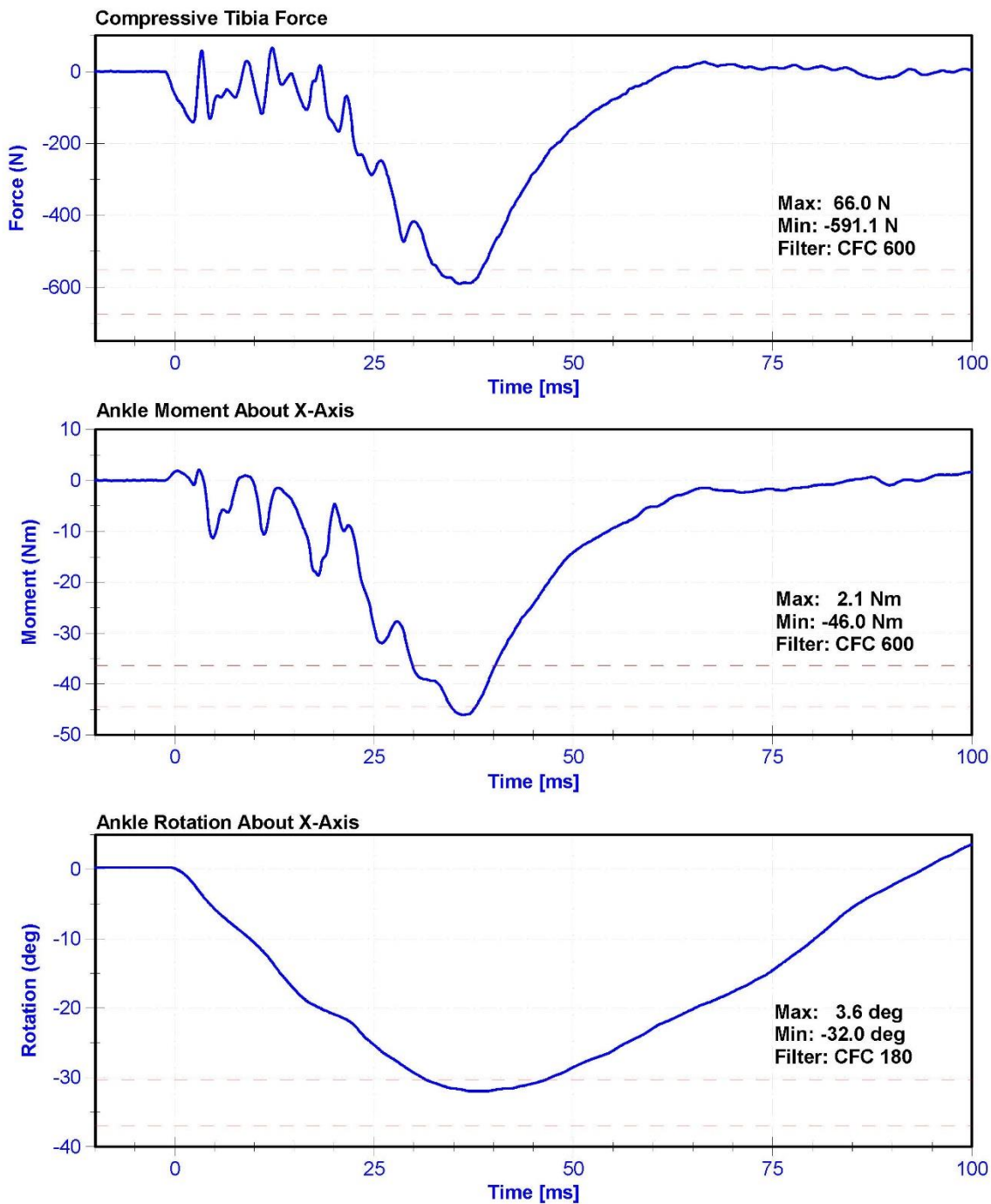
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	58.3	Pass
Velocity	1.9	2.1	m/s	1.939	Pass
Lower Tibia Compressive Force	-675	-552	N	-591.1	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-46.02	Fail
Peak Rotation about X-Axis	-37.0	-30.3	deg	-32.01	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0525	2/18/2015	2/18/2016



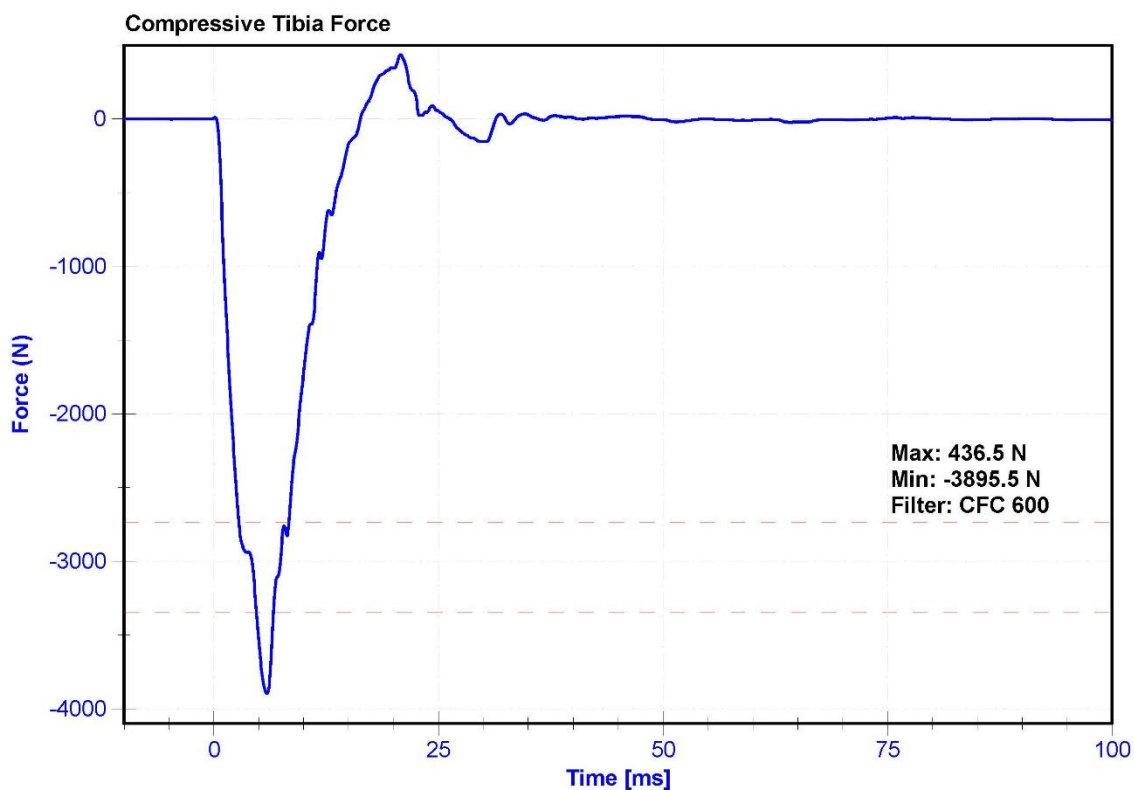
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	65.3	Pass
Velocity	3.9	4.1	m/s	3.908	Pass
Lower Tibia Compressive Force	2,738	3,346	N	-3895.5	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016





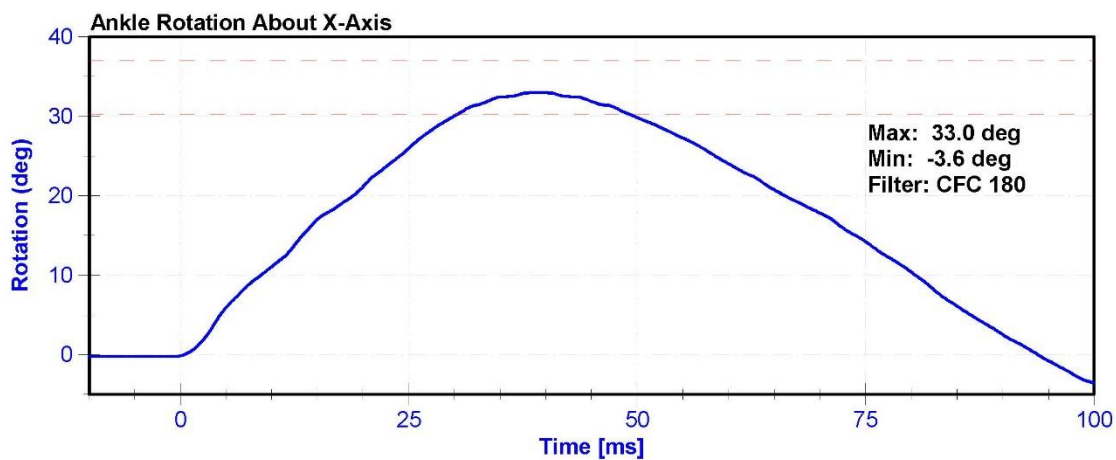
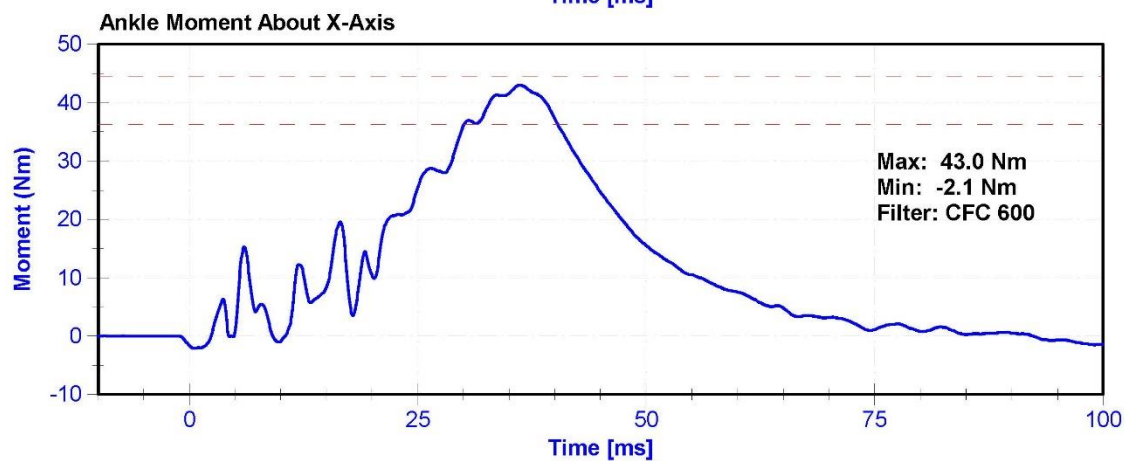
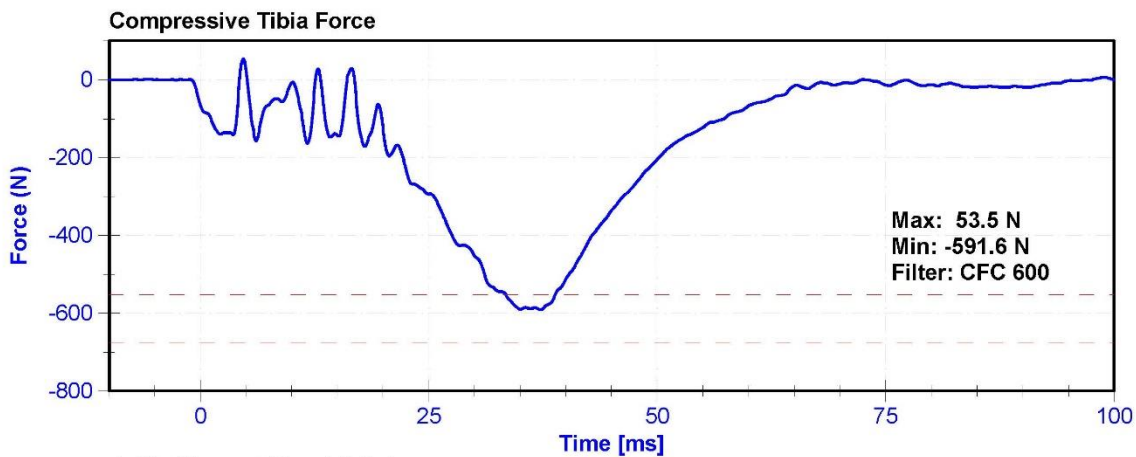
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	58.4	Pass
Velocity	1.9	2.1	m/s	2.016	Pass
Lower Tibia Compressive Force	-675	-552	N	-591.6	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	42.99	Pass
Peak Rotation about X-Axis	30.3	37.0	deg	32.97	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0525	2/18/2015	2/18/2016





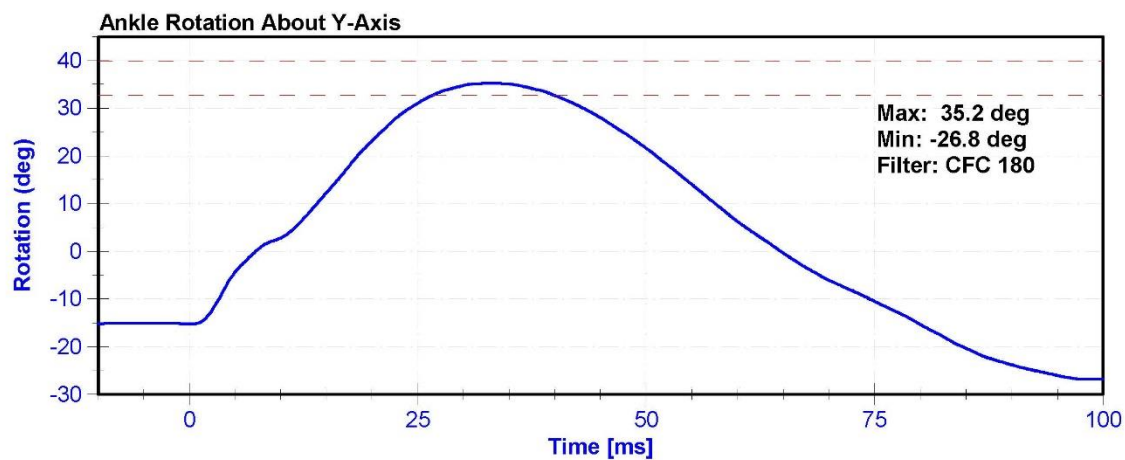
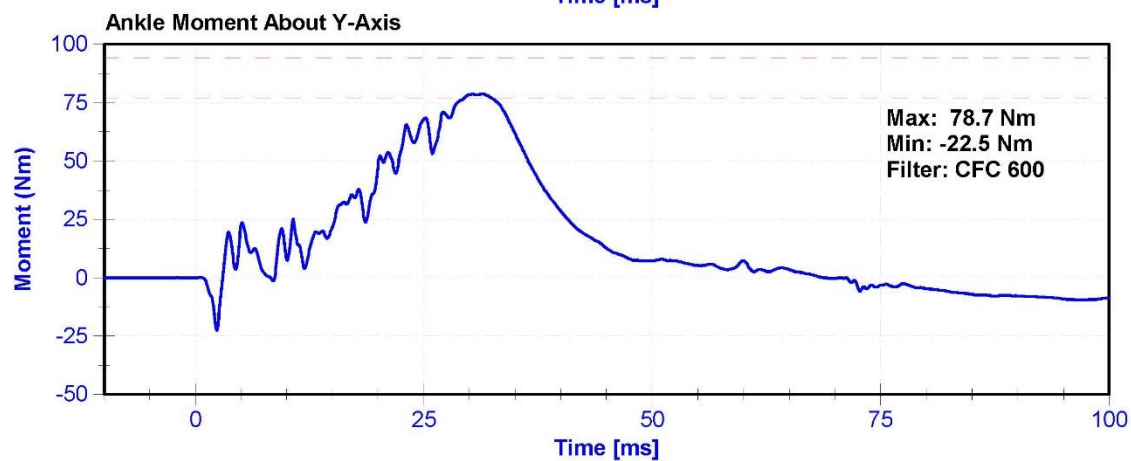
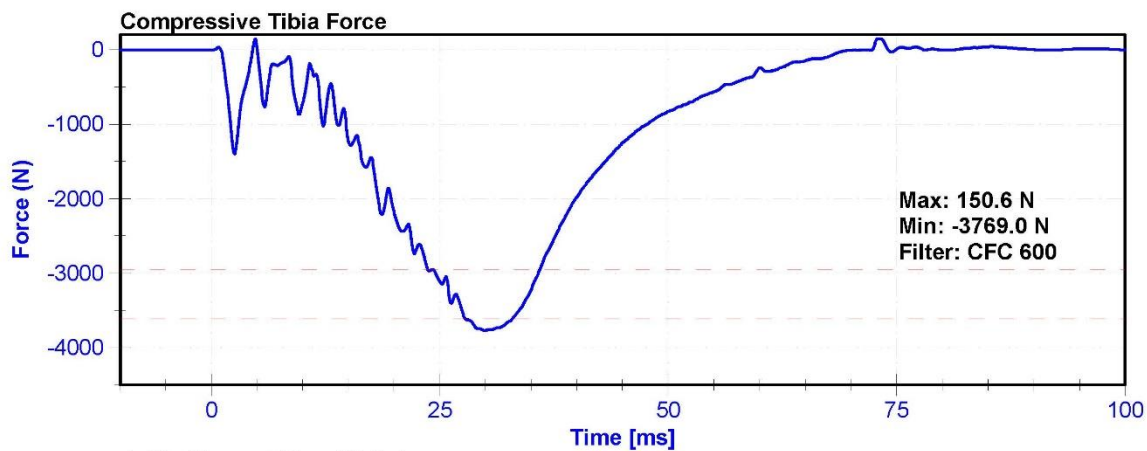
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	64.4	Pass
Velocity	4.9	5.1	m/s	4.916	Pass
Lower Tibia Compressive Force	-3,613	-2,956	N	-3769.0	Fail
Peak Moment about Y-Axis	77.1	94.2	Nm	78.73	Pass
Peak Rotation about Y-Axis	32.7	39.9	deg	35.23	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0524	2/18/2015	2/18/2016





ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	58.2	Pass
Velocity	1.9	2.1	m/s	1.934	Pass
Lower Tibia Compressive Force	-675	-552	N	-596.9	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	43.63	Pass
Peak Rotation about X-Axis	30.3	37.0	deg	30.72	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016
Ankle Y Potentiometer	Contelec PD210-4B	DS-0528	2/19/2015	2/19/2016

