

REPORT NUMBER: R&D-CAL-15-010

**VEHICLE TO FRONTAL BARRIER CRASH TEST IN SUPPORT OF NHTSA'S
FRONTAL RESEARCH PROGRAM**

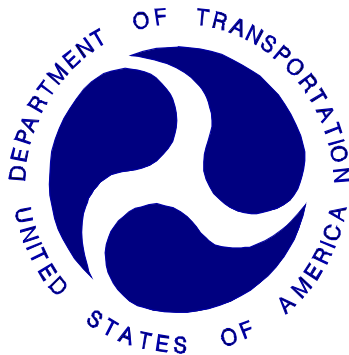
2016 Nissan Rogue

56.3 KPH RIGID BARRIER FRONTAL

TEST DATE: 1/25/2016

NHTSA No: M20165212

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May 2, 2016

PREPARED FOR:

**U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Vehicle safety Research
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Washington, DC 20590**

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STRUCTURAL AND RESTRAINTS RESEARCH DIVISION:

Date: _____

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Date: _____

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16. Abstract A test was conducted in accordance with Contract DTNH22-14-D-00359 Task Order 0002. The test consisted of a 2016 Nissan Rogue SUV traveling at a target speed of 56.3 KPH into a stationary flat frontal barrier wall. 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 January 25, 2016. The vehicle's impact velocity was 56.39 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 399 mm. The test vehicle's occupant performance was as follows: <table border="1"> <thead> <tr> <th>Measurement Description</th> <th>Units</th> <th>Driver</th> <th>Front Passenger</th> <th>Rear Passenger</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>452.90</td> <td>283.11</td> <td>1155.33</td> </tr> <tr> <td>Brain Injury Criterion (BrIC)</td> <td>N/A</td> <td>0.70</td> <td>0.69</td> <td></td> </tr> <tr> <td>Abdomen Deflection</td> <td>mm</td> <td>-58.43</td> <td></td> <td></td> </tr> <tr> <td>Resultant Acetabulum Force</td> <td>N</td> <td>3383.81</td> <td></td> <td></td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>-49.04</td> <td>-34.33</td> <td>-56.01</td> </tr> <tr> <td>Neck Injury Criteria (Nij)</td> <td>N/A</td> <td>0.78</td> <td>0.54</td> <td>1.25</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>1792.09</td> <td>998.55</td> <td>3159.87</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>-338.10</td> <td>-398.74</td> <td>-397.71</td> </tr> <tr> <td>Tibia Index</td> <td>N/A</td> <td>0.46</td> <td>0.93</td> <td></td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>-6727.22</td> <td>-766.23</td> <td></td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>-6244.33</td> <td>-69.08</td> <td>-135.83</td> </tr> </tbody> </table>					Measurement Description	Units	Driver	Front Passenger	Rear Passenger	Head Injury Criteria (HIC ₁₅)	N/A	452.90	283.11	1155.33	Brain Injury Criterion (BrIC)	N/A	0.70	0.69		Abdomen Deflection	mm	-58.43			Resultant Acetabulum Force	N	3383.81			Maximum Chest Compression	mm	-49.04	-34.33	-56.01	Neck Injury Criteria (Nij)	N/A	0.78	0.54	1.25	Neck Tension	N	1792.09	998.55	3159.87	Neck Compression	N	-338.10	-398.74	-397.71	Tibia Index	N/A	0.46	0.93		Left Femur Force	N	-6727.22	-766.23		Right Femur Force	N	-6244.33	-69.08	-135.83
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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.

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Date: May 2, 2016

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SECTION 1
PURPOSE OF TEST

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

This 56.3 kph (35 mph) test vehicle into a rigid barrier is part of the Frontal Rigid Barrier Test outlined in Contract No. DTNH22-14-D-00359 Task Order 0002. The purpose of this test is to obtain vehicle crashworthiness and occupant restraint system performance data for research purposes.

This test was conducted in accordance with the instructions set forth for a vehicle to rigid barrier impact, outlined in Contract No. DTNH22-14-D-00359 Task Order 0002. 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 0002.

SECTION 2 SUMMARY OF TEST

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

A rigid fixed barrier was impacted by a 2016 Nissan Rogue SUV at a velocity of 56.39 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on January 25, 2016. Pre- and post-test photographs of the vehicle and dummies to document the test can be found in Appendix A. One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

One 50% adult male THOR-M anthropomorphic test device (ATD) (Serial No. DL9207), was placed in the driver seating position according to dummy placement instructions specified in the THOR Seating Test Procedure, and one Part 572O 5th percentile female ATD with RibEye (Serial No. 324), was placed in the right-front passenger seating position at mid-track and positioned according to dummy placement instructions specified in the frontal NCAP laboratory test procedure. One Part 572O 5th percentile female ATD with RibEye (Serial No. 019) was also placed in the rear seating position (P3) and positioned according to dummy placement instructions specified in the Side MDB NCAP Laboratory Test Procedure.

Seat belt load cells were also on the driver's and passengers' shoulder and lap belts to measure the dummy's torso and pelvic section loading. In addition to seat belt load cells, belt movement sensors were utilized on both the driver and front passengers' seat belts to measure displacement. The driver (position 1) ATD (Serial No. DL9207), right-front passenger (position 2) ATD (Serial No. 324), and the rear passenger ATD (Serial No. 019) were calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

Two hundred and sixty eight (268) channels of data from the ATD's and test vehicle were collected using Kayser – Threde and DTS data acquisition systems. Appendix B contains dummy and vehicle response data plots.

There was 80.2% total windshield retention. 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 399 mm at C4 to the right of the vehicle's centerline. Full vehicle measurements are presented in Section 3 of this report.

SECTION 2 (CONTINUED)
SUMMARY OF TEST

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

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 and some separation along bottom corners
- Hood slightly bent inwards
- Front doors could be opened but not reclosed

The driver ATD's visible contact points were:

- Head contacted the frontal & Curtain airbag and headrest
- Torso contacted the frontal airbag
- Knees contacted the knee bolster

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

- Head contacted the frontal airbag and headrest

The rear passenger ATD's visible contact points were:

- Head contacted the headrest

SECTION 2 (CONTINUED) CRASH VEHICLE SUMMARY

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

Primary Impact Data

Measured Parameter	Units	Value
Test Vehicle Velocity at Impact	kph	56.39
Vehicle Test Weight	kg	1888
Vehicle Maximum Static Crush	mm	399
Number of Data Channels		268
Number of Real-Time Cameras		1
Number of High-Speed Cameras		16

GENERAL COMMENTS:

1. P1 (Driver) serial number – DL9207
2. P2 (Passenger) serial number – 324
3. P3 (Rear Passenger) serial number – 019

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PRELIMINARY INJURY SUMMARY: Driver

Test Vehicle: M20165212 - 2016 Nissan Rogue NHTSA No.: M20165212
 Test Program: NHTSA R&D Frontal Rigid Barrier Test Date: 1/25/2016

Driver: THOR Serial No. DL9207 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	HIC 15ms		Compute	452.90	
	Brain Injury Criteria (BrIC)		Compute	0.70	
	Head Rotational Velocity X	Deg/s	60	490.98	-370.02
	Head Rotational Velocity Y	Deg/s	60	1053.19	-1817.42
	Head Rotational Velocity Z	Deg/s	60	898.48	-992.05
Neck	Upper Neck Z-axis Force	N	1000	1792.09	-338.10
	Upper Neck Y-axis Moment	Nm	Thortest	31.92	-23.31
Chest	Upper Left Resultant Chest Deflection	mm	Thortest	38.34	
	Upper Right Resultant Chest Deflection	mm	Thortest	49.04	
	Lower Left Resultant Chest Deflection	mm	Thortest	14.16	
	Lower Right Resultant Chest Deflection	mm	Thortest	37.15	
Abdomen	Lower Left X-axis Deflection	mm	Thortest	0.08	-55.02
	Lower Right X-axis Deflection	mm	Thortest	0.09	-58.43
Acetabulum	Left Acetabulum Resultant Force	N	Compute	3383.81	0.19
	Right Acetabulum Resultant Force	N	Compute	2937.23	0.36
Femur	Left Femur Force, FZ	N	600	234.57	-6727.22
	Right Femur Force, FZ	N	600	179.41	-6244.33
Tibia	Left Upper Tibia, FZ	N	600	622.88	-1033.69
	Left Upper Tibia Index		Compute	0.46	
	Right Upper Tibia, FZ	N	600	87.38	-769.58
	Right Upper Tibia Index		Compute	0.41	
	Left Lower Tibia, FZ	N	600	277.50	-1670.21
	Left Lower Tibia Index		Compute	0.36	
	Right Lower Tibia, FZ	N	600	19.41	-2176.36
	Right Lower Tibia Index		Compute	0.42	
Ankle	Left Ankle Rotation, RX	Deg	180	12.21	-0.32
	Left Ankle Rotation, RY	Deg	180	10.51	-9.25
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	16.04	-36.16
	Left Ankle In/Eversion Moment, MX	Nm	Compute	26.11	-17.38
	Right Ankle Rotation, RX	Deg	180	6.46	-7.30
	Right Ankle Rotation, RY	Deg	180	20.51	-4.46
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	31.65	-18.28
	Right Ankle In/Eversion Moment, MX	Nm	Compute	9.32	-34.36
Anomalies: None					

PRELIMINARY INJURY SUMMARY: Right Front Passenger

Test Vehicle: M20165212 - 2016 Nissan Rogue NHTSA No.: M20165212
 Test Program: NHTSA R&D Frontal Rigid Barrier Test Date: 1/25/2016

Right Front Passenger: HF Serial No. 324 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	15 ms HIC		Compute	283.11	
	Brain Injury Criteria (BrIC)		Compute	0.69	
Neck	Upper Neck Force Z	N	1000	998.55	-398.74
	Upper Neck Moment Y	Nm	600	27.39	-34.03
	NIJ		Compute	0.54	
Chest	Chest Potentiometer Deflection	mm	600		-34.33
	Left Ribeye 01 X-Axis Deflection	mm	600	0.15	-34.28
	Left Ribeye 02 X-Axis Deflection	mm	600	0.17	-33.76
	Left Ribeye 03 X-Axis Deflection	mm	600	0.19	-33.36
	Left Ribeye 04 X-Axis Deflection	mm	600	0.53	-33.29
	Left Ribeye 05 X-Axis Deflection	mm	600	0.19	-33.28
	Left Ribeye 06 X-Axis Deflection	mm	600	0.15	-32.63
	Right Ribeye 01 X-Axis Deflection	mm	600	0.19	-24.21
	Right Ribeye 02 X-Axis Deflection	mm	600	0.22	-21.18
	Right Ribeye 03 X-Axis Deflection	mm	600	0.22	-19.62
	Right Ribeye 04 X-Axis Deflection	mm	600	0.19	-18.03
	Right Ribeye 05 X-Axis Deflection	mm	600	0.21	-17.02
	Right Ribeye 06 X-Axis Deflection	mm	600	38.33 ⁽¹⁾	-92.05 ⁽¹⁾
	Overall Ribeye X-Axis Deflection	Mm	600	38.33 ⁽¹⁾	-92.05 ⁽¹⁾
	Chest Resultant Acceleration	g	Compute	51.92	
	Chest Resultant Acceleration, 3 ms clip	g	Compute	49.21	
	Pelvis Resultant Acceleration	g	Compute	58.26	
Femur	Left Femur Force, FZ	N	600	1828.74	-766.23
	Right Femur Force, FZ	N	600	1699.46	-69.08
Tibia	Left Upper Tibia, FZ	N	600	1076.95	-2108.38
	Left Upper Tibia Index		Compute	0.93	
	Right Upper Tibia, FZ	N	600	878.46	-1149.78
	Right Upper Tibia Index		Compute	0.77	
	Left Lower Tibia, FZ	N	600	674.46	-2967.58
	Left Lower Tibia Index		Compute	0.60	
	Right Lower Tibia, FZ	N	600	546.50	-2049.22
	Right Lower Tibia Index		Compute	0.62	
Anomalies: (1) Interference by Chest Pot or Abdominal Insert					

PRELIMINARY INJURY SUMMARY: Right Rear Passenger

Test Vehicle: M20165212 - 2016 Nissan Rogue NHTSA No.: M20165212
 Test Program: NHTSA R&D Frontal Rigid Barrier Test Date: 1/25/2016

Right Rear Passenger: HF Serial No. 019 Injury Summary

Location	Description	Unit	Source	Max	Min
Head	15 ms HIC		Compute	1155.33	
Neck	Upper Neck Force Z	N	1000	3159.87	-397.71
	Upper Neck Moment Y	Nm	600	41.09	-70.67
	NIJ		Compute	1.25	
Chest	Chest Potentiometer Deflection	mm	600		-50.70
	Left Ribeye 01 X-Axis Deflection	mm	600	0.21 ⁽²⁾	-84.49 ⁽²⁾
	Left Ribeye 02 X-Axis Deflection	mm	600	0.26	-49.46
	Left Ribeye 03 X-Axis Deflection	mm	600	0.29	-52.73
	Left Ribeye 04 X-Axis Deflection	mm	600	0.28	-56.01
	Left Ribeye 05 X-Axis Deflection	mm	600	0.30 ⁽³⁾	-88.12 ⁽³⁾
	Left Ribeye 06 X-Axis Deflection	mm	600	0.21 ⁽³⁾	-87.96 ⁽³⁾
	Right Ribeye 01 X-Axis Deflection	mm	600	0.16	-33.27
	Right Ribeye 02 X-Axis Deflection	mm	600	0.20	-32.93
	Right Ribeye 03 X-Axis Deflection	mm	600	6.97 ⁽⁴⁾	-94.74 ⁽⁴⁾
	Right Ribeye 04 X-Axis Deflection	mm	600	11.22 ⁽⁵⁾	-93.53 ⁽⁵⁾
	Right Ribeye 05 X-Axis Deflection	mm	600	16.87 ⁽³⁾	-92.74 ⁽³⁾
	Right Ribeye 06 X-Axis Deflection	mm	600	32.87 ⁽³⁾	-91.61 ⁽³⁾
	Overall Ribeye X-Axis Deflection	Mm	600	32.87 ⁽³⁾	-94.74 ⁽³⁾
	Chest Resultant Acceleration	g	Compute	77.68	
	Chest Resultant Acceleration, 3 ms clip	g	Compute	76.30	
	Pelvis Resultant Acceleration	g	Compute	97.18	
Pelvis	Left ASIS Force X	N	600	78.83	-5066.84
	Right ASIS Force X	N	600	19.16	-4281.28
Femur	Left Femur Force Z	N	600	4037.02 ⁽⁶⁾	-767.74 ⁽⁶⁾
	Right Femur Force Z	N	600	3395.82	-135.83
Anomalies: (2) Questionable data 64.8ms to 116ms (3) Interference by Chest Pot or Abdominal Insert (4) Questionable data 80.4ms to 82.7ms (5) Questionable data 103ms to 108ms (6) Questionable spikes 46ms, 49.5ms. 76ms					

SECTION 3 DATA SHEETS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
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DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

VEHICLE INFORMATION

NHTSA No.	M20165212
Model Year	2016
Make	Nissan
Model	Rogue
Body Style	SUV
VIN	KNMAT2MV5GP593787
Body Color	Red
Odometer Reading (km/mi)	49.9 km / 31 mi
Engine Displacement. (L)	2.5
Type/No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
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?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Renault Samsung Motors Co. LTD for Nissan Motor Co. LTD
Date of Manufacture	08/15

GVWR (kg)	2122
GAWR Front (kg)	1072
GAWR Rear (kg)	1089

VEHICLE SEATING AND WEIGHT CAPACITY

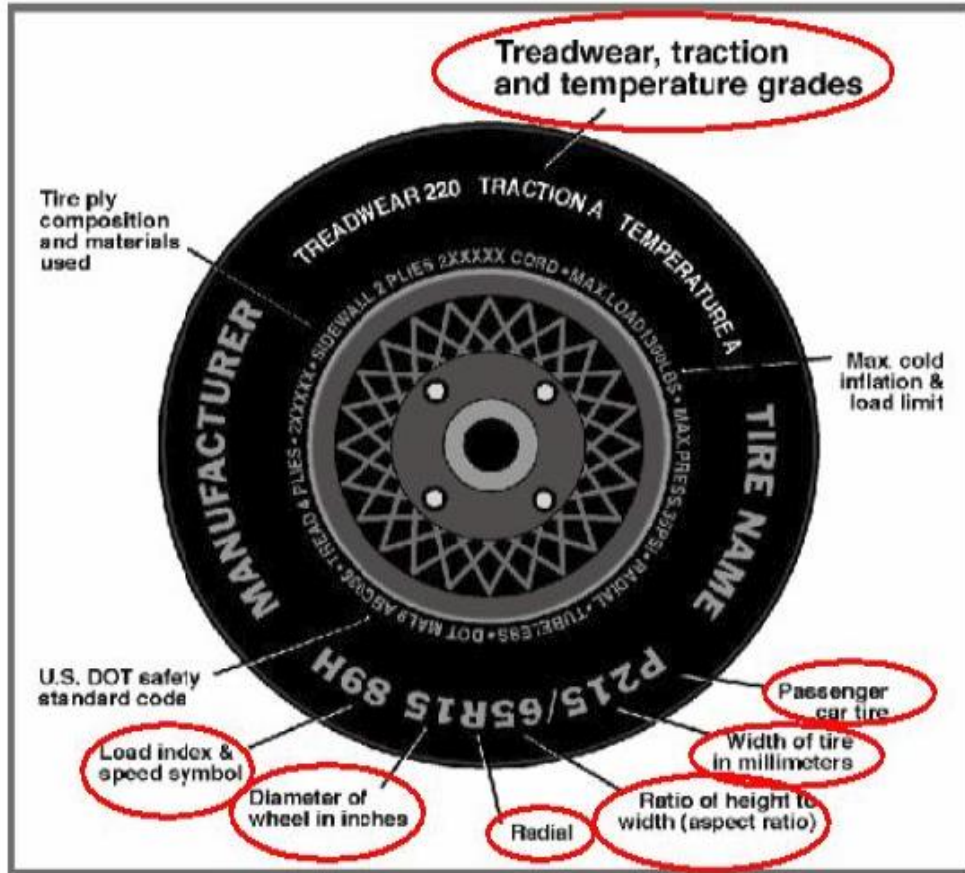
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	-	
Number of Occupants	2	3	-	5
Capacity Wt. (VCW) (kg)				408
Cargo Wt. (RCLW) (kg)				67.8

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

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

Collect items circled in red, tire manufacturer, and tire name.



Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	P225/65/R17	P225/65/R17
Tire Size on Vehicle	P225/65/R17	P225/65/R17
Tire Manufacturer	Kumho	Kumho
Tire Model	Solus KL21	Solus KL21
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index/Speed Symbol	102H	102H
Tire Material	Rubber	Rubber
DOT Safety Code Right	H2EJYAL93315	H2EJYAL93315
DOT Safety Code Left	H2EJYAL93315	H2EJYAL93315

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

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	489	329		547	401	
Right	kg	441	358		469	471	
Ratio	%	58	42		53.8	46.2	
Totals	kg	930	687	1617	1016	872	1888

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1617
Weight of 1 THOR & 2 HIII 5 th Females	kg	211
Rated Cargo/Luggage Weight (RCLW)	kg	67.8
Calculated Vehicle Target Weight (TVTW)	kg	1895.8

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	845	845	857	863	1150
As Tested	mm	839	839	828	826	1250
Post Test	mm	932	877	853	788	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2707
Total Vehicle Length at Left Side	mm	4530
Total Vehicle Length at Centerline	mm	4640
Total Vehicle Length at Right Side	mm	4528
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	66
Amount of Stoddard Solvent in Fuel Tank	L	18.3

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Rear bumper, bumper skin, rear door windows, side mirrors, trunk carpeting, spare tire
 Jack, tail light, door motors.

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

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Units	Pre-Test
1	Total Length	mm	4640
2	Total Width	mm	1821
3*	Bumper Top Height	mm	616
4*	Bumper Bottom Height	mm	721
5*	Longitudinal Member Top Height	mm	714
6	Distance Between Longitudinal Members	mm	1029
7	Longitudinal Member Width	mm	52
8*	Engine Top Height	mm	943
9*	Engine Bottom Height	mm	330
10	Engine and Gearbox Width	mm	489
11	Front Bumper-Engine Distance	mm	639
12*	Front Shock Absorber Fixing Height	mm	1035
13*	Bonnet Leading Edge Height	mm	993
14	Front Shock Absorber Fixing Width	mm	1195
15	Front Bumper – Front Axle Distance	mm	933
16	Front Axle – A Pillar Distance	mm	495
17	A-Pillar – B-Pillar Distance	mm	1123
18	B-Pillar – Rear Axle Distance	mm	1088
19	B-Pillar – C-Pillar Distance	mm	1005
20*	Roof Sill Bottom Height	mm	1587
21*	Roof Sill Top Height	mm	1647
22*	Floor Sill Bottom Height	mm	432
23*	Floor Sill Top Height	mm	504

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

DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

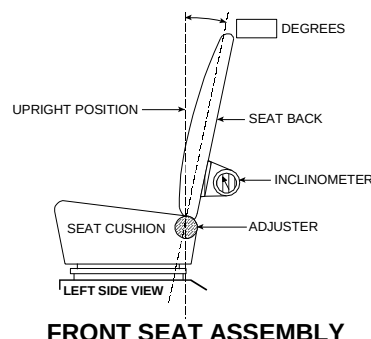
NHTSA No.: M20165212
 Test Date: 1/25/2016

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 and THOR Seating Procedure.

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



	Deg.
Driver Seat Back Angle	6.2*
Passenger Seat Back Angle	1.5
Rear Passenger Seat Back Angle	2.1

*Driver seatback was reclined 2 degrees from manufacturers to achieve head level per THOR positioning.

SEAT FORE/AFT POSITIONS

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

The driver's seat was positioned at its lowest position at mid angle and at two detents rear of Midpoint per THOR seating procedure. The passenger's seat was positioned at the mid-point of fore/aft travel.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	25 (0-24)	14*
Passenger Seat	25 (0-24)	12
Rear Passenger Seat	14	14

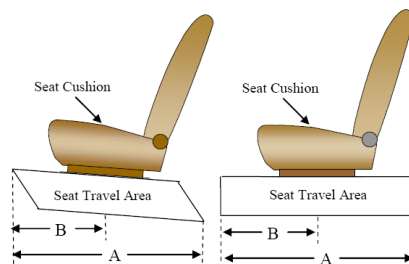
*Driver seat was positioned 2 detents rear of mid for THOR positioning.

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
Rear Passenger Seat	FIXED	FIXED



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

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

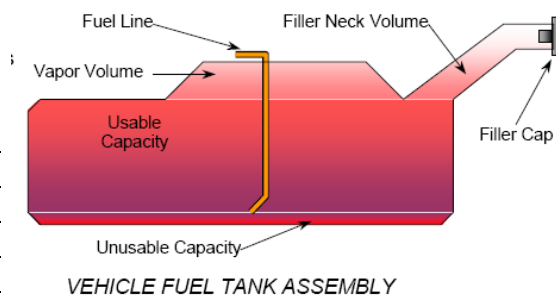
FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	55
Usable Capacity of "Optional Tank"	
93% of Usable Capacity	51.2
Actual Amount of Solvent Used	18.3
1/3 of Usable Capacity	18.3

FUEL PUMP

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

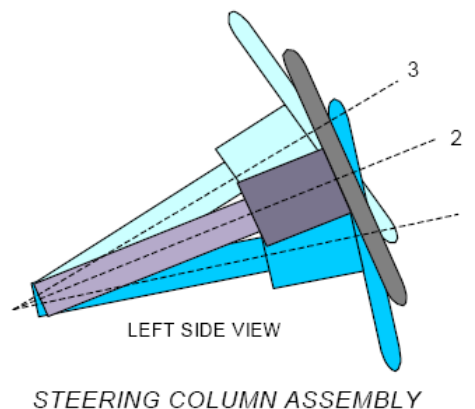
Fuel evacuated according to the specifications provided by the manufacturer in Form 1. Electric fuel pump operates when the ignition is in the 'on' position and the engine is running. The fuel filler neck is located above the right rear wheel.



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 (if applicable)



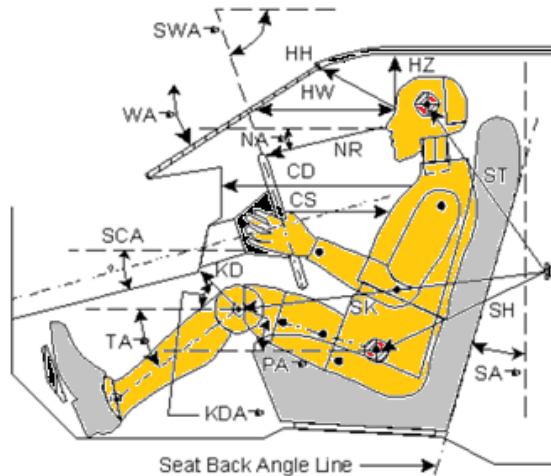
STEERING COLUMN POSITIONS

	Tilt (degrees)	Fore/Aft Position (mm)
Lowermost position No. 1	23.9	
Geometric center position No. 2	26.05	
Uppermost position No. 3	28.2	
Telescoping Steering Wheel Travel		50
Test Position	26.1	25

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

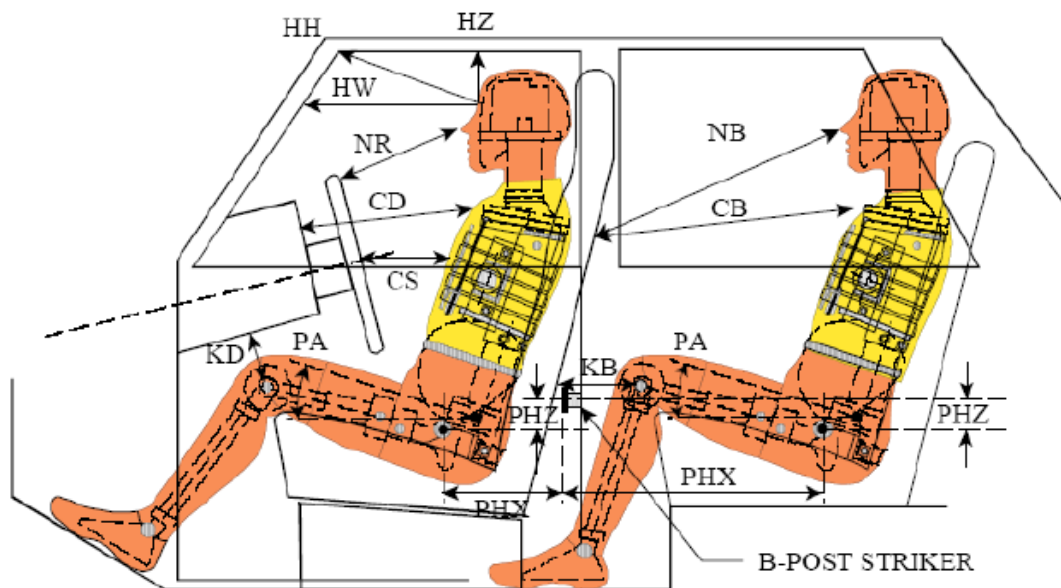


Code	Measurement Description	Driver (Serial # THOR DL9207)		Front Passenger (Serial # 324)	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		28.0		
SWA°	Steering Wheel Angle		26.1		
SCA°	Steering Column Angle		63.9		
SA°	Seat Back Angle (on headrest post)		6.2		1.5
HZ	Head to Roof (Z)	224	90	284	90
HH	Head to Header	437	16.3	398	36.7
HW	Head to Windshield	727	0	808	0
NR	Nose to Rim	534	20.2	580	29.2
CD	Chest to Dash	608		524	
CS	Chest to Steering Hub	384	7.2		
RA	Rim to Abdomen	165	0		
KDL	Left Knee to Dash	98	40	190	37.3
KDR	Right Knee to Dash	50	34.6	190	36.7
PA°	Pelvic Angle		34.5		19.9
TA°	Tibia Angle		53.4		47.9
SK	Striker to Knee	676	3.6	619	-3.6
ST	Striker to Head	578	-86.4	501	-74.9
SH	Striker to H-Point	284	-12.8	297	-16.4
HAX°	Head Angle (X)		0.3		
HAY°	Head Angle (Y)		-5.2		
TAX°	T6 Angle (X)		0.2		
TAY°	T6 Angle (Y)		24.7		
TAX°	T1 (X)		0.2		
TAY°	T1 (Y)		3.0		
TAX°	T12 (X)		0.2		
TAY°	T12 (Y)		33.7		
PAX°	Pelvis (X)		-0.1		
PAY°	Pelvis (Y)		34.5		

DATA SHEET NO. 3 (CONTINUED)
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

Code	Measurement Description	Rear Passenger (Serial # 019)	
		Length (mm)	Angle (°)
SA°	Seat Back Angle (on headrest post)		2.1
HZ	Head to Roof (Z)	296	
NB	Nose to Seatback	683	
CB	Chest to Seatback	653	
KDL	Left Knee to Seatback	343	14.2
KDR	Right Knee to Seatback	345	13.8
PAX°	Pelvic Tilt Angle (X-axis)		19.9
PAY°	Pelvic Tilt Angle (Y-axis)		0.4
PHX	Hip Point to Striker (X-Axis)	270	
PHZ	Hip Point to Striker (Z-Axis)	189	
HB	Head to Seatback	705	0

DATA SHEET NO.3 (CONTINUED) **DUMMY CMM MEASUREMENTS**

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

MEASUREMENT LOCATIONS

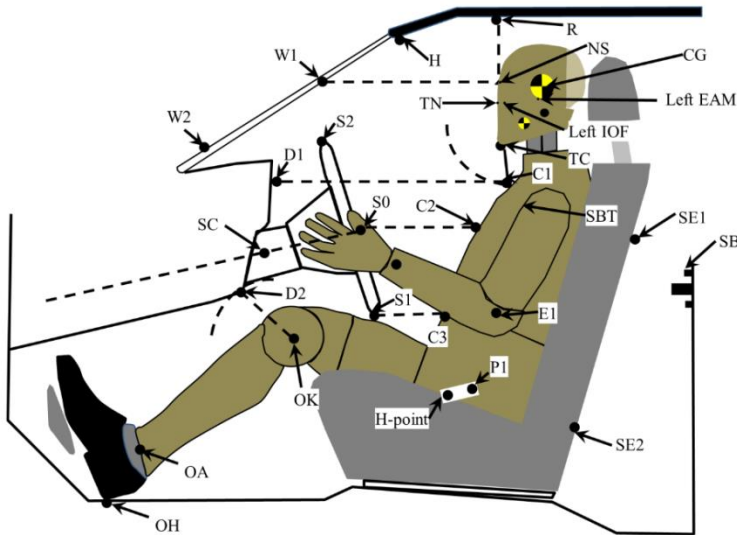


DIAGRAM #1

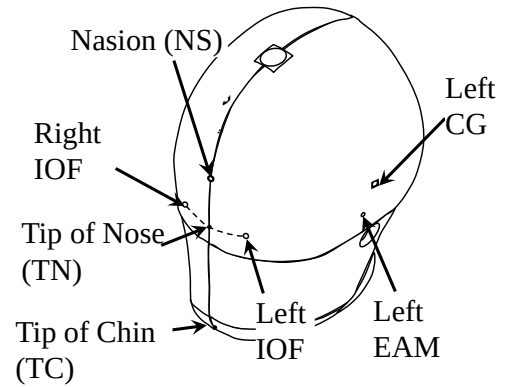


DIAGRAM #2

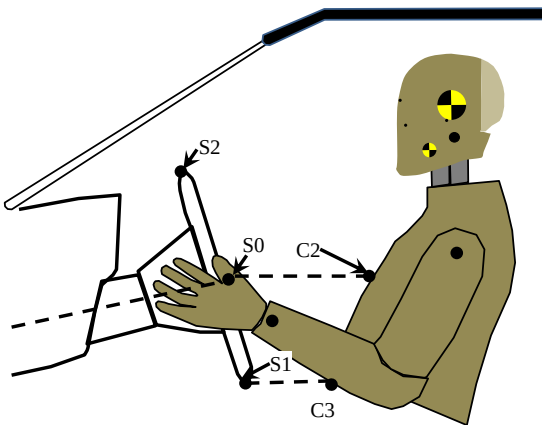


DIAGRAM #3

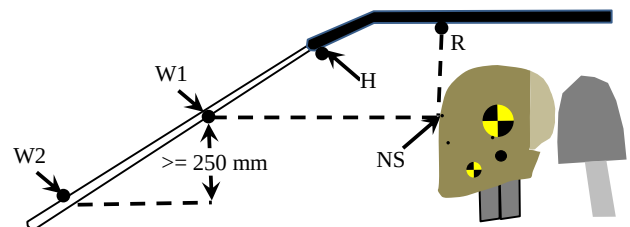


DIAGRAM #4

DATA SHEET NO.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

DRIVER MEASUREMENT PONITS

Description	Units	Driver		
		X	Y	Z
Tip of Striker	mm	2183	-791	-176
Top of Head Restraint	mm	2095	-367	-846
Outboard Head Restraint Post	mm	2033	-451	-580
Head CG	mm	2219	-443	-753
Nasion	mm	2315	-366	-753
Tip of Nose	mm	2312	-366	-717
Tip of Chin	mm	2301	-366	-618
LEAM	mm	2224	-438	-724
LIOF	mm	2308	-399	-717
RIOF	mm	2309	-334	-715
Outboard Elbow	mm	2462	-599	-326
H-Point	mm	2460	-701	-113
Center of H-Point Tool	mm	2385	-625	-140
Left Knee	mm	2858	-585	-218
Right Knee	mm	2872	-283	-200
Left Ankle	mm	3107	-593	120
Right Heel	mm	3110	-578	255
Left Heel	mm	3153	-188	255
W1 – Upper Windshield	mm	3037	-367	-753
W2 – Lower Windshield	mm	3226	-367	-653
Header	mm	2724	-367	-897
Head to Roof	mm	2315	-367	-982
C1- Upper Chest	mm	2353	-366	-489
C2 – Mid Chest	mm	2389	-367	-432
C3 – Lower Chest	mm	2501	-368	-270
S2 – Top Steering Wheel Rim	mm	2820	-366	-582
S1 – Lower Steering Wheel Rim	mm	2666	-367	-270
SC – Steering Column	mm	2937	-466	-347
D1 – Dash Point	mm	3058	-366	-489
D2 – Knee Bolster	mm	2925	-585	-287
SE1 – Seatback Point	mm	1991	-367	-556
SE2 – Seatback Point	mm	2150	-368	-49
Left Front Outboard Seat Anchor Bolt	mm	2640	-574	188
Left Rear Outboard Seat Anchor Bolt	mm	2245	-572	220

Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

- +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.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

FRONT PASSENGER MEASUREMENT POINTS

Description	Units	Front Passenger		
		X	Y	Z
Tip of Striker	mm	2182	793	-173
Top of Head Restraint	mm	2188	360	-815
Outboard Head Restraint Post	mm	2101	444	-589
Head CG	mm	2313	426	-657
Bridge of Nose	mm	2405	360	-657
Tip of Nose	mm	2427	360	-628
Tip of Chin	mm	2415	361	-556
Outboard Shoulder Bolt	mm	2303	513	-415
Outboard Elbow	mm	2356	572	-199
H-Point	mm	2467	621	-89
Center of H-Point Tool	mm	2381	634	-123
Left Knee	mm	2797	309	-132
Right Knee	mm	2800	473	-134
Left Ankle	mm	3004	282	146
Right Ankle	mm	3001	443	155
Left Heel	mm	3001	279	247
Right Heel	mm	2999	429	251
W1 – Upper Windshield	mm	3215	361	-659
W2 – Lower Windshield	mm	3397	360	-559
Header	mm	2726	360	-893
Head up to Roof	mm	2406	360	-945
C1 - Upper Chest	mm	2416	361	-422
D1 - Dash Point	mm	2996	361	-422
D2 - Dash Bolster	mm	2961	473	-227
SE1 - Seat Back Point	mm	2059	366	-577
SE2 - Seat Back Point	mm	2173	366	-54
Right Front Outboard Seat Anchor Bolt	mm	2634	573	187
Right Rear Outboard Seat Anchor Bolt	mm	2241	571	219

Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

- +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.3 (CONTINUED)
DUMMY CMM MEASUREMENTS

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

Description	Units	Rear Passenger		
		X	Y	Z
Tip of Striker	mm	1181	773	-339
Top of Head Restraint	mm	1124	376	-836
Outboard Head Restraint Post	mm	1054	431	-657
Head CG	mm	1298	440	-712
Bridge of Nose	mm	1392	375	-719
Tip of Nose	mm	1414	375	-686
Tip of Chin	mm	1398	376	-610
Outboard Shoulder Bolt	mm	1287	521	-474
Outboard Elbow	mm	1386	595	-284
H-Point	mm	1451	558	-150
Center of H-Point Tool	mm	1364	581	-179
Left Knee	mm	1792	329	-176
Right Knee	mm	1790	489	-176
Left Ankle	mm	1941	314	141
Right Ankle	mm	1940	475	138
Left Heel	mm	1878	296	216
Right Heel	mm	1875	461	209
Head up to Roof	mm	1394	376	-1012
C1 - Upper Chest	mm	1403	375	-483
D1 - Dash Point	mm	2057	375	-484
D2 - Dash Bolster	mm	2120	490	-265
SE1 - Seat Back Point	mm	1013	373	-645
SE2 - Seat Back Point	mm	1196	374	-110

Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

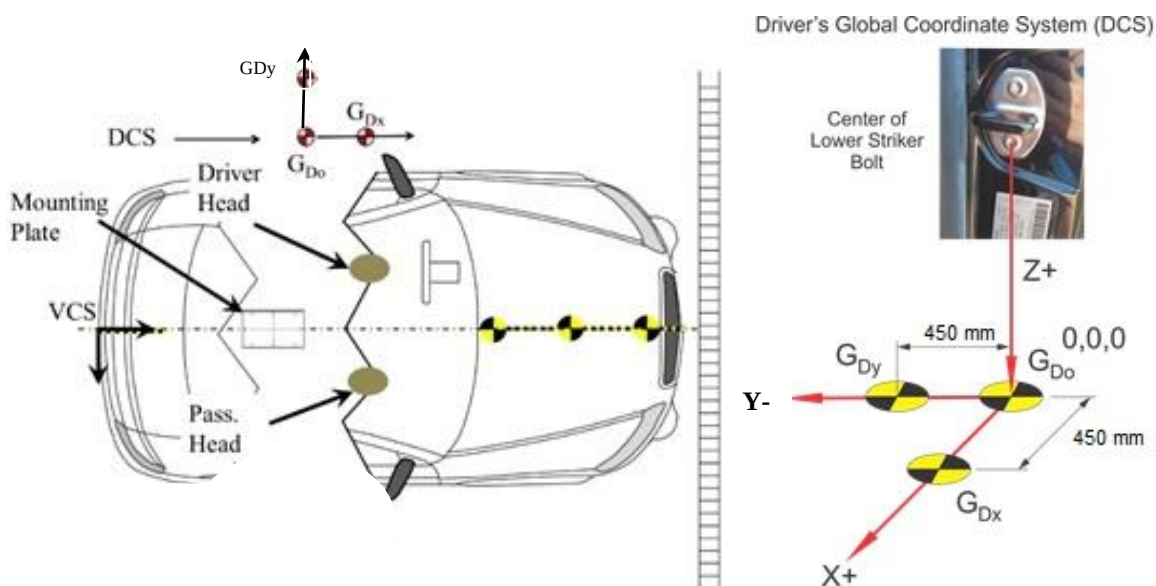
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO.3 (CONTINUED) DUMMY CMM MEASUREMENTS

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

DRIVER GLOBAL COORDINATE SYSTEM



Driver ATD Measurement Points

Measurement Points	Units	Measurements (mm)		
		X	Y	Z
Head CG	mm	82	353	-1361
Nasion	mm	177	431	-1360
Tip of Nose	mm	174	430	-1323
Tip of Chin	mm	161	430	-1224
LEAM	mm	86	358	-1332
LIOF	mm	170	397	-1323
RIOF	mm	171	462	-1321

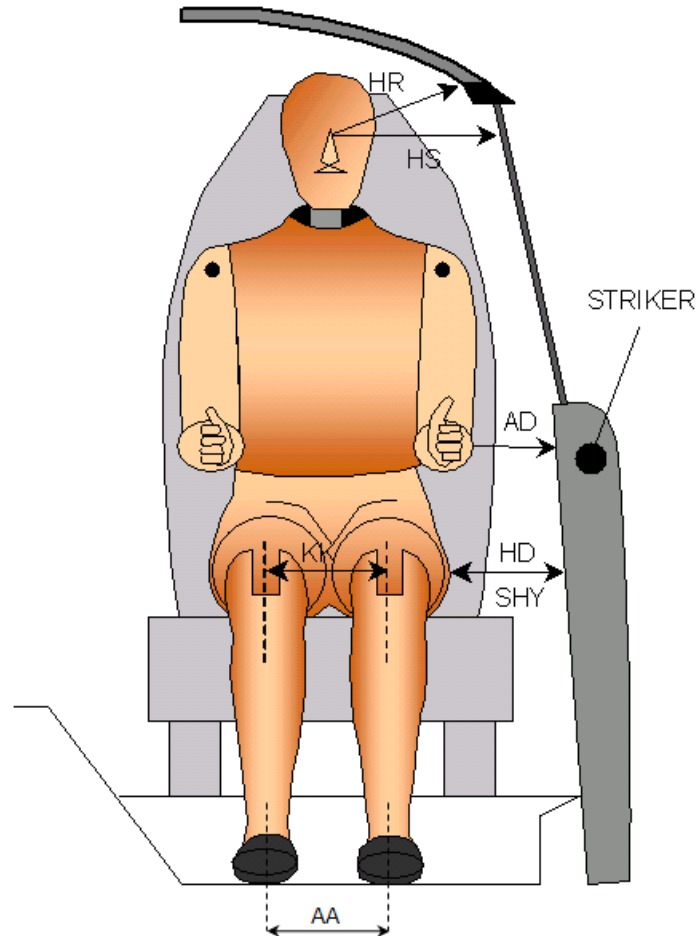
Reference point:

- +X – From GD_0 to the front of the vehicle
- +Y – From GD_0 to the right side of the vehicle
- +Z – From GD_0 into the ground

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

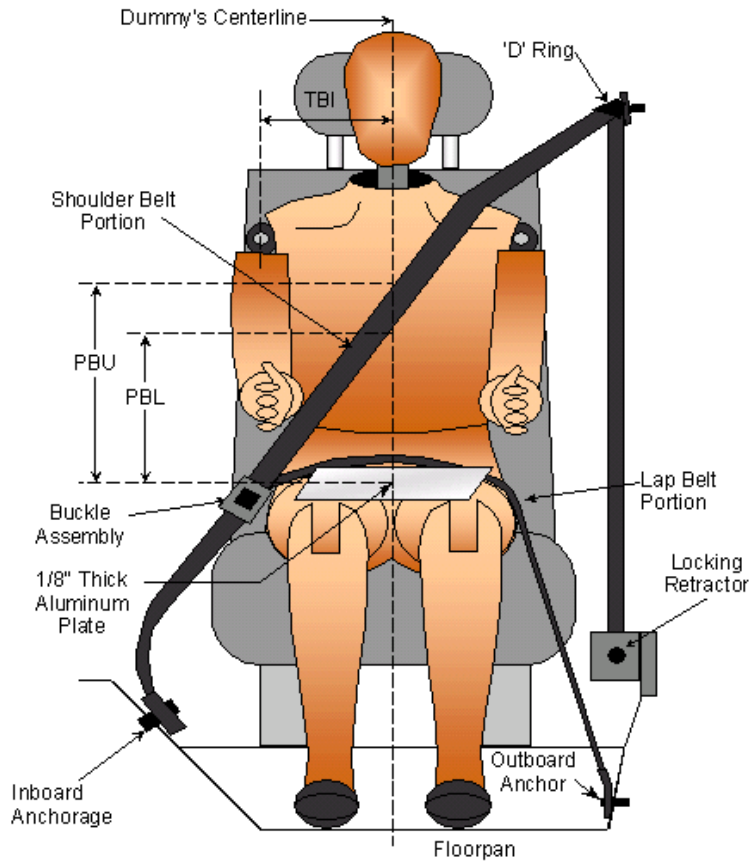


Code	Description	Units	Driver	Front Passenger	Rear Passenger
AD	Arm to Door	mm	126	93	56
HD	H-Point to Door	mm	129	184	141
HR	Head to Side Header	mm	221	288	214
HS	Head to Side Window	mm	335	380	325
KK	Knee to Knee	mm	365	168	165
SHY	Striker to H-Point (Y Direction)	mm	220	270	250
AA	Ankle to Ankle	mm	358	168	160

DATA SHEET NO. 5 **SEAT BELT POSITIONING DATA**

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger	Rear Pass.
PBU — Top surface of reference to belt upper edge	mm	380	315	320
PBL — Top surface of reference to belt lower edge	mm	305	240	240

BELT LENGTH DATA

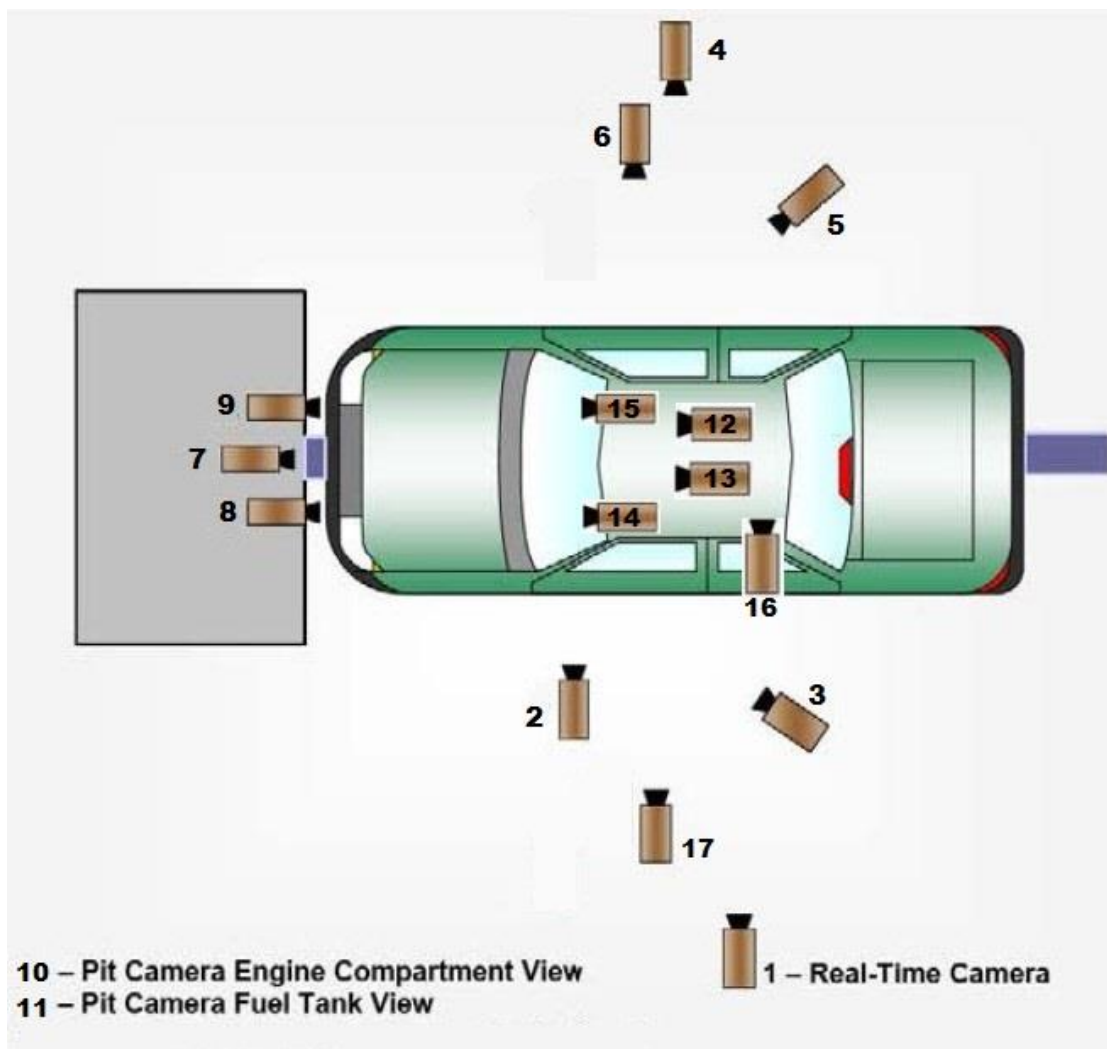
Measurement Description	Units	Driver	Passenger	Rear Pass.
Shoulder belt length as measured on ATD	mm	885	875	795
Lap Belt Length as measured on ATD	mm	810	712	620
Remainder of belt on reel	mm	705	913	1185
Total belt length for continuous webbing systems	mm	2400	2500	2600

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

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

HORIZONTAL LOCATION



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

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Side	--	--	--	Zoom	30
2	Left Front Half	-1138	-9456	-1608	35	1000
3	Left Angle	-2451	-2908	-2200	24	1000
4	Right Overall	-2281	10473	-1300	24	1000
5	Right Angle	-2608	3009	-2123	24	1000
6	Right Front Half	-1239	6571	-1190	28	1000
7	Windshield	130	0	-3505	20	1000
8	Driver Windshield	-323	-600	-2051	12.5	1000
9	Passenger Windshield	-323	600	-2051	12.5	1000
10	Pit Front	-728	0	2102	13	1000
11	Pit Rear	-2802	0	2102	13	1000
12	Onboard Driver Airbag	-2763	75	-1471	12.5	1000
13	Onboard Passenger Airbag	-2763	-75	-1471	12.5	1000
14	Onboard Driver Toepan	-1691	-356	-347	6.5	1000
15	Onboard Front Passenger Toepan	-1770	361	-358	6.5	1000
16	Onboard Rear Passenger Side View	2875	-487	-1047	8	1000
17	Left Overall	-2197	-9149	-1604	28	1000

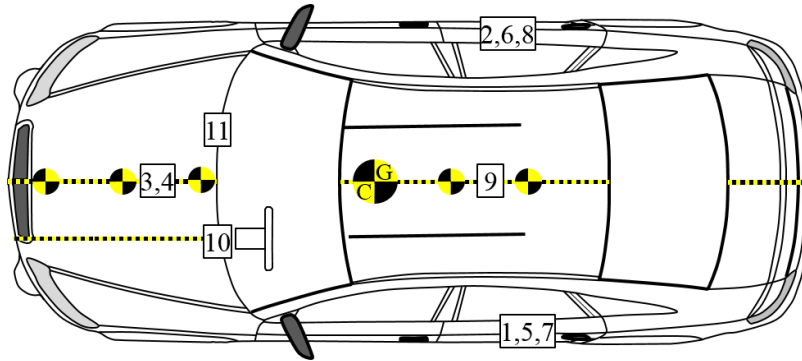
Reference Point:

- +X – Forward of impact plane
- +Y – Right of monorail center
- +Z – into ground

DATA SHEET NO. 7
VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016



VEHICLE INSTRUMENTATION PRE-TEST LOCATIONS

No.	Instrumentation Location	Axes	Units	Measurements (mm)		
				X	Y	Z
1	Left Rear Seat Cross Member	X,Z	mm	1812	-405	130
2	Right Rear Seat Cross Member	X,Z	mm	1811	399	134
3	Top of Engine	X	mm	3827	197	-274
4	Bottom of Engine	X	mm	0	0	0
5	Left Sill	X,Y	mm	1890	-707	181
6	Right Sill	X,Y	mm	1893	706	180
7	Left Rear Seat Cross Member Redundant	X,Z	mm	1804	-439	135
8	Right Rear Seat Cross Member Redundant	X,Z	mm	1811	413	134
9	Linear Acceleration & Angular Rate Sensor	X	mm	1905	0	166
		Y	mm	1893	11	165
		Z	mm	1893	0	164
10	Driver Toe Pan	X,Y,Z	mm	3476	-404	32
11	Front Passenger Toe Pan	X,Y,Z	mm	3466	368	-2

Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

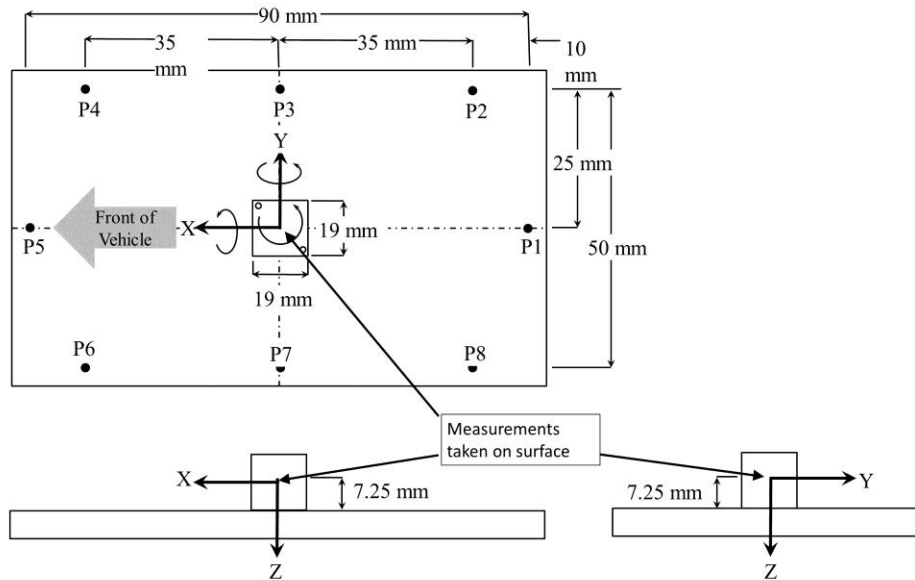
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 7 (CONTINUED) VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

ANGULAR RATE SENSOR



VEHICLE COORDINATE SYSTEM					
No.	Accelerometer Location	Units	Measurements (mm)		
			X	Y	Z
ACC-1	Accelerometer CG – X Direction	mm	1905	0	166
ACC-2	Accelerometer CG – Y Direction	mm	1893	11	165
ACC-3	Accelerometer CG – Z Direction	mm	1893	0	164
M1	Mounting Bolt 1	mm	1886	-7	164
M2	Mounting Bolt 2	mm	1901	8	164
P1	Plate Point 1	mm	1886	-7	164
P2	Plate Point 2	mm	1858	25	179
P3	Plate Point 3	mm	1893	25	179
P4	Plate Point 4	mm	1928	26	179
P5	Plate Point 5	mm	1939	1	179
P6	Plate Point 6	mm	1929	-24	179
P7	Plate Point 7		1894	-25	179
P8	Plate Point 8		1859	-25	179

Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

- +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

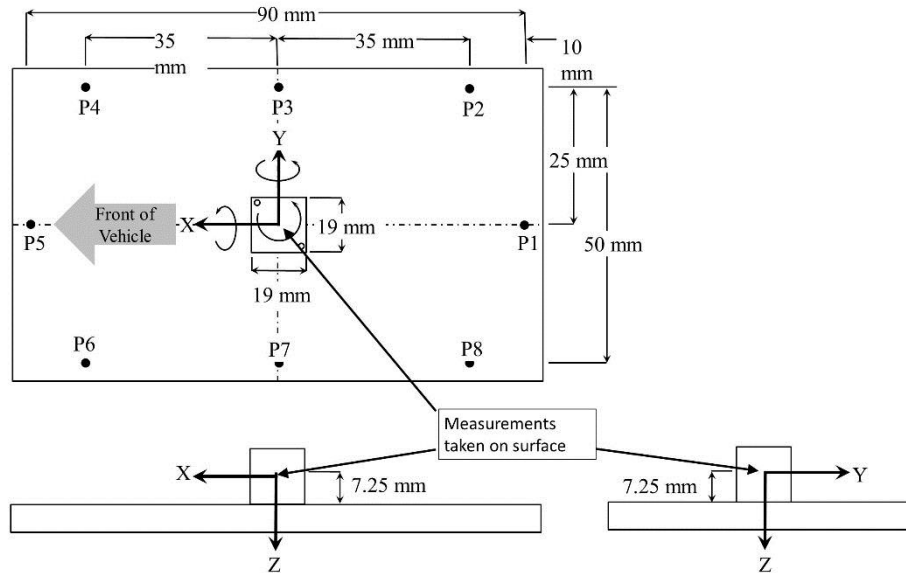
DATA SHEET NO. 7 (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

ANGULAR RATE SENSOR



DRIVER GLOBAL COORDINATE SYSTEM					
No.	Accelerometer Location	Units	Measurements (mm)		
			X	Y	Z
ACC-1	Accelerometer CG – X Direction	mm	-247	794	-445
ACC-2	Accelerometer CG – Y Direction	mm	-259	805	-446
ACC-3	Accelerometer CG – Z Direction	mm	-258	794	-447
M1	Mounting Bolt 1	mm	-265	786	-448
M2	Mounting Bolt 2	mm	-250	802	-447
P1	Plate Point 1	mm	-303	794	-433
P2	Plate Point 2	mm	-293	819	-433
P3	Plate Point 3	mm	-258	819	-432
P4	Plate Point 4	mm	-223	819	-432
P5	Plate Point 5	mm	-213	794	-432
P6	Plate Point 6	mm	-223	769	-432
P7	Plate Point 7	mm	-258	769	-433
P8	Plate Point 8	mm	-293	769	-433

Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

- +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

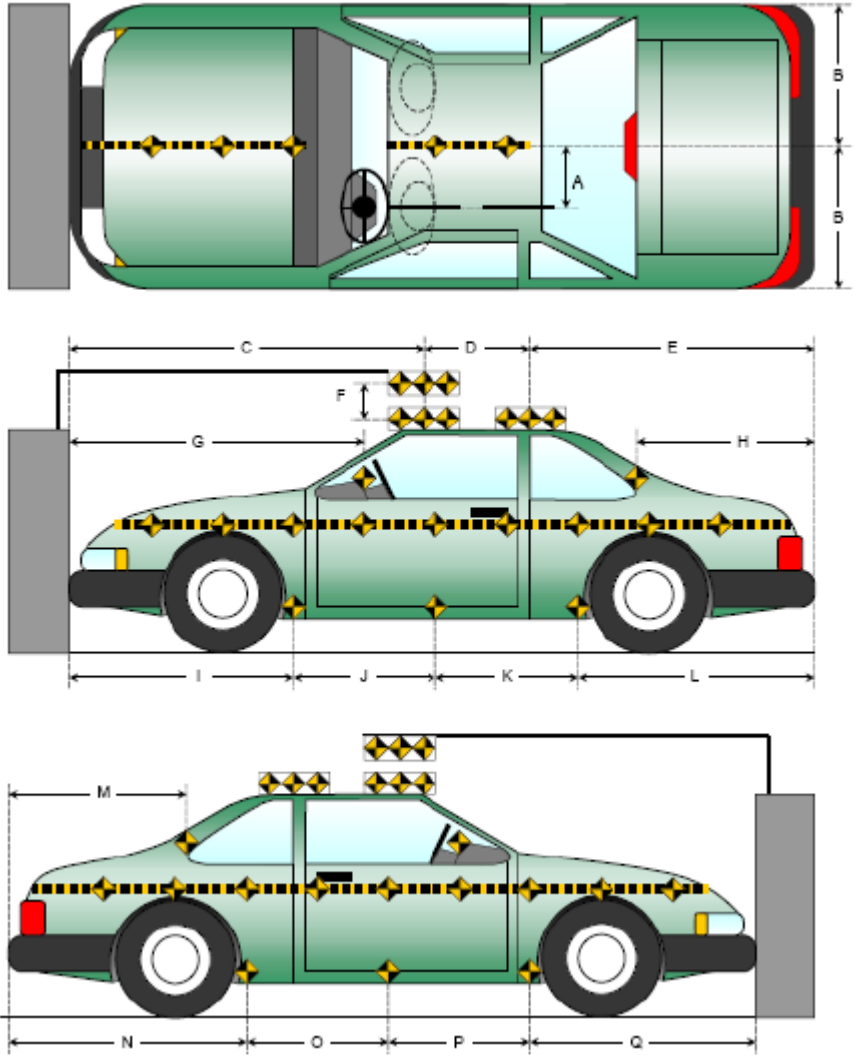
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2015 Chevrolet Malibu
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: R20155144
 Test Date: 8/11/2015

Item	Value
A	364
B	910
C	2677
D	607
E	1344
F	144
G	1728
H	1071
I	1411
J	878
K	879
L	1461
M	1067
N	1458
O	887
P	877
Q	1406

All units in millimeters



DATA SHEET NO. 9
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	108
Passenger Dummy Accelerometers	74
Rear Passenger Dummy Accelerometers	46
Vehicle Structure Accelerometers	40
Total	268

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	5
High-Speed Off-board	11
Real-Time Panning	1
Total	17

DATA SHEET NO. 10
POST TEST OBSERVATIONS

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Right Front Passenger	Rear Passenger
Dummy Type/Serial No.	DL9207	324	019
Lower Leg Type	LX		
Lower Leg Serial No.	LX0045/LX0046		
Head Contact	Front & Curtain Airbag & Headrest	Front Airbag & Headrest	Headrest
Upper Torso Contact	Front Airbag	Front Airbag	None
Lower Torso Contact	None	None	None
Left Knee Contact	Knee Bolster	None	None
Right Knee Contact	Knee Bolster	None	None

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Right Front Passenger	Rear Passenger
Locked/Unlocked Doors			
Front Door Opening	Opened but not functional	Opened but not functional	Closed & Operational
Rear Door Opening	Closed & Operational	Closed & Operational	Closed & Operational
Seat Track Shift (mm)	0	0	0
Seat Back Failure	No	No	No
Glazing Damage	None	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar Buckled
Windshield Damage	Cracks throughout with separation along drivers side
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	2187
Center	mm	2201
Right Side	mm	2172
Average	mm	2187

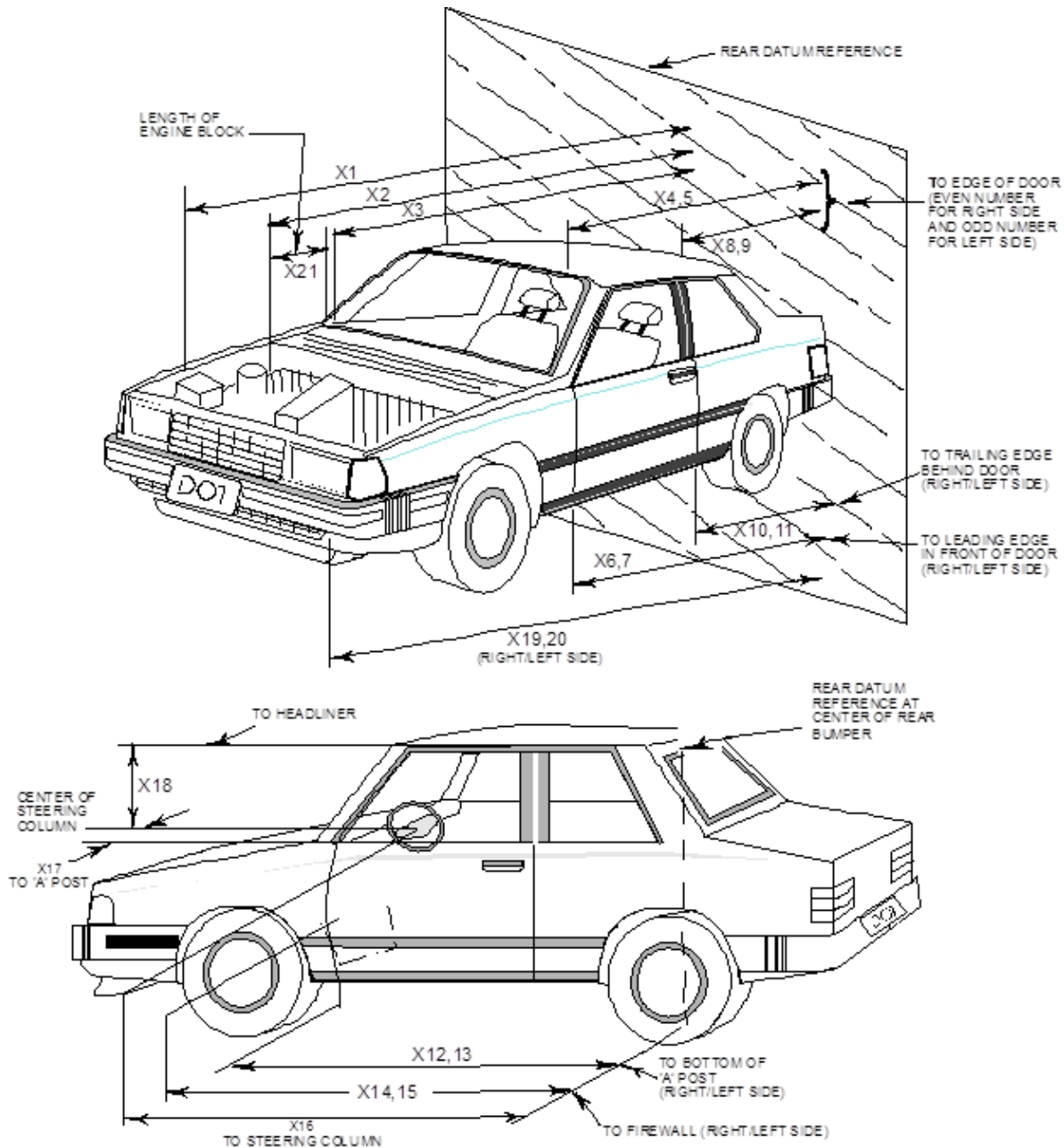
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Right Front Passenger (Occupant 2)		Rear Passenger (Occupant 3)	
	Installed	Deployed	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes	No	N/A
Curtain Airbag	Yes	Yes	Yes	Yes	Yes	Yes
Torso Airbag	Yes	Yes	Yes	Yes	No	N/A
Knee Airbag	No	N/A	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	Yes	Yes	No	N/A
Other						

DATA SHEET NO. 11 **VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016



DATA SHEET NO. 11 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	mm	4640	4257	-383
2	Rear Surface of Vehicle (RSOV) to Front of Engine	mm	4000	3795	-205
3	RSOV to Firewall	mm	3656	3857	201
4	RSOV to Upper Leading Edge of Right Door	mm	3212	3195	-17
5	RSOV to Upper Leading Edge of Left Door	mm	3212	3202	-10
6	RSOV to Lower Leading Edge of Right Door	mm	3197	3197	-1
7	RSOV to Lower Leading Edge of Left Door	mm	3196	3201	5
8	RSOV to Upper Trailing Edge of Right Door	mm	2091	2072	-19
9	RSOV to Upper Trailing Edge of Left Door	mm	2091	2081	-10
10	RSOV to Lower Trailing Edge of Right Door	mm	2113	2112	-1
11	RSOV to Lower Trailing Edge of Left Door	mm	2112	2118	6
12	RSOV to Bottom of "A" Post of Right Side	mm	3236	3235	0
13	RSOV to Bottom of "A" Post of Left Side	mm	3238	3241	3
14	RSOV to Firewall, Right Side	mm	3600	3435	-166
15	RSOV to Firewall, Left Side	mm	3601	3551	-50
16	RSOV to Steering Column	mm	2744	2784	40
17	Center of Steering Column to "A" Post	mm	269	261	-8
18	Center of Steering Column to Headliner	mm	447	429	-18
19	RSOV to Right Side of Front Bumper	mm	4575	4222	-353
20	RSOV to Left Side of Front Bumper	mm	4578	4228	-350
21	Length of Engine Block	mm	225	225	0
RD	RSOV to Right Side of Dash Panel	mm	2908	2896	-13
CD	RSOV to Center of Dash Panel	mm	2972	2962	-10
LD	RSOV to Left Side of Dash Panel	mm	2908	2906	-2

UR* = Unrecoverable Data Point

DATA SHEET NO. 12
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

VEHICLE INFORMATION

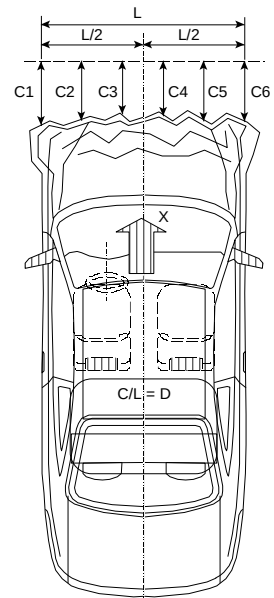
VIN: KNMAT2MV5GP593787 Wheelbase (mm): 2707
 Vehicle Size Category: Passenger Test Weight (kg): 1888

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): 56.39
 Velocity Change (kph): 56.39

CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
 Midpoint of Damage: C4
 Damage Region Length (mm): 1390
 Impact Mode: Frontal Barrier



Crush Measurements: Bumper Cover

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4458	4177	281
C2	Crush zone 2 at left side	mm	4589	4235	354
C3	Crush zone 3 at left side	mm	4624	4256	368
C4	Crush zone 4 at right side	mm	4624	4225	399
C5	Crush zone 5 at right side	mm	4587	4202	385
C6	Crush zone 6 at right side	mm	4456	4203	253
L	C1 to C6	mm	1390	1447	-57
	Logitudinal horizontal distance from the tip of the front bumper to the base of the windshield	mm	1,070	741	329

Reference point: Origin at rear centerline of vehicle. Vertical coordinate point for origin determined with contact of vehicle structure by 10 mm deep block moved downward along front edge of a level. The level is positioned perpendicular to ground and in contact with rear centerline of vehicle.

- +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
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

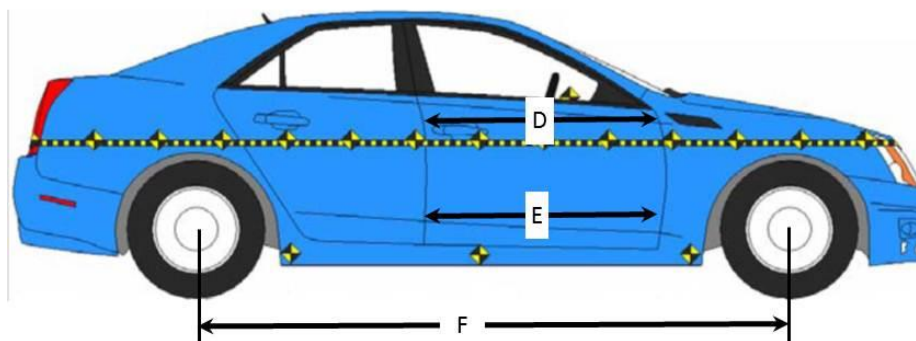
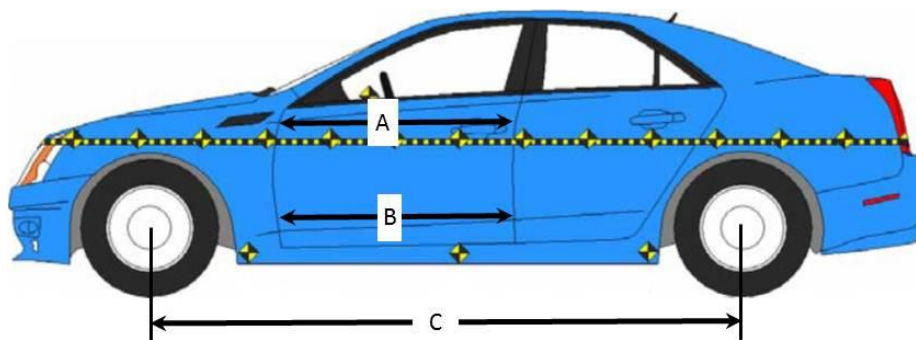
NHTSA No.: M20165212
 Test Date: 1/25/2016

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1013	1004	-9
B	Left Side Lower	mm	931	926	-5
D	Right Side Upper	mm	1014	999	-15
E	Right Side Lower	mm	927	919	-8

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2707	2643	-64
F	Right Side Wheelbase	mm	2707	2666	-41



DATA SHEET NO.13 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

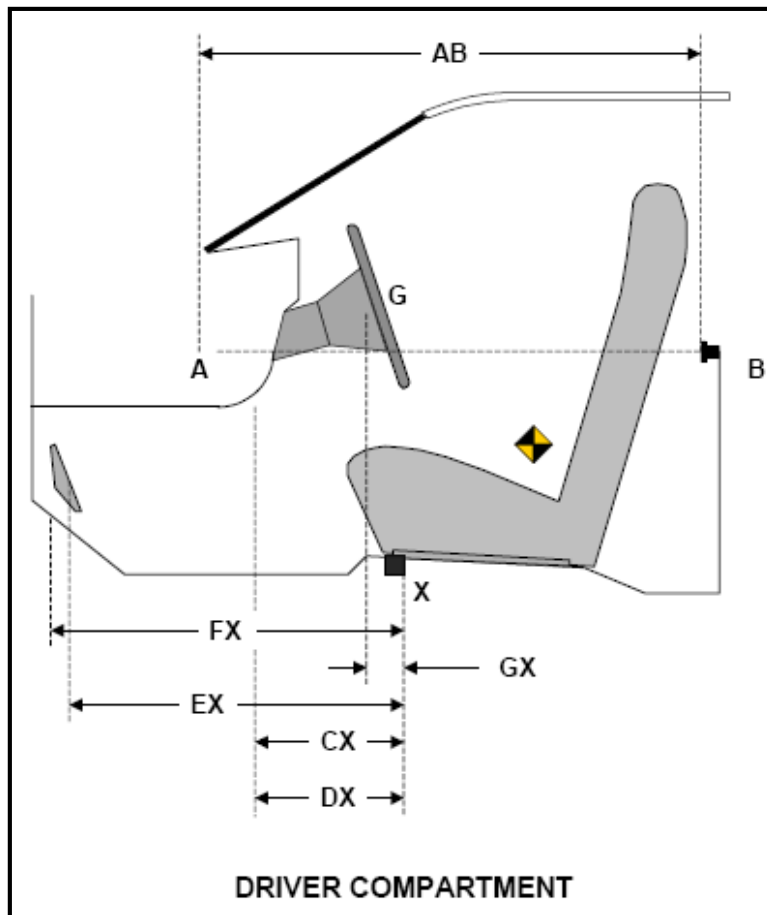
Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	809	808	-1
CX	Left Knee Bolster to X	mm	314	311	-3
DX	Right Knee Bolster to X	mm	309	300	-9
EX	Brake Pedal to X	mm	585	584	-1
FX	Foot Rest to X	mm	649	646	-3
GX	Center of Steering Column Wheel Hub to X	mm	93	131	38

X = Front of Seat Track (Stationary)



DATA SHEET NO. 14
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016

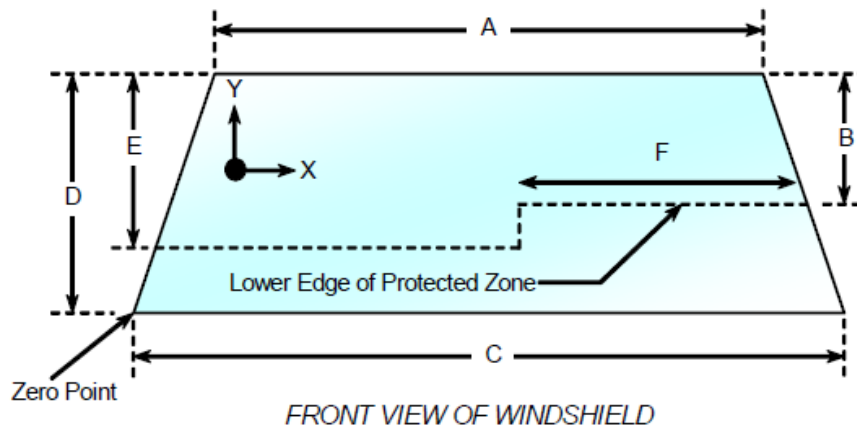
Please provide windshield mounting details. A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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	2189.5	1504.5	68.7
Right Side	2189.5	2099.5	95.5
Total	4379	3514	80.2



Item	Units	Value
A	mm	1215
B	mm	543
C	mm	1414
D	mm	875
E	mm	550
F	mm	429

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

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Ambient Temperature at Test Vehicle Time of Impact: 21° C

Test Time: 12:11 PM

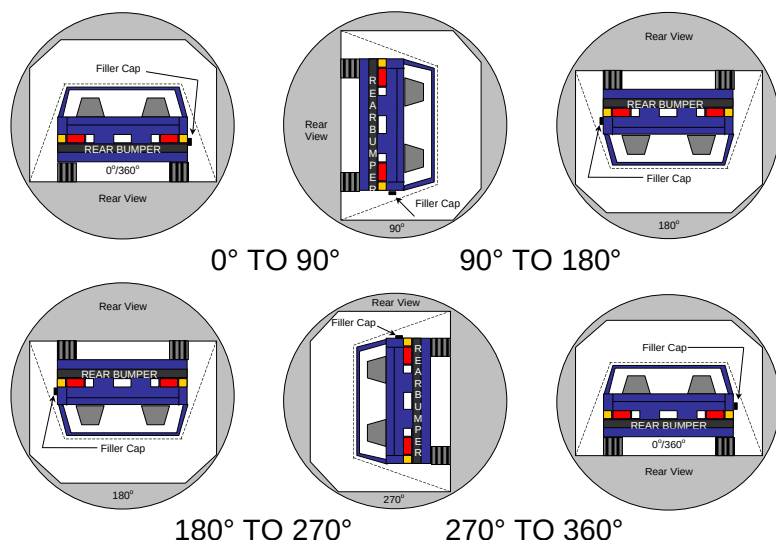
Stoddard Solvent Spillage Measurements

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

DATA SHEET NO. 15 **FMVSS 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2016 Nissan Rogue SUV
 Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
 Test Date: 1/25/2016



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°	72	300	372
90° to 180°	65	300	365
180° to 270°	61	300	361
270° to 360°	69	300	369

FMVSS 301 SPILLAGE TABLE

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

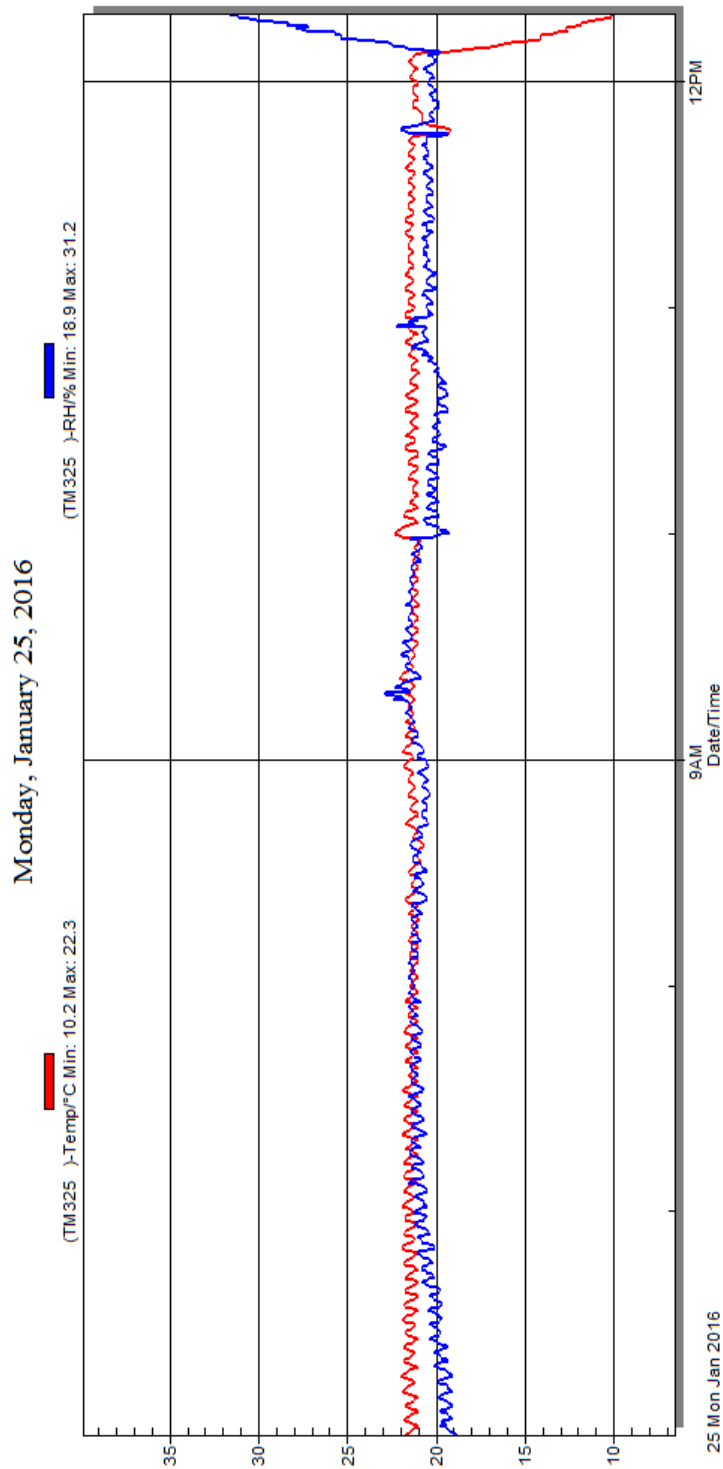
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 16
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2016 Nissan Rogue SUV
Test Program: 56.3 KPH Research Frontal Rigid Barrier Test

NHTSA No.: M20165212
Test Date: 1/25/2016



Temperature Stabilization Chart/Data

APPENDIX A
PHOTOGRAPHS

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Photo Not Applicable

Figure A-1: Load Cell Location

Photo Not Applicable

Figure A-2: Rigid Barrier Frontal Wall



Figure A-3: Manufacturer's Label

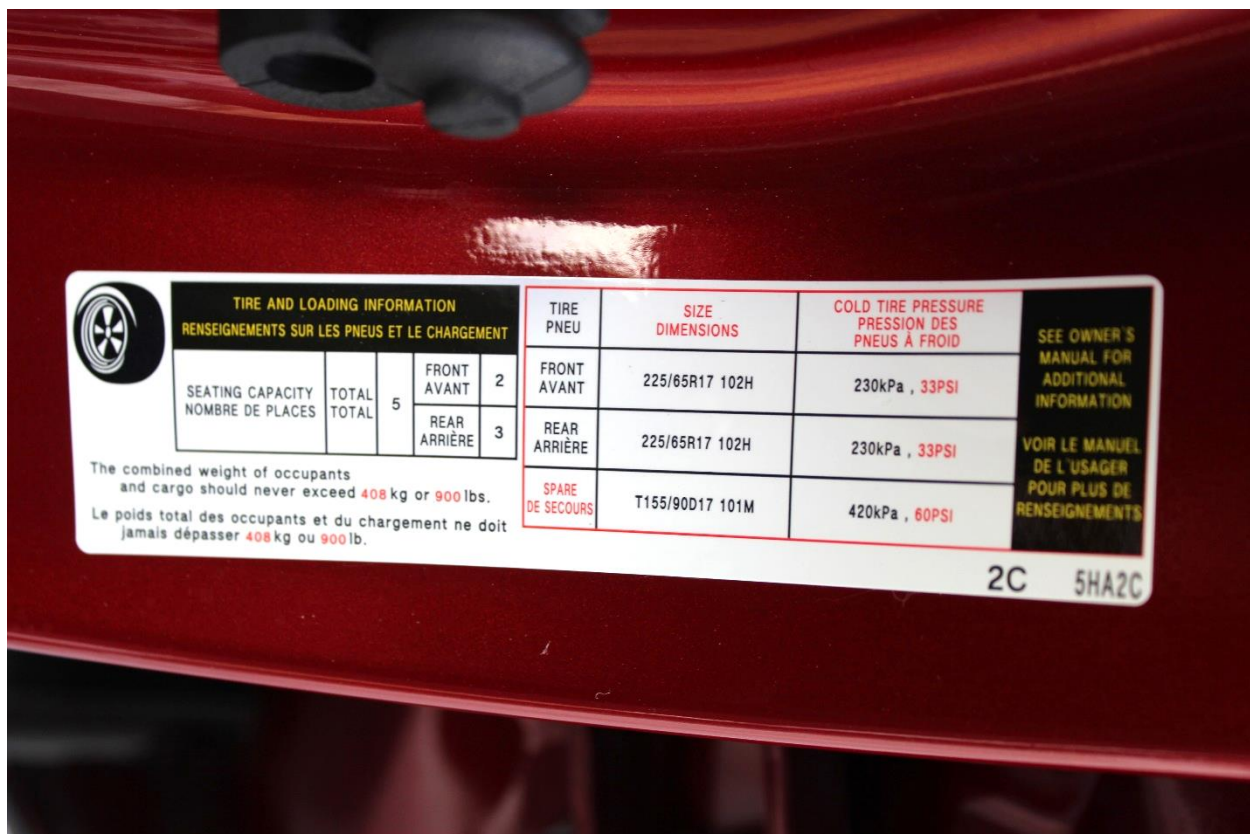


Figure A-4: Tire Placard



Figure A-5: 2016 Nissan Rogue Frontal As Delivered



Figure A-6: Left Rear 3/4 View, As Received



Figure A-7: Pre-Test Front View of Test Vehicle

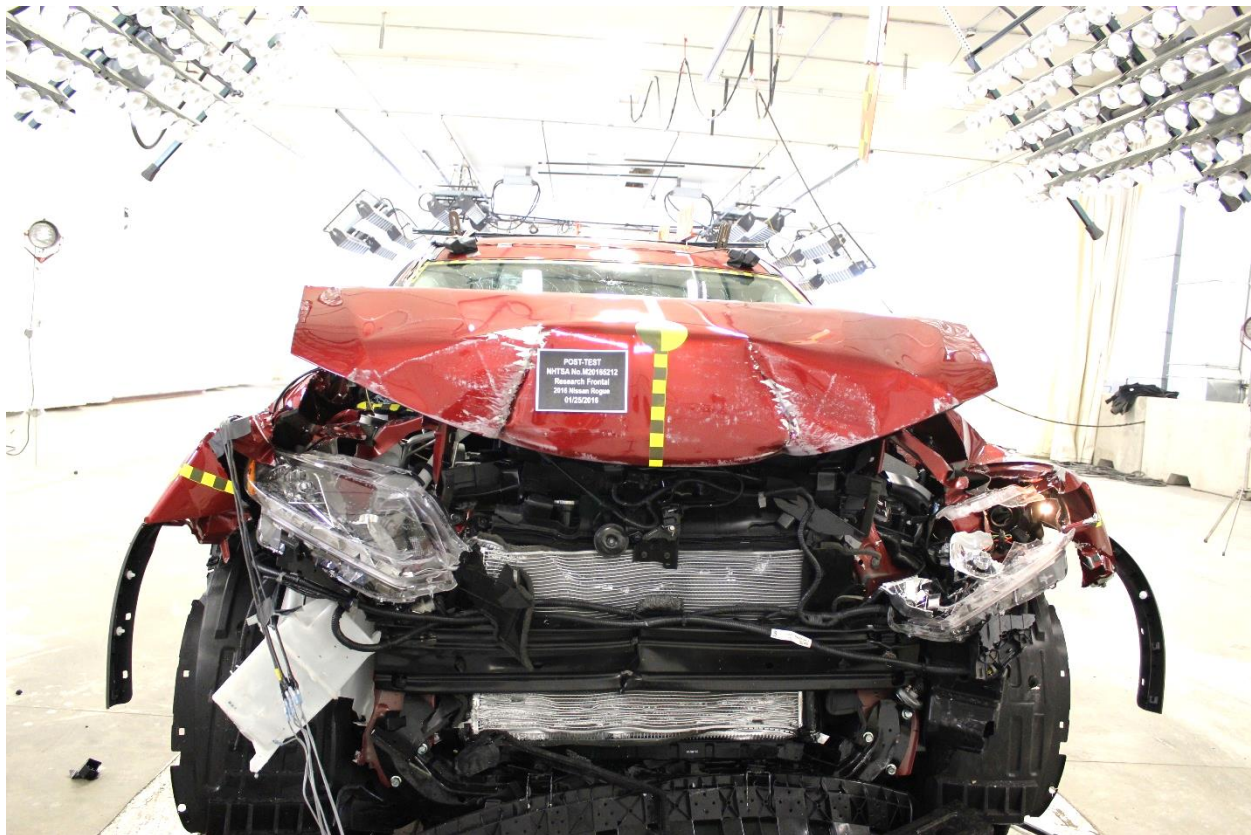


Figure A-8: Post-Test Front View of Test Vehicle



Figure A-9: Pre-Test Left View of Test Vehicle



Figure A-10: Post-Test Left View of Test Vehicle



Figure A-11: Pre-Test Right View of Test Vehicle



Figure A-12: Post-Test Right View of Test Vehicle

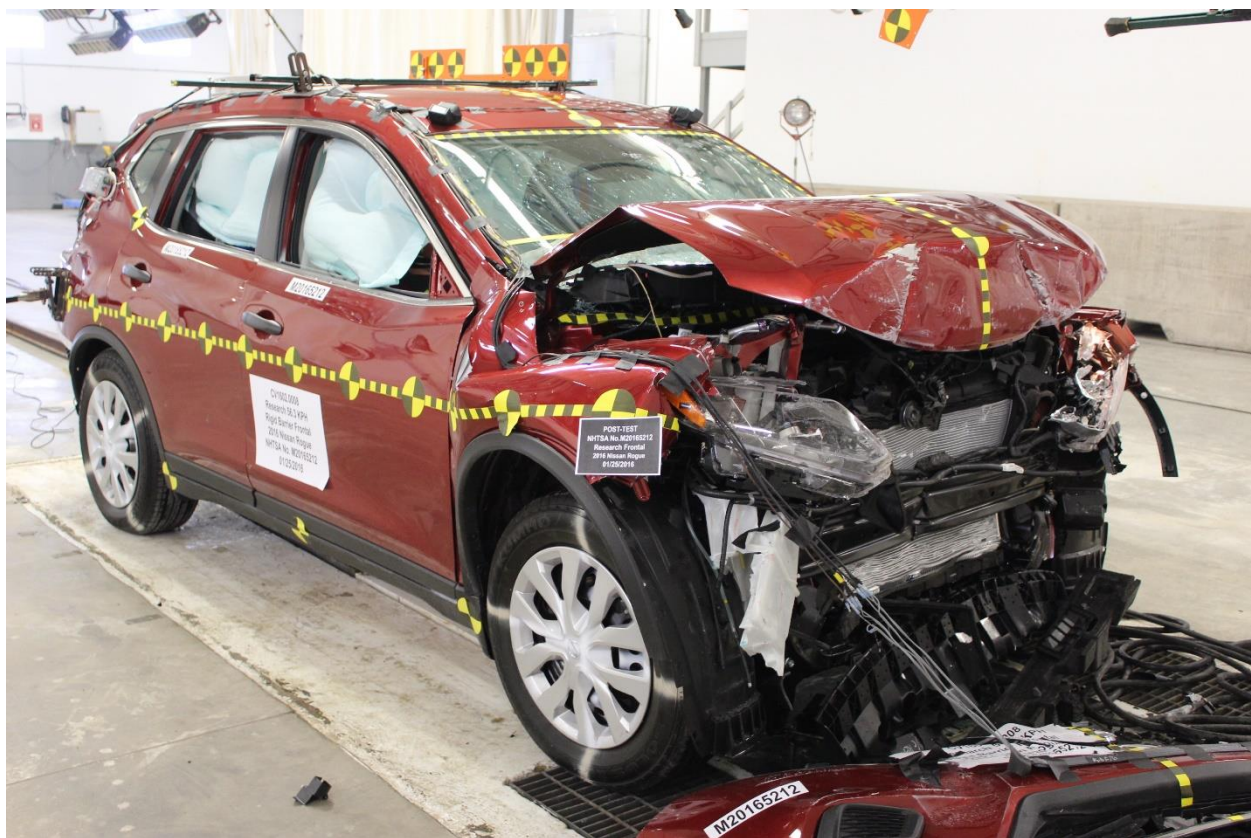




Figure A-15: Pre-Test Left Rear 3/4 View



Figure A-16: Post-Test Left Rear 3/4 View



Figure A-17: Pre-Test Windshield View



Figure A-18: Post-Test Windshield View



Figure A-19: Pre-Test Engine Compartment View



Figure A-20: Post-Test Engine Compartment View

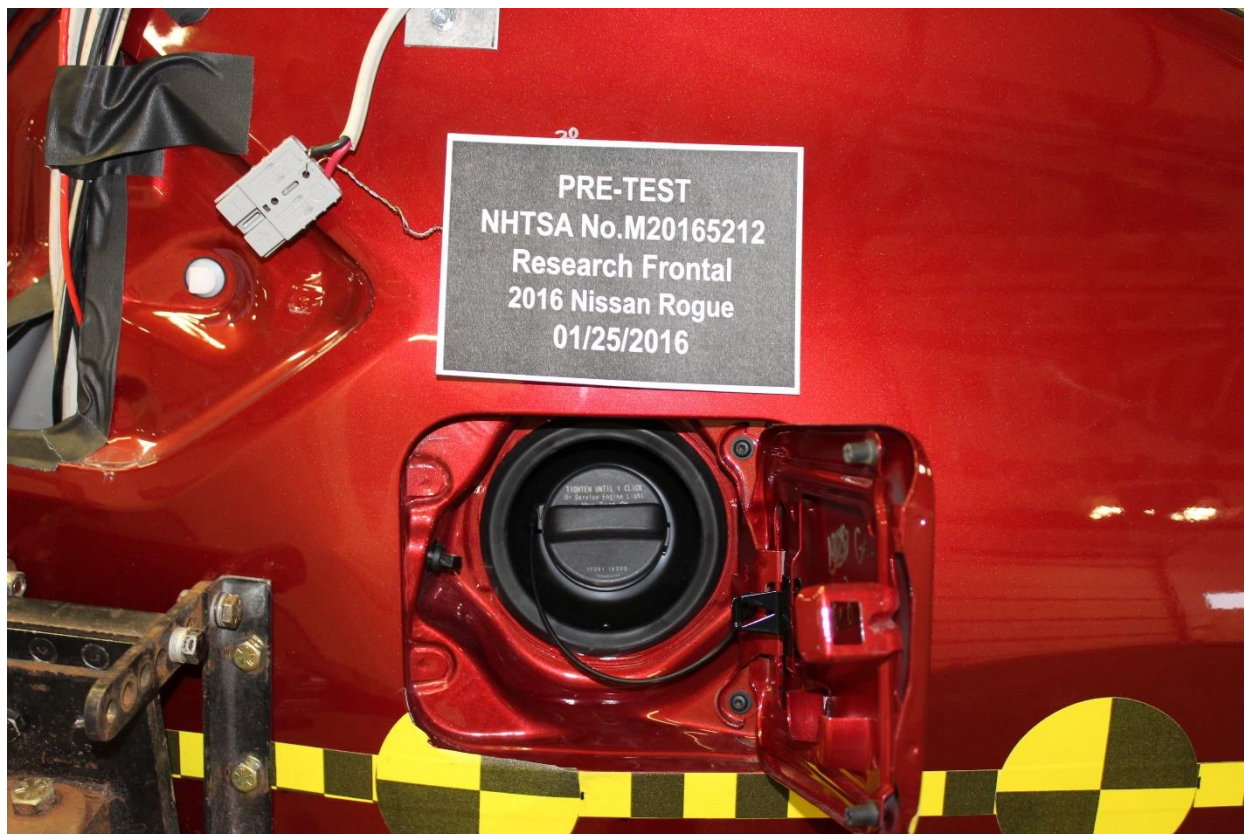


Figure A-21: Pre-Test Fuel Filler Cap View



Figure A-22: Post-Test Fuel Filler Cap View

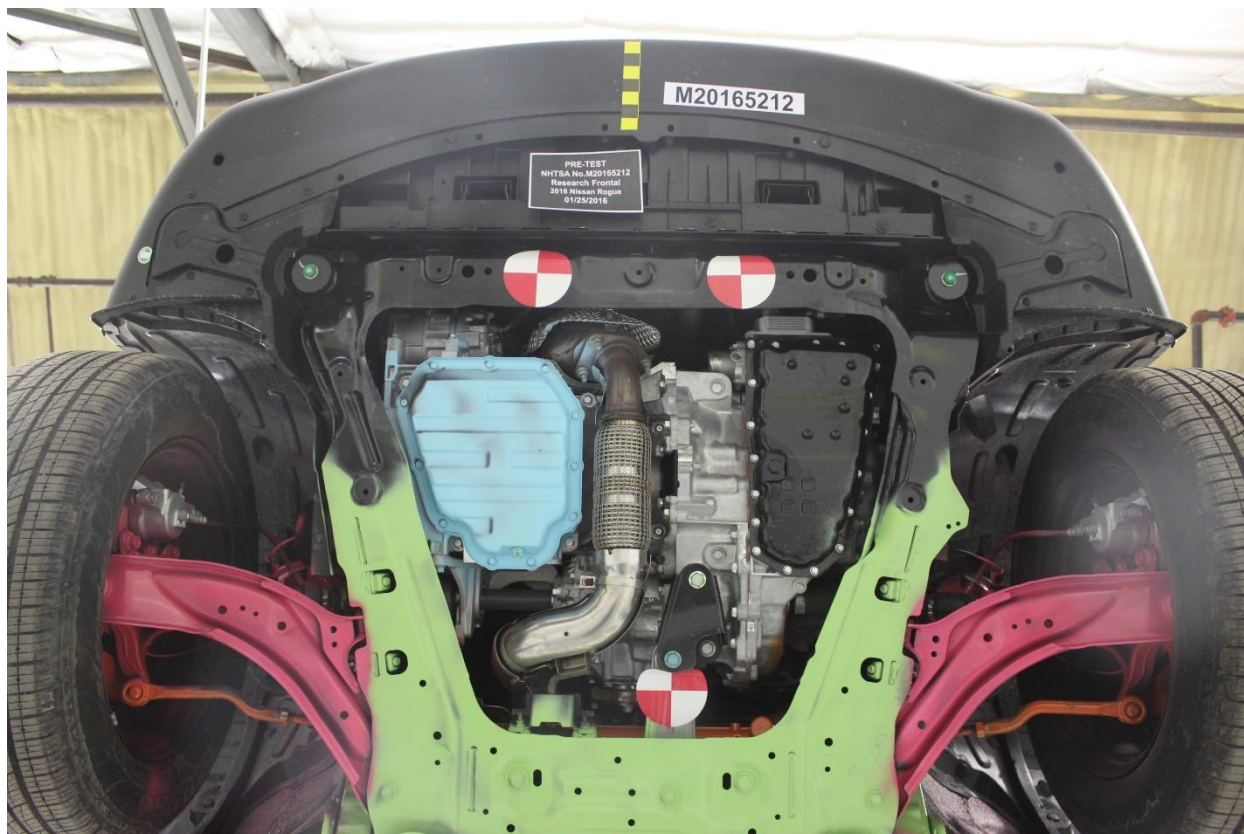


Figure A-23: Pre-Test Front Underbody View

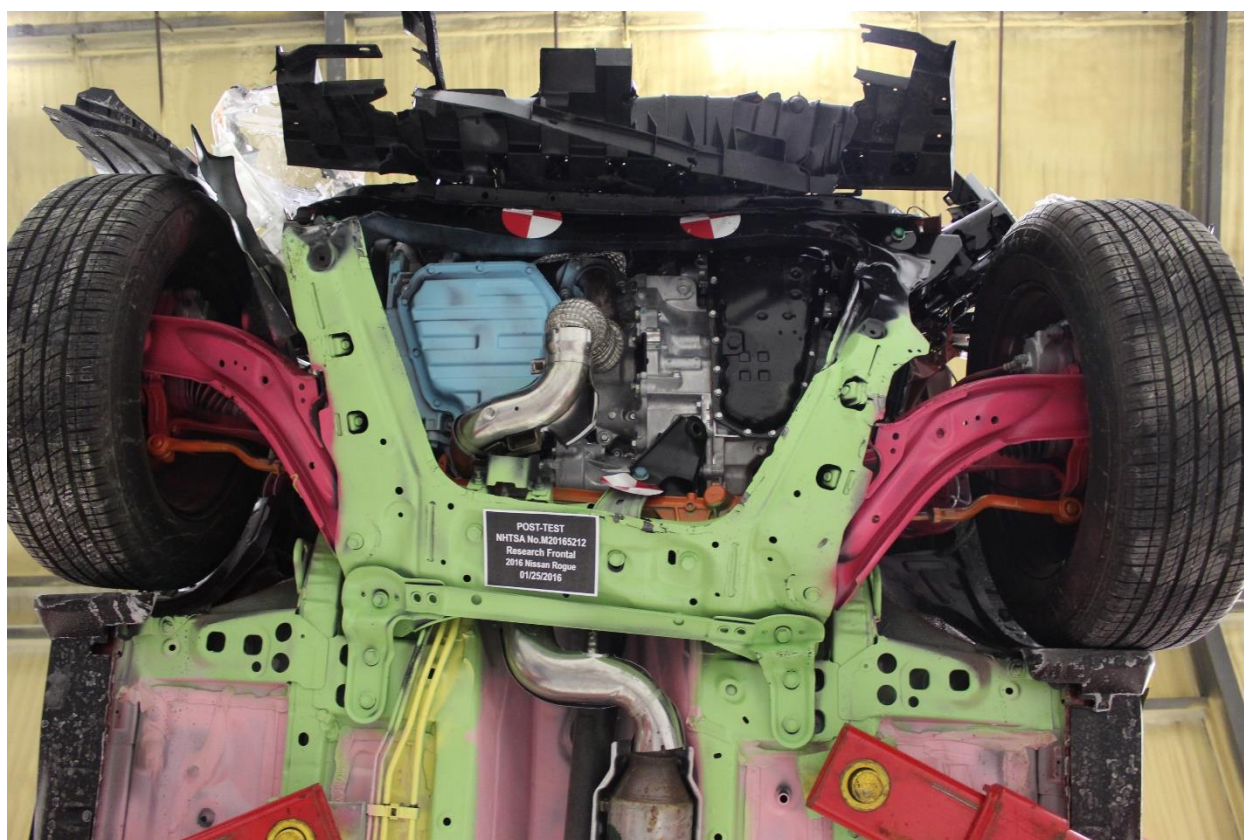


Figure A-24: Post-Test Front Underbody View



Figure A-25: Pre-Test Rear Underbody View

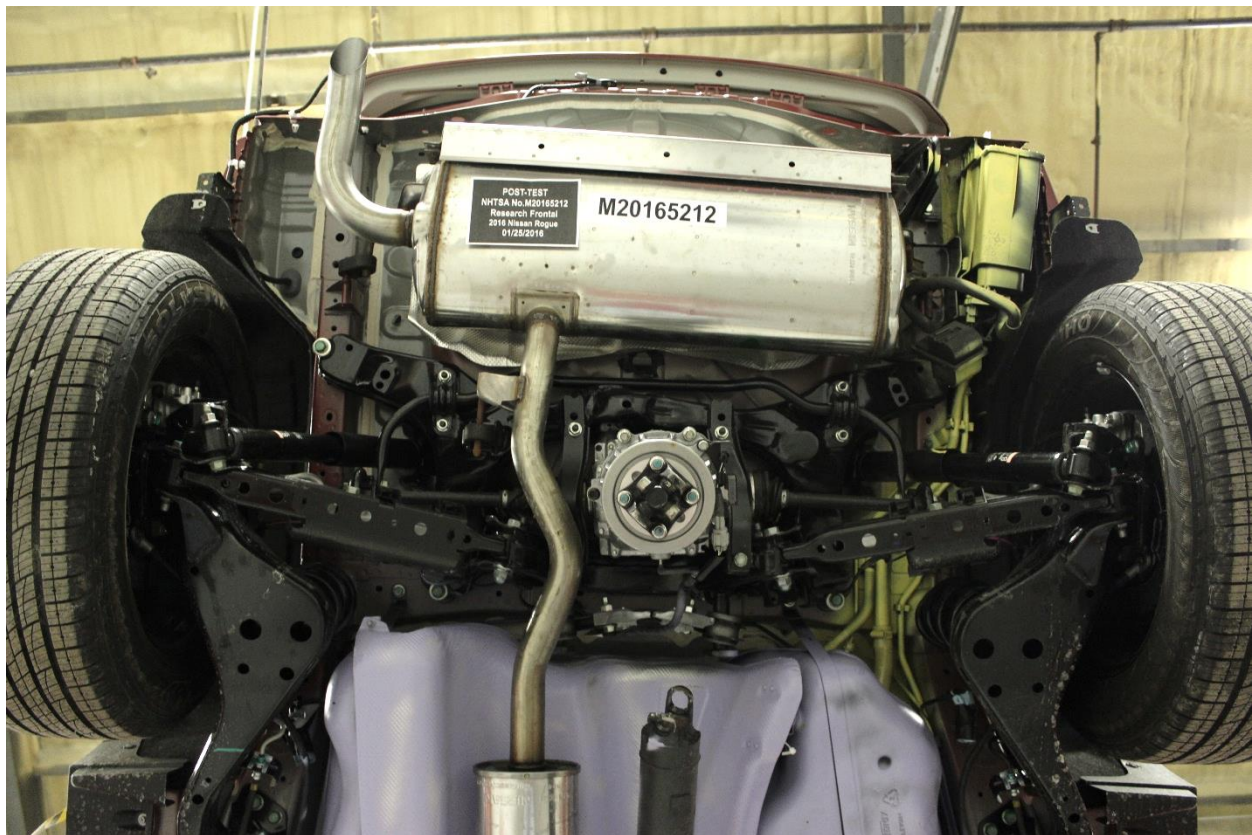


Figure A-26: Post-Test Rear Underbody View



Figure A-27: Pre-Test Dummy Cable Routing



Figure A-28: Post-Test Dummy Cable Routing



Figure A-29: Pre-Test Driver Dummy Front View



Figure A-30: Post-Test Driver Dummy Front View



Figure A-31: Pre-Test Driver Dummy Window View



Figure A-32: Post-Test Driver Dummy Window View



Figure A-33: Pre-Test Driver Dummy and Vehicle Interior View



Figure A-34: Post-Test Driver Dummy and Vehicle Interior View



Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings



Figure A-36: Post-Test Driver's Seat Fore-Aft Markings



Figure A-37: Pre-Test View of Belt Anchorage for Driver Dummy

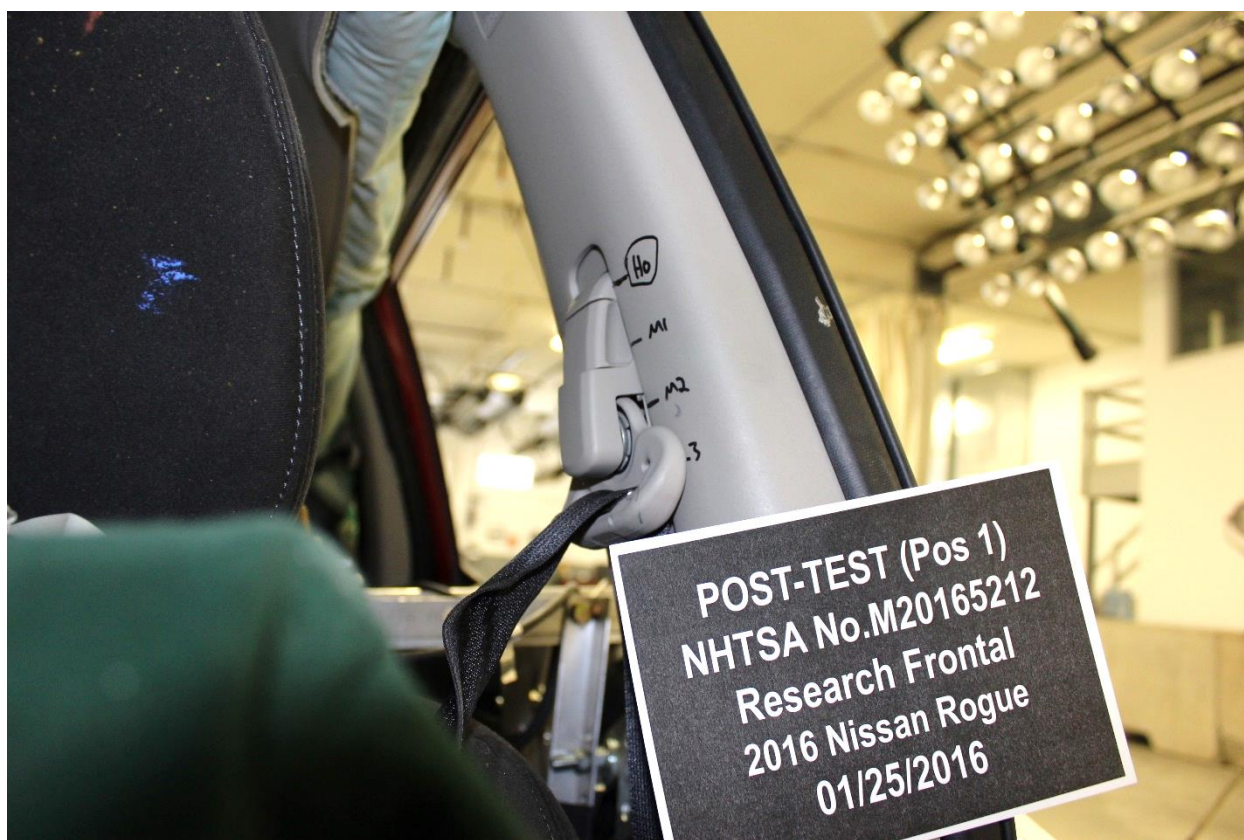


Figure A-38: Post-Test View of Belt Anchorage for Driver Dummy



Figure A-39: Pre-Test Driver Dummy Feet



Figure A-40: Post-Test Driver Dummy Feet



Figure A-41: Pre-Test Driver's Side Knee Bolster



Figure A-42: Post-Test Driver's Side Knee Bolster



Figure A-43: Pre-Test Driver's Side Floorpan



Figure A-44: Post-Test Driver's Side Floorpan



Figure A-45: Post-Test Driver Dummy Face



Figure A-46: Post-Test Driver Dummy Contact With Airbag



Figure A-47: Post-Test Driver Dummy Contact With Headrest



Figure A-48: Pre-Test View of the Steering Wheel



Figure A-49: Post-Test View of the Steering Wheel



Figure A-50: Pre-Test Passenger Dummy Front View



Figure A-51: Post-Test Passenger Dummy Front View



Figure A-52: Pre-Test Passenger Dummy Window View



Figure A-53: Post-Test Passenger Dummy Window View



Figure A-54: Pre-Test Passenger Dummy and Vehicle Interior View



Figure A-55: Post-Test Passenger Dummy and Vehicle Interior View



Figure A-56: Pre-Test Passenger's Seat Fore-Aft Markings



Figure A-57: Post-Test Passenger's Seat Fore-Aft Markings

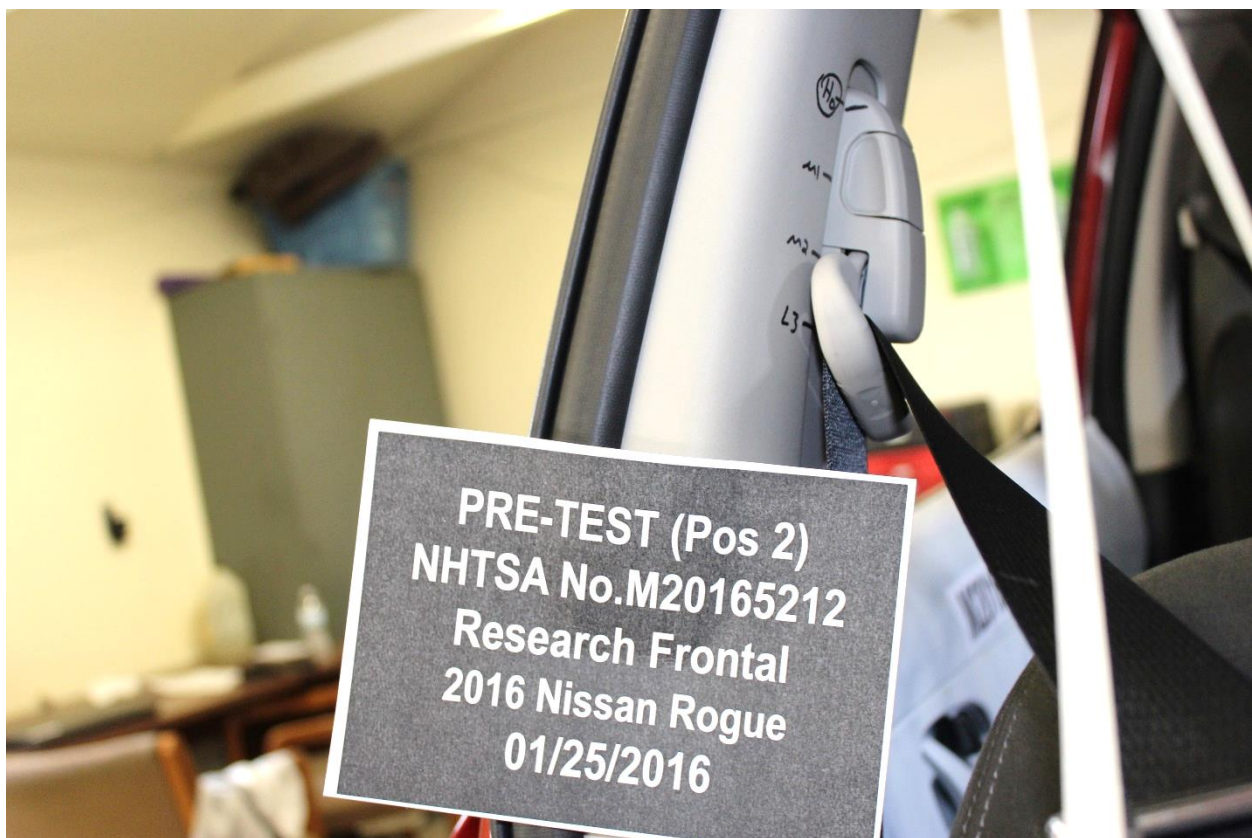


Figure A-58: Pre-Test View of Belt Anchorage for Passenger Dummy



Figure A-59: Post-Test View of Belt Anchorage for Passenger Dummy



Figure A-60: Pre-Test Passenger Dummy Feet



Figure A-61: Post-Test Passenger Dummy Feet



Figure A-62: Pre-Test Passenger's Side Knee Bolster



Figure A-63: Post-Test Passenger's Side Knee Bolster



Figure A-64: Pre-Test Passenger's Side Floorpan



Figure A-65: Post-Test Passenger's Side Floorpan



Figure A-66: Post-Test Passenger Dummy Face



Figure A-67: Post-Test Passenger Dummy Contact With Airbag



Figure A-68: Post-Test Passenger Dummy Contact With Headrest

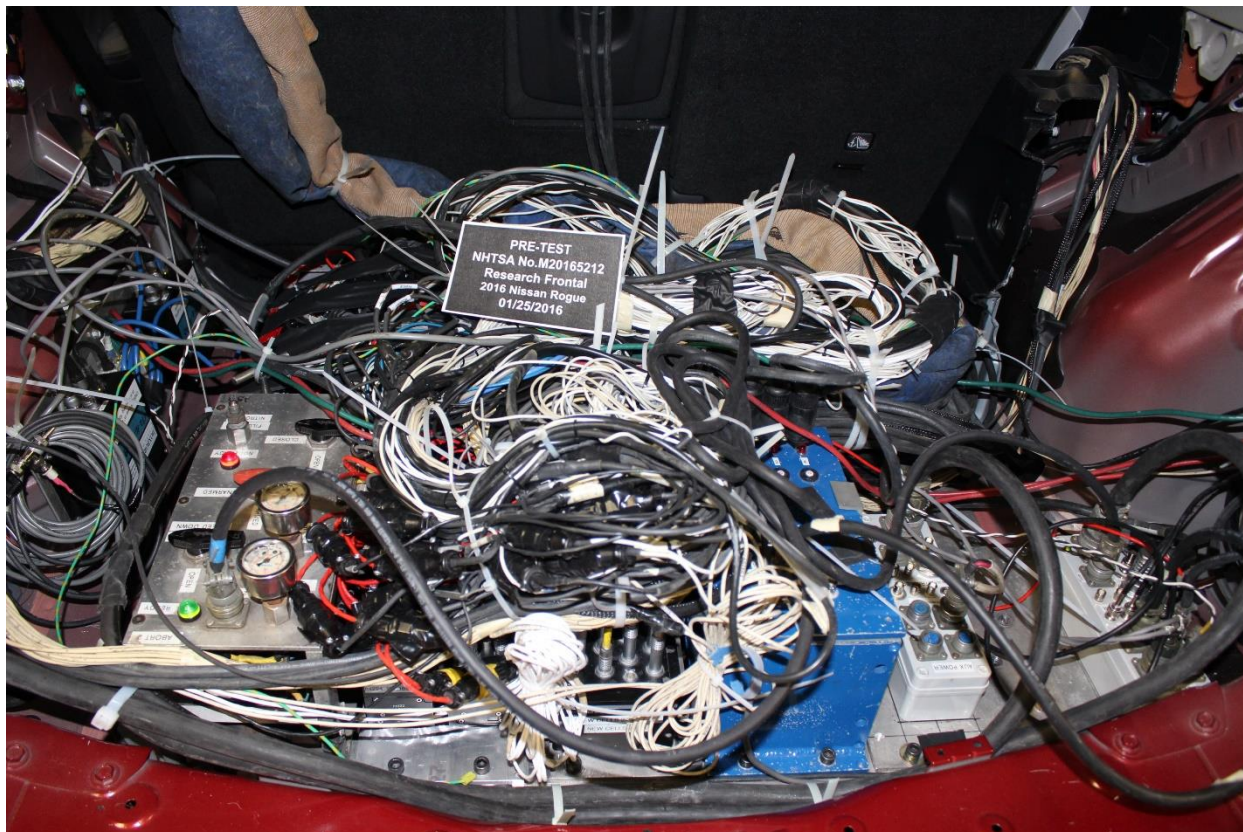


Figure A-69: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

Figure A-70: Post-Test Stoddard Solvent Spillage Location View, If Required



Figure A-71: Post-Test Speed Trap Read-Out



Figure A-72: Vehicle at 0° on Static Rollover Device



Figure A-73: Vehicle at 90° on Static Rollover Device



Figure A-74: Vehicle at 180° on Static Rollover Device



Figure A-75: Vehicle at 270° on Static Rollover Device



Figure A-76: Vehicle at 360° on Static Rollover Device



Figure A-77: 2016 Nissan Rogue Frontal Impact Event



2016 NISSAN ROGUE
S AWD



Scan QR code for general model information & options

Standard Equipment Included at No Extra Charge

MECHANICAL & PERFORMANCE
2.5-liter DOHC I-4 Engine
170 Horsepower and 175 lb-ft of Torque
Xtronic CVT8 (Continuously Variable Transmission) with Sport & Eco Modes
All-Wheel Drive
4-Wheel Front and Rear Disc Brakes
17" Steel Wheels with Full Wheel Covers
All-Season Tires/Temporary Spare Tire
Hill Start Assist
100.0lb Towing Capacity
(Additional Equipment Required*****)
Front Independent Suspension
Rear Multi-link Suspension

SAFETY & SECURITY
Driver & Front Passenger Side-Impact, Curtain Air Bags
Lower Anchors and Tethers for Children (LATCH)
4-Wheel Anti-Lock Braking System
Vehicle Dynamic Control (VDC)
Traction Control System (TCS)
Electronic Brake Force Distribution (EBD)
Brake Assist (BA)
Nissan Vehicle Immobilizer System
Vehicle Security System
Tire Pressure Monitoring System (TPMS) with Easy Fill Tire Alert

COMFORT & CONVENIENCE
EZ Flex® Seating System
40/20/40 Folding and Reclining 60/40 Sliding 2nd Row
Auxiliary Audio Input Jack
NissanConnect™ w/ Mobile App***
5" Color Audio Display
4-Speaker AM/FM/CD Audio System
SiriusXM Satellite Radio™
USB Connection Port (for iPod®)
Interface and Other Compatible Devices
Bluetooth® Hands-free Phone System
Steering Audio via Bluetooth®
Hands-Free Text Messaging Assistance™
Cruise Control
RearView Monitor
3 12-volt Power Points

COMFORT & CONVENIENCE CONT.
Illuminated Visor Vanity Mirrors with Visor Extenders
Divide-N-Hide® Cargo System
Power Door Locks w/ Auto Locking Feature
Power Windows

EXTERIOR
LED Daytime Running Lights
Hologram Headlights w/ Auto Off Function

***SiriusXM includes activation & 3 months of service only; subscription sold separately. SiriusXM services are not available in AK, HI and some markets.
****Optional Equipment Replaces Standard Where Applicable
*****Only use features when safe to do so. App availability is dependent upon vehicle model, trim level, packaging, and/or options. See NissanUSA.com/Connect for complete app availability details.
Compatible smartphone required. Cellular network and GPS signals not available in all areas and/or at all times. Nissan is not responsible for associated costs, if any, for continued operation due to cellular network or other third party termination/changes. Cellular or other third party provider may terminate/restrict service without notice.
Subscription Agreement required. See www.NissanUSA.com/Connect for details.
Text rates and/or data usage may apply.
*****Compatible smartphone required. Standard text rates and/or data usage may apply.
*****Additional cost required

Manufacturer's Suggested Retail Base Price:	\$24,490.00
Options Included by Manufacturer	
Splash Guards	160.00
Floor Mats with Cargo Area Protector (6-PC Total)	210.00
DESTINATION CHARGES	885.00
Total*	\$25,745.00

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy Small SUVs range from 17 to 33 MPG. The best vehicle rates 115 MPG.

28 MPG combined city/hwy
25 city 32 highway
3.6 gallons per 100 miles

You save \$1,000 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel Cost \$1,600

Fuel Economy & Greenhouse Gas Rating (EPA only) Smog Rating (w/ base 2015)

1 7 10 1 5 10 Best Best
This vehicle emits 222 grams CO₂ per mile. The best emits 9 grams per mile (e.g., Prius plug-in).
*Exhausting fuel also creates emissions. Learn more at EPA.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 25 MPG and costs \$8,800 to fuel over 5 years. Cost estimates calculated on 15,000 miles per year at \$3.00 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuel economy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score ★★★★★
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 ★★★★★
Side Crash	Front seat ★★★★★	Rear seat ★★★★★
Rollover	★★★★★	

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

DELIVERY

VEHICLE COLORS:
EXT: CAYENNE RED
INT: CHARCOAL

FINAL ASSEMBLY POINT:
LOS ANGELES

TRANSPORT METHOD:
TRUCK

DEALER:
ZEIGLER NISSAN GURNEE LLC
18850 W GRAND AVENUE
LAKE VILLA IL 60046

VIN: KNMA72MVG0P83787
EMS: 00 STATE EMS55CNS
MDL: 02216-08789 104-G
OPT: C-682033, 82286

20150924112743R482

Figure A-78: Monroney Label Photograph



Figure A-79: Pre-Test Rear Passenger Dummy Front view



Figure A-80: Post-Test Rear Passenger Dummy Front view



Figure A-81: Pre-Test Rear Passenger Dummy Window View



Figure A-82: Post-Test Rear Passenger Dummy Window View



Figure A-83: Pre-Test Rear Passenger Dummy and Vehicle Interior View



Figure A-84: Post-Test Rear Passenger Dummy and Vehicle Interior View



Figure A-85: Pre-Test Rear Passenger Seat Fore-Aft Markings



Figure A-86: Post-Test Rear Passenger Seat Fore-Aft Markings



Figure A-87: Pre-Test View of Belt Anchorage for Rear Passenger Dummy



Figure A-88: Post-Test View of Belt Anchorage for Rear Passenger Dummy



Figure A-89: Pre-Test Rear Passenger Dummy Feet



Figure A-90: Post-Test Rear Passenger Dummy Feet



Figure A-91: Pre-Test Rear Passenger Dummy Knee and Seatback View

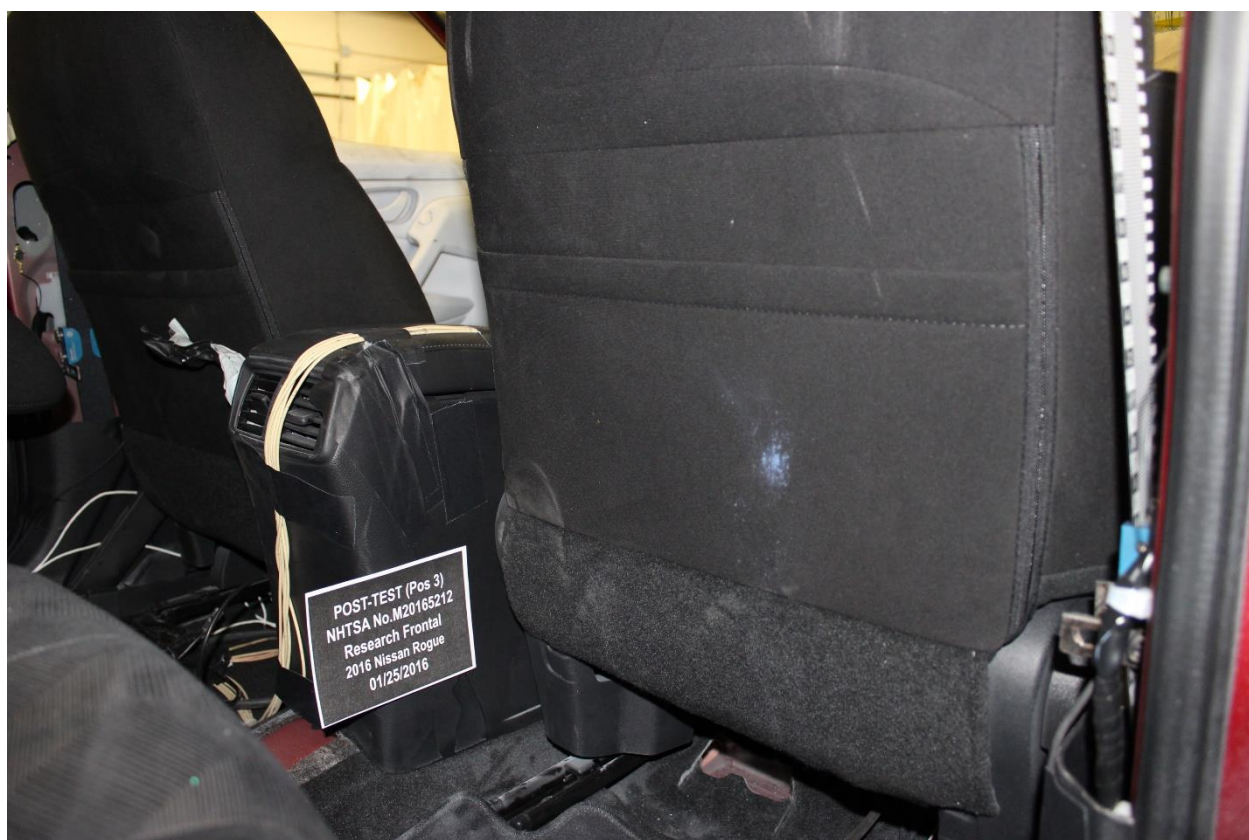


Figure A-92: Post-Test Rear Passenger Dummy Knee Contact with Seatback



Figure A-93: Pre-Test Rear Passenger's Side Floorpan



Figure A-94: Post-Test Rear Passenger's Side Floorpan



Figure A-95: Post-Test Rear Passenger Dummy Face

Photo Not Applicable

Figure A-96: Post-Test Rear Passenger Dummy Contact with Airbag



Figure A-97: Post-Test Rear Passenger dummy Contact with Headrest

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

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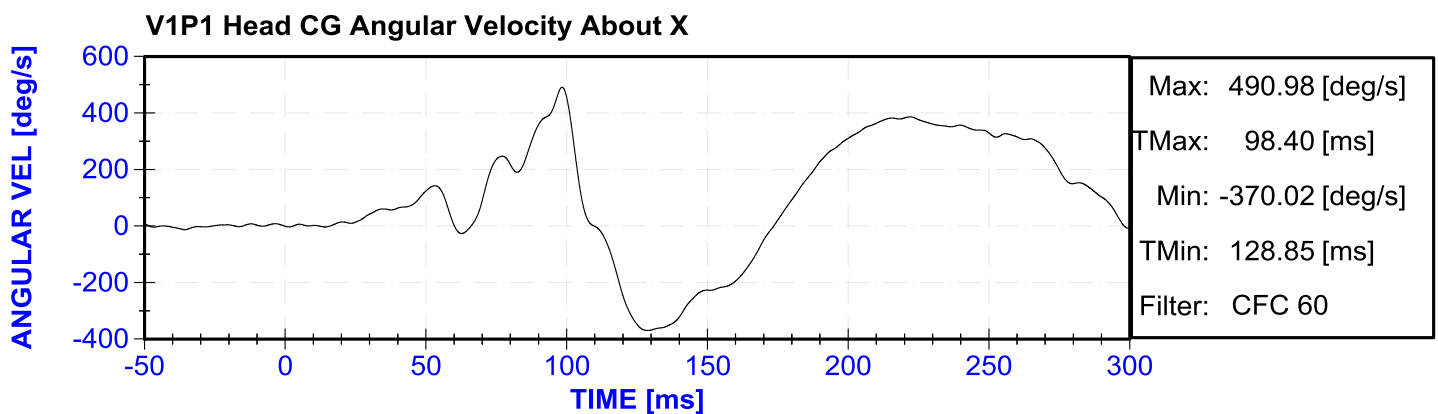
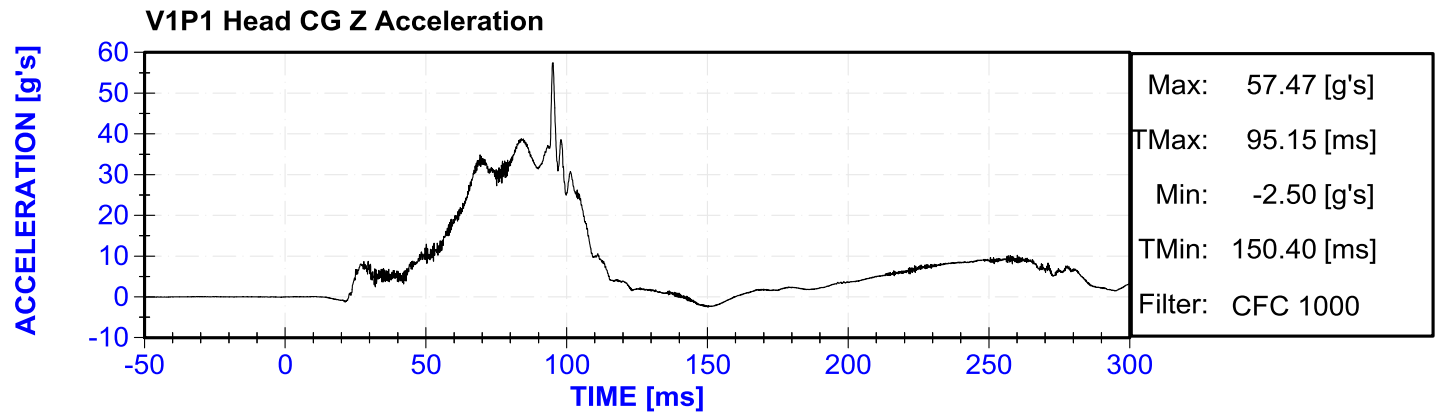
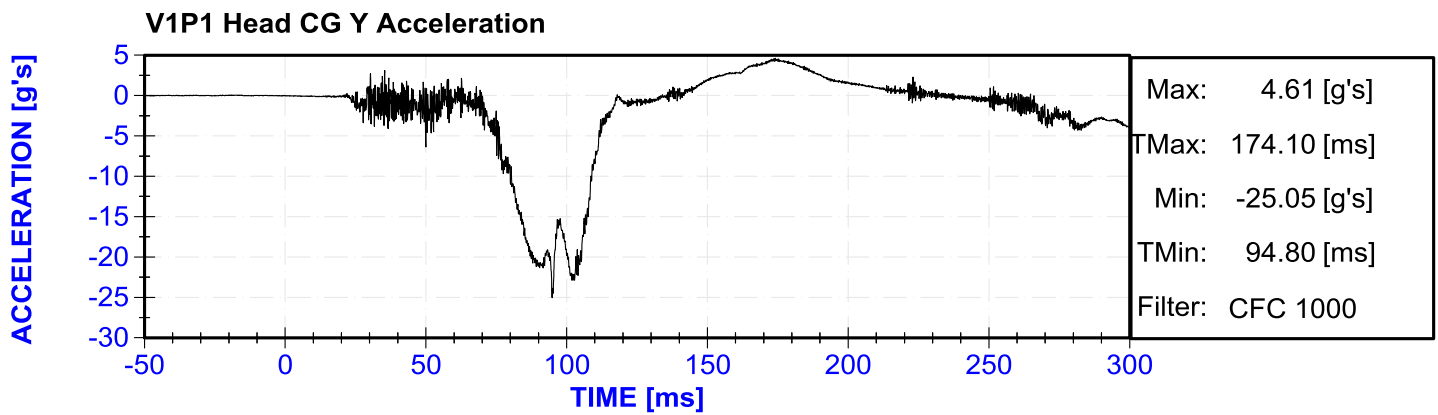
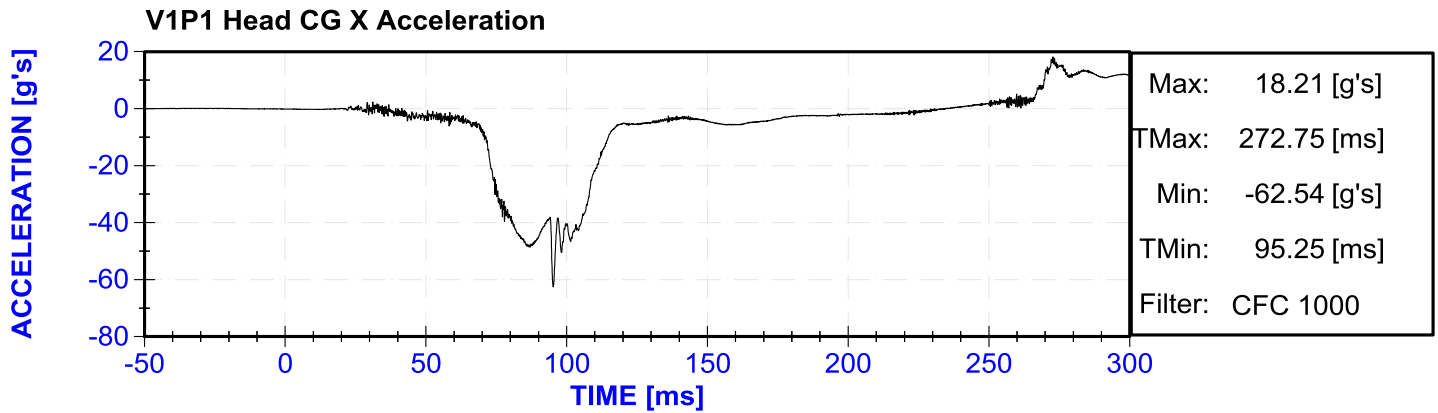
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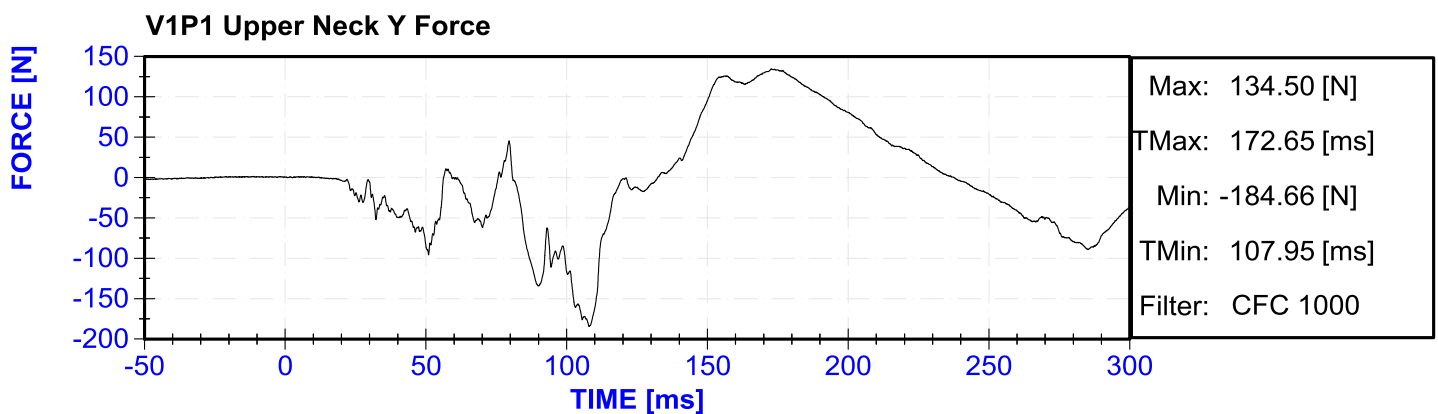
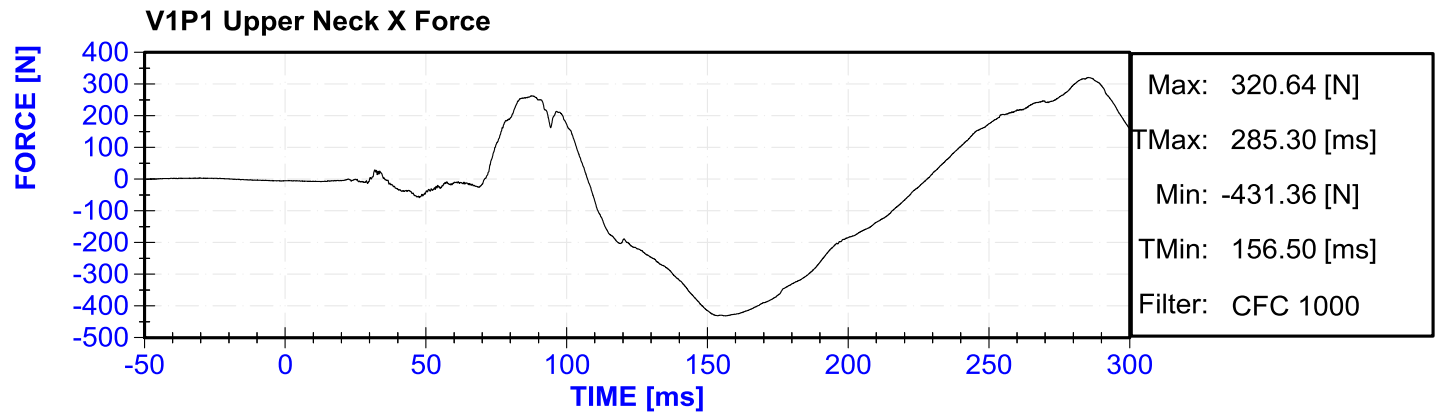
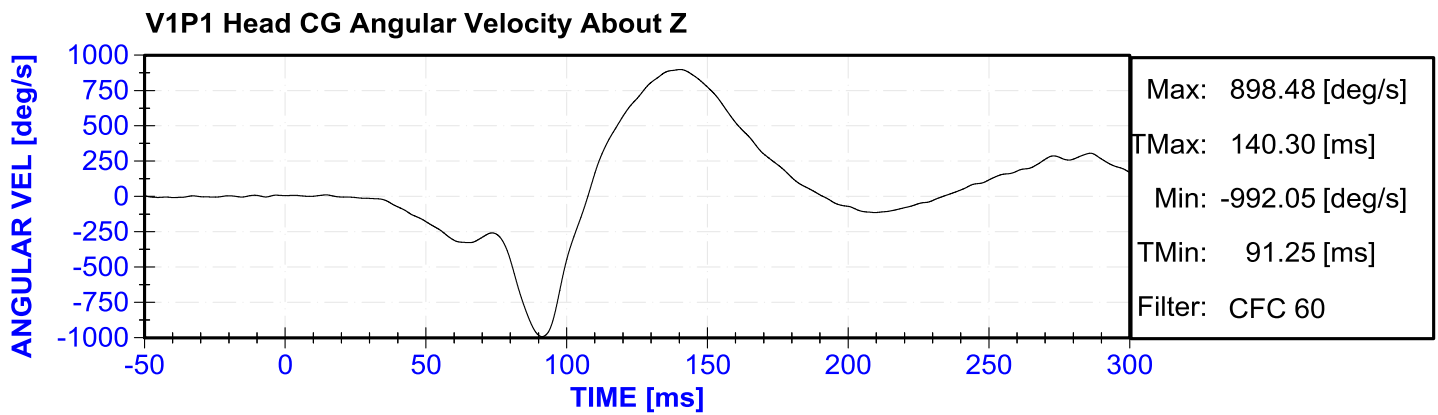
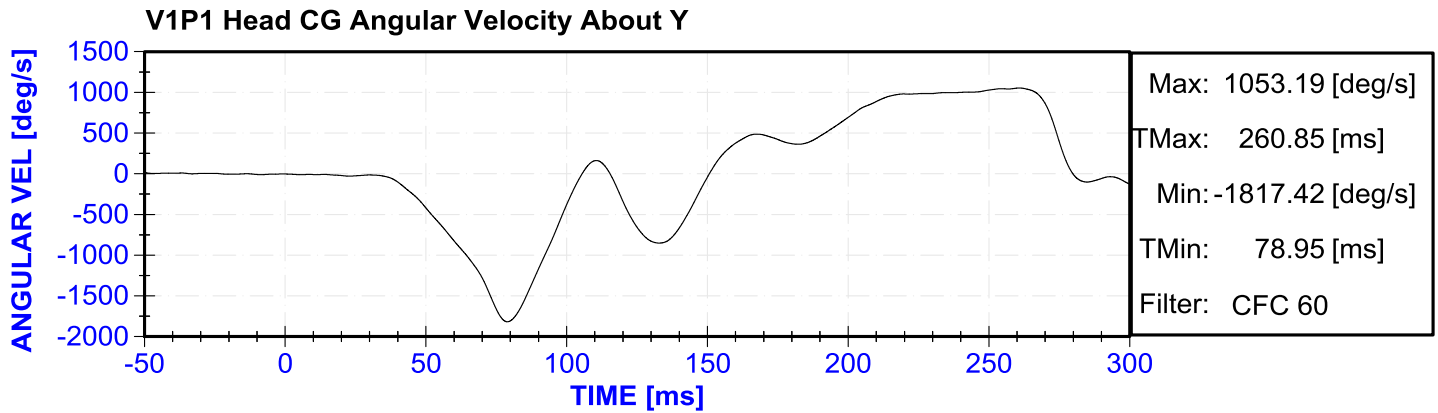
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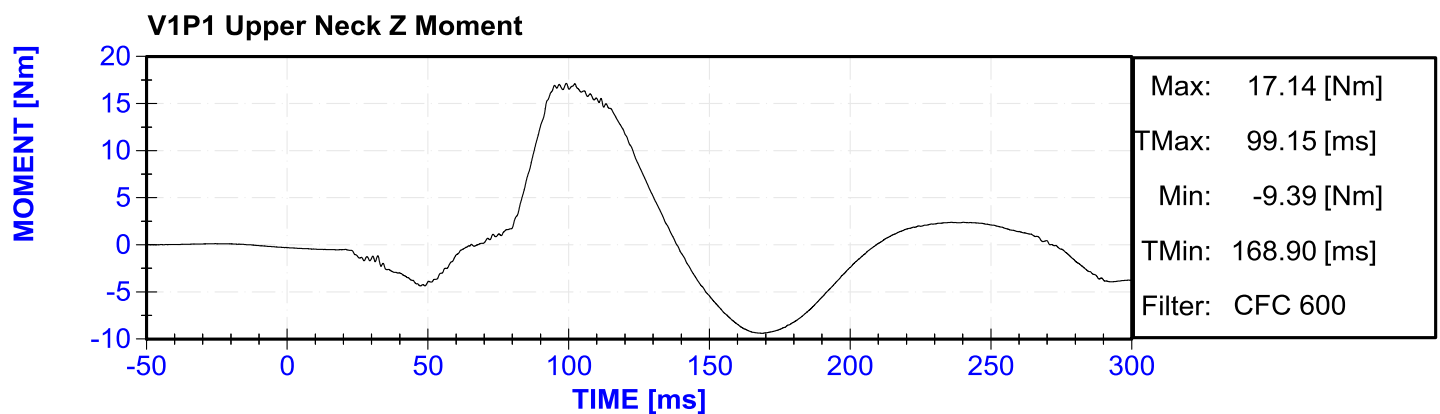
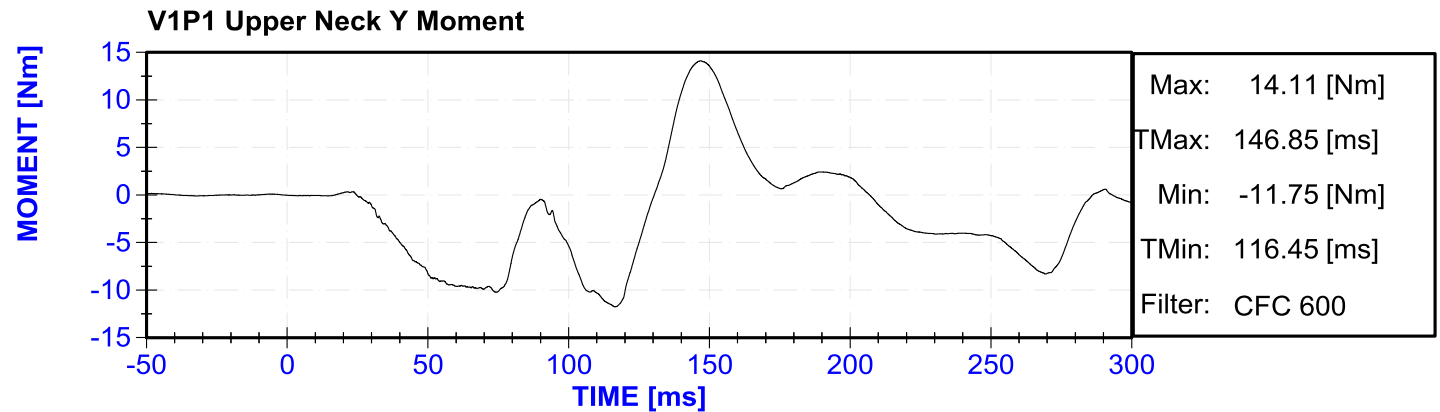
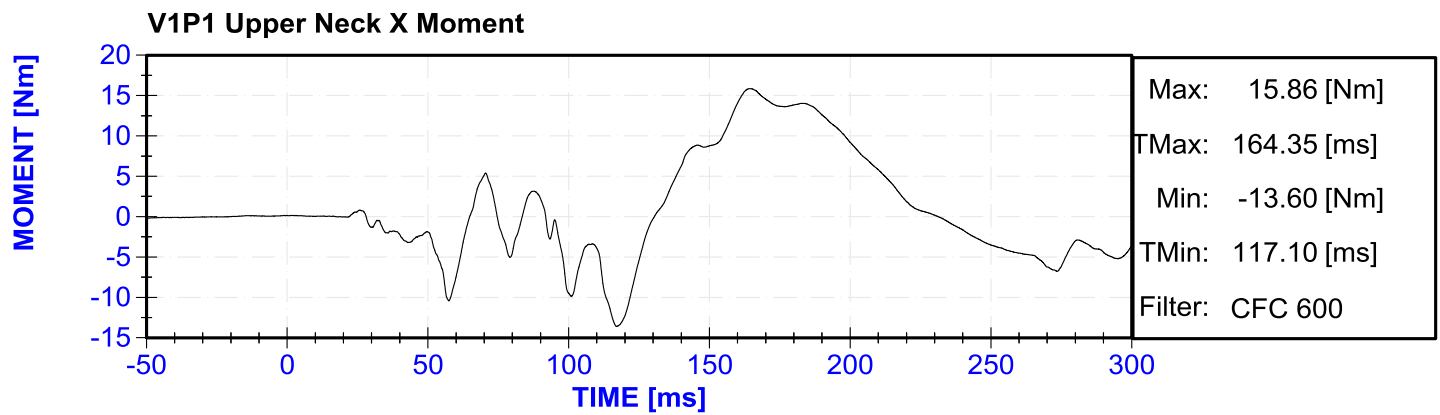
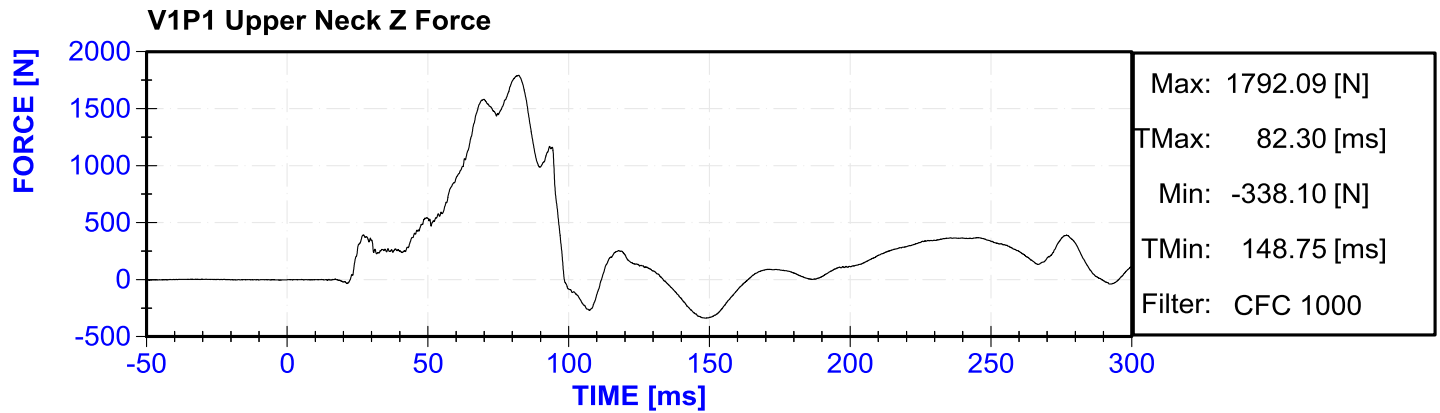
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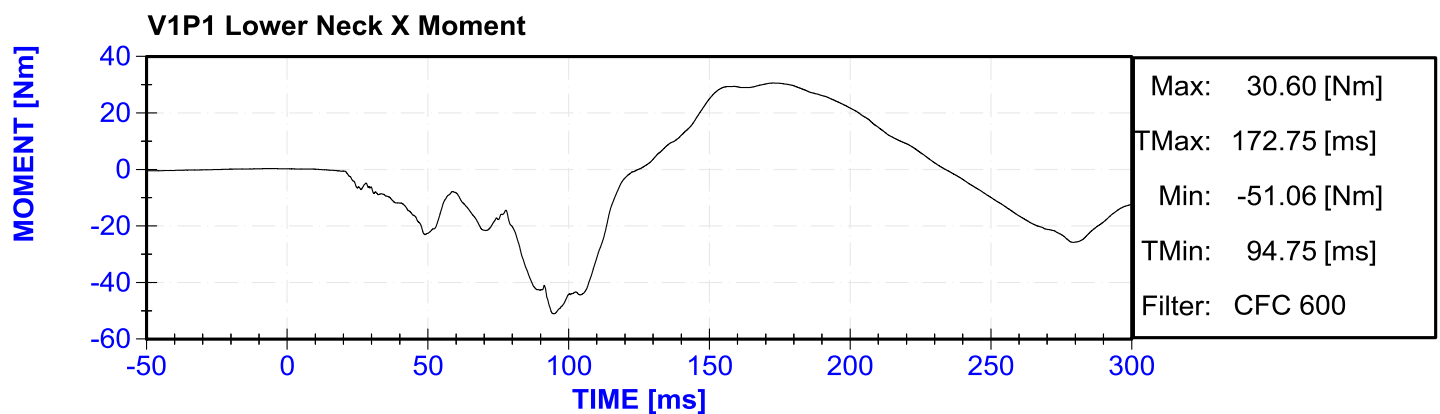
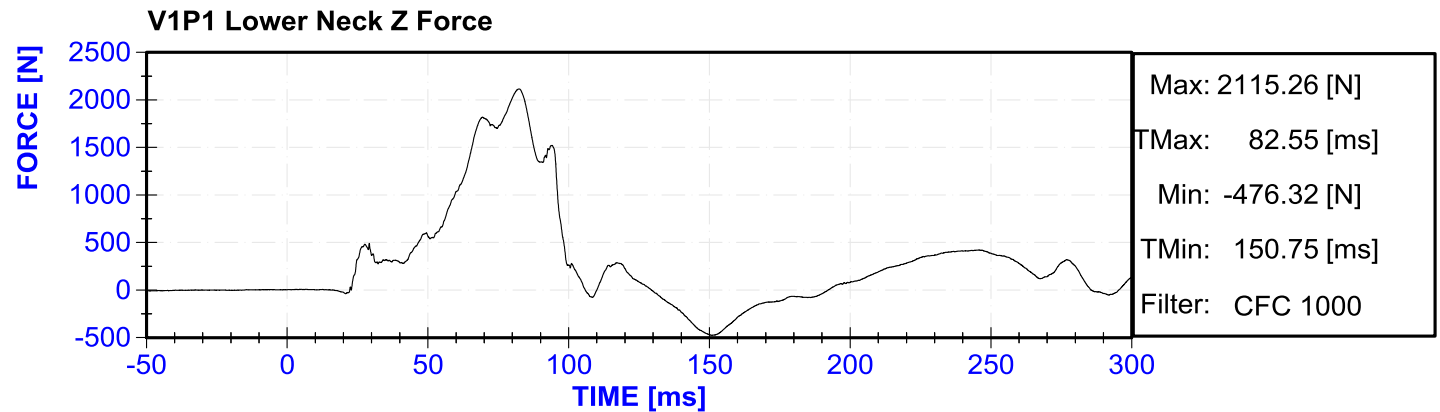
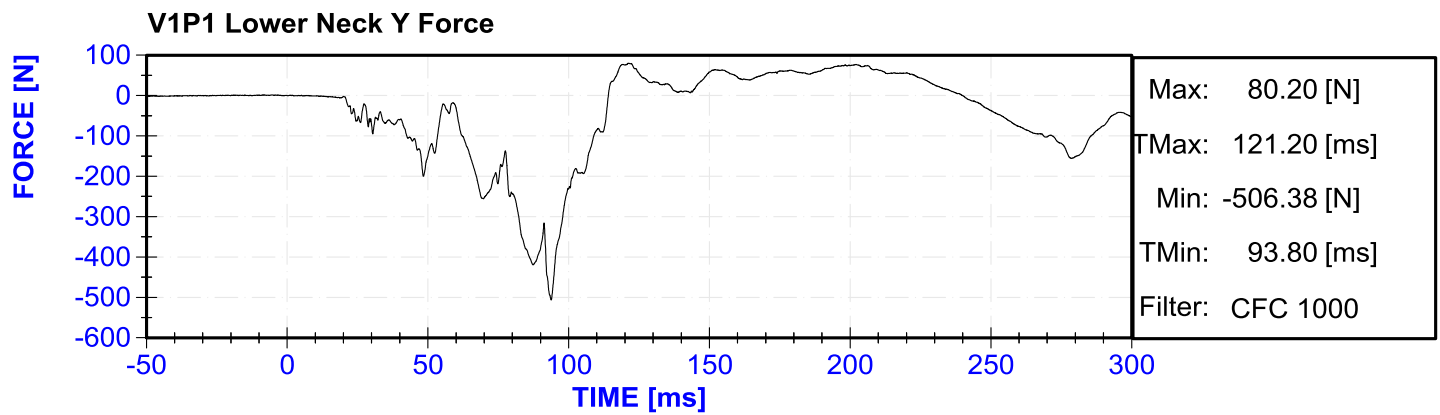
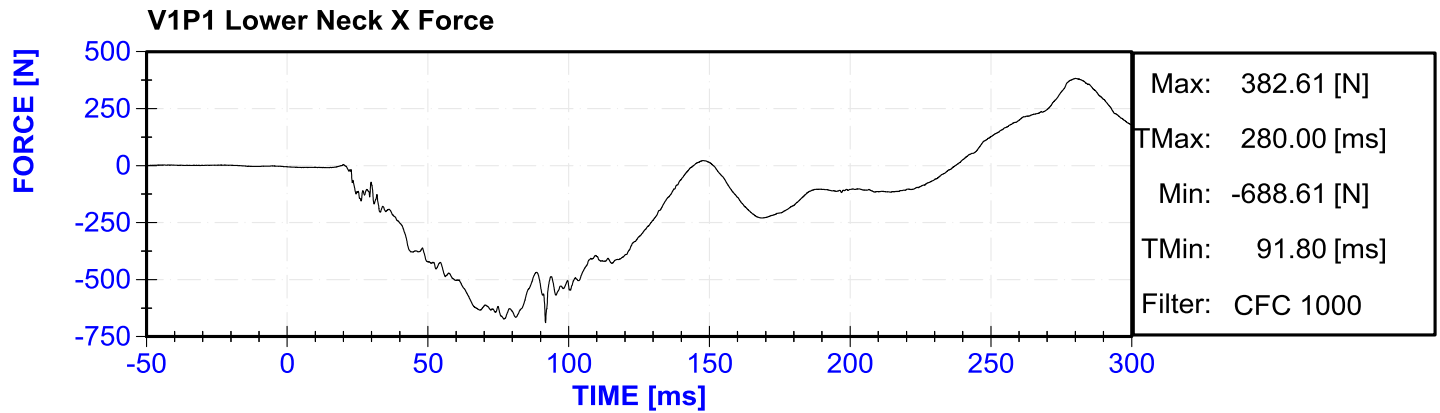
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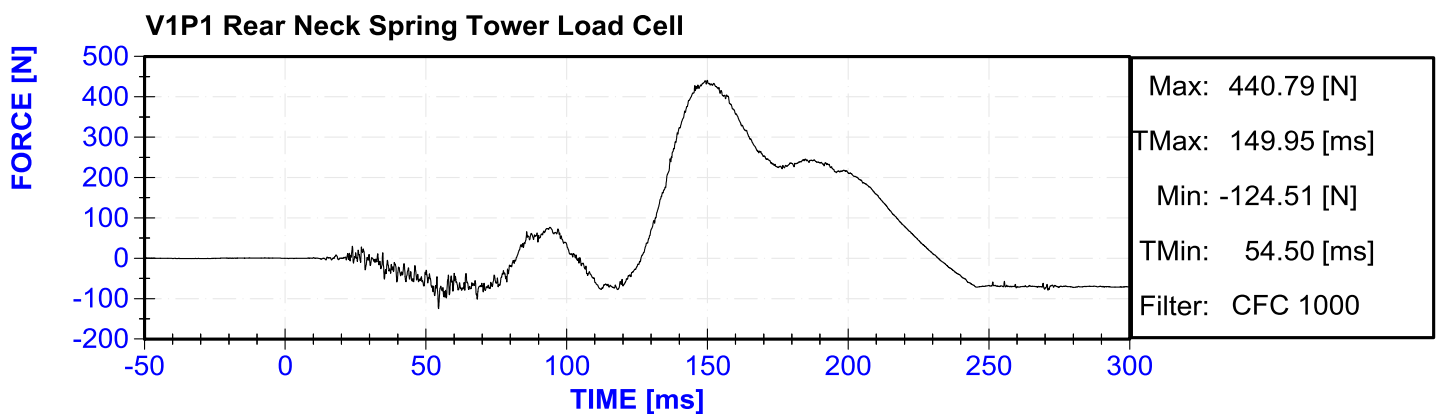
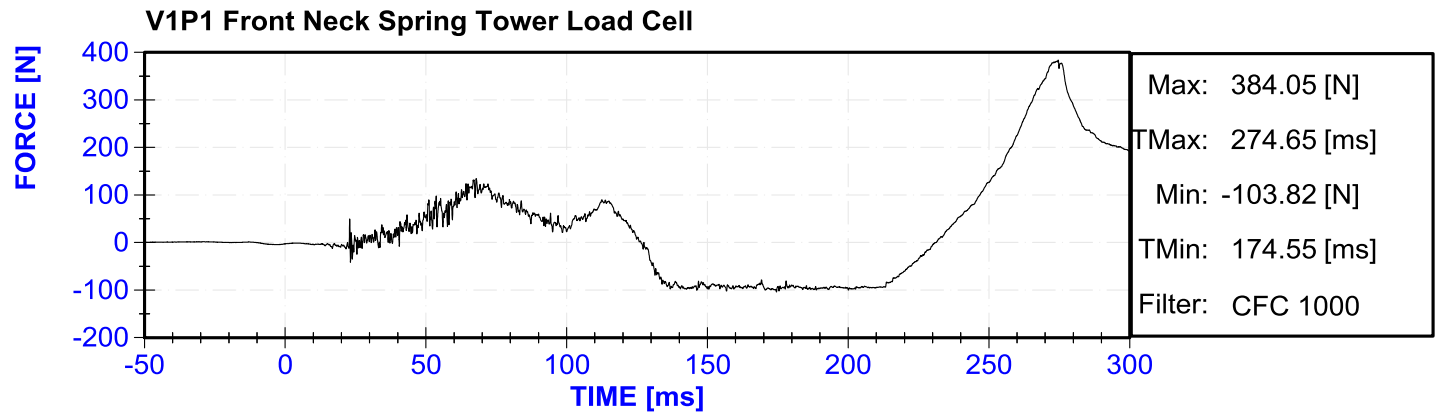
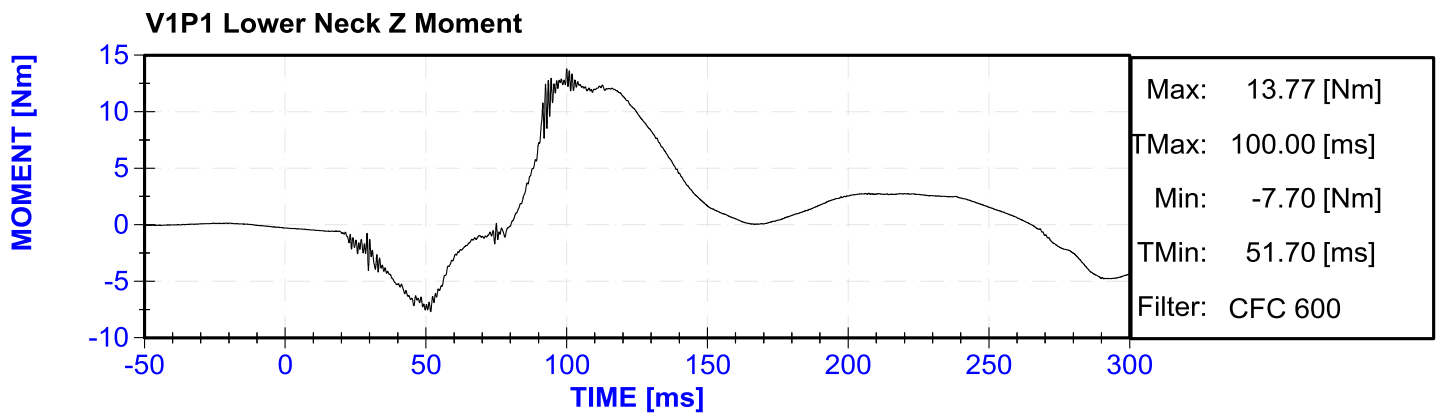
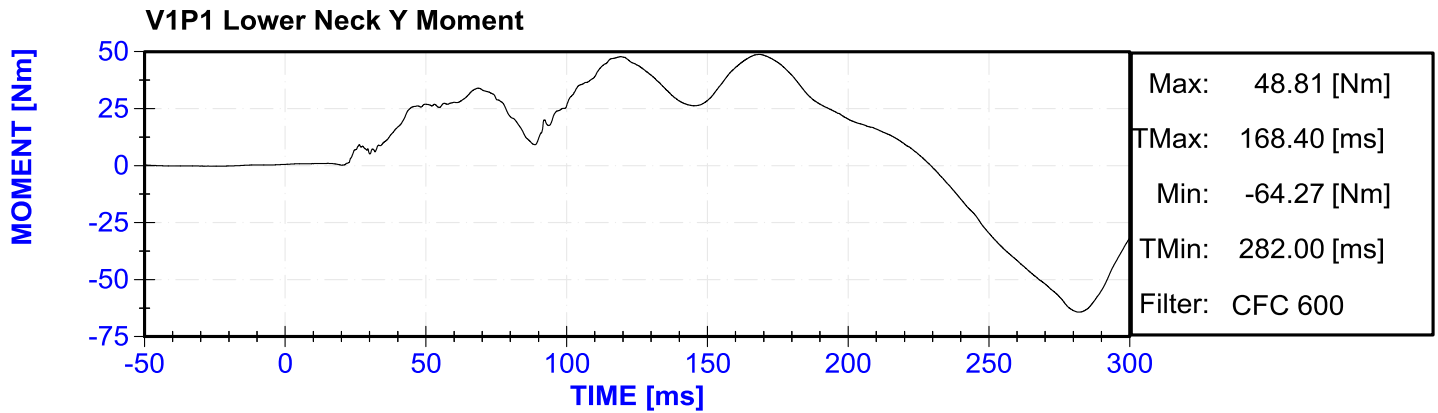
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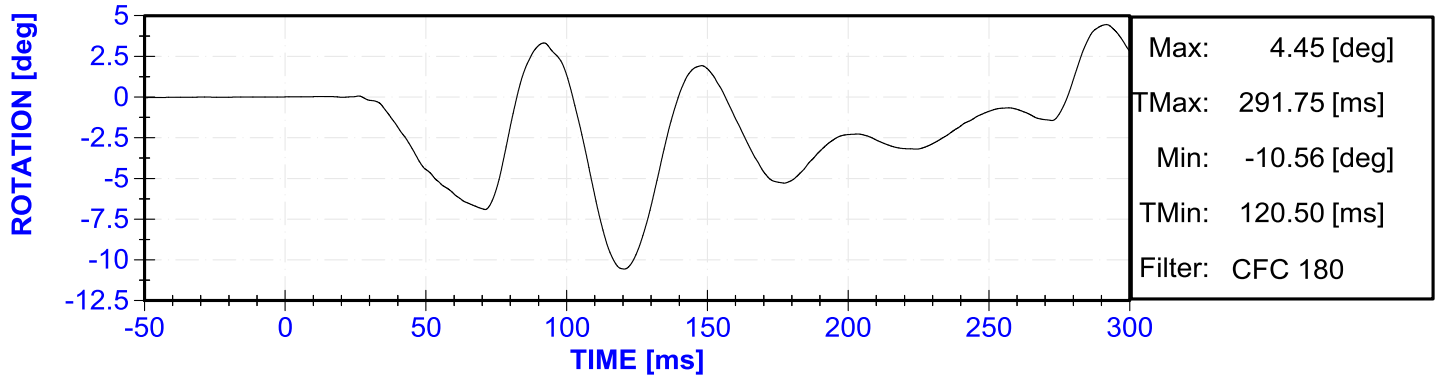




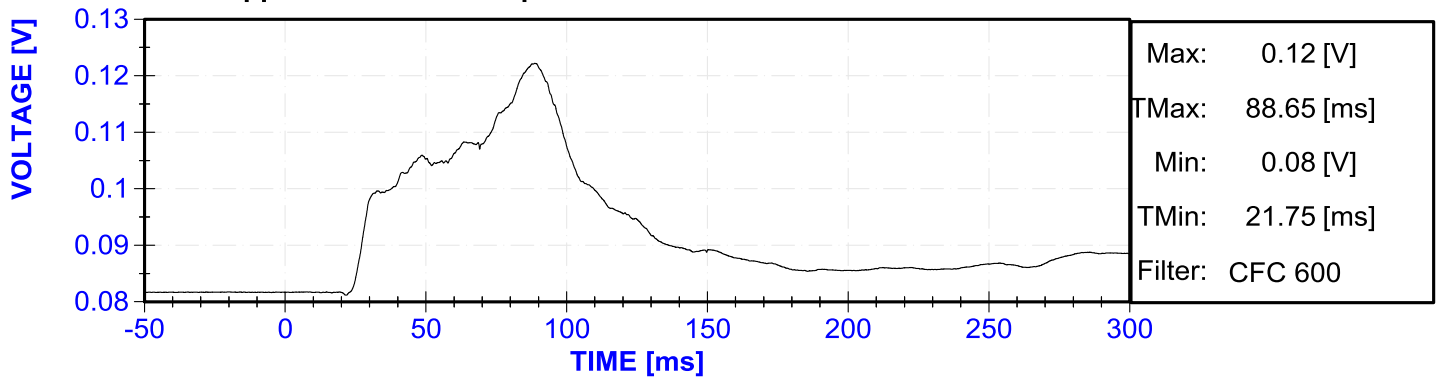




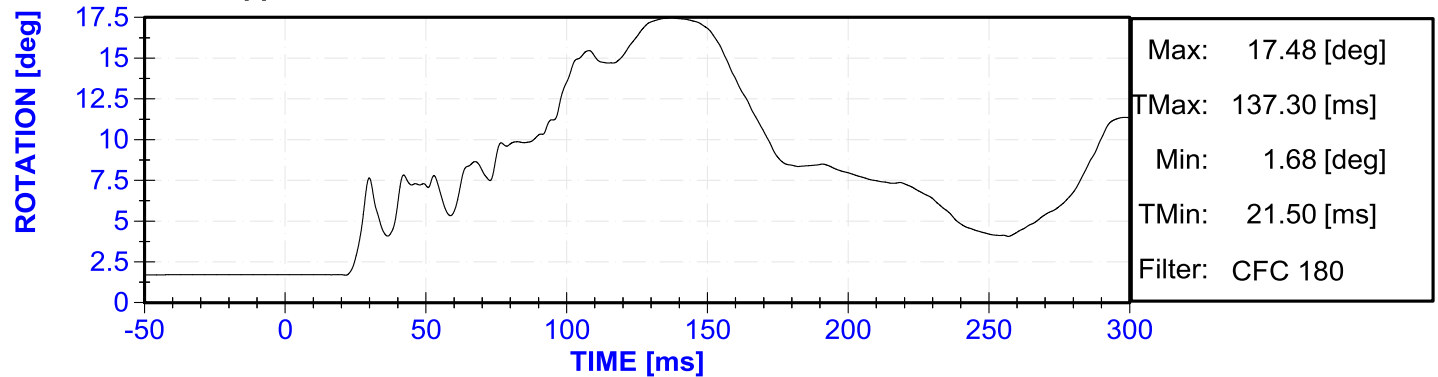
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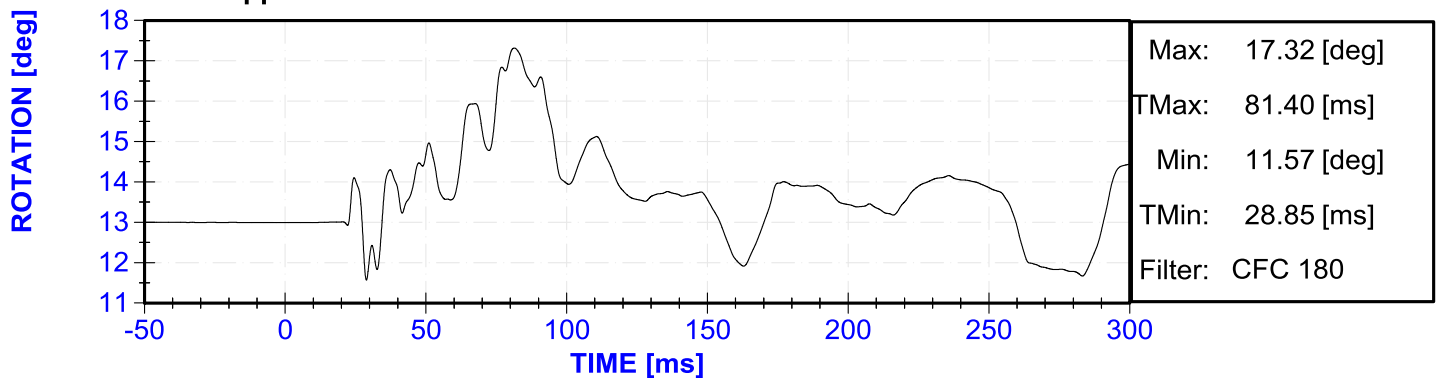
V1P1 Upper Left DGIR X Displacement



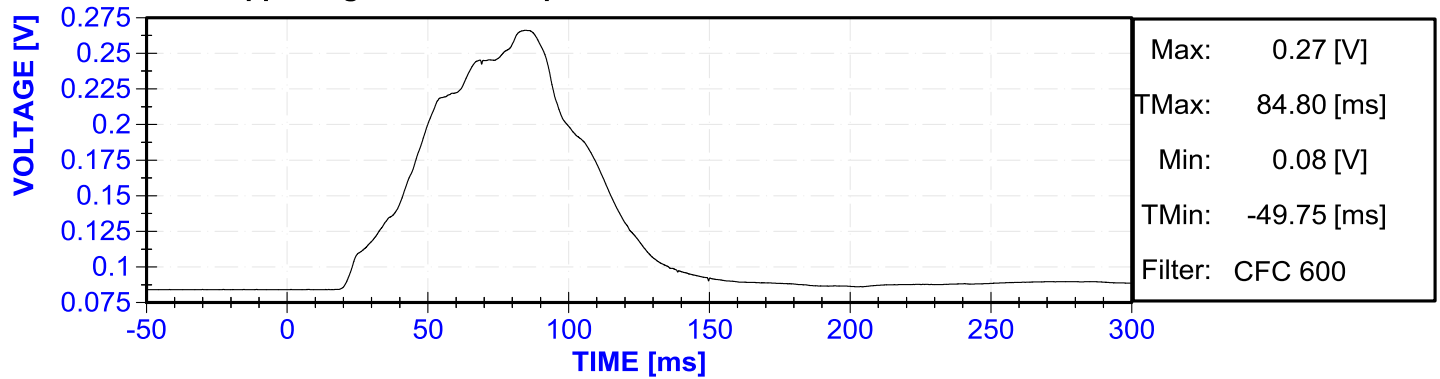
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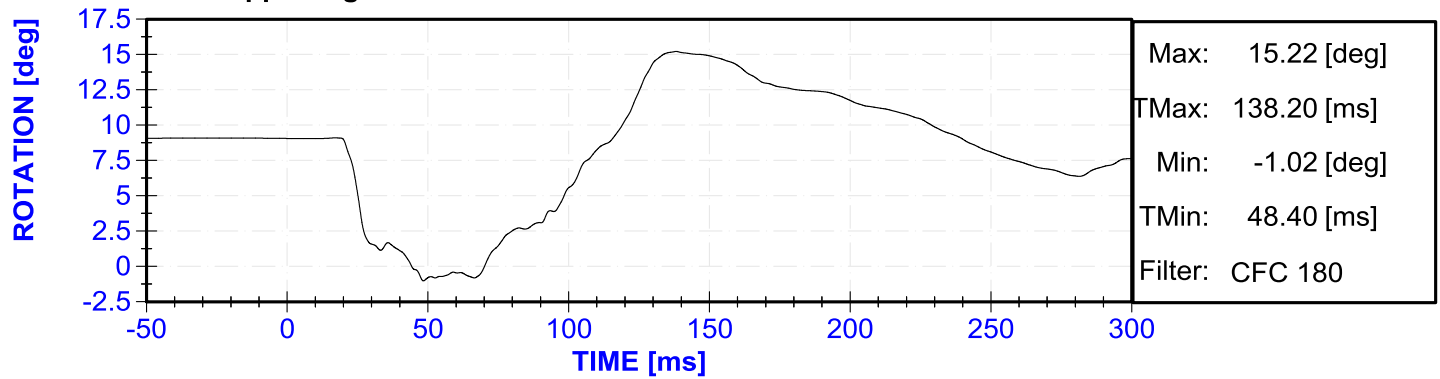
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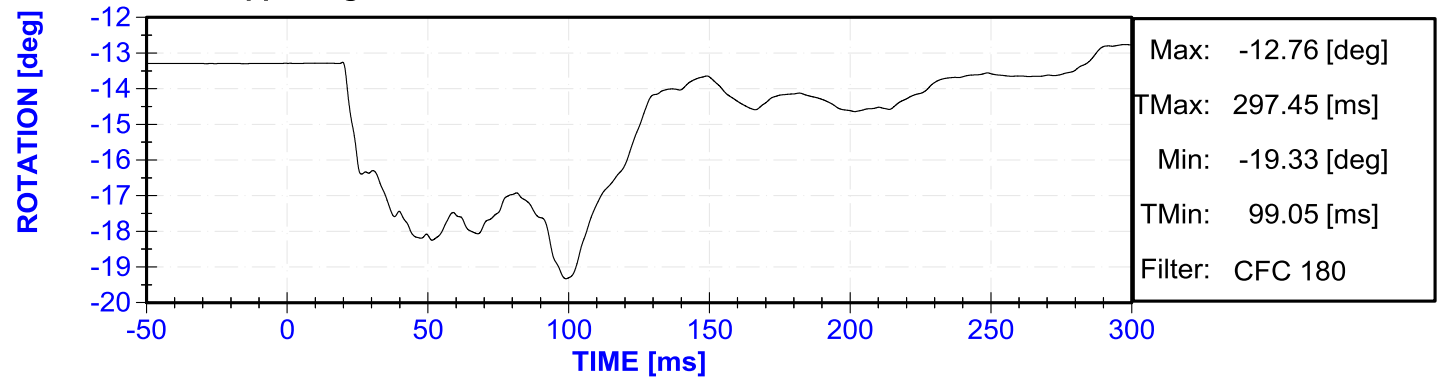
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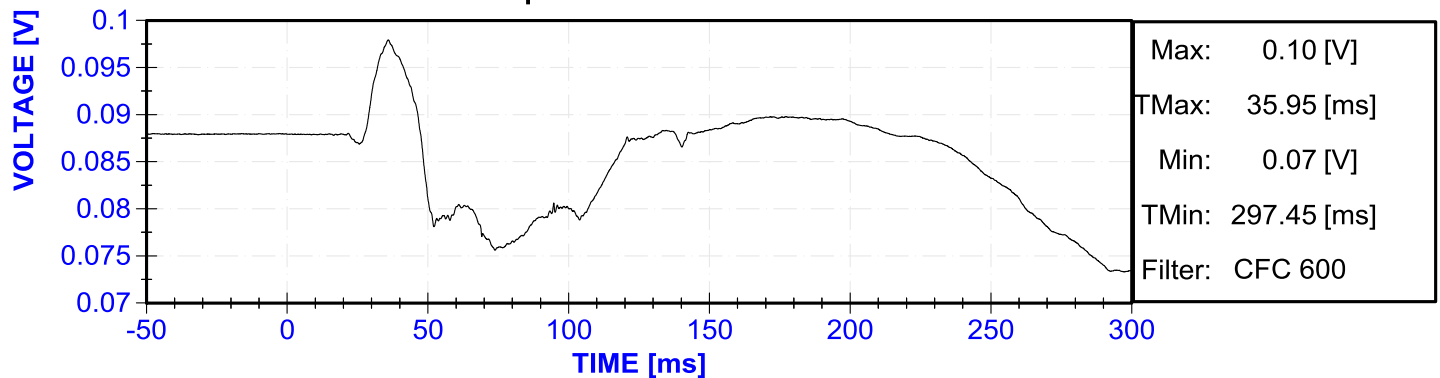
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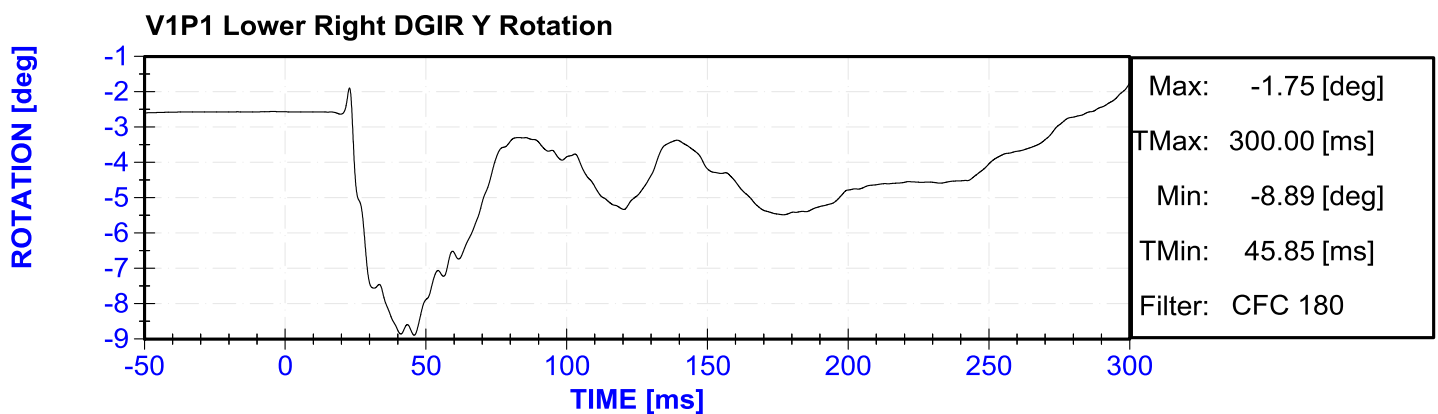
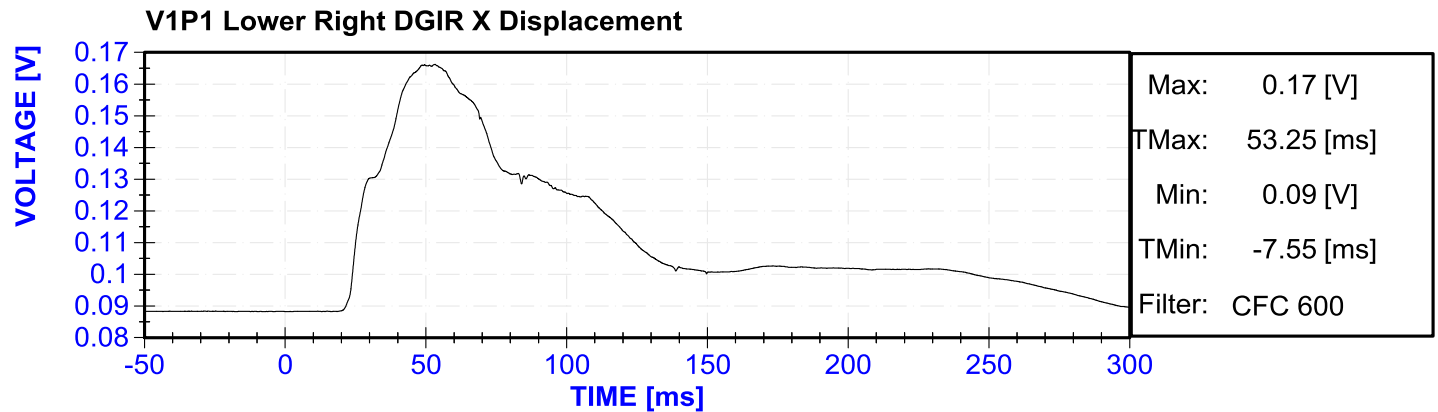
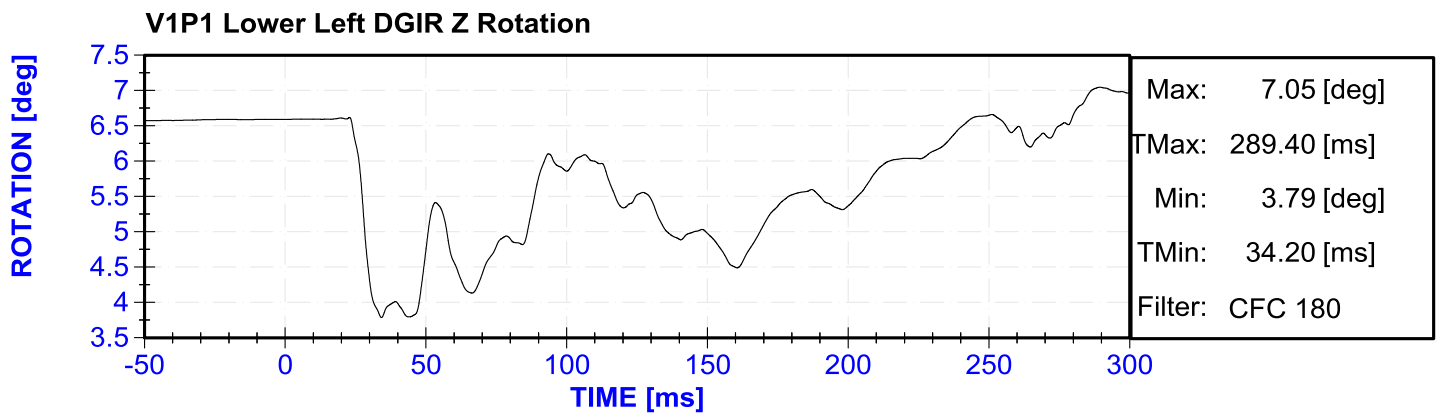
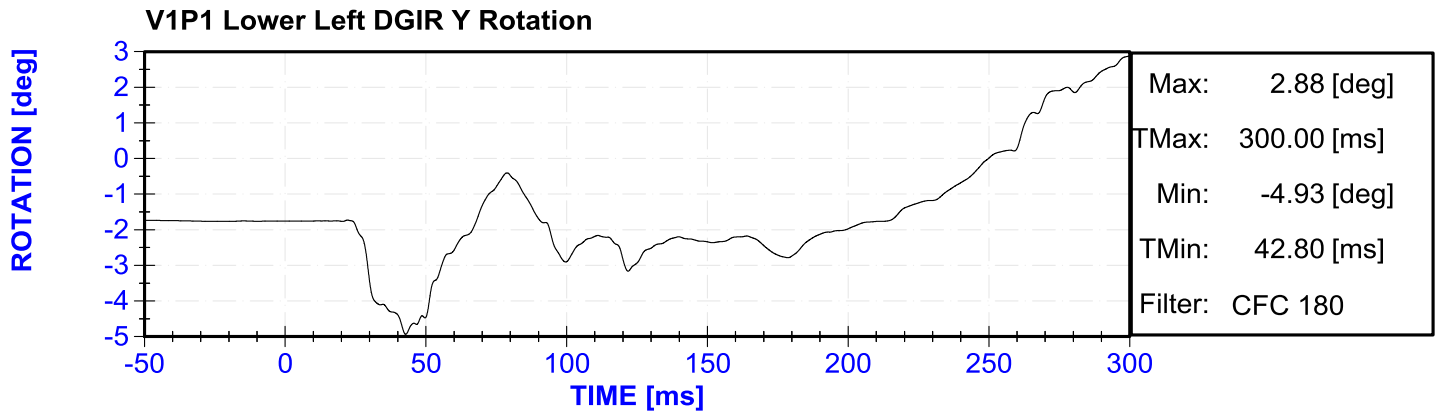


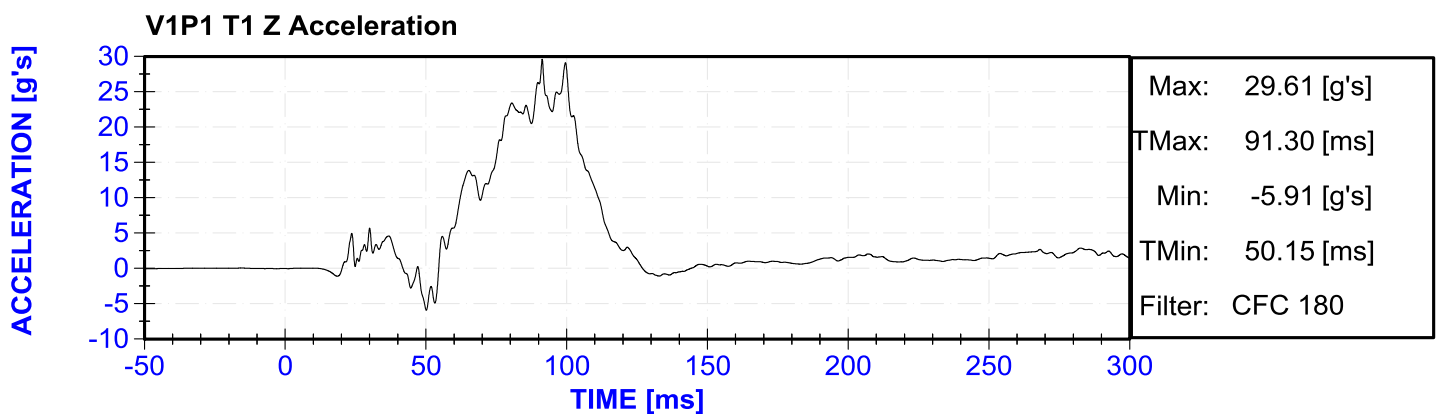
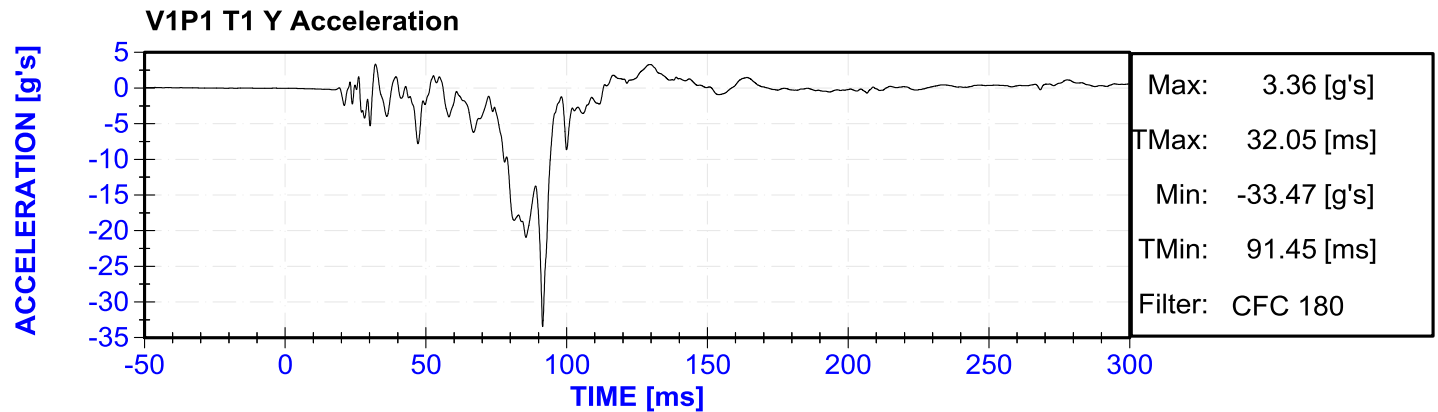
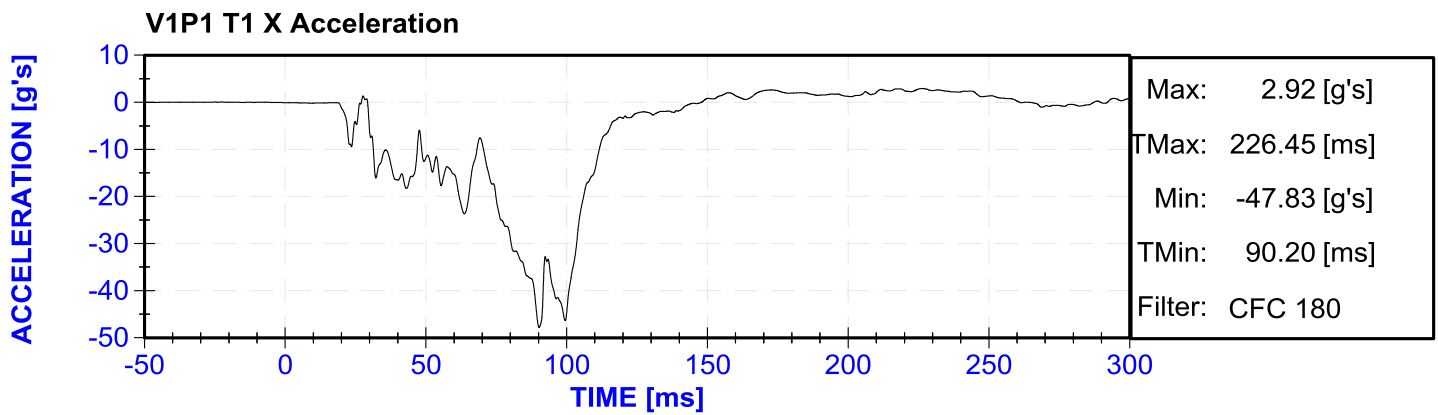
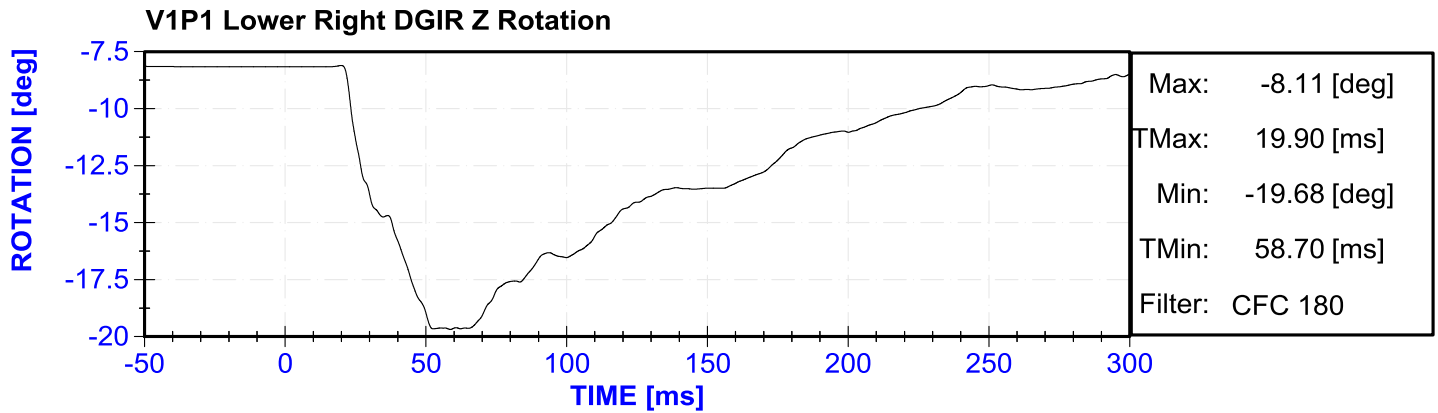
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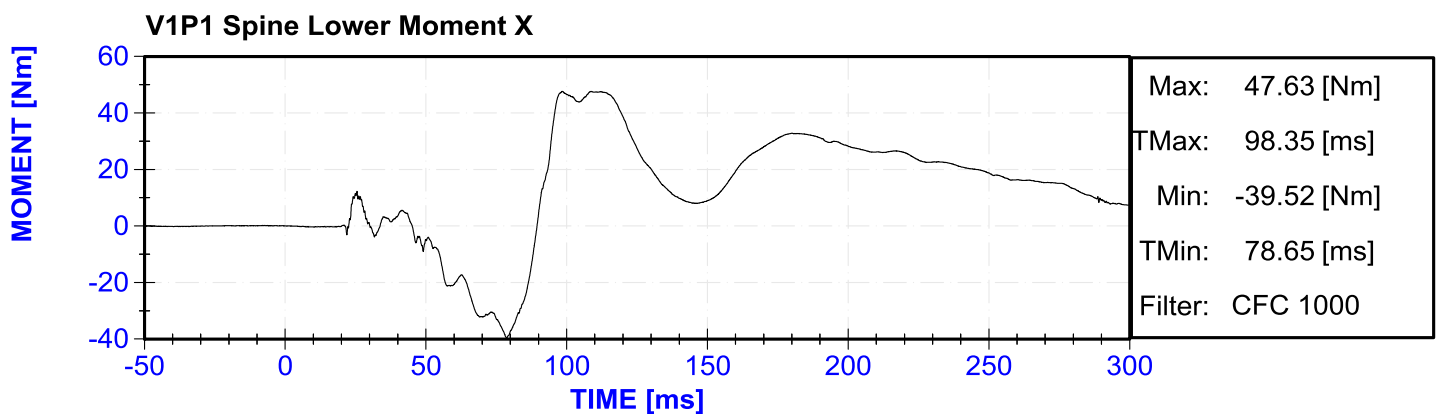
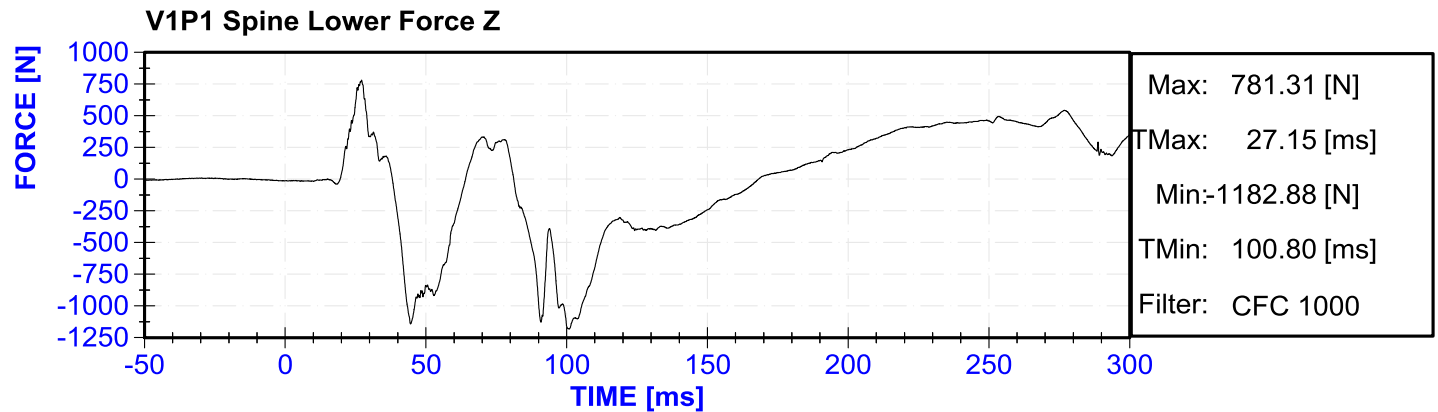
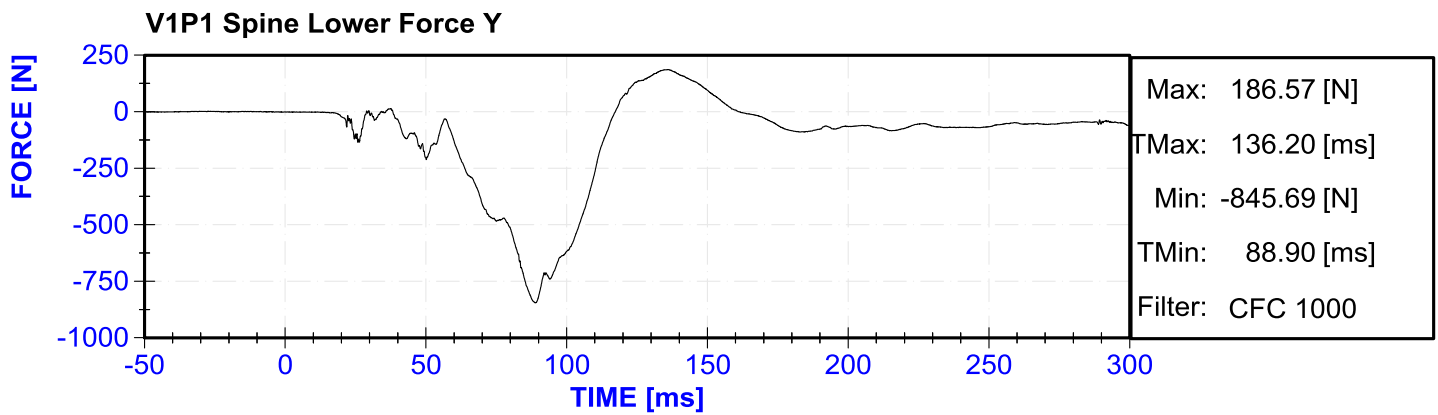
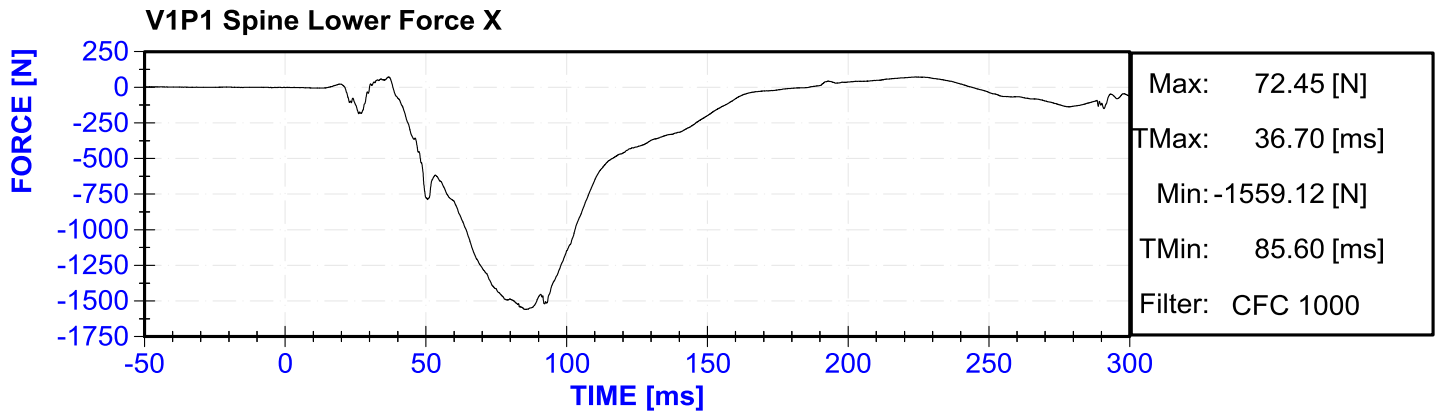


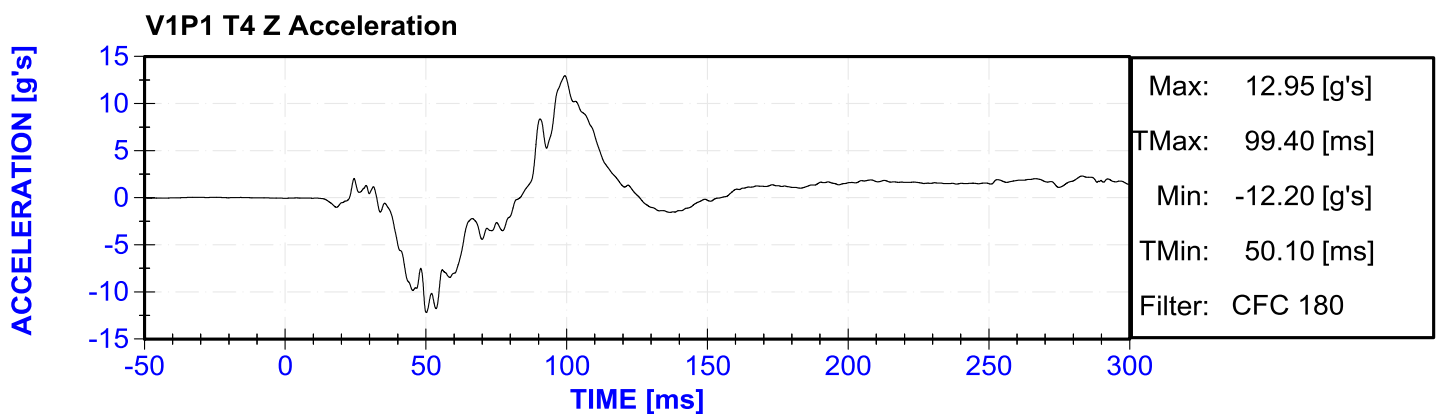
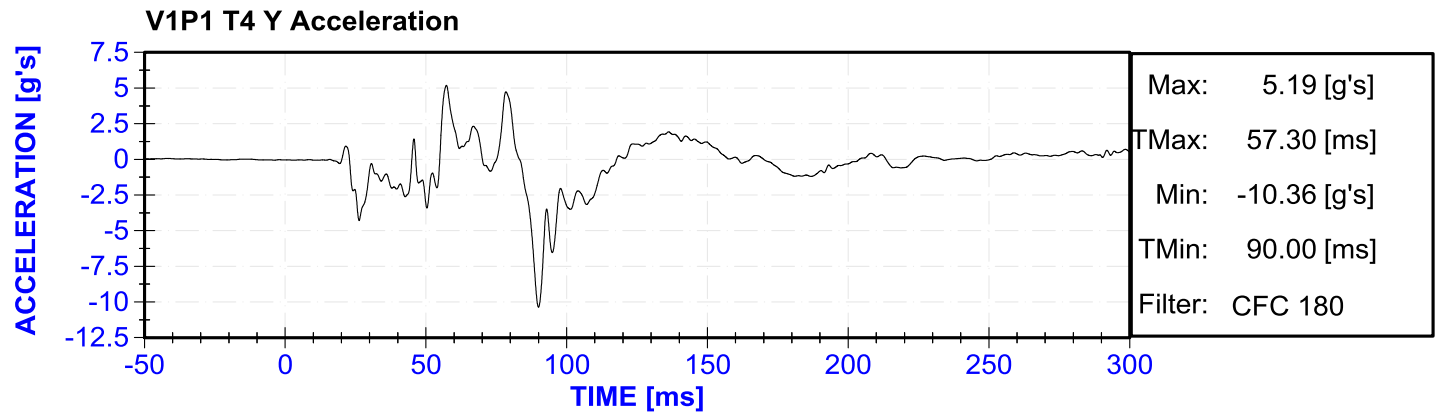
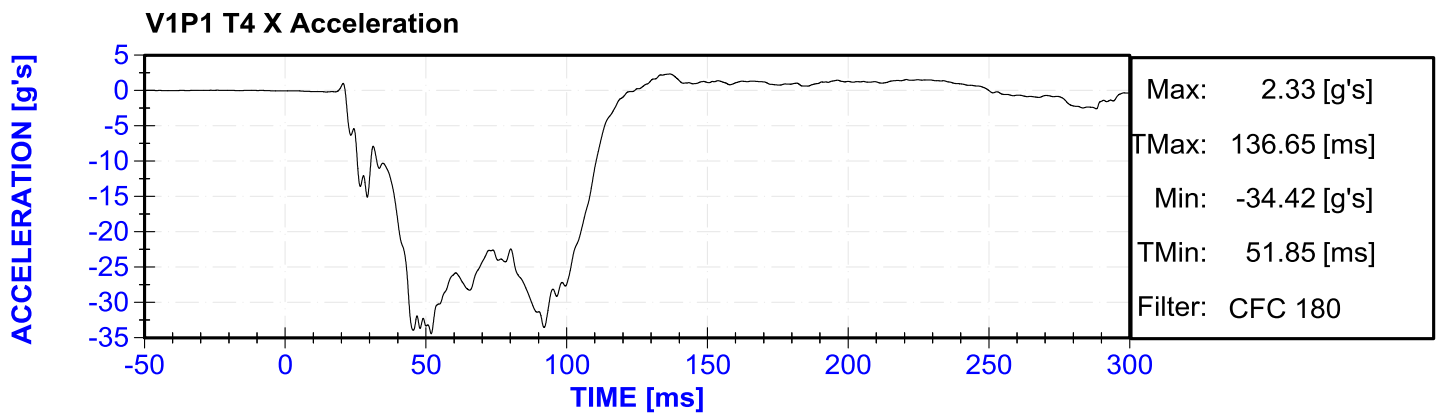
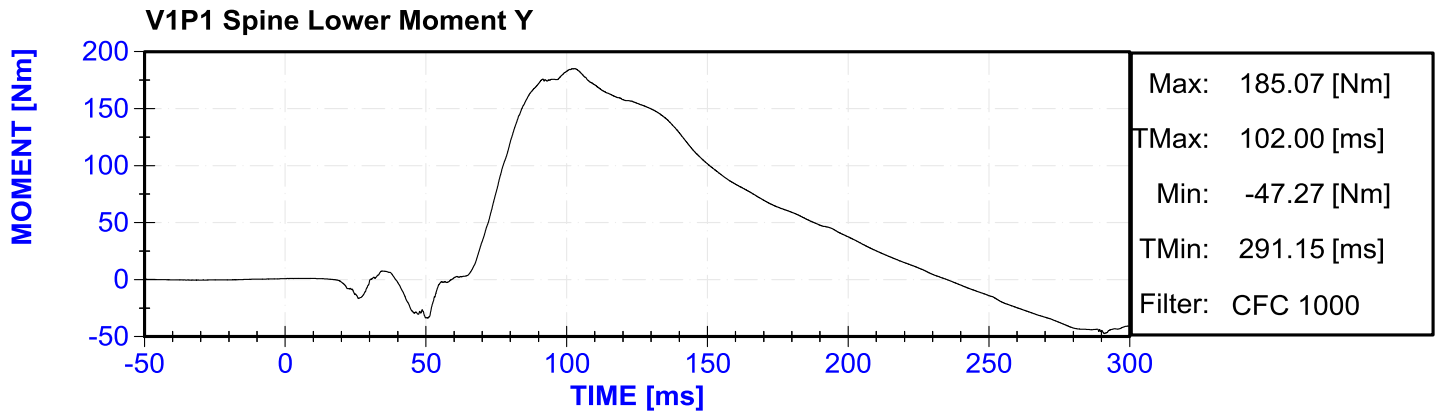
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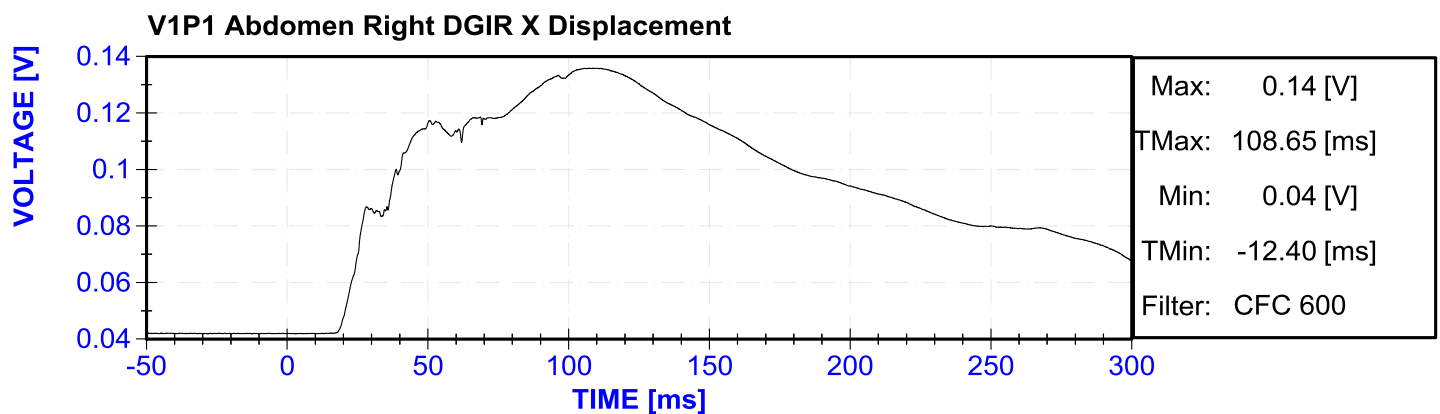
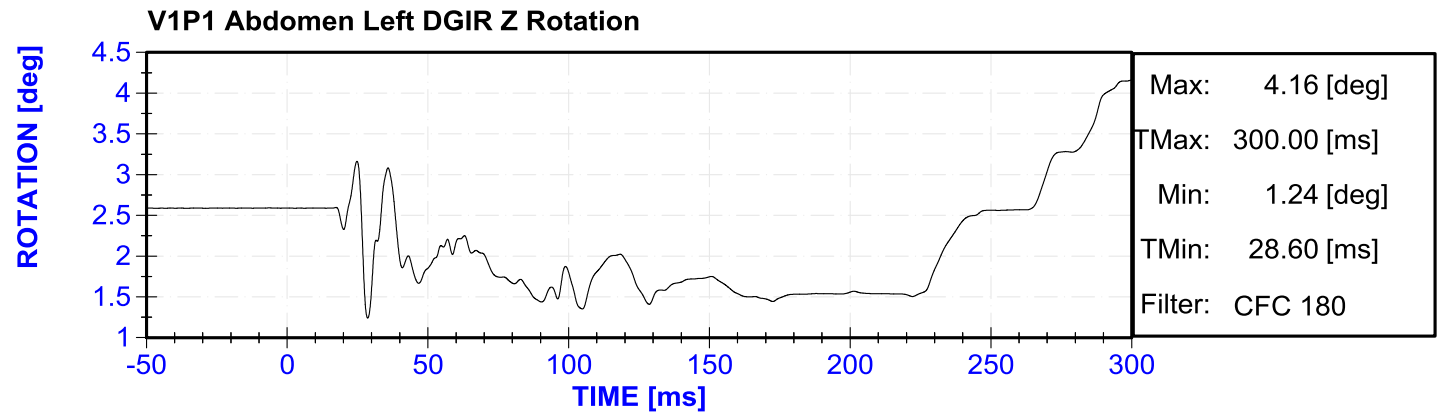
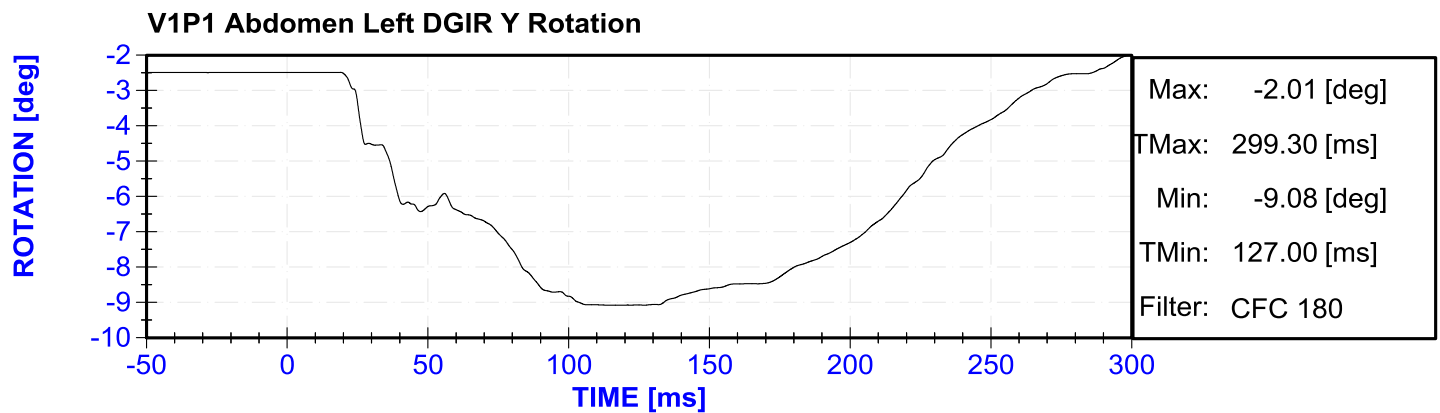
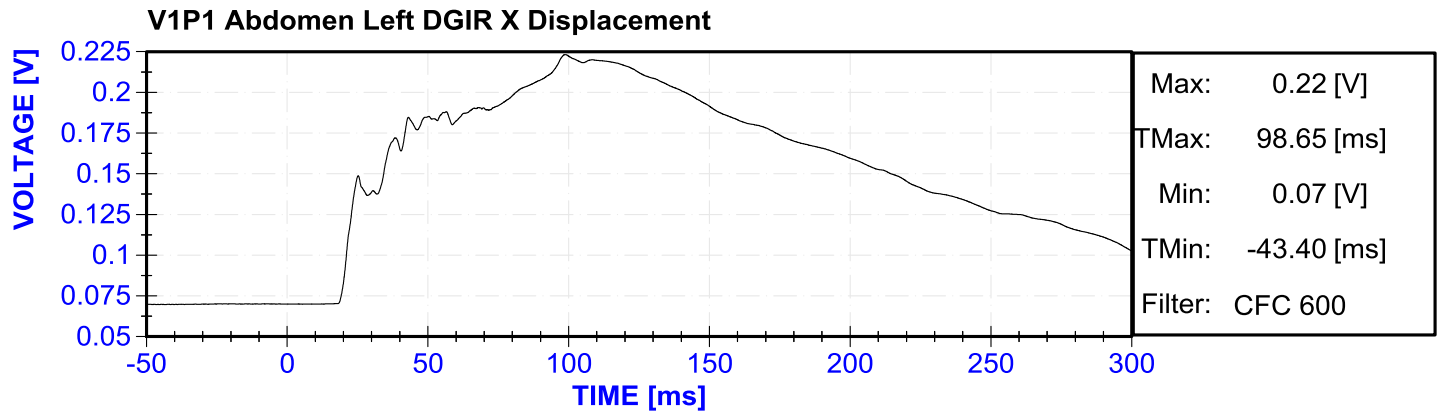


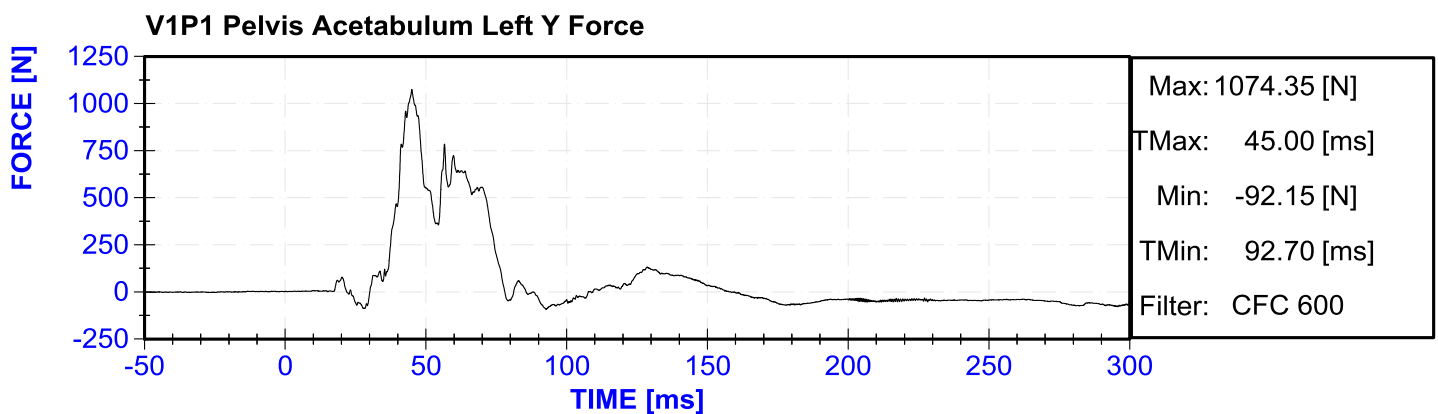
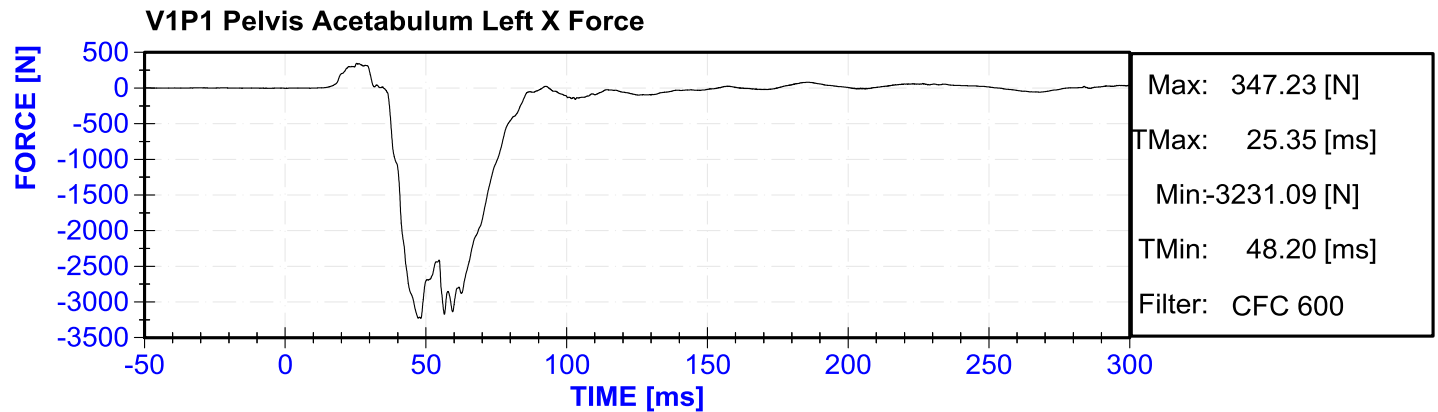
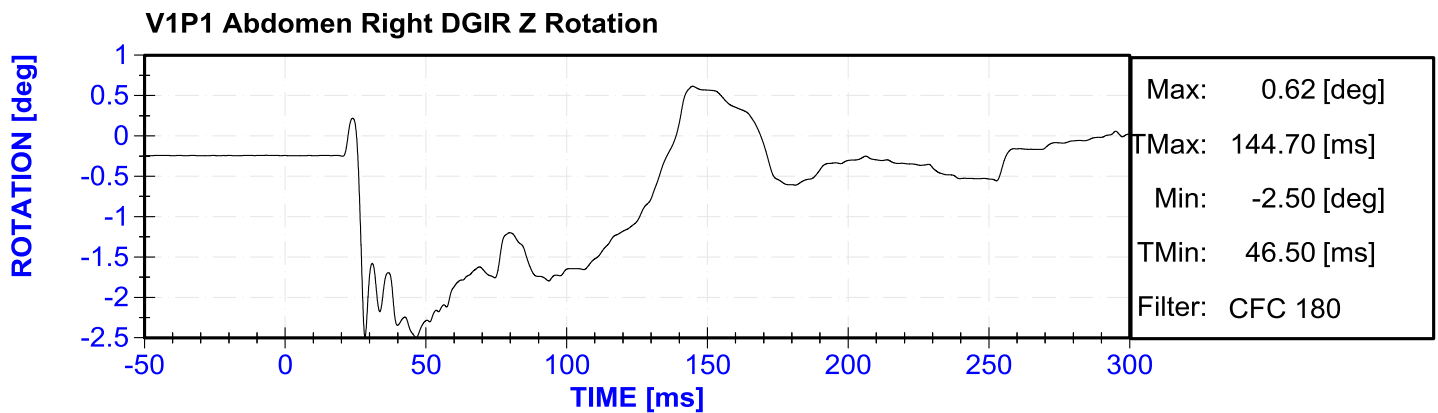
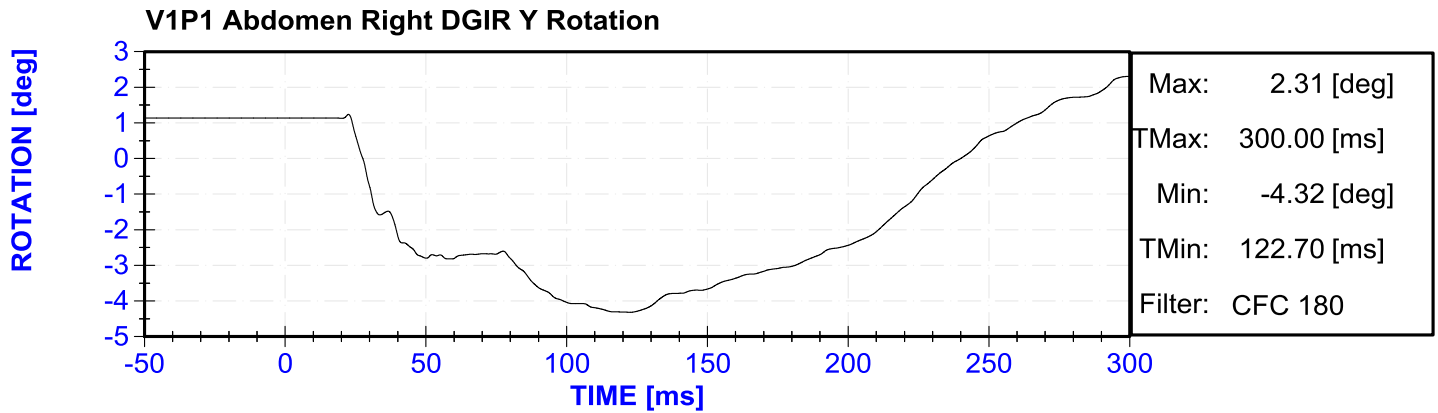


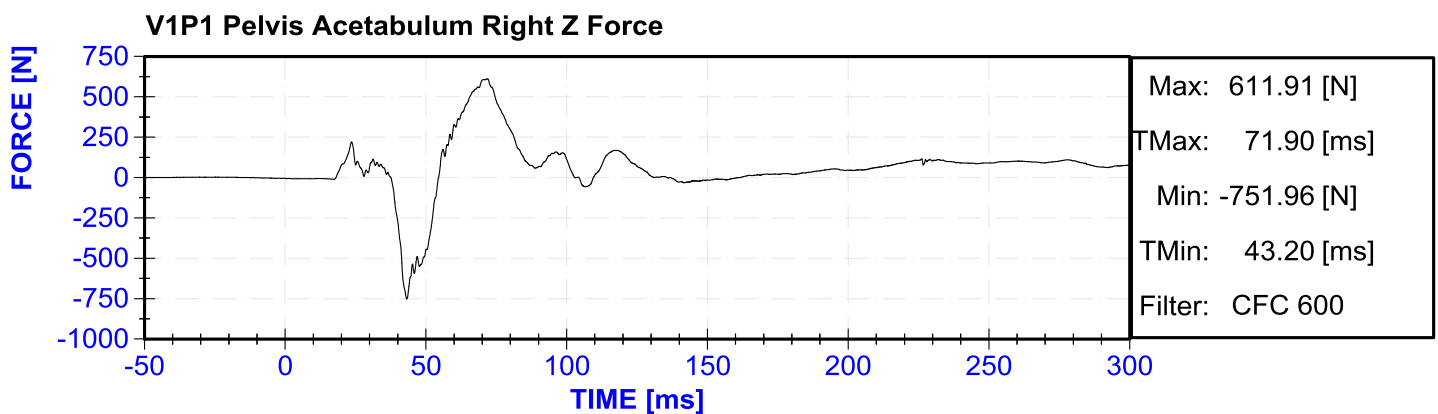
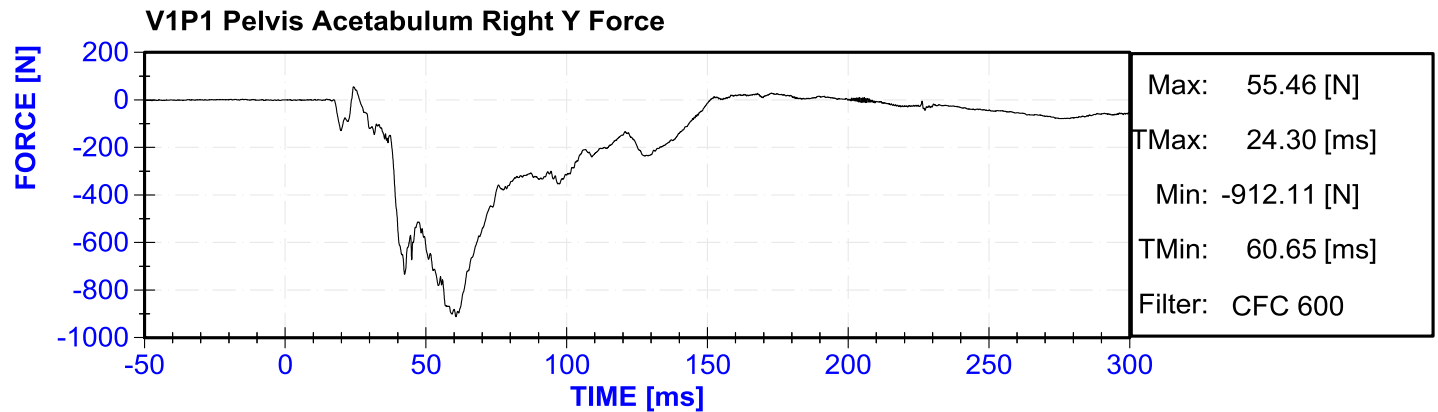
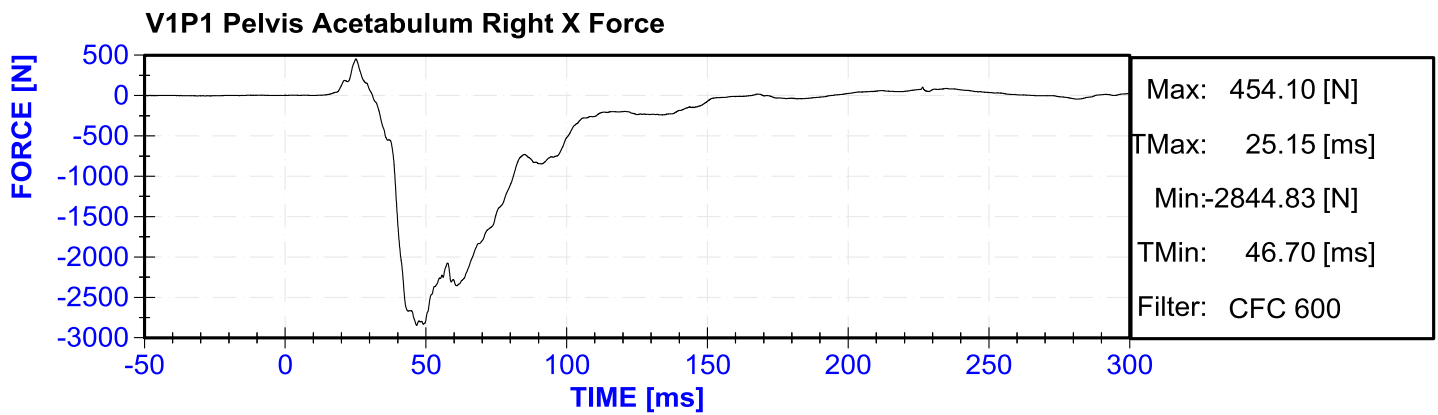
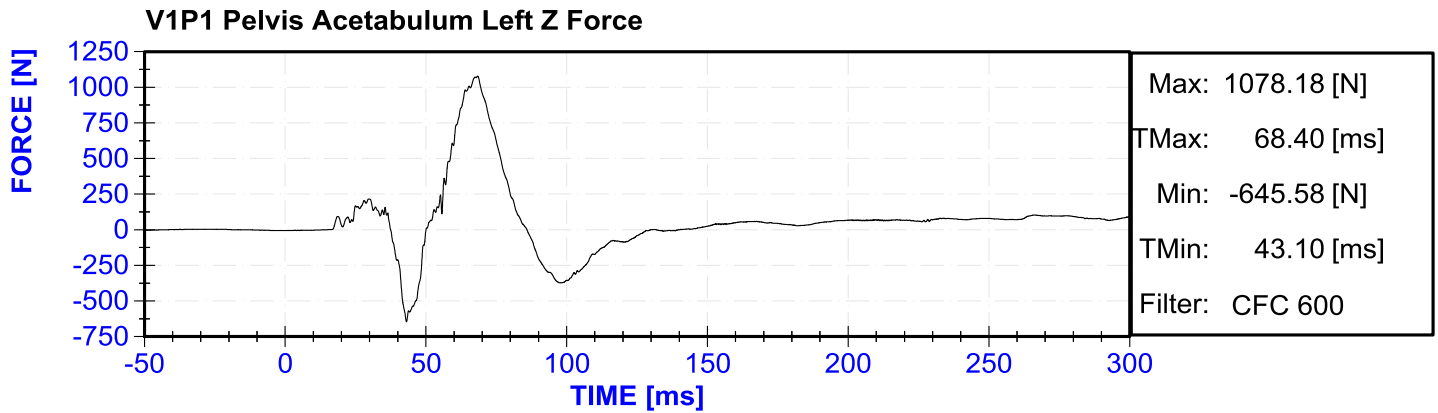


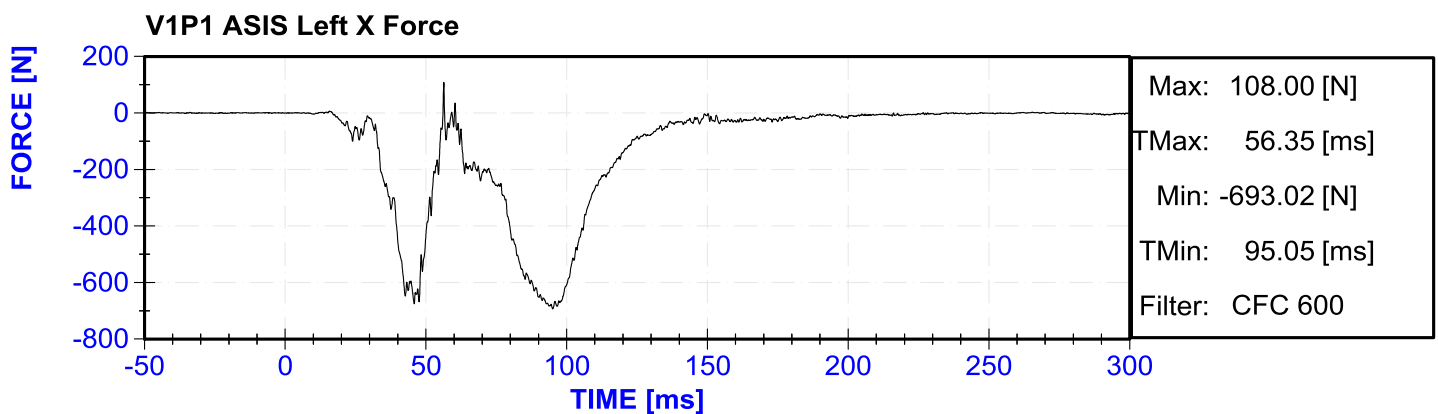
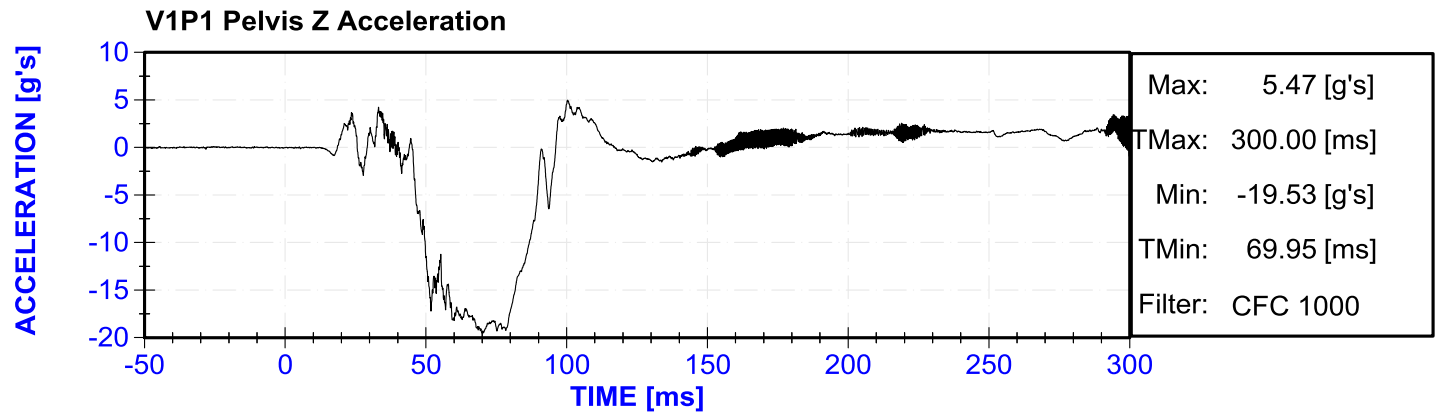
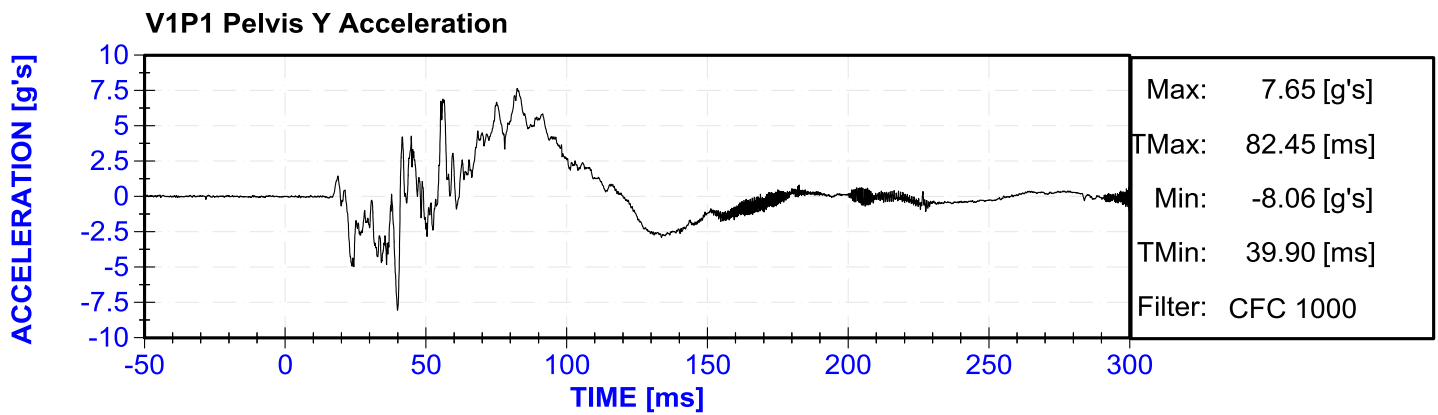
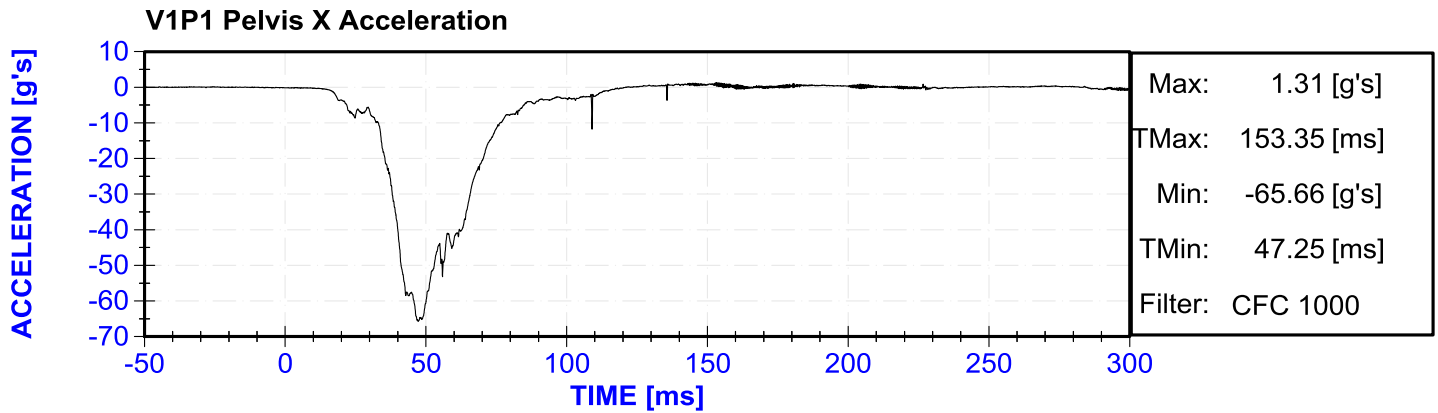


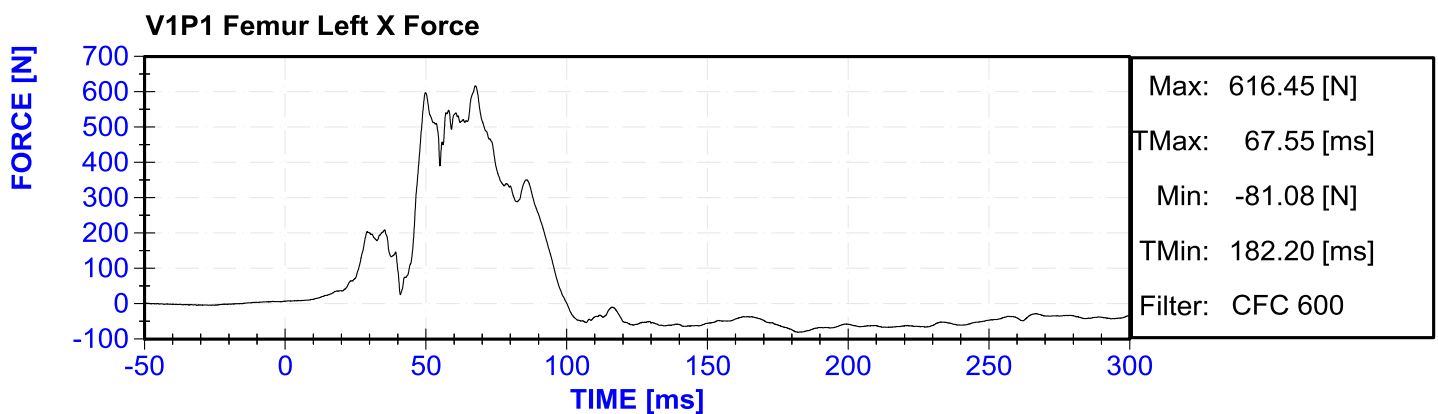
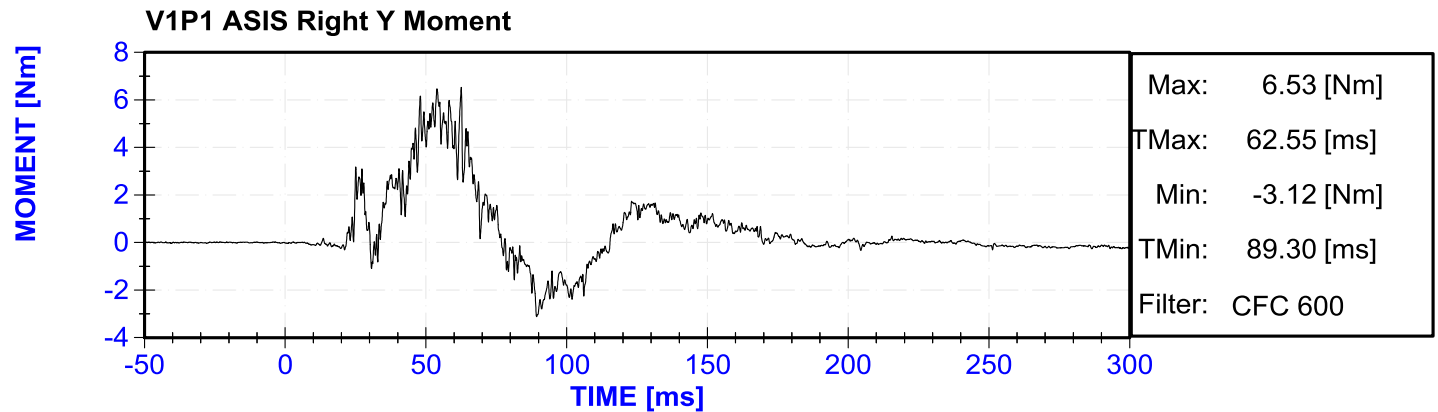
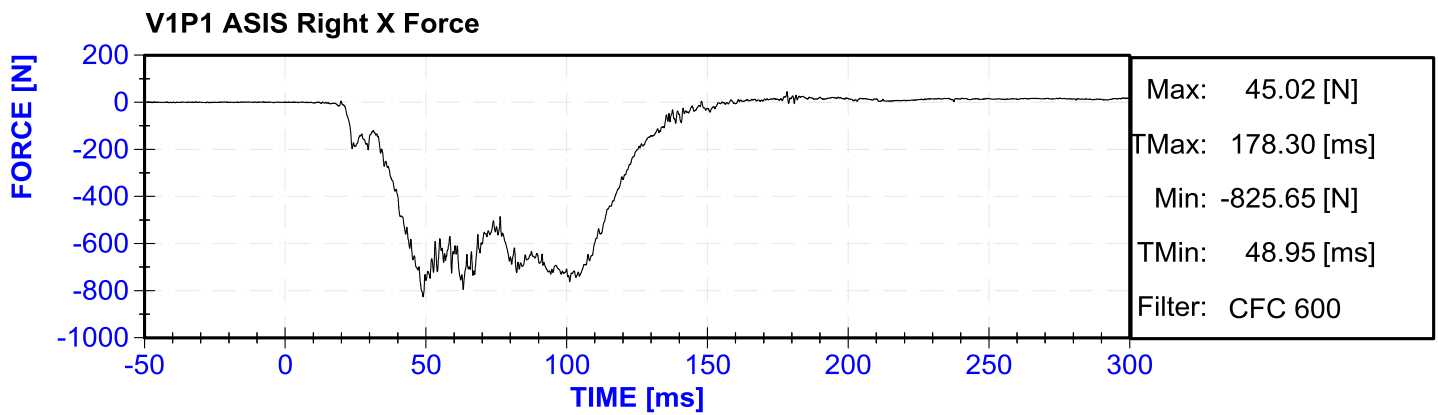
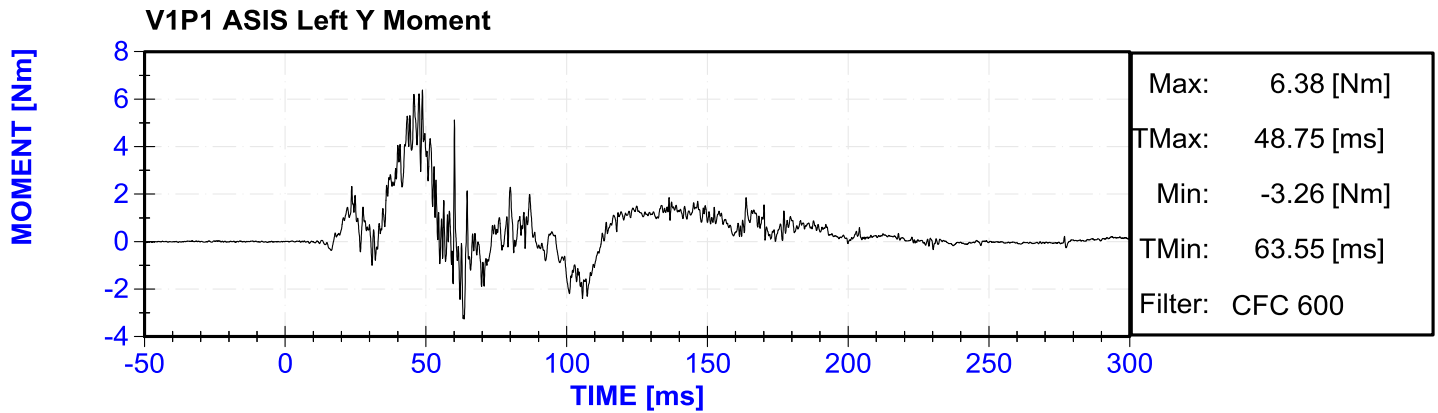


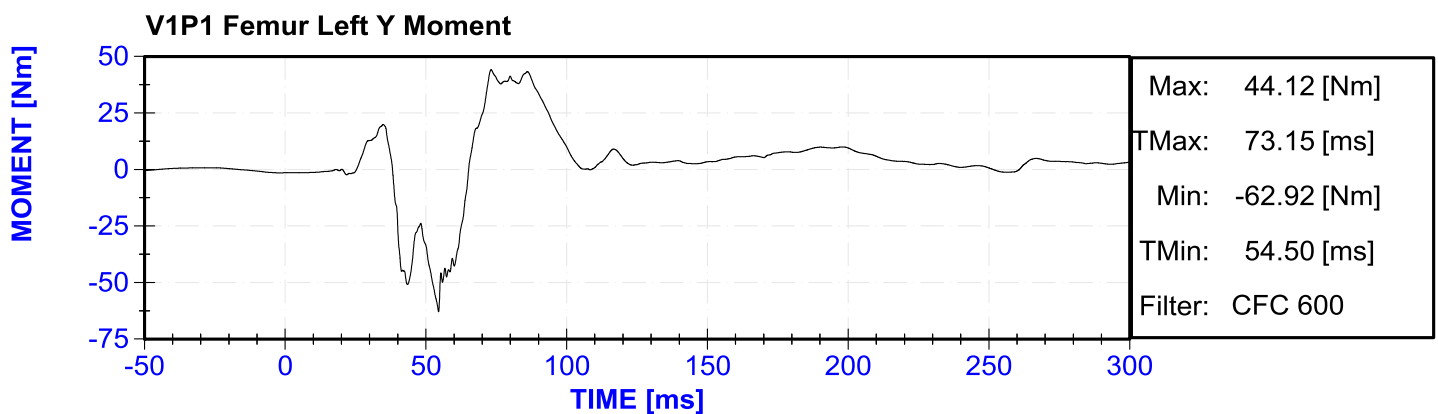
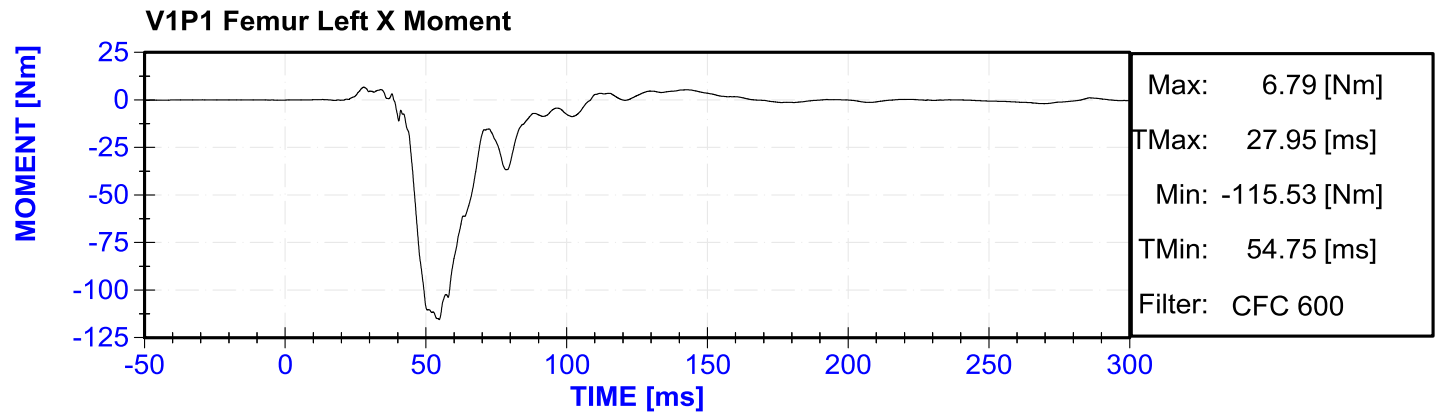
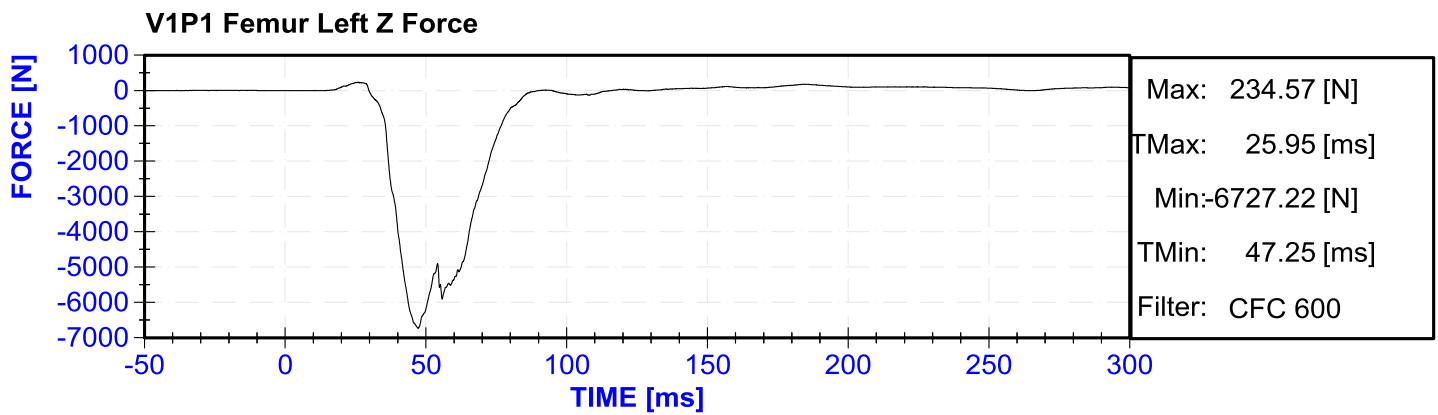
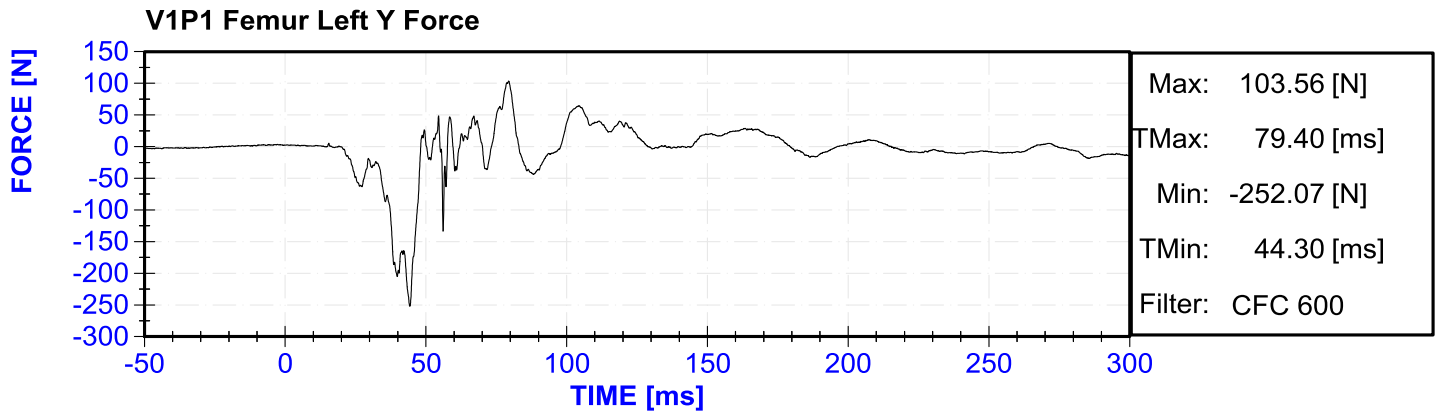


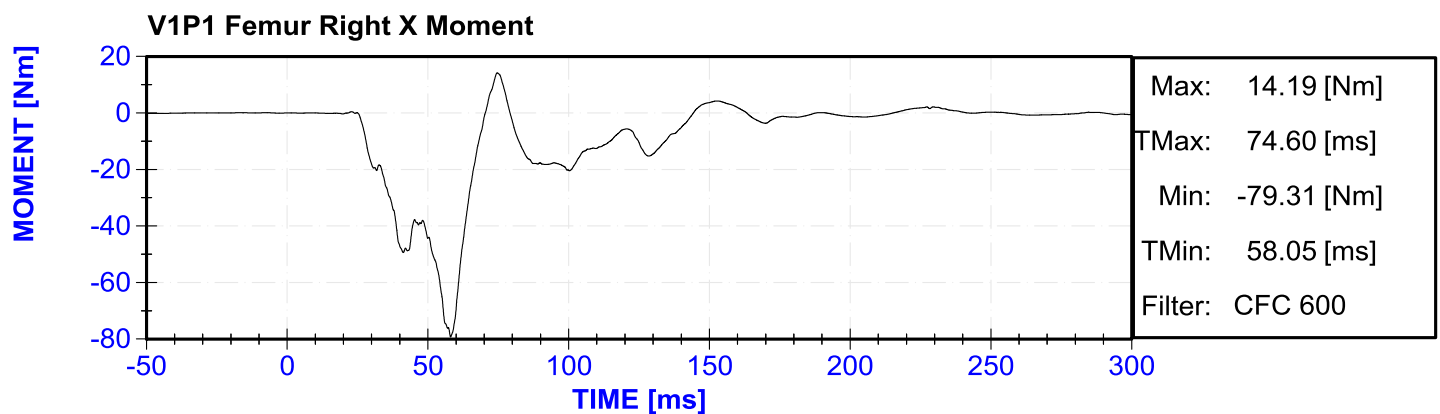
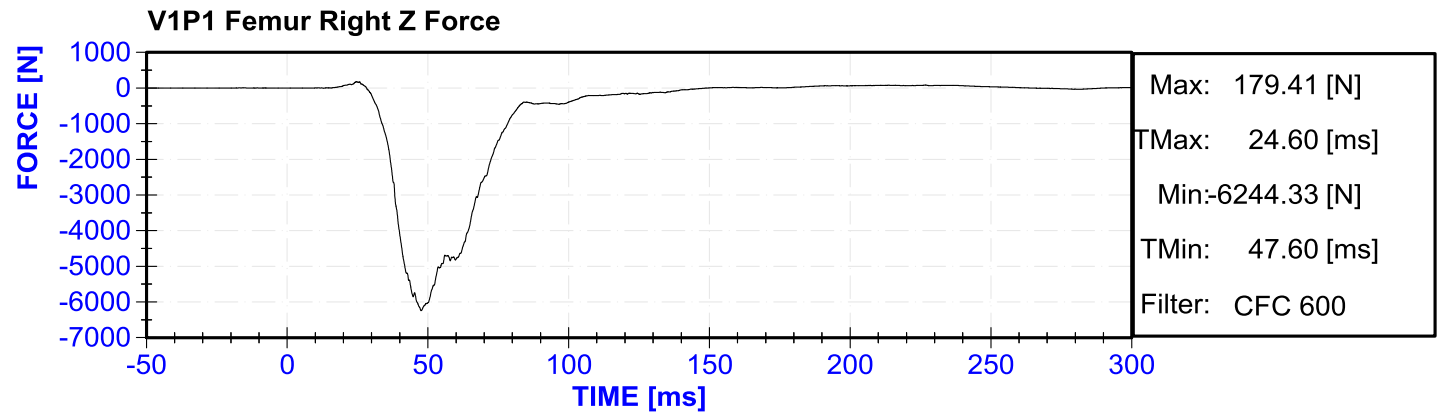
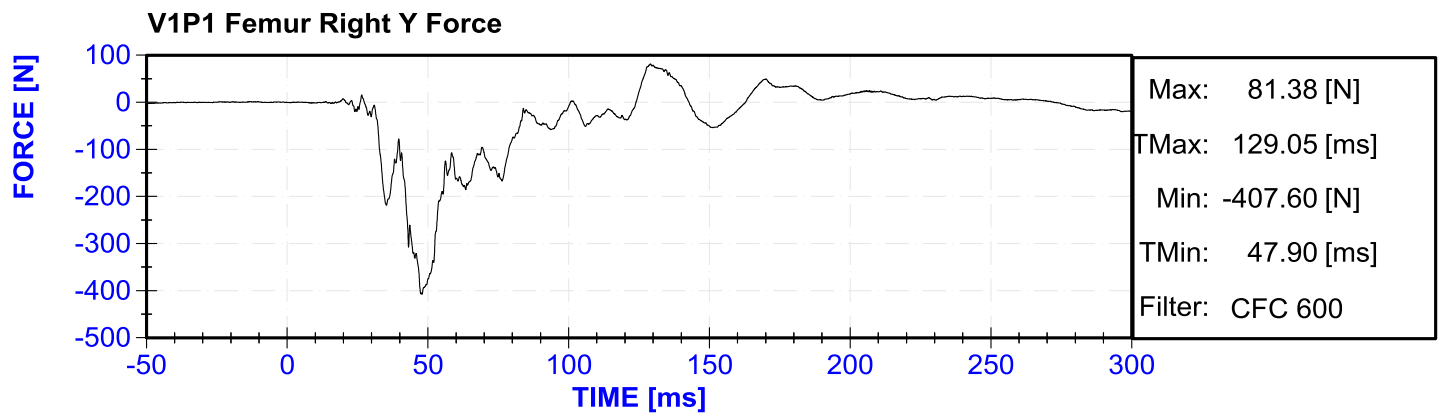
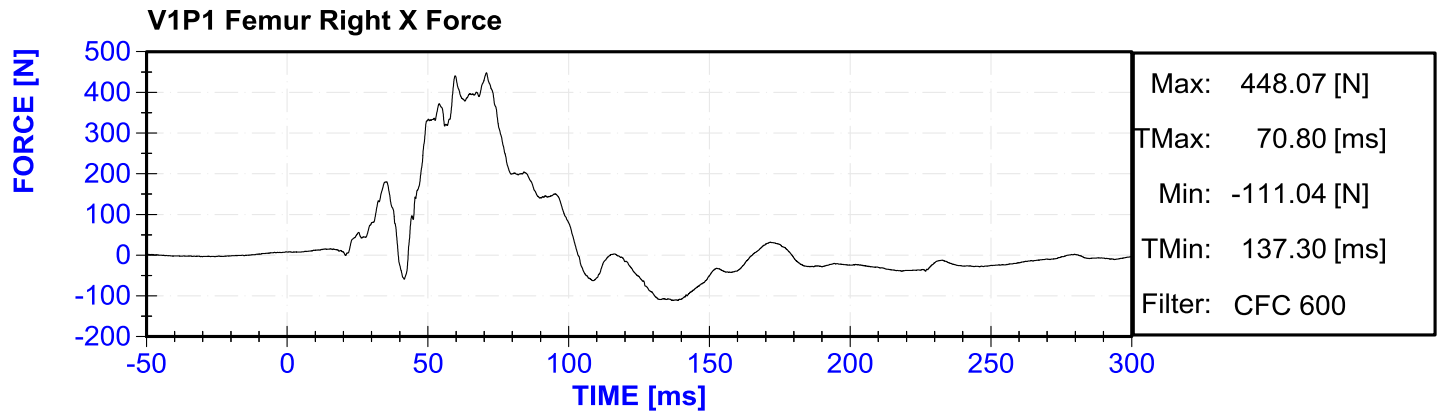


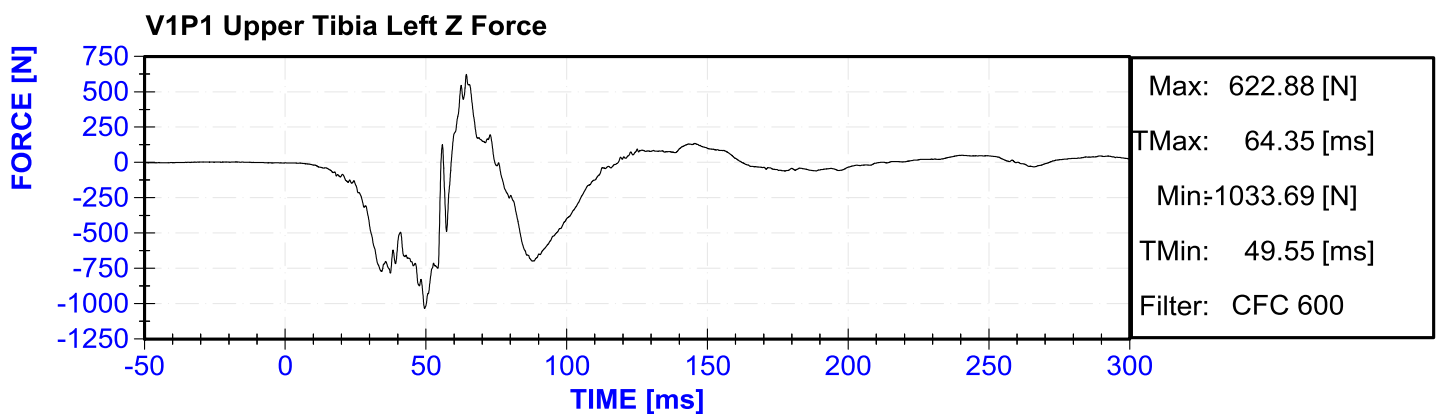
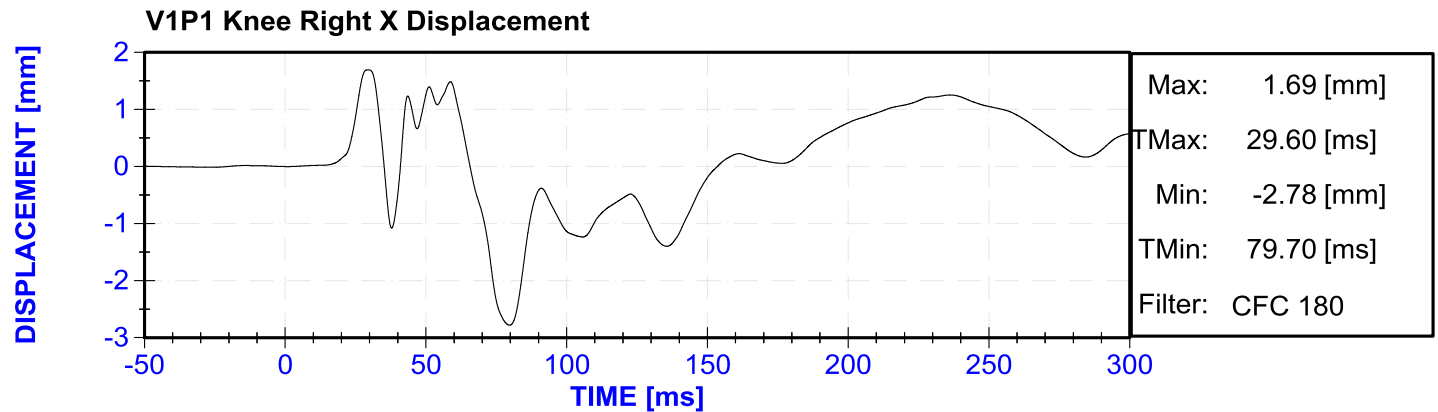
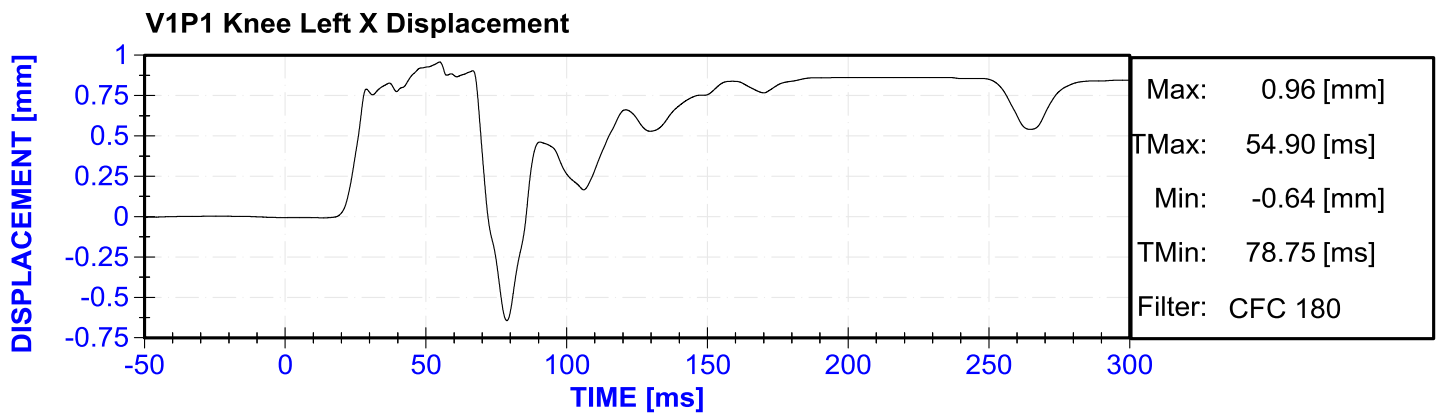
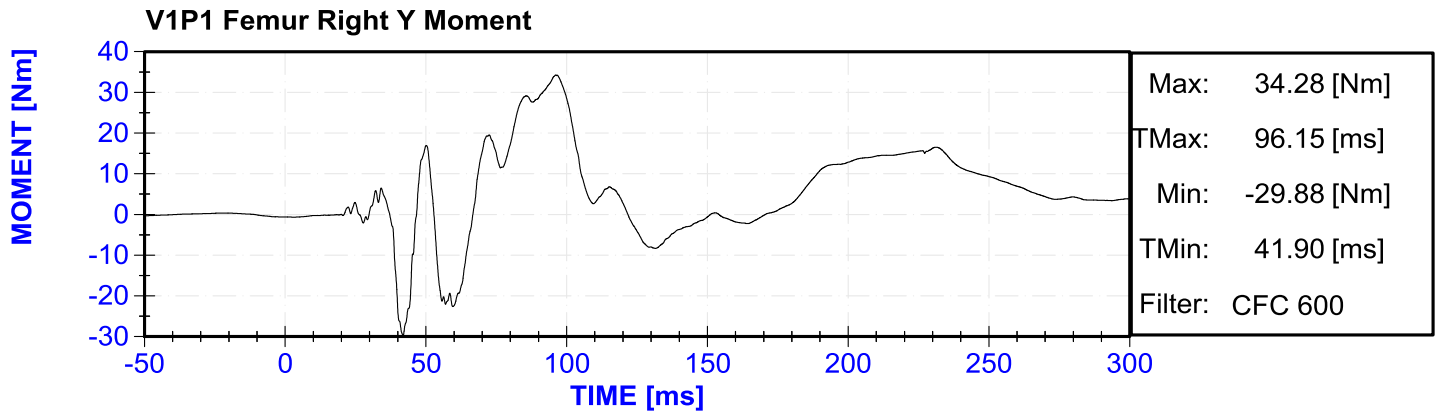


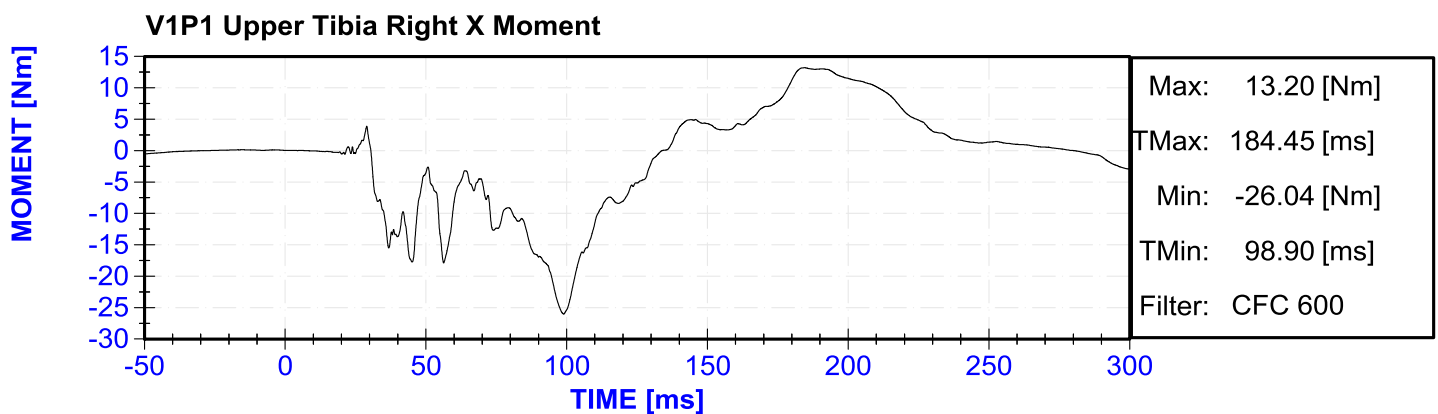
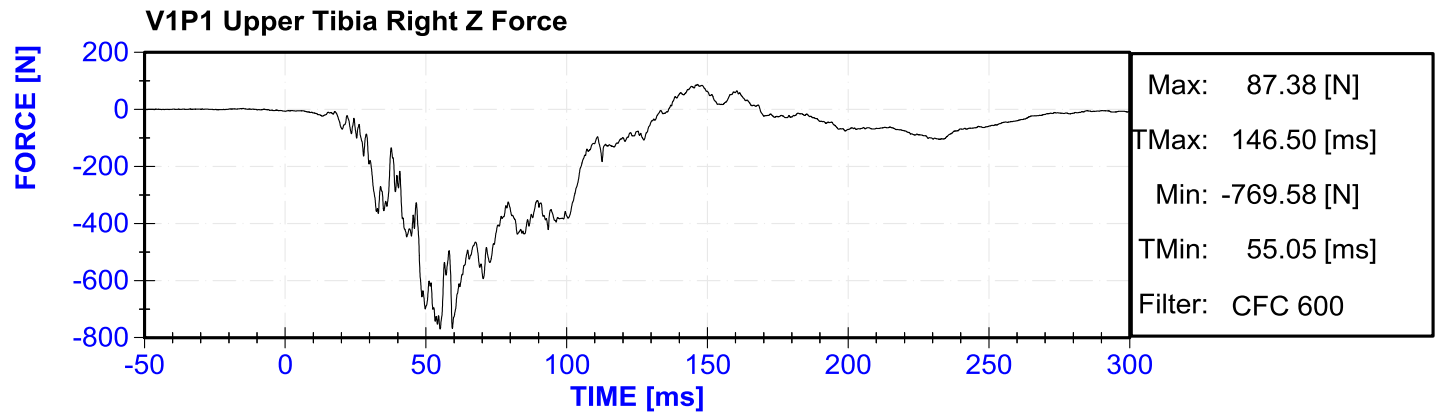
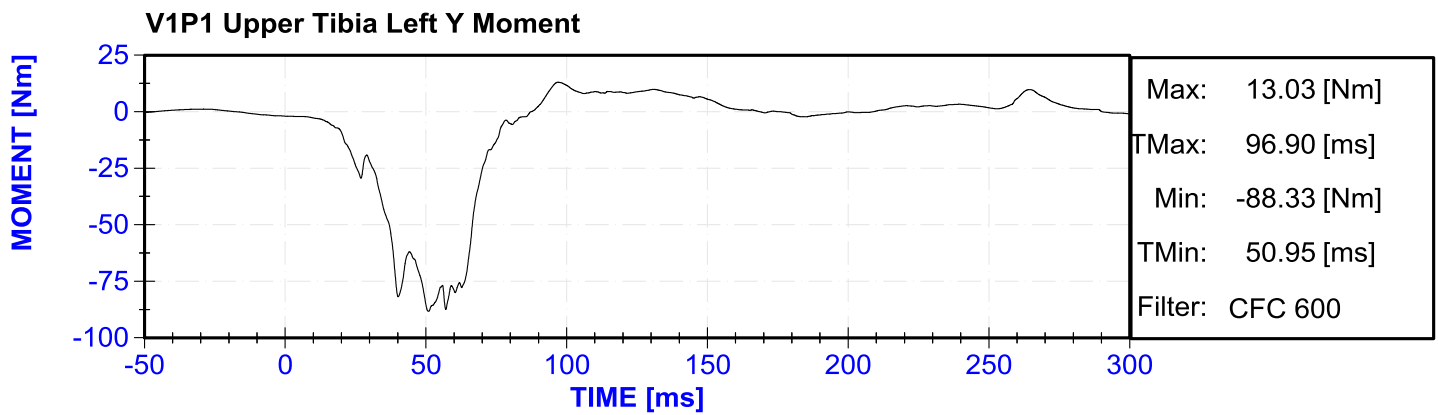
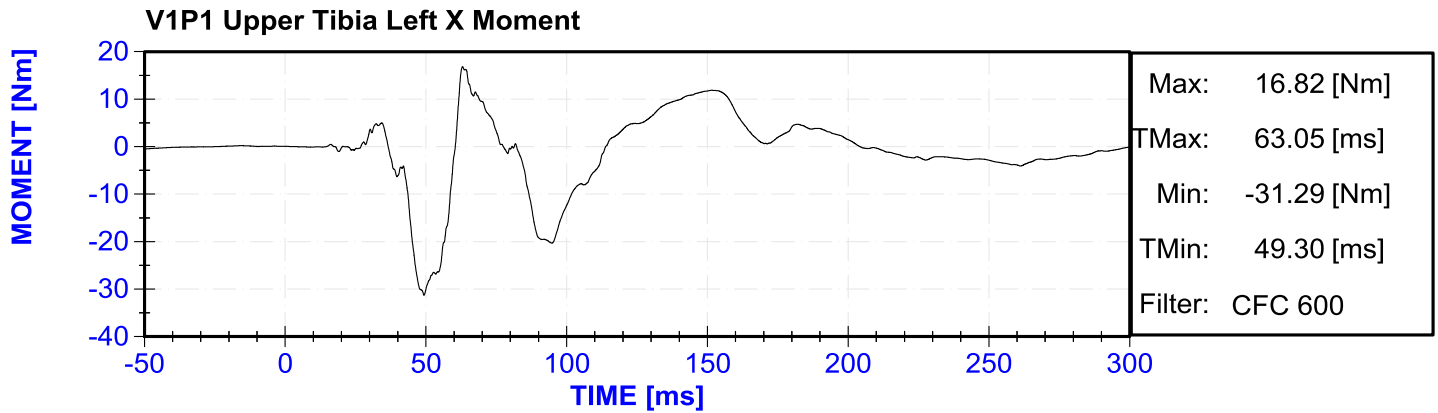


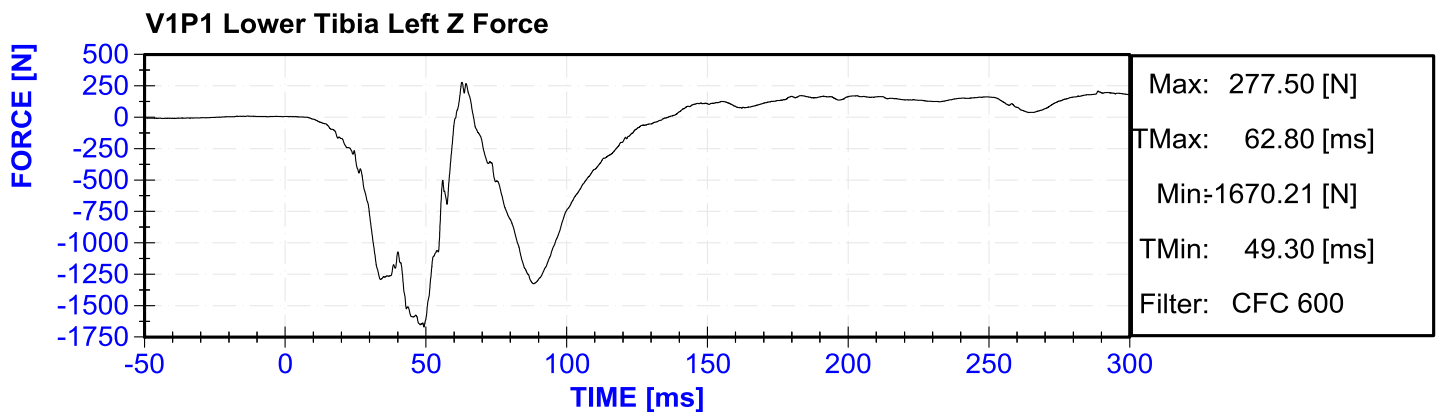
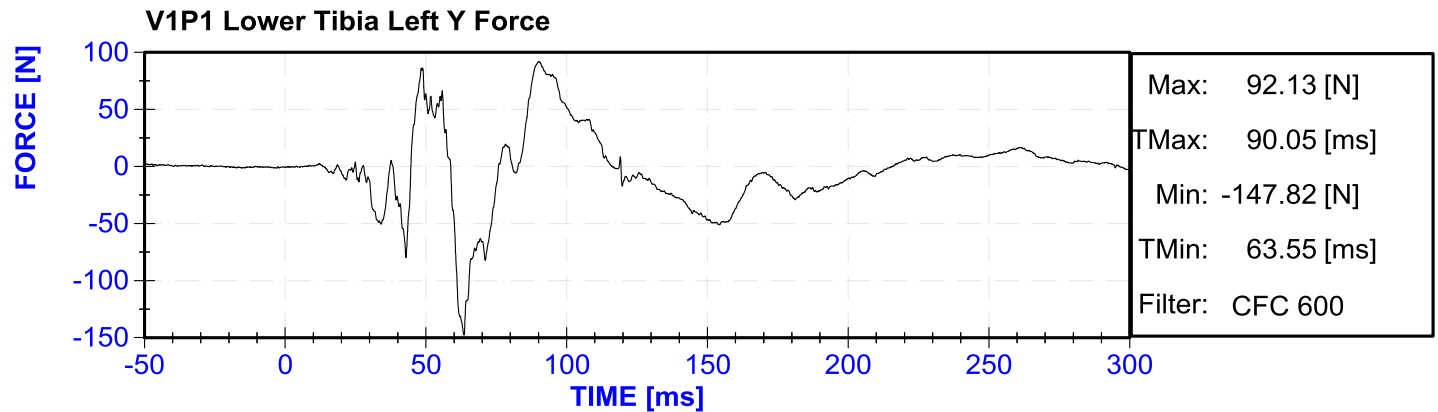
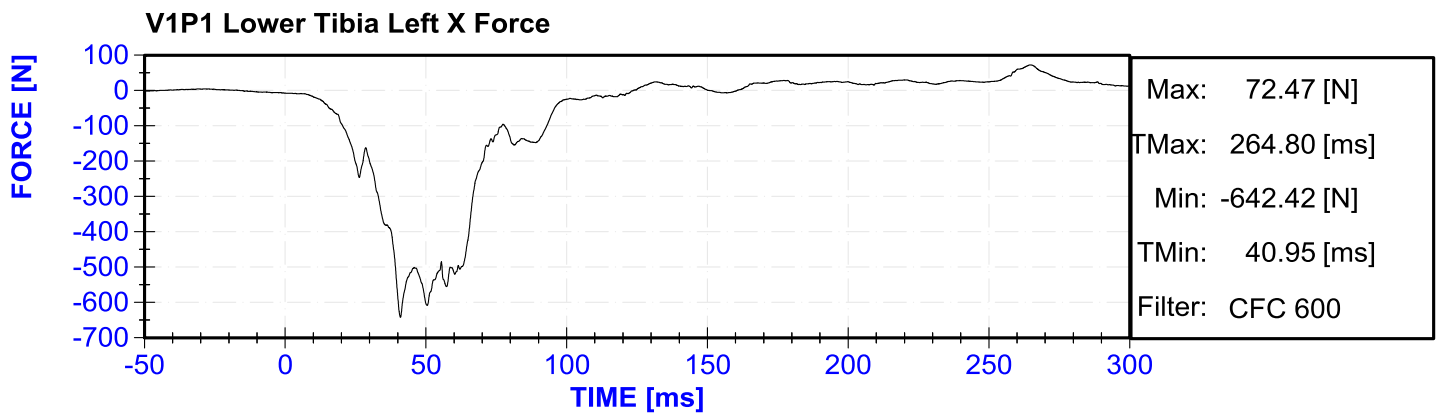
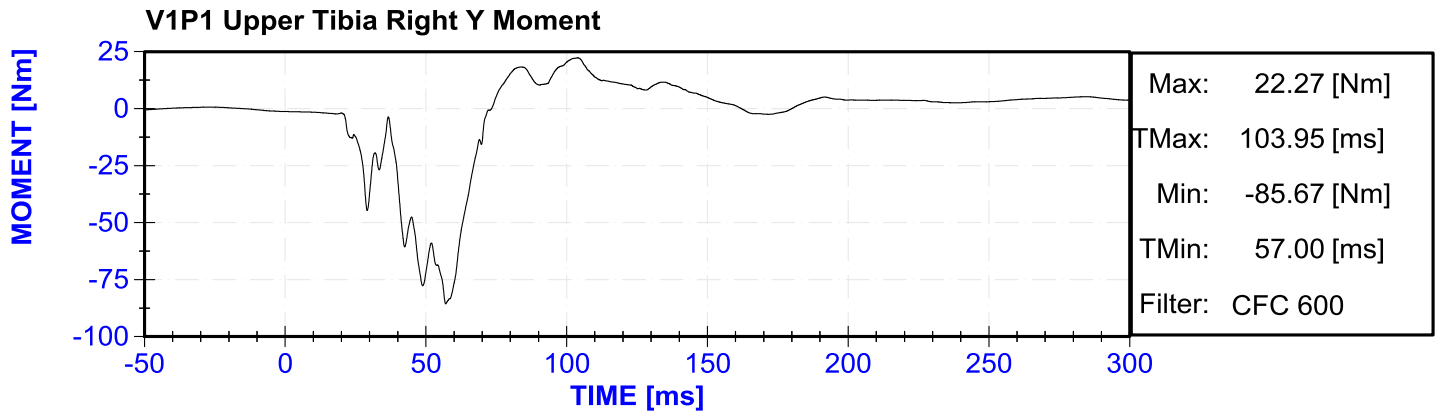


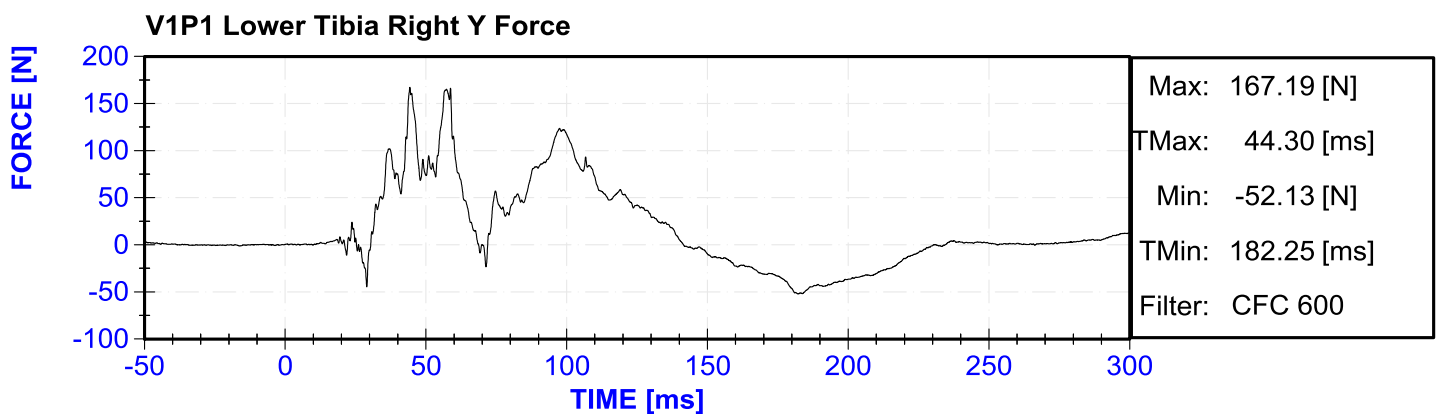
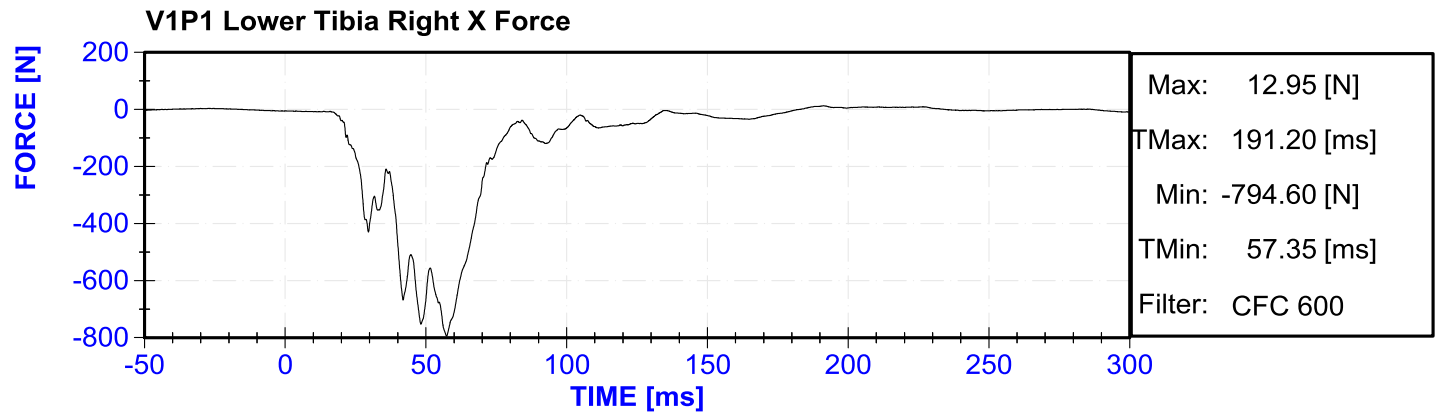
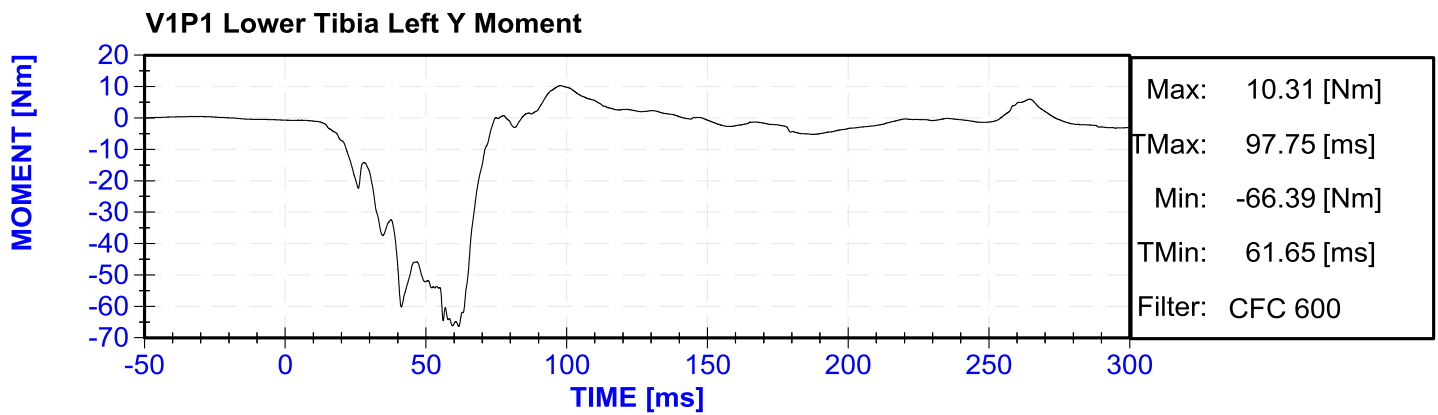
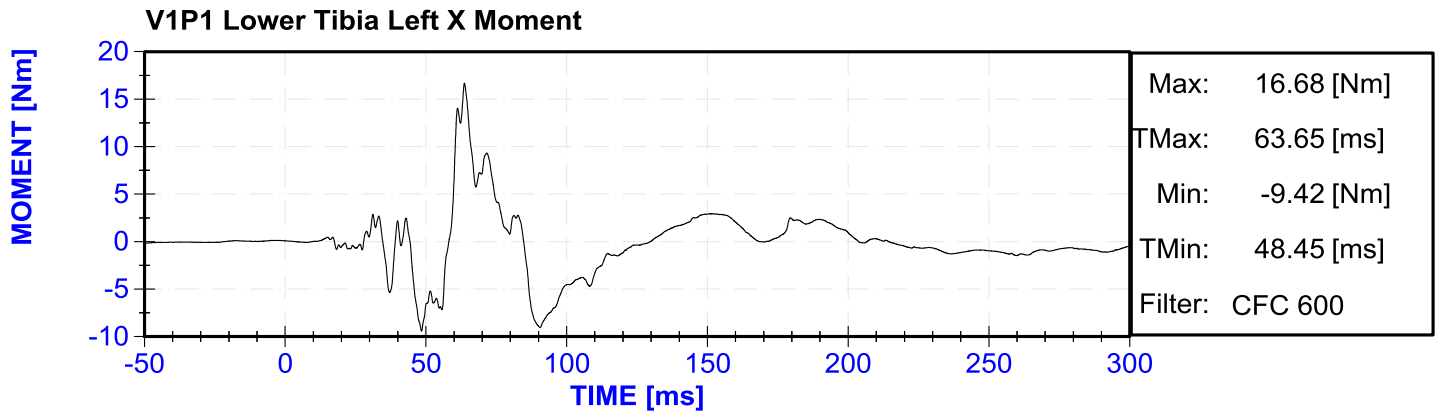


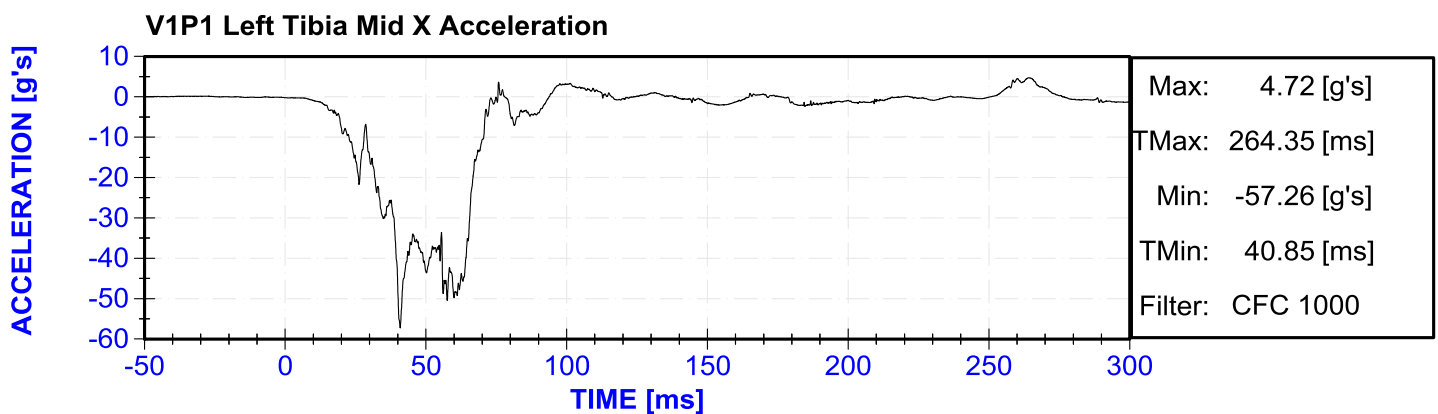
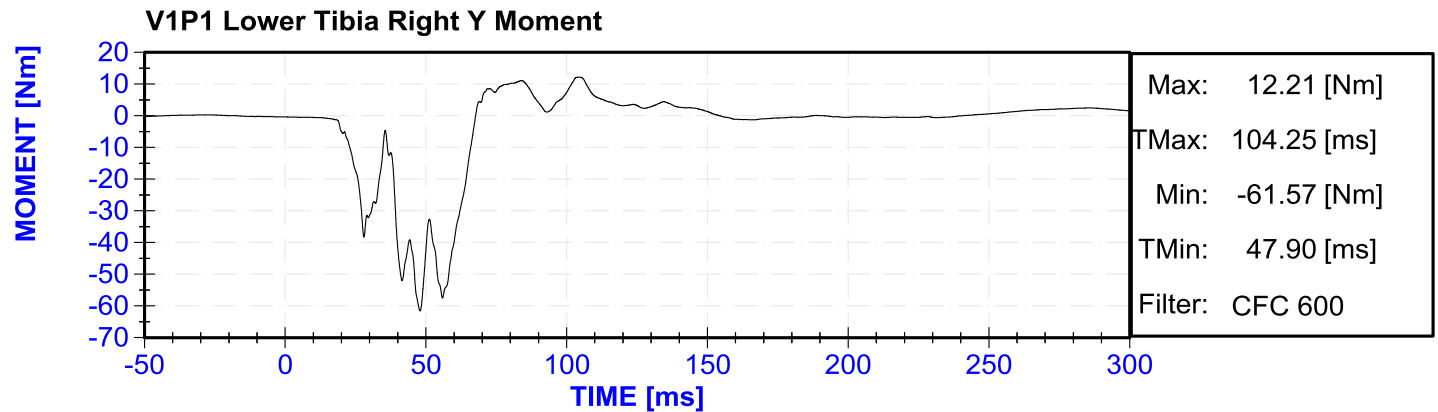
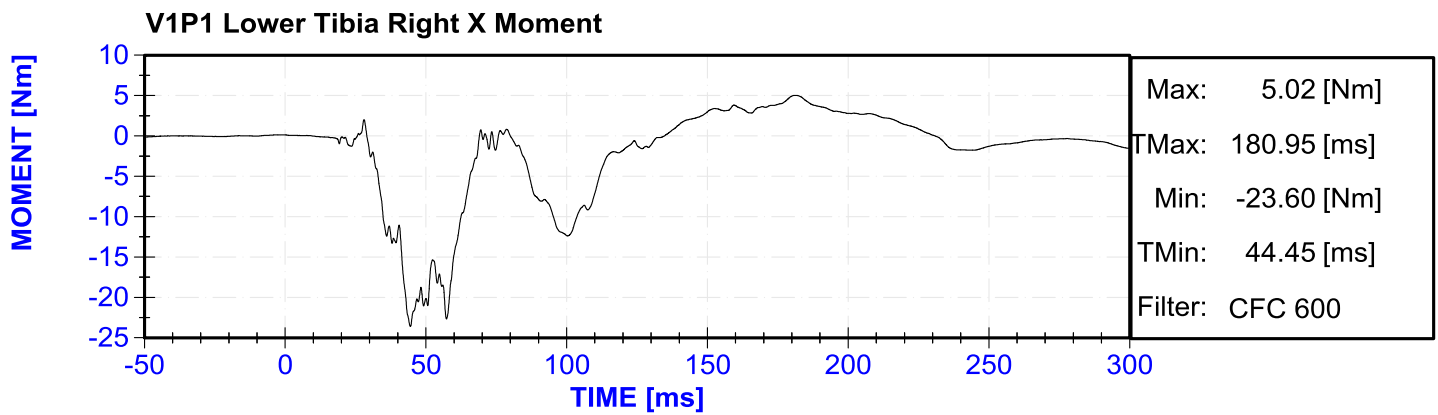
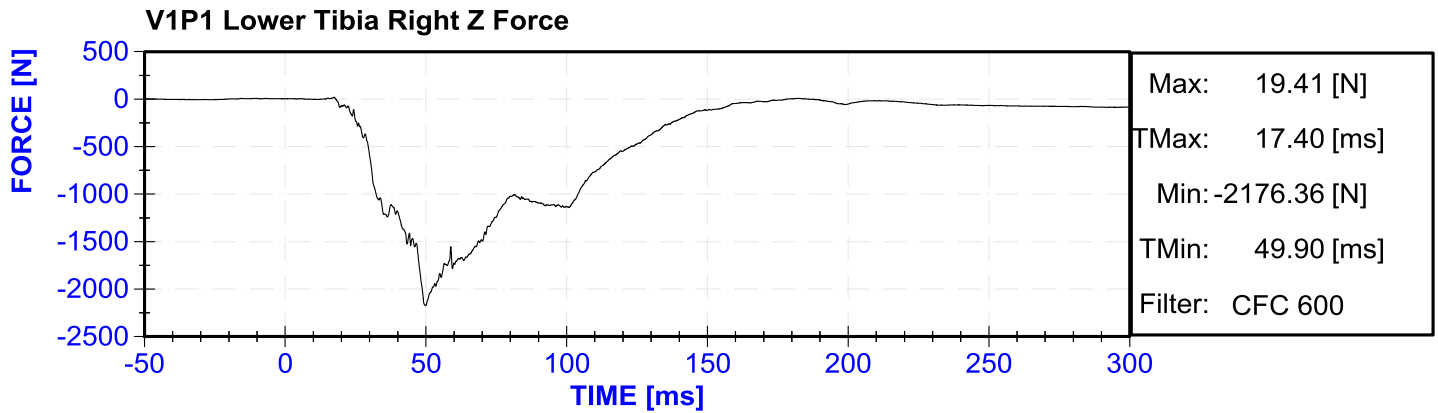


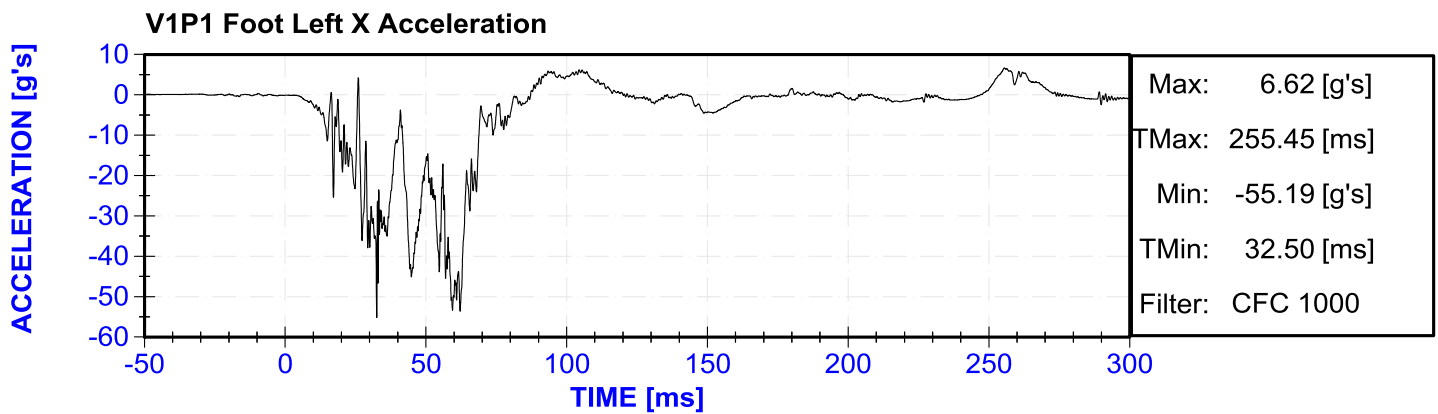
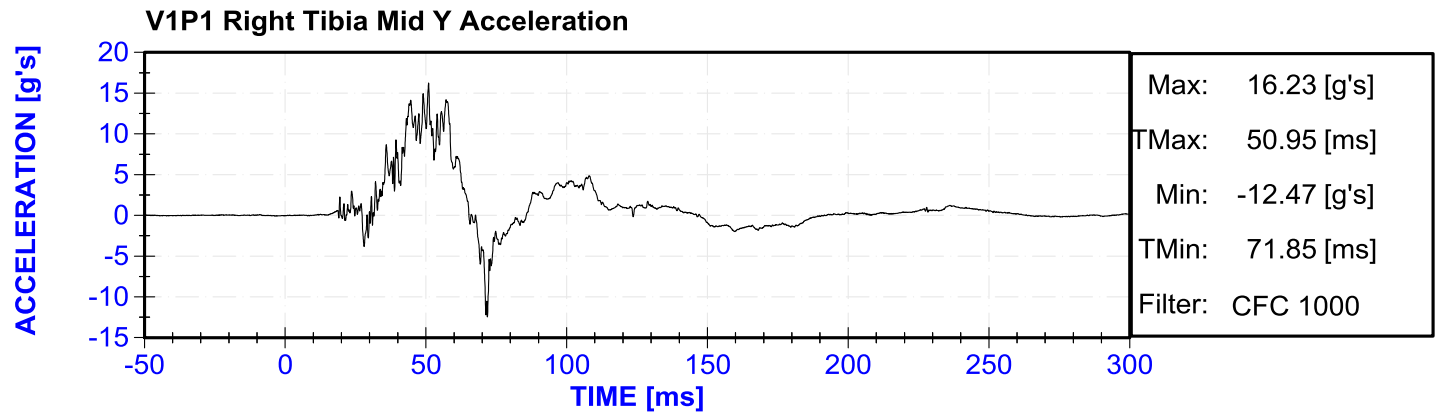
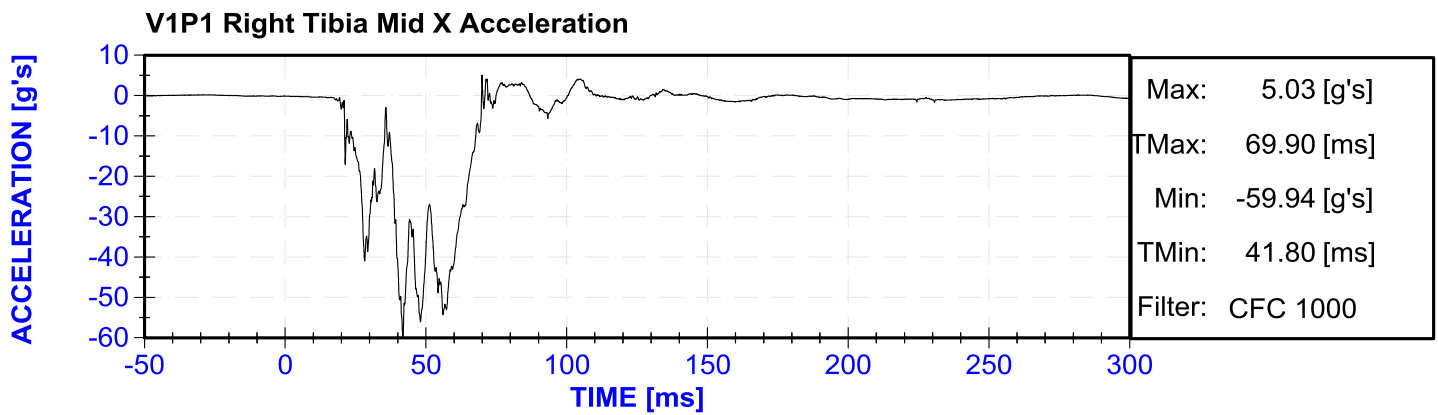
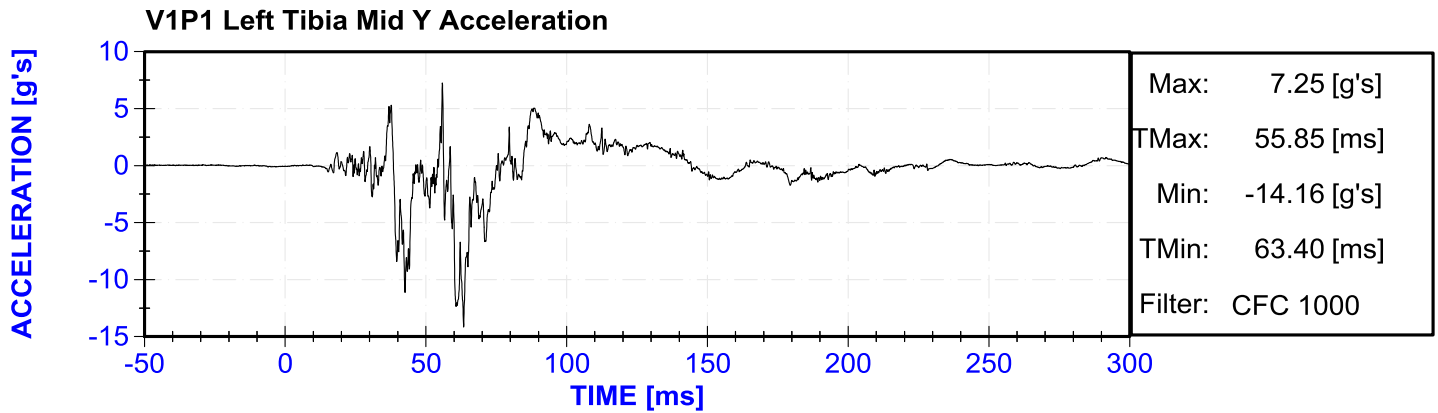


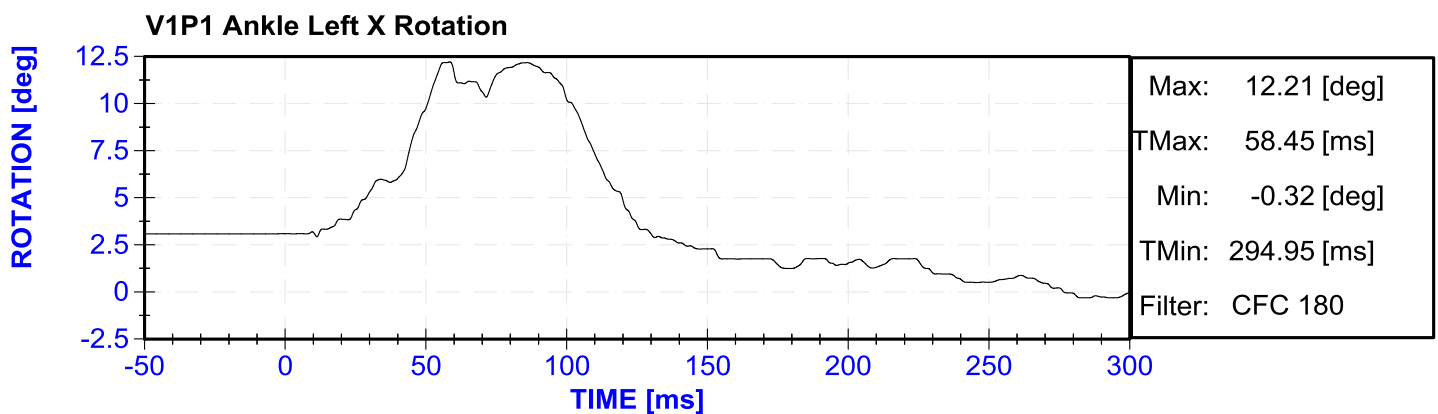
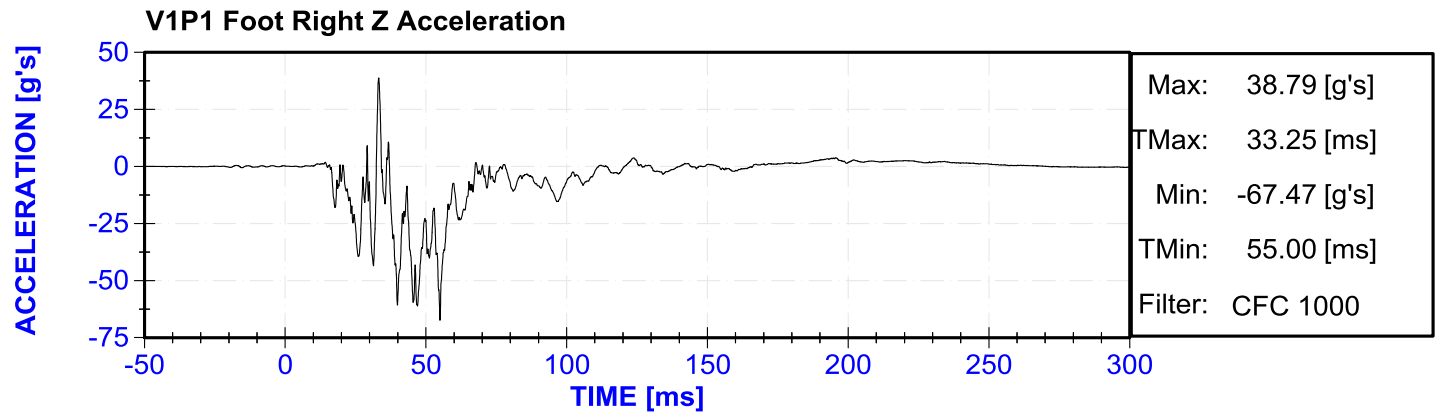
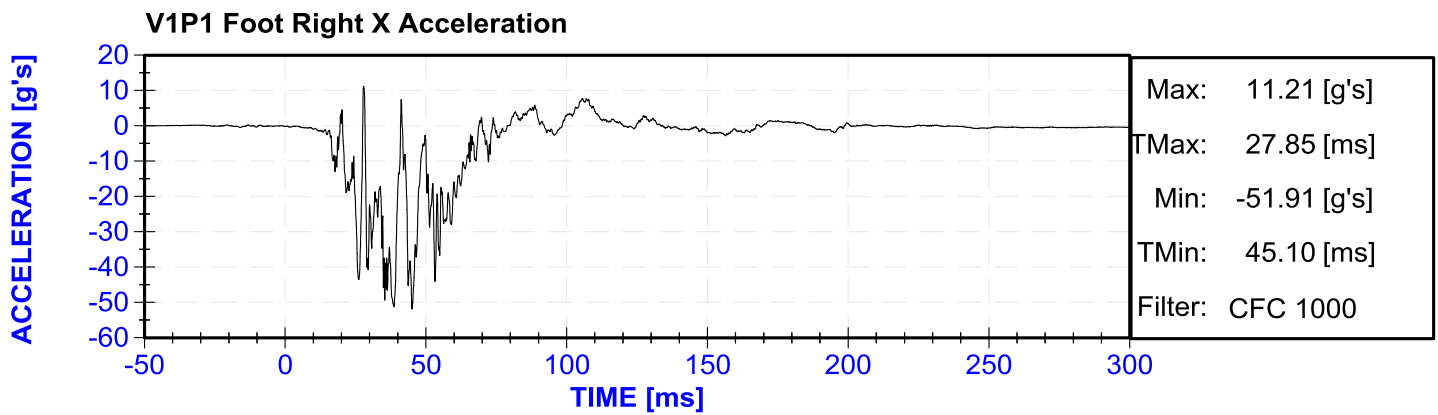
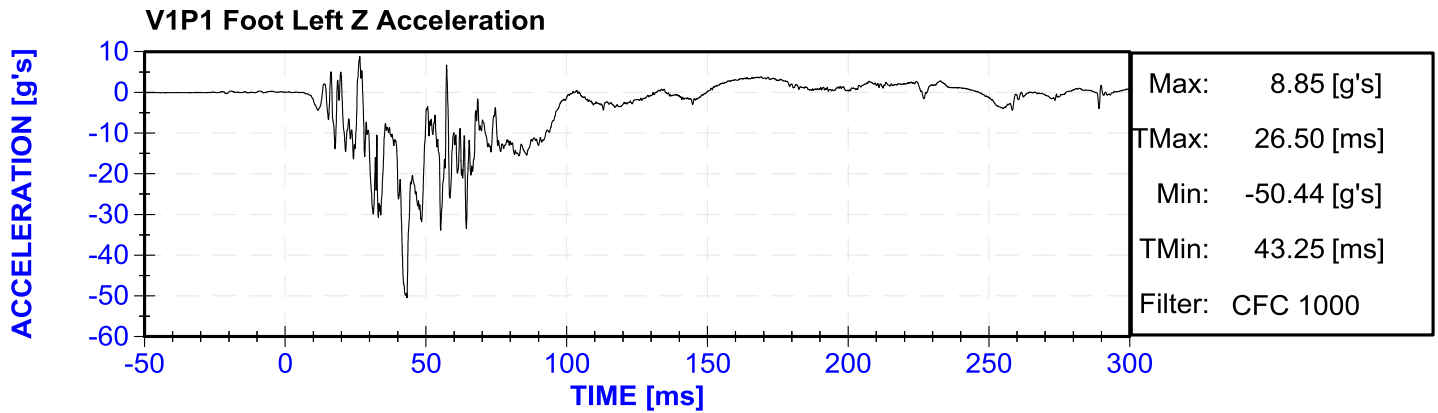


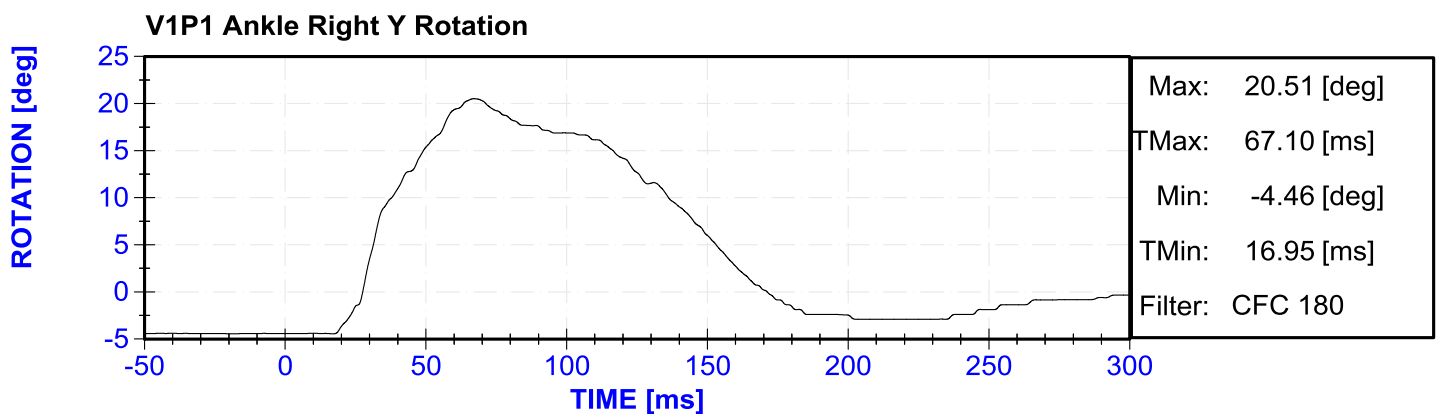
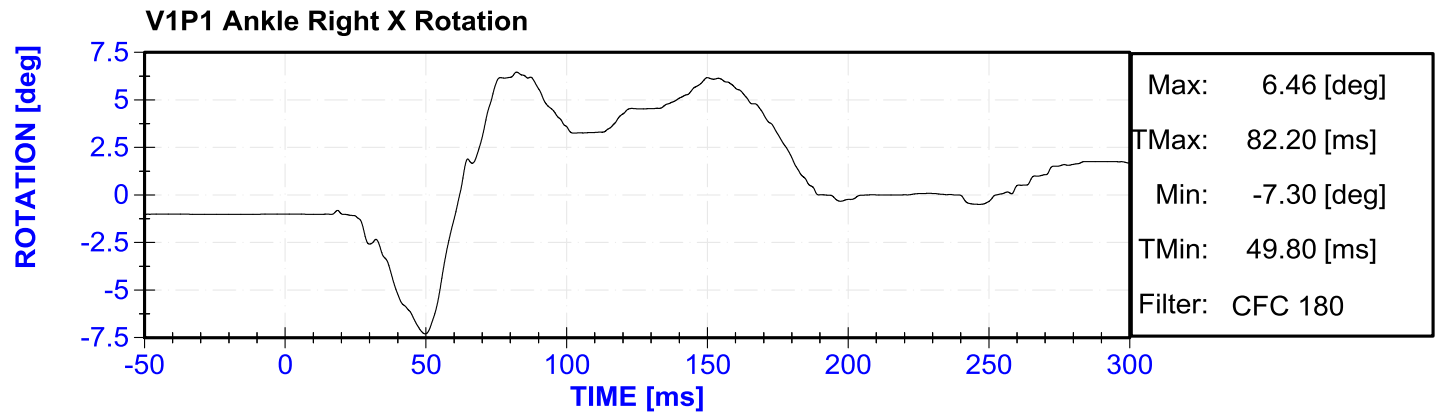
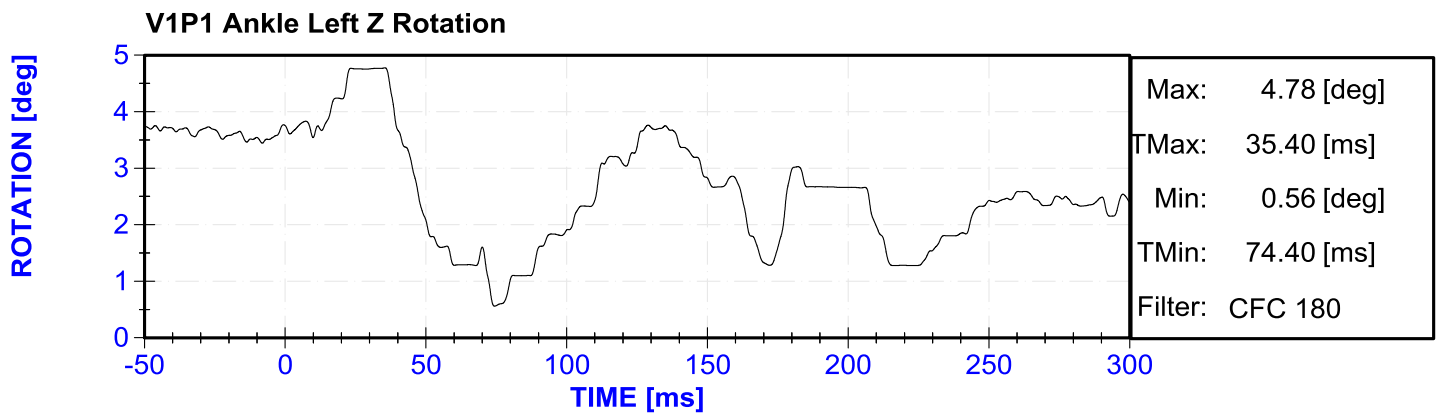
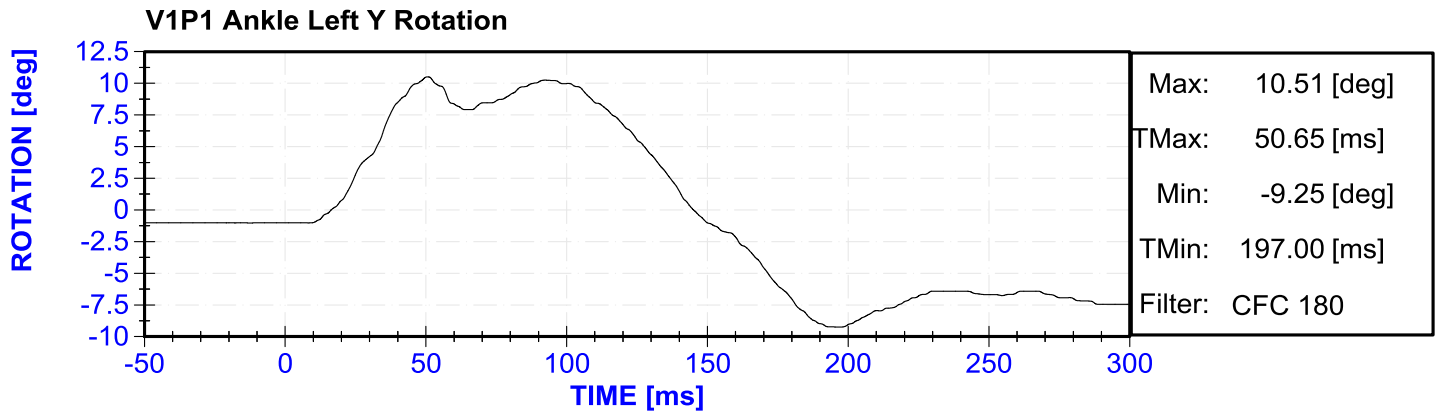


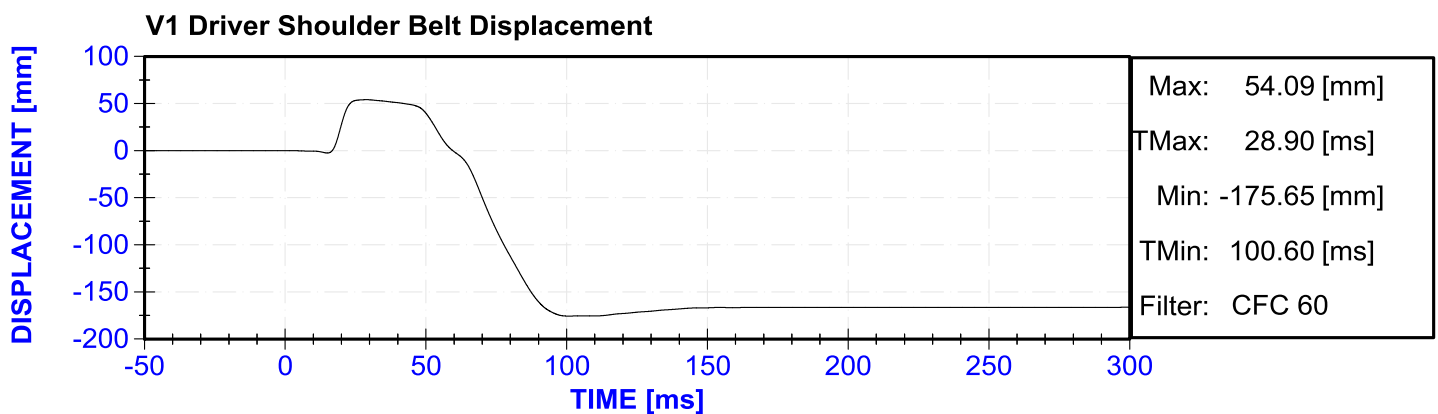
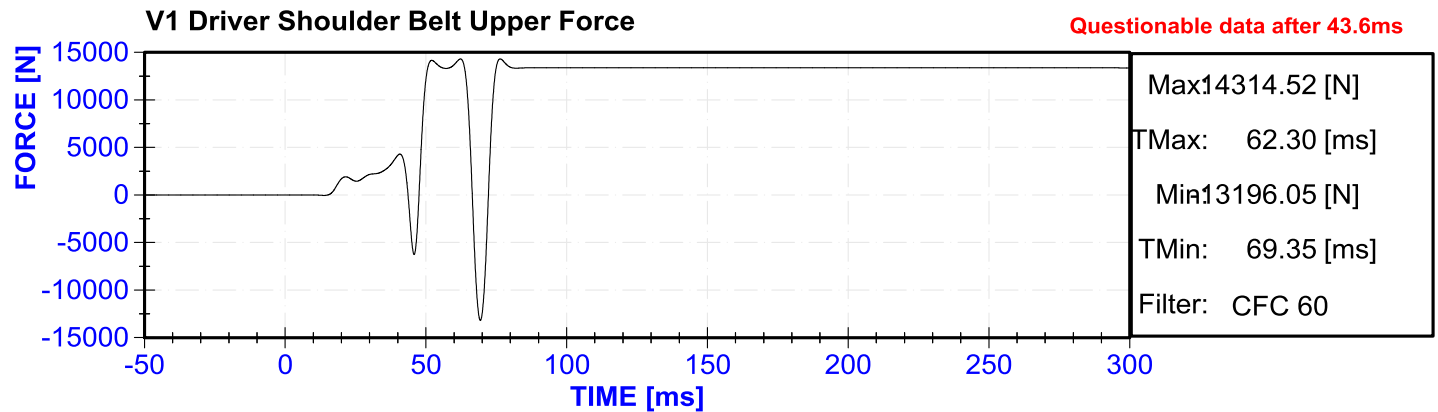
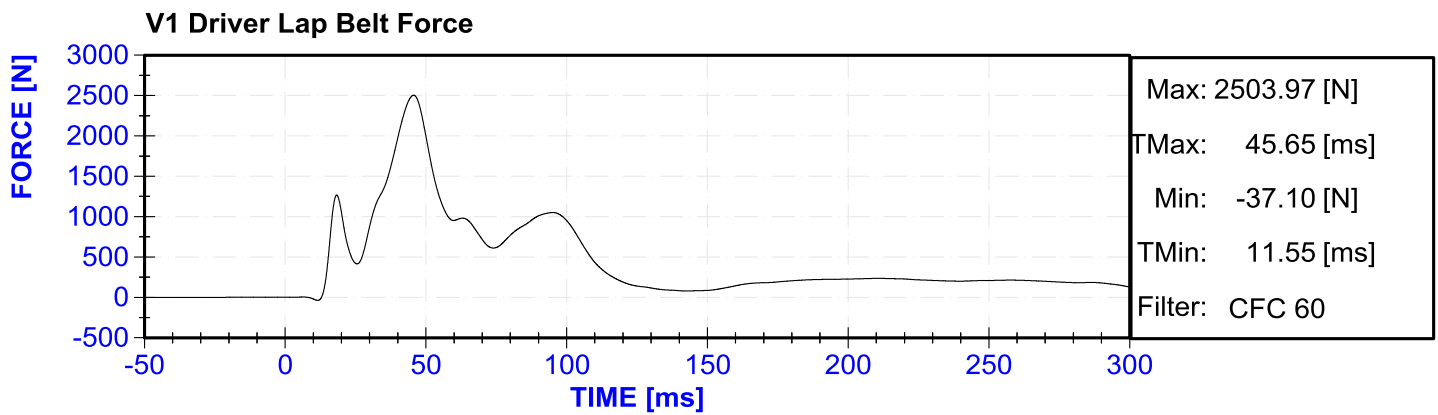
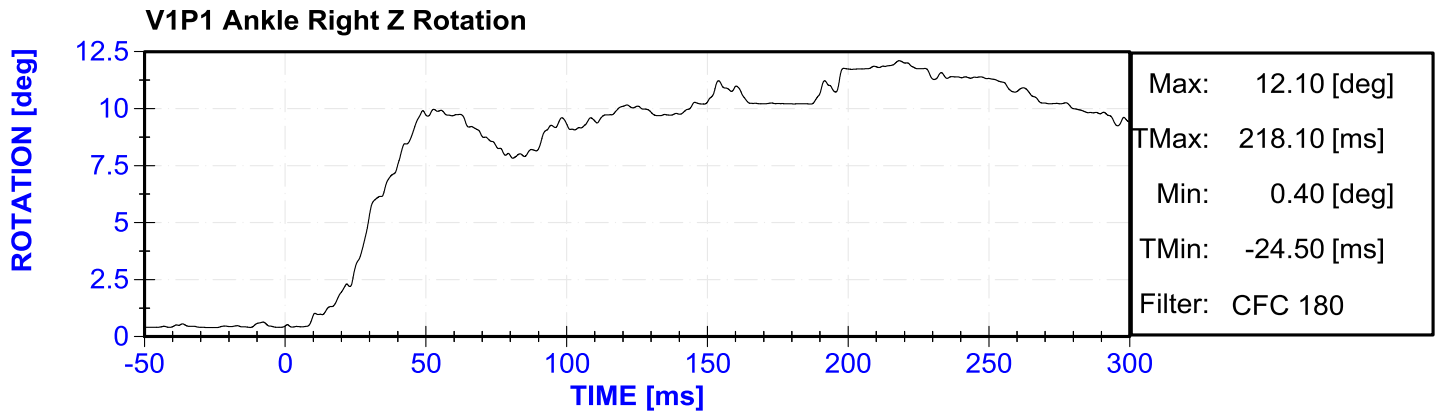


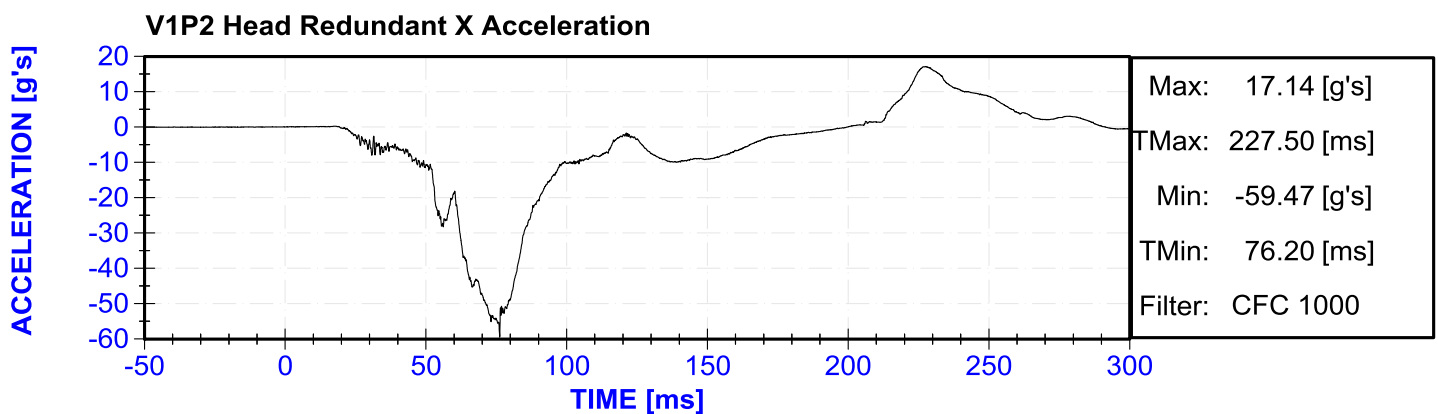
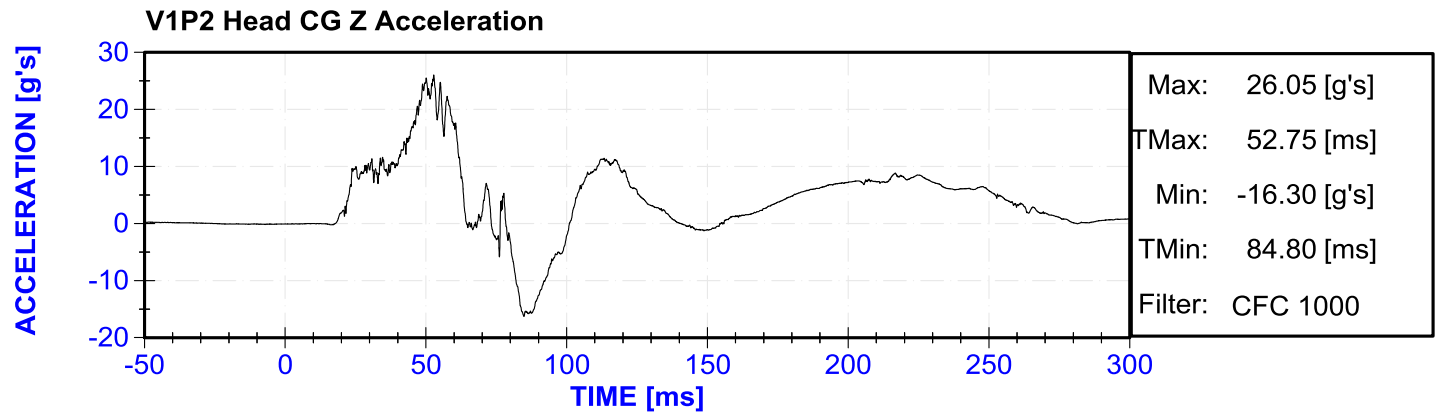
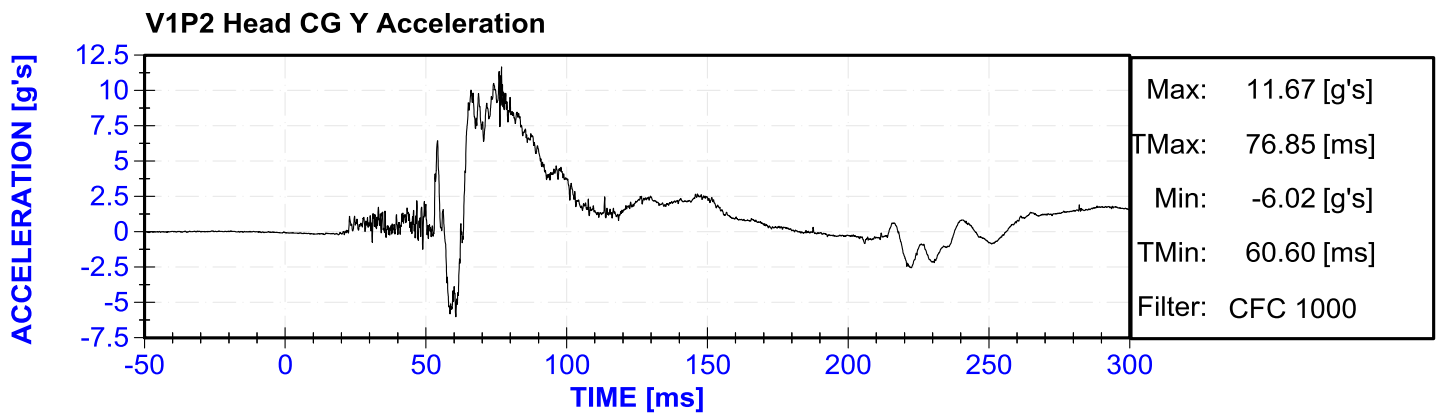
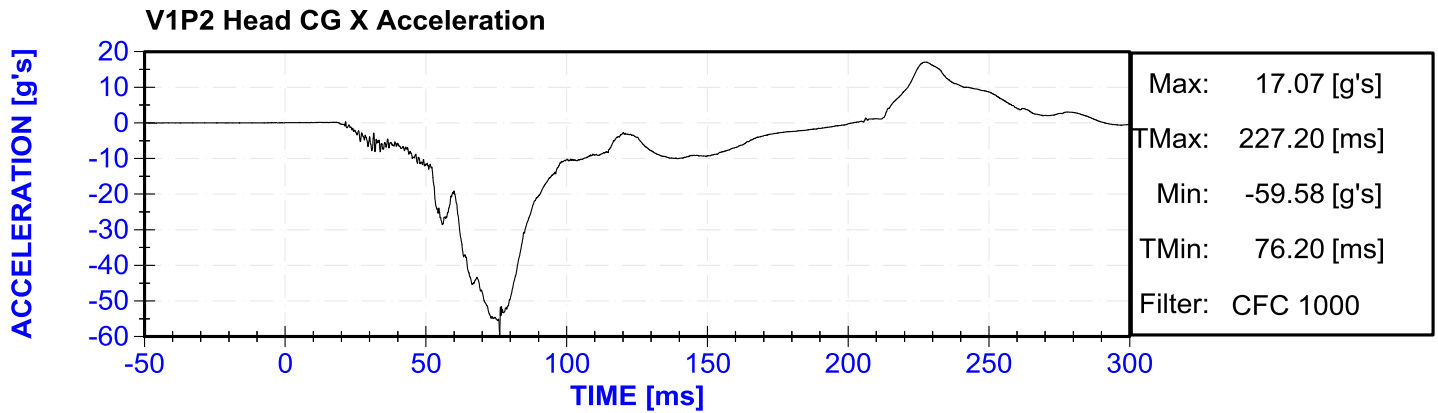


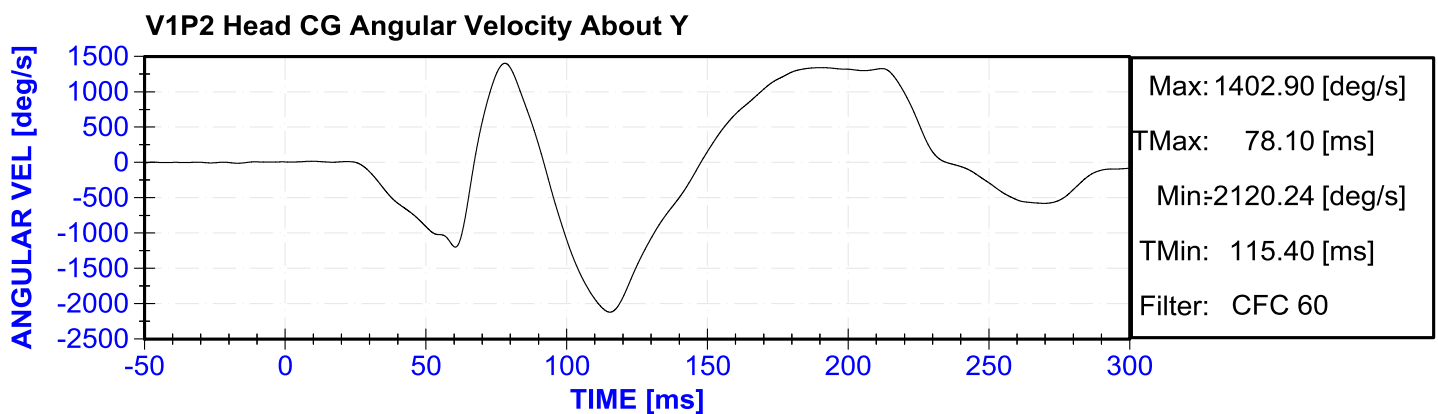
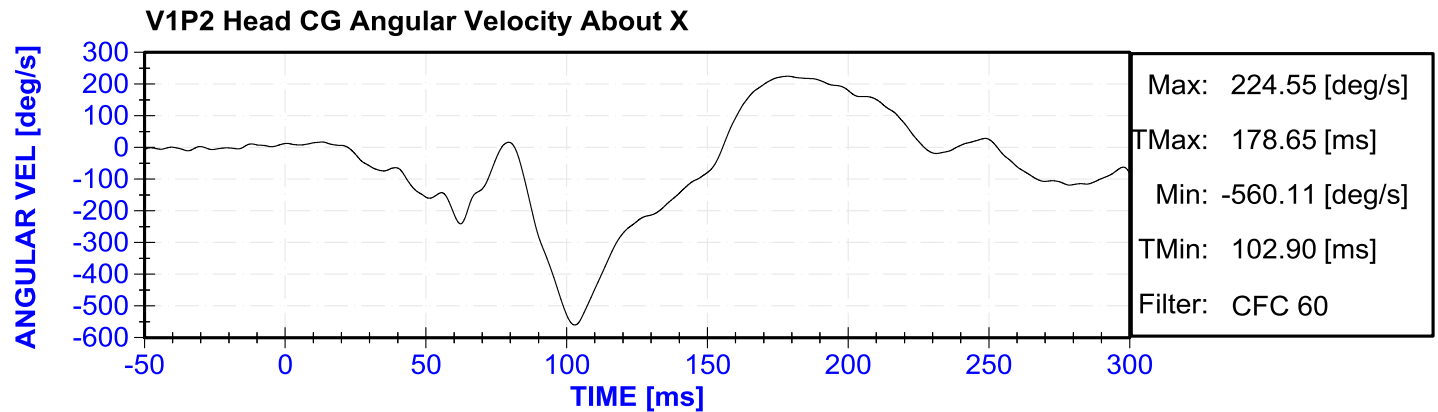
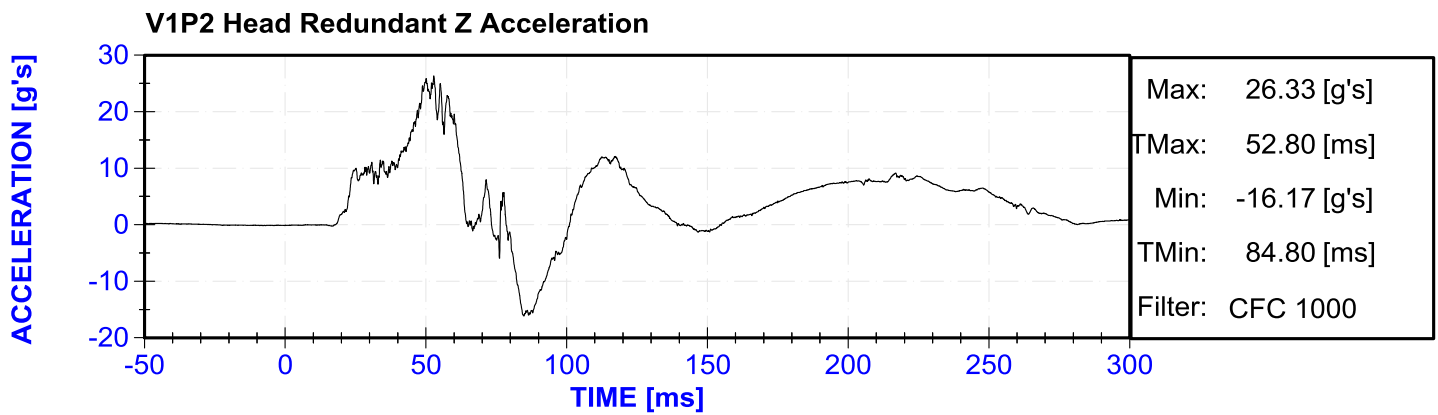
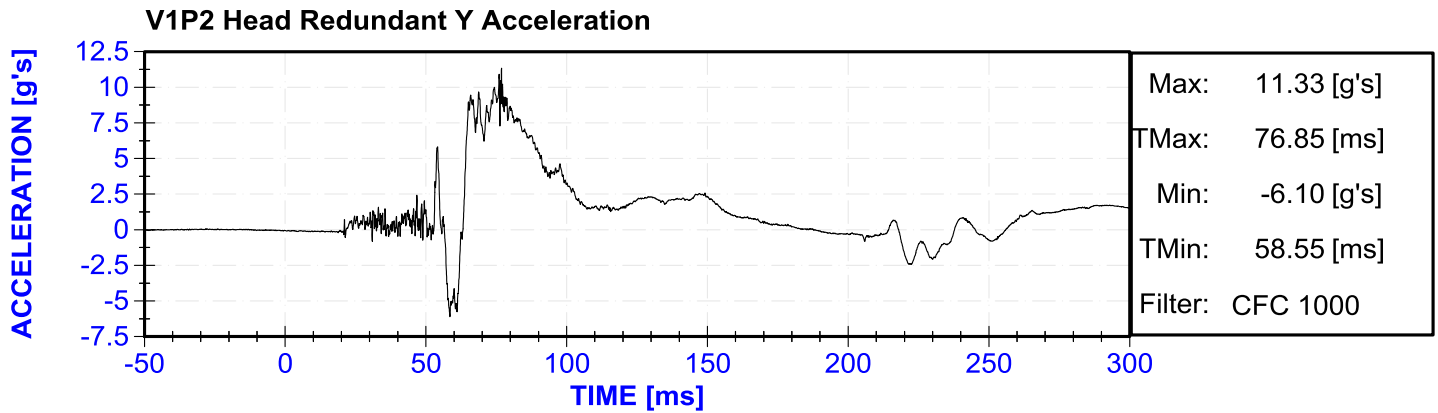


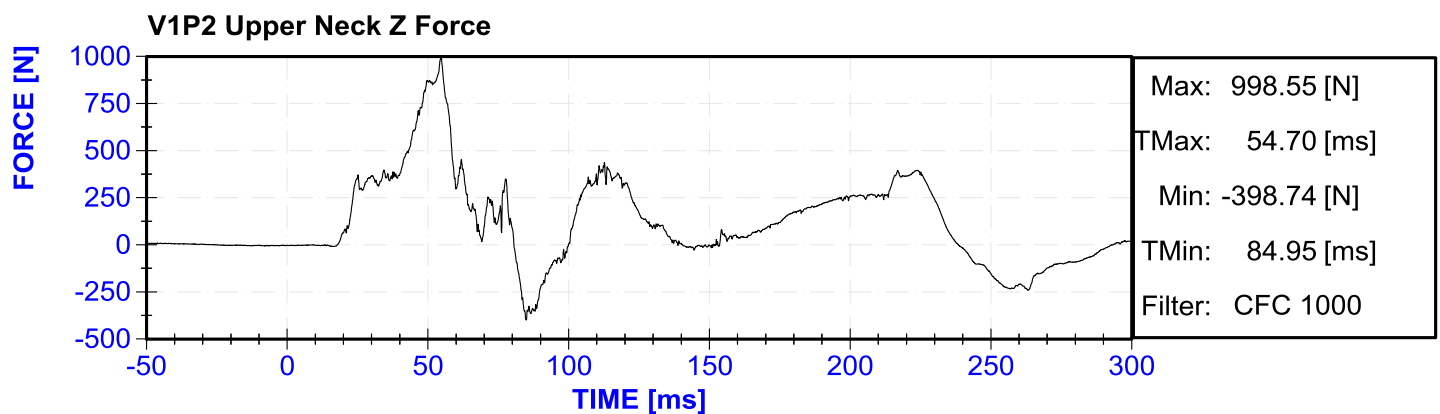
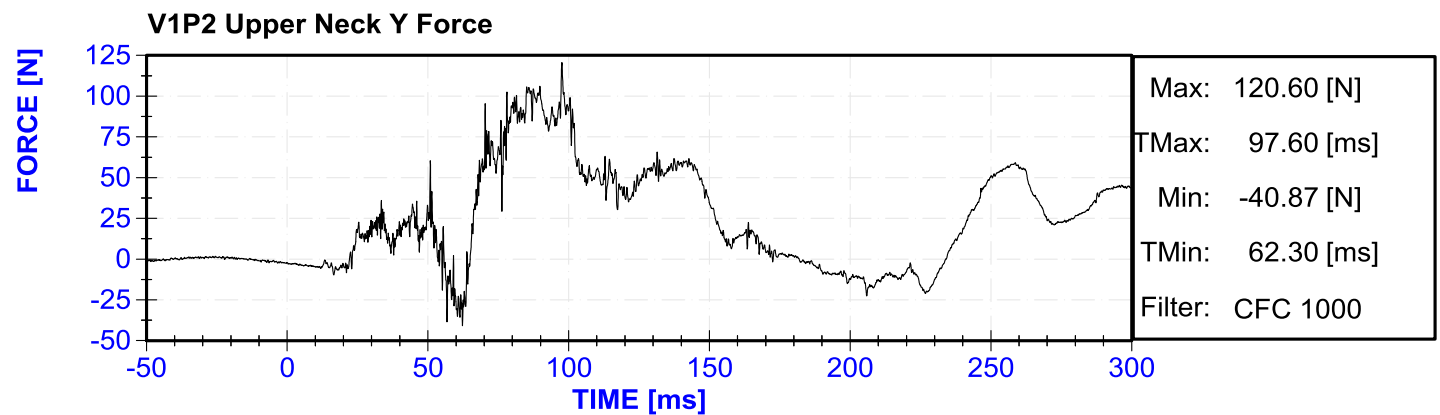
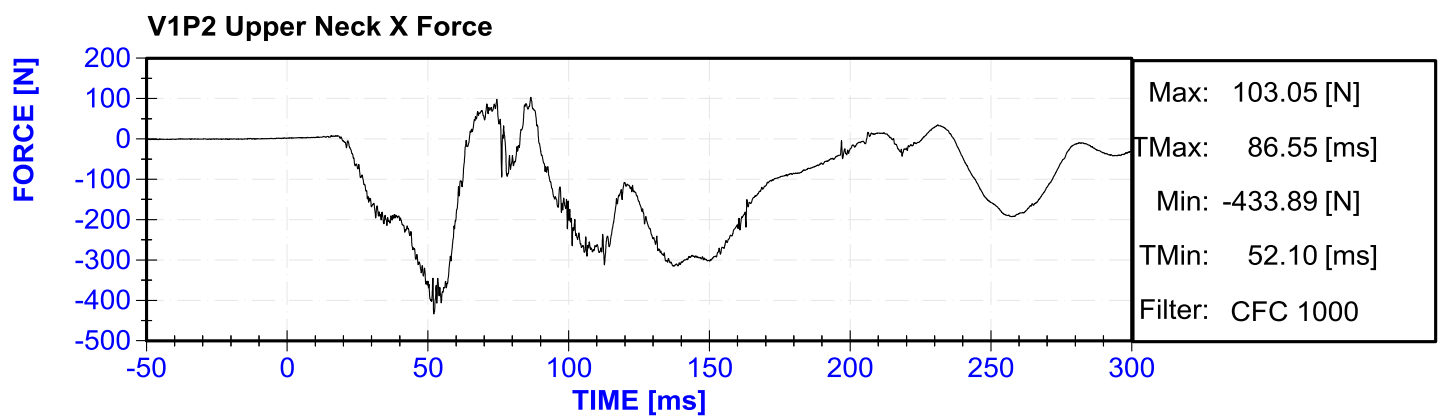
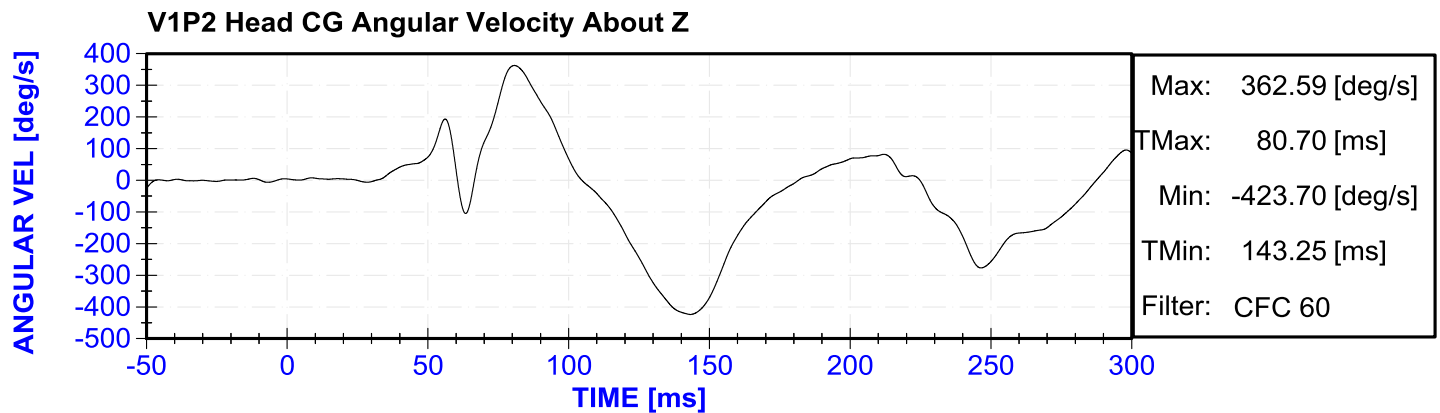


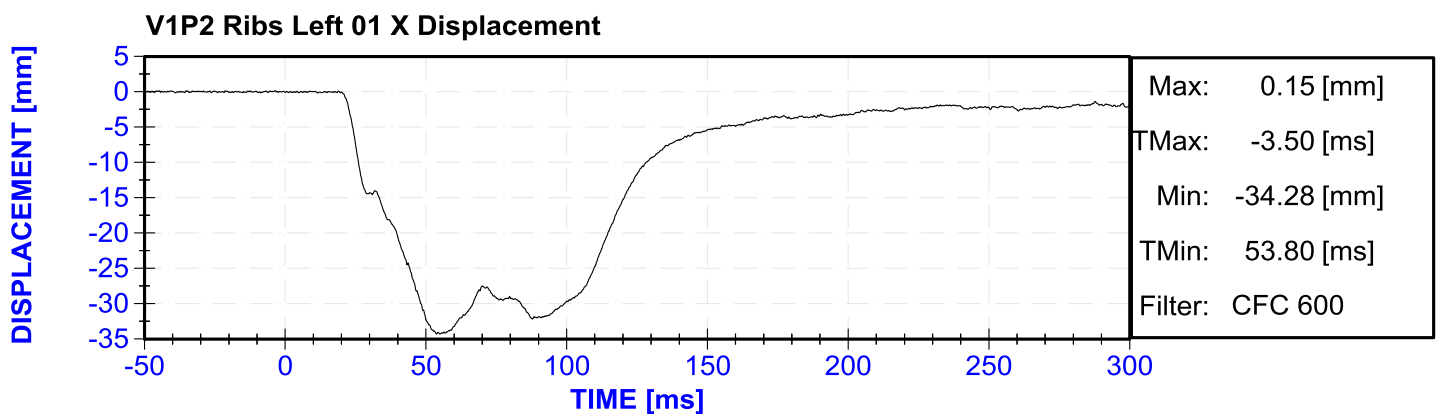
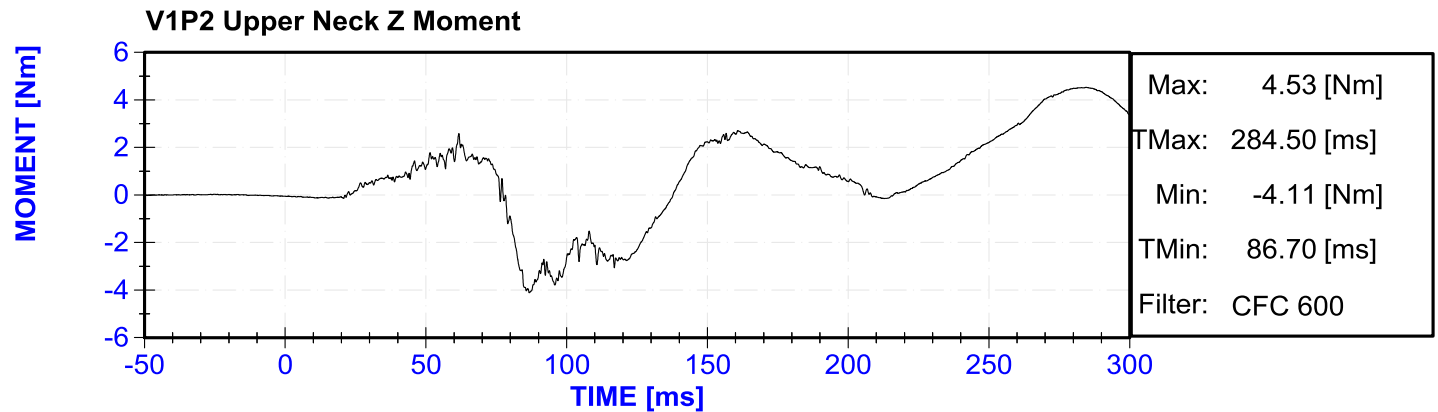
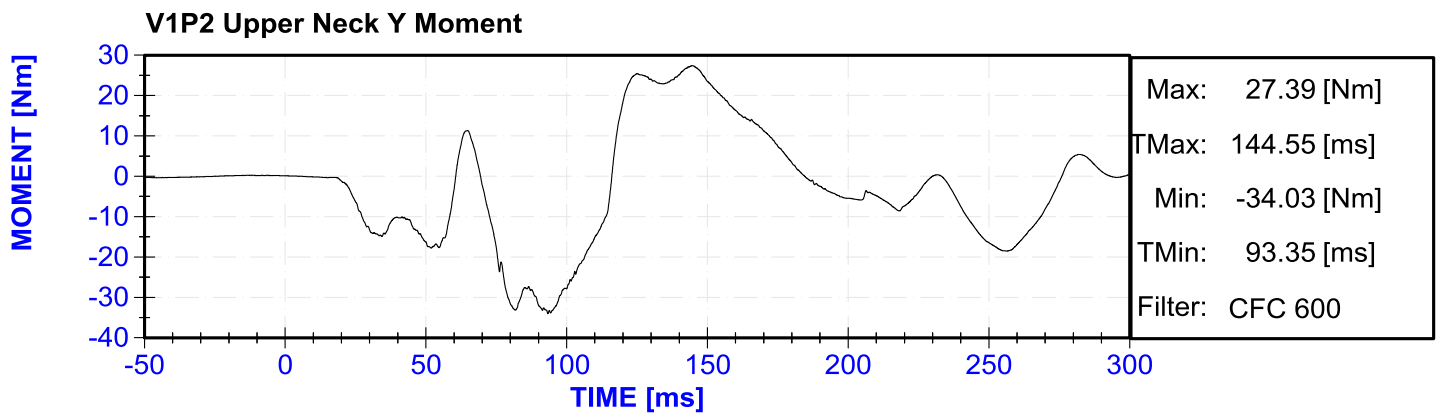
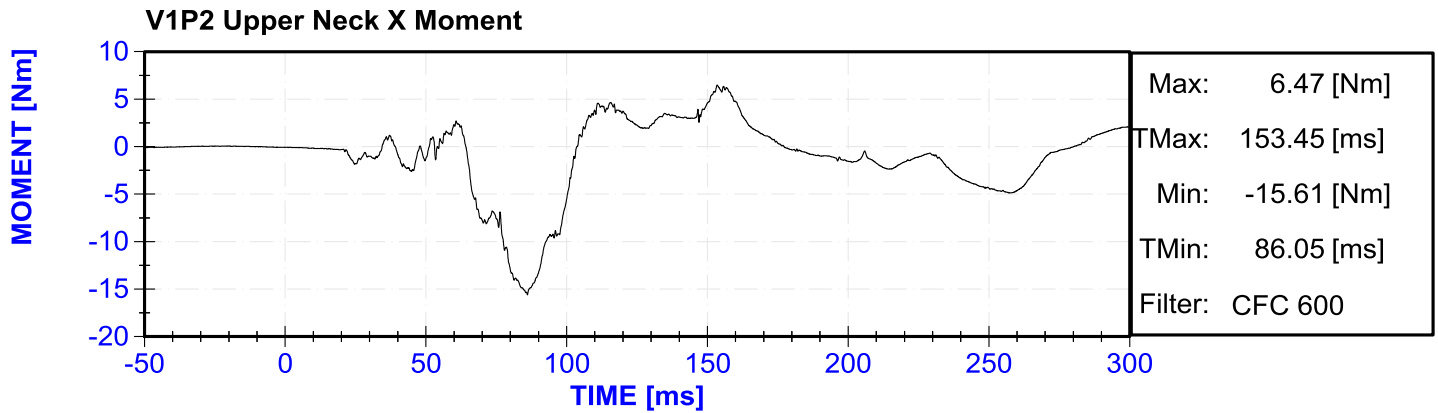


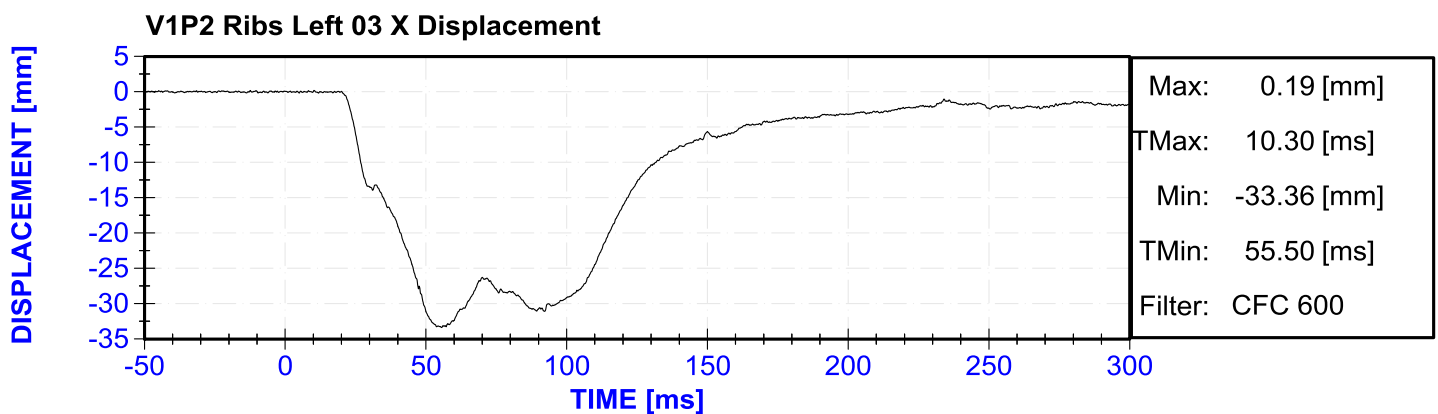
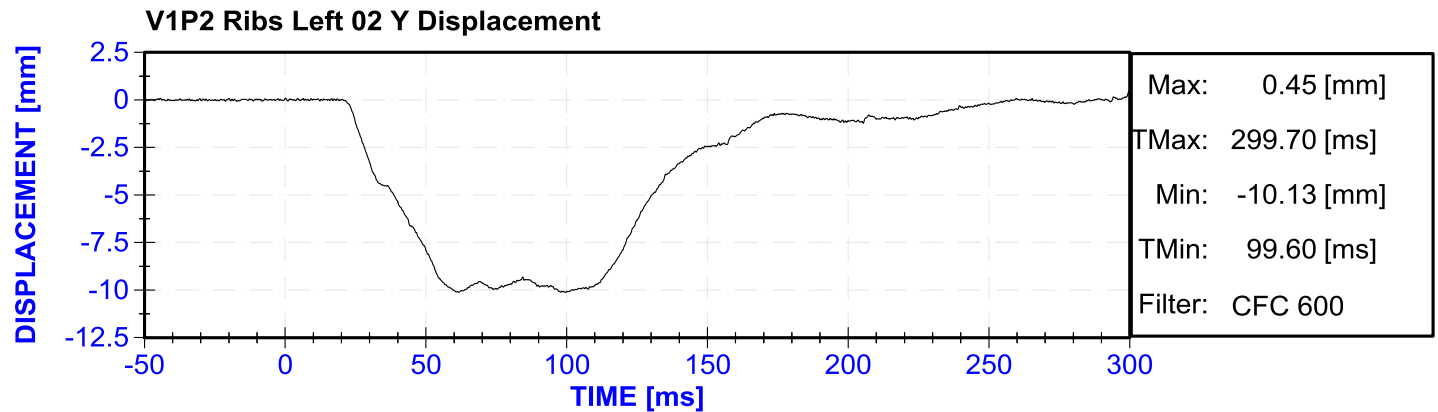
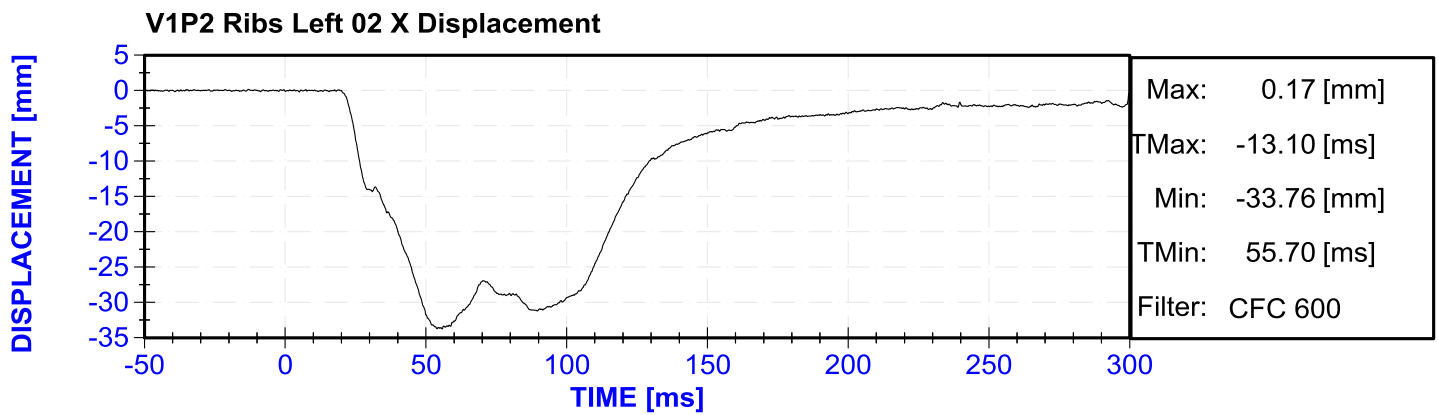
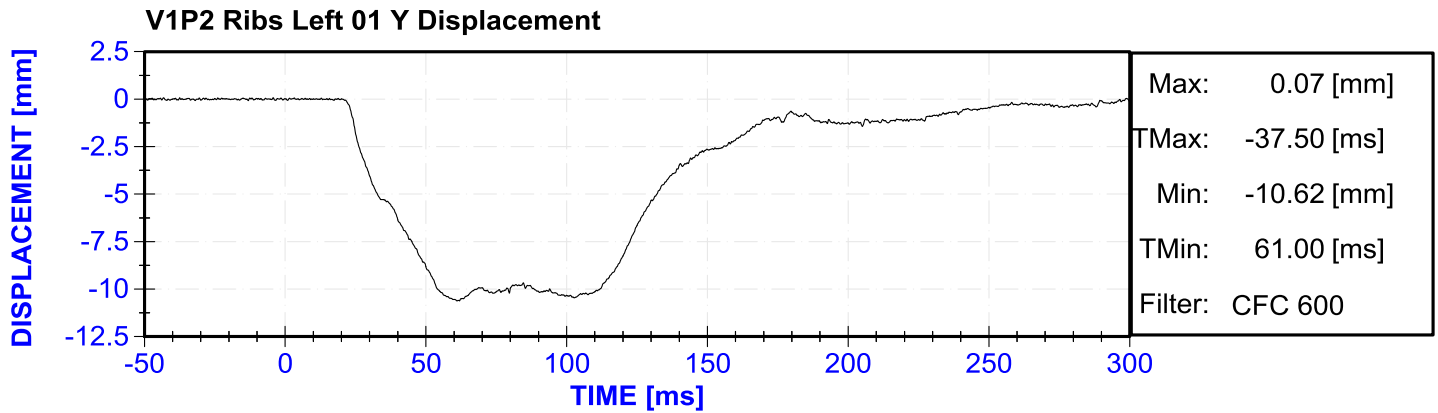


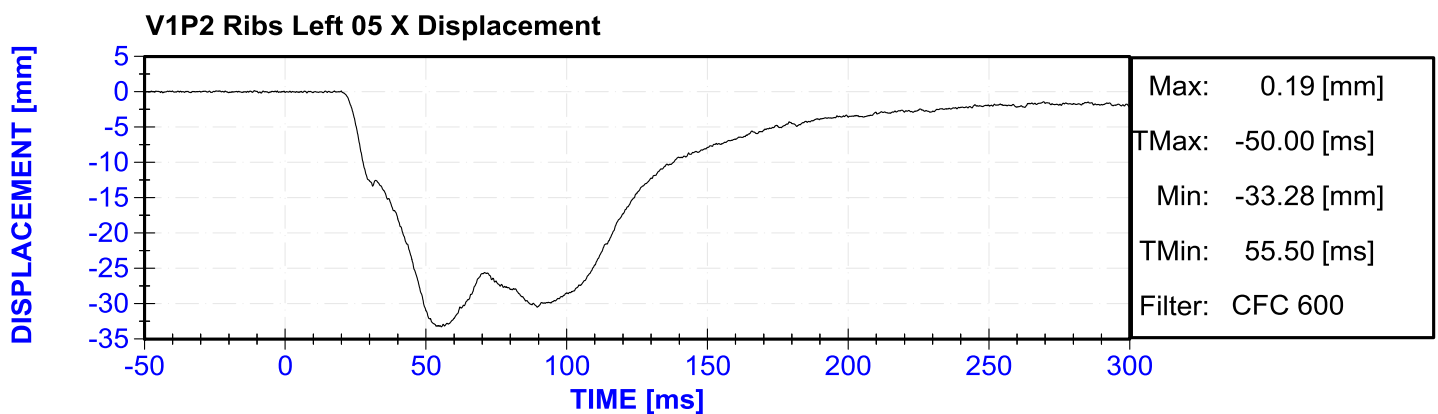
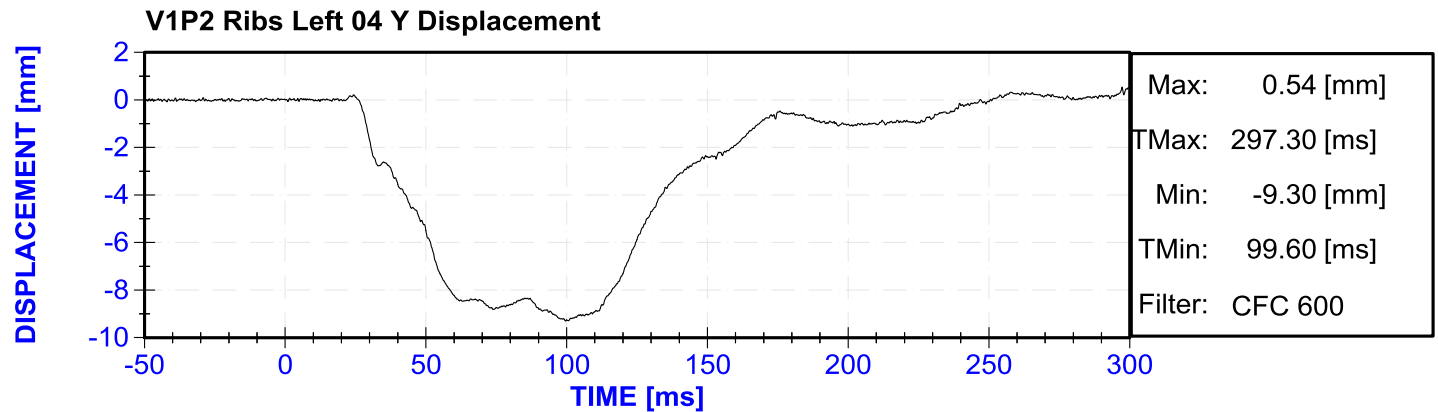
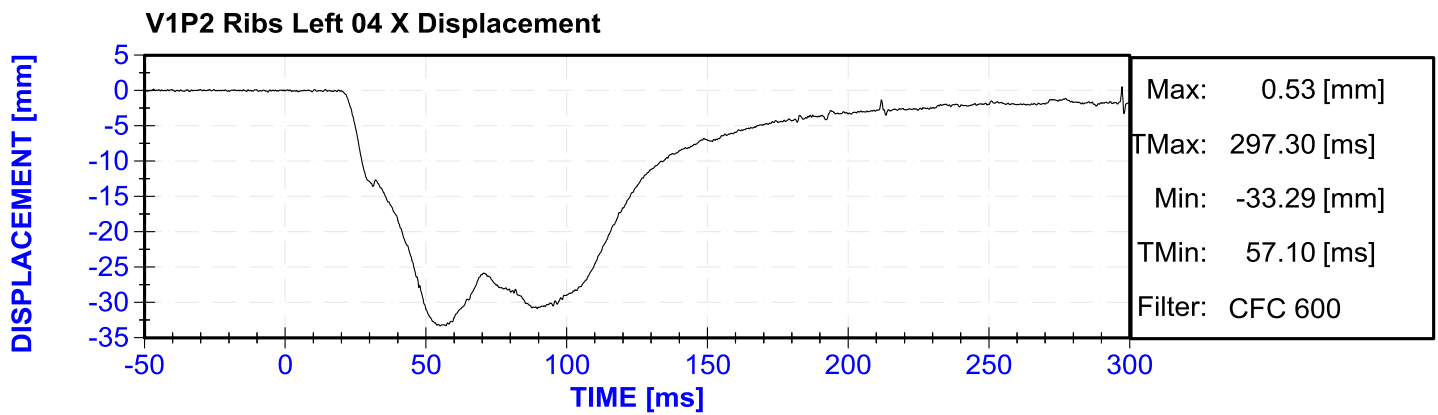
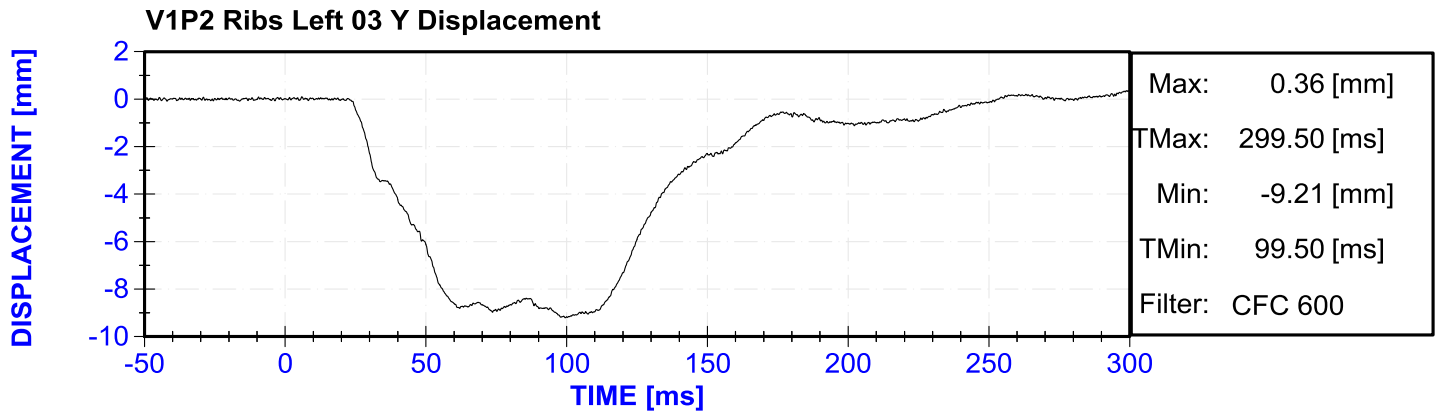


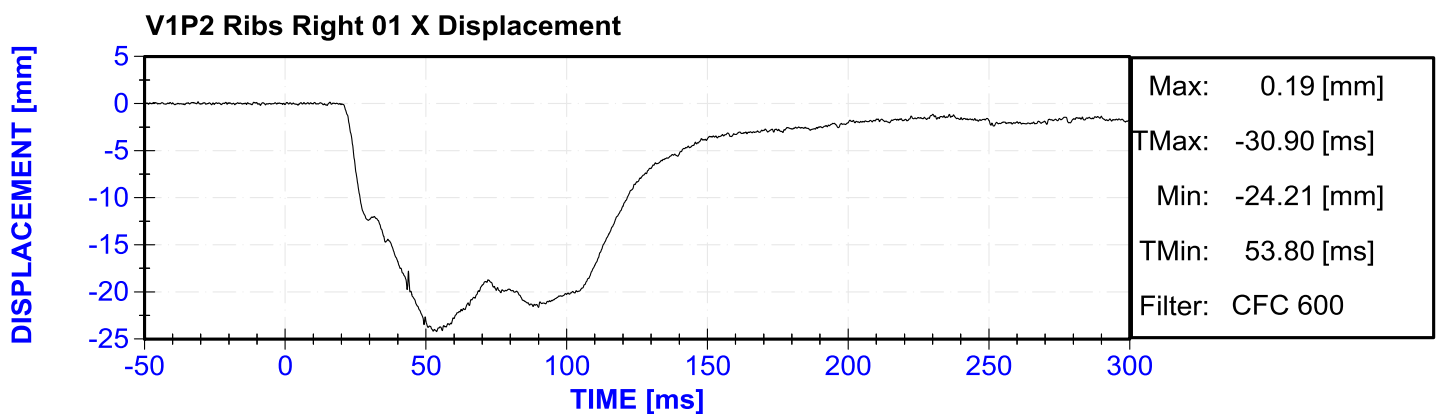
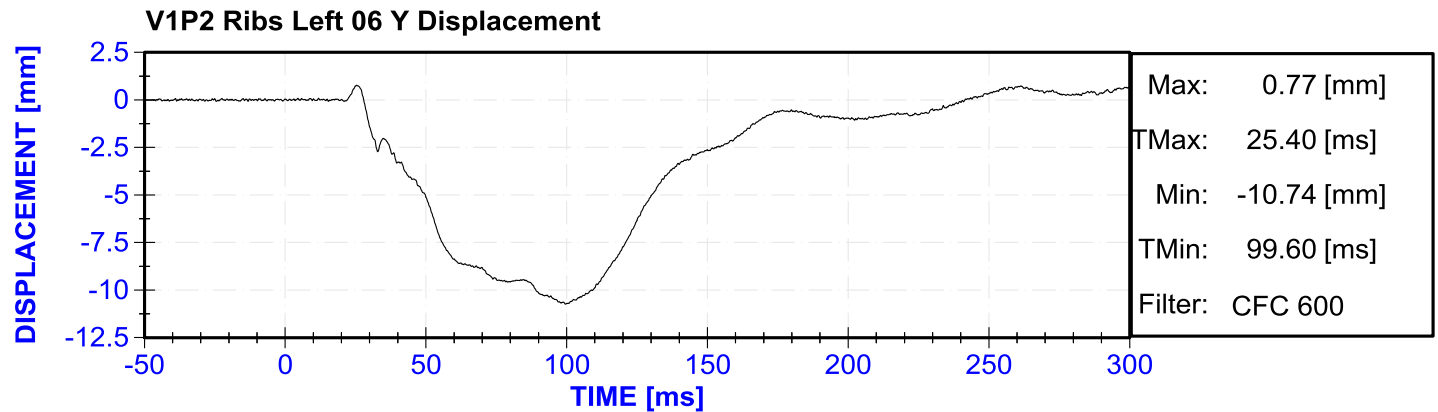
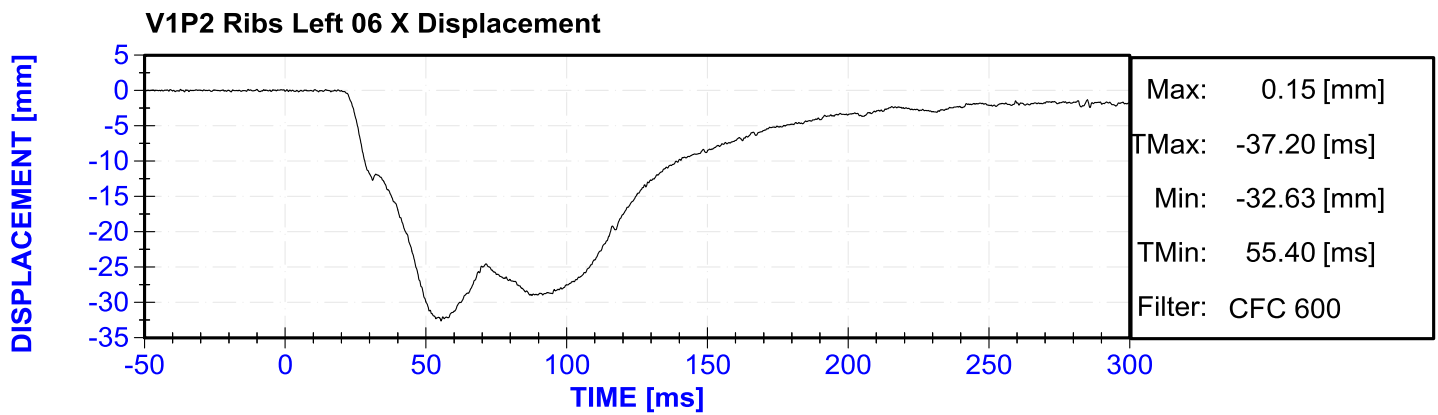
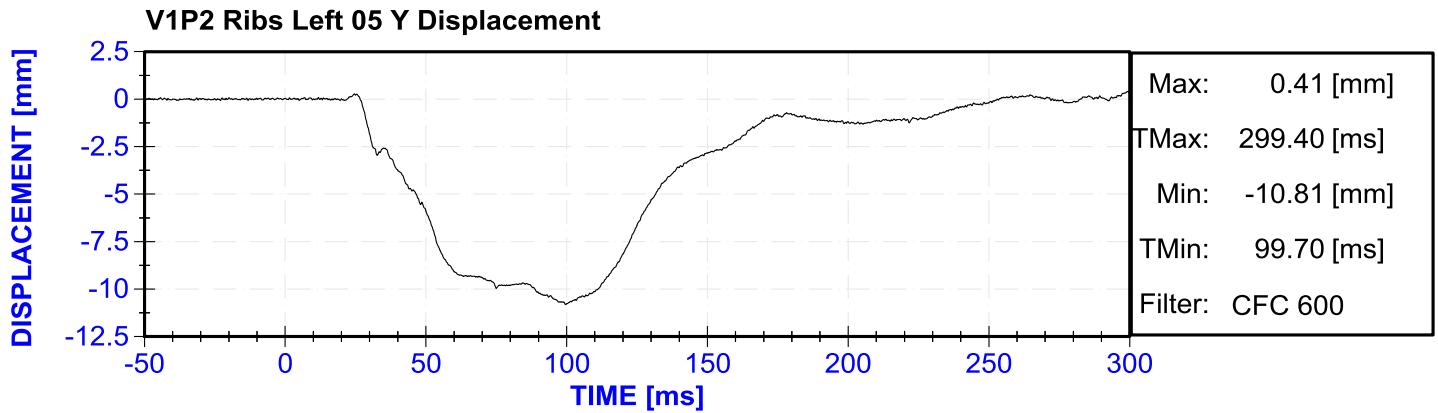


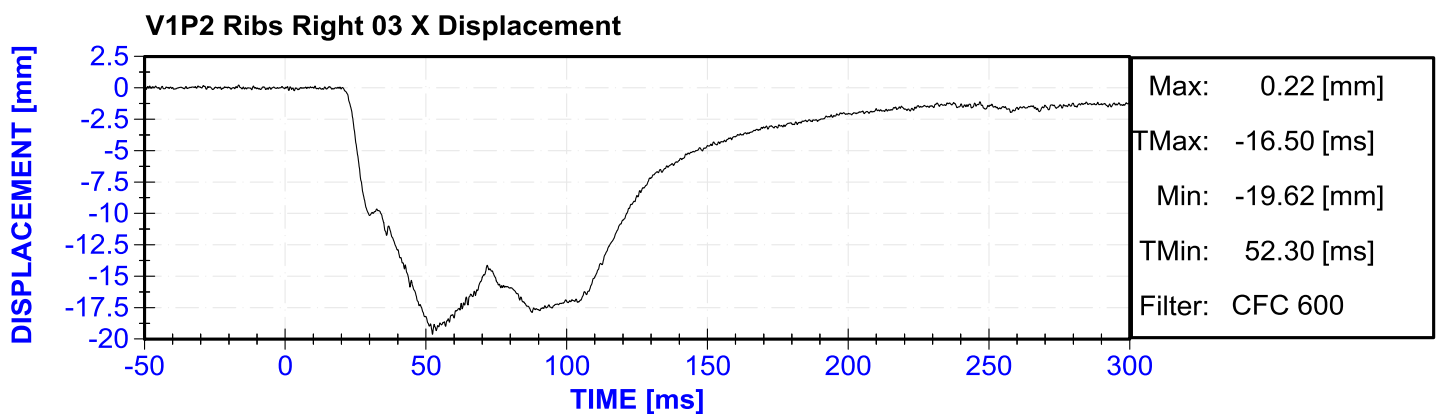
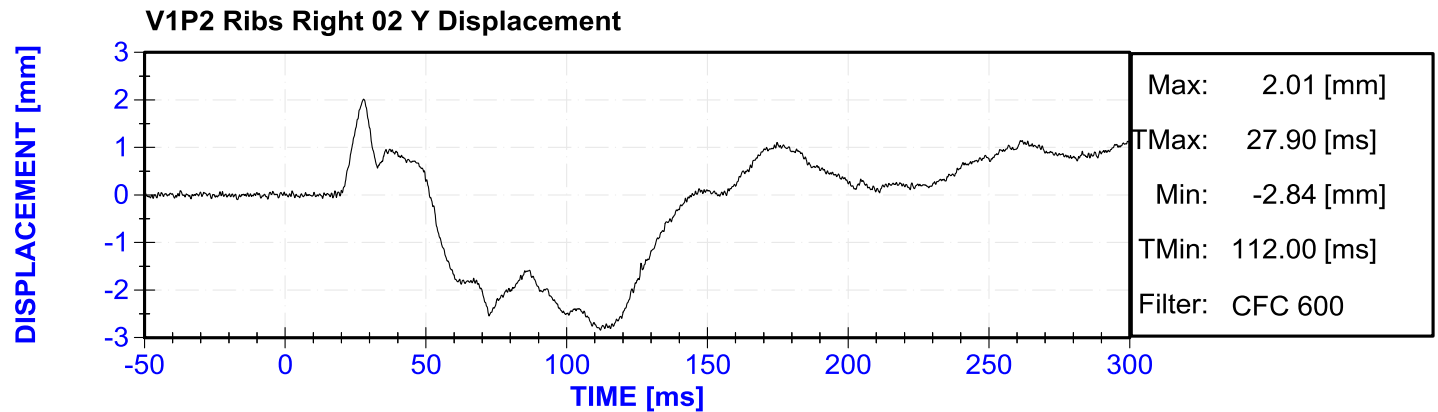
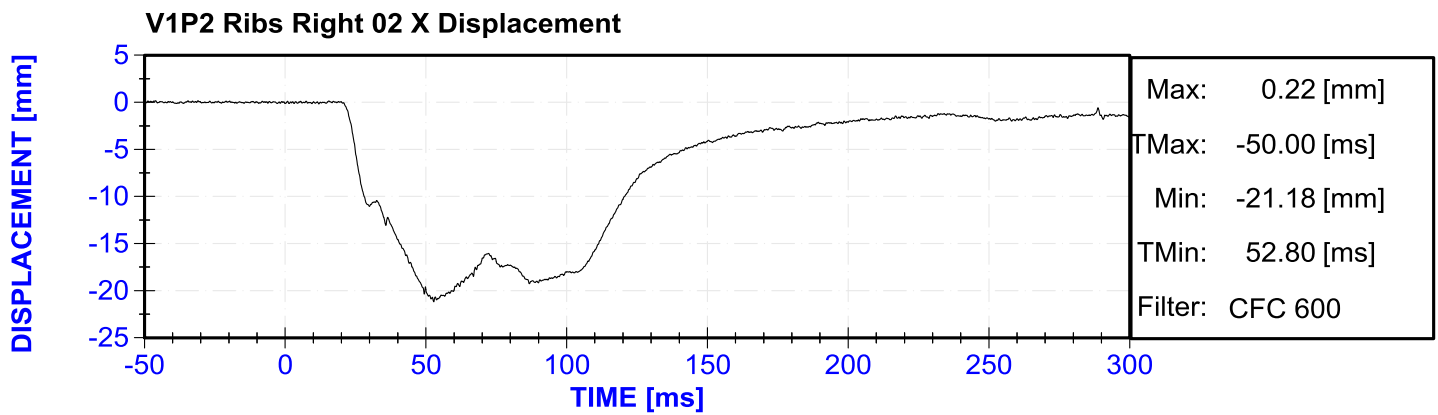
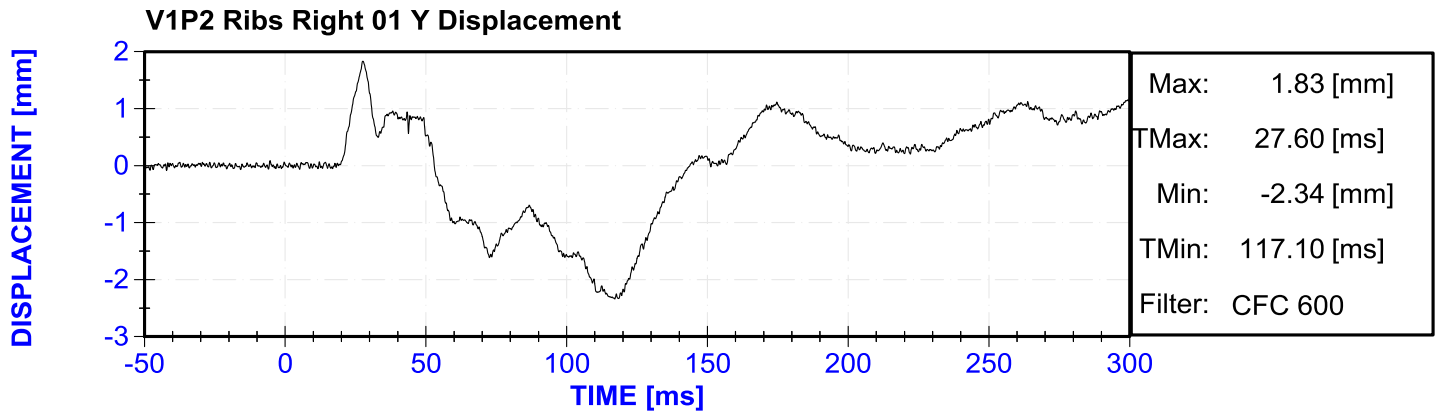


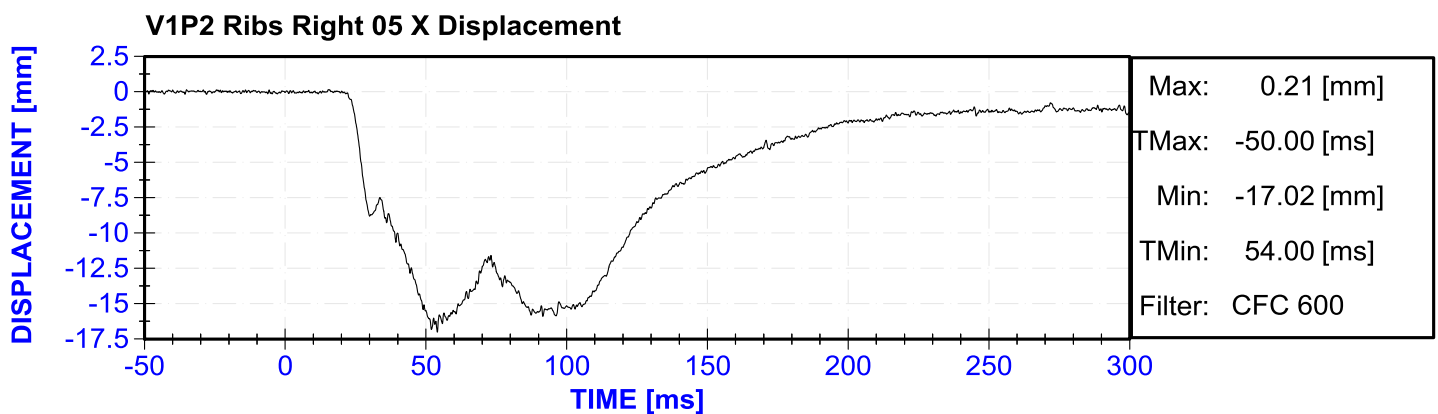
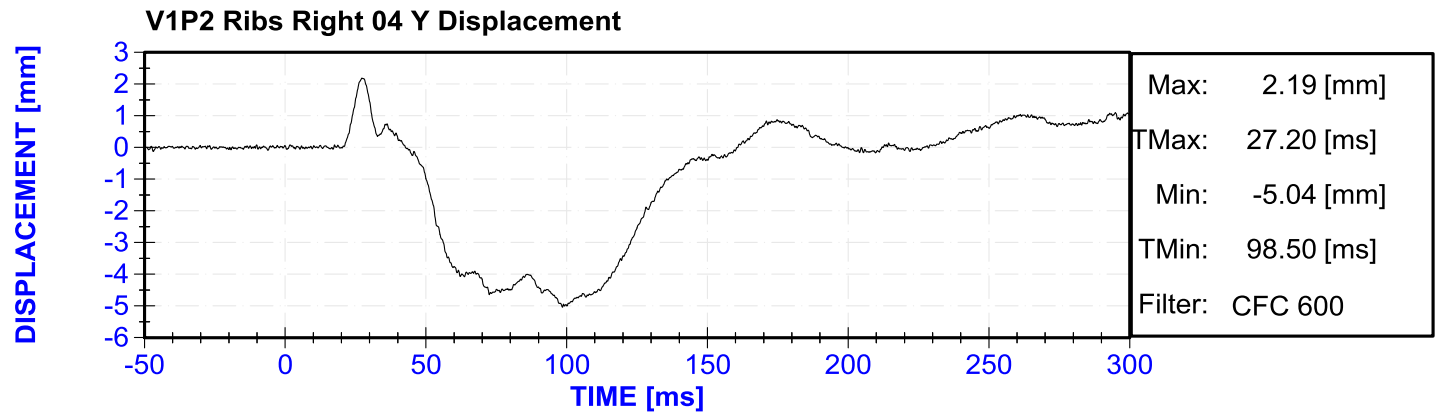
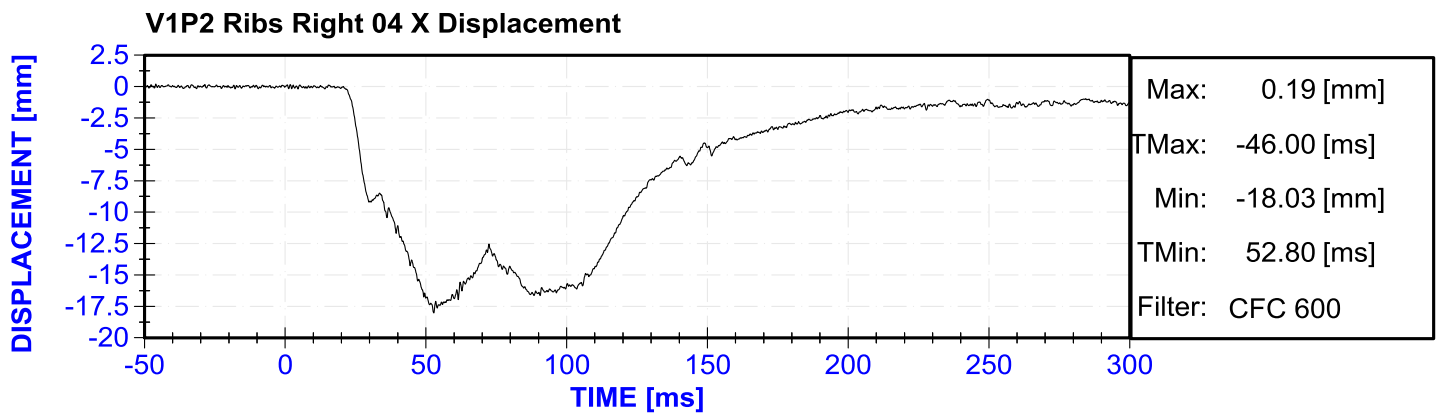
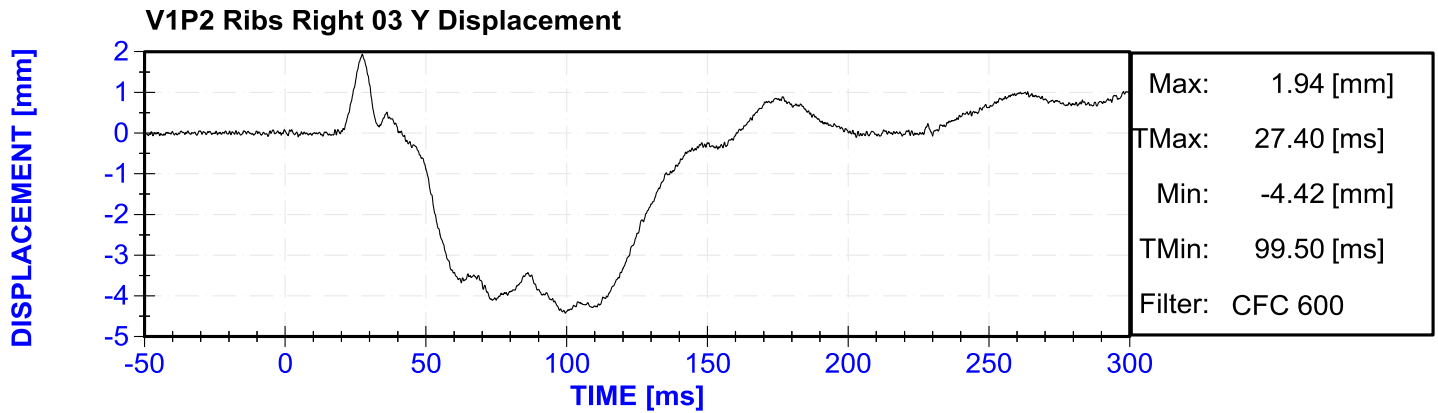


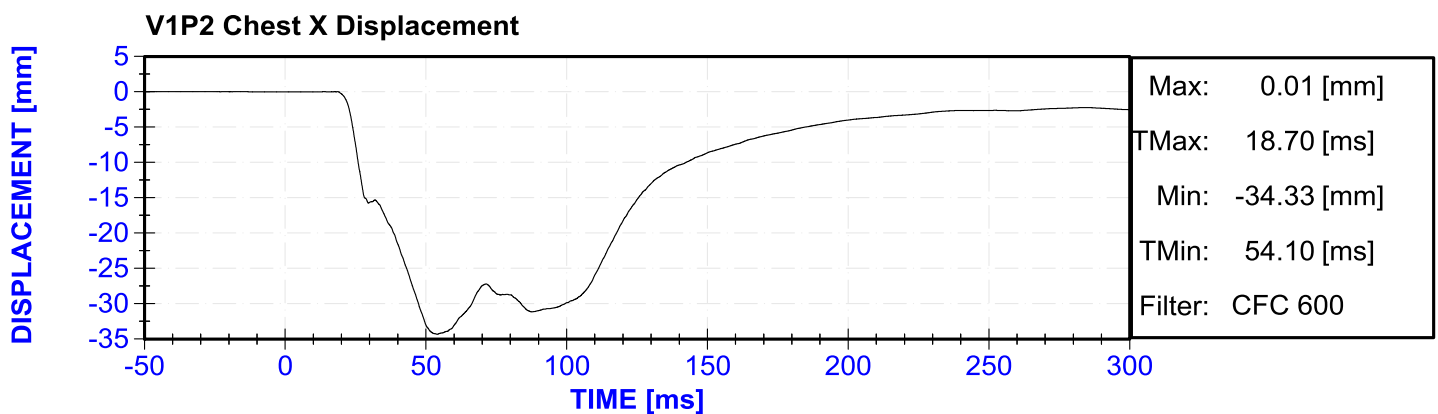
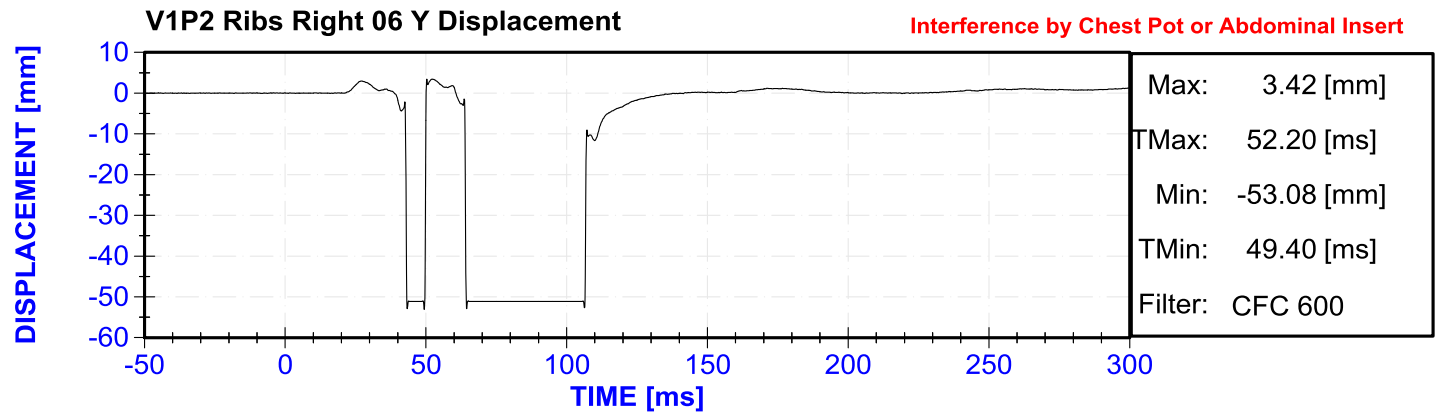
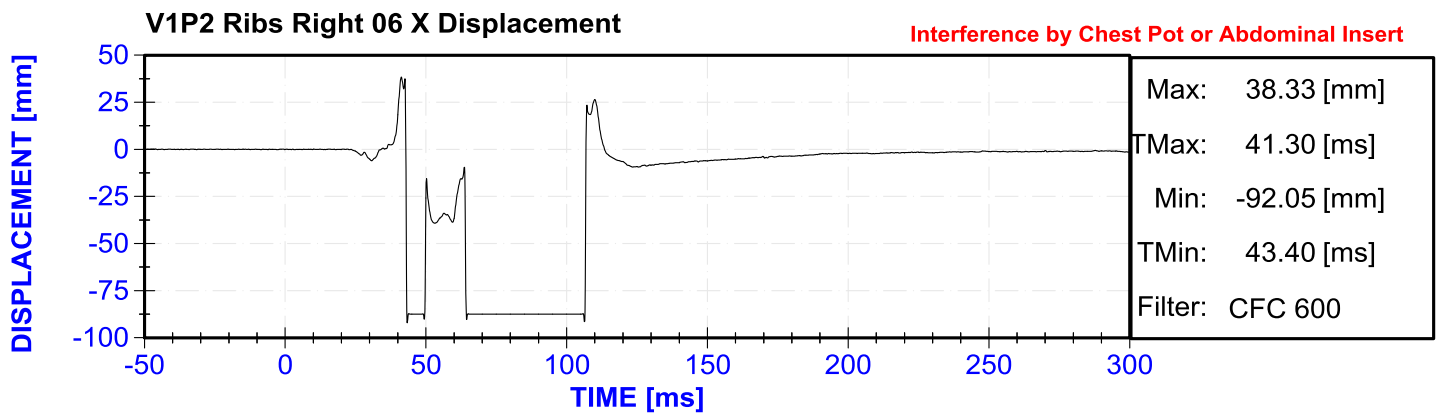
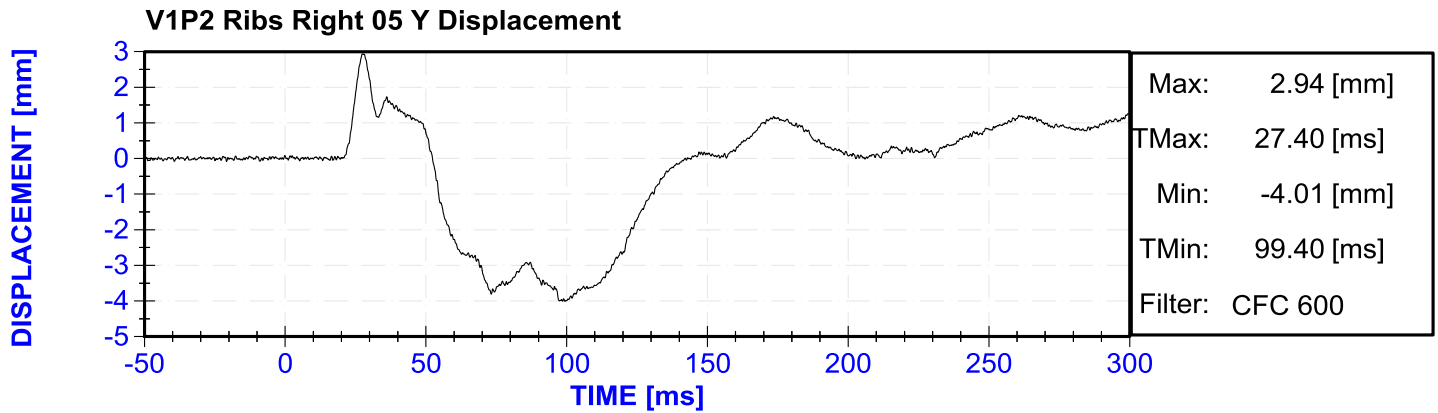


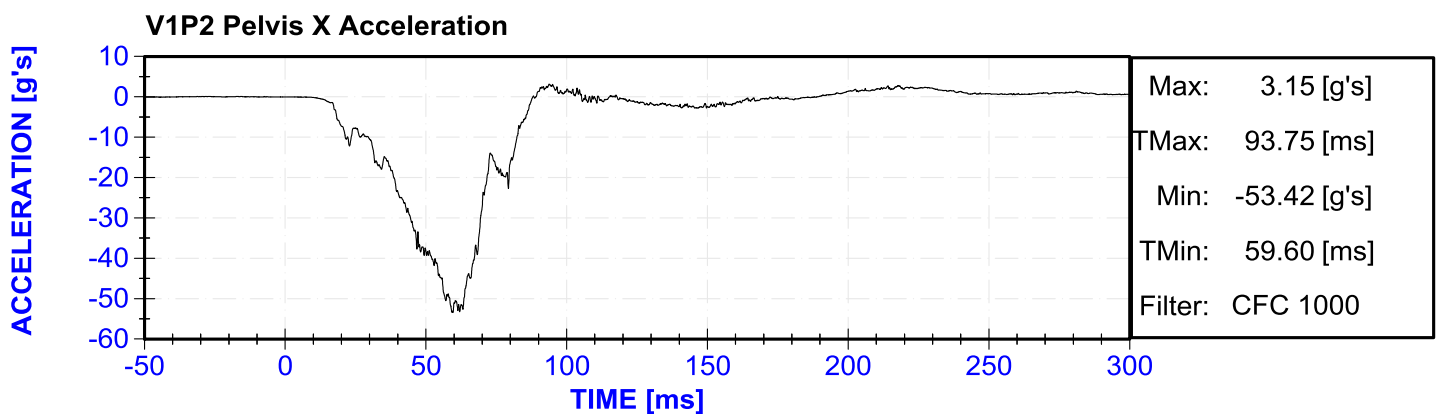
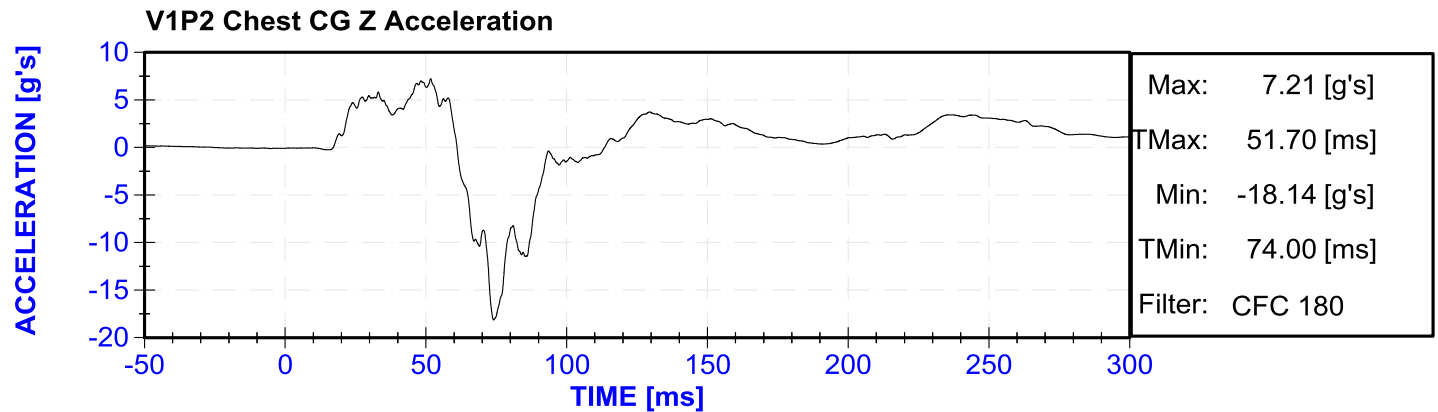
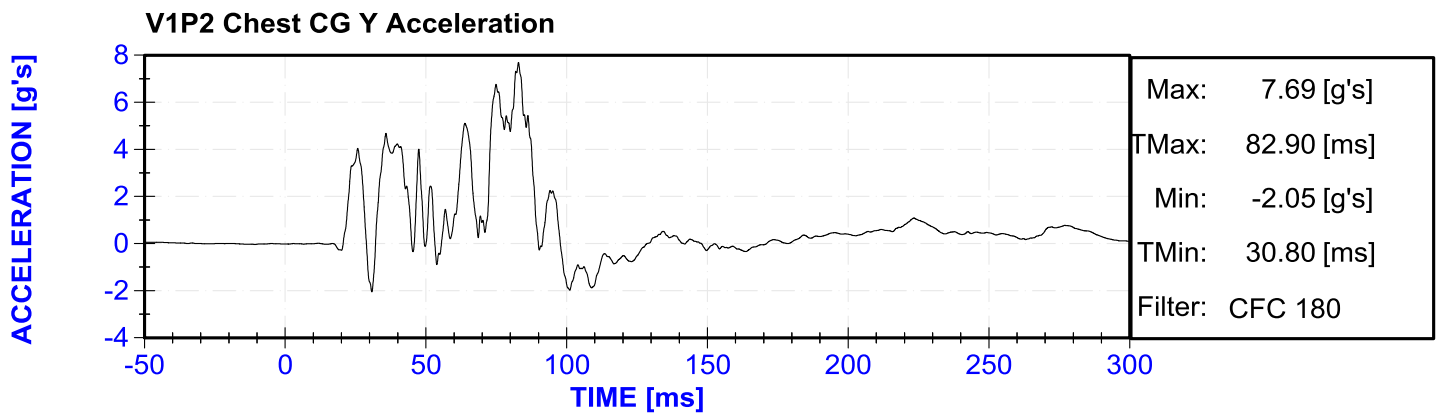
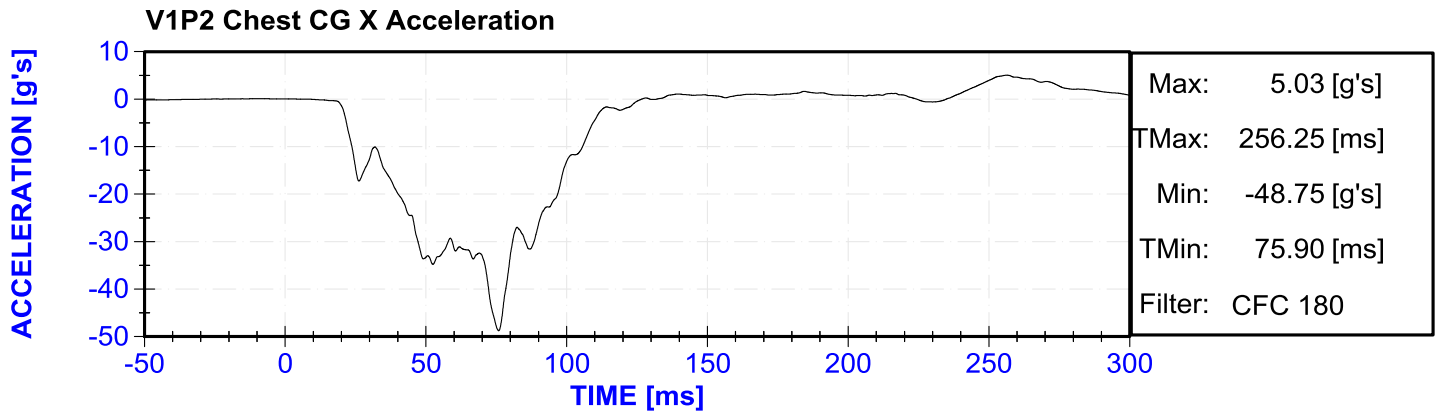


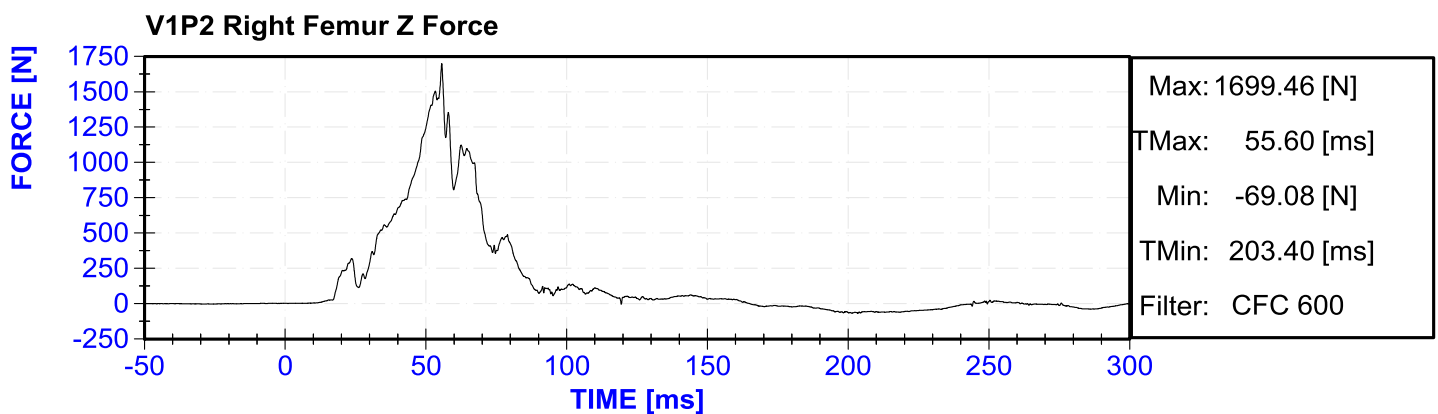
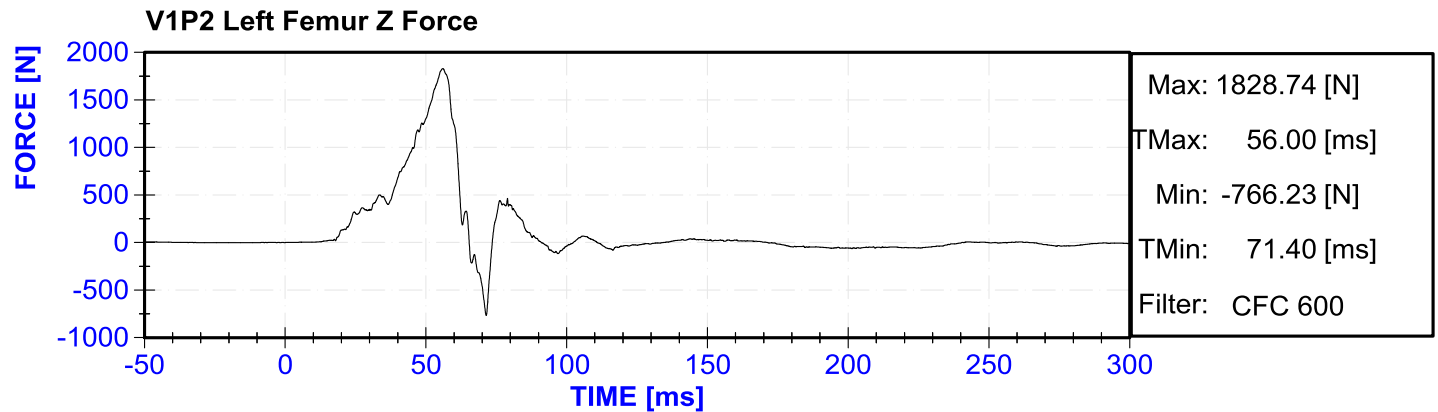
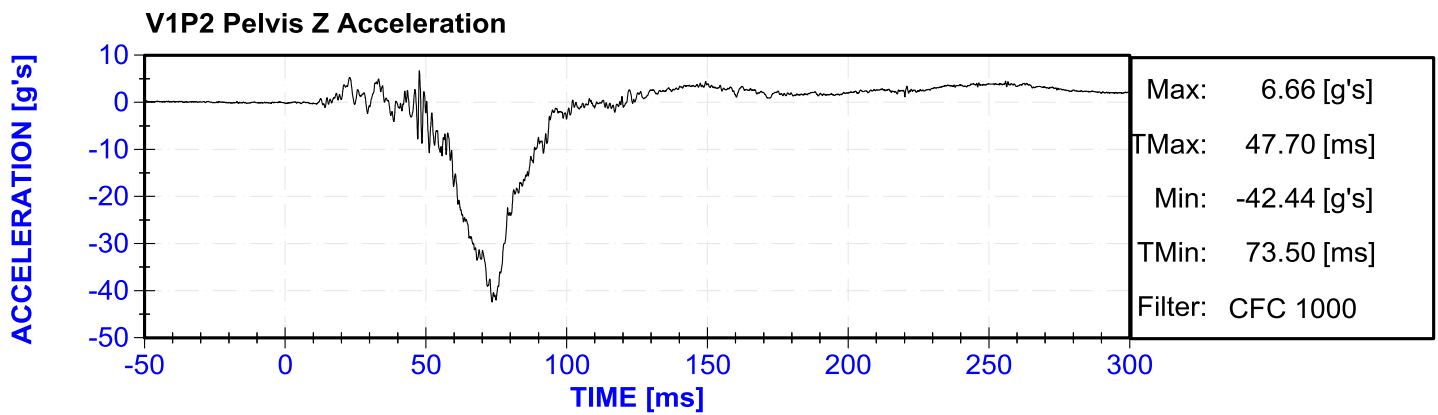
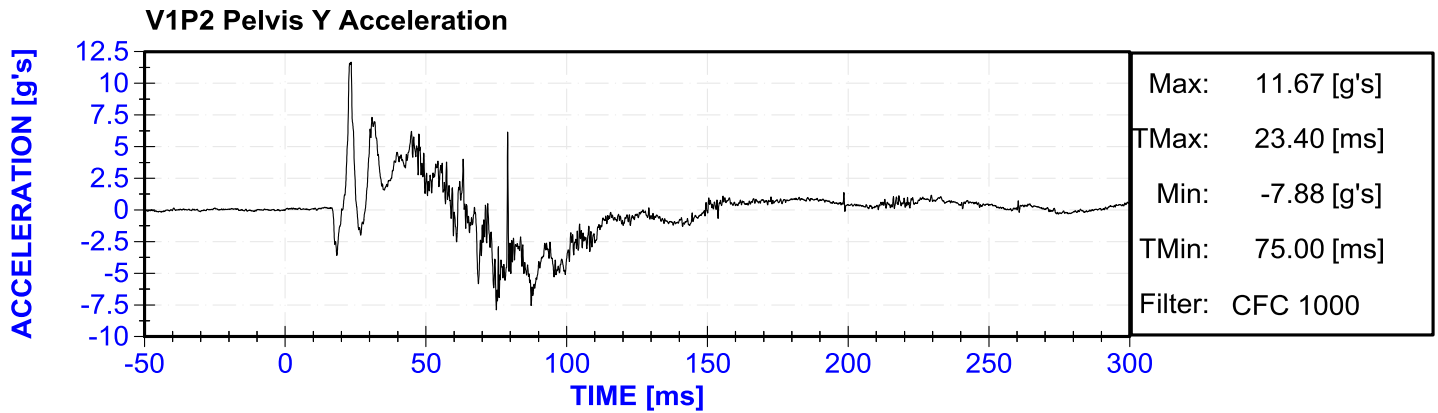


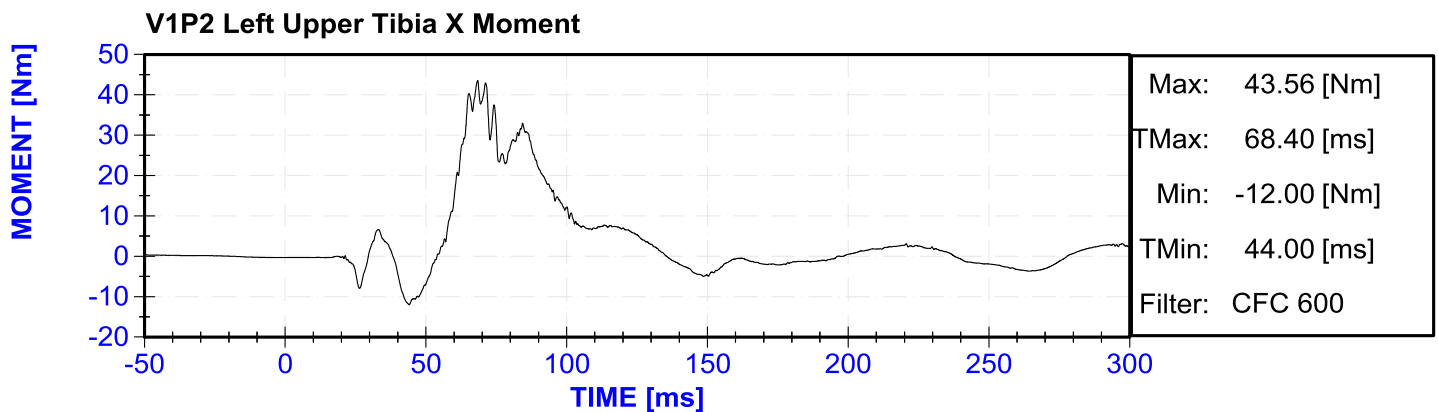
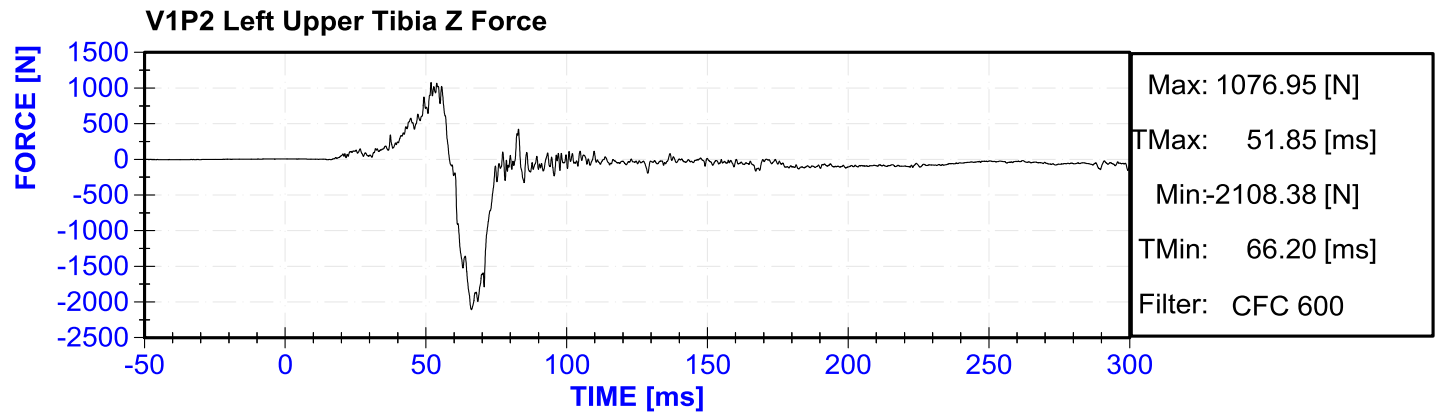
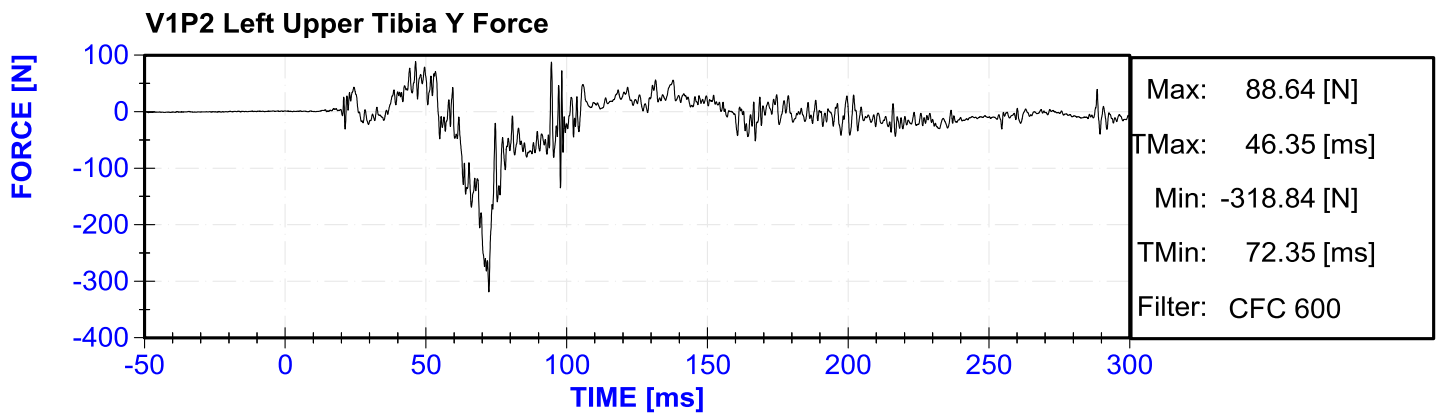
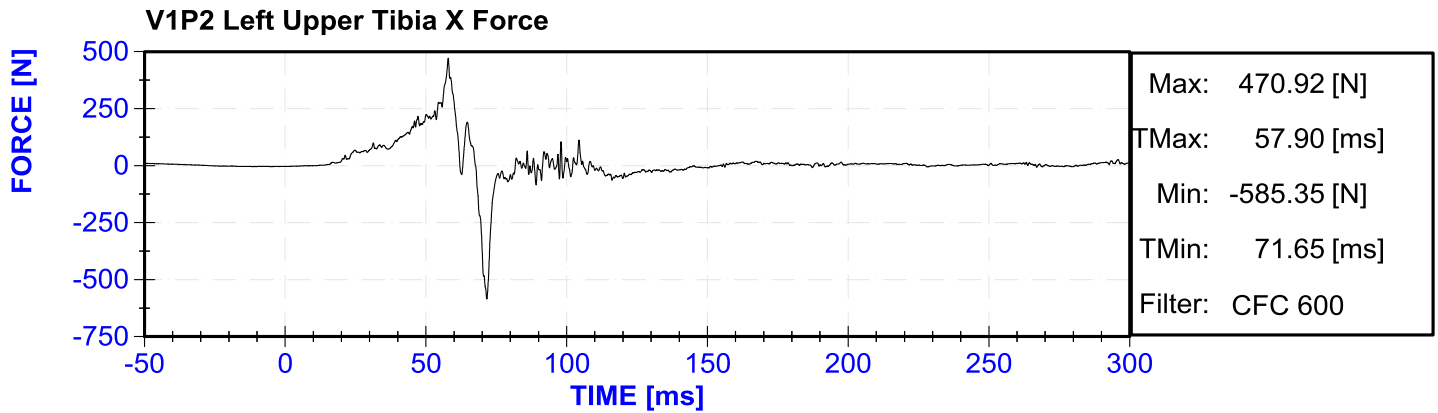


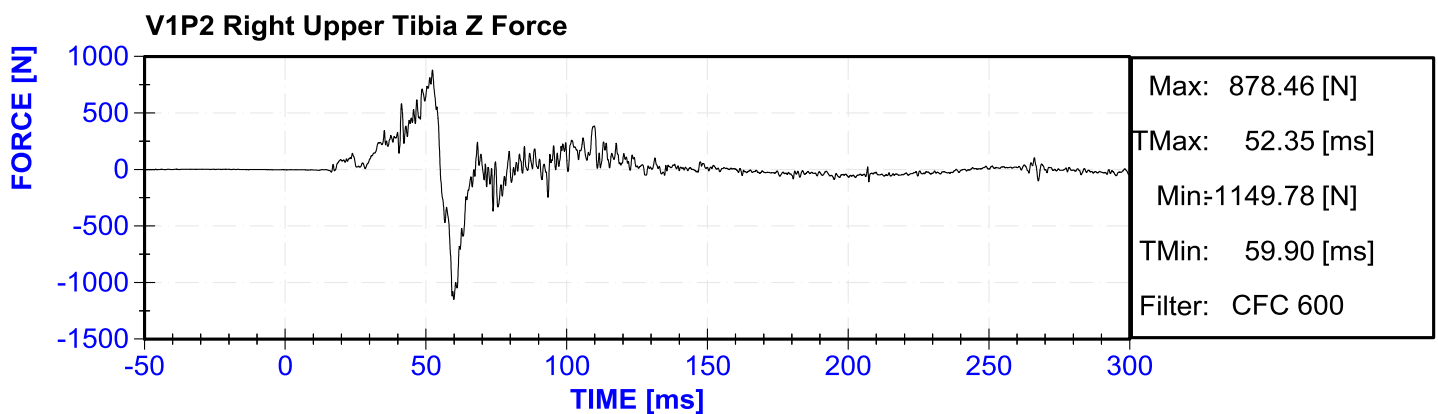
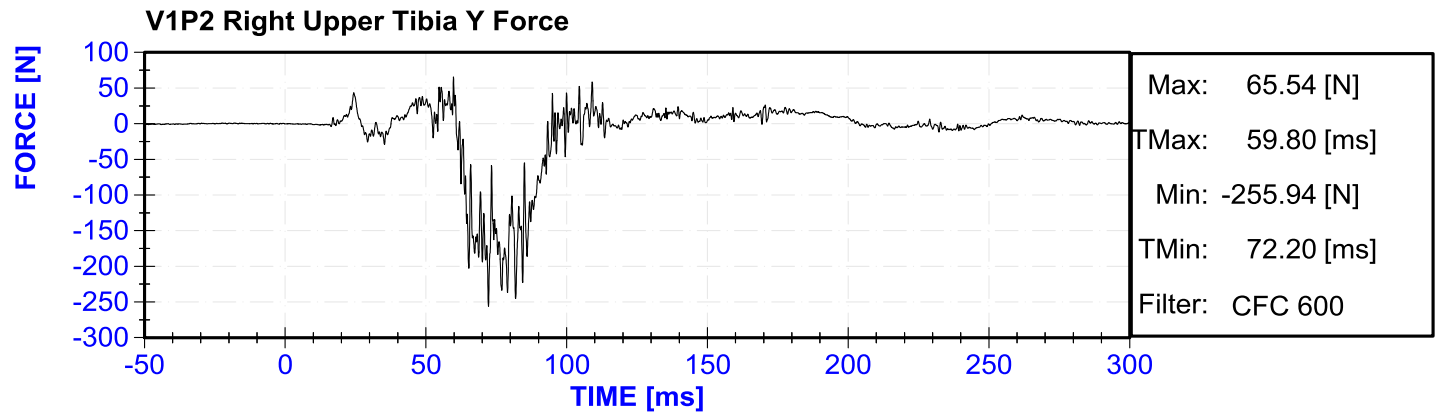
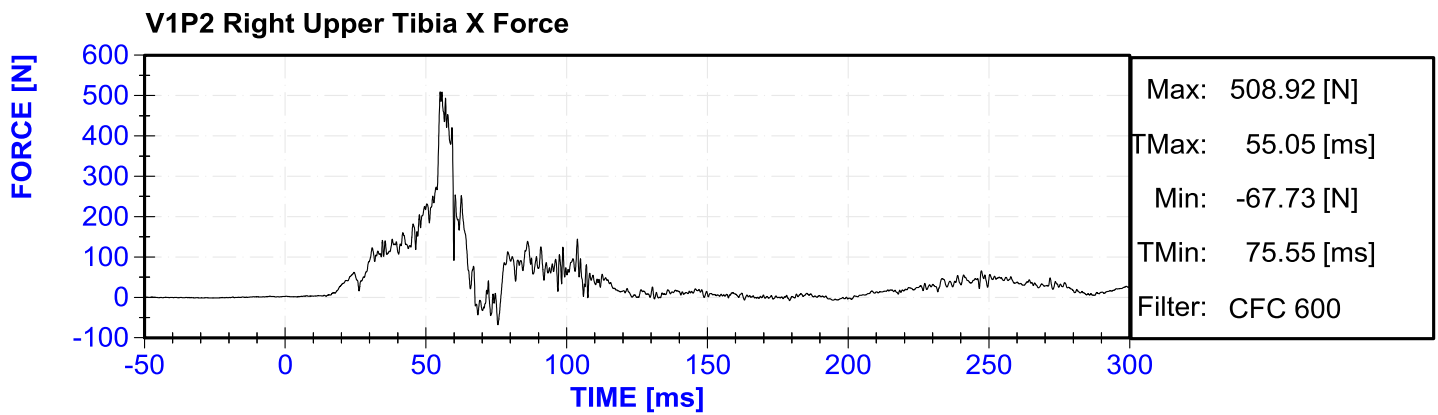
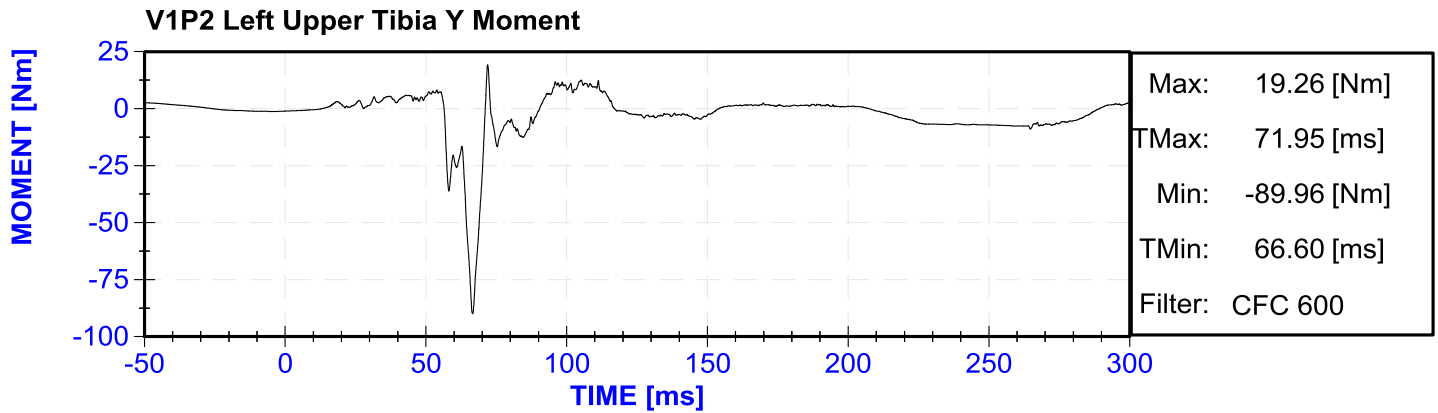


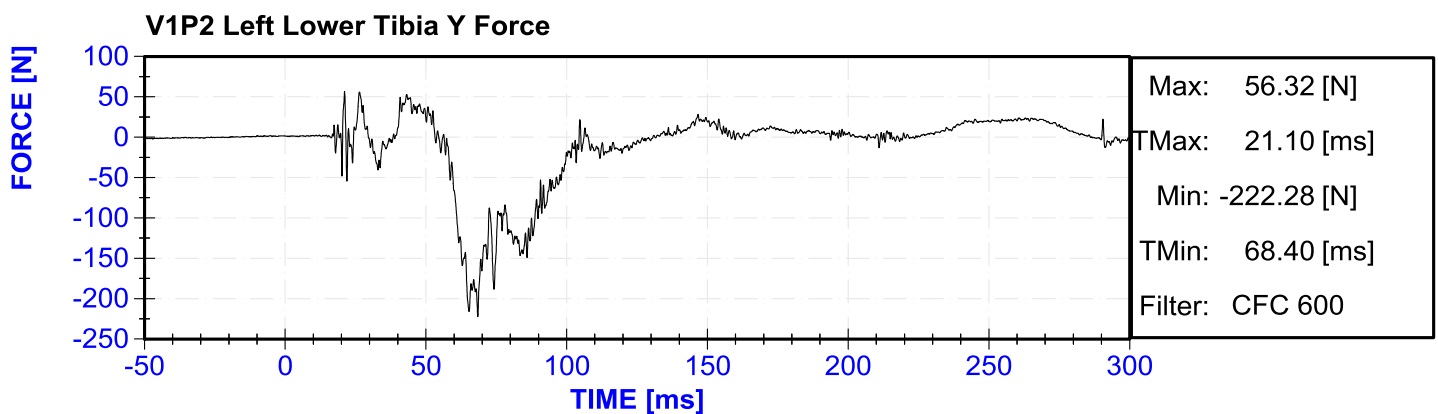
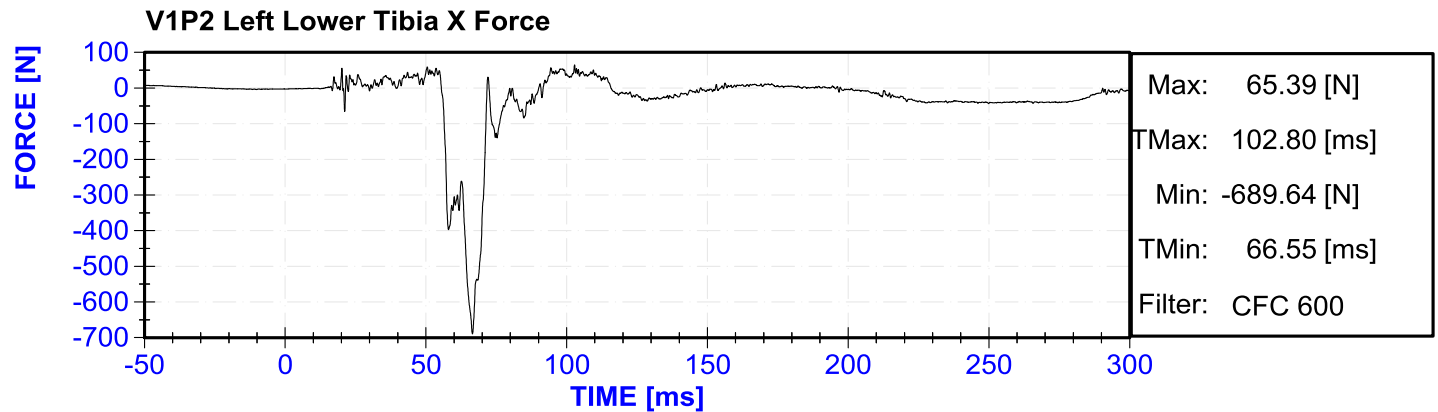
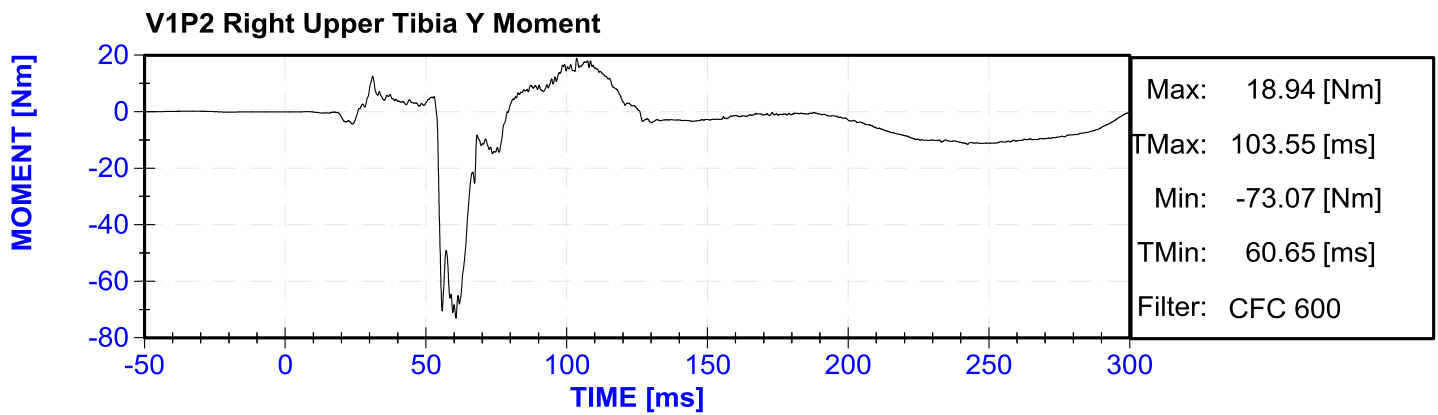
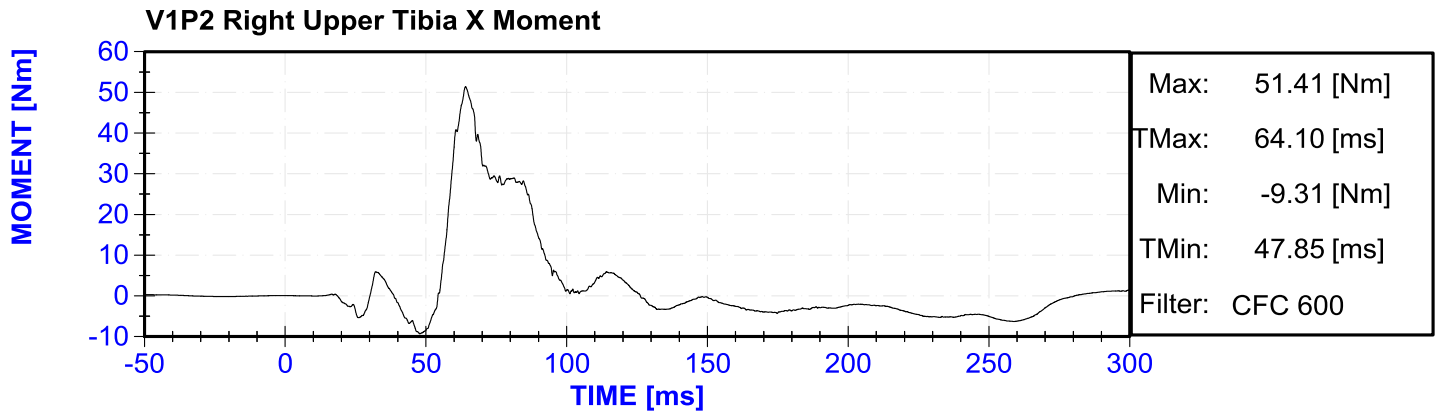


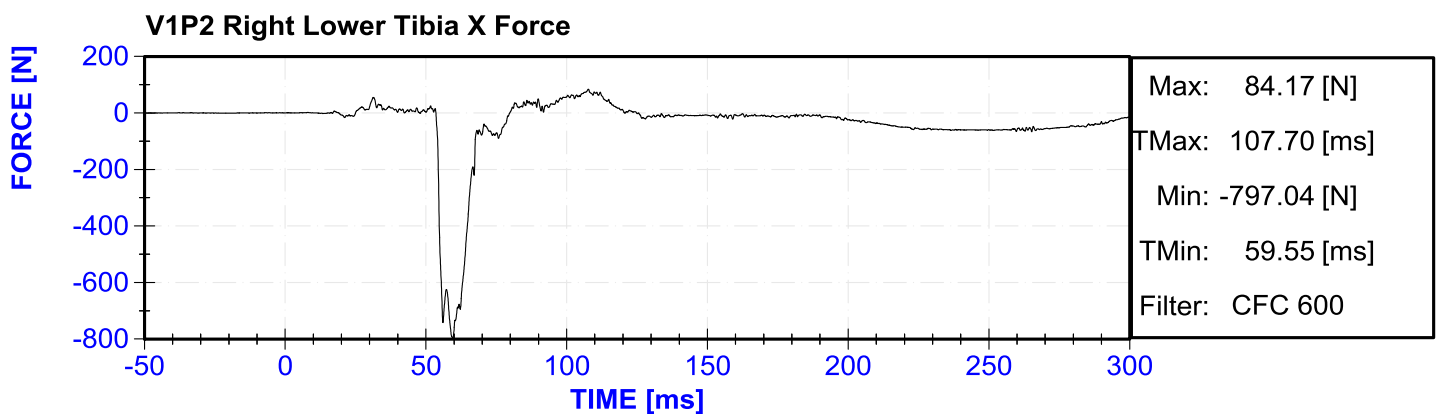
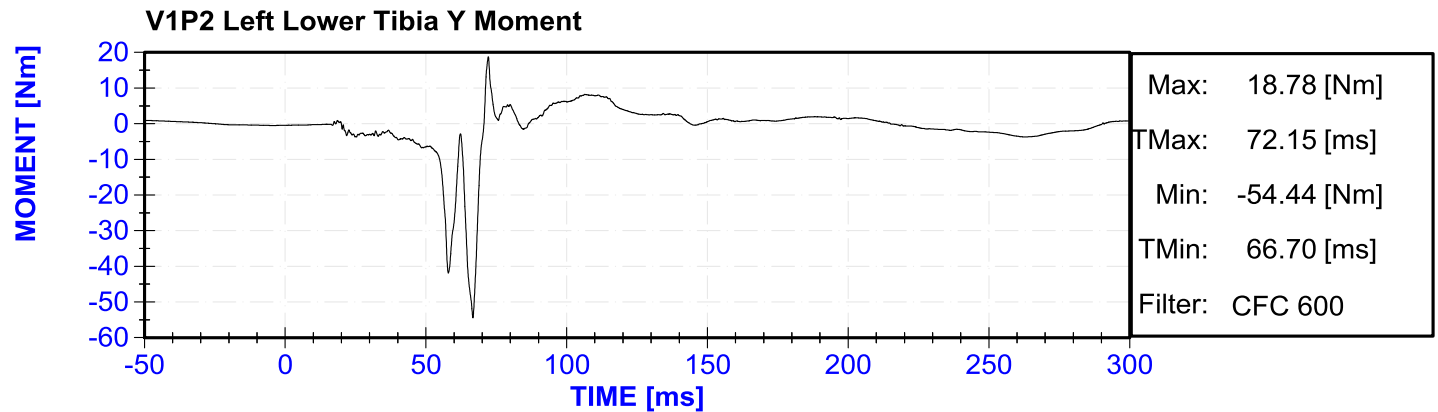
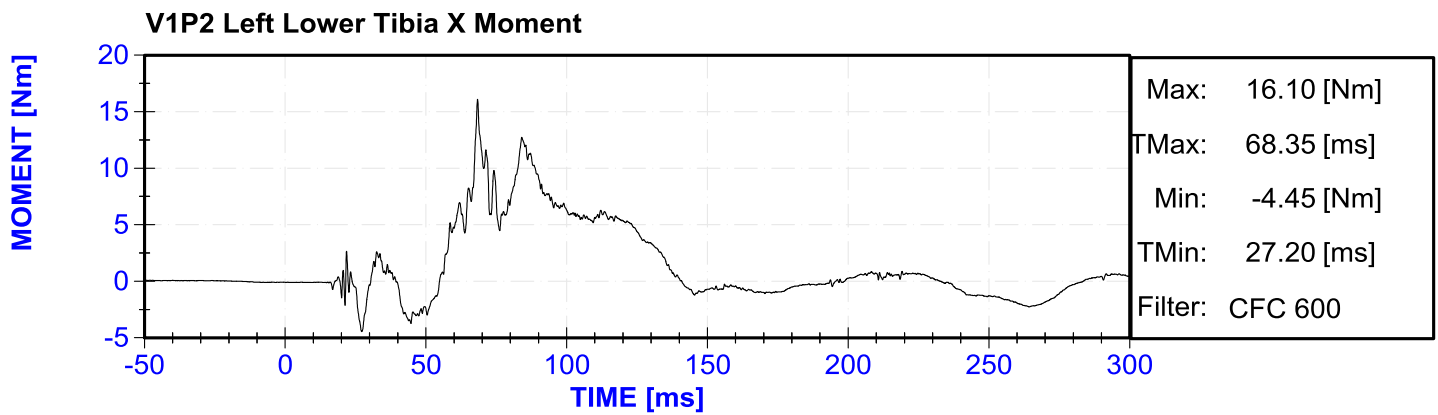
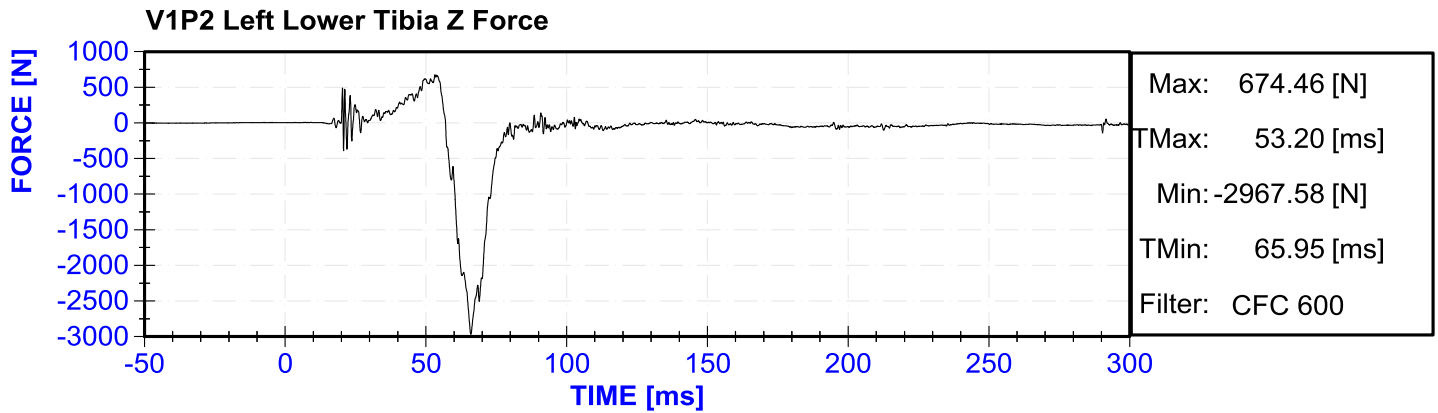


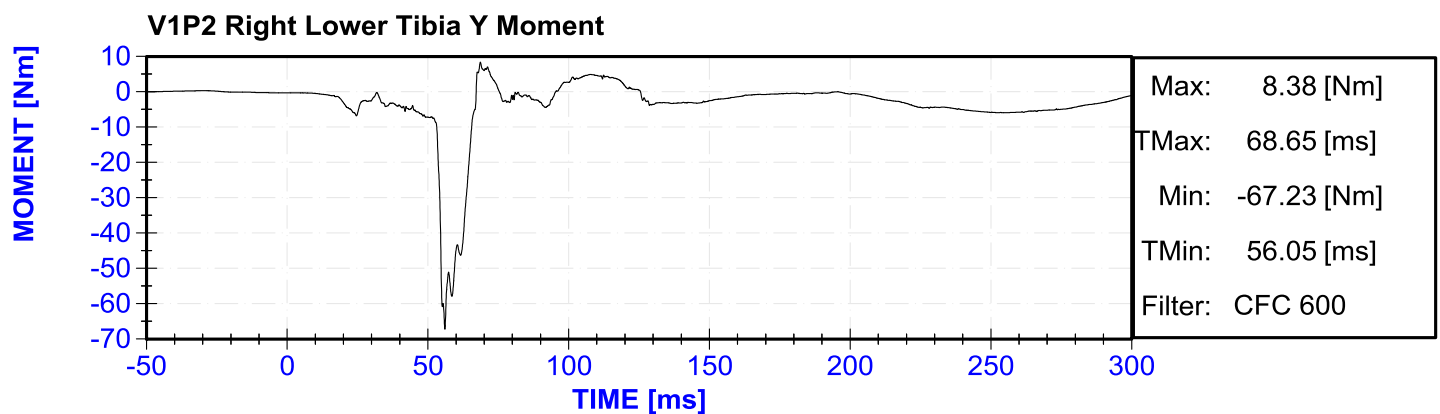
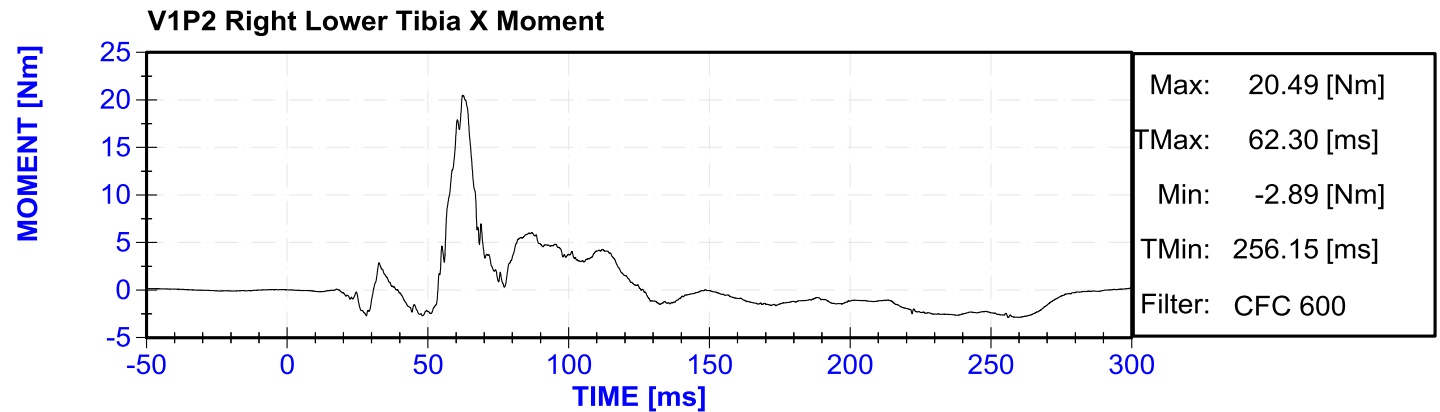
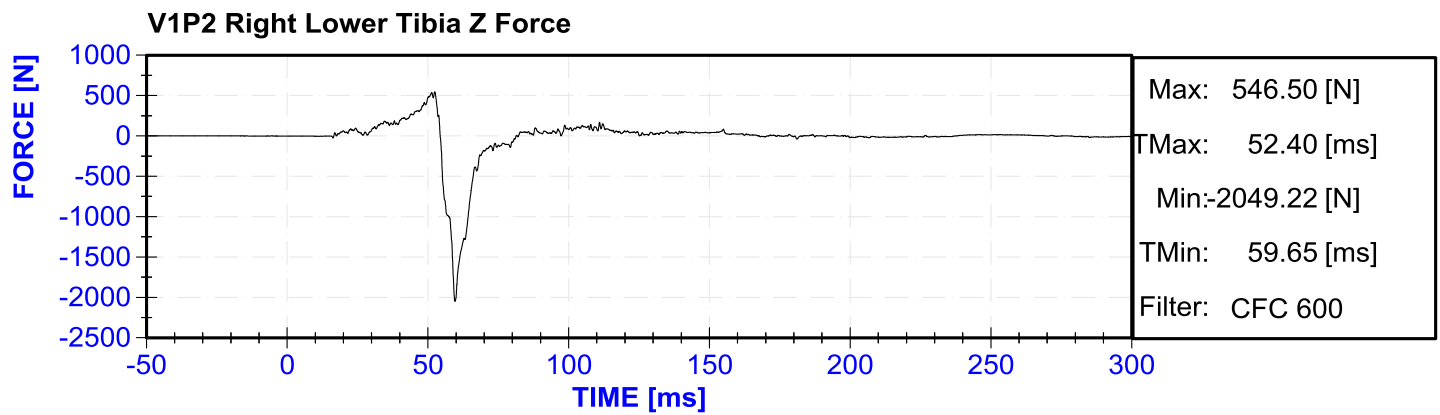
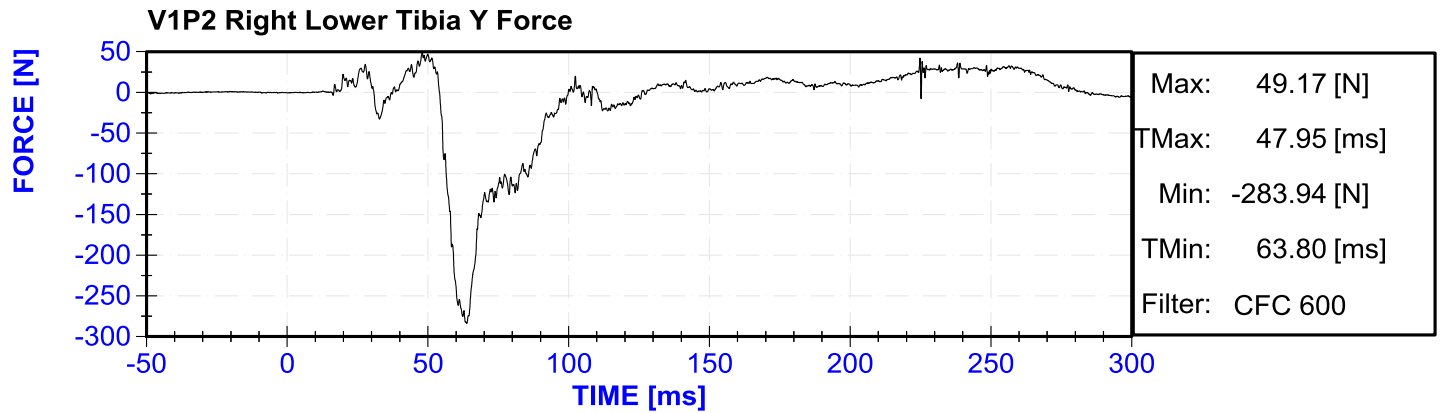


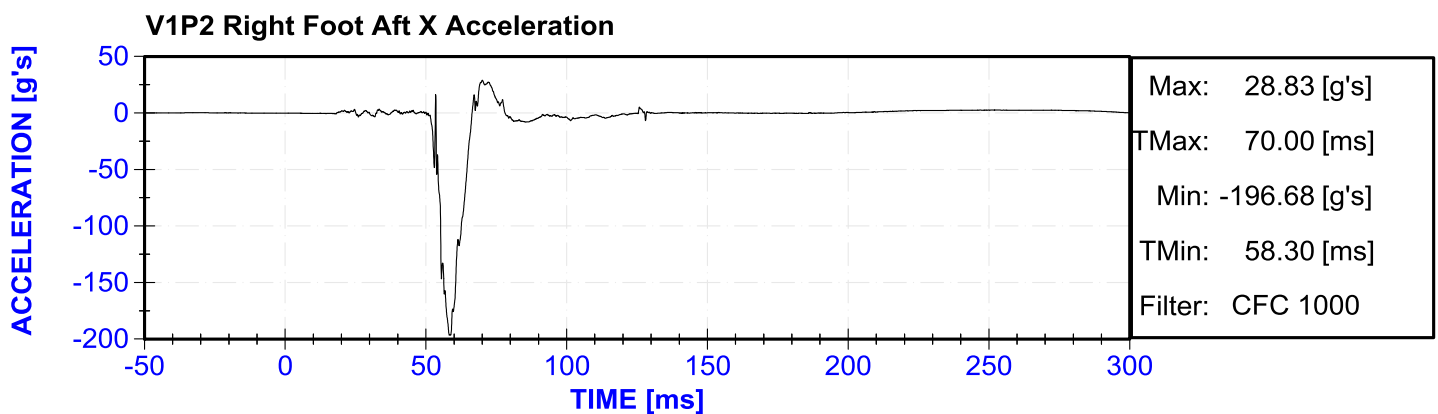
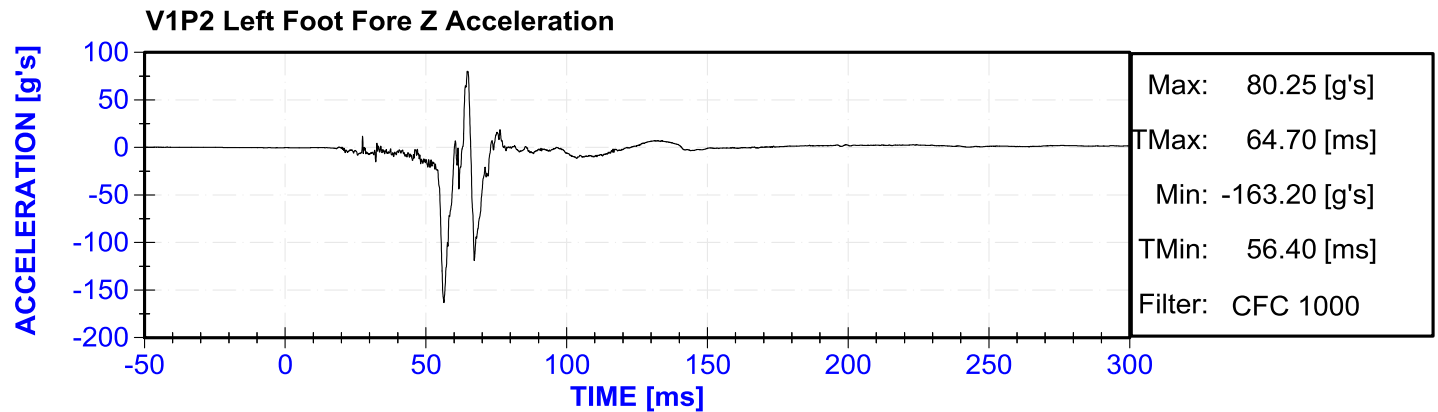
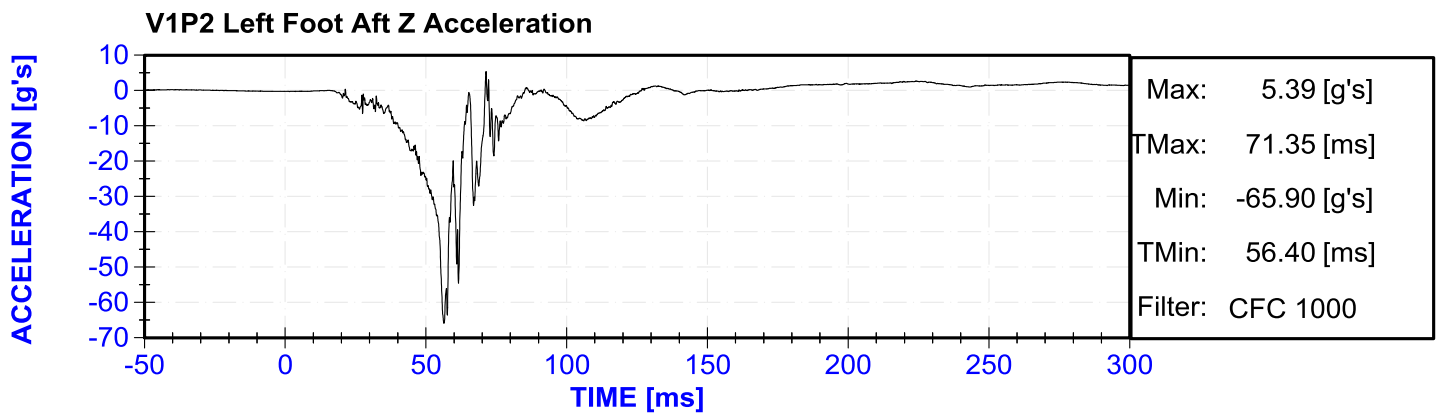
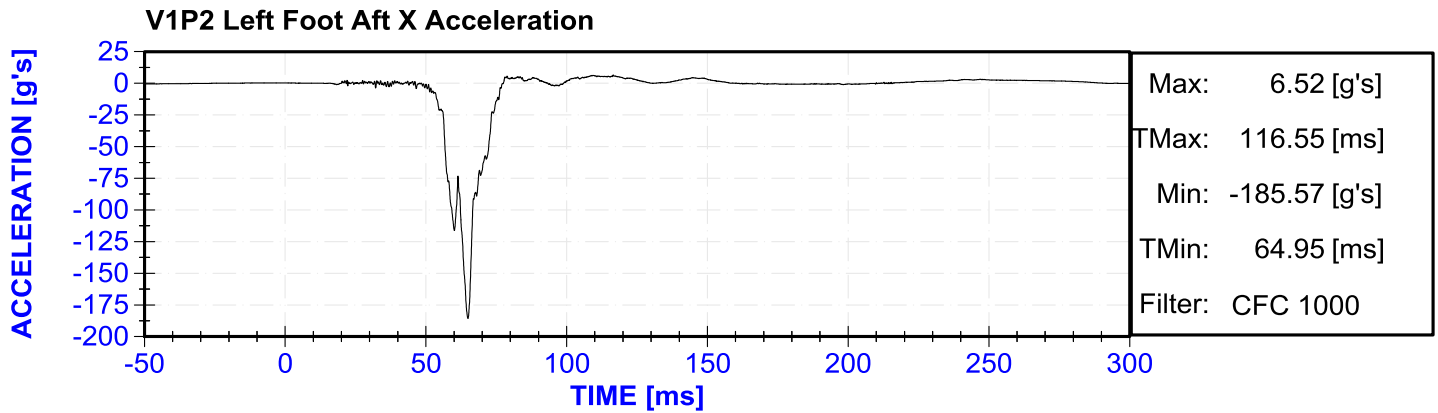


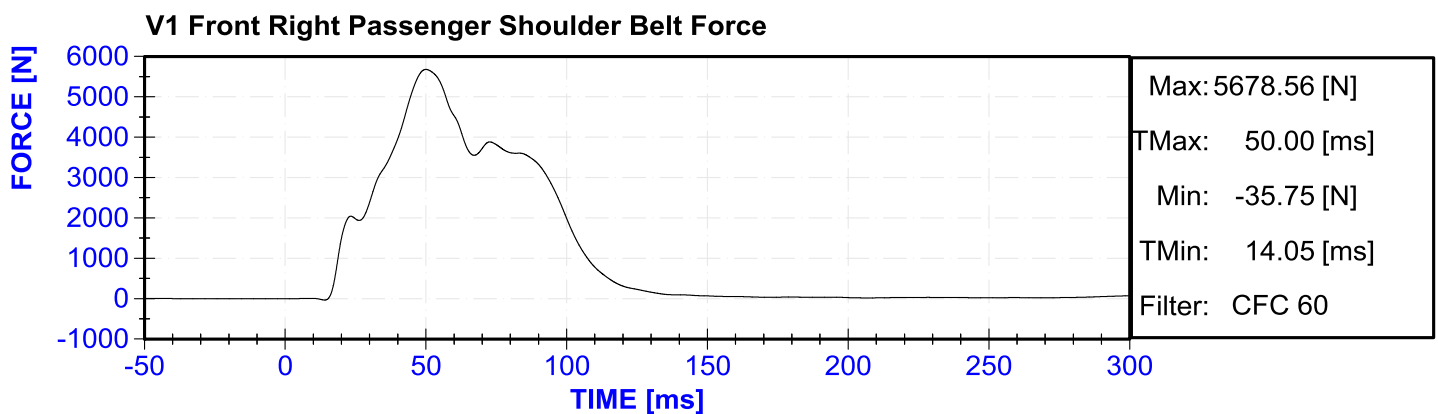
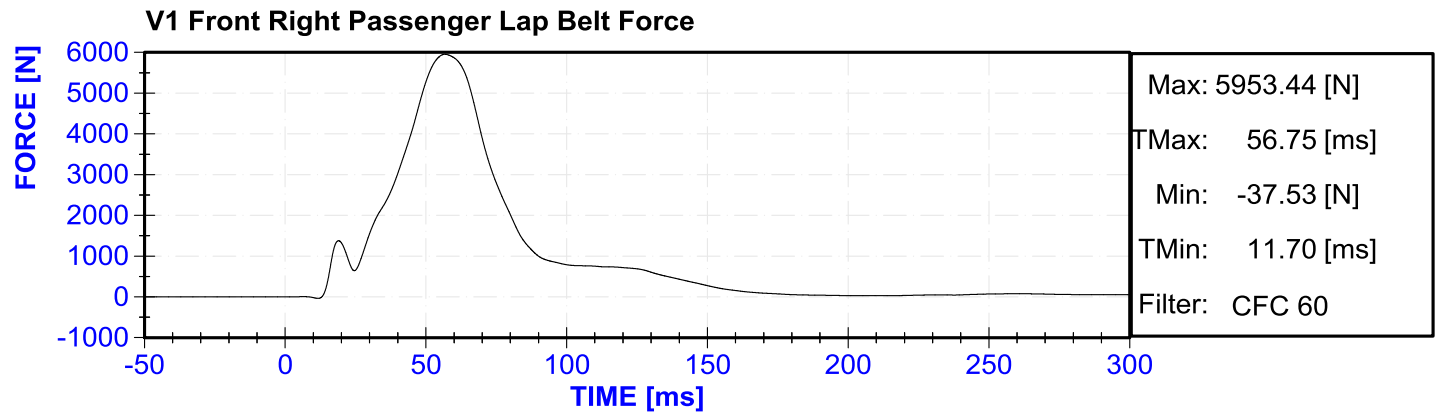
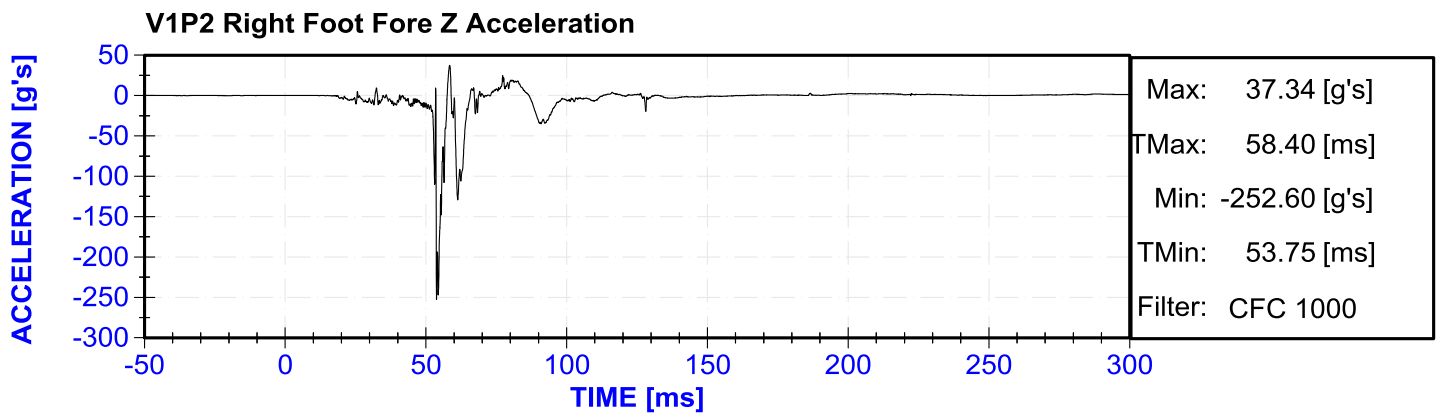
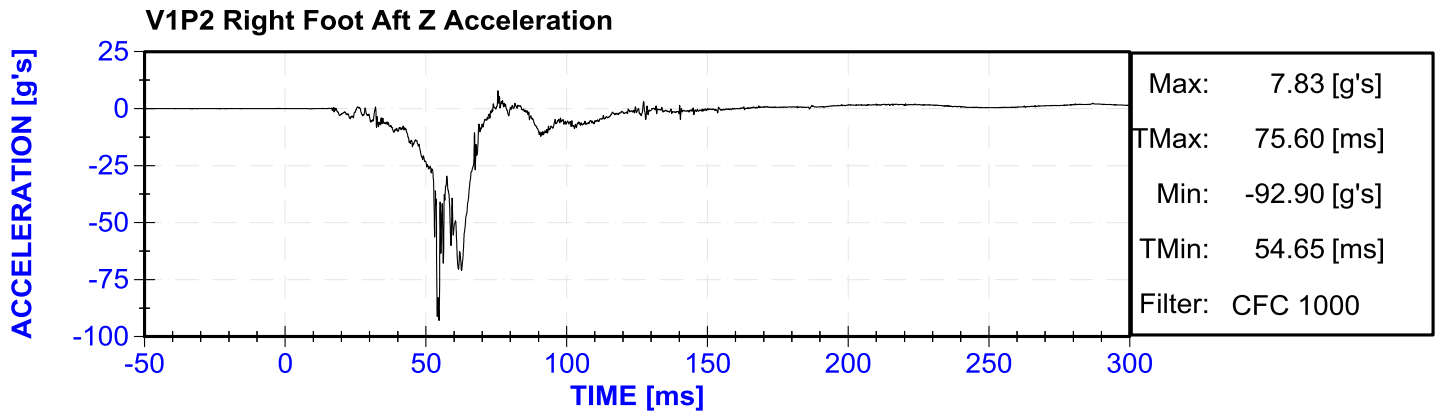




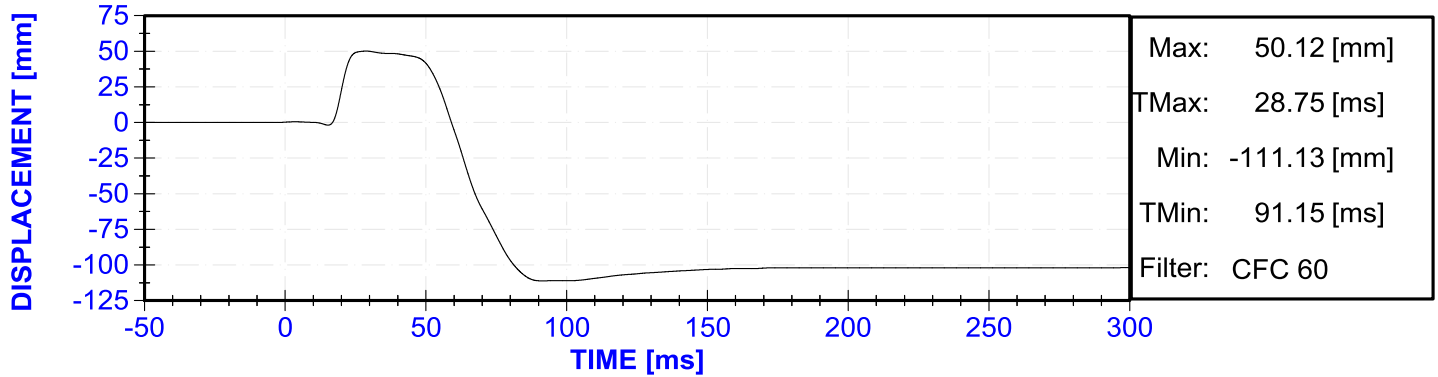




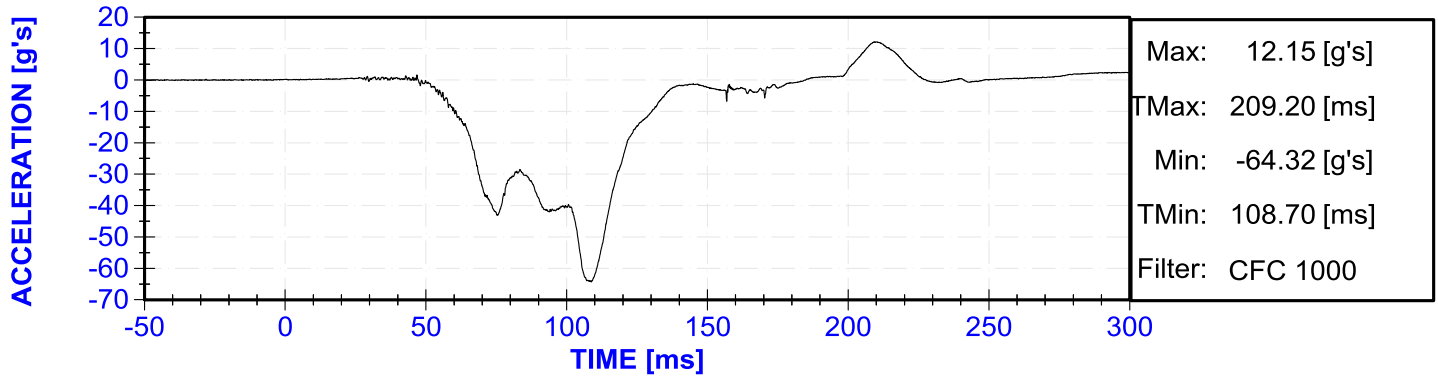




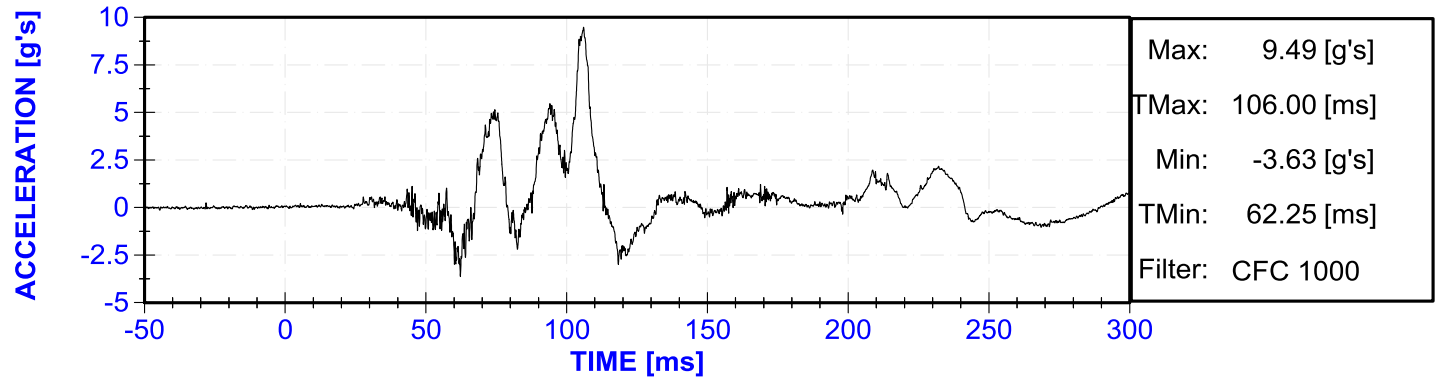
V1 Front Right Passenger Shoulder Belt Displacement



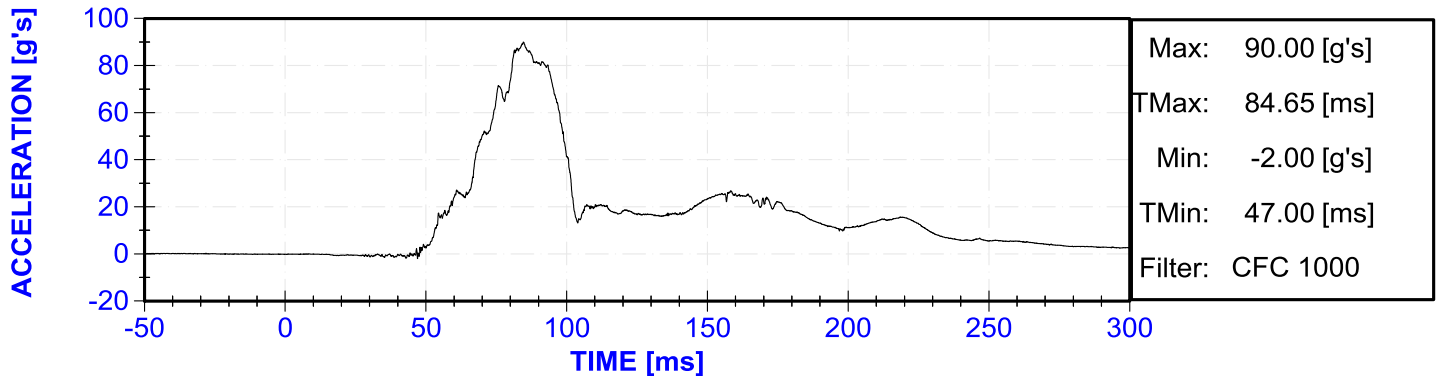
V1P3 Head CG X Acceleration

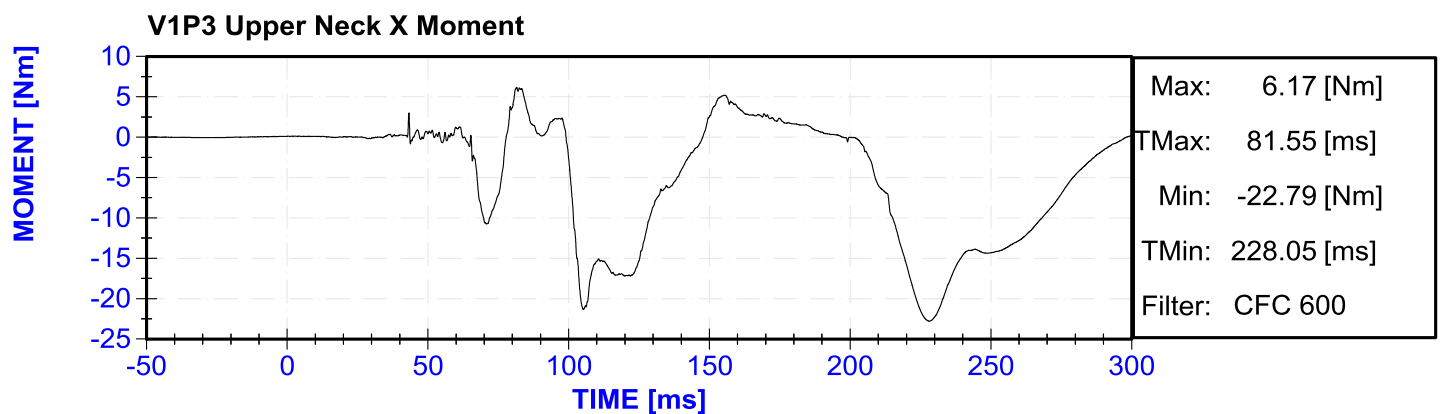
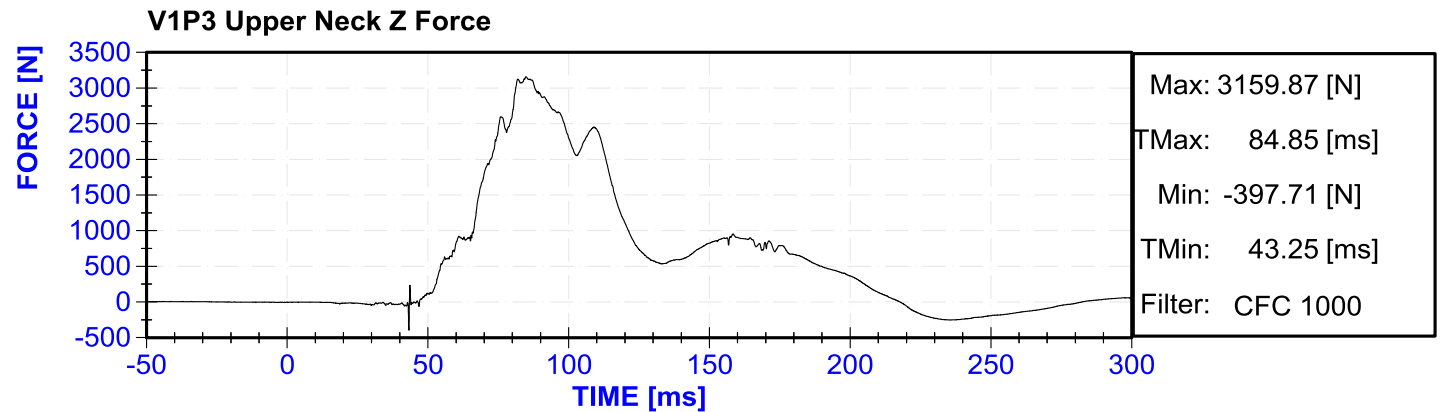
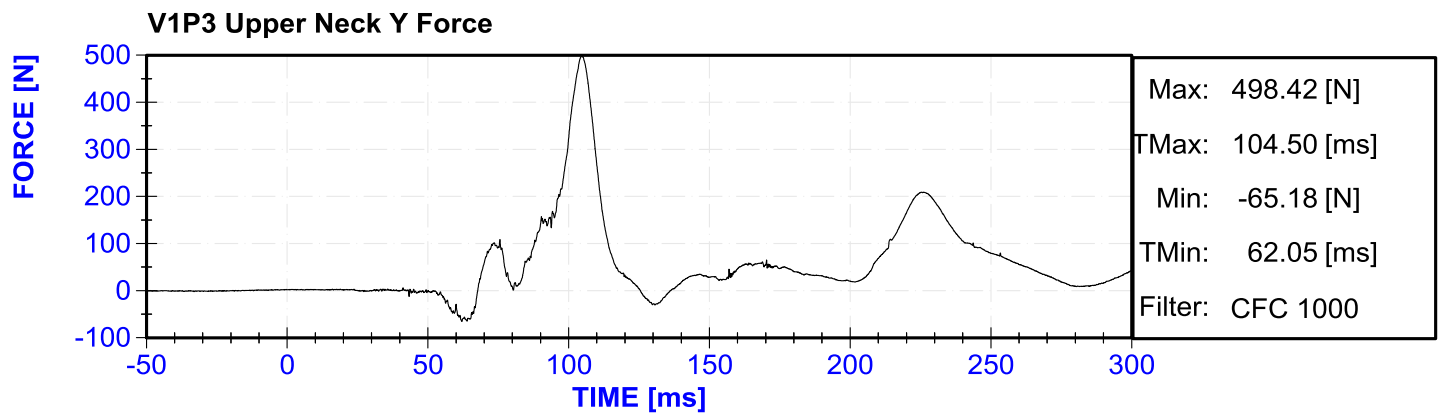
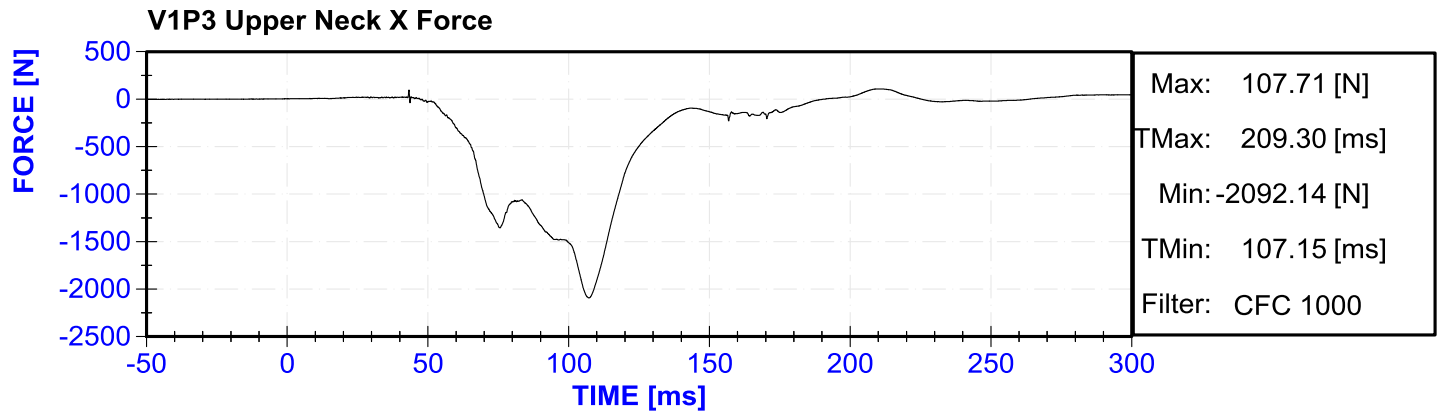


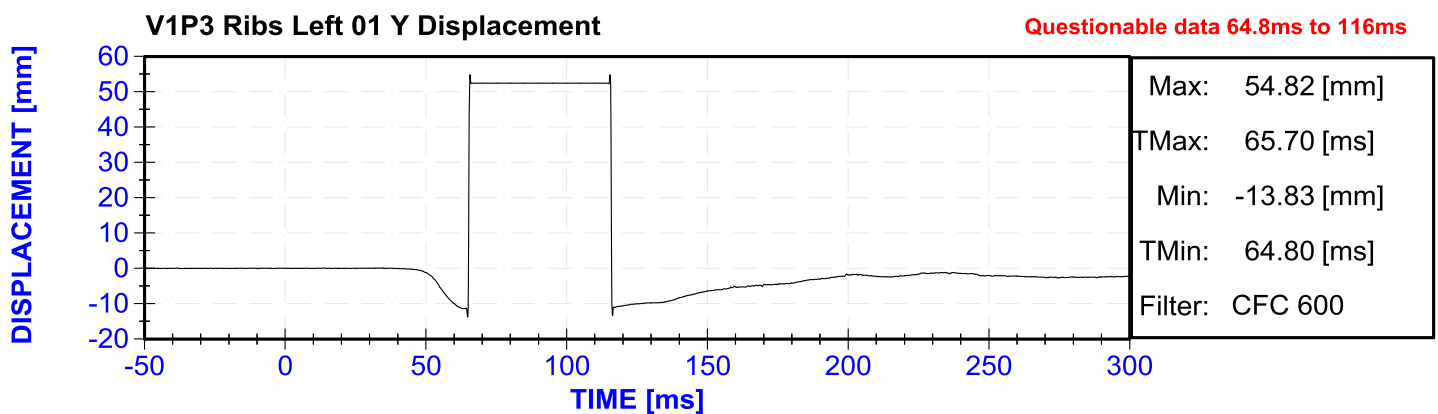
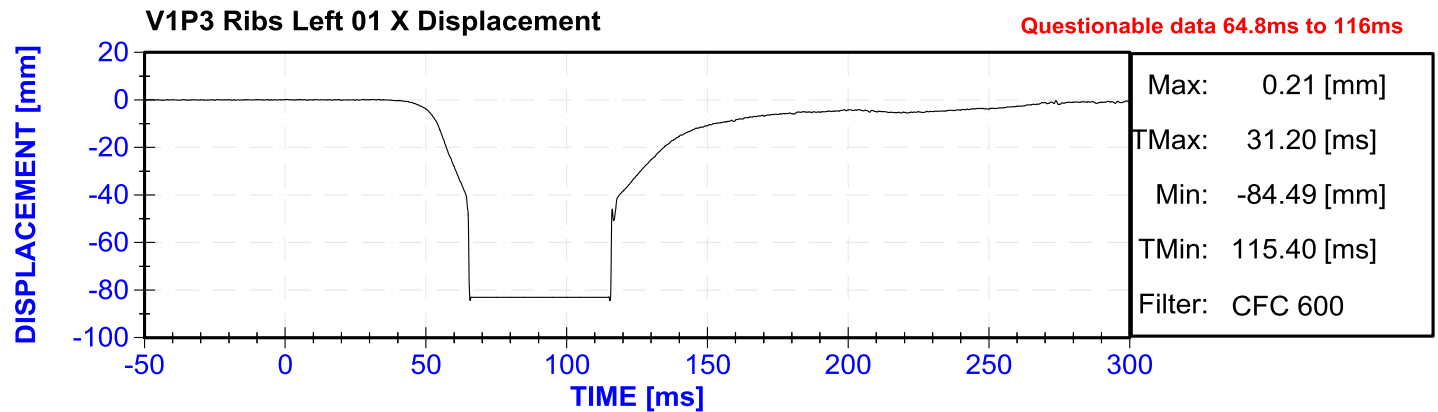
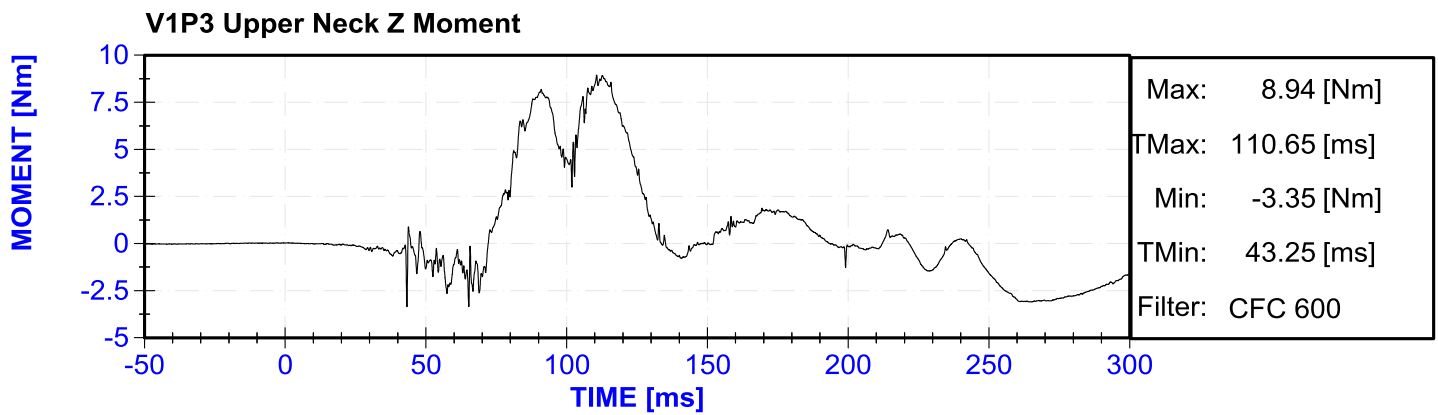
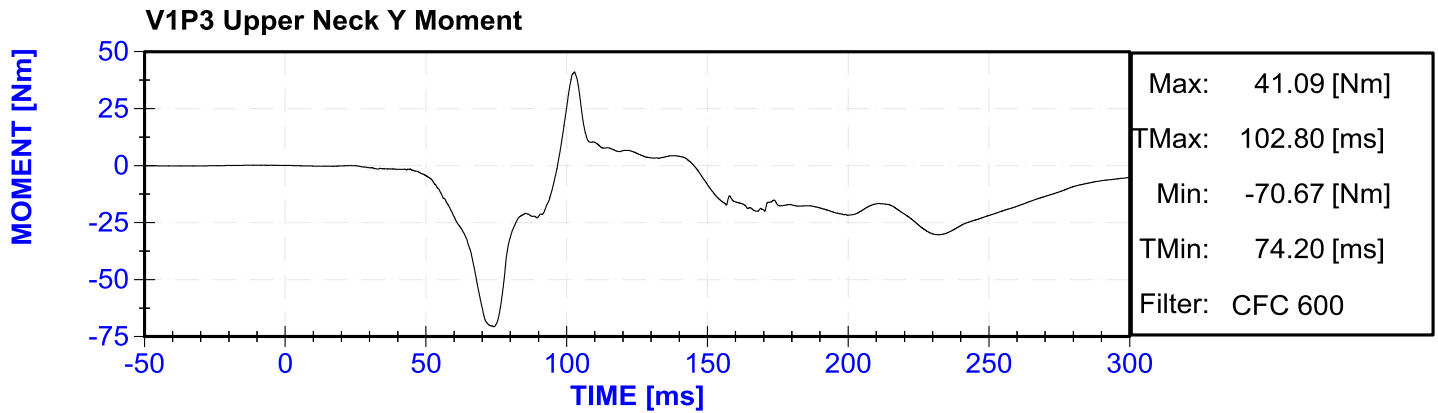
V1P3 Head CG Y Acceleration

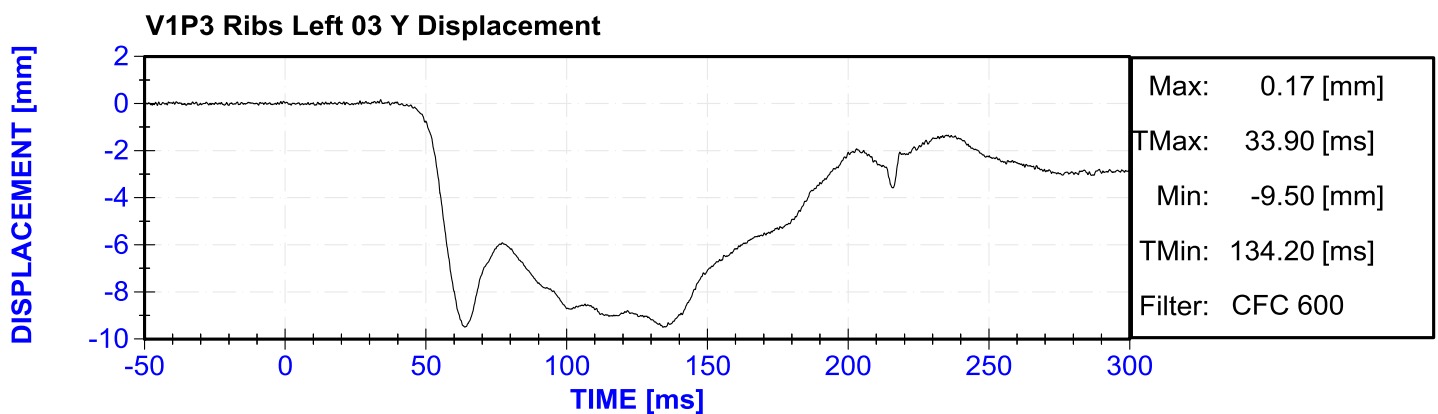
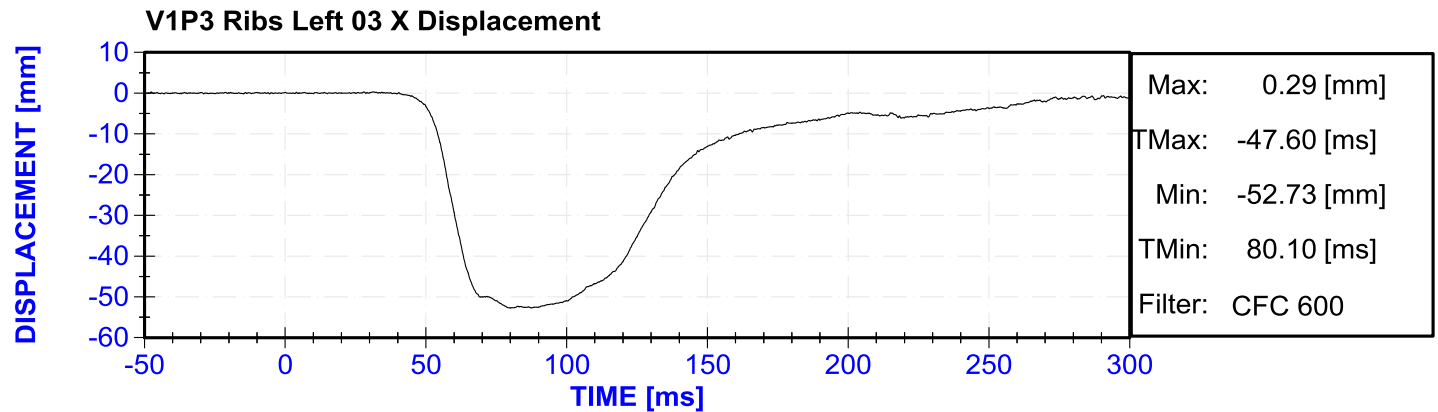
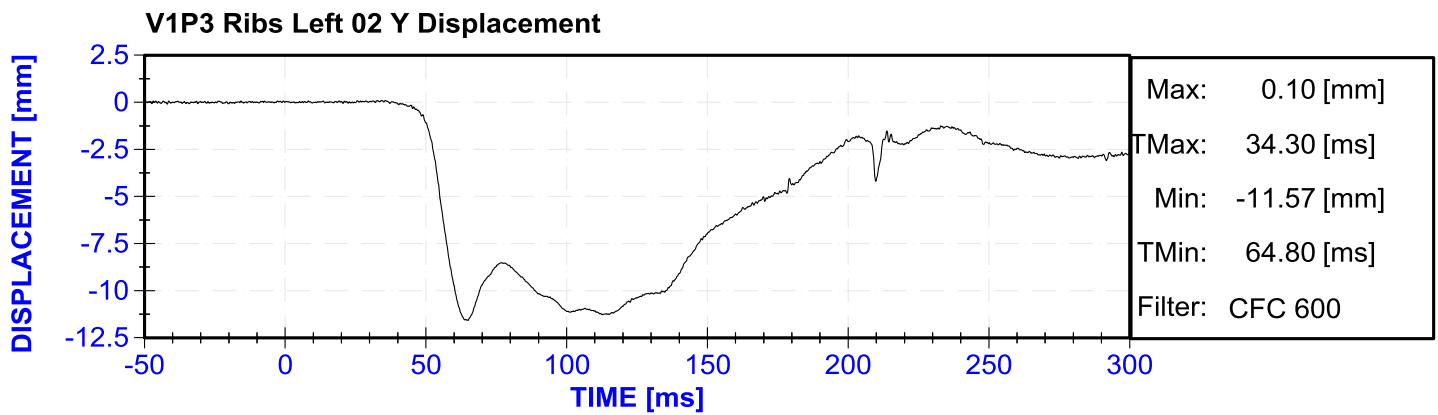
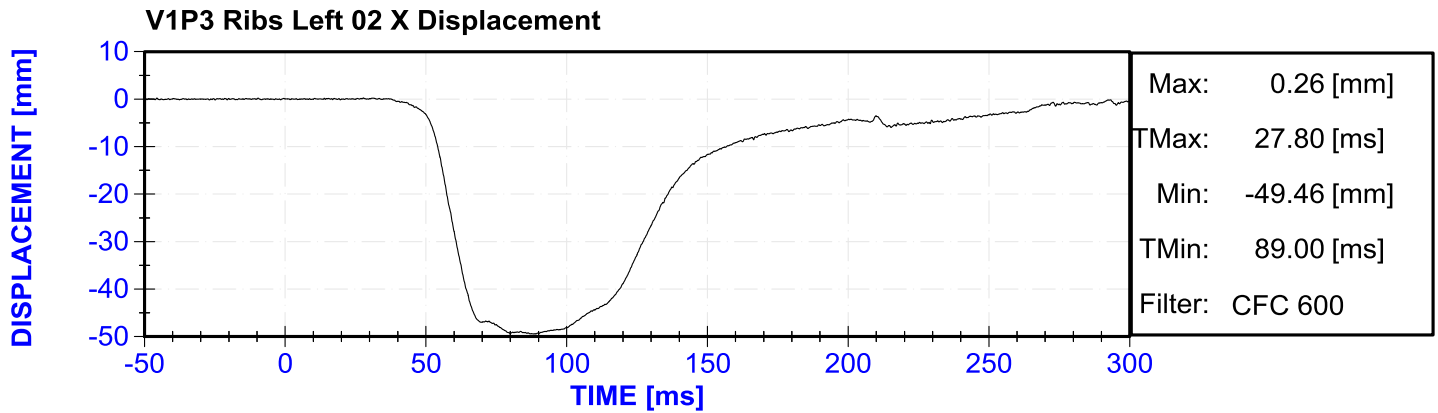


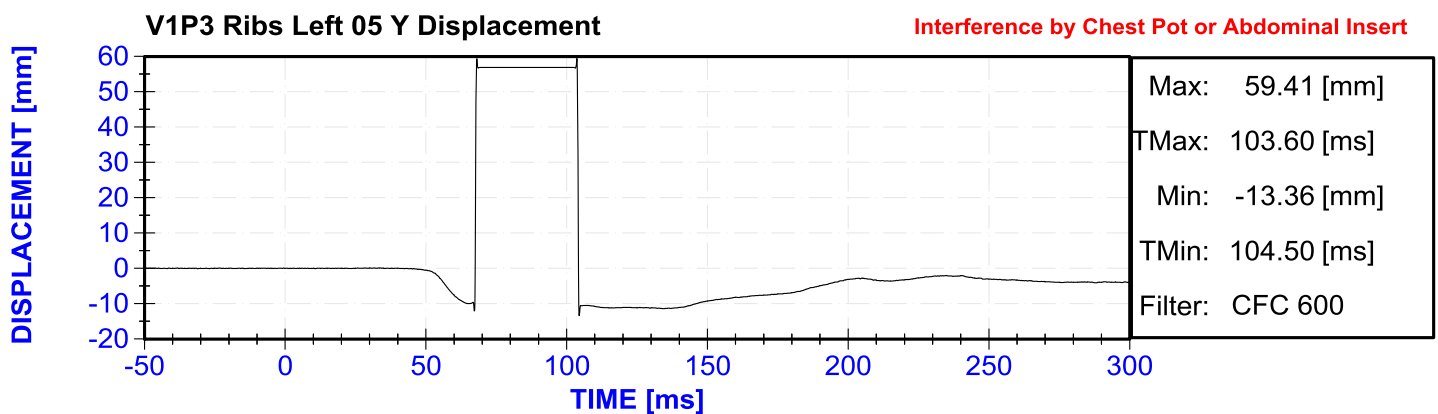
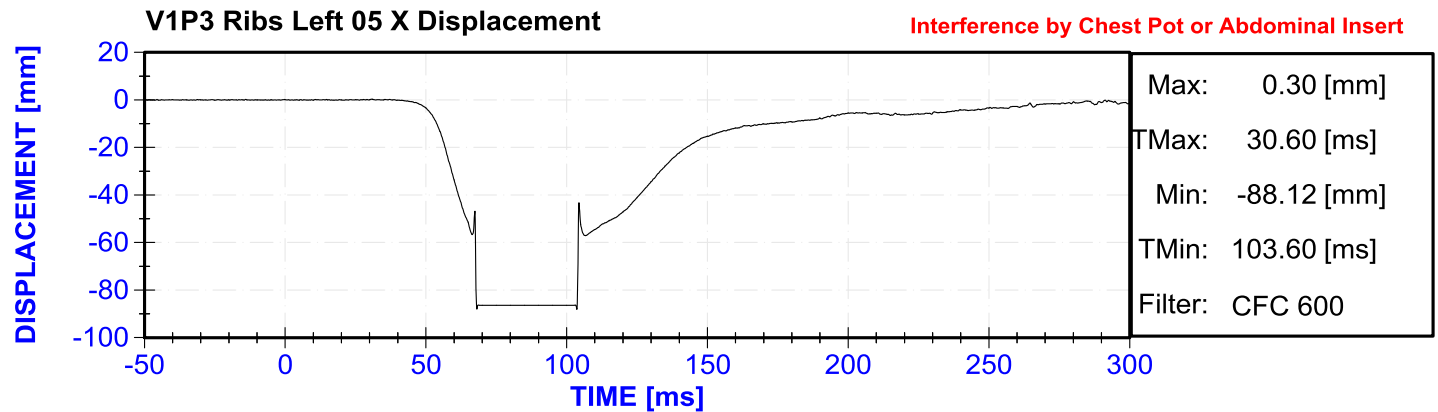
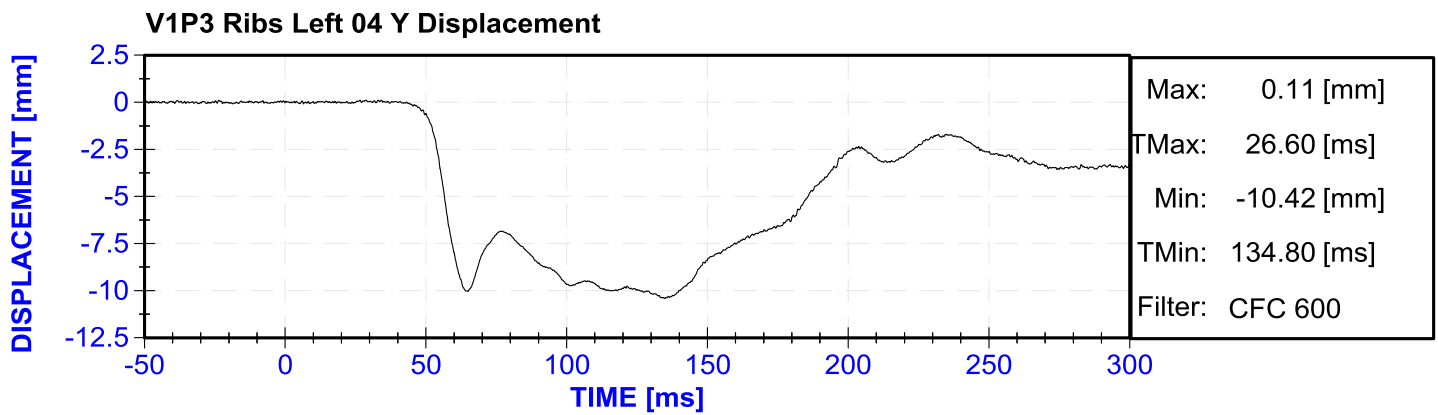
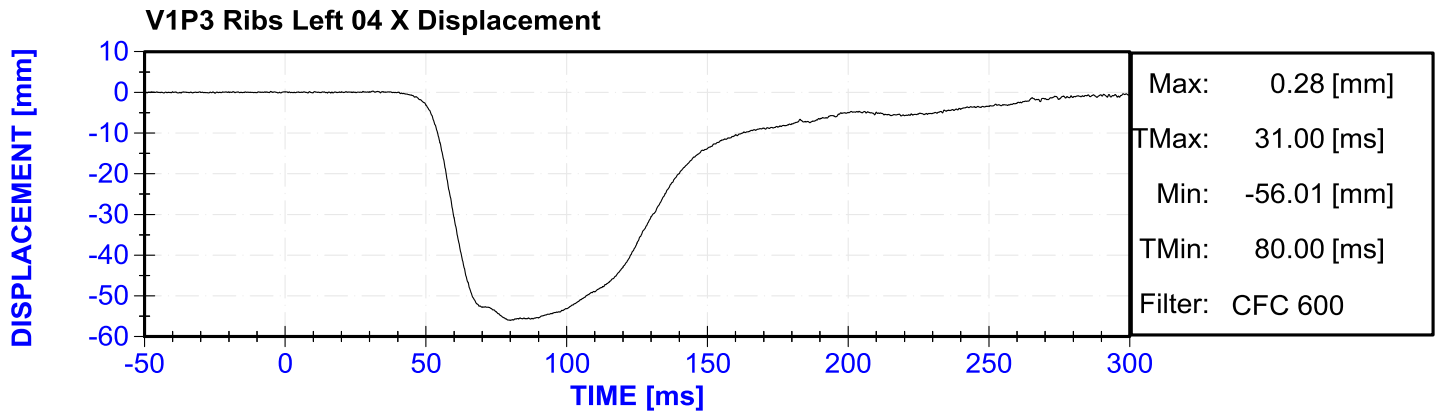
V1P3 Head CG Z Acceleration

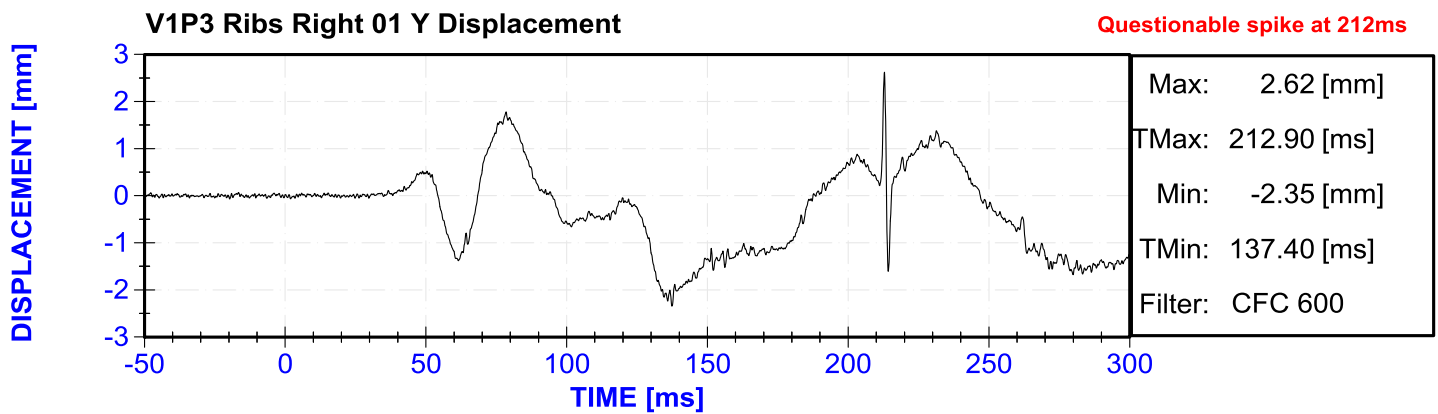
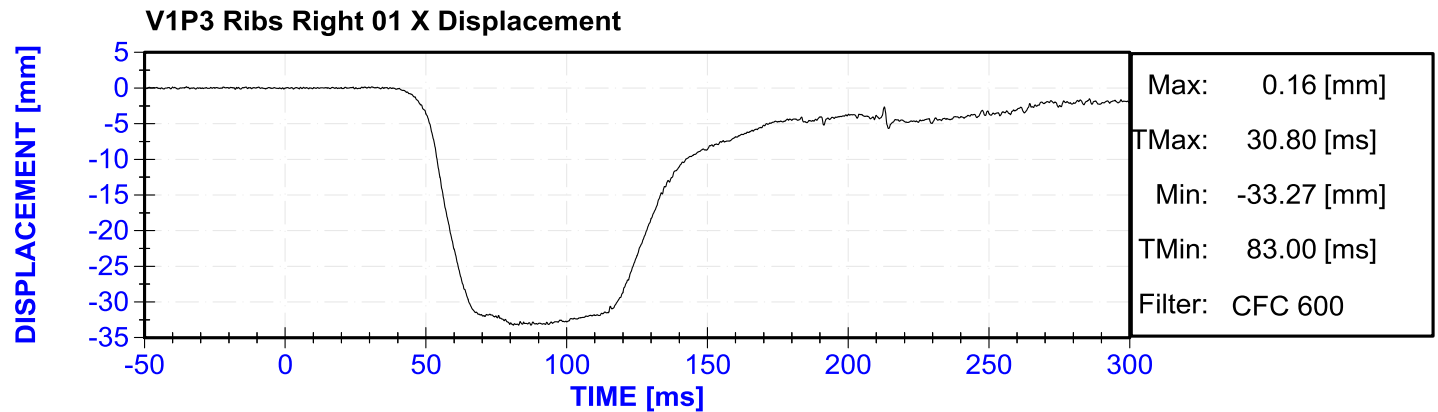
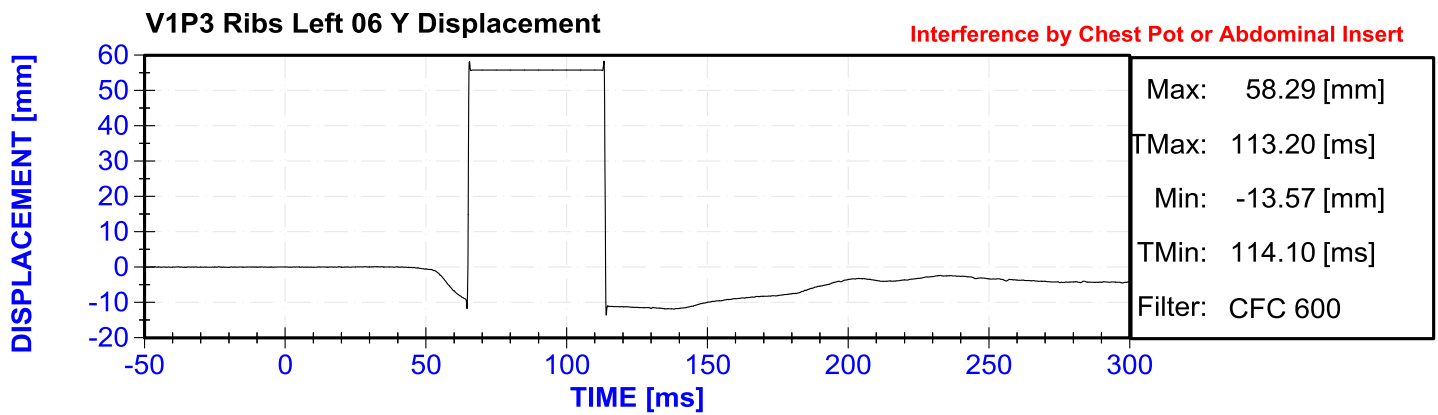
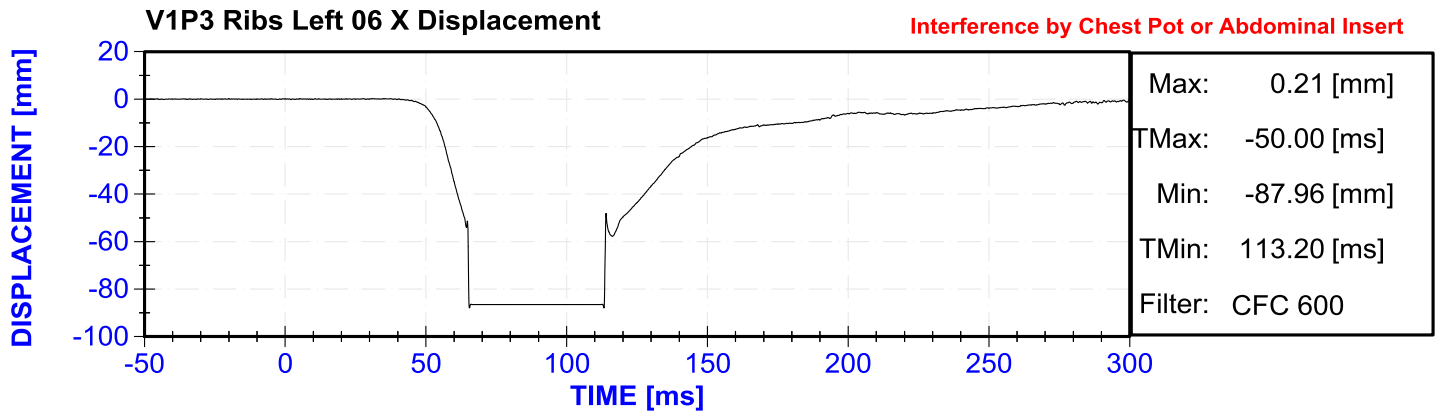


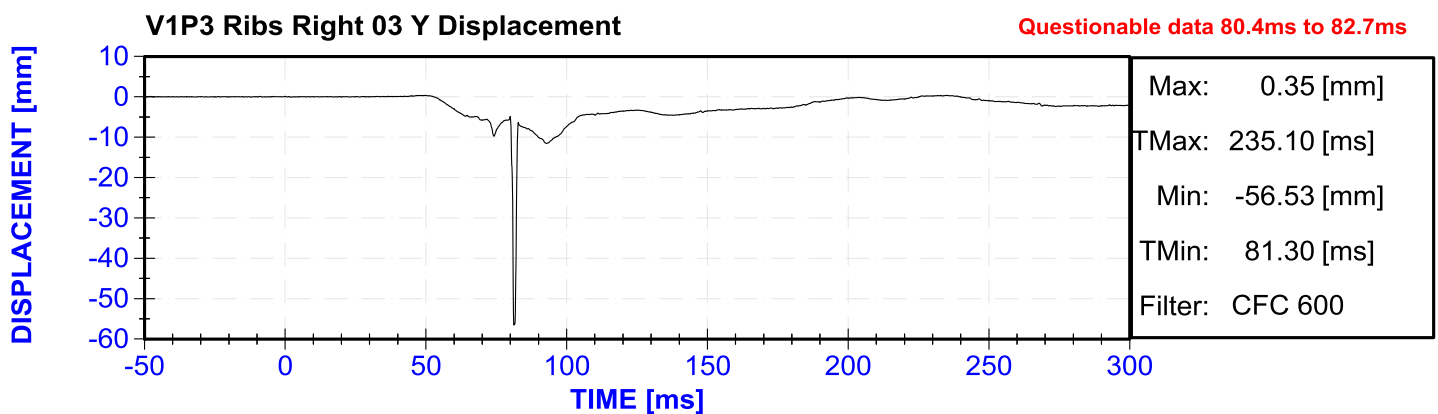
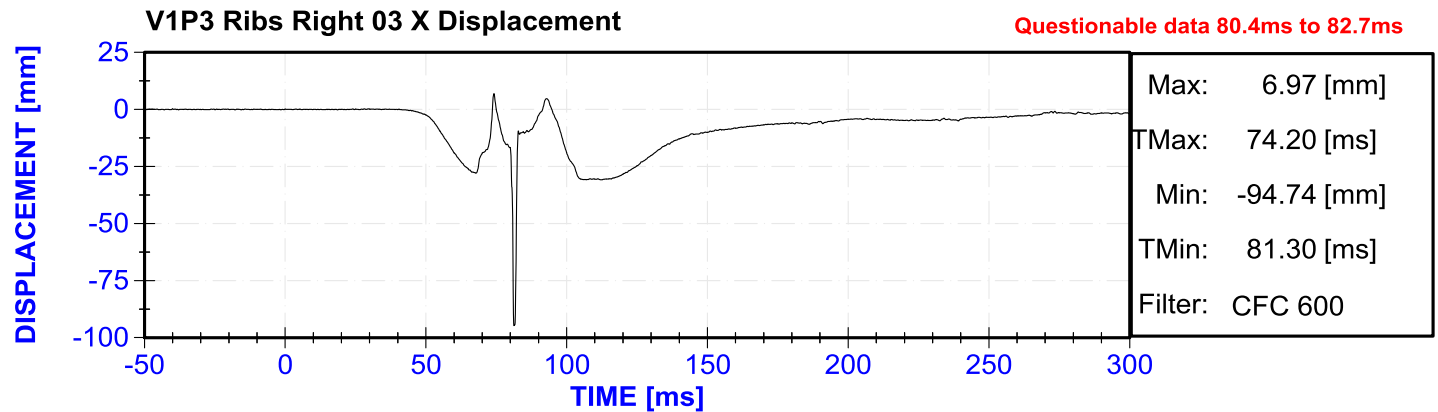
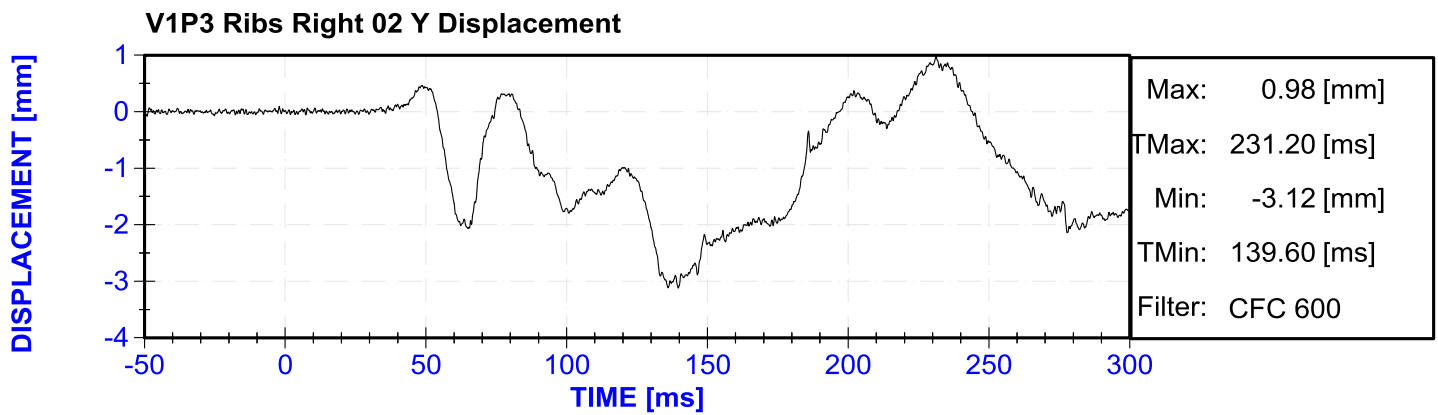
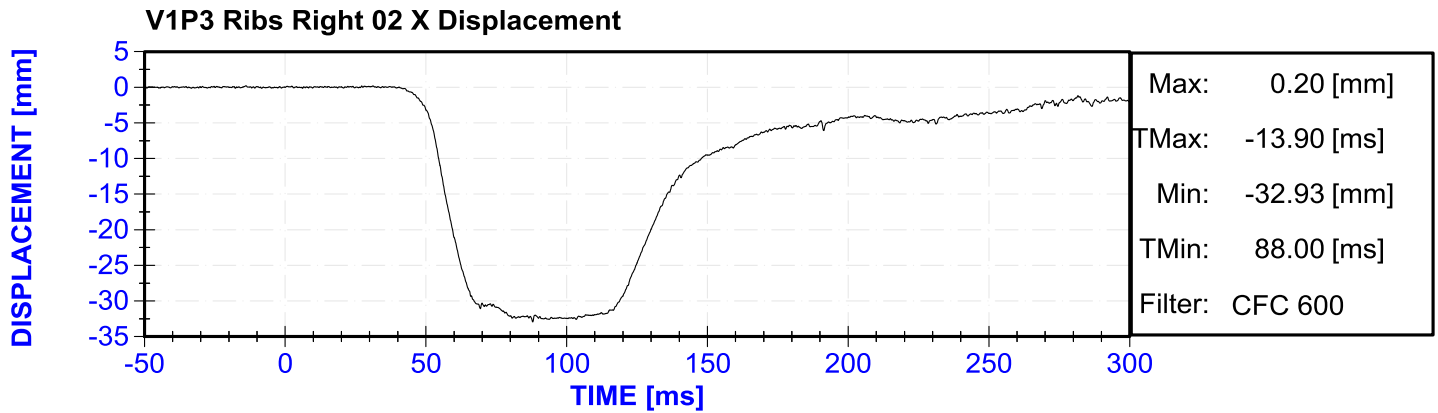


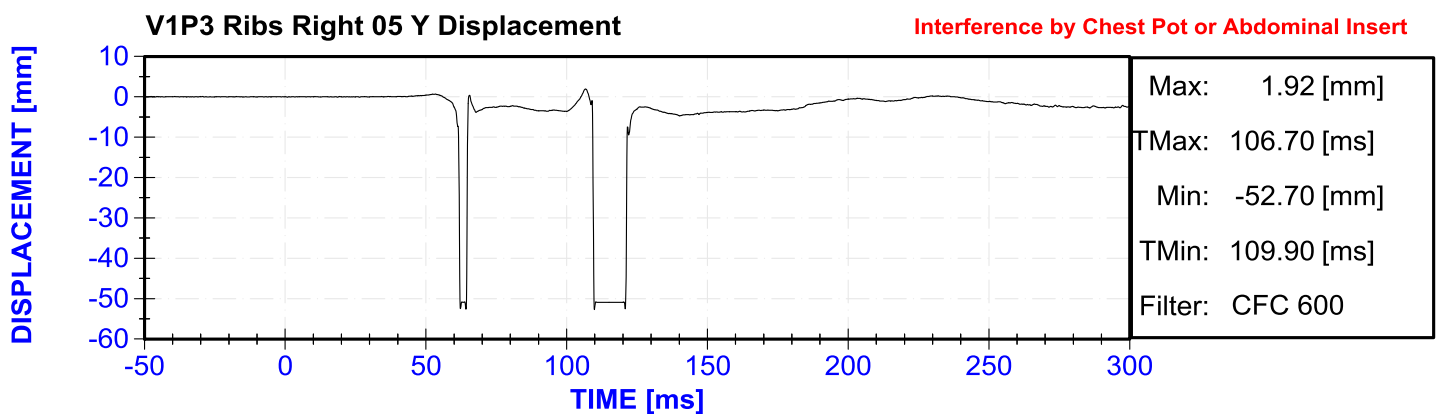
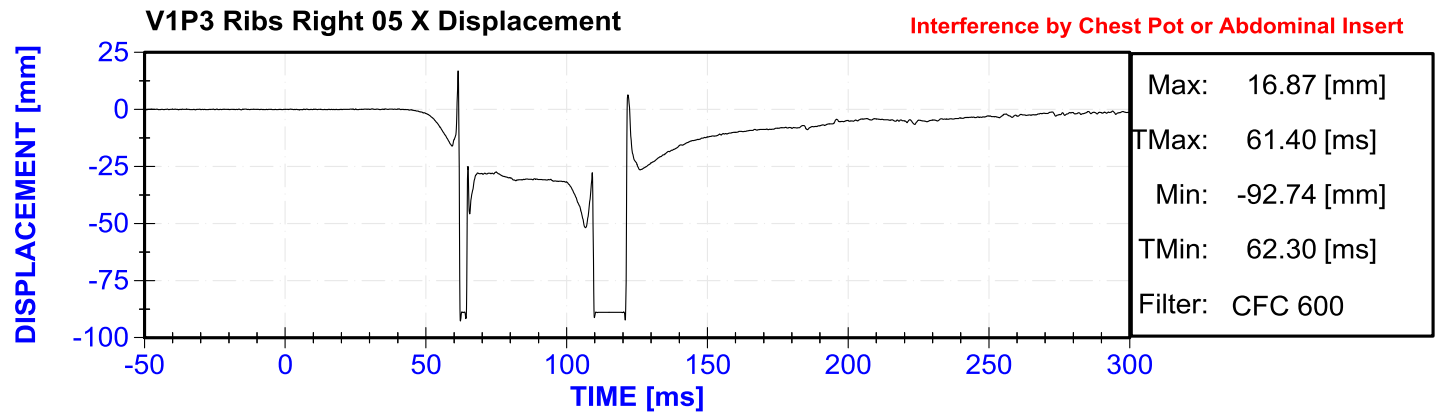
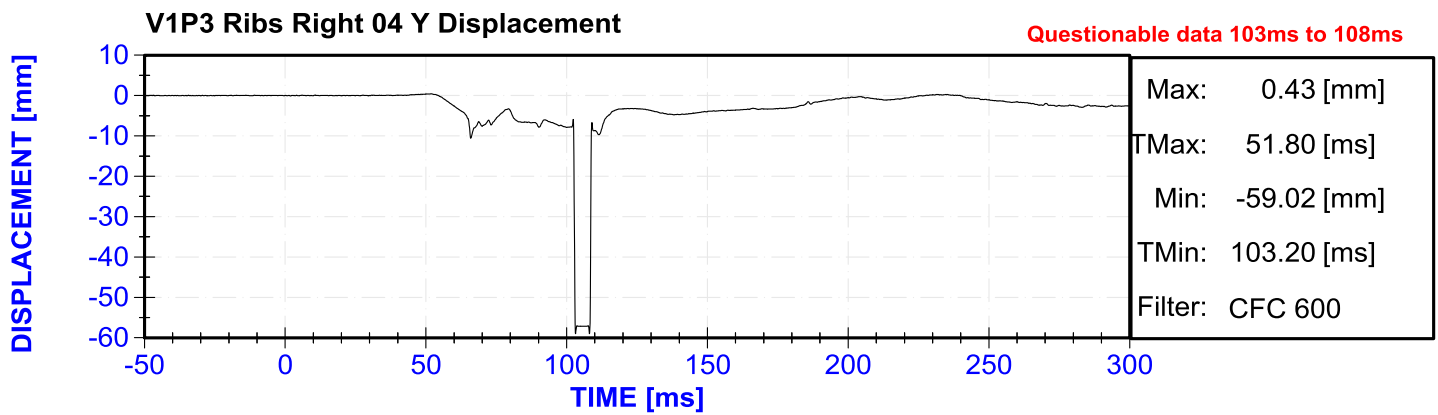
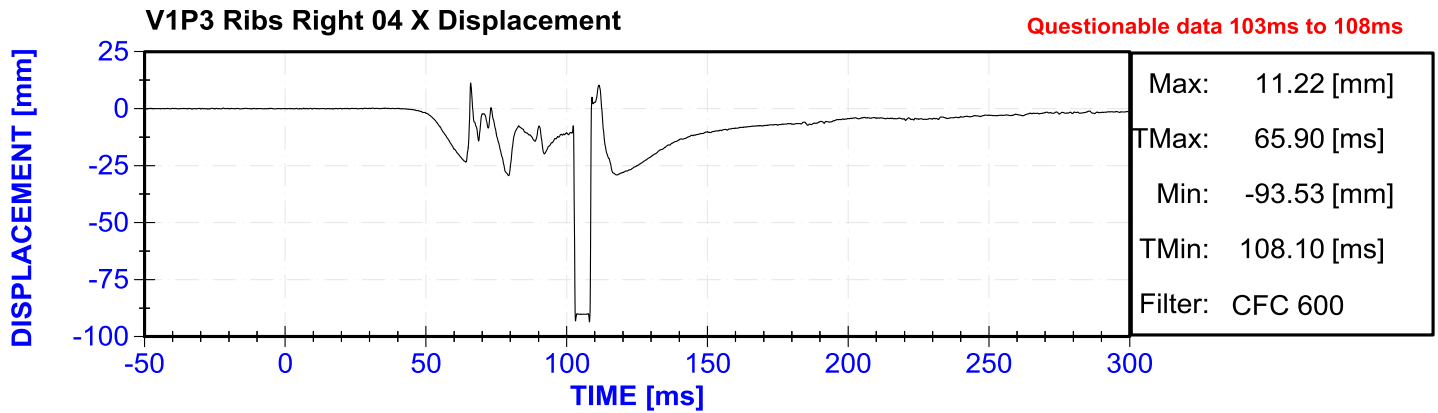


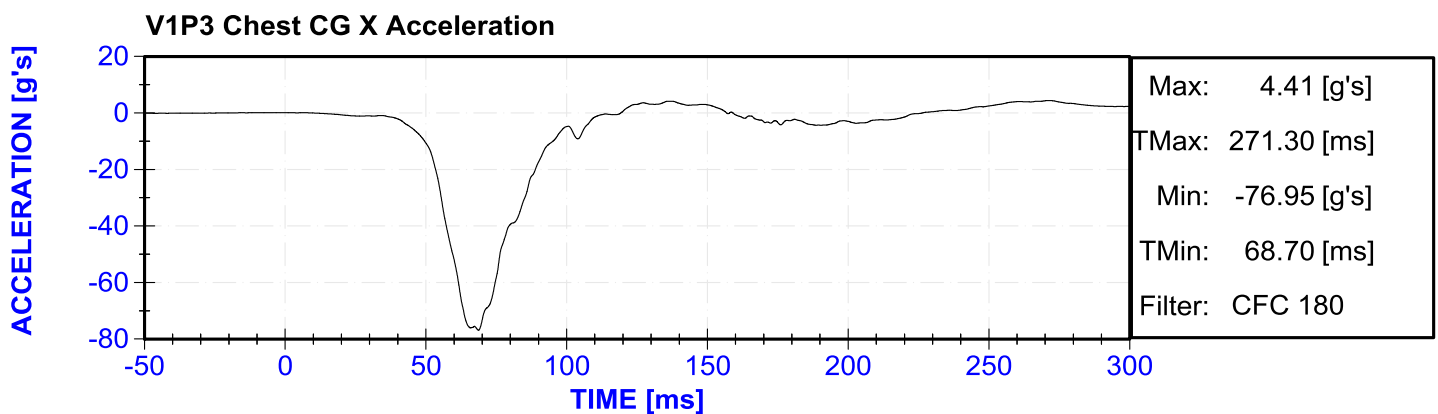
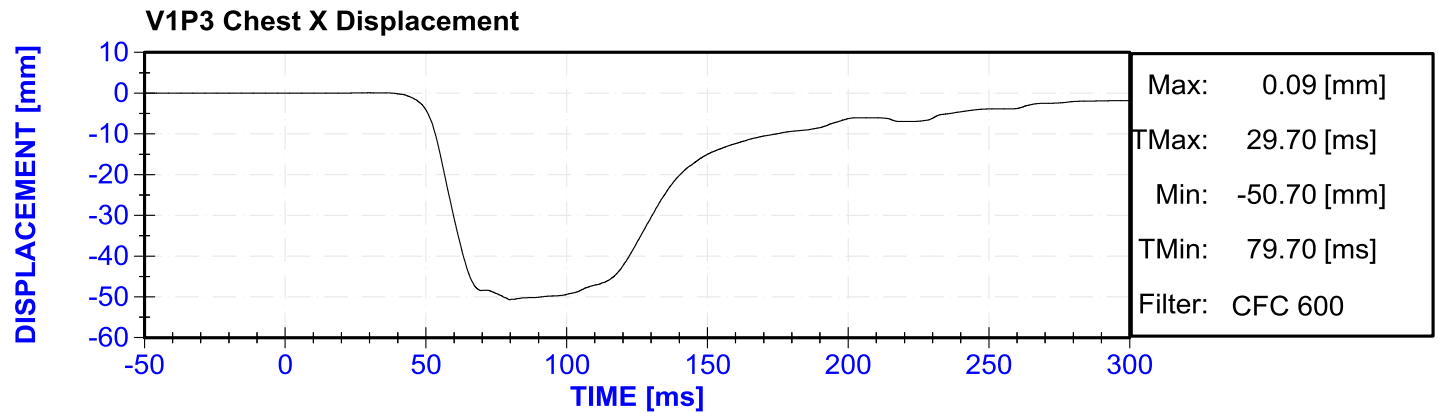
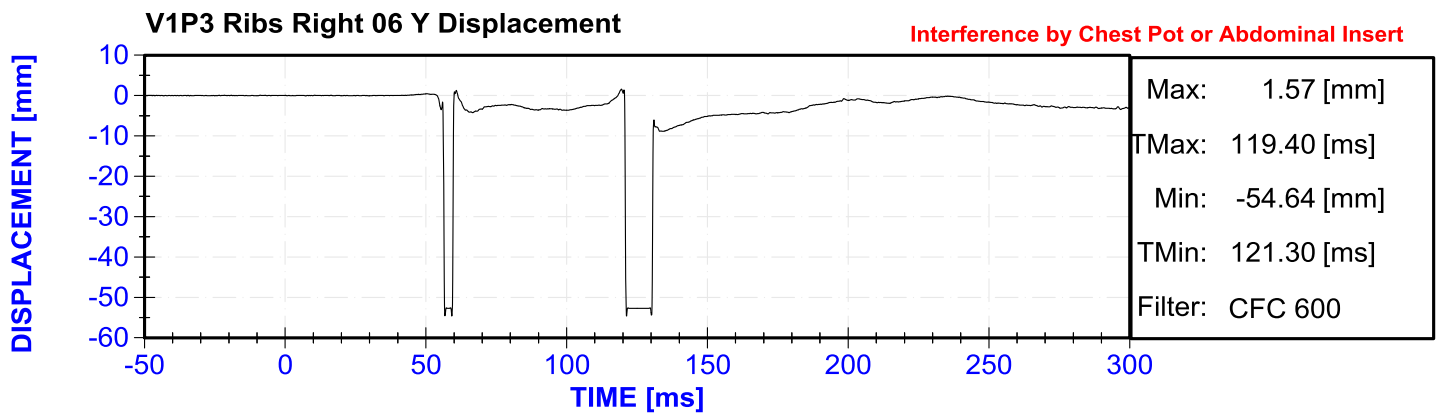
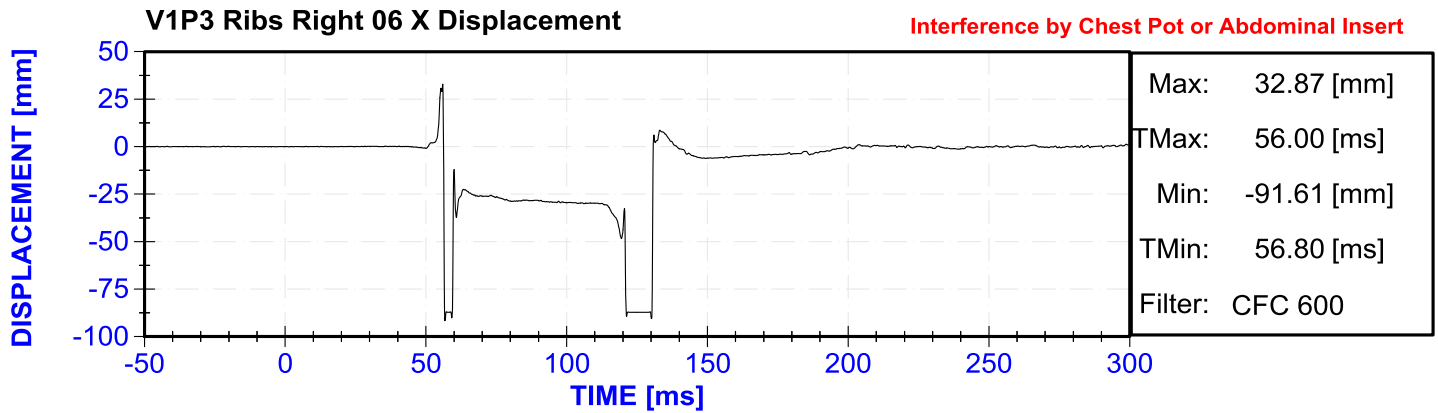


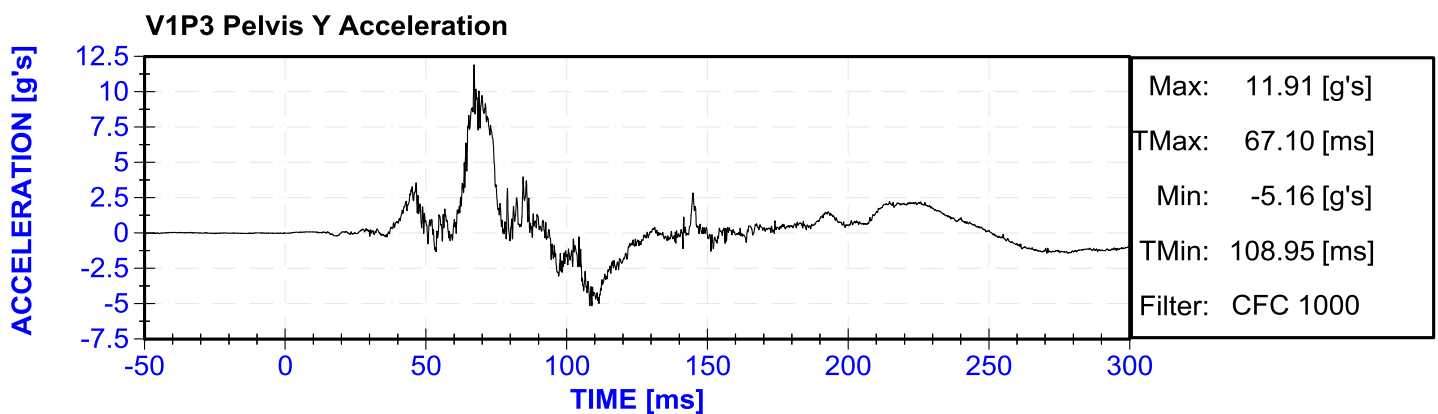
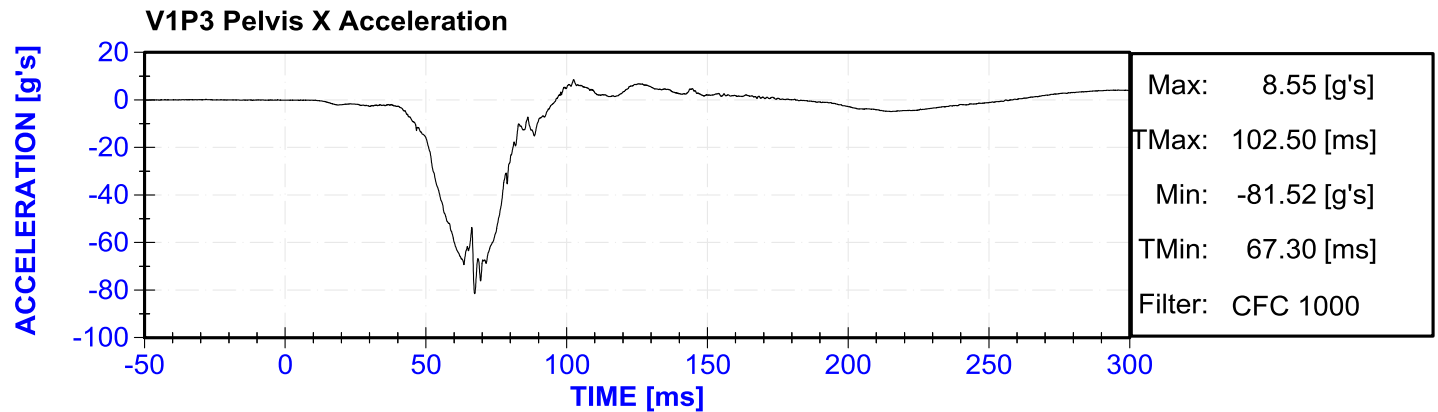
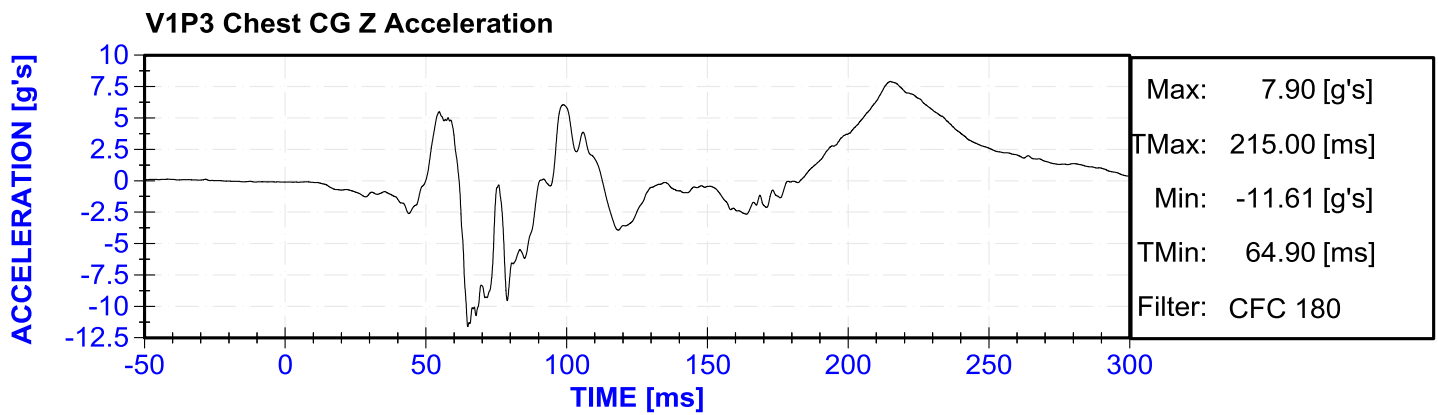
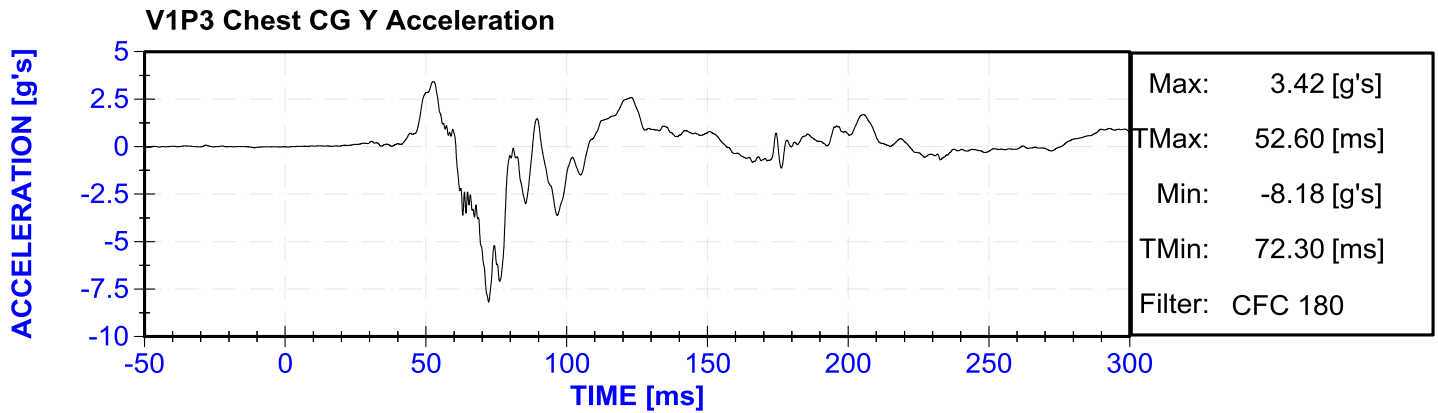


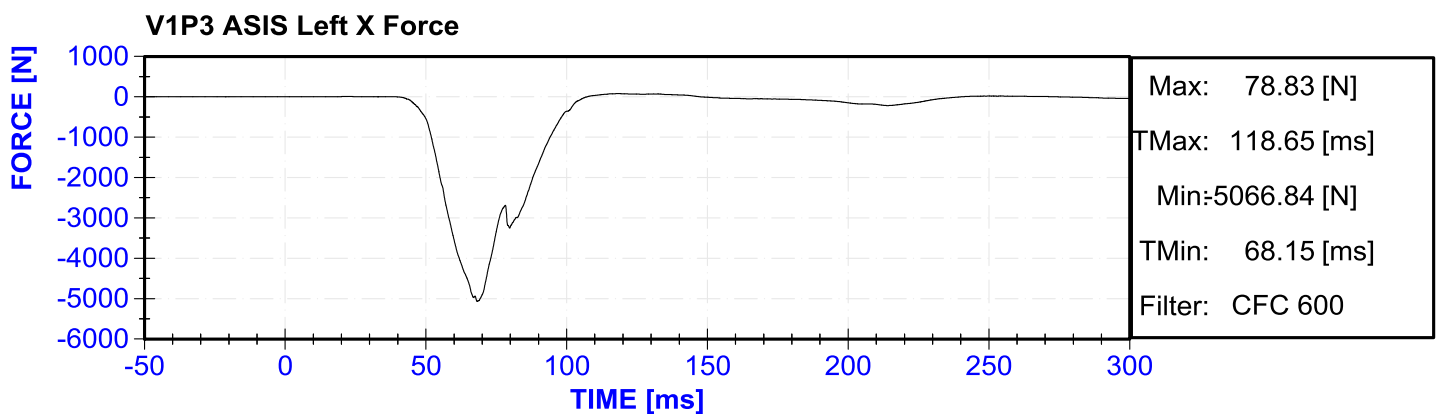
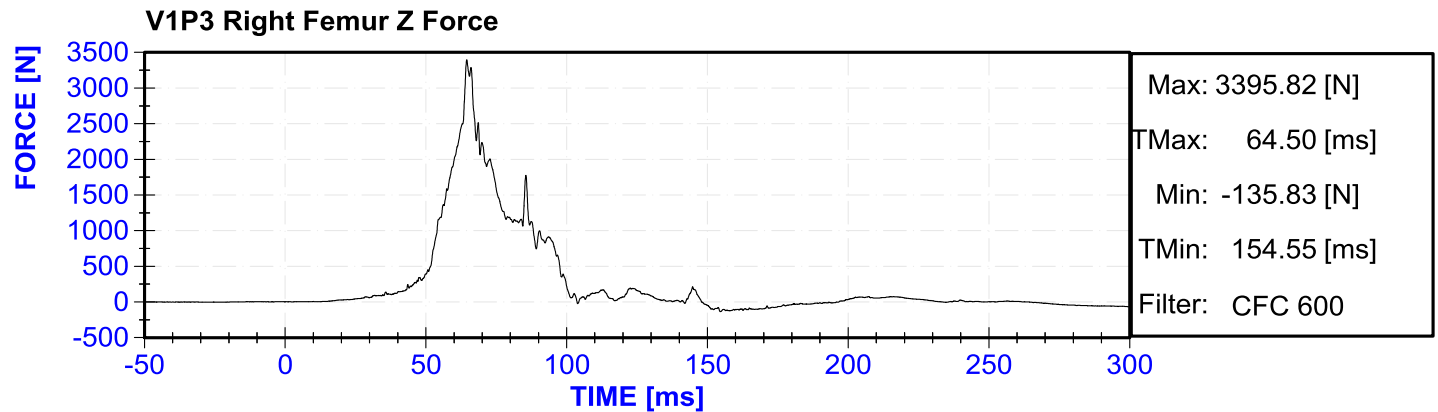
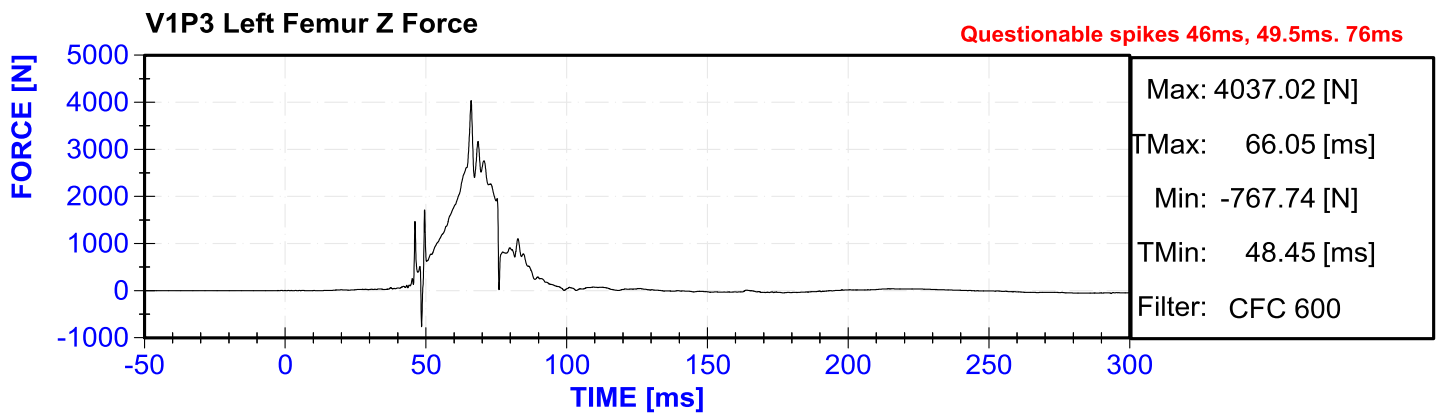
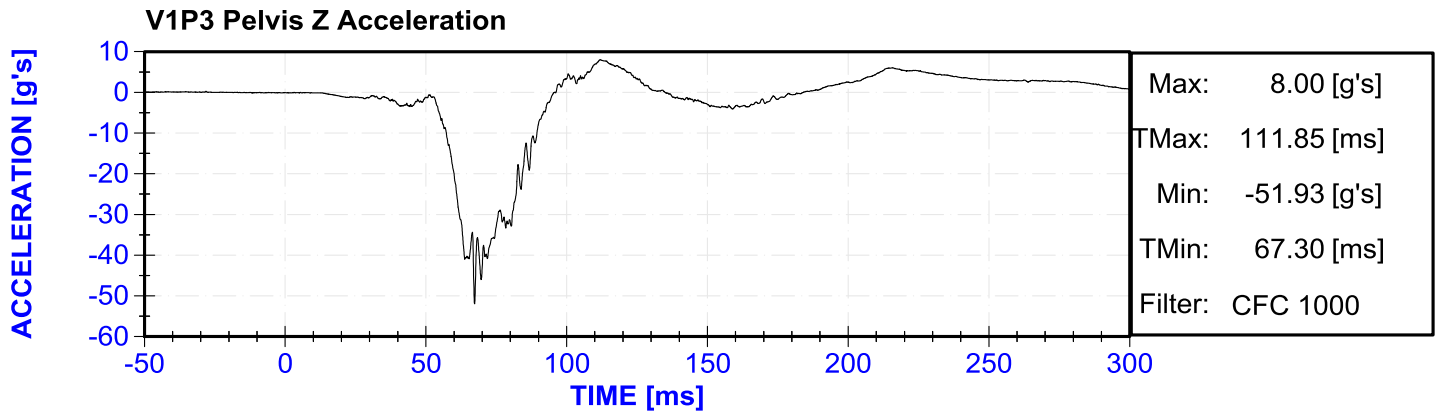


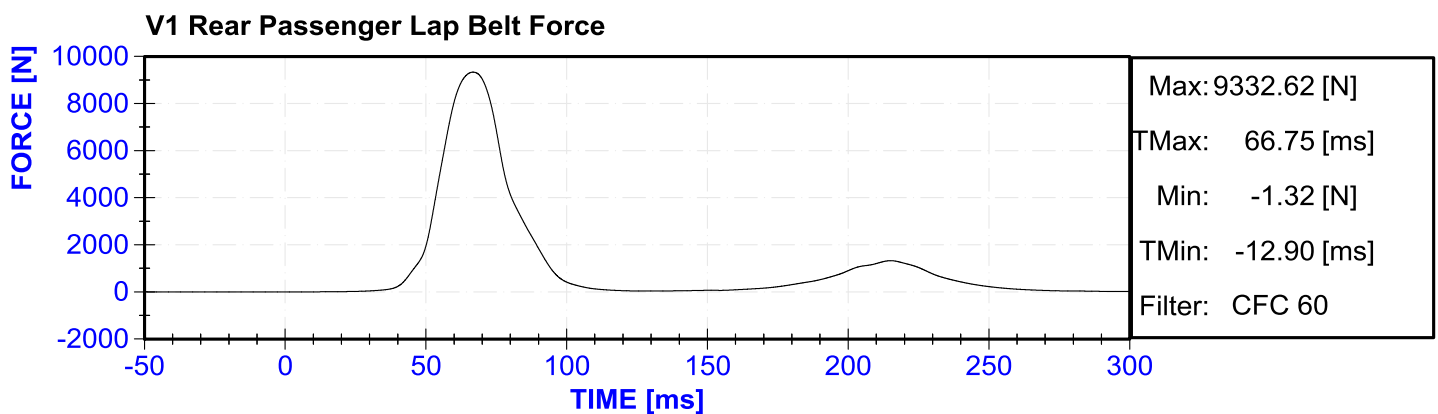
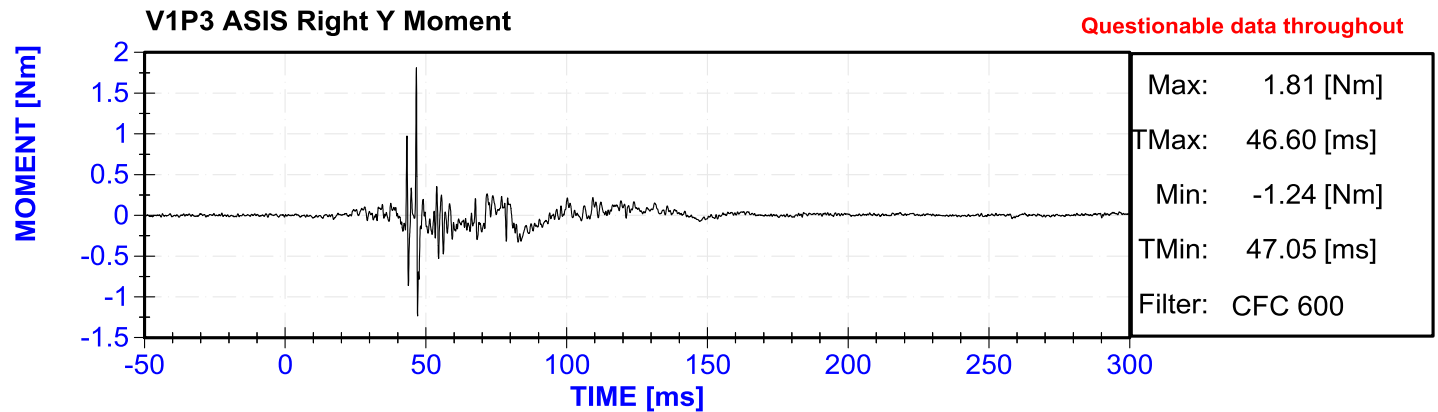
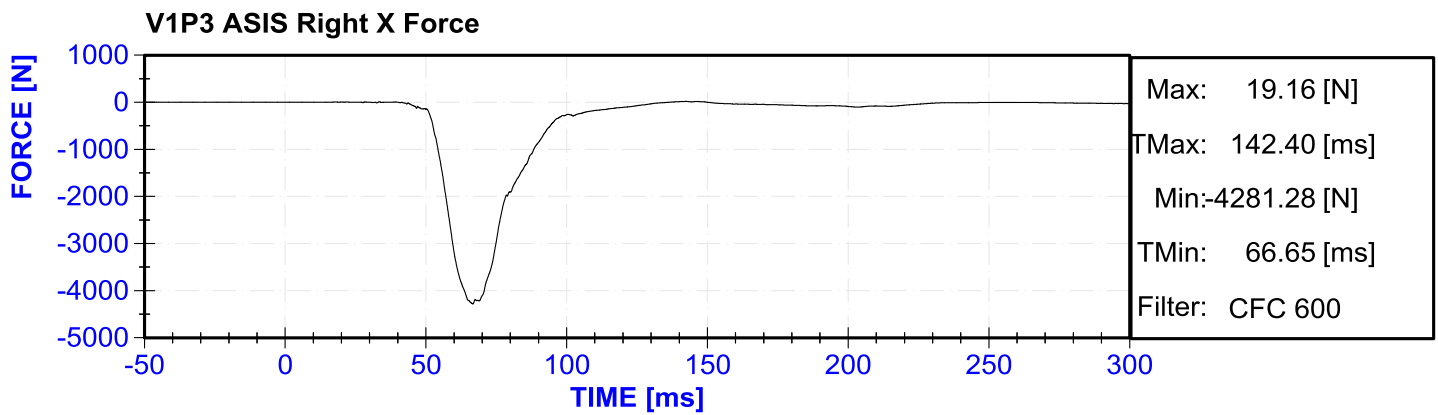
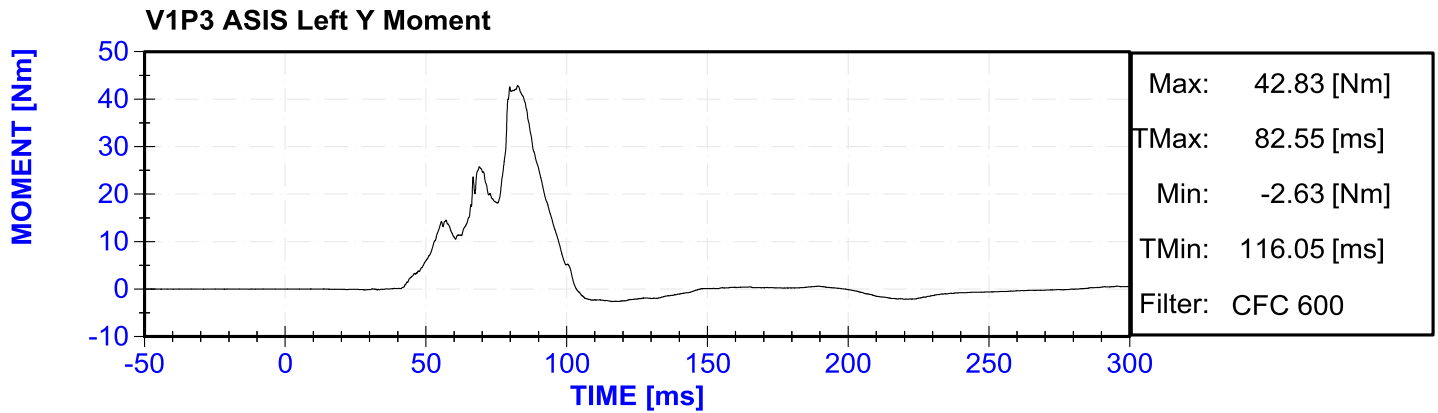




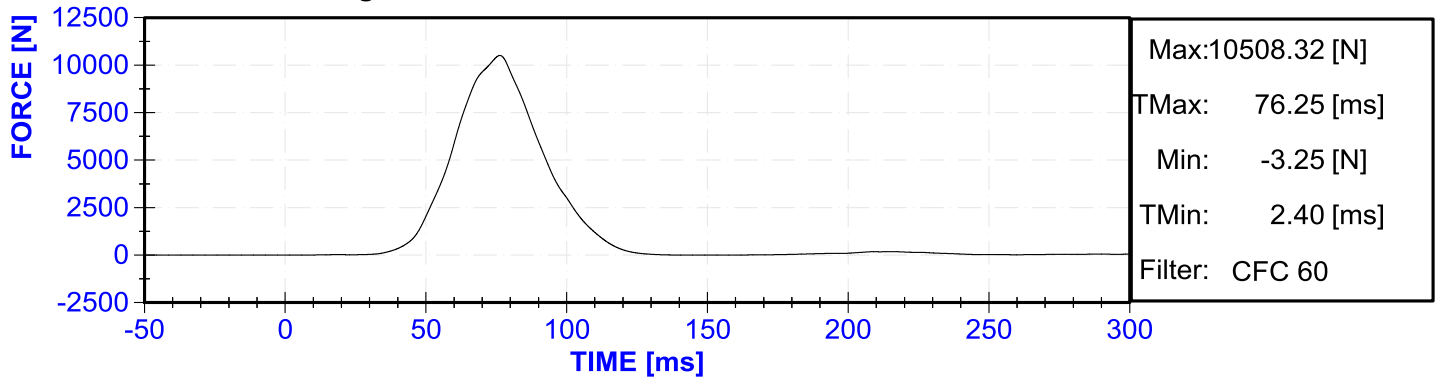




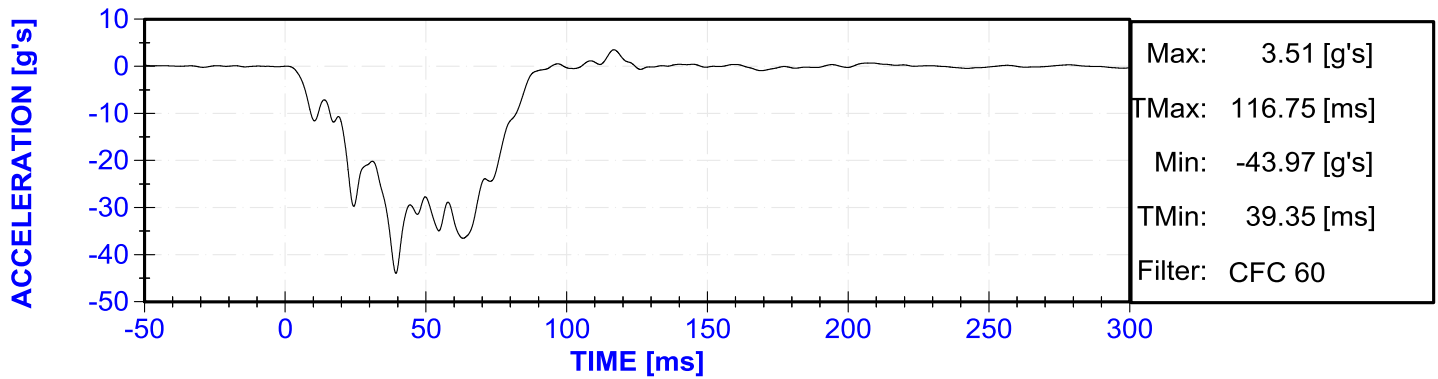




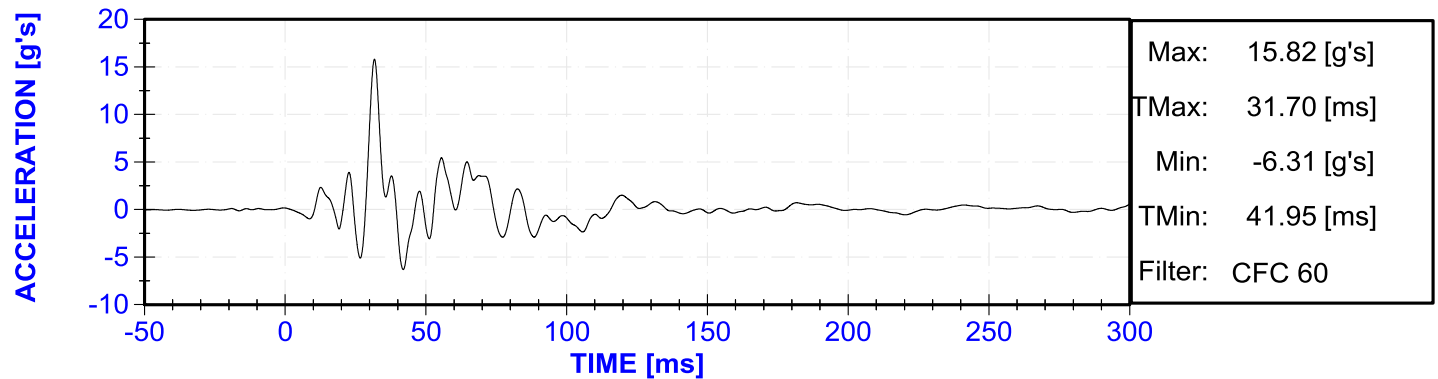
V1 Rear Passenger Shoulder Belt Force



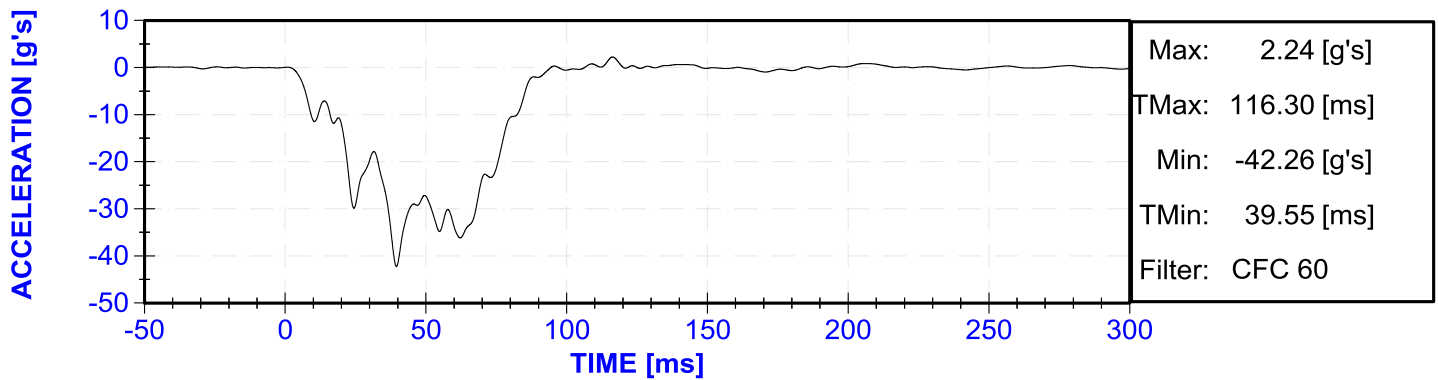
V1 Left Rear Sill X Acceleration

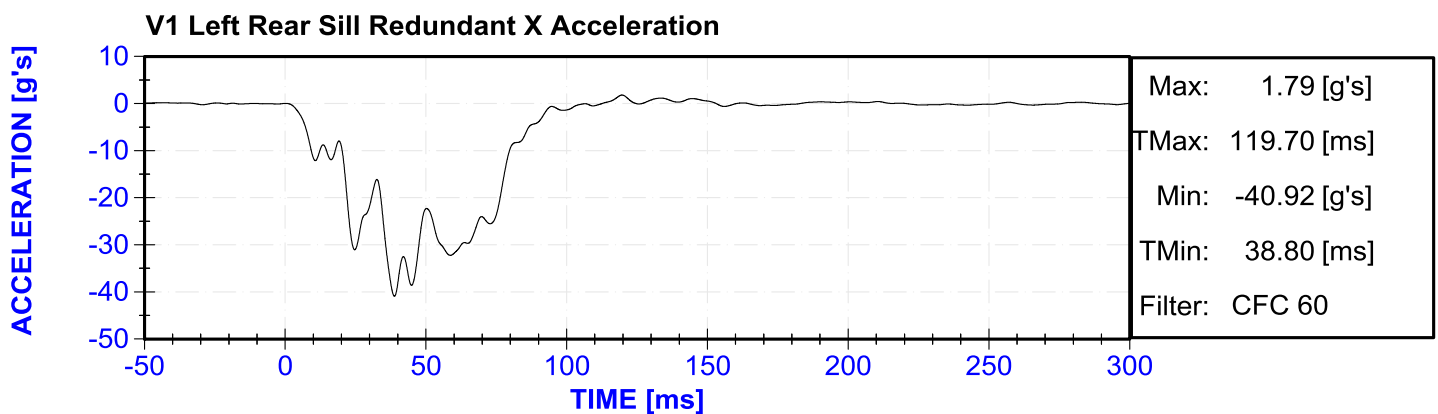
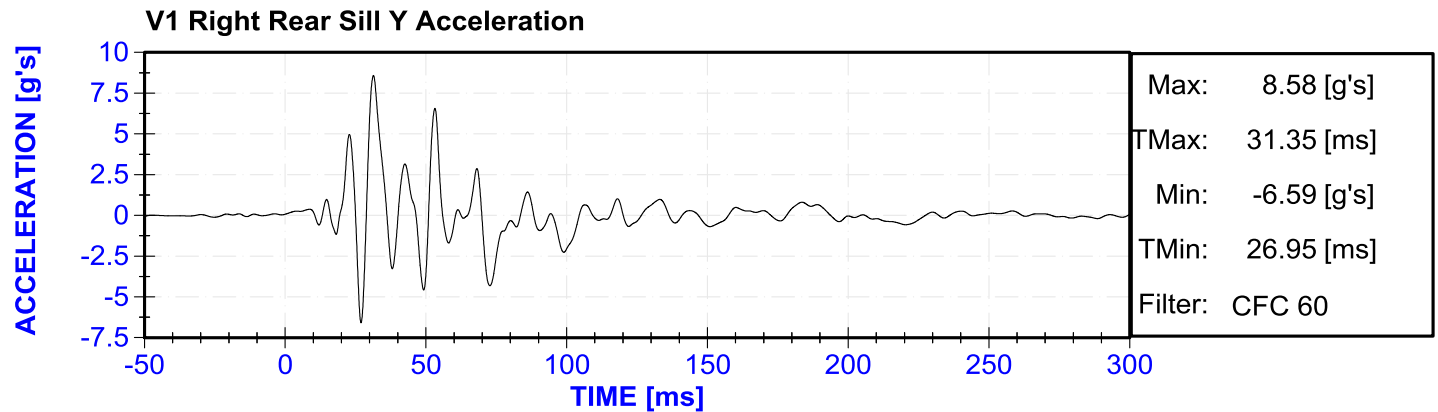
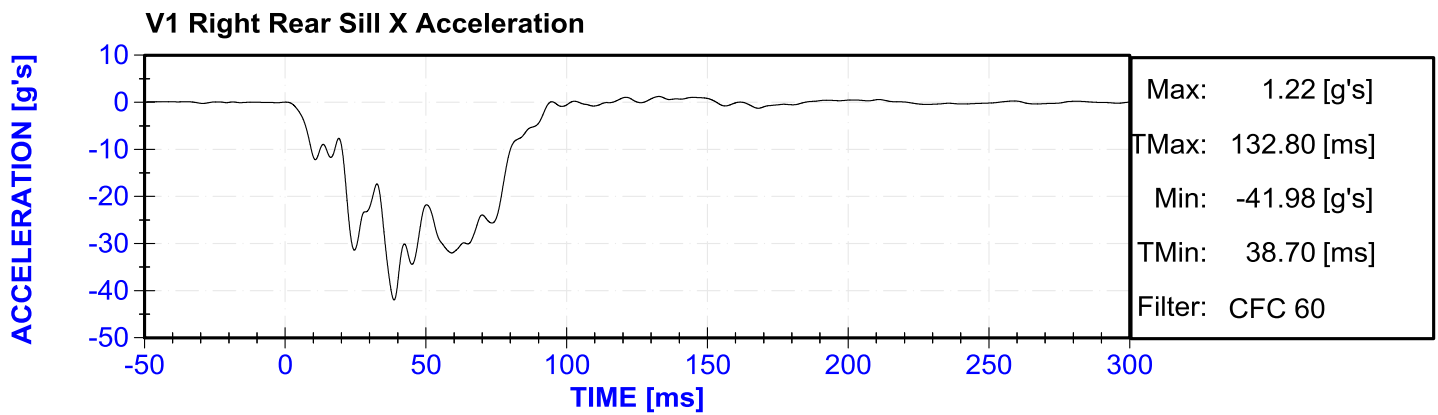
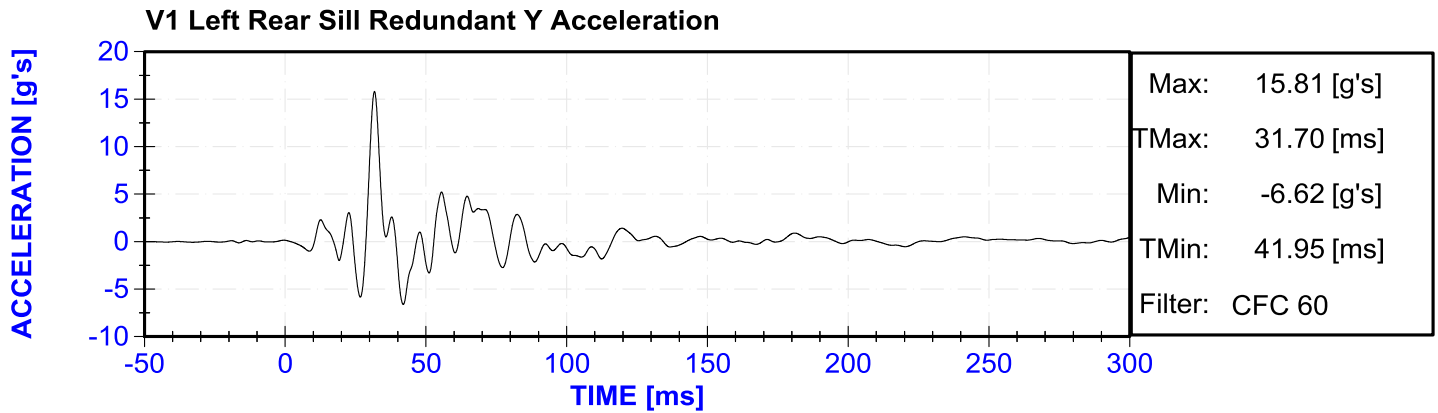


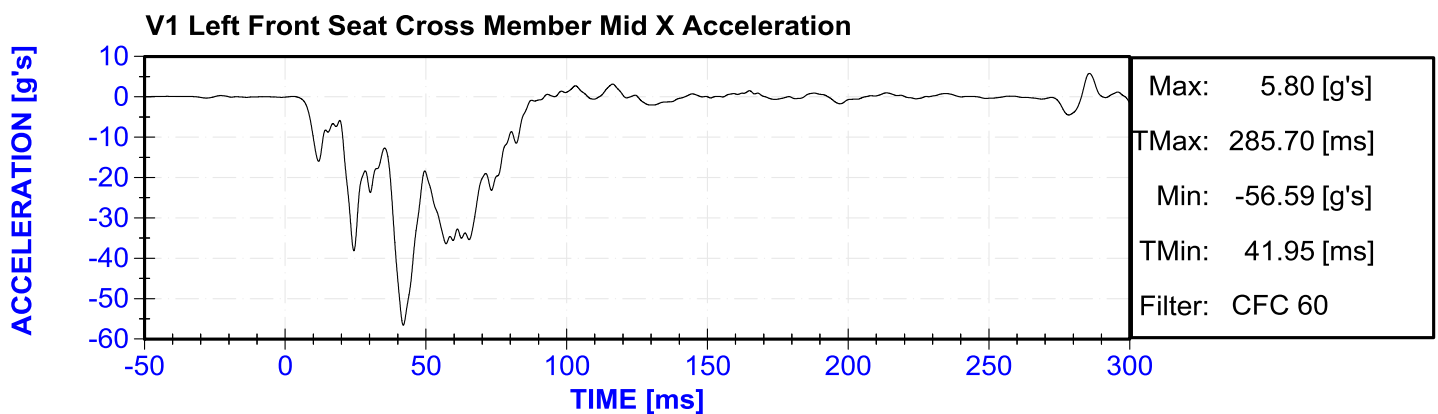
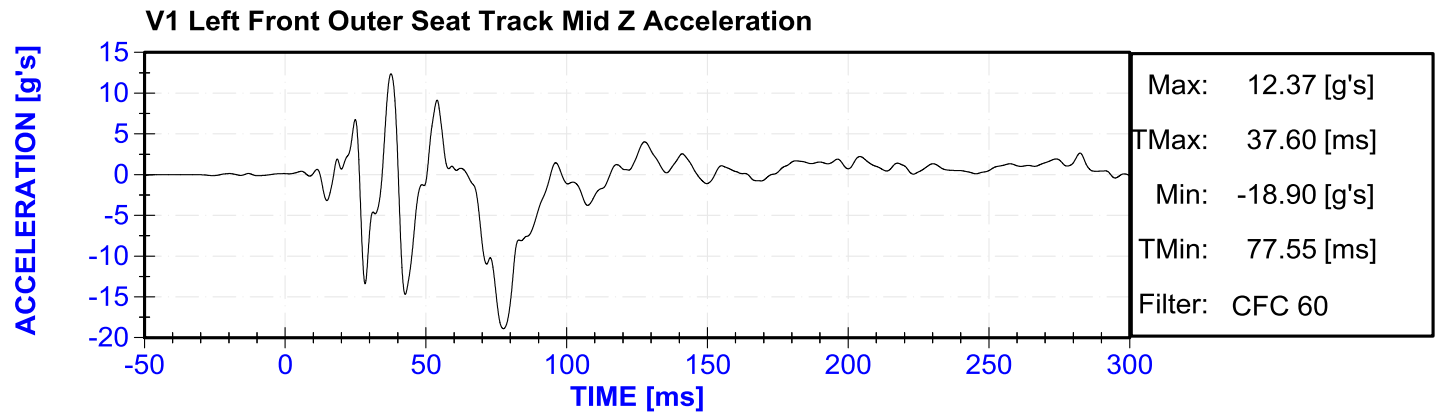
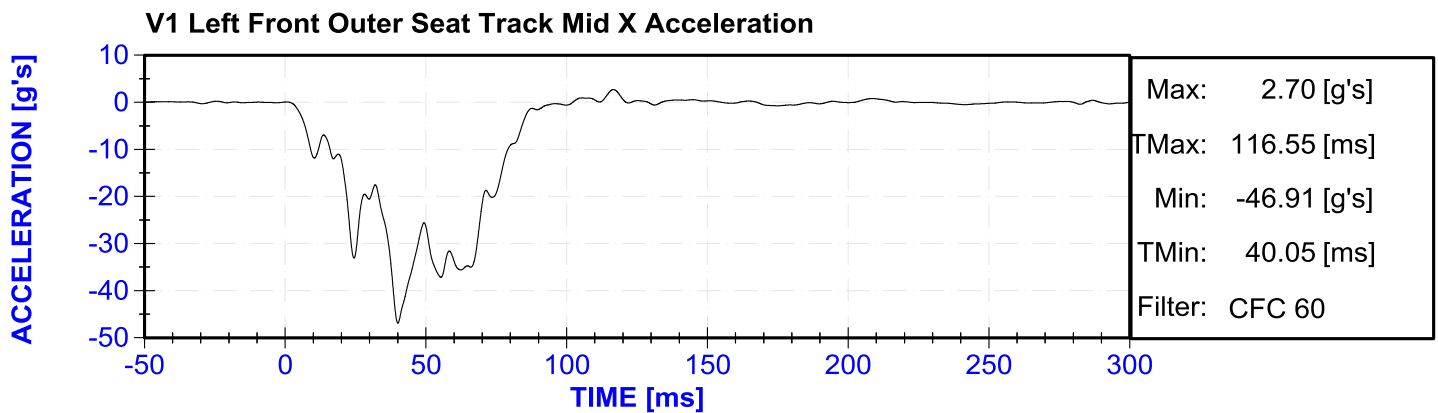
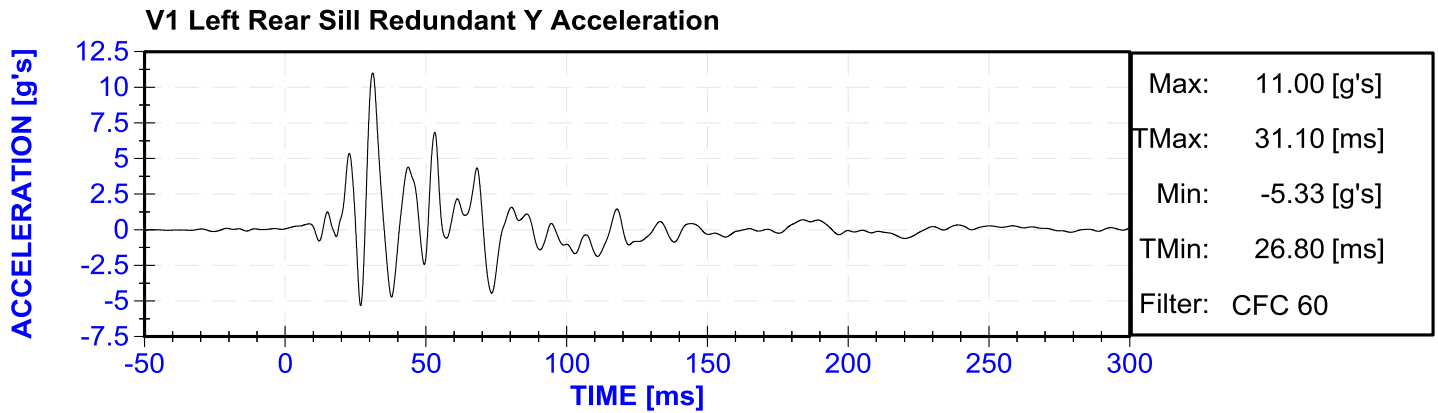
V1 Left Rear Sill Y Acceleration

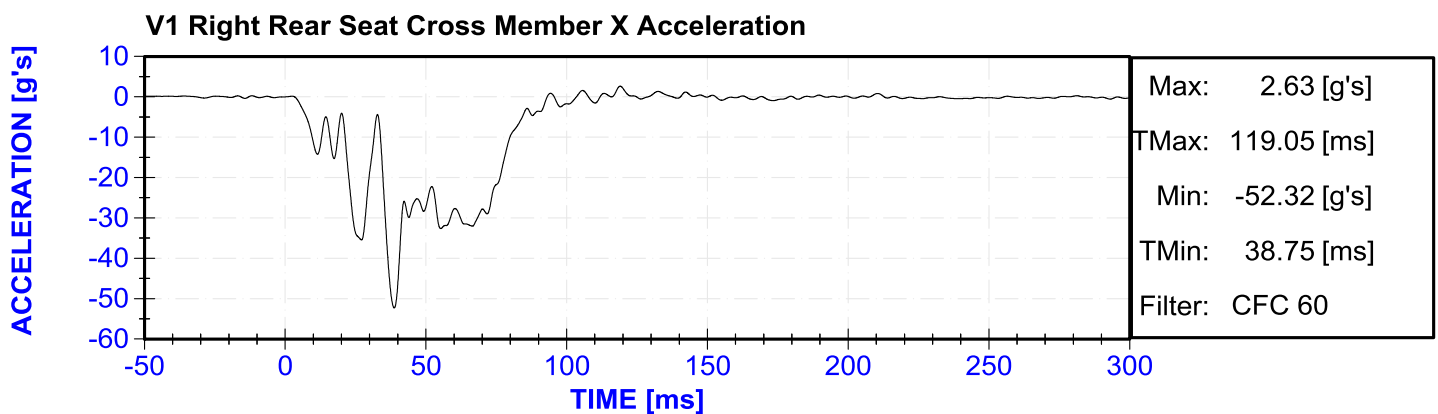
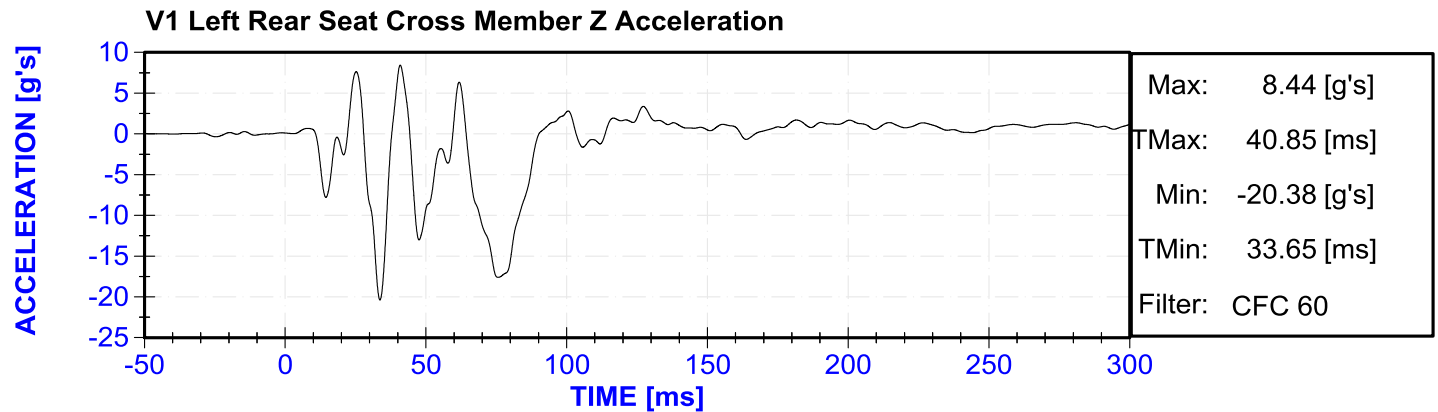
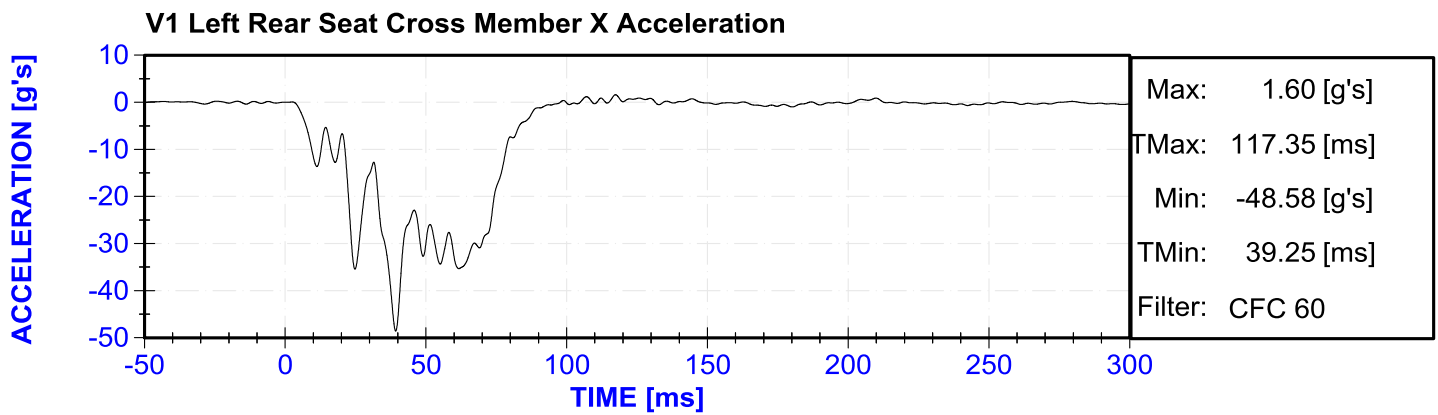
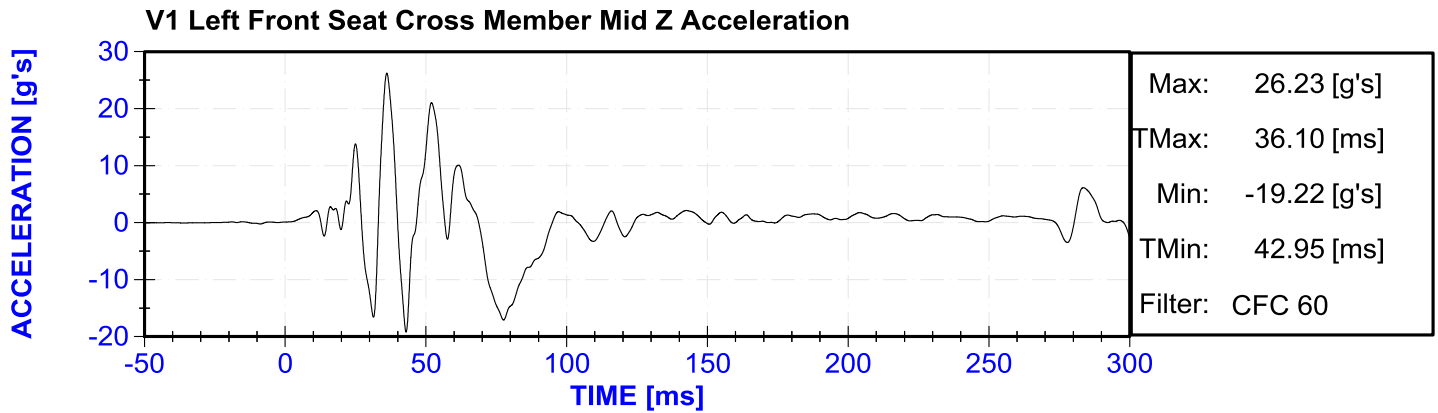


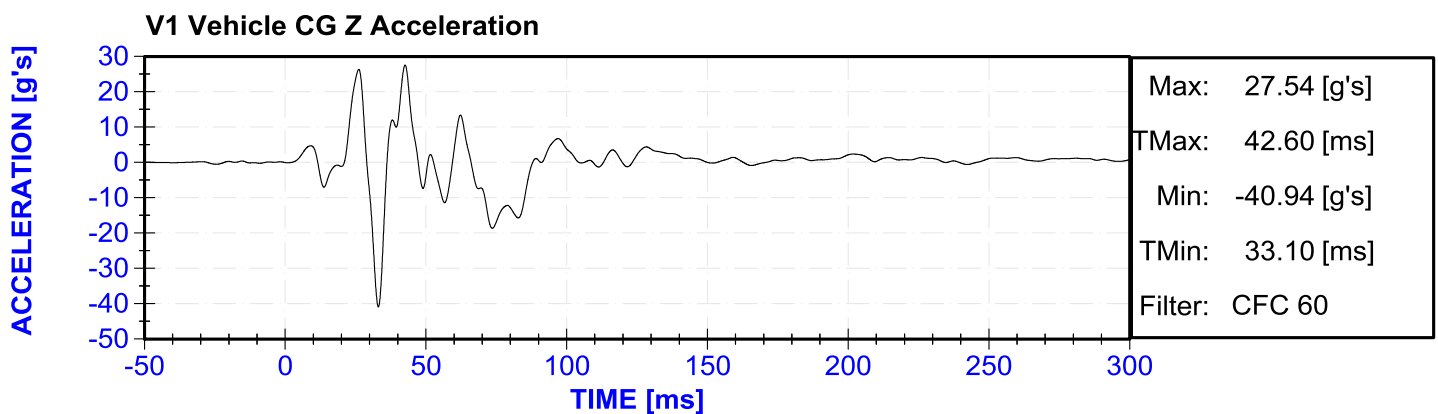
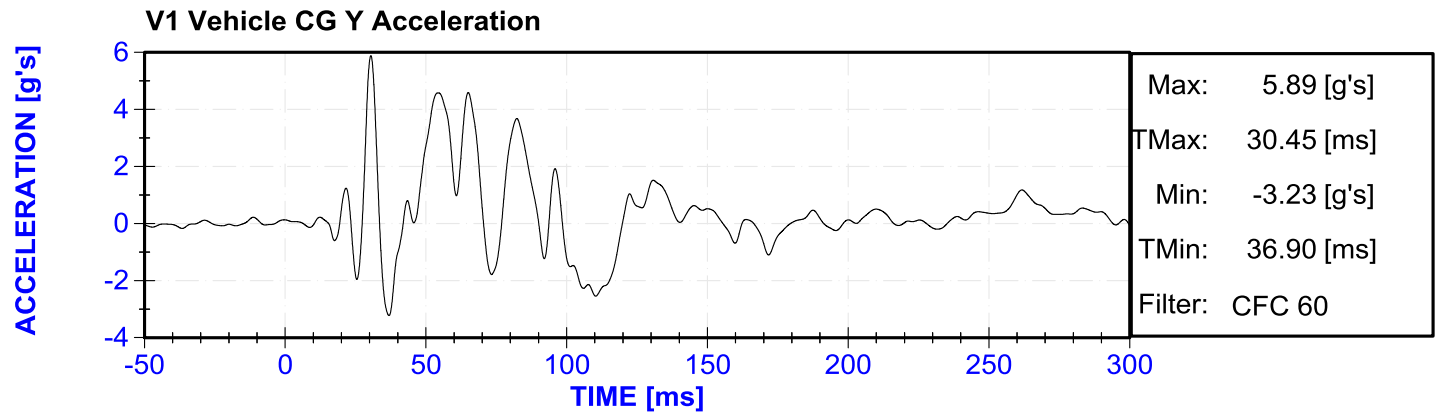
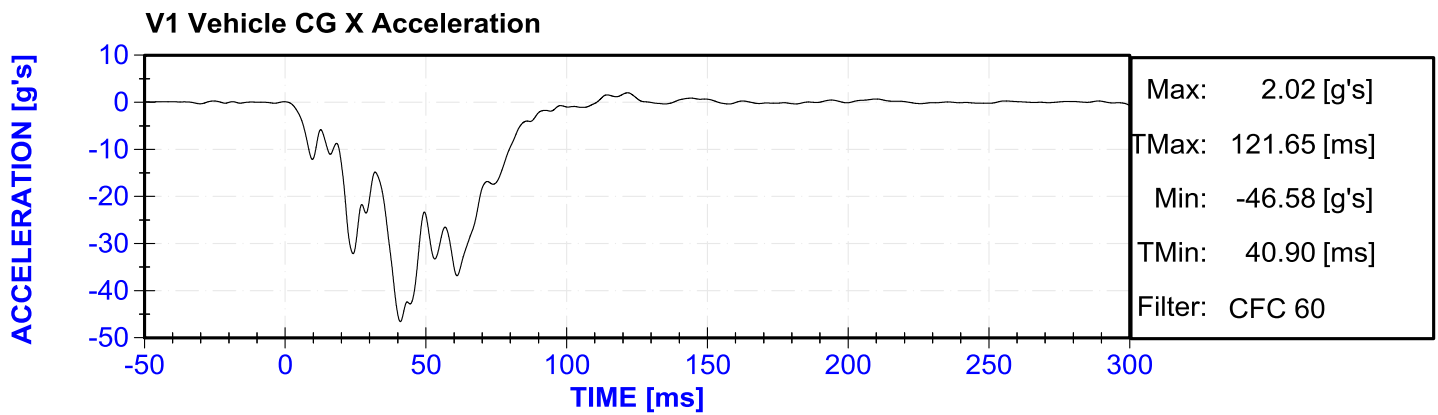
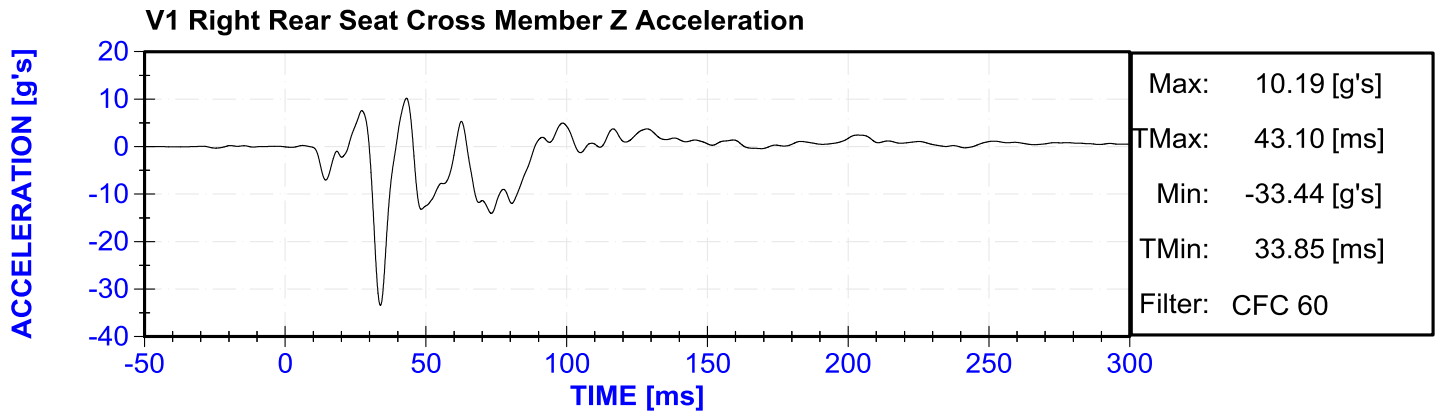
V1 Left Rear Sill Redundant X Acceleration

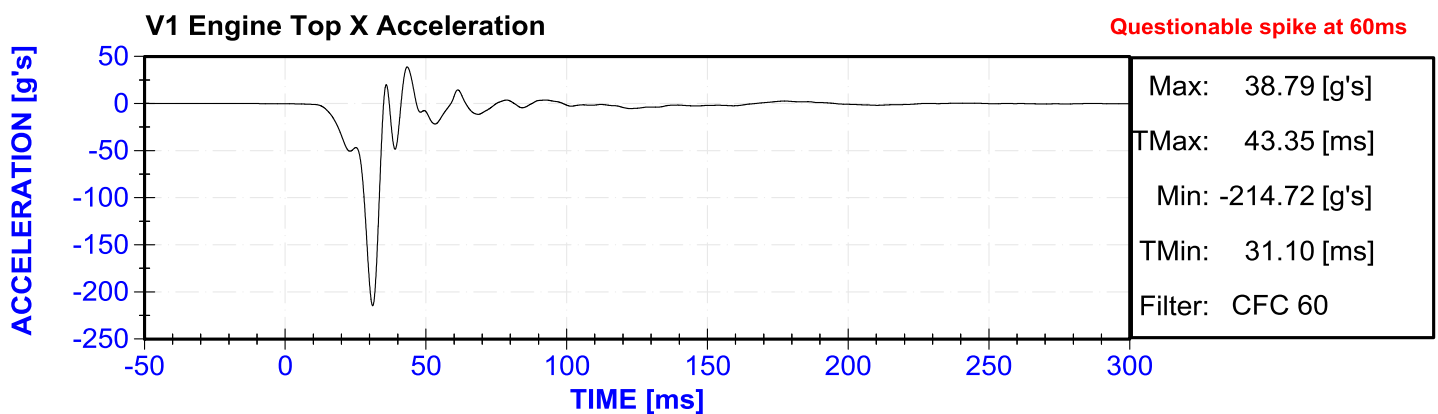
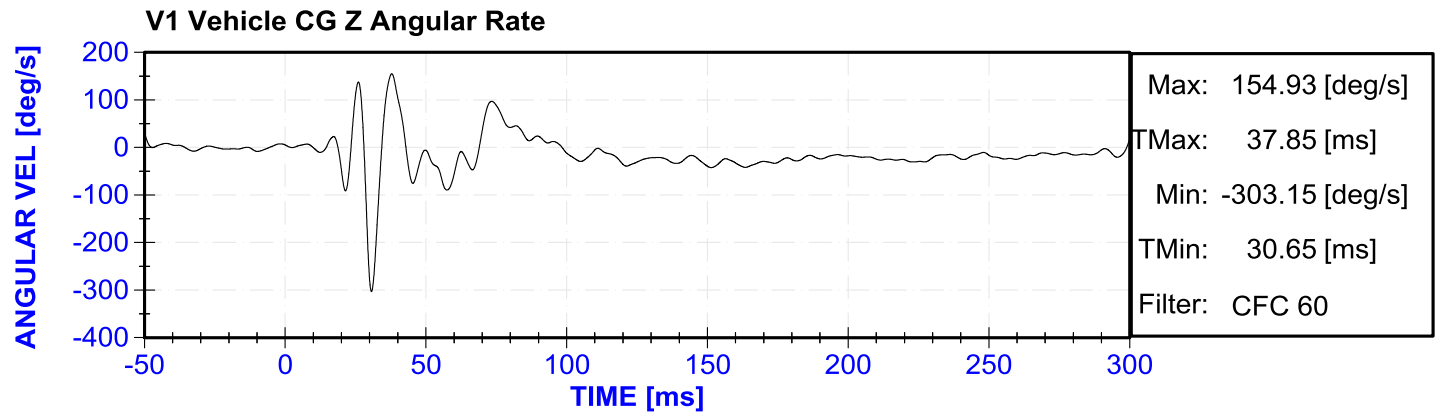
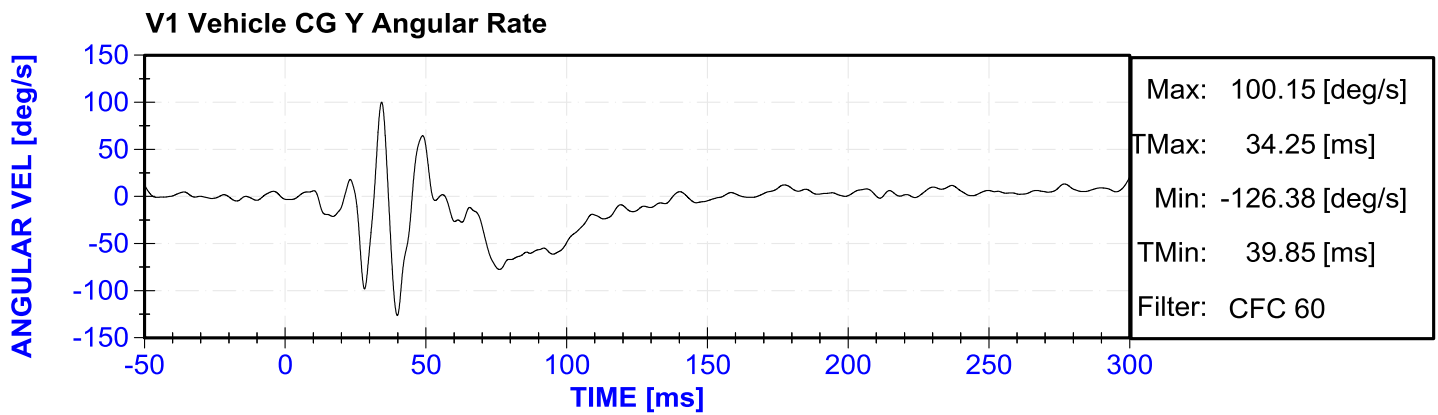
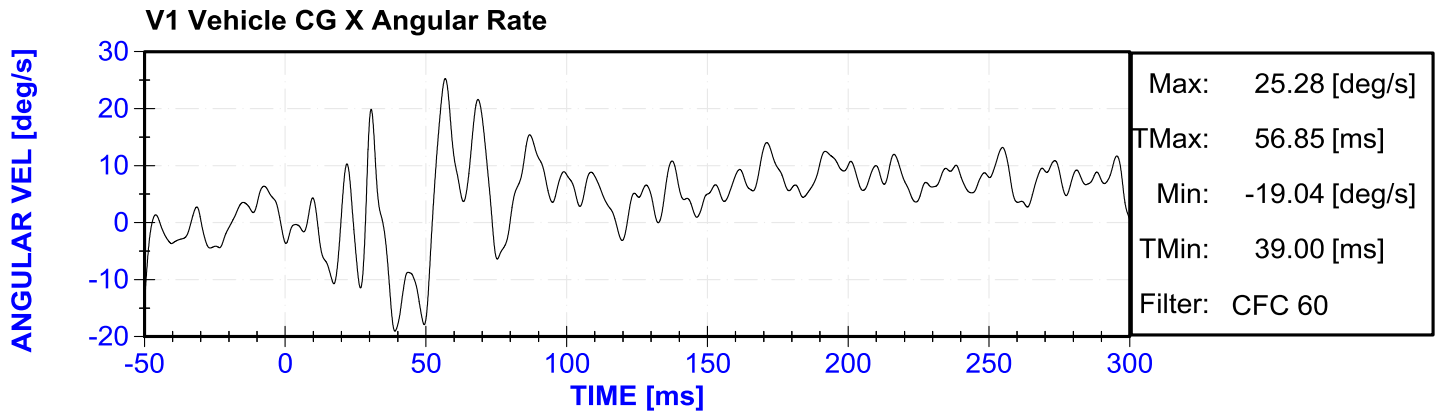


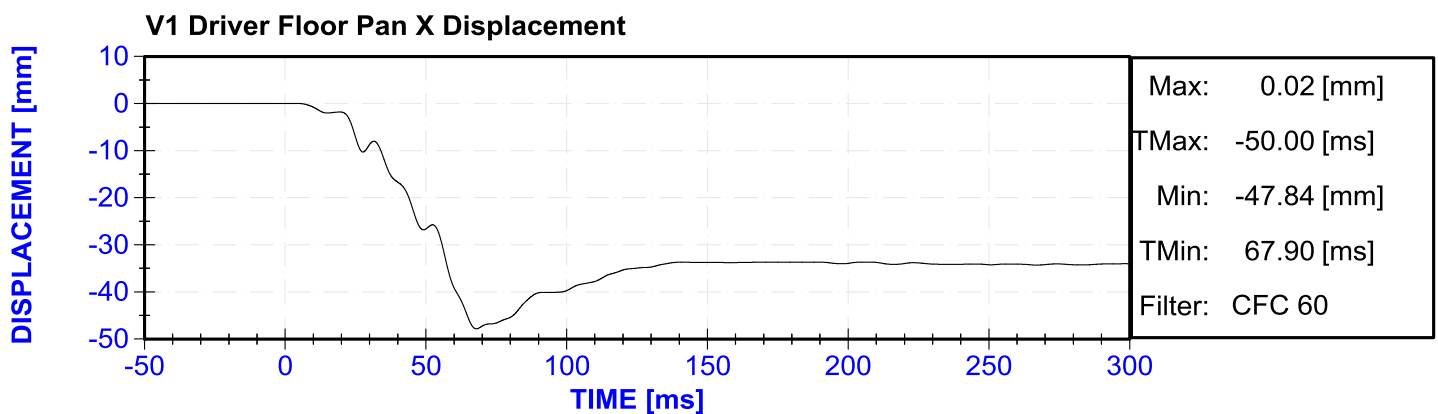
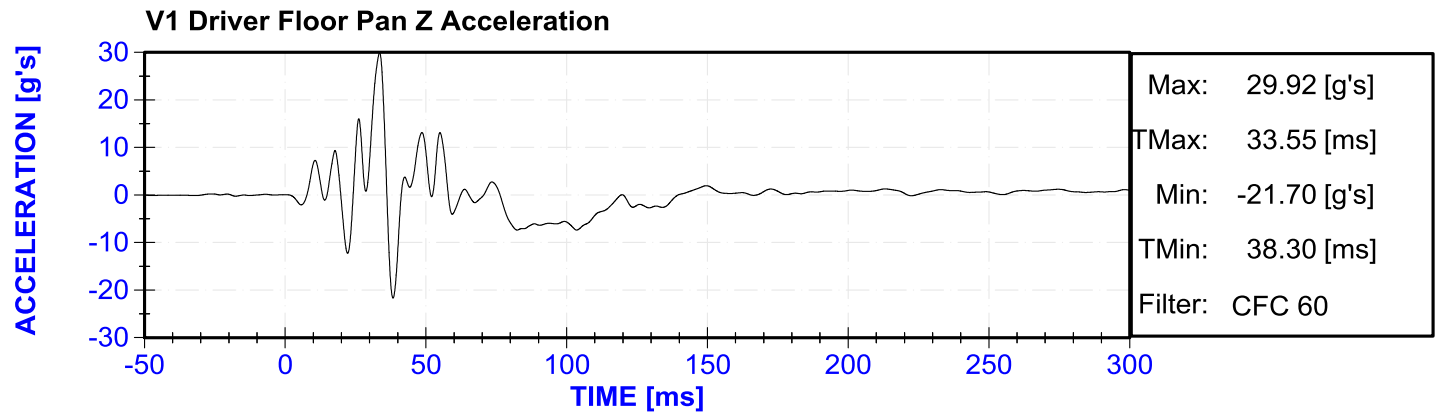
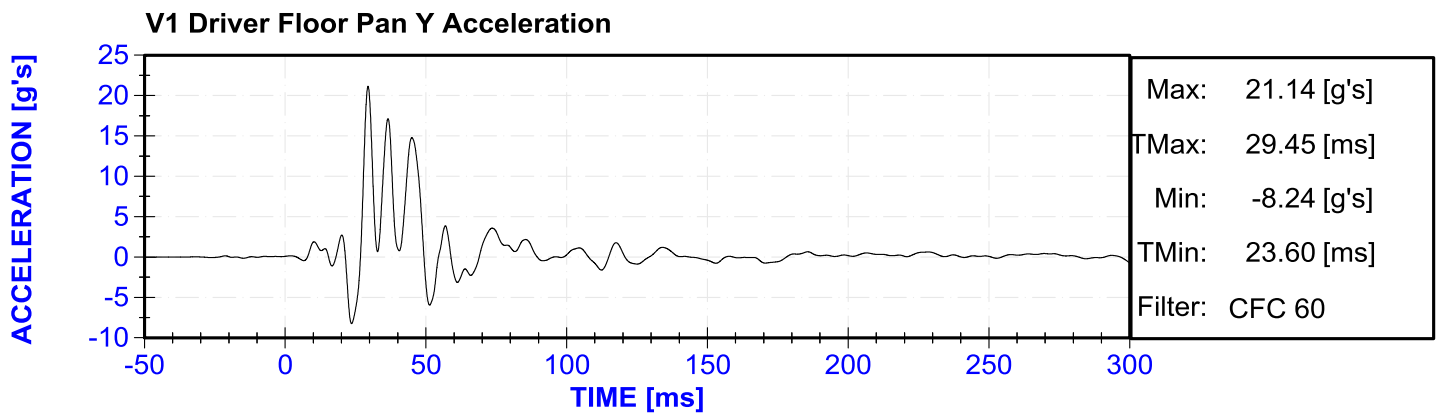
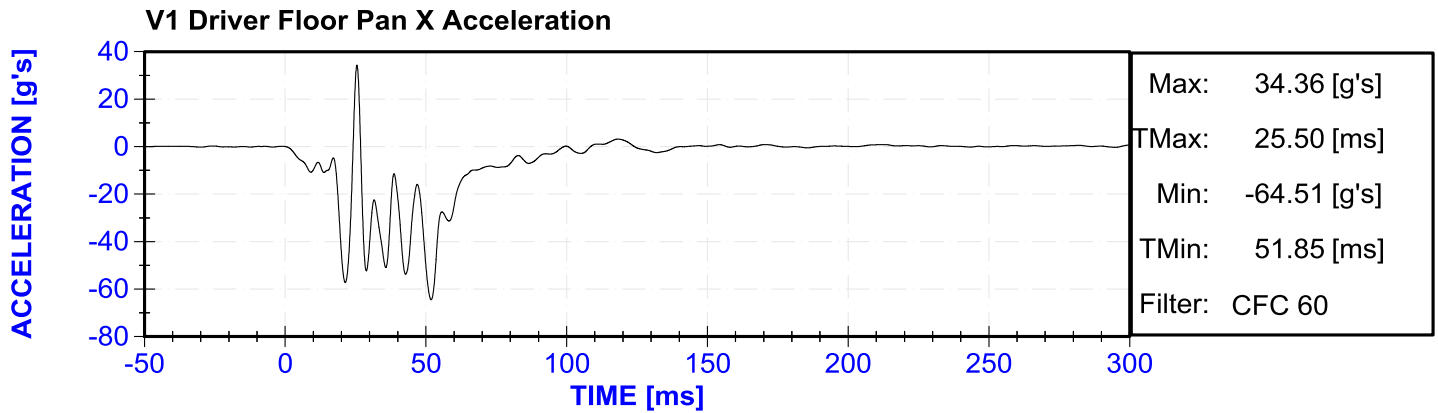




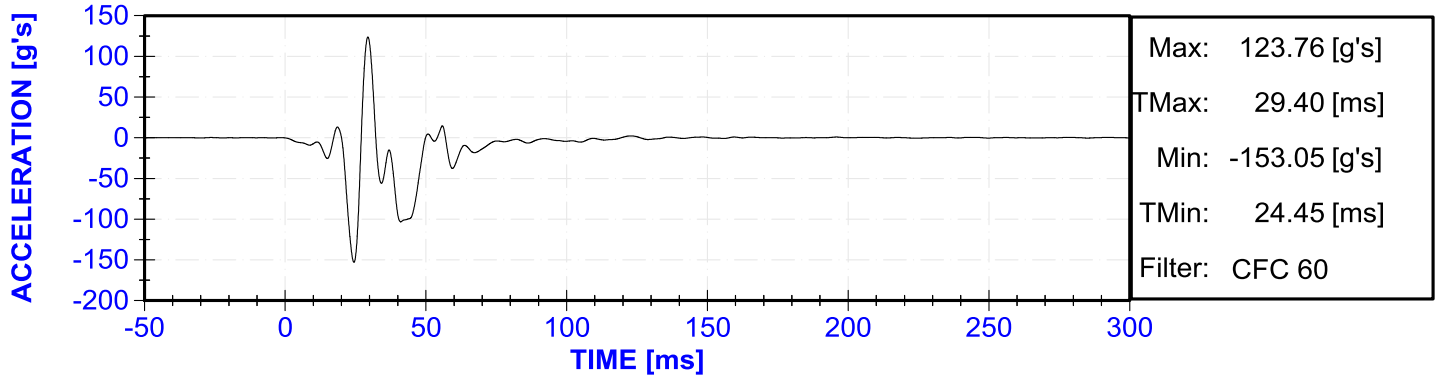




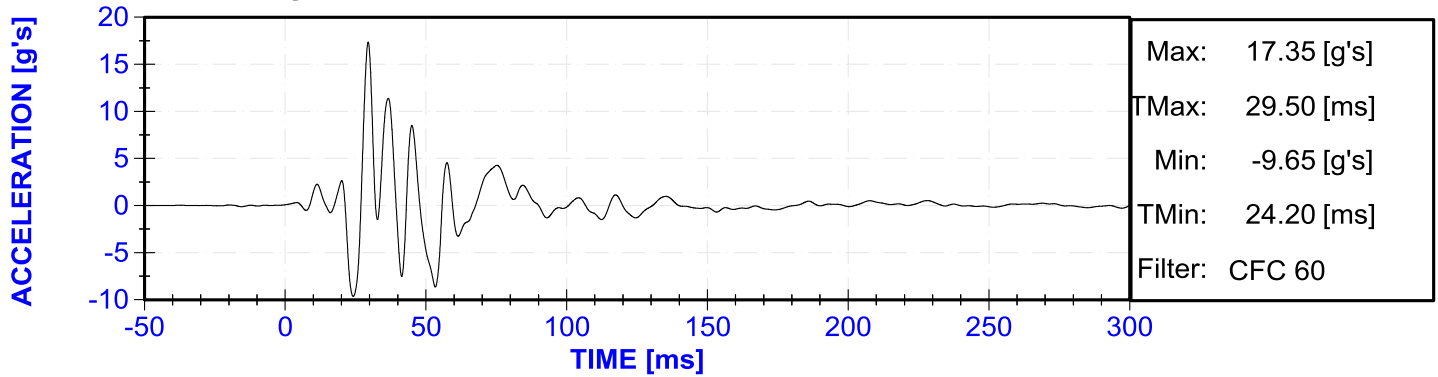




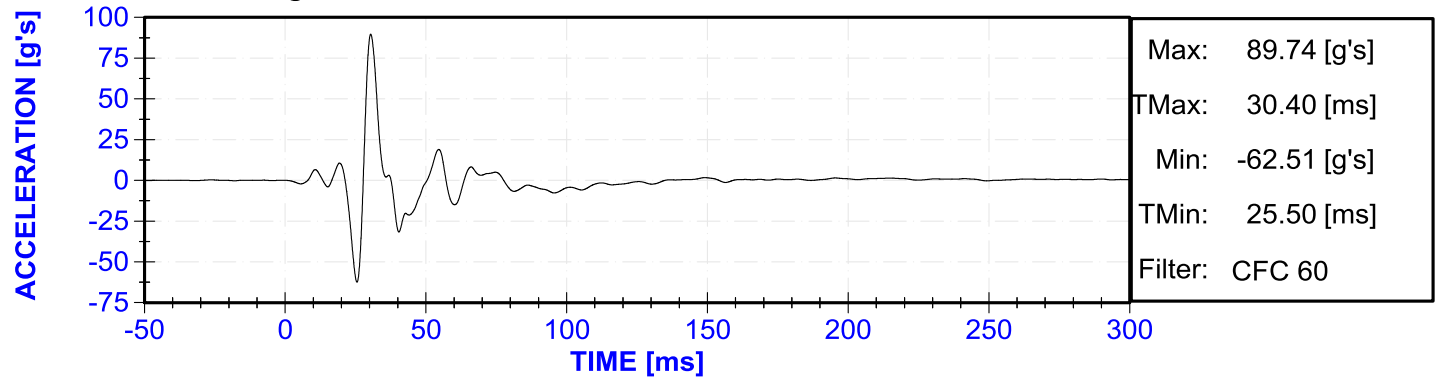
V1 Passenger Floor Pan X Acceleration



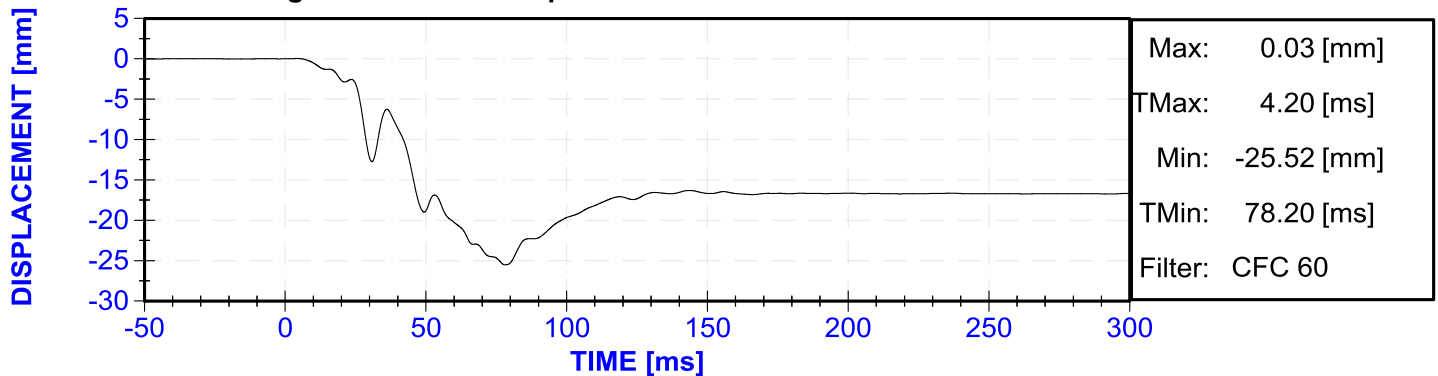
V1 Passenger Floor Pan Y Acceleration

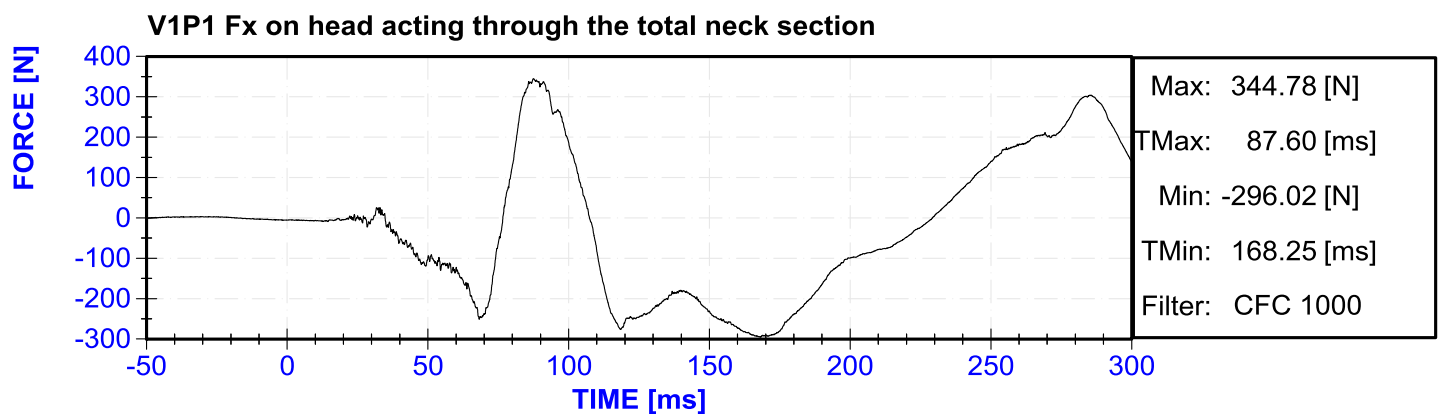
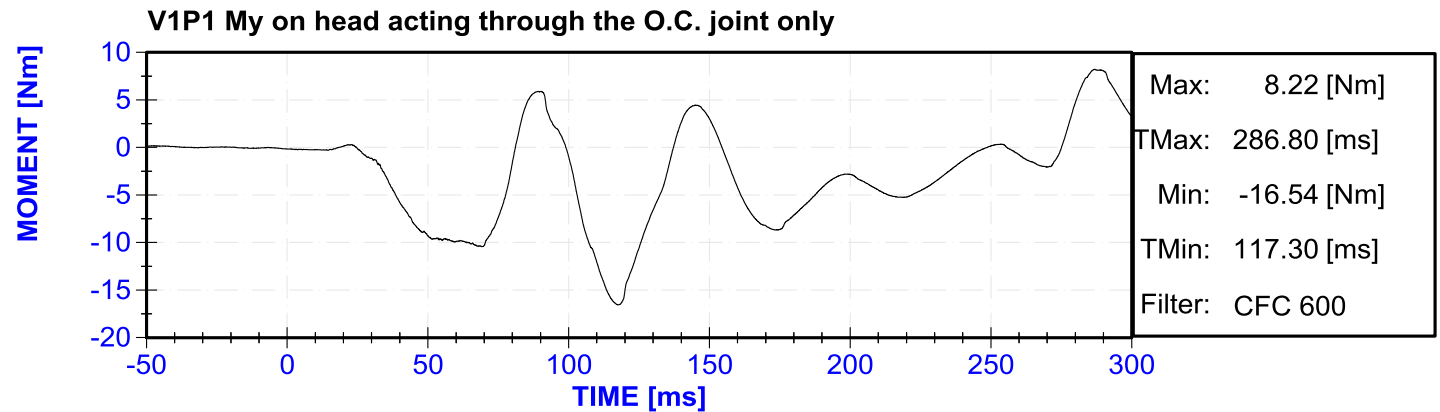
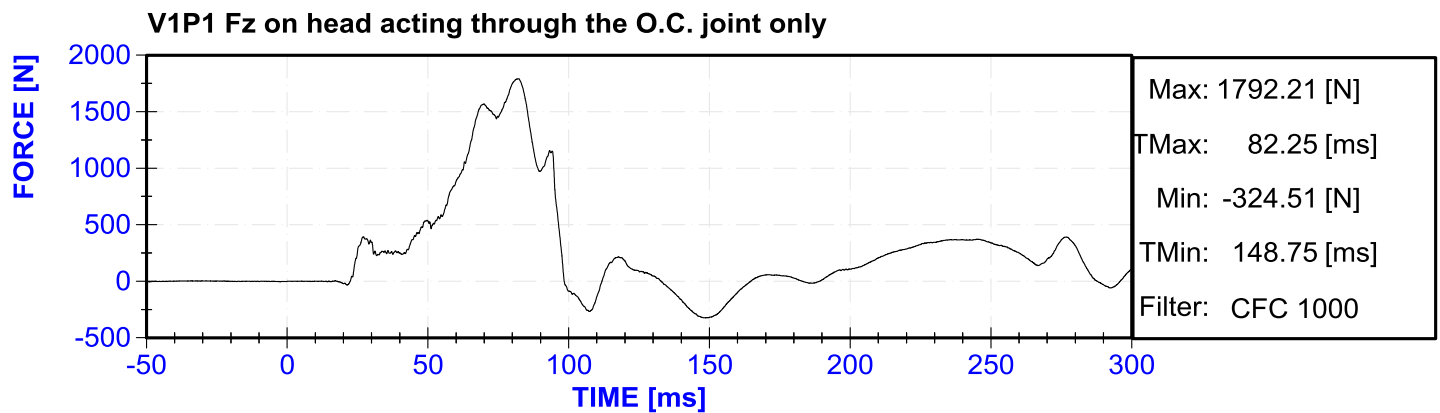
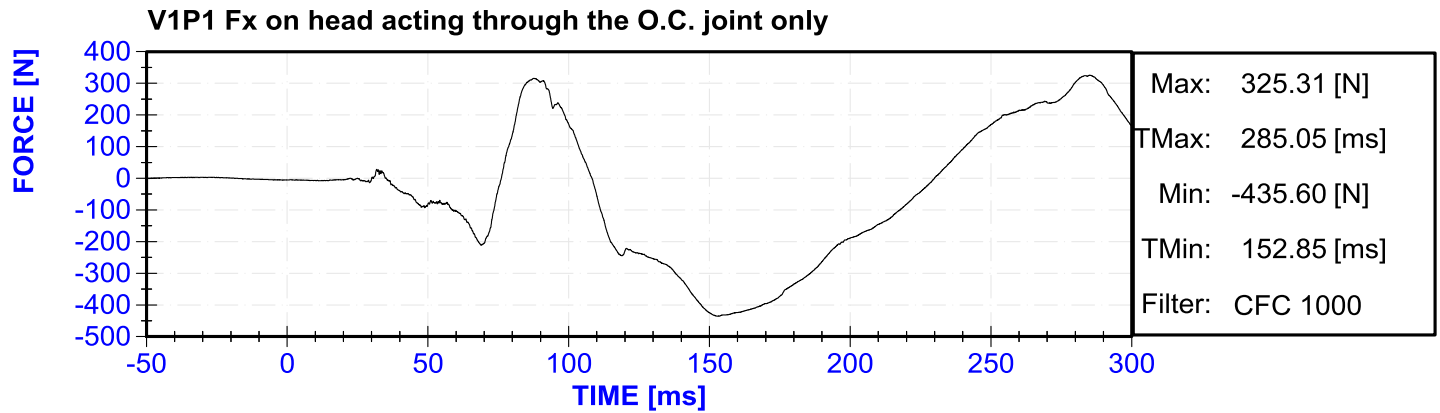


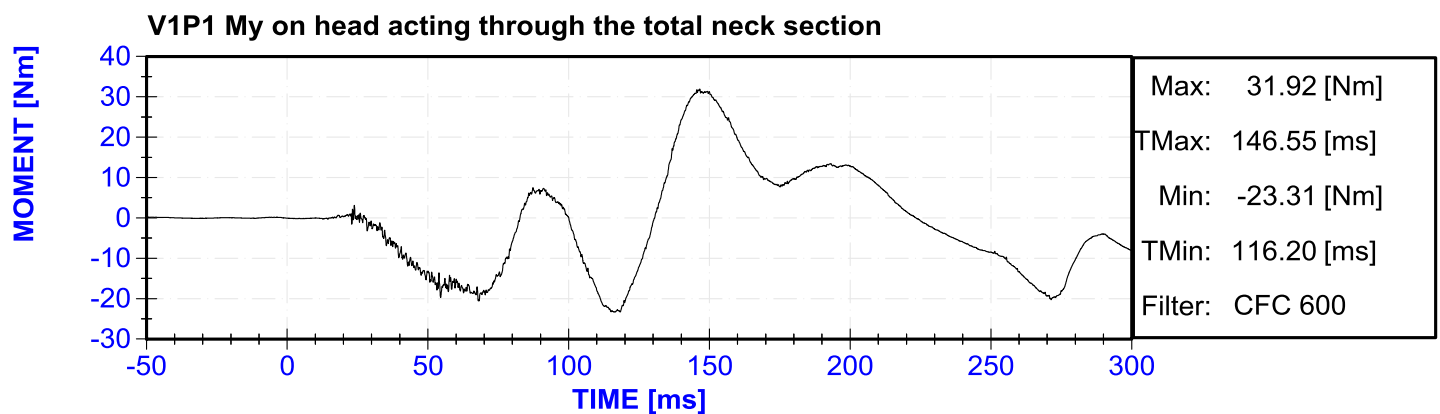
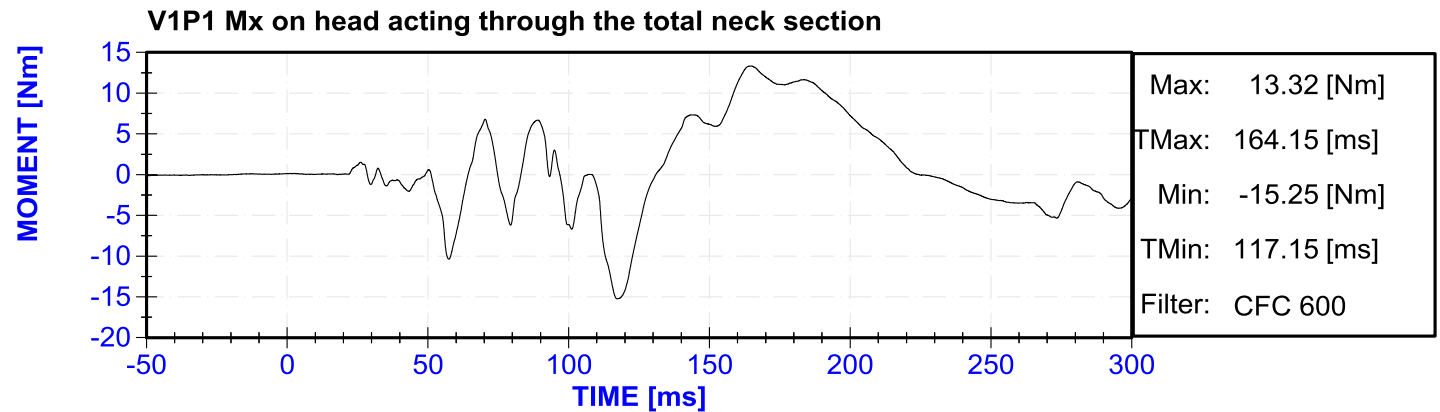
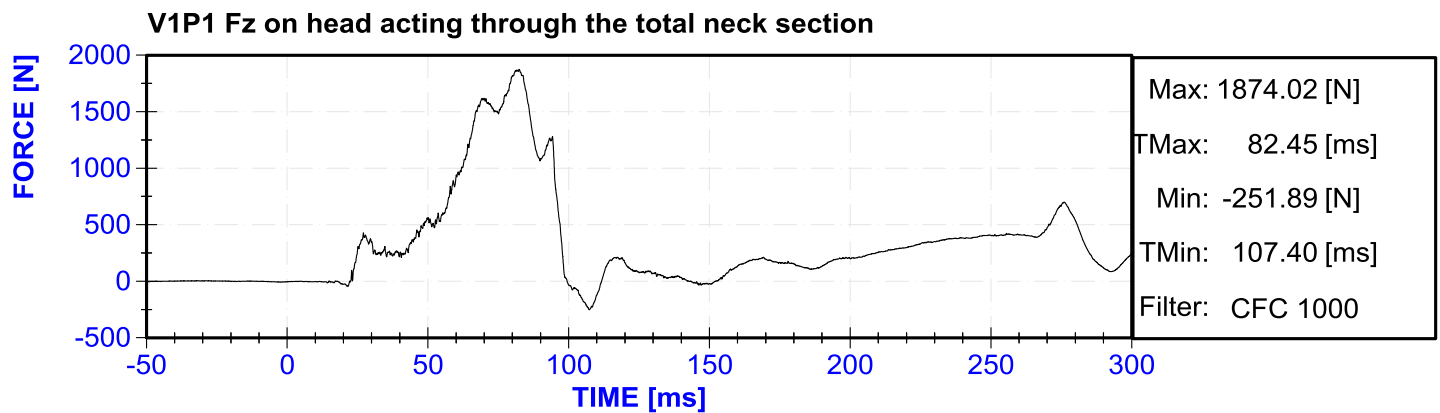
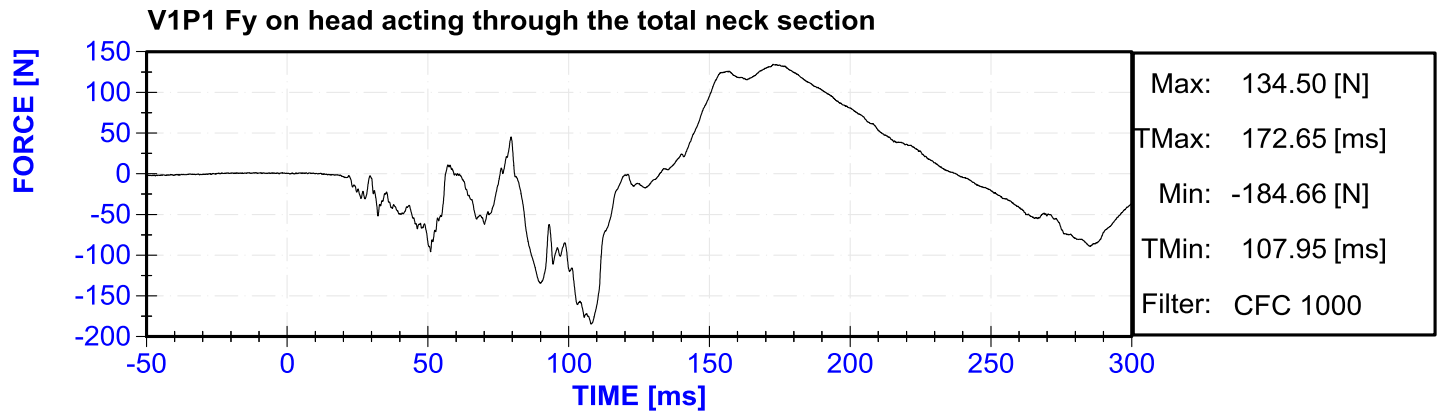
V1 Passenger Floor Pan Z Acceleration



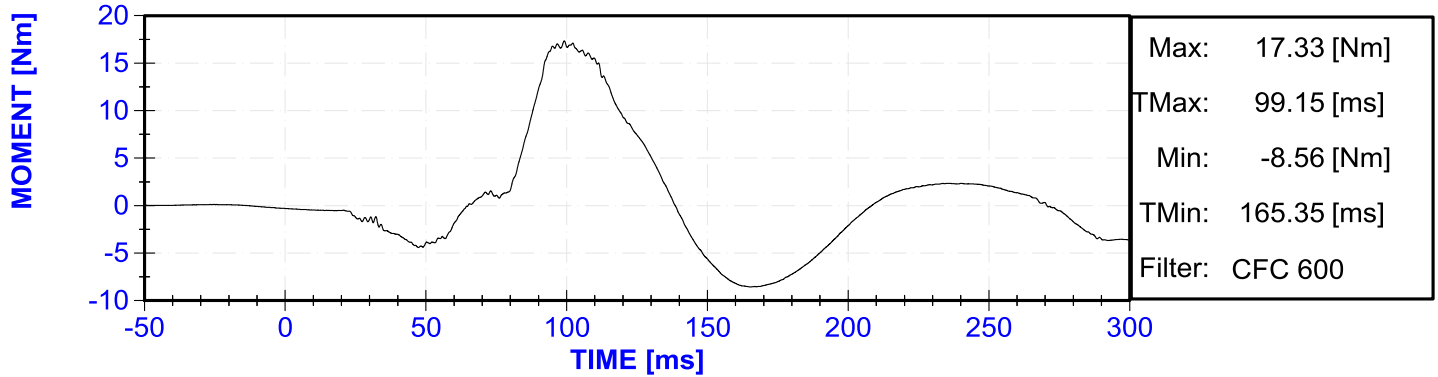
V1 Passenger Floor Pan X Displacement



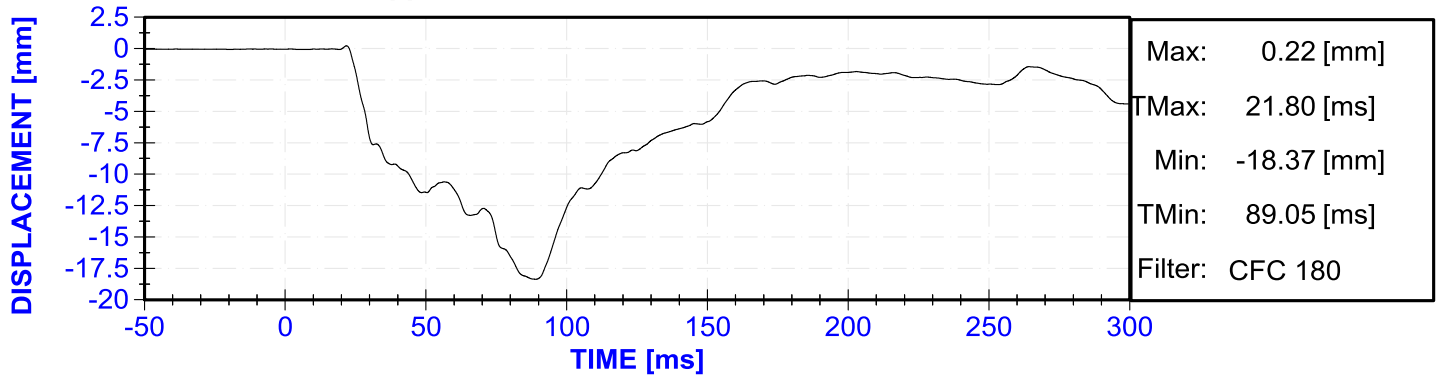




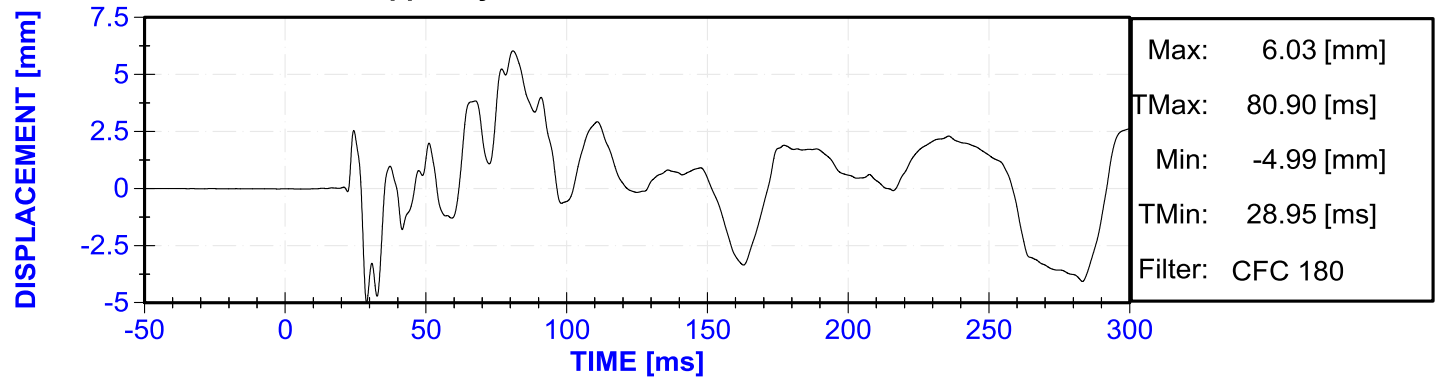
V1P1 Mz on head acting through the total neck section



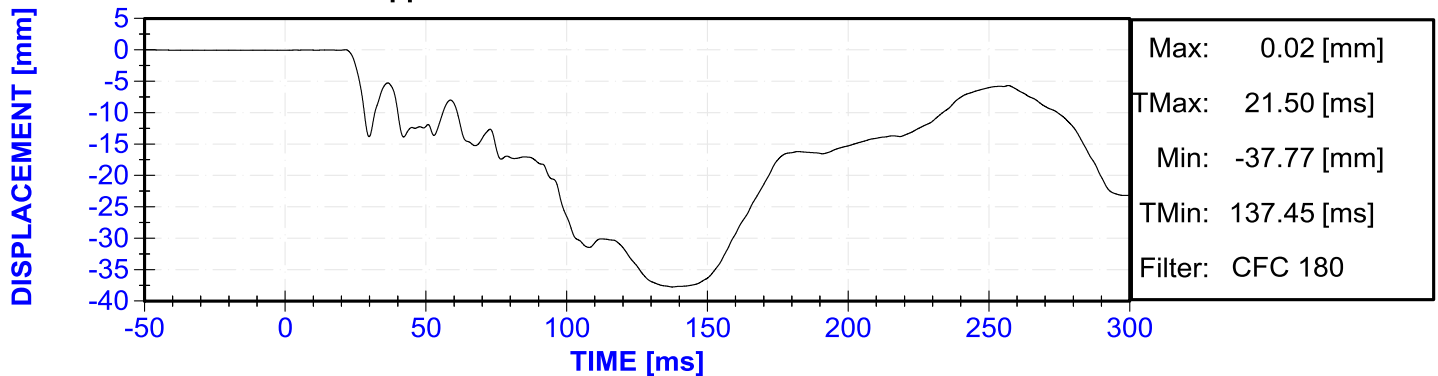
V1P1 Chest Left Upper Dx

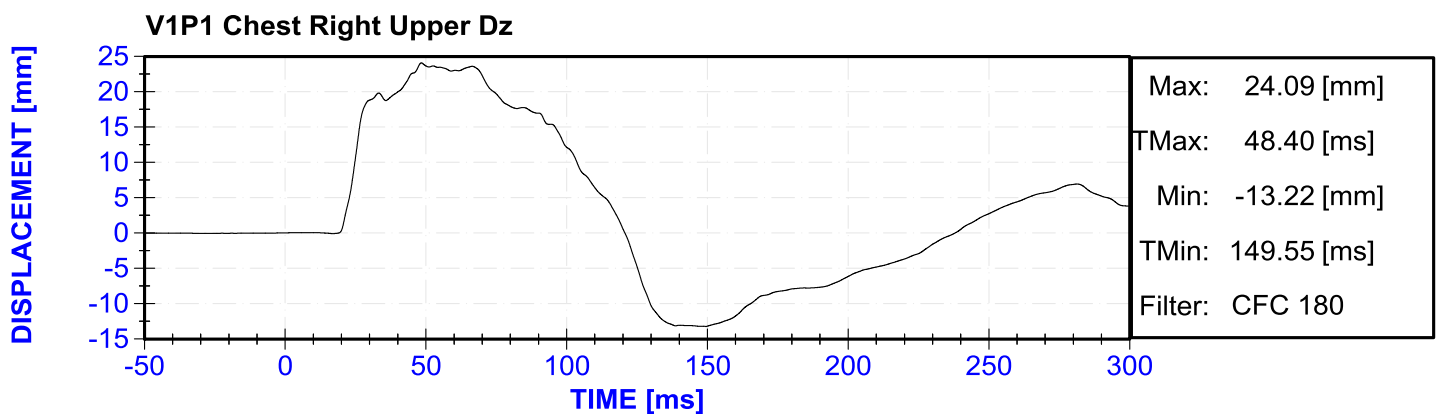
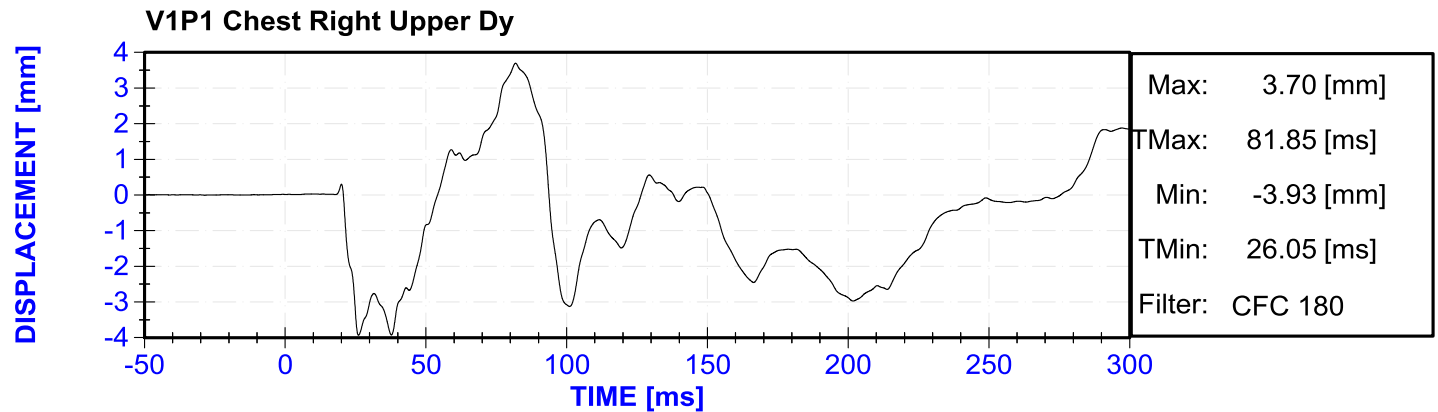
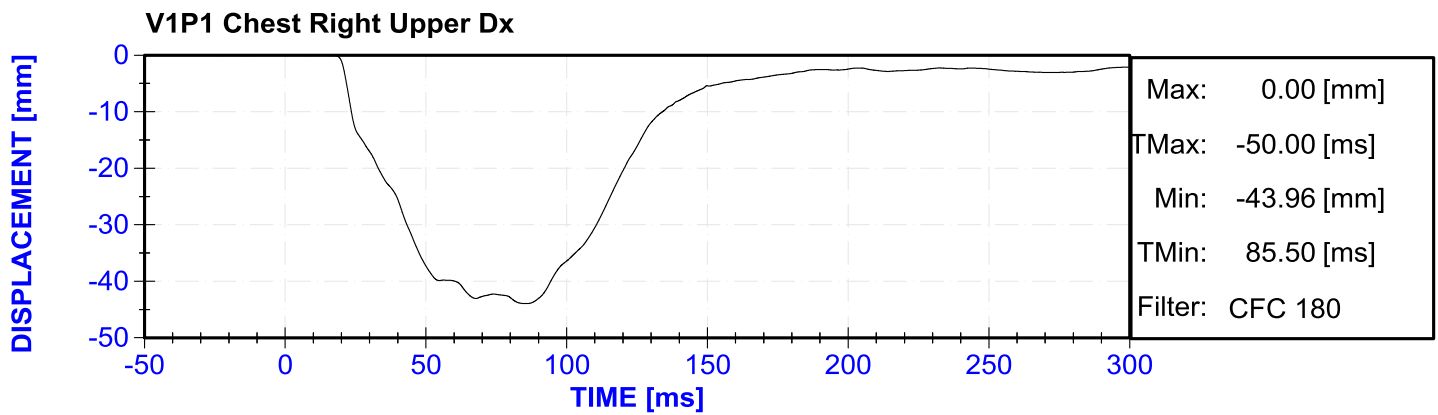
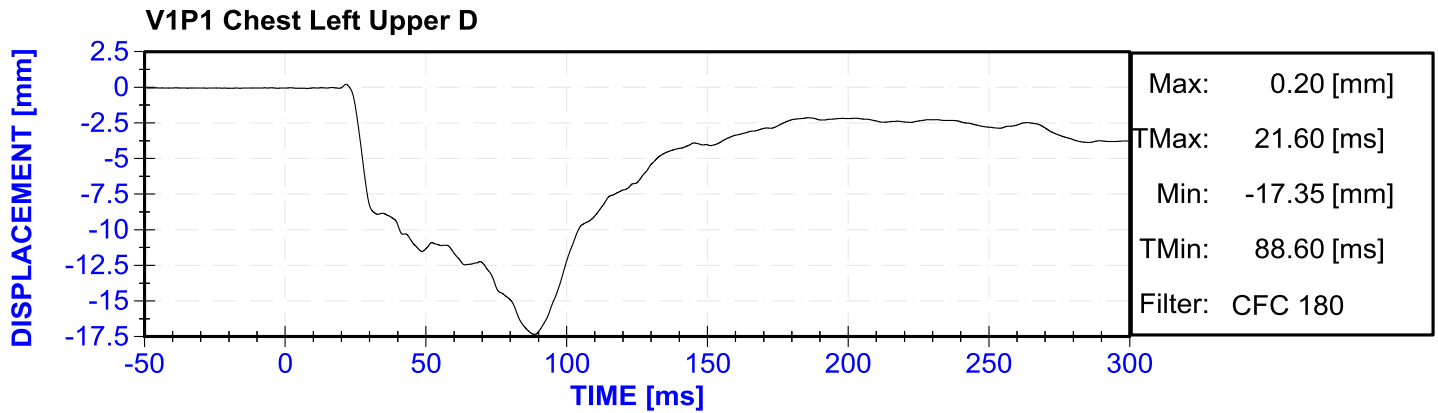


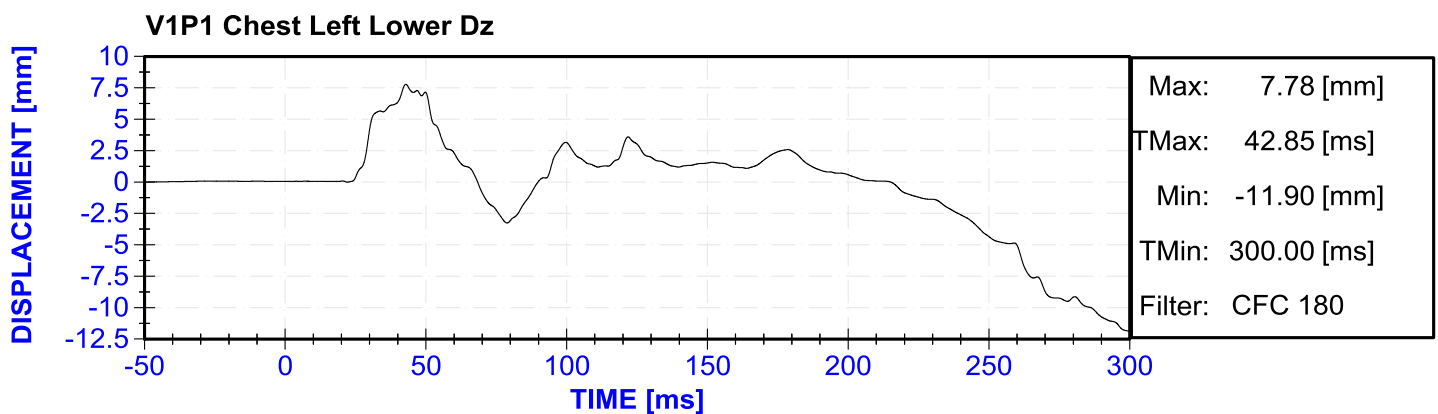
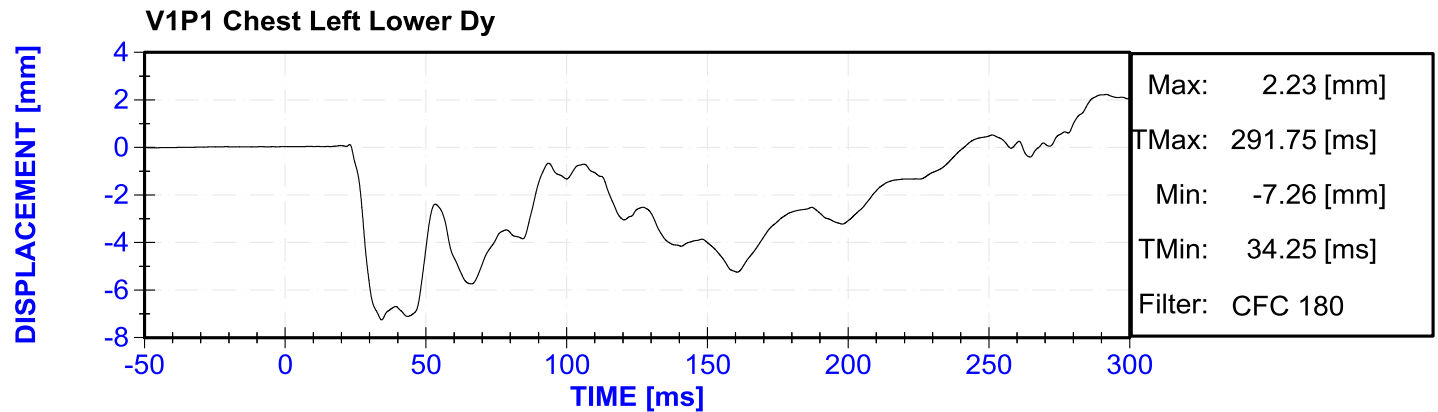
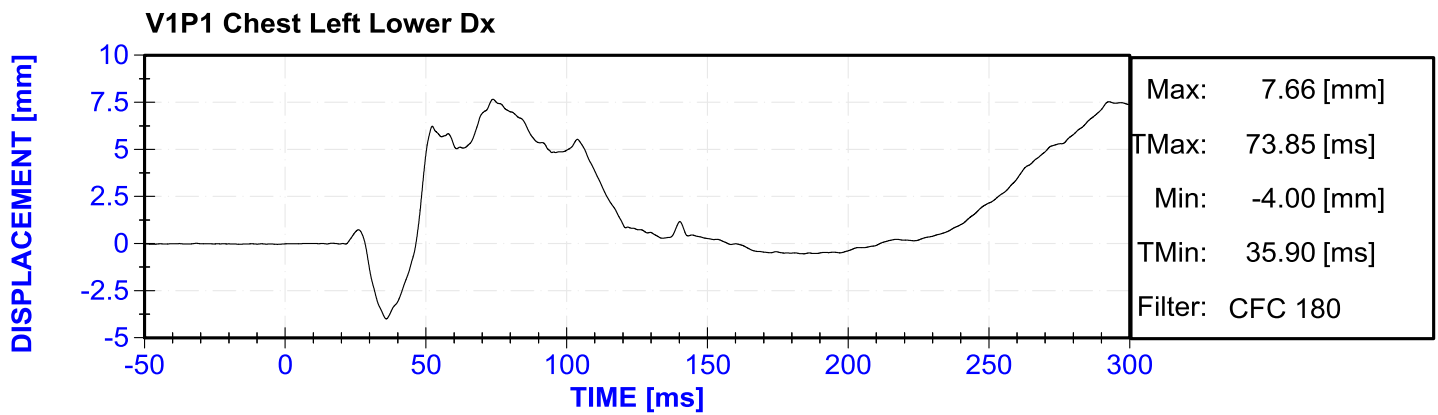
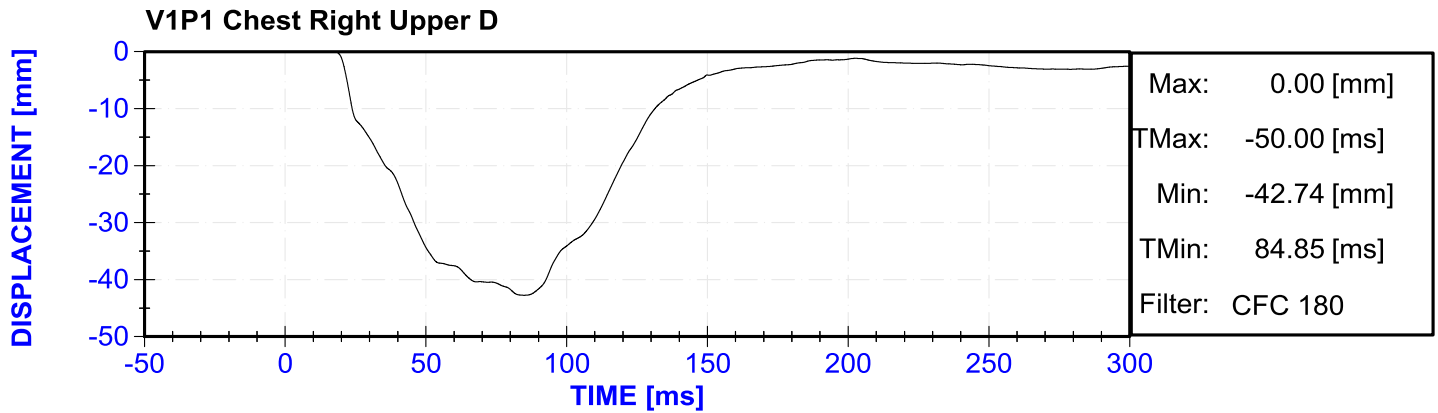
V1P1 Chest Left Upper Dy

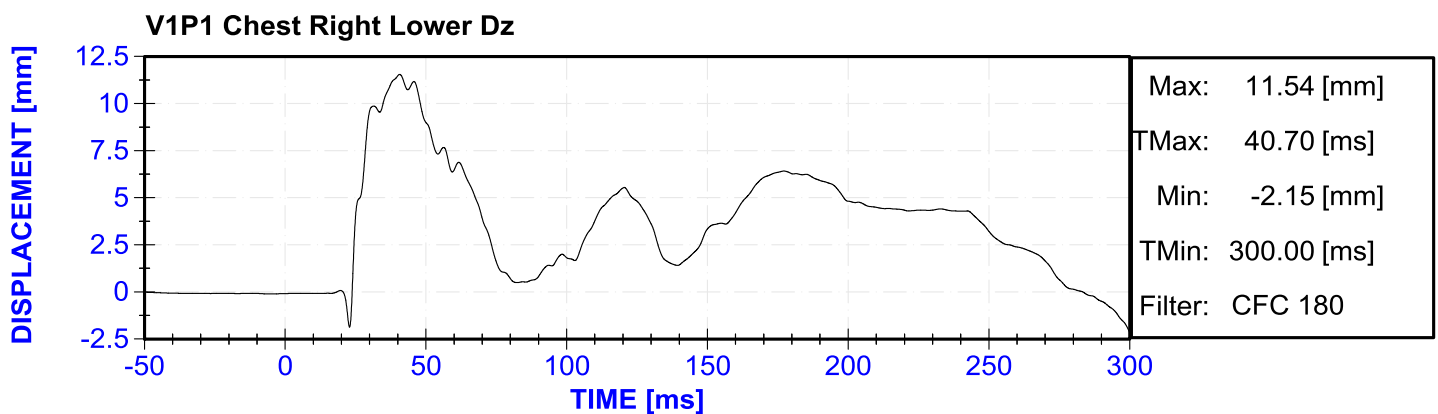
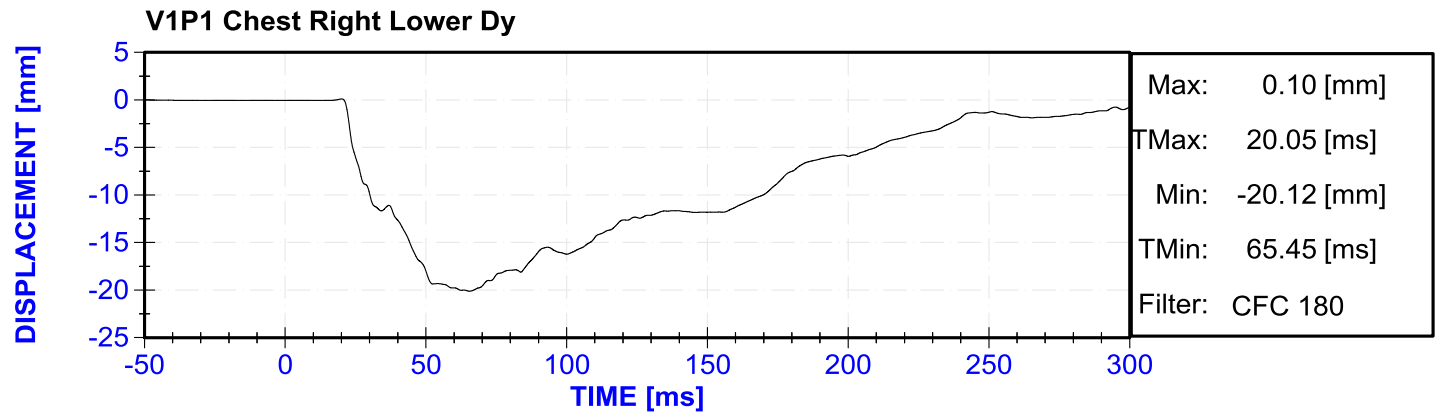
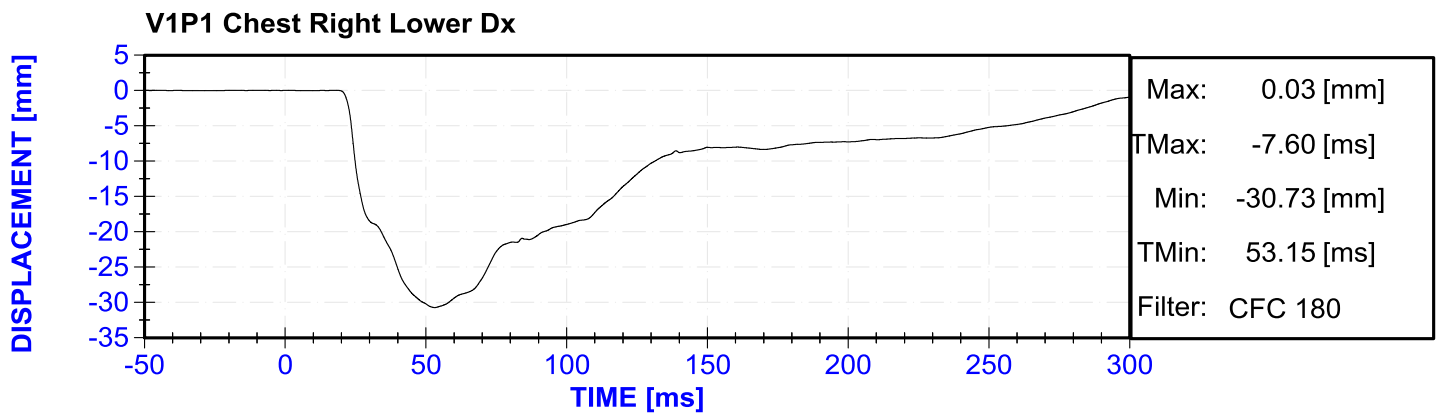
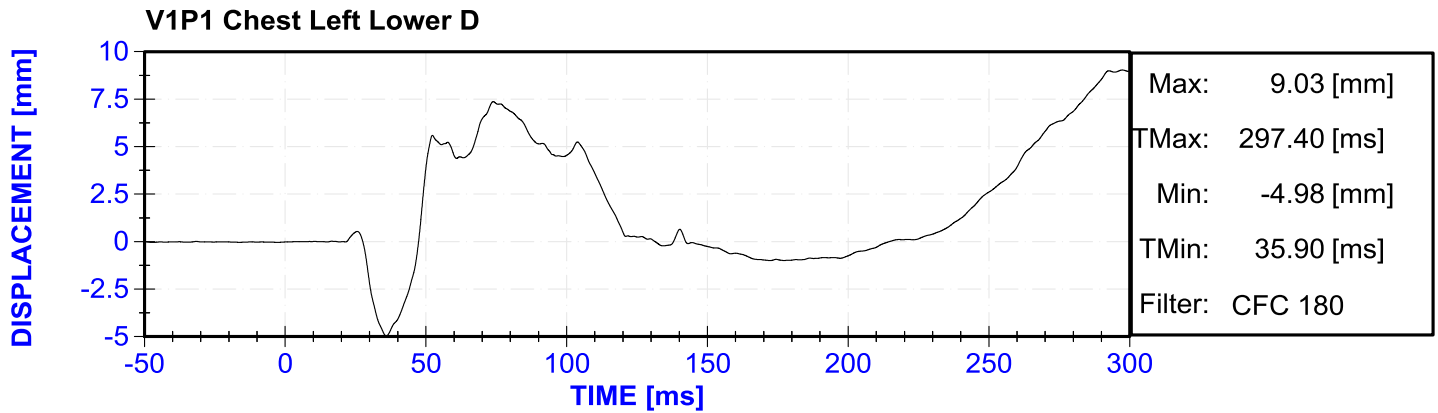


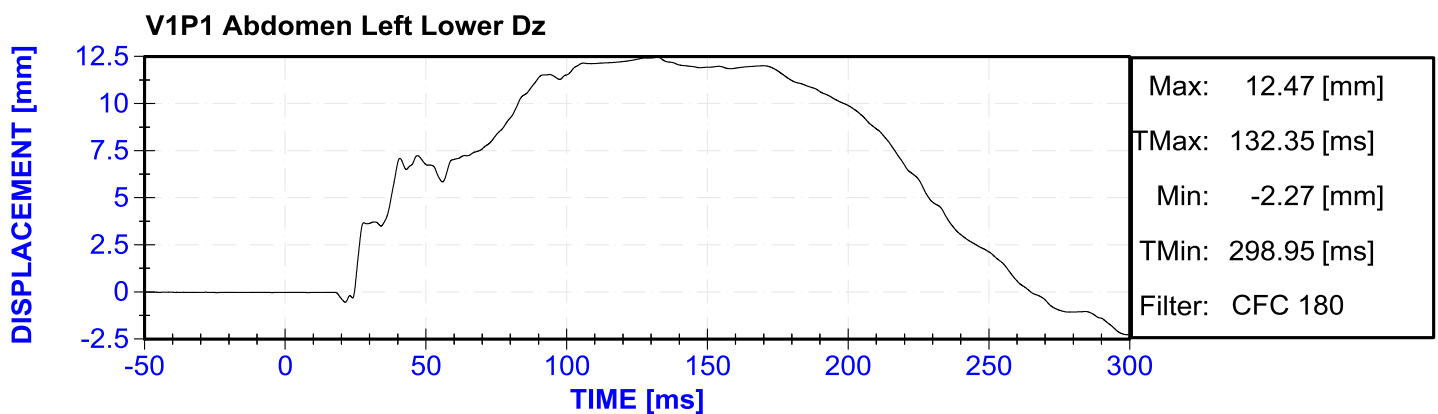
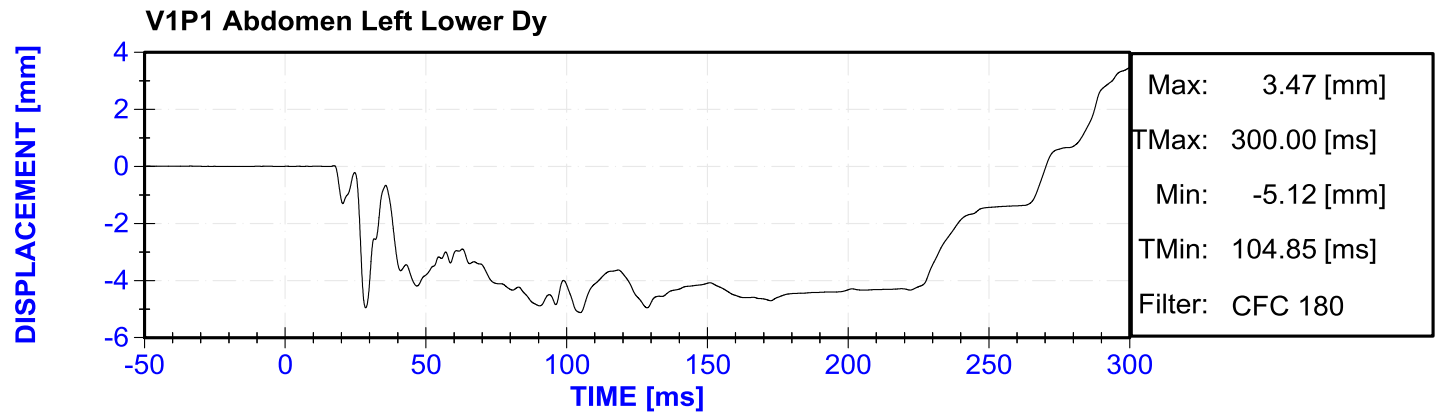
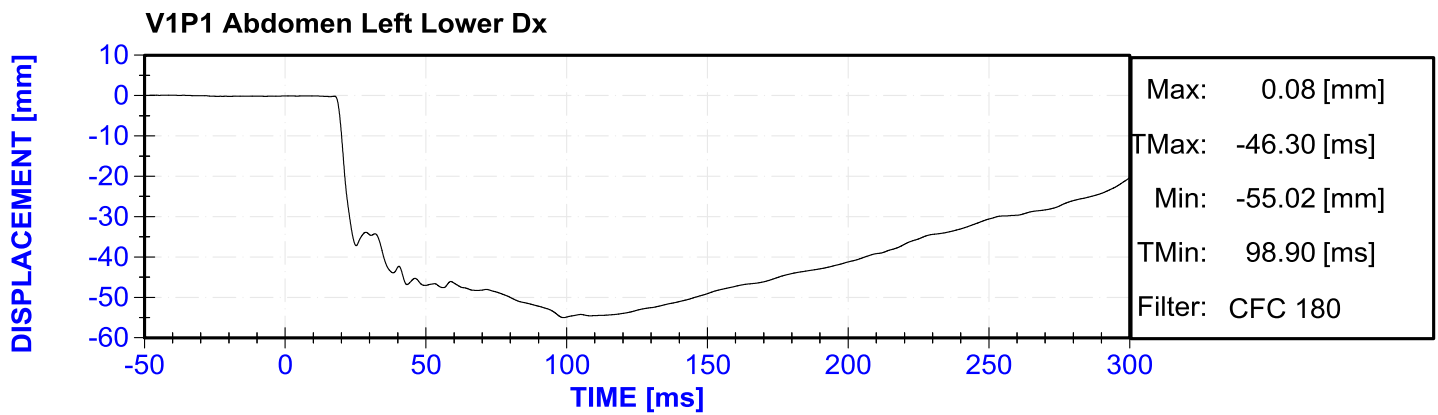
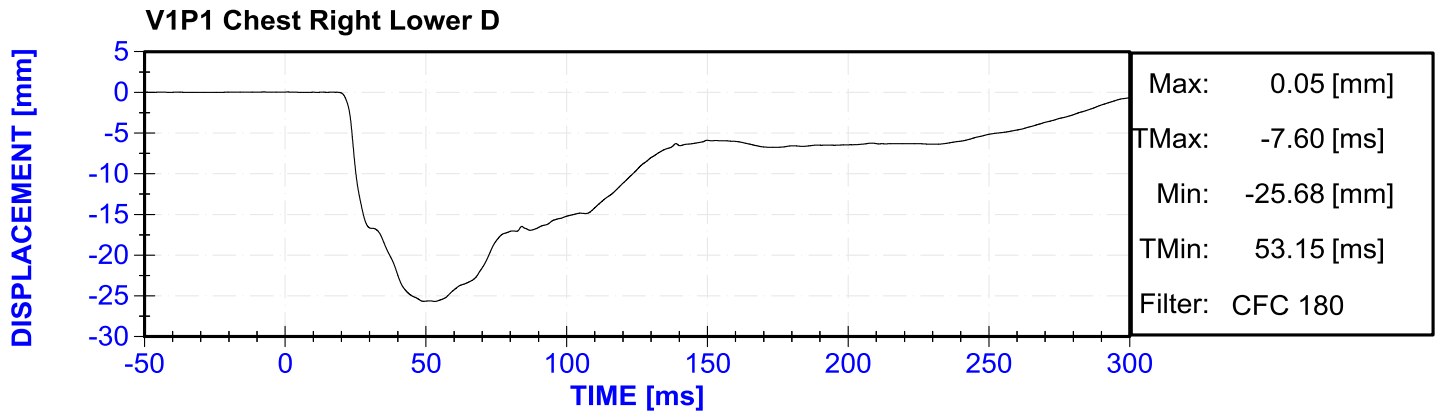
V1P1 Chest Left Upper Dz

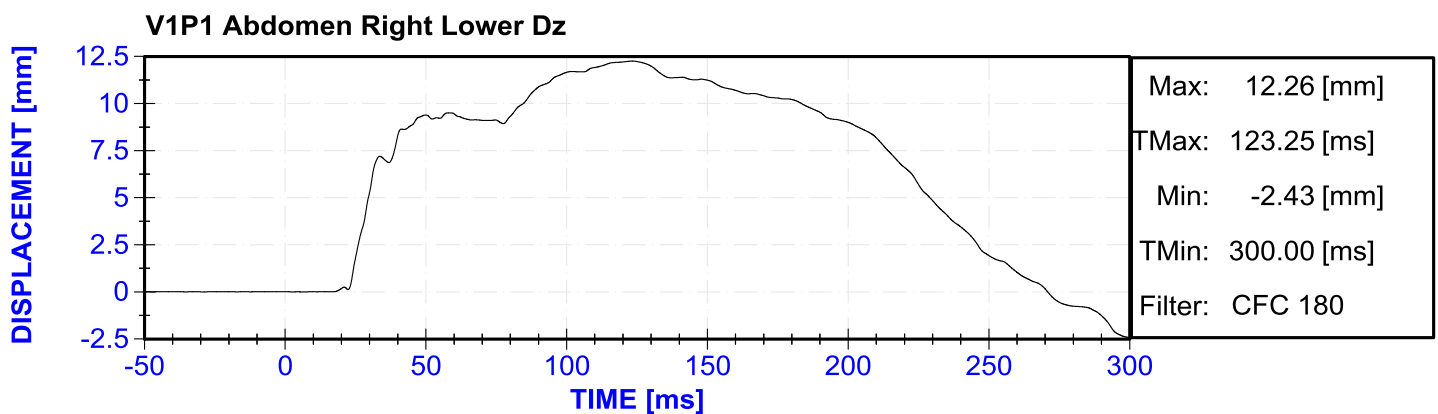
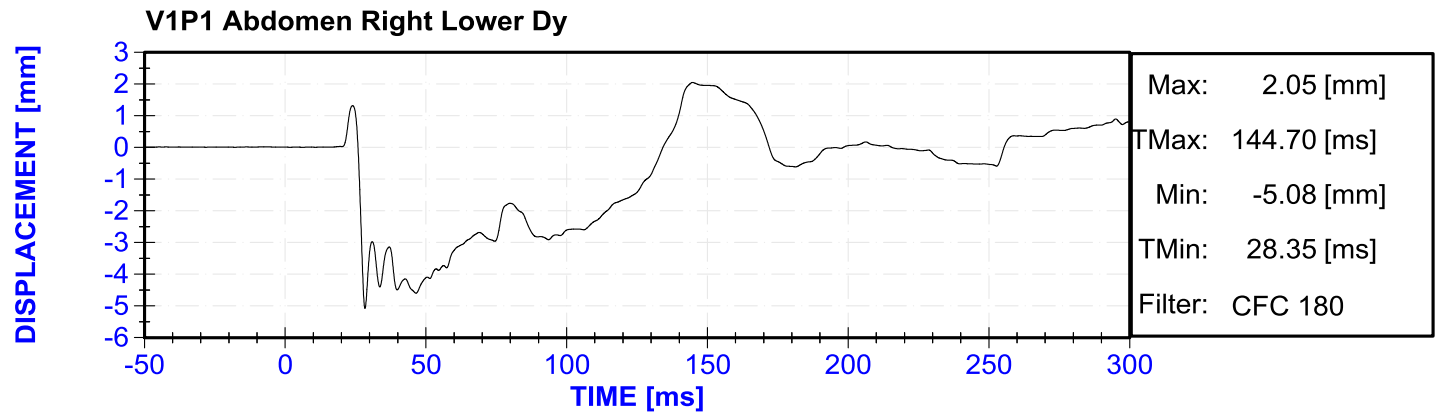
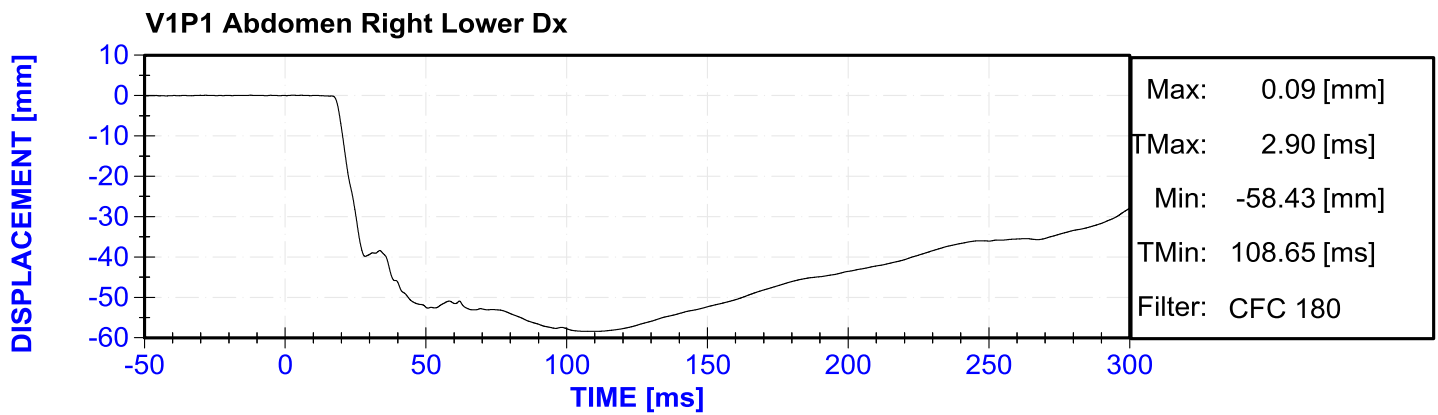
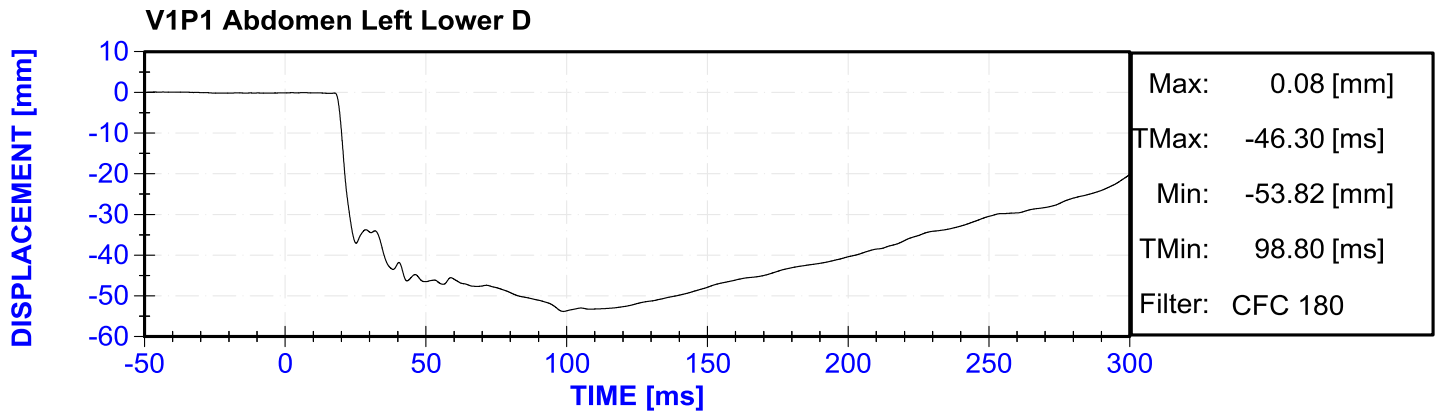


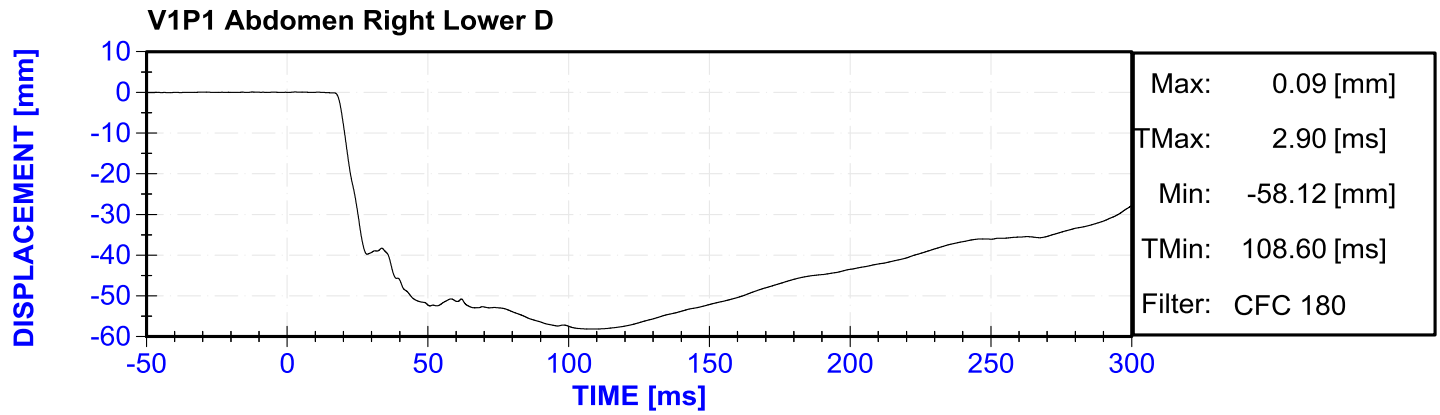












APPENDIX C

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

Table C-1: Dummy Information

TYPE	SERIAL NUMBER
THOR-M 50 TH Male	DL9207
5 th Female	324
5 th Female	019

Table C-2: THOR IR-TRACC Initial Set-Up Information

THOR – M S/N: DL9207		
IR-TRACC Location	IR-TRACC Exponent	IR-TRACC Slope
Upper Left Thorax Dx	-0.43199	36.9703
Upper Right Thorax Dx	-0.48860	29.8982
Lower Left Thorax Dx	-0.45268	35.3389
Lower Right Thorax Dx	-0.43502	37.4827
Left Abdomen Dx	-0.34061	66.5336
Right Abdomen Dx	-0.50000	26.8025

Table C- 3: THOR Dummy Initial Set-Up Information

THOR – M S/N: DL9207					
Sensor	Manufacturer	Serial Number	Range	Sensitivity	Sensitivity Units
Head CG Ax	Endevco	P82183	2000	0.017690000	mV/V/g
Head CG Ay	Endevco	P81384	2000	0.017600000	mV/V/g
Head CG Az	Endevco	P81797	2000	0.019350000	mV/V/g
Head Wx	DTS	ARS4740	18000	0.091430000	mV/deg/sec
Head Wy	DTS	ARS4737	18000	0.095640000	mV/deg/sec
Head Wz	DTS	ARS4073	18000	0.093760000	mV/deg/sec
Skull Spring Front Fz	Humanetics	DO9740	4448.2	0.000512814	mV/V/N
Skull Spring Rear Fz	Humanetics	DO9741	4448.2	0.000508183	mV/V/N
Condyle Pot Ry	Humanetics	DK5911	180	3.021000000	mV/V/deg
Upper Neck Fx	Humanetics	DP3956	8896.4	0.000224158	mV/V/N
Upper Neck Fy	Humanetics	DP3956	8896.4	0.000227755	mV/V/N
Upper Neck Fz	Humanetics	DP3956	13344.7	0.000085255	mV/V/N
Upper Neck Mx	Humanetics	DP3956	282.5	0.005819469	mV/V/Nm
Upper Neck My	Humanetics	DP3956	282.5	0.005983009	mV/V/Nm
Upper Neck Mz	Humanetics	DP3956	282.5	0.009425133	mV/V/Nm
Lower Neck Fx	Humanetics	DP4780	13344.7	0.000173709	mV/V/N
Lower Neck Fy	Humanetics	DP4780	13344.7	0.000174489	mV/V/N
Lower Neck Fz	Humanetics	DP4780	13344.7	0.000070575	mV/V/N
Lower Neck Mx	Humanetics	DP4780	451.9	0.004108210	mV/V/Nm
Lower Neck My	Humanetics	DP4780	451.9	0.004146714	mV/V/Nm
Lower Neck Mz	Humanetics	DP4780	226	0.006740265	mV/V/Nm
T1 Ax	Endevco	P79630	2000	0.020870000	mV/V/g

T1 Ay	Endevco	P78880	2000	0.019820000	mV/V/g
T1 Az	Endevco	P82758	2000	0.018610000	mV/V/g
Upper Left Thorax Dx	Humanetics	DS6355			
Upper Left Thorax Ry	Humanetics	DI2382	180	2.978800000	mV/V/deg
Upper Left Thorax Rz	Humanetics	DI2383	180	3.007300000	mV/V/deg
Upper Right Thorax Dx	Humanetics	DJ2613			
Upper Right Thorax Ry	Humanetics	DI7753	180	3.035900000	mV/V/deg
Upper Right Thorax Rz	Humanetics	DI7752	180	3.052400000	mV/V/deg
Lower Left Thorax Dx	Humanetics	DS6353			
Lower Left Thorax Ry	Humanetics	DM4781	180	3.001400000	mV/V/deg
Lower Left Thorax Rz	Humanetics	DS4092	180	3.072500000	mV/V/deg
Lower Right Thorax Dx	Humanetics	DS6354			
Lower Right Thorax Ry	Humanetics	DM4776	180	3.004900000	mV/V/deg
Lower Right Thorax Rz	Humanetics	DM4777	180	2.994700000	mV/V/deg
T6 Ax	Endevco	P49229	2000	0.018010000	mV/V/g
T6 Ay	Endevco	P49215	2000	0.016950000	mV/V/g
T6 Az	Endevco	P52122	2000	0.017050000	mV/V/g
Thoracic Spine Fx	Humanetics	DP2984	13344.7	0.000146365	mV/V/N
Thoracic Spine Fy	Humanetics	DP2984	13344.7	0.000147107	mV/V/N
Thoracic Spine Fz	Humanetics	DP2984	17792.9	0.000060193	mV/V/N
Thoracic Spine Mx	Humanetics	DP2984	677.9	0.002146039	mV/V/Nm
Thoracic Spine My	Humanetics	DP2984	903.9	0.001914371	mV/V/Nm
T12 Ax	Endevco	P74936	2000	0.017350000	mV/V/g
T12 Ay	Endevco	P74937	2000	0.017230000	mV/V/g
T12 Az	Endevco	P52005	2000	0.019870000	mV/V/g
Abdomen Left Dx	Humanetics	DQ2303			
Abdomen Left Ry	Humanetics	DS8363	150	3.024100000	mV/V/deg
Abdomen Left Rz	Humanetics	DS8361	150	3.047400000	mV/V/deg
Abdomen Right Dx	Humanetics	DM2641			
Abdomen Right Ry	Humanetics	DS4094	150	3.012300000	mV/V/deg
Abdomen Right Rz	Humanetics	DS4121	150	3.021800000	mV/V/deg
Acetabulum Right Fx	Humanetics	DP3835	22241.1	0.000118506	mV/V/N
Acetabulum Right Fy	Humanetics	DP3835	13344.7	0.000059342	mV/V/N
Acetabulum Right Fz	Humanetics	DP3835	13344.7	0.000161173	mV/V/N
Acetabulum Left Fx	Humanetics	DP4639	22241.1	0.000121280	mV/V/N
Acetabulum Left Fy	Humanetics	DP4639	13344.7	0.000059432	mV/V/N
Acetabulum Left Fz	Humanetics	DP4639	13344.7	0.000165871	mV/V/N
Pelvis Ax	Endevco	P83434	2000	0.017540000	mV/V/g
Pelvis Ay	Endevco	P82752	2000	0.018310000	mV/V/g
Pelvis Az	Endevco	P80296	2000	0.019410000	mV/V/g
ASIS Right Fx	Humanetics	DP5091	13000	0.000065215	mV/V/N
ASIS Right My	Humanetics	DP5091	325	0.003697538	mV/V/Nm
ASIS Left Fx	Humanetics	DP5092	13000	0.000067323	mV/V/N
ASIS Left My	Humanetics	DP5092	325	0.003688923	mV/V/Nm
Femur Left Fx	Denton	DM4975	15000	0.000143700	mV/V/N
Femur Left Fy	Denton	DM4975	15000	0.000143600	mV/V/N
Femur Left Fz	Denton	DM4975	15000	0.000072700	mV/V/N
Femur Left Mx	Denton	DM4975	350	0.006601400	mV/V/Nm
Femur Left My	Denton	DM4975	350	0.006642000	mV/V/Nm
Femur Left Mz	Denton	DM4975	300	0.008961300	mV/V/Nm
Femur Right Fx	Denton	DM4976	15000	0.000142600	mV/V/N

Femur Right Fy	Denton	DM4976	15000	0.000142900	mV/V/N
Femur Right Fz	Denton	DM4976	15000	0.000072200	mV/V/N
Femur Right Mx	Denton	DM4976	350	0.006505700	mV/V/Nm
Femur Right My	Denton	DM4976	350	0.006488900	mV/V/Nm
Femur Right Mz	Denton	DM4976	300	0.008811600	mV/V/Nm
Upper Tibia Fx	Denton	97	11120	0.00017270	mv/v/N
Upper Tibia Fz	Denton	97	11120	0.00009330	mv/v/N
Upper Tibia Mx	Denton	97	395	0.00733320	mv/v/Nm
Upper Tibia My	Denton	97	395	0.00739800	mv/v/Nm
Lower Tibia Fx	Denton	121	11100	0.00017510	mv/v/N
Lower Tibia Fy	Denton	121	11100	0.00017180	mv/v/N
Lower Tibia Fz	Denton	121	11100	0.00009580	mv/v/N
Lower Tibia Mx	Denton	121	395	0.00739650	mv/v/Nm
Lower Tibia My	Denton	121	395	0.00744720	mv/v/Nm
Ankle Rx	Contelec	0523	180	3.17860	mv/v/deg
Ankle Ry	Contelec	0524	180	3.19060	mv/v/deg
Ankle Rz	Contelec	0525	180	3.18790	mv/v/deg
Knee Dx	Space Age	C2102639B	33	24.09410	mv/v/mm
Leg Ax	Endevco	P77996	2000	0.01803	mv/v/g
Leg Ay	Endevco	P64094	2000	0.02214	mv/v/g
Foot Ax	Endevco	P80271	2000	0.02100	mv/v/g
Foot Ay	Endevco	P74950	2000	0.01782	mv/v/g
Foot Az	Endevco	P51684	2000	0.01953	mv/v/g
Achilles Fz	Denton	136	4448	0.000257800	mv/V/N
Upper Tibia Fx	Denton	75	11120	0.00017350	mv/v/N
Upper Tibia Fz	Denton	75	11120	0.00009520	mv/v/N
Upper Tibia Mx	Denton	75	395	0.00749000	mv/v/Nm
Upper Tibia My	Denton	75	395	0.00747580	mv/v/Nm
Lower Tibia Fx	Denton	166	11100	0.00017560	mv/v/N
Lower Tibia Fy	Denton	166	11100	0.00017130	mv/v/N
Lower Tibia Fz	Denton	166	11100	0.00009950	mv/v/N
Lower Tibia Mx	Denton	166	395	0.00742480	mv/v/Nm
Lower Tibia My	Denton	166	395	0.00737260	mv/v/Nm
Ankle Rx	Contelec	0528	180	3.20220	mv/v/deg
Ankle Ry	Contelec	0526	180	3.15530	mv/v/deg
Ankle Rz	Contelec	0527-1	180	3.16060	mv/v/deg
Knee Dx	Space Age	021033	30	23.25080	mv/v/mm
Leg Ax	Endevco	P82744	2000	0.01827	mv/v/g
Leg Ay	Endevco	P82322	2000	0.01726	mv/v/g
Foot Ax	Endevco	P74976	2000	0.01784	mv/v/g
Foot Ay	Endevco	P83340	2000	0.02038	mv/v/g
Foot Az	Endevco	P83339	2000	0.01990	mv/v/g
Achilles Fz	Denton	129	4448	0.000278100	mv/V/N

Table C- 4: 5th Female Dummy Initial Set-Up Information

5 th Female S/N: 324					
Sensor	Manufacturer	Serial Number	Range	Sensitivity	Sensitivity Units
Head CG Ax	Endevco	AC-P72219	2000	0.017320001	mV/V/g
Head CG Ax	Endevco	AC-P49160	2000	0.016579999	mV/V/g
Head CG Ax	Endevco	AC-P78168	2000	0.017820001	mV/V/g
Head CG RAx	Endevco	AC-P49438	2000	0.019560001	mV/V/g
Head CG RAY	Endevco	AC-P82323	2000	0.018110000	mV/V/g
Head CG RAz	Endevco	AC-P74784	2000	0.017210001	mV/V/g
Head Wx	DTS	LC-2254 Fx	18000	0.000190700	mV/V/sec
Head Wy	DTS	LC-2254 Fy	18000	0.000185600	mV/V/sec
Head Wz	DTS	LC-2254 Fz	18000	0.000099100	mV/V/sec
Upper Neck Fx	Denton	LC-2254 Mx	8896.4	0.005778900	mV/V/N
Upper Neck Fy	Denton	LC-2254 My	8896.4	0.005884700	mV/V/N
Upper Neck Fz	Denton	LC-2254 Mz	13344.6	0.008229600	mV/V/N
Upper Neck Mx	Denton	ARS-5931	282.5	0.093230003	mV/V/Nm
Upper Neck My	Denton	ARS-4714	282.5	0.094490002	mV/V/Nm
Upper Neck Mz	Denton	ARS-6635	282.5	0.098429999	mV/V/Nm
Chest Ax	Endevco	AC-P83431	2000	0.017900000	mV/V/g
Chest Ay	Endevco	AC-P84365	2000	0.019450001	mV/V/g
Chest Az	Endevco	AC-P84472	2000	0.019229999	mV/V/g
Chest Dx	Servo	DS-CST324	54	1.752399956	mV/V/deg
Pelvis Ax	Endevco	AC-ACCE6	2000	0.023119999	mV/V/g
Pelvis Ay	Endevco	AC-AGT82	2000	0.019800000	mV/V/g
Pelvis Az	Endevco	AC-J19561	2000	0.026219999	mV/V/g
Femur Right Fz	Denton	LC-1702 Fz	13340	0.000109400	mV/V/N
Femur Left Fz	Denton	LC-1714 Fz	13340	0.000108200	mV/V/N
Upper Tibia Right Fx	Denton	LC-372 Fx	11120.55	0.000171412	mV/V/N
Upper Tibia Right Fy	Denton	LC-372 Fy	11120.55	0.000170342	mV/V/N
Upper Tibia Right Fz	Denton	LC-372 Fz	11120.55	0.000092600	mV/V/N
Upper Tibia Right Mx	Denton	LC-372 Mx	395.4467	0.007423756	mV/V/Nm
Upper Tibia Right My	Denton	LC-372 My	395.4467	0.007387342	mV/V/Nm
Lower Tibia Right Fx	Denton	LC-405 Fx	11120.55	0.000174398	mV/V/N
Lower Tibia Right Fy	Denton	LC-405 Fy	11120.55	0.000178211	mV/V/N
Lower Tibia Right Fz	Denton	LC-405 Fz	11120.55	0.000093900	mV/V/N
Lower Tibia Right Mx	Denton	LC-405 Mx	395.4467	0.007600771	mV/V/Nm
Lower Tibia Right My	Denton	LC-405 My	395.4467	0.007638450	mV/V/Nm
Upper Tibia Left Fx	Denton	LC-484 Fx	11120.55	0.000172159	mV/V/N
Upper Tibia Left Fy	Denton	LC-484 Fy	11120.55	0.000170585	mV/V/N
Upper Tibia Left Fz	Denton	LC-484 Fz	11120.55	0.000098900	mV/V/N
Upper Tibia Left Mx	Denton	LC-484 Mx	395.4467	0.007399480	mV/V/Nm
Upper Tibia Left My	Denton	LC-484 My	395.4467	0.007426791	mV/V/Nm
Lower Tibia Left Fx	Denton	LC-397 Fx	11120.55	0.000174299	mV/V/N
Lower Tibia Left Fy	Denton	LC-397 Fy	11120.55	0.000178453	mV/V/N
Lower Tibia Left Fz	Denton	LC-397 Fz	11120.55	0.000095000	mV/V/N
Lower Tibia Left Mx	Denton	LC-397 Mx	395.4467	0.007559047	mV/V/Nm
Lower Tibia Left My	Denton	LC-397 My	395.4467	0.007546908	mV/V/Nm

Right Toe Az	Endevco	AC-P77601	2000	0.019200001	mV/V/g
Right Foot Ax	Endevco	AC-P80250	2000	0.020280000	mV/V/g
Right Foot Az	Endevco	AC-P63954	2000	0.021530001	mV/V/g
Left Toe Az	Endevco	AC-P82324	2000	0.017890001	mV/V/g
Left Foot Ax	Endevco	AC-P58708	2000	0.017799999	mV/V/g
Left Foot Az	Endevco	AC-P64109	2000	0.019409999	mV/V/g
RibEye Rib Deflection System	Boxboro	108	N/A	N/A	N/A

Table C- 5: 5th Female Dummy Initial Set-Up Information

5 th Female S/N: 019					
Sensor	Manufacturer	Serial Number	Range	Sensitivity	Sensitivity Units
Head CG Ax	Endevco	AC-P79591	2000	0.023450000	mV/V/g
Head CG Ay	Endevco	AC-P49181	2000	0.016900000	mV/V/g
Head CG Az	Endevco	AC-P49214	2000	0.018500001	mV/V/g
Upper Neck Fx	Denton	LC-2184 Fx	8896.4	0.000186800	mV/V/N
Upper Neck Fy	Denton	LC-2184 Fy	8896.4	0.000182300	mV/V/N
Upper Neck Fz	Denton	LC-2184 Fz	13344.6	0.000098100	mV/V/N
Upper Neck Mx	Denton	LC-2184 Mx	282.5	0.005686400	mV/V/Nm
Upper Neck My	Denton	LC-2184 My	282.5	0.005715100	mV/V/Nm
Upper Neck Mz	Denton	LC-2184 Mz	282.5	0.008202000	mV/V/Nm
Chest Ax	Endevco	AC-P80261	2000	0.020690000	mV/V/g
Chest Ay	Endevco	AC-P80259	2000	0.019980000	mV/V/g
Chest Az	Endevco	AC-P80254	2000	0.020050000	mV/V/g
Chest Ds	Servo	DS-FEM019	54	1.831499976	mV/V/deg
Pelvis Ax	Endevco	AC-P83343	2000	0.019850000	mV/V/g
Pelvis Ay	Endevco	AC-P49439	2000	0.019120000	mV/V/g
Pelvis Az	Endevco	AC-P82757	2000	0.018490000	mV/V/g
ASIS Left Fx	Denton	LC-1396 Fz	8896.4	0.000107900	mV/V/N
ASIS Left My	Denton	LC-1527 Fz	225.9	0.000106300	mV/V/Nm
ASIS Right Fx	Denton	LC-79 Fx	8896.4	0.000185400	mV/V/N
ASIS Right My	Denton	LC-79 My	225.9	0.005273300	mV/V/Nm
Left Femur Fz	Denton	LC-76 Fx	13340	0.000185200	mV/V/N
Right Femur Fz	Denton	LC-76 My	13340	0.005243000	mV/V/N
RibEye Rib Deflection System	Boxboro	107	N/A	N/A	N/A

Table 5 – 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 DL9207

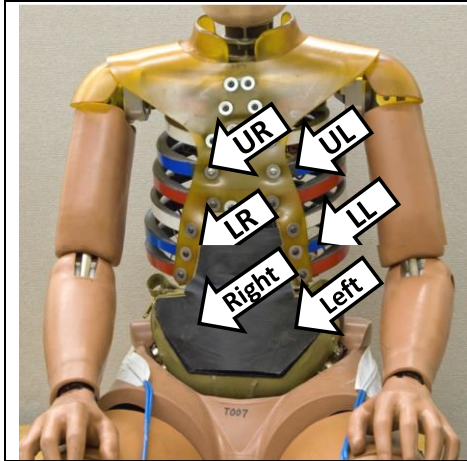


Figure 1. Manipulation to determine thoracic and abdominal IR-TRACC polarity.

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)	0.08241	+	+	DX (V)	0.14208	+	+
RY (Deg)	7.03304	+	+	RY (Deg)	3.5479	+	+
RZ (Deg)	-12.423	+	+	RZ (Deg)	11.9783	+	+
Lower Right Thorax				Lower Left Thorax			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.09267	+	+	DX (V)	0.08948	+	+
RY (Deg)	-3.8281	+	+	RY (Deg)	3.7068	+	+
RZ (Deg)	-7.9202	+	+	RZ (Deg)	7.1676	+	+
Abdomen Right				Abdomen Left			
Channel	Initial Value	Expected Polarity	Recorded Polarity	Channel	Initial Value	Expected Polarity	Recorded Polarity
DX (V)	0.04006	+	+	DX (V)	N/A	+	+
RY (Deg)	2.38104	+	+	RY (Deg)	N/A	+	+
RZ (Deg)	-0.2716	+	+	RZ (Deg)	N/A	+	+

THOR Inspection Checklist

Date: 1/16/2016	
NHTSA Representative: Tim Keon	
Inspection Reporter: Mike Hartung	
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: 12/23/2015	
<u>Tests conducted since last inspection:</u> M20160118- Chevrolet Tahoe	<u>Since last certification:</u> M20165306 - 2016 Honda Fit M20160113 – 2016 Chevrolet Malibu M20160118- Chevrolet Tahoe
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> - None	
<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 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.
	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		

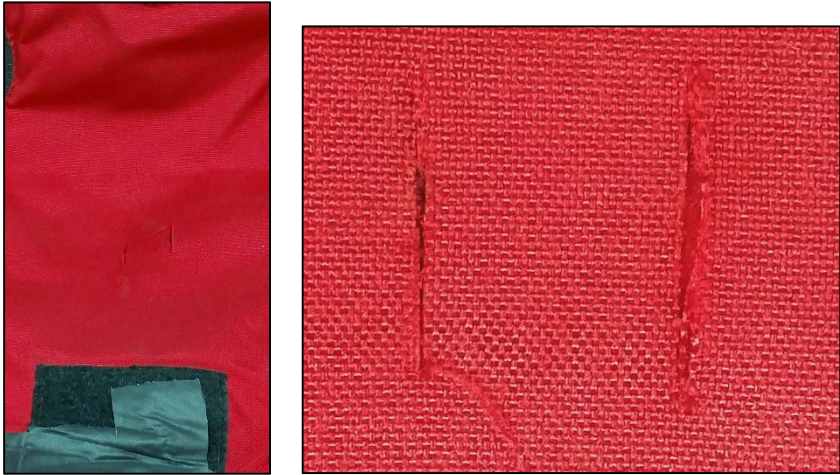
THOR Inspection Checklist

Date: 1/26/2016	
NHTSA Representative: Tim Keon	
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: 12/23/2015	
<u>Tests conducted since last inspection:</u> M20165212 - 2016 Nissan Rogue	<u>Since last certification:</u> M20165306 - 2016 Honda Fit M20160113 – 2016 Chevrolet Malibu M20160118 - Chevrolet Tahoe <i>LX Leg Certification 1-20-2016</i> M20165212 - 2016 Nissan Rogue
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> - None	
<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 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.
	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	

ATD 324: PRE-TEST INSPECTION**5th Female Inspection Checklist**

Date: 1/16/2016	
NHTSA Representative: Tim Keon	
Inspection Reporter: Mike Hartung	
Inspection type (check one): ☒ Pre-Test ☐ Post-Test	
Dummy S/N: 324	
Dummy Description: Hybrid 3 – 5th Female	
Date of last Certification: 1/5/2016	
<u>Tests conducted since last inspection:</u> M20160118 – 2016 Chevrolet Tahoe	<u>Since last certification:</u> M20165306-2016 Honda Fit M20160113 – 2016 Chevrolet Malibu M20160118 – 2016 Chevrolet Tahoe
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> None	
<u>Physical evidence of damage:</u> None New	
<u>Anecdotal evidence of damage:</u> None	
<u>Equipment delivered to Borrower:</u> Hybrid 3 5th Female 1 RibEye rib displacement system 1 RibEye trunk box 1 RibEye power cable 1 RibEye trigger cable 1 Ethernet cable 1 RibEye software and manual disk 9 Accelerometers 1 Upper neck load cell 2 ASIS load cells 2 Femur load cells	

Note: New Damage is Noted in Red

HEAD	
Y / N	Ballast secure
Y / N	General appearance Minor cuts and scuffing 
OTHER	
NECK	
Y / N	Rubber is not cracked or broken
Y / N	Upper neck bracket is firmly attached to the lower neck bracket
Y / N	The condyle joint is tight
Y / N	Nodding blocks are not cracked, broken, or out of position
OTHER	
SPINE/PELVIS	
Y / N	Rubber is not cracked or broken
Y / N	Pelvis is not broken or damaged
OTHER	
THORAX/ABDOMEN	
Y / N	Ribs are intact and straight
Y / N	Rib supports are intact and straight
Y / N	Rib damping material not separated or cracked
Y / N	Rubber bumpers in place
Y / N	Abdomen is not deformed
Y / N	Abdomen is not cracked or broken
OTHER	
KNEES	
Y / N	Skin is not torn
Y / N	Inserts are in good condition and the proper position
Y / N	Slider wires are intact
Y / N	Slider rubber returns to “at rest” position
OTHER	
LIMBS	
Y / N	Arms have normal movement and adjustment
Y / N	Arm flesh is in good condition
Y / N	Legs have normal movement and adjustment
Y / N	Leg flesh is in good condition Small cuts at top of tibia flesh: 
Y / N	Feet are in good condition
OTHER	

INSTRUMENTATION	
Y / N	Chest pot shaft is straight
Y / N	Slider arm is riding in track
Y / N	RibEye system (if equipped) has no physically broken wires or equipment
Y / N	Transducer cables are not torn or exposing shield
Y / N	Accelerometer mounts are all secure
Y / N	LEMO connectors are straight and securely fit into acquisition hardware
OTHER	

ATD 324: POST-TEST INSPECTION**5th Female Inspection Checklist**

Date: 1/26/2016	
NHTSA Representative: Tim Keon	
Inspection Reporter: Matt Goehle	
Inspection type (check one): ☐ Pre-Test ☒ Post-Test	
Dummy S/N: 324	
Dummy Description: Hybrid 3 – 5th Female	
Date of last Certification: 1/18/2016	
<u>Tests conducted since last inspection:</u> M20165212 - 2016 Nissan Rogue	<u>Since last certification:</u> M20165212 - 2016 Nissan Rogue
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> RibEye Right Rib 06 Displacement X, Interference by Chest Pot or Abdominal Insert, SN: 108 RibEye Right Rib 06 Displacement Y, Interference by Chest Pot or Abdominal Insert, SN: 108	
<u>Physical evidence of damage:</u> None New	
<u>Anecdotal evidence of damage:</u> None	
<u>Equipment delivered to Borrower:</u> Hybrid 3 5th Female 1 RibEye rib displacement system 1 RibEye trunk box 1 RibEye power cable 1 RibEye trigger cable 1 Ethernet cable 1 RibEye software and manual disk 9 Accelerometers 1 Upper neck load cell 2 ASIS load cells 2 Femur load cells	

Note: New Damage is Noted in Red

HEAD	
Y / N	Ballast secure
Y / N	General appearance Minor cuts and scuffing
	
OTHER	
NECK	
Y / N	Rubber is not cracked or broken
Y / N	Upper neck bracket is firmly attached to the lower neck bracket
Y / N	The condyle joint is tight
Y / N	Nodding blocks are not cracked, broken, or out of position
OTHER	
SPINE/PELVIS	
Y / N	Rubber is not cracked or broken
Y / N	Pelvis is not broken or damaged
OTHER	
THORAX/ABDOMEN	
Y / N	Ribs are intact and straight
Y / N	Rib supports are intact and straight
Y / N	Rib damping material not separated or cracked
Y / N	Rubber bumpers in place
Y / N	Abdomen is not deformed
Y / N	Abdomen is not cracked or broken
OTHER	
KNEES	
Y / N	Skin is not torn
Y / N	Inserts are in good condition and the proper position
Y / N	Slider wires are intact
Y / N	Slider rubber returns to “at rest” position
OTHER	
LIMBS	
Y / N	Arms have normal movement and adjustment
Y / N	Arm flesh is in good condition
Y / N	Legs have normal movement and adjustment
Y / N	Leg flesh is in good condition Small cuts at top of tibia flesh:
	
Y / N	Feet are in good condition
OTHER	

INSTRUMENTATION	
Y / N	Chest pot shaft is straight
Y / N	Slider arm is riding in track
Y / N	RibEye system (if equipped) has no physically broken wires or equipment
Y / N	Transducer cables are not torn or exposing shield
Y / N	Accelerometer mounts are all secure
Y / N	LEMO connectors are straight and securely fit into acquisition hardware
OTHER	

ATD 019: PRE-TEST INSPECTION

5th Female Inspection Checklist

Date: 1/18/2016	
NHTSA Representative: Tim Keon	
Inspection Reporter: Mary Geesey	
Inspection type (check one): ☒ Pre-Test ☐ Post-Test	
Dummy S/N: 019	
Dummy Description: Hybrid 3 – 5th Female	
Date of last Certification: 1/5/2016	
Tests conducted since last inspection: M20160118 - Chevrolet Tahoe	Since last certification: M20165306 - 2016 Honda Fit M20160113 – 2016 Chevrolet Malibu M20160118 - Chevrolet Tahoe
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> • 16RIBS01LEHFDSXP,RibEye Left Rib 01 Displacement X, Questionable data 76.7ms to 100ms • 16RIBS01LEHFDSYP,RibEye Left Rib 01 Displacement Y, Questionable data 76.7ms to 100ms • 16RIBS05RIHFDSXP,RibEye Right Rib 05 Displacement X, Interference by Chest Pot and Abdominal Insert • 16RIBS05RIHFDSYP,RibEye Right Rib 05 Displacement Y, Interference by Chest Pot and Abdominal Insert • 16RIBS06RIHFDSXP,RibEye Right Rib 06 Displacement X, Interference by Chest Pot and Abdominal Insert • 16RIBS06RIHFDSYP,RibEye Right Rib 06 Displacement Y, Interference by Chest Pot and Abdominal Insert	
<u>Physical evidence of damage:</u> None New	
<u>Anecdotal evidence of damage:</u> None	
<u>Equipment delivered to Borrower:</u> Hybrid 3 5th Female 1 RibEye rib displacement system 1 RibEye trunk box 1 RibEye power cable 1 RibEye trigger cable 1 Ethernet cable 1 RibEye software and manual disk 9 Accelerometers 1 Upper neck load cell 2 ASIS load cells 2 Femur load cells	

Note: New Damage is Noted in Red

HEAD	
Y / N	Ballast secure
Y / N	General appearance Minor scuffing
OTHER	
NECK	
Y / N	Rubber is not cracked or broken Minor scuffing
Y / N	Upper neck bracket is firmly attached to the lower neck bracket
Y / N	The condyle joint is tight
Y / N	Nodding blocks are not cracked, broken, or out of position
OTHER	
SPINE/PELVIS	
Y / N	Rubber is not cracked or broken
Y / N	Pelvis is not broken or damaged
OTHER	
THORAX/ABDOMEN	
Y / N	Ribs are intact and straight
Y / N	Rib supports are intact and straight
Y / N	Rib damping material not separated or cracked
Y / N	Rubber bumpers in place
Y / N	Abdomen is not deformed
Y / N	Abdomen is not cracked or broken
OTHER	
KNEES	
Y / N	Skin is not torn
Y / N	Inserts are in good condition and the proper position
Y / N	Slider wires are intact
Y / N	Slider rubber returns to “at rest” position
OTHER	
LIMBS	
Y / N	Arms have normal movement and adjustment
Y / N	Arm flesh is in good condition
Y / N	Legs have normal movement and adjustment
Y / N	Leg flesh is in good condition Right tibia flesh has minor cut at bottom front
	
Y / N	Feet are in good condition
OTHER	
INSTRUMENTATION	
Y / N	Chest pot shaft is straight
Y / N	Slider arm is riding in track
Y / N	RibEye system (if equipped) has no physically broken wires or equipment
Y / N	Transducer cables are not torn or exposing shield
Y / N	Accelerometer mounts are all secure
Y / N	LEMO connectors are straight and securely fit into acquisition hardware
OTHER	

ATD 019: POST-TEST INSPECTION**5th Female Inspection Checklist**

Date: 1/26/2016	
NHTSA Representative: Tim Keon	
Inspection Reporter: Matt Goehle	
Inspection type (check one): ☐ Pre-Test ☒ Post-Test	
Dummy S/N: 019	
Dummy Description: Hybrid 3 – 5th Female	
Date of last Certification: 1/18/2016	
<u>Tests conducted since last inspection:</u> M20165212 - 2016 Nissan Rogue	<u>Since last certification:</u> M20165212 - 2016 Nissan Rogue
<u>Known errors in data channels (no data, clipping, unexpected drops):</u> Left Femur Z Force, Questionable spikes 46ms, 49.5ms, 76ms, SN:LC-1396 Fz RibEye Left Rib 01 Displacement X and Y, Questionable data 64.8ms to 116ms, SN: 107 RibEye Left Rib 05 Displacement X and Y, Interference by Chest Pot or Abdominal Insert, SN: 107 RibEye Left Rib 06 Displacement X and Y, Interference by Chest Pot or Abdominal Insert, SN: 107 RibEye Right Rib 01 Displacement Y, Questionable spike at 212ms, SN: 107 RibEye Right Rib 03 Displacement X and Y, Questionable data 80.4ms to 82.7ms, SN: 107 RibEye Right Rib 04 Displacement X and Y, Questionable data 103ms to 108ms, SN: 107 RibEye Right Rib 05 Displacement X and Y, Interference by Chest Pot or Abdominal Insert, SN: 107 RibEye Right Rib 06 Displacement X and Y, Interference by Chest Pot or Abdominal Insert, SN: 107	
<u>Physical evidence of damage:</u> None New	
<u>Anecdotal evidence of damage:</u> None	
<u>Equipment delivered to Borrower:</u> Hybrid 3 5th Female 1 RibEye rib displacement system 1 RibEye trunk box 1 RibEye power cable 1 RibEye trigger cable 1 Ethernet cable 1 RibEye software and manual disk 9 Accelerometers 1 Upper neck load cell 2 ASIS load cells 2 Femur load cells	

Note: New Damage is Noted in Red

HEAD	
Y / N	Ballast secure
Y / N	General appearance Minor scuffing
OTHER	
NECK	
Y / N	Rubber is not cracked or broken Minor scuffing
Y / N	Upper neck bracket is firmly attached to the lower neck bracket
Y / N	The condyle joint is tight
Y / N	Nodding blocks are not cracked, broken, or out of position
OTHER	
SPINE/PELVIS	
Y / N	Rubber is not cracked or broken
Y / N	Pelvis is not broken or damaged
OTHER	
THORAX/ABDOMEN	
Y / N	Ribs are intact and straight
Y / N	Rib supports are intact and straight
Y / N	Rib damping material not separated or cracked
Y / N	Rubber bumpers in place
Y / N	Abdomen is not deformed
Y / N	Abdomen is not cracked or broken
OTHER	
KNEES	
Y / N	Skin is not torn
Y / N	Inserts are in good condition and the proper position
Y / N	Slider wires are intact
Y / N	Slider rubber returns to “at rest” position
OTHER	
LIMBS	
Y / N	Arms have normal movement and adjustment
Y / N	Arm flesh is in good condition
Y / N	Legs have normal movement and adjustment
Y / N	Leg flesh is in good condition Right tibia flesh has minor cut at bottom front
	
Y / N	Feet are in good condition
OTHER	
INSTRUMENTATION	
Y / N	Chest pot shaft is straight
Y / N	Slider arm is riding in track
Y / N	RibEye system (if equipped) has no physically broken wires or equipment
Y / N	Transducer cables are not torn or exposing shield
Y / N	Accelerometer mounts are all secure
Y / N	LEMO connectors are straight and securely fit into acquisition hardware
OTHER	

Test Data/Sensor Repair Notes

DUMMY CALIBRATIONS

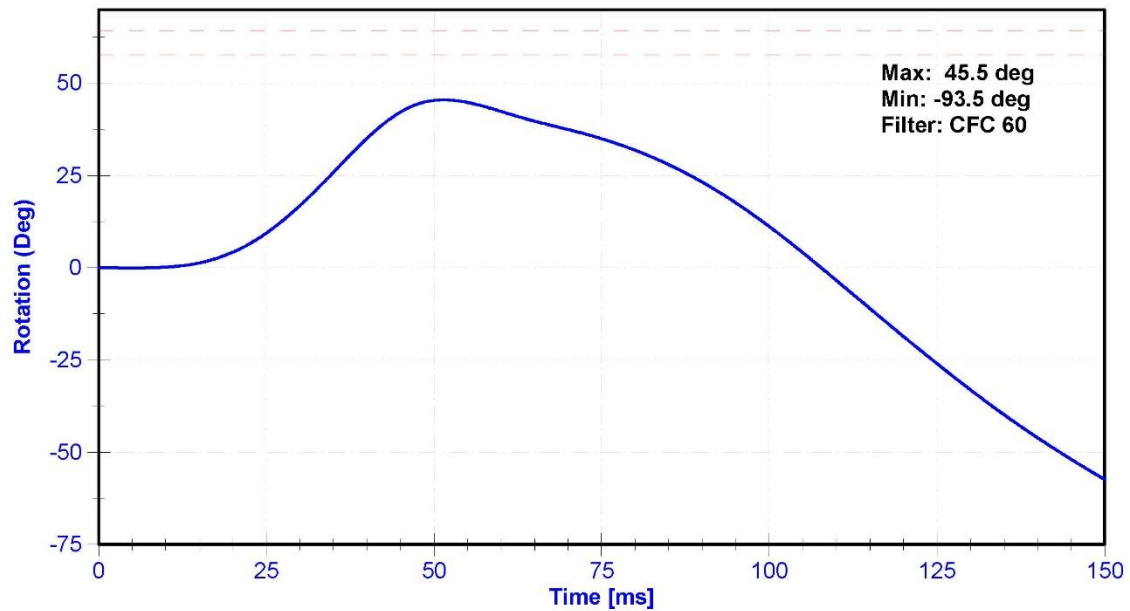
50% ADULT MALE THOR DL9207 DUMMY CALIBRATIONS



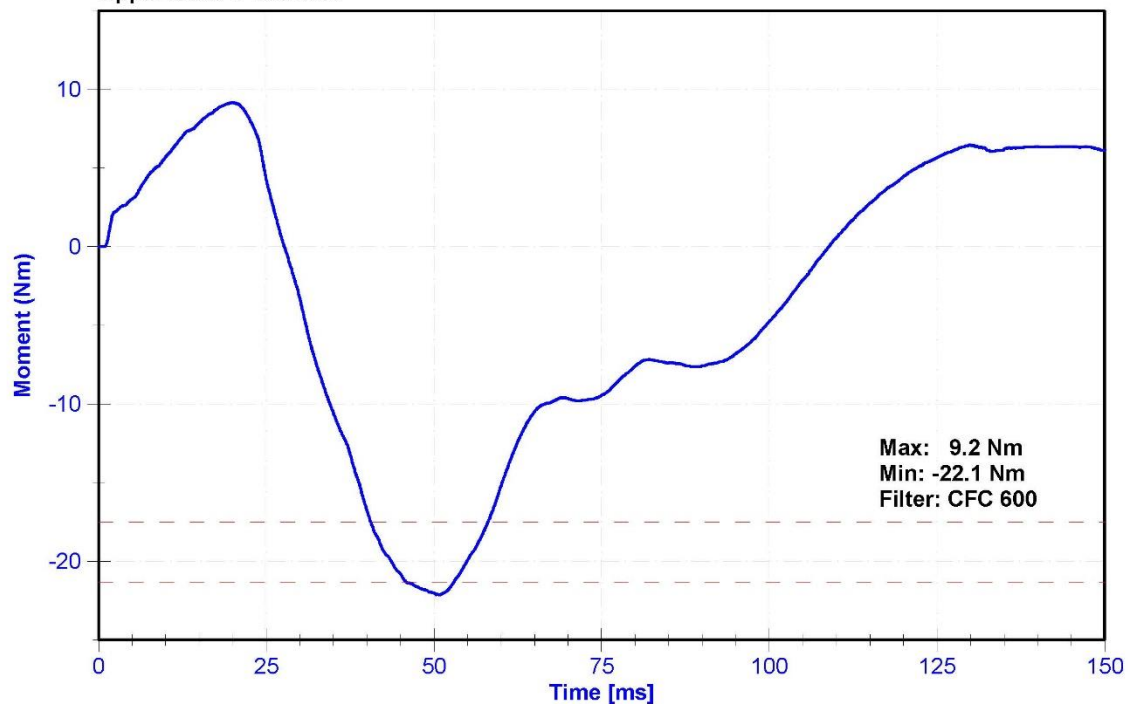
Certification Report
THOR-M 50th Male Neck Extension - NHTSA Oct 2015 Draft

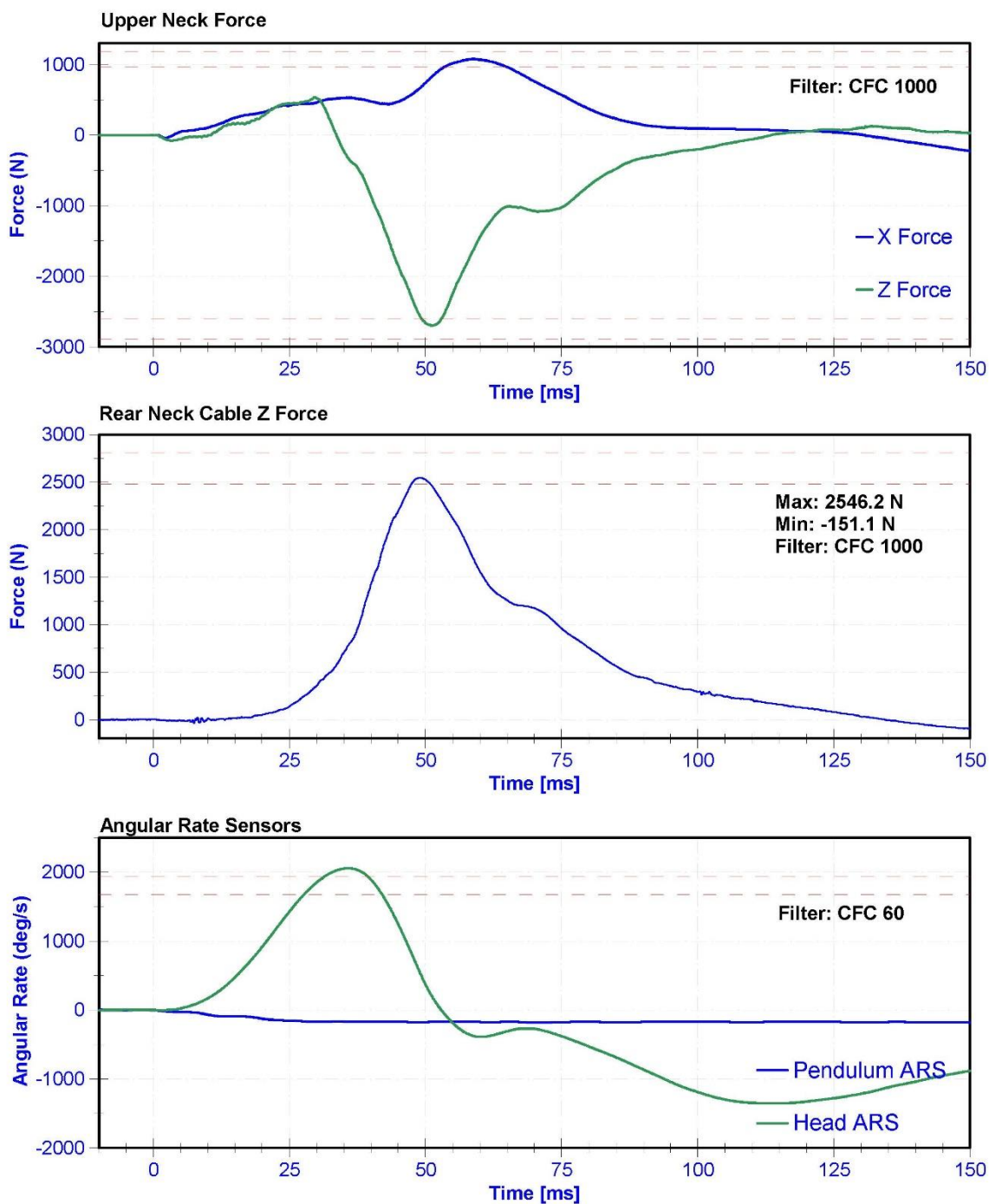
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Headform Rotation



Upper Neck Y Moment





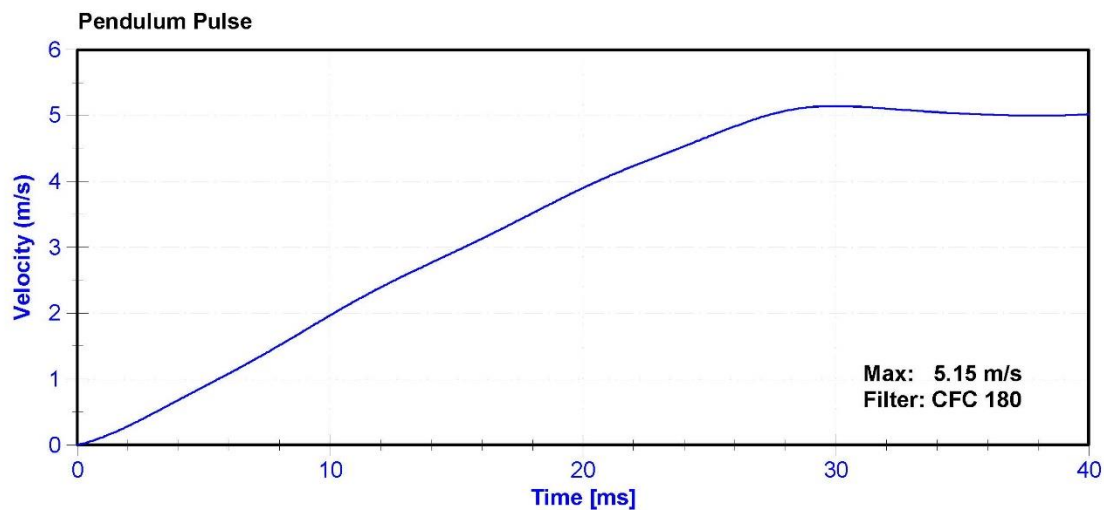
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

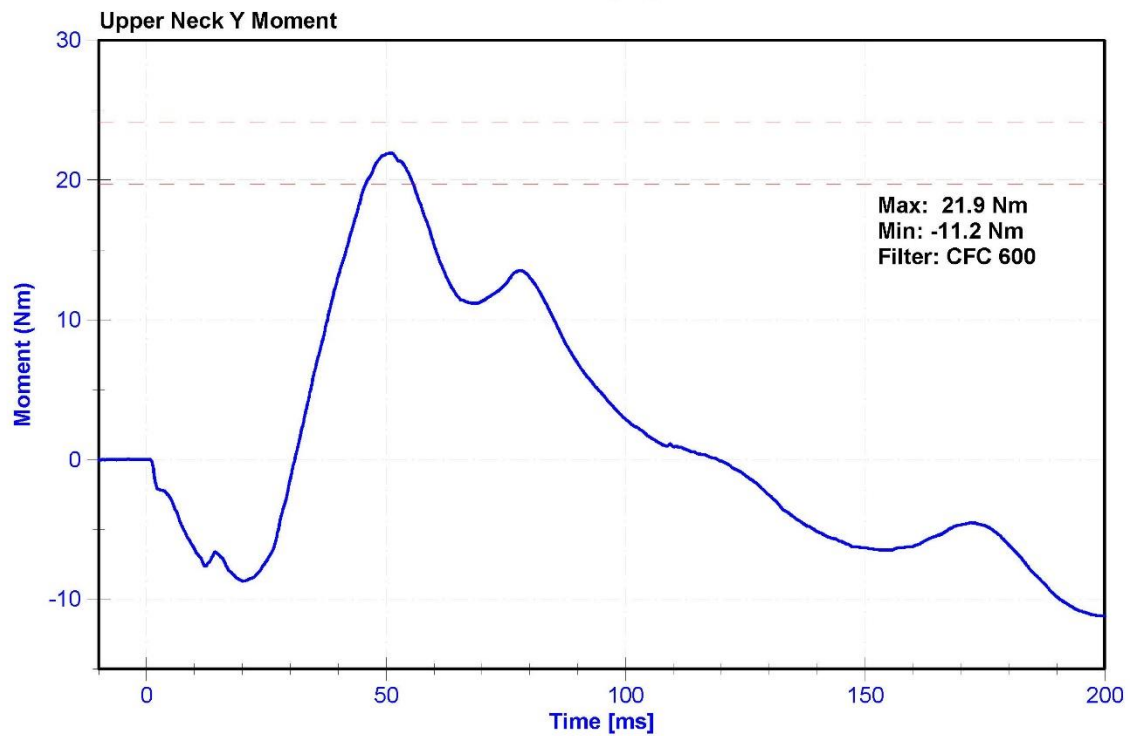
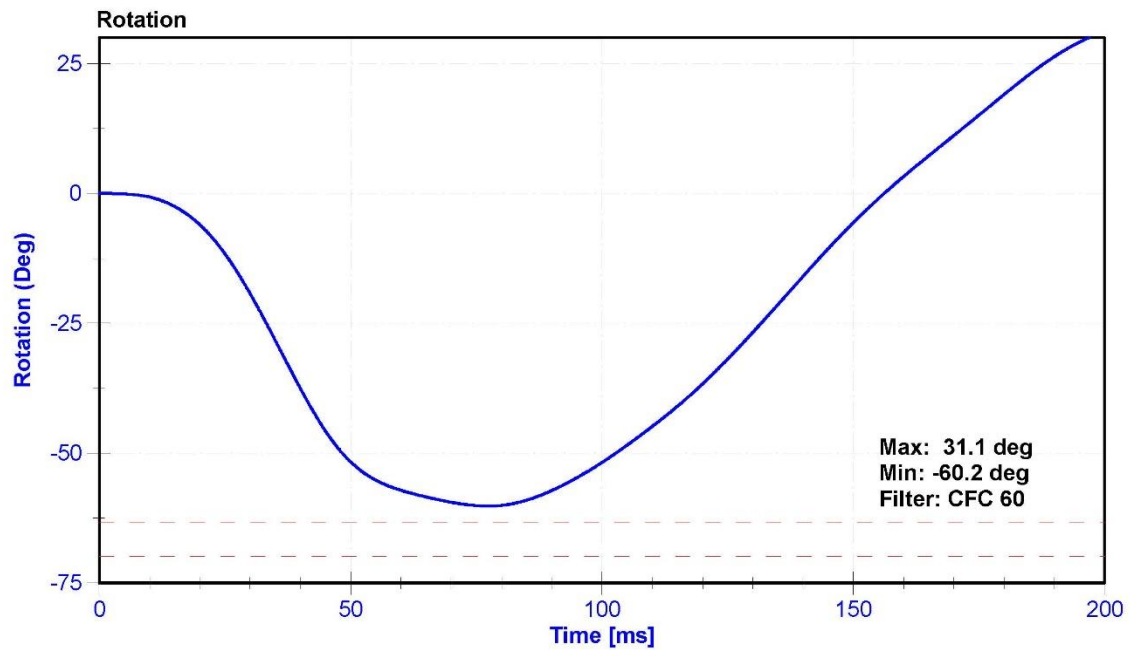
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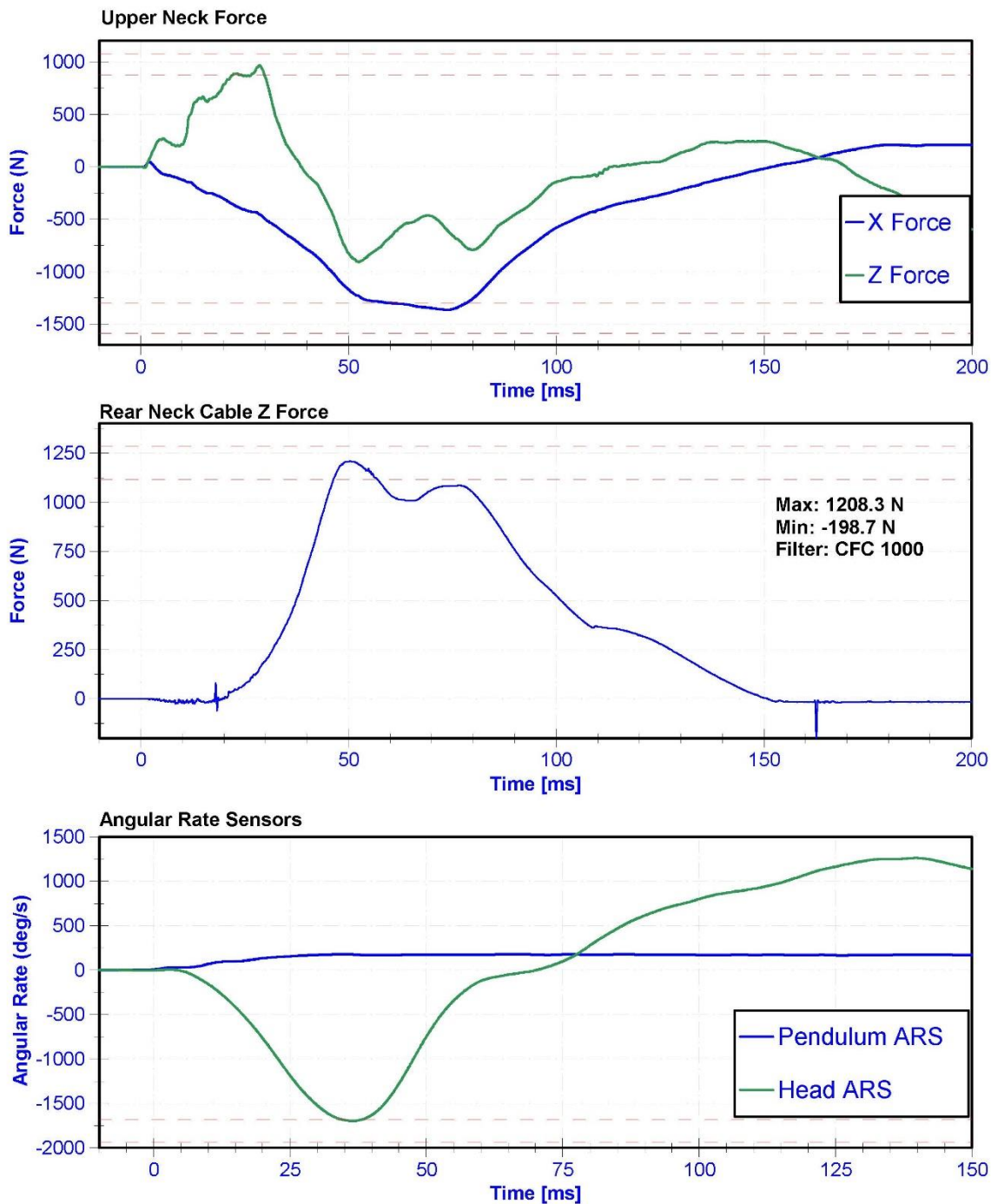
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	33.0	Pass
Velocity	4.95	5.05	m/s	4.985	Pass
Pendulum Impulse at 8ms	1.49	1.85	m/s	1.515	Pass
Pendulum Impulse at 16ms	3.08	3.86	m/s	3.134	Pass
Pendulum Impulse at 24ms	4.48	5.26	m/s	4.536	Pass
Peak Upper Neck Y Moment	19.7	24.1	Nm	21.94	Pass
Peak Upper Neck X Force	-1592	-1302	N	-1364.0	Pass
Maximum Upper Neck Z Force	877	1072	N	965.4	Pass
First Peak Rear Neck Cable Force	1115	1282	N	1208.3	Pass
Peak Head Y Angular Rate	-1935	-1675	deg/s	-1696.4	Pass
Peak Head Y Rotation	-69.9	-63.3	deg	-60.20	Fail
Rotation Decay Time to Zero	83.0	86.2	ms	78.70	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
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-9122	9/30/2015	9/29/2016
Head Y ARS	DTS ARS-18K	ARS-4737	3/30/2015	3/29/2016







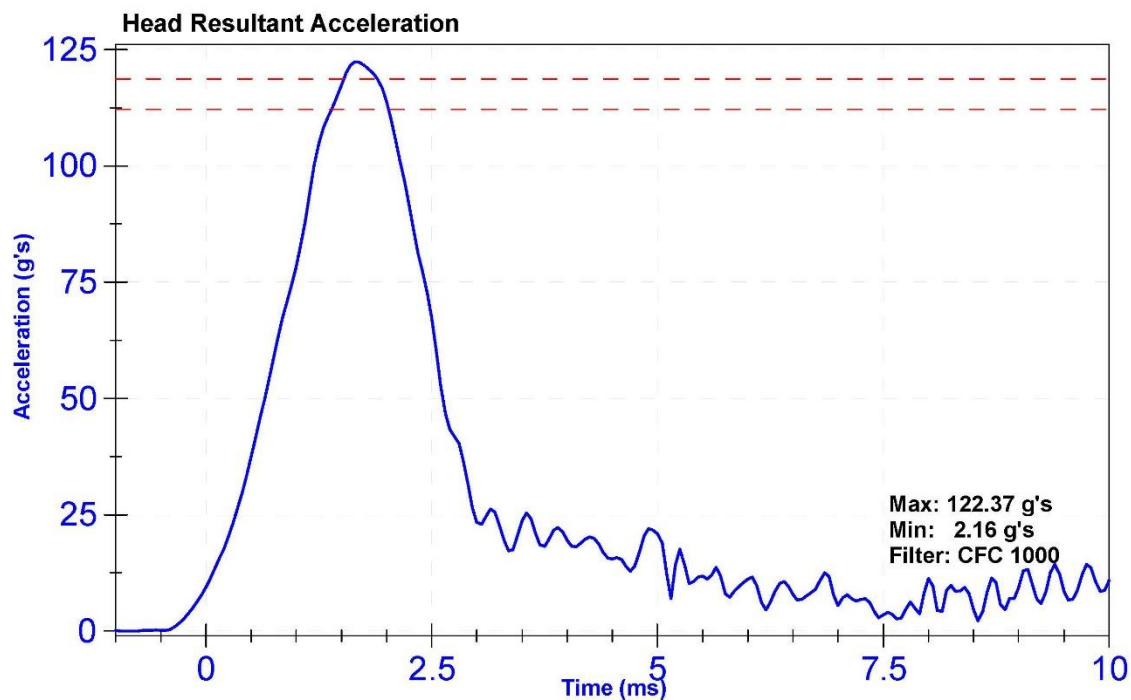
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

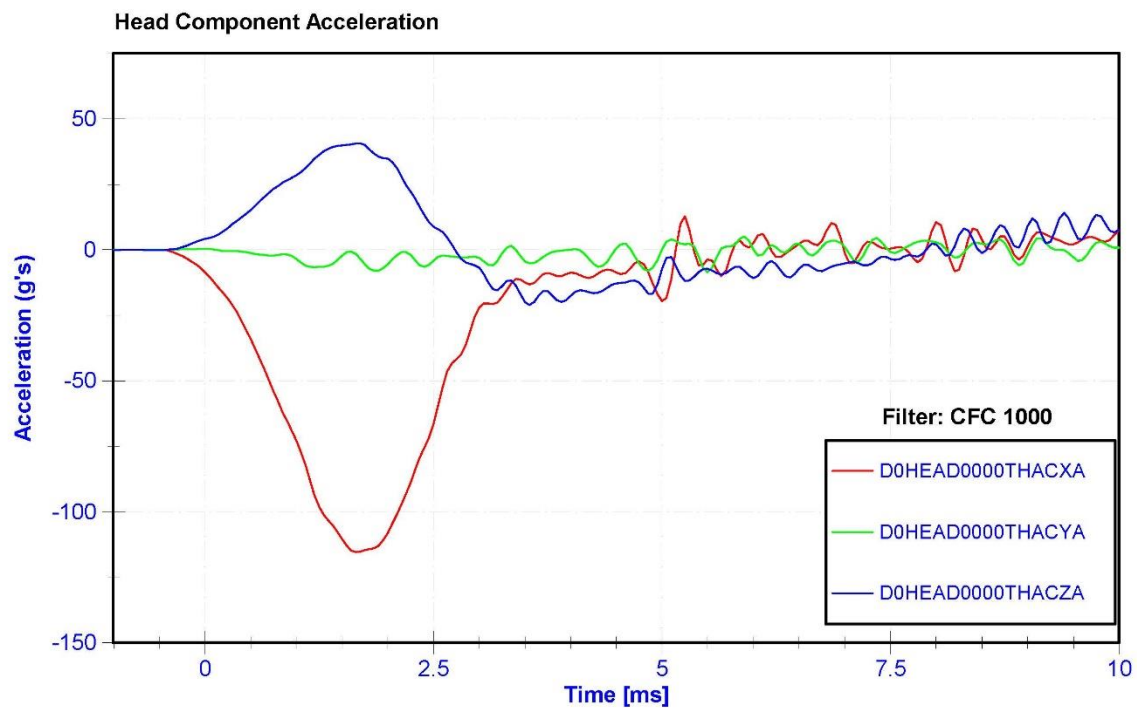
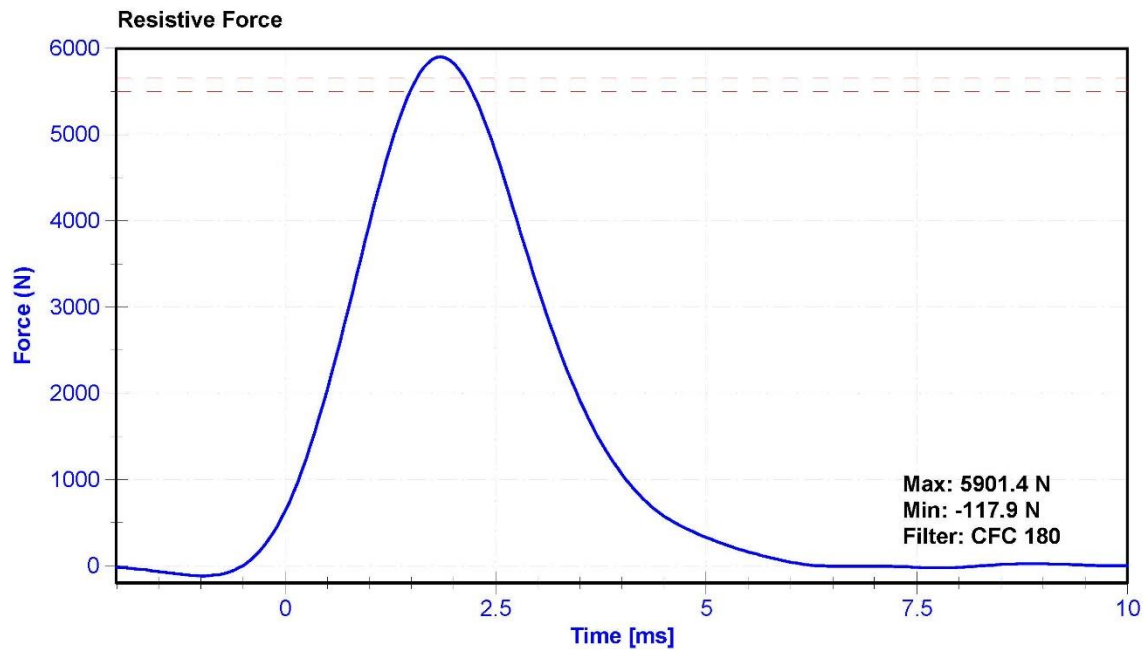
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	17.7	Pass
Impact Velocity	1.95	2.05	m/s	2.020	Pass
Probe Force	5498	5660	N	5901.4	Fail
Resultant Acceleration	112.2	118.7	g's	122.37	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-C15018	7/15/2015	7/14/2016





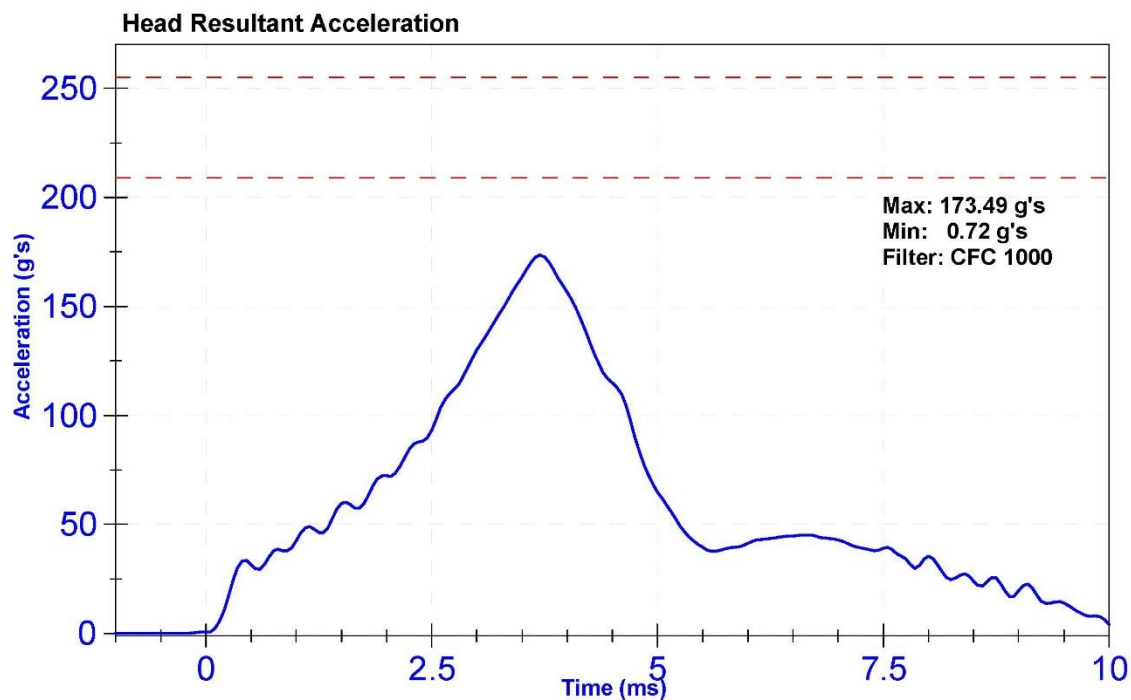
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

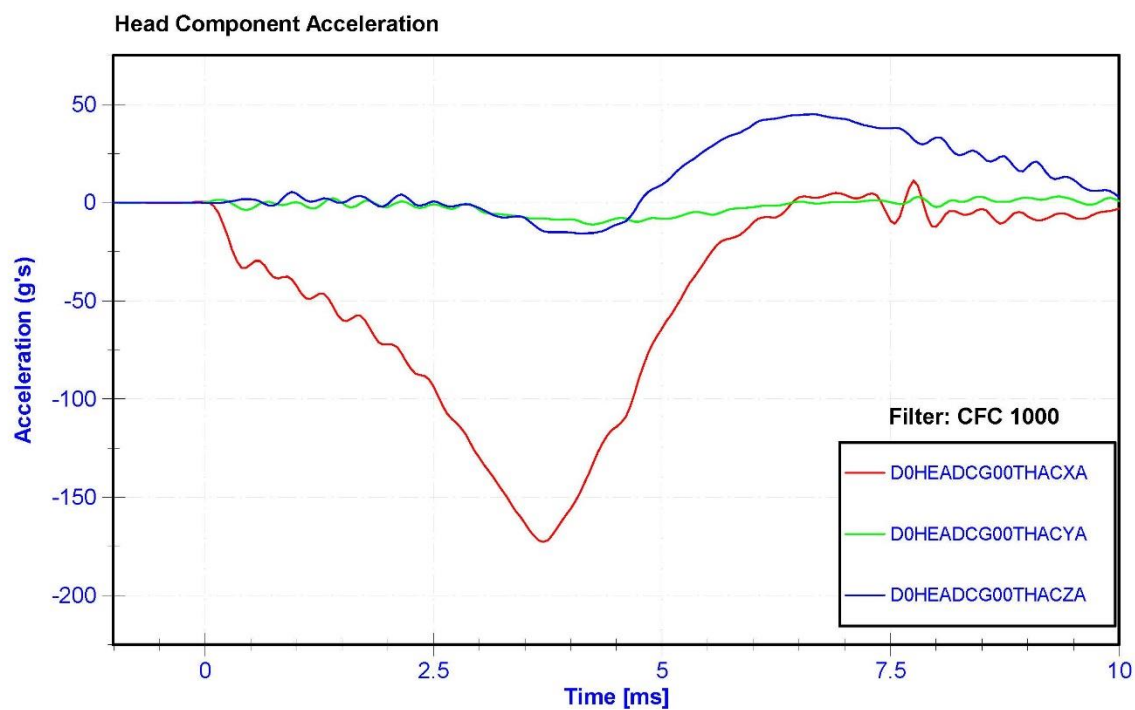
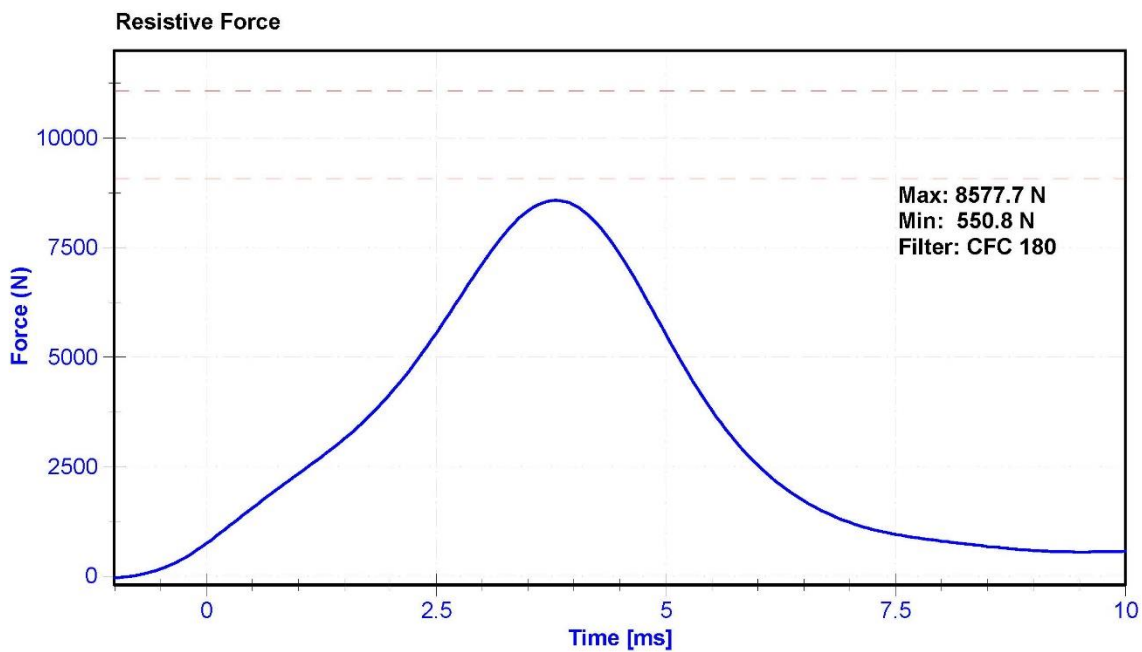
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	20.7	Pass
Impact Velocity	6.68	6.78	m/s	6.699	Pass
Probe Force	9067	11082	N	8577.7	Fail
Resultant Acceleration	209	255	g's	173.5	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-C15018	7/15/2015	7/14/2016





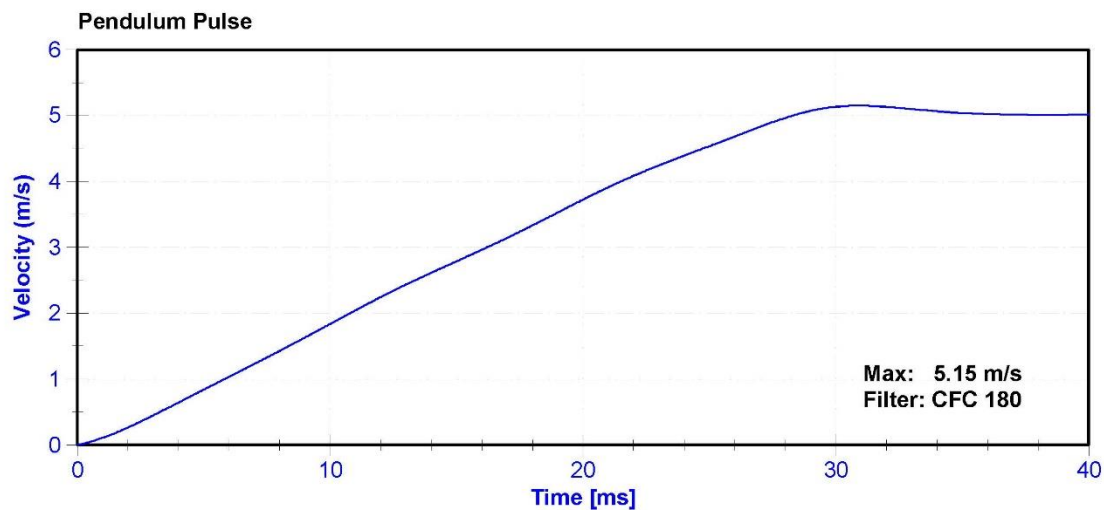
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	36.0	Pass
Velocity	4.95	5.05	m/s	4.985	Pass
Pendulum Impulse at 10ms	1.76	1.91	m/s	1.840	Pass
Pendulum Impulse at 20ms	3.50	3.75	m/s	3.727	Pass
Pendulum Impulse at 30ms	4.88	5.20	m/s	5.134	Pass
Peak Upper Neck Y Moment	-21.3	-17.5	Nm	-22.12	Fail
Peak Upper Neck X Force	967	1182	N	1078.0	Pass
Peak Upper Neck Z Force	-2893	-2603	N	-2701.5	Pass
Peak Front Neck Cable Force	2482	2809	N	2546.2	Pass
Peak Head Y Angular Rate	1907	2043	deg/s	2056.4	Fail
Peak Head Y Rotation	57.6	64.2	deg	45.50	Fail
Rotational Decay Time to Zero	79.3	82.5	ms	56.30	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Upper Neck Load Cell	Humanetics 10380JI4	LC-DP3956 Fx	3/5/2015	3/4/2016
Fr Neck Cable Load	Humanetics 10386JI4	LC-DO9740	3/6/2015	3/5/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Head ARS Y-Axis	DTS ARS-18K	ARS-4737	3/30/2015	3/29/2016



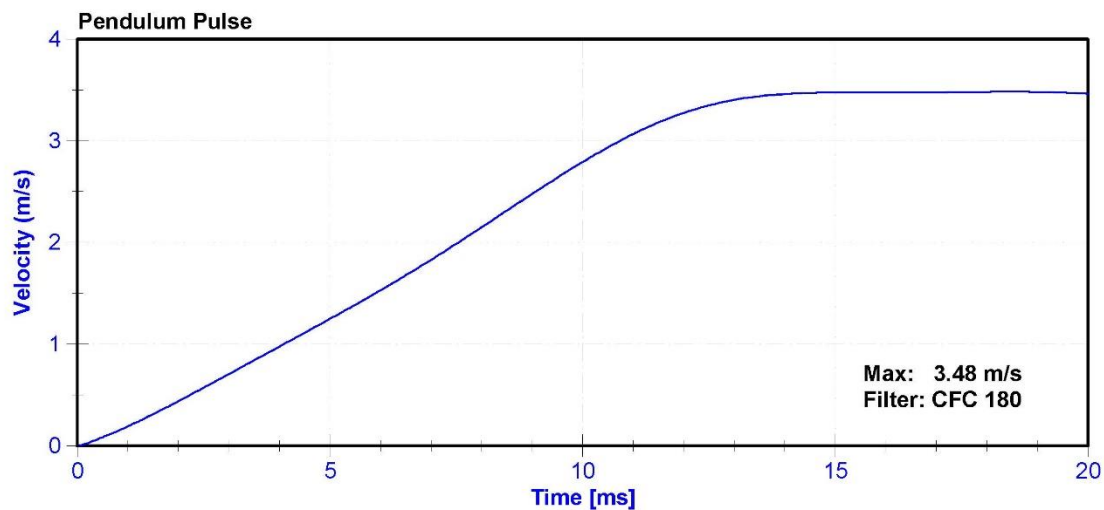
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

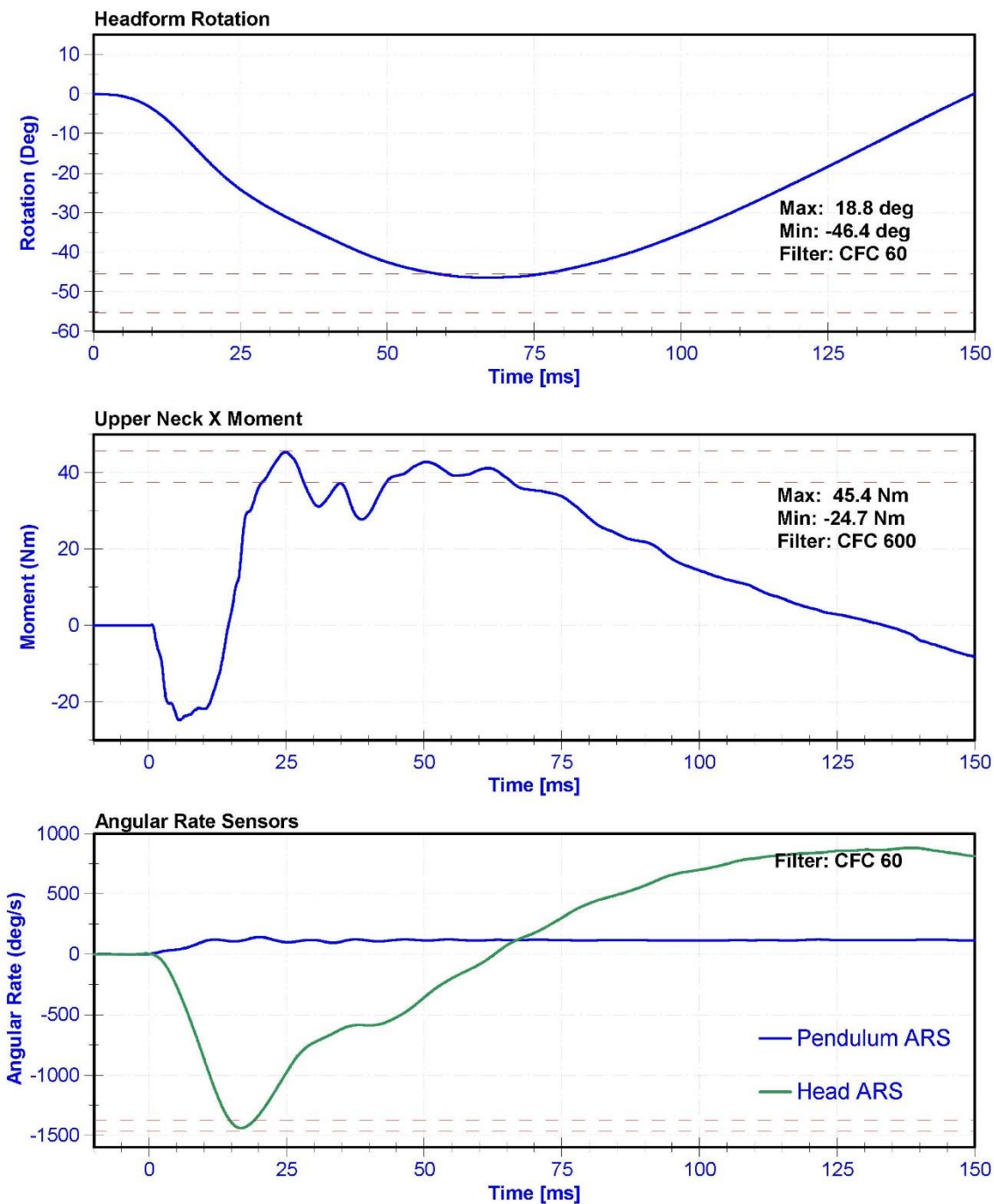
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	35.5	Pass
Velocity	3.35	3.45	m/s	3.418	Pass
Pendulum Impulse at 4ms	0.89	1.08	m/s	0.977	Pass
Pendulum Impulse at 8ms	2.04	2.36	m/s	2.150	Pass
Pendulum Impulse at 12ms	3.21	3.46	m/s	3.273	Pass
Peak Upper Neck X Moment after 40ms	37.4	45.7	Nm	42.80	Pass
Peak Head X Angular Rate	-1462	-1375	deg/s	-1440.0	Pass
Peak Head X Rotation	-55.3	-45.4	deg	-46.41	Pass
Rotational Decay Time to Zero	83.7	90.9	ms	82.95	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Upper Neck Load Cell	Humanetics 10380J14	LC-DP3956 Mx	3/5/2015	3/4/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Head X ARS	DTS ARS-18K	ARS-4740	3/30/2015	3/29/2016





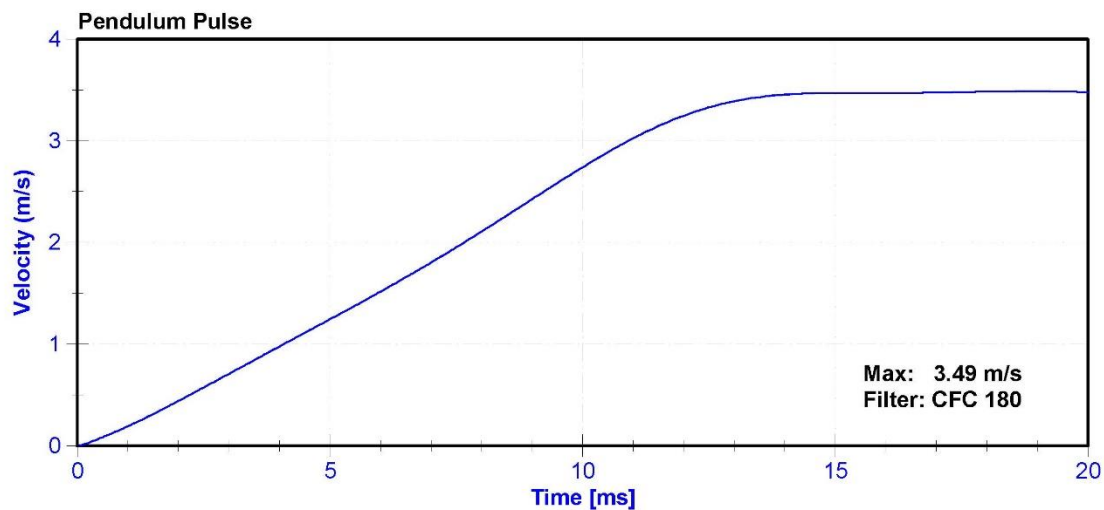
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

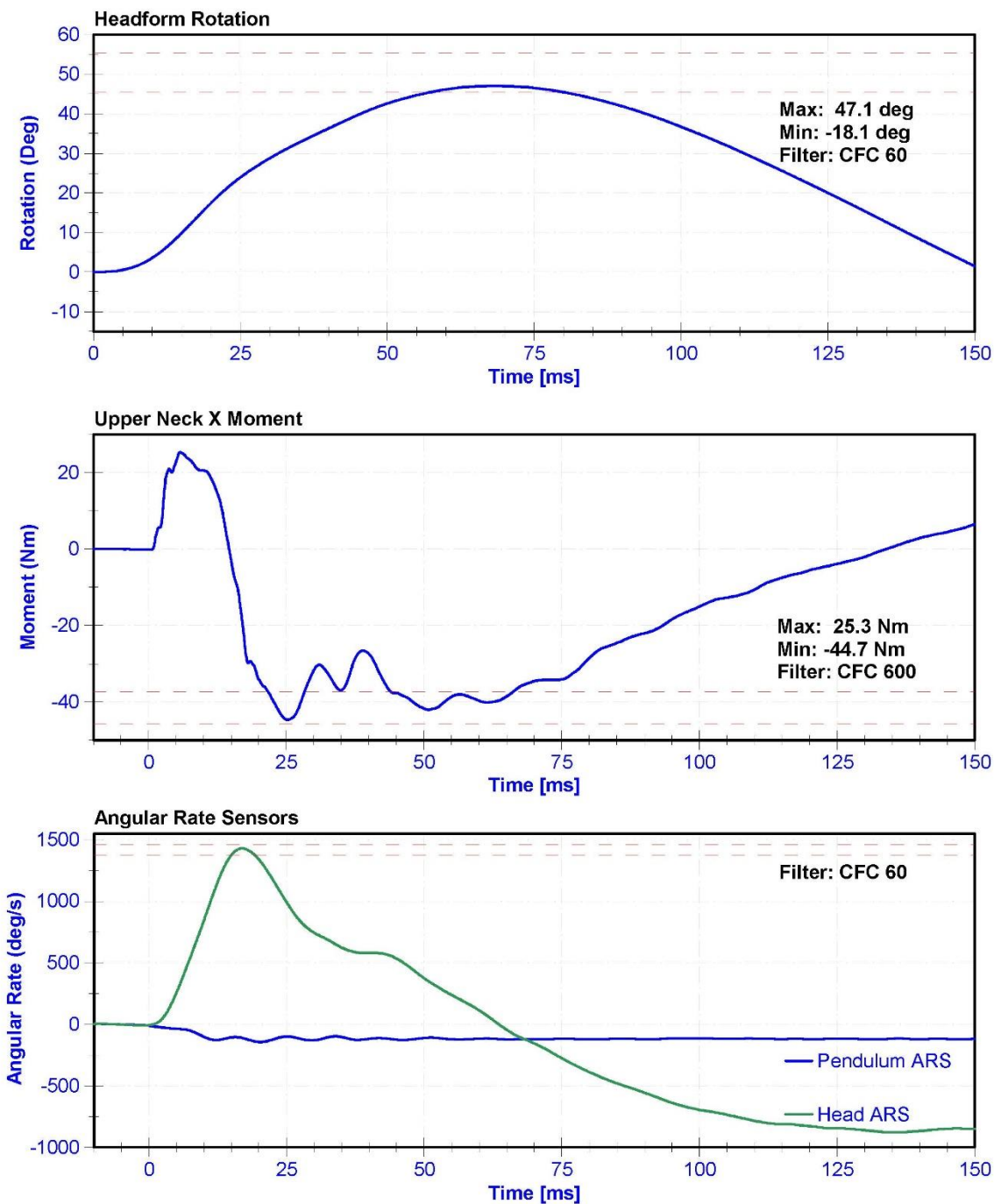
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	34.3	Pass
Velocity	3.35	3.45	m/s	3.42	Pass
Pendulum Impulse at 4ms	0.89	1.08	m/s	0.977	Pass
Pendulum Impulse at 8ms	2.04	2.36	m/s	2.107	Pass
Pendulum Impulse at 12ms	3.21	3.46	m/s	3.246	Pass
Peak Upper Neck X Moment after 40ms	-45.7	-37.4	Nm	-42.03	Pass
Peak Head X Angular Rate	1375	1462	deg/s	1430.3	Pass
Peak Head X Rotation	45.4	55.3	deg	47.06	Pass
Rotation Decay Time to Zero	83.7	90.9	ms	83.85	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Upper Neck Load Cell	Humanetics 10380J14	LC-DP3956 Mx	3/5/2015	3/4/2016
Pendulum ARS	DTS ARS PRO-18K	ARS-9122	9/30/2015	9/29/2016
Head X ARS	DTS ARS-18K	ARS-4740	3/30/2015	3/29/2016





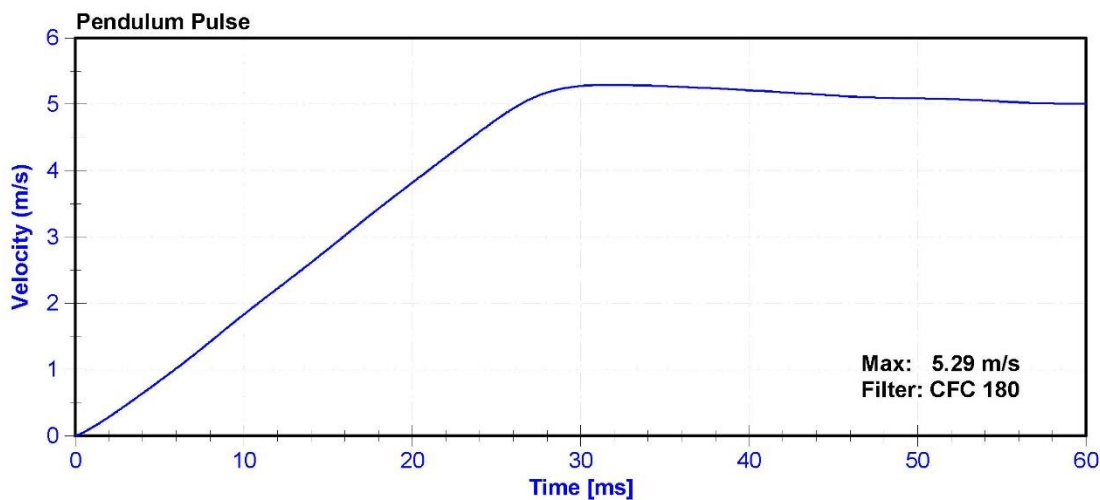
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

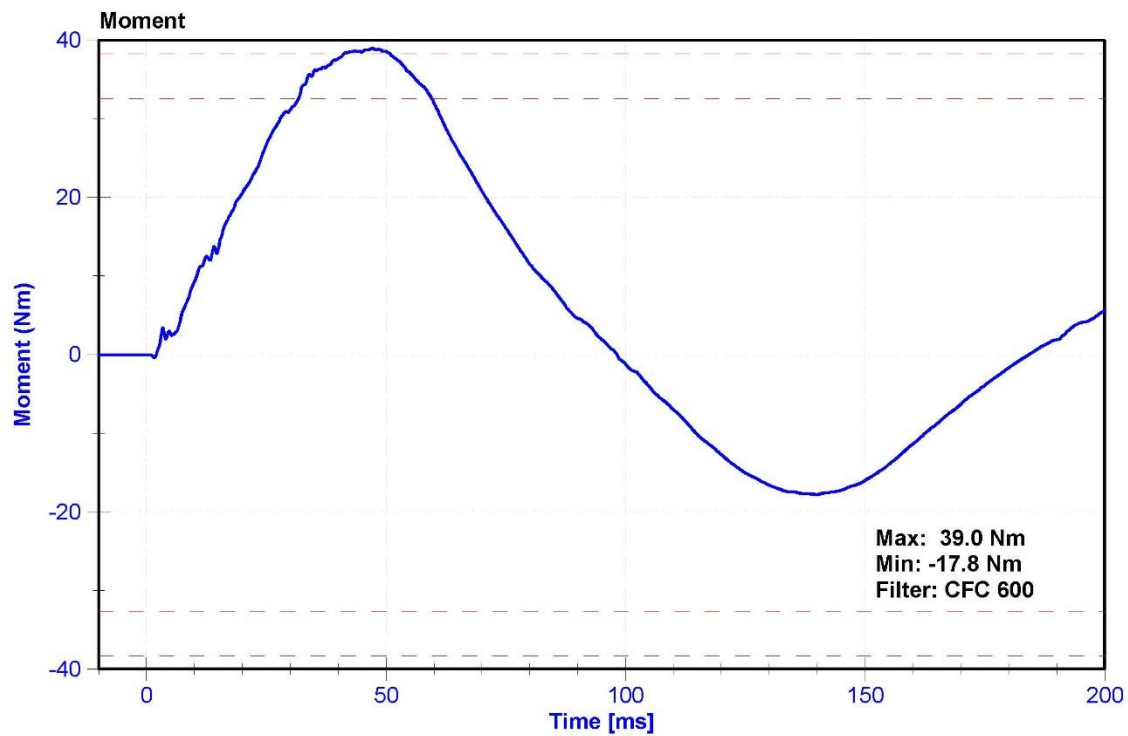
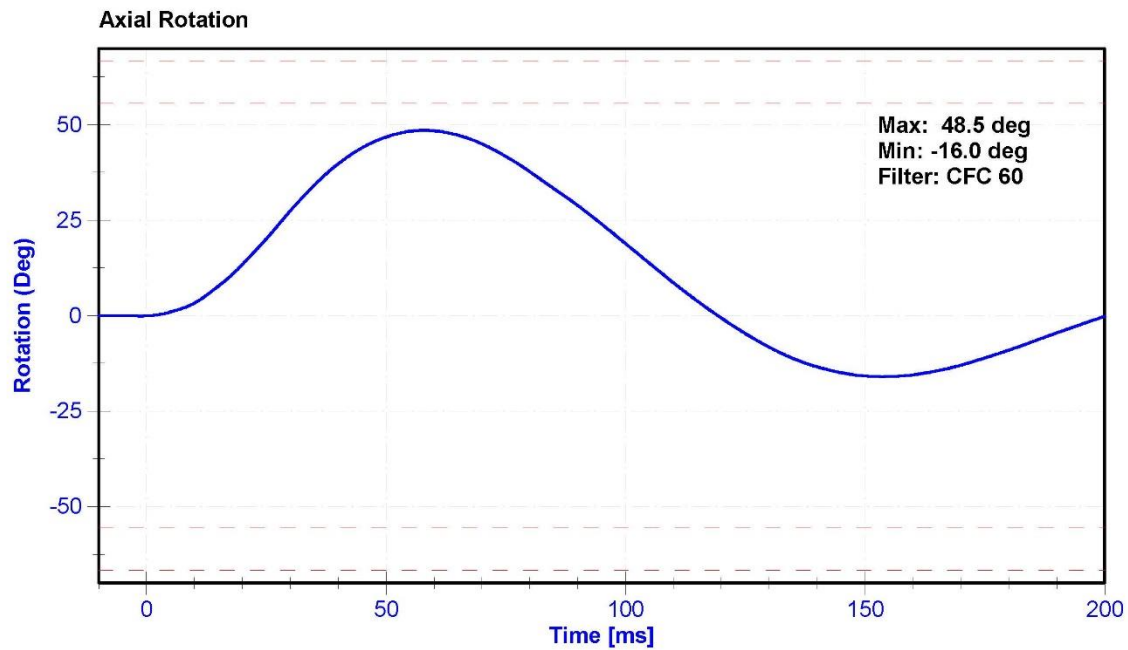
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	29.7	Pass
Velocity	4.95	5.05	m/s	5.04	Pass
Pendulum Impulse at 10ms	1.72	1.98	m/s	1.829	Pass
Pendulum Impulse at 15ms	2.67	2.97	m/s	2.816	Pass
Pendulum Impulse at 20ms	3.59	3.98	m/s	3.817	Pass
Pendulum Impulse at 25ms	4.43	4.92	m/s	4.769	Pass
Peak Upper Neck Z Moment	32.6	38.3	Nm	38.98	Fail
Peak Neck Axial Rotation	55.6	66.6	deg	48.54	Fail
Rotation Decay Time to Zero	58.0	61.6	ms	61.35	Pass
Peak Upper Neck Angular Velocity	1559	1709	deg/s	1576.78	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Neck Fixture Potentiometer	Servo 14CB1-3615	DS-0001	10/21/2015	10/20/2016
Upper Neck Load Cell	Humanetics 10380JI4	LC-DP3956 Mz	3/5/2015	3/4/2016
Upper Neck ARS	DTS ARS PRO-18K	ARS-9097	9/30/2015	9/29/2016





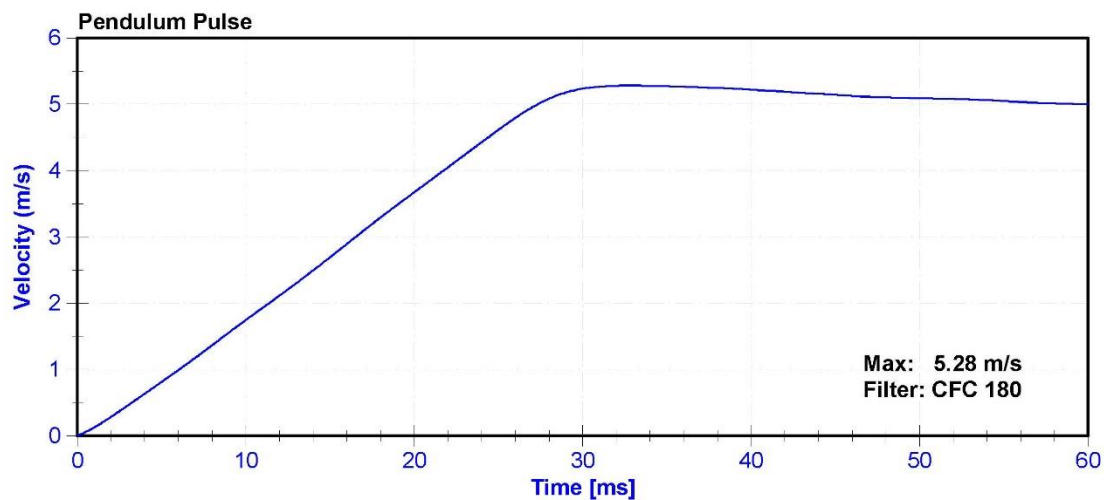
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

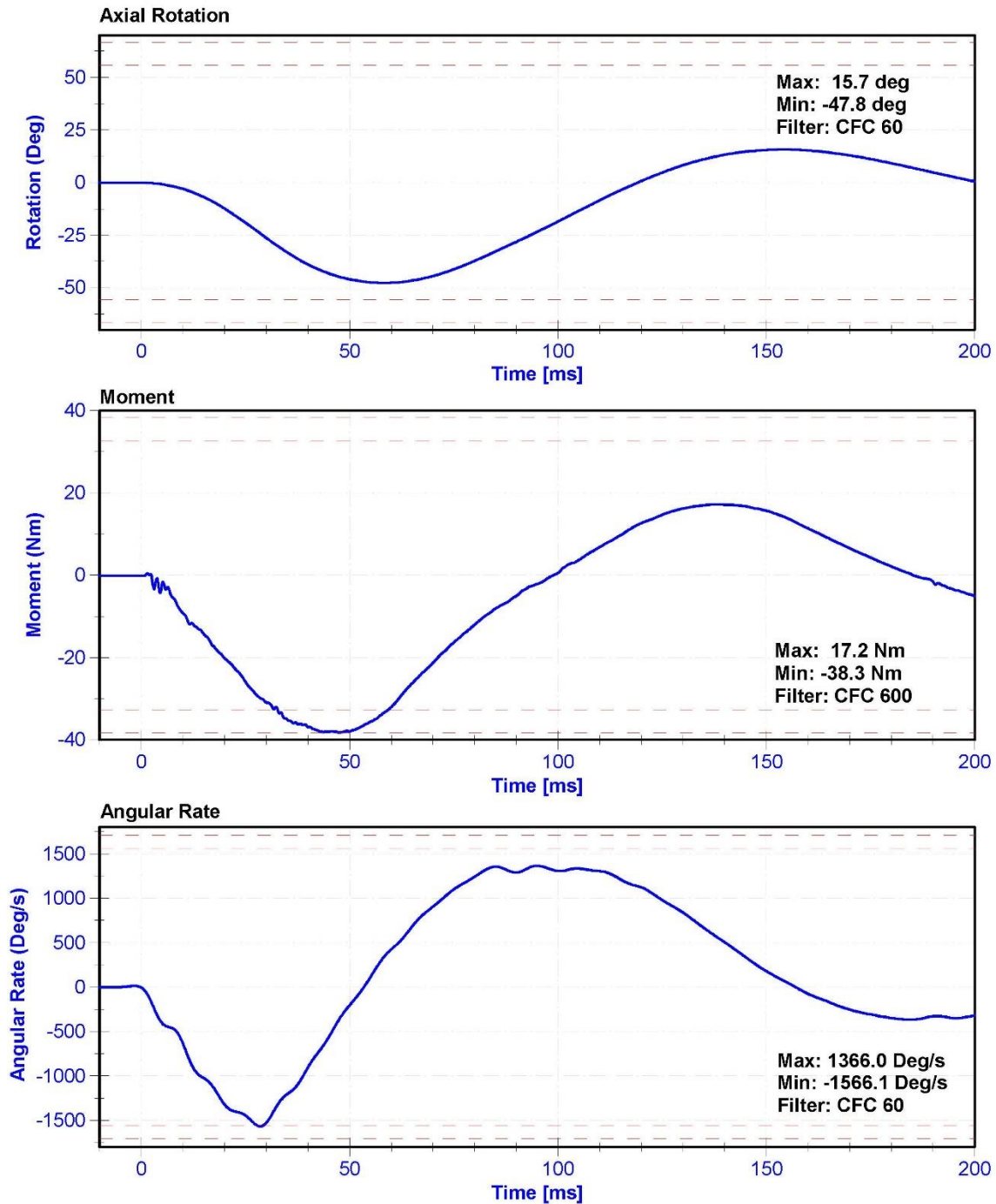
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	31.8	Pass
Velocity	4.95	5.05	m/s	5.045	Pass
Pendulum Impulse at 10ms	1.72	1.98	m/s	1.746	Pass
Pendulum Impulse at 15ms	2.67	2.97	m/s	2.693	Pass
Pendulum Impulse at 20ms	3.59	3.98	m/s	3.674	Pass
Pendulum Impulse at 25ms	4.43	4.92	m/s	4.615	Pass
Peak Upper Neck Z Moment	32.6	38.3	Nm	38.26	Pass
Peak Neck Axial Rotation	55.6	66.6	deg	47.76	Fail
Rotation Decay Time to Zero	58.0	61.6	ms	47.00	Fail
Peak Upper Neck Angular Velocity	1559	1709	deg/s	1566.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Neck Fixture Potentiometer	Servo 14CB1-3615	DS-0001	10/21/2015	10/20/2016
Upper Neck Load Cell	Humanetics 10380JI4	LC-DP3956 Mz	3/5/2015	3/4/2016
Upper Neck ARS	DTS ARS PRO-18K	ARS-9097	9/30/2015	9/29/2016





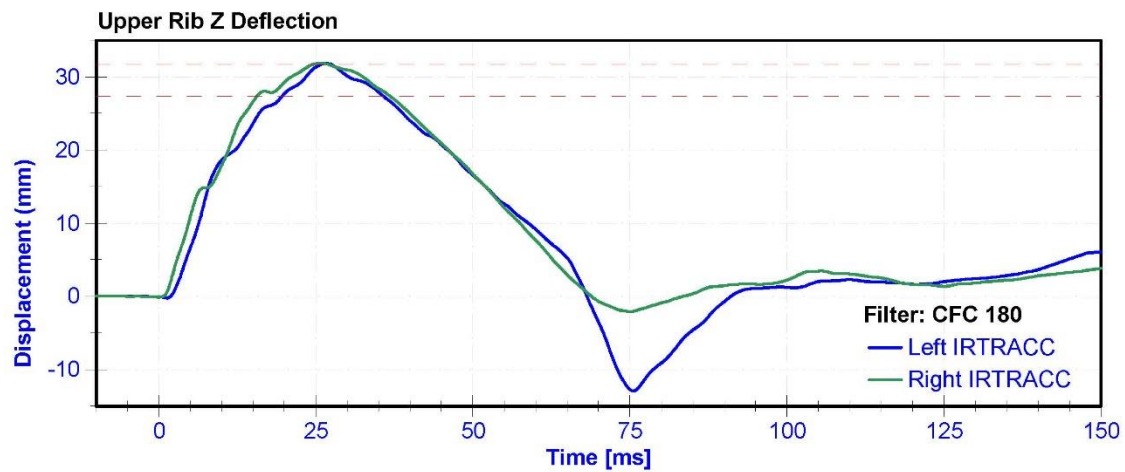
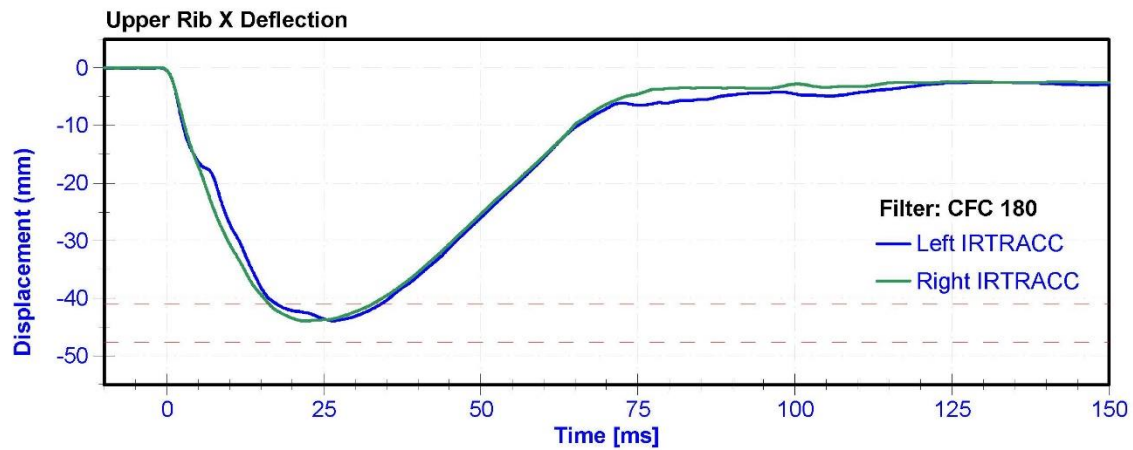
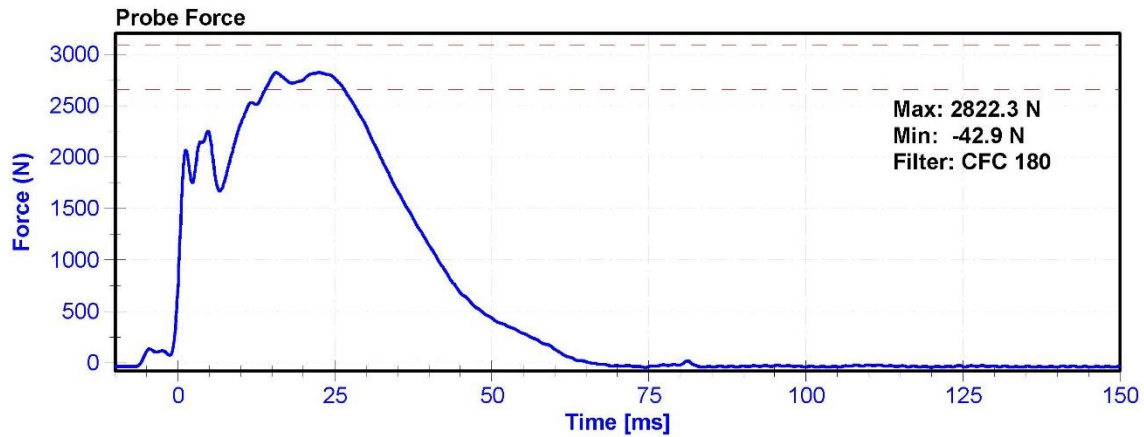
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

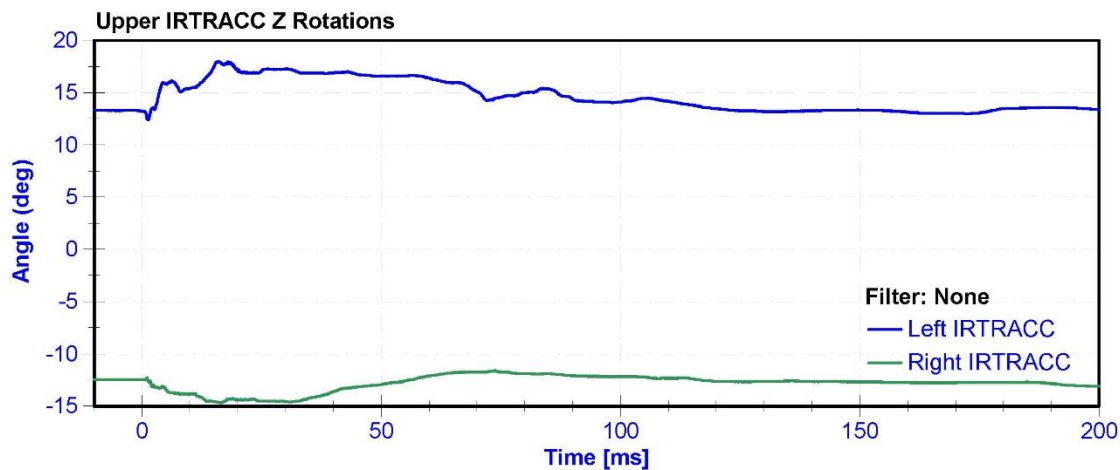
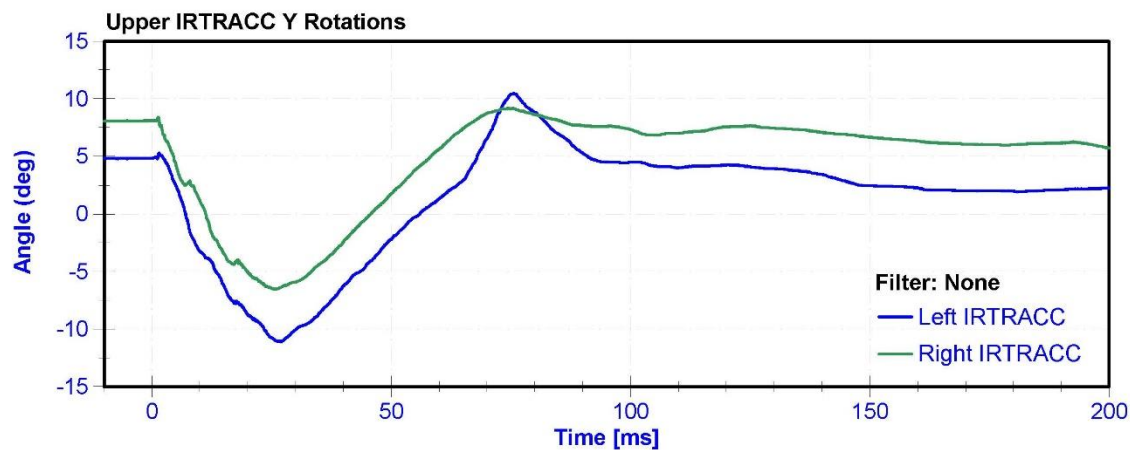
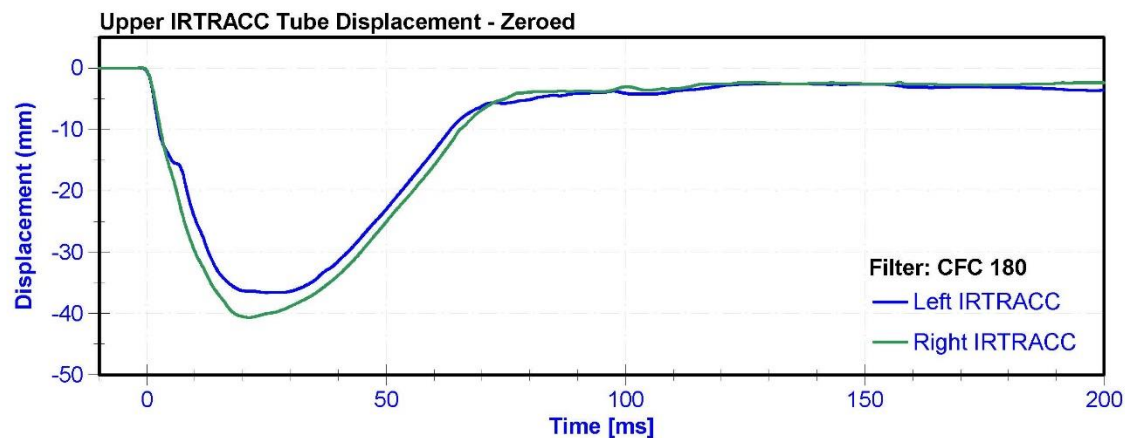
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.8	Pass
Humidity	10	70	%	30.8	Pass
Impact Velocity	4.25	4.35	m/s	4.323	Pass
Probe Force	2474	2850	N	2822.3	Pass
Upper Left X Rib Deflection	-47.6	-41.0	mm	-43.87	Pass
Upper Right X Rib Deflection	-47.6	-41.0	mm	-43.90	Pass
Left/Right X Rib Deviation	-7.00	7.00	mm	0.033	Pass
Upper Left Z Rib Deflection	27.3	31.7	mm	31.86	Fail
Upper Right Z Rib Deflection	27.3	31.7	mm	31.90	Fail
Left/Right Z Rib Deviation	-7.00	7.00	mm	-0.031	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Upper Left IRTRACC	Humanetics IF-364-C-R3	DS-DS6355	11/10/2015	11/9/2016
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





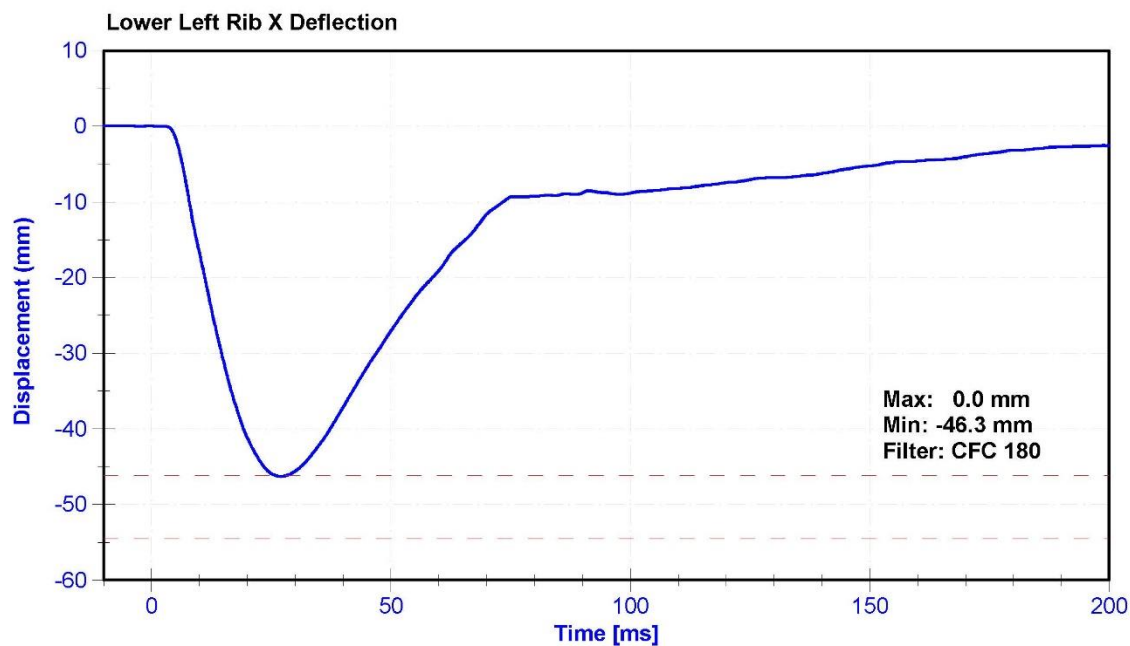
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

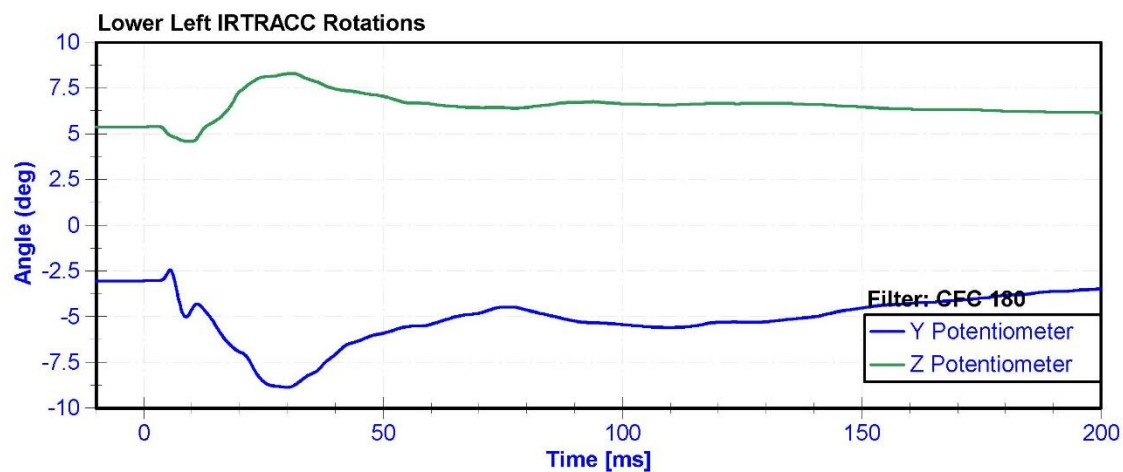
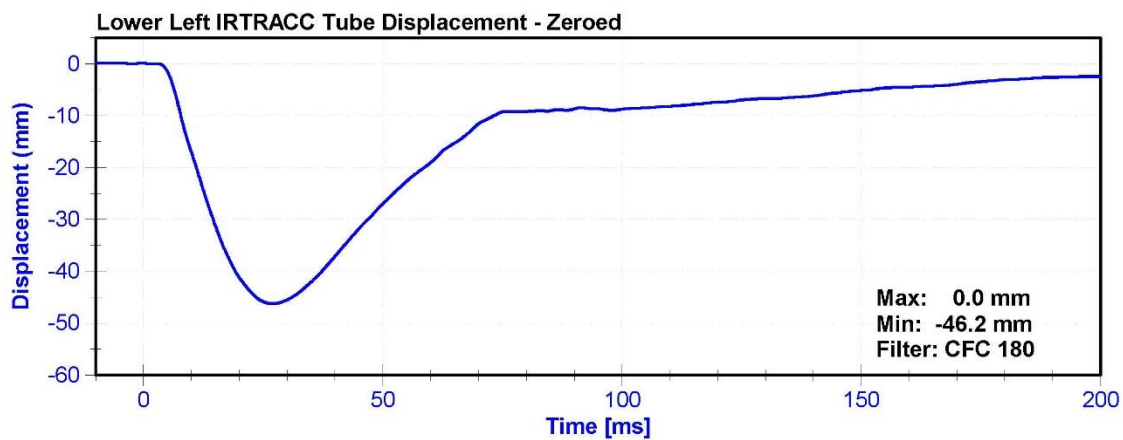
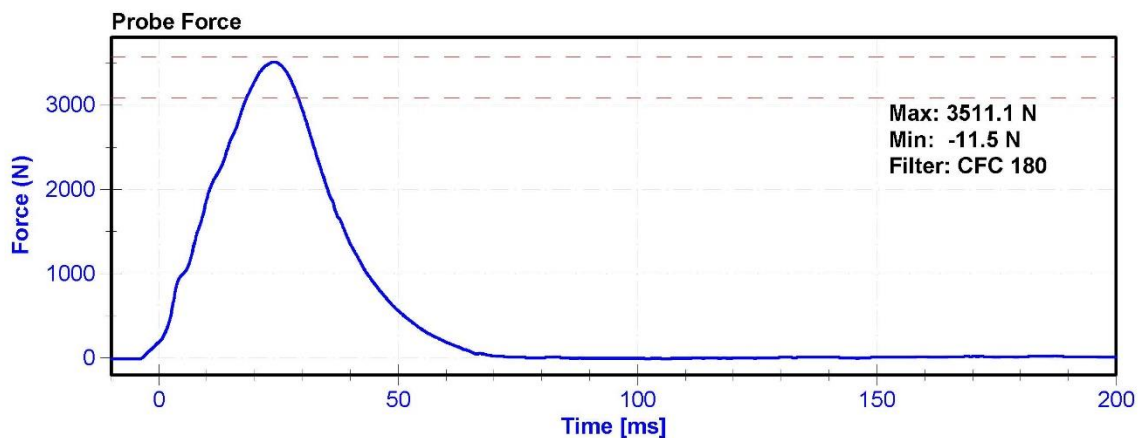
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	17.4	Pass
Impact Velocity	4.25	4.35	m/s	4.311	Pass
Peak Left X Rib Deflection	-54.5	-46.2	mm	-46.28	Pass
Probe Force during Peak Deflection	3083	3571	N	3511.1	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-DS6353	11/10/2015	11/9/2016
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





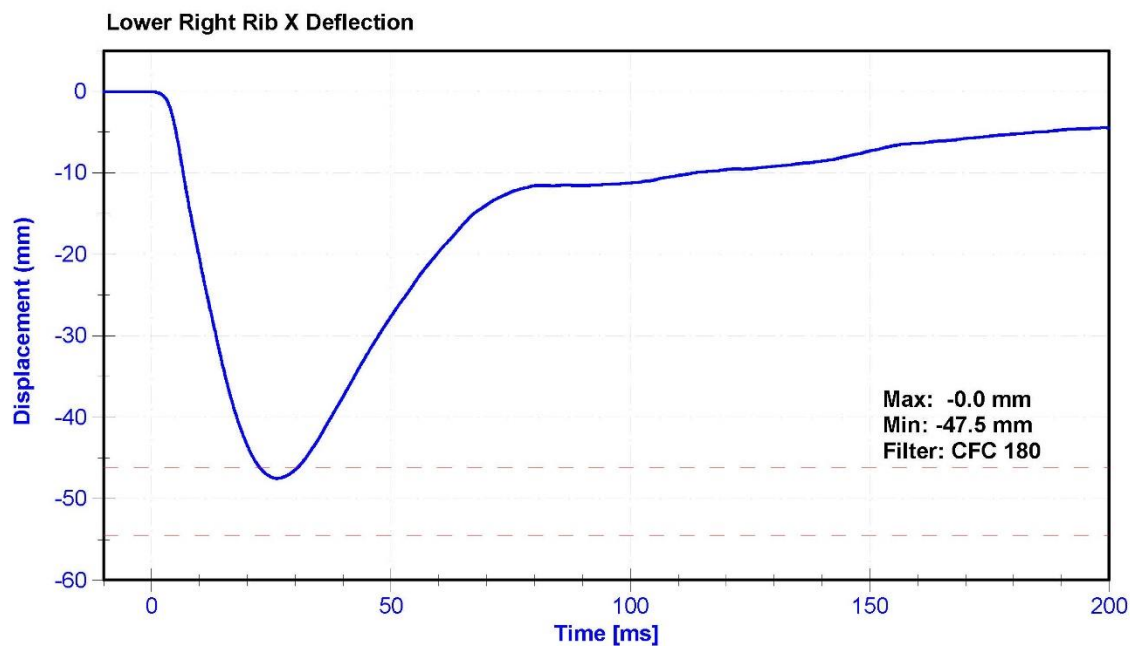
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

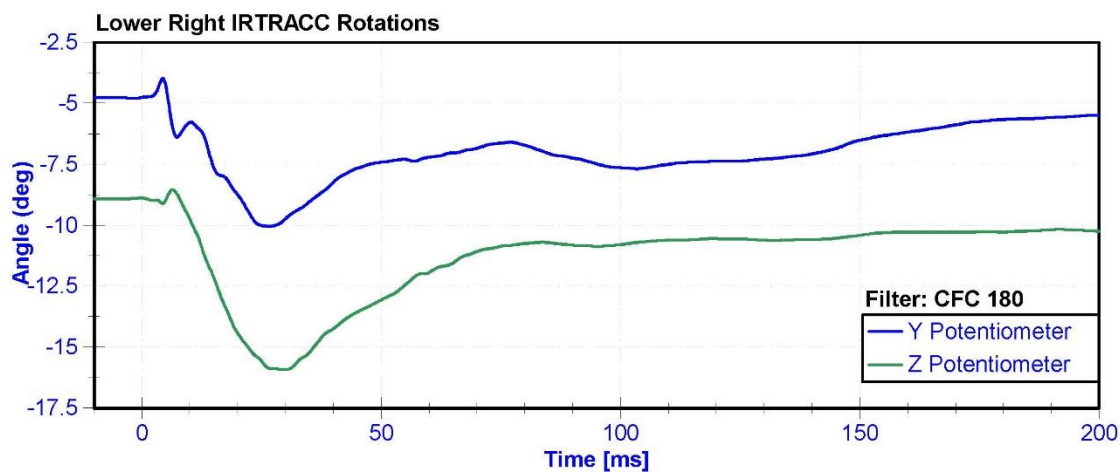
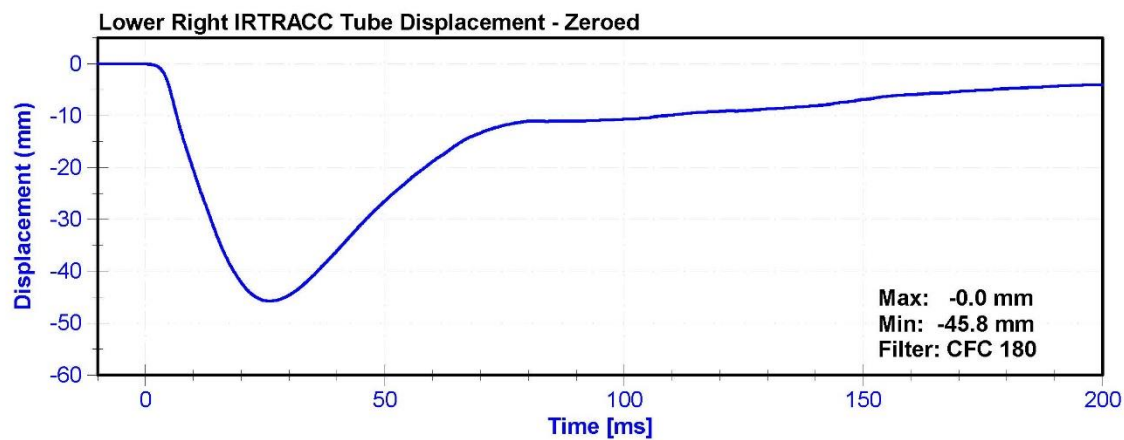
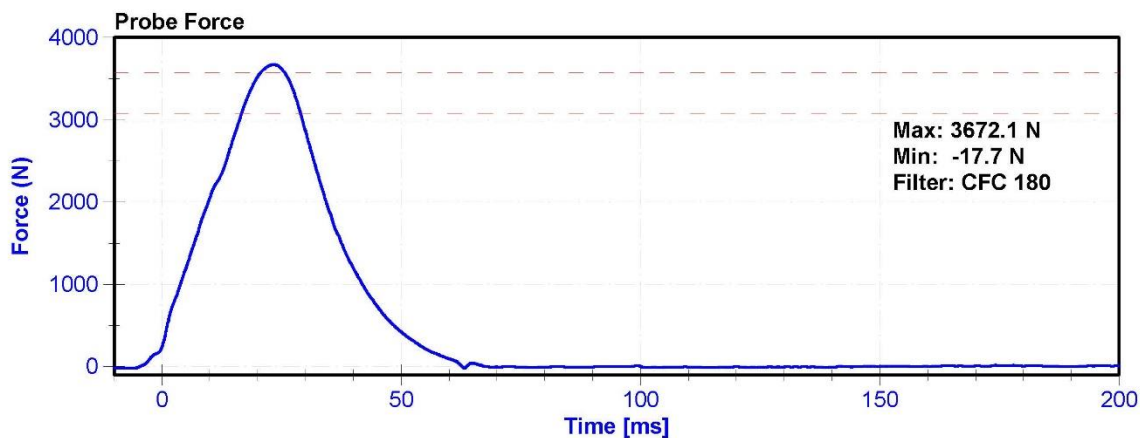
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	17.3	Pass
Impact Velocity	4.25	4.35	m/s	4.314	Pass
Peak Right X Rib Deflection	-54.5	-46.2	mm	-47.51	Pass
Probe Force during Peak Deflection	3083	3571	N	3672.1	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	11/10/2015	11/9/2016
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







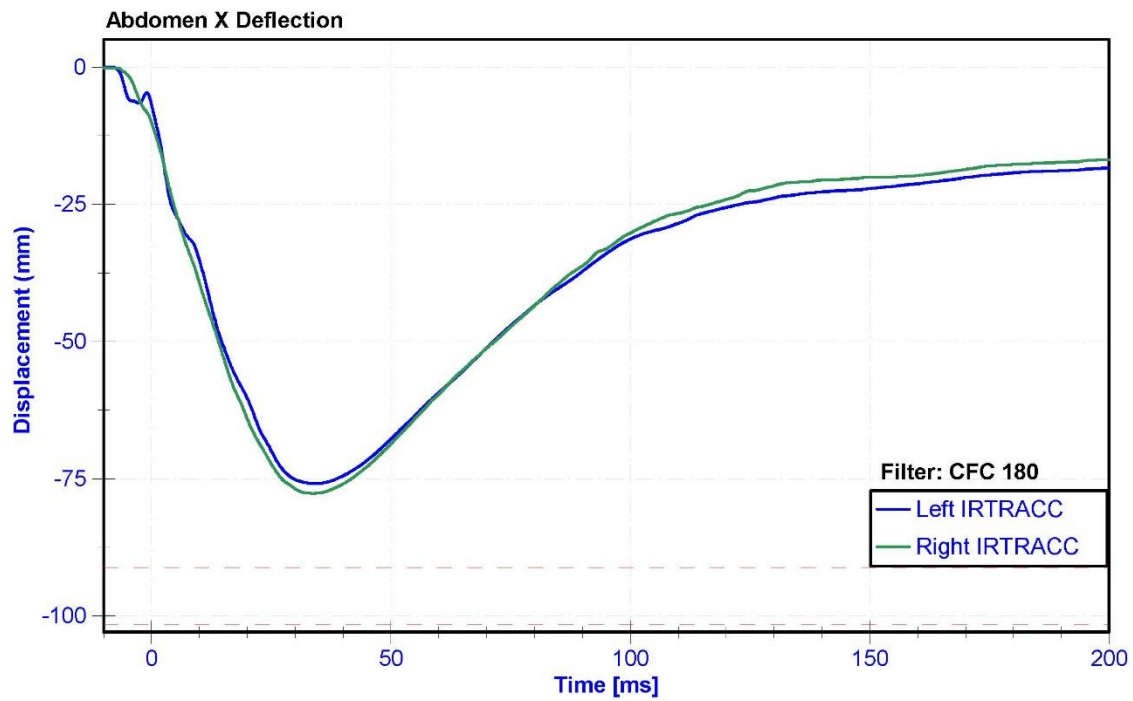
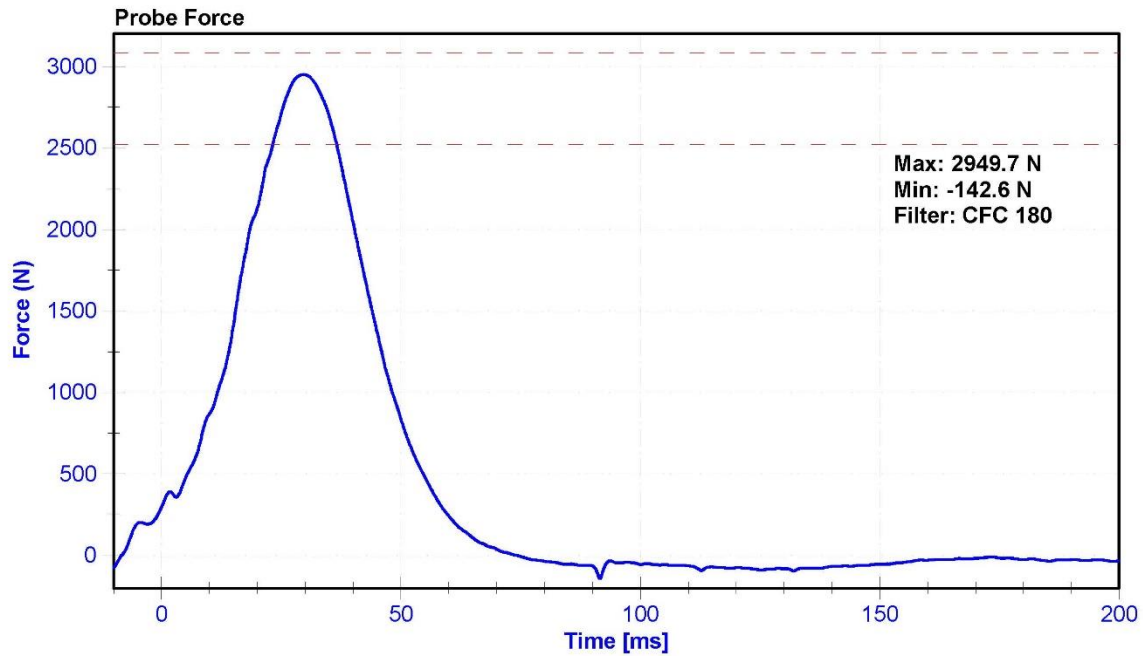
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

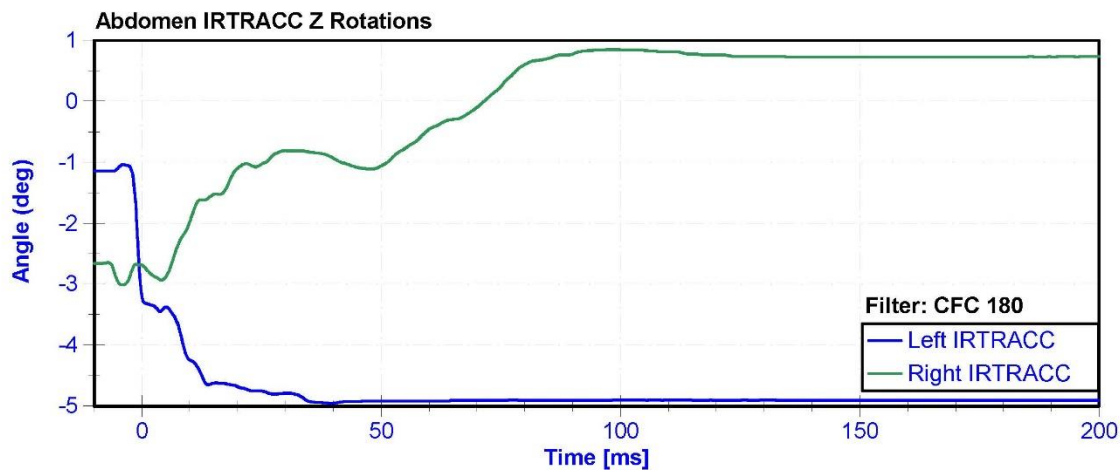
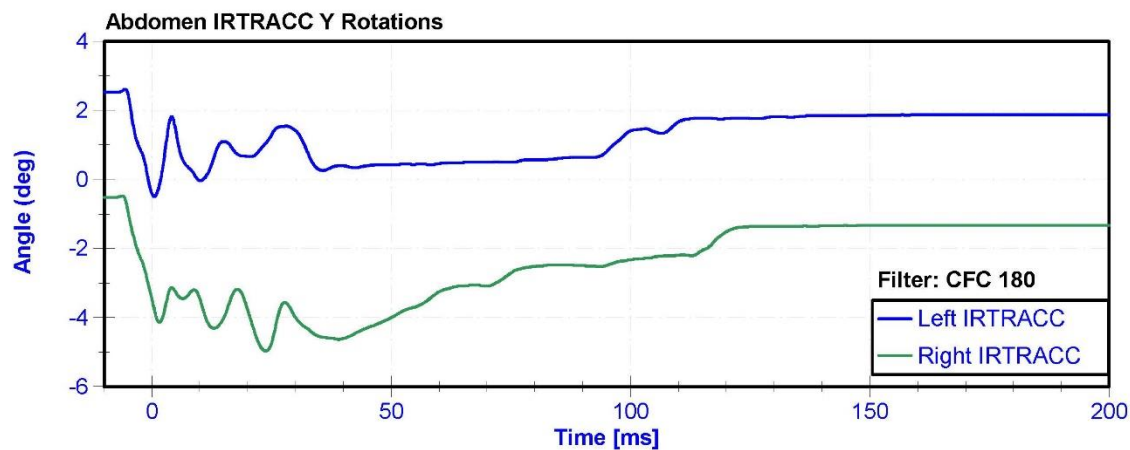
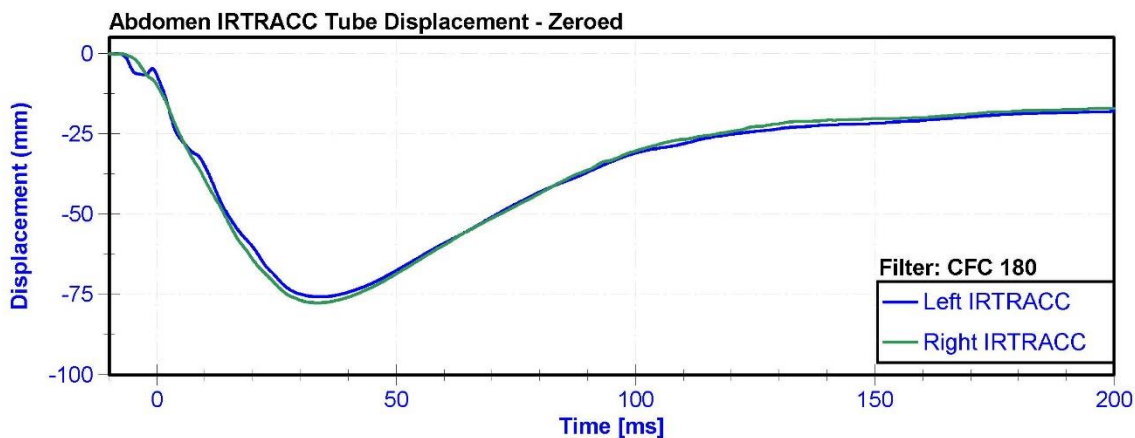
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	17.9	Pass
Impact Velocity	3.25	3.35	m/s	3.315	Pass
Probe Force	2523	3083	N	2949.7	Pass
Left Abdomen X Deflection	-101.6	-91.2	mm	-75.86	Fail
Right Abdomen X Deflection	-101.6	-91.2	mm	-77.68	Fail
Left/Right X Deviation	-7.00	7.00	mm	1.824	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	12/16/2015	12/15/2016
Abdomen Left Z Potentiometer	Humanetics 9945	DS-DS8361	12/16/2015	12/15/2016





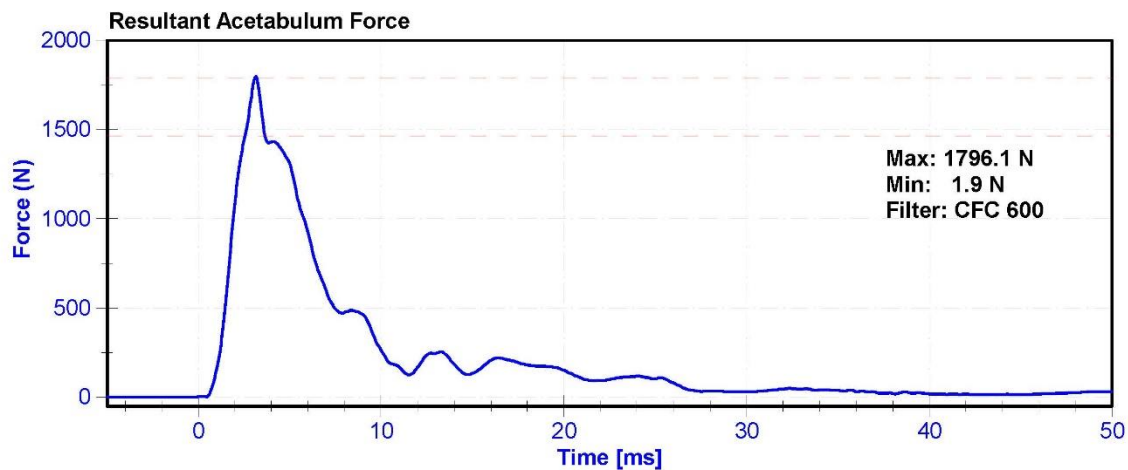
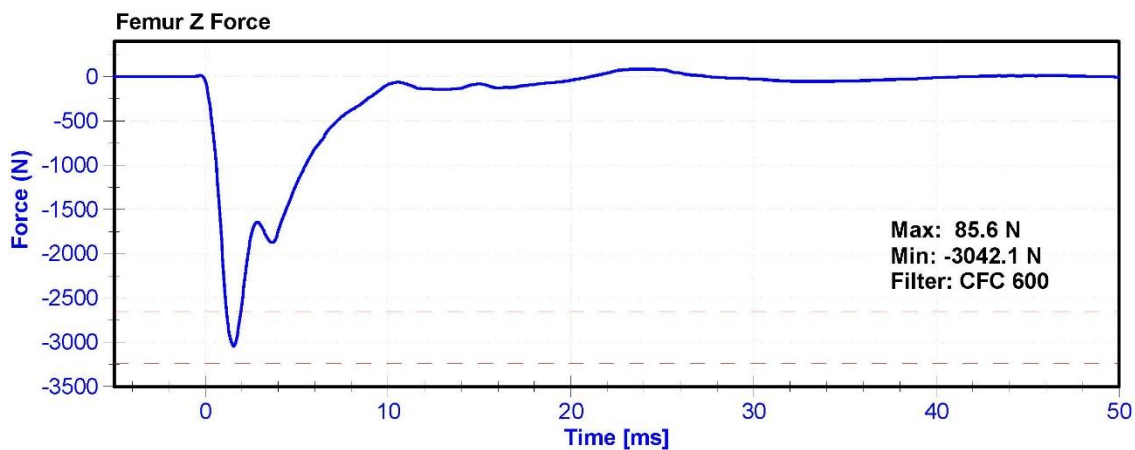
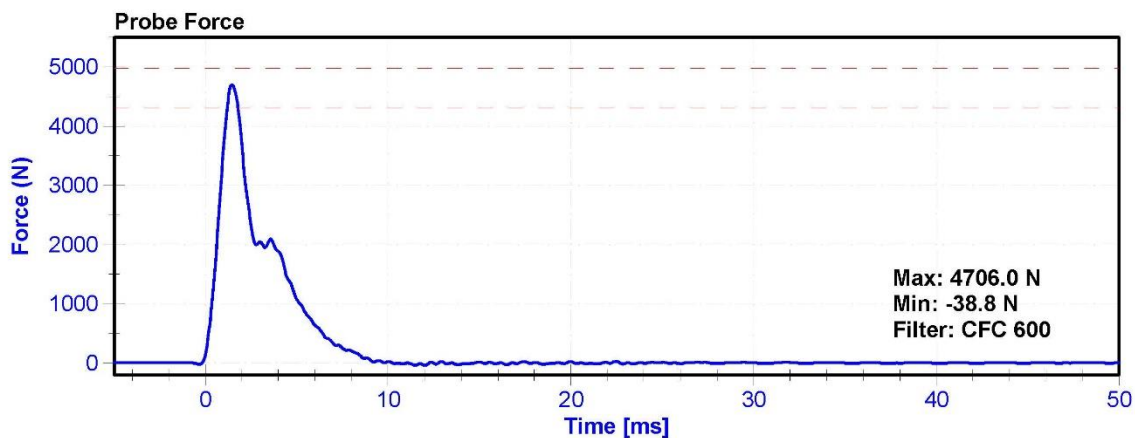
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

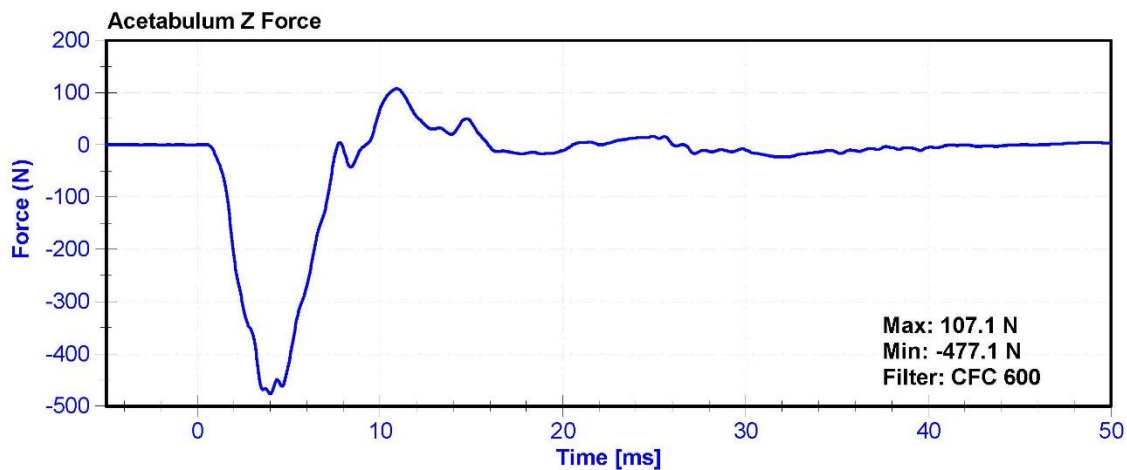
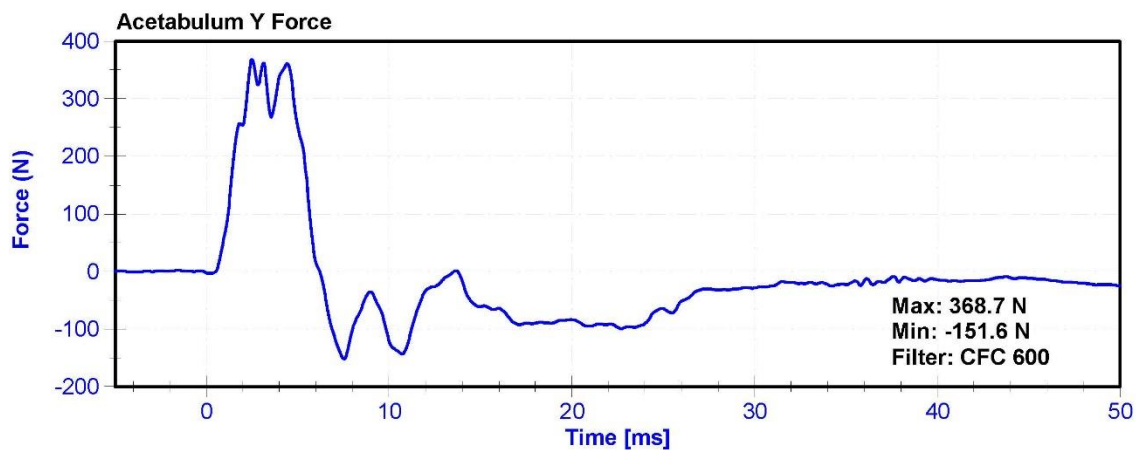
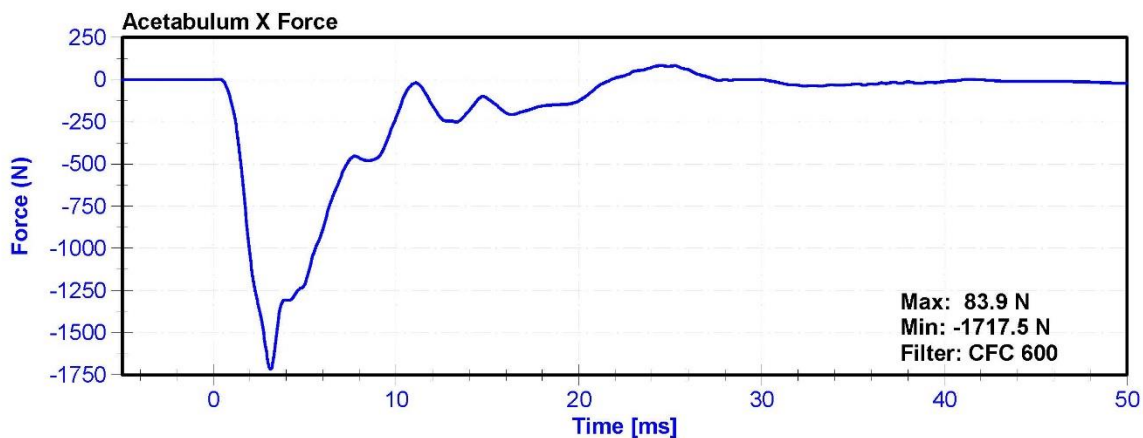
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	15.3	Pass
Impact Velocity	2.55	2.65	m/s	2.592	Pass
Probe Force	4318	4989	N	4706.0	Pass
Peak Femur Z Force	-3241	-2652	N	-3042.13	Pass
Peak Resultant Acetabulum Force	1462	1787	N	1796.09	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 10530JI4	LC-DP4639 Fx	3/6/2015	3/5/2016





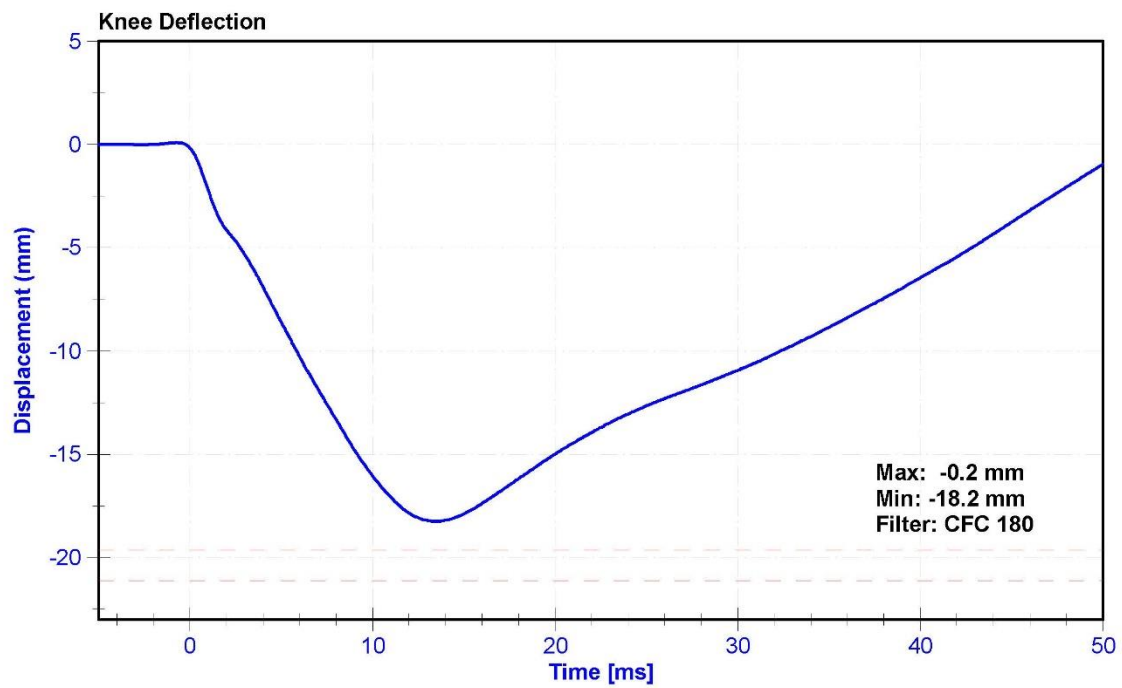
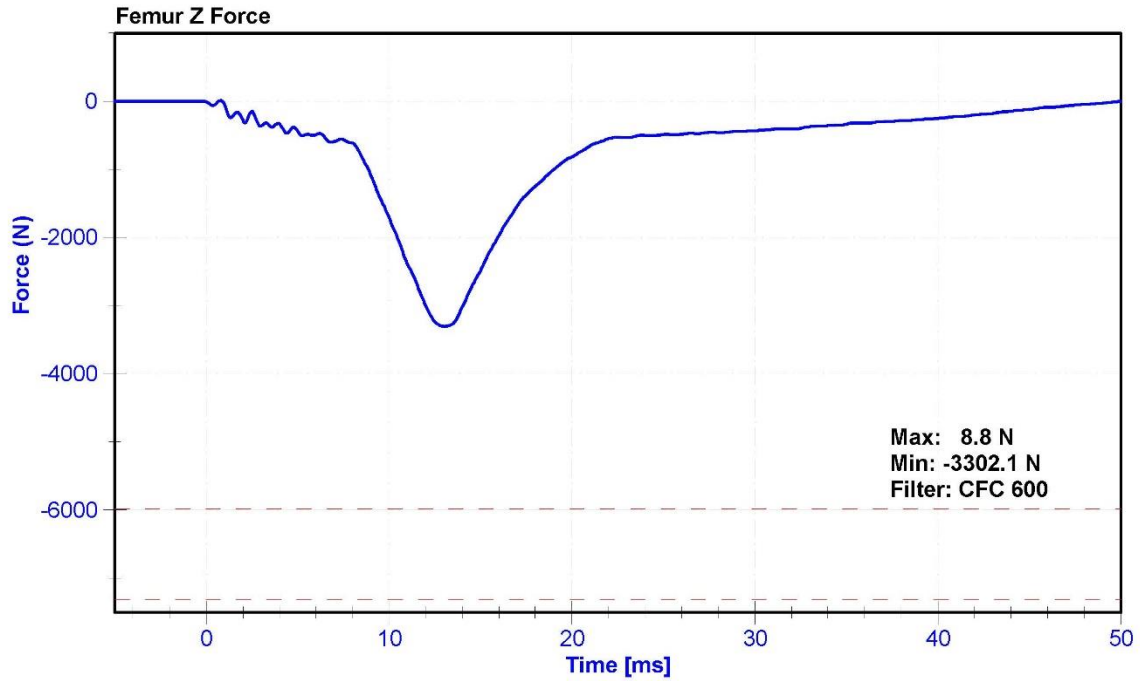
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	16.4	Pass
Impact Velocity	2.15	2.25	m/s	2.223	Pass
Peak Femur Z Force	-7317	-5987	N	-3302.1	Fail
Knee Deflection at Peak Force	-21.12	-19.62	mm	-18.24	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



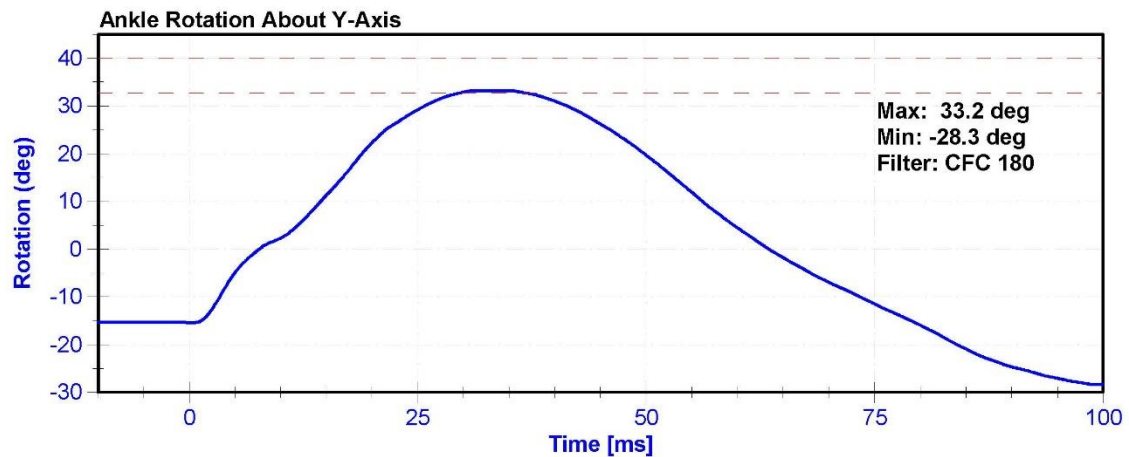
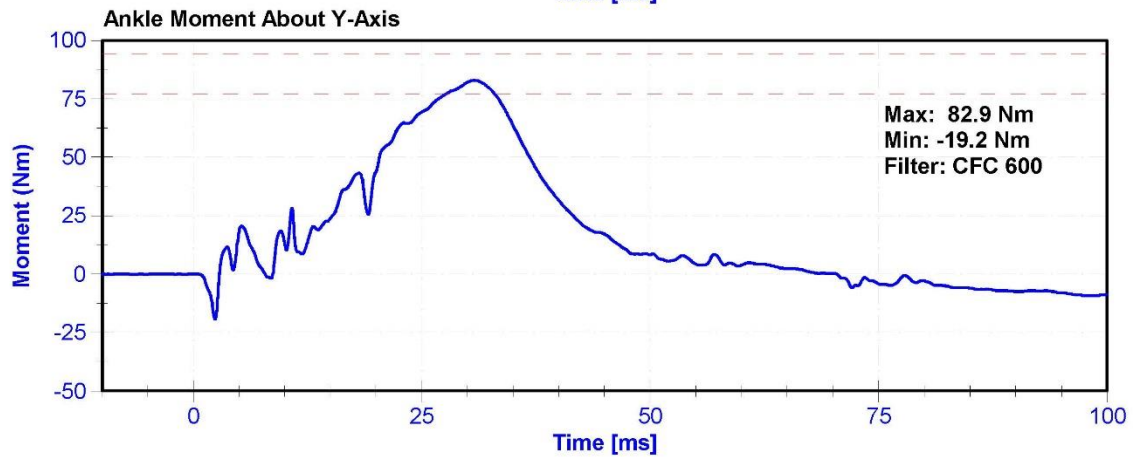
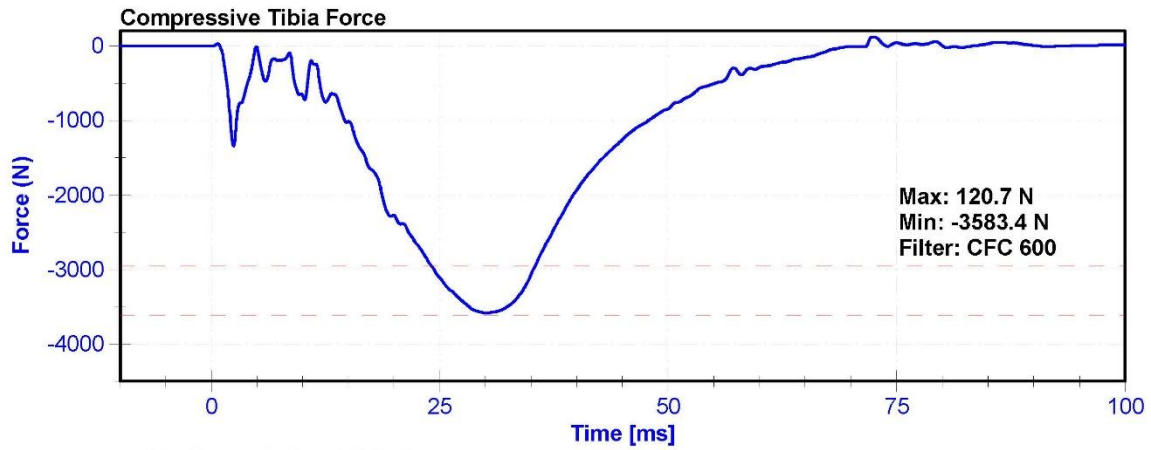
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	15.0	Pass
Velocity	4.9	5.1	m/s	5.040	Pass
Lower Tibia Compressive Force	-3613	-2956	N	-3583.4	Pass
Peak Moment about Y-Axis	77.1	94.2	Nm	82.94	Pass
Peak Rotation about Y-Axis	32.7	39.9	deg	33.19	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
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



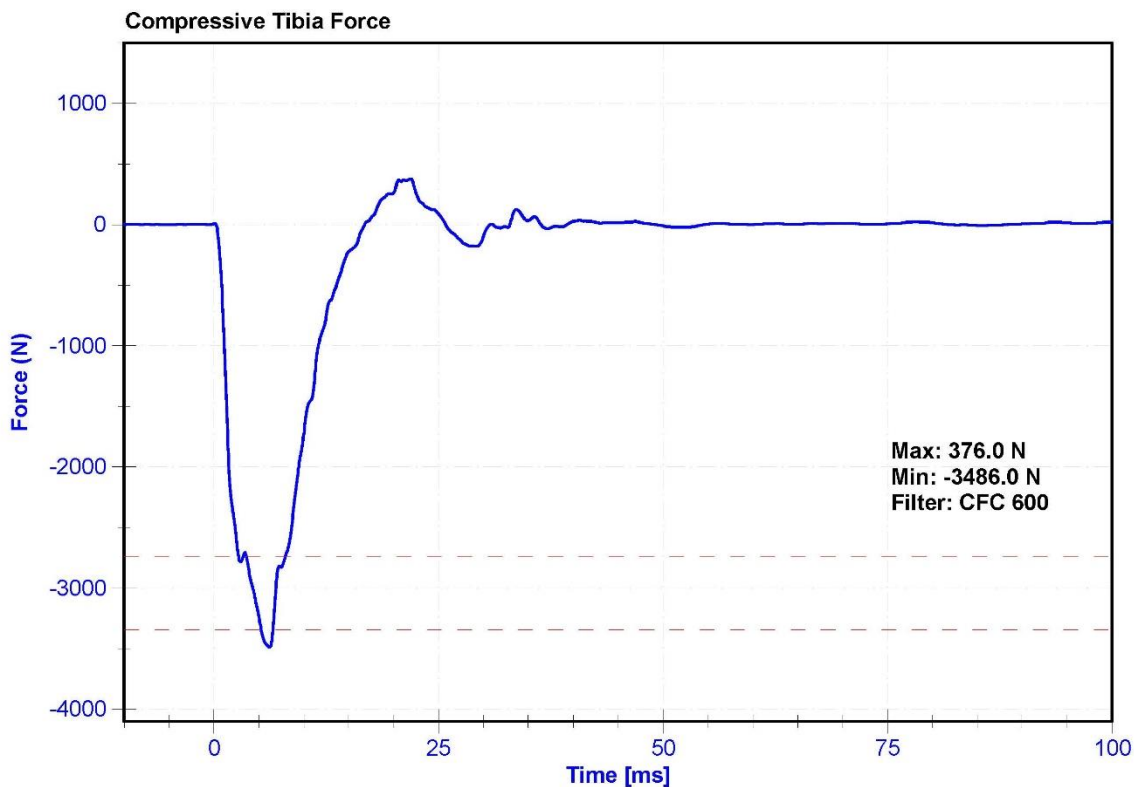
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22	Pass
Humidity	10	70	%	15	Pass
Velocity	3.9	4.1	m/s	3.944	Pass
Lower Tibia Compressive Force	-3346	-2738	N	-3486.0	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
Lower Tibia Load Cell	Denton 4929J	LC-121 Fz	2/10/2015	2/10/2016



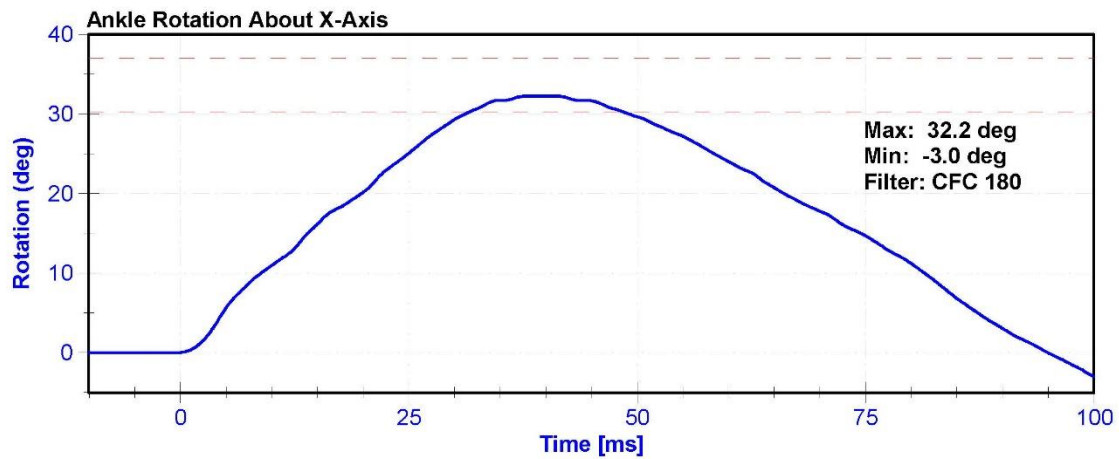
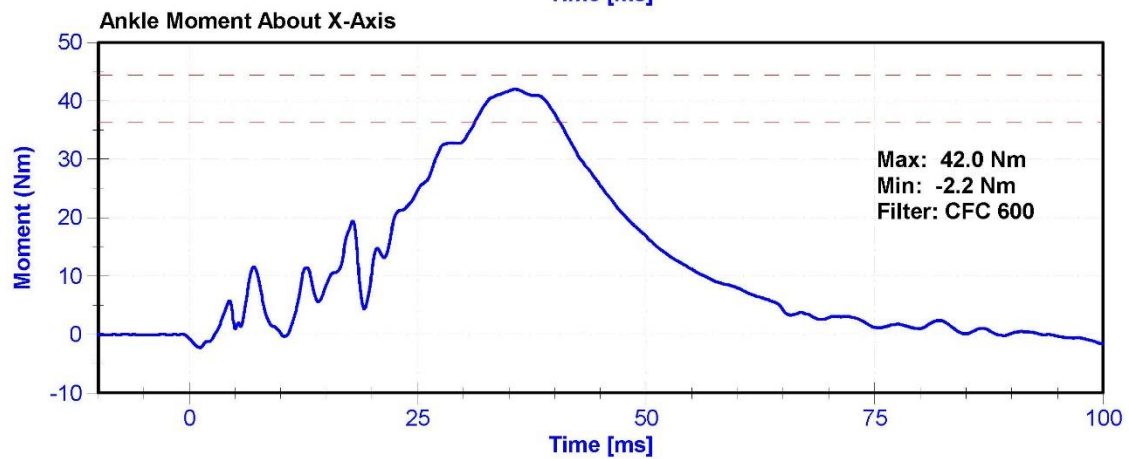
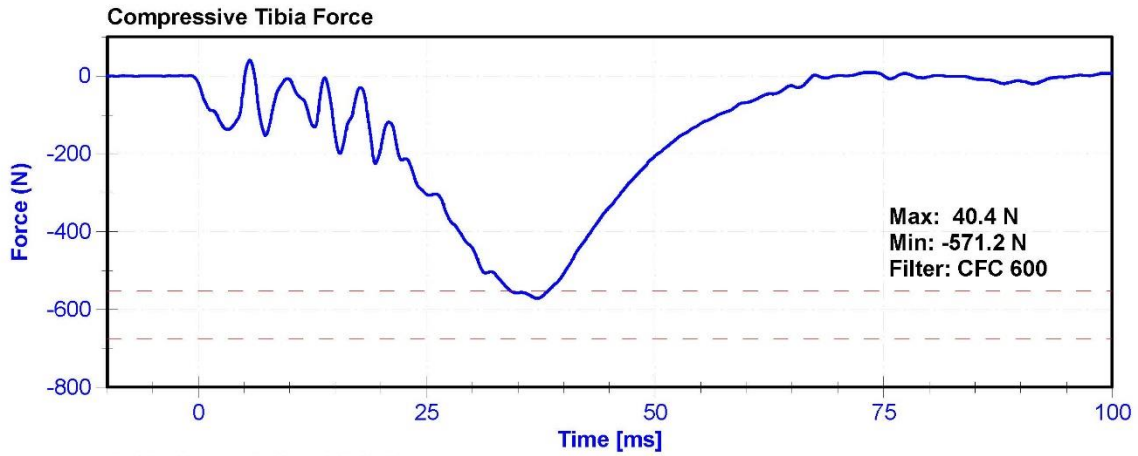
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	15.0	Pass
Velocity	1.9	2.1	m/s	1.991	Pass
Lower Tibia Compressive Force	-675	-552	N	-571.2	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	42.00	Pass
Peak Rotation about X-Axis	30.3	37.0	deg	32.22	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
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





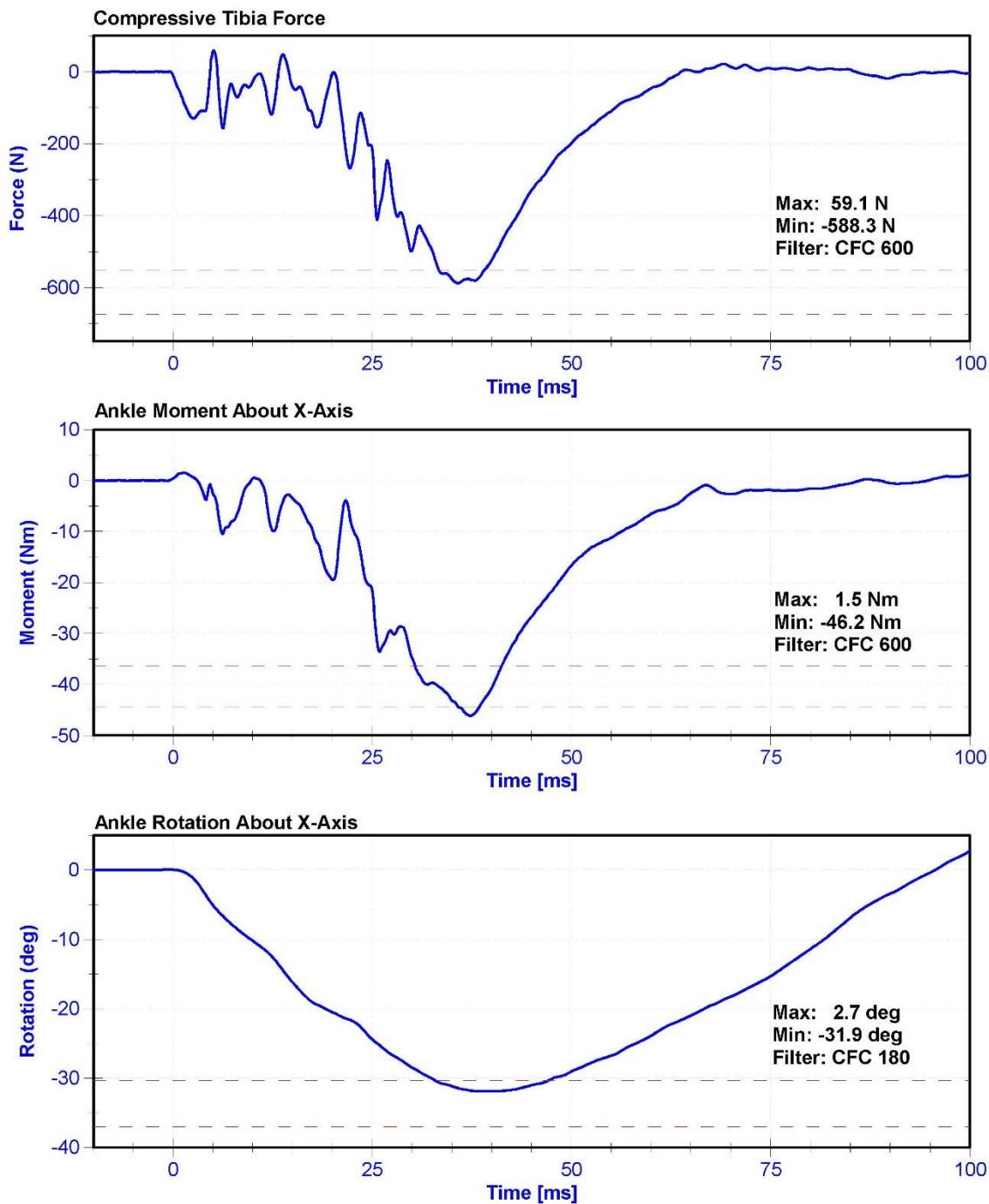
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	15.1	Pass
Velocity	1.9	2.1	m/s	1.966	Pass
Lower Tibia Compressive Force	-675	-552	N	-588.3	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-46.17	Fail
Peak Rotation about X-Axis	-37.0	-30.3	deg	-31.86	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
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



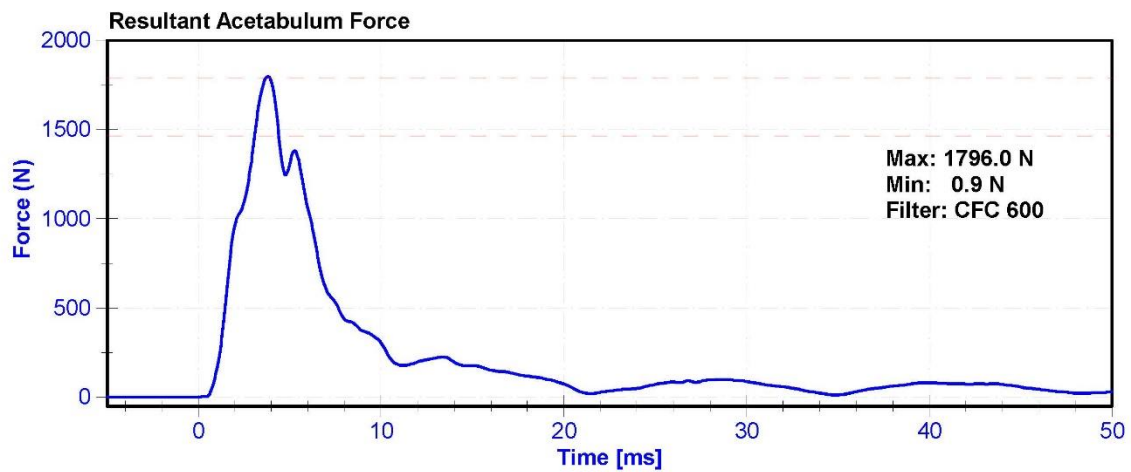
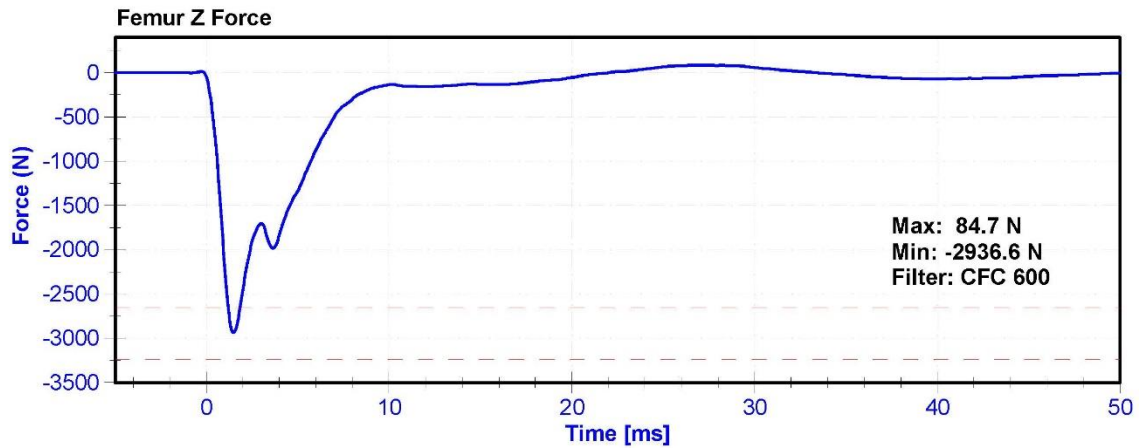
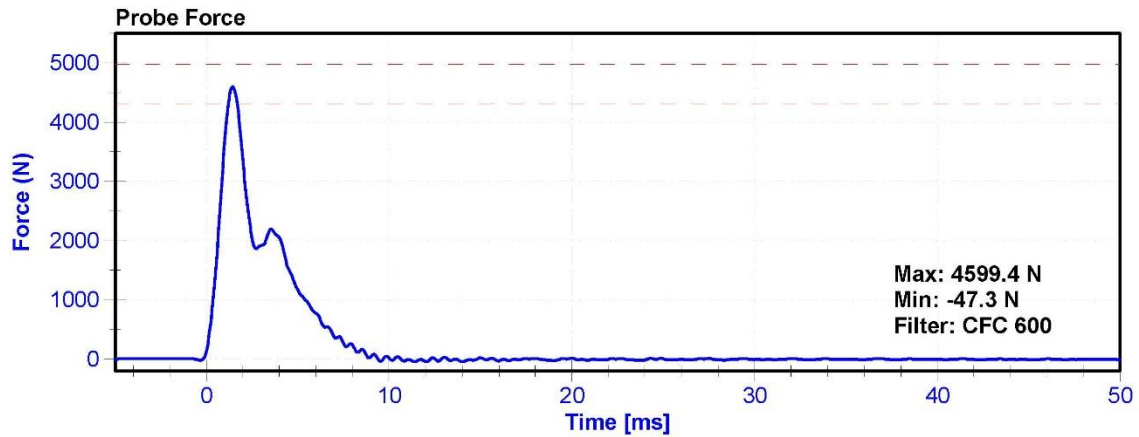
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

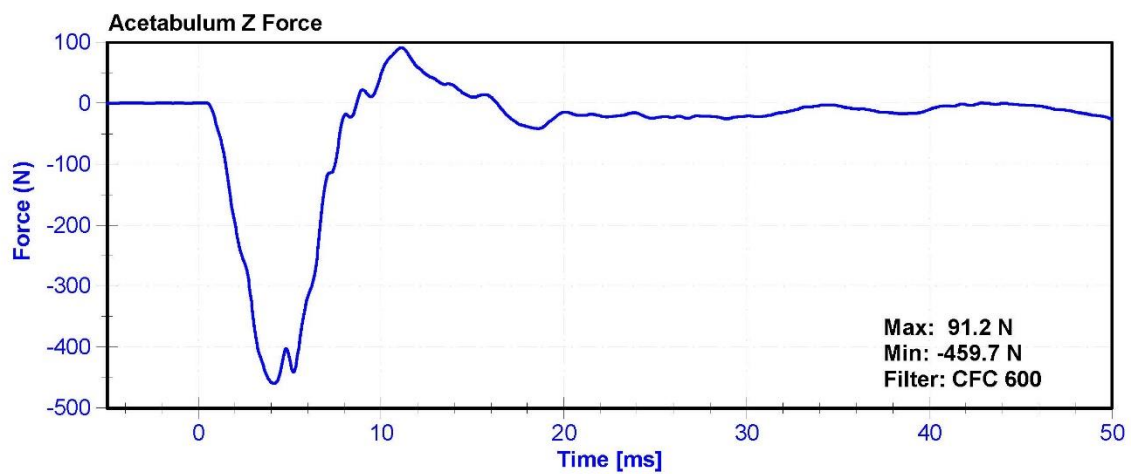
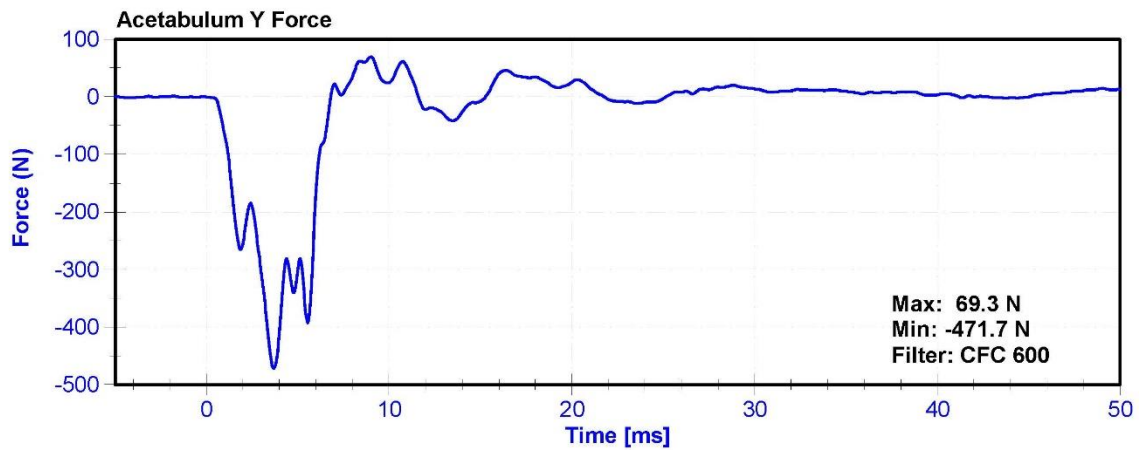
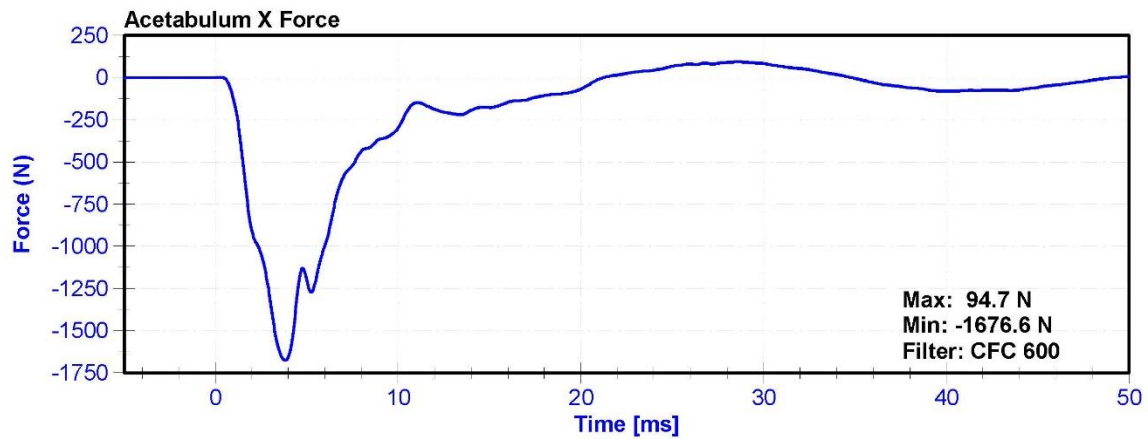
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	15.6	Pass
Impact Velocity	2.55	2.65	m/s	2.579	Pass
Probe Force	4318	4989	N	4599.4	Pass
Peak Femur Z Force	-3241	-2652	N	-2936.62	Pass
Peak Resultant Acetabulum Force	1462	1787	N	1795.97	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accel	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Right Femur Load Cell	Denton W50-7101051	LC-DM4976 Fz	2/23/2015	2/23/2016
Right Acetabulum Load Cell	Humanetics 10670JI4	LC-DP3835 Fx	3/7/2015	3/6/2016





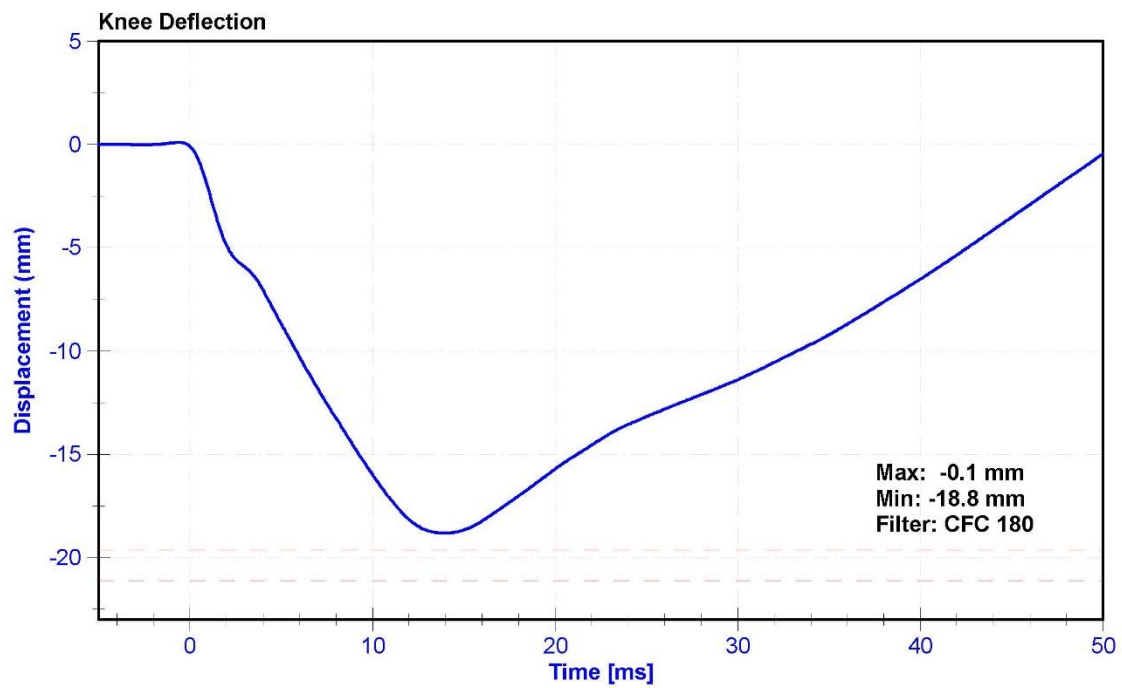
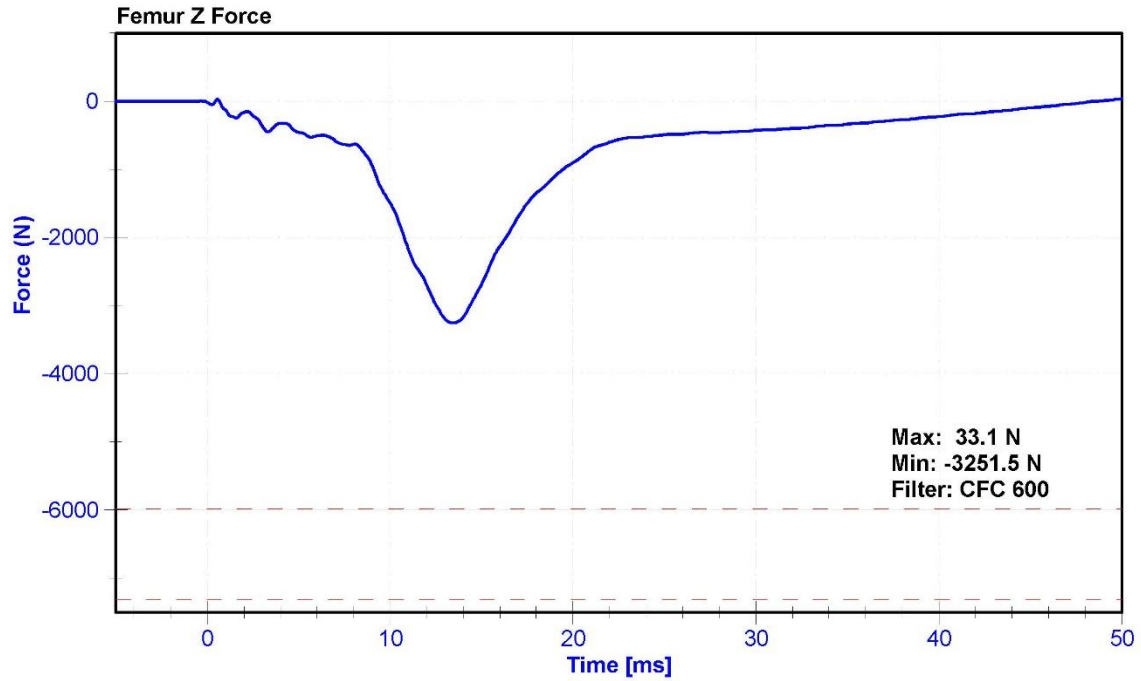
ATD Manufacturer	Humanetics	Test Technician	M. Goehle
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	16.4	Pass
Impact Velocity	2.15	2.25	m/s	2.190	Pass
Peak Femur Z Force	-7317	-5987	N	-3251.5	Fail
Knee Deflection at Peak Force	-21.12	-19.62	mm	-18.82	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-DM4976 Fz	2/23/2015	2/23/2016
Knee Potentiometer	Space Age 150-0121VL	DS-021033	3/18/2015	3/17/2016



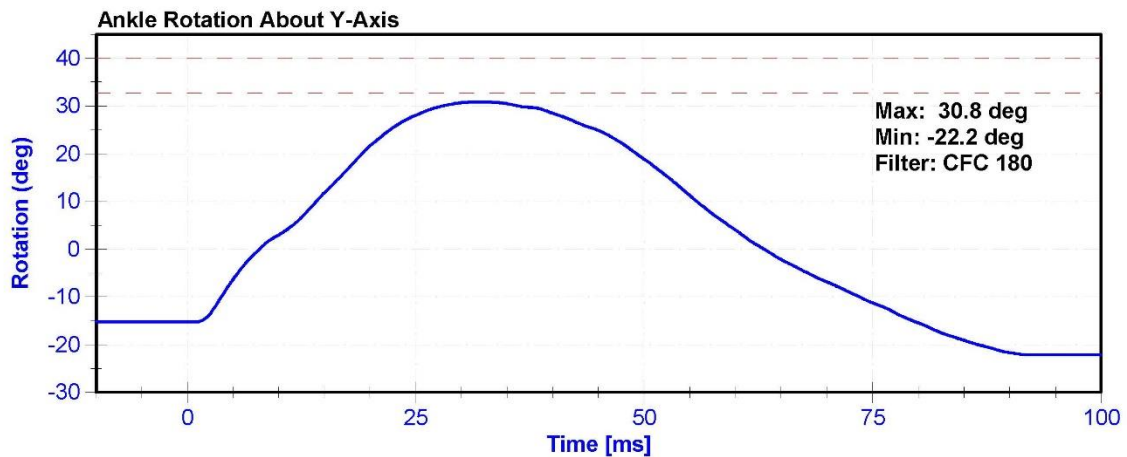
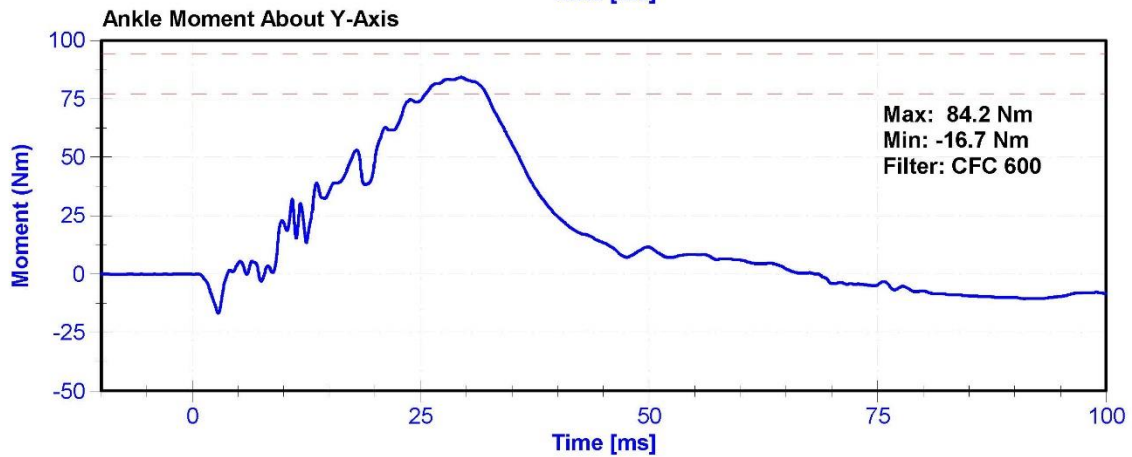
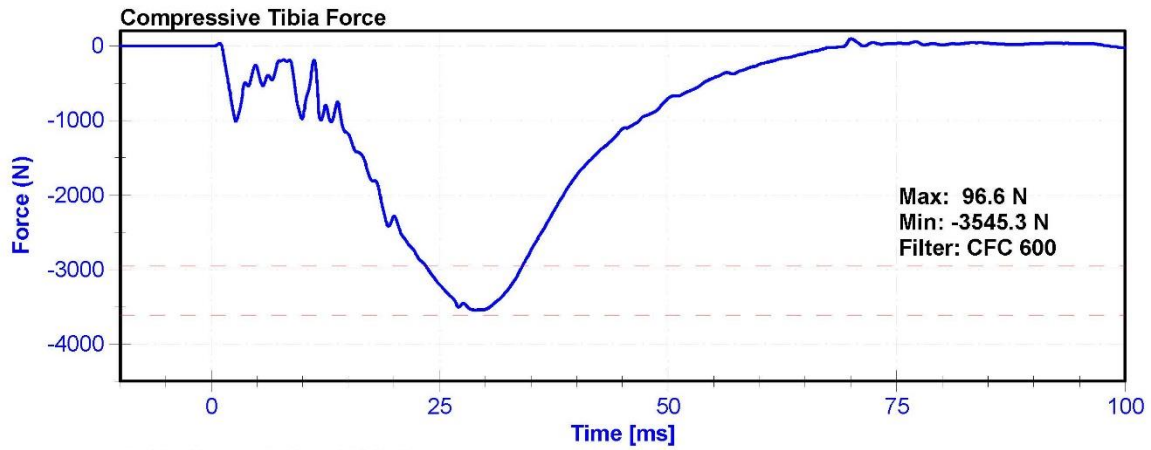
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	17.0	Pass
Velocity	4.9	5.1	m/s	4.961	Pass
Lower Tibia Compressive Force	-3613	-2956	N	-3545.3	Pass
Peak Moment about Y-Axis	77.1	94.2	Nm	84.24	Pass
Peak Rotation about Y-Axis	32.7	39.9	deg	30.82	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
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



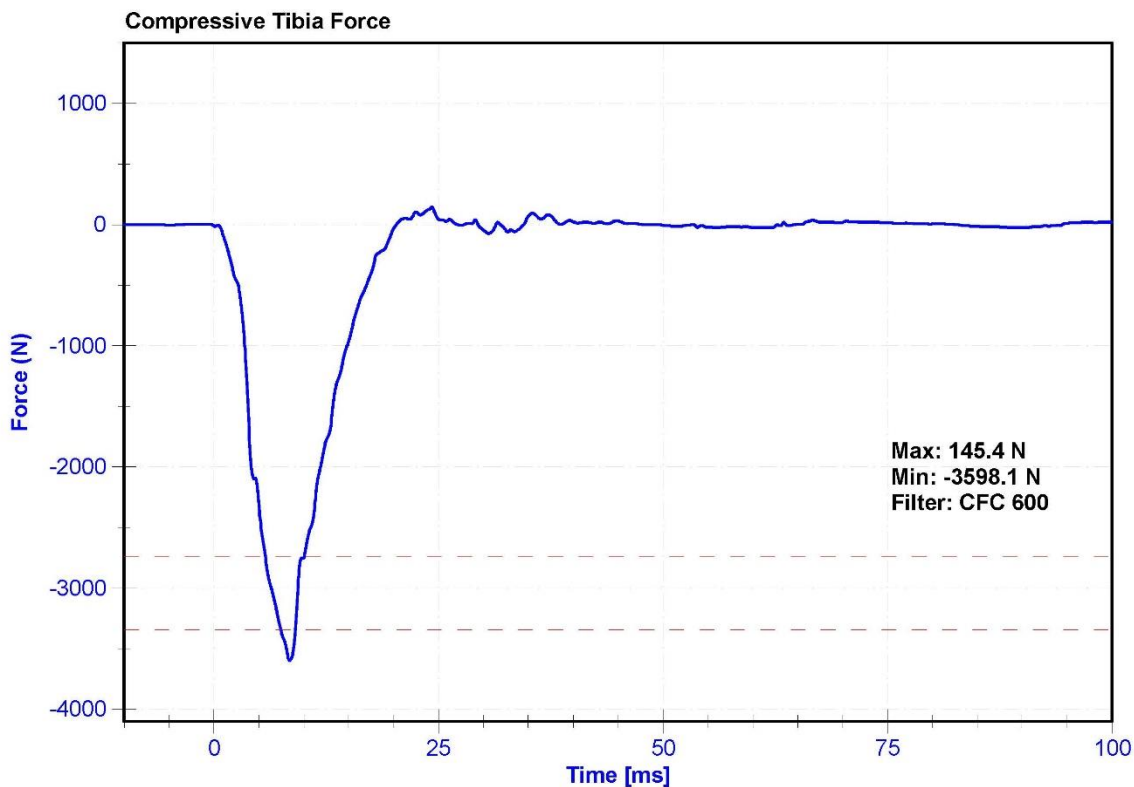
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	16.5	Pass
Velocity	3.9	4.1	m/s	3.920	Pass
Lower Tibia Compressive Force	-3346	-2738	N	-3598.1	Fail

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
Lower Tibia Load Cell	Denton 4929J	LC-166 Fz	2/9/2015	2/9/2016



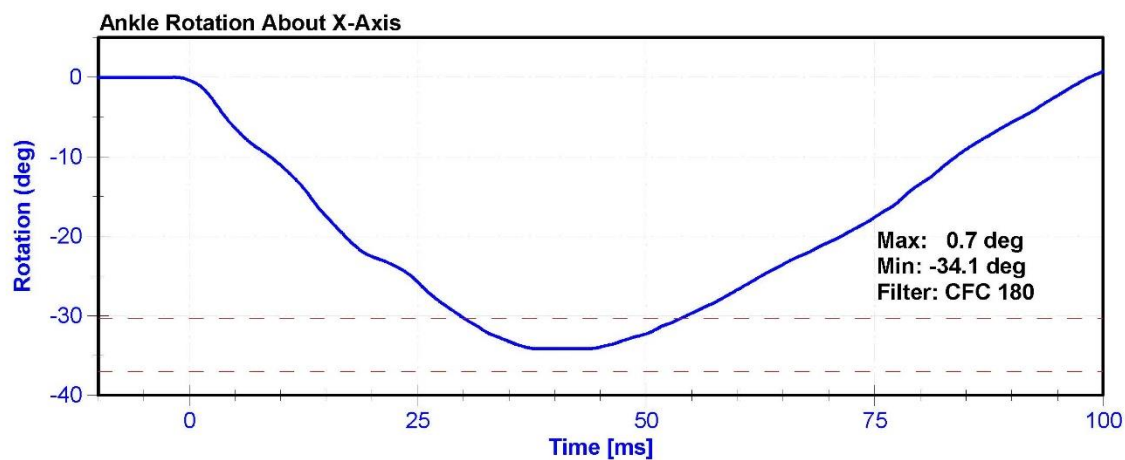
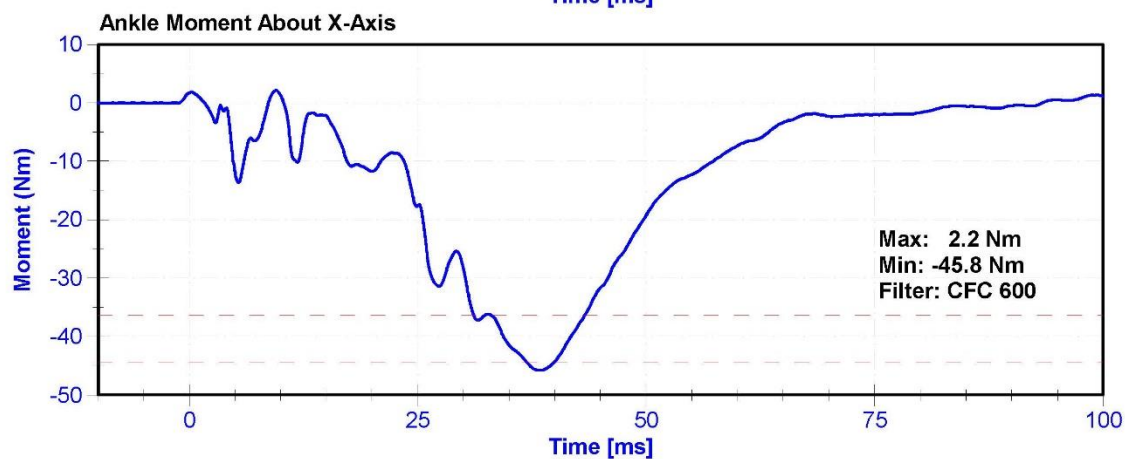
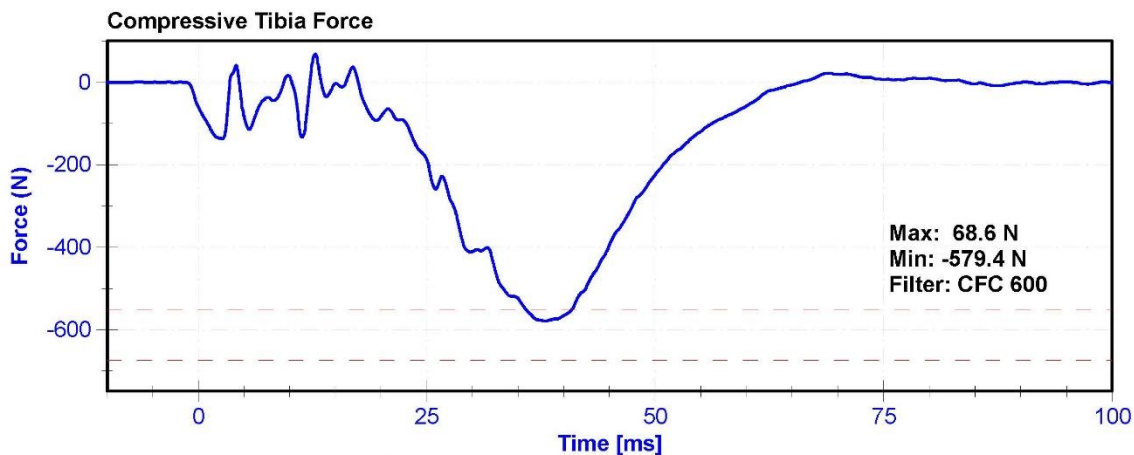
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	16.5	Pass
Velocity	1.9	2.1	m/s	1.913	Pass
Lower Tibia Compressive Force	-675	-552	N	-579.4	Pass
Peak Moment about X-Axis	-44.4	-36.3	Nm	-45.75	Fail
Peak Rotation about X-Axis	-37.0	-30.3	deg	-34.13	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
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





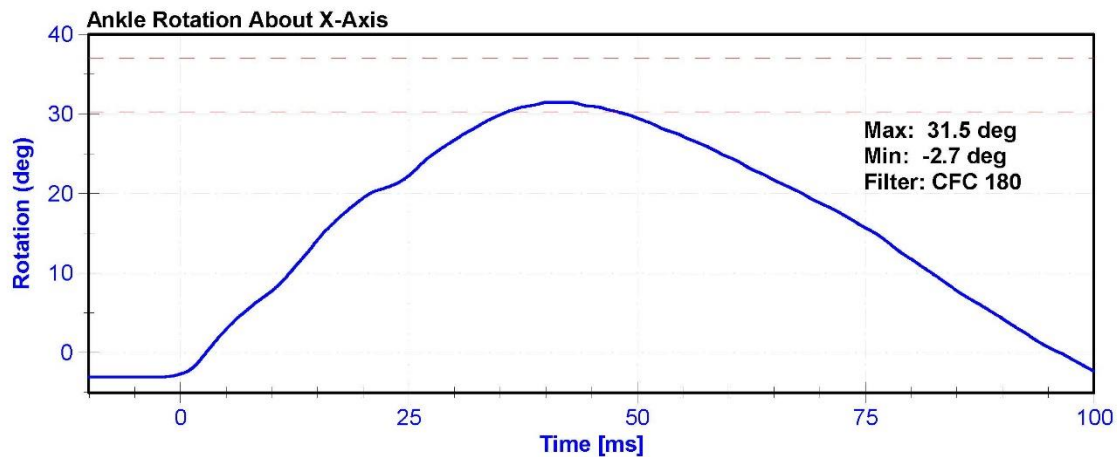
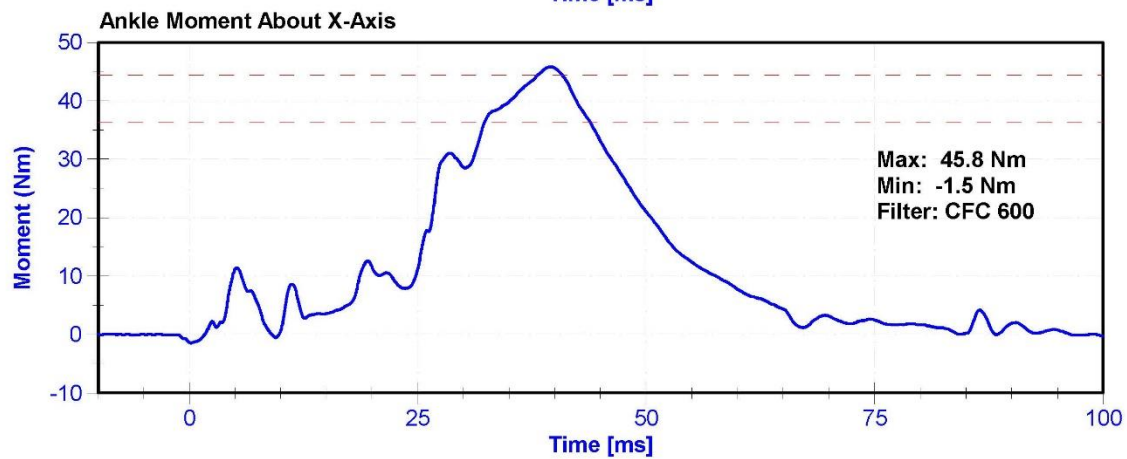
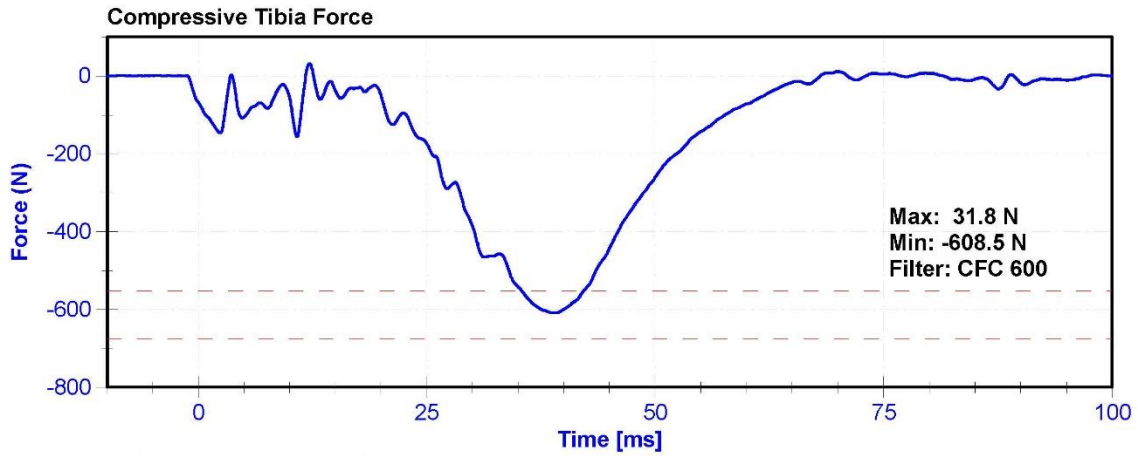
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	DL9207	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	16.3	Pass
Velocity	1.9	2.1	m/s	1.942	Pass
Lower Tibia Compressive Force	-675	-552	N	-608.5	Pass
Peak Moment about X-Axis	36.3	44.4	Nm	45.82	Fail
Peak Rotation about X-Axis	30.3	37.0	deg	31.46	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32227	8/27/2015	2/26/2016
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



Hybrid III 5th Female 019 DUMMY CALIBRATIONS

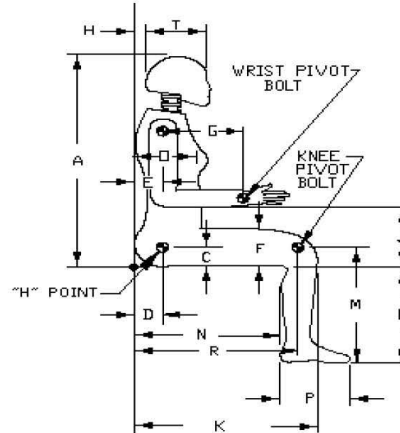
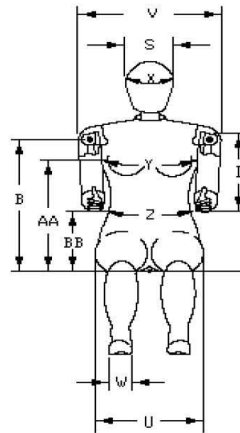


External Measurements - Hybrid 3 - 5th Female

Technician: M. Geesey

Date: 1/16/2016

Dummy Serial Number: 19



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	777	Pass
B	Shoulder Pivot Height	432	457	446	Pass
C	H-Point Height	81	86	83	Pass
D	H-Point from Backline	145	150	146	Pass
E	Shoulder Pivot from Backline	69	84	76	Pass
F	Thigh Clearance	119	135	130	Pass
G	Back of Elbow to Wrist Pivot	244	259	247	Pass
H	Head Back to Backline	43	48	45	Pass
I	Shoulder to Elbow Length	277	297	280	Pass
J	Elbow Rest Height	183	203	186	Pass
K	Buttock to Knee Length	521	546	535	Pass
L	Popliteal Height	356	376	360	Pass
M	Knee Pivot Height	394	419	402	Pass
N	Buttock Popliteal Length	414	439	429	Pass
O	Chest Depth without Jacket	175	191	182	Pass
P	Foot Length (right)	219	234	225	Pass
R	Buttock To Knee Pivot Length	457	483	478	Pass
S	Head Breadth	137	147	140	Pass
T	Head Depth	178	188	182	Pass
U	Hip Breadth	300	315	309	Pass
V	Shoulder Breadth	351	366	357	Pass
W	Foot Breadth	79	94	85	Pass
X	Head Circumference	528	549	533	Pass
Y	Chest Circumference with Jacket	851	881	869	Pass
Z	Waist Circumference	460	790	771	Pass
AA	Reference Location (Chest Circumference)	333	358	340	Pass
BB	Reference Location (Waist Circumference)	160	170	165	Pass

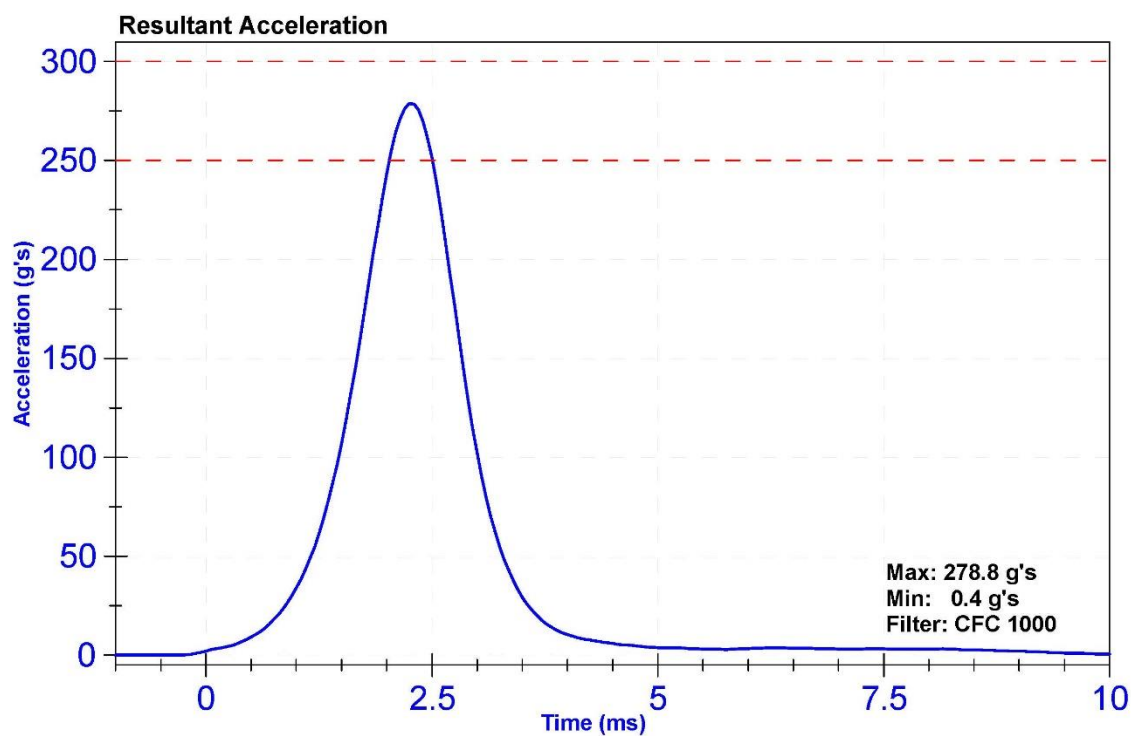
ATD Manufacturer	ASTC	Test Technician	M. Geesey
ATD Serial Number	019	Laboratory Supervisor	M. Goehle

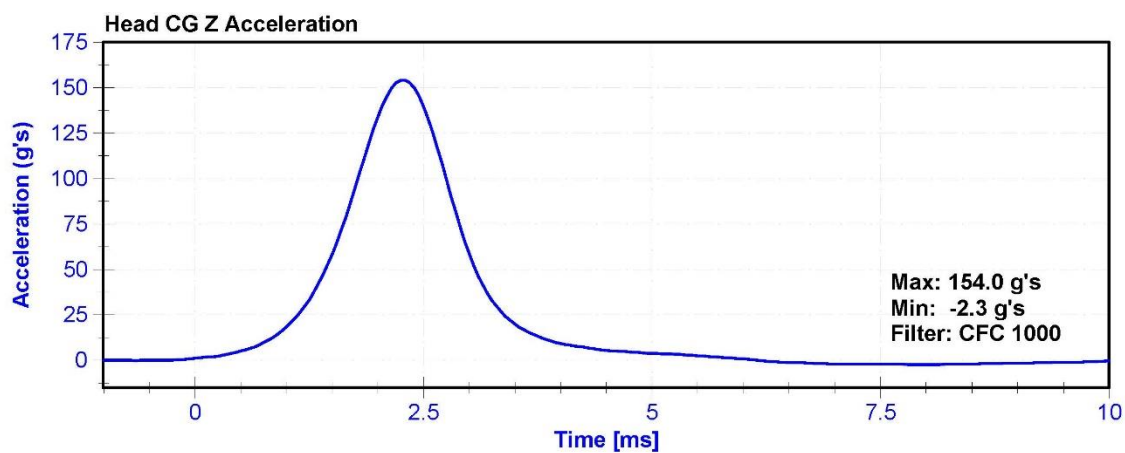
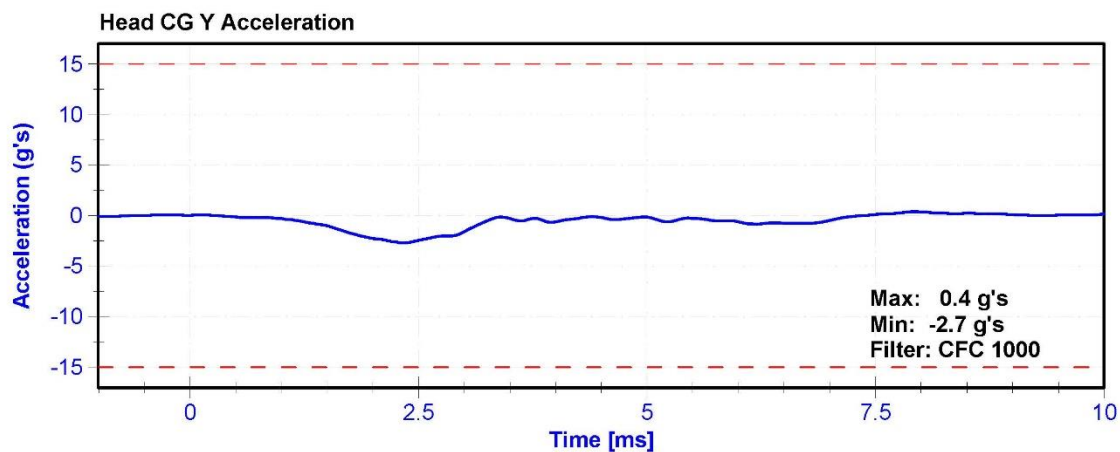
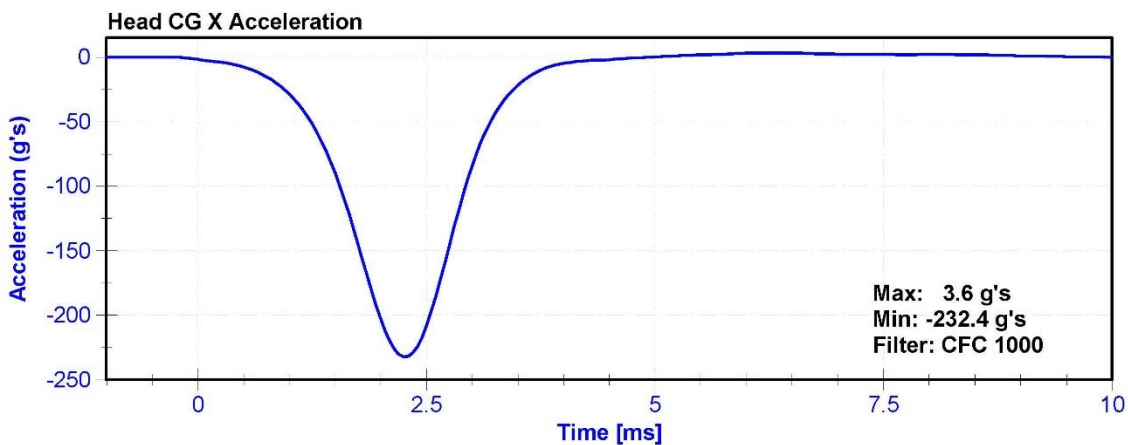
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.3	Pass
Humidity	10	70	%	26.6	Pass
Resultant Acceleration	250	300	g's	278.8	Pass
Oscillation	0	10	%	1.5	Pass
Lateral Acceleration	-15	15	g's	-2.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco 7264C	AC-P79591	10/30/2015	4/29/2016
Y Accelerometer	Endevco 7264C	AC-P49181	10/30/2015	4/29/2016
Z Accelerometer	Endevco 7264C	AC-P49214	10/30/2015	4/29/2016





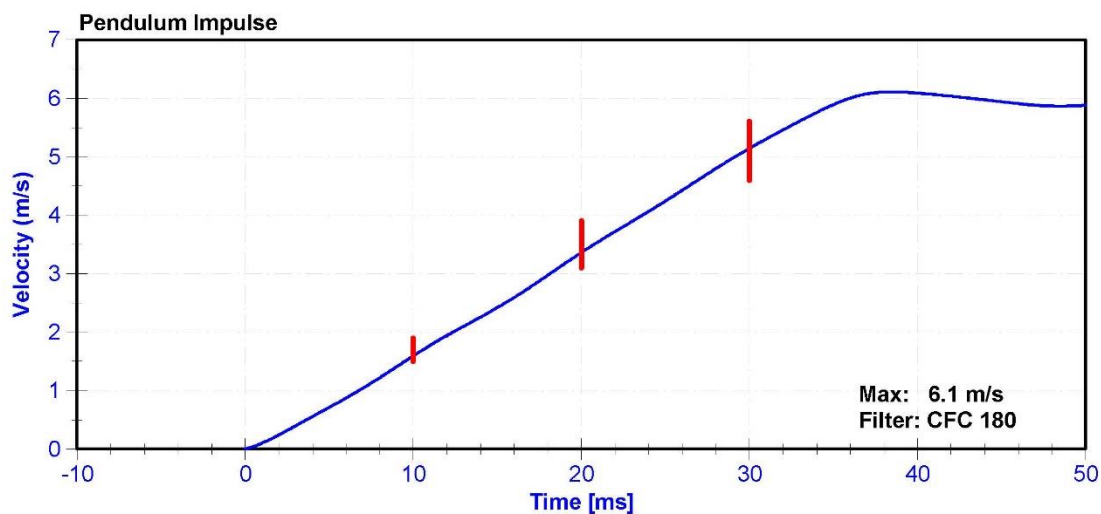
ATD Manufacturer	ASTC	Test Technician	M. Geesey
ATD Serial Number	019	Laboratory Supervisor	M. Goehle

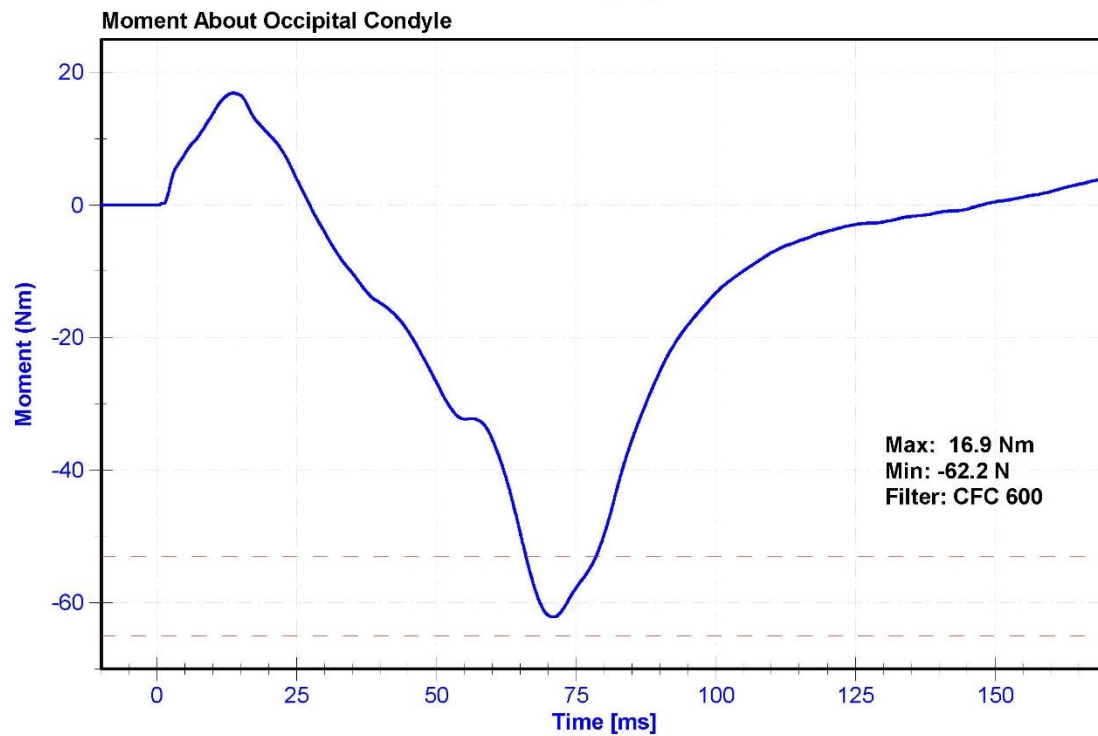
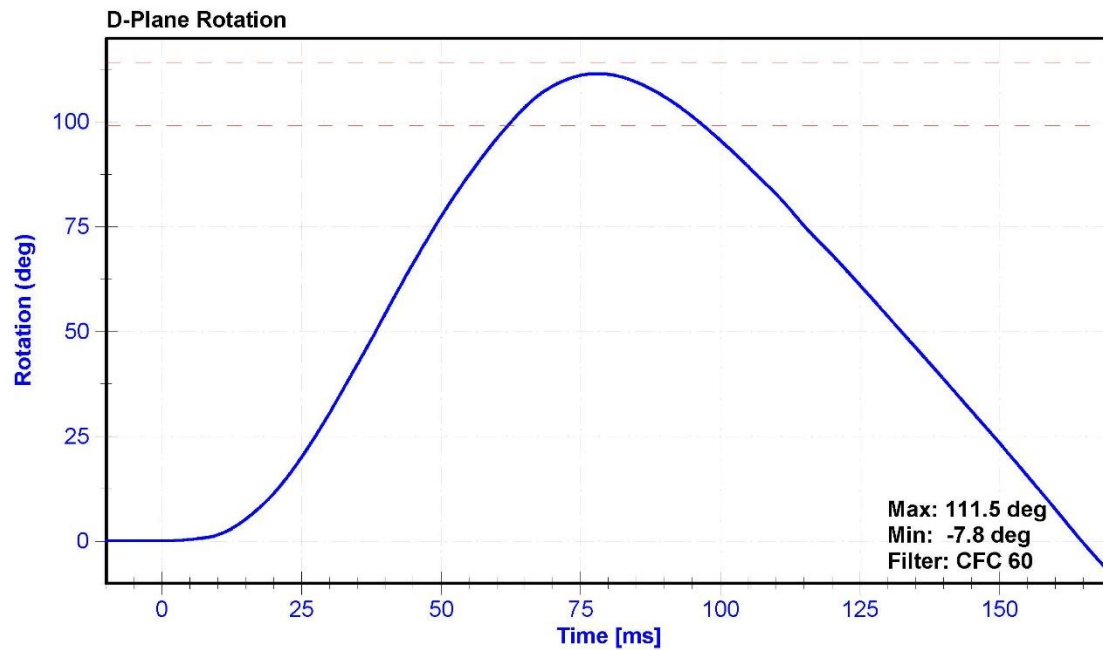
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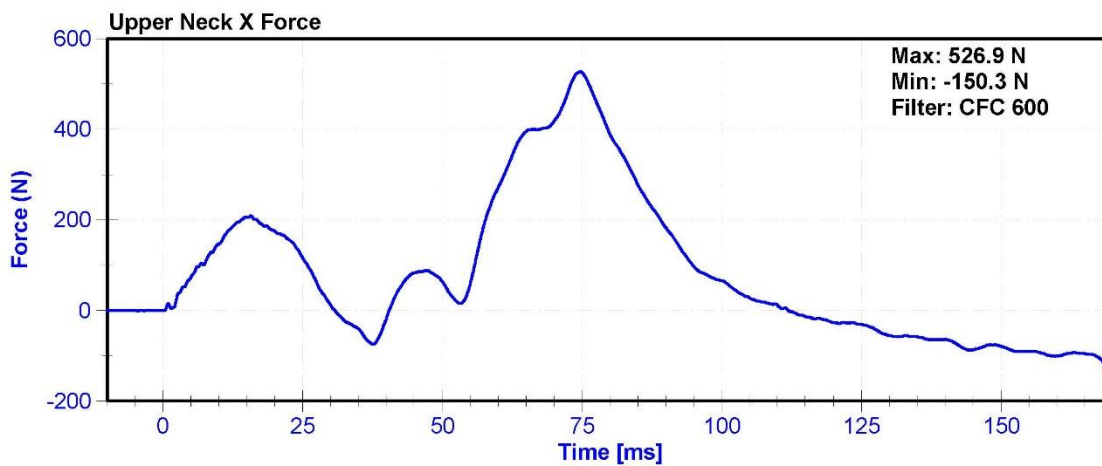
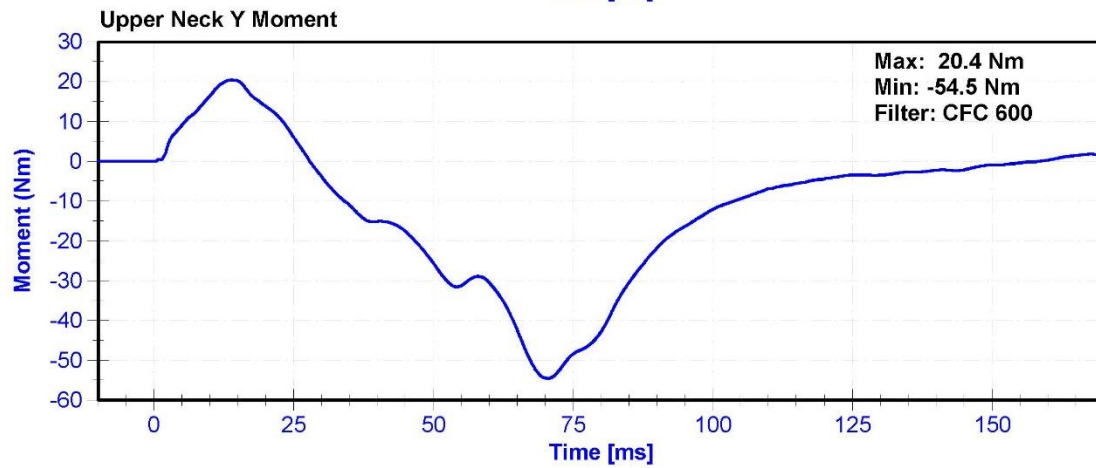
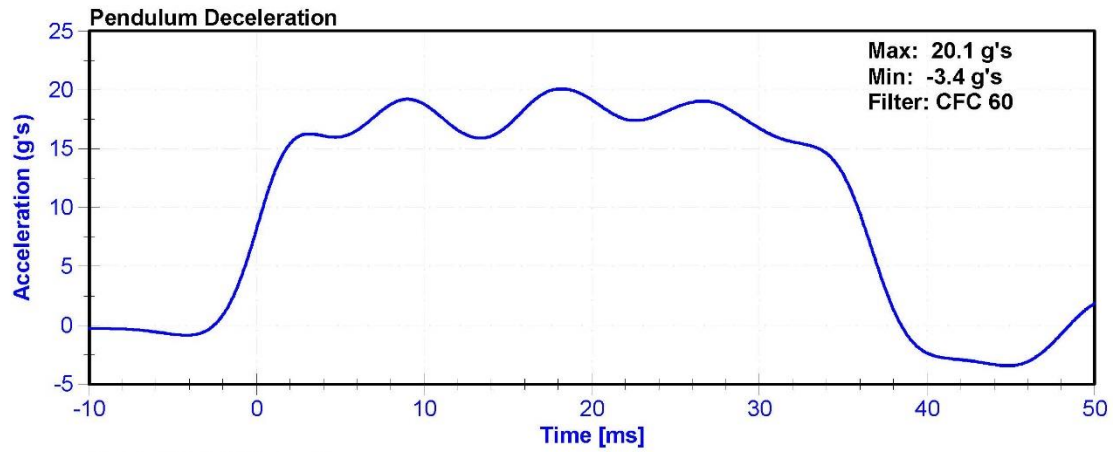
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	26.8	Pass
Velocity	5.95	6.19	m/s	6.025	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.59	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.36	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.14	Pass
D Plane Rotation	99	114	deg	111.5	Pass
Moment During Rotation Interval	-65	-53	Nm	-62.2	Pass
Moment Decay to -10Nm	94	114	ms	105.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	Denton 1716ATF	LC-2184 Fx	6/29/2015	6/28/2016







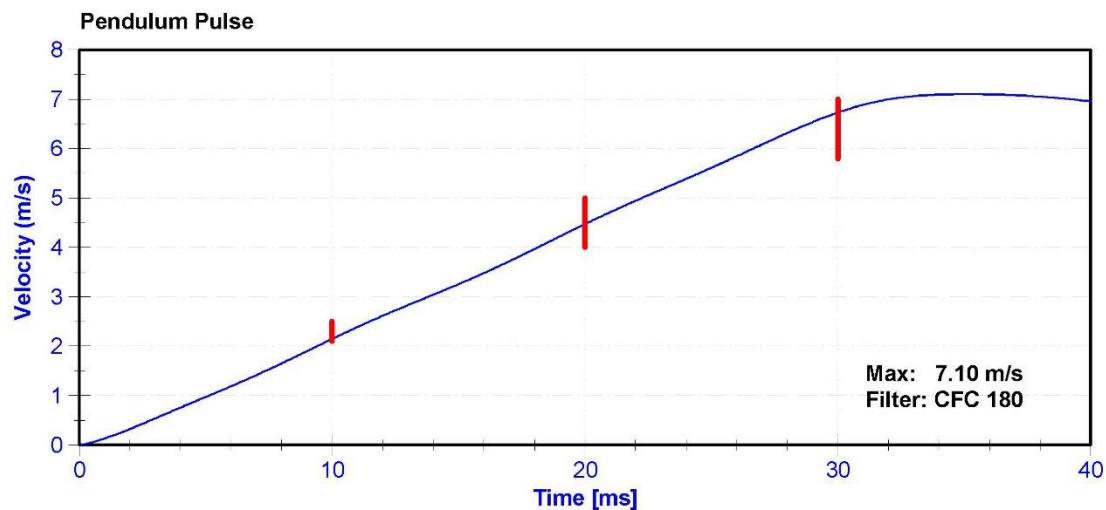
ATD Manufacturer	ASTC	Test Technician	M. Geesey
ATD Serial Number	019	Laboratory Supervisor	M. Goehle

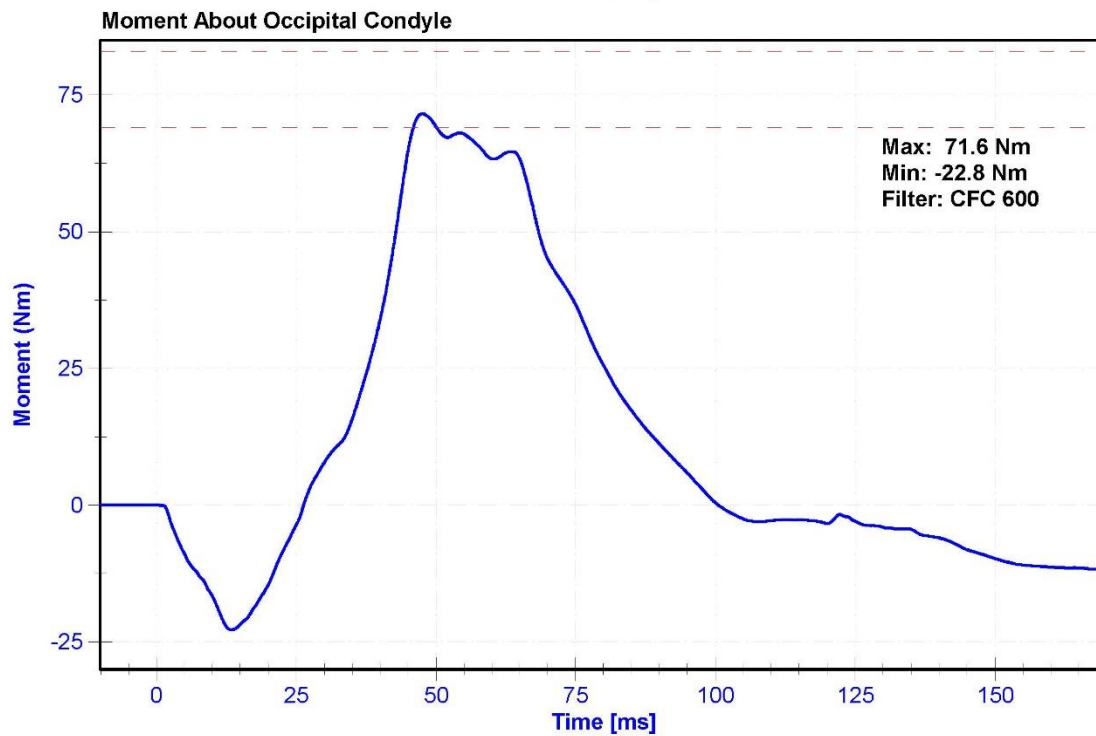
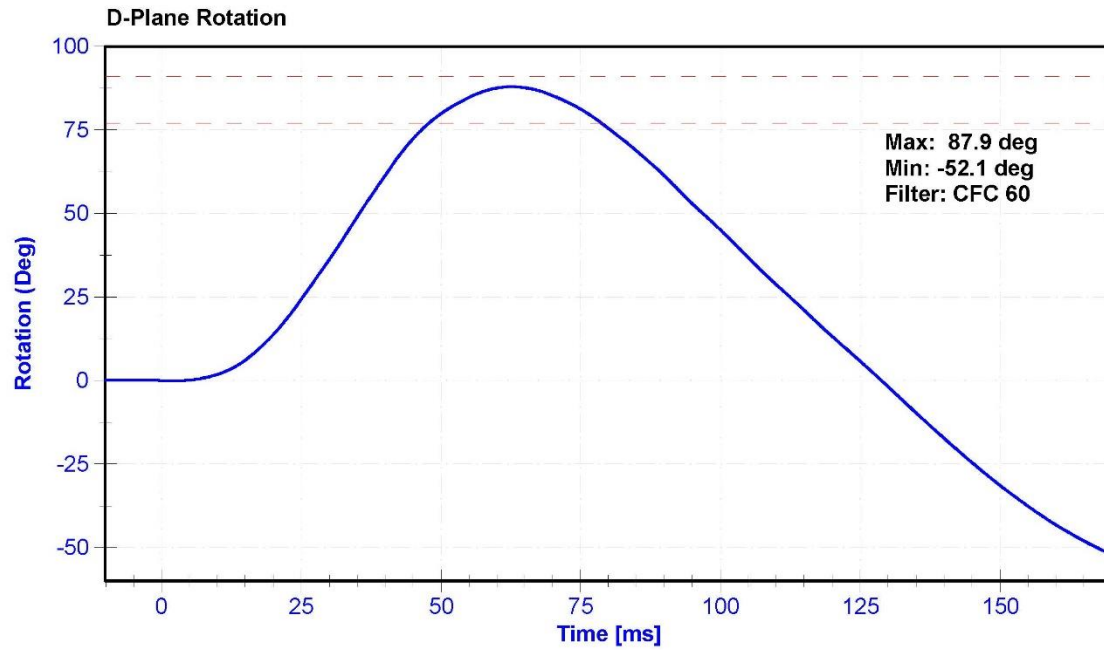
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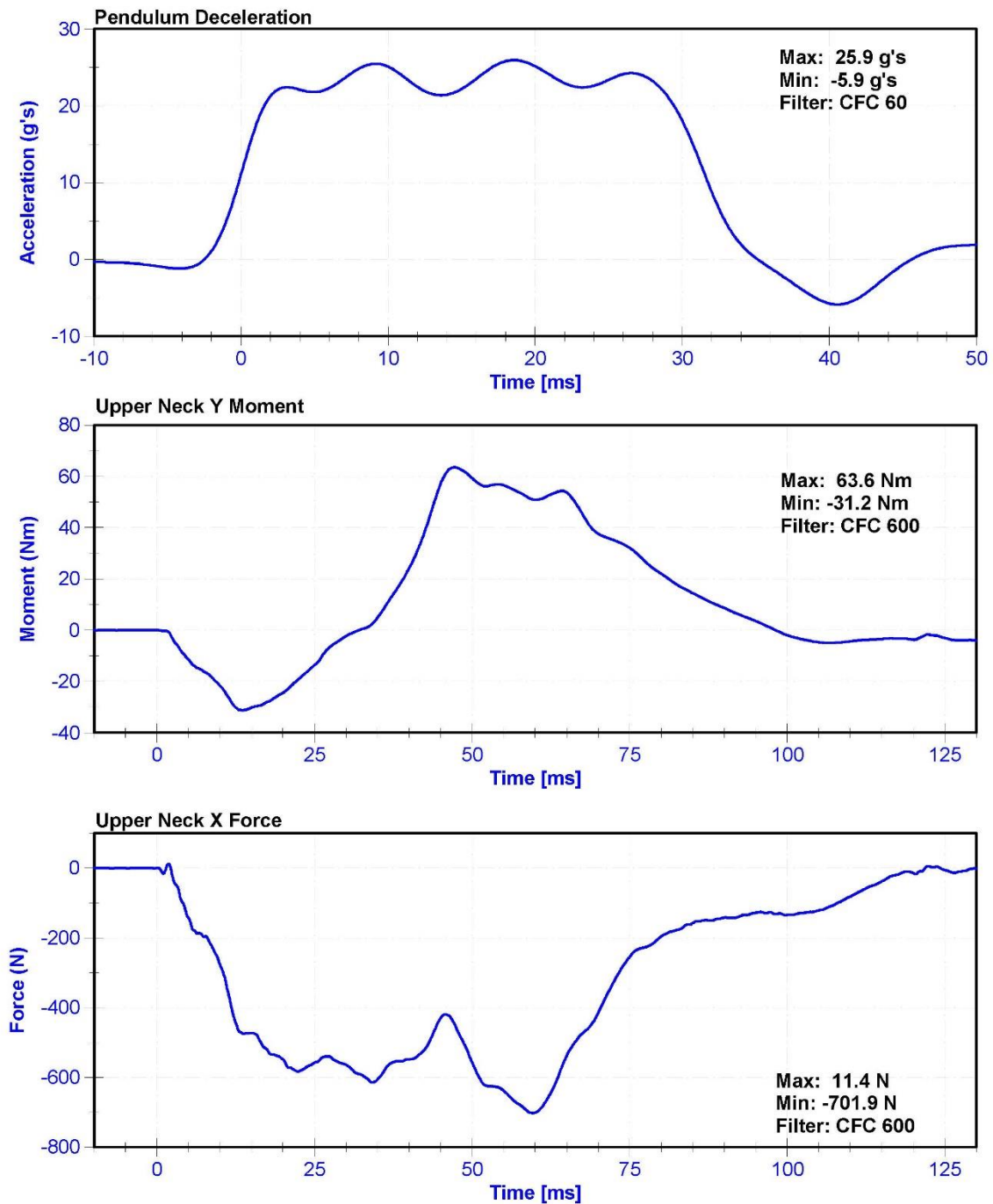
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	27.0	Pass
Velocity	6.89	7.13	m/s	6.979	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.15	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.47	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.73	Pass
Max D Plane Rotation	77	91	deg	87.9	Pass
Max Moment During Rotation Interval	69	83	Nm	71.6	Pass
Moment Decay to 10.0 Nm	80	100	ms	91.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	Denton 1716ATF	LC-2184 Fx	6/29/2015	6/28/2016







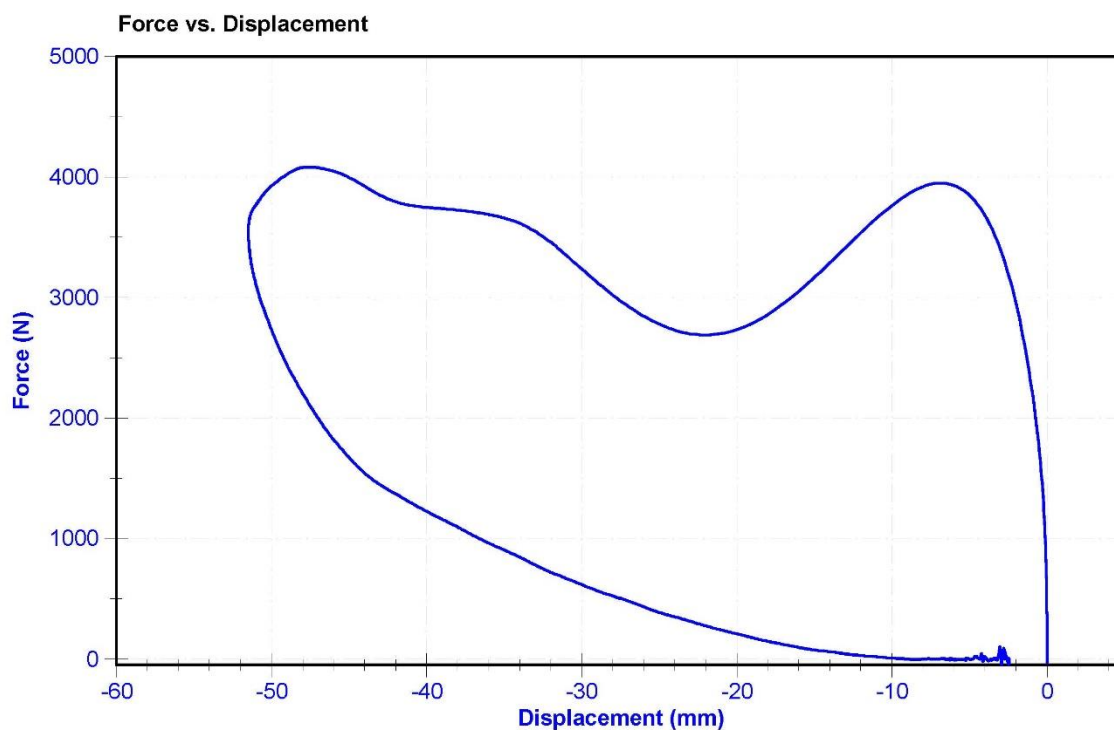
ATD Manufacturer	ASTC	Test Technician	M. Geesey
ATD Serial Number	019	Laboratory Supervisor	M. Goehle

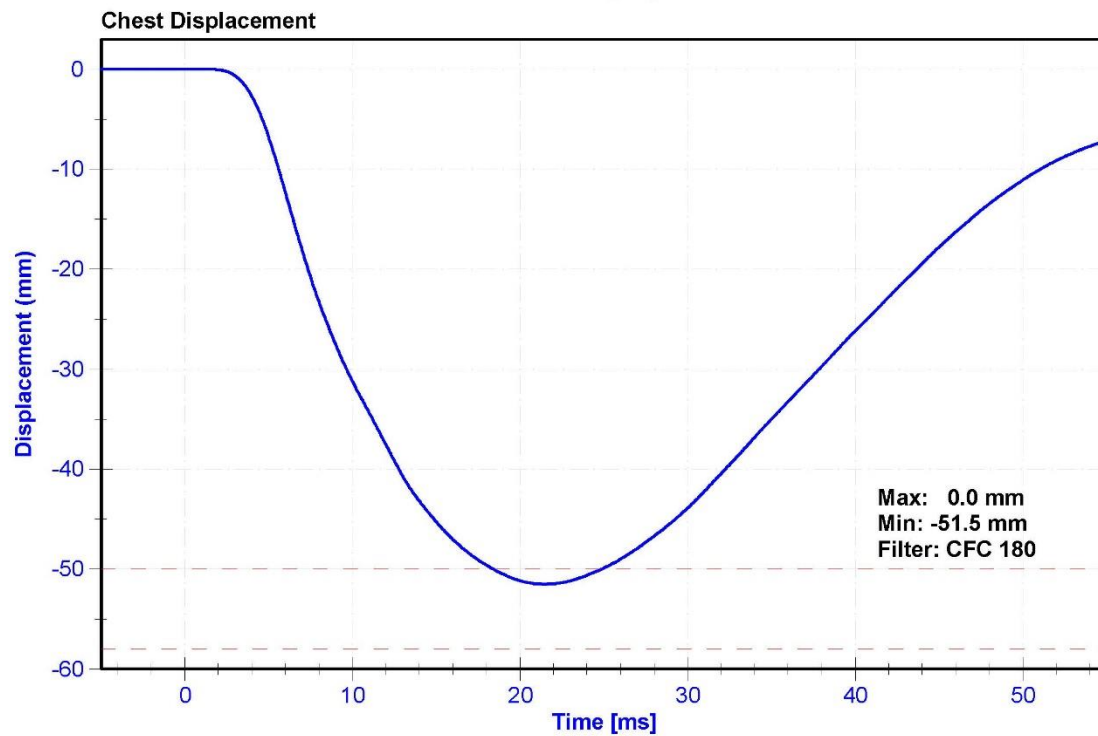
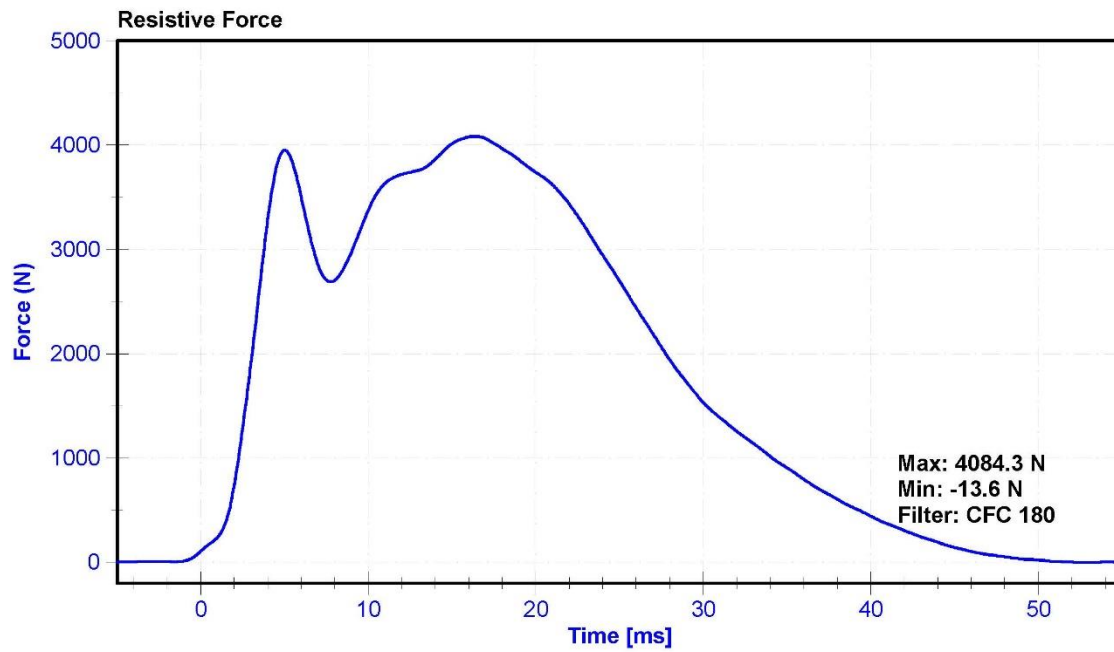
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	29.4	Pass
Velocity	6.59	6.83	m/s	6.743	Pass
Chest Deflection	-58	-50	mm	-51.5	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	3933.0	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4084.3	Pass
Hysteresis	69	85	%	79.4	Pass

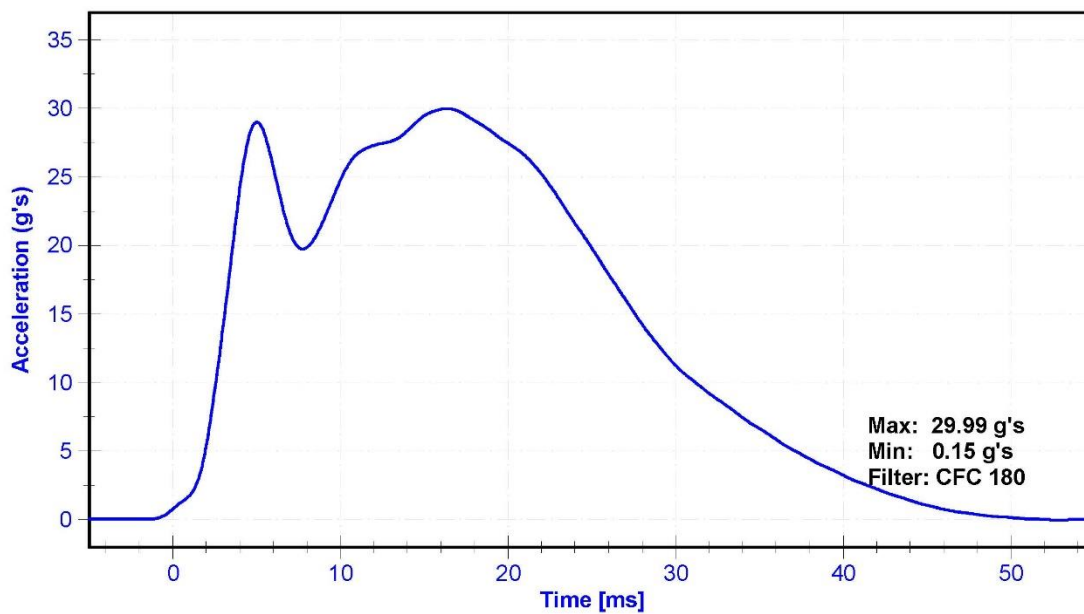
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Chest Potentiometer	Servo 14CB1	DS-FEM019	7/1/2015	6/30/2016

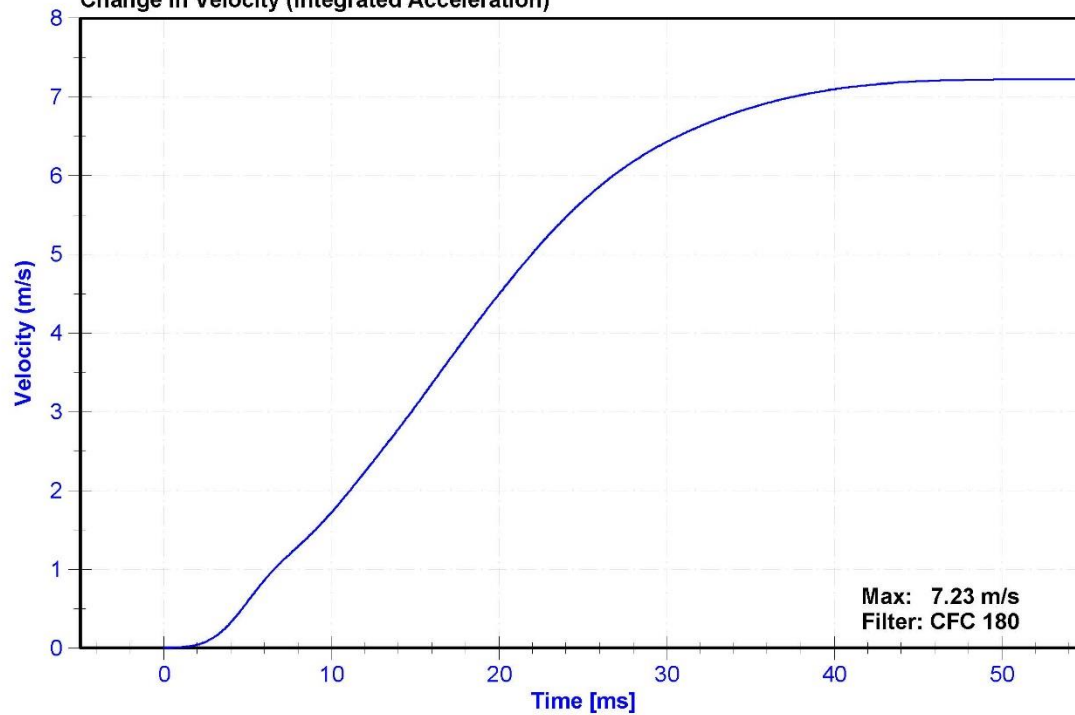




Probe Acceleration



Change in Velocity (Integrated Acceleration)



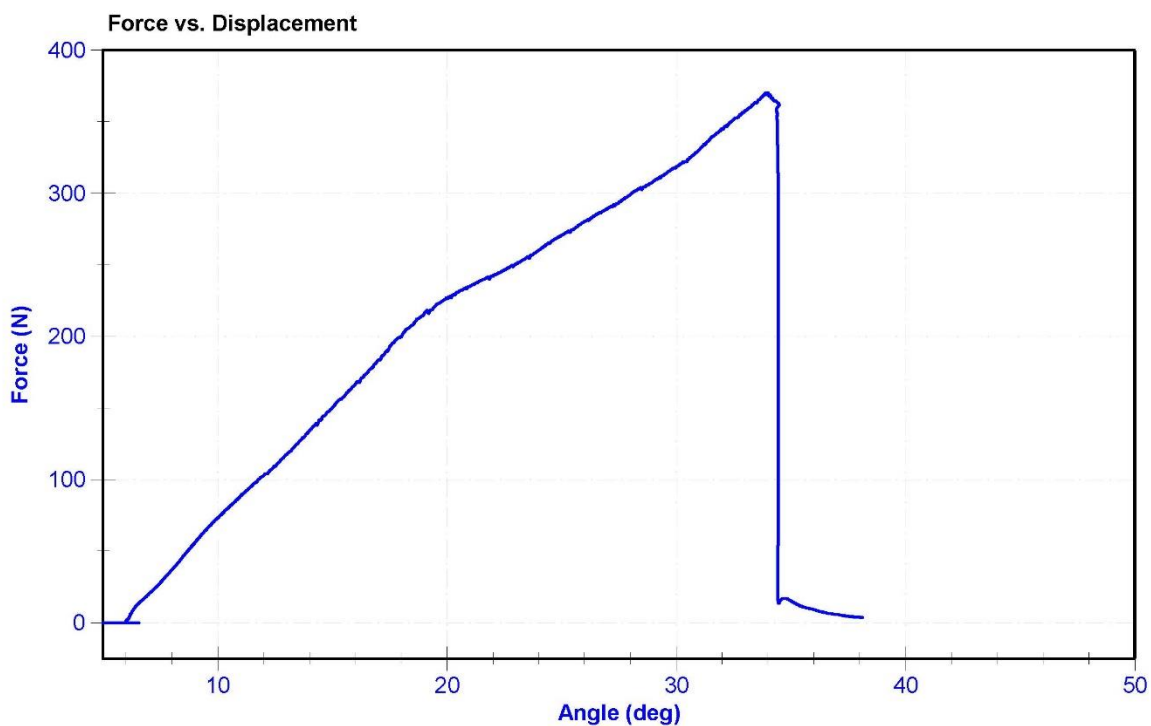
ATD Manufacturer	ASTC	Test Technician	M. Geesey
ATD Serial Number	019	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.7	Pass
Humidity	10	70	%	26	Pass
Initial Angle	0	20	deg	5.9	Pass
Force at 45 Degrees	320	390	N	370.2	Pass
Return Angle Relative to Initial	0	8	deg	6.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker N4C-1	DS-13051548	8/14/2015	8/13/2016
Load Cell	Interface SML-200	LC-493319	8/13/2015	8/12/2016



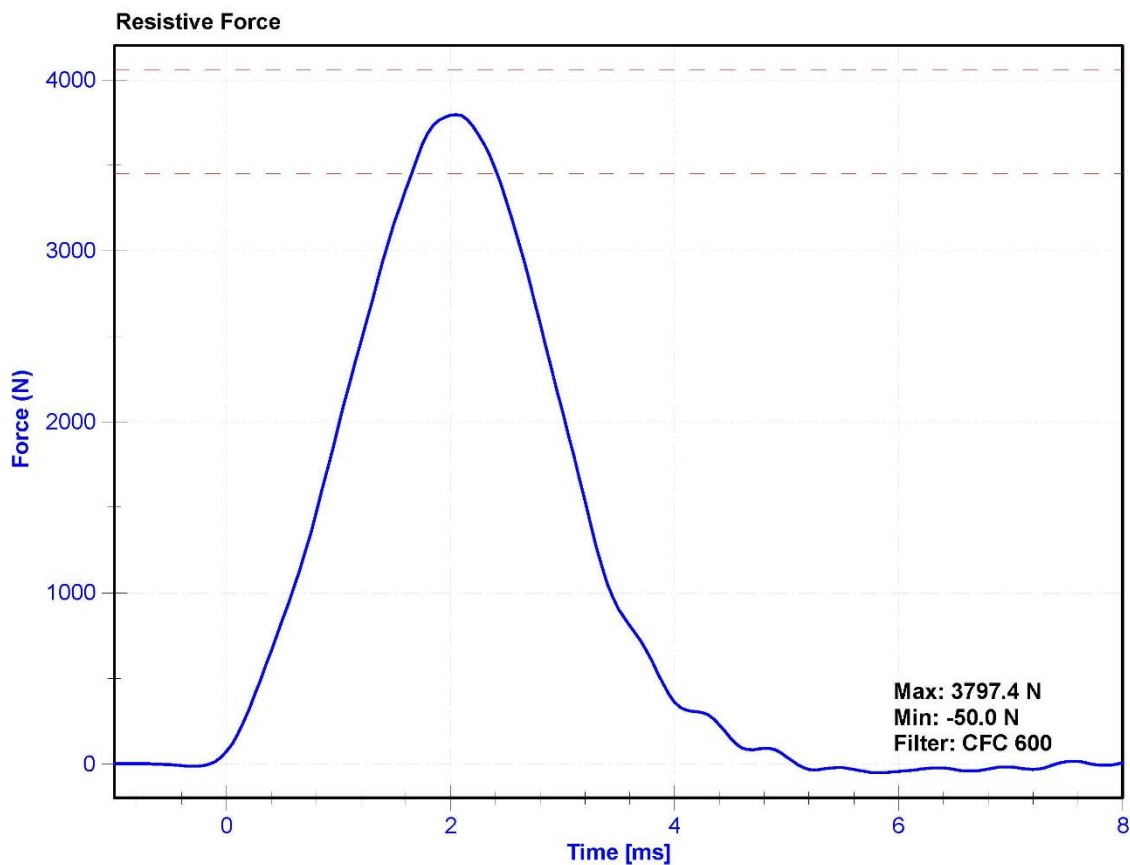
ATD Manufacturer	ASTC	Test Technician	M. Geesey
ATD Serial Number	019	Laboratory Supervisor	M. Goehle

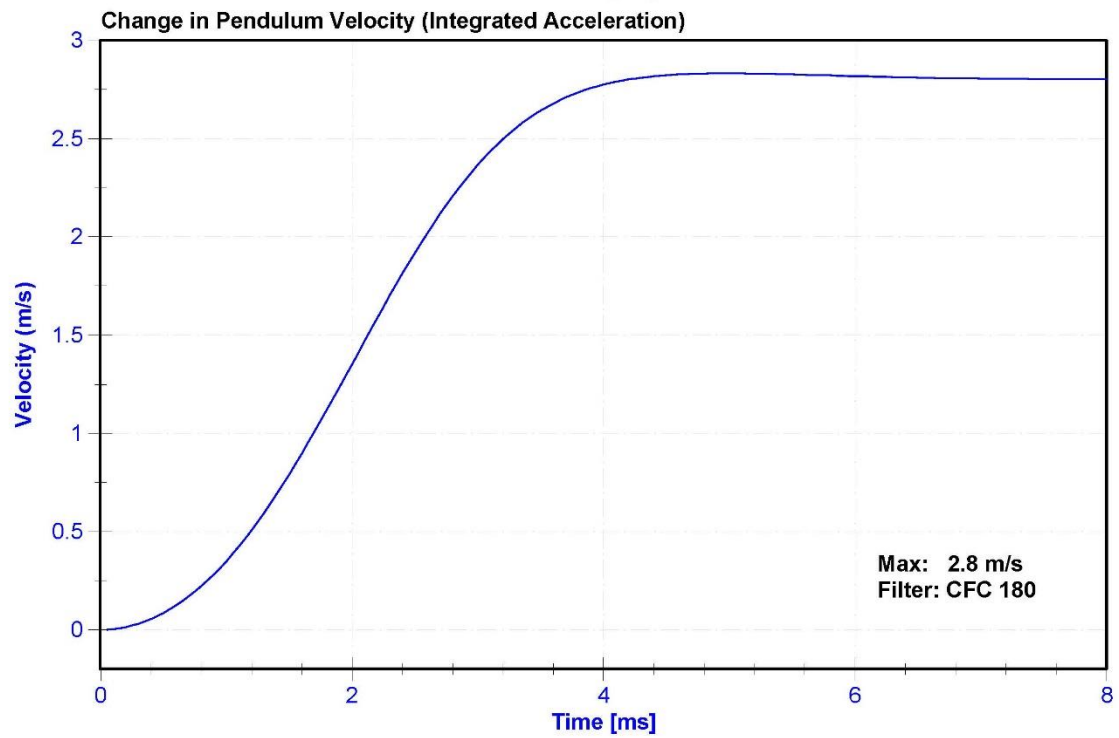
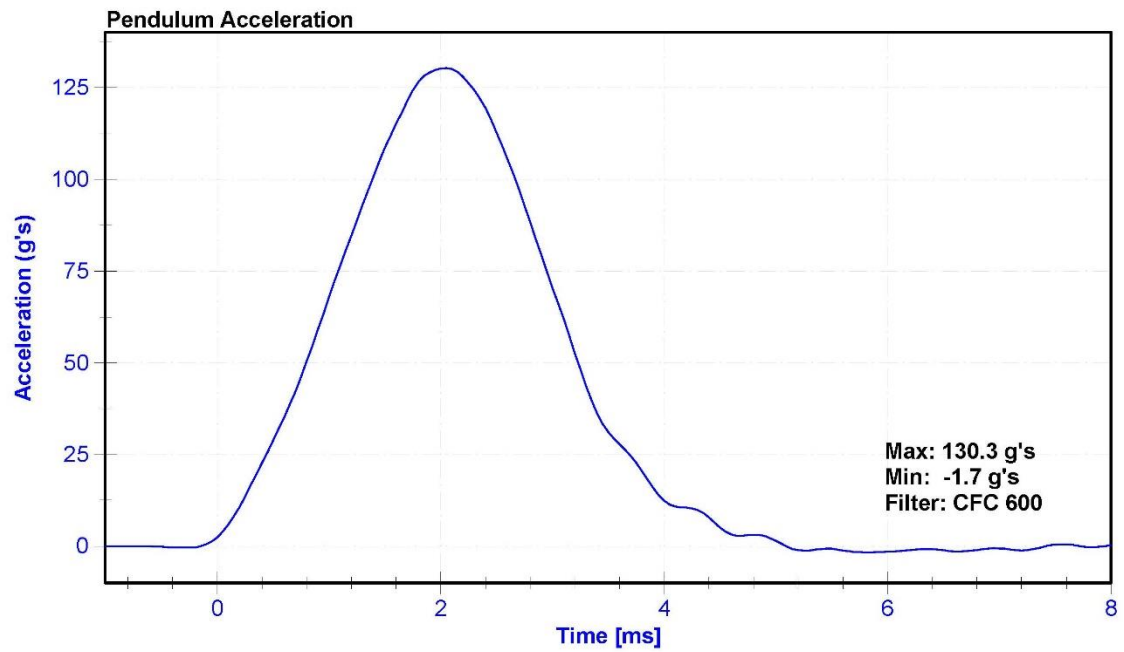
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.3	Pass
Humidity	10	70	%	28.8	Pass
Velocity	2.07	2.13	m/s	2.075	Pass
Resistive Force	3450	4060	N	3797.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016





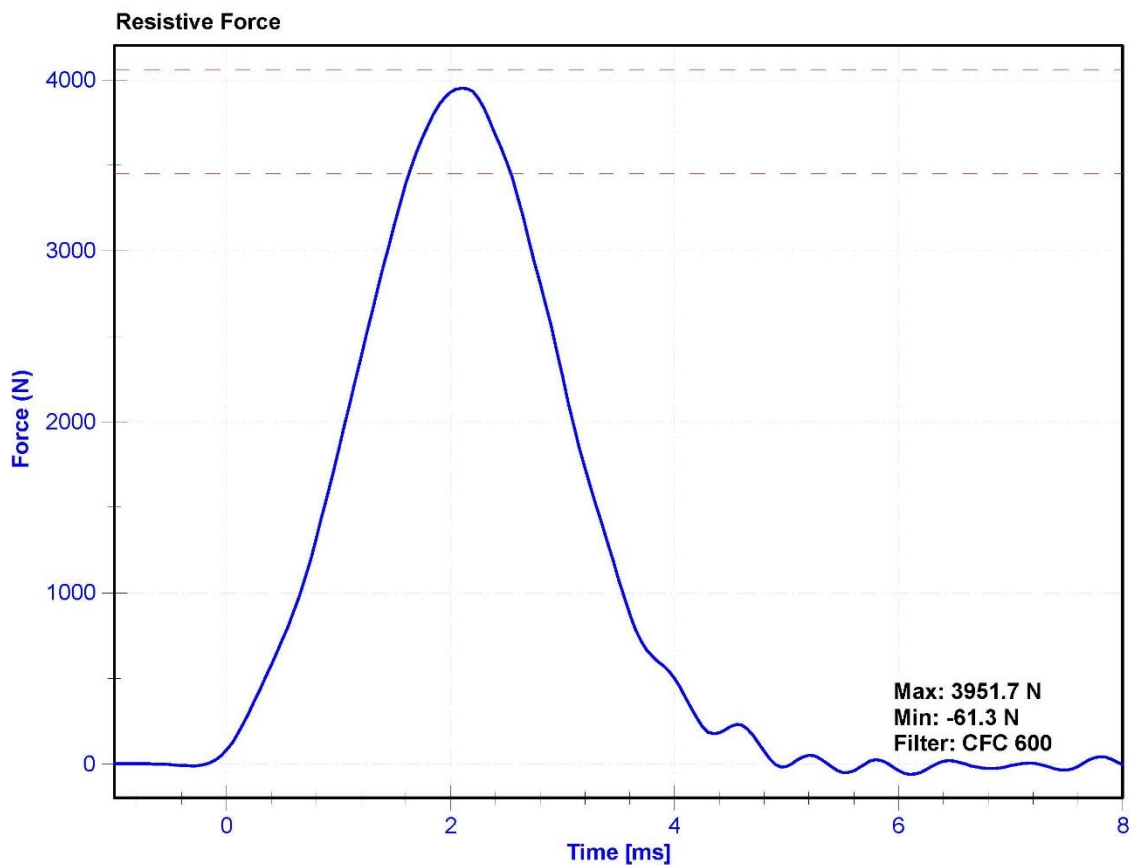
ATD Manufacturer	ASTC	Test Technician	M. Geesey
ATD Serial Number	019	Laboratory Supervisor	M. Goehle

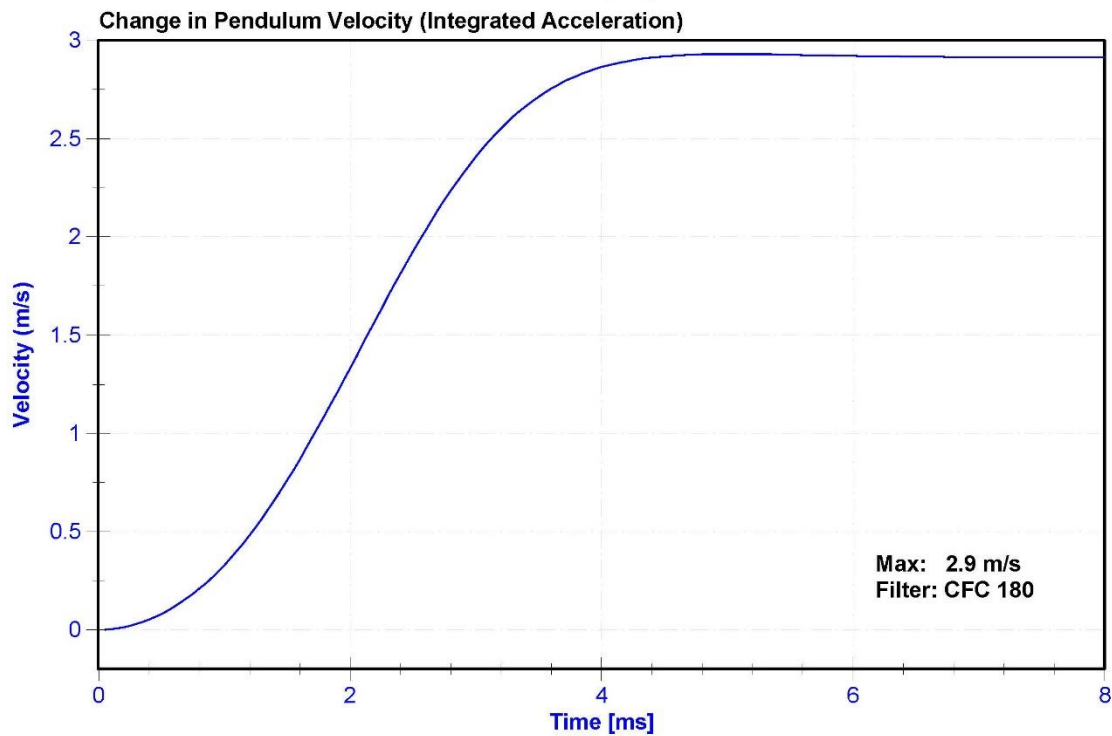
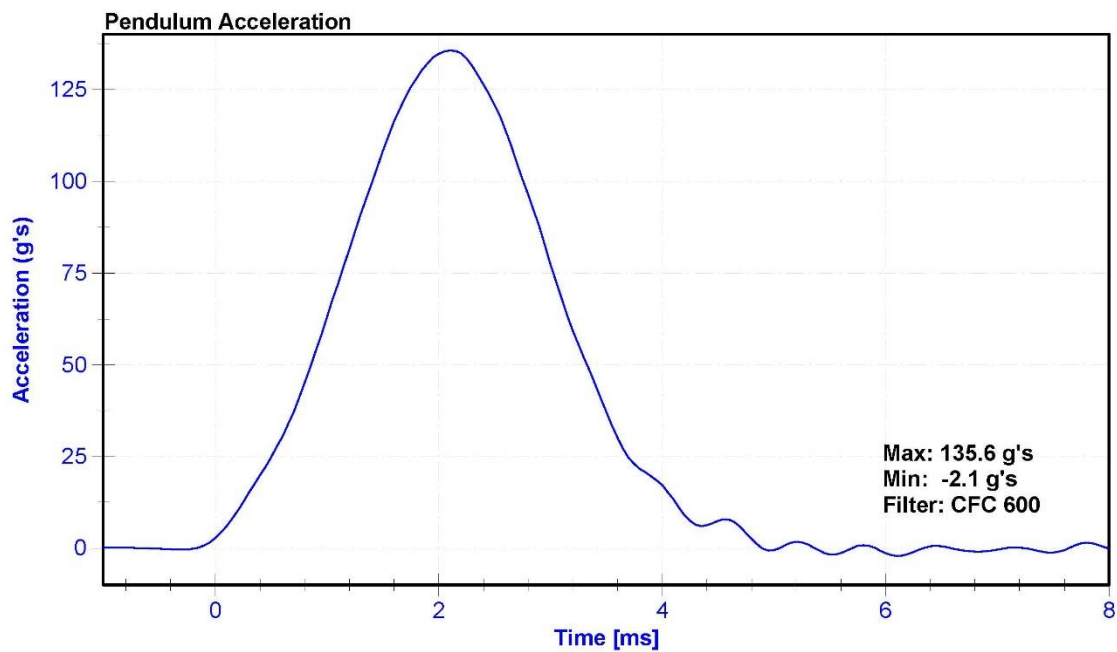
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.3	Pass
Humidity	10	70	%	28.8	Pass
Velocity	2.07	2.13	m/s	2.105	Pass
Resistive Force	3450	4060	N	3951.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016





Hybrid III 5th Female 324 DUMMY CALIBRATIONS

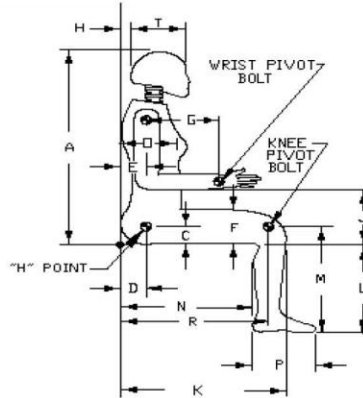
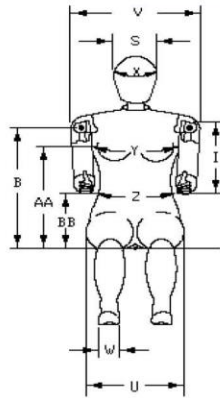


External Measurements - Hybrid 3 - 5th Female

Technician: M. Goehle

Date: 1/23/2016

Dummy Serial Number: 324



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	782	Pass
B	Shoulder Pivot Height	432	457	444	Pass
C	H-Point Height	81	86	86	Pass
D	H-Point from Backline	145	150	148	Pass
E	Shoulder Pivot from Backline	69	84	81	Pass
F	Thigh Clearance	119	135	130	Pass
G	Back of Elbow to Wrist Pivot	244	259	247	Pass
H	Head Back to Backline	43	48	45	Pass
I	Shoulder to Elbow Length	277	297	285	Pass
J	Elbow Rest Height	183	203	189	Pass
K	Buttock to Knee Length	521	546	530	Pass
L	Popliteal Height	356	376	366	Pass
M	Knee Pivot Height	394	419	411	Pass
N	Buttock Popliteal Length	414	439	430	Pass
O	Chest Depth without Jacket	175	191	182	Pass
P	Foot Length (right)	219	234	224	Pass
R	Buttock To Knee Pivot Length	457	483	474	Pass
S	Head Breadth	137	147	142	Pass
T	Head Depth	178	188	181	Pass
U	Hip Breadth	300	315	307	Pass
V	Shoulder Breadth	351	366	355	Pass
W	Foot Breadth	79	94	84	Pass
X	Head Circumference	528	549	536	Pass
Y	Chest Circumference with Jacket	851	881	867	Pass
Z	Waist Circumference	460	790	775	Pass
AA	Reference Location (Chest Circumference)	333	358	346	Pass
BB	Reference Location (Waist Circumference)	160	170	166	Pass

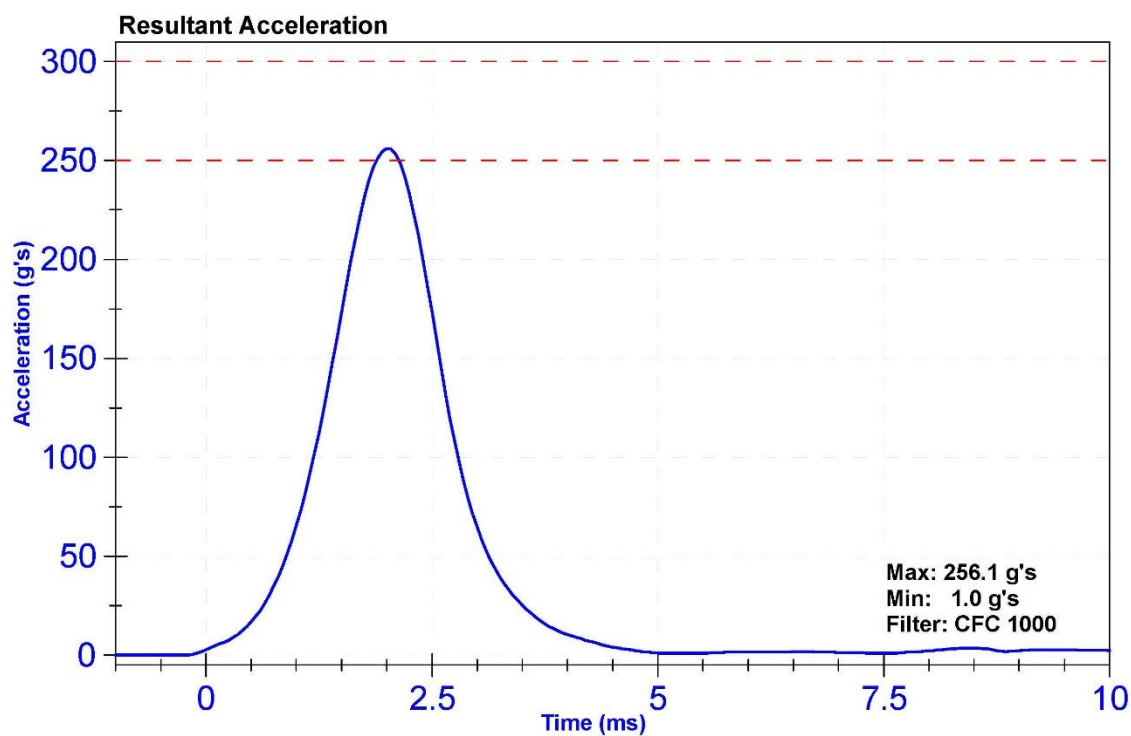
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

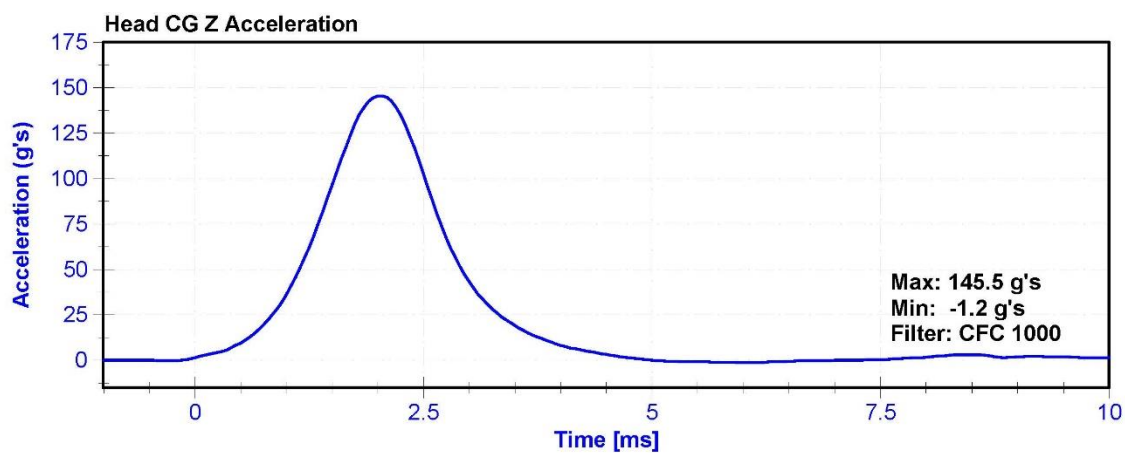
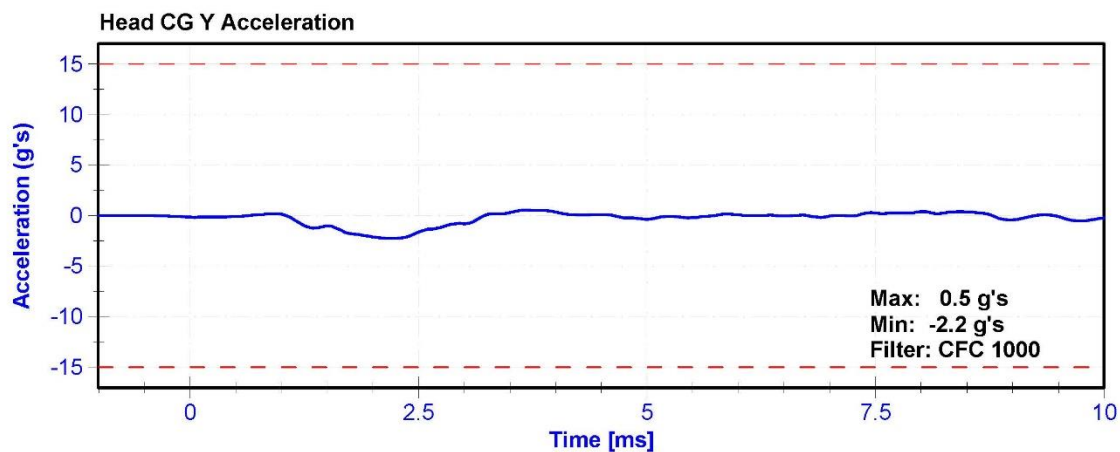
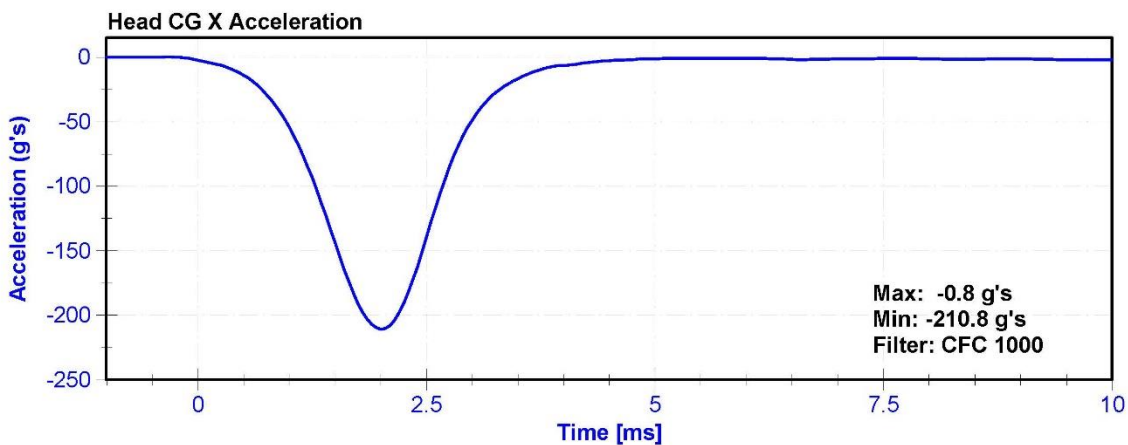
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	15.3	Pass
Resultant Acceleration	250	300	g's	256.1	Pass
Oscillation	0	10	%	1.3	Pass
Lateral Acceleration	-15	15	g's	-2.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco 7264C	AC-P72219	12/8/2015	6/7/2016
Y Accelerometer	Endevco 7264C	AC-P49160	12/8/2015	6/7/2016
Z Accelerometer	Endevco 7264	AC-P78168	12/8/2015	6/7/2016





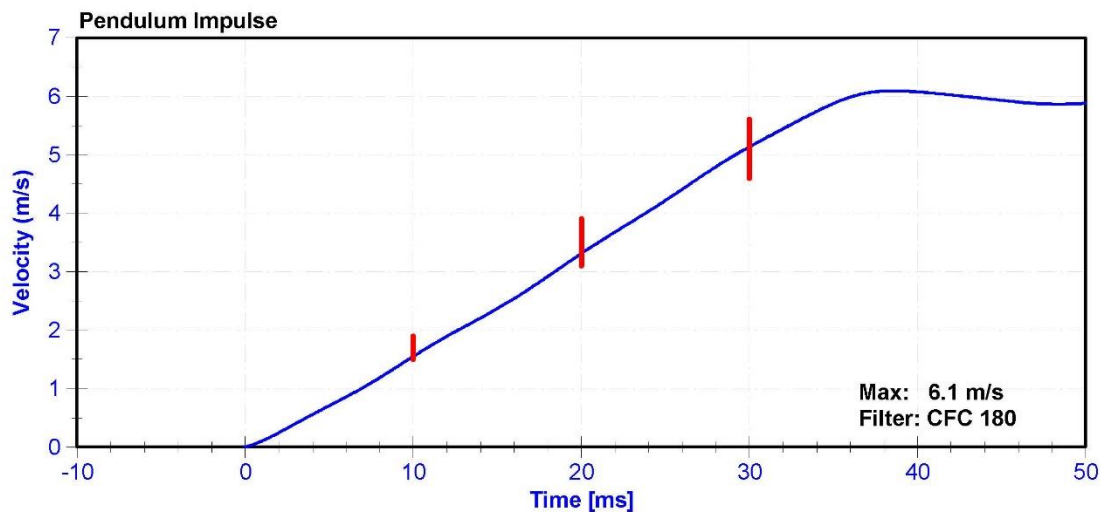
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

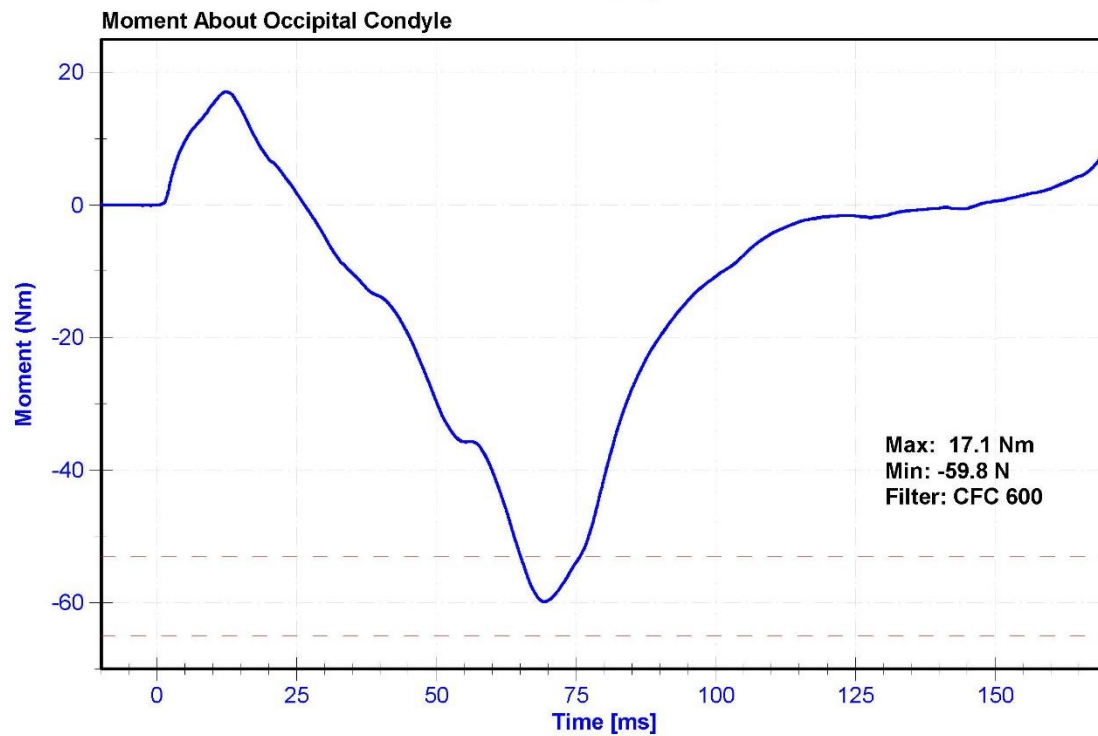
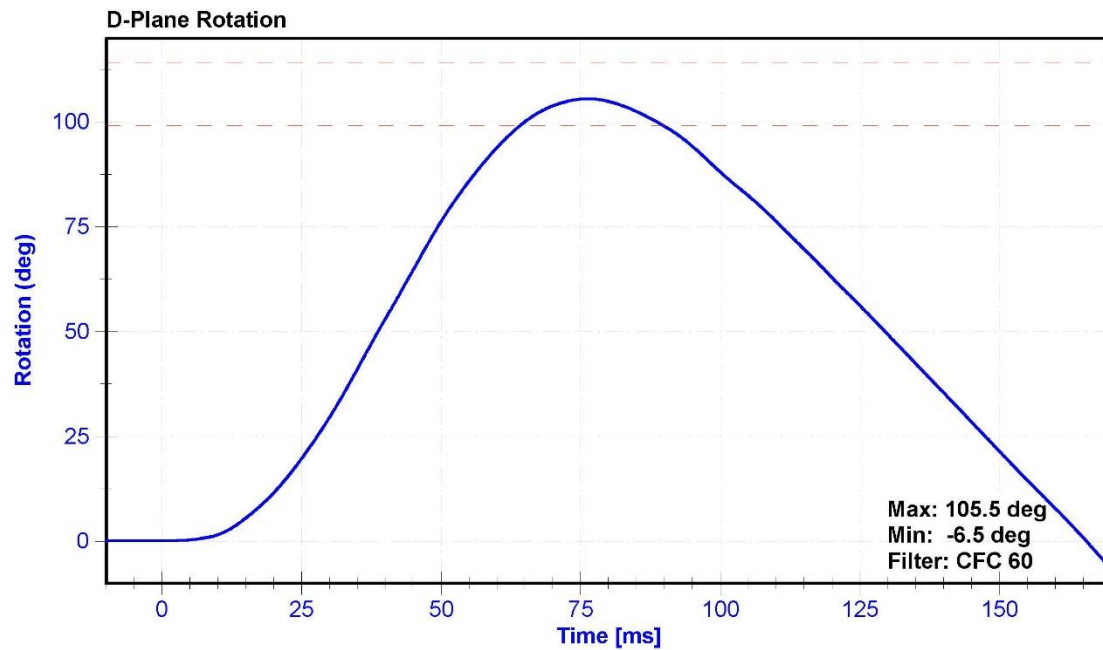
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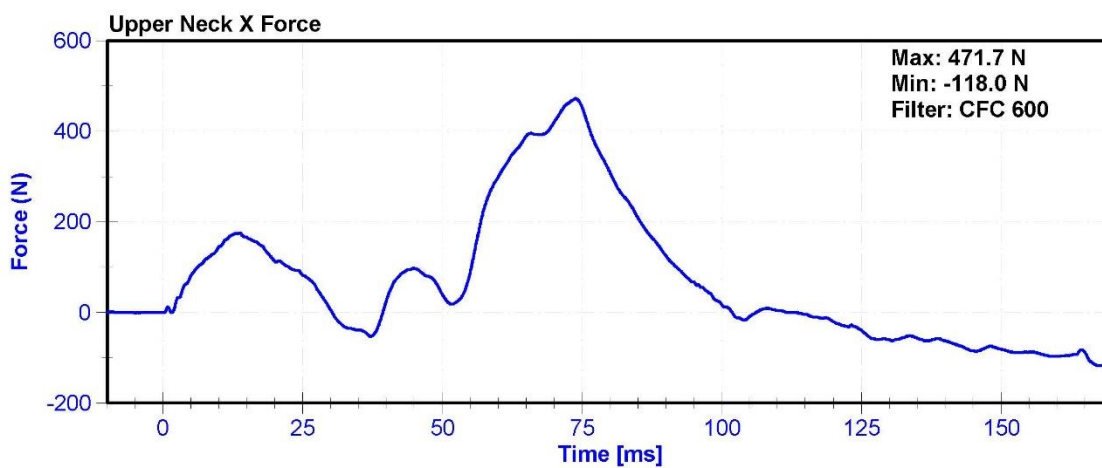
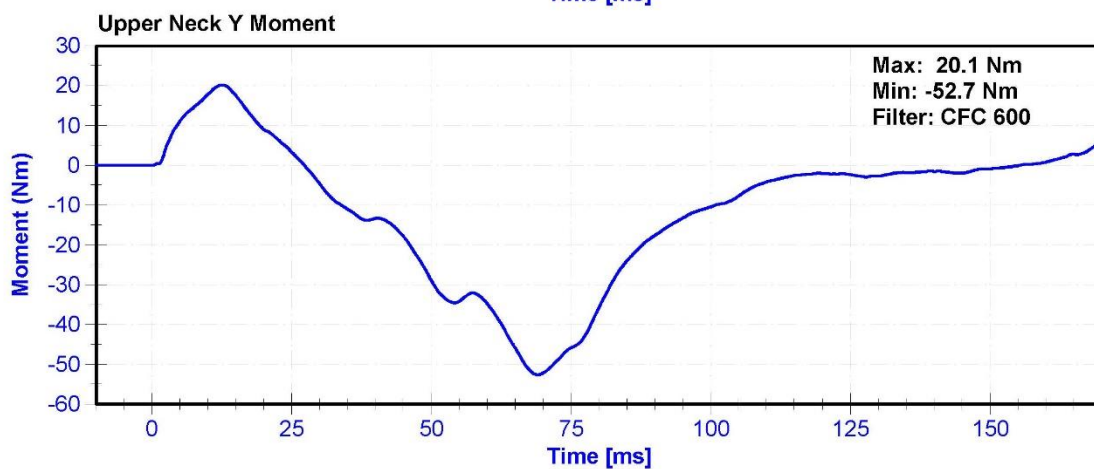
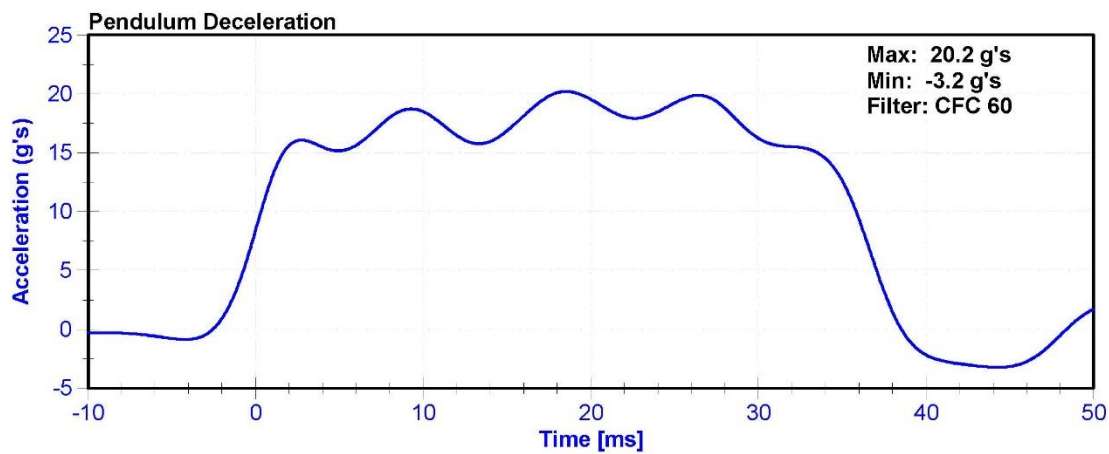
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	15.3	Pass
Velocity	5.95	6.19	m/s	5.982	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.55	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.31	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.14	Pass
D Plane Rotation	99	114	deg	105.5	Pass
Moment During Rotation Interval	-65	-53	Nm	-59.8	Pass
Moment Decay to -10Nm	94	114	ms	101.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716	LC-2254 Fx	12/17/2015	12/16/2016







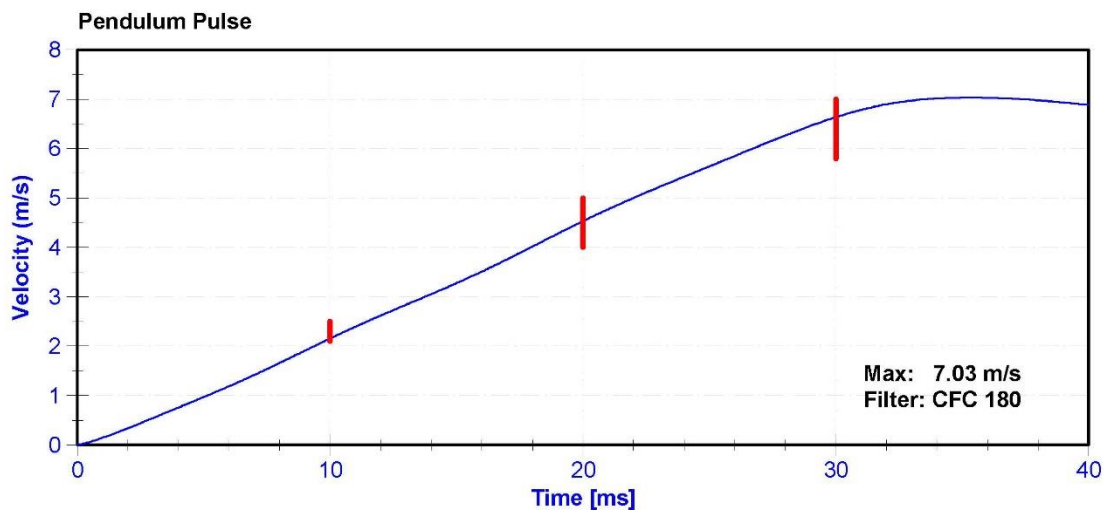
ATD Manufacturer	FTSS	Test Technician	M. Goehle
ATD Serial Number	324	Laboratory Supervisor	M. Goehle

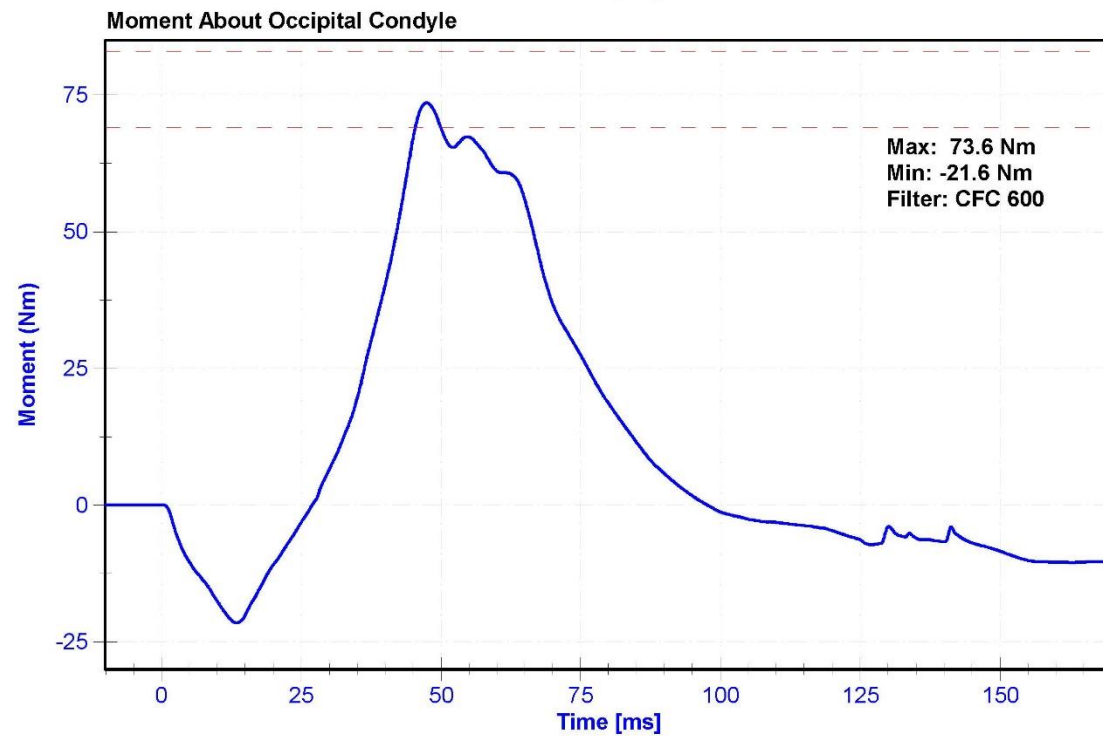
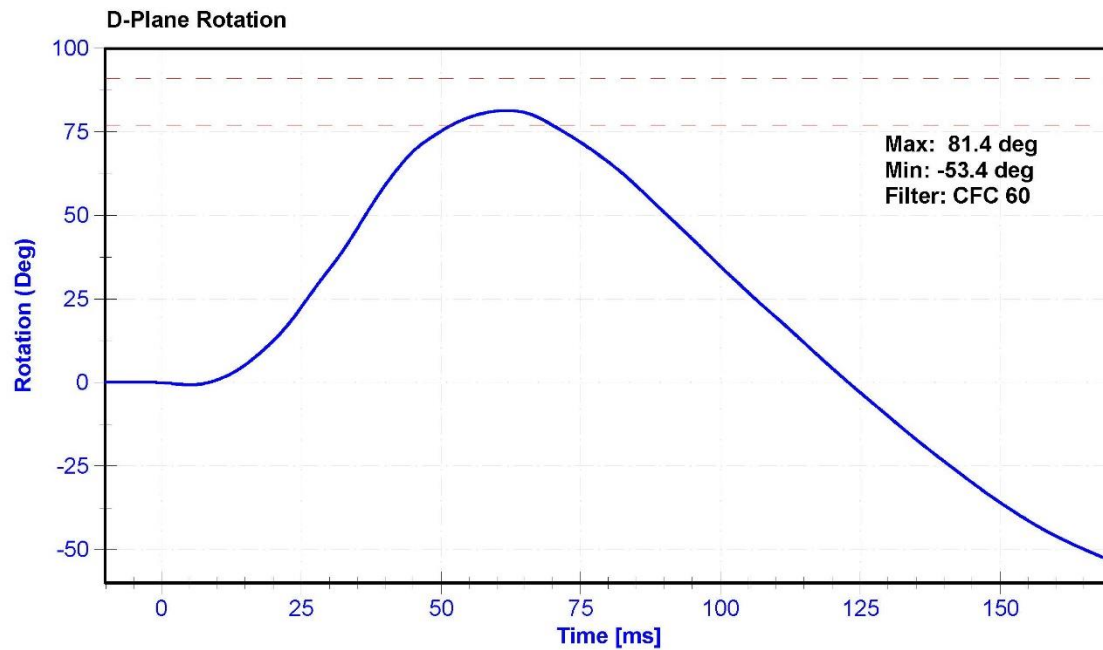
Results

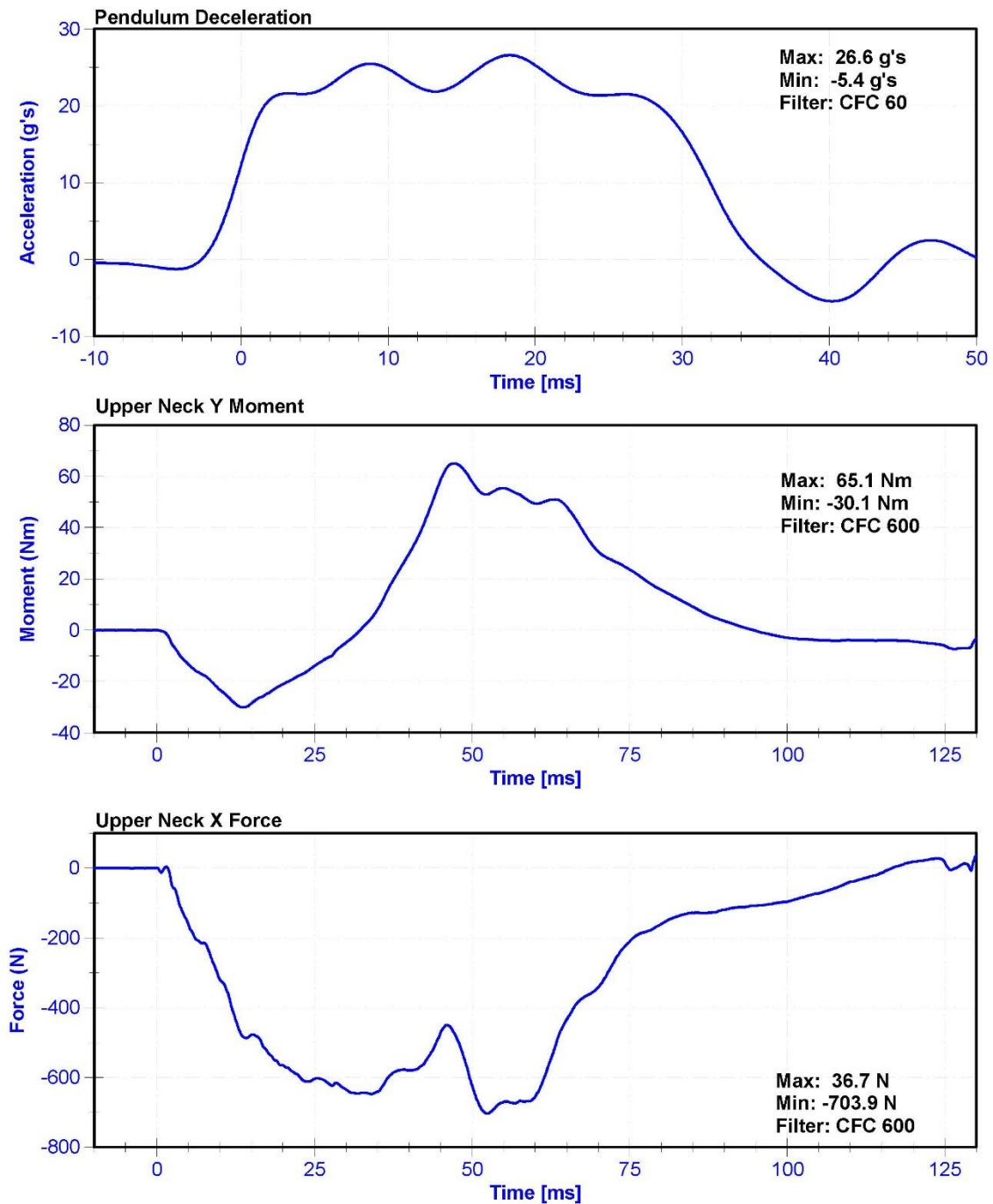
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	16.9	Pass
Velocity	6.89	7.13	m/s	7.037	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.16	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.53	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.63	Pass
Max D Plane Rotation	77	91	deg	81.4	Pass
Max Moment During Rotation Interval	69	83	Nm	73.6	Pass
Moment Decay to 10.0 Nm	80	100	ms	86.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716	LC-2254 Fx	12/17/2015	12/16/2016







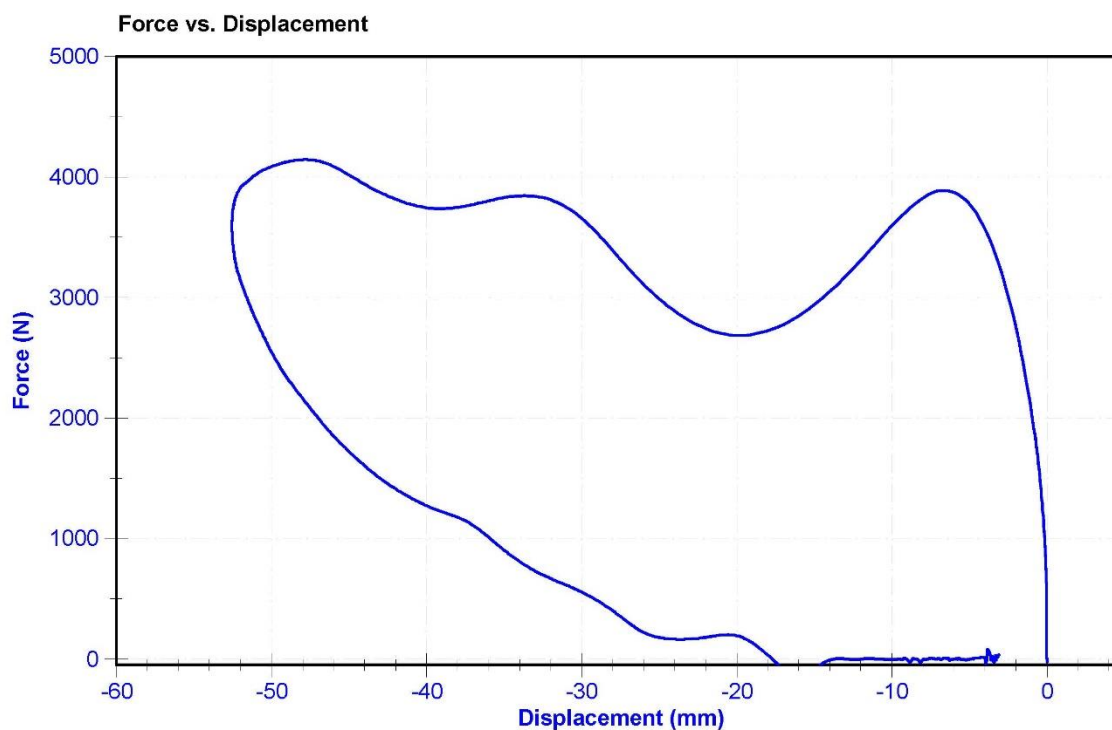
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

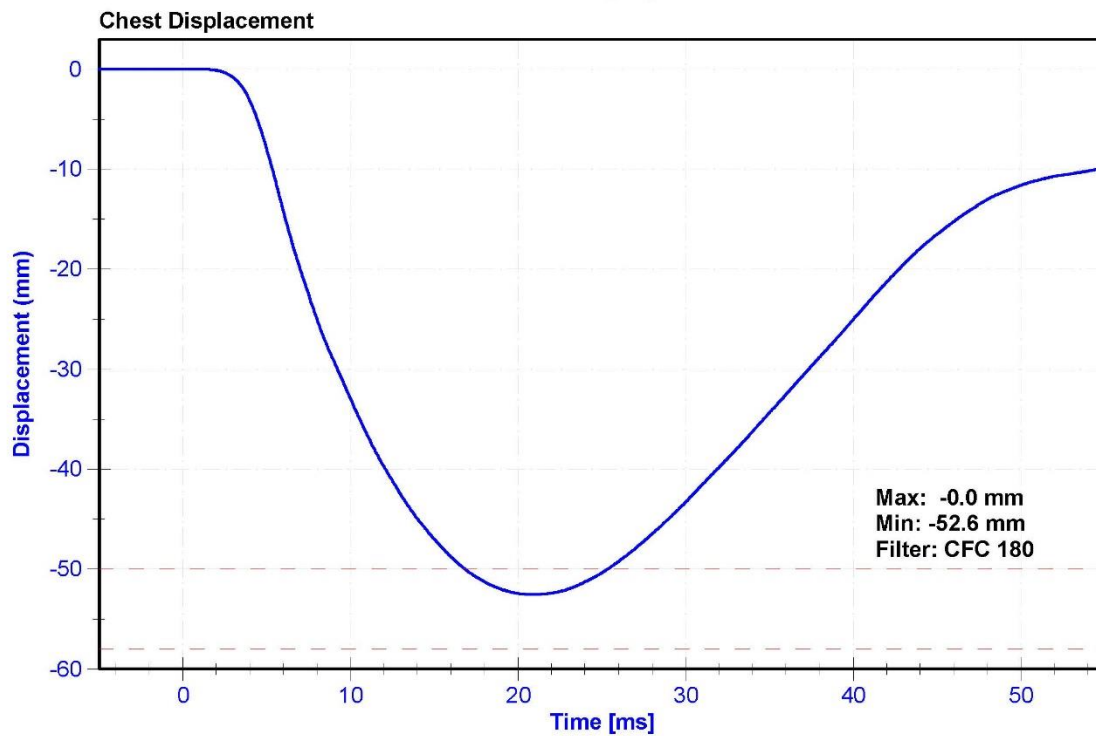
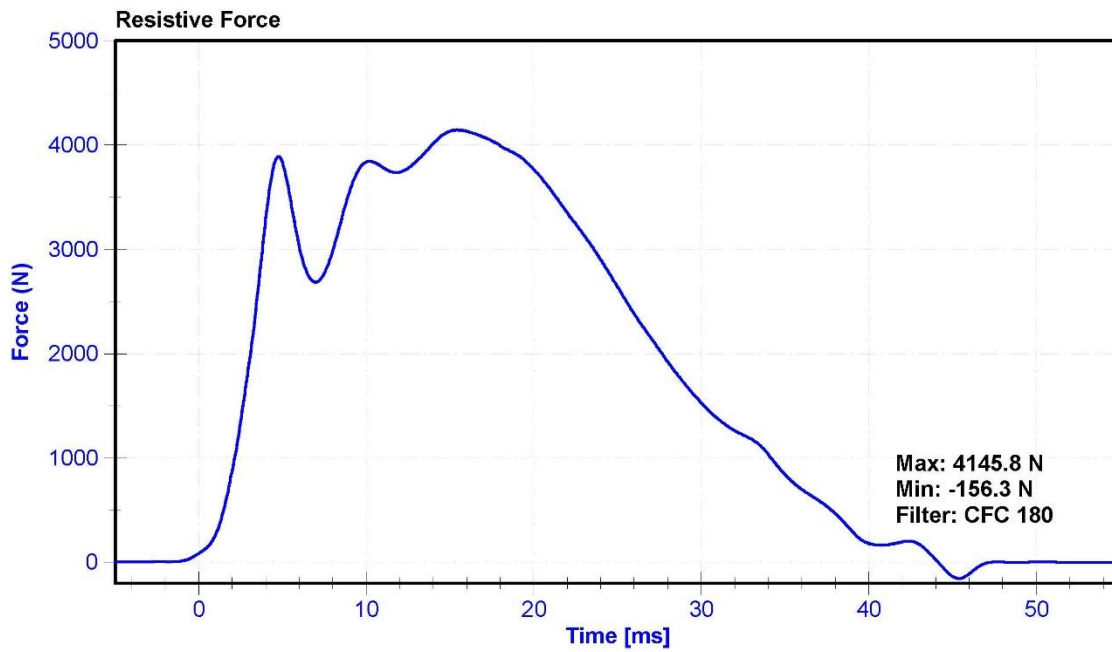
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	19.8	Pass
Velocity	6.59	6.83	m/s	6.684	Pass
Chest Deflection	-58	-50	mm	-52.6	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4089.7	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4145.8	Pass
Hysteresis	69	85	%	79.4	Pass

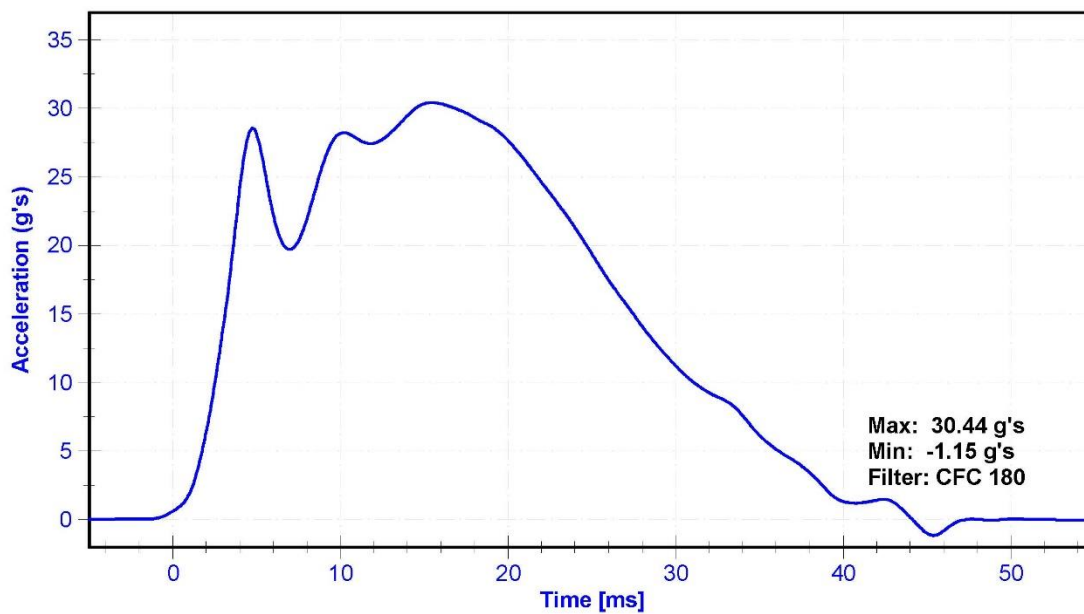
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016
Chest Potentiometer	Servo 14CB1	DS-CST324	6/30/2015	6/29/2016

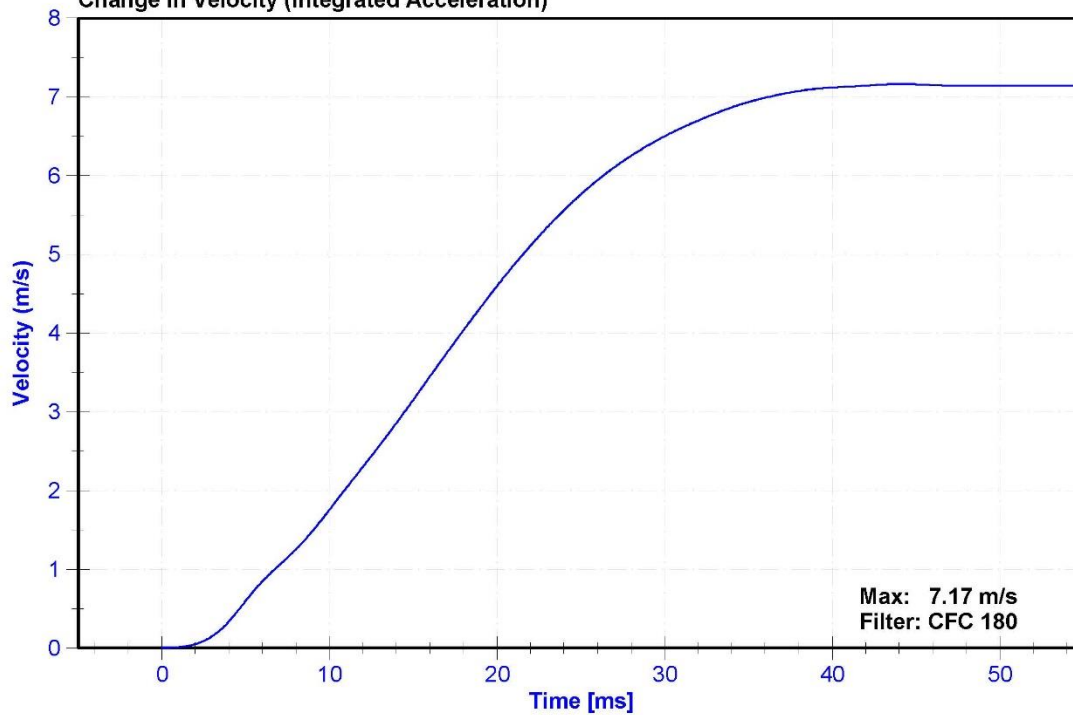




Probe Acceleration



Change in Velocity (Integrated Acceleration)



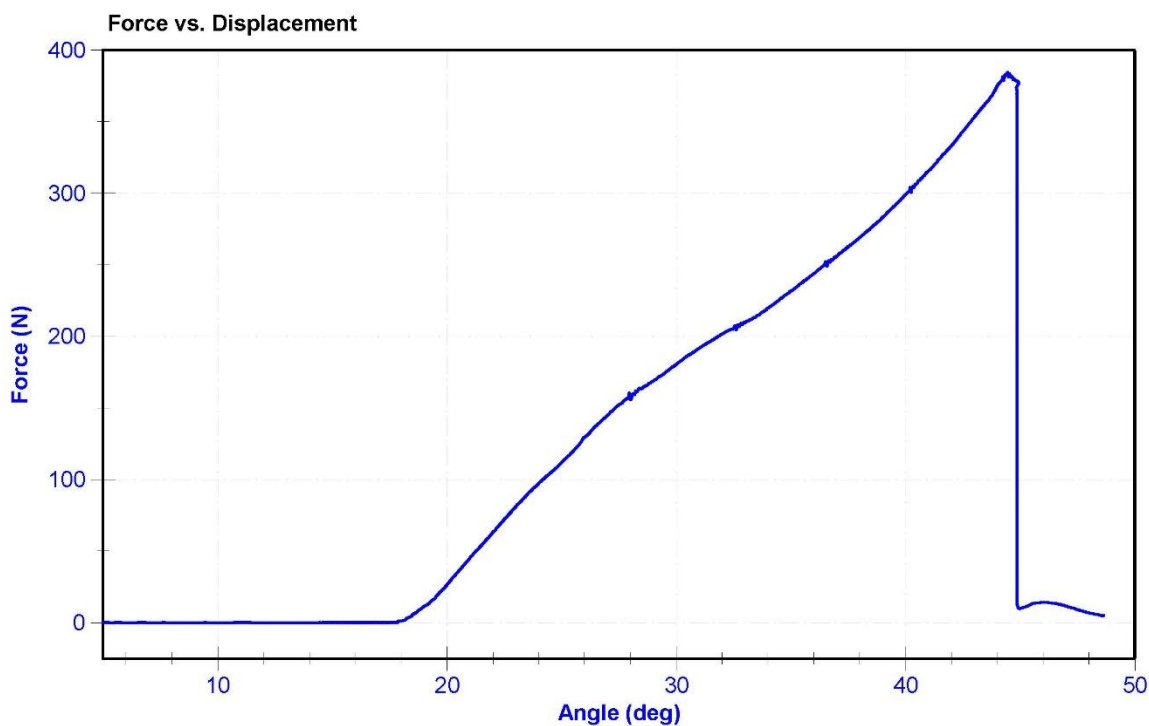
ATD Manufacturer	Humanetics	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M.Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	22.2	Pass
Humidity	10	70	%	15.3	Pass
Initial Angle	0	20	deg	16.0	Pass
Force at 45 Degrees	320	390	N	384.5	Pass
Return Angle Relative to Initial	0	8	deg	8.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker N4C-1	DS-13051548	8/14/2015	8/13/2016
Load Cell	Interface SML-200	LC-493319	8/13/2015	8/12/2016



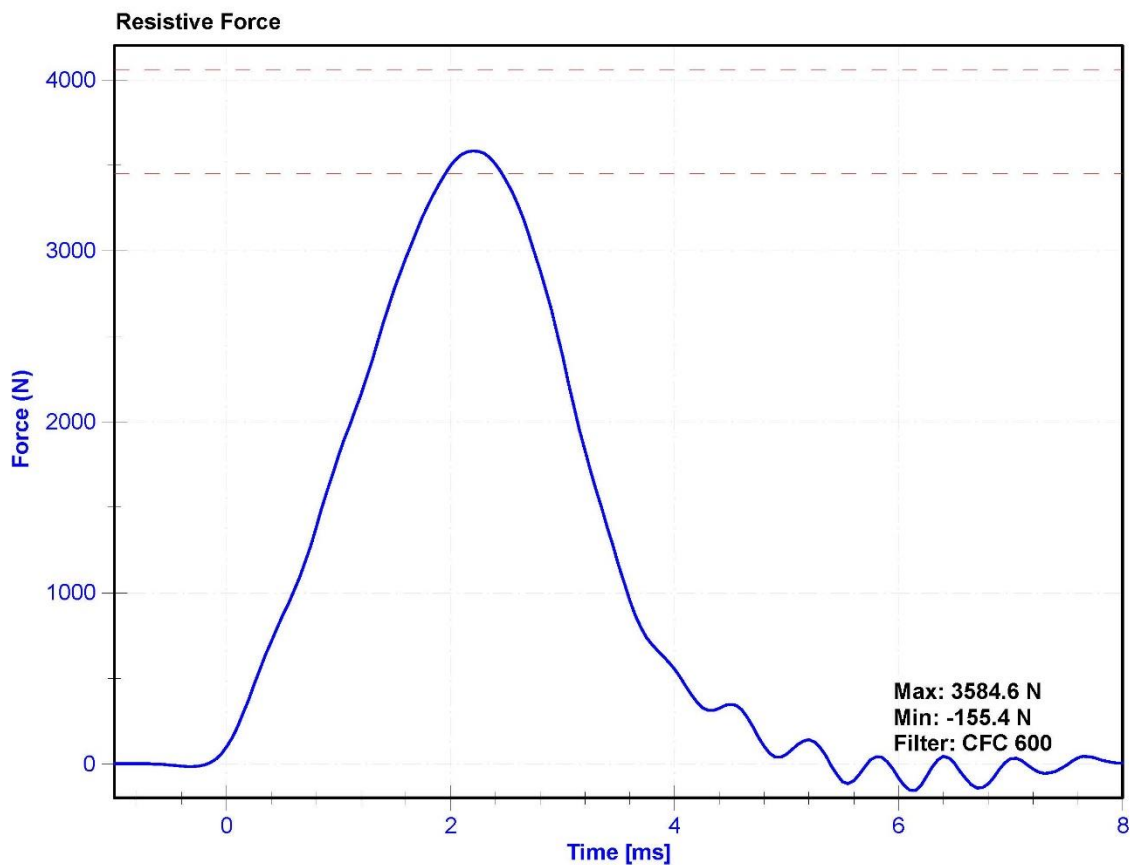
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M. Goehle

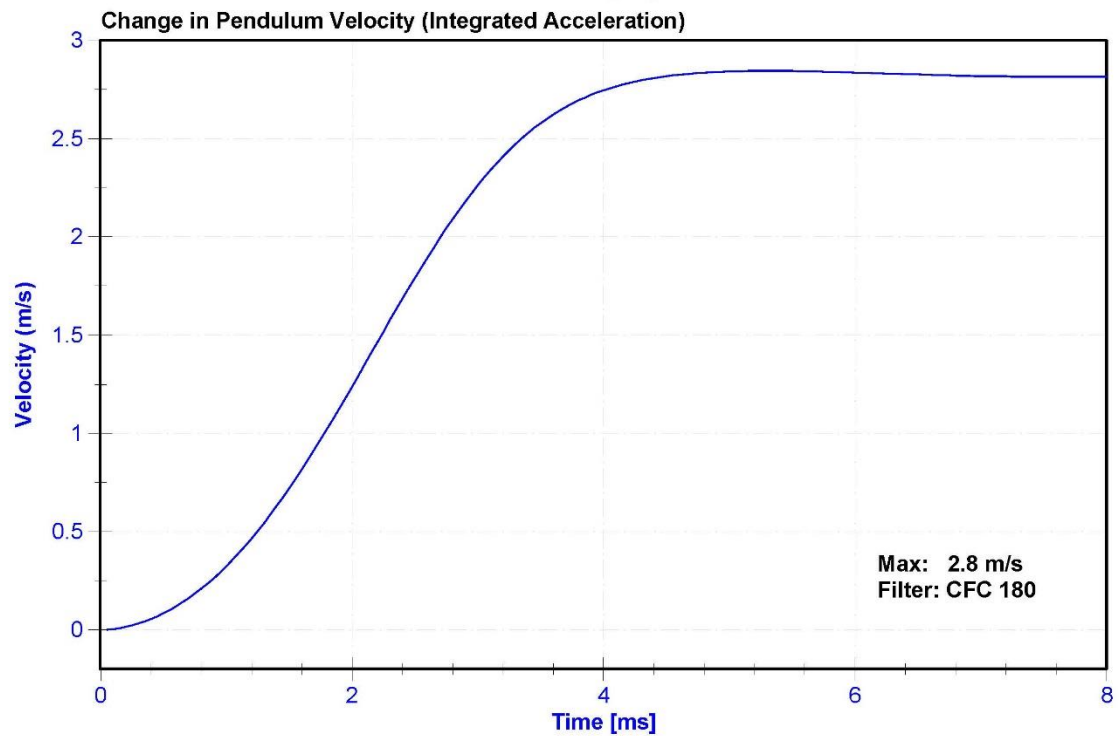
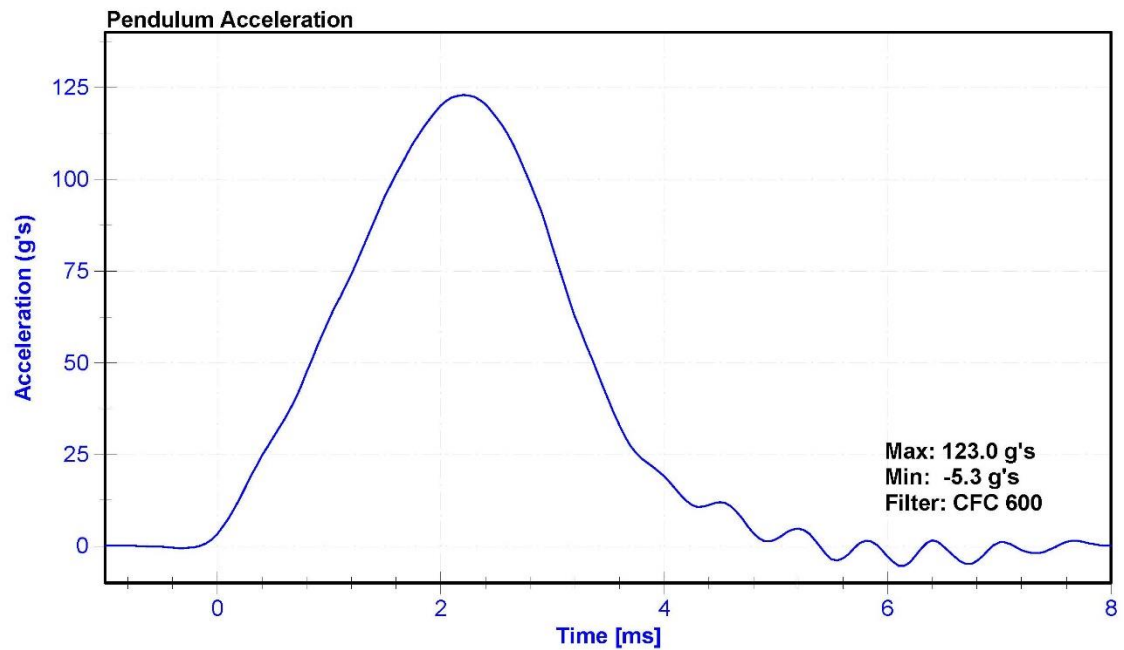
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.0	Pass
Humidity	10	70	%	19.0	Pass
Velocity	2.07	2.13	m/s	2.115	Pass
Resistive Force	3450	4060	N	3584.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016





ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	324	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.0	Pass
Humidity	10	70	%	19.0	Pass
Velocity	2.07	2.13	m/s	2.106	Pass
Resistive Force	3450	4060	N	3616.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23155	1/13/2016	7/14/2016

