

REPORT NUMBER: R&D-KAR-20-013

**VEHICLE TO RIGID BARRIER CRASH TEST IN SUPPORT OF
NHTSA'S FRONTAL RESEARCH CRASH TEST PROGRAM
LEFT SIDE 30° FRONTAL RIGID BARRIER IMPACT**

**HONDA OF AMERICA MFG., INC.
2020 HONDA ACCORD 4-DOOR SEDAN**

NHTSA No: R20205385

**PREPARED BY:
APPLUS IDIADA KARCO ENGINEERING, LLC.
9270 HOLLY ROAD
ADELANTO, CA 92301**



JULY 9, 2021

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
VEHICLE SAFETY RESEARCH
1200 NEW JERSEY AVE, SE, ROOM W46-446
WASHINGTON, D.C. 20590**

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. R&D-KAR-20-013	2. Government Accession No.	3. Recipient's Catalog No.																																															
4. Title and Subtitle Final Report of Frontal Research Crash Testing of a 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385	5. Report Date July 9, 2021		6. Performing Organization Code KAR																																														
	8. Performing Organization Report No. TR-P41132-01-NC																																																
7. Authors Mr. Amjad A. Jadallah, Project Manager, Applus IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus IDIADA KARCO	10. Work Unit No.																																																
9. Performing Organization Name and Address Applus IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	11. Contract or Grant No. DTNH22-14-D-00360L																																																
	13. Type of Report and Period Covered Final Test Report, June 24 - July 9, 2021																																																
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Vehicle Safety Research 1200 New Jersey Ave., SE, Room W46-446 Washington, D.C. 20590	14. Sponsoring Agency Code NVS-321																																																
	15. Supplementary Notes																																																
16. Abstract A 40.0 km/h Left Side 30° Frontal Rigid Barrier Impact Test was conducted on a 2020 Honda Accord 4-door sedan in accordance with Contract DTNH22-14-D-00360L, Task Order #693JJ918F000199. 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 Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on July 9, 2021. The impact velocity of the vehicle was 39.97 km/h and the ambient temperature at the barrier face at the time of impact was 33.3°C. The vehicle's post-test maximum crush was 370.4 mm measured to left of the vehicle's centerline. The test vehicle's performance was as follows:																																																	
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		19. Security Classification of this report UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 236	22. Price																																												

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SECTION 1

TEST PURPOSE AND PROCEDURE

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

This 40.0 km/h (24.9 mph) Left Side 30° Frontal Rigid Barrier Impact Test is part of the Frontal Research Crash Test Program outlined in Contract No. DTNH22-14-D-00360L, Task Order #693JJ918F000199. 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 40.0 km/h Left Side 30° Frontal Rigid Barrier Impact, outlined in Contract No. DTNH22-14-D-00360L, Task Order #693JJ918F000199. Data 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 was obtained, in addition to the data required by Contract No. DTNH22-14-D-00360L, Task Order #693JJ918F000199.

SECTION 2
SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

A 40.0 km/h Left Side 30° Frontal Rigid Barrier Impact Test was conducted on a 2020 Honda Accord 4-door sedan. The test was performed at Applus IDIADA KARCO Engineering, LLC. on June 24, 2020.

The test was documented by one (1) real-time and eighteen (18) high-speed video cameras. Pre- and post-test photographs of the test vehicle and test setup were taken using a digital still camera. Photographic documentation of the test is presented in Appendix A of this report.

One (1) 50th percentile adult male THOR anthropomorphic test device (ATD) (Serial No. EG2595) was seated in the left front seating position (P1 – Driver) and one 50th percentile adult male Hybrid III ATD (Serial No. 168) was seated in the right front passenger seating position (P2). The driver was positioned according to instructions specified in the THOR 50th Percentile Male Dummy Seating & Positioning Procedures: Driver Position. The passenger was positioned according to instructions specified in FMVSS 208 Appendix F, Dummy Positioning Procedures for Driver and Passenger Test Dummy Conforming to Subpart E of Part 572.

The driver was restrained with frontal, knee, curtain, and torso/pelvis airbags. The passenger was restrained with frontal and knee airbags. Both ATDs were unbelted for this test.

SECTION 2 ... (CONTINUED)
SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

One hundred and seventy-two (172) channels of data from the two (2) ATD's and the test vehicle were collected using Diversified Technical Systems, Inc. data acquisition systems. Appendix B contains dummy data plots, as well as vehicle response data plots.

There was 100% total windshield retention. There was no intrusion into the protected zone of the windshield during any portion of the impact event. The maximum static crush of the vehicle was 370.4 mm measured on the left of the vehicle's centerline.

All four vehicle doors remained closed and latched during the test. All doors remained operational after the impact event.

Structural observations include the following:

- The front end including the bumper, grille, and hood were crushed, with the damage concentrated on the left side
- The windshield was broken at the top left corner due to an impact with the driver ATD's head

The driver ATD's visible contact points were:

- Head contacted the front airbag, curtain airbag, headliner, sun visor, A-pillar, and windshield
- Torso contacted the front airbag
- Left leg contacted the knee airbag, knee bolster
- Right leg contacted the knee airbag and knee bolster

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

- Head contacted the front airbag and headliner
- Torso contacted the front airbag
- Left leg contacted the knee airbag
- Right leg contacted the knee airbag

SECTION 2 ... (CONTINUED)
SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Velocity at Impact	km/h	39.97
Vehicle Test Weight	kg	1623.5
Vehicle Maximum Static Crush	mm	370.4
Number of Data Channels		172
Number of Real-Time Cameras		1
Number of High-Speed Cameras		18

DUMMY CONTACTS

Description	Driver	Picture Ref.	Passenger	Picture Ref.
Dummy Type	THOR, S/N: EG2595		Hybrid III, S/N: 168	
Head Contact	Front Airbag, Curtain Airbag, Headliner, Sun Visor, A-Pillar, Windshield	A-45, A-46, A-47, A-48	Front Airbag, Headliner	A-55, A-69, A-71
Upper Torso Contact	Front Airbag	A-45	Front Airbag	A-69
Lower Torso Contact	Front Airbag	A-45	Front Airbag	A-69
Left Leg Contact	Knee Airbag, Knee Bolster	A-41, A-46, A-49, A-91	Knee Airbag	A-70
Right Leg Contact	Knee Airbag, Knee Bolster	A-40, A-41, A-43, A-91	Knee Airbag	A-70

SECTION 2 ... (CONTINUED)
SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

DATA ANOMALIES

Channel Description	Explanation
P1TH ACETABULUM RIGHT X FORCE	No data collected, Known channel failure
DRIVER FLOOR PAN X	Channel Failed, Mounting Block Decoupled at 12.3ms.
DRIVER FLOOR PAN Y	Channel Failed, Mounting Block Decoupled at 12.3ms.
DRIVER FLOOR PAN Z	Channel Failed, Mounting Block Decoupled at 12.3ms.

SECTION 2 ... (CONTINUED)
SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

Driver, THOR S/N EG2595					
LOCATION	DESCRIPTION	UNIT	SOURCE	MAX	MIN
Head	HIC 15ms		Compute	185.8	
	Brain Injury Criteria (BrIC)		Compute	0.833	
	Head Rotational Velocity X	Deg/s	60	775.8	-525.0
	Head Rotational Velocity Y	Deg/s	60	1260.5	-1859.9
	Head Rotational Velocity Z	Deg/s	60	1392.3	-415.4
Neck	Upper Neck Z-axis Force	N	1000	904.5	-4296.9
	Upper Neck Y-axis Moment	Nm	600	19.5	-26.6
Chest	Upper Left Resultant Chest Deflection	mm	Compute	34.2	
	Upper Right Resultant Chest Deflection	mm	Compute	31.5	
	Lower Left Resultant Chest Deflection	mm	Compute	25.1	
	Lower Right Resultant Chest Deflection	mm	Compute	16.0	
Abdomen	Lower Left X-axis Deflection	mm	Compute	4.3	-17.1
	Lower Right X-axis Deflection	mm	Compute	4.1	-3.9
Acetabulum	Left Acetabulum Resultant Force	N	Compute	2269.5	
	Right Acetabulum Resultant Force	N	Compute	1243.9	
Femur	Left Femur Force, FZ	N	600	243.8	-4195.0
	Right Femur Force, FZ	N	600	429.2	-3009.9
Tibia	Left Upper Tibia, FZ	N	600	47.0	-1462.1
	Left Upper Tibia Index		Compute	0.367	
	Right Upper Tibia, FZ	N	600	275.1	-1514.1
	Right Upper Tibia Index		Compute	0.188	
	Left Lower Tibia, FZ	N	600	116.7	-2424.8
	Left Lower Tibia Index		Compute	0.206	
	Right Lower Tibia, FZ	N	600	94.7	-2054.4
	Right Lower Tibia Index		Compute	0.258	
Ankle	Left Ankle Rotation, RX	Deg	180	25.2	-3.2
	Left Ankle Rotation, RY	Deg	180	16.4	-5.9
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	93.1	30.4
	Left Ankle In/Eversion Moment, MX	Nm	Compute	23.7	-13.4
	Right Ankle Rotation, RX	Deg	180	8.3	-29.8
	Right Ankle Rotation, RY	Deg	180	1.8	-14.8
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	117.6	-16.9
	Right Ankle In/Eversion Moment, MX	Nm	Compute	6.8	-30.0

Anomalies:

Lower right IRTRACC did not collect accurate raw voltage

SECTION 2 ... (CONTINUED)
SUMMARY OF TEST RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

Passenger, Hybrid III 50th Percentile Male S/N 168					
Injury Reading	Units	Limit	Value	t¹	t²
HIC 15		700	59.537	96.8	111.8
Nij		1	0.243	94.6	NTF
Upper Neck Force Z (Tension)	N	4170	626.932	140.5	
Upper Neck Force Z (Compression)	N	4000	-80.280	29.7	
Upper Neck Moment Y (Flexion)	Nm	310	88.346	92.2	
Upper Neck Moment Y (Extension)	Nm	135	-7.861	218.1	
Chest Deflection	mm	63	-2.872	121.4	
3 ms Chest Clip	g	60	27.146	98.0	101.0
Femur Force, Left	N	10000	-4010.521	98.4	
Femur Force, Right	N	10000	-3805.329	83.6	

SECTION 3

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

CONVERSION FACTORS

Quantity	Typical Application	Std Units	Metric Unit	Multiply By
Mass	Vehicle Weight	lb	kg	0.4536
Linear Velocity	Impact Velocity	miles/hr	km/hr	1.609344
Length or Distance	Measurements	in	mm	25.4
Volume	Fuel Systems	gal	liter	3.785
Volume	Small Fluids	oz	mL	29.574
Pressure	Tire Pressures	lbf/in ²	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	R20205385
Model Year	2020
Make	Honda
Model	Accord
Body Style	4-Door Sedan
VIN	1HGCV1F15LA147984
Body Color	Red
Odometer Reading (km / mi)	29 / 18
Engine Displacement (L)	1.5
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	FWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes
Automatic Door Locks (ADLs)	Yes

Traction Control System	Yes
Power Steering	Yes
Power Window Auto-Reverse	Yes
Driver Frontal 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	Yes
Front Pass. Frontal Airbag	Yes
Front Pass. Curtain Airbag	Yes
Front Pass. Head/Torso Airbag	No
Front Pass. Torso Airbag	No
Front Pass. Torso/Pelvis Airbag	Yes
Front Pass. Pelvis Airbag	No
Front Pass. Knee Airbag	Yes
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other Safety Restraint	No

Does Owner's Manual provide instructions to turn off automatic door locks? Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Honda of America Mfg., Inc.
Date of Manufacture	Sep-20

GVWR (kg)	1950
GAWR Front (kg)	1070
GAWR Rear (kg)	960

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

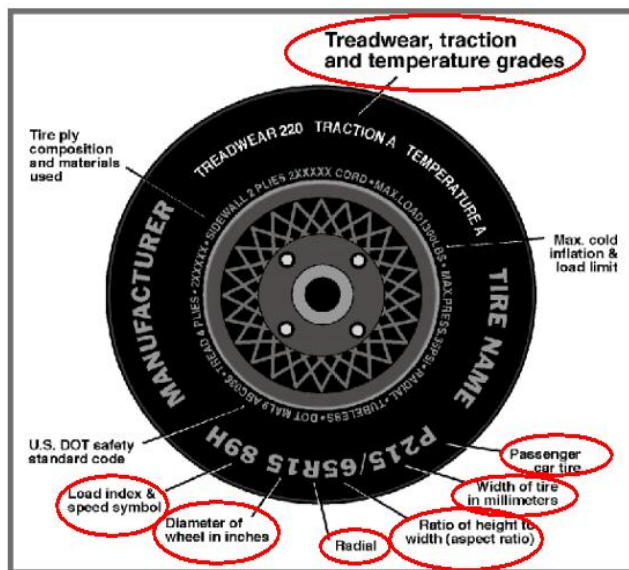
Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				385.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				44.8	A-B*

*A maximum RCLW of 136.0 kg is used for a truck, MPV, or bus

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	225/50R17	225/50R17
Tire Size on Vehicle	225/50R17	225/50R17
Tire Manufacturer	Hankook	Hankook
Tire Model	Kinergy GT	Kinergy GT
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	2 Steel, 1 Polyester, 1 Nylon	2 Steel, 1 Polyester, 1 Nylon
Load Index/Speed Symbol	94V	94V
Tire Material	Steel, Polyester, Nylon	Steel, Polyester, Nylon
DOT Safety Code Left	1T7AB 1BH0 1120	1T7AB 1BH0 1120
DOT Safety Code Right	1T7AB 1BH0 1120	1T7AB 1BH0 1120

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	435.5	284.0		465.5	351.5	
Right	kg	420.5	283.0		449.5	357.0	
Ratio	%	60.2%	39.8%	100.0%	56.4%	43.6%	100.0%
Total	kg	856.0	567.0	1423.0	915.0	708.5	1623.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1423.0	A
Weight of THOR-50M and AM50	kg	192.5	B
Rated Cargo/Luggage Weight (RCLW)	kg	44.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1631.8	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	708	708	725	728	1126
As Tested	mm	690	693	686	687	1234
Post-Test	mm	744	712	697	688	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2827
Total Vehicle Length at Left Side	mm	4754
Total Vehicle Length at Centerline	mm	4882
Total Vehicle Length at Right Side	mm	4766
Weight of Ballast/Equipment in Cargo Area	kg	90.7
Weight of Vehicle Components Removed	kg	63.0
Amount of Stoddard Solvent in Fuel Tank	L	52.10

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk Trim, Spare Tire, Spare Tire Tools, Underbody Skirts, Tail lights, Rear Bumper, Deck lid, Rear Seatback

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

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Units	Pre-Test
1	Total Length	mm	4882
2	Total Width	mm	1861
3*	Bumper Top Height	mm	599
4*	Bumper Bottom Height	mm	434
5*	Longitudinal Member Top Height	mm	599
6	Distance Between Longitudinal Members	mm	944
7	Longitudinal Member Width	mm	102
8*	Engine Top Height	mm	930
9*	Engine Bottom Height	mm	219
10	Engine and Gearbox Width	mm	607
11	Front Bumper to Engine Distance	mm	424
12*	Front Shock Absorber Fixing Height	mm	1020
13*	Bonnet Leading Edge Height	mm	900
14	Front Shock Absorber Fixing Width	mm	1183
15	Front Bumper to Front Axle Distance	mm	935
16	Front Axle to A-Pillar Distance	mm	540
17	A-Pillar to B-Pillar Distance	mm	1073
18	B-Pillar to Rear Axle Distance	mm	1213
19	B-Pillar to C-Pillar Distance	mm	911
20*	Roof Sill Bottom Height	mm	1555
21*	Roof Sill Top Height	mm	1665
22*	Floor Sill Bottom Height	mm	330
23*	Floor Sill Top Height	mm	420

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

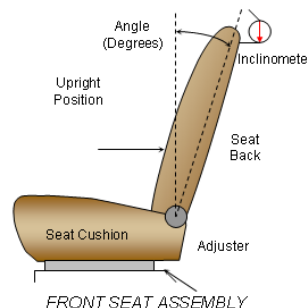
DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

NOMINAL DESIGN RIDING POSITION

The driver seat back was initially set to the manufacturer’s designated angle listed in FORM 208 but was moved rearward per THOR seating procedure to level the head. The passenger seat back was set to the manufacturer’s designated angle listed in FORM 208.

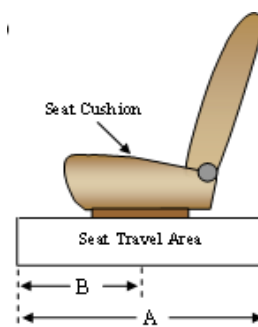


SEAT BACK ANGLE

Seating Position	Unit	FORM 208 Position	After ATD Positioning
Driver Seat Back Angle	Degrees	2.7	4.6
Passenger Seat Back Angle	Degrees	2.7	1.6

SEAT FORE / AFT POSITIONING

The driver seat travel is measured from the forward most position to the rear most position with the seat cushion set at mid angle. The driver seat was initially positioned 25 mm rearward of mid-track before being moved as far forward as possible where the ATD did not contact any interior panels, up to mid-track. The passenger seat travel is measured from the forward most possible position to the rear most possible position. The passenger seat is set to the middle of the fore-aft travel.



SEAT FORE/AFT POSITIONS

Seating Position	Total Fore/Aft Travel (mm)	Placed in Position (mm)
Driver Seat	240	120
Passenger Seat	240	120

SEAT BELT UPPER ANCHORAGE

The seat belt upper anchorage is positioned to the manufacturer’s design position for a 50th percentile adult male ATD for the driver and passenger. Position “H” is the uppermost position, followed by position “M1” and “M2.” Position “L” is the lowermost position.

SEAT BELT UPPER ANCHORAGES

Seating Position	Total No. of Positions	Placed in Position
Driver Seat	4	H
Passenger Seat	4	H

DATA SHEET NO. 2 ... (CONTINUED)

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

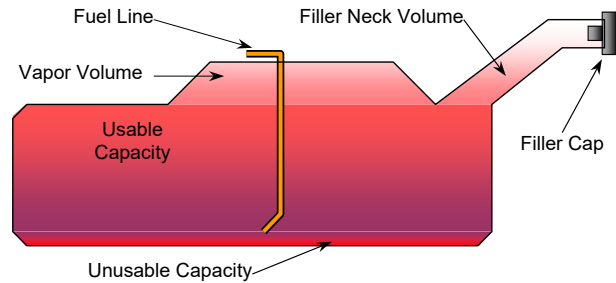
Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	56.02
Usable Capacity of "Optional Tank"	
93% of Usable Capacity	52.10
Actual Amount of Stoddard Solvent Used	52.10
1/3 of Usable Capacity	18.67

FUEL PUMP

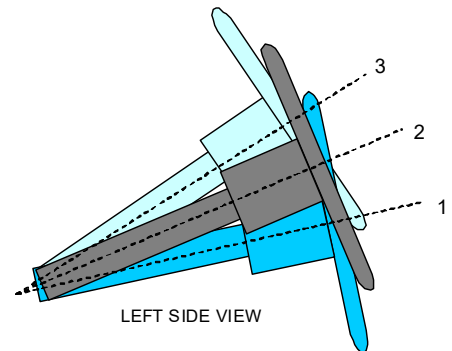
Fuel was evacuated according to the specifications provided by the manufacturer in Form 208. The electric fuel pump operates when the electrical system is activated.



VEHICLE FUEL TANK ASSEMBLY

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. A digital inclinometer is used to measure a plate which is placed across the rim of the steering wheel for angular measurements. A tape measure is used to measure telescoping steering wheel travel.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	18.4	95
Geometric Center Position, No. 2	21.2	115
Uppermost Position, No. 3	23.9	135
Telescoping Steering Wheel Travel		40
Test Position	21.2	115

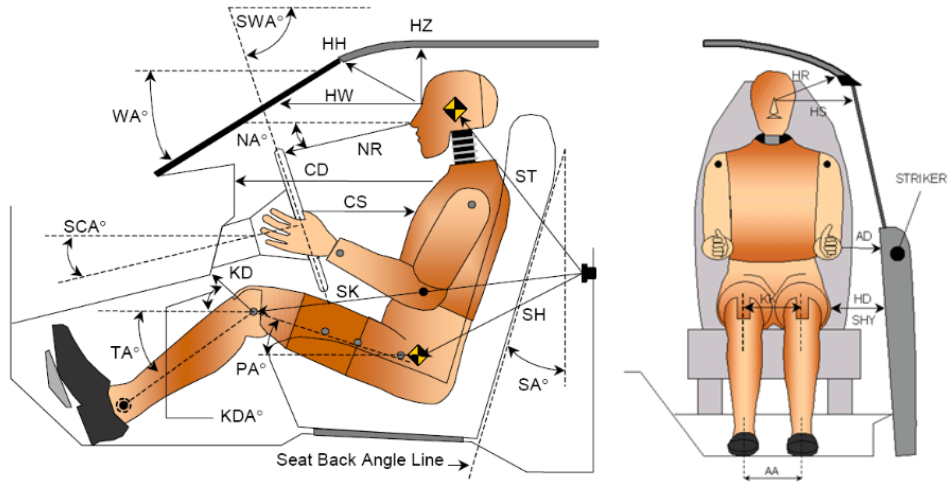
DATA SHEET NO. 3
DUMMY CLEARANCE DIMENSIONS

Test Vehicle: 2020 Honda Accord 4-Door Sedan

NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact

Test Date: 06/24/21



LEFT SIDE VIEW

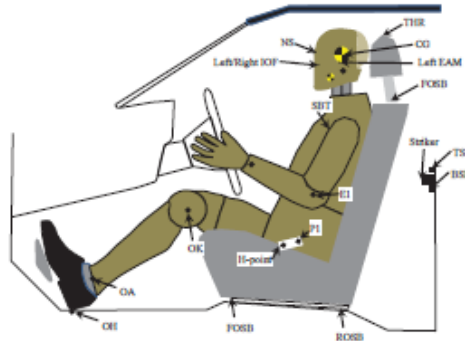
Code	Measurement Description	Driver S/N# EG2595		Passenger S/N# 168	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
HZ	Nasion to Roof (Z Distance)	197		189	
HH	Nasion to Header (3D Distance)	407		323	
HW	Nasion to Windshield Point 1 Inside (X Distance)	648		589	
NR	Tip of Nose to Top of Steering Wheel (3D Distance)	501			
CD	Chest Point 1 to Dash Point 1 (3D Distance)	583		462	
CS	Chest Point 2 to Center of Steering Wheel (X Distance)	360			
CBS	Chest Point 3 to Bottom of Steering Wheel (X Distance)	224			
IKD	Inboard Knee to Dash Point 3 (3D Distance)			148	
OKD	Outboard Knee to Dash Point 2 (3D Distance)	116		165	
HR	Nasion to Side Header (3D Distance)			213	
HS	Nasion to Side Window Distance (Y Distance)	354		351	
AD	Elbow to Door (Y Distance)	176		53	
HD	H-Point to Door (Y Distance)				
HLHL	Inboard Heel to Outboard Heel (Y Distance)	361		221	
KK	Inboard Knee to Outboard Knee (Y Distance)			311	
SH	Striker to H-Point (3D Distance)	427		423	
HRA	Head Restraint Post Angle	4.6		1.6	
	H-Point Tool Angle		24.2		24.1
	Torso Angle		18.5		11.0
	Windshield Angle		59.6		59.3
	Head Angle (X)		0.8		0.0
	Head Angle (Y)		-0.5		0.5
	T1 Angle (X)				
	T1 Angle (Y)				
	T6 Angle (X)		-0.2		
	T6 Angle (Y)		20.4		
	T12 Angle (X)				
	T12 Angle (Y)				
	Pelvis Angle (X)		-0.6		
	Pelvis Angle (Y)		35.0		

DATA SHEET NO. 4

DUMMY CMM MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21



Description	Units	Driver S/N# EG2595			Passenger S/N# 168		
		X	Y	Z	X	Y	Z
Center of Upper Striker Bolt	mm	2312	-808	-169	2316	806	-169
Center of Lower Striker Bolt	mm	2316	-809	-133	2320	808	-133
Center of Striker Bar	mm	2347	-810	-155	2351	808	-155
Front Outboard Seat Bolt	mm	2843	-605	343	2847	607	335
Rear Outboard Seat Bolt	mm	2441	-605	359	2409	606	342
Center of Steering Wheel Hub	mm	2913	-376	-252			
Outer Head Restraint Post	mm	2209	-448	-429	2242	454	-441
Right Head CG	mm	2407	-298	-543	2505	450	-535
Left Head CG	mm	2406	-453	-546	2490	305	-534
Right EAM	mm	2415	-304	-516			
Left EAM	mm	2414	-451	-519			
Nasion	mm	2497	-374	-558	2590	380	-536
Right IOF	mm	2499	-344	-519			
Left IOF	mm	2499	-409	-519			
Tip of Nose	mm	2497	-375	-521	2609	376	-486
Tip of Chin	mm	2497	-377	-420	2580	373	-413
Chest Point 1	mm	2540	-378	-295	2610	372	-274
Chest Point 2	mm	2557	-381	-251			
Chest Point 3	mm	2638	-379	-101			
Shoulder Point 1	mm	2425	-571	-322	2471	561	-271
Shoulder Point 2	mm	2473	-565	-298			
Elbow	mm	2646	-603	-83	2559	639	-37
Center of H-Point Tool	mm	2549	-647	71			
H-Point on H-Point Tool	mm	2624	-615	104	2618	650	132
H-Point on ATD Skin	mm	2624	-574	104	2619	553	131
Outboard Knee	mm	3020	-557	-50	2999	530	17
Inboard Knee	mm				3001	220	20
Outboard Ankle	mm	3327	-584	233	3327	503	204
Inboard Ankle	mm	3342	-226	250	3335	247	181
Outboard Heel	mm	3351	-560	376	3324	518	387
Inboard Heel	mm	3352	-199	379	3344	298	381

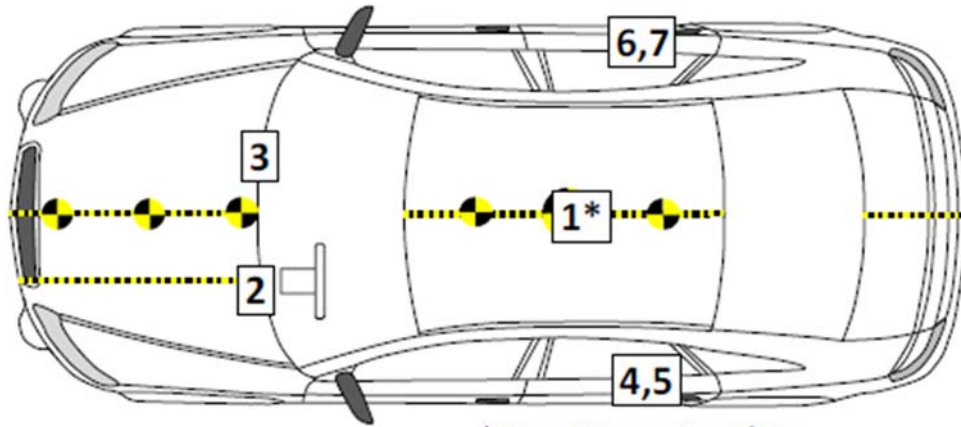
Reference Point:

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

DATA SHEET NO. 5

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21



* Use Mounting Plate

VEHICLE ACCELEROMETER PRE-TEST LOCATIONS RELATIVE TO VCS

No.	Instrumentation Location	Axes	Units	Coordinates (mm)		
				X	Y	Z
1	Vehicle CG (Acceleration and Angular Rate)	x, y, z	g, °/s	2186	4	228
2	Driver Floor Pan	x, y, z	°/s	3672	-346	141
3	Passenger Floor Pan	x, y, z	g	3666	345	152
4	Door Sill LR	x, y	g	1932	-743	279
5	Door Sill LR Redundant	x, y	g	1892	-745	279
6	Door Sill RR	x, y	g	1942	741	277
7	Door Sill RR Redundant	x, y	g	1912	743	277

Reference Point:

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

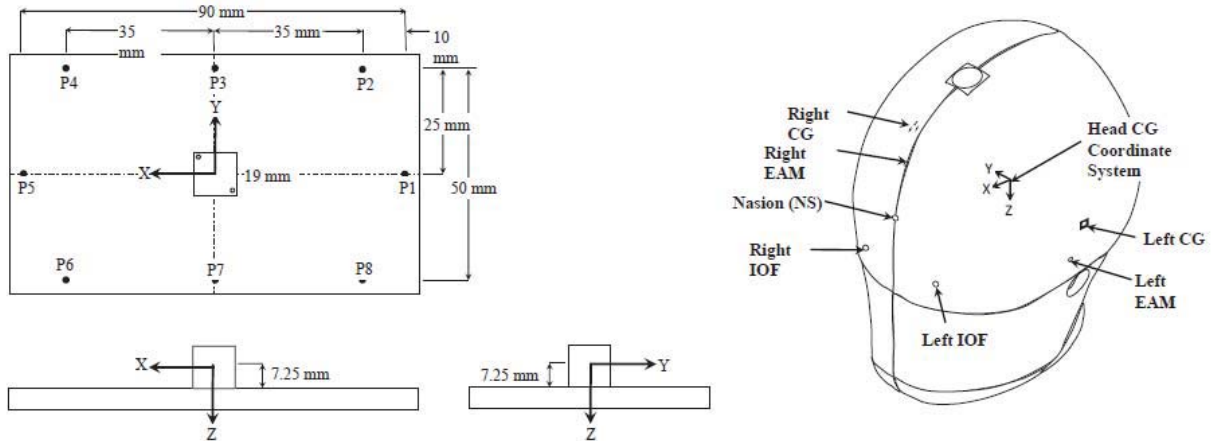
DATA SHEET NO. 5 ... (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

ANGULAR RATE SENSOR MOUNTING PLATE & THOR HEAD POINT DEFINITIONS



CG ARS MOUNTING PLATE - VEHICLE COORDINATE SYSTEM

No.	Description	Units	X	Y	Z
P1	Plate Point 1	mm	2141	3	236
P2	Plate Point 2	mm	2152	30	239
P3	Plate Point 3	mm	2186	28	240
P4	Plate Point 4	mm	2222	30	238
P5	Plate Point 5	mm	2230	5	240
P6	Plate Point 6	mm	2224	-21	236
P7	Plate Point 7	mm	2188	-22	234
P8	Plate Point 8	mm	2154	-24	236

DRIVER HEAD POINTS IN RELATION TO HEAD CG COORDINATE SYSTEM

Description	Units	x	y	z
Left CG	mm	66	-41	47
Left EAM	mm	72	-36	74
Left IOF	mm	154	5	75
Right IOF	mm	155	68	74
Nasion	mm	158	37	37
Right EAM	mm	72	109	71
Right CG	mm	66	114	44

DATA SHEET NO. 5 ... (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

Location No.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Min	Time (ms)
1	Vehicle CG	x	g	1.5	147.1	-23.4	57.9
		y	g	13.8	38.9	-4.4	62.9
		z	g	15.9	36.3	-17.2	31.0
	Vehicle CG Rotation	x	°/s	62.9	62.9	-49.1	24.8
		y	°/s	63.0	21.0	-68.2	24.3
		z	°/s	32.8	44.4	-62.6	238.9
2	Driver Floor Pan	x	g	1.7	16.7	-37.5	11.0
		y	g	11.6	10.6	-4.5	7.3
		z	g	6.2	7.7	-5.8	4.4
3	Passenger Floor Pan	x	g	0.9	137.0	-21.5	57.6
		y	g	18.9	37.4	-8.4	28.0
		z	g	6.5	31.4	-12.9	26.5
4	Door Sill LR	x	g	0.8	146.3	-24.2	59.4
		y	g	10.7	39.0	-1.2	103.4
5	Door Sill LR Redundant	x	g	1.0	145.5	-24.7	59.7
		y	g	10.2	39.0	-1.7	63.4
6	Door Sill RR	x	g	1.1	138.9	20.4	57.9
		y	g	12.3	38.7	-2.5	62.7
7	Door Sill RR Redundant	x	g	1.2	139.3	-19.7	58.0
		y	g	12.7	38.7	-1.2	62.8

Note: See Appendix B for all vehicle data plots

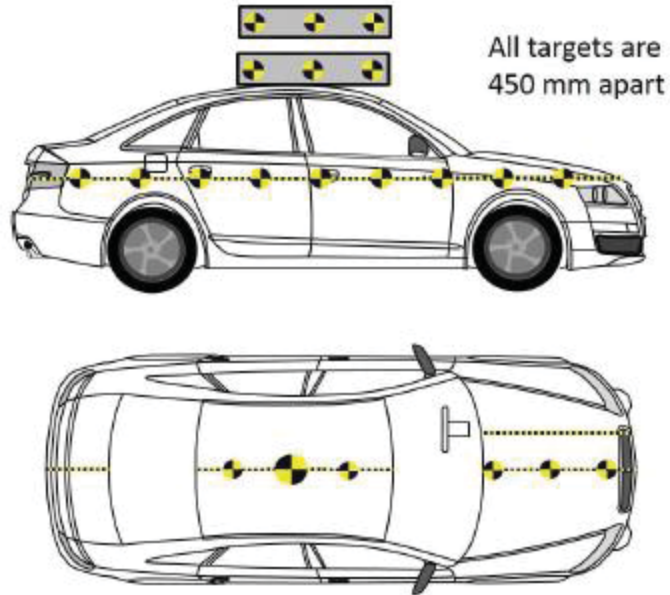
DATA SHEET NO. 6

PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

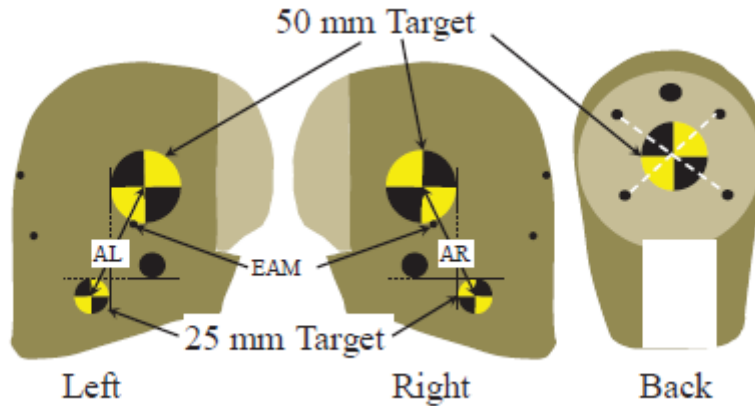
Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

VEHICLE TARGETS



ATD HEAD TARGETS



Driver

Target	Units	Measurement
AL	mm	97
AR	mm	98

DATA SHEET NO. 7

TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Sensors	99
Passenger Dummy Sensors	43
Vehicle Structure Sensors	20
Airbag Timing Sensor	10
Total	172

CAMERA COVERAGE

Type of Camera	Number of Cameras Collected
High-Speed Vehicle Onboard	4
High-Speed Off-Board	14
Real-Time Panning	1
Total	19

DATA SHEET NO. 8
POST TEST OBSERVATIONS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	THOR-50M / EG2595	AM50 / 168
Lower Leg Type	LX	
Head Contact	Front Airbag, Curtain Airbag, Headliner, Sun Visor, A-Pillar, Windshield	Front Airbag, Headliner
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	Front Airbag	Front Airbag
Left Knee Contact	Knee Airbag, Knee Bolster	Knee Airbag
Right Knee Contact	Knee Airbag, Knee Bolster	Knee Airbag

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
Front Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Rear Door Opening	Remained closed and latched, operational	Remained closed and latched, operational
Seat Track Shift (mm)	None	None
Seat Back Failure	None	None
Glazing Damage	None	

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Windshield Damage	Broken
Window Damage	None
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 9**VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4882	4753	-129
2	Rear Surface of Vehicle to Front of Engine	4459	4393	-66
3	RSOV to Firewall	3857	3854	-3
4	RSOV to Upper Leading Edge of Right Door	3483	3481	-2
5	RSOV to Upper Leading Edge of Left Door	3479	3476	-3
6	RSOV to Lower Leading Edge of Right Door	3456	3455	0
7	RSOV to Lower Leading Edge of Left Door	3457	3456	-1
8	RSOV to Upper Trailing Edge of Right Door	2298	2298	0
9	RSOV to Upper Trailing Edge of Left Door	2297	2297	-1
10	RSOV to Lower Trailing Edge of Right Door	2286	2286	0
11	RSOV to Lower Trailing Edge of Left Door	2283	2283	-1
12	RSOV to Bottom of A-Pillar, Right Side	3409	3408	-1
13	RSOV to Bottom of A-Pillar, Left Side	3407	3406	-1
14	RSOV to Firewall, Right Side	4018	4014	-3
15	RSOV to Firewall, Left Side	4021	4014	-7
16	RSOV to Steering Column	2939	2964	25
17	Center of Steering Column to A-Pillar	468	442	-26
18	Center of Steering Column to Headliner	468	419	-49
19	RSOV to Right Side of Front Bumper	4766	4776	10
20	RSOV to Left Side of Front Bumper	4754	4384	-370
21	Length of Engine Block	566	542	-24
RD	RSOV to Right Side of Dash Panel	3121	3122	1
CD	RSOV to Center of Dash Panel	3072	3080	7
LD	RSOV to Left Side of Dash Panel	3116	3118	2

All measurements in millimeters.

DATA SHEET NO. 10

ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

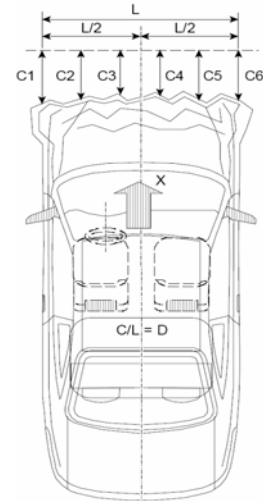
VEHICLE INFORMATION

VIN: 1HGCV1F15LA147984
 Vehicle Size Category: Passenger Car

Wheelbase (mm): 2827
 Test Weight (kg): 1623.5

ACCELEROMETER DATA

Accelerometer Locations: Vehicle CG_x
 Cal. Procedure/Interval: Vibration Test / 6 months
 Integration Algorithm: NHTSA Standard
 Linearity: Good
 Impact Velocity (km/h): 39.97



CRUSH PROFILE

Collision Deformation Classification: 12FLEW2
 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 1200
 Impact Mode: Left Side 30° Frontal

Crush Measurements

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4728	4358	-369
C2	Crush Zone 2 at Left Side	mm	4798	4499	-299
C3	Crush Zone 3 at Left Side	mm	4851	4582	-268
C4	Crush Zone 4 at Right Side	mm	4853	4681	-172
C5	Crush Zone 5 at Right Side	mm	4798	4721	-77
C6	Crush Zone 6 at Right Side	mm	4740	4751	11
L	C1 to C6	mm	1200		

DATA SHEET NO. 11

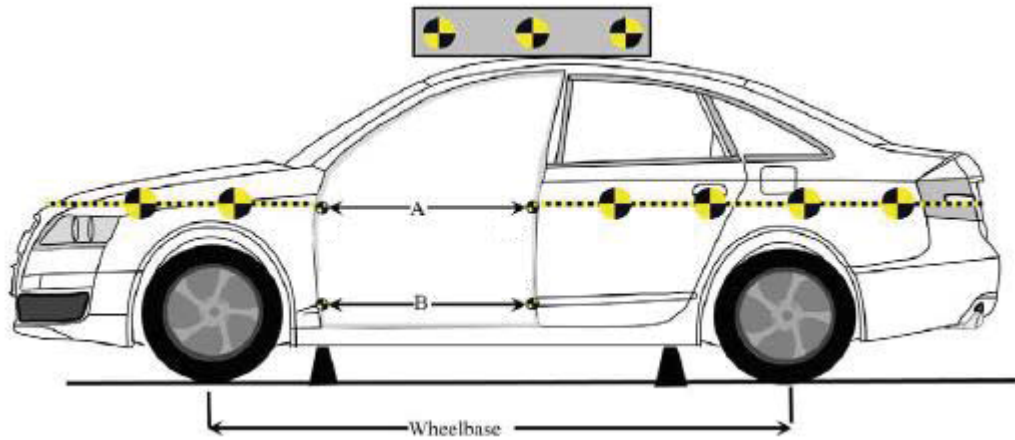
VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Driver Side Upper	mm	911	912	-2
B	Driver Side Lower	mm	794	794	0
D	Passenger Side Upper	mm	913	914	-2
E	Passenger Side Lower	mm	790	788	2



DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

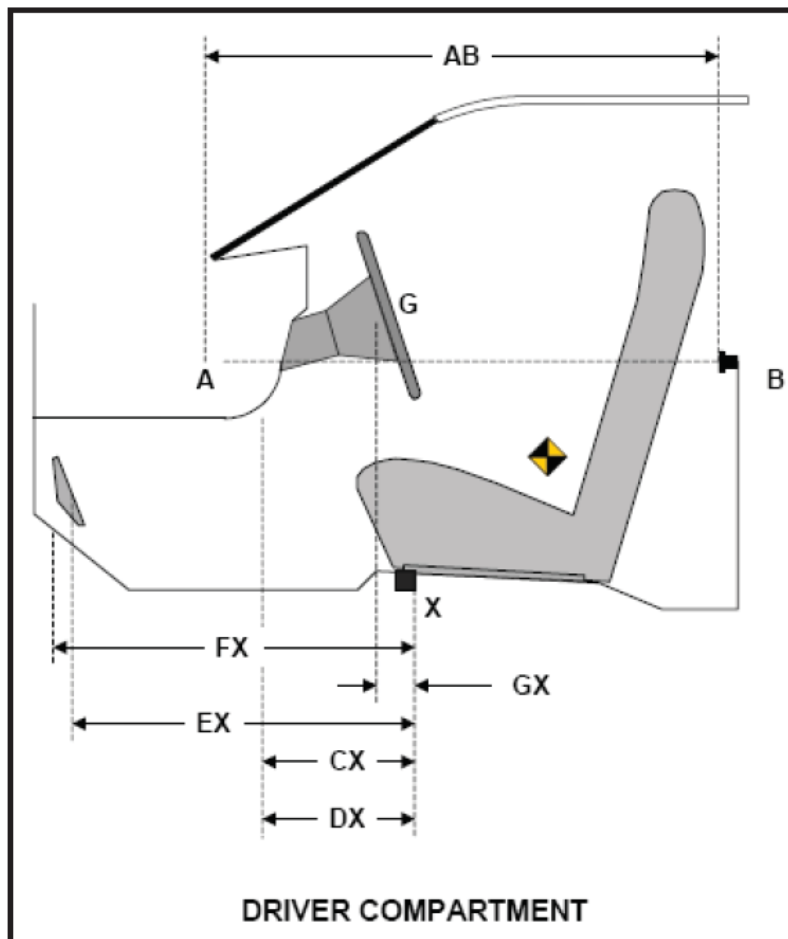
Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	887	886	1
CX	Left Knee Bolster to X	mm	273	260	13
DX	Right Knee Bolster to X	mm	262	283	-21
EX	Brake Pedal to X	mm	584	577	7
FX	Footrest to X	mm	690	693	-3
GX	Center of Steering Column Wheel Hub to X	mm	66	97	-31

X = Front of Seat Track (Stationary)



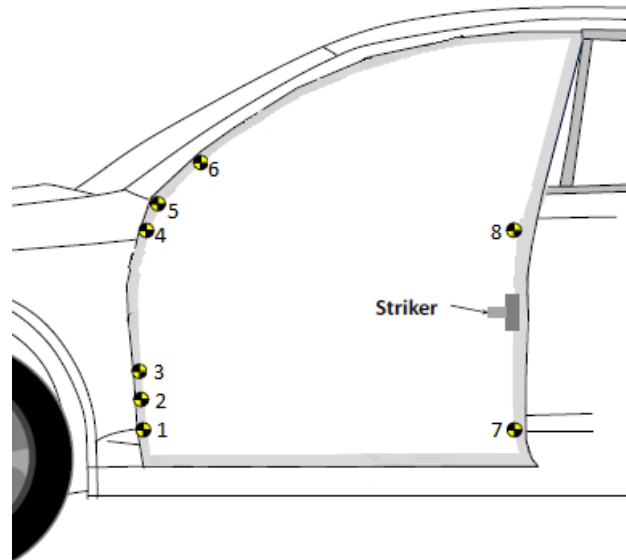
DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

DRIVER SIDE DOOR SILL INTRUSIONS



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

Point	Pre-Test			Post-Test			Difference		
	x	y	z	x	y	z	x	y	z
1	3309	-772	203	3309	-766	206	0	6	4
2	3333	-770	132	3335	-764	133	1	6	1
3	3325	-768	54	3327	-763	57	2	5	3
4	3263	-760	-247	3263	-757	-246	0	3	2
5	3234	-746	-322	3234	-744	-321	-1	2	0
6	3153	-727	-397	3153	-726	-396	0	1	1
7	2515	-772	205	2515	-765	207	0	6	2
8	2352	-758	-248	2351	-754	-245	-1	3	3

All measurements in millimeters.

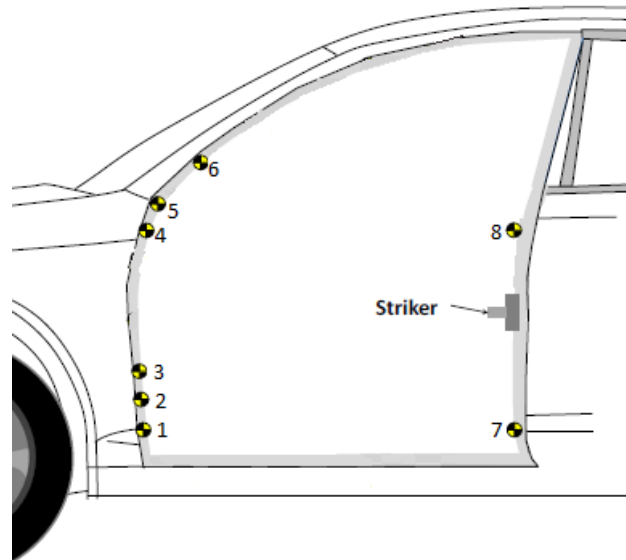
DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385

Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

PASSENGER SIDE DOOR SILL INTRUSIONS



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

Point	Pre-Test			Post-Test			Difference		
	x	y	z	x	y	z	x	y	z
1	3315	768	206	3311	769	207	-4	1	1
2	3340	766	128	3342	766	130	2	1	2
3	3327	764	52	3327	765	51	1	1	-2
4	3268	756	-246	3269	756	-247	0	0	-1
5	3239	742	-320	3241	742	-320	2	0	1
6	3159	721	-397	3157	722	-398	-1	0	-1
7	2525	770	207	2523	771	209	-2	1	2
8	2356	757	-247	2355	757	-245	-1	0	2

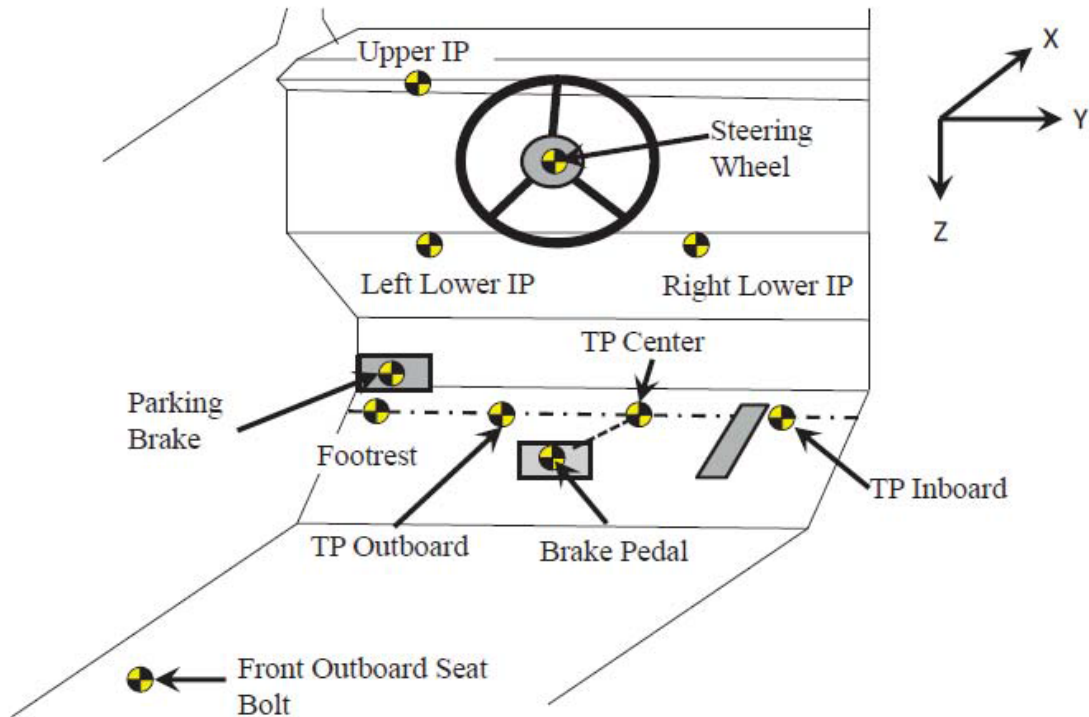
All measurements in millimeters.

DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

DRIVER FLOOR PAN MEASUREMENTS



Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	x	y	z	x	y	z	x	y	z
TP Inboard	3648	-196	208	3647	-192	213	-1	3	5
TP Center	3669	-345	204	3664	-339	198	-5	6	-6
TP Outboard	3611	-502	201	3611	-502	201	0	0	0
TP Footrest	3537	-597	203	3535	-592	200	-2	5	-3
Brake Pedal	3431	-344	202	3419	-340	197	-12	4	-6
Left Lower IP	3121	-527	-98	3119	-520	-102	-1	7	-4
Right Lower IP	3109	-229	-99	3121	-227	-108	12	2	-9
Upper IP	3079	-527	-146	3083	-520	-155	4	7	-9
Steering Wheel	2913	-376	-252	2954	-366	-272	41	10	-21
Front Outboard Bolt	2843	-605	343	2842	-598	343	0	7	0
Emergency Brake									

Reference point:

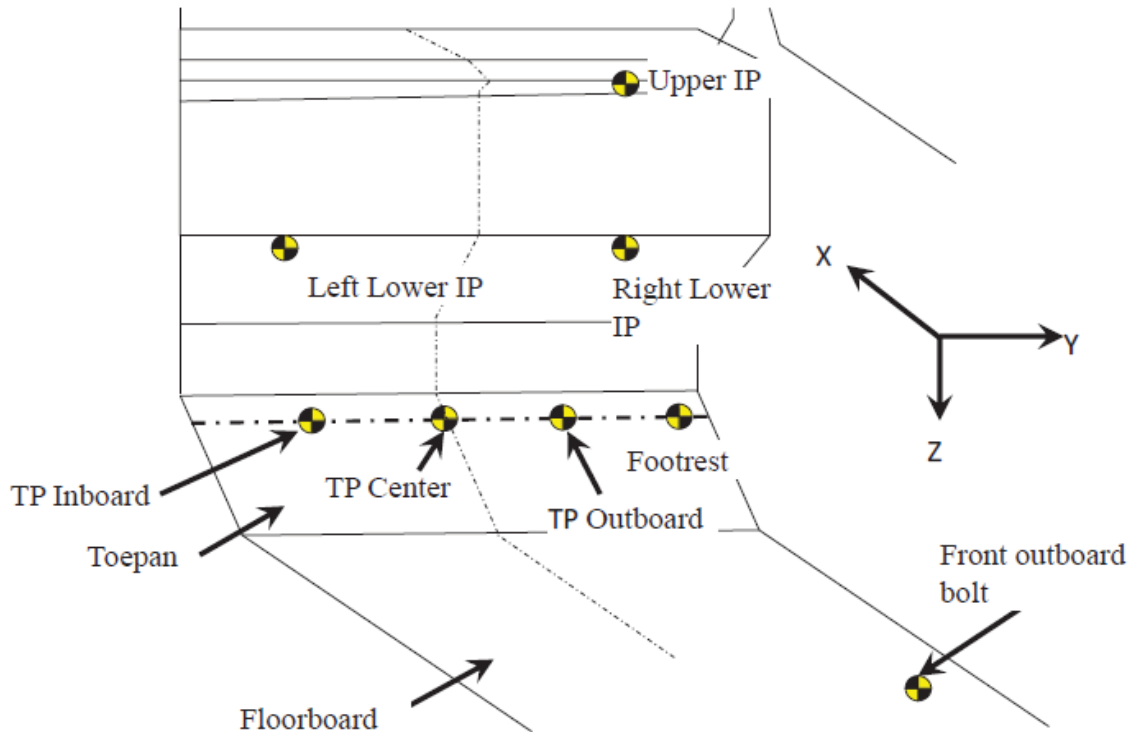
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

PASSENGER FLOOR PAN MEASUREMENTS



Intrusion Location	Pre-Test (mm)			Post-Test (mm)			Difference (mm)		
	x	y	z	x	y	z	x	y	z
TP Inboard	3644	222	205	3643	223	202	-1	1	-3
TP Center	3660	374	206	3657	376	206	-3	2	0
TP Outboard	3584	523	205	3584	522	206	-1	0	1
TP Footrest	3524	625	203	3523	625	202	-1	1	-1
Left Lower IP	3093	218	-96	3103	215	-99	10	-2	-2
Right Lower IP	3120	523	-97	3125	518	-99	6	-5	-3
Upper IP	3069	523	-173	3073	521	-177	4	-3	-5
Front Outboard Seat Bolt	2847	604	334	2846	604	335	0	0	1

Reference point:

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

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

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

DATA SHEET NO. 12

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

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

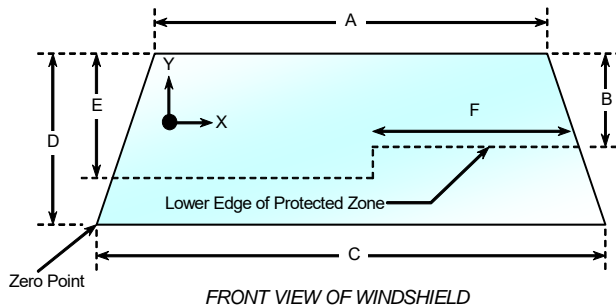
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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: 21.2° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2211	2211	100.0%
Right Side	2211	2211	100.0%
Total	4422	4422	100.0%



Item	Units	Value
A	mm	1240
B	mm	335
C	mm	1495
D	mm	843
E	mm	482
F	mm	555

AREAS OF PROTECTED ZONE FAILURES

- A. Provide Coordinates of the area that the protected zone was penetrated more than 0.25 inches by a vehicle component other than one that is normally in contact with the windshield.
- B. Provide Coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.

X	Y

X	Y

DATA SHEET NO. 12 ... (CONTINUED)

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

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 33.3° C Test Time: 6:28 PM

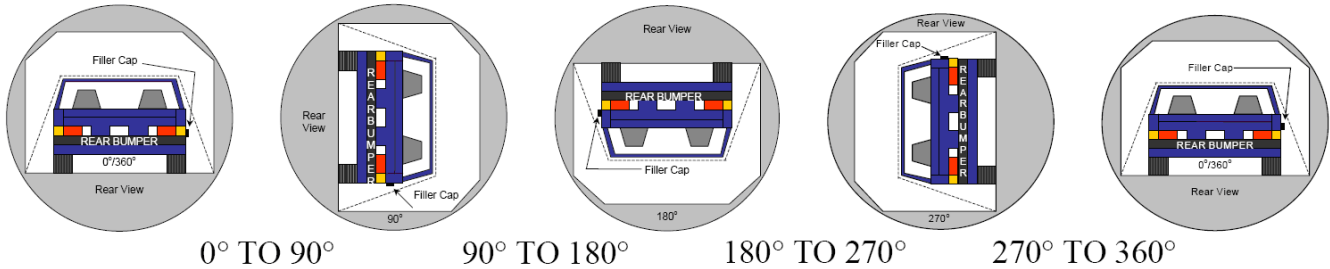
Stoddard Solvent Spillage Measurements

- A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)
- D. Spillage: There was no Stoddard solvent spillage.

DATA SHEET NO. 13

FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2020 Honda Accord 4-Door Sedan NHTSA No. R20205385
 Test Program: R&D Left Side 30° Frontal Rigid Barrier Impact Test Date: 06/24/21



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: There was no Stoddard solvent spillage.

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	81	300	381
90° To 180°	79	300	379
180° To 270°	80	300	380
270° To 360°	81	300	381

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

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

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PHOTOGRAPHS**

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FIGURE 1. Test Vehicle Certification Label

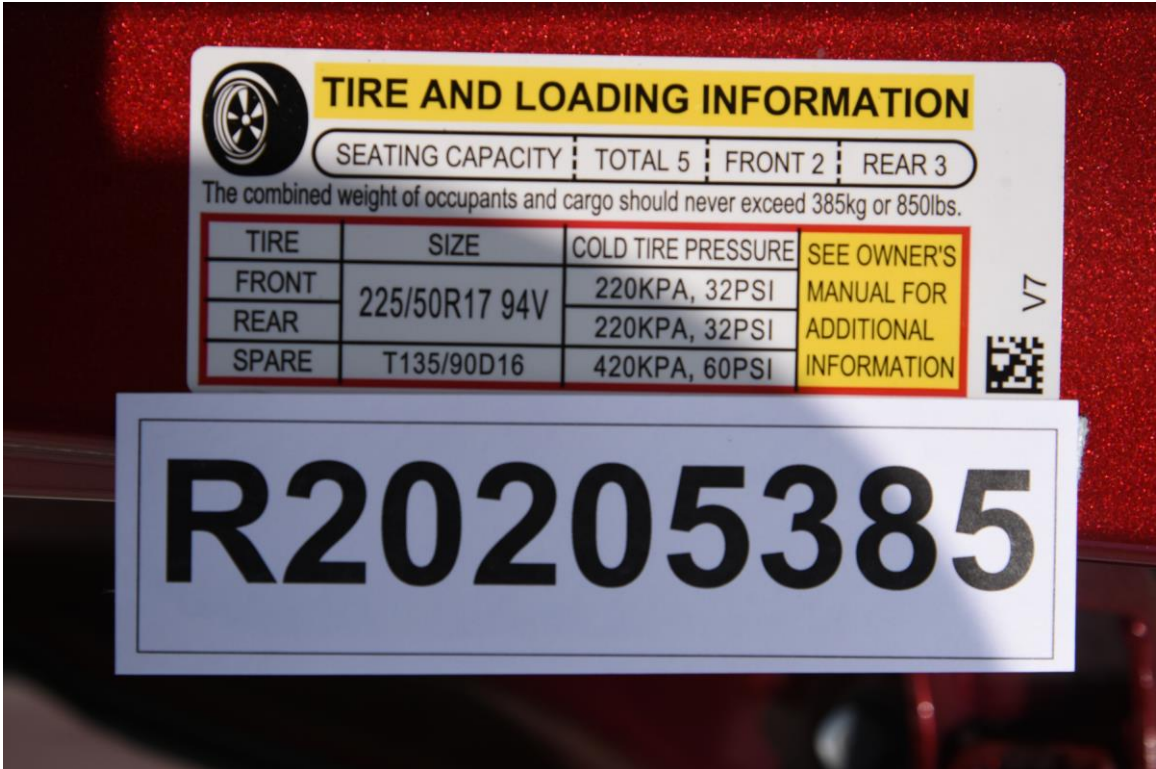


FIGURE 2. Test Vehicle Tire Placard



FIGURE 3. Right Front $\frac{3}{4}$ View, As Received



FIGURE 4. Left Rear $\frac{3}{4}$ View, As Received



FIGURE 5. Pre-Test Front View of Test Vehicle



FIGURE 6. Post-Test Front View of Test Vehicle



FIGURE 7. Pre-Test Left View of Test Vehicle



FIGURE 8. Post-Test Left View of Test Vehicle



FIGURE 9. Pre-Test Right View of Test Vehicle



FIGURE 10. Post-Test Right View of Test Vehicle



FIGURE 11. Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 12. Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 13. Pre-Test Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 14. Post-Test Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 15. Pre-Test Right Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 16. Post-Test Right Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 17. Pre-Test Rear View of Test Vehicle



FIGURE 18. Post-Test Rear View of Test Vehicle



FIGURE 19. Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 20. Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 21. Pre-Test Windshield View



FIGURE 22. Post-Test Windshield View



FIGURE 23. Pre-Test Engine Compartment View



FIGURE 24. Post-Test Engine Compartment View



FIGURE 25. Pre-Test Fuel Filler Cap View



FIGURE 26. Post-Test Fuel Filler Cap View

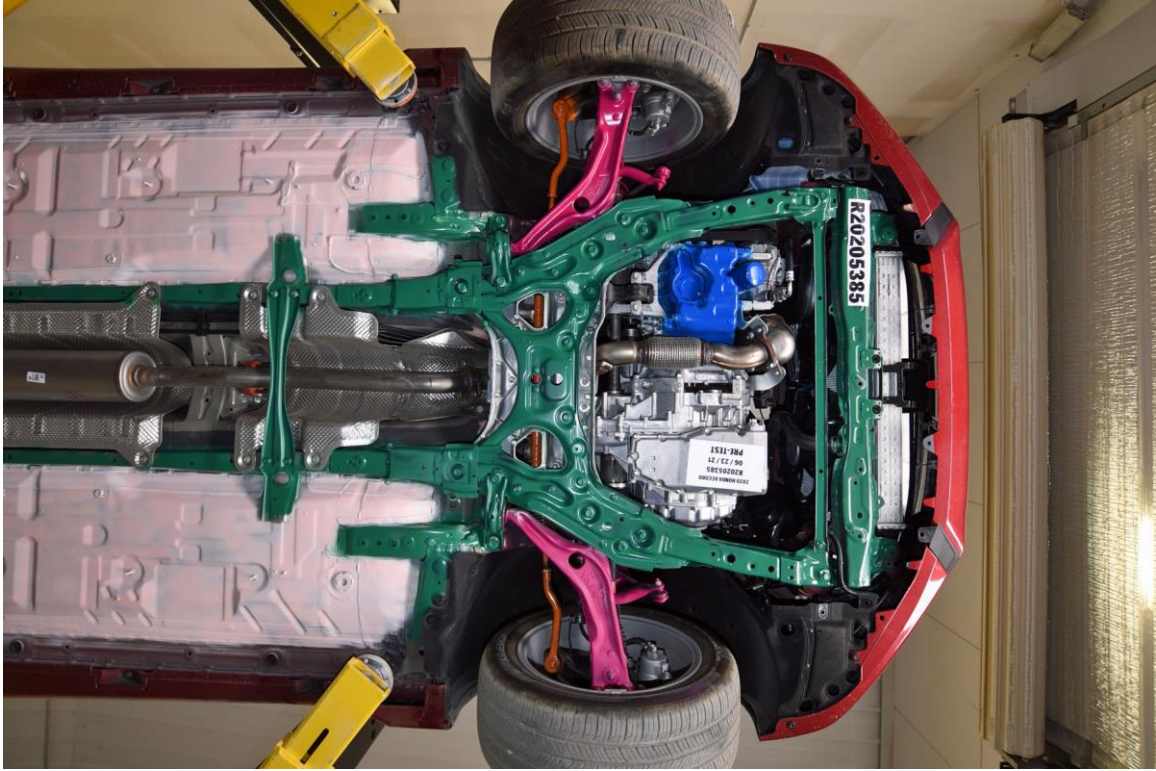


FIGURE 27. Pre-Test Front Underbody View

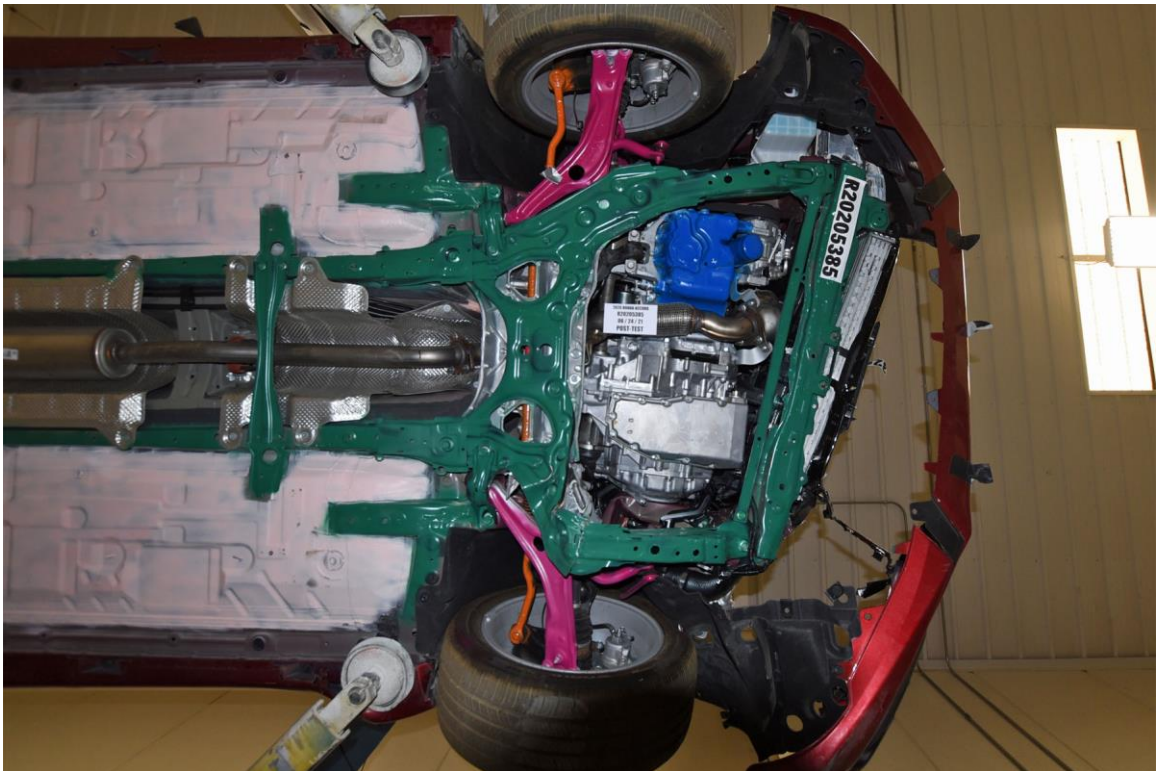


FIGURE 28. Post-Test Front Underbody View

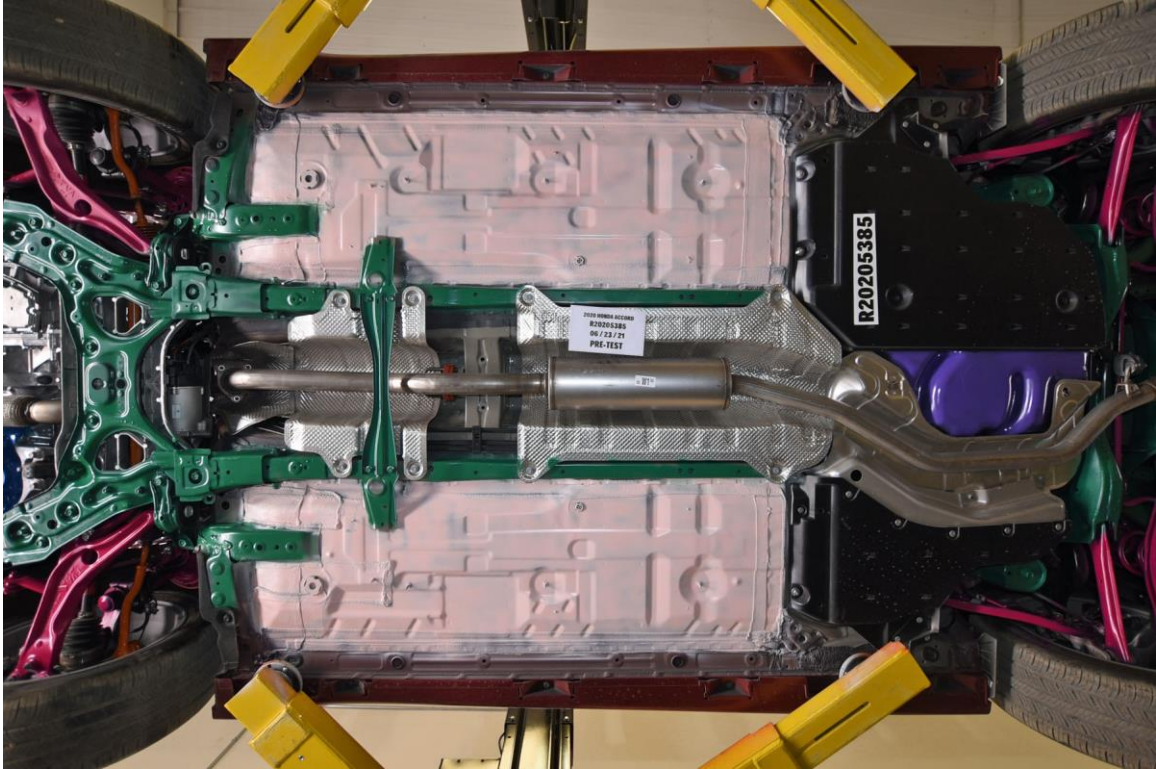


FIGURE 29. Pre-Test Mid Underbody View

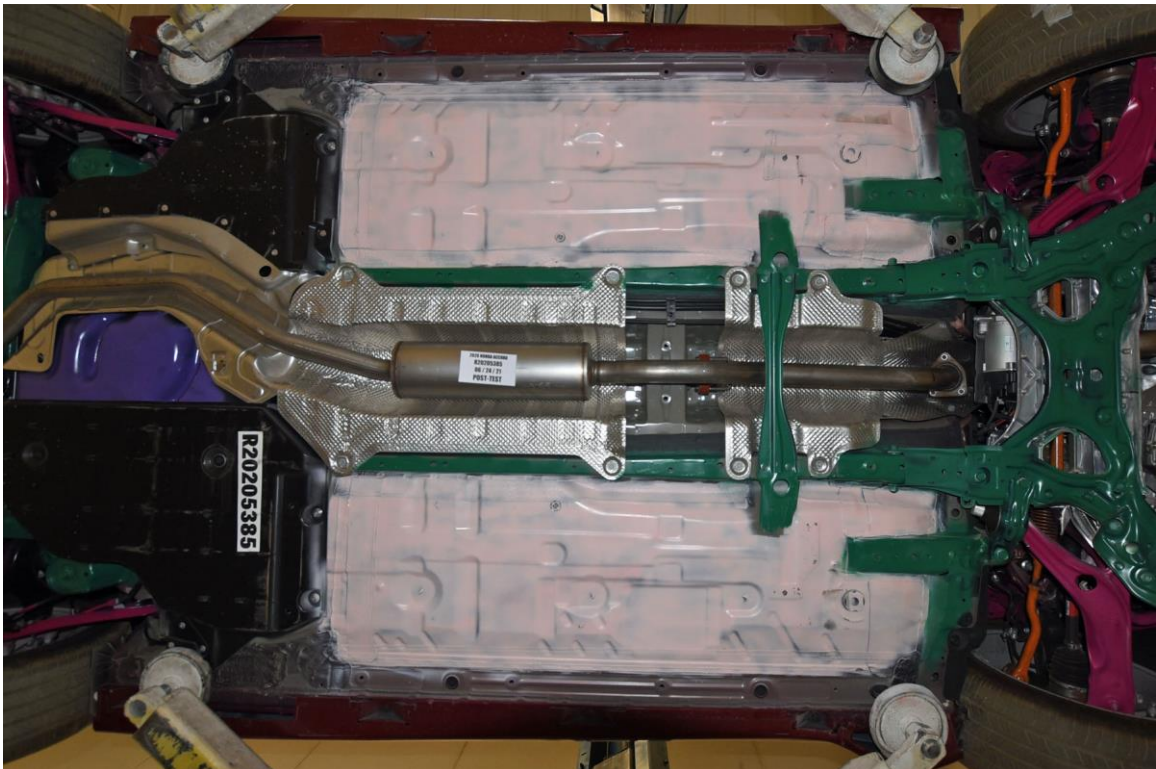


FIGURE 30. Post-Test Mid Underbody View

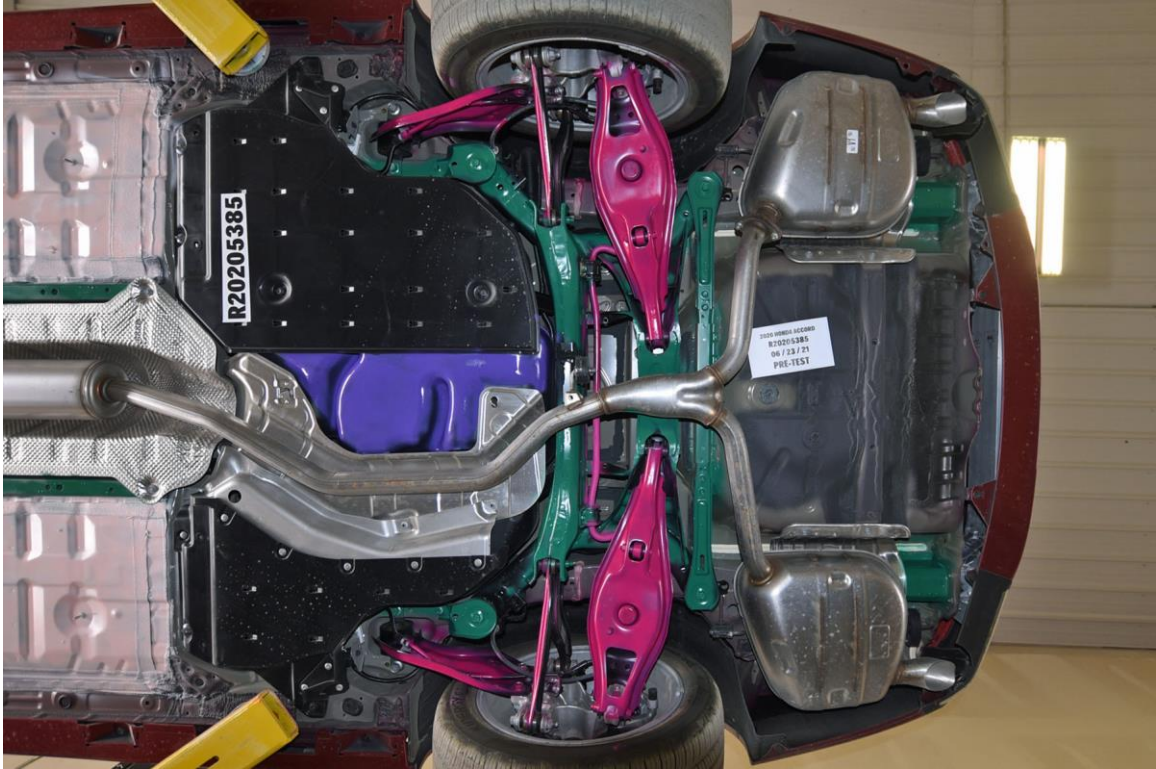


FIGURE 31. Pre-Test Rear Underbody View



FIGURE 32. Post-Test Rear Underbody View

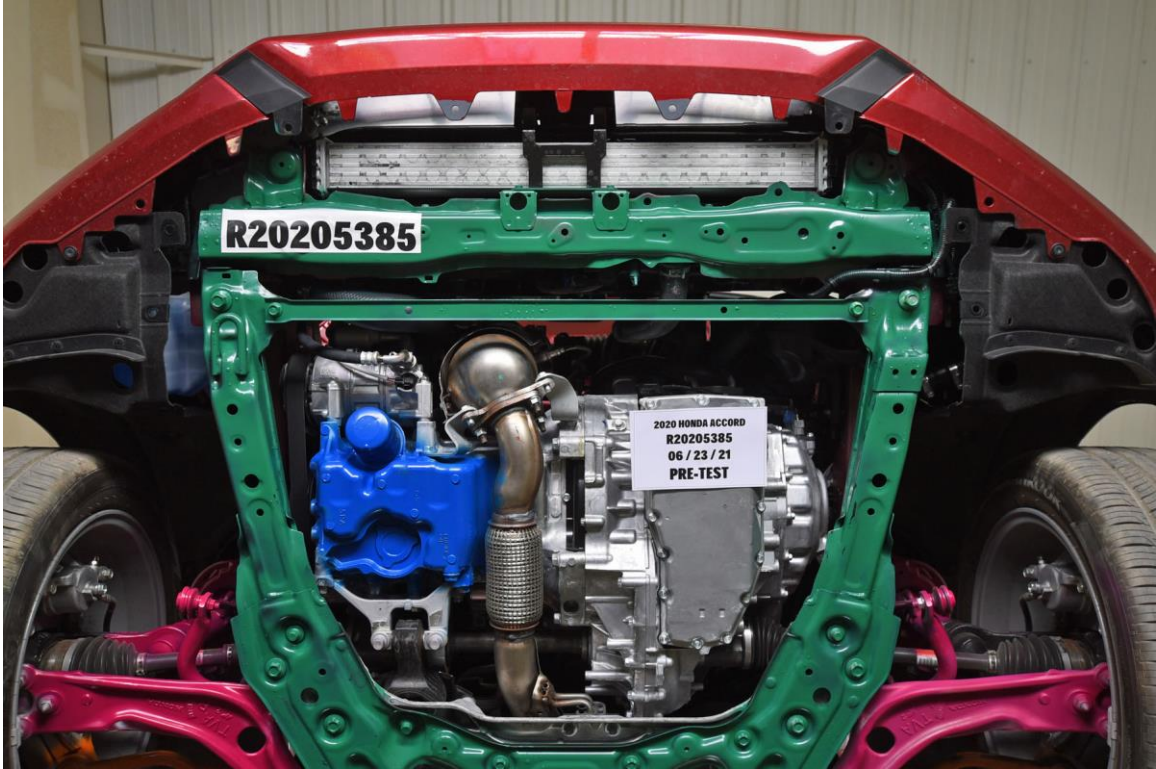


FIGURE 33. Pre-Test Bumper to Rail Attachments and Crush Initiators



FIGURE 34. Post-Test Bumper to Rail Attachments and Crush Initiators



FIGURE 35. Pre-Test Driver Side Bumper to Rail Attachments and Crush Initiators



FIGURE 36. Post-Test Driver Side Bumper to Rail Attachments and Crush Initiators



FIGURE 37. Pre-Test Passenger Side Bumper to Rail Attachments and Crush Initiators



FIGURE 38. Post-Test Passenger Side Bumper to Rail Attachments and Crush Initiators

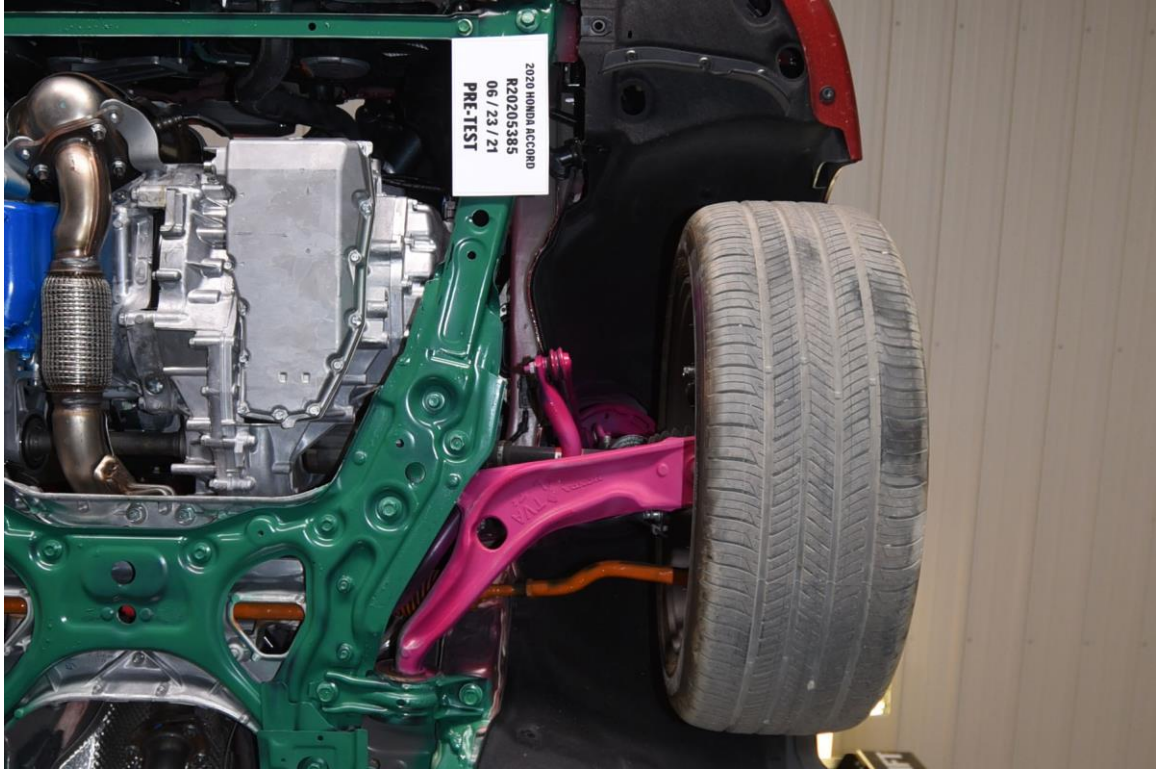


FIGURE 39. Pre-Test Driver Side Rocker

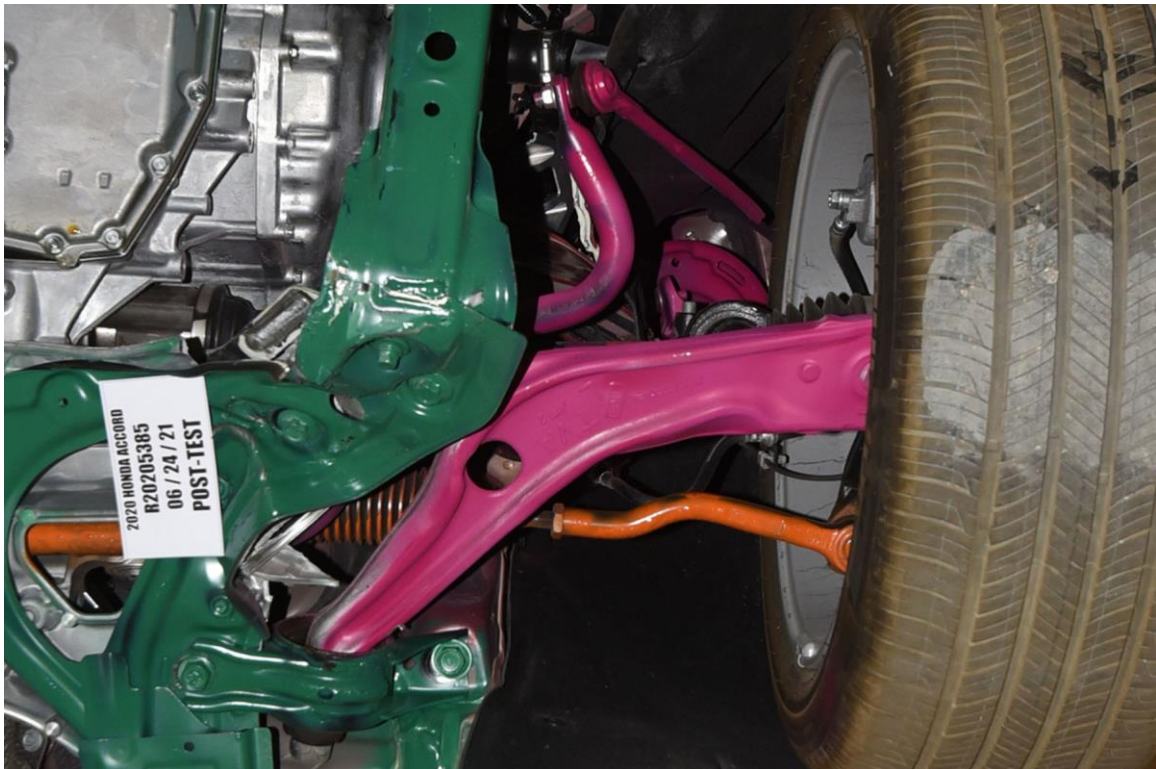


FIGURE 40. Post-Test Driver Side Rocker



FIGURE 41. Pre-Test Passenger Side Rocker



FIGURE 42. Post-Test Passenger Side Rocker



FIGURE 43. Pre-Test Driver Front Windshield View



FIGURE 44. Post-Test Driver Front Windshield View



FIGURE 45. Pre-Test Driver Side Front Window View



FIGURE 46. Post-Test Driver Side Front Window View



FIGURE 47. Pre-Test View of Driver Door Clearance



FIGURE 48. Post-Test View of Driver Door Clearance



FIGURE 49. Pre-Test Left Side View of Driver and Interior



FIGURE 50. Post-Test Left Side View of Driver and Interior



FIGURE 51. Pre-Test Left Side View of Steering Wheel Position



FIGURE 52. Post-Test Left Side View of Steering Wheel Position



FIGURE 53. Pre-Test Overhead View of Driver Thighs on Seat



FIGURE 54. Post-Test Overhead View of Driver Thighs on Seat



FIGURE 55. Pre-Test View of Driver Abdomen



FIGURE 56. Post-Test View of Driver Abdomen



FIGURE 57. Pre-Test Right Side View of Driver and Interior



FIGURE 58. Post-Test Right Side View of Driver and Interior



FIGURE 59. Pre-Test View of Driver Left Knee and Bolster



FIGURE 60. Post-Test View of Driver Left Knee and Bolster



FIGURE 61. Pre-Test View of Driver Right Knee and Bolster



FIGURE 62. Post-Test View of Driver Right Knee and Bolster



FIGURE 63. Pre-Test View of the Driver Left Leg



FIGURE 64. Post-Test View of the Driver Left Leg



FIGURE 65. Pre-Test View of the Driver Feet



FIGURE 66. Post-Test View of the Driver Feet



FIGURE 67. Pre-Test Driver Adjustable D-Ring



FIGURE 68. Post-Test Driver Adjustable D-Ring



FIGURE 69. Pre-Test Driver Seat Fore-Aft Markings



FIGURE 70. Post-Test Driver Seat Fore-Aft Markings



FIGURE 71. Pre-Test Driver Seat Back Markings



FIGURE 72. Post-Test Driver Seat Back Markings



FIGURE 73. Pre-Test Close-Up View of Driver Door Latch



FIGURE 74. Post-Test Close-Up View of Driver Door Latch



FIGURE 75. Pre-Test Driver Inner Door Panel



FIGURE 76. Post-Test Driver Inner Door Panel



FIGURE 77. Pre-Test Left Side View of Driver Knee Bolster



FIGURE 78. Post-Test Left Side View of Driver Knee Bolster



FIGURE 79. Pre-Test Overall View of Driver Knee Bolster



FIGURE 80. Post-Test Overall View of Driver Knee Bolster



FIGURE 81. Pre-Test Right Side View of Driver Knee Bolster



FIGURE 82. Post-Test Right Side View of Driver Knee Bolster



FIGURE 83. Pre-Test View of Driver Floor Pan from Outside of Vehicle

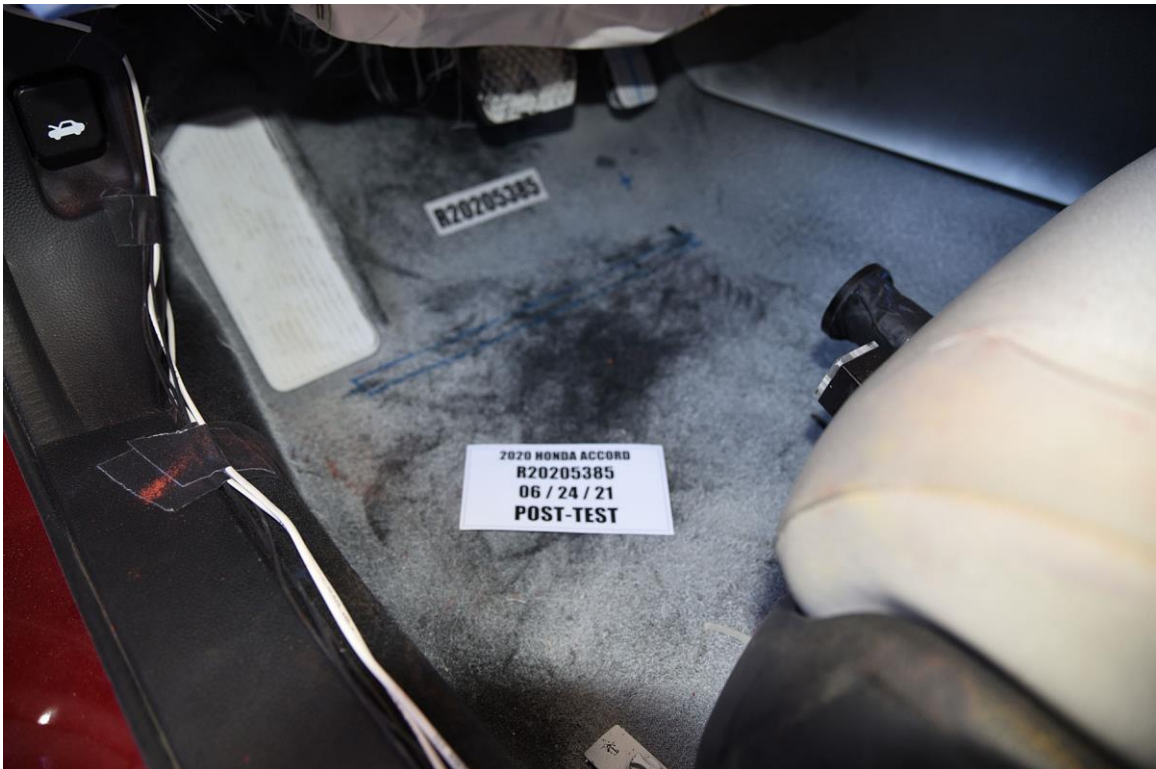


FIGURE 84. Post-Test View of Driver Floor Pan from Outside of Vehicle



FIGURE 85. Pre-Test View of Driver Floor Pan from Top of Seat



FIGURE 86. Post-Test View of Driver Floor Pan from Top of Seat



FIGURE 87. Pre-Test View of Driver Floor Pan from Center of Vehicle



FIGURE 88. Post-Test View of Driver Floor Pan from Center of Vehicle



FIGURE 89. Post-Test Driver Dummy Contact with Front Airbag



FIGURE 90. Post-Test Driver Dummy Contact with Side Airbag



FIGURE 91. Post-Test Driver Dummy Contact with Knee Airbag



FIGURE 91a. Post-Test Driver Dummy Contact with Headliner and Visor



FIGURE 91b. Post-Test Driver Dummy Contact with A Pillar and Headliner



FIGURE 91c. Post-Test Driver Dummy Contact with Windshield



FIGURE 92. Pre-Test Passenger Front Windshield View



FIGURE 93. Post-Test Passenger Front Windshield View



FIGURE 94. Pre-Test Passenger Side Front Window View



FIGURE 95. Post-Test Passenger Side Front Window View



FIGURE 96. Pre-Test View of Passenger Door Clearance



FIGURE 97. Post-Test View of Passenger Door Clearance



FIGURE 98. Pre-Test Right Side View of Passenger and Interior



FIGURE 99. Post-Test Right Side View of Passenger and Interior

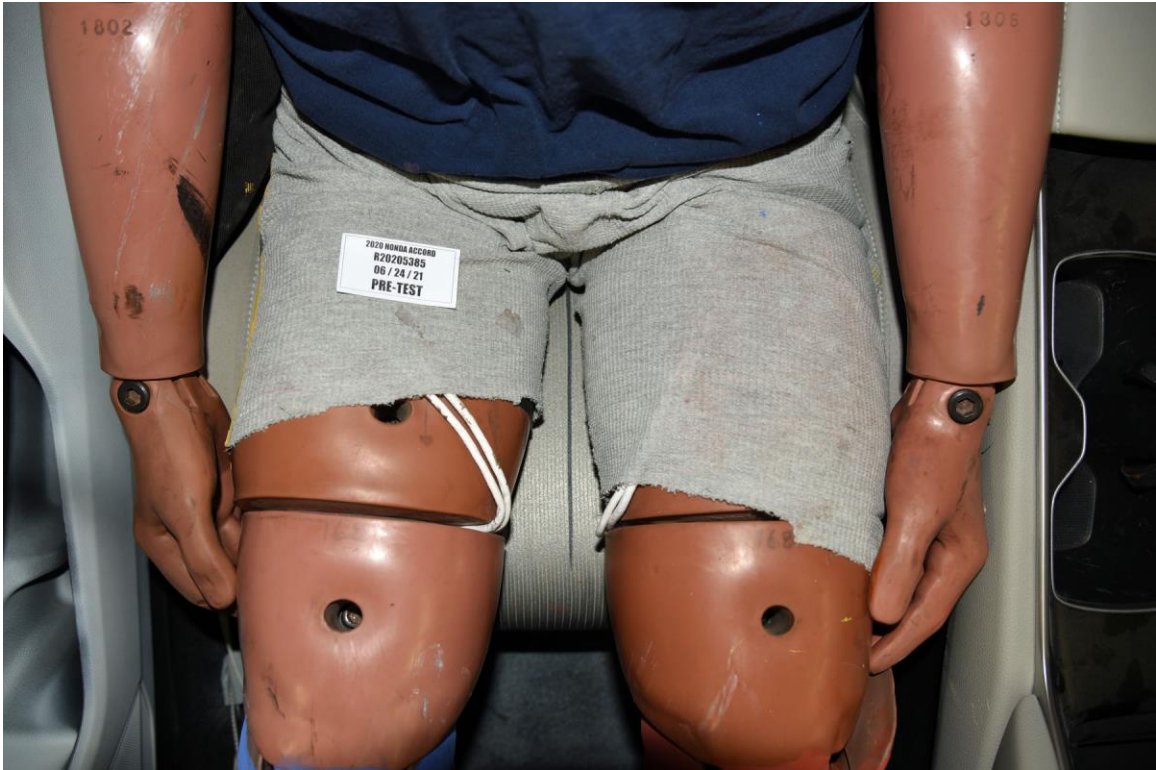


FIGURE 100. Pre-Test Overhead View of Passenger Thighs on Seat



FIGURE 101. Post-Test Overhead View of Passenger Thighs on Seat



FIGURE 102. Pre-Test View of Passenger Abdomen



FIGURE 103. Pre-Test View of Passenger Abdomen

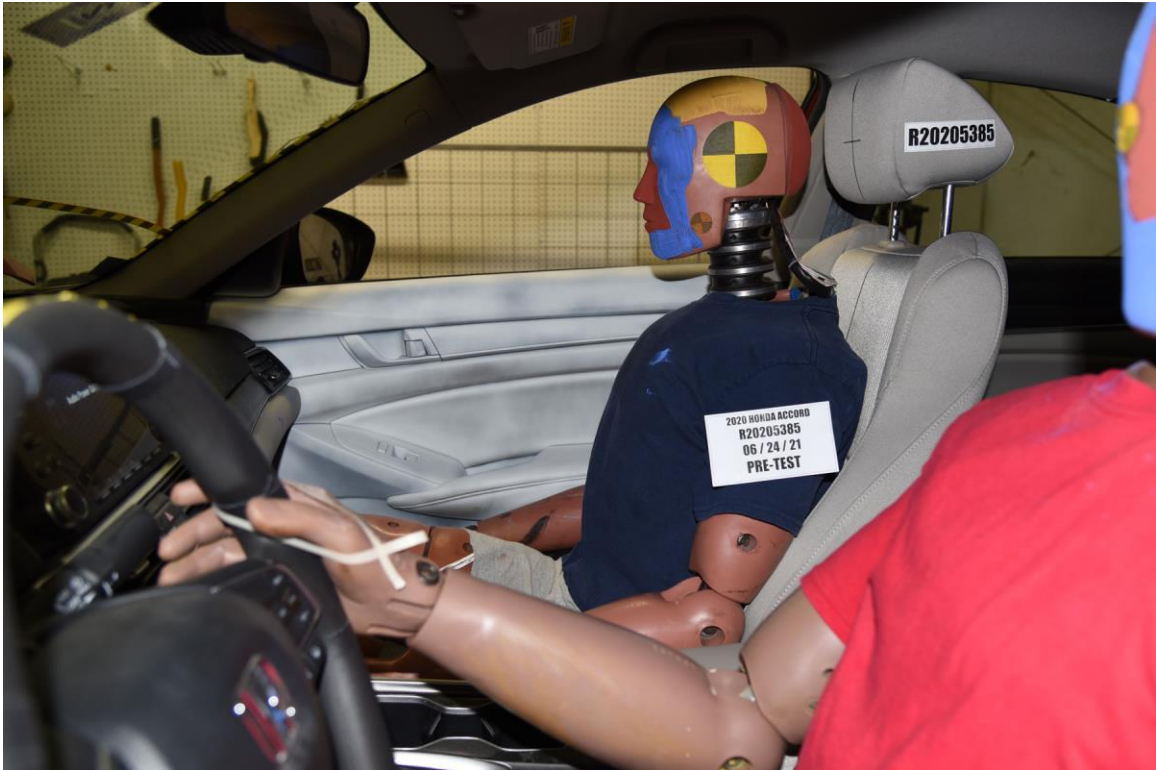


FIGURE 104. Pre-Test Left Side Passenger and Interior View



FIGURE 105. Post-Test Left Side Passenger and Interior View



FIGURE 106. Pre-Test View of Passenger Right Knee and Bolster



FIGURE 107. Post-Test View of Passenger Right Knee and Bolster

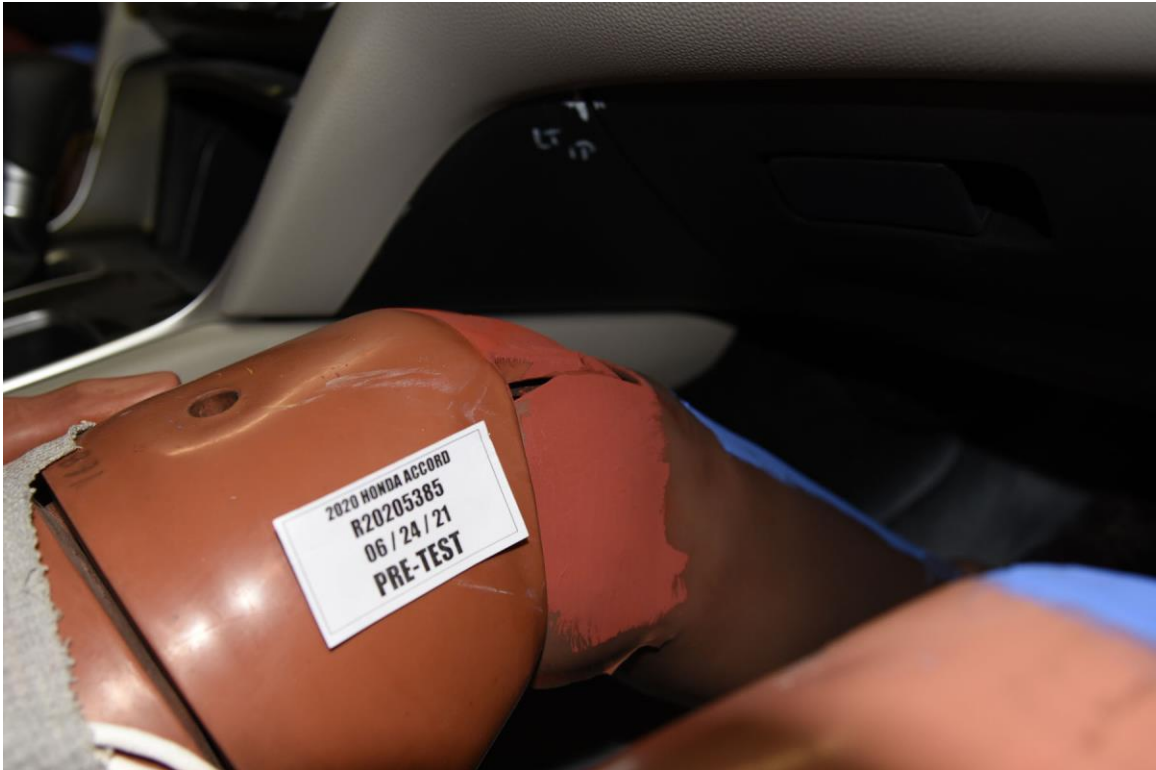


FIGURE 108. Pre-Test View of Passenger Left Knee and Bolster



FIGURE 109. Post-Test View of Passenger Left Knee and Bolster



FIGURE 110. Pre-Test View of the Passenger Feet

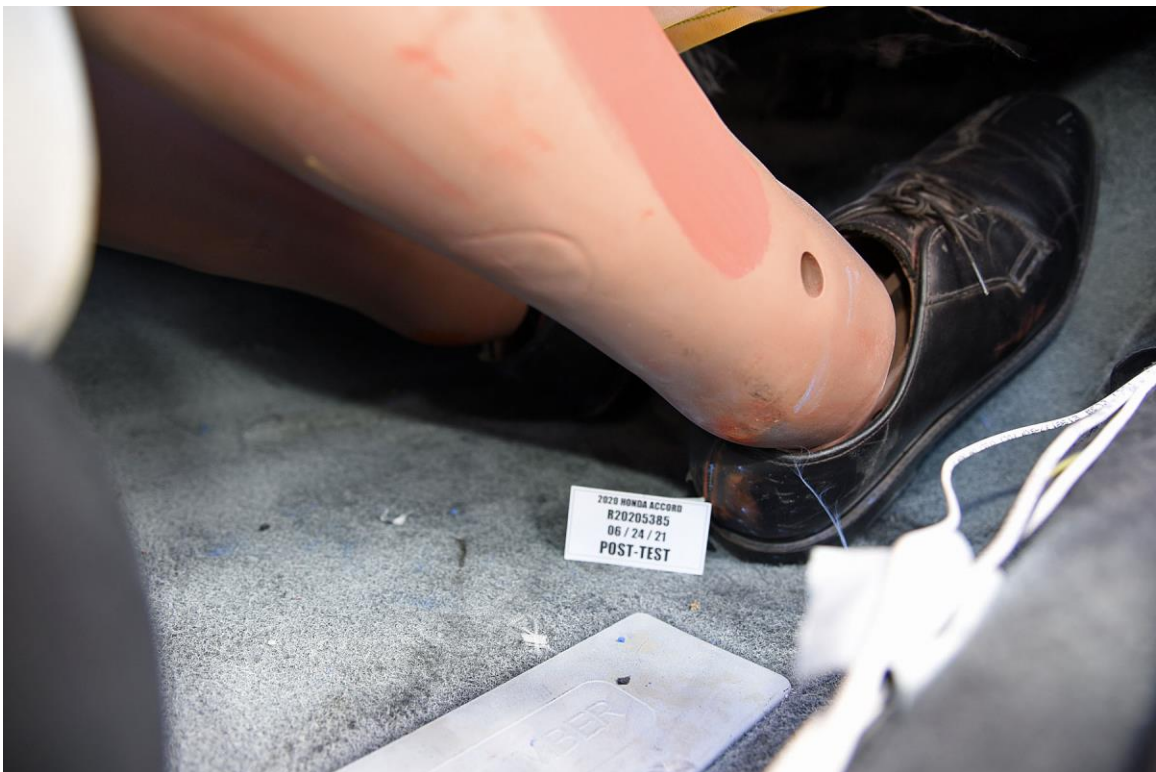


FIGURE 111. Post-Test View of the Passenger Feet



FIGURE 112. Pre-Test Passenger Adjustable D-Ring



FIGURE 113. Post-Test Passenger Adjustable D-Ring



FIGURE 114. Pre-Test Right Front Passenger Seat Fore-Aft Markings



FIGURE 115. Post-Test Right Front Passenger Seat Fore-Aft Markings



FIGURE 116. Pre-Test Passenger Seat Back Markings



FIGURE 117. Post-Test Passenger Seat Back Markings



FIGURE 118. Pre-Test Close-up View of Passenger Door Latch

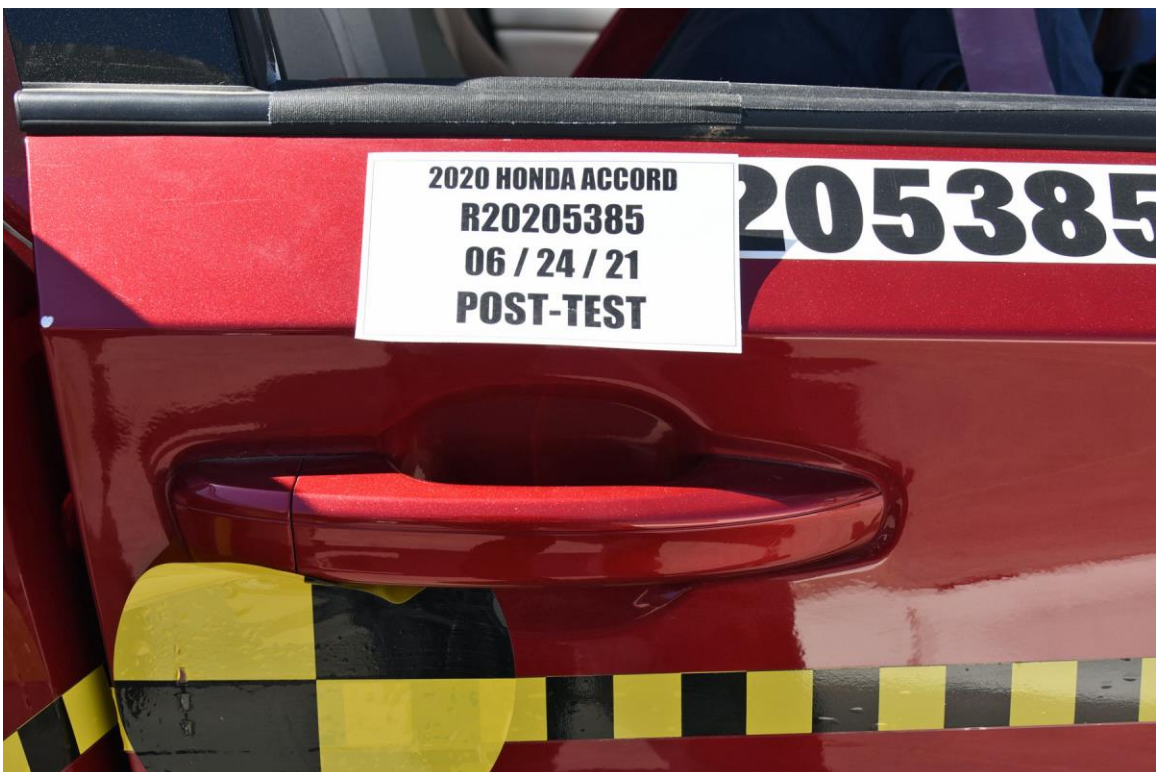


FIGURE 119. Post-Test Close-up View of Passenger Door Latch



FIGURE 120. Pre-Test Passenger Inner Door Panel



FIGURE 121. Post-Test Passenger Inner Door Panel



FIGURE 122. Pre-Test Right Side View of Passenger Knee Bolster



FIGURE 123. Post-Test Right Side View of Passenger Knee Bolster



FIGURE 124. Pre-Test Center View of Passenger Knee Bolster



FIGURE 125. Post-Test Center View of Passenger Knee Bolster



FIGURE 126. Pre-Test Left Side View of Passenger Knee Bolster



FIGURE 127. Post-Test Left Side View of Passenger Knee Bolster



FIGURE 128. Pre-Test View of Passenger Floor Pan from Outside of Vehicle



FIGURE 129. Post-Test View of Passenger Floor Pan from Outside of Vehicle



FIGURE 130. Pre-Test View of Passenger Floor Pan from Top of Front Seat



FIGURE 131. Post-Test View of Passenger Floor Pan from Top of Front Seat



FIGURE 132. Pre-Test View of Passenger Floor Pan from Center of Vehicle



FIGURE 133. Post-Test View of Passenger Floor Pan from Center of Vehicle



FIGURE 134. Post-Test Passenger Dummy Contact with Front Airbag

Photograph Not Applicable

FIGURE 135. Post-Test Passenger Dummy Contact with Side Airbag



FIGURE 136. Post-Test Passenger Dummy Contact with Knee Airbag



FIGURE 136a. Post-Test Passenger Dummy Contact with Headliner

Photograph Not Applicable

No Stoddard Solvent Spillage

FIGURE 137. Post-Test Stoddard Solvent Spillage Location View



FIGURE 138. Post-Test Speed Trap Read-Out

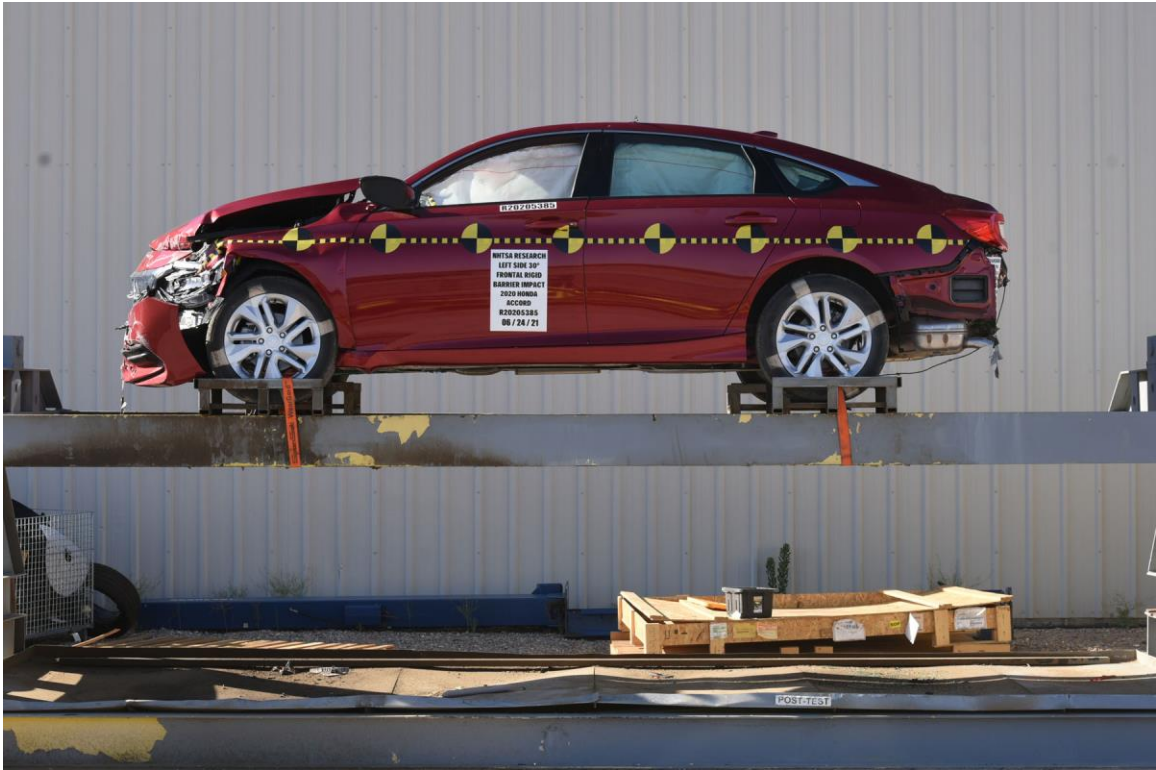


FIGURE 139. Vehicle at 0° on Static Rollover Device

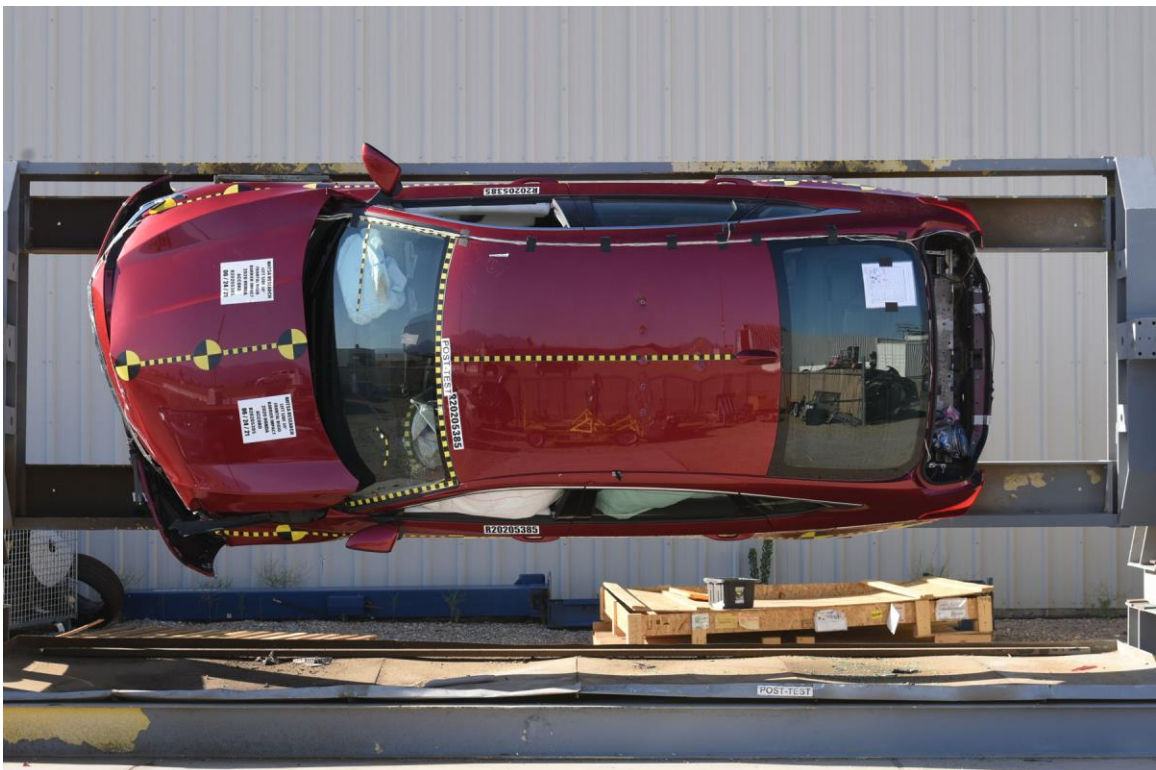


FIGURE 140. Vehicle at 90° on Static Rollover Device

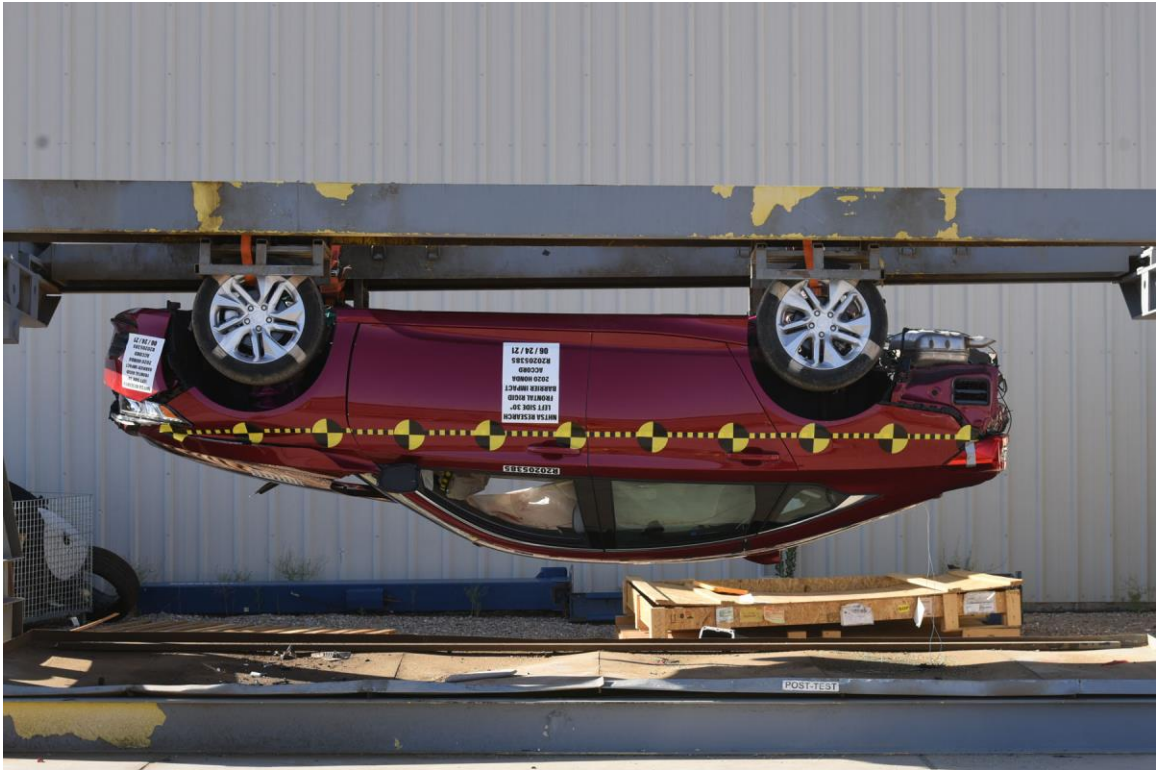


FIGURE 141. Vehicle at 180° on Static Rollover Device

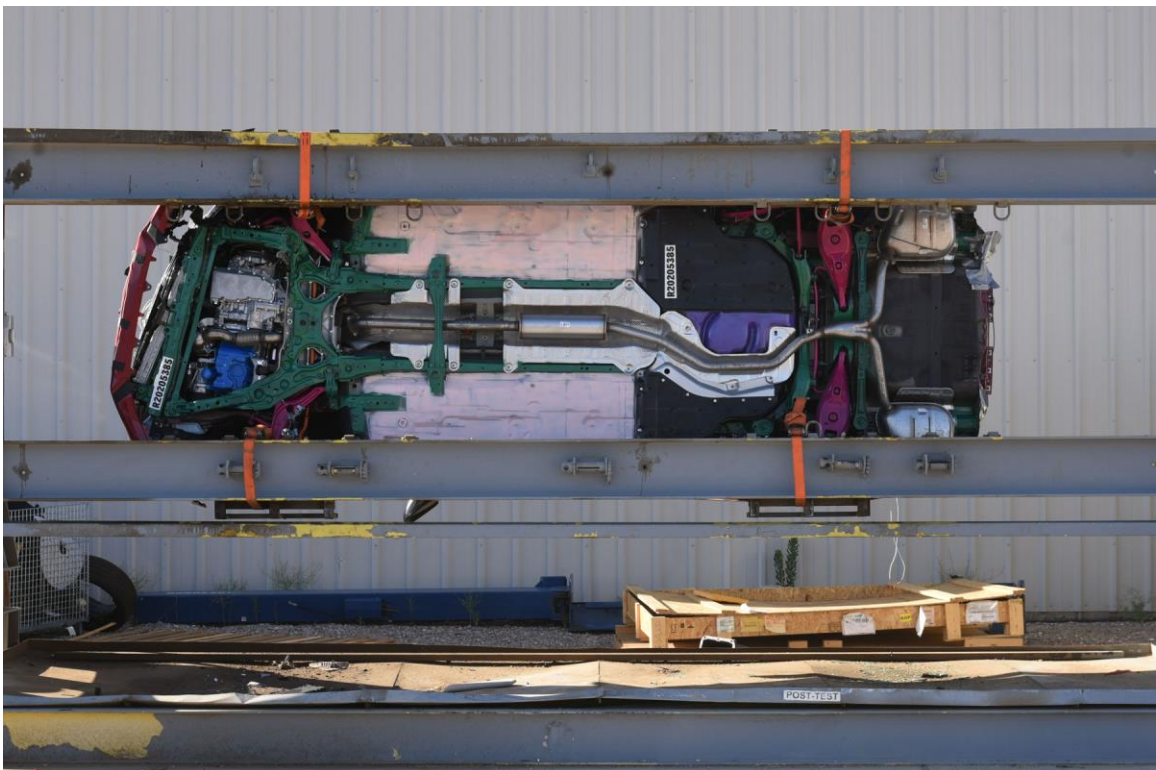



FIGURE 142. Vehicle at 270° on Static Rollover Device



FIGURE 143. Vehicle at 360° on Static Rollover Device



FIGURE 144. Frontal Impact Event



2020 ACCORD 1.5T LX
EXT: RADIANT RED M ENGINE NUMBER: L15BE175702
INT: IVORY

Manufacturer's Suggested Retail Price **\$24,271.00**

Full Tank of Fuel **No charge**

3Y/36K Mile Warranty Term

Destination and Handling **\$95.00**

TOTAL VEHICLE PRICE
(Includes Pre-Delivery Service)
\$25,225.00

License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

Fuel Economy and Environment Gasoline Vehicle

Fuel Economy
33 MPG
combined city/hwy
30 city
38 highway
3.0 gallons per 100 miles

Large Cars range from 14 to 111 MPG. The best vehicle rates 136 MPG.

You Save \$1,250
in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,250

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **7**

Smog Rating (tailpipe only) **7**

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.70 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

STANDARD EQUIPMENT AT NO EXTRA COST

TECHNICAL FEATURES*

- 192hp 1.5-Liter Direct Injection Turbo-Charged 4-Cylinder Engine
- Continuously Variable Transmission (CVT)
- 4-Wheel Disc Brakes
- Electric Power Steering
- Hill Start Assist

SAFETY FEATURES*

- Driver's and Front Passenger's Airbags
- Driver's and Front Passenger's Side Airbags
- Driver's and Front Passenger's Knee Airbags
- Side Curtain Airbags with Rollover Sensor
- Anti-Lock Braking System (ABS)
- Electronic Brake Distribution (EBD)
- Vehicle Stability Assist (VSA)
- Tire Pressure Monitoring System
- LED Daytime Running Lights
- LATCH System for Child Seats

INTERIOR FEATURES*

- Audio System with 4 Speakers
- Color LCD Screen and Multi-View Rear Camera
- Bluetooth HandsFreeLink
- USB Audio Interface
- Driver Attention Monitor

EXTERIOR FEATURES*

- 17" Alloy Wheels
- P225/50 R17 All-Season Tires
- Auto On/Off Headlights
- Power Door Mirrors
- Remote Entry with Security System
- Capless Fuel Filler

HONDA SENSING*

- Adaptive Cruise Control (ACC)
- Collision Mitigation Braking System (CMBS)
- Lane Keeping Assist System (LKAS)
- Road Departure Mitigation (RDM)

TECHNICAL FEATURES*

- Dual-Zone Automatic Climate Control with Air Filtration System
- Push-Button Start
- Driver's Seat Height Adjustment
- Fold-Down Rear Seat Center Armrest
- Power Windows and Door Locks
- Front Auto Up/Down Windows
- Illuminated Visor Vanity Mirrors
- Sunglasses Holder
- Exterior Temperature Display
- Fold-Down Rear Seatback
- Rear Mats
- 12-Volt Power Outlets
- Electric Parking Brake

HSC 39037.05 Low-Emission Motor Vehicle

THE AUTOMASTER HONDA
3328 SHELburnE ROAD
SHELburnE, VT 05482

VIN: 1HGCV1F15LA147984

PORT OF ENTRY: MARYSVILLE
DELIVERY POINT: WINDSOR LOCK
SHIP#:
ROWSPACE: 821-012
TRANSMETHOD: W10 SELKIRK

ORIG. DLN: 206812
REF. NO.: 42660
HN CODE: HN-0001
EMISSION: 50 STATE
CONTROL NO.: 246771
DEALER: 206812

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: **65 %**

NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

GOVERNMENT 5-STAR SAFETY RATING

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	★★★★★
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		
Side Crash	Front seat Rear seat	★★★★★
Based on the risk of injury in a side impact.		
Rollover		★★★★★
Based on the risk of rollover in a single vehicle crash.		

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

This vehicle is equipped with bumpers that can withstand an impact of 2.5 miles per hour with no damage to the vehicle's body and safety systems, although the bumper and related components may sustain damage. The bumper system on this vehicle conforms to the current federal bumper standard of 2.5 miles per hour.

FOR THIS VEHICLE
Final Assembly Plant:
MARYSVILLE, OHIO USA
Country of Origin: Engine:
U.S.A
Transmission:
U.S.A

FIGURE 145. Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA TRACES

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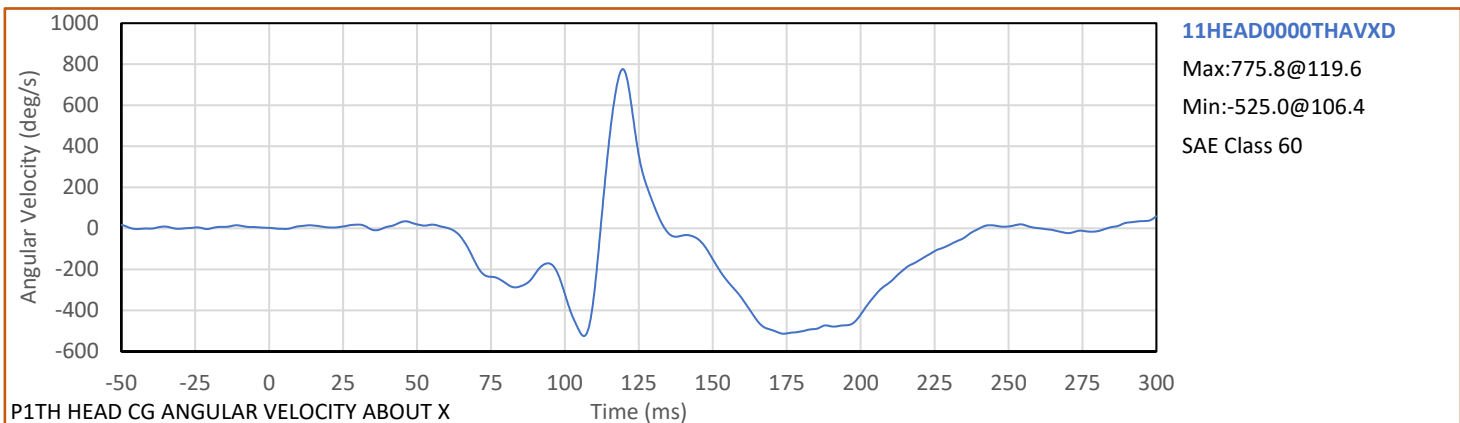
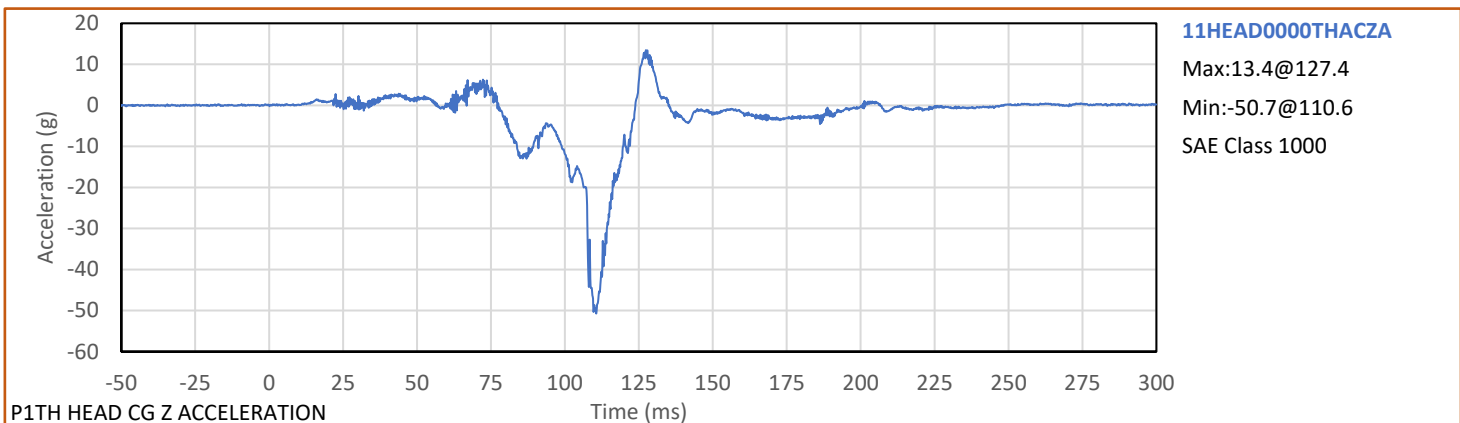
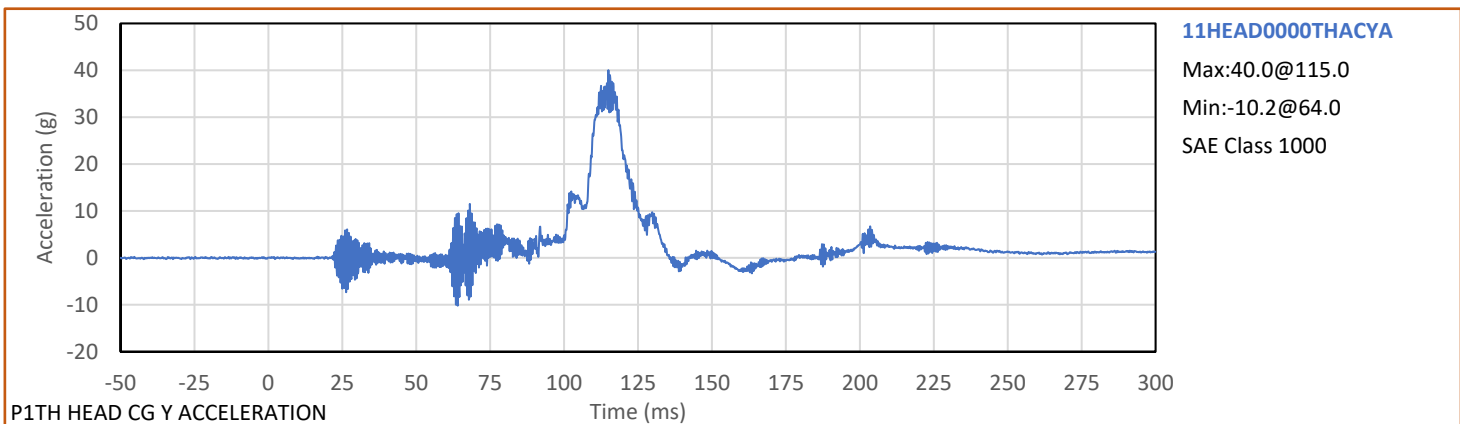
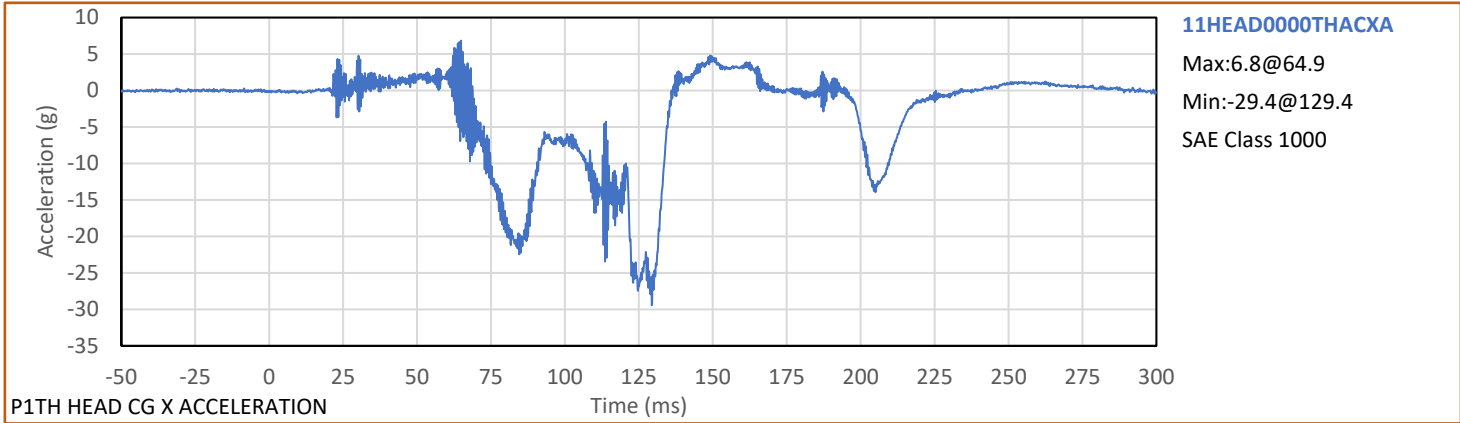
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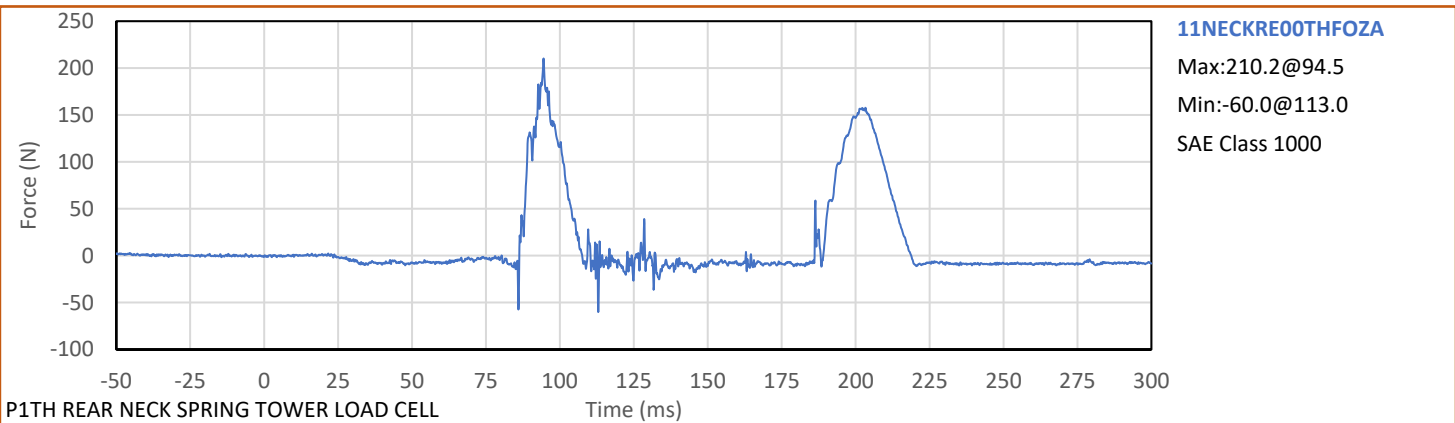
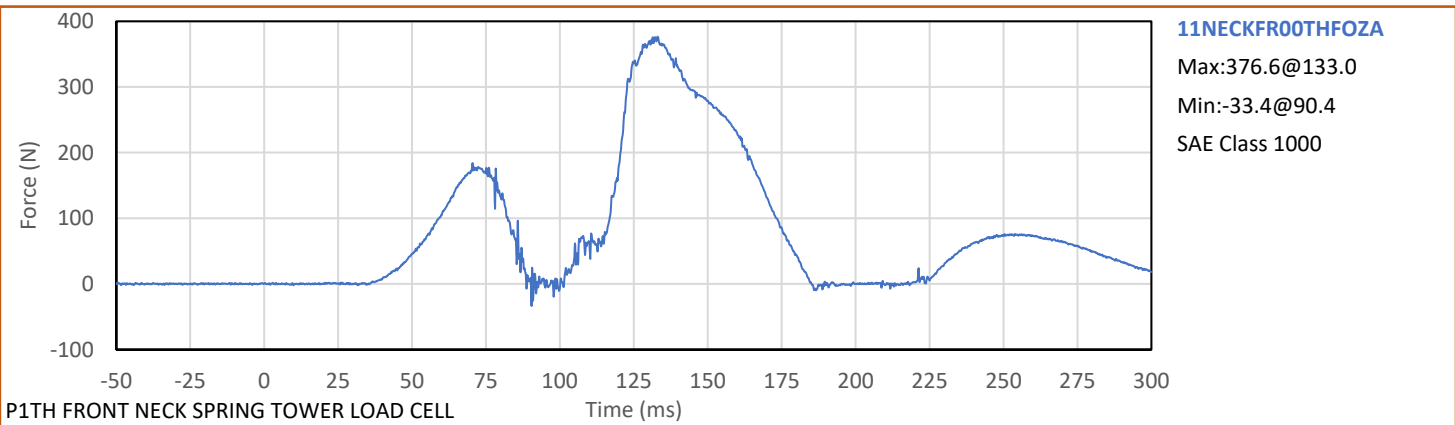
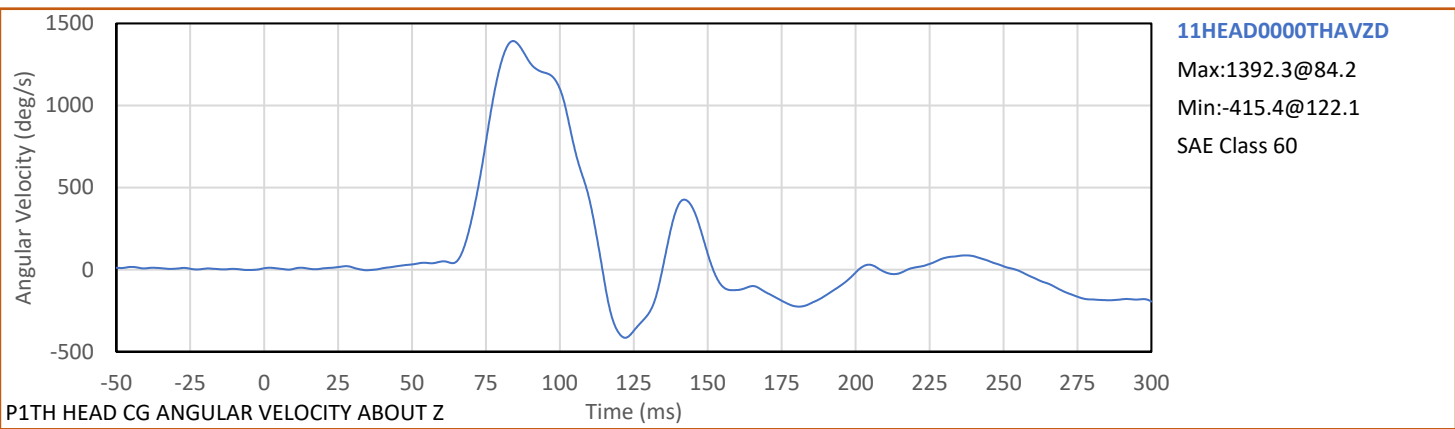
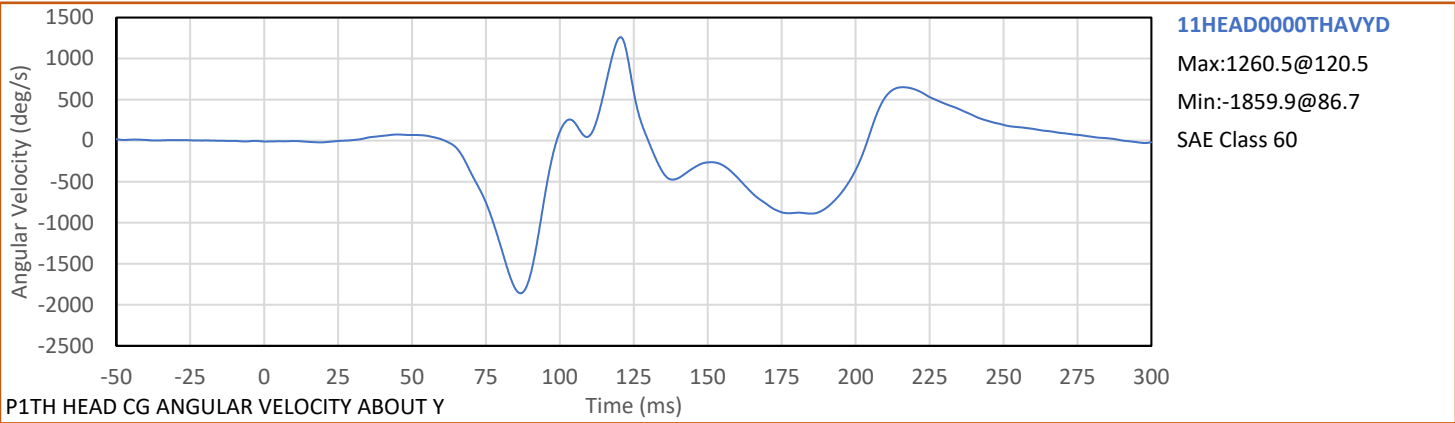
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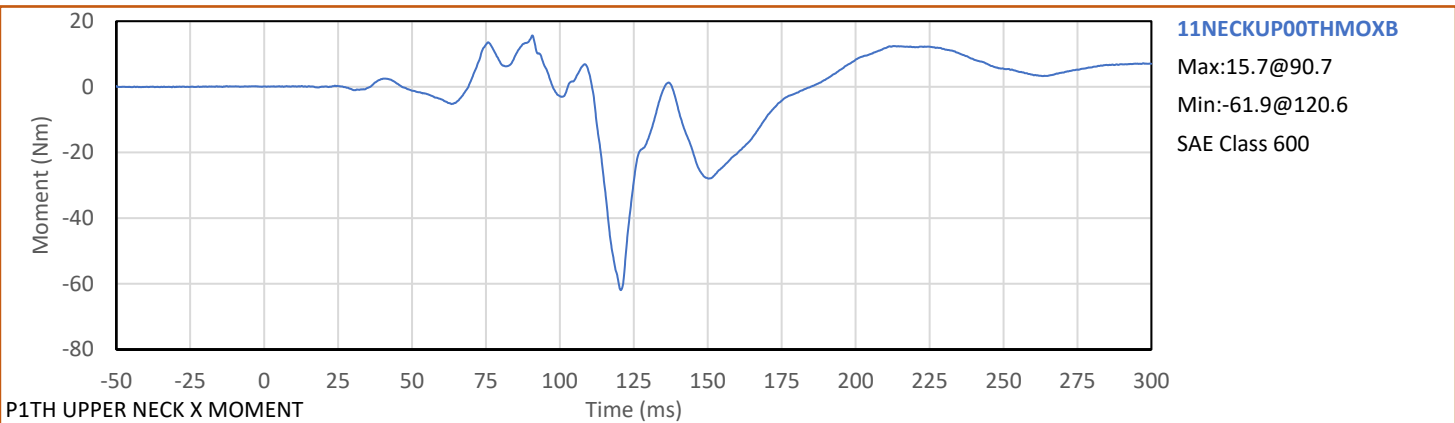
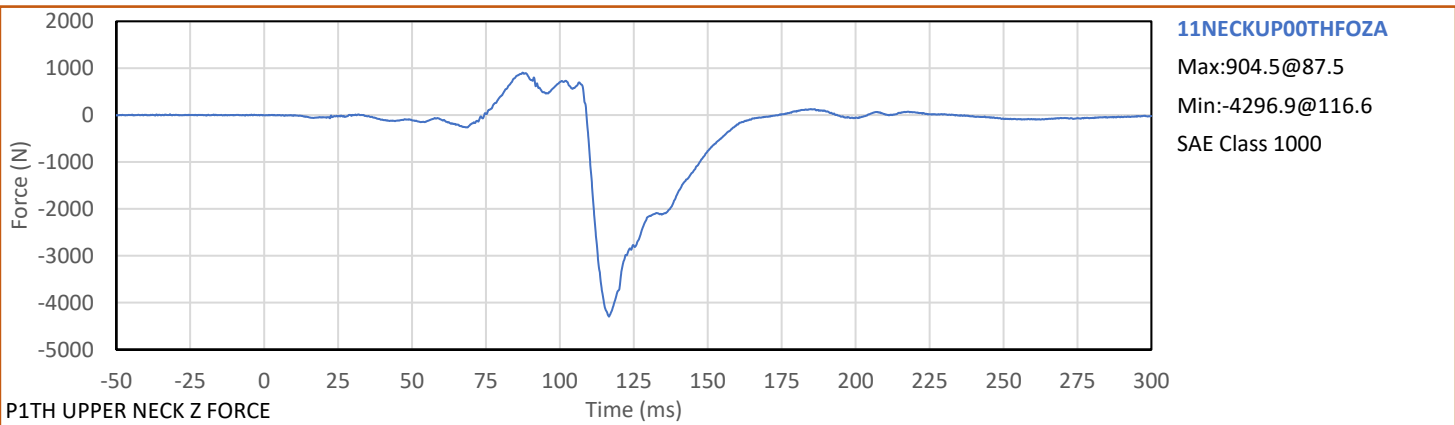
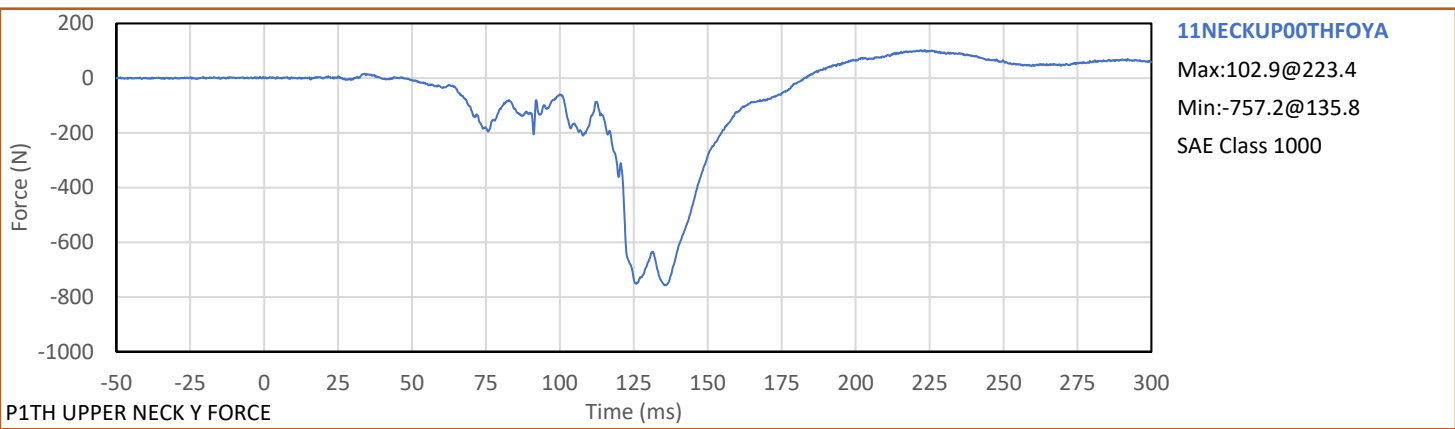
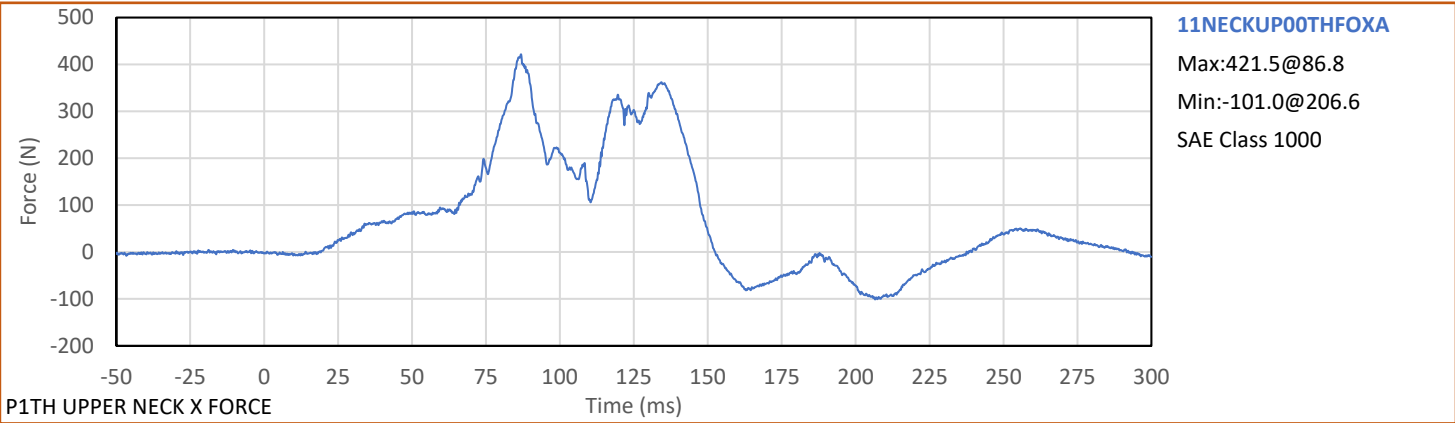
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178	P1TH CHEST RIGHT UPPER DY	B-46
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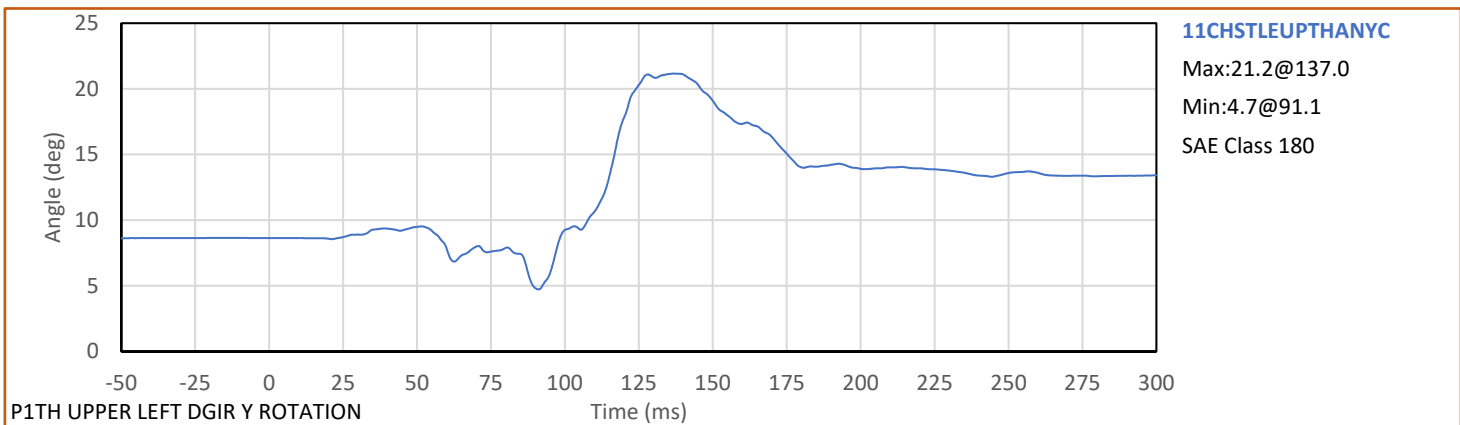
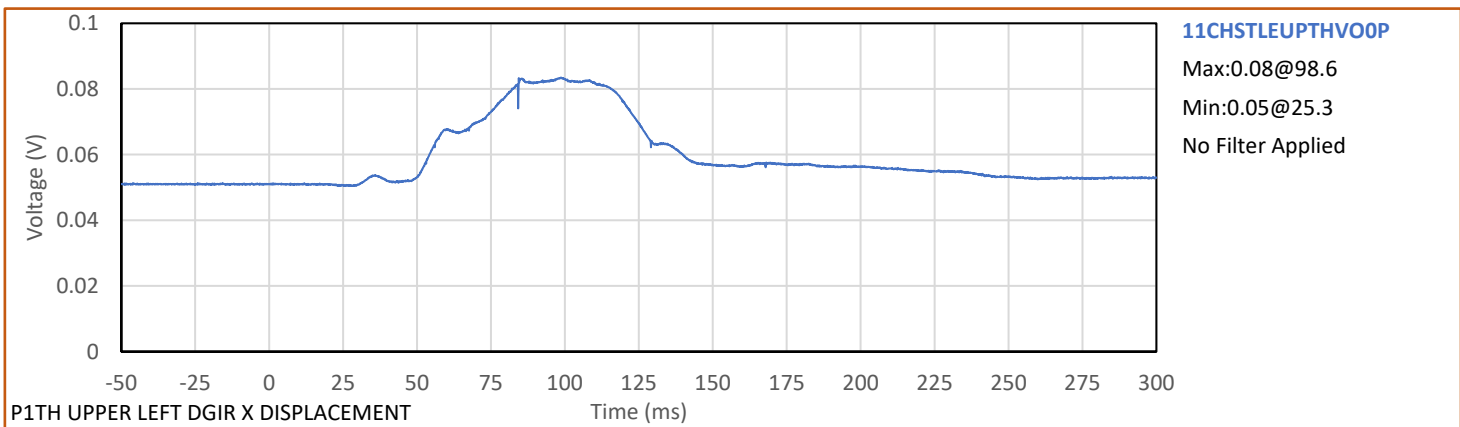
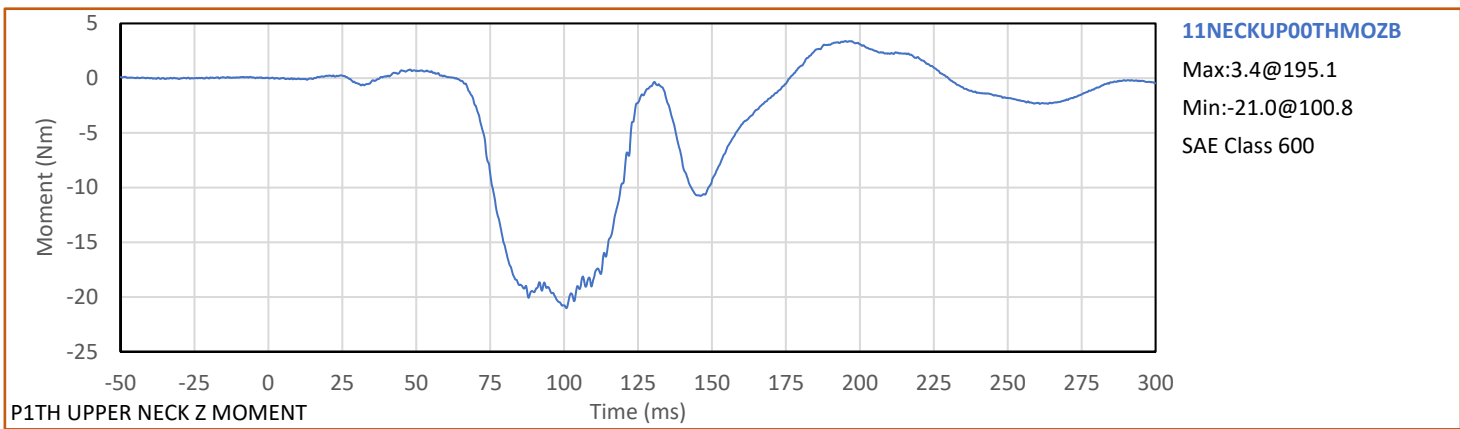
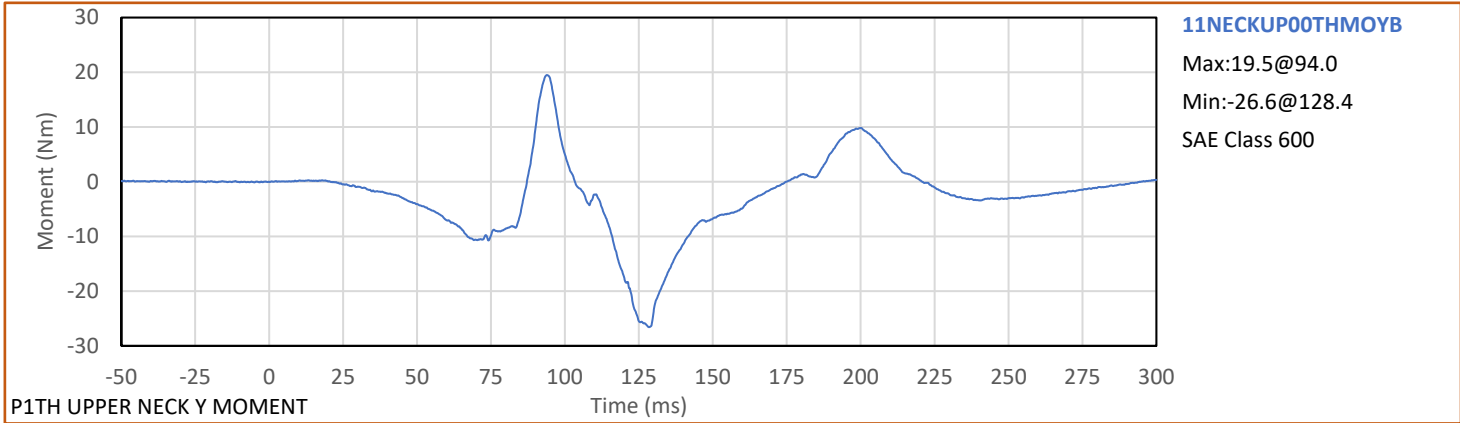
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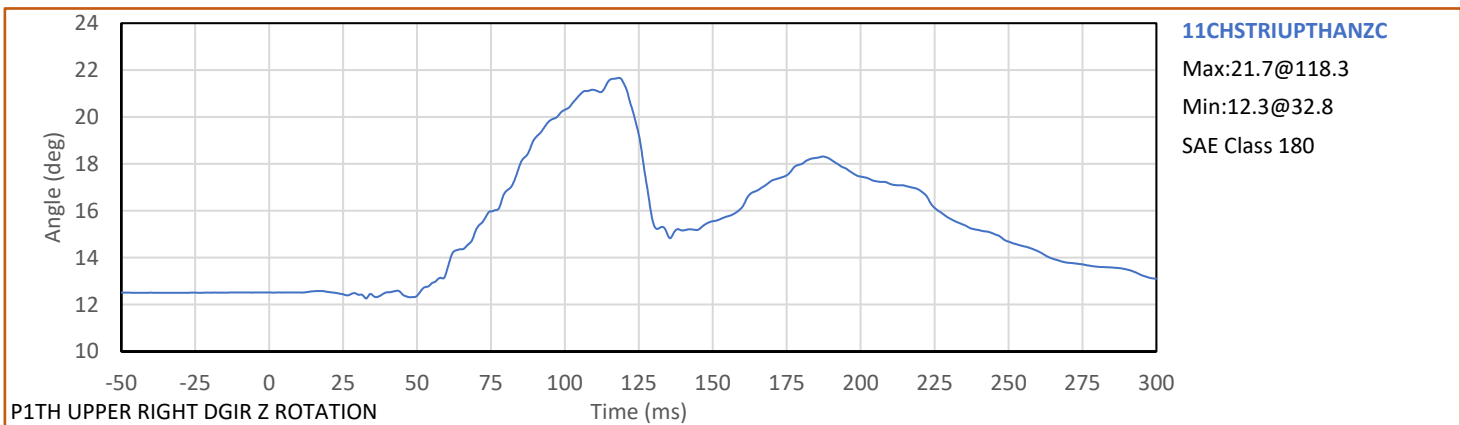
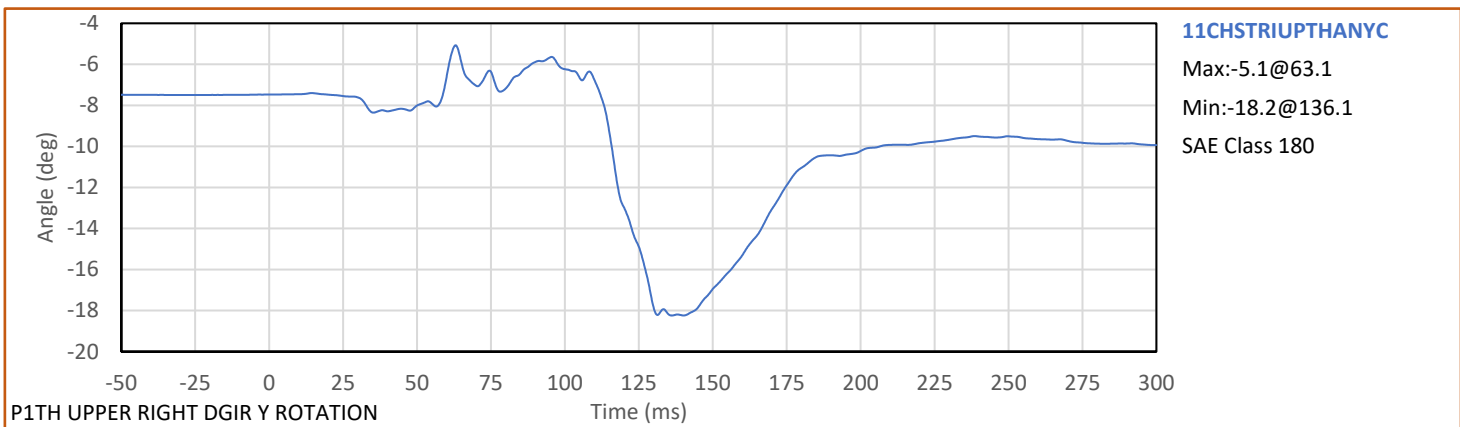
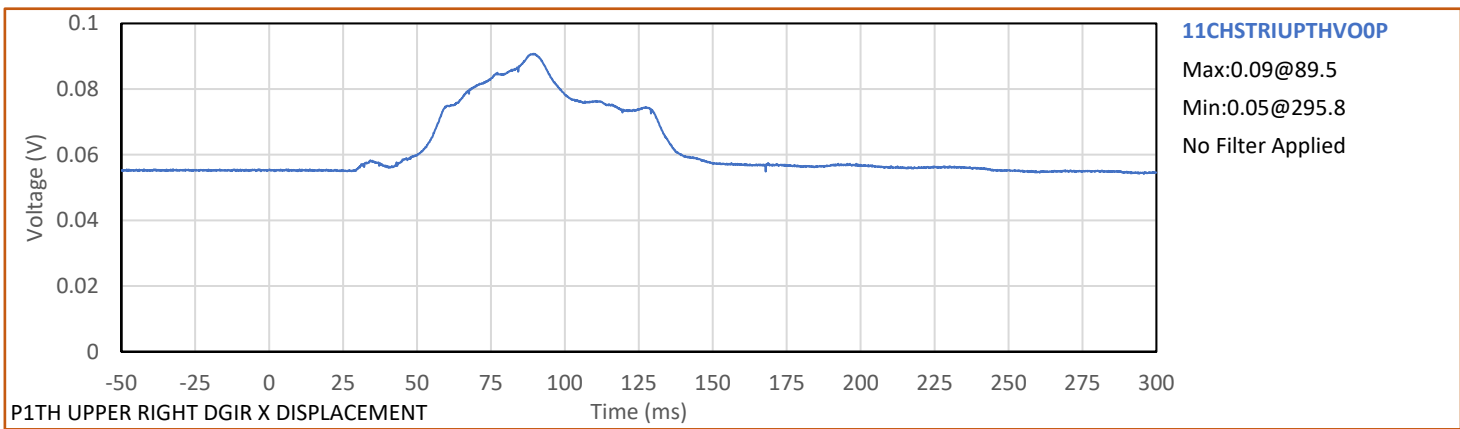
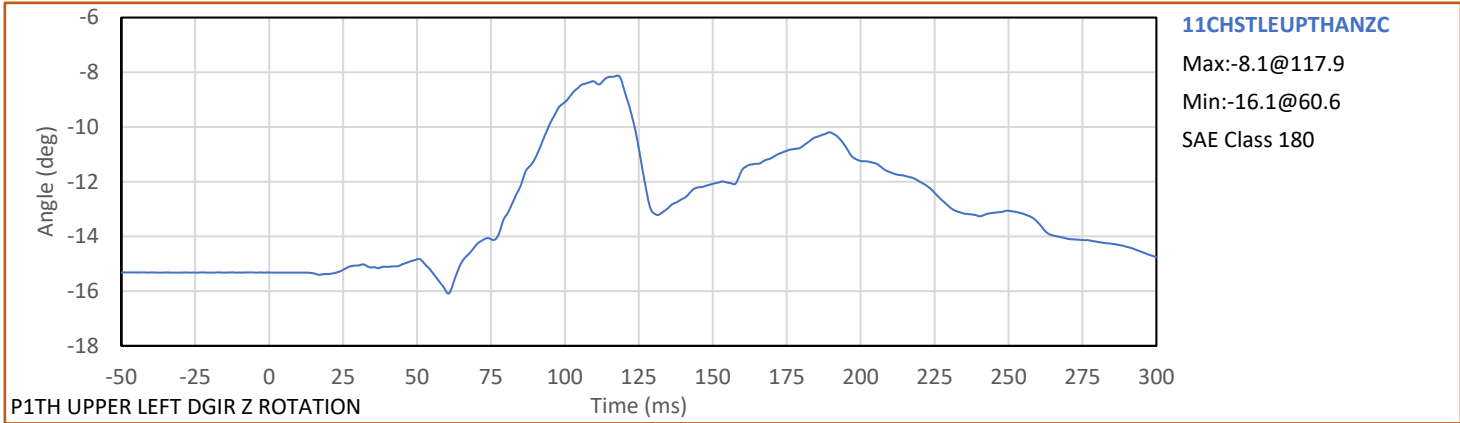
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182	P1TH CHEST LEFT LOWER DY	B-47
183	P1TH CHEST LEFT LOWER DZ	B-47
184	P1TH CHEST LEFT LOWER RESULTANT	B-47
185	P1TH CHEST RIGHT LOWER DX	B-48
186	P1TH CHEST RIGHT LOWER DY	B-48
187	P1TH CHEST RIGHT LOWER DZ	B-48
188	P1TH CHEST RIGHT LOWER RESULTANT	B-48
189	P1TH ABDOMEN LEFT LOWER DX	B-49
190	P1TH ABDOMEN LEFT LOWER DY	B-49
191	P1TH ABDOMEN LEFT LOWER DZ	B-49
192	P1TH ABDOMEN LEFT LOWER RESULTANT	B-49
193	P1TH ABDOMEN RIGHT LOWER DX	B-50
194	P1TH ABDOMEN RIGHT LOWER DY	B-50
195	P1TH ABDOMEN RIGHT LOWER DZ	B-50
196	P1TH ABDOMEN RIGHT LOWER RESULTANT	B-50

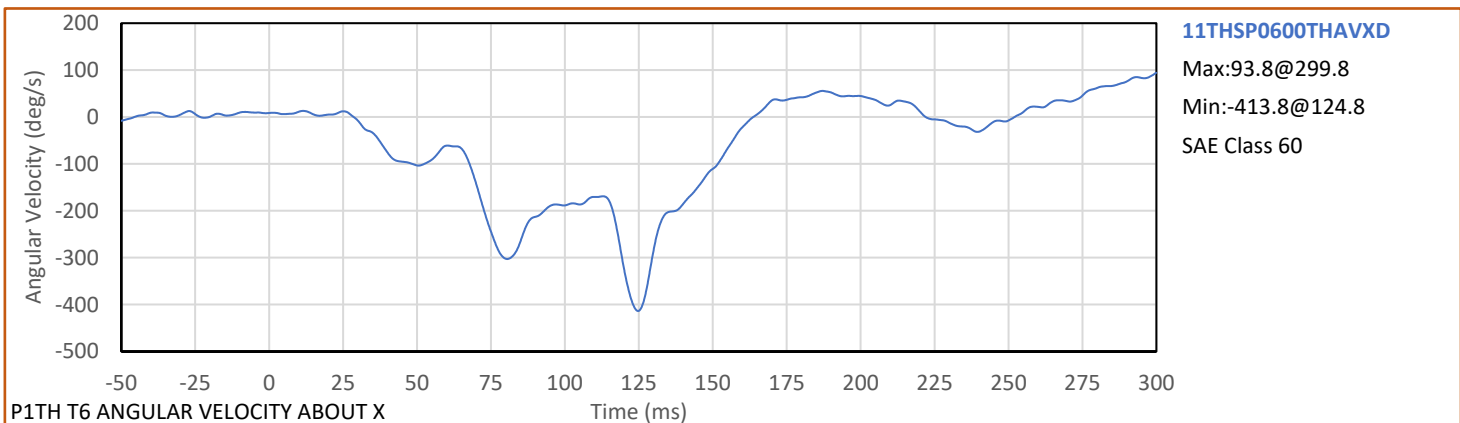
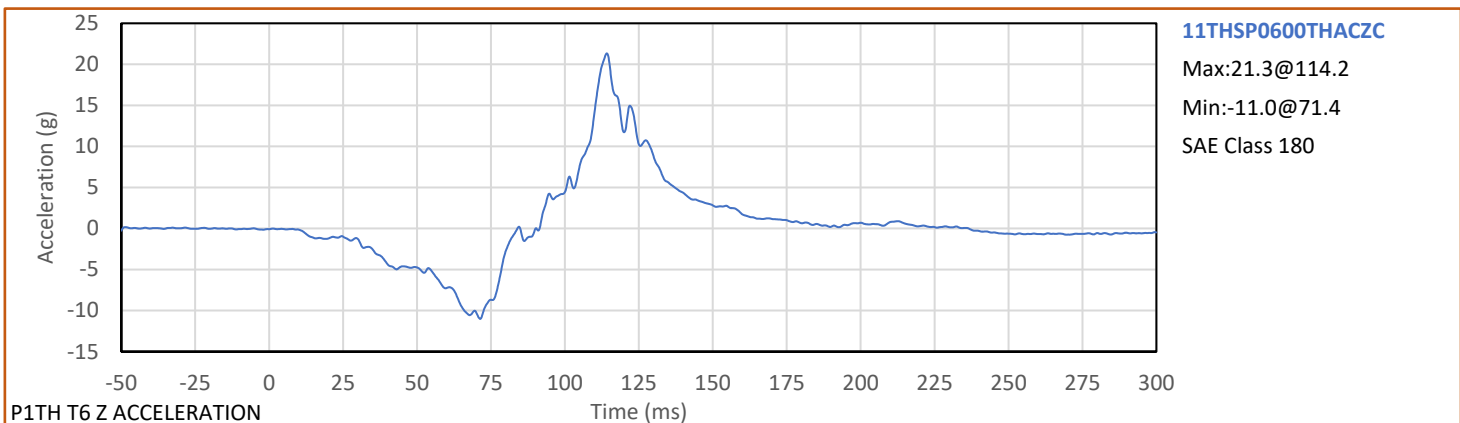
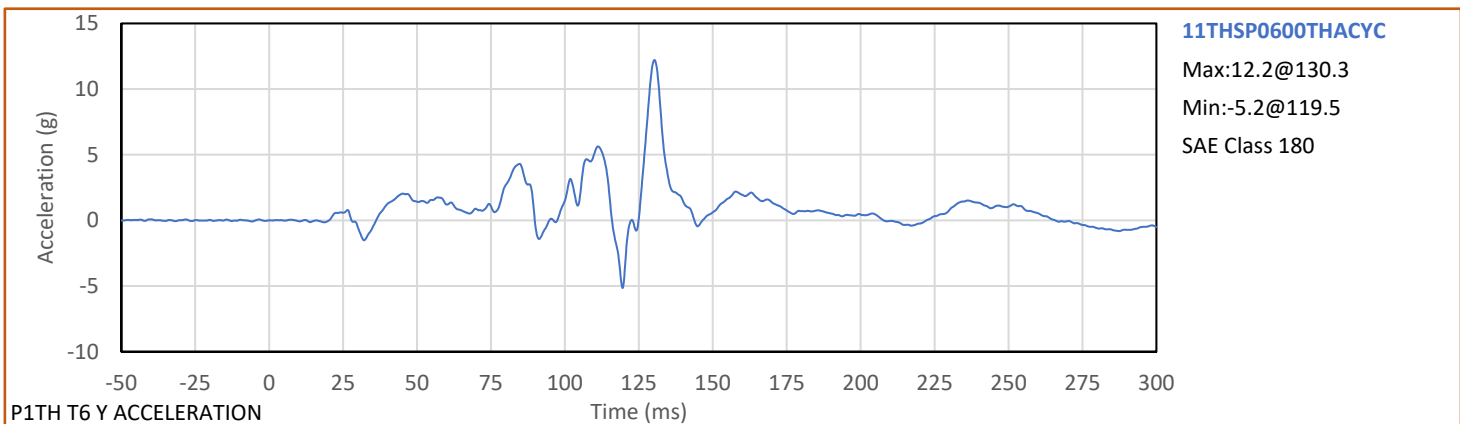
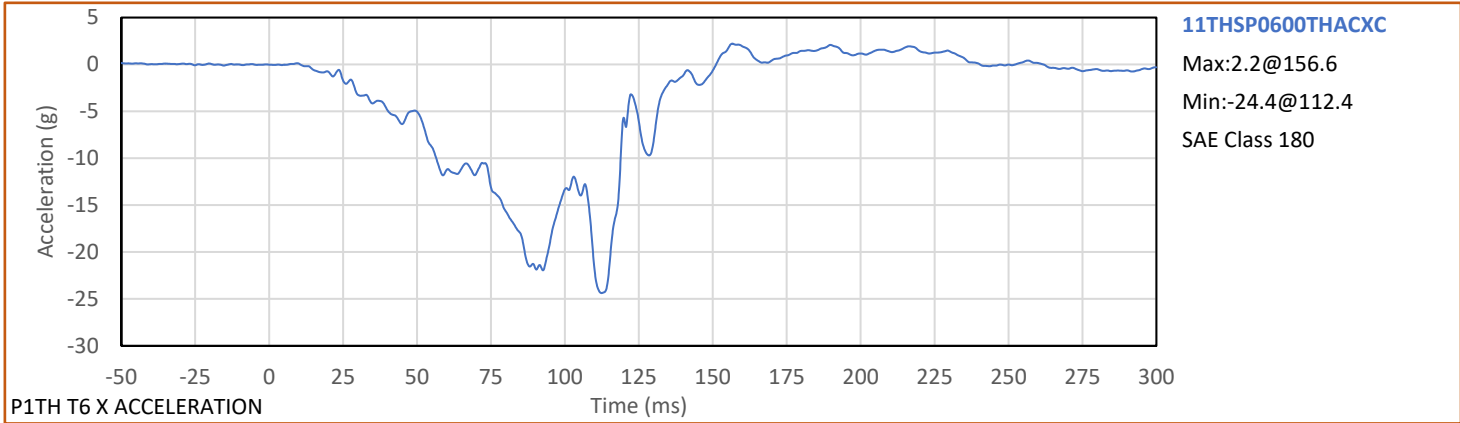


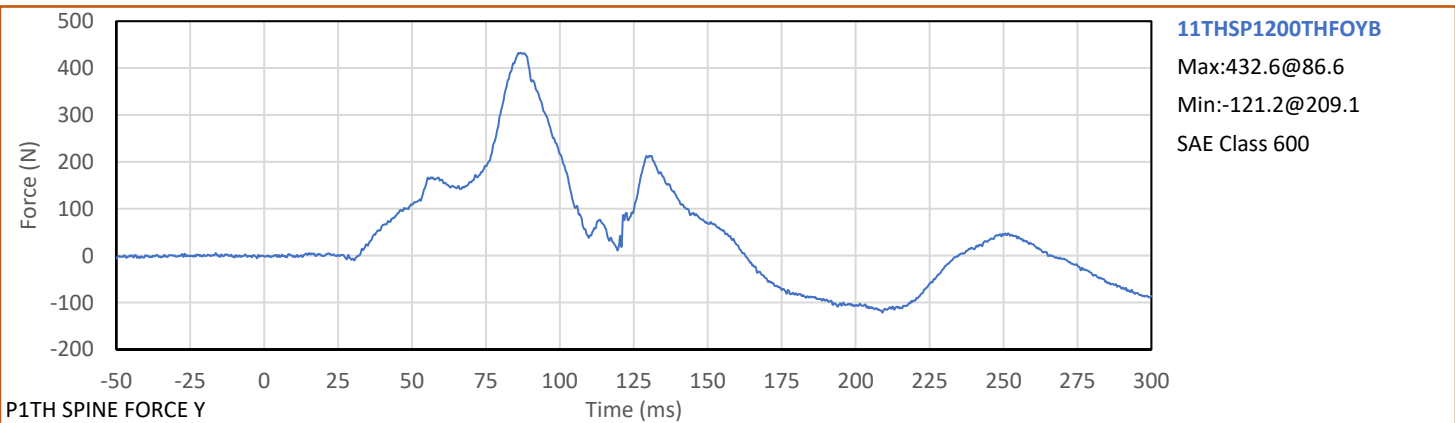
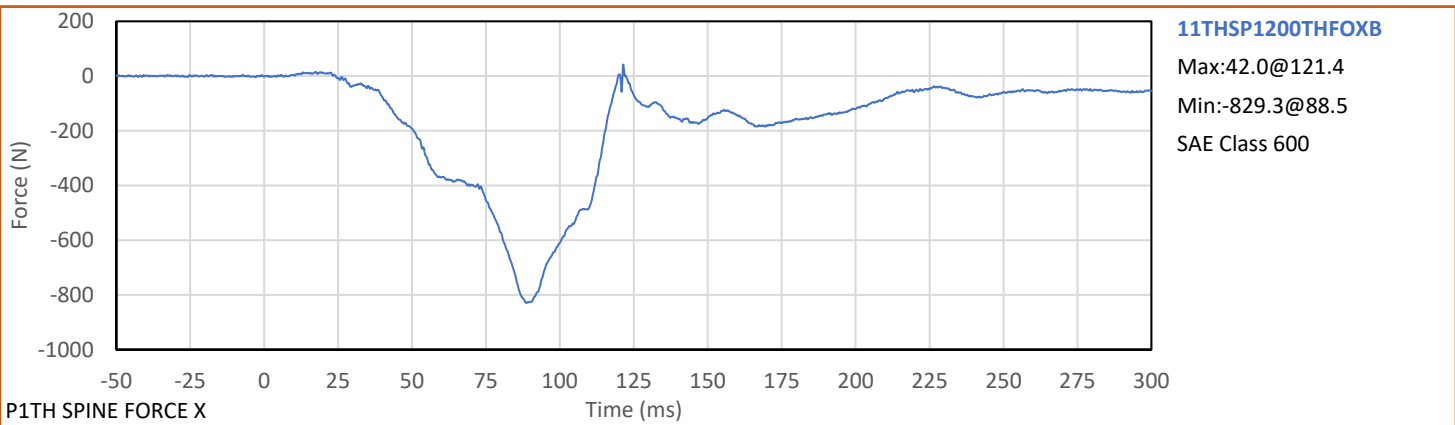
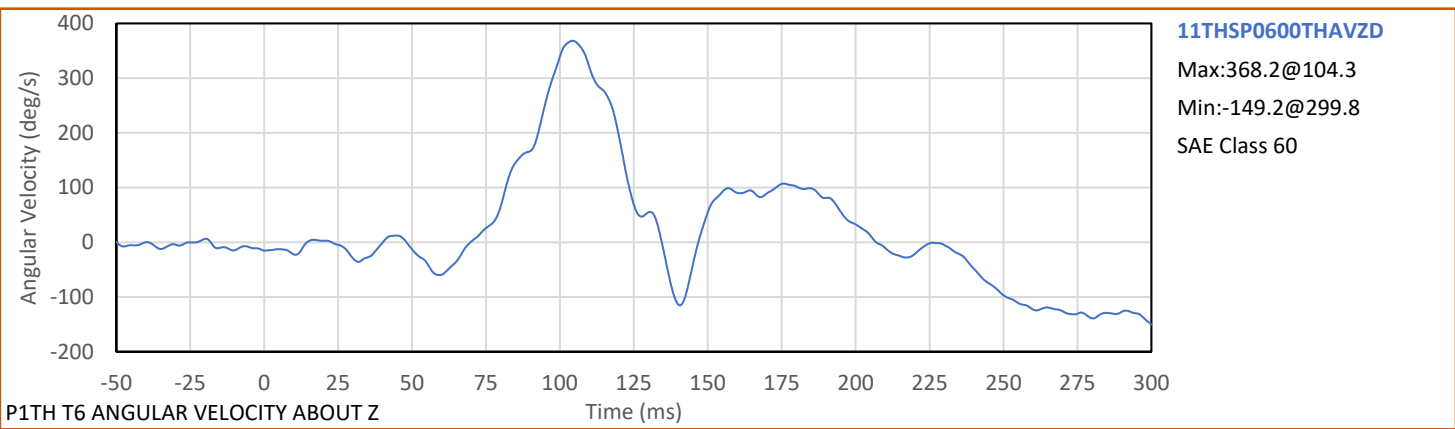
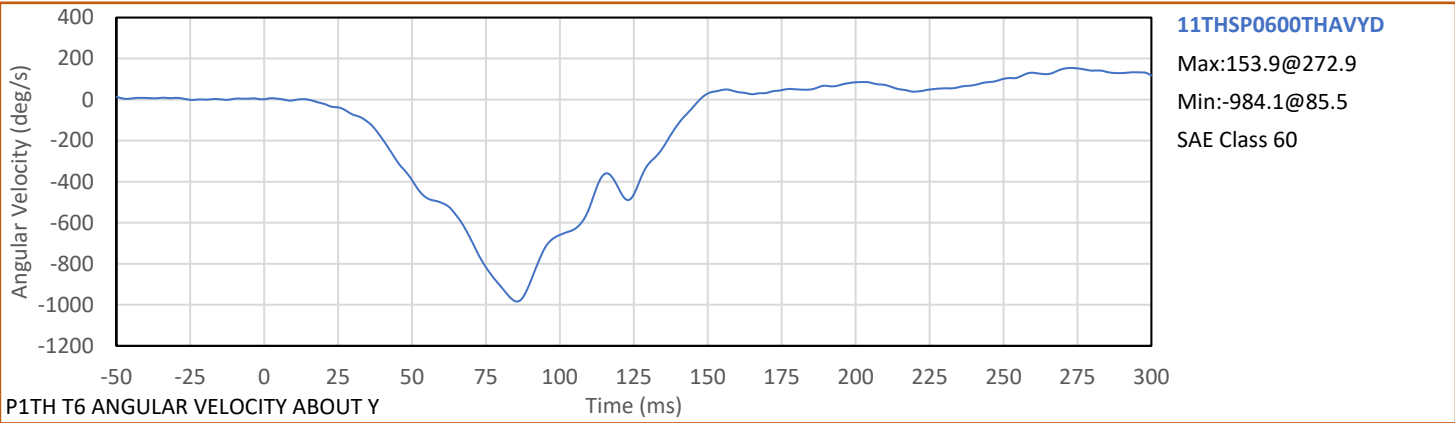


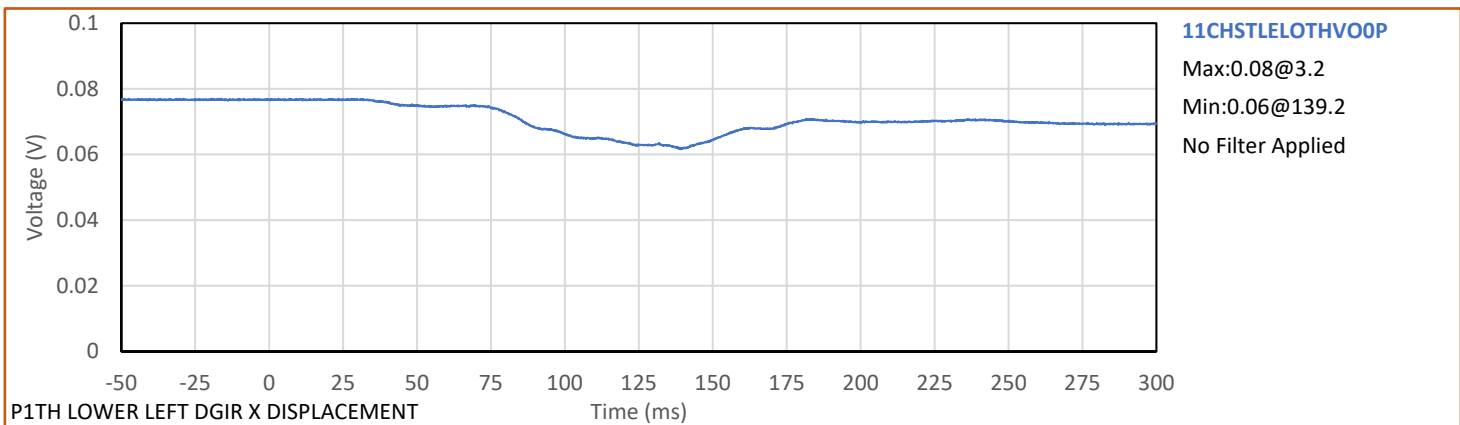
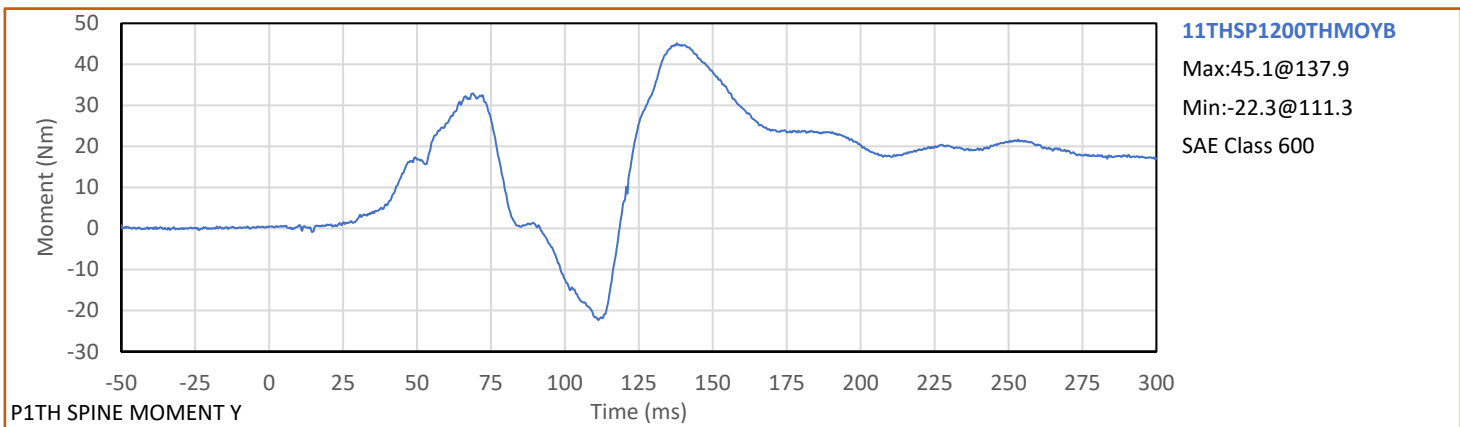
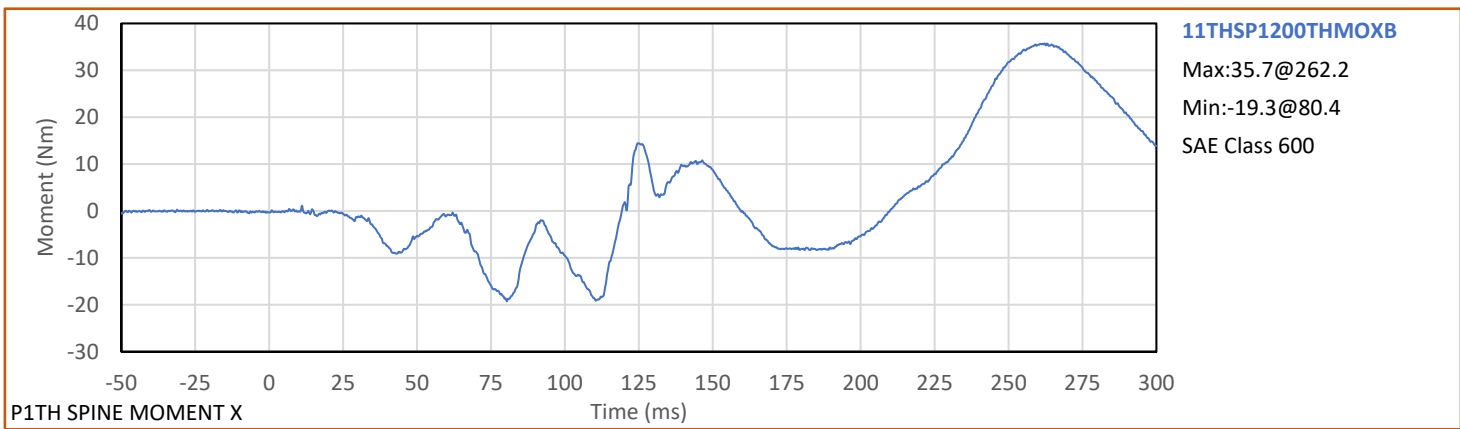
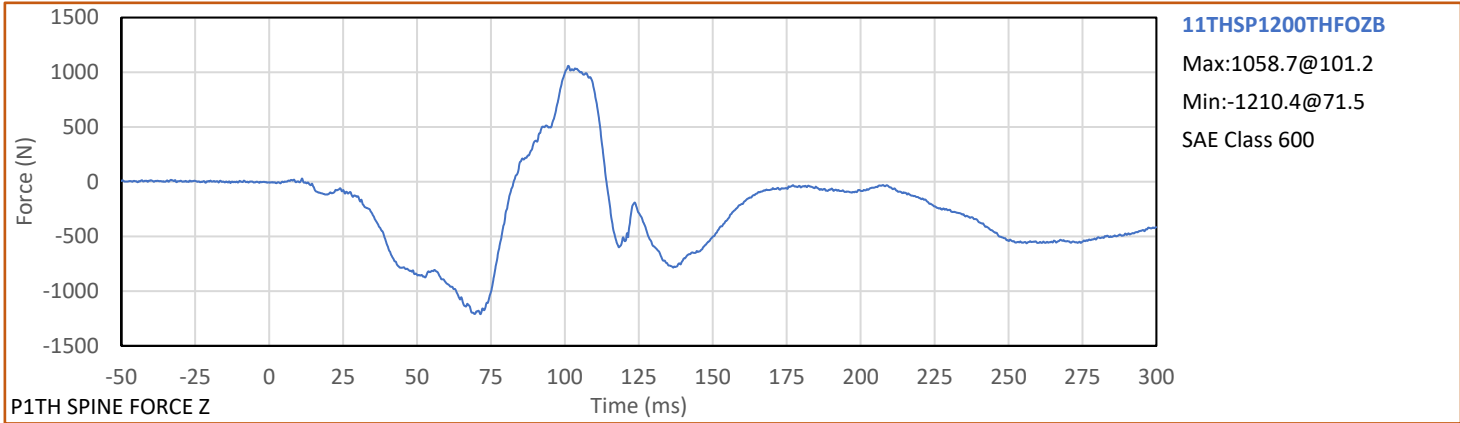


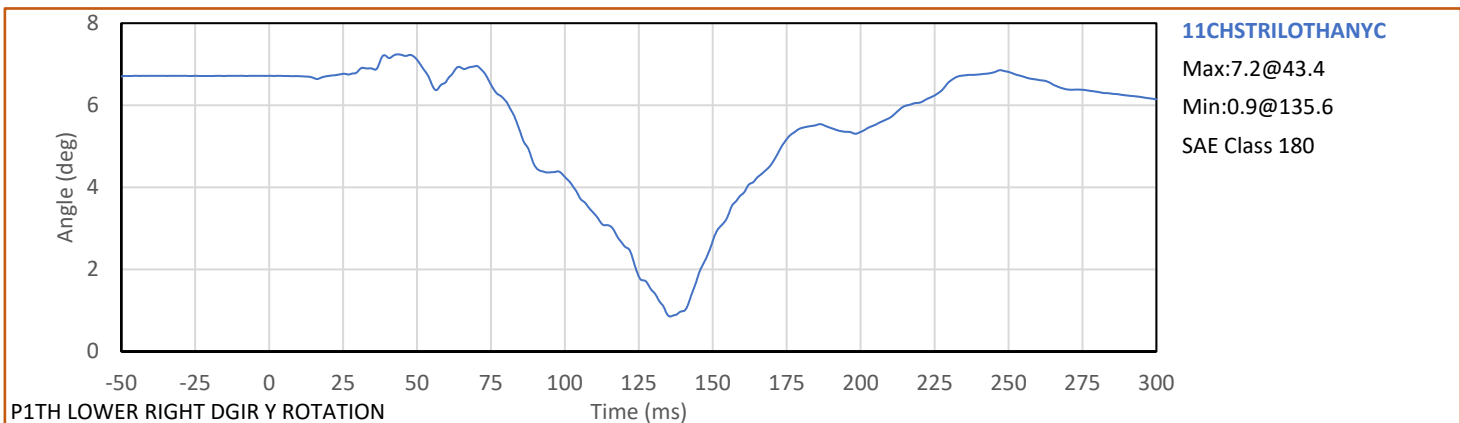
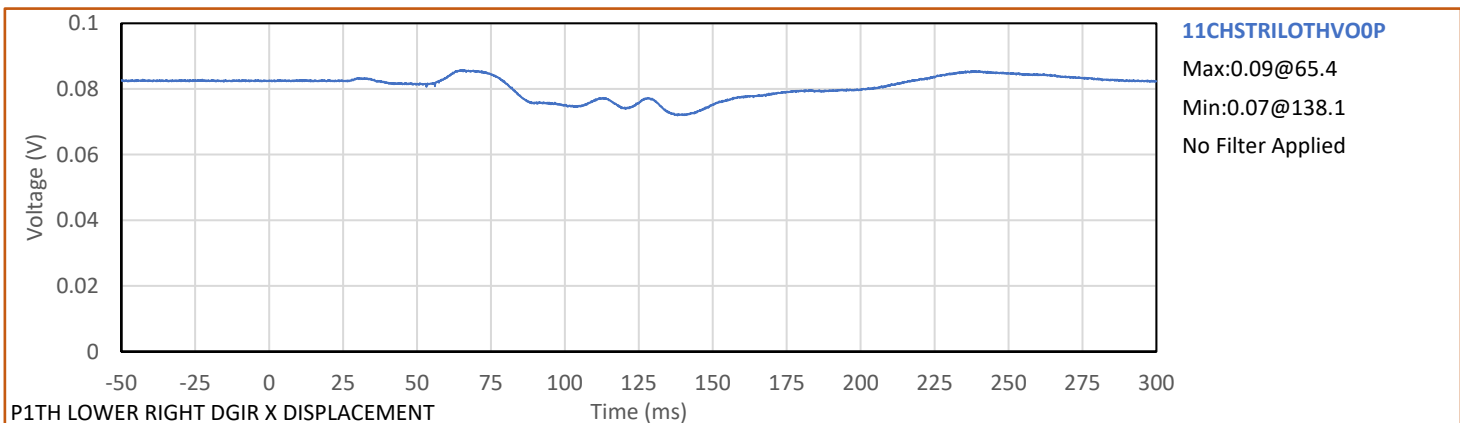
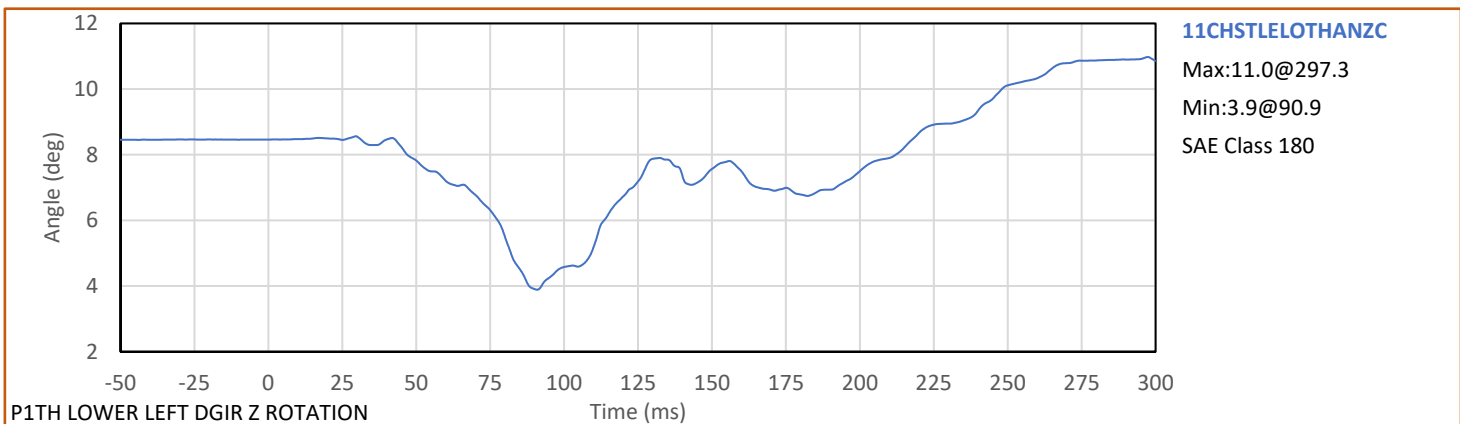
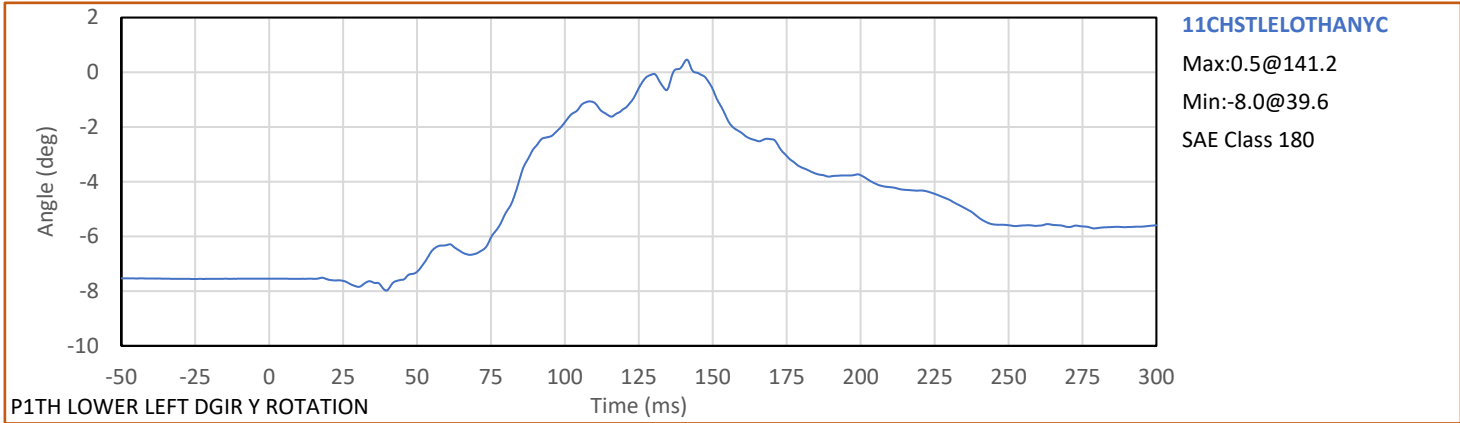


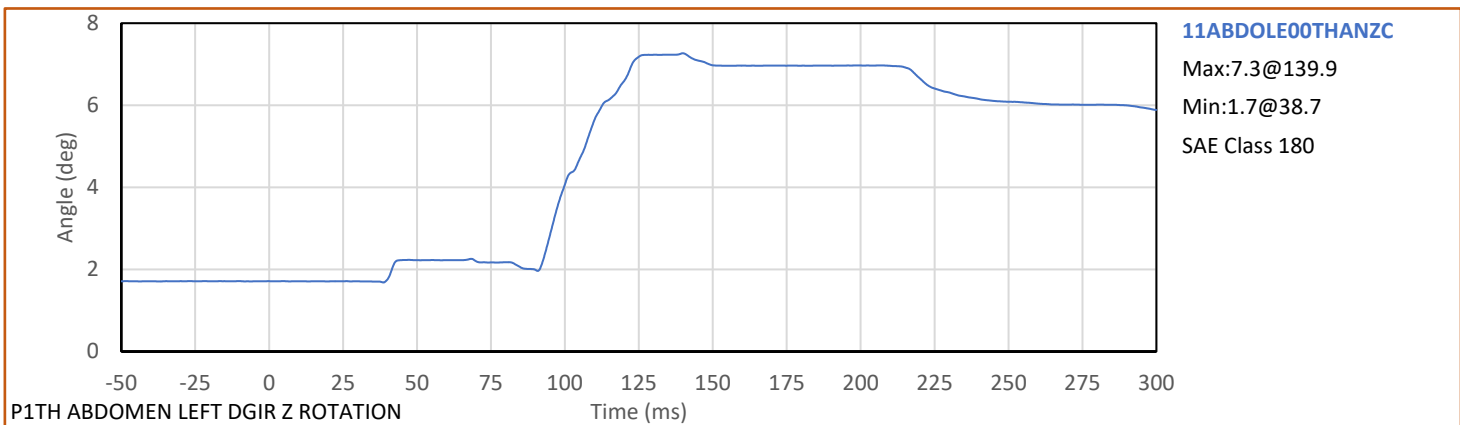
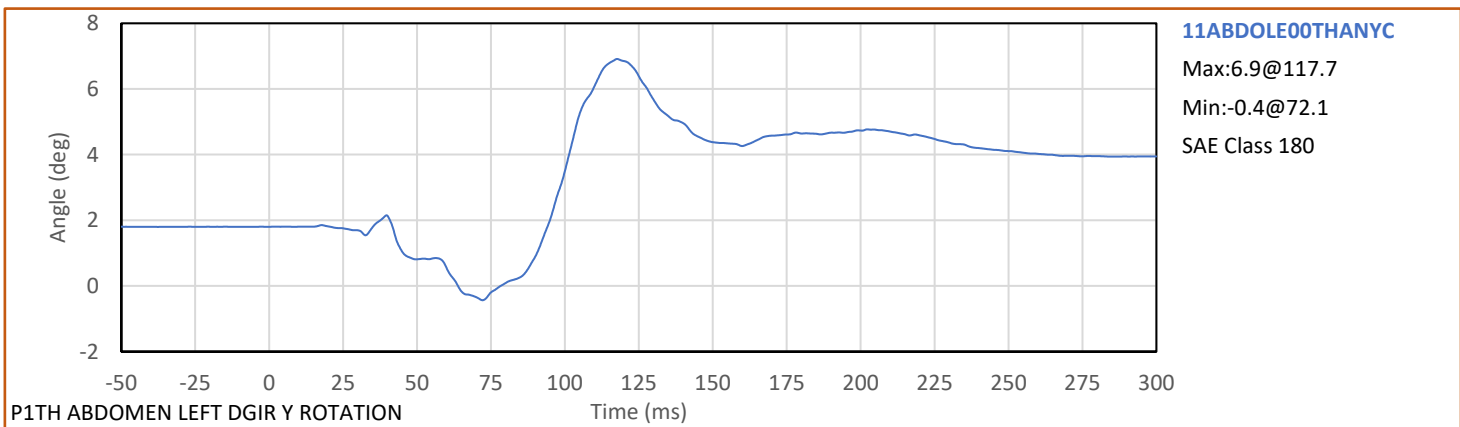
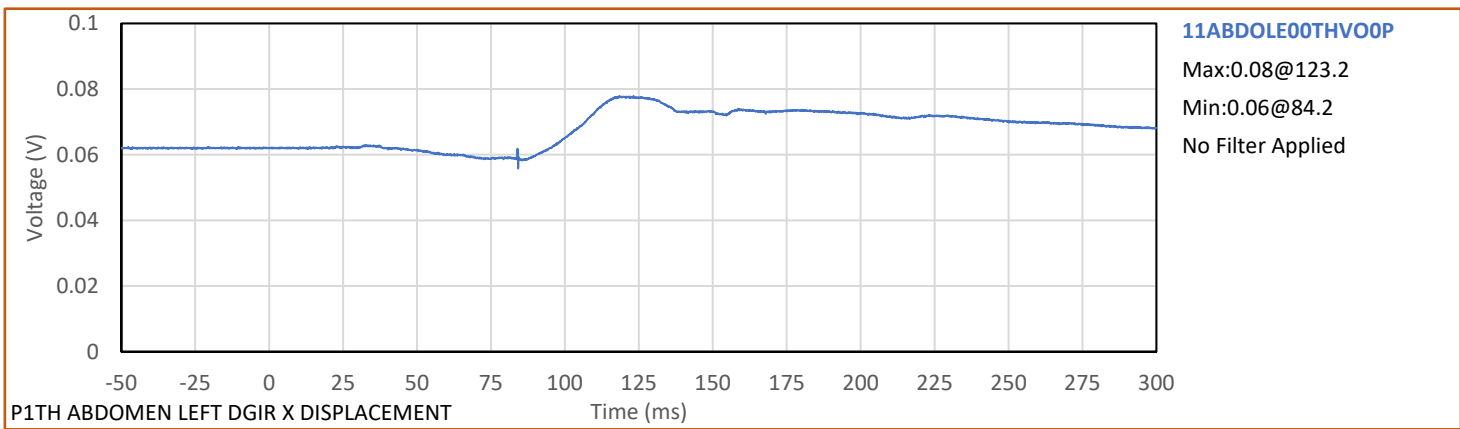
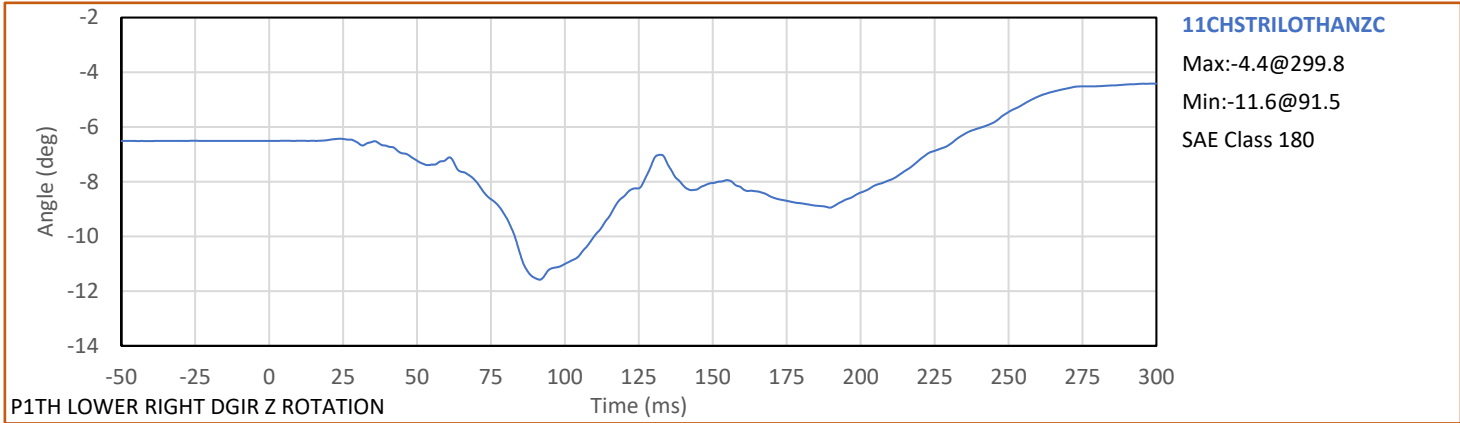


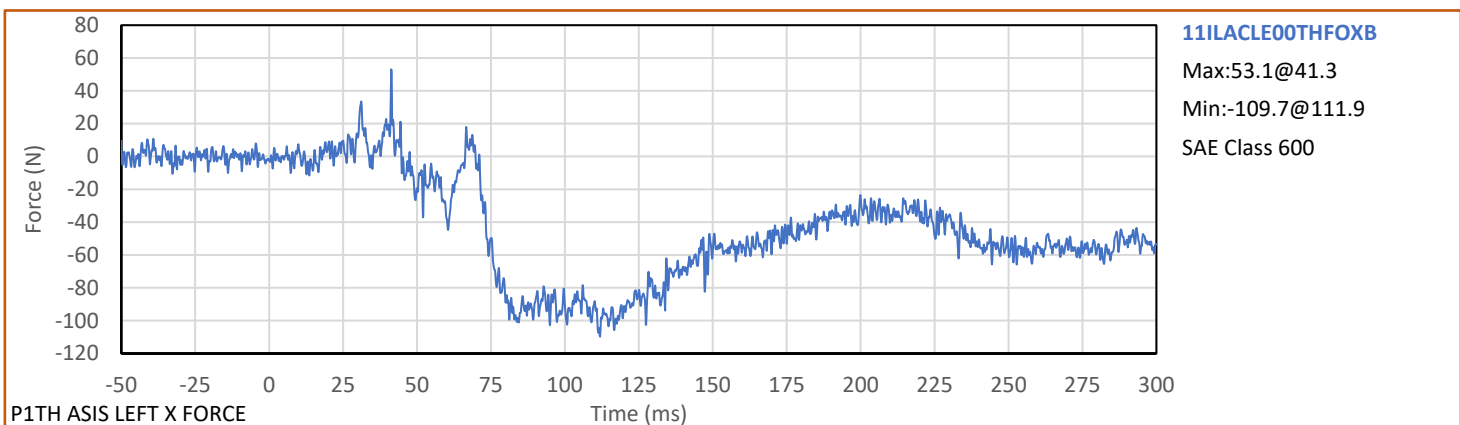
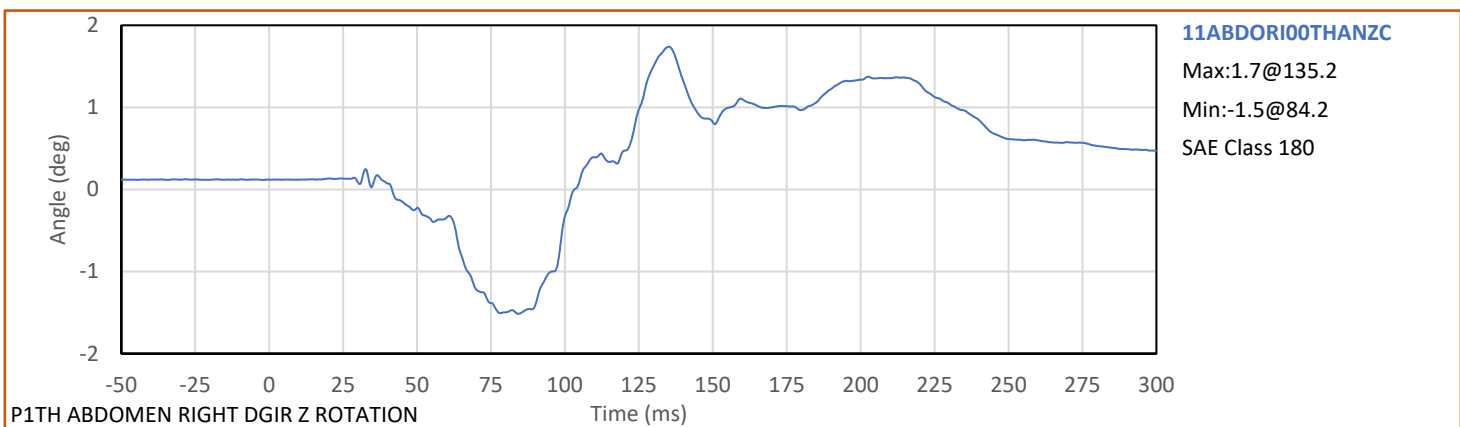
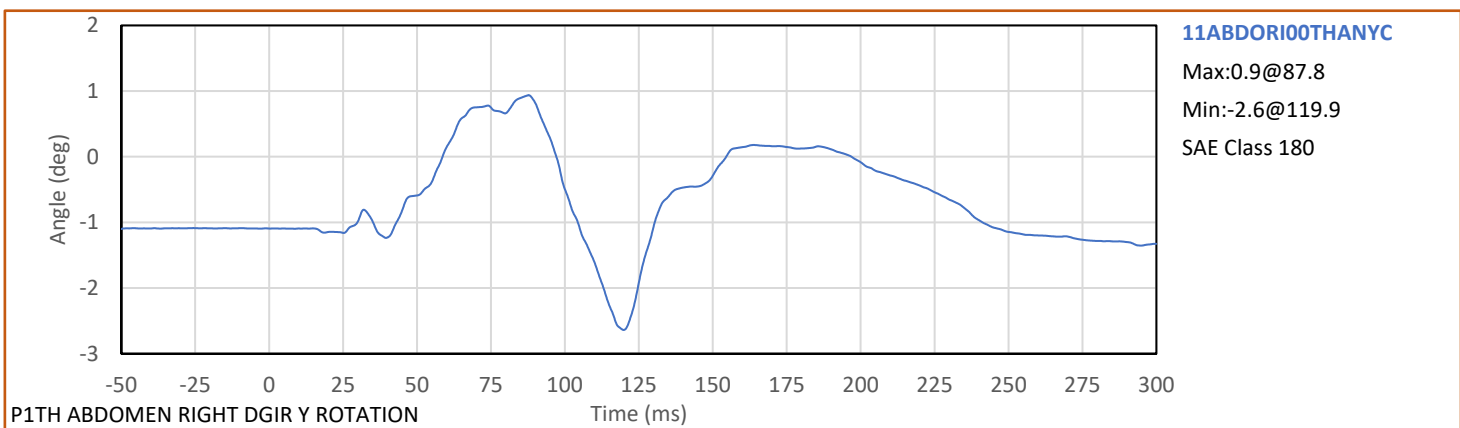
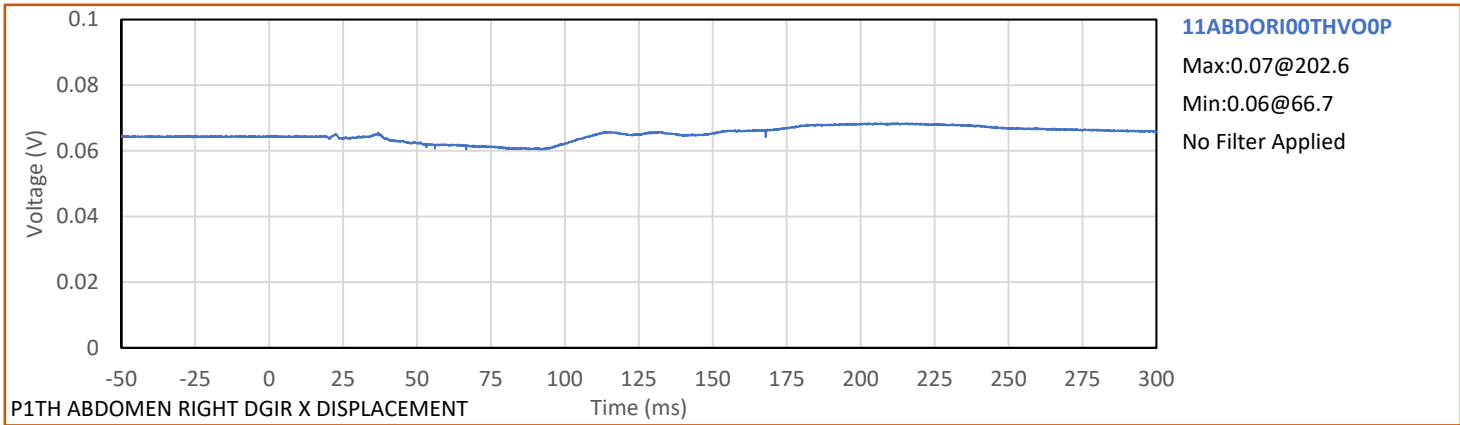


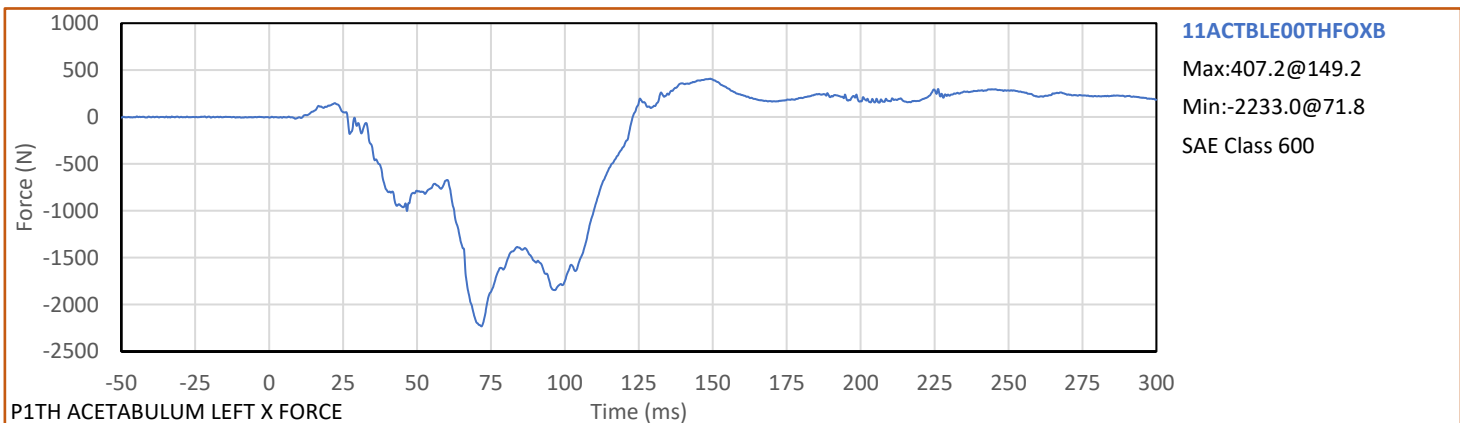
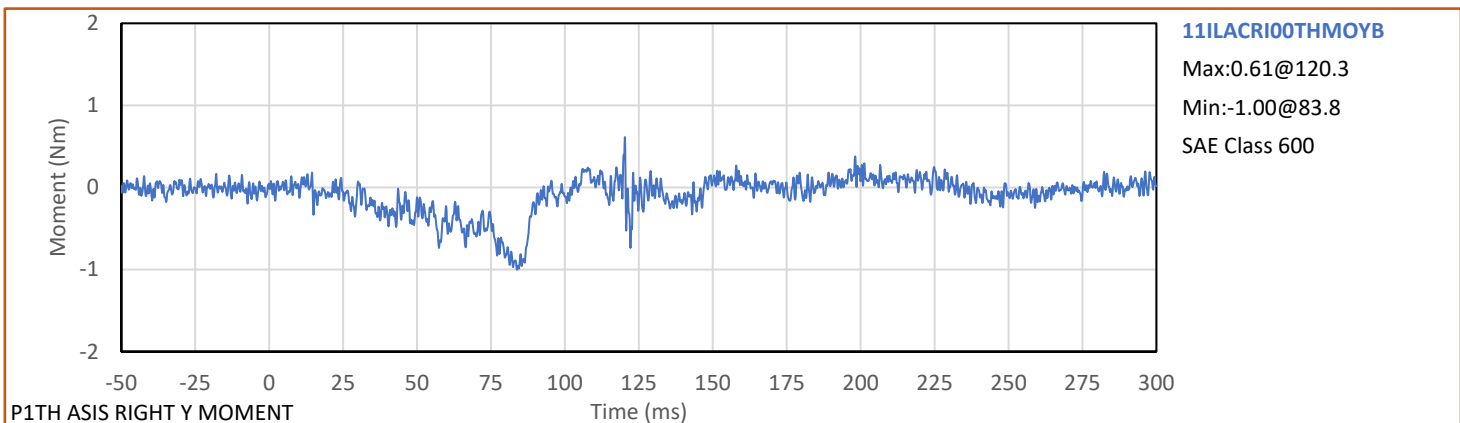
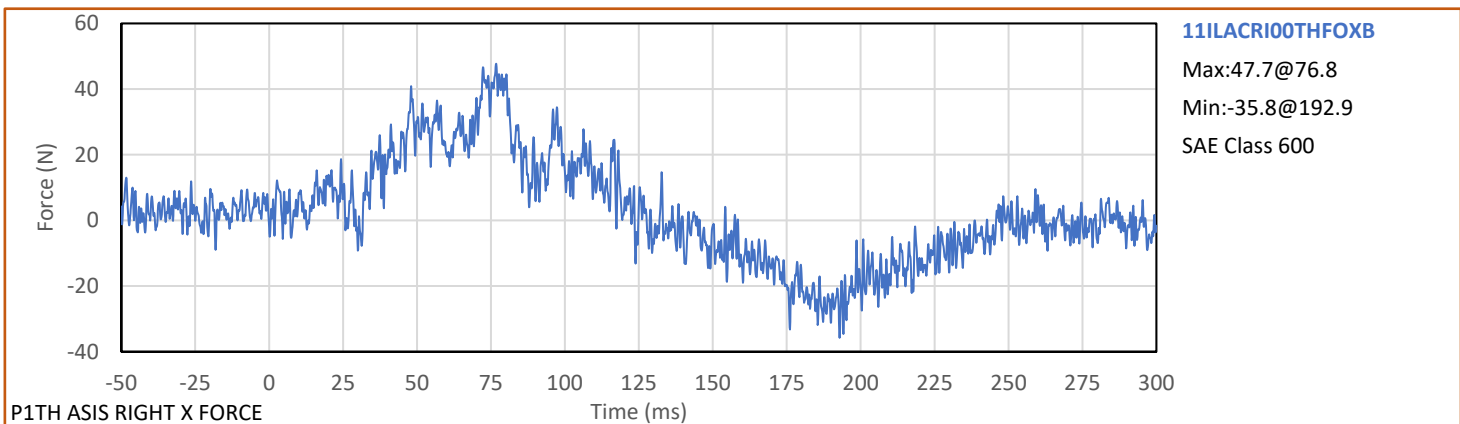
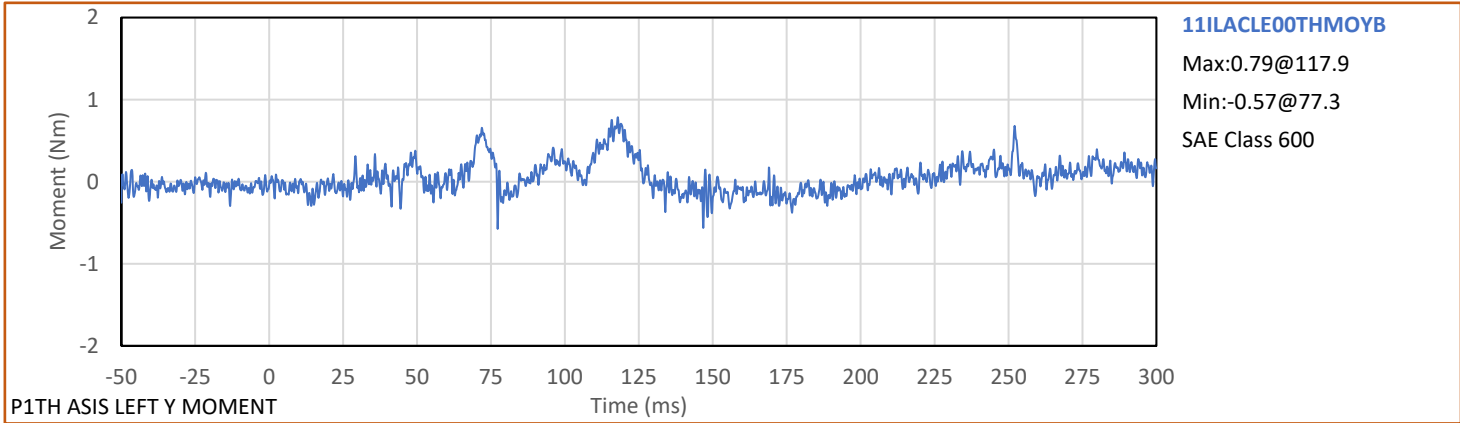


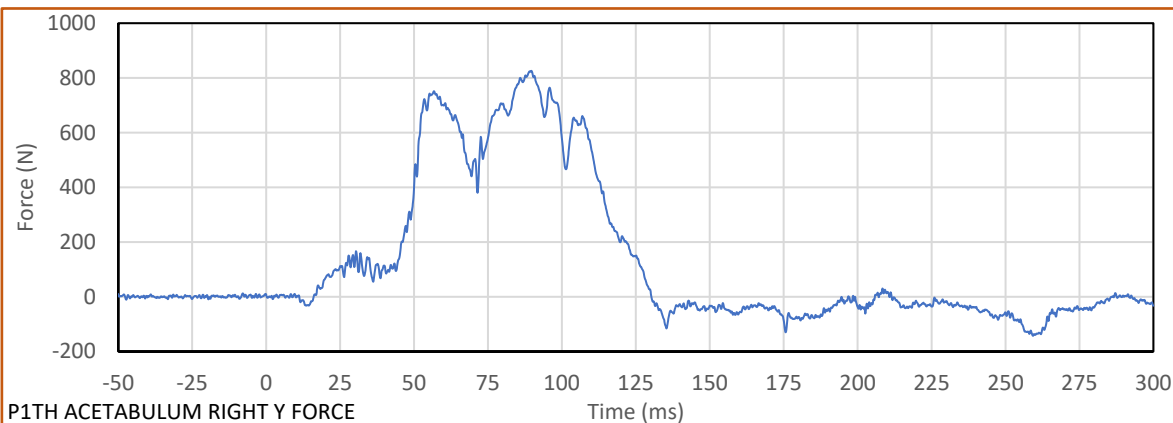
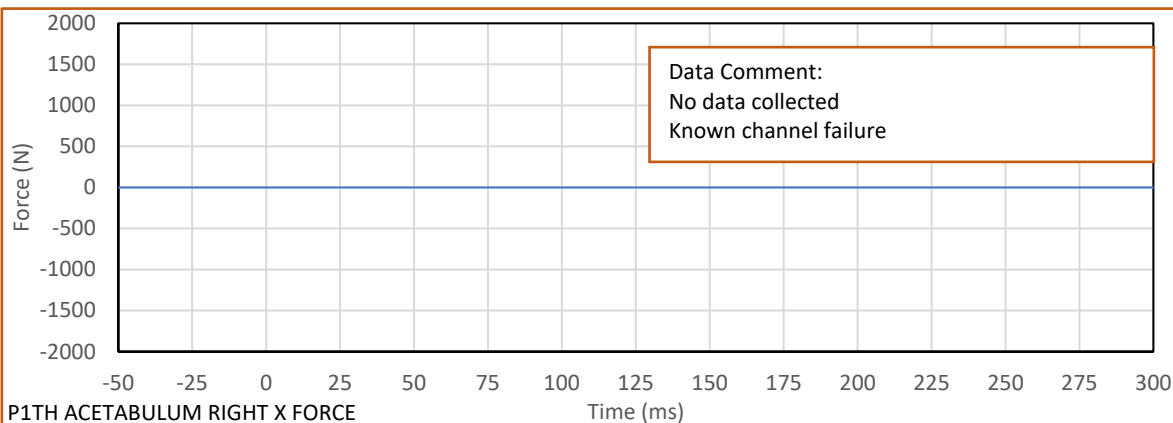
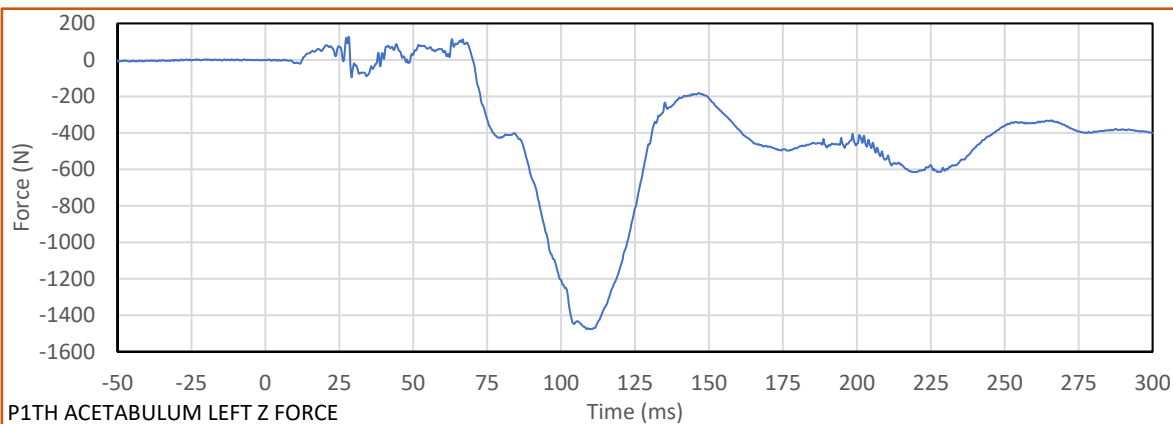
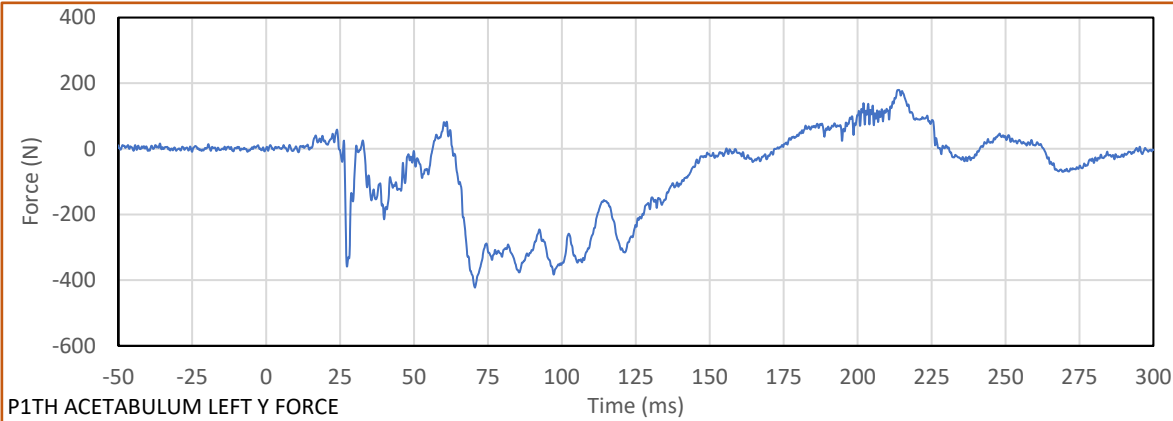


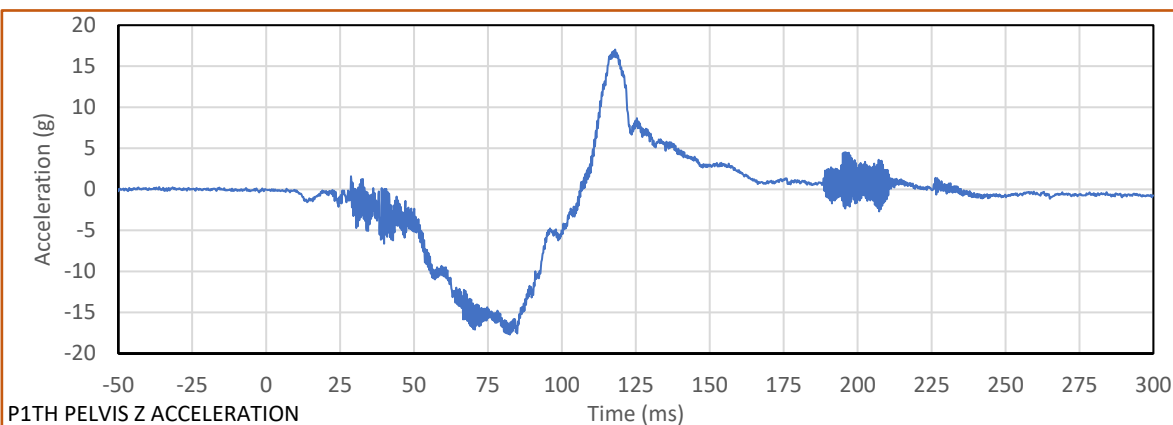
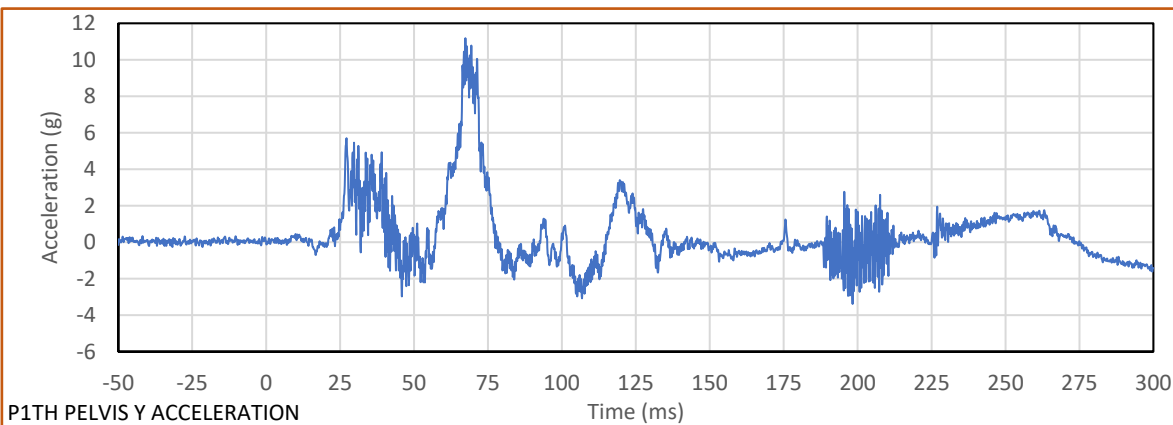
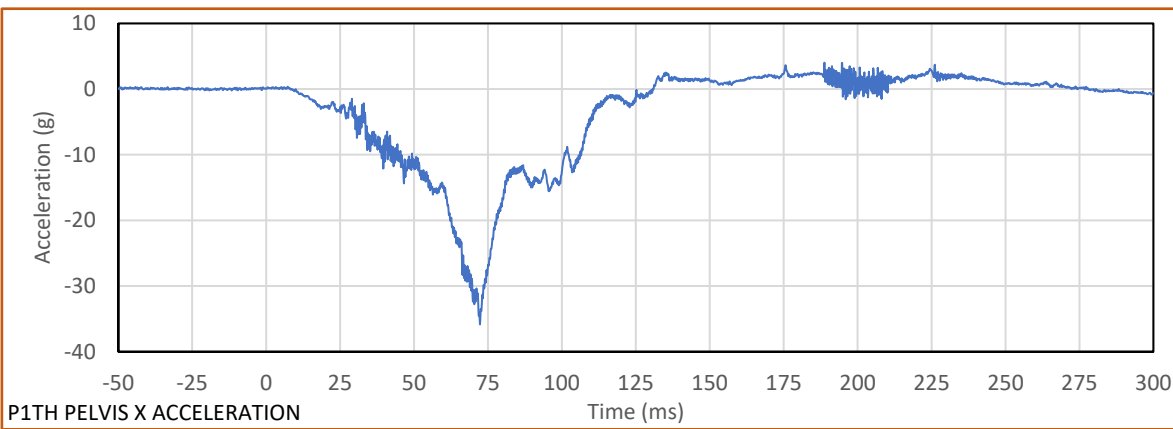
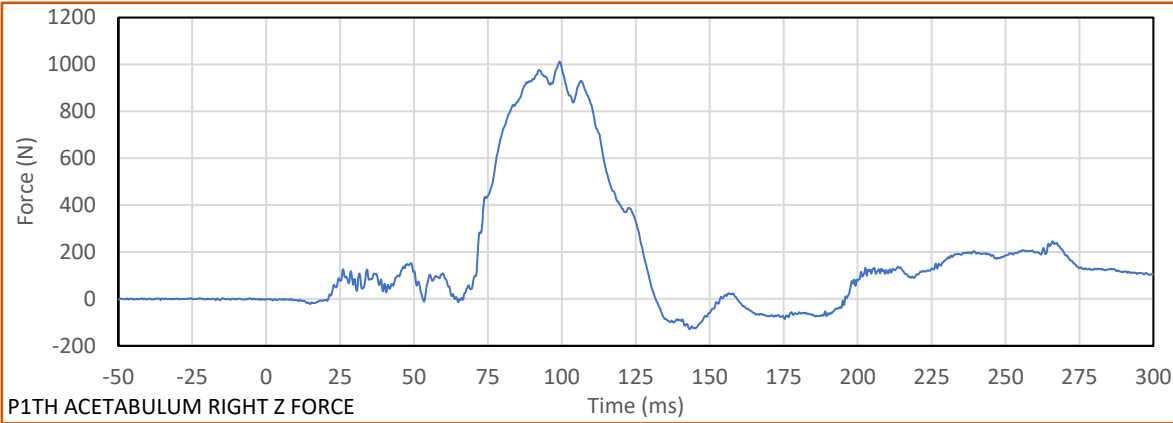


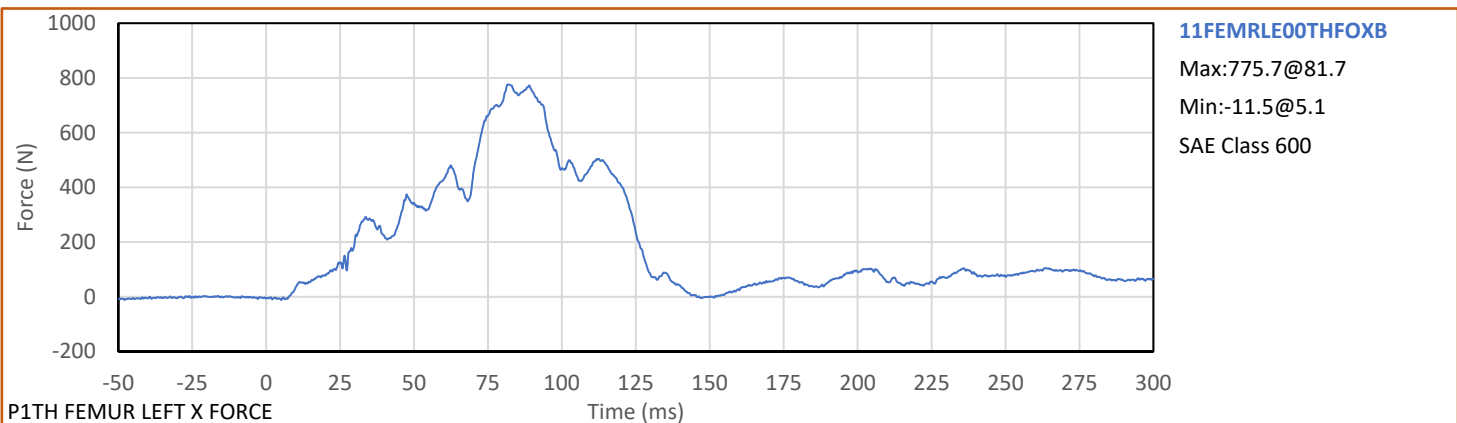
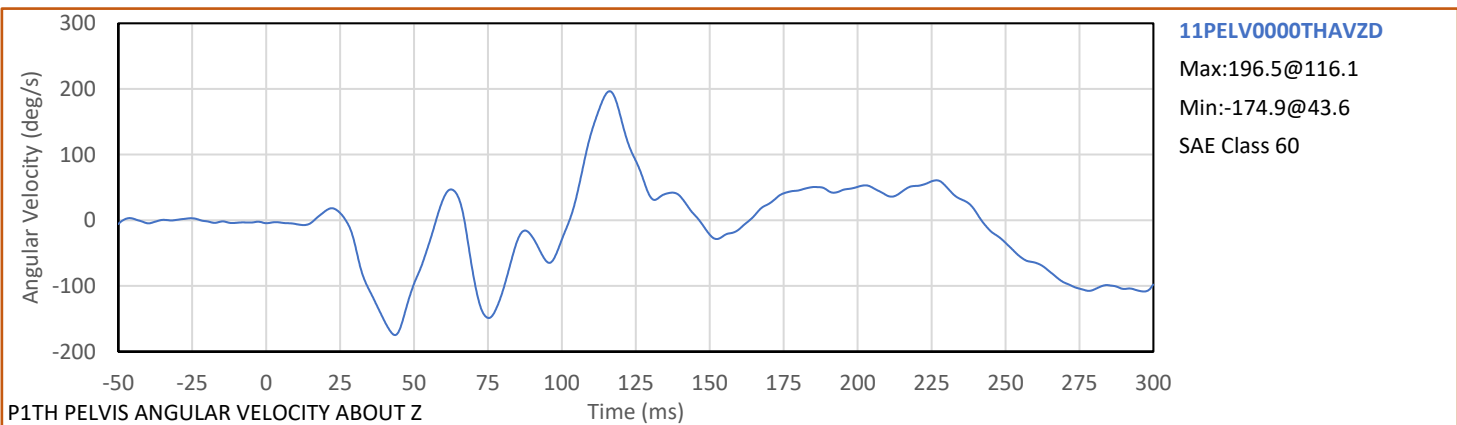
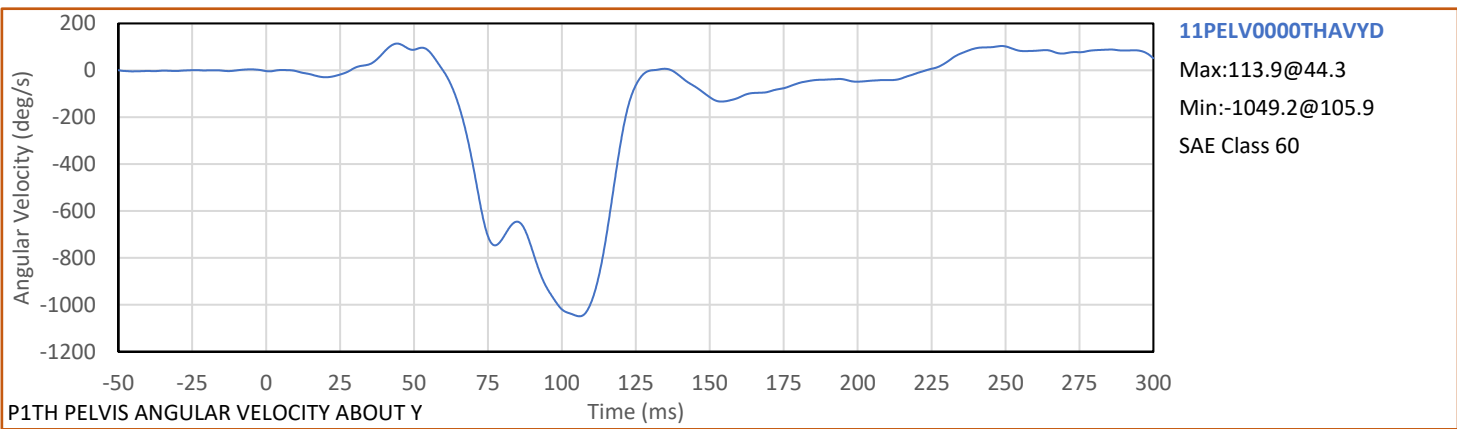
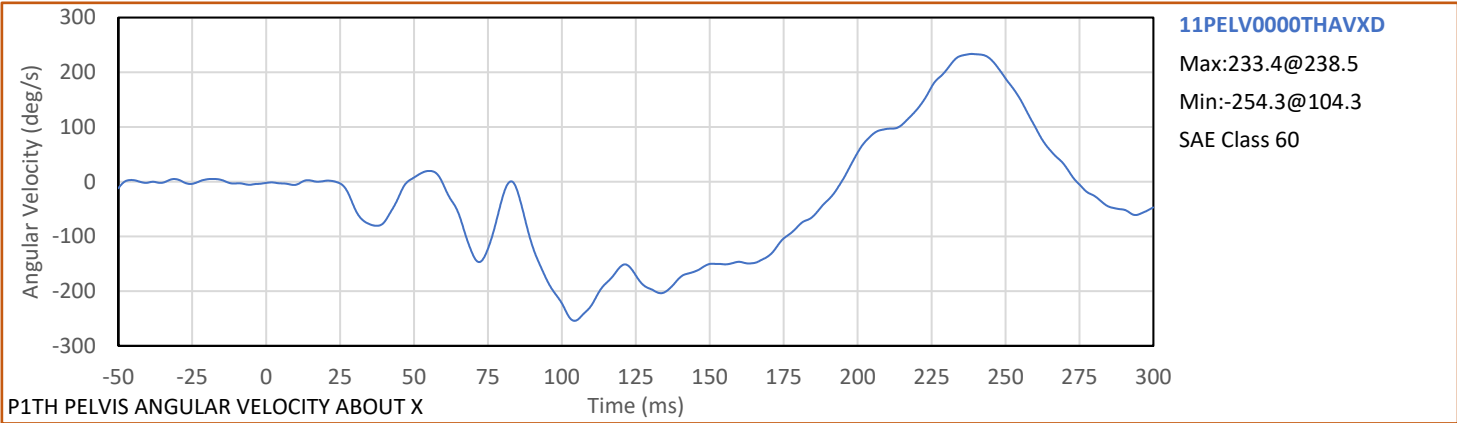


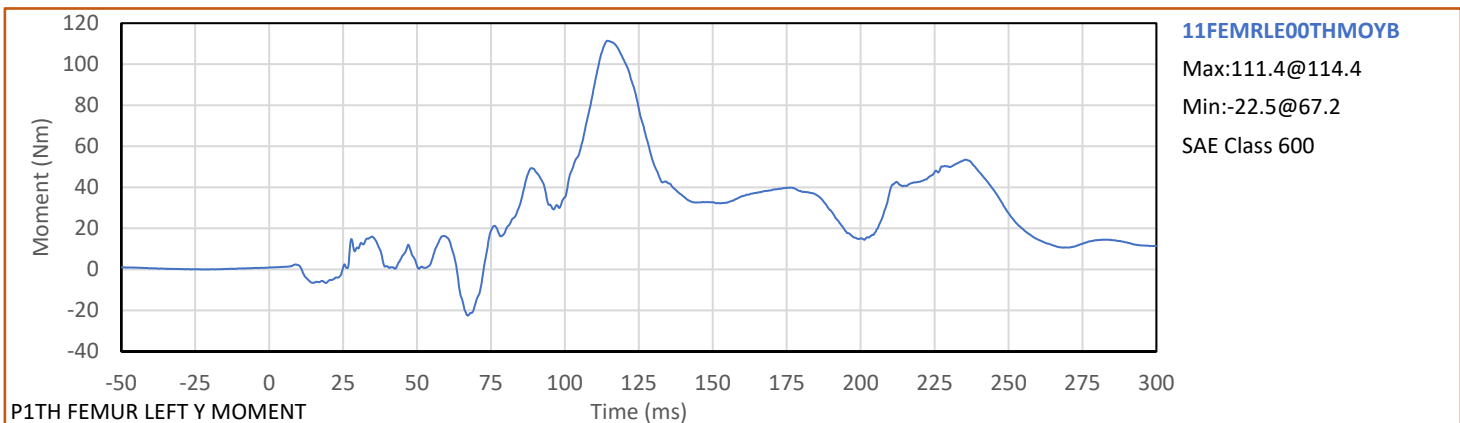
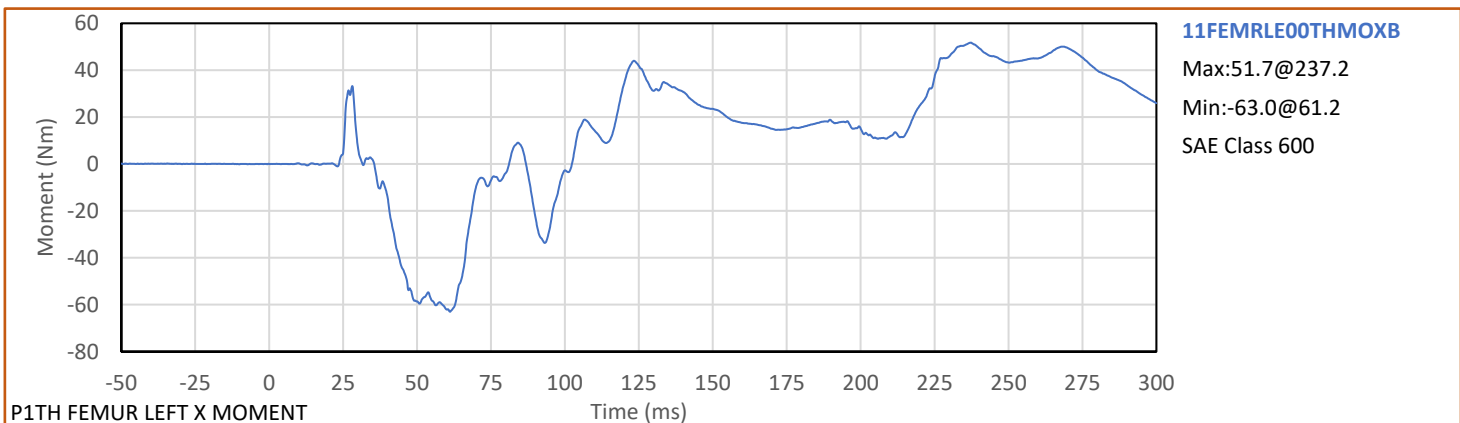
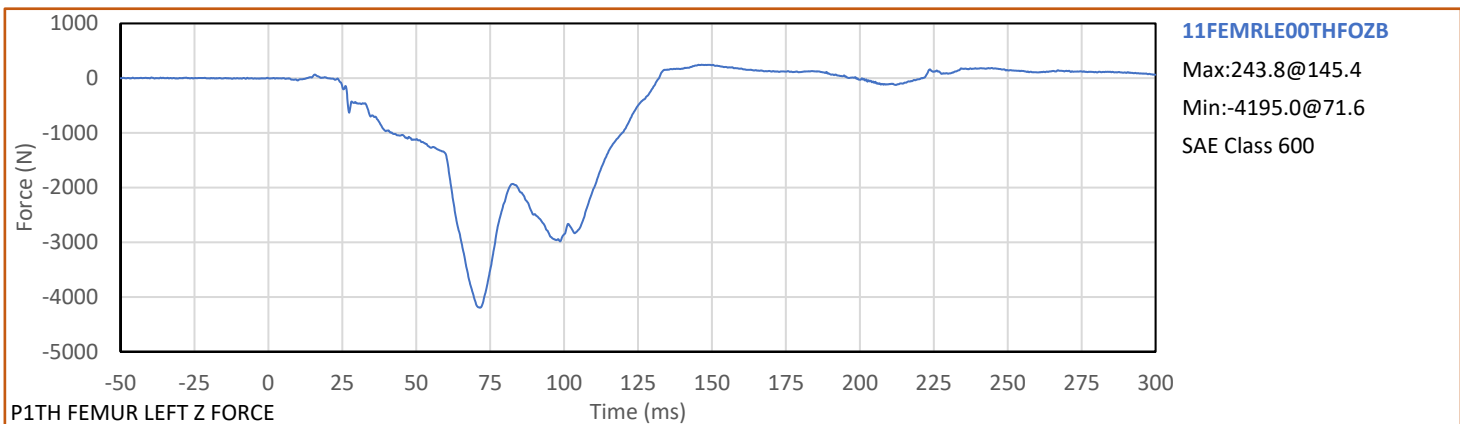
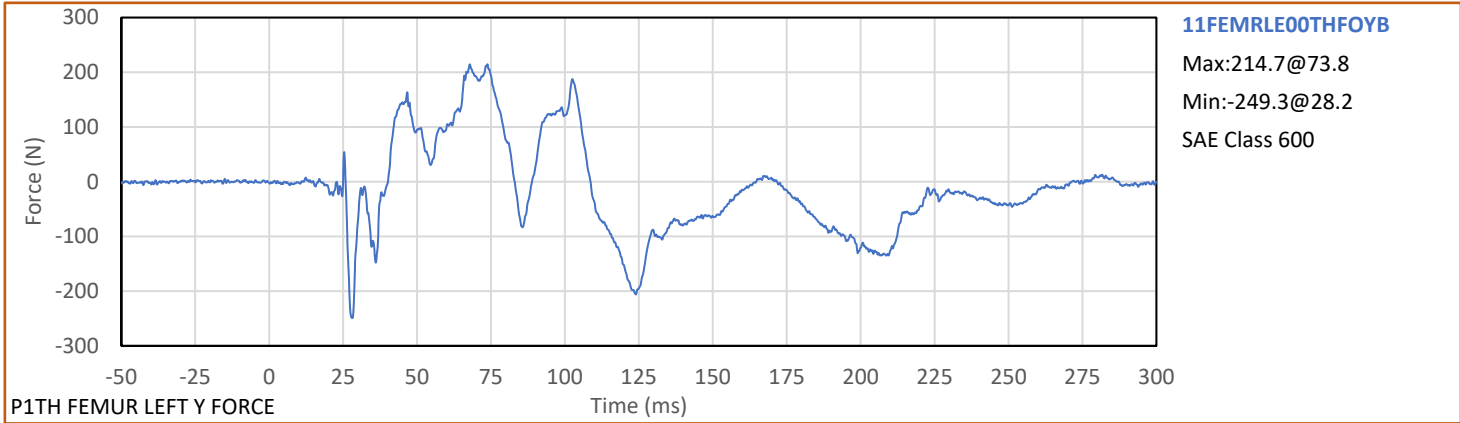


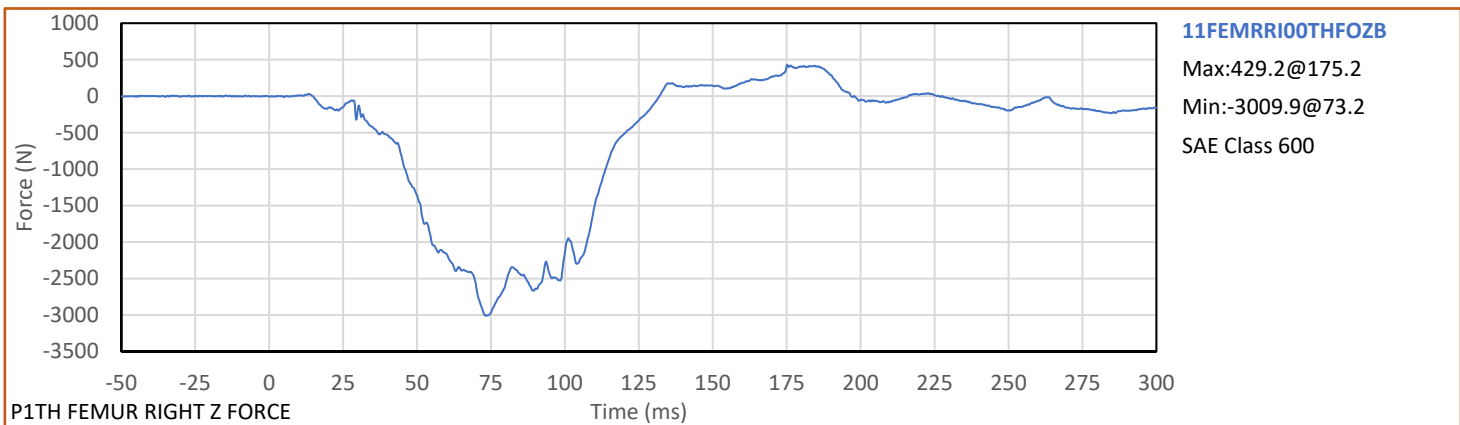
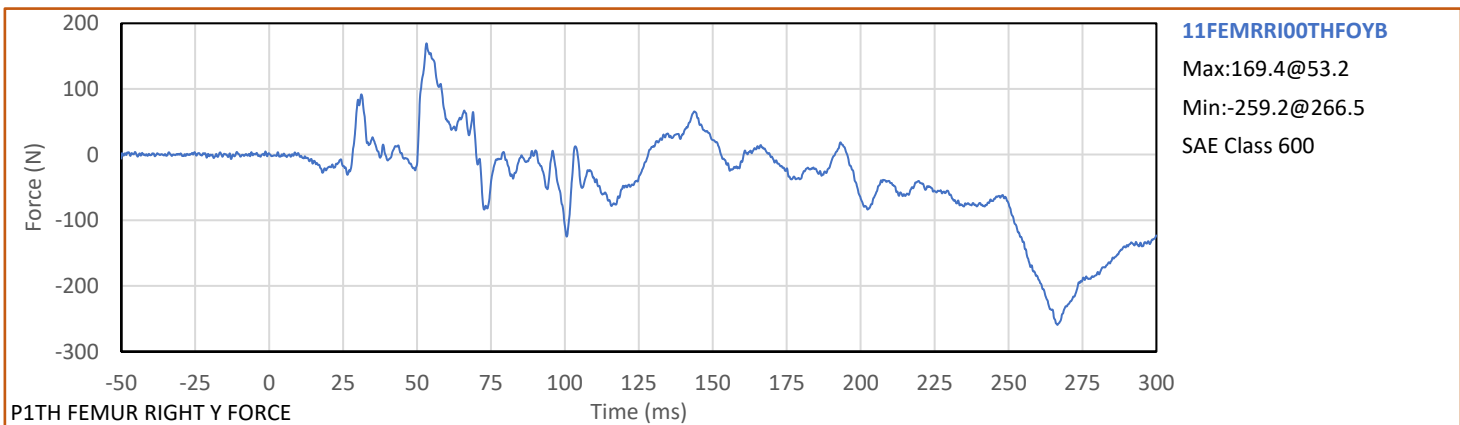
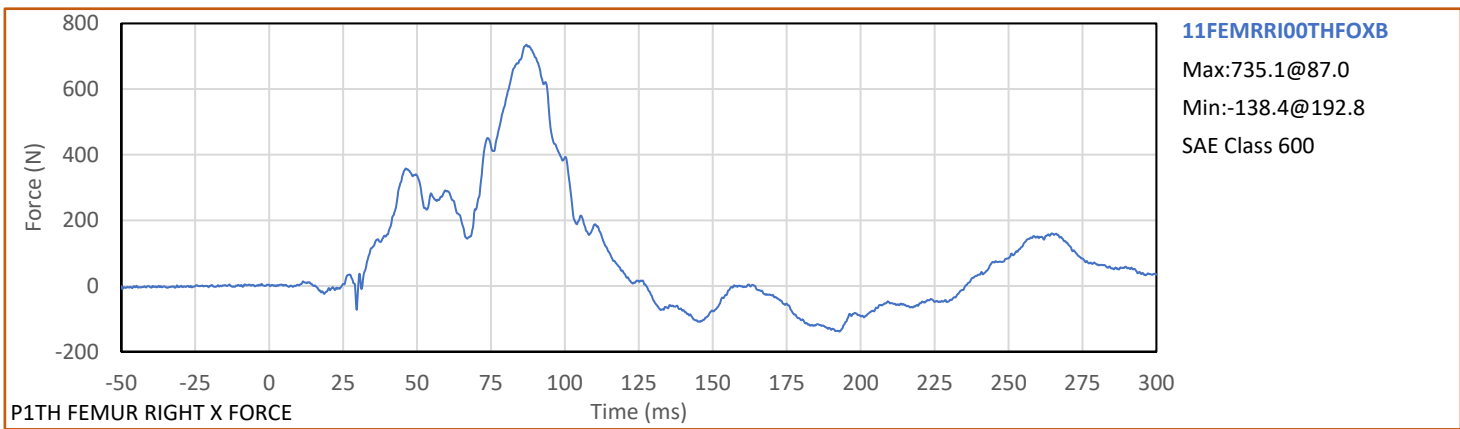
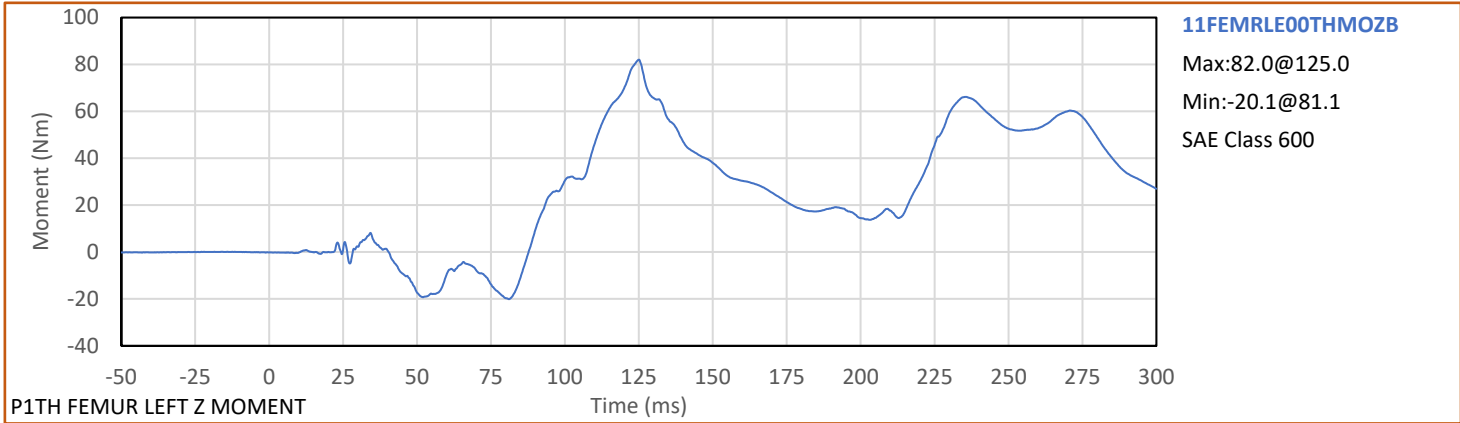


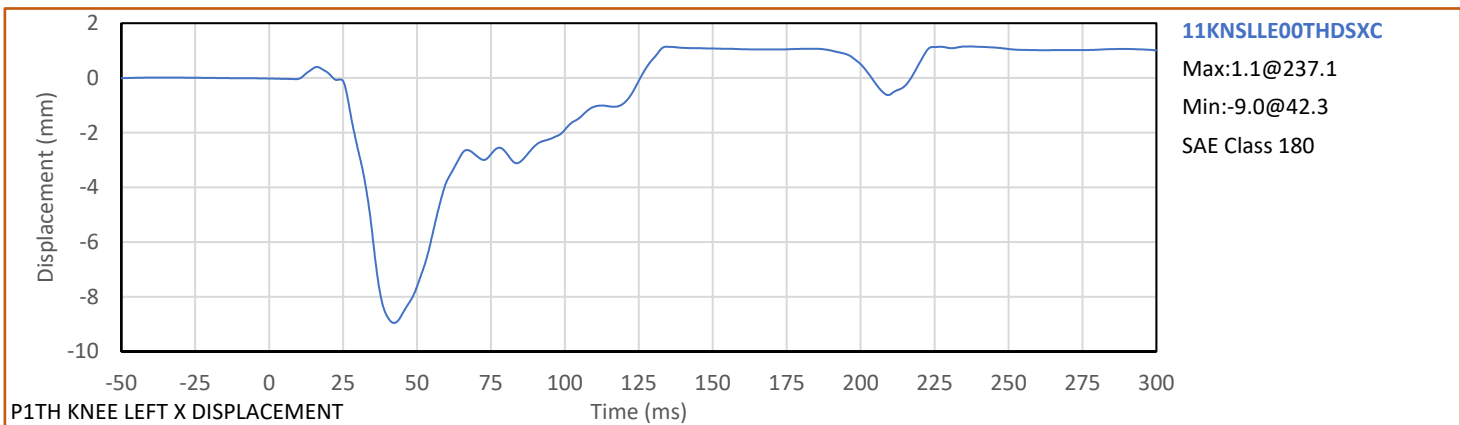
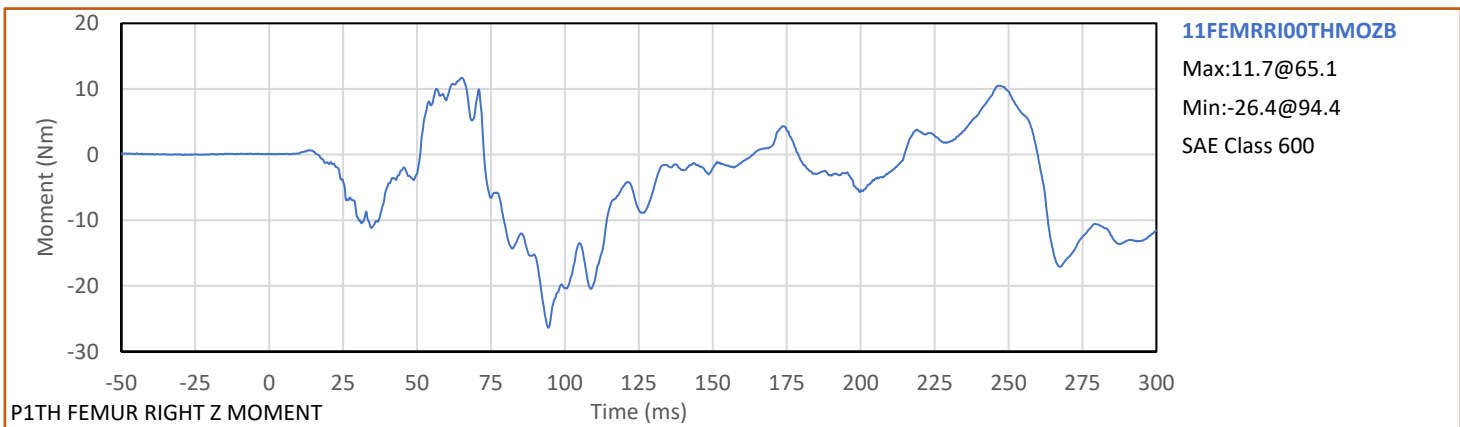
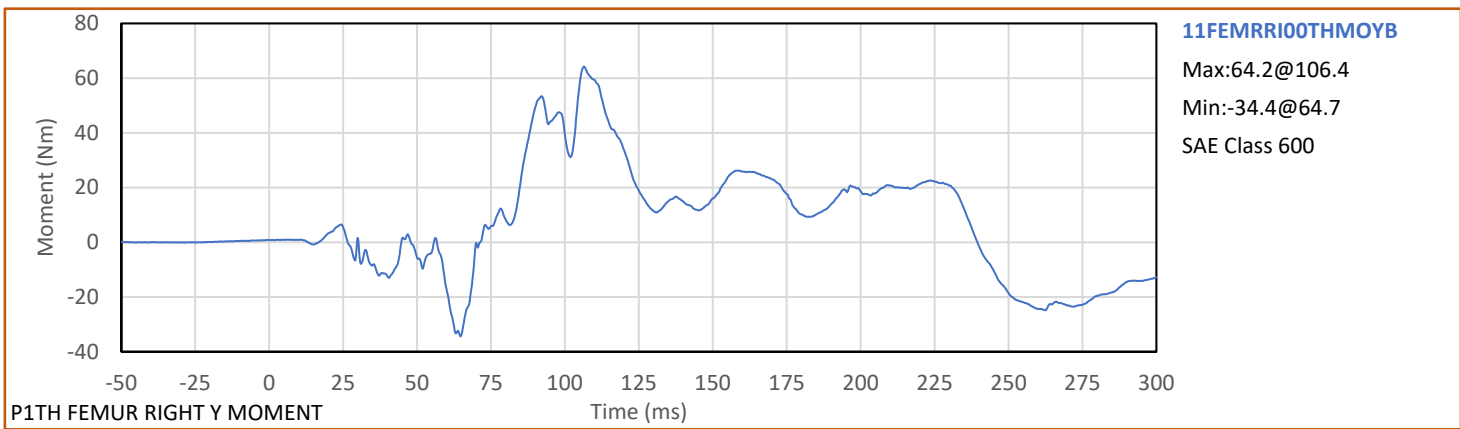
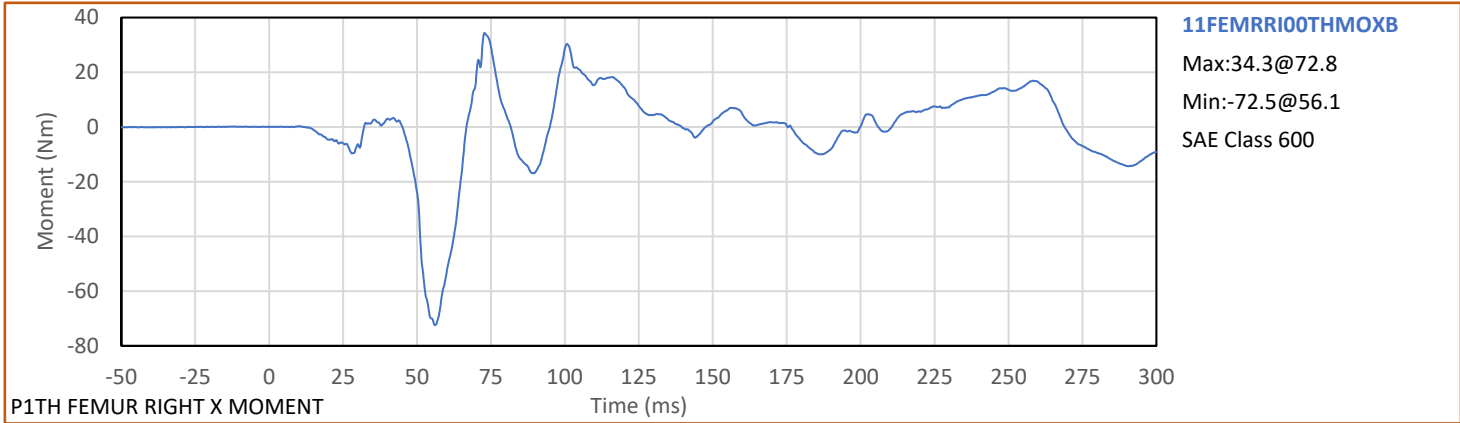


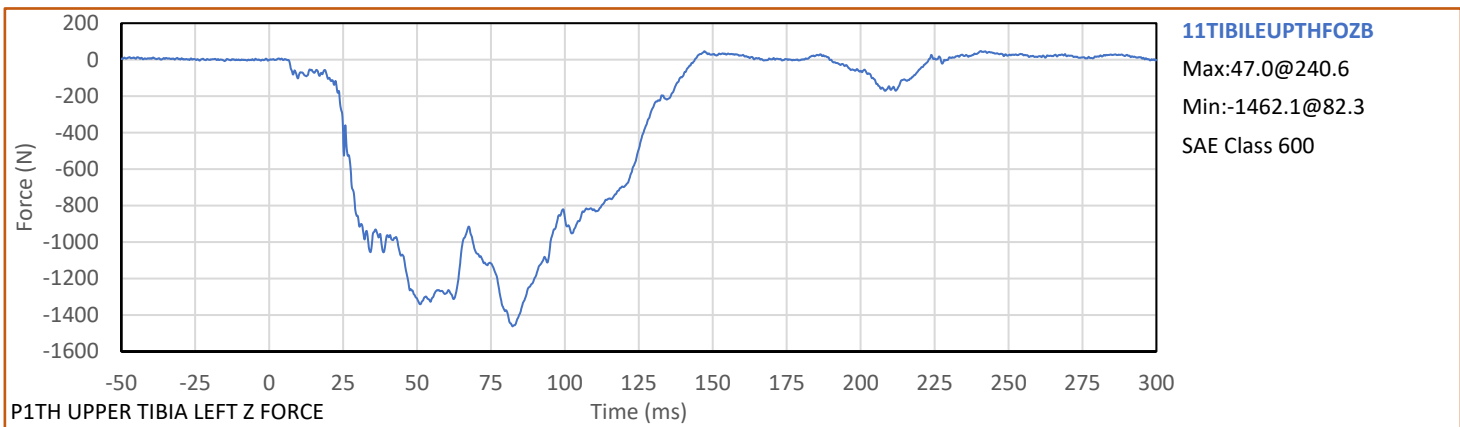
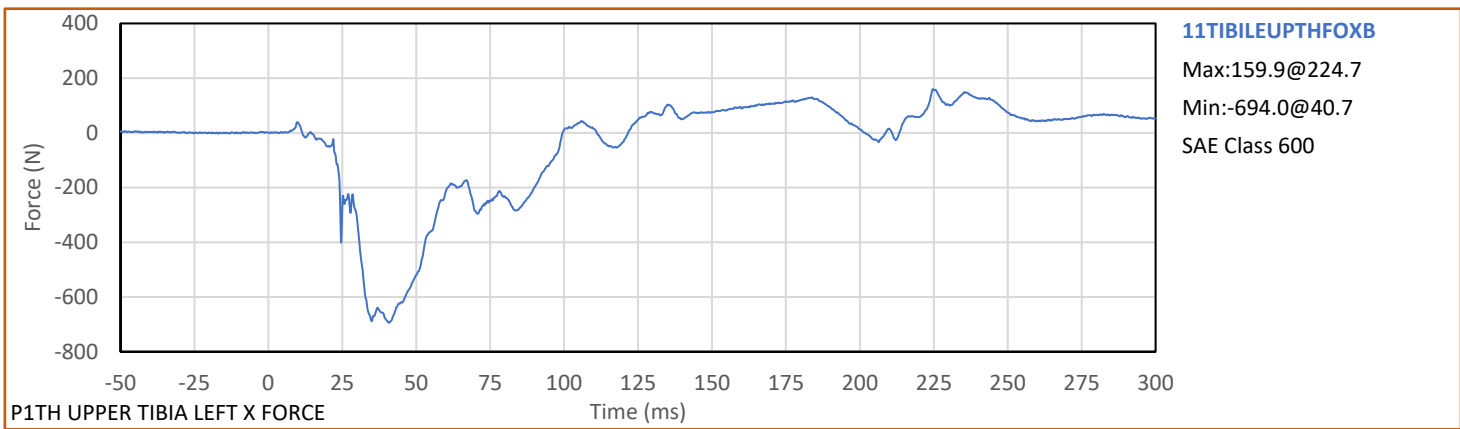
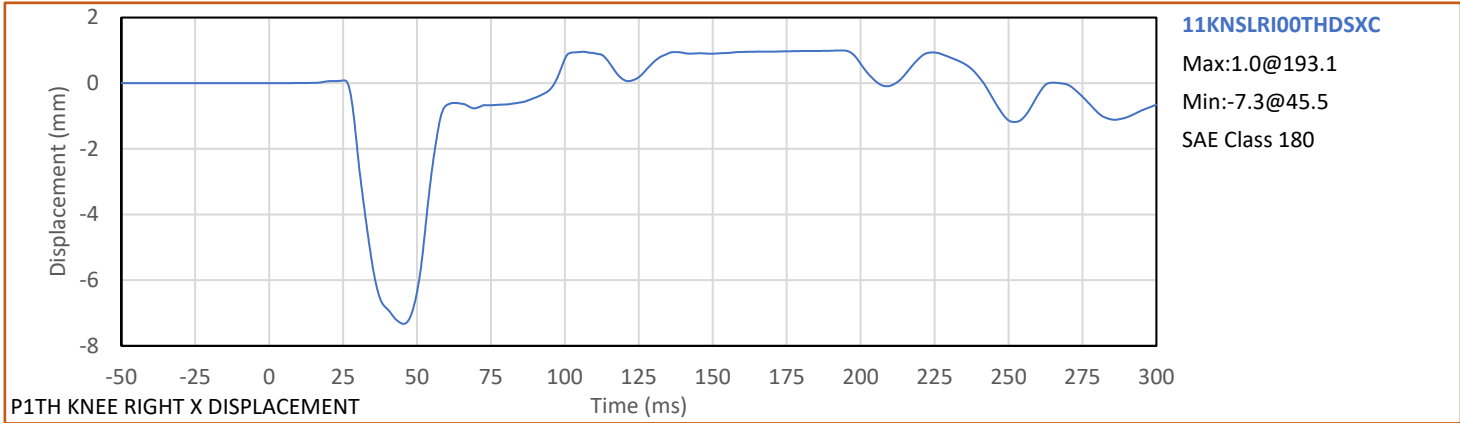


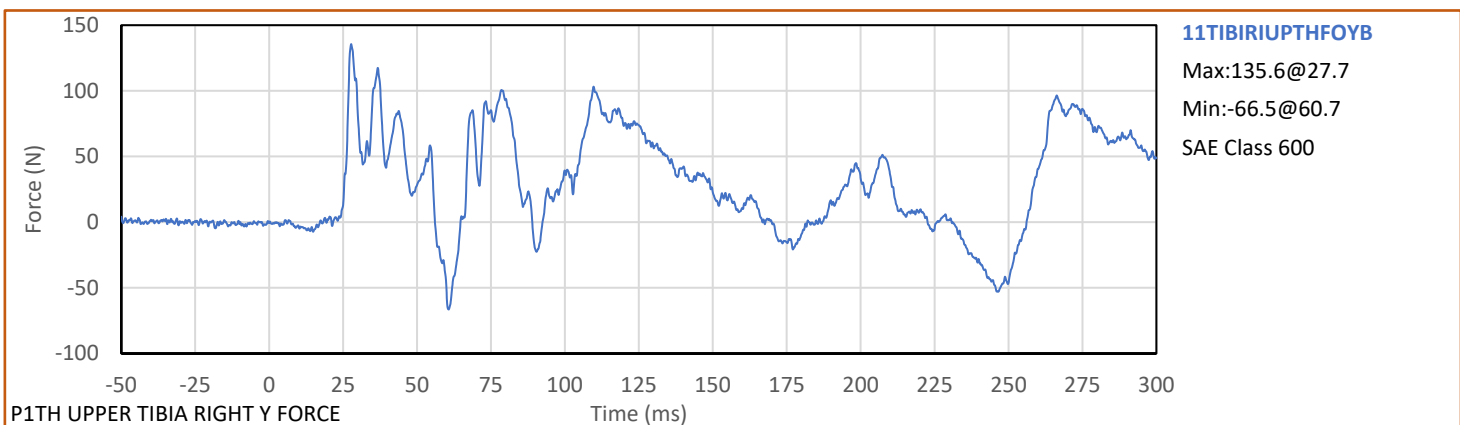
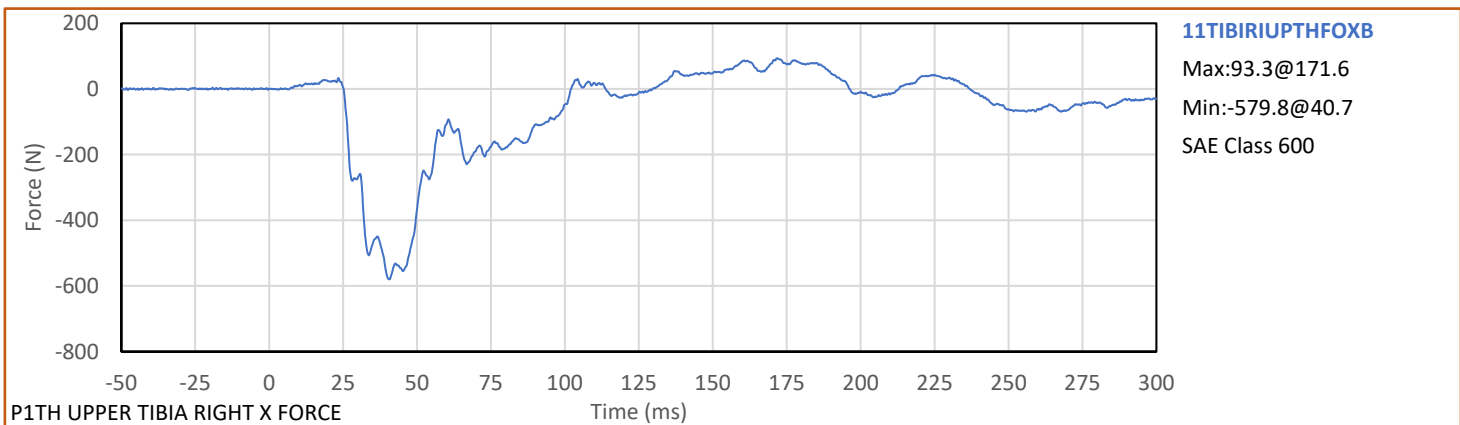
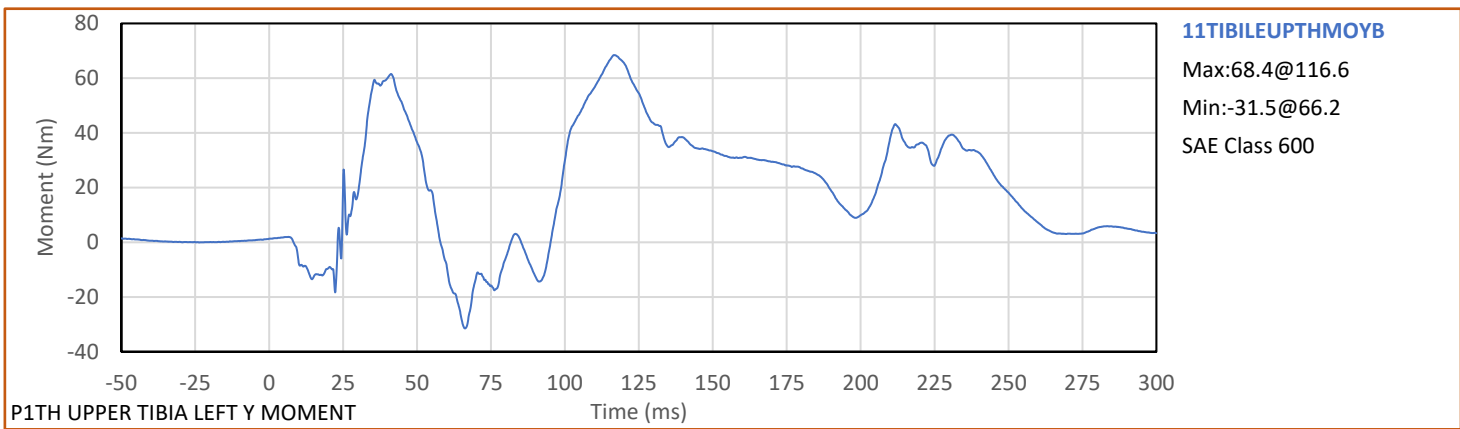
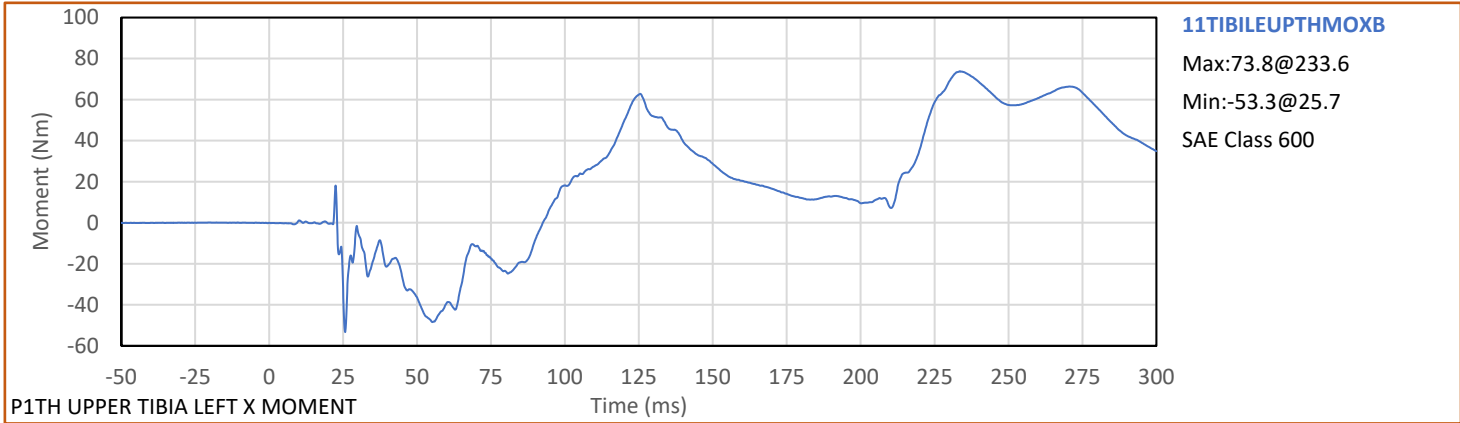


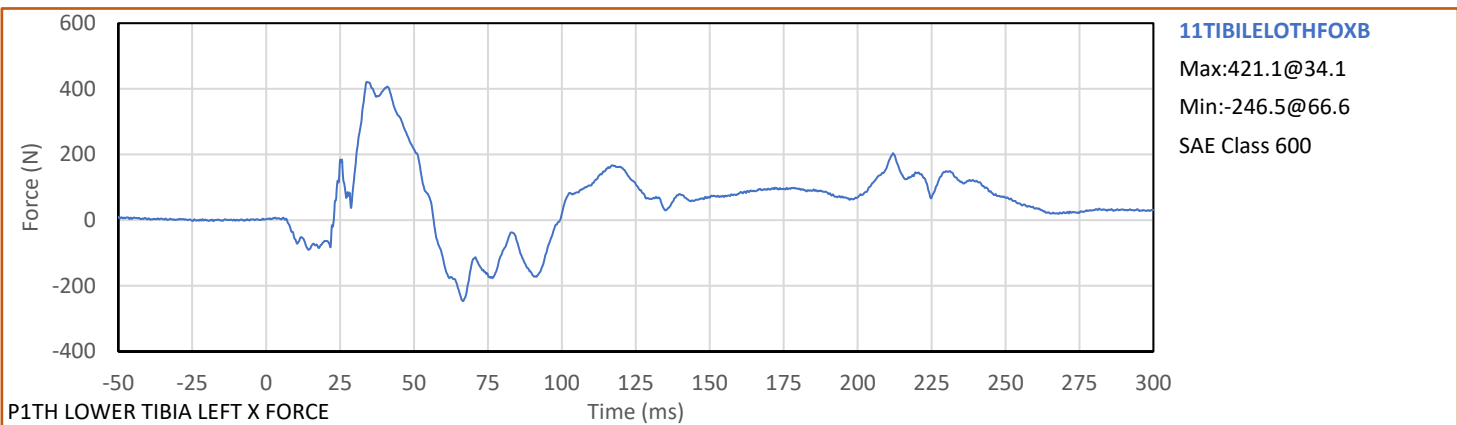
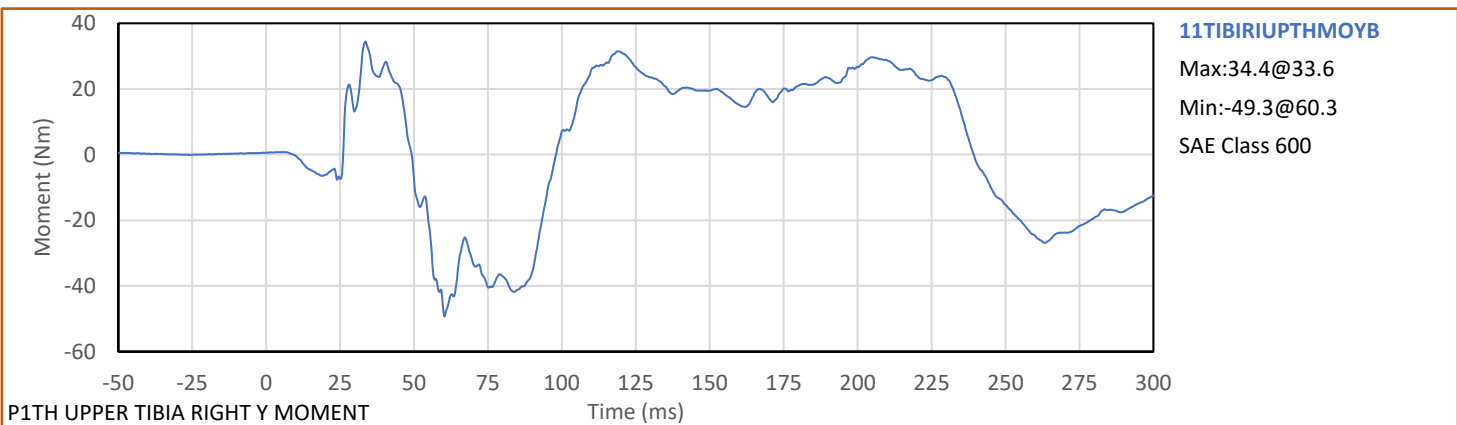
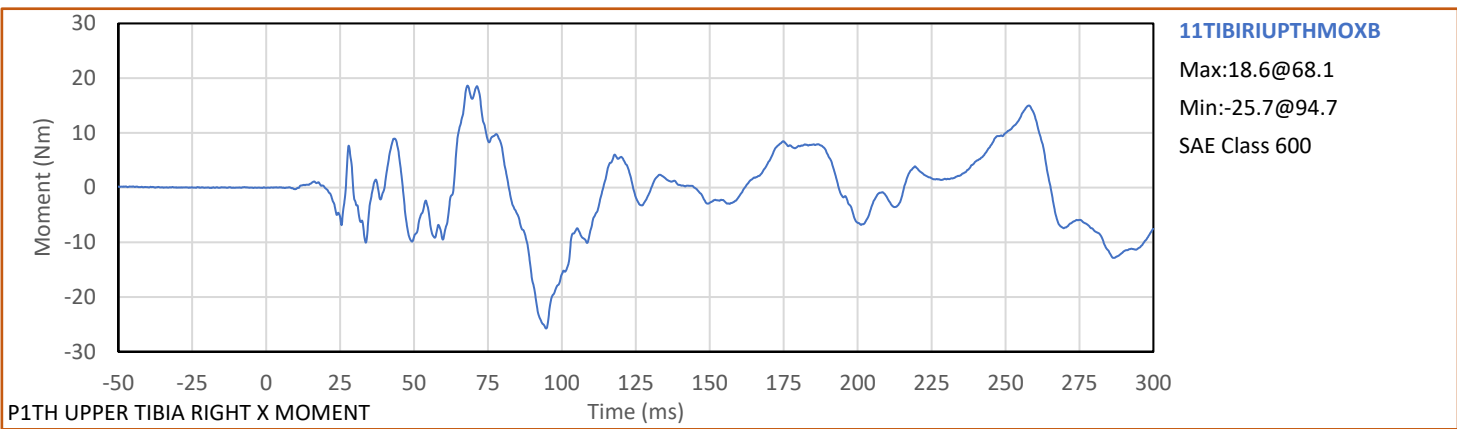
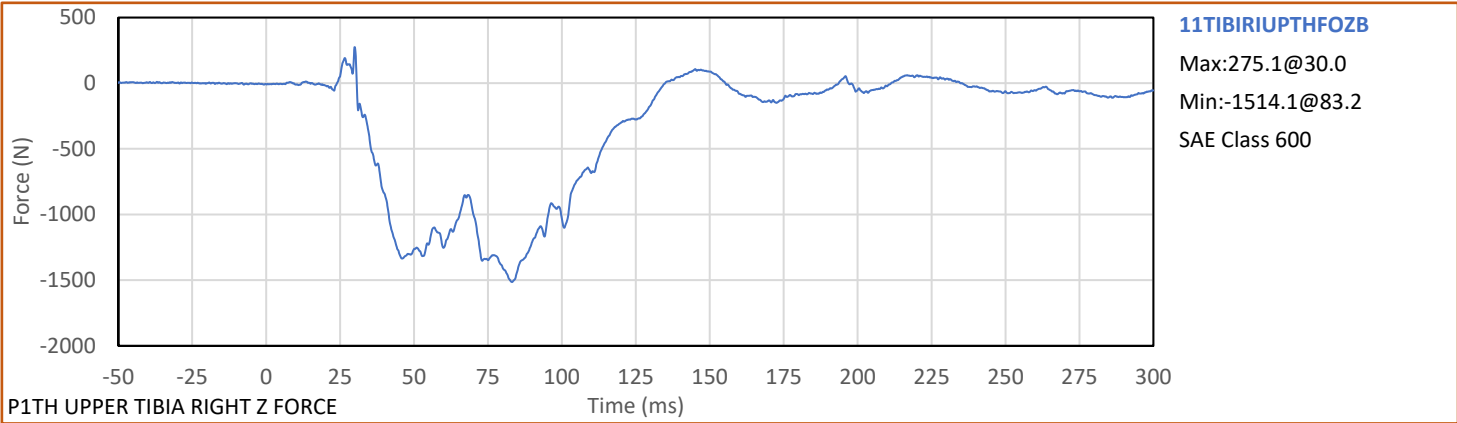


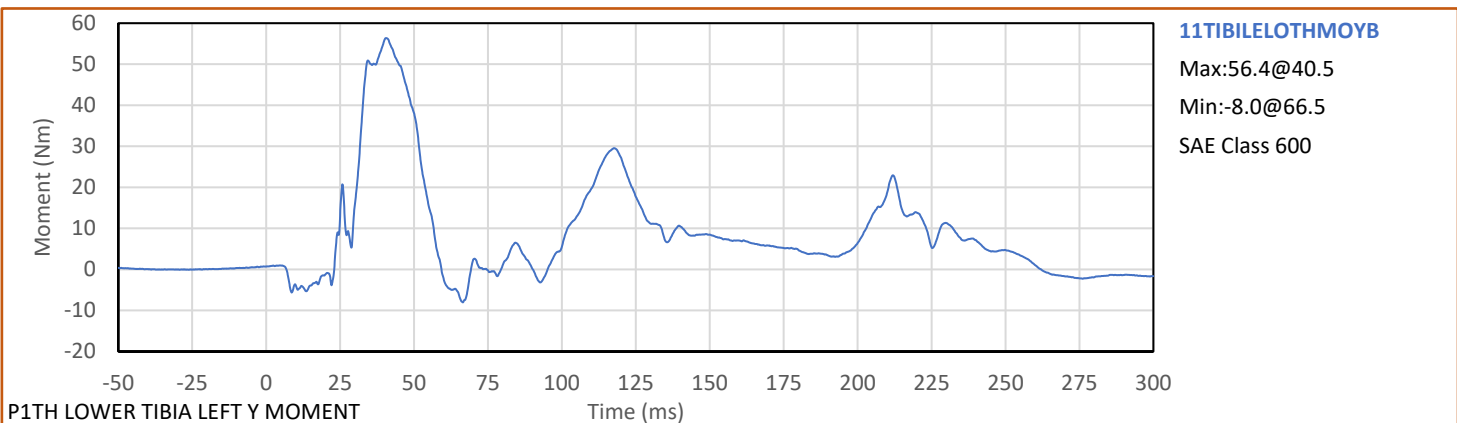
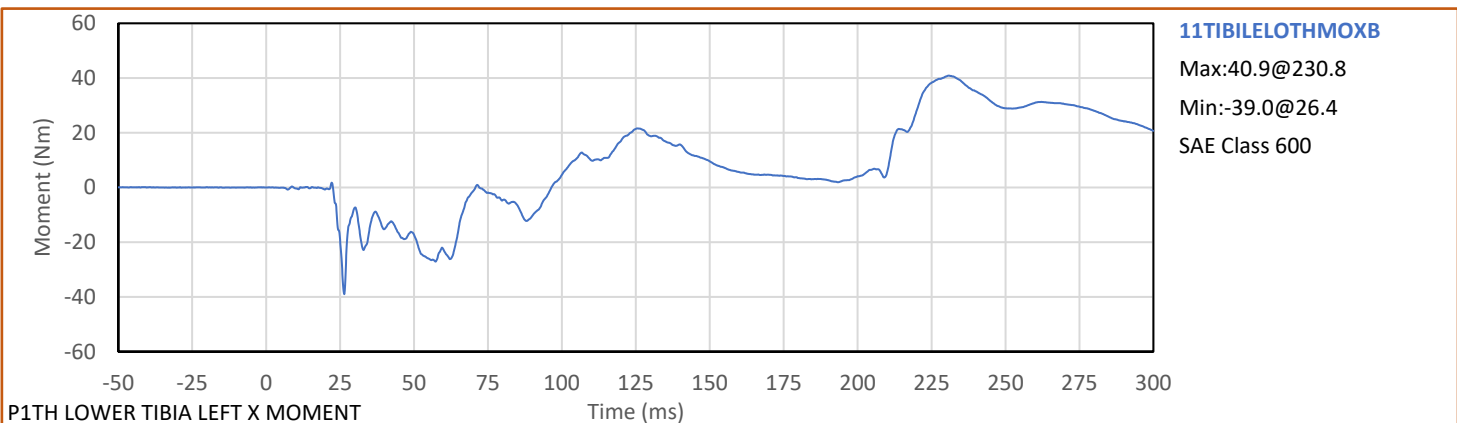
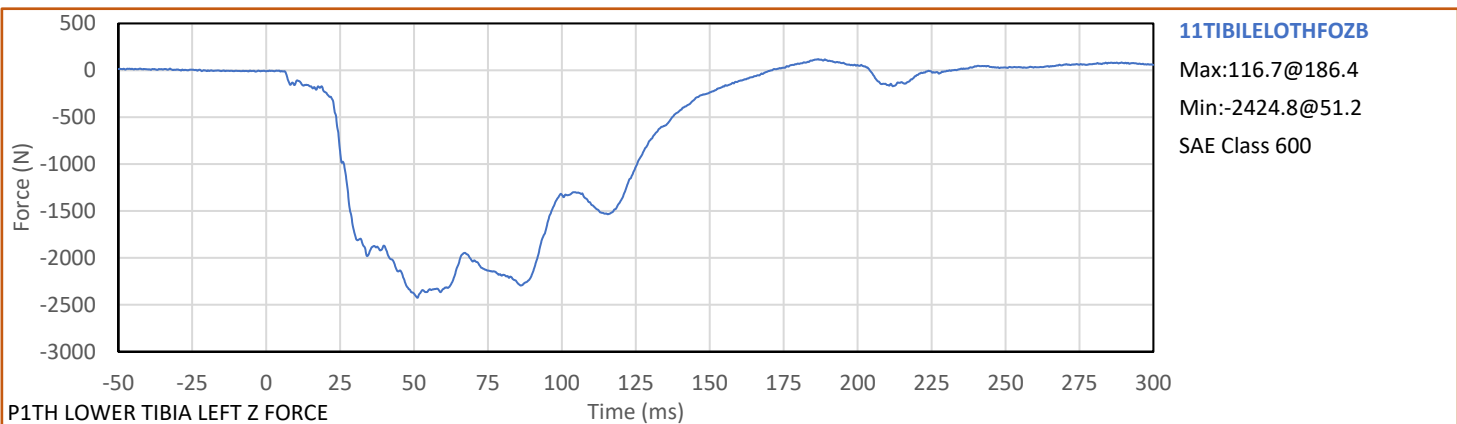
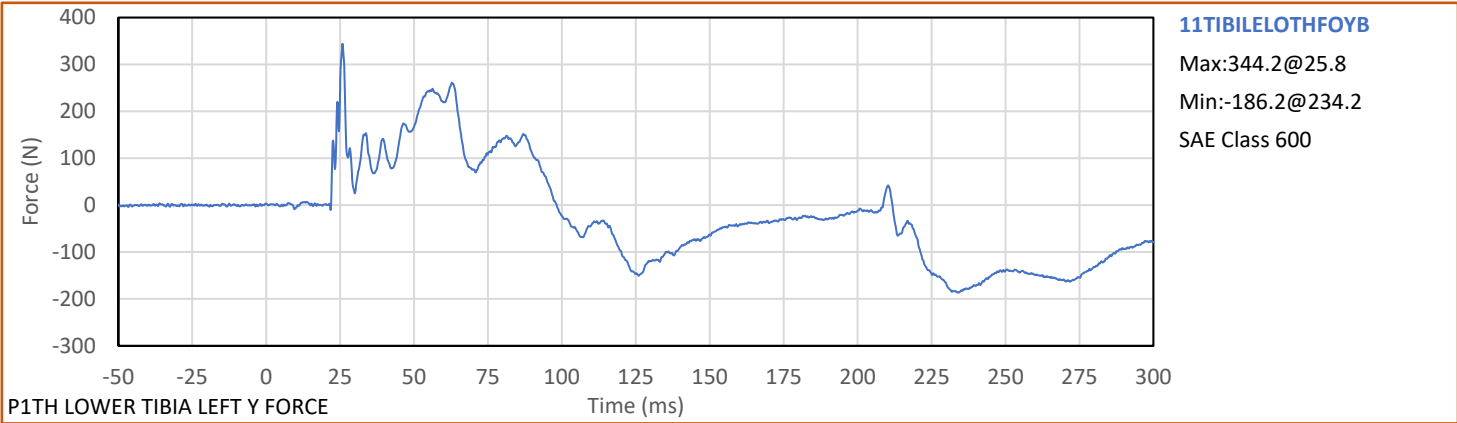


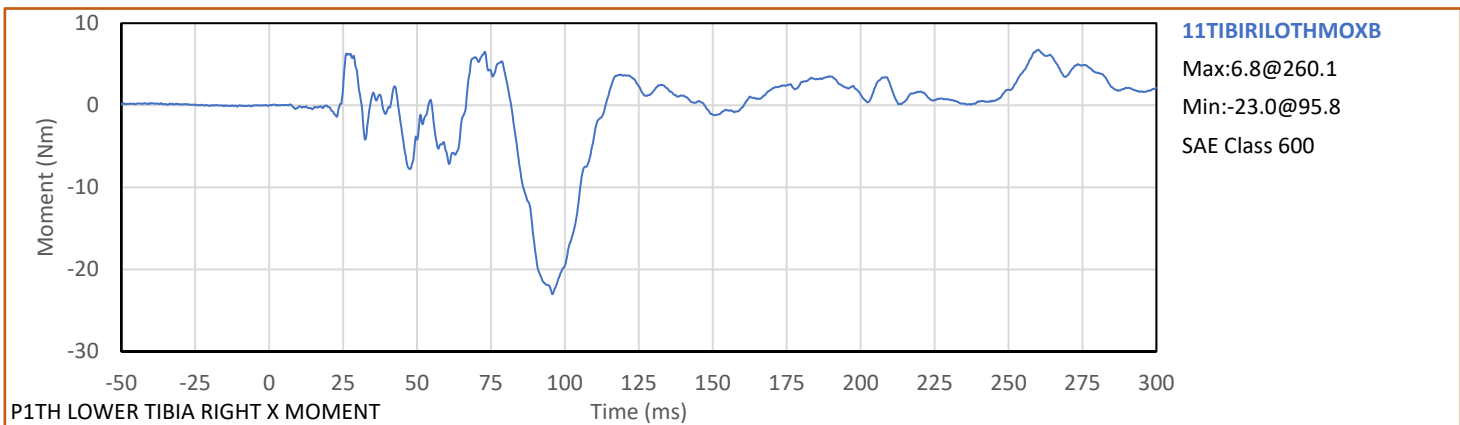
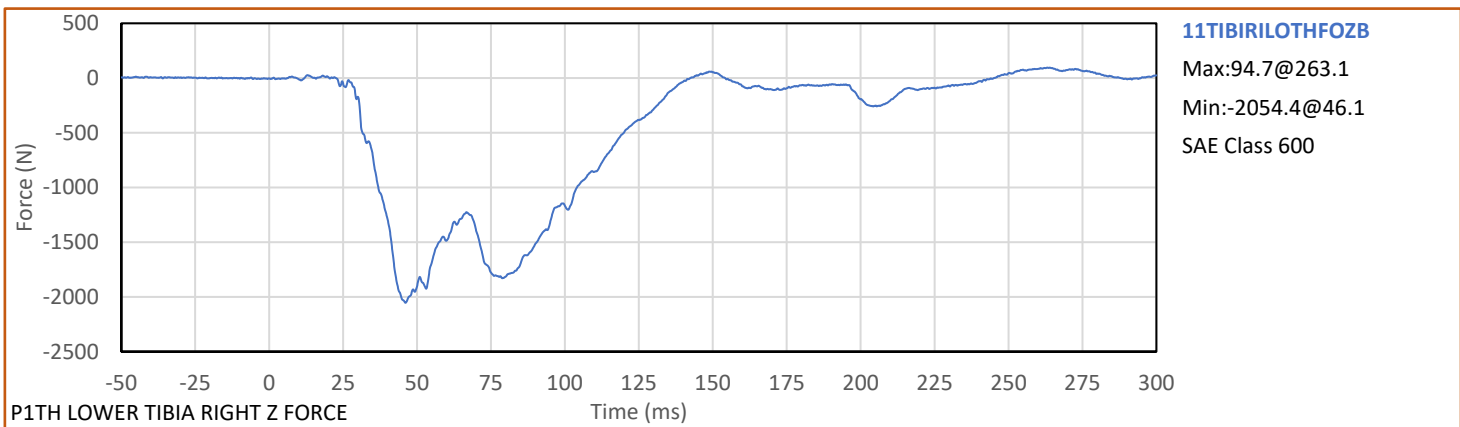
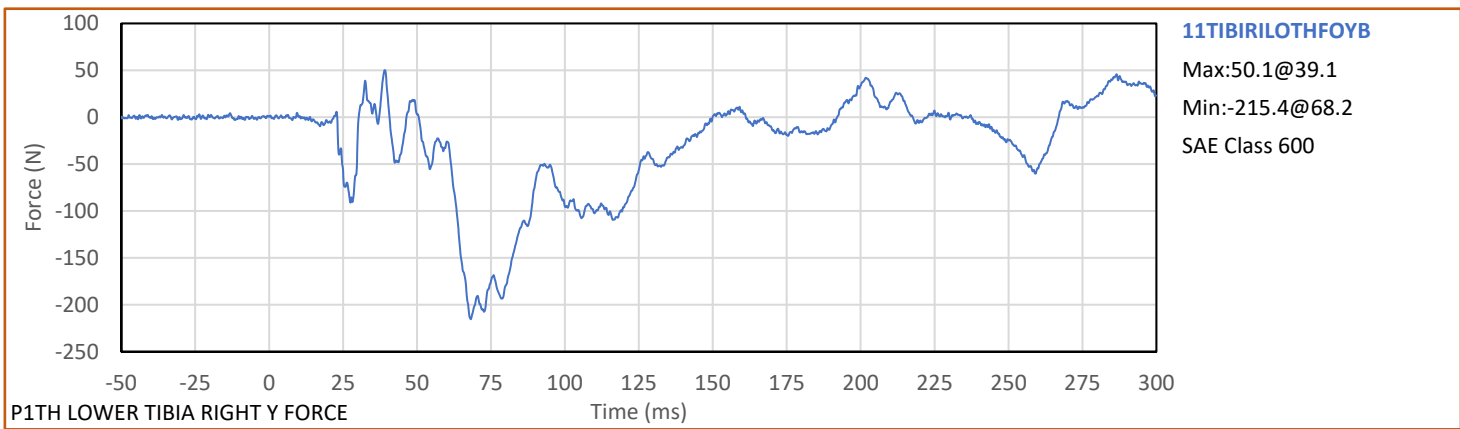
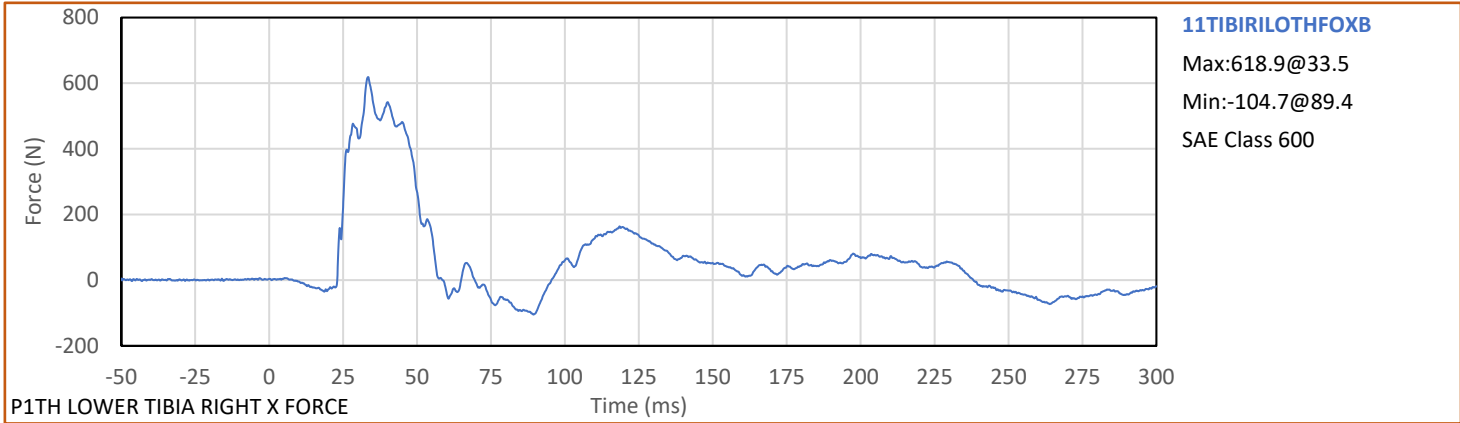


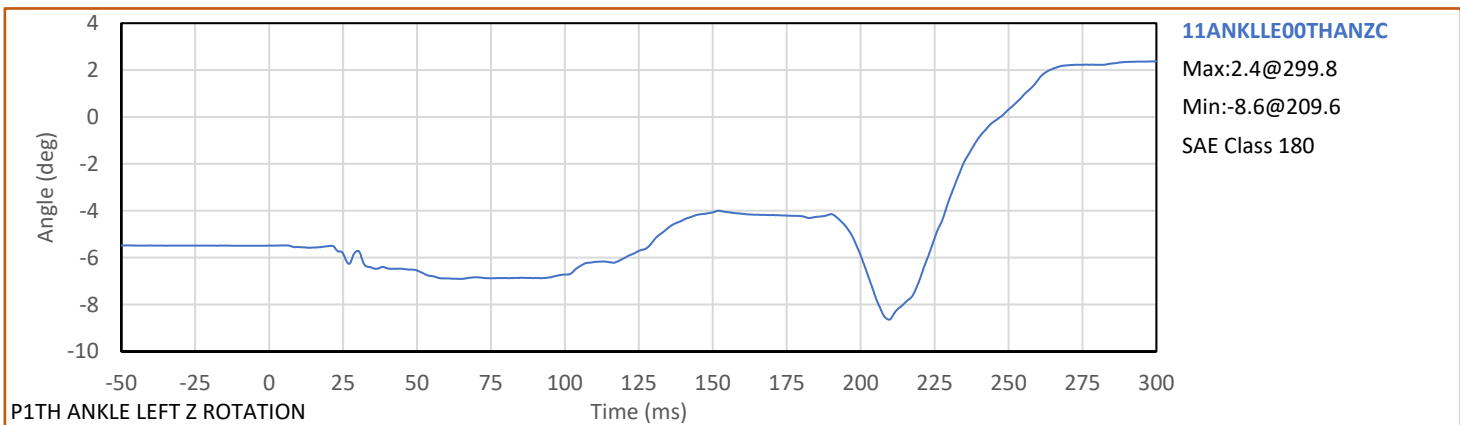
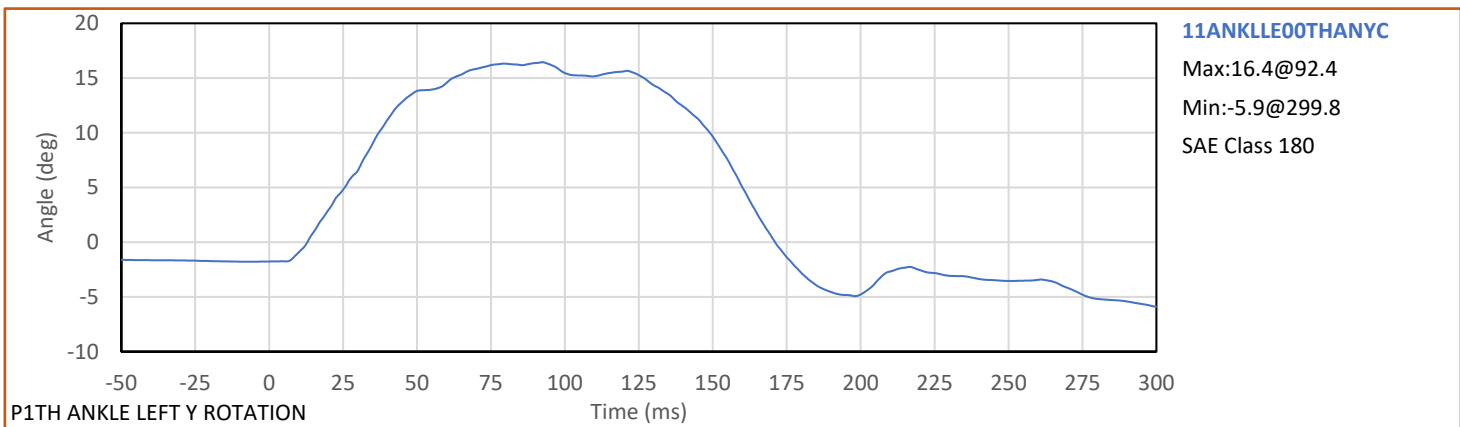
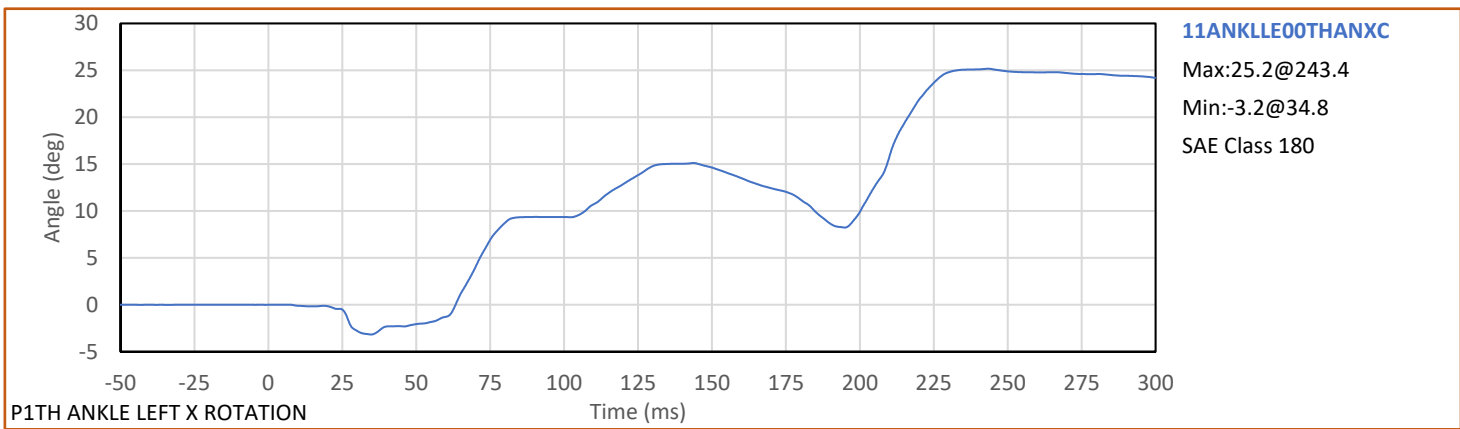
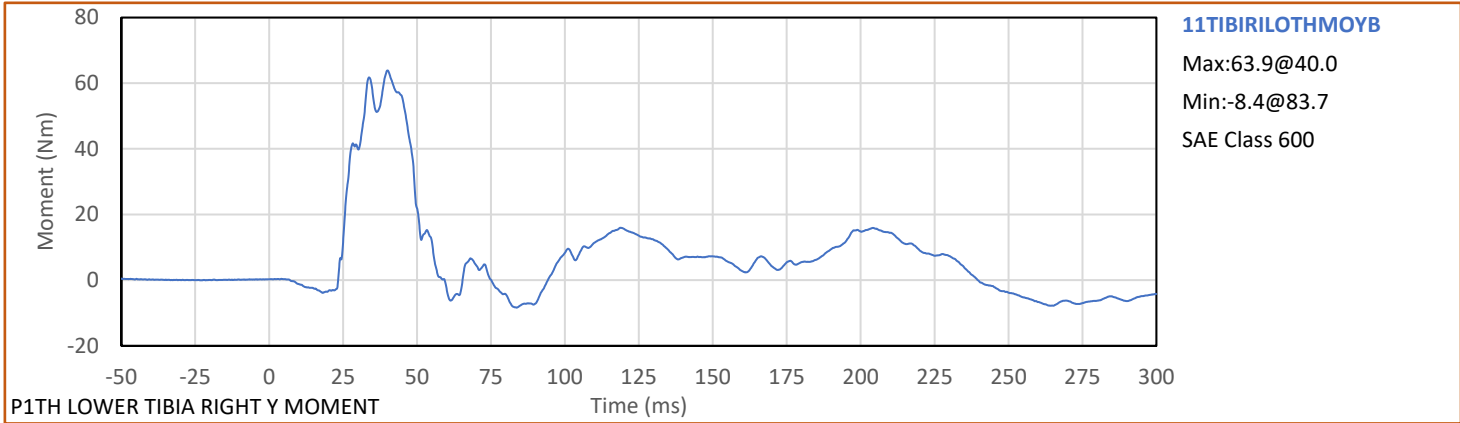






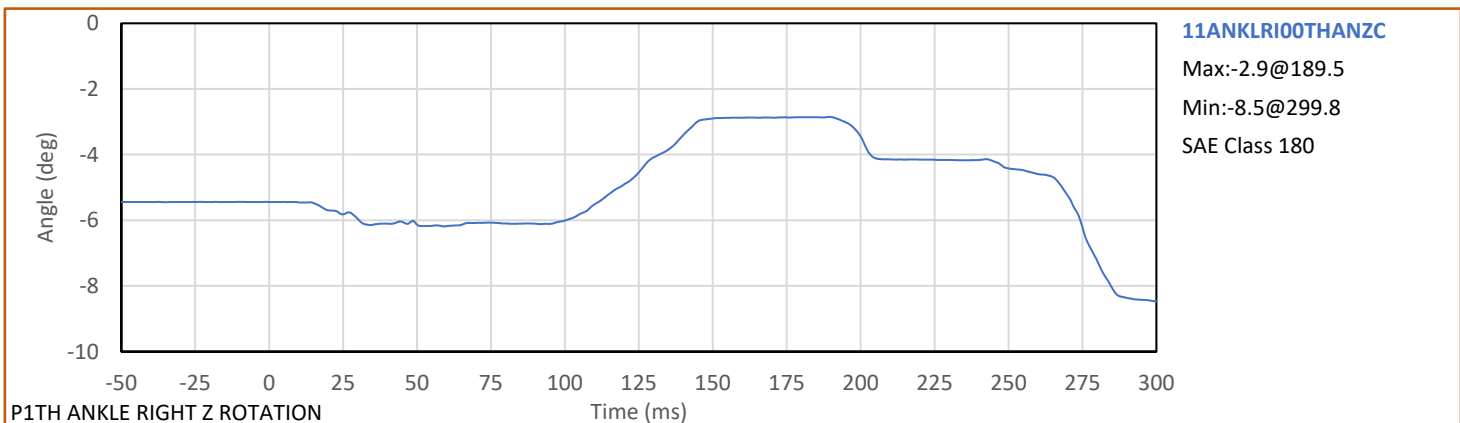
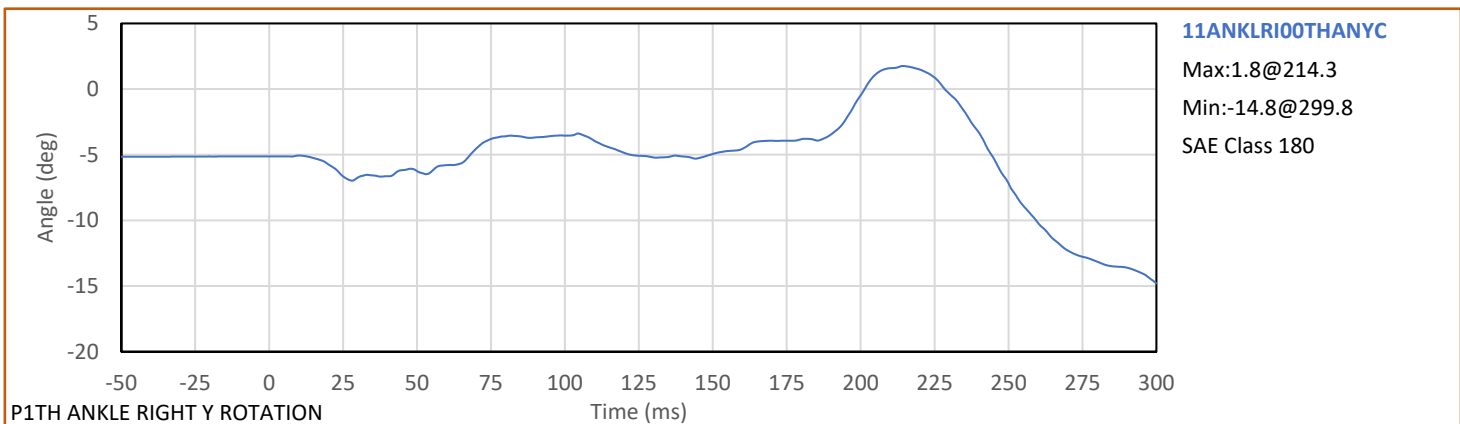
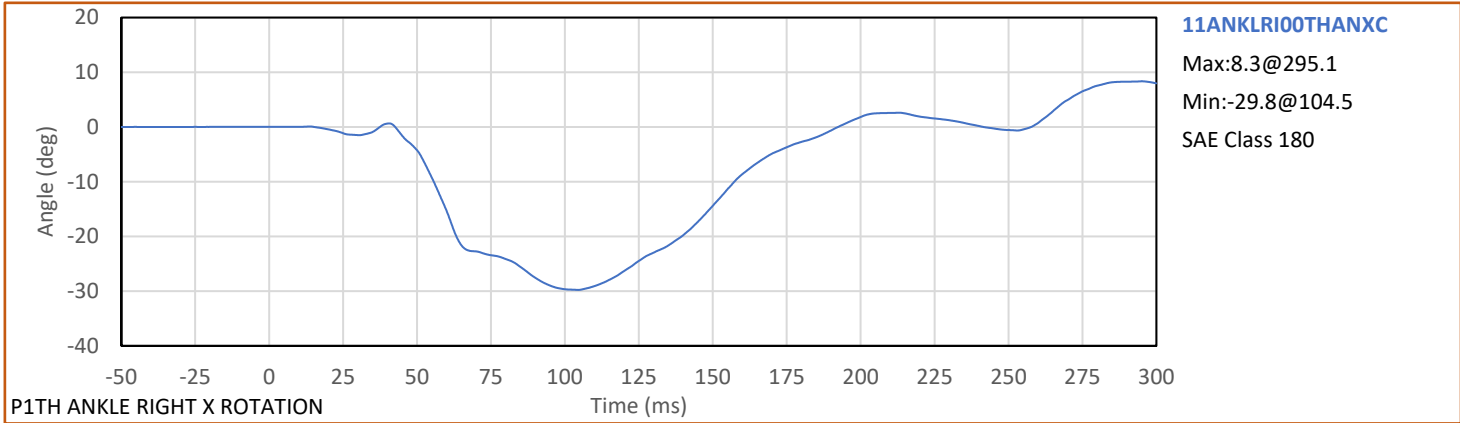


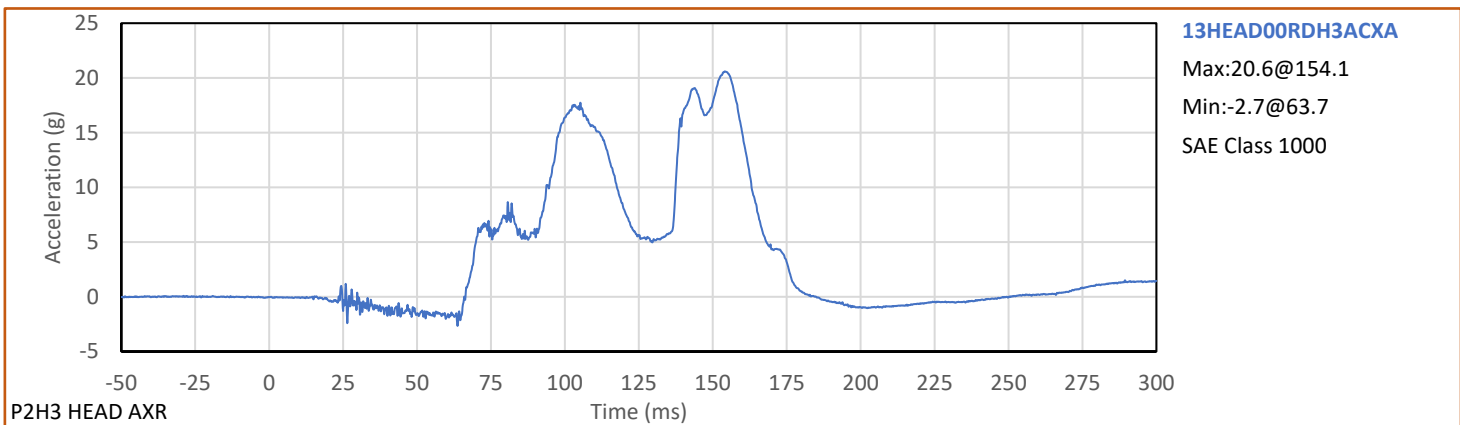
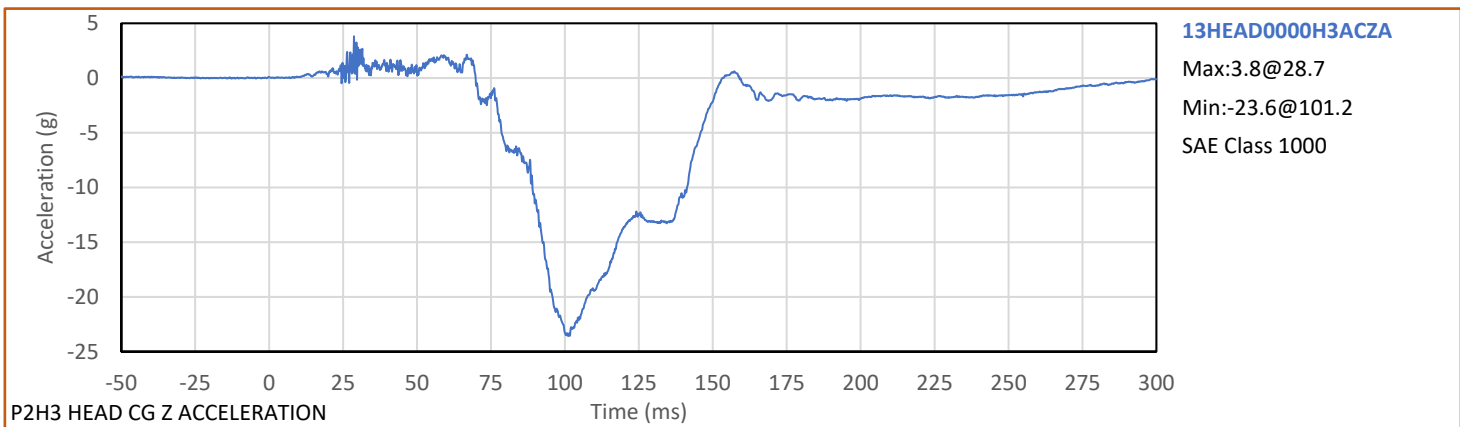
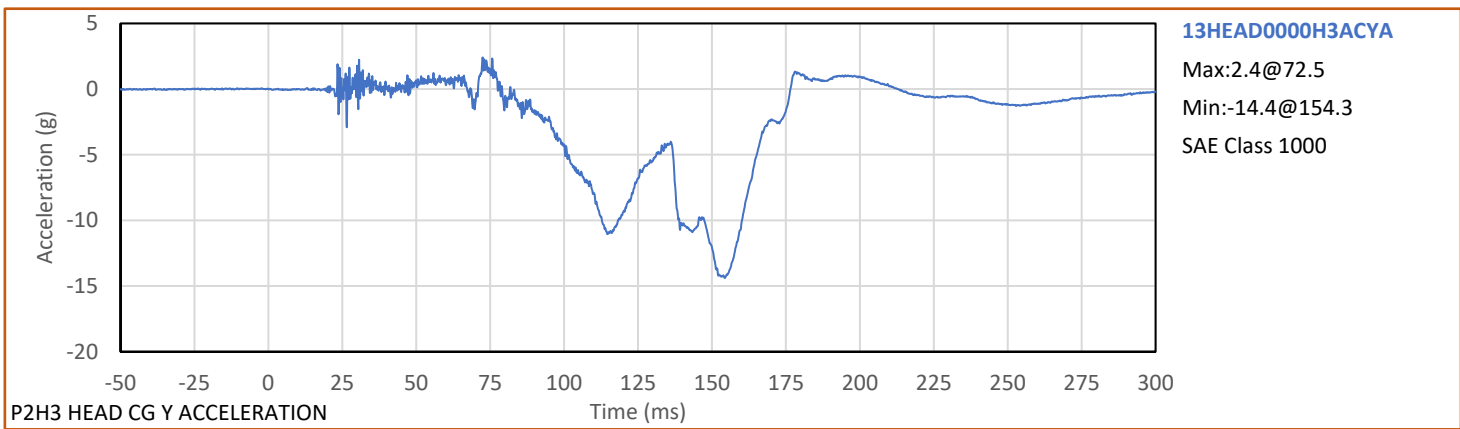
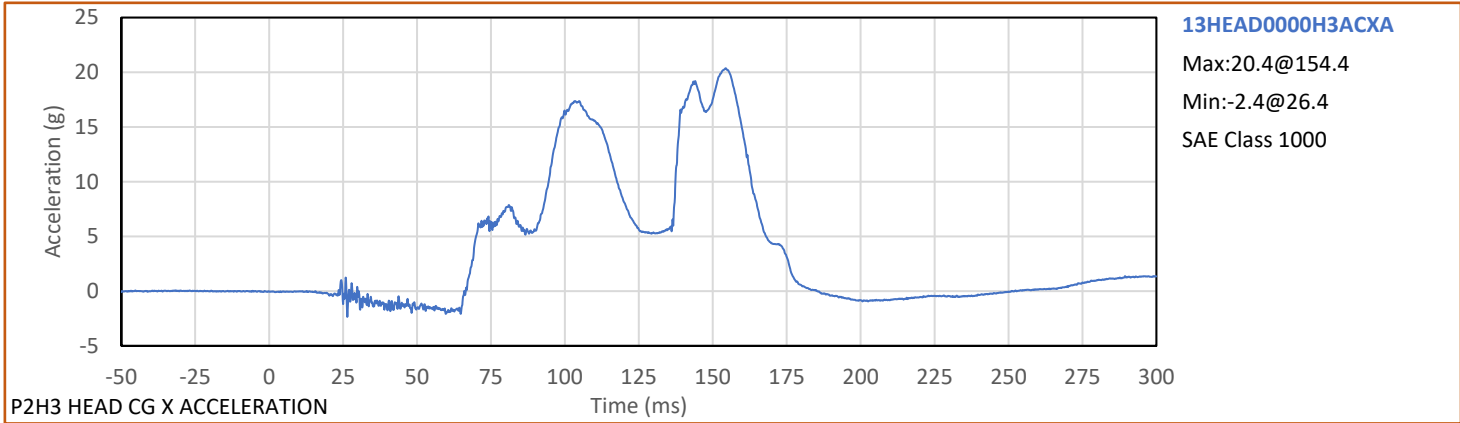


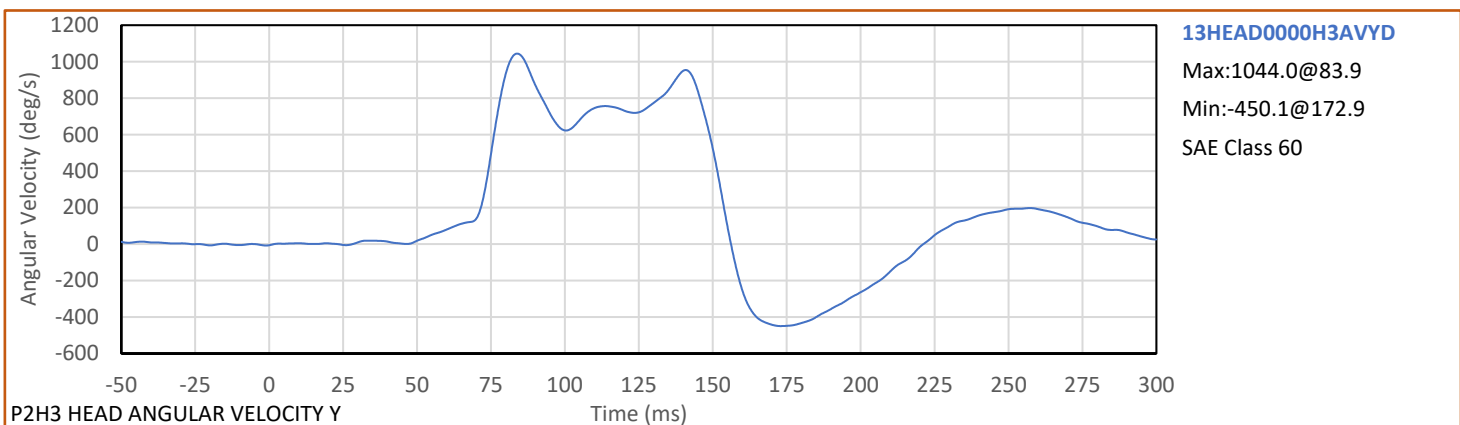
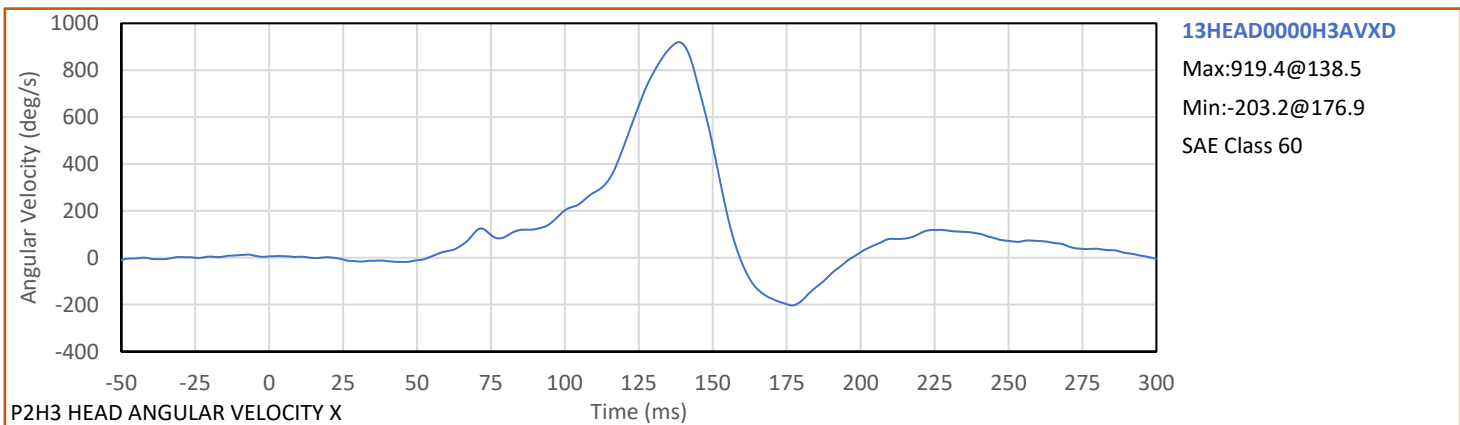
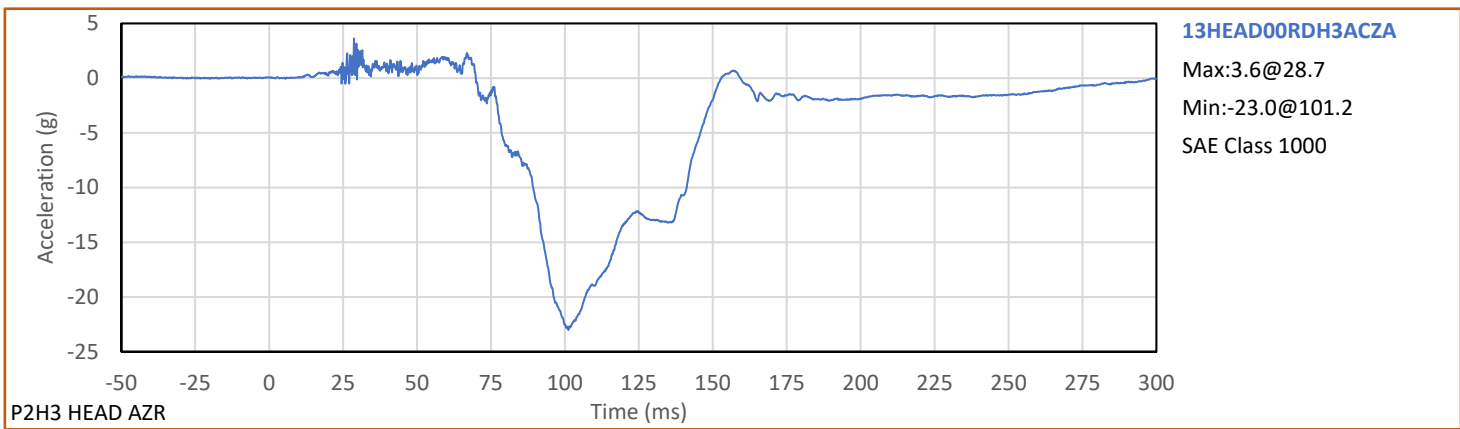
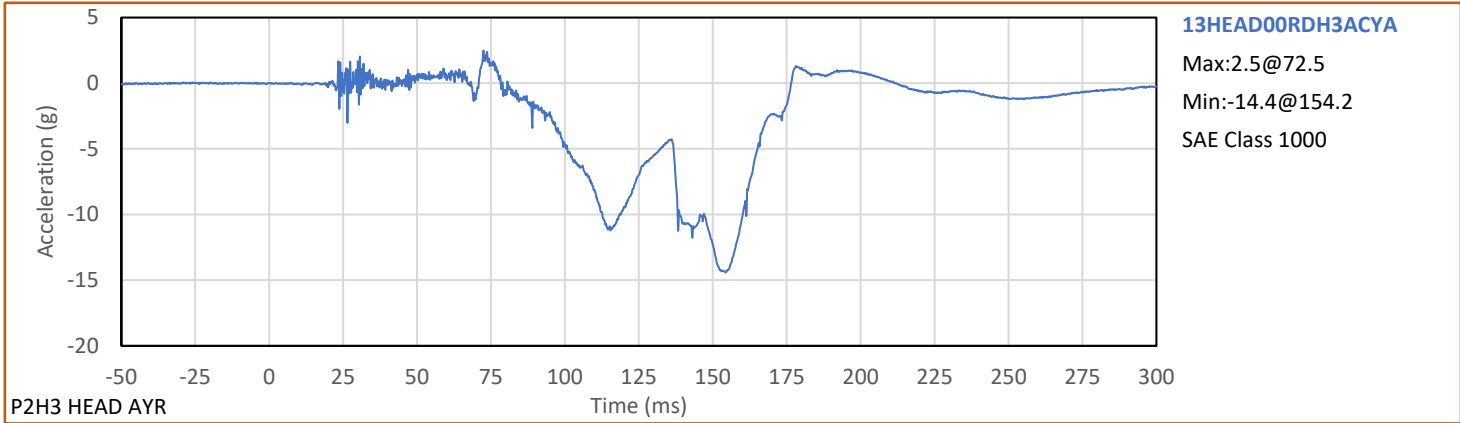


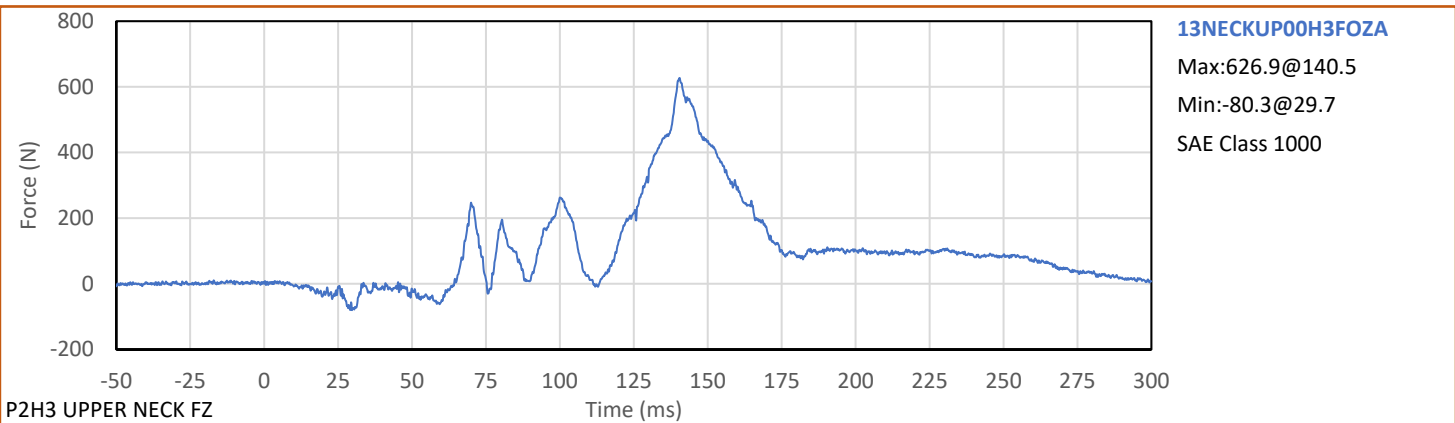
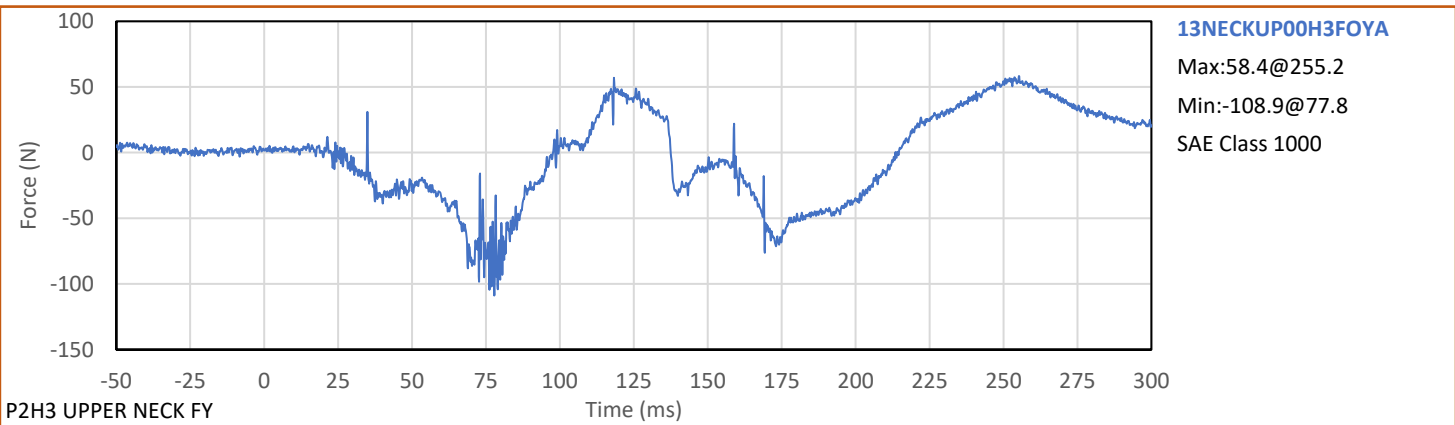
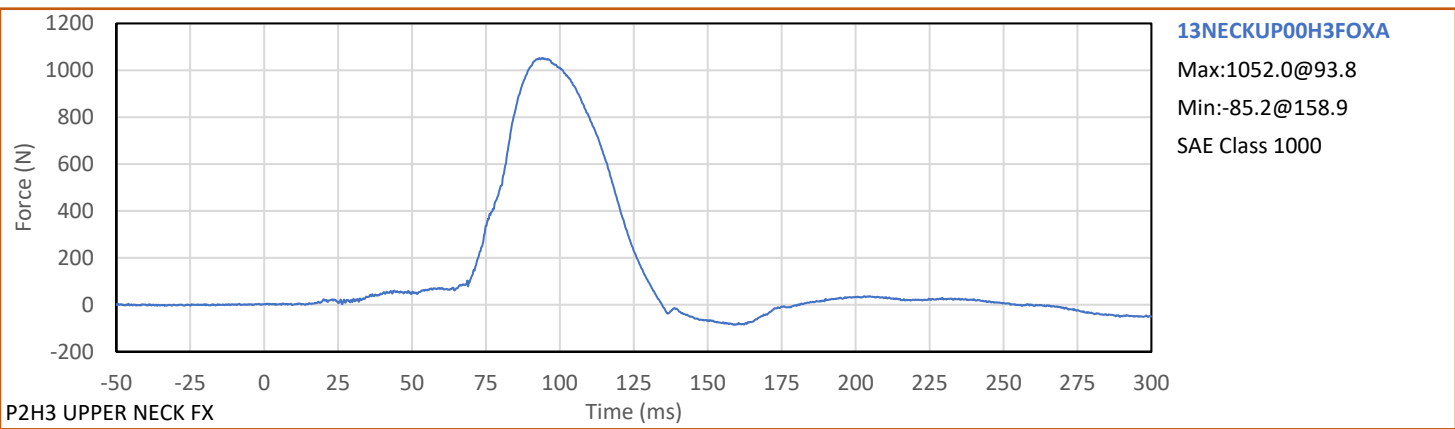
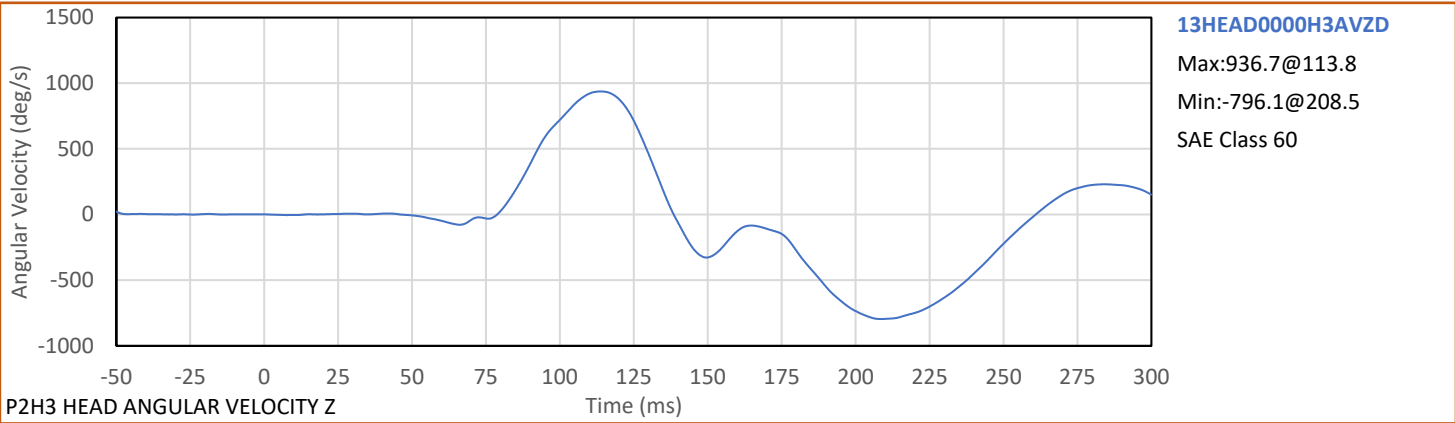
Test Vehicle: 2020 Honda Accord 4-Door Sedan
Test Program: Left Side 30° Frontal Rigid Barrier Impact

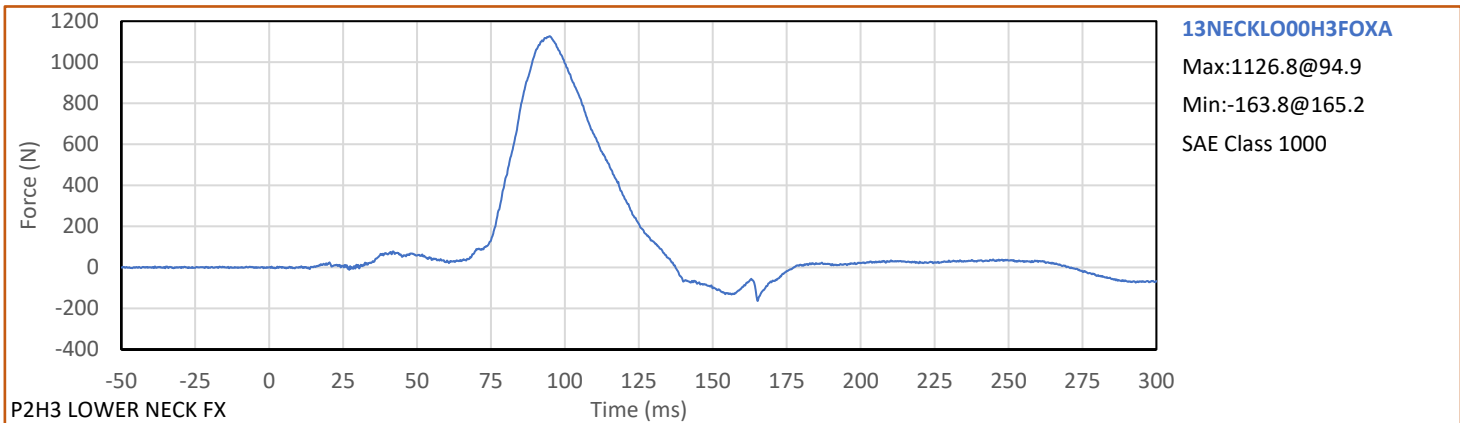
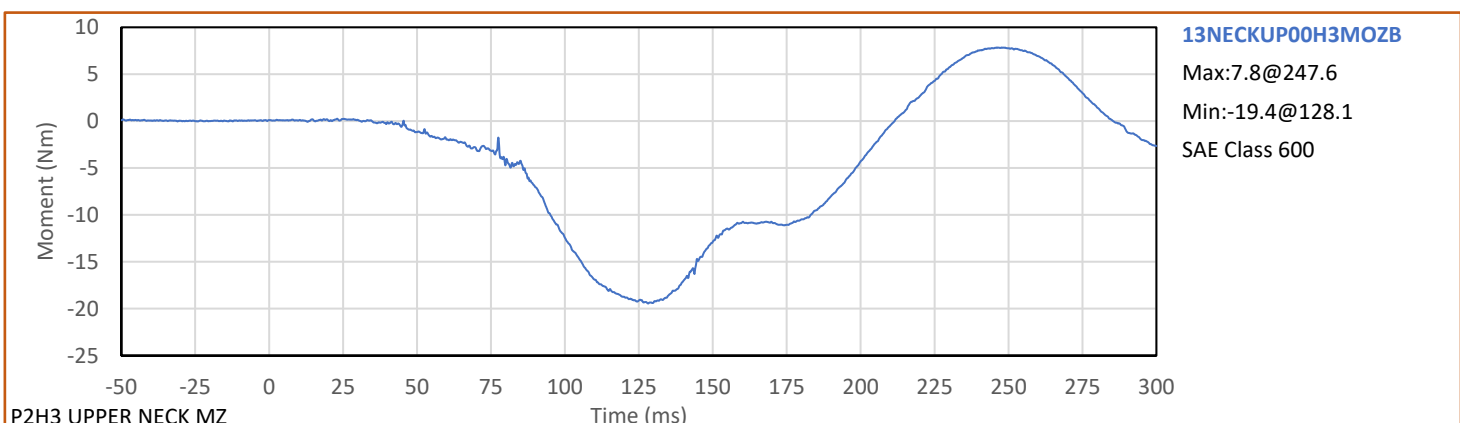
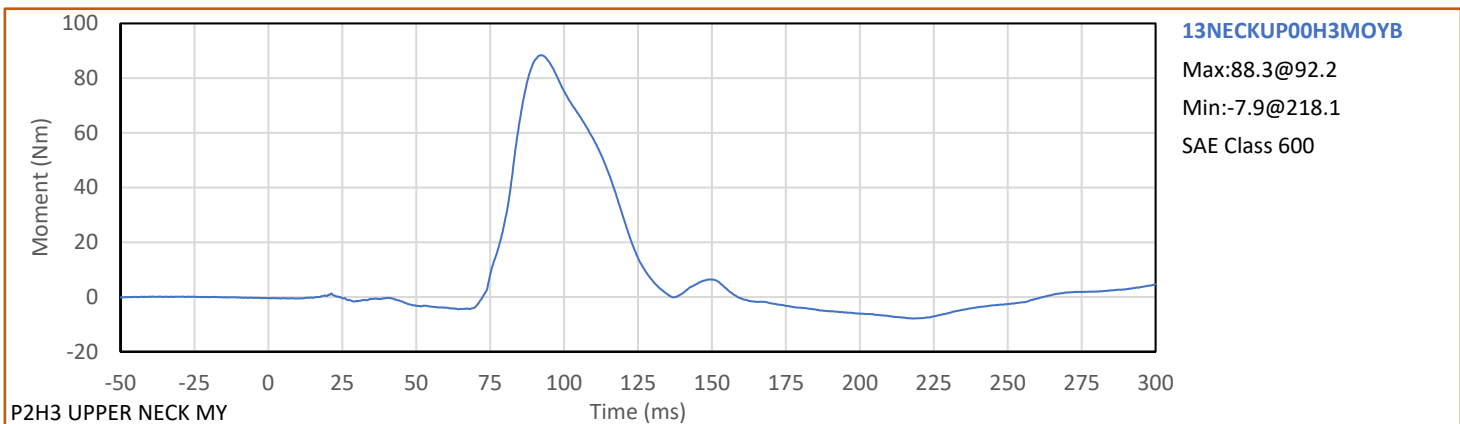
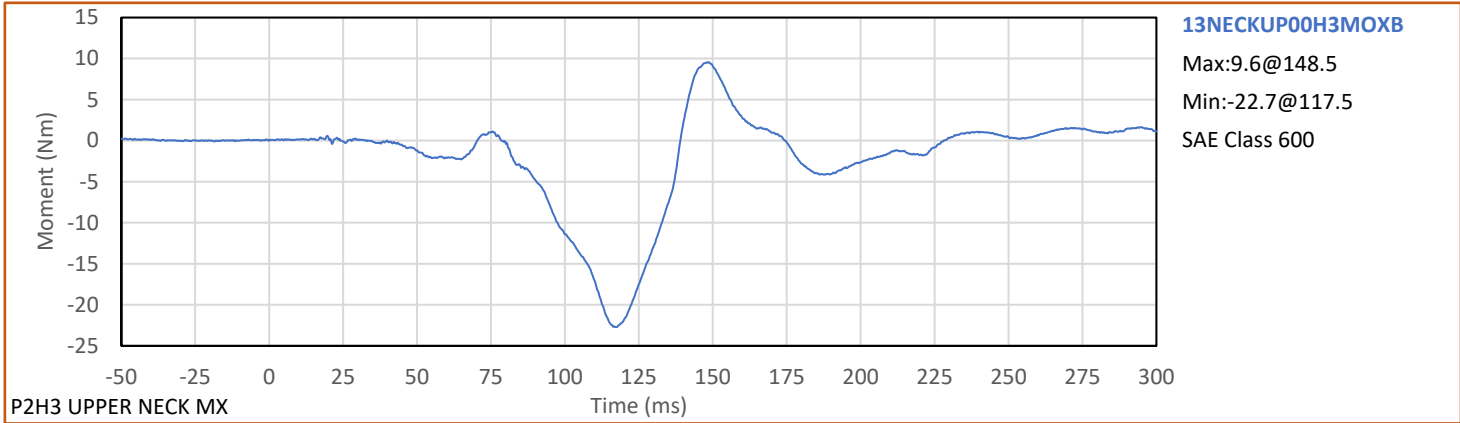
NHTSA No.: R20205385
Test Date: 6/24/2021

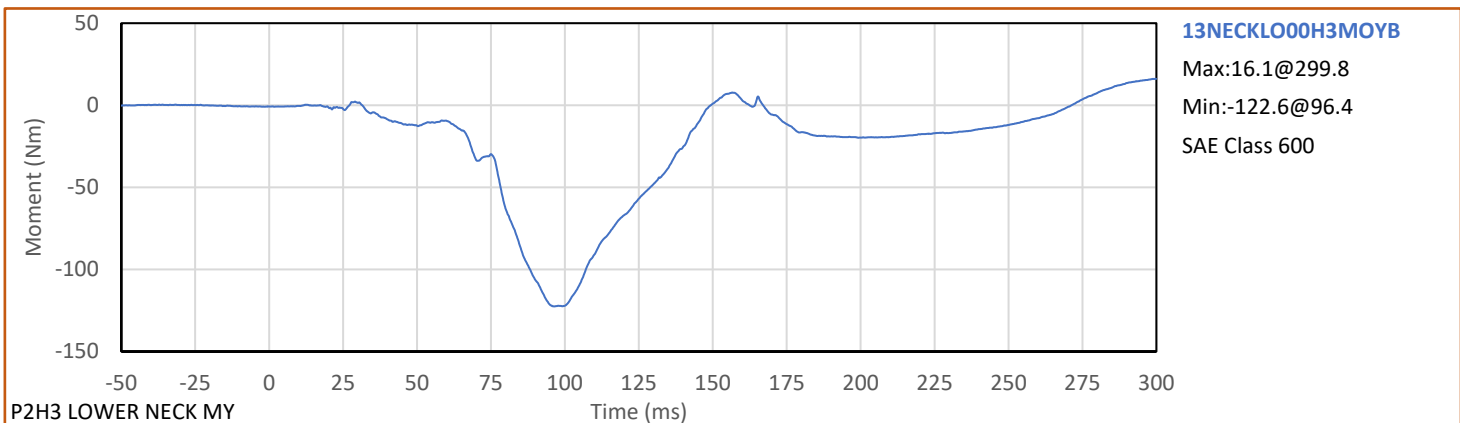
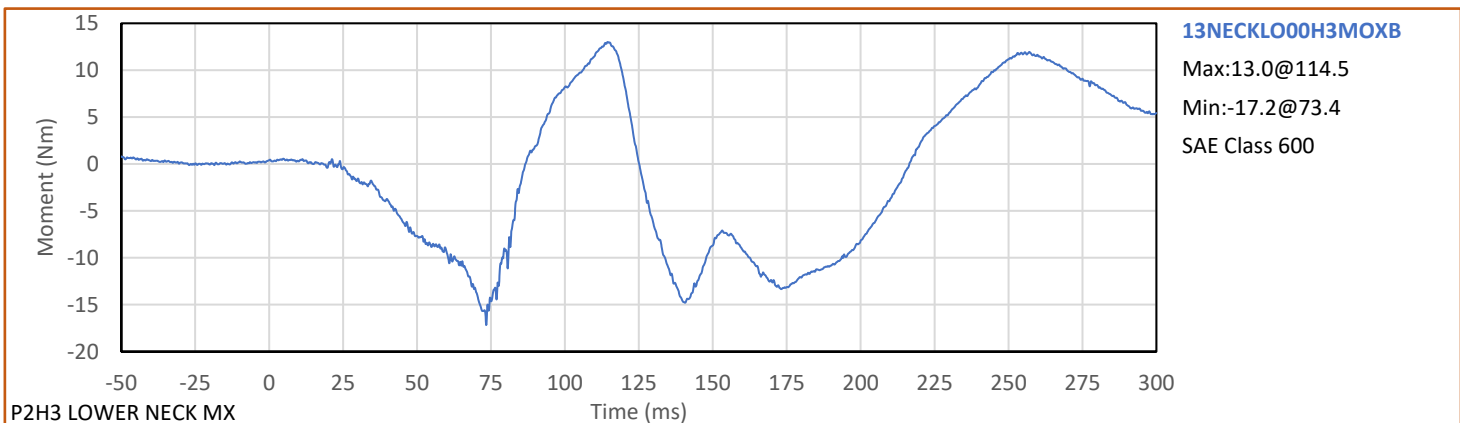
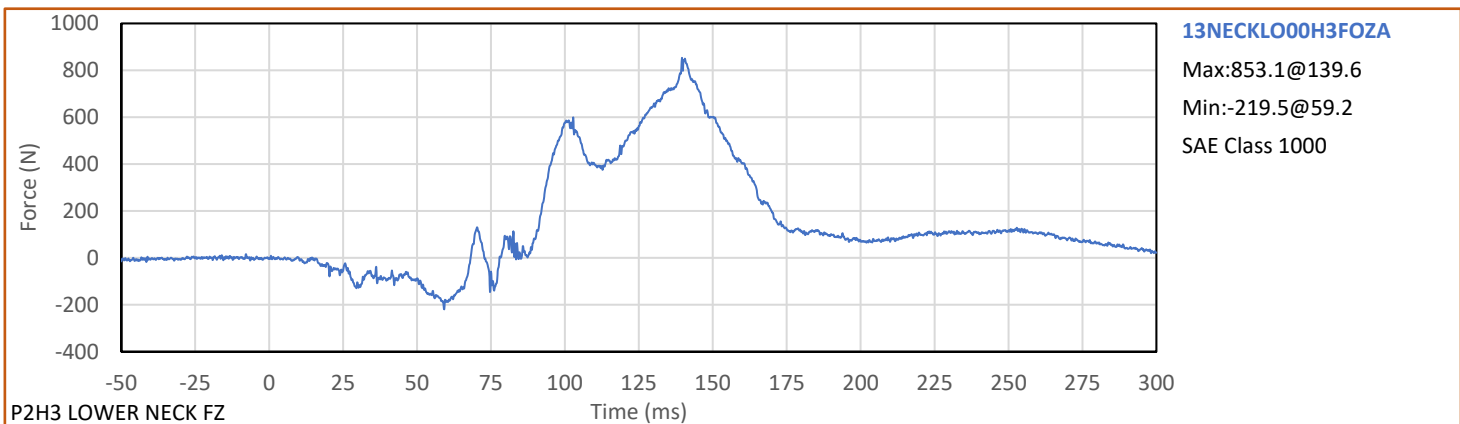
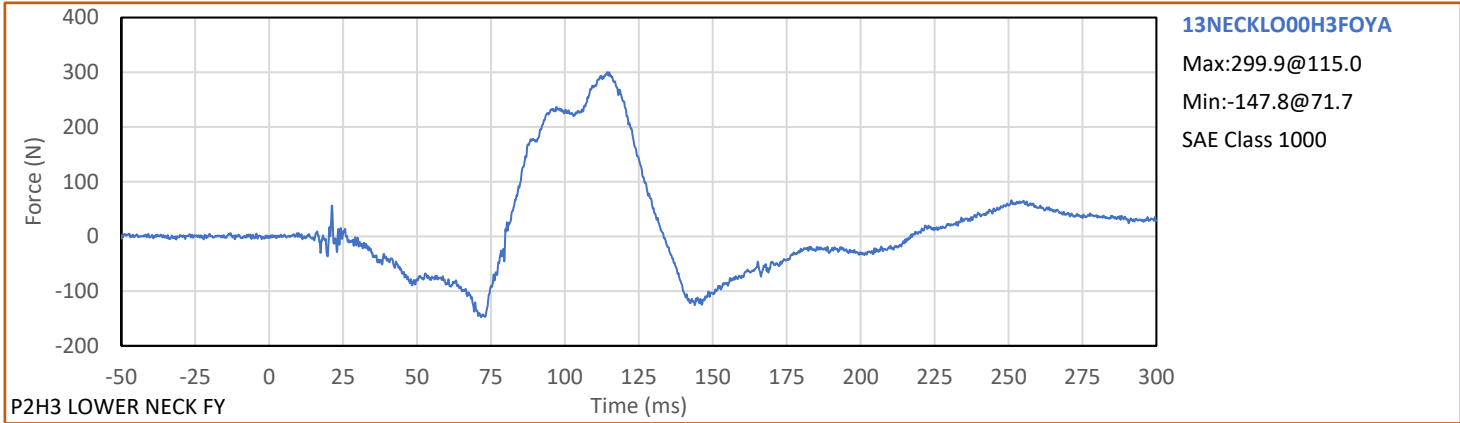


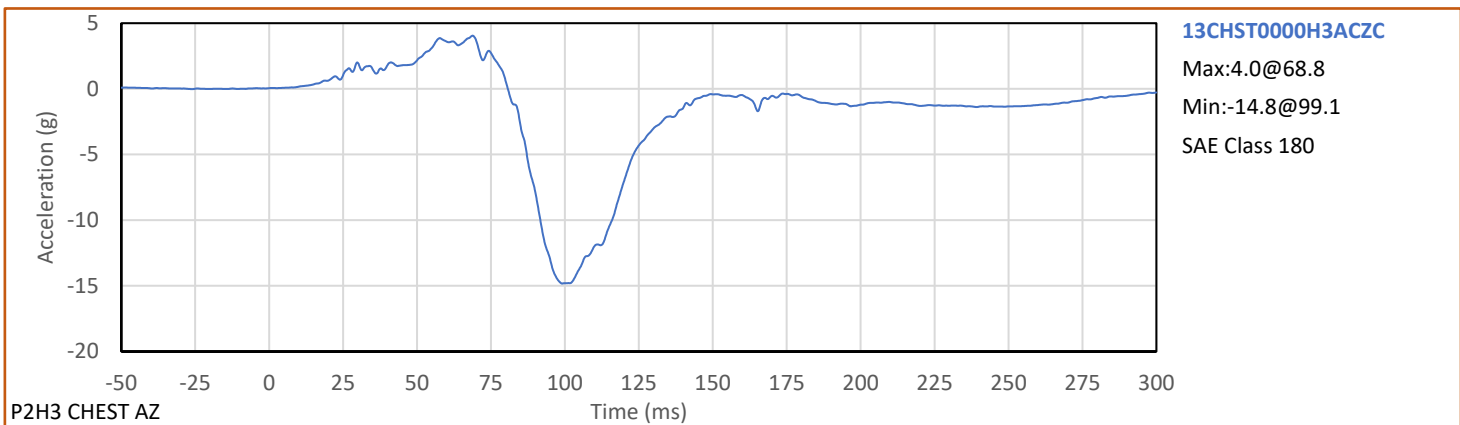
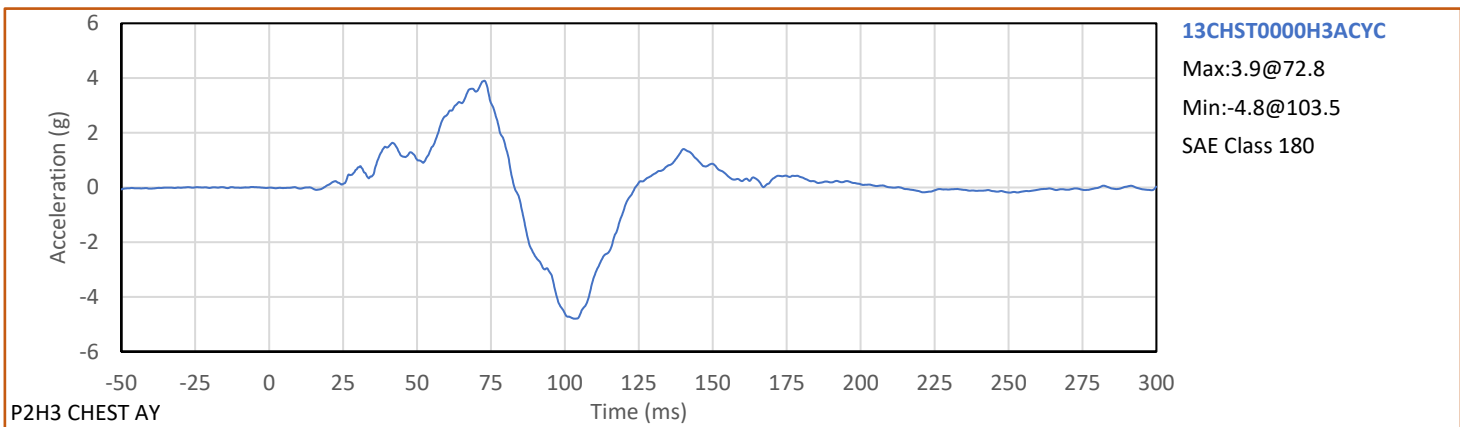
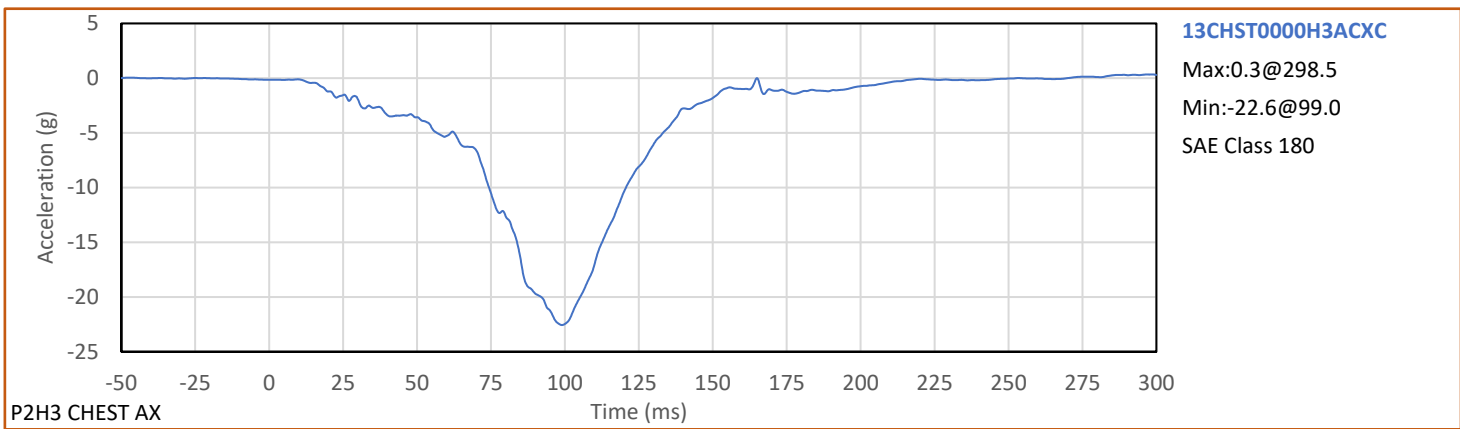
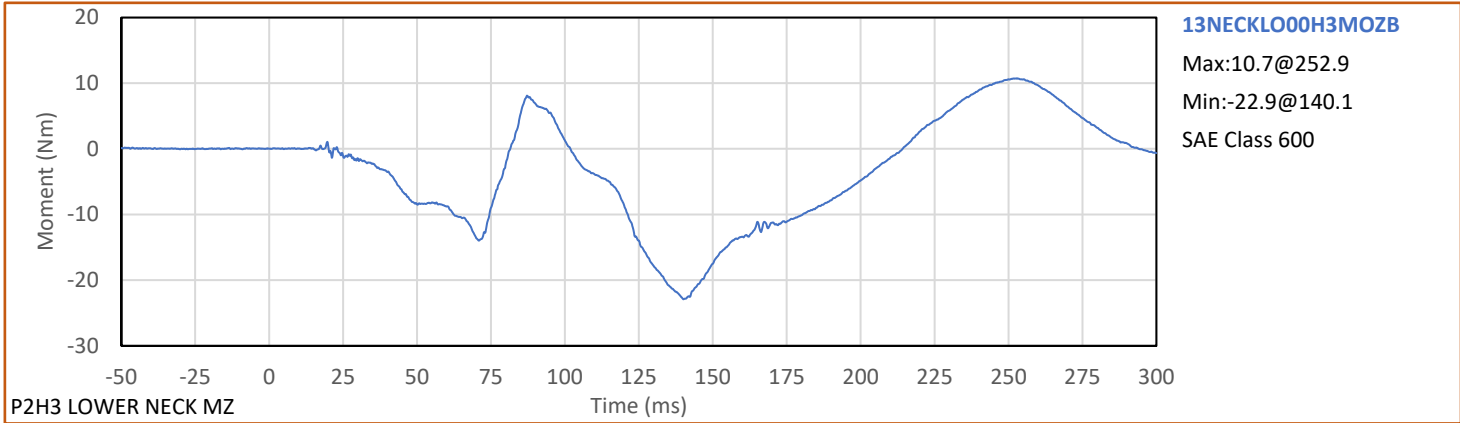


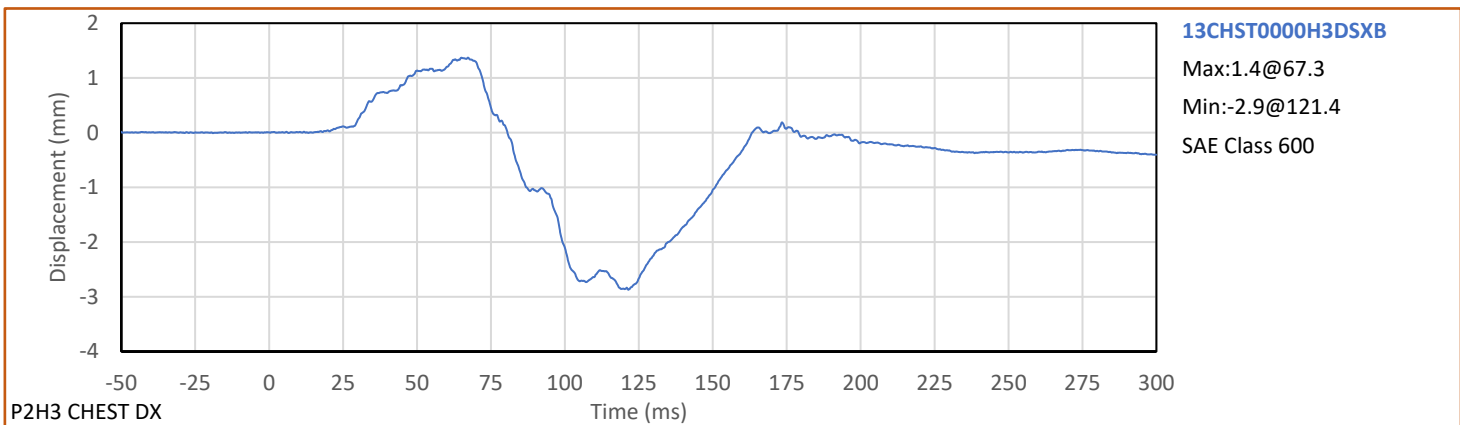
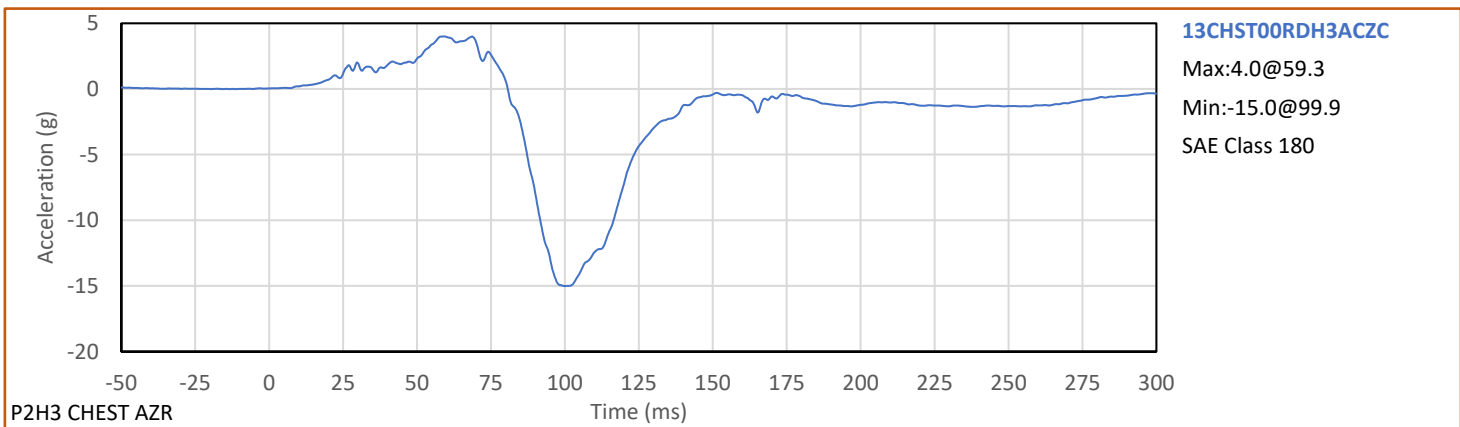
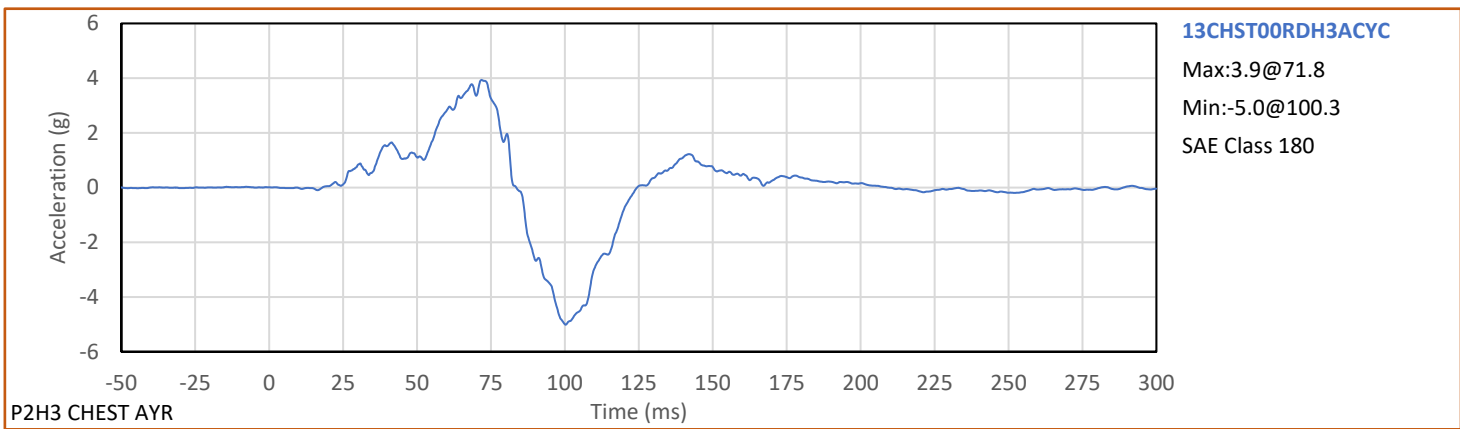
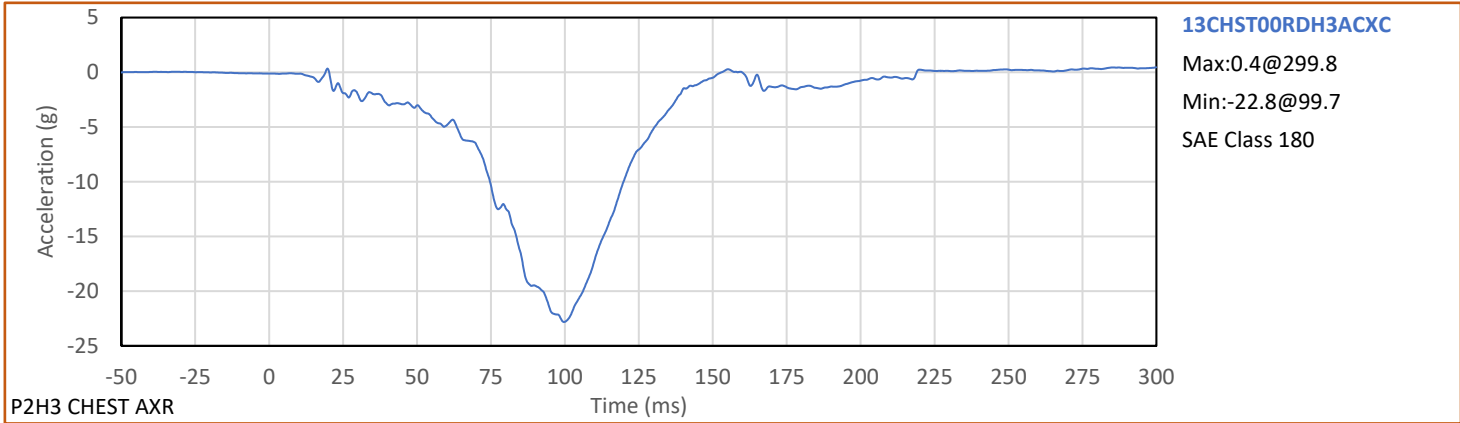


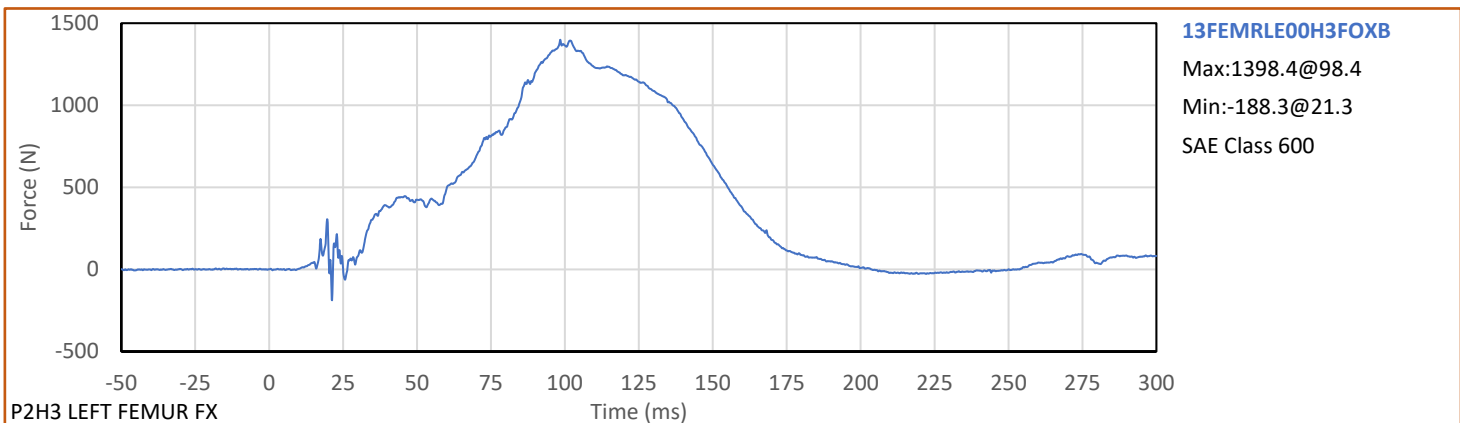
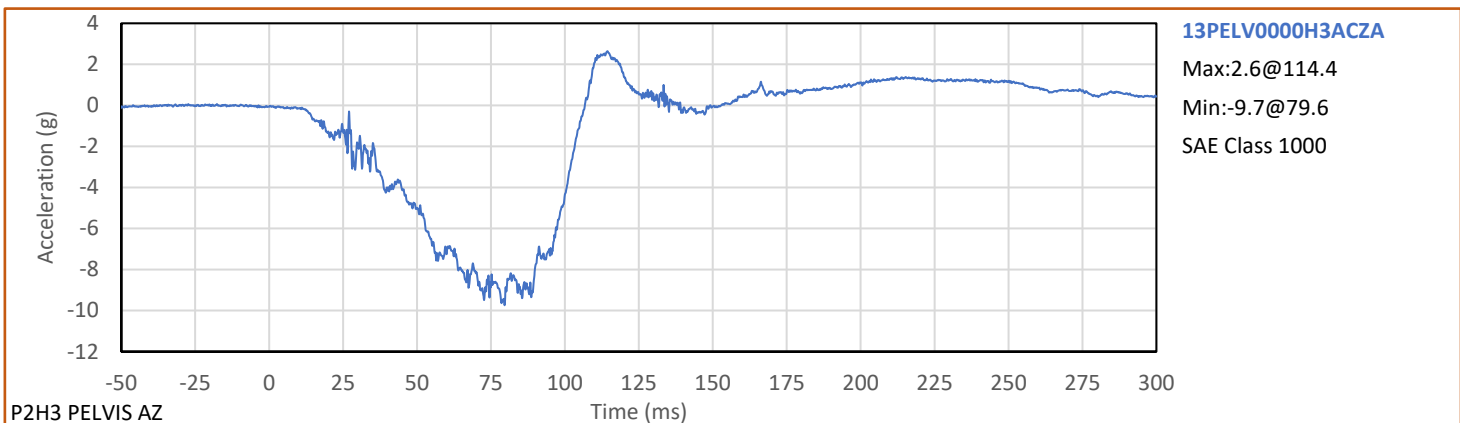
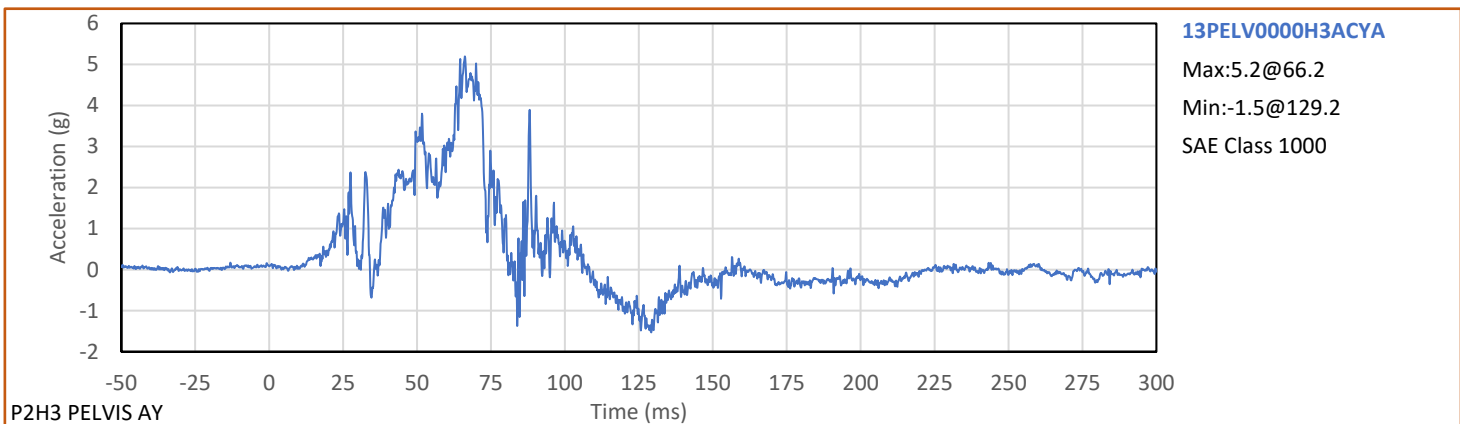
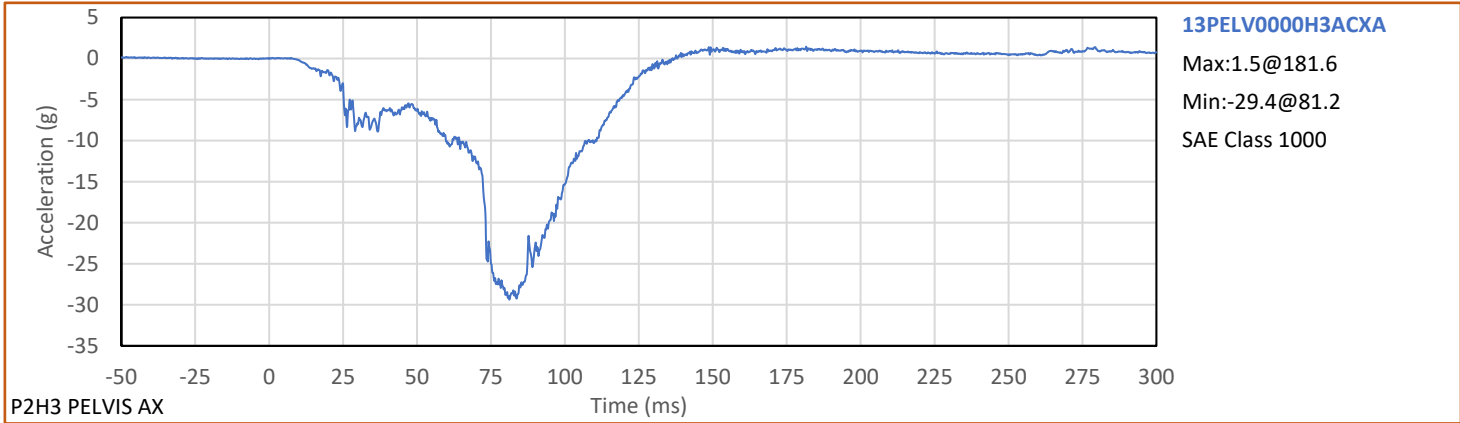


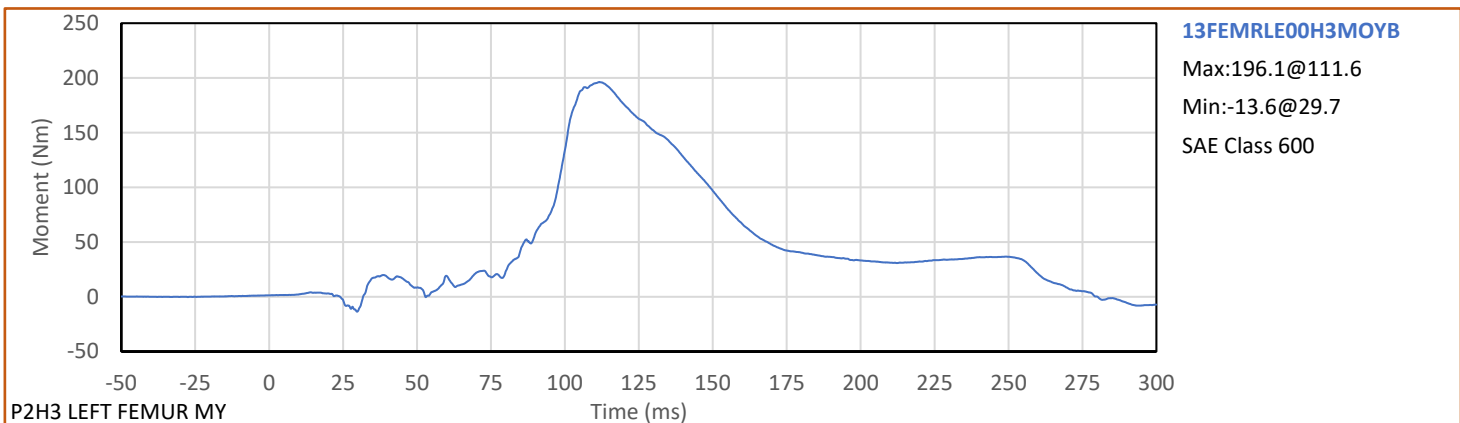
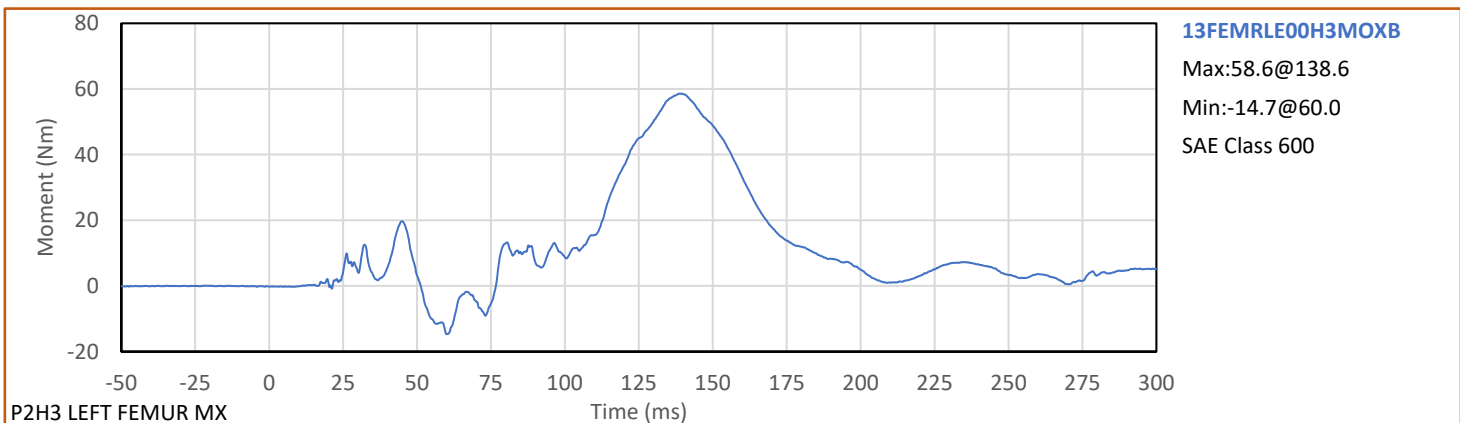
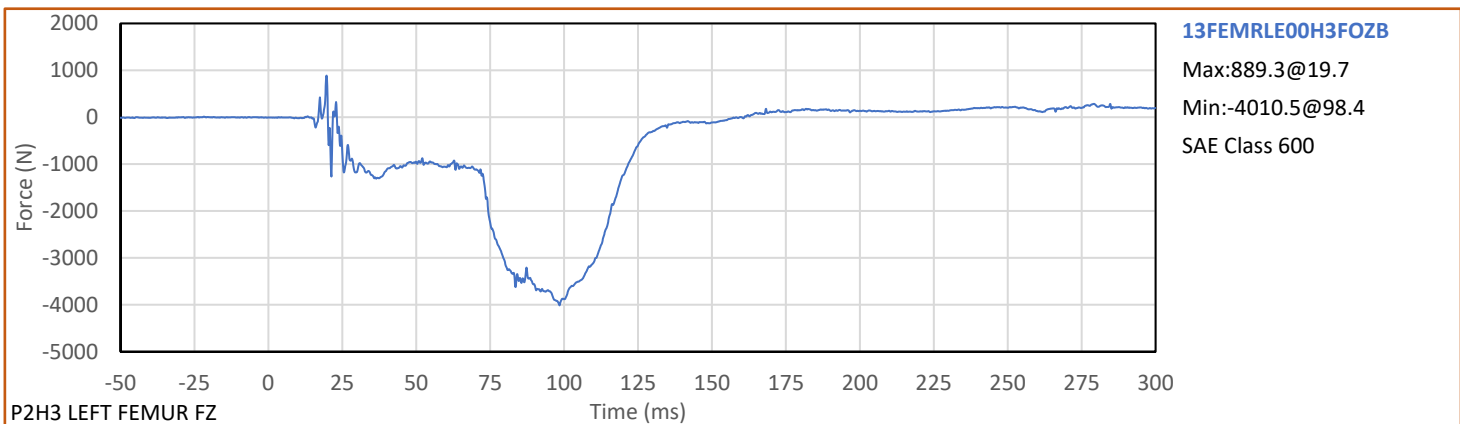
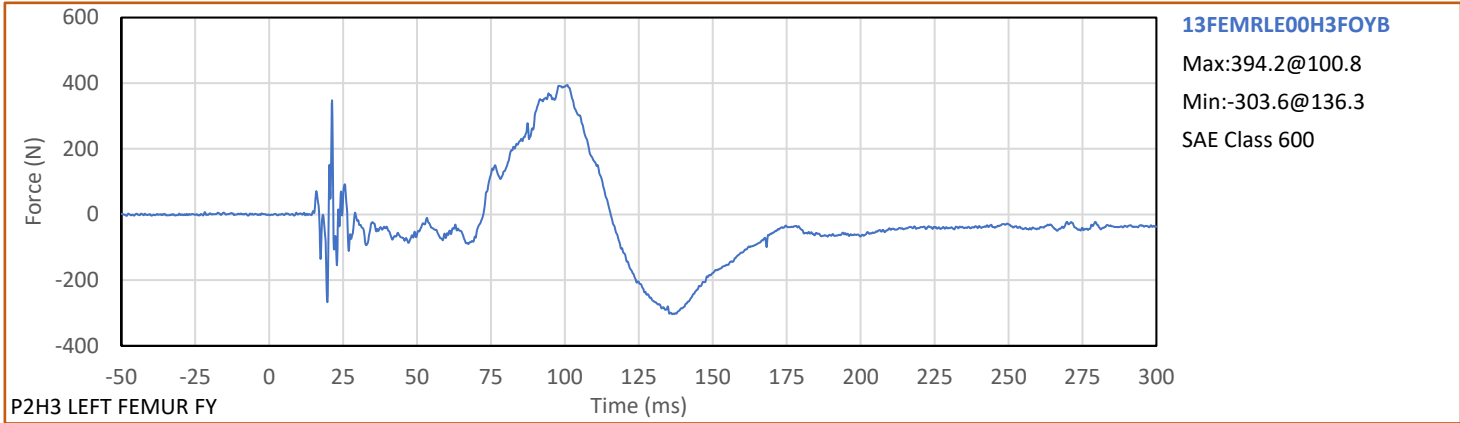


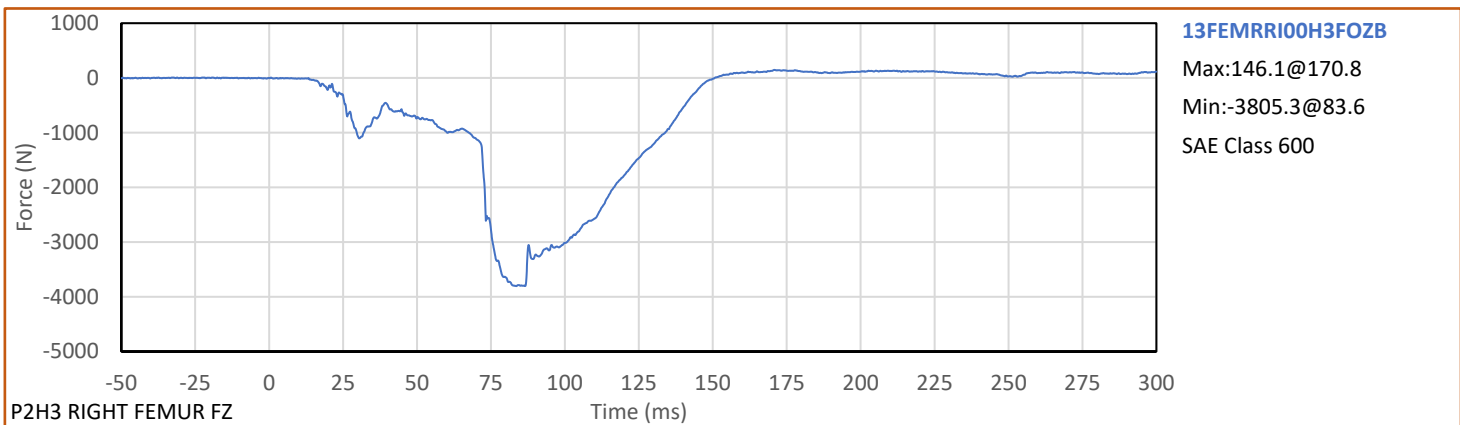
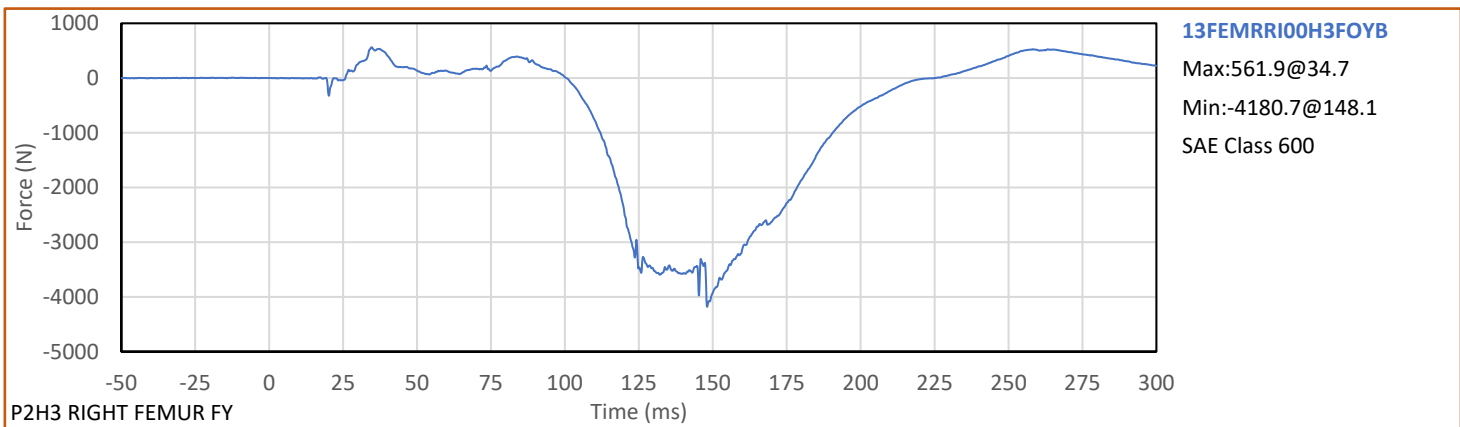
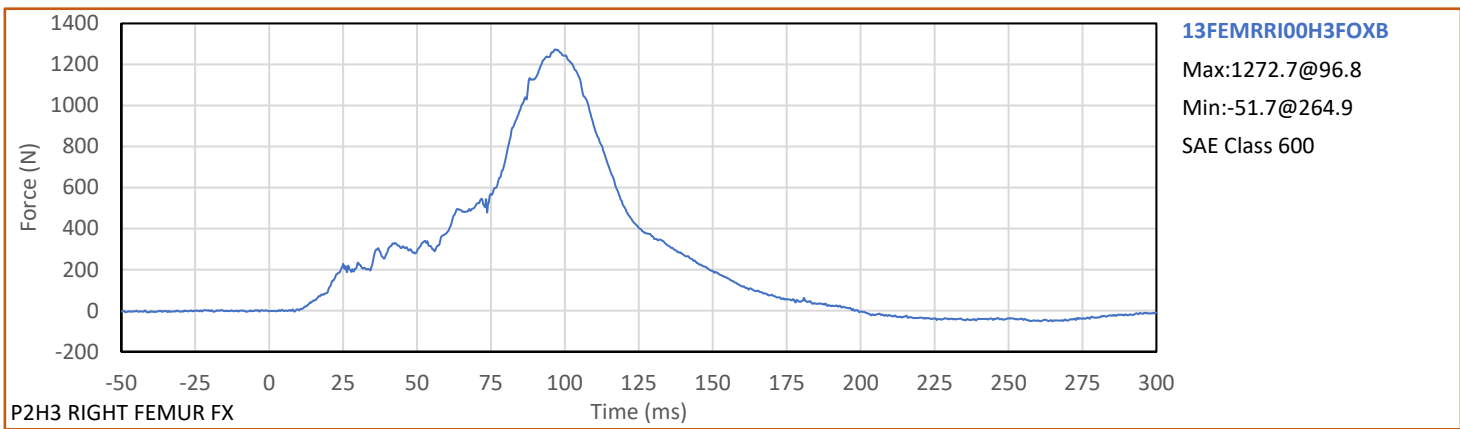
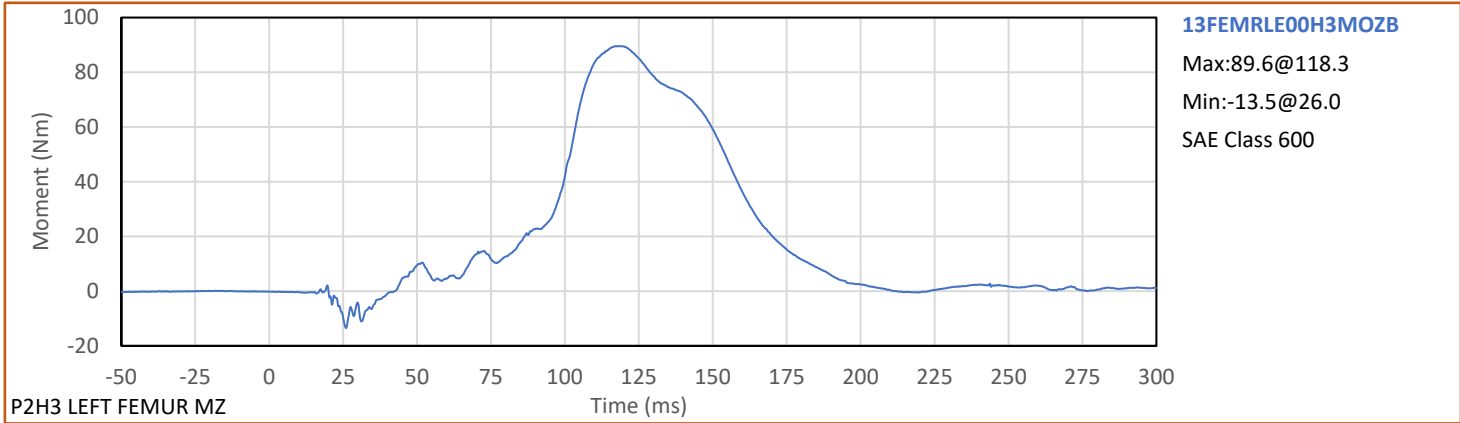


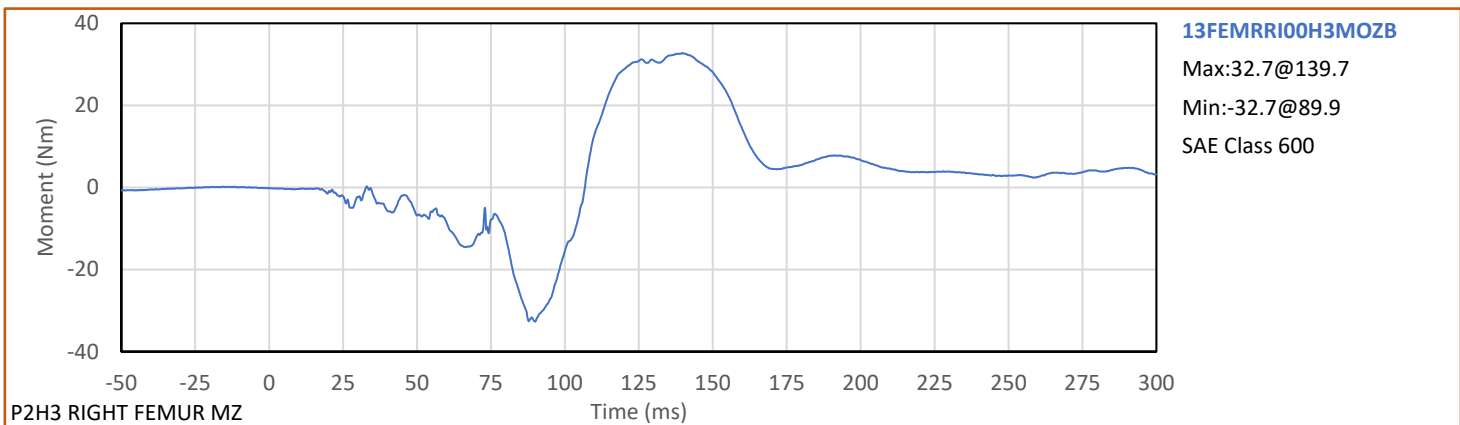
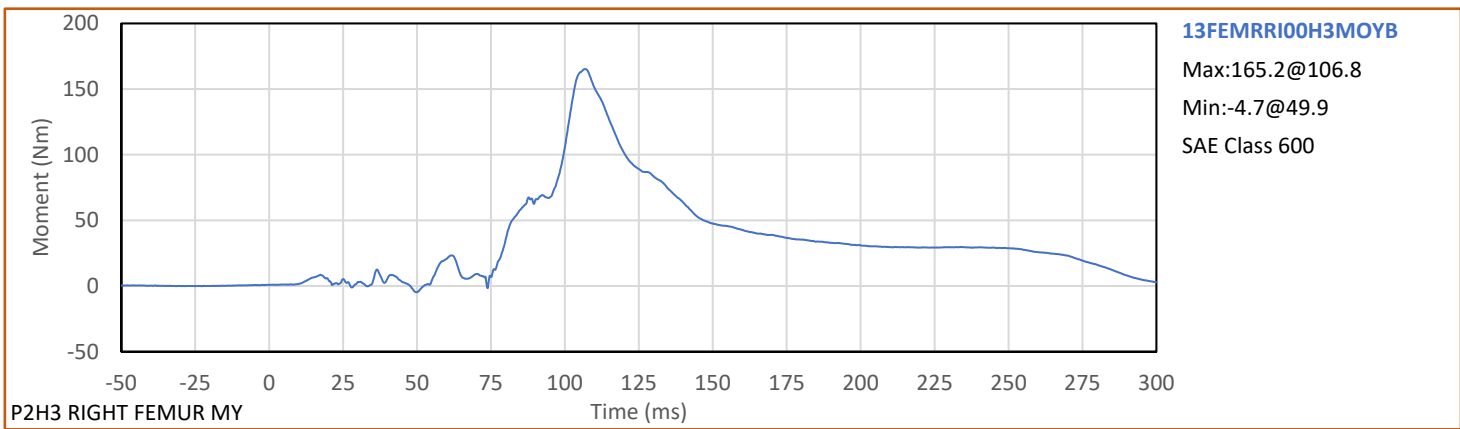
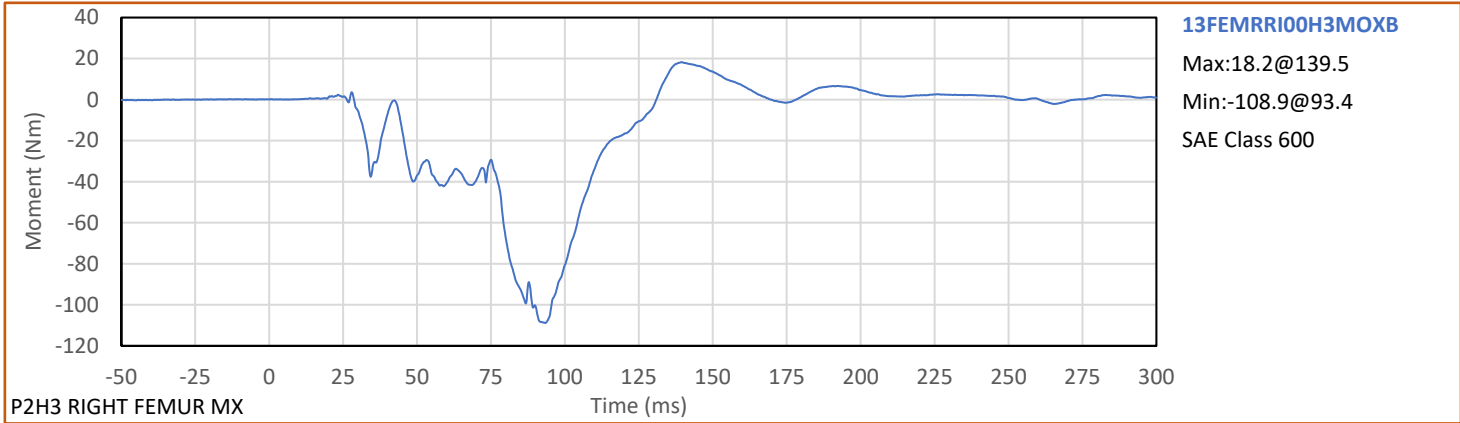


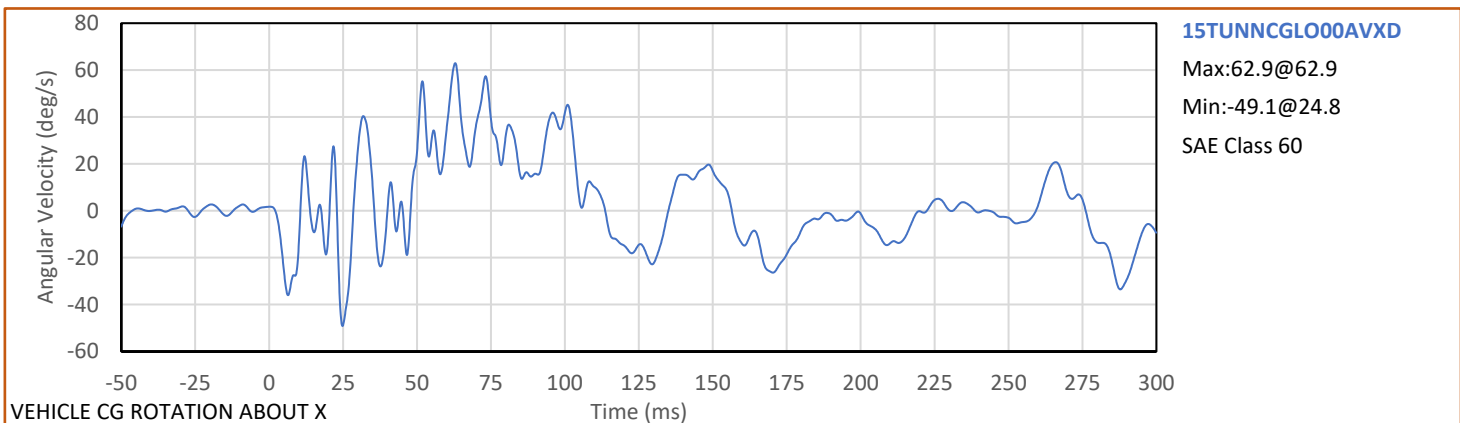
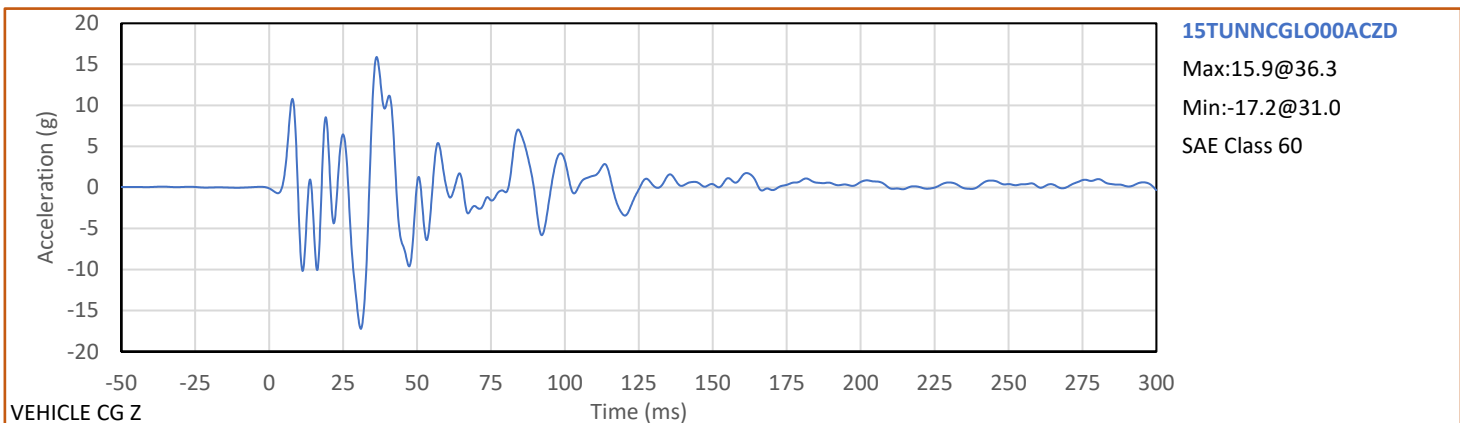
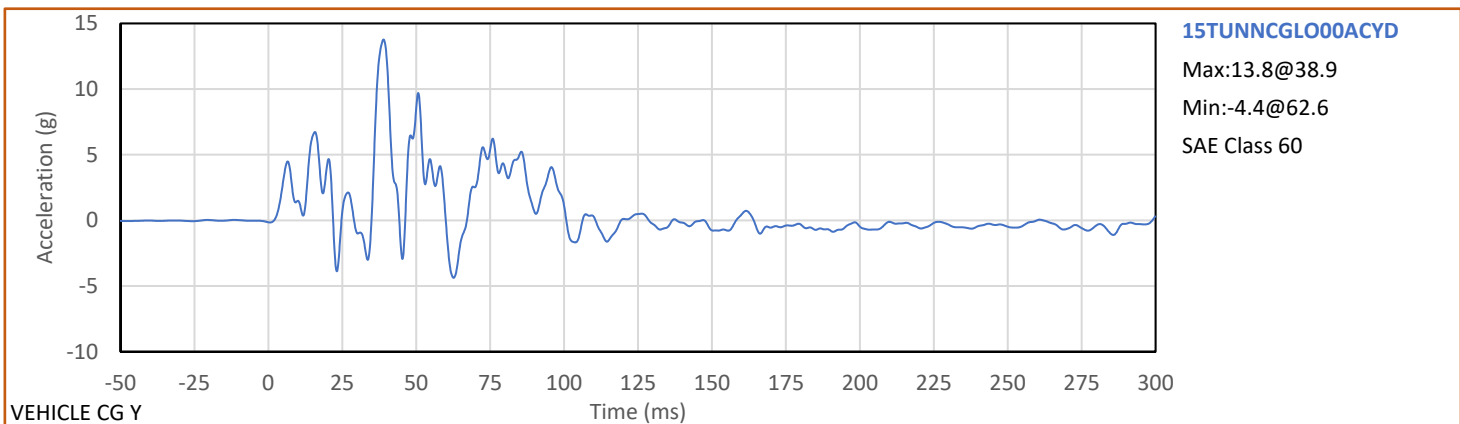
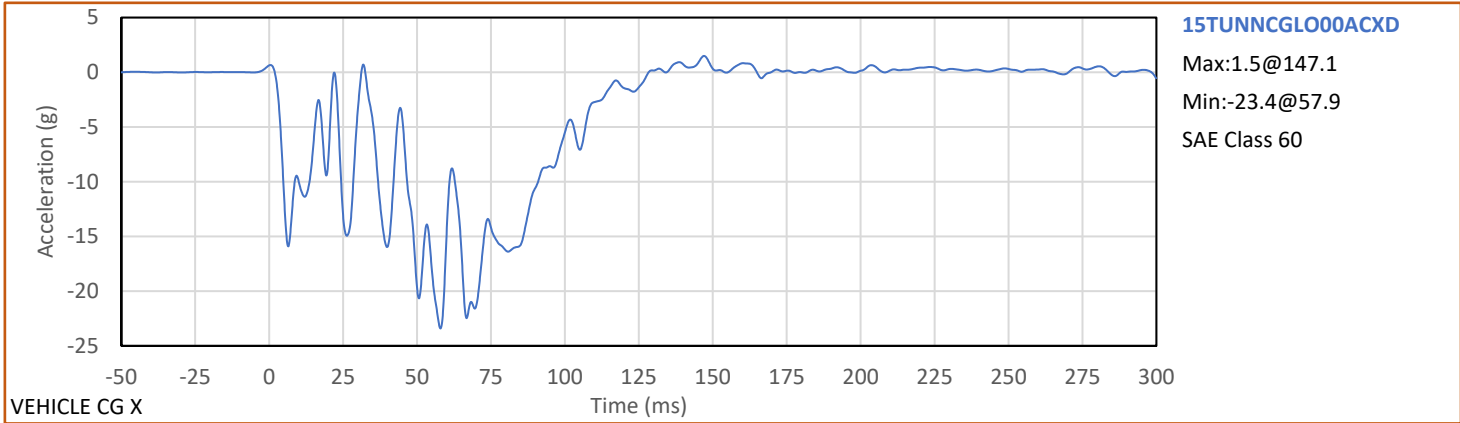


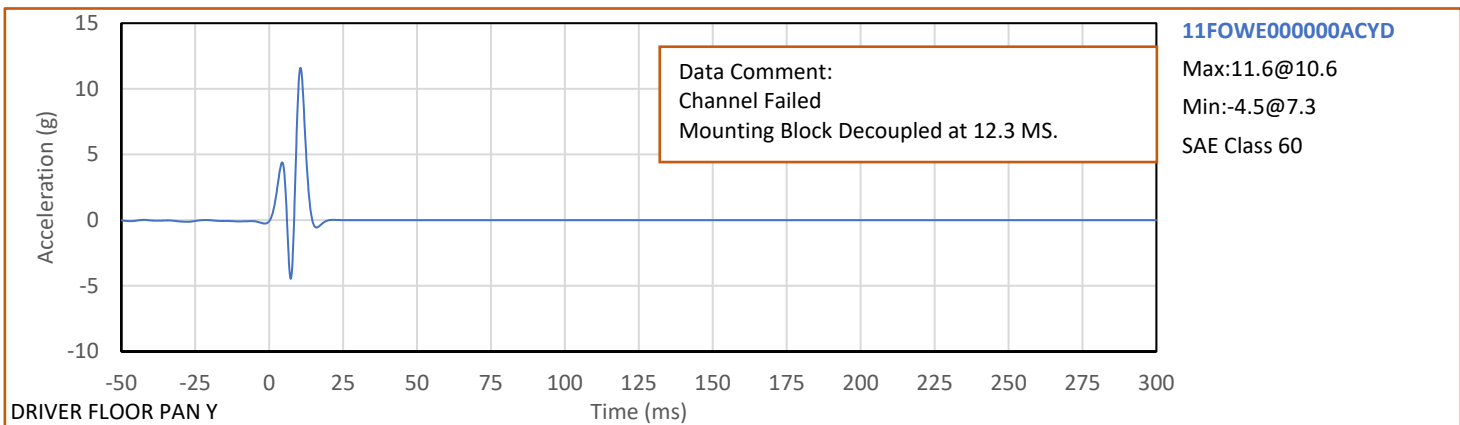
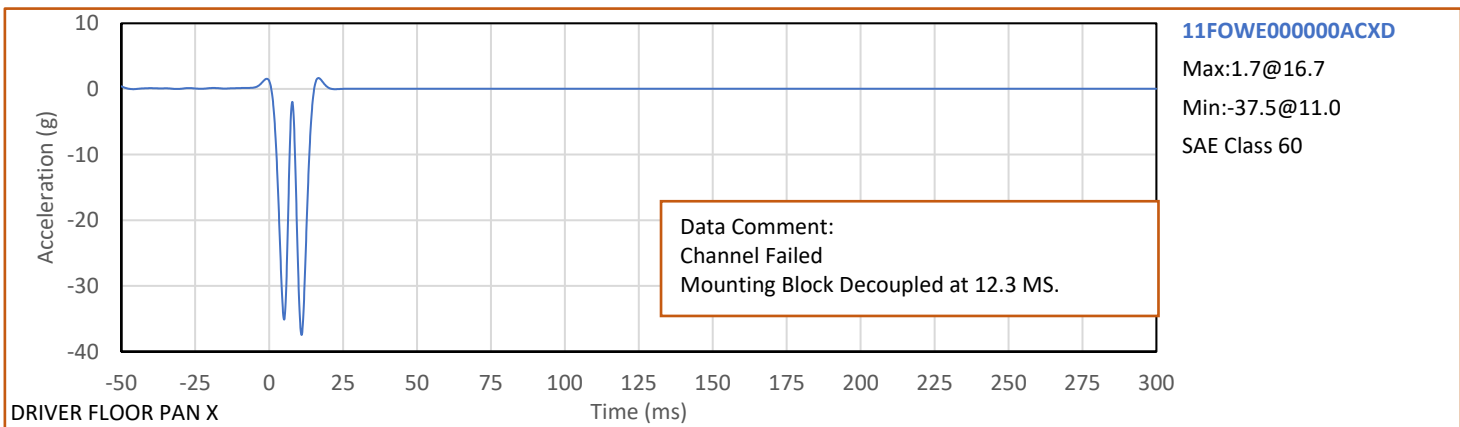
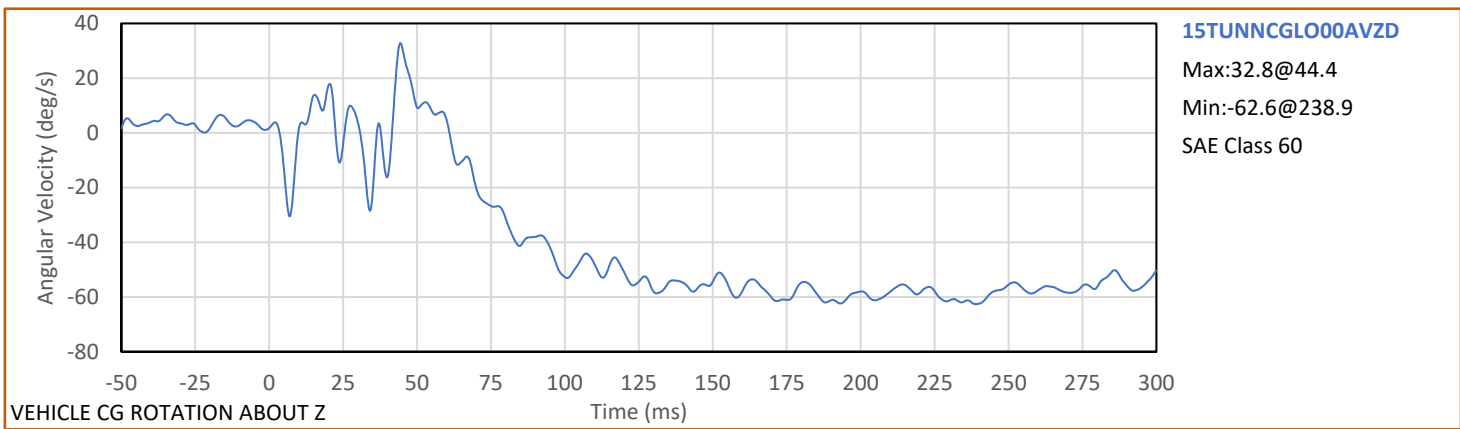
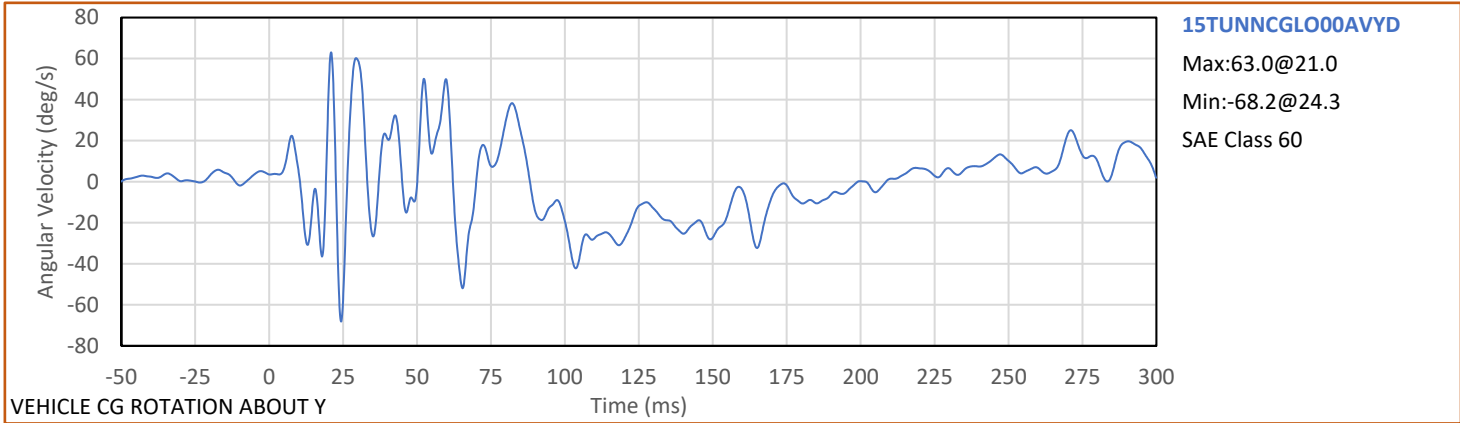


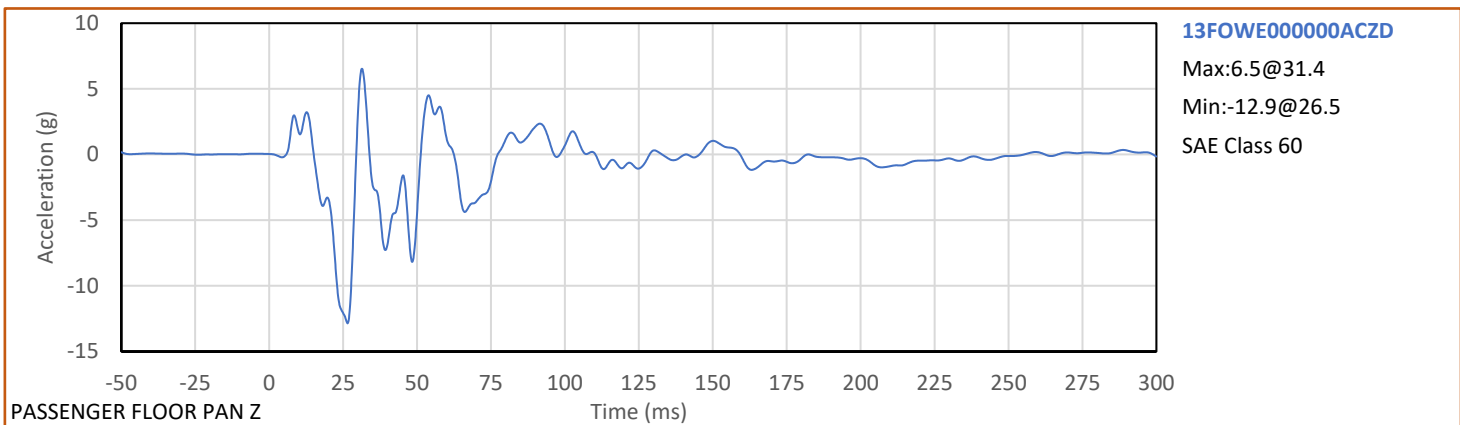
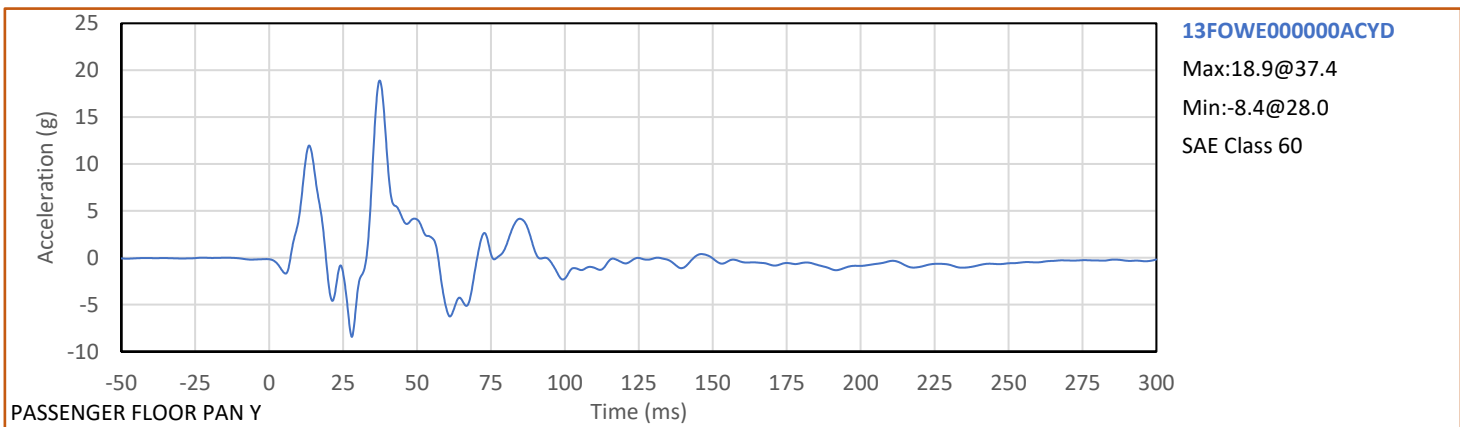
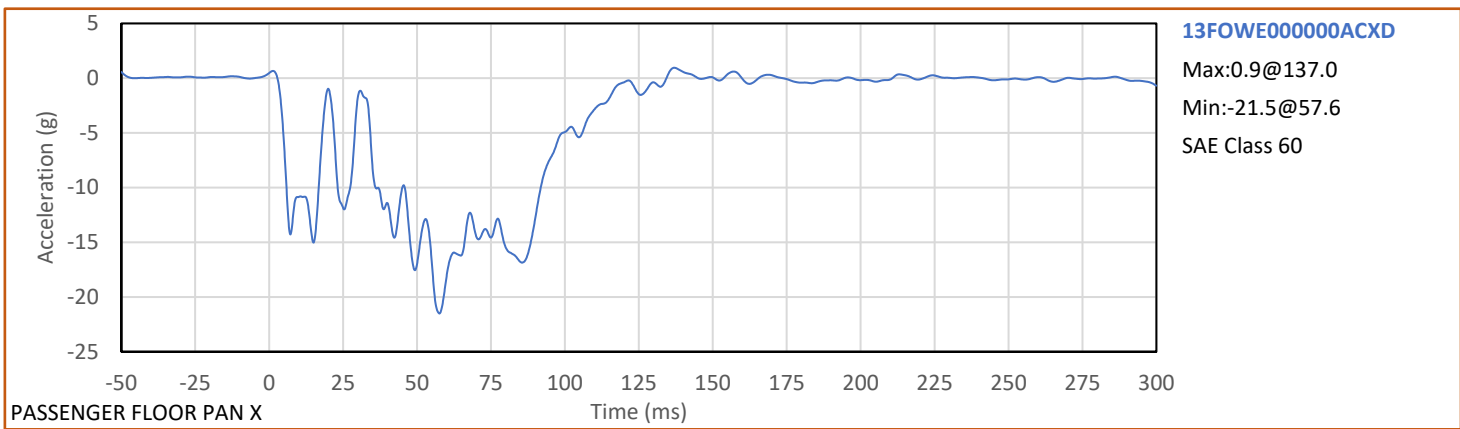
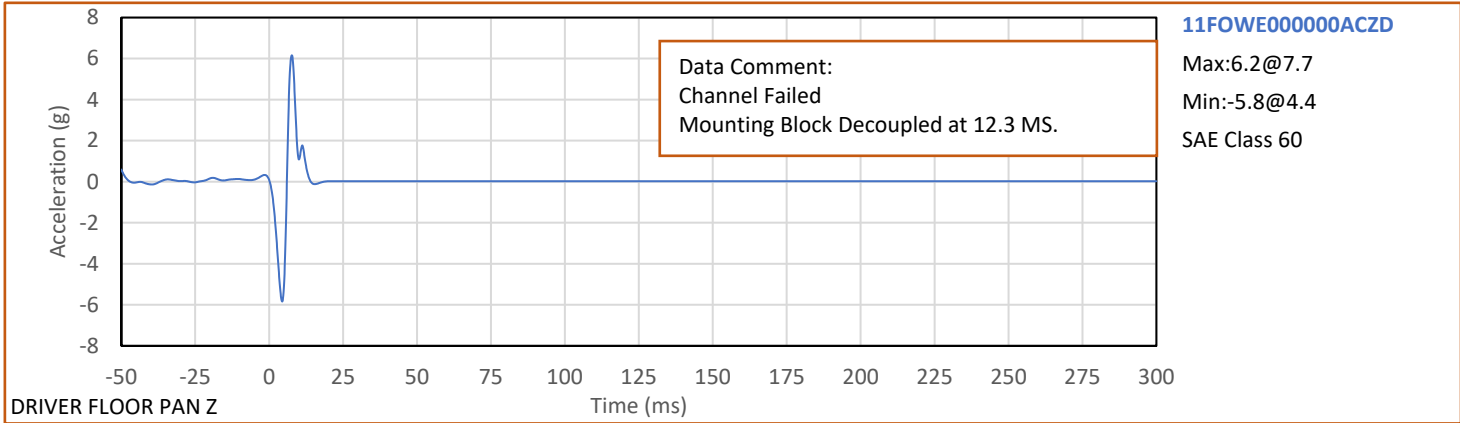


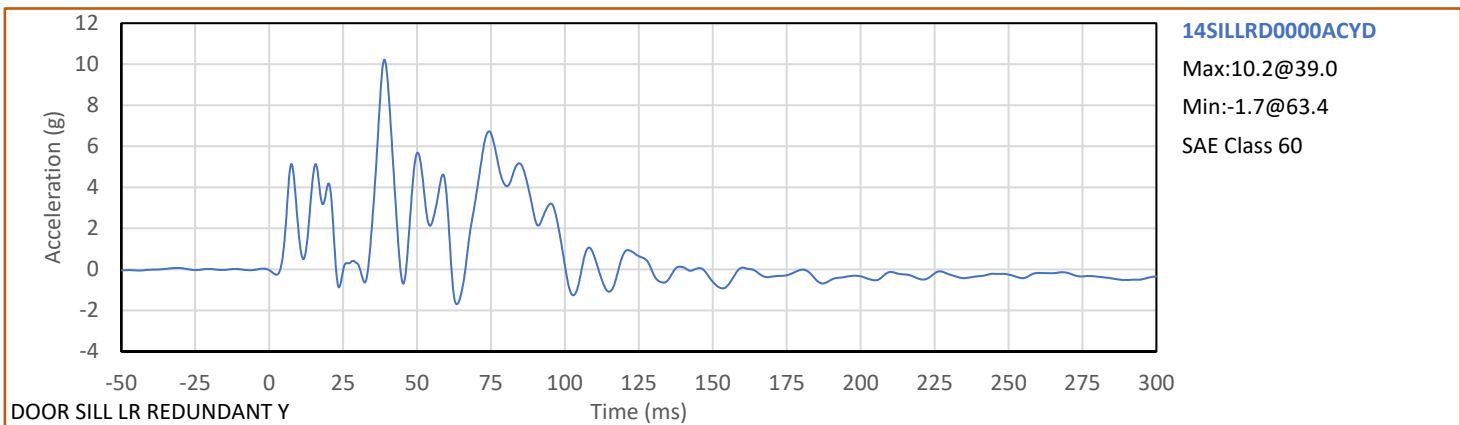
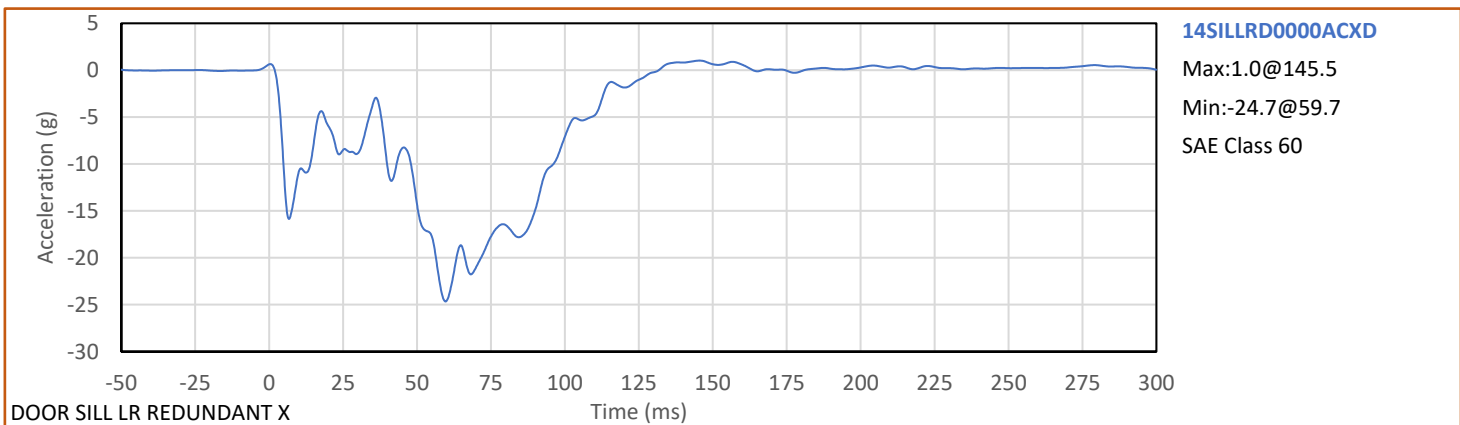
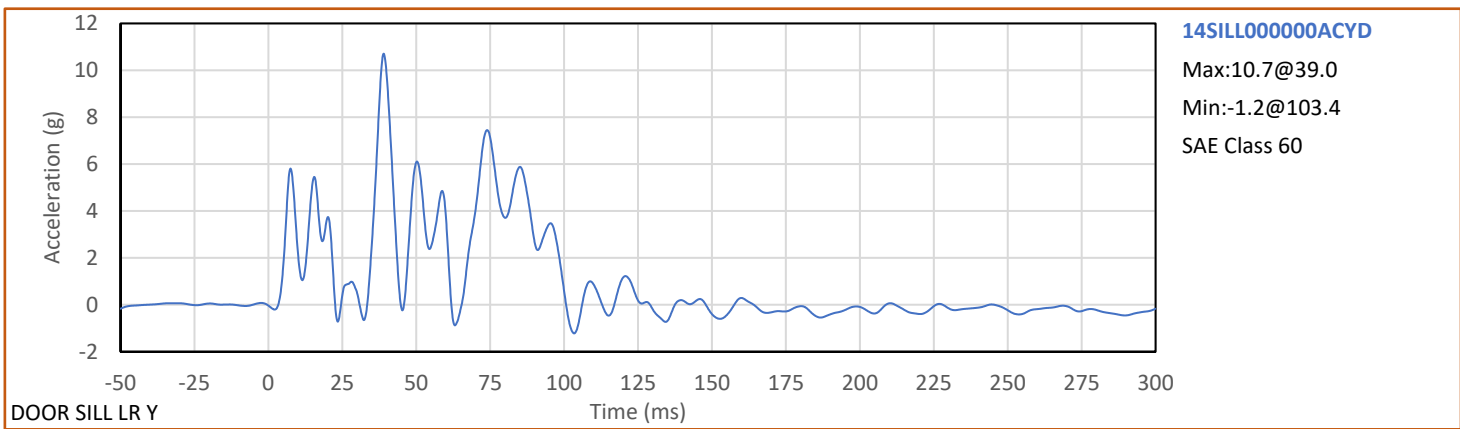
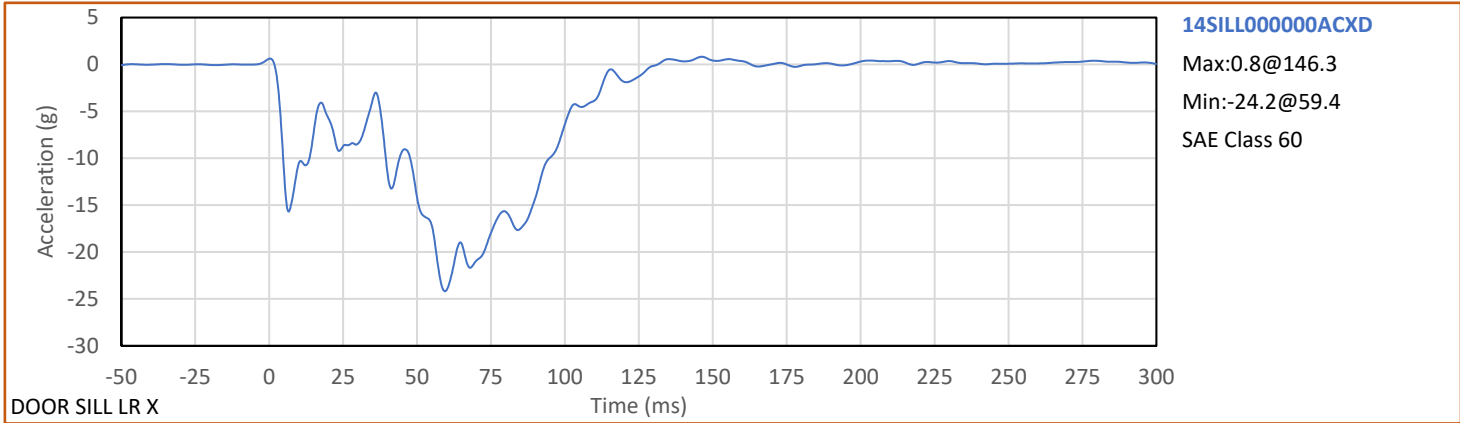


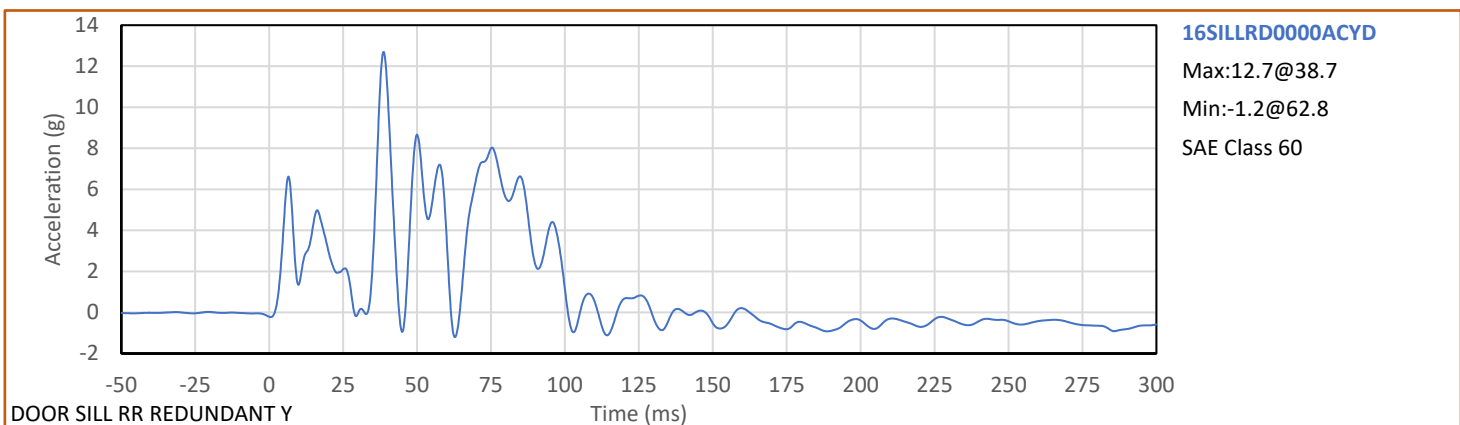
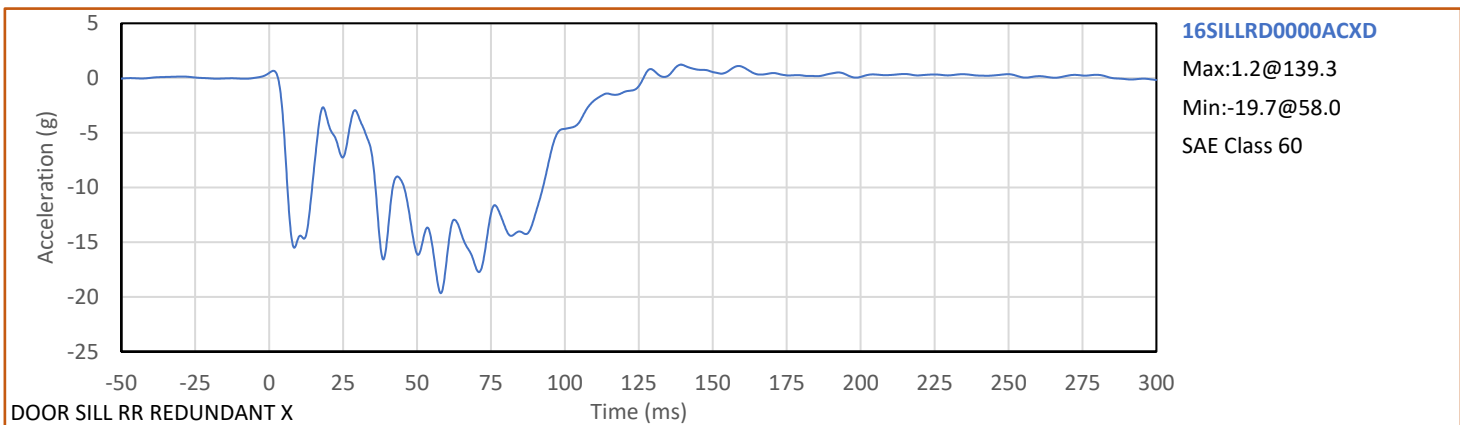
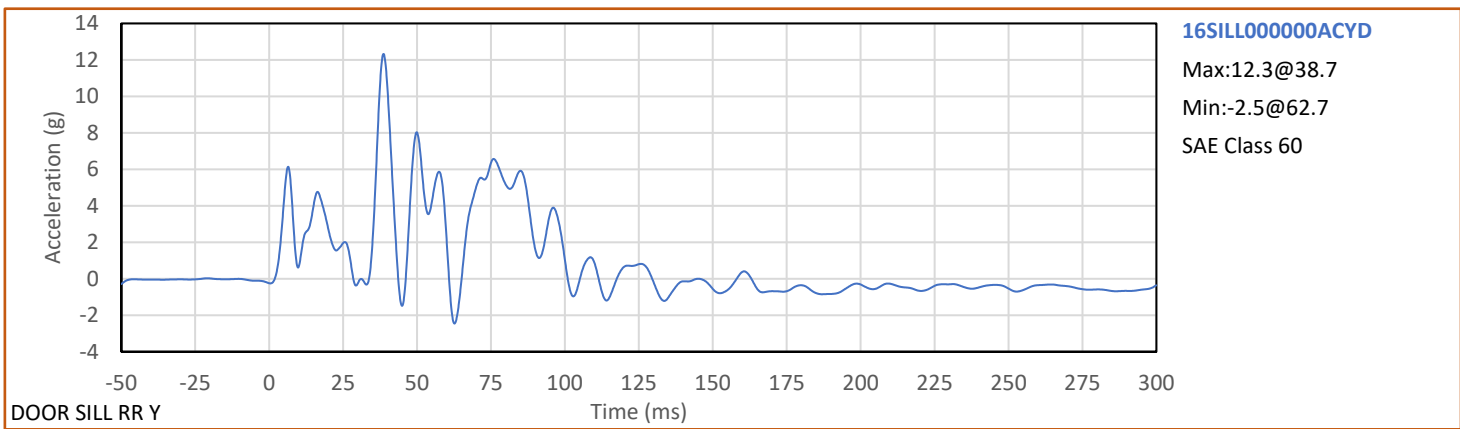
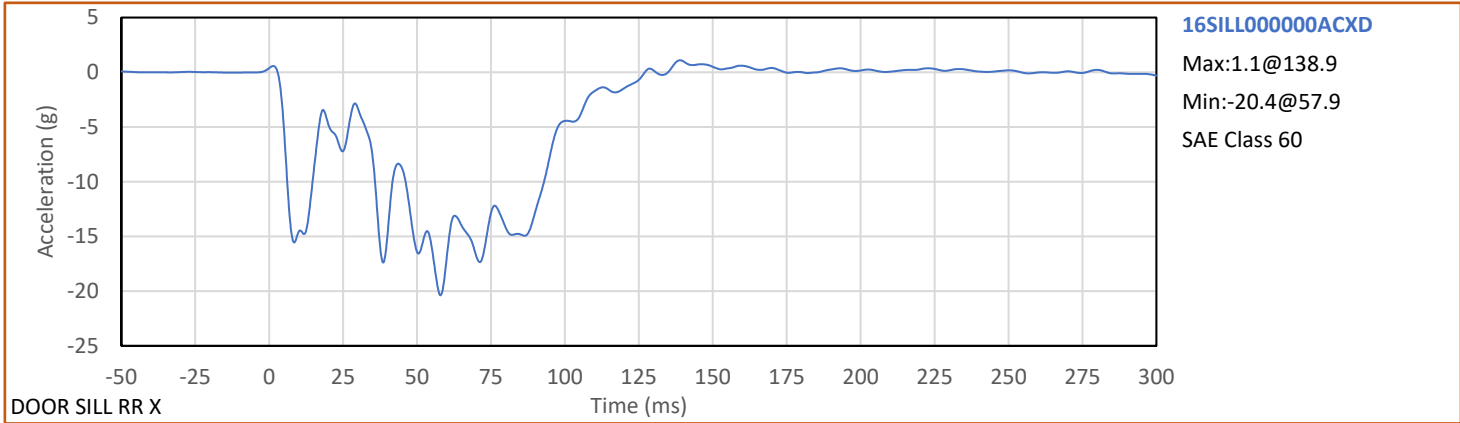


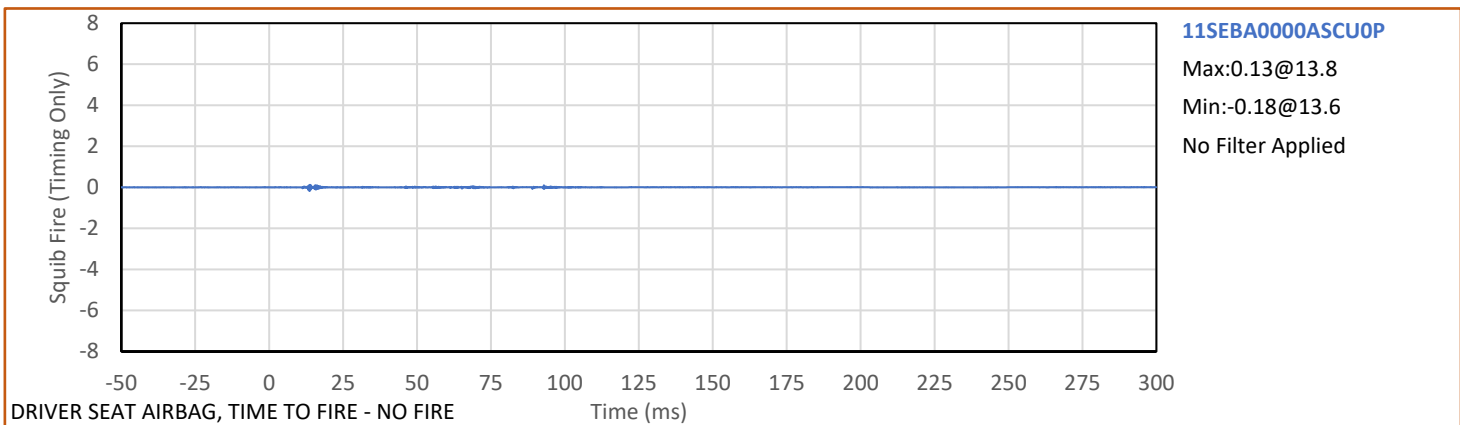
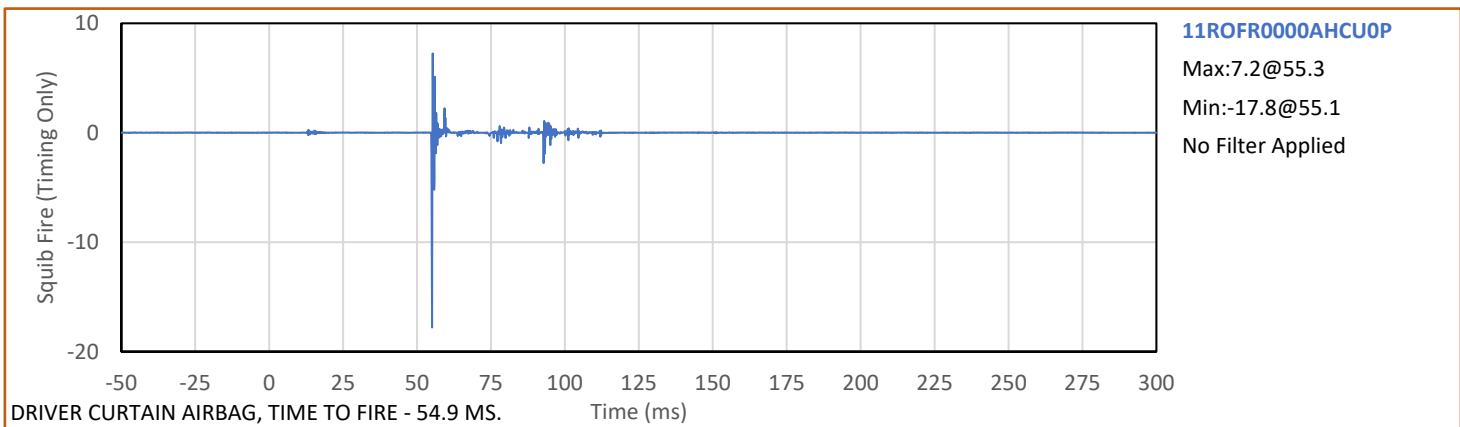
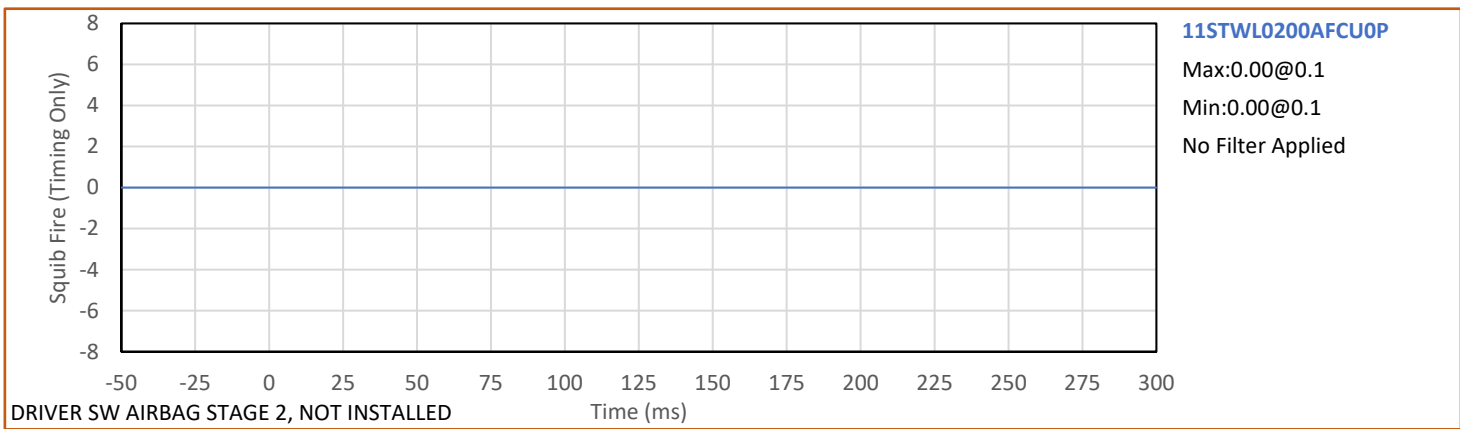
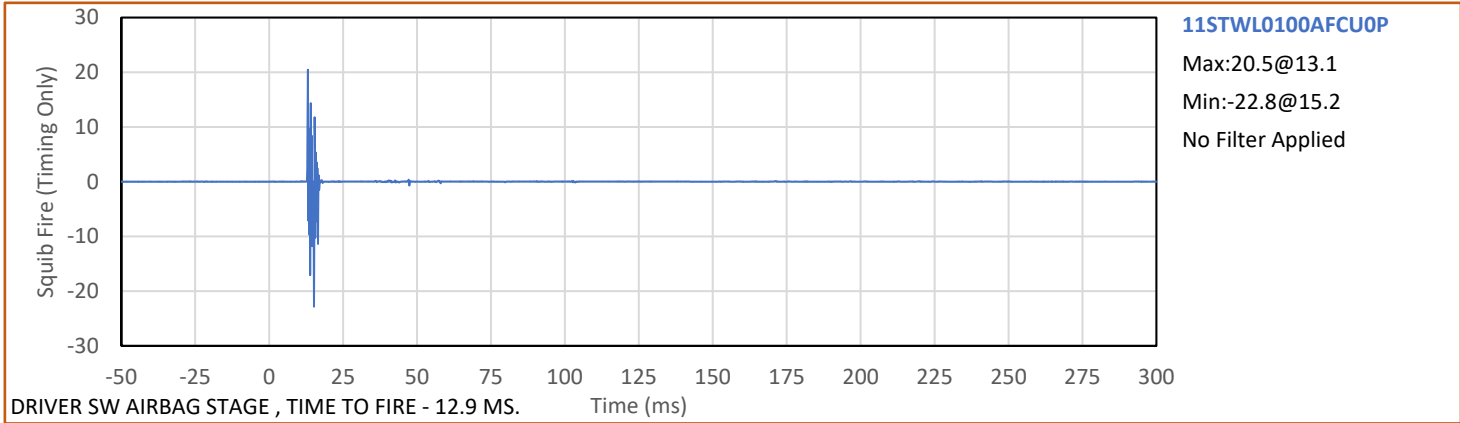


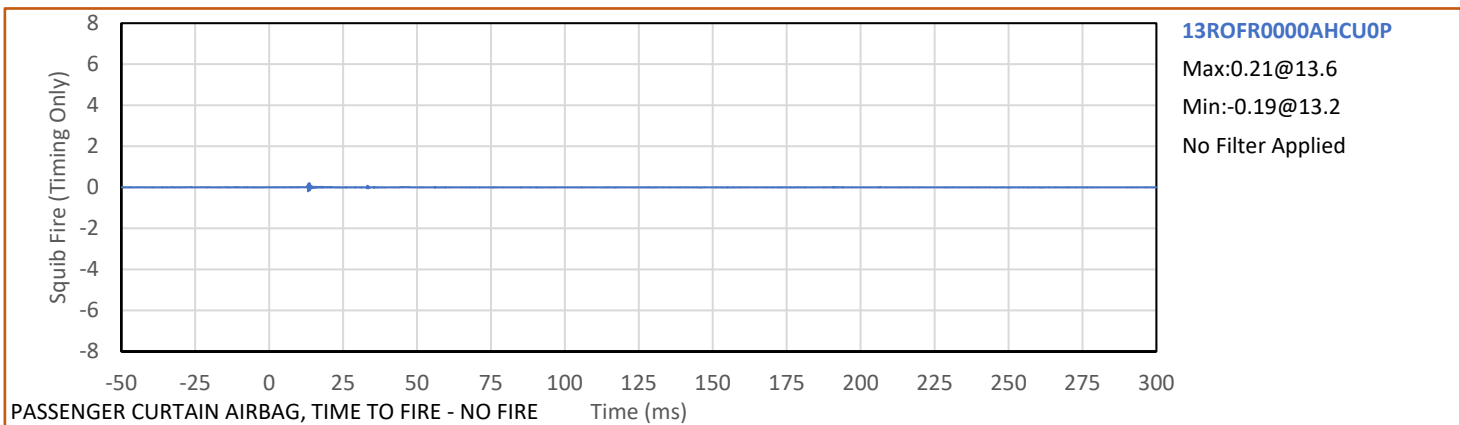
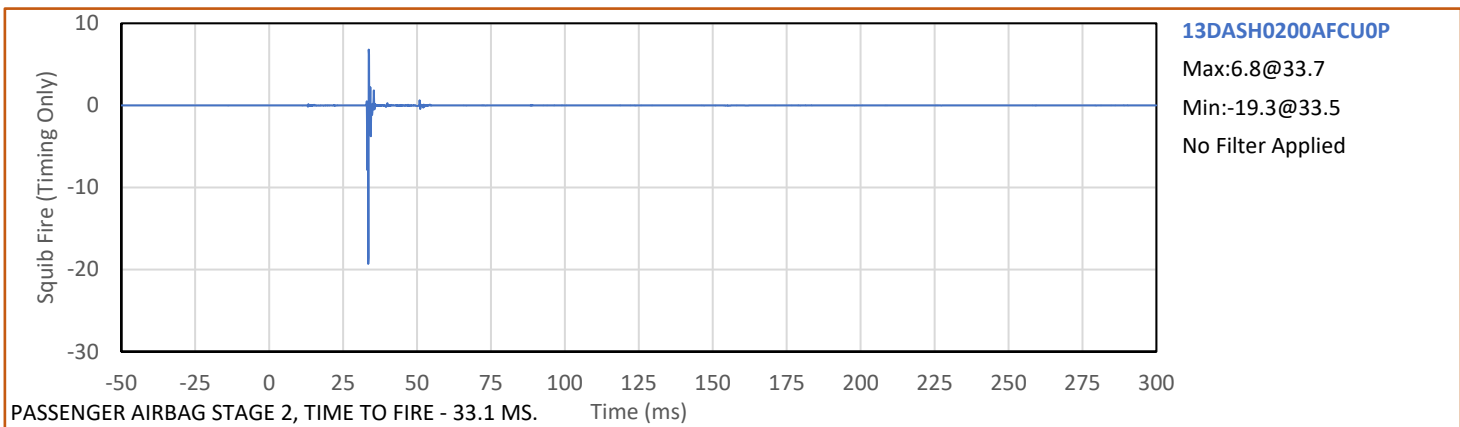
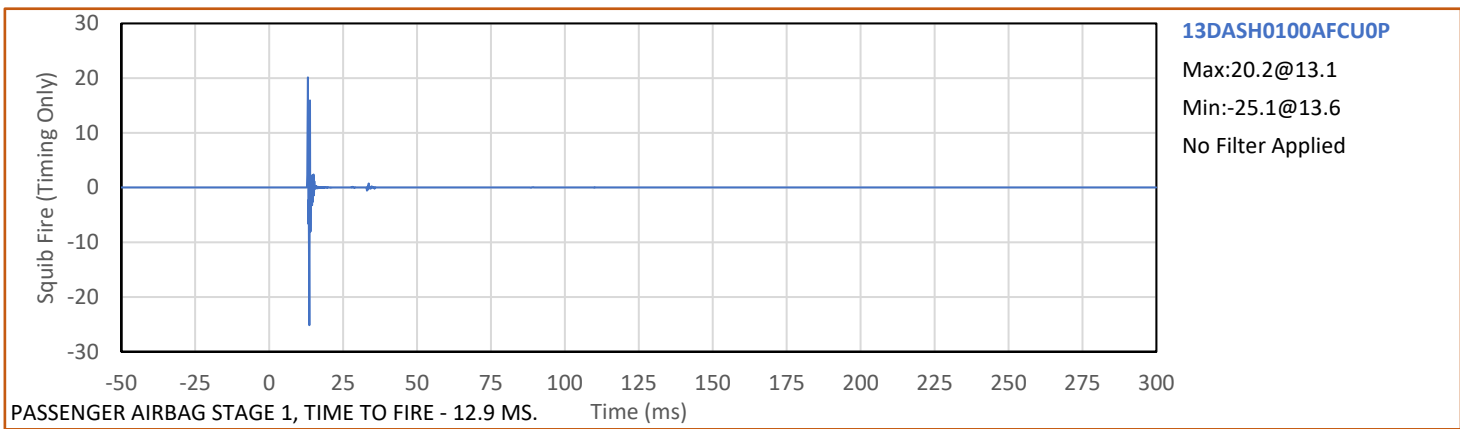
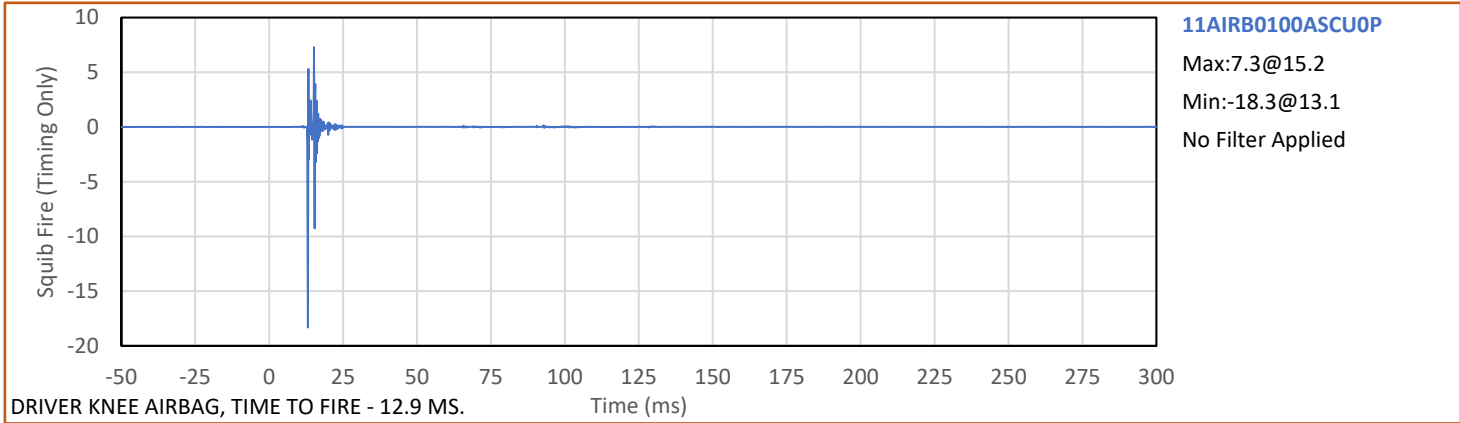






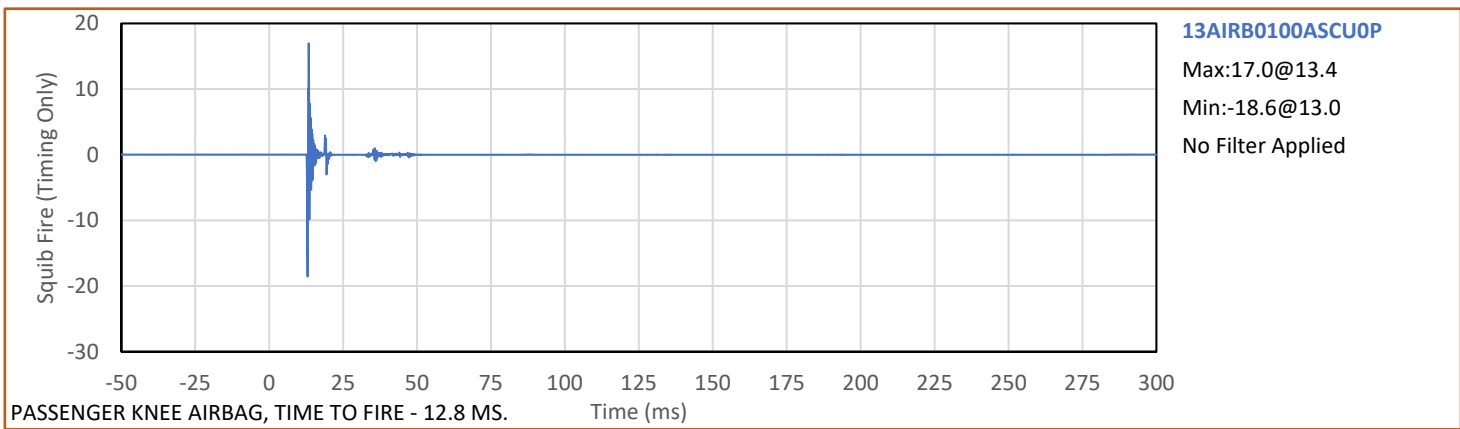
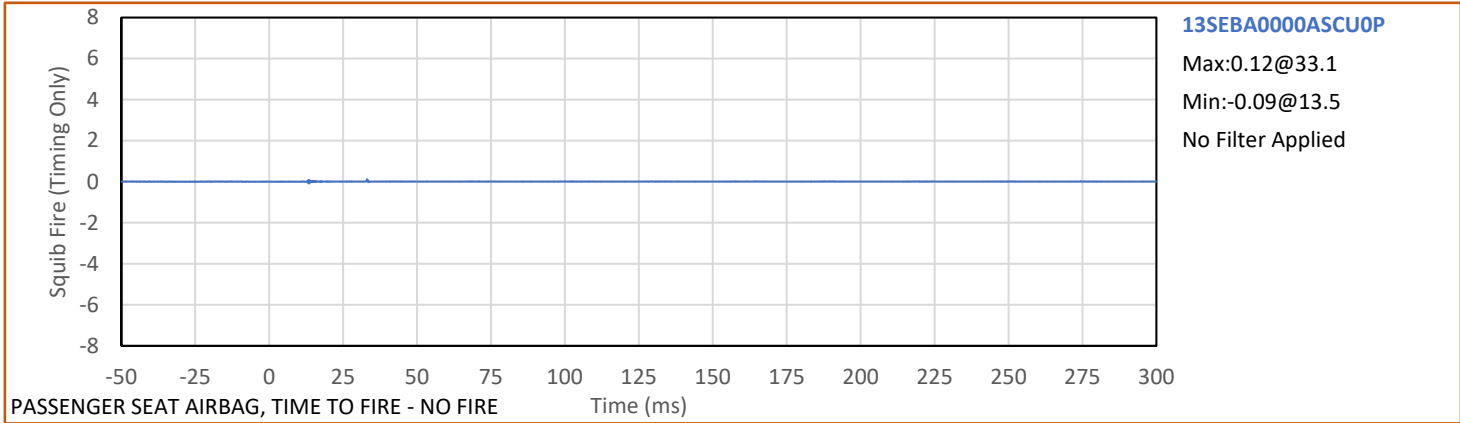


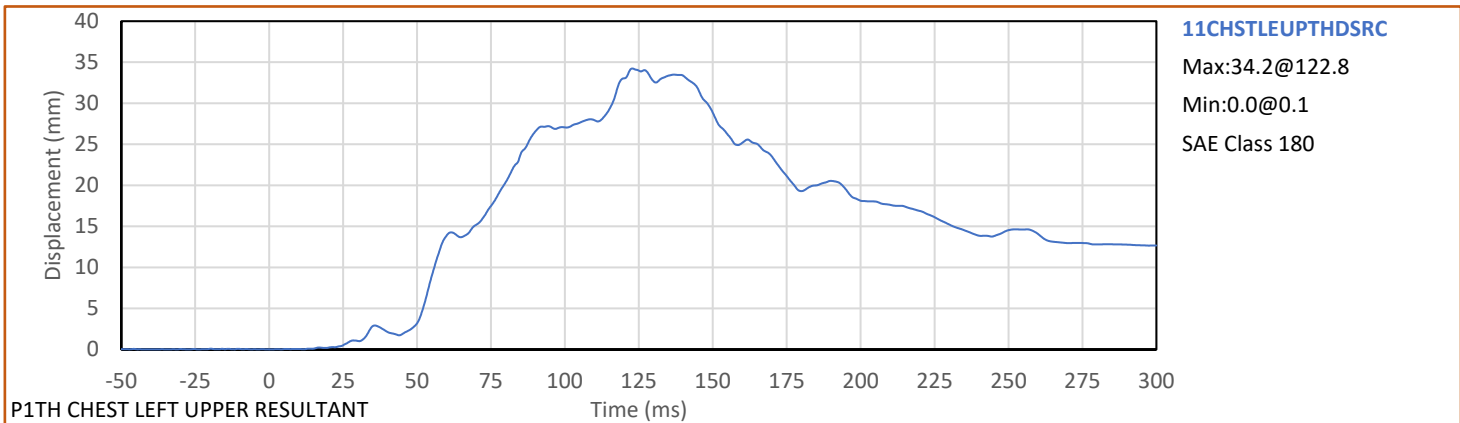
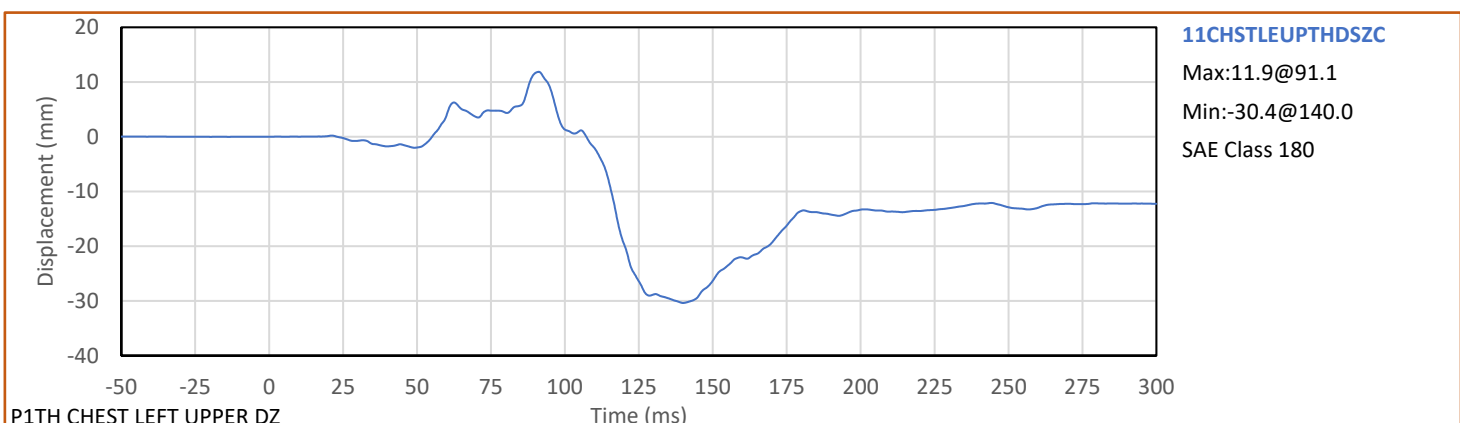
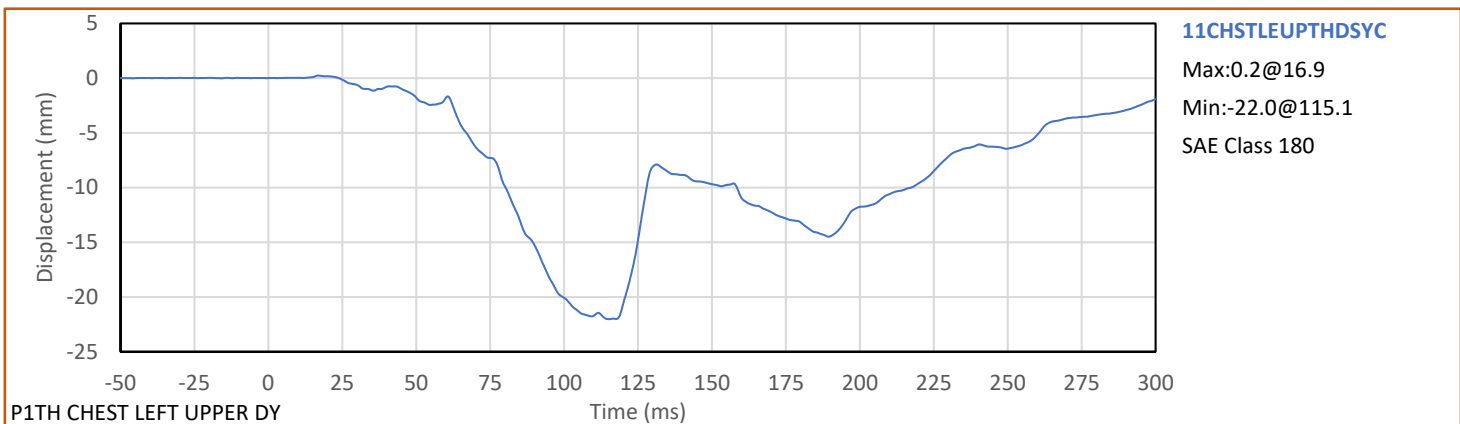
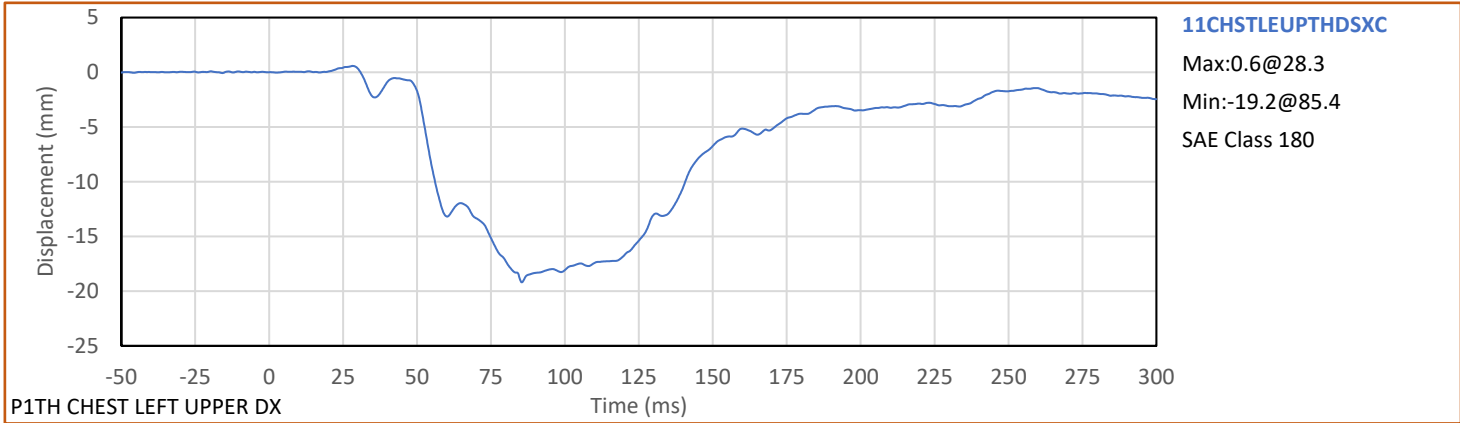


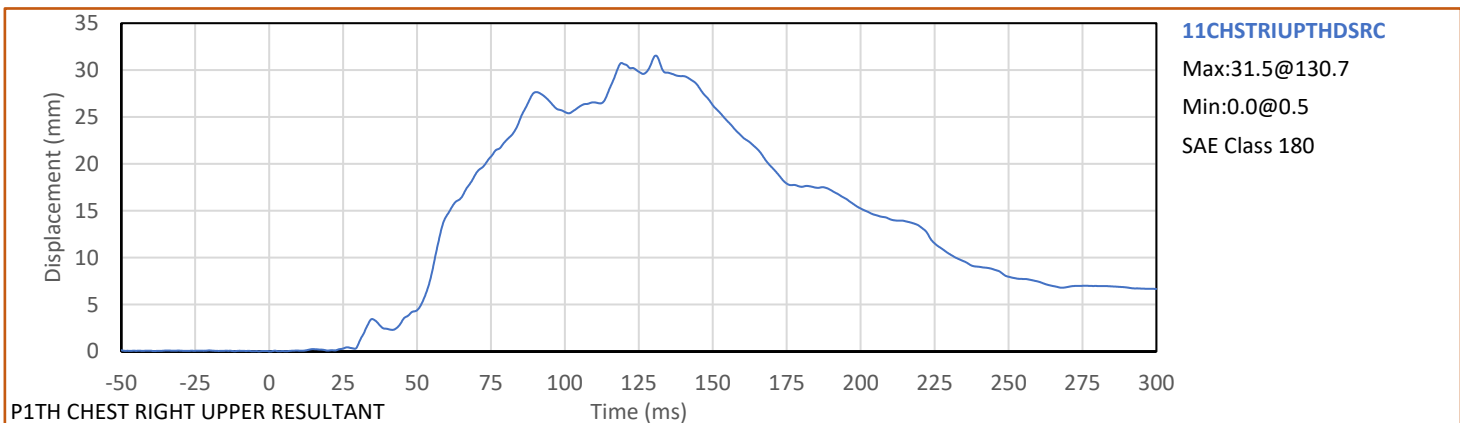
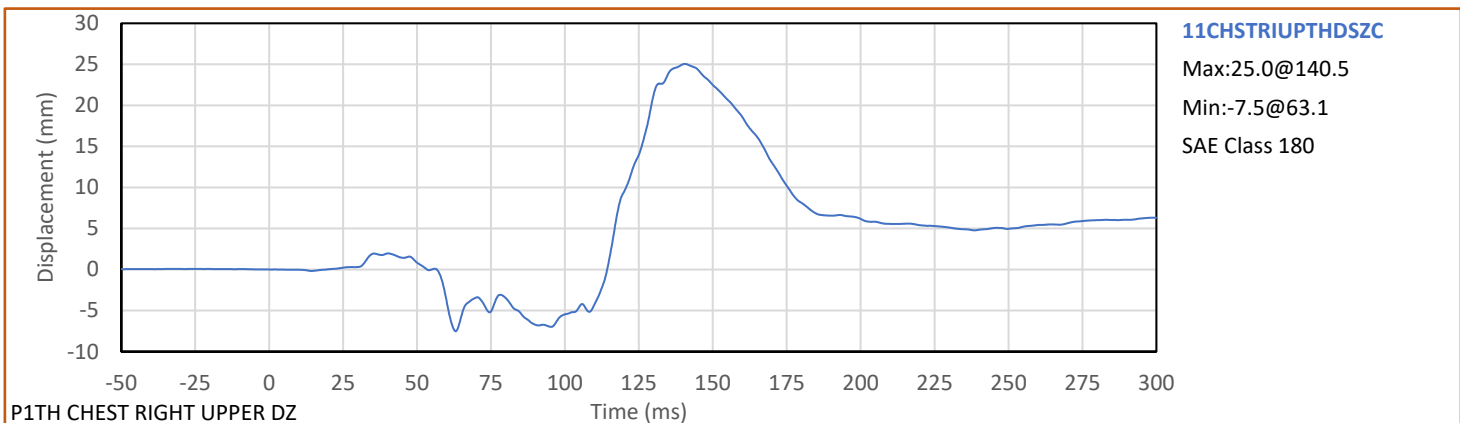
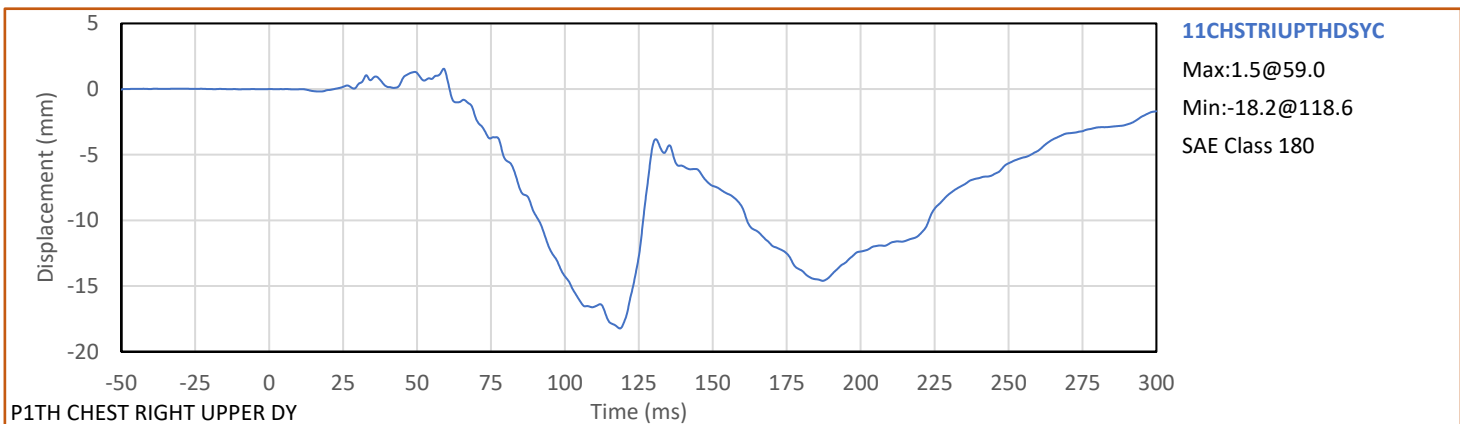
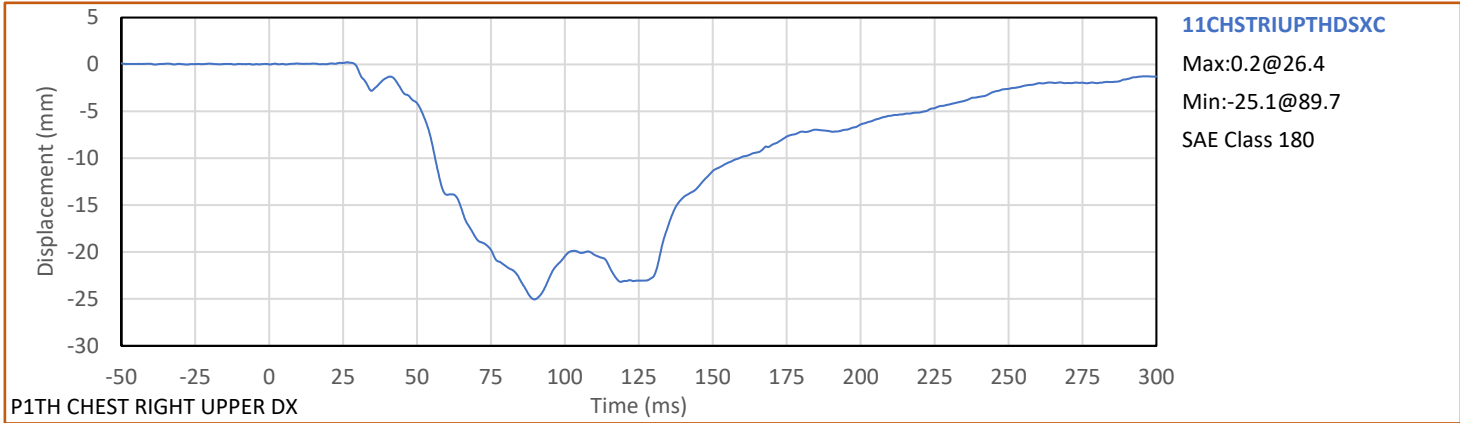


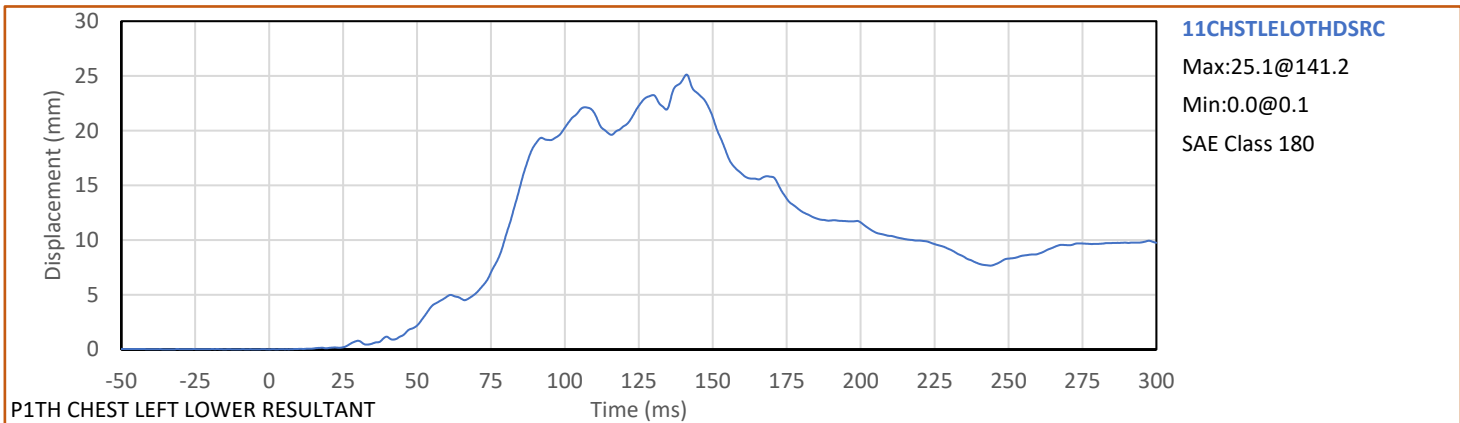
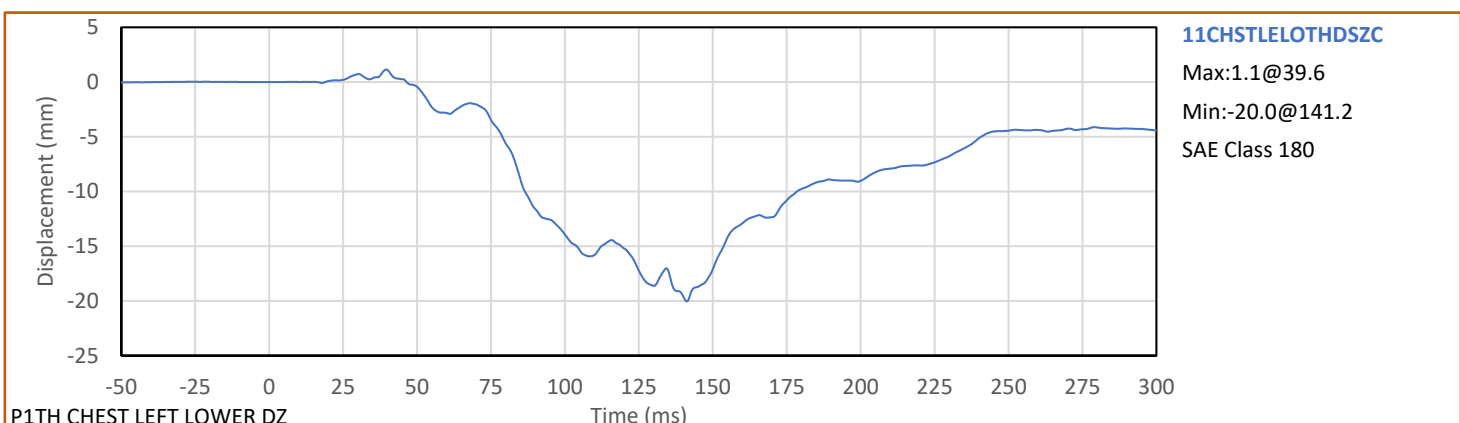
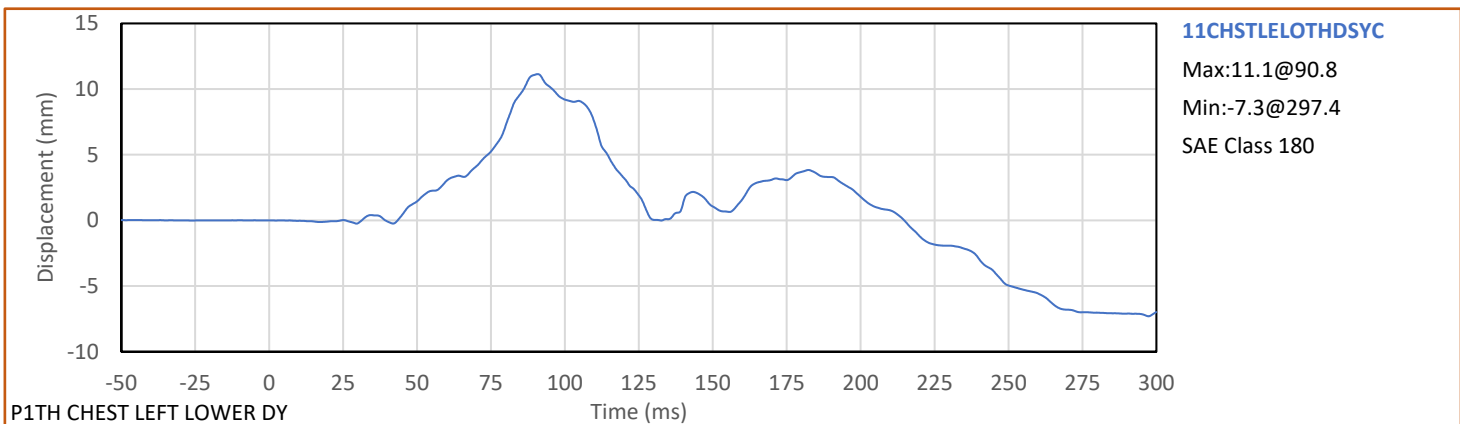
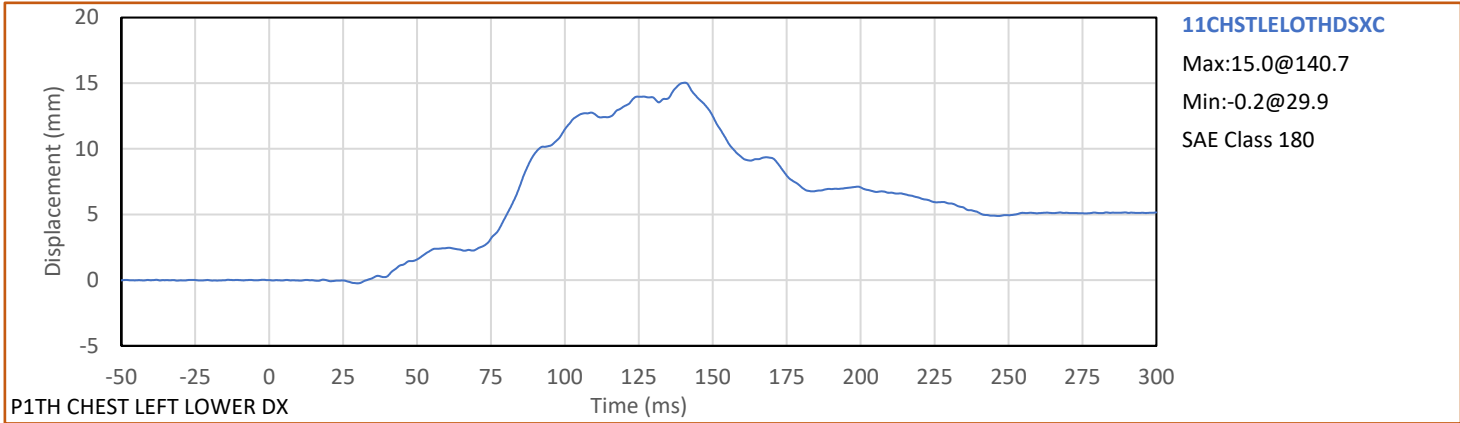
Test Vehicle: 2020 Honda Accord 4-Door Sedan
Test Program: Left Side 30° Frontal Rigid Barrier Impact

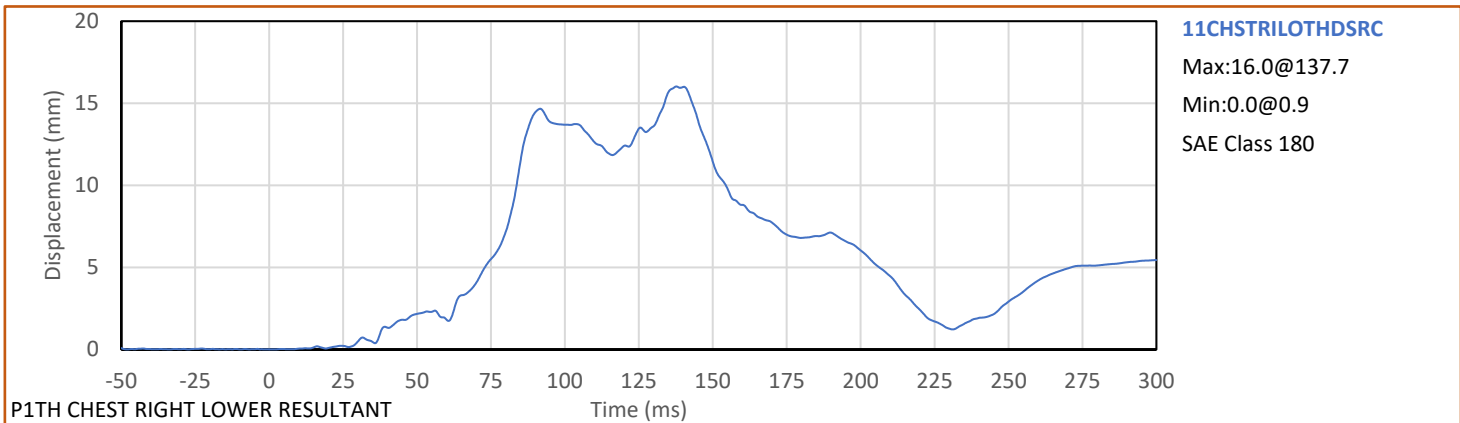
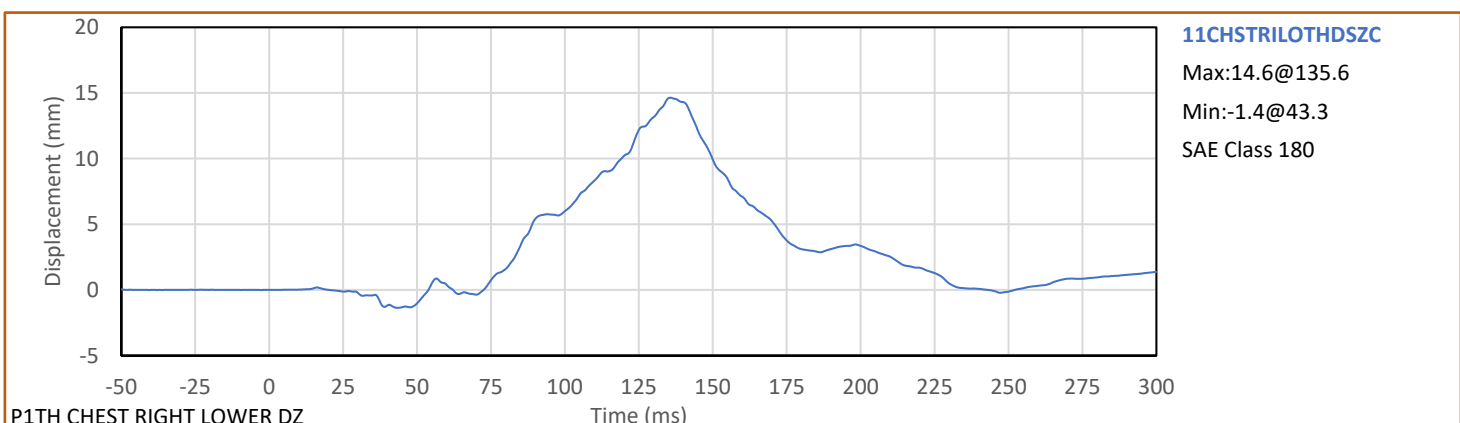
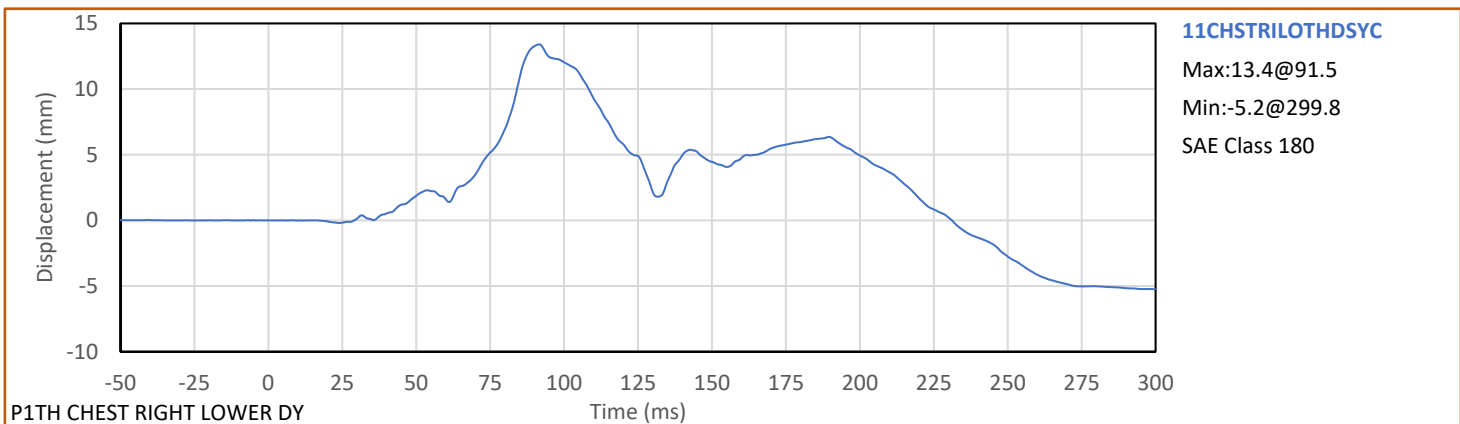
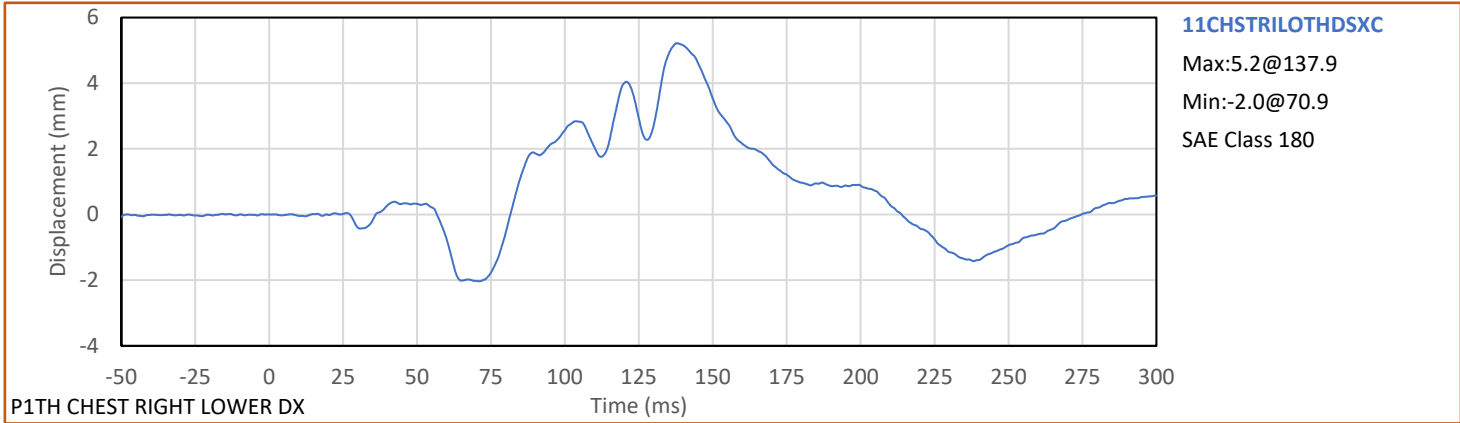
NHTSA No.: R20205385
Test Date: 6/24/2021

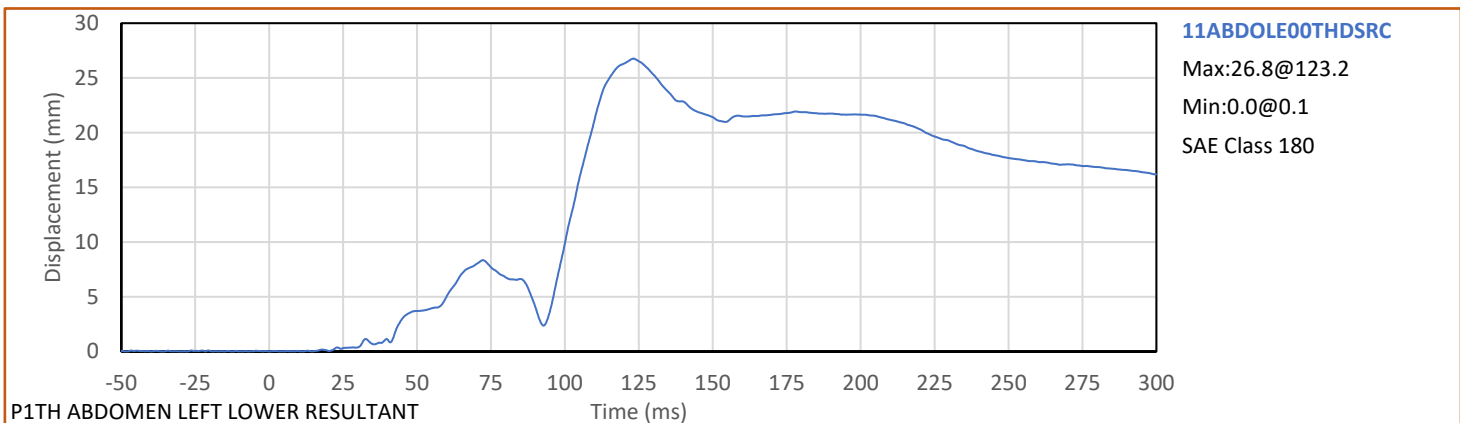
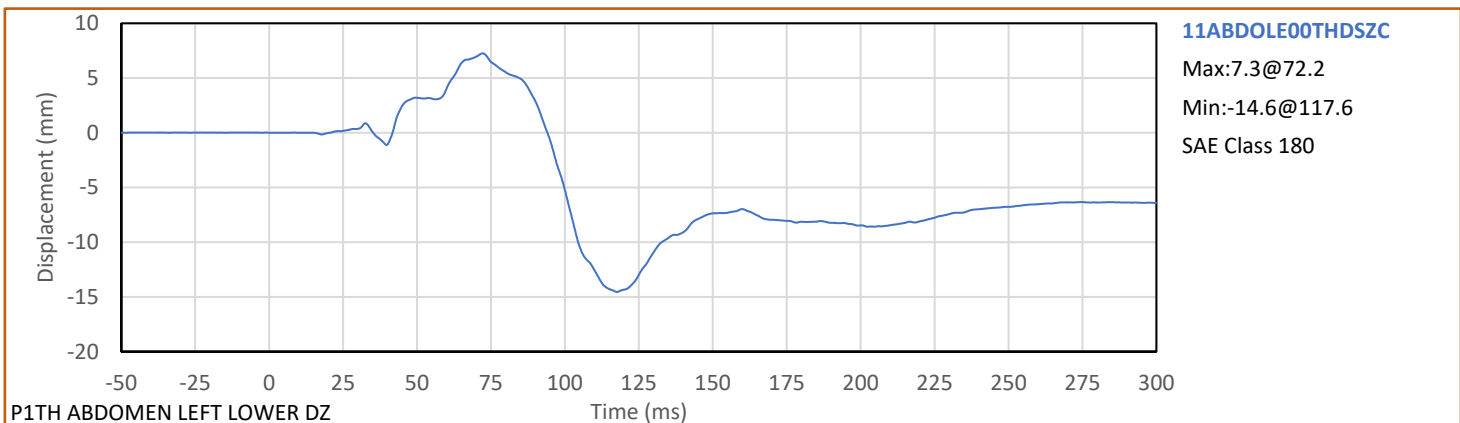
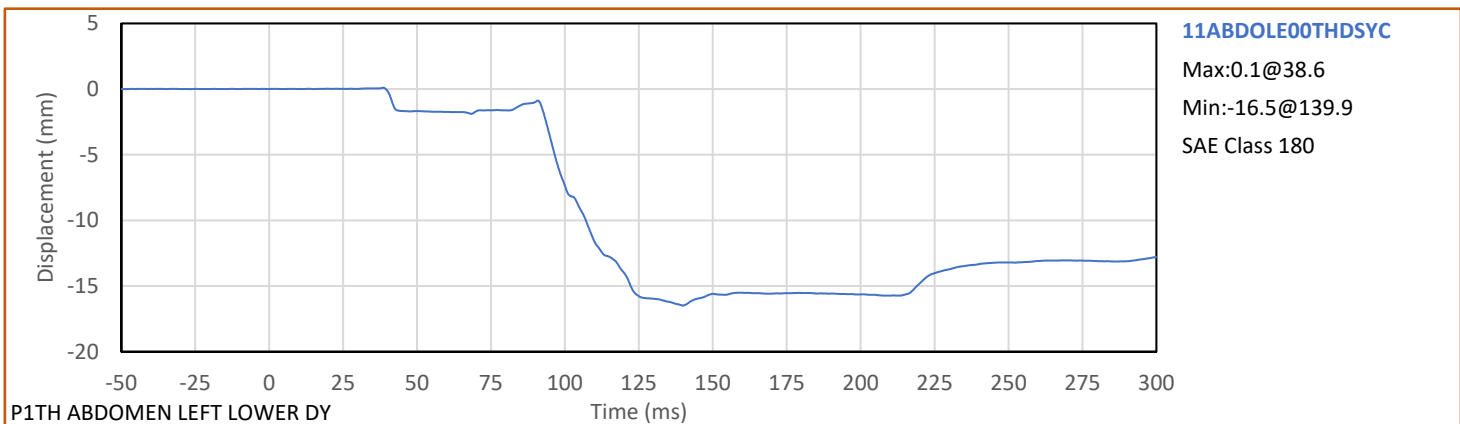
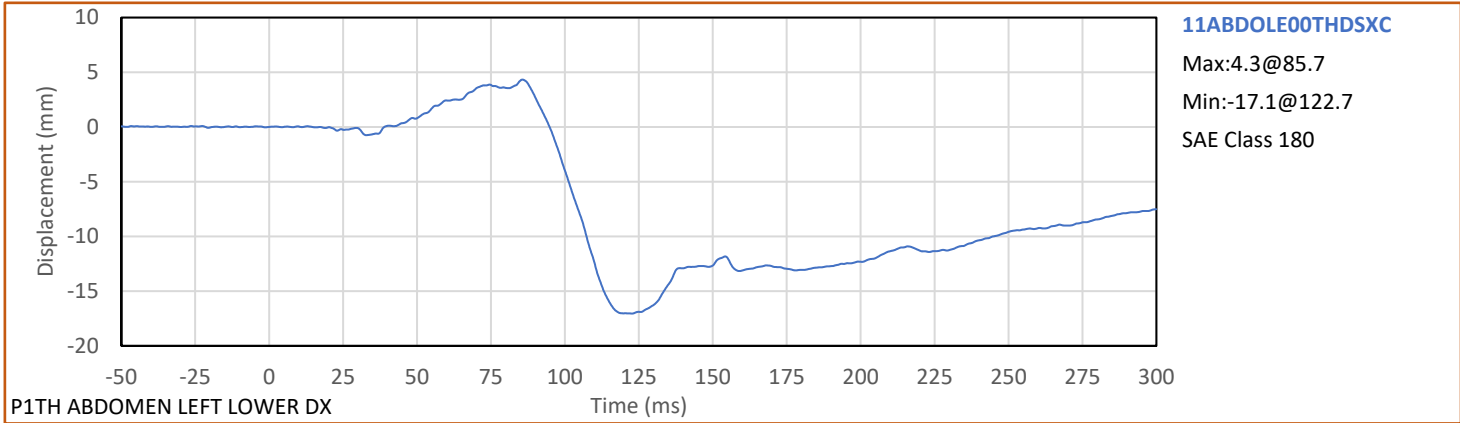


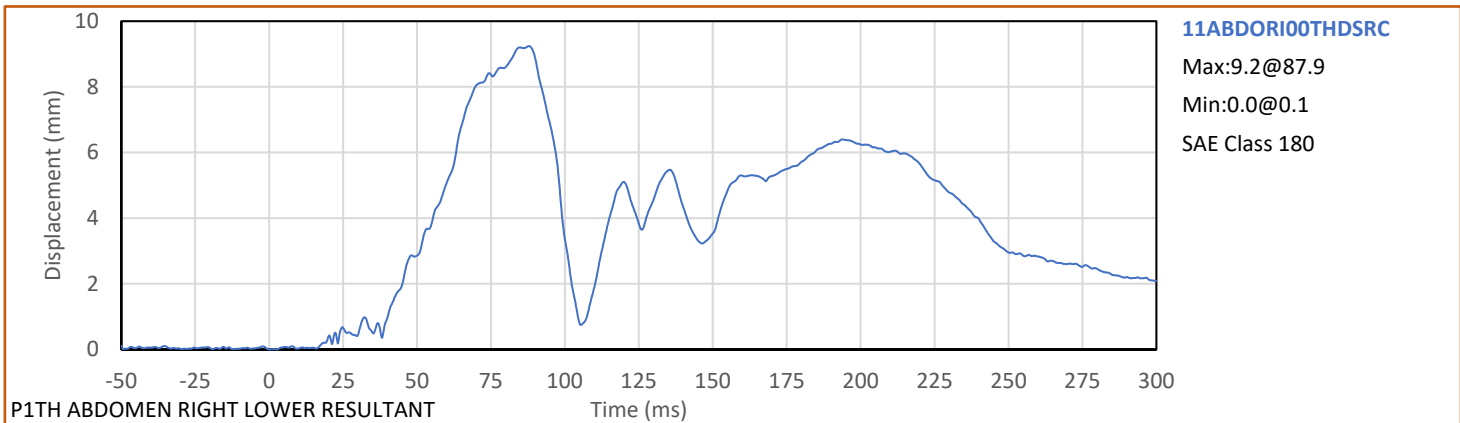
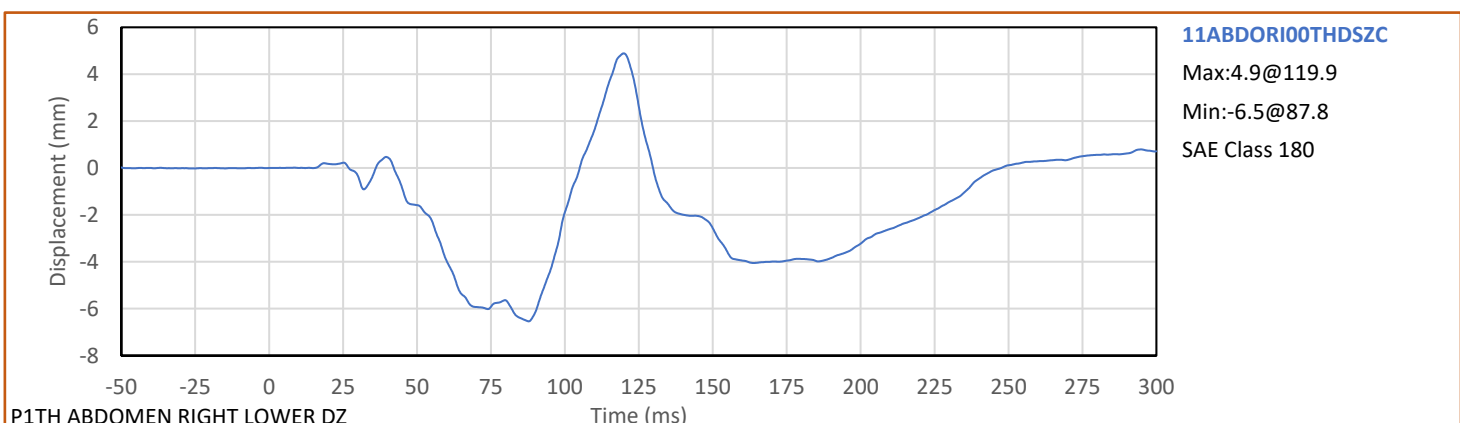
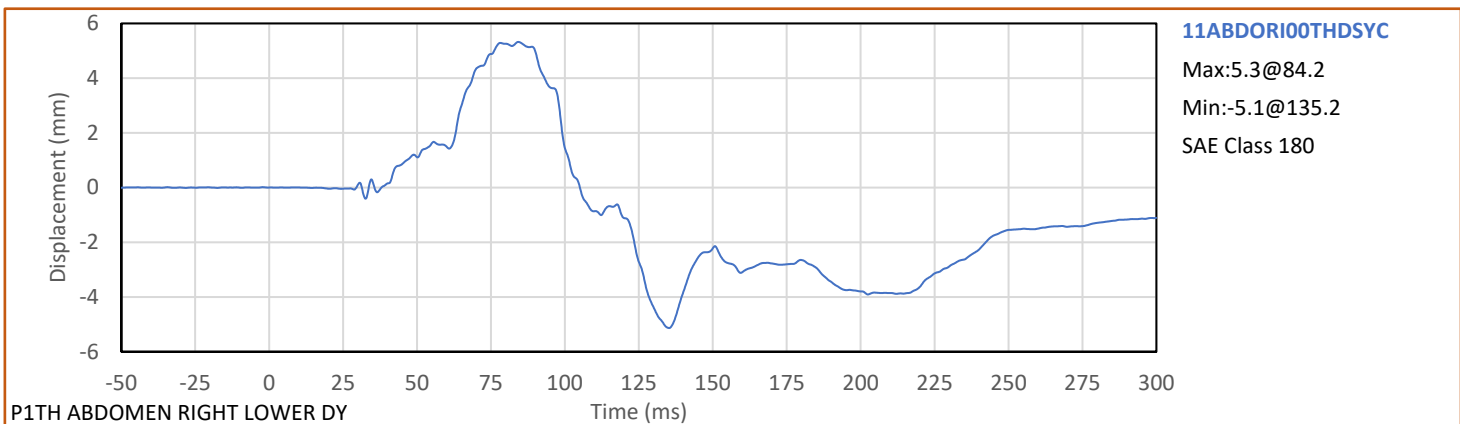
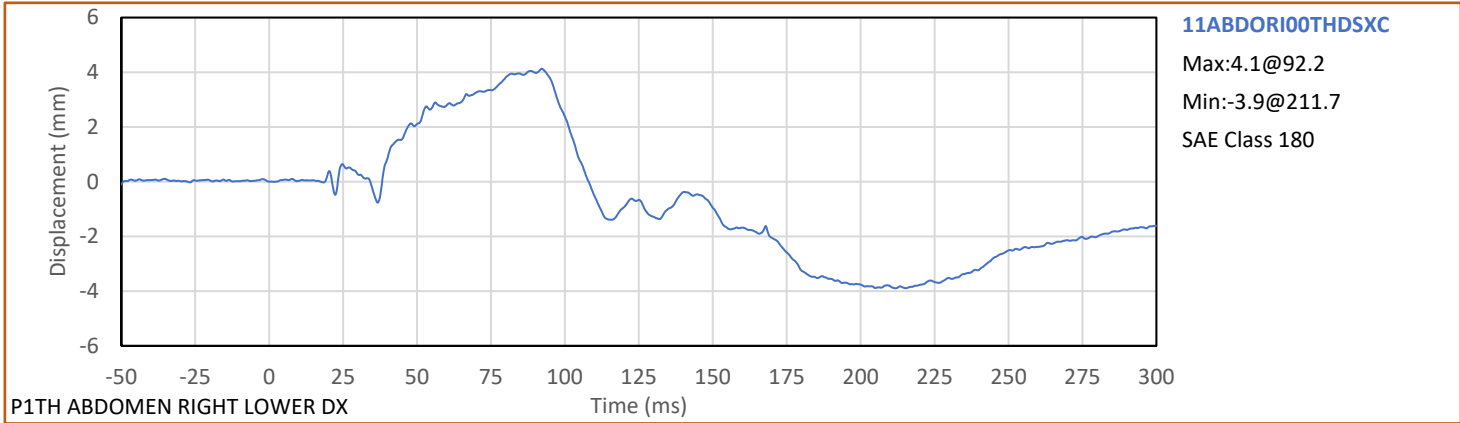








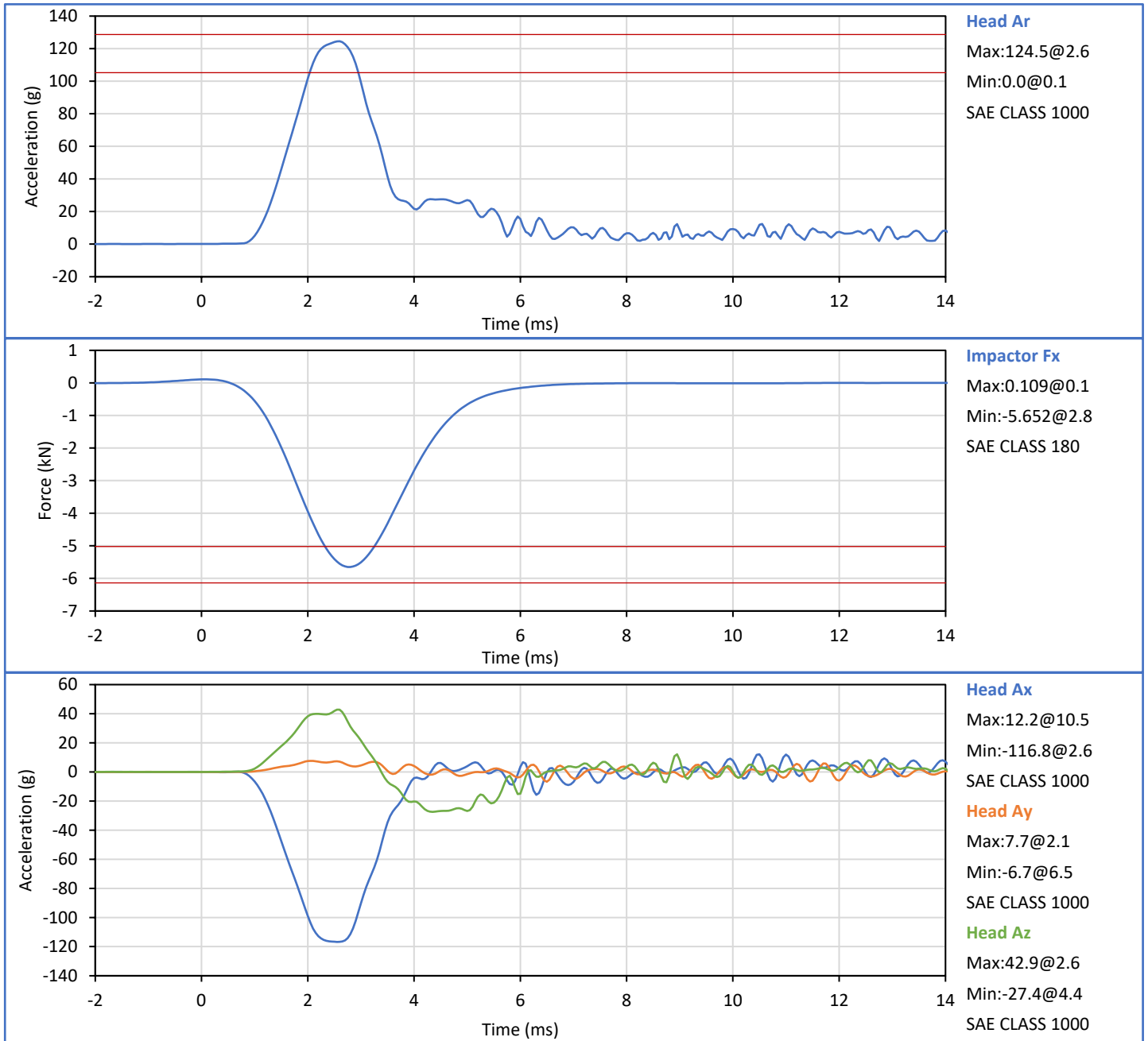




APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA
THOR-50M 50TH PERCENTILE MALE ATD
PRE-TEST QUALIFICATION (PARTIAL)

APPENDIX C
ATD Configuration and Performance Verification Data
THOR-50M 50th Percentile Male ATD
Pre-Test Qualification (Partial) S/N: EG2595

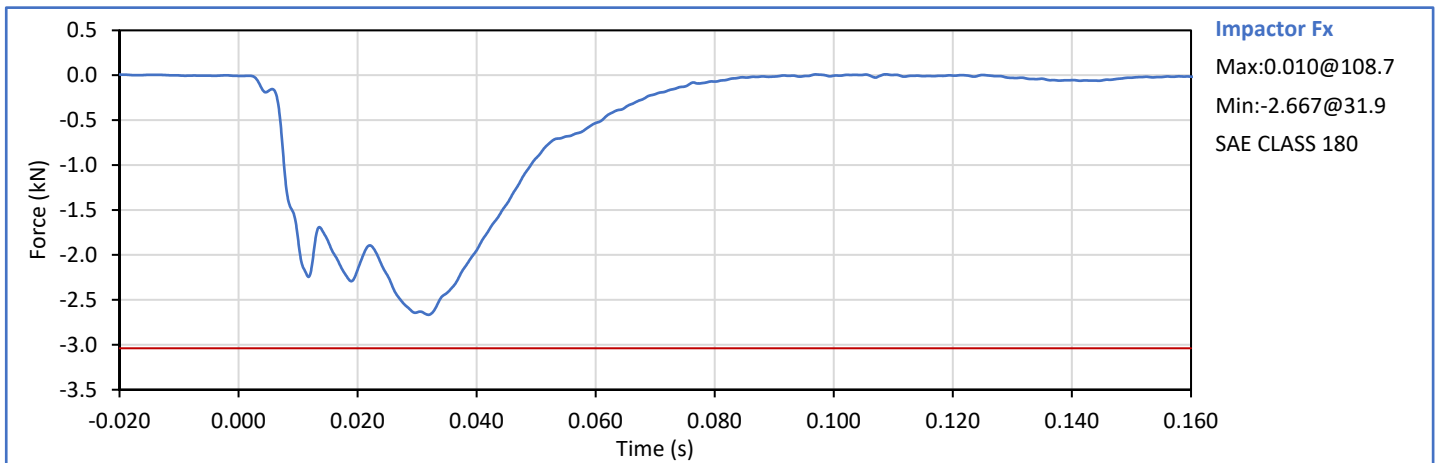
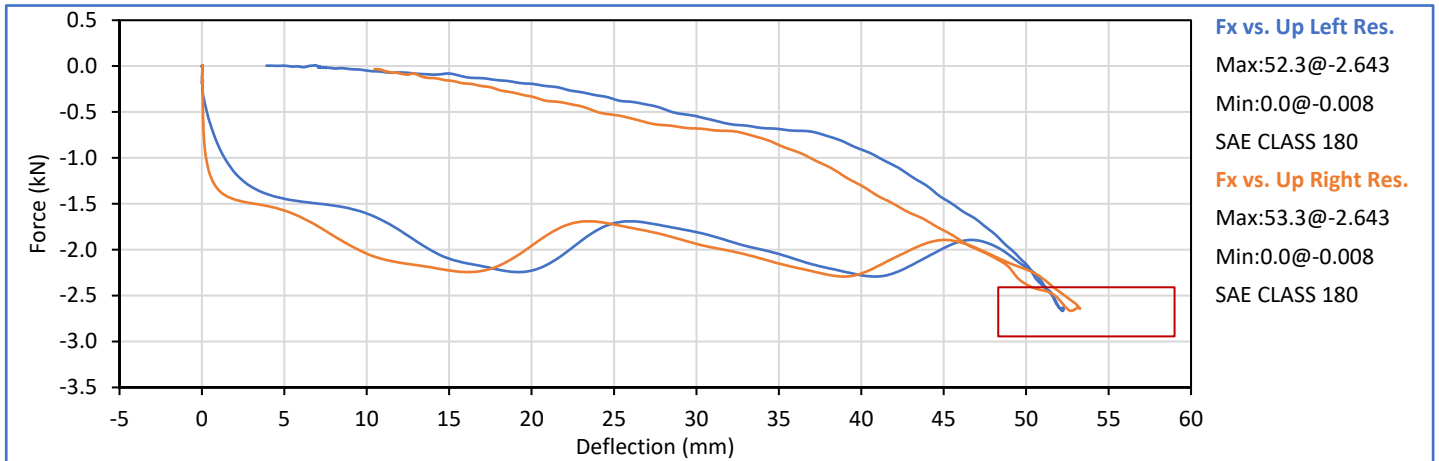
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Velocity	m/s	1.95	2.05	1.97	Pass
Peak Impactor Force	kN	-6.138	-5.022	-5.652	Pass
Peak Head Resultant Acceleration	g	105.3	128.7	124.5	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass





Technician: J. Hernandez

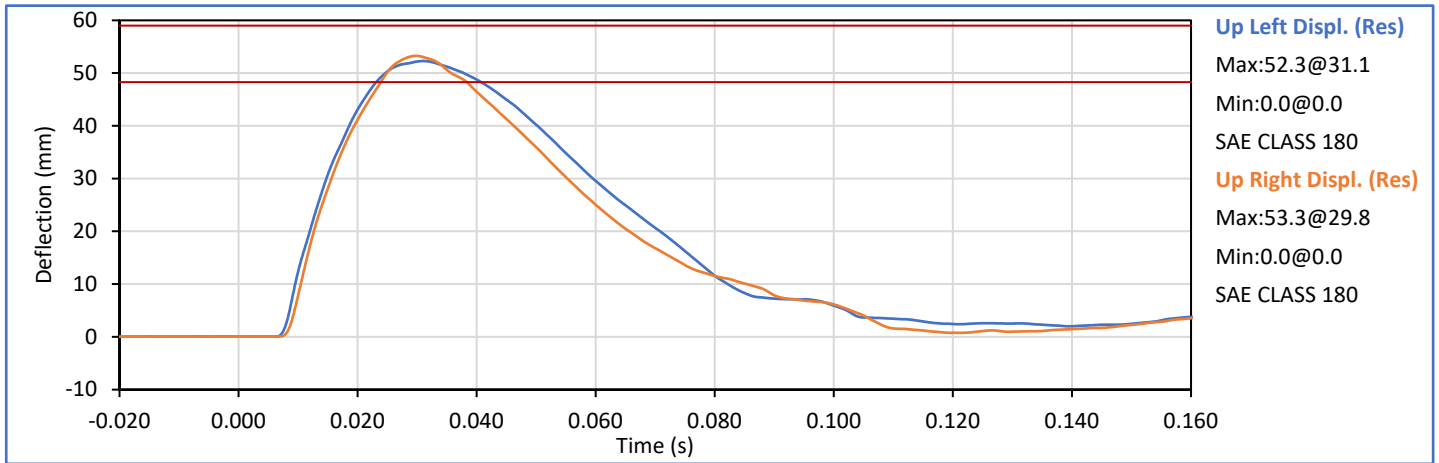
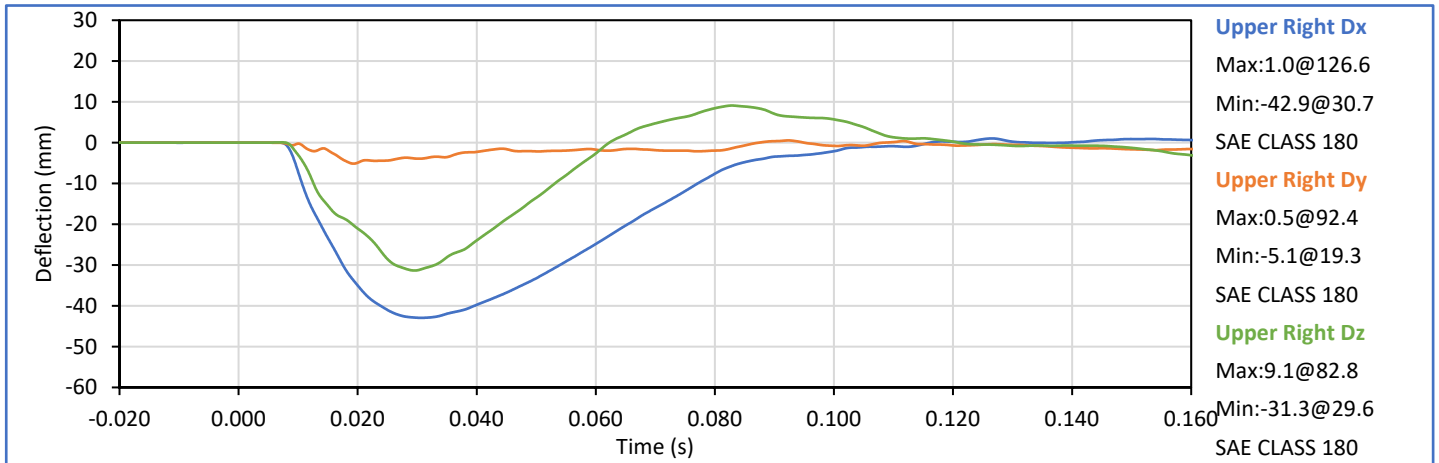
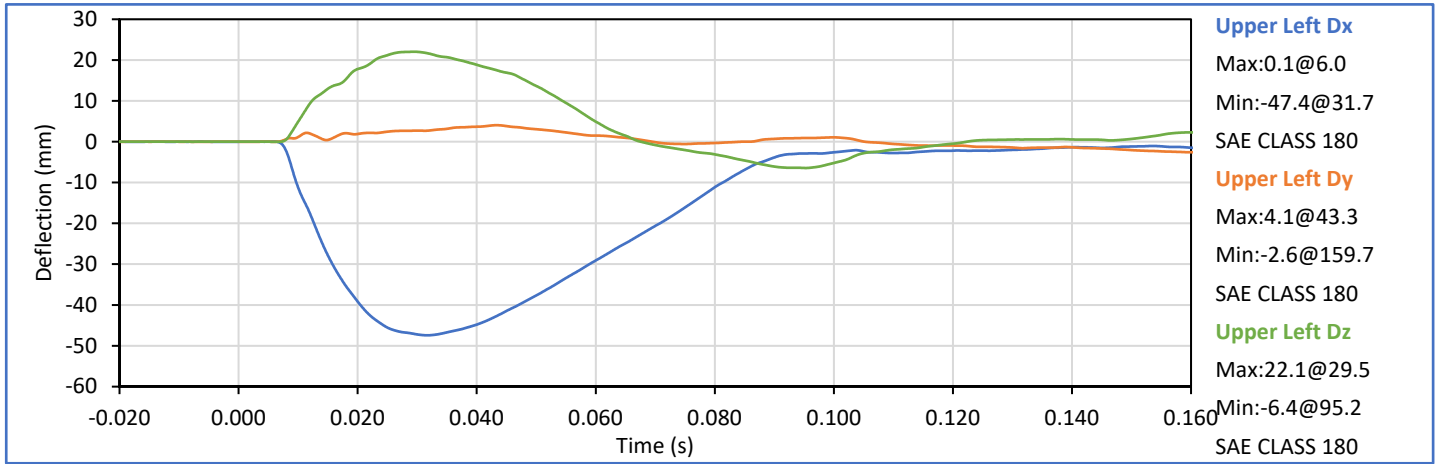
Approved By: P. Puzuto

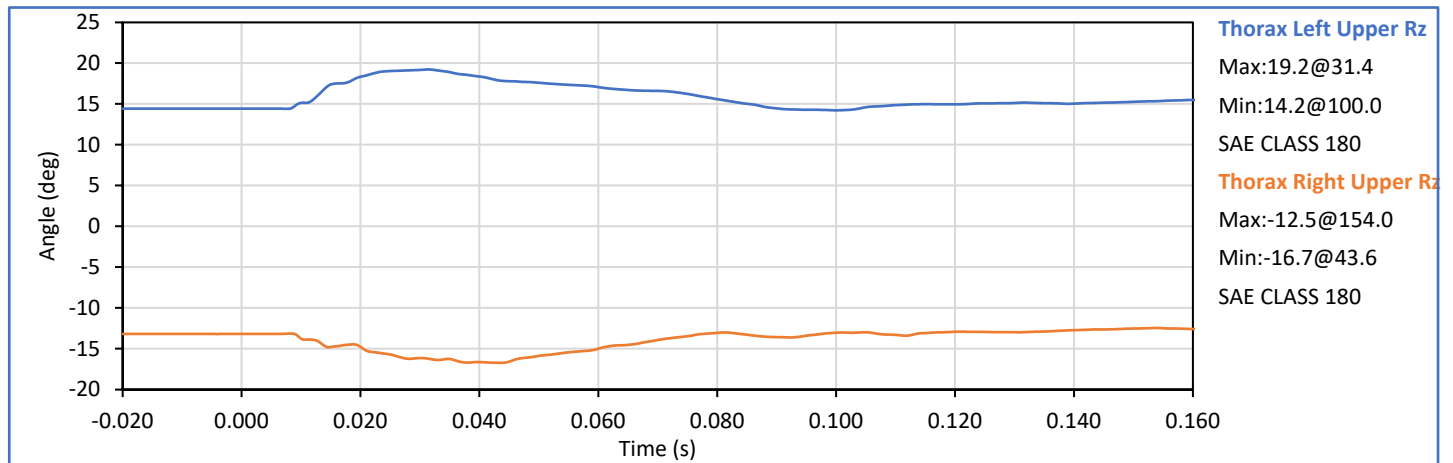
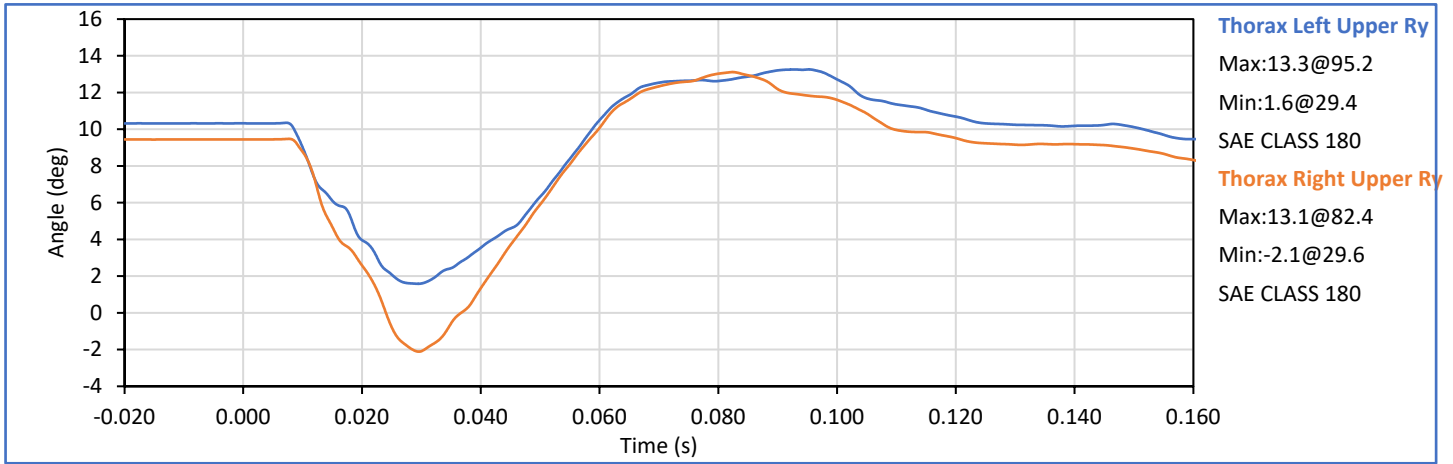
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Probe Velocity	m/s	4.25	4.35	4.30	Pass
Peak Probe Force	kN	-3.039		-2.667	Pass
Peak Upper Left Deflection Res.	mm	48.3	59.0	52.3	Pass
Peak Upper Right Deflection Res.	mm			53.3	Pass
Absolute Difference L/R Defl. Res.	mm	0.0	5.0	1.0	Pass
Force at Peak Upper Left Res.	mm	-2.944	-2.409	-2.643	Pass
Force at Peak Upper Right Res.	mm			-2.643	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass



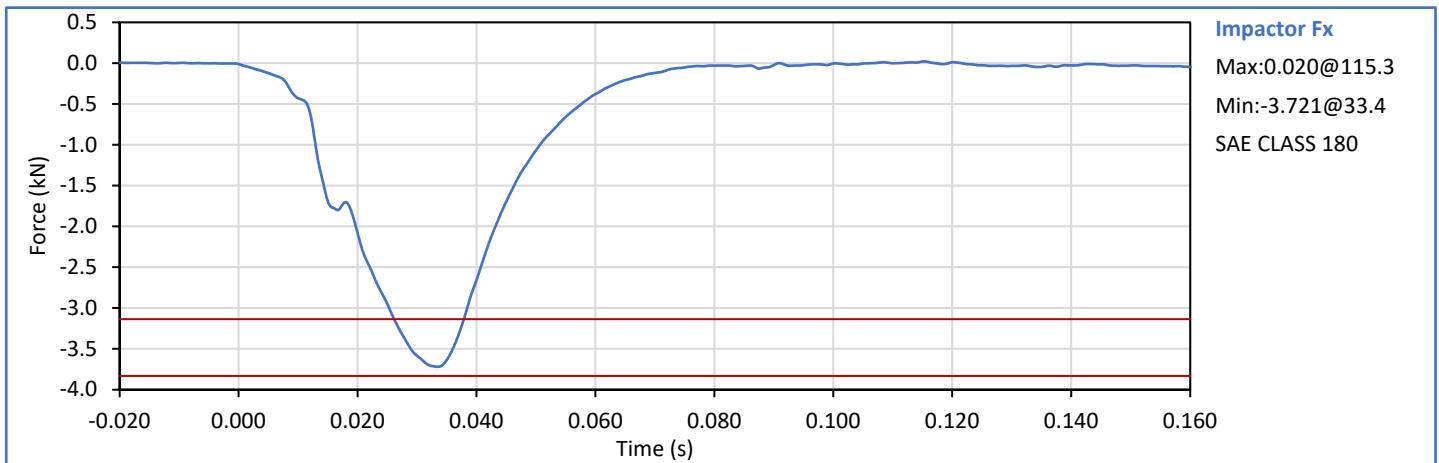
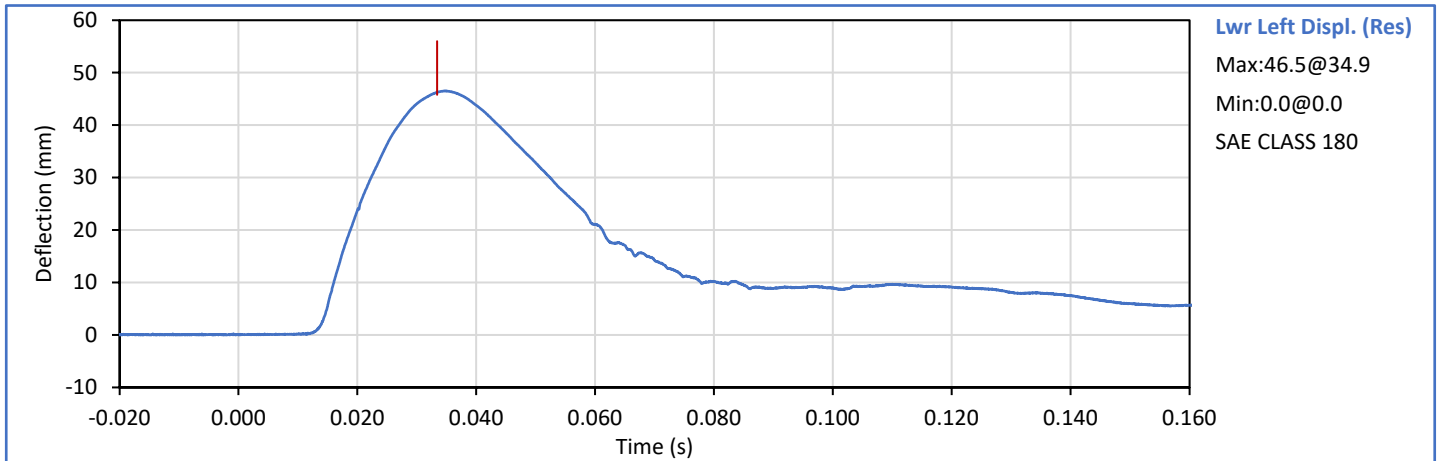
Technician: 
J. Hernandez


Approved By: 
P. Puzzuto






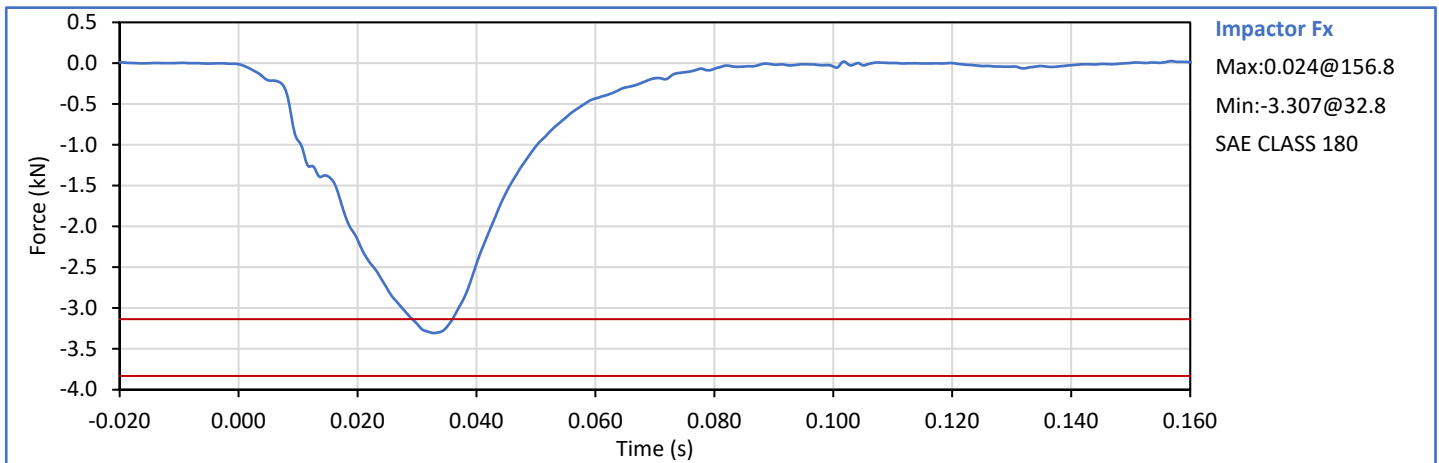
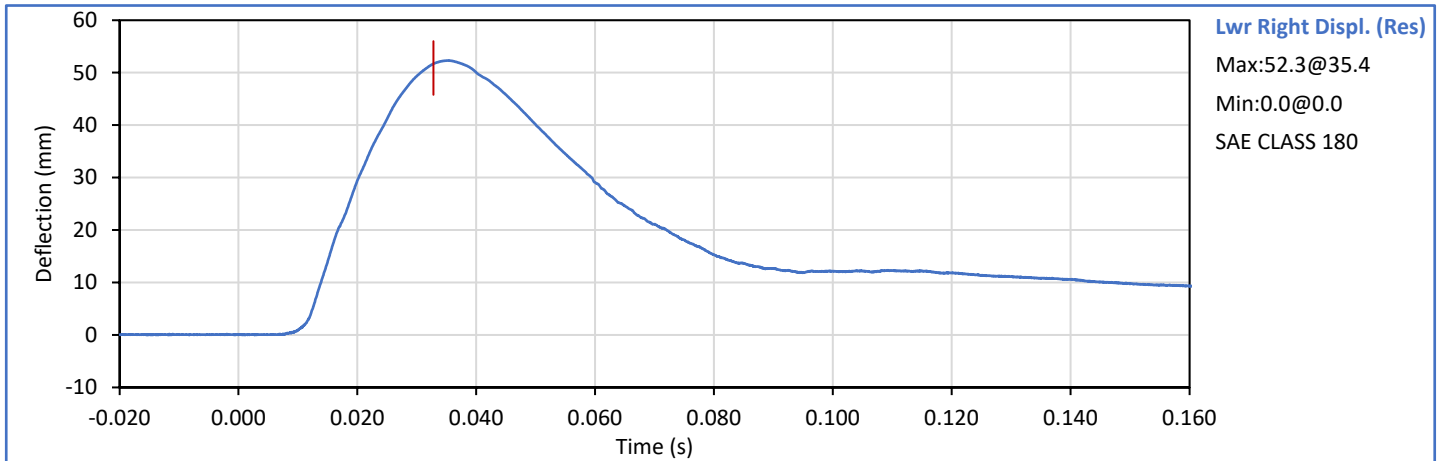
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	27	Pass
Probe Velocity	m/s	4.25	4.35	4.34	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.721	Pass
Lower Left Defl. Res. at Peak Fx	mm	45.8	56.0	46.3	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass




Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

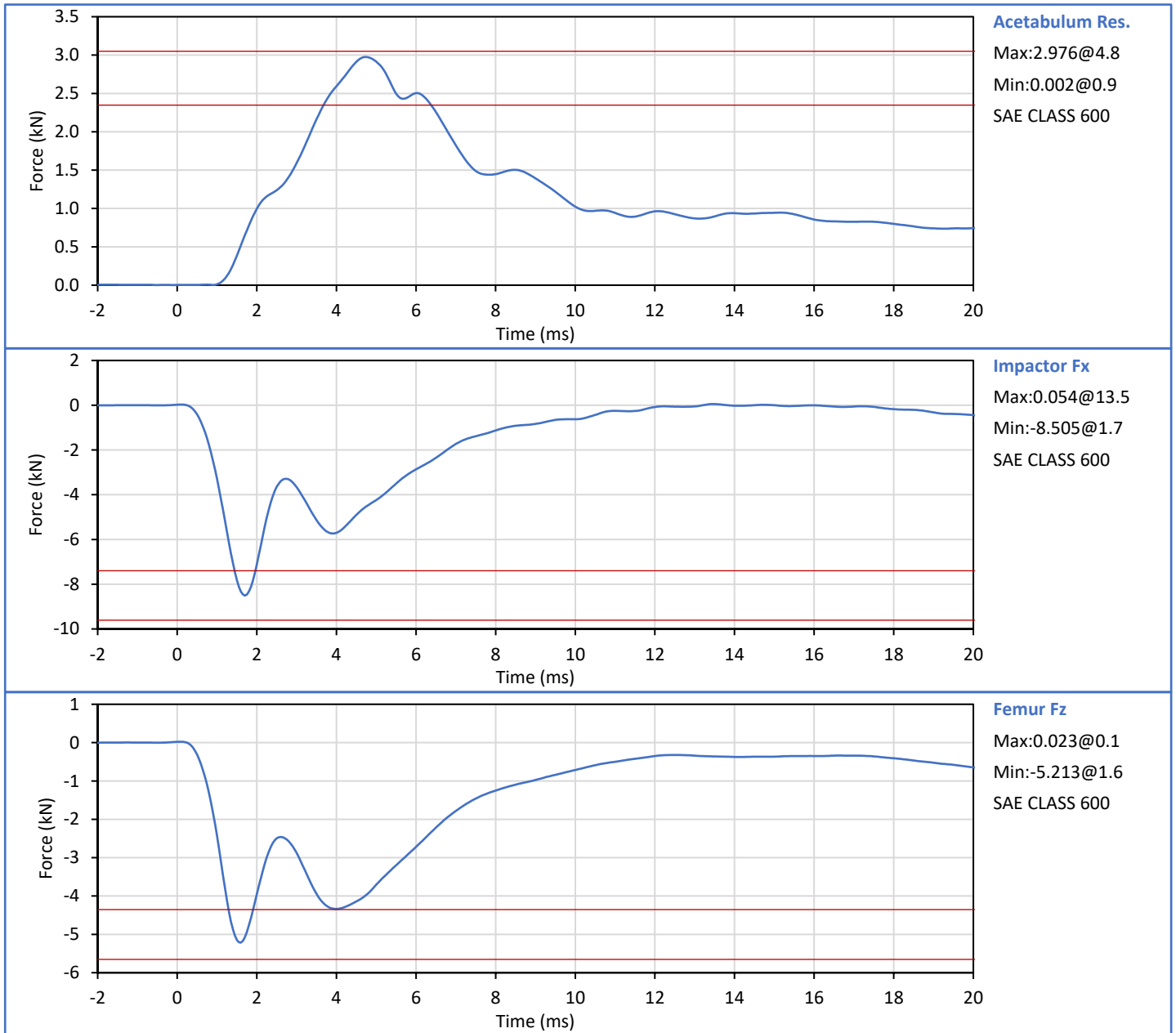
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	27	Pass
Probe Velocity	m/s	4.25	4.35	4.34	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.307	Pass
Lower Left Defl. Res. at Peak Fx	mm	45.8	56.0	51.7	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass




Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

Tested Parameter	Units	Spec. Low ¹	Spec. High ¹	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.0	Pass
Laboratory Humidity	%	10	70	31	Pass
Pendulum Velocity	m/s	3.25	3.35	3.31	Pass
Peak Impactor Force	kN	-9.605	-7.395	-8.505	Pass
Peak Femur Fz	kN	-5.650	-4.350	-5.213	Pass
Acetabulum Force Resultant	kN	2.349	3.051	2.976	Pass
NHTSA Corridor 2020-03 (Preliminary Corridor)				Overall Test Results	Pass

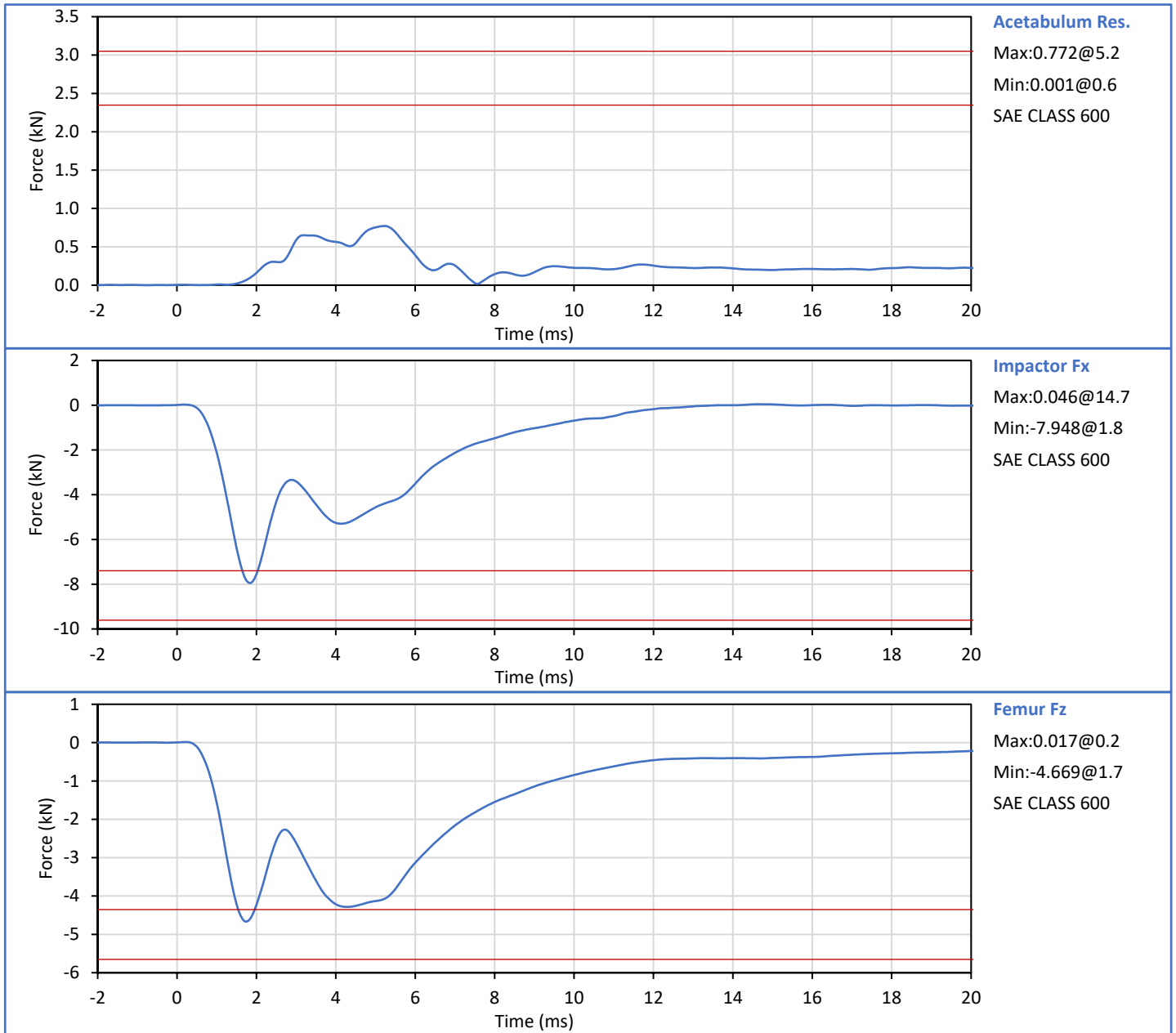


Technician: 
J. Hernandez


Approved By: 
P. Puzzuto

Tested Parameter	Units	Spec. Low ¹	Spec. High ¹	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.1	Pass
Laboratory Humidity	%	10	70	32	Pass
Pendulum Velocity	m/s	3.25	3.35	3.30	Pass
Peak Impactor Force	kN	-9.605	-7.395	-7.948	Pass
Peak Femur Fz	kN	-5.650	-4.350	-4.669	Pass
Acetabulum Force Resultant	kN	2.349	3.051	0.772	Fail
NHTSA Corridor 2020-03 (Preliminary Corridor)				Overall Test Results	Fail

* Acetabulum Load Cell Fx is not functioning



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

APPENDIX C
ATD Qualification and Performance Verification
Hybrid III 50th Percentile Male ATD
Pre-Test Qualification (Partial) S/N: 168

ATD Serial No.: 168

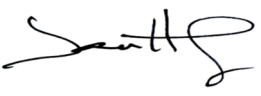
Test Date: 2021-06-15


Dummy Item	Inspect for	Comments	Damage	OK
Entire ATD	Perform general cleaning			✓
Outer Skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck bracket	Upper neck firmly attached to lower bracket			✓
Neck	Broken or cracked rubber			✓
	Looseness at the condyle joint			✓
Nodding block	Cracked or out of position			✓
Lumbar Spine	Broken or cracked rubber			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Displ. Assembly	Bent shaft			✓
	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer Mounting	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "resting" position			✓
Pelvis	Broken			✓
Other	Describe below as needed			✓

Describe any repairs or replacement of parts or other findings:

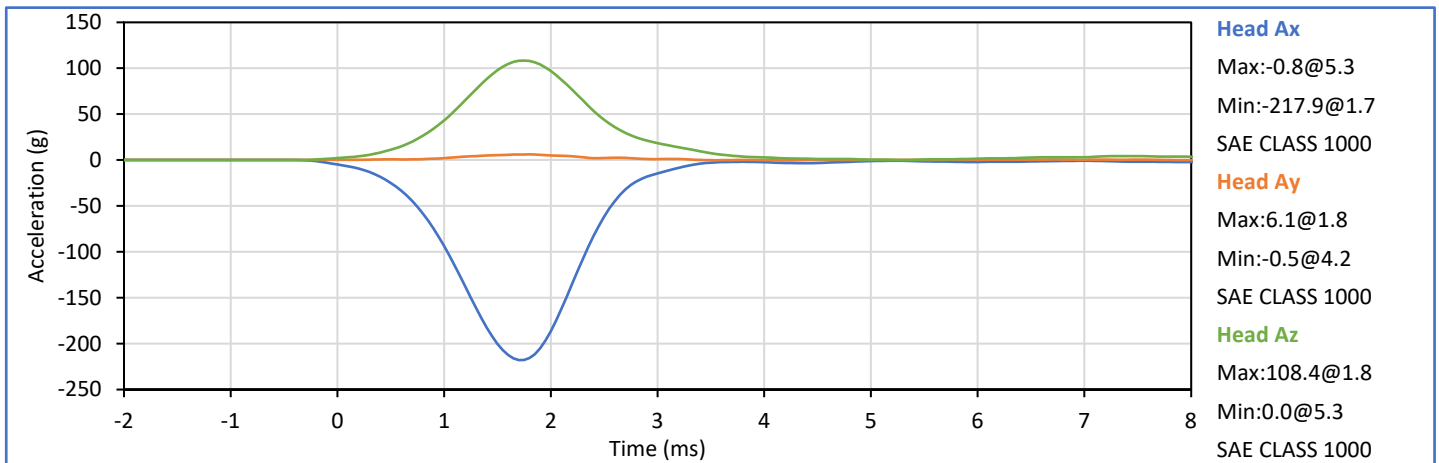
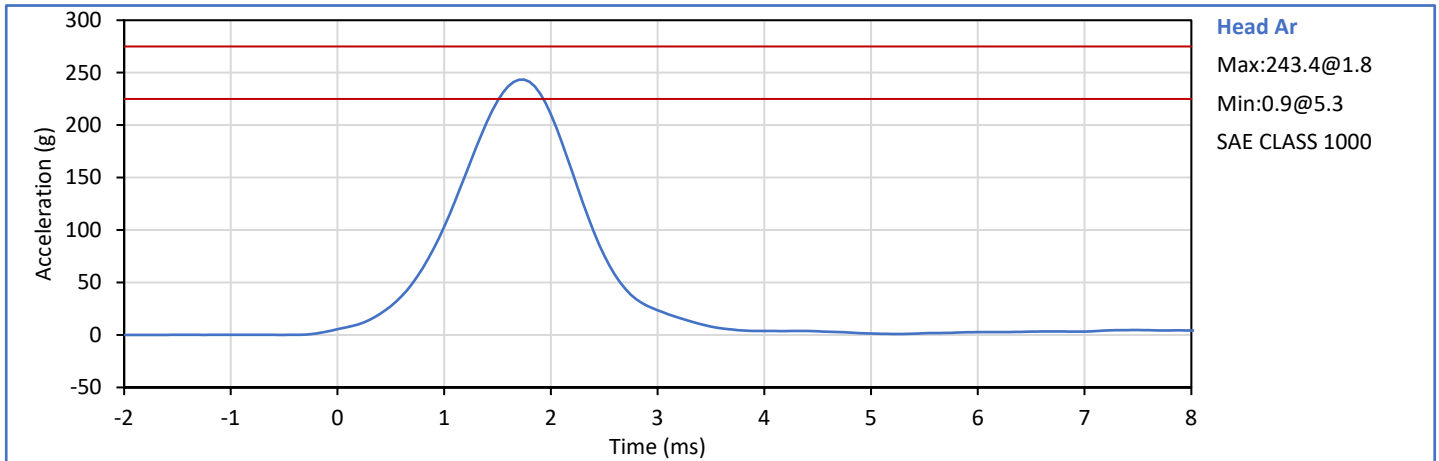
No Problems Found

Due to data excursions in the Head Redundant Ay and Head Redundant Az, sensors and cabling was checked to ensure accelerometers are properly secured and cabling is properly strain relieved; no issues found.


Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

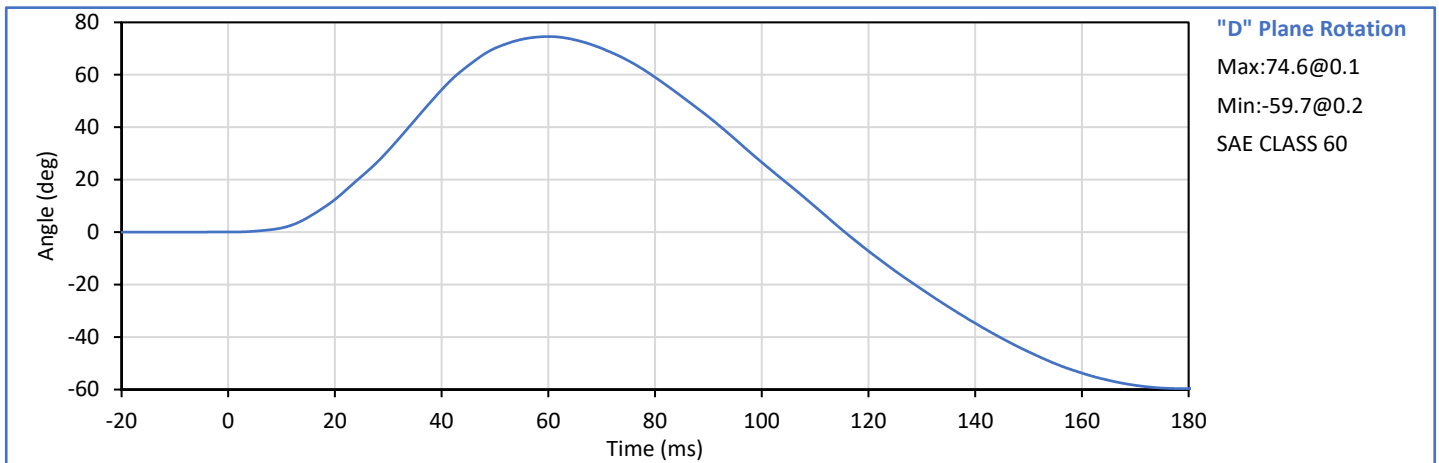
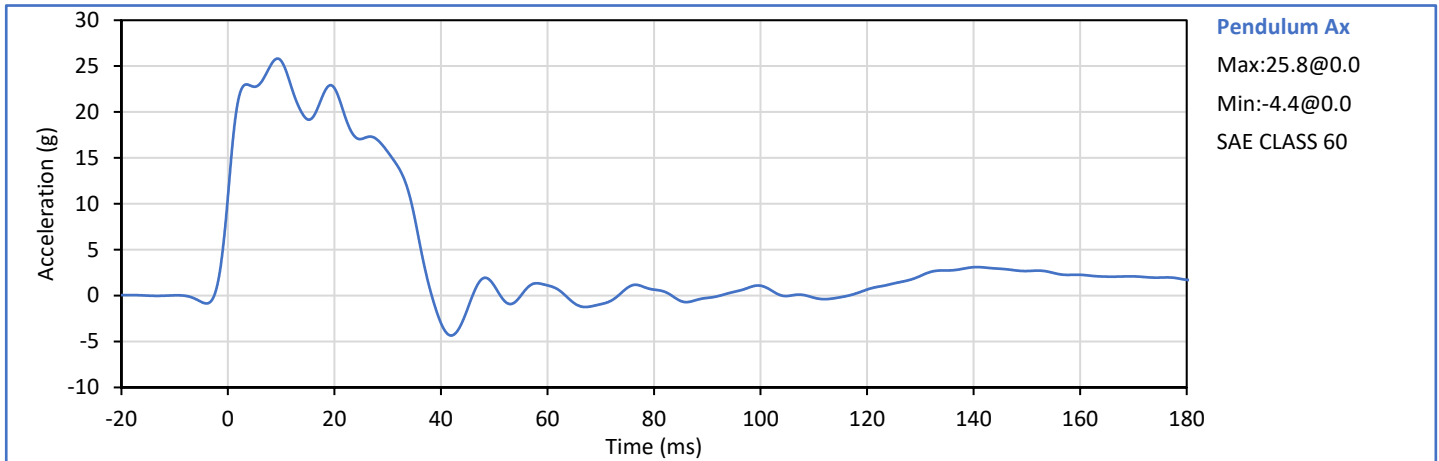
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Peak Resultant Acceleration	g	225.0	275.0	243.4	Pass
Peak Lateral Acceleration	g	-15.0	15.0	6.1	Pass
Oscillations After Main Pulse	%	0.0	10.0	1.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass




Technician: 
J. Hernandez

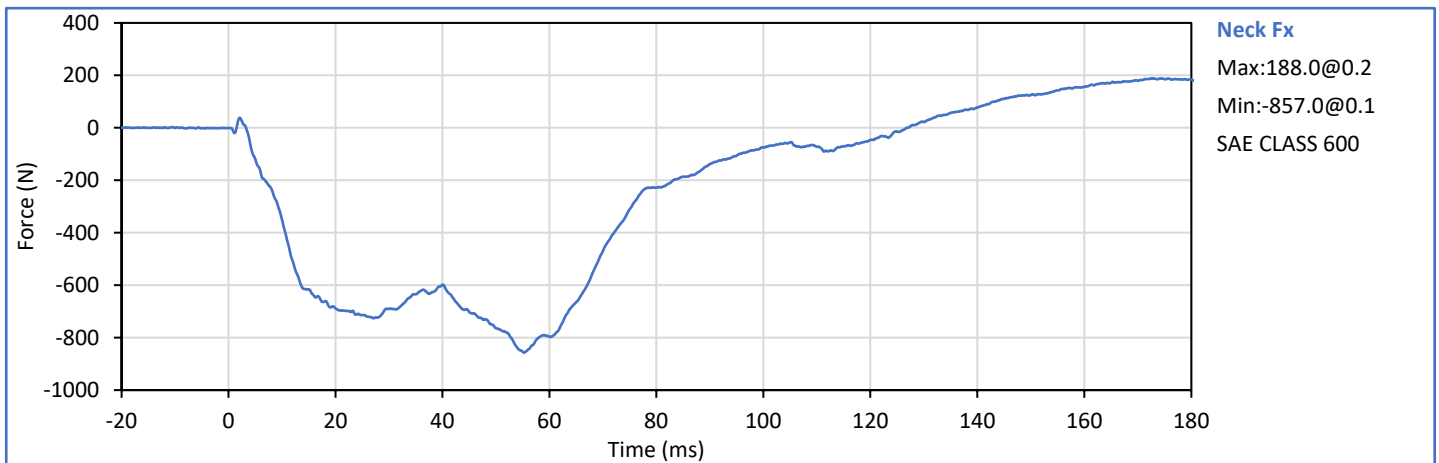
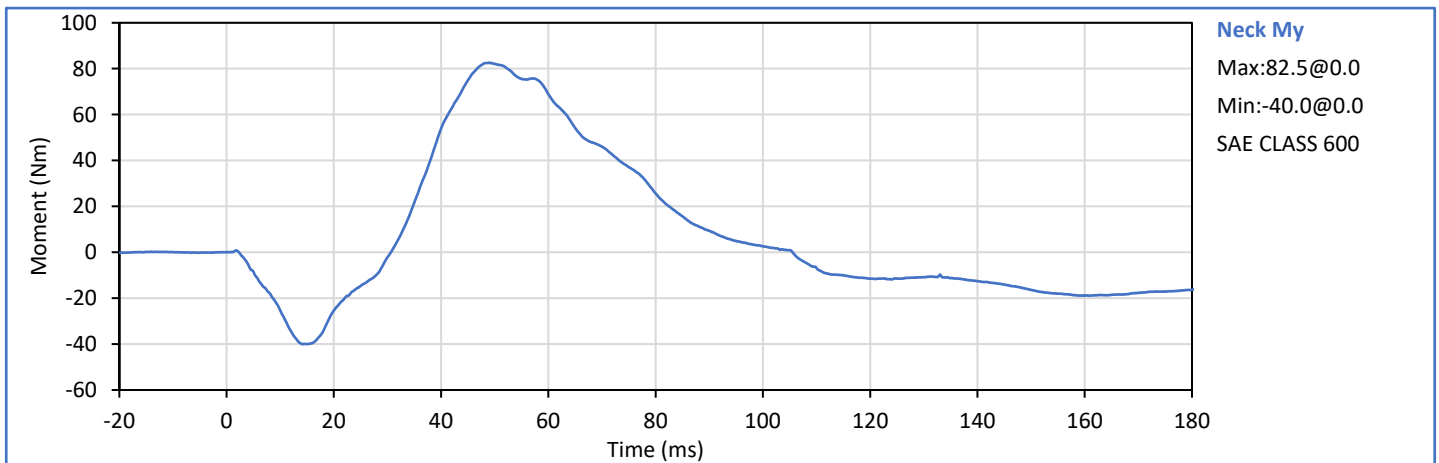
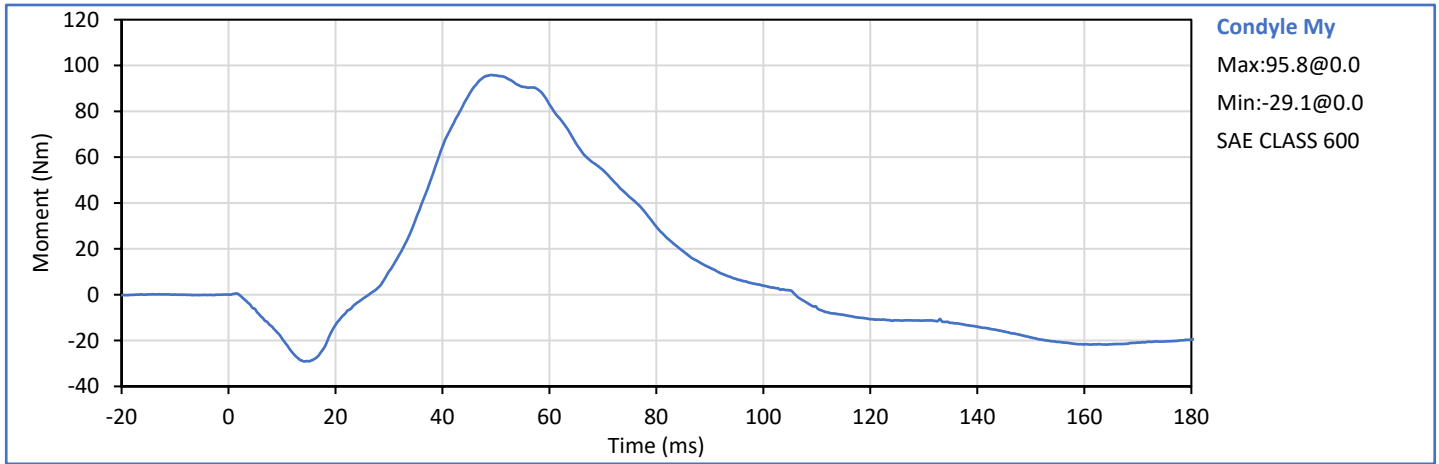
Approved By: 
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	6.89	7.13	7.04	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	25.6	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	22.6	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	15.7	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	29.0	15.7	Pass
Deceleration Decay to Cross 5 g	ms	34.0	42.0	36.2	Pass
"D" Plane Rotation peak	deg	64.0	78.0	74.6	Pass
	ms	57.0	64.0	60.1	Pass
"D" Plane Rotation Decay To Zero	ms	113.0	128.0	115.6	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	95.8	Pass
	ms	47.0	58.0	49.1	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	106.0	Pass
Overall Test Results					Pass

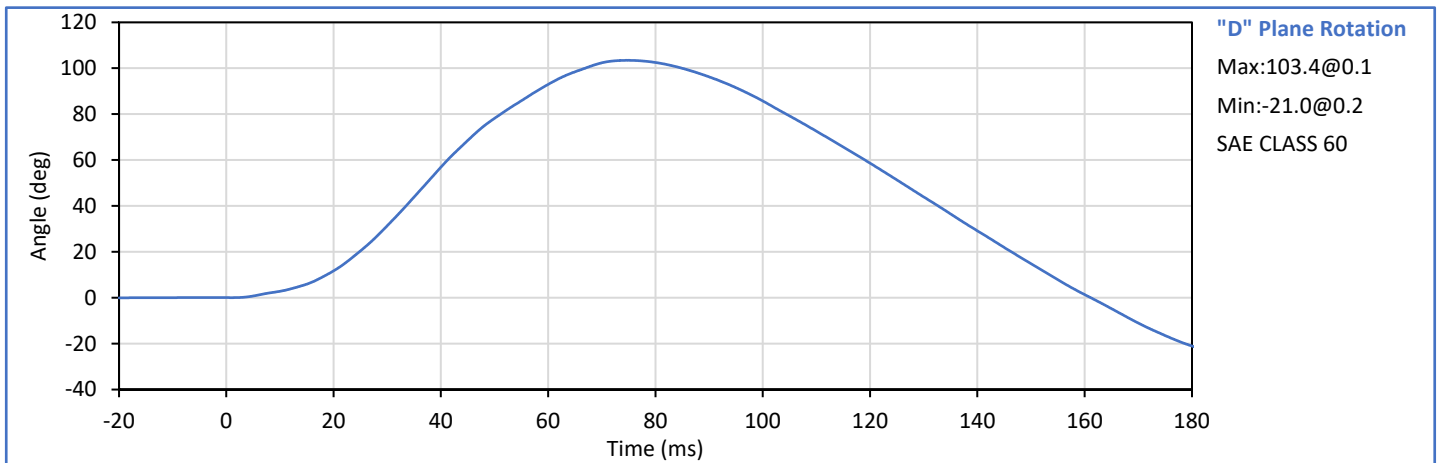
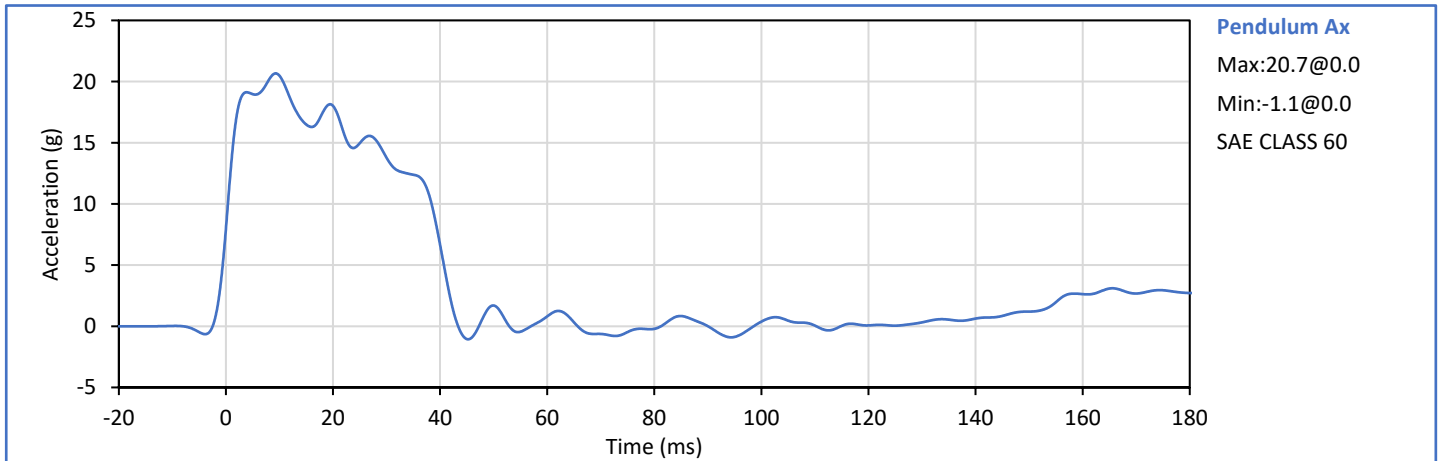


Technician: 
J. Hernandez


Approved By: 
P. Puzzuto

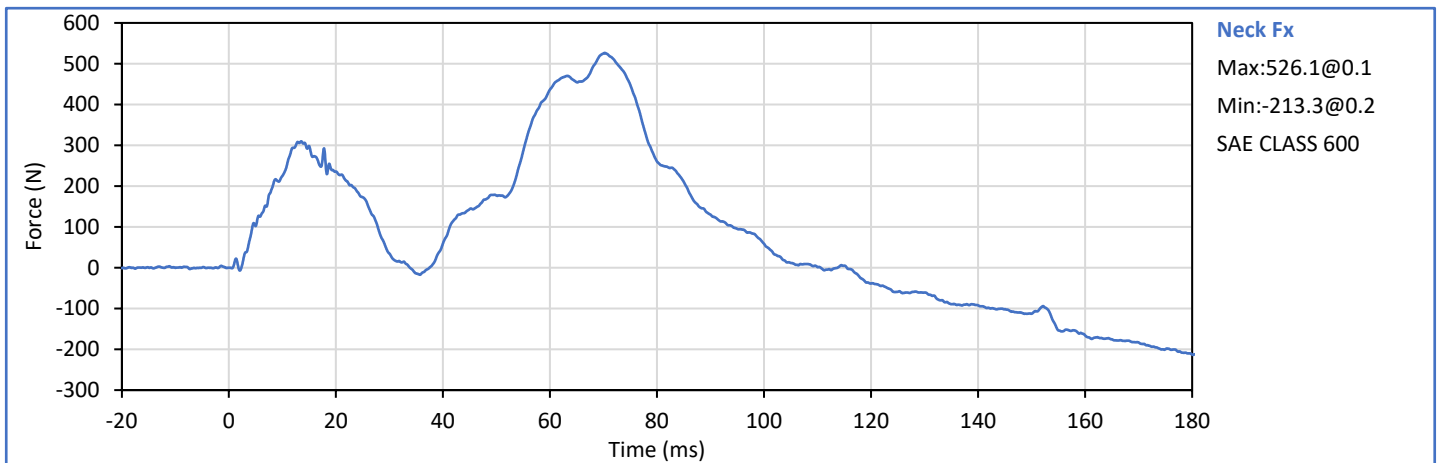
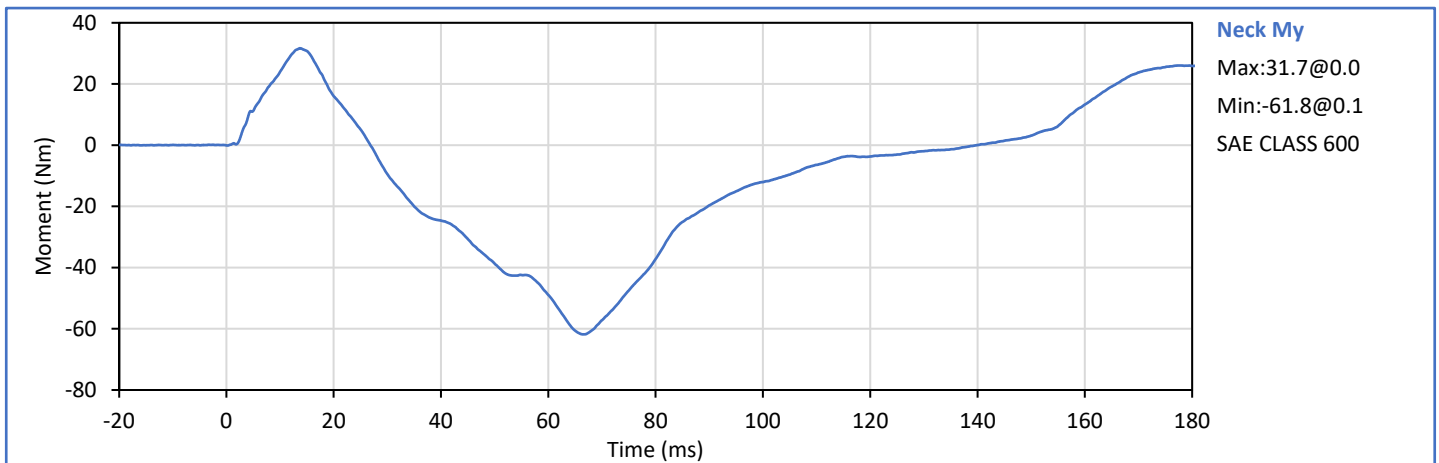
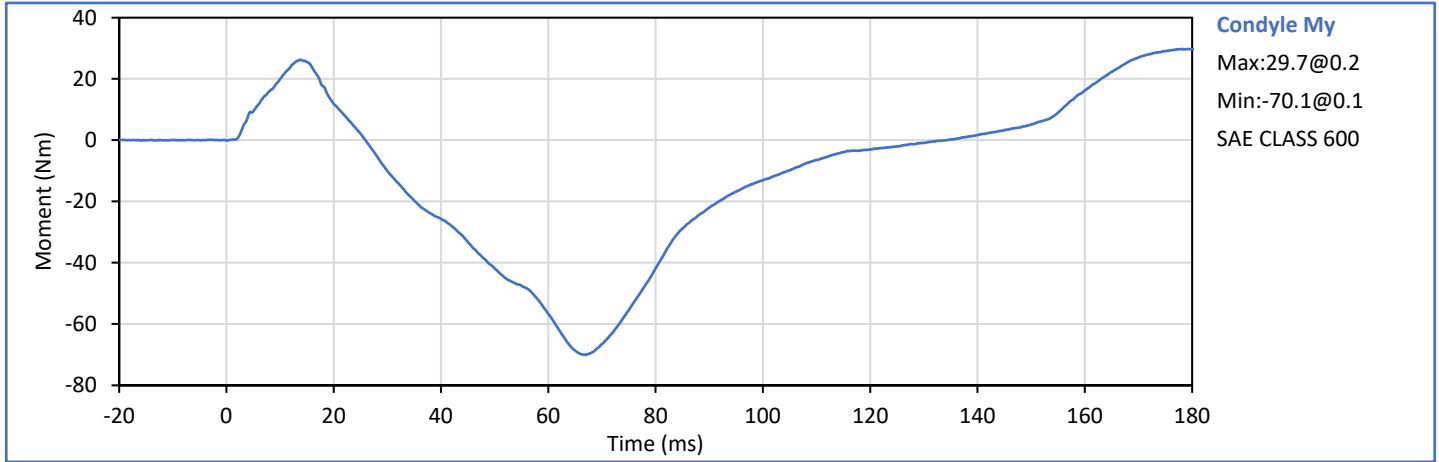


Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Pendulum Velocity	m/s	5.94	6.19	6.17	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	20.5	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.0	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.8	Pass
Peak Pendulum Decel. after 30 ms	g	0.0	22.0	13.8	Pass
Deceleration Decay to Cross 5 g	ms	38.0	46.0	40.7	Pass
"D" Plane Rotation peak	deg	81.0	106.0	103.4	Pass
	ms	72.0	82.0	74.8	Pass
"D" Plane Rotation Decay To Zero	ms	147.0	174.0	161.2	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-70.1	Pass
	ms	65.0	79.0	66.9	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	134.2	Pass
Overall Test Results					Pass

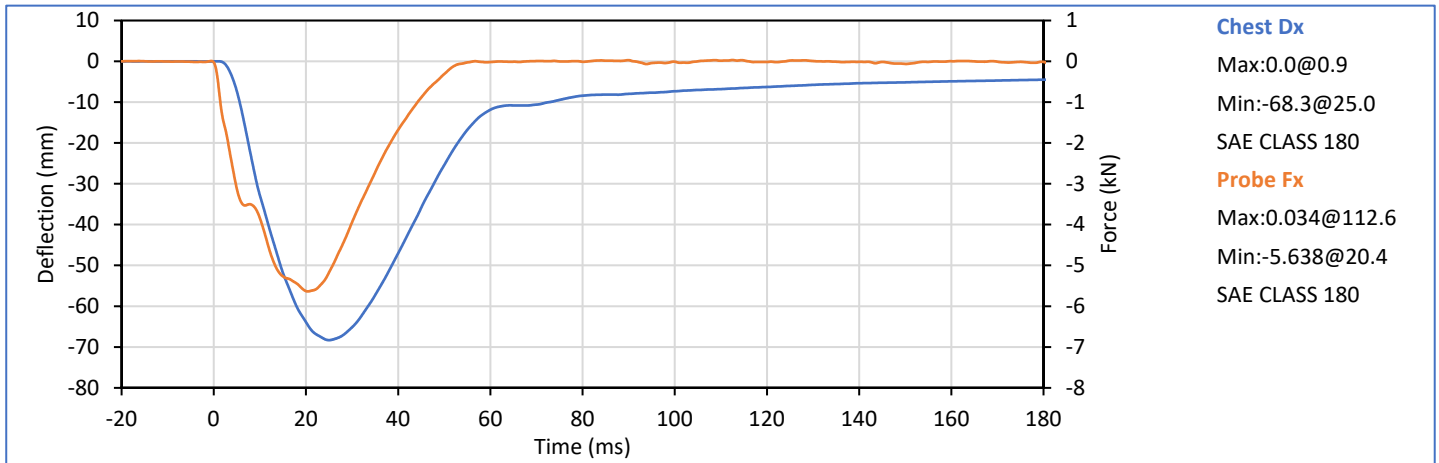
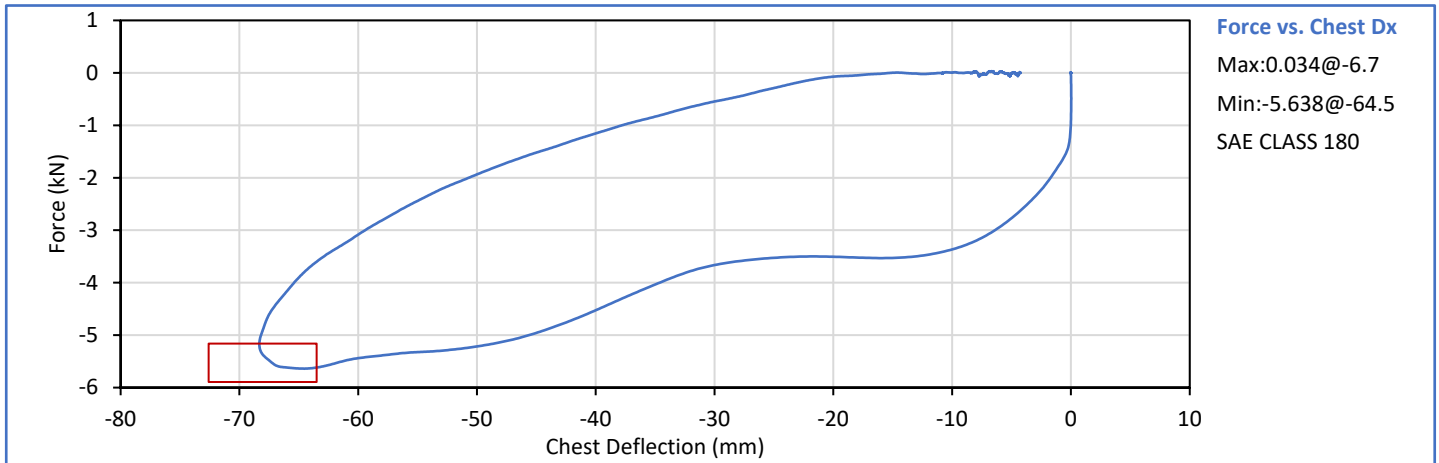


Technician: 
J. Hernandez


Approved By: 
P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.0	Pass
Laboratory Relative Humidity	%	10	70	39	Pass
Probe Velocity	m/s	6.58	6.82	6.79	Pass
Peak Chest Deflection	mm	-72.6	-63.5	-68.3	Pass
Peak Probe Force	kN	-5.893	-5.159	-5.638	Pass
Internal Hysterisis	%	69.0	85.0	70.9	Pass
Overall Test Results					Pass



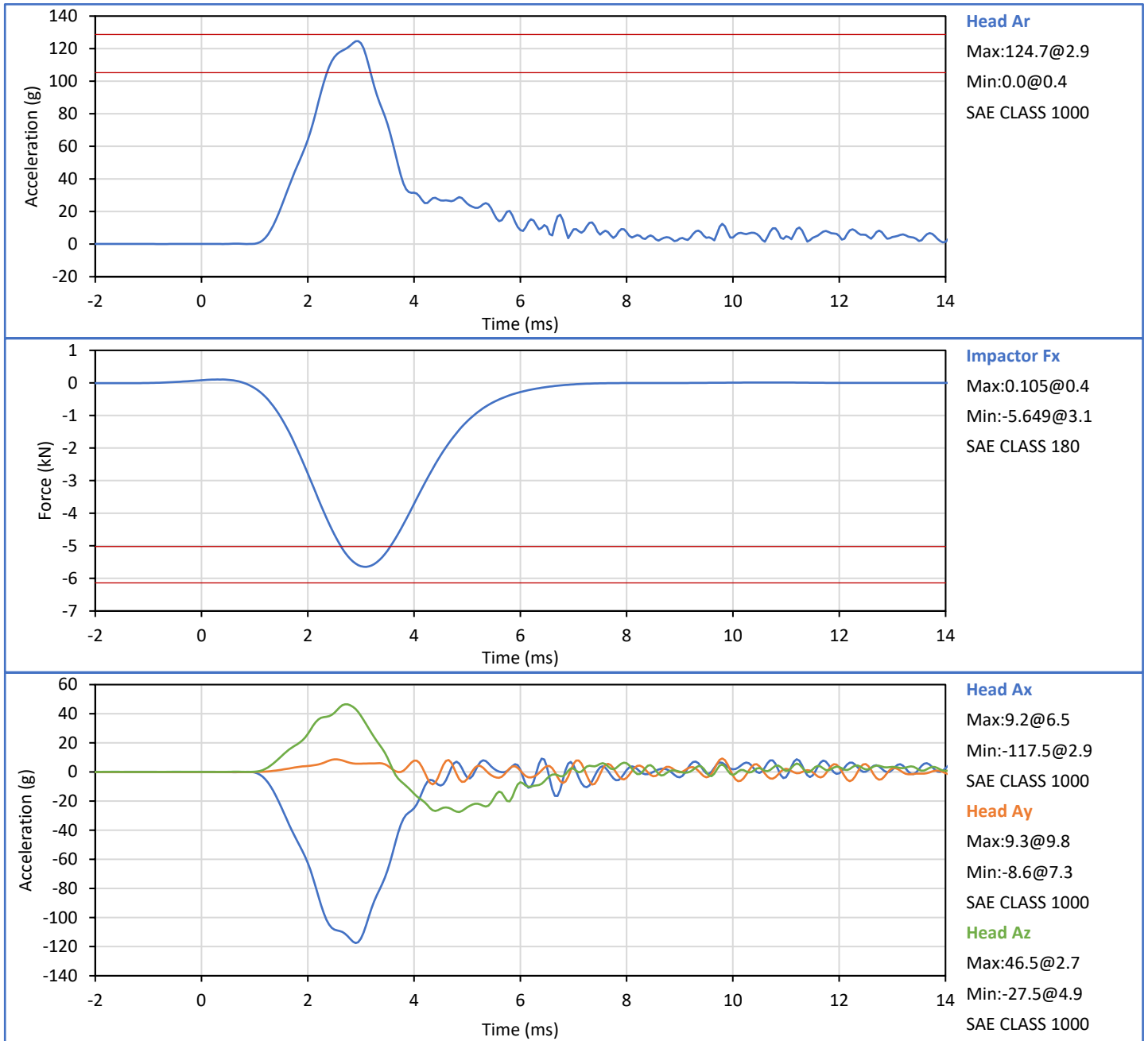
Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

APPENDIX D
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA
THOR-50M 50TH PERCENTILE MALE ATD
POST-TEST QUALIFICATION (FULL)

APPENDIX D
ATD Configuration and Performance Verification Data
THOR-50M 50th Percentile Male ATD
Post-Test Qualification (Partial) S/N: EG2595

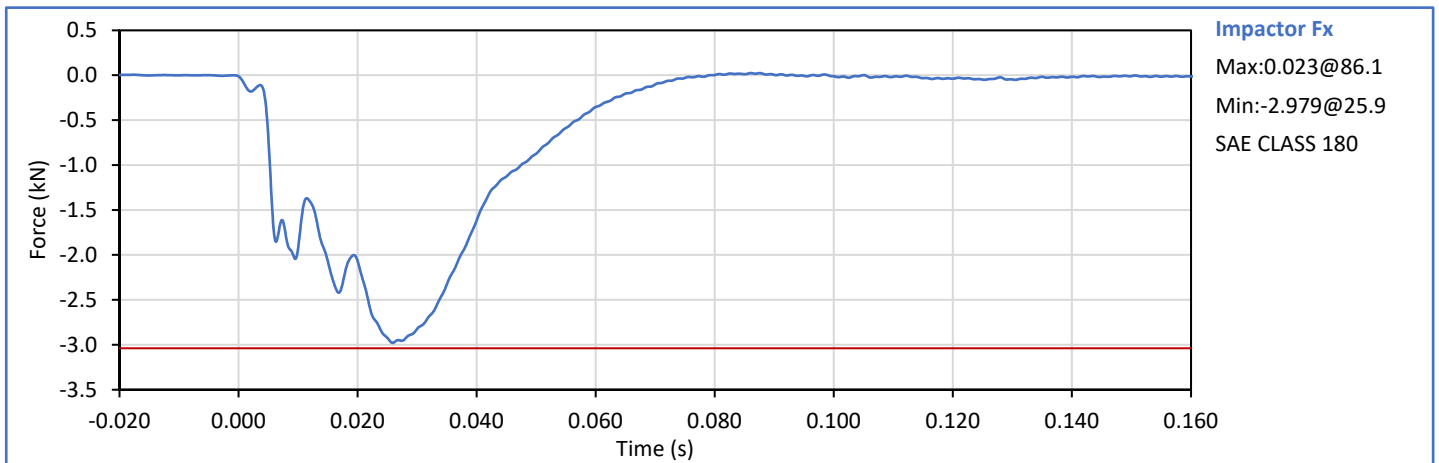
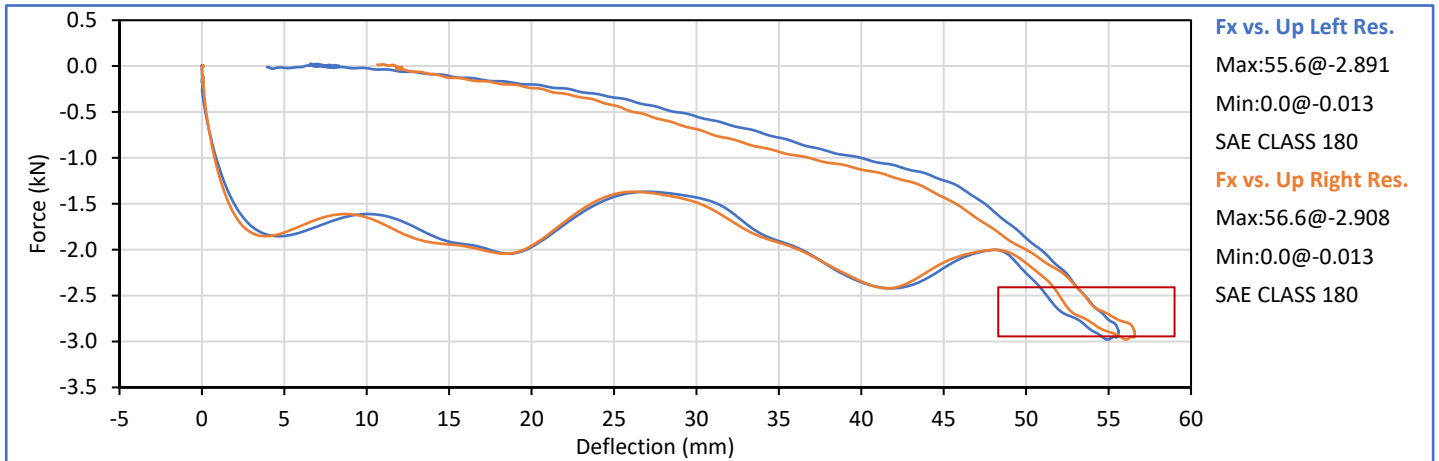
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	45	Pass
Velocity	m/s	1.95	2.05	1.97	Pass
Peak Impactor Force	kN	-6.138	-5.022	-5.649	Pass
Peak Head Resultant Acceleration	g	105.3	128.7	124.7	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass




Technician: J. Hernandez

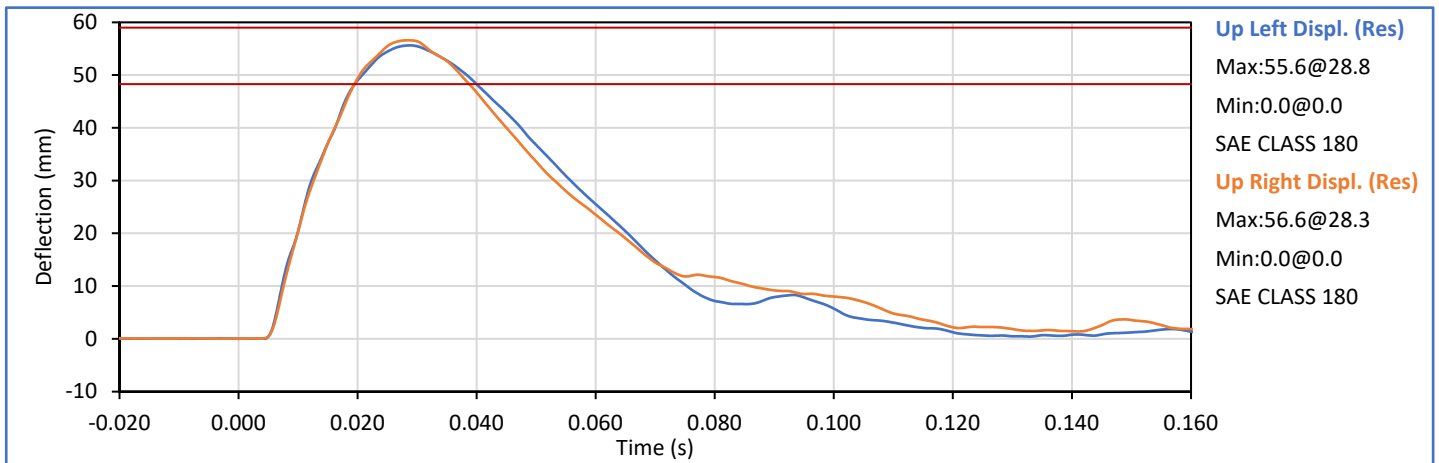
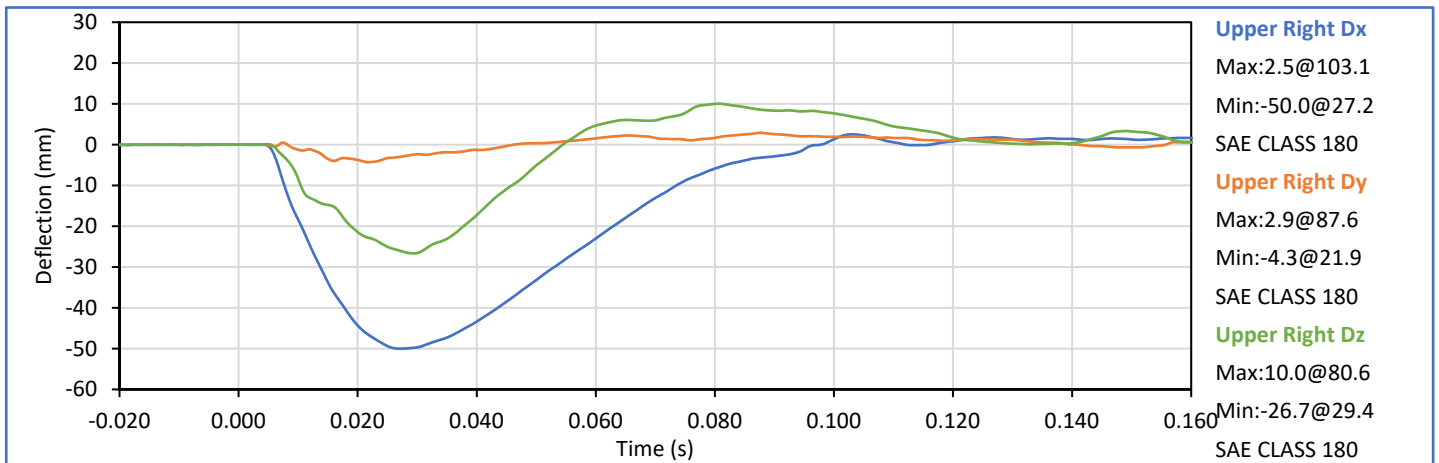
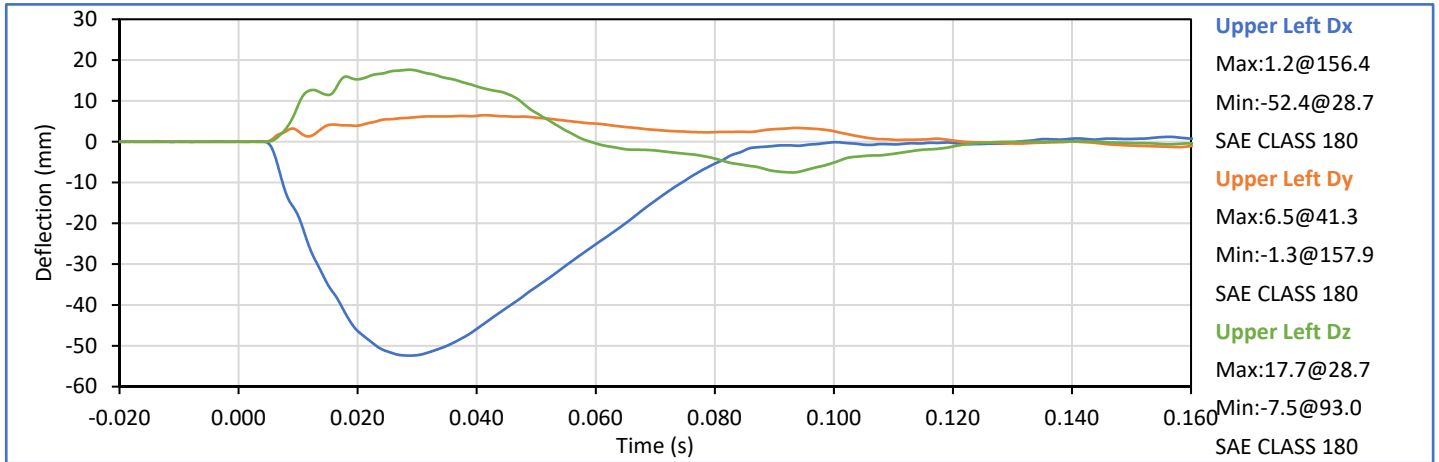
Approved By: P. Puzuto

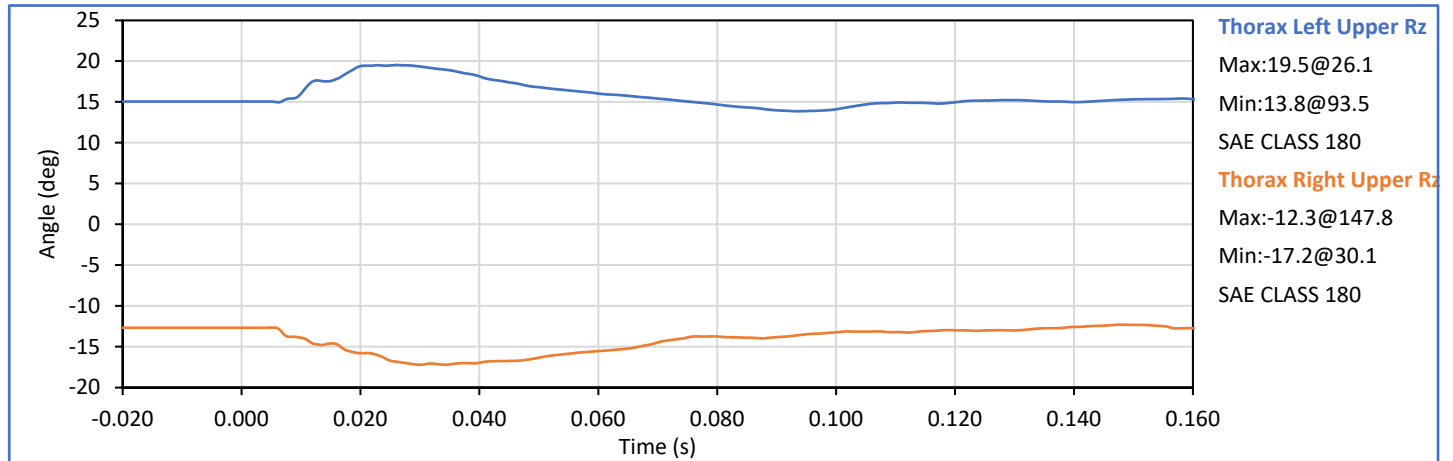
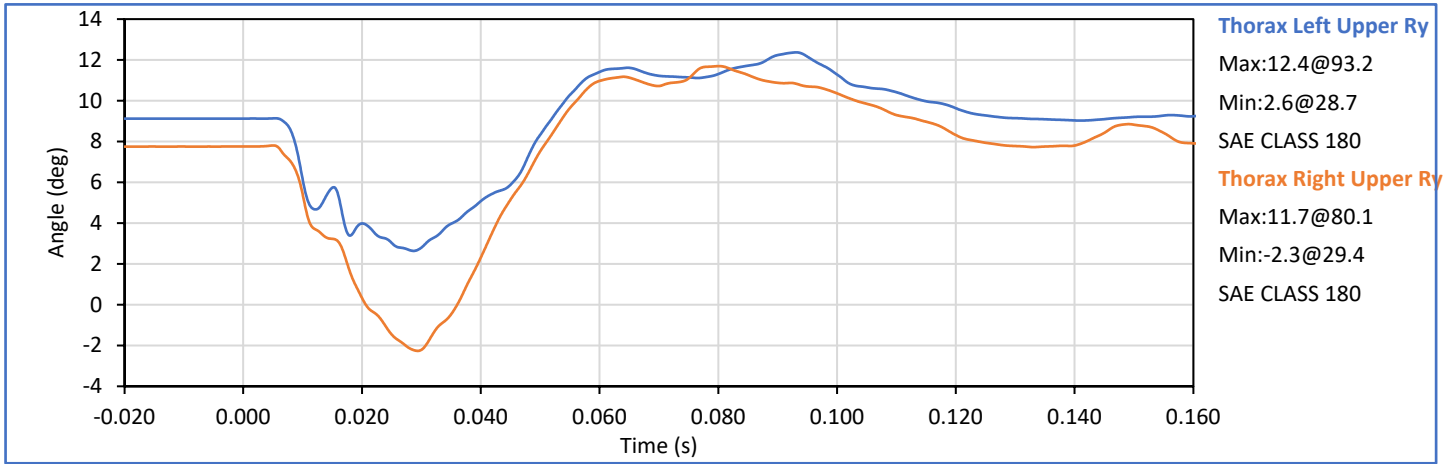
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	46	Pass
Probe Velocity	m/s	4.25	4.35	4.30	Pass
Peak Probe Force	kN	-3.039		-2.979	Pass
Peak Upper Left Deflection Res.	mm	48.3	59.0	55.6	Pass
Peak Upper Right Deflection Res.	mm			56.6	Pass
Absolute Difference L/R Defl. Res.	mm	0.0	5.0	1.0	Pass
Force at Peak Upper Left Res.	mm	-2.944	-2.409	-2.891	Pass
Force at Peak Upper Right Res.	mm			-2.908	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass



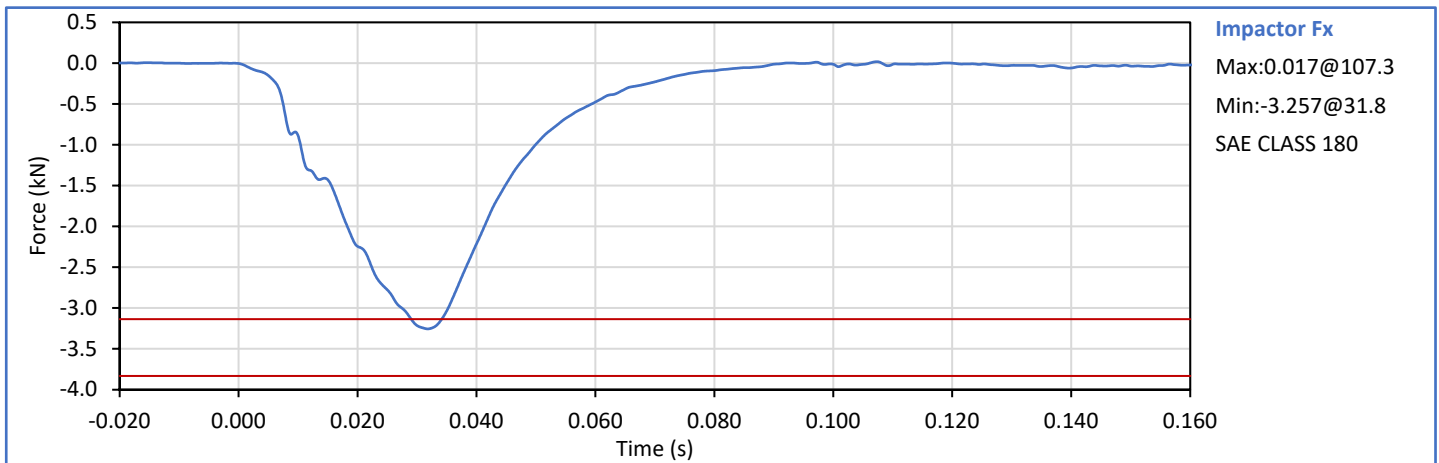
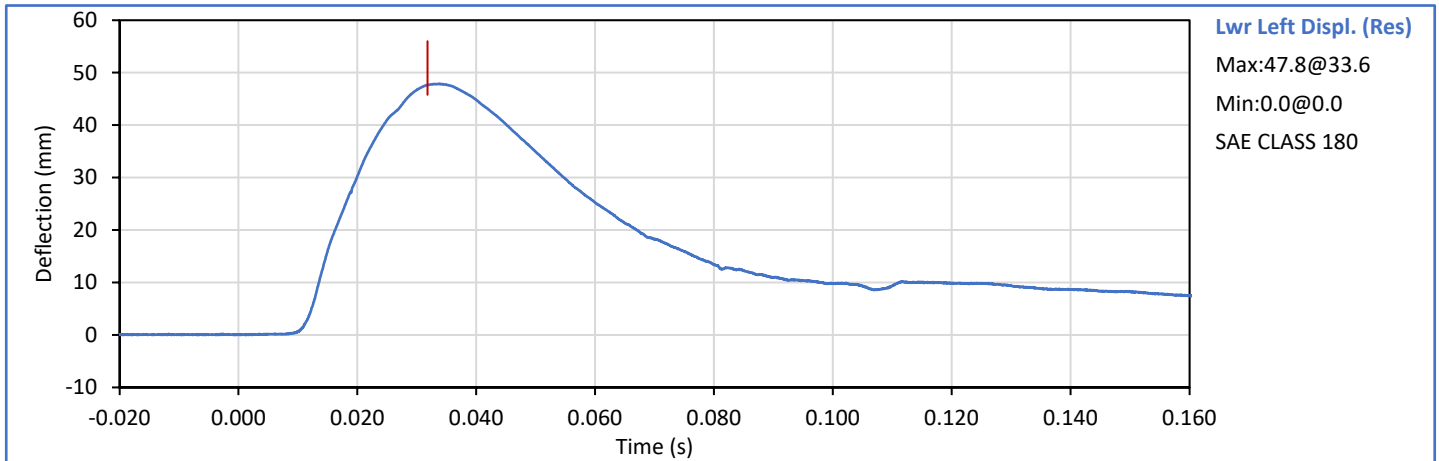
Technician: 
J. Hernandez


Approved By: 
P. Puzuto






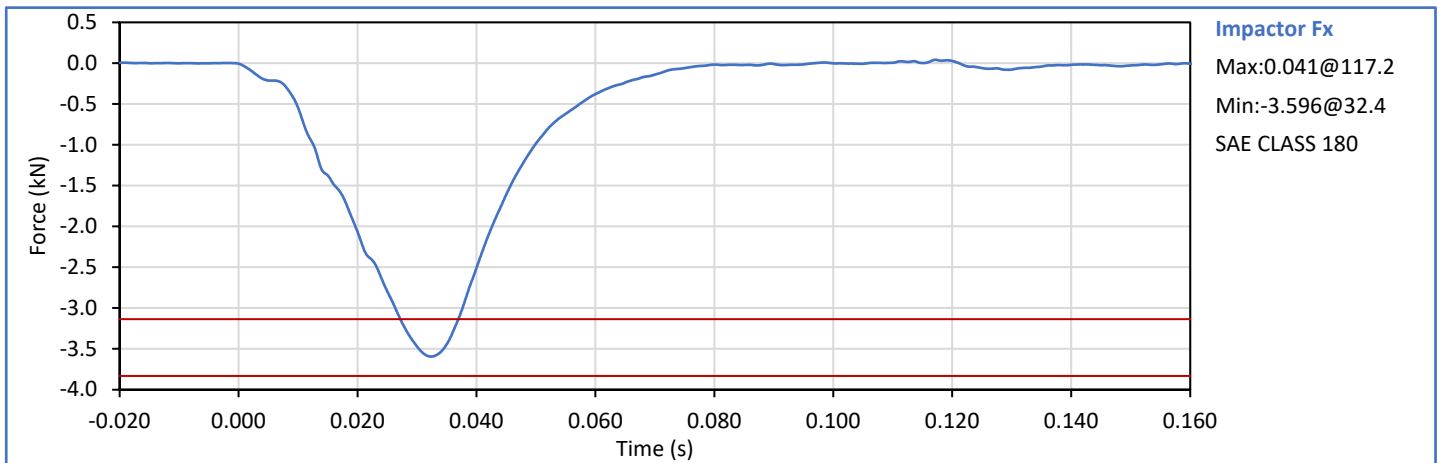
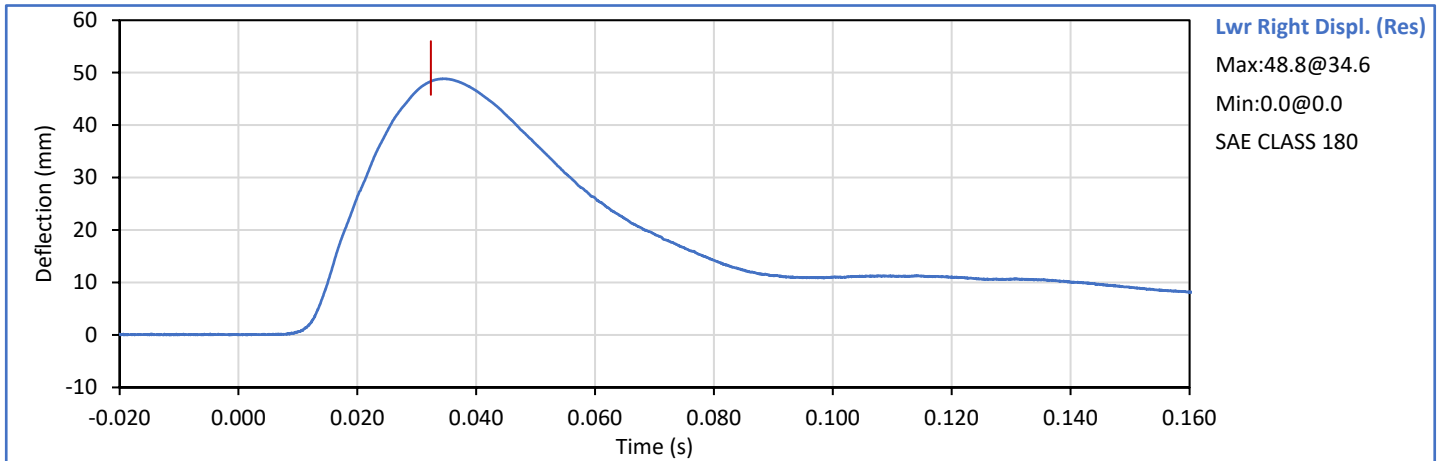
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	45	Pass
Probe Velocity	m/s	4.25	4.35	4.34	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.257	Pass
Lower Left Defl. Res. at Peak Fx	mm	45.8	56.0	47.6	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass





Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

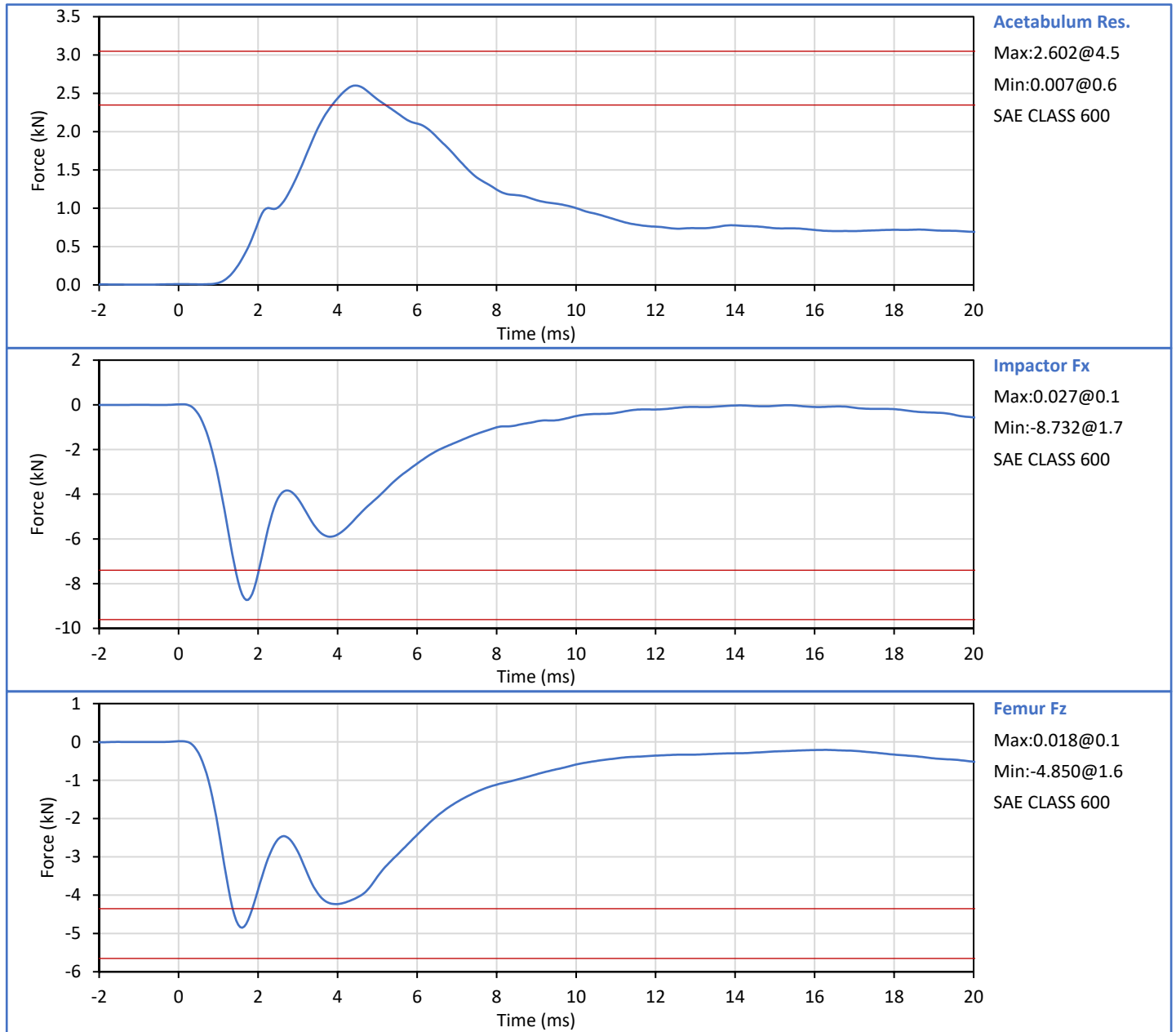
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.2	Pass
Laboratory Relative Humidity	%	10	70	42	Pass
Probe Velocity	m/s	4.25	4.35	4.33	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.596	Pass
Lower Left Defl. Res. at Peak Fx	mm	45.8	56.0	48.3	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass




Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

Tested Parameter	Units	Spec. Low ¹	Spec. High ¹	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.2	Pass
Laboratory Humidity	%	10	70	42	Pass
Pendulum Velocity	m/s	3.25	3.35	3.33	Pass
Peak Impactor Force	kN	-9.605	-7.395	-8.732	Pass
Peak Femur Fz	kN	-5.650	-4.350	-4.850	Pass
Acetabulum Force Resultant	kN	2.349	3.051	2.602	Pass
NHTSA Corridor 2020-03 (Preliminary Corridor)				Overall Test Results	Pass

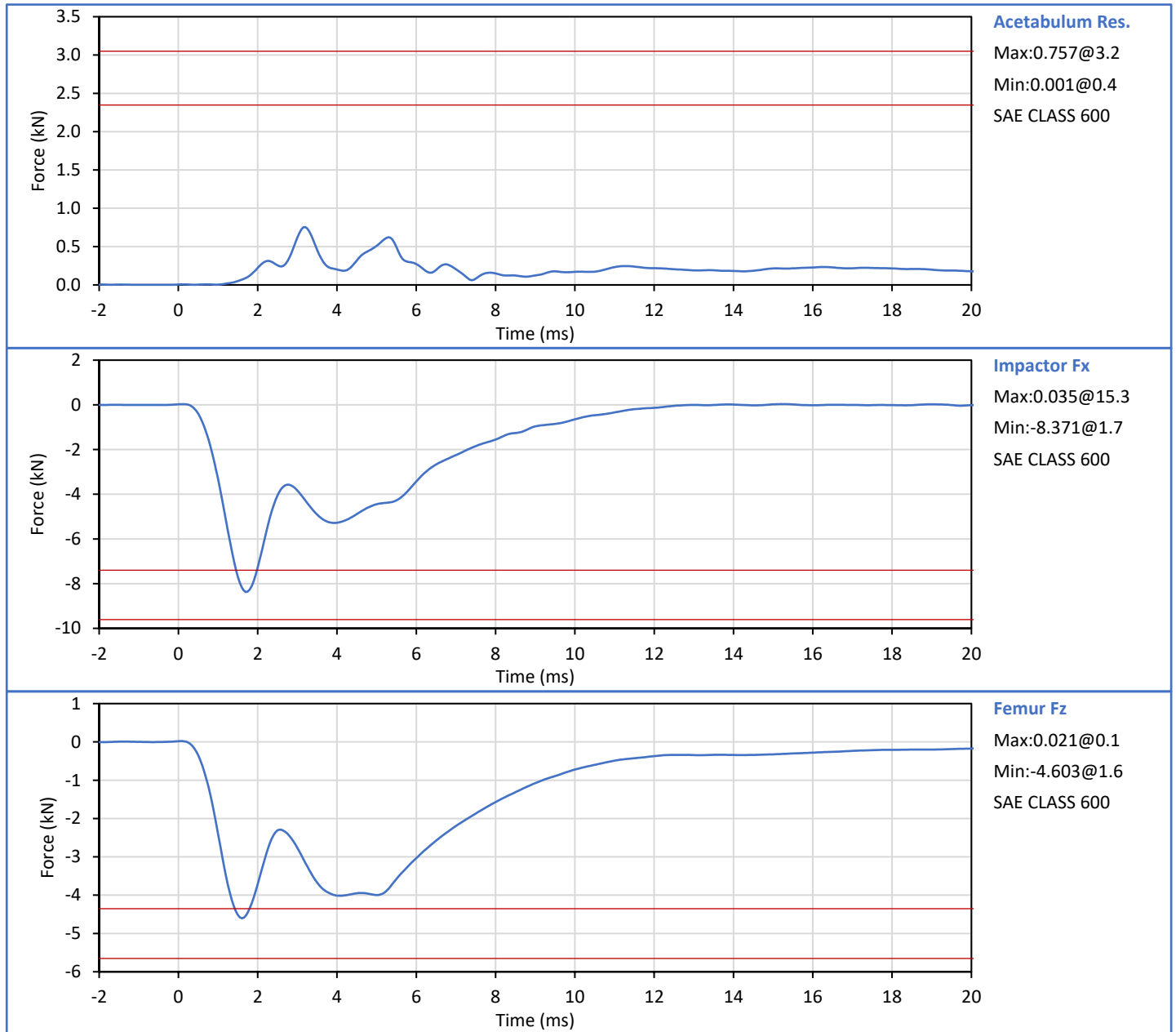


Technician: 
J. Hernandez


Approved By: 
P. Puzzuto

Tested Parameter	Units	Spec. Low ¹	Spec. High ¹	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.1	Pass
Laboratory Humidity	%	10	70	32	Pass
Pendulum Velocity	m/s	3.25	3.35	3.30	Pass
Peak Impactor Force	kN	-9.605	-7.395	-8.371	Pass
Peak Femur Fz	kN	-5.650	-4.350	-4.603	Pass
Acetabulum Force Resultant	kN	2.349	3.051	0.757	Fail
NHTSA Corridor 2020-03 (Preliminary Corridor)				Overall Test Results	Fail

* Acetabulum Load Cell Fx is not functioning



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

APPENDIX D
ATD Qualification and Performance Verification
Hybrid III 50th Percentile Male ATD
Post-Test Qualification (Full) S/N: 168

ATD Serial No.: 168

Test Date: 2021-06-28

Dummy Item	Inspect for	Comments	Damage	OK
Entire ATD	Perform general cleaning			✓
Outer Skin	Gashes, rips, cracks			✓
Head	Ballast secure			✓
	General appearance			✓
Neck bracket	Upper neck firmly attached to lower bracket			✓
Neck	Broken or cracked rubber			✓
	Looseness at the condyle joint			✓
Nodding block	Cracked or out of position			✓
Lumbar Spine	Broken or cracked rubber			✓
Ribs	Broken or bent ribs			✓
	Broken or bent rib supports			✓
	Damping material separated or cracked			✓
	Rubber bumpers in place			✓
Chest Displ. Assembly	Bent shaft			✓
	Slider arm riding in track			✓
Sensors	Check cables for cuts, tears			✓
	Check for damaged insulation			✓
Accelerometer Mounting	Head mounting secure			✓
	Chest mounting secure			✓
Knees	Skin condition			✓
	Insert (do not remove)			✓
	Casting			✓
Limbs	Normal movement and adjustment			✓
Knee Sliders	Wires intact			✓
	Rubber returned to "resting" position			✓
Pelvis	Broken			✓
Other	Describe below as needed			✓

Describe any repairs or replacement of parts or other findings:

No Problems Found

Technician: _____



J. Hernandez


Approved By: _____



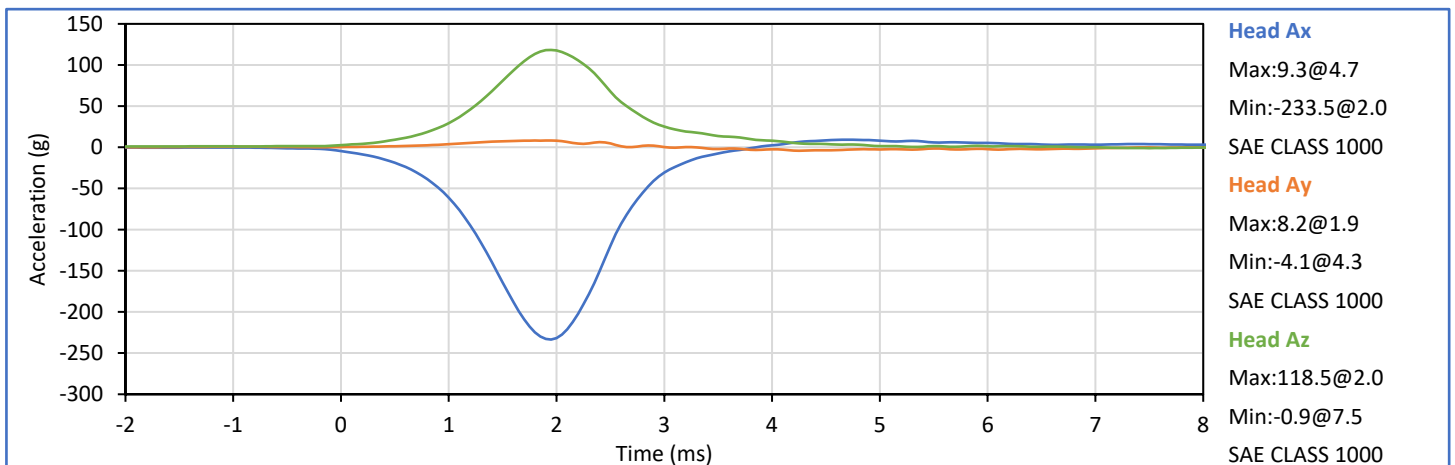
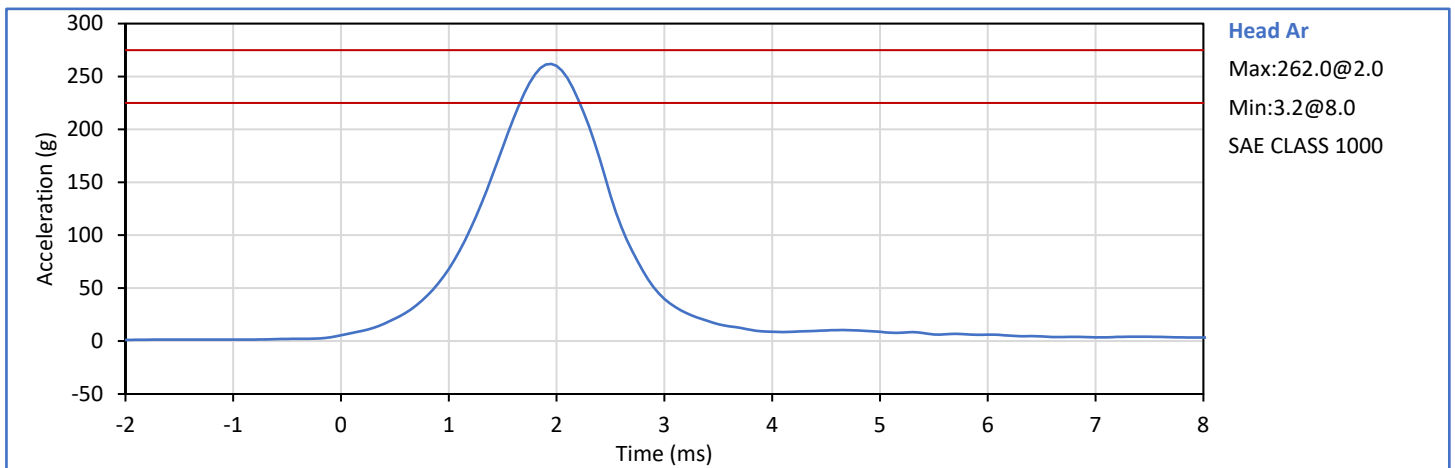
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	26	Pass
A - Total sitting height	mm	879	889	882	Pass
B - Shoulder pivot height	mm	505	521	515	Pass
C - 'H' point height	mm	84	89	86	Pass
D - 'H' point location from backline	mm	135	140	139	Pass
E - Shoulder pivot from backline	mm	84	94	89	Pass
F - Thigh clearance	mm	140	155	151	Pass
G - Back of elbow to wrist pivot	mm	290	305	295	Pass
H - Head back to backline	mm	41	46	45	Pass
I - Shoulder to elbow length	mm	330	345	337	Pass
J - Elbow rest height	mm	190	211	207	Pass
K - Buttock to knee length	mm	579	604	590	Pass
L - Popliteal length	mm	429	455	438	Pass
M - Knee pivot height	mm	485	500	493	Pass
N - Buttock popliteal length	mm	452	477	472	Pass
O - Chest depth without jacket	mm	213	229	220	Pass
P - Foot length	mm	251	267	256	Pass
V - Shoulder breadth	mm	422	437	429	Pass
W - Foot breadth	mm	91	107	101	Pass
Y - Chest circum. (w/chest jacket)	mm	970	1001	992	Pass
Z - Waist circum.	mm	836	866	855	Pass
AA - Location for chest circum.	mm	429	434	430	Pass
BB - Location for waist circum.	mm	226	231	228	Pass
Overall Test Results					Pass


Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

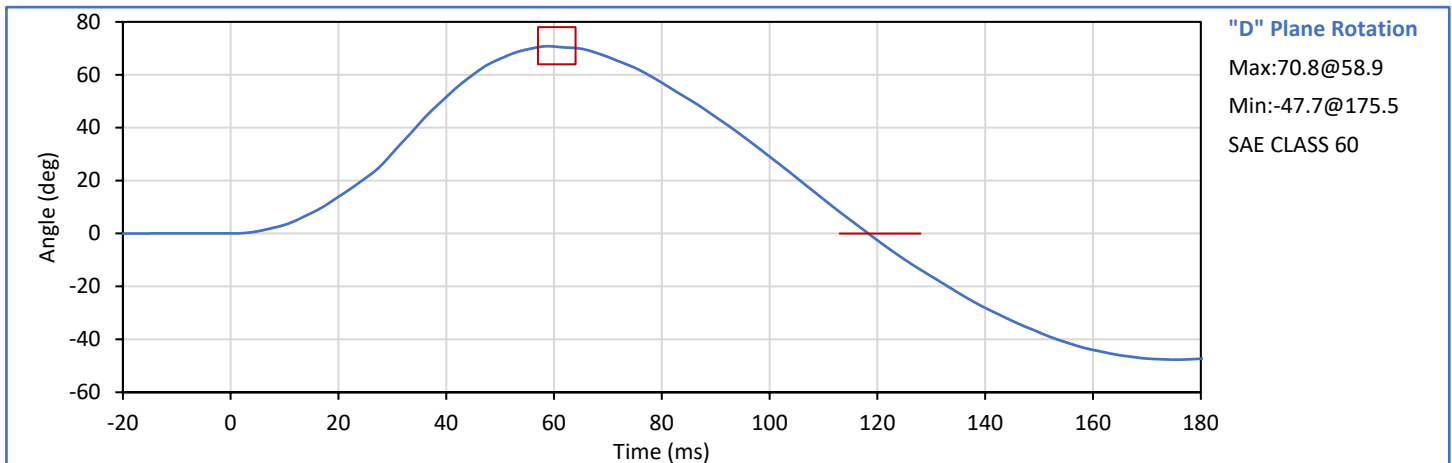
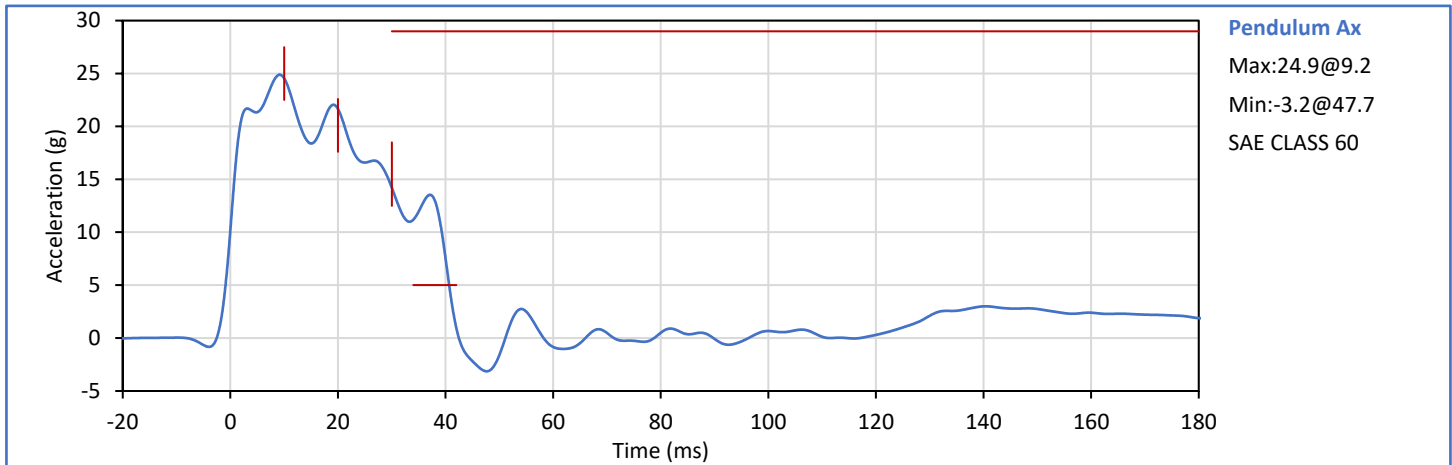
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Peak Resultant Acceleration	g	225.0	275.0	262.0	Pass
Peak Lateral Acceleration	g	-15.0	15.0	8.2	Pass
Oscillations After Main Pulse	%	0.0	10.0	2.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass




Technician: 
J. Hernandez

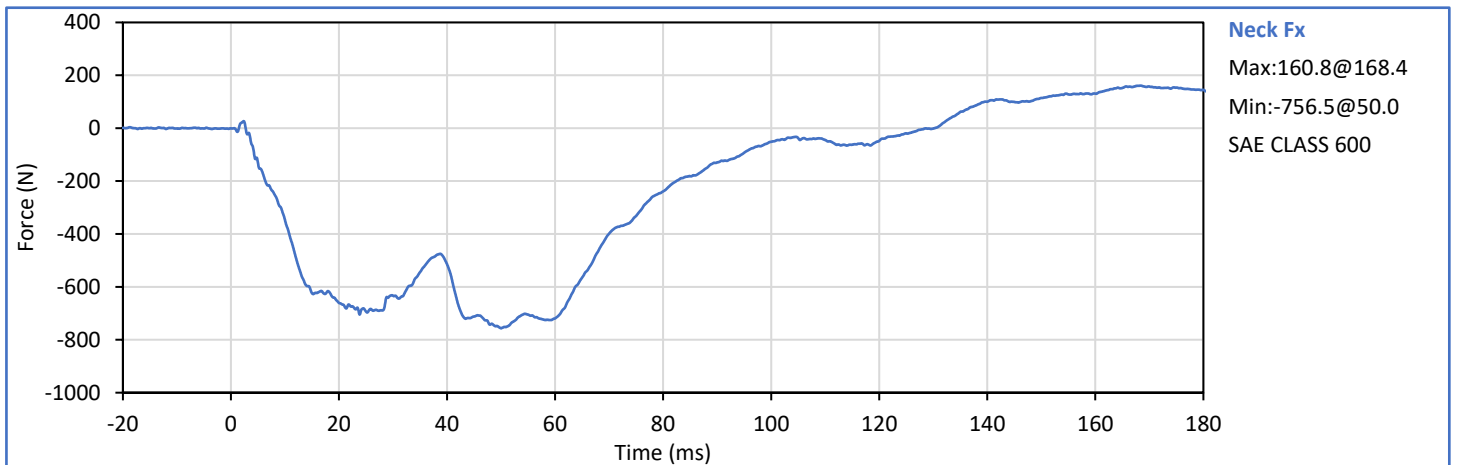
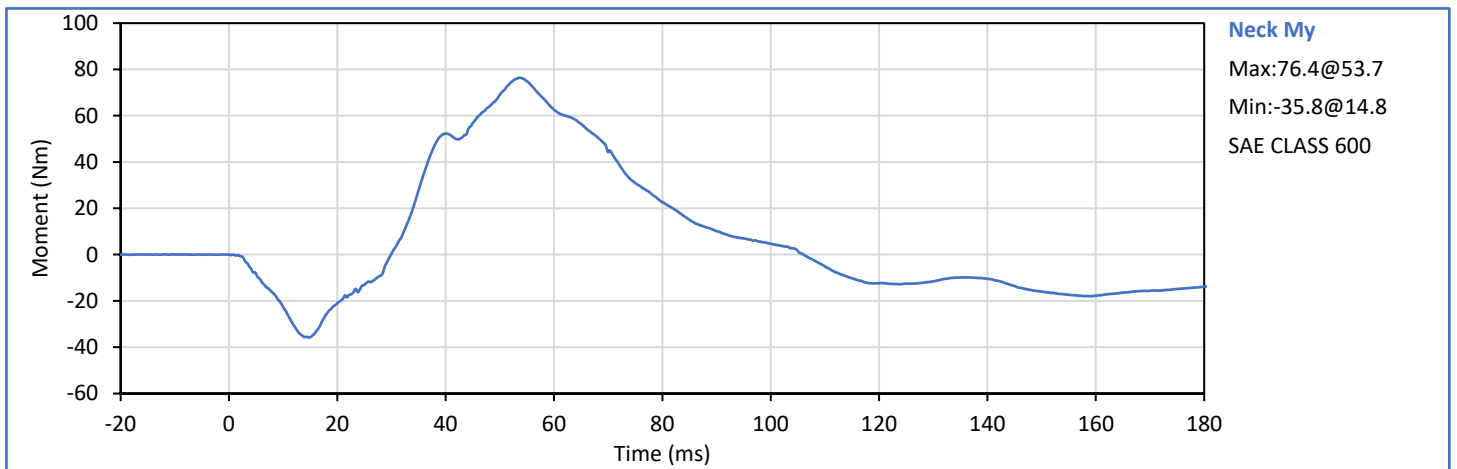
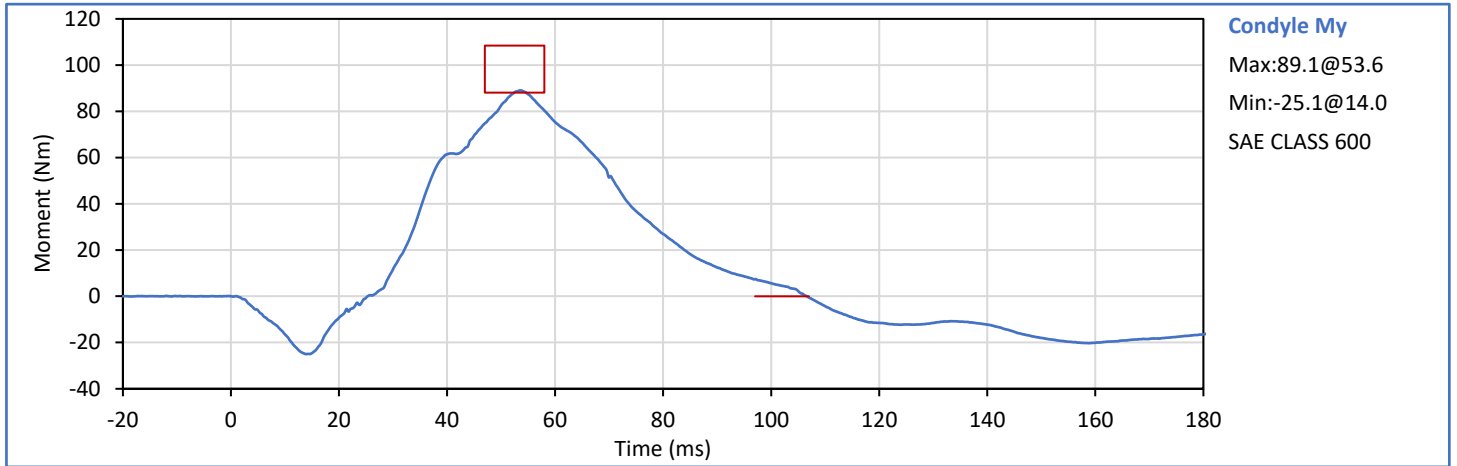
Approved By: 
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	6.89	7.13	6.96	Pass
Pendulum Deceleration at 10 ms	g	22.5	27.5	24.5	Pass
Pendulum Deceleration at 20 ms	g	17.6	22.6	21.6	Pass
Pendulum Deceleration at 30 ms	g	12.5	18.5	14.2	Pass
Peak Pendulum Decel After 30 ms	g	0.0	29.0	14.2	Pass
Deceleration Decay to Cross 5g	ms	34.0	42.0	40.7	Pass
"D" Plane Rotation peak	deg	64.0	78.0	70.8	Pass
	ms	57.0	64.0	58.9	Pass
"D" Plane Rotation Decay to Zero	ms	113.0	128.0	118.4	Pass
Moment About Occipital Condyle	Nm	88.1	108.5	89.1	Pass
	ms	47.0	58.0	53.6	Pass
Moment Decay, Peak to Zero	ms	97.0	107.0	106.6	Pass
Overall Test Results					Pass

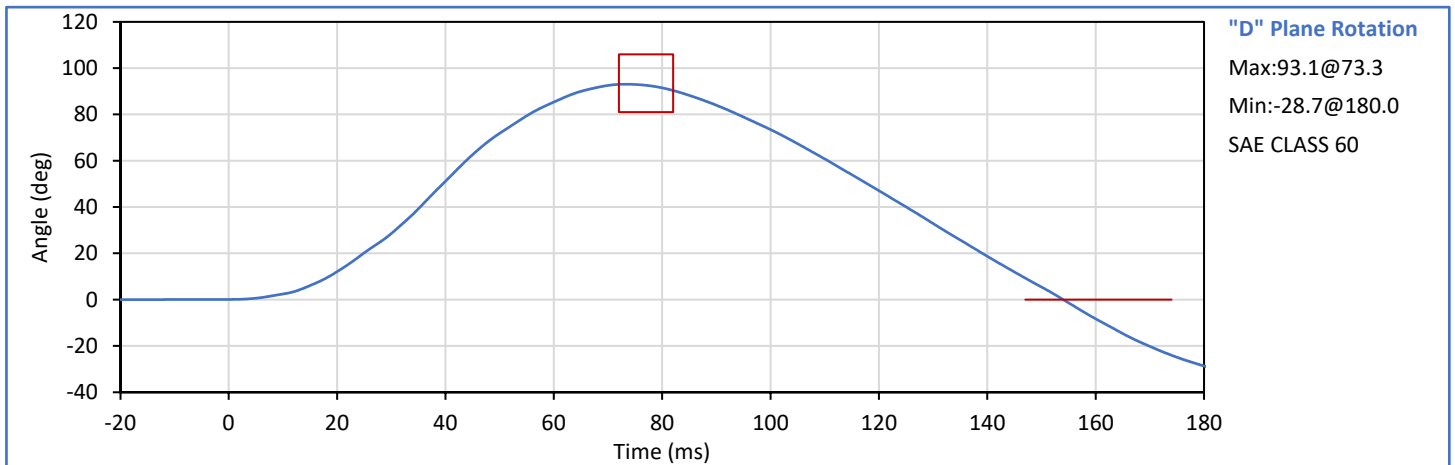
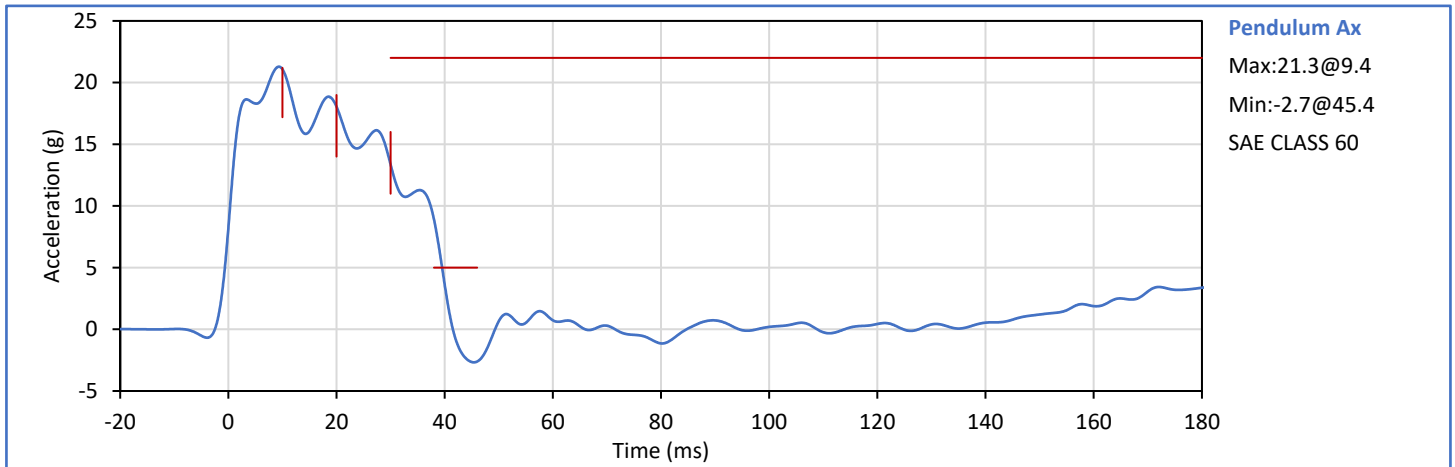


Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

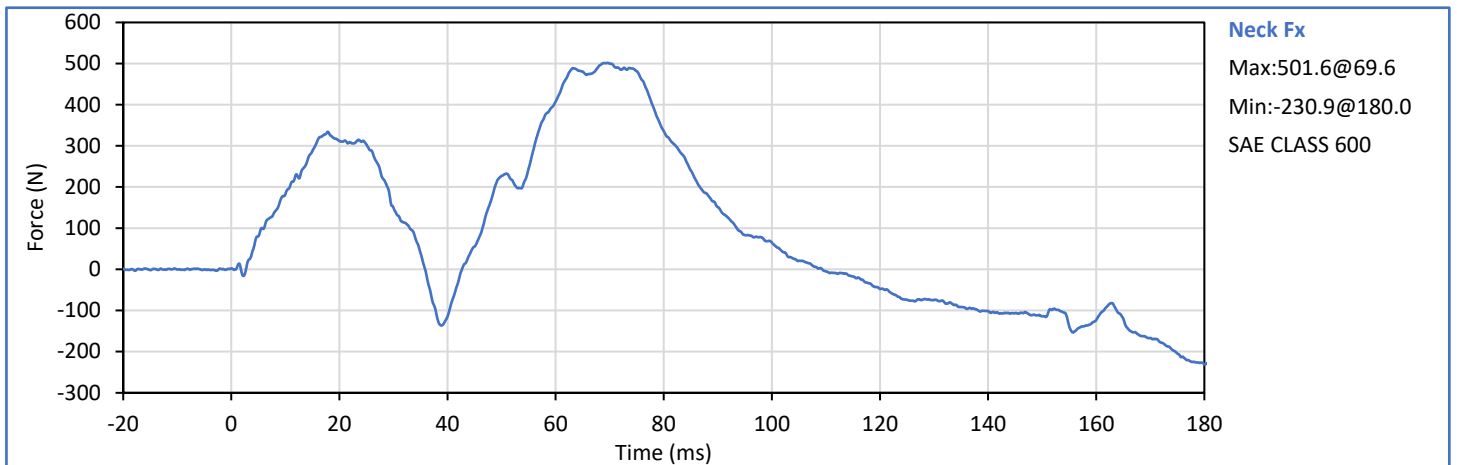
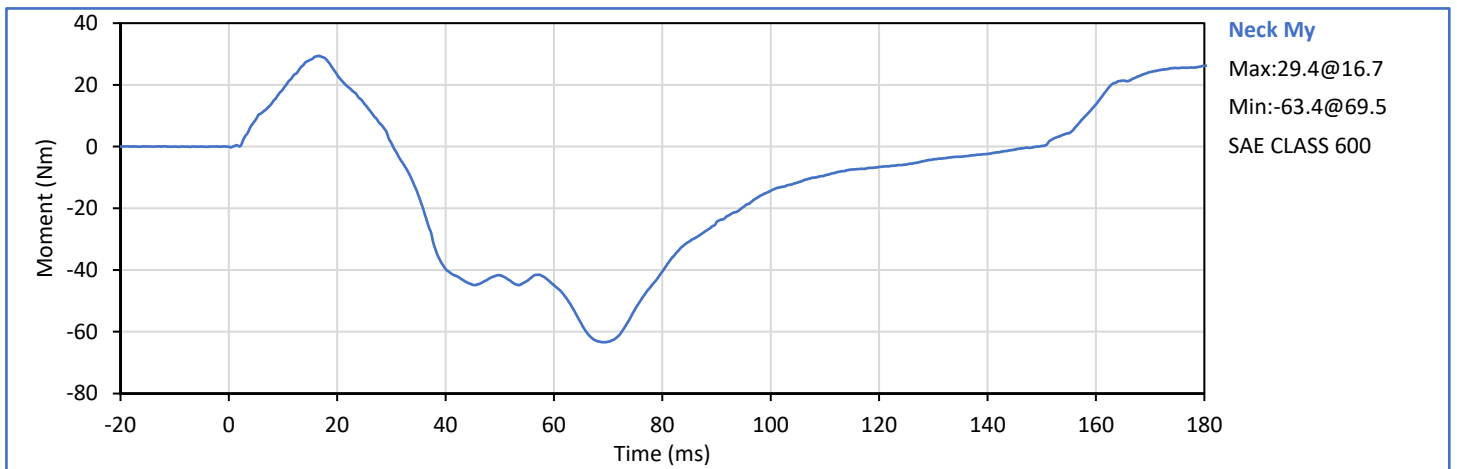
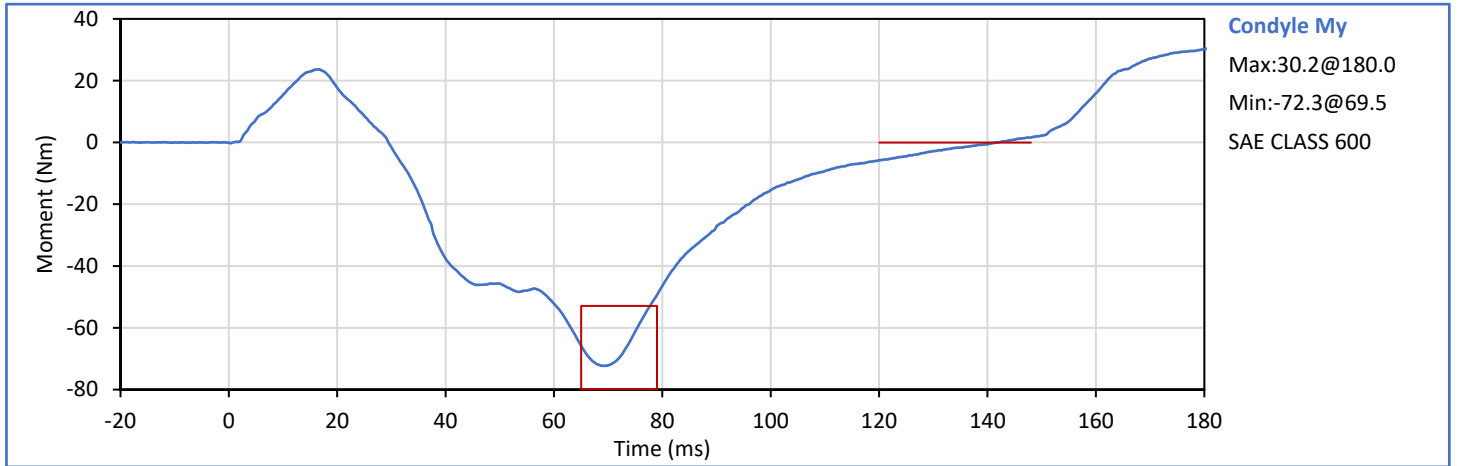


Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.94	6.19	6.11	Pass
Pendulum Deceleration at 10 ms	g	17.2	21.2	21.1	Pass
Pendulum Deceleration at 20 ms	g	14.0	19.0	18.1	Pass
Pendulum Deceleration at 30 ms	g	11.0	16.0	13.4	Pass
Peak Pendulum Decel After 30 ms	g	0.0	22.0	13.4	Pass
Deceleration Decay to Cross 5g	ms	38.0	46.0	39.5	Pass
"D" Plane Rotation peak	deg	81.0	106.0	93.1	Pass
	ms	72.0	82.0	73.3	Pass
"D" Plane Rotation Decay to Zero	ms	147.0	174.0	154.1	Pass
Moment About Occipital Condyle	Nm	-79.9	-52.9	-72.3	Pass
	ms	65.0	79.0	69.5	Pass
Moment Decay, Peak to Zero	ms	120.0	148.0	141.7	Pass
Overall Test Results					Pass

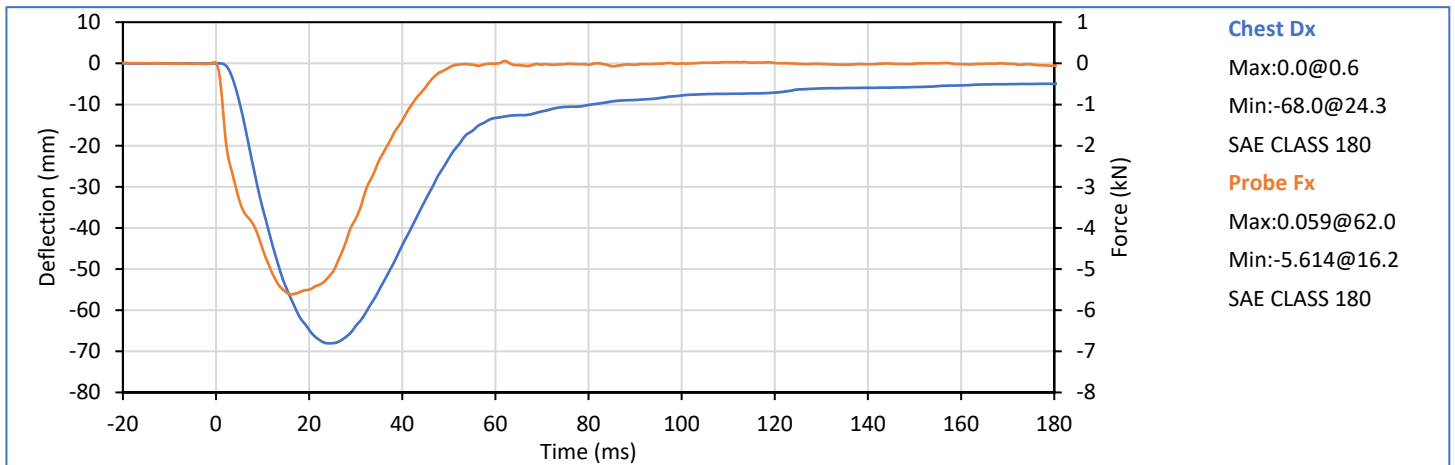
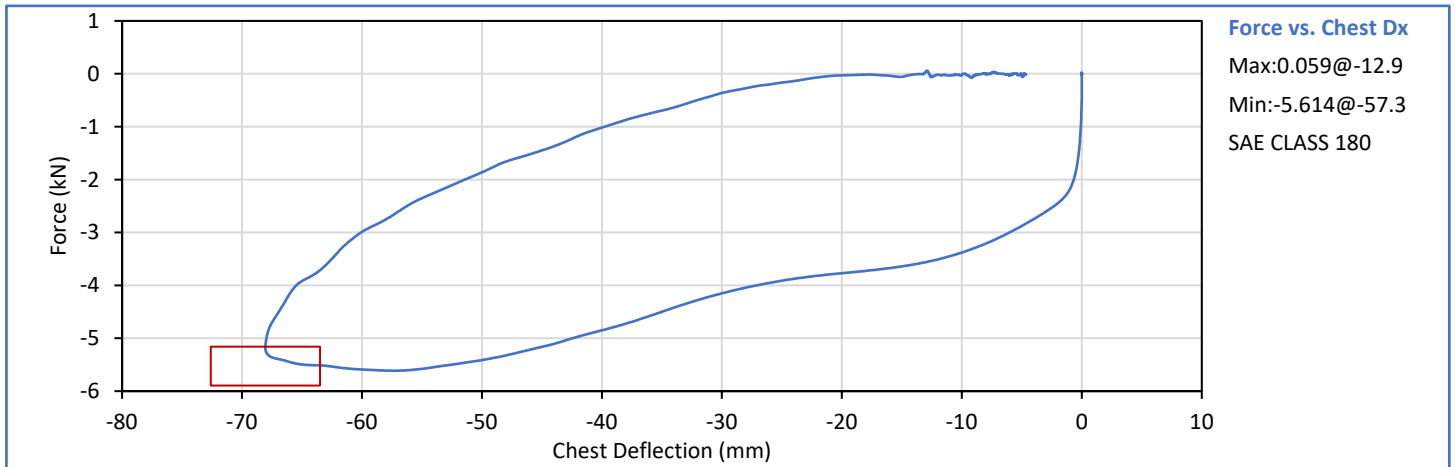


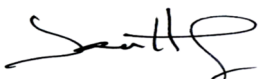
Technician: *J. Hernandez*
J. Hernandez


Approved By: *P. Puzzuto*
P. Puzzuto



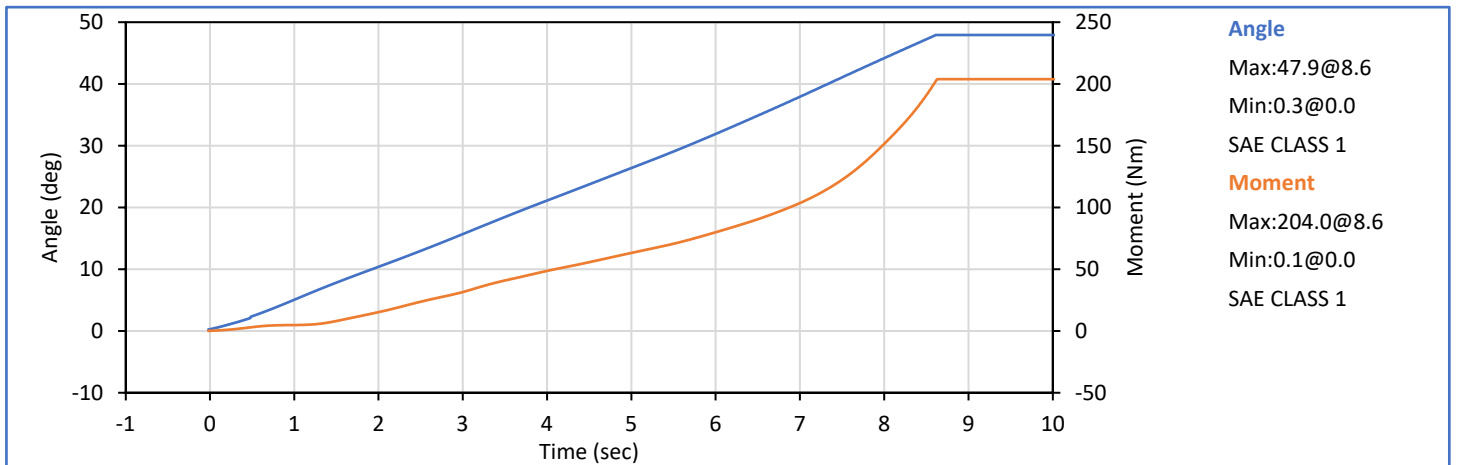
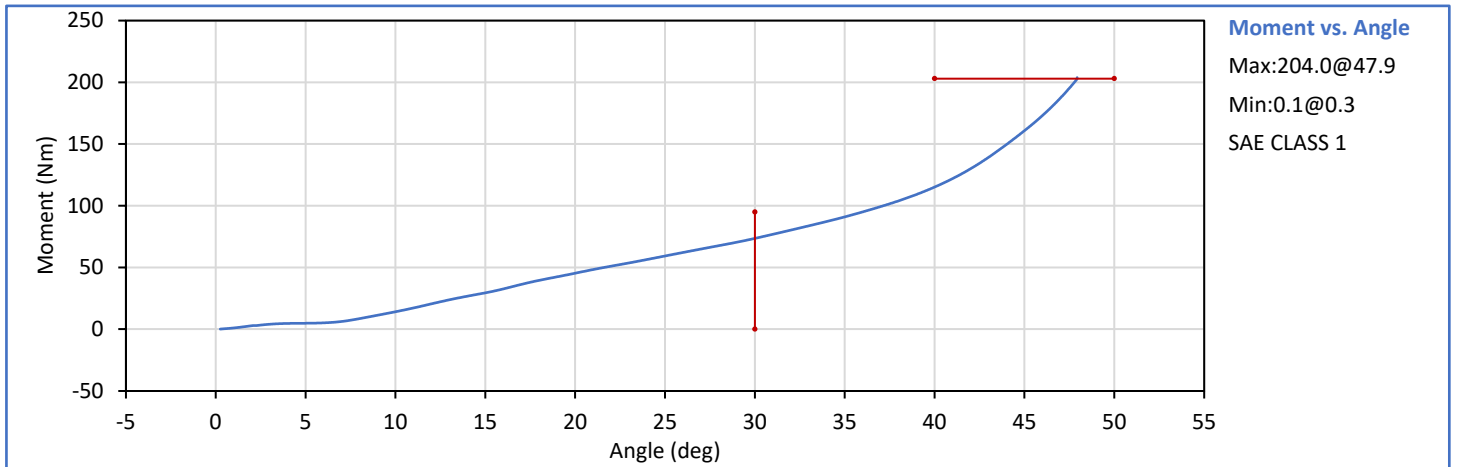
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Probe Velocity	m/s	6.58	6.82	6.71	Pass
Peak Chest Deflection	mm	-72.6	-63.5	-68.0	Pass
Peak Probe Force	kN	-5.893	-5.159	-5.614	Pass
Internal Hysterisis	%	69.0	85.0	74.0	Pass
Overall Test Results					Pass




Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

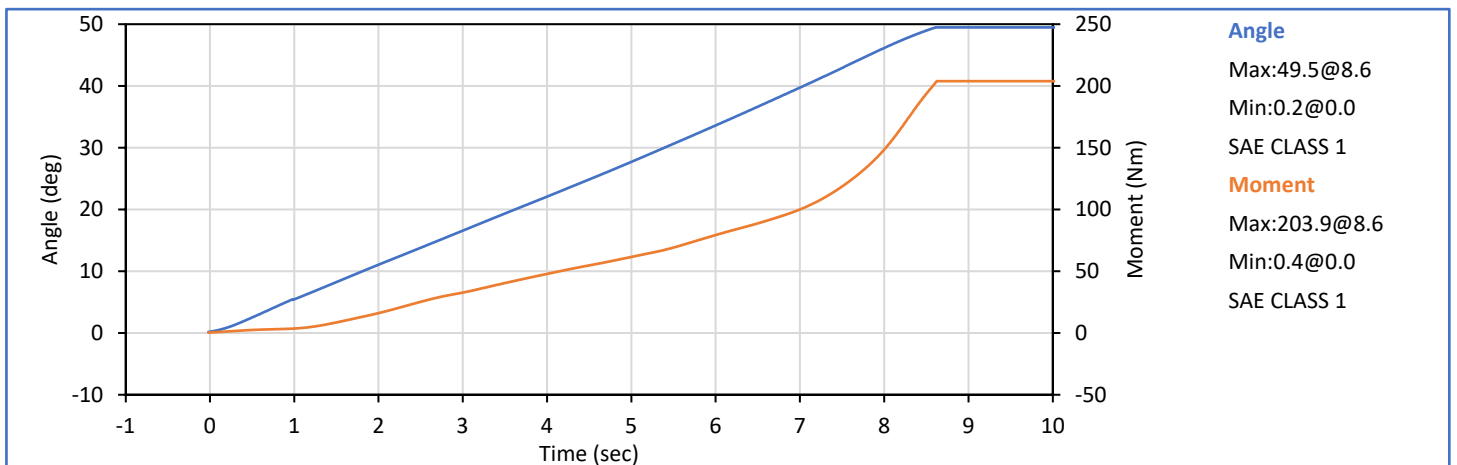
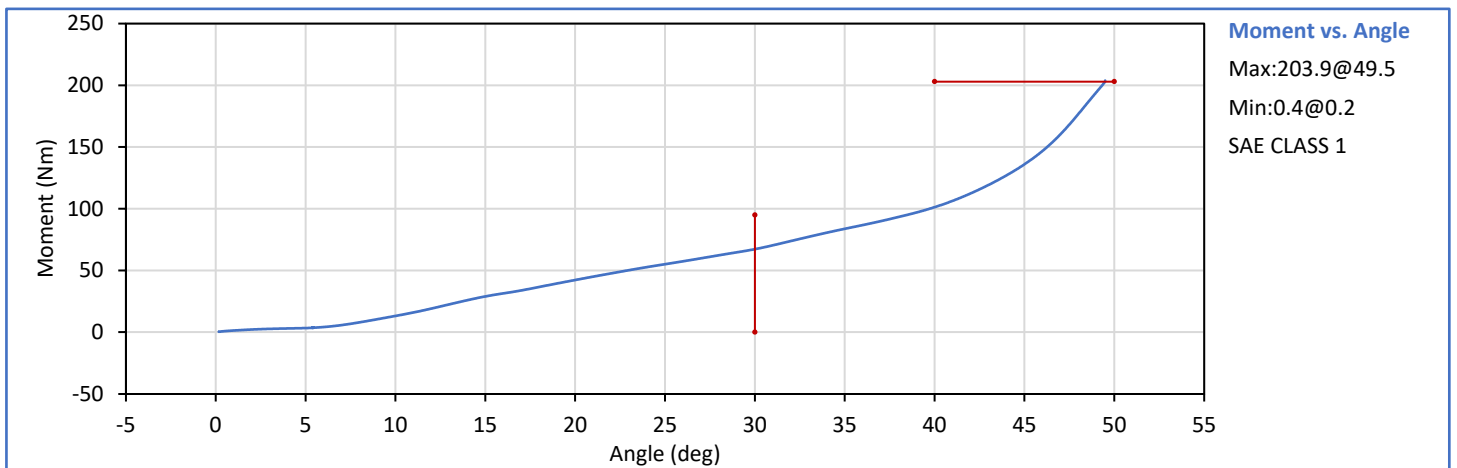
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	25	Pass
Left Hip Rotation Rate	deg/s	5.0	10.0	5.5	Pass
Left Femur Torque at 30°	Nm	0.0	95.0	73.5	Pass
Left Hip Rotation at 203 Nm	deg	40.0	50.0	47.9	Pass
Overall Test Results					Pass

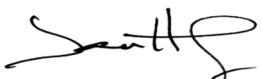



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

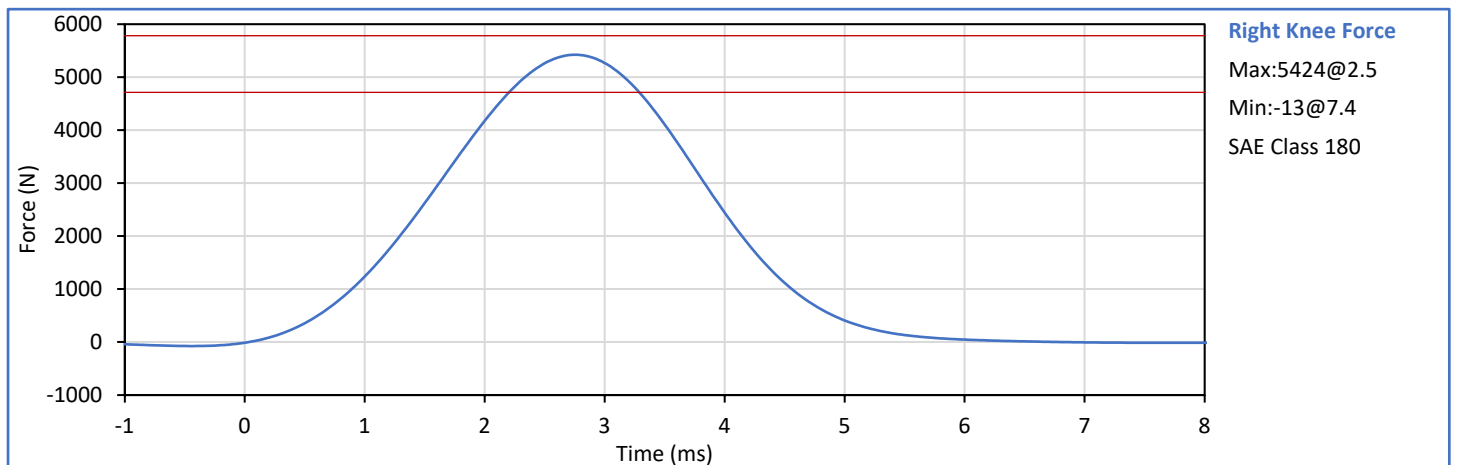
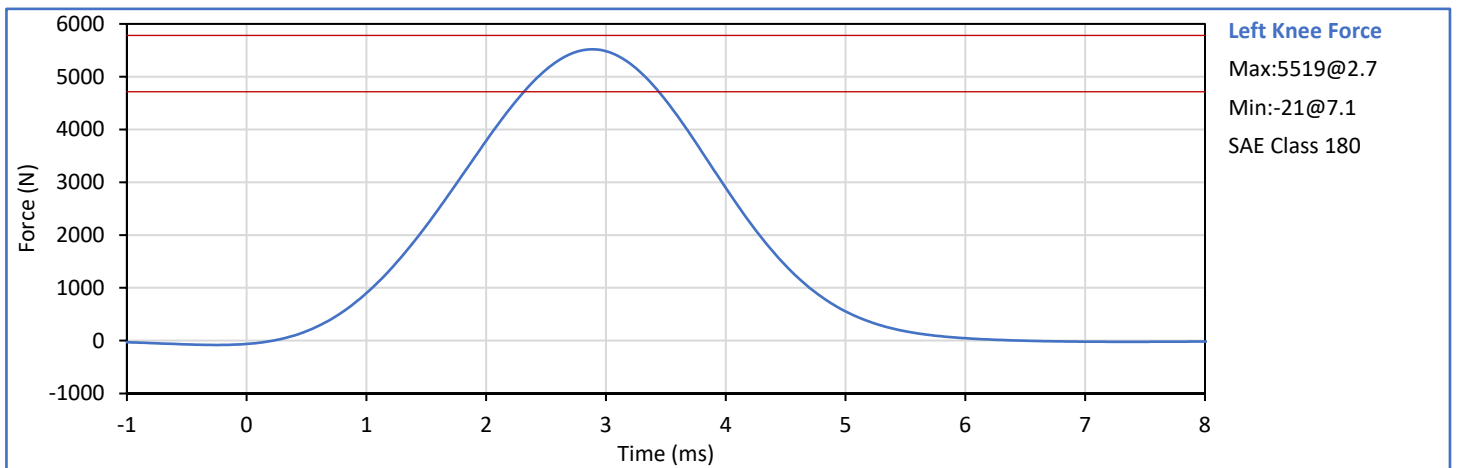
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	25	Pass
Right Hip Rotation Rate	deg/s	5.0	10.0	5.7	Pass
Right Femur Torque at 30°	Nm	0.0	95.0	67.2	Pass
Right Hip Rotation at 203 Nm	deg	40.0	50.0	49.5	Pass
Overall Test Results					Pass




Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

Tested Parameter		Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature		°C	18.9	25.6	20.6	Pass
Laboratory Relative Humidity		%	10	70	30	Pass
Left	Probe Velocity	m/s	2.070	2.130	2.110	Pass
Knee	Peak Resistive Force	N	4715	5782	5519	Pass
Right	Probe Velocity	m/s	2.070	2.130	2.110	Pass
Knee	Peak Resistive Force	N	4715	5782	5424	Pass
Overall Test Results					Pass	



Technician: 
J. Hernandez


Approved By: 
P. Puzzuto


APPENDIX E
THOR-50M 50TH PERCENTILE MALE ATD
PHYSICAL INSPECTION, PRE-TEST

ATD Serial No.: EG2595

Inspection Date: 2021-06-11

Overall Conditon/Functionality	Note
<p><u>Known errors in data channels (no data, clipping, unexpected drops):</u> Serial Number: DL9552-FX Right Acetabulum Force X bad channel. Serial Number: DW9502 Occipital Condyle Potentiometer not wired. Serial Number: DL9552-FX Right Acetabulum Force X bad channel, no data recorded during the test* Serial Number: DW9502 Occipital Condyle Potentiometer, no data recorded during the test**</p>	
<p><u>Physical evidence of damage:</u> *Right acetabulum force X was received with bad channel. It was investigated why it was not working and was determined it was not fixable without replacing the loadcell. NHTSA approved running the test without recording this channel. **Occipital Condyle Potentiometer was not wired when received and was required to be recorded. NHTSA approved running the test without recording this channel.</p>	
<p><u>Anecdotal evidence of damage:</u></p>	
<p><u>Equipment delivered to Borrower:</u> THOR-50M S/N EG2595 with DTS SLICE6 Internal DAS Laptop DTS MiniDistributor with cables and PSU</p>	

Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

ATD Serial No.: EG2595

Inspection Date: 2021-06-11

HEAD – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rear head cap mounts securely to head:	
✓	Head skin fits securely over skull	
✓	Head skin shows no sign of tears or damage	
✓	Interior components of skull (ballast, sensor mounts, sensors) securely attached:	
✓	Head securely mounted to OC joint:	
✗	Other:	See Details Page


Neck – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Neck cables slide freely through holes in neck plates:	
✓	Head can rotate about occipital condyle joint freely until the bump stops are engaged:	
✓	Neck cables show no sign of fraying, broken strands, or kinking	
✓	No evidence of de-bonding between neck pucks and plates. If failure, indicate which interface (i.e.: where plate/puck 1 attach to upper neck load cell):	
✓	No evidence of de-bonding or permanent compression in neck soft stop assemblies:	
✓	Neck securely attached to upper neck load cell:	
✓	Neck securely attached to lower neck load cell	
✓	Neck pitch change joint mechanism mating teeth are engaged	
✓	Other:	


JACKET – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rib stiffeners show no sign of permanent deformation:	
✓	No evidence of tears or holes in jacket fabric, velcro, or zippers:	
✓	Other:	

LEFT SHOULDER/ARM – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Urethane shoulder pads show no evidence of contact:	
✓	Clavicle securely attached to sternum and shoulder:	
✓	No evidence of debonding, tearing, or permanent compression of posterior soft stops	
✓	Other:	

RIGHT SHOULDER/ARM – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Urethane shoulder pads show no evidence of contact:	
✓	Clavicle securely attached to sternum and shoulder:	
✓	No evidence of debonding, tearing, or permanent compression of posterior soft stops	
✓	Other:	

Spine – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	No evidence of de-bonding between thoracic spine flex joint and metal plates:	
✓	No evidence of de-bonding between lumbar spine flex joint and metal plates:	
✓	Lumbar spine pitch change joint mechanism mating teeth are engaged:	
✓	Other:	

Technician: 
J. Hernandez

Approved By: 
P. Puzzuto


ATD Serial No.: EG2595


Inspection Date: 2021-06-11

THORAX – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	No evidence of contact at top, bottom, or interior faces of rib damping material:	
✓	No evidence of debonding between rib damping material and ribs:	
✓	IR-TRACC tubes securely attached to anterior ribs	
✓	IR-TRACC tubes securely attached to double gimbals, spine:	
✓	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration:	
✓	Ribs securely attached to posterior spine:	
✓	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners):	
✓	Other:	

ABDOMEN – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper:	
✓	Upper abdomen insert securely attached to spine:	
✓	Upper abdomen insert shows no evidence of permanent set:	
✓	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper:	
✓	Lower abdomen insert securely attached to spine:	
✓	Lower abdomen insert shows no evidence of permanent set:	
✓	Other:	

Pelvis – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Pelvis flesh fits securely over pelvis bones:	
✓	H-point tool fits securely into hole on both sides of pelvis:	
✓	ASIS load cells are secured to the iliac bones and iliac bones are firmly attached to the pelvis	
✓	The iliac bones are free from cracks or fractures	
✓	If welds are present in the iliac bones, the welds are continuous and devoid of cracks	
✓	Other:	

Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

ATD Serial No.: EG2595


Inspection Date: 2021-06-11


LEFT FEMUR – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Acetabular load cells firmly attached:	
✓	Femur load cell firmly attached:	
✓	No evidence of deformation of knee slider bump stop:	
✓	No cuts, tears, or scuffing of knee flesh:	
✓	Other:	

RIGHT FEMUR – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Acetabular load cells firmly attached:	
✓	Femur load cell firmly attached:	
✓	No evidence of deformation of knee slider bump stop:	
✓	No cuts, tears, or scuffing of knee flesh:	
✓	Other:	

LEFT LOWER EXTREMITY (LX) – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rotational potentiometers in ankle securely attached:	
✓	Achilles tendon provides resistance to dorsiflexion:	
✓	No evidence of debonding, tearing, or permanent compression of ankle soft stops:	
✓	No cuts, tears, or scuffing of leg flesh	
✓	Other:	

RIGHT LOWER EXTREMITY (LX) – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rotational potentiometers in ankle securely attached:	
✓	Achilles tendon provides resistance to dorsiflexion:	
✓	No evidence of debonding, tearing, or permanent compression of ankle soft stops:	
✓	No cuts, tears, or scuffing of leg flesh	
✓	Other:	

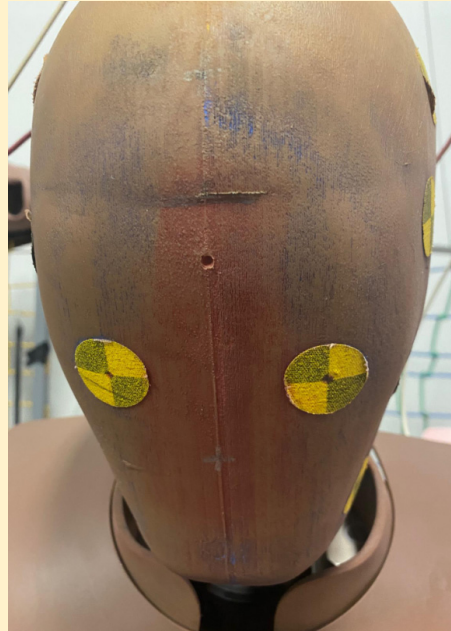
Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

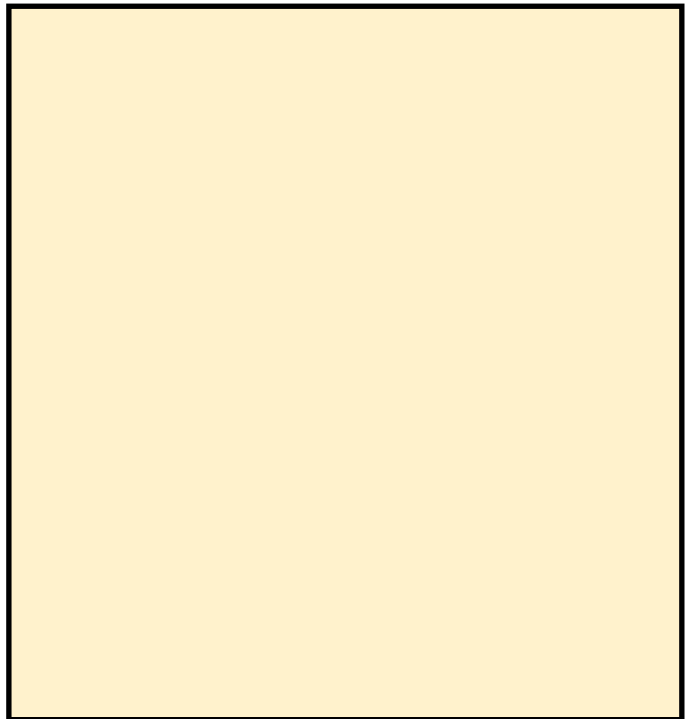
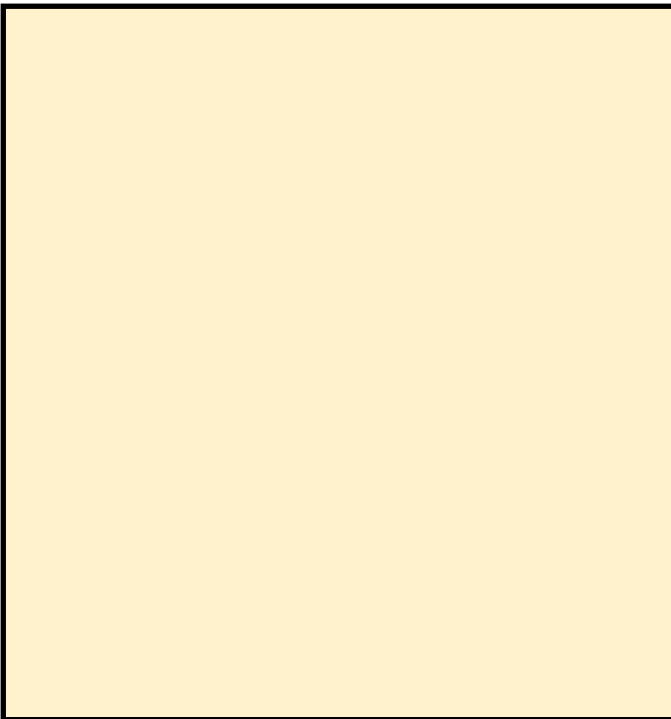
Damage and Discrepancy Details



Cuts in Face Foam



Cut on top of face.



Additional Notes:


None


APPENDIX F
THOR-50M 50TH PERCENTILE MALE ATD
PHYSICAL INSPECTION, POST-TEST

ATD Serial No.: EG2595

Inspection Date: 2021-06-30

Overall Conditon/Functionality	Note
<p><u>Known errors in data channels (no data, clipping, unexpected drops):</u> Serial Number: DL9552-FX Right Acetabulum Force X bad channel. Serial Number: DW9502 Occipital Condyle Potentiometer not wired. Serial Number: DL9552-FX Right Acetabulum Force X bad channel, no data recorded during the test* Serial Number: DW9502 Occipital Condyle Potentiometer, no data recorded during the test**</p>	
<p><u>Physical evidence of damage:</u> *Right acetabulum force X was received with bad channel. It was investigated why it was not working and was determined it was not fixable without replacing the loadcell. NHTSA approved running the test without recording this channel. **Occipital Condyle Potentiometer was not wired when received and was required to be recorded. NHTSA approved running the test without recording this channel.</p>	
<p><u>Anecdotal evidence of damage:</u></p>	
<p><u>Equipment delivered to Borrower:</u> THOR-50M S/N EG2595 with DTS SLICE6 Internal DAS Laptop DTS MiniDistributor with cables and PSU</p>	

Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

ATD Serial No.: EG2595

Inspection Date: 2021-06-30

HEAD – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rear head cap mounts securely to head:	
✓	Head skin fits securely over skull	
✓	Head skin shows no sign of tears or damage	
✓	Interior components of skull (ballast, sensor mounts, sensors) securely attached:	
✓	Head securely mounted to OC joint:	
✗	Other:	See Details Page


Neck – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Neck cables slide freely through holes in neck plates:	
✓	Head can rotate about occipital condyle joint freely until the bump stops are engaged:	
✓	Neck cables show no sign of fraying, broken strands, or kinking	
✓	No evidence of de-bonding between neck pucks and plates. If failure, indicate which interface (i.e.: where plate/puck 1 attach to upper neck load cell):	
✓	No evidence of de-bonding or permanent compression in neck soft stop assemblies:	
✓	Neck securely attached to upper neck load cell:	
✓	Neck securely attached to lower neck load cell	
✓	Neck pitch change joint mechanism mating teeth are engaged	
✓	Other:	


JACKET – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rib stiffeners show no sign of permanent deformation:	
✓	No evidence of tears or holes in jacket fabric, velcro, or zippers:	
✓	Other:	

LEFT SHOULDER/ARM – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Urethane shoulder pads show no evidence of contact:	
✓	Clavicle securely attached to sternum and shoulder:	
✓	No evidence of debonding, tearing, or permanent compression of posterior soft stops	
✓	Other:	

RIGHT SHOULDER/ARM – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Urethane shoulder pads show no evidence of contact:	
✓	Clavicle securely attached to sternum and shoulder:	
✓	No evidence of debonding, tearing, or permanent compression of posterior soft stops	
✓	Other:	

Spine – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	No evidence of de-bonding between thoracic spine flex joint and metal plates:	
✓	No evidence of de-bonding between lumbar spine flex joint and metal plates:	
✓	Lumbar spine pitch change joint mechanism mating teeth are engaged:	
✓	Other:	

Technician: 
J. Hernandez

Approved By: 
P. Puzzuto


ATD Serial No.: EG2595


Inspection Date: 2021-06-30

THORAX – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	No evidence of contact at top, bottom, or interior faces of rib damping material:	
✓	No evidence of debonding between rib damping material and ribs:	
✓	IR-TRACC tubes securely attached to anterior ribs	
✓	IR-TRACC tubes securely attached to double gimbals, spine:	
✓	Urethane bib is securely attached to ribs with no sign of tearing or washer penetration:	
✓	Ribs securely attached to posterior spine:	
✓	Rib stiffeners show no evidence of bending (no gaps between ribs and stiffeners):	
✓	Other:	

ABDOMEN – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	No evidence of tearing, cuts, or broken stitches in upper abdomen bag and zipper:	
✓	Upper abdomen insert securely attached to spine:	
✓	Upper abdomen insert shows no evidence of permanent set:	
✓	No evidence of tearing, cuts, or broken stitches in lower abdomen bag and zipper:	
✓	Lower abdomen insert securely attached to spine:	
✓	Lower abdomen insert shows no evidence of permanent set:	
✓	Other:	

Pelvis – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Pelvis flesh fits securely over pelvis bones:	
✓	H-point tool fits securely into hole on both sides of pelvis:	
✓	ASIS load cells are secured to the iliac bones and iliac bones are firmly attached to the pelvis	
✓	The iliac bones are free from cracks or fractures	
✓	If welds are present in the iliac bones, the welds are continuous and devoid of cracks	
✓	Other:	

Technician: 
J. Hernandez


Approved By: 
P. Puzzuto


LEFT FEMUR – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Acetabular load cells firmly attached:	
✓	Femur load cell firmly attached:	
✓	No evidence of deformation of knee slider bump stop:	
✓	No cuts, tears, or scuffing of knee flesh:	
✓	Other:	

RIGHT FEMUR – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Acetabular load cells firmly attached:	
✓	Femur load cell firmly attached:	
✓	No evidence of deformation of knee slider bump stop:	
✓	No cuts, tears, or scuffing of knee flesh:	
✓	Other:	

LEFT LOWER EXTREMITY (LX) – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rotational potentiometers in ankle securely attached:	
✓	Achilles tendon provides resistance to dorsiflexion:	
✓	No evidence of debonding, tearing, or permanent compression of ankle soft stops:	
✓	No cuts, tears, or scuffing of leg flesh	
✓	Other:	

RIGHT LOWER EXTREMITY (RX) – Pass(✓)/Fail(✗). If Fail, explain reason and/or attach picture		Note
✓	Rotational potentiometers in ankle securely attached:	
✓	Achilles tendon provides resistance to dorsiflexion:	
✓	No evidence of debonding, tearing, or permanent compression of ankle soft stops:	
✓	No cuts, tears, or scuffing of leg flesh	
✓	Other:	

Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

Damage and Discrepancy Details



Cuts in Face Foam



Cut on top of face.

Additional Notes:

None

APPENDIX G
THOR-50M 50TH PERCENTILE MALE ATD
SENSOR POLARITIES

THOR-50M 50th Percentile Male ATD
Sensor Polarities

ATD S/N: EG2595

Date: 5/10/2021

Note 1: Some polarities may appear counter to the specified wiring. The use of wired adapters may influence polarities

Note 2: Highlighted SAE polarity shows a deviation from SAE standard or an expected negative polarity to the mechanical input

Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Head and Neck	Head Accelerometers Primary	Ax	HEAD0000THACXP	Impact back of head	+	-	Yes
		Ay	HEAD0000THACYP	Impact left of head	+	+	No
		Az	HEAD0000THACZP	Impact top of head	+	+	No
	Head Accelerometers Redundant	Ax	HEADRD00THACXP	Impact back of head	+	NA	NA
		Ay	HEADRD00THACYP	Impact left of head	+	NA	NA
		Az	HEADRD00THACZP	Impact top of head	+	NA	NA
	Head ARS	ω_x	HEAD0000THAVXP	Rotate right ear toward right shoulder	+	-	Yes
		ω_y	HEAD0000THAVYP	Rotate chin away from sternum	+	+	No
		ω_z	HEAD0000THAVZP	Rotate chin toward right shoulder	+	-	Yes
	Front Neck Spring	Fz	NECKFR00THFOZP	Rotate head rearward	+	+	No
	Rear Neck Spring	Fz	NECKRE00THFOZP	Rotate chin toward chest	+	+	No
	O.C. Rotary Pot	Ry	NECKUP00THANYP	Rotate chin toward chest	+	NA	NA
	Upper Neck Load	Fx	NECKUP00THFOXP	Move head rear, chest forward	+	+	No
		Fy	NECKUP00THFOYP	Move head left, chest right	+	+	No
		Fz	NECKUP00THFOZP	Move head up, chest down	+	+	No
		Mx	NECKUP00THMOXP	Rotate left ear toward left shoulder	+	+	No
		My	NECKUP00THMOYP	Rotate chin toward sternum	+	+	No
		Mz	NECKUP00THMOZP	Rotate chin toward left shoulder	+	+	No
	Lower Neck Load	Fx	NECKLO00THFOXP	Move head rear, chest forward	+	NA	NA
		Fy	NECKLO00THFOYP	Move head left, chest right	+	NA	NA
		Fz	NECKLO00THFOZP	Move head up, chest down	+	NA	NA
		Mx	NECKLO00THMOXP	Rotate left ear toward left shoulder	+	NA	Yes
		My	NECKLO00THMOYP	Rotate chin toward sternum	+	NA	Yes
Mz		NECKLO00THMOZP	Rotate chin toward left shoulder	+	NA	Yes	
Face Loads	Fx	NA	Hold back of head, push face rearward	-	NA	NA	

THOR-50M 50th Percentile Male ATD
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Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Spine and Thorax	T1 Accelerometer	Ax	THSP0100THACXP	Impact back of T1Spine	+	NA	NA
		Ay	THSP0100THACYP	Impact left of T1Spine	+	NA	NA
		Az	THSP0100THACZP	Impact top of Spine	+	NA	NA
	T1 ARS	ω_x	THSP0100THAVXP	Rotate spine sideways to the right	+	NA	NA
		ω_y	THSP0100THAVYP	Rotate spine rearward	+	NA	NA
		ω_z	THSP0100THAVZP	Left shoulder forward, right shoulder aft	+	NA	NA
	Mid Sternum Accelerometer	Ax	STRN0000THACXP	Rotate dummy back (face up)	+	NA	NA
	T6 Accelerometer (Chest CG)	Ax	THSP0600THACXP	Impact back of T6 Spine	+	-	Yes
		Ay	THSP0600THACYP	Impact left of T6 Spine	+	+	No
		Az	THSP0600THACZP	Impact top of Spine	+	-	Yes
	T6 ARS	ω_x	THSP0600THAVXP	Right shoulder down	+	-	Yes
		ω_y	THSP0600THAVYP	Shoulders back	+	+	No
		ω_z	THSP0600THAVZP	Left shoulder forward, right shoulder back	+	-	Yes
	T12 (Thoracic Spine) Accelerometer	Ax	THSP1200THACXP	Impact back of T12 Spine	+	NA	NA
		Ay	THSP1200THACYP	Impact left of T12 Spine	+	NA	NA
		Az	THSP1200THACZP	Impact top of Spine	+	NA	NA
	T12 (Thoracic Spine) ARS	ω_x	THSP1200THAVXP	Impact back of T12 Spine	+	NA	NA
		ω_y	THSP1200THAVYP	Impact left of T12 Spine	+	NA	NA
		ω_z	THSP1200THAVZP	Impact top of Spine	+	NA	NA
	T12 (Thoracic Spine) Load	Fx	THSP1200THFOXP	Move chest rear, pelvis forward	+	+	No
		Fy	THSP1200THFOYP	Move chest left, pelvis right	+	+	No
		Fz	THSP1200THFOZP	Move chest up, pelvis down	+	+	No
		Mx	THSP1200THMOXP	Rotate left shoulder toward left hip	+	+	No
		My	THSP1200THMOYP	Rotate sternum towards front of legs	+	+	No
	Left Clavicle (Medial) Load	Fx	NA	Pull clavicle forward away from spine	+	NA	NA
		Fz	NA	Push clavicle down towards pelvis	+	NA	NA
	Left Clavicle (Lateral) Load	Fx	NA	Push clavicle forward away from spine	+	NA	NA
Fz		NA	Push clavicle down towards pelvis	+	NA	NA	
Right Clavicle (Medial) Load	Fx	NA	Push clavicle forward away from spine	+	NA	NA	
	Fz	NA	Push clavicle down towards pelvis	+	NA	NA	
Right Clavicle (Lateral) Load	Fx	NA	Push clavicle forward away from spine	+	NA	NA	
	Fz	NA	Push clavicle down towards pelvis	+	NA	NA	
Abdomen	Upper Abdomen Accel,	Ax	NA	Impact back of Spine	+	NA	NA

THOR-50M 50th Percentile Male ATD
Sensor Polarities

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Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Pelvis	Left ASIS Load (Anterior Superior Iliac Spine)	Fx	ILACLE00THFOXP	Push in towards back of pelvis	-	-	No
		My	ILACLE00THMOYP	Push top of ASIS towards back of pelvis	+	+	No
	Right ASIS Load (Anterior Superior Iliac Spine)	Fx	ILACRI00THFOXP	Push in towards back of pelvis	-	-	No
		My	ILACRI00THMOYP	Push top of ASIS towards back of pelvis	+	+	No
	Left Acetabular Load	Fx	ACTBLE00THFOXP	Move femur forward, pelvis rear	+	-	Yes
		Fy	ACTBLE00THFOYP	Move femur right, pelvis left	+	+	No
		Fz	ACTBLE00THFOZP	Move femur down, pelvis up	+	+	No
	Right Acetabular Load	Fx	ACTBRI00THFOXP	Move femur forward, pelvis rear	+	+	No
		Fy	ACTBRI00THFOYP	Move femur right, pelvis left	+	-	Yes
		Fz	ACTBRI00THFOZP	Move femur down, pelvis up	+	-	Yes
	Pelvis CG Accelerometer	Ax	PELV0000THACXP	Impact back of Pelvis	+	-	Yes
		Ay	PELV0000THACYP	Impact left of Pelvis	+	+	No
		Az	PELV0000THACZP	Impact top of Spine	+	+	No
	Pelvis CG ARS	ω_x	PELV0000THAVXP	Right shoulder down	+	-	Yes
		ω_y	PELV0000THAVYP	Shoulders back, legs up	+	+	No
ω_z		PELV0000THAVZP	Twist pelvis, body, and legs right	+	+	No	
Femurs	Left Femur Load	Fx	FEMRLE00THFOXP	Move knee upward, upper femur down	+	+	No
		Fy	FEMRLE00THFOYP	Move knee right, upper femur left	+	+	No
		Fz	FEMRLE00THFOZP	Move knee forward, femur rear	+	+	No
		Mx	FEMRLE00THMOXP	Rotate knee left, hold upper femur	+	+	No
		My	FEMRLE00THMOYP	Rotate knee up, hold upper femur	+	+	No
		Mz	FEMRLE00THMOZP	Rotate tibia left, hold pelvis	+	+	No
	Right Femur Load	Fx	FEMRRI00THFOXP	Move knee upward, upper femur down	+	+	No
		Fy	FEMRRI00THFOYP	Move knee right, upper femur left	+	+	No
		Fz	FEMRRI00THFOZP	Move knee forward, femur rear	+	+	No
		Mx	FEMRRI00THMOXP	Rotate knee left, hold upper femur	+	+	No
		My	FEMRRI00THMOYP	Rotate knee up, hold upper femur	+	+	No
		Mz	FEMRRI00THMOZP	Rotate tibia left, hold pelvis	+	+	No

THOR-50M 50th Percentile Male ATD
Sensor Polarities

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Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Lower Extremity Left	Knee Shear Displacement	Dx	KNSLLE00THDSXP	Hold femur, move tibia forward	+	+	No
	Upper Tibia Load	Fx	TIBILEUPTHFOXP	Move tibia forward, knee rearward	+	+	No
		Fy	TIBILEUPTHFOYP	Move ankle right, knee left	+	+	No
		Fz	TIBILEUPTHFOZP	Move ankle down, knee up	+	+	No
		Mx	TIBILEUPTHMOXP	Impact left of Tibia	+	+	No
		My	TIBILEUPTHMOYP	Impact front of Tibia	+	+	No
	Lower Tibia Load	Fx	TIBILELOTHFOXP	Move ankle forward, knee rearward	+	+	No
		Fy	TIBILELOTHFOYP	Move ankle right, knee left	+	+	No
		Fz	TIBILELOTHFOZP	Move ankle down, knee up	+	+	No
		Mx	TIBILELOTHMOXP	Impact left of Tibia	+	+	No
		My	TIBILELOTHMOYP	Impact front of Tibia	+	+	No
	Tibia Accelerometer	Ax	TIBILE00THACXP	Impact back of Tibia	+	NA	NA
		Ay	TIBILE00THACYP	Impact left of Tibia	+	NA	NA
	Achilles Load	Fz	ANKLLE00THFOOP	Rotate foot forward	+	NA	NA
	Ankle Rotation	Rx	ANKLLE00THANXP	Hold tibia, rotate foot leftward	+	+	No
		Ry	ANKLLE00THANYP	Hold tibia, push toe upward	+	-	Yes
		Rz	ANKLLE00THANZP	From top, hold tibia, rotate foot CCW	+	-	Yes
	Foot Acceleration	Ax	FOOTLE00THACXP	Impact back of Foot	+	NA	NA
Ay		FOOTLE00THACYP	Impact left of Foot	+	NA	NA	
Az		FOOTLE00THACZP	Impact top of Foot	+	NA	NA	

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Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Lower Extremity Right	Knee Shear Displacement	Dx	KNSLR100THDSXP	Hold femur, move tibia forward	+	+	No
	Upper Tibia Load	Fx	TIBIRIUPTHFOXP	Move tibia forward, knee rearward	+	+	No
		Fy	TIBIRIUPTHFOYP	Move ankle right, knee left	+	+	No
		Fz	TIBIRIUPTHFOZP	Move ankle down, knee up	+	+	No
		Mx	TIBIRIUPTHMOXP	Impact left of Tibia	+	+	No
		My	TIBIRIUPTHMOYP	Impact front of Tibia	+	+	No
	Lower Tibia Load	Fx	TIBIRILOTHFOXP	Move ankle forward, knee rearward	+	+	No
		Fy	TIBIRILOTHFOYP	Move ankle right, knee left	+	+	No
		Fz	TIBIRILOTHFOZP	Move ankle down, knee up	+	+	No
		Mx	TIBIRILOTHMOXP	Impact left of Tibia	+	+	No
		My	TIBIRILOTHMOYP	Impact front of Tibia	+	+	No
	Tibia Accelerometer	Ax	TIBIRI00THACXP	Impact back of Tibia	+	NA	NA
		Ay	TIBIRI00THACYP	Impact left of Tibia	+	NA	NA
	Achilles Load	Fz	ANKLR100THFOOP	Rotate foot forward	+	NA	NA
	Ankle Rotation	Rx	ANKLR100THANXP	Hold tibia, rotate foot leftward	+	+	No
		Ry	ANKLR100THANYP	Hold tibia, push toe upward	+	-	Yes
		Rz	ANKLR100THANZP	From top, hold tibia, rotate foot CCW	+	-	Yes
	Foot Acceleration	Ax	FOOTRI00THACXP	Impact back of Foot	+	NA	NA
		Ay	FOOTRI00THACYP	Impact left of Foot	+	NA	NA
		Az	FOOTRI00THACZP	Impact top of Foot	+	NA	NA

THOR-50M 50th Percentile Male ATD
Sensor Polarities

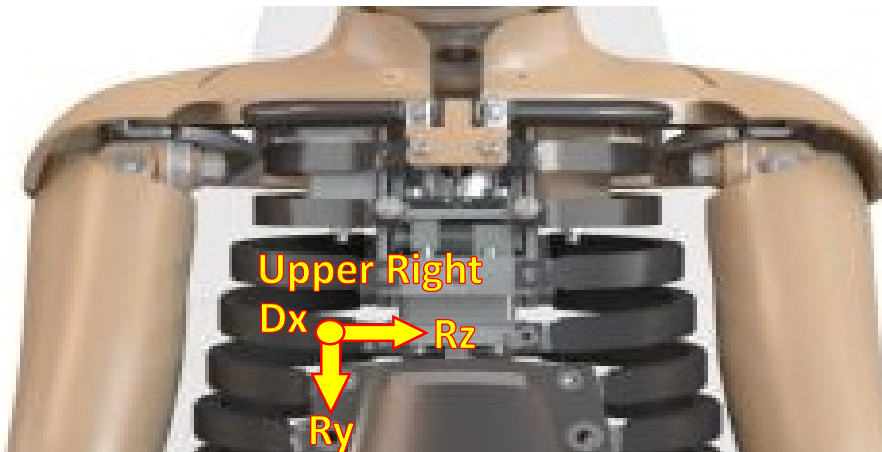
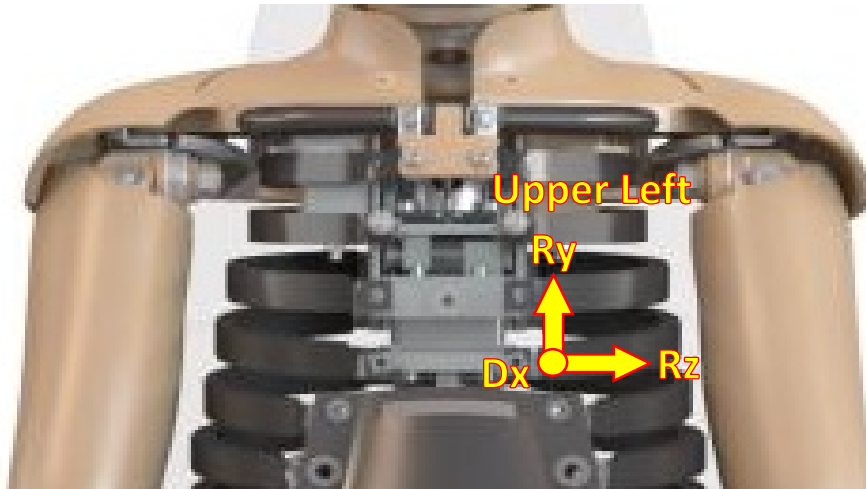
ATD S/N: EG2595

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Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Thorax Upper Left	IRTRACC Raw Voltage	Dx (V)	CHSTLEUPTHVOOP	Push Inward	+	+	No
	Rotation Pitch	Ry	CHSTLEUPTHANYP	Push upward	+	+	No
	Rotation Yaw	Rz	CHSTLEUPTHANZP	Push leftward	+	+	No
Thorax Upper Right	IRTRACC Raw Voltage	Dx (V)	CHSTRIUPTHVOOP	Push Inward	+	+	No
	Rotation Pitch	Ry	CHSTRIUPTHANYP	Push downward	+	+	No
	Rotation Yaw	Rz	CHSTRIUPTHANZP	Push leftward	+	+	No



THOR-50M 50th Percentile Male ATD
Sensor Polarities

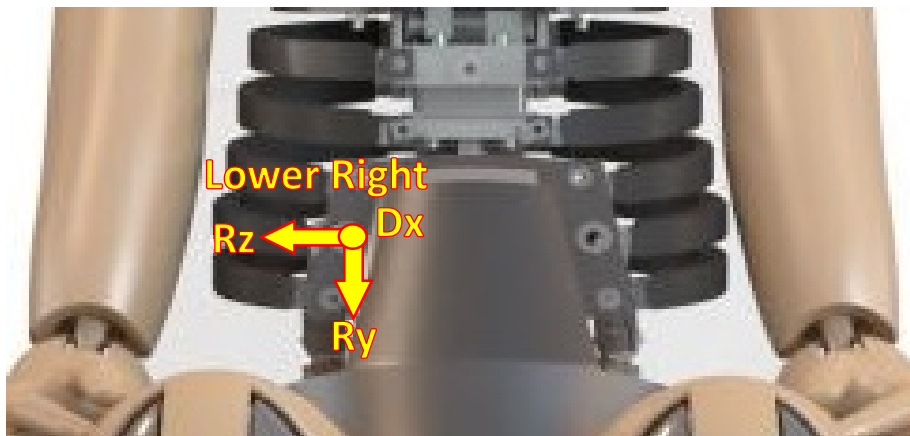
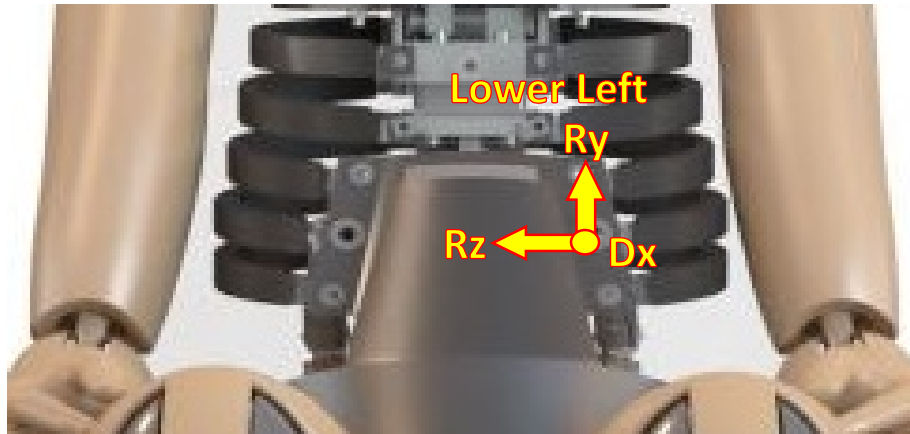
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Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Thorax Lower Left	IRTRACC Raw Voltage	Dx (V)	CHSTLELOTHVOOP	Push Inward	+	+	No
	Rotation Pitch	Ry	CHSTLELOTHANYP	Push upward	+	+	No
	Rotation Yaw	Rz	CHSTLELOTHANZP	Push rightward	+	+	No
Thorax Lower Right	IRTRACC Raw Voltage	Dx (V)	CHSTRILOTHVOOP	Push Inward	+	+	No
	Rotation Pitch	Ry	CHSTRILOTHANYP	Push downward	+	+	No
	Rotation Yaw	Rz	CHSTRILOTHANZP	Push rightward	+	+	No



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Segment	Instrument	Axis	ISO Code	Motion	J211	Actual	Invert
Abdomen Left	IRTRACC Raw Voltage	Dx (V)	ABDOLE00THVO0P	Push Inward	+	+	No
	Rotation Pitch	Ry	ABDOLE00THANYP	Push upward	+	+	No
	Rotation Yaw	Rz	ABDOLE00THANZP	Push rightward	+	+	No
Abdomen Right	IRTRACC Raw Voltage	Dx (V)	ABDORI00THVO0P	Push Inward	+	+	No
	Rotation Pitch	Ry	ABDORI00THANYP	Push downward	+	+	No
	Rotation Yaw	Rz	ABDORI00THANZP	Push rightward	+	+	No

