REPORT NUMBER: SPNCAP-KAR-20-029

NEW CAR ASSESSMENT PROGRAM (NCAP)

SIDE IMPACT POLE TEST

TESLA INC.

2020 TESLA MODEL Y 5-DOOR MPV

NHTSA No: O20205001

PREPARED BY:

APPLUS IDIADA KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

DECEMBER 8, 2020

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NRM-110

1200 NEW JERSEY AVE, SE, ROOM W43-410

WASHINGTON, D.C. 20590

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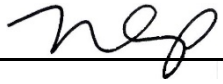
Reviewed By: 

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Approval Date: December 8, 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

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SPNCAP-KAR-20-029		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing and FMVSS No. 305 Testing of a 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001	December 8, 2020
	6. Performing Organization Code KAR
7. Authors Mr. Matthew J. Angeles, Project Engineer, Applus IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus IDIADA KARCO	**8. Performing Organization Report No.** TR-P40344-01-NC
9. Performing Organization Name and Address Applus IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.**
	11. Contract or Grant No. DTNH22-14-D-00355L
12. Sponsoring Agency Name and Address 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	**13. Type of Report and Period Covered** Final Test Report, November 23 - December 8, 2020
	14. Sponsoring Agency Code NRM-110

15. Supplementary Notes

16. Abstract

A 32.2 km/h 75° rigid pole side NCAP 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 Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on November 23, 2020.

The impact velocity was 32.59 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 21.1°C. The target vehicle's maximum post-test static crush was 184 mm located at level 2. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC_{36})		1000	283.1
Resultant Lower Spine Acceleration	g	82	39
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3034
Maximum Thoracic Rib Deflection	mm	38	27
Maximum Abdominal Rib Deflection	mm	45	23

The struck side door at the front of the vehicle was jammed shut and did not separate from the body at the hinges or latches. The remaining doors did not open during the side impact event.

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	Copies of this report are available from: National Highway Traffic Safety Admin. Technical Information Services Division 1200 New Jersey Ave., SE Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	133	

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SECTION 1
TEST PURPOSE AND SUMMARY OF TEST

PURPOSE

This 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 date October 2015.

SUMMARY

A rigid pole side impact test was conducted on a 2020 Tesla Model Y 5-door MPV. The subject vehicle was towed into the rigid pole at an angle of 76.5° and a velocity of 32.59 km/h. The test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California on November 23, 2020. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated October 2015. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) was instrumented accordingly:

Primary and Redundant Head CG tri-axial accelerometers
Thorax upper, middle and lower rib displacement potentiometers
Abdomen upper and lower rib displacement potentiometers
Lower spine (12) tri-axial accelerometers
Iliac load cell
Acetabulum load cell

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 contains the test equipment and instrumentation calibration data.

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Units	Driver ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC_{36})		1000	283.1
Lower Spine (T12) Resultant Acceleration	g	82	39
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3034
Maximum Thoracic Rib Deflection	mm	38*	27
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	Yes	No	
Knee Airbag	Yes	Yes	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	Yes	No
Seat Belt Load Limiter	Yes	Yes	Yes	No

GENERAL COMMENTS

The struck side door at the front of the vehicle was jammed shut. There was no separation at the hinges or latches. The remaining doors remained closed and latched. There were no ATD values that exceeded limits.

- The left floor at sill AY, channel failed at 27.5 ms
- The left A-Post at sill AY, channel failed at 20.0 ms
- The left lower A-Post AY, channel failed at 20.0 ms
- The left Mid A-Post at sill AY, channel failed at 46.5 ms
- The floor pan at Rear Axle AY, channel failed at 35.0 ms
- The floor pan at Rear Axle AY, channel failed at 35.0 ms
- Vehicle CG Az, questionable data
- Some pre-test photos have test date of 11/20/20 and post-test photos have test date of 11/23/20, The test was run on 11/23/20

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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^2	kPa	6.895
Temperature	General Use	^oF	^oC	=(Tf -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. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	O20205001
Model Year	2020
Make	Tesla
Model	Model Y
Body Style	5-Door MPV
VIN	5YJYGDEE5LF059254
Body Color	Deep Blue Metallic
Odometer Reading (km / mi)	111/69
Engine Displacement (L)	N/A
Type / No. of Cylinders	N/A
Engine Placement	N/A
Transmission Type	Automatic
Transmission Speeds	1
Overdrive	No
Final Drive	AWD
Roof Rack	No
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

Does Owner's Manual provide instructions to turn off automatic door locks?	N/A

DATA FROM CERTIFICATION LABEL

Manufactured By	Tesla Inc.	GVWR (kg)	2405
Date of Manufacture	Oct-20	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	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				34.8	*A-B*

VEHICLE SEAT TYPE

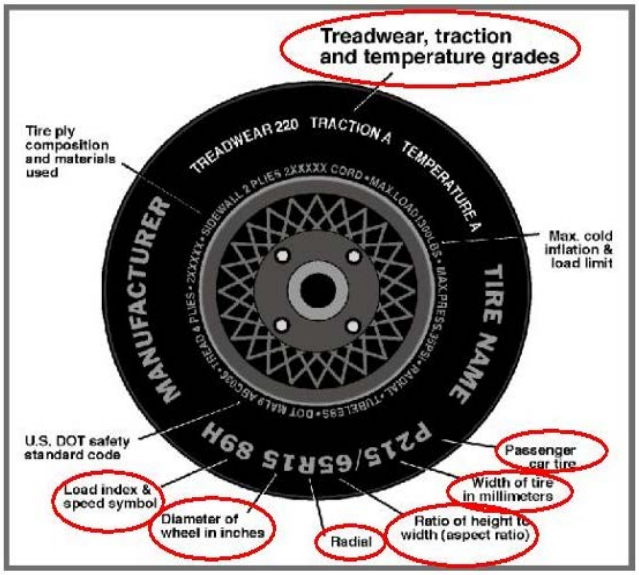
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



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	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	101W	101W
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	M673 JYIR 3520	M673 JYIR 3520
DOT Safety Code Right	M673 JYIR 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. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	485.5	509.0		528.5	513.0		518.0	552.5	
Right	kg	500.5	492.5		464.0	558.5		525.0	477.0	
Ratio	%	49.6%	50.4%	100.0%	48.1%	51.9%	100.0%	50.3%	49.7%	100.0%
Total	kg	986.0	1001.5	1987.5	992.5	1071.5	2064.0	1043.0	1029.5	2072.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1987.5	A
Actual Weight of 1 SID II-s ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	34.8	C
Calculated Vehicle Target Wt (TVTW)	kg	2071.3	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	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.9	0.4	0.4	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.5	-0.9	-0.9	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.6	0.1	0.2	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.5	0.1	0.1	Yes
Vehicle CG (Aft of Front Axle)	mm	1454	1498	1434	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	1	7	27	

*ND=Nose Down (-), NU=Nose Up (+) **LD=Left Down (-), LU=Left Up (+)

***The “As Tested” vehicle attitude angle measurements must be within “As Delivered” and the “Fully Loaded” vehicle attitude measurements at each location. 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. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Rear Trim	6.5
Rear Underbody Cover	2.5
Ballast / Equipment Added	53.7

Test Height Adjustable Setting (If Applicable)	

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. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and front passenger's seat should be set to the forward most, mid-height, mid-angle position. The struck side rear passenger's seat, rear center seat, and non-struck side rear passenger's seat should be set to the rear most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	11.8	0.0	5.8
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	5.8	678	Max	695	700	709
			Mid	674	678	685
			Min	650	655	662
Front Passenger Seat	4.5	329	Max	335	342	351
			Mid	321	329	337
			Min	306	316	322
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. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

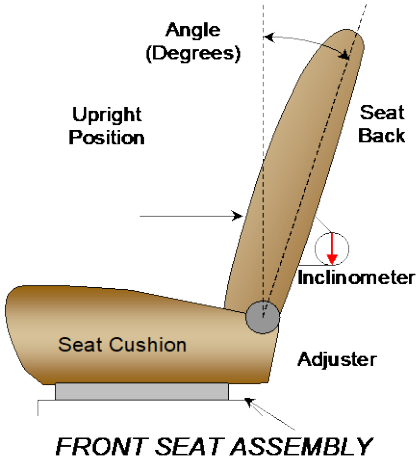
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	N/A	130	N/A
Front Passenger Seat	260	N/A	0	N/A
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 such that the dummy's head is level. The front passenger's seat back is positioned in a similar manner to the driver's seat. The struck side rear passenger seat back is positioned in accordance with the information provided by the manufacturer in Form 1 for the 5th percentile female dummy in a Side NCAP MDB Test. The rear center and non-struck side rear passenger's seat back is set to match the struck side rear seat back. Seat back angle is measured using a flat bar along the seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	56.1	N/A	9.6	N/A
Front Passenger Seat	55.7	5	17.0	0
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. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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

HEAD RESTRAINT ADJUSTMENT

The driver'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

DATA SHEET NO. 2 … (CONTINUED)

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

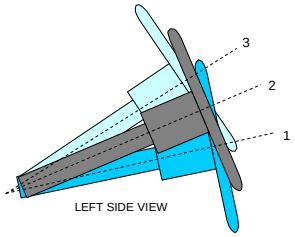
Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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.

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	16.1	95
Geometric Center - Position 2	18.5	125
Uppermost - Position 3	20.9	155
Telescoping Steering Wheel Travel		60
Test Position	18.5	125



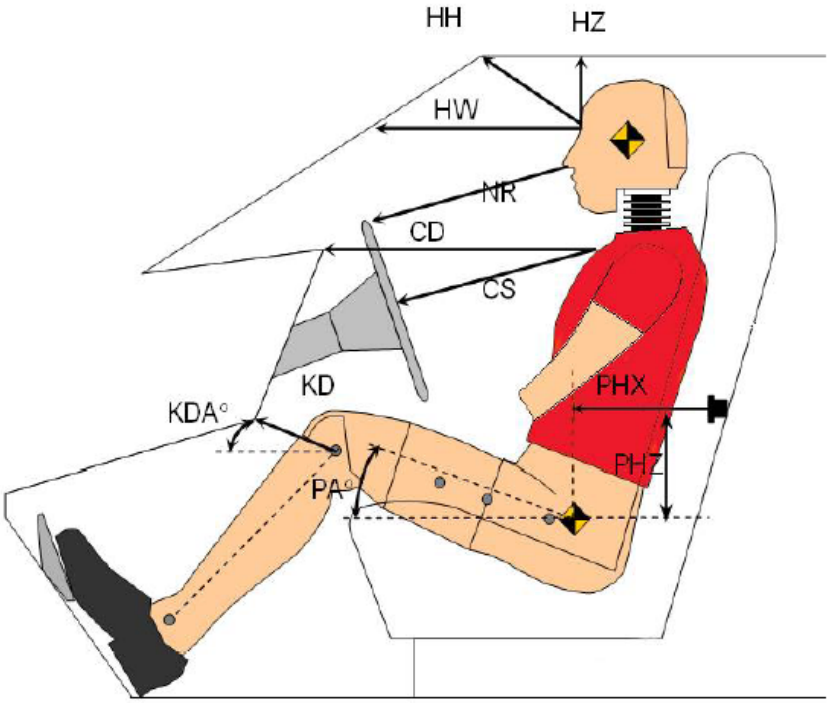
STEERING COLUMN ASSEMBLY

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



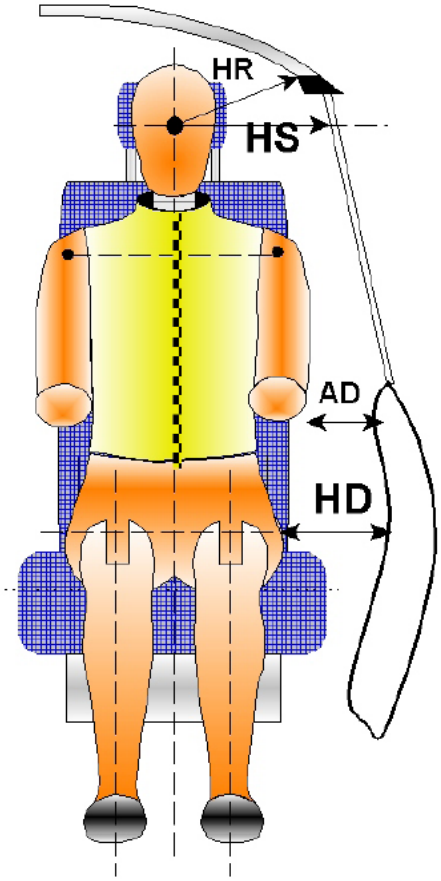
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	234	
HW	Head to Windshield	654	
HZ	Head to Roof	180	
NR	Nose to Rim	189	
CD	Chest to Dash	N/A	
CS	Chest to Steering Wheel	146	
KD(L)/KDA(L)°	Left Knee to Dash	205	26.8
KD(R)/KDA(R)°	Right Knee to Dash	176	22.3
PAX°	Pelvic Tilt Angle (x-axis)		20.1
PAY°	Pelvic Tilt Angle (y-axis)		0.2
PHX	Hip Point to Striker (x-axis)	343	
PHZ	Hip Point to Striker (z-axis)	39	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



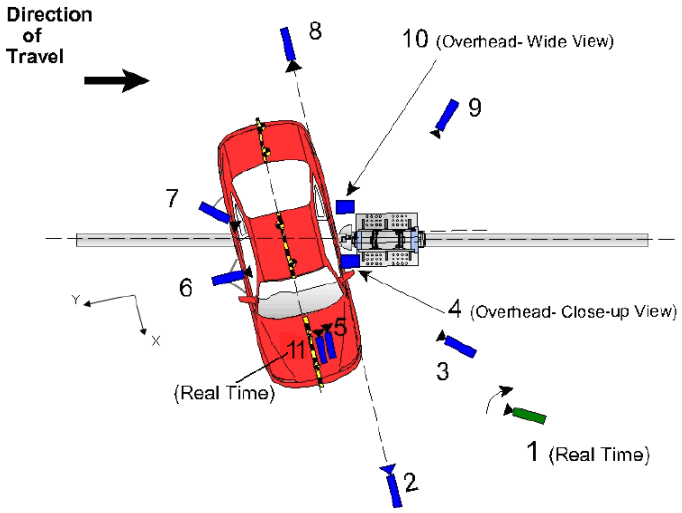
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	276
HS	Head to Side Window	mm	305
AD	Arm to Door	mm	136
HD	Hip Point to Door	mm	181

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



Reference from Point of Impact for X and Y; from Ground for Z):
+X = Forward of Vehicle, +Y = Right of Vehicle, +Z = Down

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	1.28	0.52	-1.46	8.5	1000
6	On-Board - Dummy Side View	1.28	0.52	-1.41	8.5	1000
7	On-Board - Dummy Rear Oblique View	-0.04	1.75	-1.20	8.5	1000
8	Rear Ground Level - Impact View	-1.30	1.68	-1.26	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.24	0.58	-1.42		30

*All measurements accurate to ±6 mm

NOTE: Vehicle is at a 75 angle to the rigid pole.

If applicable, explain why camera(s) did not operate as intended: N/A

INSTRUMENTATION

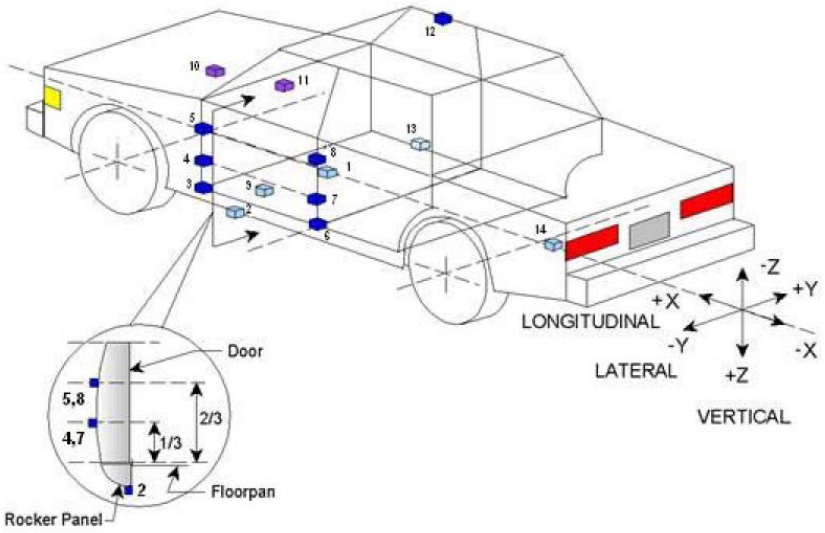
Driver Dummy Channels	19
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	45

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2053	0	250
2	Left Floor Sill	2957	-705	340
3	A-Pillar Sill	3173	-785	513
4	A-Pillar Low	3173	-785	635
5	A-Pillar Mid	3173	-785	823
6	B-Pillar Sill	2407	-732	476
7	B-Pillar Low	2407	-732	731
8	B-Pillar Mid	2407	-732	925
9	Driver Seat Track	2324	-570	415
10	Engine Top	3642	0	765
11	Firewall	3415	500	947
12	Right Roof	2132	585	1562
13	Right Floor Sill	2957	705	340
14	Rear Floorpan	951	0	590

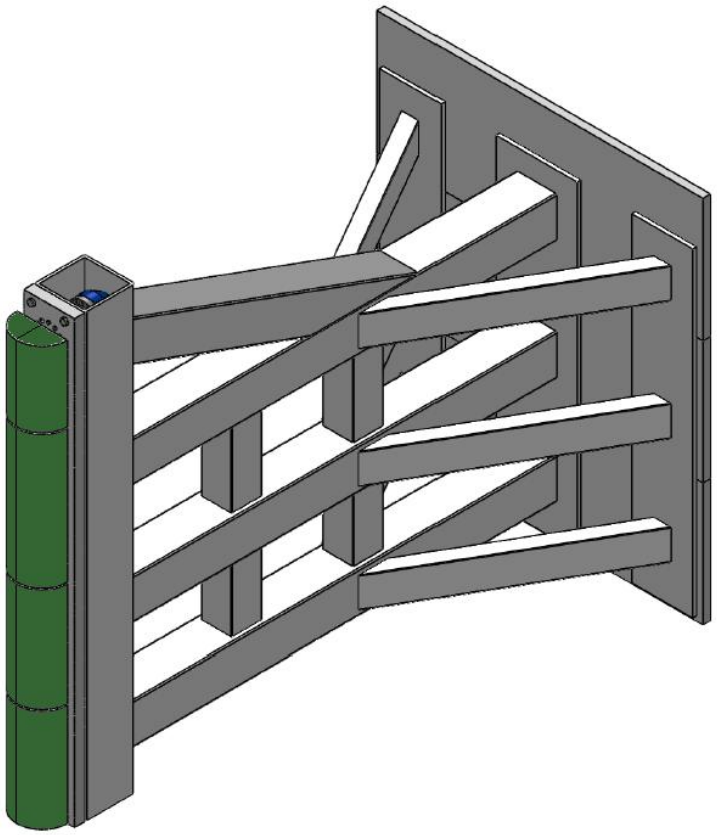
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



ID	Units	Height From Ground
1	mm	87
2	mm	468
3	mm	648
4	mm	978
5	mm	1168
6	mm	1651
7	mm	1816
8	mm	2057

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag, Headliner
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Headrest
Left Shoulder	Side Airbag
Upper Torso	Side Airbag
Lower Torso	Side Airbag
Left Hip	Door Panel
Left Knee	Door Panel, Knee Airbag

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	Yes	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	No	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

POST-TEST SEAT PERFORMANCE

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	No separation occurred
Sill Separation	No separation occurred
Windshield Damage	Broken
Side Window Damage	Left front window broken
Other Notable Effects	Roof glass broken and separation occurred

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

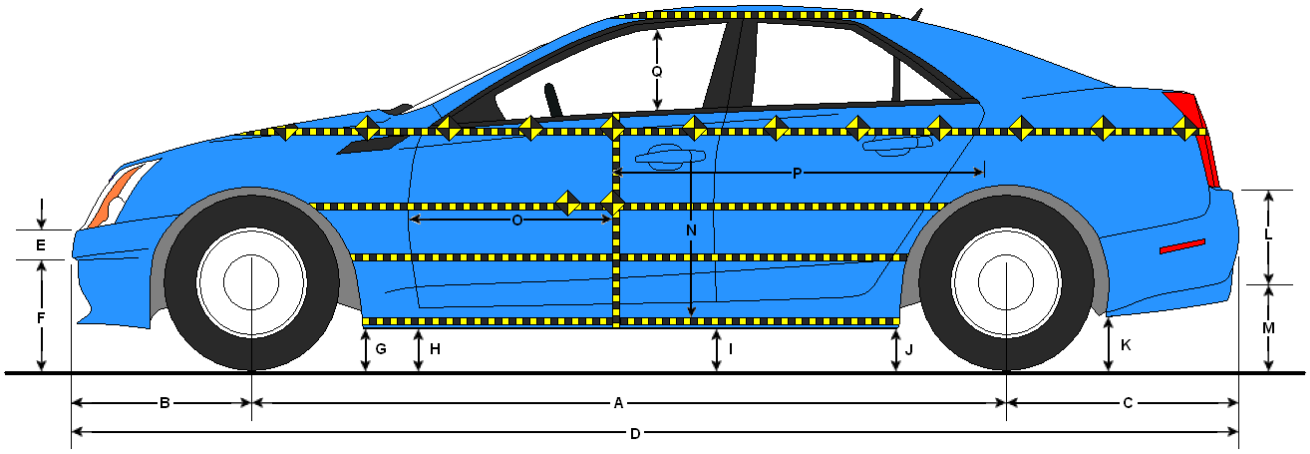
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1344
Actual Impact Point (Aft of Front Axle)	mm		1361
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	17
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	76.5
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.59
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.58

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

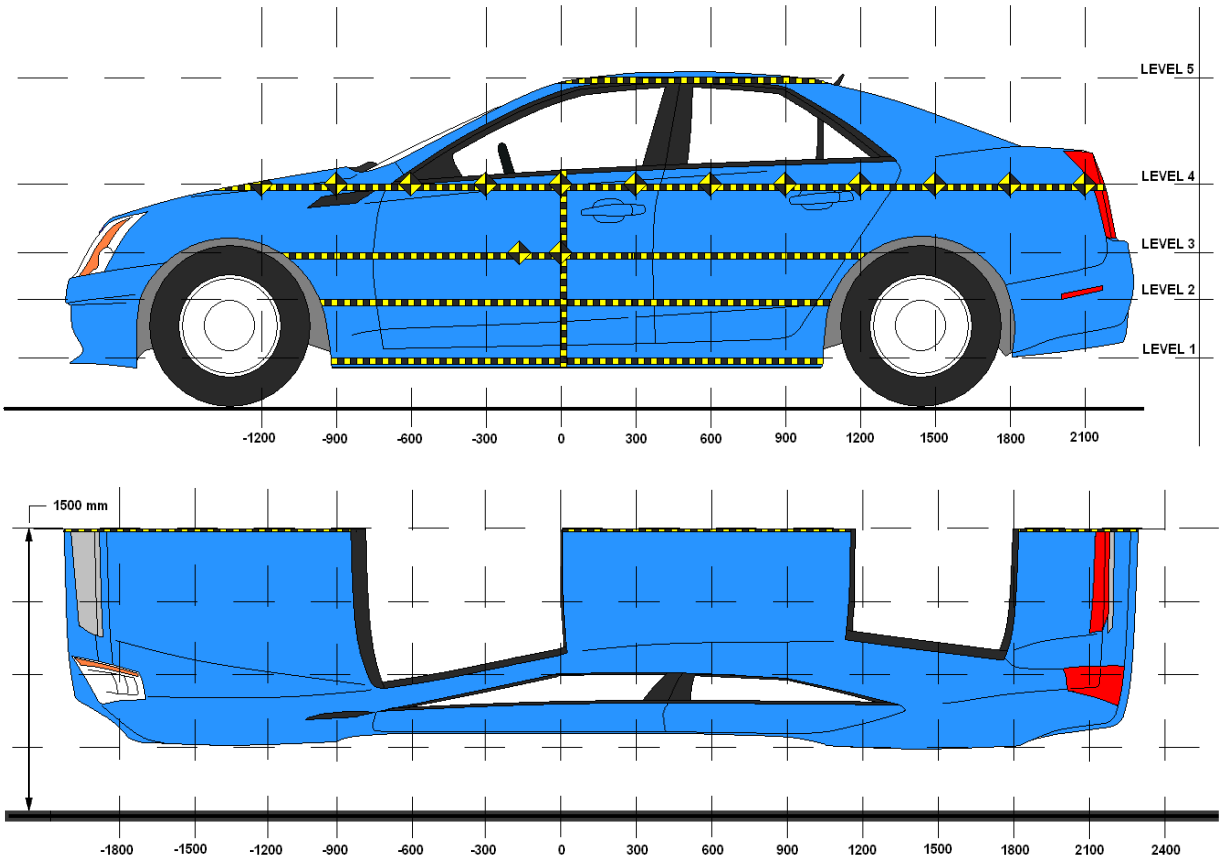
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2886	2834	-52
B	Front Axle to FSOV	876	923	47
C	Rear Axle to RSOV	984	991	7
D	Total Length at Centerline	4721	4748	27
E	Front Bumper Thickness	268	267	-1
F	Fromt Bumper Bottom to Ground	489	451	-38
G	Sill Height at Front Wheel Well	314	296	-18
H	Sill Height at Front Door Leading Edge	316	302	-14
I	Sill Height at B-Pillar	335	327	-8
J1	Sill Height at Rear Wheel Well	352	351	-1
J2	Pinch Weld Height at Rear Wheel Well	215	210	-5
K	Sill Height Aft of Rear Wheel Well	400	400	0
L	Rear Bumper Thickness	234	234	0
M	Rear Bumper Bottom to Ground	448	451	3
N	Sill Height to Bottom of Front Window Sill	784	794	10
O	Front Door Leading Edge to Impact CL	675	658	-17
P	Rear Door Trailing Edge to Impact CL	1585	1567	-18
Q	Front Window Opening	460	448	-12
R	Right Side Length	3468	3474	6
S	Left Side Length	3462	3456	-6
T	Vehicle Width at B-Pillar	1855	1837	-18

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



NOTE: All measurements in mm with tolerance of ± 3mm

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	301	50	150
2	Occupant H-Point	770	184	-150
3	Mid-Door	742	183	-150
4	Window Sill	1075	121	-150
5	Window Top	1613	20	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

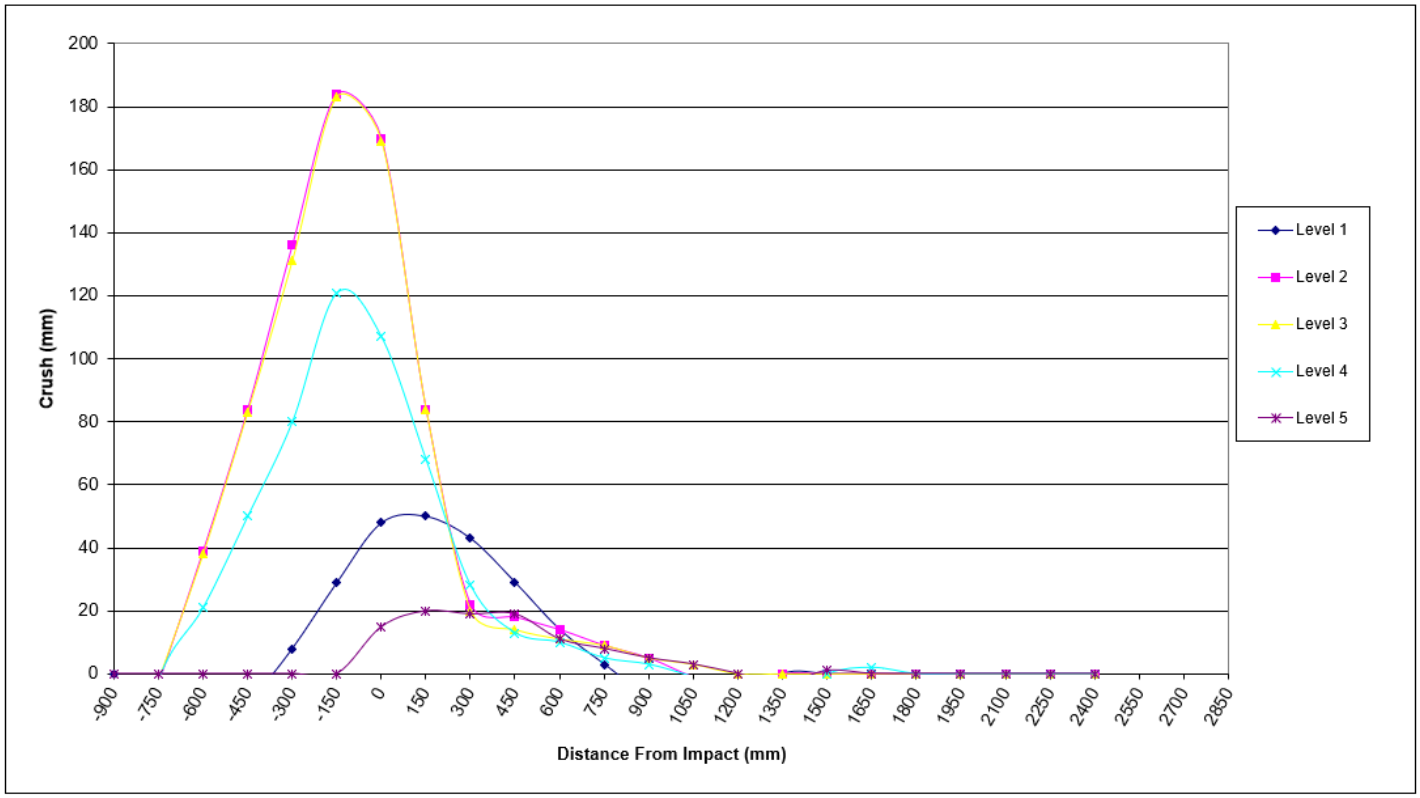
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900		561	559	699			516	517	641			-45	-42	-58	
-750	589	572	572	683		565	569	570	681		-24	-3	-2	-2	
-600	608	573	573	667		581	612	611	688		-27	39	38	21	
-450	622	573	574	656		612	657	657	706		-10	84	83	50	
-300	626	574	576	651		634	710	707	731		8	136	131	80	
-150	627	576	577	645		656	760	760	766		29	184	183	121	
0	629	577	579	641	855	677	747	748	748	870	48	170	169	107	15
150	629	579	581	636	850	679	663	665	704	870	50	84	84	68	20
300	629	581	583	636	853	672	603	603	664	872	43	22	20	28	19
450	628	584	586	637	857	657	602	600	650	876	29	18	14	13	19
600	628	584	586	638	864	642	598	597	648	875	14	14	11	10	11
750	628	585	585	637	870	631	594	594	642	878	3	9	9	5	8
900	629	584	585	629	878	622	589	590	632	883	-7	5	5	3	5
1050	622	576	574	622	890	612	575	577	621	893	-10	-1	3	-1	3
1200	590	549	547	618	902	579	545	547	613	902	-11	-4	0	-5	0
1350				614	916				605	913				-9	-3
1500				616	935				616	936				0	1
1650				621					623					2	
1800															
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

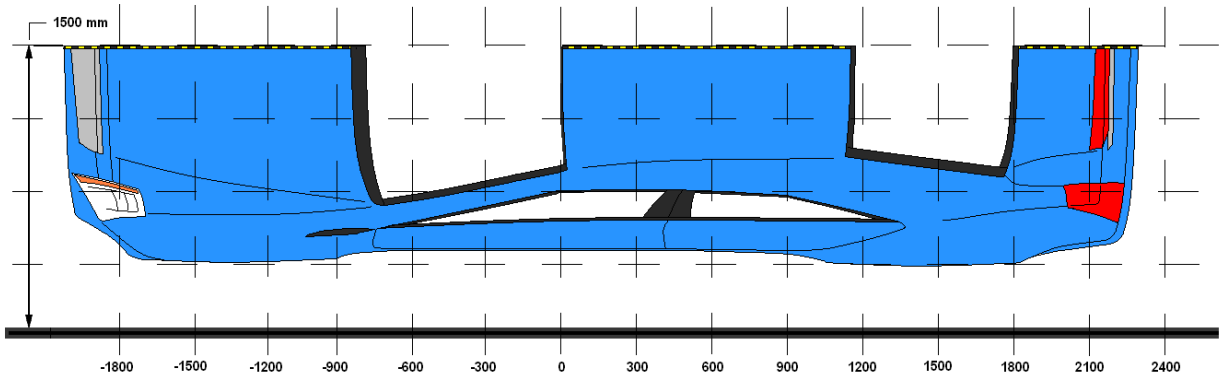


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1650	4	621	623	2
2	1200	3	547	547	0
3	600	1	628	642	14
4	150	2	579	663	84
5	-450	2	573	657	84
6	-900	3	559	517	-42

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

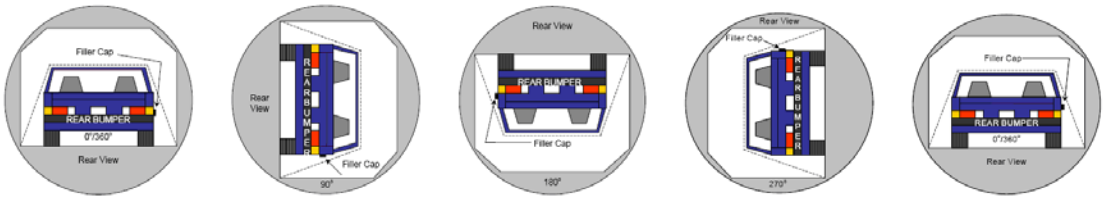
Temperature at Time of Impact: 21.1° C Test Time: 3:14 PM

A. From impact until vehicle motion ceases: 0 oz.
(Maximum allowable = 1 oz.)

B. For the 5 minute period after motion ceases: 0 oz.
(Maximum allowable = 5 oz.)

C. For the following 25 minutes: 0 oz.
(Maximum allowable = 1 oz./minute)

D. Spillage Details: There was no Stoddard solvent spillage.



0° TO 90° 90° TO 180° 180° TO 270° 270° TO 360°

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	81	300	381
90° To 180°	84	300	384
180° To 270°	81	300	381
270° To 360°	82	300	382

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

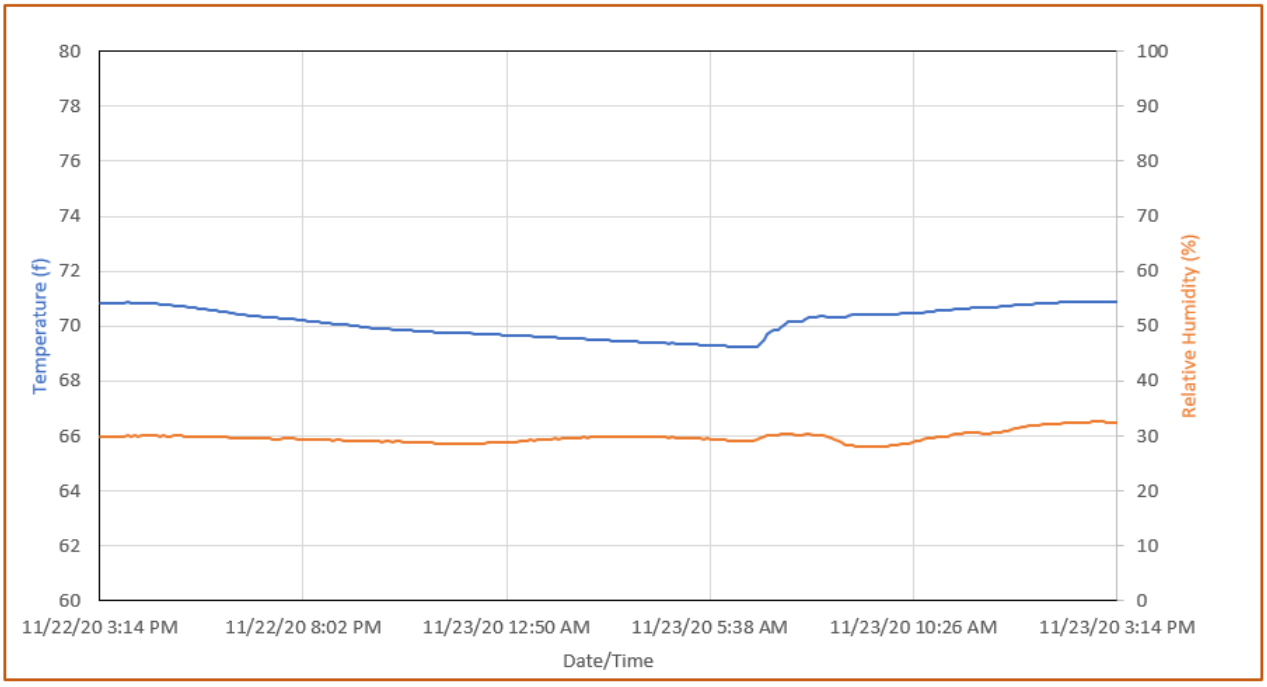
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No. O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



DATA SHEET NO. 305-1

GENERAL TEST AND VEHICLE PARAMETER DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

TEST VEHICLE INFORMATION

NHTSA Number	O20205001
Model Year	2020
Make	Tesla
Model	Model Y
Body Style	5-Door MPV
Body Color	Deep Blue Metallic
Odometer Reading (km / mi)	111/69

DATA FROM VEHICLE'S CERTIFICATION LABEL

Manufactured By	Tesla Motors Inc.
Date of Manufacture	Oct-20
VIN	5YJYGDEE5LF059254
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 NO. 305 TESTING

Test Vehicle: 2020 Tesla Model Y 5-Door MPV NHTSA No.: O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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)	396.8

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.: O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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.: O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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_b	V		396.80
V_1	V		195.30
V_2	V		209.30
R_o	Ω		219,300
V_1'	V		56.02
V_2'	V		54.80
R_{i1}	Ω		1,129,556
R_{i2}	Ω		1,195,207
R_i	Ω		1,129,556
R_i/V_b	Ω/V	500	2,847

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.: O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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_b	V		7.38
V_1	V		3.45
V_2	V		3.75
R_o	Ω		219,300
V_1'	V		0.93
V_2'	V		0.99
R_{i1}	Ω		1,240,137
R_{i2}	Ω		1,173,853
R_i	Ω		1,173,853
R_i/V_b	Ω/V	500	159,059

* "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?

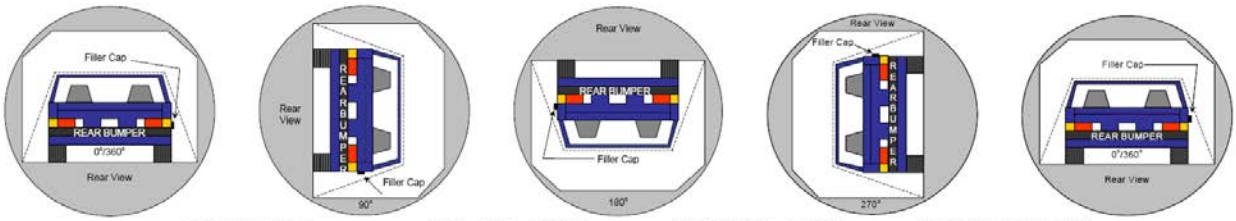
No

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.: O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20



0° TO 90° 90° TO 180° 180° TO 270° 270° TO 360°

PROPULSION BATTERY ELECTROLYTE COLLECTION TIME PERIOD

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	81	300	381
90° To 180°	84	300	384
180° To 270°	81	300	381
270° To 360°	82	300	382

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.: O20205001

Test Program: NCAP Side Pole Impact Test Test Date: 11/23/20

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_b	V		0.001	0.001	0.001	0.001	0.001
V_1	V		0.002	0.003	0.003	0.008	0.002
V_2	V		0.002	0.002	0.006	0.008	0.002
R_o	Ω		219,300	219,300	219,300	219,300	219,300
V_1'	V		0.001	0.001	0.002	0.003	0.001
V_2'	V		0.001	0.001	0.001	0.002	0.001
R_{i1}	Ω		438,600	731,000	328,950	731,000	438,600
R_{i2}	Ω		438,600	548,250	1,644,750	1,315,800	438,600
R_i	Ω		438,600	548,250	328,950	731,000	438,600
R_i/V_b	Ω/V	500	438,600,000	548,250,000	328,950,000	731,000,000	438,600,000

* ”Zero Volts” is considered as being compliant.

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

APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

Some Pre-Test Photos have test date of 11/20/20 and Post-Test Photos have test date of 11/23/20

FIGURE 1. As-Delivered Right Front ¾ View of Test Vehicle

FIGURE 2. As-Delivered Left Rear ¾ View of Test Vehicle

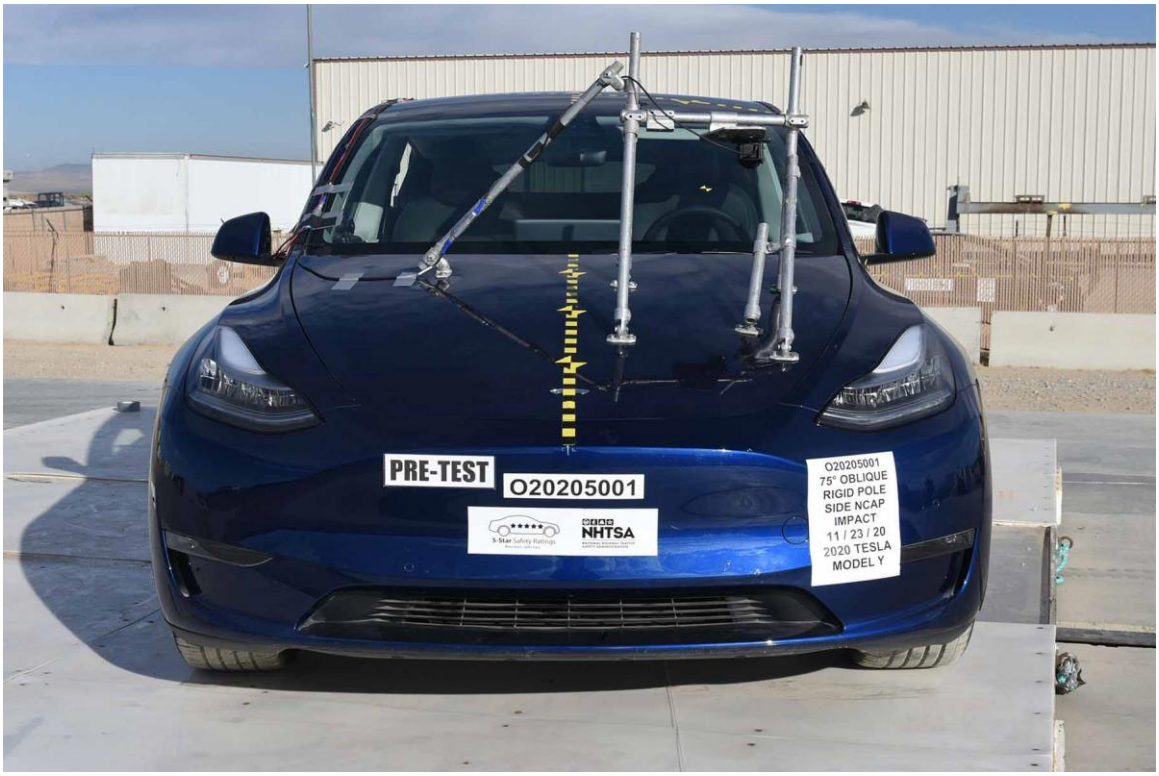


FIGURE 3. Pre-Test Frontal View of Test Vehicle

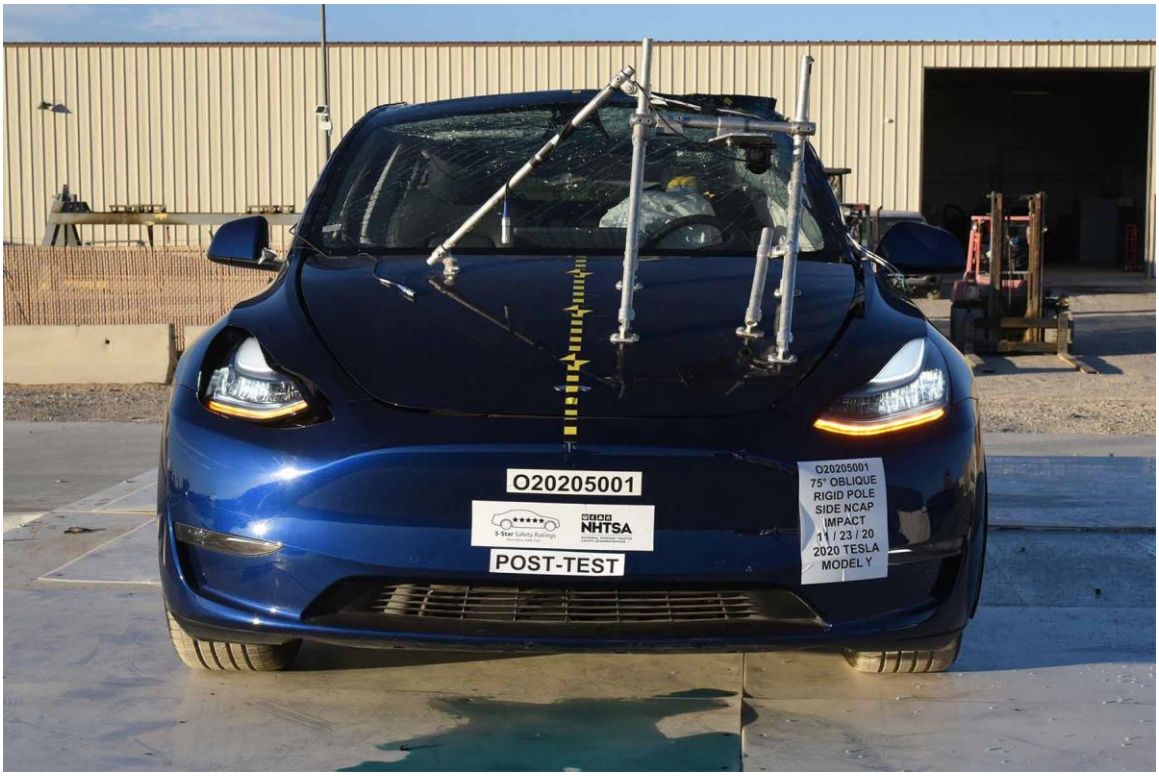


FIGURE 4. Post-Test Frontal View of Test Vehicle

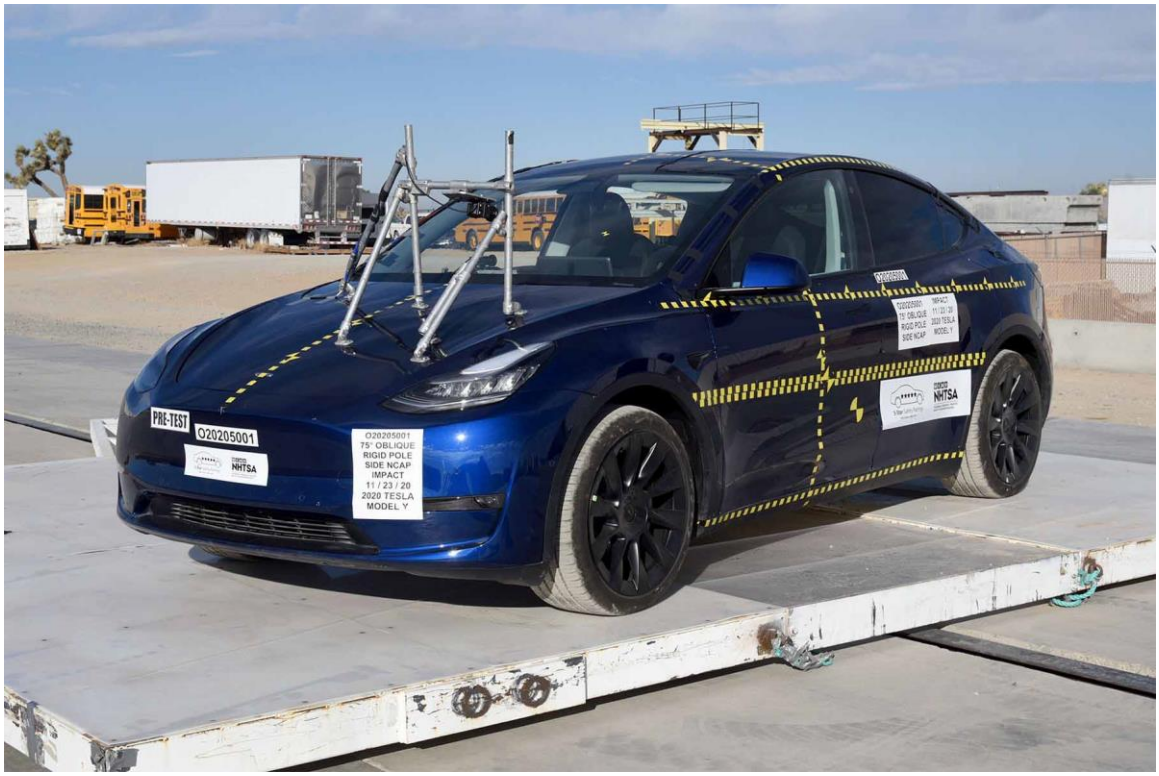


FIGURE 5. Pre-Test Left Front ¾ View of Test Vehicle

FIGURE 6. Post-Test Left Front ¾ 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

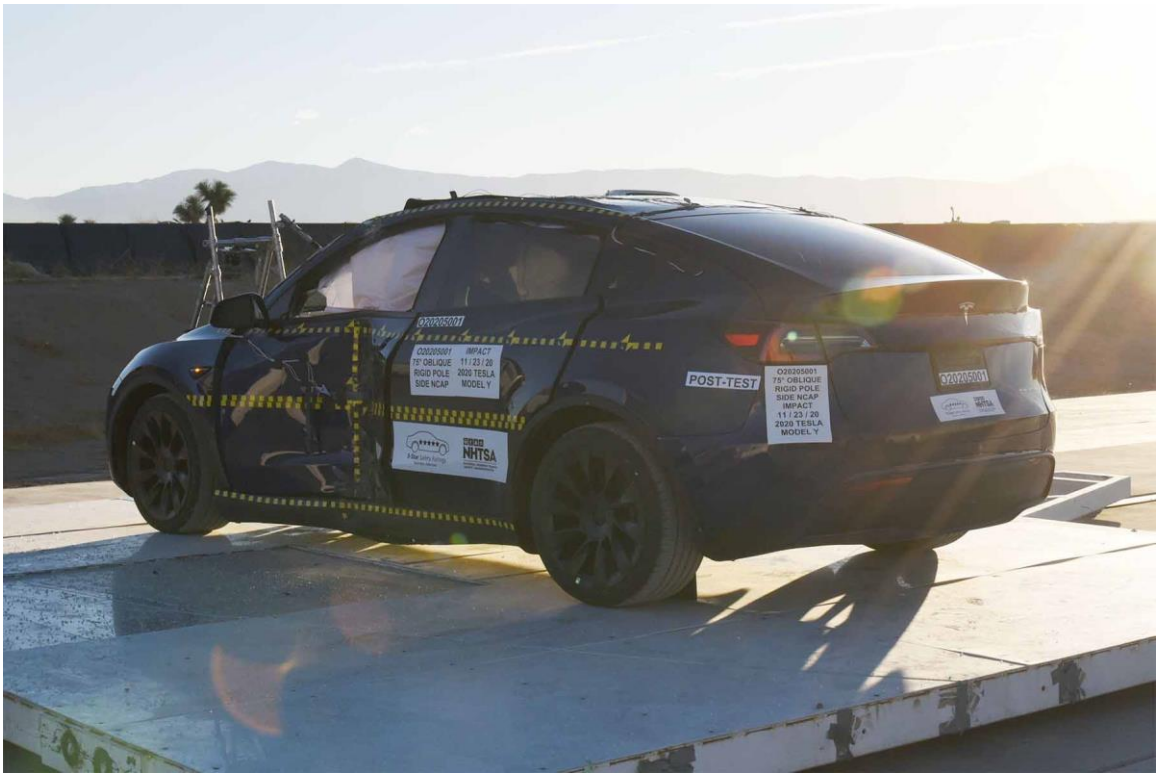


FIGURE 10. Post-Test Left Rear ¾ View of Test Vehicle

FIGURE 11. Pre-Test Rear View of Test Vehicle

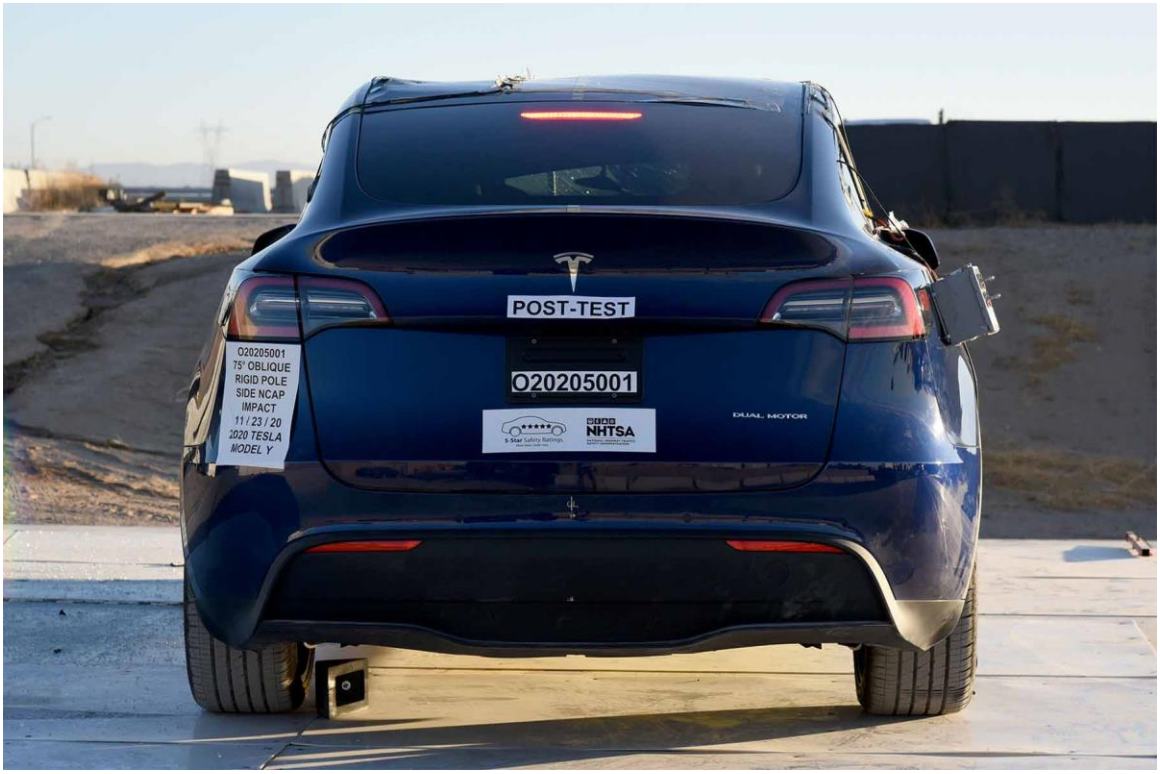


FIGURE 12. Post-Test Rear View of Test Vehicle

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

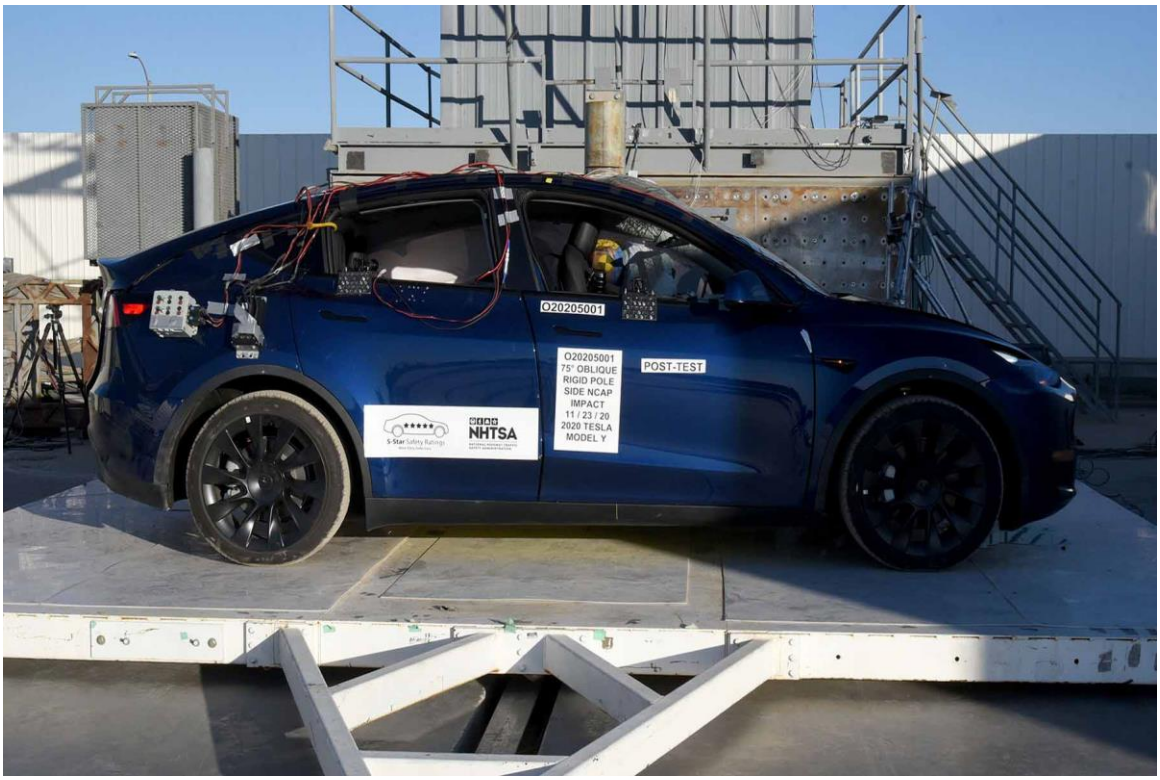


FIGURE 14. Post-Test Right Side View of Test Vehicle

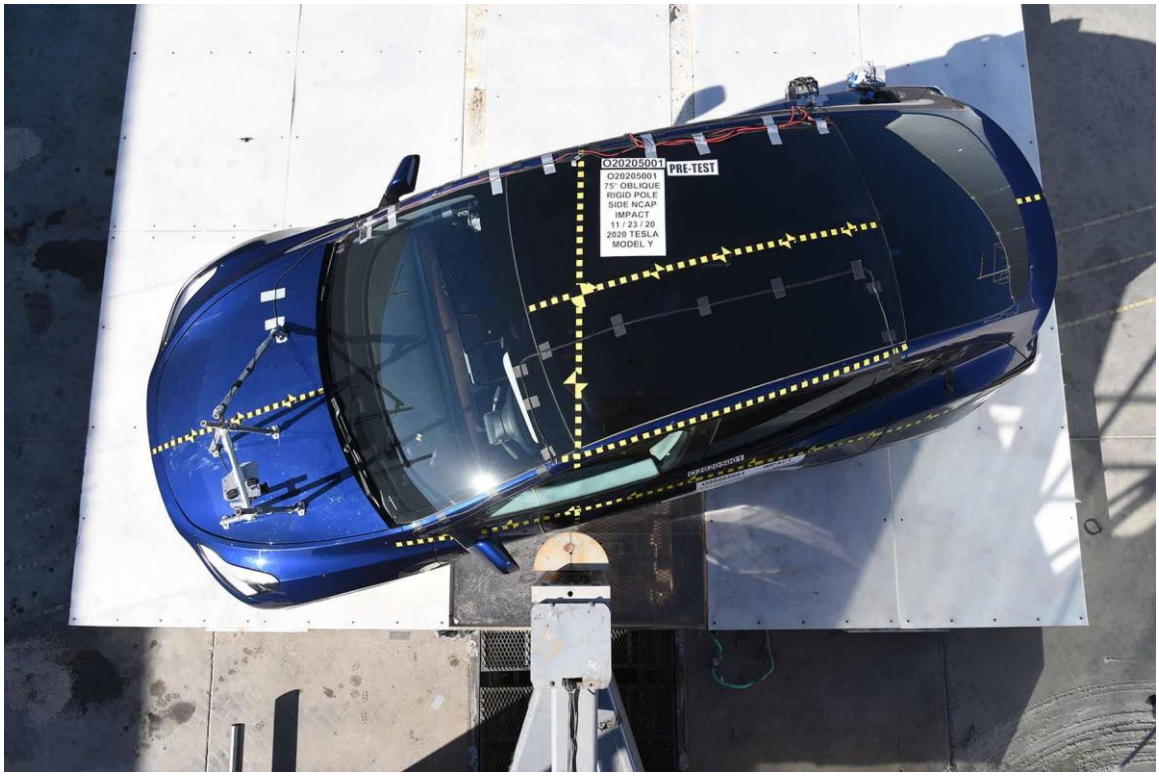


FIGURE 15. Pre-Test Overhead View of Test Area

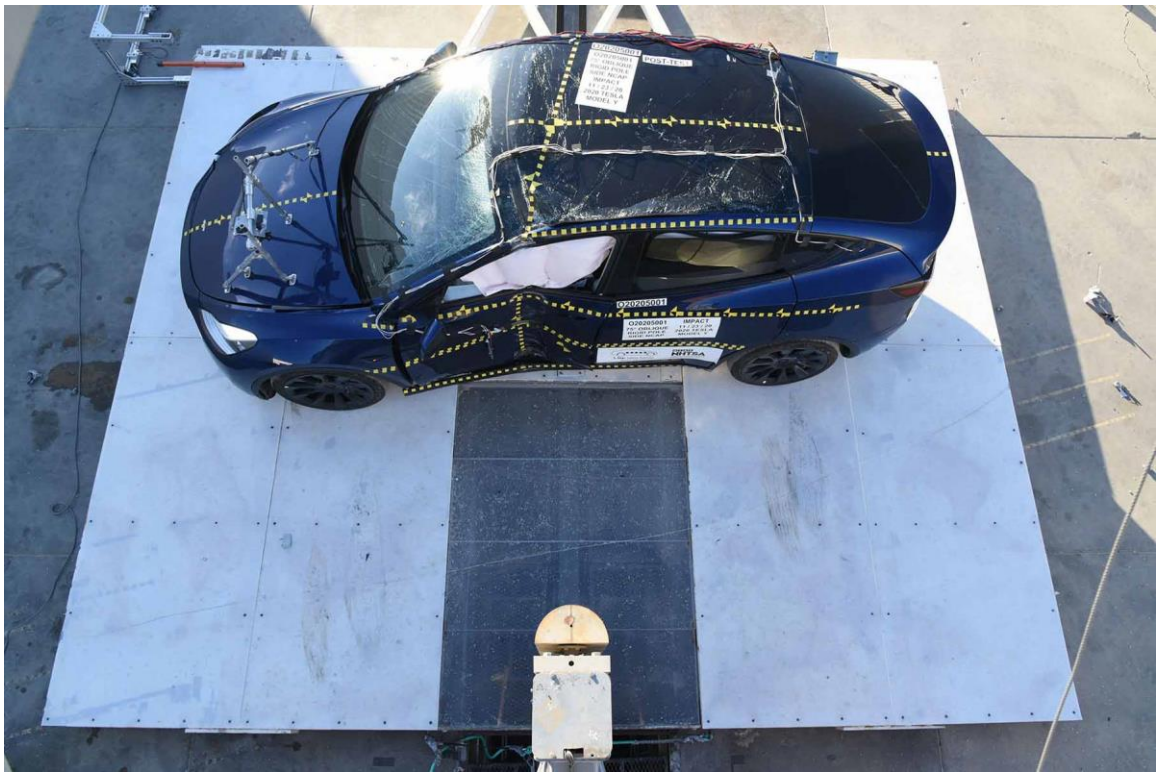


FIGURE 16. Post-Test Overhead View of Test Area

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

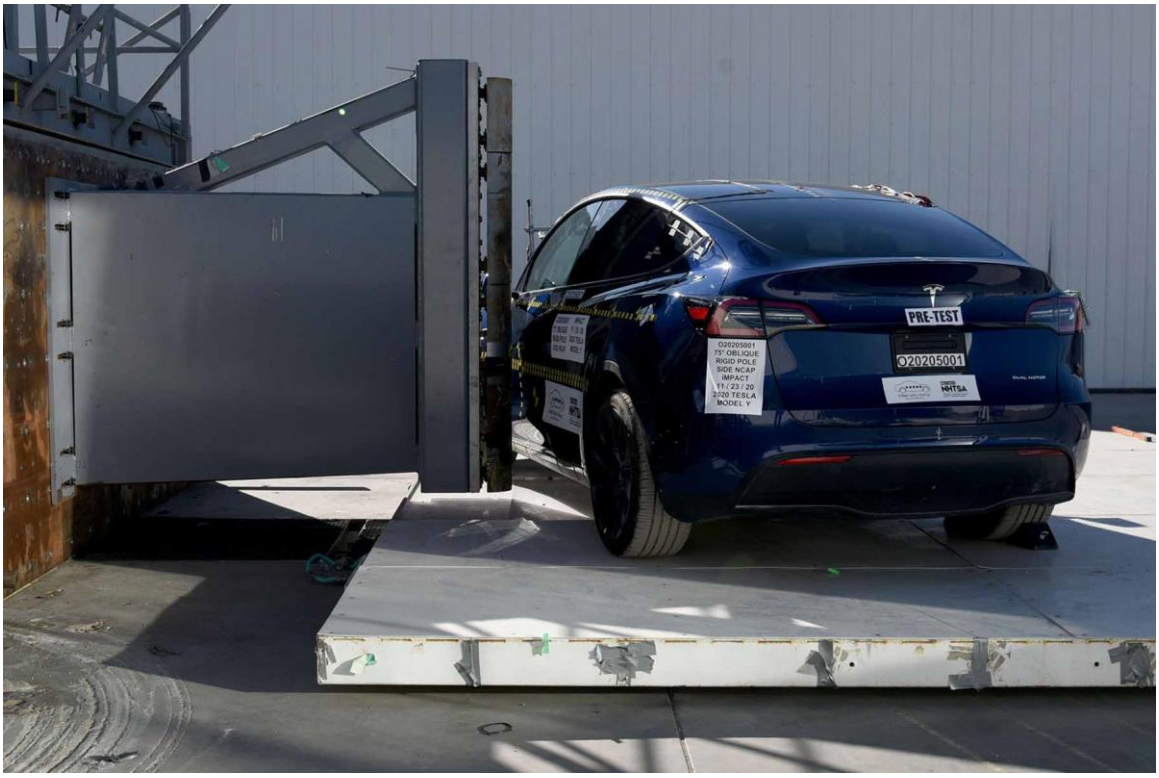


FIGURE 18. Pre-Test Right Side View of Pole Positioned Against Side of Vehicle

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

Note: Date on Placard Should Read 11/23/20

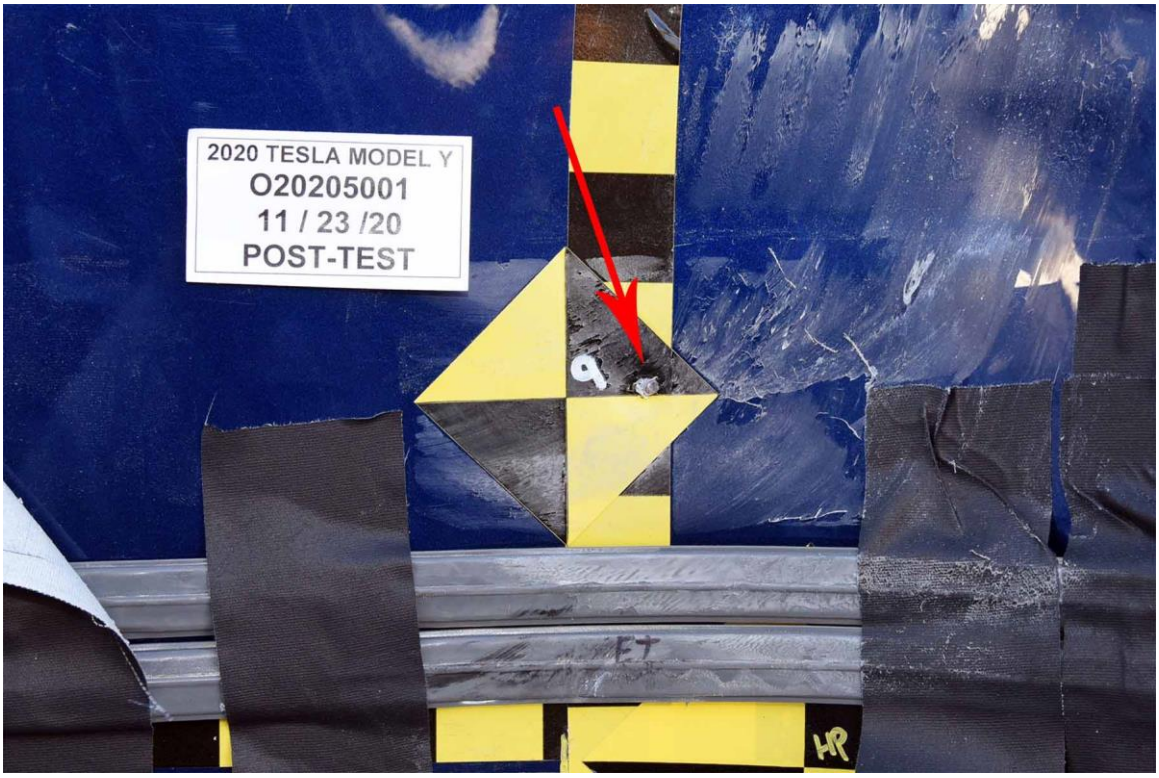


FIGURE 20. Post-Test Close-Up View of Impact Point Target Showing Impact Location

FIGURE 21. Pre-Test Front Close-Up View of Dummy Head and Chest

Note: Date on Placard Should Read 11/23/20

FIGURE 22. Post-Test Front Close-Up View of Dummy

FIGURE 23. Pre-Test Left Side View of Dummy Showing Belt and Chalking

Note: Date on Placard Should Read 11/23/20

FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and Door Top View

FIGURE 25. Post-Test Left Side View of Dummy Shoulder and Door Top View

FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning
Note: Date on Placard Should Read 11/23/20

Note: Date on Placard Should Read 11/23/20

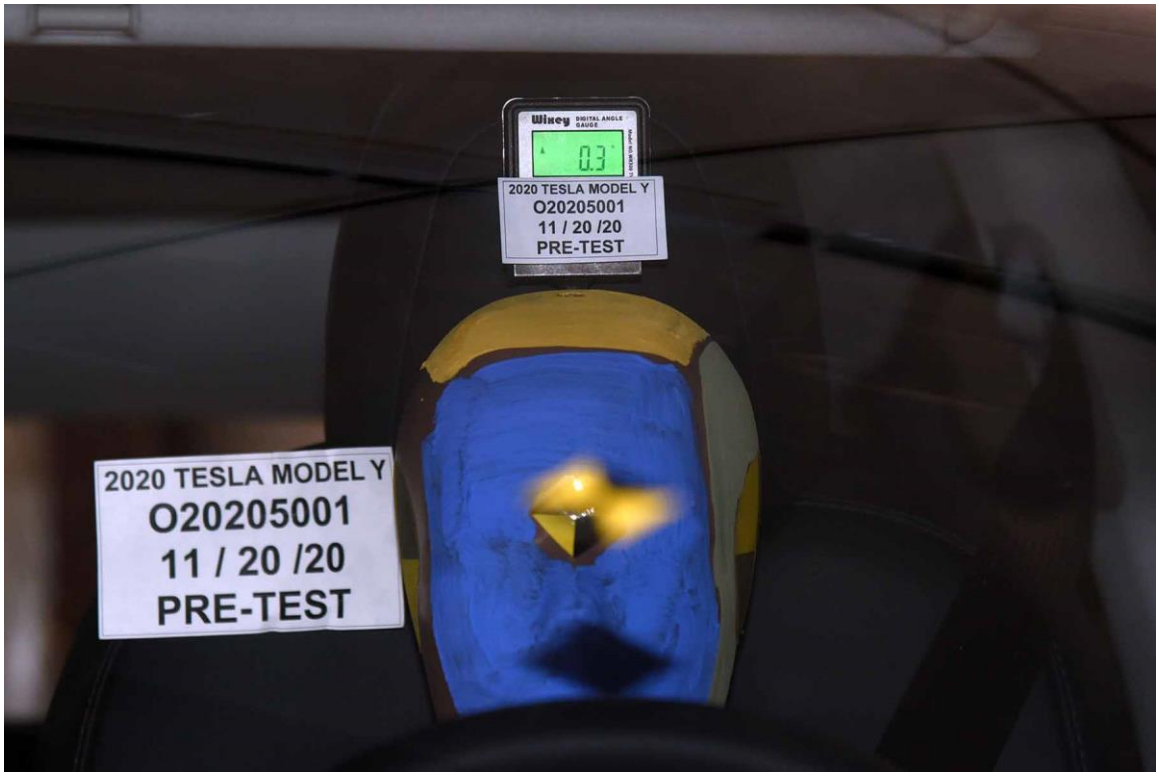


FIGURE 27. Pre-Test Frontal Close-Up View of
Dummy Head and Shoulders in Relation to Head Restraint

FIGURE 28. Pre-Test Overhead View of Seat Pan Prior to Dummy Positioning
Note: Date on Placard Should Read 11/23/20

FIGURE 29. Pre-Test Overhead View of Dummy Thighs on Seat Pan

FIGURE 30. Pre-Test Left Side View of Dummy's Neck
Showing Position of Adjustable Neck Bracket

Note: Date on Placard Should Read 11/23/20

FIGURE 31. Pre-Test Left Side View of Dummy's Head

Showing Dummy’s Head is Level

FIGURE 32. Pre-Test Placement of Dummy's Feet

FIGURE 33. Pre-Test View of Belt Anchorage for Dummy

FIGURE 34. Pre-Test Left Side View of Steering Wheel

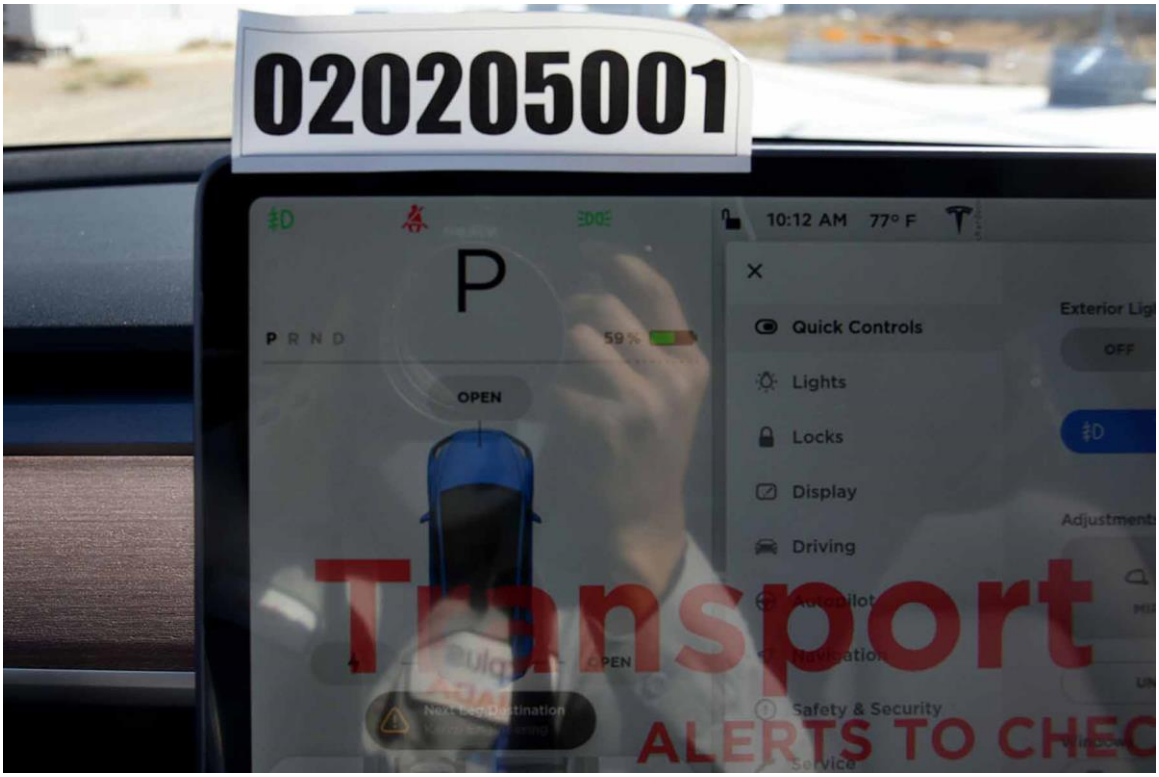


FIGURE 35. View of Disengaged Parking Brake

FIGURE 36. Pre-Test View of Parking Brake

FIGURE 37. Pre-Test Close-Up Left Side View of Driver Seat Track

FIGURE 38. Pre-Test Close-Up Left Side View of Driver Seat Back

FIGURE 39. Pre-Test Close-Up View of Driver Seat Back or Head Restraint

Note: Date on Placard Should Read 11/23/20

FIGURE 40. Pre-Test Dummy and Door Clearance View

Note: Date on Placard Should Read 11/23/20

FIGURE 41. Post-Test Dummy and Door Clearance View

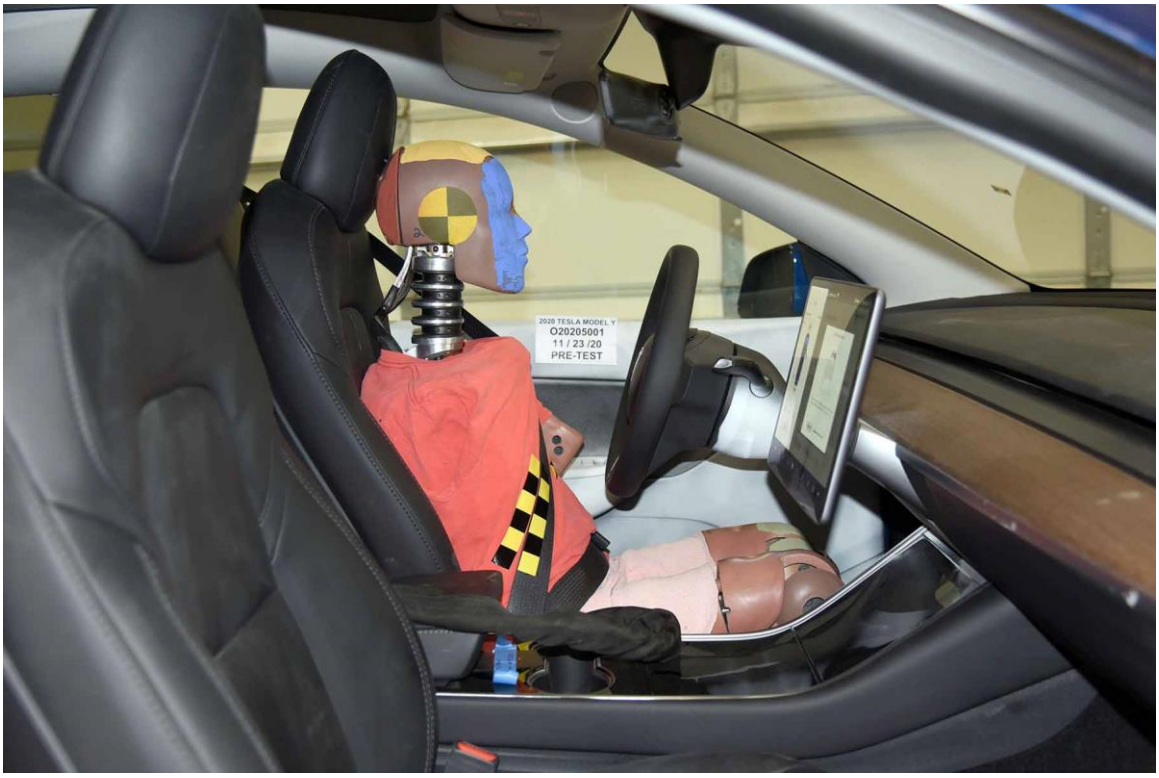


FIGURE 42. Pre-Test Right Side View of Dummy and
Front Seat of Occupant Compartment

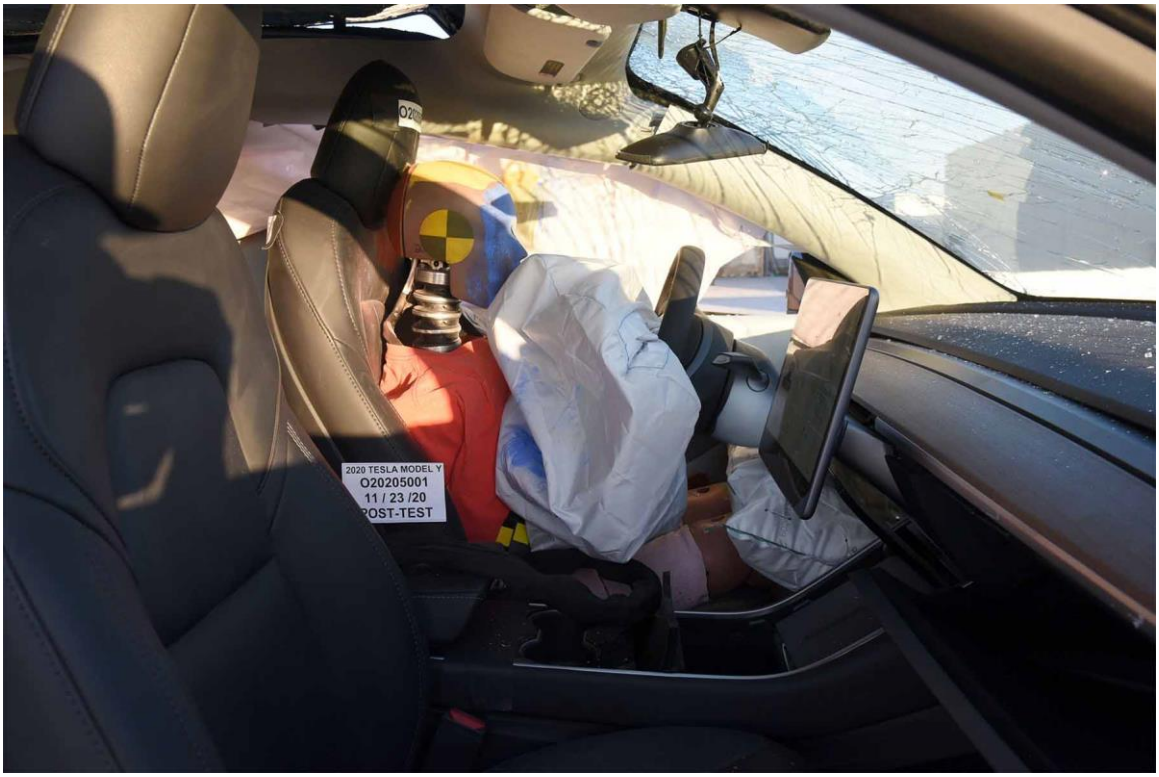


FIGURE 43. Post-Test Right Side View of Dummy and
Front Seat of Occupant Compartment

FIGURE 44. Pre-Test Inner Door Panel View
Note: Date on Placard Should Read 11/23/20

FIGURE 45. Post-Test Inner Door Panel View Showing Dummy Contact Locations

FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View

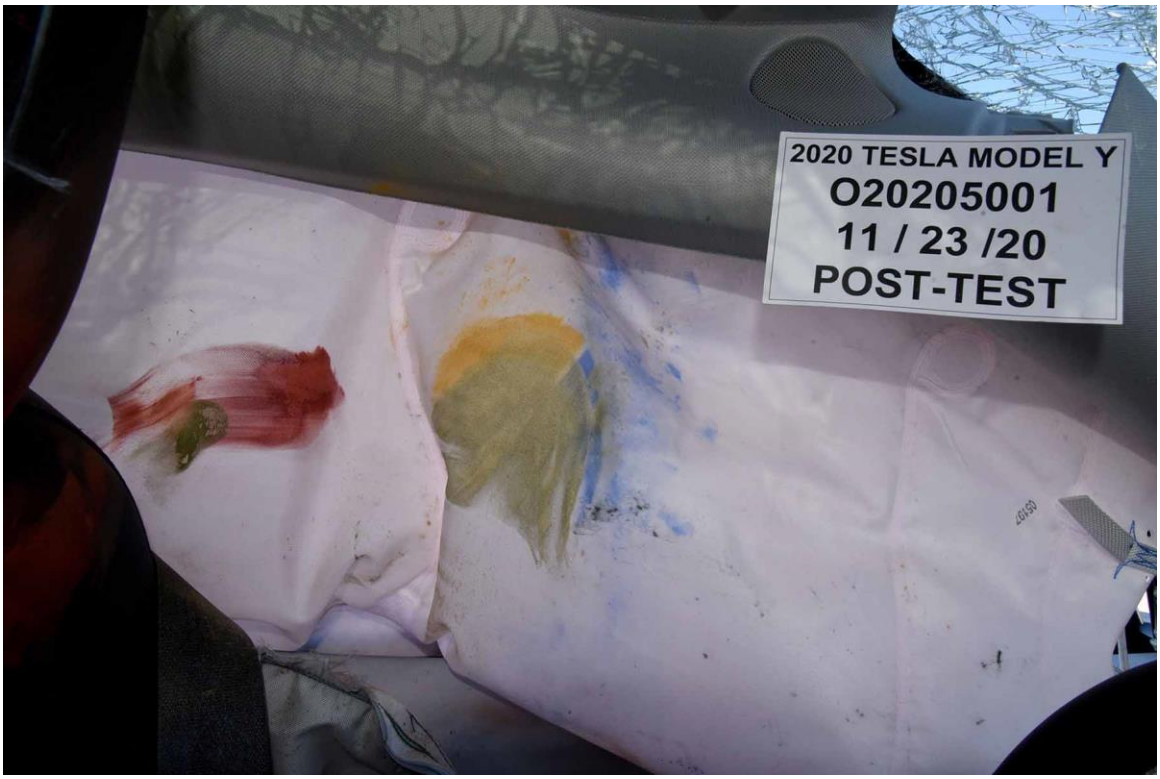


FIGURE 47. Post-Test Dummy Close-Up Head Contact With Side Airbag View

FIGURE 48. Post-Test Dummy Close-Up Torso Contact With Vehicle Interior View

FIGURE 49. Post-Test Dummy Close-Up Torso Contact With Side Airbag View

FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact With Vehicle Interior View

Photograph Not Applicable

FIGURE 51. Post-Test Dummy Close-Up Pelvis Contact With Side Airbag View

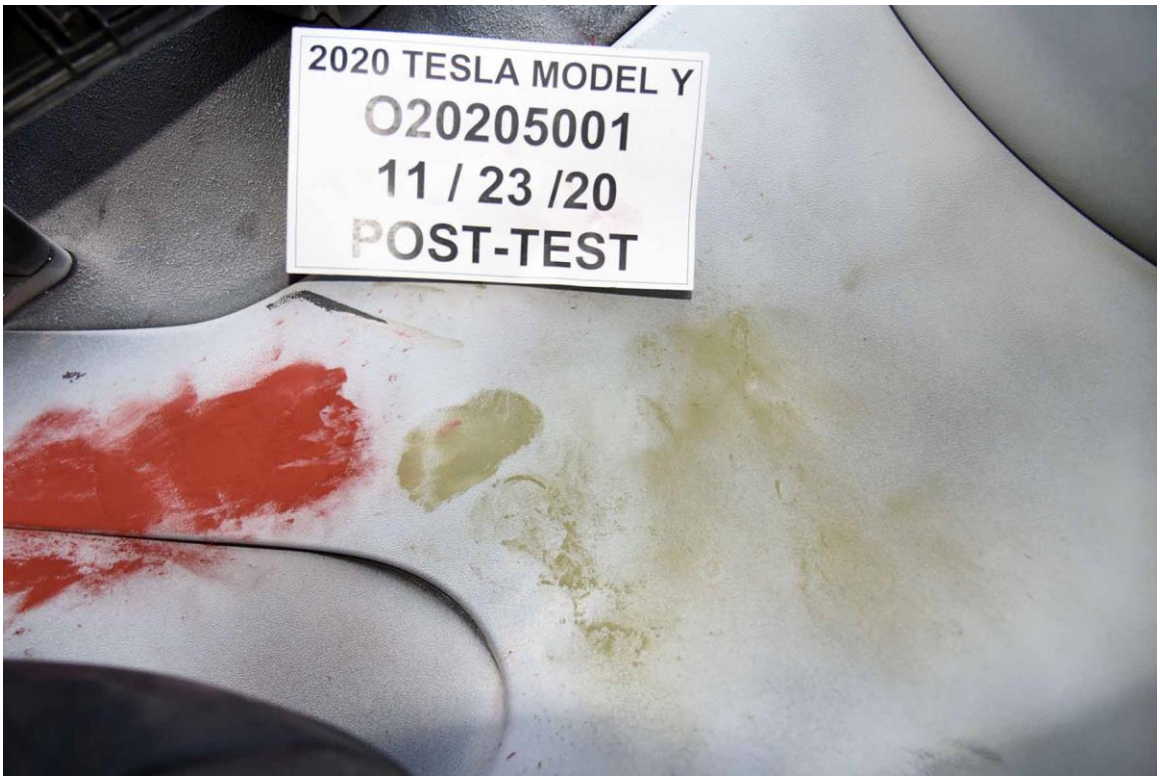


FIGURE 52. Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View

FIGURE 53. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 54. Post-Test View of Fuel Filler Cap or Fuel Filler Neck

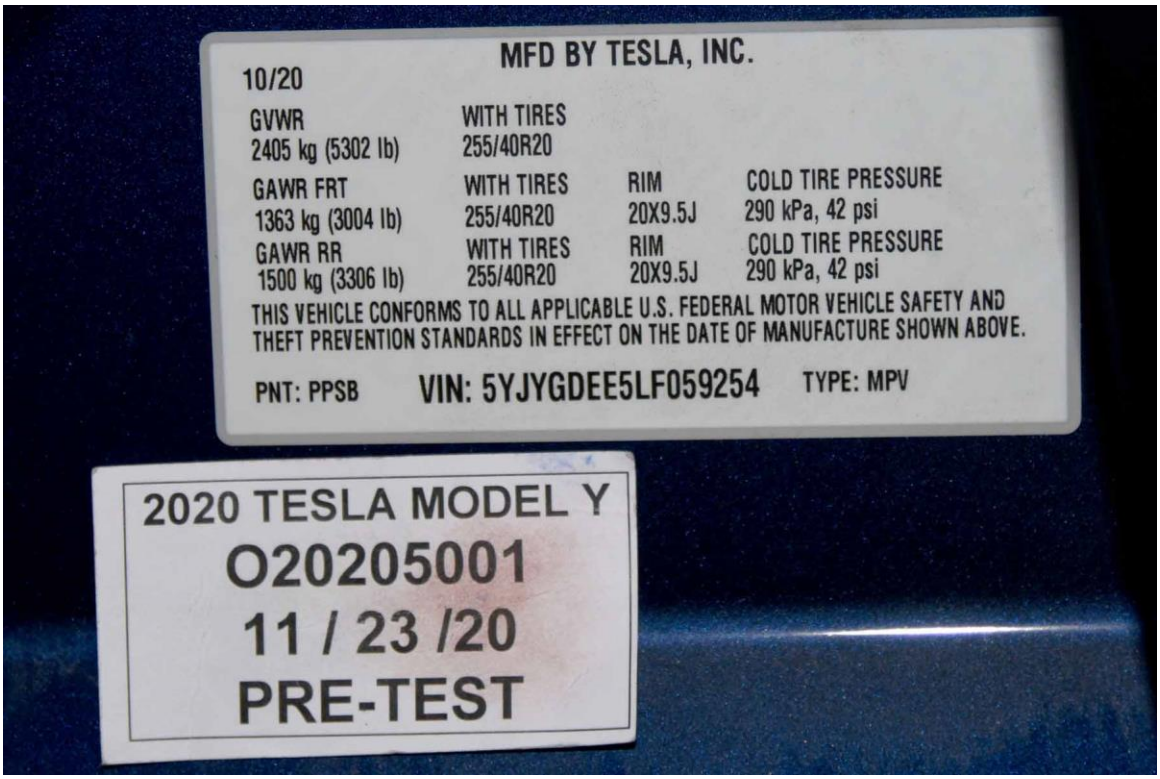


FIGURE 55. Close-Up View of Vehicle's Certification Label

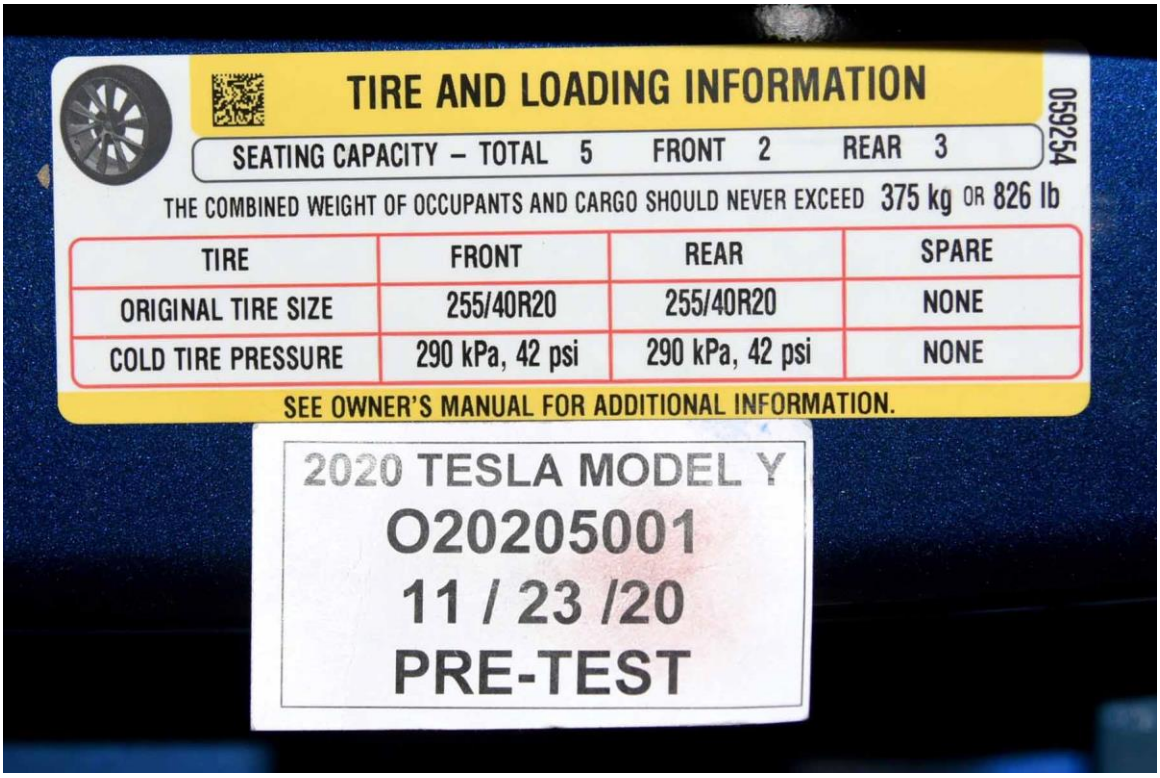


FIGURE 56. Close-Up View of Vehicle's Tire Information Placard or Label

FIGURE 57. Pre-Test Pole Barrier Front View

FIGURE 58. Post-Test Pole Barrier Front View

FIGURE 59. Pre-Test Pole Barrier Side View

FIGURE 60. Post-Test Pole Barrier Side View

FIGURE 61. Pre-Test Ballast View

FIGURE 62. Post-Test Primary and Redundant Speed Trap Read-Out

Photograph Not Applicable

FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

Photograph Not Applicable

FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees

Photograph Not Applicable

FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees

Photograph Not Applicable

FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees

Photograph Not Applicable

FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 68. Impact Event

TESLA MODEL Y **Long Range AWD**

Vehicle Identification Number	5YJYGDEE5LF059254	Transportation Method	Truck
Date Of Manufacture	10/2020	Delivered to	TESLA MOTORS, INC. Fremont, California, USA

STANDARD FEATURES

TECHNICAL
- 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

SAFETY
- 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

INTERIOR
- 15 inch capacitive touchscreen
- Onboard 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

EXTERIOR
- Full LED lighting

AS CONFIGURED

Model Y	$41,000
All Black Premium Interior	INCLUDED
Base Autopilot	INCLUDED
Long Range Dual Motor All-Wheel Drive	$9,990
20" Induction Wheels	$2,000
Deep Blue Metallic Paint	$1,000
Dual Motor All-Wheel Drive	INCLUDED
Premium Interior	INCLUDED
Pay-as-you-go Supercharging	INCLUDED
Five Seat Interior	INCLUDED
Destination and Regulatory Doc Fee	$1,200
Total vehicle price	**$54,190**

GOVERNMENT 5-STAR SAFETY RATINGS

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) www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

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

ADDITIONAL ASSEMBLY INFORMATION

FOR THIS VEHICLE:
BATTERY FINAL ASSEMBLY POINT:
FREMONT, CA, USA
ON-BOARD CHARGER FINAL ASSEMBLY POINT:
FREMONT, CA, USA

EPA DOT Fuel Economy and Environment — Electric Vehicle

Fuel Economy: 121 MPGe combined city/hwy (Small sport utility vehicle cars range from 18 to 120 MPGe. The best vehicle rates 136 MPGe.)
127 city | 114 highway | 28 kW-hr per 100 miles

You save $4,750 in fuel costs over 5 years compared to the average new vehicle.

Driving Range: When fully charged, vehicle can travel about... 316 miles
Charge Time: 10 hours (240V)

Annual fuel cost $550

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 1 / 10 Best
Smog Rating (tailpipe only): 1 / 10 Best

This vehicle emits 0 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $ 7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at 0.13 per kW-hr. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code

FIGURE 69. Monroney Label

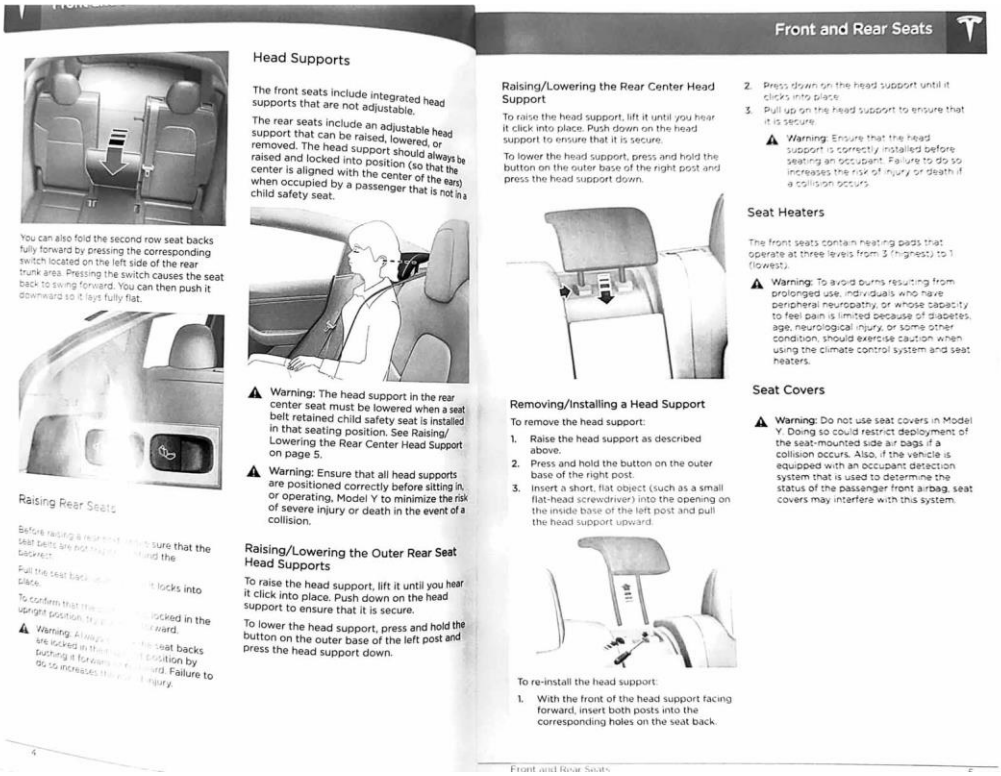


FIGURE 70. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Photograph Not Applicable

FIGURE 71. Post-Test View of Shattered Vehicle Inner Door Panel

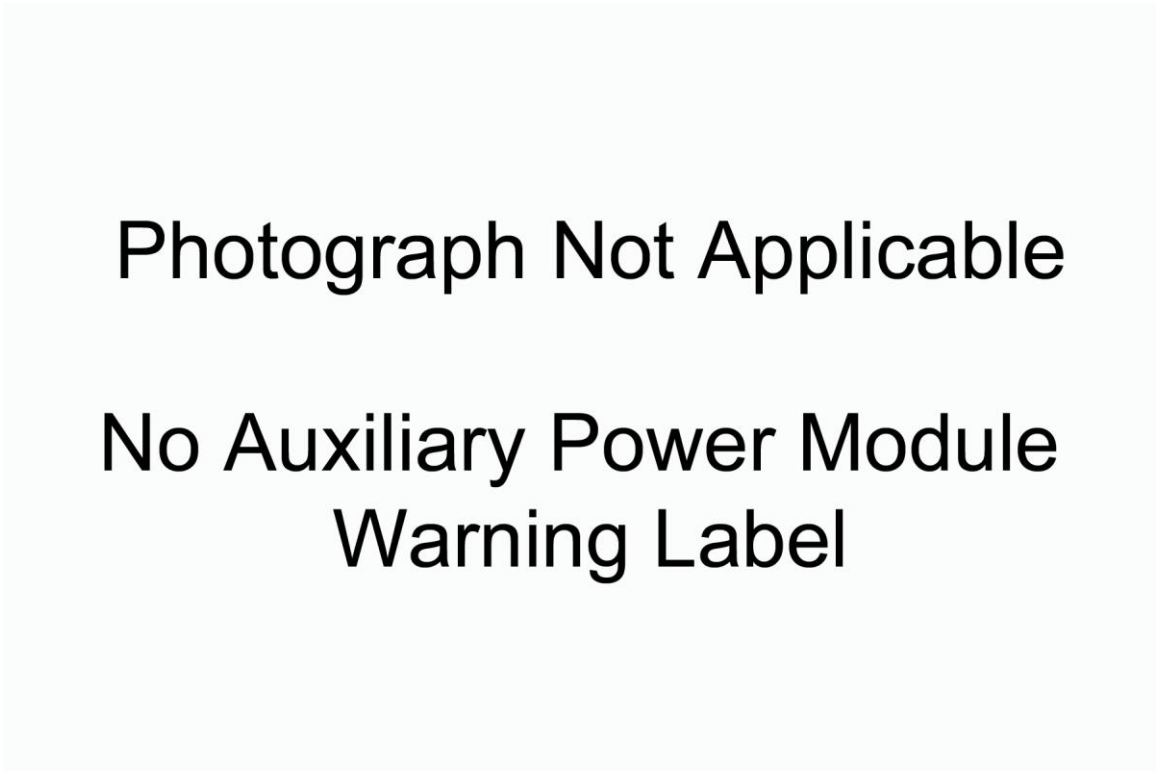


FIGURE 305-01. Auxiliary Power Module Warning Label

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

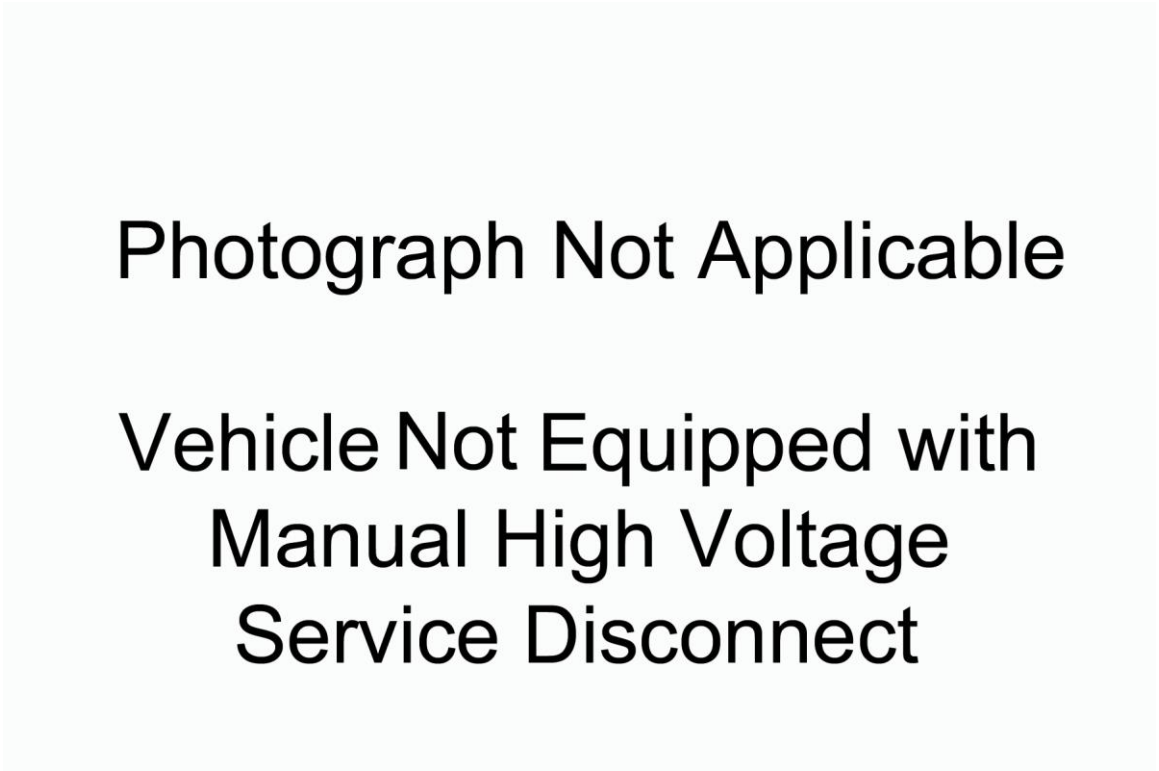


FIGURE 305-06. Manual High Voltage Service Disconnect in Place

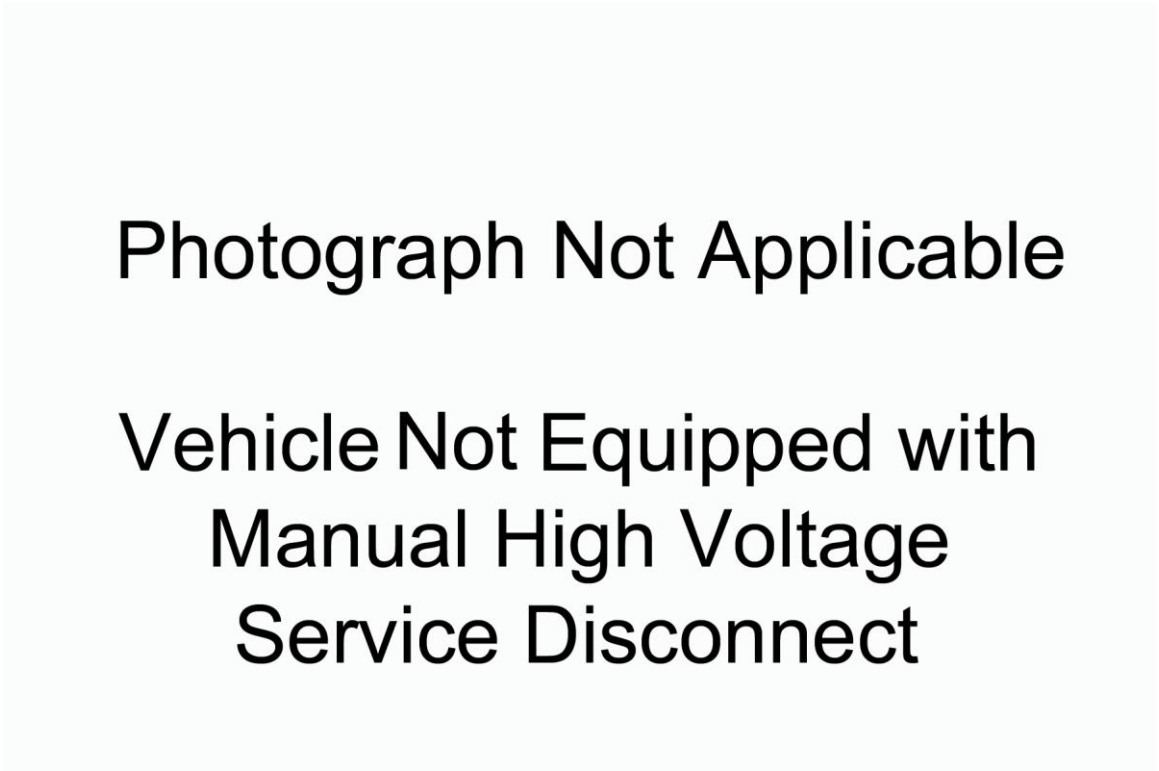


FIGURE 305-07. Manual High Voltage Service Disconnect Removed

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
Note: Date on Placard Should Read 11/23/20

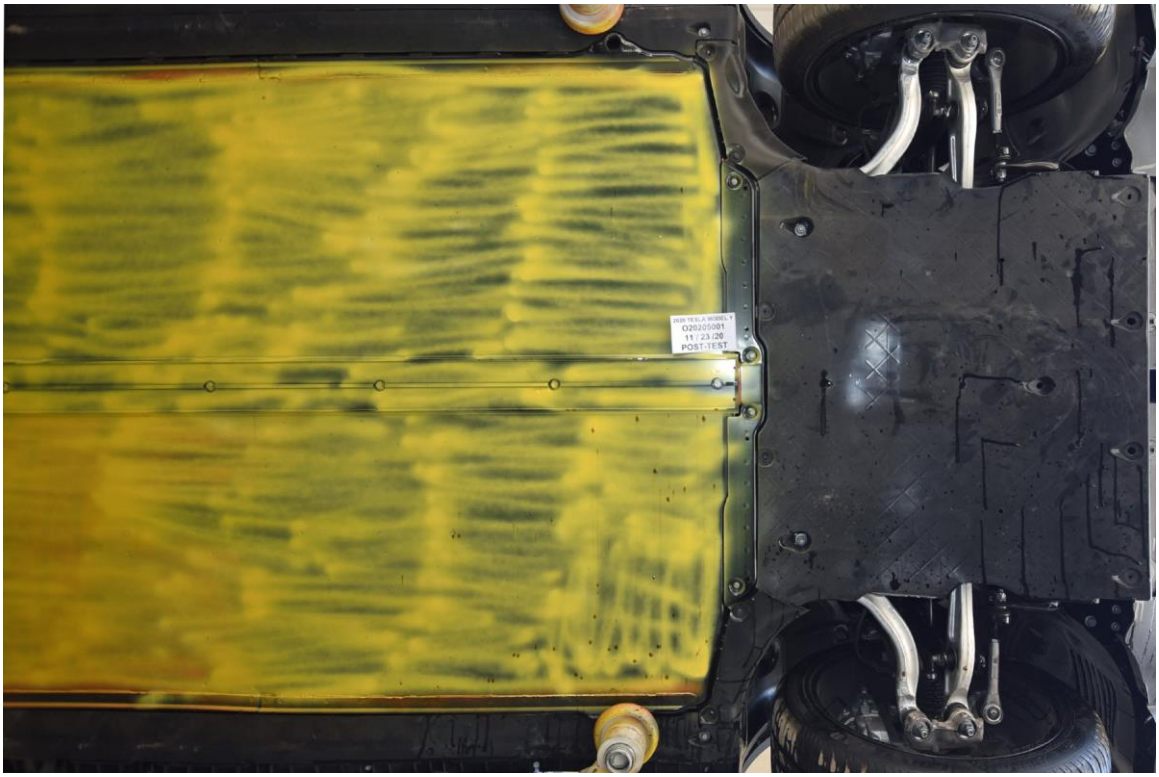


FIGURE 305-010. Post-Impact Front View of Propulsion Battery

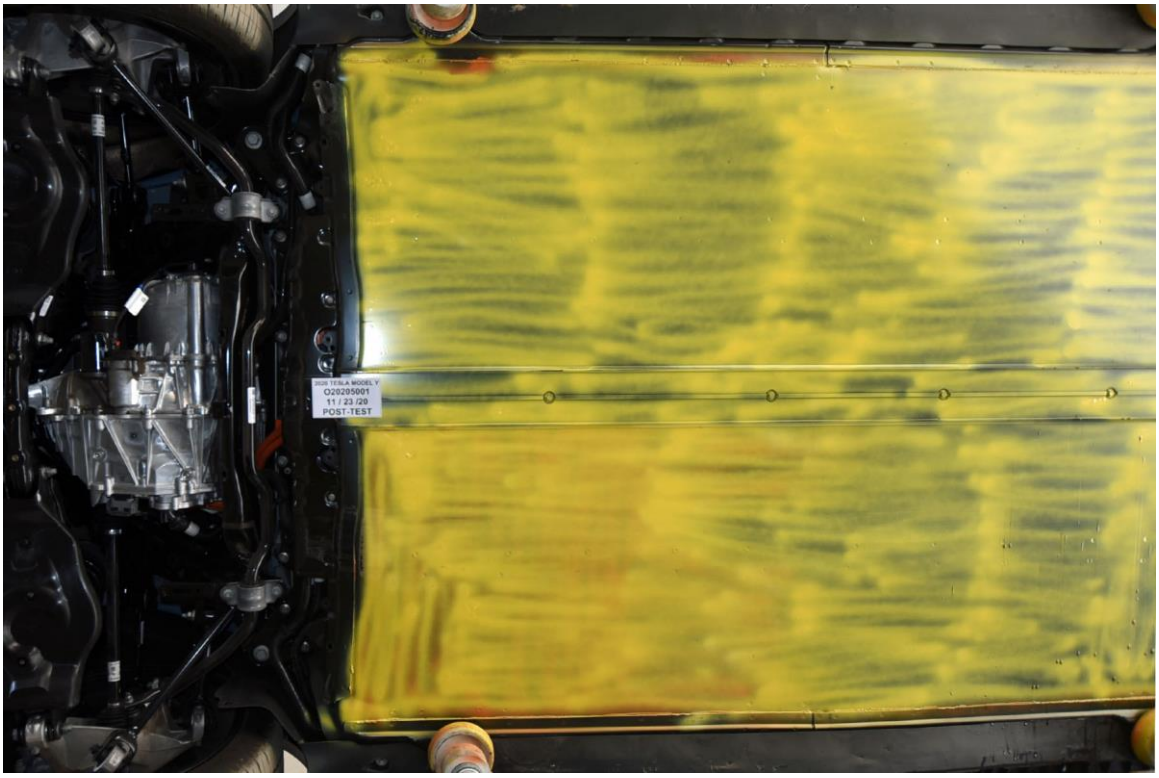


FIGURE 305-011. Post-Impact Rear View of Propulsion Battery

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

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

FIGURE No. 305-015. Post-Impact View of Propulsion Battery Module(s)

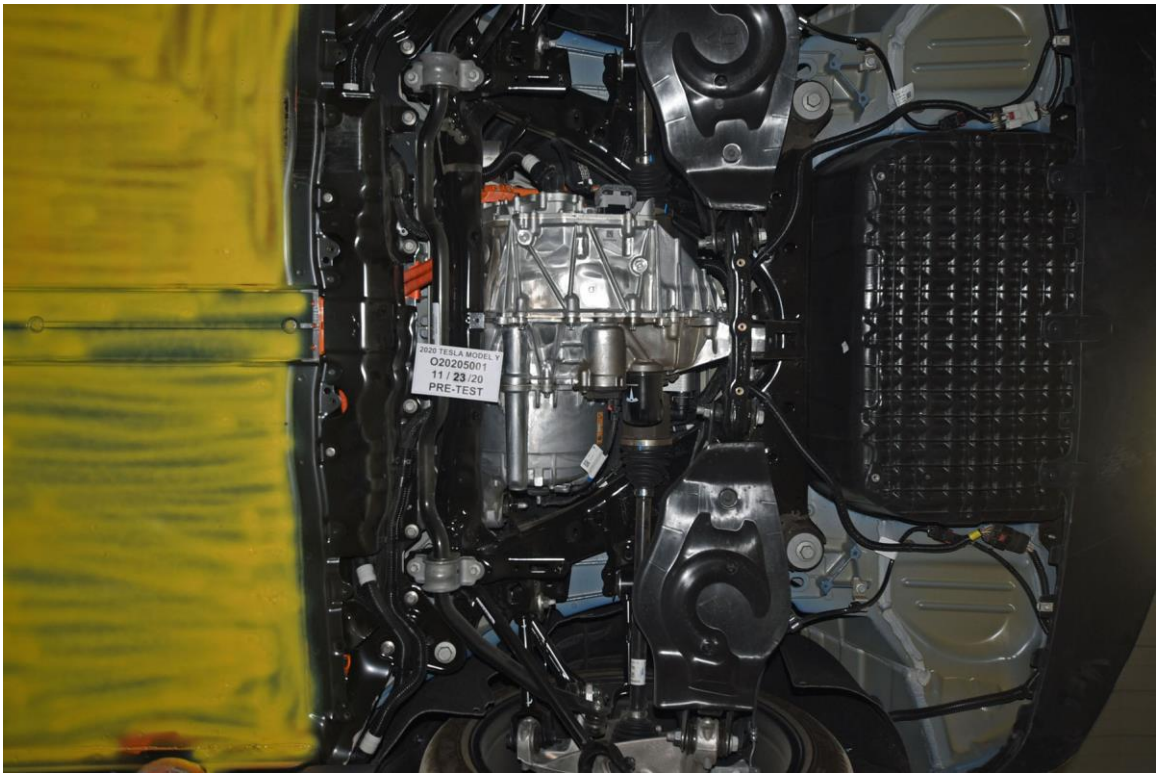


FIGURE 305-016. Pre-Impact View of Electric Propulsion Drive

Note: Date on Placard Should Read 11/23/20

Photograph Not Available

FIGURE No. 305-017. Post-Impact View of Electric Propulsion Drive

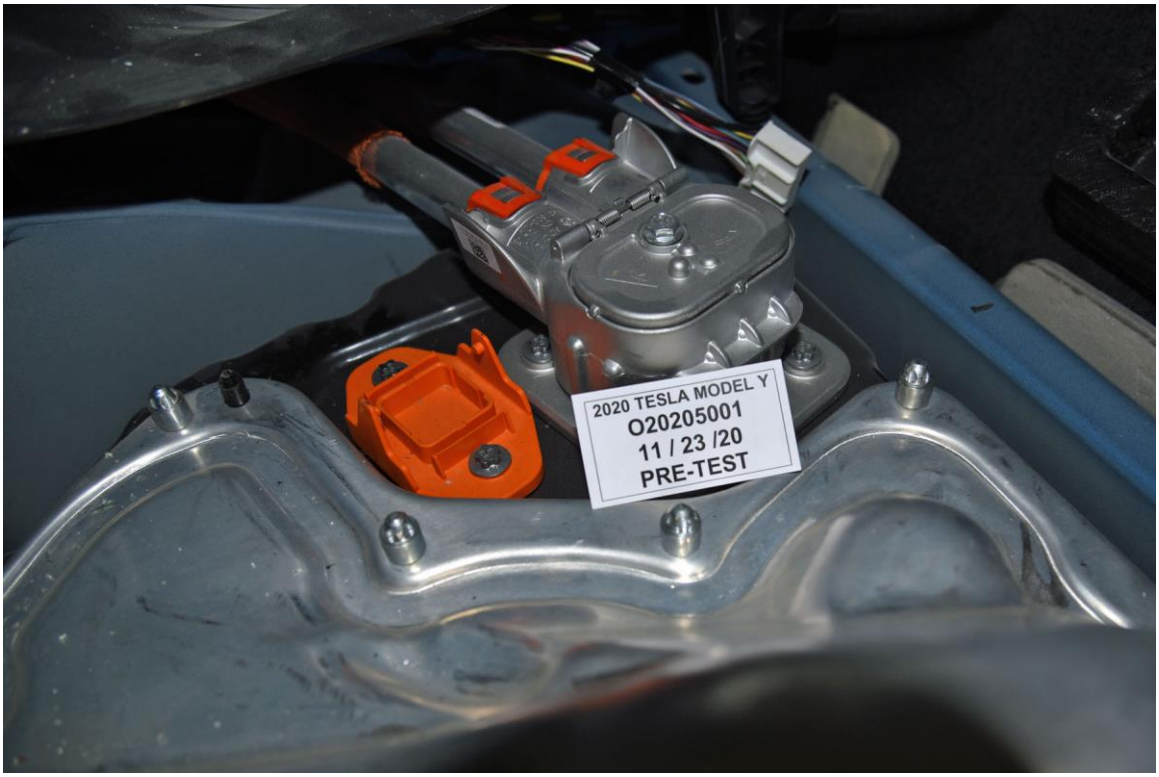


FIGURE 305-018. Pre-Impact View of High Voltage Interconnect(s)

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

Photograph Not Available

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

FIGURE 305-020. Pre-Impact View of Other Visible Electric Propulsion Components
Note: Date on Placard Should Read 11/23/20

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

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

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

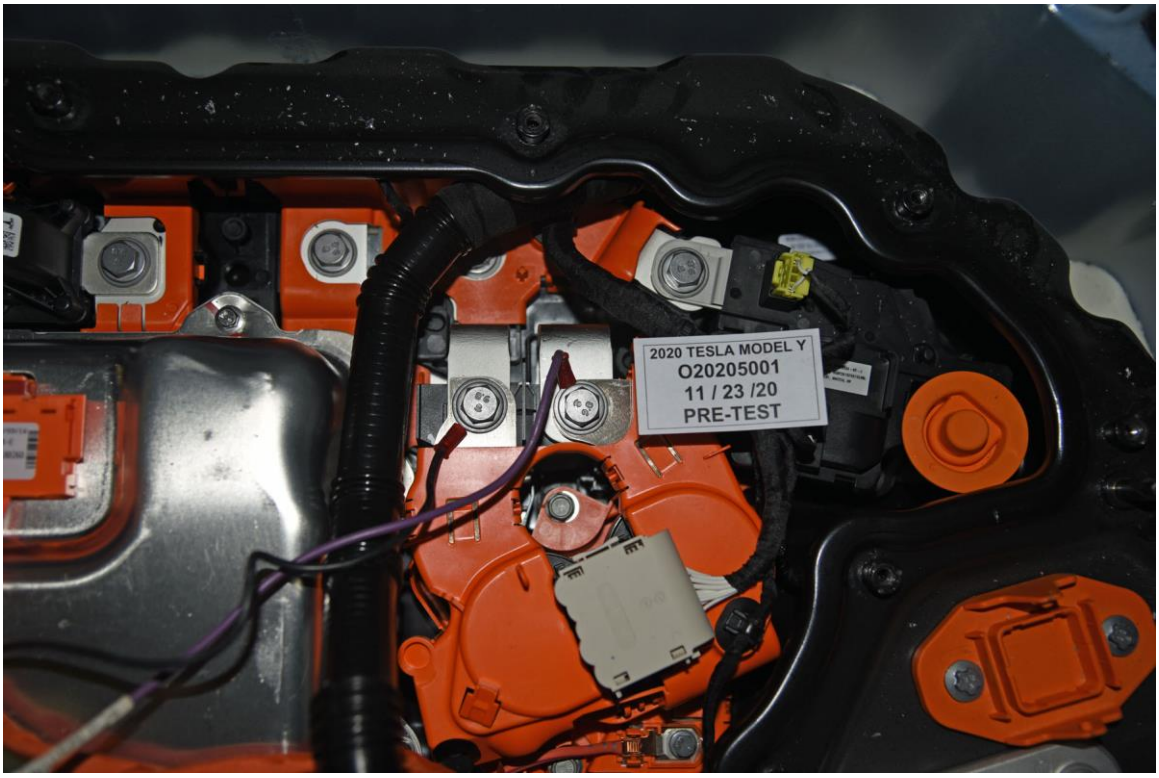


FIGURE 305-023a. Pre-Impact Close-Up View of High Voltage Leads Attached

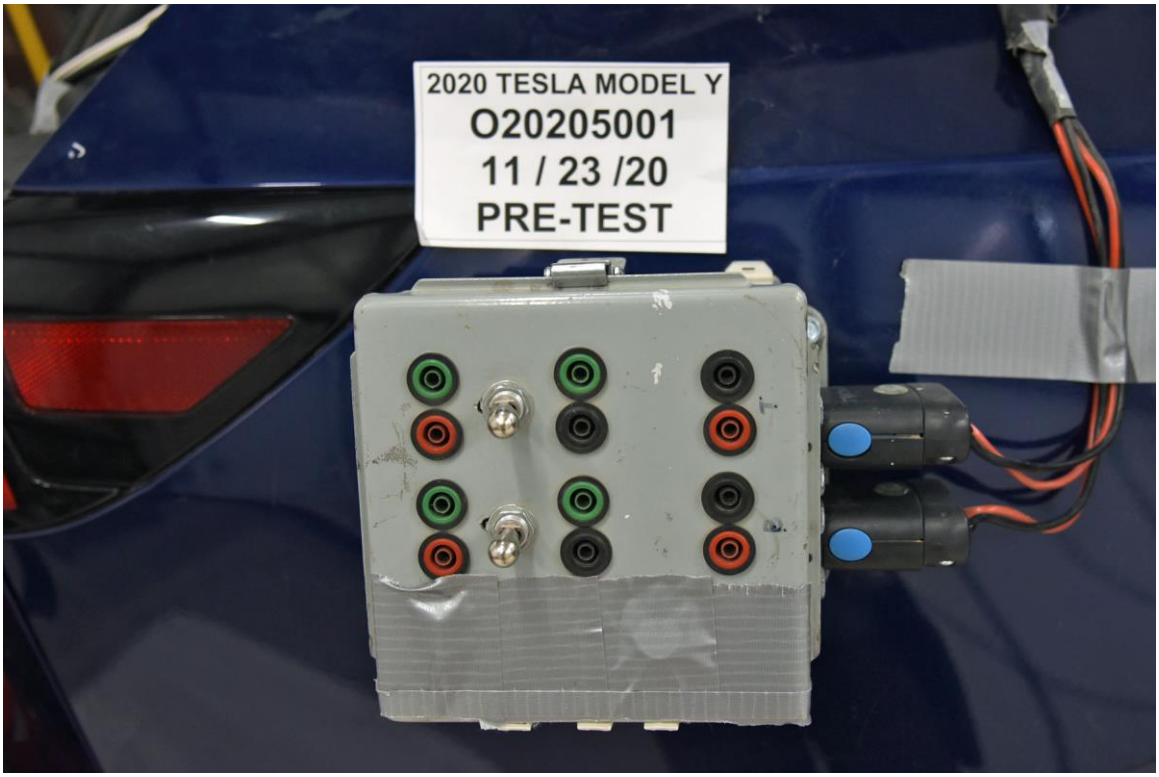


FIGURE 305-024. Pre-Impact View of Installed Test Interface Port

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

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

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

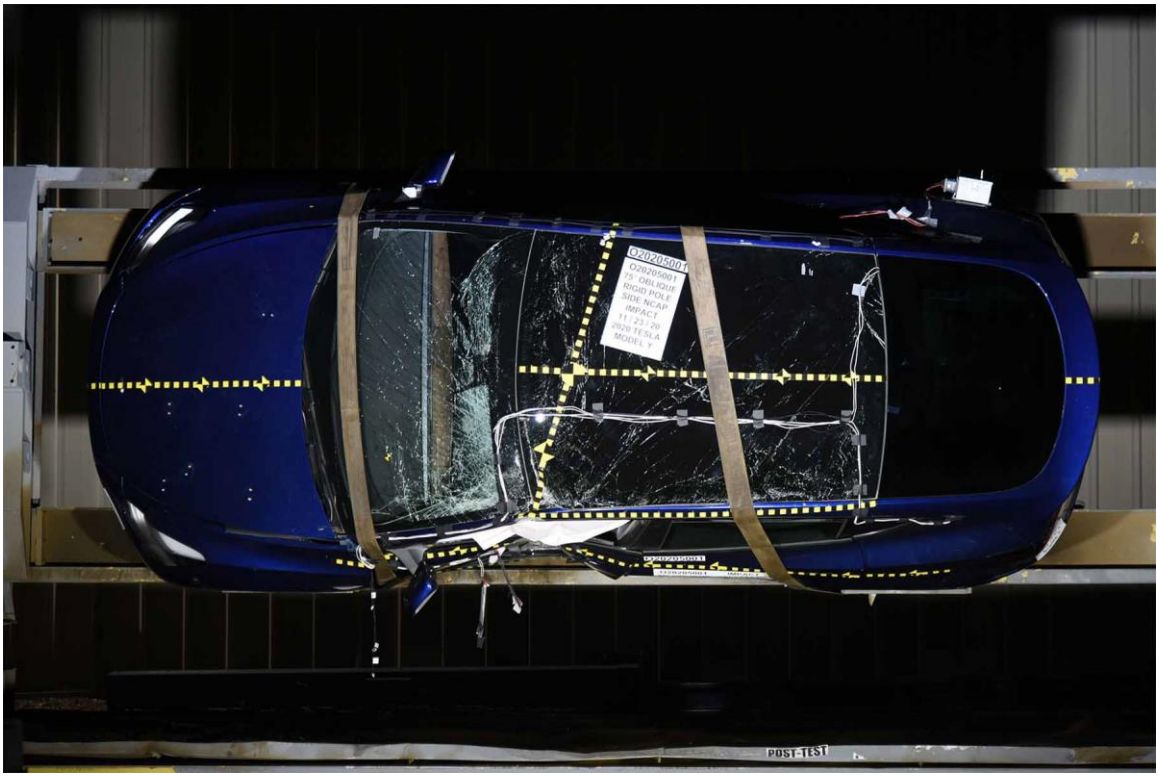


FIGURE 305-028. FMVSS No. 305 Static Rollover at 90°

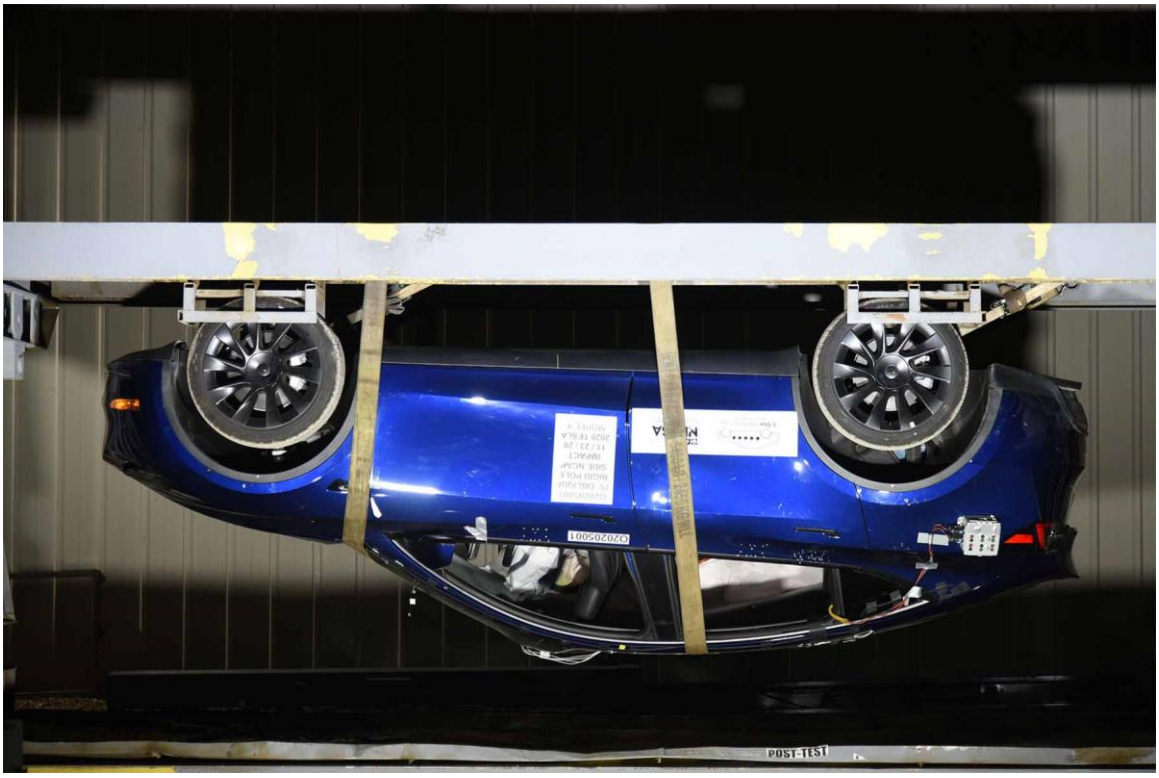


FIGURE 305-029. FMVSS No. 305 Static Rollover at 180°

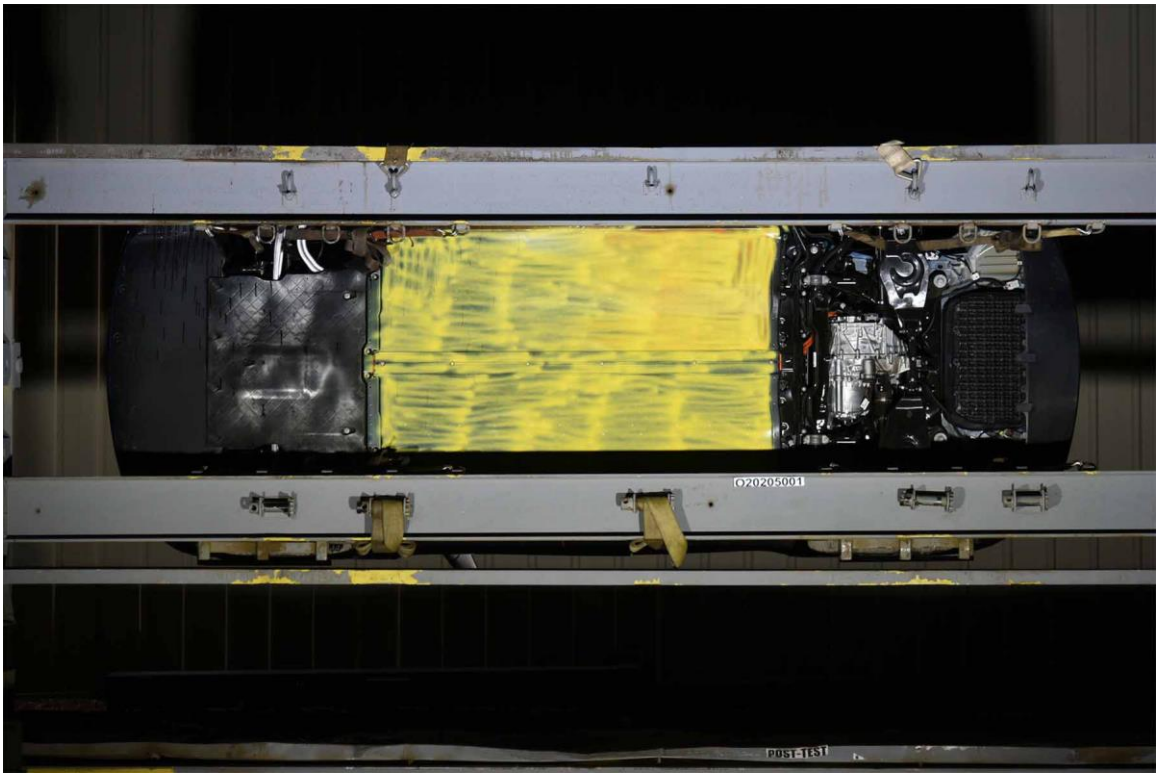


FIGURE. 305-030. FMVSS No. 305 Static Rollover at 270°

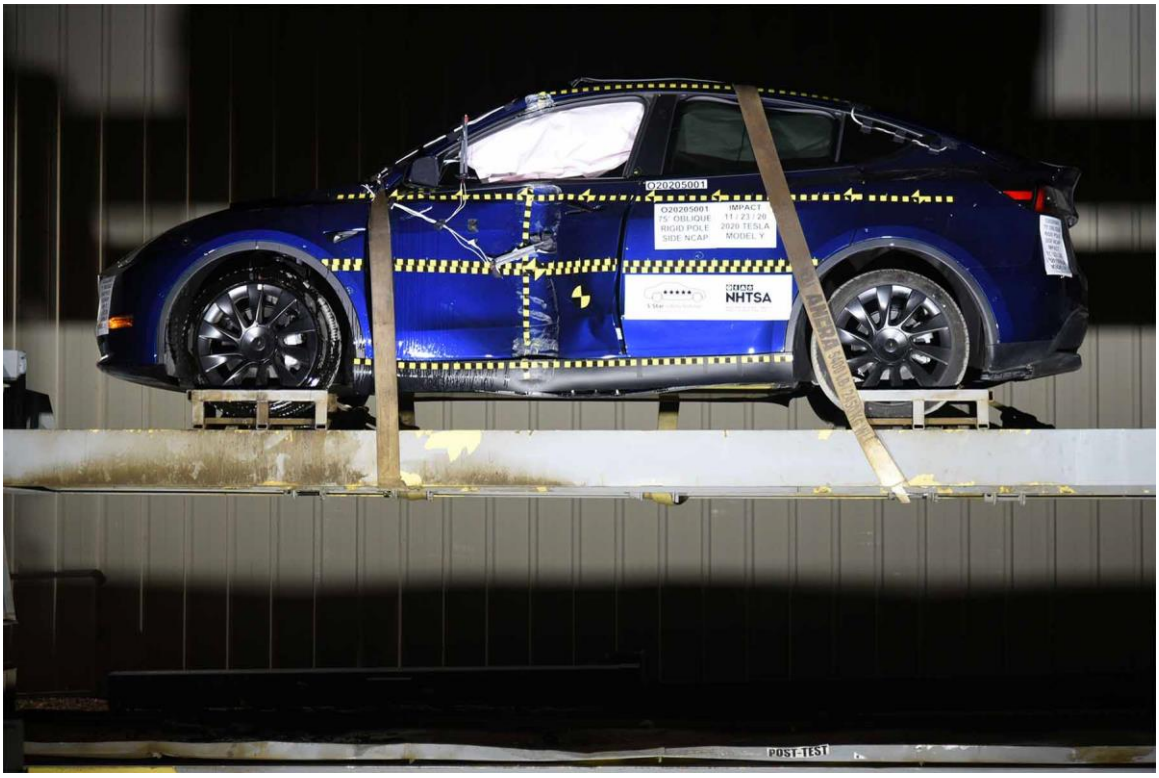


FIGURE 305-031. FMVSS No. 305 Static Rollover at 360°

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

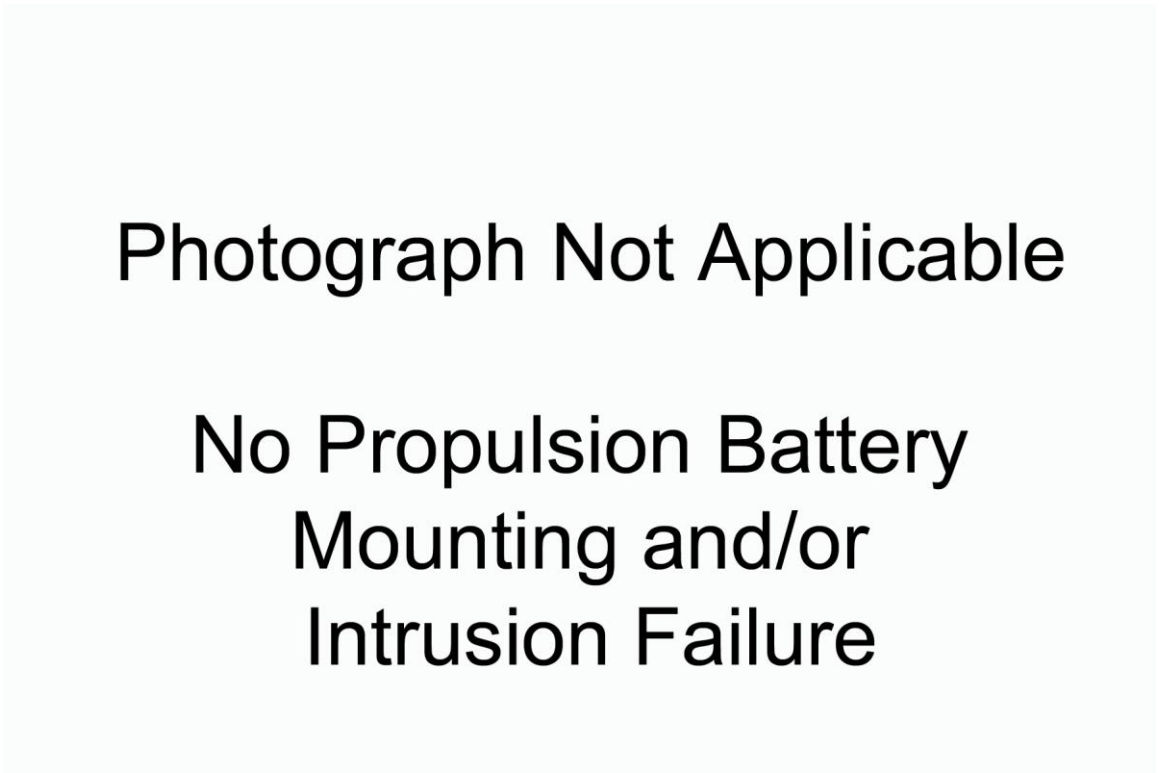


FIGURE 305-034. Post-Impact Propulsion Battery System Mounting and or Intrusion Failure(s)

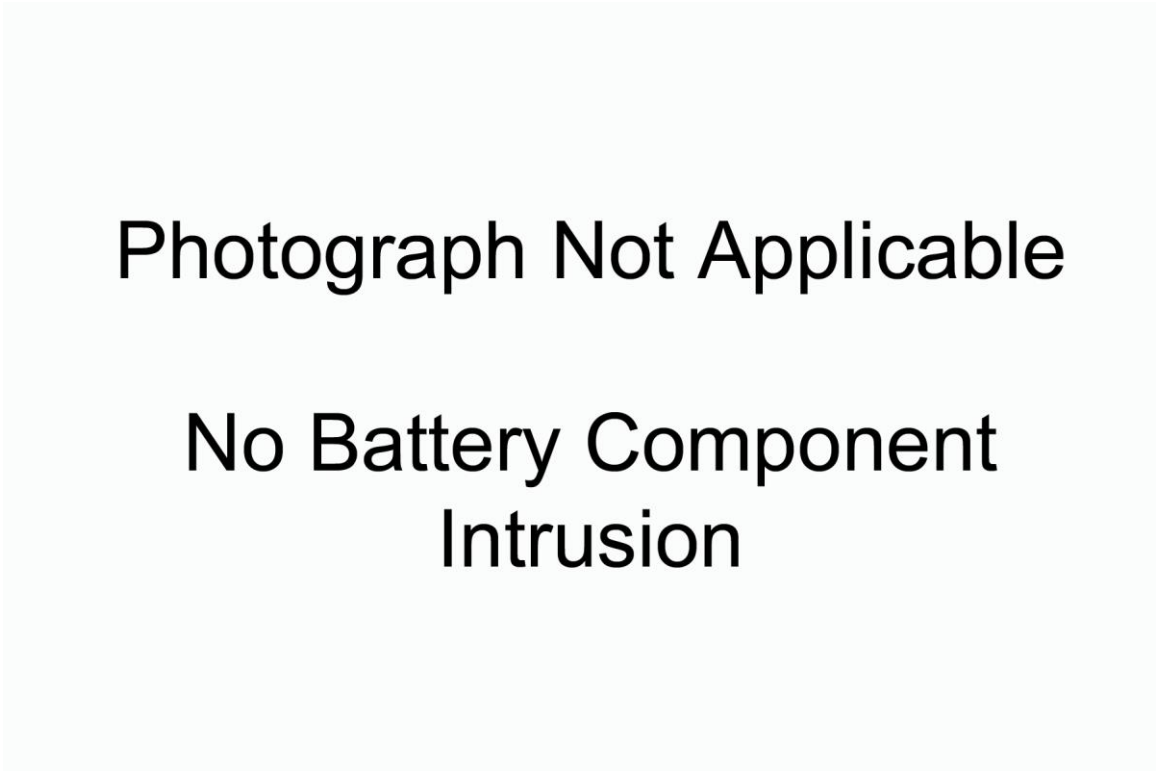


FIGURE 305-035. Post-Impact View of Battery Component Intrusion

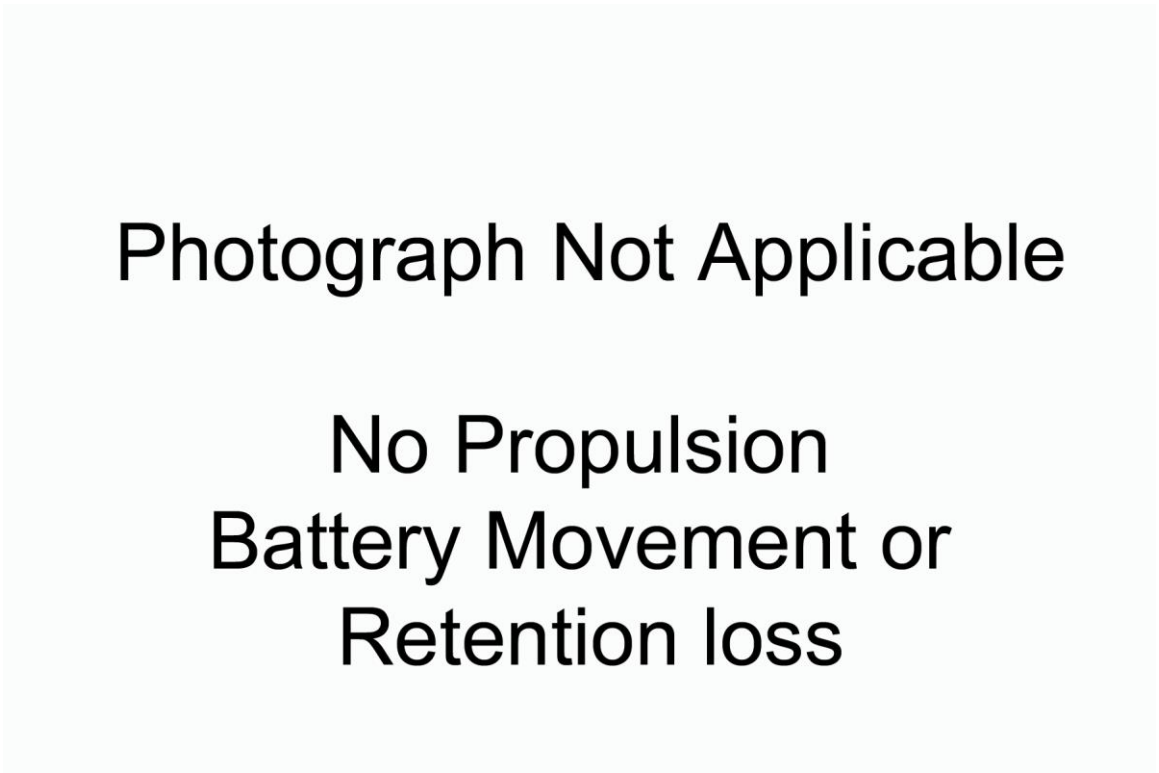


FIGURE 305-036. Post-Impact View of Battery Module Movement or Retention Loss

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

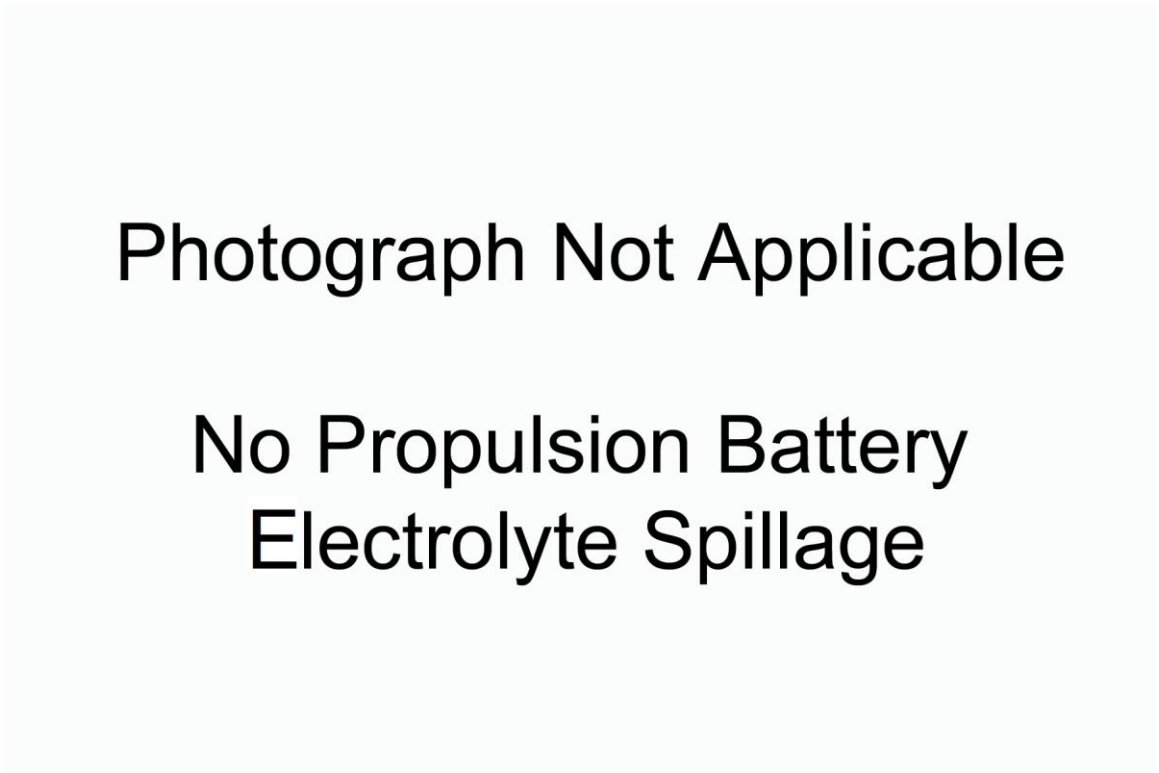


FIGURE 305-038. Post-Test View of Propulsion Battery Electrolyte Spillage Location

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration Redundant (X)

Driver Head Acceleration Redundant (Y)

Driver 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)

Left Floor Sill Acceleration (Y)

Left A-Pillar Sill Acceleration (Y)

Left Lower A-Pillar Acceleration (Y)

Left Mid A-Pillar Acceleration (Y)

Left B-Pillar Sill Acceleration

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

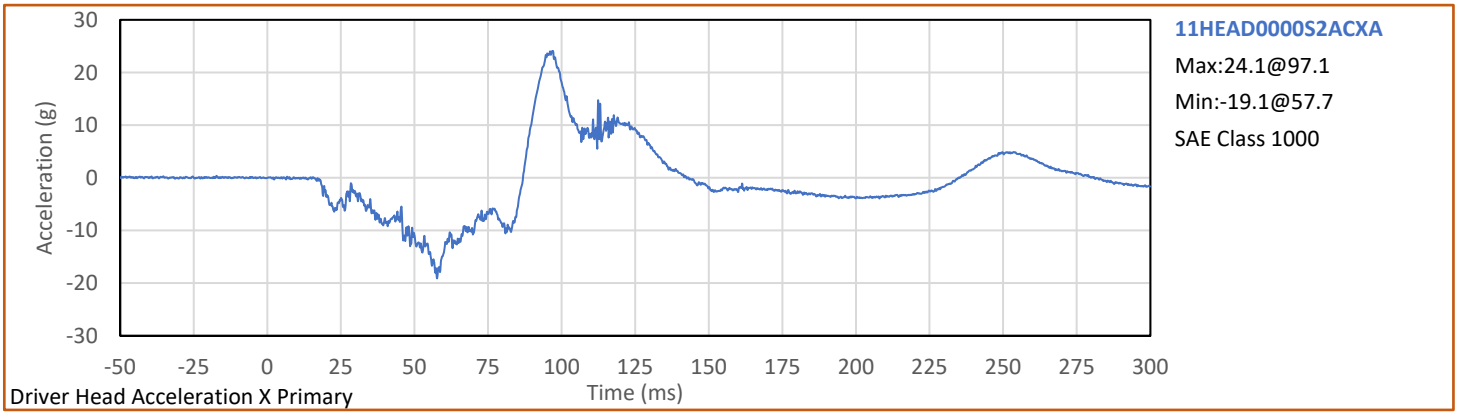
Load Cell Pole Barrier #4 Force (Y)

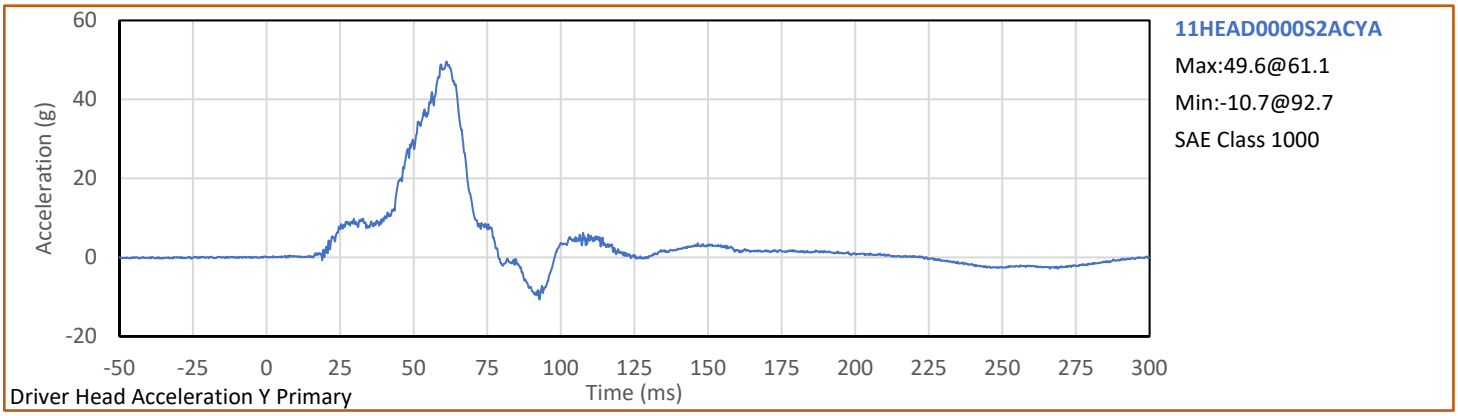
Load Cell Pole Barrier #5 Force (Y)

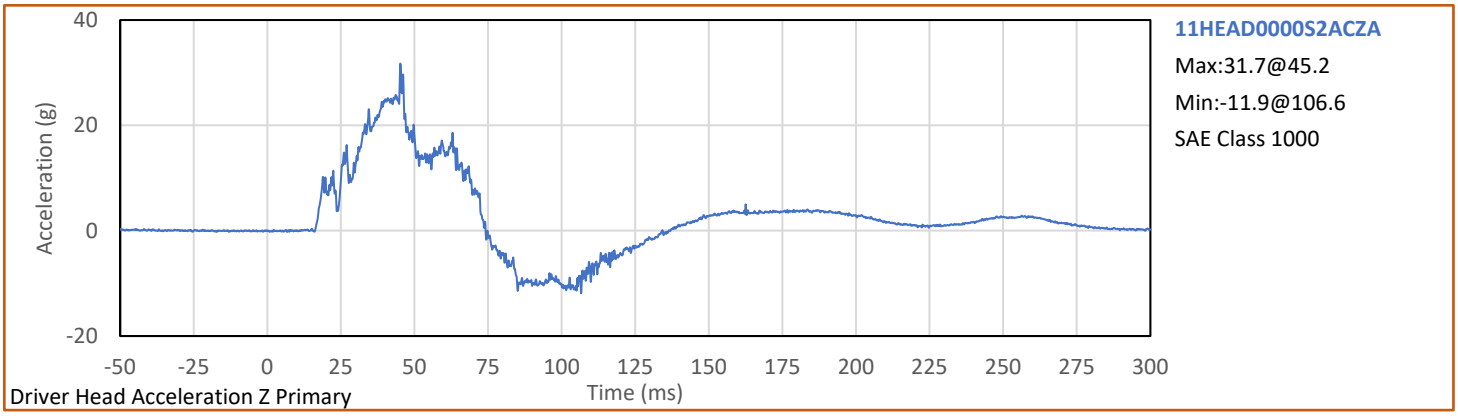
Load Cell Pole Barrier #6 Force (Y)

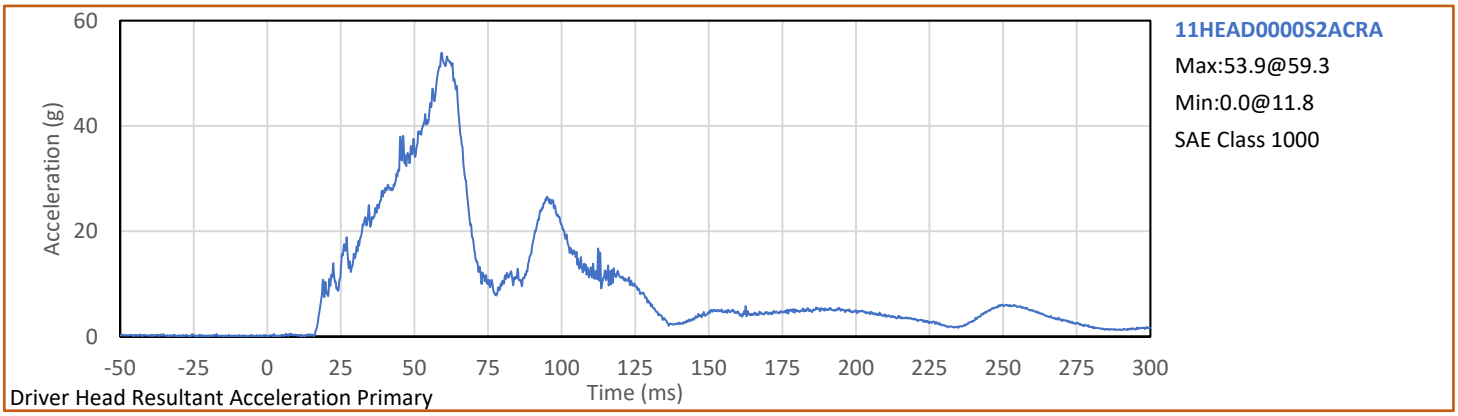
Load Cell Pole Barrier #7 Force (Y)

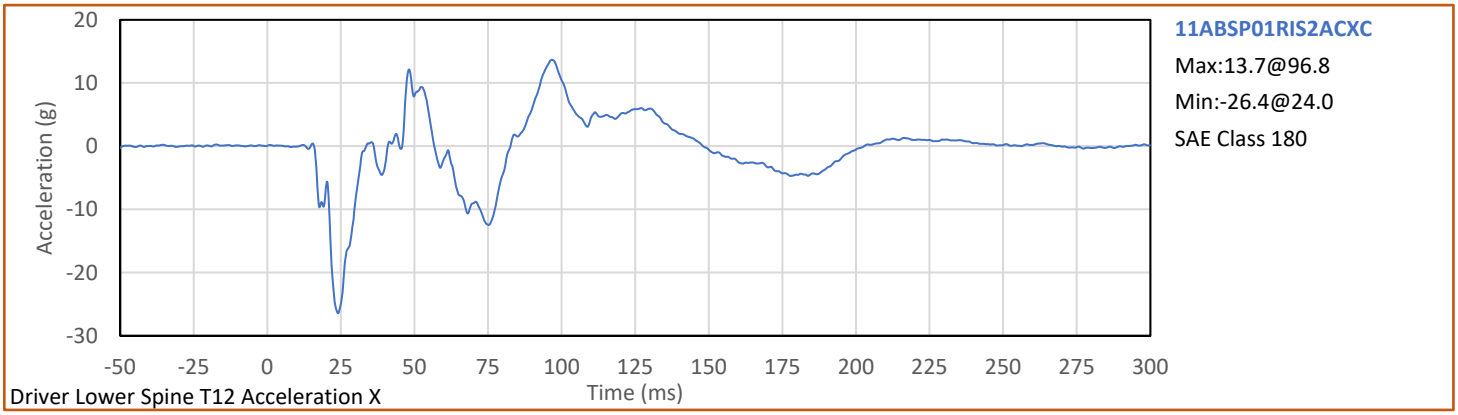
Load Cell Pole Barrier #8 Force (Y)


Acceleration (g)
Time (ms)
Driver Head Acceleration X Primary
11HEAD0000S2ACXA
Max:24.1@97.1
Min:-19.1@57.7
SAE Class 1000

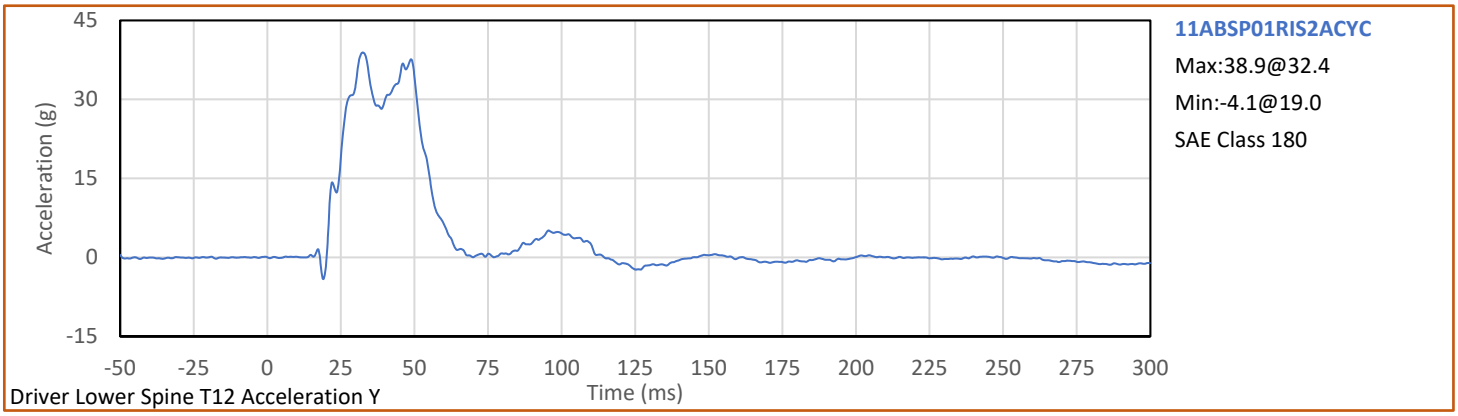

Acceleration (g)
Time (ms)
Driver Head Acceleration Y Primary
11HEAD0000S2ACYA
Max:49.6@61.1
Min:-10.7@92.7
SAE Class 1000


Acceleration (g)
Time (ms)
Driver Head Acceleration Z Primary
11HEAD0000S2ACZA
Max:31.7@45.2
Min:-11.9@106.6
SAE Class 1000

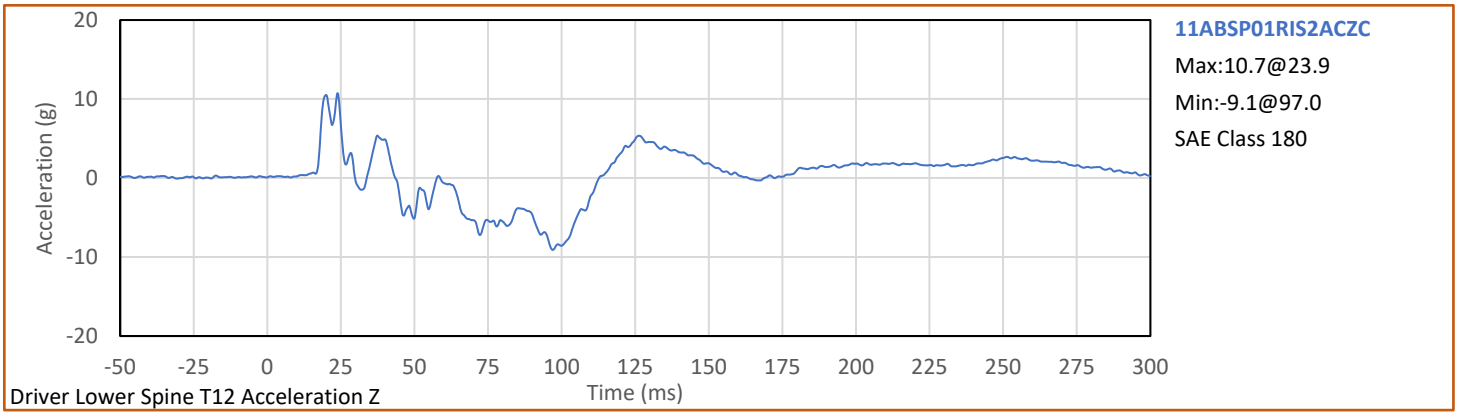

Acceleration (g)
Time (ms)
Driver Head Resultant Acceleration Primary
11HEAD0000S2ACRA
Max:53.9@59.3
Min:0.0@11.8
SAE Class 1000



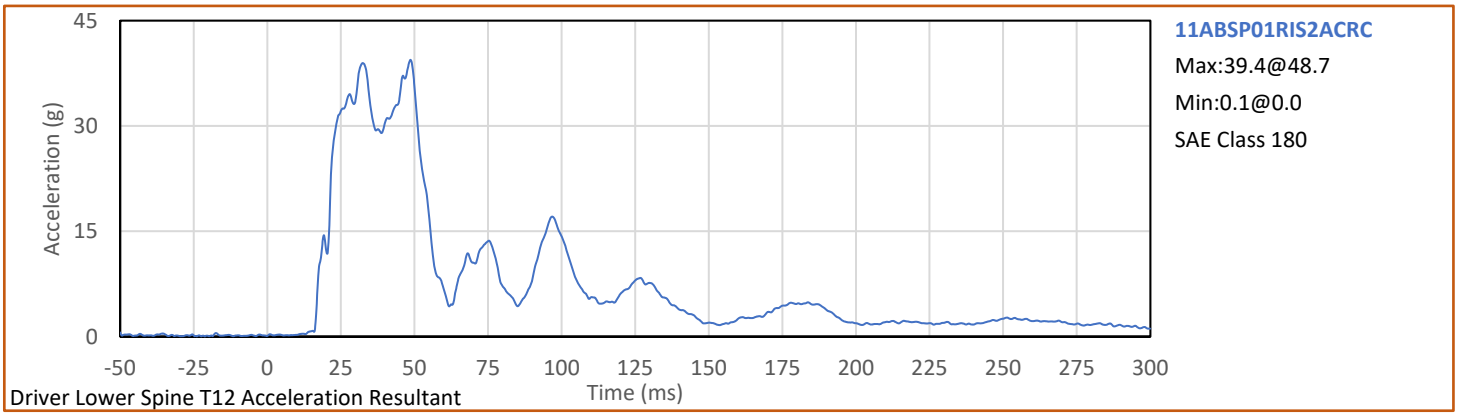
Driver Lower Spine T12 Acceleration X



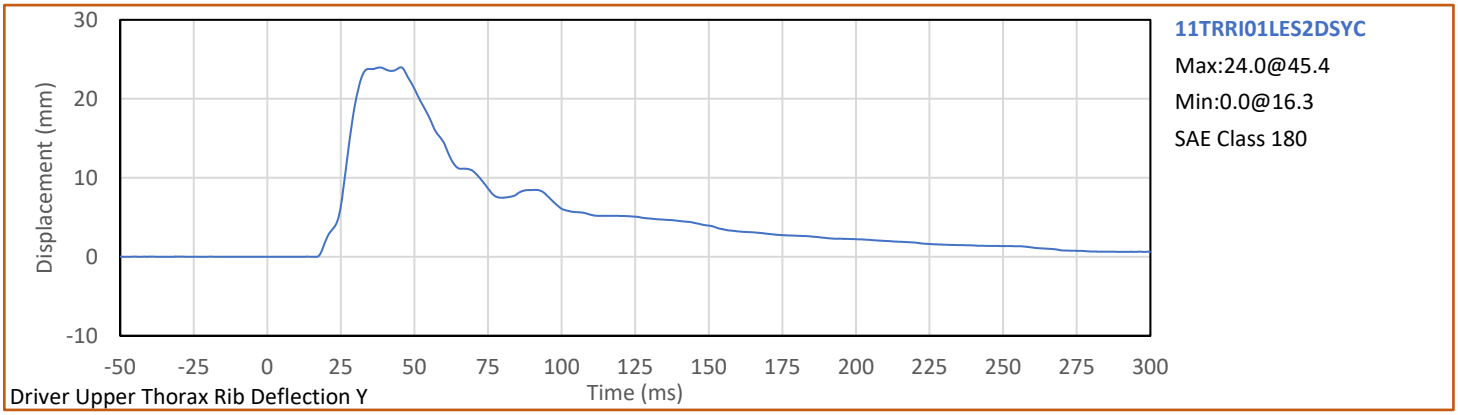
Driver Lower Spine T12 Acceleration Y

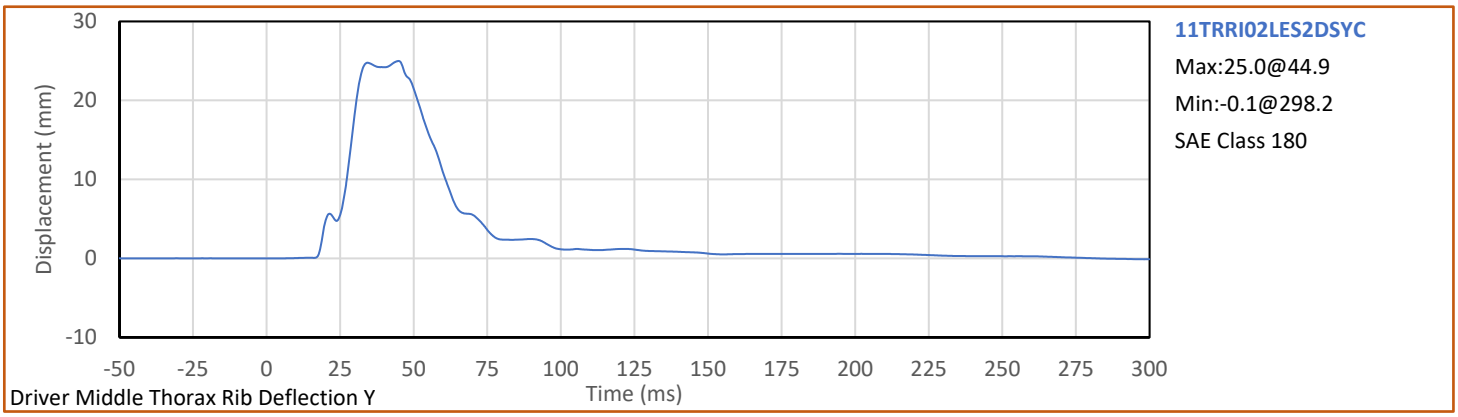


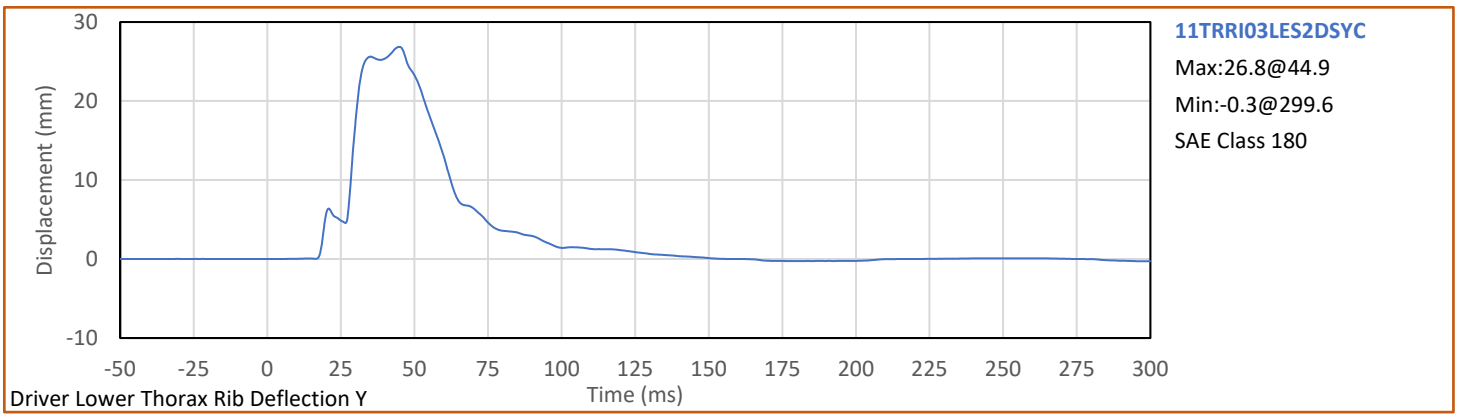
Driver Lower Spine T12 Acceleration Z

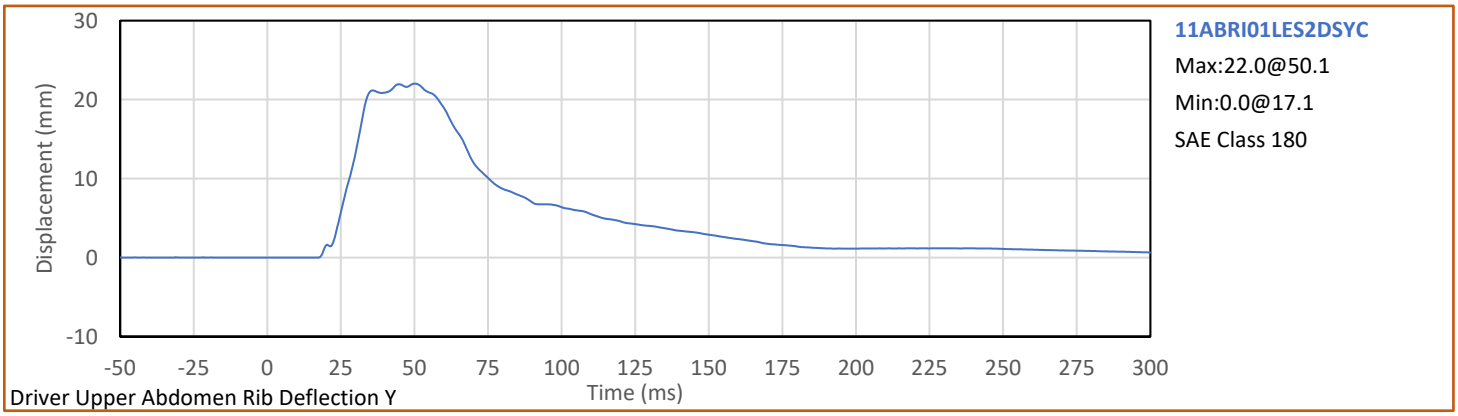


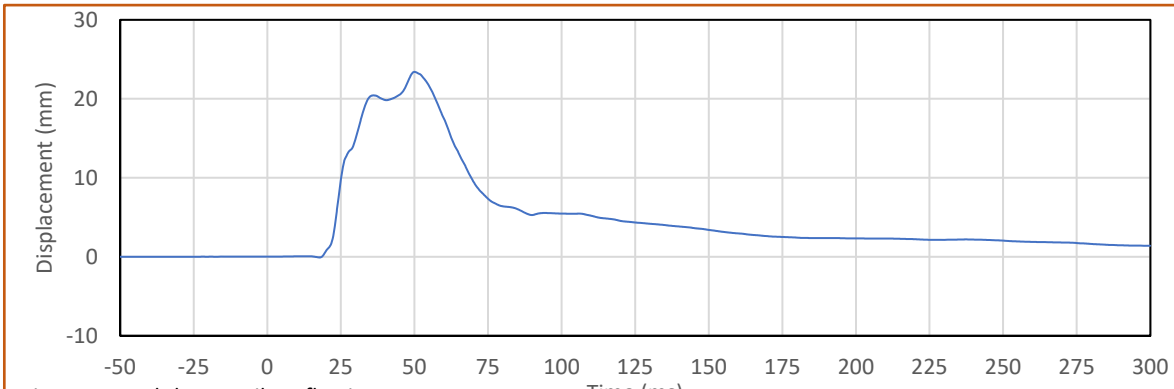
Driver Lower Spine T12 Acceleration Resultant


Displacement (mm)
Time (ms)
Driver Upper Thorax Rib Deflection Y
11TRRI01LES2DSYC
Max:24.0@45.4
Min:0.0@16.3
SAE Class 180


Displacement (mm)
Time (ms)
Driver Middle Thorax Rib Deflection Y
11TRRI02LES2DSYC
Max:25.0@44.9
Min:-0.1@298.2
SAE Class 180

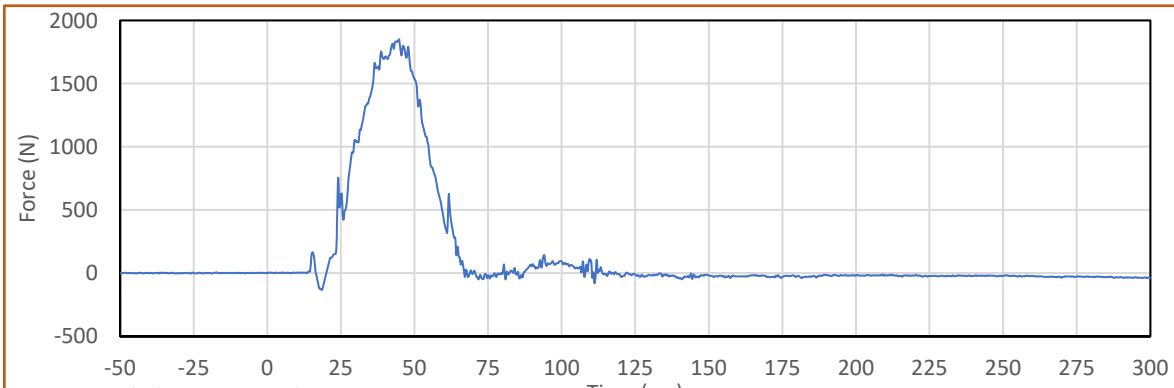

Displacement (mm)
Time (ms)
Driver Lower Thorax Rib Deflection Y
11TRRI03LES2DSYC
Max:26.8@44.9
Min:-0.3@299.6
SAE Class 180


Displacement (mm)
Time (ms)
Driver Upper Abdomen Rib Deflection Y
11ABRI01LES2DSYC
Max:22.0@50.1
Min:0.0@17.1
SAE Class 180



Driver Lower Abdomen Rib Deflection Y

11ABRI02LES2DSYC
Max:23.4@50.0
Min:-0.1@17.8
SAE Class 180



Driver Acetabulum Impact Side Force Y

11ACTBLE00S2FOYB
Max:1850.9@44.7
Min:-133.1@18.5
SAE Class 600

Driver Iliac Wing Impact Side Force Y

11ILACLE00S2FOYB
Max:1272.9@47.1
Min:-82.7@18.7
SAE Class 600

Driver Combined Pelvic Force

11PELVLE00S2FOYB
Max:3033.8@47.9
Min:-214.4@18.6
SAE Class 600

APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
SID-IIs Small Side Impact ATD
S/N: 299

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 299 Test Date: 2020-11-16

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	781	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	85	Pass
D - H Point From Seatback	mm	141	151	149	Pass
E - Shoulder Pivot From Backline	mm	97	107	106	Pass
F - Thigh Clearance	mm	119	135	123	Pass
G - Head Breadth	mm	140	148	144	Pass
H - Head Back From Backline	mm	40	46	43	Pass
I - Head Depth	mm	178	188	182	Pass
J - Head Circumference	mm	541	551	548	Pass
K - Buttock To Knee Length	mm	514	540	520	Pass
L - Popliteal Height	mm	343	369	354	Pass
K - Knee Pivot To Floor Height	mm	392	409	397	Pass
N - Buttock Popliteal Length	mm	416	442	429	Pass
O - Chest Depth W/O Jacket	mm	195	211	203	Pass
P - Foot Length	mm	216	232	223	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	316	Pass
R - Arm Length	mm	249	259	256	Pass
S - Knee Joint To Seatback	mm	477	493	485	Pass
V - Shoulder Width	mm	341	357	343	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	869	Pass
Z - Waist Circumference	mm	761	791	781	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

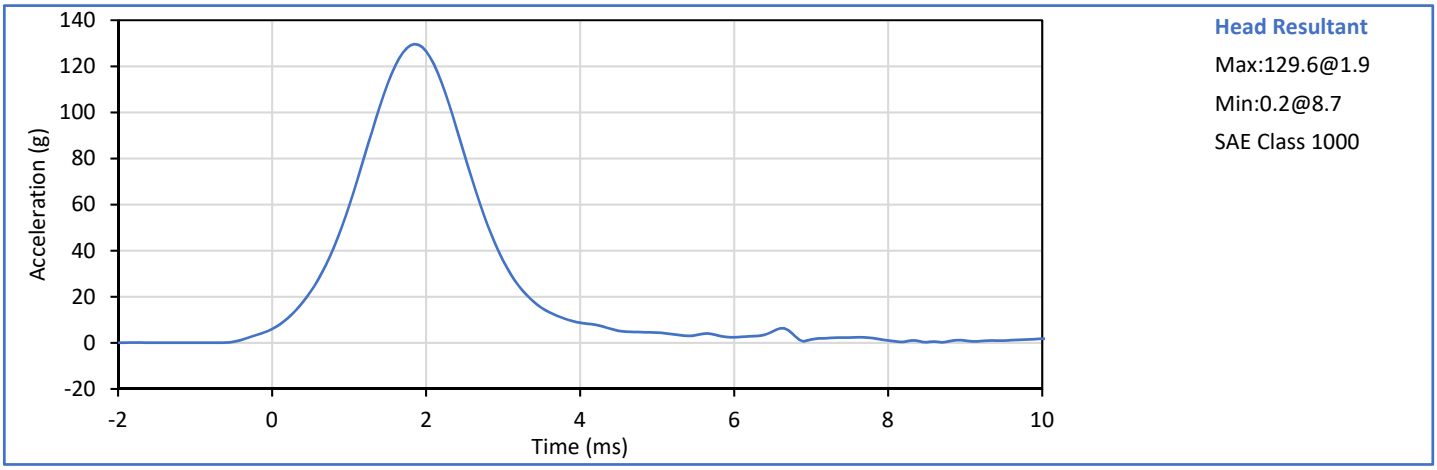
Approved By: P. Puzzuto

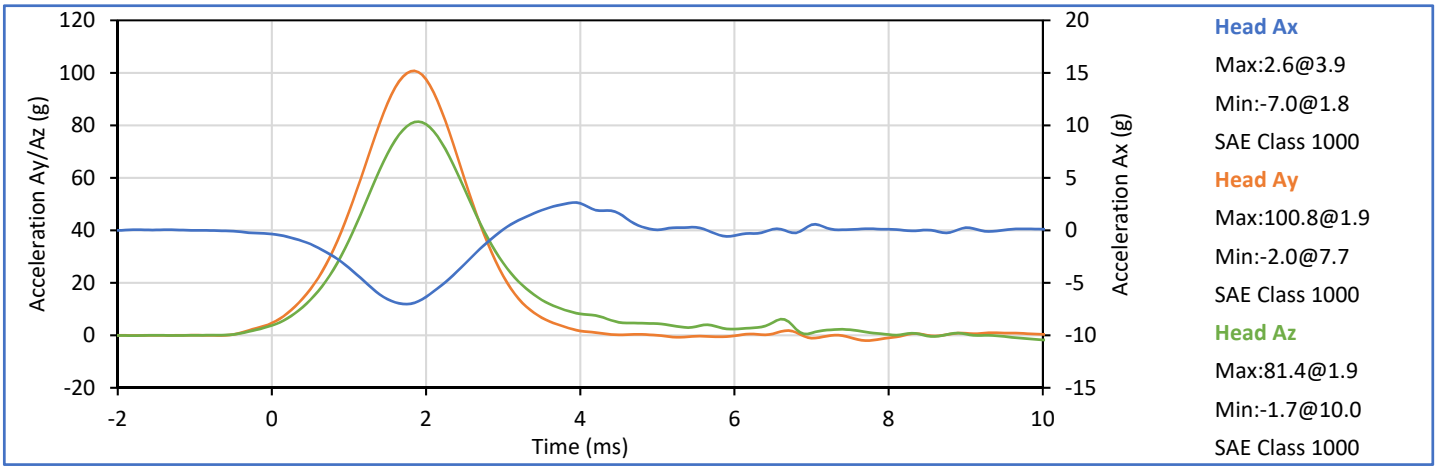
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 299 Test Date: 2020-11-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.4	Pass
Laboratory Humidity	%	10	70	34	Pass
Peak Resultant Acceleration	g	115.0	137.0	129.6	Pass
Peak Head Ax	g	-15.0	15.0	-7.0	Pass
Oscillations After Main Pulse	%	0.0	15.0	4.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

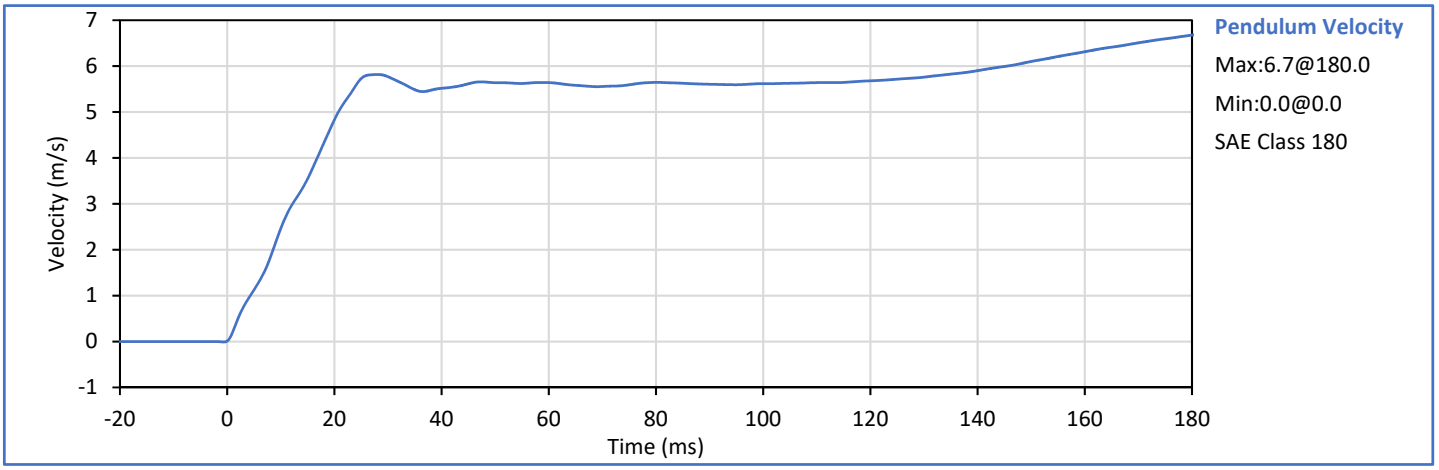
Approved By: P. Puzzuto

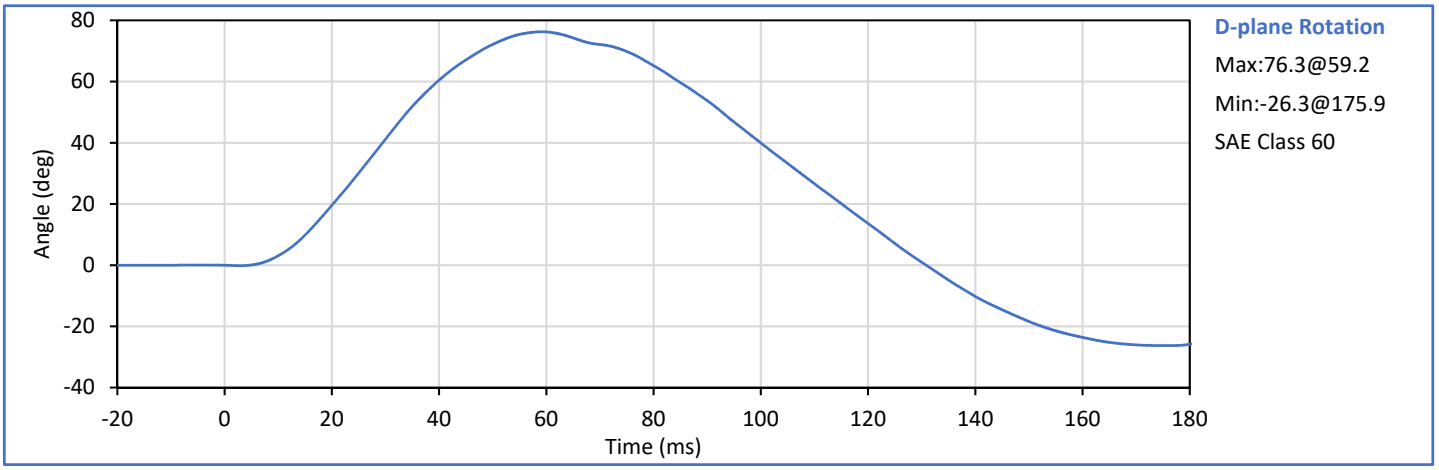
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2020-11-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	34	Pass
Pendulum Velocity	m/s	5.51	5.63	5.61	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.46	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	4.83	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.73	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.82	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	76.3	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	59.2	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-41.9	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	108.1	Pass
			Overall Test Results		Pass



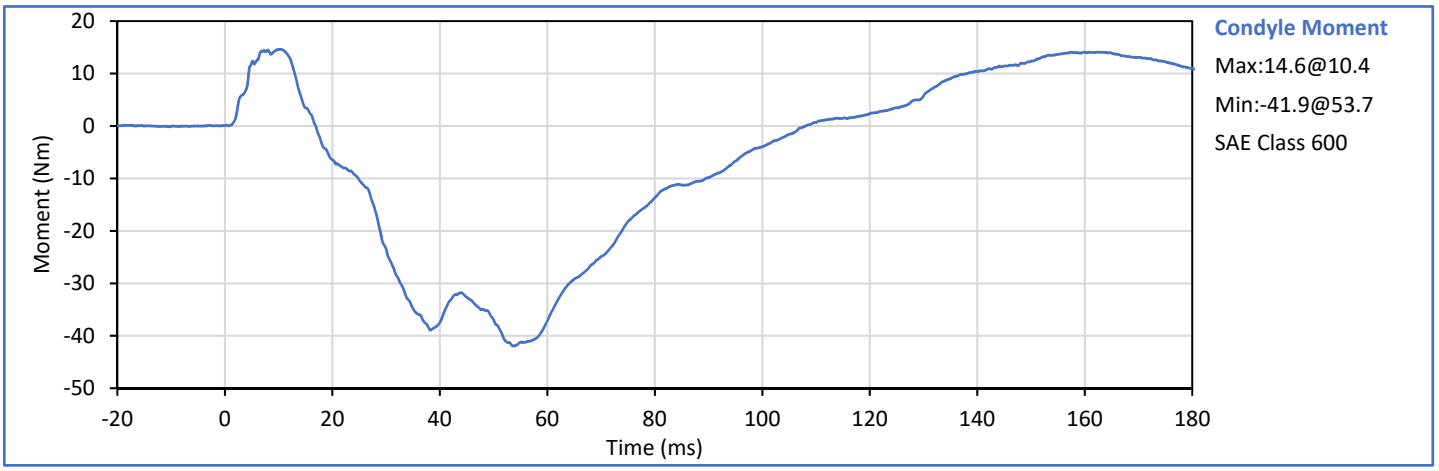


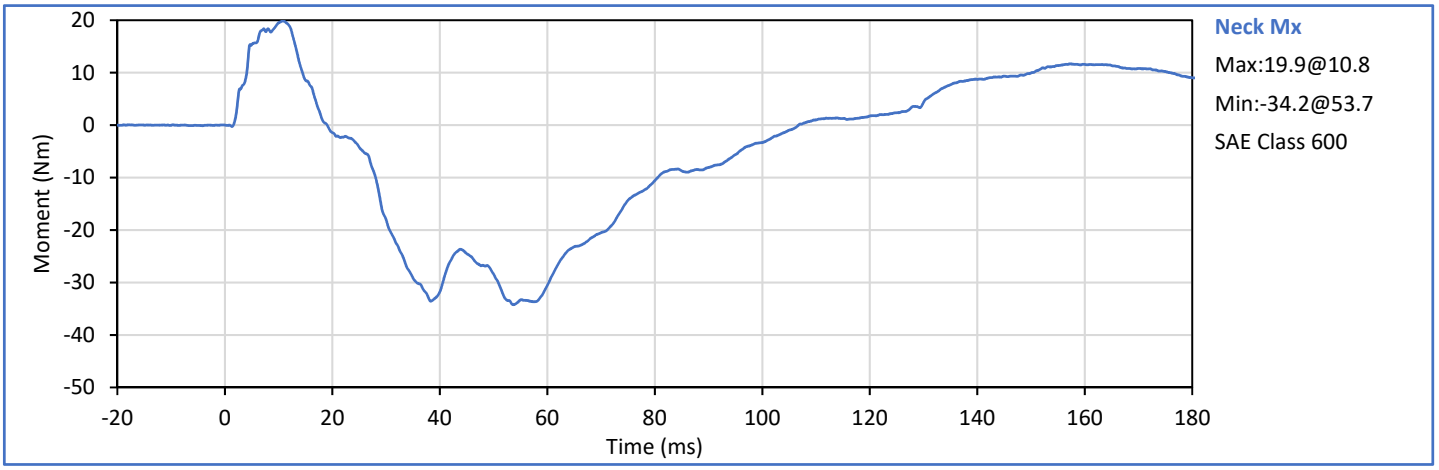
Technician: J. Hernandez

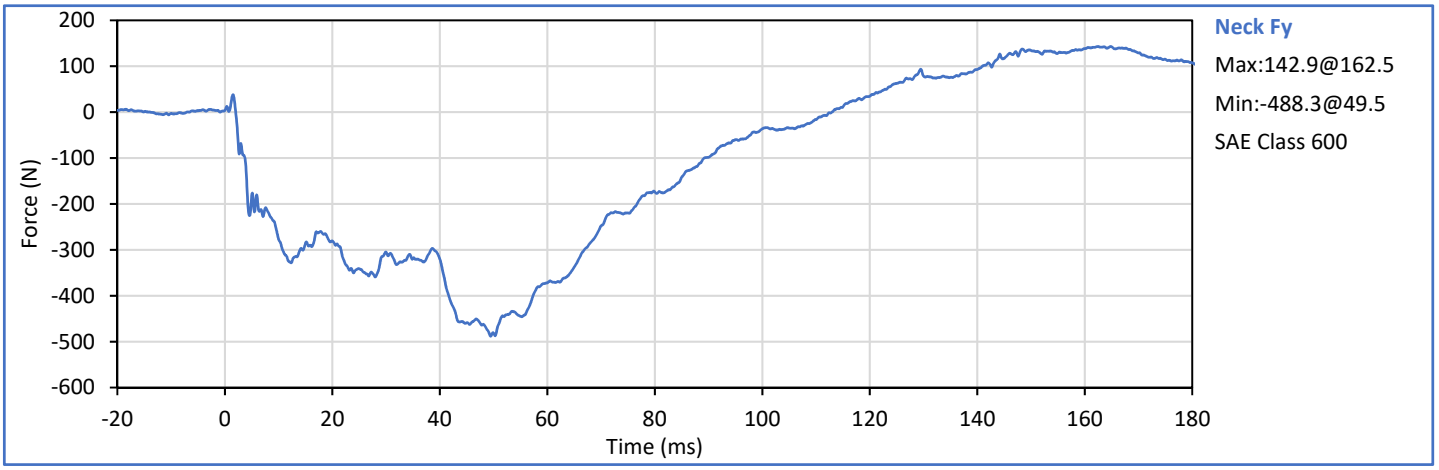
Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2020-11-16





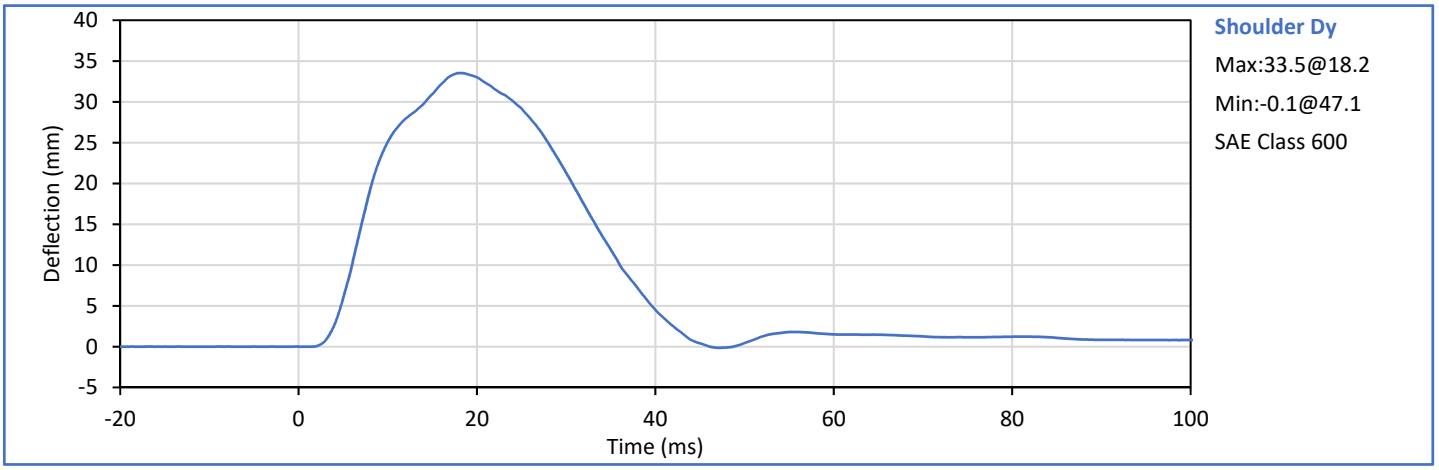


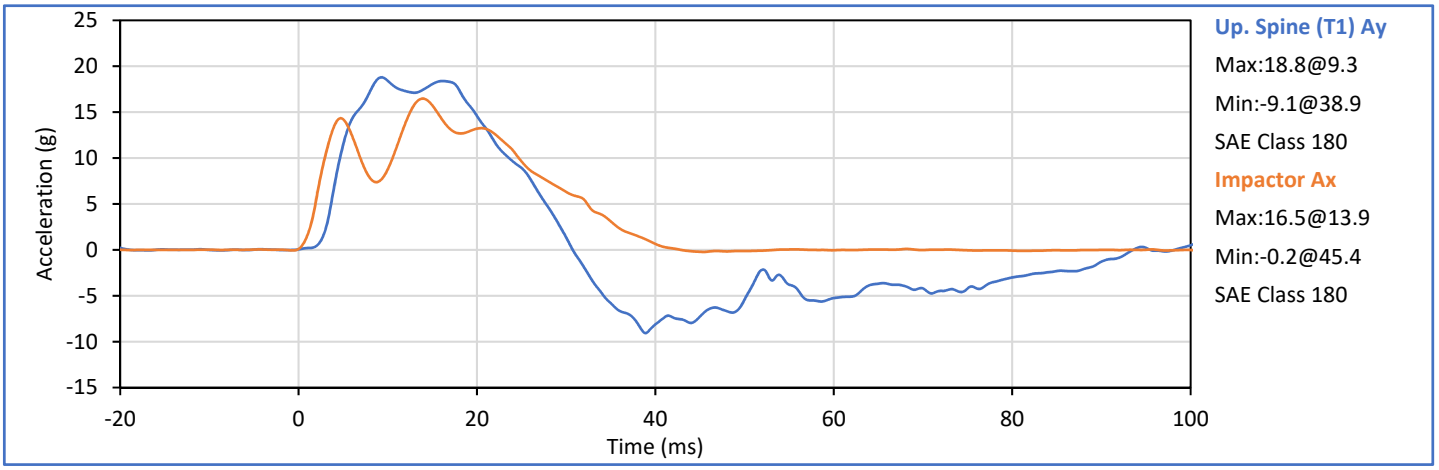
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 299 Test Date: 2020-11-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	27	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	18.8	Pass
Peak Impactor Ax	g	13.0	18.0	16.5	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

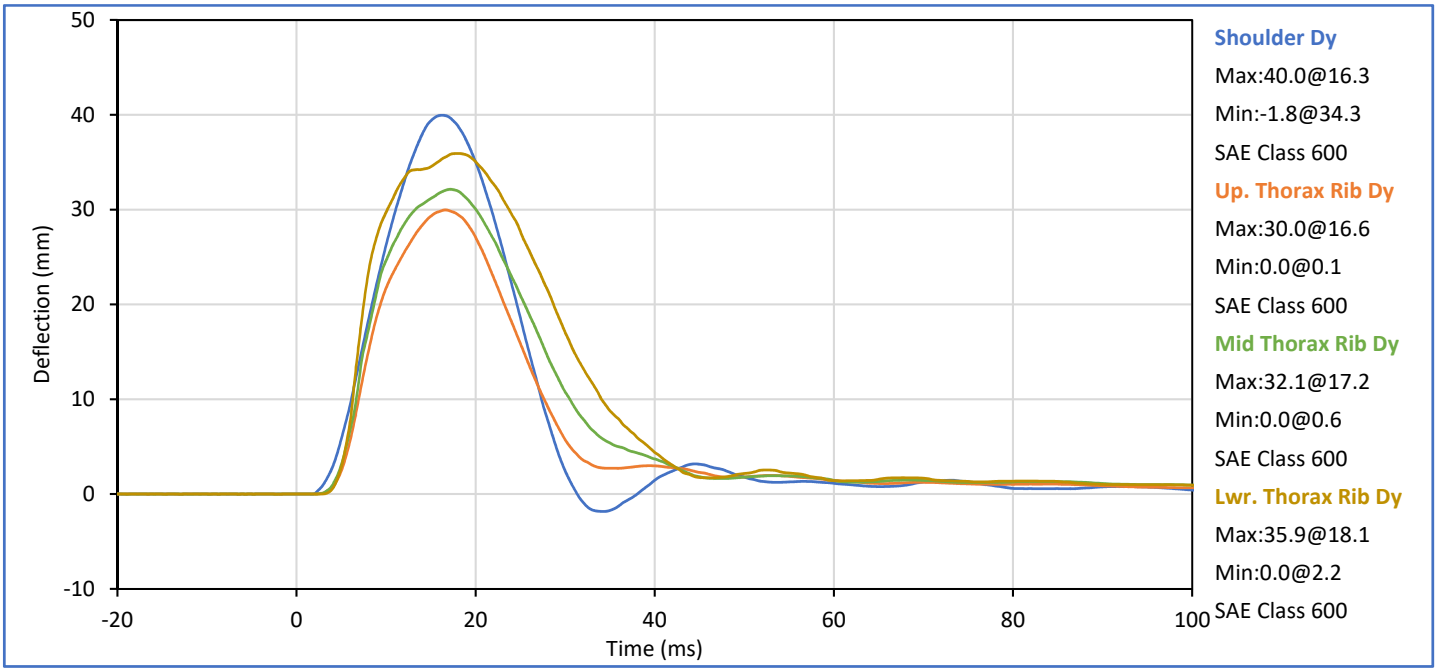
Approved By: P. Puzzuto

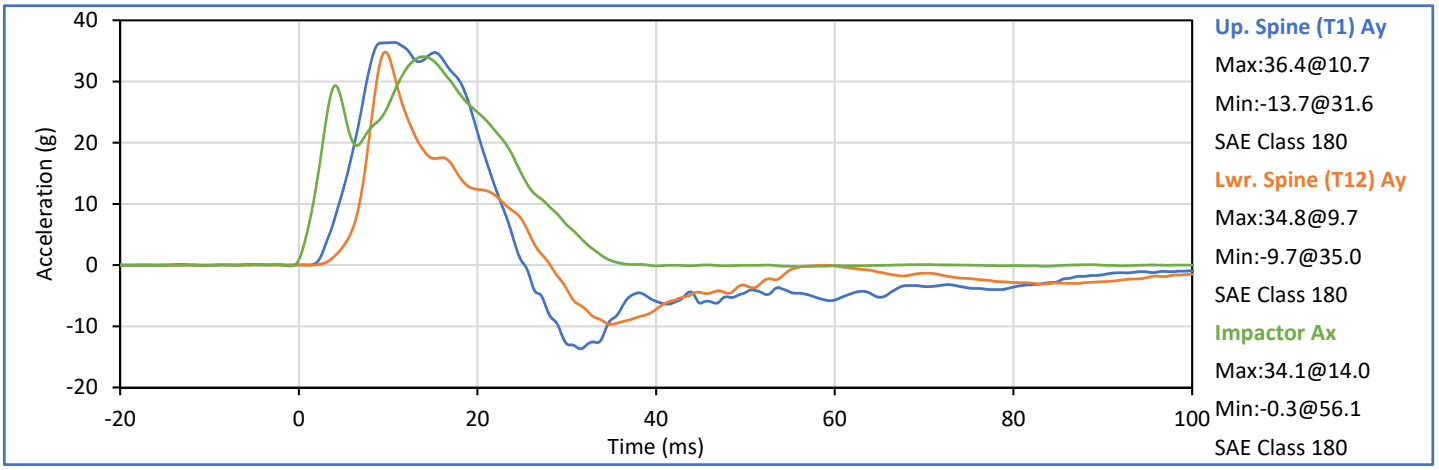
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Thorax (With Arm)

ATD Serial No.: 299 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 Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	6.60	6.80	6.64	Pass
Peak Shoulder Dy	mm	31.0	40.0	40.0	Pass
Peak Upper Rib Dy	mm	25.0	32.0	30.0	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.1	Pass
Peak Lower Rib Dy	mm	32.0	38.0	35.9	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	36.4	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	34.8	Pass
Peak Impactor Ax	g	30.0	36.0	34.1	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

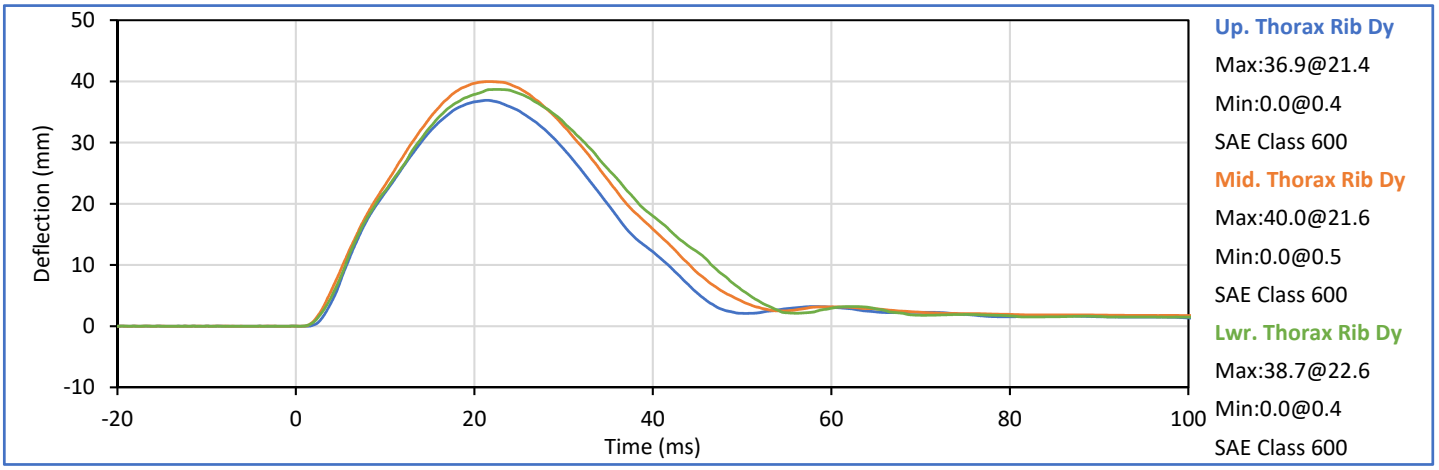
Approved By: P. Puzzuto

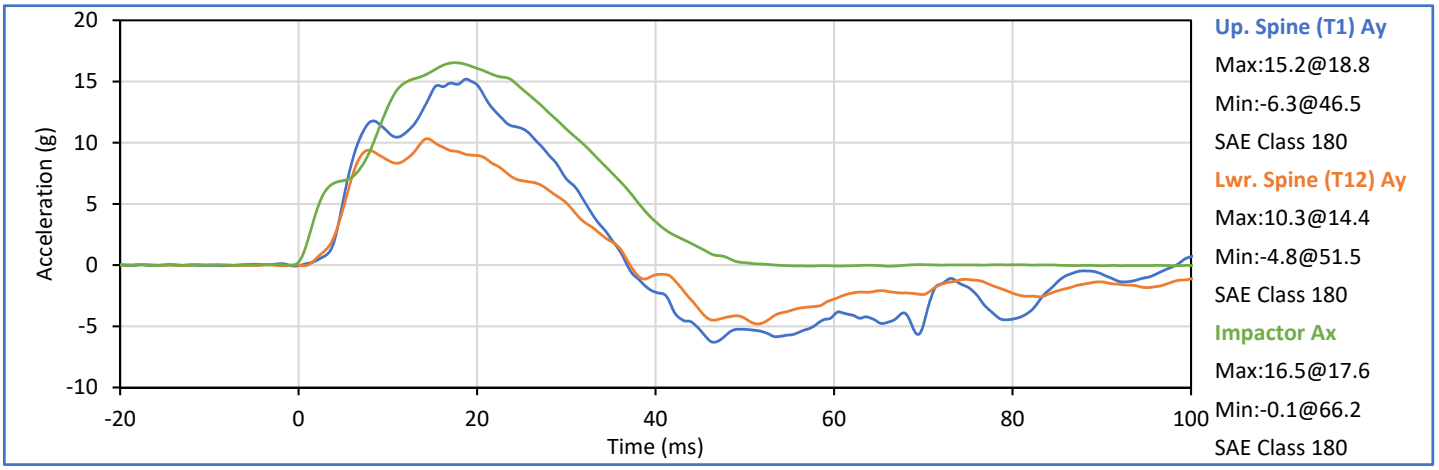
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Thorax (No Arm)

ATD Serial No.: 299 Test Date: 2020-11-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	36.9	Pass
Peak Middle Rib Dy	mm	39.0	45.0	40.0	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.7	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.2	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	10.3	Pass
Peak Impactor Ax	g	14.0	18.0	16.5	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

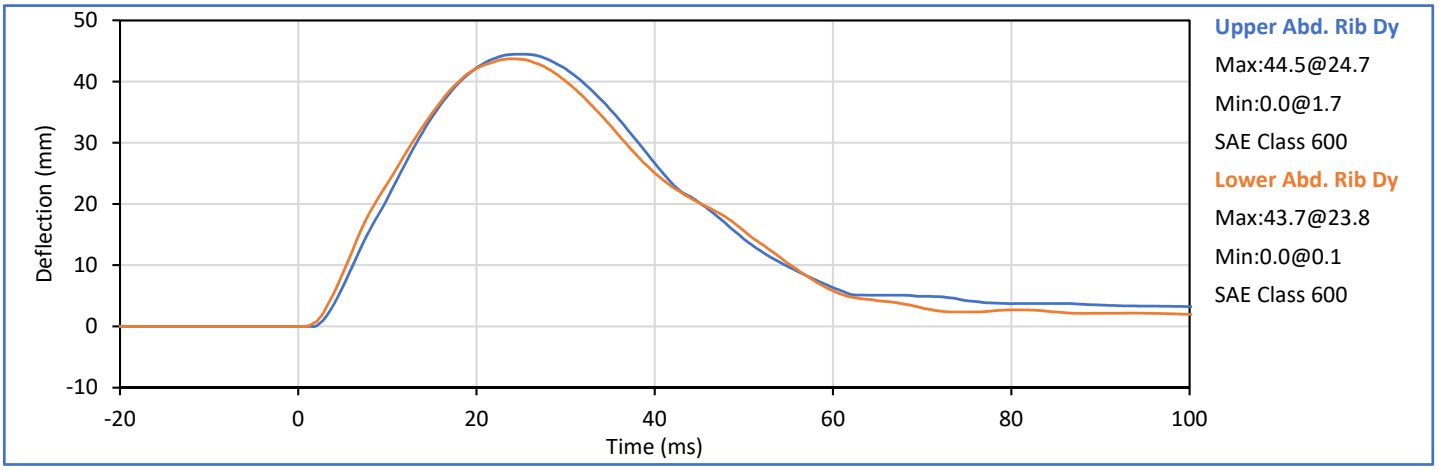
Approved By: P. Puzzuto

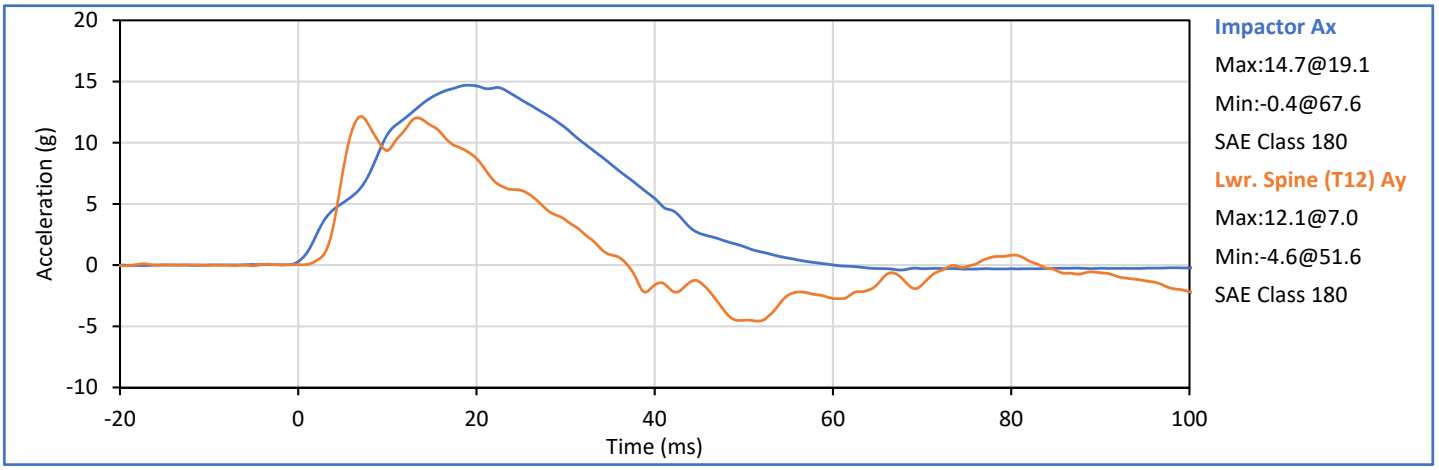
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 299 Test Date: 2020-11-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	44.5	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	43.7	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	12.1	Pass
Peak Impactor Ax	g	12.0	16.0	14.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

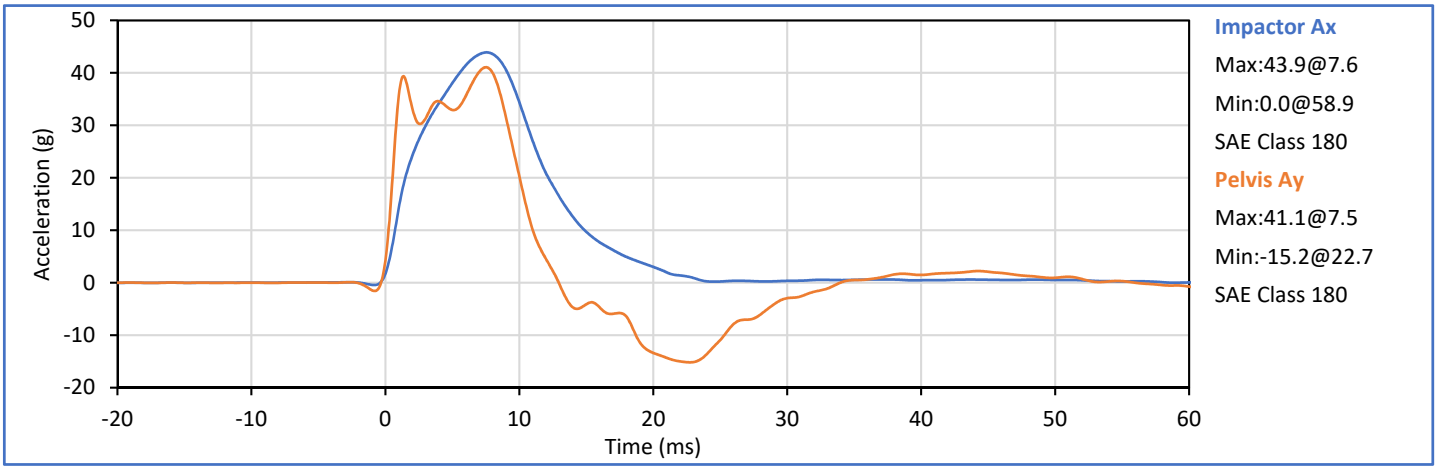
Applus IDIADA KARCO

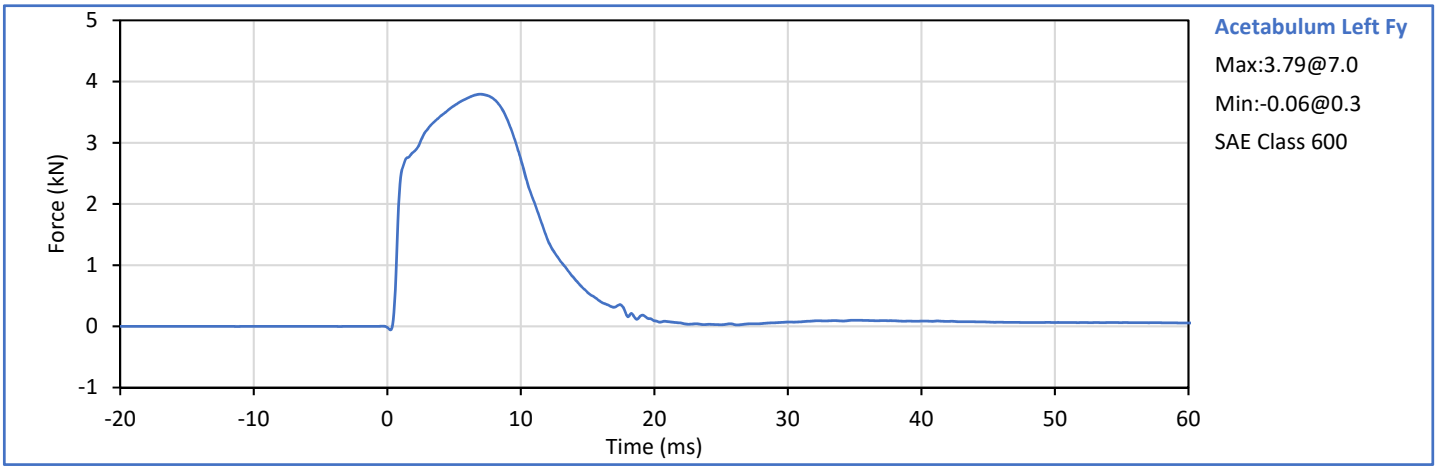
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 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 Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.79	Pass
Pelvis Ay after 6ms	g	34.0	42.0	41.1	Pass
Peak Impactor Ax	g	38.0	47.0	43.9	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13599





Technician: J. Hernandez

Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2020-11-16

Pelvis Plug S/N: 13599

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13599
Test Number 11243
Report Number 11281
Test Date 9/25/2019 12:54:10 PM

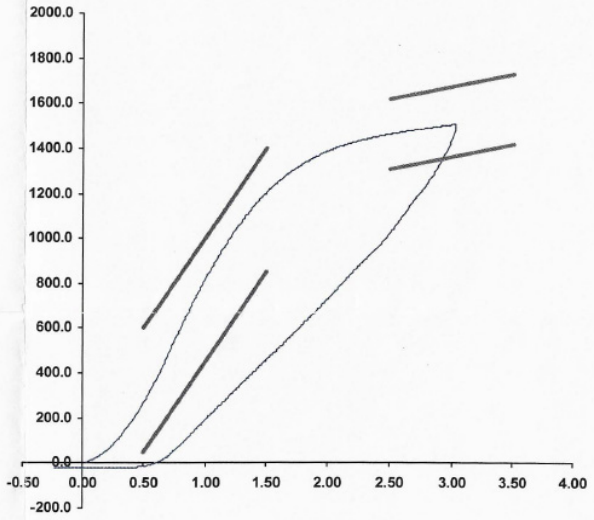
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	279.97	50.00	600.00
Force @ 1.5 mm (N)	1,209.73	850.00	1,400.00
Force @ 2.5 mm (N)	1,465.29	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,507.98	1,361.00	1,673.00

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

Crosshead Speed (mm / min) or Rat 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 : DC Date : 9/25/2019

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

Applus IDIADA
KARCO

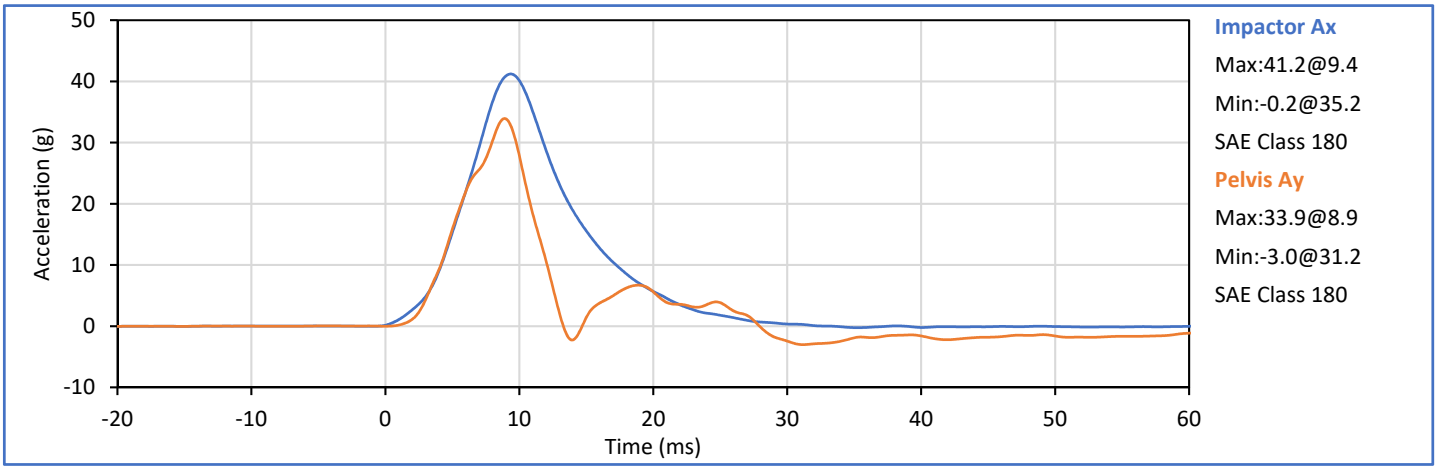
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

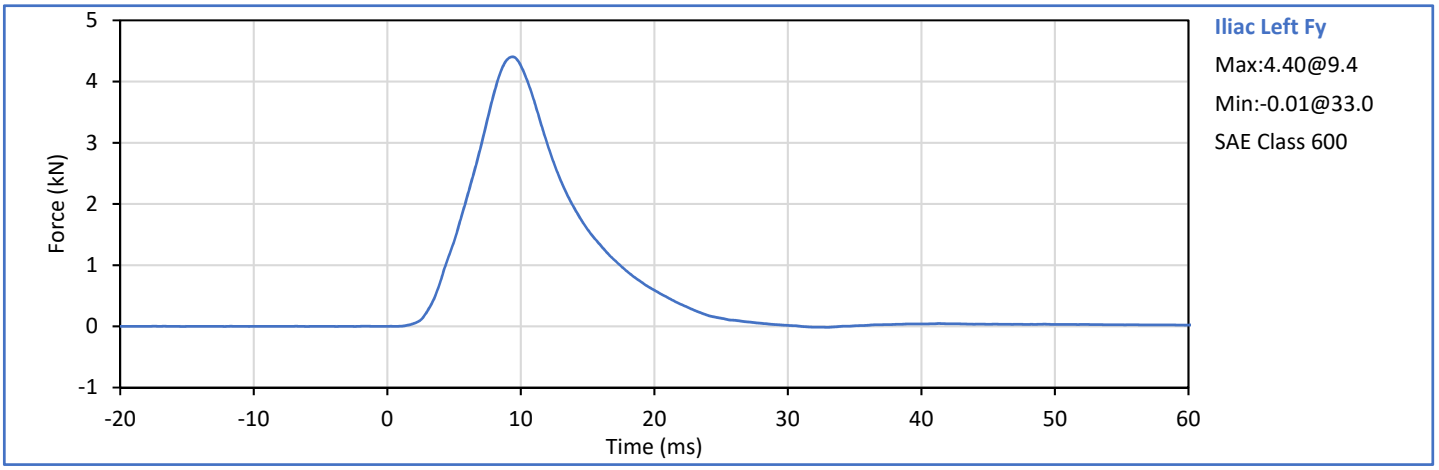
ATD Serial No.: 299 Test Date: 2020-11-16

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Iliac Fy	kN	4.10	5.10	4.40	Pass
Pelvis Ay after 6ms	g	28.0	39.0	33.9	Pass
Peak Impactor Ax	g	36.0	45.0	41.2	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 C
Post-Test ATD Qualification and Performance Verification
SID-IIs Small Side Impact ATD
S/N: 299

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 299 Test Date: 2020-11-30

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

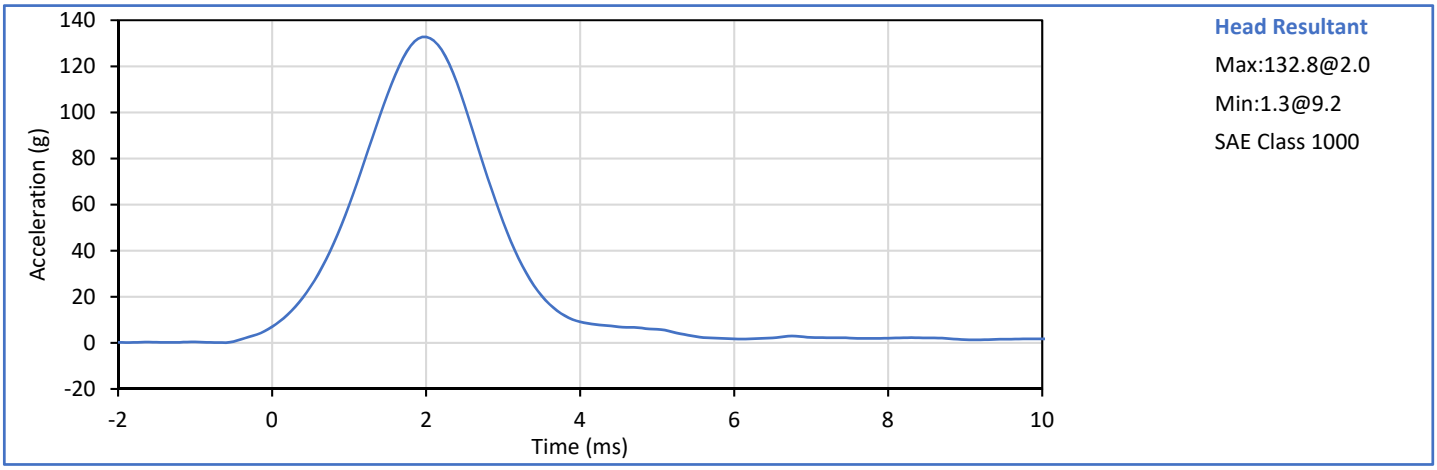
Applus IDIADA
KARCO

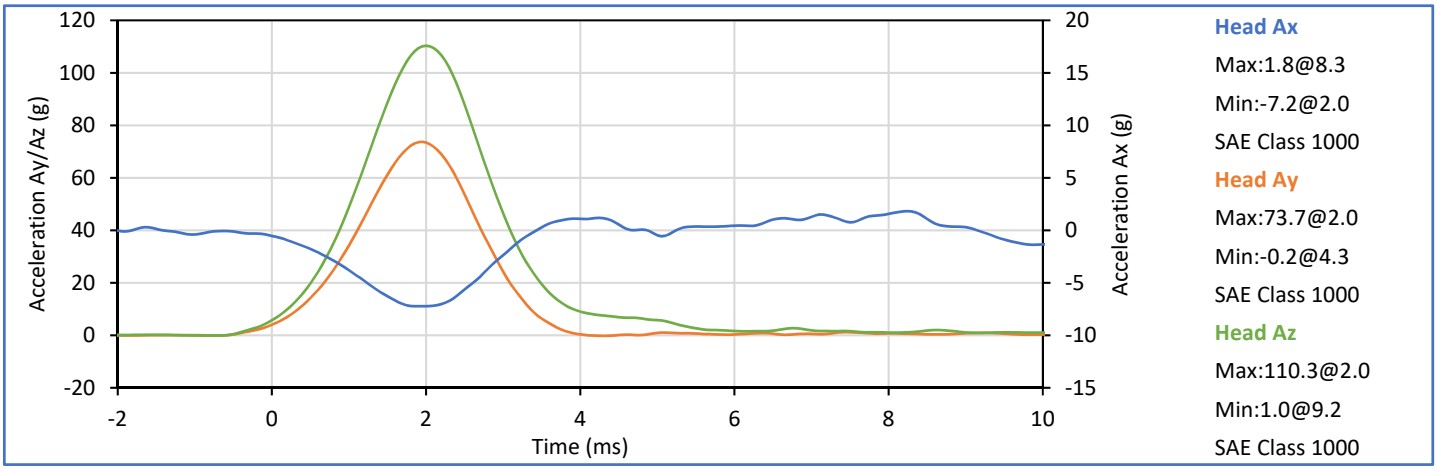
SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 299

Test Date: 2020-11-30

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.5	Pass
Laboratory Humidity	%	10	70	20	Pass
Peak Resultant Acceleration	g	115.0	137.0	132.8	Pass
Peak Head Ax	g	-15.0	15.0	-7.2	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

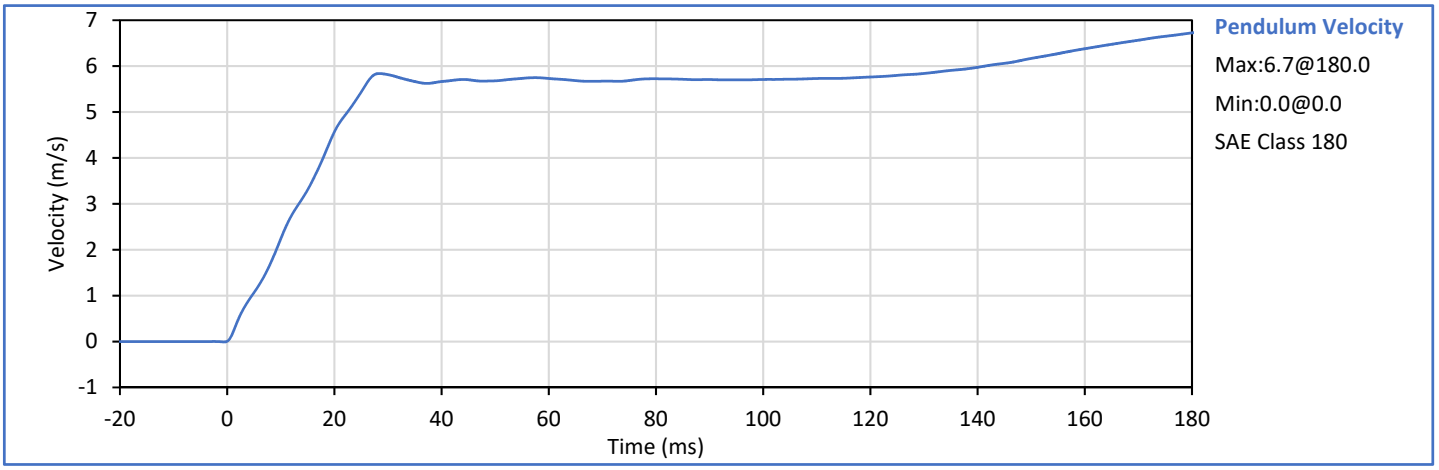
Approved By: P. Puzzuto

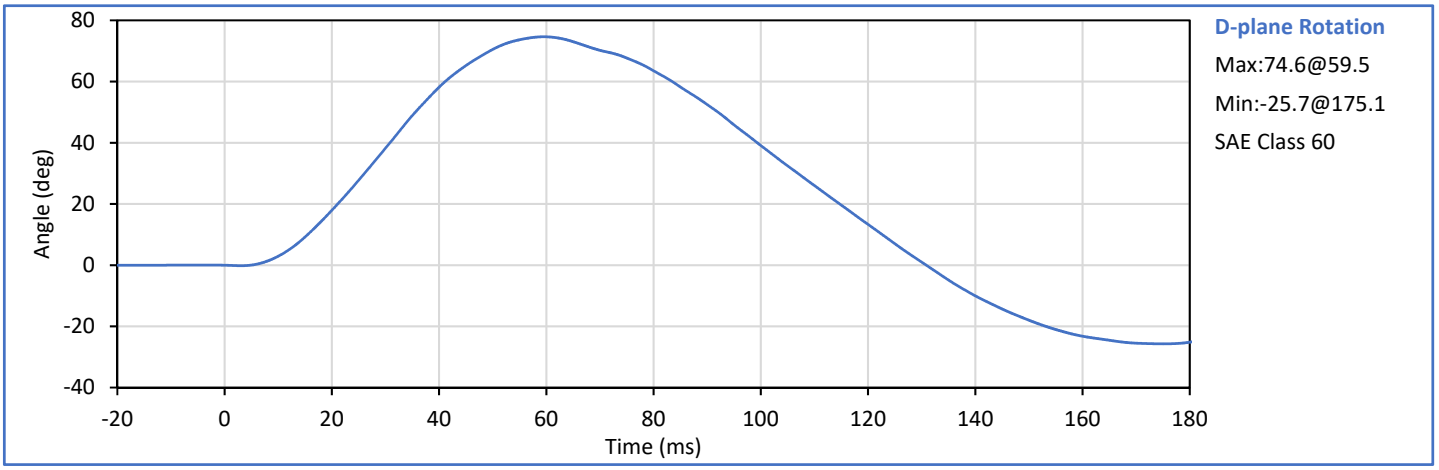
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2020-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	34	Pass
Pendulum Velocity	m/s	5.51	5.63	5.61	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.24	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.30	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.56	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.43	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.84	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	74.6	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	59.5	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-40.1	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	109.4	Pass
			Overall Test Results		Pass



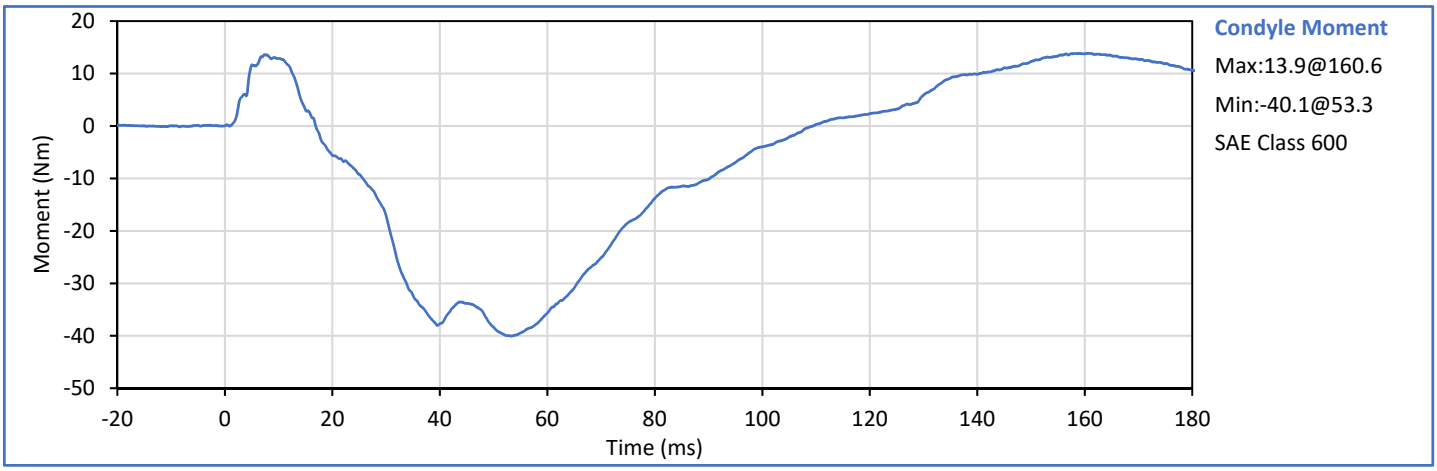


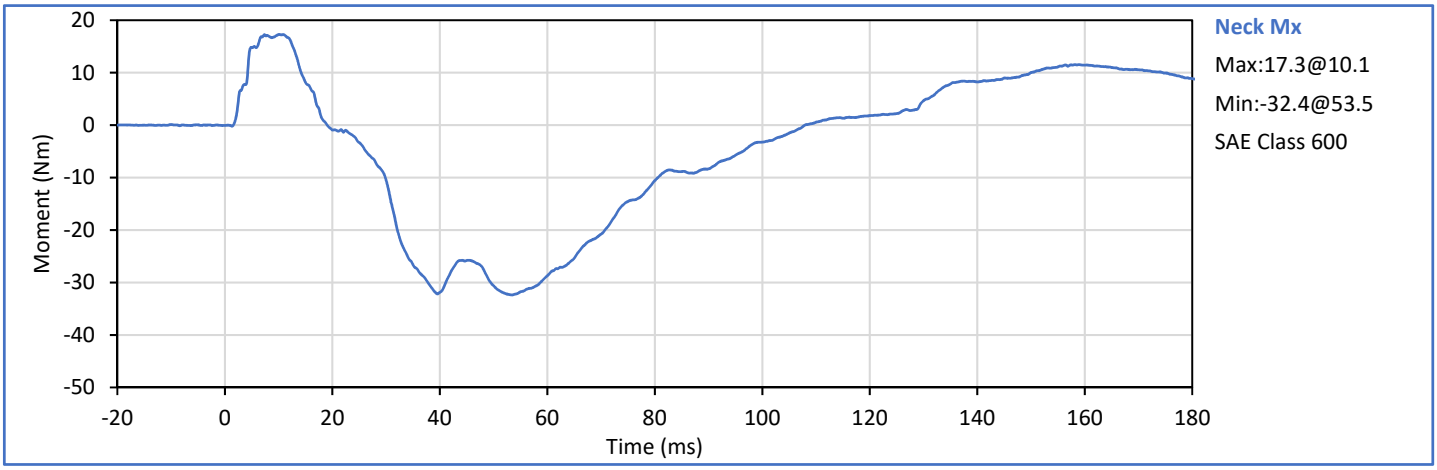
Technician: J. Hernandez

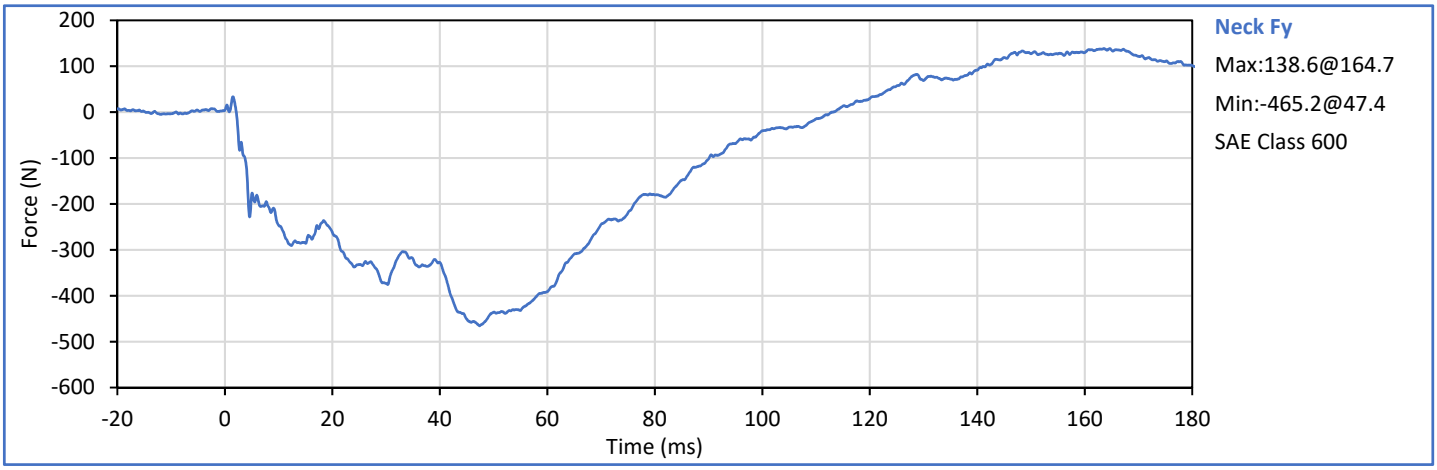
Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2020-12-04





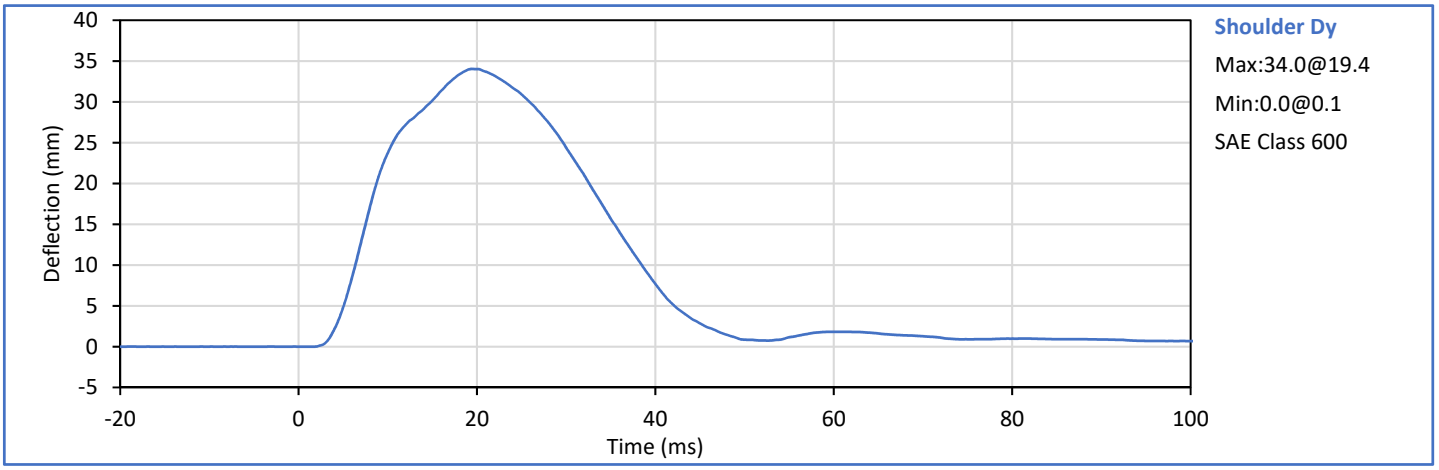


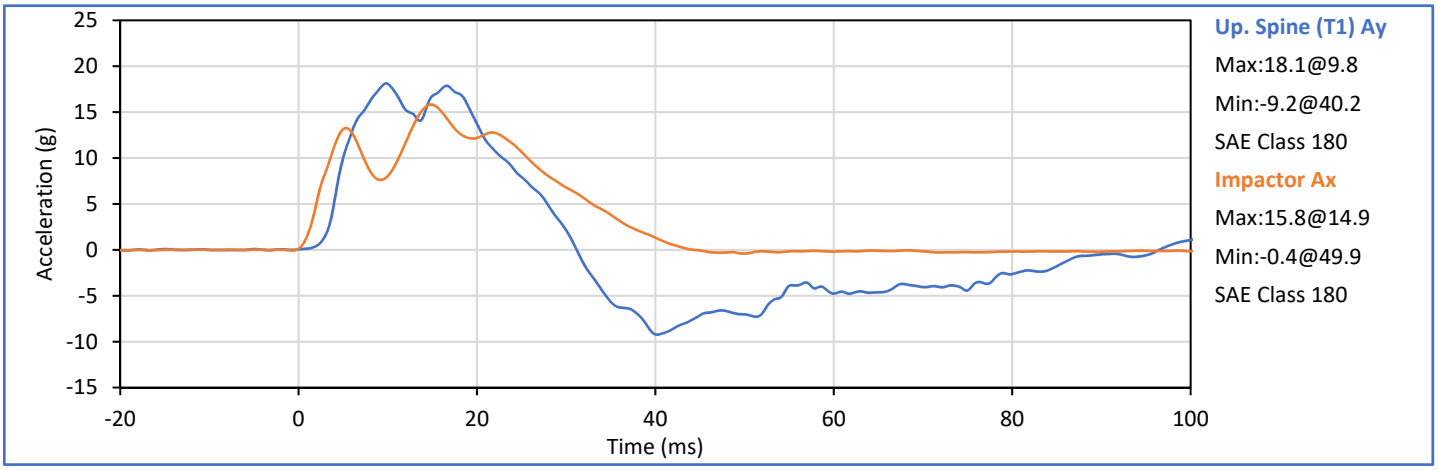
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 299 Test Date: 2020-12-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	15	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Shoulder Dy	mm	28.0	37.0	34.0	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.1	Pass
Peak Impactor Ax	g	13.0	18.0	15.8	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

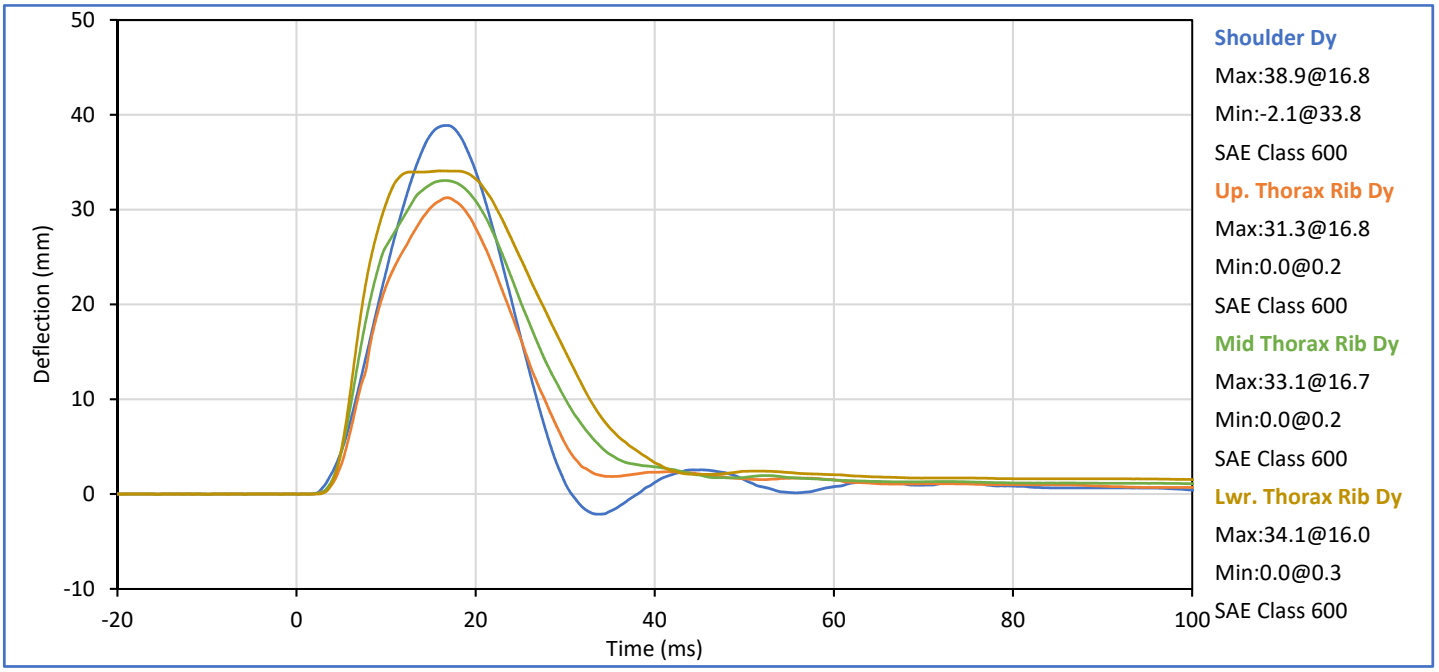
Approved By: P. Puzzuto

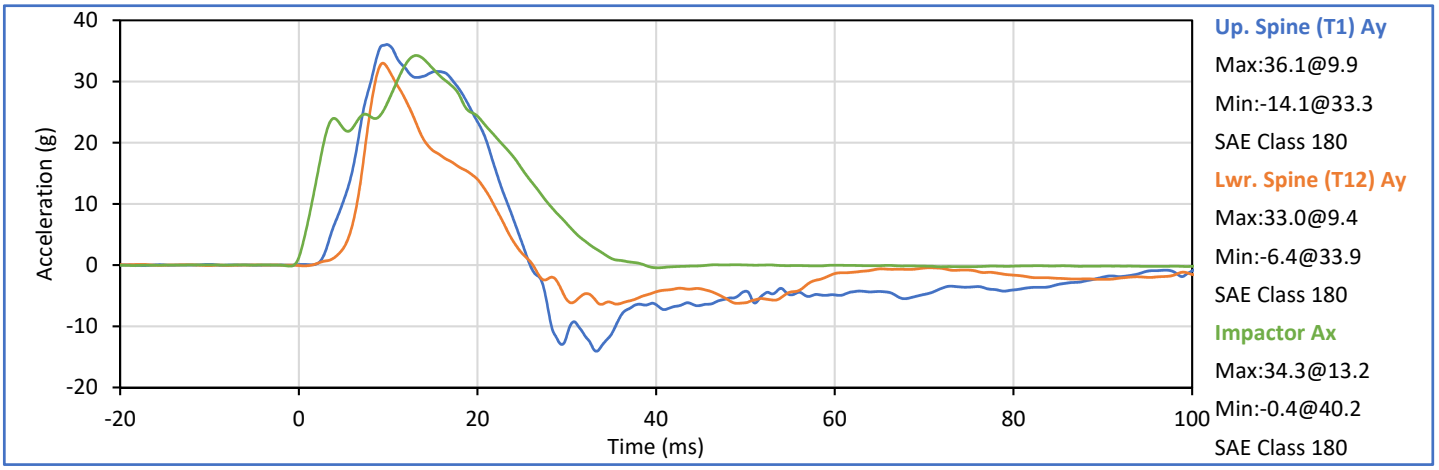
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Thorax (With Arm)

ATD Serial No.: 299 Test Date: 2020-12-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	15	Pass
Impactor Velocity	m/s	6.60	6.80	6.65	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.9	Pass
Peak Upper Rib Dy	mm	25.0	32.0	31.3	Pass
Peak Middle Rib Dy	mm	30.0	36.0	33.1	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.1	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	36.1	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	33.0	Pass
Peak Impactor Ax	g	30.0	36.0	34.3	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

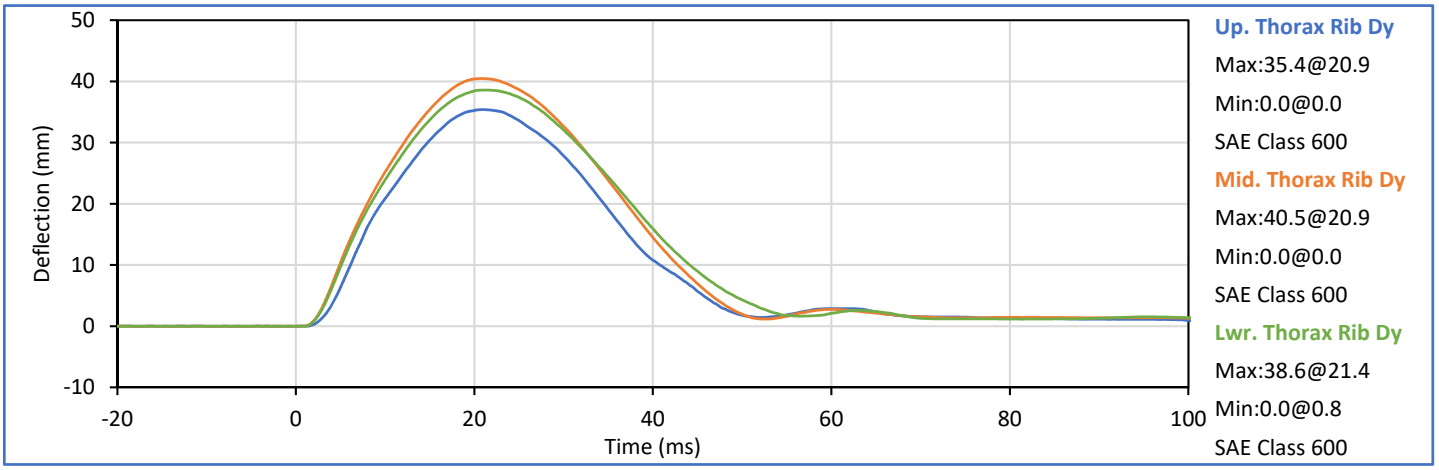
Approved By: P. Puzzuto

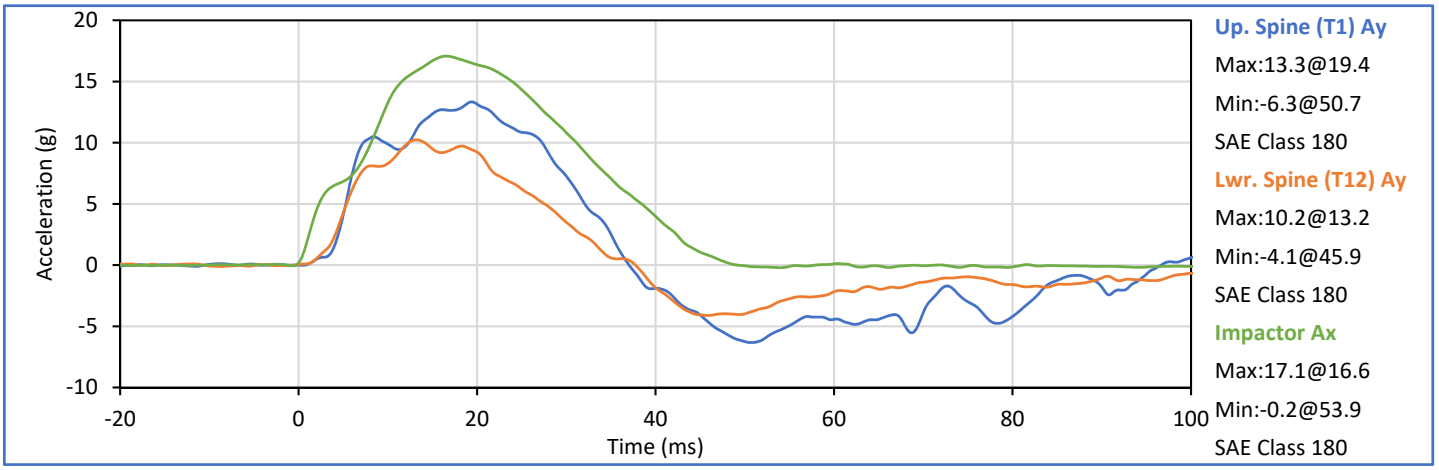
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Thorax (No Arm)

ATD Serial No.: 299 Test Date: 2020-12-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	16	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	35.4	Pass
Peak Middle Rib Dy	mm	39.0	45.0	40.5	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.6	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	13.3	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	10.2	Pass
Peak Impactor Ax	g	14.0	18.0	17.1	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

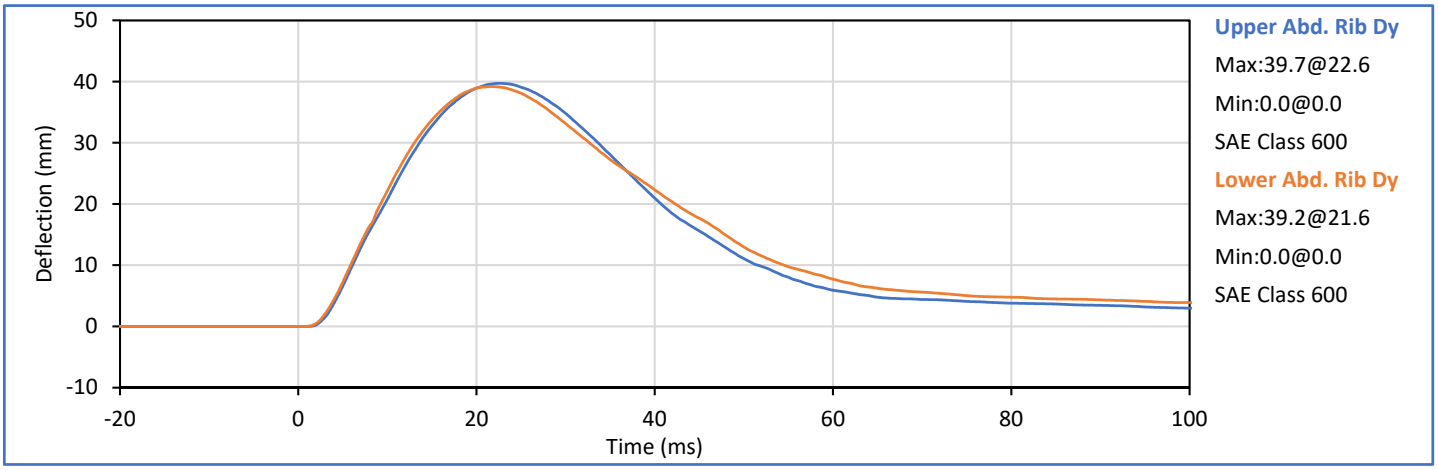
Approved By: P. Puzzuto

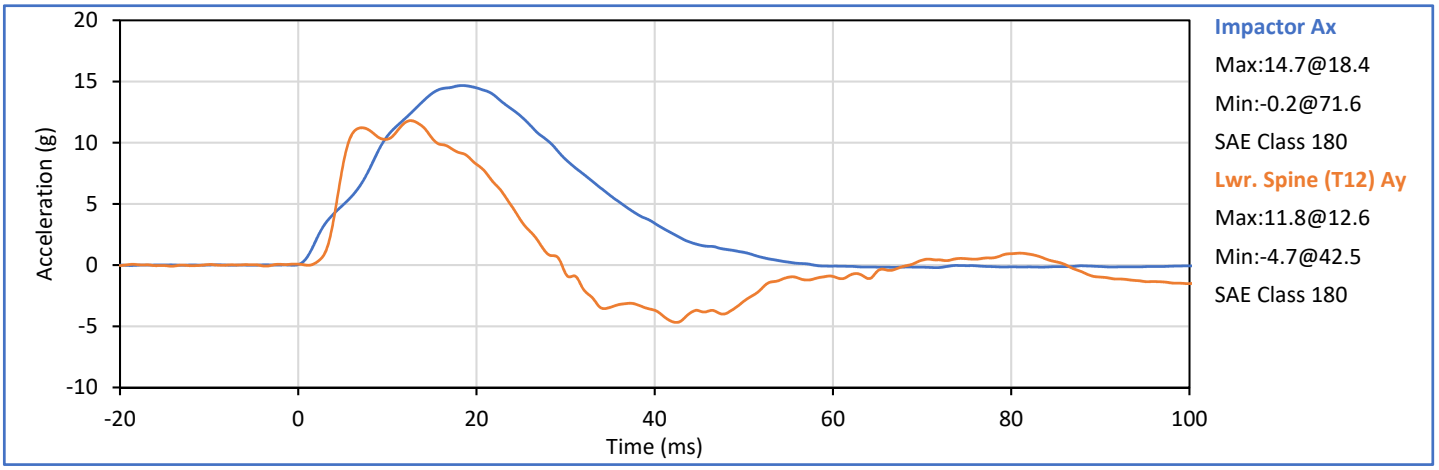
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 299 Test Date: 2020-12-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	15	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	39.7	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	39.2	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	11.8	Pass
Peak Impactor Ax	g	12.0	16.0	14.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

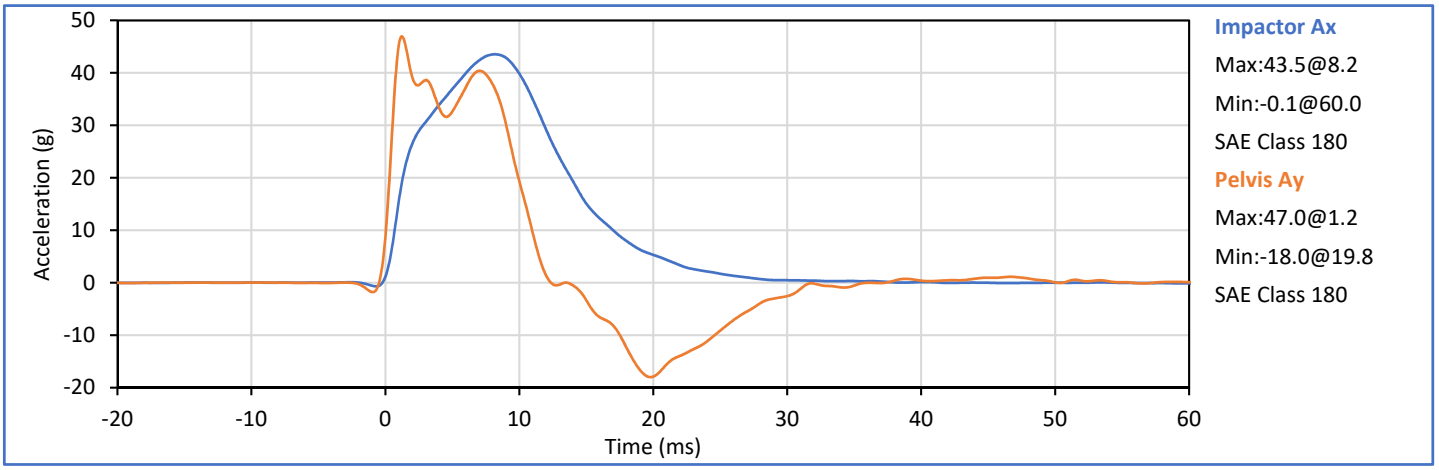
Applus IDIADA
KARCO

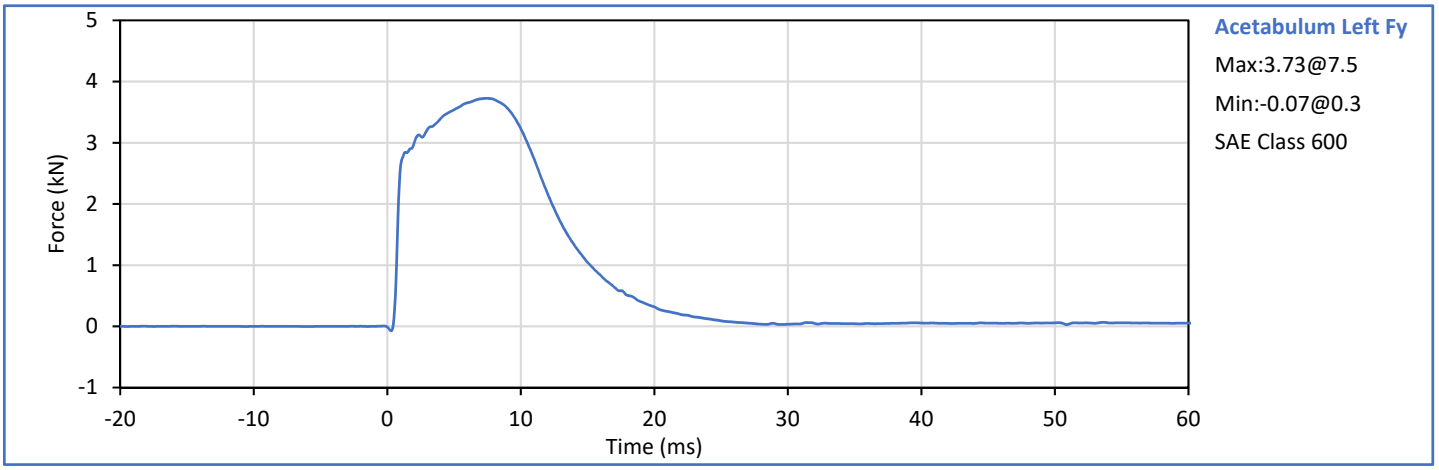
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2020-12-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.5	Pass
Laboratory Humidity	%	10	70	16	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.73	Pass
Pelvis Ay after 6ms	g	34.0	42.0	40.4	Pass
Peak Impactor Ax	g	38.0	47.0	43.5	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13601





Technician: J. Hernandez

Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2020-12-01

Pelvis Plug S/N: 13601

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13601
Test Number 11245
Report Number 11283
Test Date 9/25/2019 12:56:59 PM

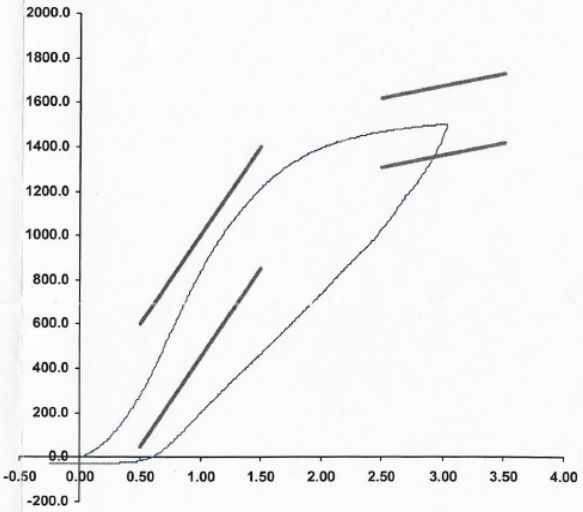
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	287.79	50.00	600.00
Force @ 1.5 mm (N)	1,219.02	850.00	1,400.00
Force @ 2.5 mm (N)	1,470.46	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,503.98	1,361.00	1,673.00

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

Crosshead Speed (mm / min) or Rat 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 : DC Date : 9/25/2019

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

Applus IDIADA
KARCO

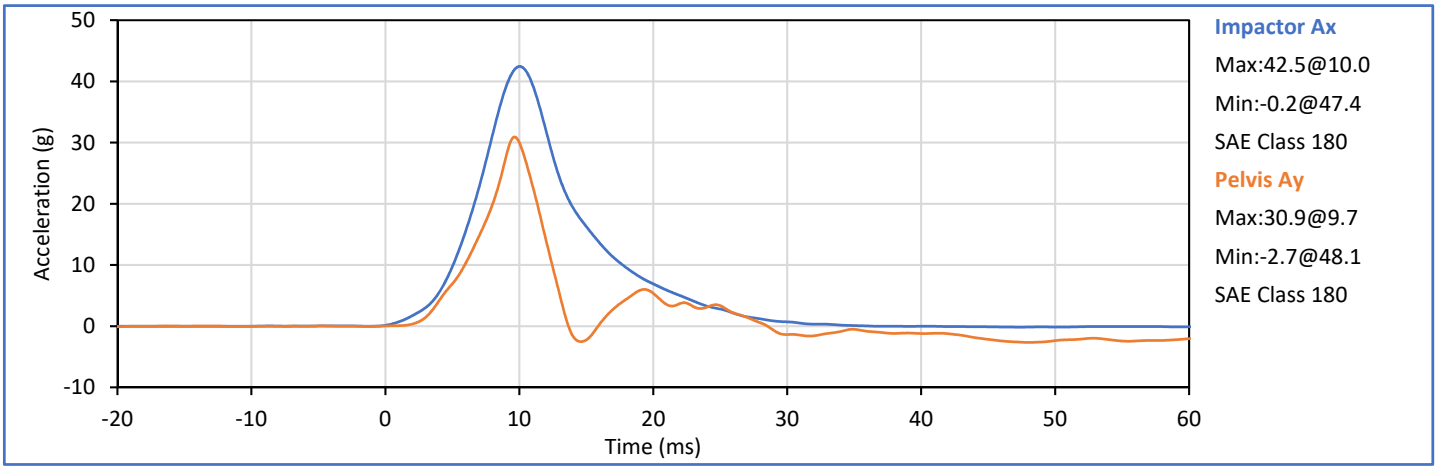
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

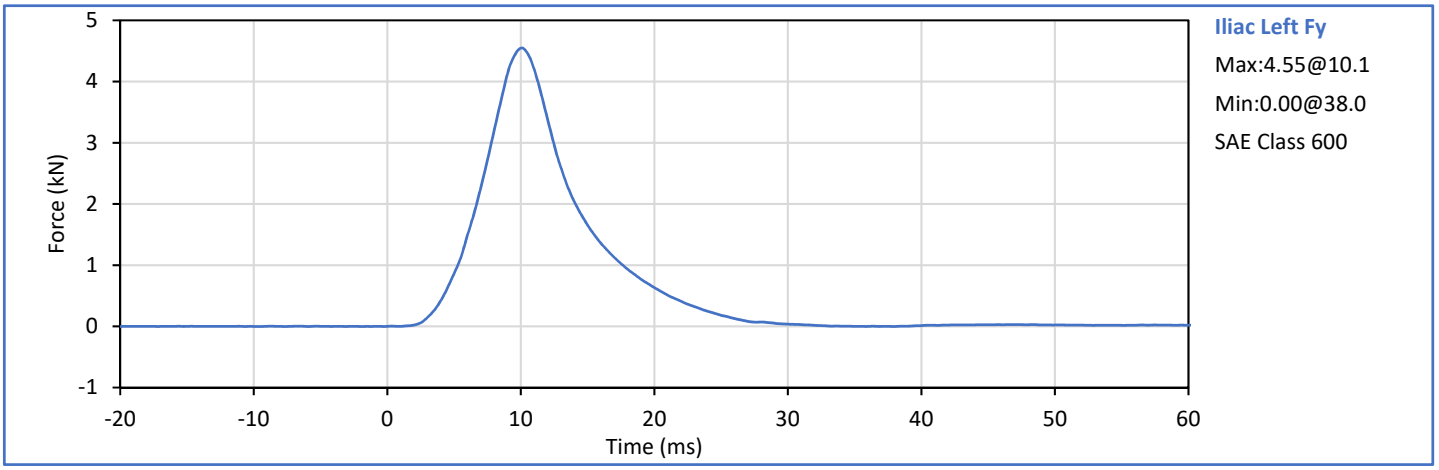
ATD Serial No.: 299 Test Date: 2020-12-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	14	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Iliac Fy	kN	4.10	5.10	4.55	Pass
Pelvis Ay after 6ms	g	28.0	39.0	30.9	Pass
Peak Impactor Ax	g	36.0	45.0	42.5	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

SID-IIs ATD S/N: 299

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P51929	Endevco	7264C-2k	2020-07-22
Head Acceleration Y Primary	P50086	Endevco	7264C-2k	2020-07-22
Head Acceleration Z Primary	P51931	Endevco	7264C-2k	2020-07-22
Head Acceleration X Redundant	P68604	Endevco	7264C-2k	2020-07-22
Head Acceleration Y Redundant	P51934	Endevco	7264C-2k	2020-07-22
Head Acceleration Z Redundant	P58736	Endevco	7264C-2k	2020-07-22
Head Rotation Rate X	ARS7449	DTS	ARS PRO-8k (2000Hz)	2020-02-21
Head Rotation Rate Y	ARS7510	DTS	ARS PRO-8k (2000Hz)	2020-02-21
Head Rotation Rate Z	ARS7573	DTS	ARS PRO-8k (2000Hz)	2020-02-21
Upper Thorax Rib Deflection Y	1143	Servo	08TCI-3725	2020-07-21
Middle Thorax Rib Deflection Y	1075	Servo	08TCI-3725	2020-07-21
Lower Thorax Rib Deflection Y	1213	Servo	08TCI-3725	2020-07-21
Upper Abdomen Rib Deflection Y	1218	Servo	08TCI-3725	2020-07-21
Lower Abdomen Rib Deflection Y	1177	Servo	08TCI-3725	2020-07-21
Lower Spine T12 Acceleration X	P58761	Endevco	7264C-2k	2020-07-22
Lower Spine T12 Acceleration Y	P50077	Endevco	7264C-2k	2020-07-22
Lower Spine T12 Acceleration Z	P58795	Endevco	7264C-2k	2020-07-22
Iliac Wing Impact Side Force Y	284 Fy (Iliac)	R.A. Denton	3228J	2020-01-16
Acetabulum Impact Side Force Y	272 Fy (Acetabulum)	R.A. Denton	3249J	2020-01-16

Table 2 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	A265887	MSI	52F-2k	2020-06-22
Vehicle CG Ay	A265917	MSI	52F-2k	2020-06-17
Vehicle CG Az	A356274	MSI	52F-2k	2020-09-15
Left Floor Sill Ay	A345124	MSI	52F-2k	2020-07-25
A-Pillar Sill Ay	A356321	MSI	52F-2k	2020-09-15
A-Pillar Low Ay	A265922	MSI	52F-2k	2020-07-18
A-Pillar Mid Ay	A354822	MSI	52F-2k	2020-09-08
B-Pillar Sill Ay	A354840	MSI	52F-2k	2020-06-10
B-Pillar Low Ay	A343459	MSI	52F-2k	2020-07-11
B-Pillar Mid Ay	A356282	MSI	52F-2k	2020-09-15
Driver Seat Track at H-Point Ay	A265947	MSI	52F-2k	2020-06-17
Engine Top Ax	A354843	MSI	52F-2k	2020-09-08
Engine Top Ay	A266317	MSI	52F-2k	2020-06-17
Firewall Ay	A356500	MSI	52F-2k	2020-09-16
Right Roof Ay	A265853	MSI	52F-2k	2020-06-18
Right Floor Sill Ay	A356322	MSI	52F-2k	2020-09-15
Rear Floorpan Ax	A354882	MSI	52F-2k	2020-09-08
Rear Floorpan Ay	A354871	MSI	52F-2k	2020-09-08

Table 3 - Barrier Pole Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Barrier Pole 01 Fx	19461A	Interface	1220FS-50k	2020-03-16
Barrier Pole 02 Fx	131822A	Interface	1220-FS	2020-03-16
Barrier Pole 03 Fx	131816A	Interface	1220AF-50k	2020-03-16
Barrier Pole 04 Fx	19325	Interface	1220-FS	2020-03-16
Barrier Pole 05 Fx	131827A	Interface	1220-FS	2020-03-16
Barrier Pole 06 Fx	19340	Interface	1220FS-50k	2020-03-16
Barrier Pole 07 Fx	19267	Interface	1220-FS	2020-03-16
Barrier Pole 08 Fx	19466A	Interface	1220FS-50k	2020-03-16