

REPORT NUMBER: SideNCAPMDB-KAR-22-011

**NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST**

**SUBARU CORPORATION
2022 SUBARU WRX PREMIUM 4-DOOR SEDAN**

NHTSA No: O20225502

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



DECEMBER 27, 2022

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NRM-100
1200 NEW JERSEY AVE, SE
WASHINGTON, D.C. 20590**

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. SideNCPMDB-KAR-22-011	2. Government Accession No.	3. Recipient's Catalog No.																												
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502		5. Report Date December 27, 2022																												
		6. Performing Organization Code KAR																												
7. Authors Mr. Matthew J. Angeles, Project Engineer, Applus+IDIADA KARCO Engineering, LLC Mr. Alex Beltran, Engineering Manager, Applus+IDIADA KARCO Engineer, LLC		8. Performing Organization Report No. TR-P42254-01-NC																												
		10. Work Unit No.																												
9. Performing Organization Name and Address Applus+IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301		11. Contract or Grant No. 693JJ920D000015																												
		13. Type of Report and Period Covered Final Test Report, December 07 - 27, 2022																												
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-100) 1200 New Jersey Ave., SE Washington, D.C. 20590		14. Sponsoring Agency Code NRM-100																												
		15. Supplementary Notes																												
16. Abstract A 61.9 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2022 Subaru WRX Premium 4-door sedan in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at the Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on December 7, 2022 The impact velocity of the Moving Deformable Barrier was 61.78 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 19.4°C. The target vehicle's maximum post-test static crush was 190 mm located at level 3. The test vehicle's occupant performance data is as follows:																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 35%;">Measurement Description</th> <th colspan="3" style="text-align: center;">Driver ATD (ES-2re)</th> </tr> <tr> <th style="width: 10%;">Units</th> <th style="width: 15%;">IARV</th> <th style="width: 40%;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td style="text-align: center;">1000</td> <td style="text-align: center;">152.173</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">44</td> <td style="text-align: center;">24.502</td> </tr> <tr> <td>Total Abdominal Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">2500</td> <td style="text-align: center;">734.540</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">6000</td> <td style="text-align: center;">1726.269</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (ES-2re)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)		1000	152.173	Maximum Thoracic Rib Deflection	mm	44	24.502	Total Abdominal Force	N	2500	734.540	Pubic Symphysis Force	N	6000	1726.269				
Measurement Description	Driver ATD (ES-2re)																													
	Units	IARV	Result																											
Head Injury Criteria (HIC ₃₆)		1000	152.173																											
Maximum Thoracic Rib Deflection	mm	44	24.502																											
Total Abdominal Force	N	2500	734.540																											
Pubic Symphysis Force	N	6000	1726.269																											
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 35%;">Measurement Description</th> <th colspan="3" style="text-align: center;">Passenger ATD (SID-IIs)</th> </tr> <tr> <th style="width: 10%;">Units</th> <th style="width: 15%;">IARV</th> <th style="width: 40%;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td style="text-align: center;">1000</td> <td style="text-align: center;">356.532</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">g</td> <td style="text-align: center;">82</td> <td style="text-align: center;">66.431</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetubular and Iliac Forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">3732.783</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38*</td> <td style="text-align: center;">20.910</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45*</td> <td style="text-align: center;">33.255</td> </tr> </tbody> </table>				Measurement Description	Passenger ATD (SID-IIs)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)		1000	356.532	Resultant Lower Spine Acceleration	g	82	66.431	Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	3732.783	Maximum Thoracic Rib Deflection	mm	38*	20.910	Maximum Abdominal Rib Deflection	mm	45*	33.255
Measurement Description	Passenger ATD (SID-IIs)																													
	Units	IARV	Result																											
Head Injury Criteria (HIC ₃₆)		1000	356.532																											
Resultant Lower Spine Acceleration	g	82	66.431																											
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	3732.783																											
Maximum Thoracic Rib Deflection	mm	38*	20.910																											
Maximum Abdominal Rib Deflection	mm	45*	33.255																											
Both struck side doors were jammed shut and did not separate from the body at the hinges or latches. The opposite side doors did not open during the side impact event.																														
17. Key Words New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division 1200 New Jersey Ave., SE Washington, DC 20590																												
19. Security Classification of this report UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 153	22. Price																											

*Proposed IARV

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	4
<u>Data Sheet</u>		<u>Page</u>
1	General Test and Vehicle Parameter Data	5
2	Seat, Seat Belt, Steering Wheel Adjustment, and Fuel System Data	9
3	Dummy Longitudinal Clearance Dimensions	13
4	Dummy Lateral Clearance Dimensions	14
5	Camera and Instrumentation Data	15
6	Test Vehicle Accelerometer Locations	16
7	MDB Accelerometer Locations	17
8	Post-Test Observations	18
9	MDB Summary of Results	21
10	Test Vehicle Profile Measurements	22
11	Test Vehicle Exterior Crush Measurements	23
12	MDB Exterior Static Crush Measurements	26
13	Vehicle and MDB Damage Profile Distances	27
14	FMVSS No. 301 Static Rollover Results	28
15	Dummy/Vehicle Temperature and Humidity Stabilization	29
<u>Appendix</u>		<u>Page</u>
A	Photographs	A
B	Vehicle and Dummy Response Data Plots	B
C	ATD Configuration and Performance Verification Data	C
D	Test Equipment and Instrumentation Calibration Data	D

SECTION 1
TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2022 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number 693JJ920D000015. The purpose of this test is to generate comparative side impact performance in a 2022 Subaru WRX Premium 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated March 2020.

SECTION 2

SUMMARY OF TEST RESULTS

A 2022 Subaru WRX Premium 4-door sedan was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.78 km/h (38.39 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California, on December 7, 2022. Pre- and post-test photographs of the test vehicle, the MDB and the dummy (ES-2re and SID-IIs) are included in Appendix A of this report.

The dummies were placed in the driver and left rear designated seating position according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated March 2020. The side impact event was documented by 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib and lower rib y-axis displacement potentiometers

Abdomen forward, middle, and rear y-axis load cells

Lower spine (12) tri-axial accelerometers

Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib and lower rib y-axis displacement potentiometers

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

Appendix B contains the vehicle and dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D of this report contains the test equipment and instrumentation calibration data.

Dummy injury readings were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	152.173
Maximum Thoracic Rib Deflection	mm	44	24.502
Combined Abdominal Force	N	2500	734.540
Pubic Symphysis Force	N	6000	1726.269

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	356.532
Lower Spine (T12) Resultant Acceleration	g	82	66.431
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3732.783
Maximum Thoracic Rib Deflection	mm	38*	20.910
Maximum Abdominal Rib Deflection	mm	45*	33.255

*Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

GENERAL COMMENTS:

- Left Front Sill, Channel Failed at 4.4 ms
- Left Rear Sill Ay, Channel Failed at 46.8 ms

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

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: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	O20225502
Model Year	2022
Make	Subaru
Model	WRX
Body Style	4-Door Sedan
VIN	JF1VBAF6XN9015471
Body Color	Blue
Odometer Reading (km / mi)	172 / 107
Engine Displacement (L)	2.4
Type / No. of Cylinders	4
Engine Placement	Longitudinal
Transmission Type	Manual
Transmission Speeds	6
Overdrive	No
Final Drive	AWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Subaru Corporation
Date of Manufacture	22-Jul
Vehicle Type	Sedan

GVWR (kg)	2100
GAWR Front (kg)	1140
GAWR Rear (kg)	1100

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
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*

**For trucks or MPVs, if A-B>136, RCLW=136 kg

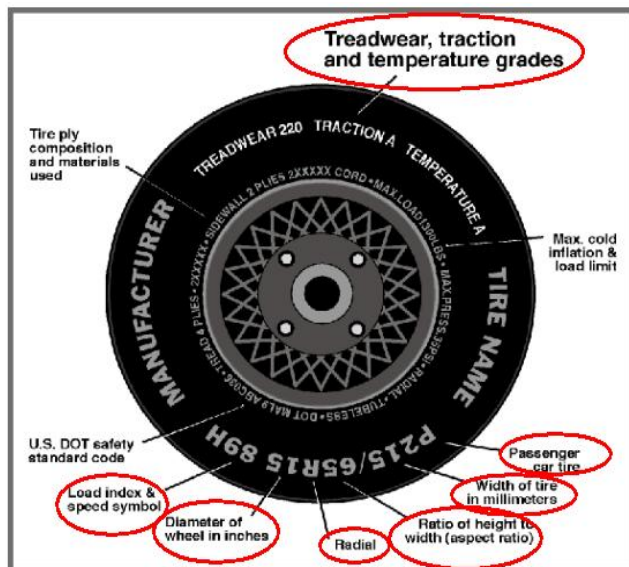
VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	340	340
Cold Pressure (kPa)	220	220
Recommended Tire Size	245/40R18	245/40R18
Tire Size on Vehicle	245/40R18	245/40R18
Tire Manufacturer	Dunlop	Dunlop
Tire Model	SP Sport Maxx GT	SP Sport Maxx GT
Treadware	200	200
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 steel, 2 polyamide	2 Polyester, 2 steel, 2 polyamide
Load Index/Speed Symbol	97Y	97Y
Tire Material	Polyester, steel, polyamide	Polyester, steel, polyamide
DOT Safety Code Left	1U2JX-HVYR2322	1U2JX-HVYR0922
DOT Safety Code Right	1U2JX-HVYR2322	1U2JX-HVYR0922

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	193	195	200	191
Tire Placard	kPa	230	230	220	220
Owner's Manual	kPa	230	230	220	220
As Tested	kPa	230	230	220	220

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	453.0	310.0		485.5	460.0		493.0	384.0	
Right	kg	459.0	290.5		394.5	337.0		463.0	345.0	
Ratio	%	60.3%	39.7%		52.5%	47.5%		56.7%	43.3%	
Total	kg	912.0	600.5	1512.5	880.0	797.0	1677.0	956.0	729.0	1685.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1512.5	A
Actual Weight of 2 P572 ATD Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	44.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1682.3	A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e.

Calculated Test Vehicle Target Weight -4.5 kg to -9.0 kg)? Yes No

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	757	764	Yes
RF	mm	764	764	Yes
LR	mm	755	762	Yes
RR	mm	775	770	Yes
Vehicle CG (Aft of Front Axle)	mm	1156	1166	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	31	38	

***The "As Tested" vehicle attitude measurements must be equal to or within ±10 mm of the "Fully Loaded" vehicle attitude measurements at each wheel well. Indicate "Yes" or "No" for "Meets Requirement"

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

Test Height Adjustable Setting (If Applicable)	
--	--

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Bumper fascia	6.5
Bumper beam	5.5
Taillights	6.0
Front door panel	3.5
Speakers	1.0
Tire repair kit	6.0

TEST SURFACE MARKINGS

	Distance from 63° Impact Angle Line (mm)
Fore 25 mm target	0
Aft 25 mm target	0
Pre-Impact Angle Line	63°

Parallel Track Target	X Location (mm)	Y Location (mm)
A	0	0
B	1355	689
C	1355	3756
D	0	3059

DATA SHEET NO. 2

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

SEAT POSITIONING

The driver’s seat, front center seat (if applicable), and right front passenger’s seat should be set to the mid-track, lowest, mid-angle position. The struck side rear passenger’s seat, rear center seat, and non-struck side rear passenger’s seats should be set to the rearmost, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	9.0	0.0	4.5
Front Passenger Seat	4.3	0.0	2.2
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	4.5	538	Max	526	538	549
			Mid	526	538	549
			Min	526	538	549
Front Passenger Seat	2.2		Max	523	532	541
			Mid	523	532	541
			Min	523	532	541
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 ... (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

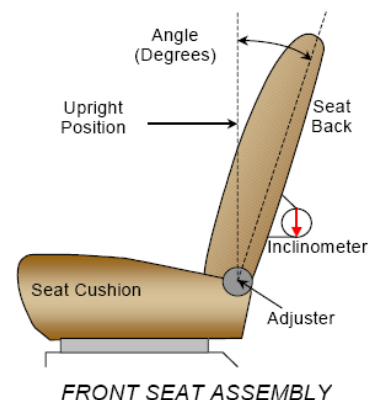
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	27	130	13
Front Passenger Seat		27		13
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The right front passenger's seat back is positioned in a similar manner as the driver's seat back. The struck side rear seat back is fixed. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck side rear seat back. Seat back angle is measured at the head rest post.



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/ Seated Dummy	74.7	27	7.5	
Front Passenger Seat	68.3	41	7.8	
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

DATA SHEET NO. 2 ... (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. The positions are marked H, M2, M1, L from top to bottom.

	Total No. of Positions	Placed in Position
Driver Seat	4	M1
Rear Seat	Fixed	Fixed

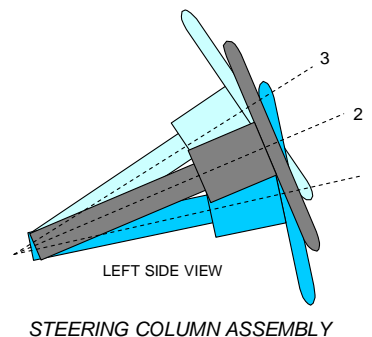
HEAD RESTRAINT ADJUSTMENT

The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total No. of Positions	Placed in Position
Driver Seat	4	H
Rear Seat	4	L

STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.



STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	68.5	130
Geometric Center Position, No. 2	66.6	165
Uppermost Position, No. 3	64.6	200
Telescoping Steering Wheel Travel		70
Test Position	66.6	165

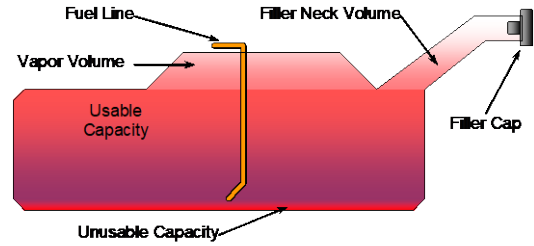
DATA SHEET NO. 2 ... (CONTINUED)

SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The fuel pump is activated when the ignition is turned to "ON" position.



FUEL TANK CAPACITY

VEHICLE FUEL TANK ASSEMBLY

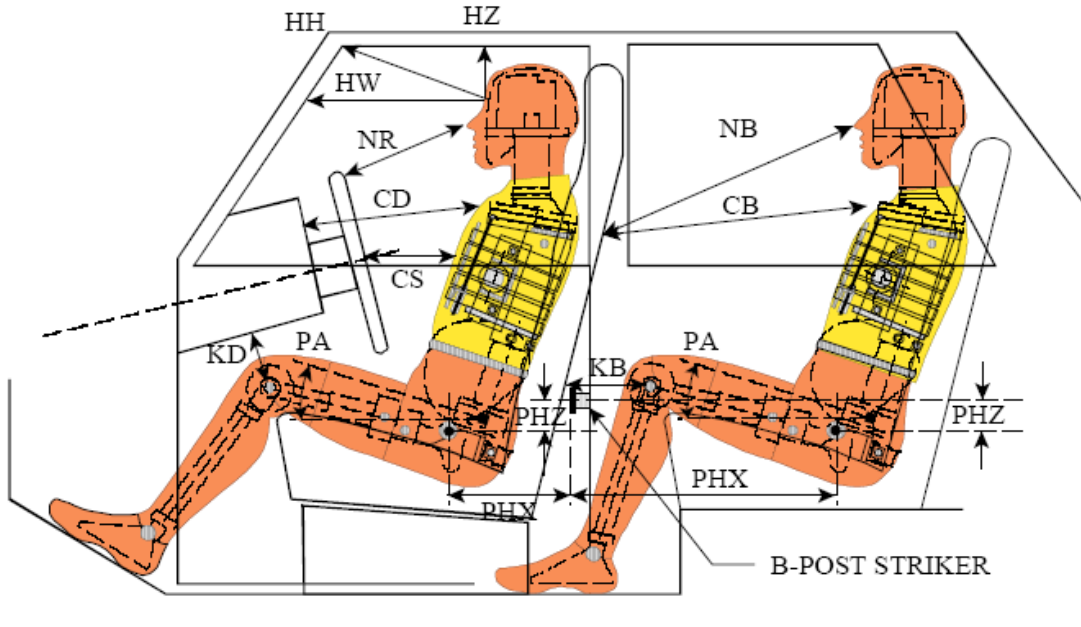
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	62.84
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	32.20
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	58.44
Actual amount of Solvent Used in Test	58.44
1/3 of Usable Capacity	20.95

Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? **Yes** **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



LEFT SIDE VIEW

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

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	350			
HW		Head to Windshield	698			
HZ	HZ	Head to Roof	159		257	
NR	NB	Nose to Rim/Seat Back	416		599	
CD	CB	Chest to Dash/Seat Back	605		590	
CS		Chest to Steering Wheel	380			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	172	28.5	335	5.6
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	152	28.1	341	6.7
PAX°	PAX°	Pelvic Tilt Angle X		0.4		21.4
	PAY°	Pelvic Tilt Angle Y		0.0		0.3
PHX	PHX	Hip Point to Striker (x-axis)	227		296	
PHZ	PHZ	Hip Point to Striker (z-axis)	190		294	

DATA SHEET NO. 4

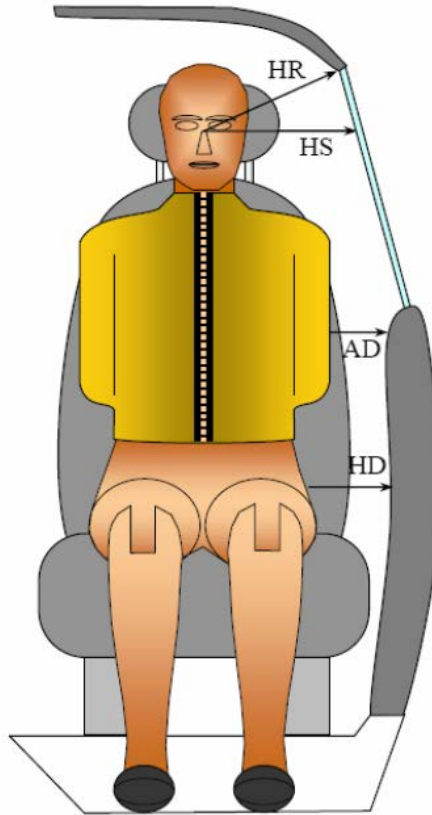
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan

NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test

Test Date: 12/07/22



DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

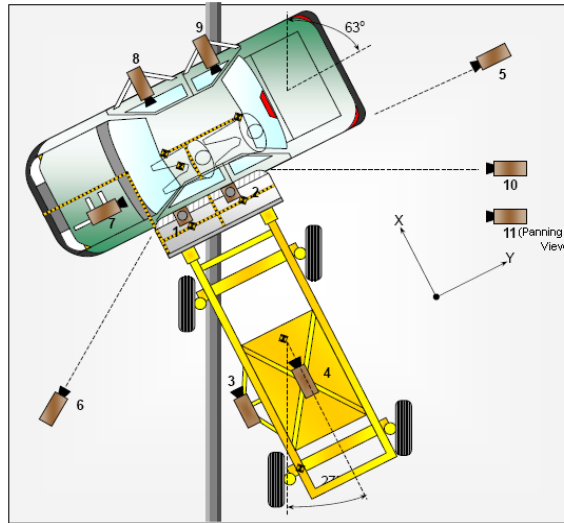
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	205	300
HS	Head to Side Window	mm	258	360
AD	Arm to Door	mm	182	162
HD	H-Point to Door	mm	205	229

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



CAMERA LOCATIONS AND DATA

No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	1220	2287	-5486	14	1000
2	Overhead Close-Up	609	2287	-5102	35	1000
3	Left Impact Point (MDB)	-2134	0	-1143	25	1000
4	Side Overall (MDB)	-3912	838	-1829	12.5	1000
5	Rear	-64	2485	-1348	85	1000
6	Left Front	-2266	-3564	-1475	24	1000
7	Driver Front (On-Board)	316	-1424	608	8.5	1000
8	Driver Side (On-Board)	435	-1451	576	8	1000
9	Passenger Side (On-Board)	342	-1418	650	8	1000
10	Real Time Overall				Zoom	30
11	Real Time Inrun				Zoom	30

Reference: Impact Point Projected to Ground; +X = To Front of MDB, +Y = To Right of MDB, +Z = Down

*All measurements accurate to ±6 mm

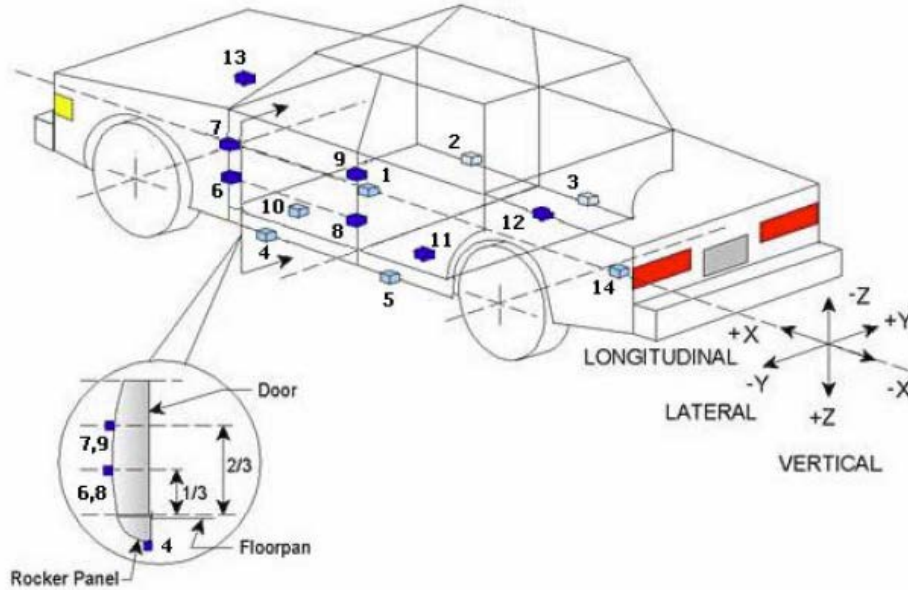
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	19
Vehicle Structure Accelerometers	23
MDB Channels	5
Total	63

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1843	0	-335
2	Right Sill at Front Seat	2644	705	-304
3	Right Sill at Rear Seat	1721	728	-308
4	Left Sill at Front Door	2660	766	-184
5	Left Sill at Rear Door	1772	766	-188
6	A-Pillar Lower	3169	810	-580
7	A-Pillar Middle	3169	810	-845
8	B-Pillar Lower	2060	725	-622
9	B-Pillar Middle	2060	725	-957
10	Front Seat Track	2265	171	-259
11	Rear Seat Structure	1785	362	-261
12	Right Rear Occupant Compartment	1986	370	-203
13	Engine Block	3591	0	-793
14	Rear Floorpan Above Axle	962	0	-441

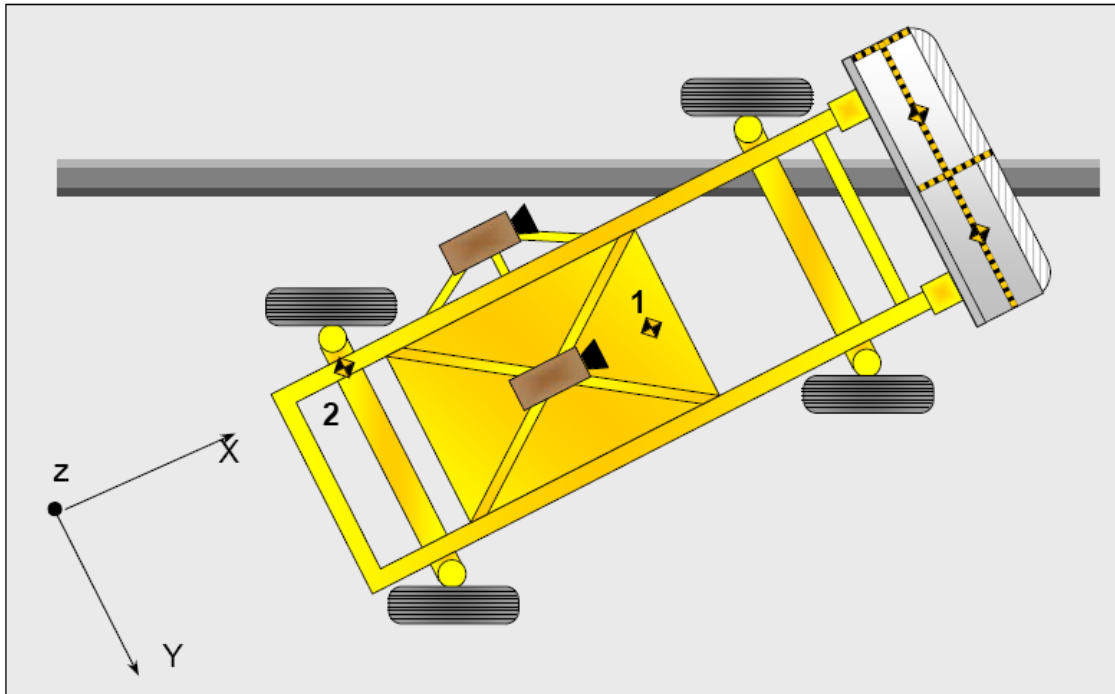
Reference: X – Rear surface of vehicle (+ forward)
 Y – Vehicle centerline (+ to right)
 Z – Ground plane (+ down)

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Measurement		
		X	Y	Z
1	MDB CG	-1195	0	-430
2	MDB Rear	-2642	-593	-608

Reference: X – Face of MDB (+ forward)
 Y – MDB centerline (+ to right)
 Z – Ground plane (+ down)

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag & Side Header	Curtain Airbag & Center Seat
Top of Head	Side Header	Curtain Airbag & Side Header
Left Side of Head	Curtain Airbag & Side Header	Curtain Airbag
Back of Head	Headrest, Side Header, & Curtain Airbag	Headrest, Side Header, & Curtain Airbag
Left Shoulder	Curtain, T/P Airbag, & Door Panel	Curtain Airbag & Door Panel
Upper Torso	T/P Airbag & Seatback	Door Panel
Lower Torso	T/P Airbag & Seatback	Door Panel
Left Hip	T/P Airbag & Door Panel	Door Panel
Left Knee	Door Panel	Door Panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Other
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	N/A	N/A	N/A	N/A	N/A

DATA SHEET NO. 8 ... (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	No	No	No
Seat Disengagement from Floor Pan	No	No	No	No
Seat Back Movement from Initial Position	No	No	No	No
Seat Back Collapse	No	No	No	No

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	No separation
Windshield Damage	None
Side Window Damage	Broken
Other Notable Effects	None

DATA SHEET NO. 8 ... (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side		Struck Side	
	Driver		Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No			
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheelbase	mm		2673
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		411
Actual Impact Point (Aft of Front Axle)	mm		411
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	0
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	10

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1251
Overall Length including Honeycomb Face	4115
Wheel Base of Framework Carriage	2595
CG location aft of Front Axle	1118

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	402.0	297.5	699.5
Right	kg	377.0	290.0	667.0
Ratio	%	57.0%	43.0%	100.0%
Totals	kg	779.0	587.5	1366.5

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.78
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.93
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	91.2
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.3
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.9

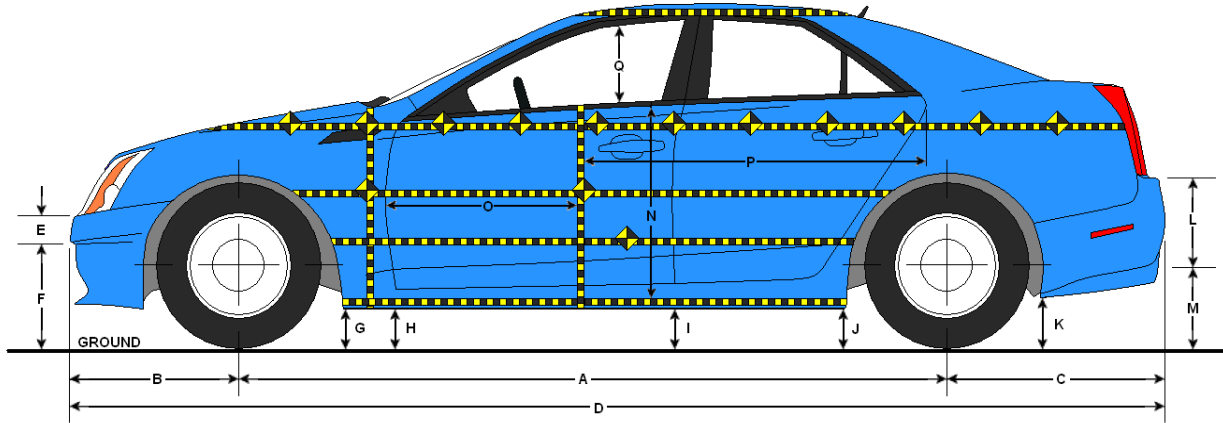
MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Left	233
B	Top of Bumper	533	800	Left	146
C	Mid Level	686	800	Right	94
D	Top of Stack	813	800	Right	113

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Change
A	Vehicle Wheelbase	2673	2669	-4
B	Front Axle to FSOV	995	990	-5
C	Rear Axle to RSOV	1008	1006	-2
D	Total Vehicle Length at Centerline	4675	4665	-10
E	Front Bumper Thickness	105	103	-2
F	Front Bumper Bottom to Ground	438	429	-9
G	Sill Height at Front Wheel Well	277	277	0
H	Sill Height at Front Door Leading Edge	281	259	-22
I	Sill Height at B-Pillar	290	296	6
J1	Sill Height at Rear Wheel Well	284	251	-33
J2	Pinch Weld Height at Rear Wheel Well	189	194	5
K	Sill Height Aft of Rear Wheel Well	340	343	3
L	Rear Bumper Thickness	136	137	1
M	Rear Bumper Bottom to Ground	447	448	1
N	Sill Height to Window Sill Bottom	680	650	-30
O	Front Door Leading Edge to Impact CL	768	739	-29
P	Rear Door Trailing Edge to Impact CL	1424	1401	-23
Q	Front Window Opening	391	407	16
R	Right Side Length	4420	4423	3
S	Left Side Length	4422	4418	-4
T	Vehicle Width at B-Pillar	1781	1662	-119

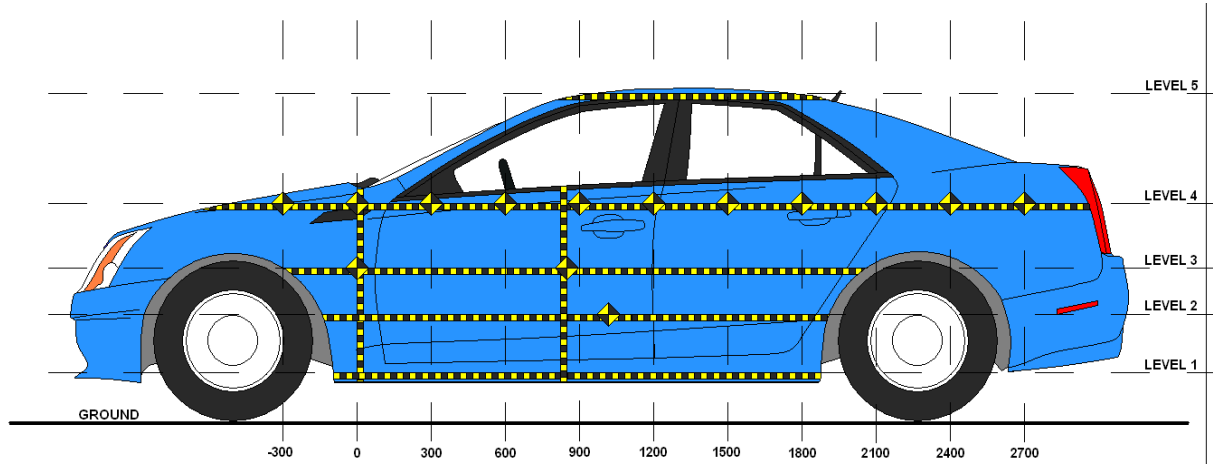
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



LEFT SIDE VIEW

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	343	61	750
2	Occupant H-Point	556	178	450
3	Mid-Door	661	190	1200
4	Window Sill	849	150	1650
5	Window Top	1448	-13	1350

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test (mm)					Post-Test (mm)					Crush (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450				678					678					0	
-300				662					663					1	
-150			583	660				603	660				20	0	
0	609	589	600	669		597	598	723	668		-12	9	123	-1	
150	635	610	609	664		656	732	770	688		21	122	161	24	
300	638	609	606	656		682	778	769	735		44	169	163	79	
450	637	607	602	650		690	785	766	753		53	178	164	103	
600	636	605	600	641		690	773	759	745		54	168	159	104	
750	633	604	599	637		694	759	757	736		61	155	158	99	
900	635	605	600	630	887	696	755	751	722	874	61	150	151	92	-13
1050	637	606	601	632	889	695	740	754	710	876	58	134	153	78	-13
1200	640	608	602	622	893	680	764	792	686	878	40	156	190	64	-15
1350	643	610	606	619	896	668	759	789	714	883	25	149	183	95	-13
1500	644	609	606	621	898	662	752	778	755	878	18	143	172	134	-20
1650	635	599	597	625	897	651	749	720	775	875	16	150	123	150	-22
1800	606	585	584	629	895	589	697	651	712	869	-17	112	67	83	-26
1950				625	901				652	867				27	-34
2100				610	911				582	875				-28	-36
2250				605					570					-35	
2400															
2550															
2700															
2850															

DATA SHEET NO. 11 ... (CONTINUED)

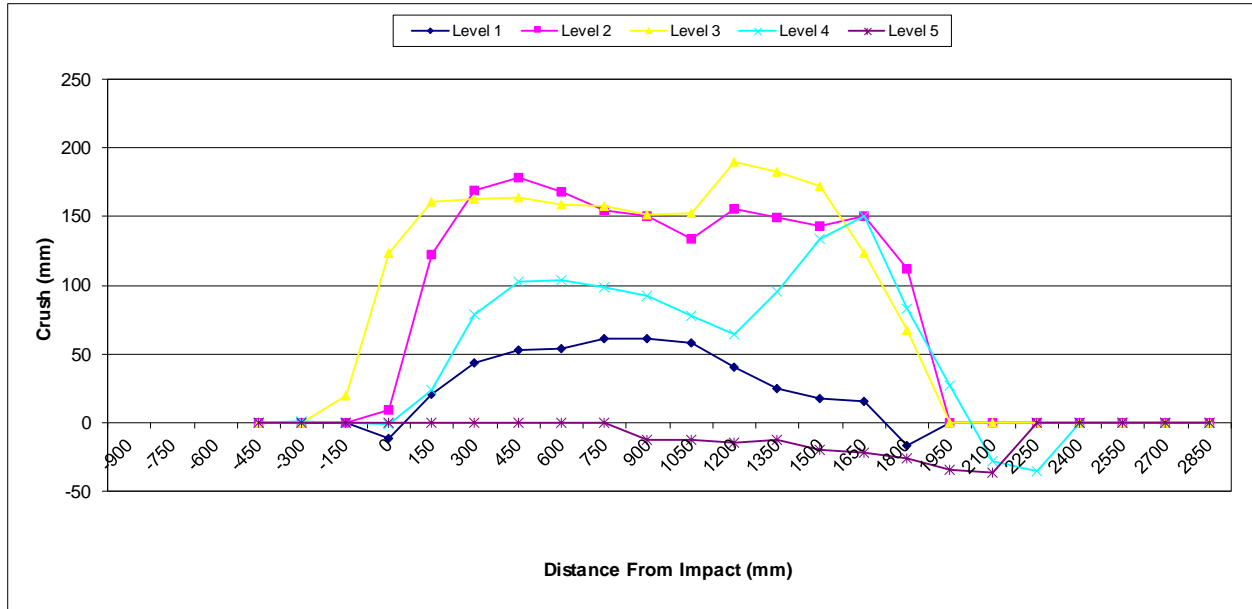
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan

NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test

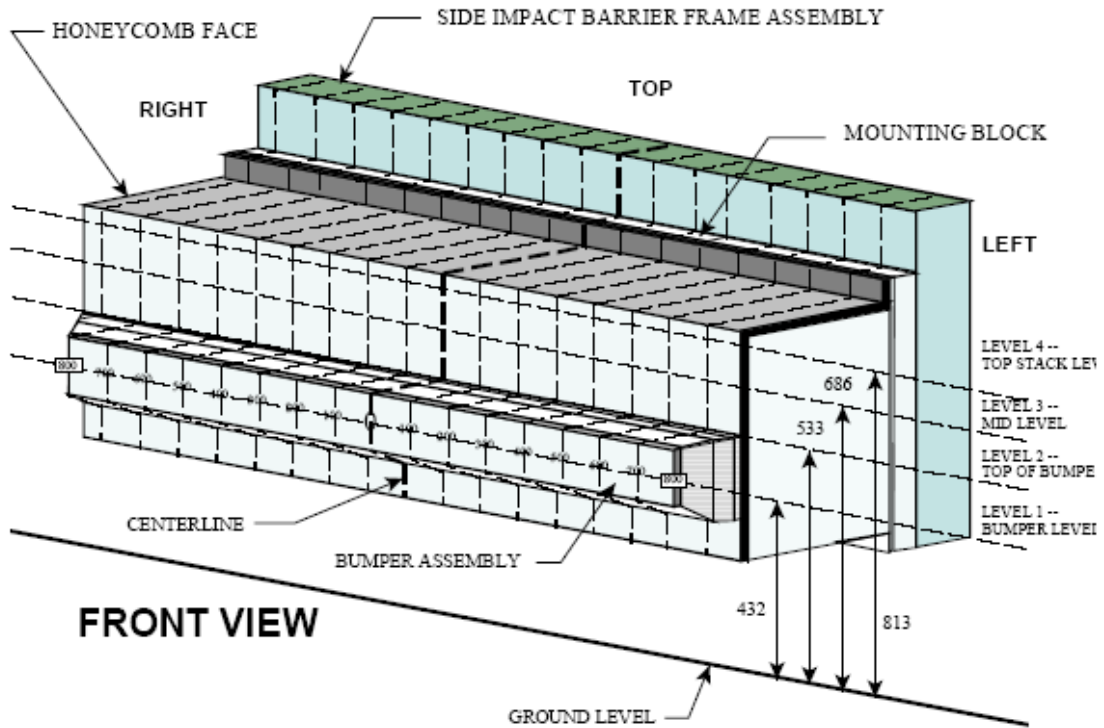
Test Date: 12/07/22



DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

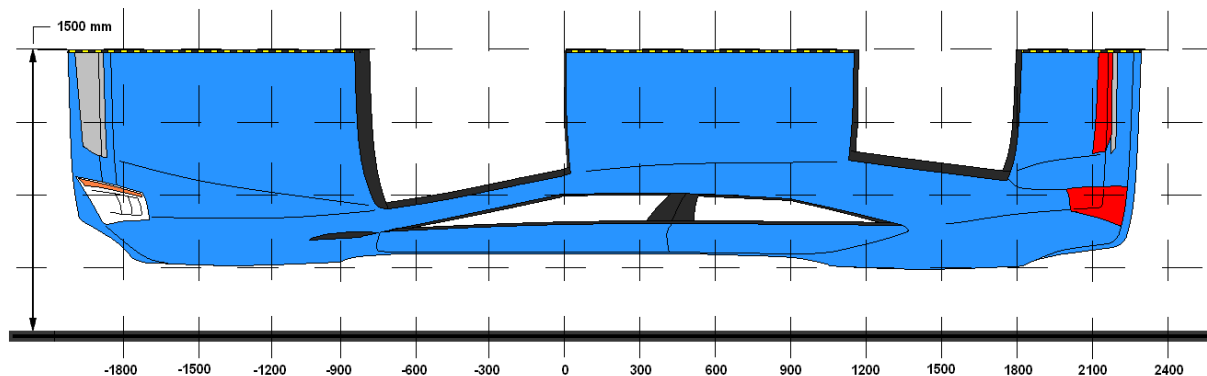
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	-116	146	125	122	133	136	143	150	158	163	167	173	181	194	198	209	233
2	91	55	60	61	64	62	63	75	25	80	91	91	95	102	124	124	146
3	94	45	31	20	18	14	22	32	42	60	76	78	32	24	22	31	60
4	113	71	33	26	15	19	21	29	41	54	91	101	43	28	13	20	63

All dimensions in millimeters.

DATA SHEET NO. 13

VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2250	4	605	570	-35
2	1800	4	625	775	150
3	1200	3	602	792	190
4	600	2	605	773	168
5	0	3	600	723	123
6	-450	4	678	678	0

MDB DAMAGE PROFILE DISTANCES

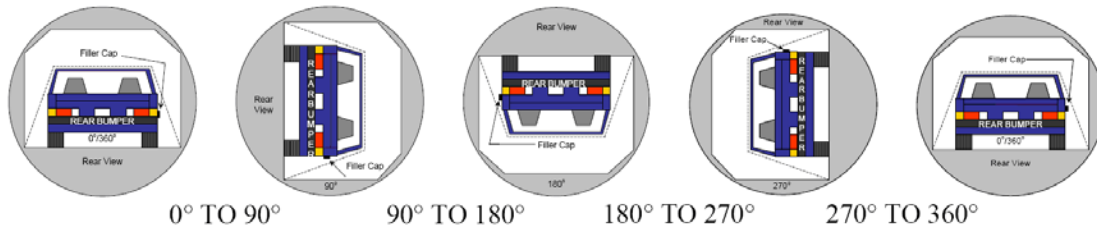
DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	233
2	500	Left	1	194
3	200	Left	1	167
4	200	Right	1	143
5	500	Right	1	122
6	800	Right	4	113

DATA SHEET NO. 14

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22
 Temperature at Time of Impact: 19.4°C Test Time: 3:51 P.M.

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	83	300	383
90° To 180°	82	300	382
180° To 270°	81	300	381
270° To 360°	80	300	380

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

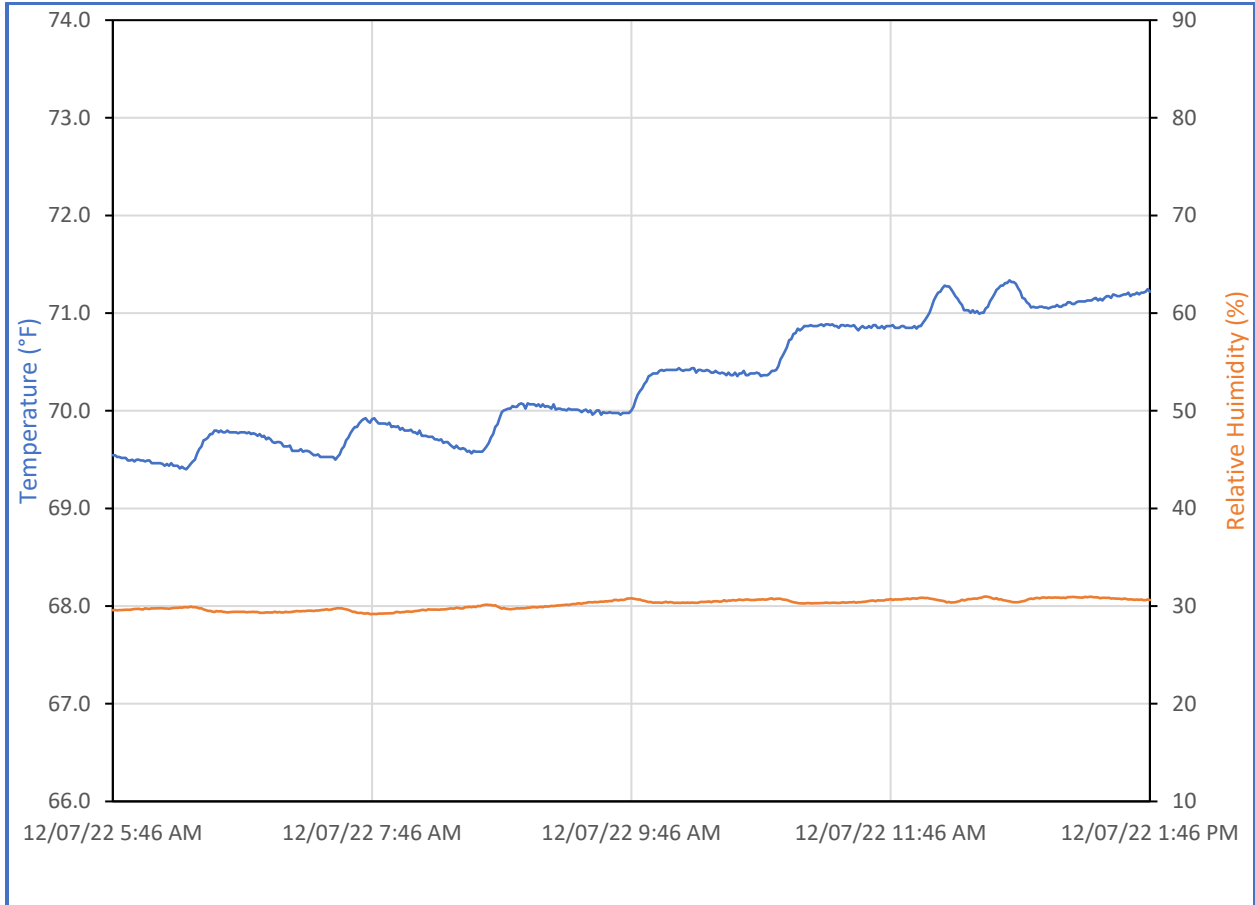
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 15

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2022 Subaru WRX Premium 4-Door Sedan NHTSA No. O20225502

Test Program: NCAP MDB Side Impact Test Test Date: 12/07/22



**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS

Figure		Page
1	As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle	A-1
2	As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	A-1
3	Pre-Test Frontal View of Test Vehicle	A-2
4	Post-Test Frontal View of Test Vehicle	A-2
5	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-3
6	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-3
7	Pre-Test Left Side View of Test Vehicle	A-4
8	Post-Test Left Side View of Test Vehicle	A-4
9	Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
10	Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
11	Pre-Test Rear View of Test Vehicle	A-6
12	Post-Test Rear View of Test Vehicle	A-6
13	Pre-Test Right Side View of Test Vehicle	A-7
14	Post-Test Right Side View of Test Vehicle	A-7
15	Pre-Test Overhead View of Test Area	A-8
16	Post-Test Overhead View of Test Area	A-8
17	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	A-9
18	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	A-9
19	Pre-Test Close-Up View of Impact Point Target	A-10
20	Post-Test Close-Up View of Impact Point Target	A-10
21	Pre-Test Left Front Door Latch Close-Up	A-11
22	Post-Test Left Front Door Latch Close-Up	A-11
23	Pre-Test Left Rear Door Latch Close-Up	A-12
24	Post-Test Left Rear Door Latch Close-Up	A-12
25	Pre-Test Front Close-Up View of Driver Dummy	A-13
26	Post-Test Front Close-Up View of Driver Dummy	A-13
27	Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking	A-14
28	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-14
29	Post-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-15
30	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	A-15
31	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-16
32	Pre-Test Overhead View of Driver Seat Pan Prior to Dummy Positioning	A-16
33	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-17
34	Pre-Test Placement of Driver Dummy's Feet	A-17
35	Pre-Test View of Belt Anchorage for Driver Dummy	A-18

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
36	Pre-Test Left Side View of Steering Wheel	A-18
37	View of Disengaged Parking Brake	A-19
38	Pre-Test View of Parking Brake	A-19
39	Pre-Test Close-Up Left Side View of Driver Seat Track	A-20
40	Pre-Test Close-Up Left Side View of Driver Seat Back	A-20
41	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-21
42	Pre-Test Driver Dummy and Door Clearance View	A-21
43	Post-Test Driver Dummy and Door Clearance View	A-22
44	Pre-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment	A-22
45	Post-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment	A-23
46	Pre-Test Driver Inner Door Panel View	A-23
47	Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations	A-24
48	Post-Test Driver Dummy Close-Up Head Contact with Vehicle Interior View	A-24
49	Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View	A-25
49a	Post-Test Driver Dummy Close-Up Head Contact with Vehicle Interior View	A-25
50	Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View	A-26
51	Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View	A-26
52	Post-Test Driver Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-27
53	Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View	A-27
54	Post-Test Driver Dummy Close-Up Knee Contact View	A-28
55	Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking	A-28
56	Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-29
57	Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-29
58	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-30
59	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-30
60	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-31
61	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-31
62	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-32
63	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-32
64	Pre-Test Placement of Rear Passenger Dummy's Feet	A-33
65	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-33
66	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-34
67	Pre-Test Close-Up Left Side View of Rear Passenger Seat Back	A-34
68	Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint	A-35
69	Pre-Test Rear Passenger Dummy and Door Clearance View	A-35

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
70	Post-Test Rear Passenger Dummy and Door Clearance View	A-36
71	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-36
72	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-37
73	Pre-Test Rear Passenger Inner Door Panel View	A-37
74	Post-Test Rear Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations	A-38
75	Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle Interior View	A-38
76	Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View	A-39
77	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View	A-39
78	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View	A-40
79	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-40
80	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View	A-41
81	Post-Test Rear Passenger Dummy Close-Up Knee Contact View	A-41
82	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-42
83	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-42
84	Pre-Test Front View of MDB Impactor Face	A-43
85	Post-Test Front View of MDB Impactor Face	A-43
86	Pre-Test Top View of MDB Impactor Face	A-44
87	Post-Test Top View of MDB Impactor Face	A-44
88	Pre-Test Left Side View of MDB Impactor Face	A-45
89	Post-Test Left Side View of MDB Impactor Face	A-45
90	Pre-Test Right Side View of MDB Impactor Face	A-46
91	Post-Test Right Side View of MDB Impactor Face	A-46
92	Close-Up View of Vehicle's Certification Label	A-47
93	Close-Up View of Vehicle's Tire Information Placard or Label	A-47
94	Pre-Test Ballast View	A-48
95	Post-Test Primary and Redundant Speed Trap Read-Out	A-48
96	FMVSS No. 301 Static Rollover 0 Degrees	A-49
97	FMVSS No. 301 Static Rollover 90 Degrees	A-49
98	FMVSS No. 301 Static Rollover 180 Degrees	A-50
99	FMVSS No. 301 Static Rollover 270 Degrees	A-50
100	FMVSS No. 301 Static Rollover 360 Degrees	A-51
101	Impact Event	A-51
102	Monroney Label	A-52
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52
104	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-53



FIGURE 1. As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 2. As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 3. Pre-Test Frontal View of Test Vehicle



FIGURE 4. Post-Test Frontal View of Test Vehicle



FIGURE 5. Pre-Test Left Front 3/4 View of Test Vehicle



FIGURE 6. Post-Test Left Front 3/4 View of Test Vehicle



FIGURE 7. Pre-Test Left Side View of Test Vehicle



FIGURE 8. Post-Test Left Side View of Test Vehicle



FIGURE 9. Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 10. Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



FIGURE 13. Pre-Test Right Side View of Test Vehicle



FIGURE 14. Post-Test Right Side View of Test Vehicle



FIGURE 15. Pre-Test Overhead View of Test Area

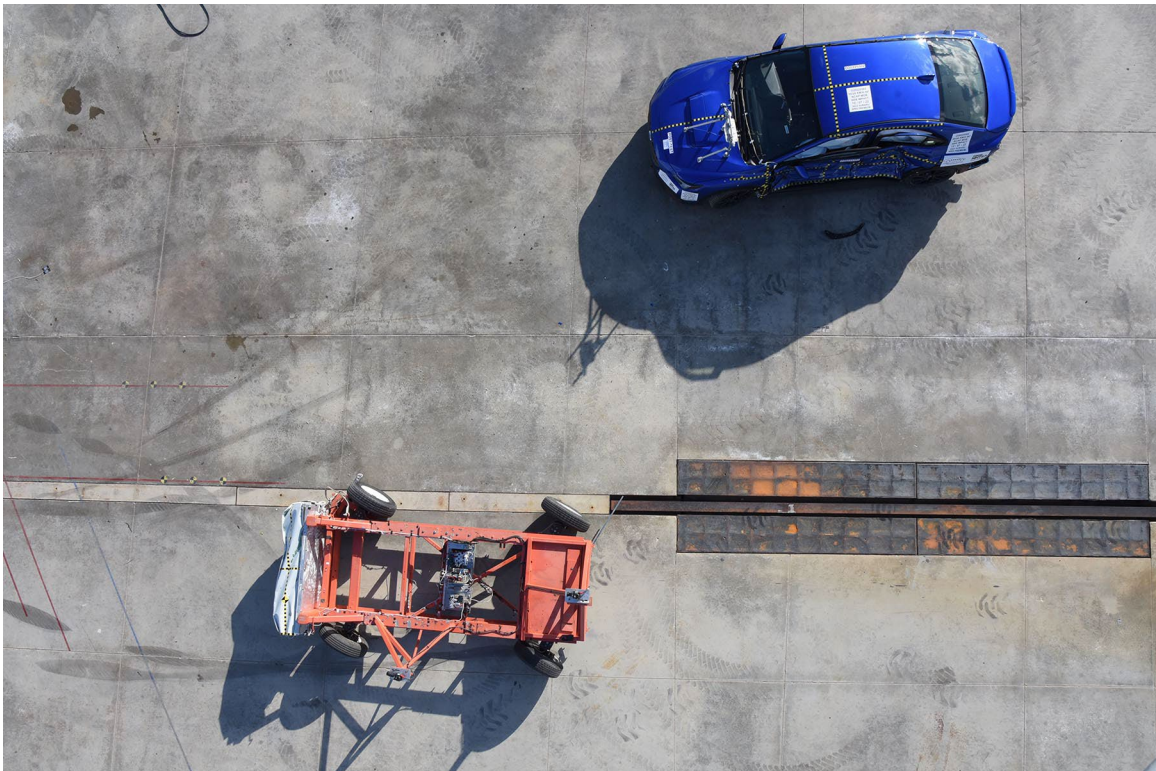


FIGURE 16. Post-Test Overhead View of Test Area



FIGURE 17. Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



FIGURE 18. Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle



FIGURE 19. Pre-Test Close-Up View of Impact Point Target



FIGURE 20. Post-Test Close-Up View of Impact Point Target



FIGURE 21. Pre-Test Left Front Door Latch Close-Up



FIGURE 22. Post-Test Left Front Door Latch Close-Up



FIGURE 23. Pre-Test Left Rear Door Latch Close-Up



FIGURE 24. Post-Test Left Rear Door Latch Close-Up



FIGURE 25. Pre-Test Front Close-Up View of Driver Dummy



FIGURE 26. Post-Test Front Close-Up View of Driver Dummy



FIGURE 27. Pre-Test Left Side View of Driver Dummy
Showing Belt and Chalking



FIGURE 28. Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



FIGURE 29. Post-Test Left Side View of Driver Dummy Shoulder and Door Top View

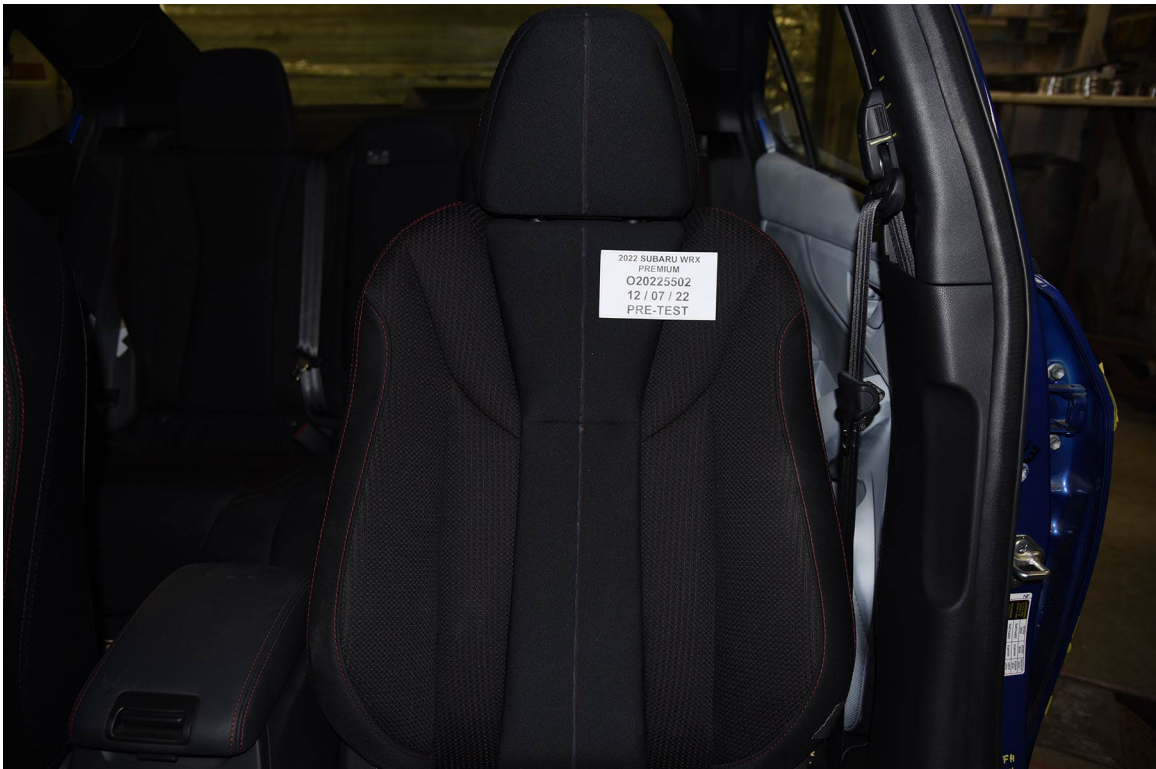


FIGURE 30. Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



FIGURE 31. Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



FIGURE 32. Pre-Test Overhead View of Driver Seat Pan Prior to Dummy Positioning



FIGURE 33. Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



FIGURE 34. Pre-Test Placement of Driver Dummy's Feet



FIGURE 35. Pre-Test View of Belt Anchorage for Driver Dummy



FIGURE 36. Pre-Test Left Side View of Steering Wheel



FIGURE 37. View of Disengaged Parking Brake



FIGURE 38. Pre-Test View of Parking Brake



FIGURE 39. Pre-Test Close-Up Left Side View of Driver Seat Track



FIGURE 40. Pre-Test Close-Up Left Side View of Driver Seat Back



FIGURE 41. Pre-Test Close-Up View of Driver Seat Back or Head Restraint



FIGURE 42. Pre-Test Driver Dummy and Door Clearance View



FIGURE 43. Post-Test Driver Dummy and Door Clearance View



FIGURE 44. Pre-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment



FIGURE 45. Post-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment



FIGURE 46. Pre-Test Driver Inner Door Panel View



FIGURE 47. Post-Test Driver Inner Door Panel View
Showing Driver Dummy Contact Locations



FIGURE 48. Post-Test Driver Dummy Close-Up Head Contact
with Vehicle Interior View



FIGURE 49. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View



FIGURE 49a. Post-Test Driver Dummy Close-Up Head Contact with Vehicle Interior View



FIGURE 50. Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View



FIGURE 51. Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View



FIGURE 52. Post-Test Driver Dummy Close-Up Pelvis Contact with Vehicle Interior View



FIGURE 53. Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



FIGURE 54. Post-Test Driver Dummy Close-Up Knee Contact View



FIGURE 55. Pre-Test Left Side View of Rear Passenger Dummy
Showing Belt and Chalking



FIGURE 56. Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



FIGURE 57. Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View



FIGURE 58. Pre-Test Frontal View of Rear Passenger Seat Back
Prior to Dummy Positioning



FIGURE 59. Pre-Test Frontal View of Rear Passenger Dummy
Head and Shoulders in Relation to Head Restraint



FIGURE 60. Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



FIGURE 61. Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan



FIGURE 62. Pre-Test View of Rear Passenger Dummy's Neck
Showing Position of Adjustable Neck Bracket



FIGURE 63. Pre-Test View of Rear Passenger Dummy's Head
Showing Dummy's Head is Level



FIGURE 64. Pre-Test Placement of Rear Passenger Dummy's Feet



FIGURE 65. Pre-Test View of Belt Anchorage for Rear Passenger Dummy



FIGURE 66. Pre-Test Close-Up Left Side View of Rear Passenger Seat Track

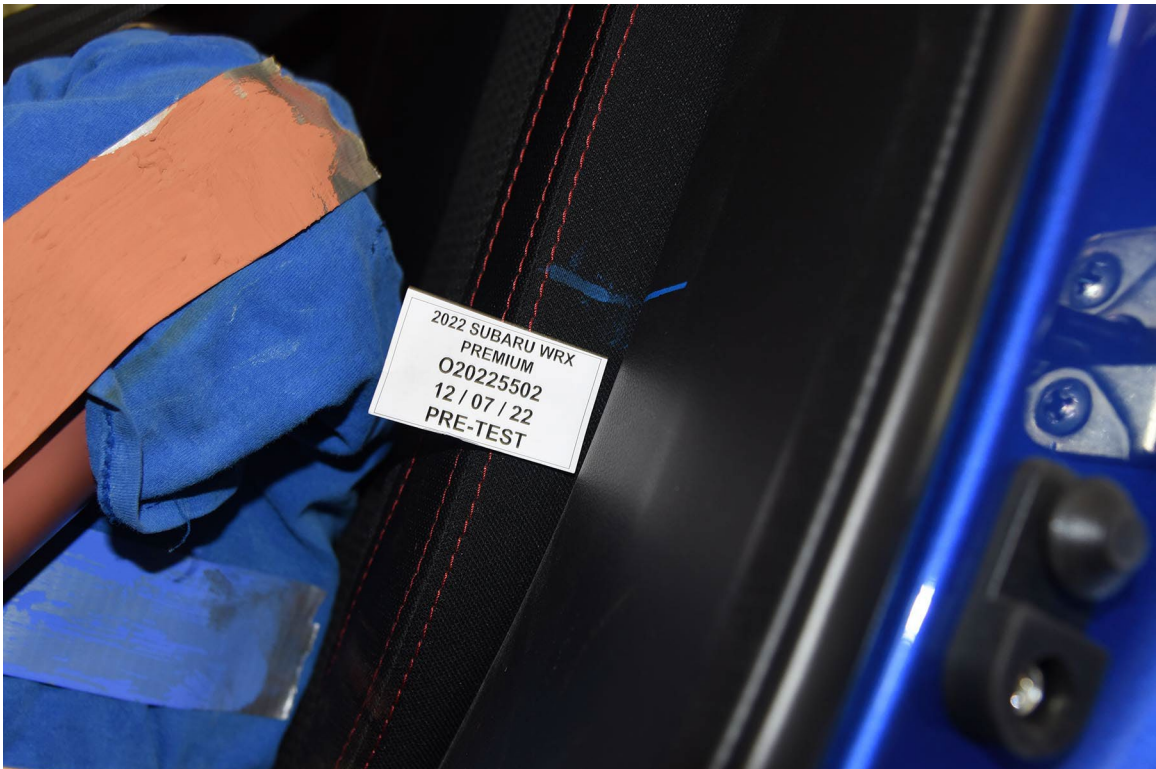


FIGURE 67. Pre-Test Close-Up Left Side View of Rear Passenger Seat Back



FIGURE 68. Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



FIGURE 69. Pre-Test Rear Passenger Dummy and Door Clearance View



FIGURE 70. Post-Test Rear Passenger Dummy and Door Clearance View



FIGURE 71. Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



FIGURE 72. Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



FIGURE 73. Pre-Test Rear Passenger Inner Door Panel View



FIGURE 74. Post-Test Rear Passenger Inner Door Panel View
Showing Rear Passenger Dummy Contact Locations



FIGURE 75. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Vehicle Interior View



FIGURE 76. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Side Airbag View

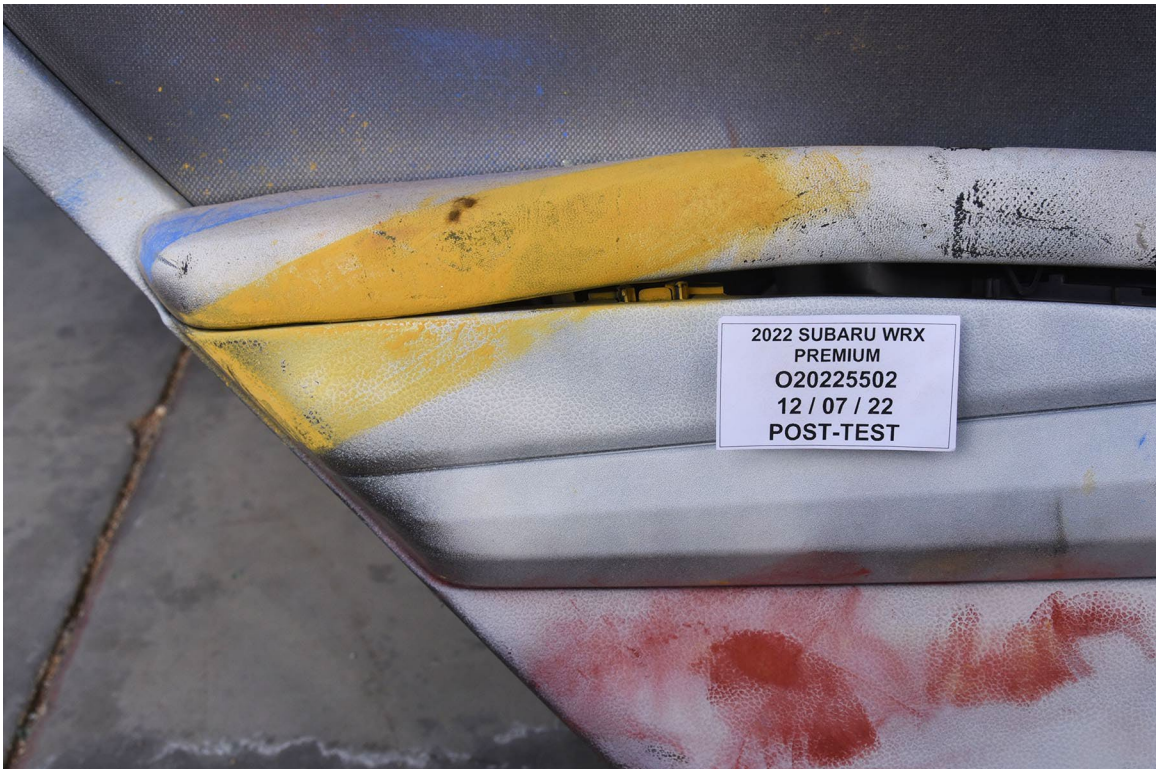


FIGURE 77. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Vehicle Interior View

Photograph Not Applicable

FIGURE 78. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Side Airbag View



FIGURE 79. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Vehicle Interior View

Photograph Not Applicable

FIGURE 80. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Side Airbag View

Photograph Not Applicable

FIGURE 81. Post-Test Rear Passenger Dummy Close-Up Knee Contact View



FIGURE 82. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 83. Post-Test View of Fuel Filler Cap or Fuel Filler Neck



FIGURE 84. Pre-Test Front View of MDB Impactor Face



FIGURE 85. Post-Test Front View of MDB Impactor Face

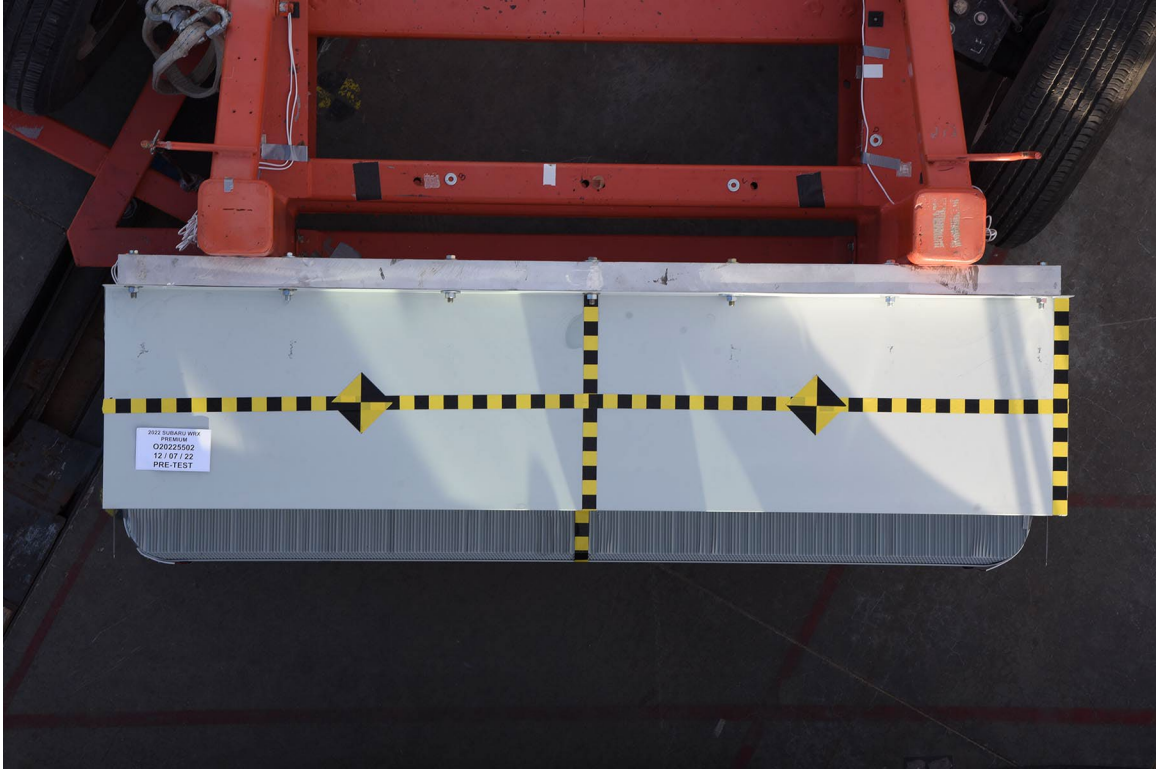


FIGURE 86. Pre-Test Top View of MDB Impactor Face



FIGURE 87. Post-Test Top View of MDB Impactor Face



FIGURE 88. Pre-Test Left Side View of MDB Impactor Face



FIGURE 89. Post-Test Left Side View of MDB Impactor Face



FIGURE 90. Pre-Test Right Side View of MDB Impactor Face



FIGURE 91. Post-Test Right Side View of MDB Impactor Face



FIGURE 92. Close-Up View of Vehicle's Certification Label



FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label



FIGURE 94. Pre-Test Ballast View



FIGURE 95. Post-Test Primary and Redundant Speed Trap Read-Out



FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees



FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

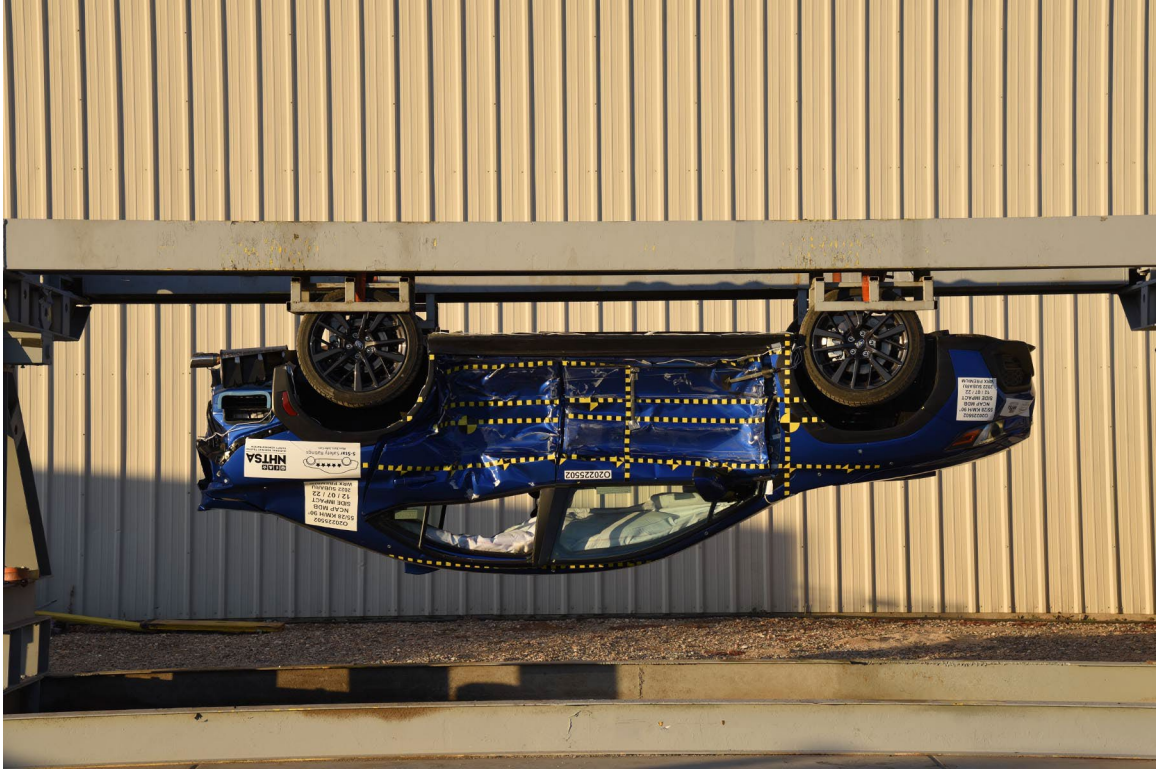


FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

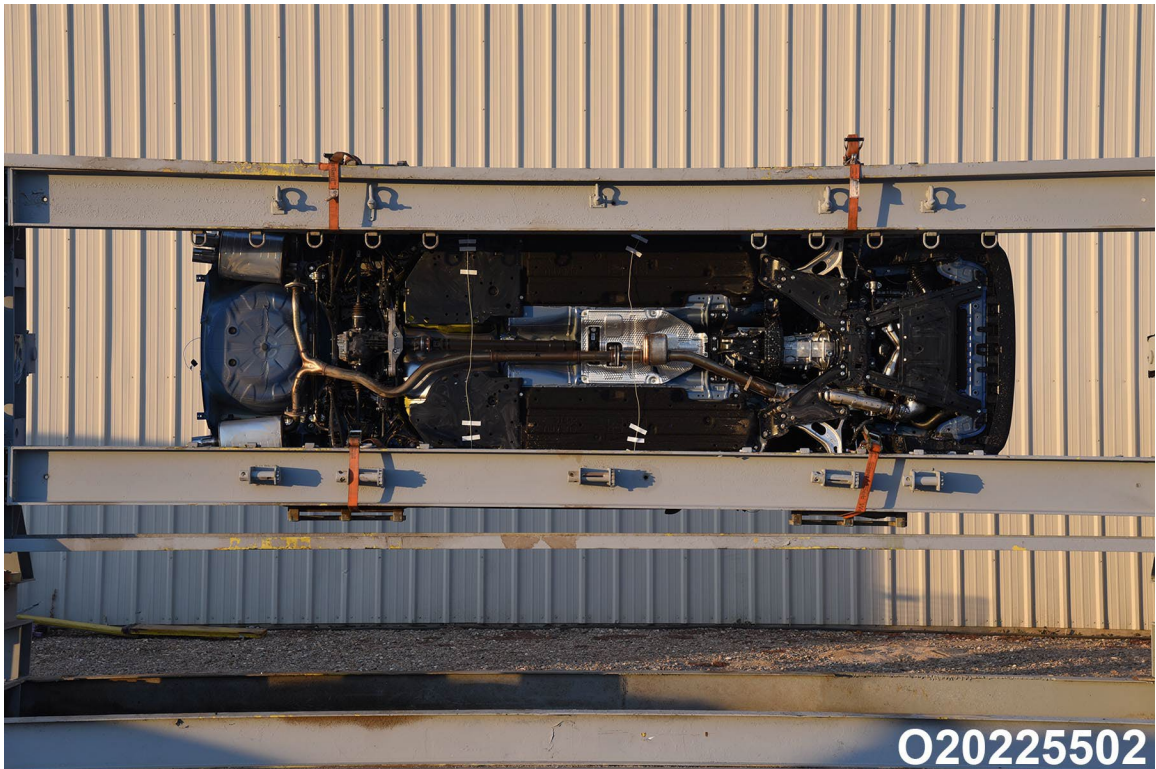


FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees



FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees



FIGURE 101. Impact Event

WRX VIN: JF1VBAF6XN9015471
 Model/Code: 2022 SUBARU WRX PREMIUM/NC
 Port/Assembly: HUSKINE
 Deliver by/Carrier: TRUCK / 456

SHIP TO: 090796
 SUBARU OF GLENDALE
 1300 S BRAND BLVD
 GLENDALE CA 91204

SOLD TO: 090796
 SUBARU OF GLENDALE
 1300 S BRAND BLVD
 GLENDALE CA 91204

GOVERNMENT 5-STAR SAFETY RATINGS

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

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest.
 Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4238

Subaru Added Security®
 Agreement Backed By Subaru
 The Only Extended Service™

- Protection designed to fit your driving needs, up to 10 years/100,000 miles of coverage
- We only use Genuine Subaru replacement parts
- We use Subaru-trained technicians - those who know your vehicle best
- Towing and rental car reimbursements during covered repairs
- Transferable coverage to the next owner

Scan the QR code or ask your sales representative for more details

STAN DARD EQUIPMENT

SAFETY

- Ring-Stitched Reinforcement Frame
- Symmetrical All-Wheel Drive (AWD)
- Multi-Mode Vehicle Dynamics Control System (VDC)
- Subaru Advanced Frontal Airbag System
- Side-Curtain Airbags, Driver's Side Knee Airbag
- Front Side Side (Pelvis/Torso) Airbags
- Anti-Lock Braking System (ABS); Whiplash Reducing Front Seats
- Electronic Brake-Force Distribution
- 4-Wheel Disc Brakes w/ Brake Assist
- Brake Override System; Safety Pedal System
- LATCH System for Child Safety Seats, Rear Seat Reminder
- Tire Pressure Monitoring System (TPMS)
- Anti-Theft Alarm & Engine Immobilizer System
- LED Headlights w/ High Beam Assist, LED Fog Lights
- LED Daytime Running Lights (DRL); Rear Vision, Camera

PERFORMANCE AND EXTERIOR

- 2.4L BOXER DOHC Intercooled Turbocharged Engine
- 6-Speed Manual Transmission
- Sport-Tuned Suspension; Active Torque Vectoring
- 18" Aluminum-Alloy Wheels
- 245/40 R18 Summer-Performance Tires
- Quick-Response Dual Pinion Electric Power-Assisted Steering
- Dual Outlets; Dual Tailpipe w/ Stainless Steel Tips
- Performance Design Front Seats; Aluminum-Alloy Pedal Covers
- Trunk Lip Spoiler

COMFORT, CONVENIENCE & INTERIOR

- Heated Front Seats/Side Mirrors; Windshield Wiper De-Icer
- Auto-Dimming Rearview Mirror
- Dual-Zone Automatic Climate Control w/ Air Filtration System
- STARLINK 11.6" Multi-Media Audio System & Dual USB Ports
- SUBARU STARLINK Safety Plus - 3 Years Free
- *Not Available in Massachusetts Residents or Businesses
- SiriusXM Radio & SiriusXM Travel Link - 4 Months Free
- Apple CarPlay & Android Auto
- Tilt/Telescoping Steering Column w/ Bluetooth & Audio Switches
- Leather-Draped Steering Wheel, Leather Trimmed Shifter
- Illuminated Vanity Mirrors; Auto-Up/Down Windows
- Power Door Locks & Dual Power Mirrors
- Removable Keyless Entry System & Push-Button Start
- Incline Start Assist; Cruise Control
- Height Adjustable Driver's Seat
- Rear Armrest w/ Dual Cupholder
- Dual Rear Seat USB Charging Ports
- 60/40 Split Fold-Down Rear Seatback; Tire Repair Kit

LIMITED WARRANTY/ROADSIDE ASSISTANCE

- 3 Year / 36,000 Miles Basic
- 5 Year / 60,000 Miles Powertrain
- 5 Year / Unlimited Mileage Rust Perforation
- 3 Year / 36,000 24/7 Roadside Assistance
- See Owner Info Kit/Warranty For Details

OPTIONAL EQUIPMENT AND OTHER ITEMS

Manufacturer's Suggested Retail Price	\$32,105.00
Exterior Color: Wr Blue Pearl	
Full Tank of Gas	INCLD
Standard Option: 11	
WRX Short Throw Shifter Pkg	\$612.00
STI Short Throw Shifter Shift Knob	
Center Armrest Extension	\$275.00
Sunshade - Windshield	\$76.00

EPA DOT Fuel Economy and Environment

Fuel Economy

Compact cars range from 14 to 142 MPG. The best vehicle rates 142 MPG.

22 combined city/hwy
19 city
26 highway

4.5 gallons per 100 miles

You spend \$1,500 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,600

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **5** (1-10 scale)

Smog Rating (tailpipe only) **1** (1-10 scale)

This vehicle emits 407 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions. Learn more at fuelconomy.gov.

fuelconomy.gov
 Calculate personalized estimates and compare vehicles.

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS COUNTRY: U.S./CANADIAN PARTS CONTENT: 0%
 MAJOR SOURCES OF FOREIGN PARTS CONTENT: JAPAN: 85%

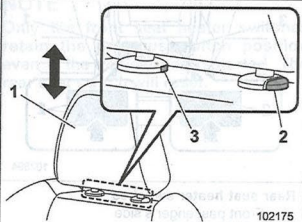
FOR THIS VEHICLE: FINAL ASSEMBLY POINT: OTA, GUNMA, JAPAN
 COUNTRY OF ORIGIN: ENGINE: JAPAN
 TRANSMISSION: JAPAN

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

Destination and Delivery \$995.00
 Total Suggested Retail Price \$34,063.00

FIGURE 102. Monroney Label

Head restraint height adjustment



- Head restraint
- Release button
- Remove button

To release:

- Lowermost to the 1st step

Pull the head restraint up to the 1st step.

To raise:

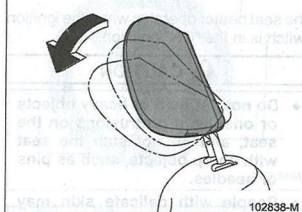
- 1st step to the 3rd step

Pull the head restraint up while pressing the release button on the top of the seatback.

To lower:

Push the head restraint down while pressing the release button on the top of the seatback.

Head restraint angle adjustment



The angle of the head restraint can be adjusted in several steps. While maintaining a suitable driving posture, adjust the head restraint to a position where the back of your head is as close to the head restraint as possible.

To tilt:

Tilt the head restraint by hand to the preferred position. A click will be audible when the head restraint is locked.

To return:

Tilt the head restraint once as far forward as it can go. The head restraint will automatically return to the fully upright position. Then, adjust the head restraint again to the preferred angle.

Each head restraint should be adjusted so that the center of the head restraint is closest to the top of the occupant's ears.

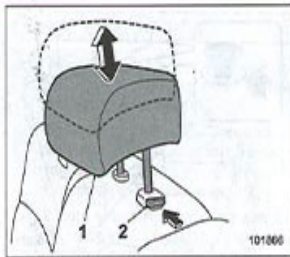
NOTE

It is not possible to remove or install the head restraint without reclining the front seatback. Reclining the front seatback and then remove or install the head restraint.

Front Seats 35

Seat, Seatbelt and SRS Airbags

FIGURE 103. Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



- 1) Head restraint
- 2) Release button

To raise:

Pull the head restraint up.

To lower:

Push the head restraint down while pressing the release button on the top of the seatback.

To remove:

While pressing the release button, pull out the head restraint.

To install:

Install the head restraint into the holes that are located on the top of the seatback until the head restraint locks. Press and hold the release button to lower the head restraint.

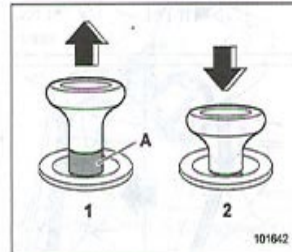
When the rear-center seating position is occupied, raise the head restraint to the extended position. When the rear center seating position is not occupied, lower the head restraint to improve rearward visibility.

Folding Down the Rear Seatback

WARNING

- When you fold down the seatback, check that there are no passengers or objects on the rear seat. Not doing so creates a risk of injury or property damage if the seatback suddenly folds down.
- Never allow passengers to ride on the folded rear seatback or in the trunk. Doing so may result in serious injury or death.
- Secure all objects and especially long items properly to prevent them from being thrown around inside the vehicle and causing serious injury during a sudden stop, a sudden steering maneuver or a rapid acceleration.
- When you return the seatback to its original position, shake the

seatback slightly to confirm that it is securely fixed in place. If the seatback is not securely fixed in place, the seatback may suddenly fold down in the event of sudden braking, or objects may move out from the trunk, which could cause serious injury or death.



Lock release knob

- 1) Unlocked
- 2) Locked
- A) Unlocking marker in red

7
Seat, Seatbelt and SRS Airbags

- CONTINUED -

FIGURE 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary vs. Time	B-1
2	Driver Head Acceleration (Y) Primary vs. Time	B-1
3	Driver Head Acceleration (Z) Primary vs. Time	B-1
4	Driver Head Resultant Acceleration Primary vs. Time	B-1
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
8	Driver Thorax Rib Deflection Maximum vs. Time	B-2
9	Driver Anterior Abdominal Force (Y) vs. Time	B-3
10	Driver Middle Abdominal Force (Y) vs. Time	B-3
11	Driver Posterior Abdominal Force (Y) vs. Time	B-3
12	Driver Total Abdominal Force (Y) vs. Time	B-3
13	Driver Pubic Symphysis Force (Y) vs. Time	B-4
14	Passenger Head Acceleration (X) vs. Time Primary	B-5
15	Passenger Head Acceleration (Y) vs. Time Primary	B-5
16	Passenger Head Acceleration (Z) vs. Time Primary	B-5
17	Passenger Head Resultant Acceleration Primary vs. Time	B-5
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
22	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
23	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website (www.NHTSA.gov)

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Structure Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

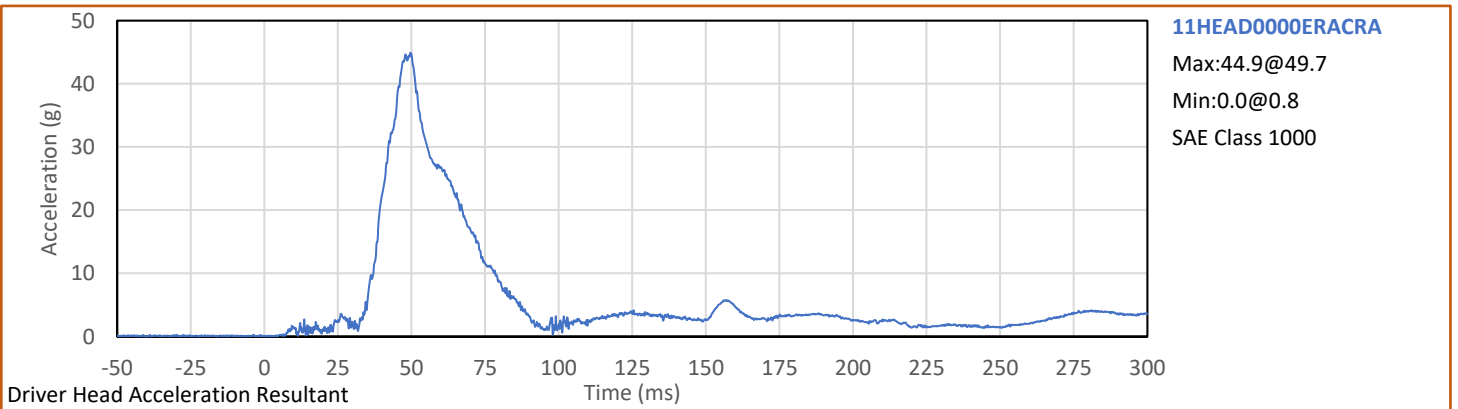
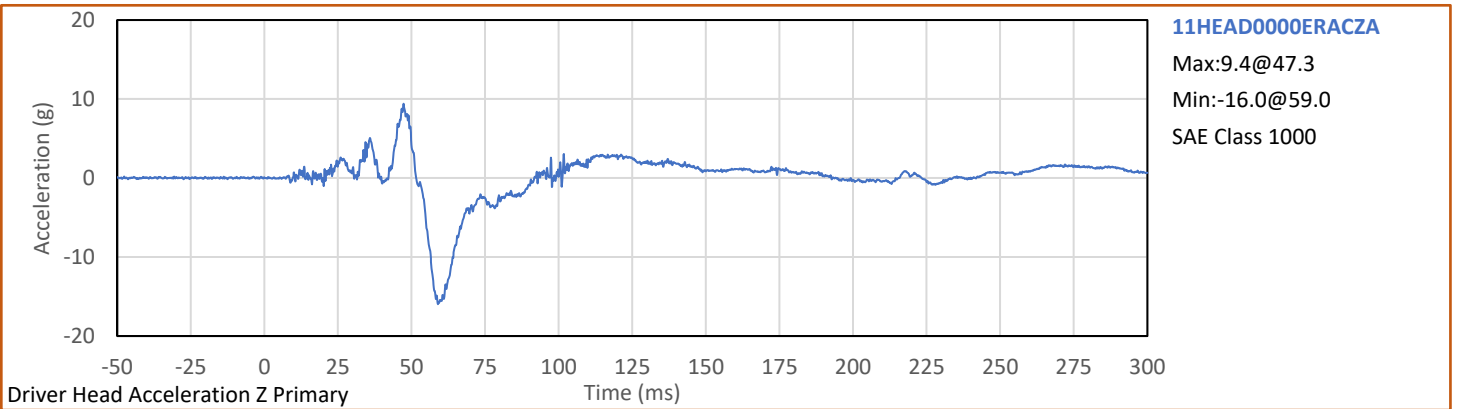
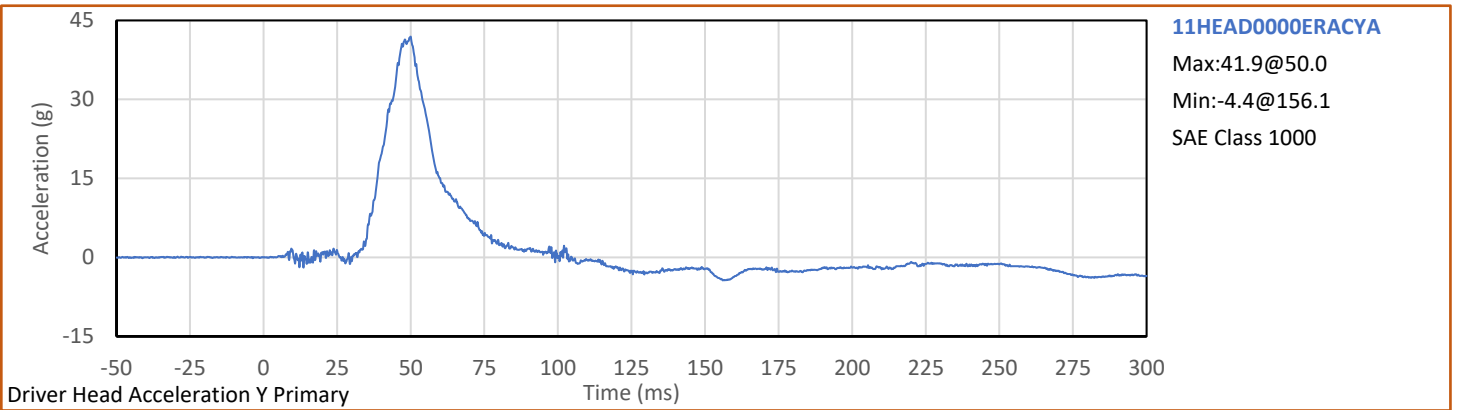
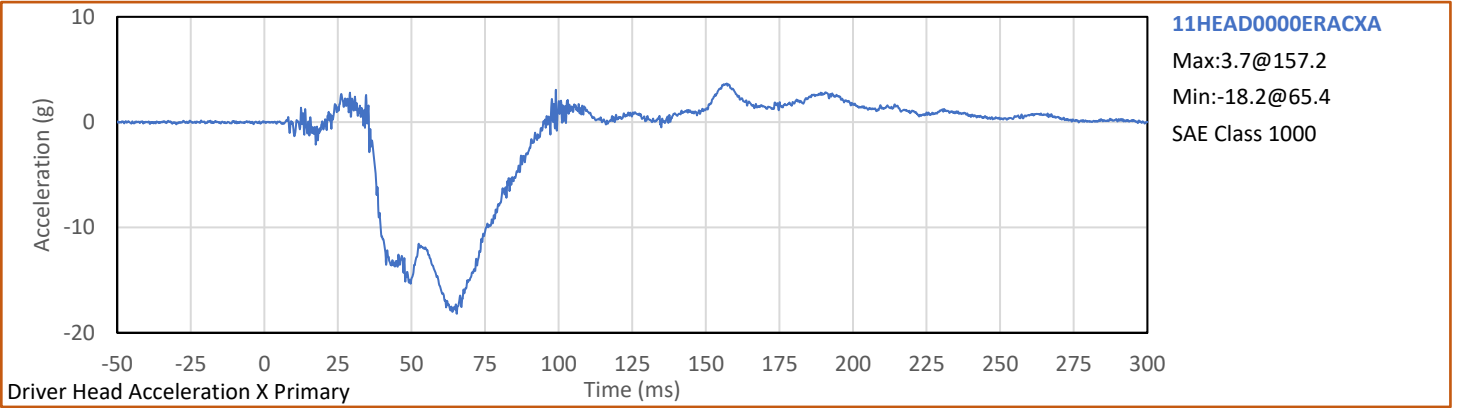
MDB Center of Gravity Acceleration (Z)

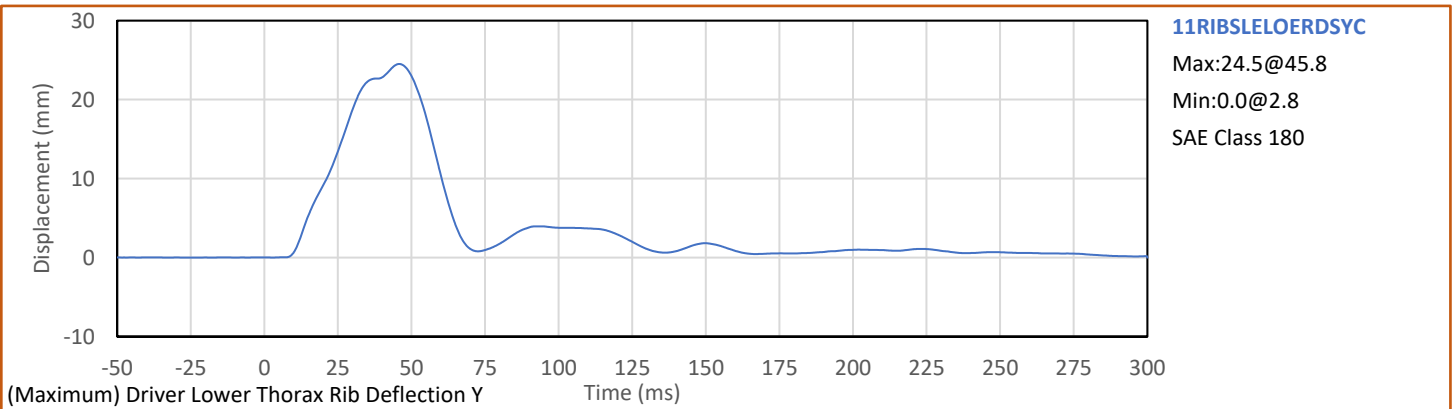
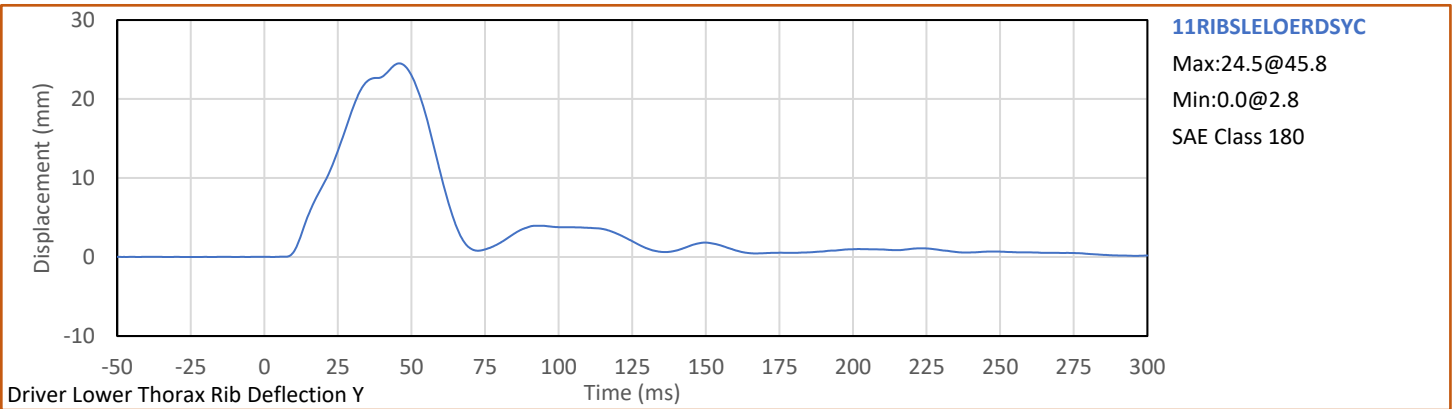
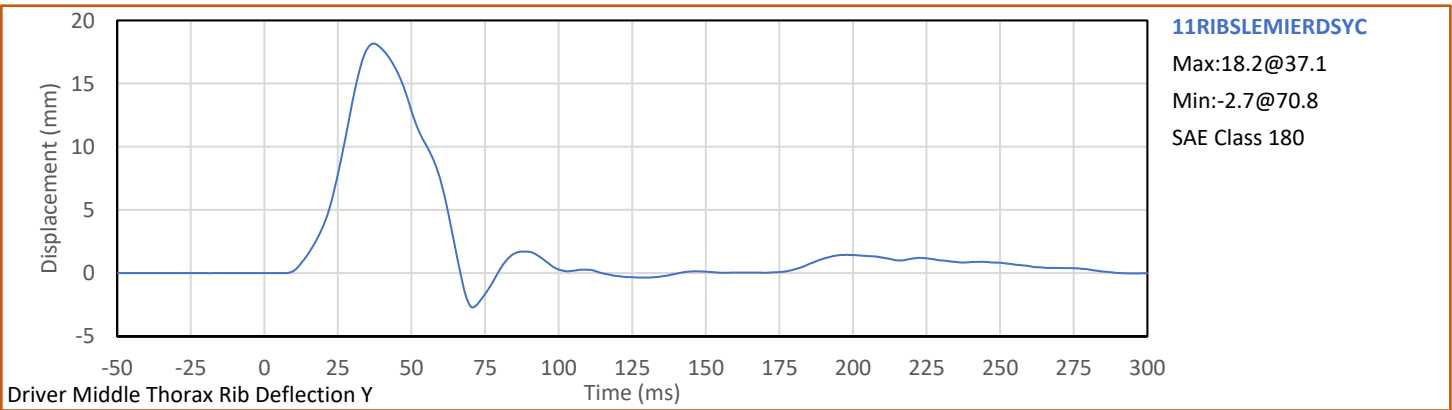
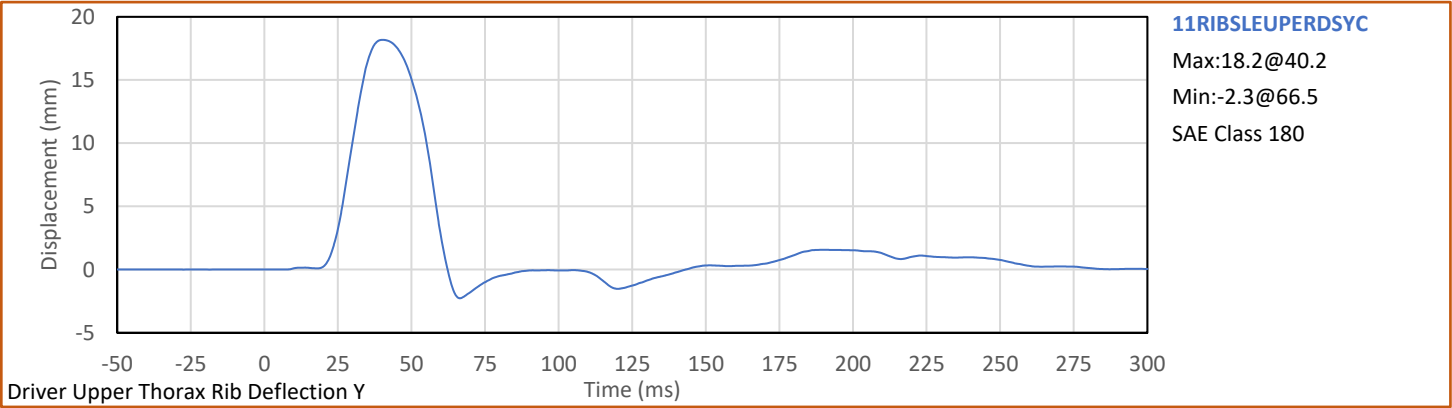
MDB Rear Acceleration (X)

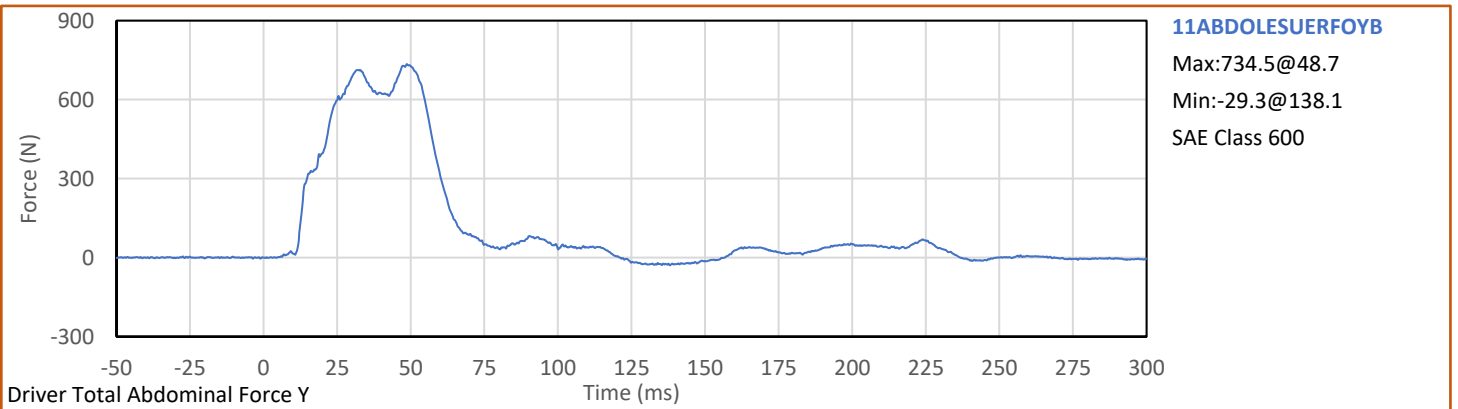
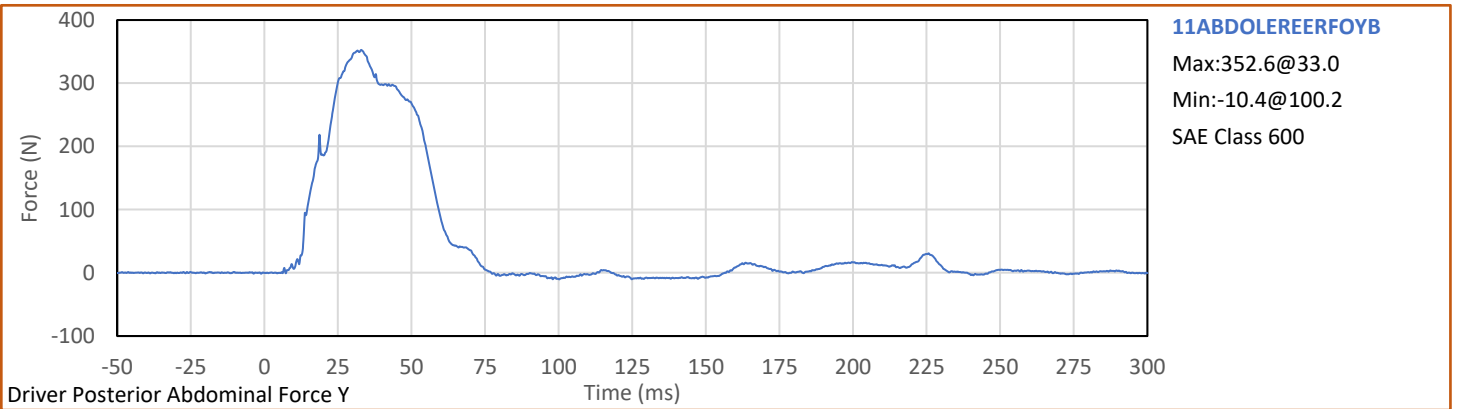
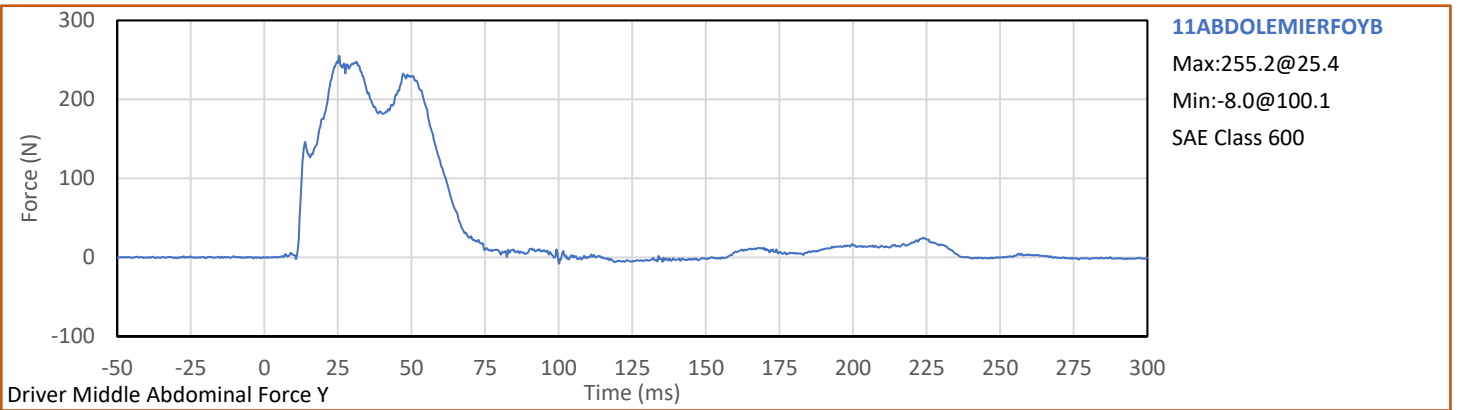
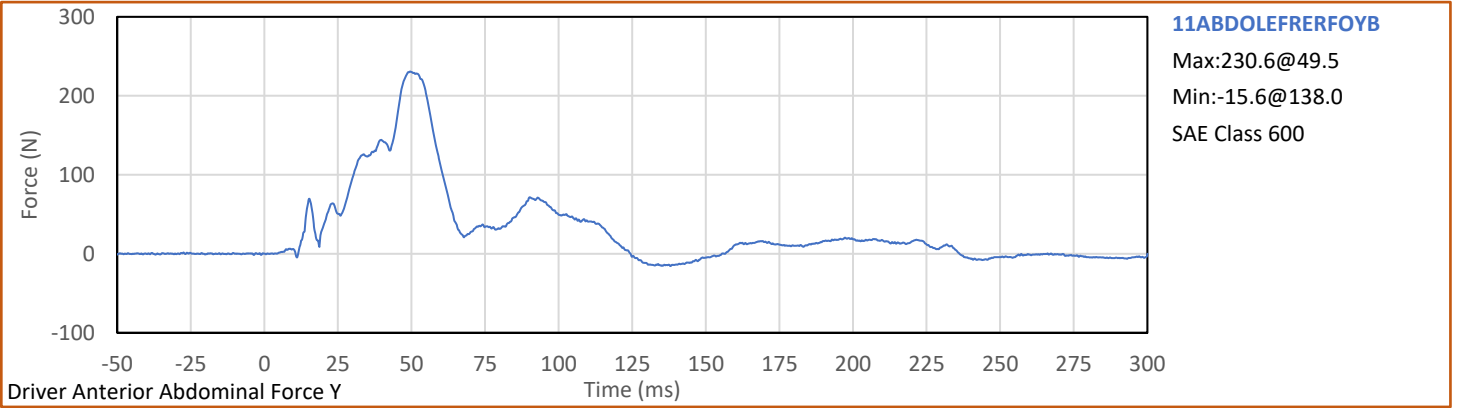
MDB Rear Acceleration (Y)

Left MDB Contact Switch

Right MDB Contact Switch

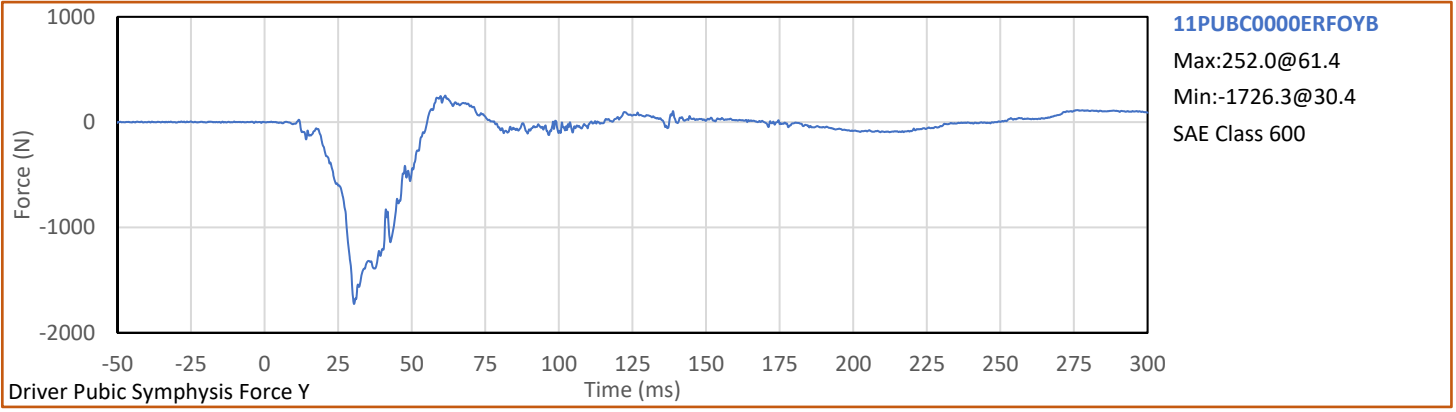


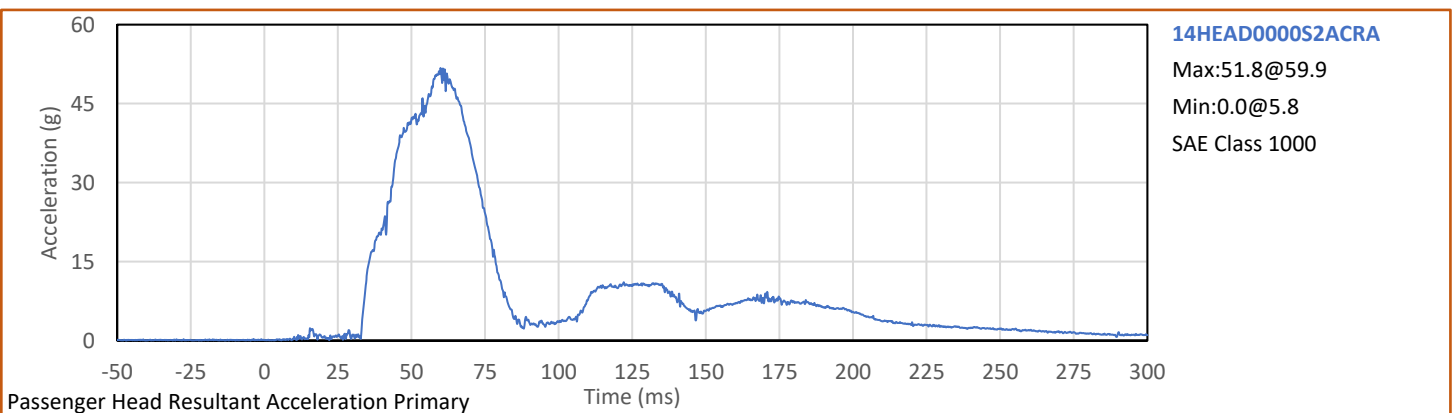
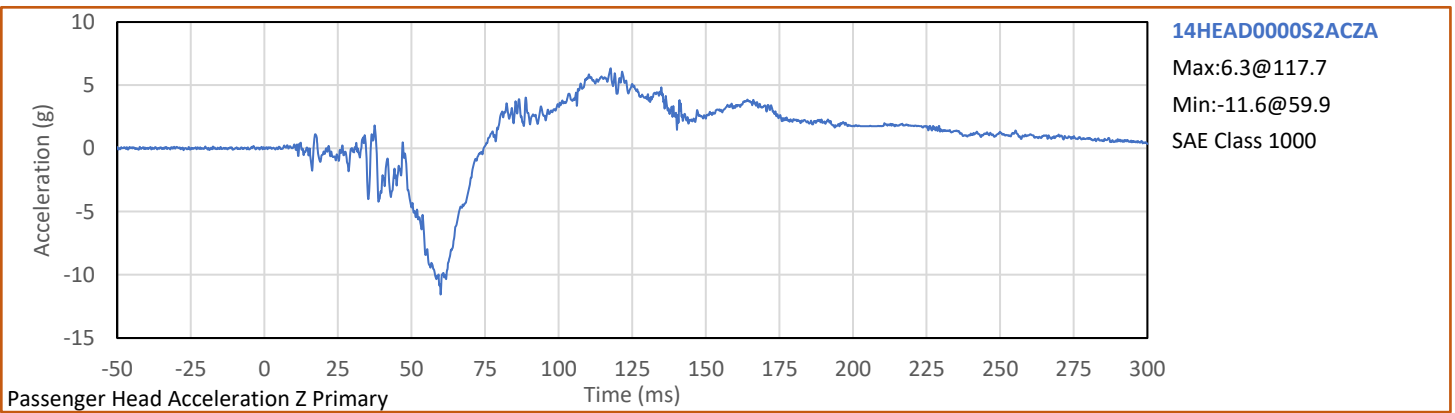
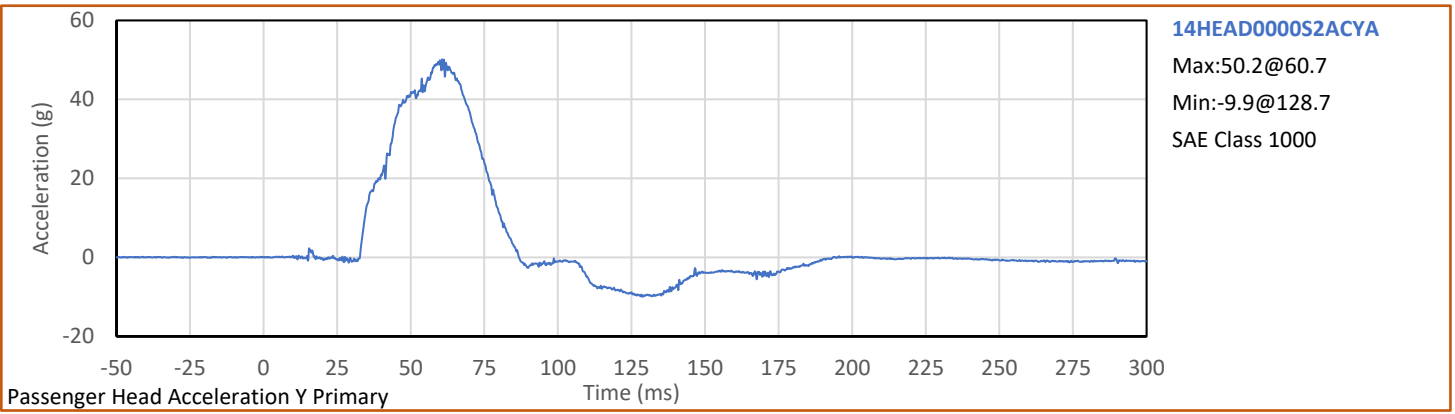
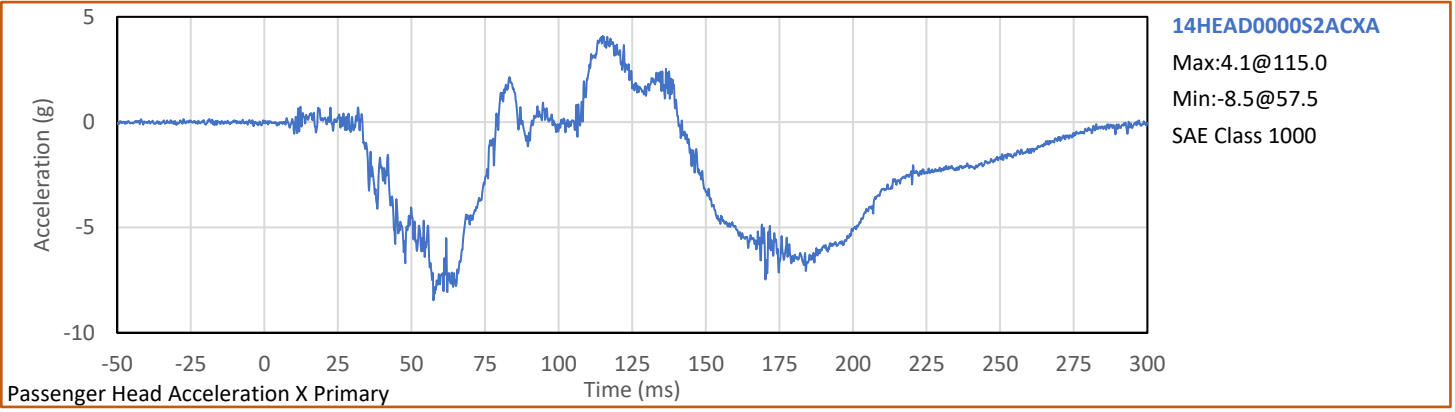


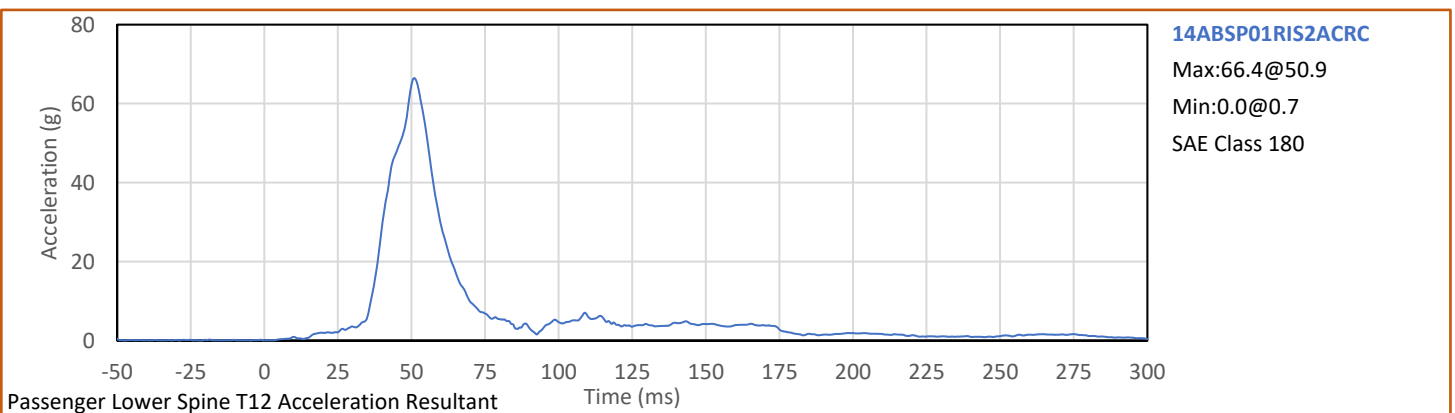
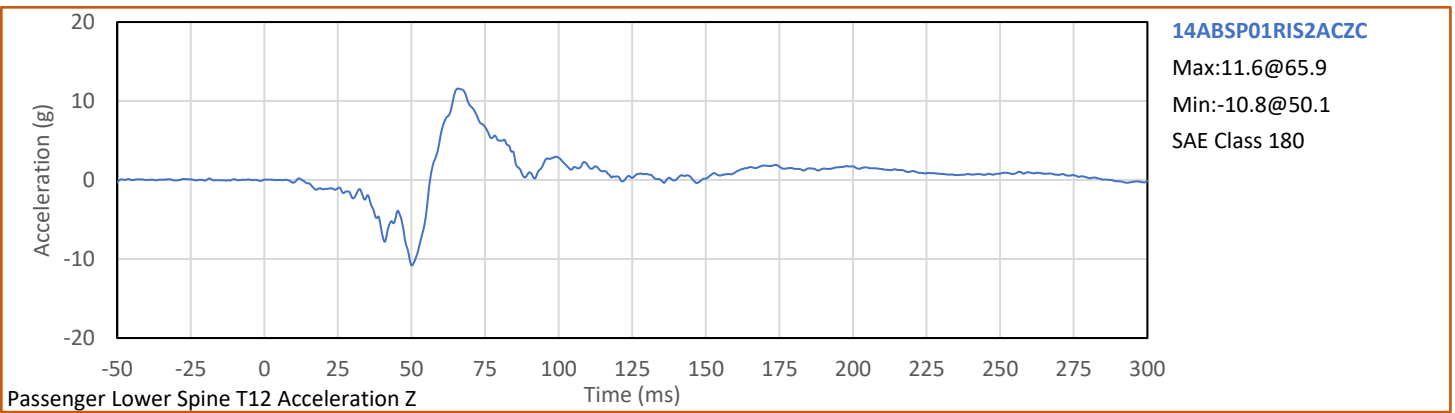
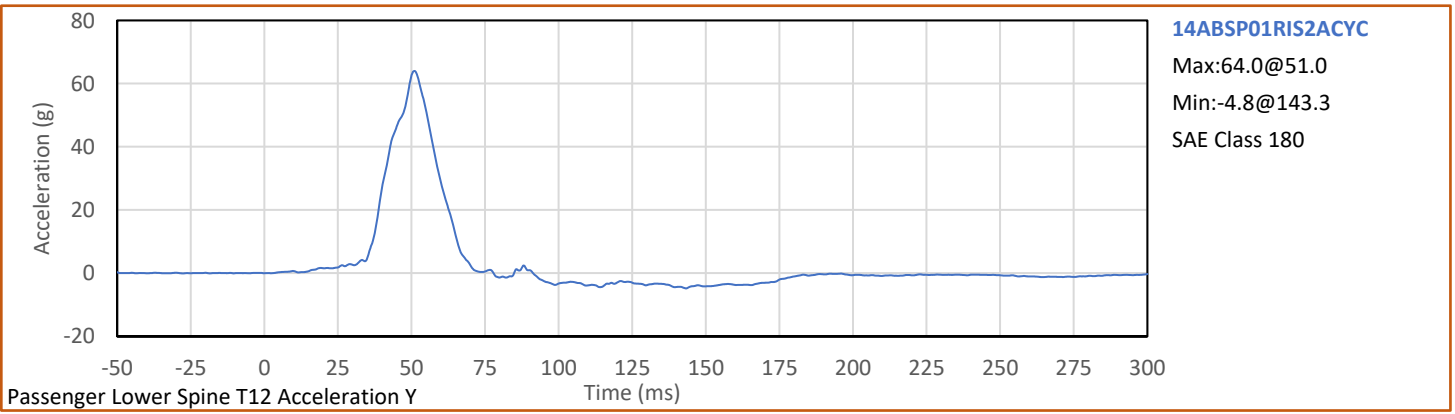
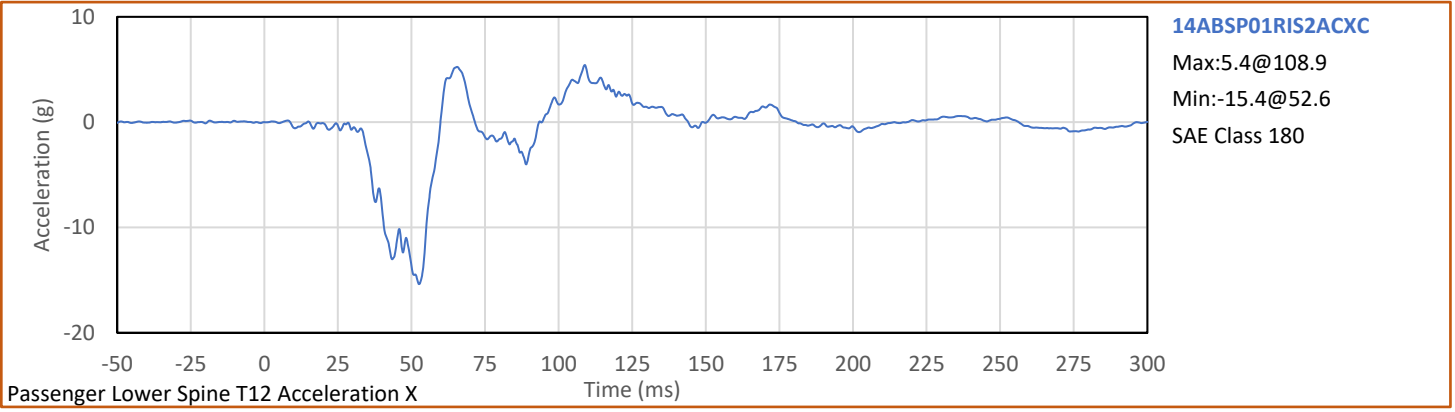


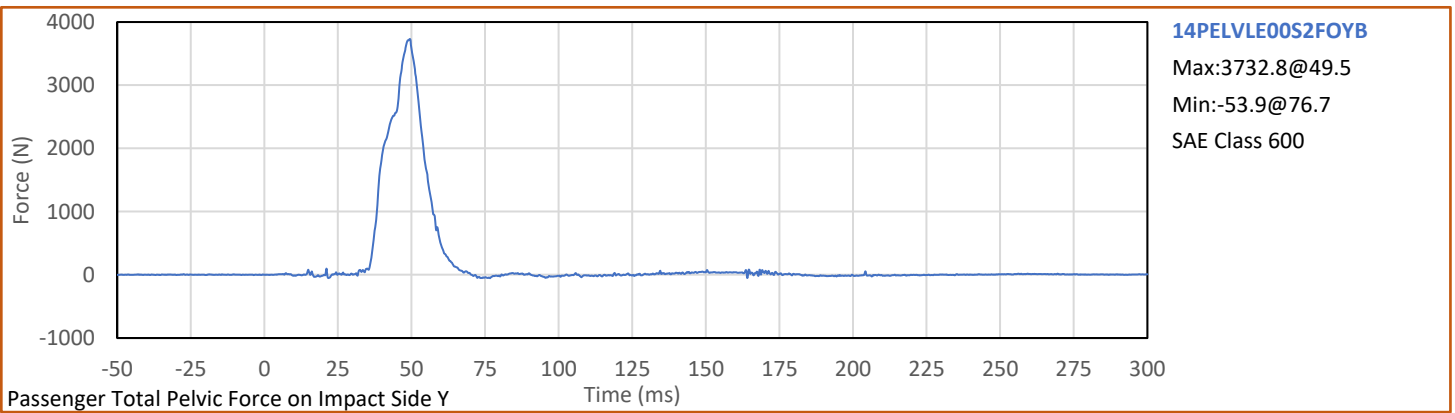
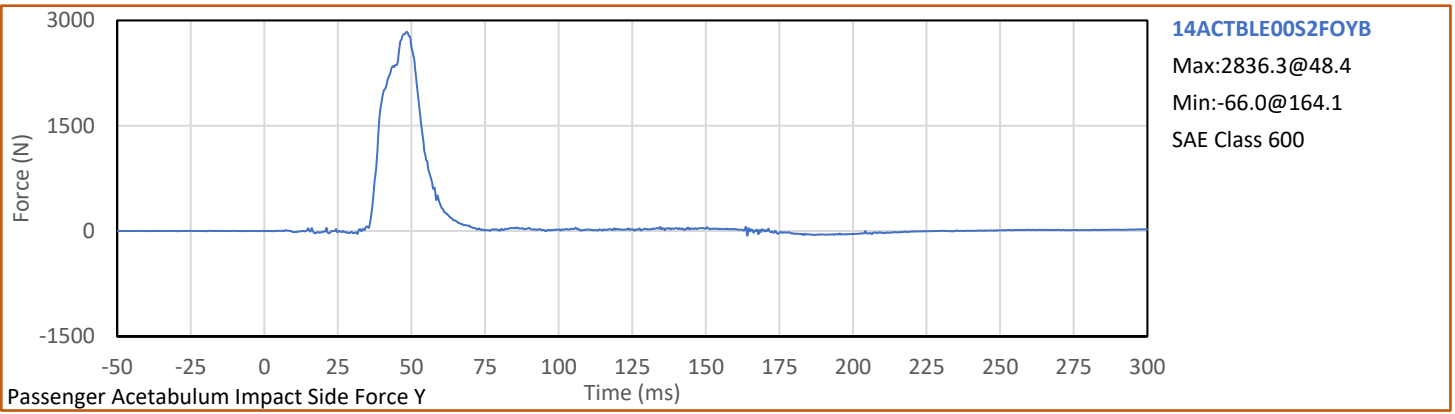
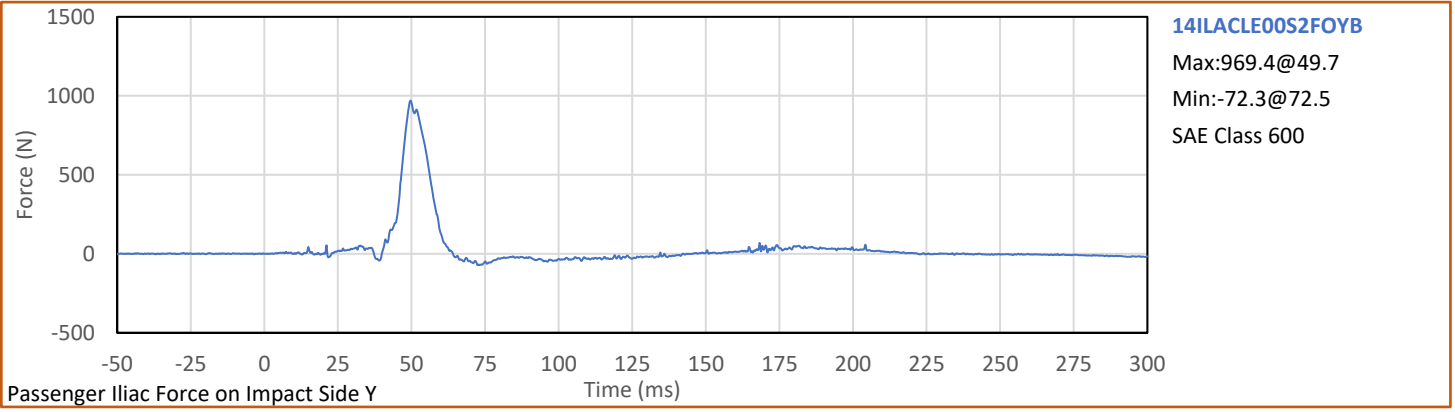
Test Vehicle: 2022 Subaru WRX 4-Door Sedan
Test Program: NCAP MDB Side Impact Test

NHTSA No.: O20225502
Test Date: 12/7/2022









APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
ES-2re 50th Male Side Impact ATD, Left Side Configuration
S/N: F037

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
1 - Sitting Height	mm	900	918	909	Pass
2 - Seat to Shoulder Joint	mm	558	572	563	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	349	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	101	Pass
5 - Sole to Seat, Sitting	mm	433	451	439	Pass
6 - Head Width	mm	152	158	155	Pass
7 - Shoulder/Arm Width	mm	461	479	469	Pass
8 - Thorax Width	mm	322	332	326	Pass
9 - Abdomen Width	mm	273	287	280	Pass
10 - Pelvis Lap Width	mm	359	373	368	Pass
11 - Head Depth	mm	196	206	200	Pass
12 - Thorax Depth	mm	262	272	269	Pass
13 - Abdomen Depth	mm	194	204	201	Pass
14 - Pelvis Depth	mm	235	245	242	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	154	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	604	Pass
Overall Test Results					Pass

Technician:



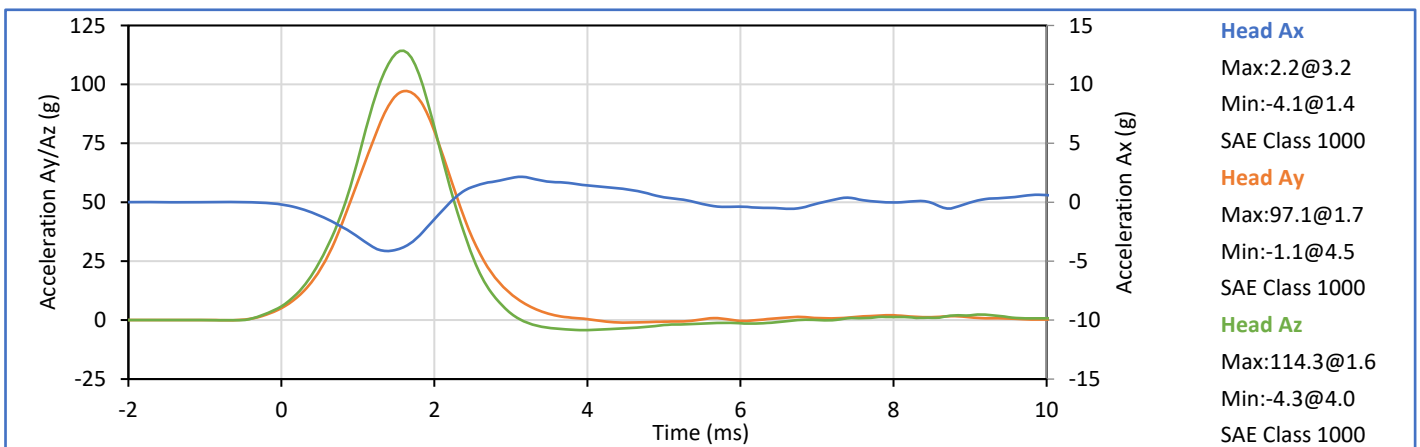
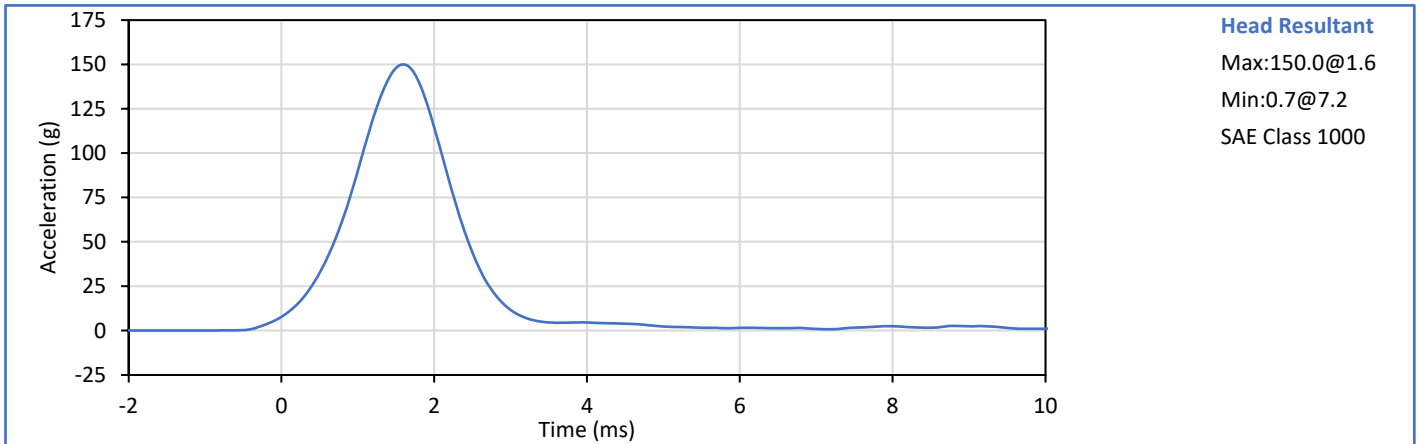
G. Fuentes

Approved By:



J. Hernandez

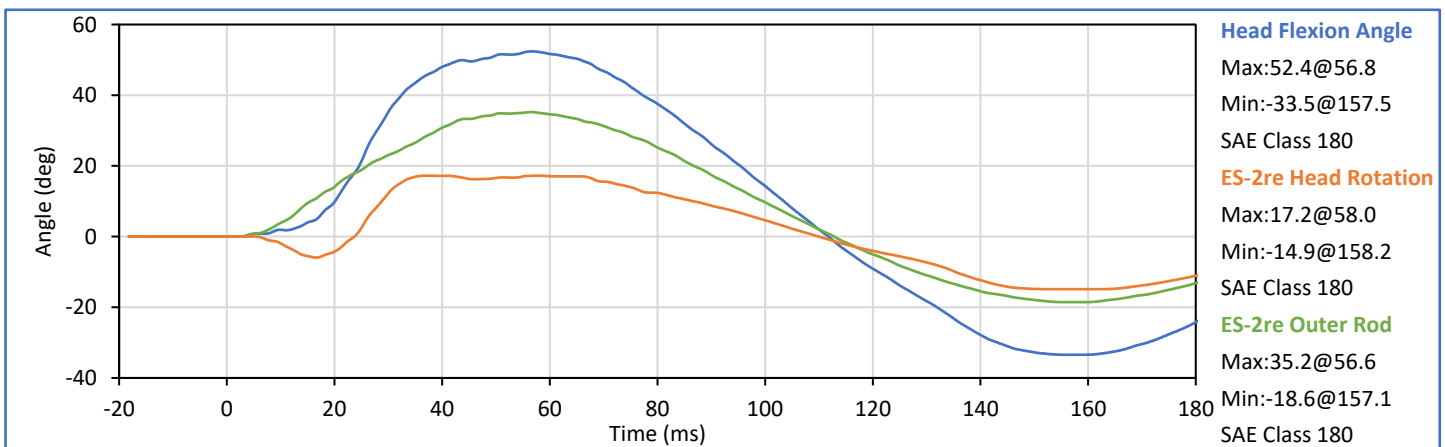
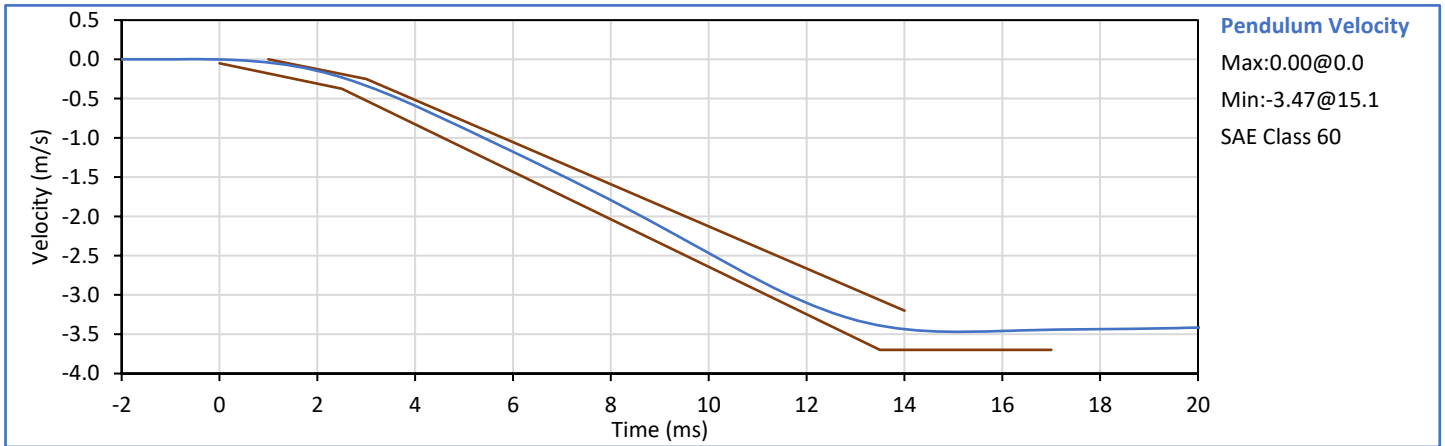
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.8	Pass
Laboratory Relative Humidity	%	10	70	32	Pass
Peak Resultant Acceleration	g	125.0	155.0	150.0	Pass
Peak Head Ax	g	-15.0	15.0	2.2	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

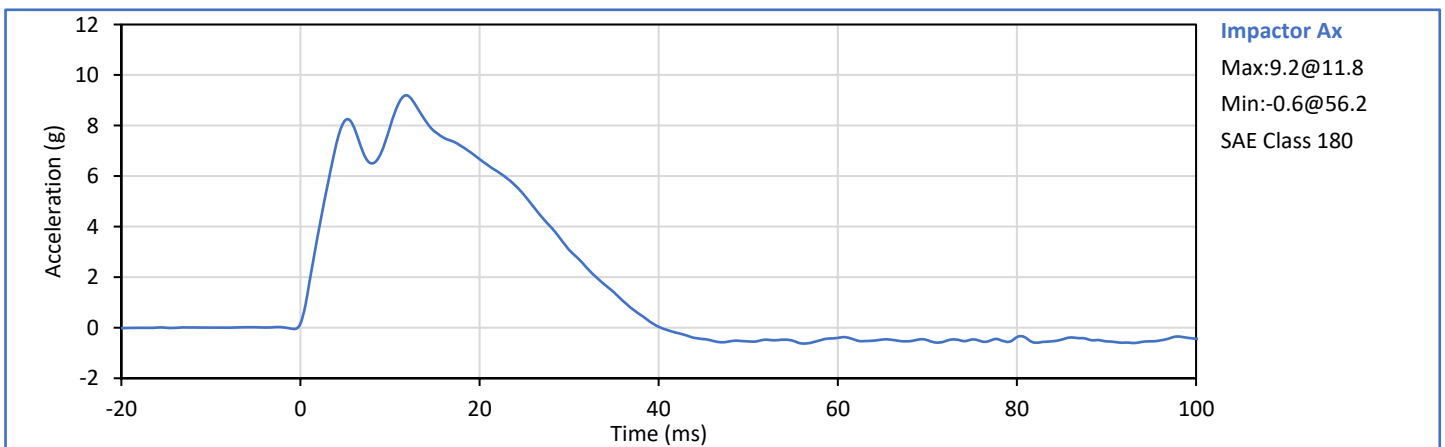
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.9	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Pendulum Velocity	m/s	3.30	3.50	3.44	Pass
Peak Headform Flexion	deg	49.0	59.0	52.4	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	56.8	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	55.0	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *J. Hernandez*
J. Hernandez

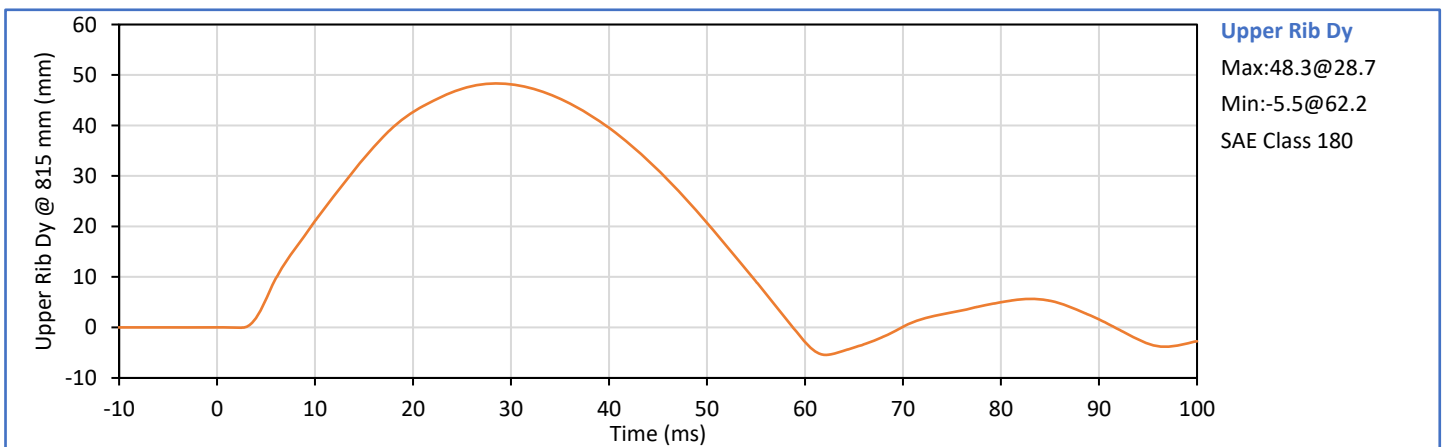
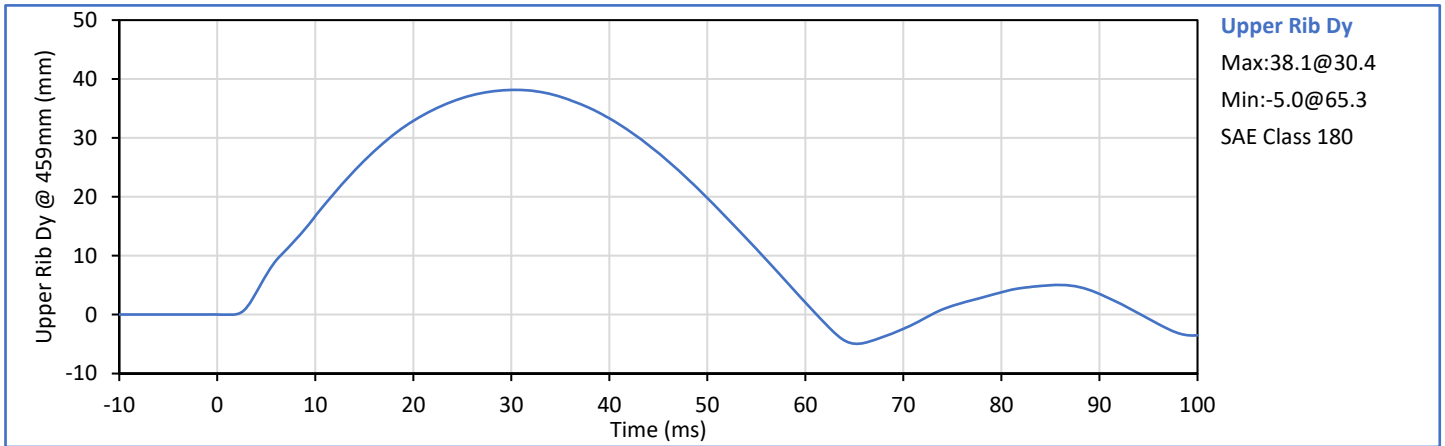
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	31	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Impactor Ax	g	7.5	10.5	9.2	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

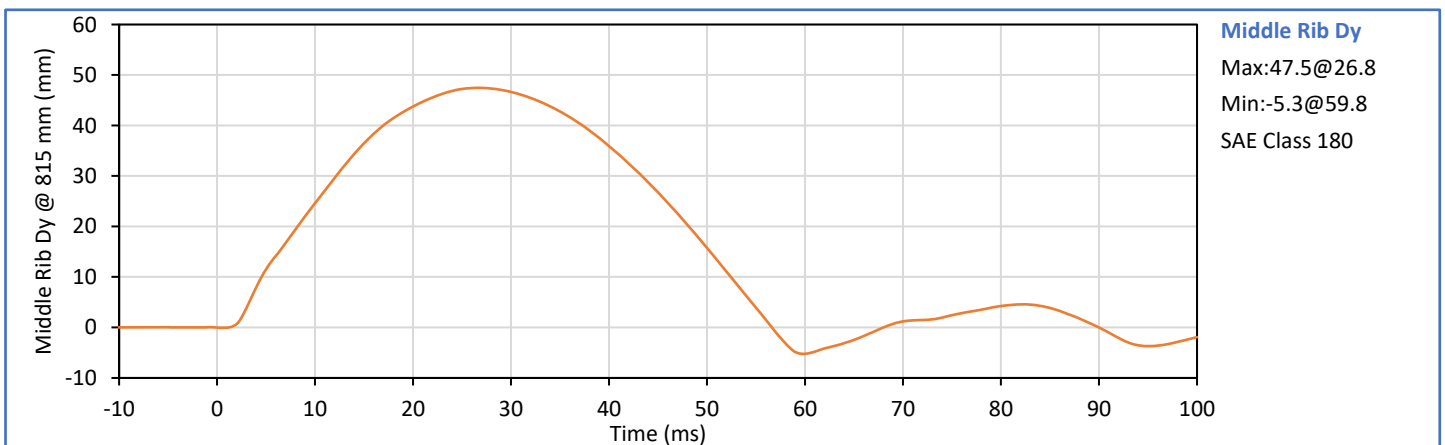
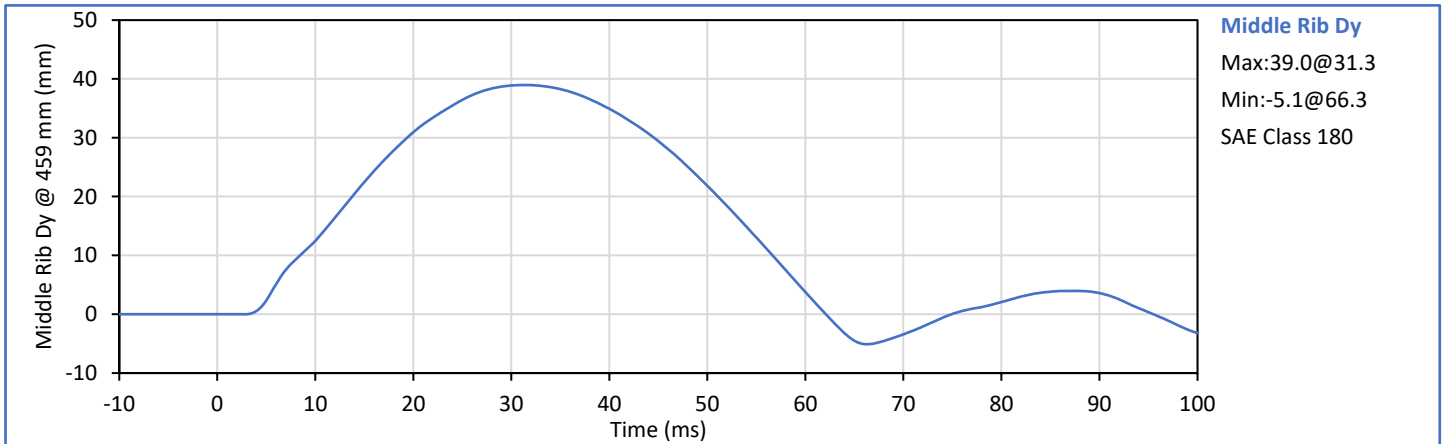
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	38.1	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	48.3	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

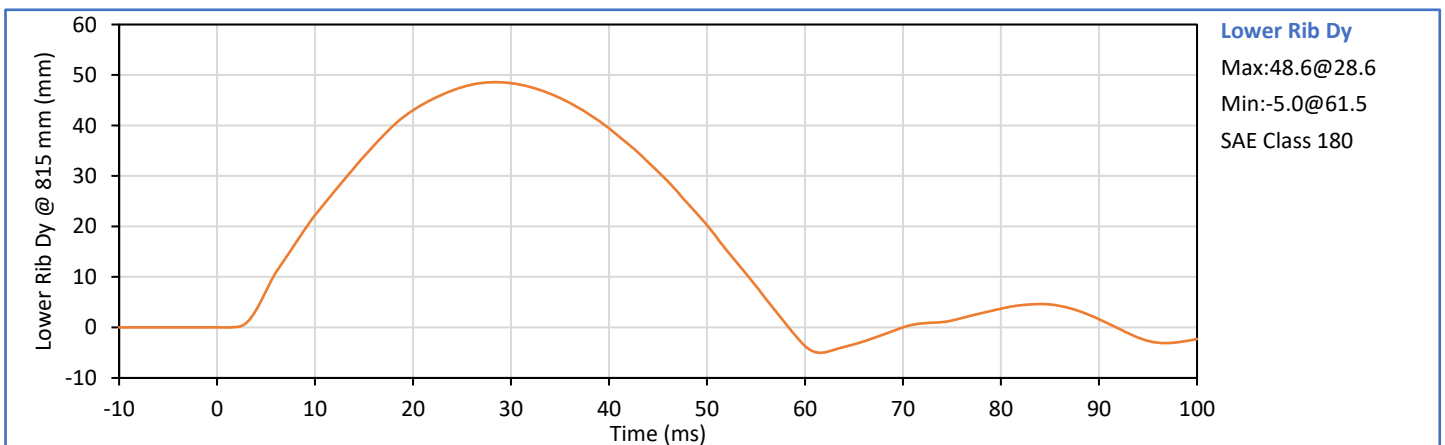
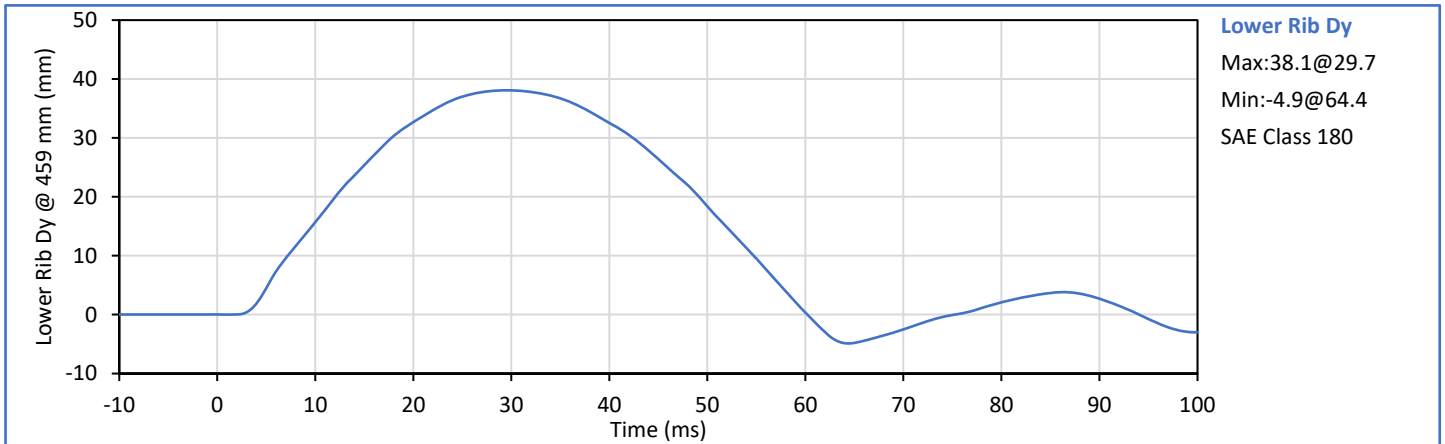
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	39.0	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	47.5	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

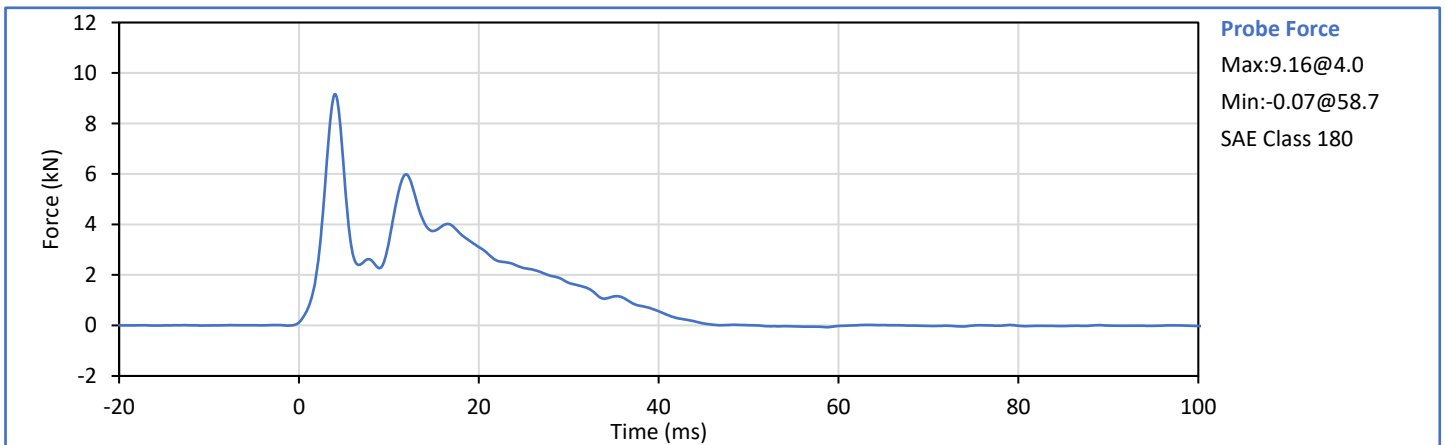
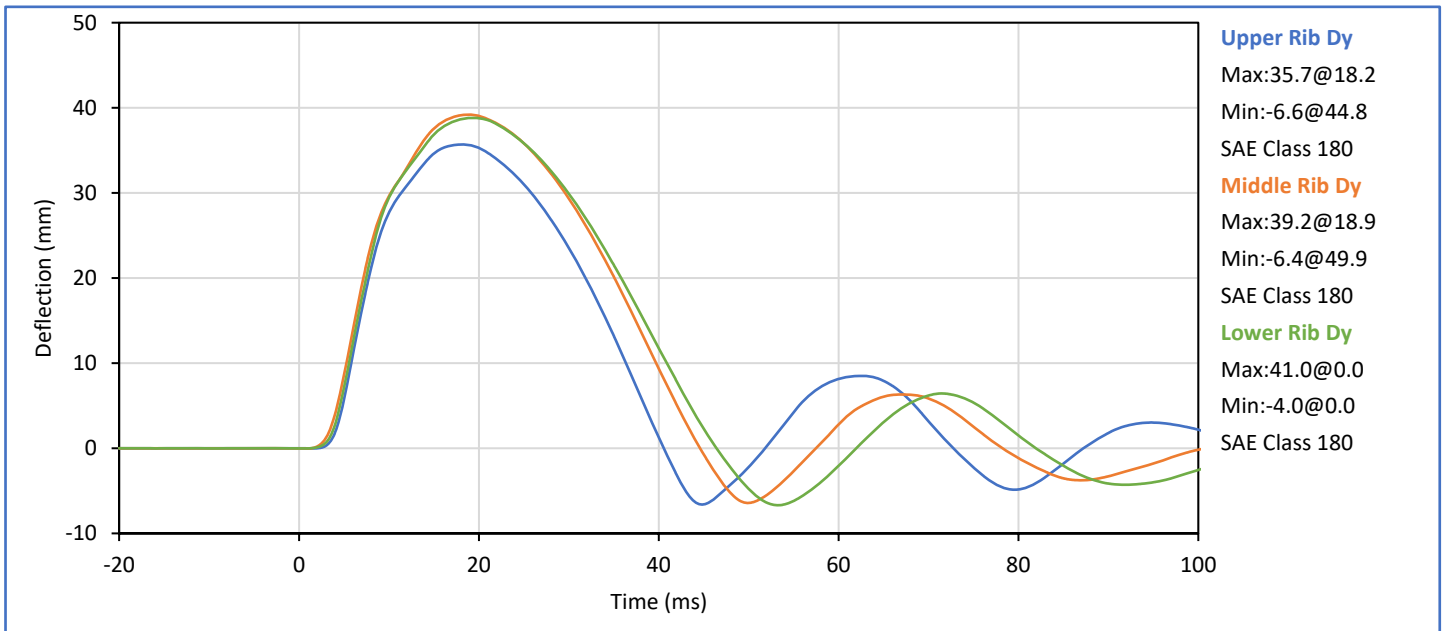
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Lower Rib Dy @ 459mm	mm	36.0	40.0	38.1	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	48.6	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

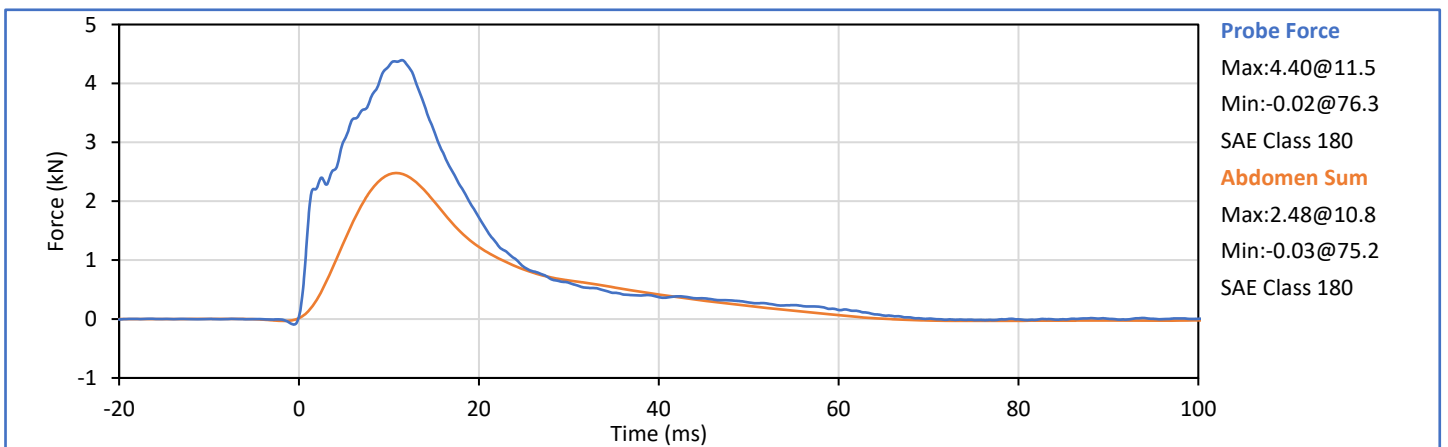
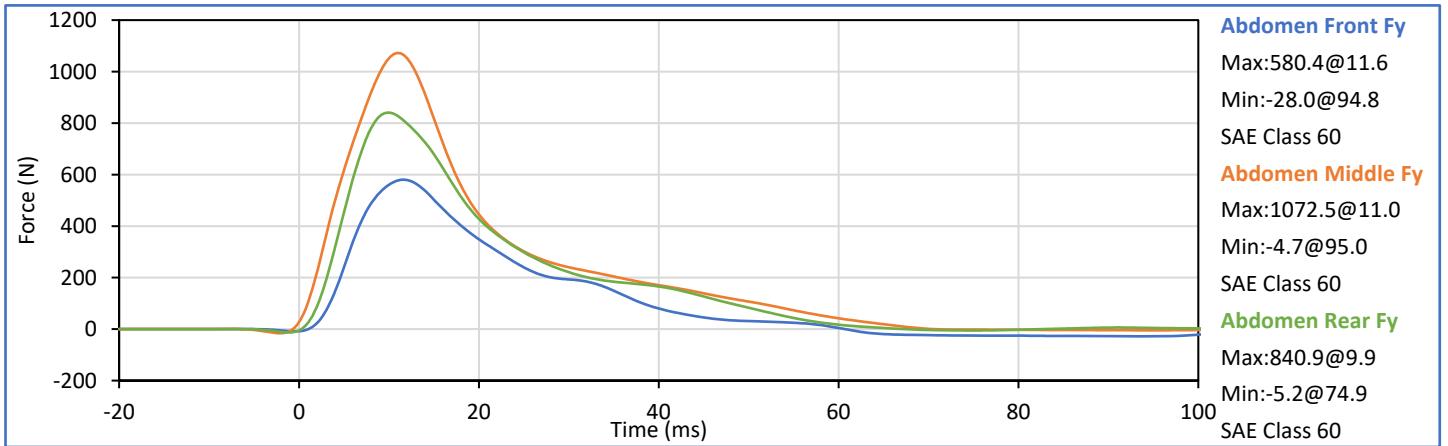
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	5.40	5.60	5.57	Pass
Peak Upper Rib Dy	mm	34.0	41.0	35.7	Pass
Peak Middle Rib Dy	mm	37.0	45.0	39.2	Pass
Peak Lower Rib Dy	mm	37.0	44.0	38.8	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.98	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

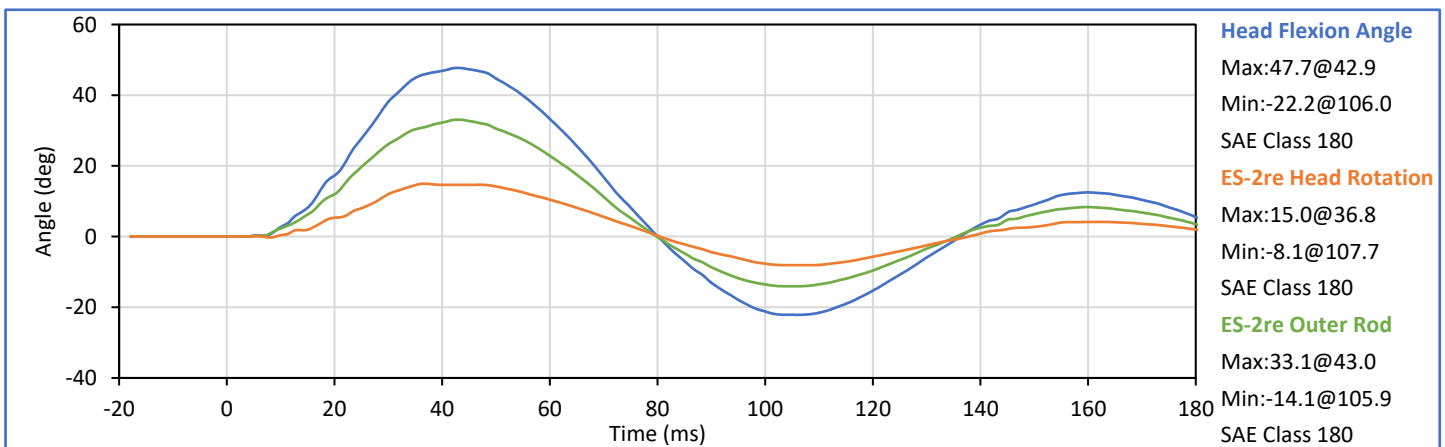
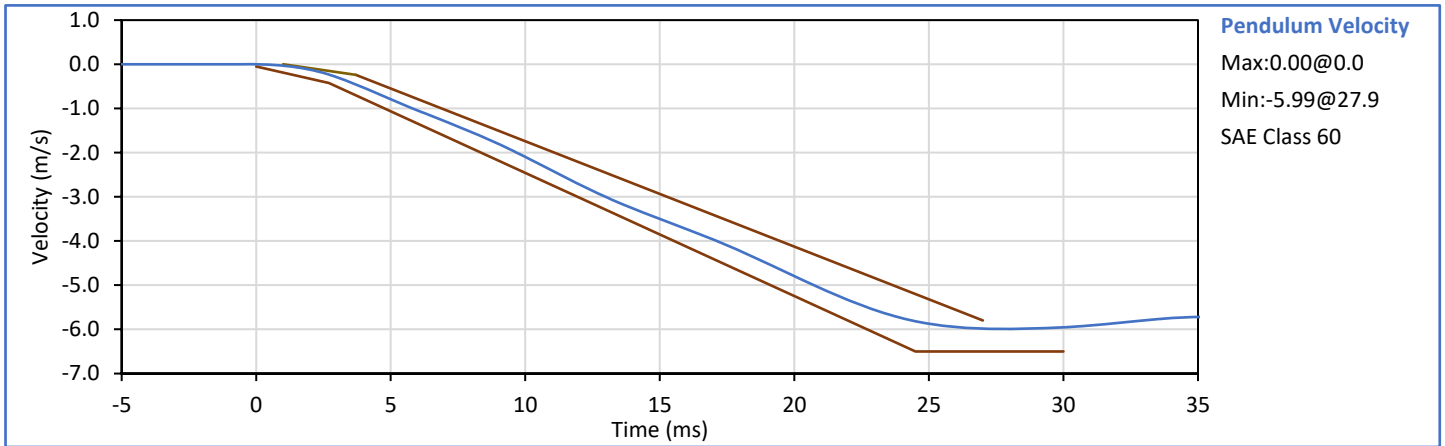
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	3.90	4.10	4.01	Pass
Peak Impactor Force	kN	4.00	4.80	4.40	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.5	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.48	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.8	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seuth*
J. Hernandez

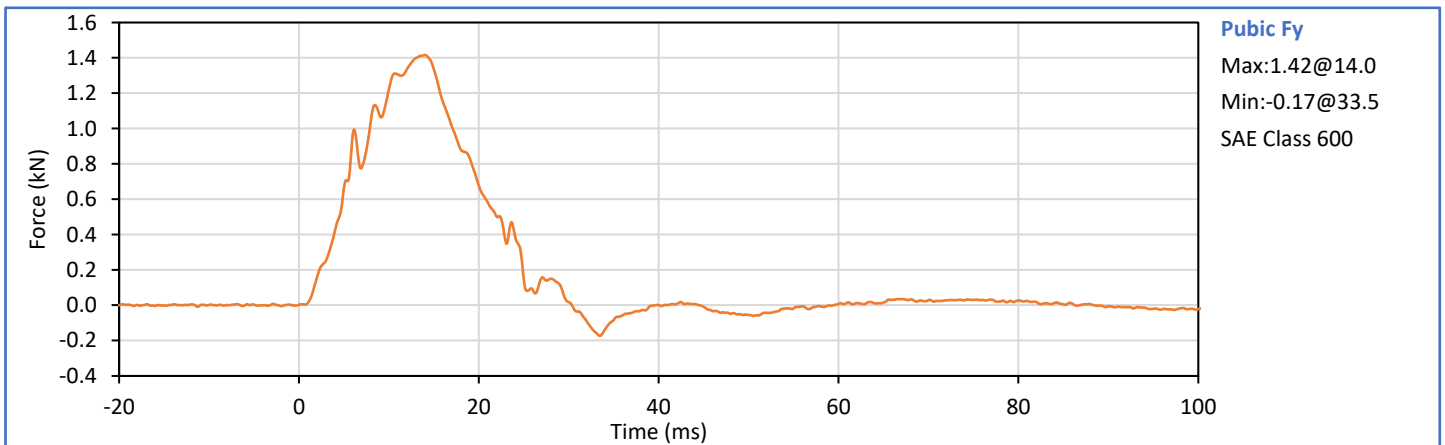
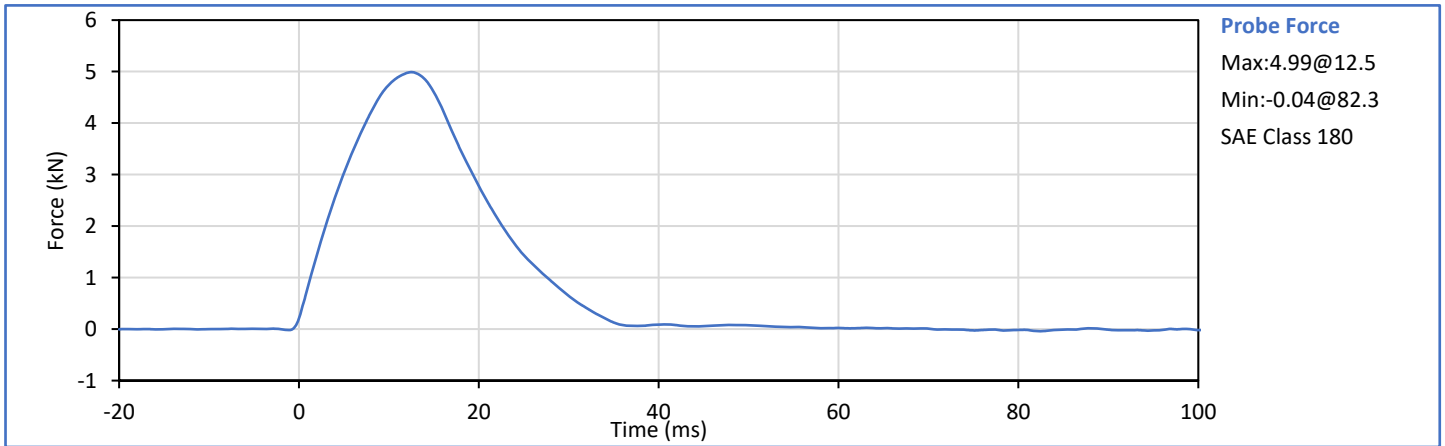
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Pendulum Velocity	m/s	5.95	6.15	6.13	Pass
Peak Headform Flexion	deg	45.0	55.0	47.7	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	42.9	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	37.2	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Santh*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Force	kN	4.70	5.40	4.99	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.5	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.42	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	14.0	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
SID-IIs Small Side Impact ATD, Left Side Configuration
S/N: 308

ATD Serial No.: 308

Test Date: 2022-10-31

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	29	Pass
A - Sitting Height	mm	772	788	776	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	86	Pass
D - H Point From Seatback	mm	141	151	146	Pass
E - Shoulder Pivot From Backline	mm	97	107	104	Pass
F - Thigh Clearance	mm	119	135	130	Pass
G - Head Breadth	mm	140	148	144	Pass
H - Head Back From Backline	mm	40	46	43	Pass
I - Head Depth	mm	178	188	183	Pass
J - Head Circumference	mm	541	551	544	Pass
K - Buttock To Knee Length	mm	514	540	527	Pass
L - Popliteal Height	mm	343	369	350	Pass
K - Knee Pivot To Floor Height	mm	392	409	398	Pass
N - Buttock Popliteal Length	mm	416	442	427	Pass
O - Chest Depth W/O Jacket	mm	195	211	203	Pass
P - Foot Length	mm	216	232	225	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	319	Pass
R - Arm Length	mm	249	259	254	Pass
S - Knee Joint To Seatback	mm	477	493	486	Pass
V - Shoulder Width	mm	341	357	353	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	860	Pass
Z - Waist Circumference	mm	761	791	776	Pass
				Overall Test Results	Pass

Technician:



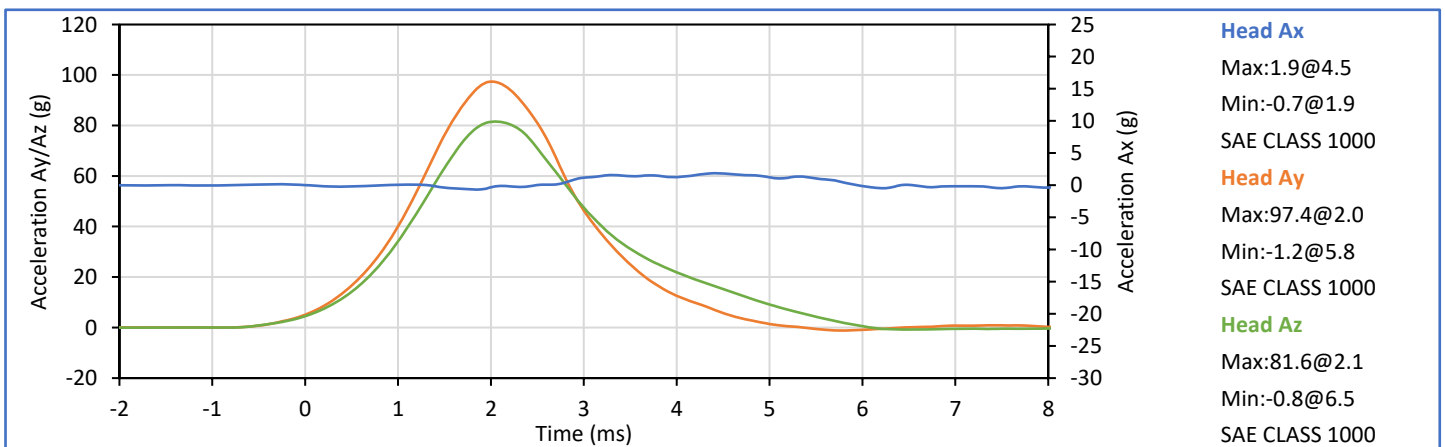
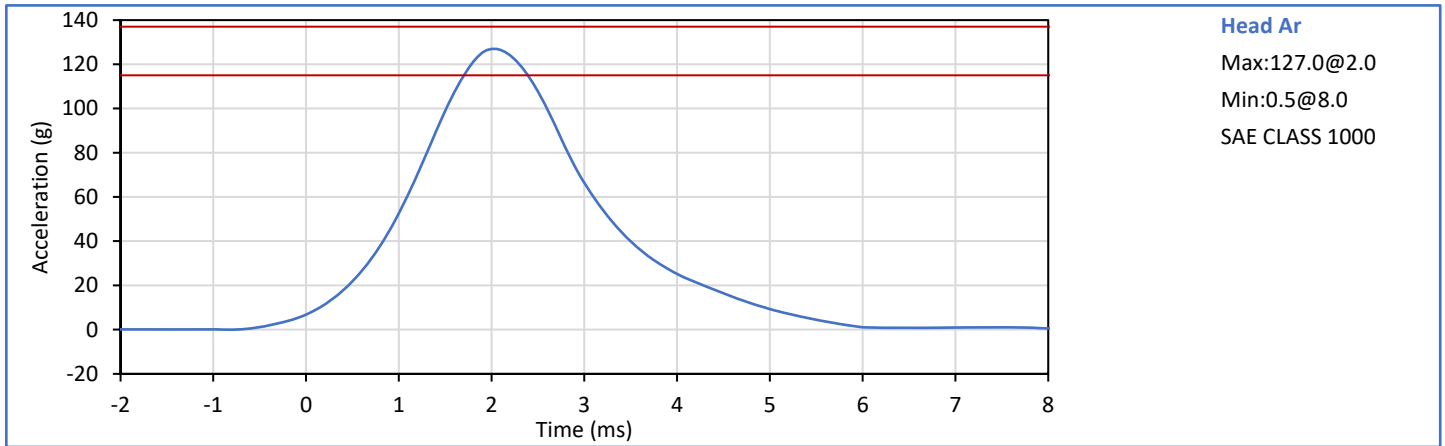
G. Fuentes

Approved By:



J. Hernandez

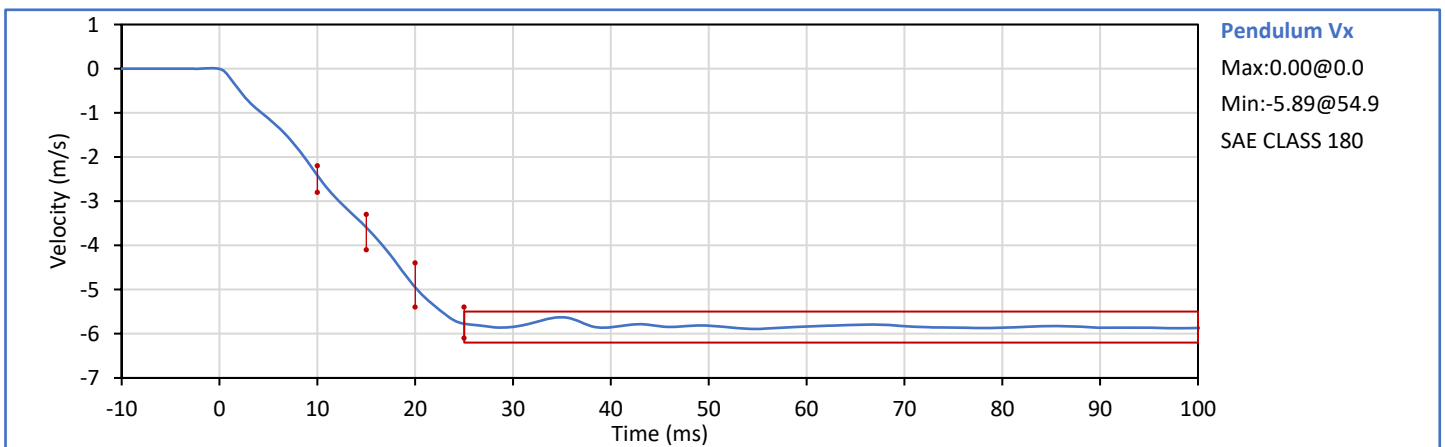
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Peak Resultant Acceleration	g	115.0	137.0	127.0	Pass
Peak Head Ax	g	-15.0	15.0	1.9	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

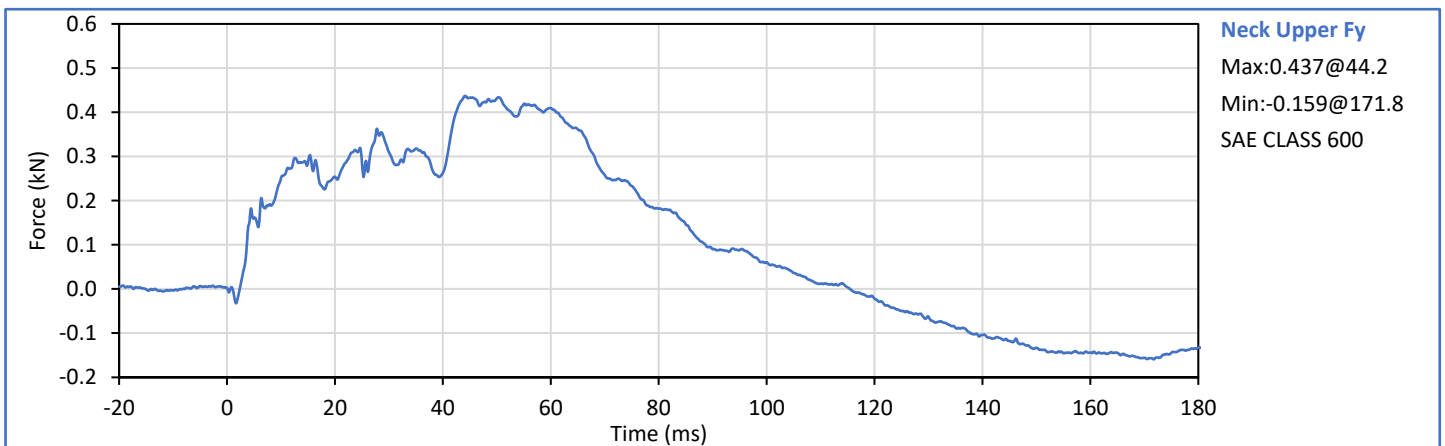
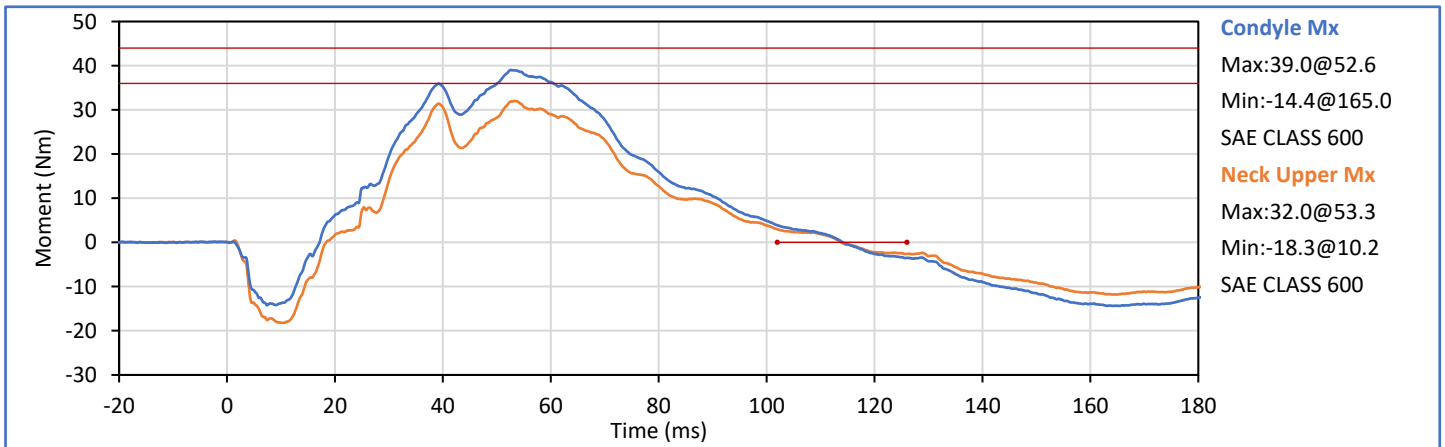
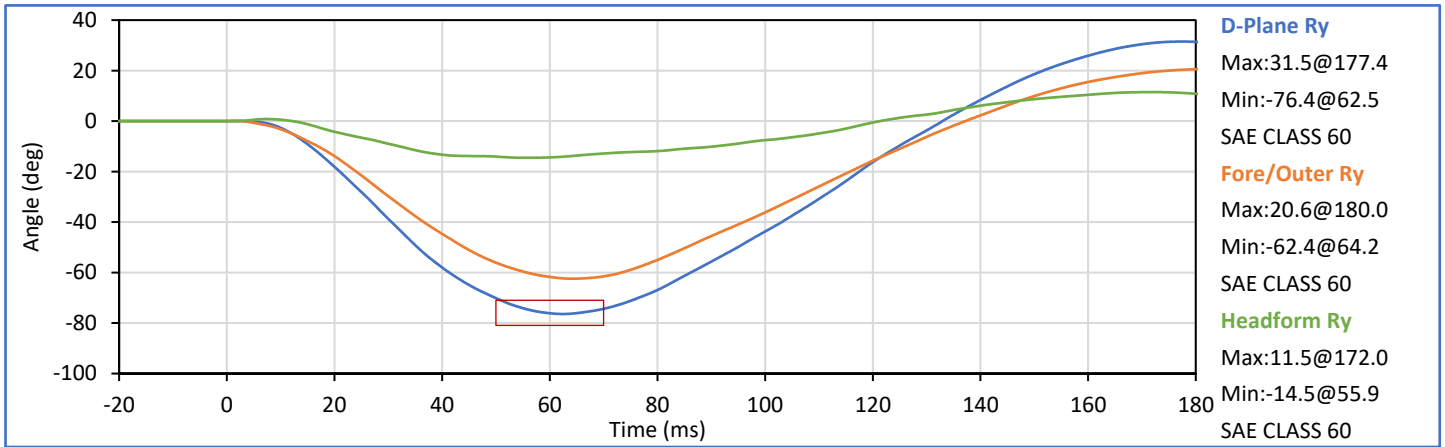
Approved By: *Smith*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	31	Pass
Pendulum Velocity	m/s	5.51	5.63	5.57	Pass
Pendulum Decel at 10 ms	m/s	-2.80	-2.20	-2.41	Pass
Pendulum Decel at 15 ms	m/s	-4.10	-3.30	-3.59	Pass
Pendulum Decel at 20 ms	m/s	-5.40	-4.40	-4.95	Pass
Pendulum Decel at 25 ms	m/s	-6.10	-5.40	-5.78	Pass
Pendulum Decel from 25-100 ms	m/s	-6.20	-5.50	-5.89/-5.63	Pass
Peak "D" Plane Rotation	deg	-81.0	-71.0	-76.4	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	62.5	Pass
Peak Occ. Condyle Moment	Nm	36.0	44.0	39.0	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	114.1	Pass
Overall Test Results					Pass

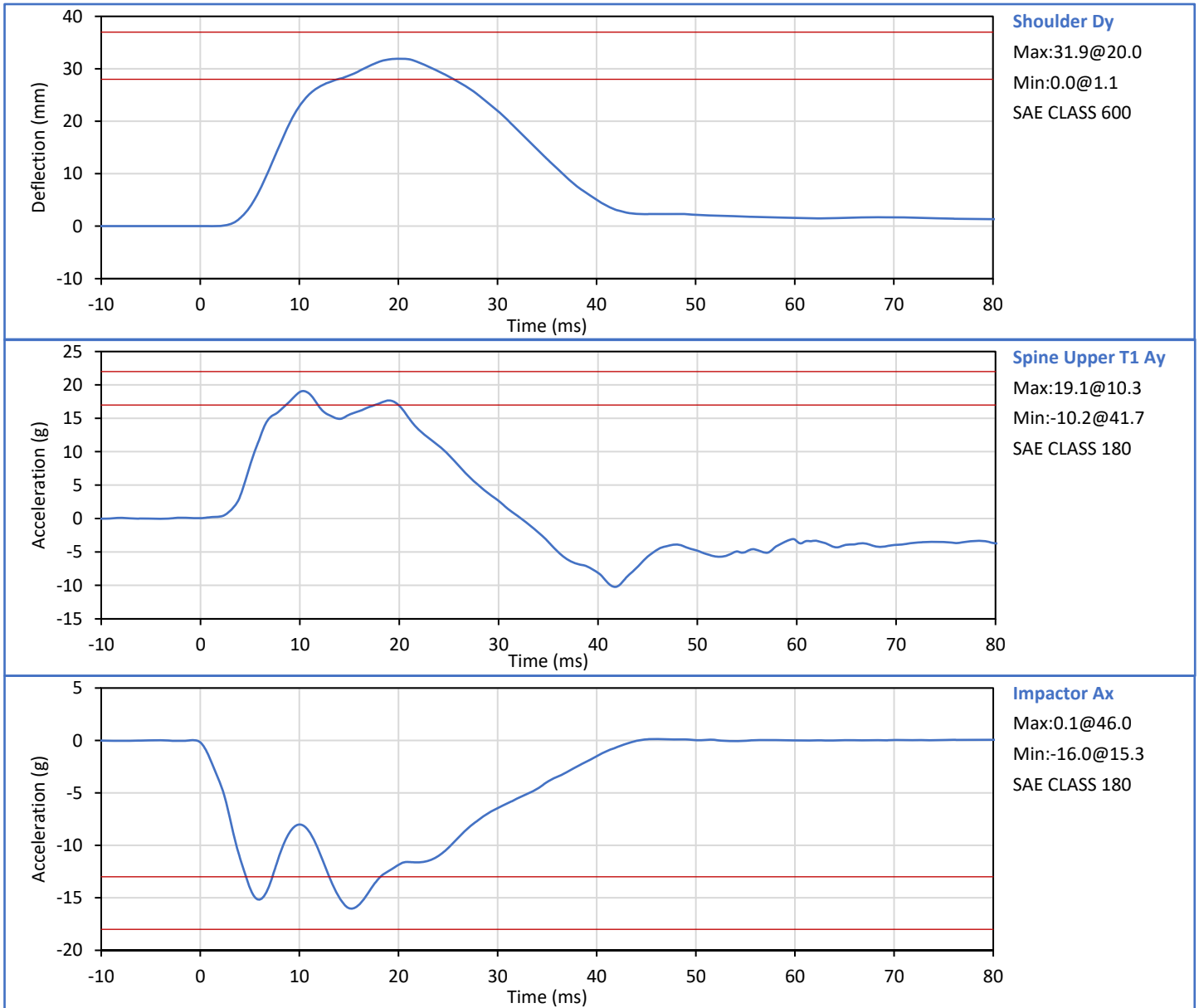


Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez



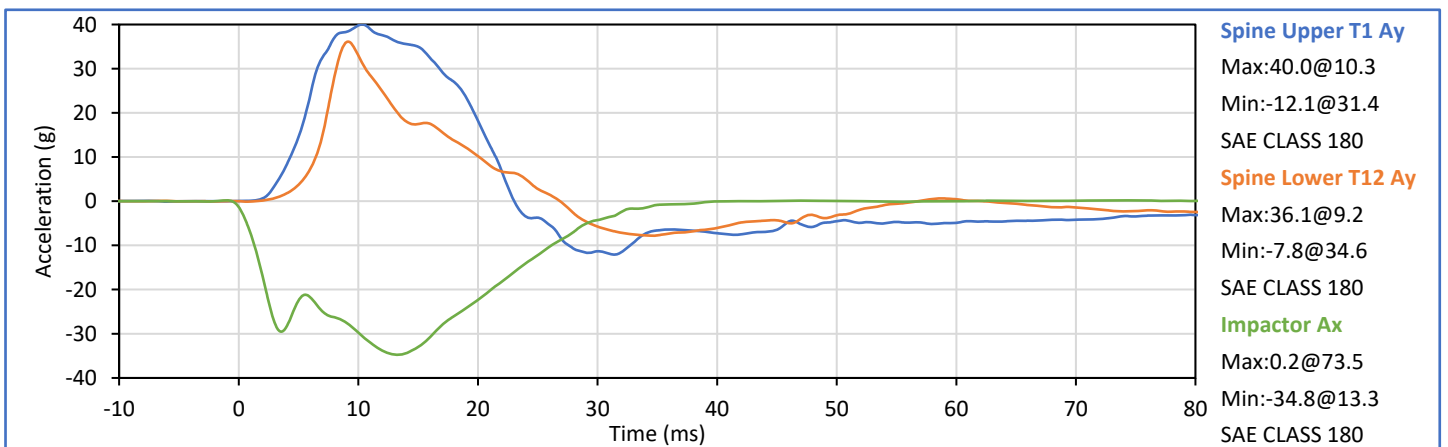
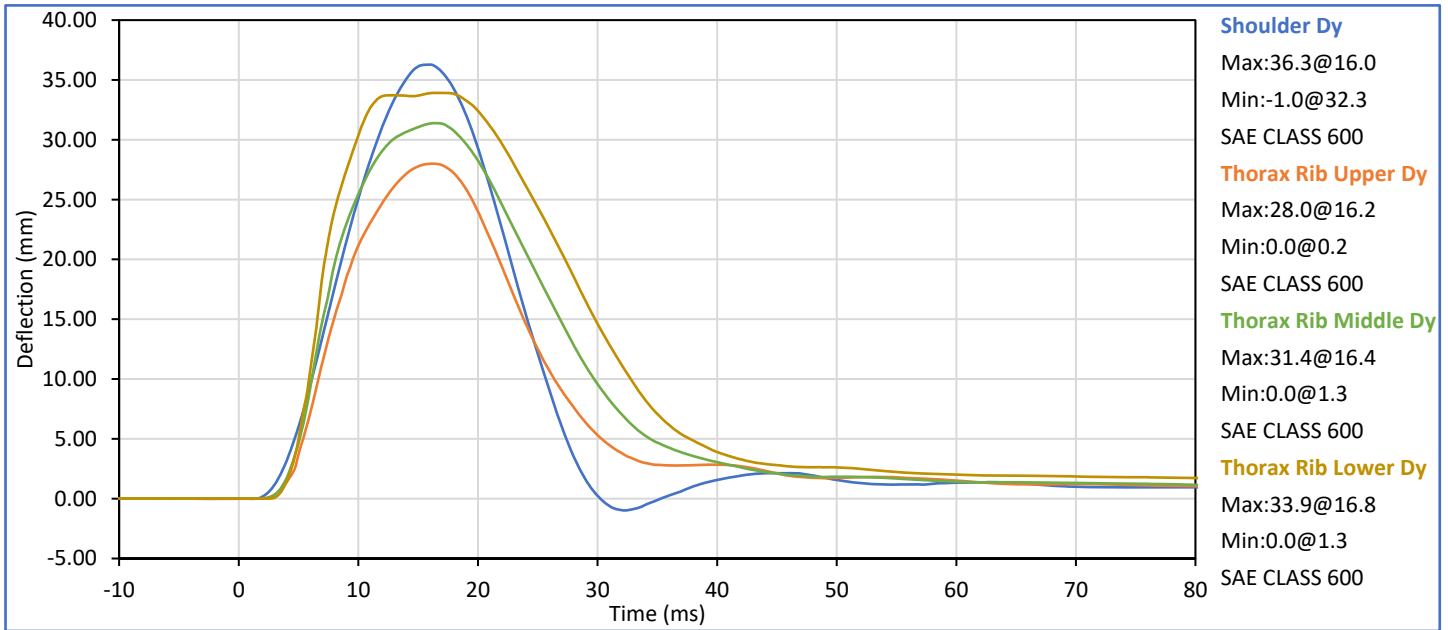
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Shoulder Dy	mm	28.0	37.0	31.9	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	19.1	Pass
Peak Impactor Ax	g	-18.0	-13.0	-16.0	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seuth*
J. Hernandez

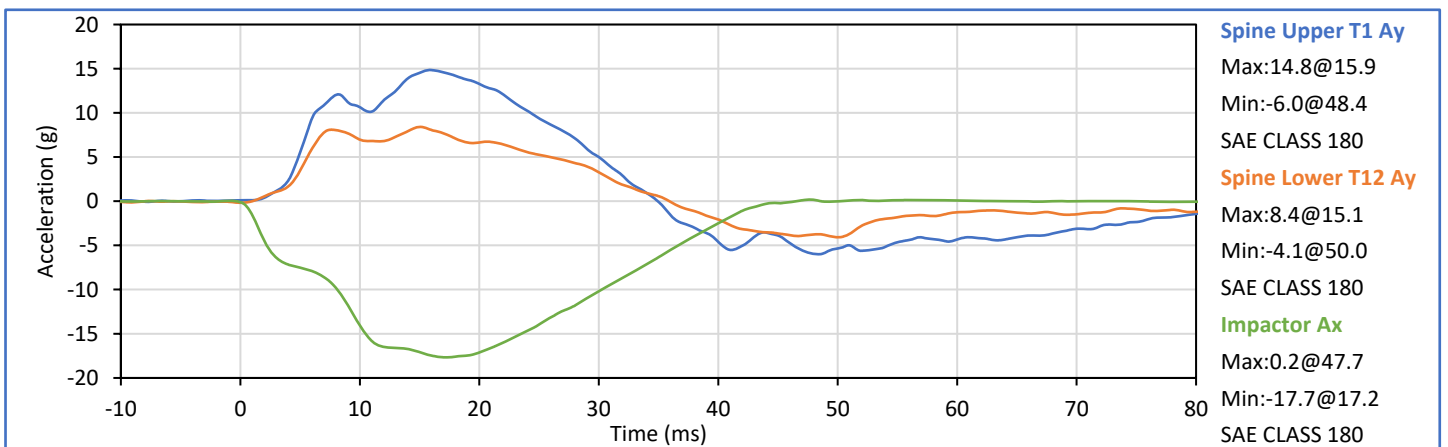
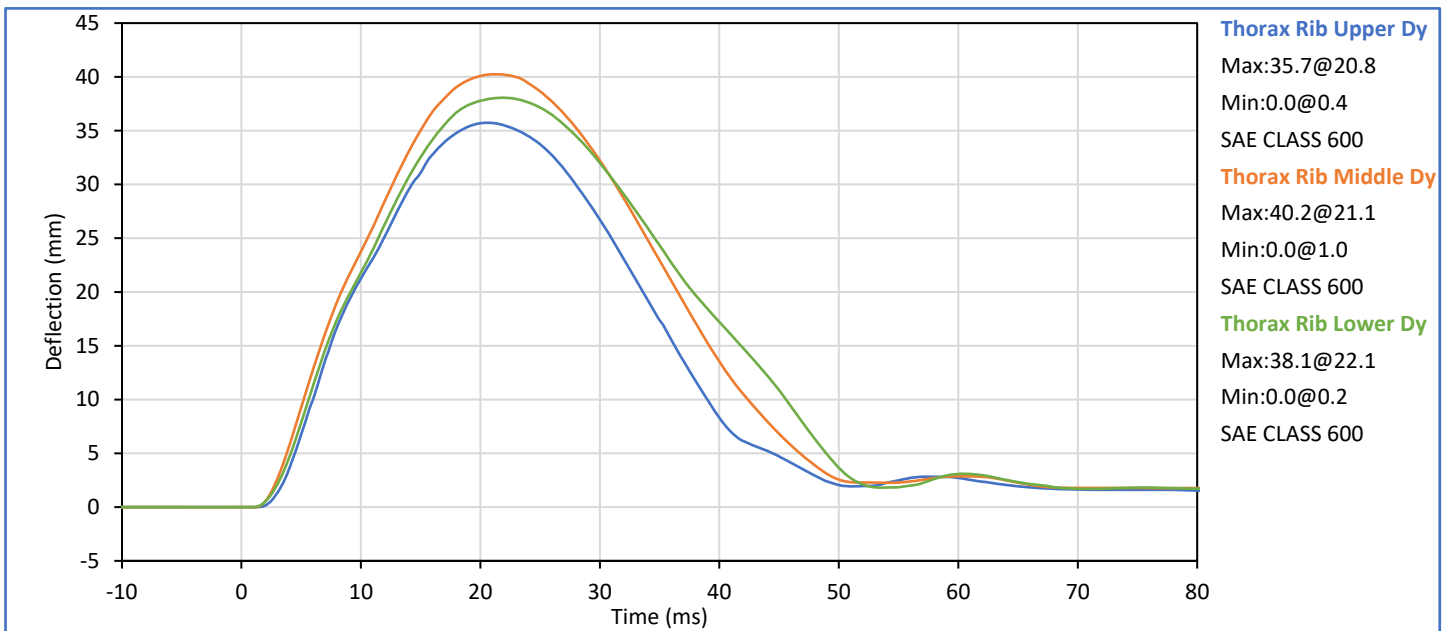
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.5	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Shoulder Dy	mm	31.0	40.0	36.3	Pass
Peak Upper Rib Dy	mm	25.0	32.0	28.0	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.4	Pass
Peak Lower Rib Dy	mm	32.0	38.0	33.9	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	40.0	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	36.1	Pass
Peak Impactor Ax	g	-36.0	-30.0	-34.8	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *J. Hernandez*
J. Hernandez

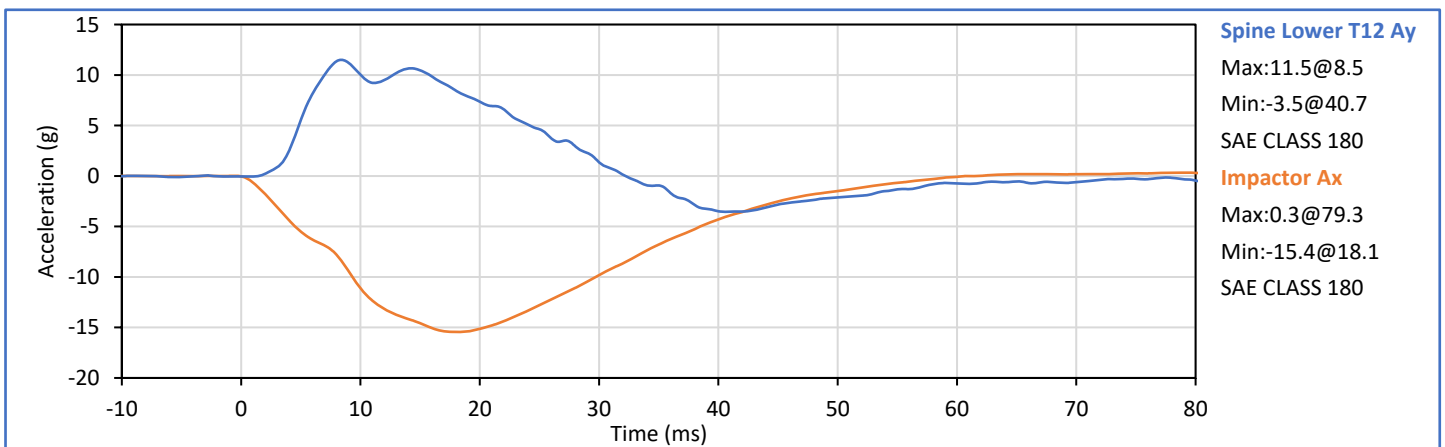
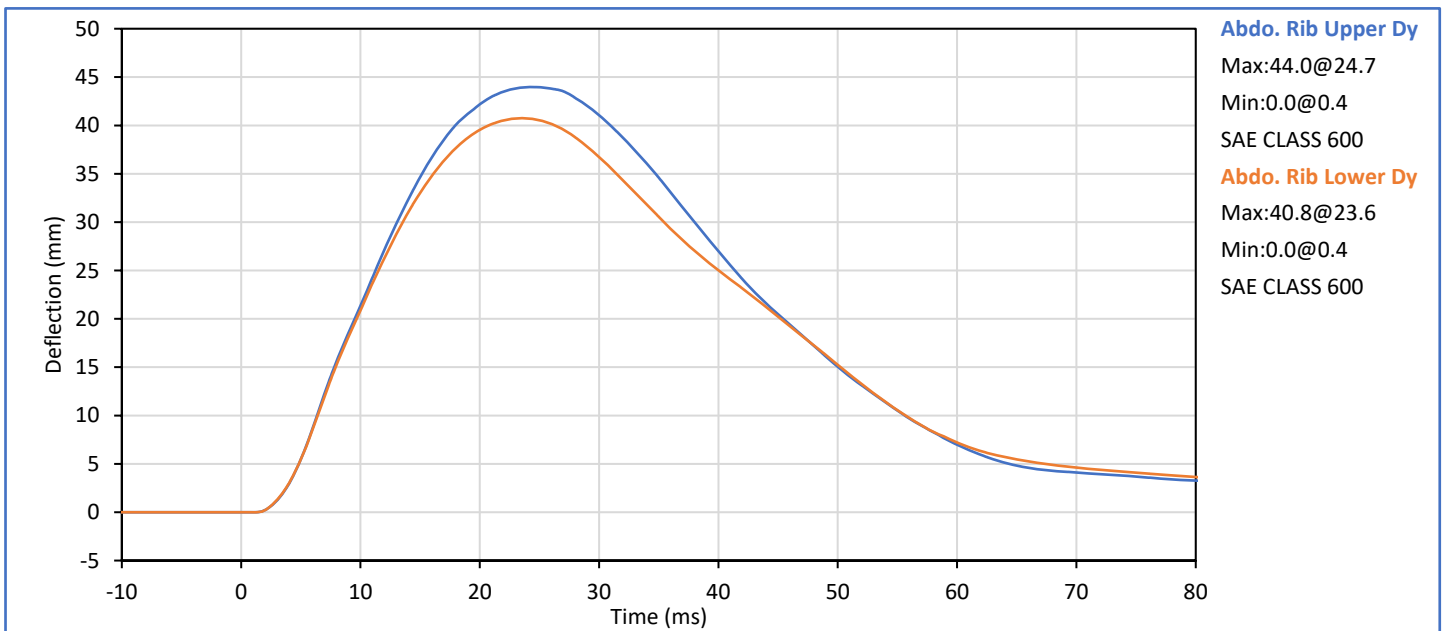
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	43	Pass
Impactor Velocity	m/s	4.20	4.40	4.30	Pass
Peak Thorax Rib Upper Dy	mm	32.0	40.0	35.7	Pass
Peak Thorax Rib Middle Dy	mm	39.0	45.0	40.2	Pass
Peak Thorax Rib Lower Dy	mm	35.0	43.0	38.1	Pass
Peak Spine Upper T1 Ay	g	13.0	17.0	14.8	Pass
Peak Spine Lower T12 Ay	g	7.0	11.0	8.4	Pass
Peak Impactor Ax	g	-18.0	-14.0	-17.7	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	44.0	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	40.8	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	11.5	Pass
Peak Impactor Ax	g	-16.0	-12.0	-15.4	Pass
Overall Test Results					Pass

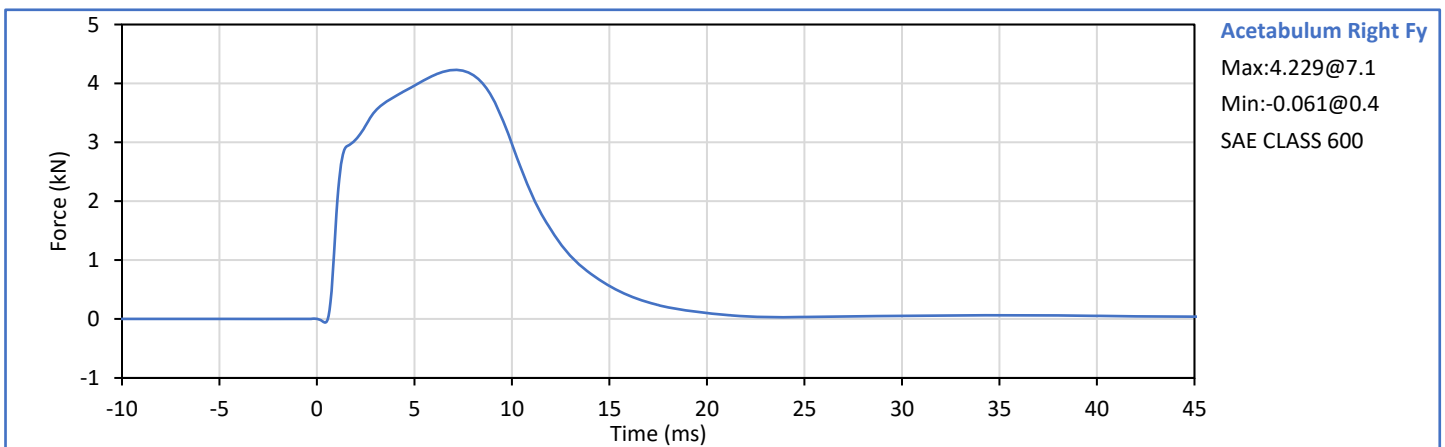
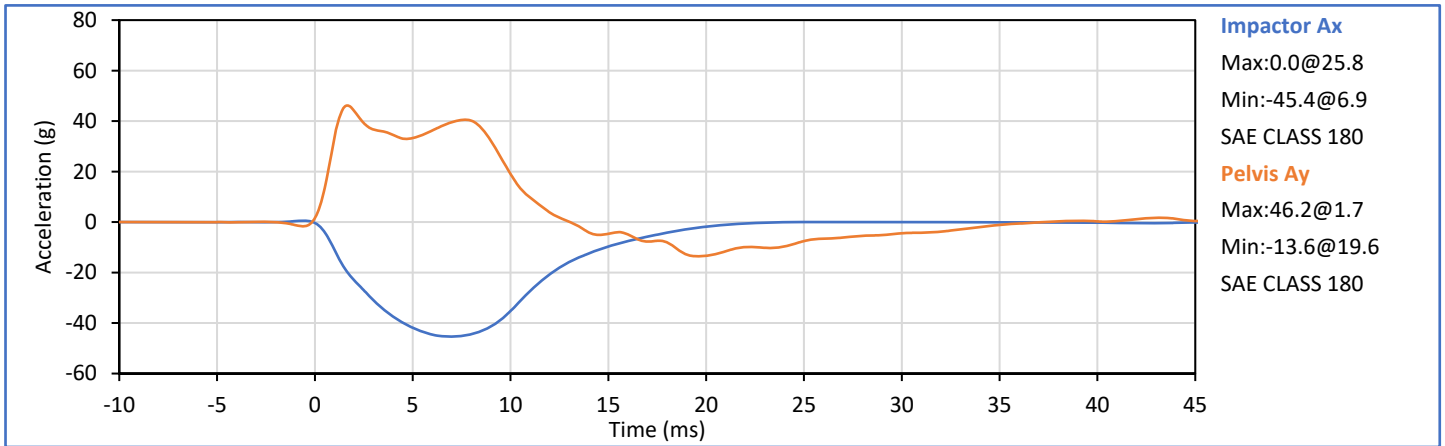


Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	6.60	6.80	6.70	Pass
Peak Acetabulum Fy	kN	3.60	4.30	4.23	Pass
Pelvis Ay after 6ms	g	34.0	42.0	40.5	Pass
Peak Impactor Ax	g	-47.0	-38.0	-45.4	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 13698



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez



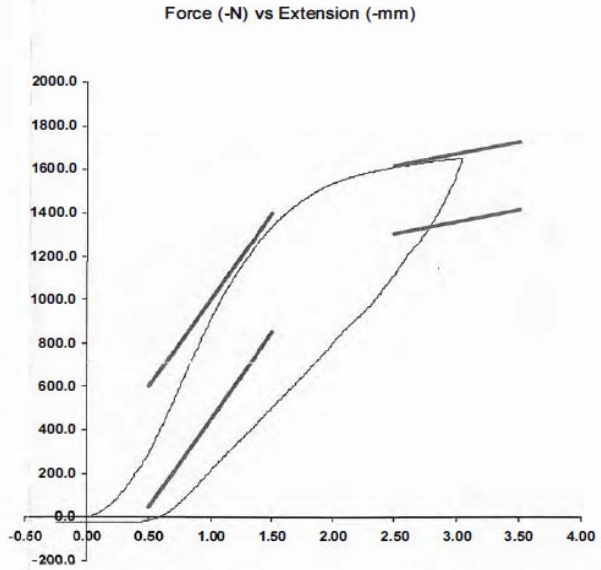
SID-IIs Pelvis Plug Certification Test

Plug S/N 13698
 Test Number 11346
 Report Number 11384
 Test Date 9/26/2019 1:55:22 PM

	Test Results	Spec.Min	Spec.Max
Force @ 0.5 mm (N)	302.10	50.00	600.00
Force @ 1.5 mm (N)	1,342.25	850.00	1,400.00
Force @ 2.5 mm (N)	1,614.53	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,652.70	1,361.00	1,673.00

Testing Machine STM-20 596554;
 Load Cell S/N (F1360947), Units (LBS) 1000
 Crosshead Speed (mm / min) or Rat 12.7
 Extension or Position Measured by XHD_100 (XHD100)

Notes:



Operator _____
 Part Number 180-4450

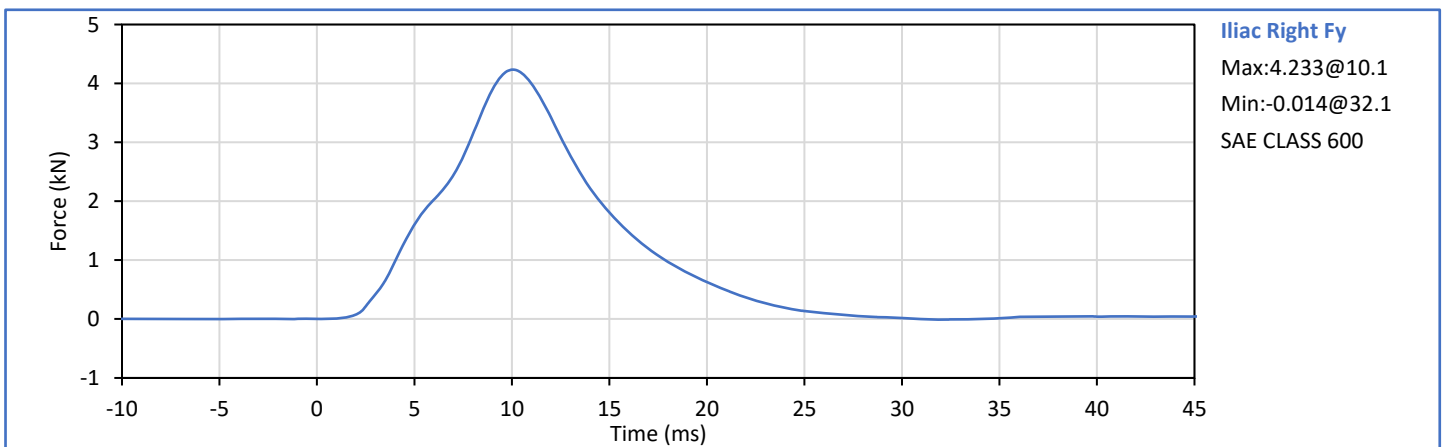
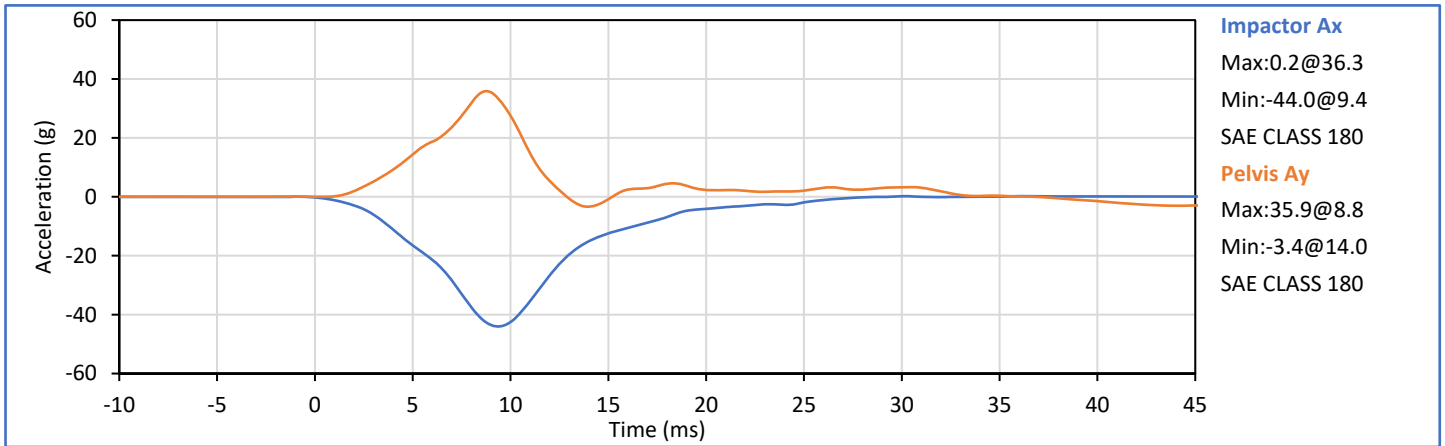
Template No 107 26-Sep-19
 SACO Research

By: [Signature] Date: 9/26/2019
 SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Iliac Fy	kN	4.10	5.10	4.23	Pass
Peak Pelvis Ay	g	28.0	39.0	34.7	Pass
Peak Impactor Ax	g	-45.0	-36.0	-44.0	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12228 *

* Plug is not impacted and remains certified



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seuth*
J. Hernandez

APPENDIX C
Post-Test ATD Qualification and Performance Verification
ES-2re 50th Male Side Impact ATD, Left Side Configuration
S/N: F037

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
1 - Sitting Height	mm	900	918	909	Pass
2 - Seat to Shoulder Joint	mm	558	572	563	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	349	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	101	Pass
5 - Sole to Seat, Sitting	mm	433	451	439	Pass
6 - Head Width	mm	152	158	155	Pass
7 - Shoulder/Arm Width	mm	461	479	469	Pass
8 - Thorax Width	mm	322	332	326	Pass
9 - Abdomen Width	mm	273	287	280	Pass
10 - Pelvis Lap Width	mm	359	373	368	Pass
11 - Head Depth	mm	196	206	200	Pass
12 - Thorax Depth	mm	262	272	269	Pass
13 - Abdomen Depth	mm	194	204	201	Pass
14 - Pelvis Depth	mm	235	245	242	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	154	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	604	Pass
				Overall Test Results	Pass

Technician:



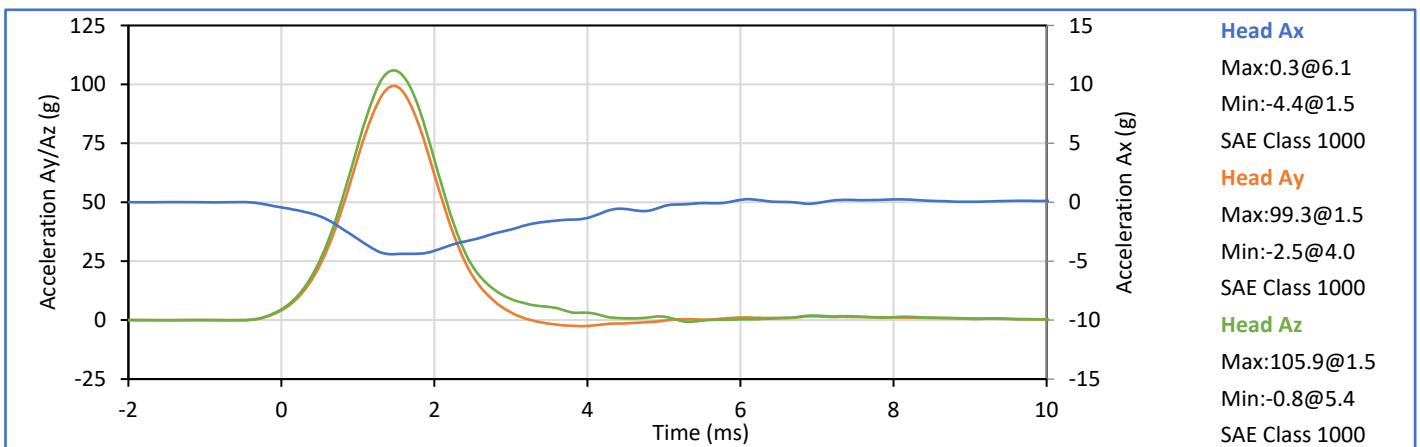
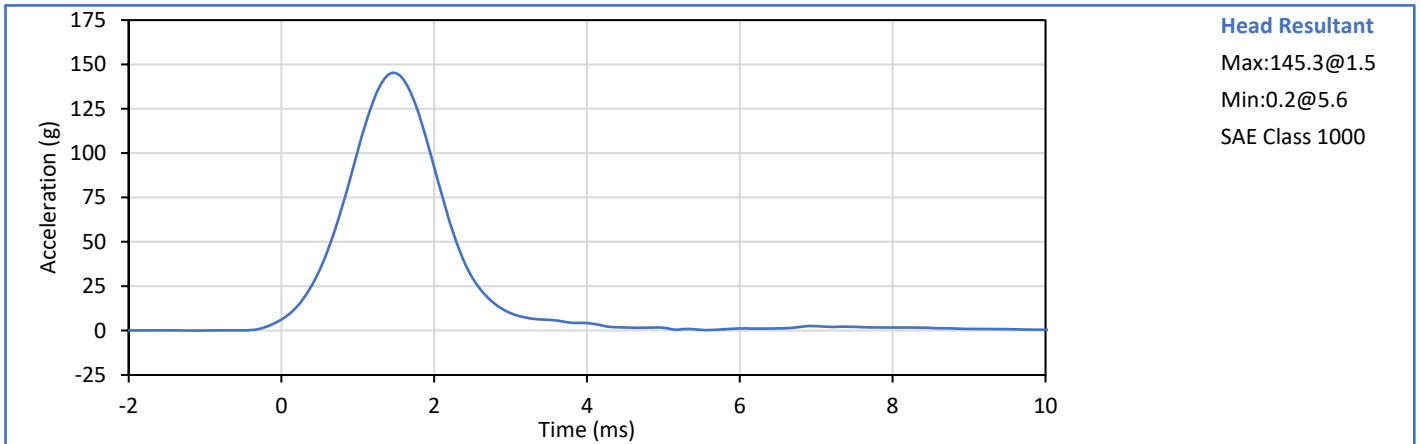
G. Fuentes

Approved By:



J. Hernandez

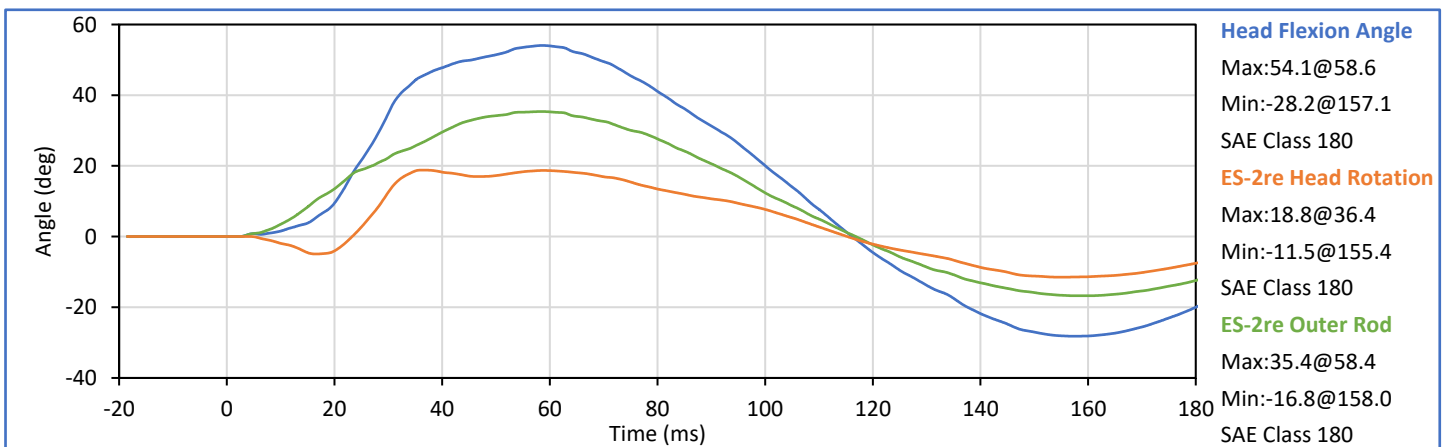
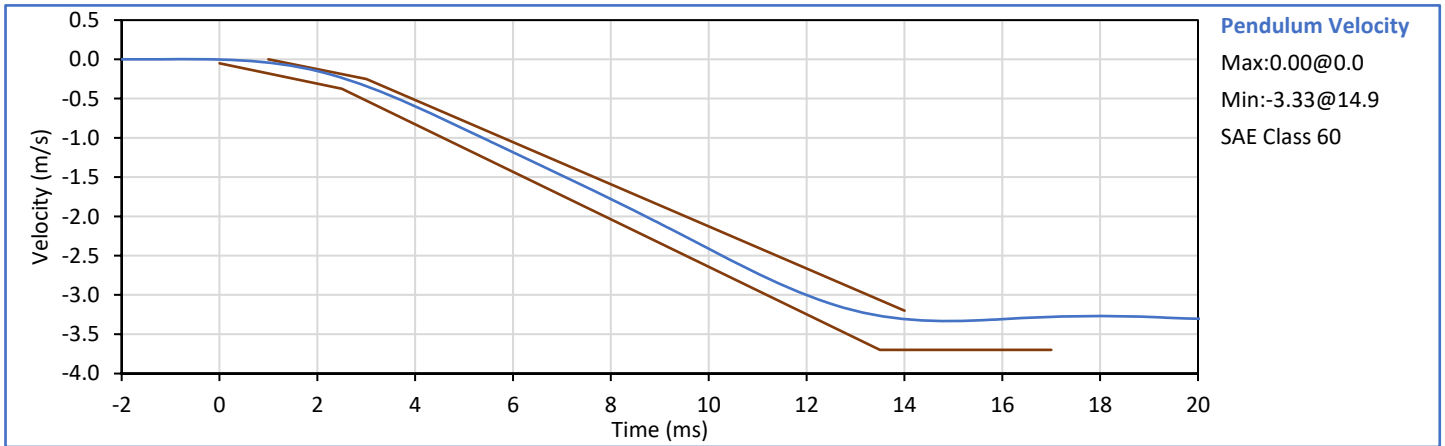
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.4	Pass
Laboratory Relative Humidity	%	10	70	31	Pass
Peak Resultant Acceleration	g	125.0	155.0	145.3	Pass
Peak Head Ax	g	-15.0	15.0	0.3	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.9	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	3.30	3.50	3.46	Pass
Peak Headform Flexion	deg	49.0	59.0	54.1	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	58.6	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	57.6	Pass
Overall Test Results					Pass



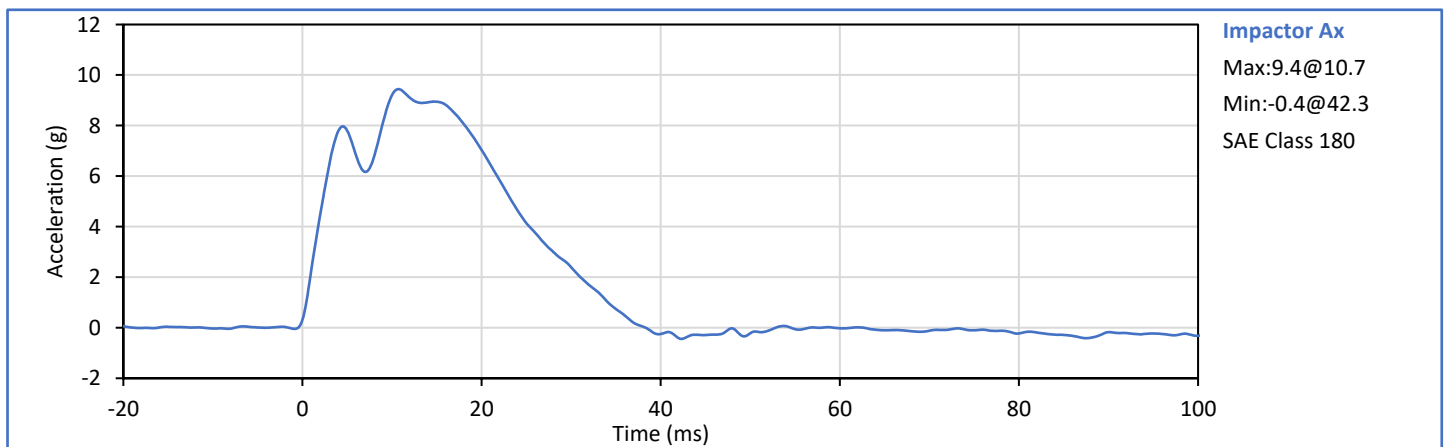
Technician: *Mill LGS III*
G. Fuentes

Approved By: *J. Hernandez*
J. Hernandez

ATD Serial No.: F037

Test Date: 2022-12-15

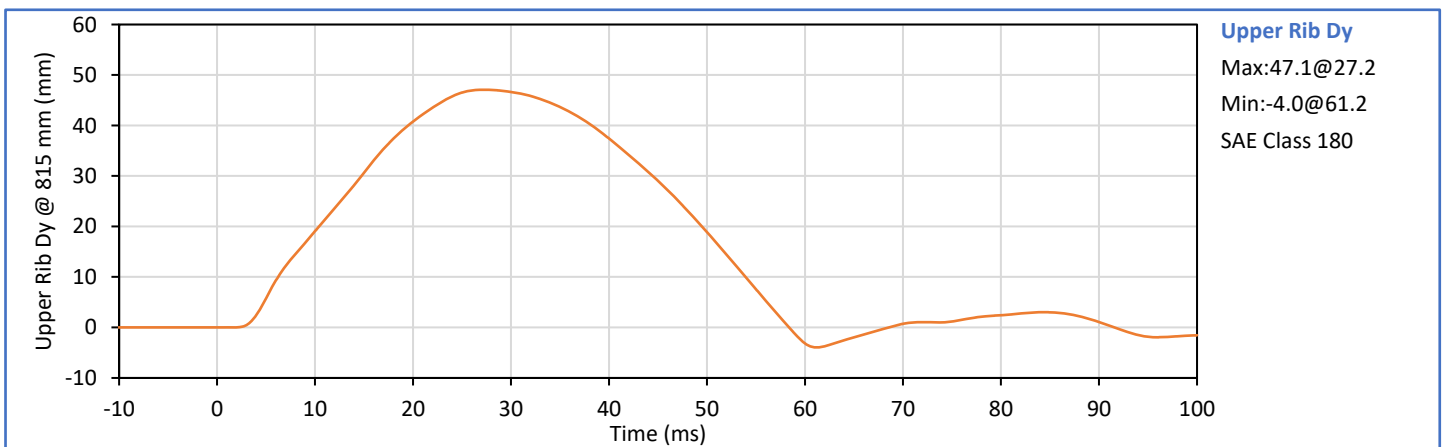
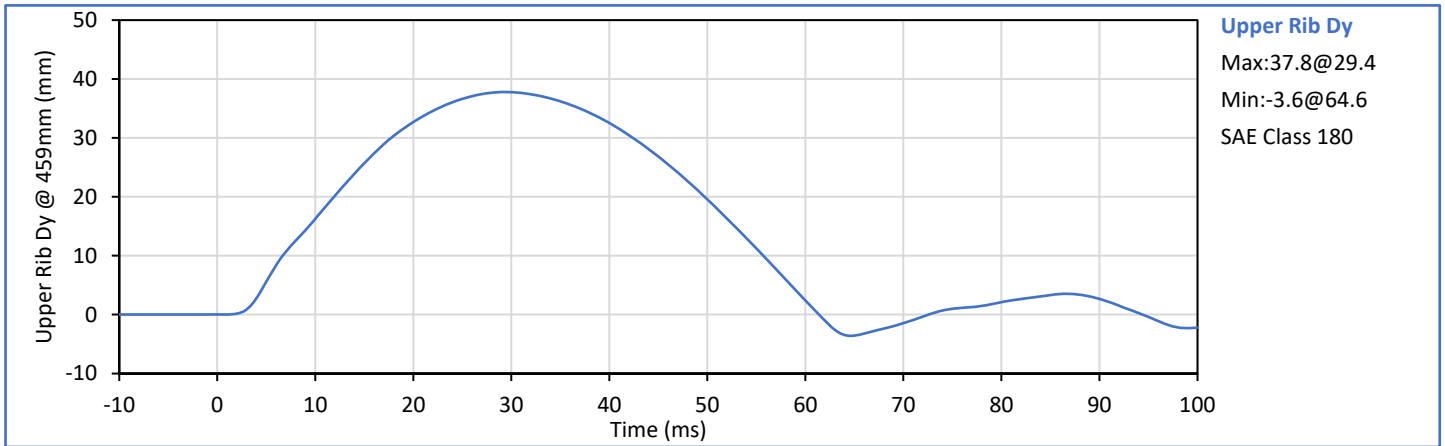
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.7	Pass
Laboratory Relative Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Impactor Ax	g	7.5	10.5	9.4	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seuth*
J. Hernandez

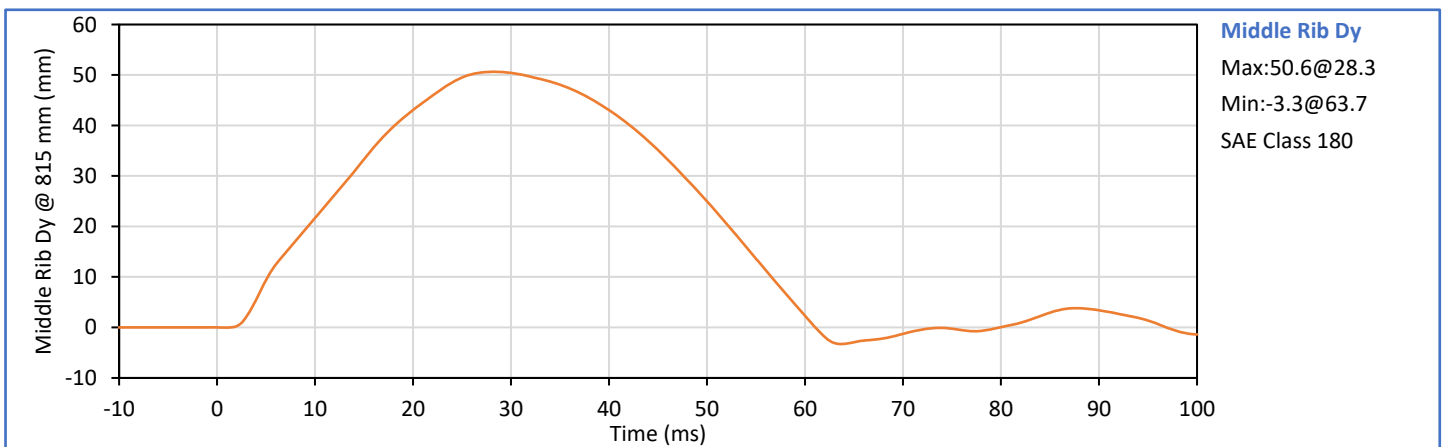
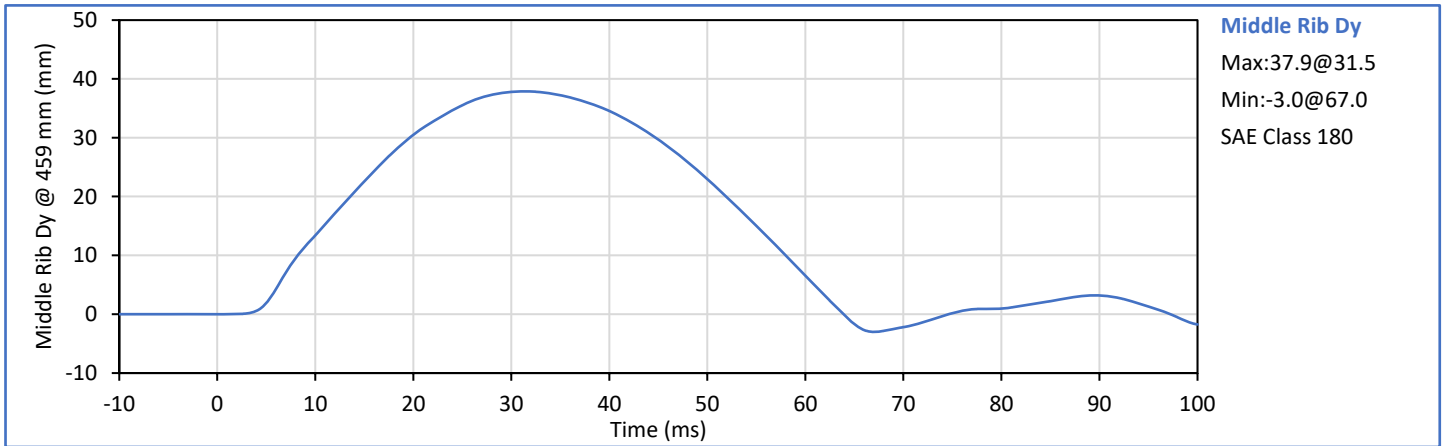
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.8	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	47.1	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

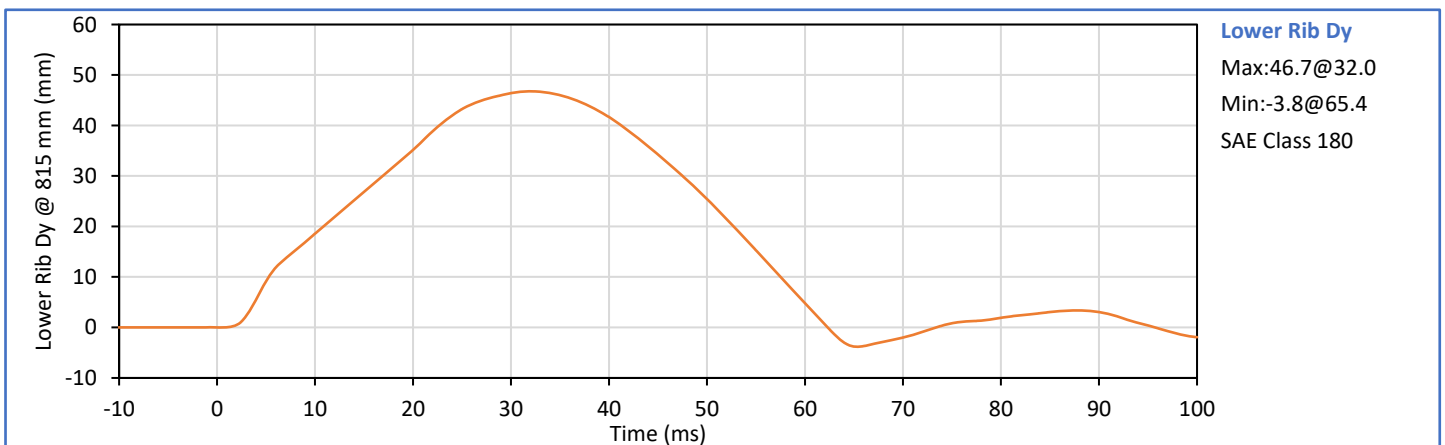
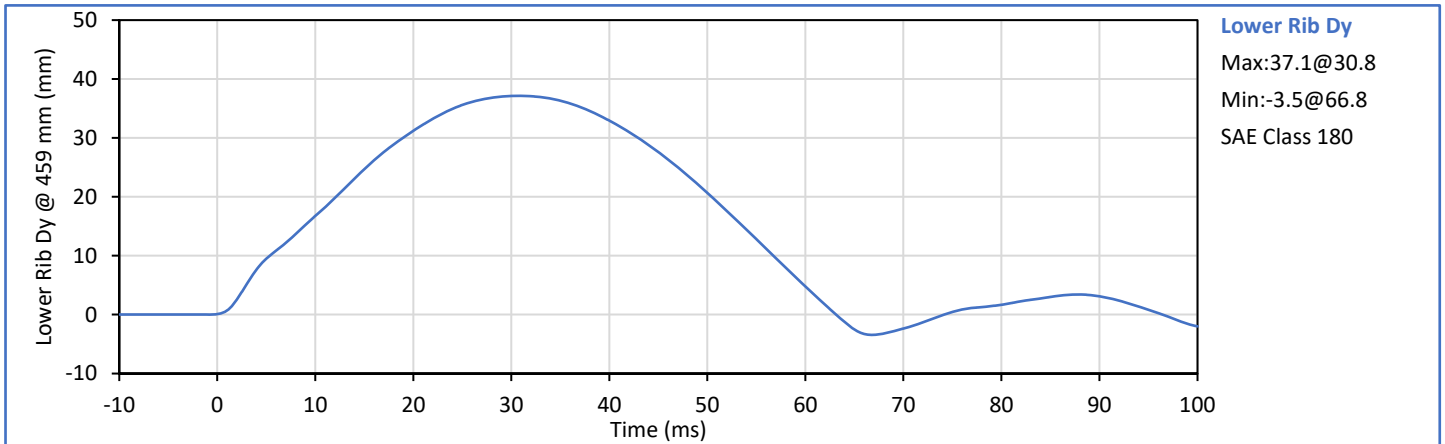
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	37.9	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	50.6	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

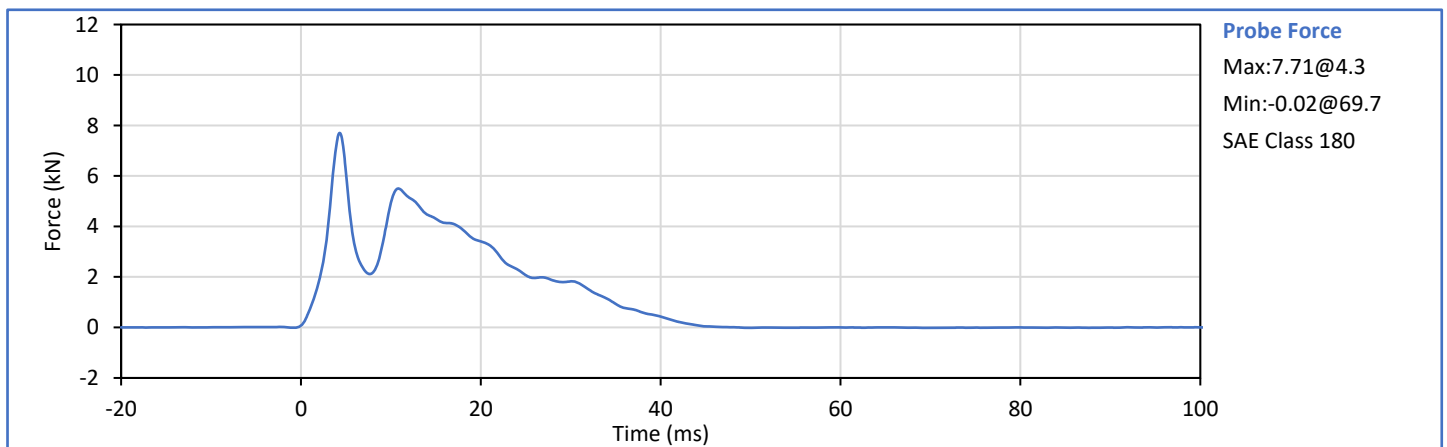
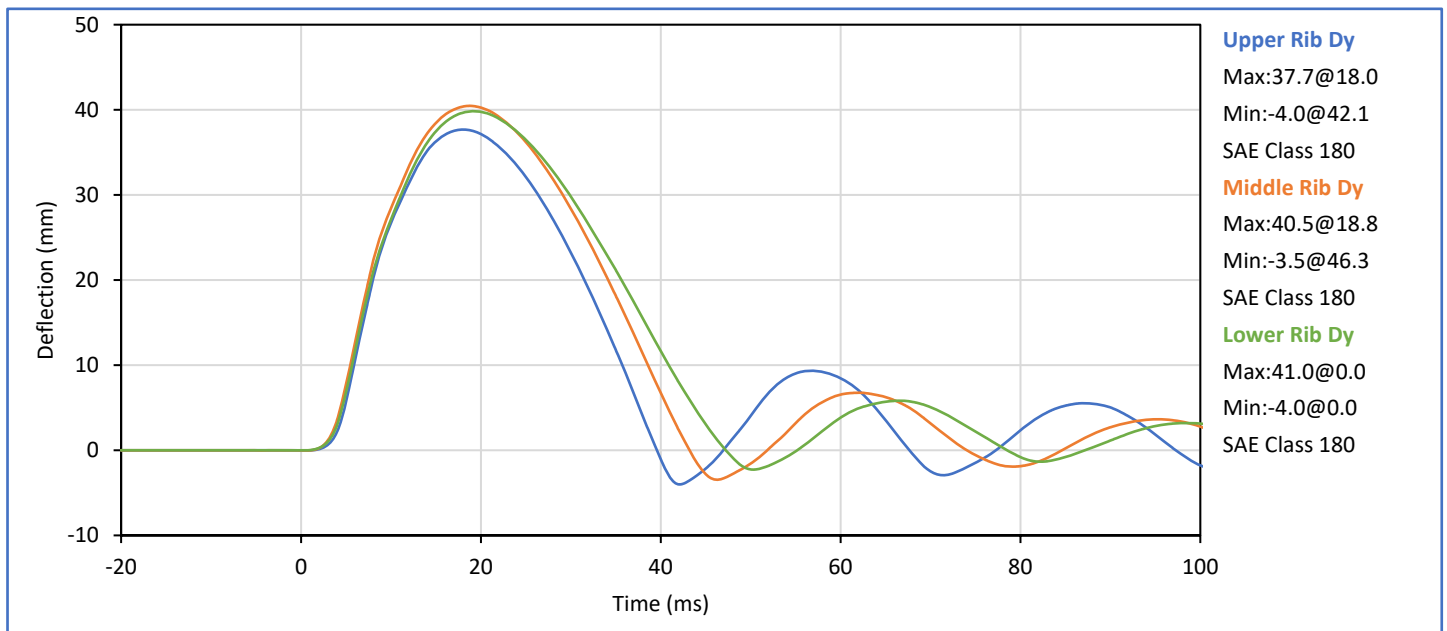
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Lower Rib Dy @ 459mm	mm	36.0	40.0	37.1	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	46.7	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

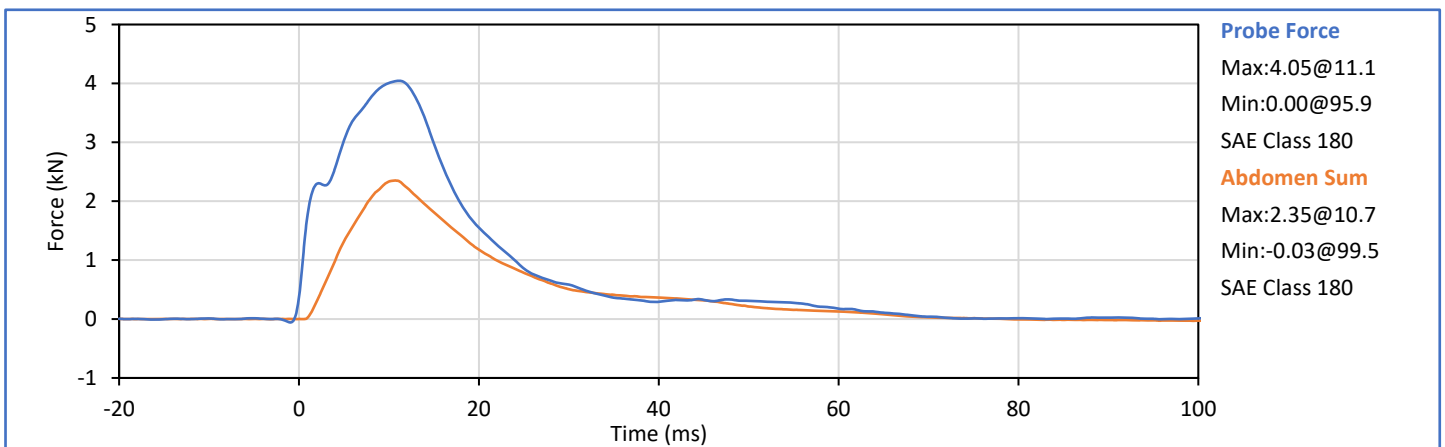
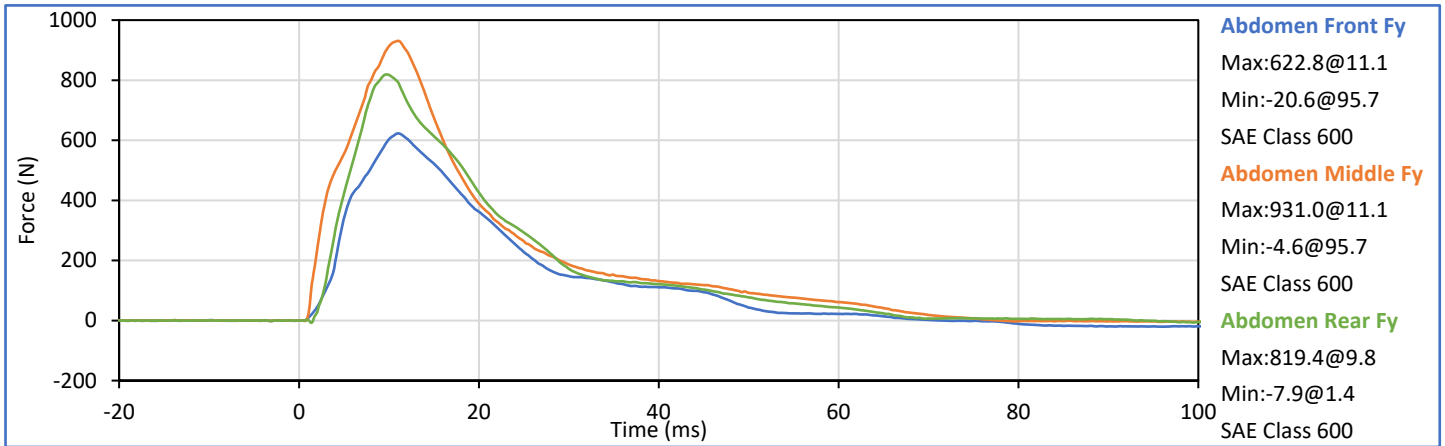
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.8	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	5.40	5.60	5.45	Pass
Peak Upper Rib Dy	mm	34.0	41.0	37.7	Pass
Peak Middle Rib Dy	mm	37.0	45.0	40.5	Pass
Peak Lower Rib Dy	mm	37.0	44.0	39.8	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.50	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

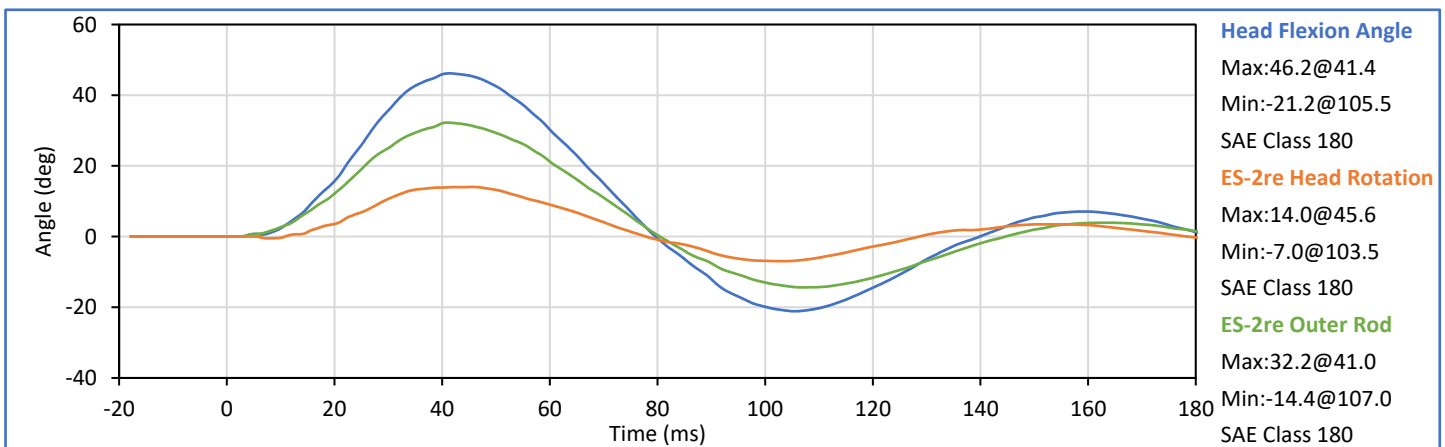
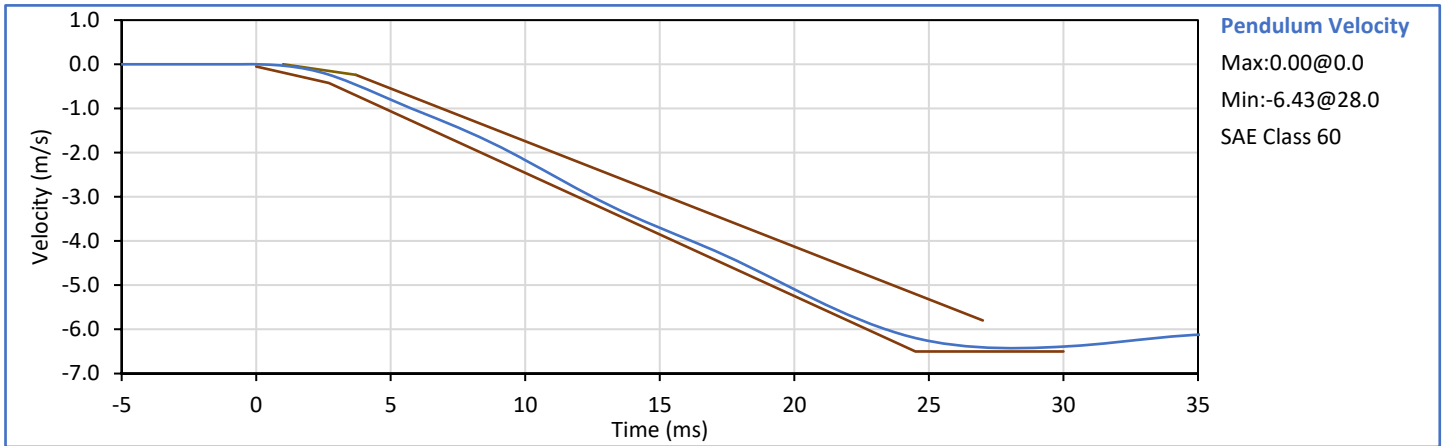
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	3.90	4.10	4.02	Pass
Peak Impactor Force	kN	4.00	4.80	4.05	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.1	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.35	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.7	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

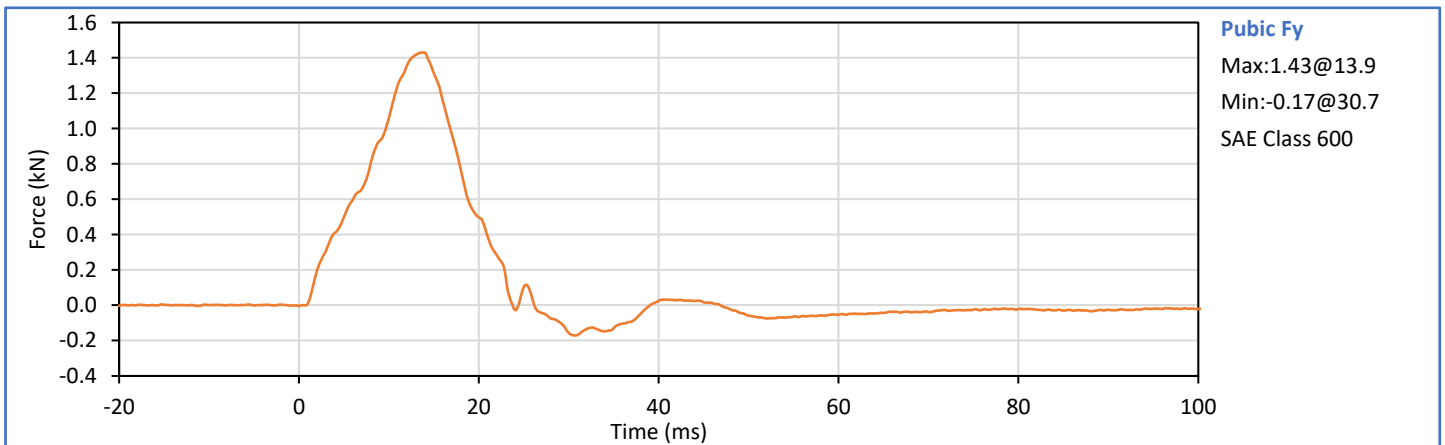
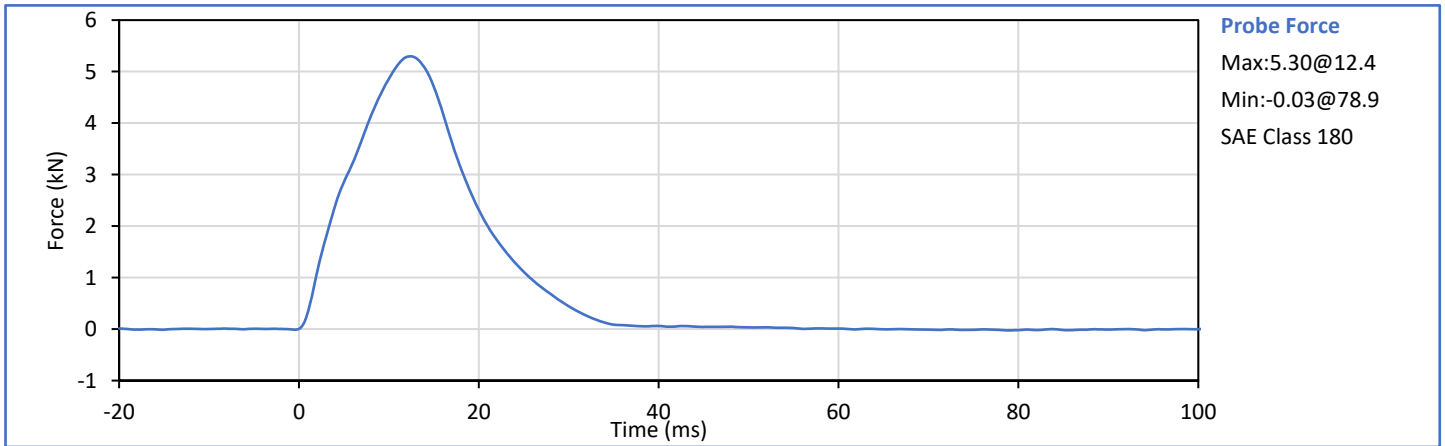
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.95	6.15	6.14	Pass
Peak Headform Flexion	deg	45.0	55.0	46.2	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	41.4	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	38.3	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seuth*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Force	kN	4.70	5.40	5.30	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.4	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.43	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	13.9	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

APPENDIX C
Post-Test ATD Qualification and Performance Verification
SID-IIs Small Side Impact ATD, Left Side Configuration
S/N: 308

ATD Serial No.: 308

Test Date: 2022-12-12

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	29	Pass
A - Sitting Height	mm	772	788	777	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	83	Pass
D - H Point From Seatback	mm	141	151	147	Pass
E - Shoulder Pivot From Backline	mm	97	107	102	Pass
F - Thigh Clearance	mm	119	135	131	Pass
G - Head Breadth	mm	140	148	146	Pass
H - Head Back From Backline	mm	40	46	43	Pass
I - Head Depth	mm	178	188	184	Pass
J - Head Circumference	mm	541	551	546	Pass
K - Buttock To Knee Length	mm	514	540	521	Pass
L - Popliteal Height	mm	343	369	351	Pass
K - Knee Pivot To Floor Height	mm	392	409	403	Pass
N - Buttock Popliteal Length	mm	416	442	431	Pass
O - Chest Depth W/O Jacket	mm	195	211	207	Pass
P - Foot Length	mm	216	232	228	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	318	Pass
R - Arm Length	mm	249	259	256	Pass
S - Knee Joint To Seatback	mm	477	493	485	Pass
V - Shoulder Width	mm	341	357	349	Pass
W - Foot Width	mm	78	94	82	Pass
Y - Chest Circumference W/Jacket	mm	851	881	864	Pass
Z - Waist Circumference	mm	761	791	773	Pass
				Overall Test Results	Pass

Technician:



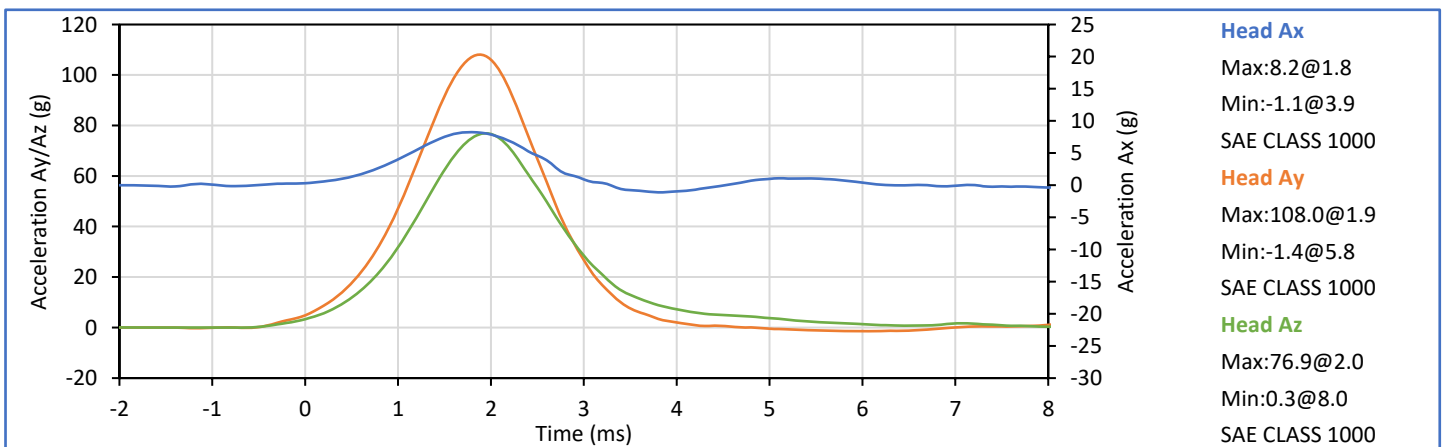
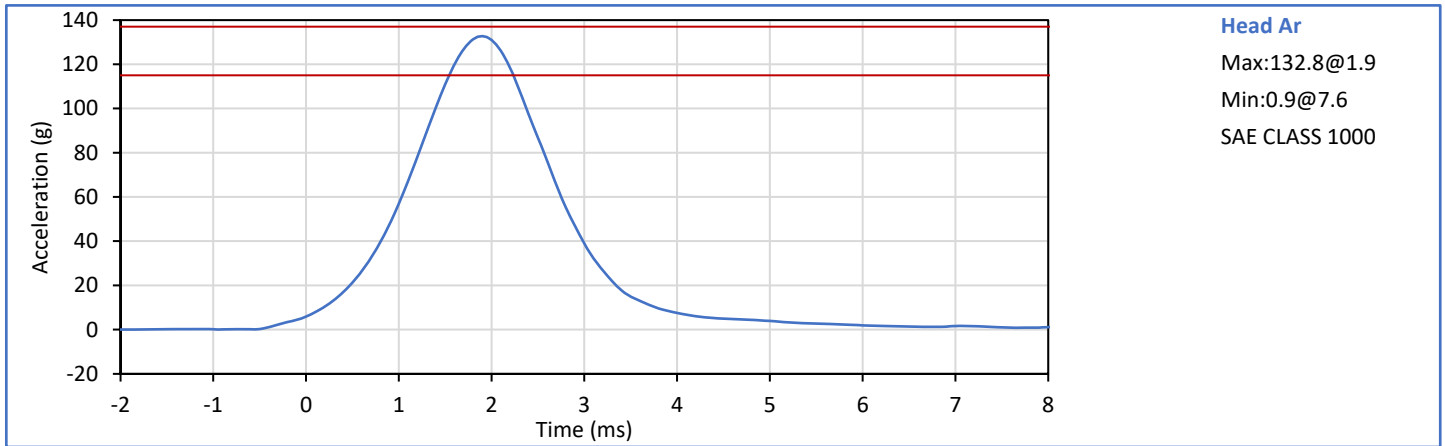
G. Fuentes

Approved By:



J. Hernandez

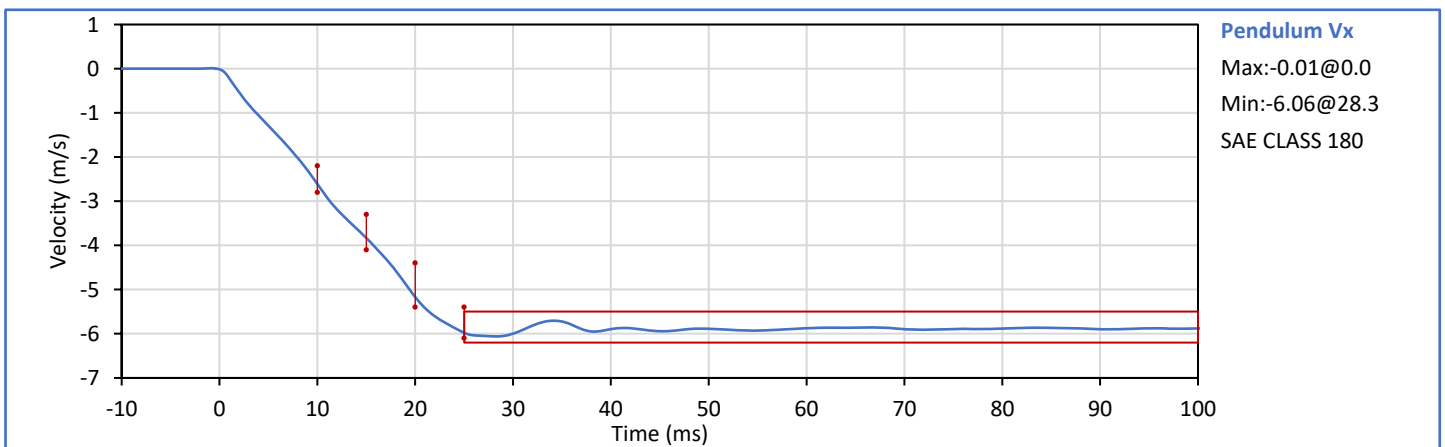
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	20.8	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Peak Resultant Acceleration	g	115.0	137.0	132.8	Pass
Peak Head Ax	g	-15.0	15.0	8.2	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

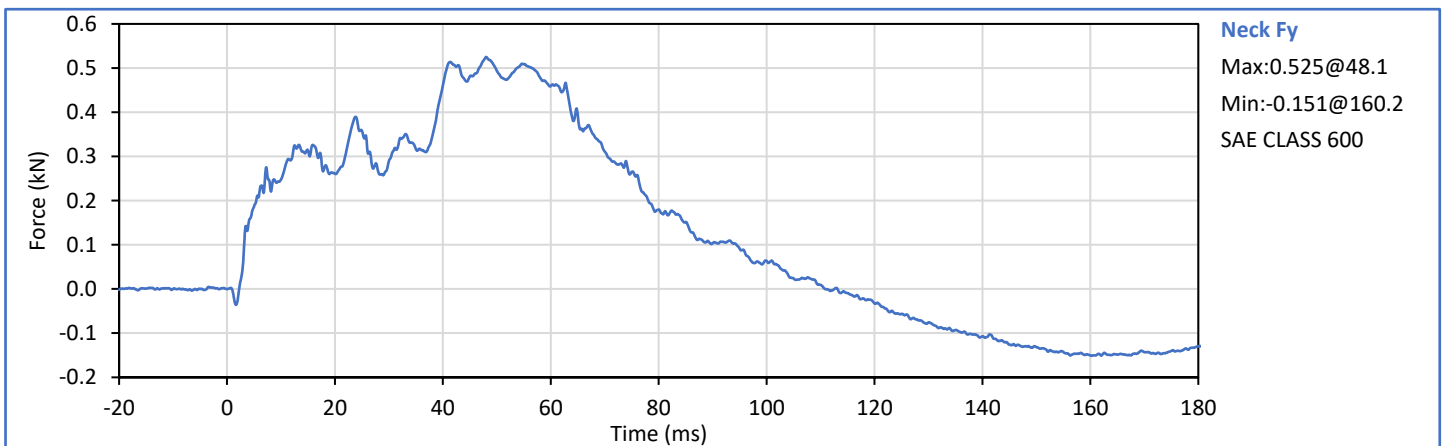
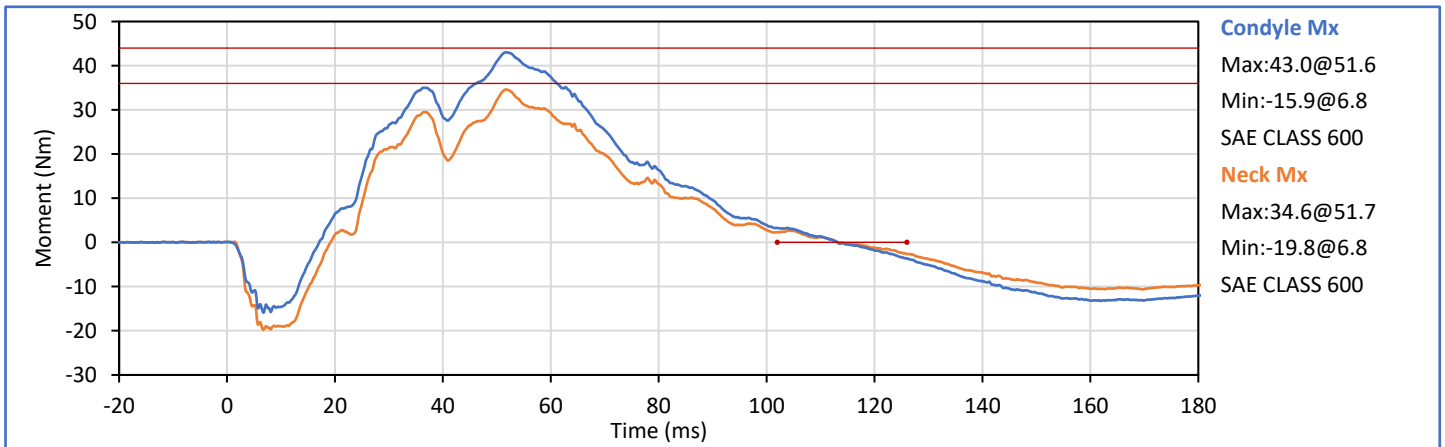
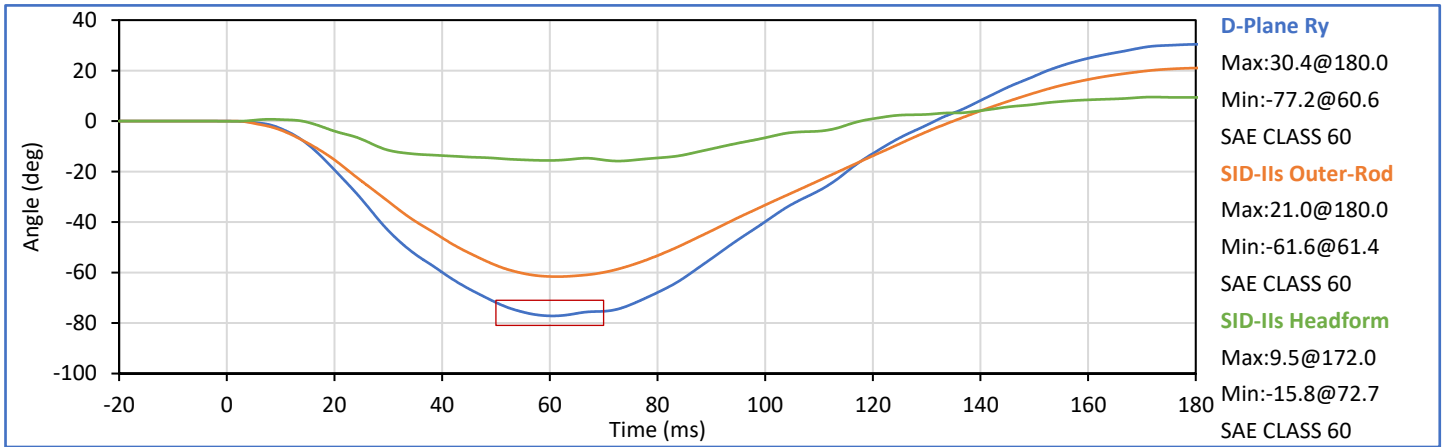
Approved By: *Smith*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	31	Pass
Pendulum Velocity	m/s	5.51	5.63	5.57	Pass
Pendulum Decel at 10 ms	m/s	-2.80	-2.20	-2.61	Pass
Pendulum Decel at 15 ms	m/s	-4.10	-3.30	-3.83	Pass
Pendulum Decel at 20 ms	m/s	-5.40	-4.40	-5.17	Pass
Pendulum Decel at 25 ms	m/s	-6.10	-5.40	-5.98	Pass
Pendulum Decel from 25-100 ms	m/s	-6.20	-5.50	-6.06/-5.71	Pass
Peak "D" Plane Rotation	deg	-81.0	-71.0	-77.2	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.6	Pass
Peak Occ. Condyle Moment	Nm	36.0	44.0	43.0	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	113.2	Pass
Overall Test Results					Pass

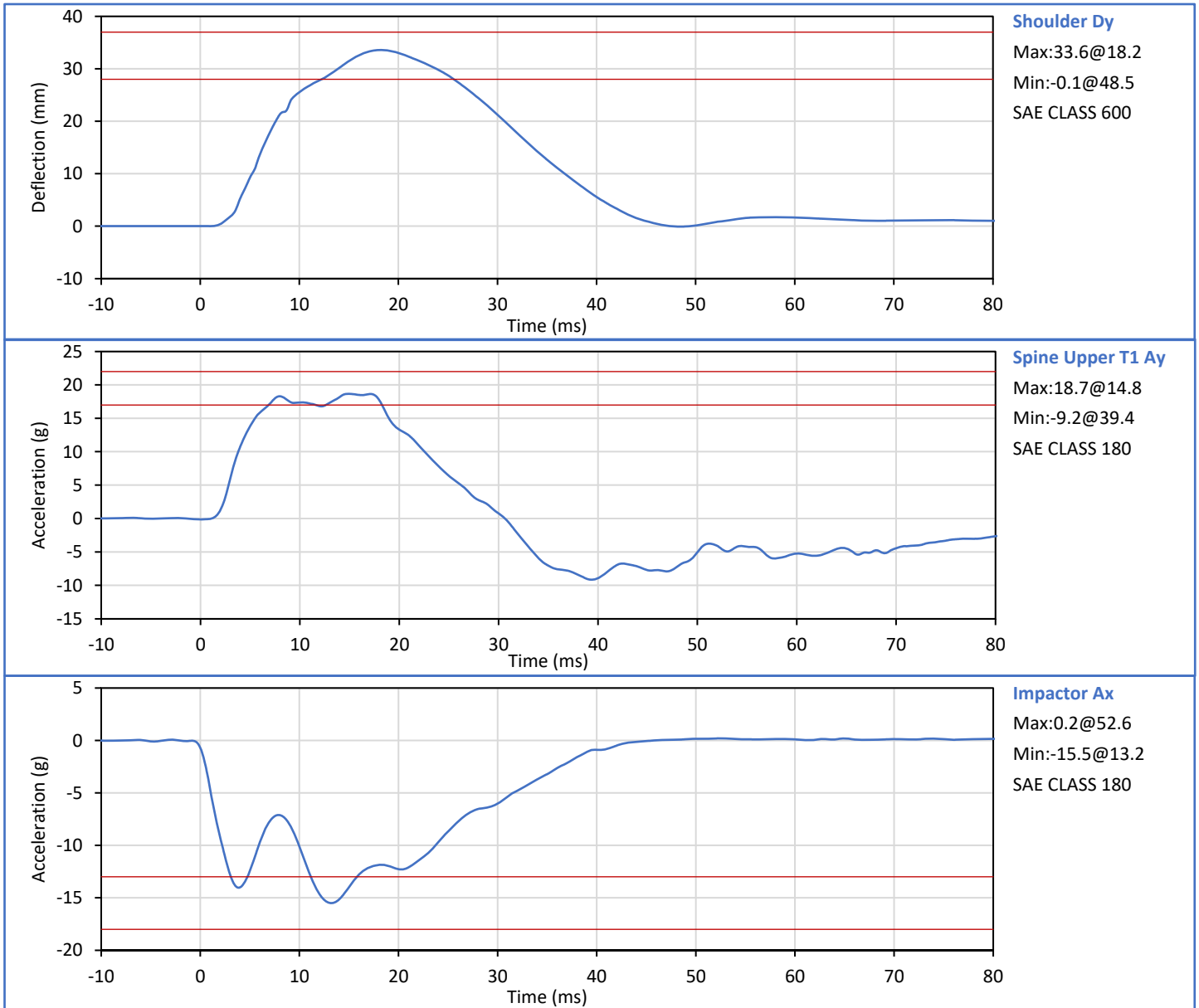


Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez



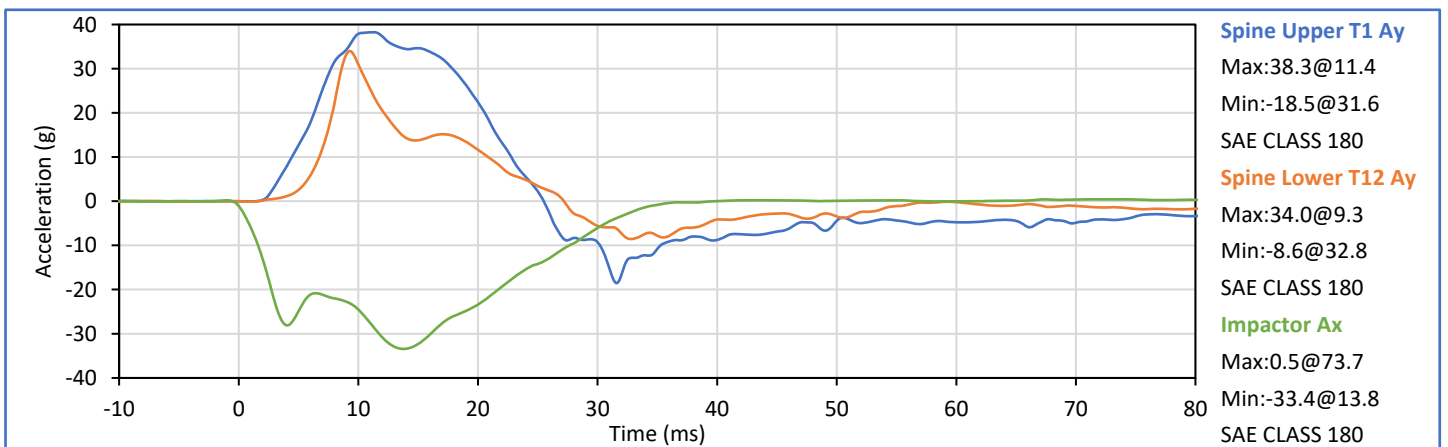
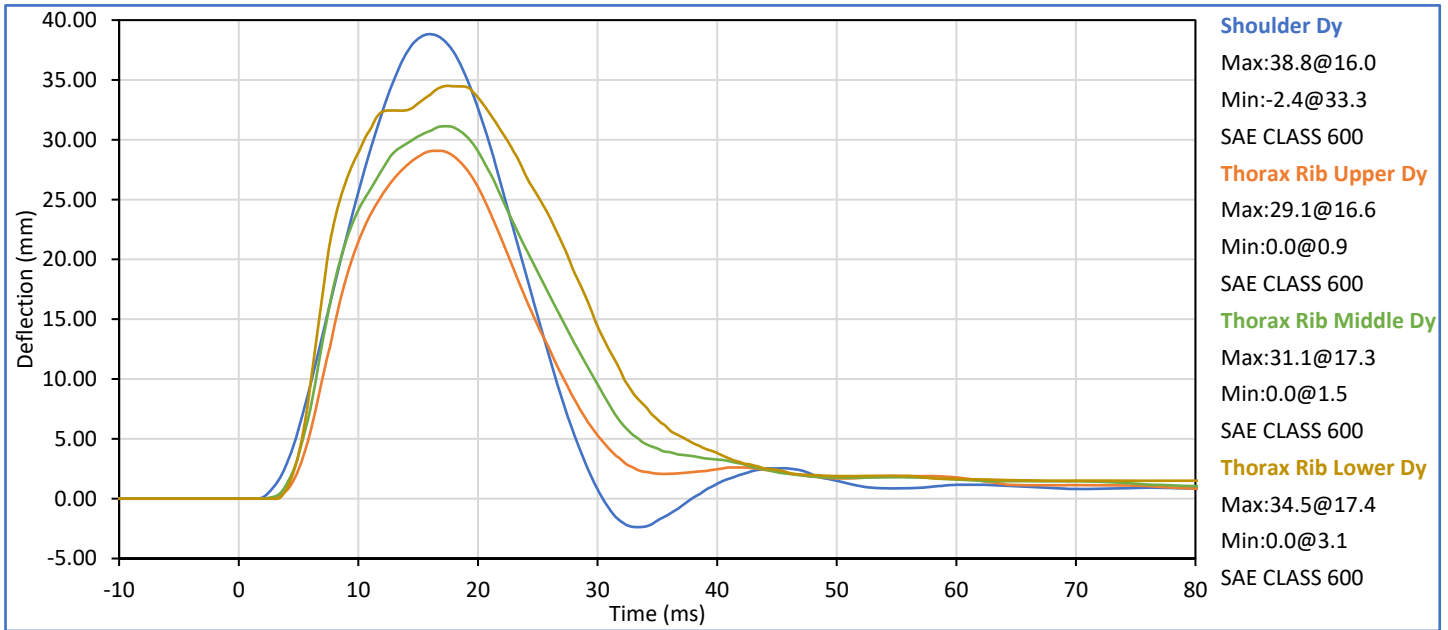
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	4.20	4.40	4.30	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.6	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.7	Pass
Peak Impactor Ax	g	-18.0	-13.0	-15.5	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *J. Hernandez*
J. Hernandez

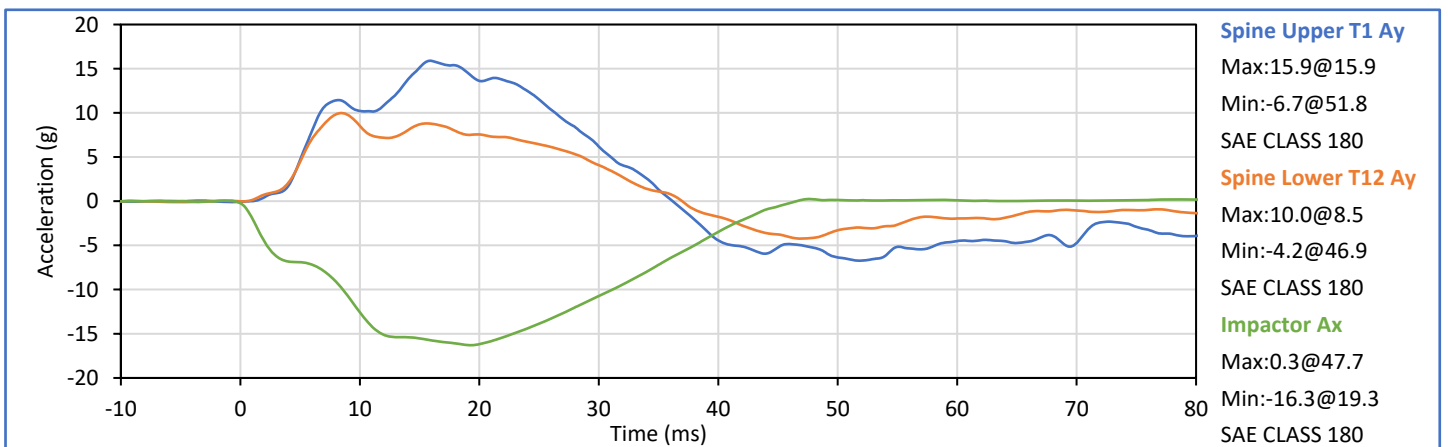
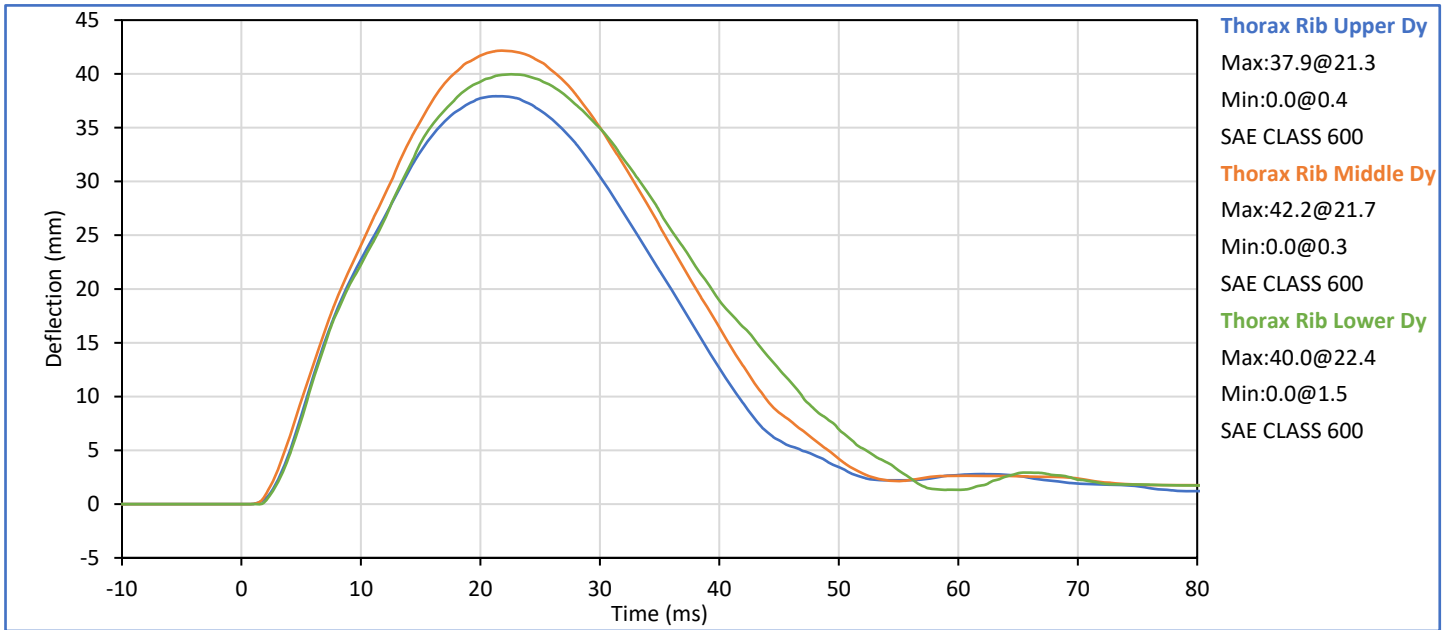
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.5	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	6.60	6.80	6.72	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.8	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.1	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.1	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.5	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	38.3	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	34.0	Pass
Peak Impactor Ax	g	-36.0	-30.0	-33.4	Pass
Overall Test Results					Pass



Technician: Mill LGS III
G. Fuentes

Approved By: J. Hernandez
J. Hernandez

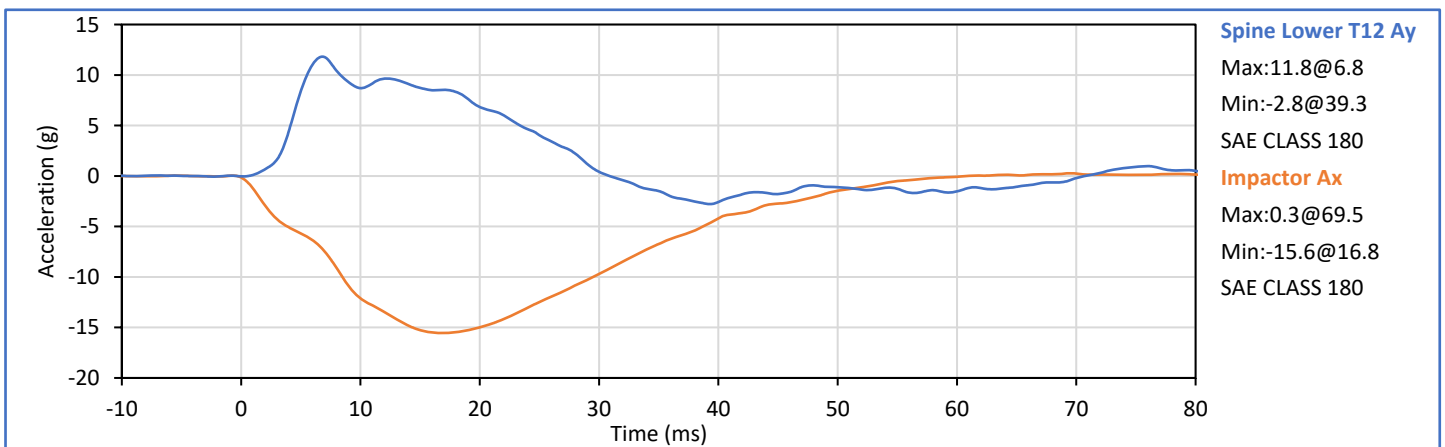
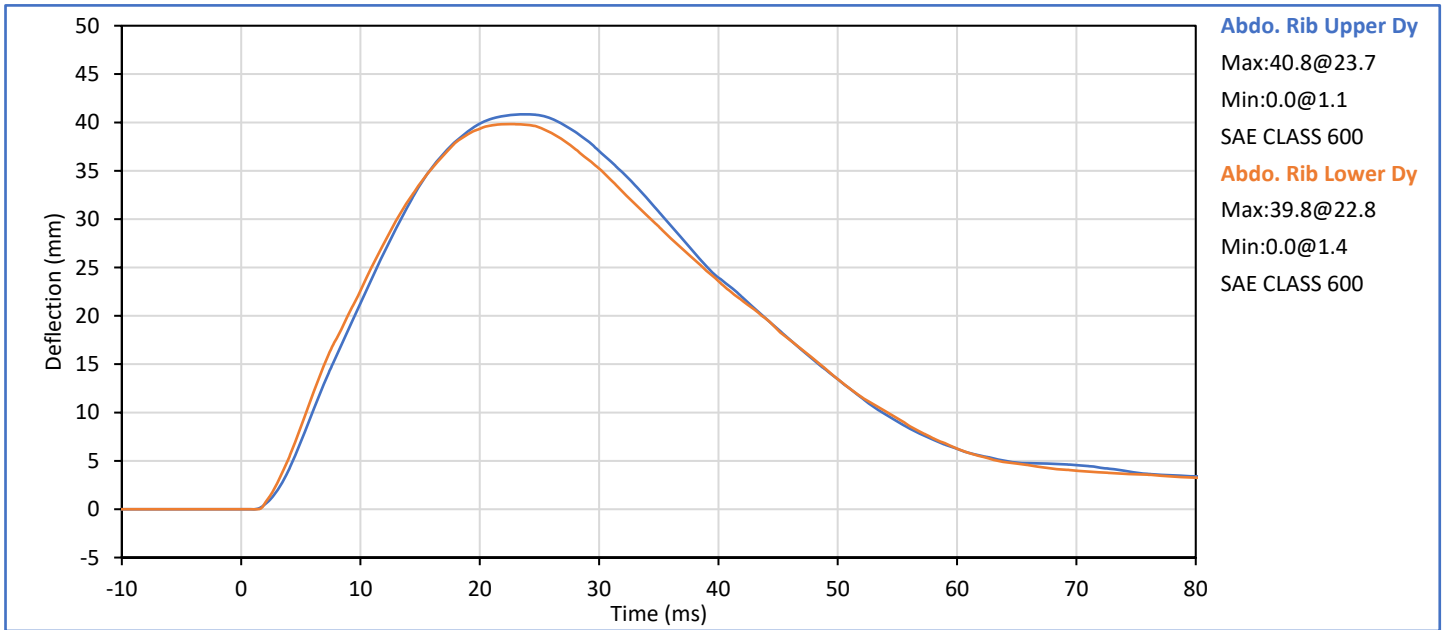
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	4.20	4.40	4.27	Pass
Peak Thorax Rib Upper Dy	mm	32.0	40.0	37.9	Pass
Peak Thorax Rib Middle Dy	mm	39.0	45.0	42.2	Pass
Peak Thorax Rib Lower Dy	mm	35.0	43.0	40.0	Pass
Peak Spine Upper T1 Ay	g	13.0	17.0	15.9	Pass
Peak Spine Lower T12 Ay	g	7.0	11.0	10.0	Pass
Peak Impactor Ax	g	-18.0	-14.0	-16.3	Pass
Overall Test Results					Pass



Technician: *Mill LGS III*
G. Fuentes

Approved By: *J. Hernandez*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	40.8	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	39.8	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	11.8	Pass
Peak Impactor Ax	g	-16.0	-12.0	-15.6	Pass
Overall Test Results					Pass

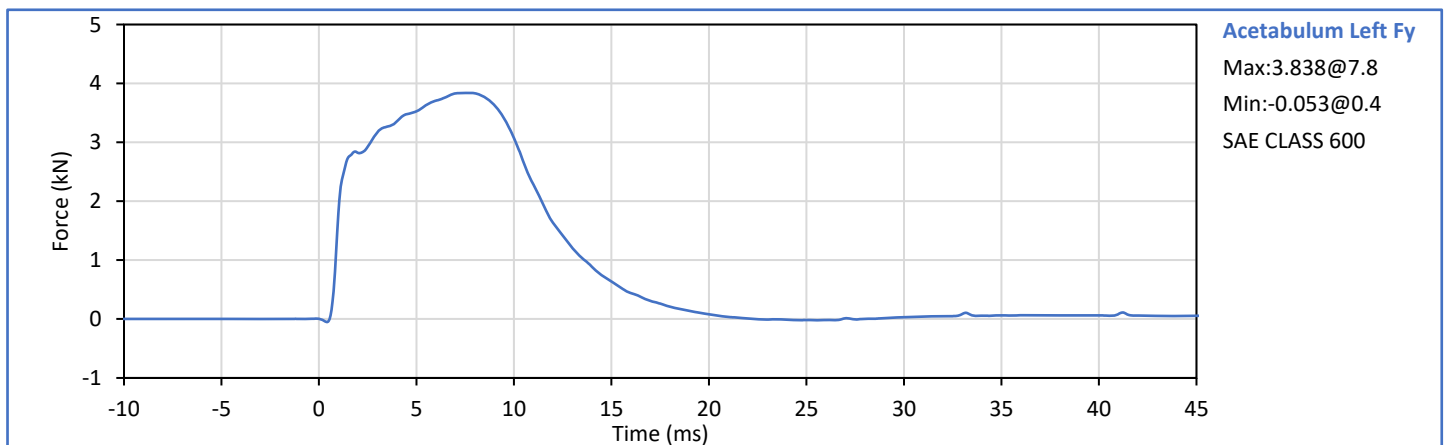
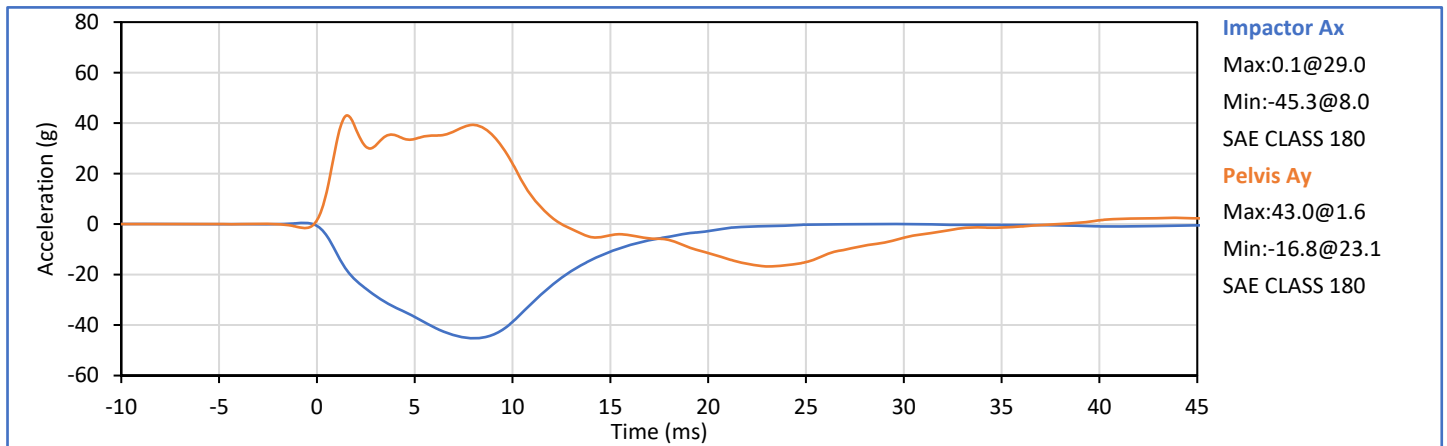


Technician: *Mill LGS III*
G. Fuentes

Approved By: *Seath*
J. Hernandez

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	6.60	6.80	6.70	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.84	Pass
Pelvis Ay after 6ms	g	34.0	42.0	39.3	Pass
Peak Impactor Ax	g	-47.0	-38.0	-45.3	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 14790



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

ATD Serial No.: 308

Test Date: 2022-12-15

Pelvis Plug S/N: 14790



SID-IIs Pelvis Plug Certification Test

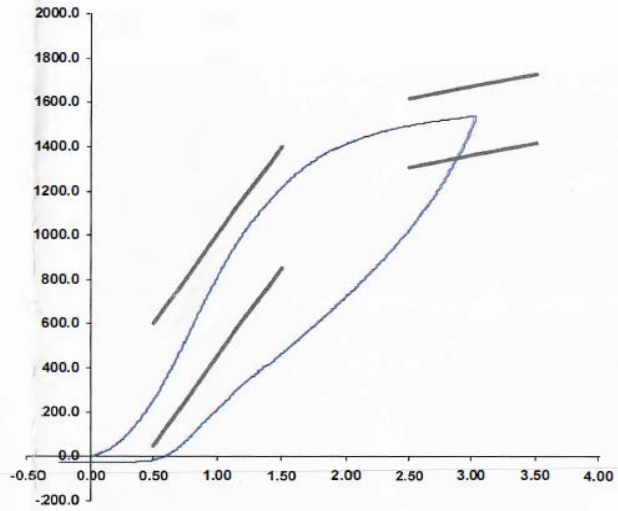
Plug S/N 14790
Test Number 16763
Report Number 16809
Test Date 12/29/2020 11:46:06 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	264.21	50.00	600.00
Force @ 1.5 mm (N)	1,214.64	850.00	1,400.00
Force @ 2.5 mm (N)	1,495.28	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,537.07	1,361.00	1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000
Preload Value (-N) 22.24
Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 29-Dec-20
SACO Research

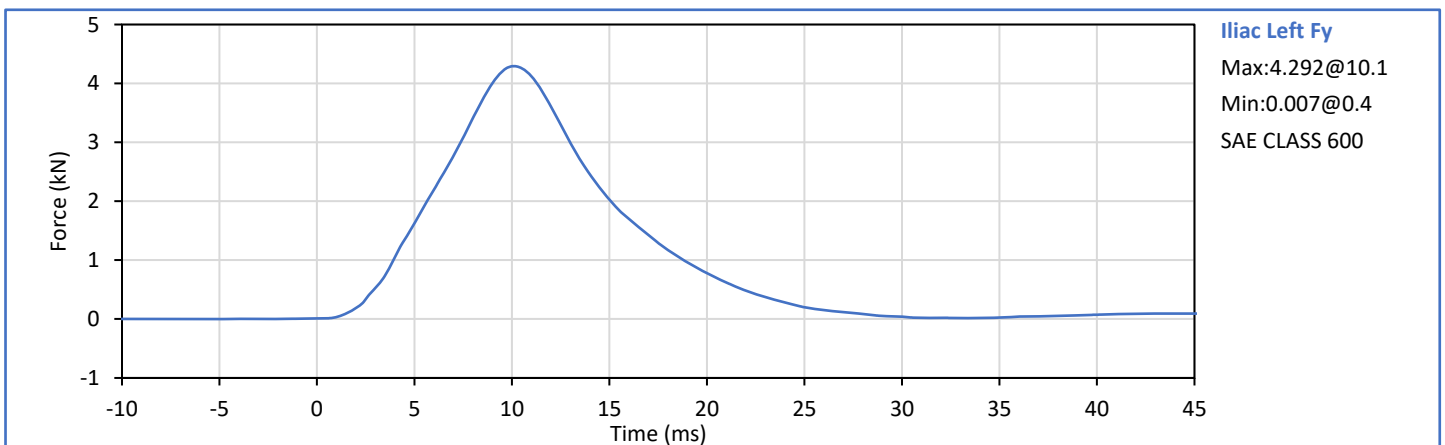
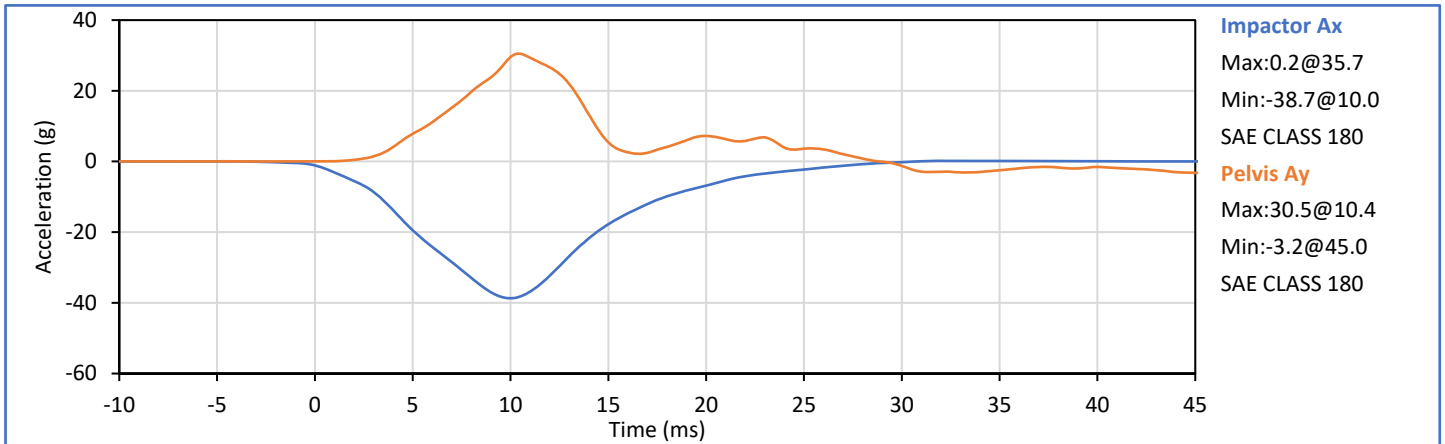
By: DC Date: 12/29/2020

SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.34	Pass
Peak Iliac Fy	kN	4.10	5.10	4.29	Pass
Peak Pelvis Ay	g	28.0	39.0	34.7	Pass
Peak Impactor Ax	g	-45.0	-36.0	-38.7	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12228 *

* Plug is not impacted and remains certified



Technician: *Mill LGS III*
G. Fuentes

Approved By: *Smith*
J. Hernandez

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P58858	Endevco	7264C-2k	2022-10-19
Head Acceleration Y Primary	P58865	Endevco	7264C-2k	2022-10-19
Head Acceleration Z Primary	P58867	Endevco	7264C-2k	2022-10-19
Head Acceleration X Redundant	P58859	Endevco	7264C-2k	2022-10-19
Head Acceleration Y Redundant	P58866	Endevco	7264C-2k	2022-10-19
Head Acceleration Z Redundant	P58873	Endevco	7264C-2k	2022-10-19
Upper Thorax Rib Deflection Y	209 (ES-2 Rib)	Honeywell	F38000203	2022-10-18
Middle Thorax Rib Deflection Y	210 (ES-2 Rib)	Honeywell	F38000203	2022-10-18
Lower Thorax Rib Deflection Y	207 (ES-2 Rib)	Honeywell	F38000203	2022-10-18
Anterior Abdominal Force Y	1514 Fy	R.A. Denton	2631J	2022-03-30
Middle Abdominal Force Y	1510 Fy	R.A. Denton	2631J	2022-03-30
Posterior Abdominal Force Y	1515 Fy	R.A. Denton	2631J	2022-03-30
Lower Spine T12 Acceleration X	P63856	Endevco	7264C-2k	2022-10-19
Lower Spine T12 Acceleration Y	P50063	Endevco	7264C-2k	2022-10-19
Lower Spine T12 Acceleration Z	P51880	Endevco	7264C-2k	2022-10-19
Pubic Symphysis Force Y	506 (Pubic)	R.A. Denton	3096JFL	2022-03-30

Table 2 - Left Rear Passenger ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P63980	Endevco	7264C-2k	2022-11-14
Head Acceleration Y Primary	P58861	Endevco	7264C-2k	2022-11-14
Head Acceleration Z Primary	P51261	Endevco	7264C-2k	2022-11-14
Head Acceleration X Redundant	P58808	Endevco	7264C-2k	2022-11-14
Head Acceleration Y Redundant	P63310	Endevco	7264C-2k	2022-11-14
Head Acceleration Z Redundant	P49189	Endevco	7264C-2k	2022-11-14
Head Rotation Rate X	ARS7449	DTS	ARS PRO-8k (2kHz)	2022-03-15
Head Rotation Rate Y	ARS7510	DTS	ARS PRO-8k (2kHz)	2022-03-10
Head Rotation Rate Z	ARS7573	DTS	ARS PRO-8k (2kHz)	2022-03-15
Upper Thorax Rib Deflection Y	1249	Servo	08TCI-3725	2022-11-13
Middle Thorax Rib Deflection Y	1219	Servo	08TCI-3725	2022-11-13
Lower Thorax Rib Deflection Y	1221	Servo	08TCI-3725	2022-11-13
Upper Abdomen Rib Deflection Y	1252	Servo	08TCI-3725	2022-11-13
Lower Abdomen Rib Deflection Y	1233	Servo	08TCI-3725	2022-11-14
Lower Spine T12 Acceleration X	P52108	Endevco	7264C-2k	2022-11-14
Lower Spine T12 Acceleration Y	P63970	Endevco	7264C-2k	2022-11-14
Lower Spine T12 Acceleration Z	P51712	Endevco	7264C-2k	2022-11-14
Iliac Wing Impact Side Force Y	289 (Iliac)	R.A. Denton	3228J	2022-04-29
Acetabulum Impact Side Force Y	277 (Acetabulum)	R.A. Denton	3249J	2022-04-29

Table 3 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	M11098	Endevco	758H-2k	2022-11-09
Vehicle CG Ay	M11073	Endevco	758H-2k	2022-11-11
Vehicle CG Az	M11085	Endevco	758H-2k	2022-11-07
Right Side Sill at Front Seat Ax	M11078	Endevco	758H-2k	2022-11-05
Right Side Sill at Front Seat Ay	M11131	Endevco	758H-2k	2022-11-11
Right Side Sill at Front Seat Az	M11150	Endevco	758H-2k	2022-11-04
Right Side Sill at Rear Seat Ax	M11267	Endevco	758H-2k	2022-10-11
Right Side Sill at Rear Seat Ay	M11286	Endevco	758H-2k	2022-11-11
Right Side Sill at Rear Seat Az	M11057	Endevco	758H-2k	2022-11-11
Left Side Sill at Front Seat Ay	M11037	Endevco	758H-2k	2022-10-10
Left Side Sill at Rear Seat Ay	M11172	Endevco	758H-2k	2022-11-09
Left Lower A-Pillar Ay	M11196	Endevco	758H-2k	2022-11-08
Left Middle A-Pillar Ay	M10903	Endevco	758H-2k	2022-06-07
Left Lower B-Pillar Ay	M11233	Endevco	758H-2k	2022-11-08
Left Middle B-Pillar Ay	M11130	Endevco	758H-2k	2022-11-09
Driver Seat Track at H-Point Ay	M11191	Endevco	758H-2k	2022-11-09
Rear Seat Structure Ay	M11170	Endevco	758H-2k	2022-11-05
Right Rear Occupant Comp. Ay	M11255	Endevco	758H-2k	2022-11-10
Engine Block Top Ax	M10907	Endevco	758H-2k	2022-06-07
Engine Block Top Ay	M11094	Endevco	758H-2k	2022-11-09
Rear Floopan Above Axle Ax	M11277	Endevco	758H-2k	2022-10-12
Rear Floopan Above Axle Ay	M11283	Endevco	758H-2k	2022-07-10
Rear Floopan Above Axle Az	M11039	Endevco	758H-2k	2022-11-10

Table 4 - Moving Deformable Barrier (MDB) Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
MDB CG Ax	220258	BST	11CF-2k	2022-07-19
MDB CG Ay	220342	BST	11CF-2k	2022-07-21
MDB CG Az	220346	BST	11CF-2k	2022-07-21
MDB Left Side at Rear Axle Ax	220303	BST	11CF-2k	2022-07-11
MDB Left Side at Rear Axle Ay	220305	BST	11CF-2k	2022-07-11