

**REPORT NUMBER: SINCAP-KAR-20-030**

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

**TESLA INC.  
2020 TESLA MODEL Y 5-DOOR MPV**

**NHTSA No: O20205002**

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

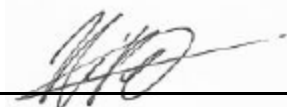


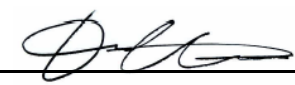
**DECEMBER 4, 2020**

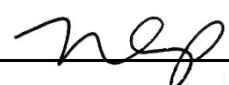
**FINAL REPORT**

**PREPARED FOR:  
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NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
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Approval Date: December 4, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

\_\_\_\_\_  
Division Chief, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

\_\_\_\_\_  
COTR, New Car Assessment Program  
NHTSA, Office of Crashworthiness Standards

Date: \_\_\_\_\_

## TECHNICAL REPORT DOCUMENTATION PAGE

<b>1. Report No.</b> SINCAP-KAR-20-030	<b>2. Government Accession No.</b>	<b>3. Recipient's Catalog No.</b>																												
<b>4. Title and Subtitle</b> Final Report of New Car Assessment Program Side Impact MDB Testing and FMVSS No. 305 Testing of a 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002		<b>5. Report Date</b> December 4, 2020																												
		<b>6. Performing Organization Code</b> KAR																												
<b>7. Authors</b> Mr. Neeraj N. Patel, Project Engineer, Applus+ IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus+ IDIADA KARCO		<b>8. Performing Organization Report No.</b> TR-P40345-01-NC																												
		<b>10. Work Unit No.</b>																												
<b>9. Performing Organization Name and Address</b> Applus+ IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301		<b>11. Contract or Grant No.</b> DTNH22-14-D-00355L																												
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<b>12. Sponsoring Agency Name and Address</b> U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590		<b>14. Sponsoring Agency Code</b> NRM-110																												
		<b>15. Supplementary Notes</b>																												
<b>16. Abstract</b> A 61.9 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2020 Tesla Model Y 5-door MPV 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 November 18, 2020.  The impact velocity of the Moving Deformable Barrier was 62.09 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 20.0°C. The target vehicle's maximum post-test static crush was 195 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: 15%;">Units</th> <th style="width: 15%;">IARV</th> <th style="width: 35%;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td></td> <td style="text-align: center;">1000</td> <td style="text-align: center;">42.0</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;">14</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;">644</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;">959</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (ES-2re)			Units	IARV	Result	Head Injury Criteria (HIC <sub>36</sub> )		1000	42.0	Maximum Thoracic Rib Deflection	mm	44	14	Total Abdominal Force	N	2500	644	Pubic Symphysis Force	N	6000	959				
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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.																														
<b>17. Key Words</b> New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs		<b>18. Distribution Statement</b> Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference Division 1200 New Jersey Ave., SE Washington, DC 20590																												
<b>19. Security Classification of this report</b> UNCLASSIFIED	<b>20. Security Classification of this page</b> UNCLASSIFIED	<b>21. No. of Pages</b> 185	<b>22. Price</b>																											

\*Proposed IARV

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**SECTION 1**  
**TEST PURPOSE AND PROCEDURE**

This moving deformable barrier side impact test is part of the MY 2020 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-00355L. The purpose of this test is to generate comparative side impact performance in a 2020 Tesla Model Y 5-door MPV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated October 2015.

## SECTION 2

### SUMMARY OF TEST RESULTS

A 2020 Tesla Model Y 5-door MPV 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 62.09 km/h (38.58 mph). The target vehicle was stationary and was positioned at an angle of 63.5° to the line of forward motion. The side impact test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California, on November 18, 2020. 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 October 2015. 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 <sub>36</sub> )		1000	42.0
Maximum Thoracic Rib Deflection	mm	44	14
Combined Abdominal Force	N	2500	644
Pubic Symphysis Force	N	6000	959

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC <sub>36</sub> )		1000	357.6
Lower Spine (T12) Resultant Acceleration	g	82	45
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2521
Maximum Thoracic Rib Deflection	mm	38*	11
Maximum Abdominal Rib Deflection	mm	45*	23

\*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		
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

General Comments:

- LEFT LOWER A-POST AY, Channel Failed at 4.0 ms
- LEFT MID A-POST AY, Channel Failed at 7.0 ms
- LEFT LOWER B-POST AY, Channel Failed at 7.0 ms

### SECTION 3

#### OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002

Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

#### 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 <sup>2</sup>	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355



**DATA SHEET NO. 1**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA Number	O20205002	Traction Control System (TCS)	Yes
Model Year	2020	Auto-Leveling System	Yes
Make	Tesla	Automatic Door Locks	Yes
Model	Model Y	Power Window Auto-Reverse	Yes
Body Style	5 Door MPV	Other Optional Feature	No
VIN	5YJYGDEE5LF059237	Driver Front Airbag	Yes
Body Color	Deep Blue Metallic	Driver Curtain Airbag	Yes
Odometer Reading (km / mi)	6/4	Driver Head/Torso Airbag	No
Engine Displacement (L)	NA	Driver Torso Airbag	No
Type / No. of Cylinders	NA	Driver Torso/Pelvis Airbag	Yes
Engine Placement	NA	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	Yes
Transmission Speeds	1	Rear Pass. Curtain Airbag	Yes
Overdrive	No	Rear Pass. Head/Torso Airbag	No
Final Drive	AWD	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof / T-Top	Yes	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	Yes
		Other Safety Restraint	No
		Does Owner's Manual provide instructions to turn off automatic door locks?	No

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Tesla Inc.	GVWR (kg)	2405
Date of Manufacture	20-Oct	GAWR Front (kg)	1363
Vehicle Type	MPV	GAWR Rear (kg)	1500

**VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION**

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity	2	3		5
Capacity Weight (VCW) (kg)				375.0
DSC x 68.04 (kg)				340.2
Cargo Weight (RCLW) (kg)				34.8

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

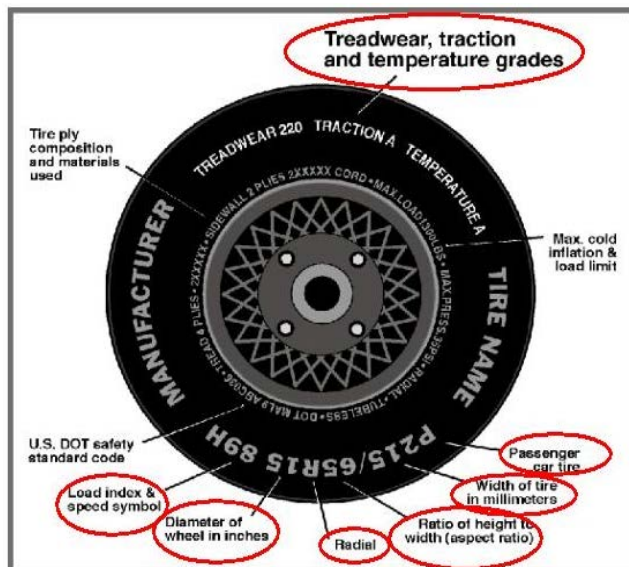
**VEHICLE SEAT TYPE**

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: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	340	340
Cold Pressure (kPa)	290	290
Recommended Tire Size	P255/40 R20	P255/40 R20
Tire Size on Vehicle	P255/40 R20	P255/40 R20
Tire Manufacturer	Goodyear	Goodyear
Tire Model	EAGLE F1	EAGLE F1
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 1 Polyester, 1 Polyamide	2 Steel, 1 Polyester, 1 Polyamide
Load Index/Speed Symbol	101 W	101 W
Tire Material	Steel, Polyester, Polyamide	Steel, Polyester, Polyamide
DOT Safety Code Left	M673 37IR 3520	M673 JYIR 3520
DOT Safety Code Right	M673 37IR 3520	M673 JYIR 3520

**DATA SHEET NO. 1 ... (CONTINUED)**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**TIRE PRESSURES**

	Units	LF	RF	LR	RR
As Delivered	kPa	290	290	290	290
Tire Placard	kPa	290	290	290	290
Owner's Manual	kPa	290	290	290	290
As Tested	kPa	290	290	290	290

**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 (UWV)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	485.5	503.0		531.0	565.0		525.5	563.5	
Right	kg	501.5	497.5		510.0	534.0		521.0	544.0	
Ratio	%	49.7%	50.3%		48.6%	51.4%		48.6%	51.4%	
Total	kg	987.0	1000.5	1987.5	1041.0	1099.0	2140.0	1046.5	1107.5	2154.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UWV)	kg	1987.5	A
Actual Weight of 2 P572 ATD Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	34.8	C
Calculated Vehicle Target Wt (TVTW)	kg	2147.3	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	815	819	Yes
RF	mm	820	825	Yes
LR	mm	822	822	Yes
RR	mm	825	830	Yes
Vehicle CG (Aft of Front Axle)	mm	1478	1476	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	9	20	

\*\*\*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: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW**

Component Description	Weight (kg)
Rear Trim	6.3
Ballast / Equipment Added	57.3

Test Height Adjustable Setting (If Applicable)	N/A
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**DATA SHEET NO. 2**

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

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**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	8.9	0.0	4.5
Front Passenger Seat	8.9	0.0	4.5
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	304.5	Max	316	321	330
			Mid	298	304.5	312.5
			Min	280	288	295
Front Passenger Seat	4.5	332.5	Max	346	350	358
			Mid	327	332.5	341.5
			Min	308	315	325
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: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
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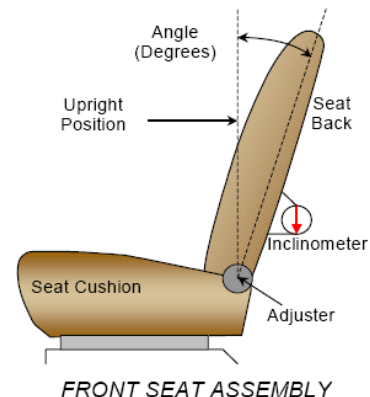
**SEAT FORE/AFT POSITION**

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260		130	
Front Passenger Seat	260		130	
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 with a flat edge along the seat back.



**SEAT BACK POSITION**

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/ Seated Dummy	55.9		16.5	
Front Passenger Seat	55.9		16.5	
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: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

#### 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	3	H
Rear Seat	Fixed	Fixed

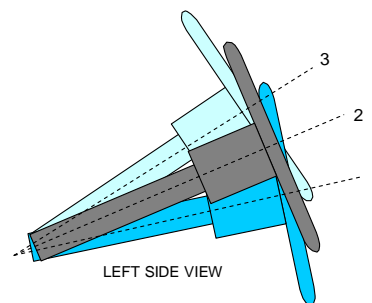
#### HEAD RESTRAINT ADJUSTMENT

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	Fixed	Fixed
Rear Seat	Fixed	Fixed

#### 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.



LEFT SIDE VIEW  
STEERING COLUMN ASSEMBLY

#### STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	16.0	100
Geometric Center Position, No. 2	18.5	128
Uppermost Position, No. 3	20.9	155
Telescoping Steering Wheel Travel		55
Test Position	18.5	128

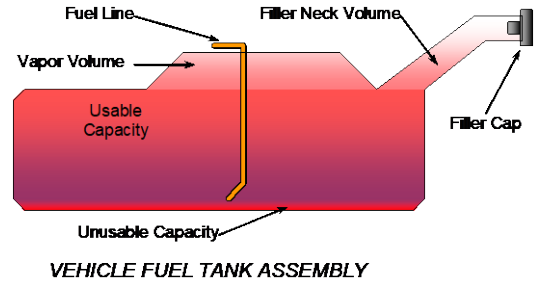
**DATA SHEET NO. 2 ... (CONTINUED)**

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

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**FUEL PUMP**

The vehicle is not equipped with an electric fuel pump.



**FUEL TANK CAPACITY**

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

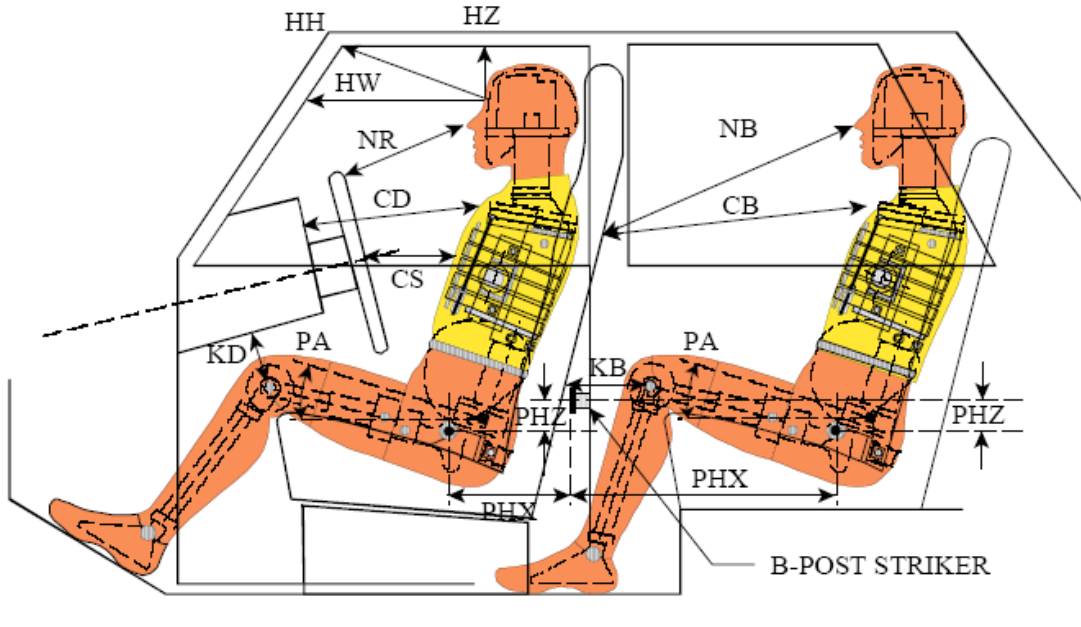
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1?  Yes  No



**DATA SHEET NO. 3**

**DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



**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

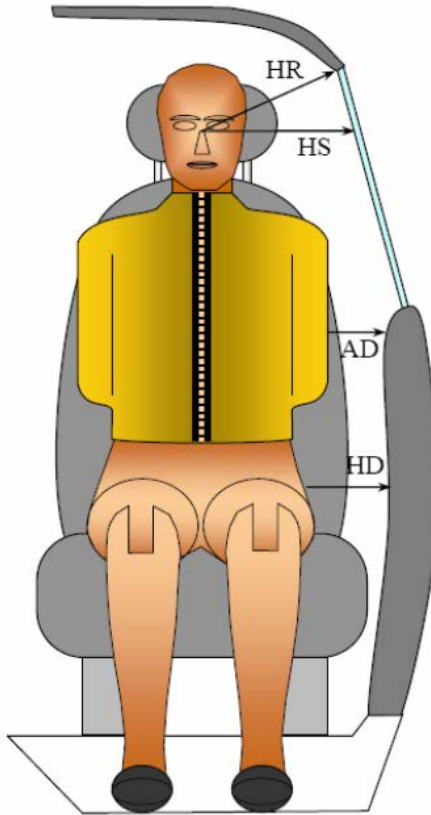
**DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION**

Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	342			
HW		Head to Windshield	625			
HZ	HZ	Head to Roof	216		320	
NR	NB	Nose to Rim/Seat Back	396		558	
CD	CB	Chest to Dash/Seat Back			570	
CS		Chest to Steering Wheel	301			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	275	15.5	310	13.7
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	243	10.3	295	20.1
PAX°	PAX°	Pelvic Tilt Angle X		15.9		22.2
	PAY°	Pelvic Tilt Angle Y				0.0
PHX	PHX	Hip Point to Striker (x-axis)	183		N/A	
PHZ	PHZ	Hip Point to Striker (z-axis)	65		N/A	

## DATA SHEET NO. 4

### DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



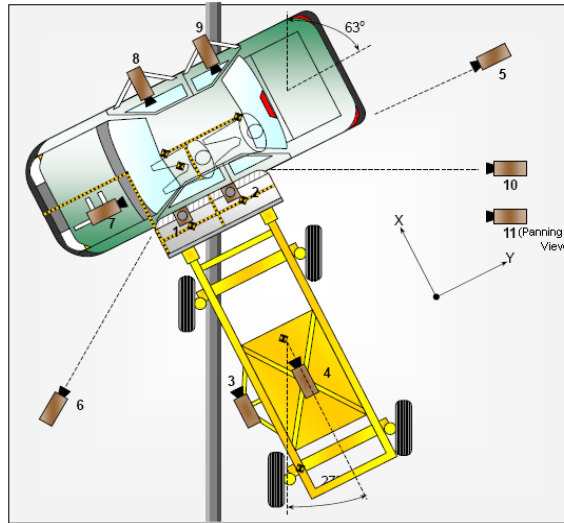
### DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	226	285
HS	Head to Side Window	mm	354	385
AD	Arm to Door	mm	75	137
HD	H-Point to Door	mm	156	172

**DATA SHEET NO. 5**

**CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



**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)	663	-732	655	6	1000
8	Driver Side (On-Board)	1741	508	377	6	1000
9	Passenger Side (On-Board)	1667	1992	442	6	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

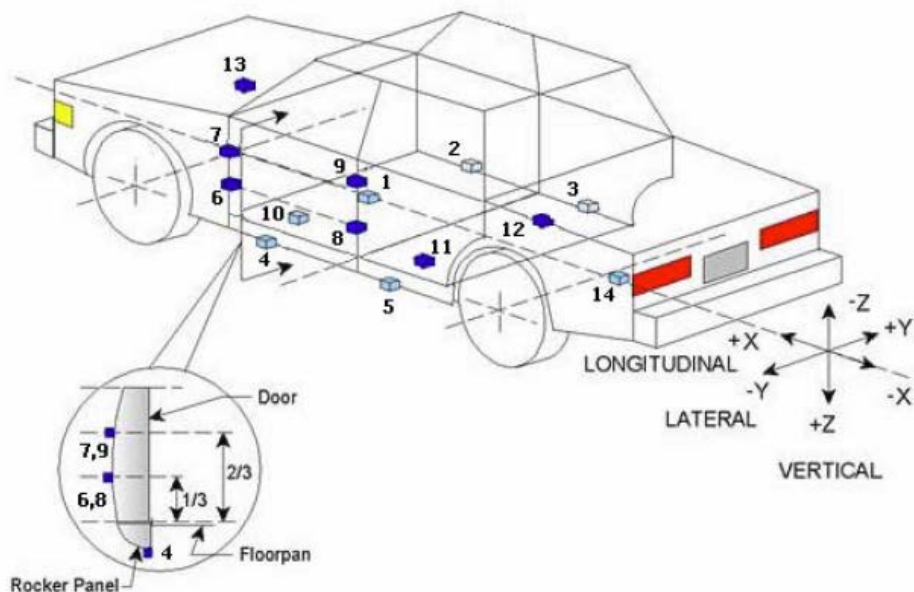
**INSTRUMENTATION**

Driver Dummy Channels	16
Passenger Dummy Channels	19
Vehicle Structure Accelerometers	23
MDB Channels	5
<b>Total</b>	<b>63</b>

## DATA SHEET NO. 6

### TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



### VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2082	0	218
2	Right Sill at Front Seat	2932	704	332
3	Right Sill at Rear Seat	1621	704	332
4	Left Sill at Front Door	3011	-620	153
5	Left Sill at Rear Door	1814	-620	153
6	A-Pillar Lower	3264	-810	355
7	A-Pillar Middle	3264	-810	620
8	B-Pillar Lower	2112	-745	560
9	B-Pillar Middle	2112	-745	880
10	Front Seat Track	2127	-90	427
11	Rear Seat Structure			
12	Right Rear Occupant Compartment	1804	365	270
13	Engine Block	3735	0	
14	Rear Floorpan Above Axle	920	0	423

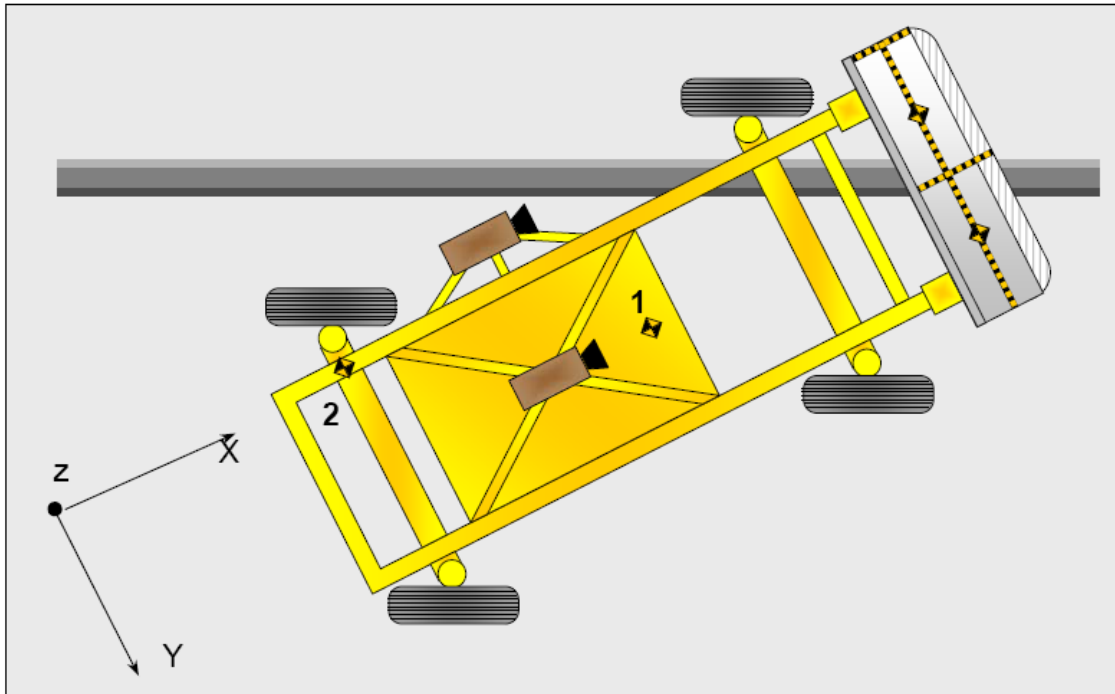
Reference: X – Rear surface of vehicle (+ forward)  
 Y – Vehicle centerline (+ to right)  
 Z – Ground plane (+ down)

**DATA SHEET NO. 7**

**MDB ACCELEROMETER LOCATIONS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002

Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



**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: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**TEST DUMMY INFORMATION AND CONTACT POINTS**

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	Curtain Airbag
Top of Head	Side Header	Curtain Airbag
Left Side of Head	Curtain Airbag, Side Header	Curtain Airbag
Back of Head	Curtain Airbag Side Header, Headrest	Curtain Airbag, Center Seat Back
Left Shoulder	Curtain Airbag, Door Panel	Door Panel
Upper Torso	Side Airbag	Door Panel
Lower Torso	Side Airbag	Door Panel
Left Hip	Door Panel	Door Panel, Seat
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: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**POST-TEST SEAT PERFORMANCE**

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No	N/A	No	N/A
Seat Disengagement from Floor Pan	No	N/A	No	N/A
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	None
Other Notable Effects	None

**DATA SHEET NO. 8 ... (CONTINUED)**

**POST-TEST OBSERVATIONS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Struck Side		Struck Side	
	Driver		Rear Passenger	
	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		
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		2871
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		502
Actual Impact Point (Aft of Front Axle)	mm		502
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	0
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	11



**DATA SHEET NO. 9**  
**MDB SUMMARY OF RESULTS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**MDB SPECIFICATIONS**

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1251
Overall Length including Honeycomb Face	4115
Wheel Base of Framework Carriage	2875
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	62.09
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.16
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.2
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.5
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	26.7

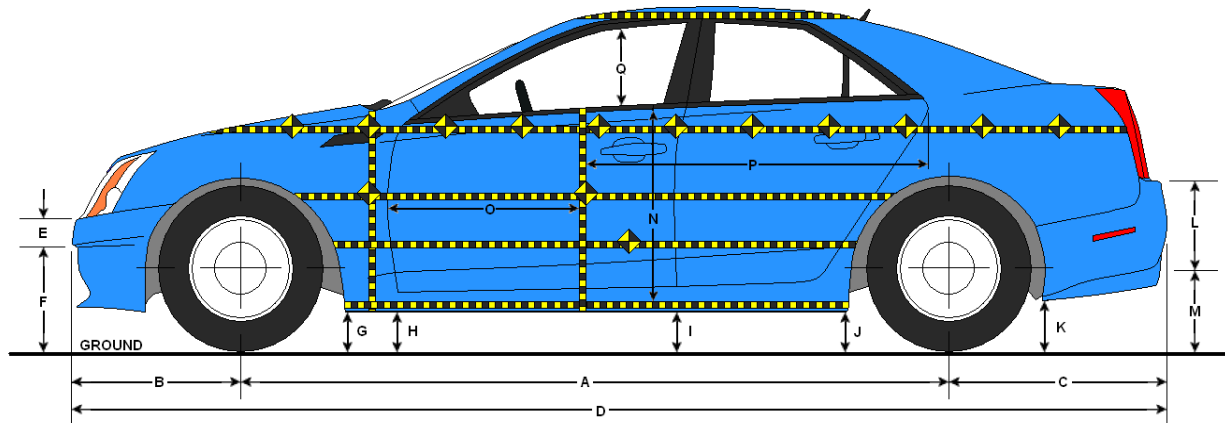
**MAXIMUM STATIC CRUSH OF HONEYCOMB FACE**

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	300	C/L	306
B	Top of Bumper	533	300	Right	218
C	Mid Level	686	200	Right	144
D	Top of Stack	813	800	Left	182

**DATA SHEET NO. 10**

**TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



**LEFT SIDE VIEW**

**VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION**

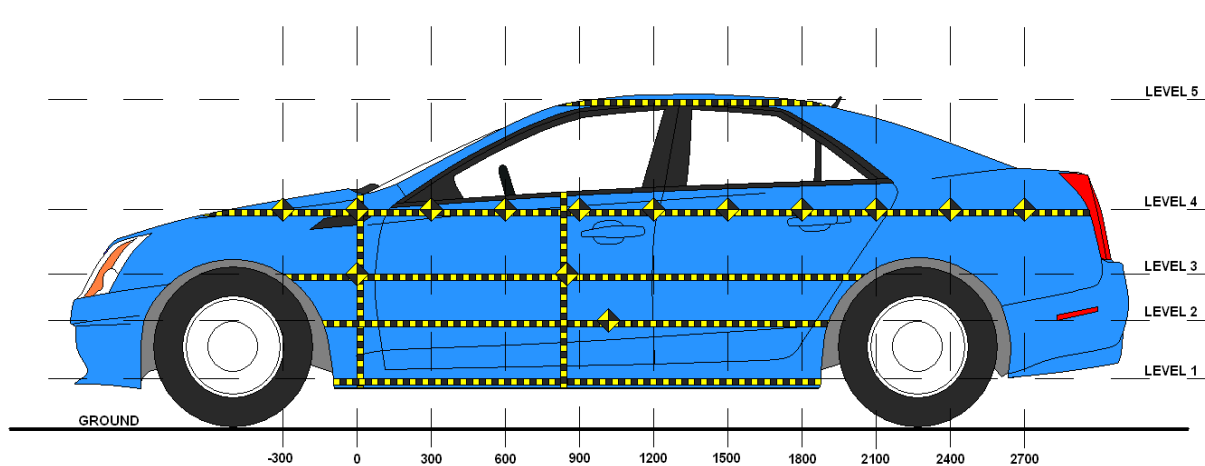
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2875	2871	-4
B	Front Axle to FSOV	874	890	16
C	Rear Axle to RSOV	994	984	-10
D	Total Length at Centerline	4743	4745	2
E	Front Bumper Thickness	197	198	1
F	Front Bumper Bottom to Ground	506	501	-5
G	Sill Height at Front Wheel Well	311	306	-5
H	Sill Height at Front Door Leading Edge	314	337	23
I	Sill Height at B-Pillar	337	356	19
J1	Sill Height at Rear Wheel Well	350	430	80
J2	Pinch Weld Height at Rear Wheel Well	214	211	-3
K	Sill Height Aft of Rear Wheel Well	399	401	2
L	Rear Bumper Thickness	233	232	-1
M	Rear Bumper Bottom to Ground	433	436	3
N	Sill Height to Bottom of Front Window Sill	780	753	-27
O	Front Door Leading Edge to Impact CL	819	782	-37
P	Rear Door Trailing Edge to Impact CL	1442	1428	-14
Q	Front Window Opening	453	472	19
R	Right Side Length	3464	3465	1
S	Left Side Length	3460	3461	1
T	Vehicle Width at B-Pillar	1859	1791	-68

All measurements in mm with tolerance of  $\pm 3$ mm

## DATA SHEET NO. 11

### TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV      NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test      Test Date: 11/18/20



**LEFT SIDE VIEW**

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	337	54	1800
2	Occupant H-Point	724	194	1800
3	Mid-Door	766	195	1800
4	Window Sill	1020	61	1500
5	Window Top	1623	0	1800

**DATA SHEET NO. 11 ... (CONTINUED)**

**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL**

	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				651					649					-2	
-150		544	546	640			542	545	639			-2	-1	-1	
0	576	563	566	633		573	551	551	633		-3	-12	-15	0	
150	595	572	572	630		625	688	684	642		30	116	112	12	
300	605	573	573	623		628	742	736	643		23	169	163	20	
450	609	574	573	622		629	759	764	641		20	185	191	19	
600	611	576	575	617		629	761	768	645		18	185	193	28	
750	613	578	576	615	844	627	764	768	647	843	14	186	192	32	-1
900	613	580	578	614	854	628	759	754	649	854	15	179	176	35	0
1050	613	581	579	614	863	622	716	710	646	863	9	135	131	32	0
1200	612	586	584	613	872	632	709	704	636	871	20	123	120	23	-1
1350	613	586	585	615	879	645	739	741	653	877	32	153	156	38	-2
1500	613	586	585	613	884	652	761	760	674	882	39	175	175	61	-2
1650	614	584	585	611	888	660	777	775	670	888	46	193	190	59	0
1800	600	581	584	609	893	654	775	779	659	893	54	194	195	50	0
1950	570	559	567	607	900	609	650	674	644	897	39	91	107	37	-3
2100			544	604	904			555	629	902			11	25	-2
2250				599	911				557	909				-42	-2
2400				596					598					2	
2550															
2700															
2850															

DATA SHEET NO. 11 ... (CONTINUED)

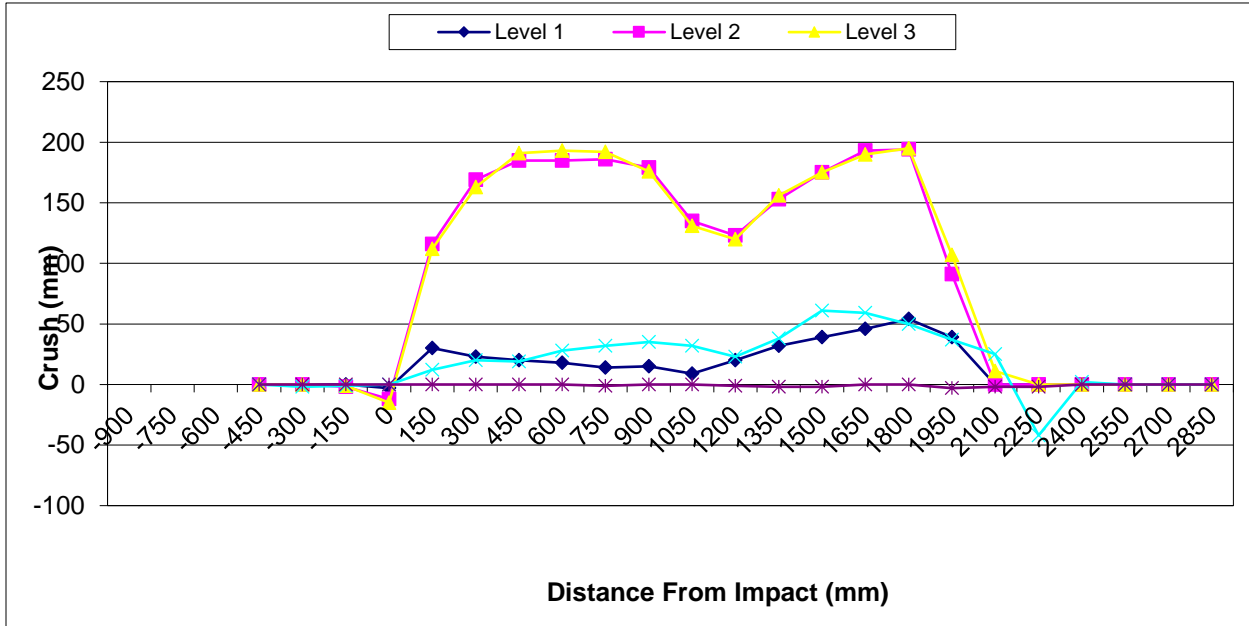
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV

NHTSA No. O20205002

Test Program: NCAP MDB Side Impact Test

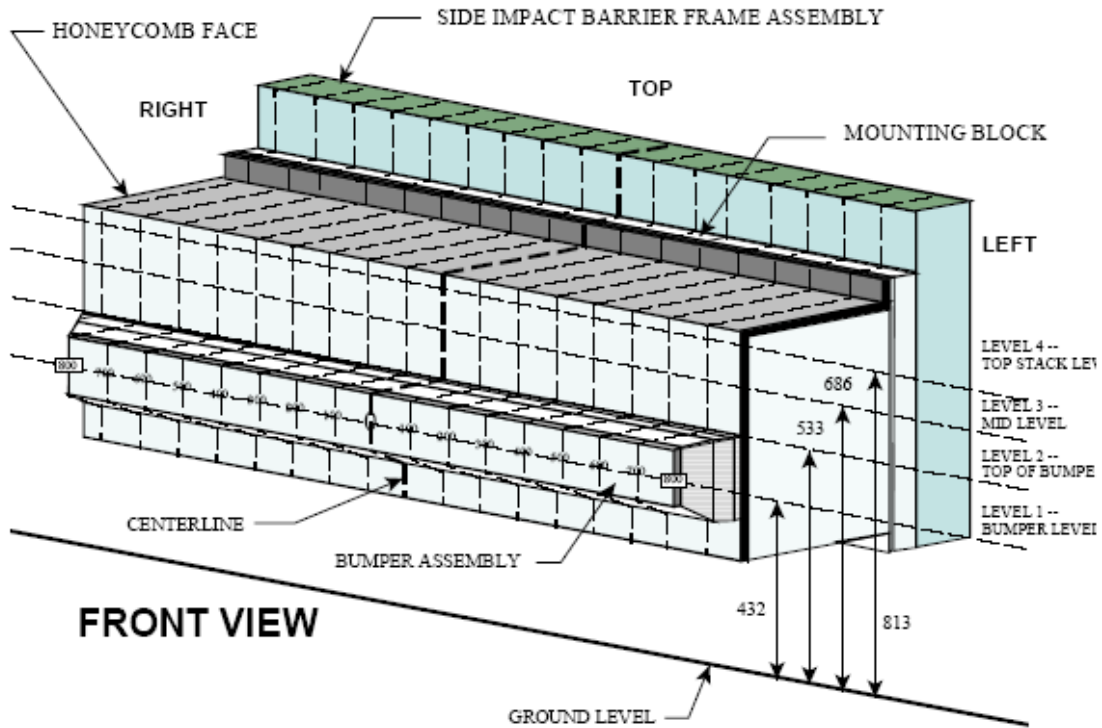
Test Date: 11/18/20



**DATA SHEET NO. 12**

**MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



NOTE: Dimensions are shown in millimeters, mm

**DEFORMABLE BARRIER STATIC CRUSH**

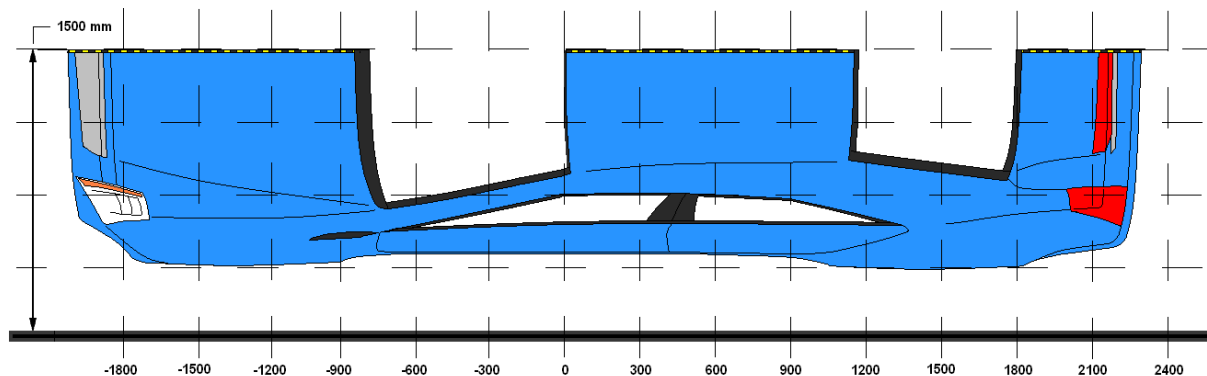
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	246	210	201	204	212	221	227	234	242	259	276	306	270	257	255	248	253
2	155	138	134	138	140	147	141	139	144	154	173	218	199	194	184	189	177
3	144	106	72	64	64	64	67	71	84	124	133	134	114	106	99	94	99
4	164	114	89	84	79	74	71	74	106	140	182	159	127	110	98	100	109

All dimensions in millimeters.

### DATA SHEET NO. 13

#### VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



#### VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2400	4	596	598	2
2	1950	3	567	674	107
3	1350	3	585	741	156
4	750	3	576	768	192
5	150	2	572	688	116
6	-300	4	651	649	-2

#### MDB DAMAGE PROFILE DISTANCES

DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	253
2	500	Left	1	257
3	200	Left	1	276
4	200	Right	1	227
5	500	Right	1	204
6	800	Right	1	246

**DATA SHEET NO. 14**

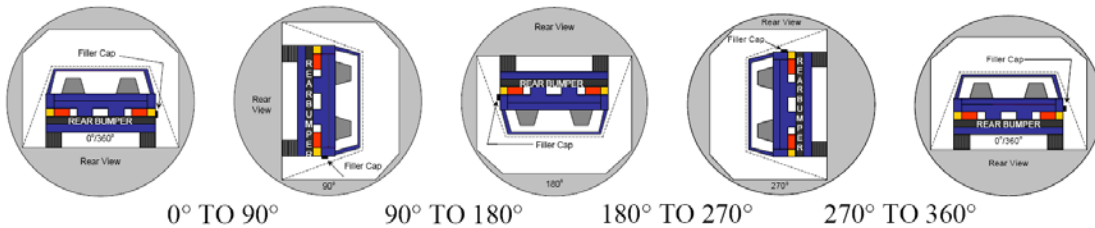
**FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002

Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

Temperature at Time of Impact: 20.0°C Test Time: \_\_\_\_\_

- 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°			
90° To 180°			
180° To 270°			
270° To 360°			

**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°	

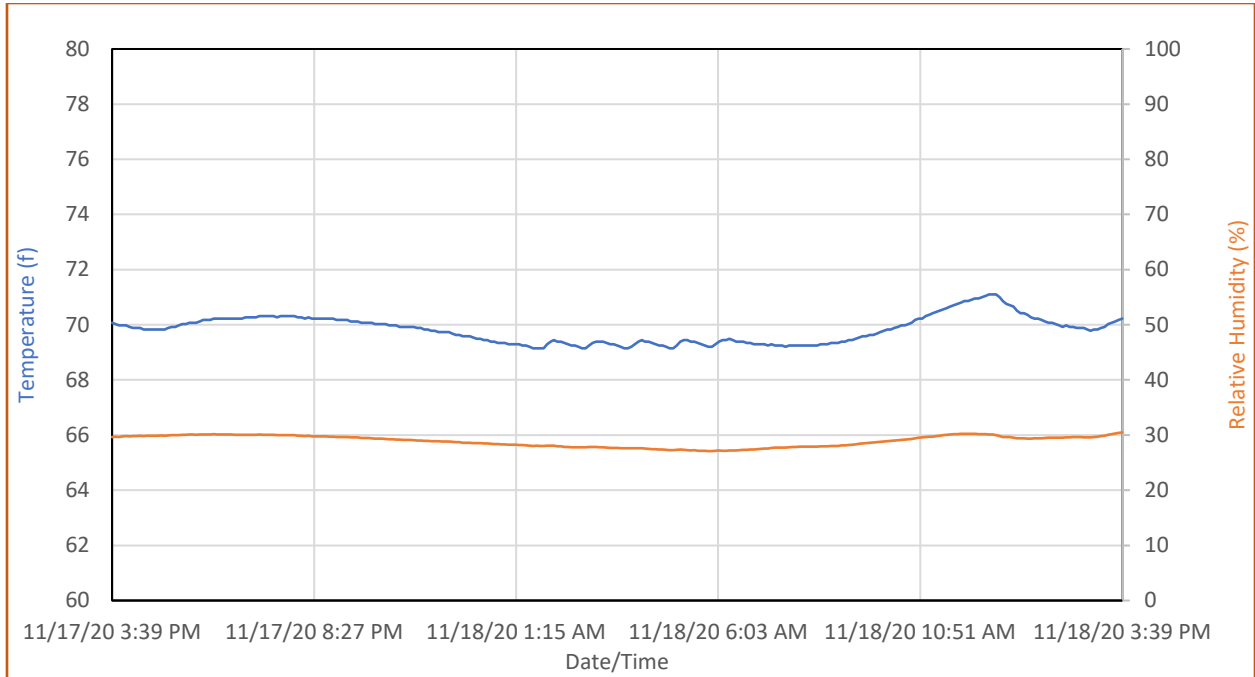


**DATA SHEET NO. 15**

**DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205002

Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



**DATA SHEET NO. 305-1**

**GENERAL TEST AND VEHICLE PARAMETER DATA FOR INDICANT FMVSS 305 TESTING**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**TEST VEHICLE INFORMATION**

NHTSA Number	O20205002
Model Year	2020
Make	Tesla
Model	Model Y
Body Style	5-Door MPV
Body Color	Deep Blue Metallic
Odometer Reading (km / mi)	No Screen

**DATA FROM VEHICLE'S CERTIFICATION LABEL**

Manufactured By	Tesla Inc.
Date of Manufacture	
VIN	5YJYGDEE5LF059237
GVWR (kg)	2405

**ELECTRIC VEHICLE PROPULSION SYSTEM**

Type of Electrical Vehicle	Electric
Propulsion Battery Type	Lithium-Ion
Nominal Voltage (V)	350
Automatic Propulsion Battery Disconnect	Yes
Physical Location of Automatic Propulsion Battery Disconnect	Internal to HV Battery
Auxiliary Battery Type	12 Volt

**PROPULSION BATTERY SYSTEM DATA**

Electrolyte Fluid Type	Organic Electrolyte
Electrolyte Fluid Specific Gravity (g/cc)	1.2
Electrolyte Fluid Dynamic Viscosity (mPa s)	2-6 cSt
Electrolyte Fluid Color	Clear
Propulsion Battery Coolant Type	G48 Ethylene Glycol
Propulsion Battery Coolant Color	Light Blue
Propulsion Battery Coolant Specific Gravity	1.122 / 1.0

**LOCATION OF BATTERY MODULES**

Location	Beneath the occupant compartment underneath the vehicle; floor-mounted HV battery
----------	---

**DATA SHEET NO. 305-1**

**GENERAL TEST AND VEHICLE PARAMETER DATA FOR INDICANT FMVSS 305 TESTING**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205002  
Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

*For all battery types:*

Description	Volts
Minimum Operating Voltage	240.0
Maximum Operating Voltage	403.2
95% of Maximum Operating Voltage	383.0
Test Voltage (no less than 95% of Maximum)	400.4

*For batteries that are rechargeable ONLY by an energy source on the vehicle:*

Description	Volts
Minimum Operating Voltage	
Maximum Operating Voltage	
Test Voltage (Maximum practicable state of charge within normal operating range)	

**DATA SHEET NO. 305-2**

**PRE-IMPACT DATA FOR INDICANT FMVSS NO. 305 TESTING**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205002  
Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**VEHICLE CHASSIS GROUND POINT(S) LOCATION(S)**

DETAILS OF VEHICLE CHASSIS GROUND POINT(S) AND LOCATION(S):

The FMVSS 305 ground terminal is located under the passenger side of the second row seat.

---

**PROPULSION BATTERY SYSTEM**

DETAILS OF PROPULSION BATTERY COMPONENTS:

The FMVSS 305 connections for high voltage battery positive and negative are located under the propulsion battery housing under the second row seat.

---

**DATA SHEET NO. 305-3**

**PRE-IMPACT ELECTRICAL ISOLATION MEASUREMENTS AND CALCULATIONS FOR  
INDICANT FMVSS NO. 305 TESTING**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**VOLTMETER INFORMATION**

Make	Fluke
Model	87V MAX
Serial No.	50790043
Internal Impedence Value	50 MΩ
Resolution	0.001

**HV BATTERY ELECTRICAL ISOLATION DATA**

Code	Units	Threshold	Pre-Test
V <sub>b</sub>	V		400.40
V <sub>1</sub>	V		180.60
V <sub>2</sub>	V		203.20
R <sub>o</sub>	Ω		219,300
V <sub>1</sub> '	V		57.26
V <sub>2</sub> '	V		55.22
R <sub>i1</sub>	Ω		1,003,872
R <sub>i2</sub>	Ω		1,110,009
R <sub>i</sub>	Ω		1,003,872
R <sub>i</sub> /V <sub>b</sub>	Ω/V	500	2,507

Is the Measured Electrical Isolation Value ≥ 500 Ω/V?	Yes
---	-----

**DATA SHEET NO. 305-4**

**POST-IMPACT DATA FOR INDICANT FMVSS NO. 305 TESTING**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205002

Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**VOLTMETER INFORMATION**

Make	Fluke
Model	87V MAX
Serial No.	50790043
Internal Impedence Value	50 MΩ
Resolution	0.001

**HV BATTERY ELECTRICAL ISOLATION DATA**

Code	Units	Threshold	Post-Test
V <sub>b</sub>	V		7.06
V <sub>1</sub>	V		3.34
V <sub>2</sub>	V		3.59
R <sub>o</sub>	Ω		219,300
V <sub>1</sub> '	V		0.89
V <sub>2</sub> '	V		0.94
R <sub>i1</sub>	Ω		1,252,568
R <sub>i2</sub>	Ω		1,193,426
R <sub>i</sub>	Ω		1,193,426
R <sub>i</sub> /V <sub>b</sub>	Ω/V	500	169,040

\* "Zero Volts" is considered as being compliant.

Is the Measured Electrical Isolation Value ≥ 500 Ω/V?	Yes
---	-----

**PROPULSION BATTERY SYSTEM COMPONENTS**

Has the propulsion battery module moved within the passenger compartment?

No

Describe any movement: There was no movement of the propulsion battery within the passenger compartment.

Has an outside propulsion battery component intruded into the passenger compartment?

No

Describe any intrusion: There was no intrusion of the outside propulsion battery into the passenger compartment.

Is there propulsion battery electrolyte spillage visible in the passenger compartment?

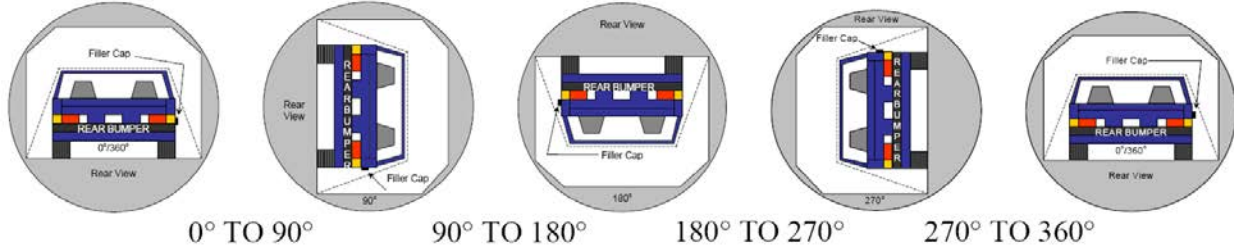
No

**DATA SHEET NO. 305-5**

**STATIC ROLLOVER TEST DATA FOR INDICANT FMVSS NO. 305 TESTING**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205002

Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20



**PROPULSION BATTERY ELECTROLYTE COLLECTION TIME PERIOD**

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	80	300	380
90° To 180°	82	300	382
180° To 270°	83	300	383
270° To 360°	78	300	378

**TEST VEHICLE PROPULSION BATTERY ELECTROLYTE SPILLAGE**

**NOTE: The maximum allowable Propulsion Battery Electrolyte Spillage is 5.0 Liters.**

Test Phase	Propulsion Battery Electrolyte Spillage (L)	Spillage Location
0° To 90°	0.0	N/A
90° To 180°	0.0	N/A
180° To 270°	0.0	N/A
270° To 360°	0.0	N/A

Is the Total Propulsion Battery Electrolyte Spillage Greater Than 5.0 Liters?	No spillage occurred
Is the Propulsion Battery Electrolyte Spillage Visible in the Passenger Compartment?	N/A

**DATA SHEET NO. 305-5**

**STATIC ROLLOVER TEST DATA FOR INDICANT FMVSS NO. 305 TESTING**

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205002  
 Test Program: NCAP MDB Side Impact Test Test Date: 11/18/20

**VOLTMETER INFORMATION**

Make	Fluke
Model	87V MAX
Serial No.	50790043
Internal Impedence Value	50 MΩ
Nominal Propulsion Battery Voltage (Vb)	0.001

**HV BATTERY ELECTRICAL ISOLATION MEASUREMENTS AND CALCULATIONS**

Code	Units	Threshold	0°	90°	180°	270°	360°
V <sub>b</sub>	V		0.000	0.000	0.001	0.001	0.000
V <sub>1</sub>	V		0.000	0.008	0.003	0.006	0.000
V <sub>2</sub>	V		0.000	0.007	0.003	0.006	0.000
R <sub>o</sub>	Ω		219,300	219,300	219,300	219,300	219,300
V <sub>1</sub> '	V		0.000	0.002	0.001	0.002	0.000
V <sub>2</sub> '	V		0.000	0.002	0.001	0.001	0.000
R <sub>i1</sub>	Ω		*Zero Volts	1,233,563	877,200	877,200	*Zero Volts
R <sub>i2</sub>	Ω		*Zero Volts	1,174,821	877,200	2,193,000	*Zero Volts
R <sub>i</sub>	Ω		*Zero Volts	1,174,821	877,200	877,200	*Zero Volts
R <sub>i</sub> /V <sub>b</sub>	Ω/V	500	*Zero Volts	*Zero Volts	877,200,000	877,200,000	*Zero Volts

\* "Zero Volts" is considered as being compliant.

Is the Measured Electrical Isolation Value ≥ 500 Ω/V?	Yes
---	-----



**APPENDIX A  
PHOTOGRAPHS**

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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  $\frac{3}{4}$  View of Test Vehicle



FIGURE 6. Post-Test Left Front  $\frac{3}{4}$  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 ¾ View of Test Vehicle



FIGURE 10. Post-Test Left Rear ¾ 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

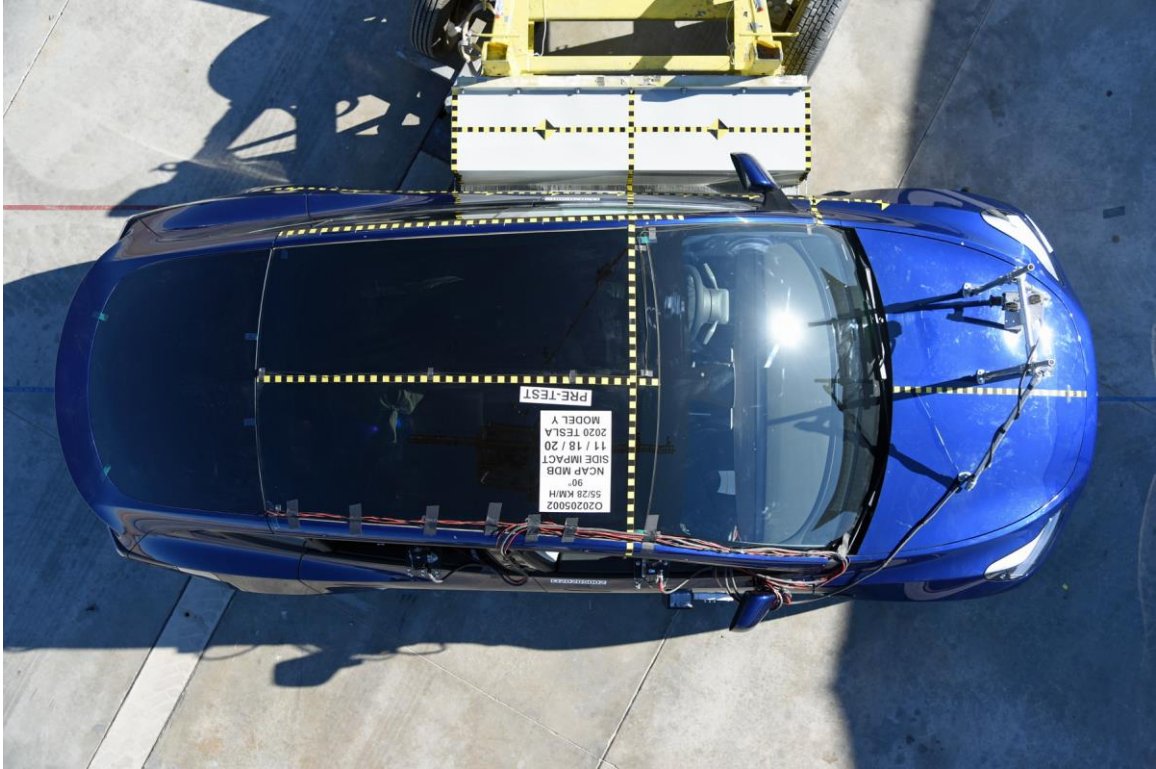


FIGURE 15. Pre-Test Overhead View of Test Area

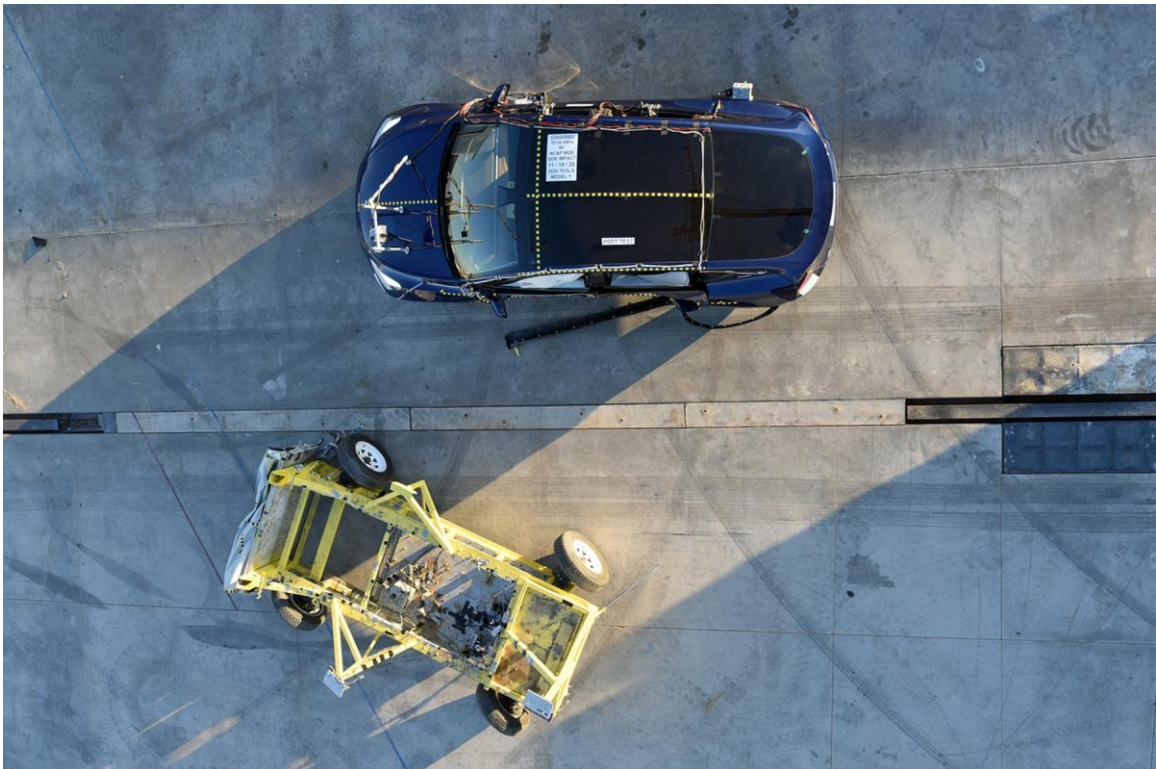


FIGURE 16. Post-Test Overhead View of Test Area



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

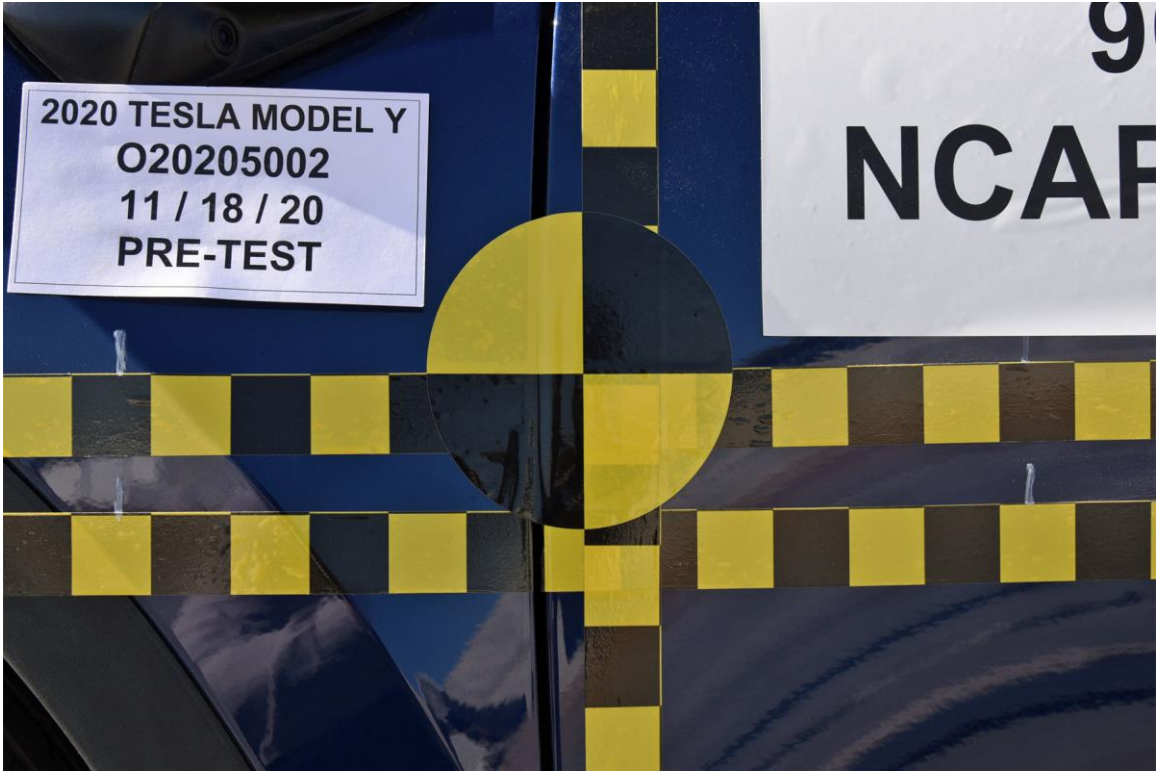


FIGURE 19. Pre-Test Close-Up View of Impact Point Target



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



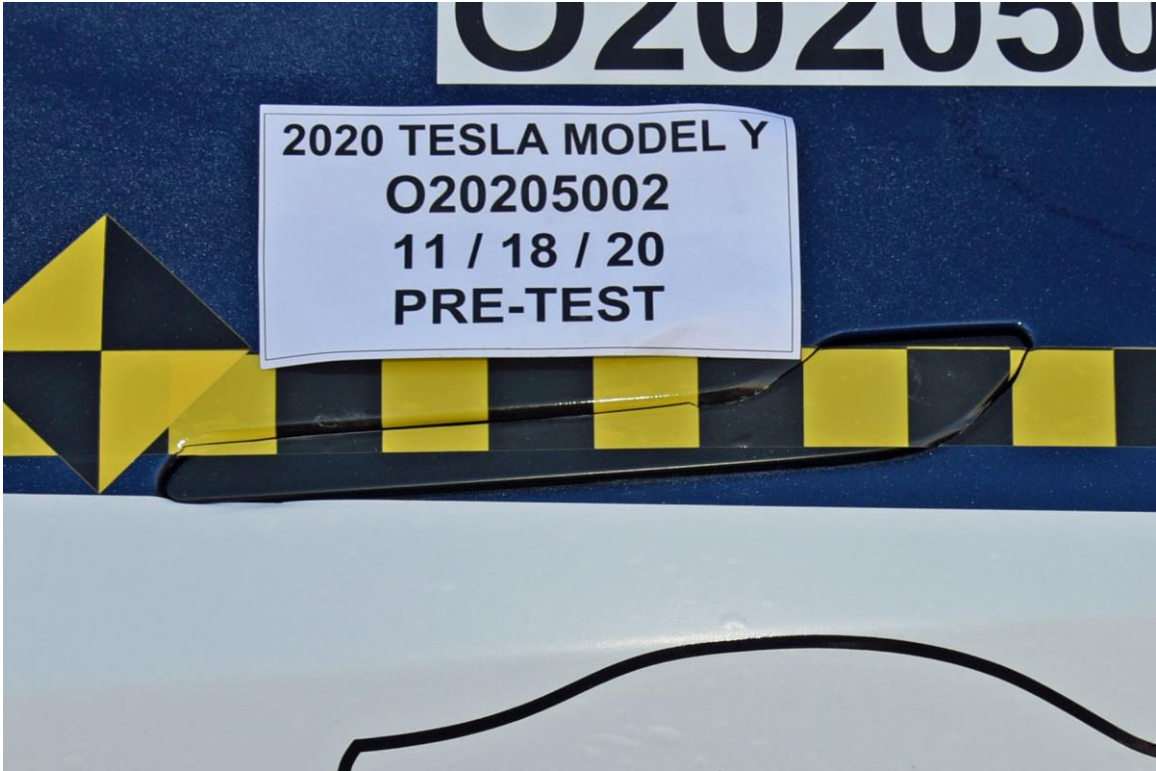


FIGURE 21. Pre-Test Left Front Door Latch Close-Up

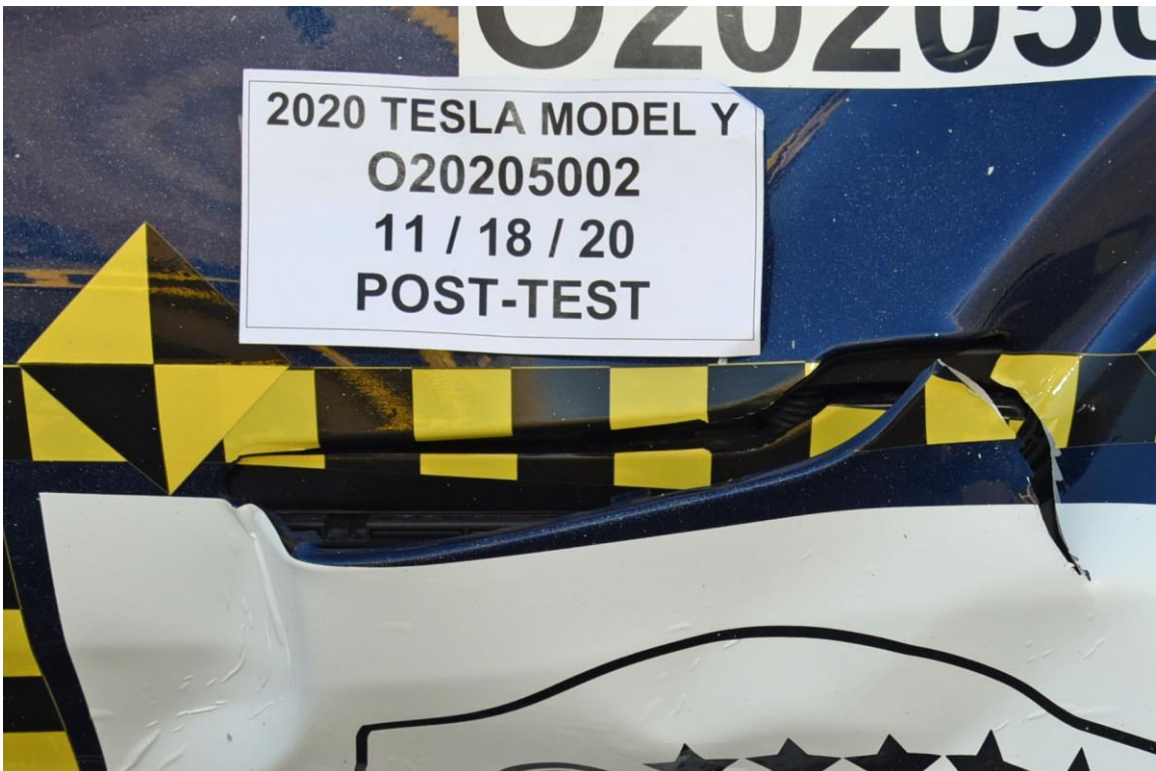


FIGURE 22. Post-Test Left Front Door Latch Close-Up



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

# Photograph Not Available

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

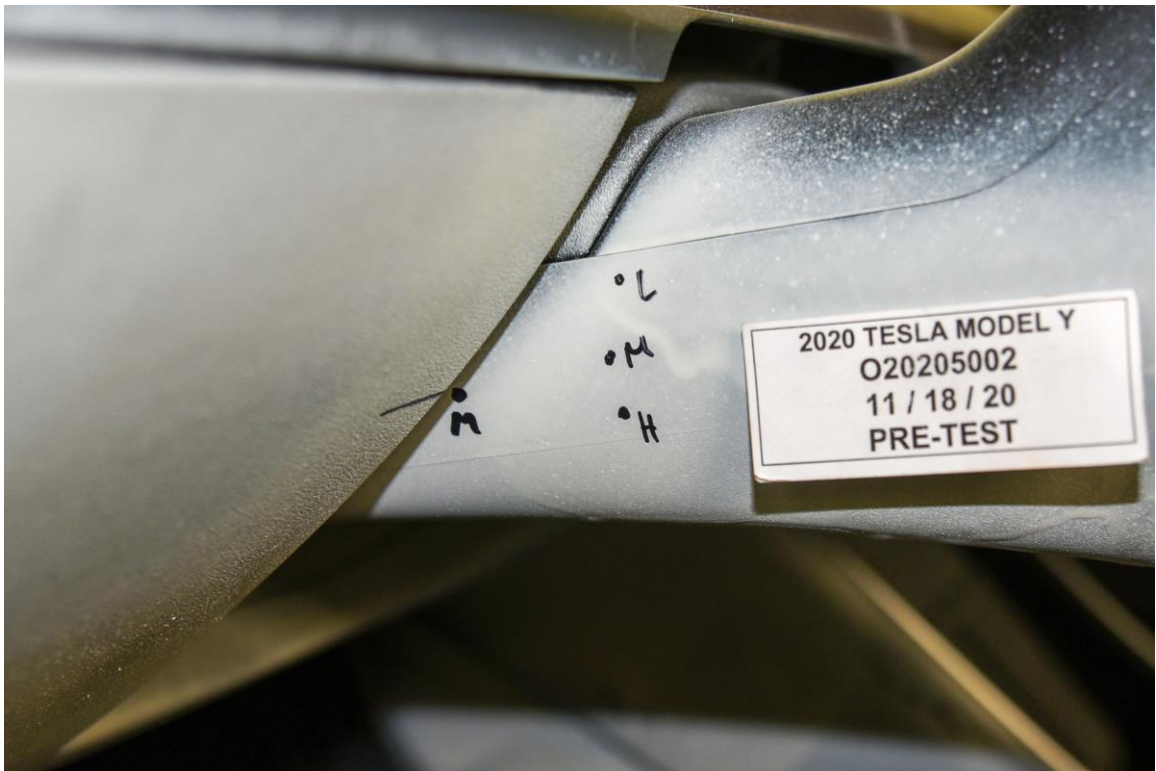


FIGURE 36. Pre-Test Left Side View of Steering Wheel





FIGURE 37. View of Disengaged Parking Brake

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FIGURE 38. Pre-Test View of Parking Brake

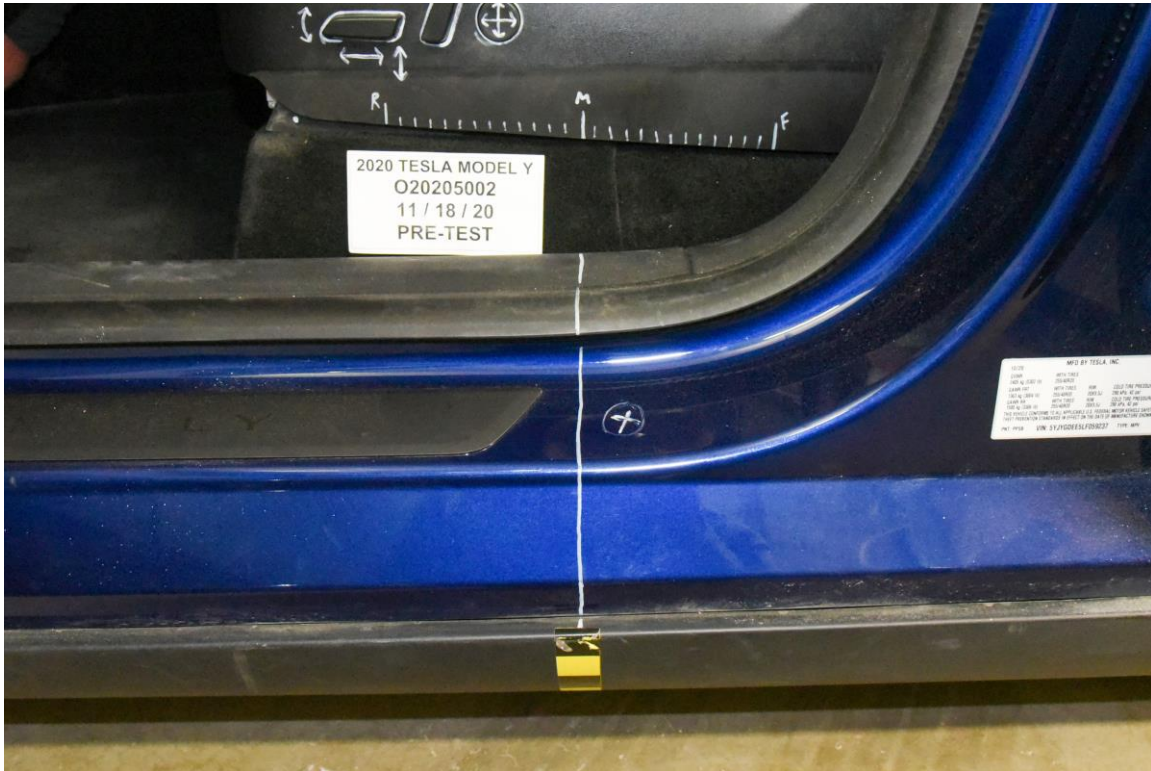


FIGURE 39. Pre-Test Close-Up Left Side View of Driver Seat Track

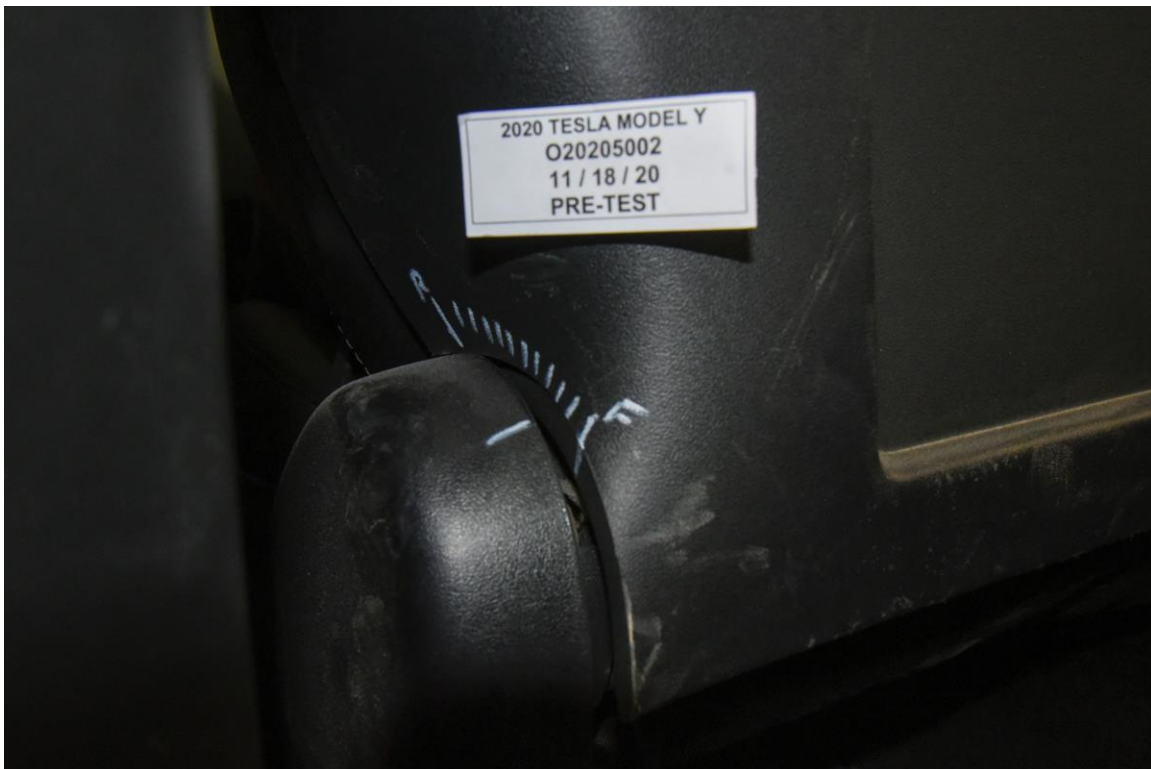


FIGURE 40. Pre-Test Close-Up Left Side View of Driver Seat Back



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

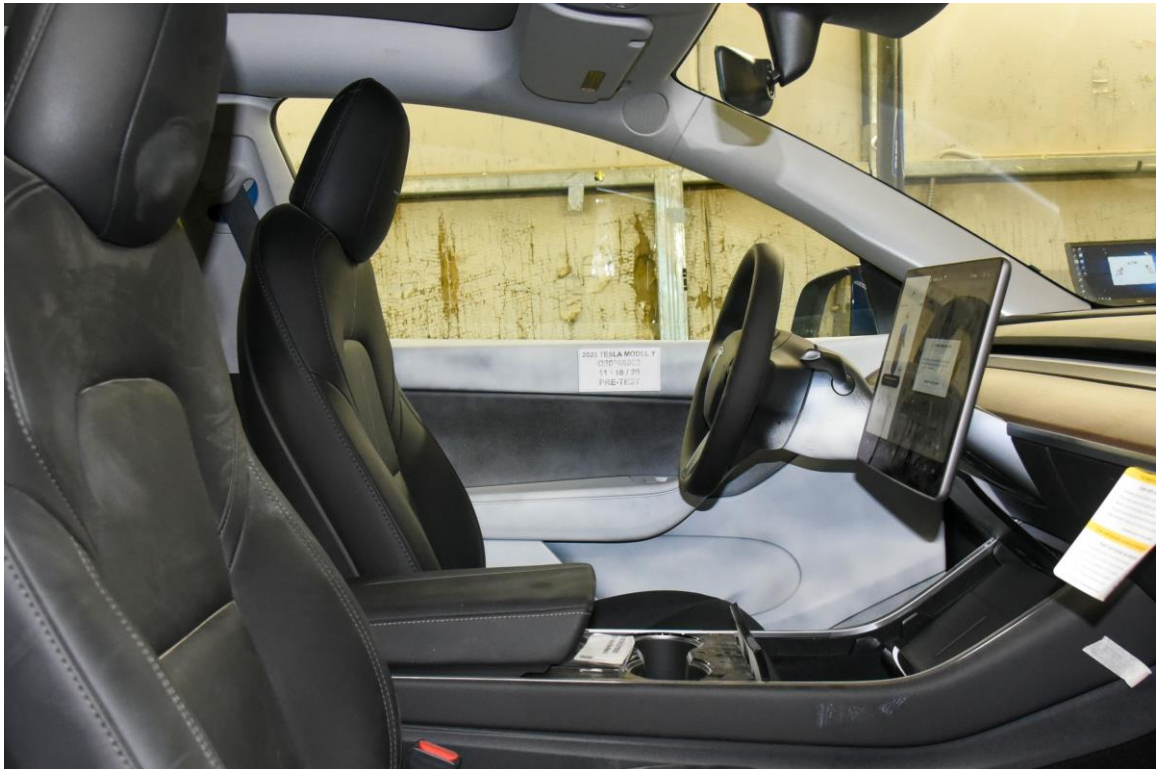


FIGURE 46. Pre-Test Driver Inner Door Panel View



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 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

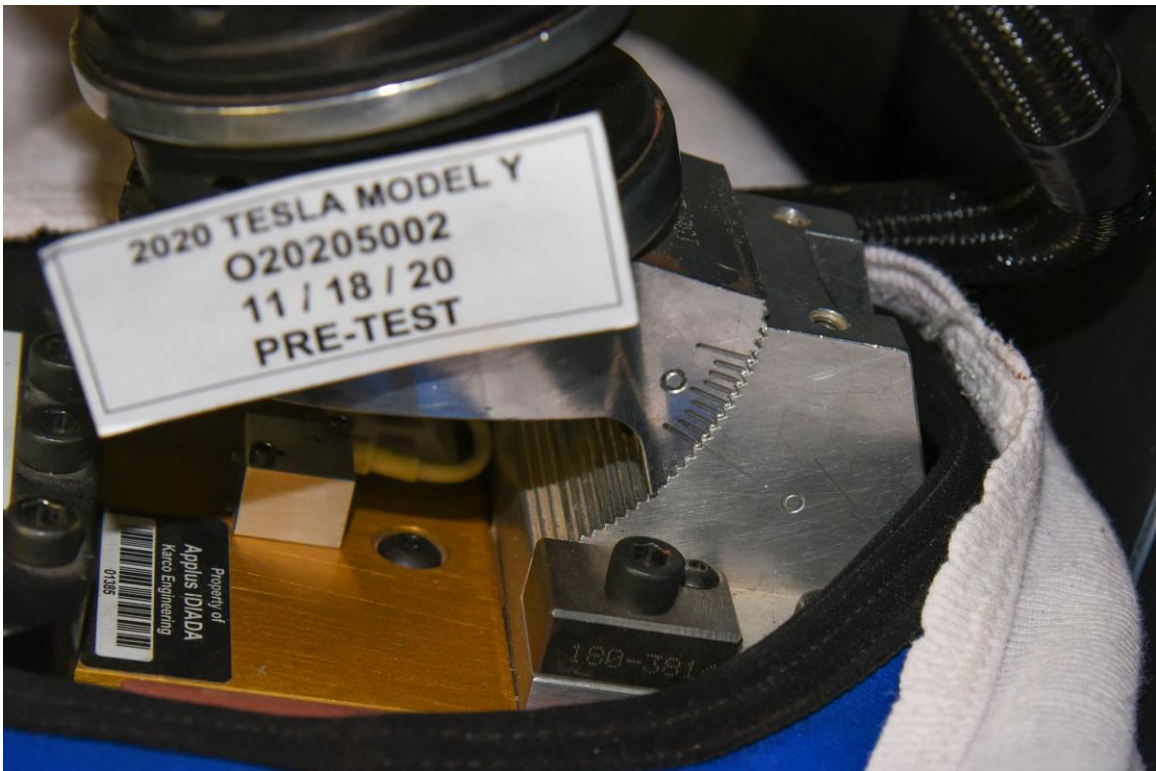


FIGURE 62. Pre-Test View of Rear Passenger Dummy's Neck  
Showing Position of Adjustable Neck Bracket



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

# Photograph Not Available

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

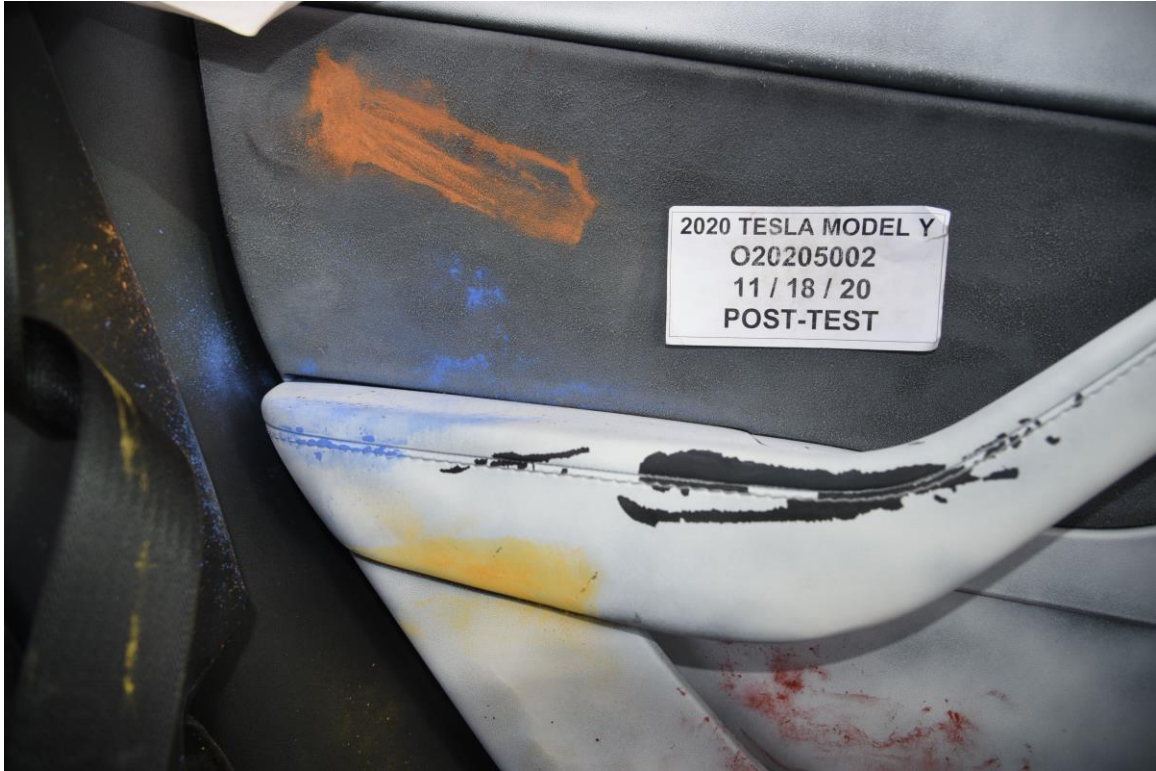


FIGURE 77. Post-Test Rear Passenger Dummy Close-Up  
Torso Contact with Vehicle Interior View

**Photograph Not Applicable**

**Vehicle Not Equipped with  
Rear Side Airbag**

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**

**Vehicle Not Equipped with  
Rear Side Airbag**

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



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

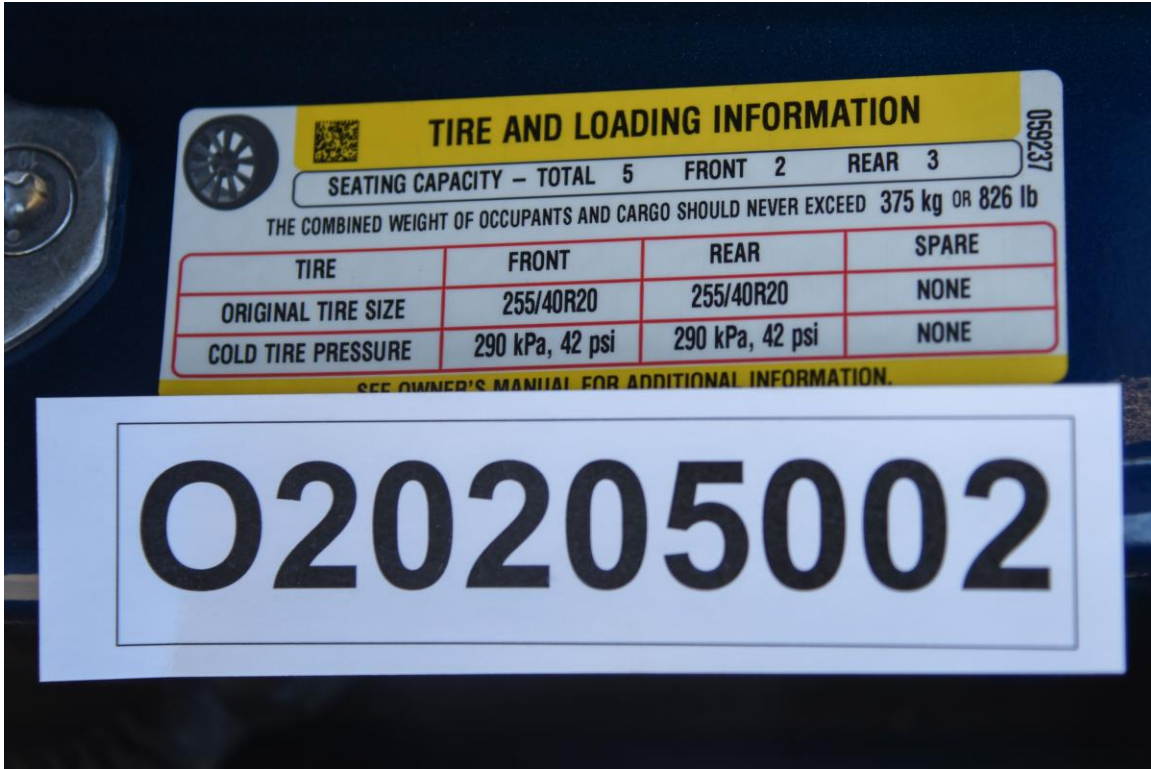


FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

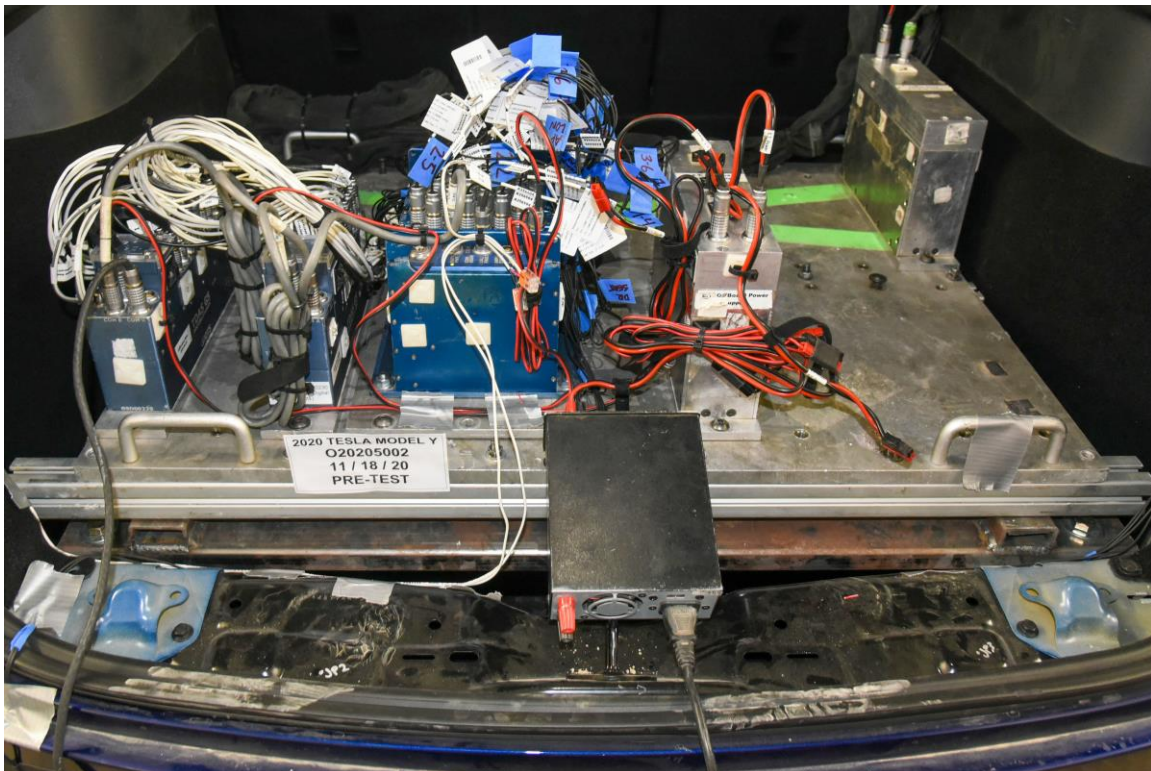


FIGURE 94. Pre-Test Ballast View

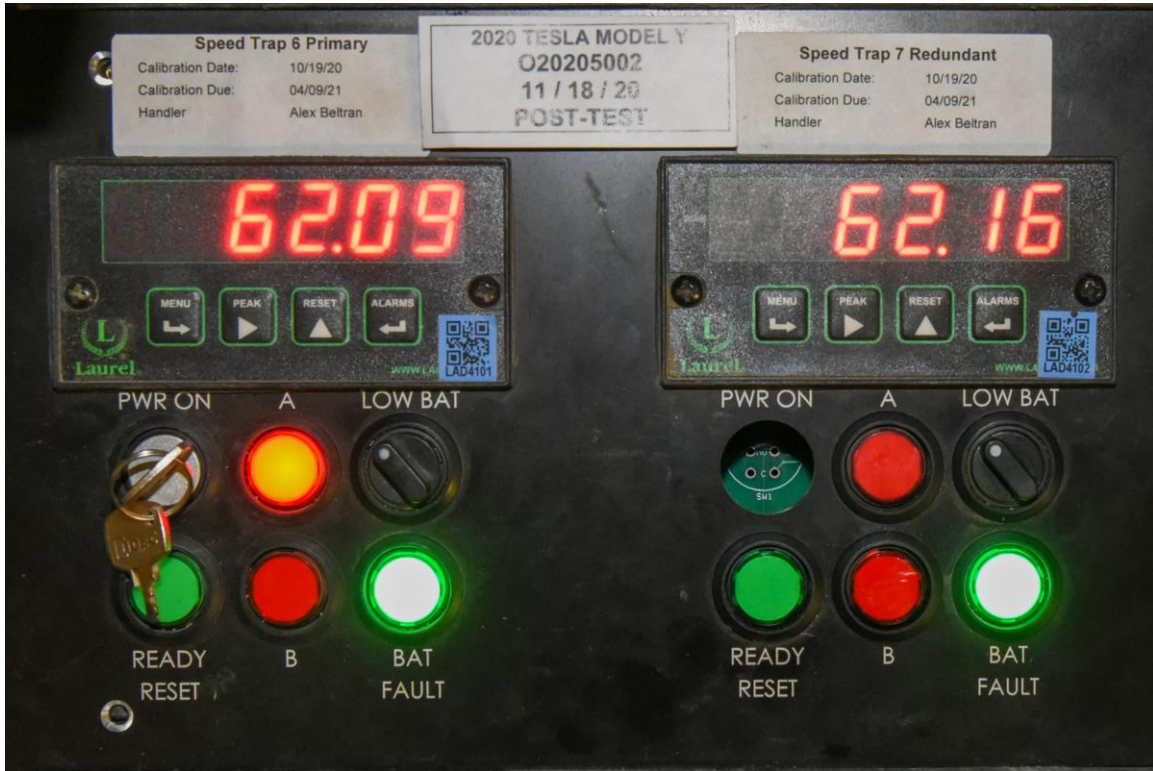


FIGURE 95. Post-Test Primary and Redundant Speed Trap Read-Out

Photograph Not Applicable

FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees

# Photograph Not Applicable

FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

# Photograph Not Applicable

FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

# Photograph Not Applicable

FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees

# Photograph Not Applicable

FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees





FIGURE 101. Impact Event

<b>TESLA</b> MODEL Y Long Range AWD		Vehicle Identification Number: 5YJYGDESLF099237 Date Of Manufacture: 10/2020	Transportation Method: Truck Delivered to: TESLA MOTORS, INC. Fremont, California, USA																				
<b>STANDARD FEATURES</b>		<b>AS CONFIGURED</b>																					
<b>TECHNICAL</b> Three phase, four pole, induction motor (Front) Three phase, six pole, internal permanent magnet motor (Rear) Drive inverter with regenerative braking system Microprocessor controlled, lithium-ion battery Onboard charger and mobile connector 120 volt and J1772 charging adapters  <b>SAFETY</b> Seven cameras, forward radar and twelve ultrasonic sensors Six front row and two side curtain airbags Three point safety belts with belt-reminders for driver and four passengers Two LATCH (Lower Anchors and Tethers for Children) in second row Electronic stability and traction control Four wheel antilock disc brakes with electronic parking brake Child safety locks and manual cargo door release mechanisms Anti-Theft Alarm System OFF-ROAD ASSIST	<b>INTERIOR</b> 15 inch capacitive touchscreen On-board maps and navigation WiFi and mobile network connectivity FM radio Hands free talking with Bluetooth Voice activated controls High definition backup camera One touch power windows Dual zone climate control 12 volt power outlet and four USB ports  <b>EXTERIOR</b> Full LED lighting	<table border="1"> <tr> <td>Model Y</td> <td>\$47,000</td> </tr> <tr> <td>All-Black Premium interior</td> <td>INCLUDED</td> </tr> <tr> <td>Black Autopilot</td> <td>INCLUDED</td> </tr> <tr> <td>Long Range Dual Motor All-Wheel Drive</td> <td>\$4,990</td> </tr> <tr> <td>20" induction Wheels</td> <td>\$3,000</td> </tr> <tr> <td>Deep Blue Metallic Paint</td> <td>\$1,000</td> </tr> <tr> <td>Dual Motor All-Wheel Drive</td> <td>INCLUDED</td> </tr> <tr> <td>Premium interior</td> <td>INCLUDED</td> </tr> <tr> <td>Play+with-gig Supercharging</td> <td>INCLUDED</td> </tr> <tr> <td>Full Seat Interior</td> <td>INCLUDED</td> </tr> </table>		Model Y	\$47,000	All-Black Premium interior	INCLUDED	Black Autopilot	INCLUDED	Long Range Dual Motor All-Wheel Drive	\$4,990	20" induction Wheels	\$3,000	Deep Blue Metallic Paint	\$1,000	Dual Motor All-Wheel Drive	INCLUDED	Premium interior	INCLUDED	Play+with-gig Supercharging	INCLUDED	Full Seat Interior	INCLUDED
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Premium interior	INCLUDED																						
Play+with-gig Supercharging	INCLUDED																						
Full Seat Interior	INCLUDED																						
<b>GOVERNMENT 5-STAR SAFETY RATINGS</b> This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash, or rollover risk. Source: National Highway Traffic Safety Administration (NHTSA) <a href="http://www.safercar.gov">www.safercar.gov</a> or 1-888-327-4236		<b>PARTS CONTENT INFORMATION</b> FOR THIS VEHICLE: US/CANADIAN PARTS CONTENT: 55% MAJOR SOURCES OF FOREIGN PARTS CONTENT MEXICO: 20% Note: Parts content does not include final assembly, distribution or other non-parts costs.  FOR THIS VEHICLE: FINAL ASSEMBLY POINT: FREMONT, CA COUNTRY OF ORIGIN: MOTOR ASSEMBLY: USA GEARBOX/TRANSMISSION: USA																					
<b>ADDITIONAL ASSEMBLY INFORMATION</b> FOR THIS VEHICLE: BATTERY FINAL ASSEMBLY POINT: FREMONT, CA, USA ON-BOARD CHARGER FINAL ASSEMBLY POINT: FREMONT, CA, USA		<b>EPA DOT Fuel Economy and Environment</b> Electric Vehicle <table border="1"> <tr> <td><b>Fuel Economy</b></td> <td colspan="3">           121 MPGe (combined city/hwy)            127 city / 114 highway / 28 kWh per 100 miles            Driving Range: 316 miles (when fully charged, vehicle can travel about)         </td> <td>           You save <b>\$4,750</b> in fuel costs over 5 years compared to the average new vehicle.         </td> </tr> <tr> <td><b>Annual fuel Cost</b></td> <td colspan="3"> <b>\$550</b> </td> <td> <b>Fuel Economy &amp; Greenhouse Gas Rating</b> 10 (Best)         </td> </tr> <tr> <td colspan="2"> <b>Smog Rating</b> 10 (Best)         </td> <td colspan="2">           This vehicle emits 6 grams CO<sub>2</sub> per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions learn more at <a href="http://fuel-economy.gov">fuel-economy.gov</a>.         </td> </tr> </table>		<b>Fuel Economy</b>	121 MPGe (combined city/hwy) 127 city / 114 highway / 28 kWh per 100 miles Driving Range: 316 miles (when fully charged, vehicle can travel about)			You save <b>\$4,750</b> in fuel costs over 5 years compared to the average new vehicle.	<b>Annual fuel Cost</b>	<b>\$550</b>			<b>Fuel Economy &amp; Greenhouse Gas Rating</b> 10 (Best)	<b>Smog Rating</b> 10 (Best)		This vehicle emits 6 grams CO <sub>2</sub> per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions learn more at <a href="http://fuel-economy.gov">fuel-economy.gov</a> .							
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<b>Annual fuel Cost</b>	<b>\$550</b>			<b>Fuel Economy &amp; Greenhouse Gas Rating</b> 10 (Best)																			
<b>Smog Rating</b> 10 (Best)		This vehicle emits 6 grams CO <sub>2</sub> per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions learn more at <a href="http://fuel-economy.gov">fuel-economy.gov</a> .																					

FIGURE 102. Monroney Label

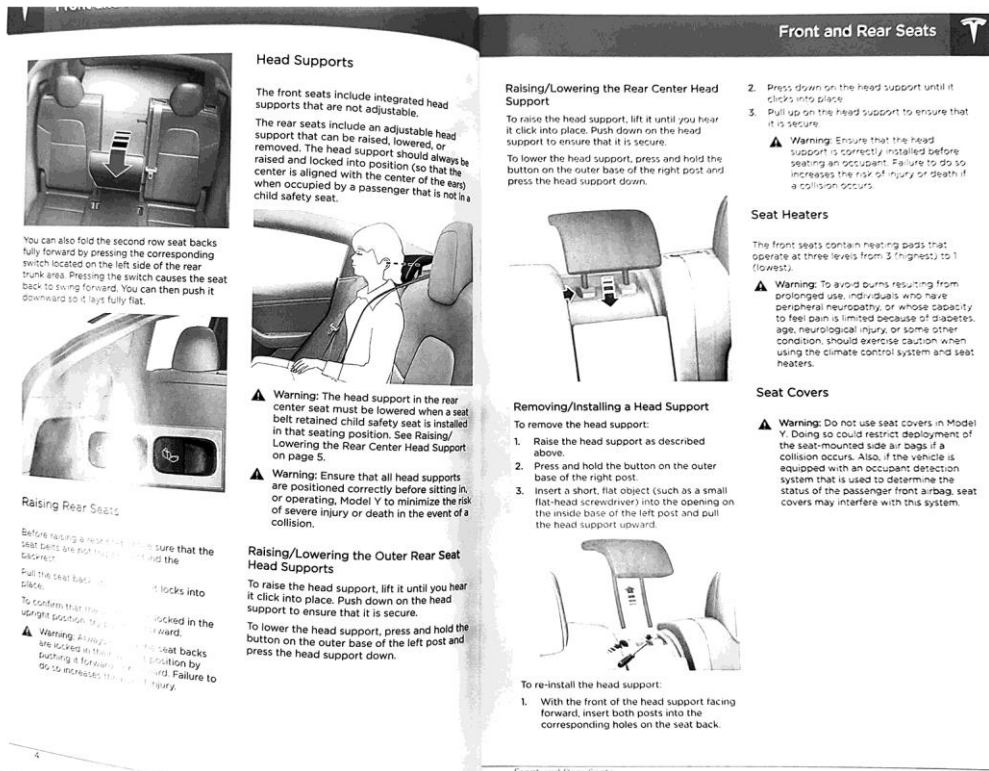


FIGURE 103. Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

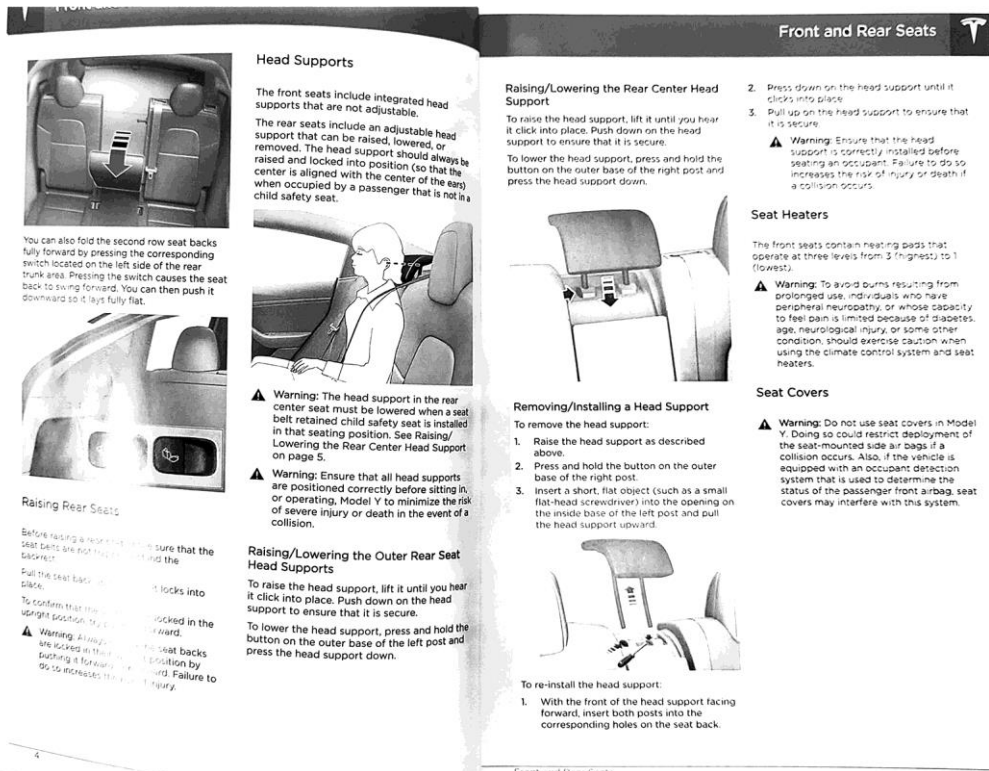


FIGURE 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Photograph Not Applicable

No Auxiliary Power Module  
Warning Label

FIGURE 305-01. Auxiliary Power Module Warning Label



FIGURE 305-02. Power Inverter Warning Label



FIGURE 305-02a. Power Inverter Warning Label



FIGURE 305-02b. Power Inverter Warning Label

# Photograph Not Available

FIGURE 305-03. First Responder Warning Label

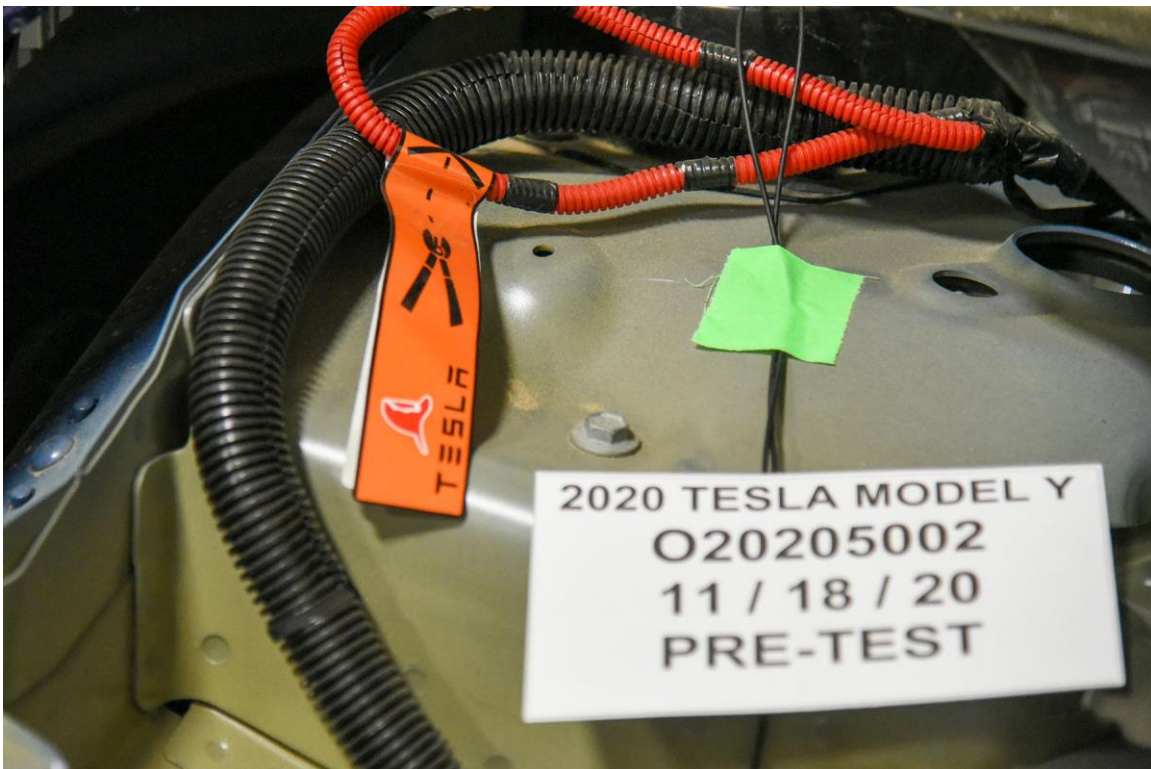


FIGURE 305-04. First Responder Warning Location

**Photograph Not Applicable**

**No Other Vehicle Label  
Related to Electric  
Propulsion System**

FIGURE 305-05. Other Vehicle Label(s) Related to Electrical Propulsion System

**Photograph Not Applicable**

**Vehicle Not Equipped with  
Manual High Voltage  
Service Disconnect**

FIGURE 305-06. Manual High Voltage Service Disconnect in Place

**Photograph Not Applicable**

**Vehicle Not Equipped with  
Manual High Voltage  
Service Disconnect**

FIGURE 305-07. Manual High Voltage Service Disconnect Removed

**Photograph Not Applicable**

**Vehicle Not Equipped with  
Manual High Voltage  
Service Disconnect**

FIGURE 305-08. Manual High Voltage Service Disconnect Removed

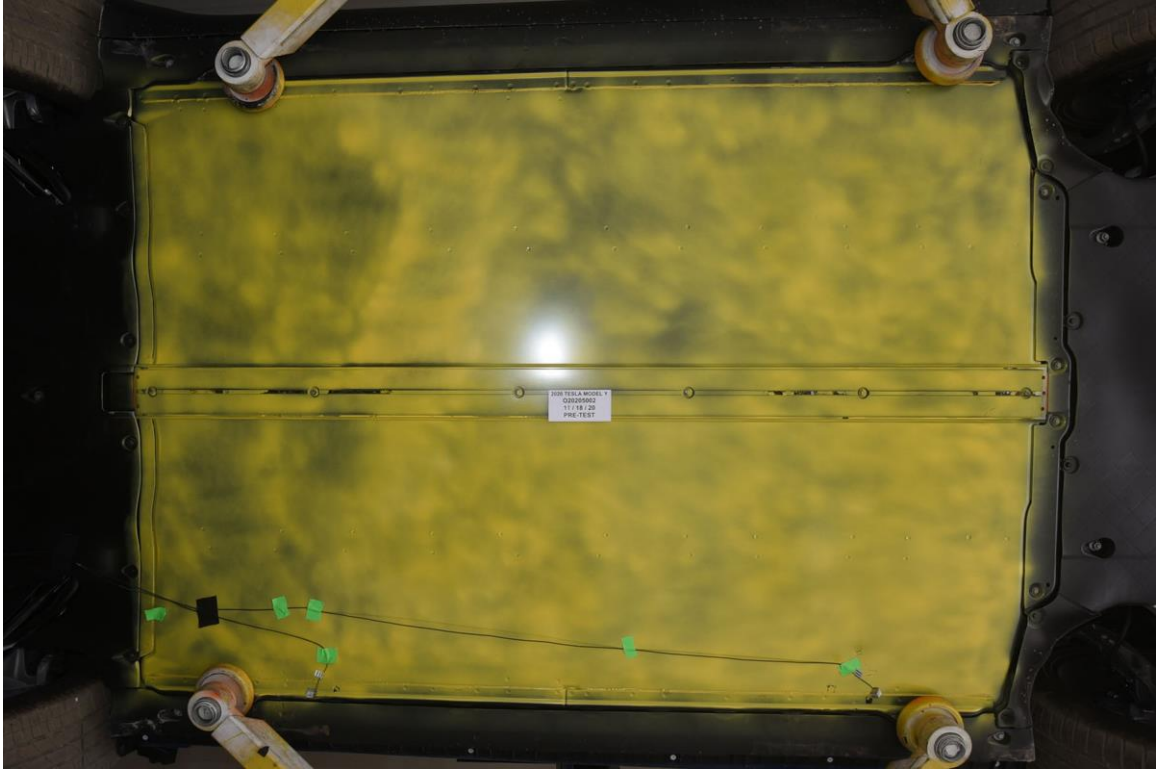


FIGURE 305-09. Pre-Impact View of Propulsion Battery

Photograph Not Available

FIGURE 305-010. Post-Impact Front View of Propulsion Battery



# Photograph Not Available

FIGURE 305-011. Post-Impact Rear View of Propulsion Battery

# Photograph Not Available

FIGURE 305-012. Pre-Impact View of Battery Box(s) or Container(s)  
Which Holds Individual Battery Modules

# Photograph Not Available

FIGURE 305-013. Post-Impact View of Battery Box(s) or Container(s)  
Which Holds Individual Battery Modules

Photograph Not Applicable

Battery Not Removed  
From Vehicle

FIGURE 305-014. Pre-Impact View of Propulsion Battery Module(s)

Photograph Not Applicable

Battery Not Removed  
From Vehicle

FIGURE 305-015. Post-Impact View of Propulsion Battery Module(s)

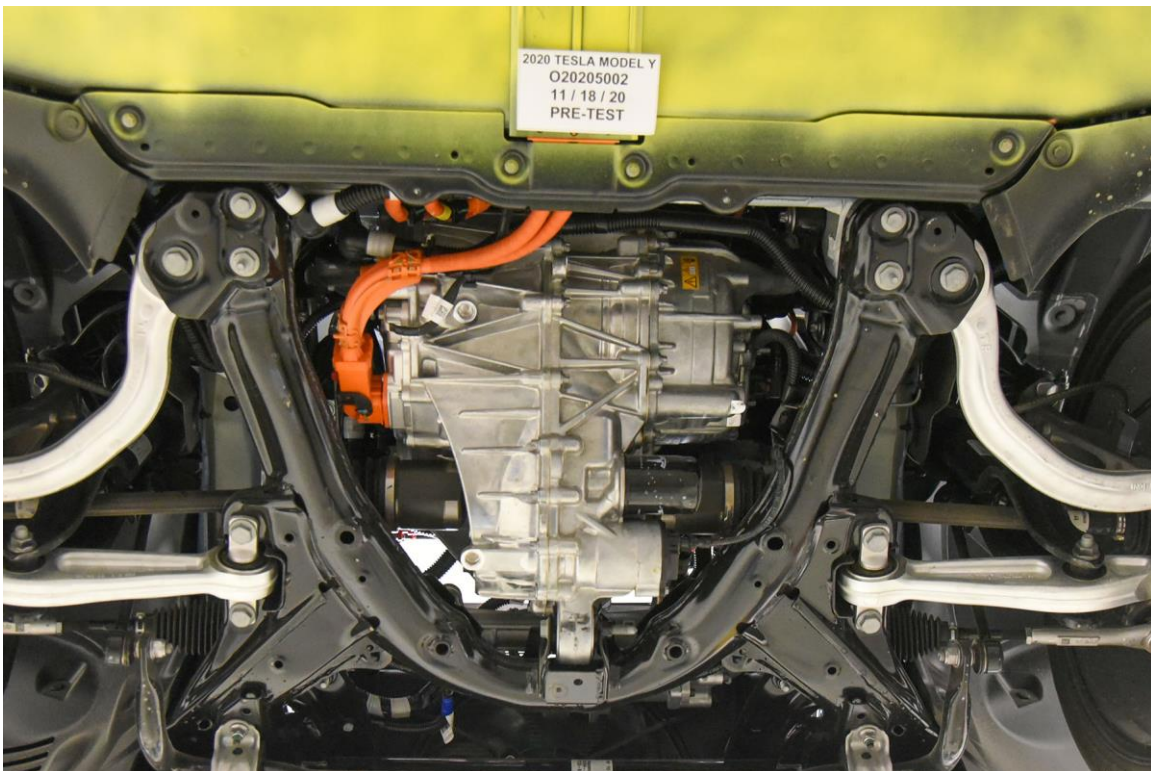


FIGURE 305-016. Pre-Impact View of Electric Propulsion Drive

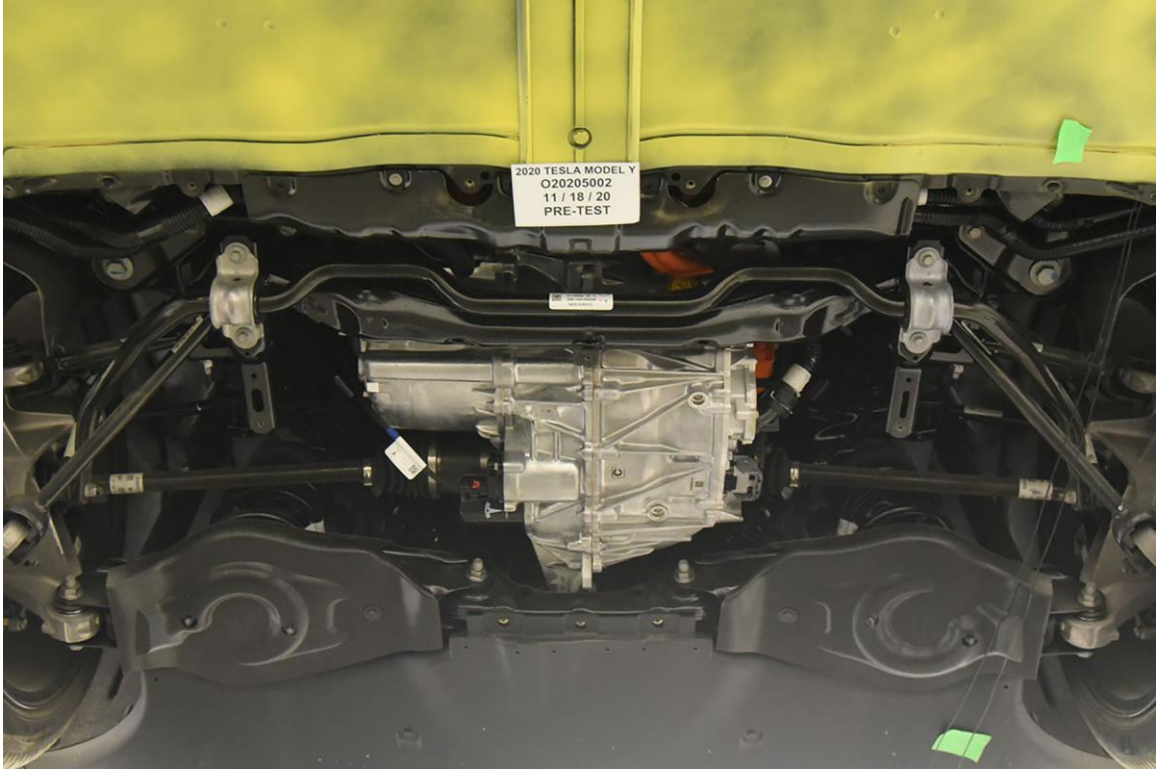


FIGURE 305-017. Post-Impact View of Electric Propulsion Drive

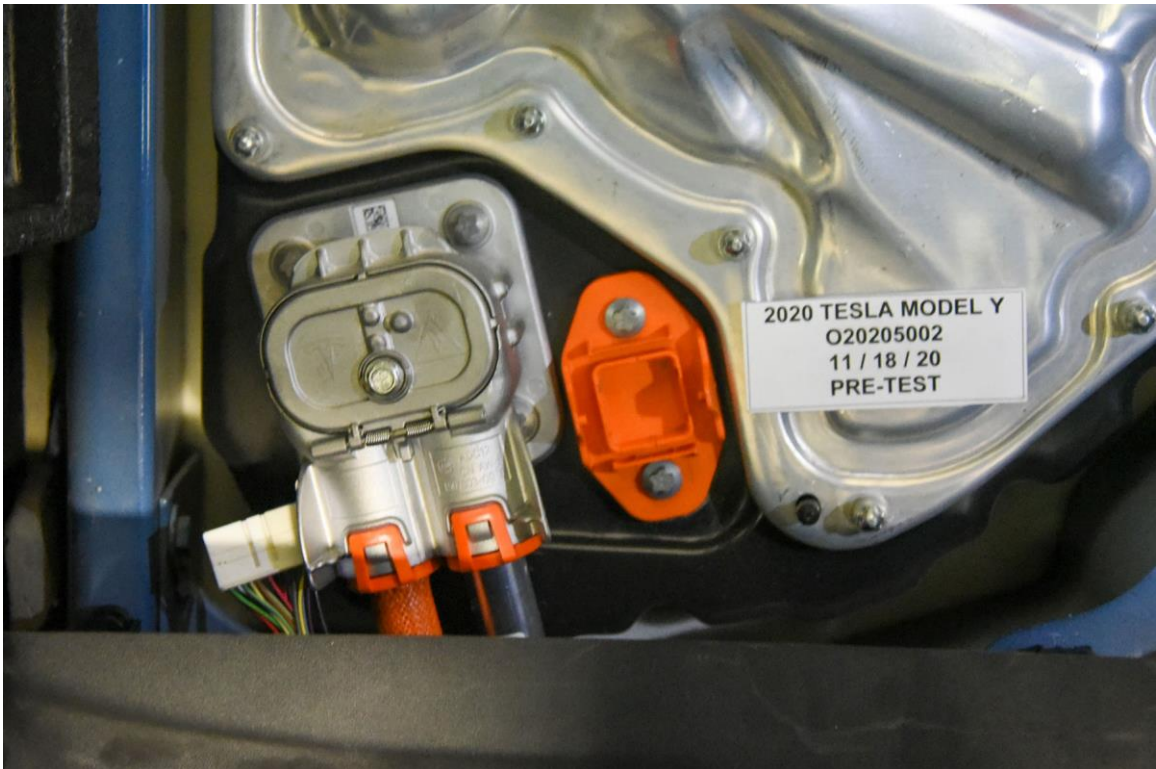


FIGURE 305-018. Pre-Impact View of High Voltage Interconnect(s)

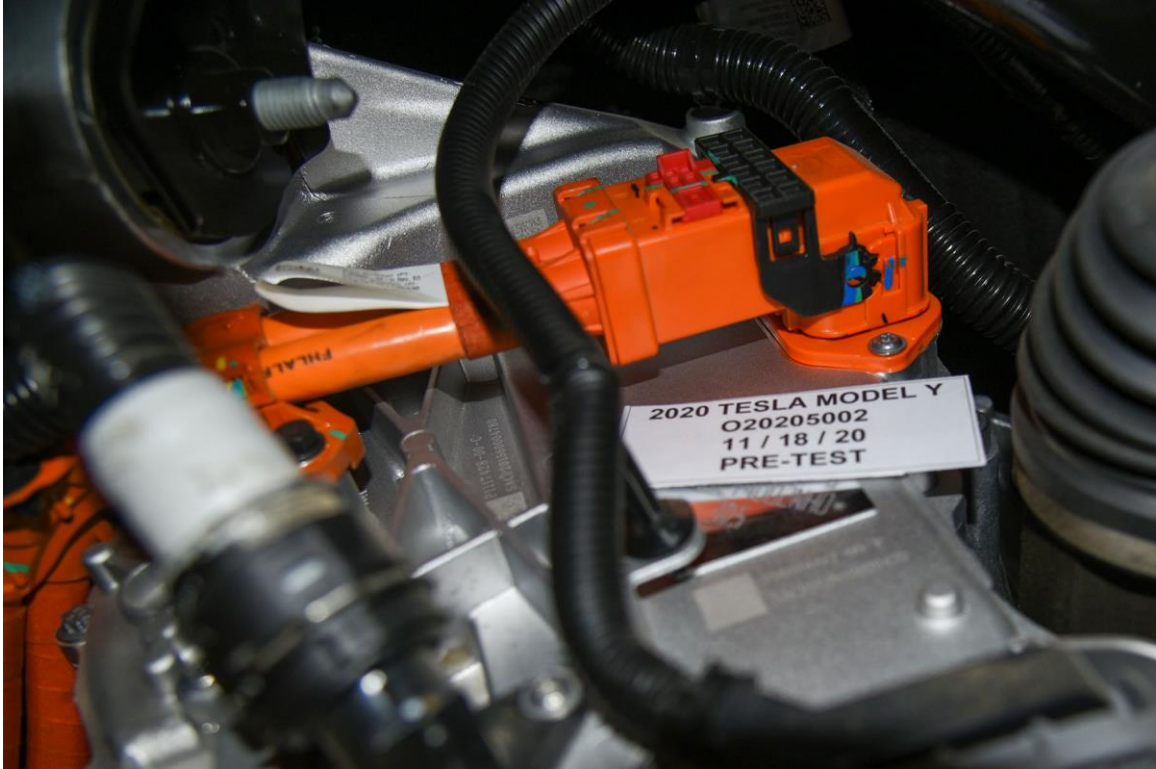


FIGURE 305-018a. Pre-Impact View of High Voltage Interconnect(s)



FIGURE 305-019. Pre-Impact View Propulsion Battery Venting System(s)



FIGURE 305-020. Pre-Impact View of Other Visible Electric Propulsion Components

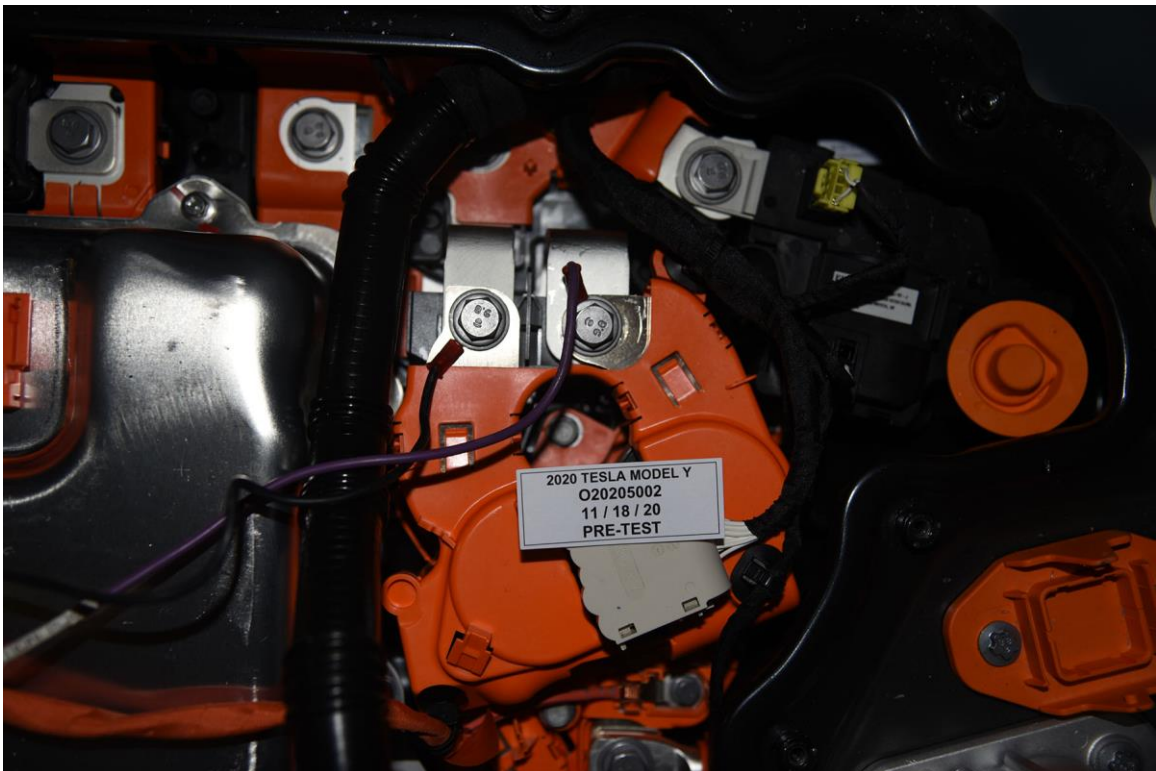


FIGURE 305-021. Pre-Impact View of Ground Lead Attached

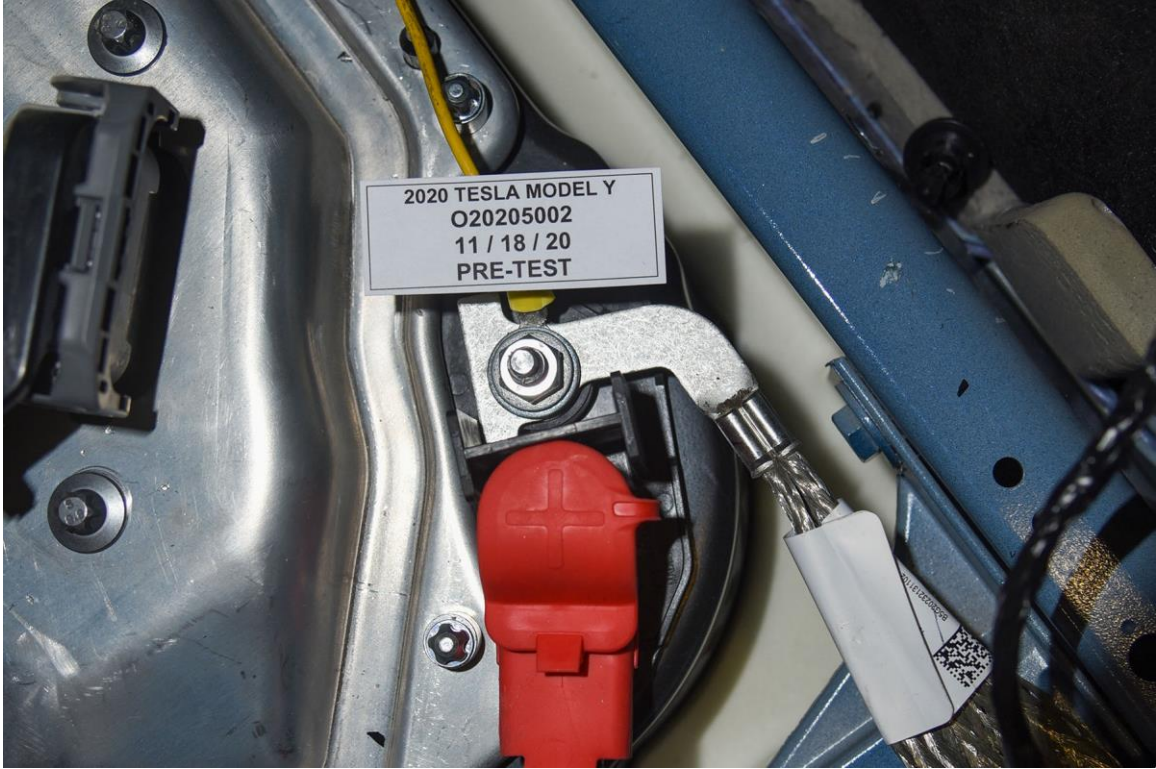


FIGURE 305-022. Pre-Impact View of High Voltage Leads Attached

# Photograph Not Available

FIGURE 305-023. Pre-Impact Close-Up View of High Voltage Leads Attached



FIGURE 305-024. Pre-Impact View of Installed Test Interface Port

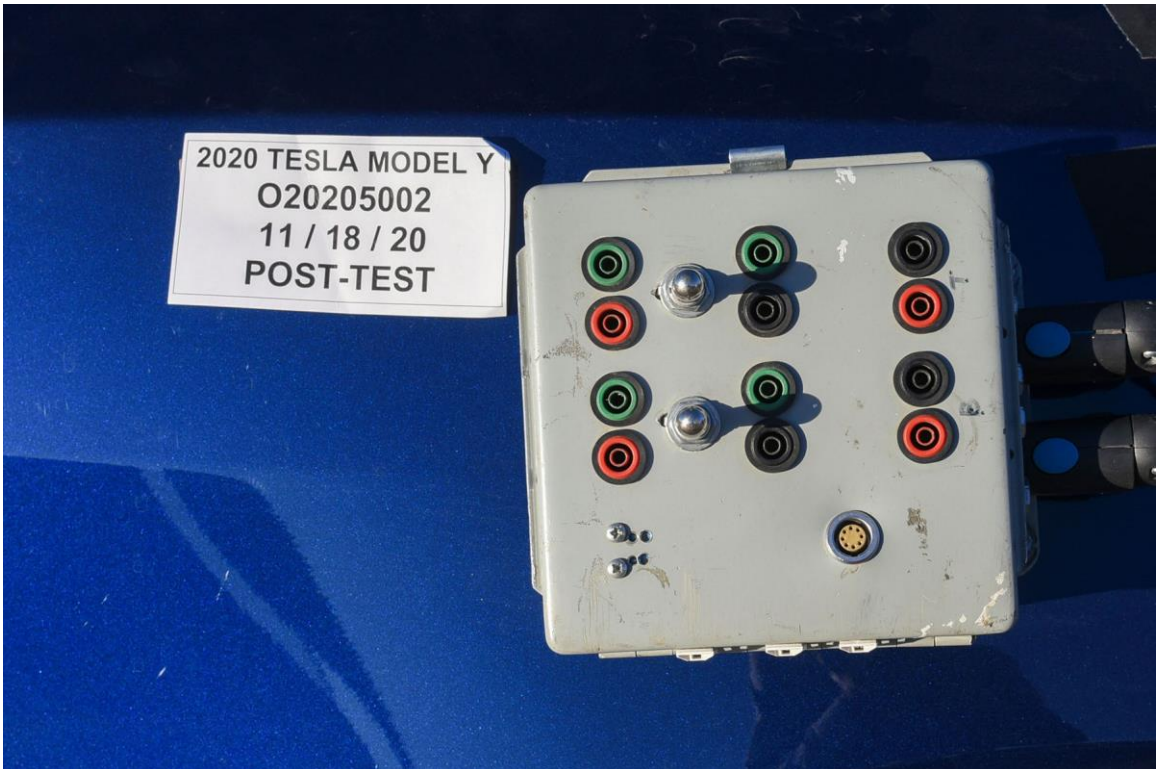


FIGURE 305-025. Post-Impact View of Installed Test Interface Port



# Photograph Not Available

FIGURE 305-026. Pre-Impact View of Other Test Devices

# Photograph Not Available

FIGURE 305-027. Post-Impact View of Other Test Devices

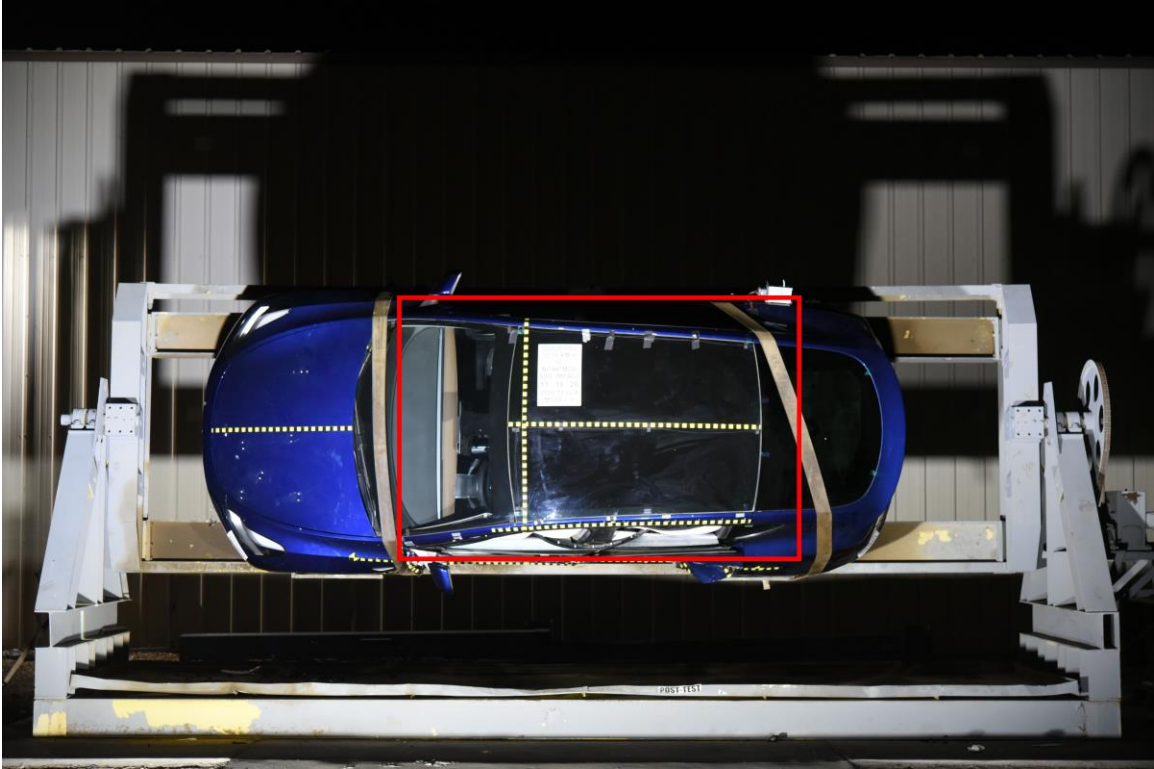


FIGURE 305-028. FMVSS No. 305 Static Rollover at 90°

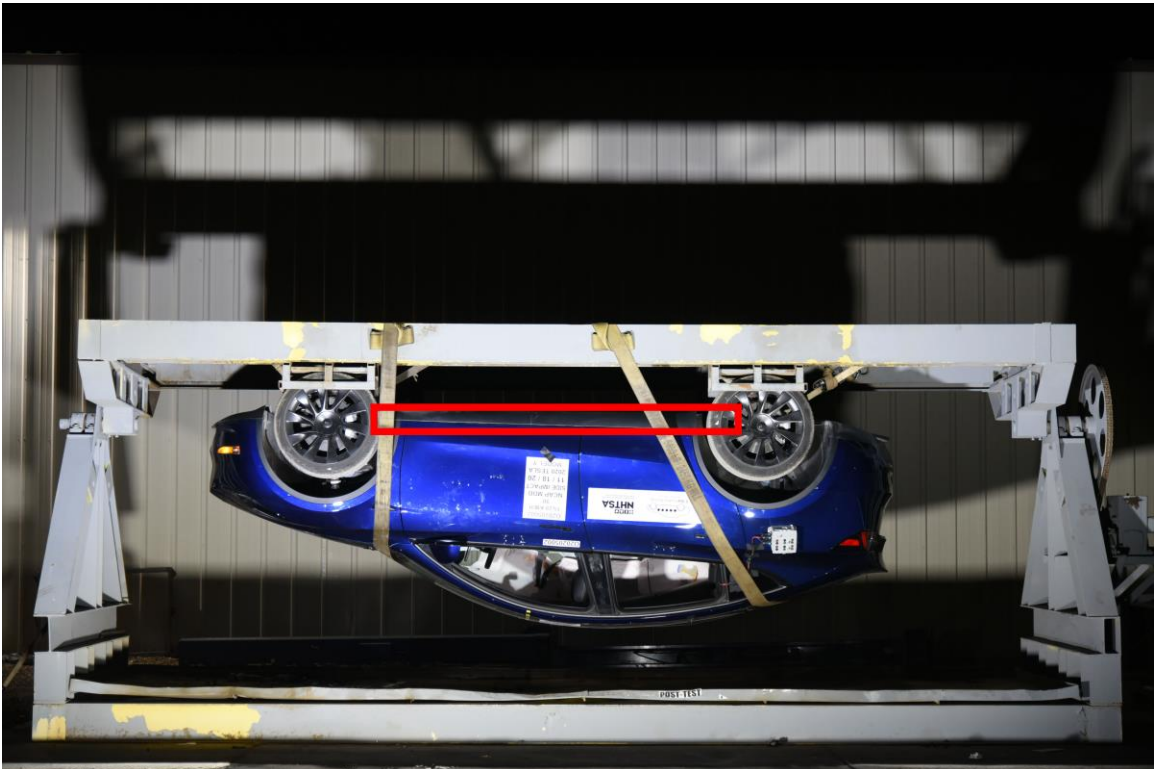


FIGURE 305-029. FMVSS No. 305 Static Rollover at 180°

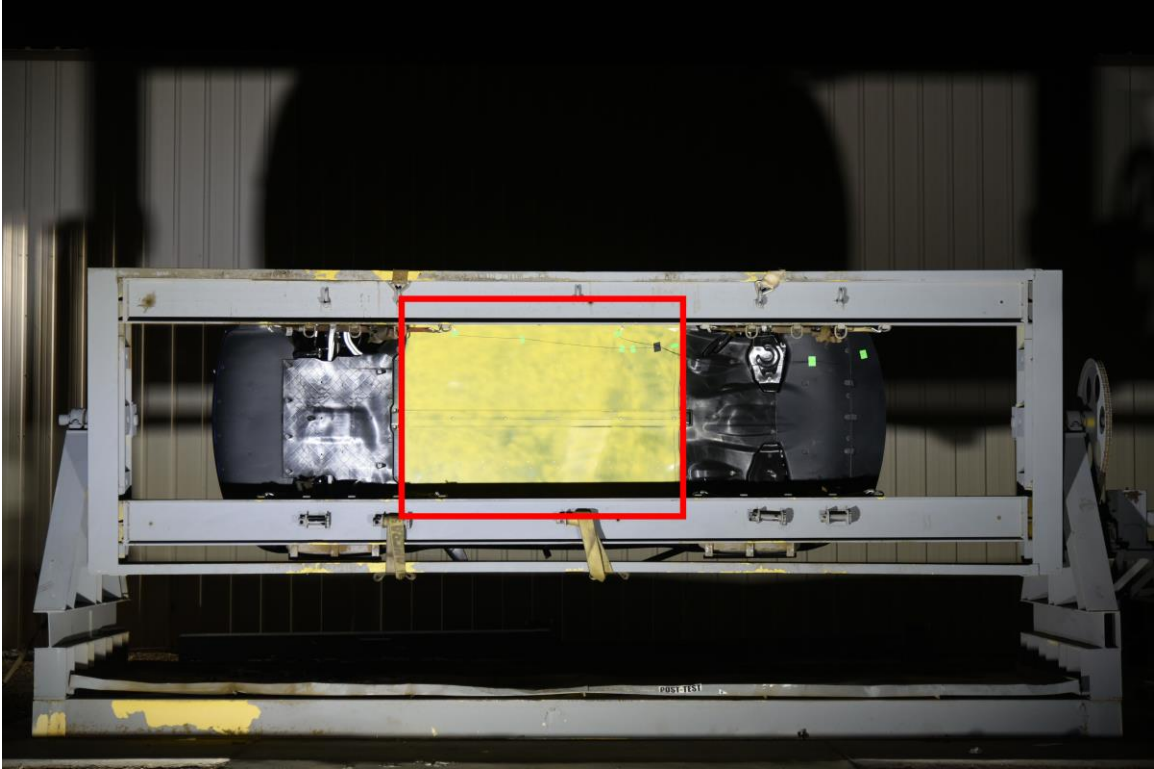


FIGURE 305-030. FMVSS No. 305 Static Rollover at 270°

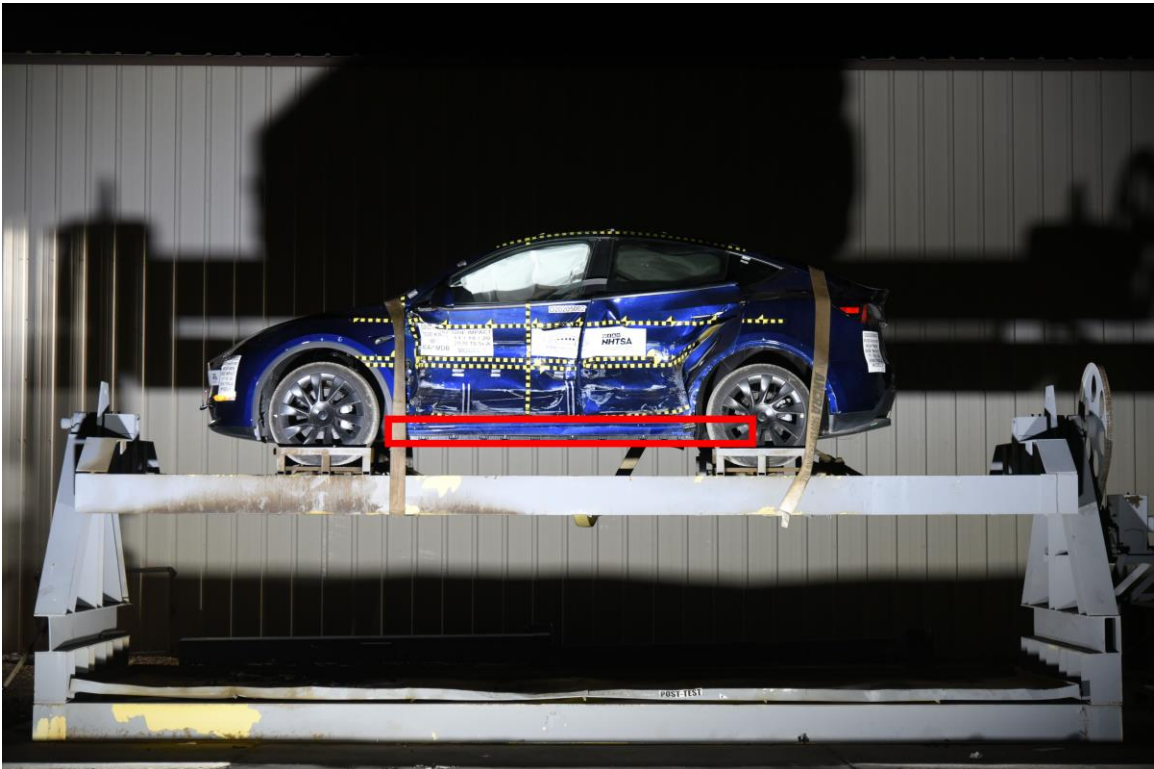


FIGURE 305-031. FMVSS No. 305 Static Rollover at 360°

# Photograph Not Available

FIGURE 305-032. Pre-Impact View of the Vehicle Passenger Compartment  
Adjacent to Propulsion Battery

# Photograph Not Available

FIGURE 305-033. Post-Impact View of the Vehicle Passenger Compartment  
Adjacent to Propulsion Battery

**Photograph Not Applicable**

**No Propulsion Battery  
Mounting and/or  
Intrusion Failure**

FIGURE 305-034. Post-Impact Propulsion Battery System Mounting and or Intrusion Failure(s)

**Photograph Not Applicable**

**No Battery Component  
Intrusion**

FIGURE 305-035. Post-Impact View of Battery Component Intrusion

**Photograph Not Applicable**

**No Propulsion Battery  
Mounting and/or  
Intrusion Failure**

FIGURE 305-036. Post-Impact View of Battery Module Movement or Retention Loss

**Photograph Not Applicable**

**No Battery Component  
Intrusion**

FIGURE 305-037. Post-Impact View of Propulsion Battery Electrolyte Spillage Location

**Photograph Not Applicable**

**No Propulsion  
Battery Movement or  
Retention loss**

FIGURE 305-038. Post-Test View of Propulsion Battery Electrolyte Spillage Location

**APPENDIX B**  
**DUMMY RESPONSE DATA**



## 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
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12	Driver Total Abdominal Force (Y) vs. Time	B-3
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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
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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
25	Passenger Upper Thorax Rib Deflection (Y) vs. Time	B-8
26	Passenger Middle Thorax Rib Deflection (Y) vs. Time	B-8
27	Passenger Lower Thorax Rib Deflection (Y) vs. Time	B-8
28	Passenger Upper Abdomen Rib Deflection (Y) vs. Time	B-8
29	Passenger Lower Abdomen Rib Deflection (Y) vs. Time	B-9

**The following additional data for this test can be obtained from the Research and Development section of the NHTSA website ([www.NHTSA.gov](http://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

Position 1 - ES-2re S/N F035						
	Class	Units	Limit	Value	t <sup>1</sup>	t <sup>2</sup>
<b>HIC 36</b>	1000		1000	42.025	36.0	72.0
<b>Max. Thorax Rib Deflection</b>	180	mm	44	14.398		
<b>Combined Abdominal Force</b>	600	N	2500	644.101		
<b>Pubic Symphysis Force</b>	600	N	6000	959.357		

Position 4 - SID-IIs S/N 308						
	Class	Units	Limit	Value	t <sup>1</sup>	t <sup>2</sup>
<b>HIC 36</b>	1000		1000	357.635	62.3	79.3
<b>Lower Spine (T12) Resultant</b>	180	g	82	45.299		
<b>Combined Pelvic Force</b>	600	N	5525	2520.743		
<b>Max. Thorax Rib Deflection</b>	600	mm	38	10.668		
<b>Max. Abdomen Rib Deflection</b>	600	mm	45	23.084		

ES-2re Filtered Data						
	Class	Units	Max	Time	Min	Time
Upper Thorax Rib Deflection	180	mm	9.908	49.7	-3.920	19.5
Middle Thorax Rib Deflection	180	mm	12.901	45.1	-0.602	276.8
Lower Thorax Rib Deflection	180	mm	14.398	42.5	-0.504	299.9
Anterior Abdominal Force	600	N	173.695	26.9	-16.932	13.7
Middle Abdominal Force	600	N	225.344	34.5	-7.521	276.0
Posterior Abdominal Force	600	N	253.161	36.1	-14.847	255.0
Lower Spine (T12) Resultant	180	g	19.531	19.2	0.014	0.8
Pubic Symphysis Force	600	N	176.500	10.7	-959.357	52.4

SID-IIs Filtered Data						
	Class	Units	Max	Time	Min	Time
Upper Thorax Rib Deflection	600	mm	5.538	69.3	-2.149	45.5
Middle Thorax Rib Deflection	600	mm	1.624	54.9	-2.283	79.9
Lower Thorax Rib Deflection	600	mm	10.668	57.8	-3.668	15.9
Upper Abdomen Rib Deflection	600	mm	23.084	57.9	-5.743	16.2
Lower Abdomen Rib Deflection	600	mm	22.516	58.0	-3.098	17.5
Lower Spine (T12) Resultant	180	g	45.299	55.9	0.016	2.7
Iliac Force	600	N	682.856	53.3	-81.678	119.0
Acetabulum Force	600	N	1870.033	48.4	-11.367	98.2

Vehicle Safety Features	
Pretensioners	Yes
Load Limiters	Yes
Adjustable Belt Anchors	Yes
ABS	Yes
ADLs	Yes

Standards Measured Post-Test	
301- Fuel System Integrity	N/A
If No, Amount Measured In Ounces	
305 - Electrolyte Spillage	Yes
If No, Amount Measured In Ounces	
305 - Electrical Isolation	Yes
If No, Ohms / Volts	
305 - Battery Retention	Yes
If No, Failure Location	

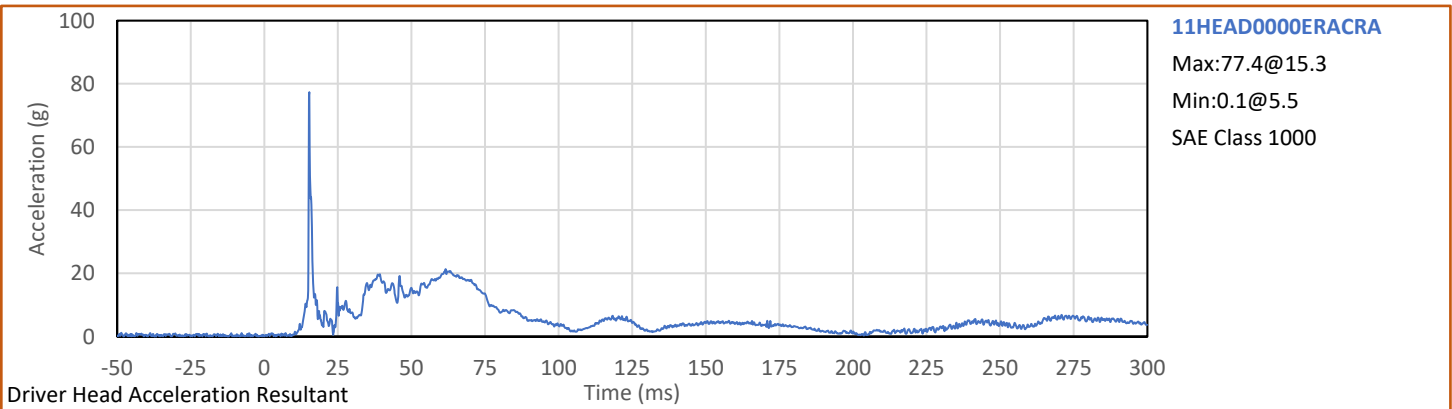
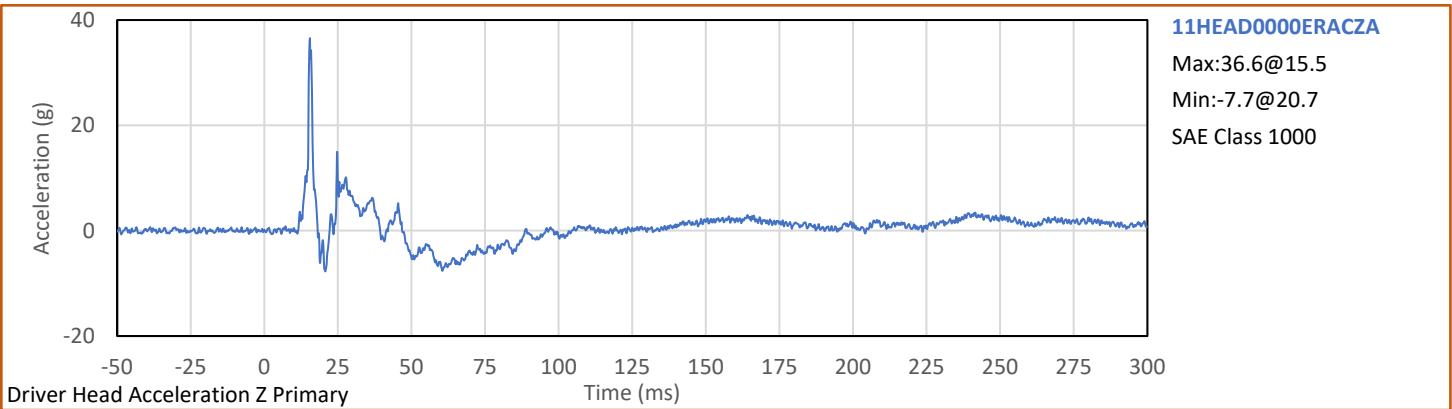
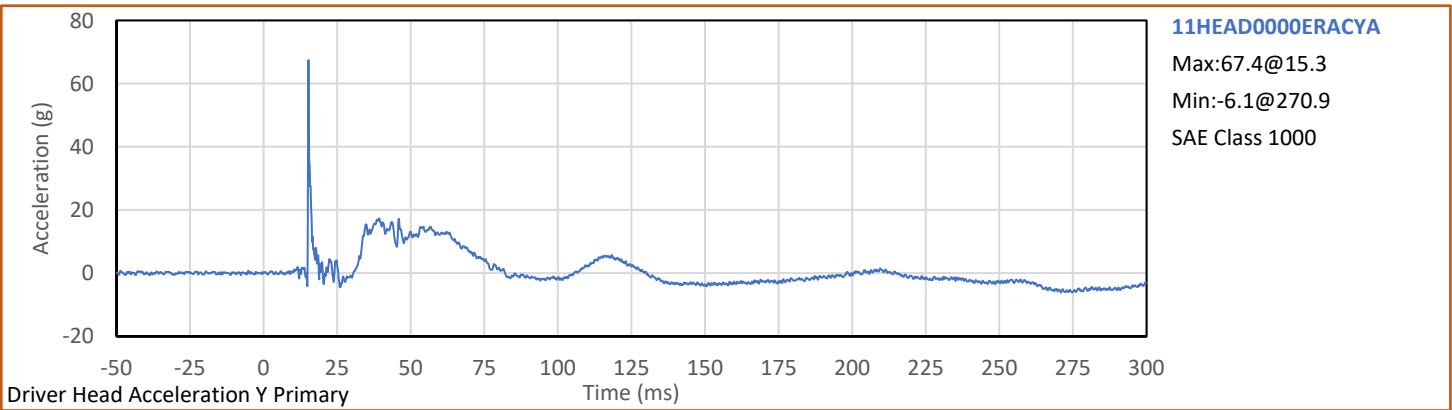
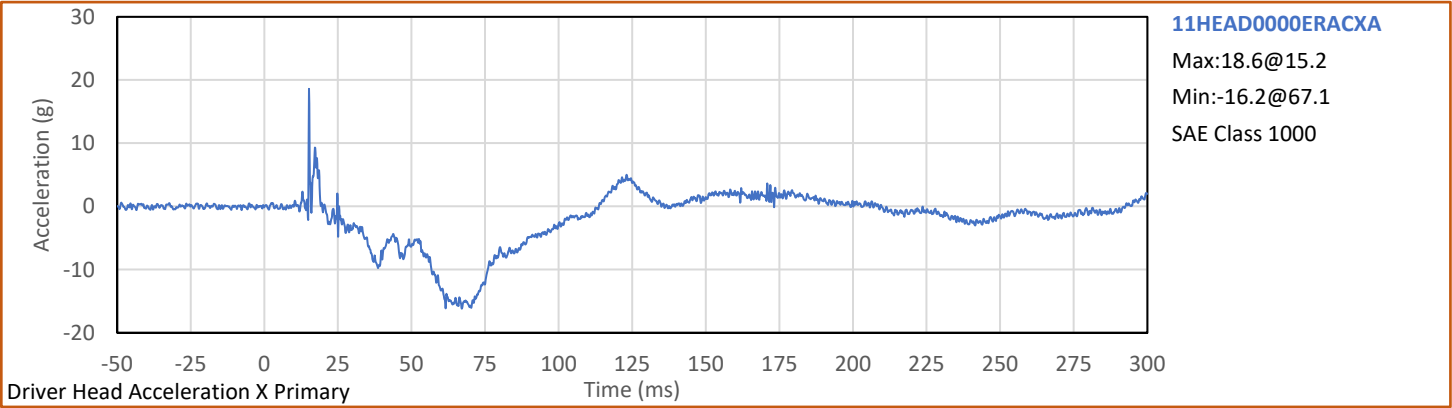
Test Vehicle Doors	
Can Disable ADLs Using Owner's Manual	No
Doors Locked (Pre-Test)	Yes
Driver Door Latched (Post-Test)	Yes
Rear Passenger Door Latched (Post-Test)	Yes

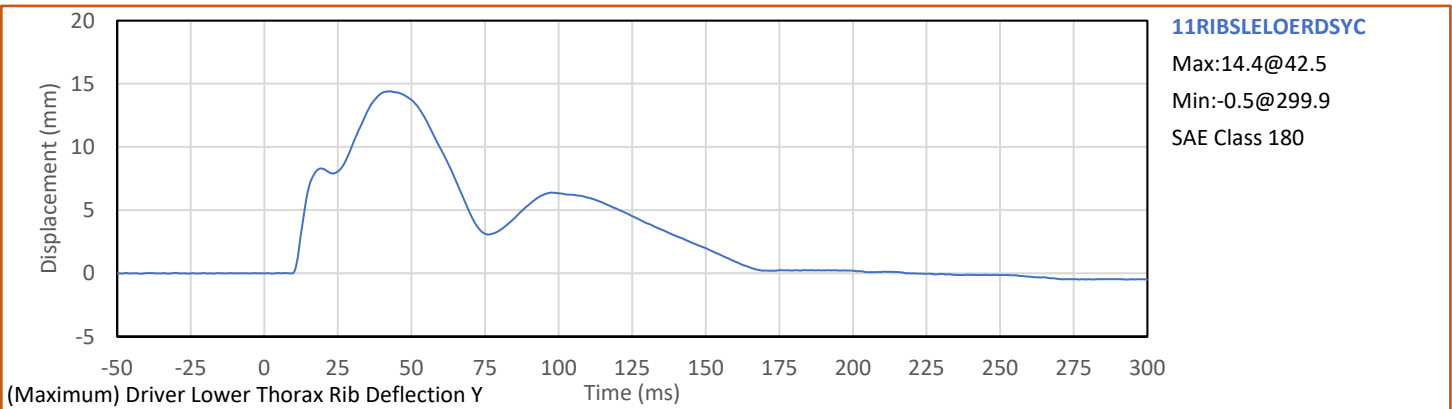
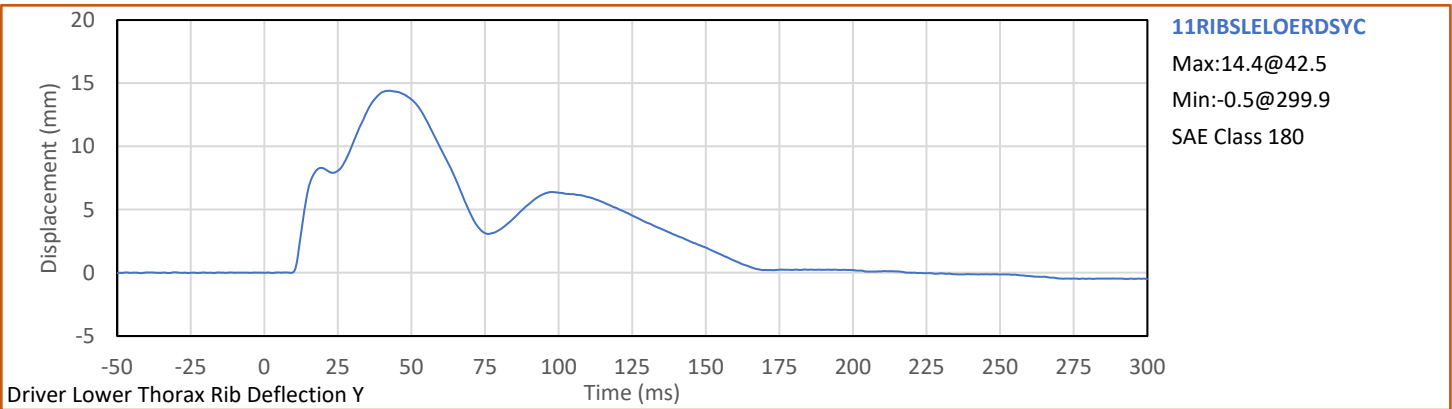
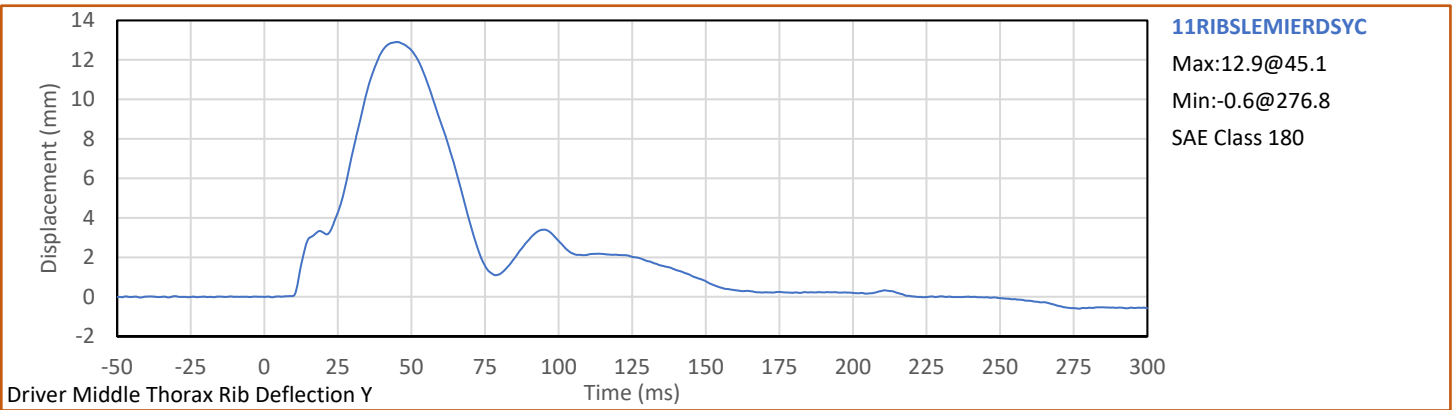
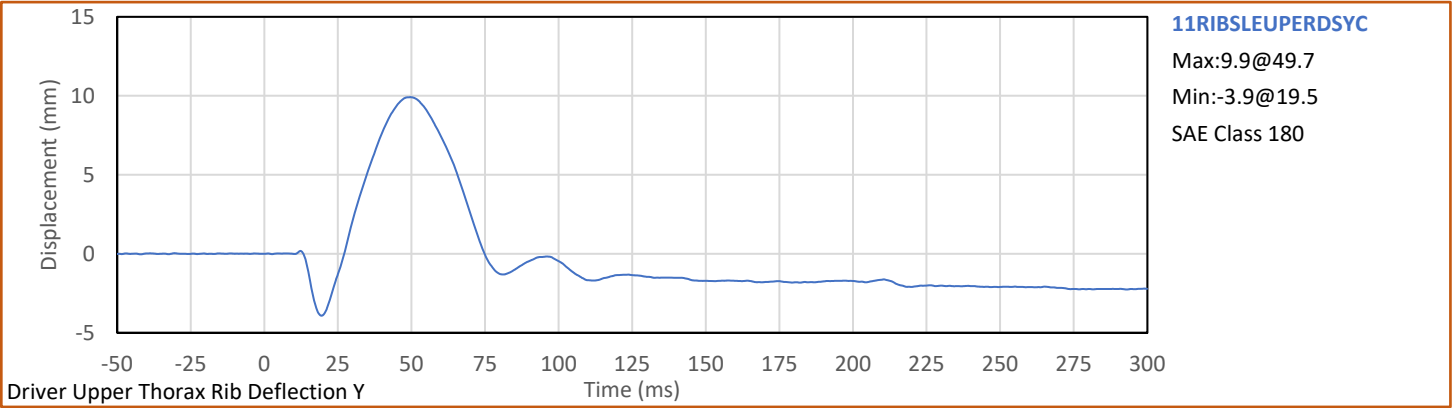
Impact Location		
Horizontal Distance from Impact Point to Vertical Impact Line (+Left/-Right)	mm	0
Vertical Distance from Impact Point to Horizontal Impact Line (-Up/+Down)	mm	11

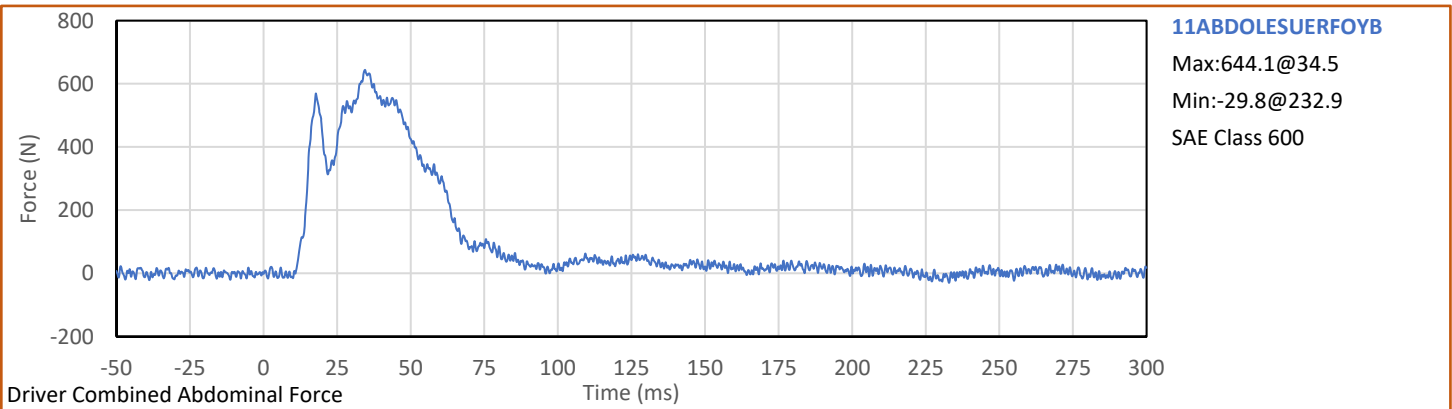
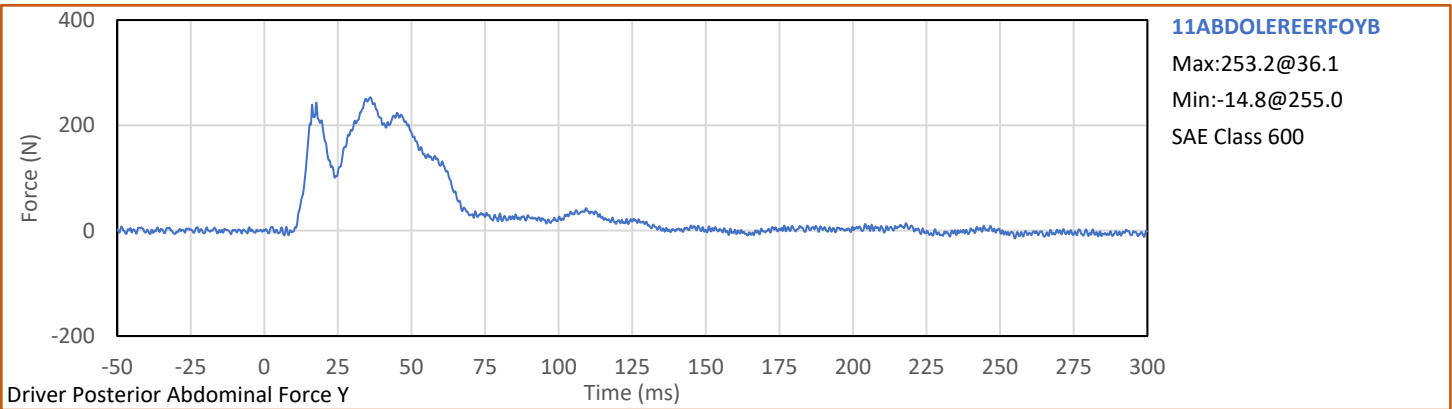
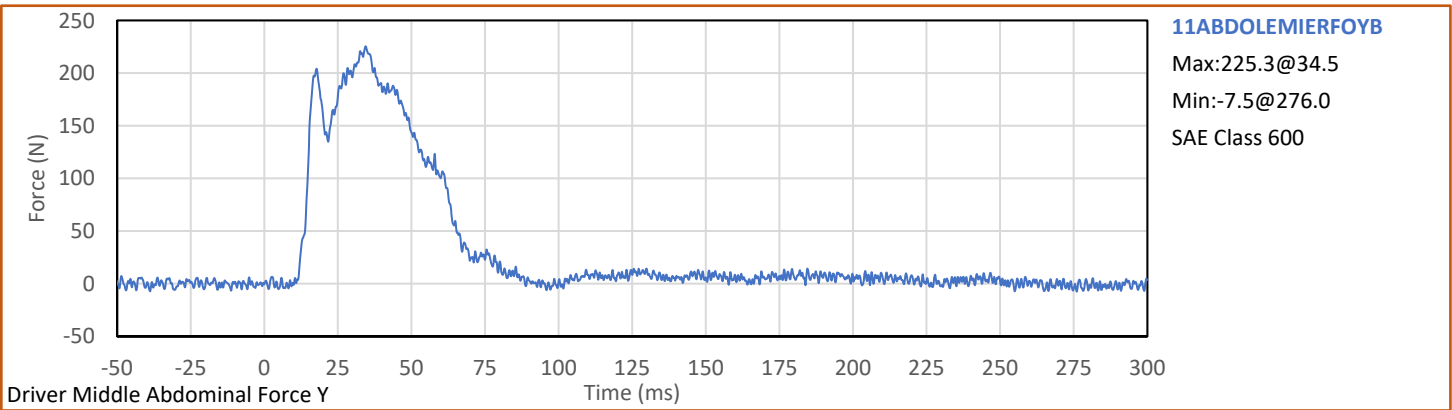
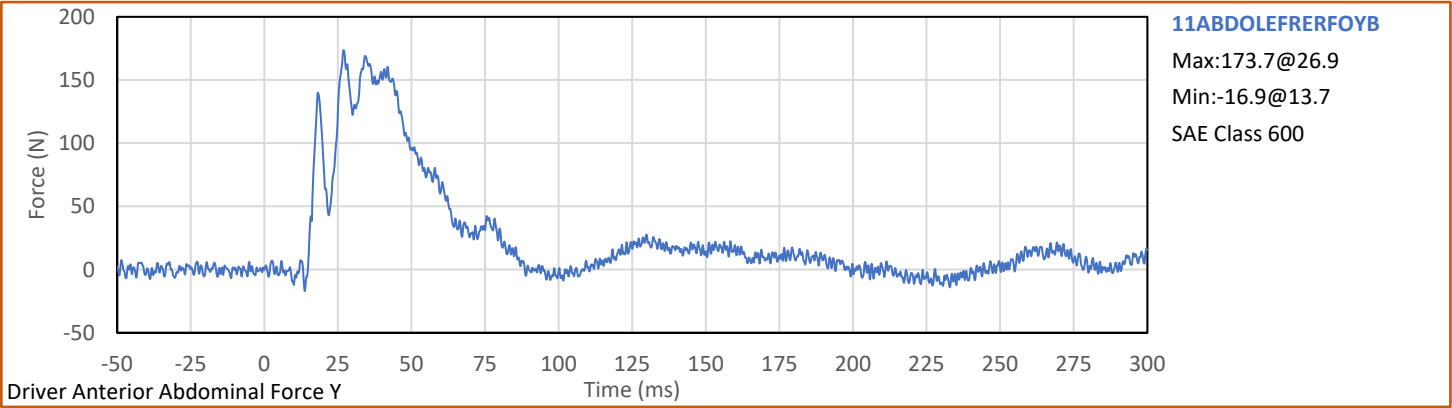
	Airbag Deployment			
	Driver (P1)		Left Rear Passenger (P4)	
	Deployed	Mount	Deployed	Mount
Head Bag	Yes	Curtain	Yes	Curtain
Torso Bag	N/A	N/A	N/A	N/A
Pelvis Bag	N/A	N/A	N/A	N/A
Torso/Abdomen/Pelvis Bag	Yes	Seatback	N/A	N/A
Combination Bag	N/A	N/A	N/A	N/A
Frontal Bag	No	Strng. Wheel		

	Test Particulars			
	Metric Units		English Units	
	Units	Value	Units	Value
MDB Velocity	km/h	62.09	mph	38.58
Vehicle Curb Weight	kg	1988	lbs	4382
Vehicle Test Weight	kg	2140	lbs	4718
Vehicle Width	mm	1859	Inches	73.2
Vehicle Wheelbase	mm	2875	Inches	113.2
Vehicle Length	mm	4743	Inches	186.7
Suspension Mode, if adjustable:	N/A			

Comments:

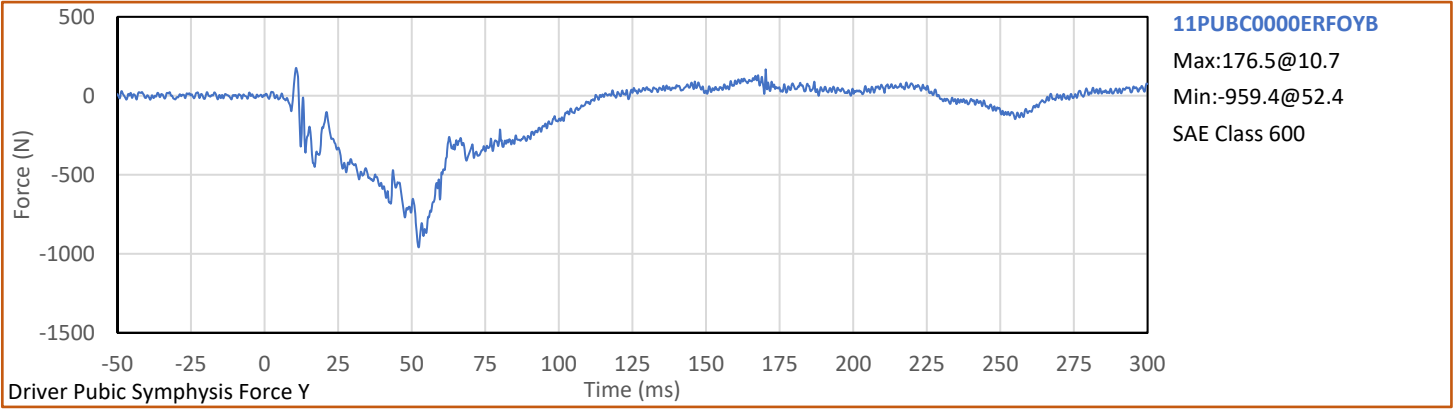




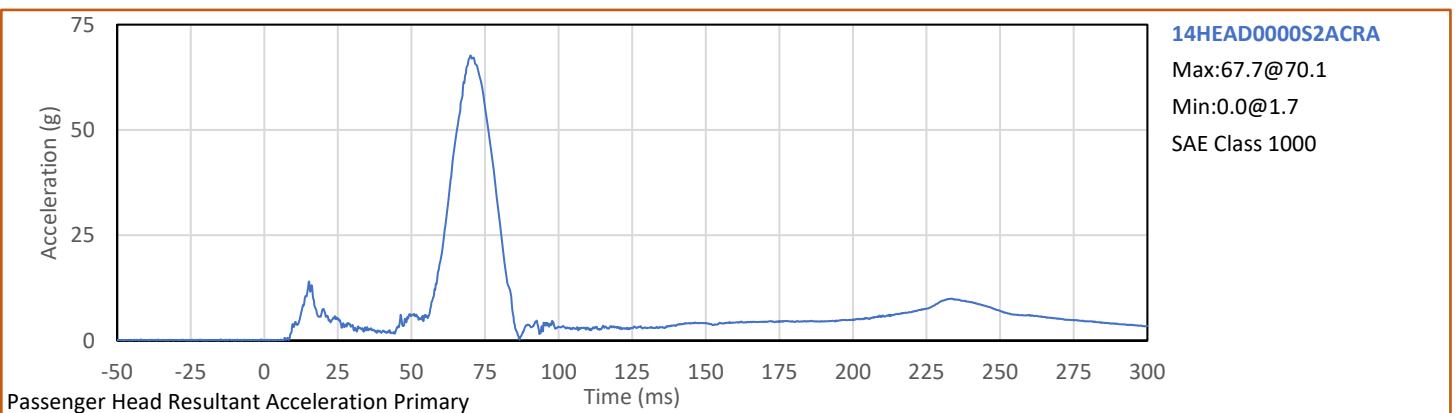
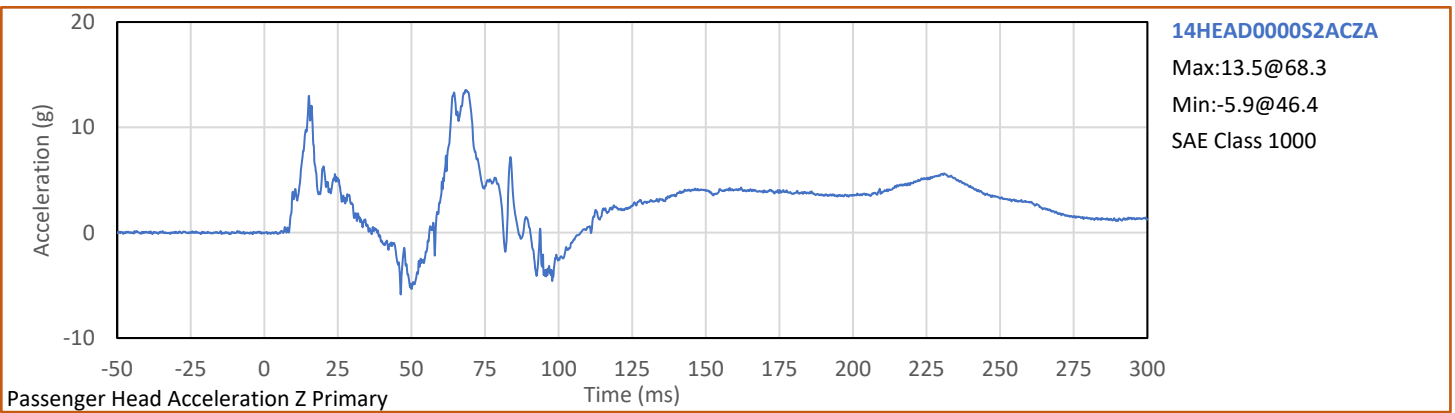
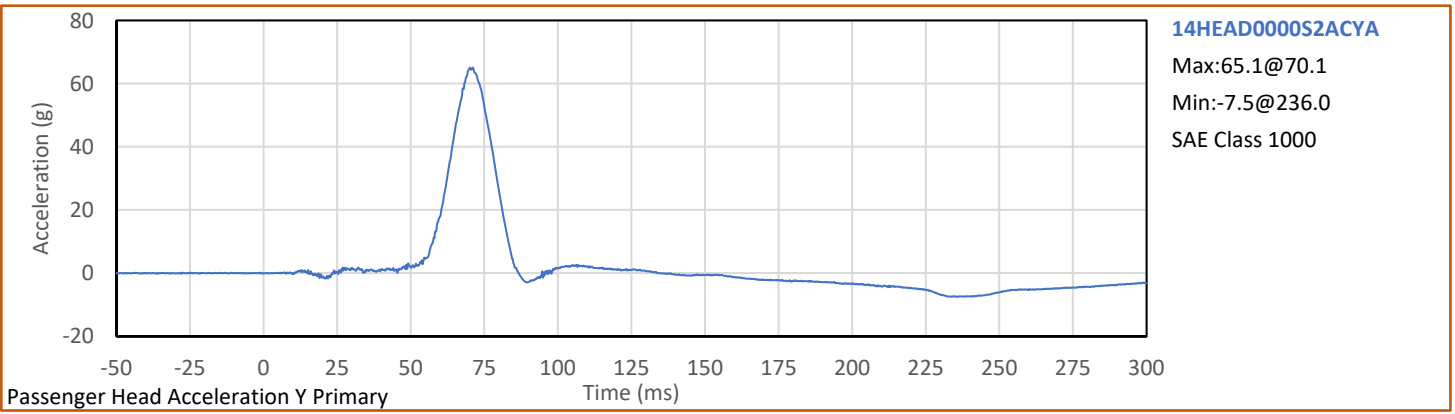
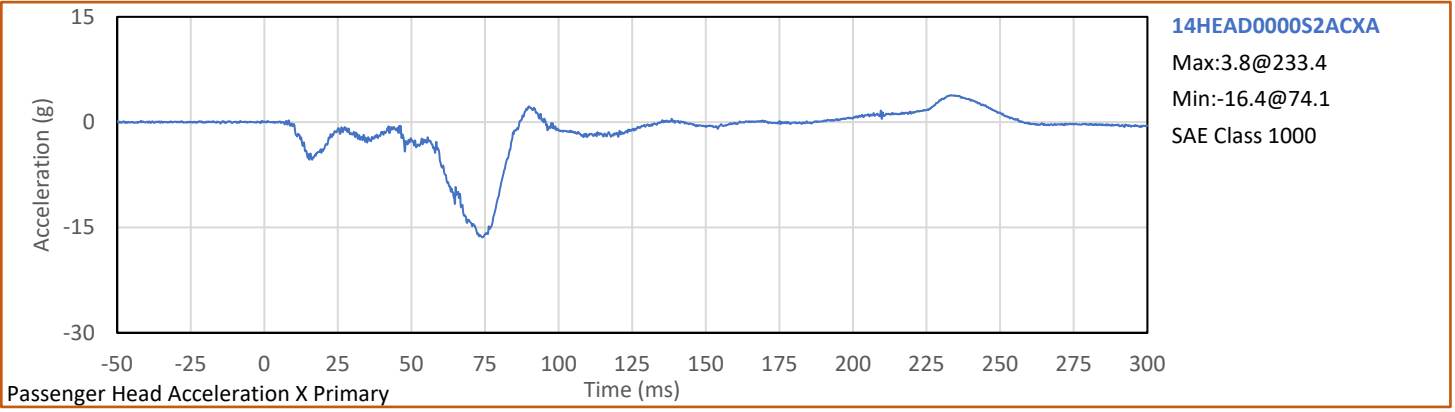


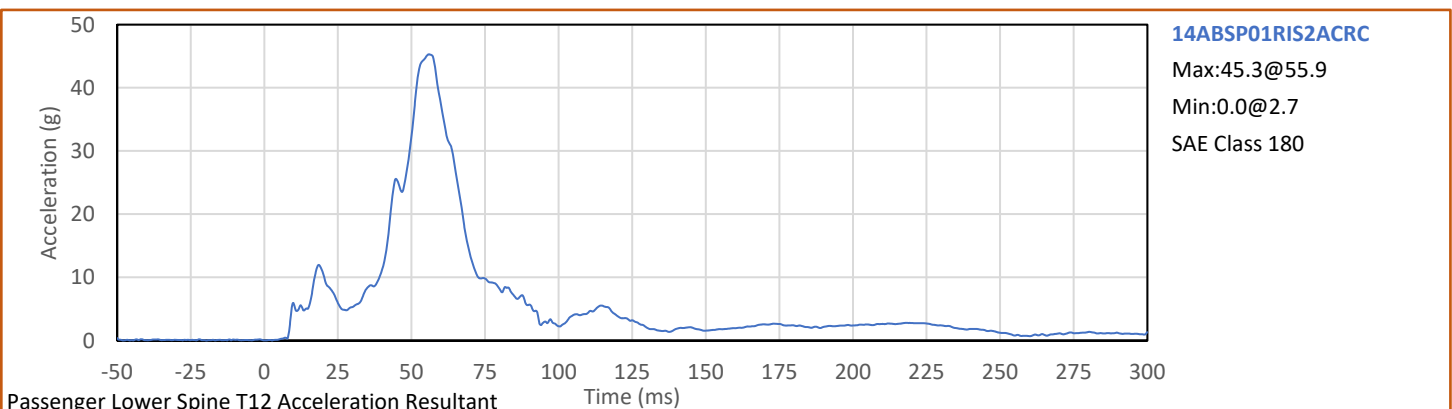
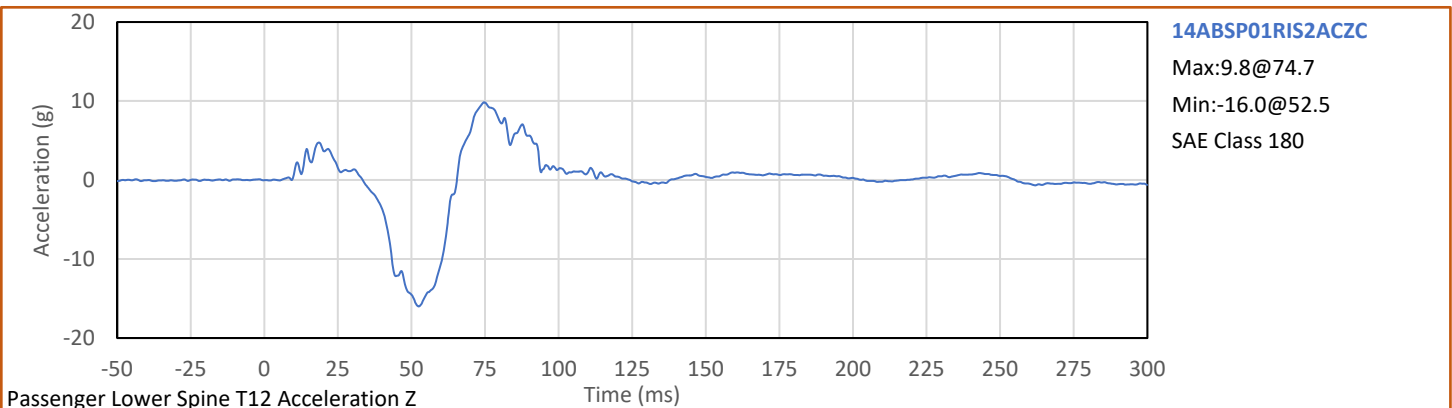
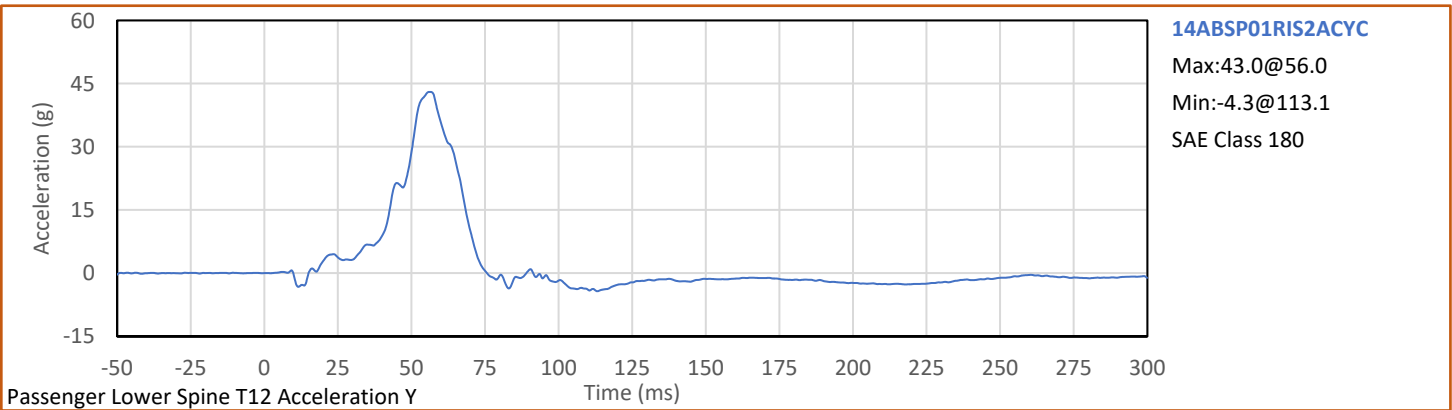
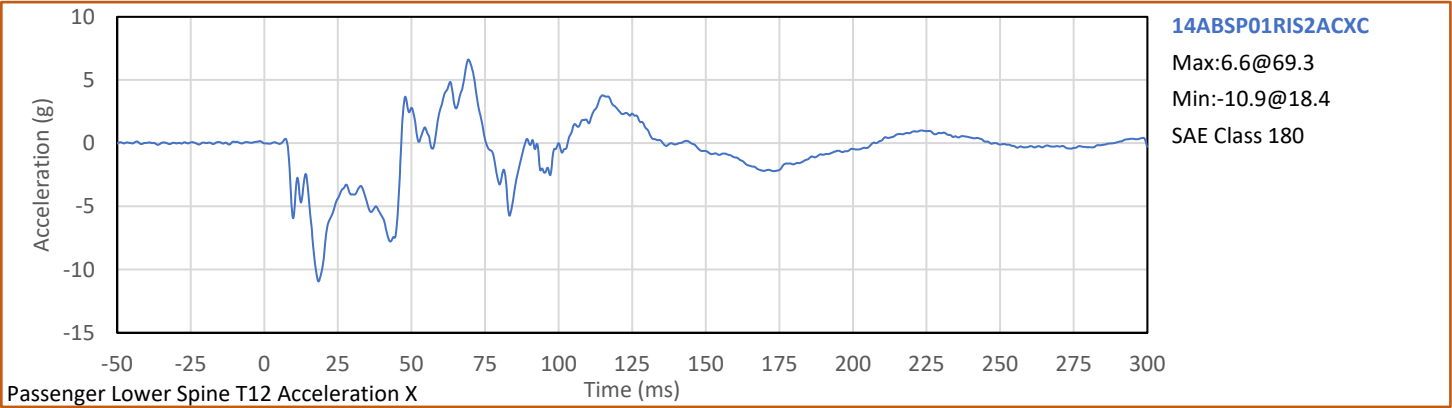
Test Vehicle: 2020 Tesla Model Y 5-Door MPV  
Test Program: NCAP MDB Side Impact Test

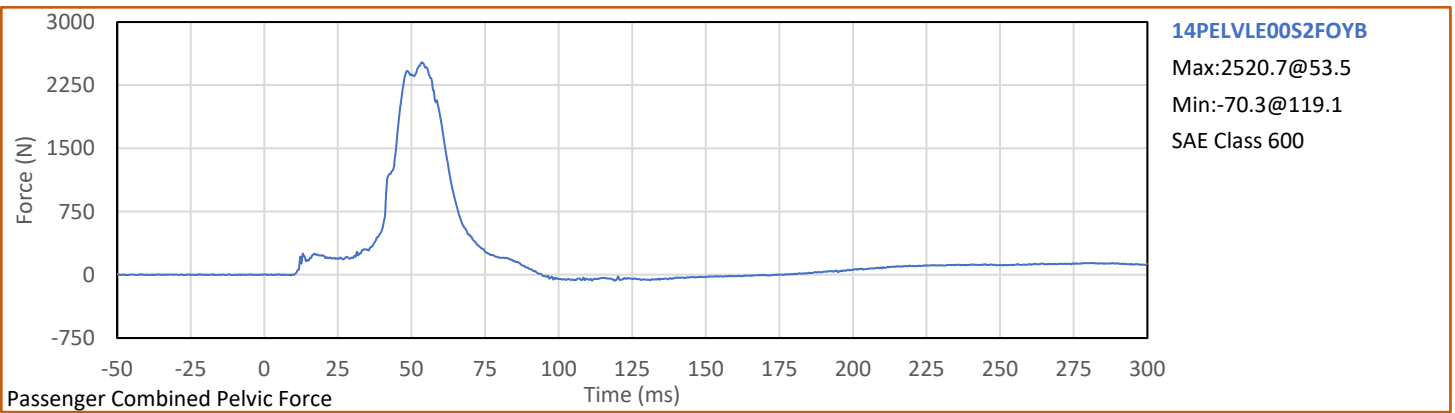
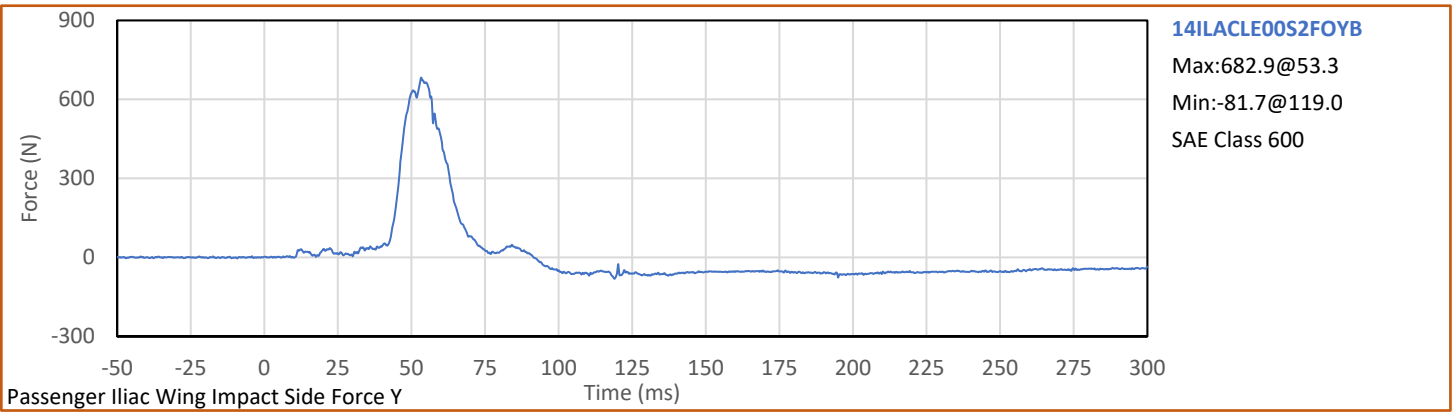
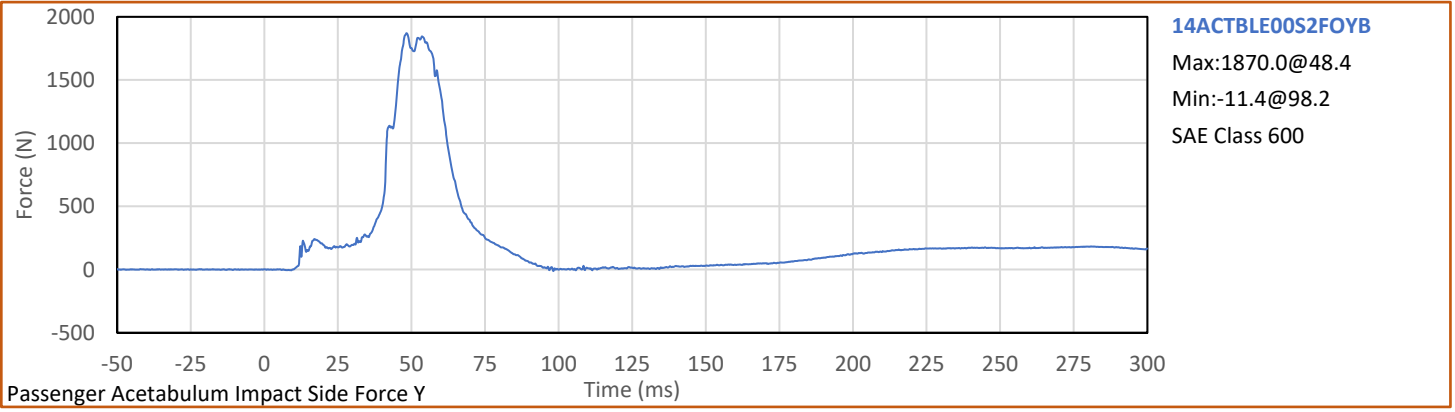
NHTSA No.: O20205002  
Test Date: 11/18/2020

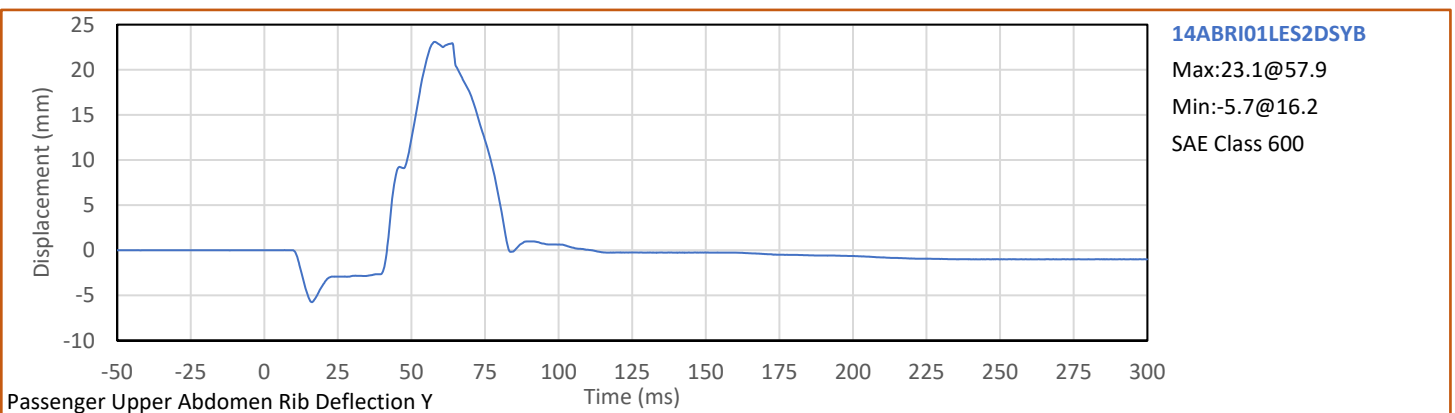
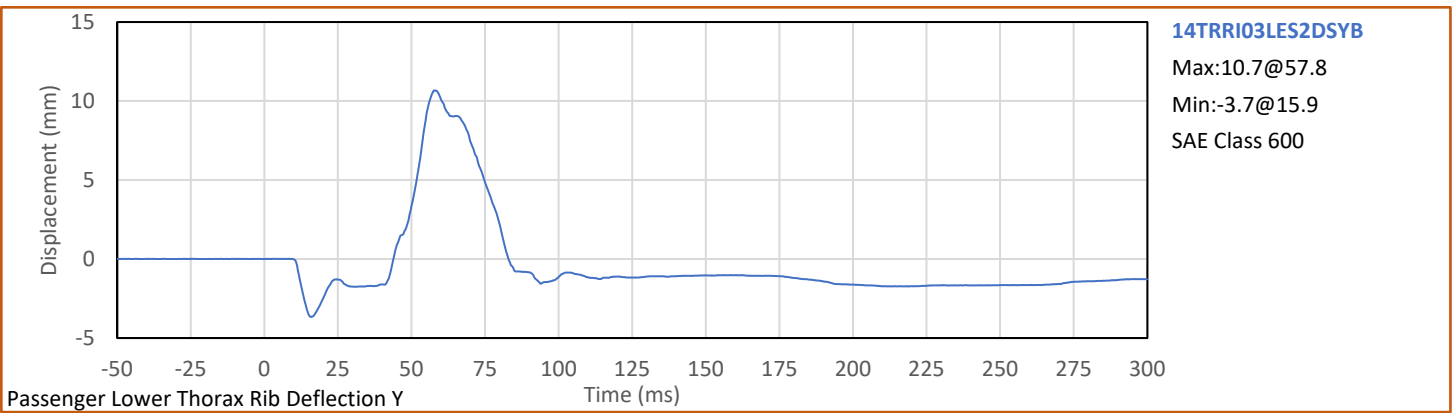
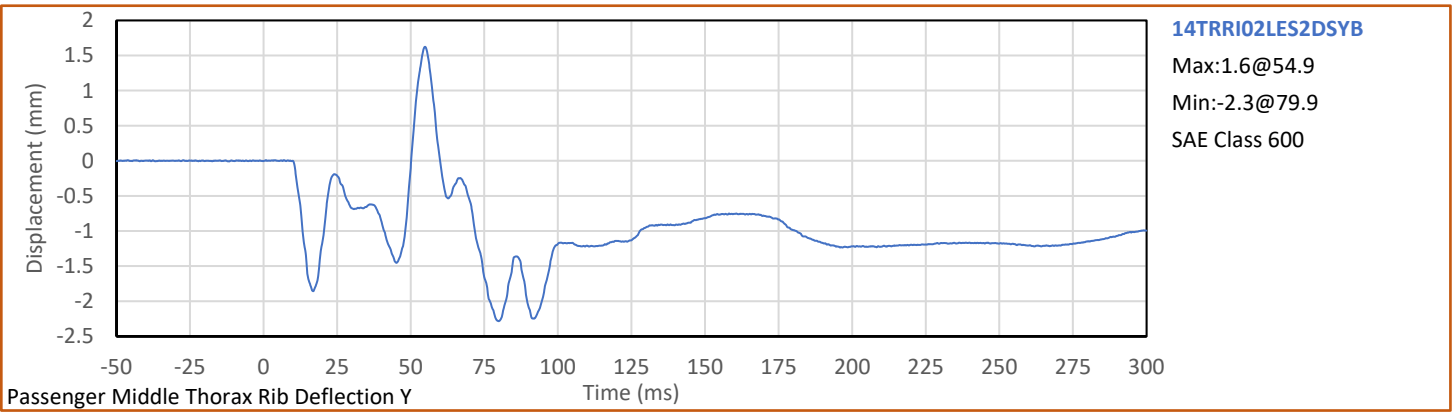
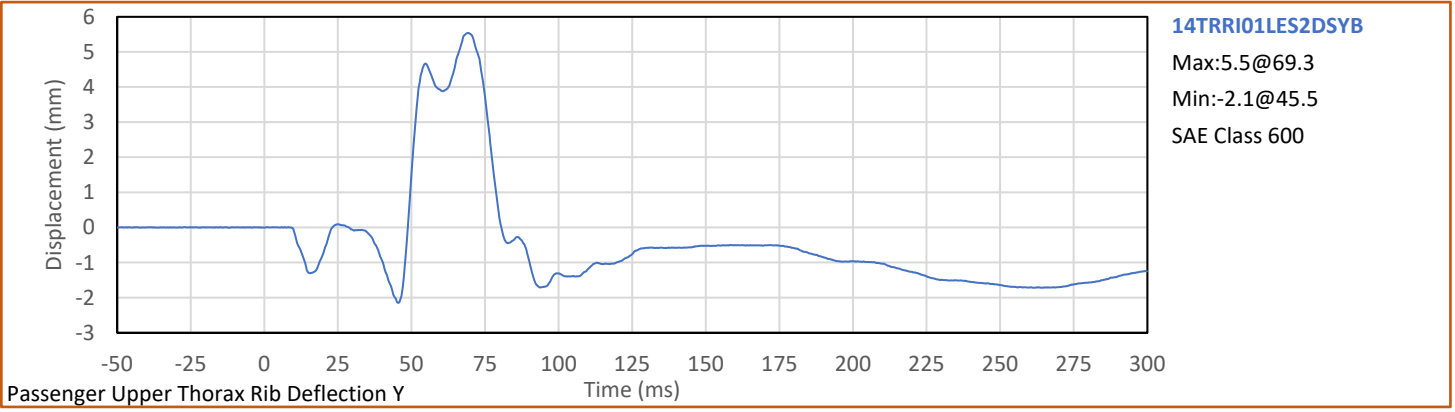












Test Vehicle: 2020 Tesla Model Y 5-Door MPV

NHTSA No.: O20205002

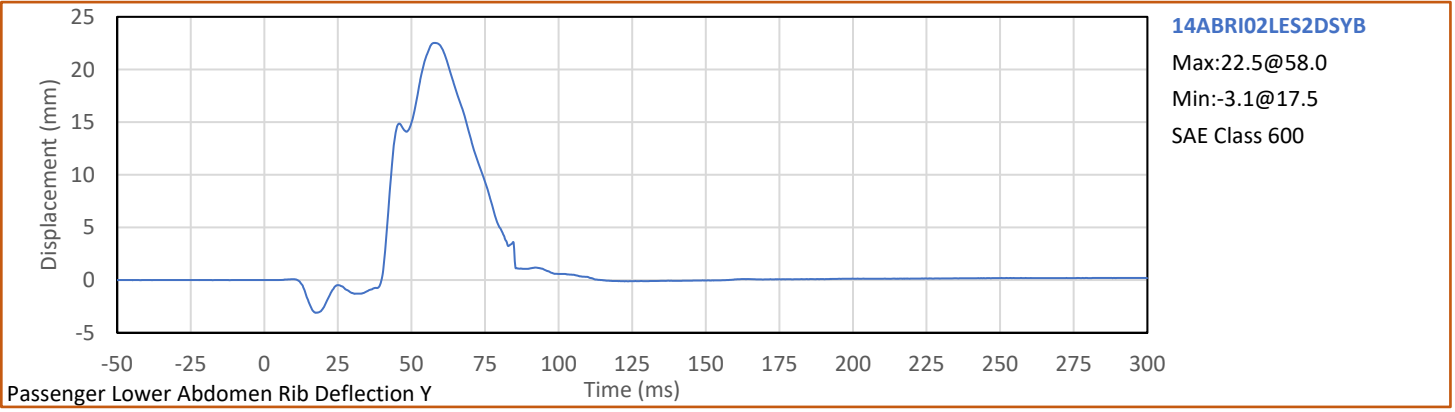
Applus<sup>®</sup>

Test Program: NCAP MDB Side Impact Test

Test Date: 11/18/2020

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**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: F035**

ATD Serial No.: F035

Test Date: 2020-11-13

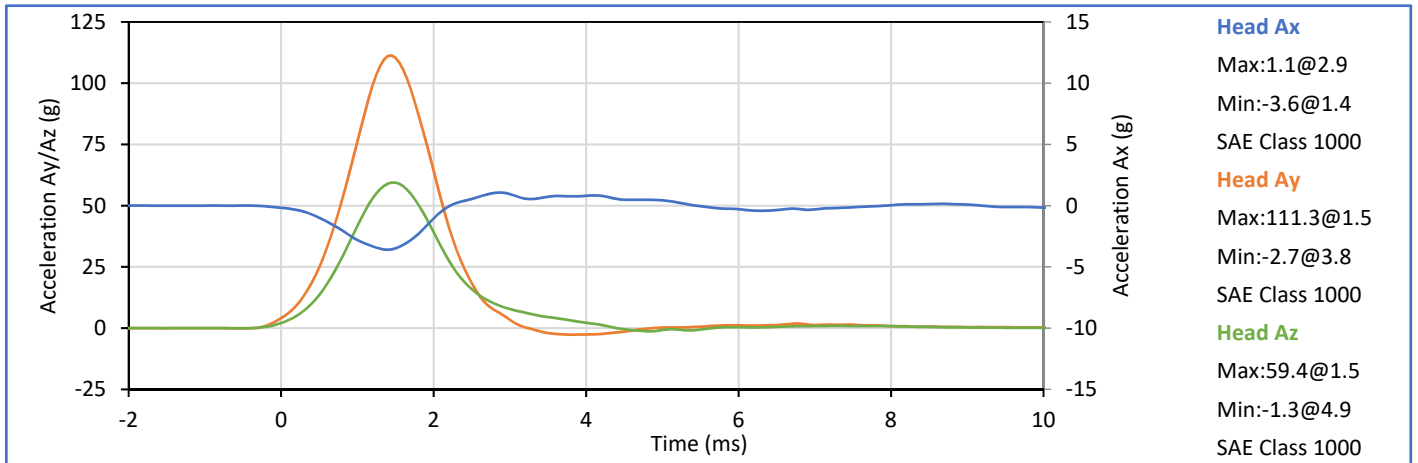
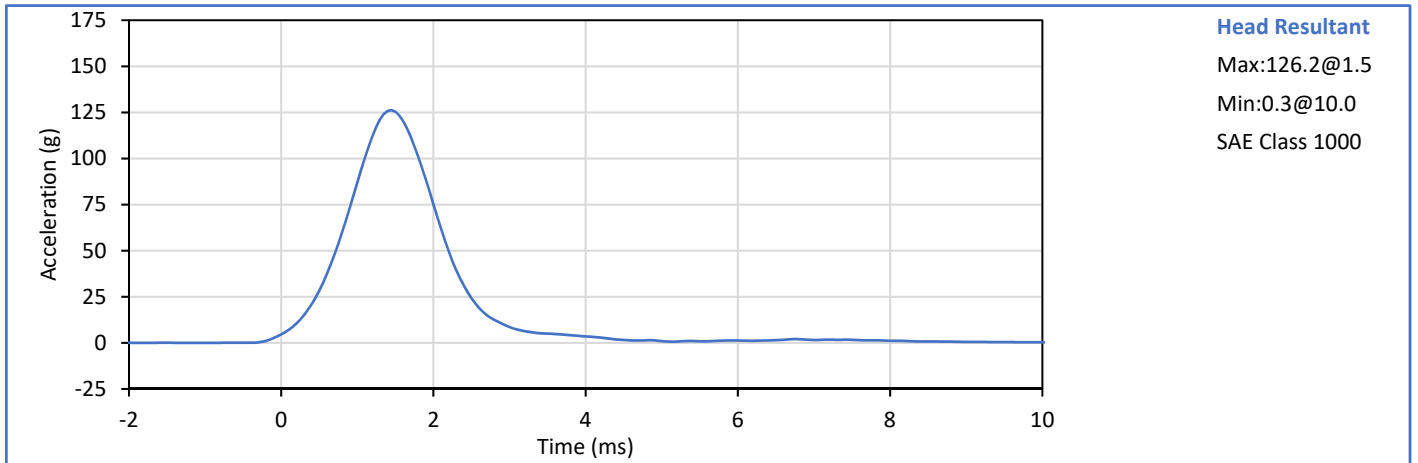
Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	32	Pass
1 - Sitting Height	mm	900	918	907	Pass
2 - Seat to Shoulder Joint	mm	558	572	564	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	348	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	102	Pass
5 - Sole to Seat, Sitting	mm	433	451	445	Pass
6 - Head Width	mm	152	158	154	Pass
7 - Shoulder/Arm Width	mm	461	479	476	Pass
8 - Thorax Width	mm	322	332	324	Pass
9 - Abdomen Width	mm	273	287	277	Pass
10 - Pelvis Lap Width	mm	359	373	362	Pass
11 - Head Depth	mm	196	206	199	Pass
12 - Thorax Depth	mm	262	272	270	Pass
13 - Abdomen Depth	mm	194	204	197	Pass
14 - Pelvis Depth	mm	235	245	238	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	156	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	612	Pass
				Overall Test Results	Pass


Technician:   
J. Hernandez


Approved By:   
P. Puzzuto



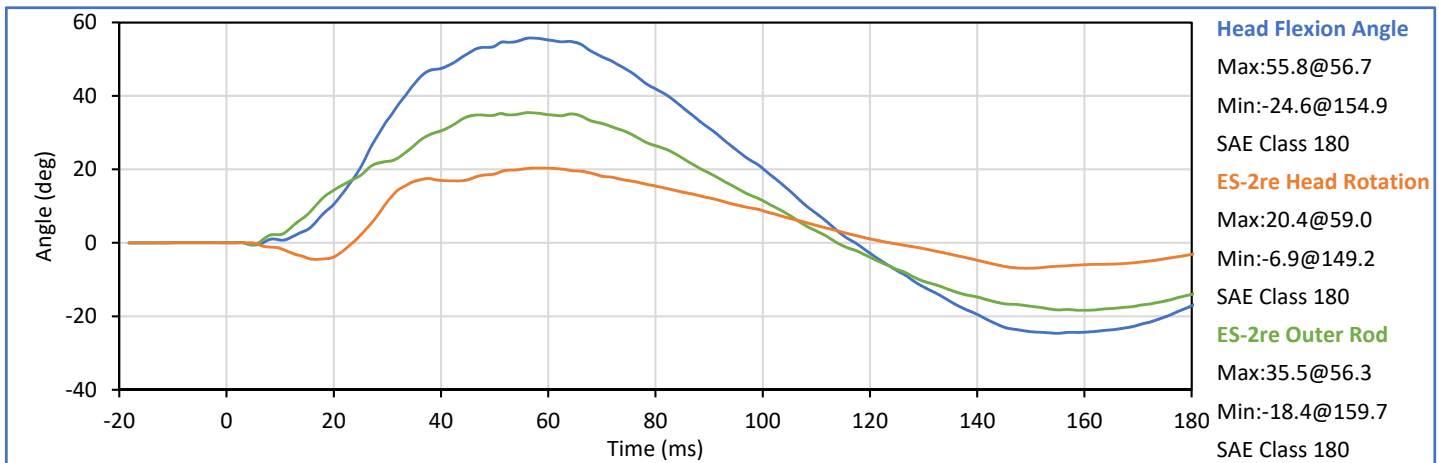
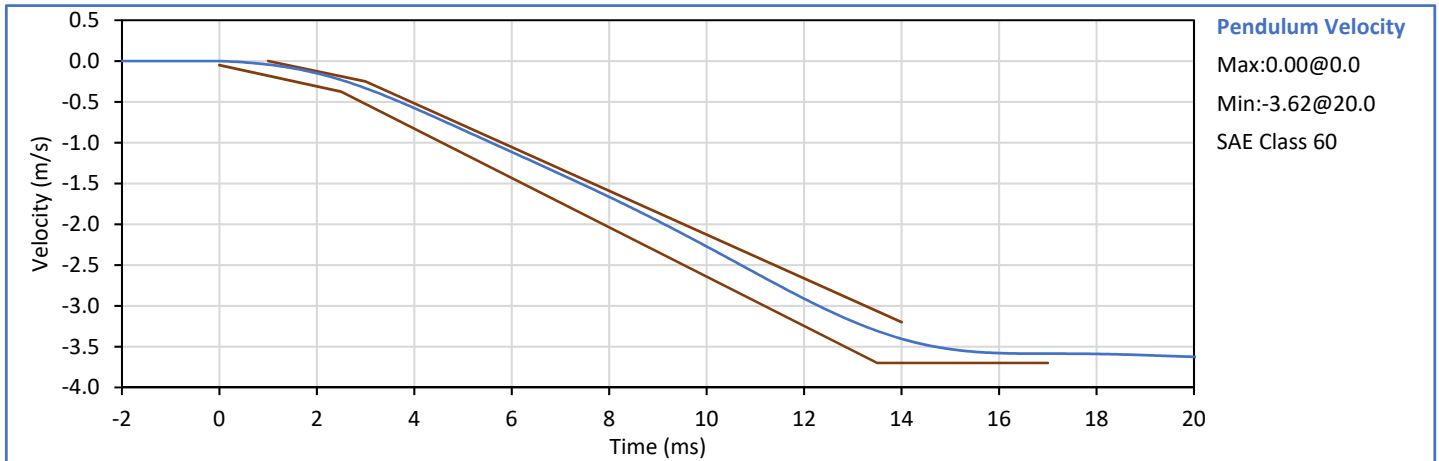
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Peak Resultant Acceleration	g	125.0	155.0	126.2	Pass
Peak Head Ax	g	-15.0	15.0	1.1	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass




Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

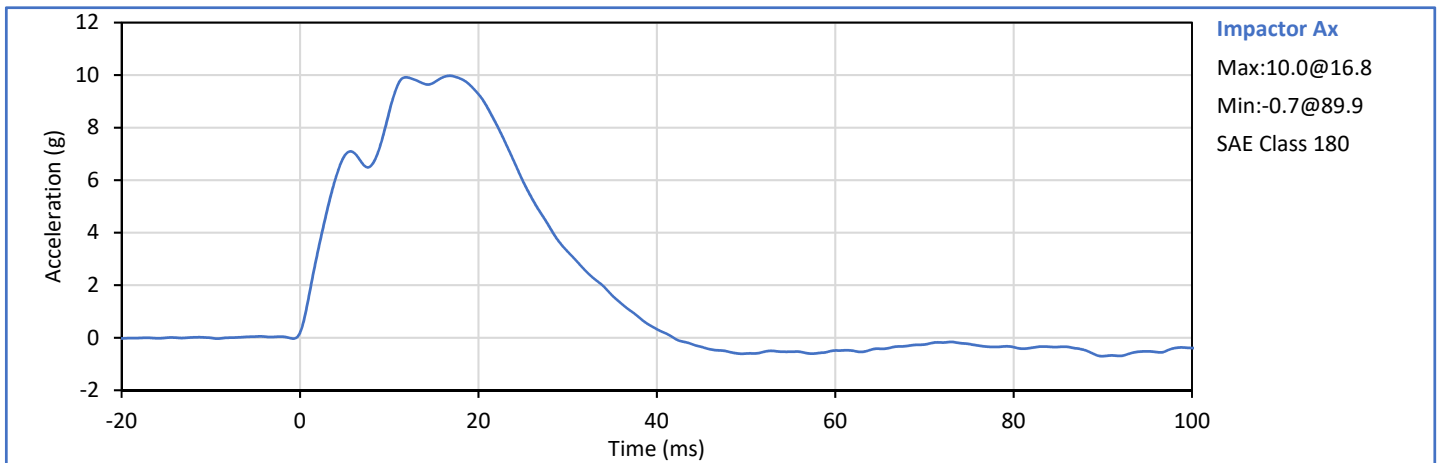
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Pendulum Velocity	m/s	3.30	3.50	3.47	Pass
Peak Headform Flexion	deg	49.0	59.0	55.8	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	56.7	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	60.6	Pass
Overall Test Results					Pass



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Impactor Ax	g	7.5	10.5	10.0	Pass
Overall Test Results					Pass



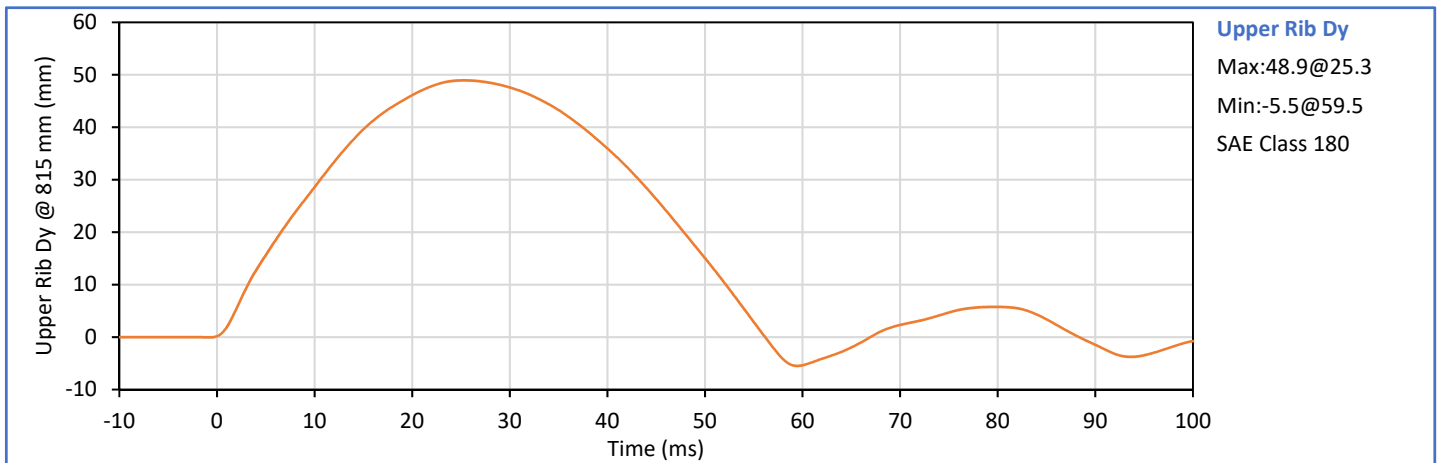
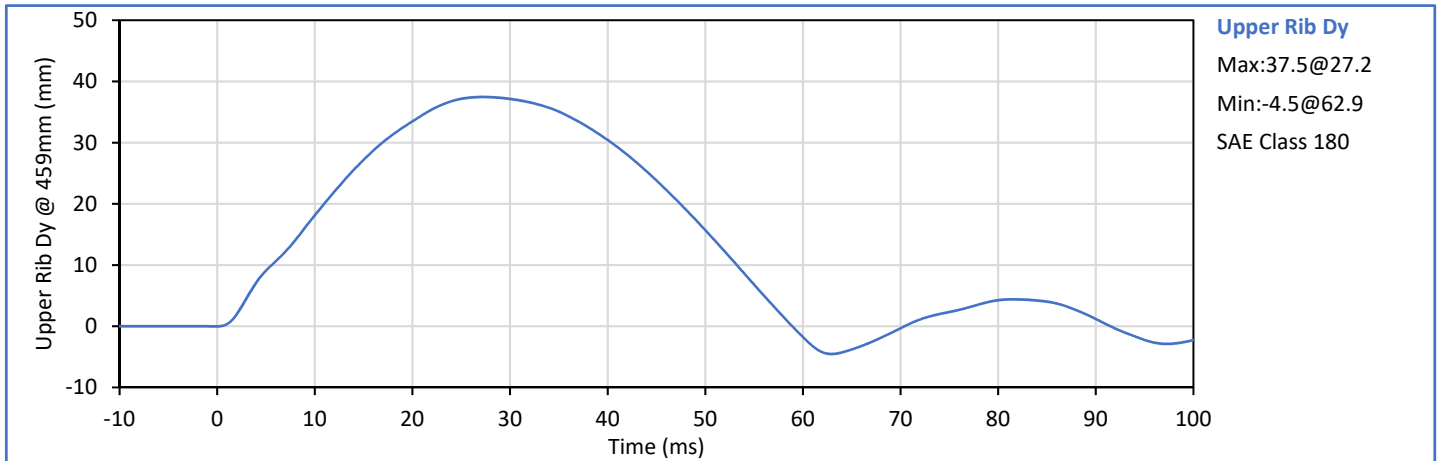
Technician: *J. Hernandez*  
J. Hernandez

Approved By: *P. Puzzuto*  
P. Puzzuto

ATD Serial No.: F035

Test Date: 2020-11-16

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	19	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.5	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	48.9	Pass
Overall Test Results					Pass



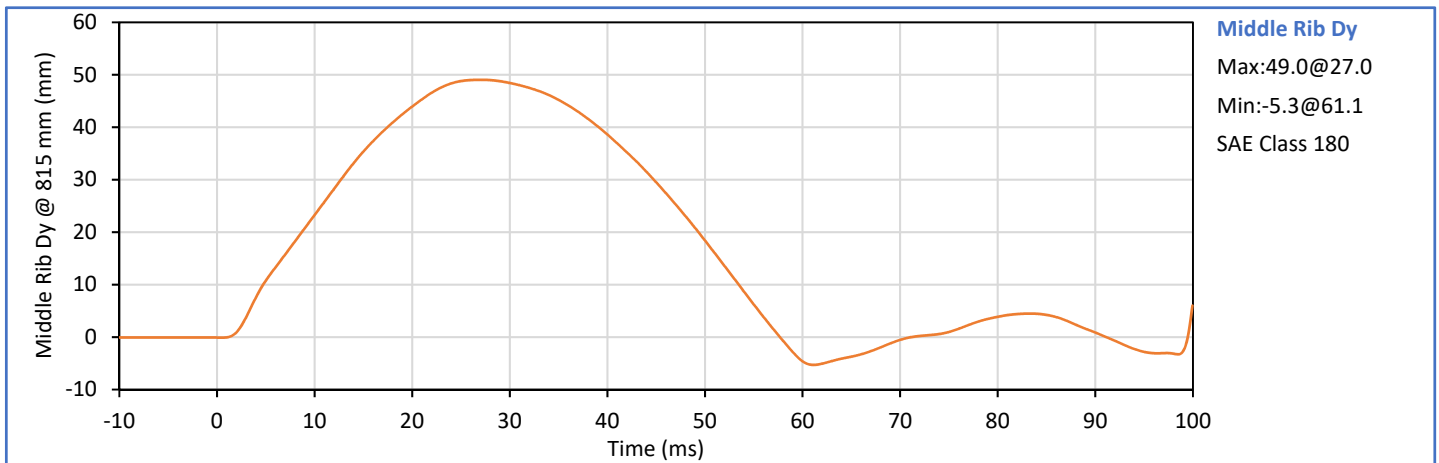
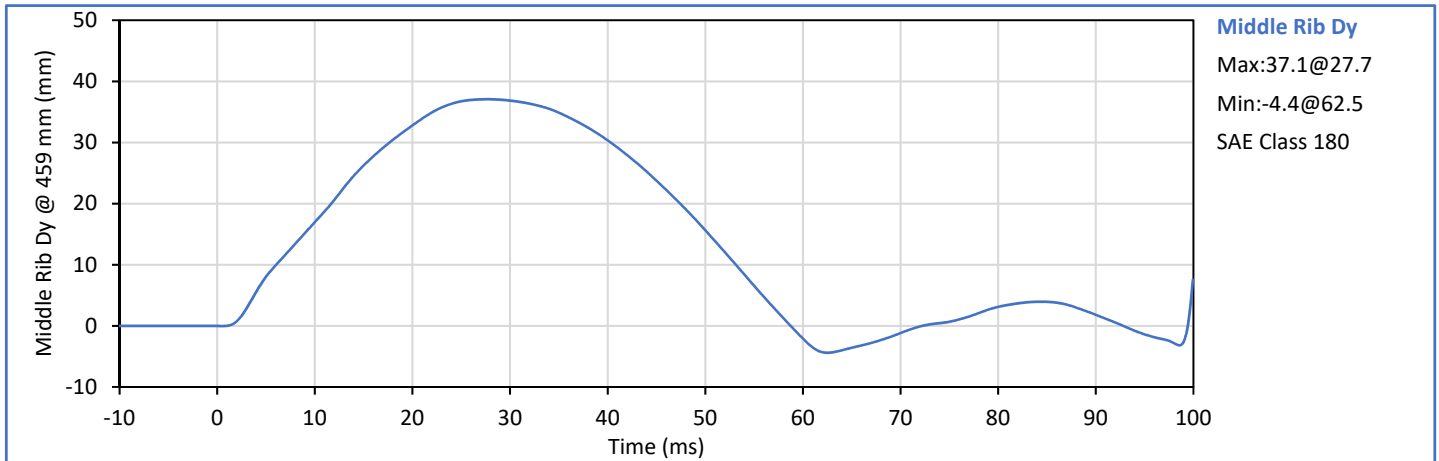
Technician: *J. Hernandez*  
J. Hernandez

Approved By: *P. Puzzuto*  
P. Puzzuto

ATD Serial No.: F035

Test Date: 2020-11-16

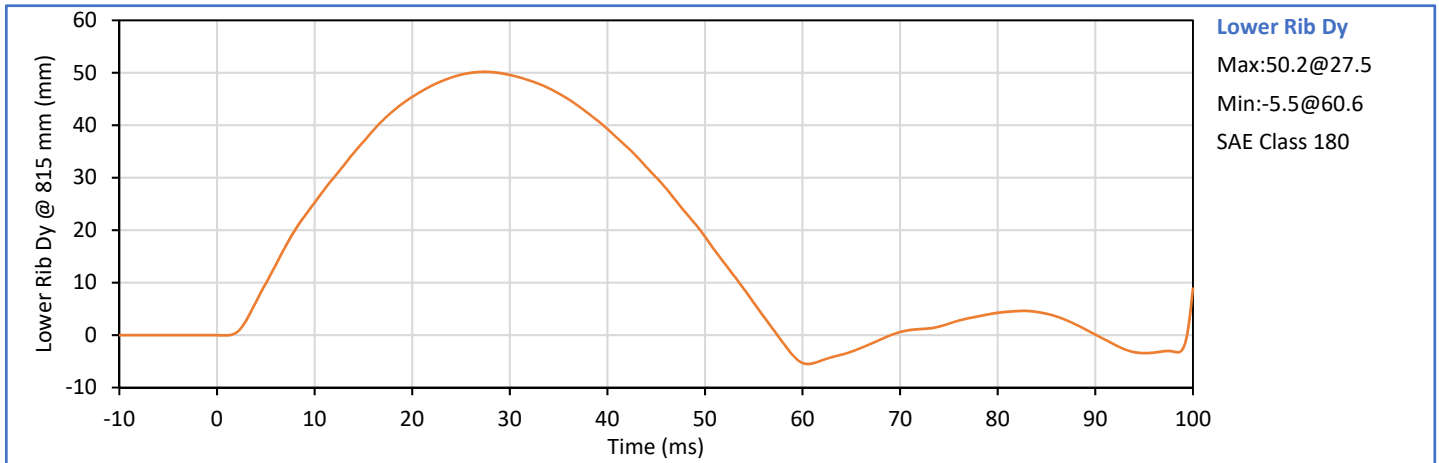
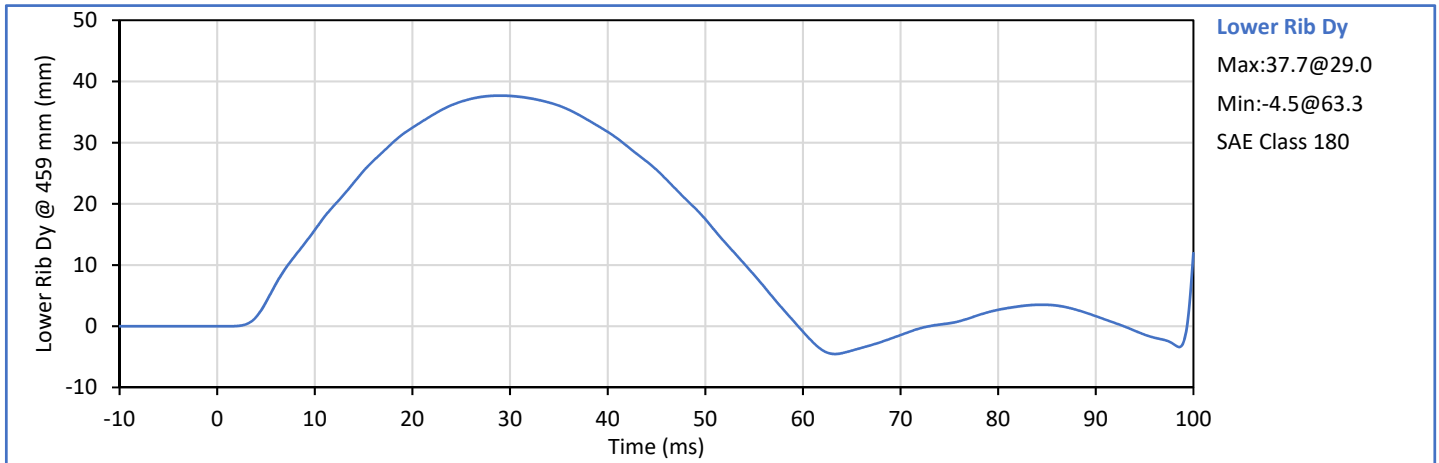
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	37.1	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	49.0	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*  
J. Hernandez

Approved By: *P. Puzzuto*  
P. Puzzuto

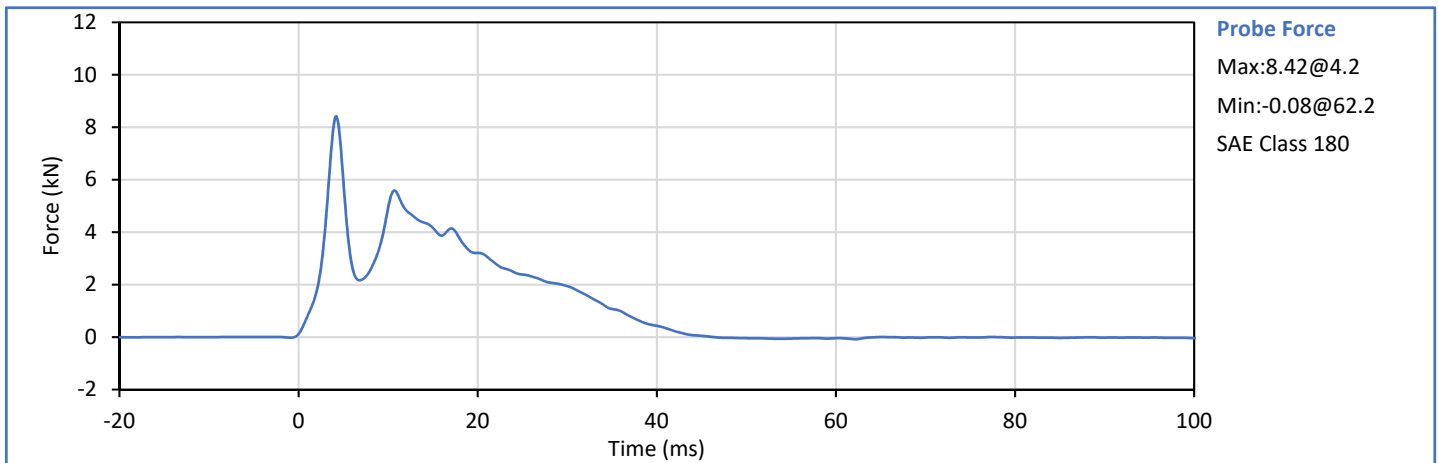
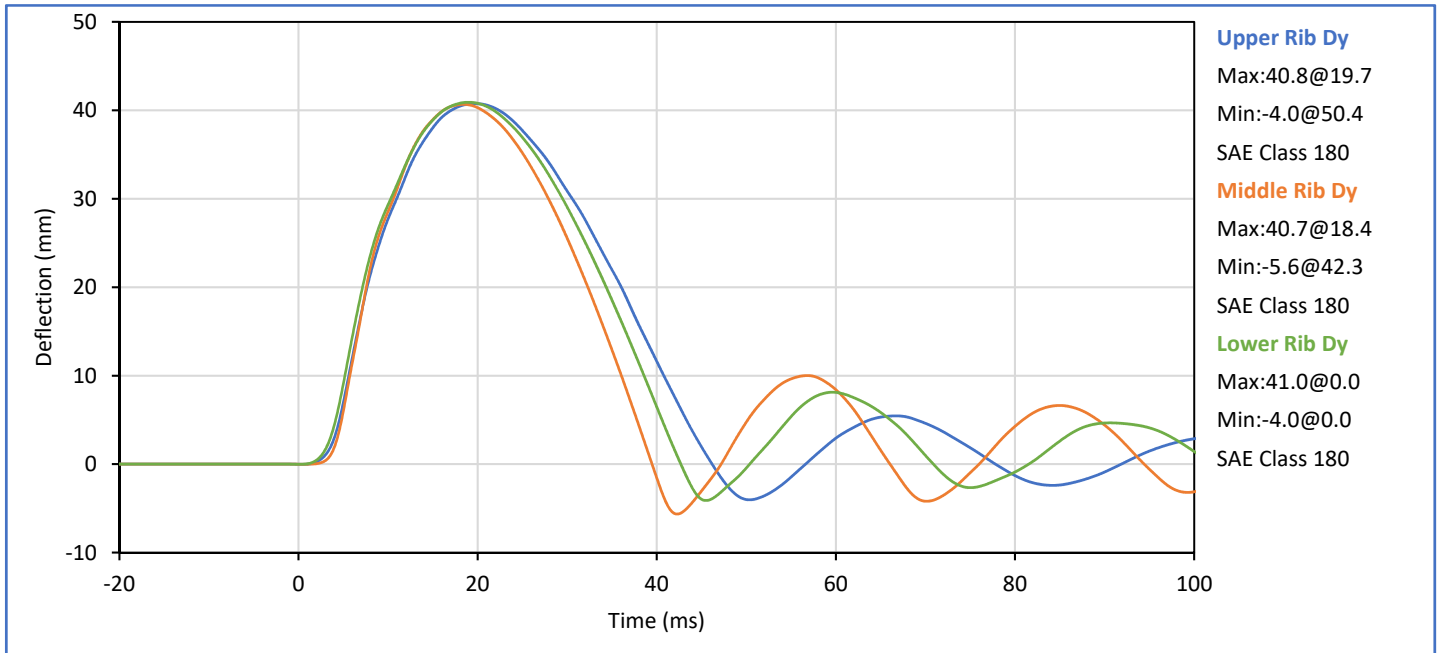
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Lower Rib Dy @ 459mm	mm	36.0	40.0	37.7	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	50.2	Pass
Overall Test Results					Pass

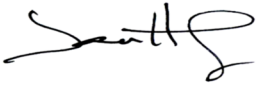



Technician: *J. Hernandez*  
J. Hernandez

Approved By: *P. Puzzuto*  
P. Puzzuto

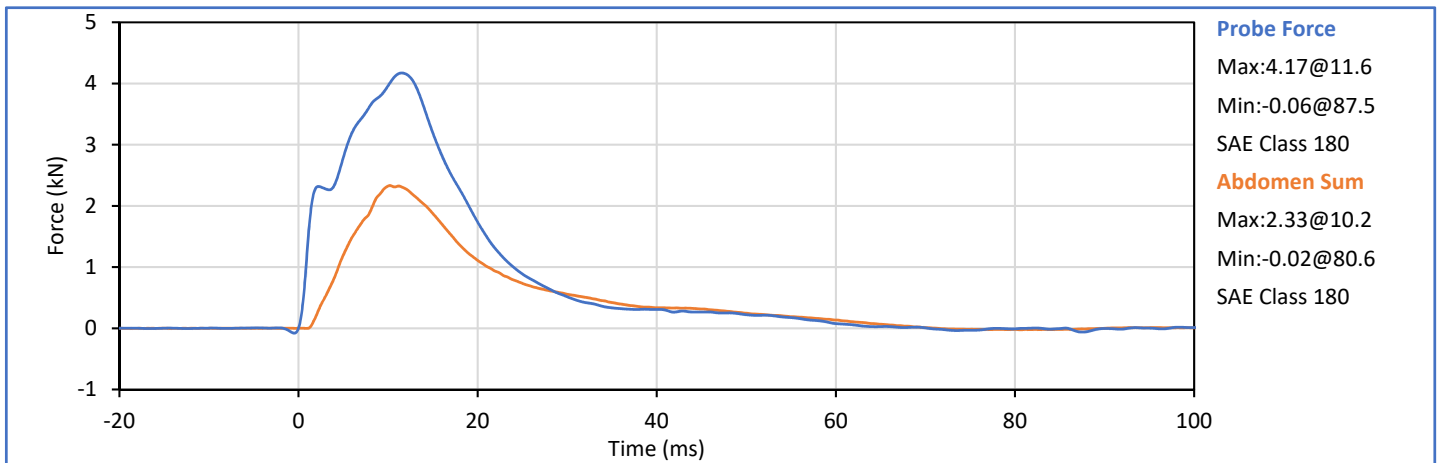
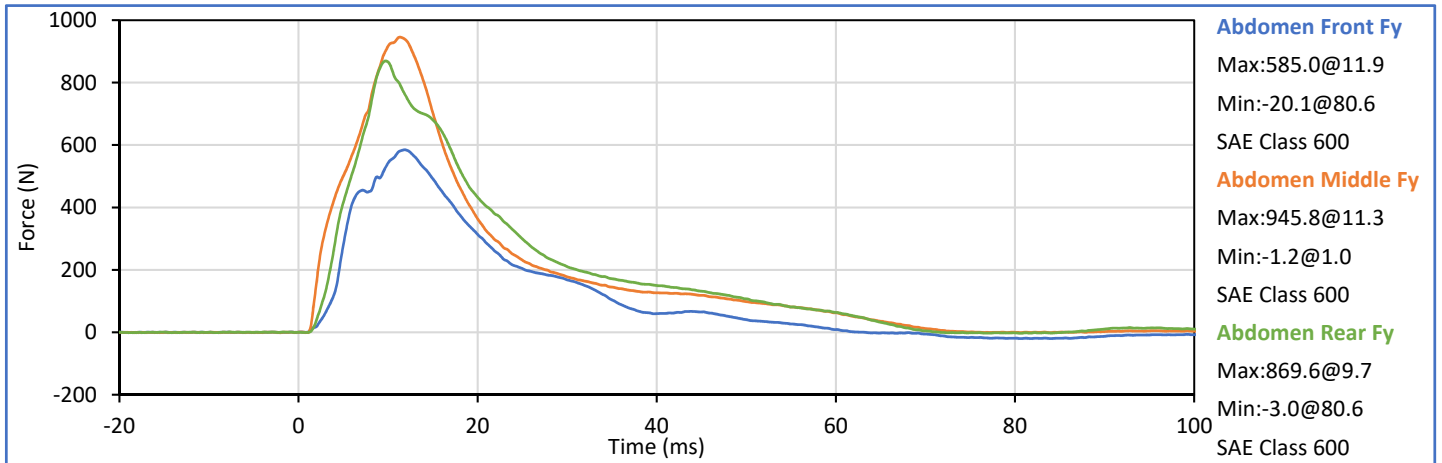
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
Impactor Velocity	m/s	5.40	5.60	5.46	Pass
Peak Upper Rib Dy	mm	34.0	41.0	40.8	Pass
Peak Middle Rib Dy	mm	37.0	45.0	40.7	Pass
Peak Lower Rib Dy	mm	37.0	44.0	40.9	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.59	Pass
<b>Overall Test Results</b>					<b>Pass</b>

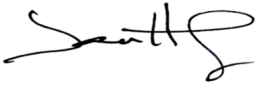



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
Impactor Velocity	m/s	3.90	4.10	4.03	Pass
Peak Impactor Force	kN	4.00	4.80	4.17	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.6	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.33	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.2	Pass
<b>Overall Test Results</b>					<b>Pass</b>

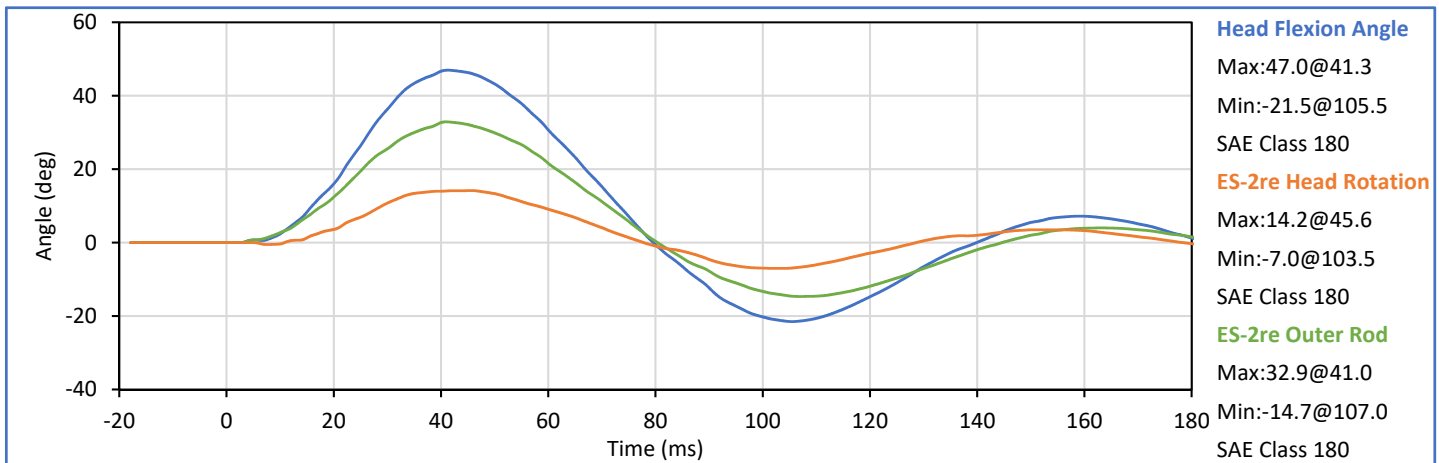
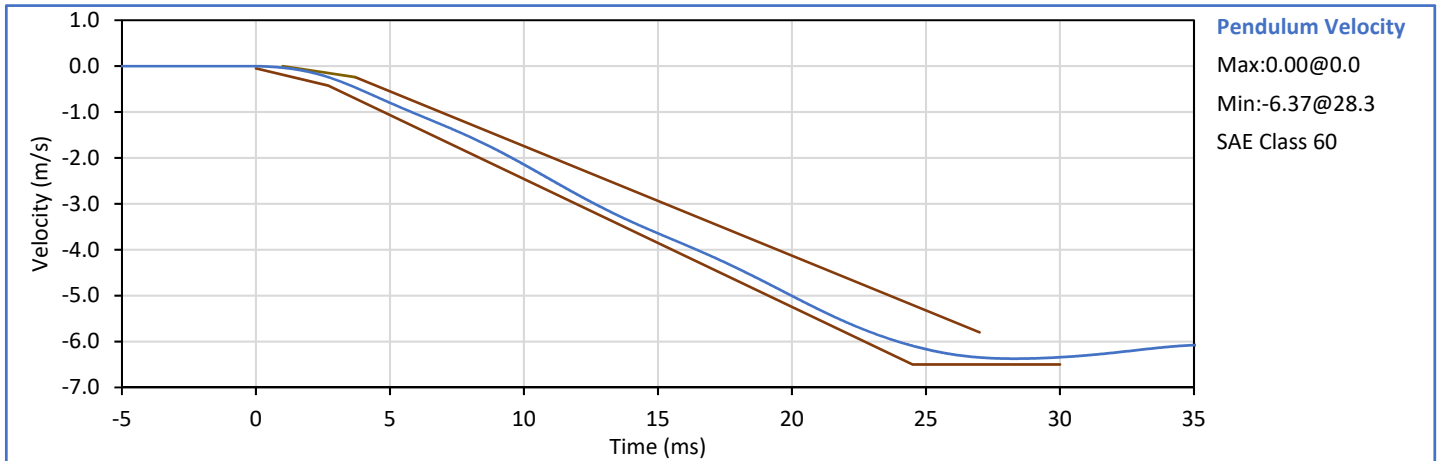


Technician:   
J. Hernandez

Approved By:   
P. Puzzuto



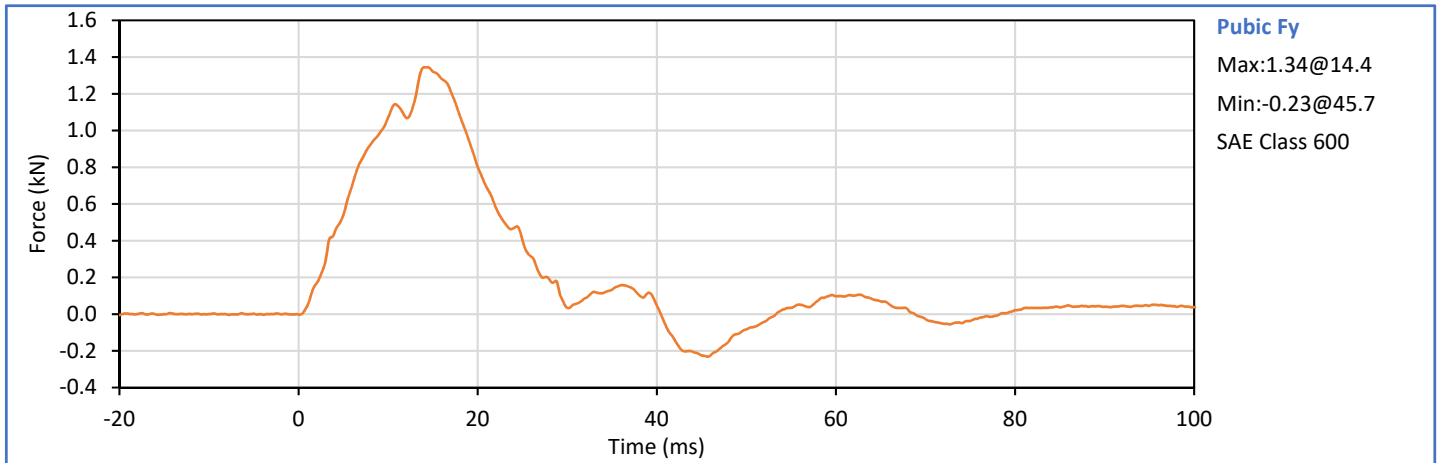
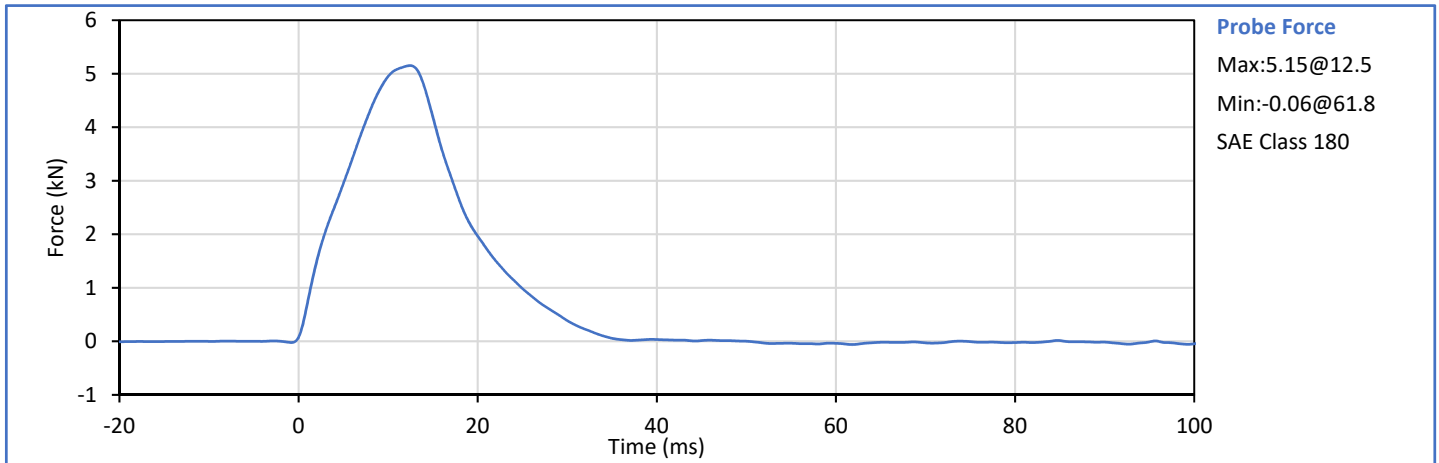
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Pendulum Velocity	m/s	5.95	6.15	6.05	Pass
Peak Headform Flexion	deg	45.0	55.0	47.0	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	41.3	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	38.3	Pass
Overall Test Results					Pass

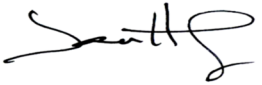



Technician: *J. Hernandez*  
J. Hernandez

Approved By: *P. Puzzuto*  
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Relative Humidity	%	10	70	21	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Impactor Force	kN	4.70	5.40	5.15	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.5	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.34	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	14.4	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

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

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	44	Pass
A - Sitting Height	mm	772	788	782	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	149	Pass
E - Shoulder Pivot From Backline	mm	97	107	105	Pass
F - Thigh Clearance	mm	119	135	126	Pass
G - Head Breadth	mm	140	148	143	Pass
H - Head Back From Backline	mm	40	46	42	Pass
I - Head Depth	mm	178	188	186	Pass
J - Head Circumference	mm	541	551	547	Pass
K - Buttock To Knee Length	mm	514	540	524	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	437	Pass
O - Chest Depth W/O Jacket	mm	195	211	207	Pass
P - Foot Length	mm	216	232	221	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	486	Pass
V - Shoulder Width	mm	341	357	345	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	862	Pass
Z - Waist Circumference	mm	761	791	779	Pass
Overall Test Results					Pass

Technician:



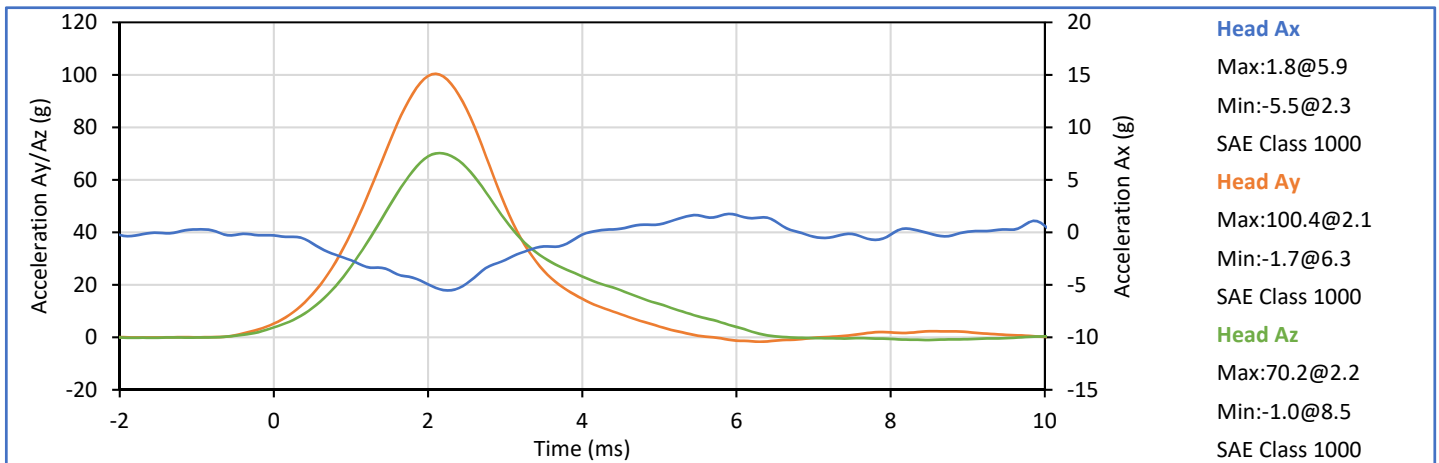
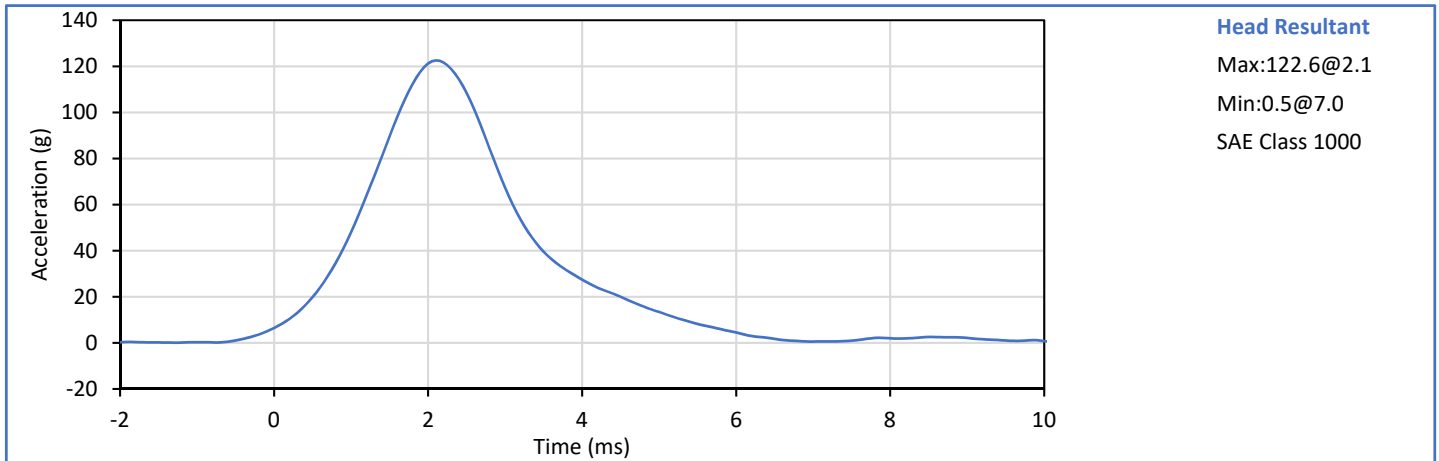
J. Hernandez

Approved By:




P. Puzzuto

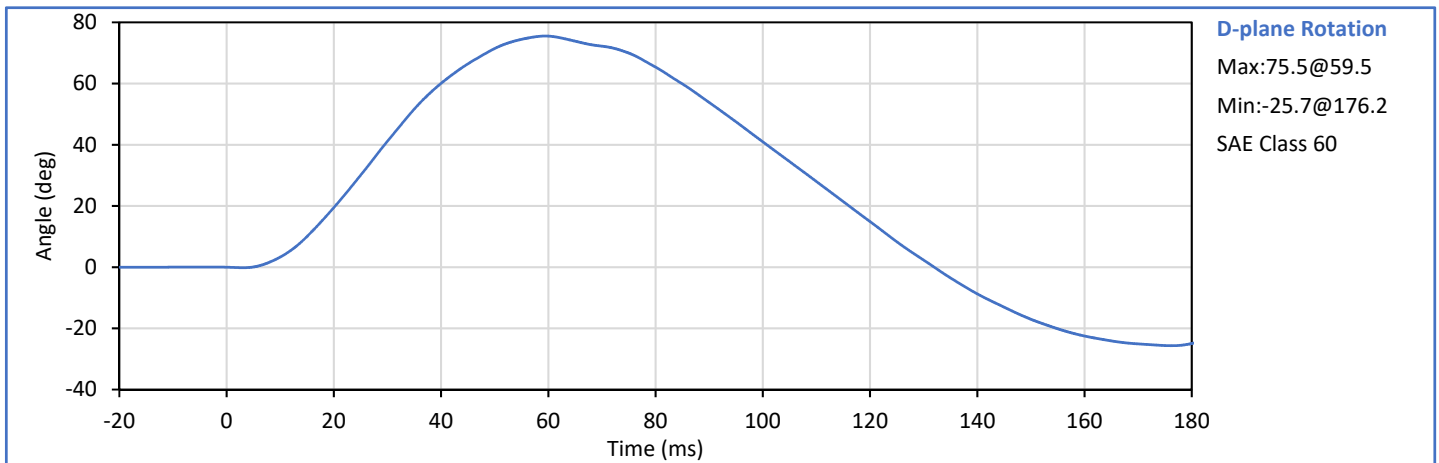
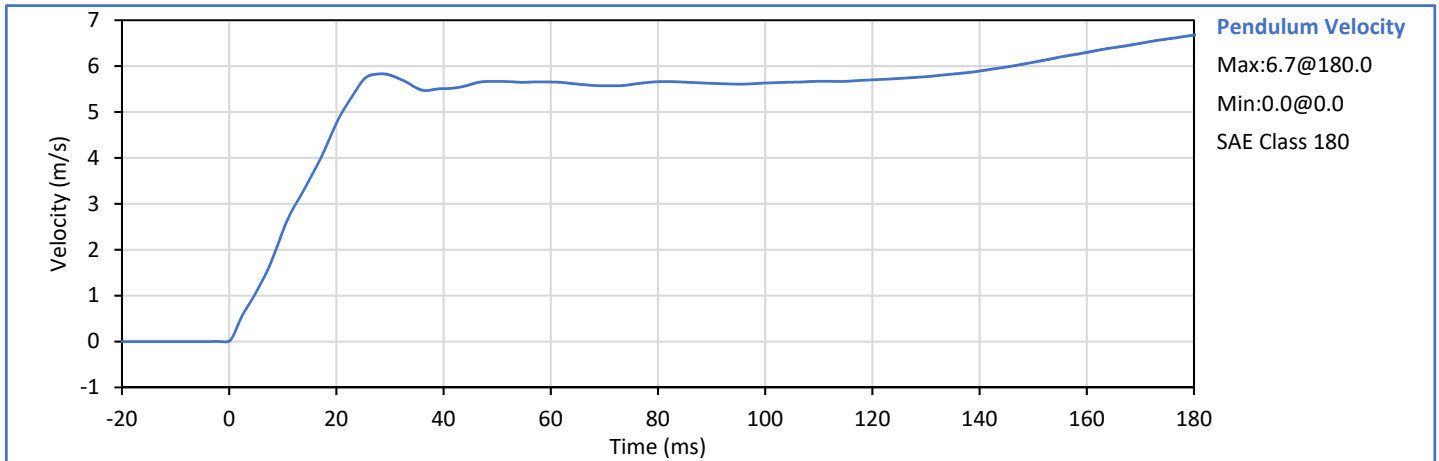
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	26	Pass
Peak Resultant Acceleration	g	115.0	137.0	122.6	Pass
Peak Head Ax	g	-15.0	15.0	-5.5	Pass
Oscillations After Main Pulse	%	0.0	15.0	3.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
<b>Overall Test Results</b>					<b>Pass</b>




Technician:   
J. Hernandez

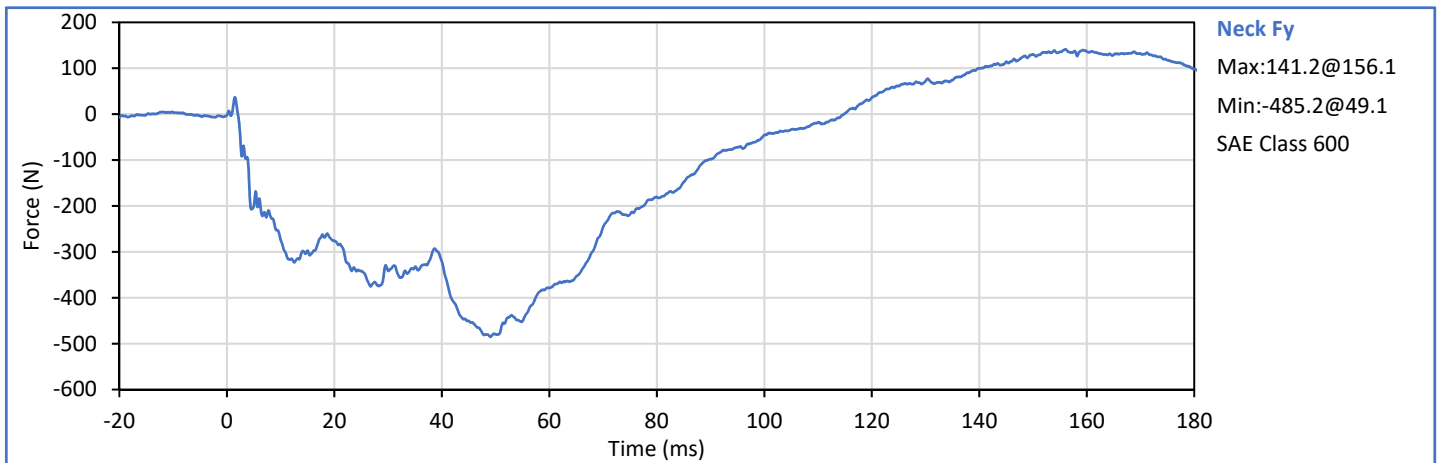
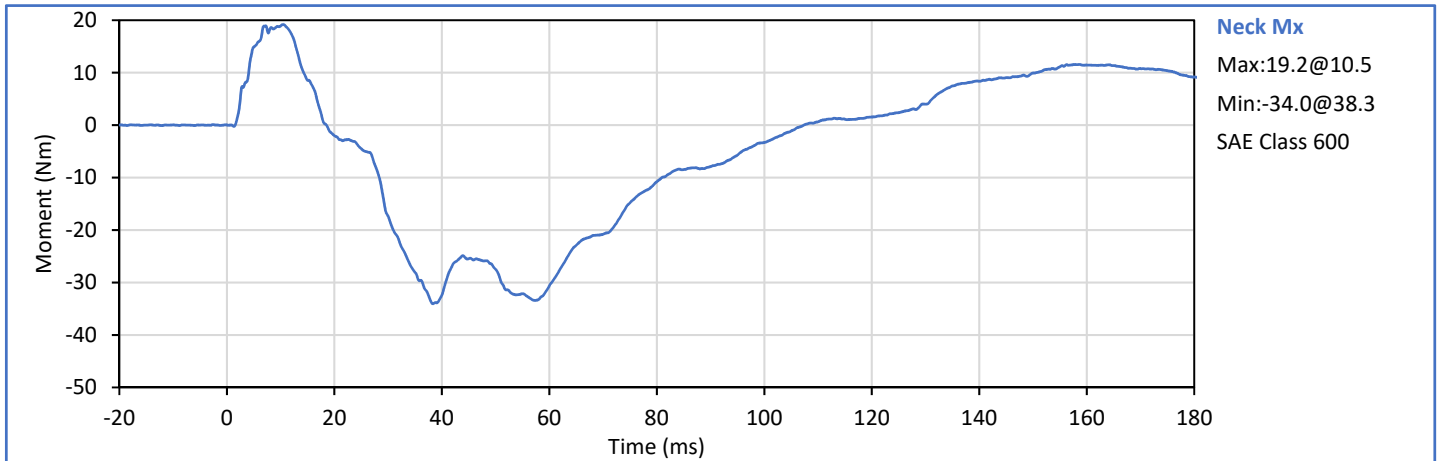
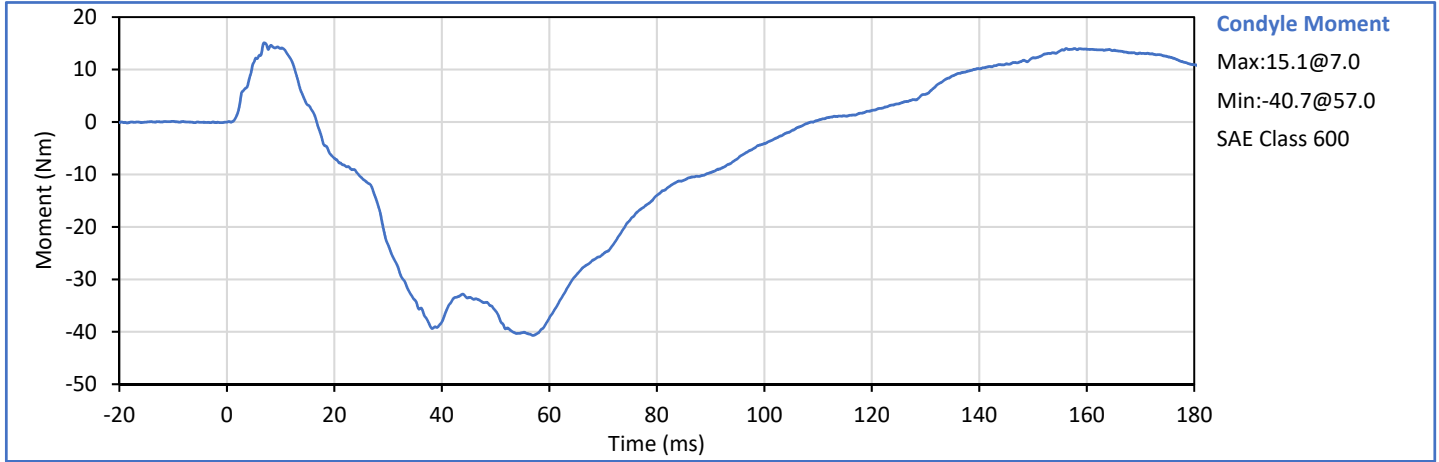
Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	26	Pass
Pendulum Velocity	m/s	5.51	5.63	5.62	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.40	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.53	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.75	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.70	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.83	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	75.5	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	59.5	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-40.7	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	109.2	Pass
<b>Overall Test Results</b>					<b>Pass</b>

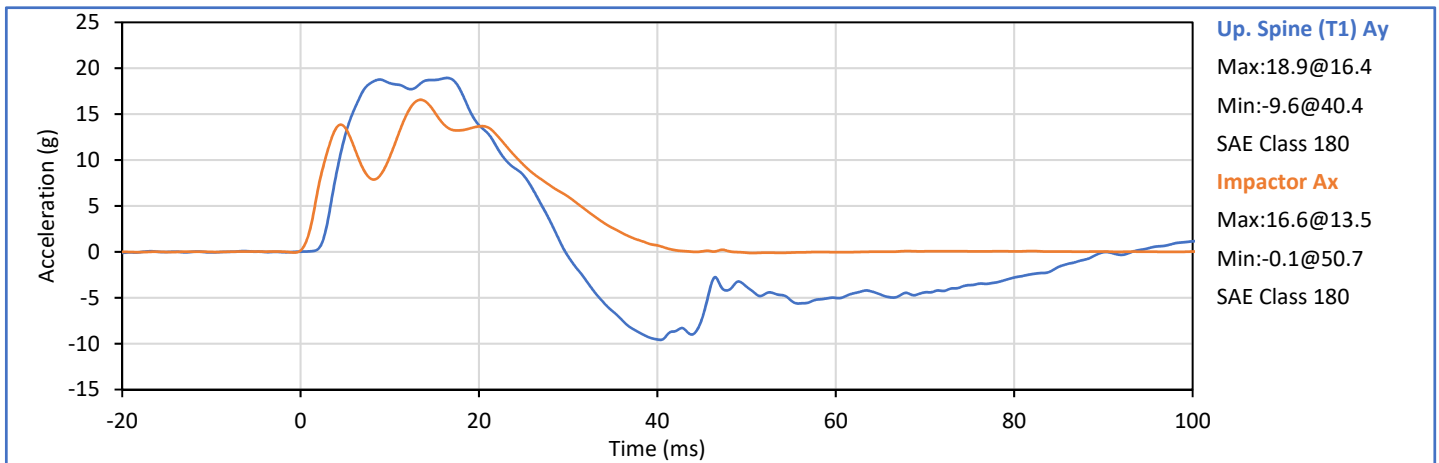
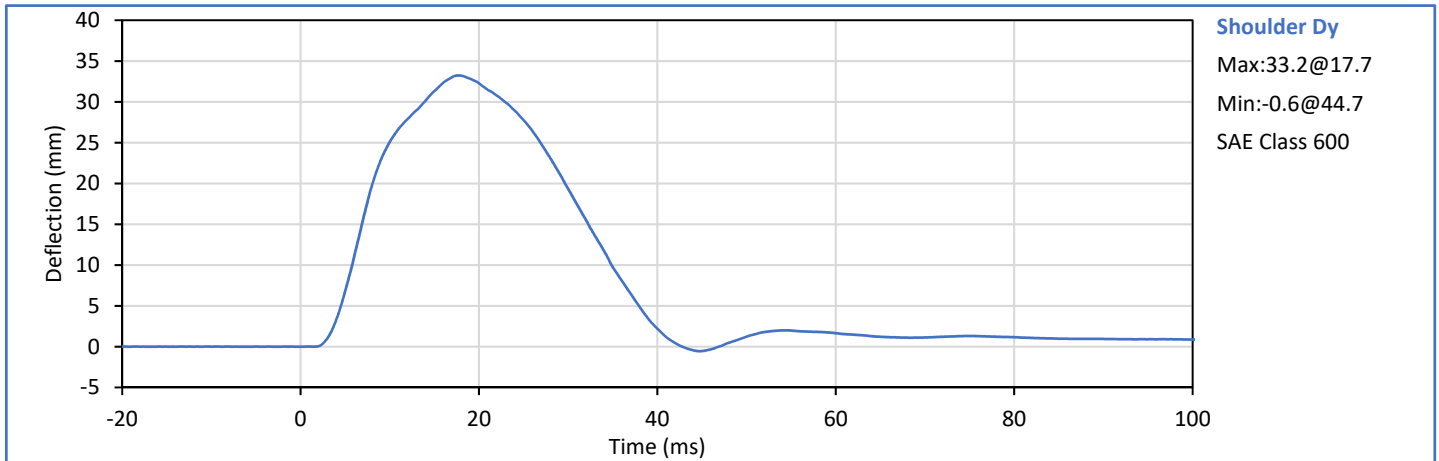


Technician:   
J. Hernandez


Approved By:   
P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.2	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.9	Pass
Peak Impactor Ax	g	13.0	18.0	16.6	Pass
Overall Test Results					Pass

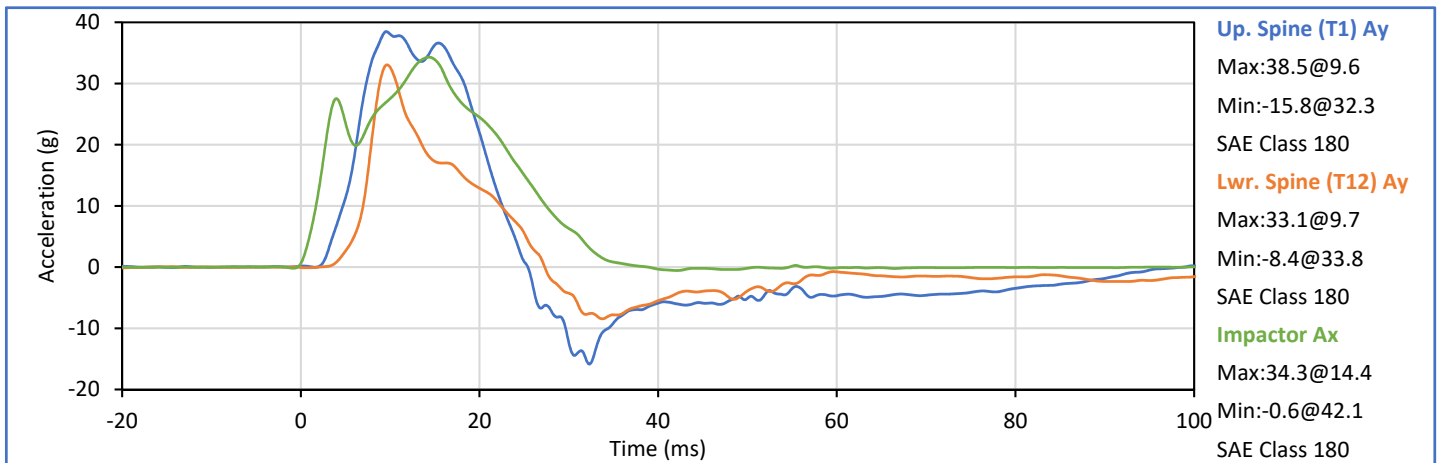
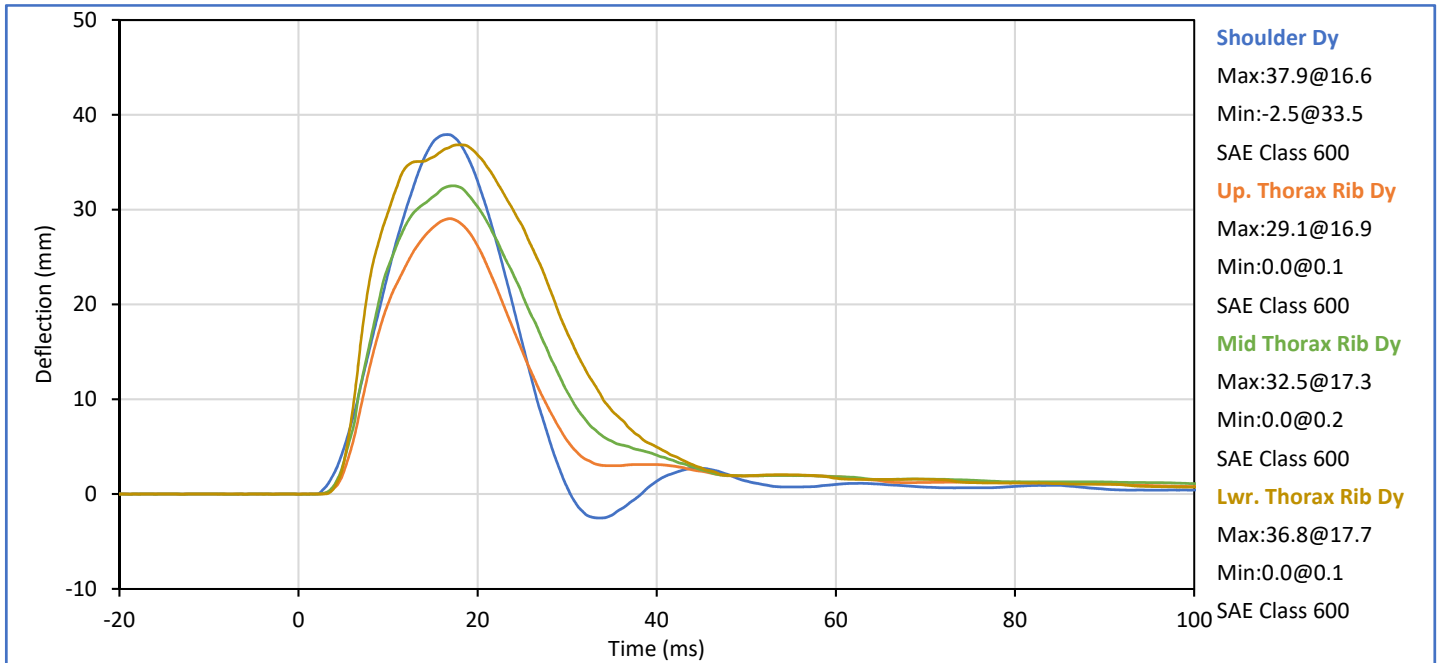


Technician:   
J. Hernandez


Approved By:   
P. Puzzuto



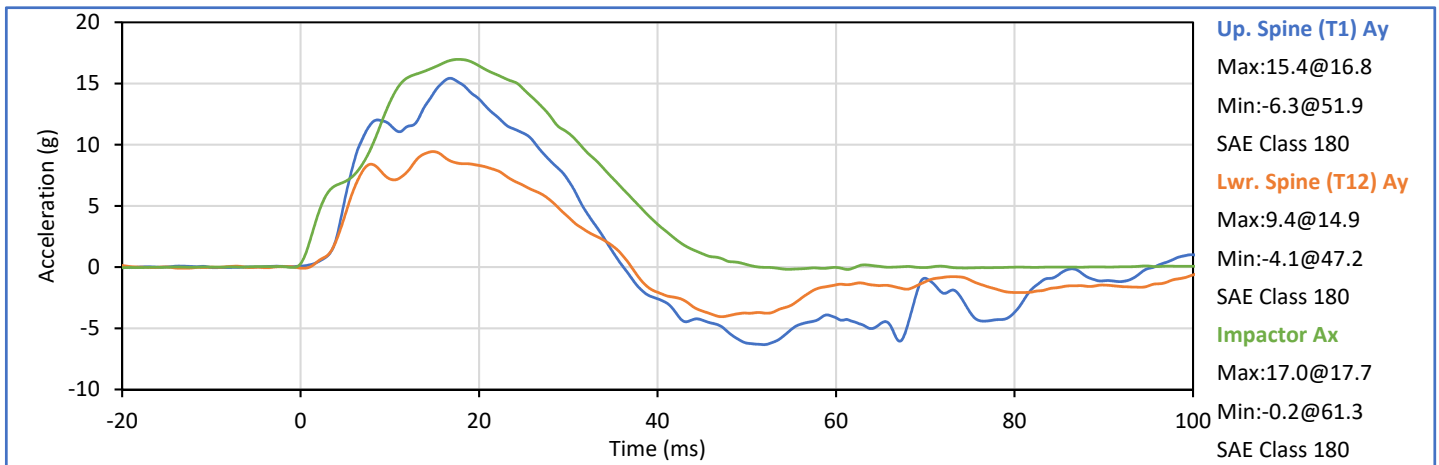
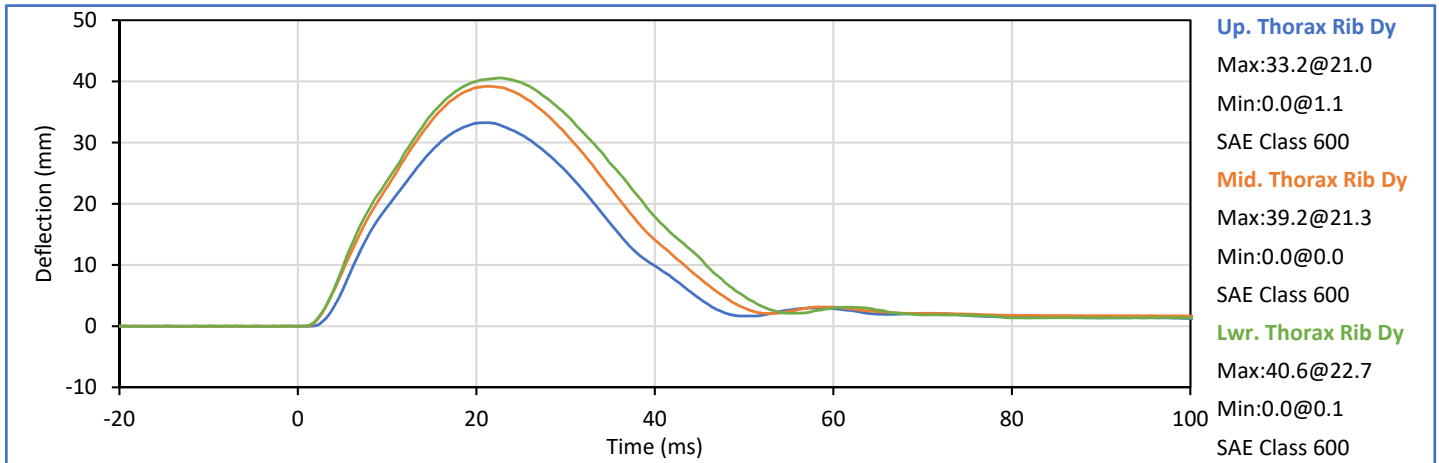
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	6.60	6.80	6.65	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.9	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.1	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.5	Pass
Peak Lower Rib Dy	mm	32.0	38.0	36.8	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	38.5	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	33.1	Pass
Peak Impactor Ax	g	30.0	36.0	34.3	Pass
<b>Overall Test Results</b>					<b>Pass</b>




Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

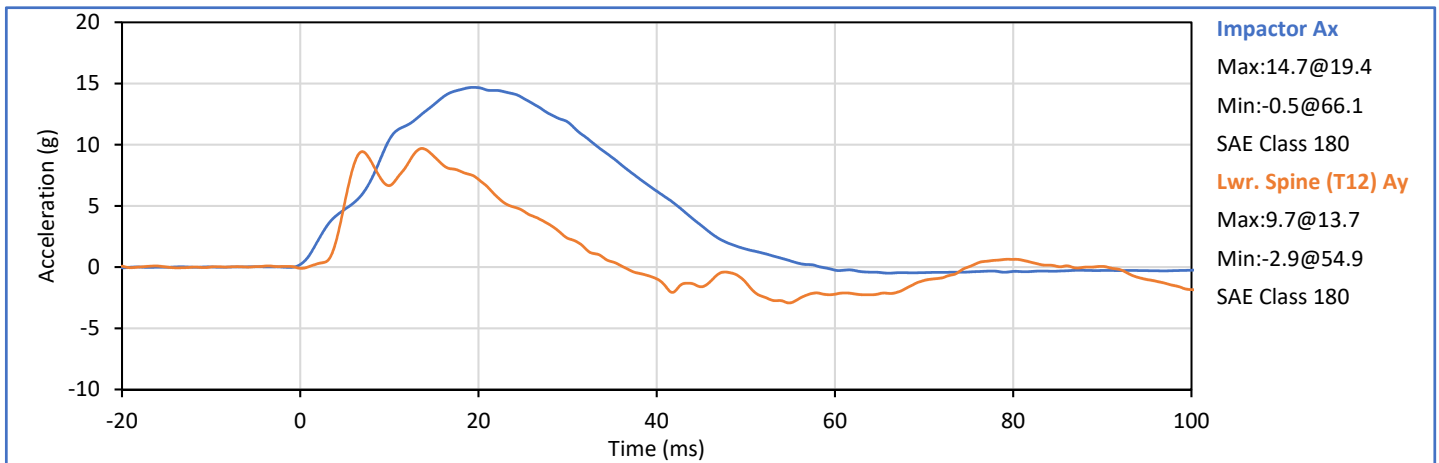
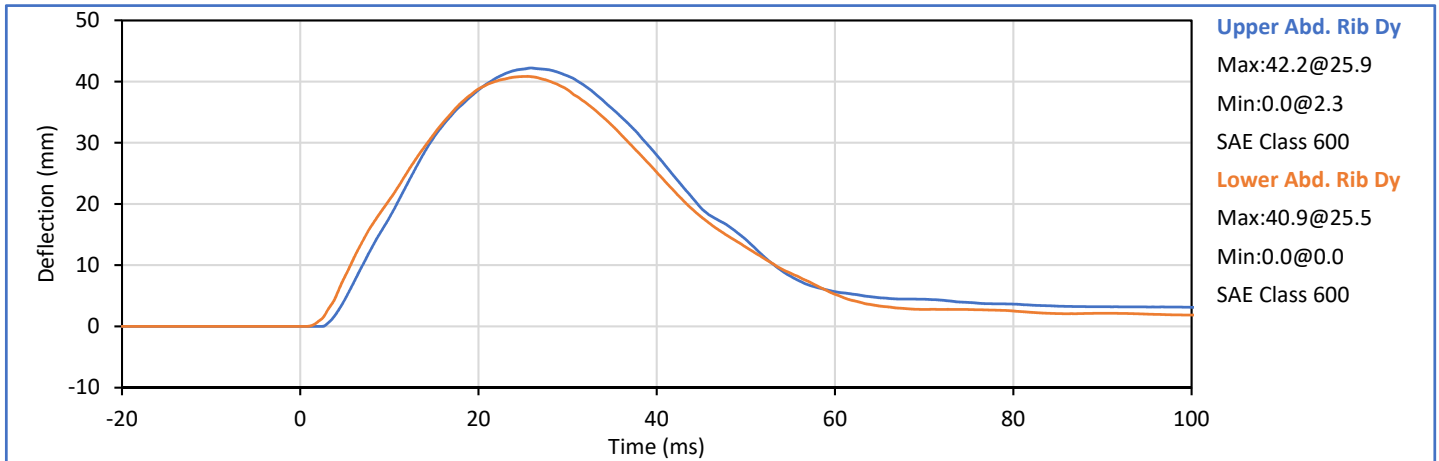
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	33.2	Pass
Peak Middle Rib Dy	mm	39.0	45.0	39.2	Pass
Peak Lower Rib Dy	mm	35.0	43.0	40.6	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.4	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.4	Pass
Peak Impactor Ax	g	14.0	18.0	17.0	Pass
Overall Test Results					Pass





Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	42.2	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	40.9	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.7	Pass
Peak Impactor Ax	g	12.0	16.0	14.7	Pass
<b>Overall Test Results</b>					<b>Pass</b>

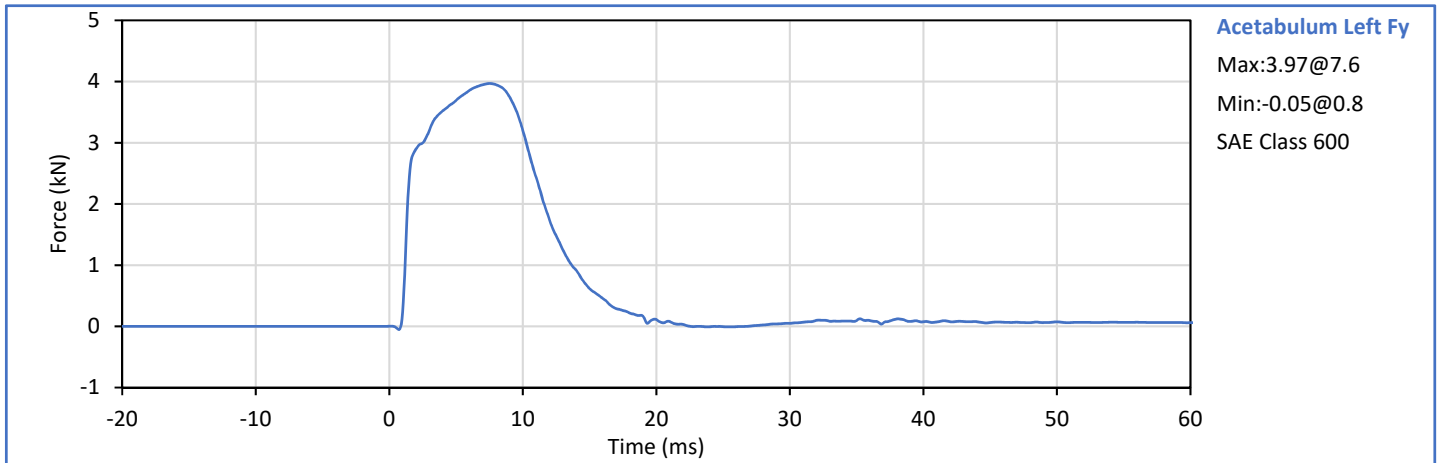
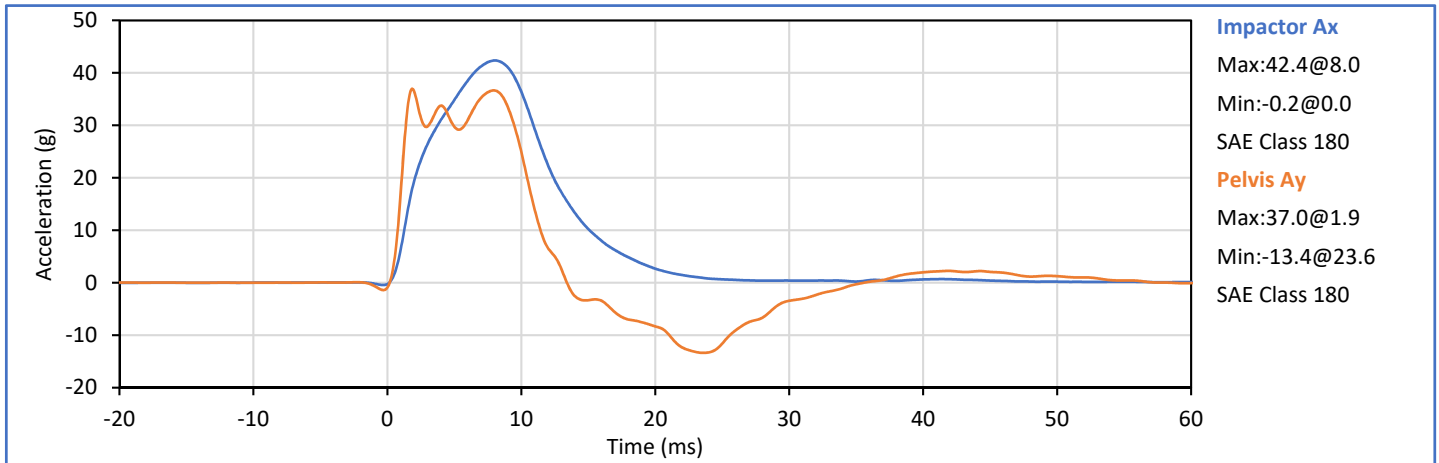


Technician:   
J. Hernandez


Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.7	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.97	Pass
Pelvis Ay after 6ms	g	34.0	42.0	36.7	Pass
Peak Impactor Ax	g	38.0	47.0	42.4	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 13473



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto



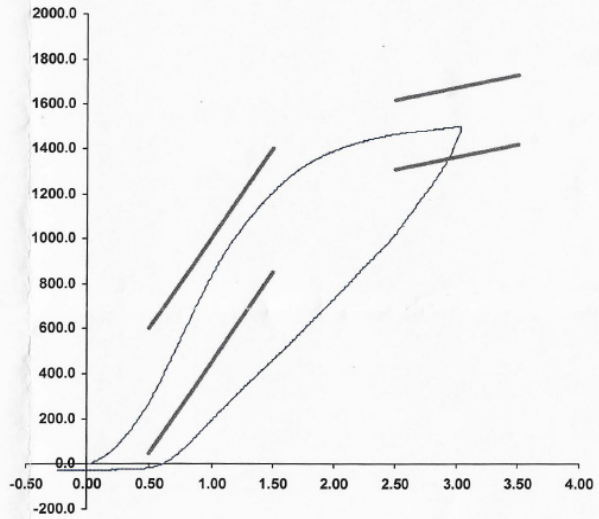
**SID-IIs Pelvis Plug Certification Test**

Plug S/N 13473.  
Test Number 11116  
Report Number 11154  
Test Date 9/20/2019 10:44:24 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	277.99	50.00	600.00
Force @ 1.5 mm (N)	1,209.78	850.00	1,400.00
Force @ 2.5 mm (N)	1,464.63	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,504.13	1,361.00	1,673.00

Testing Machine STM-20 5985542  
Load Cell S/N (FI360947), Units (LBS) 1000  
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

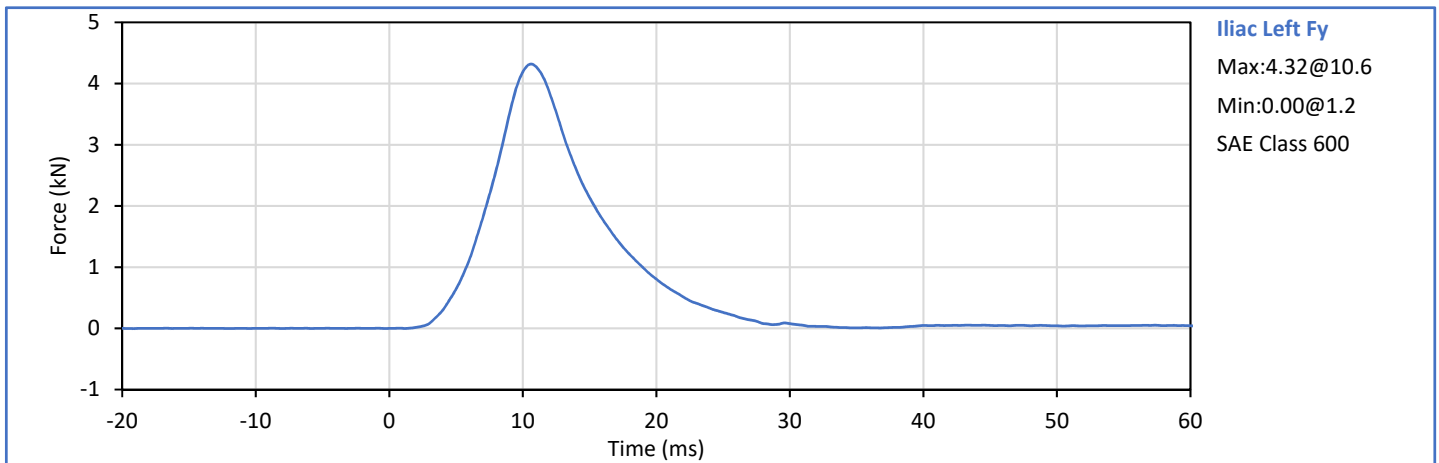
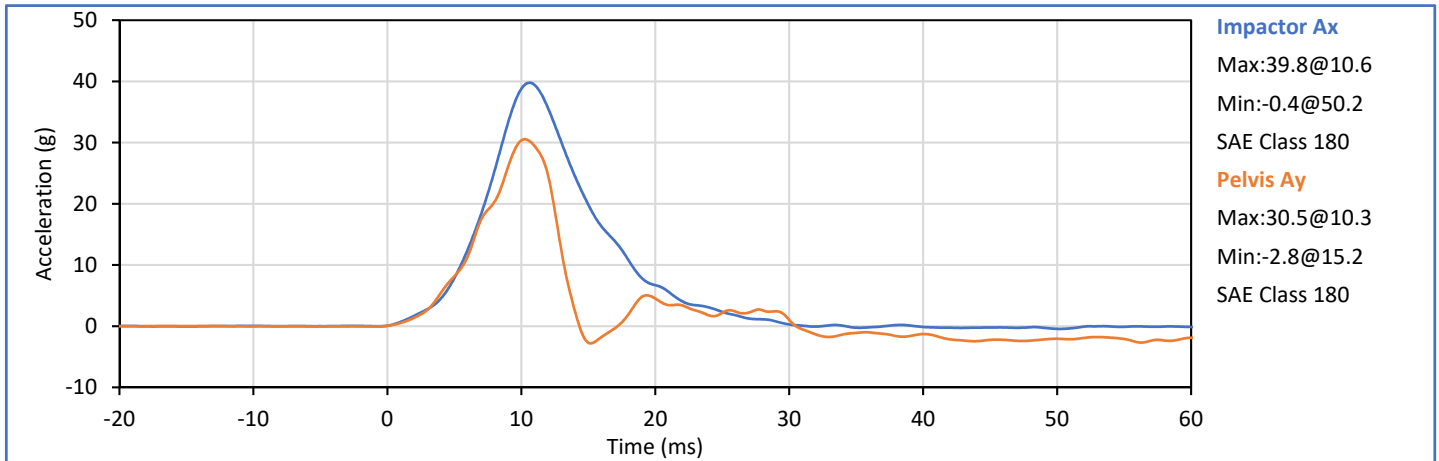
Template No 107 20-Sep-19  
SACO Research

By: SC Date: 9/20/2019  
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	22.0	Pass
Laboratory Humidity	%	10	70	25	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Iliac Fy	kN	4.10	5.10	4.32	Pass
Pelvis Ay after 6ms	g	28.0	39.0	30.5	Pass
Peak Impactor Ax	g	36.0	45.0	39.8	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12228 \*

\* Plug is not impacted and remains certified



Technician: *J. Hernandez*  
J. Hernandez

Approved By: *P. Puzzuto*  
P. Puzzuto


**APPENDIX C**  
**Post-Test ATD Qualification and Performance Verification**  
**ES-2re 50th Male Side Impact ATD, Left Side Configuration**  
**S/N: F035**

ATD Serial No.: F035

Test Date: 2020-11-30

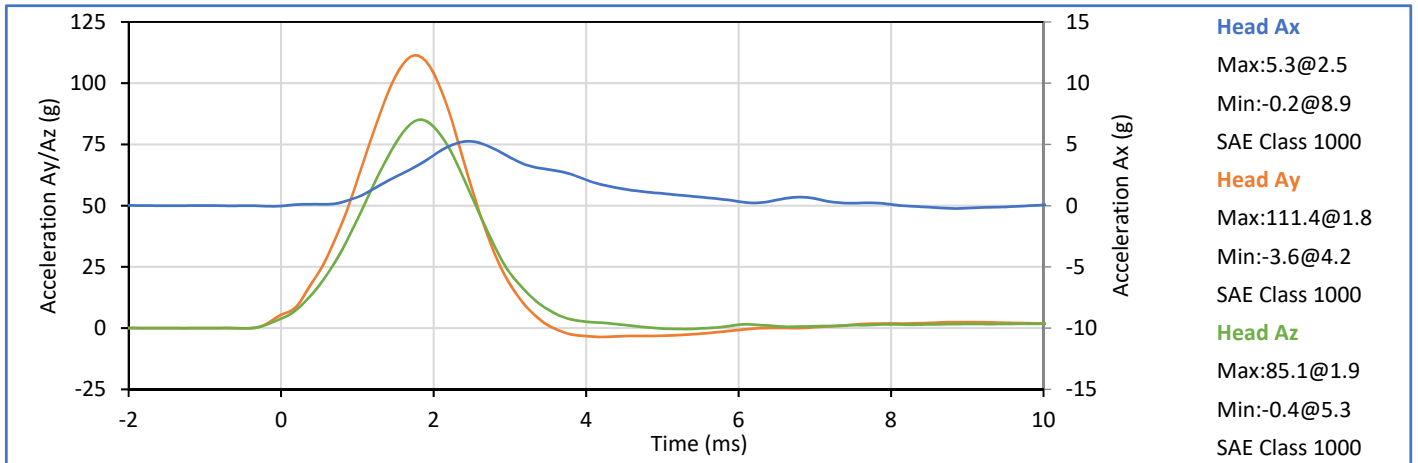
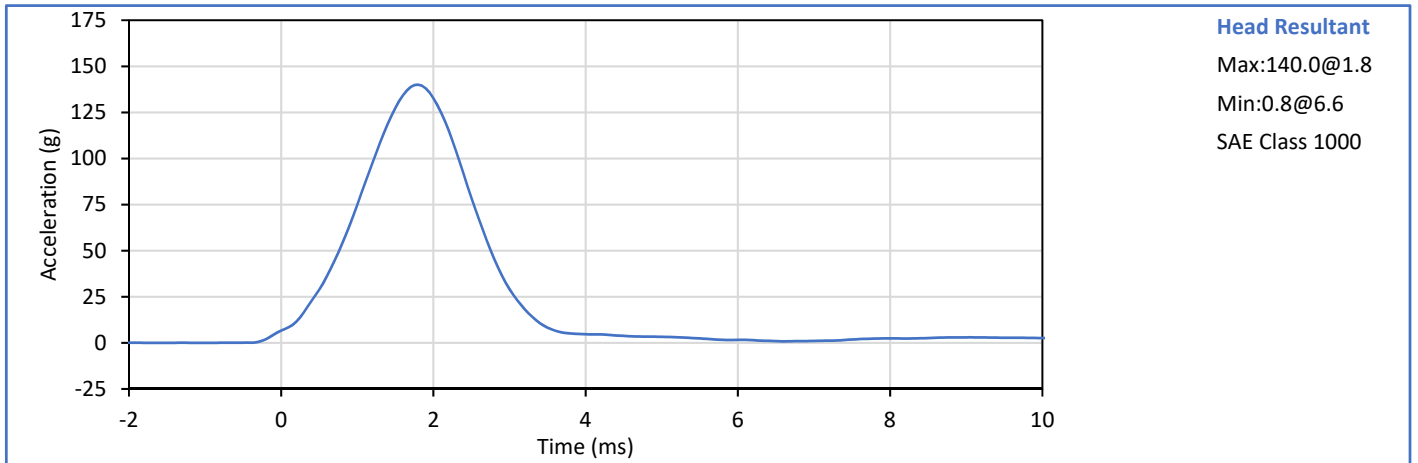
Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	32	Pass
1 - Sitting Height	mm	900	918	909	Pass
2 - Seat to Shoulder Joint	mm	558	572	568	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	352	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	102	Pass
5 - Sole to Seat, Sitting	mm	433	451	439	Pass
6 - Head Width	mm	152	158	157	Pass
7 - Shoulder/Arm Width	mm	461	479	469	Pass
8 - Thorax Width	mm	322	332	327	Pass
9 - Abdomen Width	mm	273	287	282	Pass
10 - Pelvis Lap Width	mm	359	373	363	Pass
11 - Head Depth	mm	196	206	200	Pass
12 - Thorax Depth	mm	262	272	268	Pass
13 - Abdomen Depth	mm	194	204	200	Pass
14 - Pelvis Depth	mm	235	245	241	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	159	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	608	Pass
				Overall Test Results	Pass


Technician:   
J. Hernandez


Approved By:   
P. Puzzuto



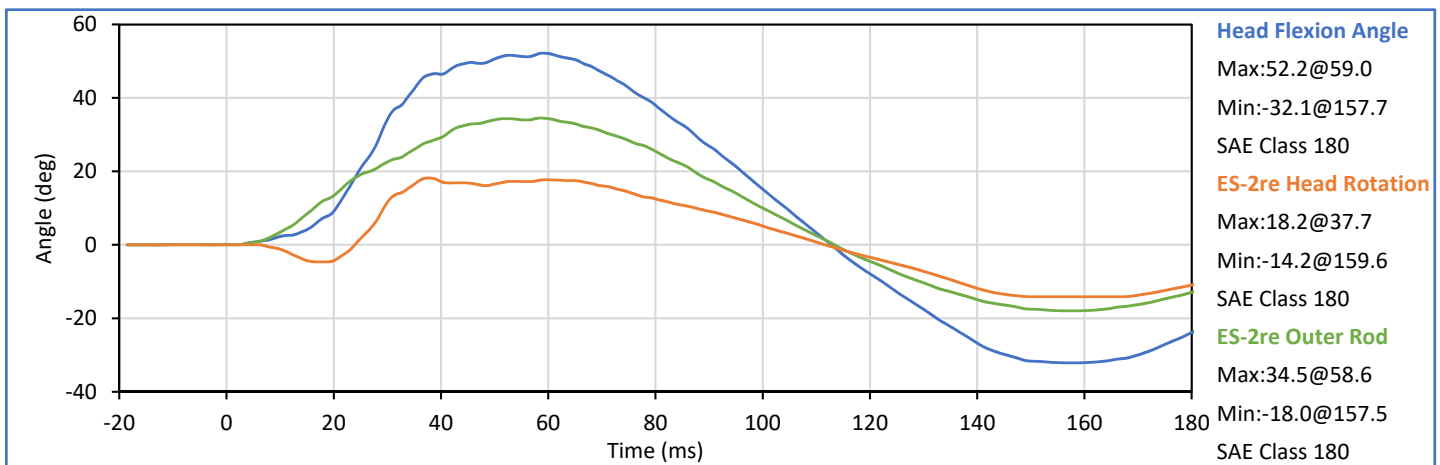
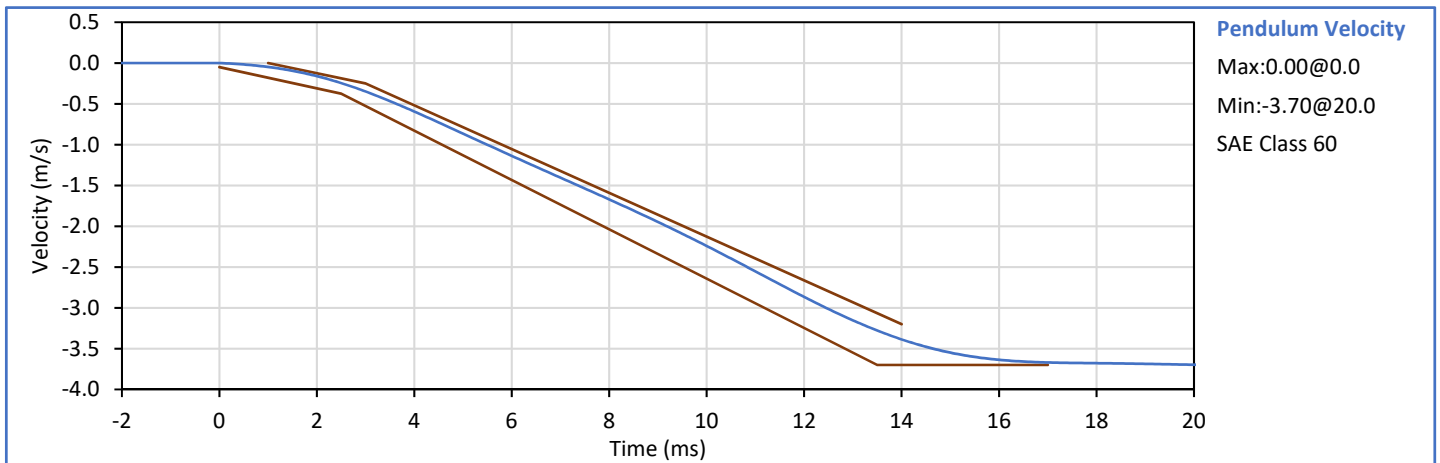
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	32	Pass
Peak Resultant Acceleration	g	125.0	155.0	140.0	Pass
Peak Head Ax	g	-15.0	15.0	5.3	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass




Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

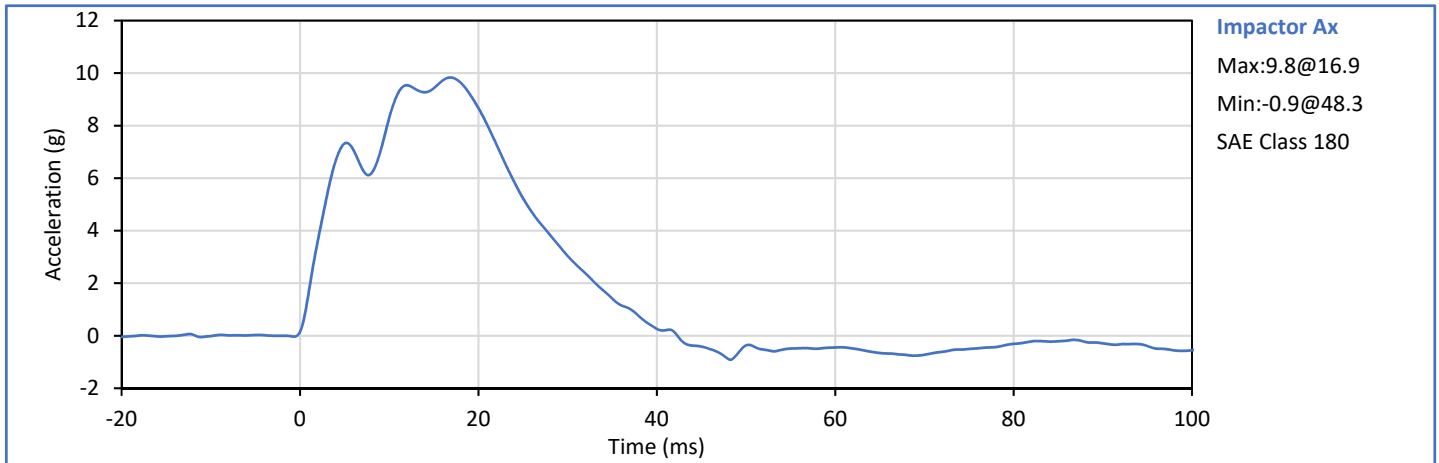
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	3.30	3.50	3.46	Pass
Peak Headform Flexion	deg	49.0	59.0	52.2	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	59.0	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	53.8	Pass
Overall Test Results					Pass

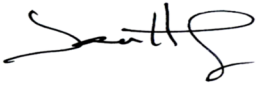



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Impactor Ax	g	7.5	10.5	9.8	Pass
Overall Test Results					Pass



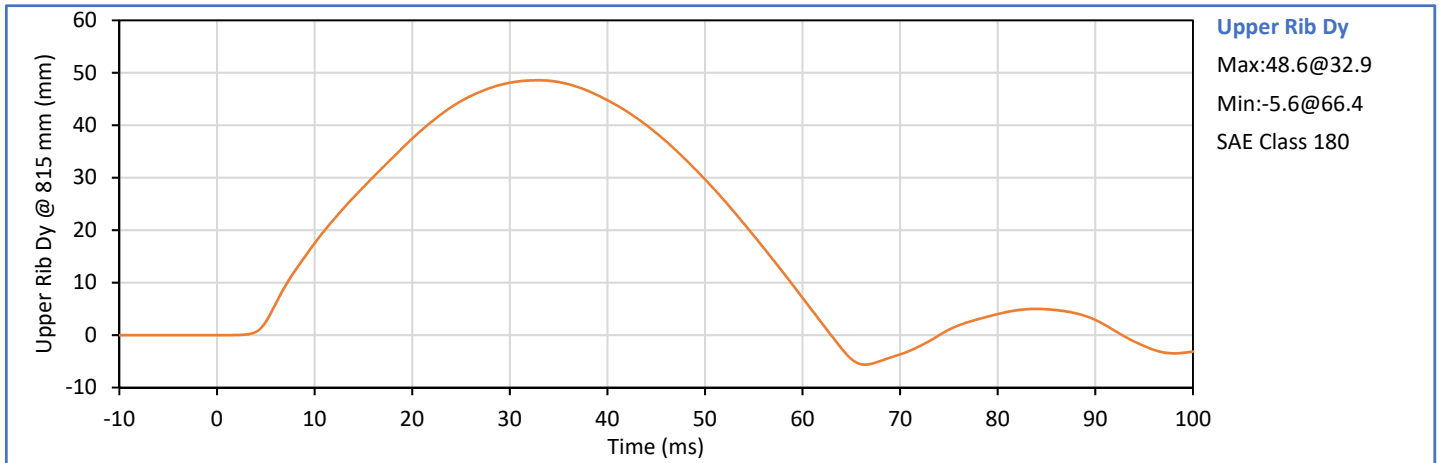
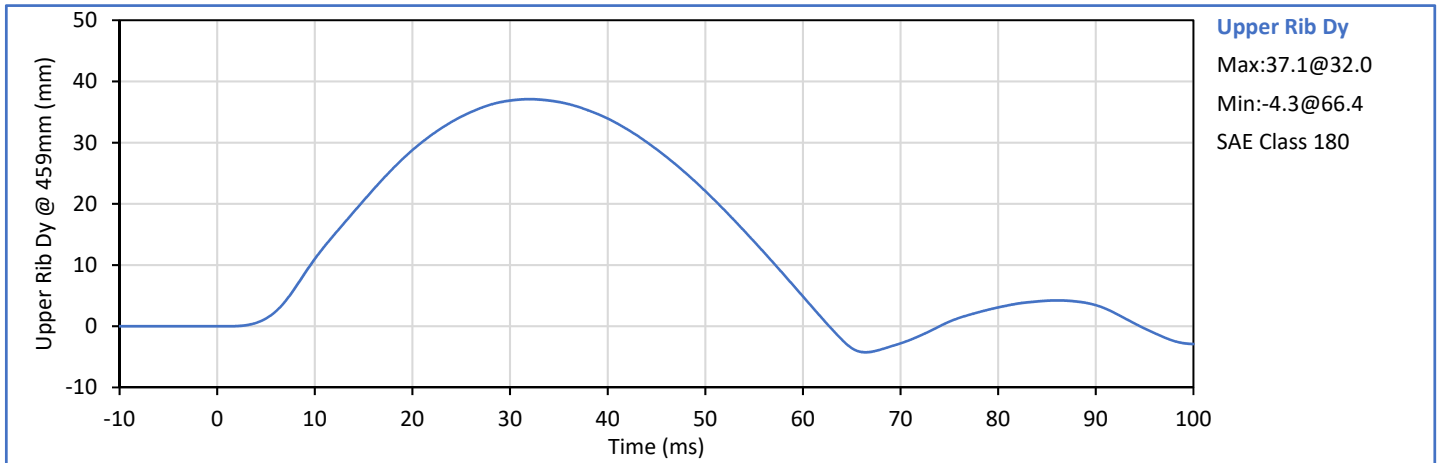
Technician:   
J. Hernandez

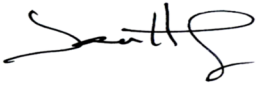
Approved By:   
P. Puzzuto


ATD Serial No.: F035

Test Date: 2020-12-01

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	17	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.1	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	48.6	Pass
Overall Test Results					Pass



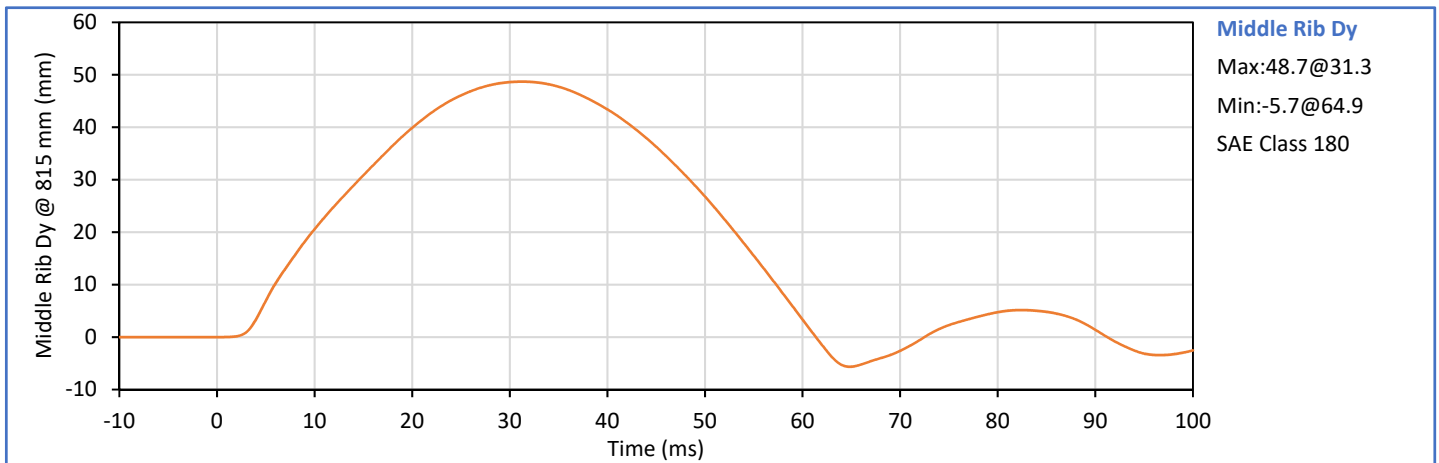
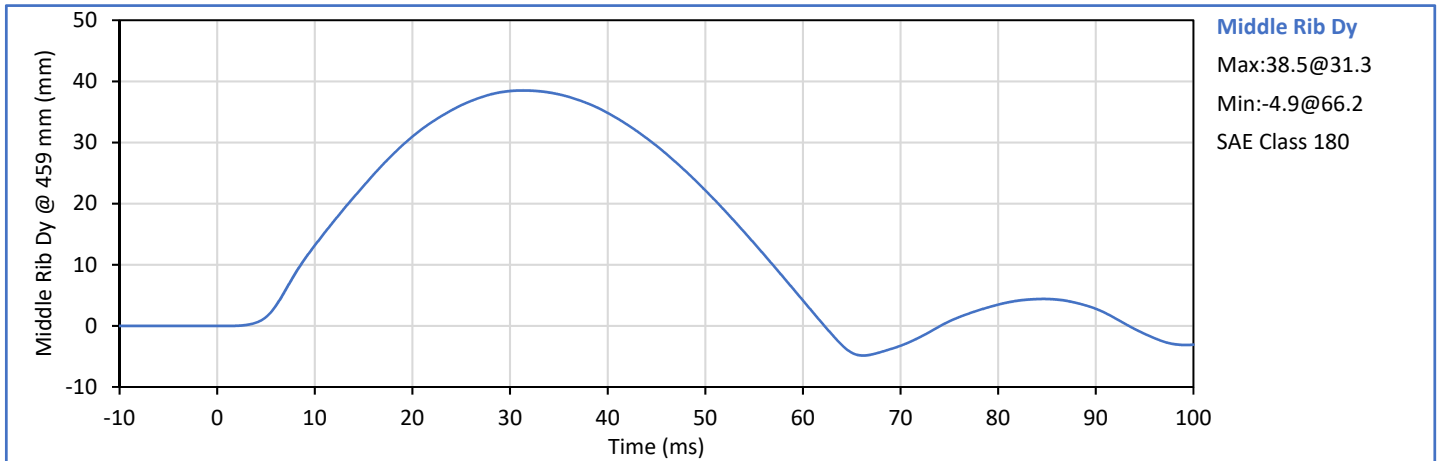
Technician:   
J. Hernandez

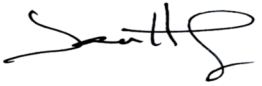
Approved By:   
P. Puzzuto


ATD Serial No.: F035

Test Date: 2020-12-01

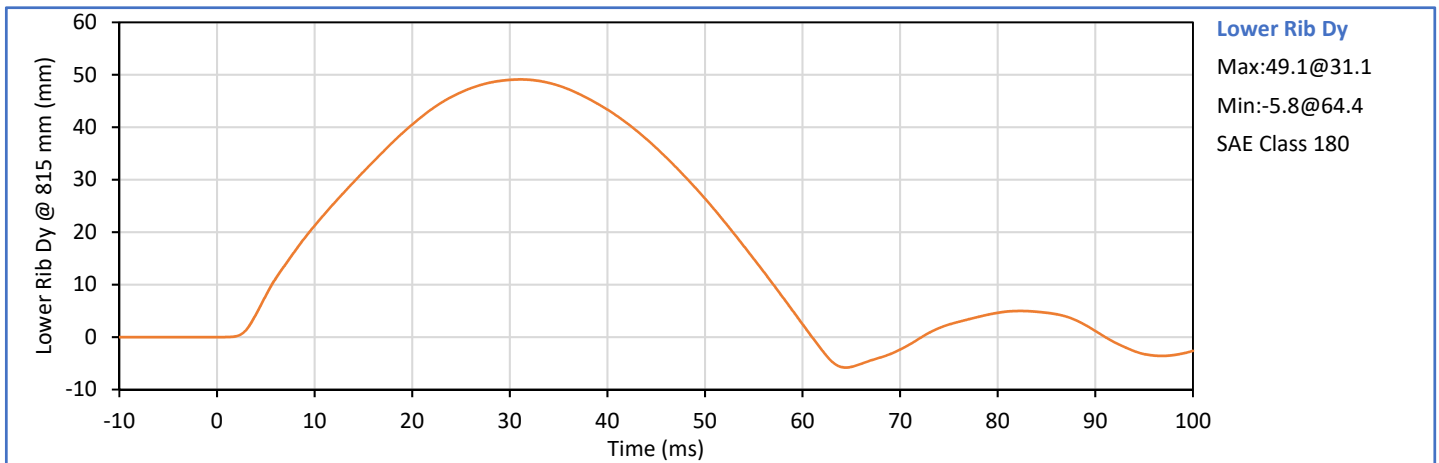
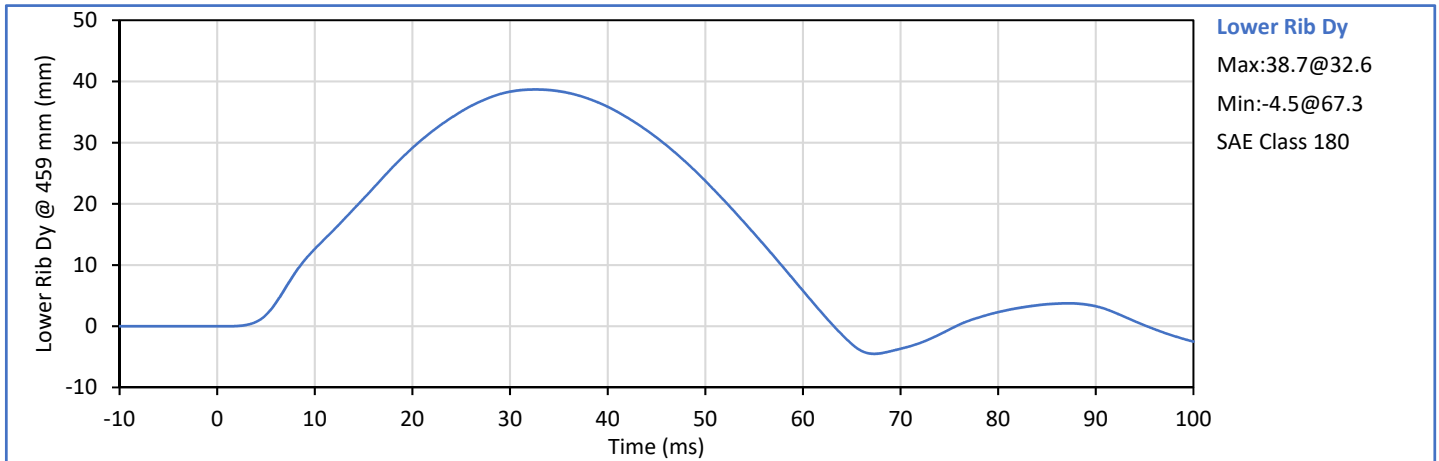
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	38.5	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	48.7	Pass
Overall Test Results					Pass



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

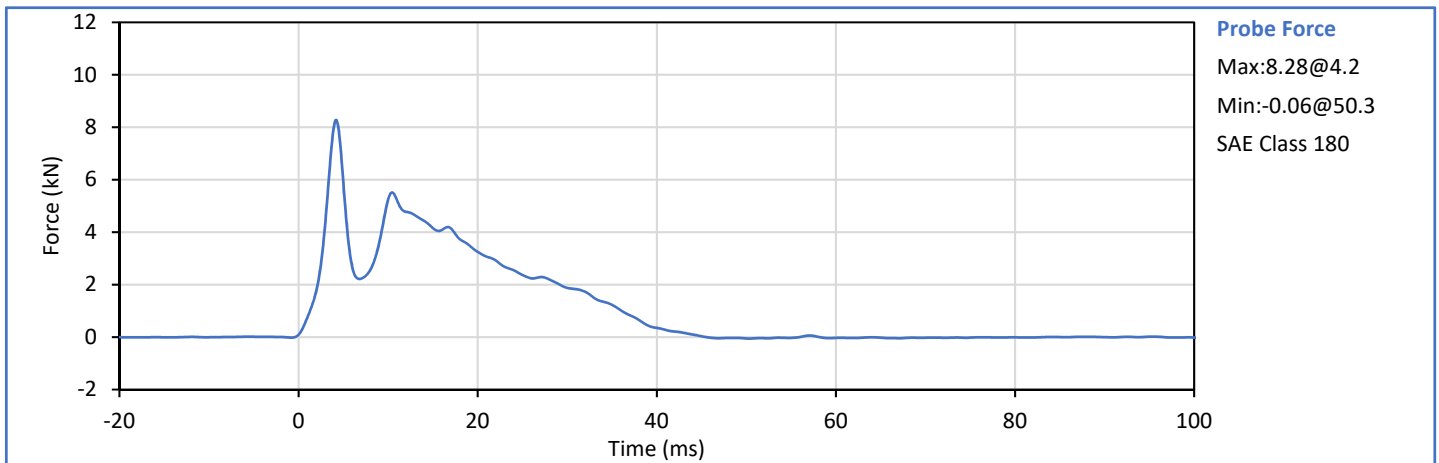
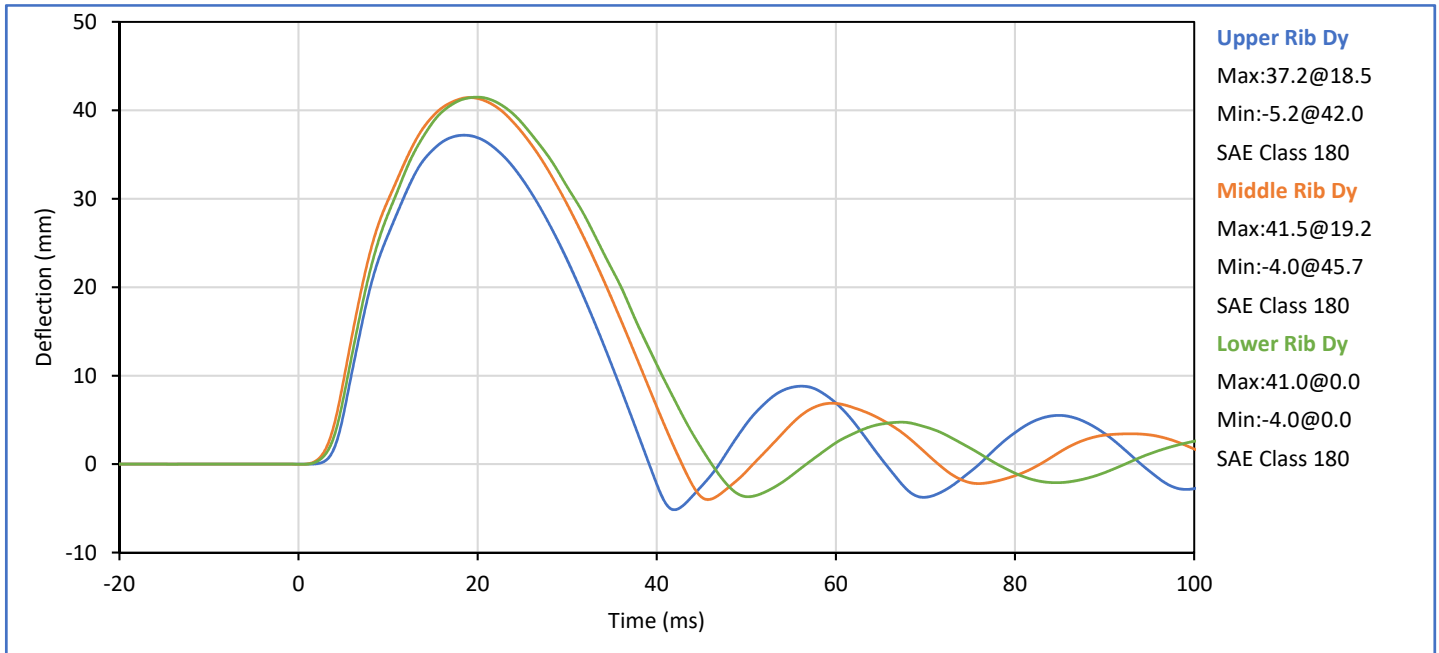
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	17	Pass
Lower Rib Dy @ 459mm	mm	36.0	40.0	38.7	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	49.1	Pass
Overall Test Results					Pass




Technician: *J. Hernandez*  
J. Hernandez

Approved By: *P. Puzzuto*  
P. Puzzuto

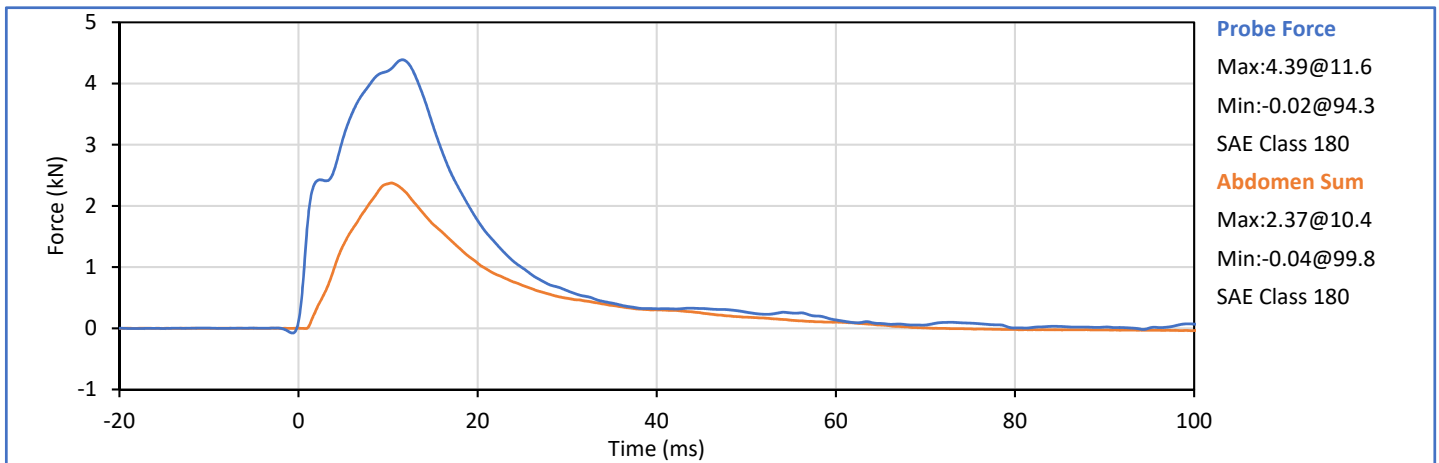
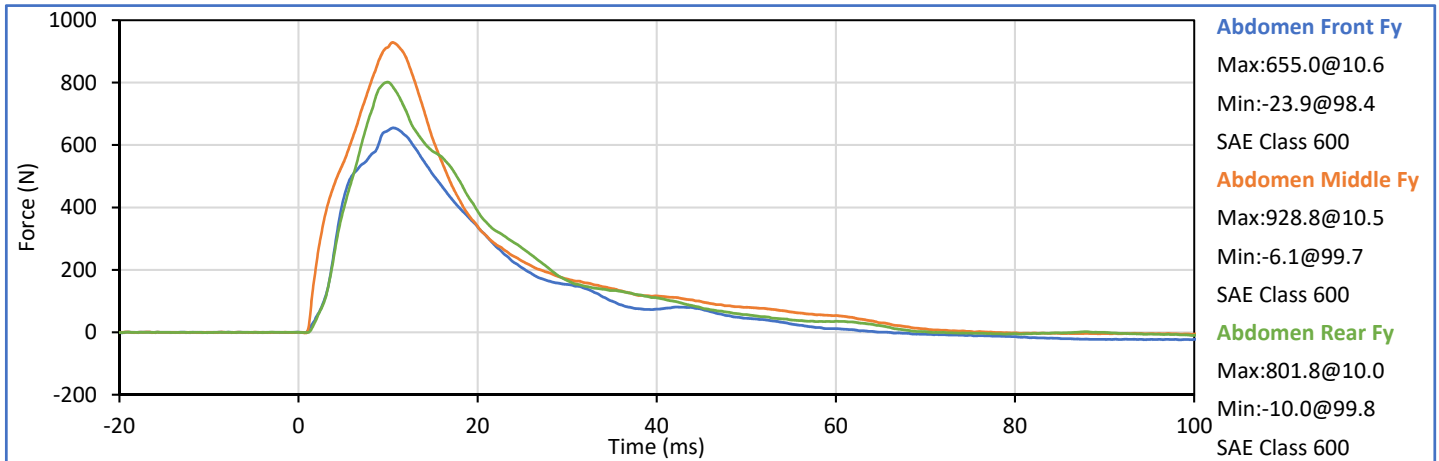
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	5.40	5.60	5.52	Pass
Peak Upper Rib Dy	mm	34.0	41.0	37.2	Pass
Peak Middle Rib Dy	mm	37.0	45.0	41.5	Pass
Peak Lower Rib Dy	mm	37.0	44.0	41.5	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.51	Pass
<b>Overall Test Results</b>					<b>Pass</b>




Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	3.90	4.10	4.01	Pass
Peak Impactor Force	kN	4.00	4.80	4.39	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.6	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.37	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.4	Pass
<b>Overall Test Results</b>					<b>Pass</b>

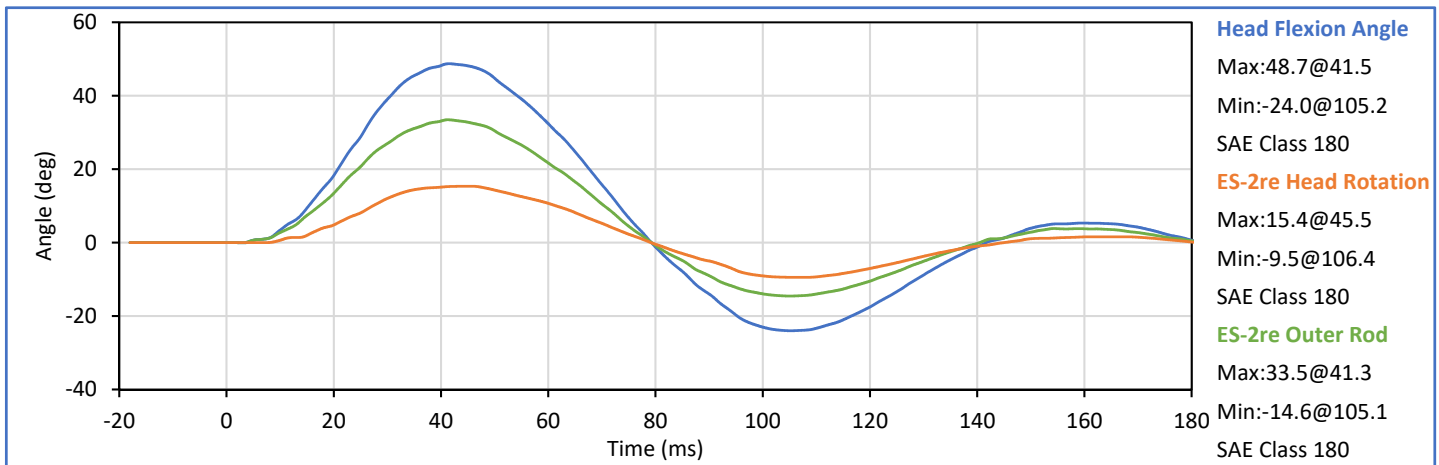
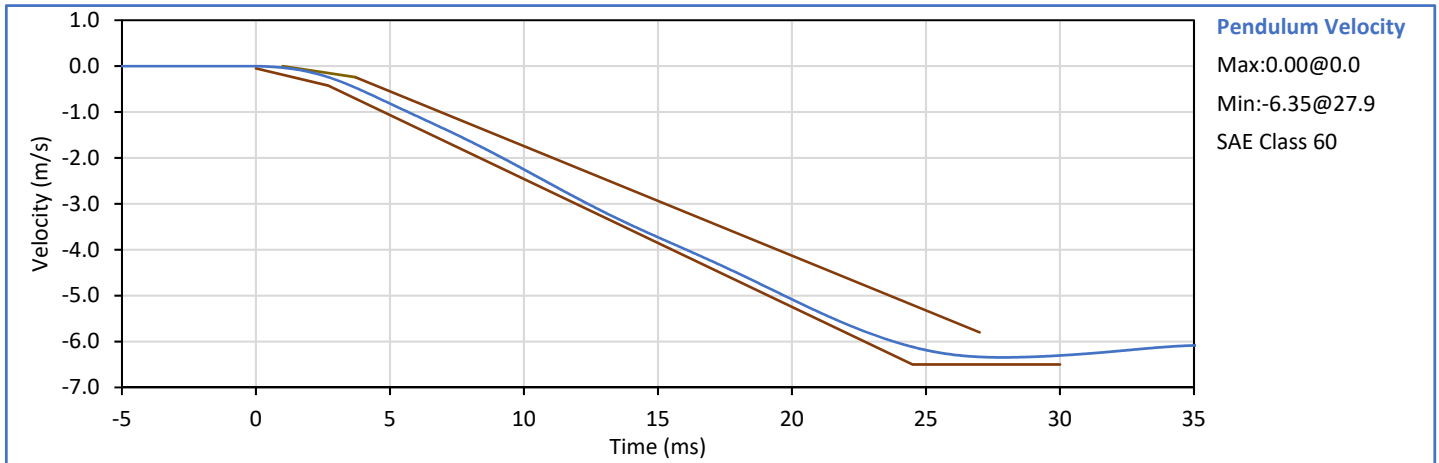



Technician:   
J. Hernandez


Approved By:   
P. Puzzuto



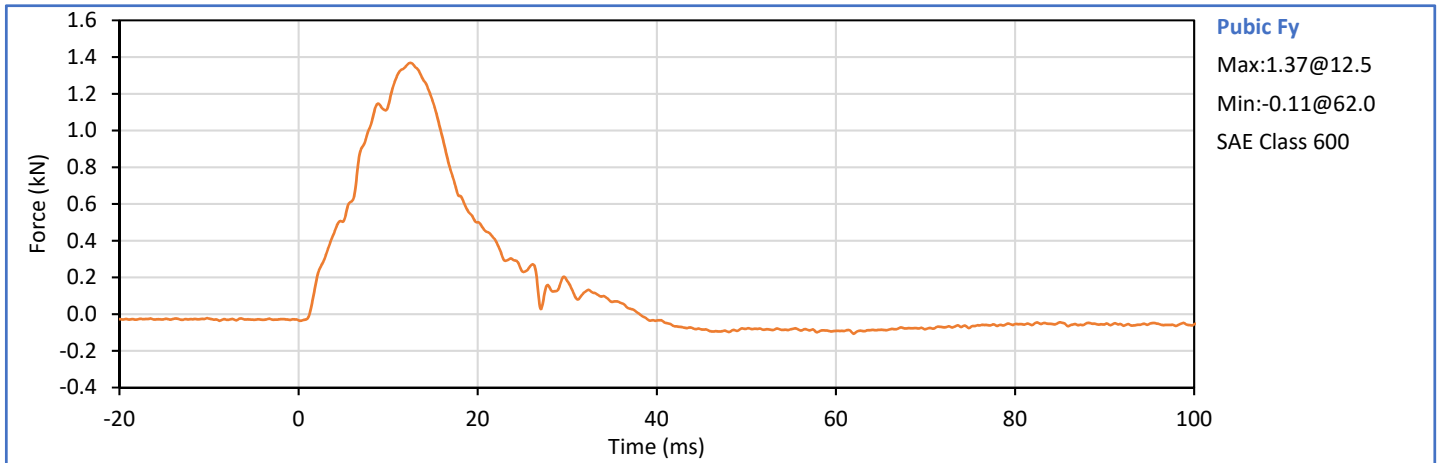
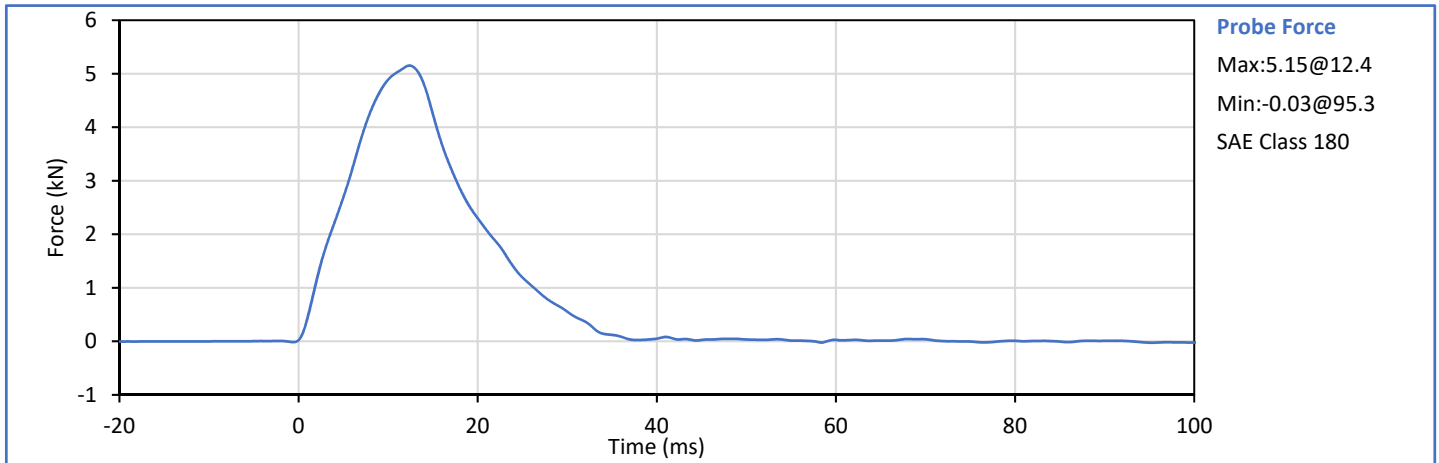
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.95	6.15	6.05	Pass
Peak Headform Flexion	deg	45.0	55.0	48.7	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	41.5	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	37.8	Pass
Overall Test Results					Pass





Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Force	kN	4.70	5.40	5.15	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.4	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.37	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	12.5	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

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

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	44	Pass
A - Sitting Height	mm	772	788	778	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	84	Pass
D - H Point From Seatback	mm	141	151	149	Pass
E - Shoulder Pivot From Backline	mm	97	107	104	Pass
F - Thigh Clearance	mm	119	135	125	Pass
G - Head Breadth	mm	140	148	145	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	183	Pass
J - Head Circumference	mm	541	551	545	Pass
K - Buttock To Knee Length	mm	514	540	530	Pass
L - Popliteal Height	mm	343	369	347	Pass
K - Knee Pivot To Floor Height	mm	392	409	403	Pass
N - Buttock Popliteal Length	mm	416	442	438	Pass
O - Chest Depth W/O Jacket	mm	195	211	208	Pass
P - Foot Length	mm	216	232	224	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	316	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	345	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	866	Pass
Z - Waist Circumference	mm	761	791	774	Pass
Overall Test Results					Pass

Technician: \_\_\_\_\_



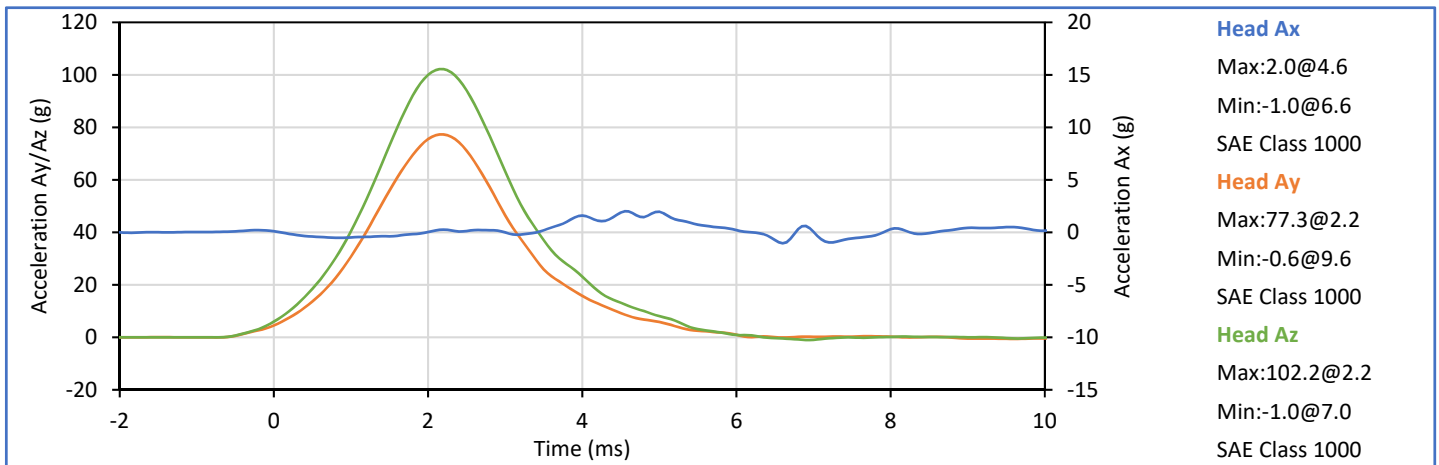
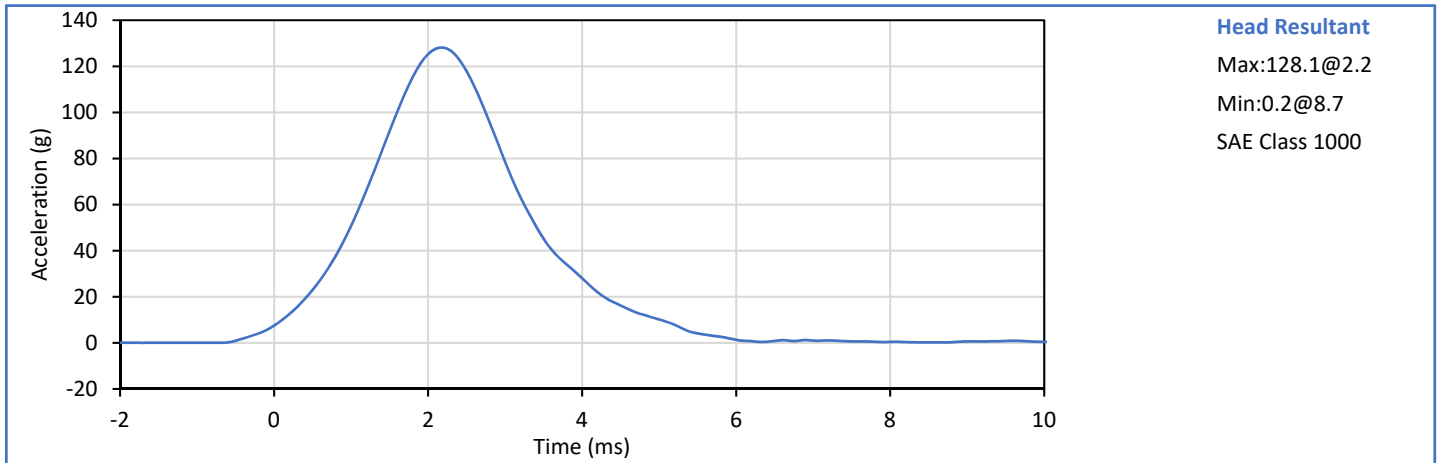
J. Hernandez

Approved By: \_\_\_\_\_




P. Puzzuto

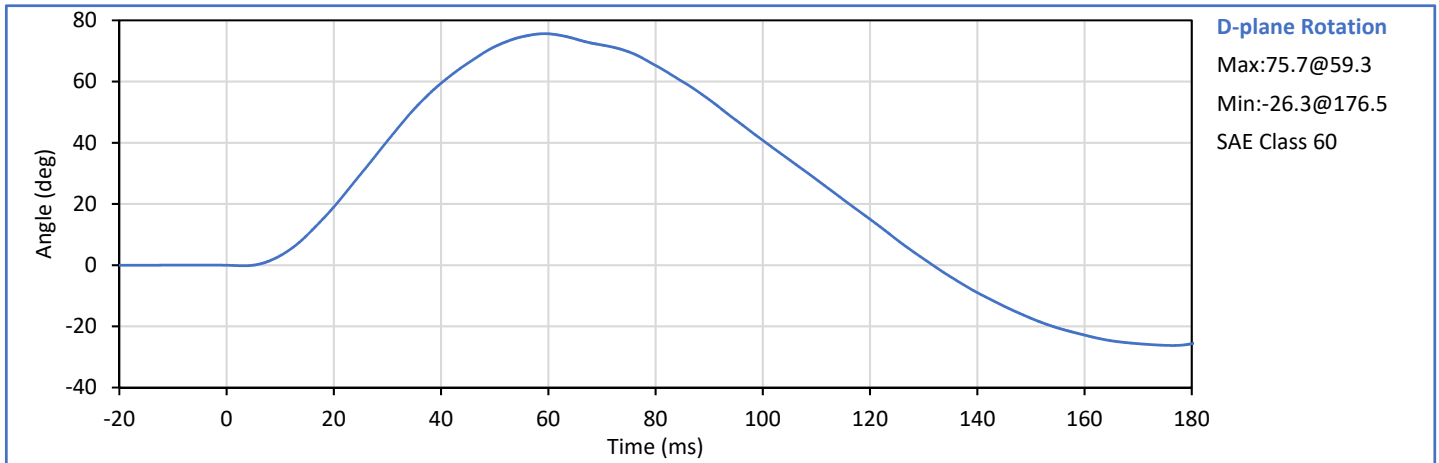
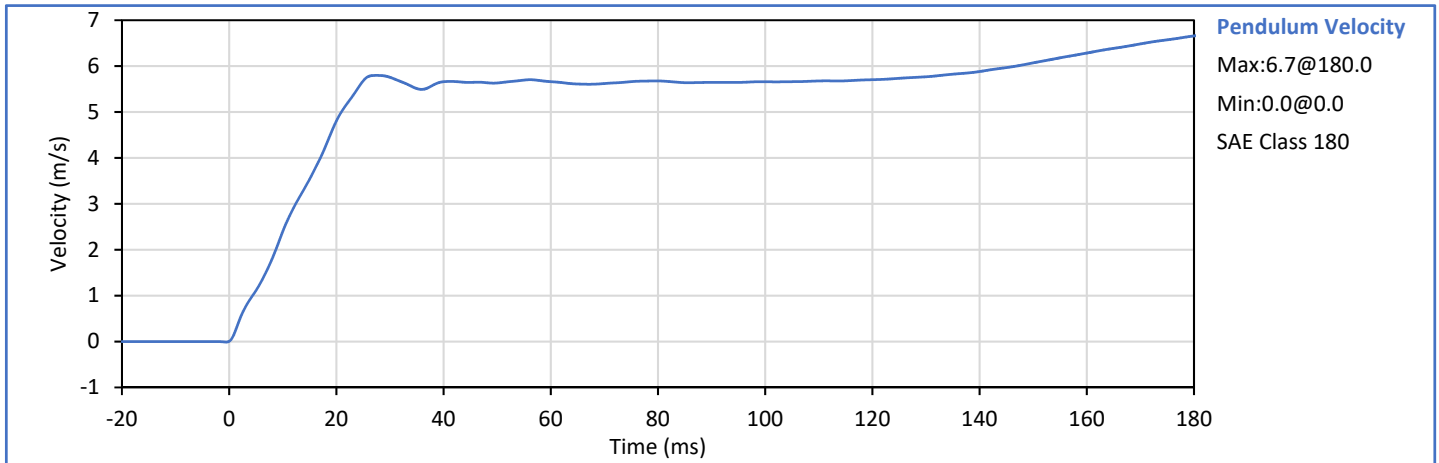
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	20.8	Pass
Laboratory Humidity	%	10	70	21	Pass
Peak Resultant Acceleration	g	115.0	137.0	128.1	Pass
Peak Head Ax	g	-15.0	15.0	-1.0	Pass
Oscillations After Main Pulse	%	0.0	15.0	0.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
<b>Overall Test Results</b>					<b>Pass</b>




Technician:   
J. Hernandez

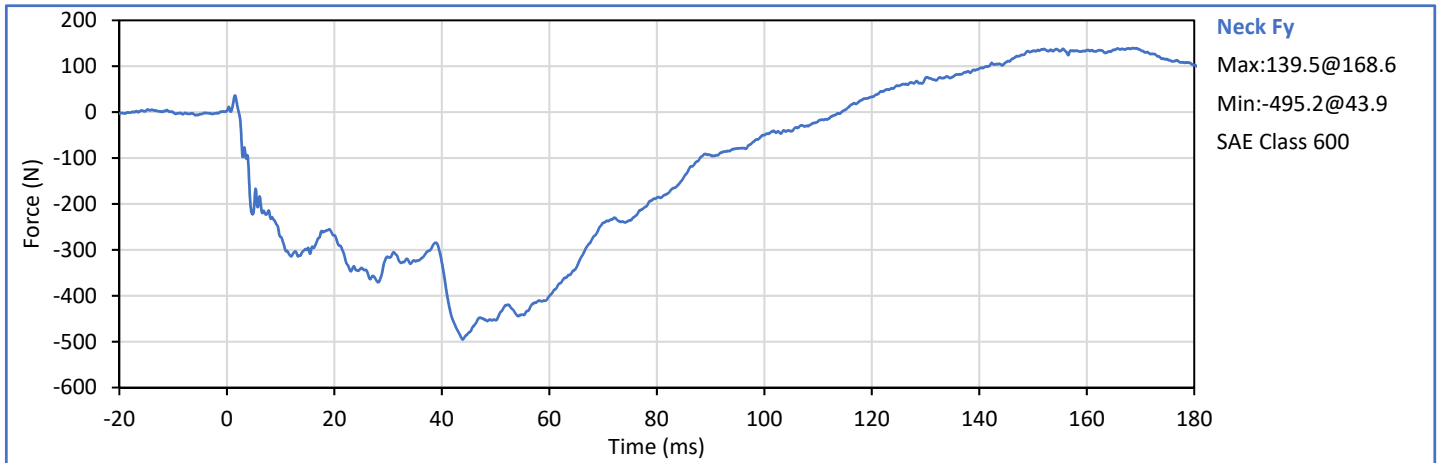
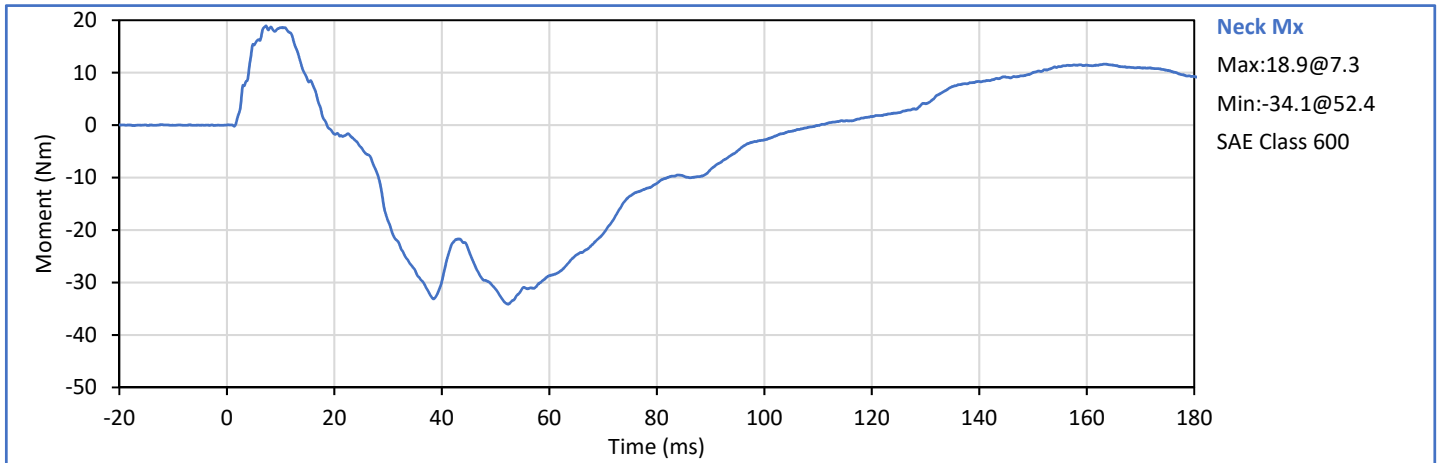
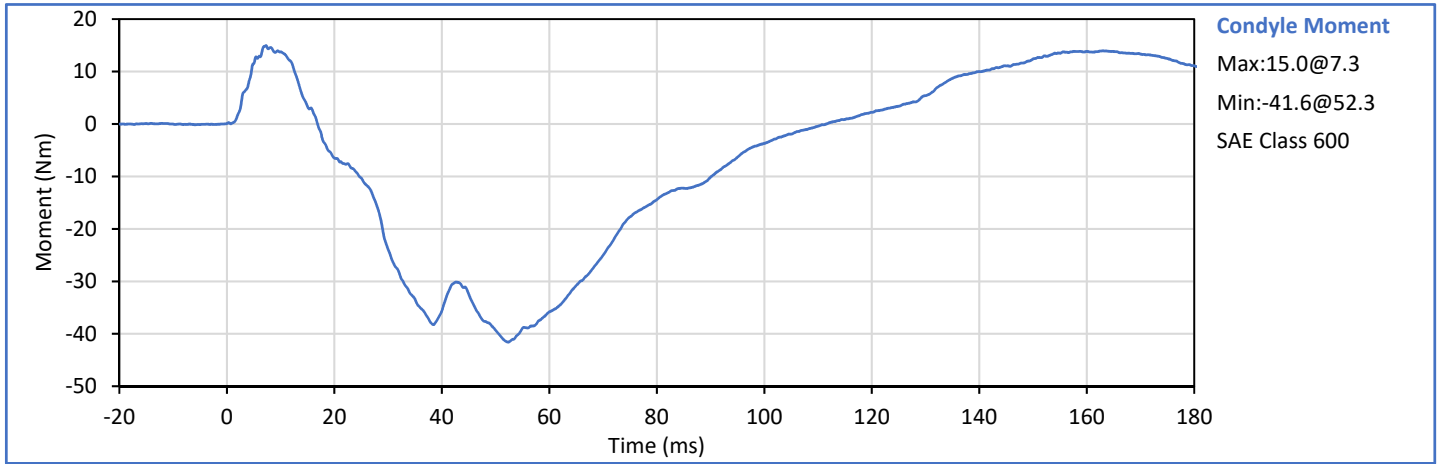
Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	16	Pass
Pendulum Velocity	m/s	5.51	5.63	5.63	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.40	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.54	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.80	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.68	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.80	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	75.7	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	59.3	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-41.6	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	111.6	Pass
<b>Overall Test Results</b>					<b>Pass</b>

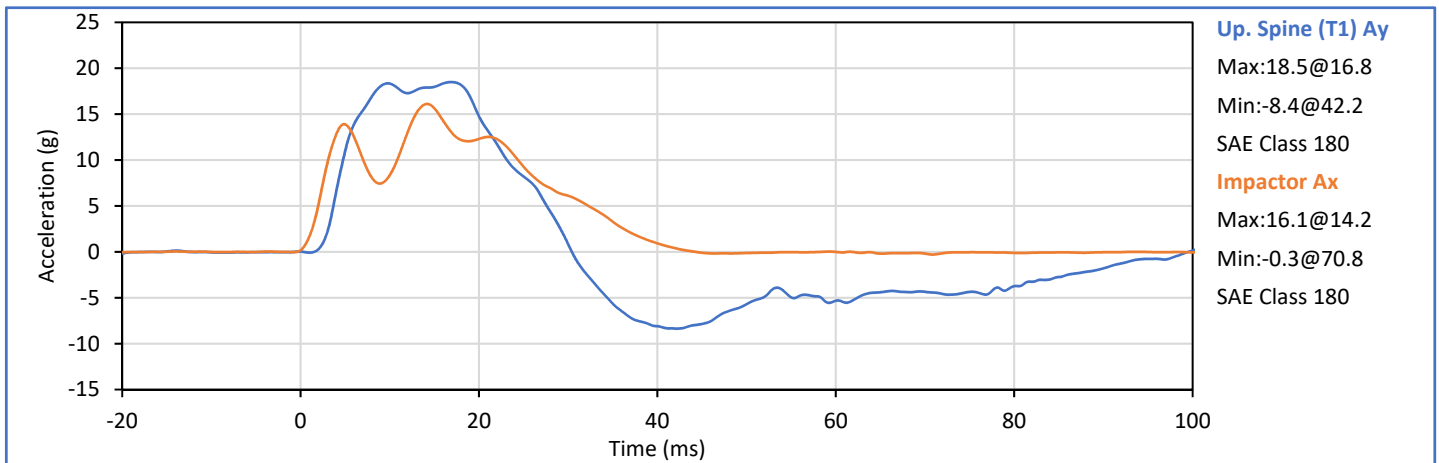
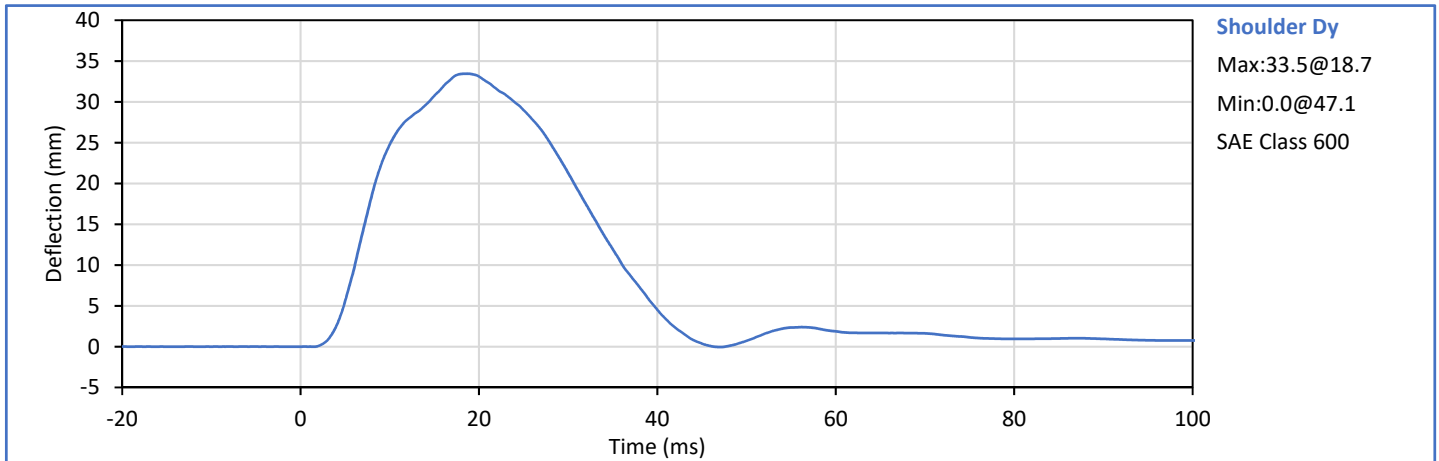


Technician:   
J. Hernandez


Approved By:   
P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	16	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.5	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.5	Pass
Peak Impactor Ax	g	13.0	18.0	16.1	Pass
Overall Test Results					Pass

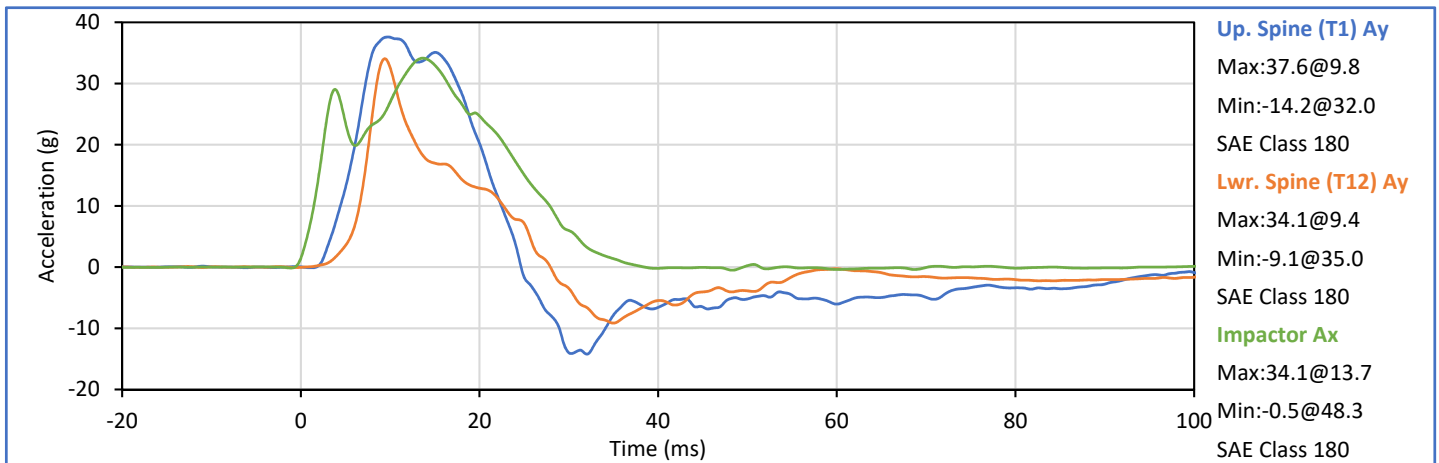
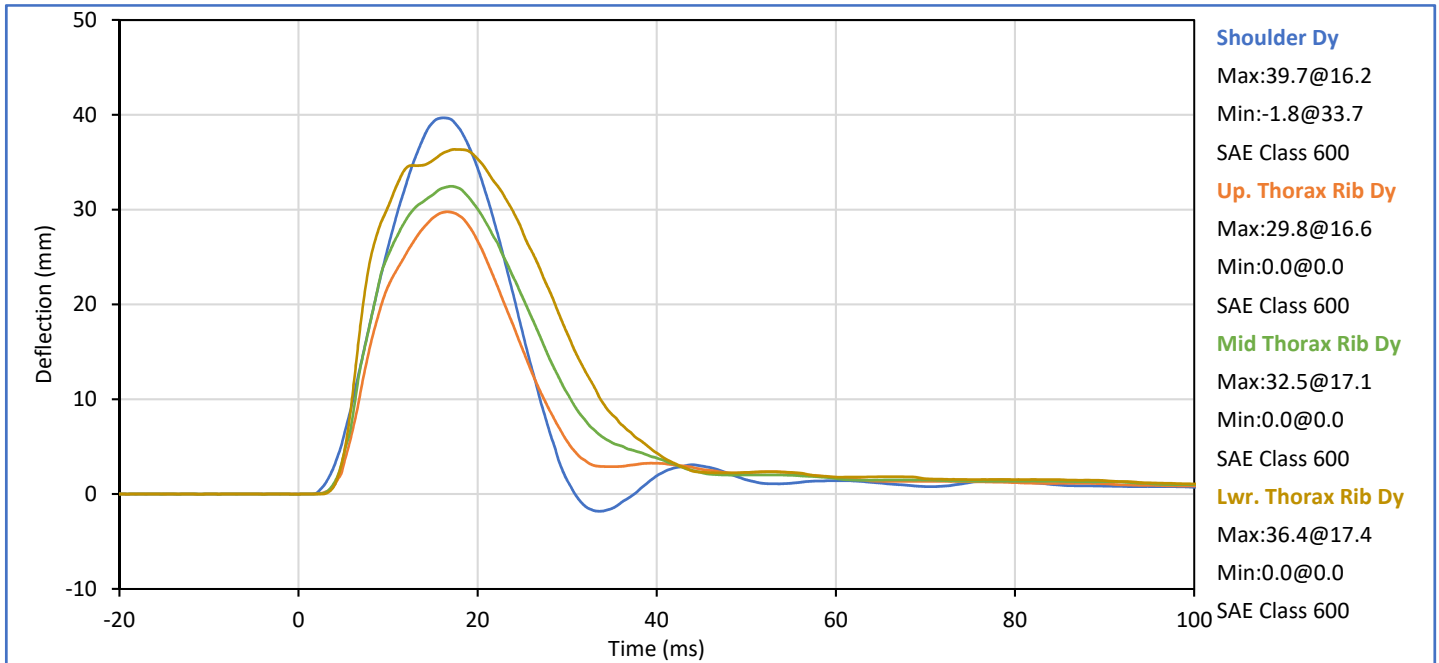


Technician:   
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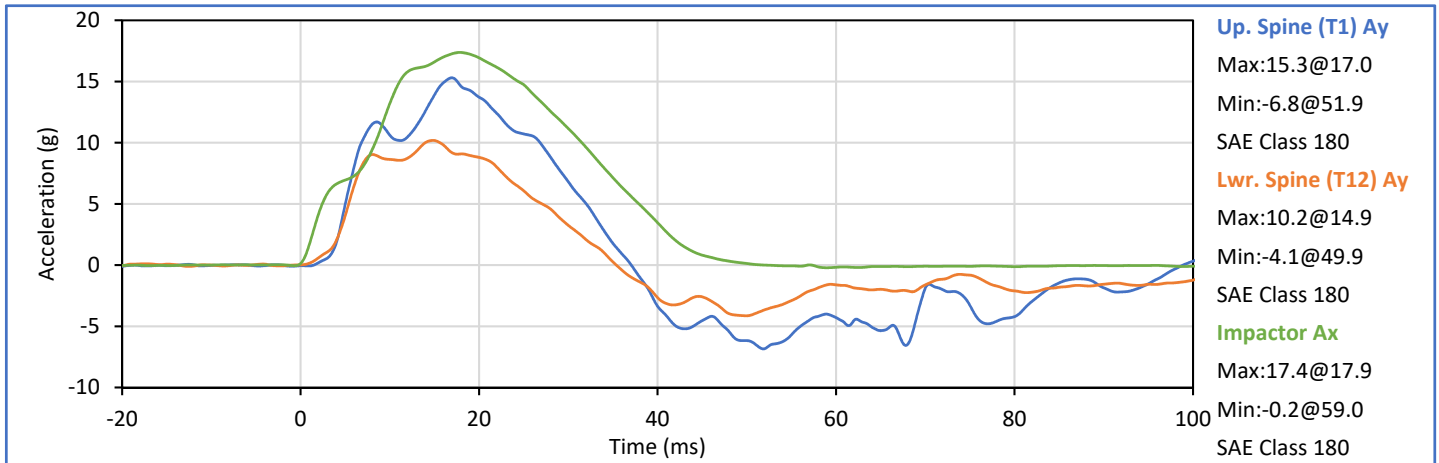
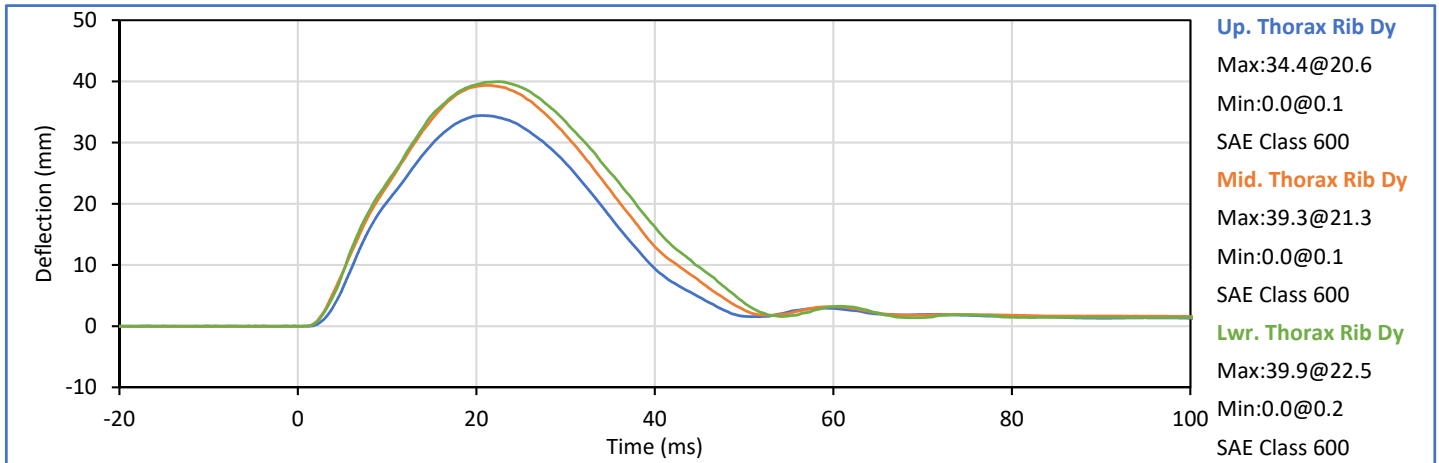
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	6.60	6.80	6.65	Pass
Peak Shoulder Dy	mm	31.0	40.0	39.7	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.8	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.5	Pass
Peak Lower Rib Dy	mm	32.0	38.0	36.4	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	37.6	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	34.1	Pass
Peak Impactor Ax	g	30.0	36.0	34.1	Pass
<b>Overall Test Results</b>					<b>Pass</b>




Technician:   
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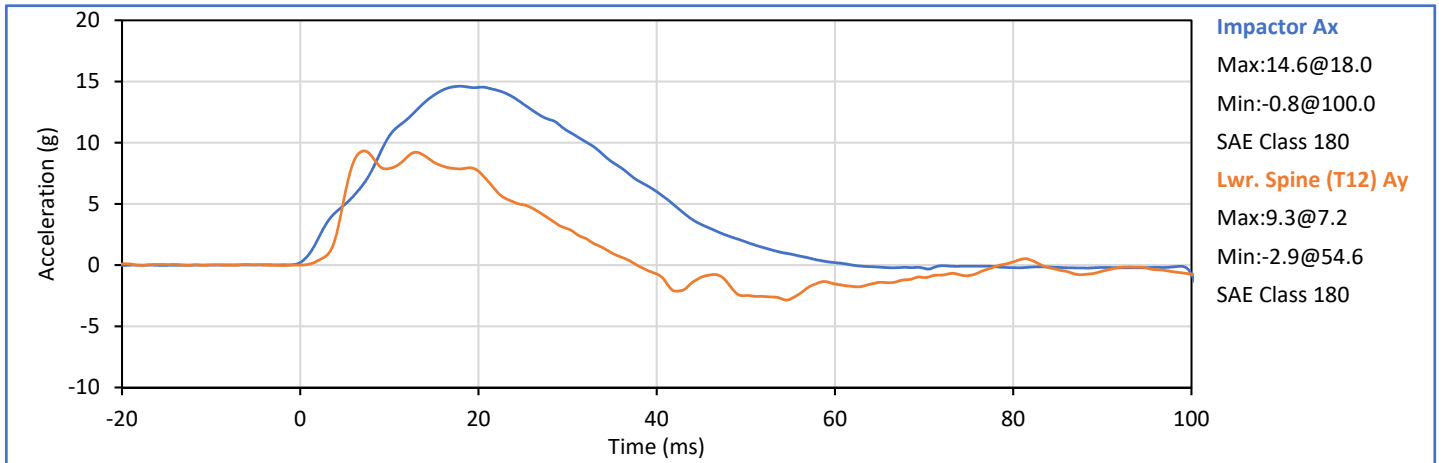
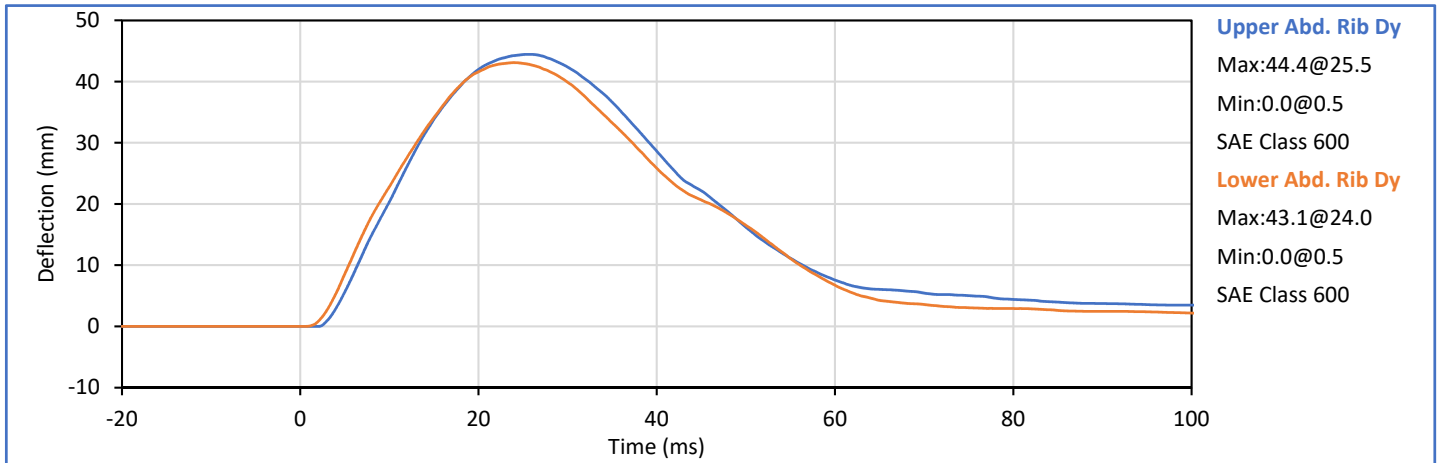
Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	19	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	34.4	Pass
Peak Middle Rib Dy	mm	39.0	45.0	39.3	Pass
Peak Lower Rib Dy	mm	35.0	43.0	39.9	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.3	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	10.2	Pass
Peak Impactor Ax	g	14.0	18.0	17.4	Pass
Overall Test Results					Pass





Technician:   
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Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	16	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	44.4	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	43.1	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.3	Pass
Peak Impactor Ax	g	12.0	16.0	14.6	Pass
<b>Overall Test Results</b>					<b>Pass</b>

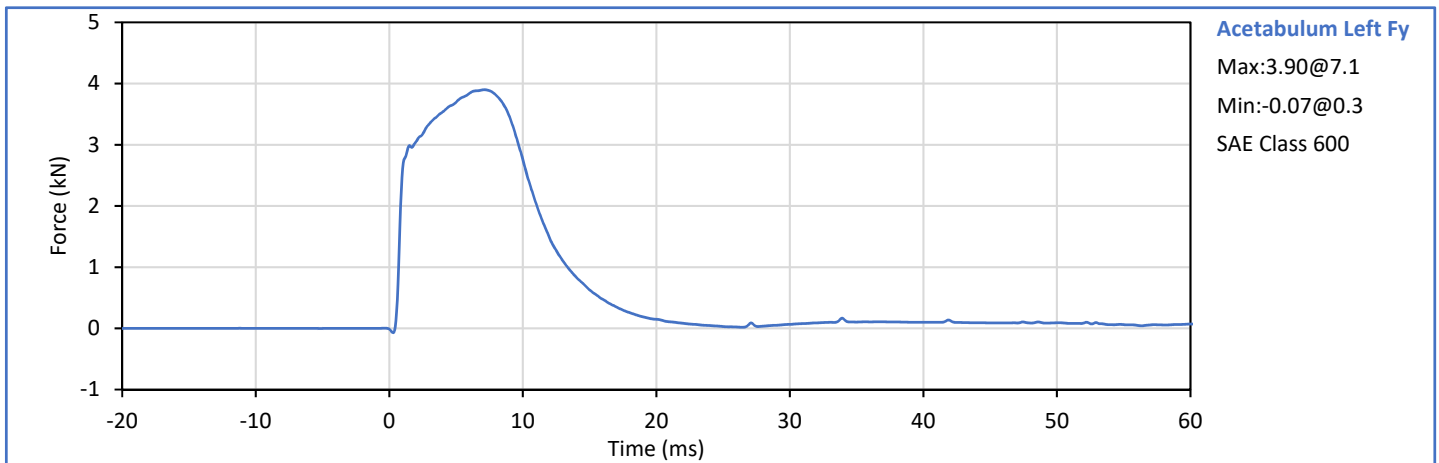
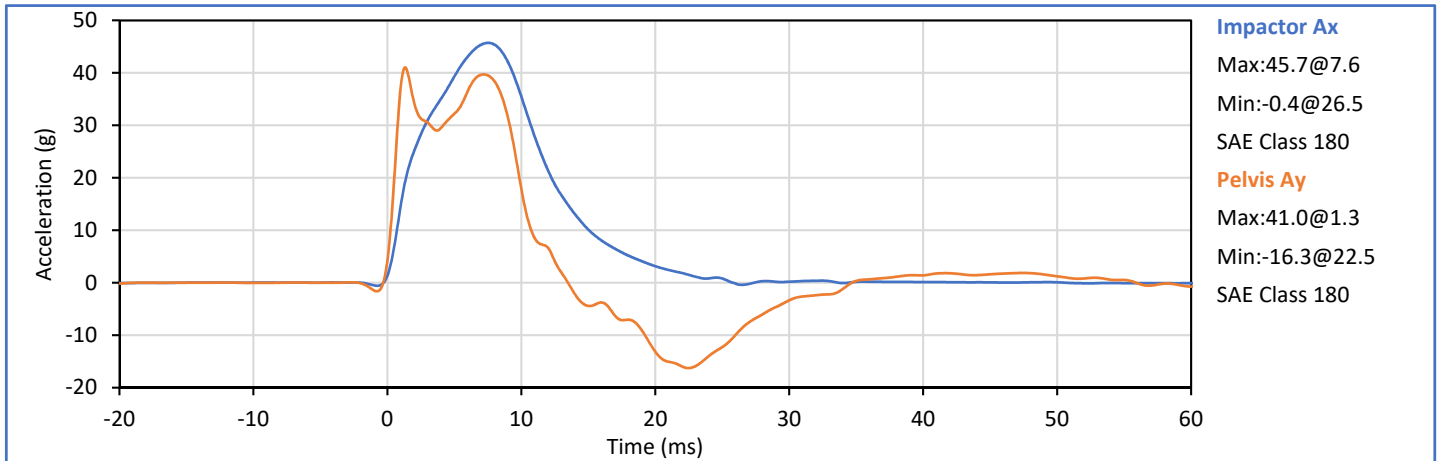



Technician:   
J. Hernandez


Approved By:   
P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.5	Pass
Laboratory Humidity	%	10	70	21	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.90	Pass
Pelvis Ay after 6ms	g	34.0	42.0	39.7	Pass
Peak Impactor Ax	g	38.0	47.0	45.7	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 13600



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto



**SID-IIs Pelvis Plug Certification Test**

Plug S/N 13600

Test Number 11244

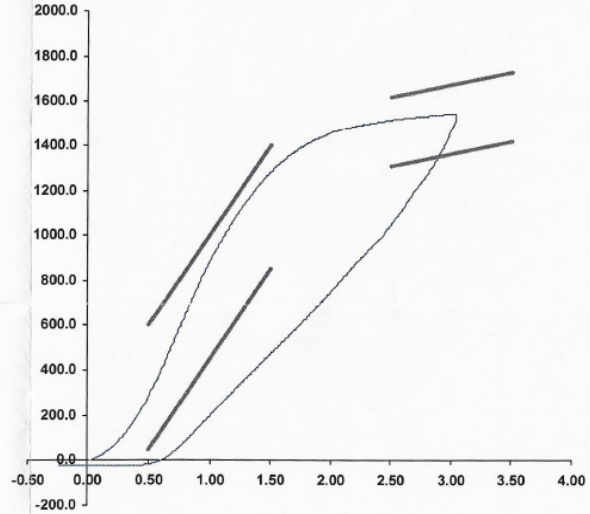
Report Number 11282

Test Date 9/25/2019 12:55:35 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	293.22	50.00	600.00
Force @ 1.5 mm (N)	1,281.10	850.00	1,400.00
Force @ 2.5 mm (N)	1,518.09	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,543.67	1,361.00	1,673.00

Testing Machine STM-20 5965542  
Load Cell S/N (FI360947), Units (LBS) 1000  
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

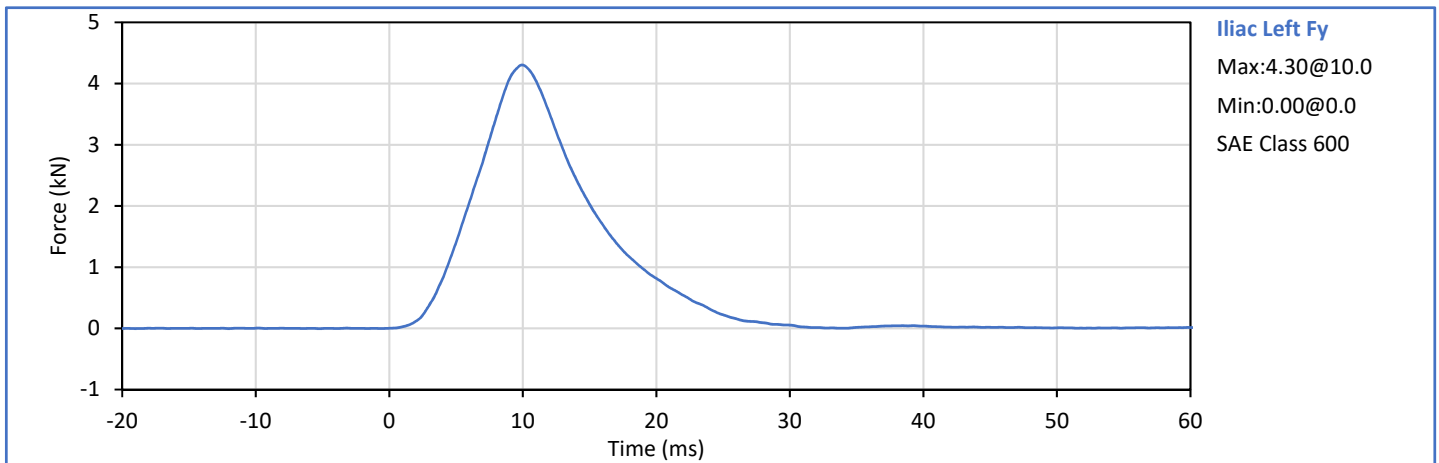
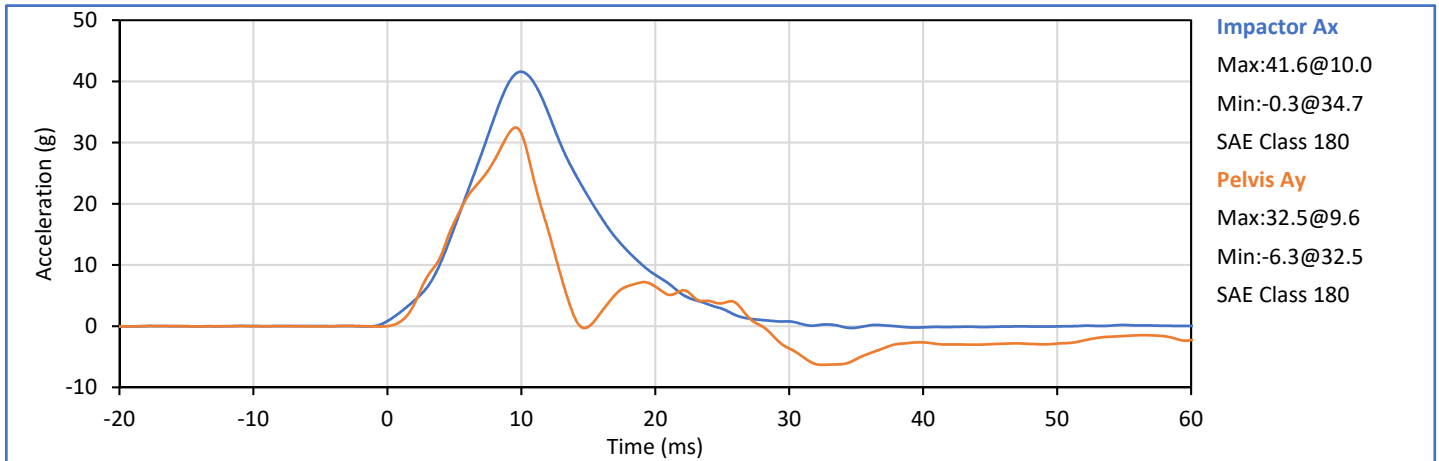
Template No 107 25-Sep-19  
SACO Research

By: [Signature] Date: 9/25/2019


Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	13	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Iliac Fy	kN	4.10	5.10	4.30	Pass
Pelvis Ay after 6ms	g	28.0	39.0	32.5	Pass
Peak Impactor Ax	g	36.0	45.0	41.6	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12228 \*

\* Plug is not impacted and remains certified



Technician:   
J. Hernandez

Approved By:   
P. Puzzuto

**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	P58760	Endevco	7264C-2k	2020-08-24
Head Acceleration Y Primary	P58763	Endevco	7264C-2k	2020-08-24
Head Acceleration Z Primary	P52093	Endevco	7264C-2k	2020-08-24
Head Acceleration X Redundant	P52072	Endevco	7264C-2k	2020-08-24
Head Acceleration Y Redundant	P58768	Endevco	7264C-2k	2020-08-24
Head Acceleration Z Redundant	P52074	Endevco	7264C-2k	2020-08-24
Upper Thorax Rib Deflection Y	180 (ES-2 Rib)	Honeywell	F38000203	2020-08-26
Middle Thorax Rib Deflection Y	177 (ES-2 Rib)	Honeywell	F38000203	2020-08-26
Lower Thorax Rib Deflection Y	186 (ES-2 Rib)	Honeywell	F38000203	2020-08-26
Anterior Abdominal Force Y	1514 Fy	R.A. Denton	2631J	2020-01-07
Middle Abdominal Force Y	1510 Fy	R.A. Denton	2631J	2020-01-07
Posterior Abdominal Force Y	1515 Fy	R.A. Denton	2631J	2020-01-07
Lower Spine T12 Acceleration X	P63850	Endevco	7264C-2KTZ	2020-08-24
Lower Spine T12 Acceleration Y	P51278	Endevco	7264C-2KTZ	2020-08-24
Lower Spine T12 Acceleration Z	P51696	Endevco	7264C-2KTZ	2020-08-24
Pubic Symphysis Force Y	506 Fy	R.A. Denton	3096JFL	2020-01-06

**Table 2 - Left Rear Passenger ATD Instrumentation**

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P63980	Endevco	7264C-2k	2020-07-23
Head Acceleration Y Primary	P58861	Endevco	7264C-2k	2020-07-23
Head Acceleration Z Primary	P51261	Endevco	7264C-2k	2020-07-23
Head Acceleration X Redundant	P58808	Endevco	7264C-2k	2020-07-23
Head Acceleration Y Redundant	P63310	Endevco	7264C-2k	2020-07-23
Head Acceleration Z Redundant	P49189	Endevco	7264C-2k	2020-07-23
Head Rotation Rate X	ARS7498	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Y	ARS7367	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Z	ARS7377	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Upper Thorax Rib Deflection Y	1249	Servo	08TCI-3725	2020-08-17
Middle Thorax Rib Deflection Y	1219	Servo	08TCI-3725	2020-08-17
Lower Thorax Rib Deflection Y	1221	Servo	08TCI-3725	2020-08-17
Upper Abdomen Rib Deflection Y	1252	Servo	08TCI-3725	2020-08-17
Lower Abdomen Rib Deflection Y	1283	Servo	08TCI-3725	2020-08-17
Lower Spine T12 Acceleration X	P52108	Endevco	7264C-2k	2020-07-23
Lower Spine T12 Acceleration Y	P63970	Endevco	7264C-2k	2020-07-23
Lower Spine T12 Acceleration Z	P51712	Endevco	7264C-2k	2020-07-23
Iliac Wing Impact Side Force Y	272 Fy (Iliac)	R.A. Denton	3228J	2020-07-17
Acetabulum Impact Side Force Y	260 Fy (Acetabulum)	R.A. Denton	3249J	2020-07-17



**Table 3 - Vehicle Instrumentation**

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	A354797	MSI	52F-2k	2020-09-11
Vehicle CG Ay	A354805	MSI	52F-2k	2020-09-11
Vehicle CG Az	A356318	MSI	52F-2k	2020-09-15
Right Side Sill at Front Seat Ax	A356504	MSI	52F-2k	2020-09-16
Right Side Sill at Front Seat Ay	A356310	MSI	52F-2k	2020-09-15
Right Side Sill at Front Seat Az	A354814	MSI	52F-2k	2020-09-11
Right Side Sill at Rear Seat Ax	A356323	MSI	52F-2k	2020-09-15
Right Side Sill at Rear Seat Ay	A356325	MSI	52F-2k	2020-09-15
Right Side Sill at Rear Seat Az	A356326	MSI	52F-2k	2020-09-15
Left Side Sill at Front Seat Ay	A354868	MSI	52F-2k	2020-09-08
Left Side Sill at Rear Seat Ay	A356446	MSI	52F-2k	2020-09-15
Left Lower A-Pillar Ay	A354799	MSI	52F-2k	2020-09-11
Left Middle A-Pillar Ay	A354810	MSI	52F-2k	2020-09-11
Left Lower B-Pillar Ay	A354800	MSI	52F-2k	2020-09-11
Left Middle B-Pillar Ay	A356460	MSI	52F-2k	2020-09-15
Driver Seat Track at H-Point Ay	A356443	MSI	52F-2k	2020-09-15
Rear Seat Structure Ay	A354811	MSI	52F-2k	2020-09-11
Right Rear Occupant Comp. Ay	A356458	MSI	52F-2k	2020-09-15
Engine Block Top Ax	A356327	MSI	52F-2k	2020-09-15
Engine Block Top Ay	A354796	MSI	52F-2k	2020-09-11
Rear Floopan Above Axle Ax	A354880	MSI	52F-2k	2020-09-08
Rear Floopan Above Axle Ay	A356486	MSI	52F-2k	2020-09-16
Rear Floopan Above Axle Az	A354798	MSI	52F-2k	2020-09-11

**Table 4 - Moving Deformable Barrier (MDB) Instrumentation**

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
MDB CG Ax	A298580	MSI	52F-2k	2020-07-24
MDB CG Ay	A298575	MSI	52F-2k	2020-07-24
MDB CG Az	A298387	MSI	52F-2k	2020-07-24
MDB Left Side at Rear Axle Ax	A298572	MSI	52F-2k	2020-06-23
MDB Left Side at Rear Axle Ay	A298567	MSI	52F-2k	2020-06-23