

REPORT NUMBER: R&D-KAR-20-010

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

**MAZDA MOTOR CORPORATION
2020 MAZDA CX-5 5-DOOR MPV**

NHTSA No: R20205415

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



JULY 2, 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**

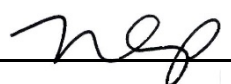
This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By:  _____

Mr. Neeraj Patel, Project Engineer
Applus IDIADA KARCO Engineering, LLC.

Reviewed By:  _____

Mr. Steven D. Matsusaka, Engineering Manager
Applus IDIADA KARCO Engineering, LLC.

Approved By:  _____

Mr. Michael L. Dunlap, Director of Operations
KARCO Engineering, LLC.

Approval Date: _____ July 2, 2021 _____

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

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. R&D-KAR-20-010	2. Government Accession No.	3. Recipient's Catalog No.																																															
4. Title and Subtitle Final Report of Frontal Research Crash Testing of a 2020 Mazda CX-5 5-door MPV NHTSA No. R20205415		5. Report Date July 2, 2021																																															
		6. Performing Organization Code KAR																																															
7. Authors Mr. Neeraj N. Patel, Project Engineer, Applus IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus IDIADA KARCO		8. Performing Organization Report No. TR-P40213-01-NC																																															
9. Performing Organization Name and Address Applus IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301		10. Work Unit No.																																															
		11. Contract or Grant No. DTNH22-14-D-00360L																																															
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		13. Type of Report and Period Covered Final Test Report, January 15, 2021-July 2, 2021																																															
		14. Sponsoring Agency Code NVS-321																																															
15. Supplementary Notes																																																	
16. Abstract A 40.0 km/h Full Frontal Rigid Barrier Impact Test was conducted on a 2020 Mazda CX-5 5-door MPV 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 January 15, 2021. The impact velocity of the vehicle was 39.77 km/h and the ambient temperature at the barrier face at the time of impact was 22.2°C. The vehicle's post-test maximum crush was 361 mm measured at the vehicle centerline. The test vehicle's performance was as follows:																																																	
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 35%;">Measurement Description</th> <th rowspan="2" style="width: 10%;">Units</th> <th style="width: 20%;">Driver THOR</th> <th style="width: 35%;">Passenger THOR</th> </tr> <tr> <th>Result</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td></td> <td style="text-align: center;">174.60</td> <td style="text-align: center;">269.40</td> </tr> <tr> <td>Brain Injury Criteria (BrIC)</td> <td></td> <td style="text-align: center;">0.63</td> <td style="text-align: center;">0.64</td> </tr> <tr> <td>Nij</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Peak Neck Tension</td> <td style="text-align: center;">N</td> <td style="text-align: center;">1189.90</td> <td style="text-align: center;">222.60</td> </tr> <tr> <td>Peak Neck Compression</td> <td style="text-align: center;">N</td> <td style="text-align: center;">-1980.70</td> <td style="text-align: center;">-2365.00</td> </tr> <tr> <td>Peak Chest Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">31.00</td> <td style="text-align: center;">37.90</td> </tr> <tr> <td>Peak Abdomen Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">6.20</td> <td style="text-align: center;">-18.50</td> </tr> <tr> <td>Peak Resultant Acetabulum Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">3296.20</td> <td style="text-align: center;">2855.50</td> </tr> <tr> <td>Peak Femur Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">-4913.90</td> <td style="text-align: center;">-5577.30</td> </tr> <tr> <td>Peak Tibia Index</td> <td></td> <td style="text-align: center;">0.35</td> <td style="text-align: center;">0.25</td> </tr> </tbody> </table>				Measurement Description	Units	Driver THOR	Passenger THOR	Result	Result	Head Injury Criteria (HIC ₁₅)		174.60	269.40	Brain Injury Criteria (BrIC)		0.63	0.64	Nij				Peak Neck Tension	N	1189.90	222.60	Peak Neck Compression	N	-1980.70	-2365.00	Peak Chest Deflection	mm	31.00	37.90	Peak Abdomen Deflection	mm	6.20	-18.50	Peak Resultant Acetabulum Force	N	3296.20	2855.50	Peak Femur Force	N	-4913.90	-5577.30	Peak Tibia Index		0.35	0.25
Measurement Description	Units	Driver THOR	Passenger THOR																																														
		Result	Result																																														
Head Injury Criteria (HIC ₁₅)		174.60	269.40																																														
Brain Injury Criteria (BrIC)		0.63	0.64																																														
Nij																																																	
Peak Neck Tension	N	1189.90	222.60																																														
Peak Neck Compression	N	-1980.70	-2365.00																																														
Peak Chest Deflection	mm	31.00	37.90																																														
Peak Abdomen Deflection	mm	6.20	-18.50																																														
Peak Resultant Acetabulum Force	N	3296.20	2855.50																																														
Peak Femur Force	N	-4913.90	-5577.30																																														
Peak Tibia Index		0.35	0.25																																														
17. Key Words Full Frontal Rigid Barrier Impact Frontal Research Crash Test THOR (Driver) THOR (Passenger)		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Reference Division 1200 New Jersey Ave., SE Washington, D.C. 20590																																															
19. Security Classification of this report UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 220	22. Price																																														

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	Test Purpose and Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information / Data Sheets	8
<u>Data Sheet</u>		<u>Page</u>
1	General Test and Vehicle Parameter Data	9
2	Seat Adjustment, Fuel System, and Steering Wheel	13
3	Dummy Clearance Dimensions	15
4	Dummy CMM Measurements Relative to VCS	16
5	Vehicle Instrumentation Data	17
6	Photographic Reference Target Locations	20
7	Test Vehicle Summary of Results	21
8	Post-Test Observations	22
9	Vehicle Profile Measurements	23
10	Accident Investigation Division Data	24
11	Vehicle Intrusion Measurements Relative to VCS	25
12	Summary of FMVSS 212, 219 (Partial), and 301 Data	31
13	FMVSS 301 Static Rollover Results	33
<u>Appendix</u>		<u>Page</u>
A	Photographs	A
B	Vehicle and Dummy Response Data Traces	B
C	Dummy Calibration and Performance Verification Data Sheets	C

SECTION 1

TEST PURPOSE AND PROCEDURE

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

This 40.0 km/h (25.85 mph) Full 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 Full 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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

A 40.0 km/h Full Frontal Rigid Barrier Impact Test was conducted on a 2020 Mazda CX-5 5-door MPV. The test was performed at Applus IDIADA KARCO Engineering, LLC. on January 15, 2021.

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. DO9799) was seated in the left front seating position (P1 – Driver) and one (1) 50th percentile adult male THOR anthropomorphic test device (ATD) (Serial No. EG2595) was seated in the right front passenger seating position (P2 - Passenger). 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 the THOR 50th Percentile Male Dummy Seating & Positioning Procedures: Right Front Passenger Position.

The driver was restrained with a frontal airbag. The passenger was restrained with a frontal airbag. Both ATDs were unbelted for this test.

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

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

Two hundred forty seven (247) 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 vehicle and dummy data plots.

The windshield was broken during impact but there was no separation recorded. 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 361 mm measured at 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, grill, and hood were crushed, with the damage concentrated at the vehicle's centerline
- The windshield was broken at the top left and right corner due to an impact with the driver and passenger ATD's head, respectively.

The driver ATD's visible contact points were:

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

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

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

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

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

PRIMARY IMPACT DATA

Measured Parameter	Units	Value
Impact Velocity	km/h	39.77
Test Vehicle Weight	kg	1764.5
Maximum Static Crush	mm	361.0
Number of Data Channels		257
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: DO9799		THOR, S/N: EG2595	
Head Contact	Front airbag, headliner, windshield	A-89, A-91a, A-93	Front airbag, headliner, windshield	A-134, A-136a, A-136b
Upper Torso Contact	Front airbag	A-89	Front airbag	A-134
Lower Torso Contact	Front airbag	A-89	Front airbag	A-134
Left Leg Contact	Knee bolster	A-80	Knee bolster	A-136d
Right Leg Contact	Knee bolster	A-80	Knee bolster	A-136d

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

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

DATA ANOMALIES

Channel Description	Explanation
T1 Ax (Dummy S/N: DO9799)	No data collected, the T1 Ax accelerometer is intermittent and the exact cause of the problem could not be determined
Left Tibia Ax (Dummy S/N: DO9799)	Damaged cable at accelerometer (upon receipt of the ATD), no data collected.
Right Tibia Ax (Dummy S/N: DO9799)	Damaged cable at accelerometer and deemed too close to the accelerometer head to repair, no data collected.
Right Acetabulum Fx (Dummy S/N: EG2595)	Damaged channel upon receipt of the ATD, it was determined that it was not repairable without removal of the load cell
Occipital Condyle Potentiometer (Dummy S/N: EG2595)	Potentiometer was not wired upon receipt of the ATD and was not required to be recorded, no data collected

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

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

Driver, THOR S/N DO9799					
LOCATION	DESCRIPTION	UNIT	SOURCE	MAX	MIN
Head	HIC 15ms		Compute	174.6	
	Brain Injury Criteria (BrIC)		Compute	0.634	
	Head Rotational Velocity X	Deg/s	60	374.0	-61.2
	Head Rotational Velocity Y	Deg/s	60	264.0	-1942.1
	Head Rotational Velocity Z	Deg/s	60	234.2	-438.0
Neck	Upper Neck Z-axis Force	N	1000	1189.9	-1980.7
	Upper Neck Y-axis Moment	Nm	600	16.8	-12.3
Chest	Upper Left Resultant Chest Deflection	mm	Compute	31.0	
	Upper Right Resultant Chest Deflection	mm	Compute	21.9	
	Lower Left Resultant Chest Deflection	mm	Compute	18.8	
	Lower Right Resultant Chest Deflection	mm	Compute	13.3	
Abdomen	Lower Left X-axis Deflection	mm	Compute	4.4	-3.7
	Lower Right X-axis Deflection	mm	Compute	6.2	-3.0
Acetabulum	Left Acetabulum Resultant Force	N	Compute	2485.9	
	Right Acetabulum Resultant Force	N	Compute	3296.2	
Femur	Left Femur Force, FZ	N	600	288.0	-4395.1
	Right Femur Force, FZ	N	600	394.4	-4913.9
Tibia	Left Upper Tibia, FZ	N	600	95.6	-1115.8
	Left Upper Tibia Index		Compute	0.354	
	Right Upper Tibia, FZ	N	600	360.8	-1675.7
	Right Upper Tibia Index		Compute	0.177	
	Left Lower Tibia, FZ	N	600	169.0	-1858.6
	Left Lower Tibia Index		Compute	0.137	
	Right Lower Tibia, FZ	N	600	396.6	-1956.3
	Right Lower Tibia Index		Compute	0.134	
Ankle	Left Ankle Rotation, RX	Deg	180	4.6	-10.4
	Left Ankle Rotation, RY	Deg	180	28.7	7.9
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	26.5	-89.7
	Left Ankle In/Eversion Moment, MX	Nm	Compute	8.4	-5.3
	Right Ankle Rotation, RX	Deg	180	11.3	-24.0
	Right Ankle Rotation, RY	Deg	180	-2.8	-28.9
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	20.3	-5.2
	Right Ankle In/Eversion Moment, MX	Nm	Compute	12.8	-35.8

Anomalies:
None

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

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

Passenger, THOR S/N EG2595					
LOCATION	DESCRIPTION	UNIT	SOURCE	MAX	MIN
Head	HIC 15ms		Compute	269.4	
	Brain Injury Criteria (BrIC)		Compute	0.637	
	Head Rotational Velocity X	Deg/s	60	197.1	-533.4
	Head Rotational Velocity Y	Deg/s	60	419.6	-1601.2
	Head Rotational Velocity Z	Deg/s	60	453.3	-921.4
Neck	Upper Neck Z-axis Force	N	1000	222.6	-2365.0
	Upper Neck Y-axis Moment	Nm	600	22.0	-15.4
Chest	Upper Left Resultant Chest Deflection	mm	Compute	37.9	
	Upper Right Resultant Chest Deflection	mm	Compute	36.0	
	Lower Left Resultant Chest Deflection	mm	Compute	32.5	
	Lower Right Resultant Chest Deflection	mm	Compute	34.7	
Abdomen	Lower Left X-axis Deflection	mm	Compute	3.5	-18.5
	Lower Right X-axis Deflection	mm	Compute	6.6	-10.8
Acetabulum	Left Acetabulum Resultant Force	N	Compute	2855.5	
	Right Acetabulum Resultant Force	N	Compute	1657.2	
Femur	Left Femur Force, FZ	N	600	138.0	-4338.9
	Right Femur Force, FZ	N	600	82.9	-5577.3
Tibia	Left Upper Tibia, FZ	N	600	63.8	-2031.4
	Left Upper Tibia Index		Compute	0.245	
	Right Upper Tibia, FZ	N	600	22.2	-1779.7
	Right Upper Tibia Index		Compute	0.242	
	Left Lower Tibia, FZ	N	600	65.6	-2160.4
	Left Lower Tibia Index		Compute	0.130	
	Right Lower Tibia, FZ	N	600	32.5	-2067.8
	Right Lower Tibia Index		Compute	0.198	
Ankle	Left Ankle Rotation, RX	Deg	180	12.9	-2.2
	Left Ankle Rotation, RY	Deg	180	-1.7	-11.0
	Left Ankle Dorsiflexion Moment, MY	Nm	Compute	41.3	-72.1
	Left Ankle In/Eversion Moment, MX	Nm	Compute	8.2	-2.8
	Right Ankle Rotation, RX	Deg	180	0.8	-7.1
	Right Ankle Rotation, RY	Deg	180	-4.0	-14.2
	Right Ankle Dorsiflexion Moment, MY	Nm	Compute	38.7	-95.4
	Right Ankle In/Eversion Moment, MX	Nm	Compute	5.9	-5.3

Anomalies:

Right Acetabulum Fx is not functioning

SECTION 3

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	R20205415
Model Year	2020
Make	Mazda
Model	CX-5
Body Style	5-Door MPV
VIN	JM3KFABM0L0732170
Body Color	Black
Odometer Reading (km / mi)	108 / 67
Engine Displacement (L)	2.5
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6
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	No
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	No
Driver Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Front Pass. Seat Belt Pretensioner	Yes
Front Pass. Load Limiter	Yes
Other Safety Restraint	Yes

Does Owner's Manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured By	Mazda Motor Corporation
Date of Manufacture	Oct-19

GVWR (kg)	2075
GAWR Front (kg)	1075
GAWR Rear (kg)	1000

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

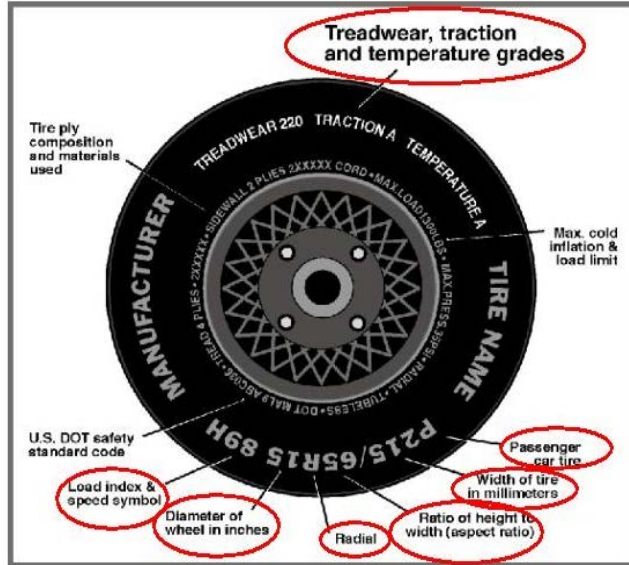
Measured Parameter	Front	Rear	Third	Total	
Type of Seats	Bucket	Split Bench			
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				385.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				44.8	A-B

*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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	P225/65 R17	P225/65 R17
Tire Size on Vehicle	P225/65 R17	P225/65 R17
Tire Manufacturer	Yokohama	Yokohama
Tire Model	Geolander	Geolander
Treadware	280	280
Traction Grade	B	B
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index/Speed Symbol	100H	100H
Tire Material	Steel, Polyester, Nylon	Steel, Polyester, Nylon
DOT Safety Code Left	FDF5-PC50120	FDF5-PC50120
DOT Safety Code Right	FDF5-PC50120	FDF5-PC50120

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	461.0	318.5		524.5	392.5	
Right	kg	452.0	310.0		490.5	357.0	
Ratio	%	59.2%	40.8%	100.0%	57.5%	42.5%	100.0%
Total	kg	913.0	628.5	1541.5	1015.0	749.5	1764.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1541.5	A
Weight of THOR-50M and THOR-50M	kg	186.0	B
Rated Cargo/Luggage Weight (RCLW)	kg	44.8	C
Calculated Vehicle Target Weight (TVTW)	kg	1772.3	A+B+C

TEST VEHICLE ATTITUDES

Condition	Units	LF	RF	LR	RR	CG Aft of Front Axle
As Delivered	mm	803	800	831	825	1101
As Tested	mm	790	790	795	795	1147
Post-Test	mm	820	825	790	795	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2700
Total Vehicle Length at Left Side	mm	4315
Total Vehicle Length at Centerline	mm	4560
Total Vehicle Length at Right Side	mm	4302
Weight of Ballast/Equipment in Cargo Area	kg	107.3
Weight of Vehicle Components Removed	kg	29.5
Amount of Stoddard Solvent in Fuel Tank	L	52.10

VEHICLE COMPONENTS REMOVED TO MEET TEST WEIGHT:

Underbody panels, rear trim, spare tire and tools

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

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

TARGET VEHICLE STRUCTURAL MEASUREMENTS

No.	Description	Units	Pre-Test
1	Total Length	mm	4560
2	Total Width	mm	1850
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	891
7	Longitudinal Member Width	mm	96
8*	Engine Top Height	mm	930
9*	Engine Bottom Height	mm	219
10	Engine and Gearbox Width	mm	634
11	Front Bumper to Engine Distance	mm	490
12*	Front Shock Absorber Fixing Height	mm	1020
13*	Bonnet Leading Edge Height	mm	900
14	Front Shock Absorber Fixing Width	mm	586
15	Front Bumper to Front Axle Distance	mm	943
16	Front Axle to A-Pillar Distance	mm	602
17	A-Pillar to B-Pillar Distance	mm	985
18	B-Pillar to Rear Axle Distance	mm	1108
19	B-Pillar to C-Pillar Distance	mm	959
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.

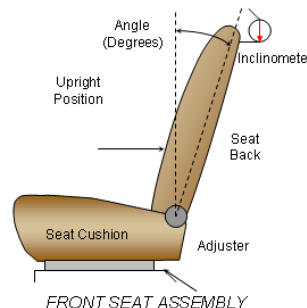
DATA SHEET NO. 2

SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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. The seat back angle is taken at the back of the headrest.

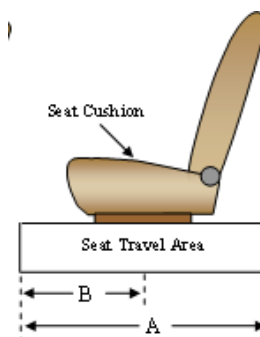


SEAT BACK ANGLE

Seating Position	Unit	FORM 208 Position	After ATD Positioning
Driver Seat Back Angle	Degrees	6.2	6.0
Passenger Seat Back Angle	Degrees	3.5	7.4

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	257	129
Passenger Seat	259	130

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

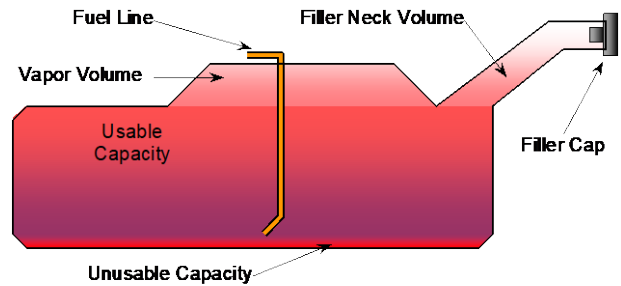
Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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

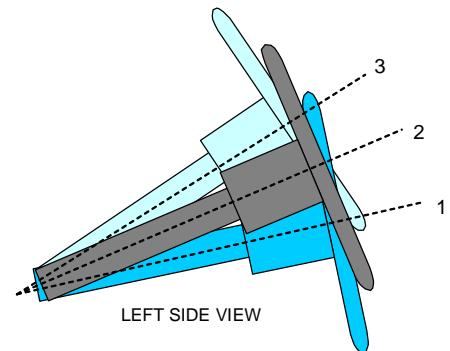
Fuel was evacuated according to the specifications provided by the manufacturer in Form 208. The electric fuel pump operates when the electrical system is activated.



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	22.3	105
Geometric Center Position, No. 2	25.0	130
Uppermost Position, No. 3	27.7	155
Telescoping Steering Wheel Travel		50
Test Position	25.0	130

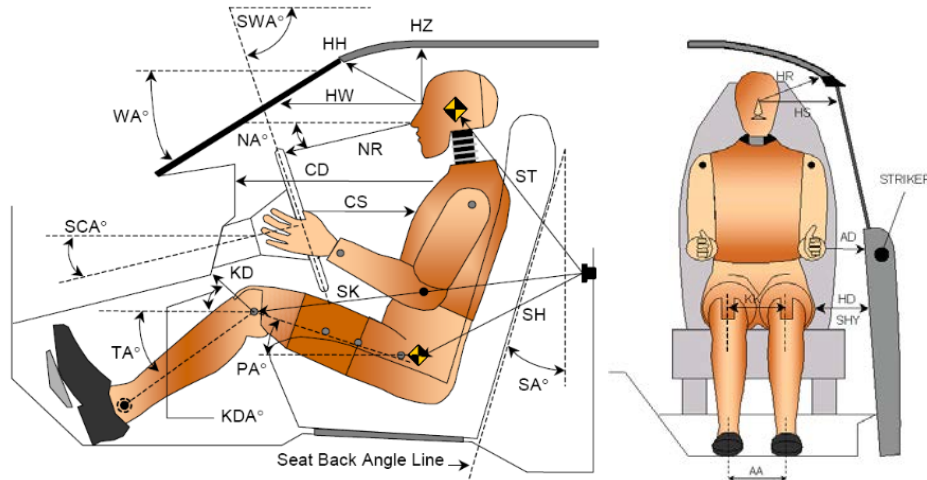
DATA SHEET NO. 3
DUMMY CLEARANCE DIMENSIONS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV

NHTSA No. R20205415

Test Program: R&D Full Frontal Rigid Barrier Impact

Test Date: 01/15/21



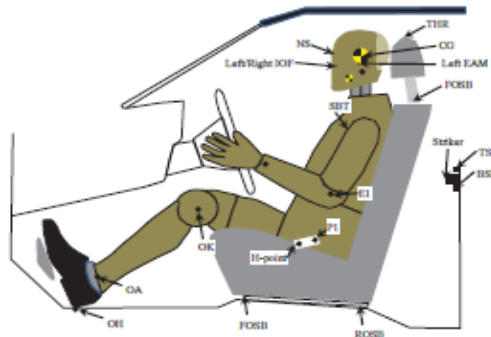
LEFT SIDE VIEW

Code	Measurement Description	Driver S/N# DO9799		Passenger S/N# EG2595	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
HZ	Nasion to Roof (Z Distance)	207		192	
HH	Nasion to Header (3D Distance)	381		380	
HW	Nasion to Windshield Point 1 Inside (X Distance)	729		699	
NR	Tip of Nose to Top of Steering Wheel (3D Distance)	490			
CD	Chest Point 1 to Dash Point 1 (3D Distance)	574		564	
CS	Chest Point 2 to Center of Steering Wheel (X Distance)	329			
CBS	Chest Point 3 to Bottom of Steering Wheel (X Distance)	204			
IKD	Inboard Knee to Dash Point 3 (3D Distance)			87	
OKD	Outboard Knee to Dash Point 2 (3D Distance)	123		102	
HR	Nasion to Side Header (3D Distance)	219		216	
HS	Nasion to Side Window Distance (Y Distance)	345		347	
AD	Elbow to Door (Y Distance)	153		60	
HD	H-Point to Door (Y Distance)	207		195	
HLHL	Inboard Heel to Outboard Heel (Y Distance)	351		261	
KK	Inboard Knee to Outboard Knee (Y Distance)			254	
SH	Striker to H-Point (3D Distance)	334		346	
HRA	Head Restraint Post Angle				
	H-Point Tool Angle		20.3		16.0
	Torso Angle		19.6		
	Windshield Angle		61.0		60.8
	Head Angle (X)		-0.7		0.6
	Head Angle (Y)		0.8		0.1
	T1 Angle (X)		-1.1		
	T1 Angle (Y)		0.5		
	T6 Angle (X)		-0.8		-1.4
	T6 Angle (Y)		20.9		18.2
	T12 Angle (X)		-0.6		
	T12 Angle (Y)		29.6		
	Pelvis Angle (X)		-0.5		-0.1
	Pelvis Angle (Y)		34.8		34.7

DATA SHEET NO. 4

DUMMY CMM MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21



Description	Units	Driver S/N# DO9799			Passenger S/N# EG2595		
		X	Y	Z	X	Y	Z
Center of Upper Striker Bolt	mm	2031	-798	-328	2035	794	-329
Center of Lower Striker Bolt	mm	2037	-798	-292	2041	796	-294
Center of Striker Bar	mm	2065	-799	-315	2069	797	-317
Front Outboard Seat Bolt	mm	2556	-611	77			
Rear Outboard Seat Bolt	mm	2116	-613	125	2122	606	122
Center of Steering Wheel Hub	mm	2559	-375	-531			
Outer Head Restraint Post	mm	1871	-453	-676	1875	451	-677
Right Head CG	mm	2075	-287	-807	2076	438	-826
Left Head CG	mm	2075	-443	-807	2075	272	-824
Right EAM	mm	2079	-292	-781	2080	434	-796
Left EAM	mm	2078	-439	-780	2083	280	-796
Nasion	mm	2164	-368	-823	2168	359	-839
Right IOF	mm	2165	-335	-788	2172	390	-797
Left IOF	mm	2163	-401	-786	2170	325	-799
Tip of Nose	mm	2167	-368	-785	2175	358	-767
Tip of Chin	mm	2170	-369	-691	2175	354	-702
Chest Point 1	mm	2213	-381	-569	2209	358	-591
Chest Point 2	mm	2230	-371	-526			
Chest Point 3	mm	2309	-371	-366			
Shoulder Point 1	mm	2066	-560	-579	2054	548	-598
Shoulder Point 2	mm	2146	-557	-563	2109	544	-572
Elbow	mm	2315	-612	-356	2229	629	-317
Center of H-Point Tool	mm	2227	-620	-194	2237	631	-207
H-Point on H-Point Tool	mm	2304	-618	-166	2313	590	-185
H-Point on ATD Skin	mm	2303	-566	-166	2313	558	-185
Outboard Knee	mm	2702	-571	-310	2721	546	-303
Inboard Knee	mm				2730	292	-295
Outboard Ankle	mm	2953	-582	22	3004	584	-3
Inboard Ankle	mm				3023	304	-2
Outboard Heel	mm	2967	-565	156	3008	535	135
Inboard Heel	mm	2982	-214	152	3005	274	133

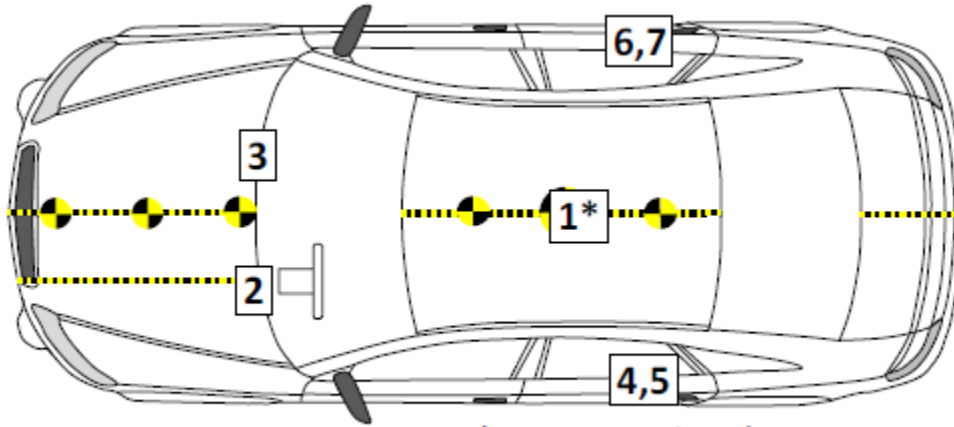
Reference Point:

- +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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21



* 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	1801	-4	75
2	Driver Floor Pan	x, y, z	°/s	3288	-406	35
3	Passenger Floor Pan	x, y, z	g	3368	396	-81
4	Door Sill LR	x, y	g	1607	-717	153
5	Door Sill LR Redundant	x, y	g	1587	-718	154
6	Door Sill RR	x, y	g	1608	709	153
7	Door Sill RR Redundant	x, y	g	1586	710	154

Reference Point:

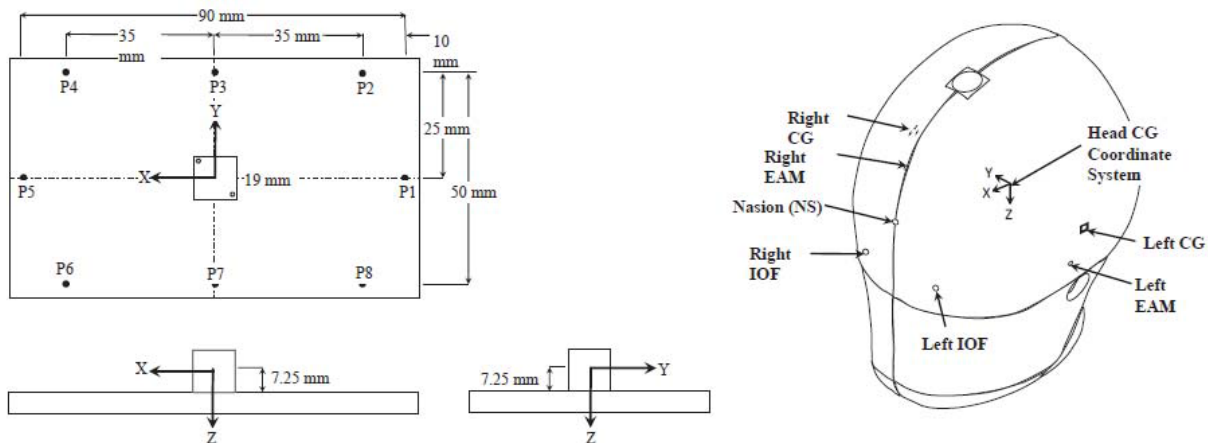
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 5 ... (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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	1846	-6	70
P2	Plate Point 2	mm	1835	-31	71
P3	Plate Point 3	mm	1800	-29	74
P4	Plate Point 4	mm	1765	-27	77
P5	Plate Point 5	mm	1757	-2	78
P6	Plate Point 6	mm	1768	23	77
P7	Plate Point 7	mm	1803	21	74
P8	Plate Point 8	mm	1837	19	71

DRIVER HEAD POINTS IN RELATION TO HEAD CG COORDINATE SYSTEM

Description	Units	x	y	z
Left CG	mm	66	-42	44
Left EAM	mm	72	-37	72
Left IOF	mm	153	2	72
Right IOF	mm	153	66	72
Nasion	mm	158	34	35
Right EAM	mm	71	106	71
Right CG	mm	65	112	45

DATA SHEET NO. 5 ... (CONTINUED)

VEHICLE INSTRUMENTATION DATA

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

Location No.	Description	Axes	Units	Positive Direction		Negative Direction	
				Max	Time (ms)	Min	Time (ms)
1	Vehicle CG	x	g	0.9	129.2	-30.3	37.3
		y	g	2.6	61.6	-2.9	29.7
		z	g	22.7	40.0	-45.0	44.5
	Vehicle CG Rotation	x	°/s	11.2	35.1	-31.0	41.6
		y	°/s	128.4	49.4	-36.0	17.5
		z	°/s	25.5	60.4	0.2	34.0
2	Driver Floor Pan	x	g	11.1	41.6	-19.8	35.0
		y	g	7.9	44.7	-10.2	68.0
		z	g	23.2	35.5	-5.8	88.8
3	Passenger Floor Pan	x	g	17.7	42.2	-22.1	37.1
		y	g	10.3	41.7	-4.1	19.1
		z	g	21.7	33.4	-5.4	92.6
4	Door Sill LR	x	g	0.6	164.0	-24.6	39.7
		y	g	3.1	61.5	-2.6	29.6
5	Door Sill LR Redundant	x	g	0.7	164.1	-24.8	39.7
		y	g	4.4	61.7	-1.8	57.1
6	Door Sill RR	x	g	0.6	111.5	-27.1	39.1
		y	g	0.1	25.8	-8.4	45.4
7	Door Sill RR Redundant	x	g	0.6	111.4	-26.8	39.3
		y	g	3.2	52.4	-4.1	45.2

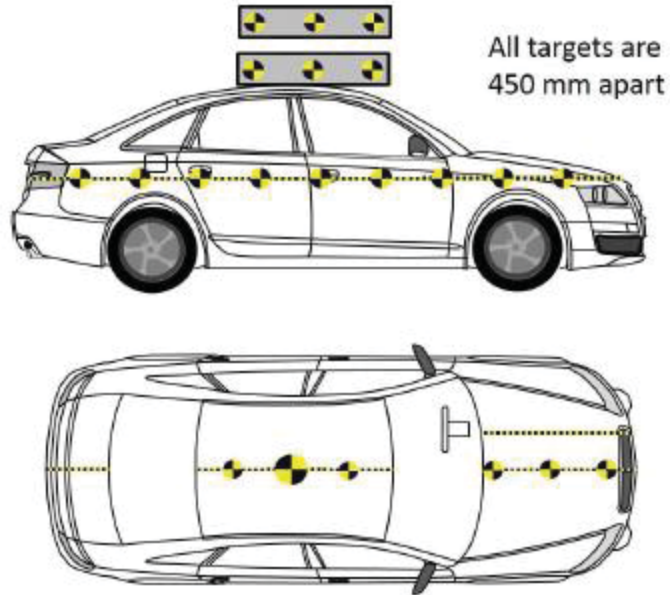
Note: See Appendix B for all vehicle data plots

DATA SHEET NO. 6

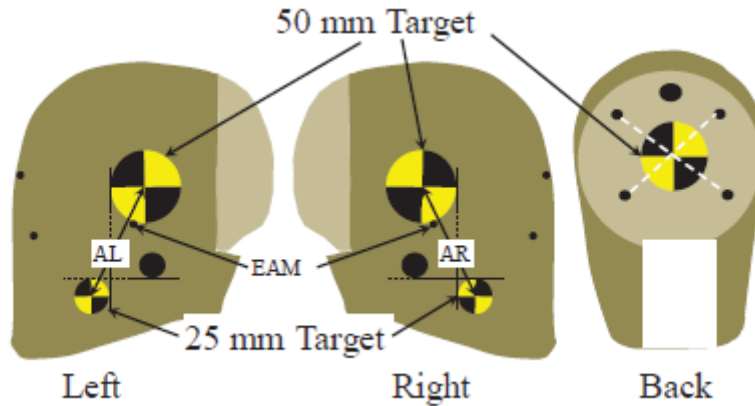
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Sensors	118
Passenger Dummy Sensors	99
Vehicle Structure Sensors	30
Total	247

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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	THOR-50M / DO9799	THOR-50M / EG2595
Lower Leg Type	LX	
Lower Leg Serial No.		
Head Contact	Front airbag, headliner, windshield	Front airbag, headliner, windshield
Upper Torso Contact	Front airbag	Front Airbag
Lower Torso Contact	Front airbag	Front Airbag
Left Knee Contact	Knee bolster	Knee bolster
Right Knee Contact	Knee bolster	Knee bolster

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)		
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	No	Yes	No
Side Airbag 2 (Torso/Pelvis)	Yes	No	Yes	No
Knee Airbag	Yes	No	Yes	No
Seat Belt Pretensioner	Yes		Yes	
Seat Belt Load Limiter	Yes		Yes	

DATA SHEET NO. 9

VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

No.	Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4560	4199	-361
2	Rear Surface of Vehicle to Front of Engine	4070	3896	-174
3	RSOV to Firewall	3549	3548	-1
4	RSOV to Upper Leading Edge of Right Door	3060	3042	-19
5	RSOV to Upper Leading Edge of Left Door	3059	3055	-4
6	RSOV to Lower Leading Edge of Right Door	3087	3085	-2
7	RSOV to Lower Leading Edge of Left Door	3087	3083	-4
8	RSOV to Upper Trailing Edge of Right Door	1947	1942	-4
9	RSOV to Upper Trailing Edge of Left Door	1942	1941	-1
10	RSOV to Lower Trailing Edge of Right Door	2074	2072	-2
11	RSOV to Lower Trailing Edge of Left Door	2072	2069	-3
12	RSOV to Bottom of A-Pillar, Right Side	3020	3018	-2
13	RSOV to Bottom of A-Pillar, Left Side	3015	3013	-1
14	RSOV to Firewall, Right Side	3640	3628	-12
15	RSOV to Firewall, Left Side	3635	3635	0
16	RSOV to Steering Column	2562	2564	2
17	Center of Steering Column to A-Pillar	453	449	-4
18	Center of Steering Column to Headliner	474	498	24
19	RSOV to Right Side of Front Bumper	4302	4135	-167
20	RSOV to Left Side of Front Bumper	4315	4187	-128
21	Length of Engine Block	492	440	-52
RD	RSOV to Right Side of Dash Panel	2785	2788	3
CD	RSOV to Center of Dash Panel	2752	2761	8
LD	RSOV to Left Side of Dash Panel	2780	2779	-1

All measurements in millimeters.

DATA SHEET NO. 10

ACCIDENT INVESTIGATION DIVISION DATA

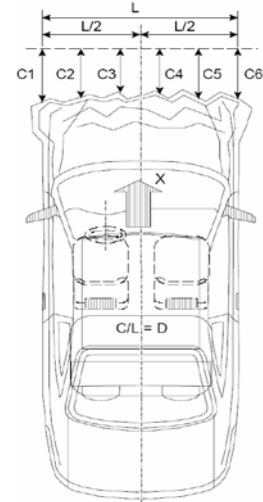
Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

VEHICLE INFORMATION

VIN: JM3KFABM0L0732170 Wheelbase (mm): 2700
 Vehicle Size Category: 5-door MPV Test Weight (kg): 1764.5

ACCELEROMETER DATA

Accelerometer Locations: Vehicle CG_x
 Cal. Procedure/Interval: Vibration Test / 6 months
 Integration Algorithm: NHTSA Standard
 Linearity: Good
 Impact Velocity (km/h): 49.77



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
 Midpoint of Damage: 754
 Damage Region Length (mm): 1508
 Impact Mode: Full Frontal

Crush Measurements

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4313	4187	-126
C2	Crush Zone 2 at Left Side	mm	4455	4204	-251
C3	Crush Zone 3 at Left Side	mm	4513	4198	-315
C4	Crush Zone 4 at Right Side	mm	4512	4176	-337
C5	Crush Zone 5 at Right Side	mm	4448	4155	-293
C6	Crush Zone 6 at Right Side	mm	4300	4135	-165
L	C1 to C6	mm	1508		

DATA SHEET NO. 11

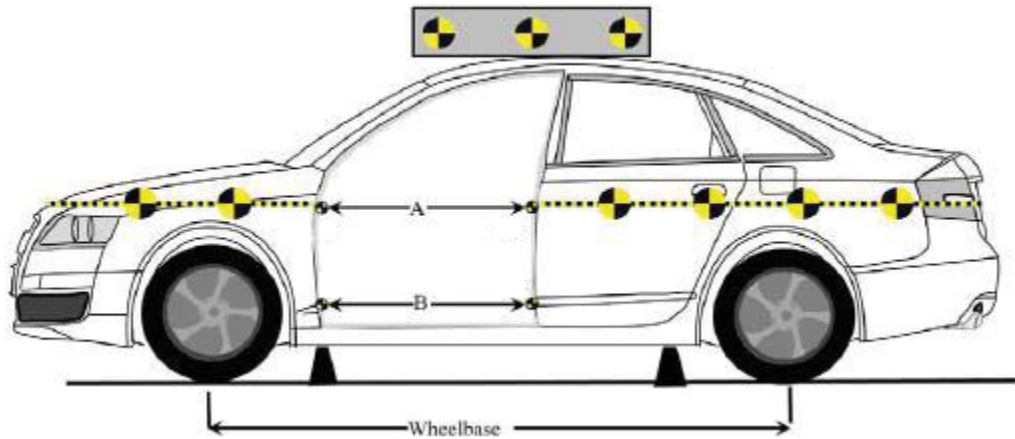
VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415

Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Driver Side Upper	mm	873	873	0
B	Driver Side Lower	mm	733	733	0
D	Passenger Side Upper	mm	872	870	2
E	Passenger Side Lower	mm	734	735	-1



DATA SHEET NO. 11 ... (CONTINUED)

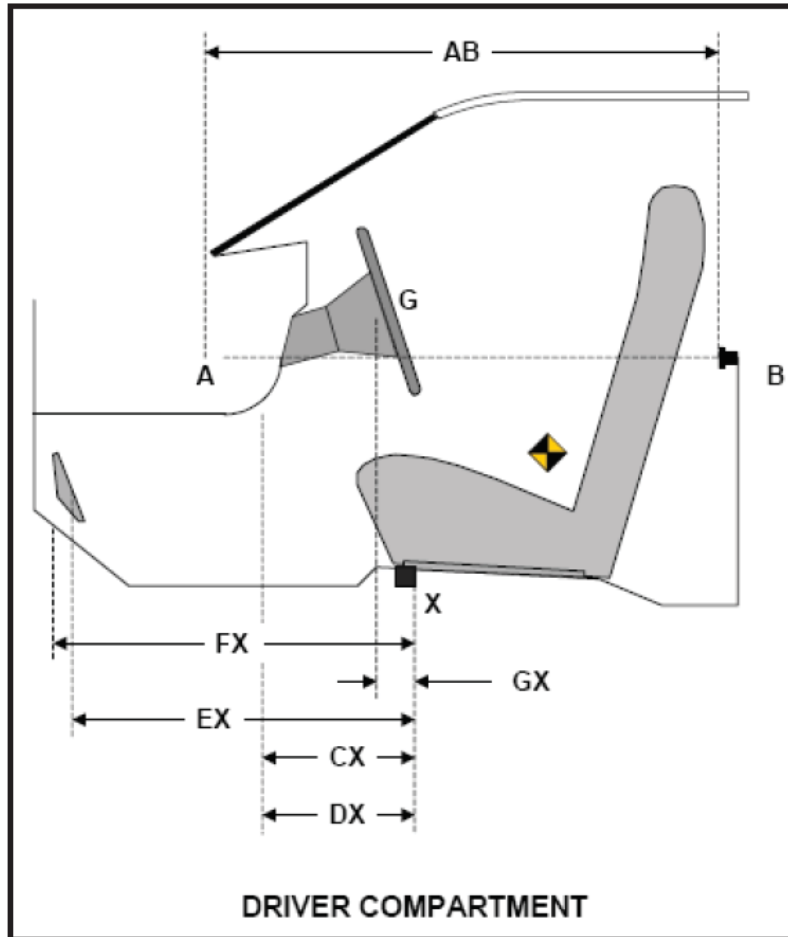
VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	859	862	-3
CX	Left Knee Bolster to X	mm	280	276	4
DX	Right Knee Bolster to X	mm	256	297	-41
EX	Brake Pedal to X	mm	519	516	3
FX	Footrest to X	mm	655	655	0
GX	Center of Steering Column Wheel Hub to X	mm	5	7	-3

X = Front of Seat Track (Stationary)

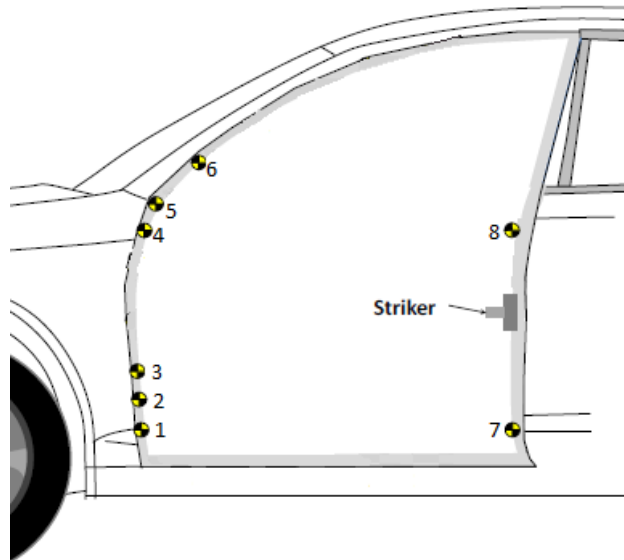


DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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	2955	-760	-16	2953	-757	-15	-2	3	1
2	2963	-755	-89	2963	-753	-89	0	2	1
3	2953	-751	-164	2953	-749	-162	0	2	1
4	2917	-752	-464	2916	-751	-464	-1	1	1
5	2905	-757	-541	2903	-755	-540	-2	1	1
6	2880	-758	-617	2879	-757	-615	-1	1	2
7	2222	-762	-14	2220	-760	-16	-2	1	-2
8	2044	-745	-467	2044	-744	-467	-1	1	0

All measurements in millimeters.

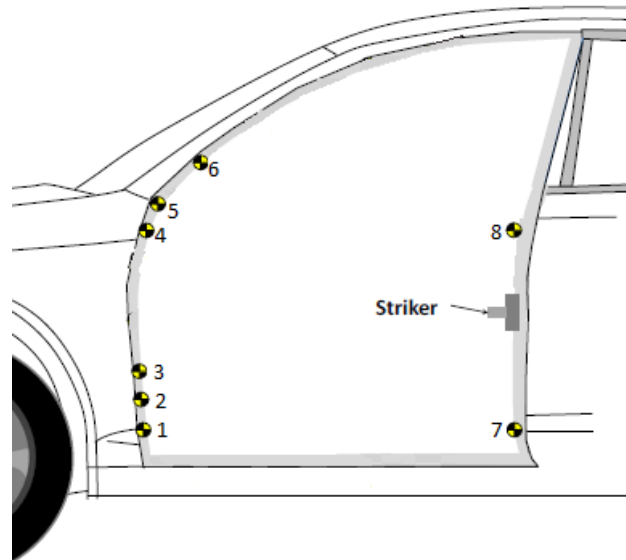
DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415

Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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	2960	750	-16	2949	752	-15	-11	1	1
2	2966	745	-90	2955	746	-90	-11	1	0
3	2959	741	-164	2948	742	-163	-11	2	2
4	2924	743	-464	2910	743	-463	-14	1	2
5	2908	747	-541	2896	748	-541	-12	1	1
6	2882	748	-618	2870	749	-615	-11	1	3
7	2226	757	-14	2214	758	-15	-12	1	0
8	2052	741	-465	2039	742	-463	-12	1	2

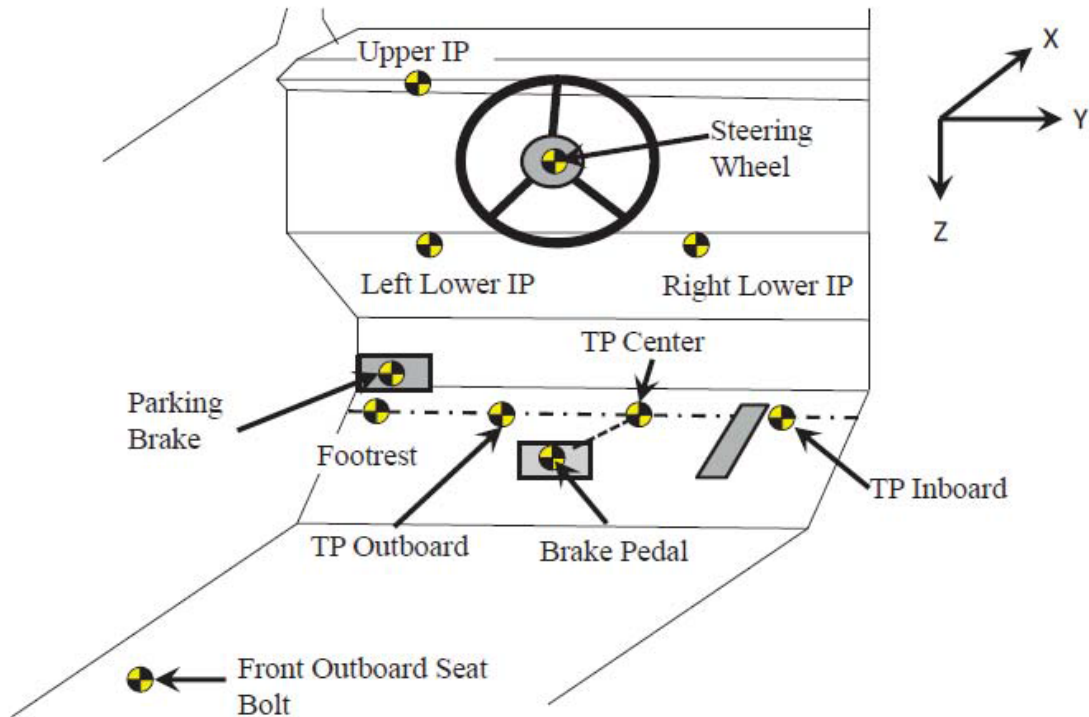
All measurements in millimeters.

DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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	3357	-185	-29	3348	-186	-29	-9	-1	0
TP Center	3350	-340	-16	3343	-340	-17	-7	1	-1
TP Outboard	3306	-485	-15	3294	-484	-13	-12	1	1
TP Footrest	3220	-587	-14	3212	-586	-15	-7	1	-1
Brake Pedal	3083	-334	-16	3072	-339	-20	-11	-4	-3
Left Lower IP	2844	-523	-299	2845	-524	-296	1	-1	3
Right Lower IP	2821	-221	-299	2828	-224	-294	8	-3	5
Upper IP	2755	-523	-435	2759	-521	-438	4	2	-3
Steering Wheel	2560	-375	-531	2556	-360	-504	-4	15	27
Front Outboard Bolt	2556	-611	77	2557	-611	77	1	0	0
Emergency Brake									

Reference point:

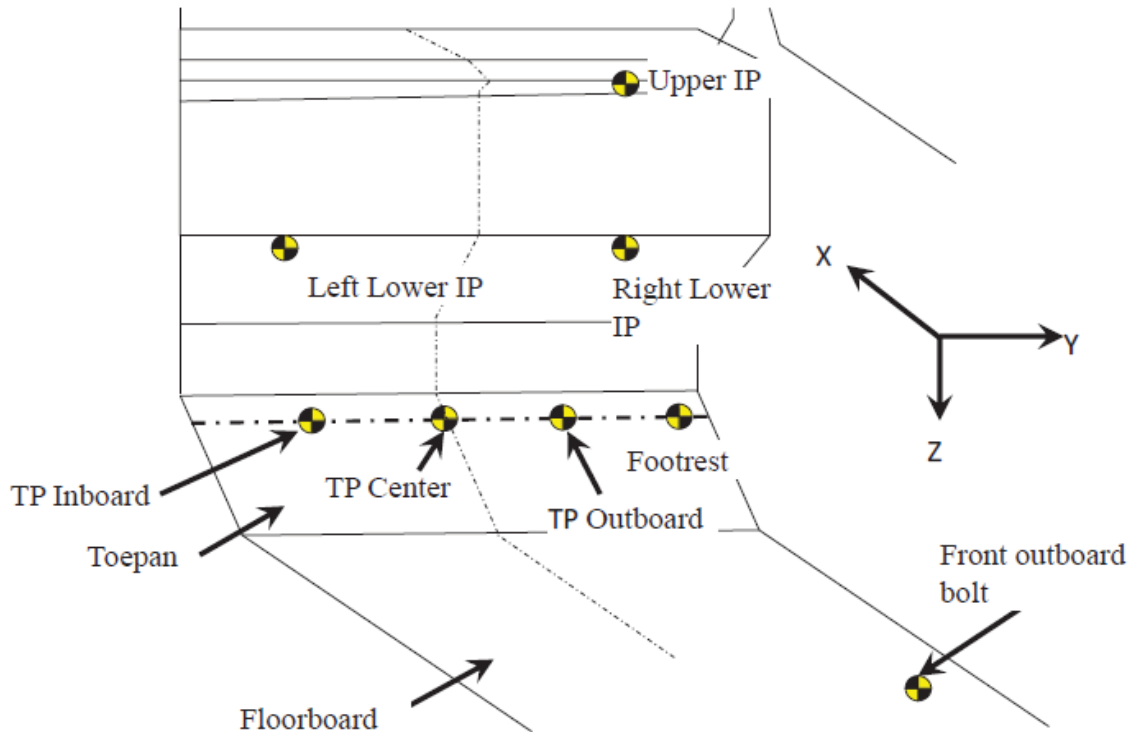
- +X – From the rear of the vehicle to the front of the vehicle
- +Y – From the left side of the vehicle to the right side of the vehicle
- +Z – From the top of the vehicle to the bottom of the vehicle

DATA SHEET NO. 11 ... (CONTINUED)

VEHICLE INTRUSION MEASUREMENTS RELATIVE TO VCS

Test Vehicle: 2020 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

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	3336	214	-17	3319	215	-15	-17	1	2
TP Center	3349	364	-15	3338	361	-17	-11	-3	-1
TP Outboard	3258	509	-13	3239	511	-12	-19	2	0
TP Footrest	3202	614	-15	3185	618	-14	-18	4	1
Left Lower IP	2814	216	-301	2832	216	-302	19	0	-2
Right Lower IP	2846	514	-300	2854	513	-302	8	-1	-2
Upper IP	2749	517	-454	2756	516	-457	8	-1	-2
Front Outboard Seat Bolt	2564	605	75	2561	607	75	-3	2	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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

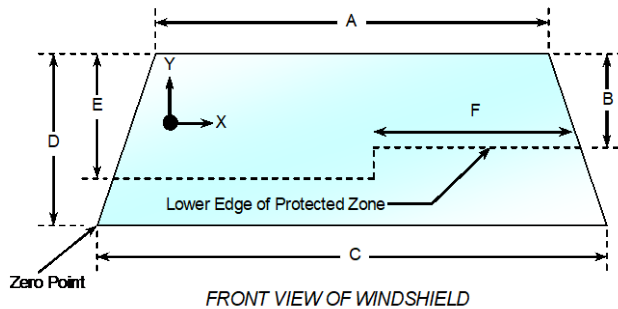
Windshield Mounting Details: Windshield glass is secured to the vehicle frame with plastic molding and rubber cement.

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: 22.2°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2315	2315	100.0%
Right Side	2315	2315	100.0%
Total	4630	4630	100.0%



Item	Units	Value
A	mm	1260
B	mm	375
C	mm	1520
D	mm	925
E	mm	505
F	mm	580

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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 22.2°C Test Time: 1:41 PM

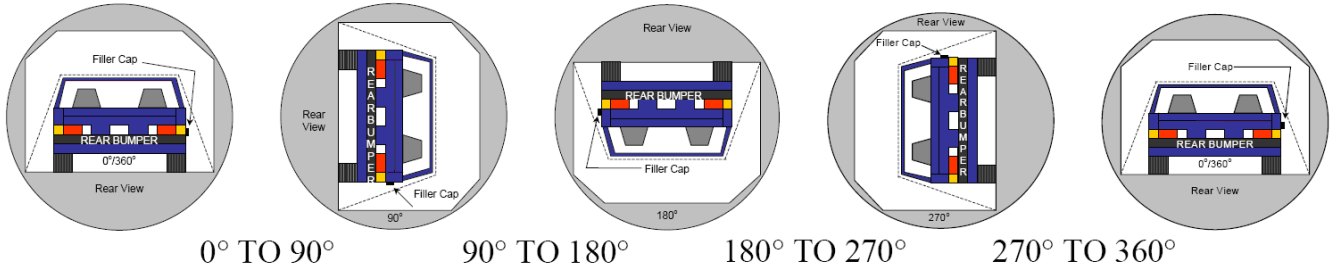
Stoddard Solvent Spillage Measurements

- 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 Mazda CX-5 5-Door MPV NHTSA No. R20205415
 Test Program: R&D Full Frontal Rigid Barrier Impact Test Date: 01/15/21



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°	79	300	379
90° To 180°	85	300	385
180° To 270°	86	300	386
270° To 360°	88	300	388

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°	

**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS

Figure		Page
1	Test Vehicle Certification Label	A-1
2	Test Vehicle Tire Placard	A-1
3	Right Front $\frac{3}{4}$ View, As Received	A-2
4	Left Rear $\frac{3}{4}$ View, As Received	A-2
5	Pre-Test Front View of Test Vehicle	A-3
6	Post-Test Front View of Test Vehicle	A-3
7	Pre-Test Left View of Test Vehicle	A-4
8	Post-Test Left View of Test Vehicle	A-4
9	Pre-Test Right View of Test Vehicle	A-5
10	Post-Test Right View of Test Vehicle	A-5
11	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-6
12	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-6
13	Pre-Test Right Front $\frac{3}{4}$ View of Test Vehicle	A-7
14	Post-Test Right Front $\frac{3}{4}$ View of Test Vehicle	A-7
15	Pre-Test Right Rear $\frac{3}{4}$ View of Test Vehicle	A-8
16	Post-Test Right Rear $\frac{3}{4}$ View of Test Vehicle	A-8
17	Pre-Test Rear View of Test Vehicle	A-9
18	Post-Test Rear View of Test Vehicle	A-9
19	Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-10
20	Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-10
21	Pre-Test Windshield View	A-11
22	Post-Test Windshield View	A-11
23	Pre-Test Engine Compartment View	A-12
24	Post-Test Engine Compartment View	A-12
25	Pre-Test Fuel Filler Cap View	A-13
26	Post-Test Fuel Filler Cap View	A-13
27	Pre-Test Front Underbody View	A-14
28	Post-Test Front Underbody View	A-14
29	Pre-Test Mid Underbody View	A-15
30	Post-Test Mid Underbody View	A-15
31	Pre-Test Rear Underbody View	A-16
32	Post-Test Rear Underbody View	A-16
33	Pre-Test Bumper to Rail Attachments and Crush Initiators	A-17
34	Post-Test Bumper to Rail Attachments and Crush Initiators	A-17
35	Pre-Test Driver Side Bumper to Rail Attachments and Crush Initiators	A-18
36	Post-Test Driver Side Bumper to Rail Attachments and Crush Initiators	A-18

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
37	Pre-Test Passenger Side Bumper to Rail Attachments and Crush Initiators	A-19
38	Post-Test Passenger Side Bumper to Rail Attachments and Crush Initiators	A-19
39	Pre-Test Driver Side Rocker	A-20
40	Post-Test Driver Side Rocker	A-20
41	Pre-Test Passenger Side Rocker	A-21
42	Post-Test Passenger Side Rocker	A-21
43	Pre-Test Driver Front Windshield View	A-22
44	Post-Test Driver Front Windshield View	A-22
45	Pre-Test Driver Side Front Window View	A-23
46	Post-Test Driver Side Front Window View	A-23
47	Pre-Test View of Driver Door Clearance	A-24
48	Post-Test View of Driver Door Clearance	A-24
49	Pre-Test Left Side View of Driver and Interior	A-25
50	Post-Test Left Side View of Driver and Interior	A-25
51	Pre-Test Left Side View of Steering Wheel Position	A-26
52	Post-Test Left Side View of Steering Wheel Position	A-26
53	Pre-Test Overhead View of Driver Thighs on Seat	A-27
54	Post-Test Overhead View of Driver Thighs on Seat	A-27
55	Pre-Test View of Driver Abdomen	A-28
56	Post-Test View of Driver Abdomen	A-28
57	Pre-Test Right Side View of Driver and Interior	A-29
58	Post-Test Right Side View of Driver and Interior	A-29
59	Pre-Test View of Driver Left Knee and Bolster	A-30
60	Post-Test View of Driver Left Knee and Bolster	A-30
61	Pre-Test View of Driver Right Knee and Bolster	A-31
62	Post-Test View of Driver Right Knee and Bolster	A-31
63	Pre-Test View of the Driver Left Leg	A-32
64	Post-Test View of the Driver Left Leg	A-32
65	Pre-Test View of the Driver Feet	A-33
66	Post-Test View of the Driver Feet	A-33
67	Pre-Test Driver Adjustable D-Ring	A-34
68	Post-Test Driver Adjustable D-Ring	A-34
69	Pre-Test Driver Seat Fore-Aft Markings	A-35
70	Post-Test Driver Seat Fore-Aft Markings	A-35
71	Pre-Test Driver Seat Back Markings	A-36
72	Post-Test Driver Seat Back Markings	A-36

TABLE OF PHOTOGRAPHS ... (CONTINUED)

<u>Figure</u>		<u>Page</u>
73	Pre-Test Close-Up View of Driver Door Latch	A-37
74	Post-Test Close-Up View of Driver Door Latch	A-37
75	Pre-Test Driver Inner Door Panel	A-38
76	Post-Test Driver Inner Door Panel	A-38
77	Pre-Test Left Side View of Driver Knee Bolster	A-39
78	Post-Test Left Side View of Driver Knee Bolster	A-39
79	Pre-Test Overall View of Driver Knee Bolster	A-40
80	Post-Test Overall View of Driver Knee Bolster	A-40
81	Pre-Test Right Side View of Driver Knee Bolster	A-41
82	Post-Test Right Side View of Driver Knee Bolster	A-41
83	Pre-Test View of Driver Floor Pan from Outside of Vehicle	A-42
84	Post-Test View of Driver Floor Pan from Outside of Vehicle	A-42
85	Pre-Test View of Driver Floor Pan from Top of Seat	A-43
86	Post-Test View of Driver Floor Pan from Top of Seat	A-43
87	Pre-Test View of Driver Floor Pan from Center of Vehicle	A-44
88	Post-Test View of Driver Floor Pan from Center of Vehicle	A-44
89	Post-Test Driver Dummy Contact with Front Airbag	A-45
90	Post-Test Driver Dummy Contact with Side Airbag	A-45
91	Post-Test Driver Dummy Contact with Knee Airbag	A-46
91a	Post-Test Driver Dummy Contact with Headliner	A-46
91b	Post-Test Driver Dummy Contact with A-Pillar	A-47
92	Pre-Test Passenger Front Windshield View	A-47
93	Post-Test Passenger Front Windshield View	A-48
94	Pre-Test Passenger Side Front Window View	A-48
95	Post-Test Passenger Side Front Window View	A-49
96	Pre-Test View of Passenger Door Clearance	A-49
97	Post-Test View of Passenger Door Clearance	A-50
98	Pre-Test Right Side View of Passenger and Interior	A-50
99	Post-Test Right Side View of Passenger and Interior	A-51
100	Pre-Test Overhead View of Passenger Thighs on Seat	A-51
101	Post-Test Overhead View of Passenger Thighs on Seat	A-52
102	Pre-Test View of Passenger Abdomen	A-52

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
103	Post-Test View of Passenger Abdomen	A-53
104	Pre-Test Left Side Passenger and Interior View	A-53
105	Post-Test Left Side Passenger and Interior View	A-54
106	Pre-Test View of Passenger Right Knee and Bolster	A-54
107	Post-Test View of Passenger Right Knee and Bolster	A-55
108	Pre-Test View of Passenger Left Knee and Bolster	A-55
109	Post-Test View of Passenger Left Knee and Bolster	A-56
110	Pre-Test View of the Passenger Feet	A-56
111	Post-Test View of the Passenger Feet	A-57
112	Pre-Test Passenger Adjustable D-Ring	A-57
113	Post-Test Passenger Adjustable D-Ring	A-58
114	Pre-Test Right Front Passenger Seat Fore-Aft Markings	A-58
115	Post-Test Right Front Passenger Seat Fore-Aft Markings	A-59
116	Pre-Test Passenger Seat Back Markings	A-59
117	Post-Test Passenger Seat Back Markings	A-60
118	Pre-Test Close-up View of Passenger Door Latch	A-60
119	Post-Test Close-up View of Passenger Door Latch	A-61
120	Pre-Test Passenger Inner Door Panel	A-61
121	Post-Test Passenger Inner Door Panel	A-62
122	Pre-Test Right Side View of Passenger Knee Bolster	A-62
123	Post-Test Right Side View of Passenger Knee Bolster	A-63
124	Pre-Test Center View of Passenger Knee Bolster	A-63
125	Post-Test Center View of Passenger Knee Bolster	A-64
126	Pre-Test Left Side View of Passenger Knee Bolster	A-64
127	Post-Test Left Side View of Passenger Knee Bolster	A-65
128	Pre-Test View of Passenger Floor Pan from Outside of Vehicle	A-65
129	Post-Test View of Passenger Floor Pan from Outside of Vehicle	A-66
130	Pre-Test View of Passenger Floor Pan from Top of Front Seat	A-66
131	Post-Test View of Passenger Floor Pan from Top of Front Seat	A-67
132	Pre-Test View of Passenger Floor Pan from Center of Vehicle	A-67
133	Post-Test View of Passenger Floor Pan from Center of Vehicle	A-68
134	Post-Test Driver Dummy Contact with Front Airbag	A-68
135	Post-Test Driver Dummy Contact with Side Airbag	A-69
136	Post-Test Passenger Dummy Contact with Knee Airbag	A-69
136a	Post-Test Passenger Dummy Contact with Headliner	A-70

TABLE OF PHOTOGRAPHS ... (CONTINUED)

<u>Figure</u>		<u>Page</u>
136b	Post-Test Passenger Dummy Contact with Windshield	A-70
136c	Post-Test Passenger Dummy Contact with Pelvis Airbag	A-71
136d	Post-Test Passenger Dummy Contact with Knee Bolster	A-71
136e	Post-Test Passenger Dummy Contact with Door Panel	A-72
136f	Post-Test Passenger Dummy Contact with Knee Airbag	A-72
137	Photograph of Ballast Installed in Vehicle	A-73
138	Post-Test Stoddard Solvent Spillage Location View	A-73
139	Post-Test Speed Trap Read-Out	A-74
140	Vehicle at 0° on Static Rollover Device	A-74
141	Vehicle at 90° on Static Rollover Device	A-75
142	Vehicle at 180° on Static Rollover Device	A-75
143	Vehicle at 270° on Static Rollover Device	A-76
144	Vehicle at 360° on Static Rollover Device	A-76
145	Frontal Impact Event	A-77
146	Monroney Label Photograph	A-77



FIGURE 1. Test Vehicle Certification Label

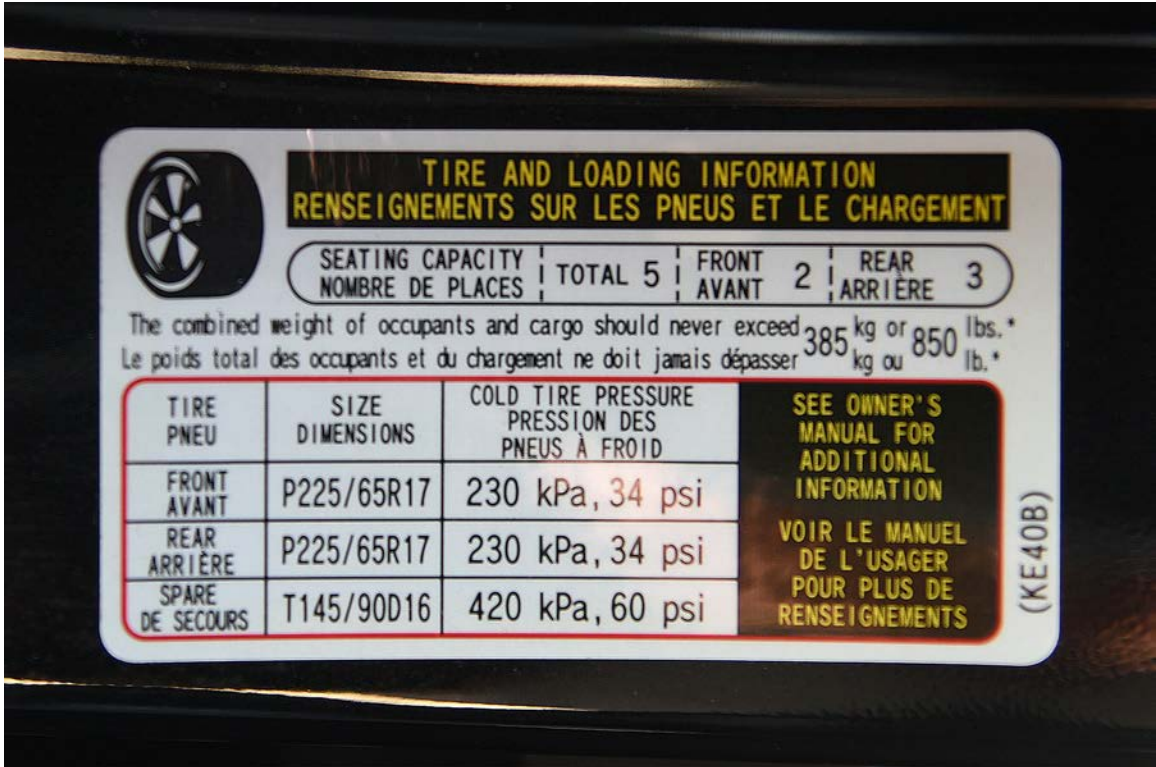


FIGURE 2. Test Vehicle Tire Placard



FIGURE 3. Right Front ¾ View, As Received



FIGURE 4. Left Rear ¾ View, As Received



FIGURE 5. Pre-Test Front View of Test Vehicle

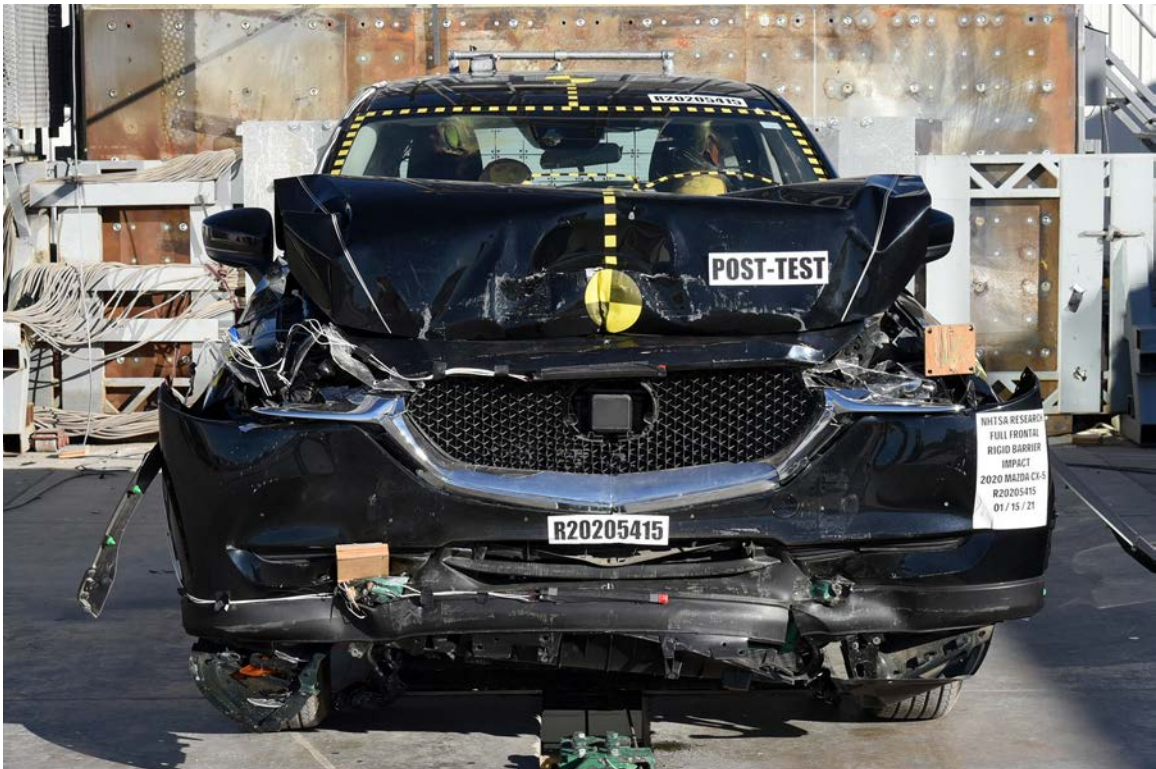


FIGURE 6. Post-Test Front View of Test Vehicle



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

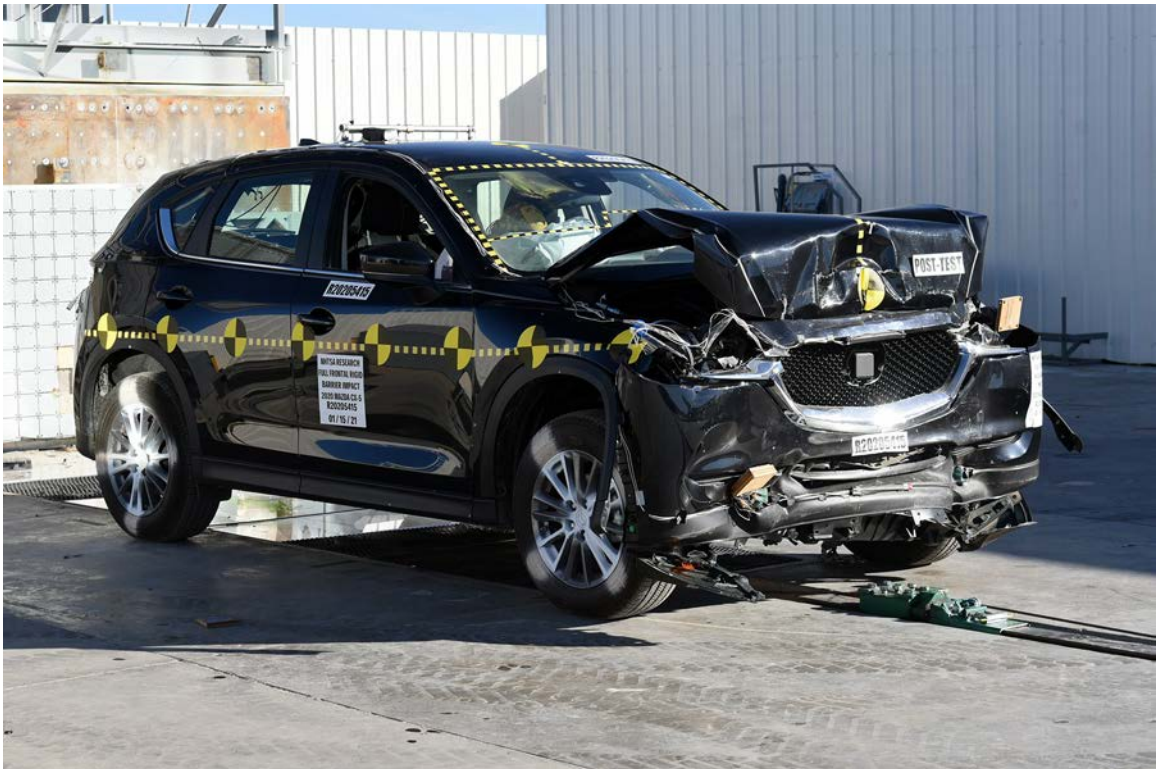


FIGURE 14. Post-Test Right Front $\frac{3}{4}$ View of Test Vehicle



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

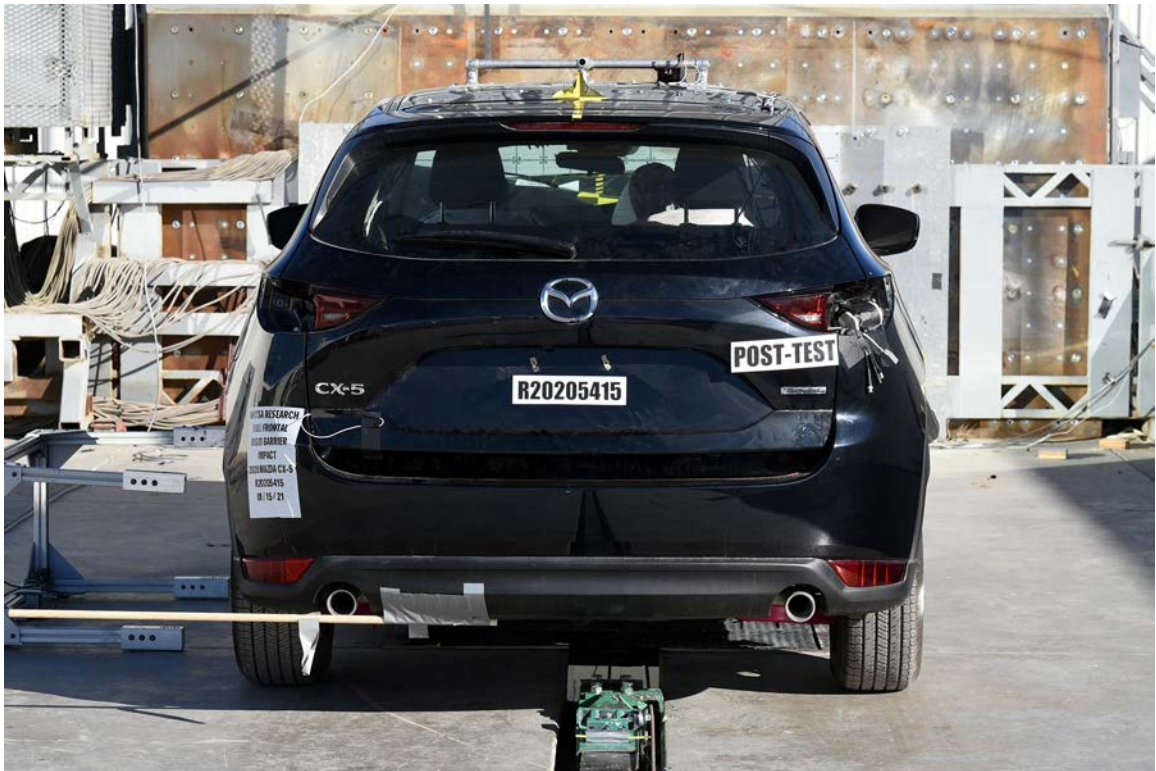


FIGURE 18. Post-Test Rear View of Test Vehicle



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

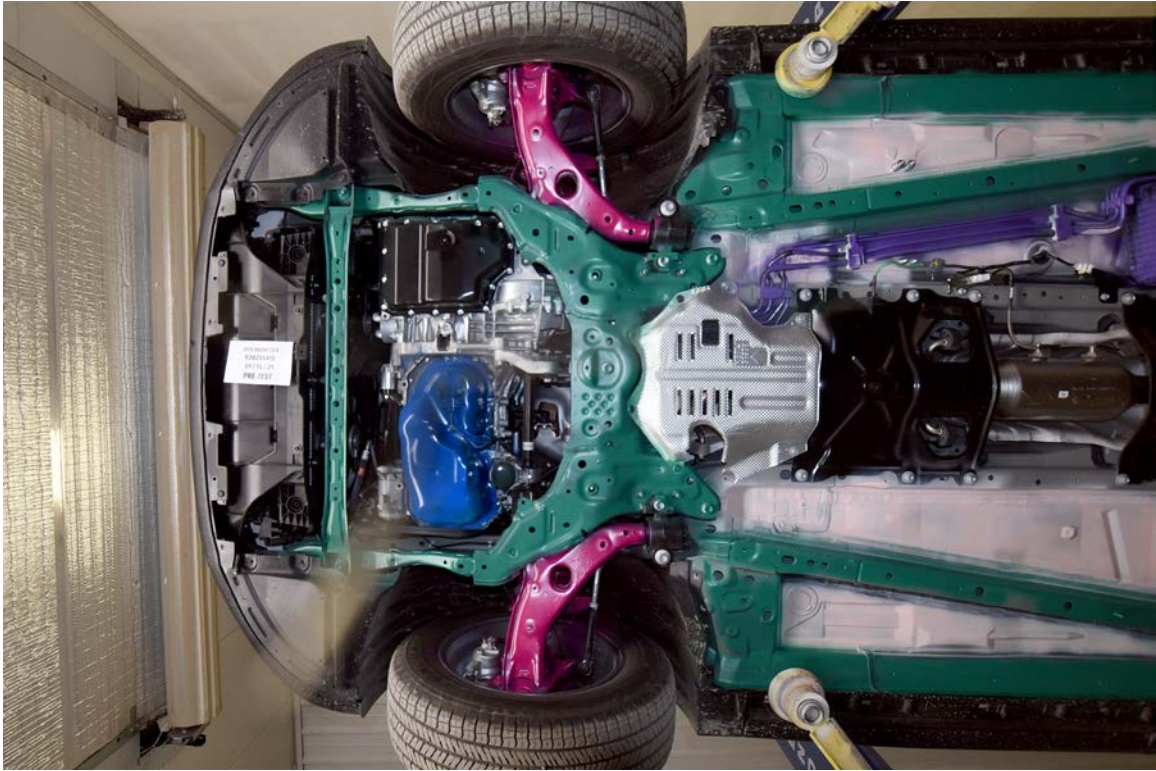


FIGURE 27. Pre-Test Front Underbody View

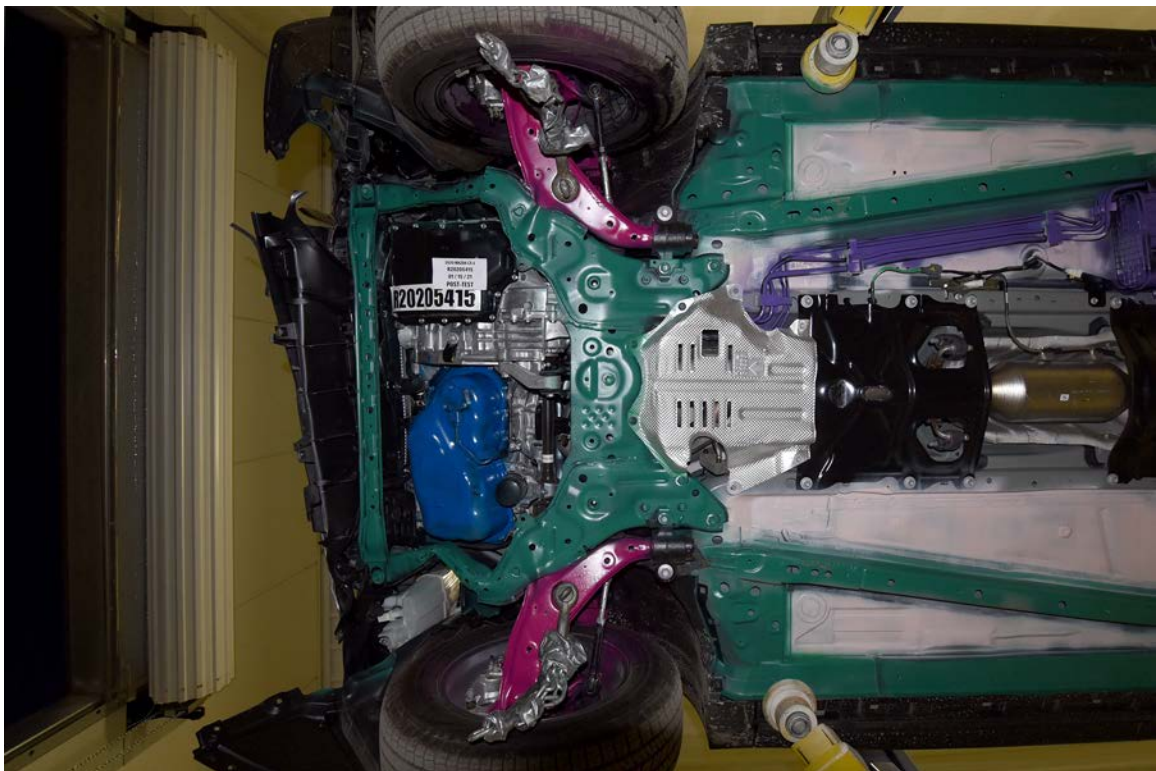


FIGURE 28. Post-Test Front Underbody View

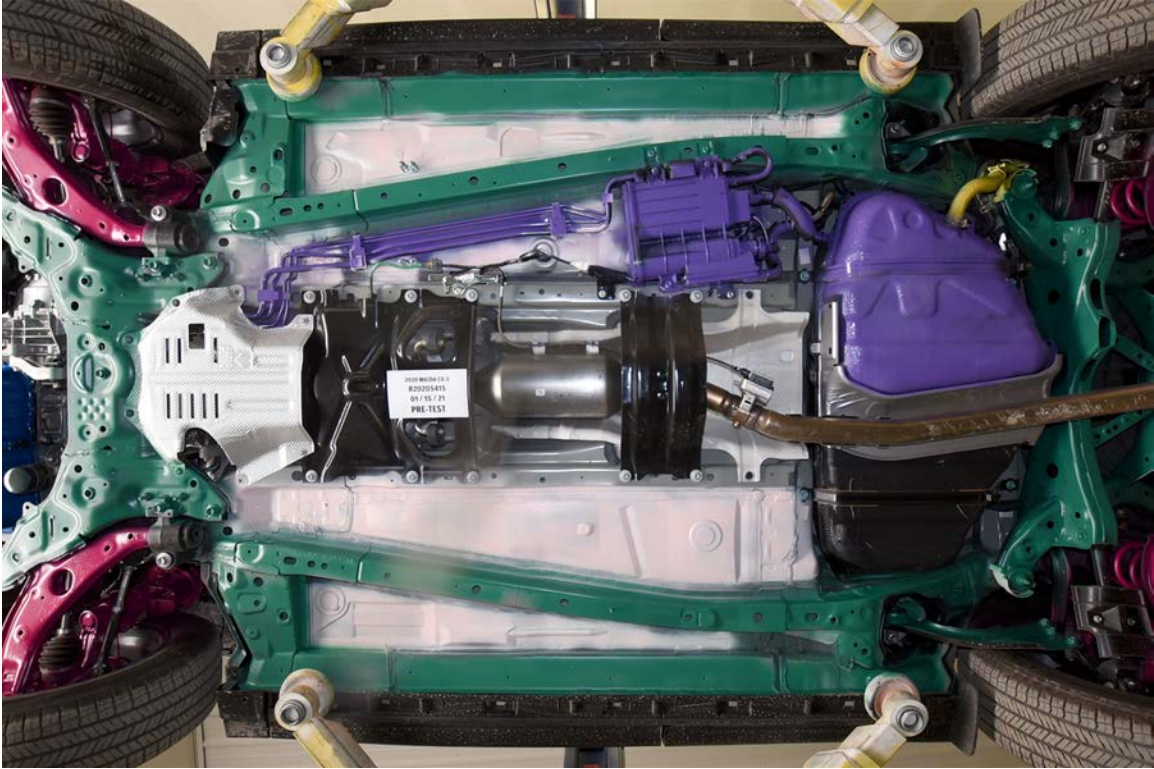


FIGURE 29. Pre-Test Mid Underbody View

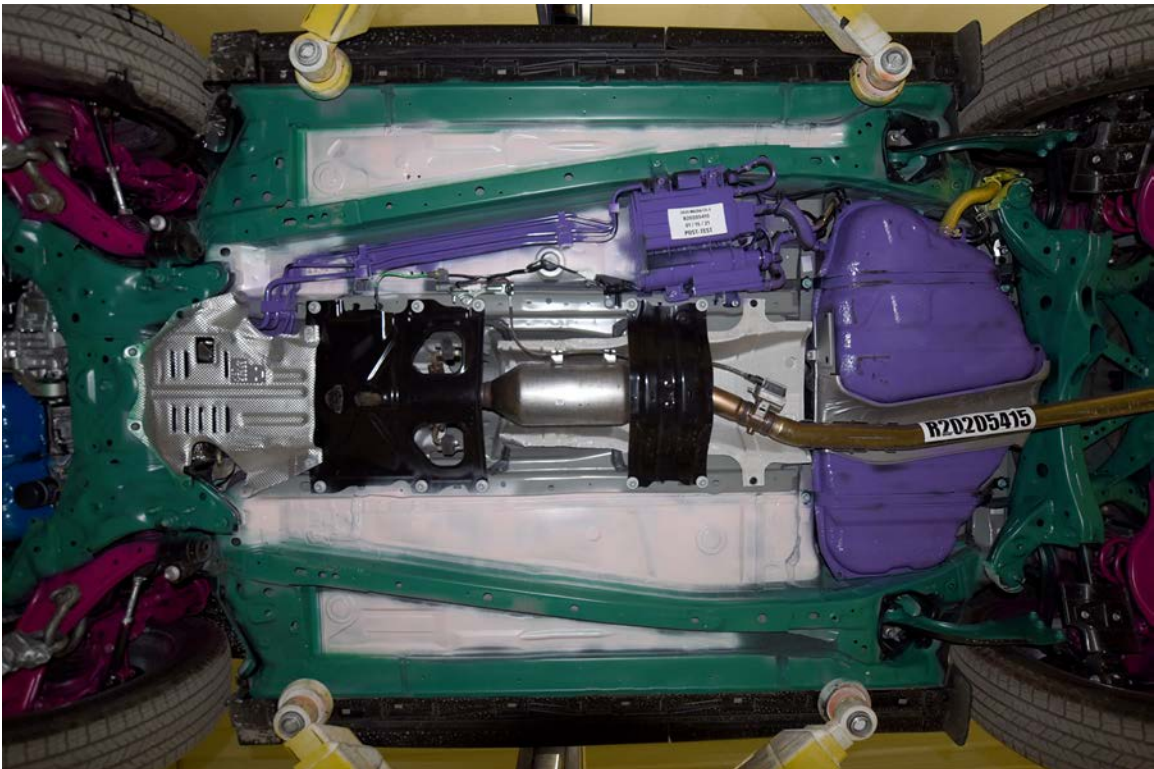


FIGURE 30. Post-Test Mid Underbody View

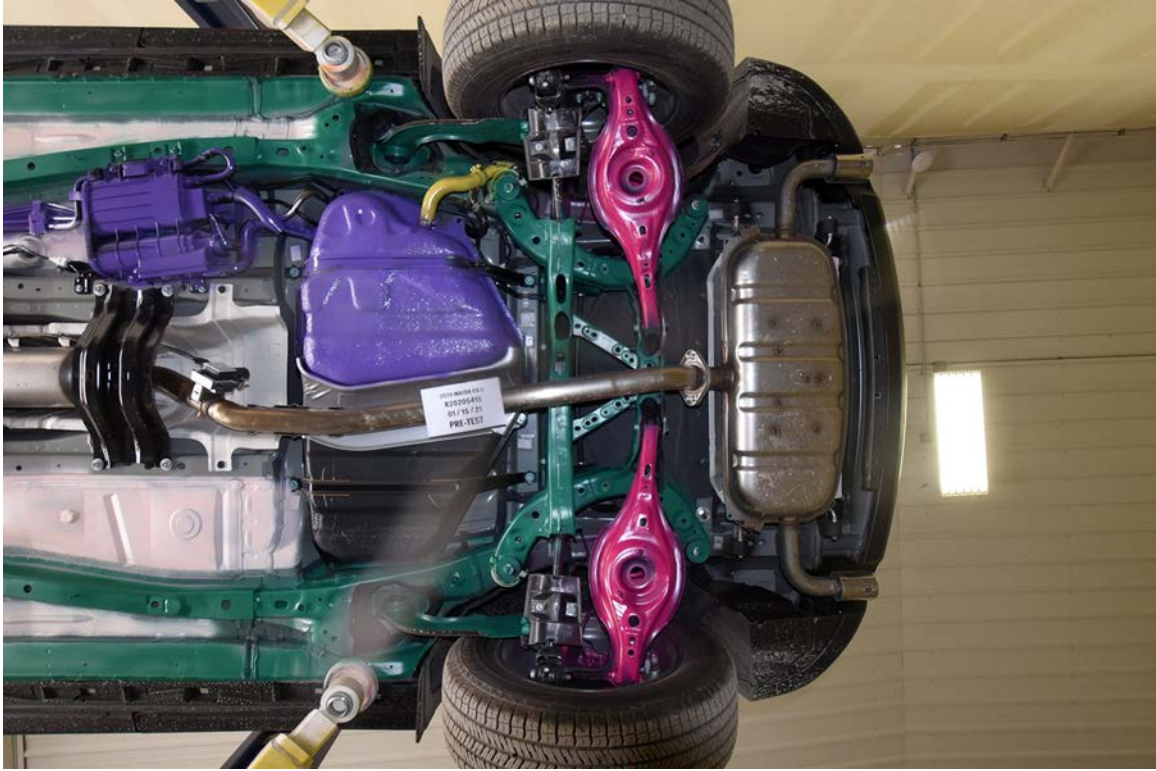


FIGURE 31. Pre-Test Rear Underbody View

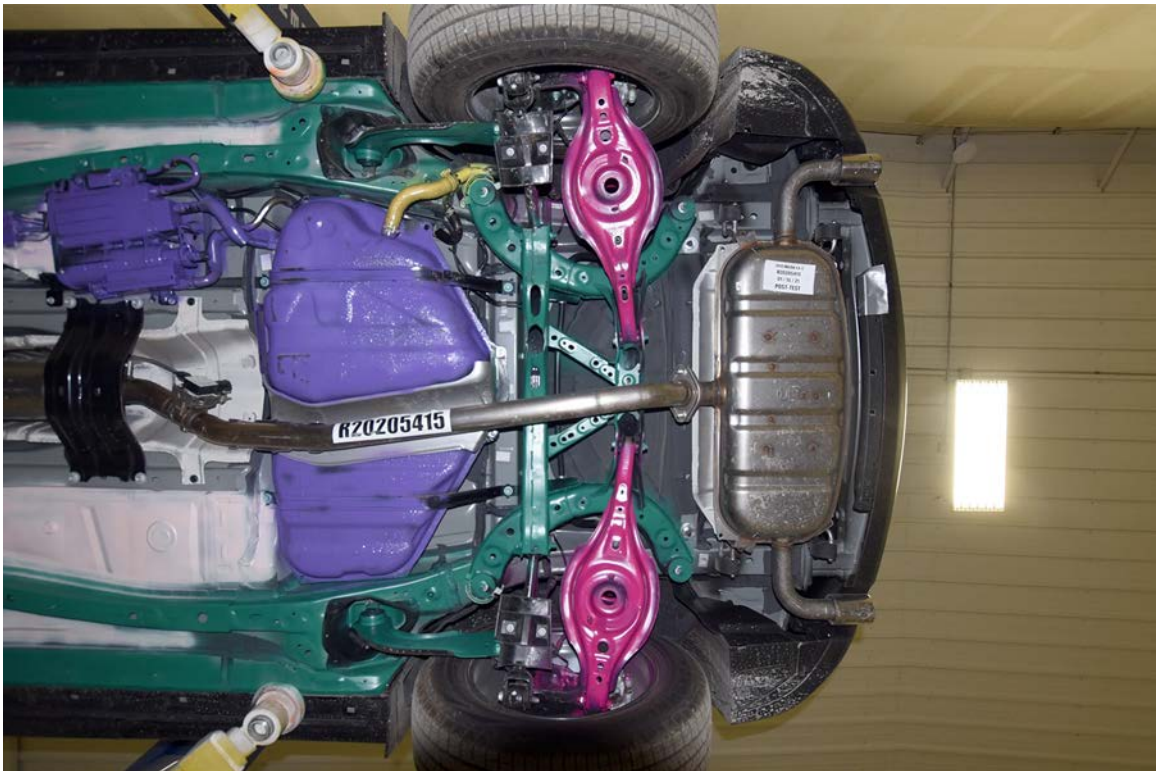


FIGURE 32. Post-Test Rear Underbody View



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



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

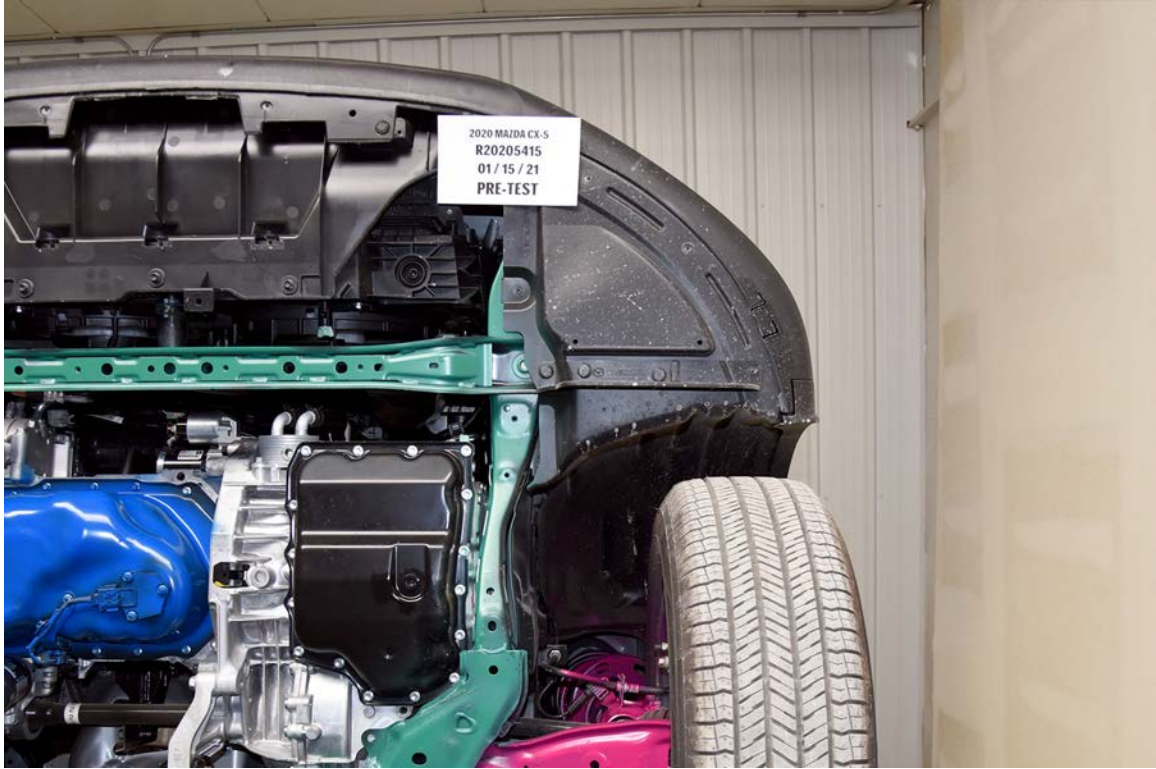


FIGURE 35. Pre-Test Driver Side Bumper to Rail Attachments and Crush Initiators



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

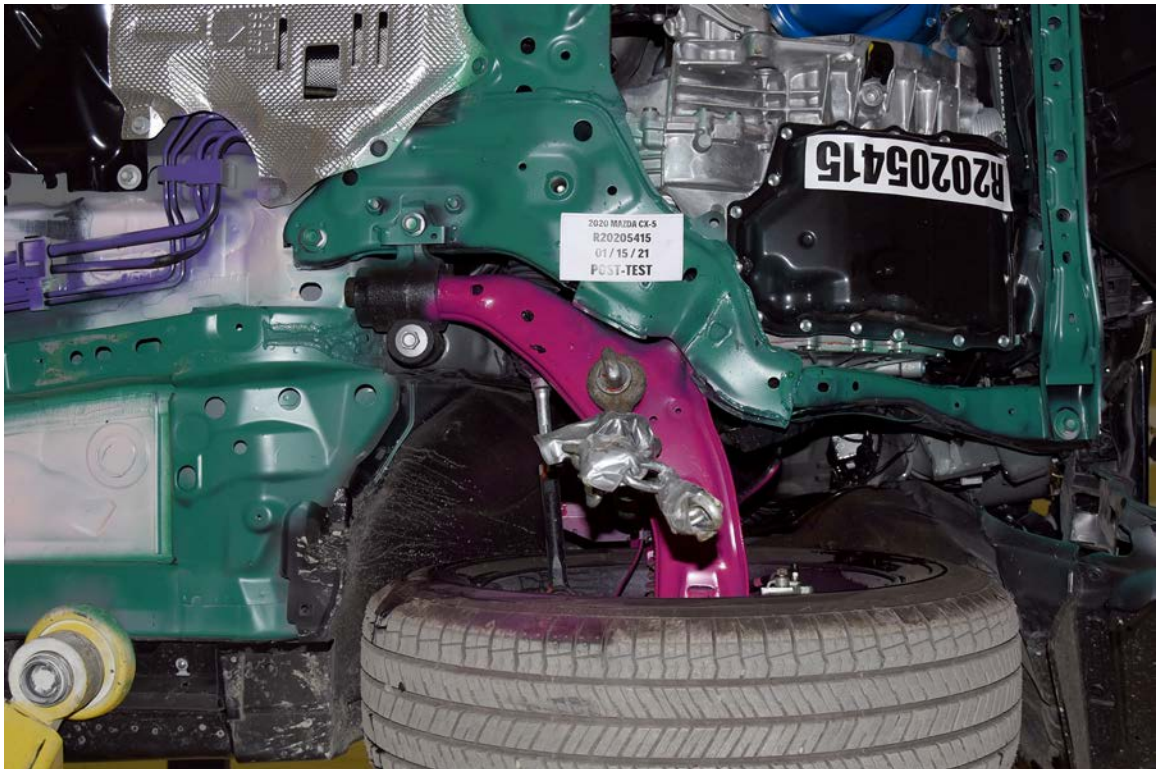


FIGURE 40. Post-Test Driver Side Rocker

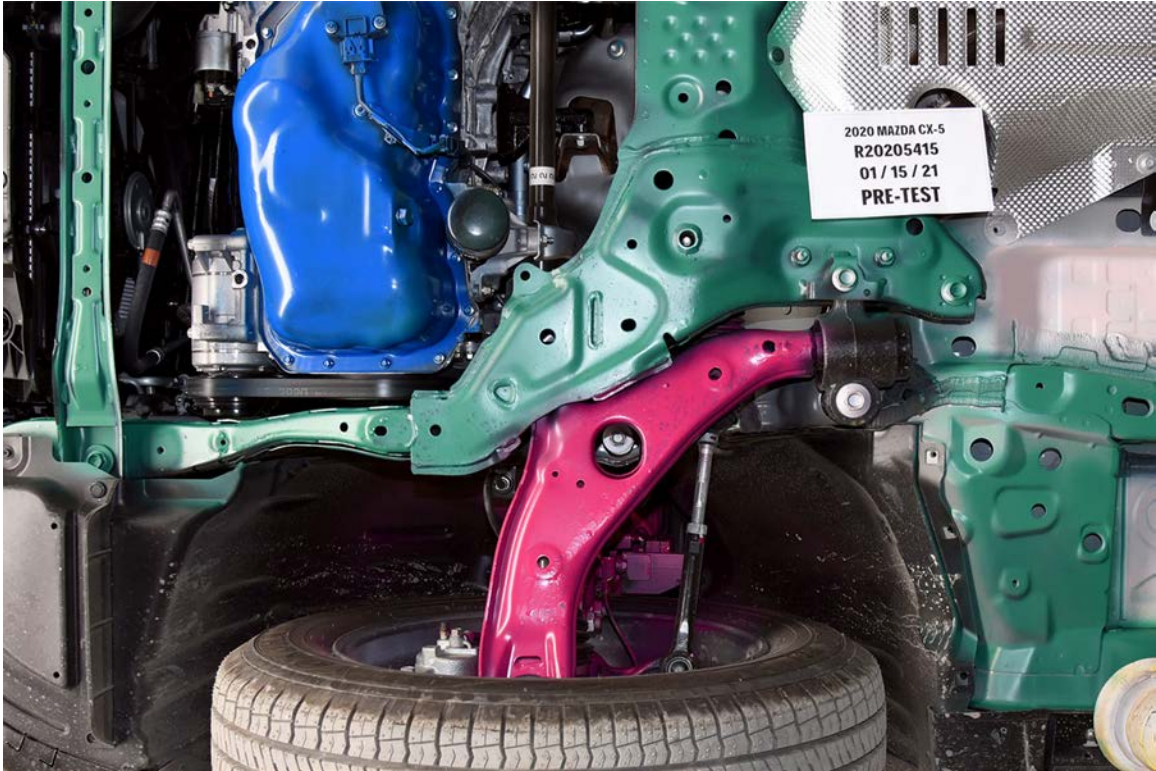


FIGURE 41. Pre-Test Passenger Side Rocker

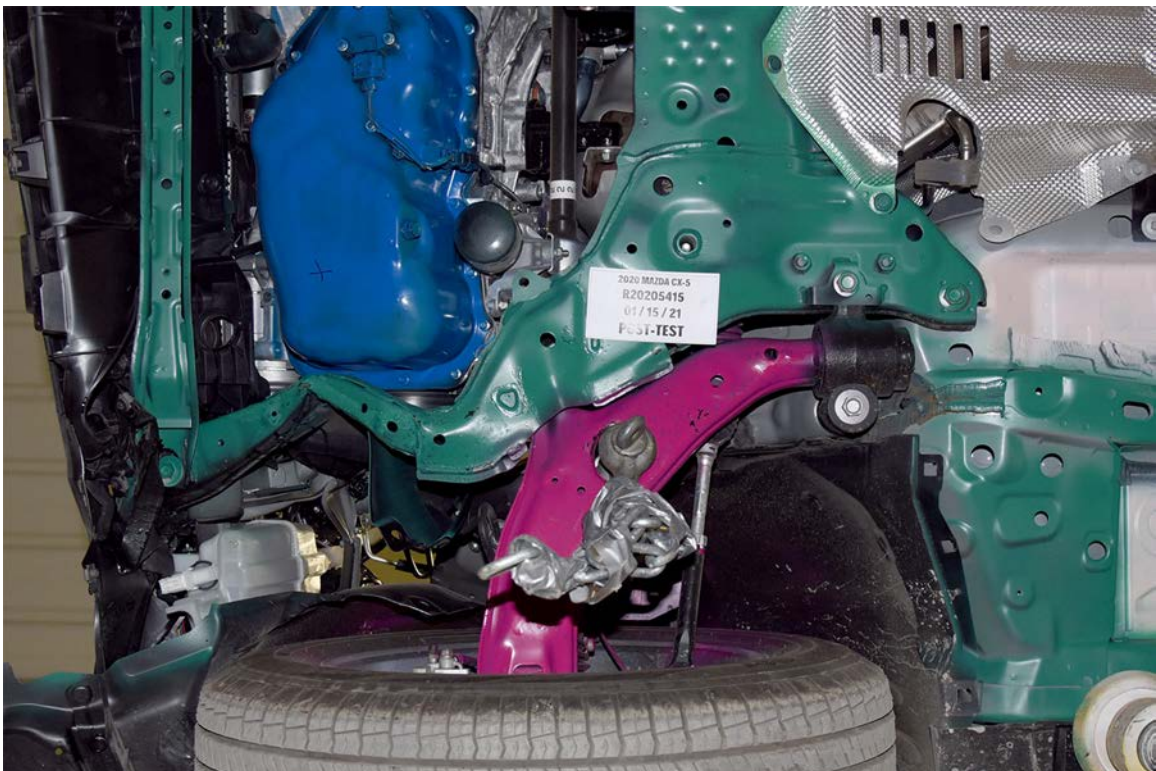


FIGURE 42. Post-Test Passenger Side Rocker



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

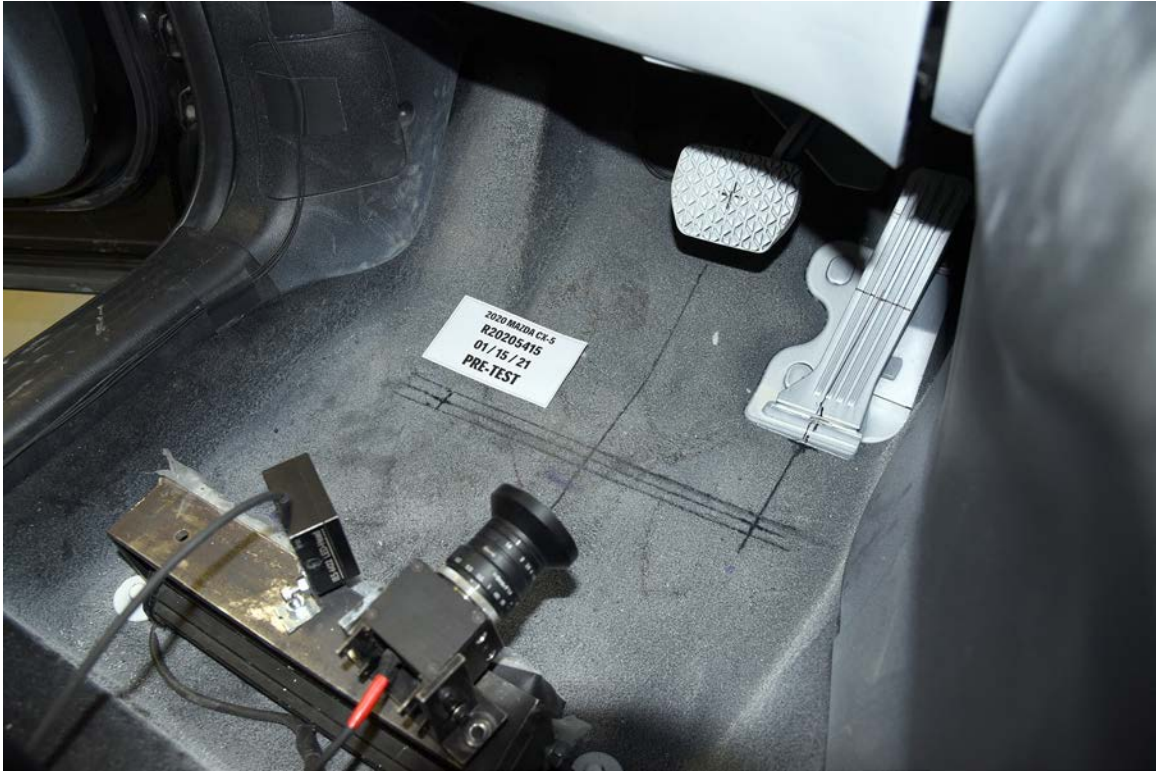


FIGURE 87. Pre-Test View of Driver Floor Pan from Center of Vehicle

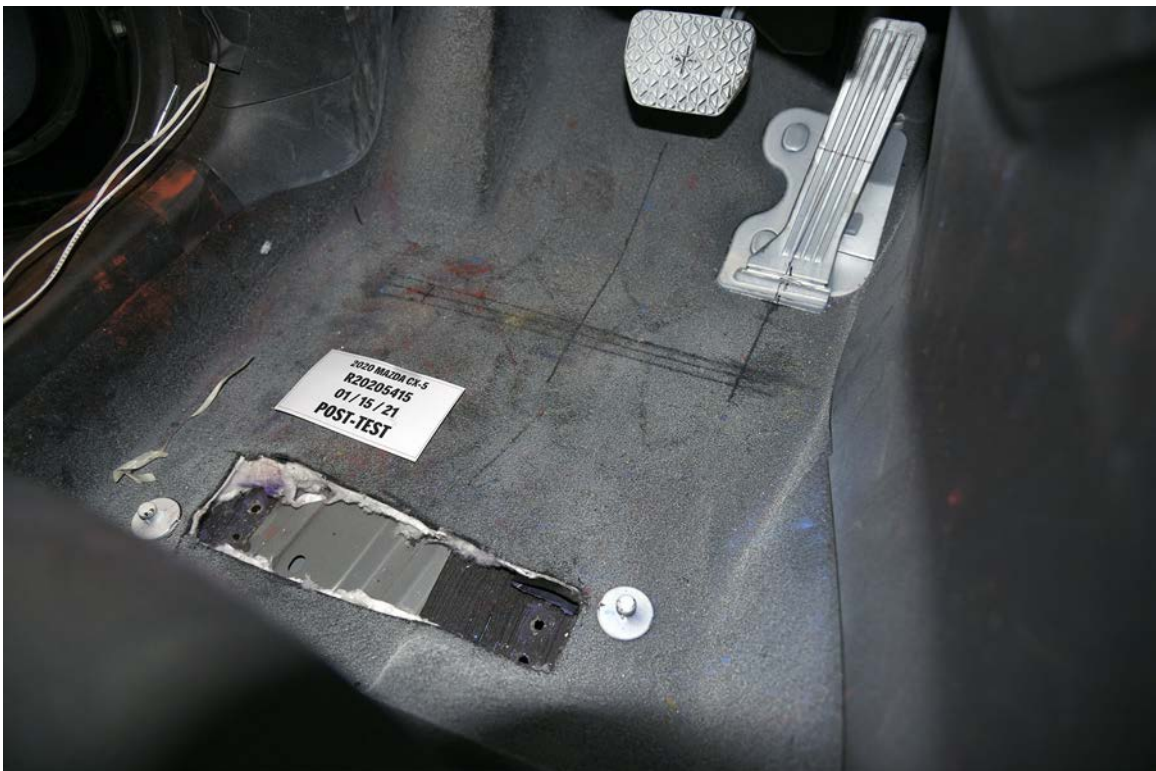


FIGURE 88. Post-Test View of Driver Floor Pan from Center of Vehicle



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

Photograph Not Applicable

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

Photograph Not Applicable

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

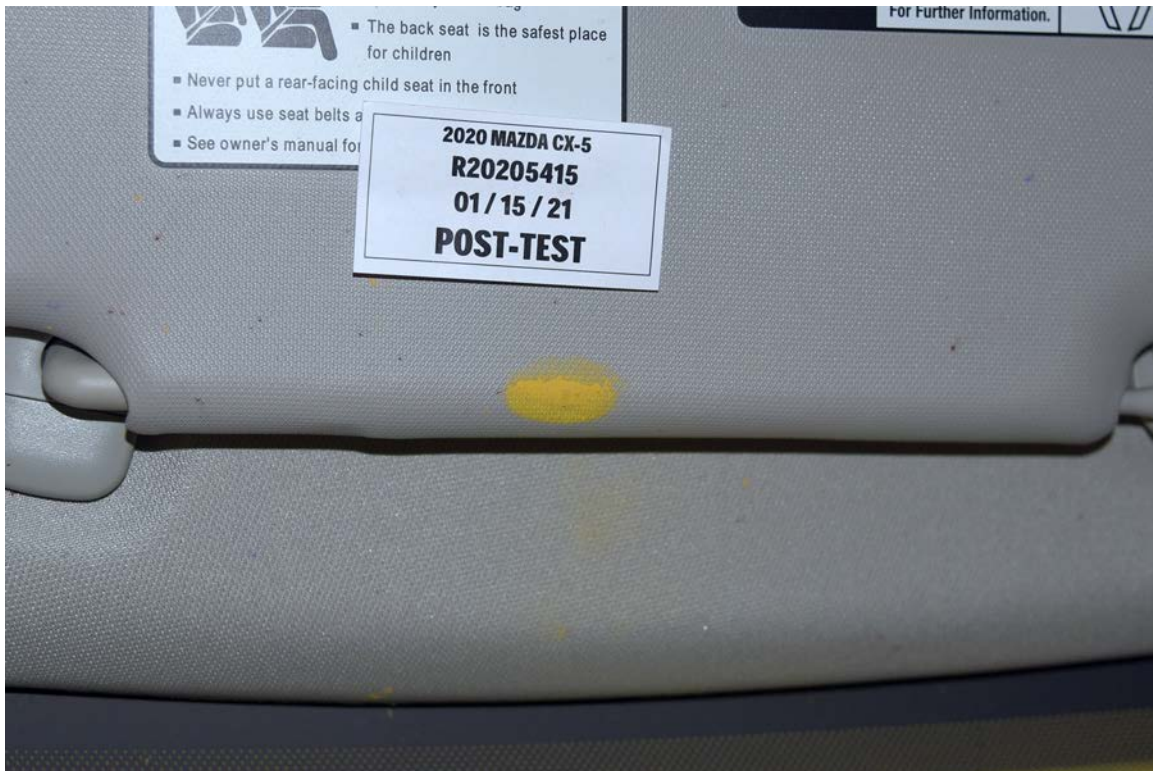


FIGURE 91a. Post-Test Driver Dummy Contact with Headliner



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



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

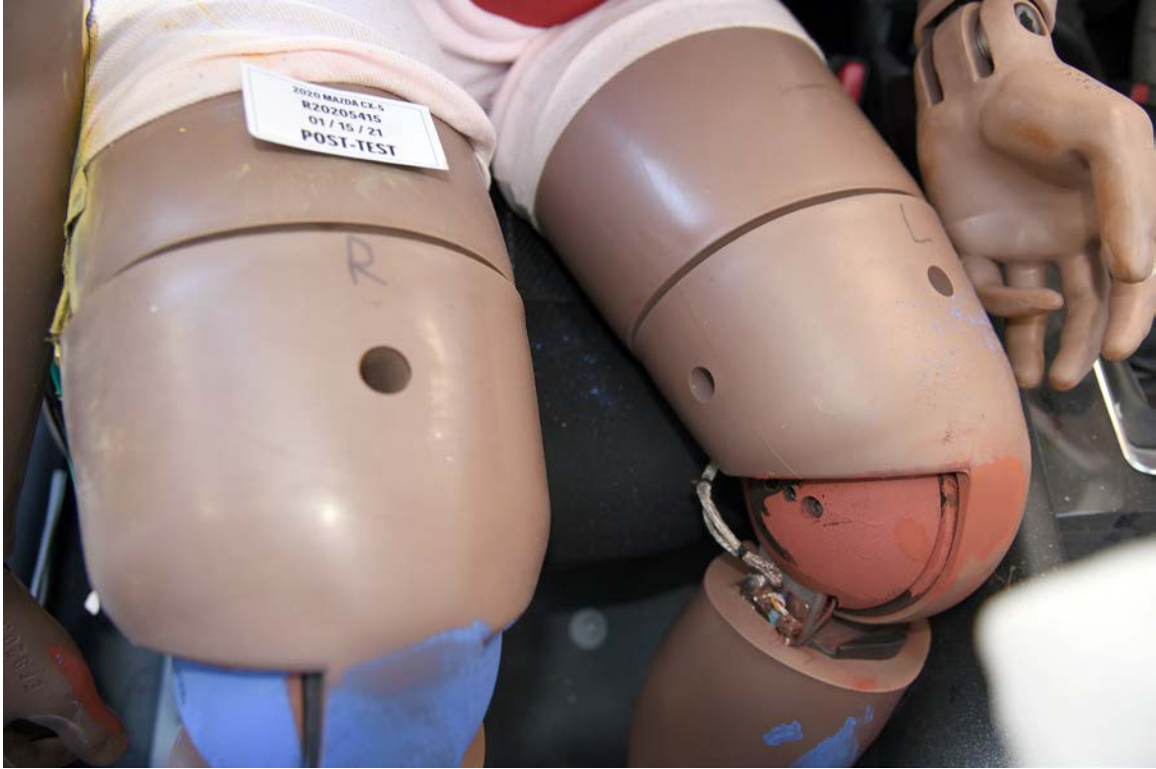


FIGURE 101. Post-Test Overhead View of Passenger Thighs on Seat



FIGURE 102. Pre-Test View of Passenger Abdomen



FIGURE 103. Post-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

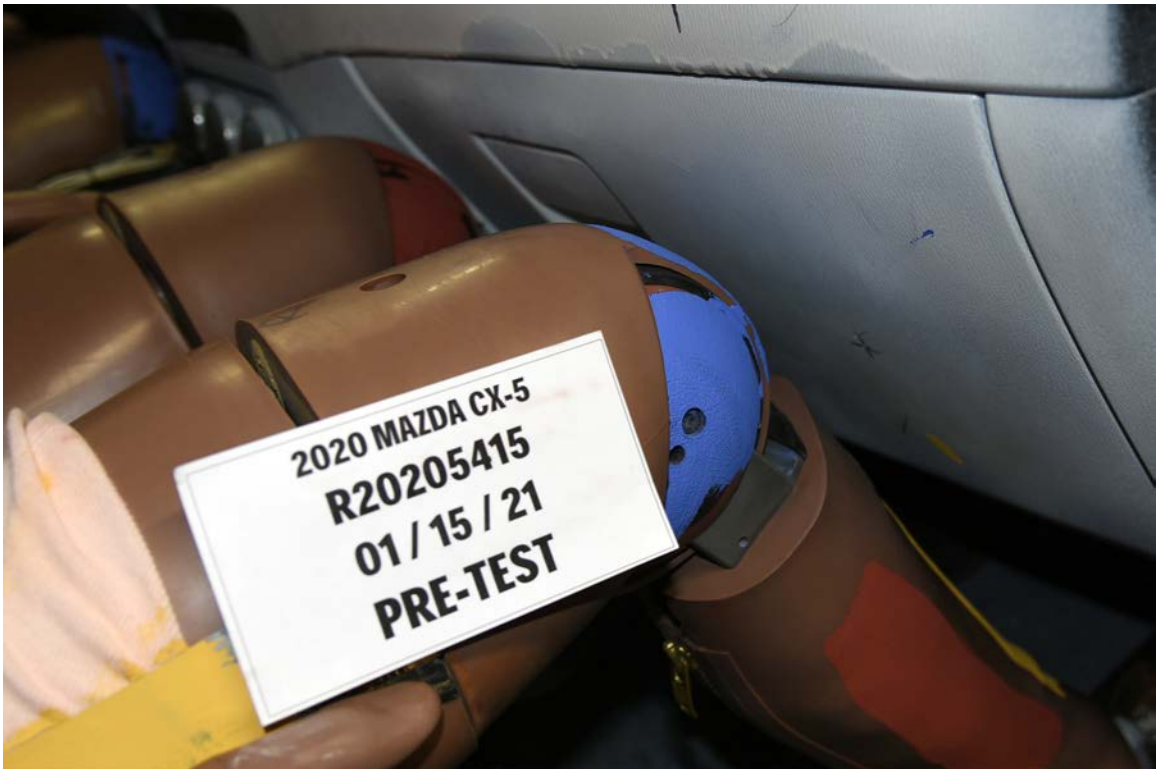


FIGURE 106. Pre-Test View of Passenger Right Knee and Bolster



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

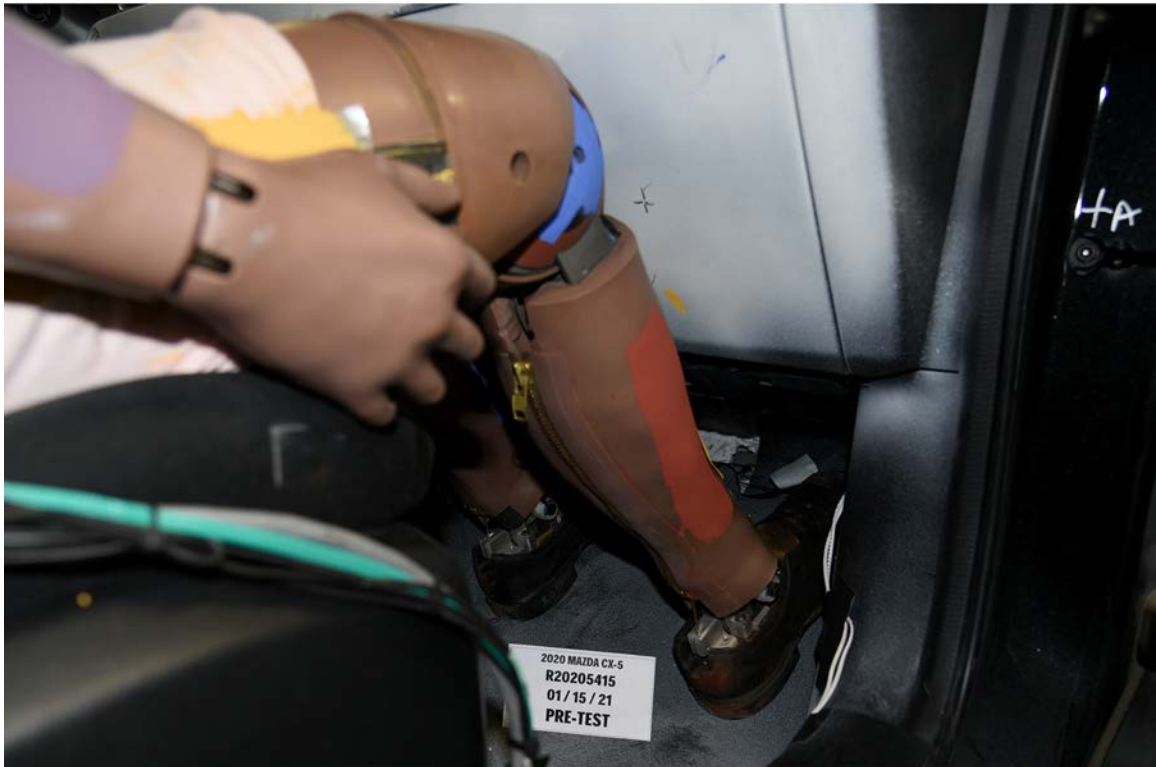


FIGURE 110. Pre-Test View of the Passenger Feet

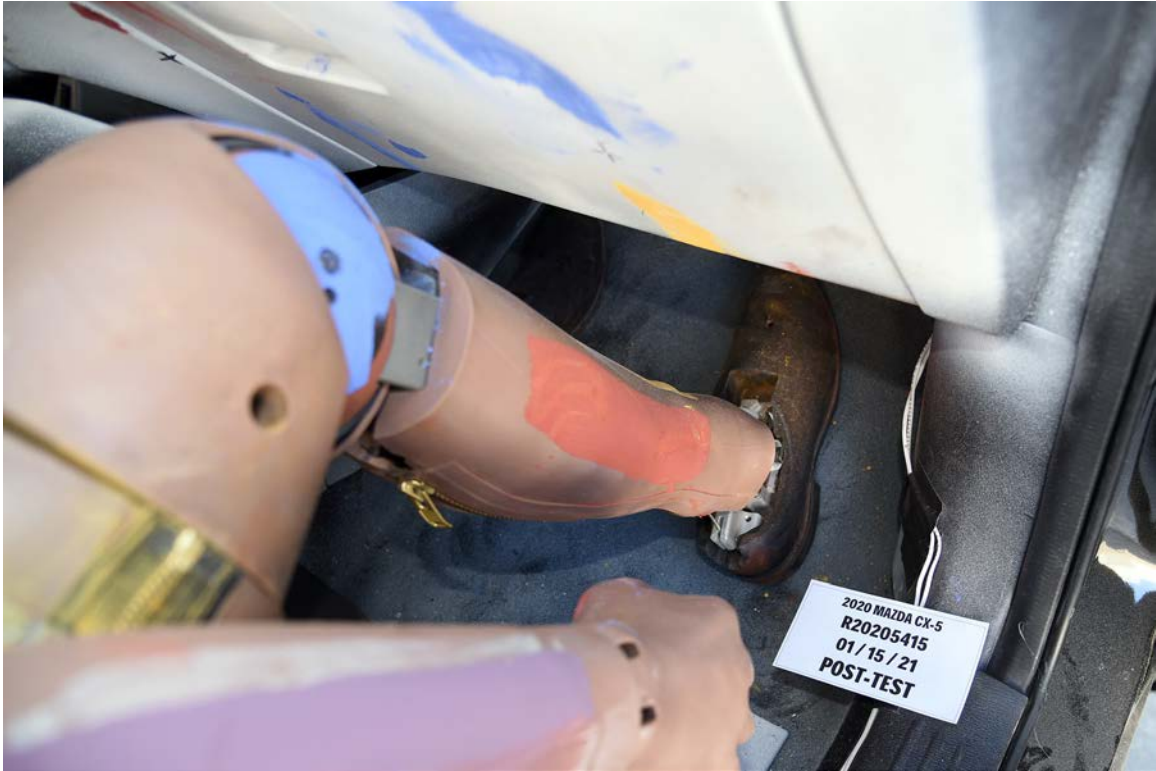


FIGURE 111. Post-Test View of the Passenger Feet



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

Photograph Not Available

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

Photograph Not Applicable

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



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

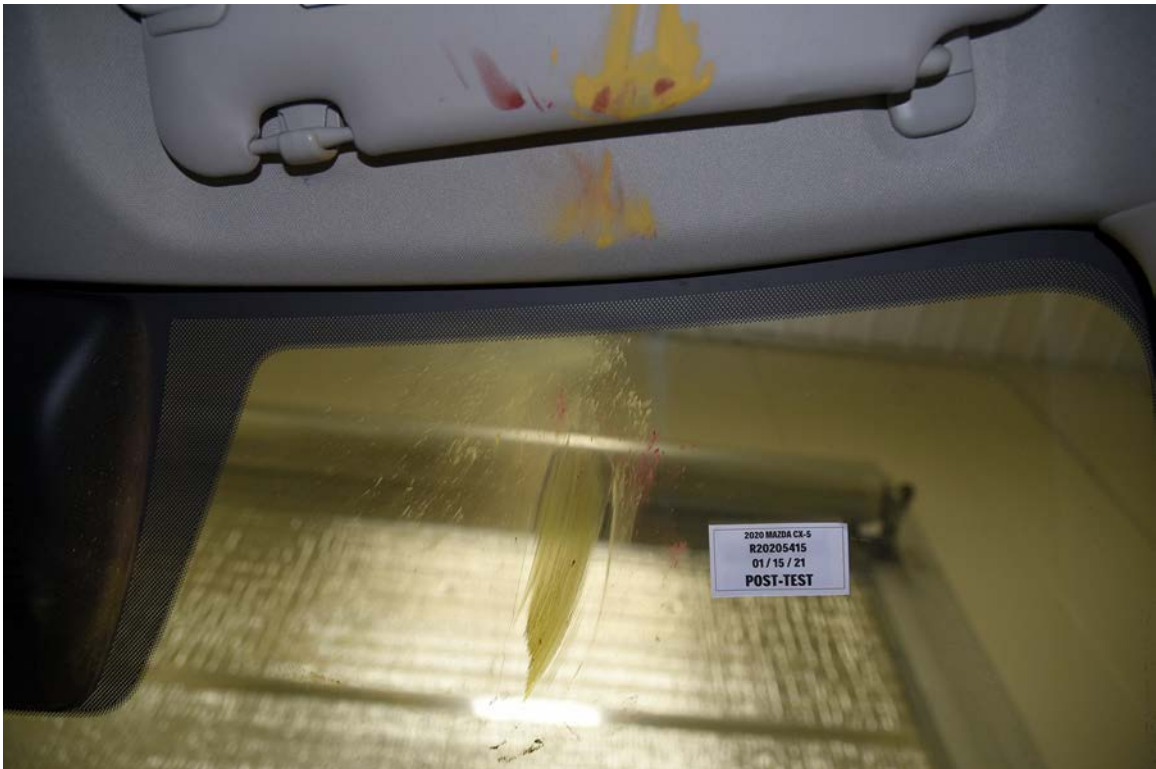


FIGURE 136b. Post-Test Passenger Dummy Contact with Windshield

Photograph Not Applicable

FIGURE 136c. Post-Test Passenger Dummy Contact with Pelvis Airbag



FIGURE 136d. Post-Test Passenger Dummy Contact with Knee Bolster



FIGURE 136e. Post-Test Passenger Dummy Contact with Door Panel

Photograph Not Applicable

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

Photograph Not Applicable

FIGURE 137. Photograph of Ballast Installed in Vehicle

Photograph Not Applicable

**No Stoddard
Solvent Spillage**

FIGURE 138. Post-Test Stoddard Solvent Spillage Location View



FIGURE 139. Post-Test Speed Trap Read-Out

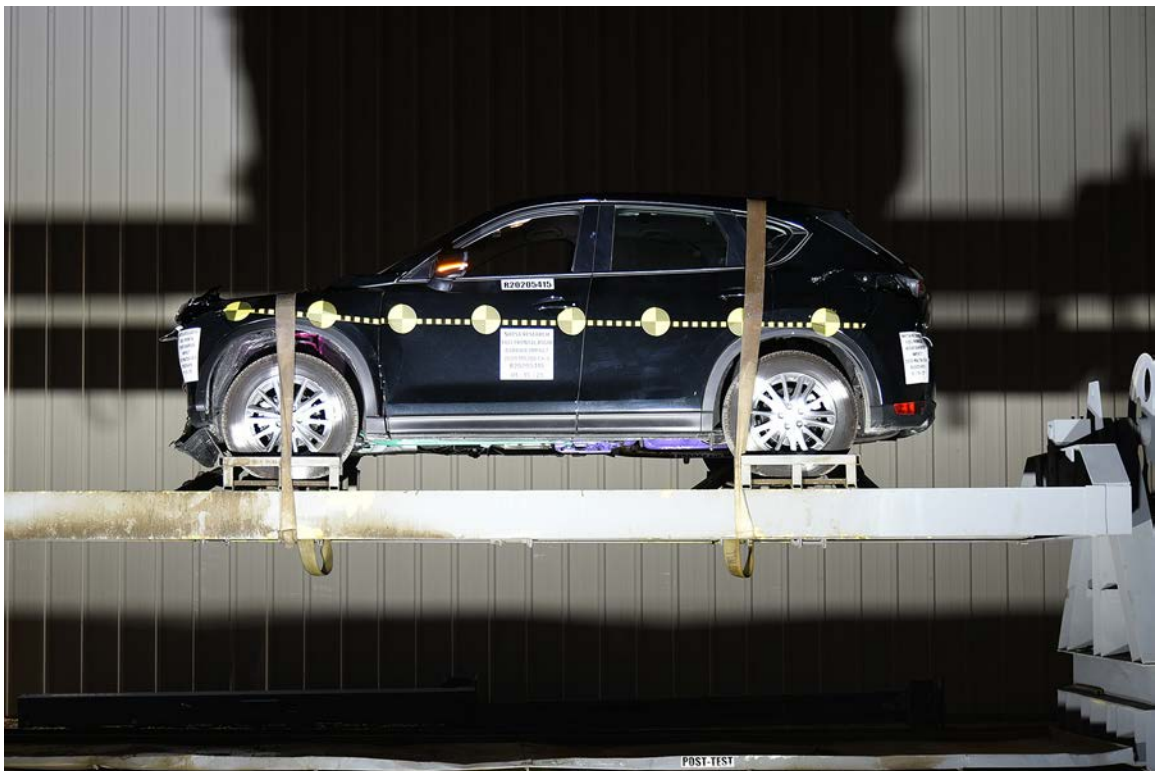


FIGURE 140. Vehicle at 0° on Static Rollover Device



FIGURE 141. Vehicle at 90° on Static Rollover Device

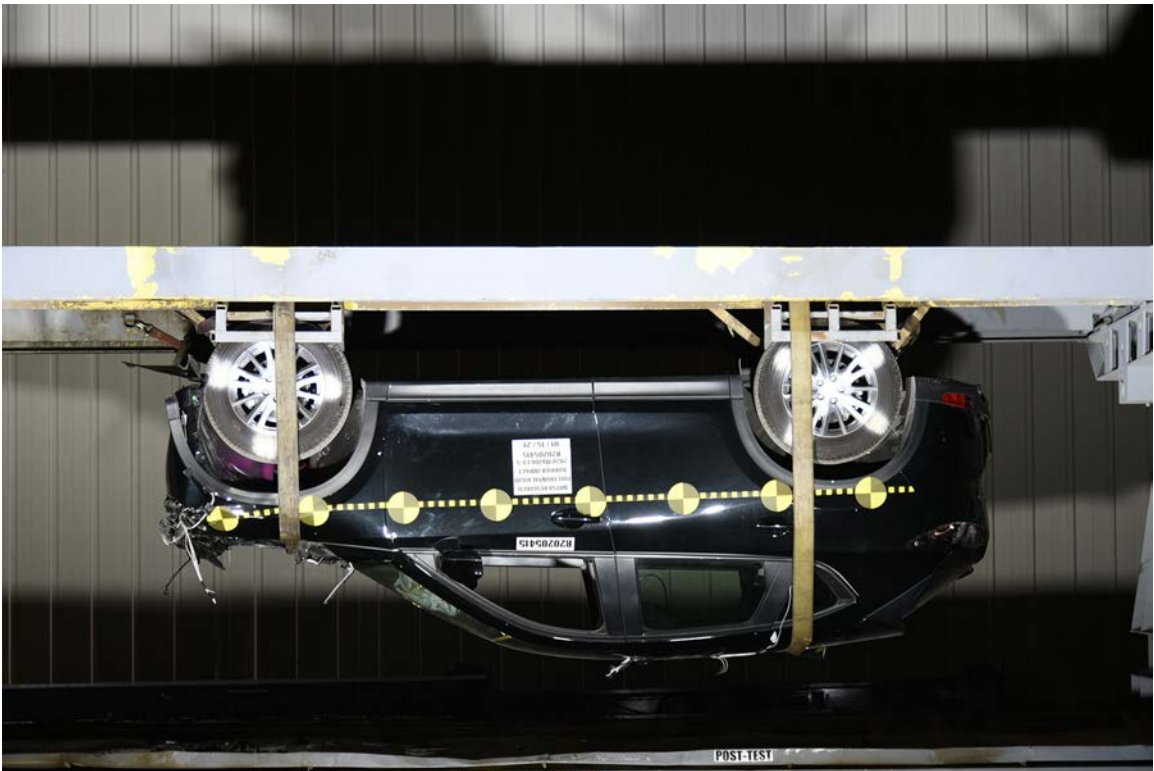


FIGURE 142. Vehicle at 180° on Static Rollover Device



FIGURE 143. Vehicle at 270° on Static Rollover Device

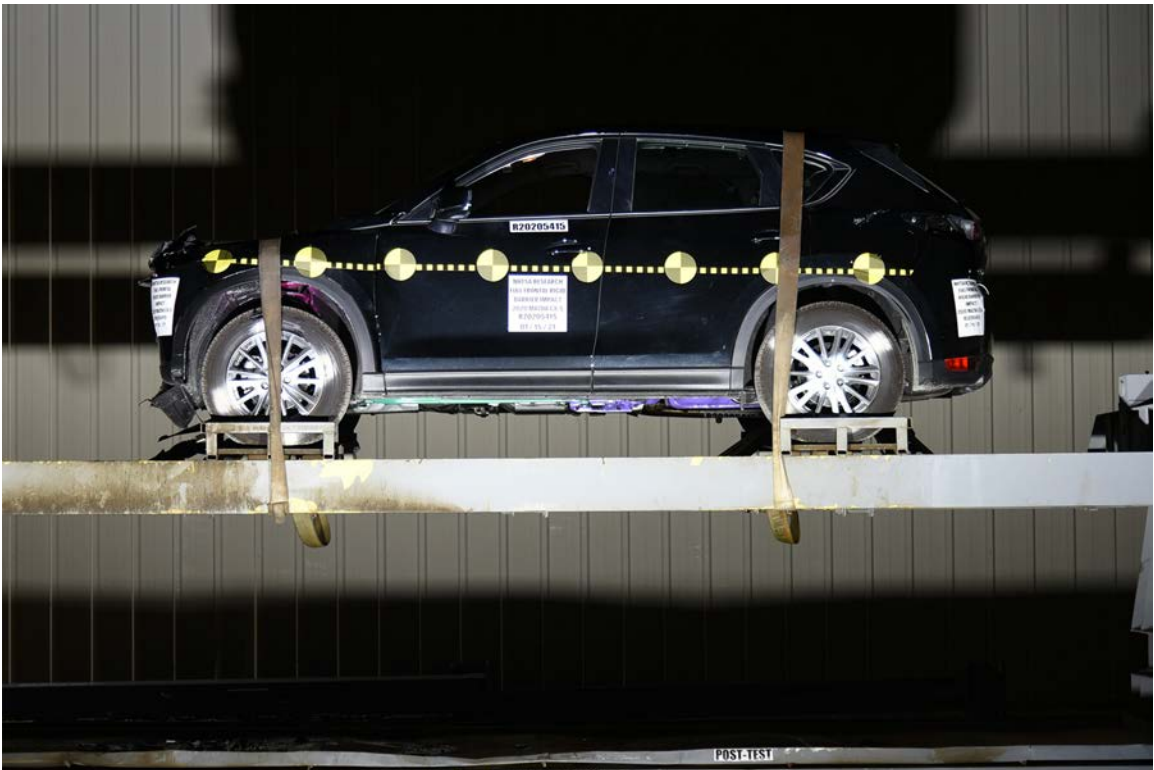


FIGURE 144. Vehicle at 360° on Static Rollover Device

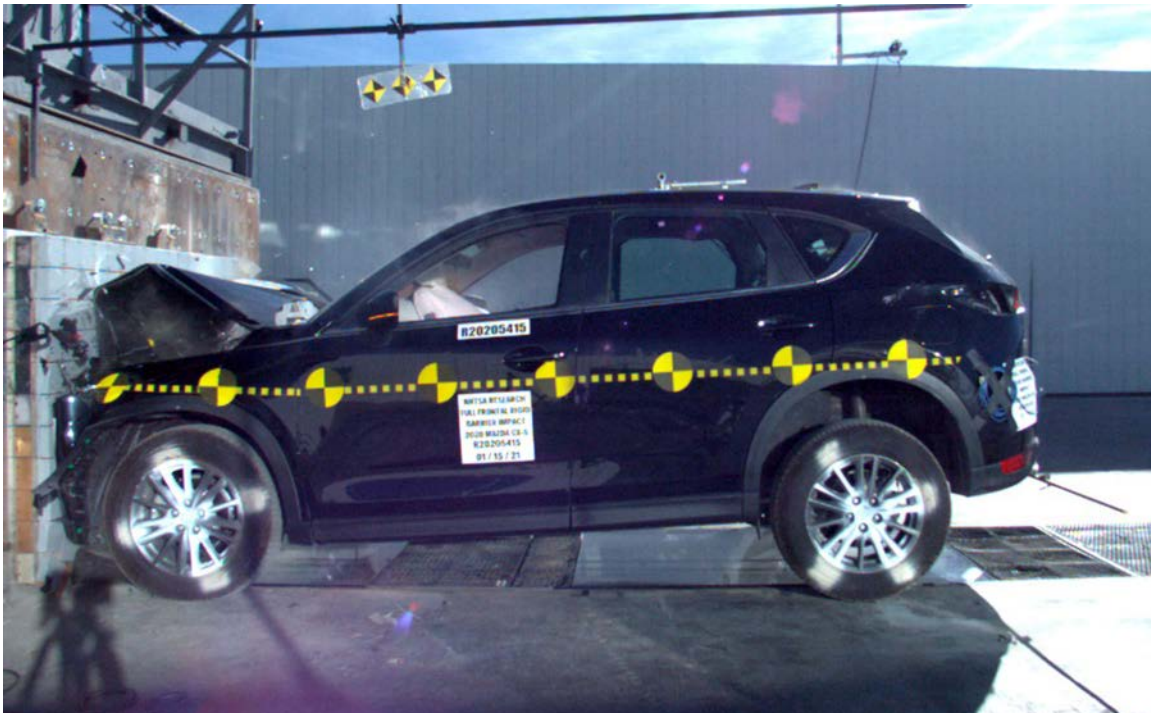


FIGURE 145. Frontal Impact Event

Fuel Economy and Environment

28 MPG
combined city/hwy

25 MPG
city

31 MPG
highway

3.6 gallons per 100 miles

Annual fuel cost \$1,450

Fuel Economy & Greenhouse Gas Rating (passenger only): 6

Smog Rating (passenger only): 7

SAFETY

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score ★★★★★

Frontal Crash Driver ★★★★★, Passenger ★★★★★

Side Crash Front seat ★★★★★, Rear seat ★★★★★

Rollover ★★★★★

2020 Mazda CX-5

Model: 2020 CX-5 SPORT FRONT WHEEL DRIVE
Exterior Color: JET BLACK MC
Interior Color: BLACK

STANDARD EQUIPMENT

ENGINE/MECHANICAL FEATURES

- SKYACTIV 2.5L ENGINE
- 187 HORSEPOWER, 196 LB-FT TORQUE
- SKYACTIV-DRIVE 6-SPD SPORT MODE AT
- FRONT VENTILATED DISC BRAKES
- REAR SOLID DISC BRAKES

EXTERIOR FEATURES

- 17-SPoke ALLOY WHEELS
- 225/55R17 ALL-SEASON TIRES
- RAIN-SENSING WINDSHIELD WIPERS
- TOXIC-INTERMITTENT REAR WIPER
- BODY-COLORED REAR ROOF SPOILER
- POWER SIDE MIRRORS WITH TURN LAMPS

INTERIOR FEATURES

- 8-PASSENGER SEATING
- CLOTH-TRIMMED SEATS
- 3-WAY MANUAL DRIVER'S SEAT
- LEATHER-WRAPPED STEERING WHEEL
- LEATHER-WRAPPED SHIFT KNOB
- POWER AUTOMATIC DOOR LOCKS
- POWER WINDOWS WITH ONE-TOUCH UP/DOWN
- ELECTRONIC PARKING BRAKE
- REMOTE KEYLESS ENTRY
- PUSH BUTTON ENGINE START
- REARVIEW CAMERA

SAFETY AND SECURITY FEATURES

- 160-MONOROCK MR POWERTRAIN & 36MO/50K MI BUMPER-TO-BUMPER WARRANTY
- 24-HOUR ROADSIDE ASSISTANCE
- 5-PASSENGER 3-POINT SAFETY BELTS
- LATCH CHILD SAFETY SEAT ANCHORS
- ANTI-THEFT ENGINE IMMOBILIZER
- TIRE PRESSURE MONITORING SYSTEM
- BLIND SPOT MONITORING
- LANE DEPARTURE WARNING SYSTEM
- LANE KEEP ASSIST
- REAR CROSS TRAFFIC ALERT

MSRP \$25,090

Total Vehicle and Options \$25,090
Delivery, Processing and Handling Fee \$1,045
Total MSRP \$26,135

Scan for Vehicle Info and offers

PARTS CONTENT INFORMATION:

FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 0%

MAJOR SOURCES OF FOREIGN PARTS CONTENT: JAPAN 90%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE: FINAL ASSEMBLY POINT: HIROSHIMA, JAPAN
COUNTRY OF ORIGIN: ENGINE: JAPAN
TRANSMISSION: JAPAN

This label is affixed pursuant to the Federal Automobile Information Disclosure Act. Gasoline, License and Title fees, State and local taxes, and Dealer-installed options are not included.

SALE INFORMATION:

SOLD TO: 23688 MAZDA CITY OF ORANGE PARK 6916 BLANDING BLVD. JACKSONVILLE, FL 32244

SHIP TO: 23688 MAZDA CITY OF ORANGE PARK 6916 BLANDING BLVD. JACKSONVILLE, FL 32244

JM3KFABMOL0732170

CSB-SP-2A-KR17MAB-JE--019101

MazdaUSA.com

FIGURE 146. Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA TRACES

TABLE OF DATA PLOTS

Plot		Page
1	P1TH HEAD CG X ACCELERATION	B-1
2	P1TH HEAD CG Y ACCELERATION	B-1
3	P1TH HEAD CG Z ACCELERATION	B-1
4	P1TH HEAD CG ANGULAR VELOCITY ABOUT X	B-1
5	P1TH HEAD CG ANGULAR VELOCITY ABOUT Y	B-2
6	P1TH HEAD CG ANGULAR VELOCITY ABOUT Z	B-2
7	P1TH FRONT NECK SPRING TOWER LOAD CELL	B-2
8	P1TH REAR NECK SPRING TOWER LOAD CELL	B-2
9	P1TH OCCIPITAL CONDYLE ROTATION POTENTIOMETER	B-3
10	P1TH UPPER NECK X FORCE	B-3
11	P1TH UPPER NECK Y FORCE	B-3
12	P1TH UPPER NECK Z FORCE	B-3
13	P1TH UPPER NECK X MOMENT	B-4
14	P1TH UPPER NECK Y MOMENT	B-4
15	P1TH UPPER NECK Z MOMENT	B-4
16	P1TH LOWER NECK X FORCE	B-4
17	P1TH LOWER NECK Y FORCE	B-5
18	P1TH LOWER NECK Z FORCE	B-5
19	P1TH LOWER NECK X MOMENT	B-5
20	P1TH LOWER NECK Y MOMENT	B-5
21	P1TH LOWER NECK Z MOMENT	B-6
22	P1TH T1 X ACCELERATION	B-6
23	P1TH T1 Y ACCELERATION	B-6
24	P1TH T1 Z ACCELERATION	B-6
25	P1TH UPPER LEFT DGIR X DISPLACEMENT	B-7
26	P1TH UPPER LEFT DGIR Y ROTATION	B-7
27	P1TH UPPER LEFT DGIR Z ROTATION	B-7
28	P1TH UPPER RIGHT DGIR X DISPLACEMENT	B-7
29	P1TH UPPER RIGHT DGIR Y ROTATION	B-8
30	P1TH UPPER RIGHT DGIR Z ROTATION	B-8
31	P1TH T6 X ACCELERATION	B-8
32	P1TH T6 Y ACCELERATION	B-8
33	P1TH T6 Z ACCELERATION	B-9
34	P1TH SPINE FORCE X	B-9
35	P1TH SPINE FORCE Y	B-9
36	P1TH SPINE FORCE Z	B-9

TABLE OF DATA PLOTS ... (CONTINUED)

Plot		Page
37	P1TH SPINE MOMENT X	B-10
38	P1TH SPINE MOMENT Y	B-10
39	P1TH LOWER LEFT DGIR X DISPLACEMENT	B-10
40	P1TH LOWER LEFT DGIR Y ROTATION	B-10
41	P1TH LOWER LEFT DGIR Z ROTATION	B-11
42	P1TH LOWER RIGHT DGIR X DISPLACEMENT	B-11
43	P1TH LOWER RIGHT DGIR Y ROTATION	B-11
44	P1TH LOWER RIGHT DGIR Z ROTATION	B-11
45	P1TH T12 X ACCELERATION	B-12
46	P1TH T12 Y ACCELERATION	B-12
47	P1TH T12 Z ACCELERATION	B-12
48	P1TH ABDOMEN LEFT DGIR X DISPLACEMENT	B-12
49	P1TH ABDOMEN LEFT DGIR Y ROTATION	B-13
50	P1TH ABDOMEN LEFT DGIR Z ROTATION	B-13
51	P1TH ABDOMEN RIGHT DGIR X DISPLACEMENT	B-13
52	P1TH ABDOMEN RIGHT DGIR Y ROTATION	B-13
53	P1TH ABDOMEN RIGHT DGIR Z ROTATION	B-14
54	P1TH ASIS LEFT X FORCE	B-14
55	P1TH ASIS LEFT Y MOMENT	B-14
56	P1TH ASIS RIGHT X FORCE	B-14
57	P1TH ASIS RIGHT Y MOMENT	B-15
58	P1TH ACETABULUM LEFT X FORCE	B-15
59	P1TH ACETABULUM LEFT Y FORCE	B-15
60	P1TH ACETABULUM LEFT Z FORCE	B-15
61	P1TH ACETABULUM RIGHT X FORCE	B-16
62	P1TH ACETABULUM RIGHT Y FORCE	B-16
63	P1TH ACETABULUM RIGHT Z FORCE	B-16
64	P1TH PELVIS X ACCELERATION	B-16
65	P1TH PELVIS Y ACCELERATION	B-17
66	P1TH PELVIS Z ACCELERATION	B-17
67	P1TH FEMUR LEFT X FORCE	B-17
68	P1TH FEMUR LEFT Y FORCE	B-17
69	P1TH FEMUR LEFT Z FORCE	B-18
70	P1TH FEMUR LEFT X MOMENT	B-18
71	P1TH FEMUR LEFT Y MOMENT	B-18
72	P1TH FEMUR LEFT Z MOMENT	B-18

TABLE OF DATA PLOTS ... (CONTINUED)

Plot		Page
73	P1TH FEMUR RIGHT X FORCE	B-19
74	P1TH FEMUR RIGHT Y FORCE	B-19
75	P1TH FEMUR RIGHT Z FORCE	B-19
76	P1TH FEMUR RIGHT X MOMENT	B-19
77	P1TH FEMUR RIGHT Y MOMENT	B-20
78	P1TH FEMUR RIGHT Z MOMENT	B-20
79	P1TH KNEE LEFT X DISPLACEMENT	B-20
80	P1TH KNEE RIGHT X DISPLACEMENT	B-20
81	P1TH UPPER TIBIA LEFT X FORCE	B-21
82	P1TH UPPER TIBIA LEFT Y FORCE	B-21
83	P1TH UPPER TIBIA LEFT Z FORCE	B-21
84	P1TH UPPER TIBIA LEFT X MOMENT	B-21
85	P1TH UPPER TIBIA LEFT Y MOMENT	B-22
86	P1TH UPPER TIBIA RIGHT X FORCE	B-22
87	P1TH UPPER TIBIA RIGHT Y FORCE	B-22
88	P1TH UPPER TIBIA RIGHT Z FORCE	B-22
89	P1TH UPPER TIBIA RIGHT X MOMENT	B-23
90	P1TH UPPER TIBIA RIGHT Y MOMENT	B-23
91	P1TH LOWER TIBIA LEFT X FORCE	B-23
92	P1TH LOWER TIBIA LEFT Y FORCE	B-23
93	P1TH LOWER TIBIA LEFT Z FORCE	B-24
94	P1TH LOWER TIBIA LEFT X MOMENT	B-24
95	P1TH LOWER TIBIA LEFT Y MOMENT	B-24
96	P1TH LOWER TIBIA RIGHT X FORCE	B-24
97	P1TH LOWER TIBIA RIGHT Y FORCE	B-25
98	P1TH LOWER TIBIA RIGHT Z FORCE	B-25
99	P1TH LOWER TIBIA RIGHT X MOMENT	B-25
100	P1TH LOWER TIBIA RIGHT Y MOMENT	B-25
101	P1TH ACHILLES LEFT Z FORCE	B-26
102	P1TH ACHILLES RIGHT Z FORCE	B-26
103	P1TH MID TIBIA LEFT X ACCELERATION	B-26
104	P1TH MID TIBIA LEFT Y ACCELERATION	B-26
105	P1TH MID TIBIA RIGHT X ACCELERATION	B-27
106	P1TH MID TIBIA RIGHT Y ACCELERATION	B-27
107	P1TH ANKLE LEFT X ROTATION	B-27
108	P1TH ANKLE LEFT Y ROTATION	B-27

TABLE OF DATA PLOTS ... (CONTINUED)

Plot		Page
109	P1TH ANKLE LEFT Z ROTATION	B-28
110	P1TH ANKLE RIGHT X ROTATION	B-28
111	P1TH ANKLE RIGHT Y ROTATION	B-28
112	P1TH ANKLE RIGHT Z ROTATION	B-28
113	P1TH FOOT LEFT X ACCELERATION	B-29
114	P1TH FOOT LEFT Y ACCELERATION	B-29
115	P1TH FOOT LEFT Z ACCELERATION	B-29
116	P1TH FOOT RIGHT X ACCELERATION	B-29
117	P1TH FOOT RIGHT Y ACCELERATION	B-30
118	P1TH FOOT RIGHT Z ACCELERATION	B-30
119	P2TH HEAD CG X ACCELERATION	B-31
120	P2TH HEAD CG Y ACCELERATION	B-31
121	P2TH HEAD CG Z ACCELERATION	B-31
122	P2TH HEAD CG ANGULAR VELOCITY ABOUT X	B-31
123	P2TH HEAD CG ANGULAR VELOCITY ABOUT Y	B-32
124	P2TH HEAD CG ANGULAR VELOCITY ABOUT Z	B-32
125	P2TH FRONT NECK SPRING TOWER LOAD CELL	B-32
126	P2TH REAR NECK SPRING TOWER LOAD CELL	B-32
127	P2TH UPPER NECK X FORCE	B-33
128	P2TH UPPER NECK Y FORCE	B-33
129	P2TH UPPER NECK Z FORCE	B-33
130	P2TH UPPER NECK X MOMENT	B-33
131	P2TH UPPER NECK Y MOMENT	B-34
132	P2TH UPPER NECK Z MOMENT	B-34
133	P2TH UPPER LEFT DGIR X DISPLACEMENT	B-34
134	P2TH UPPER LEFT DGIR Y ROTATION	B-34
135	P2TH UPPER LEFT DGIR Z ROTATION	B-35
136	P2TH UPPER RIGHT DGIR X DISPLACEMENT	B-35
137	P2TH UPPER RIGHT DGIR Y ROTATION	B-35
138	P2TH UPPER RIGHT DGIR Z ROTATION	B-35
139	P2TH T6 X ACCELERATION	B-36
140	P2TH T6 Y ACCELERATION	B-36
141	P2TH T6 Z ACCELERATION	B-36
142	P2TH T6 ANGULAR VELOCITY ABOUT X	B-36
143	P2TH T6 ANGULAR VELOCITY ABOUT Y	B-37
144	P2TH T6 ANGULAR VELOCITY ABOUT Z	B-37

TABLE OF DATA PLOTS ... (CONTINUED)

Plot		Page
145	P2TH SPINE FORCE X	B-37
146	P2TH SPINE FORCE Y	B-37
147	P2TH SPINE FORCE Z	B-38
148	P2TH SPINE MOMENT X	B-38
149	P2TH SPINE MOMENT Y	B-38
150	P2TH LOWER LEFT DGIR X DISPLACEMENT	B-38
151	P2TH LOWER LEFT DGIR Y ROTATION	B-39
152	P2TH LOWER LEFT DGIR Z ROTATION	B-39
153	P2TH LOWER RIGHT DGIR X DISPLACEMENT	B-39
154	P2TH LOWER RIGHT DGIR Y ROTATION	B-39
155	P2TH LOWER RIGHT DGIR Z ROTATION	B-40
156	P2TH ABDOMEN LEFT DGIR X DISPLACEMENT	B-40
157	P2TH ABDOMEN LEFT DGIR Y ROTATION	B-40
158	P2TH ABDOMEN LEFT DGIR Z ROTATION	B-40
159	P2TH ABDOMEN RIGHT DGIR X DISPLACEMENT	B-41
160	P2TH ABDOMEN RIGHT DGIR Y ROTATION	B-41
161	P2TH ABDOMEN RIGHT DGIR Z ROTATION	B-41
162	P2TH ASIS LEFT X FORCE	B-41
163	P2TH ASIS LEFT Y MOMENT	B-42
164	P2TH ASIS RIGHT X FORCE	B-42
165	P2TH ASIS RIGHT Y MOMENT	B-42
166	P2TH ACETABULUM LEFT X FORCE	B-42
167	P2TH ACETABULUM LEFT Y FORCE	B-43
168	P2TH ACETABULUM LEFT Z FORCE	B-43
169	P2TH ACETABULUM RIGHT X FORCE	B-43
170	P2TH ACETABULUM RIGHT Y FORCE	B-43
171	P2TH ACETABULUM RIGHT Z FORCE	B-44
172	P2TH PELVIS X ACCELERATION	B-44
173	P2TH PELVIS Y ACCELERATION	B-44
174	P2TH PELVIS Z ACCELERATION	B-44
175	P2TH PELVIS ANGULAR VELOCITY ABOUT X	B-45
176	P2TH PELVIS ANGULAR VELOCITY ABOUT Y	B-45
177	P2TH PELVIS ANGULAR VELOCITY ABOUT Z	B-45
178	P2TH FEMUR LEFT X FORCE	B-45
179	P2TH FEMUR LEFT Y FORCE	B-46
180	P2TH FEMUR LEFT Z FORCE	B-46

TABLE OF DATA PLOTS ... (CONTINUED)

Plot	Page	
183	P2TH FEMUR LEFT X MOMENT	B-46
184	P2TH FEMUR LEFT Y MOMENT	B-46
185	P2TH FEMUR LEFT Z MOMENT	B-47
186	P2TH FEMUR RIGHT X FORCE	B-47
187	P2TH FEMUR RIGHT Y FORCE	B-47
188	P2TH FEMUR RIGHT Z FORCE	B-47
189	P2TH FEMUR RIGHT X MOMENT	B-48
190	P2TH FEMUR RIGHT Y MOMENT	B-48
191	P2TH FEMUR RIGHT Z MOMENT	B-48
192	P2TH KNEE LEFT X DISPLACEMENT	B-48
193	P2TH KNEE RIGHT X DISPLACEMENT	B-49
194	P2TH UPPER TIBIA LEFT X FORCE	B-49
195	P2TH UPPER TIBIA LEFT Y FORCE	B-49
196	P2TH UPPER TIBIA LEFT Z FORCE	B-49
197	P2TH UPPER TIBIA LEFT X MOMENT	B-50
198	P2TH UPPER TIBIA LEFT Y MOMENT	B-50
199	P2TH UPPER TIBIA RIGHT X FORCE	B-50
200	P2TH UPPER TIBIA RIGHT Y FORCE	B-50
201	P2TH UPPER TIBIA RIGHT Z FORCE	B-51
202	P2TH UPPER TIBIA RIGHT X MOMENT	B-51
203	P2TH UPPER TIBIA RIGHT Y MOMENT	B-51
204	P2TH LOWER TIBIA LEFT X FORCE	B-51
205	P2TH LOWER TIBIA LEFT Y FORCE	B-52
206	P2TH LOWER TIBIA LEFT Z FORCE	B-52
207	P2TH LOWER TIBIA LEFT X MOMENT	B-52
208	P2TH LOWER TIBIA LEFT Y MOMENT	B-52
209	P2TH LOWER TIBIA RIGHT X FORCE	B-53
210	P2TH LOWER TIBIA RIGHT Y FORCE	B-53
211	P2TH LOWER TIBIA RIGHT Z FORCE	B-53
212	P2TH LOWER TIBIA RIGHT X MOMENT	B-53
213	P2TH LOWER TIBIA RIGHT Y MOMENT	B-54
214	P2TH ANKLE LEFT X ROTATION	B-54
215	P2TH ANKLE LEFT Y ROTATION	B-54
216	P2TH ANKLE LEFT Z ROTATION	B-54
217	P2TH ANKLE RIGHT X ROTATION	B-55
218	P2TH ANKLE RIGHT Y ROTATION	B-55

TABLE OF DATA PLOTS ... (CONTINUED)

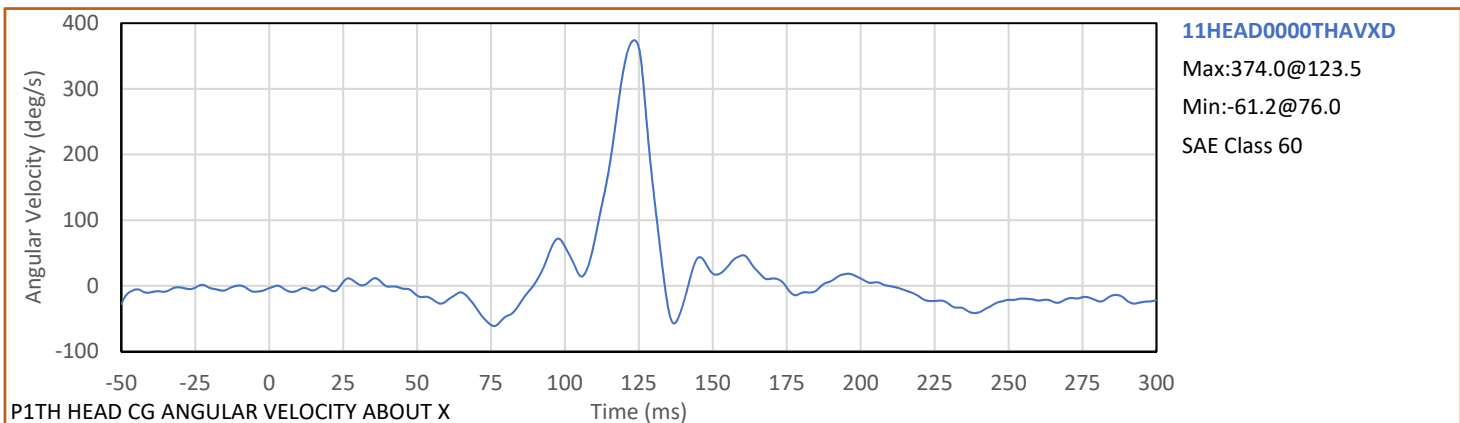
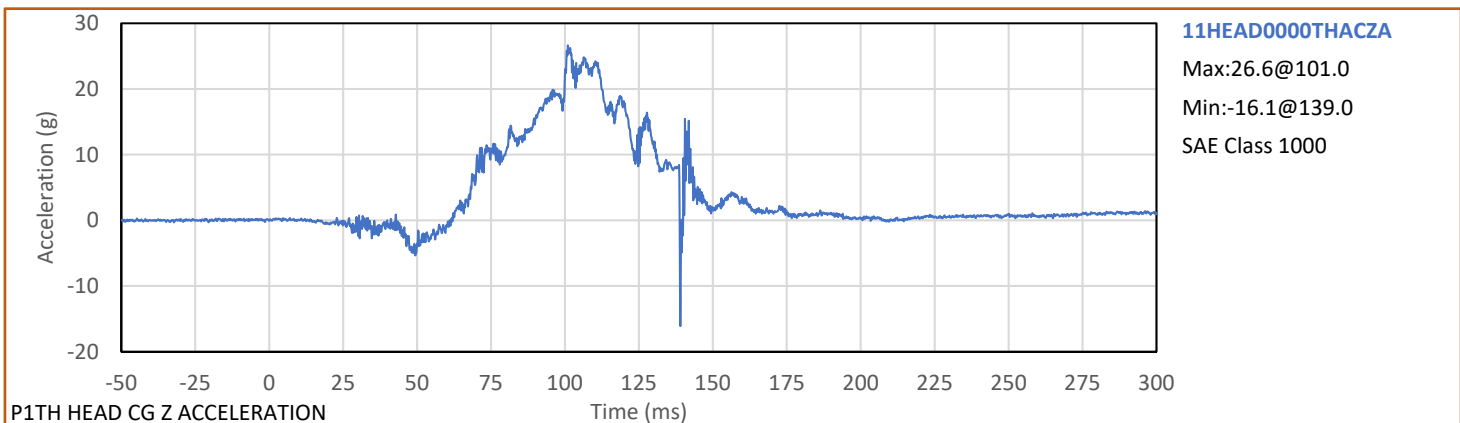
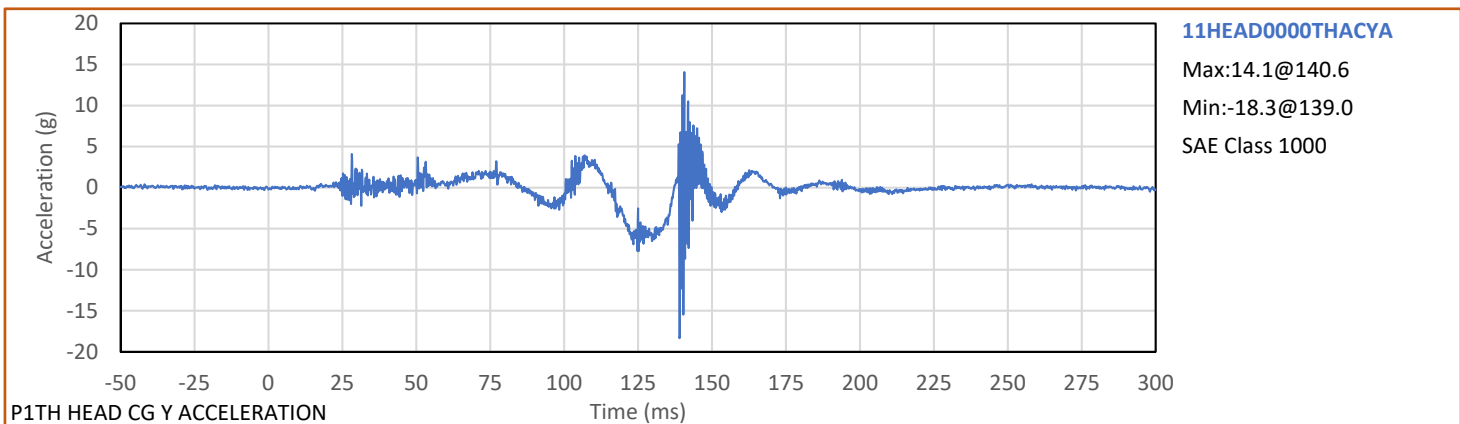
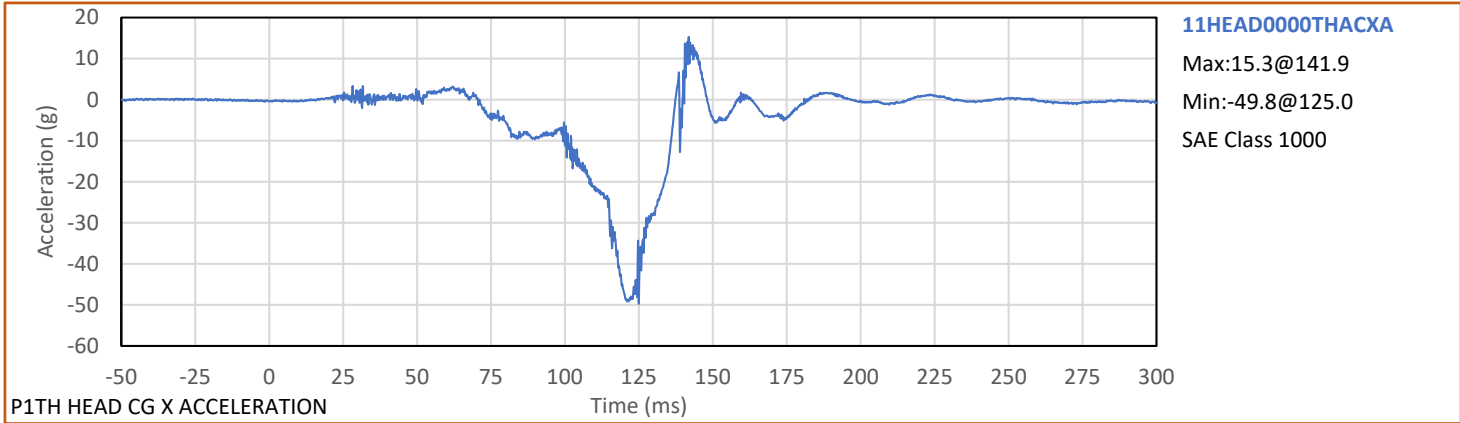
Plot		Page
216	P2TH ANKLE RIGHT Z ROTATION	B-55
217	P1TH CHEST LEFT UPPER DX	B-56
218	P1TH CHEST LEFT UPPER DY	B-56
219	P1TH CHEST LEFT UPPER DZ	B-56
220	P1TH CHEST LEFT UPPER RESULTANT	B-56
221	P1TH CHEST RIGHT UPPER DX	B-57
222	P1TH CHEST RIGHT UPPER DY	B-57
223	P1TH CHEST RIGHT UPPER DZ	B-57
224	P1TH CHEST RIGHT UPPER RESULTANT	B-57
225	P1TH CHEST LEFT LOWER DX	B-58
226	P1TH CHEST LEFT LOWER DY	B-58
227	P1TH CHEST LEFT LOWER DZ	B-58
228	P1TH CHEST LEFT LOWER RESULTANT	B-58
229	P1TH CHEST RIGHT LOWER DX	B-59
230	P1TH CHEST RIGHT LOWER DY	B-59
231	P1TH CHEST RIGHT LOWER DZ	B-59
232	P1TH CHEST RIGHT LOWER RESULTANT	B-59
233	P1TH ABDOMEN LEFT LOWER DX	B-60
234	P1TH ABDOMEN LEFT LOWER DY	B-60
235	P1TH ABDOMEN LEFT LOWER DZ	B-60
236	P1TH ABDOMEN LEFT LOWER RESULTANT	B-60
237	P1TH ABDOMEN RIGHT LOWER DX	B-61
238	P1TH ABDOMEN RIGHT LOWER DY	B-61
239	P1TH ABDOMEN RIGHT LOWER DZ	B-61
240	P1TH ABDOMEN RIGHT LOWER RESULTANT	B-61
241	P2TH CHEST LEFT UPPER DX	B-62
242	P2TH CHEST LEFT UPPER DY	B-62
243	P2TH CHEST LEFT UPPER DZ	B-62
244	P2TH CHEST LEFT UPPER RESULTANT	B-62
245	P2TH CHEST RIGHT UPPER DX	B-63
246	P2TH CHEST RIGHT UPPER DY	B-63
247	P2TH CHEST RIGHT UPPER DZ	B-63
248	P2TH CHEST RIGHT UPPER RESULTANT	B-63
249	P2TH CHEST LEFT LOWER DX	B-64
250	P2TH CHEST LEFT LOWER DY	B-64
251	P2TH CHEST LEFT LOWER DZ	B-64

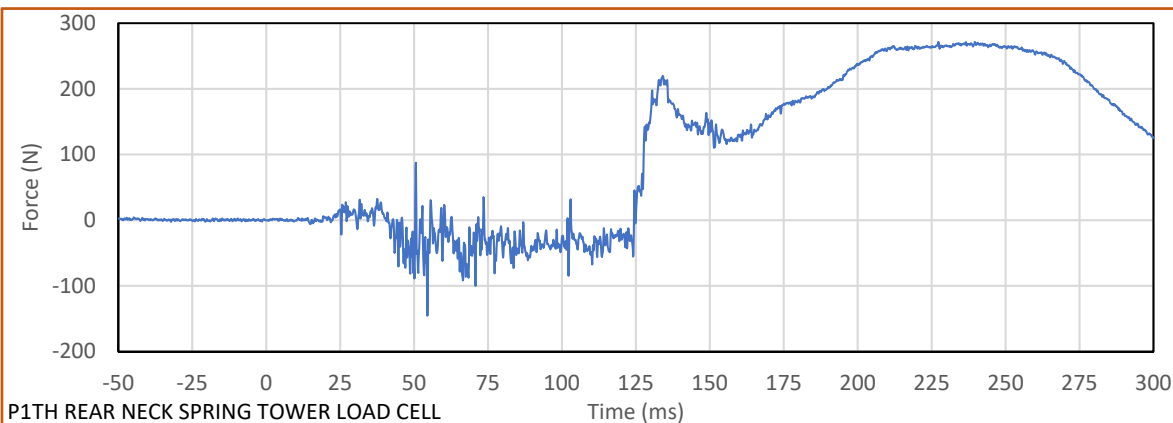
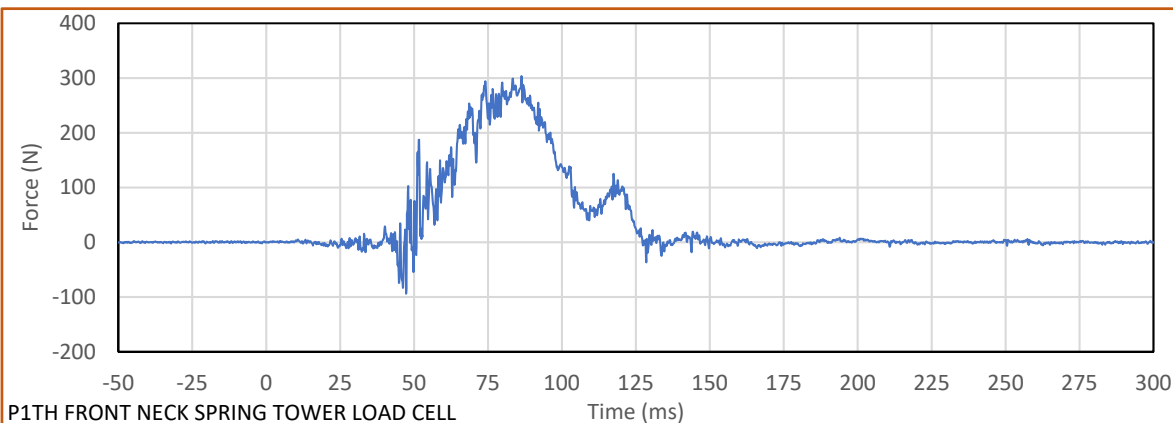
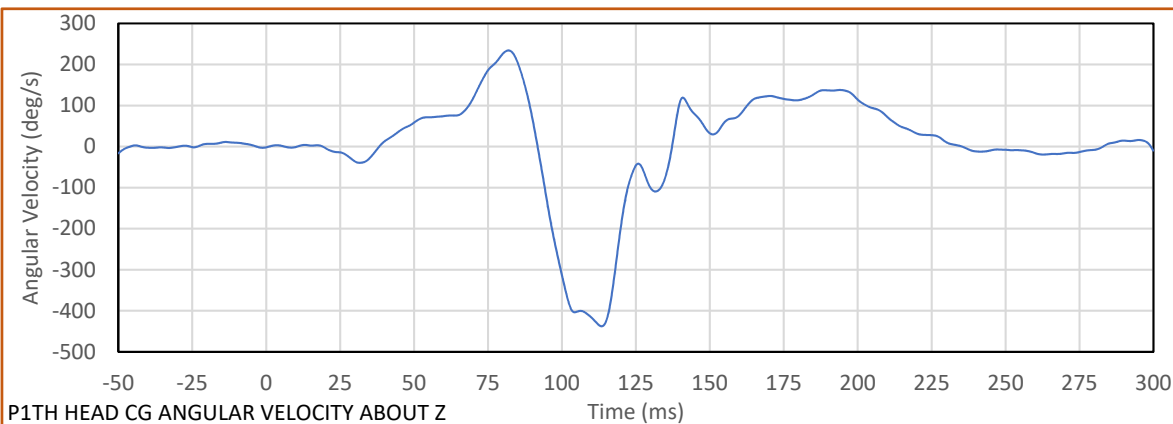
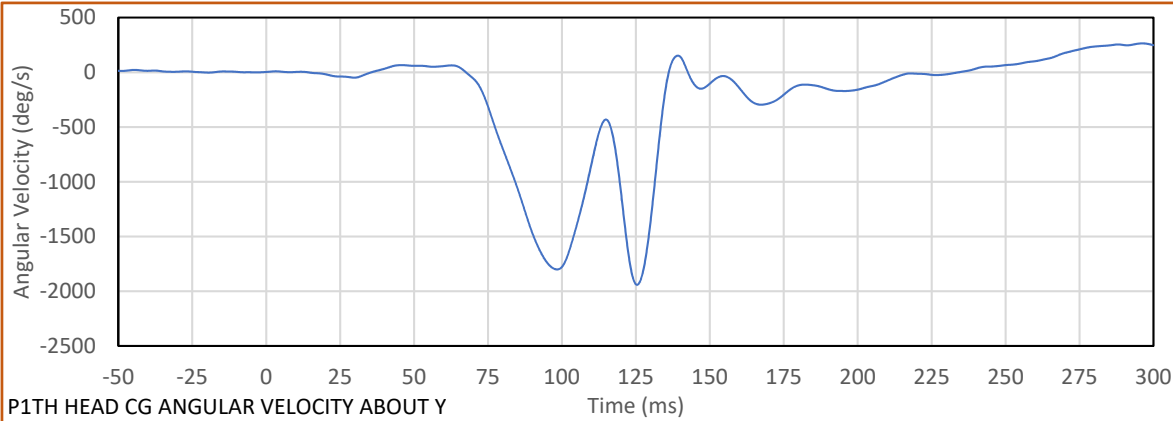
TABLE OF DATA PLOTS ... (CONTINUED)

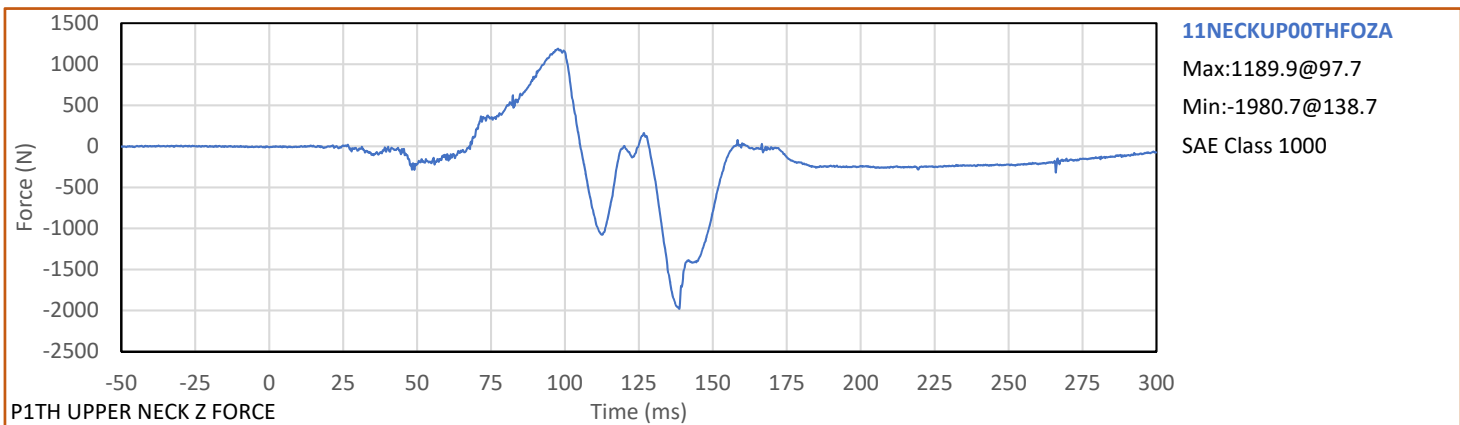
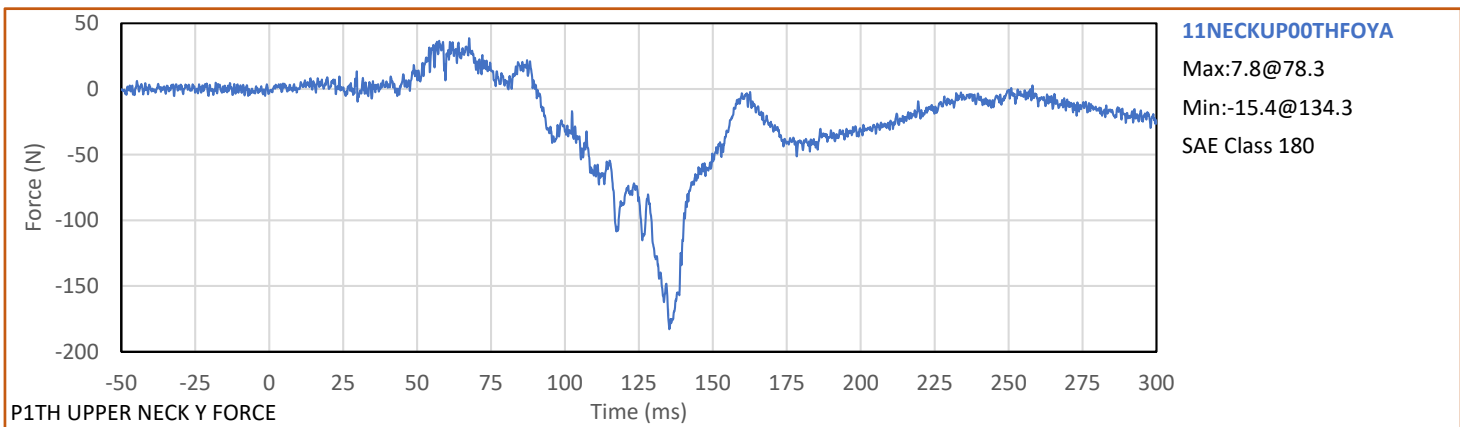
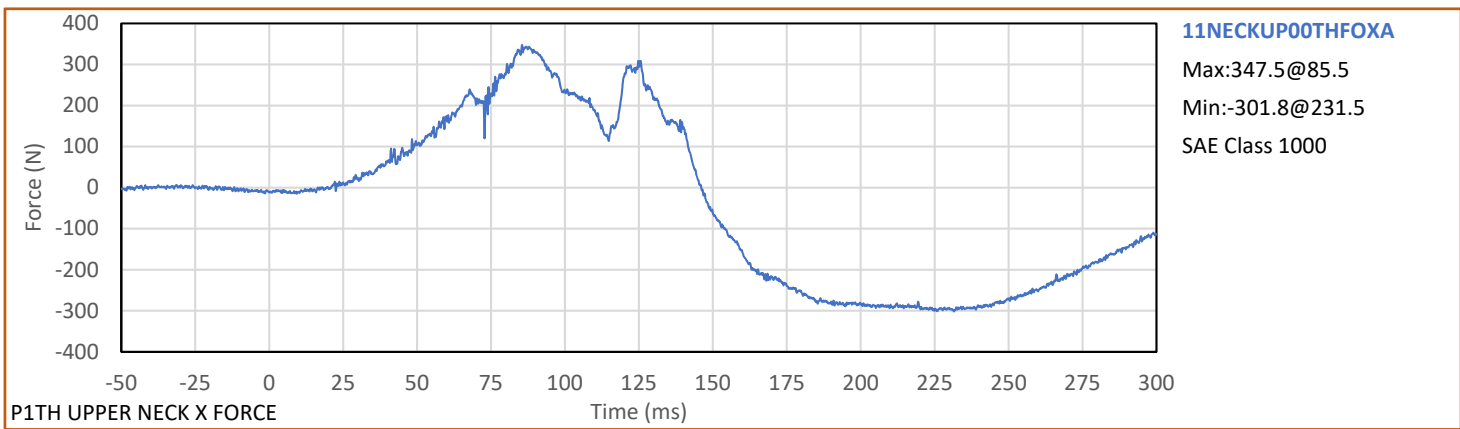
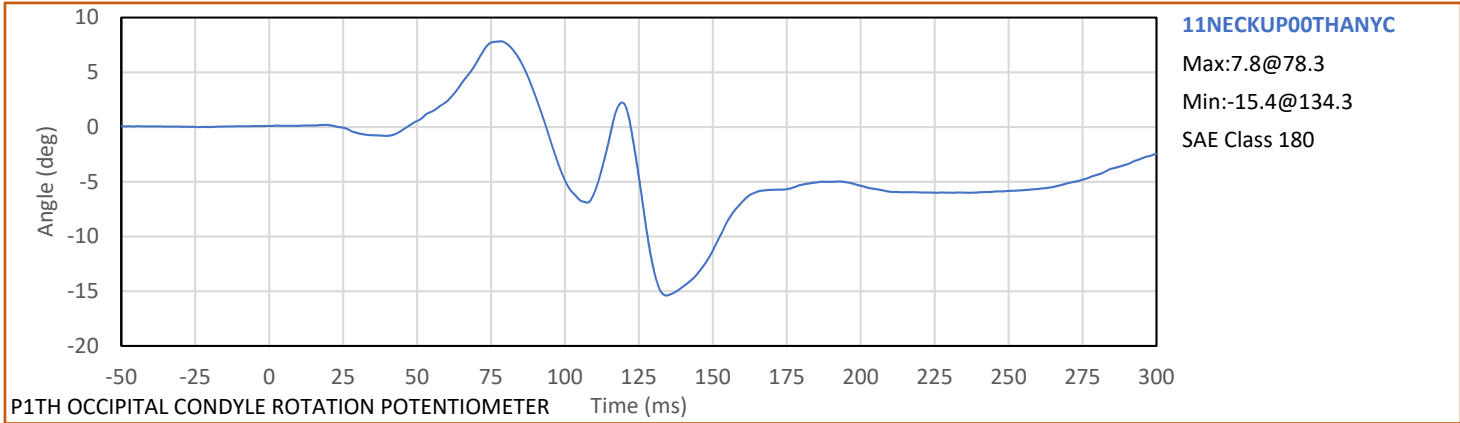
Plot		Page
252	P2TH CHEST LEFT LOWER RESULTANT	B-64
253	P2TH CHEST RIGHT LOWER DX	B-65
254	P2TH CHEST RIGHT LOWER DY	B-65
255	P2TH CHEST RIGHT LOWER DZ	B-65
256	P2TH CHEST RIGHT LOWER RESULTANT	B-65
257	P2TH ABDOMEN LEFT LOWER DX	B-66
258	P2TH ABDOMEN LEFT LOWER DY	B-66
259	P2TH ABDOMEN LEFT LOWER DZ	B-66
260	P2TH ABDOMEN LEFT LOWER RESULTANT	B-66
261	P2TH ABDOMEN RIGHT LOWER DX	B-67
262	P2TH ABDOMEN RIGHT LOWER DY	B-67
263	P2TH ABDOMEN RIGHT LOWER DZ	B-67
264	P2TH ABDOMEN RIGHT LOWER RESULTANT	B-67
265	VEHICLE CG X	B-68
266	VEHICLE CG Y	B-68
267	VEHICLE CG Z	B-68
268	VEHICLE CG ROTATION ABOUT X	B-68
269	VEHICLE CG ROTATION ABOUT Y	B-69
270	VEHICLE CG ROTATION ABOUT Z	B-69
271	DRIVER FLOOR PAN X	B-69
272	DRIVER FLOOR PAN Y	B-69
273	DRIVER FLOOR PAN Z	B-70
274	PASSENGER FLOOR PAN X	B-70
275	PASSENGER FLOOR PAN Y	B-70
276	PASSENGER FLOOR PAN Z	B-70
277	DOOR SILL LR X	B-71
278	DOOR SILL LR Y	B-71
279	DOOR SILL LR REDUNDANT X	B-71
280	DOOR SILL LR REDUNDANT Y	B-71
281	DOOR SILL RR X	B-72
282	DOOR SILL RR Y	B-72
283	DOOR SILL RR REDUNDANT X	B-72
284	DOOR SILL RR REDUNDANT Y	B-72
285	DRIVER SW AIRBAG STAGE 1 - TIME TO FIRE - 14.7 MS.	B-73
286	DRIVER SW AIRBAG STAGE 2 - TIME TO FIRE - 19.7 MS.	B-73
287	DRIVER CURTAIN AIRBAG - TIME TO FIRE - NO FIRE	B-73

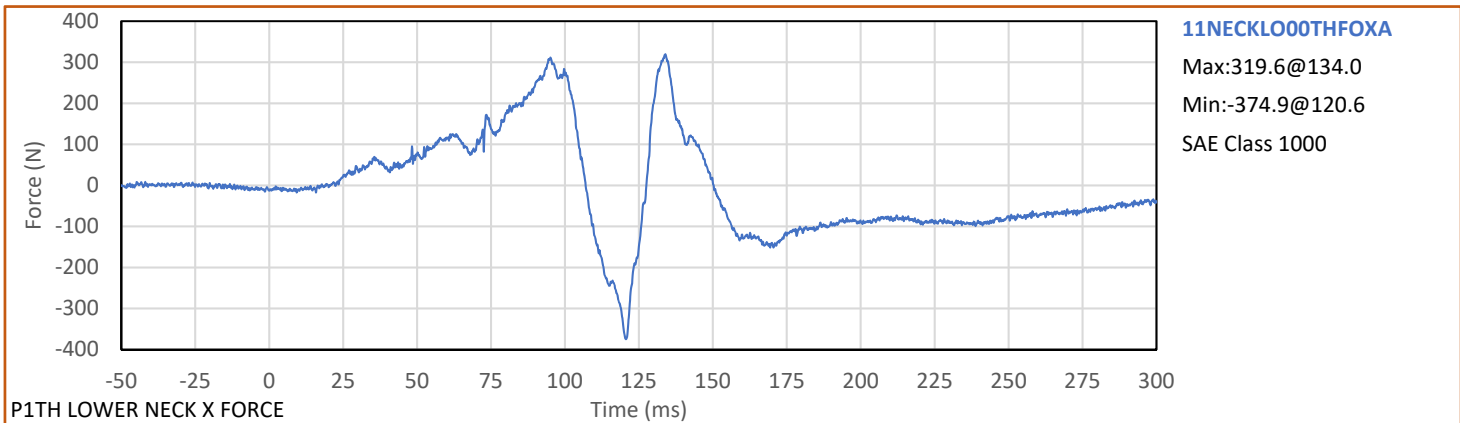
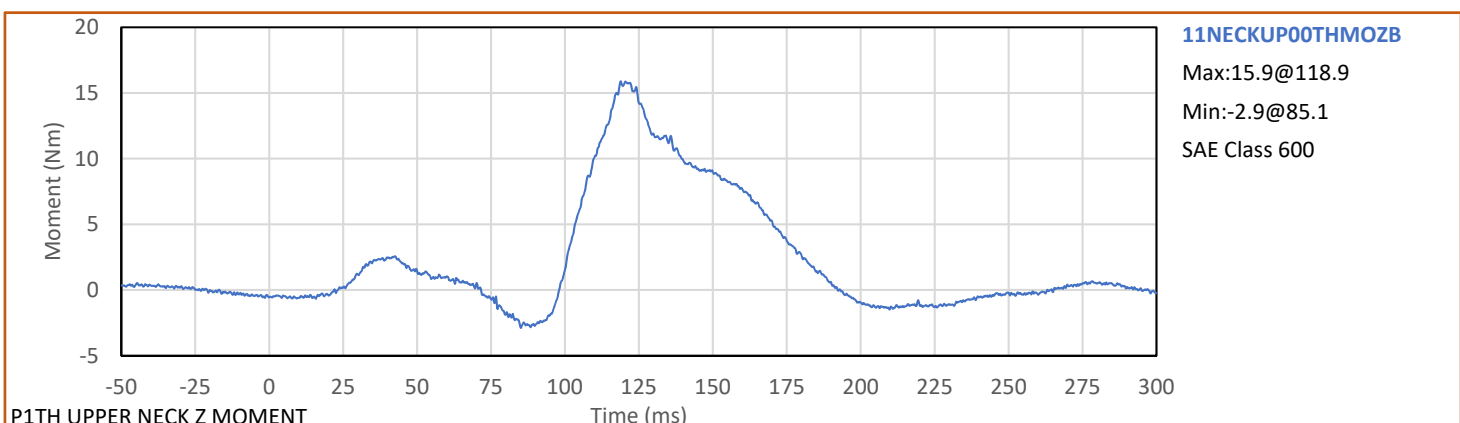
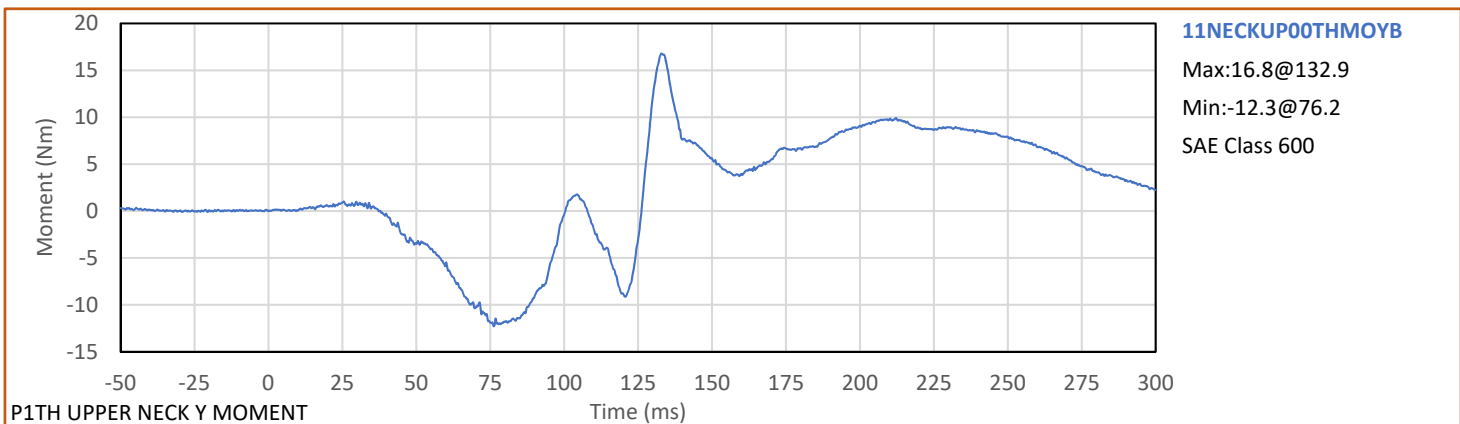
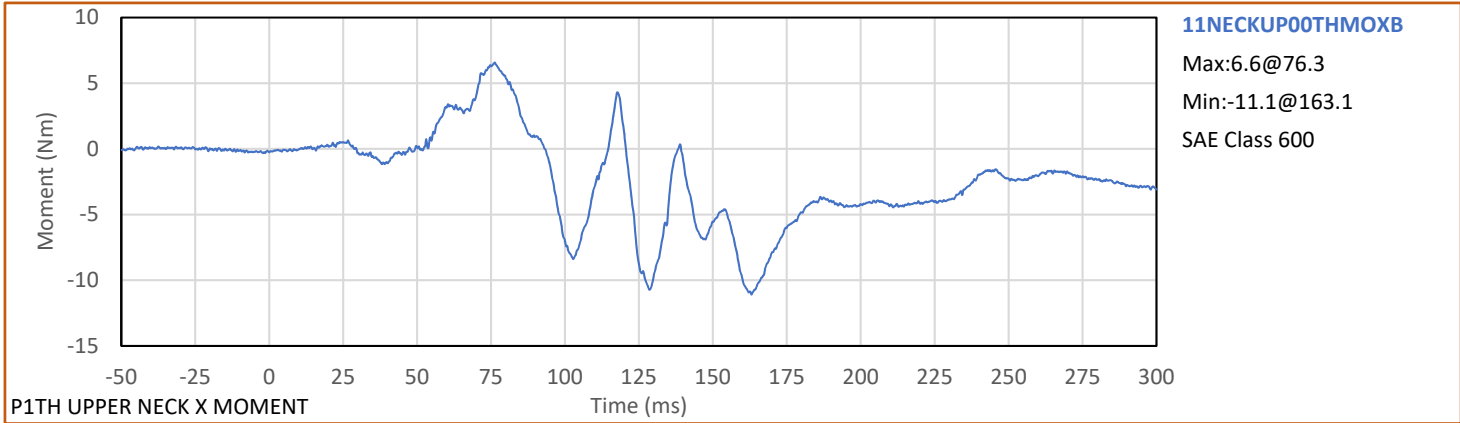
TABLE OF DATA PLOTS ... (CONTINUED)

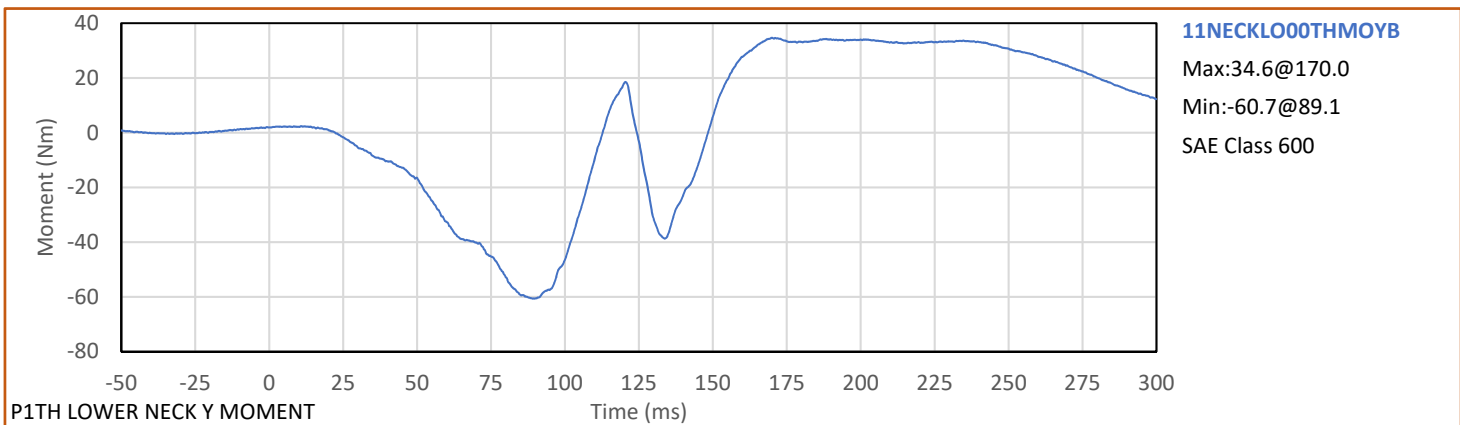
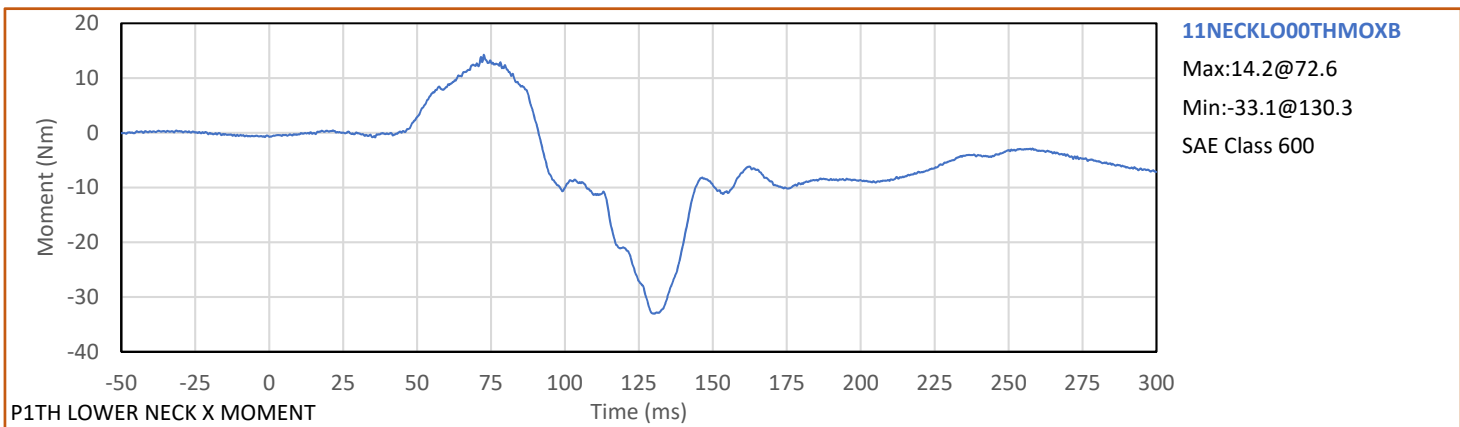
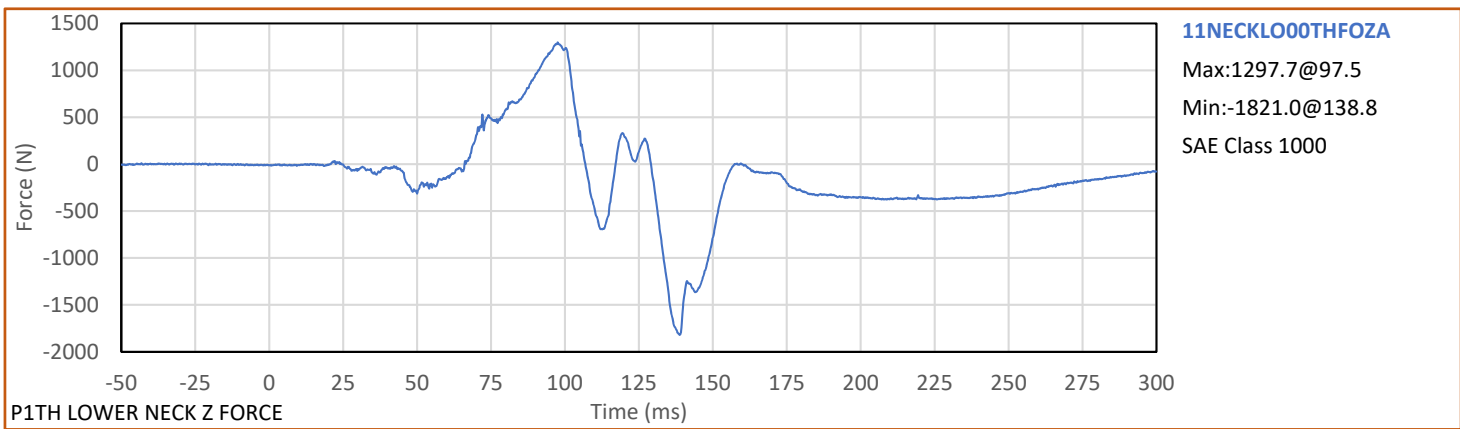
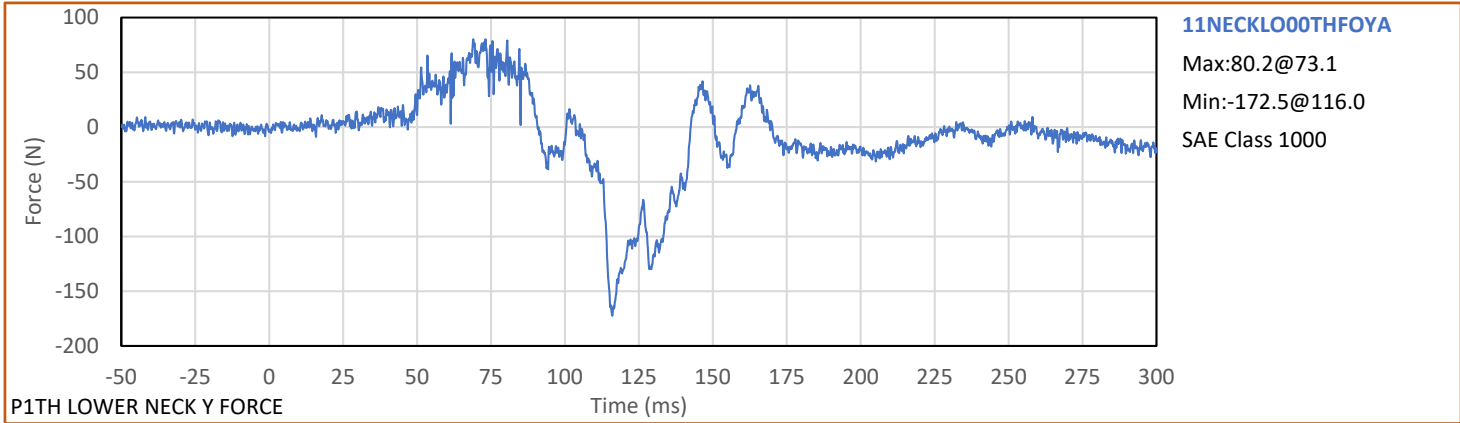
<u>Plot</u>		<u>Page</u>
288	DRIVER SEAT AIRBAG - TIME TO FIRE - NO FIRE	B-73
289	DRIVER KNEE AIRBAG - TIME TO FIRE - NOT INSTALLED	B-74
290	PASSENGER AIRBAG STAGE 1 - TIME TO FIRE - 14.7 MS.	B-74
291	PASSENGER AIRBAG STAGE 2 - TIME TO FIRE - 19.7 MS.	B-74
292	PASSENGER CURTAIN AIRBAG - TIME TO FIRE - NO FIRE	B-74
293	PASSENGER SEAT AIRBAG - TIME TO FIRE - NO FIRE	B-75
294	PASSENGER KNEE AIRBAG - TIME TO FIRE - NOT INSTALLED	B-75

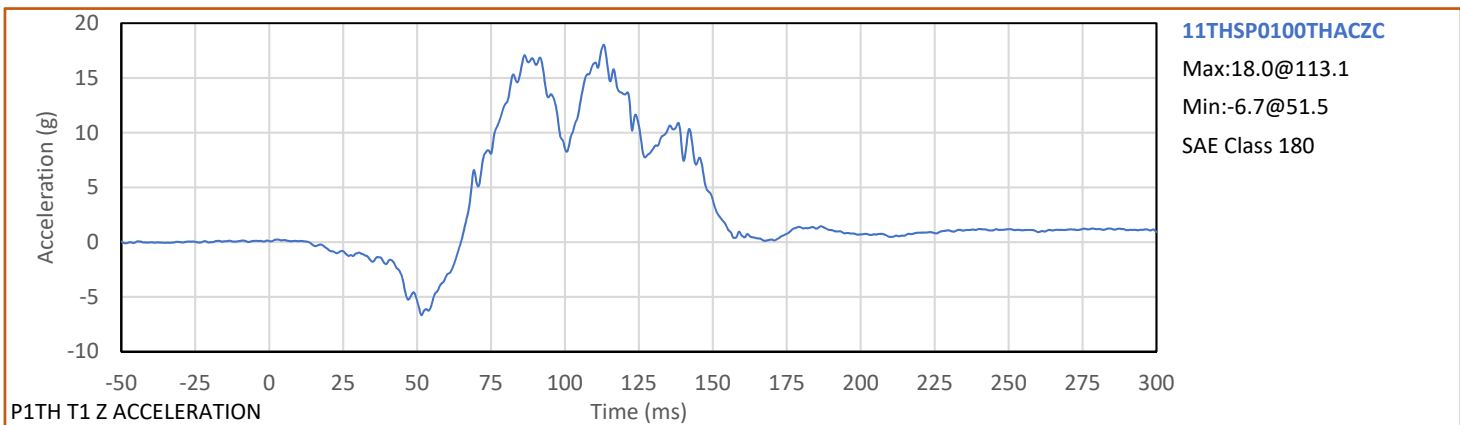
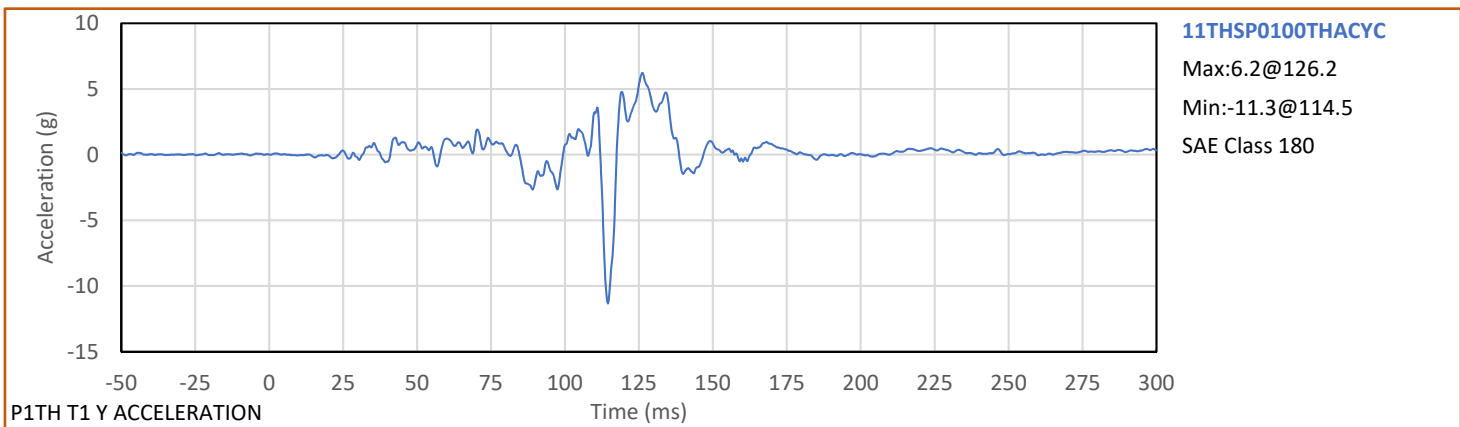
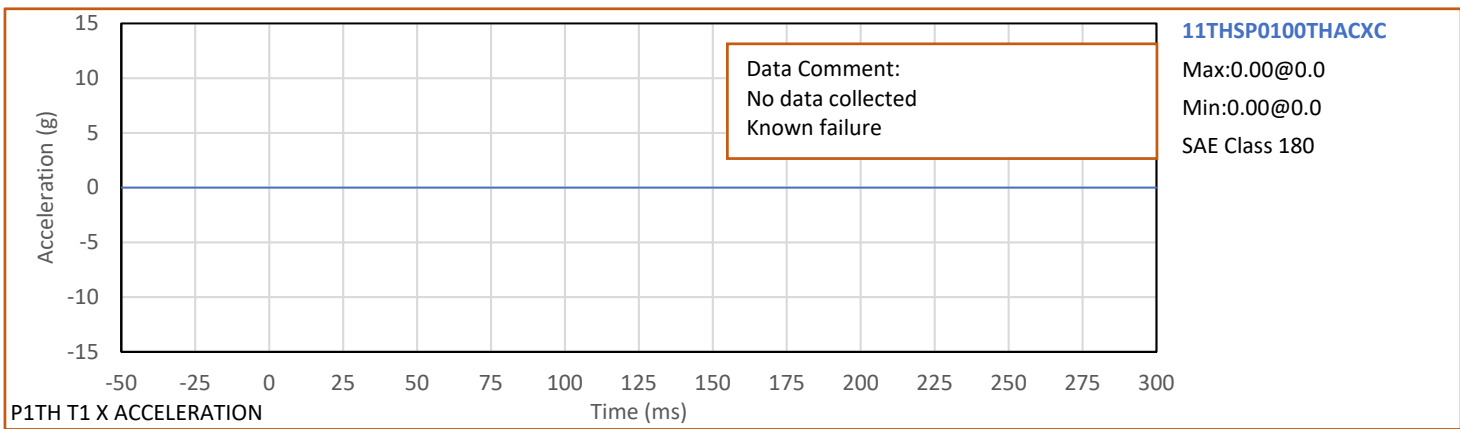
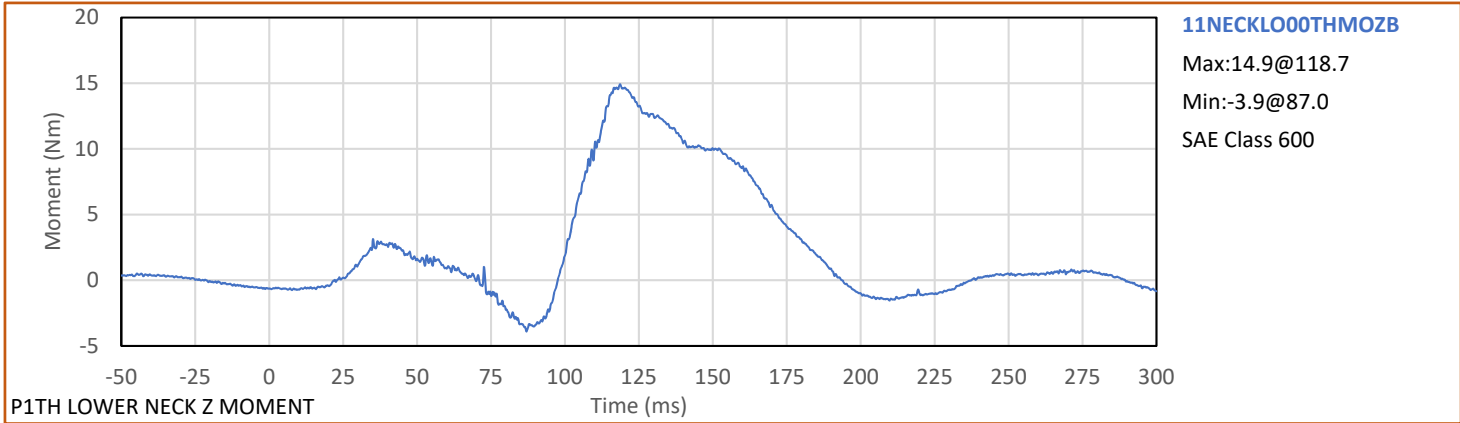


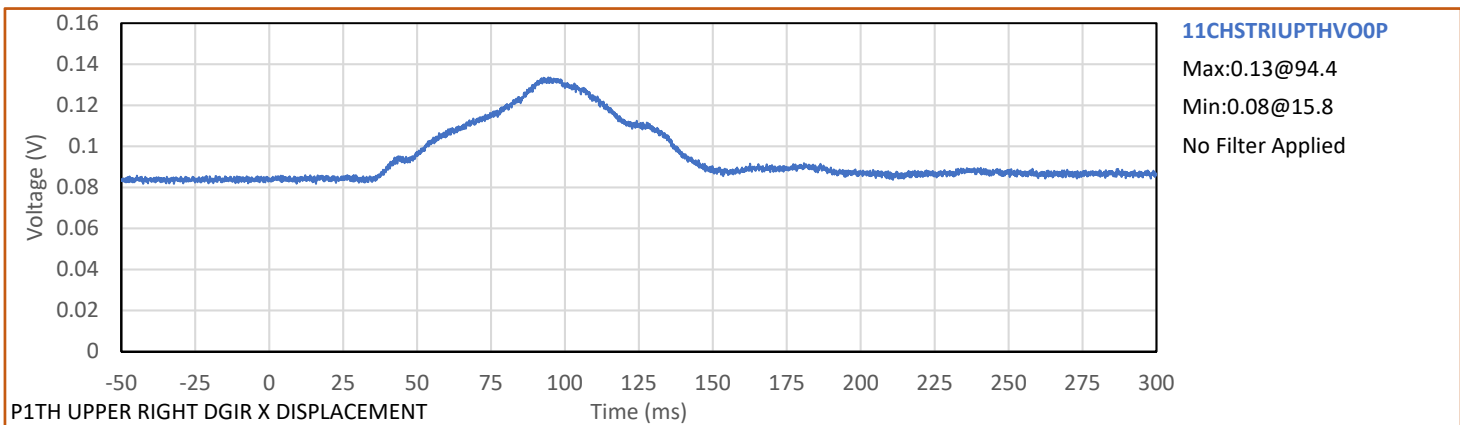
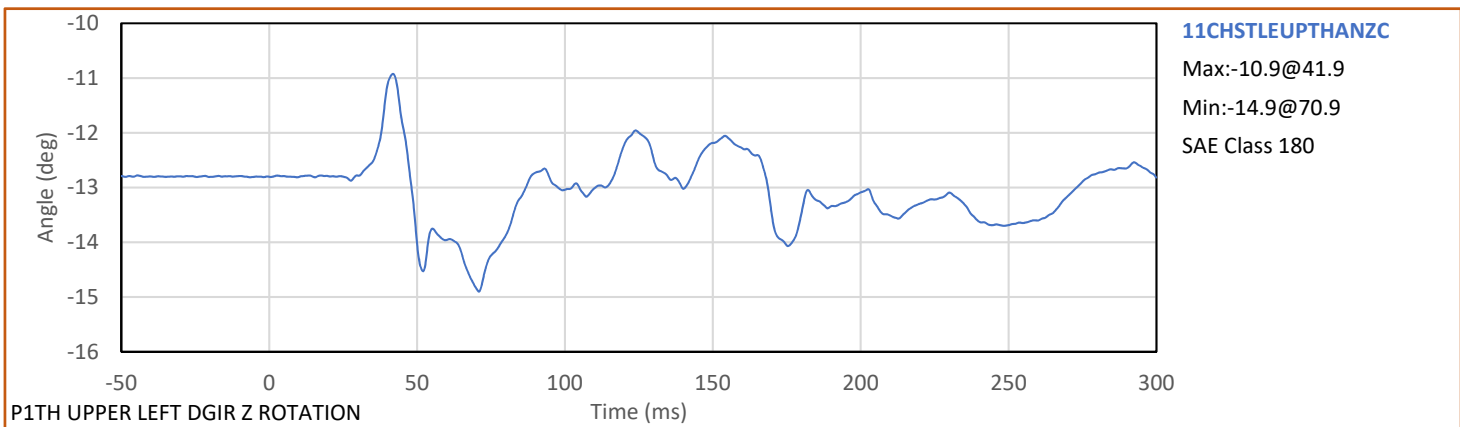
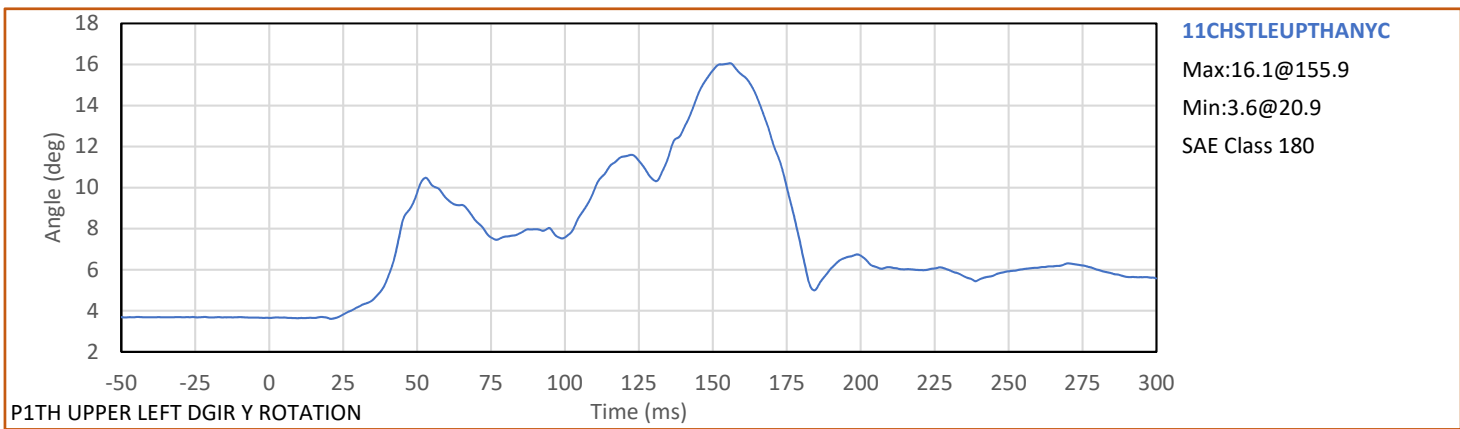
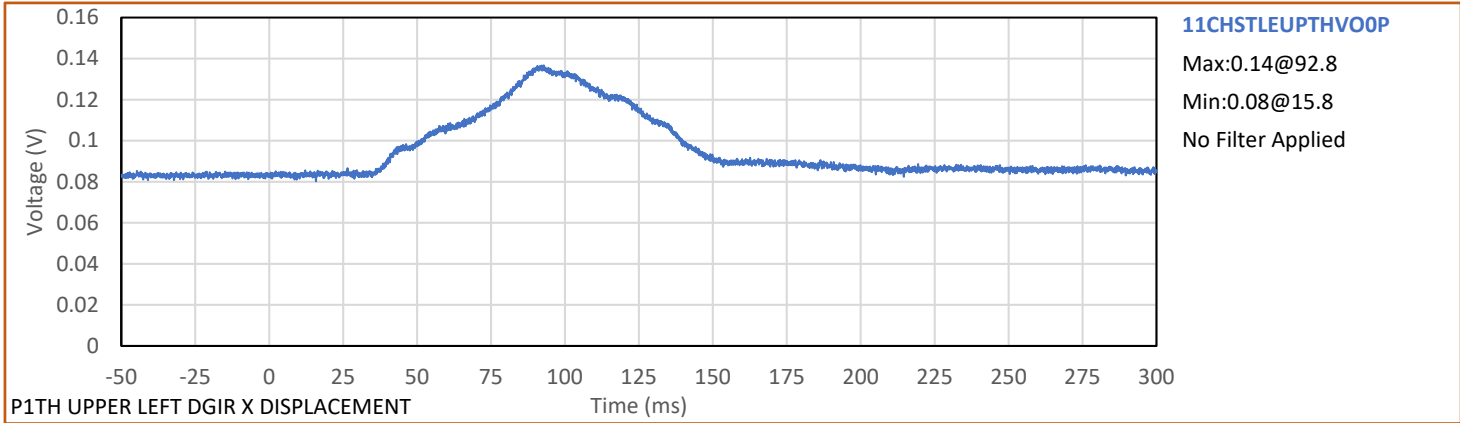


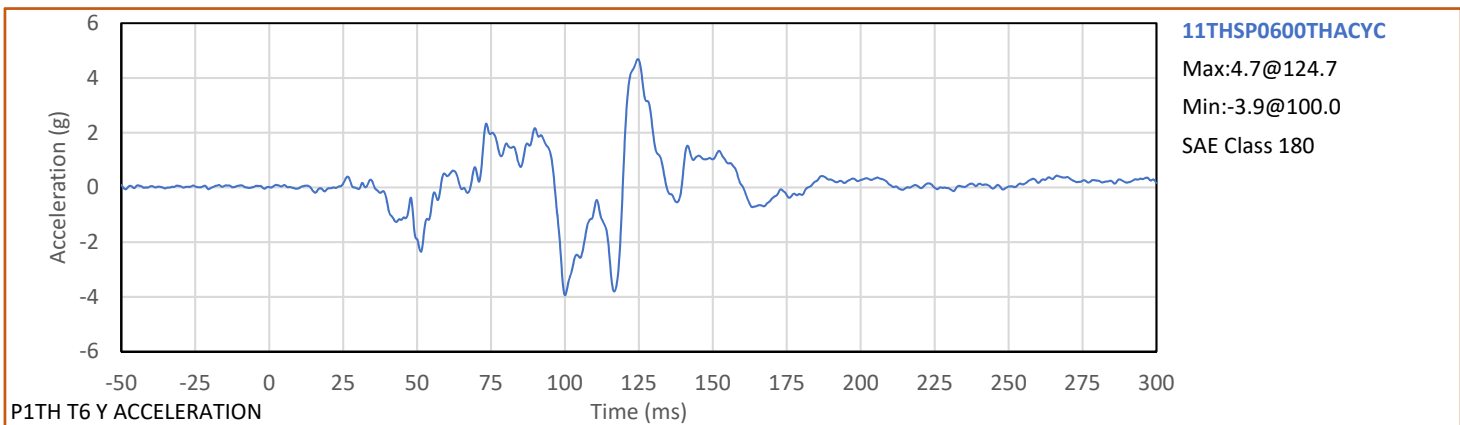
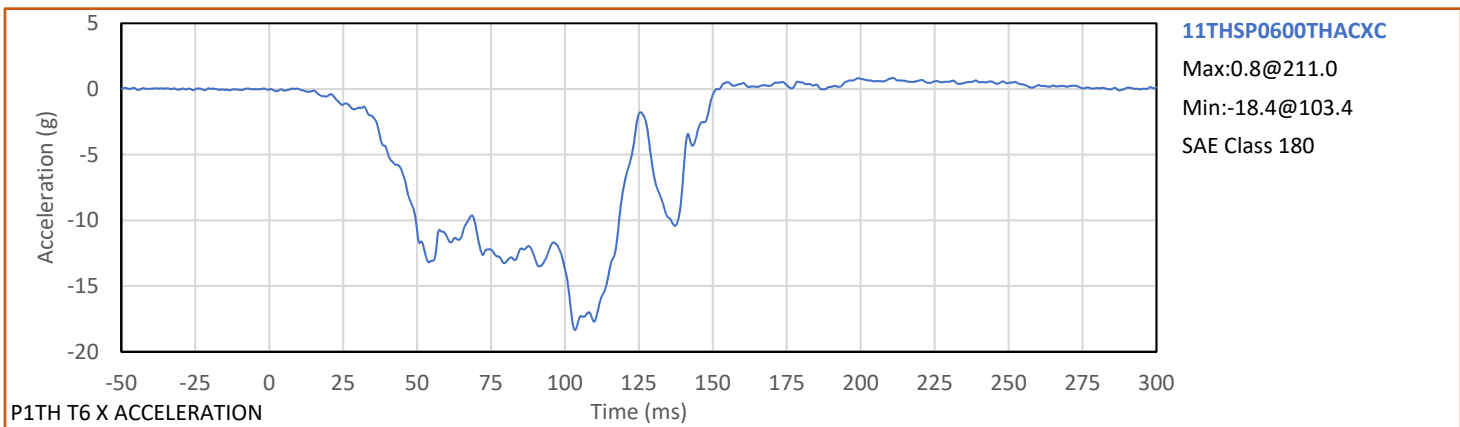
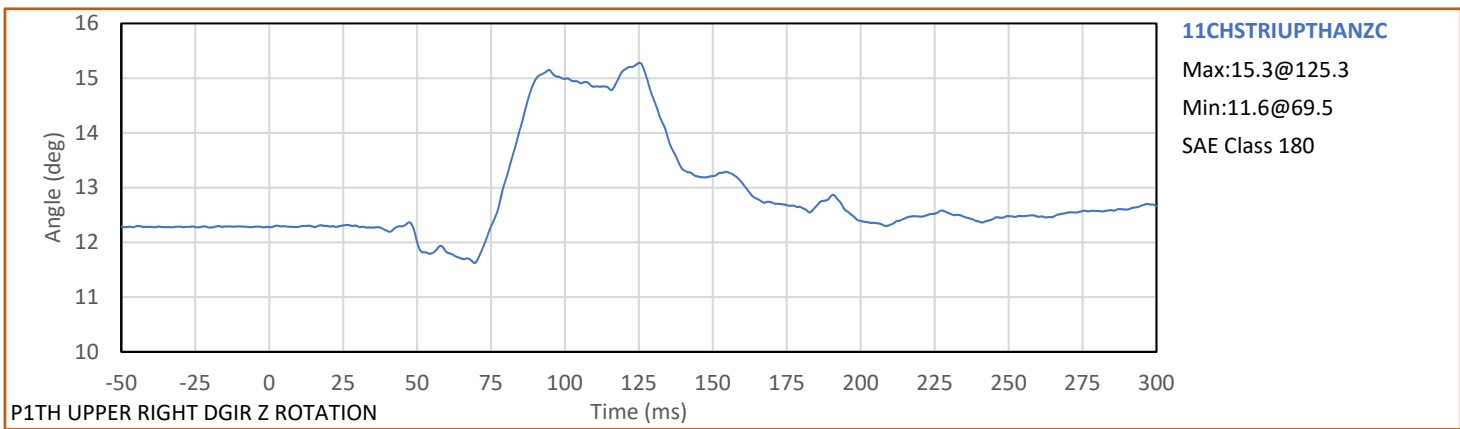
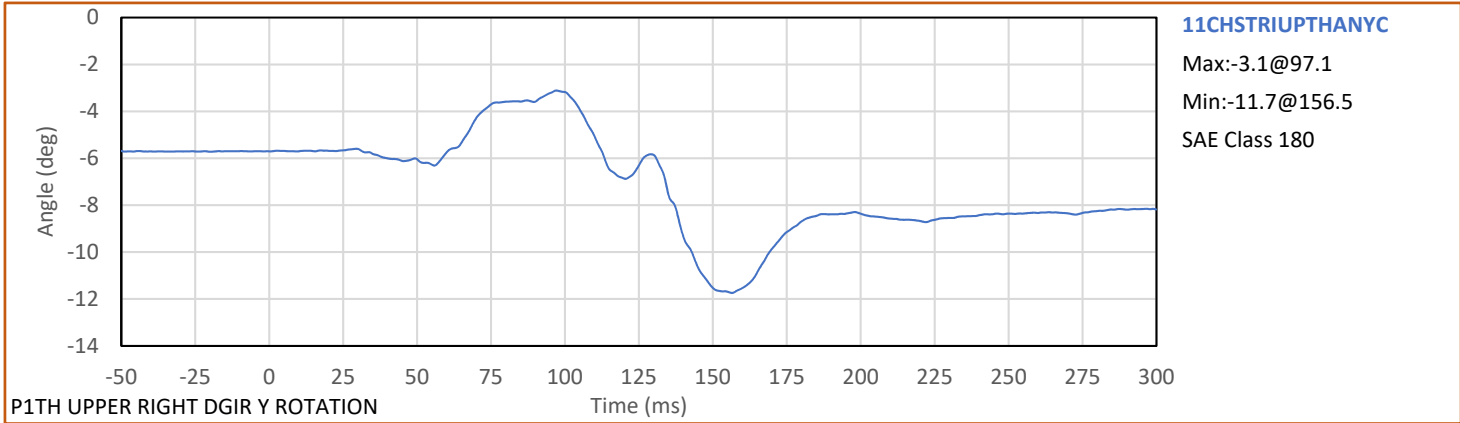


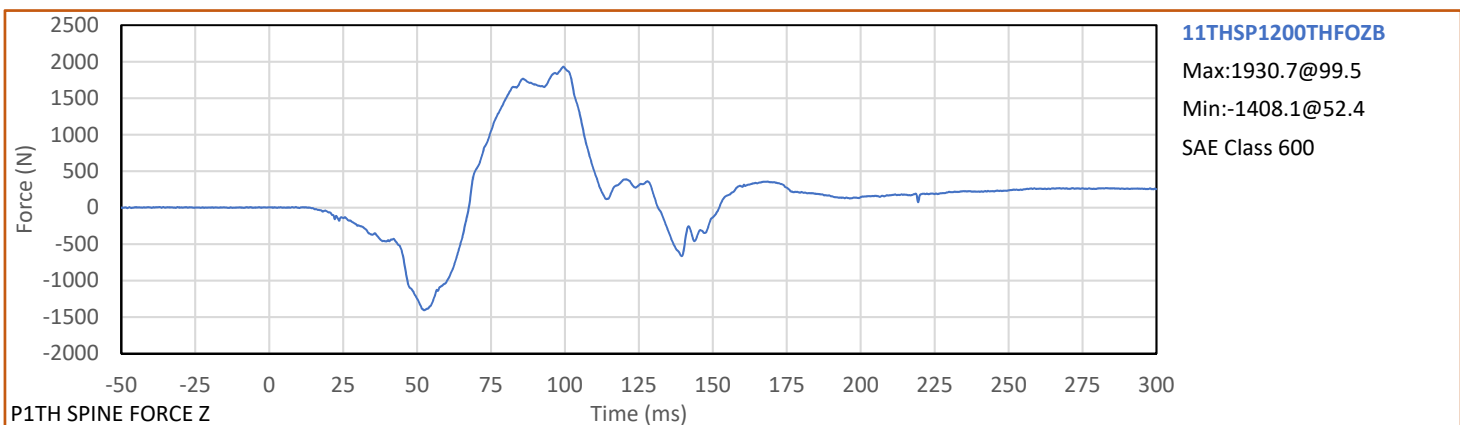
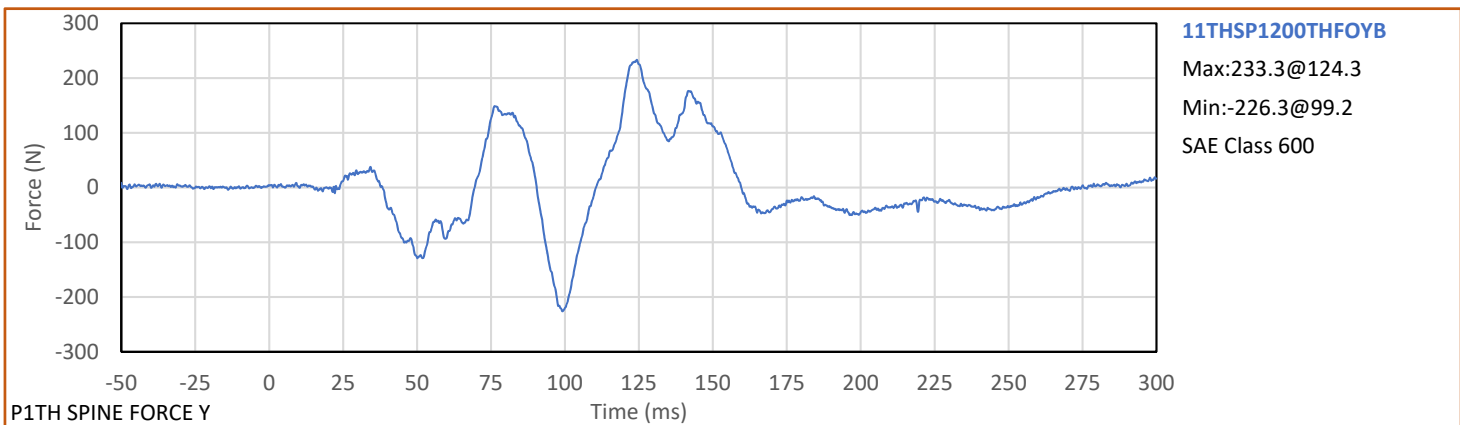
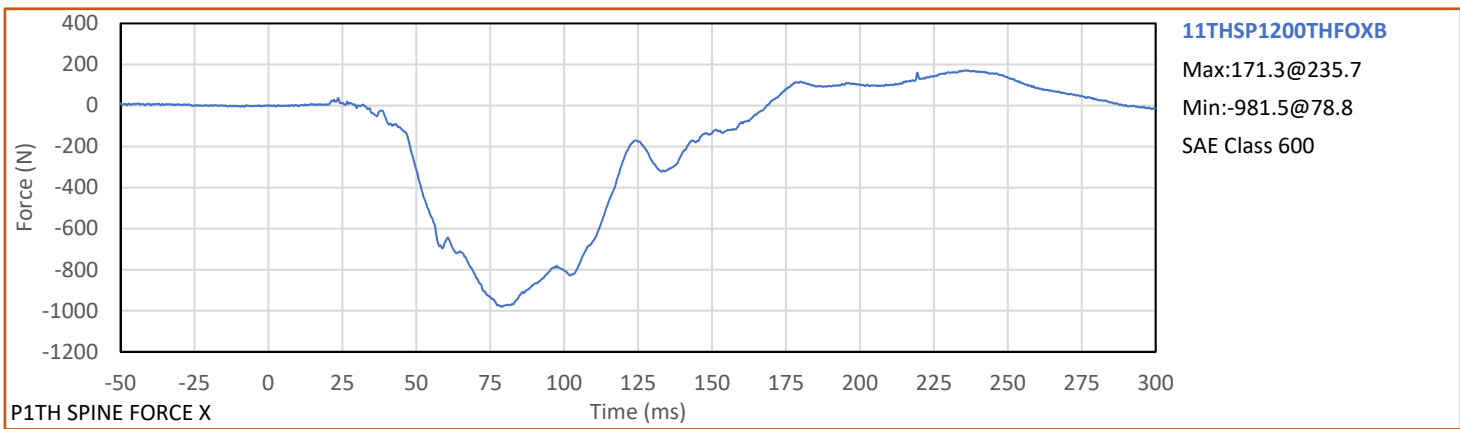
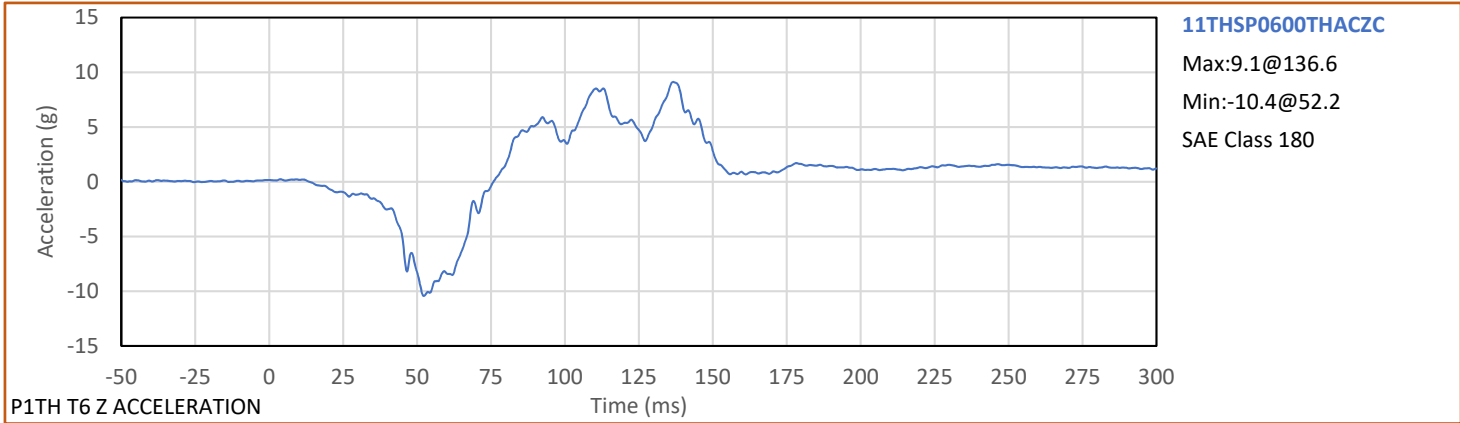


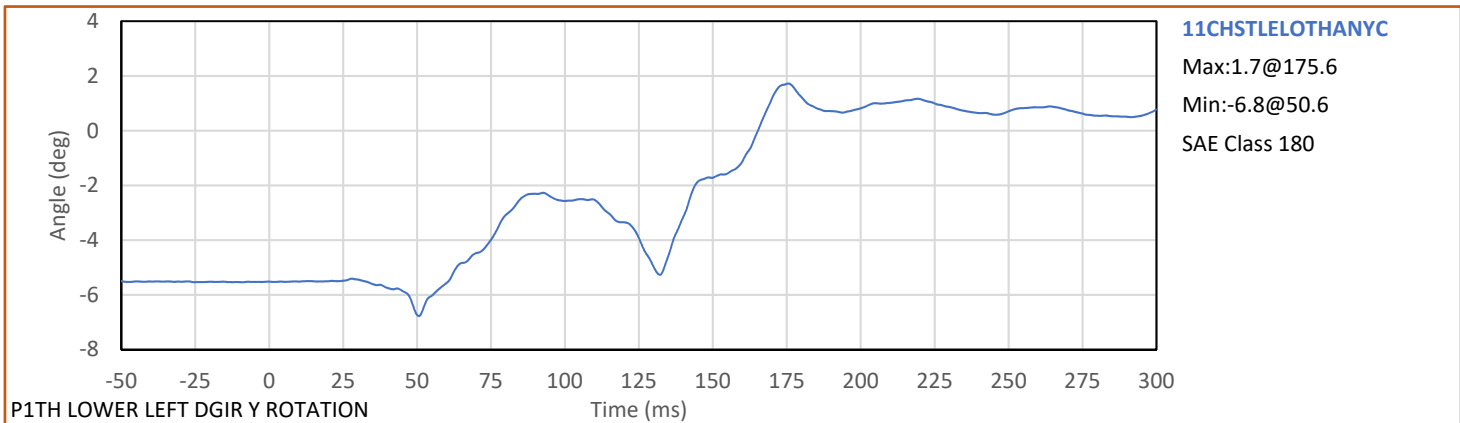
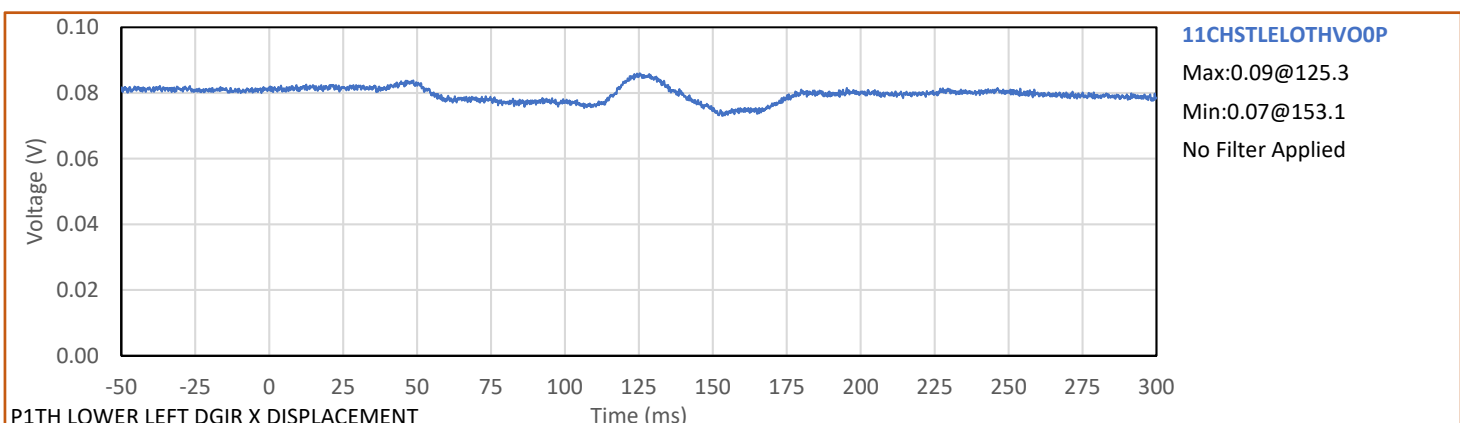
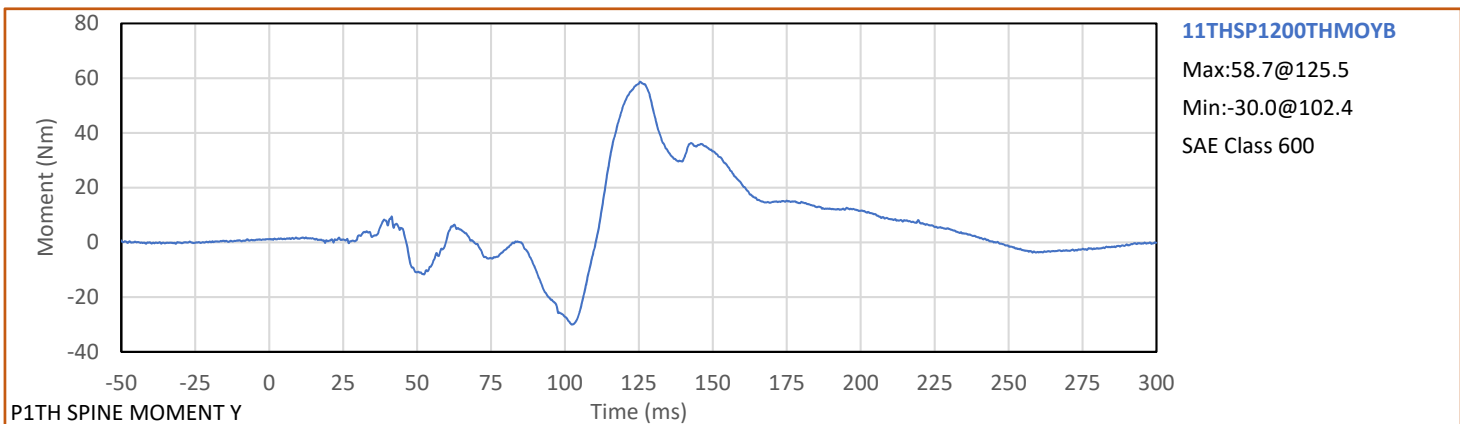
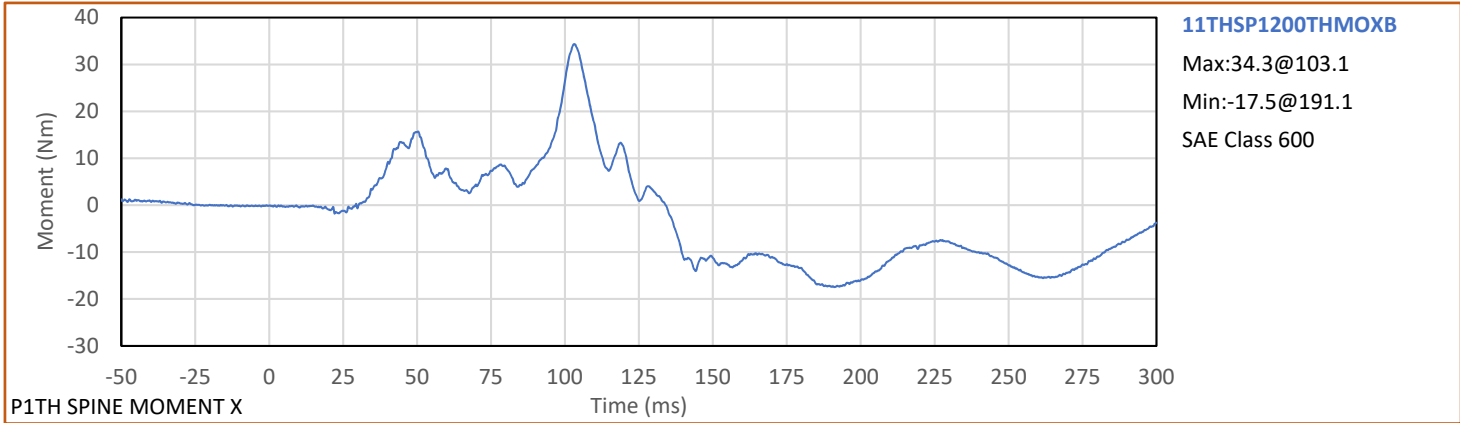


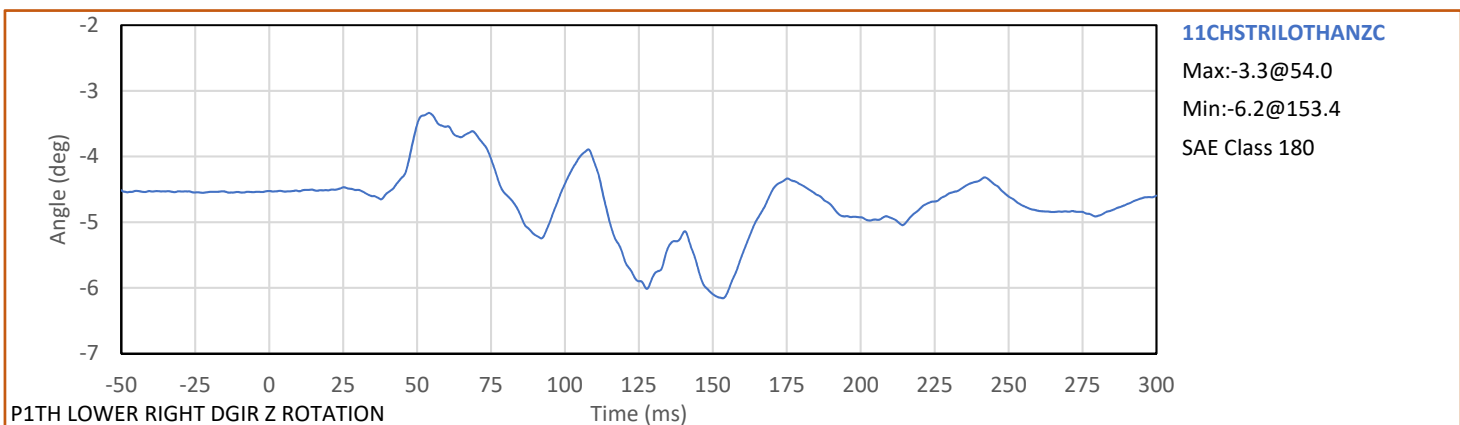
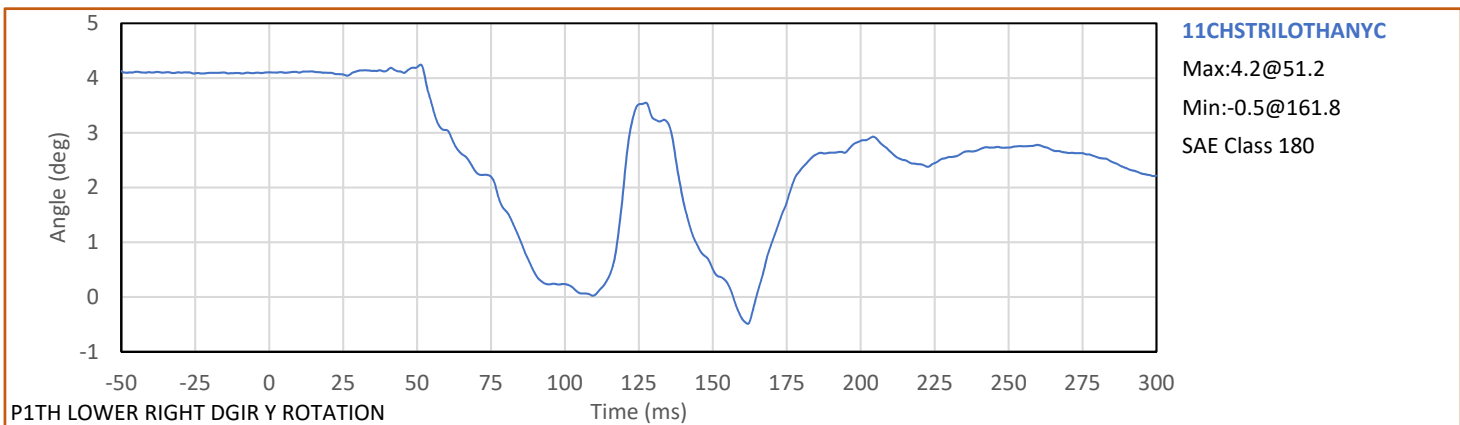
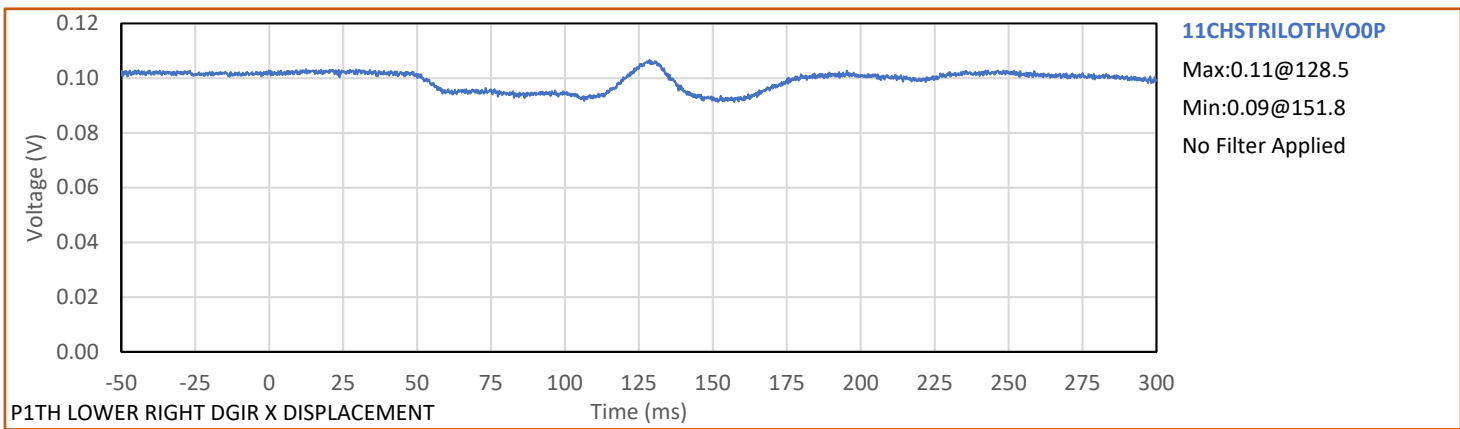
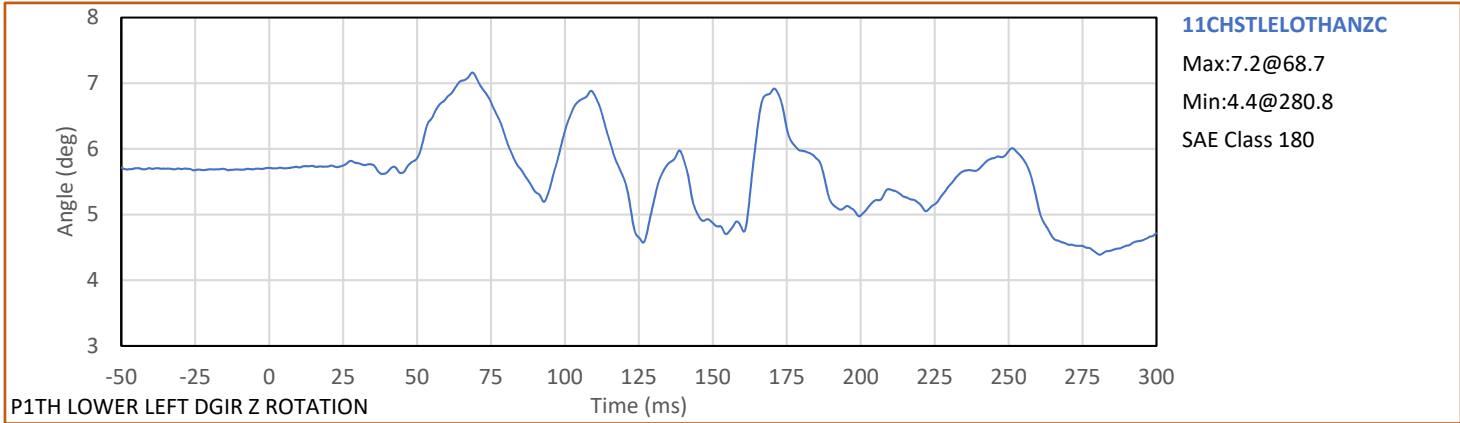


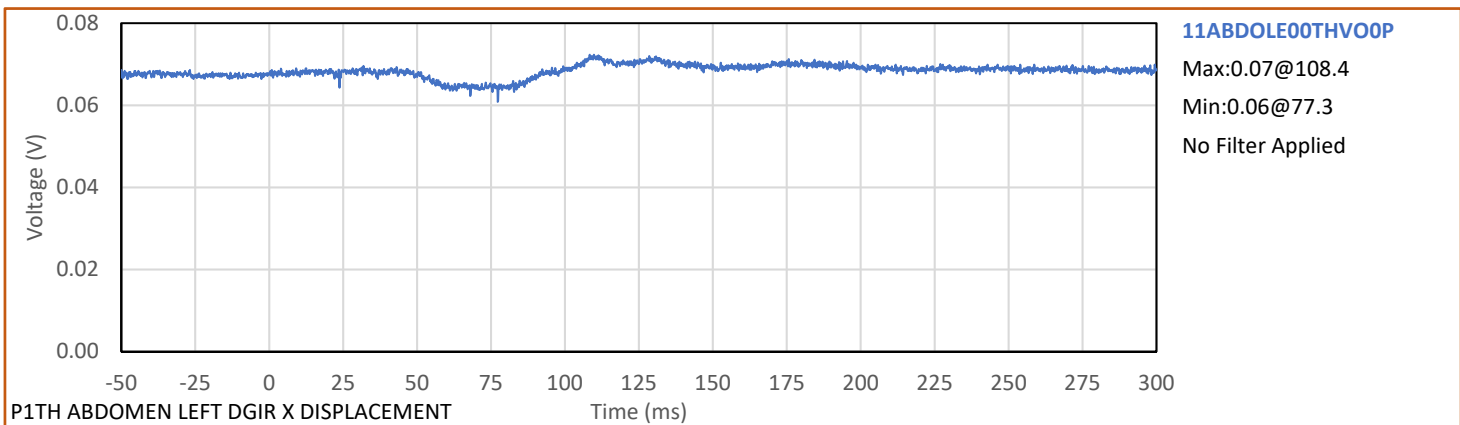
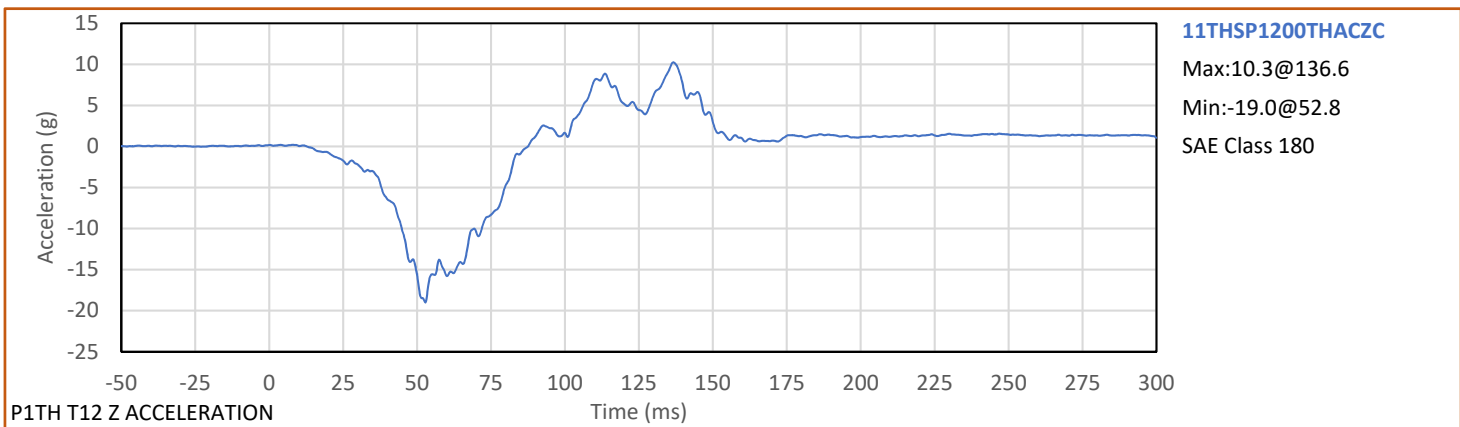
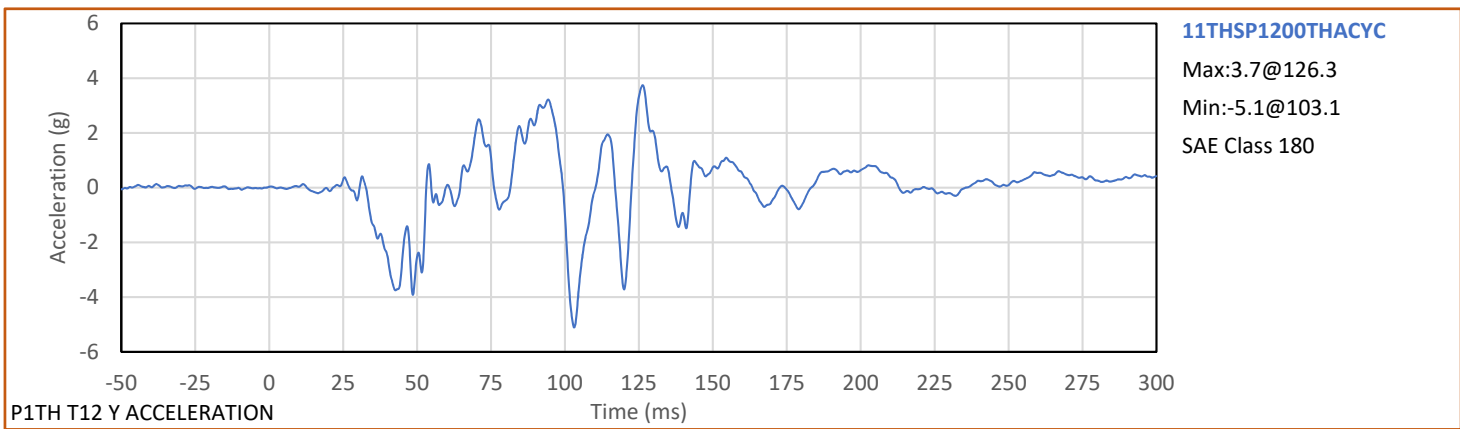
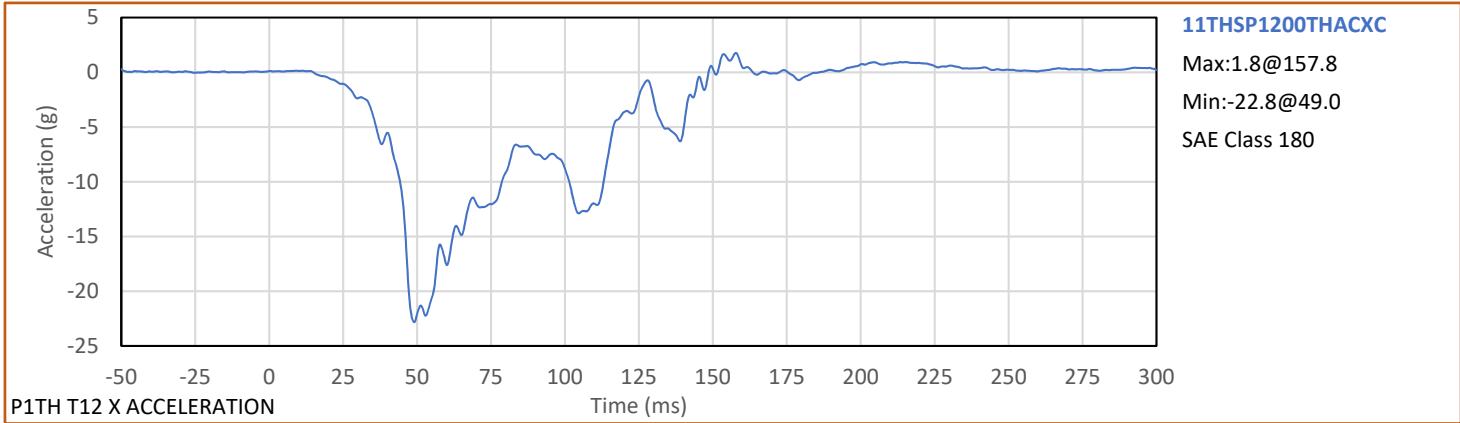


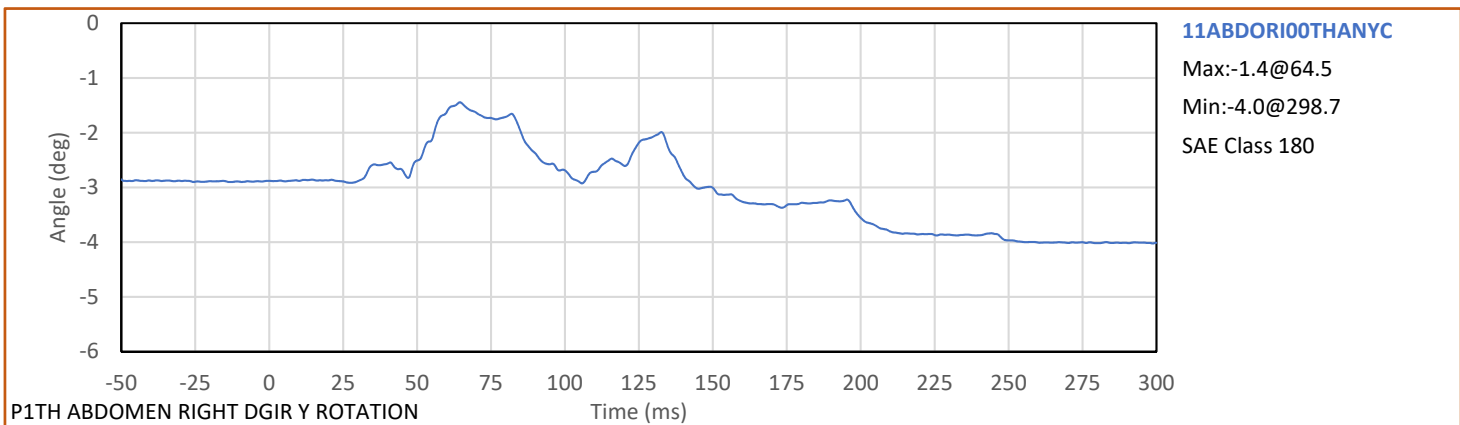
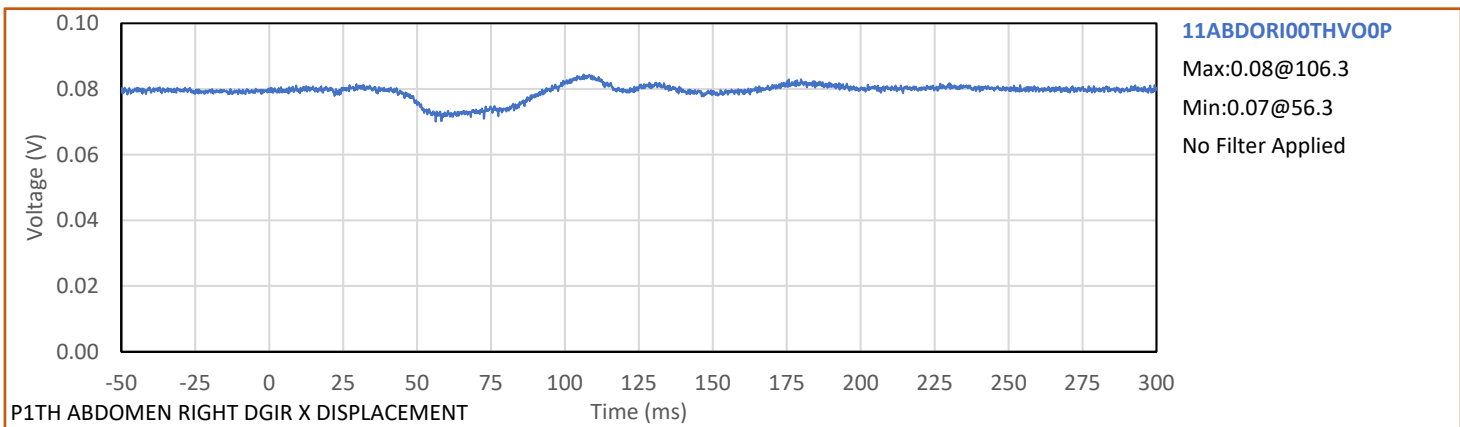
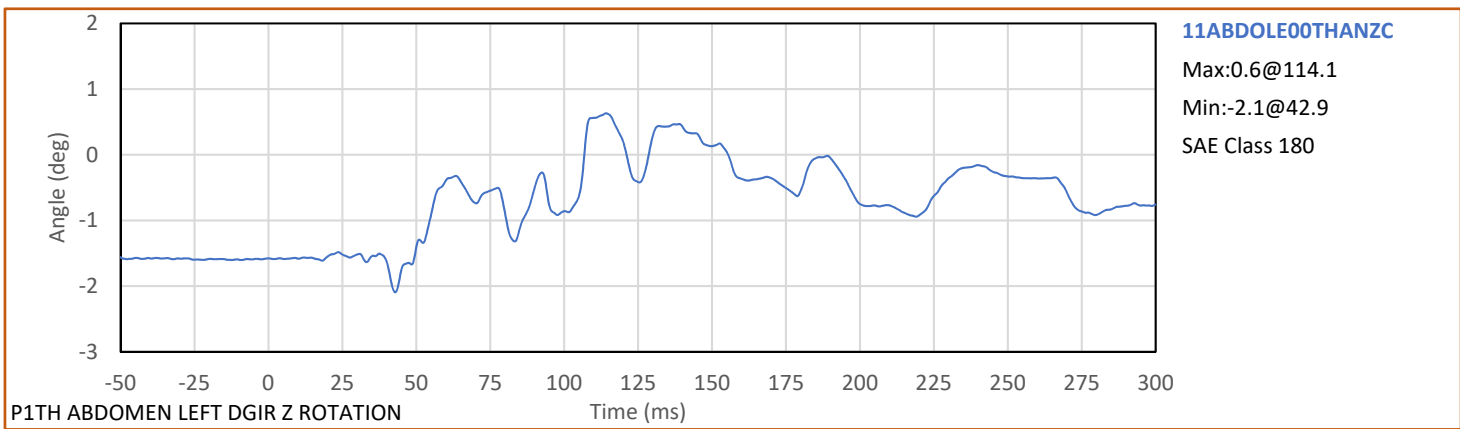
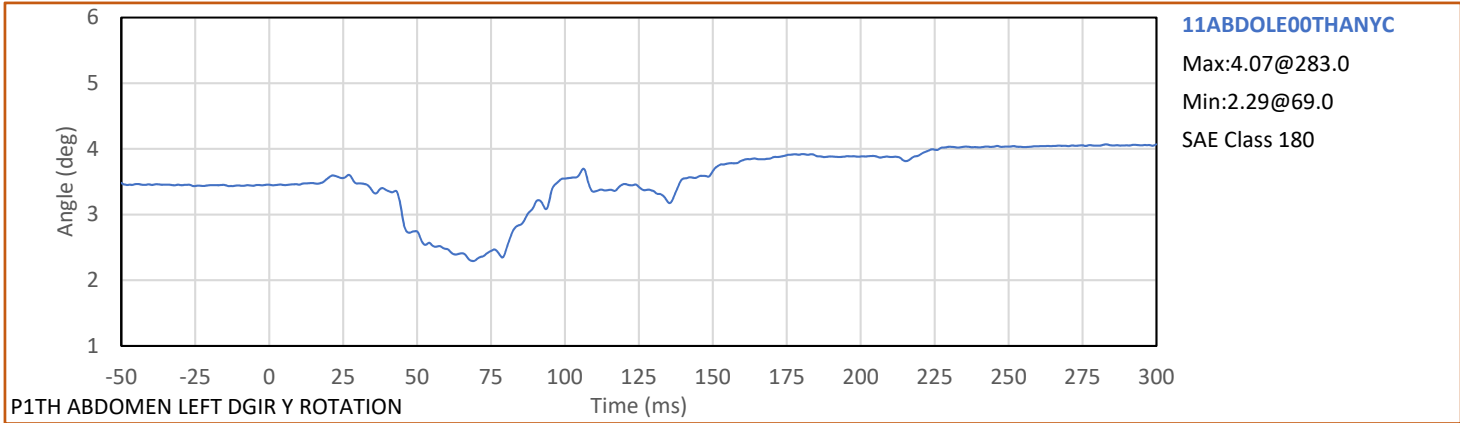


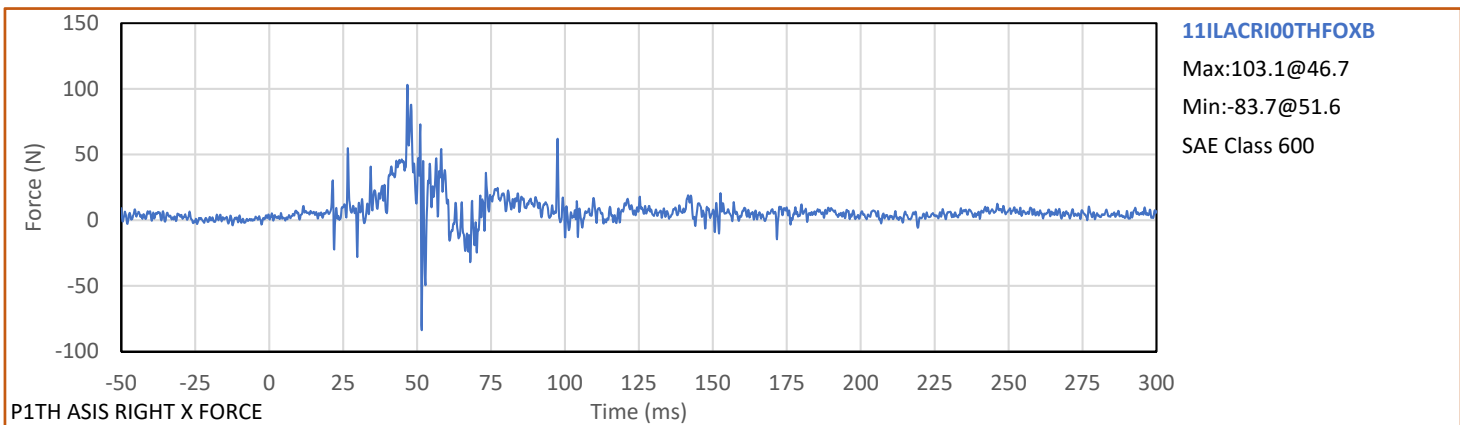
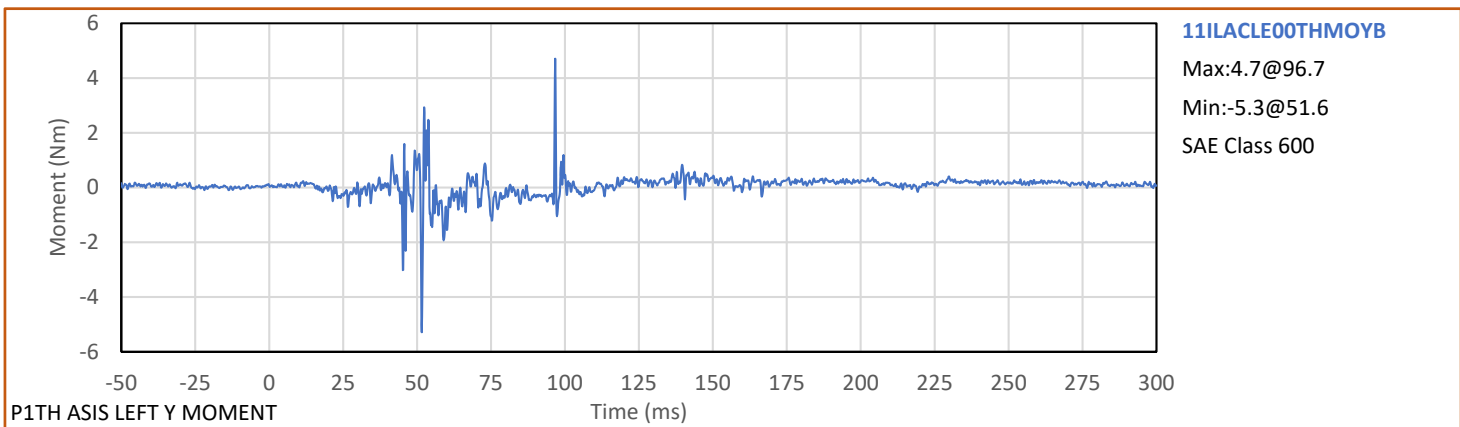
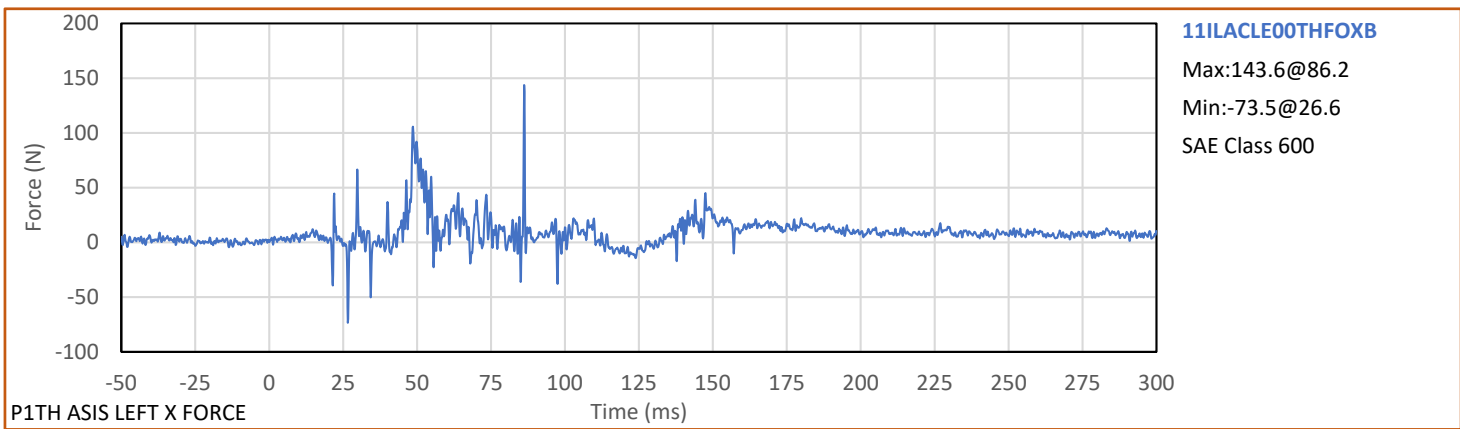
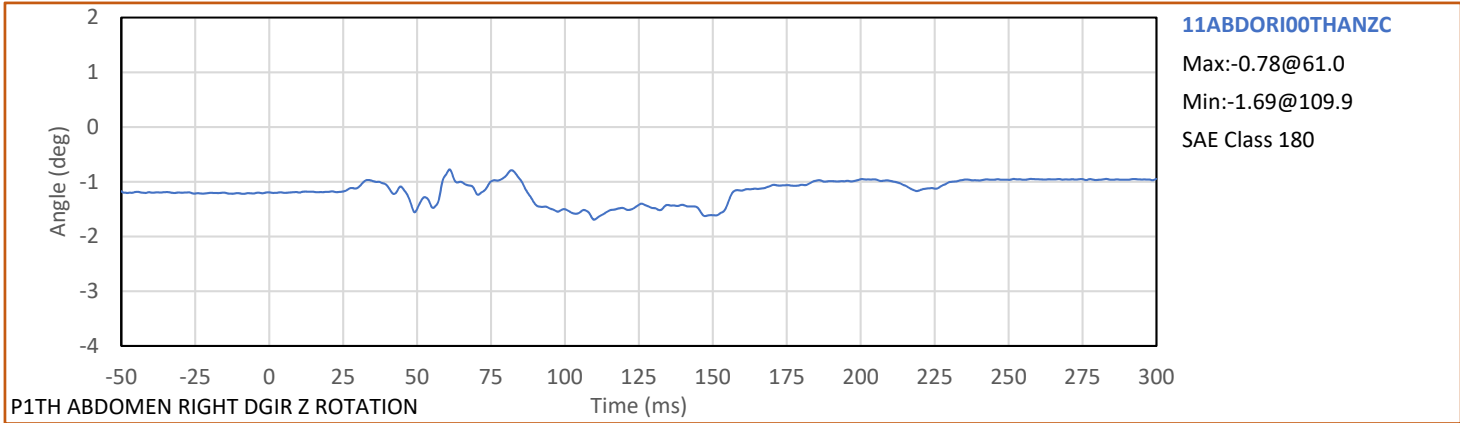


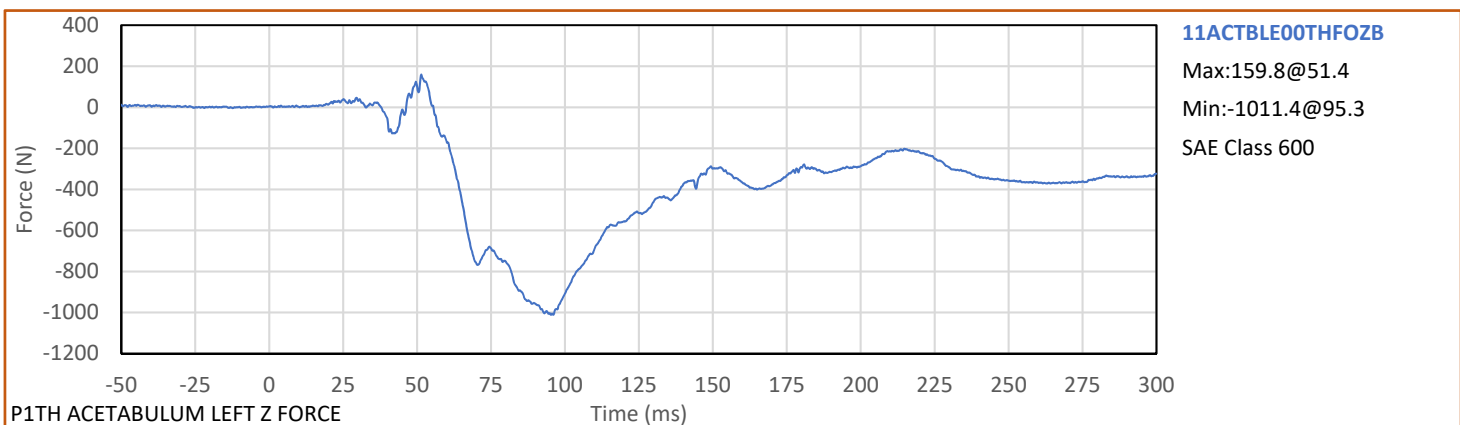
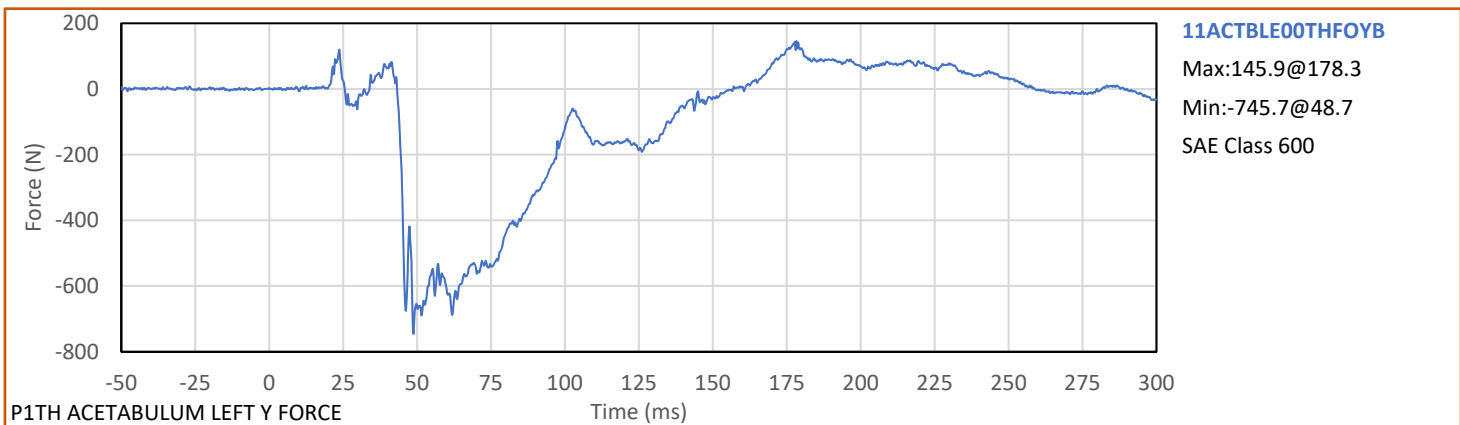
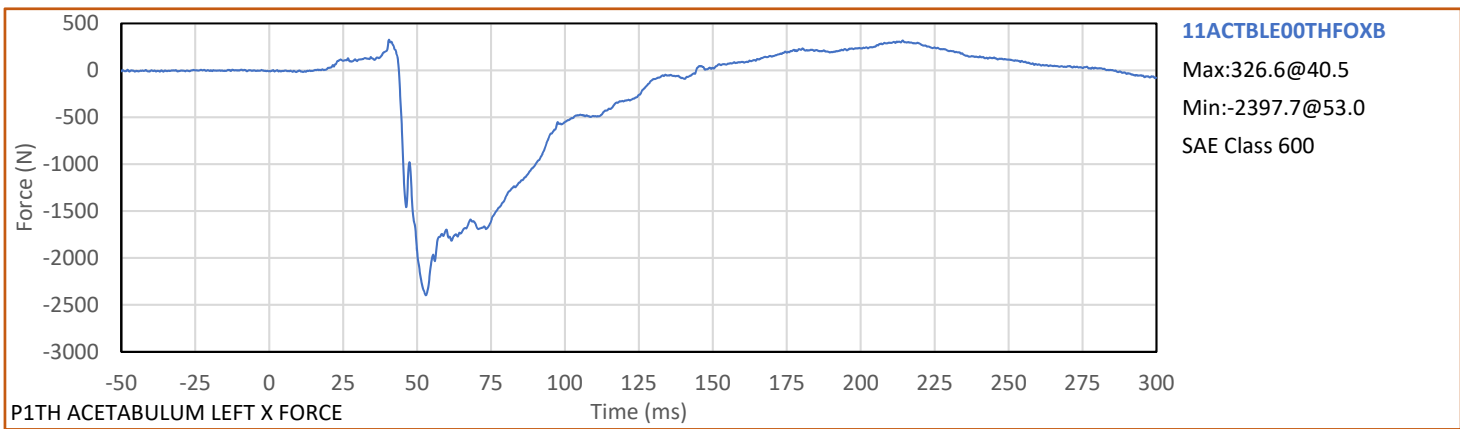
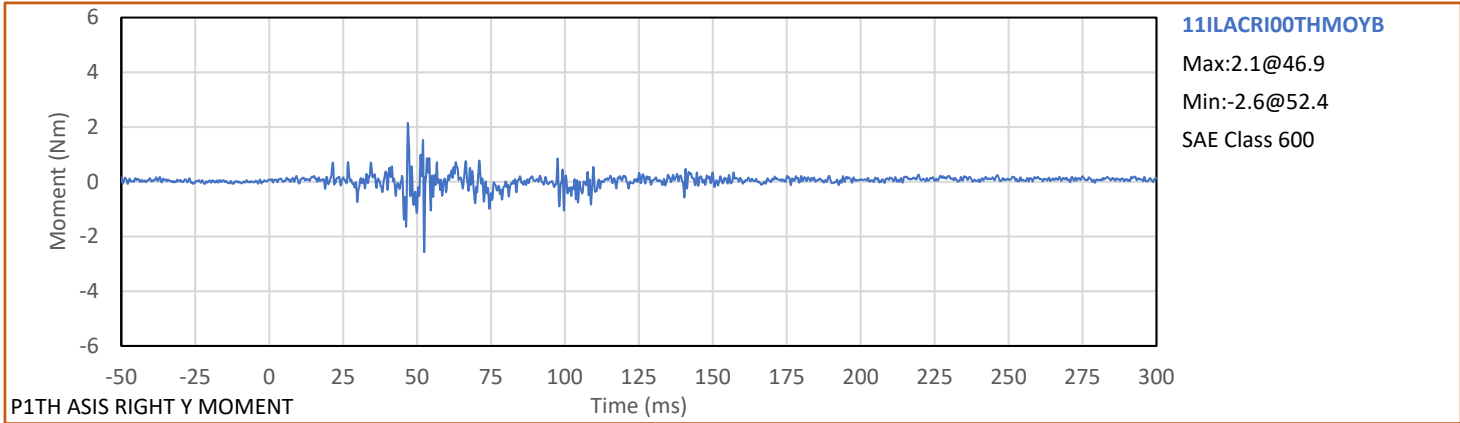


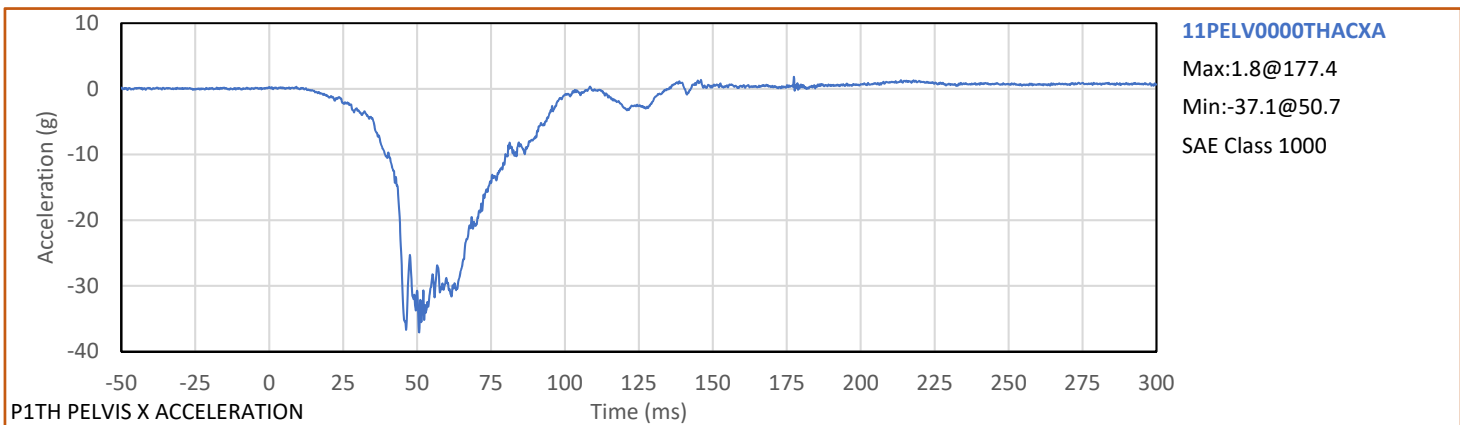
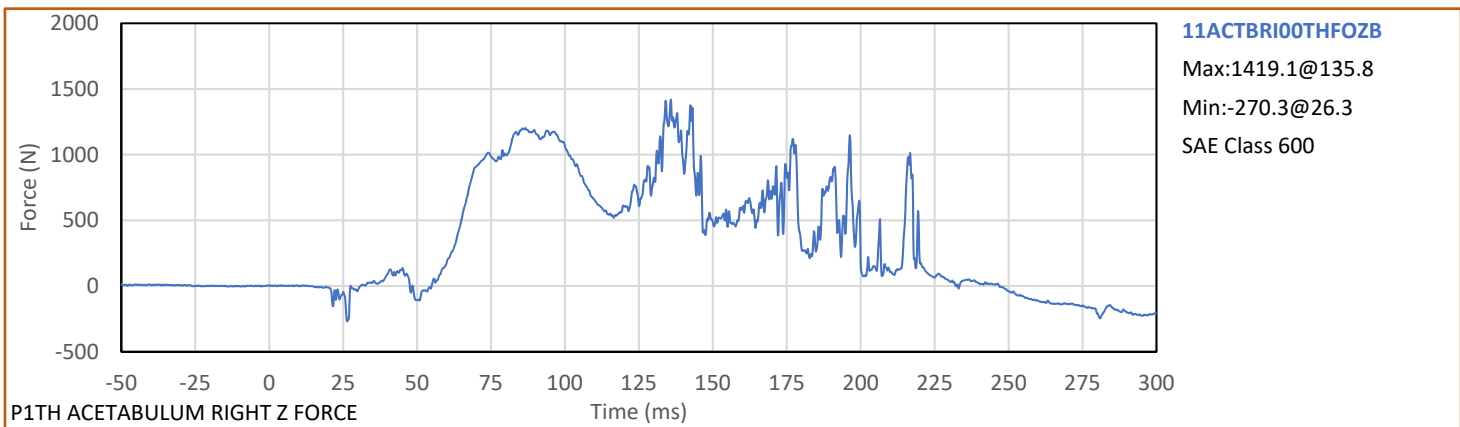
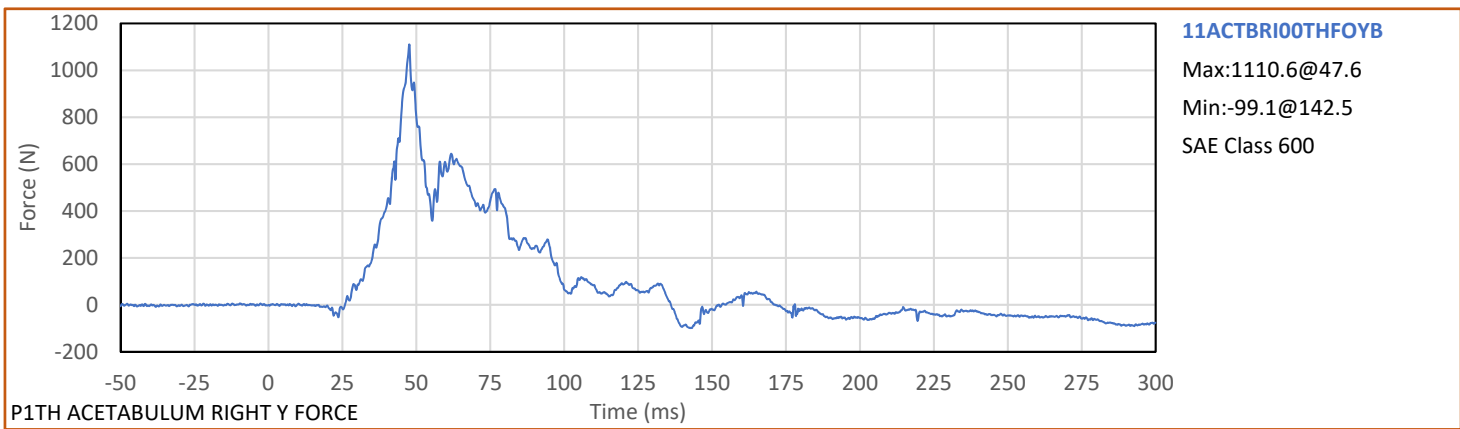
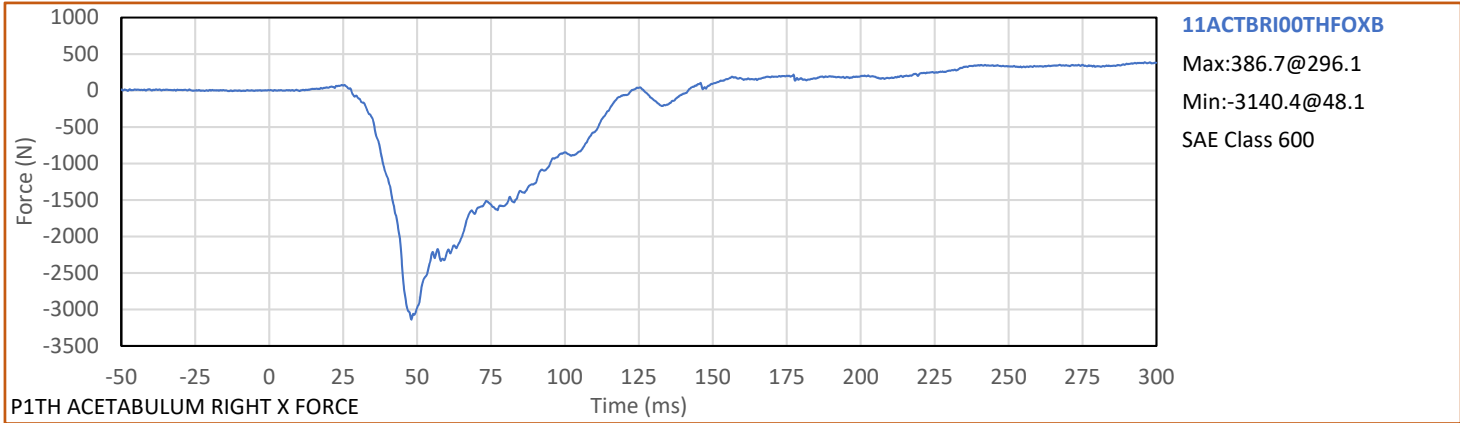


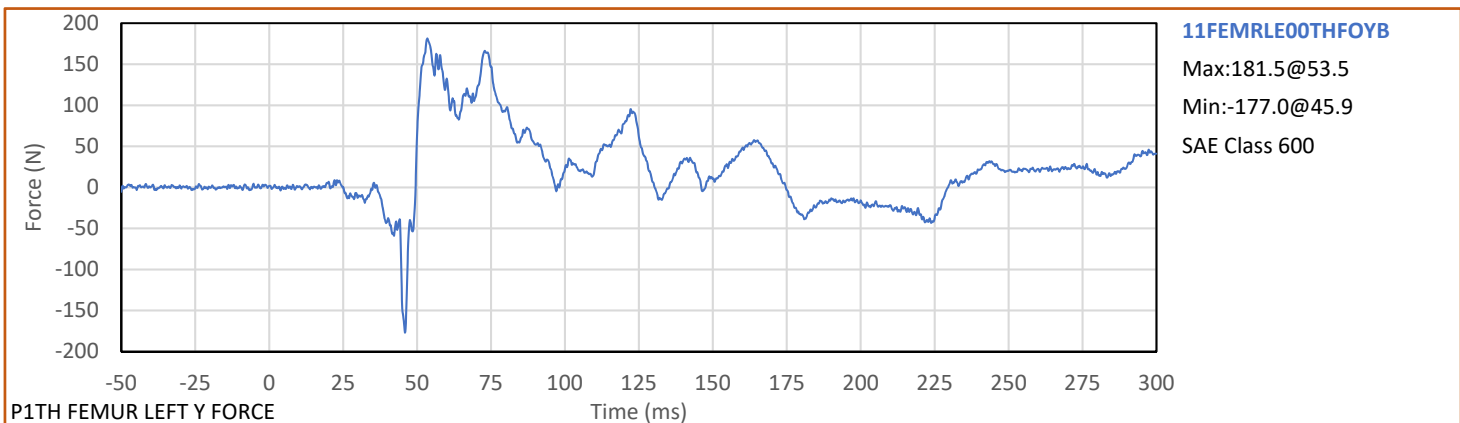
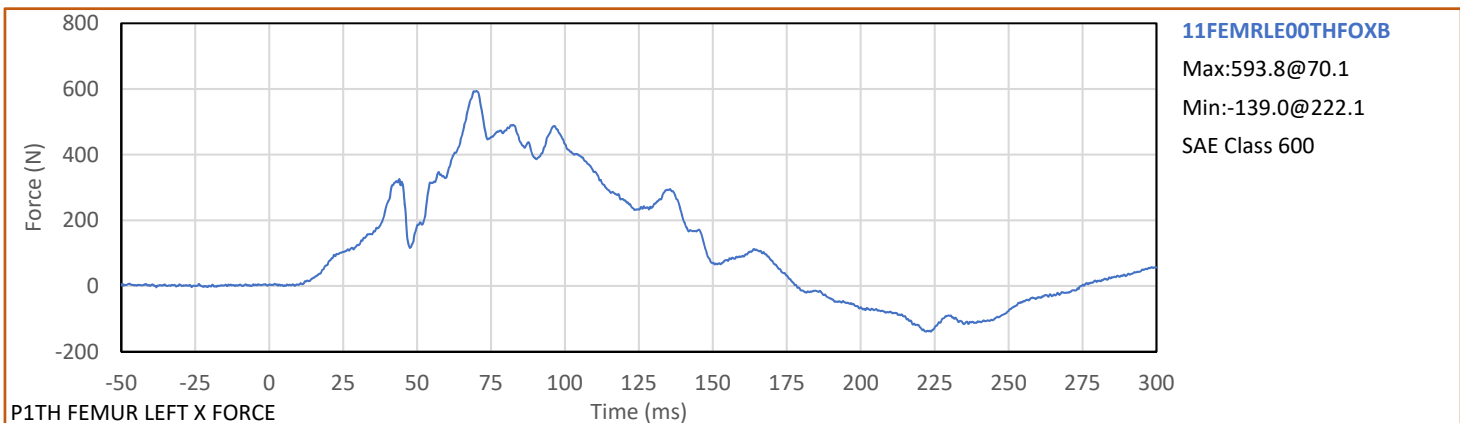
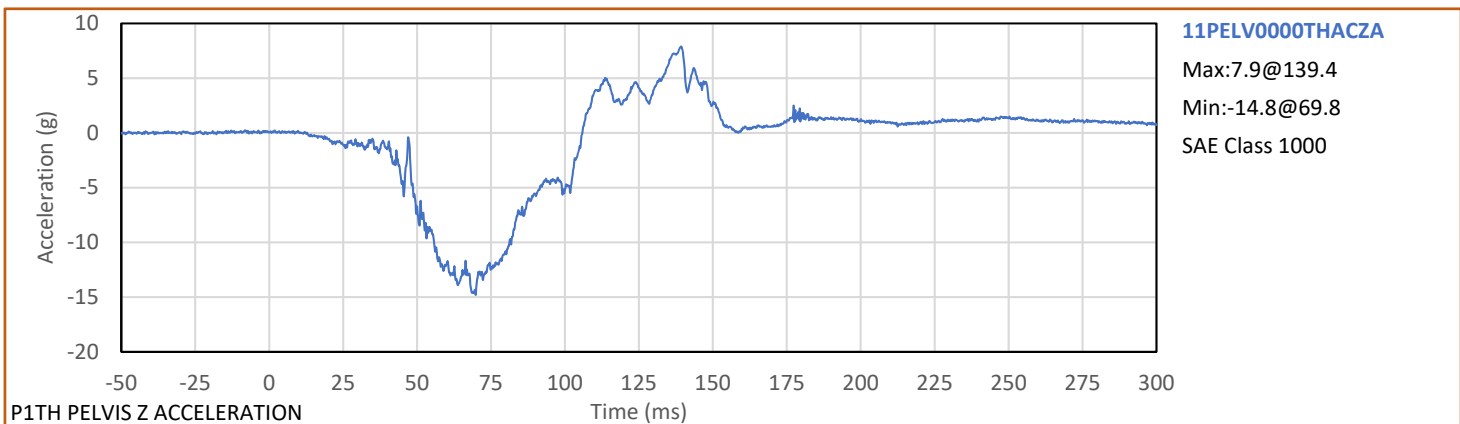
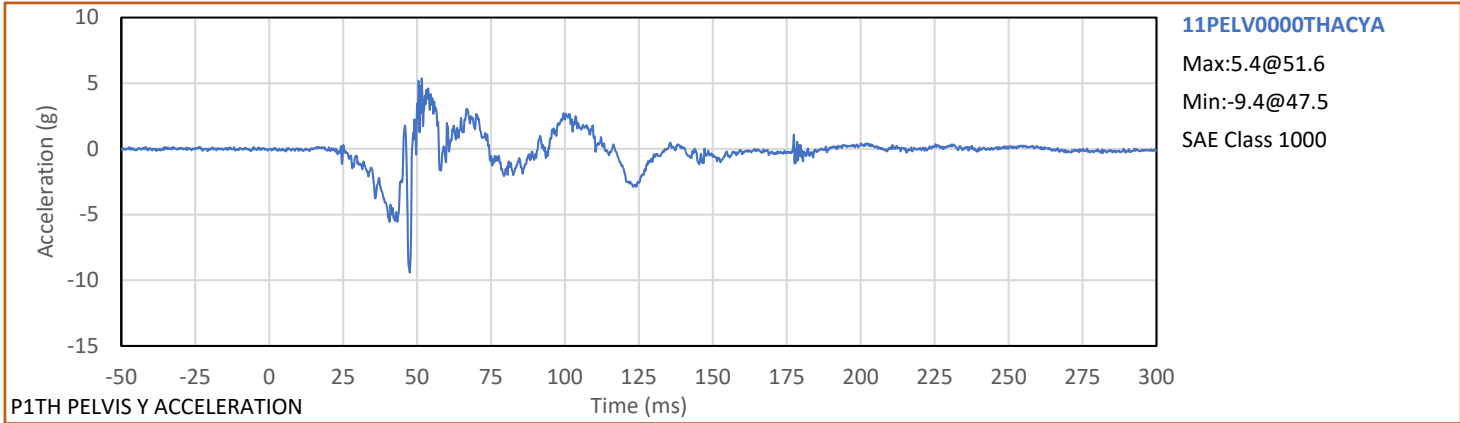


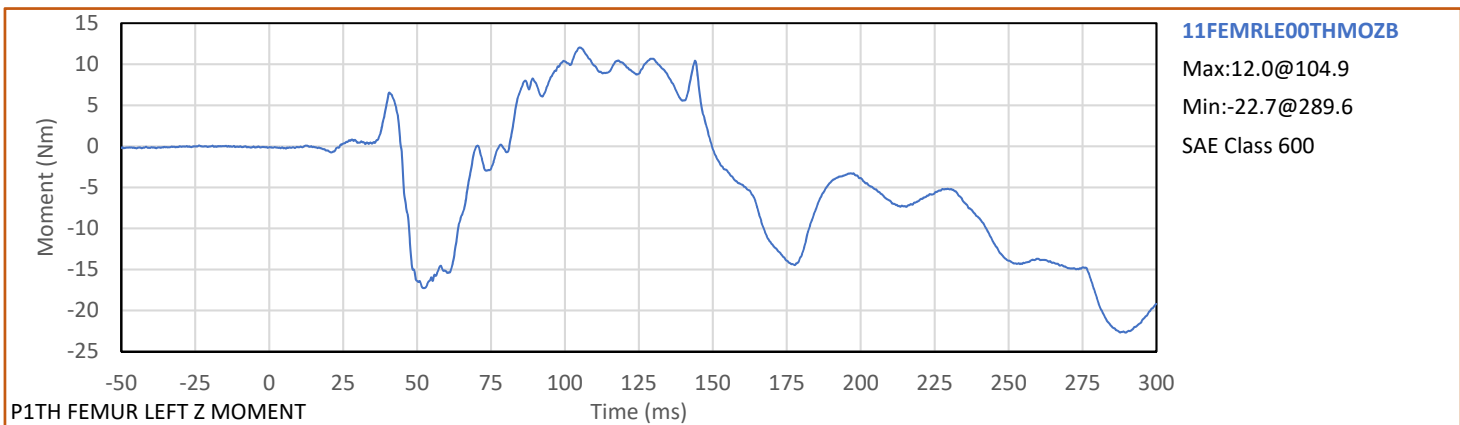
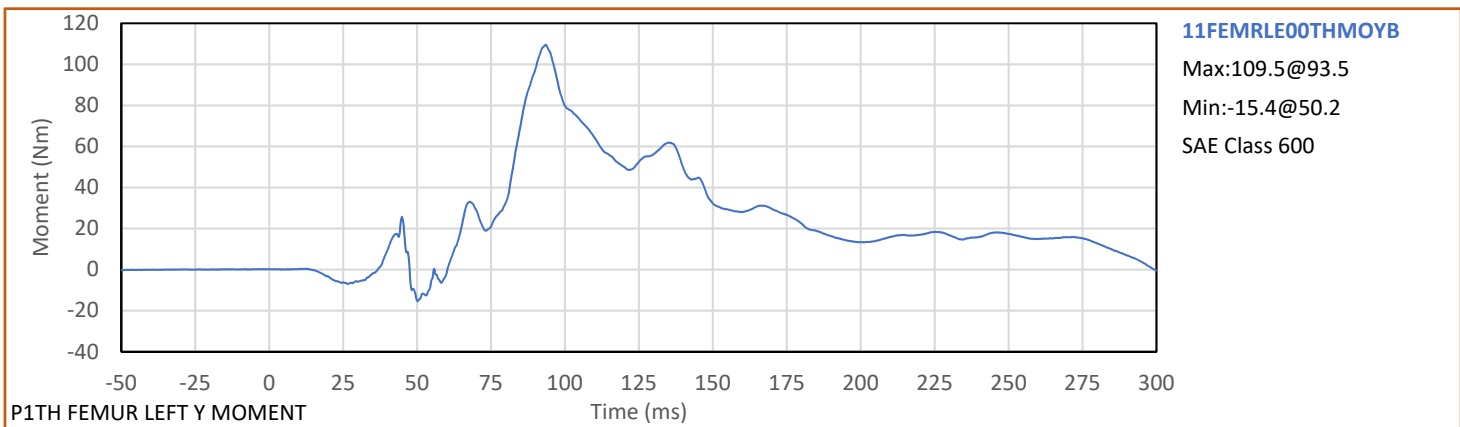
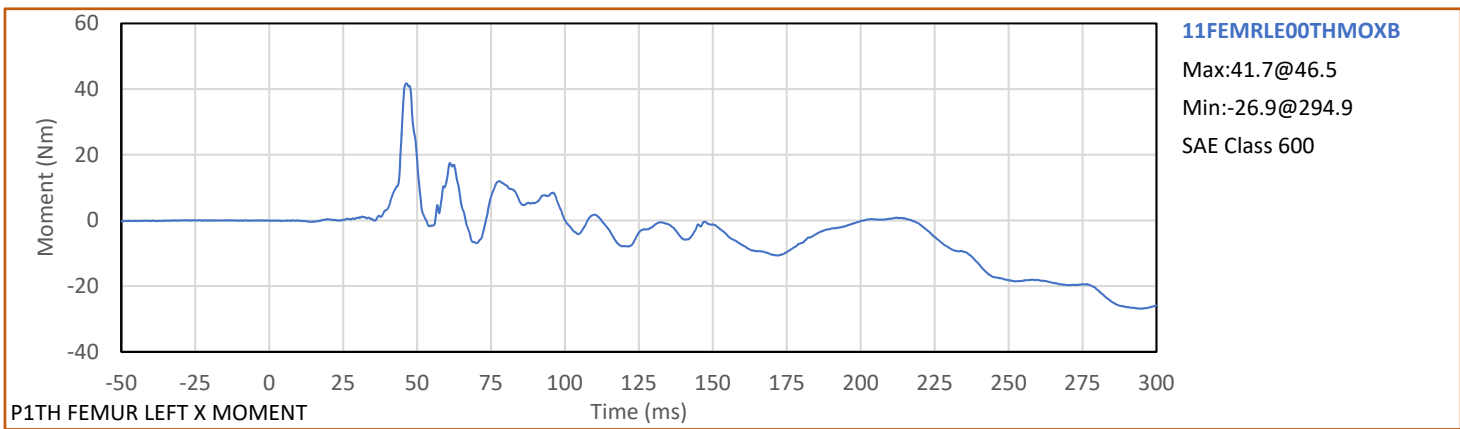
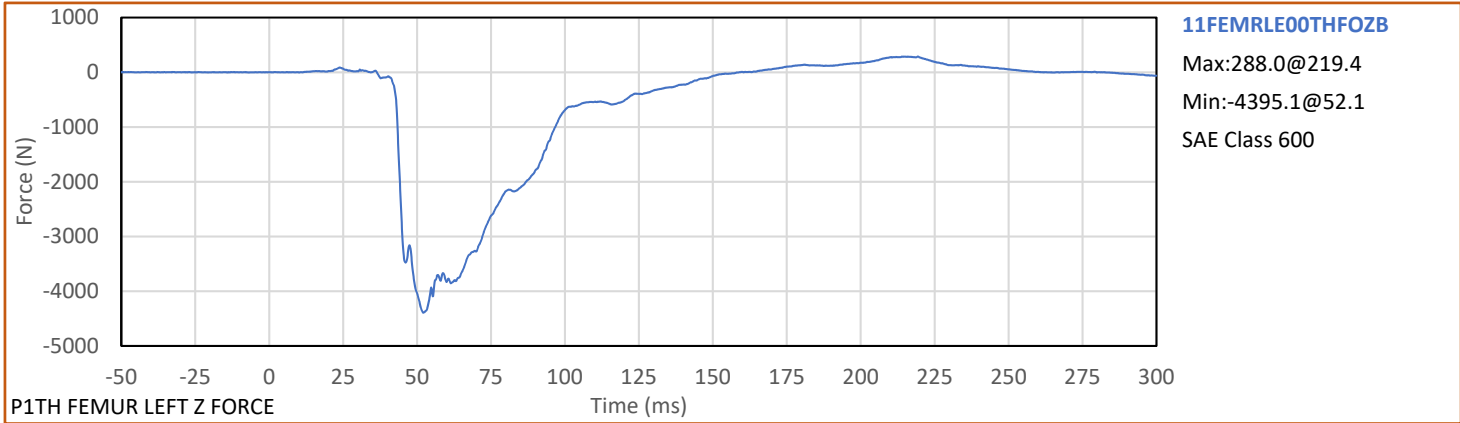


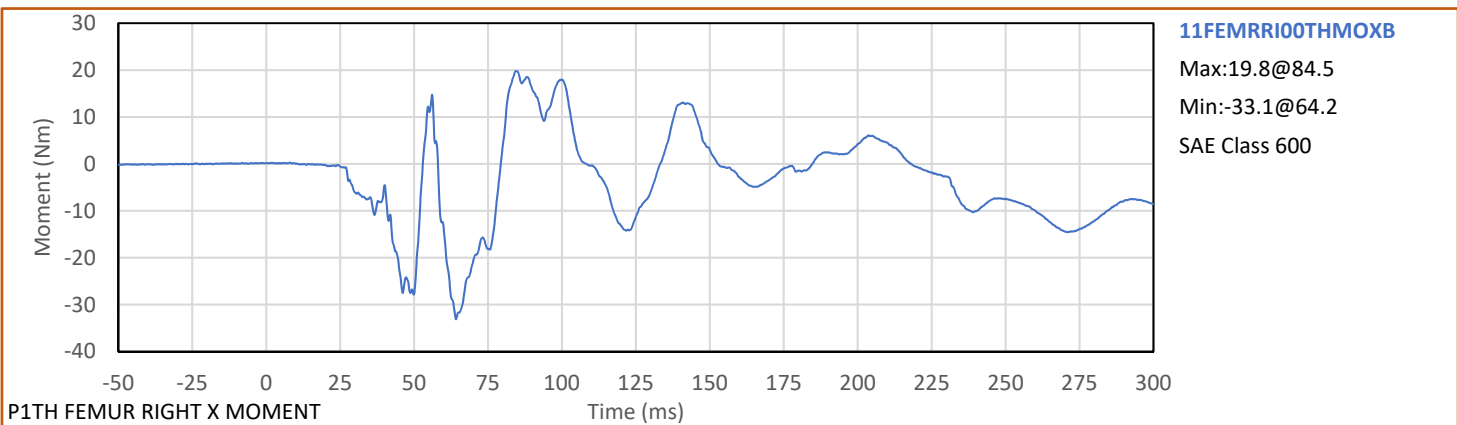
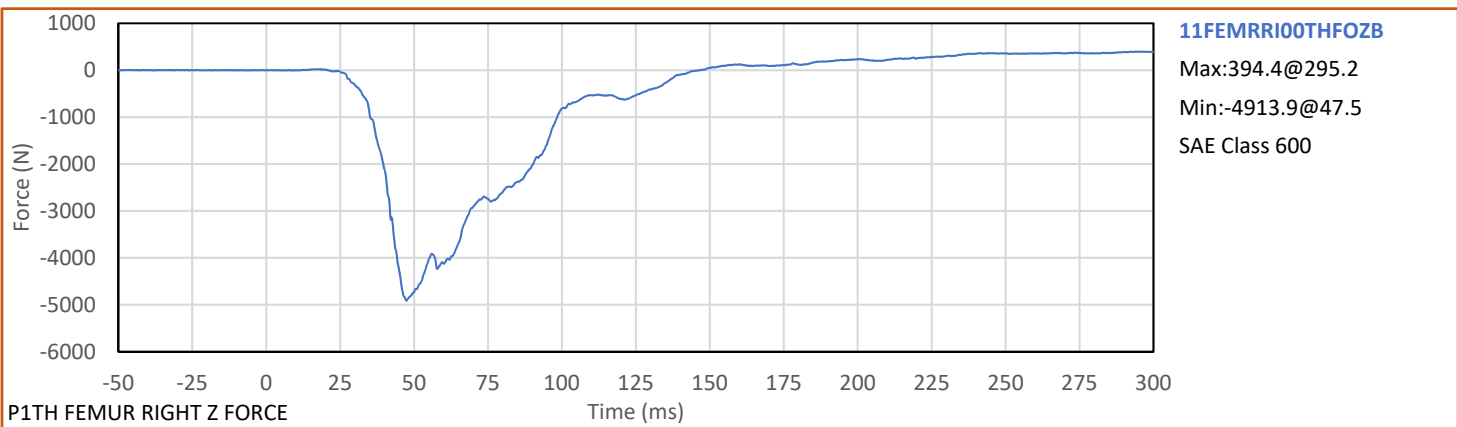
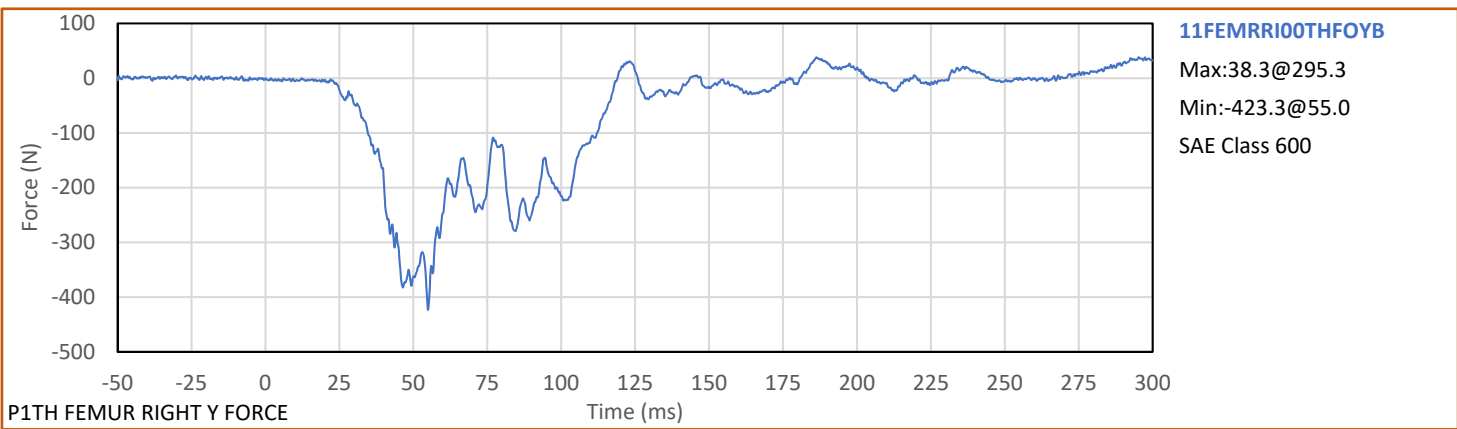
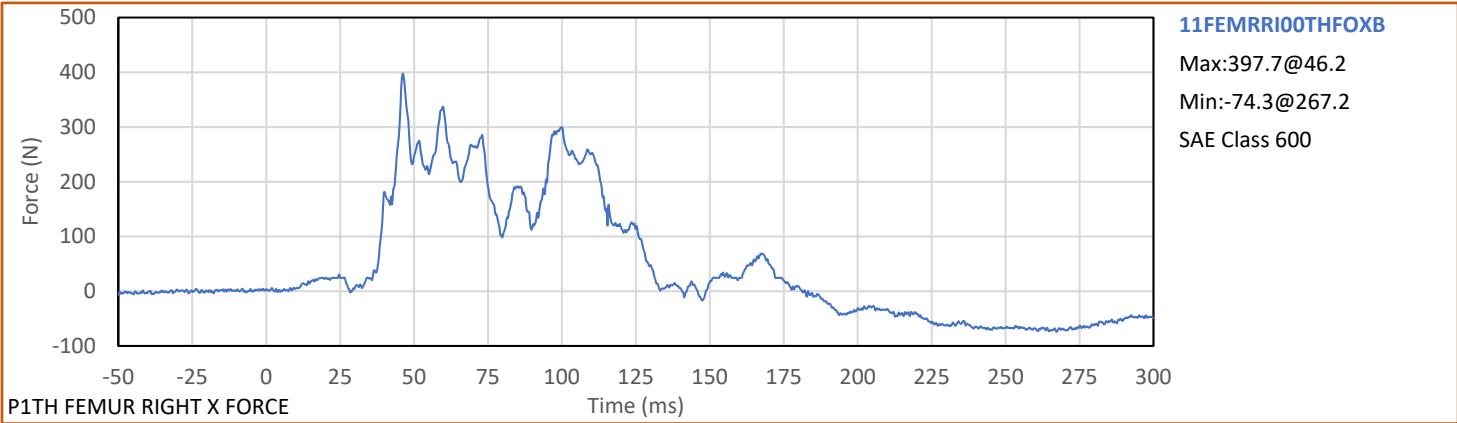


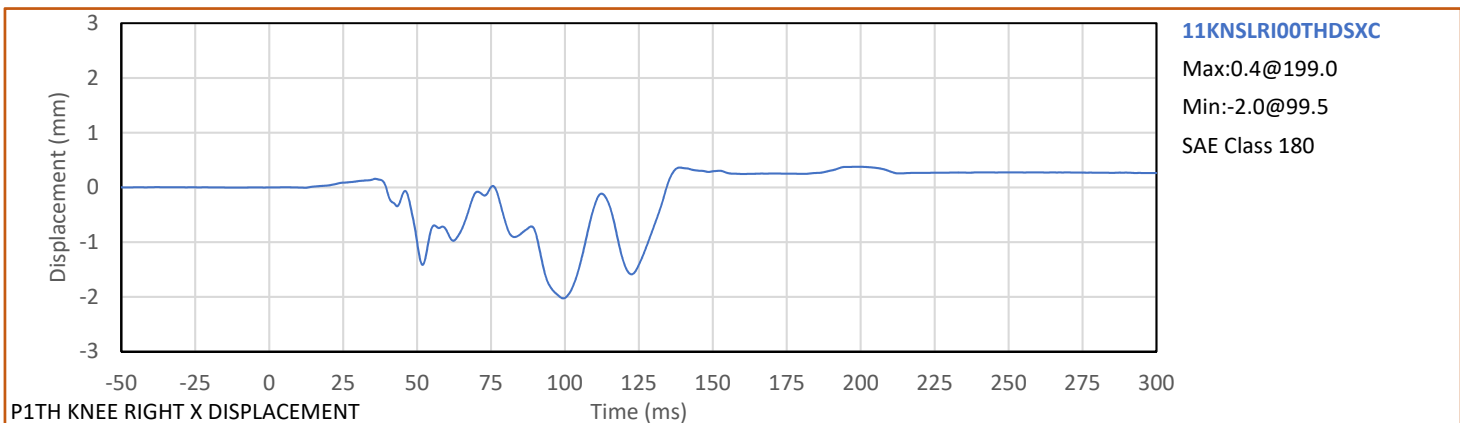
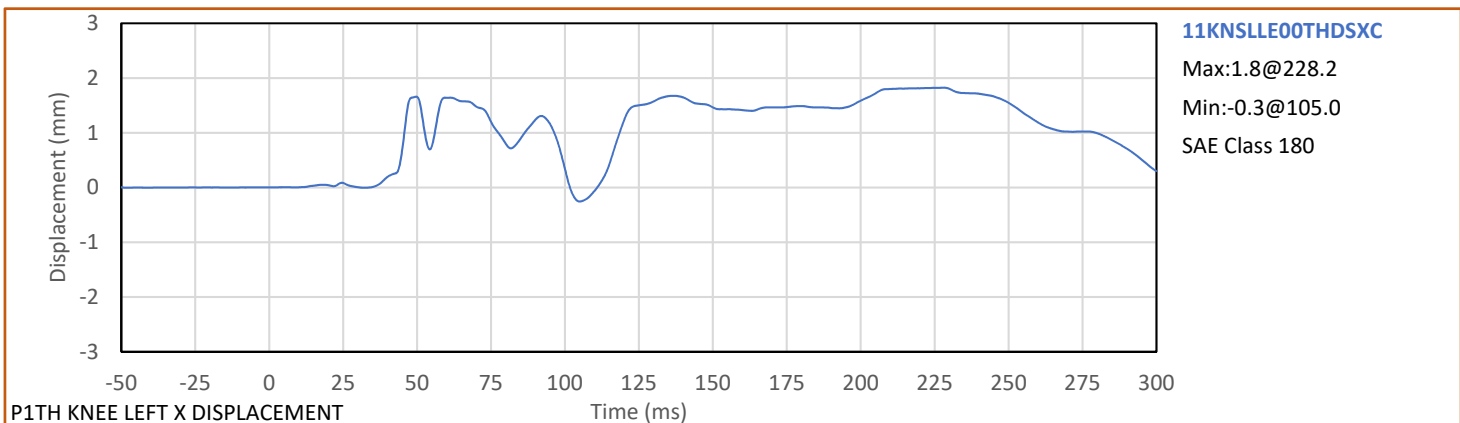
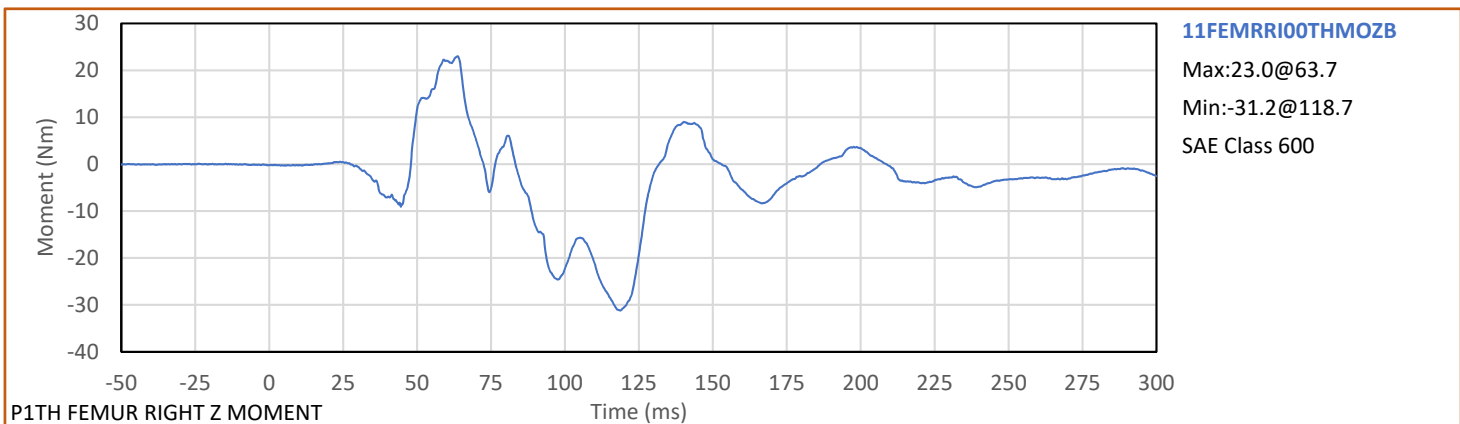
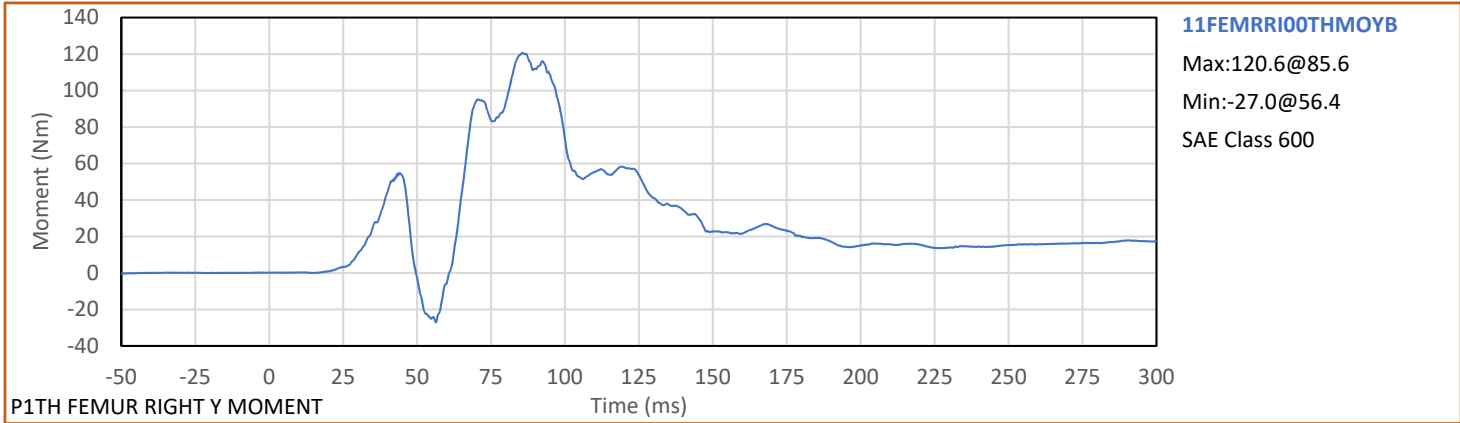


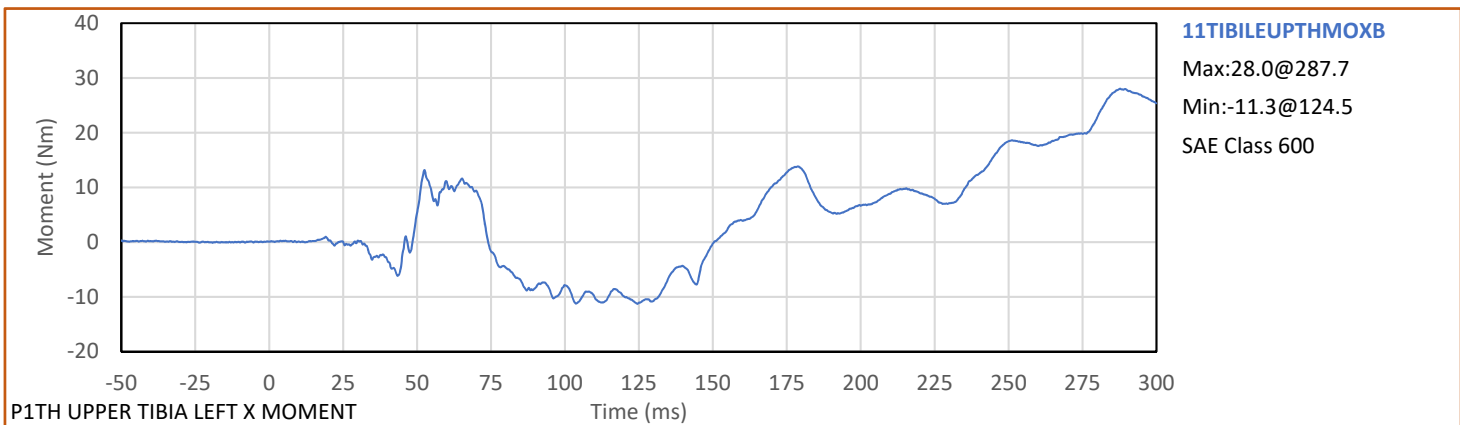
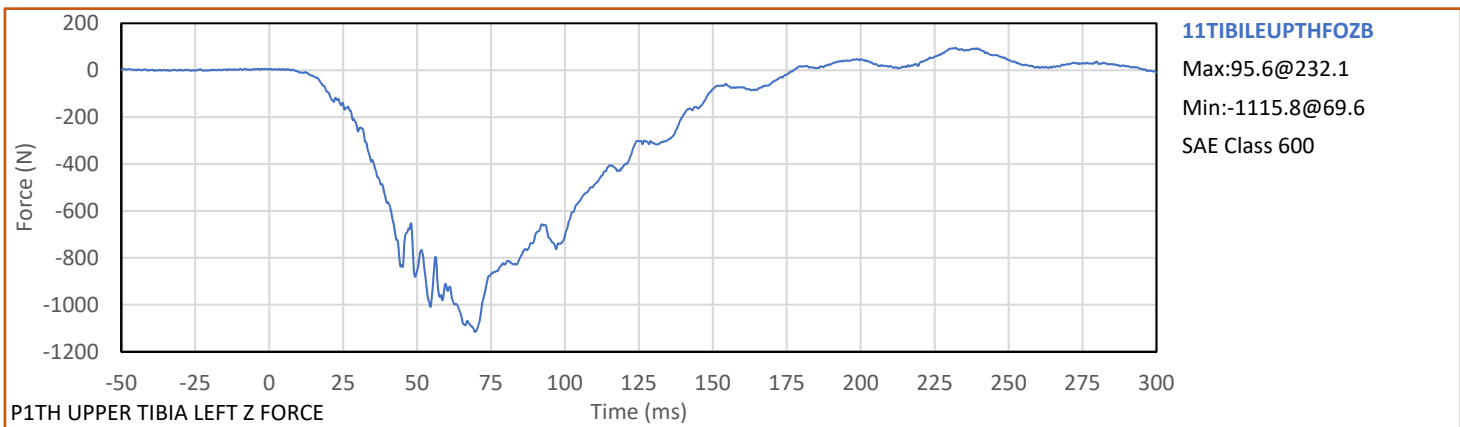
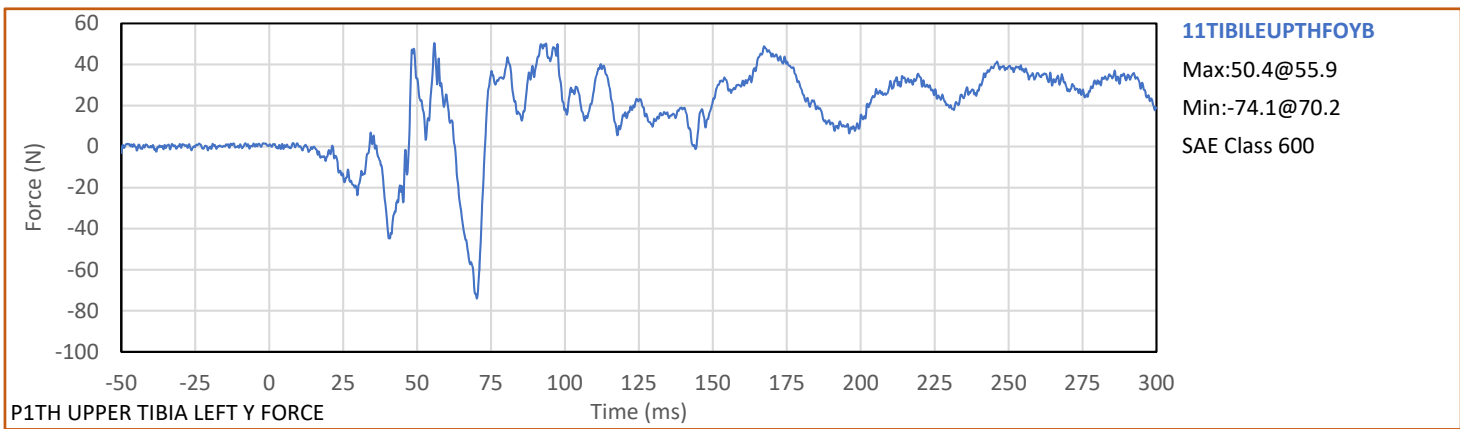


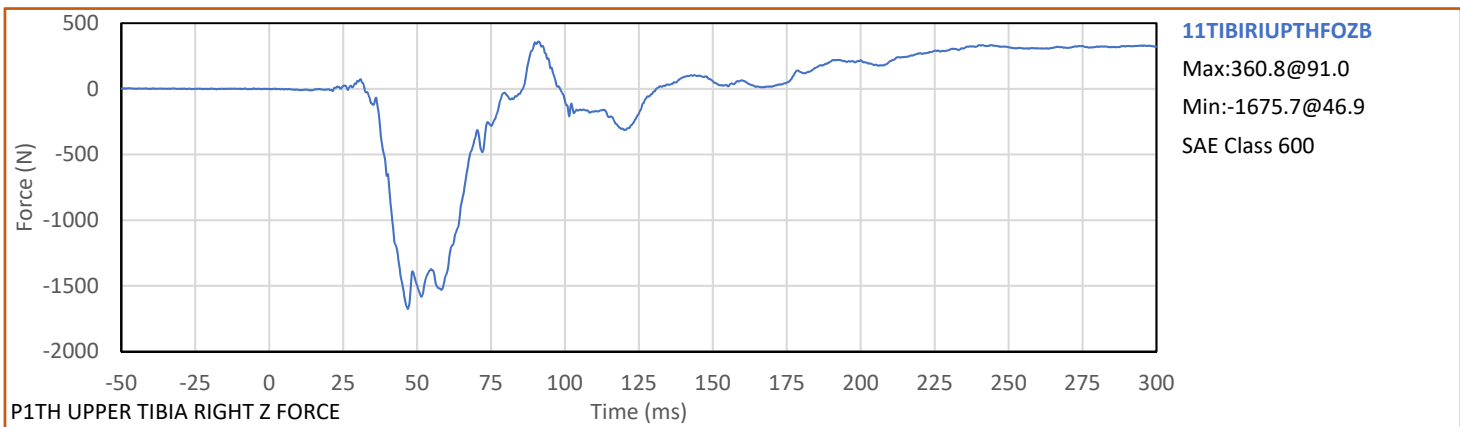
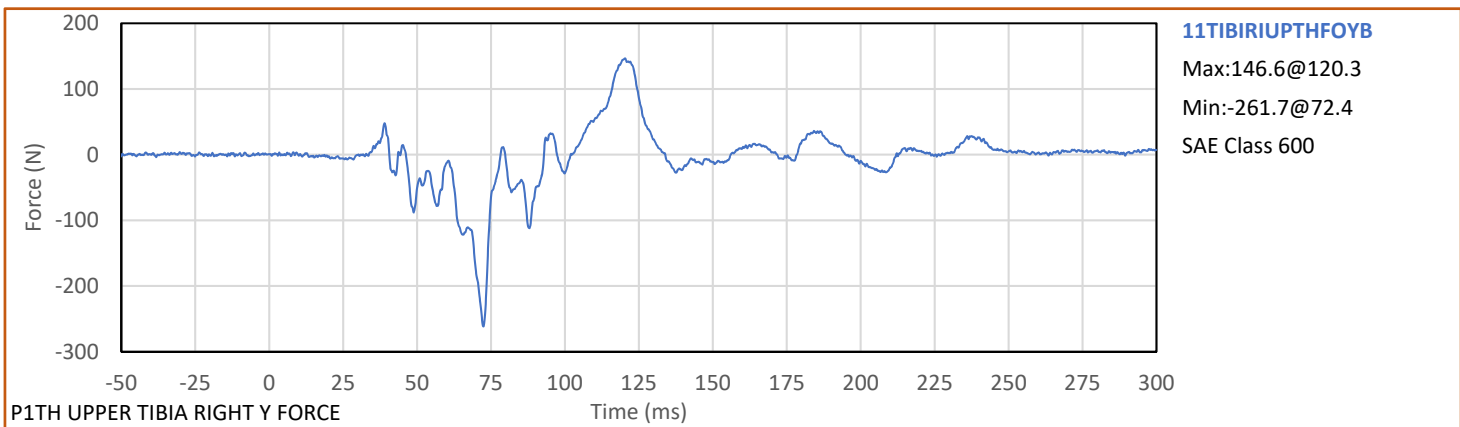
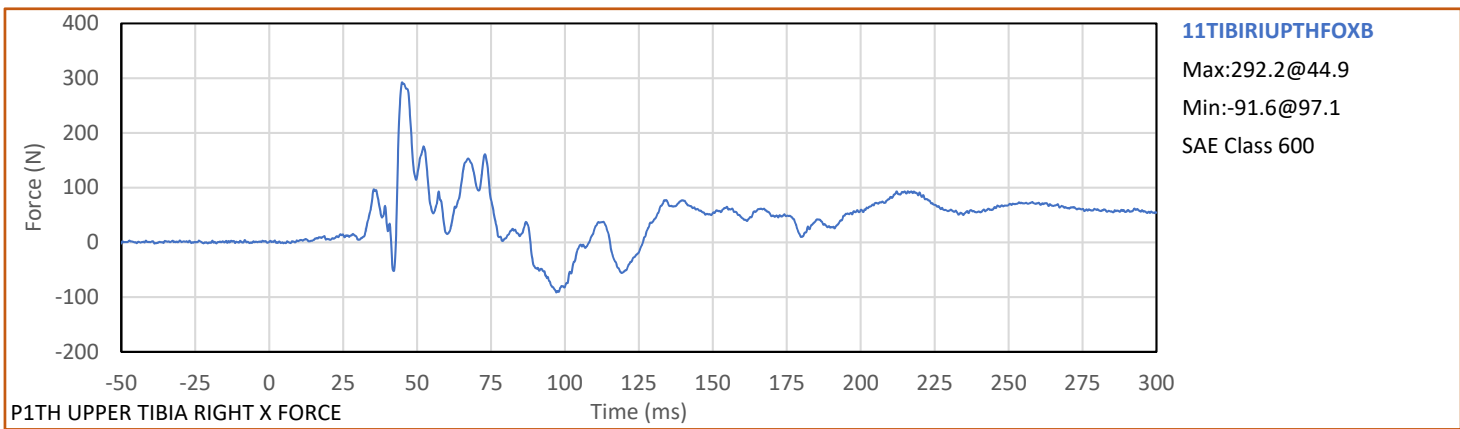
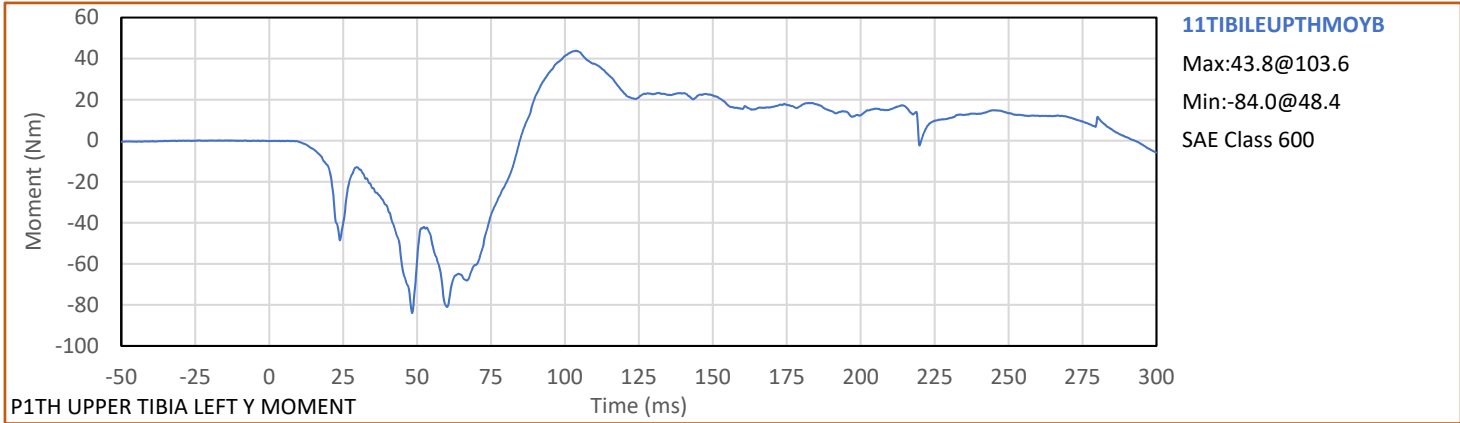


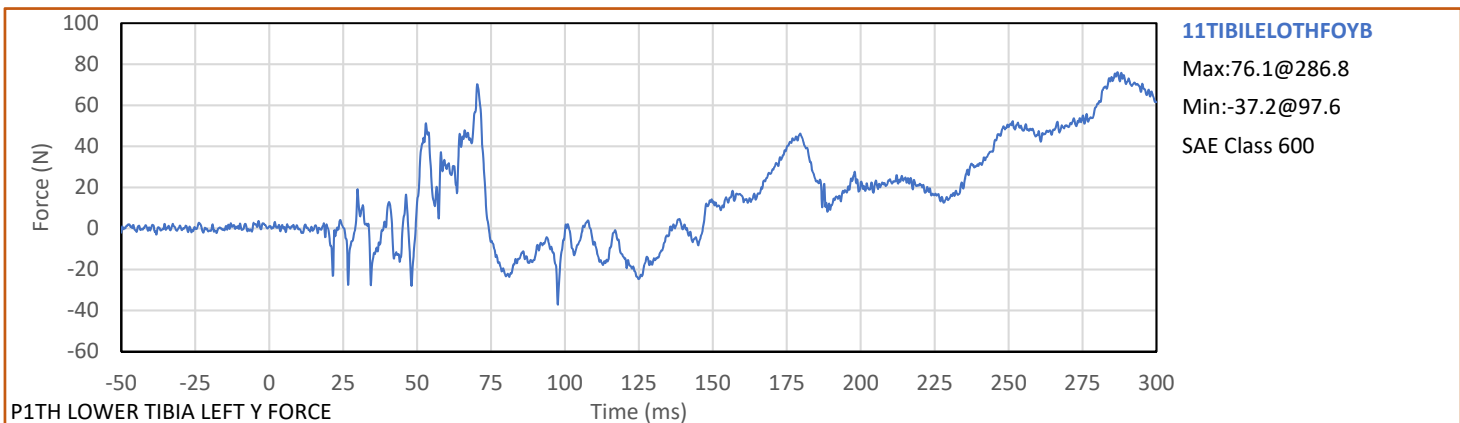
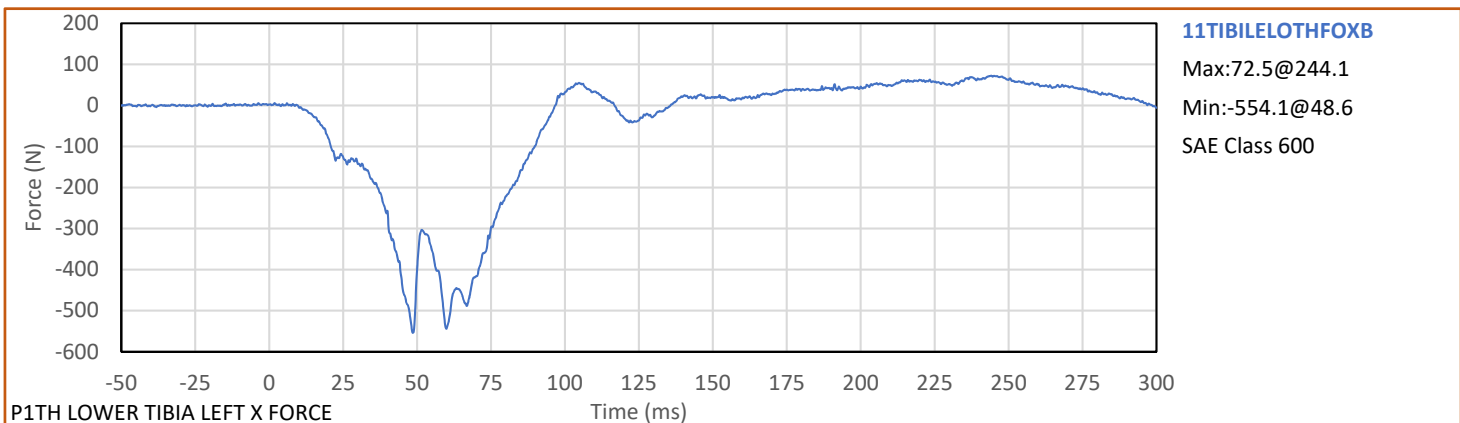
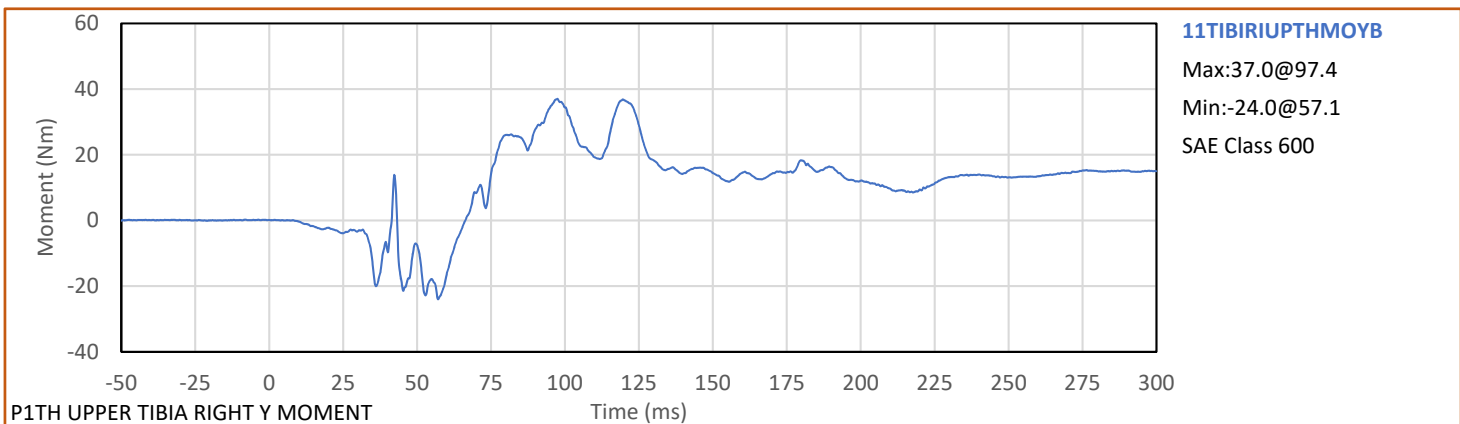
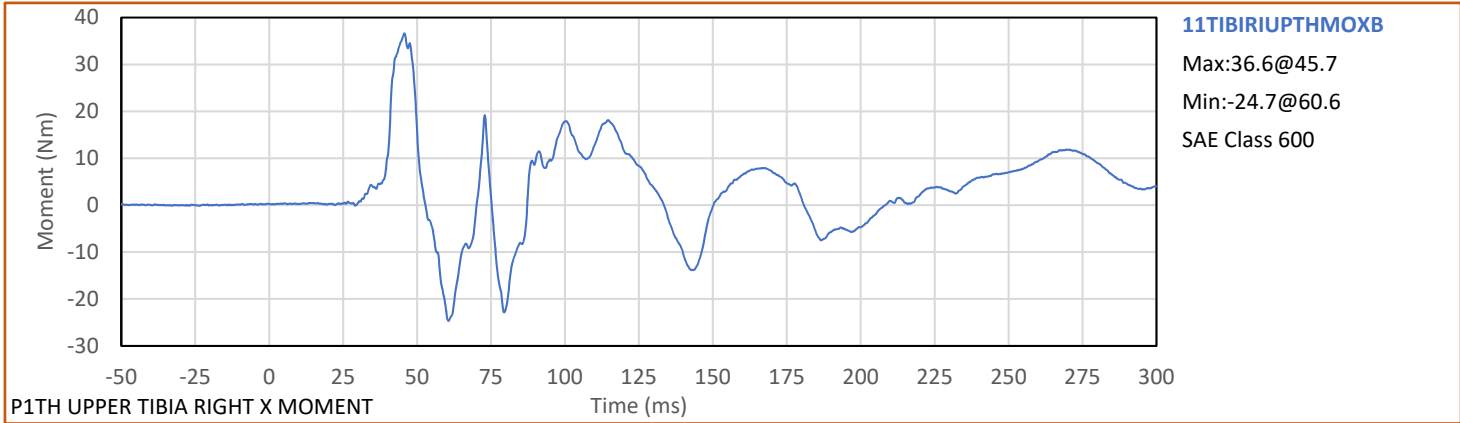


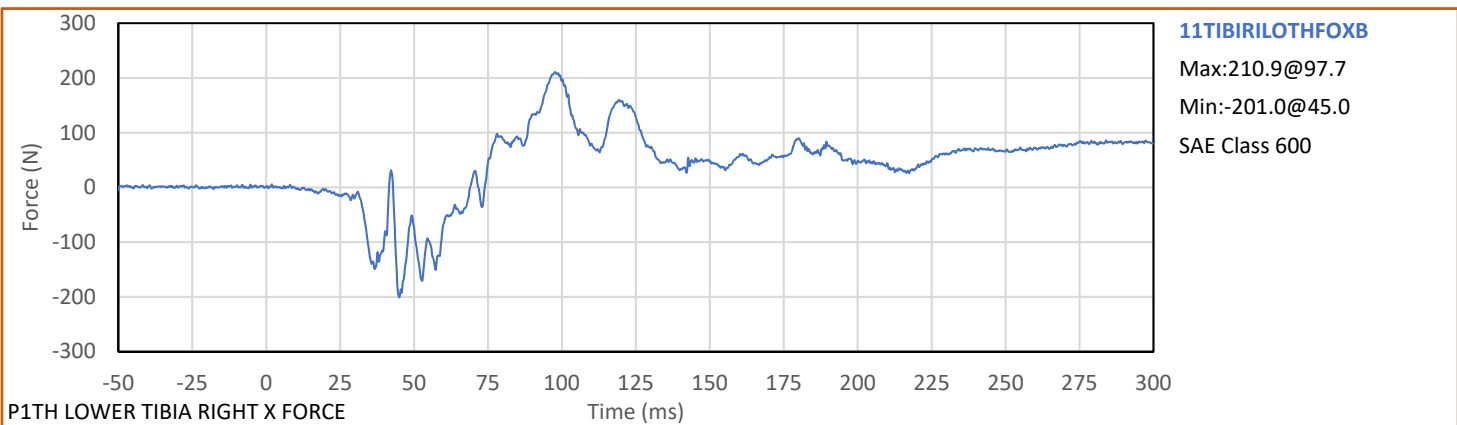
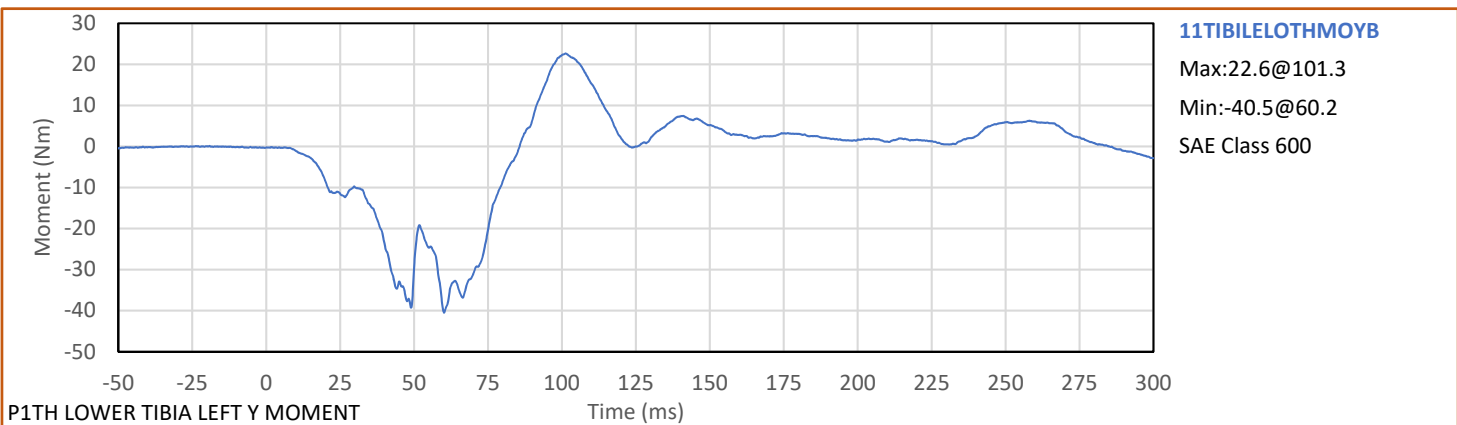
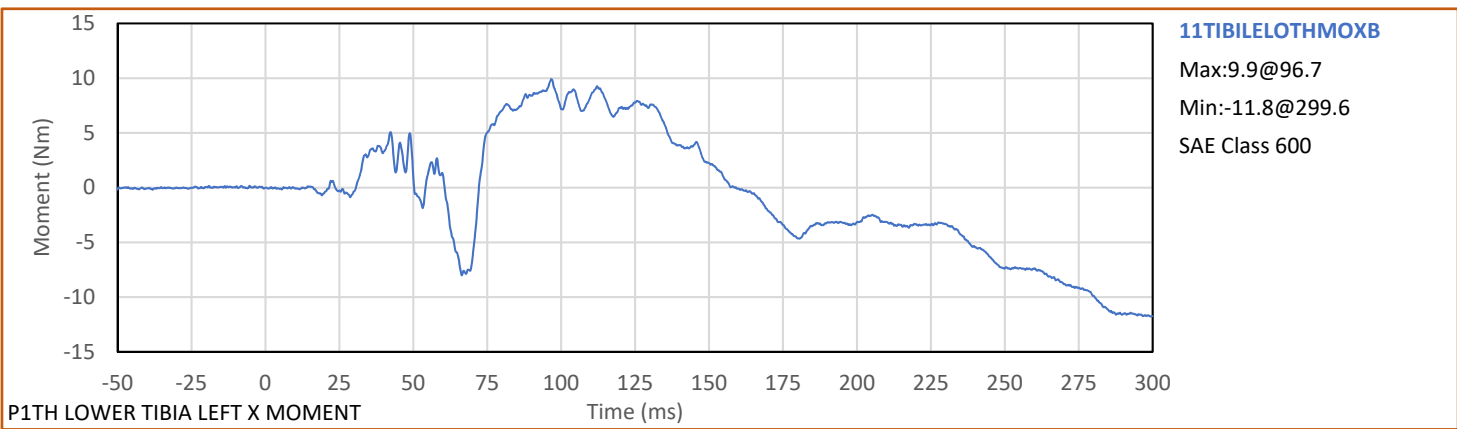
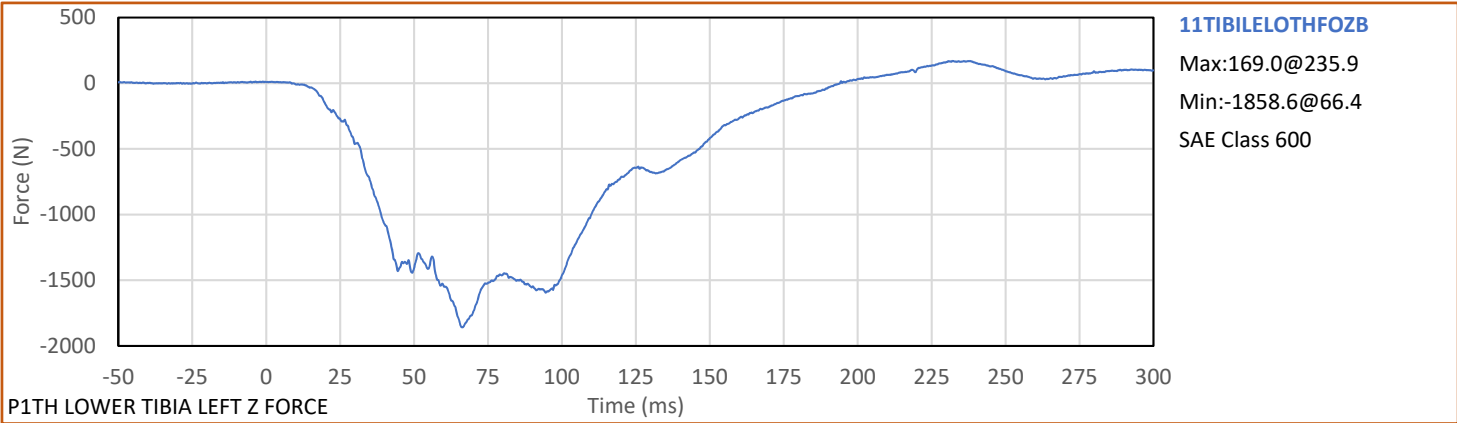


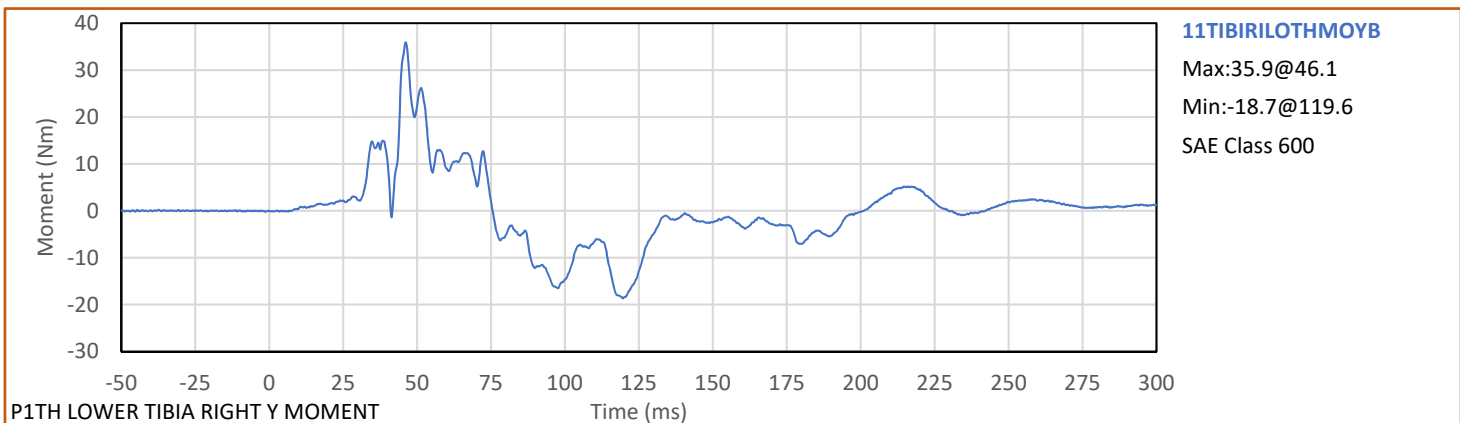
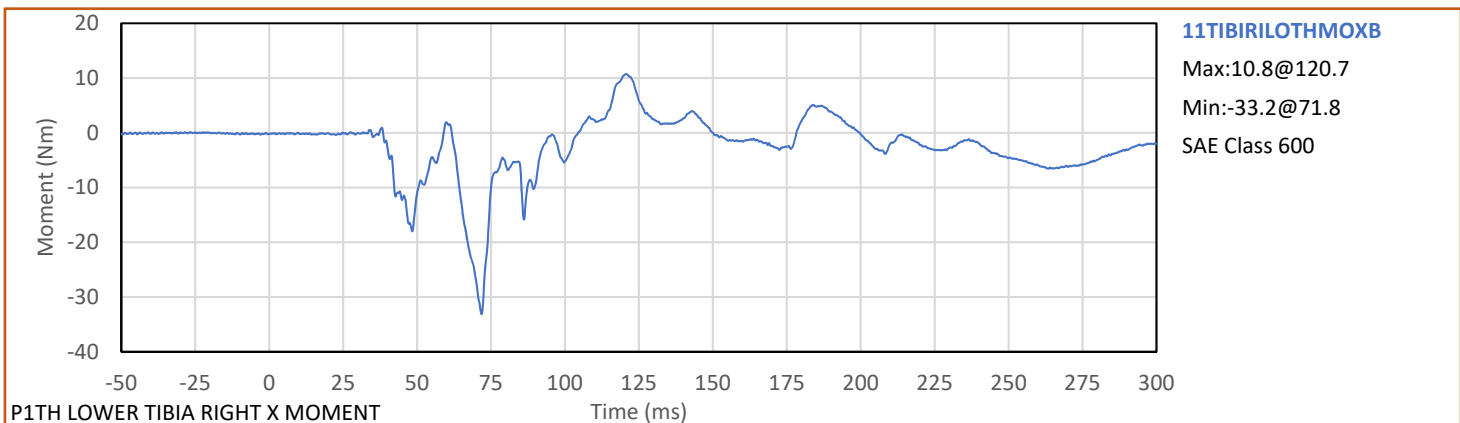
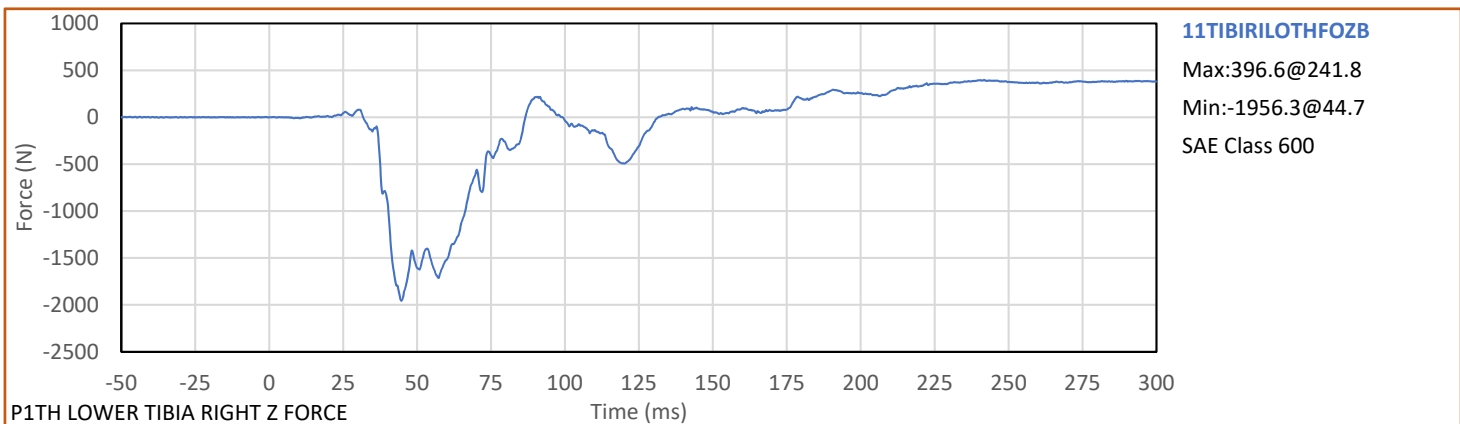
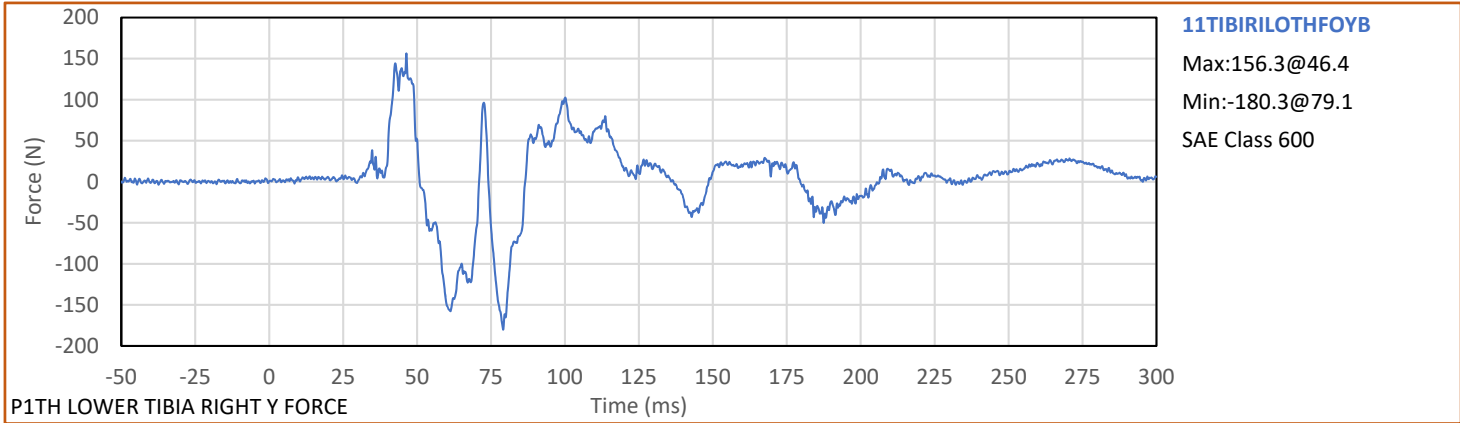


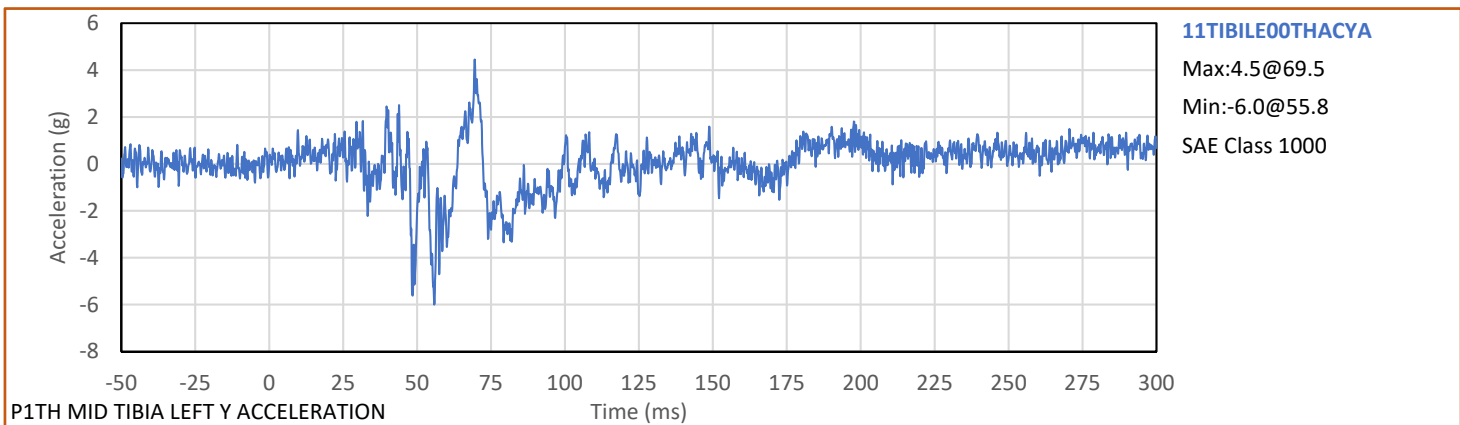
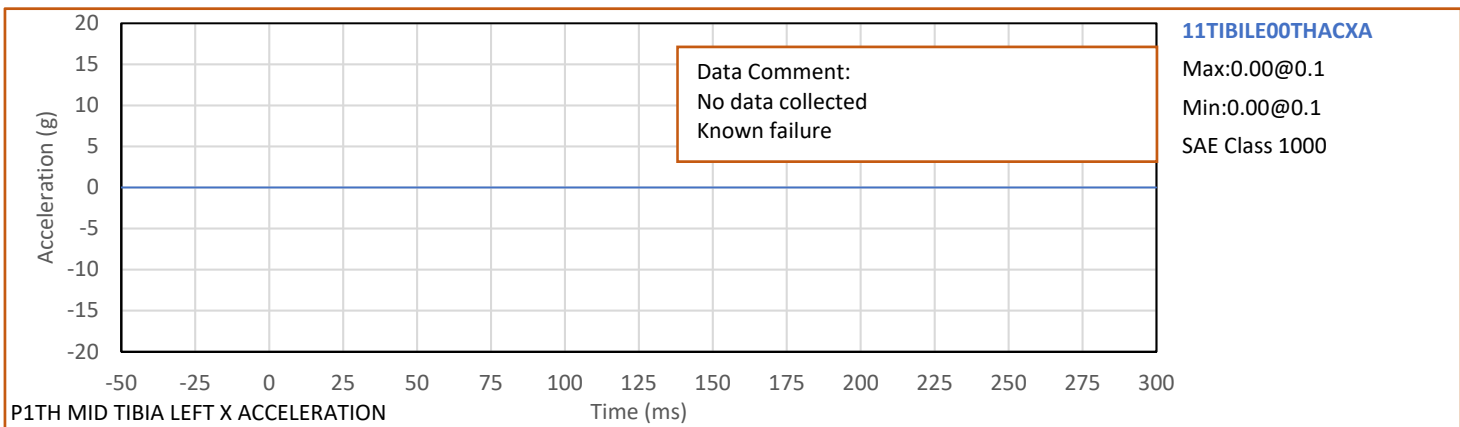
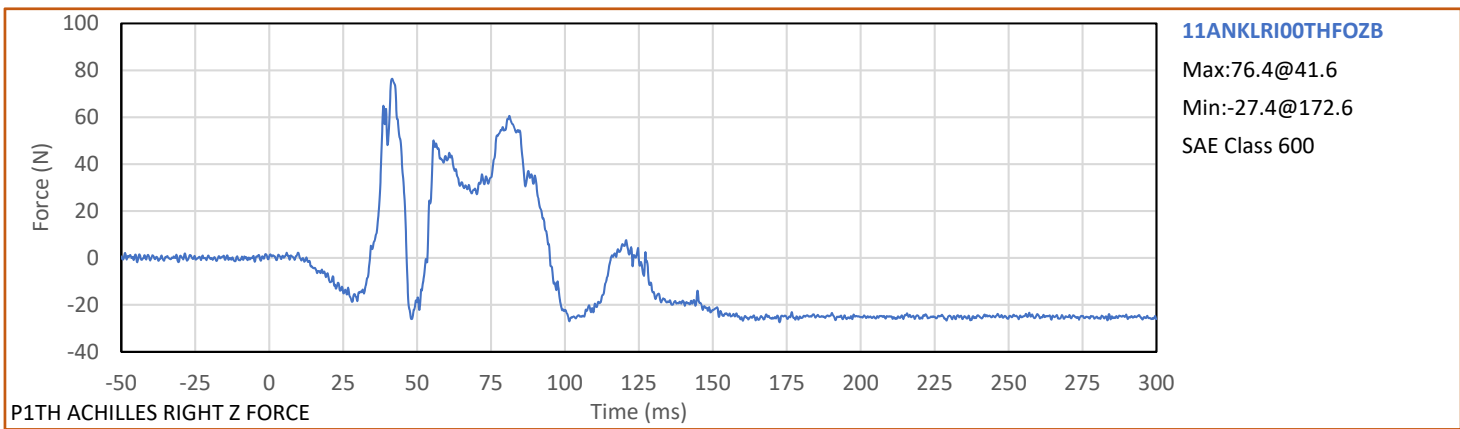
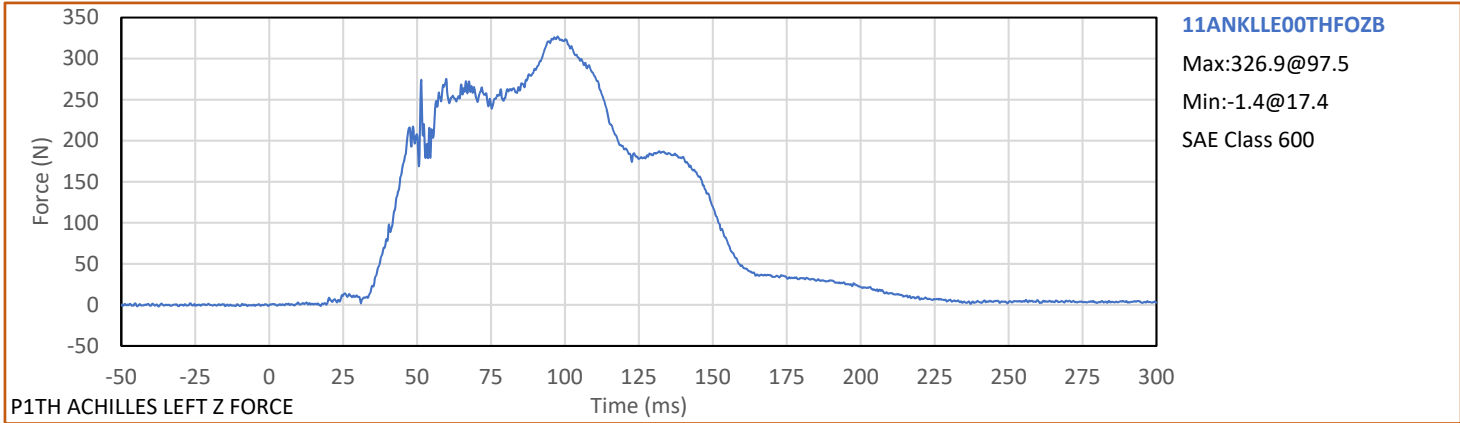


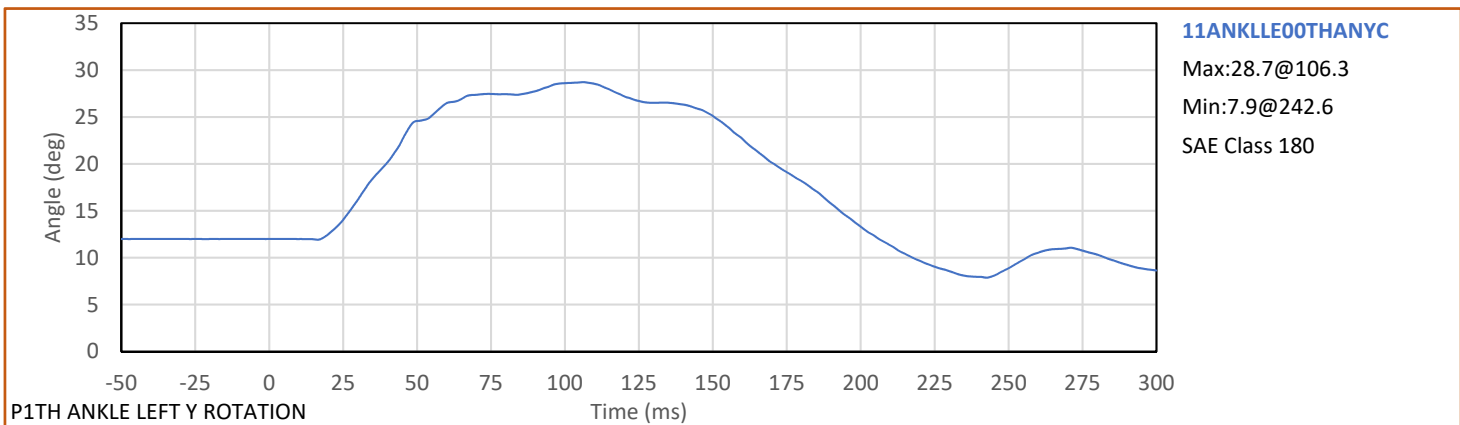
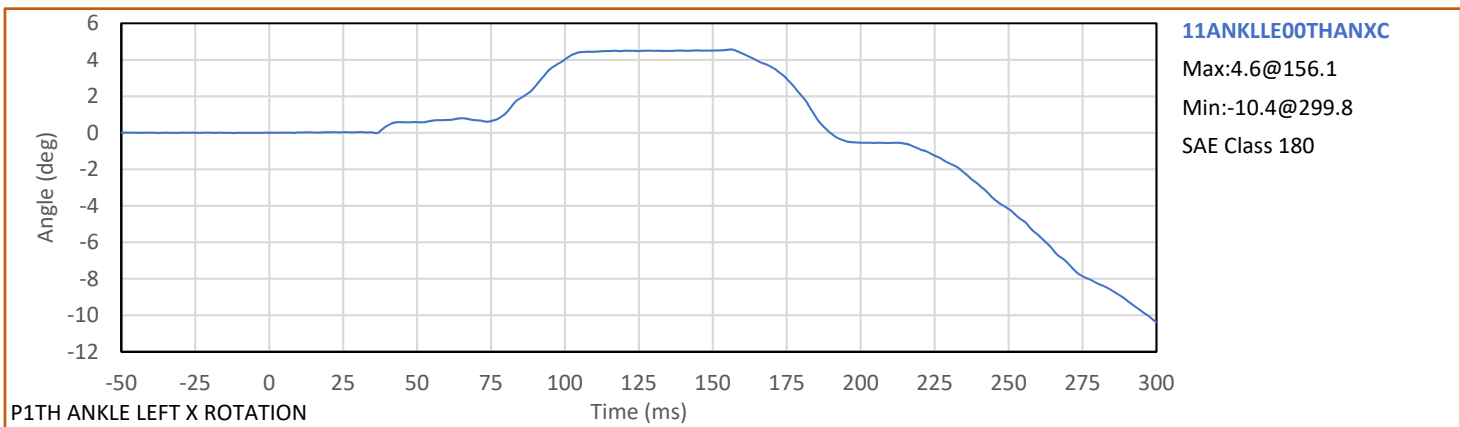
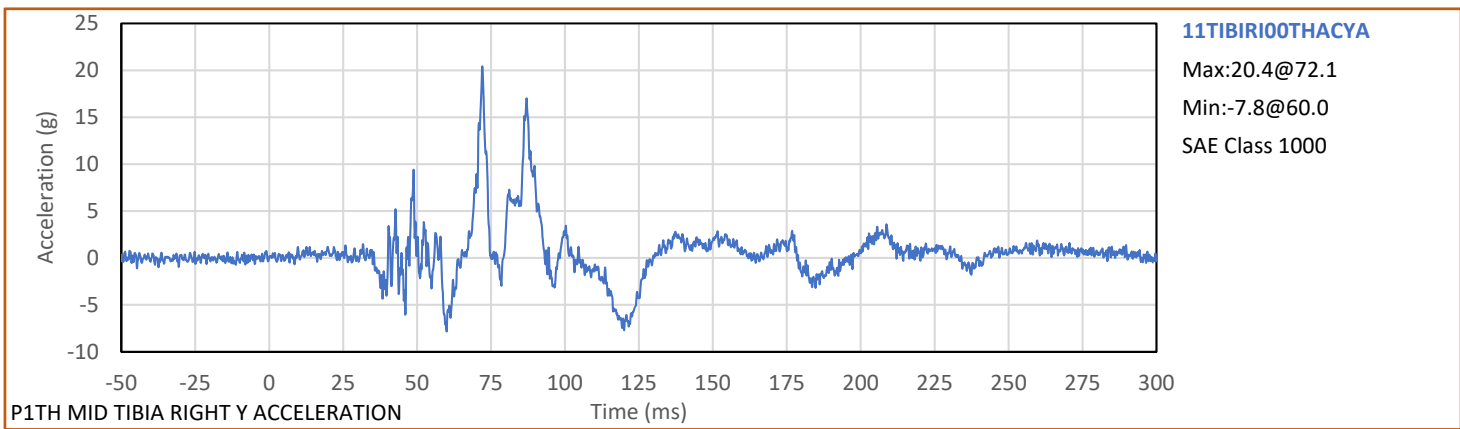
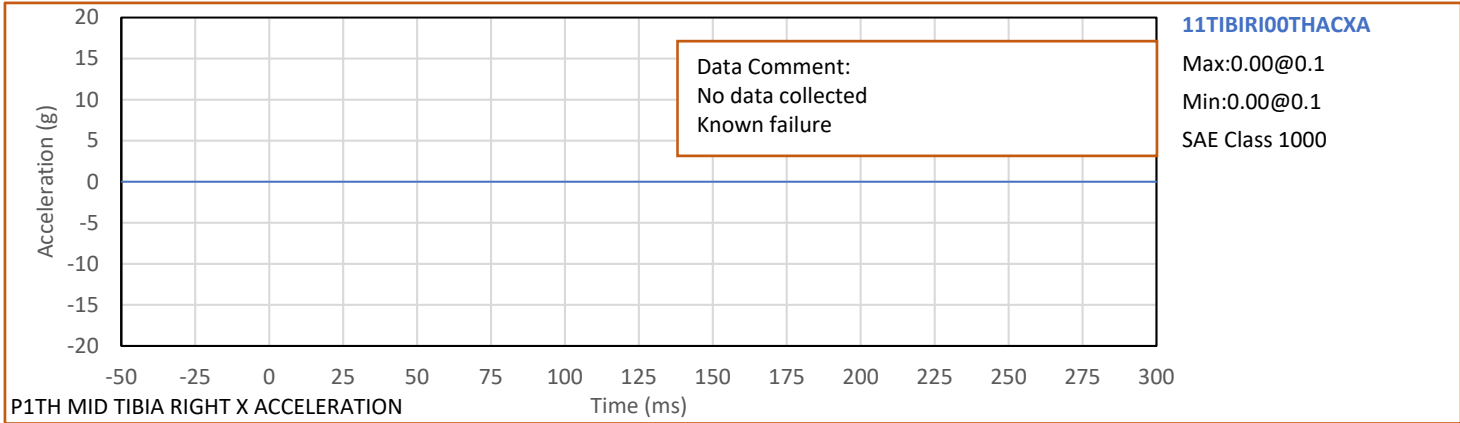


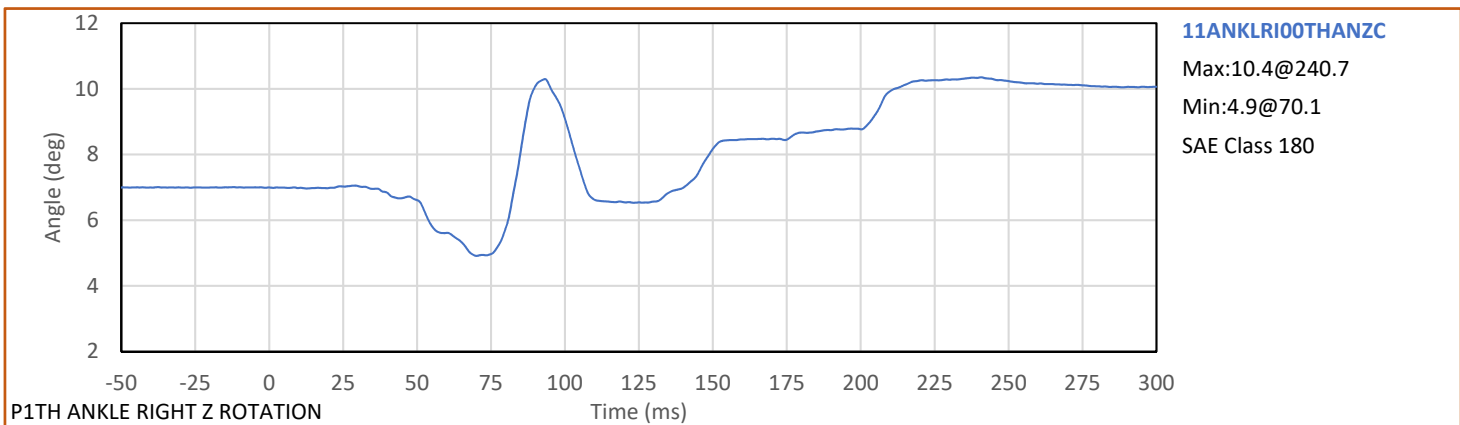
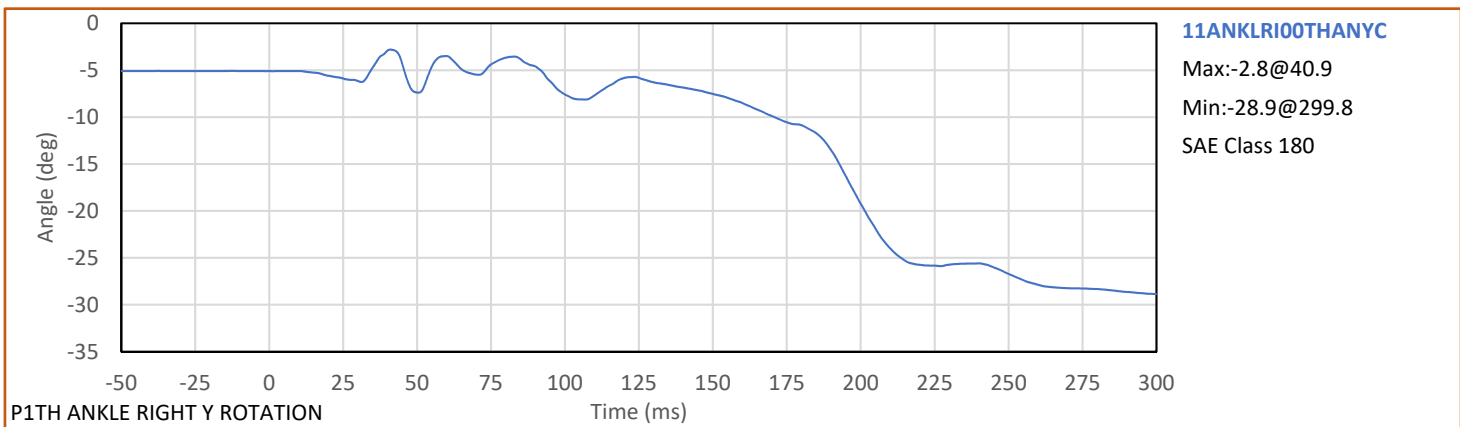
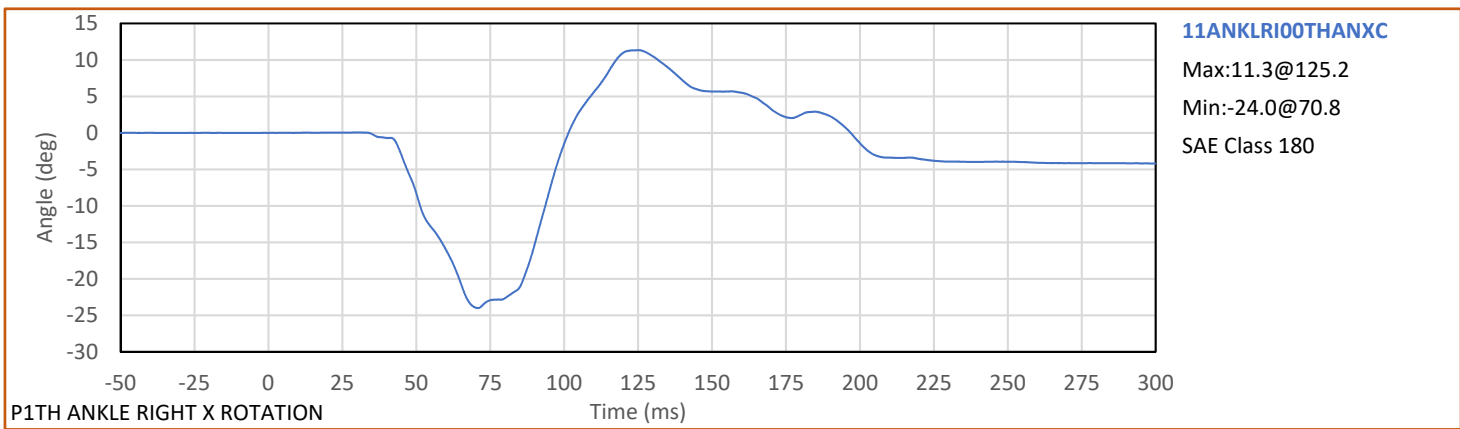
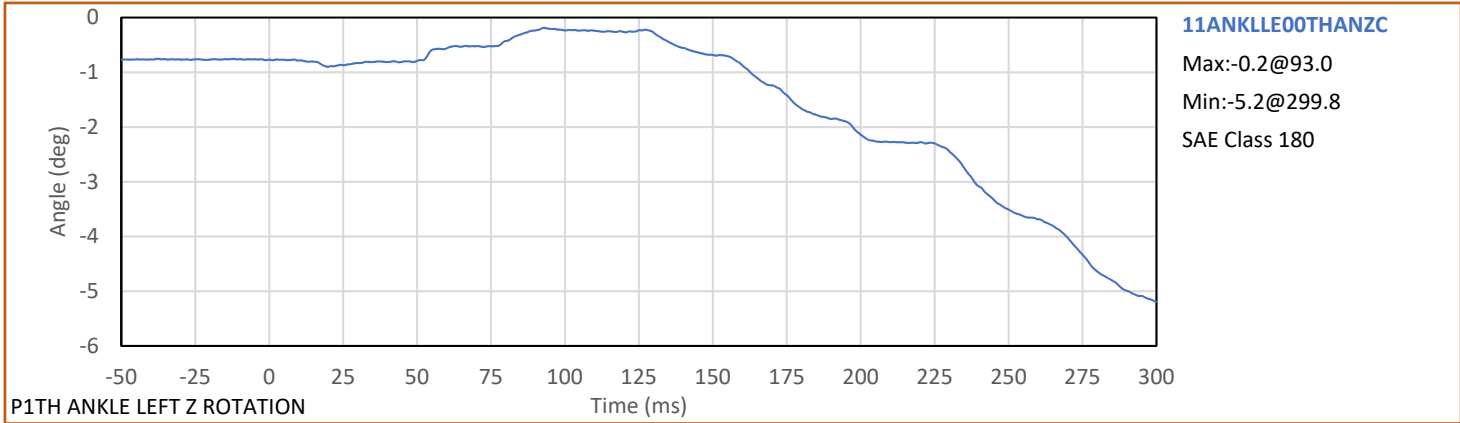


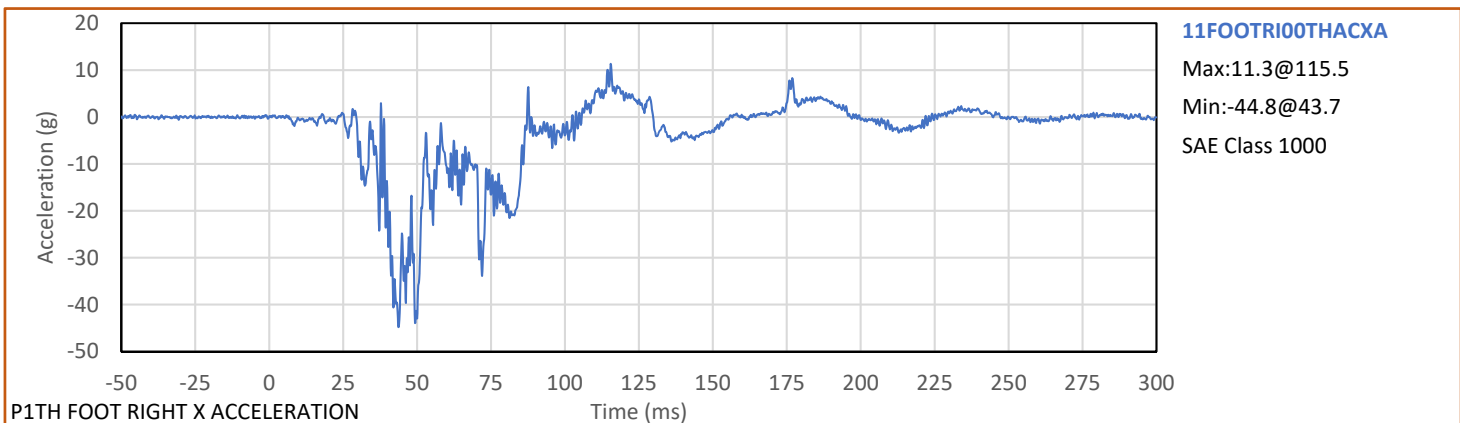
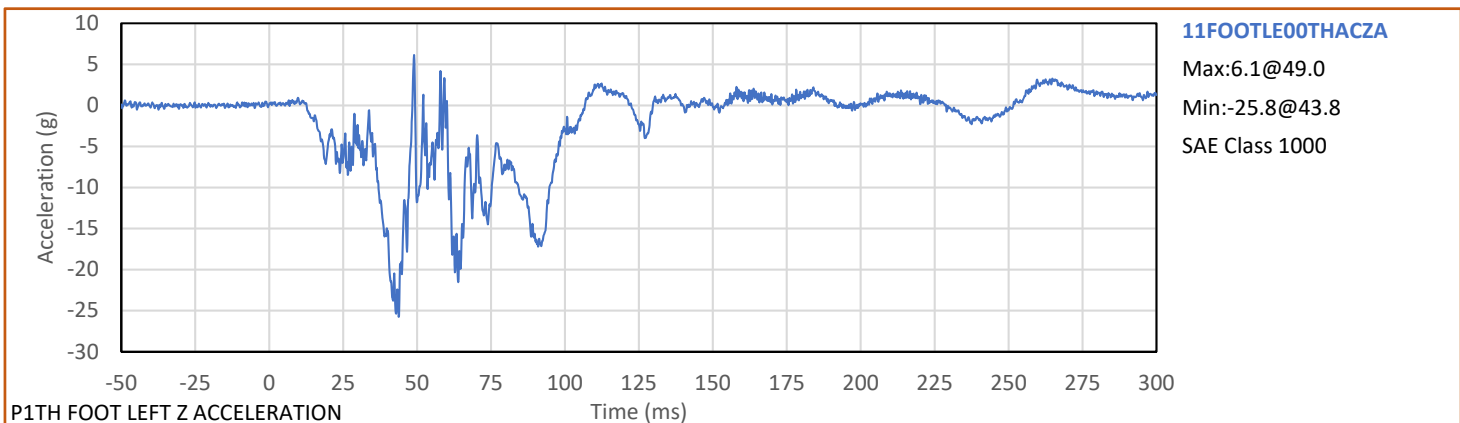
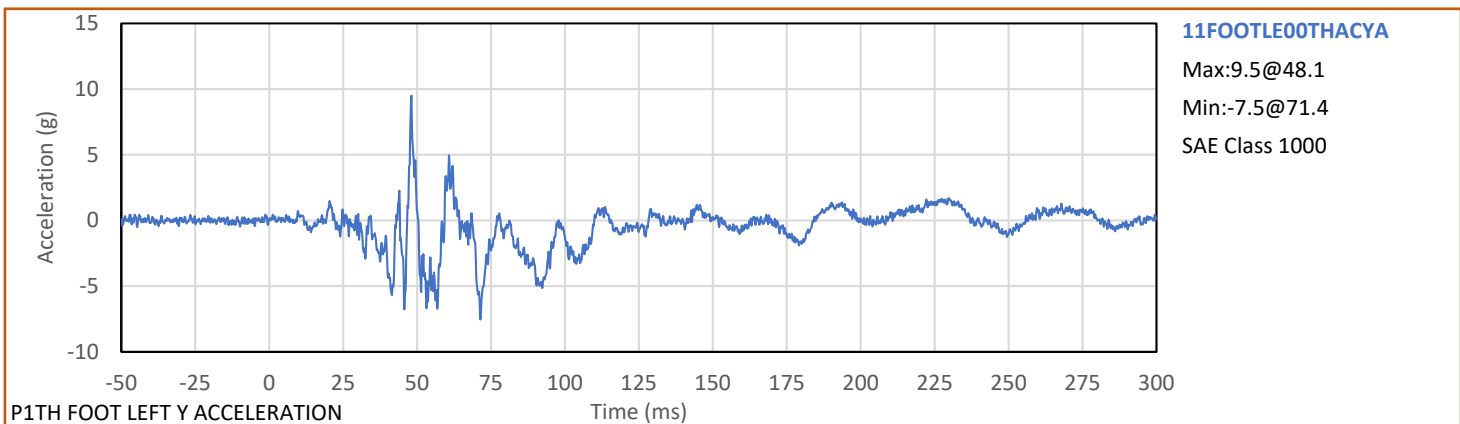
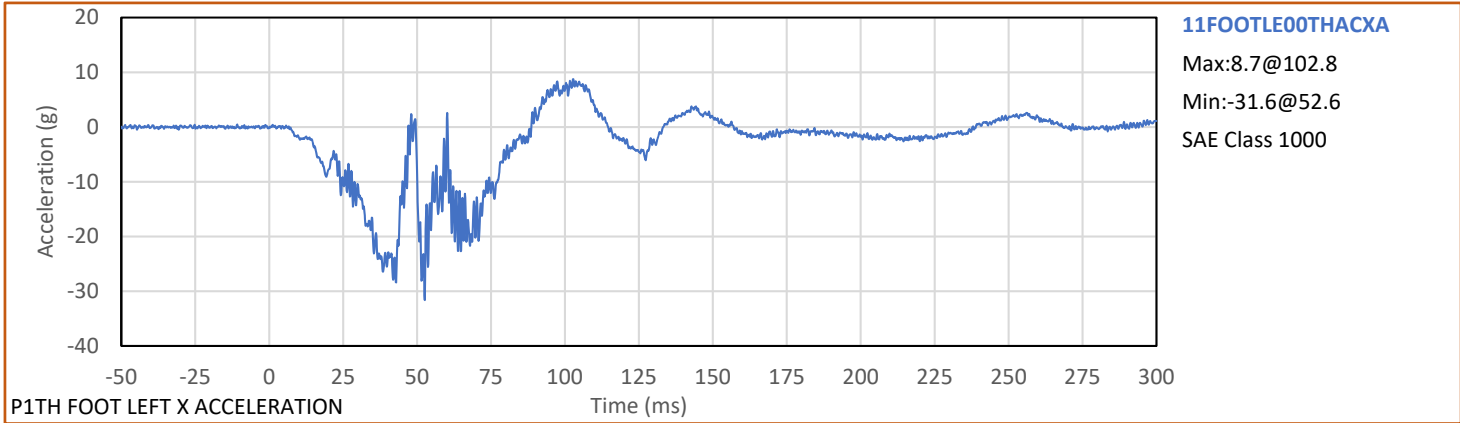






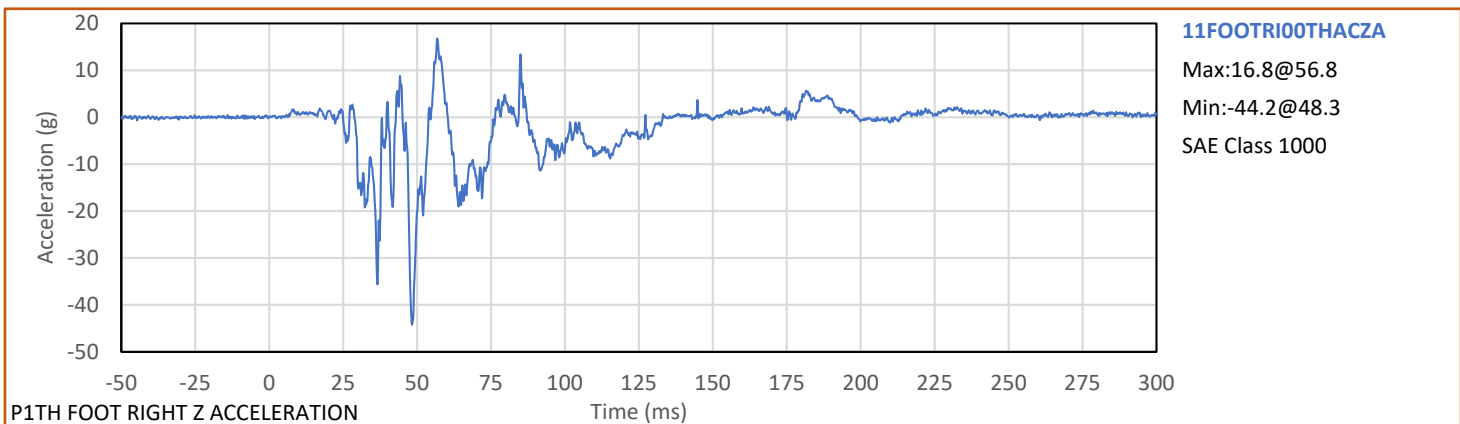
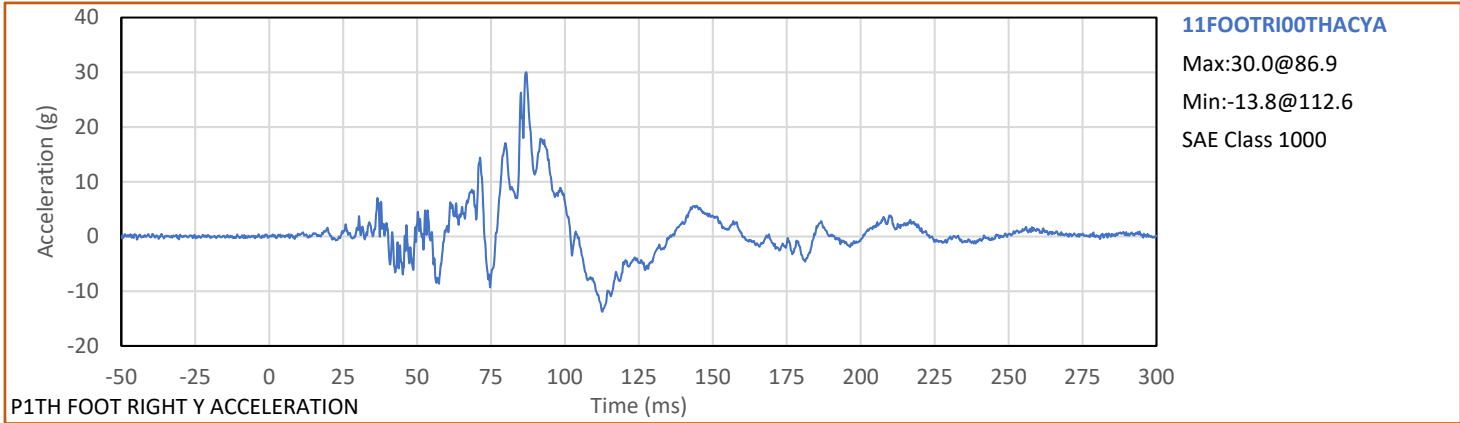


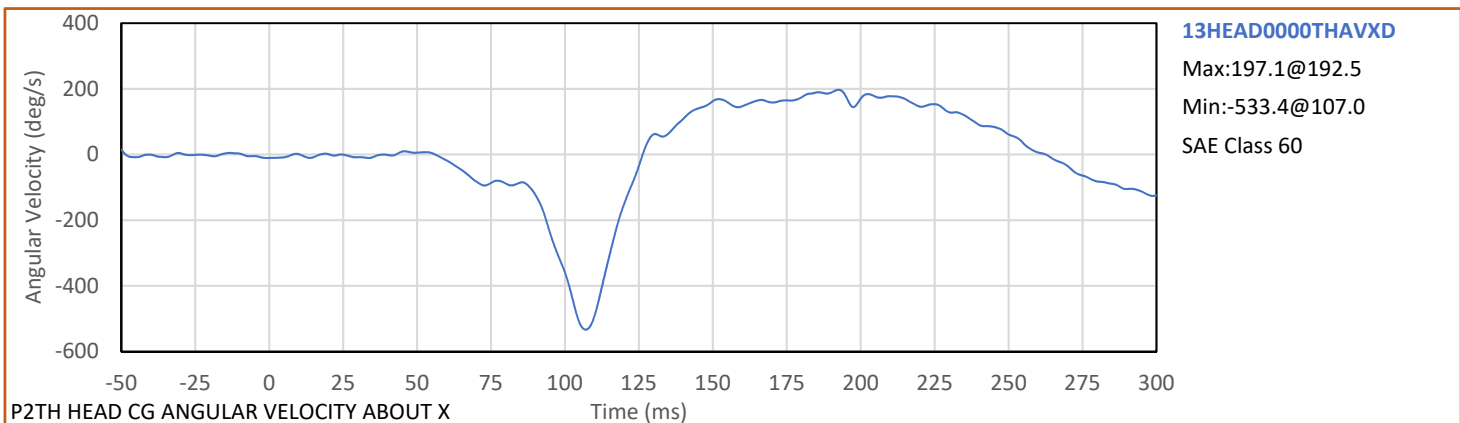
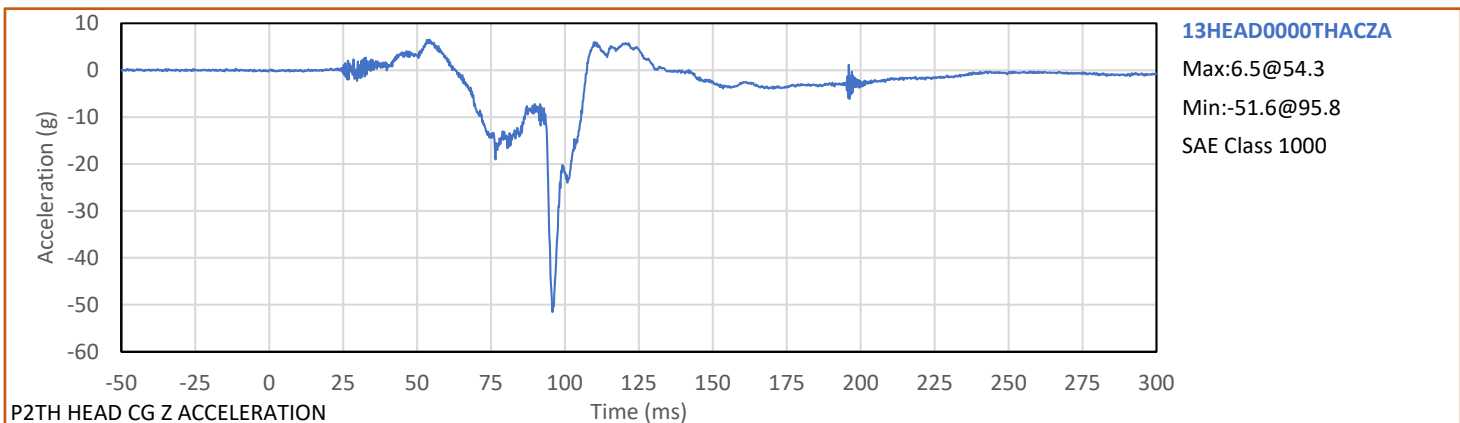
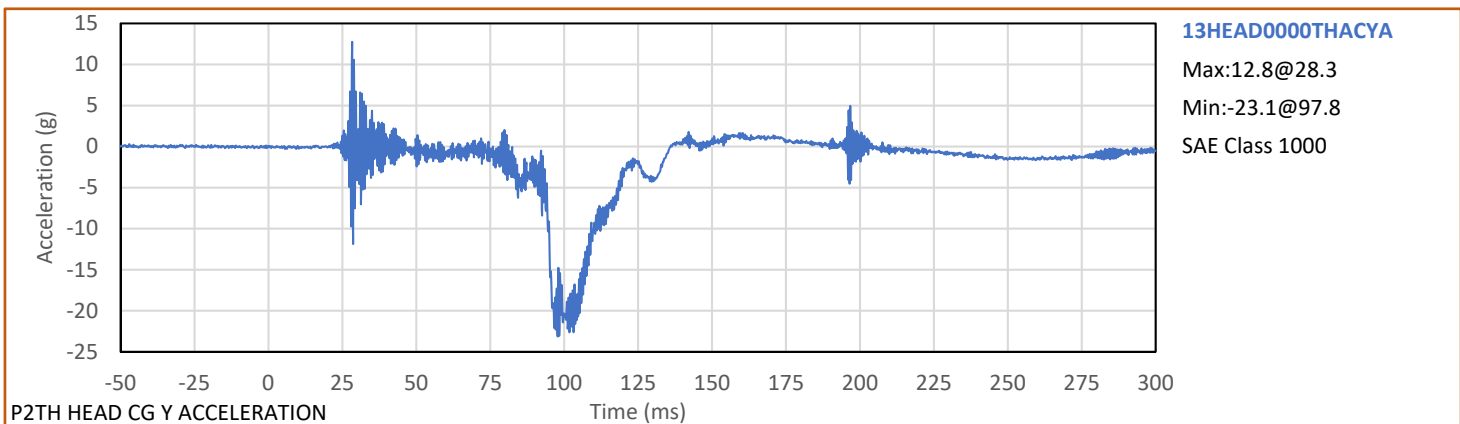
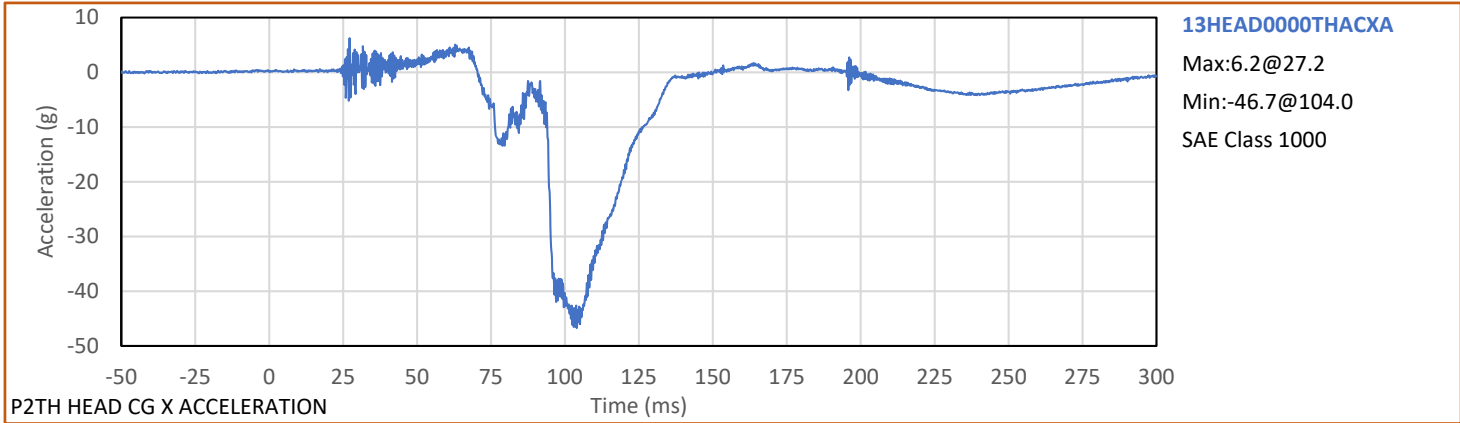


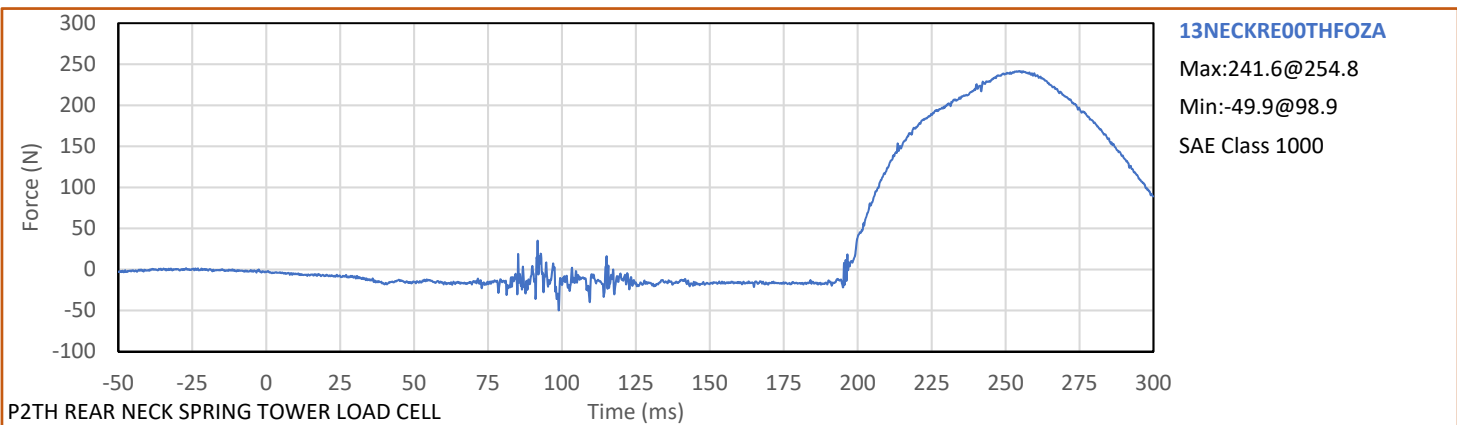
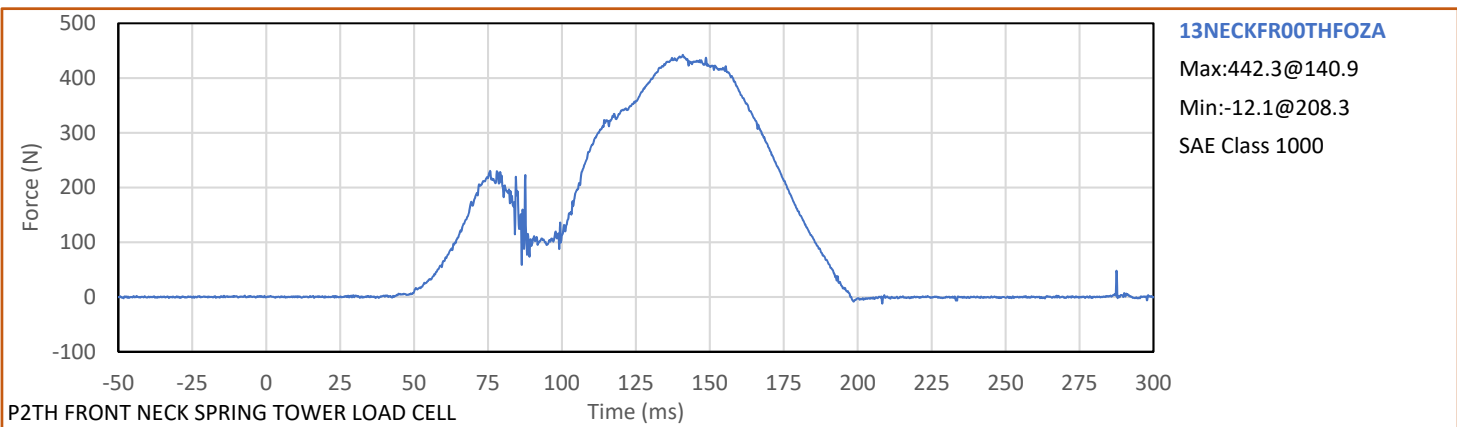
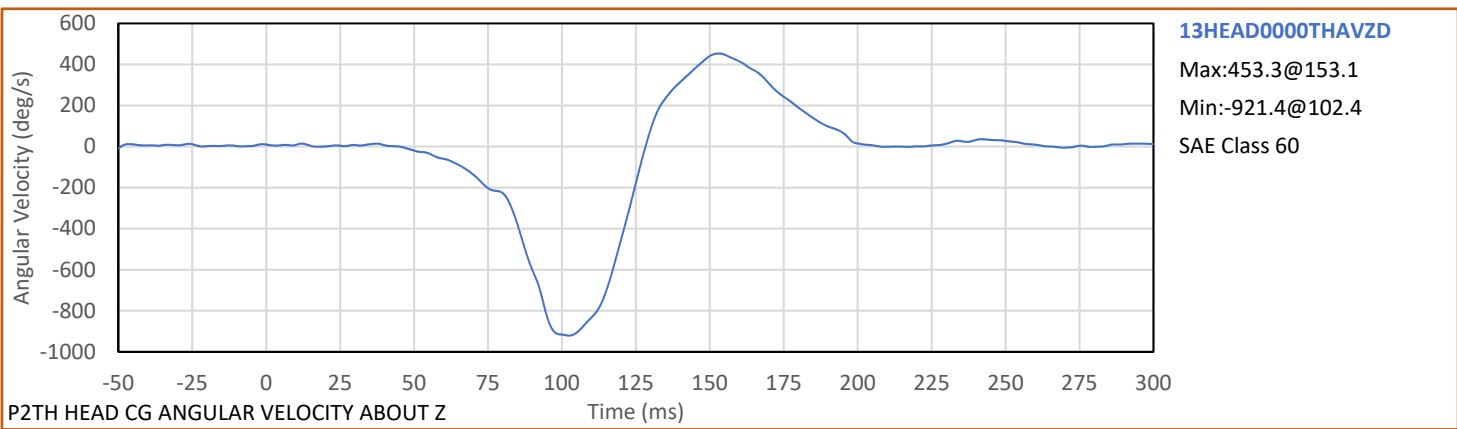
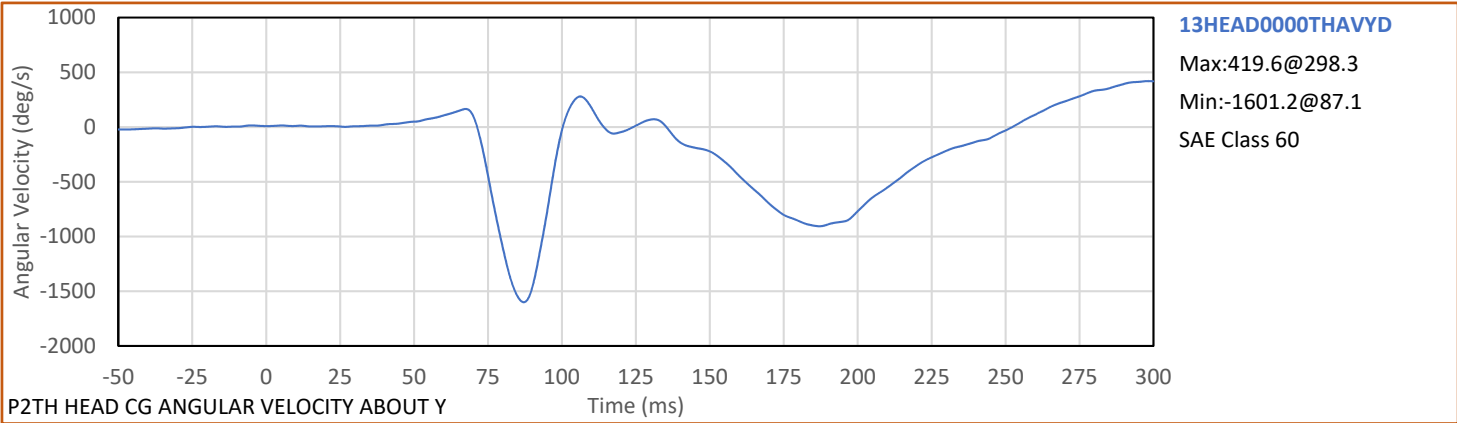


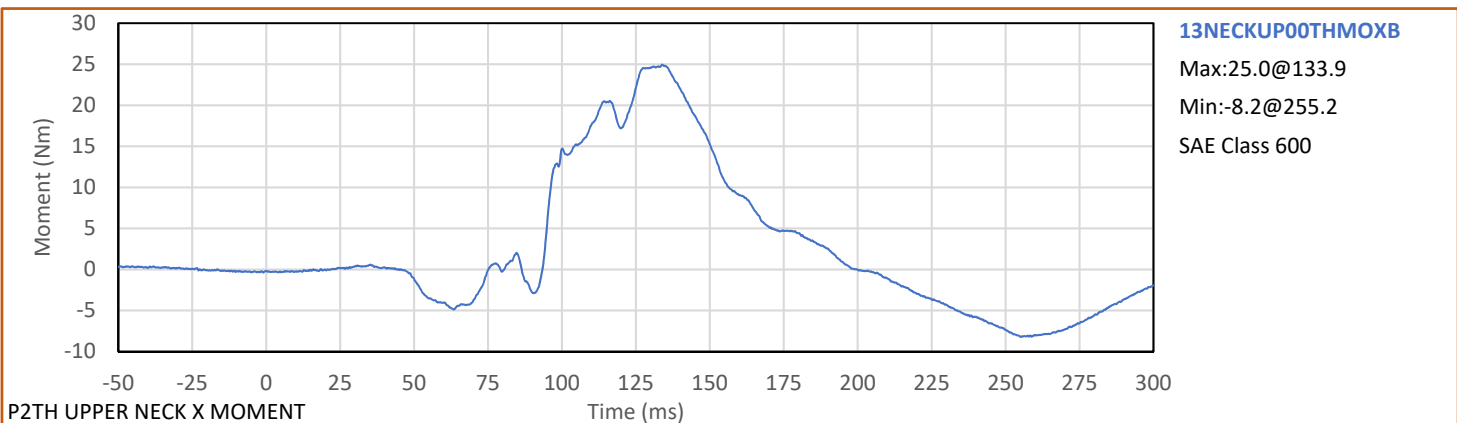
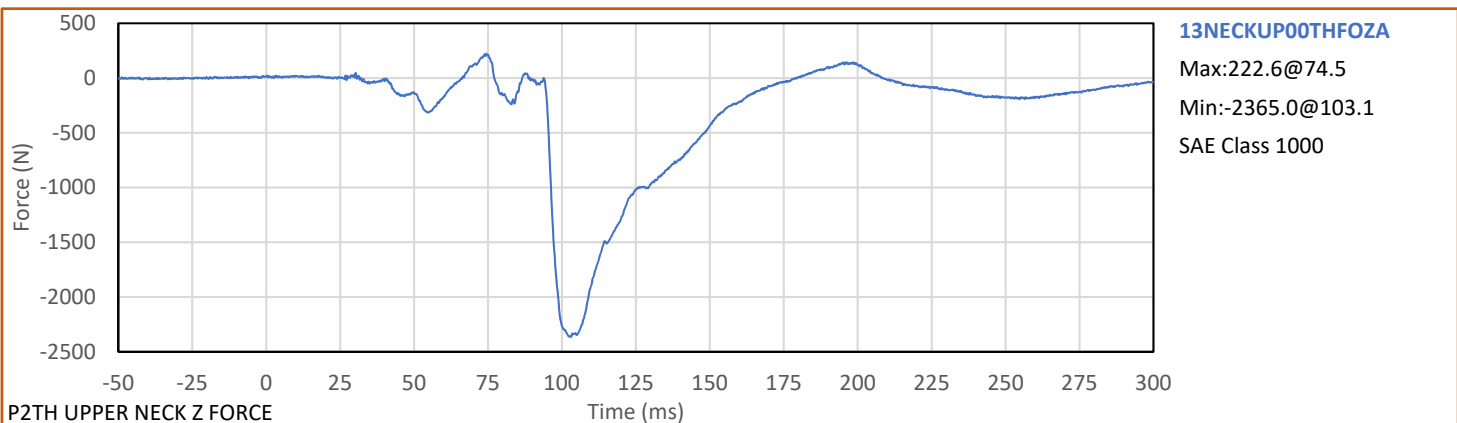
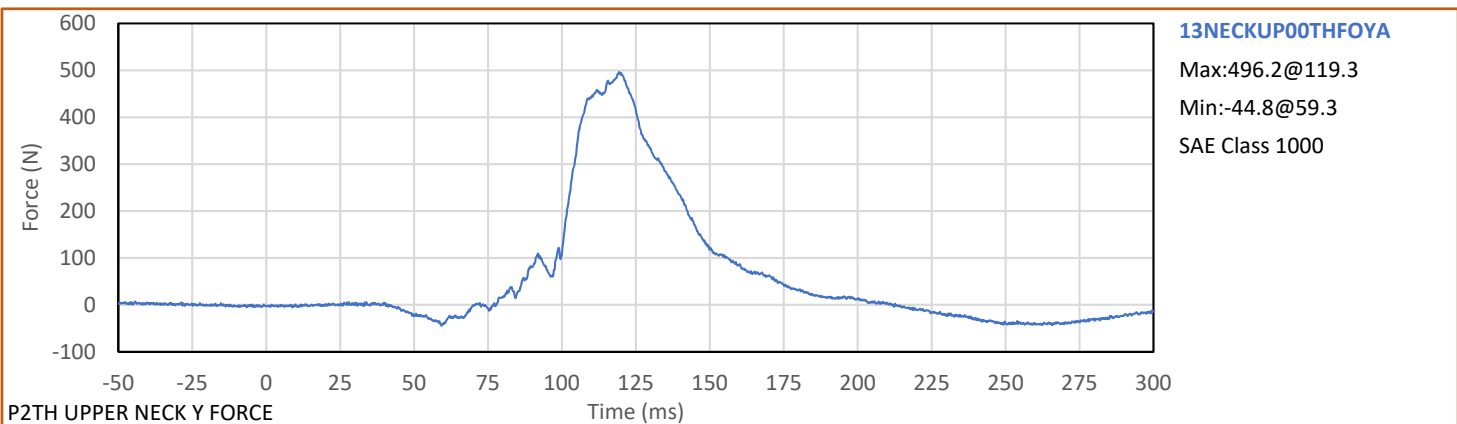
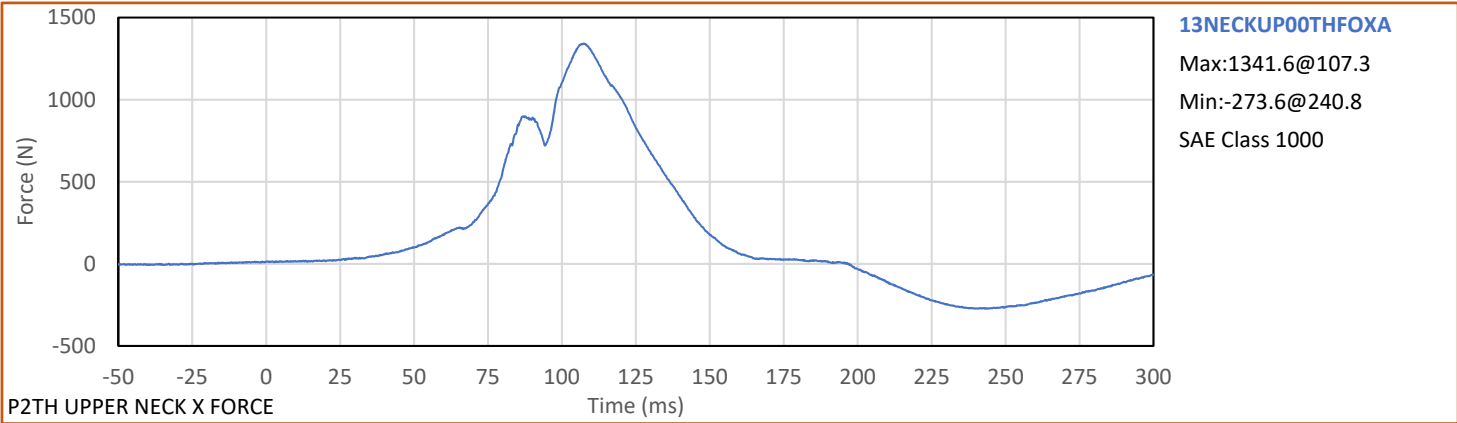
Test Vehicle: 2020 Mazda CX-5 5-Door MPV
Test Program: Full Frontal Rigid Barrier Impact

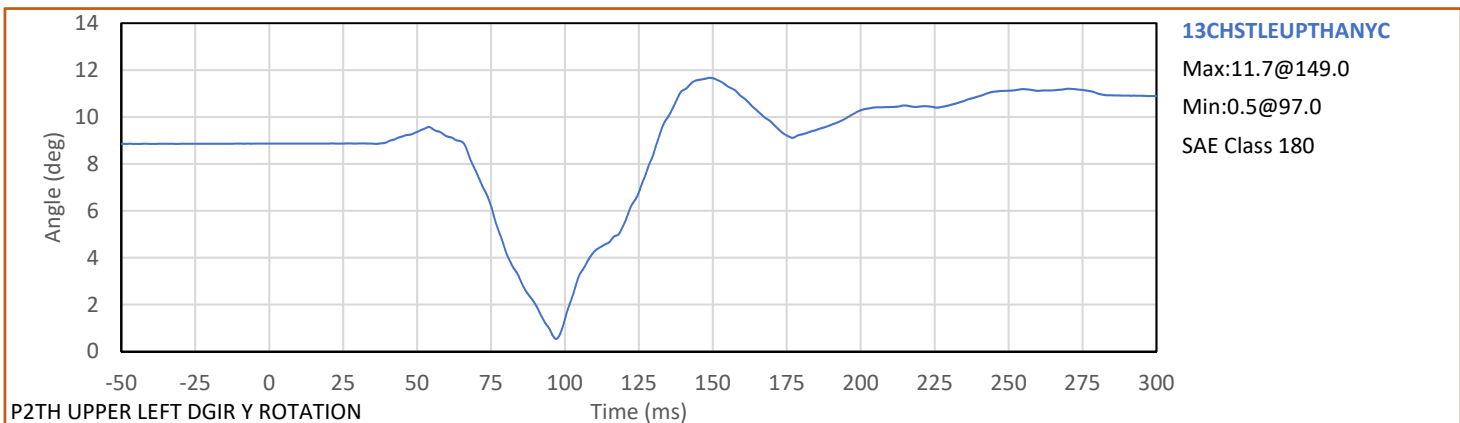
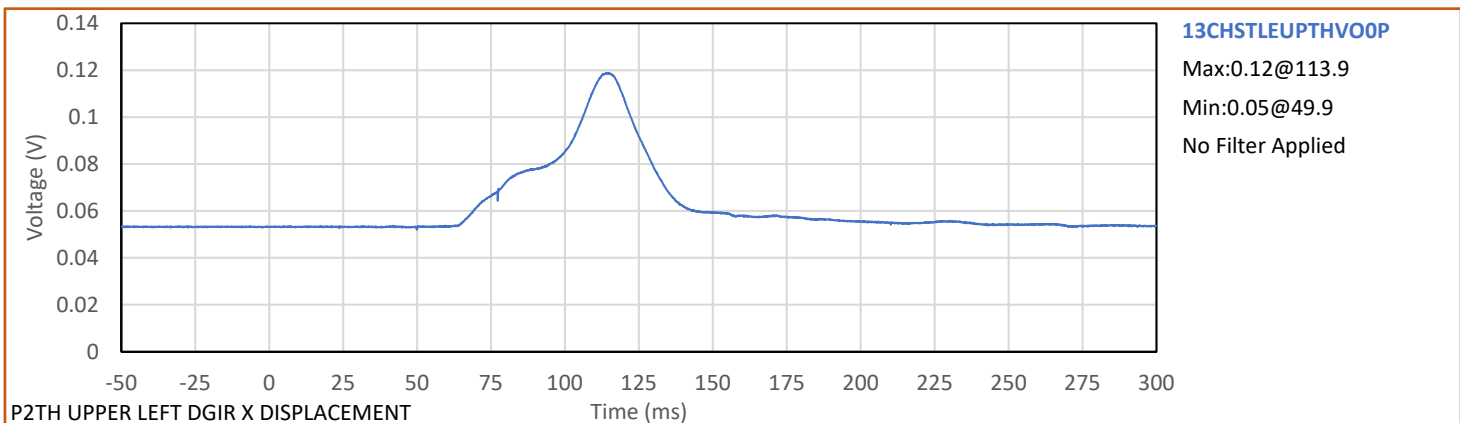
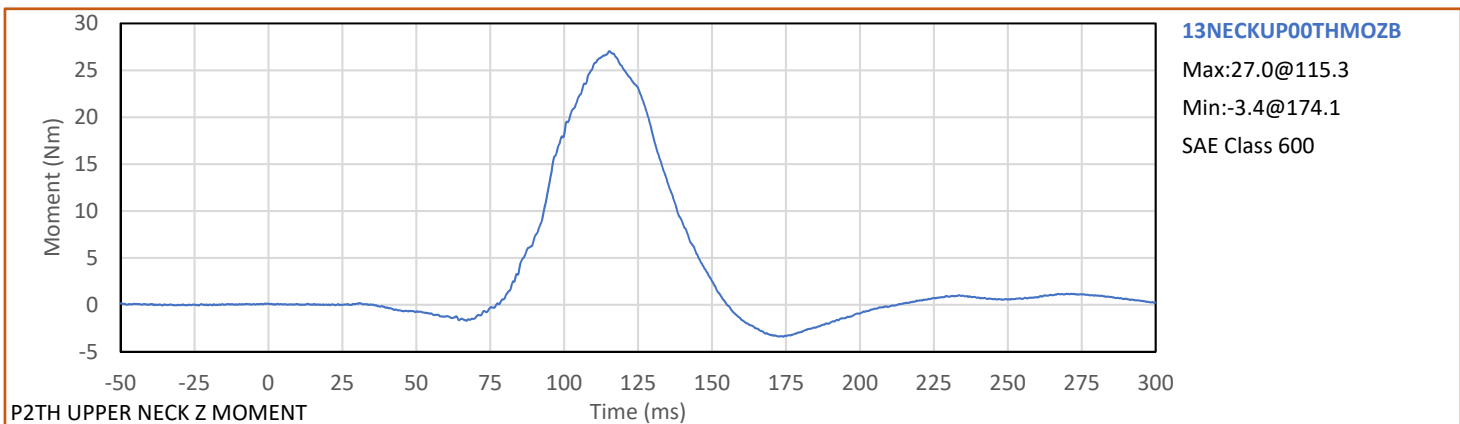
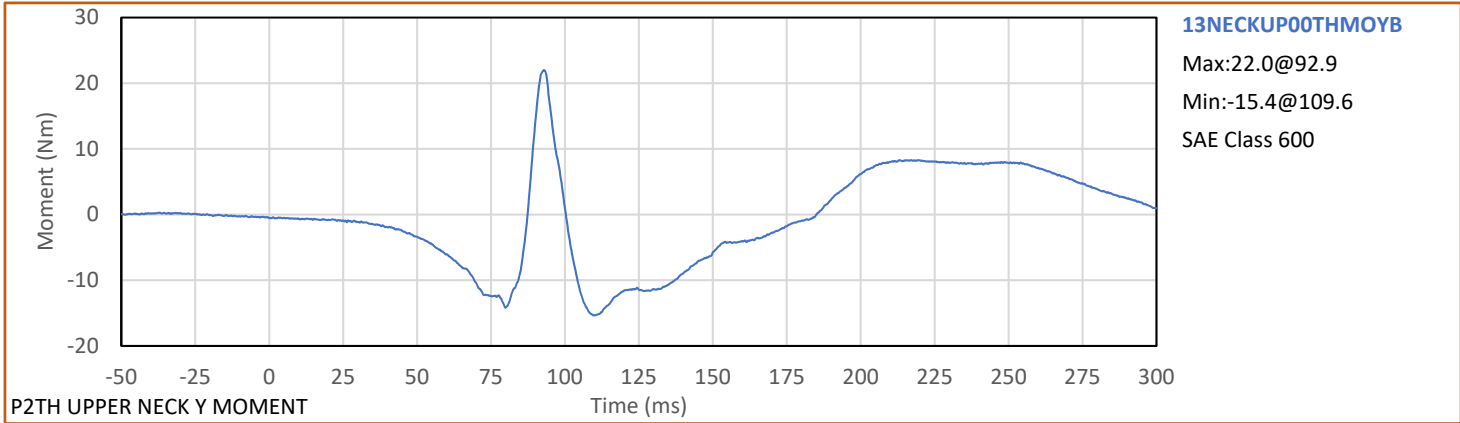
NHTSA No.: R20205415
Test Date: 1/15/2021

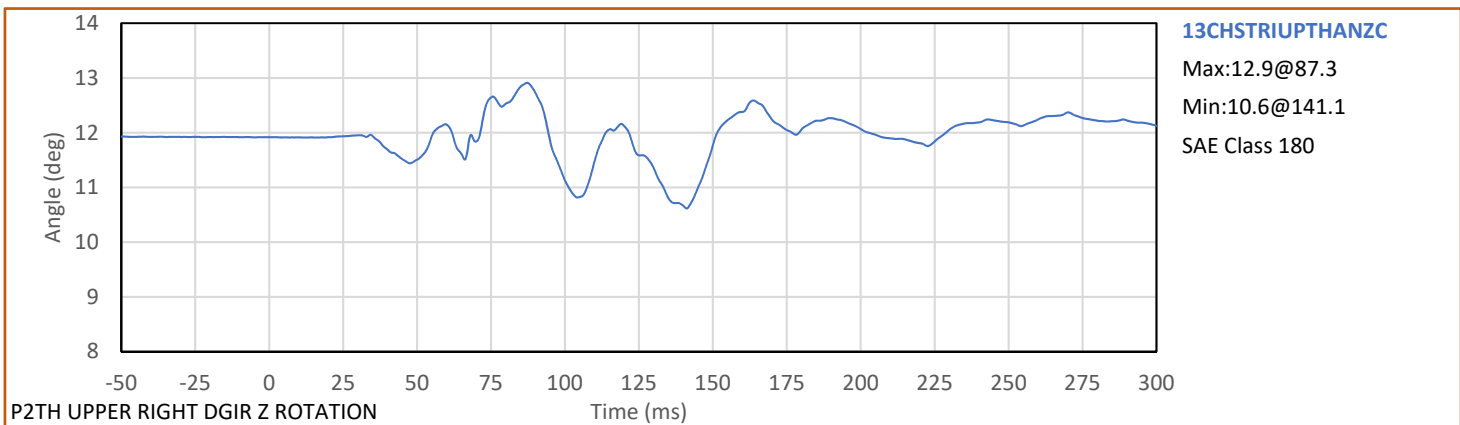
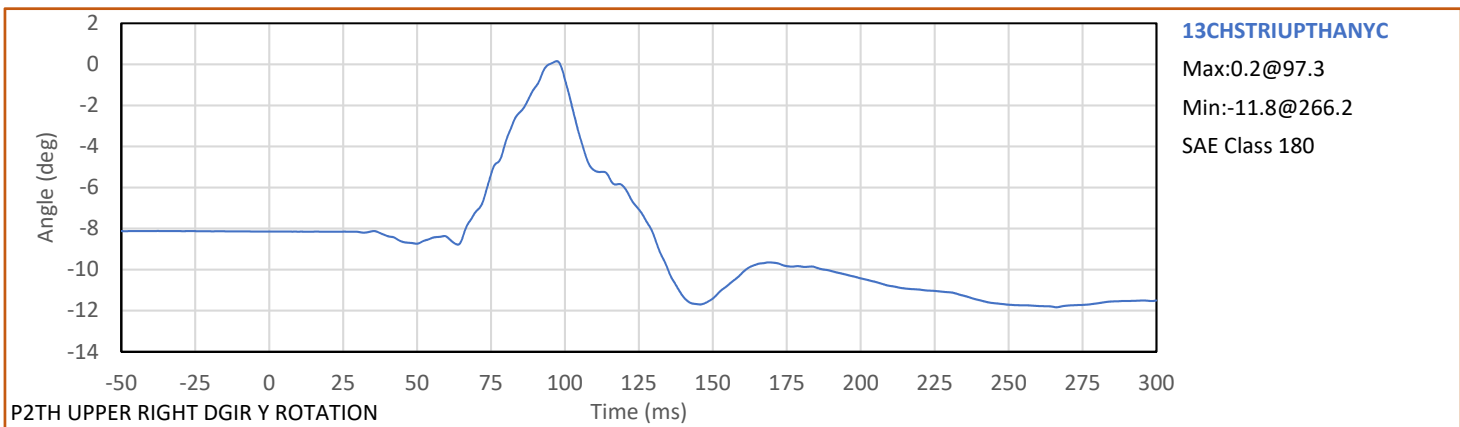
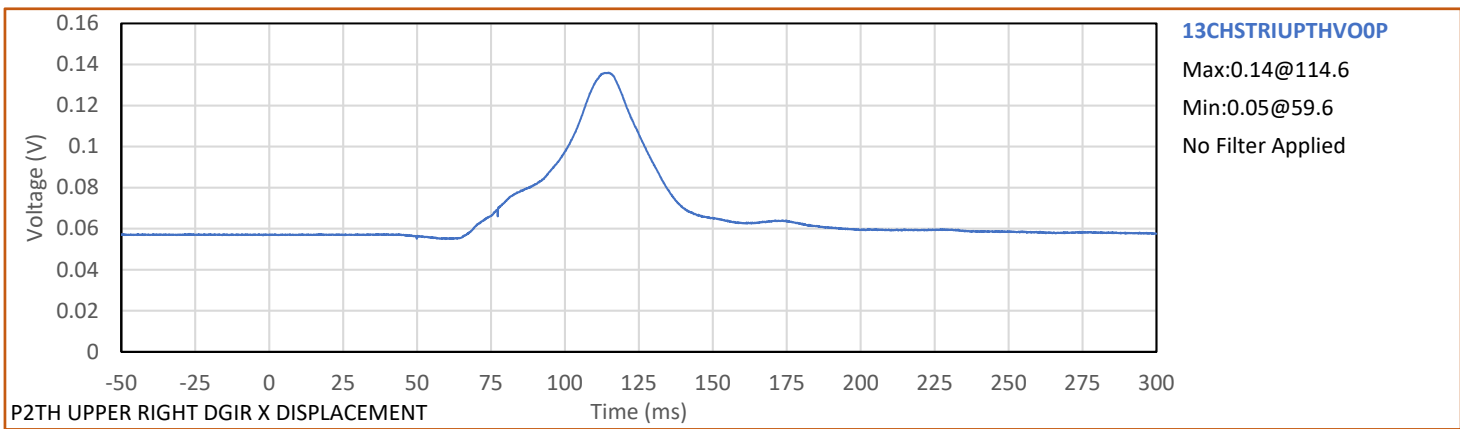
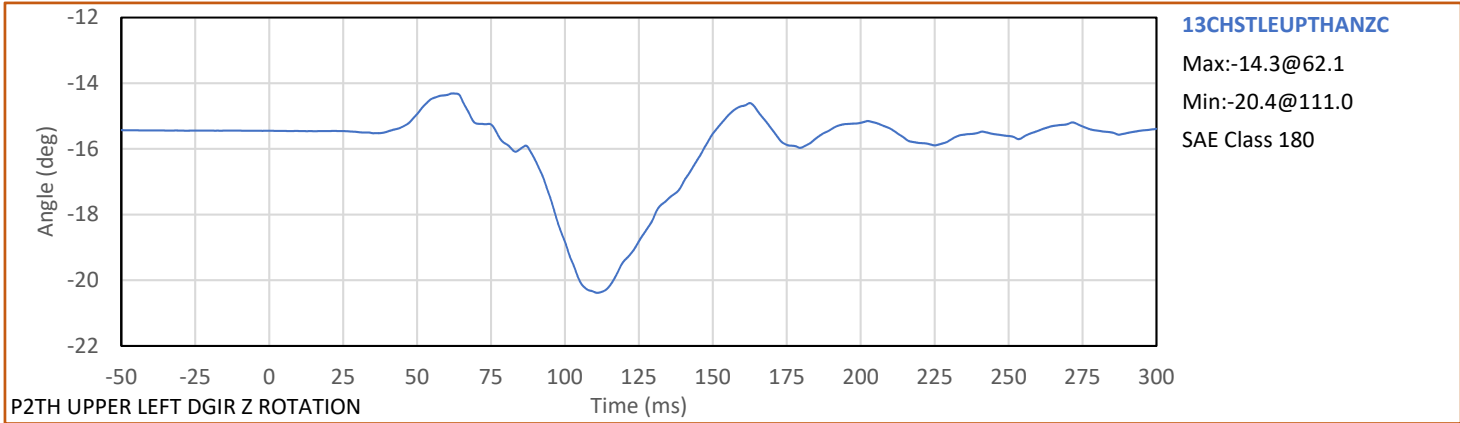


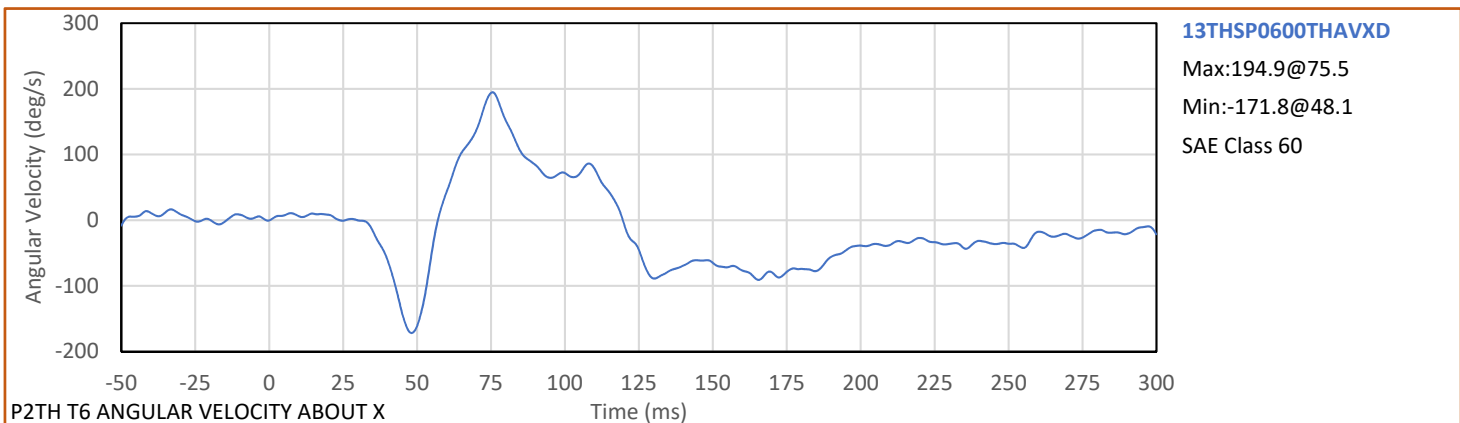
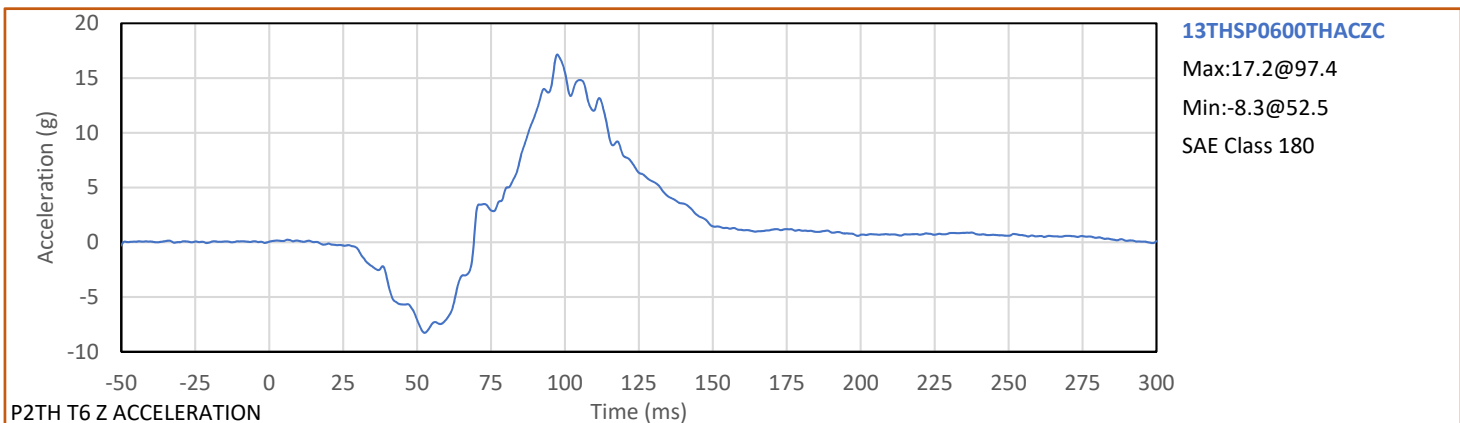
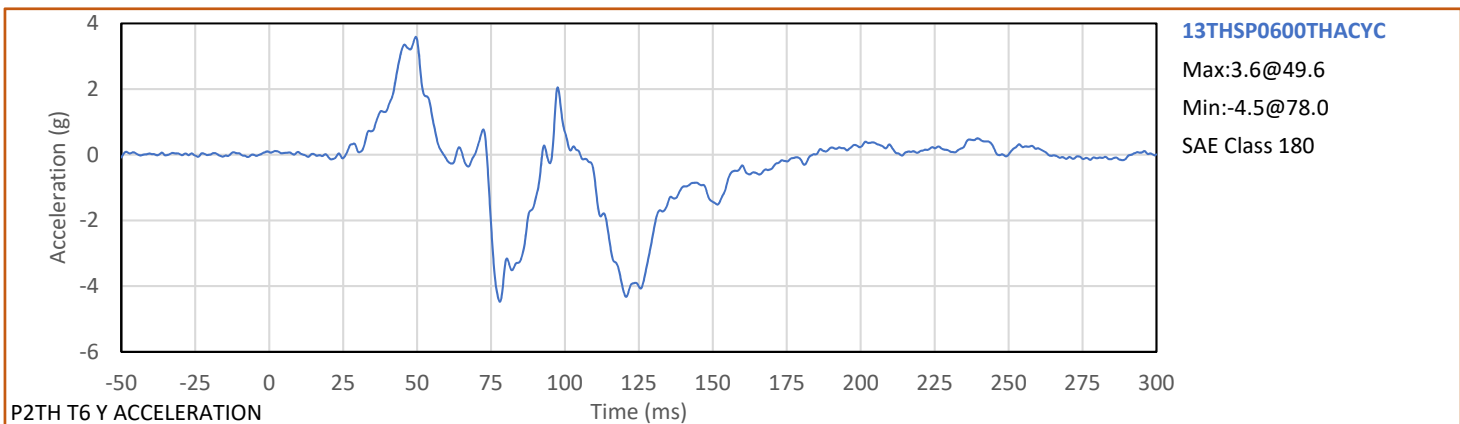
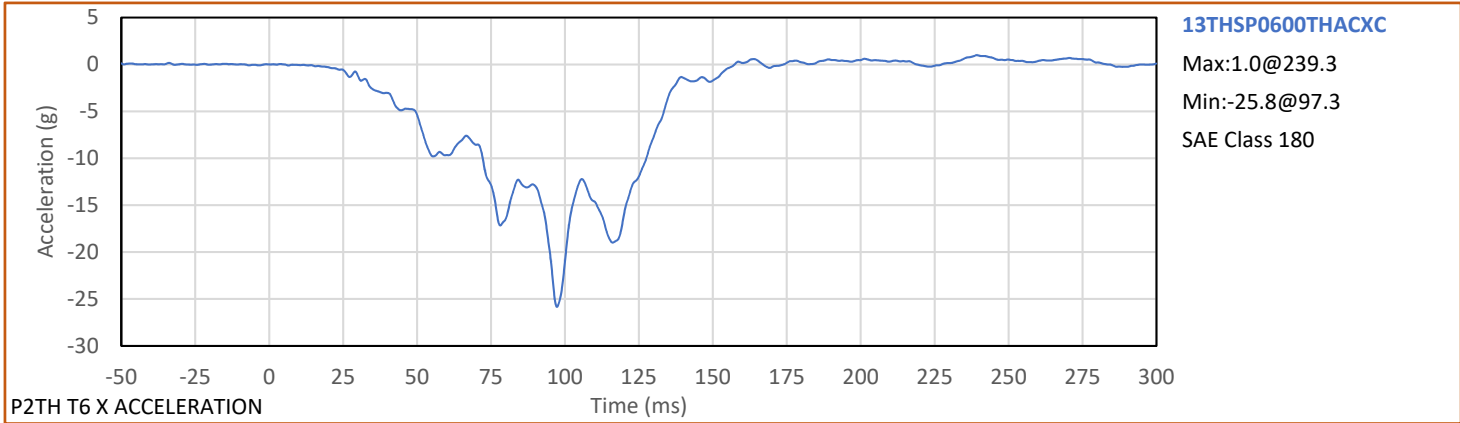


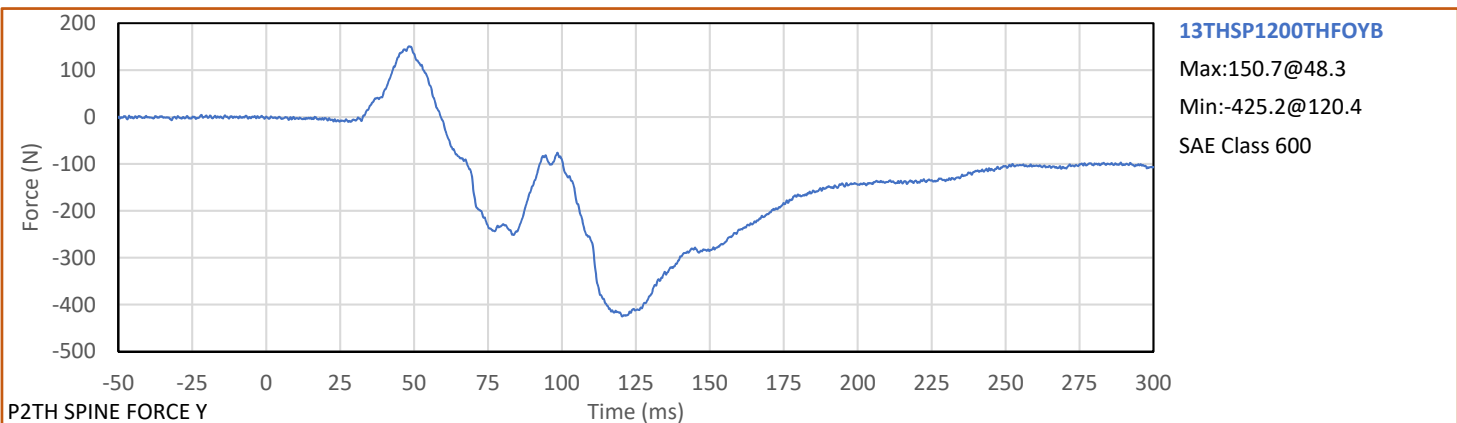
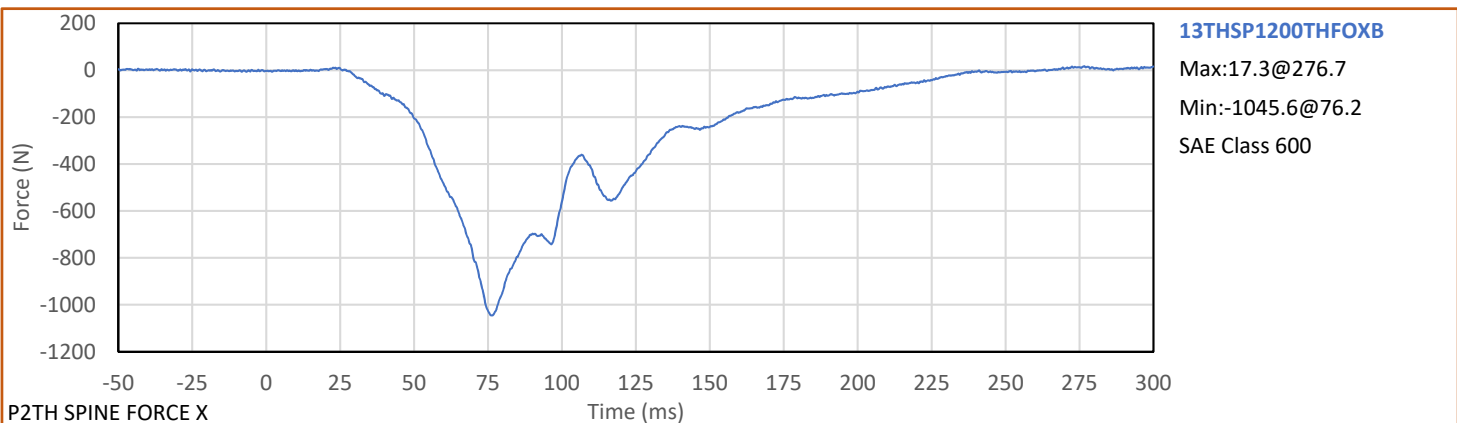
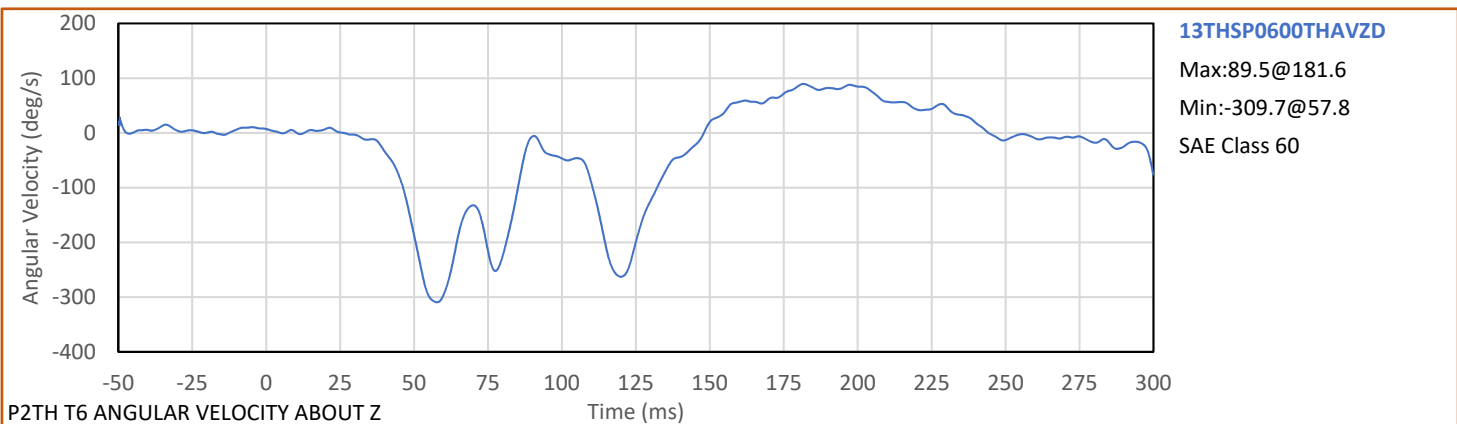
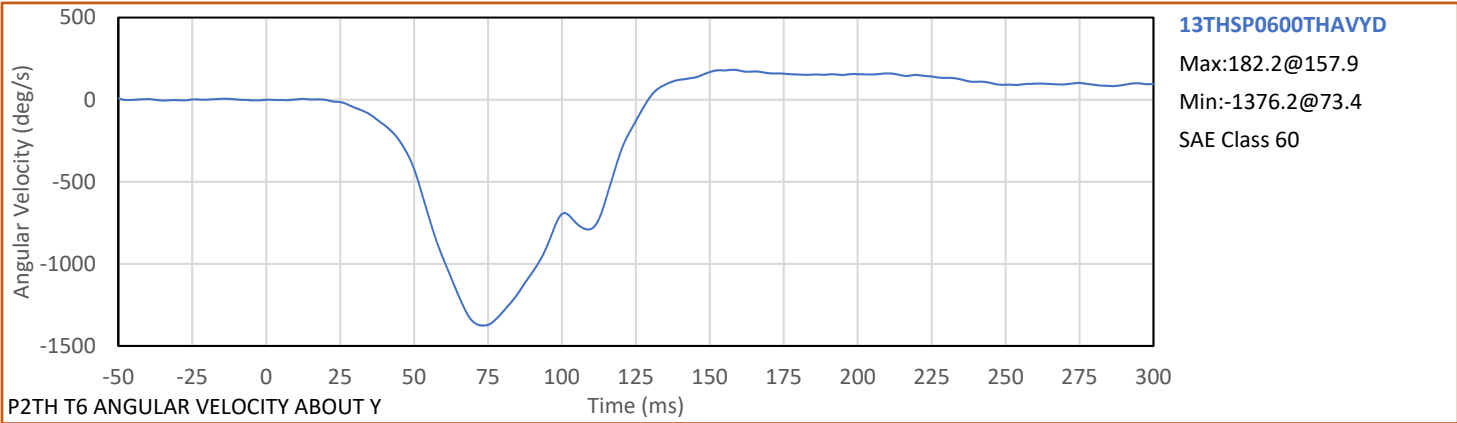


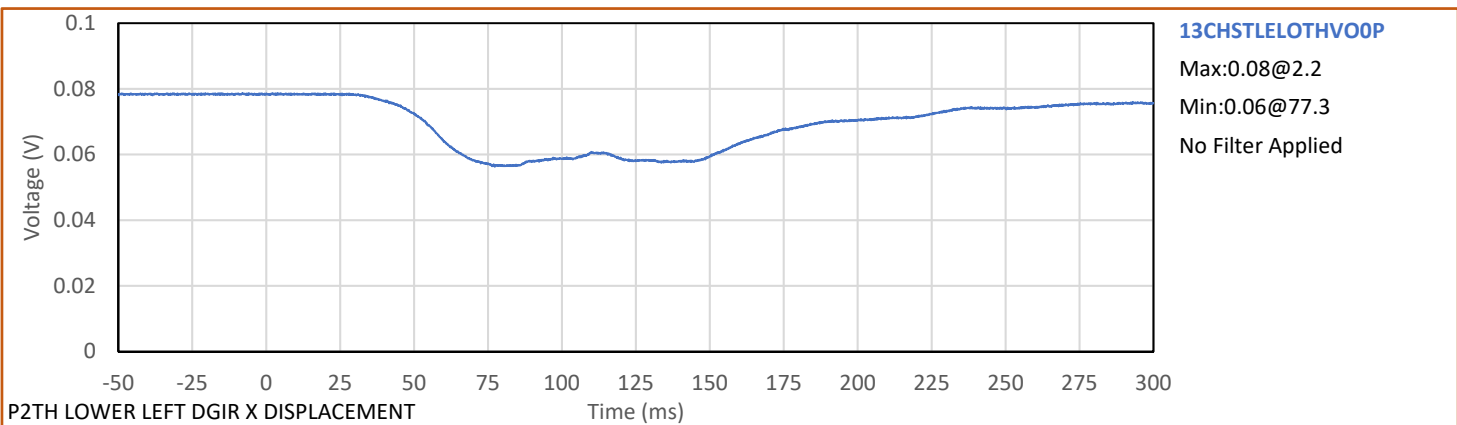
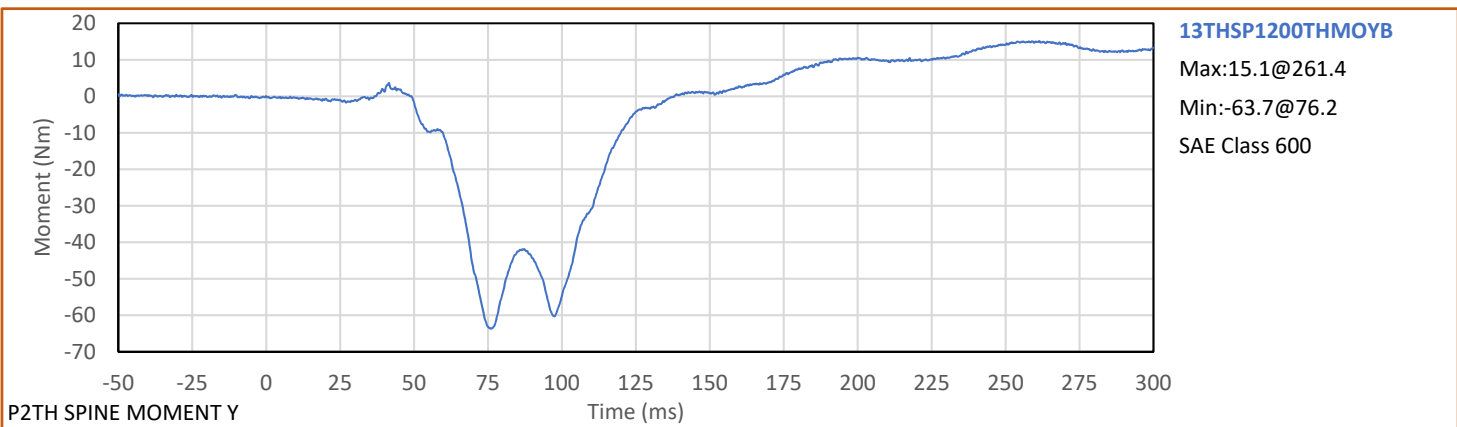
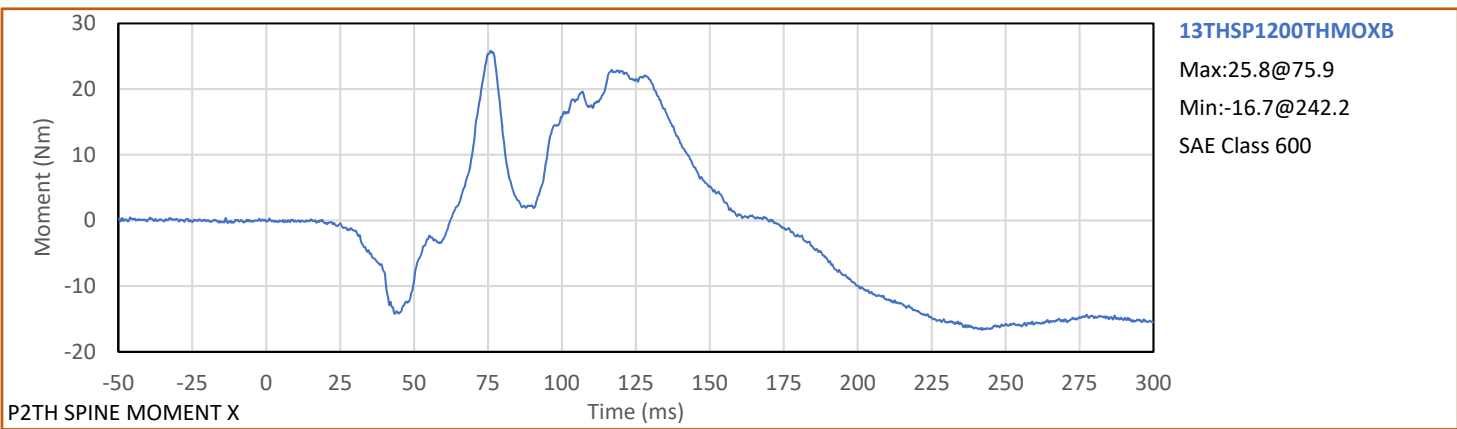
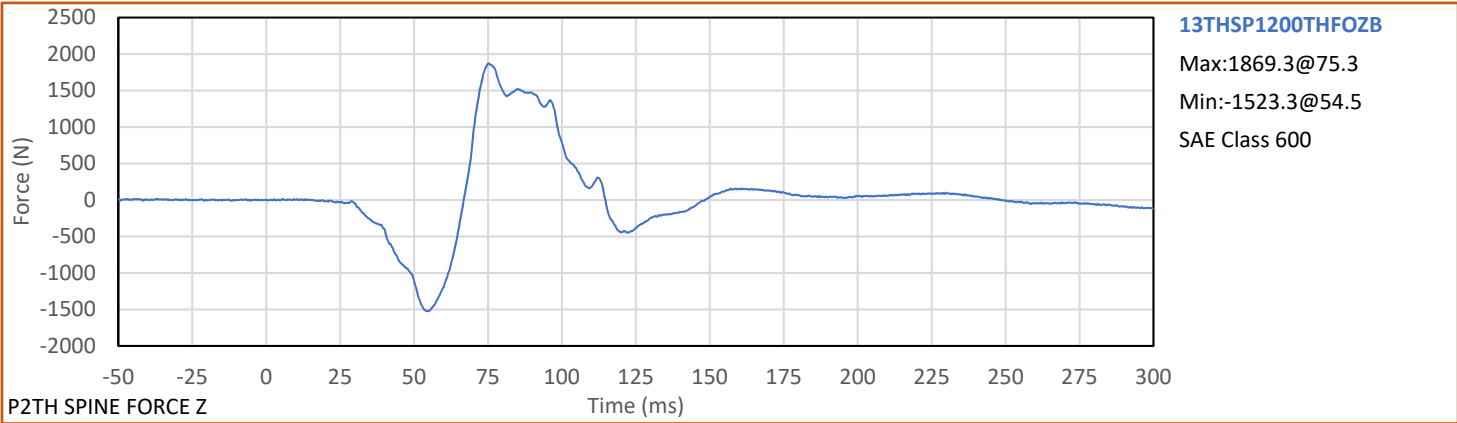


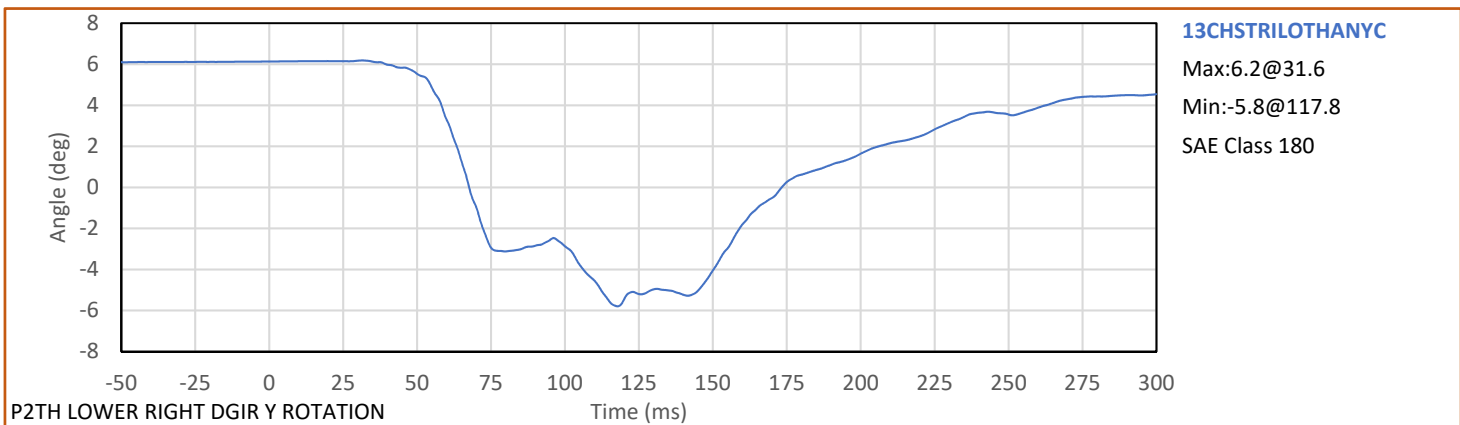
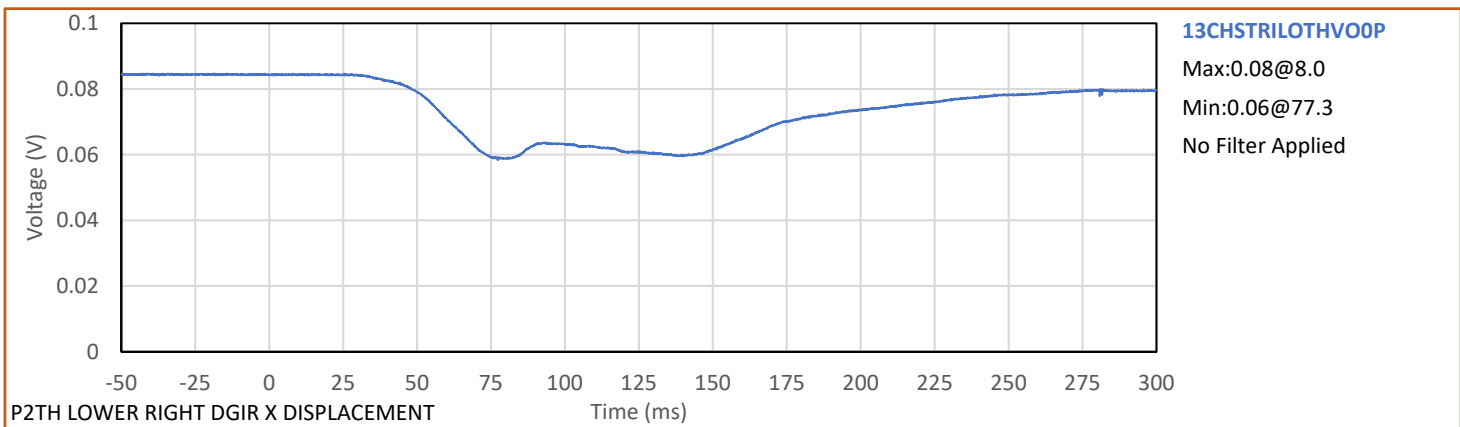
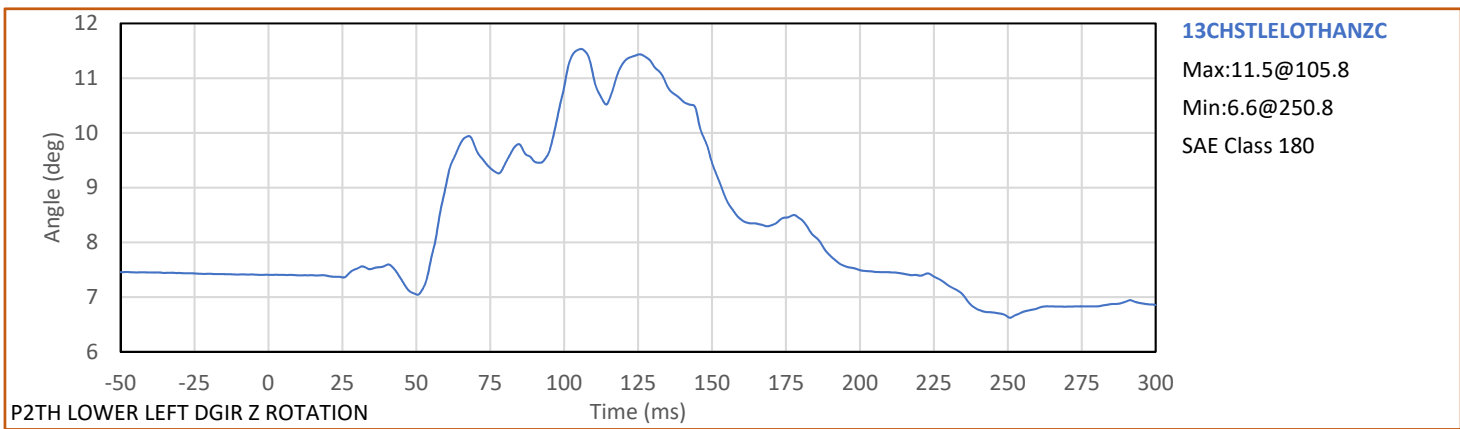
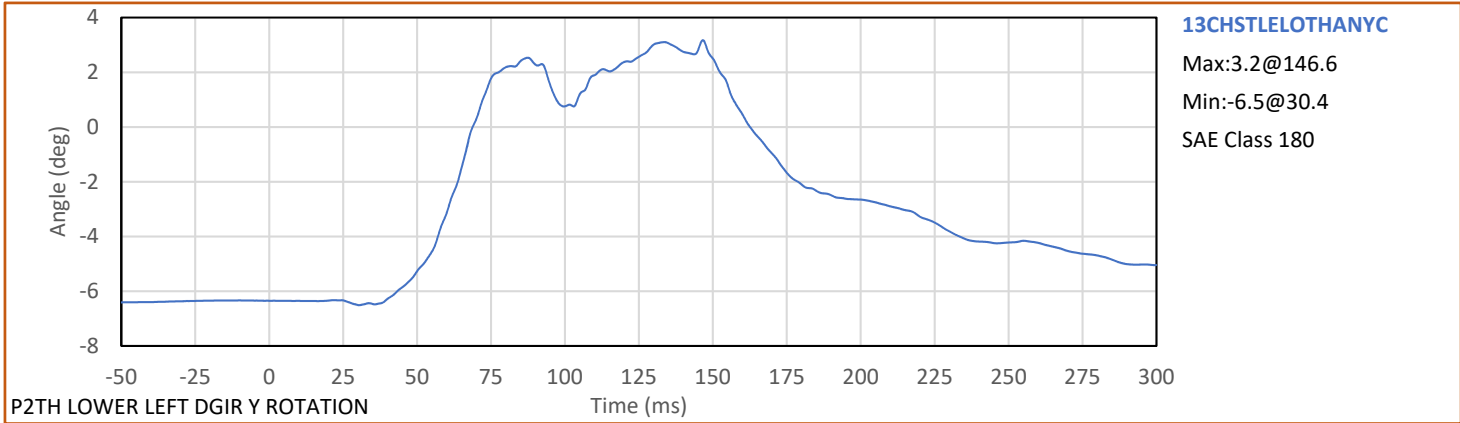


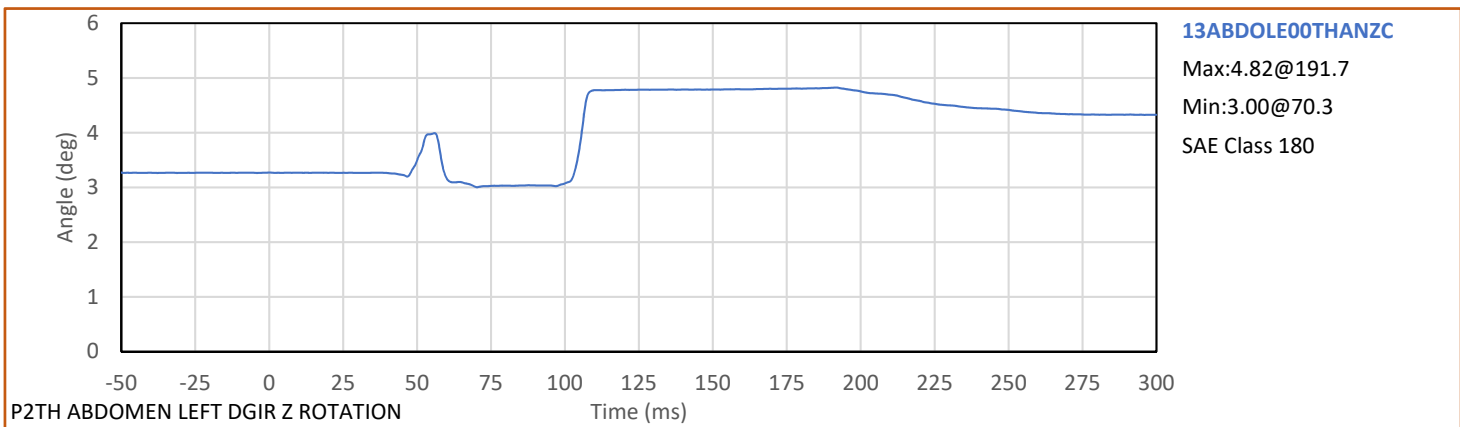
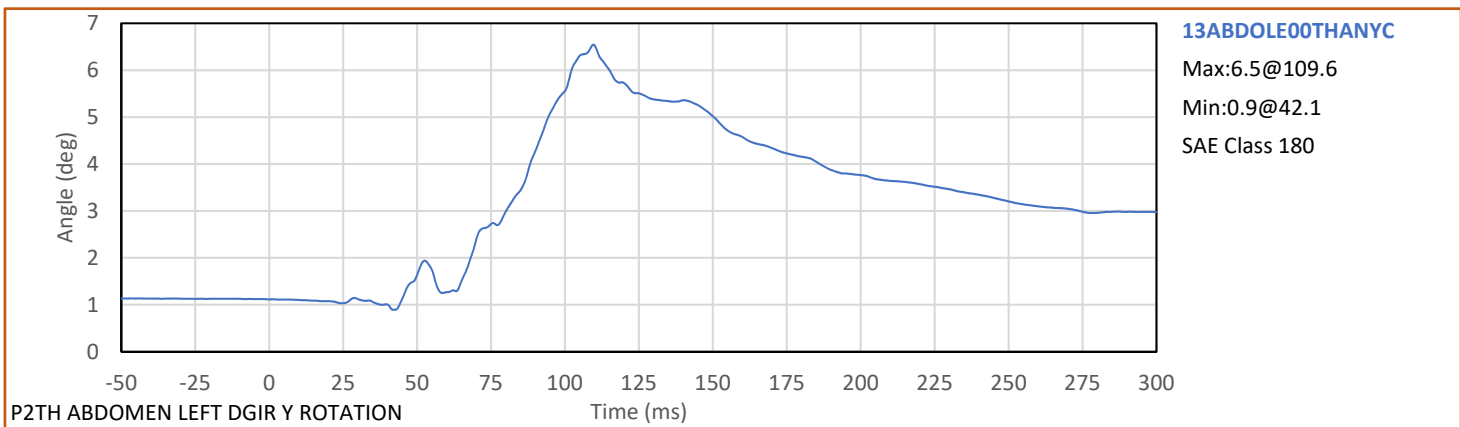
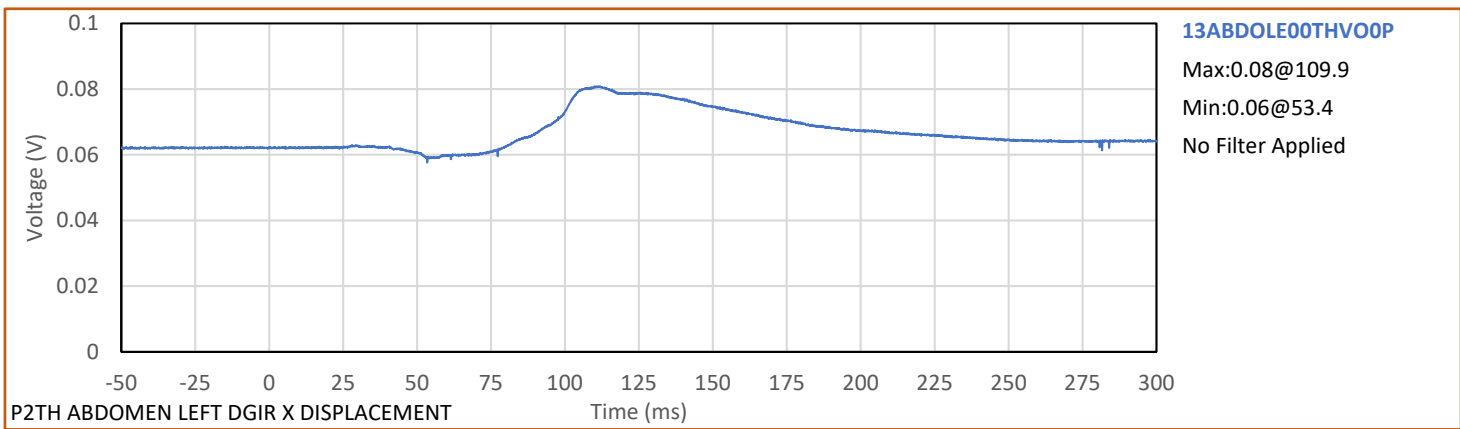
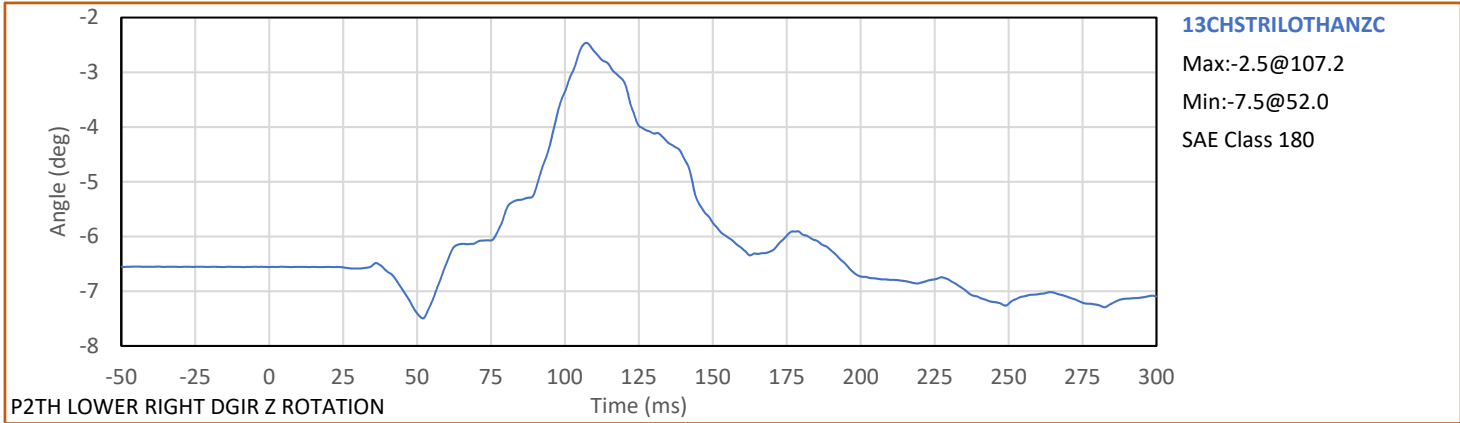


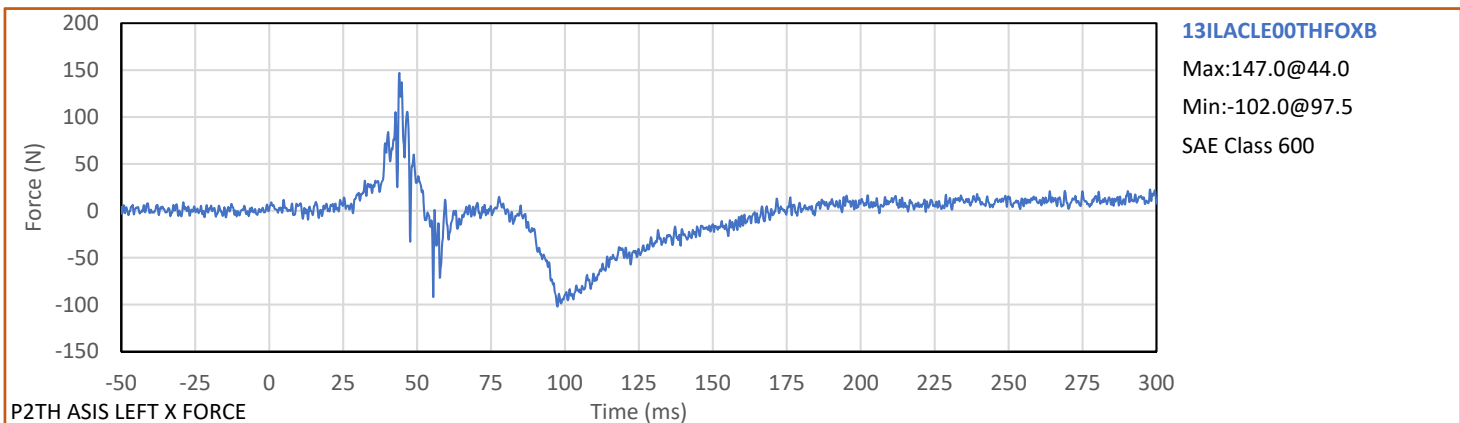
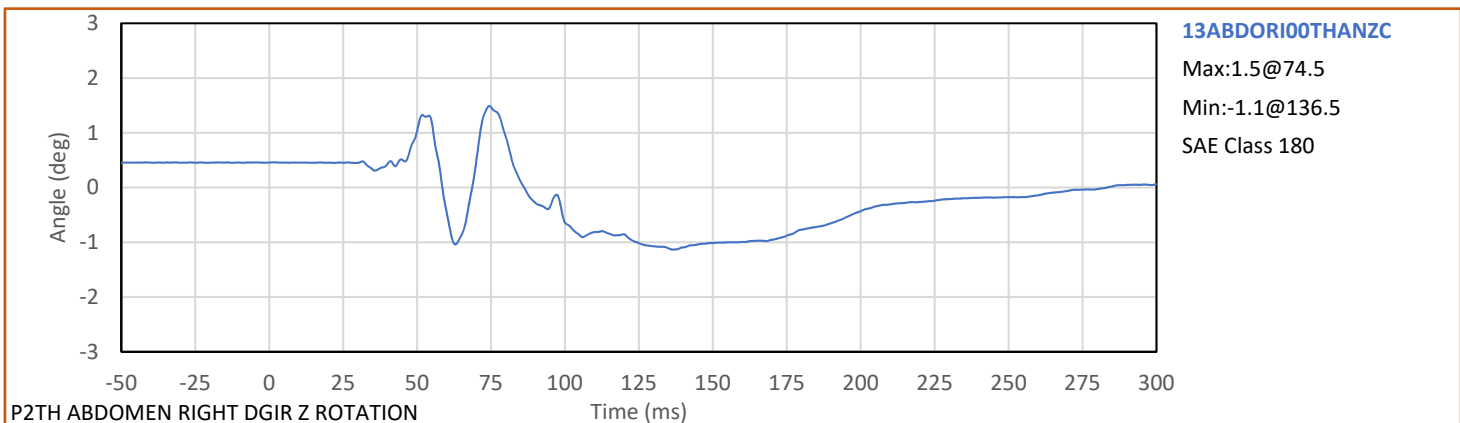
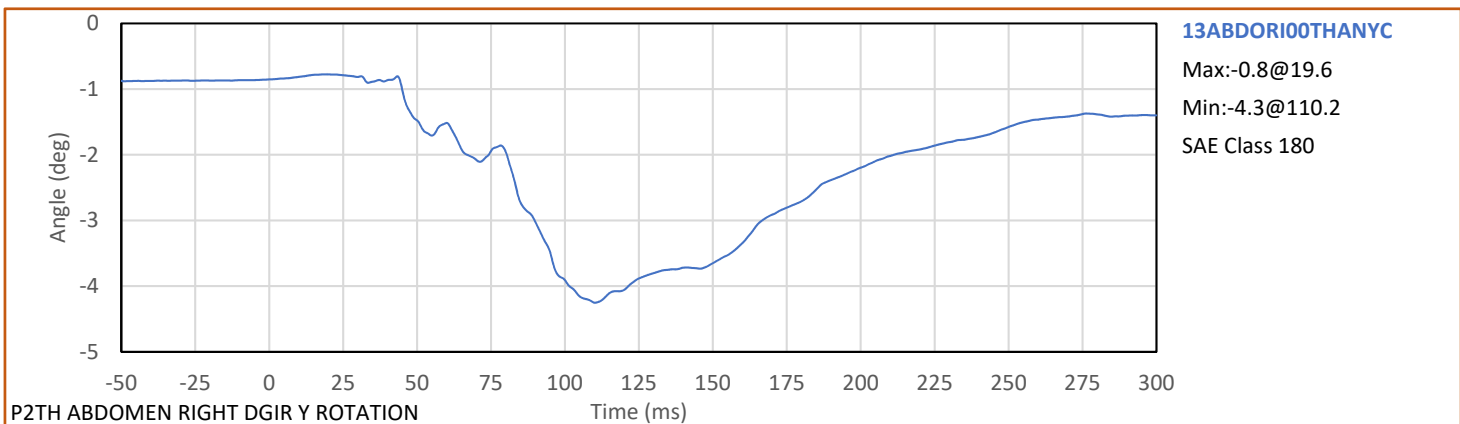
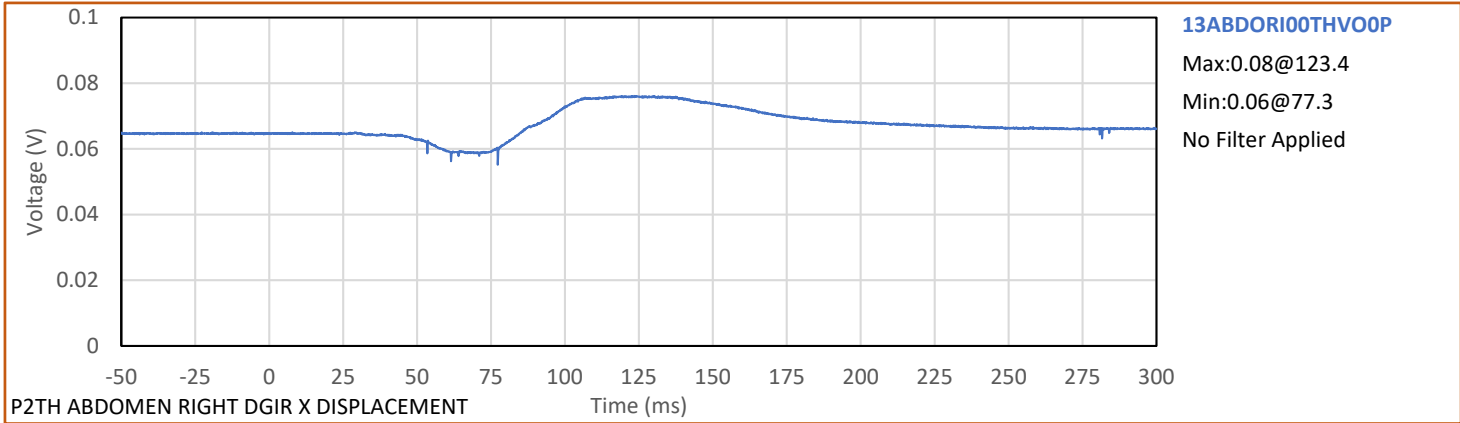


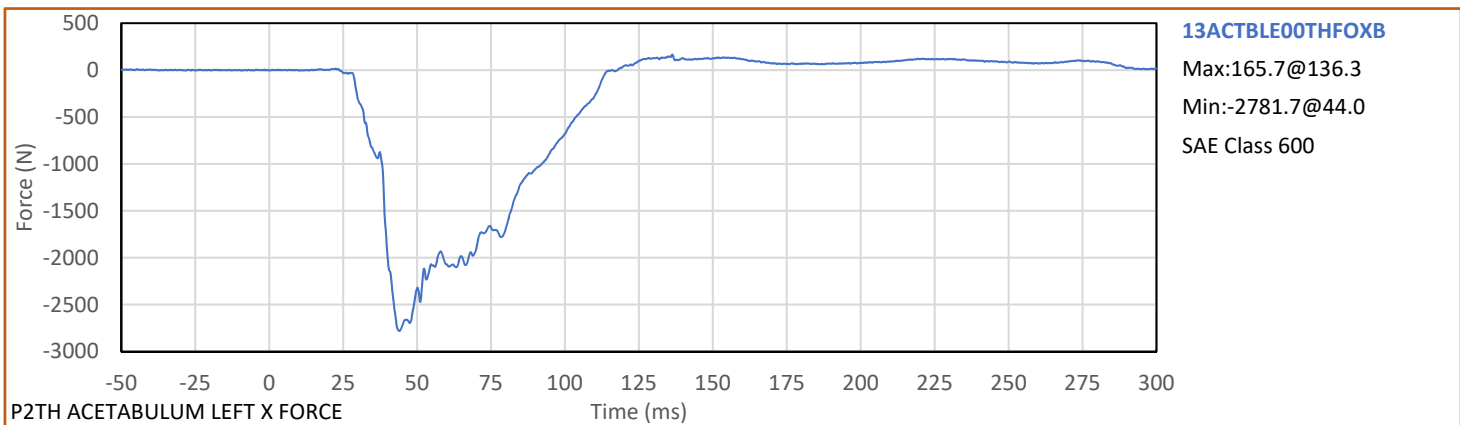
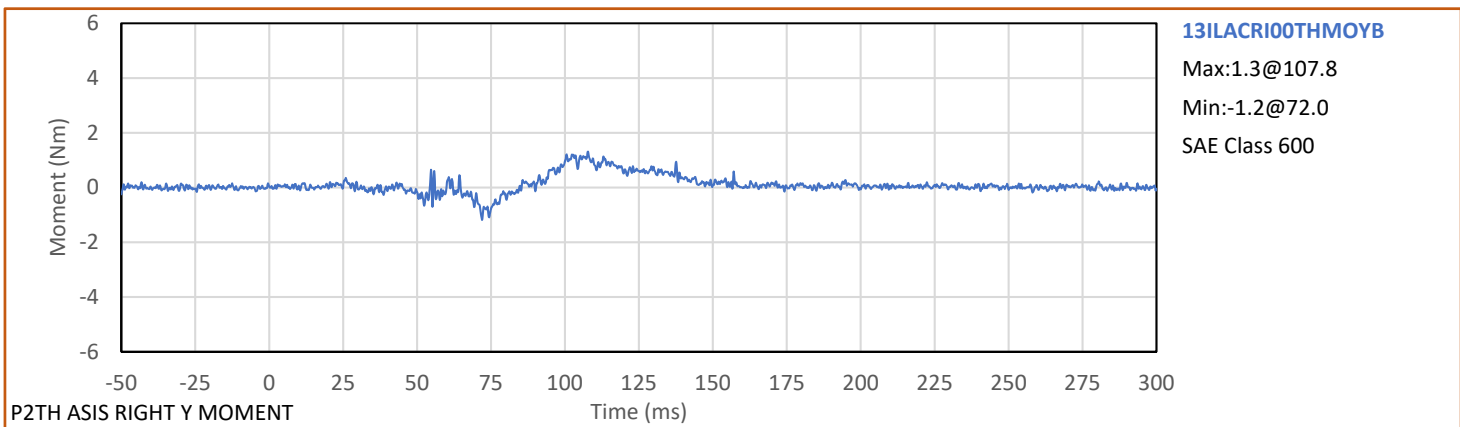
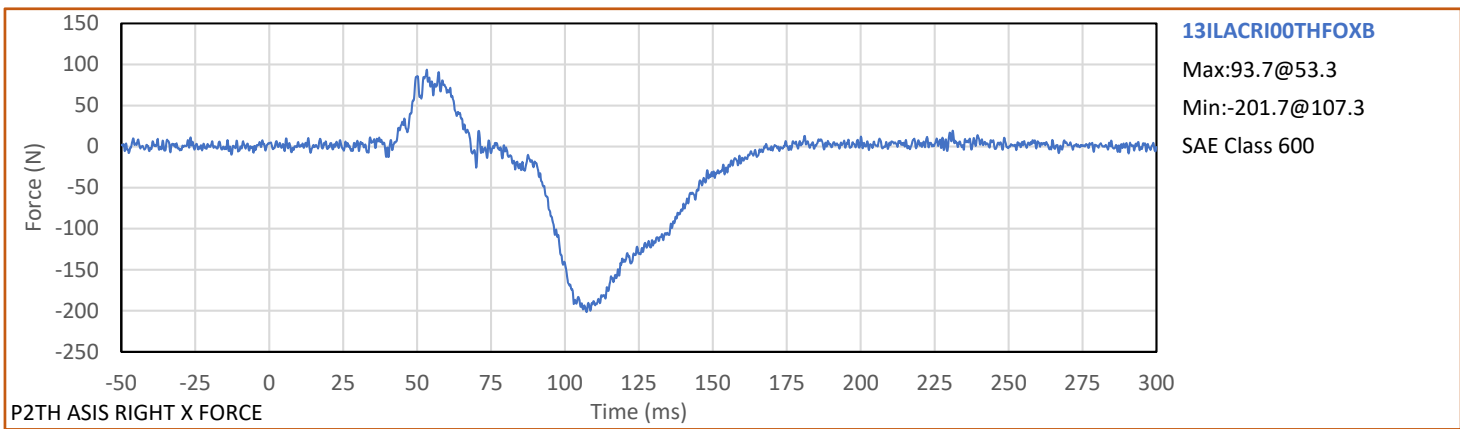
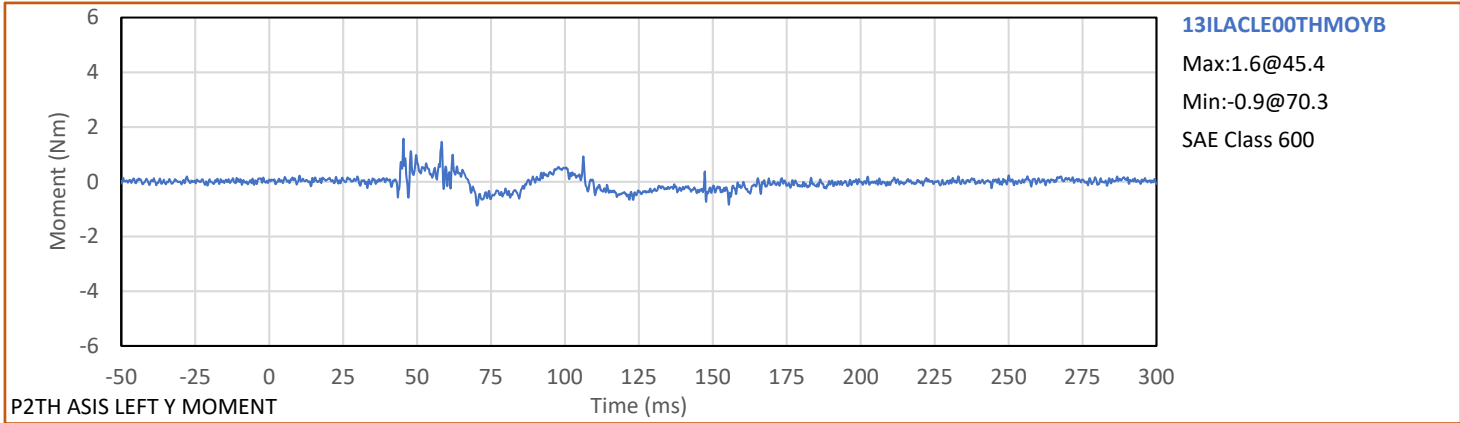


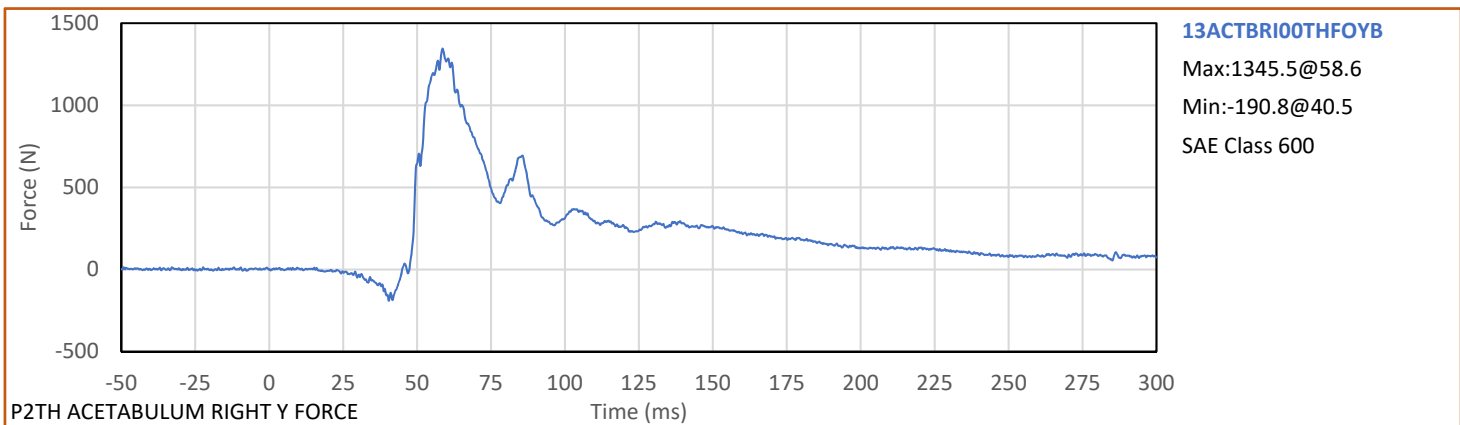
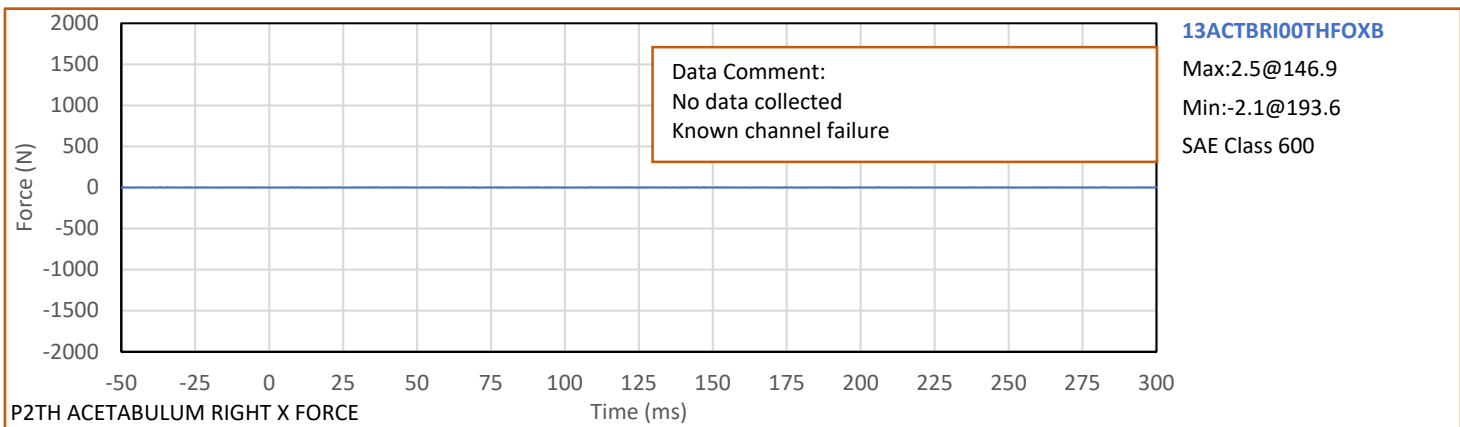
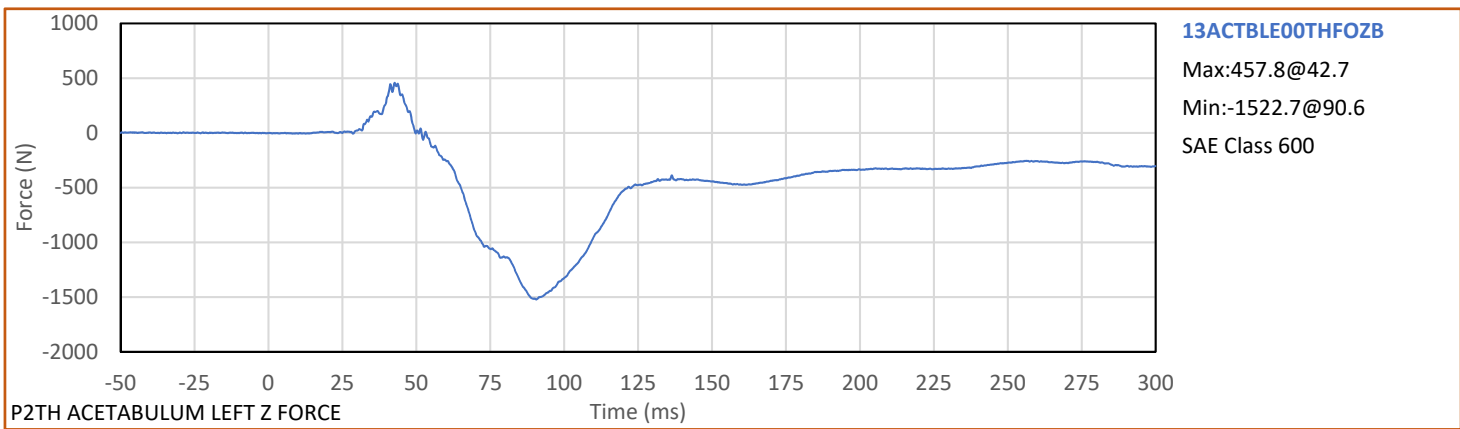
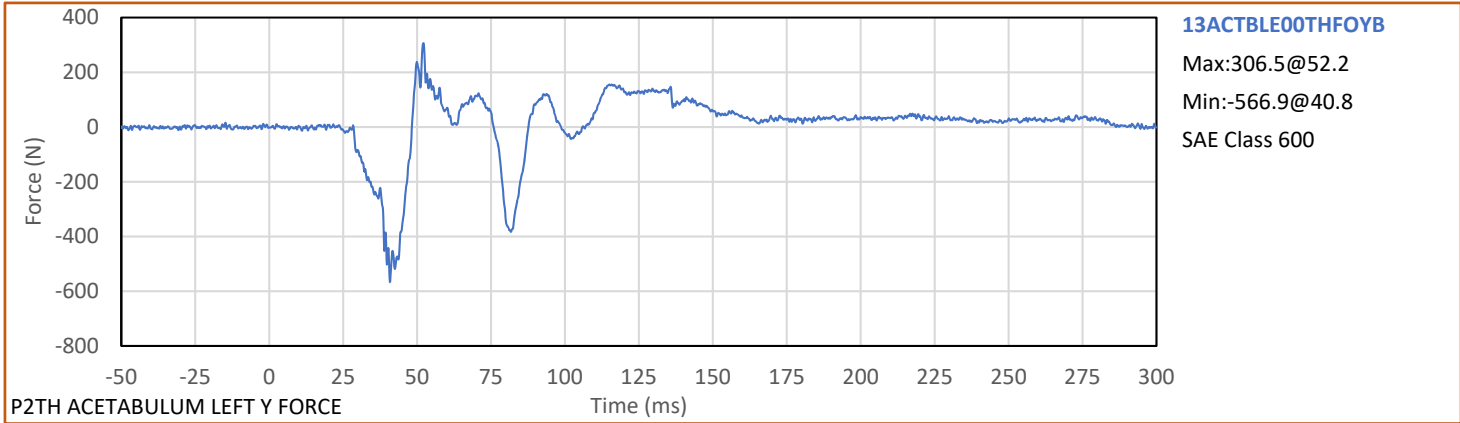


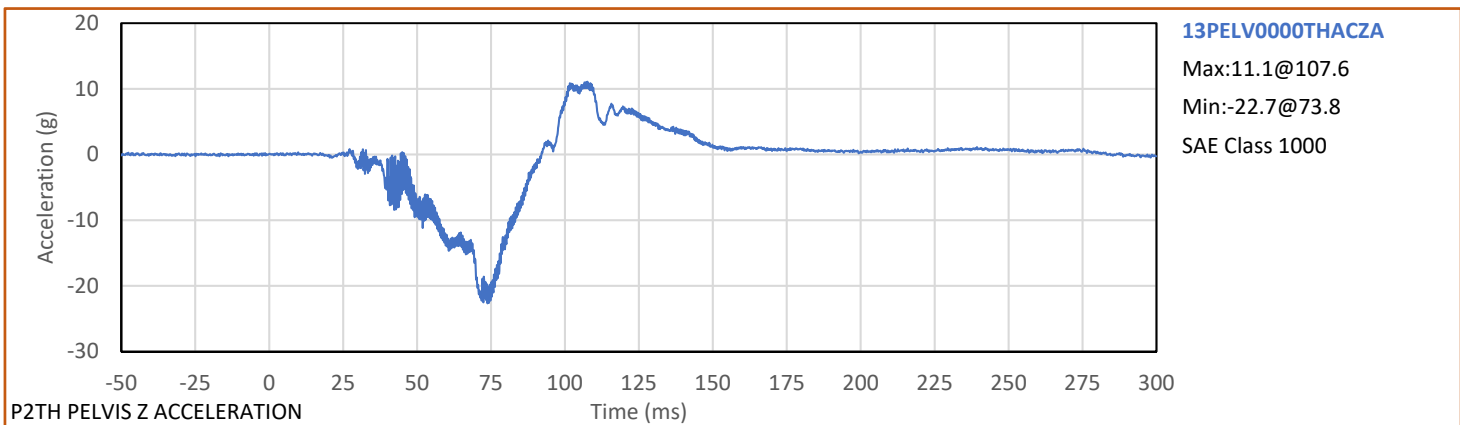
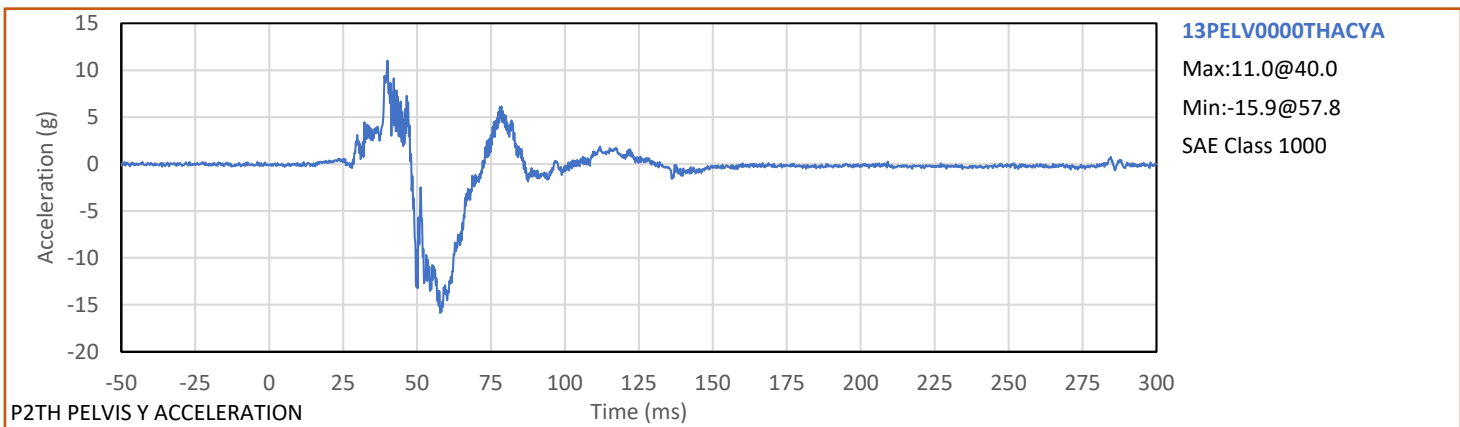
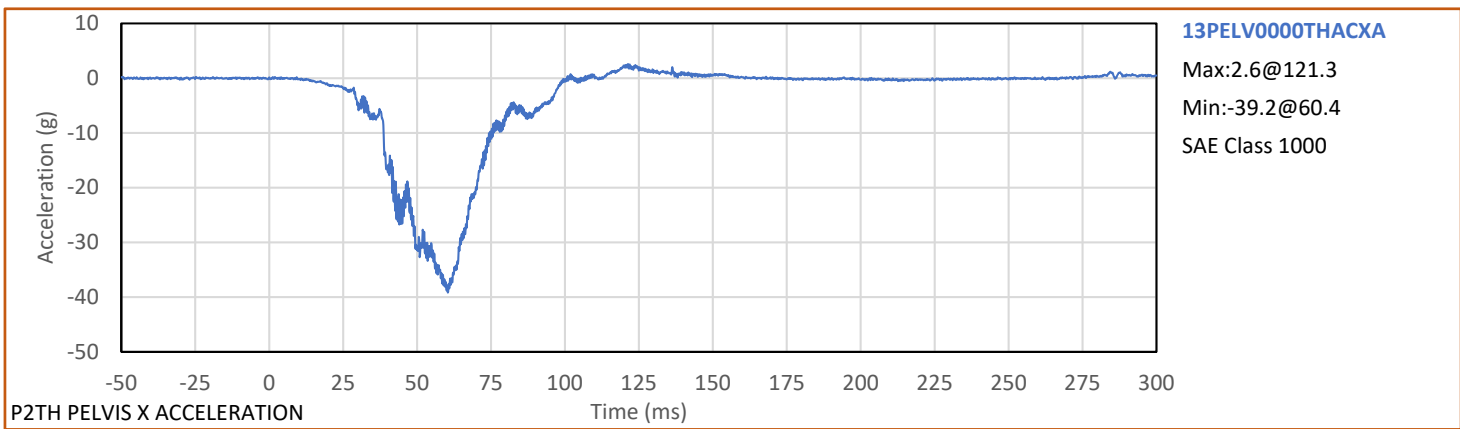
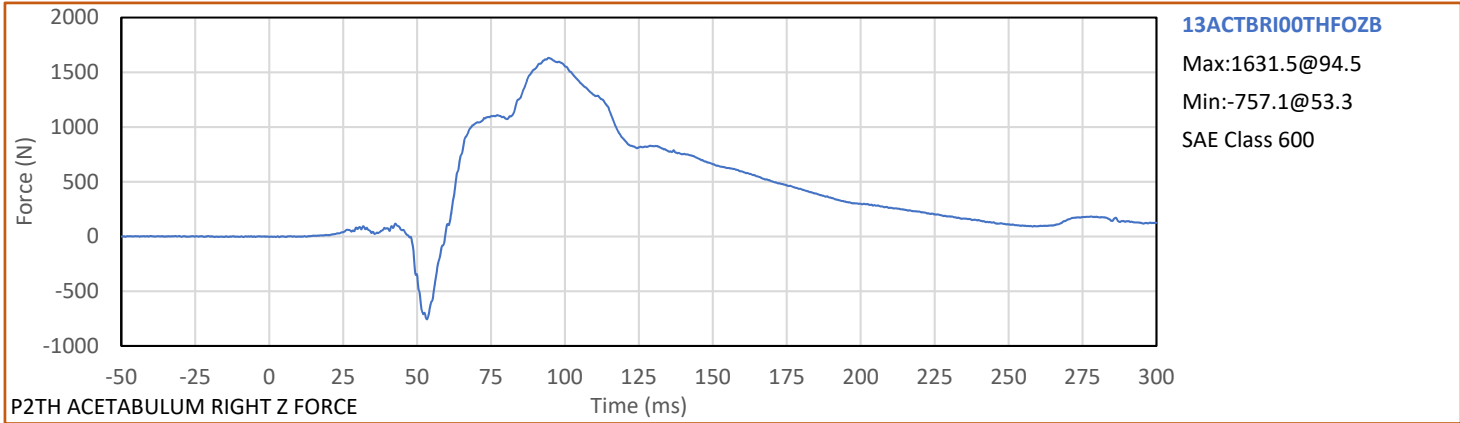


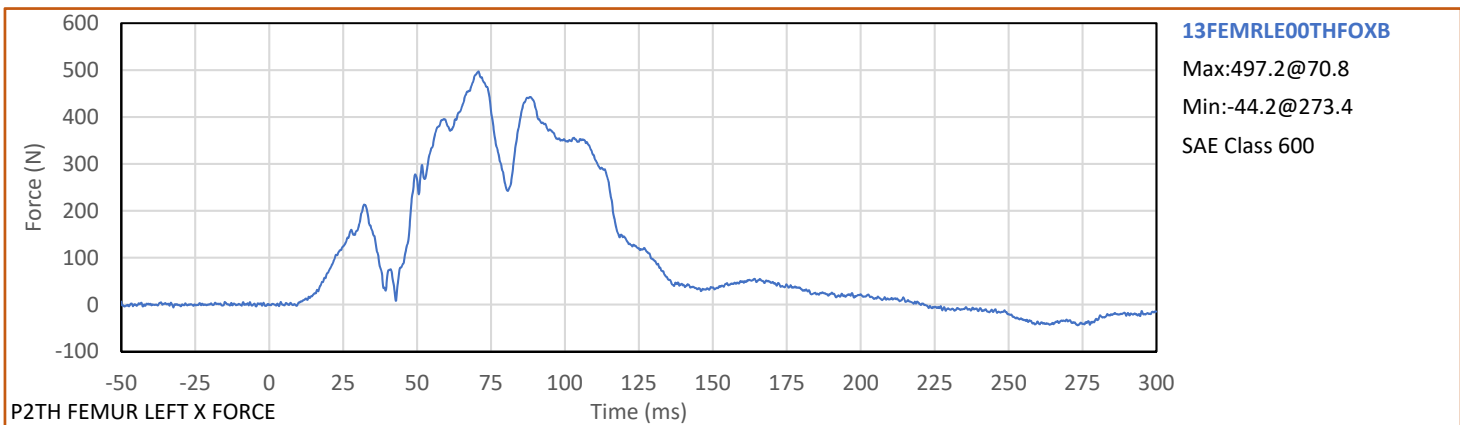
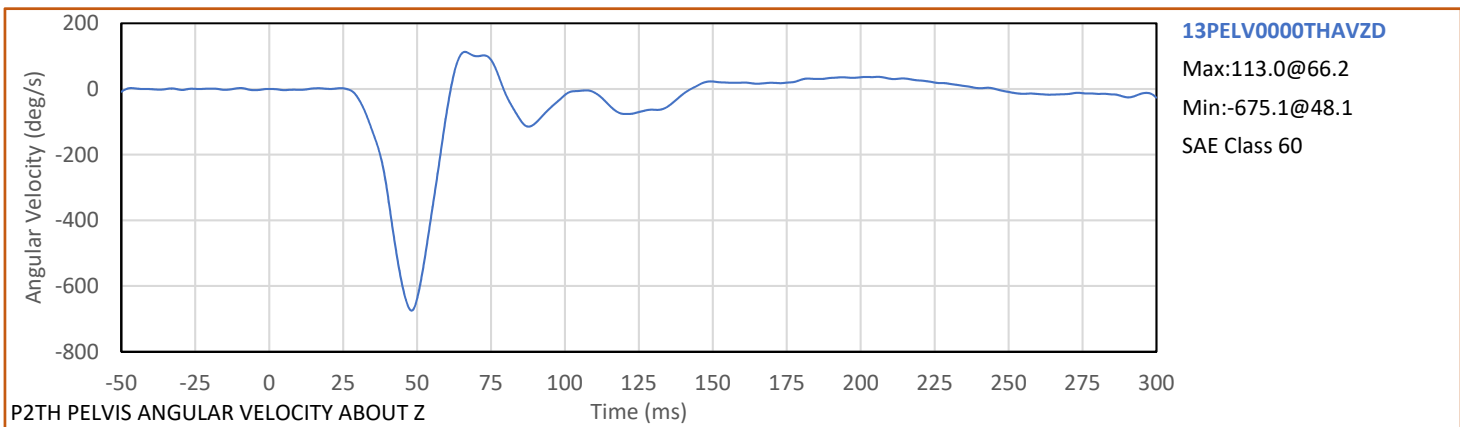
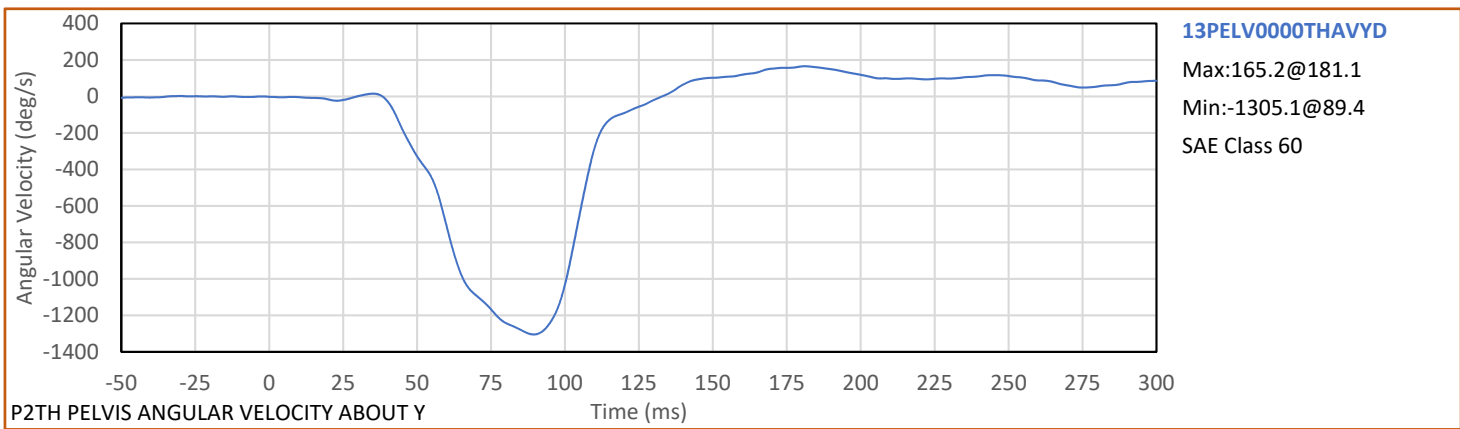
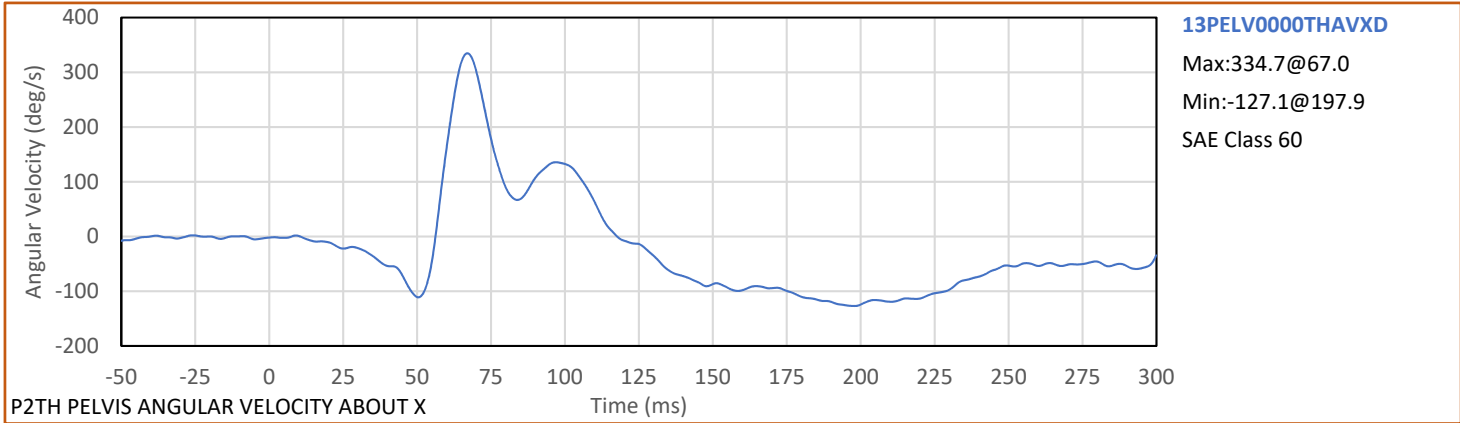


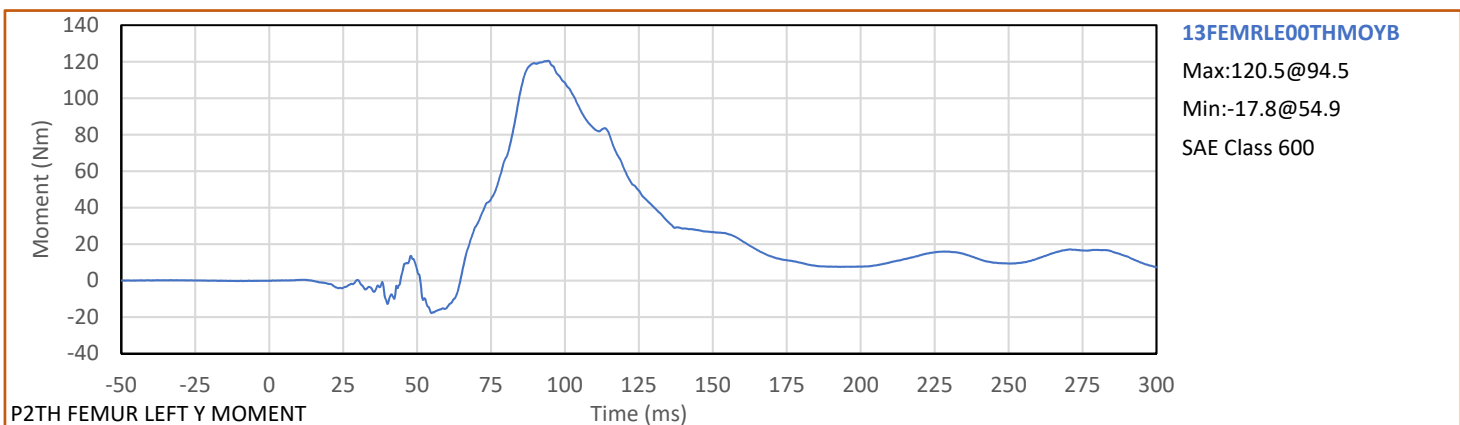
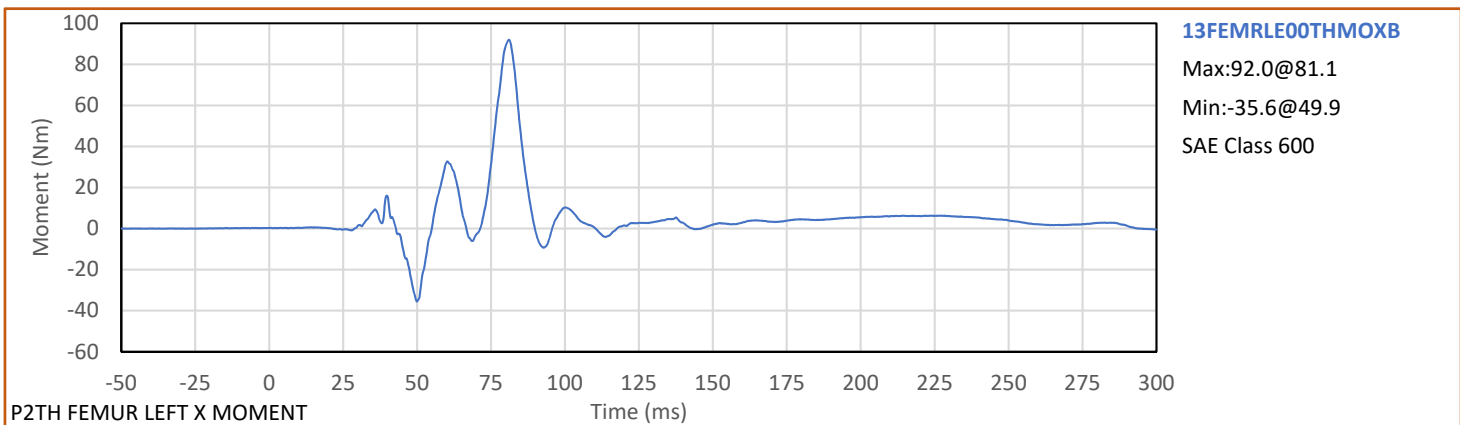
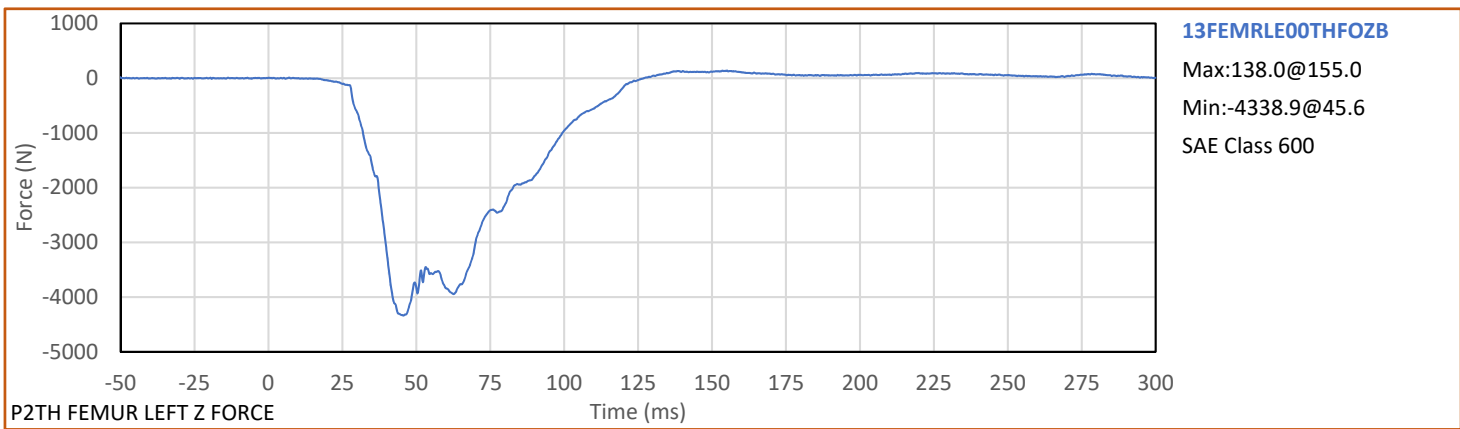
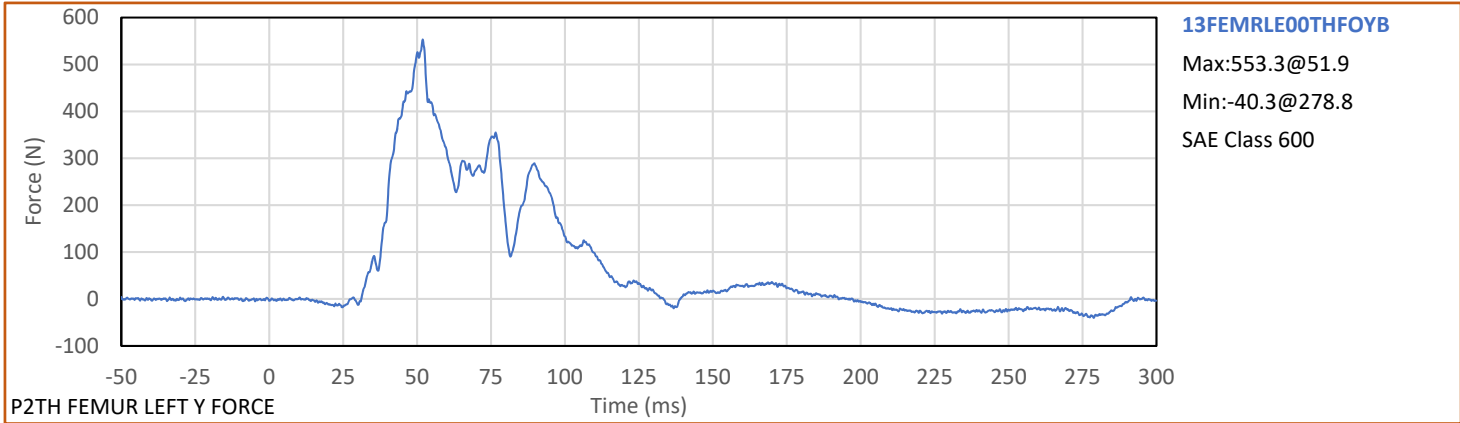


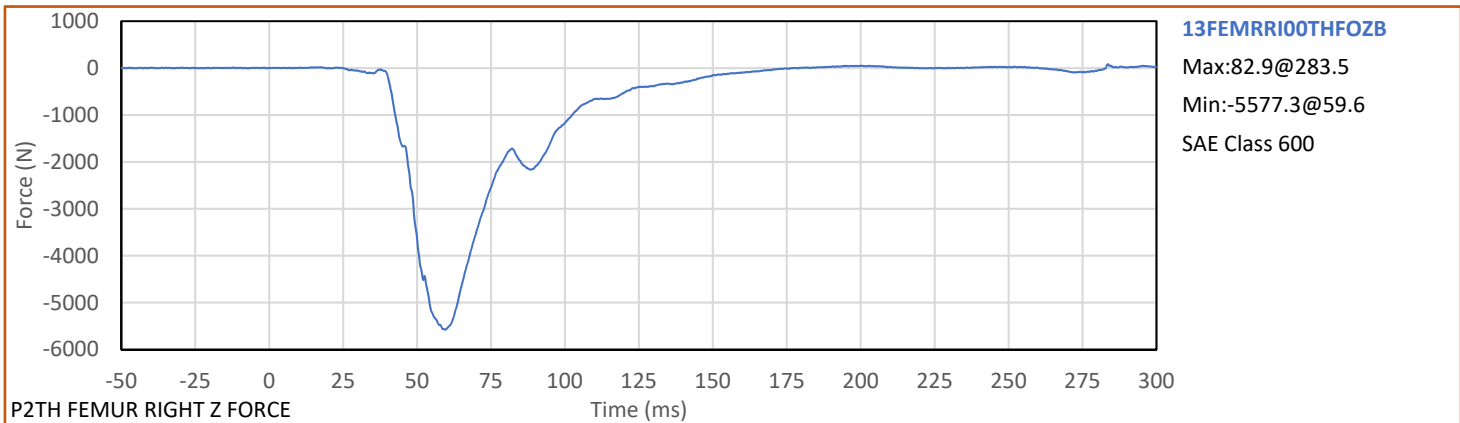
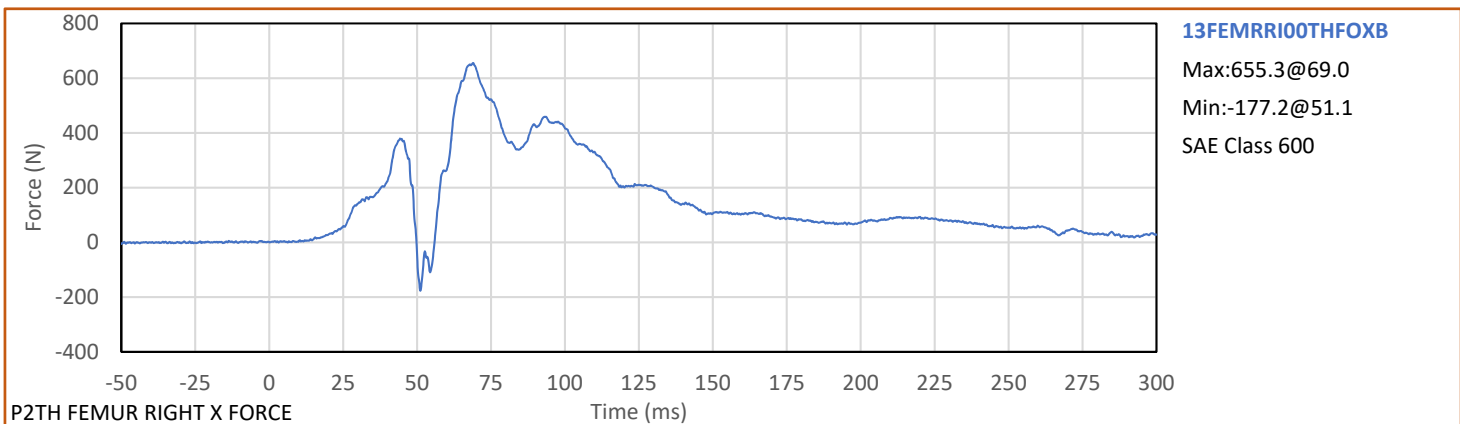
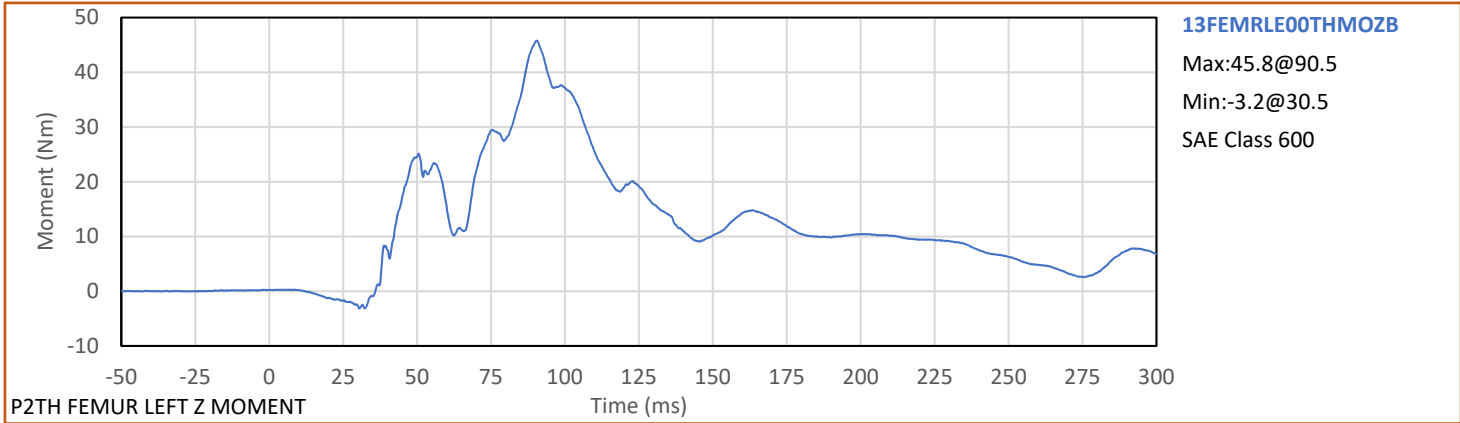


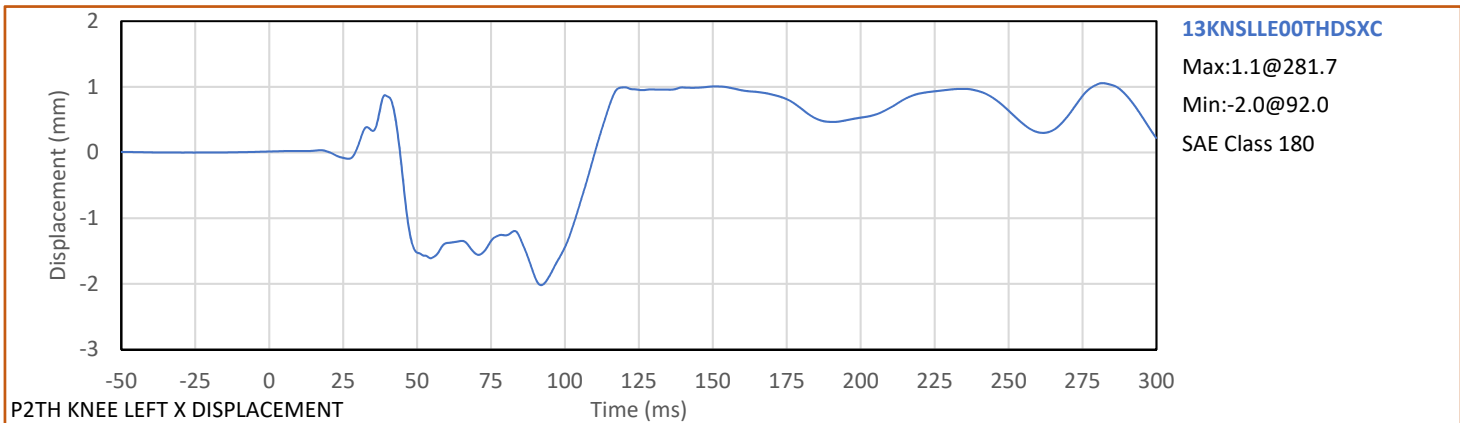
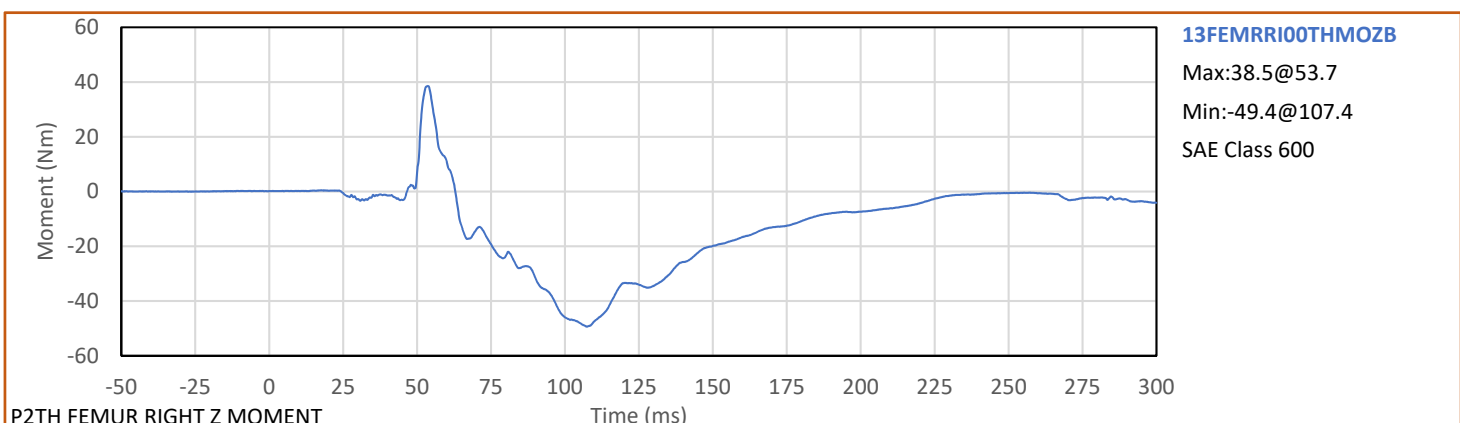
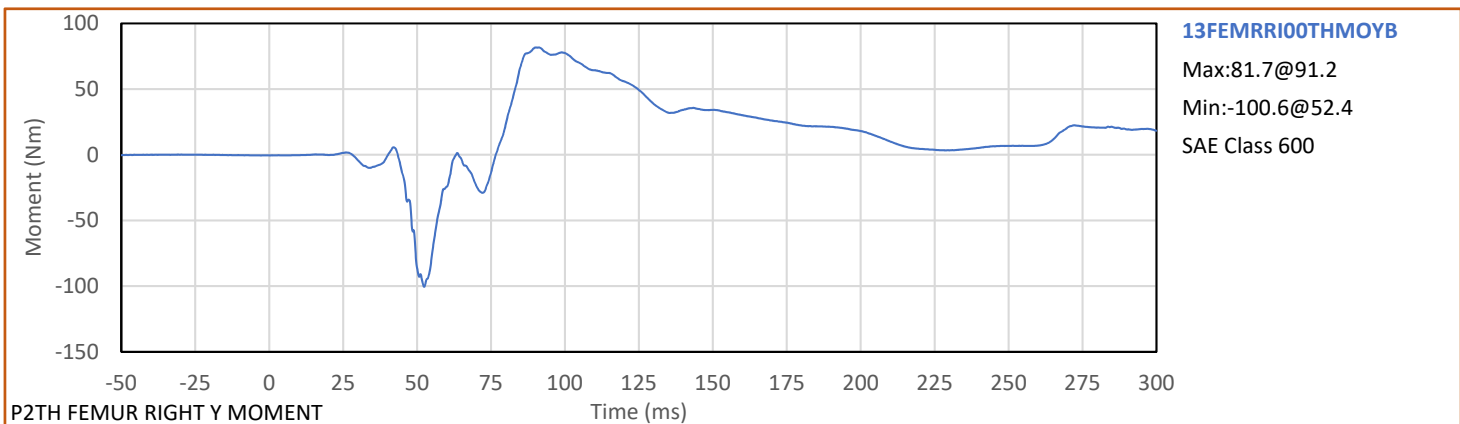
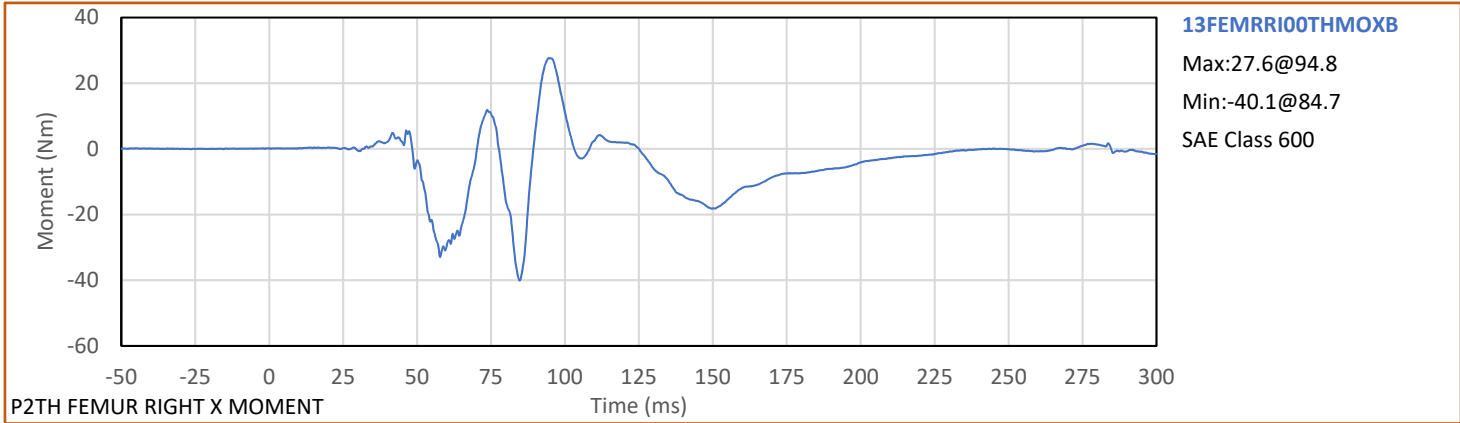


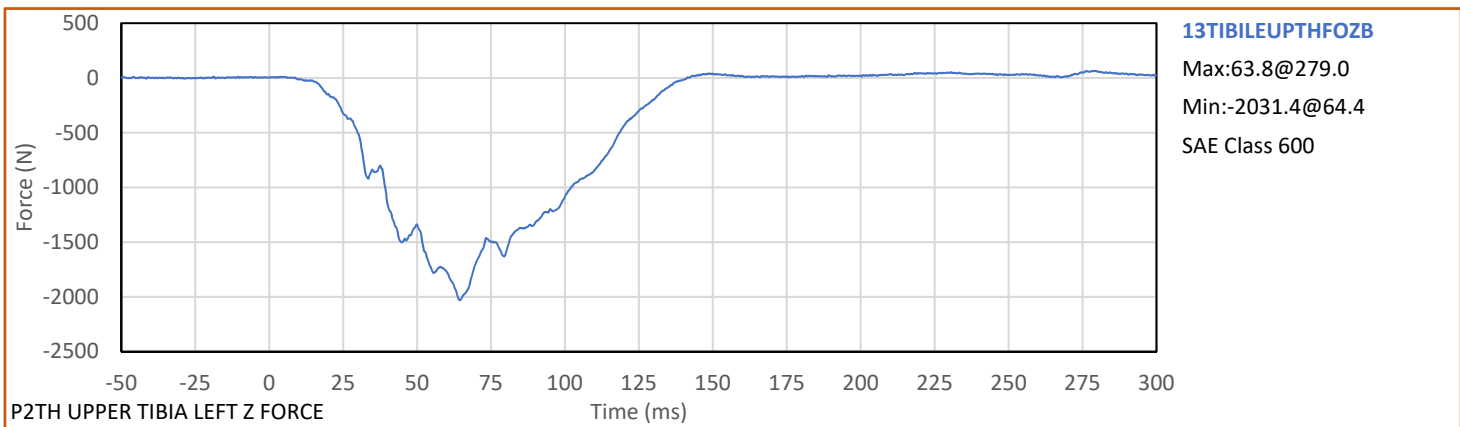
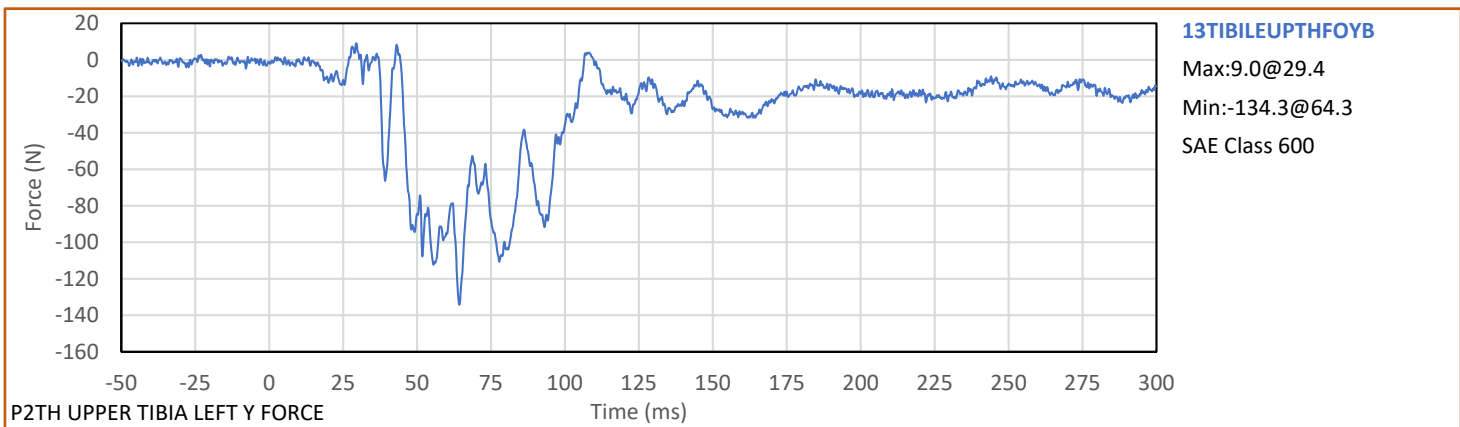
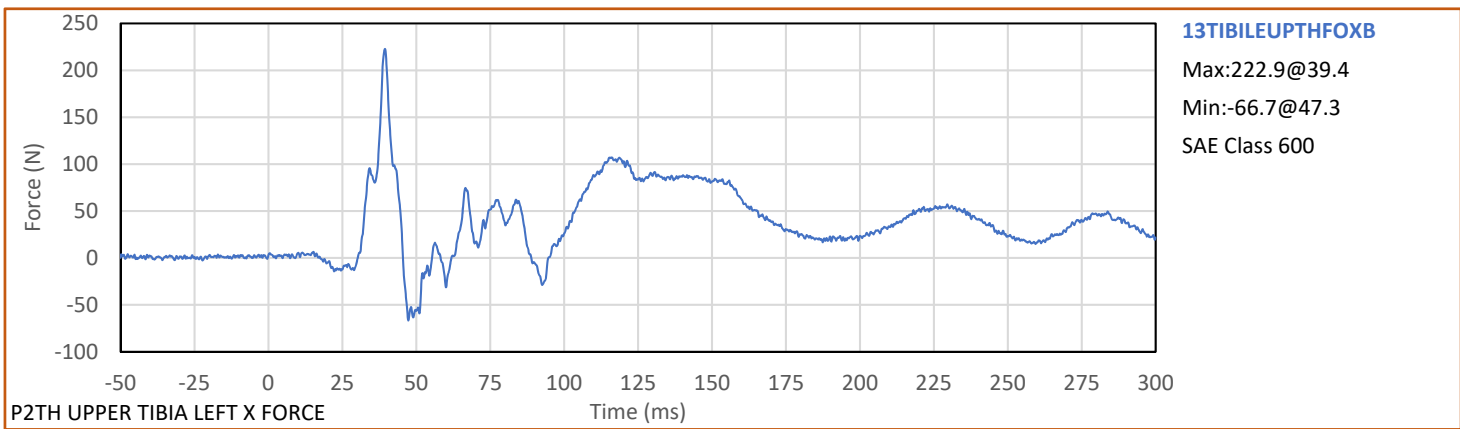
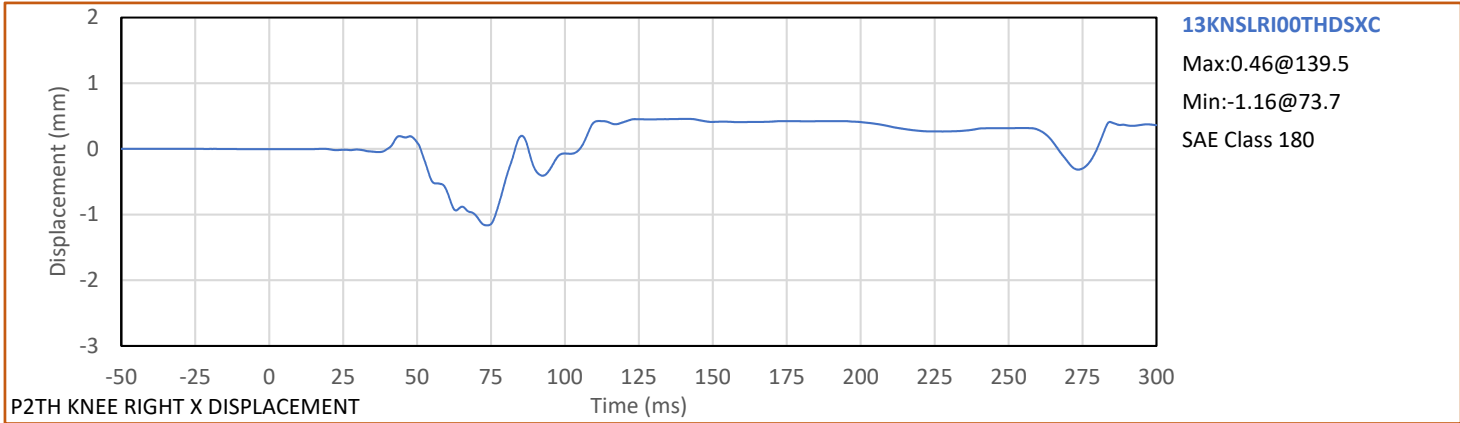


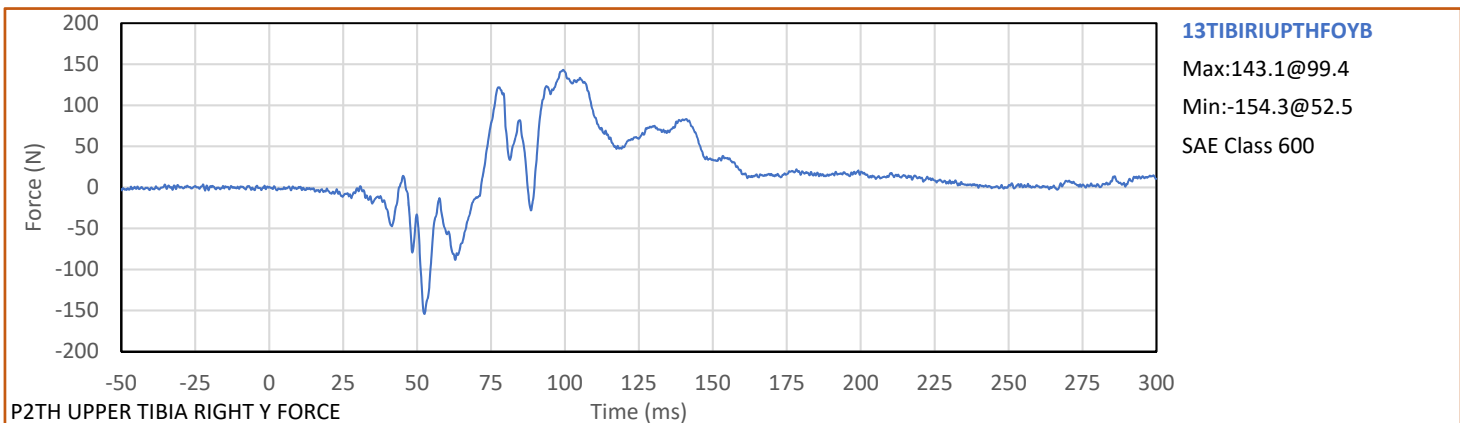
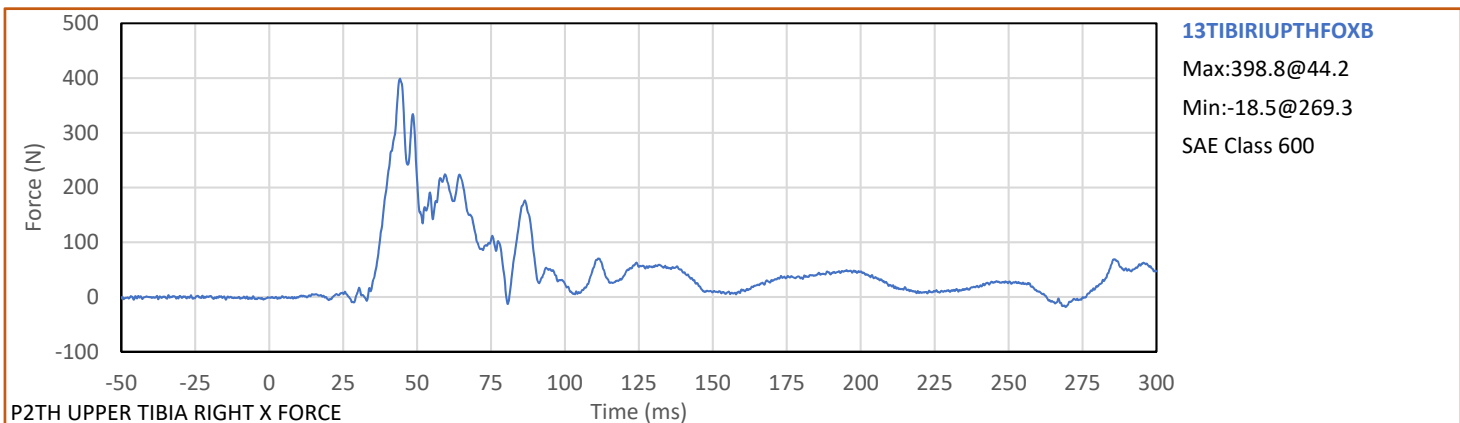
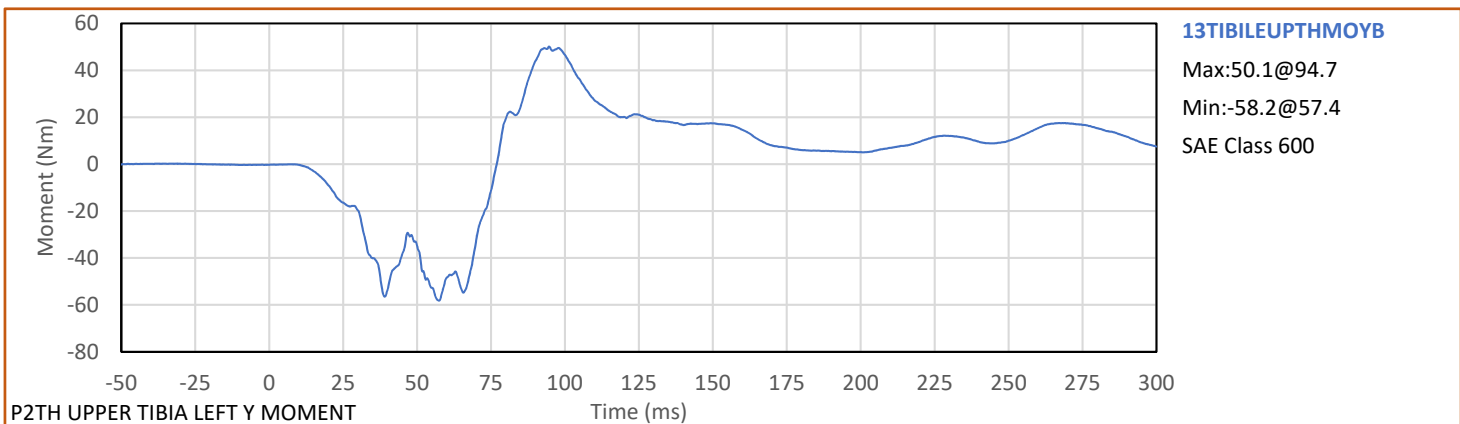
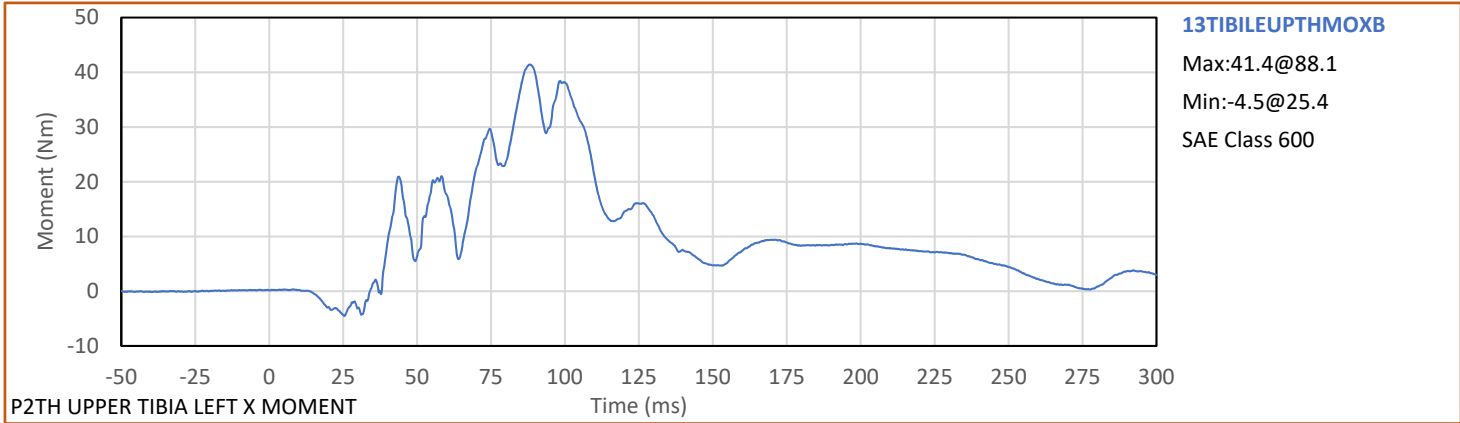


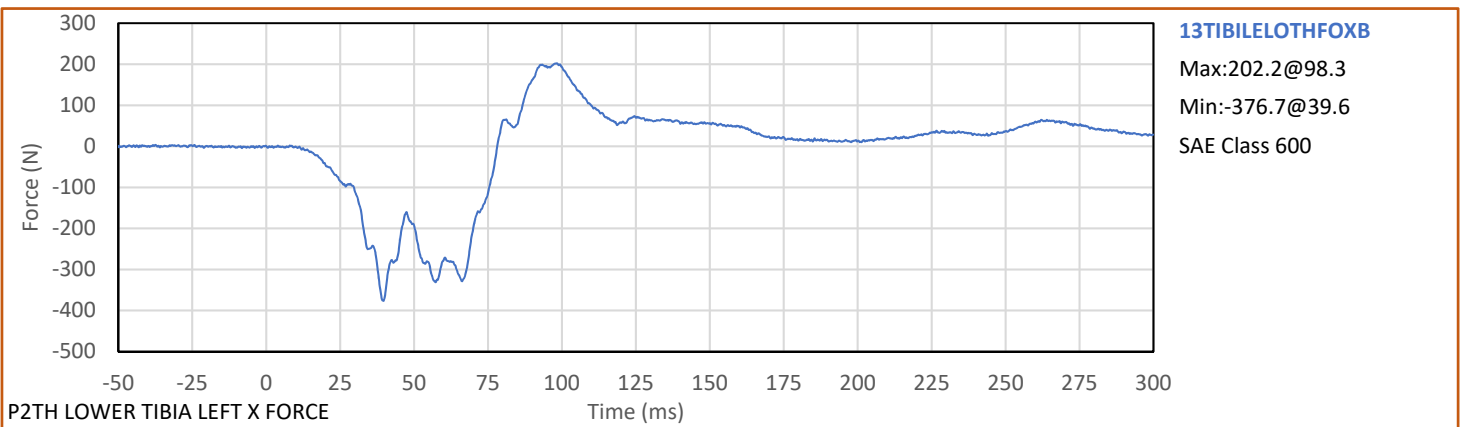
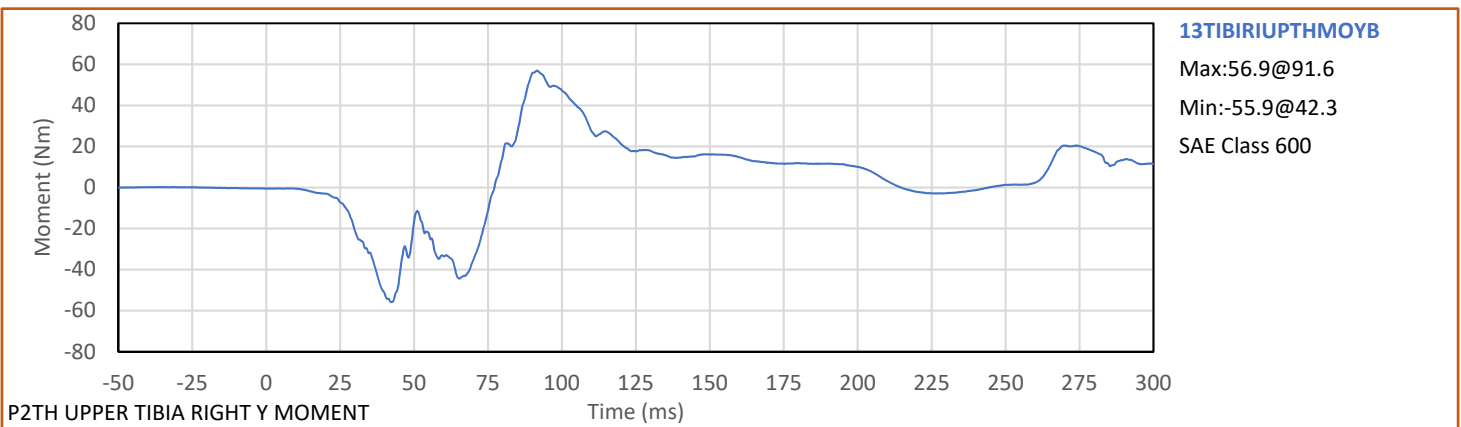
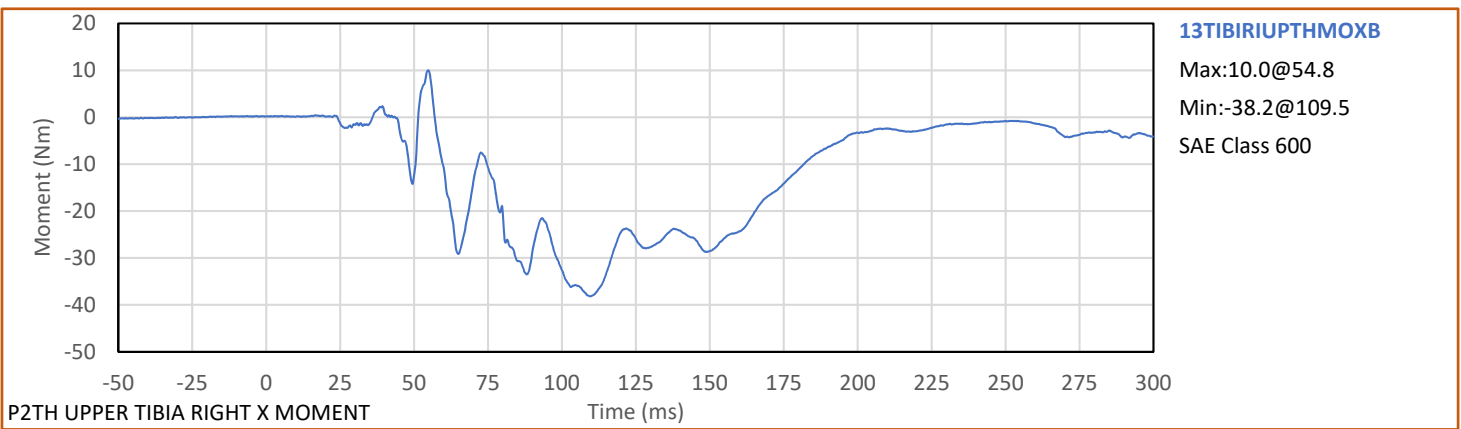
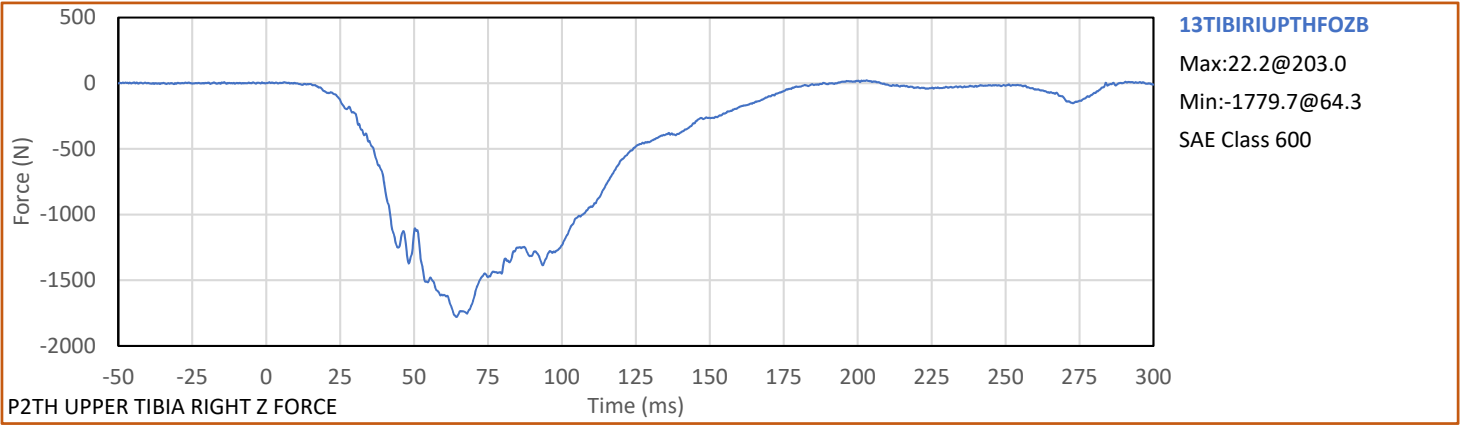


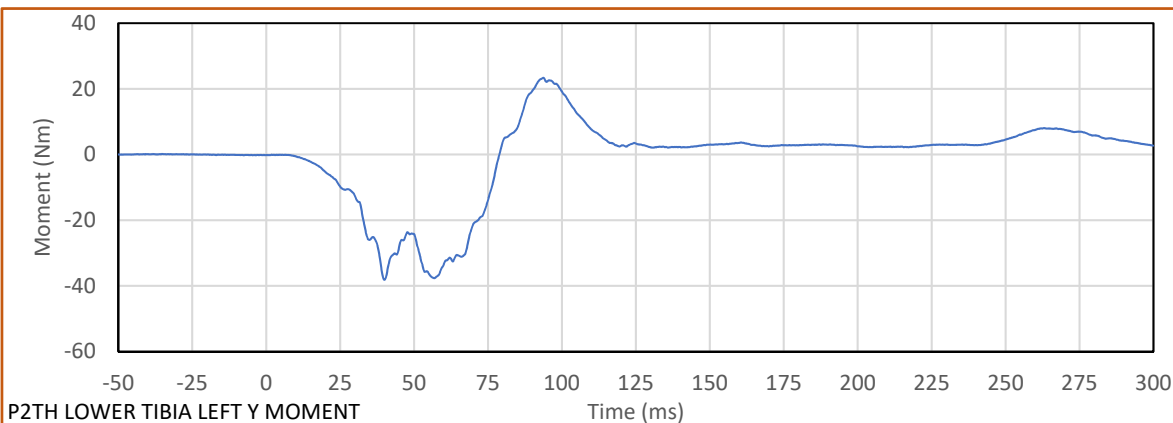
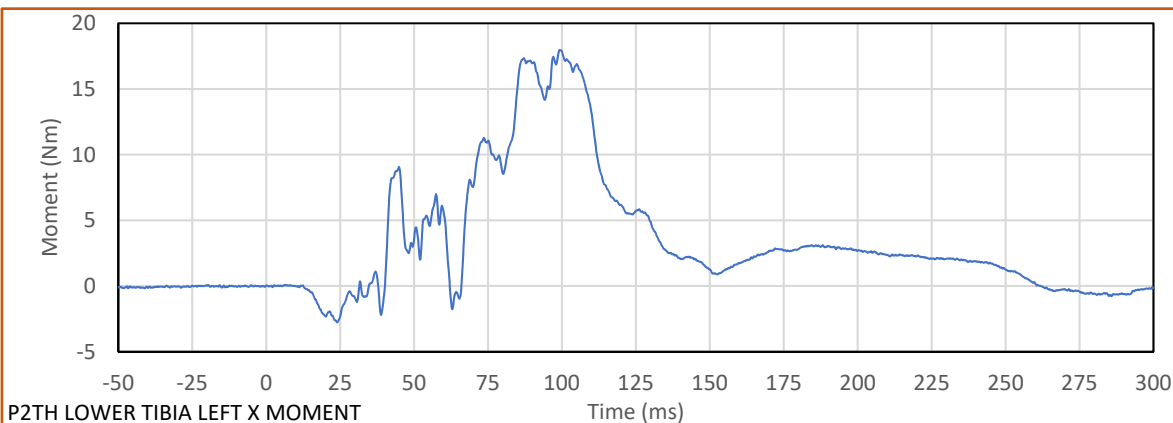
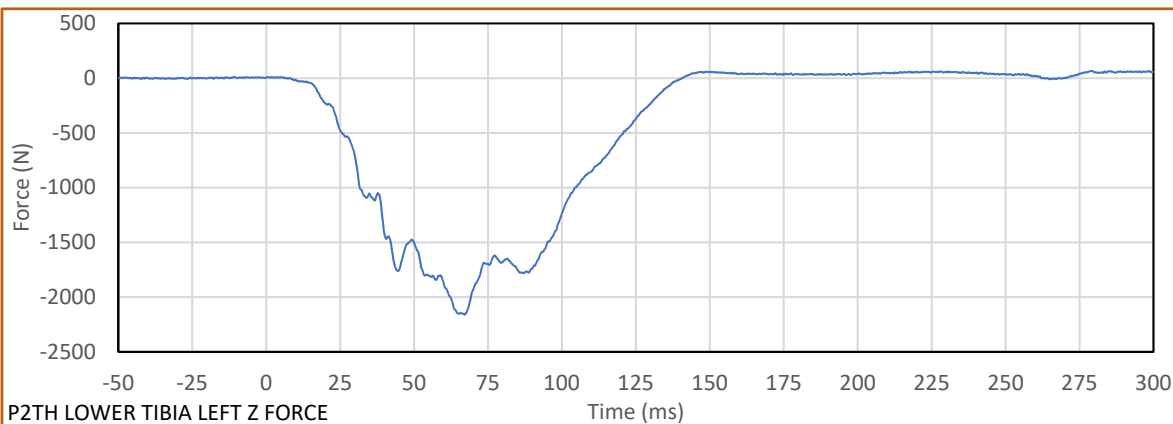
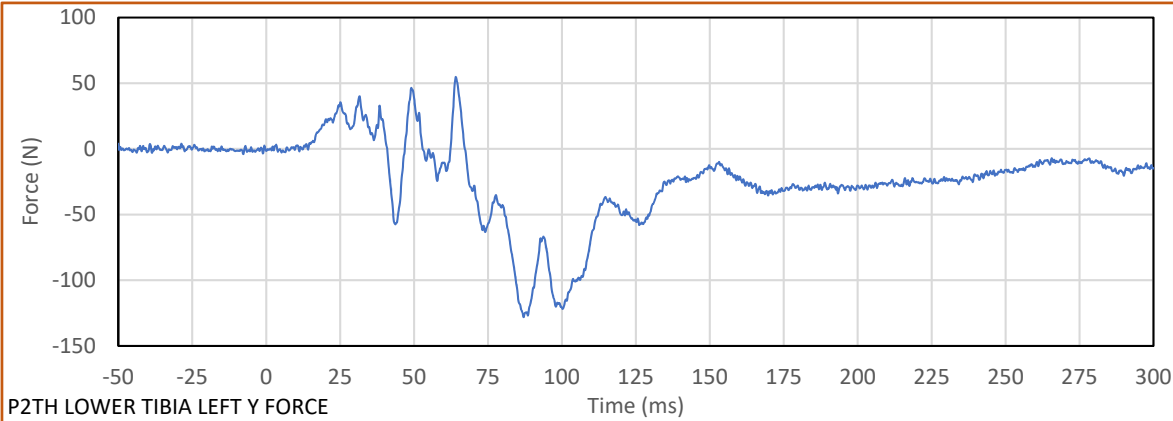


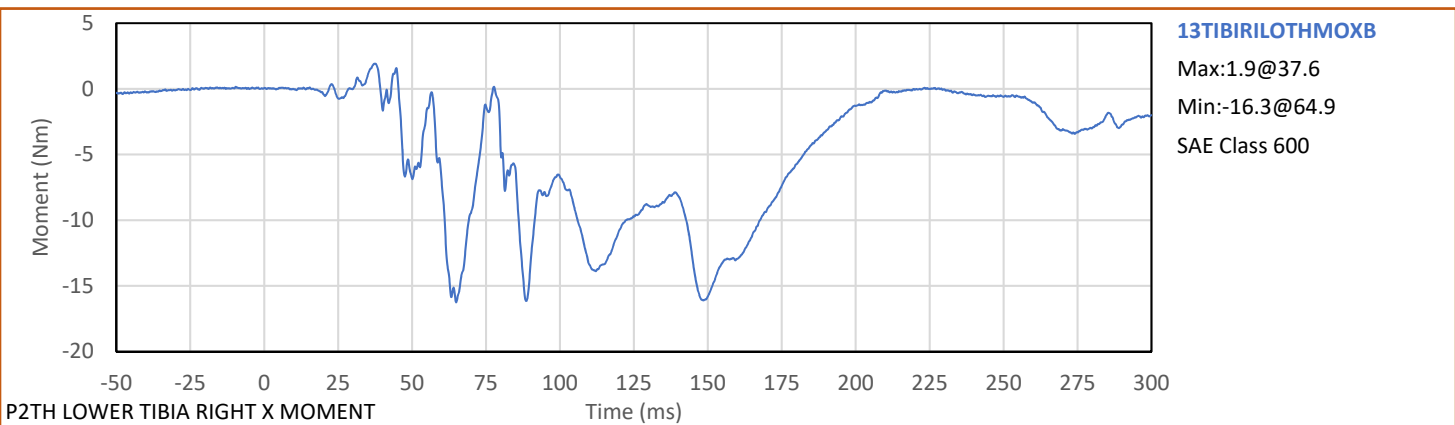
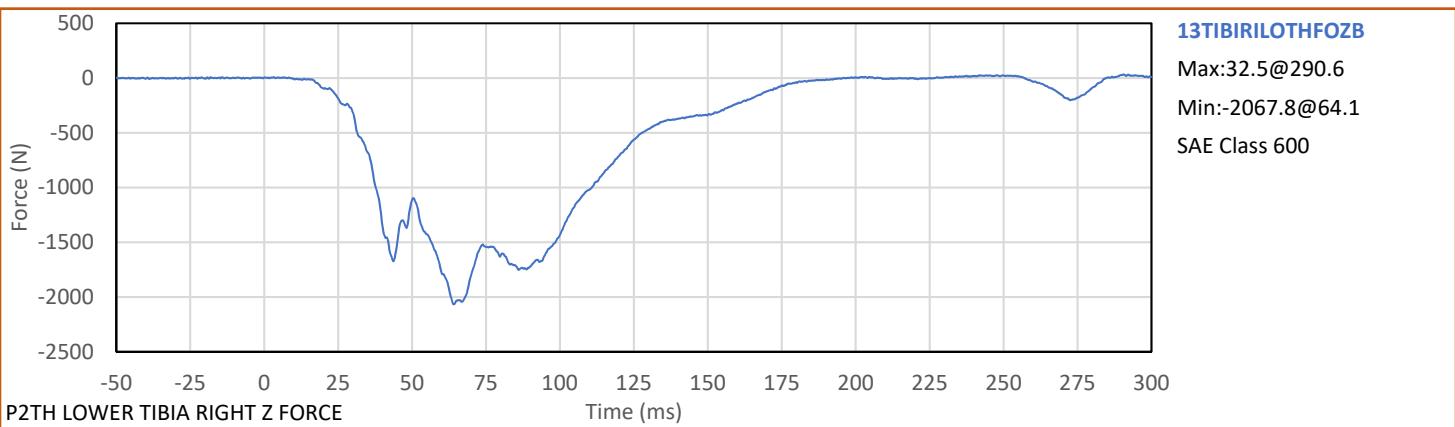
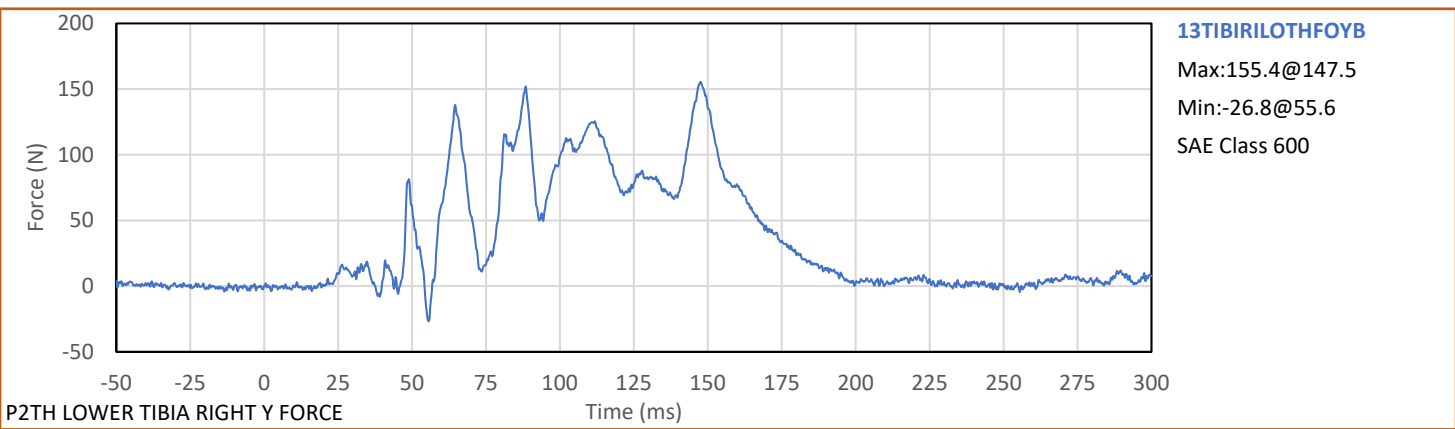
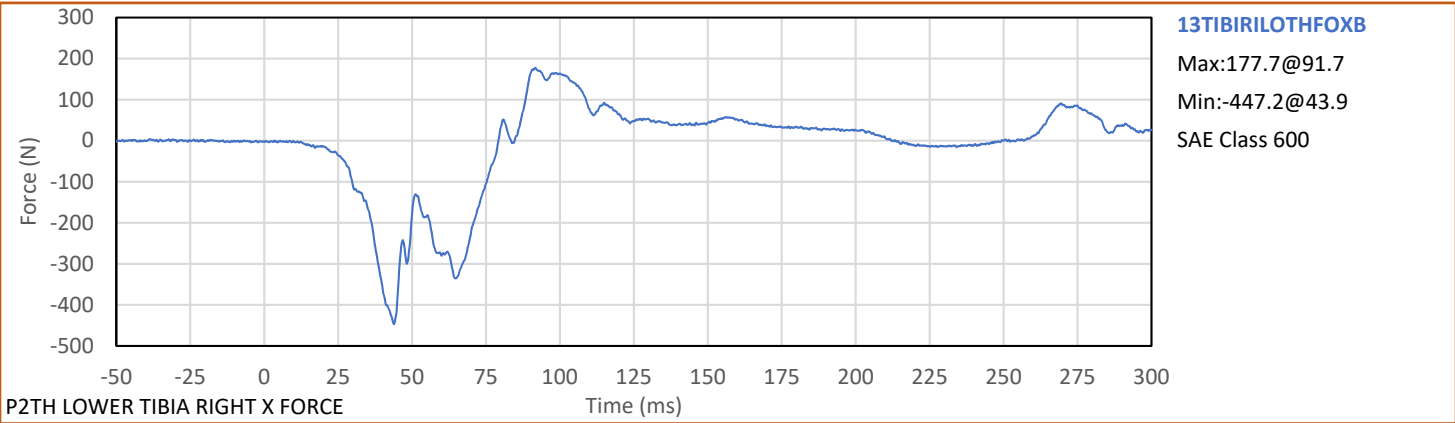


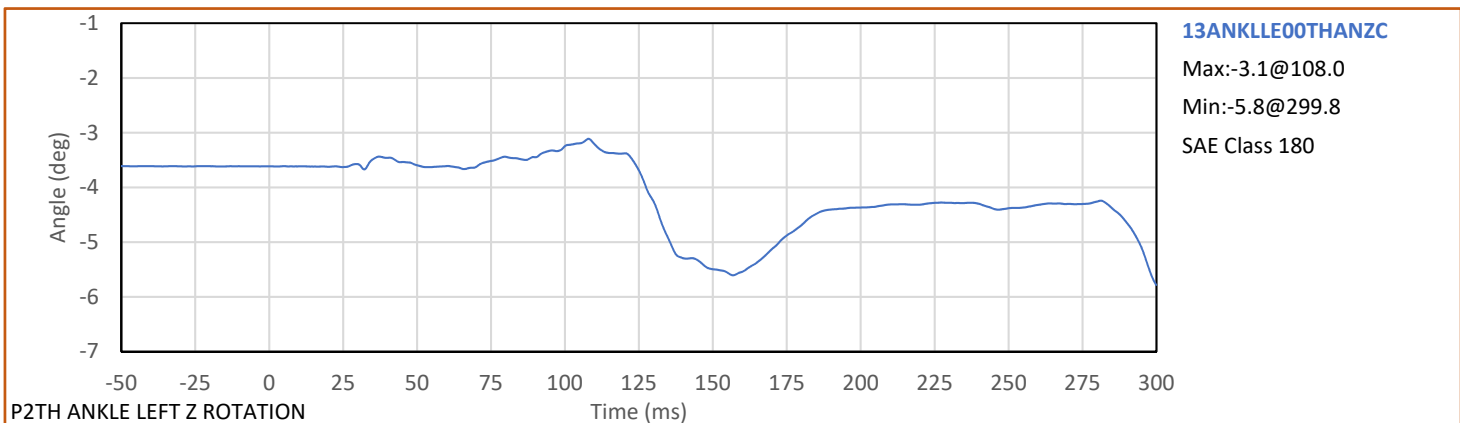
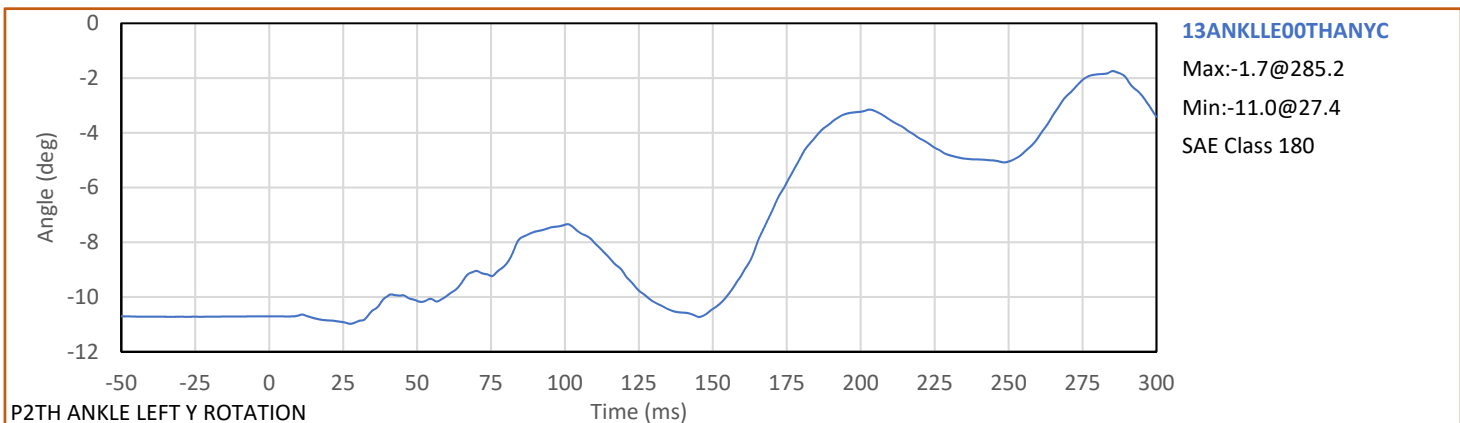
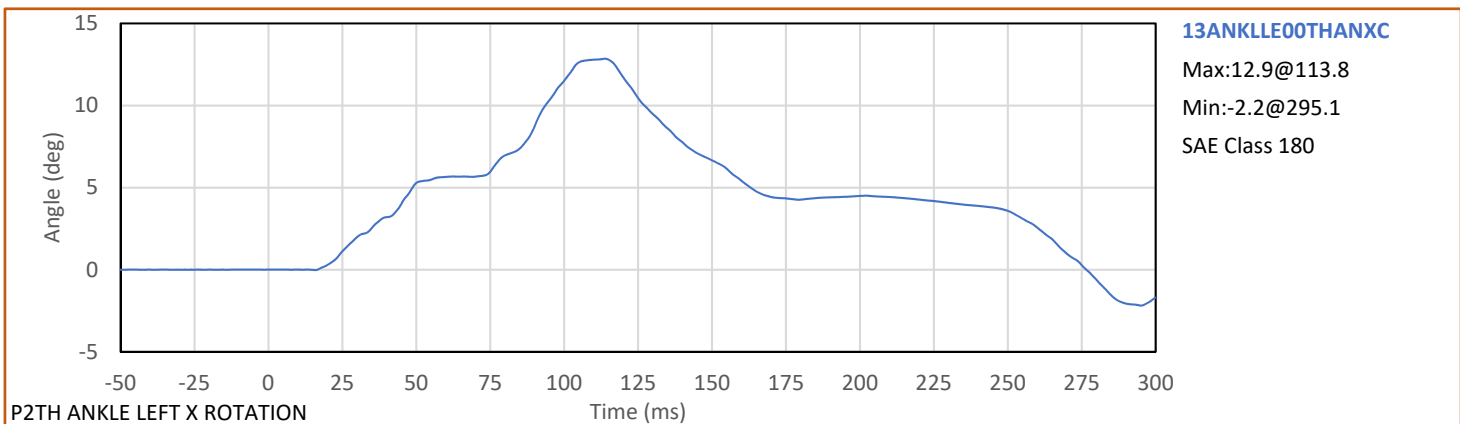
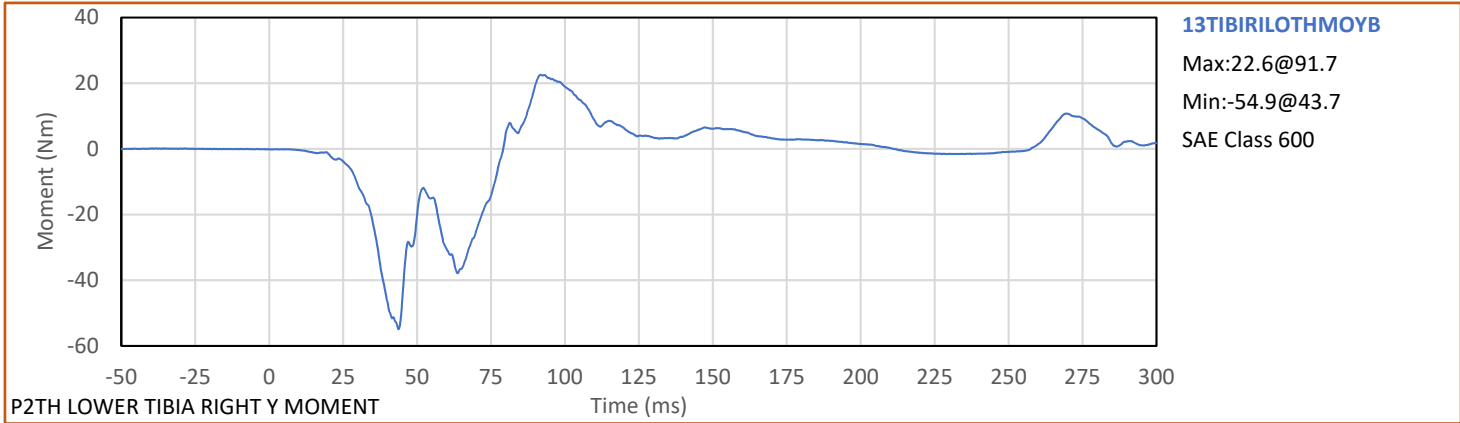






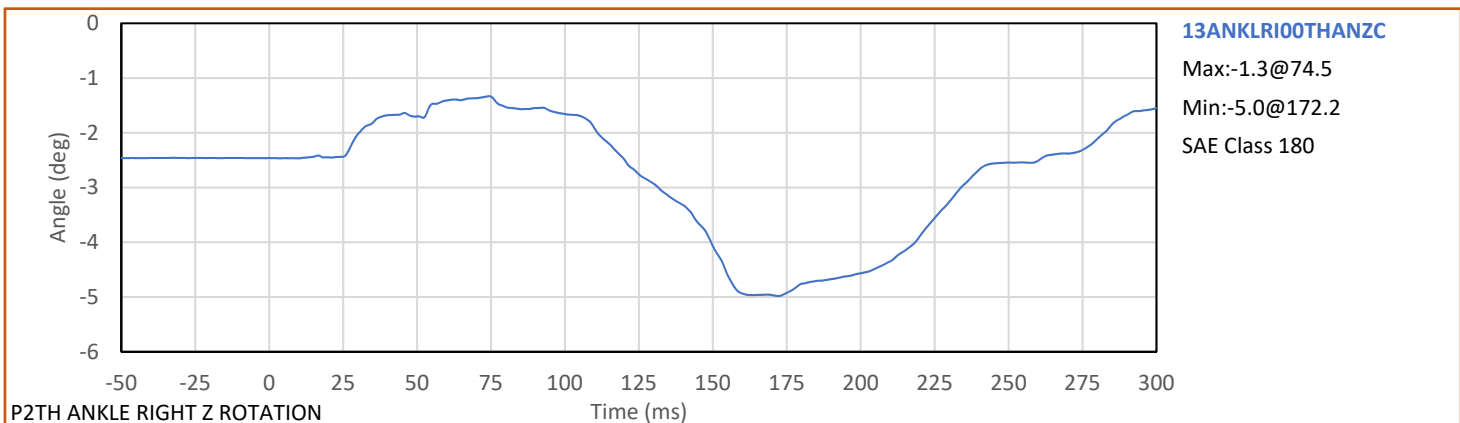
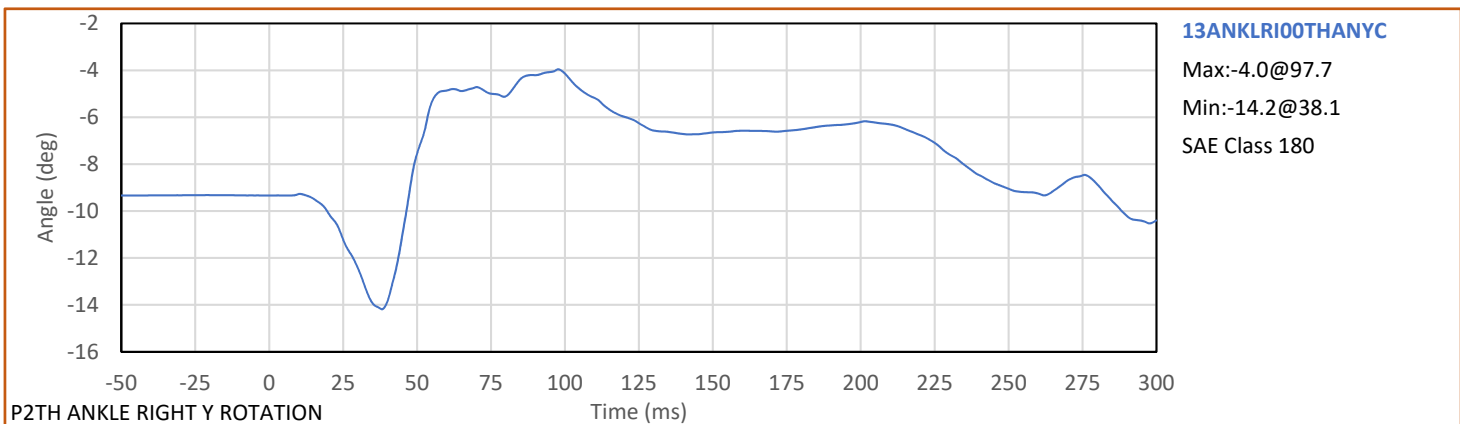
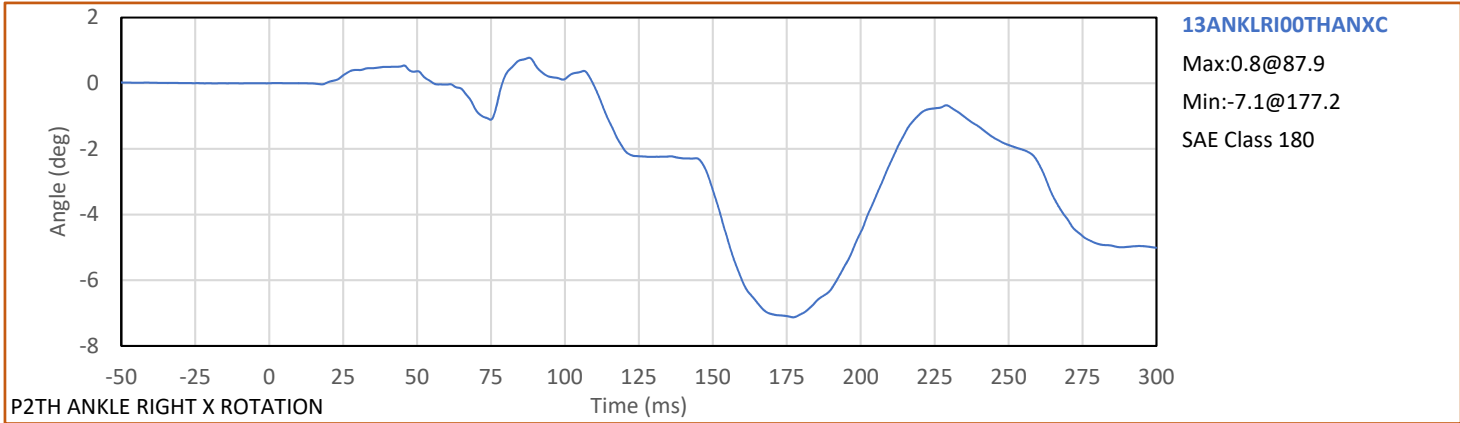


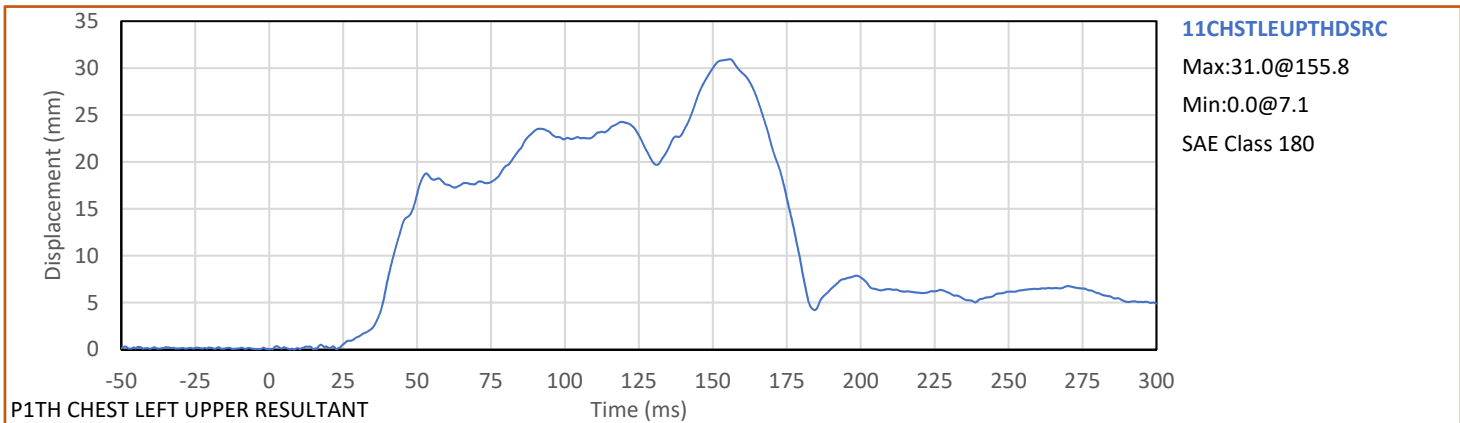
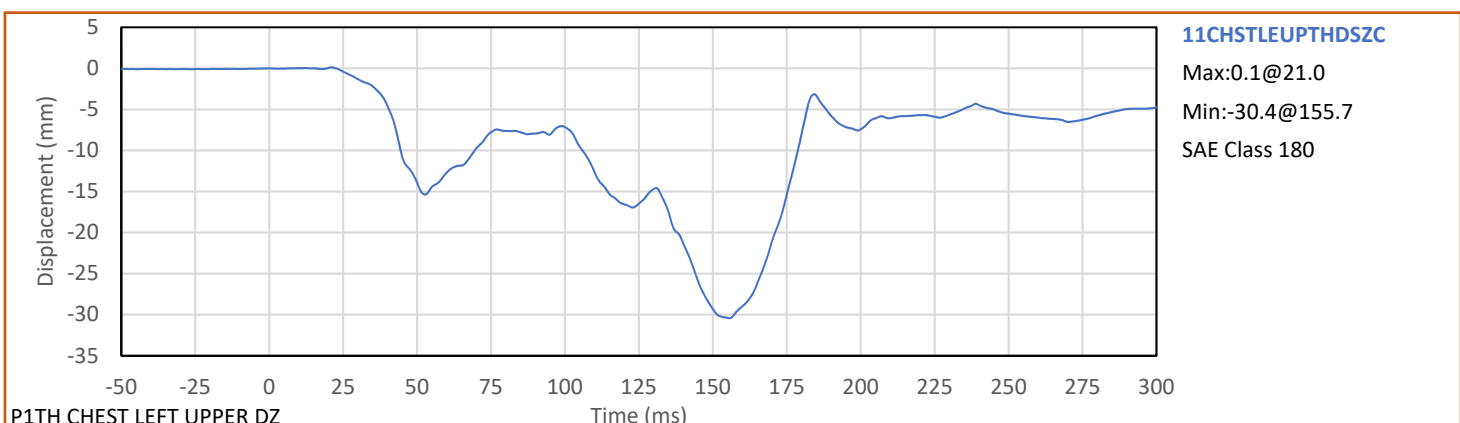
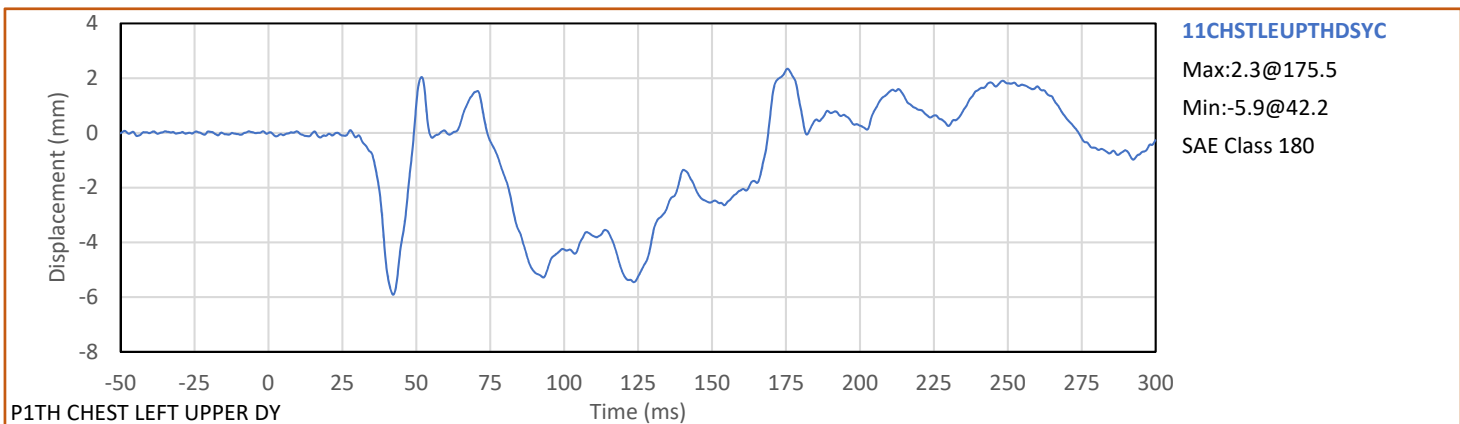
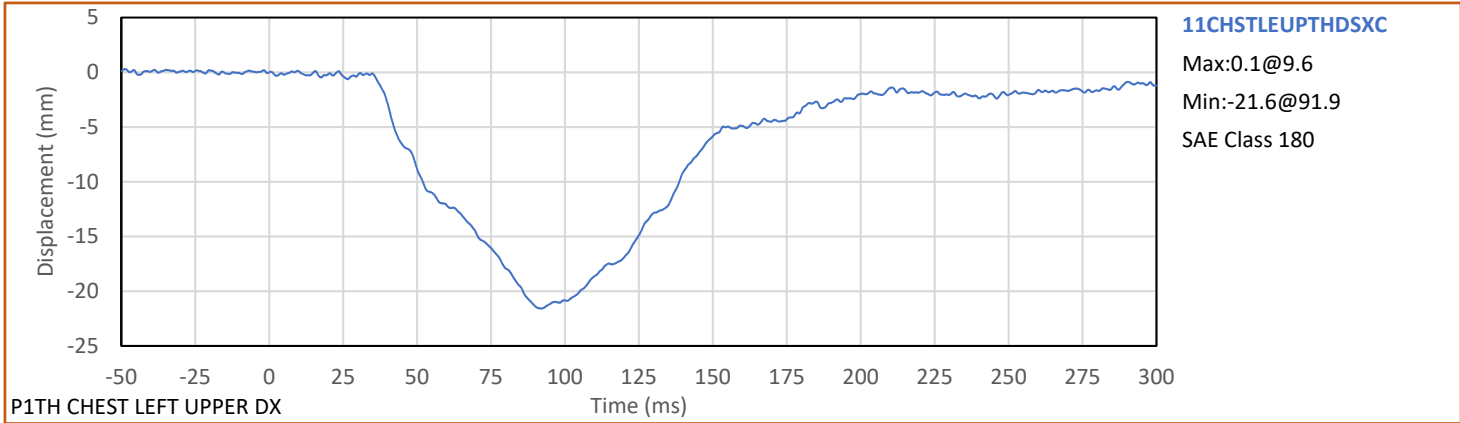


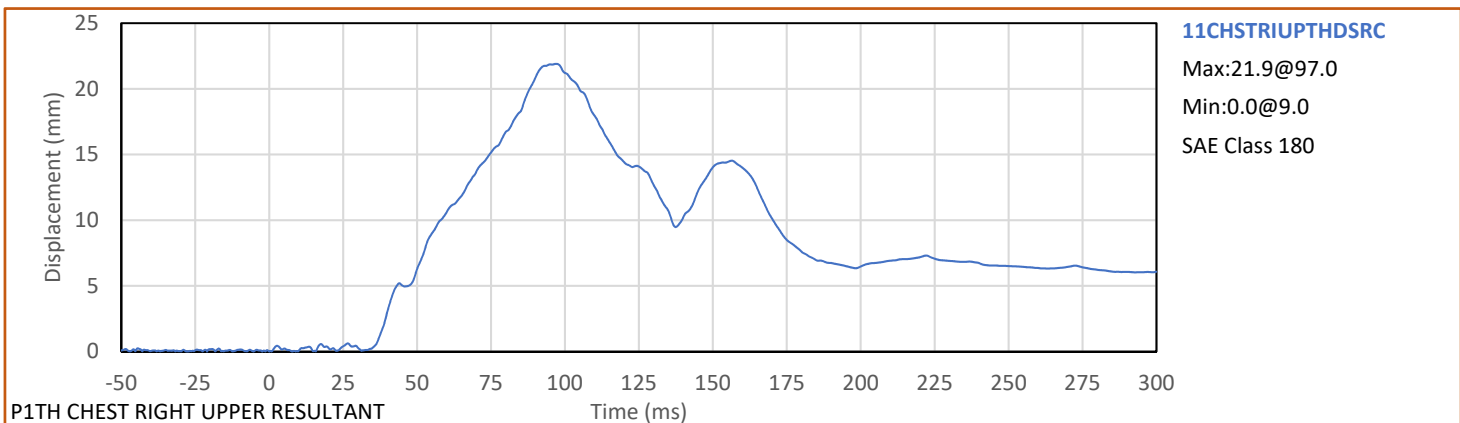
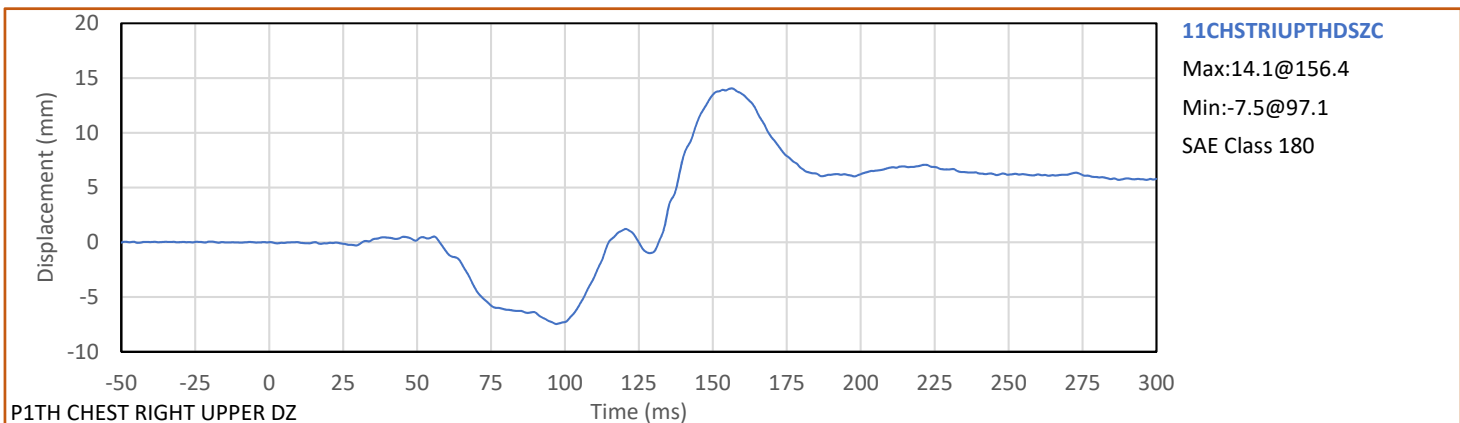
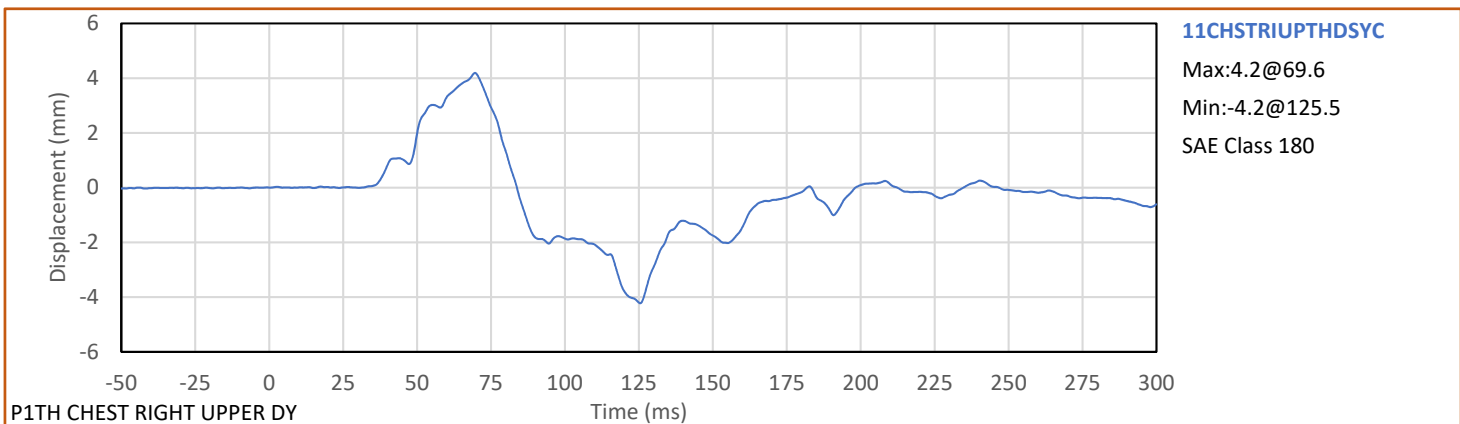
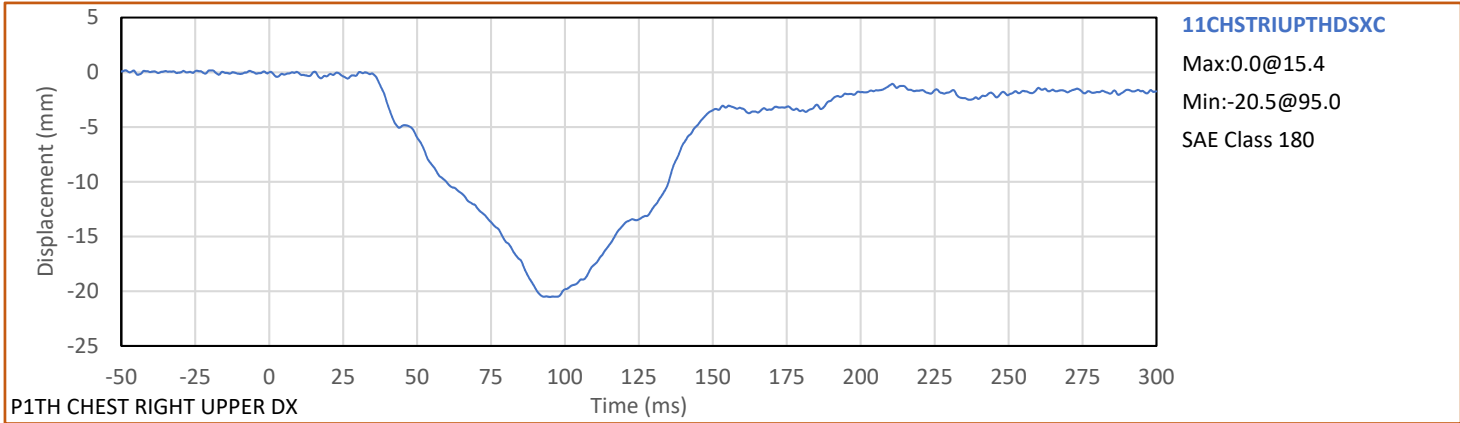


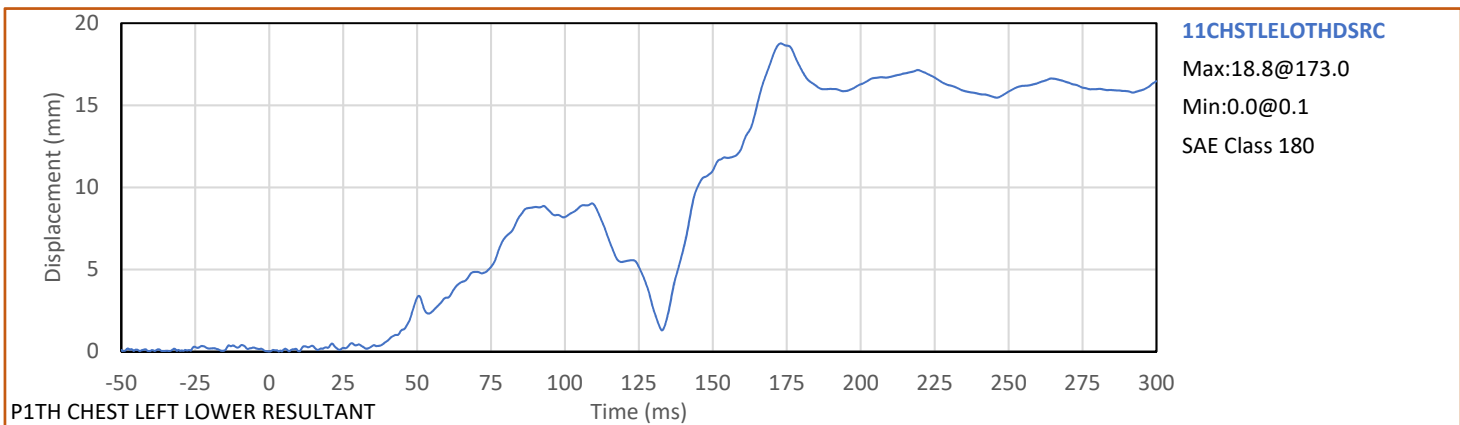
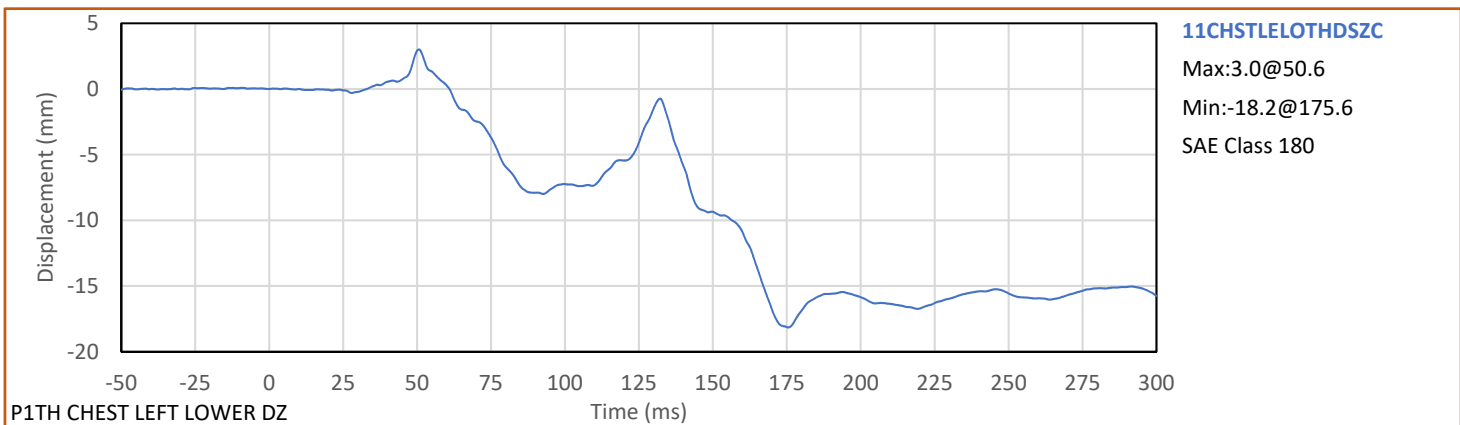
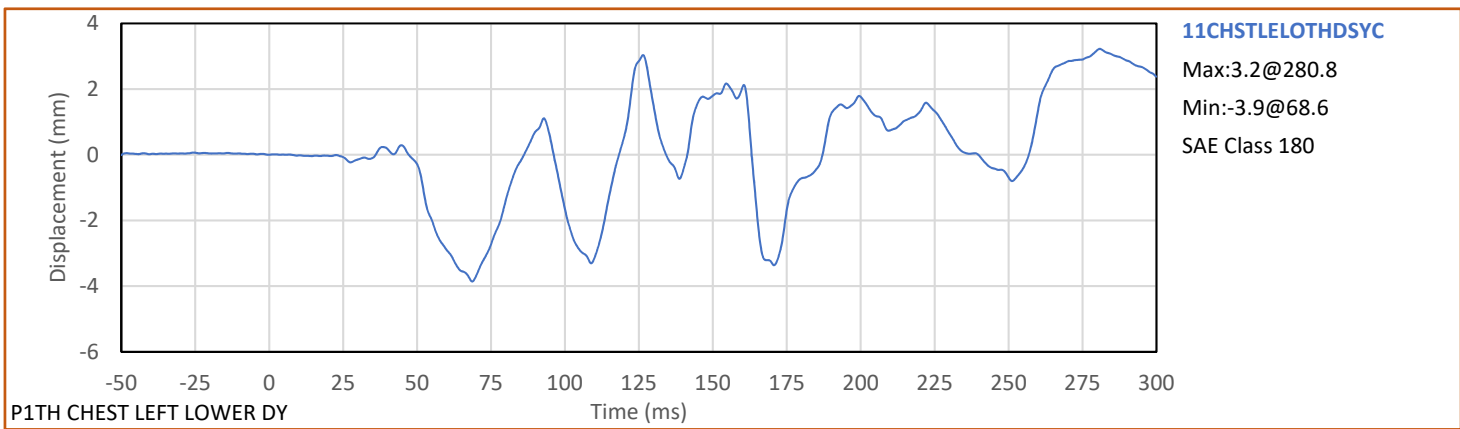
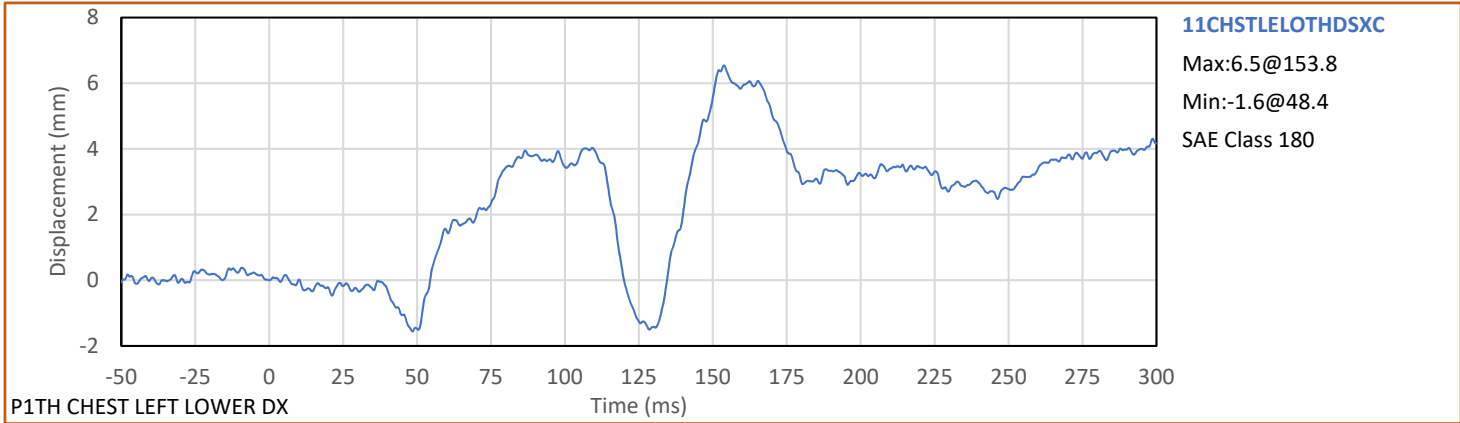
Test Vehicle: 2020 Mazda CX-5 5-Door MPV
Test Program: Full Frontal Rigid Barrier Impact

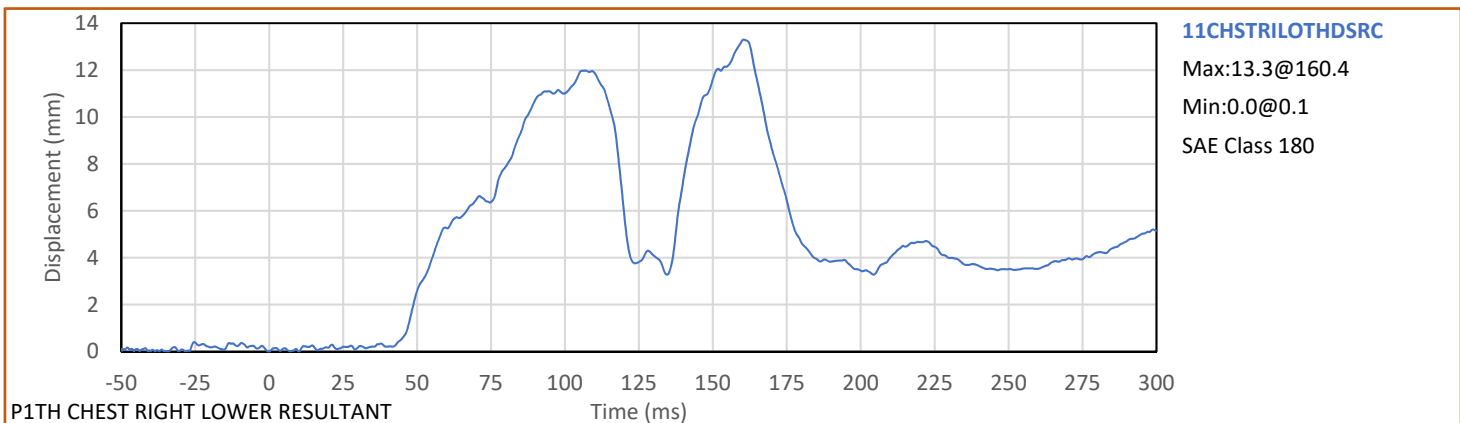
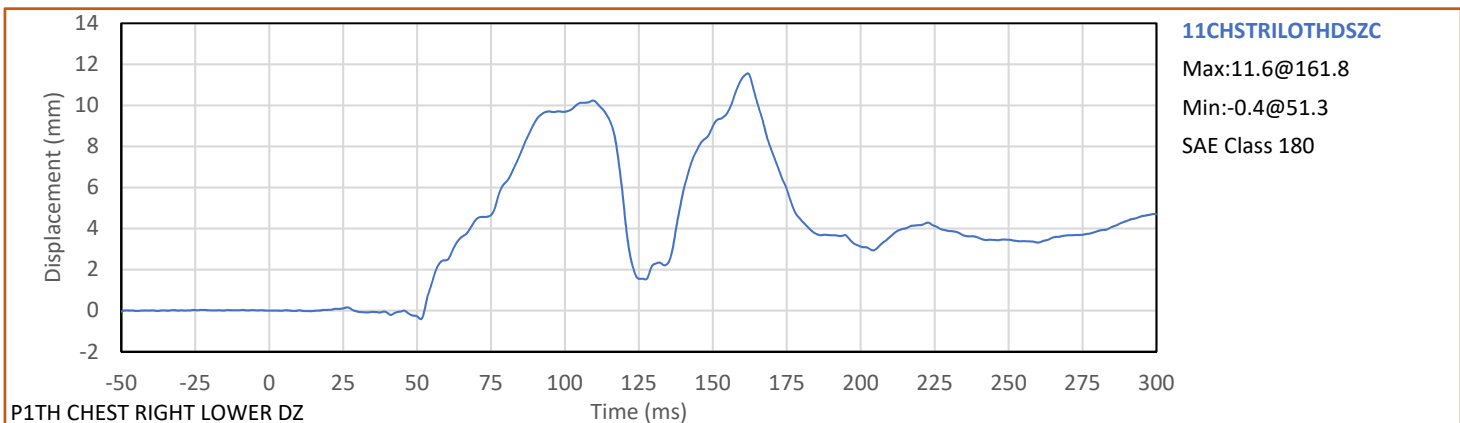
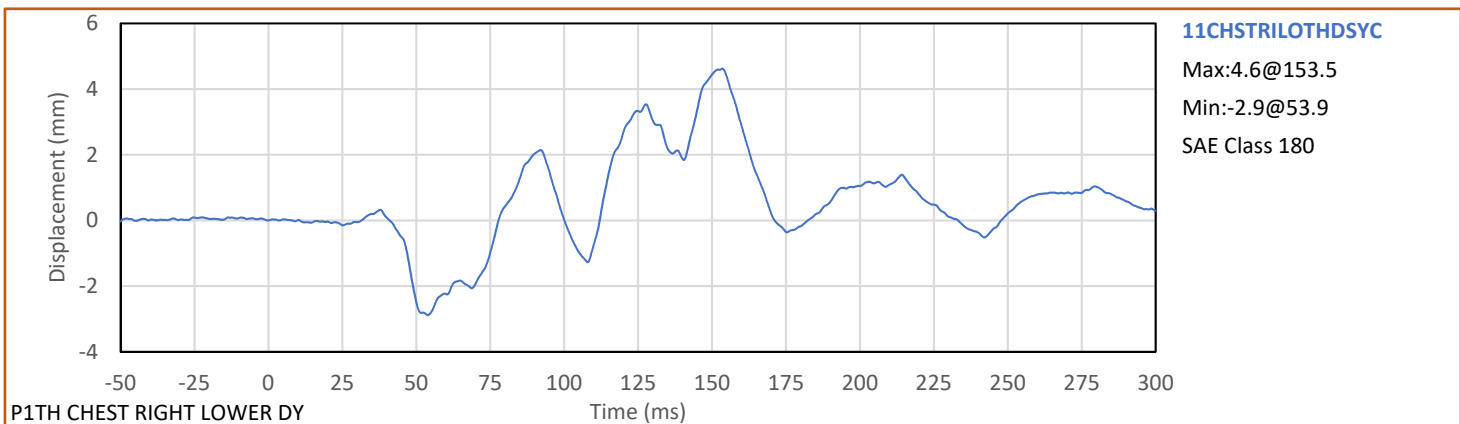
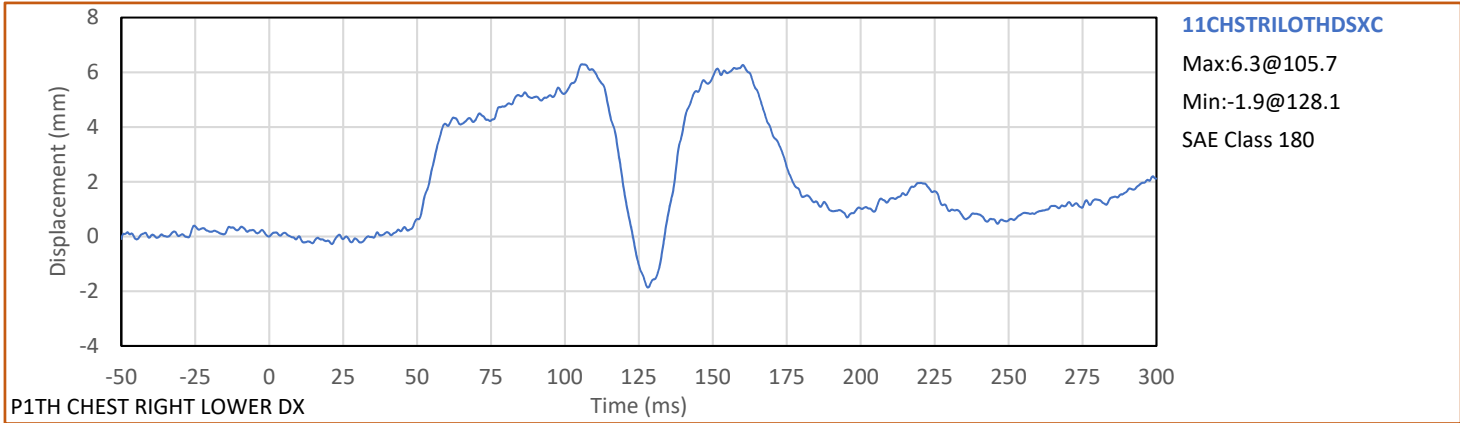
NHTSA No.: R20205415
Test Date: 1/15/2021

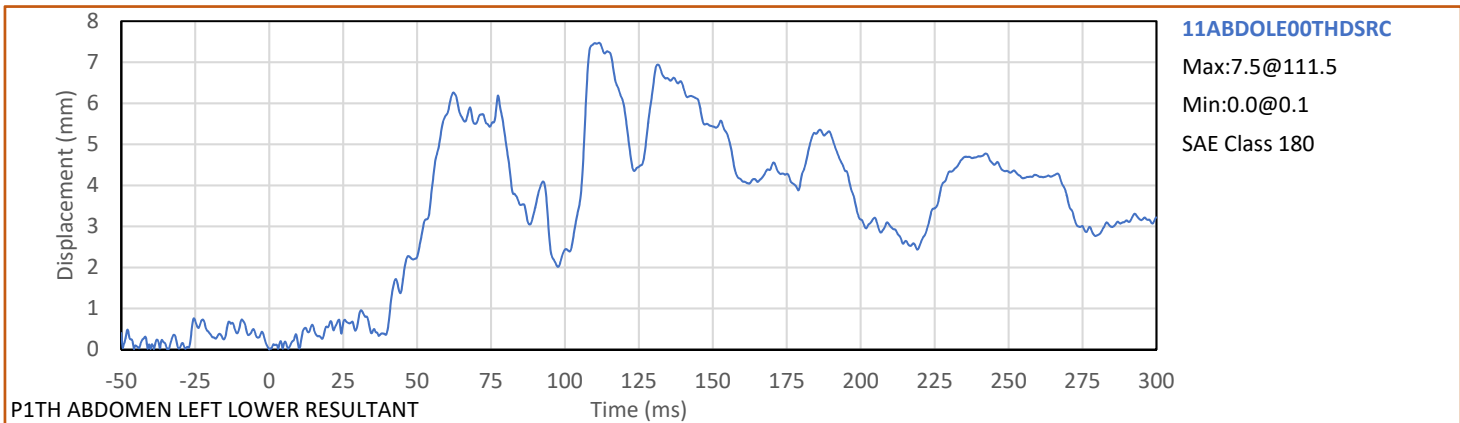
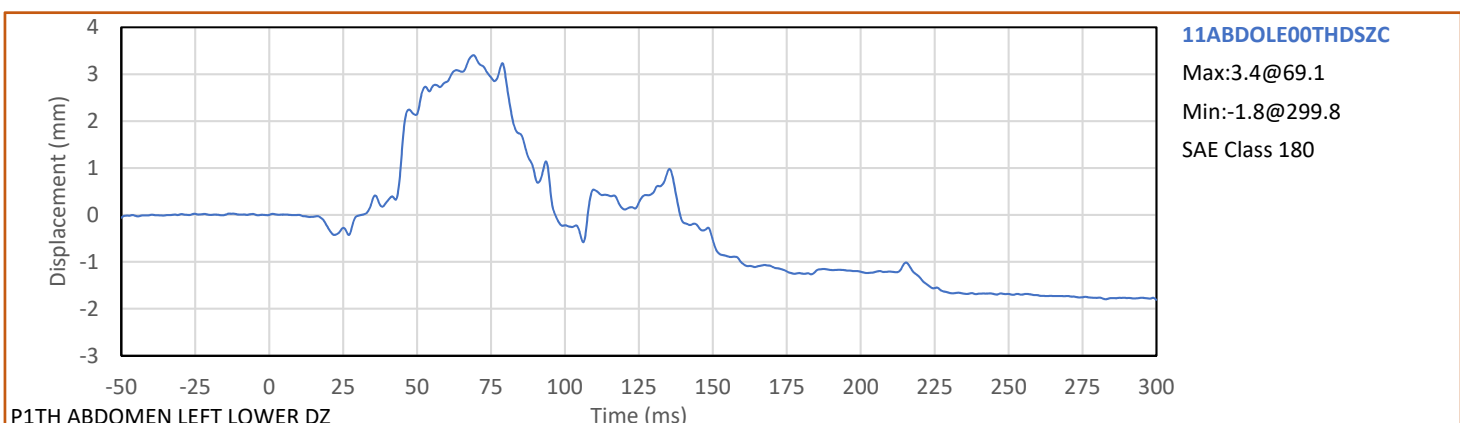
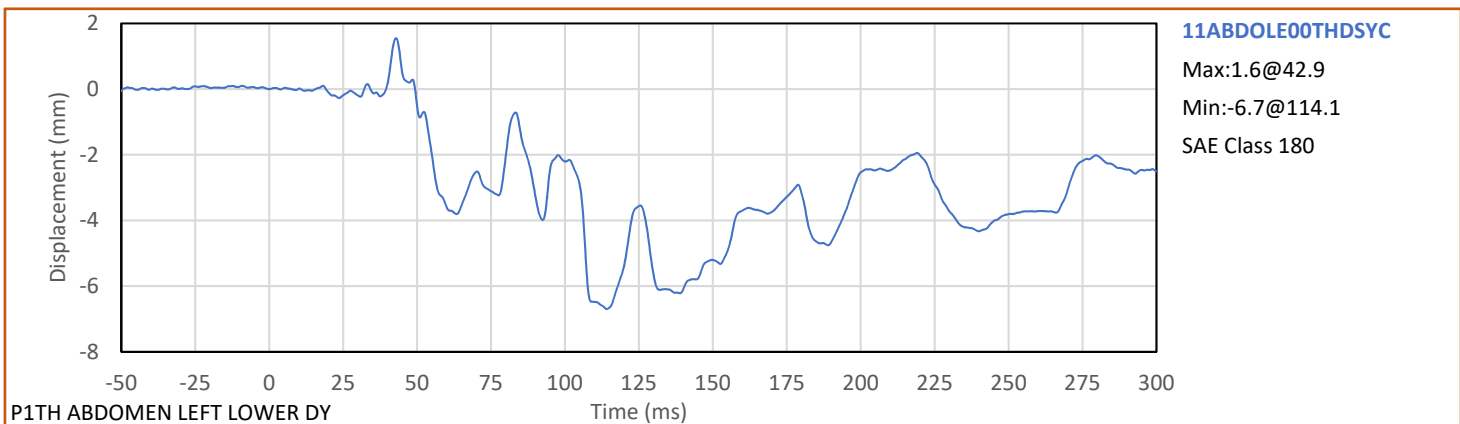
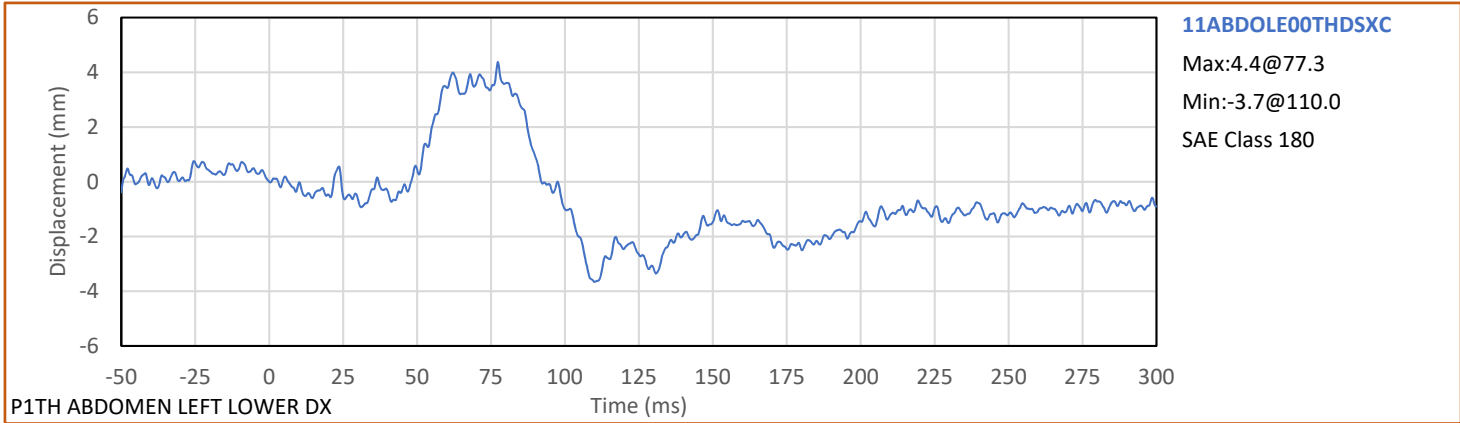


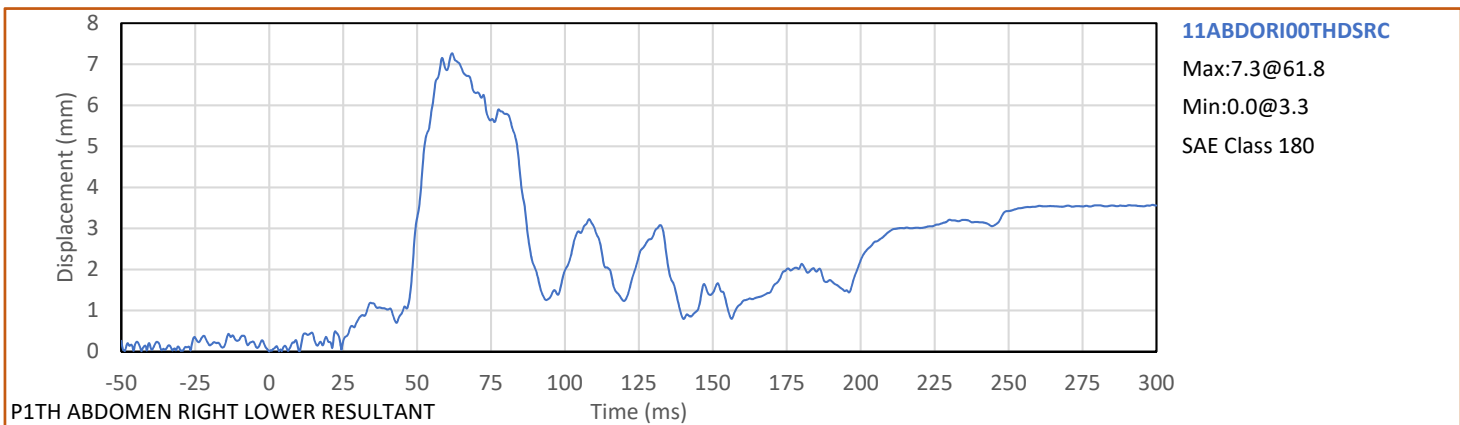
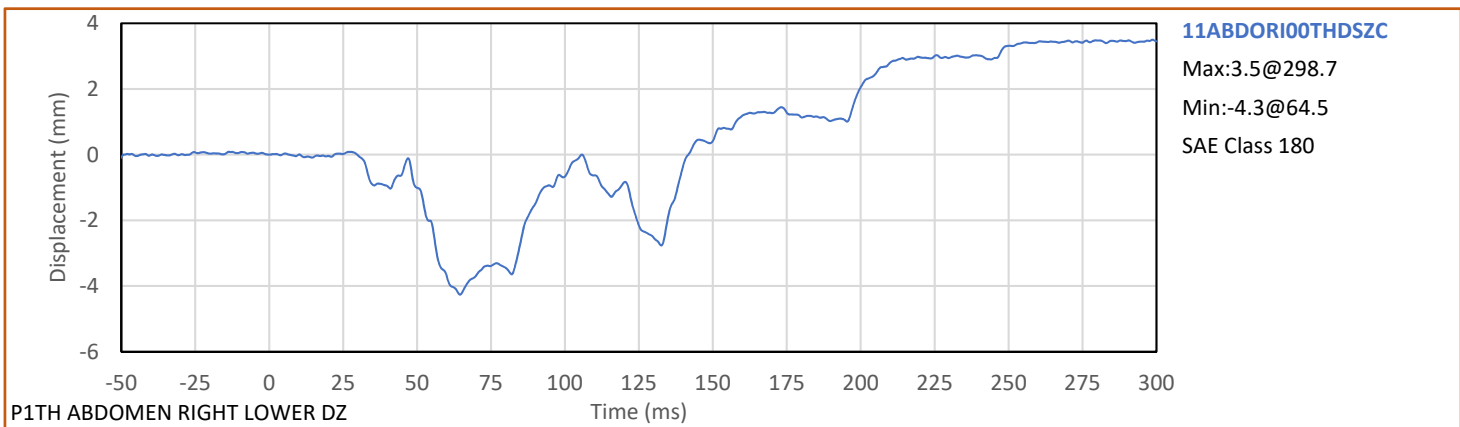
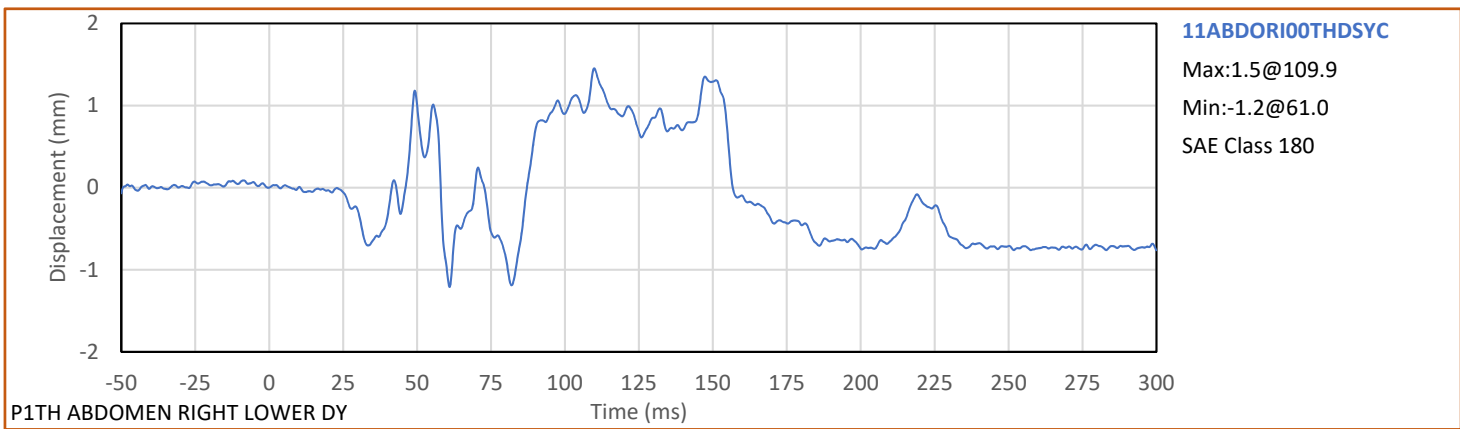
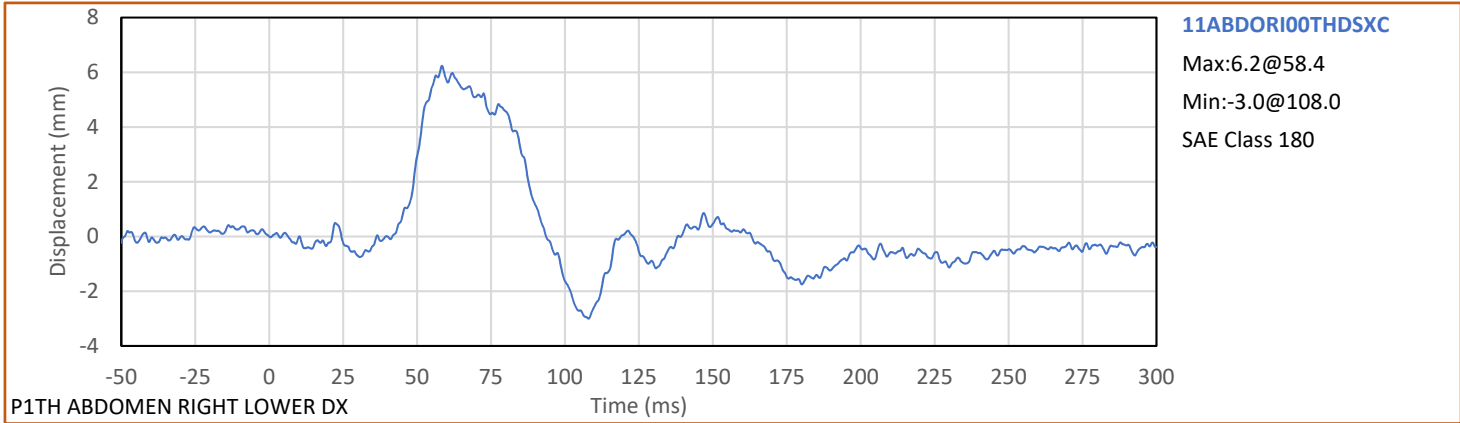


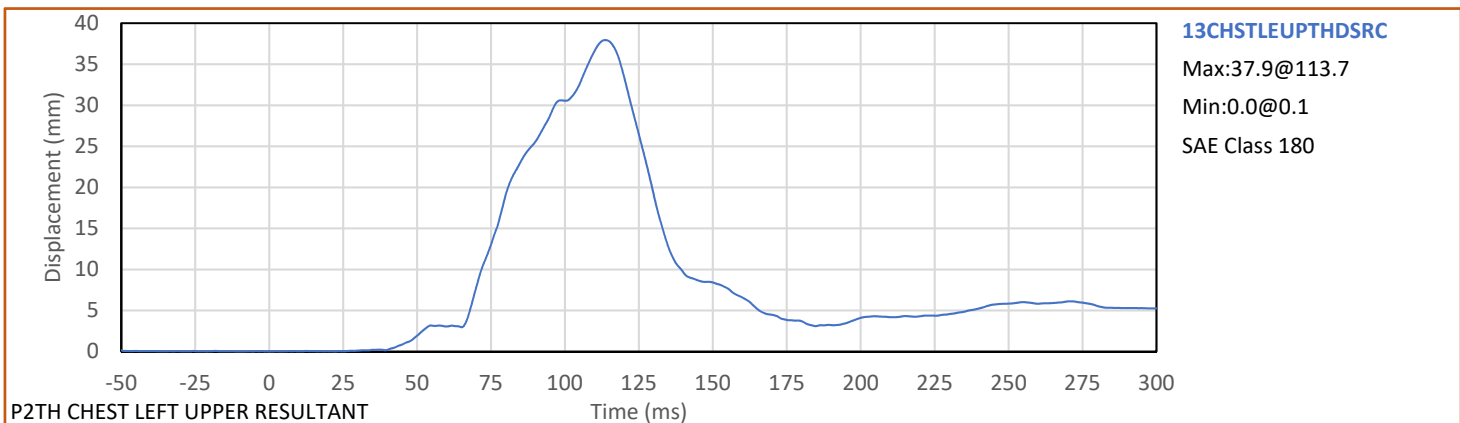
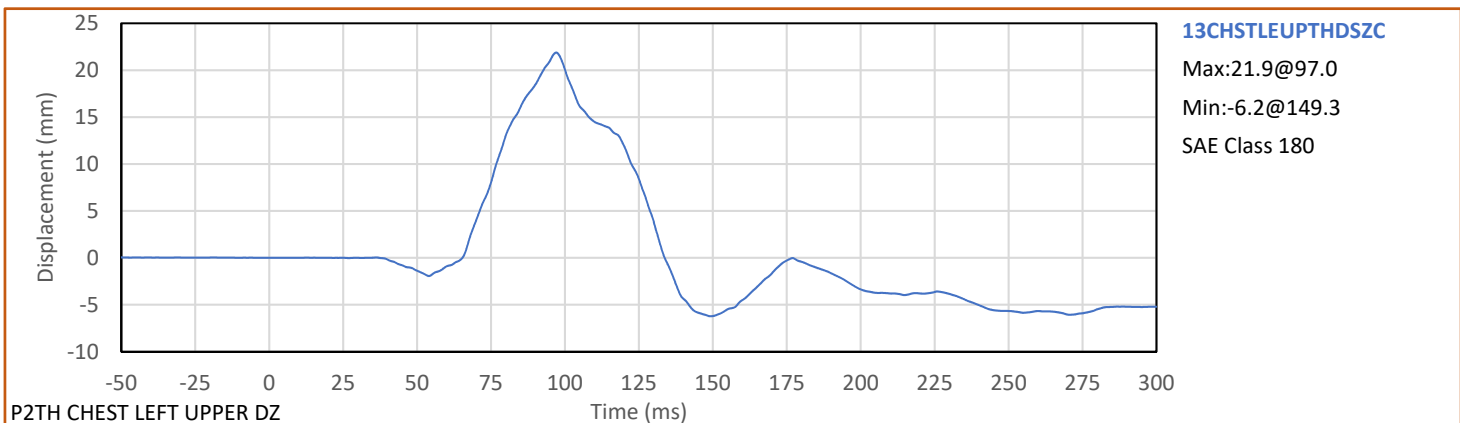
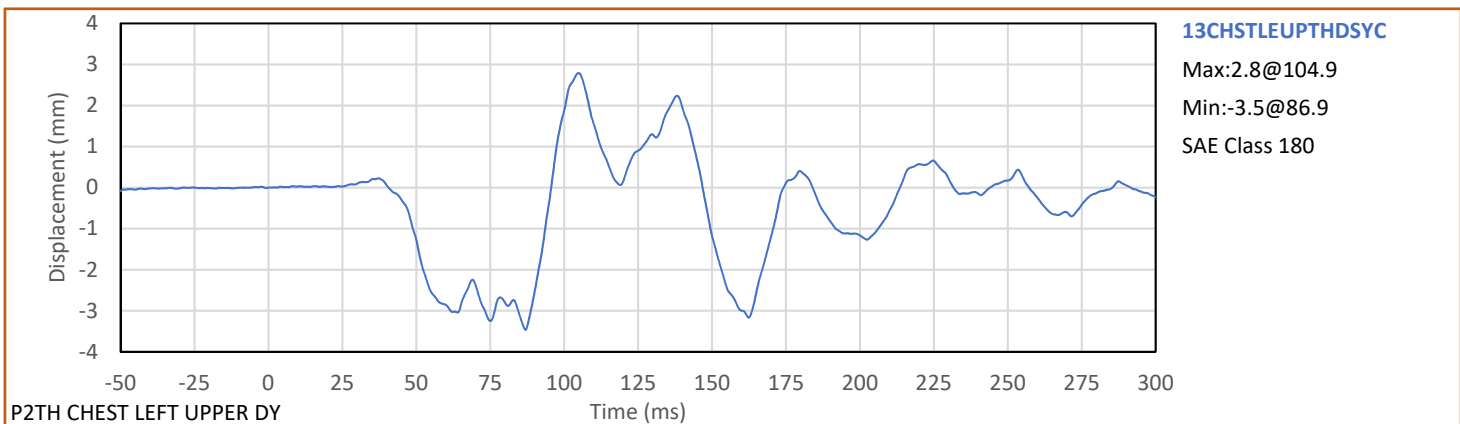
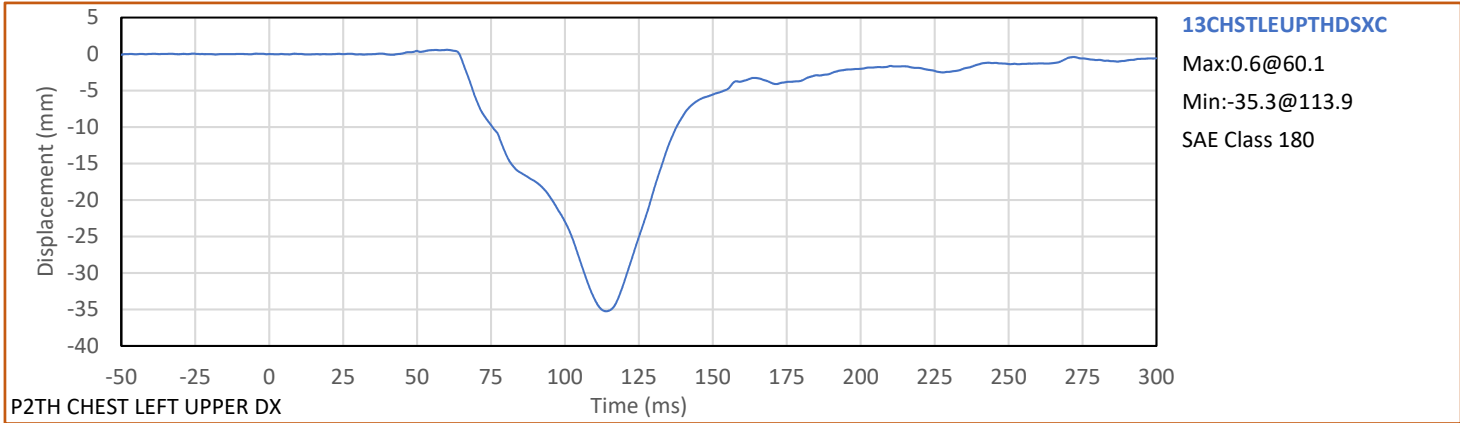


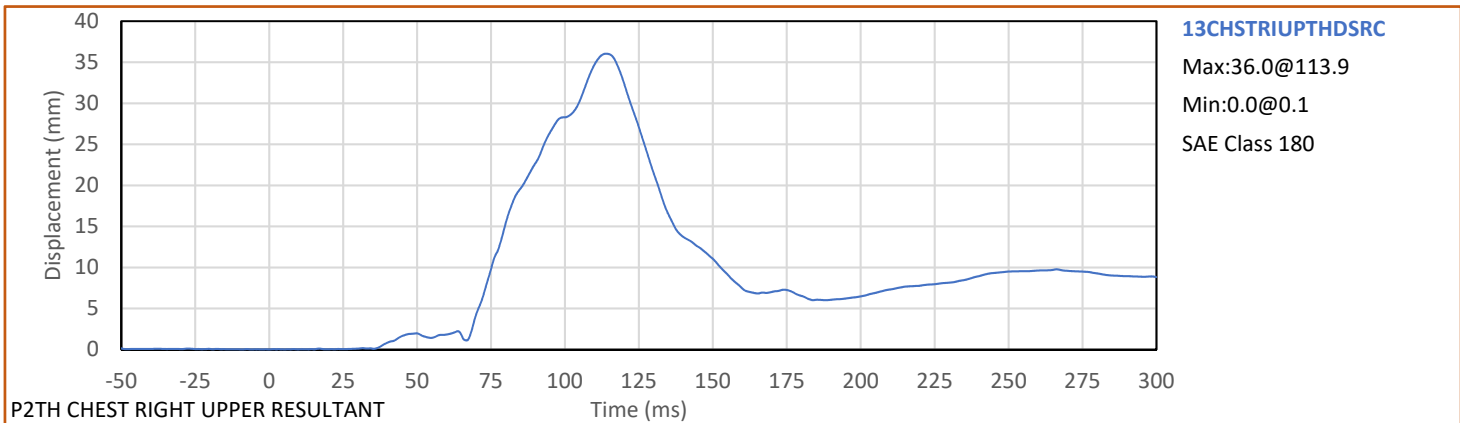
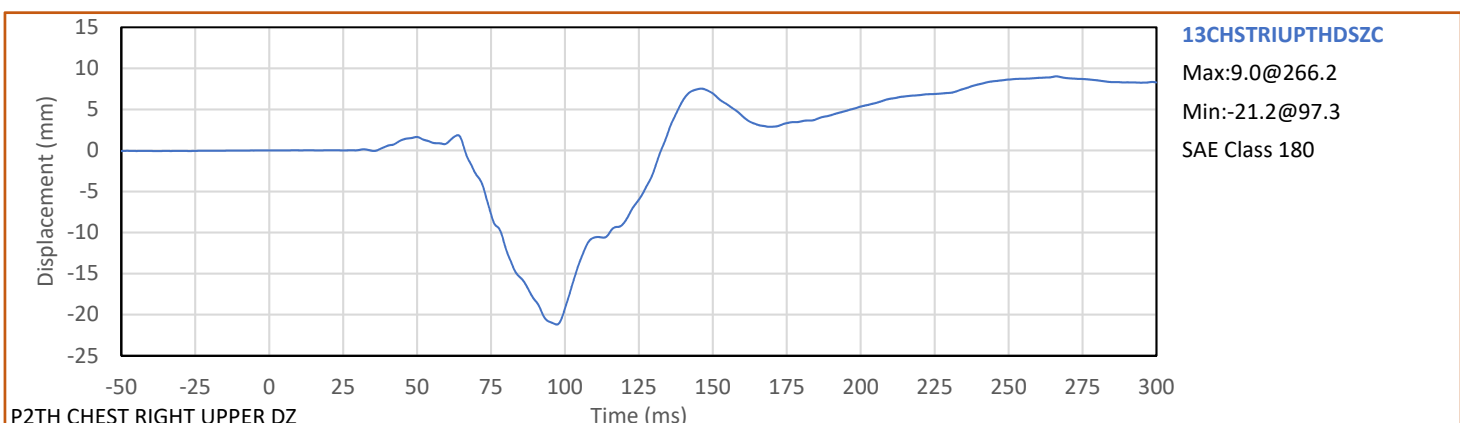
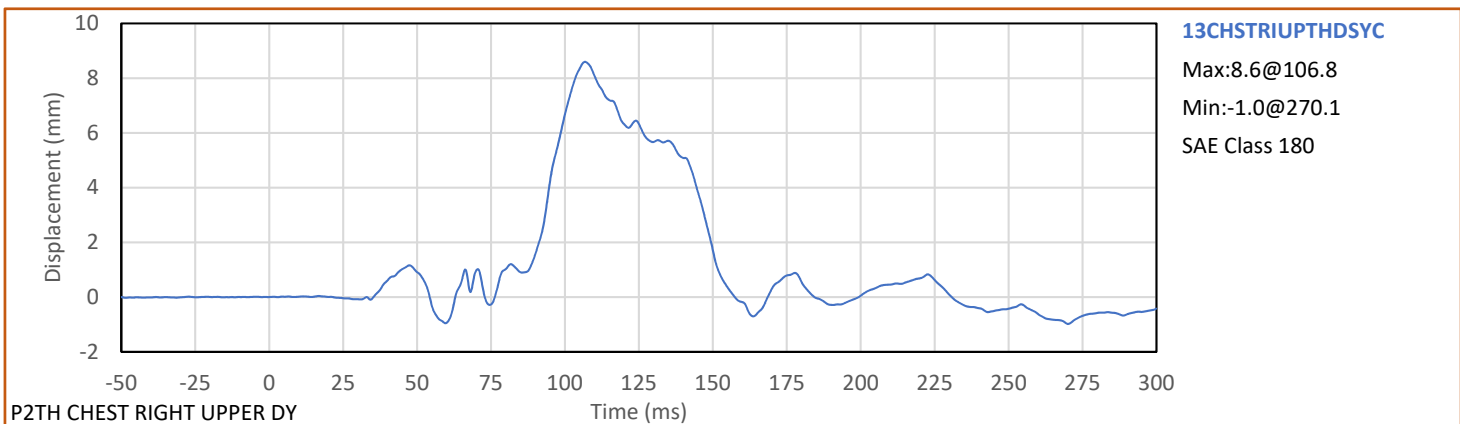
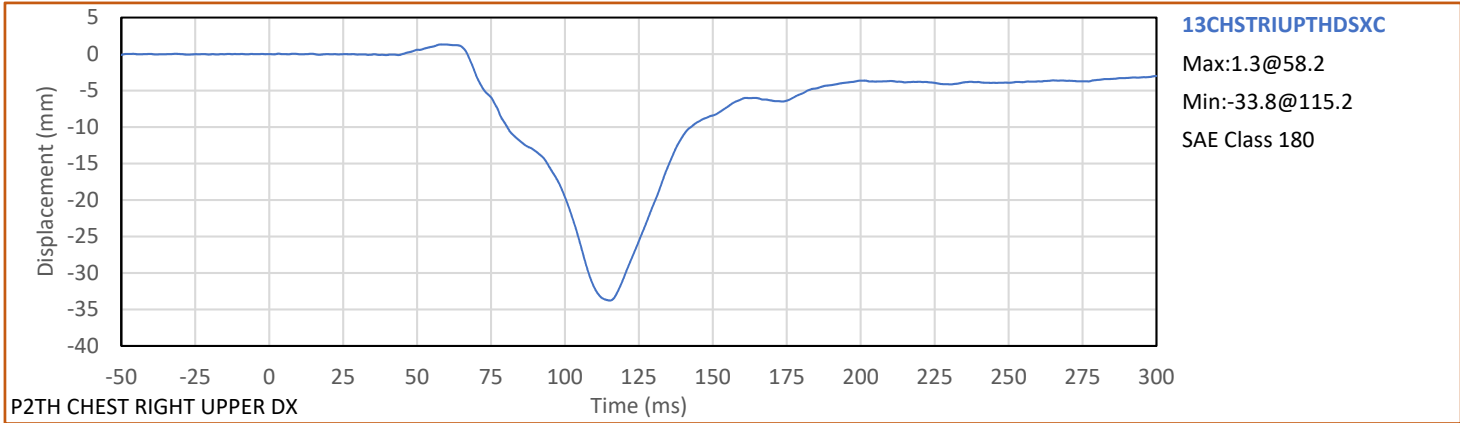


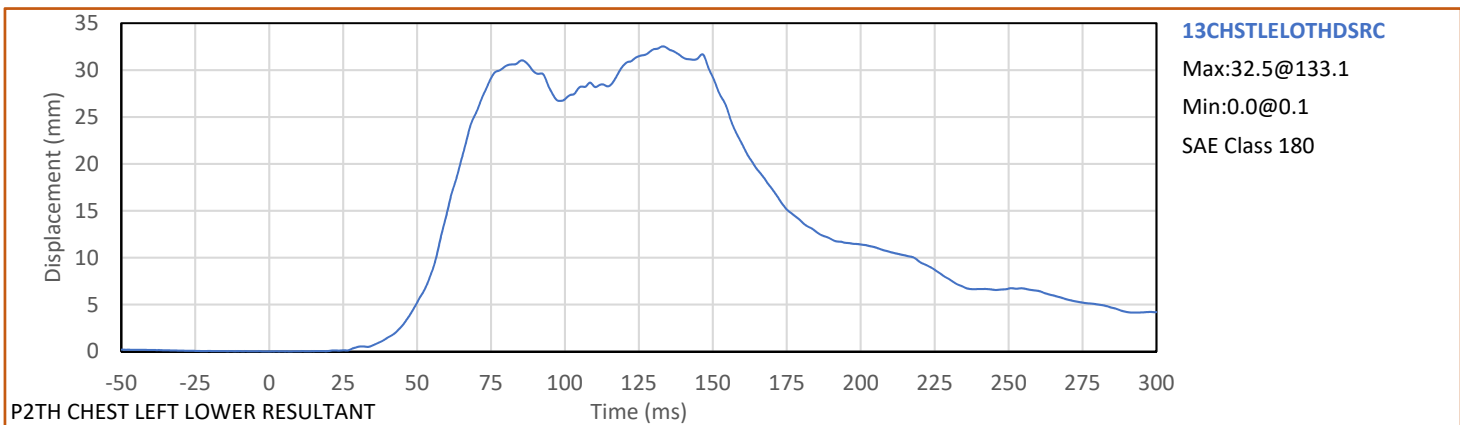
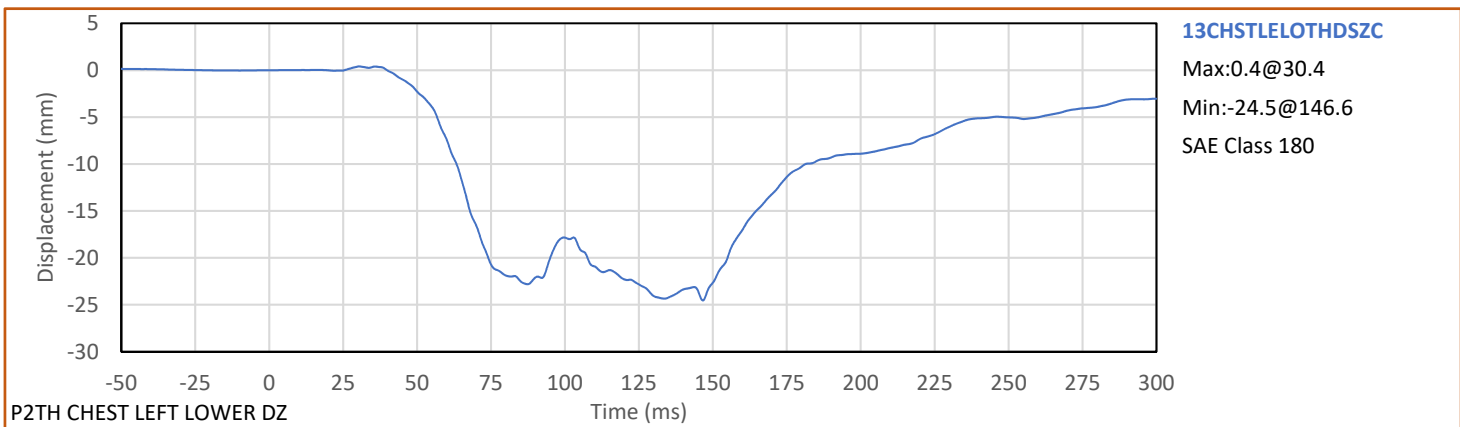
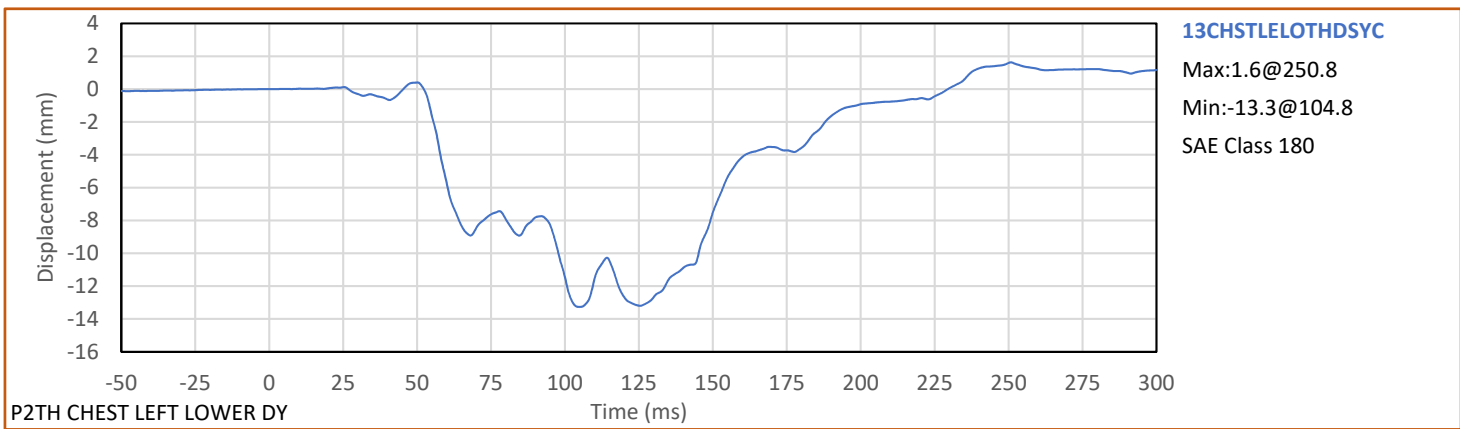
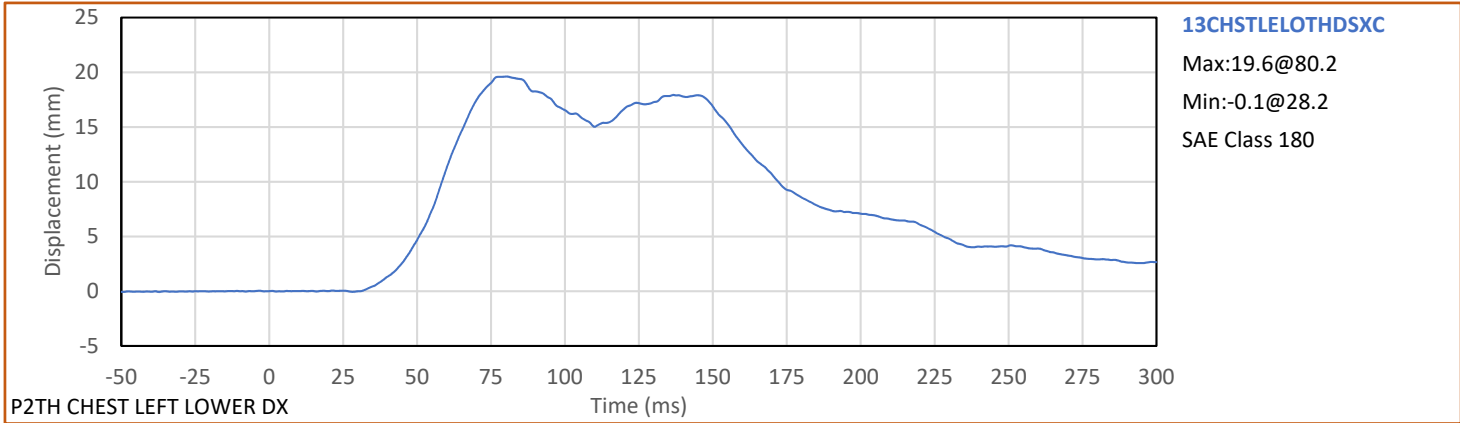


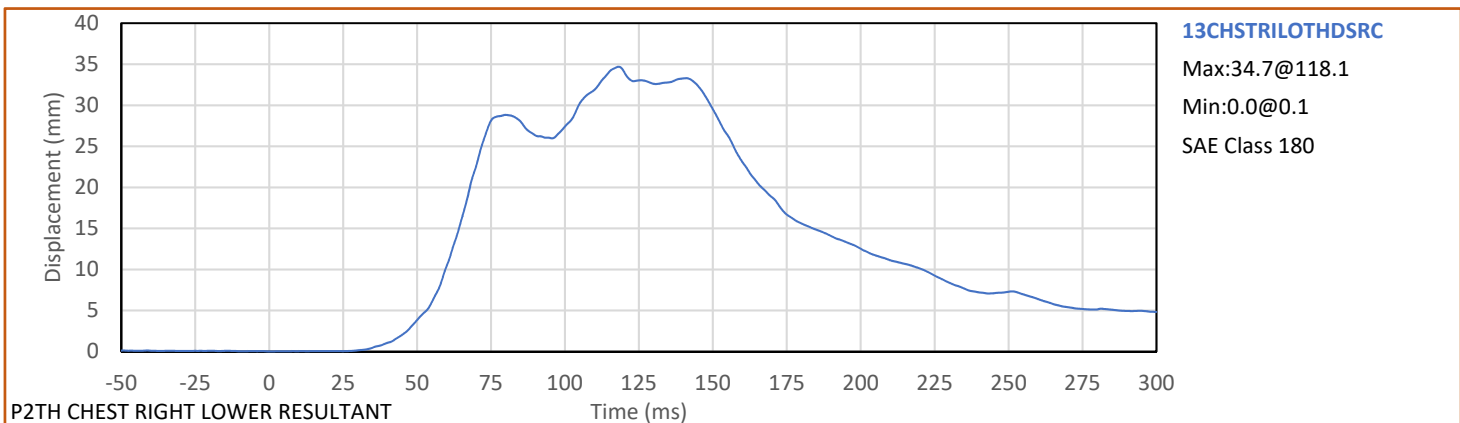
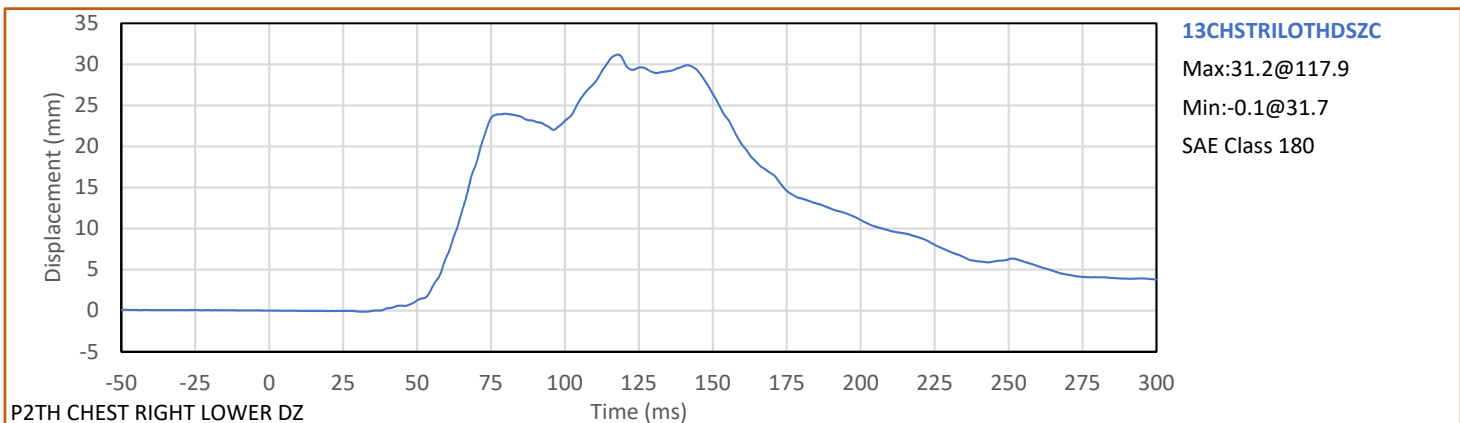
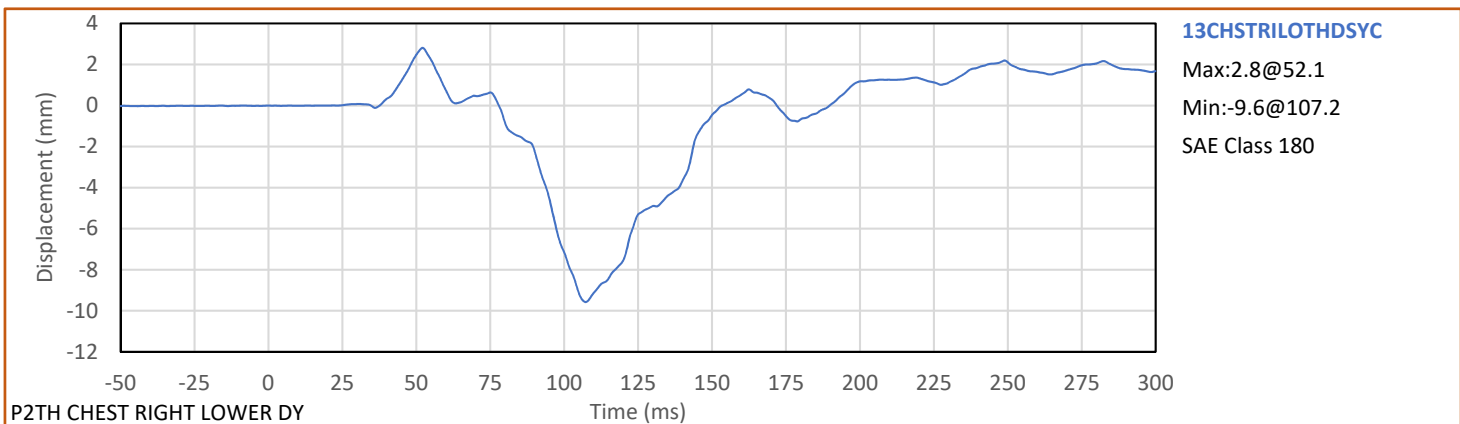
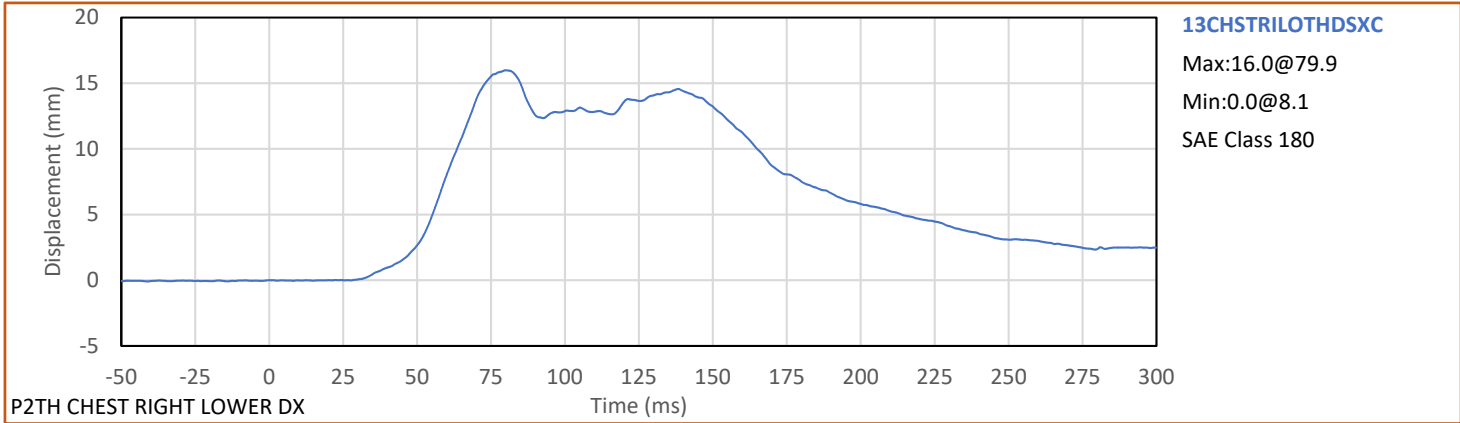


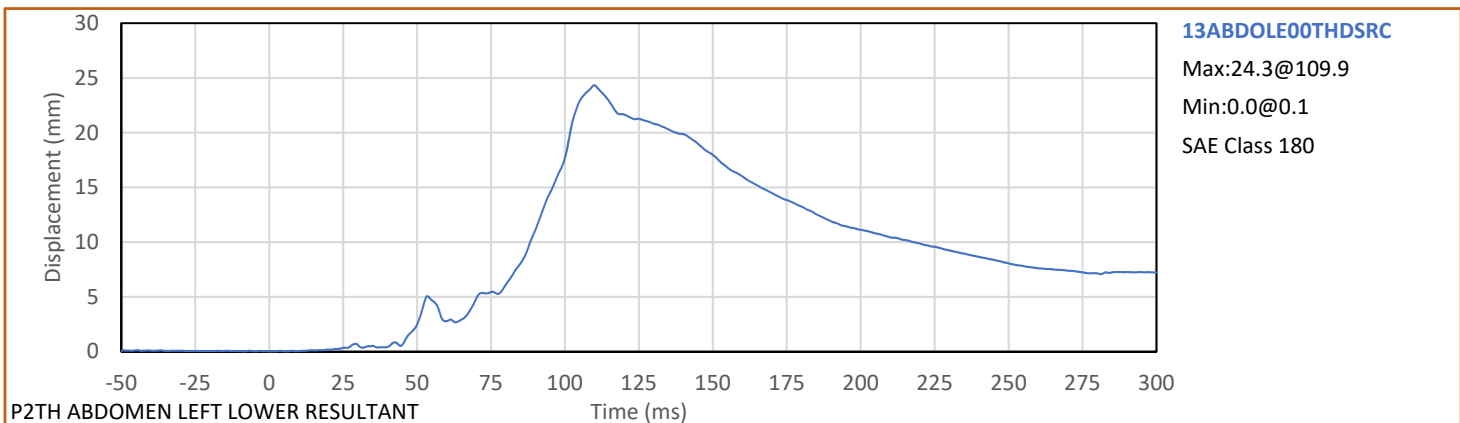
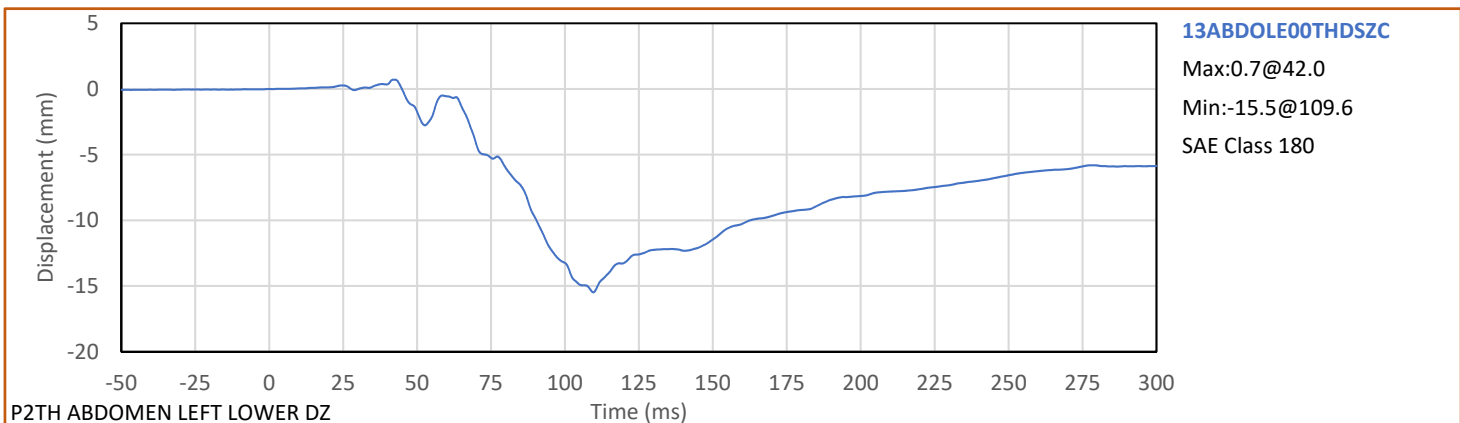
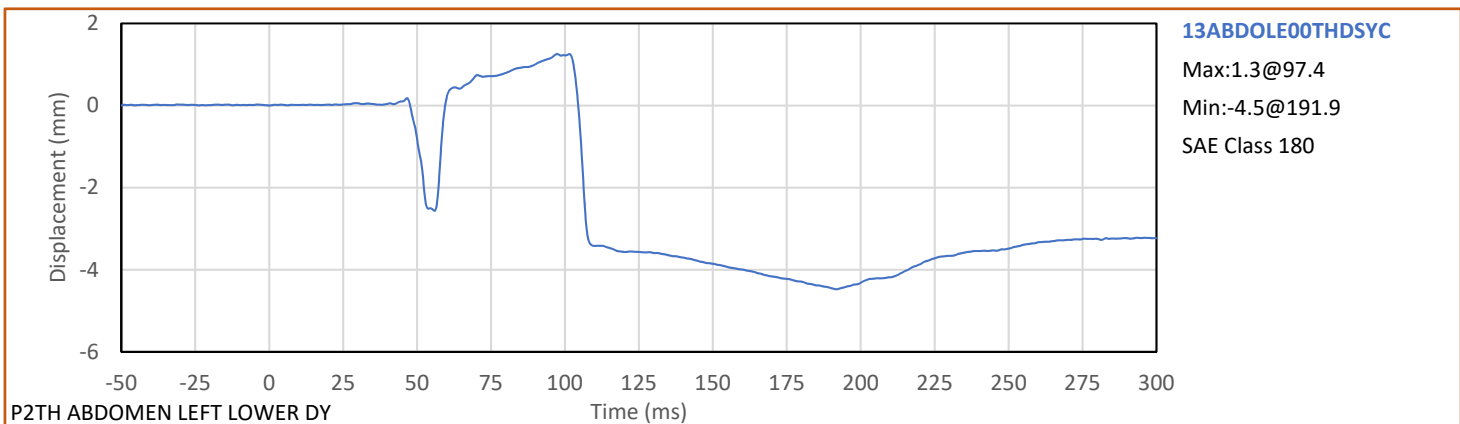
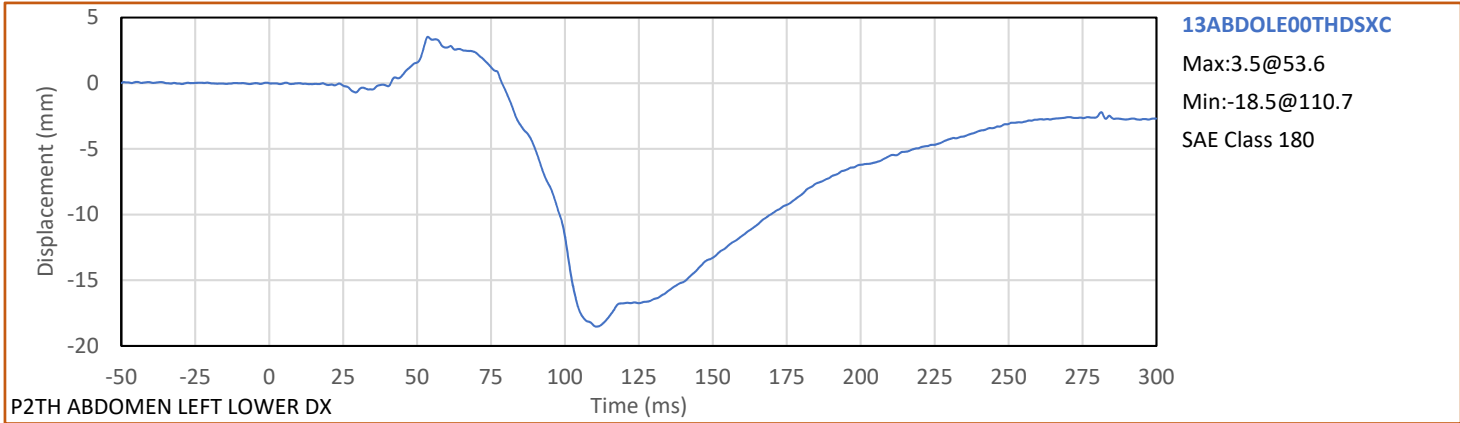


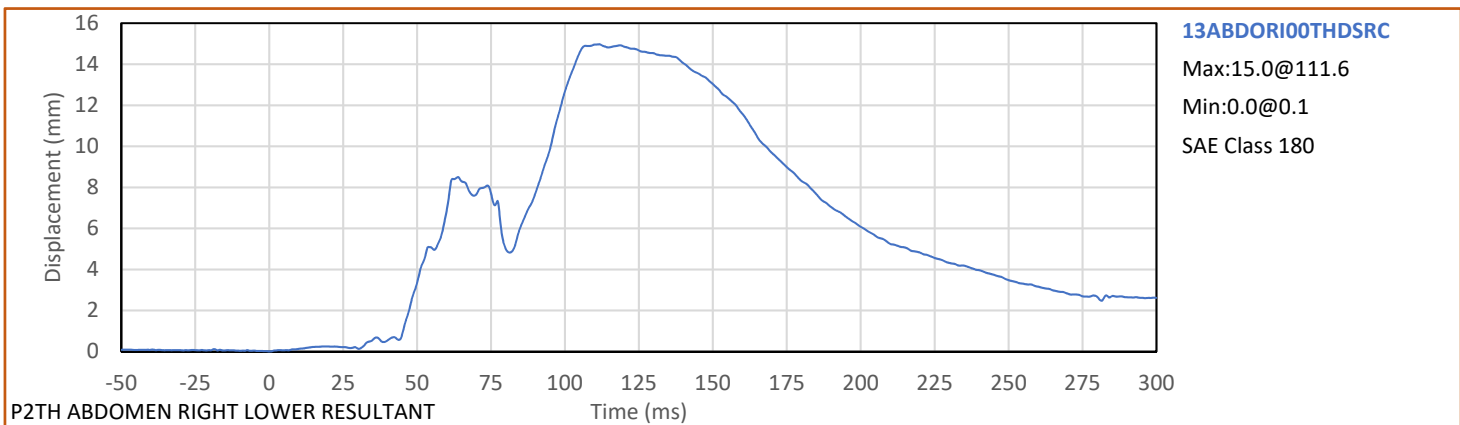
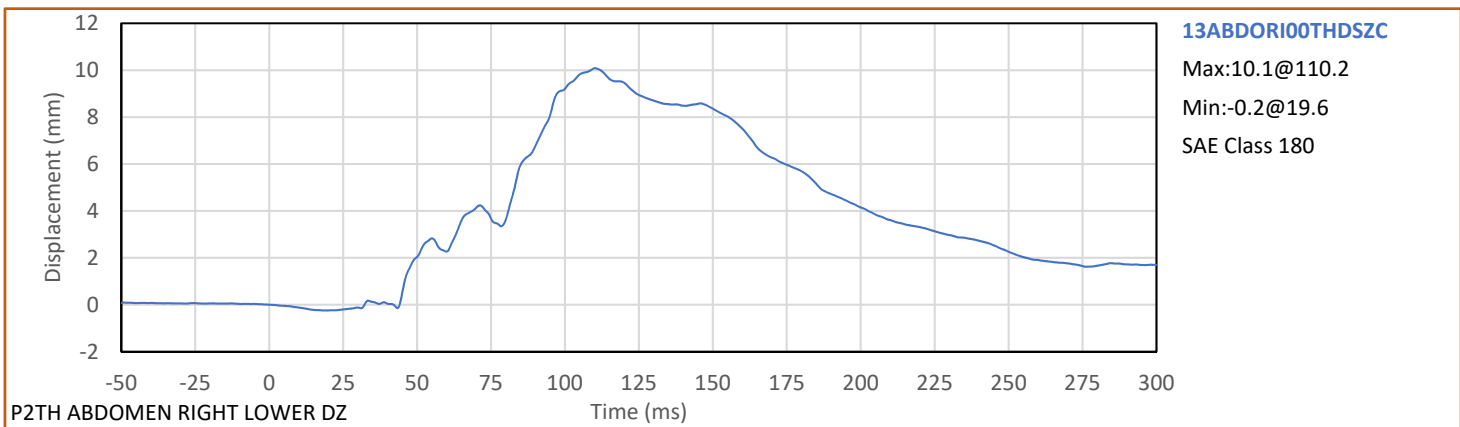
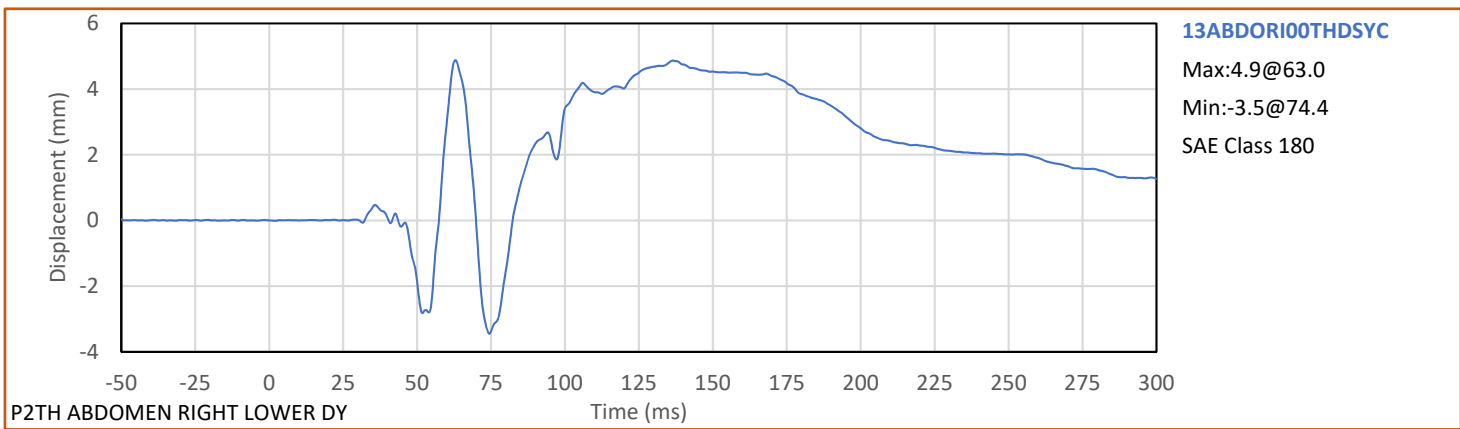
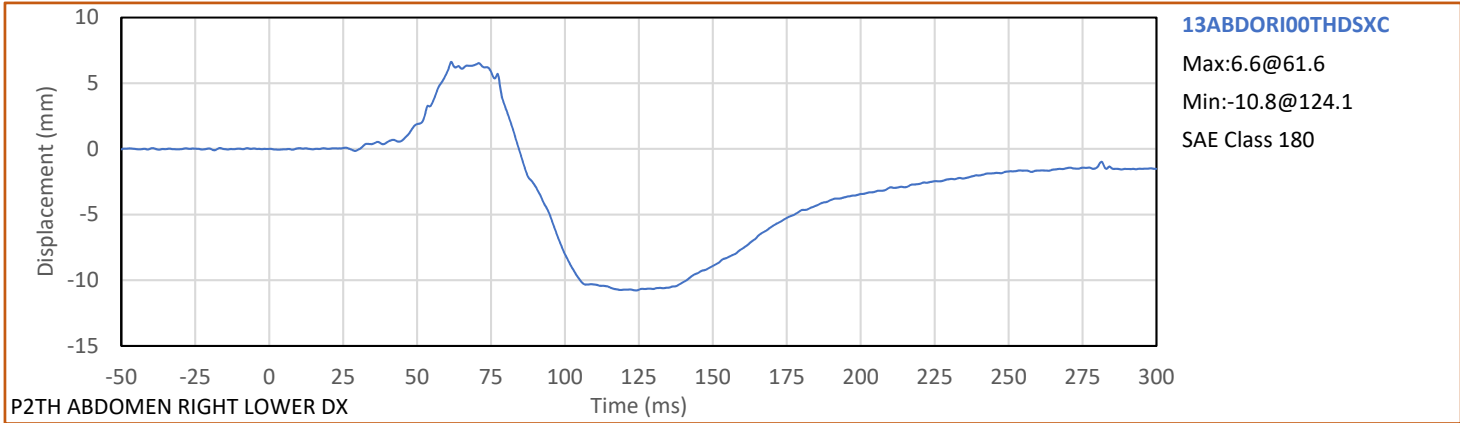


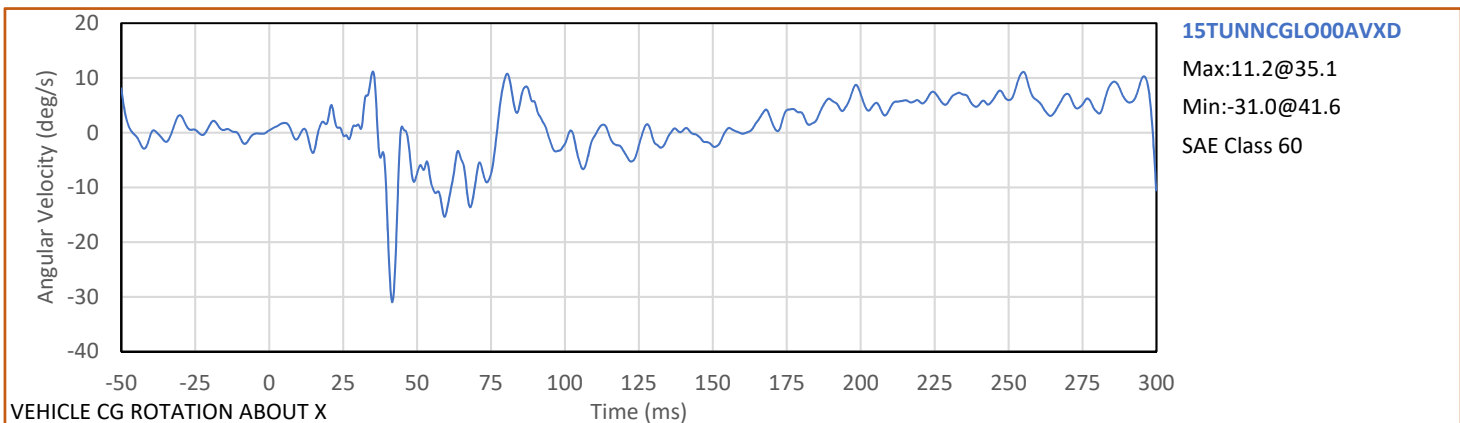
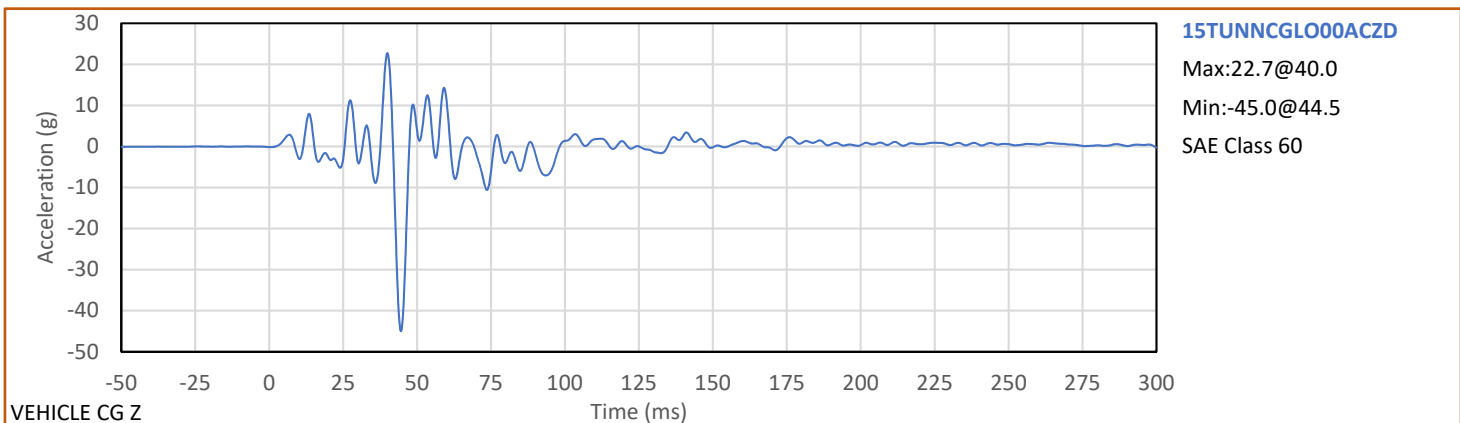
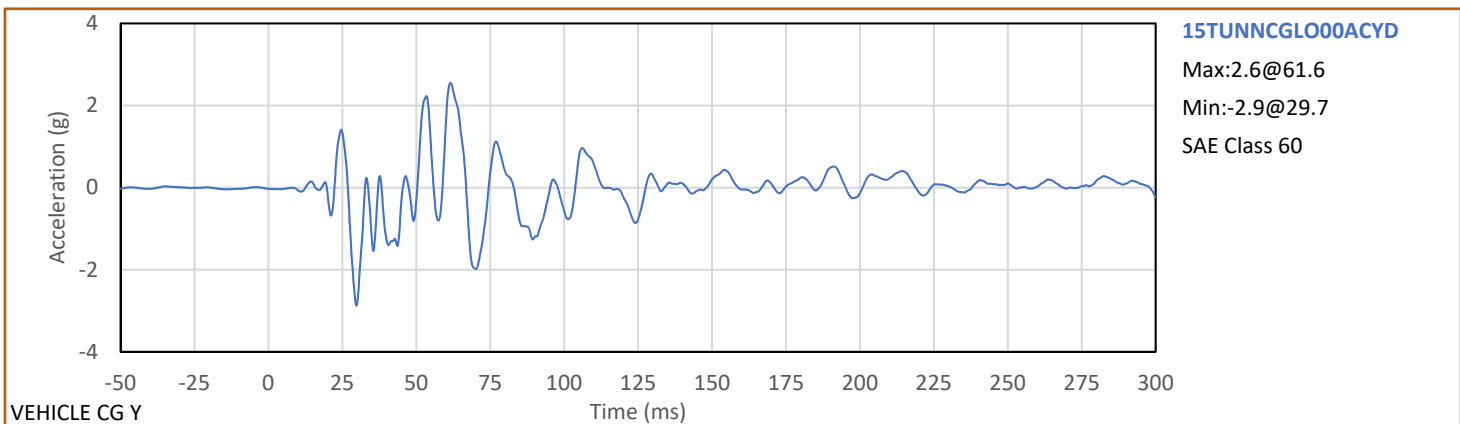
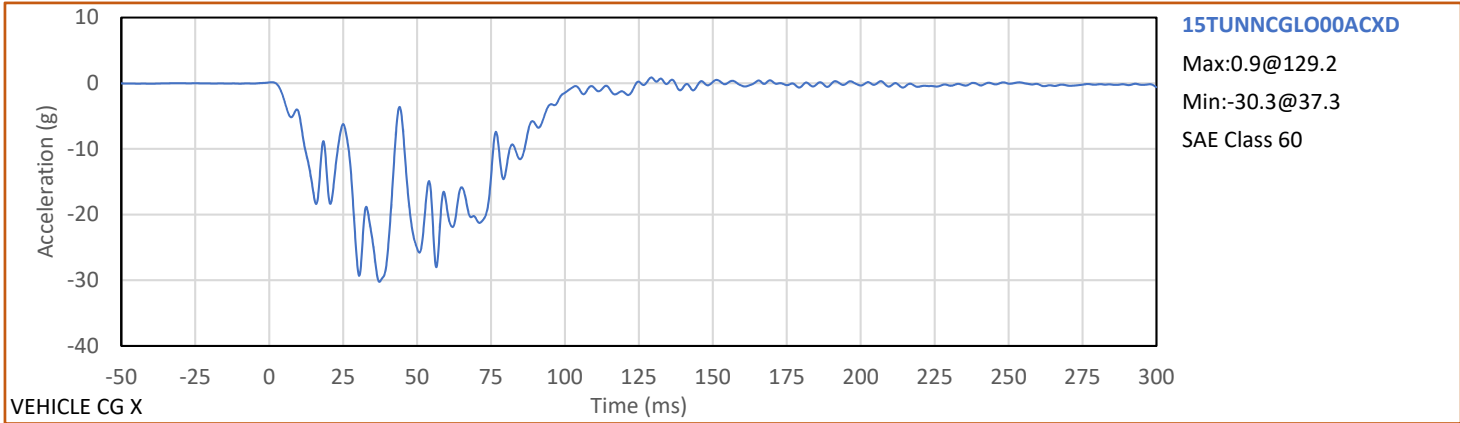


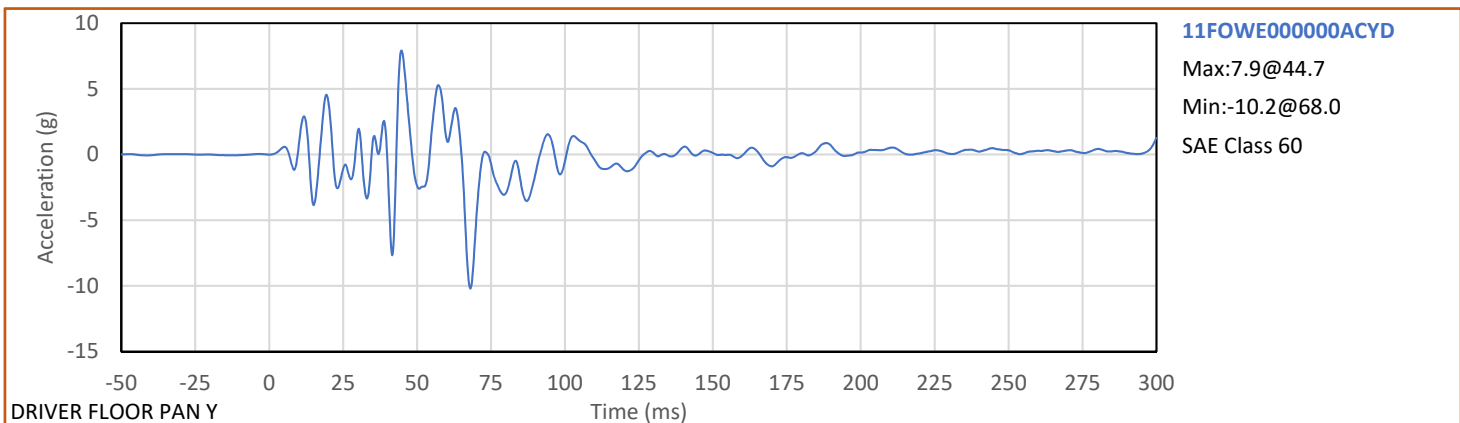
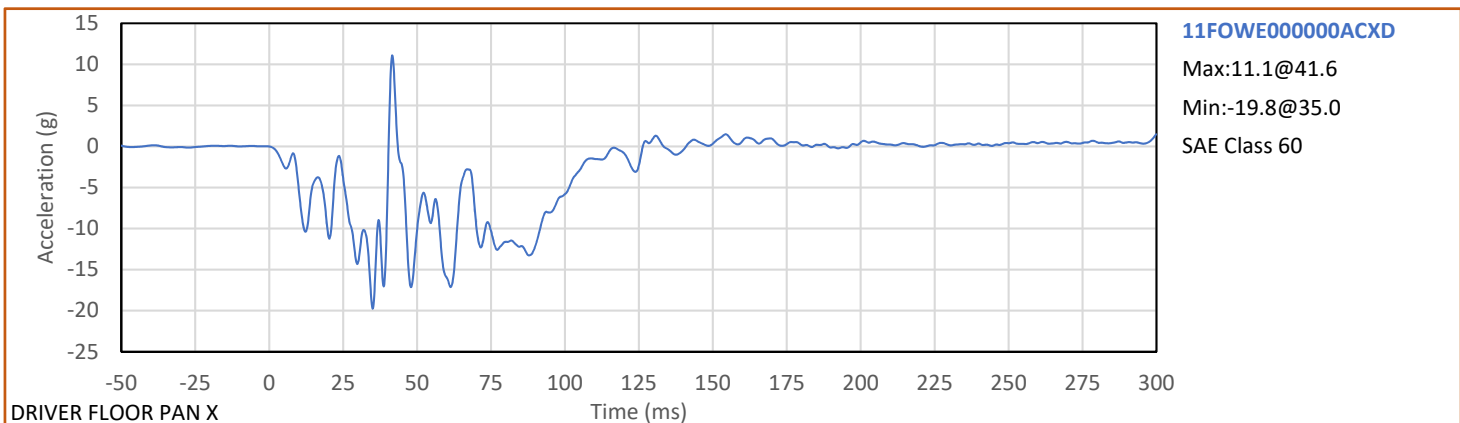
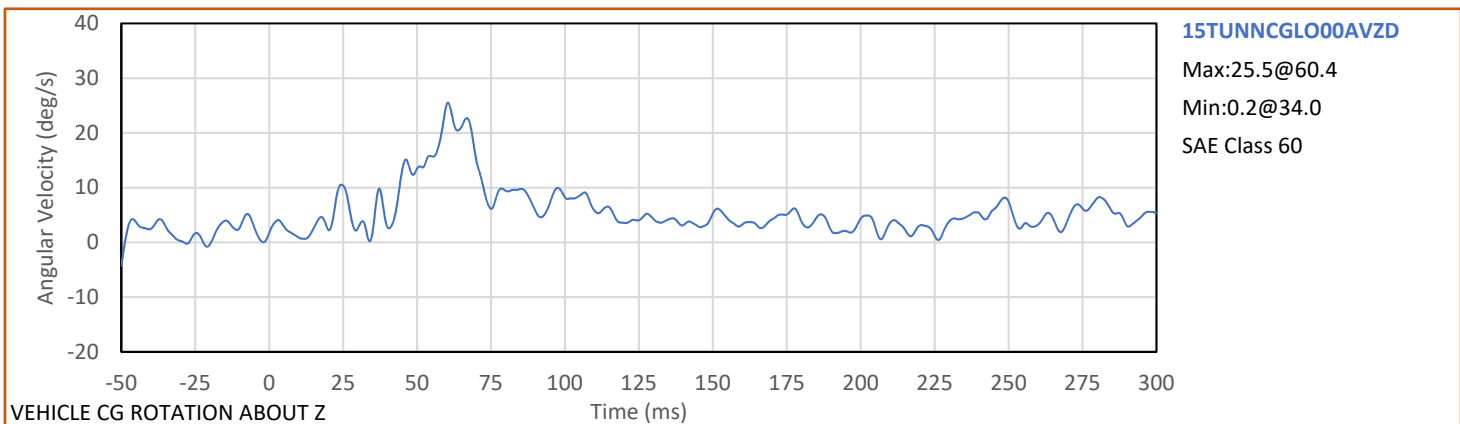
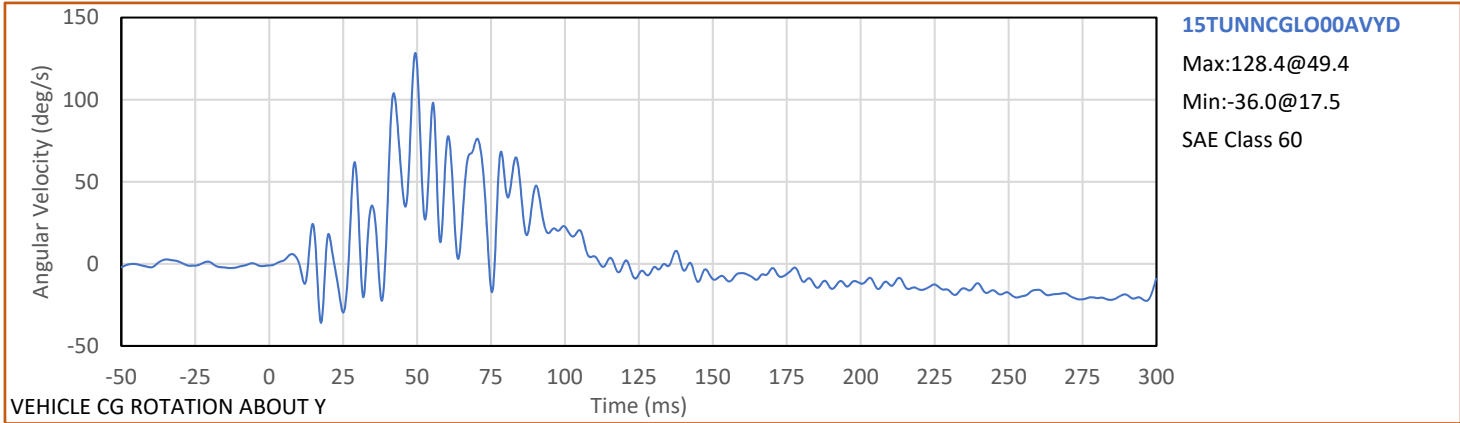


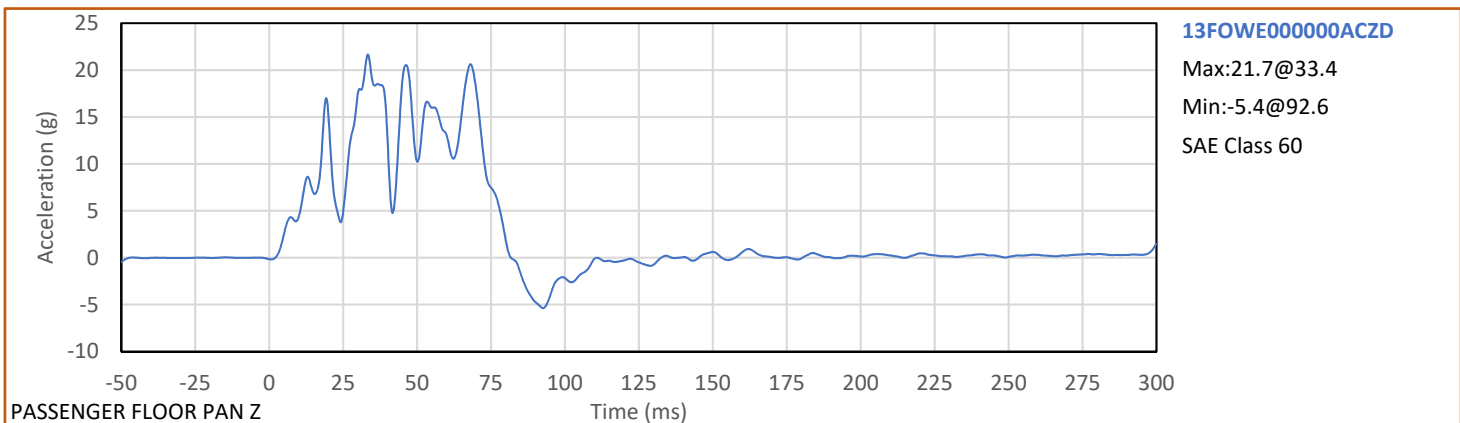
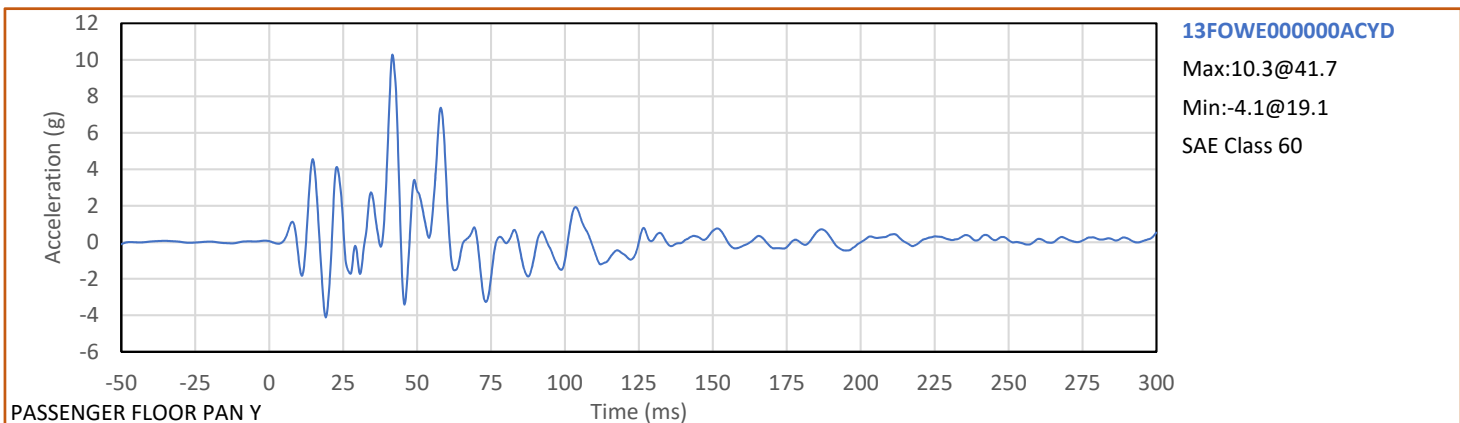
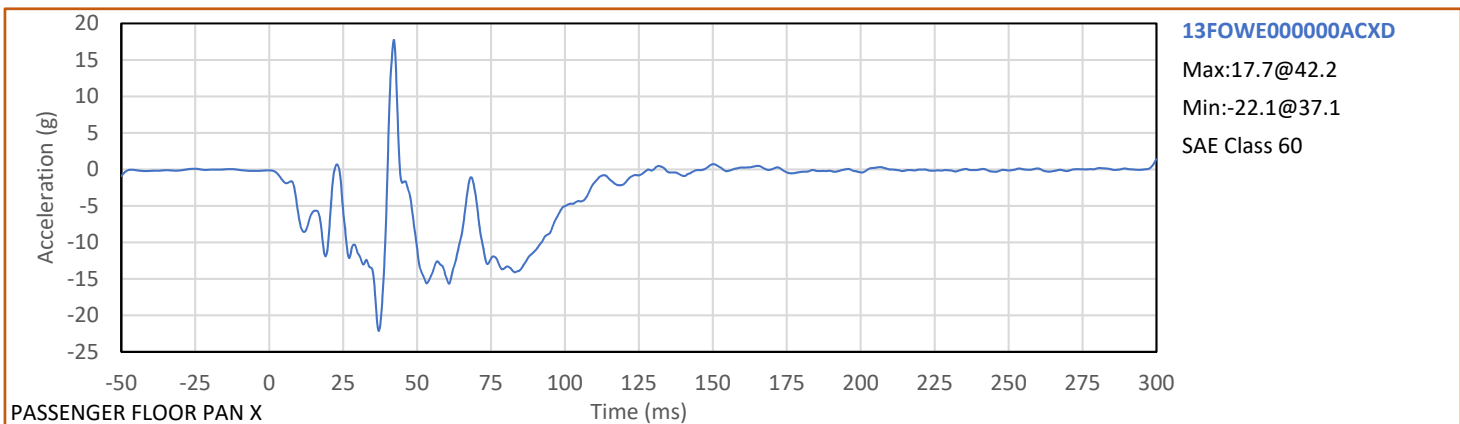
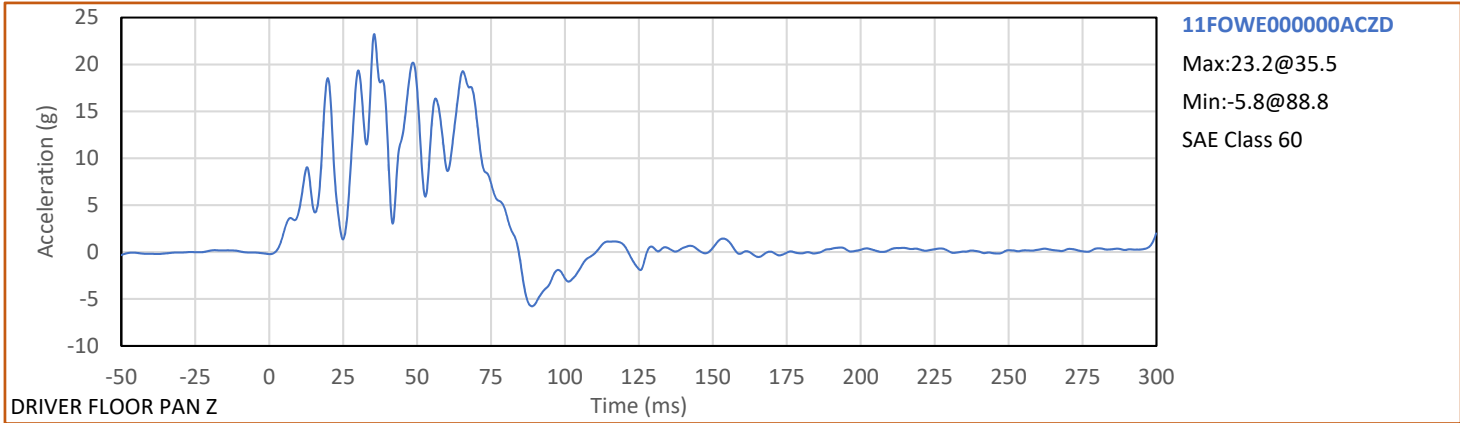


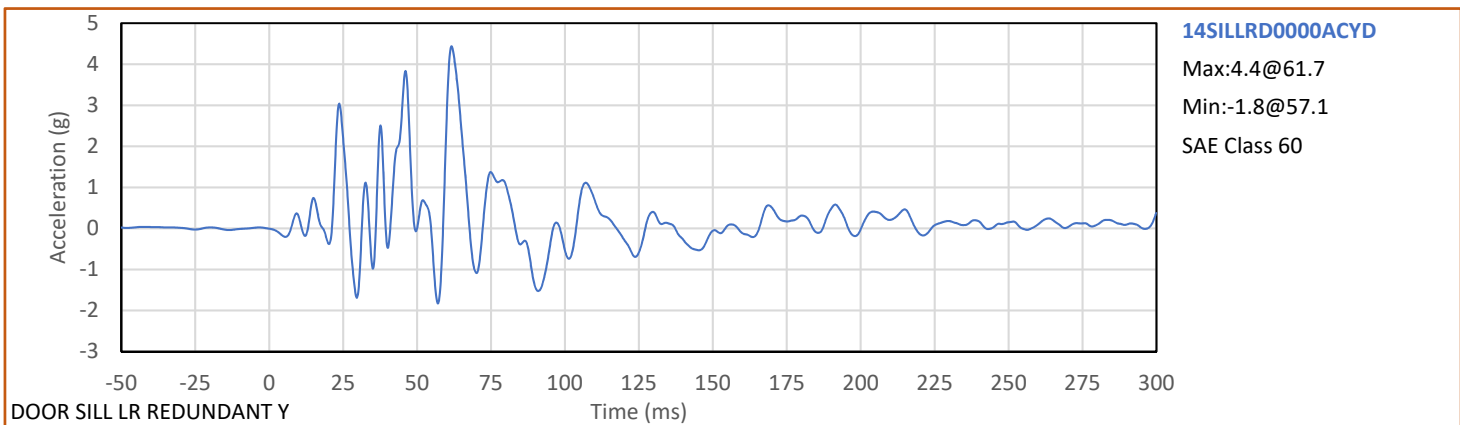
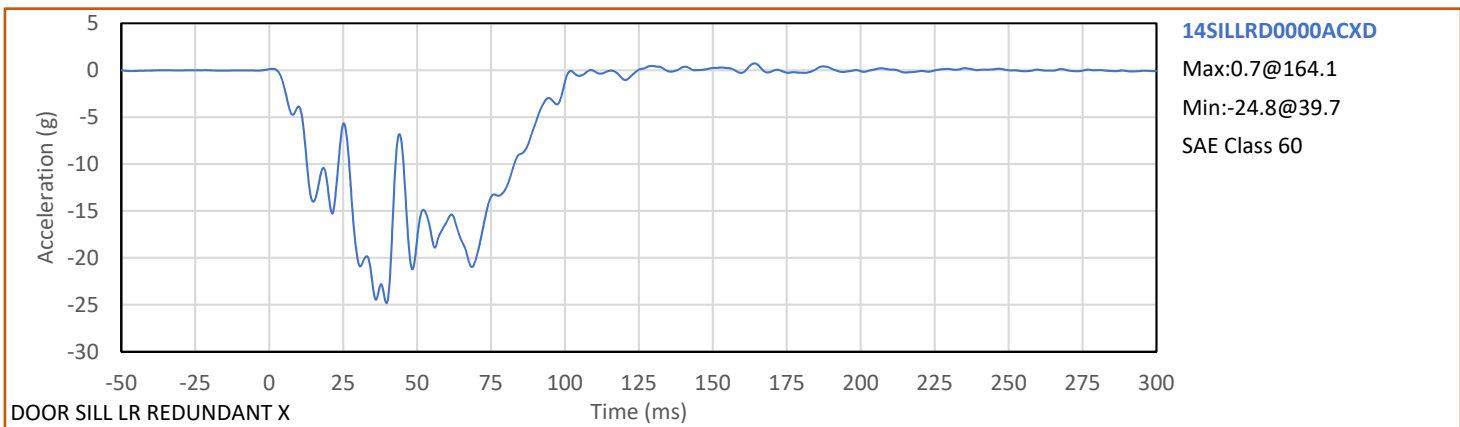
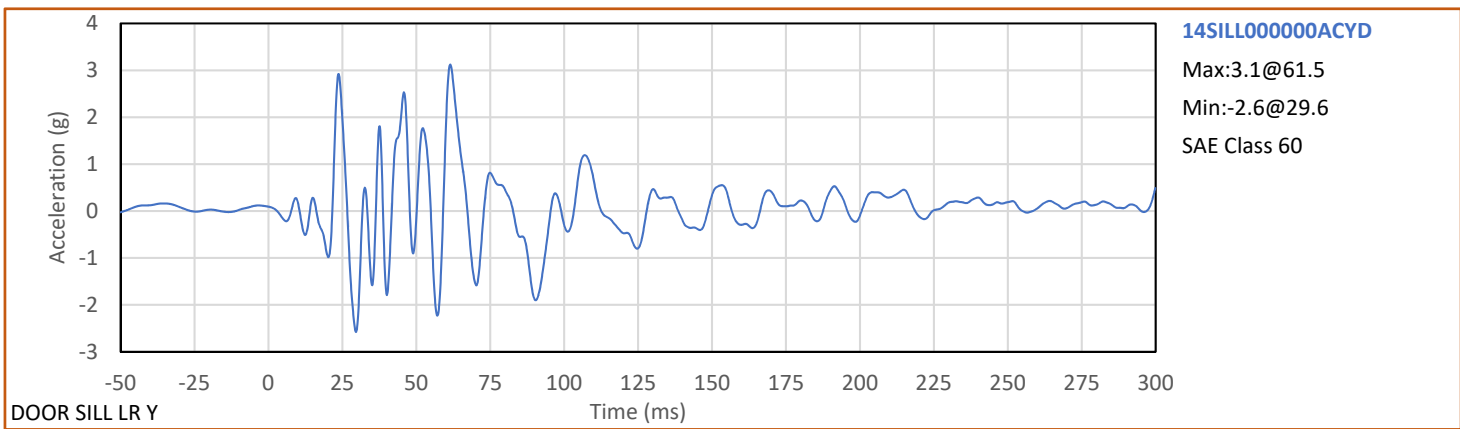
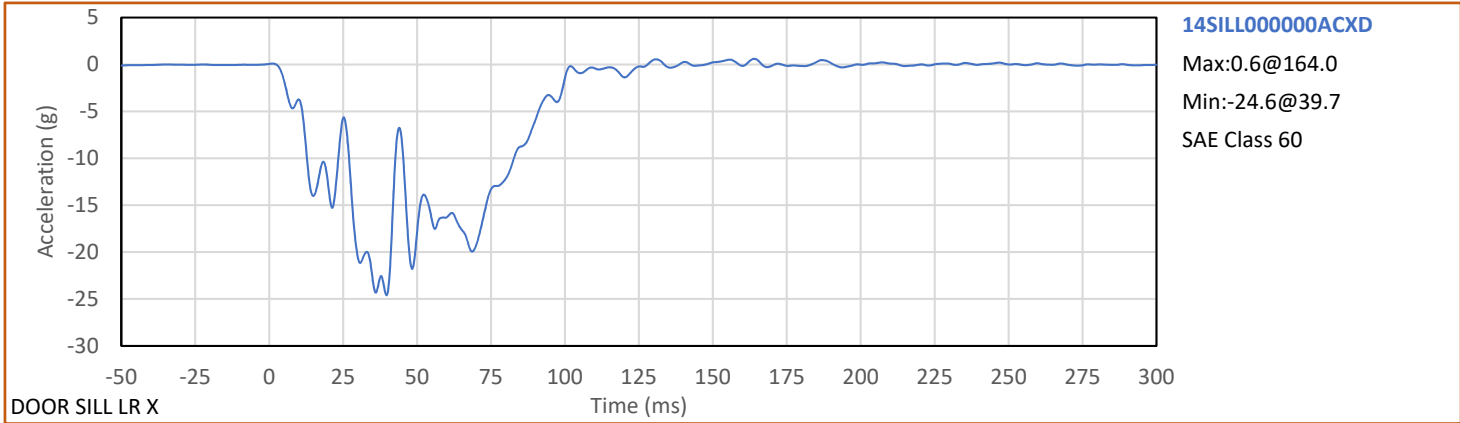


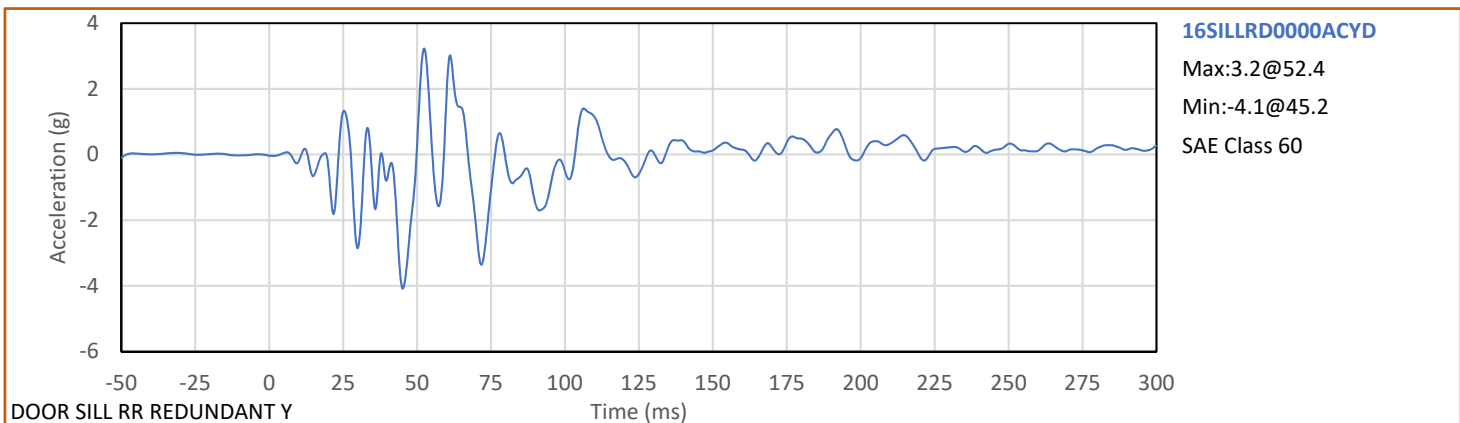
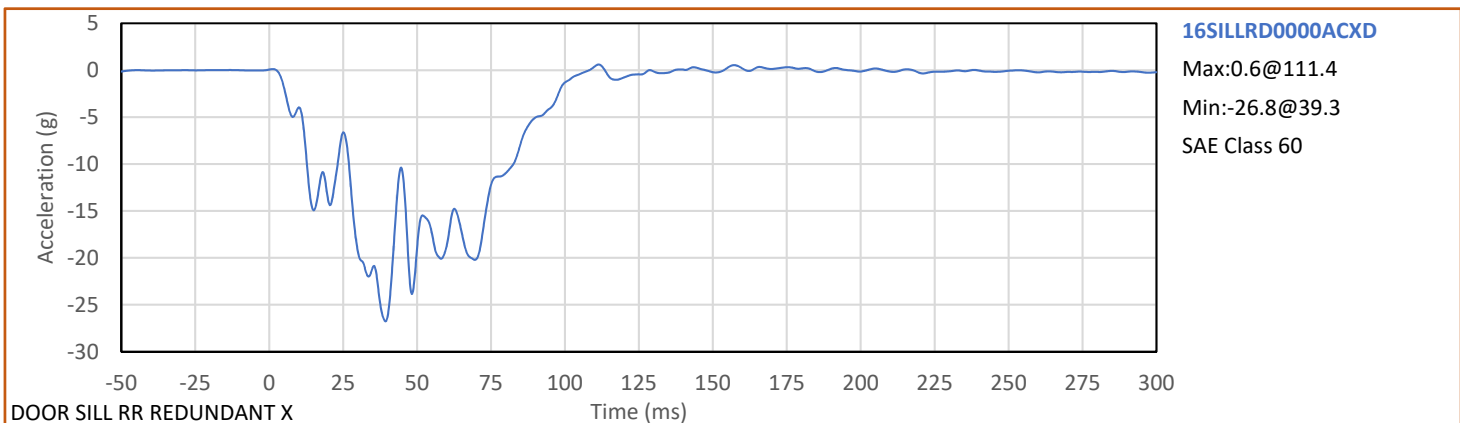
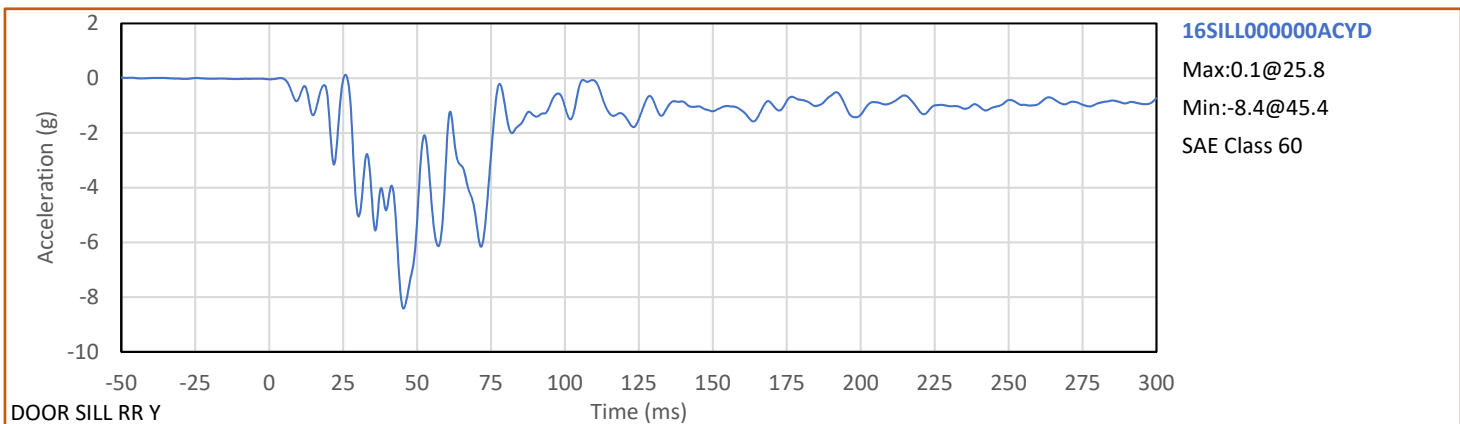
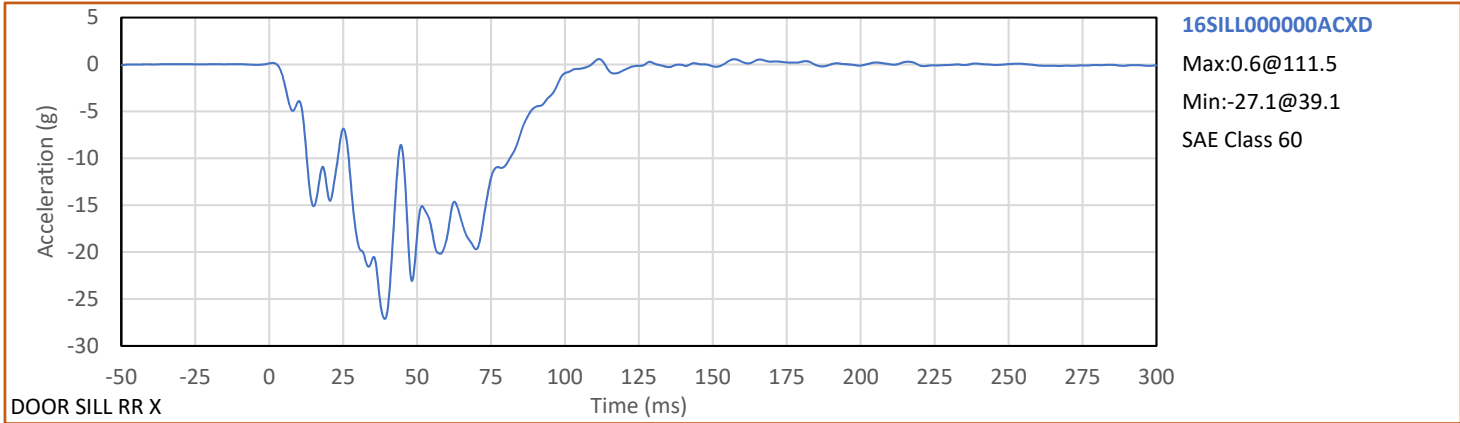


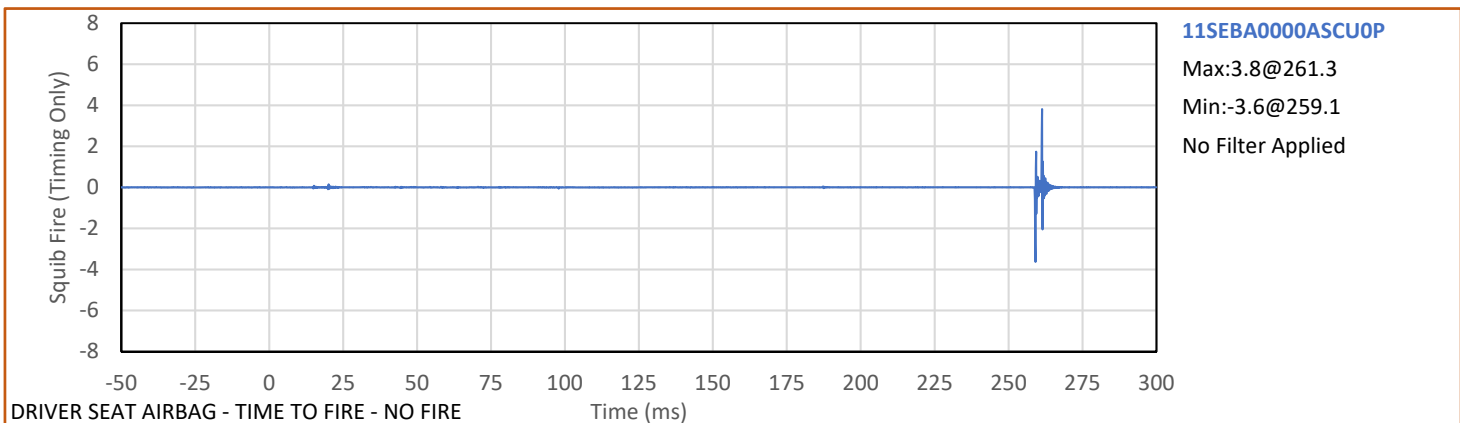
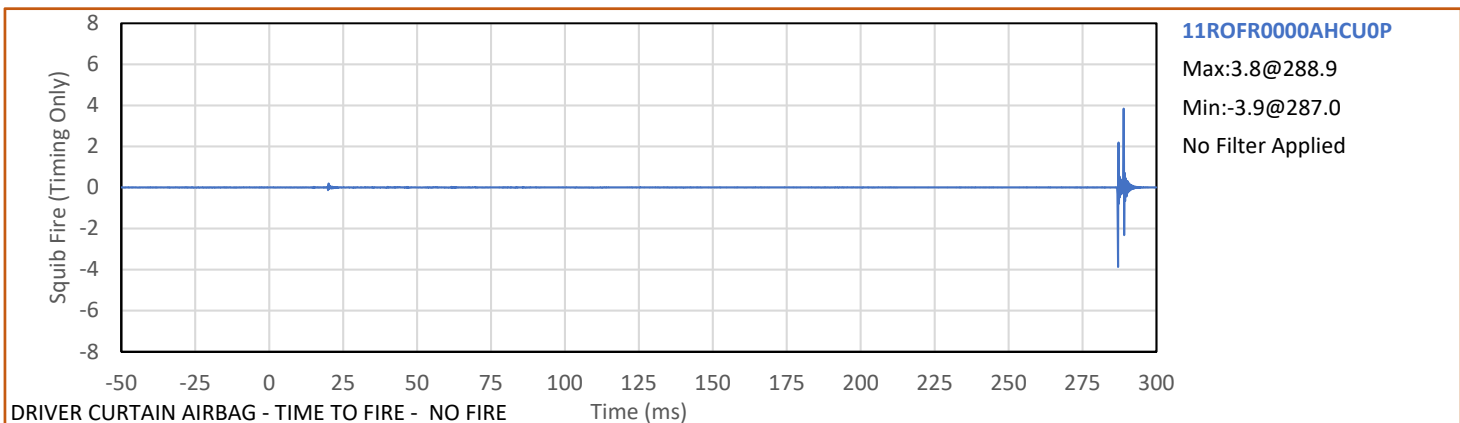
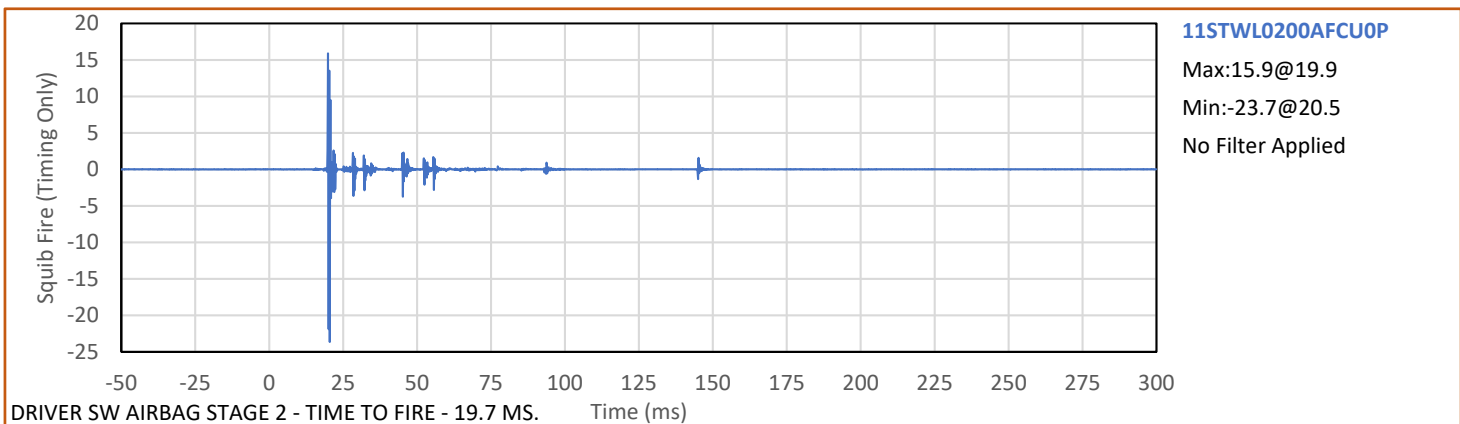
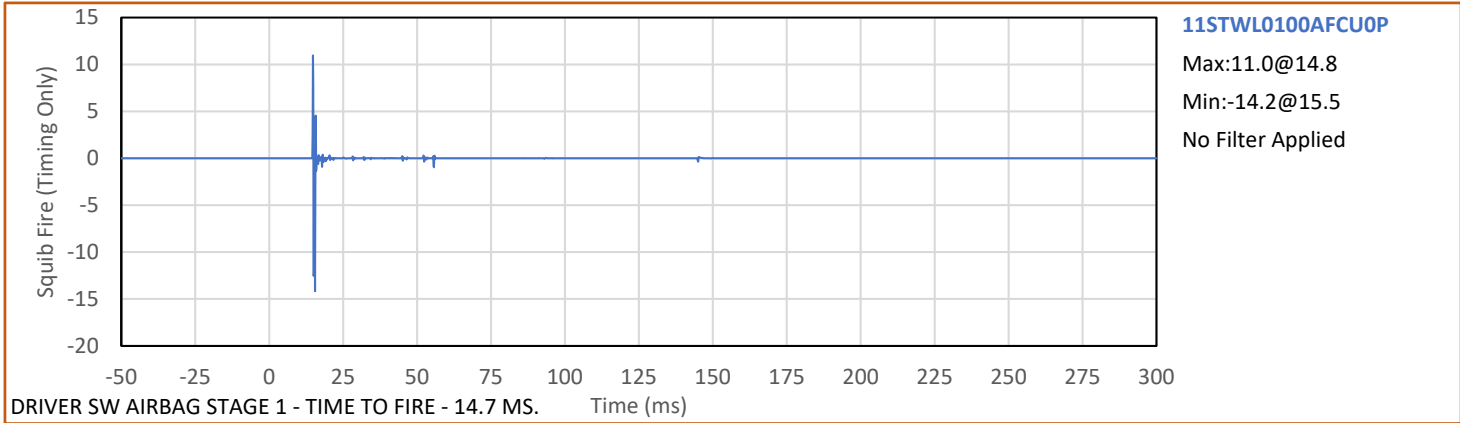






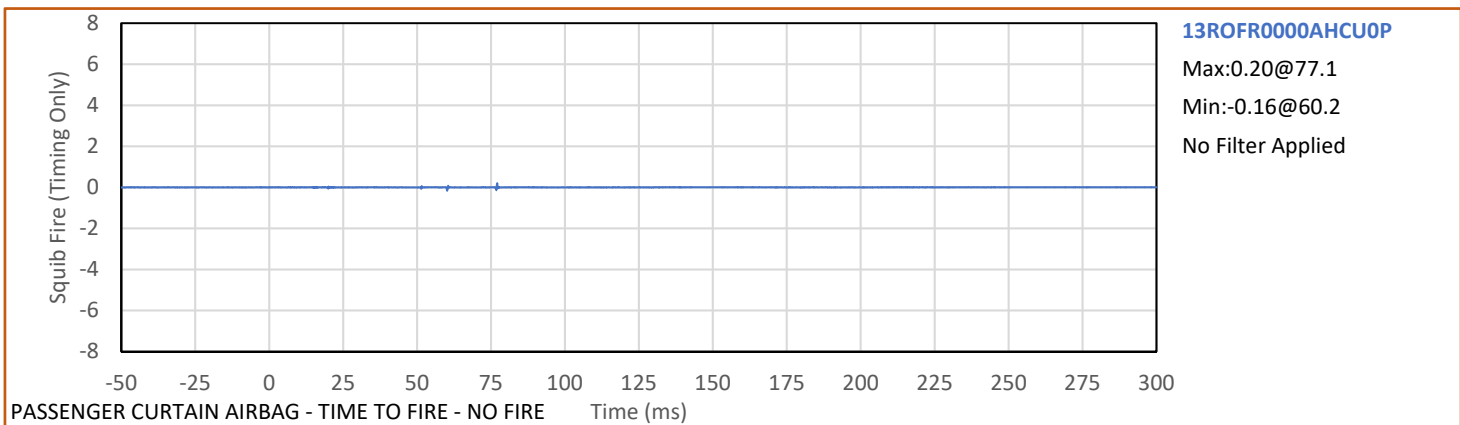
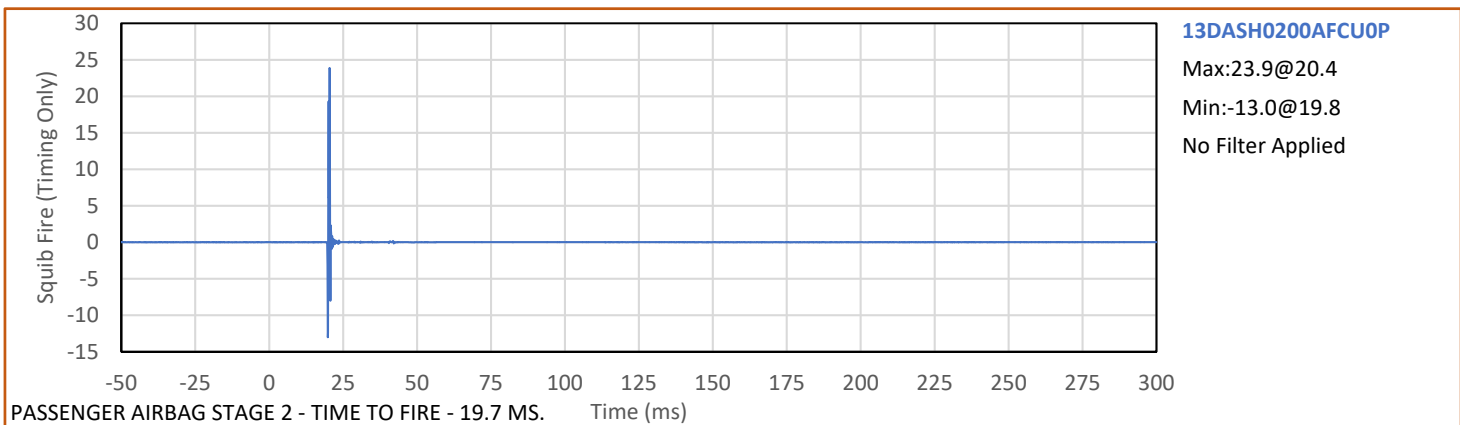
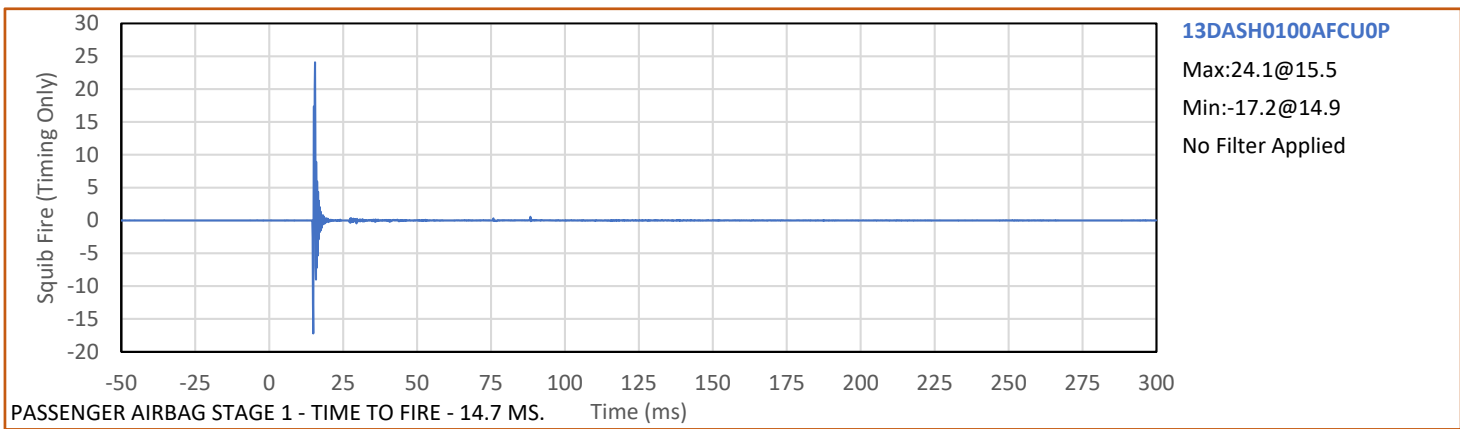
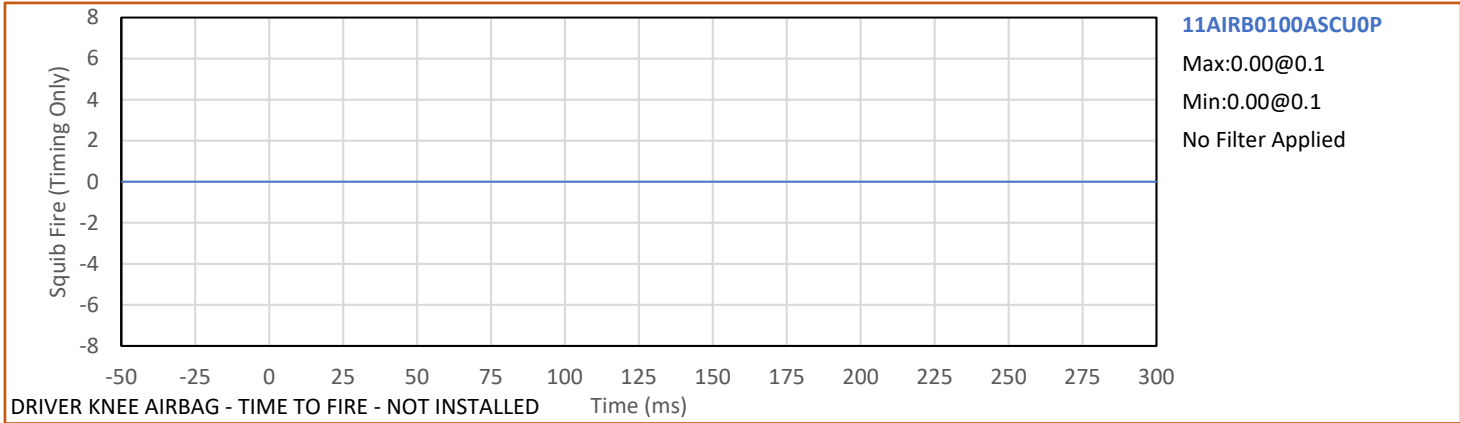






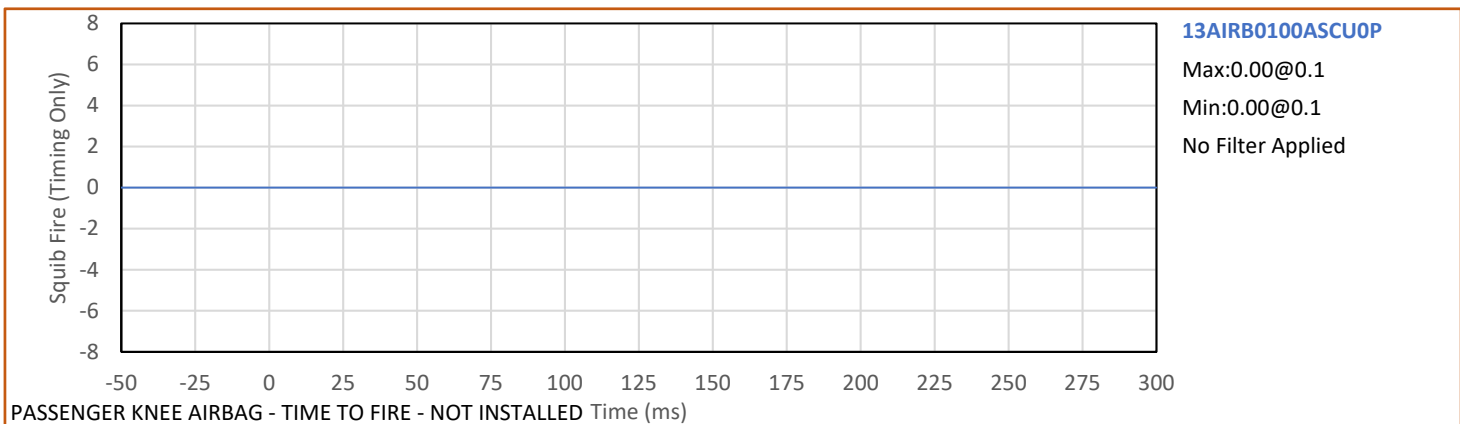
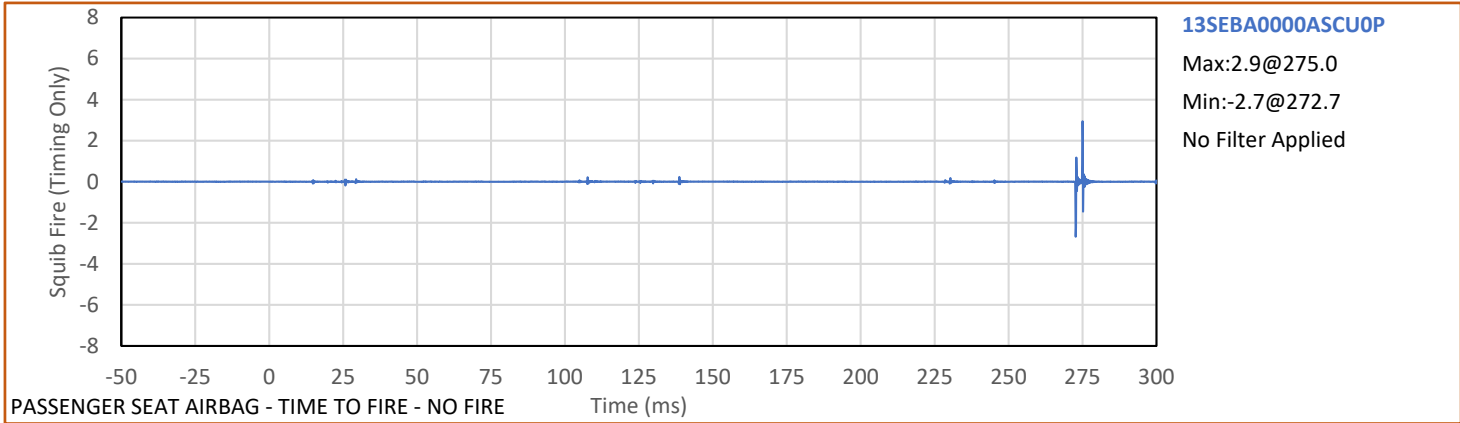
Test Vehicle: 2020 Mazda CX-5 5-Door MPV
Test Program: Full Frontal Rigid Barrier Impact

NHTSA No.: R20205415
Test Date: 1/15/2021



Test Vehicle: 2020 Mazda CX-5 5-Door MPV
Test Program: Full Frontal Rigid Barrier Impact

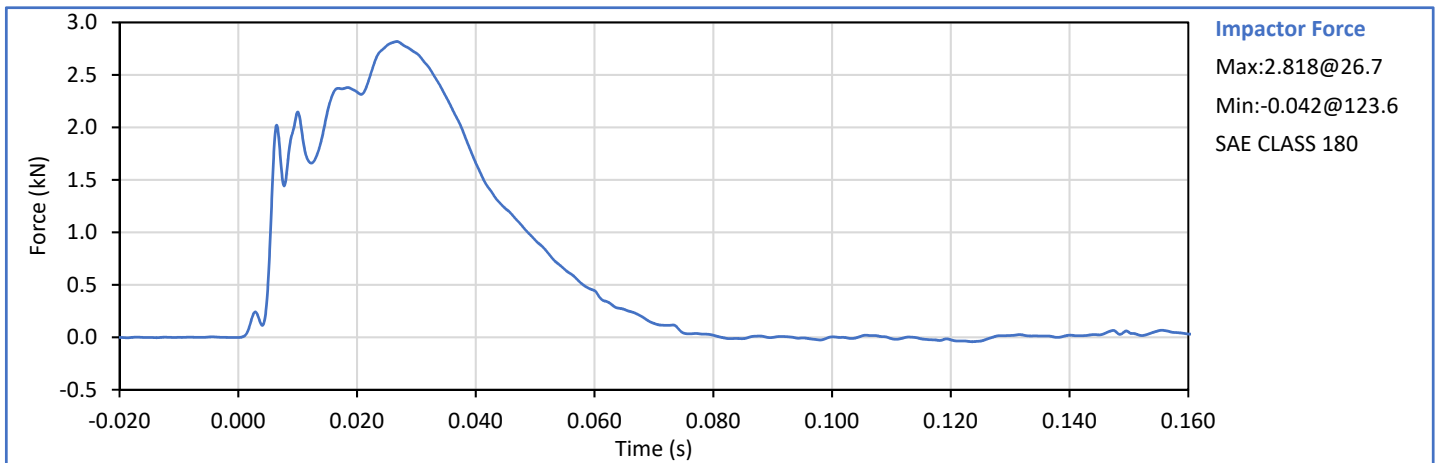
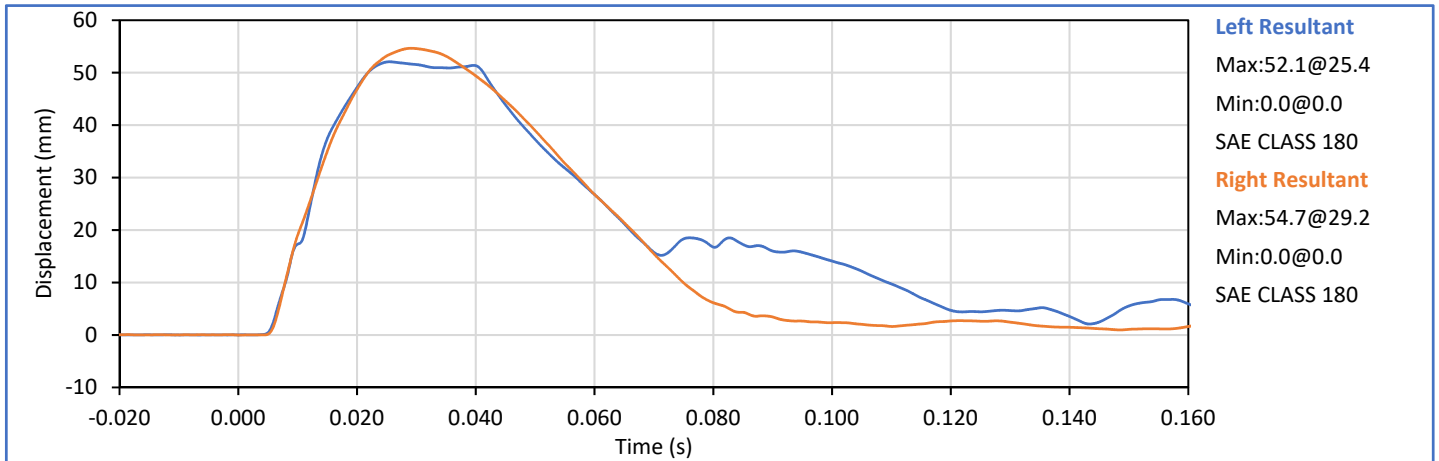
NHTSA No.: R20205415
Test Date: 1/15/2021




APPENDIX C
DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA SHEETS

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
THOR-50M 50th Percentile Male ATD, (Reduced Certification)
S/N: D09799

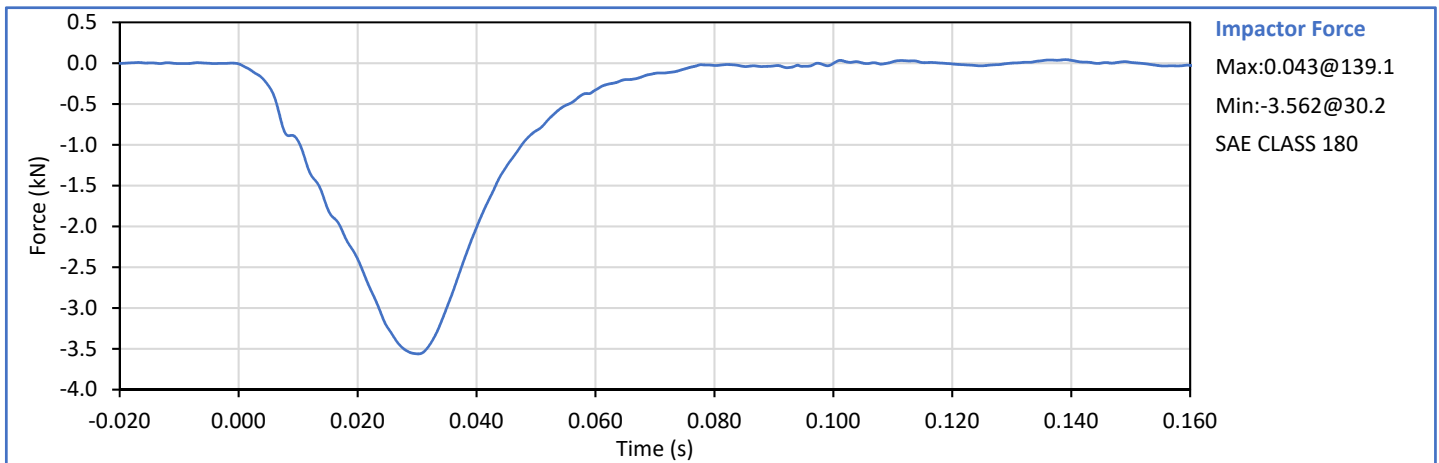
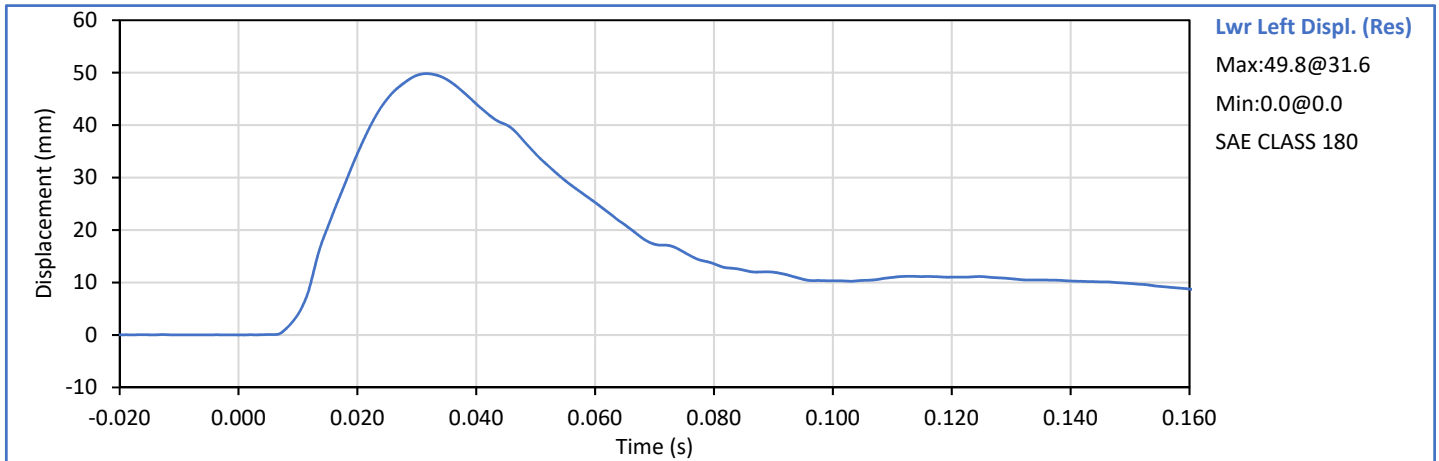
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	31	Pass
Probe Velocity	m/sec	4.25	4.35	4.33	Pass
Peak Probe Force	kN		3.039	2.818	Pass
Peak Upper Left Deflection Resultant	mm	48.3	59.0	52.1	Pass
Peak Upper Right Deflection Resultant	mm			54.7	Pass
Absolute Difference L/R Dx Resultant	mm	0.0	5.0	2.6	Pass
Force at Peak Upper Left Resultant	mm	2.409	2.944	2.797	Pass
Force at Peak Upper Right Resultant	mm			2.738	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

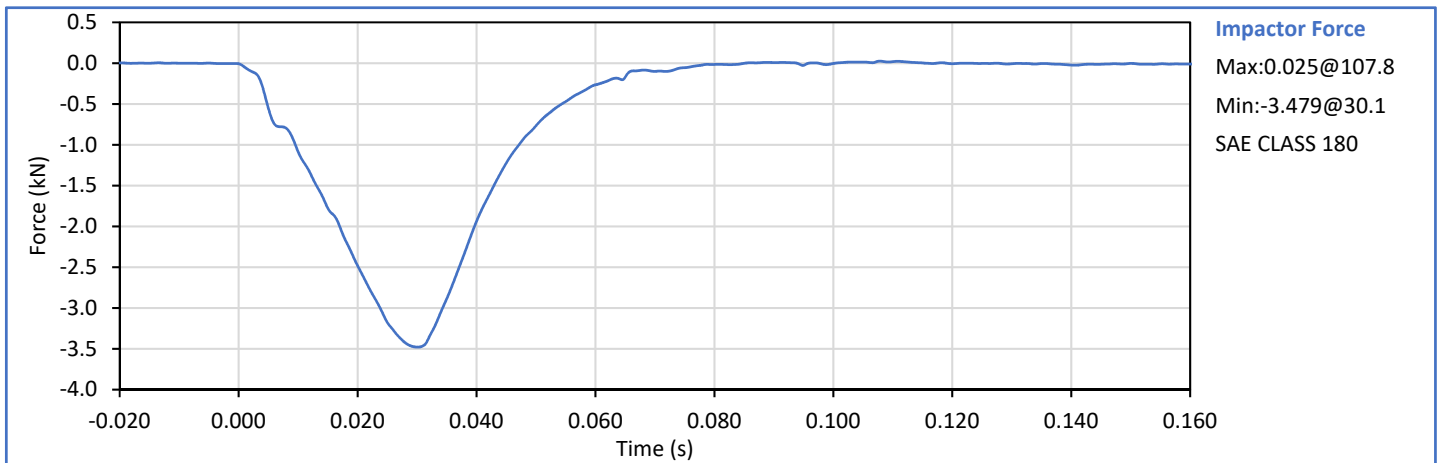
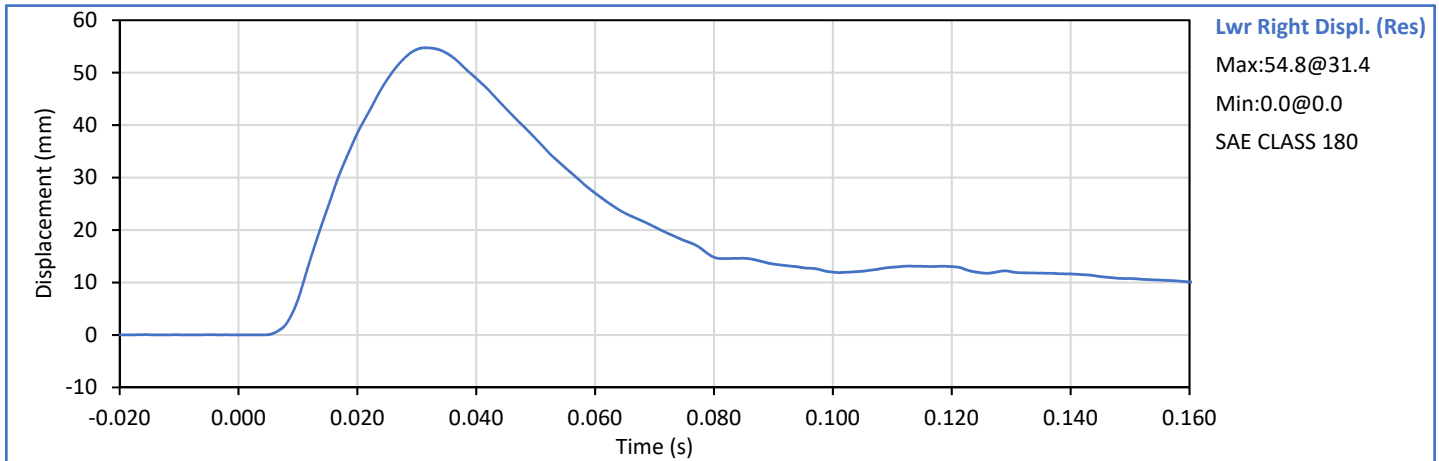
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	21	Pass
Probe Velocity	m/sec	4.25	4.35	4.30	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.562	Pass
Lower Left Resultant Dx at Peak Fx	mm	45.8	56.0	49.6	Pass
NHTSA Corridor 2019-05				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	21.9	Pass
Laboratory Relative Humidity	%	10	70	21	Pass
Probe Velocity	m/sec	4.25	4.35	4.29	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.479	Pass
Lower Right Resultant Dx at Peak Fx	mm	45.8	56.0	54.5	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass

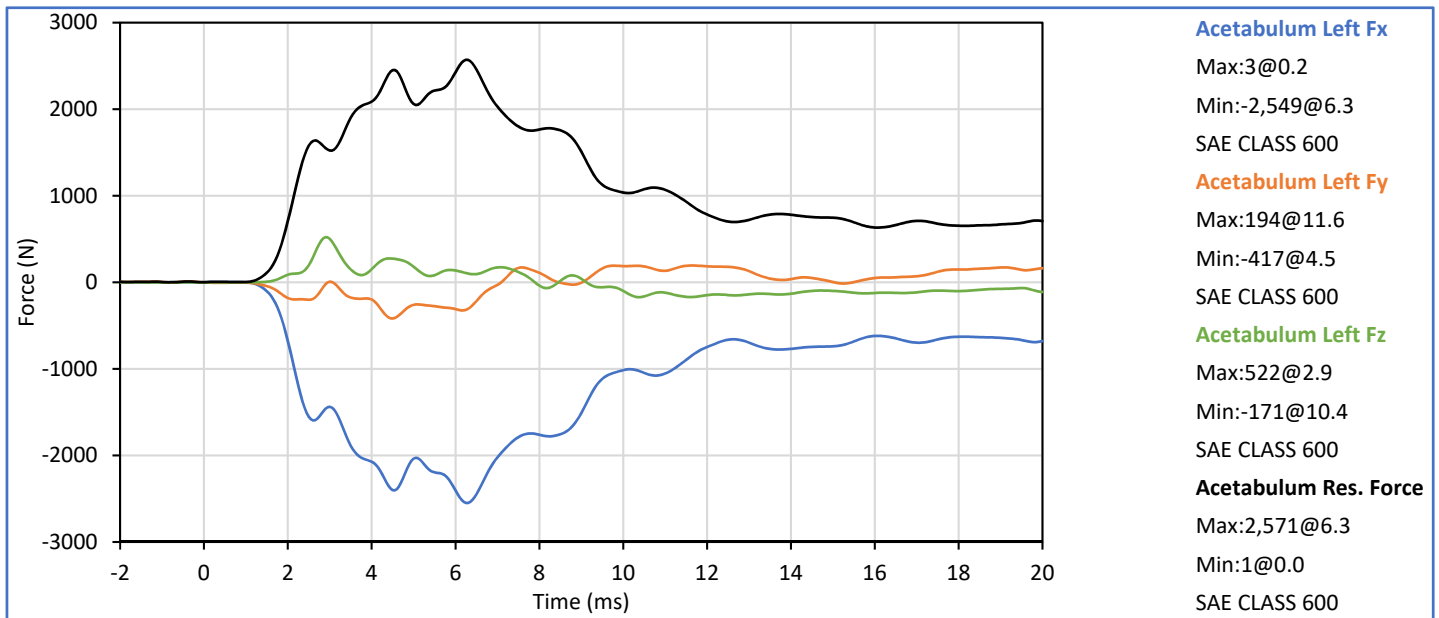
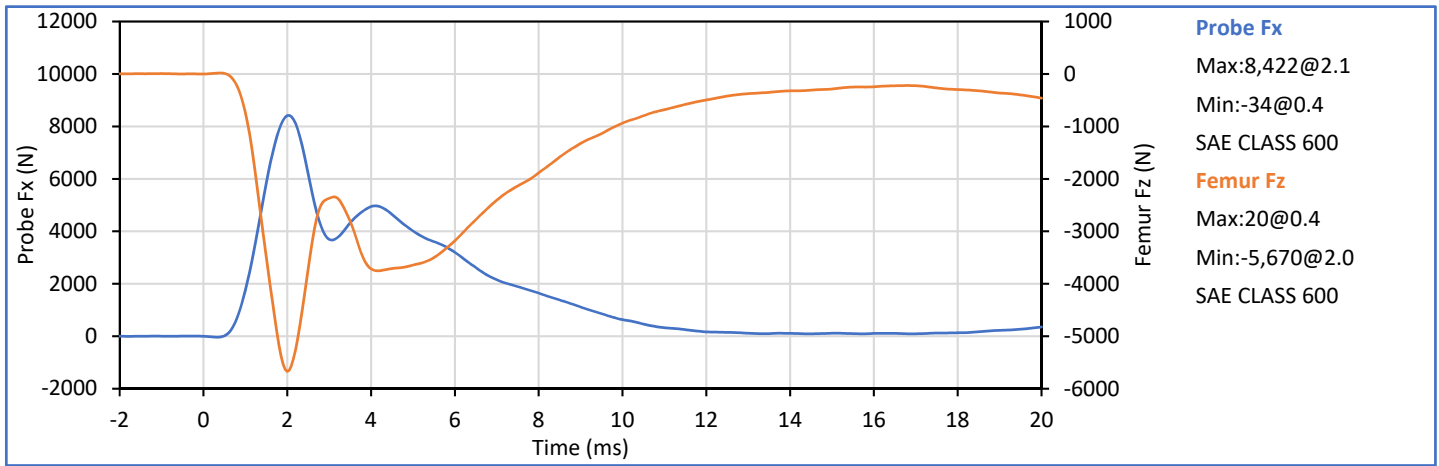


Technician: *J. Hernandez*
 J. Hernandez

Approved By: *P. Puzzuto*
 P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Pendulum Velocity	m/s	3.25	3.35	3.28	Pass
Peak Probe Force	N	*	*	8422	*
Peak Femur Fz	N	*	*	-5670	*
Acetabulum Force Resultant	N	*	*	2571	*
				Overall Test Results	Pass

* Research data. No defined P/F corridor

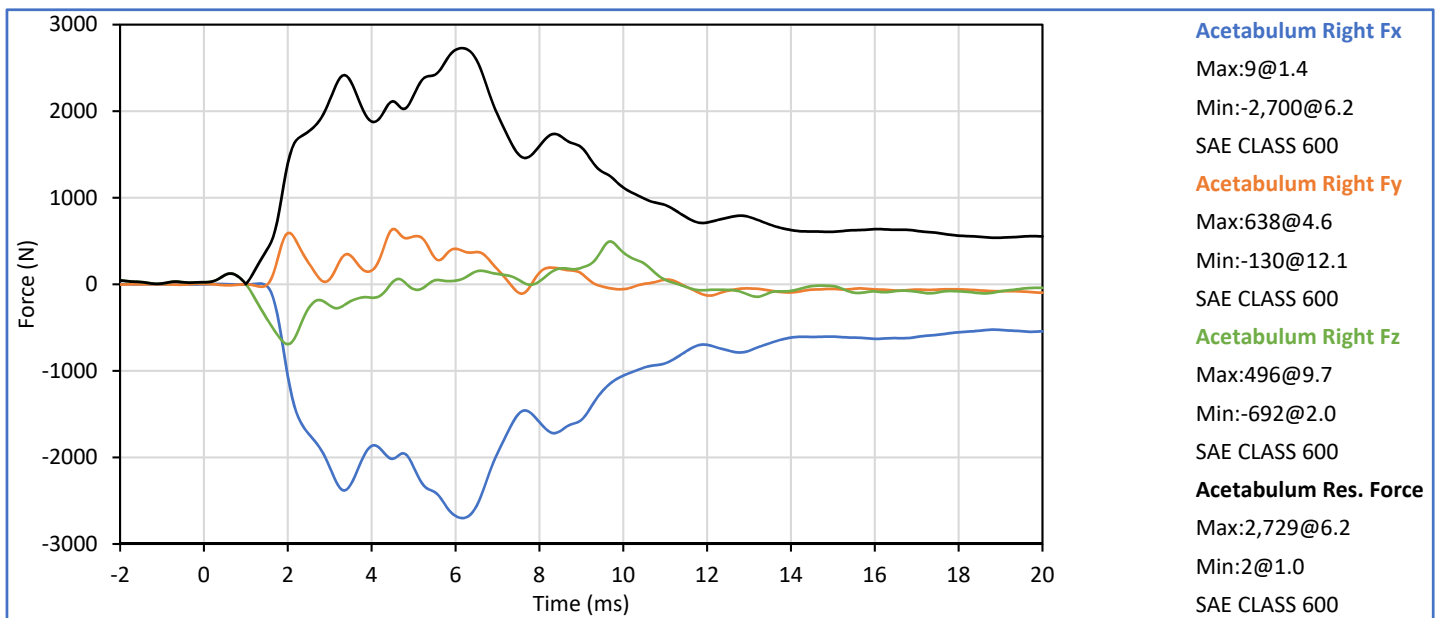
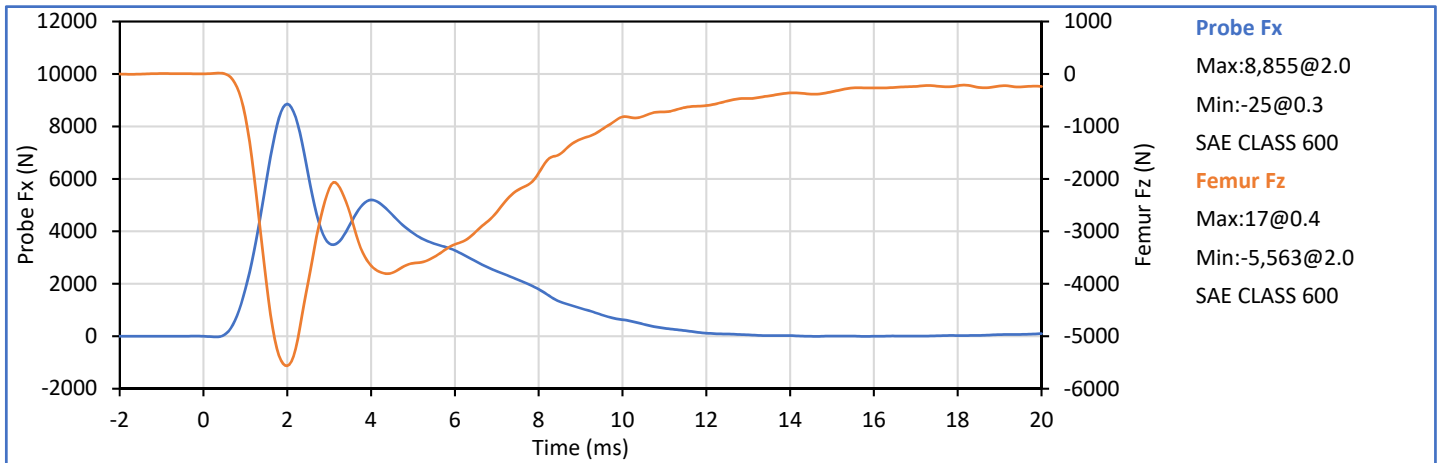


Technician: *J. Hernandez*
J. Hernandez

Approved By: *P. Puzzuto*
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	18	Pass
Pendulum Velocity	m/s	3.25	3.35	3.31	Pass
Peak Probe Force	N	*	*	8855	*
Peak Femur Fz	N	*	*	-5563	*
Acetabulum Force Resultant	N	*	*	2729	*
				Overall Test Results	Pass

* Research data. No defined P/F corridor

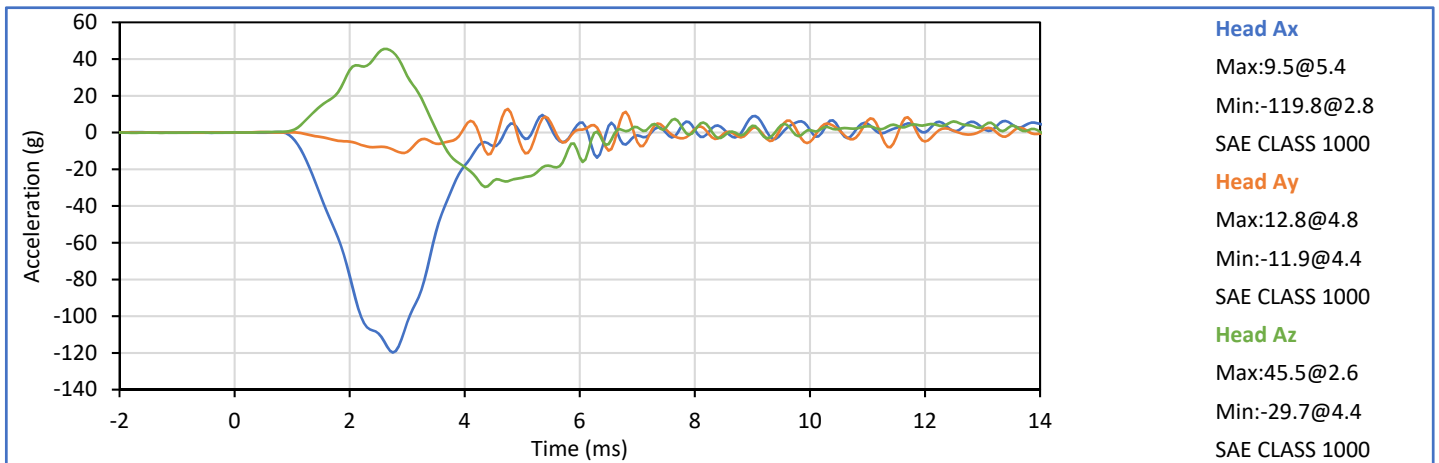
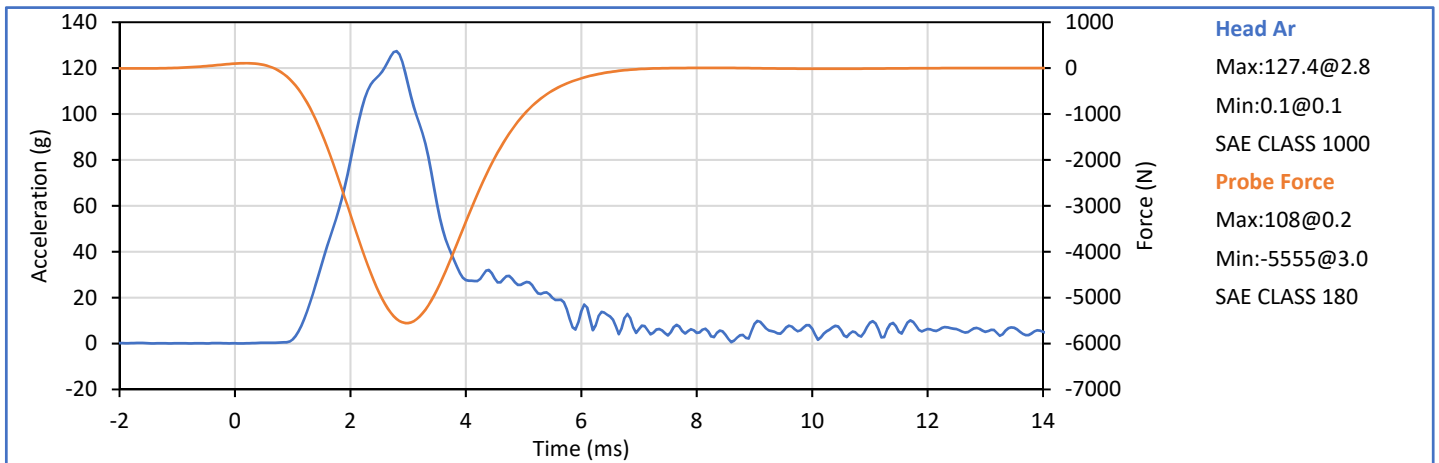



Technician: J. Hernandez


Approved By: P. Puzzuto

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
THOR-50M 50th Percentile Male ATD, (Reduced Certification)
S/N: EG2595

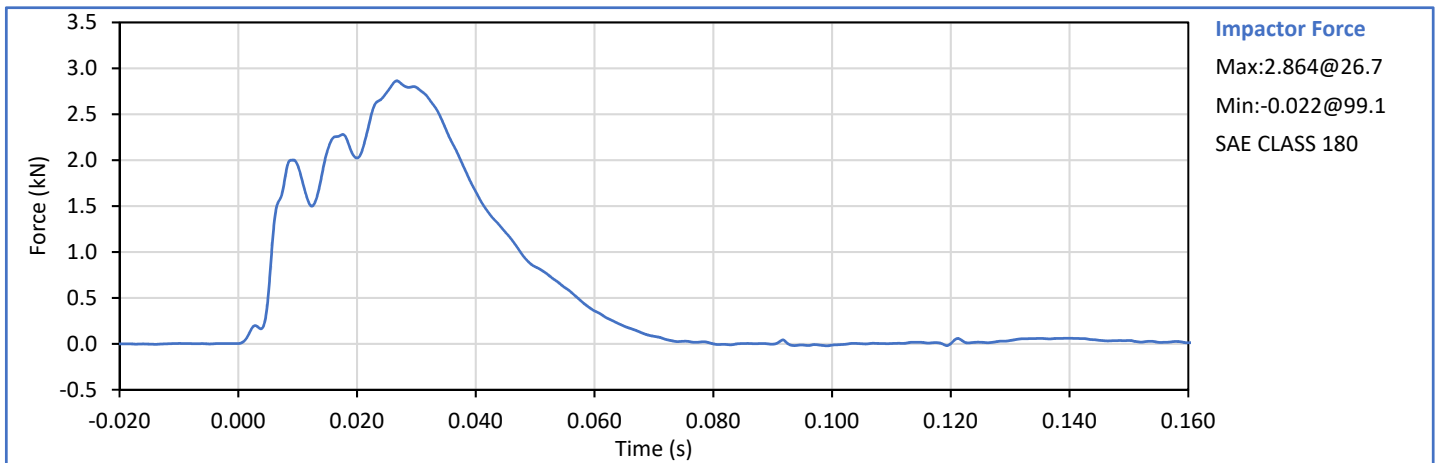
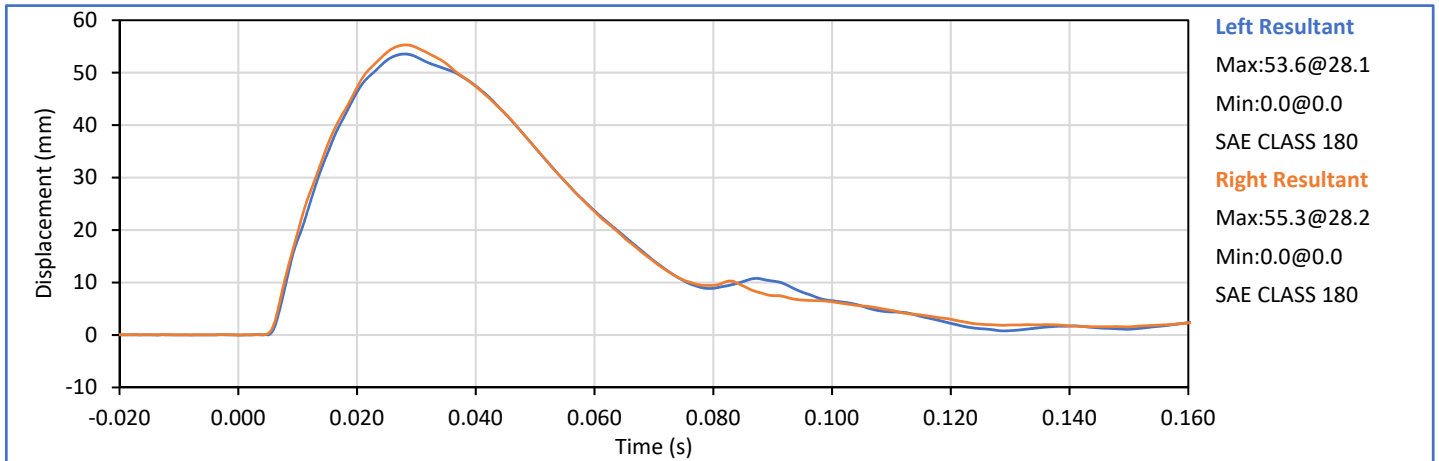
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Probe Velocity	m/s	1.95	2.05	1.97	Pass
Peak Probe Force	kN	-6138	-5022	-5555	Pass
Peak Head Resultant Acceleration	g	105.3	128.7	127.4	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass




Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

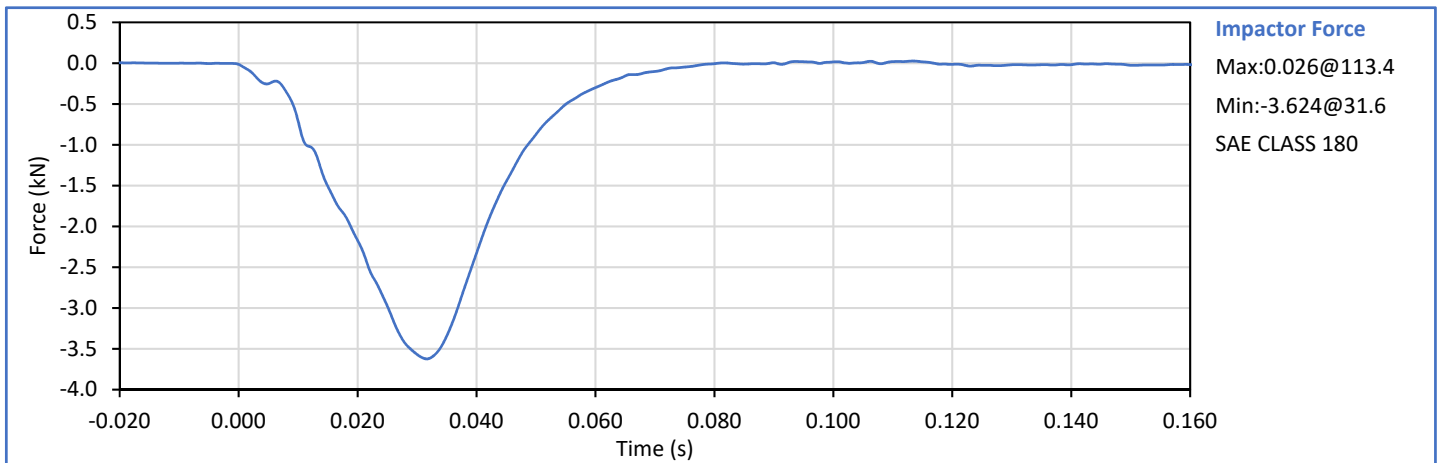
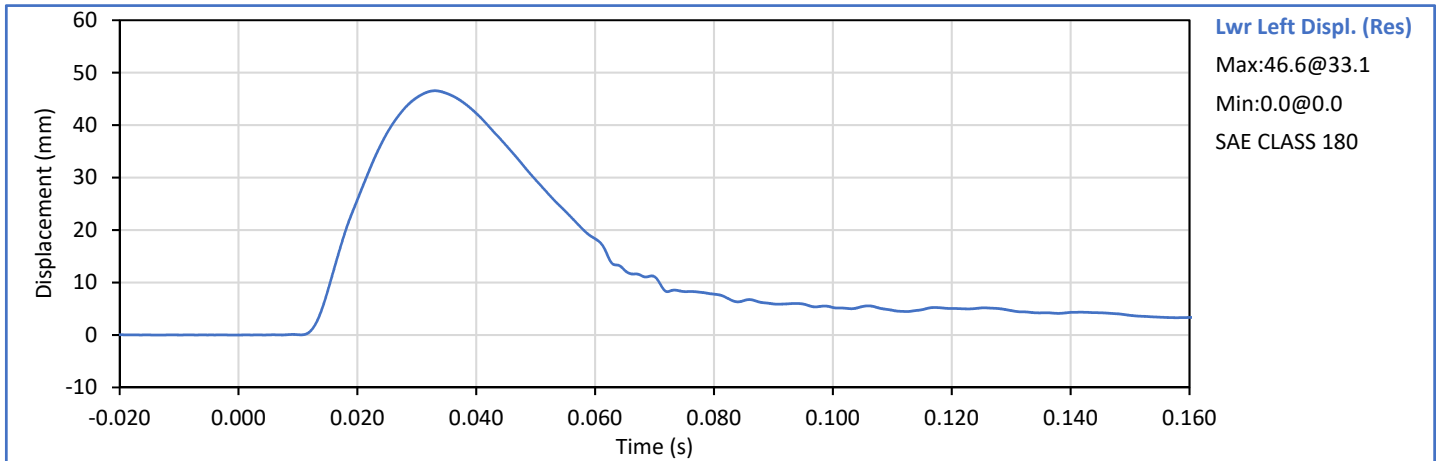
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
Probe Velocity	m/sec	4.25	4.35	4.30	Pass
Peak Probe Force	kN		3.039	2.864	Pass
Peak Upper Left Deflection Resultant	mm	48.3	59.0	53.6	Pass
Peak Upper Right Deflection Resultant	mm			55.3	Pass
Absolute Difference L/R Dx Resultant	mm	0.0	5.0	1.7	Pass
Force at Peak Upper Left Resultant	mm	2.409	2.944	2.805	Pass
Force at Peak Upper Right Resultant	mm			2.800	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass

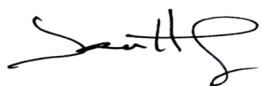



Technician: 
J. Hernandez

Approved By: 
P. Puzzuto

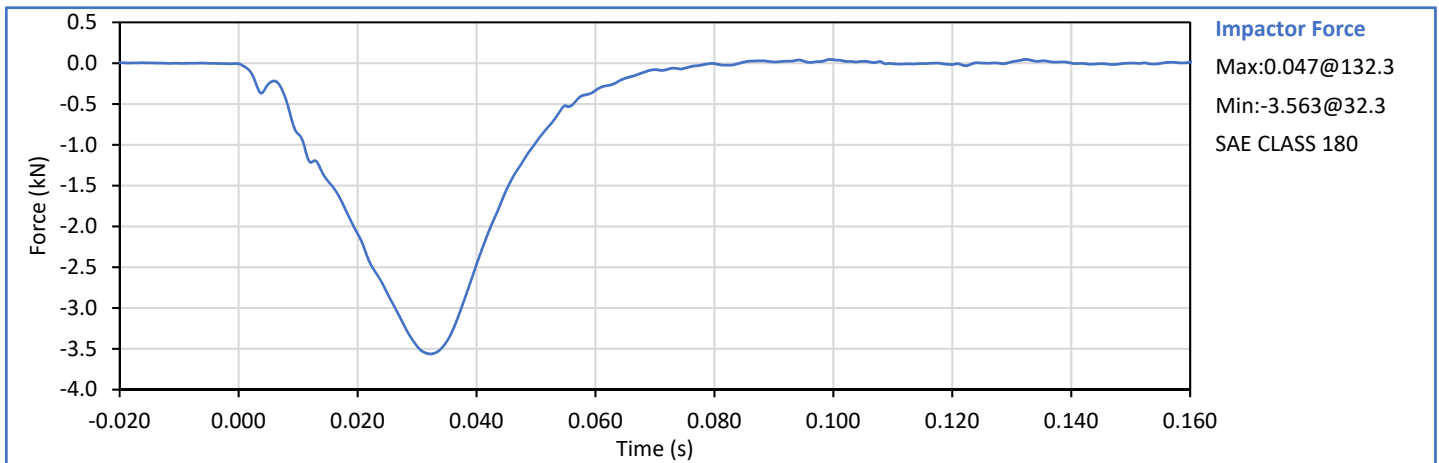
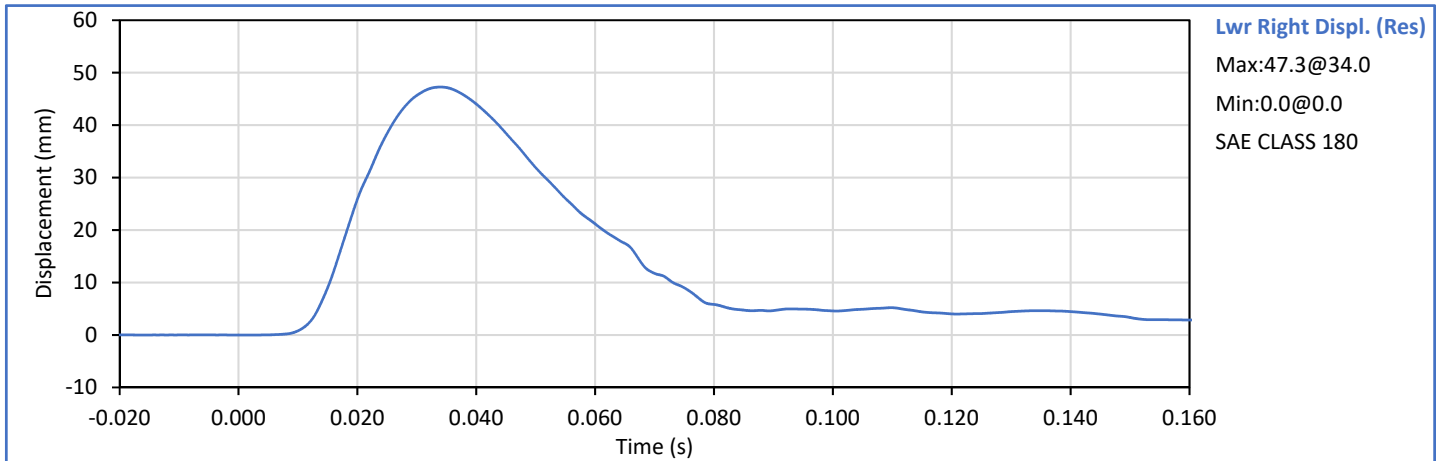
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	23	Pass
Probe Velocity	m/sec	4.25	4.35	4.31	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.624	Pass
Lower Left Resultant Dx at Peak Fx	mm	45.8	56.0	46.3	Pass
NHTSA 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	21.9	Pass
Laboratory Relative Humidity	%	10	70	23	Pass
Probe Velocity	m/sec	4.25	4.35	4.33	Pass
Peak Probe Force	kN	-3.832	-3.136	-3.563	Pass
Lower Right Resultant Dx at Peak Fx	mm	45.8	56.0	47.0	Pass
NHTSA Corridor 2019-05				Overall Test Results	Pass

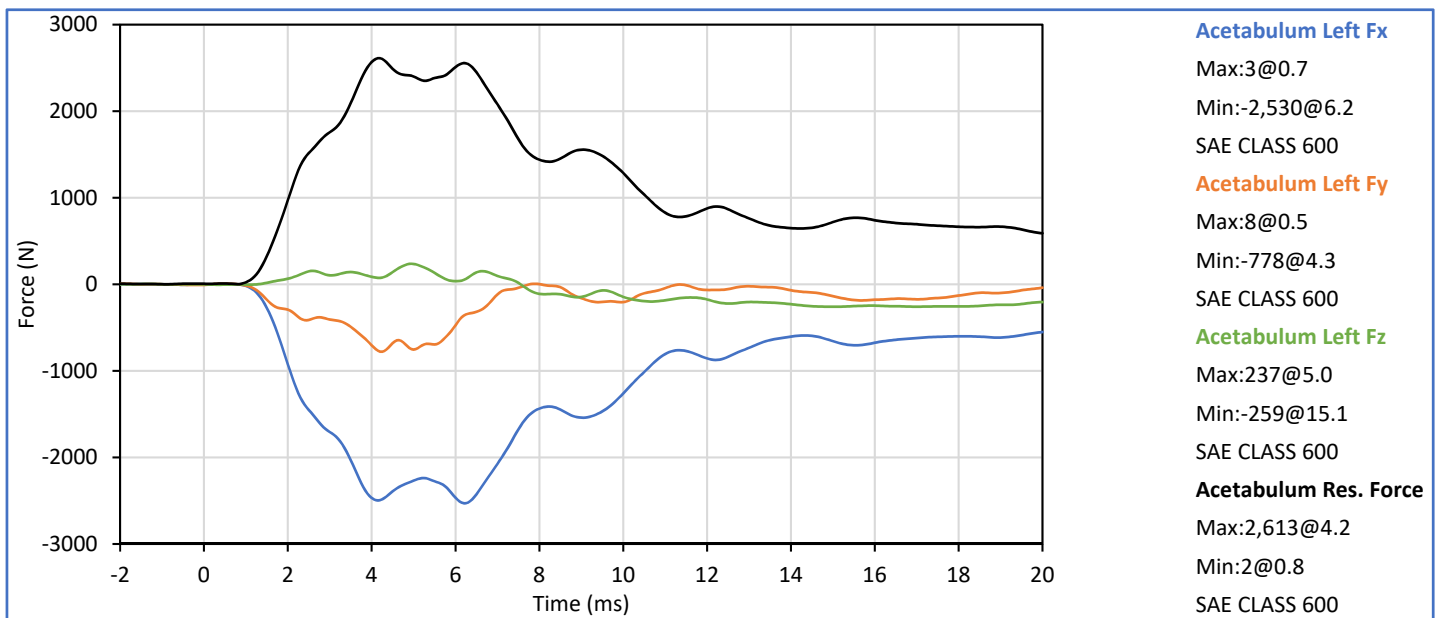
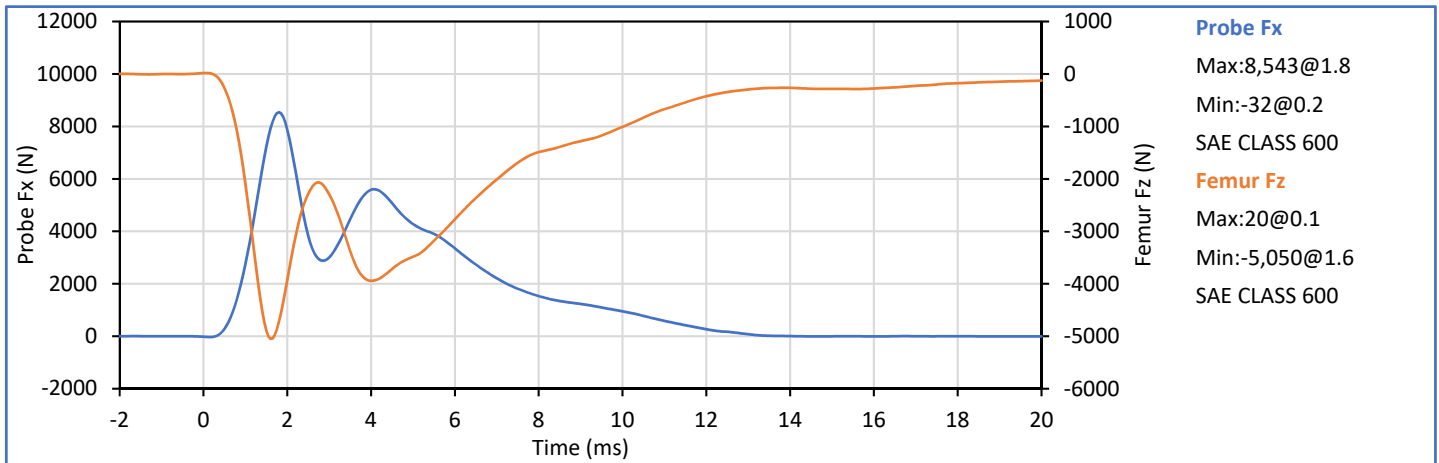


Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Pendulum Velocity	m/s	3.25	3.35	3.30	Pass
Peak Probe Force	N	*	*	8543	*
Peak Femur Fz	N	*	*	-5050	*
Acetabulum Force Resultant	N	*	*	2613	*
				Overall Test Results	Pass

* Research data. No defined P/F corridor



Technician: J. Hernandez

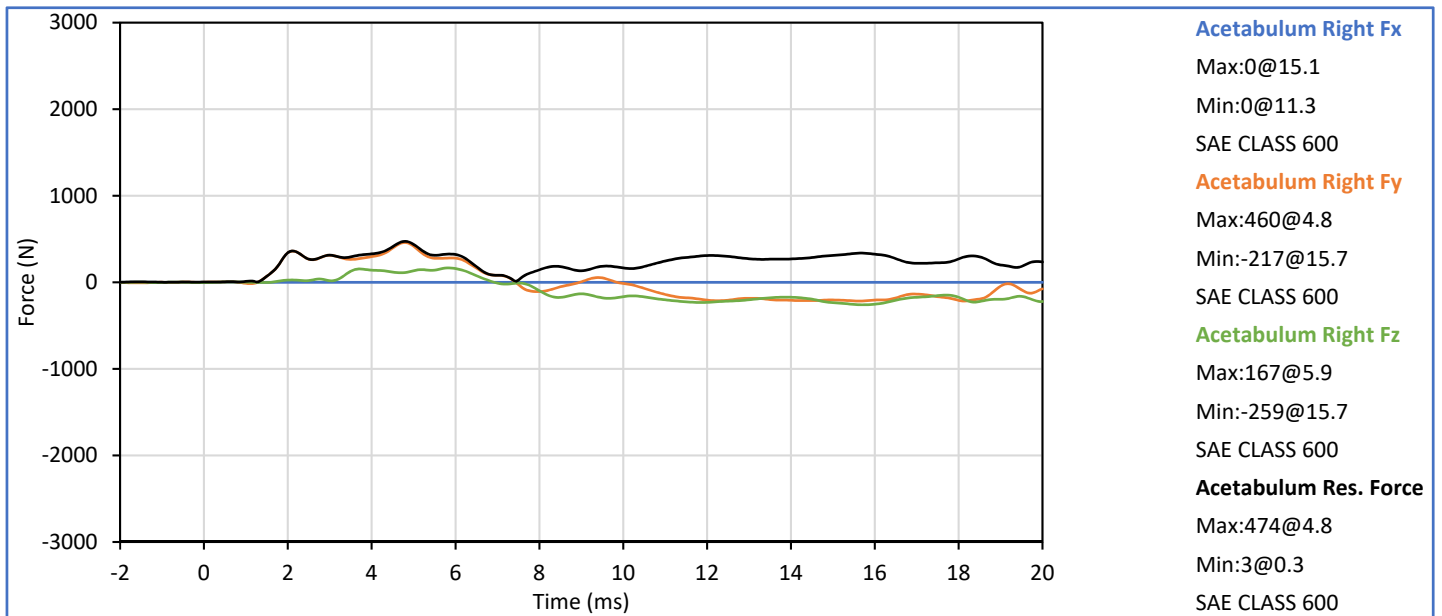
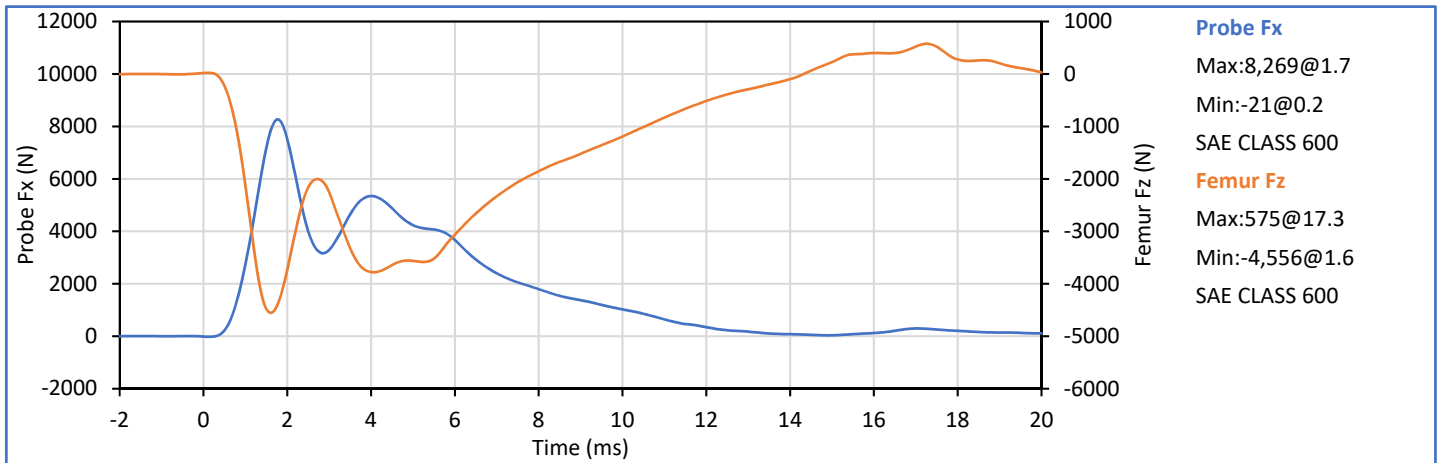
Approved By: P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Pendulum Velocity	m/s	3.25	3.35	3.30	Pass
Peak Probe Force	N	*	*	8269	*
Peak Femur Fz	N	*	*	-4556	*
Acetabulum Force Resultant	N	*	*	474	*
Overall Test Results					Pass

* Research data. No defined P/F corridor

** Acetabulum Fx is not functioning

**



Technician: J. Hernandez

Approved By: P. Puzzuto