

REPORT NUMBER: SPNCAP-KAR-20-008
NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

NISSAN MOTOR CO., LTD
2020 NISSAN VERSA 4-DOOR SEDAN

NHTSA No: M20205216

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



DECEMBER 20, 2019

FINAL REPORT

PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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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: _____

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		15. Supplementary Notes																												
16. Abstract A 32.20 km/h 75° rigid pole side NCAP impact test was conducted on the subject 2020 Nissan Versa 4-door sedan 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 December 06, 2019. The impact velocity was 32.11 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 13.3°C. The target vehicle's maximum post-test static crush was 250 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>231.8</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>g</td> <td>82</td> <td>29</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td>N</td> <td>5525</td> <td>2140</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>18</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45</td> <td>15</td> </tr> </tbody> </table> The struck side doors of the vehicle were 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.				Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	231.8	Resultant Lower Spine Acceleration	g	82	29	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	2140	Maximum Thoracic Rib Deflection	mm	38	18	Maximum Abdominal Rib Deflection	mm	45	15
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Admin. Technical Information Services Division 1200 New Jersey Ave., SE Washington, DC 20590																												
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SECTION 1

TEST PURPOSE AND PROCEDURE

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 Nissan Versa 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure date October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2020 Nissan Versa 4-door sedan. The subject vehicle was towed into the rigid pole at an angle of 75.3° and a velocity of 32.11 km/h. The test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California on December 06, 2019. 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	231.8
Lower Spine (T12) Resultant Acceleration	g	82	29
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2140
Maximum Thoracic Rib Deflection	mm	38*	18
Maximum Abdominal Rib Deflection	mm	45*	15

*Proposed IARV

Supplemental restraint information is given below:

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

GENERAL COMMENTS

The struck side doors of the vehicle were 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 y-direction accelerometer located on Mid B Pillar Post failed at 24.4 milliseconds.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20205216
Model Year	2020
Make	Nissan
Model	Versa
Body Style	4-Door Sedan
VIN	3N1CN8BV7LL801637
Body Color	Brilliant Silver
Odometer Reading (km / mi)	47 / 29
Engine Displacement (L)	1.6
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Manual
Transmission Speeds	5
Overdrive	Manual
Final Drive	FWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., LTD
Date of Manufacture	Jul-19
Vehicle Type	Passenger

GVWR (kg)	3461
GAWR Front (kg)	1819
GAWR Rear (kg)	1676

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

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

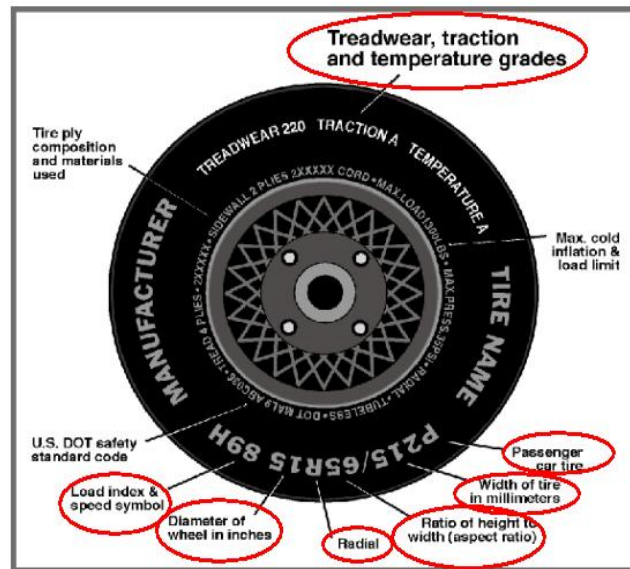
VEHICLE SEAT TYPE

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 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	195/65R15	195/65R15
Tire Size on Vehicle	195/65R15	195/65R15
Tire Manufacturer	Continental	Continental
Tire Model	ProContact TX	ProContact TX
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	91H	91H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	P5AE WM1D 2418	P5AE WM1D 2419
DOT Safety Code Right	P5AE WM1D 2419	P5AE WM1D 2419

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	238	231	238	234
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	230	230	230	230
As Tested	kPa	230	230	230	230

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	357.5	241.5		375.0	296.0		370.0	278.0	
Right	kg	344.0	230.0		334.0	253.5		351.0	266.0	
Ratio	%	59.8%	40.2%	100.0%	56.3%	43.7%	100.0%	57.0%	43.0%	100.0%
Total	kg	701.5	471.5	1173.0	709.0	549.5	1258.5	721.0	544.0	1265.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1173.0	A
Actual Weight of 1 P572V ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	44.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1266.8	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)*	°	-0.4	-0.3	-0.2	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.3	-0.1	-0.1	Yes
Front Bumper-Line Angle (left-to-right)**	°	-1.1	-1.0	-1.1	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.1	-0.2	-0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1053	1146	1127	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	16	50	18	

*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 Nissan Versa 4-Door Sedan NHTSA No. M20205216
Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Spare Tire and Tools	18.5
Trim	2.0
Ballast / Equipment Added	53.5

Test Height Adjustable Setting (If Applicable)	
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DATA SHEET NO. 2**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA**

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

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	6.6	0.0	3.3
Front Passenger Seat	Fixed	Fixed	Fixed
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	3.3	241	Max	239	250	260
			Mid	221	232	241
			Min	202	213	222
Front Passenger Seat	Fixed	238	Max			
			Mid	220	231	238
			Min			
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 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

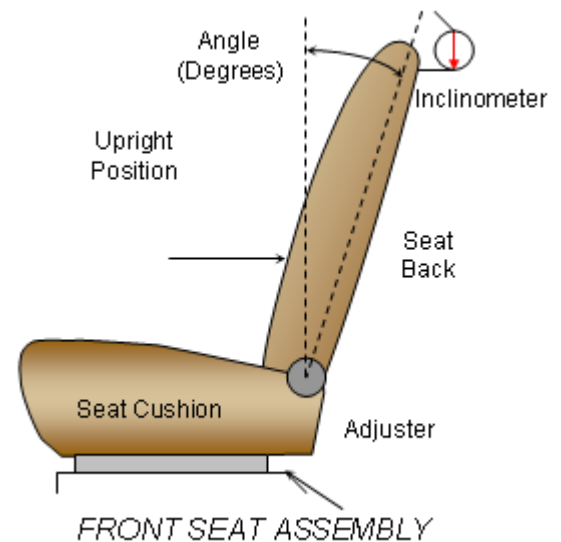
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	240	25	0	0
Front Passenger Seat	240	25	0	0
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 from the headrest post.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	61.9	29	2.6	0
Front Passenger Seat	56.8	29	2.6	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 Nissan Versa 4-Door Sedan NHTSA No. M20205216Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19**SEAT BELT ANCHORAGE ADJUSTMENT**

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

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

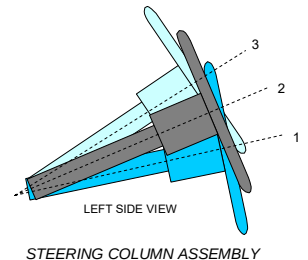
DATA SHEET NO. 2 ... (CONTINUED)**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA**

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

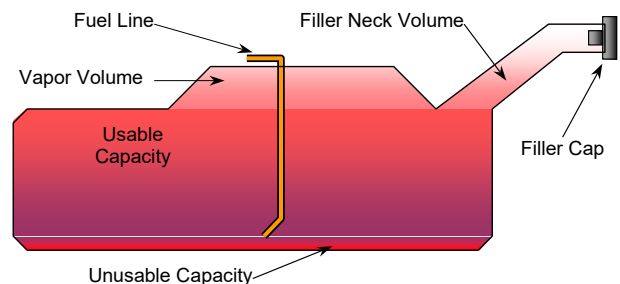
STEERING COLUMN ADJUSTMENT

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	20.4	86
Geometric Center - Position 2	22.2	105
Uppermost - Position 3	23.9	123
Telescoping Steering Wheel Travel		37
Test Position	22.2	105

**FUEL PUMP**

The vehicle is equipped with an electronic fuel pump. The pump operates a few seconds after the ignition switch is turned ON. After that the pump operates only while the engine is running.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

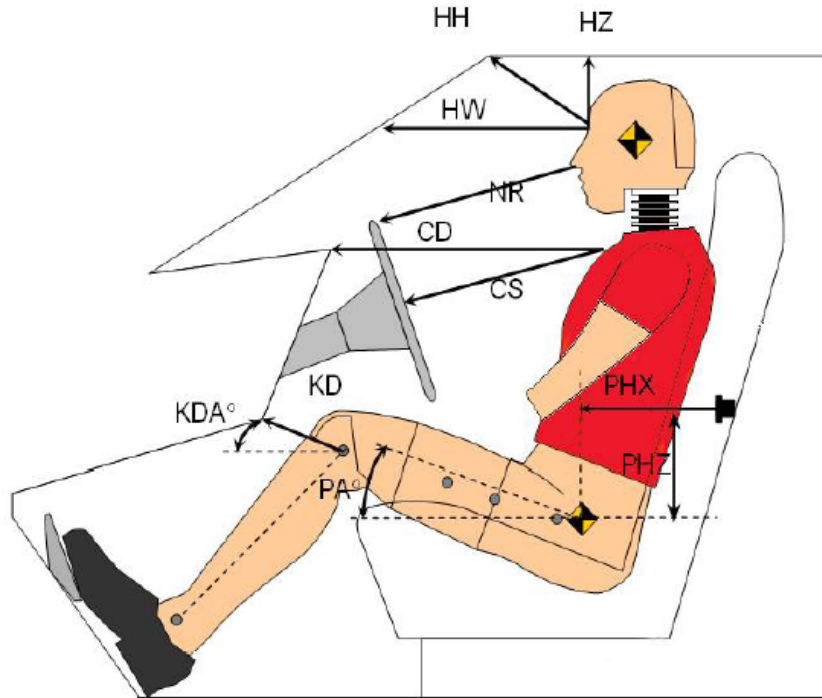
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	40.88
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	40.88
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	38.02
Actual amount of Solvent Used in Test	38.02
1/3 of Usable Capacity	13.63

Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in the Form No. 1? ☒ Yes ☐ No

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	276	
HW	Head to Windshield	770	
HZ	Head to Roof	198	
NR	Nose to Rim	258	
CD	Chest to Dash	438	
CS	Chest to Steering Wheel	198	
KD(L)/KDA(L)°	Left Knee to Dash	145	39.2
KD(R)/KDA(R)°	Right Knee to Dash	135	36.5
PAX°	Pelvic Tilt Angle (x-axis)		19.9
PAY°	Pelvic Tilt Angle (y-axis)		0.1
PHX	Hip Point to Striker (x-axis)	293	
PHZ	Hip Point to Striker (z-axis)	33	

DATA SHEET NO. 4

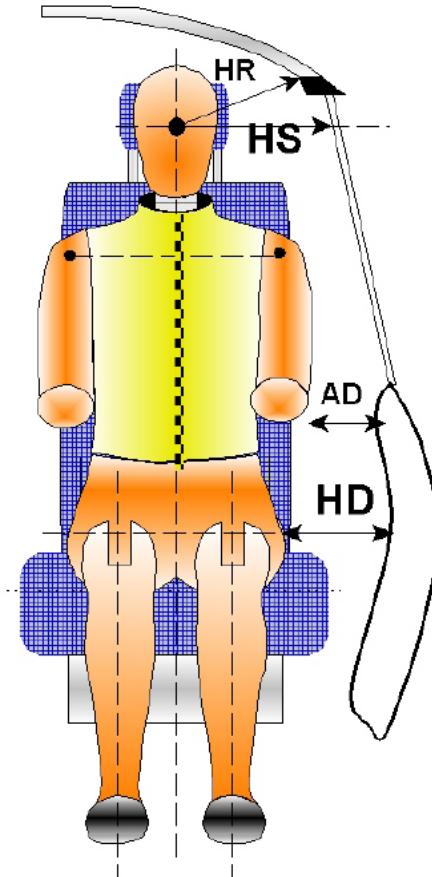
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan

NHTSA No. M20205216

Test Program: NCAP Side Pole Impact Test

Test Date: 12/06/19

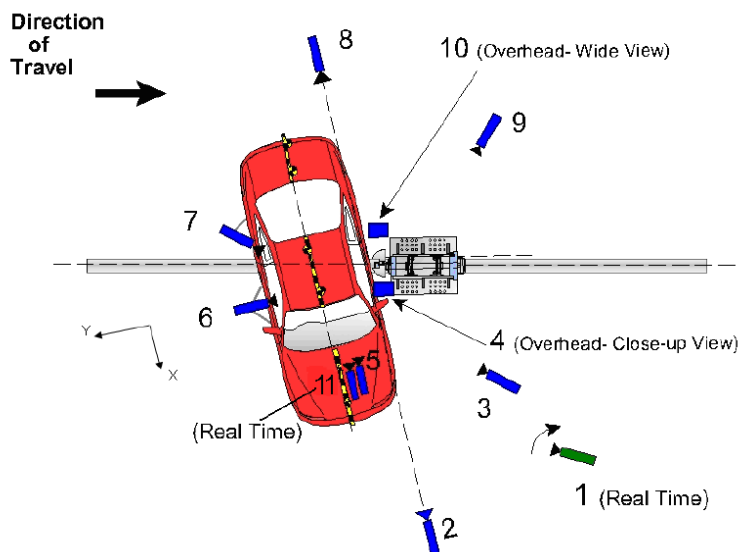


Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	242
HS	Head to Side Window	mm	355
AD	Arm to Door	mm	148
HD	Hip Point to Door	mm	166

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



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	0.83	0.51	-1.40	8.5	1000
6	On-Board - Dummy Side View	-0.04	1.61	-1.13	8.5	1000
7	On-Board - Dummy Rear Oblique View	-0.85	1.61	-1.17	8.5	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	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	0.84	0.51	-1.40		30

*All measurements accurate to ± 6 mm

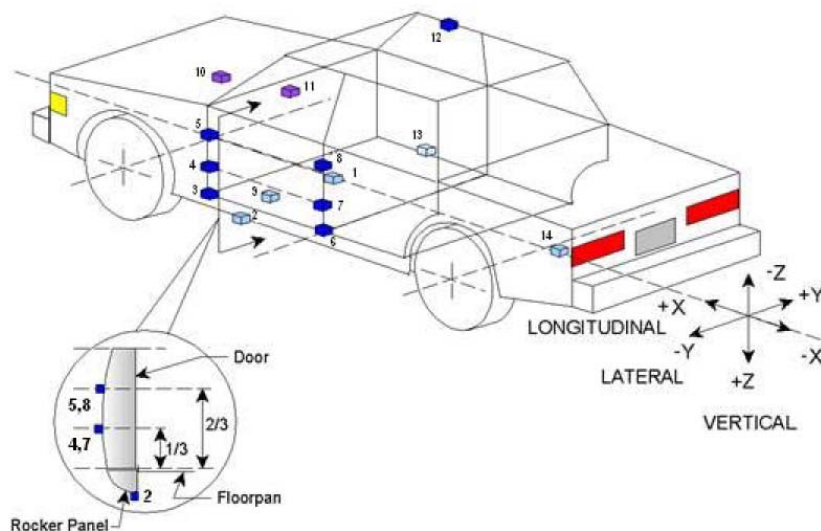
INSTRUMENTATION

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 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

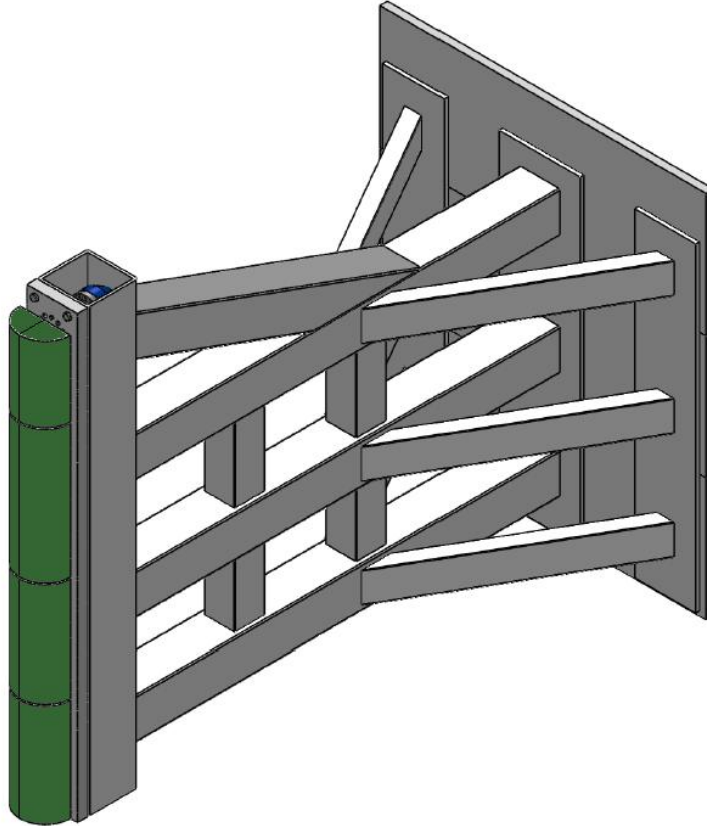


Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2010	0	-400
2	Left Floor Sill	2670	-735	-185
3	A-Pillar Sill	3120	-810	-820
4	A-Pillar Low	3145	-780	-450
5	A-Pillar Mid	3155	-760	-765
6	B-Pillar Sill	2140	-675	-340
7	B-Pillar Low	2110	-680	-510
8	B-Pillar Mid	2115	-690	-890
9	Driver Seat Track	2260	-525	-425
10	Engine Top	3640	290	-910
11	Firewall	3490	310	-890
12	Right Roof	2400	530	-1440
13	Right Floor Sill	2870	670	-330
14	Rear Floorpan	1130	100	-650

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 Nissan Versa 4-Door Sedan NHTSA No. M20205216
Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



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 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest
Left Shoulder	Side Airbag
Upper Torso	Side Airbag, Seatback
Lower Torso	Side Airbag, Seatback
Left Hip	Side Airbag, Seat, Door Panel
Left Knee	None

POST-TEST DOOR PERFORMANCE

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

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 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

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	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

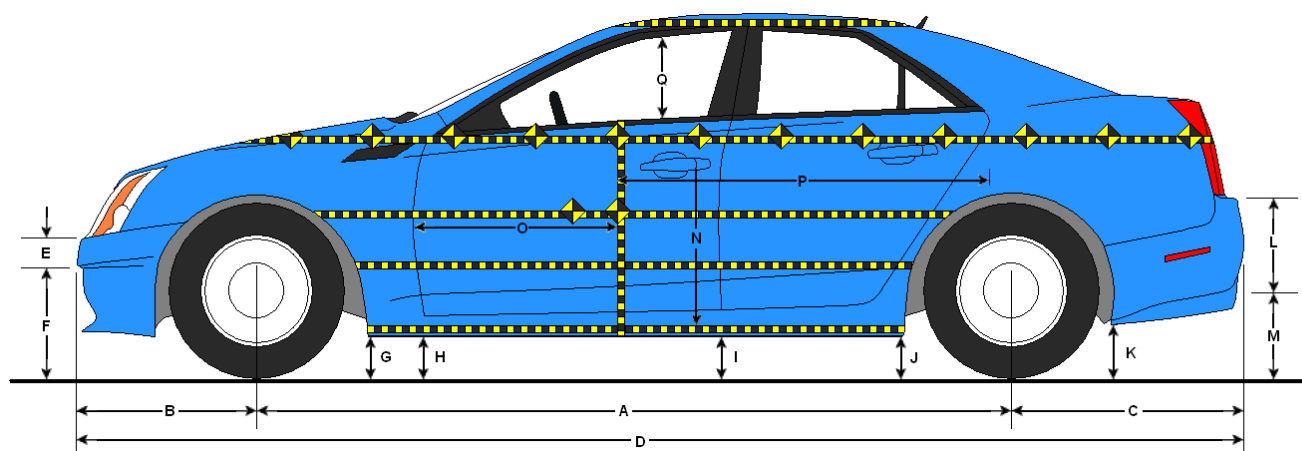
IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1055
Actual Impact Point (Aft of Front Axle)	mm		1063
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-8
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.3
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.11
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.17

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



LEFT SIDE VIEW

All measurements in mm with tolerance of $\pm 3\text{mm}$

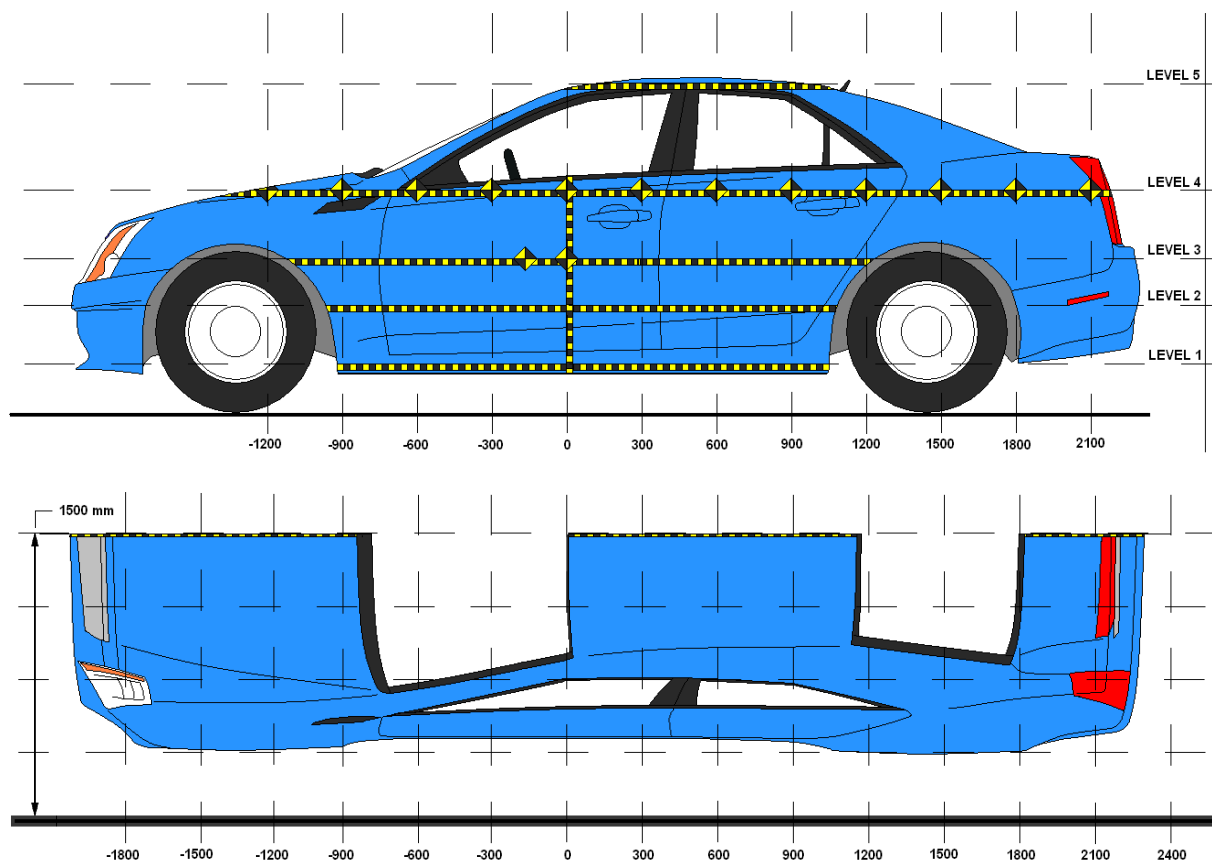
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2620	2580	-40
B	Front Axle to FSOV	874	923	49
C	Rear Axle to RSOV	996	975	-21
D	Total Length at Centerline	4489	4478	-11
E	Front Bumper Thickness	91	91	0
F	Front Bumper Bottom to Ground	566	539	-27
G	Sill Height at Front Wheel Well	359	321	-38
H	Sill Height at Front Door Leading Edge	364	327	-37
I	Sill Height at B-Pillar	380	365	-15
J1	Sill Height at Rear Wheel Well	360	356	-4
J2	Pinch Weld Height at Rear Wheel Well	322	315	-7
K	Sill Height Aft of Rear Wheel Well	367	373	6
L	Rear Bumper Thickness	132	132	0
M	Rear Bumper Bottom to Ground	610	619	9
N	Sill Height to Bottom of Front Window Sill	643	647	4
O	Front Door Leading Edge to Impact CL	638	569	-69
P	Rear Door Trailing Edge to Impact CL	1548	1504	-44
Q	Front Window Opening	408	427	19
R	Right Side Length	3049	3058	9
S	Left Side Length	3048	3010	-38
T	Vehicle Width at B-Pillar	1725	1665	-60

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



NOTE: All measurements in mm with tolerance of $\pm 3\text{mm}$

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	409	191	0
2	Occupant H-Point	684	241	0
3	Mid-Door	789	250	0
4	Window Sill	1056	204	0
5	Window Top	1535	50	0

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

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			625	740				576	681				-49	-59	
-750		630	630	730			591	587	677			-39	-43	-53	
-600	671	636	637	721		641	607	609	684		-30	-29	-28	-37	
-450	680	640	637	713		698	670	672	727		18	30	35	14	
-300	682	640	636	709		745	732	738	774		63	92	102	65	
-150	682	640	635	701		801	804	811	835		119	164	176	134	
0	683	639	635	696	920	874	880	885	900	970	191	241	250	204	50
150	684	639	635	689	919	844	854	864	874	958	160	215	229	185	39
300	684	640	635	684	922	791	766	767	782	944	107	126	132	98	22
450	685	641	636	680	921	754	691	684	713	931	69	50	48	33	10
600	685	643	639	678	918	728	680	674	707	920	43	37	35	29	2
750	685	645	641	675	917	707	669	665	692	915	22	24	24	17	-2
900	685	644	642	673	918	687	656	653	678	915	2	12	11	5	-3
1050	679	640	639	674	919	675	639	638	668	914	-4	-1	-1	-6	-5
1200		634	634	680	923		621	620	662	920		-13	-14	-18	-3
1350			630	700	939			627	666	934			-3	-34	-5
1500			631	697				631	653				0	-44	
1650				709					707					-2	
1800				723					722					-1	
1950				741					739					-2	
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

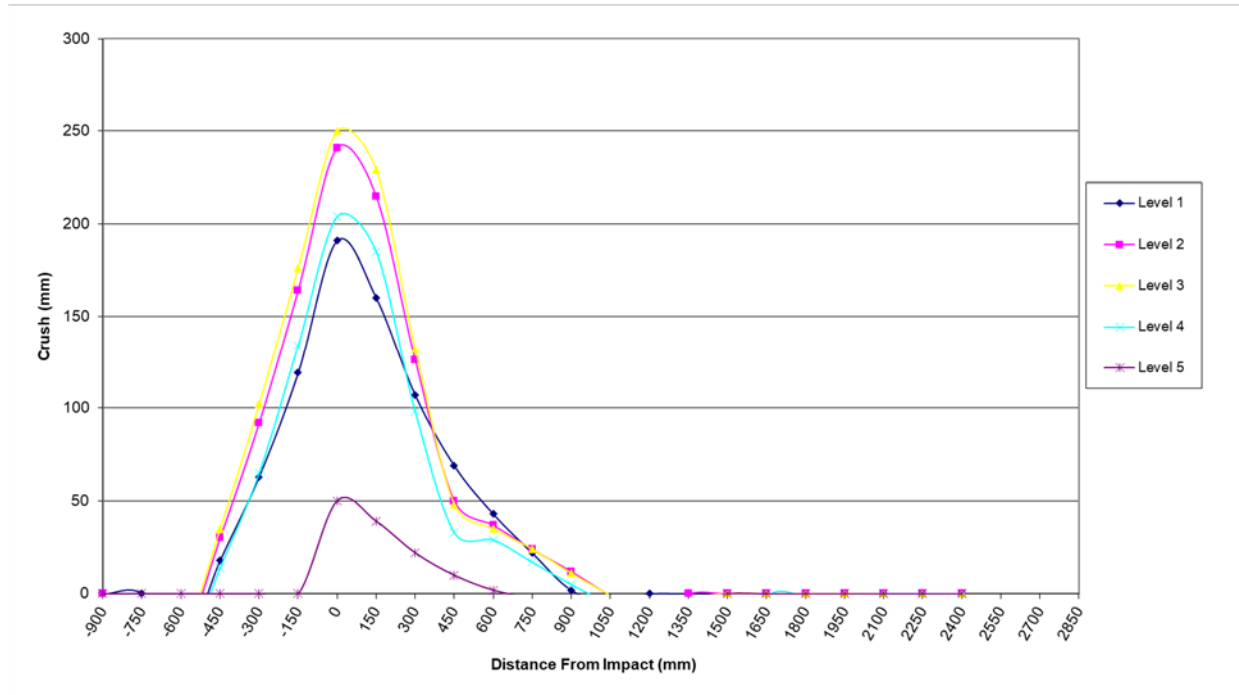
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan

NHTSA No. M20205216

Test Program: NCAP Side Pole Impact Test

Test Date: 12/06/19

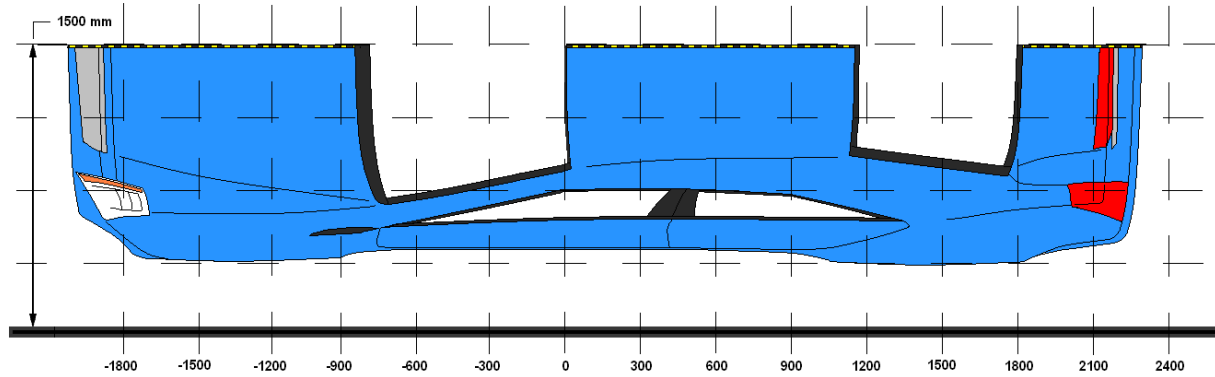


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216

Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1950	4	741	739	-2
2	1350	3	630	627	-3
3	750	2	645	669	24
4	300	3	635	767	132
5	-300	3	636	738	102
6	-900	3	625	576	-49

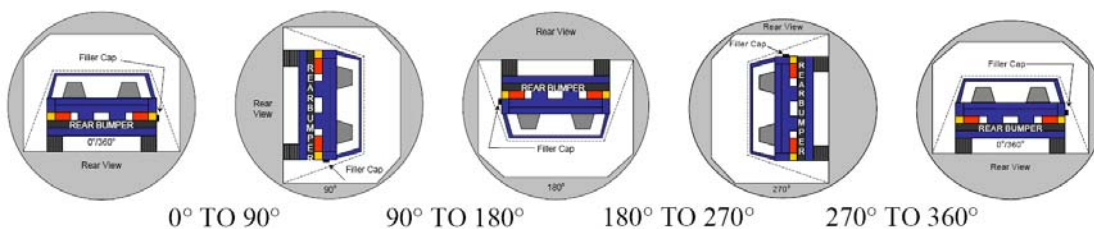
DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216
 Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19

Temperature at Time of Impact: 13.3° C Test Time: 12:36 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.



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	78	300	378
90° To 180°	82	300	382
180° To 270°	79	300	379
270° To 360°	76	300	376

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

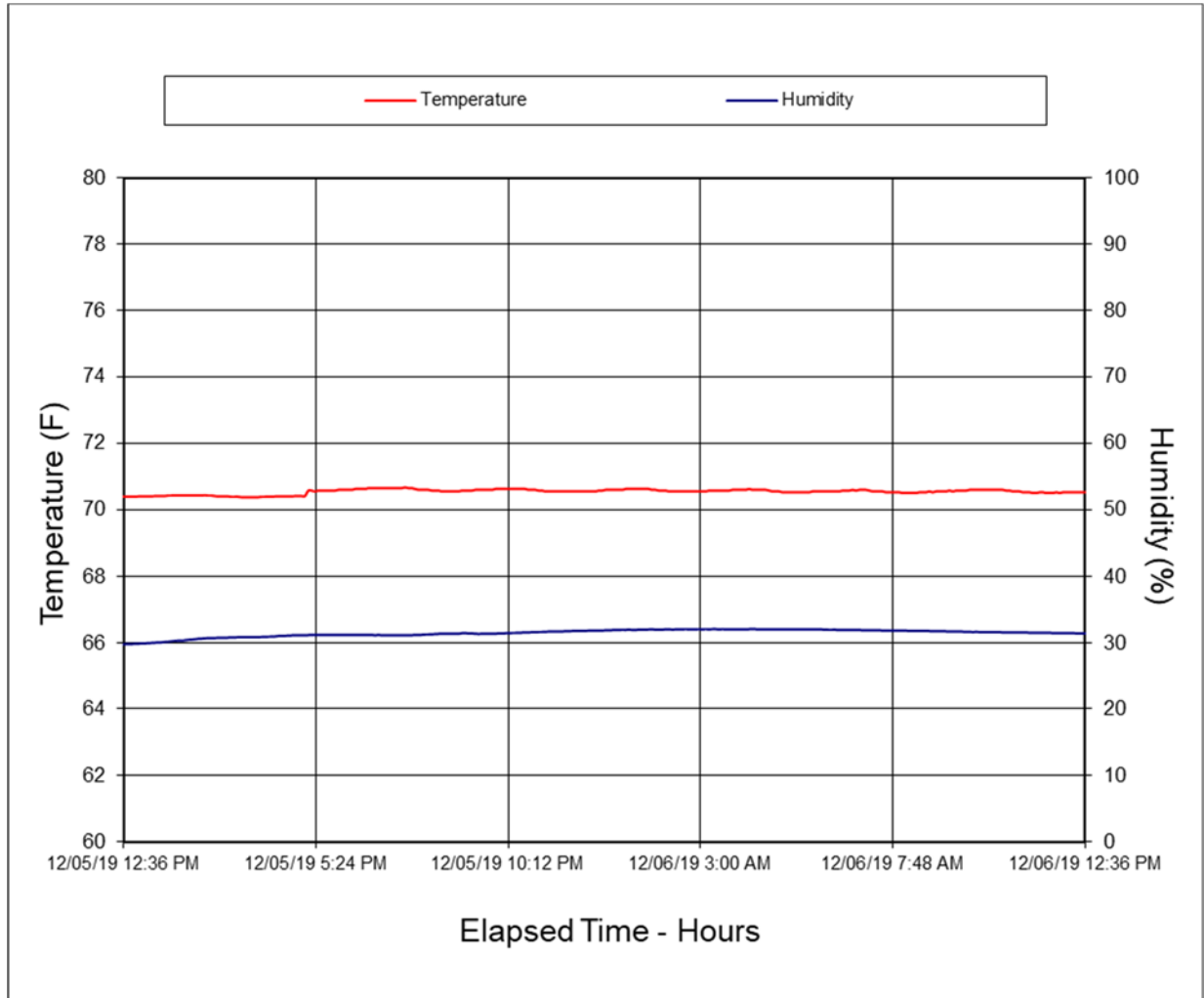
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2020 Nissan Versa 4-Door Sedan NHTSA No. M20205216

Test Program: NCAP Side Pole Impact Test Test Date: 12/06/19



APPENDIX A
PHOTOGRAPHS

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



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



FIGURE 3. Pre-Test Frontal View of Test Vehicle



FIGURE 4. Post-Test Frontal View of Test Vehicle



FIGURE 5. Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



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



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



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



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



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



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



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



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

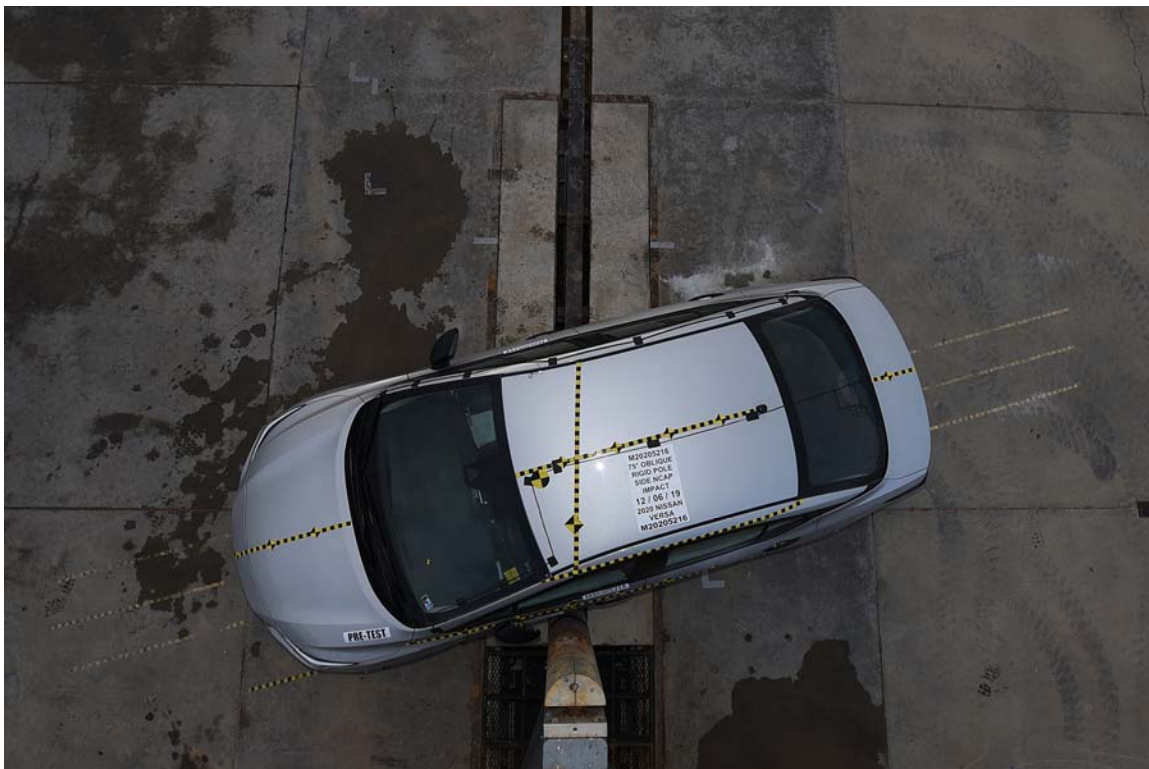


FIGURE 15. Pre-Test Overhead View of Test Area

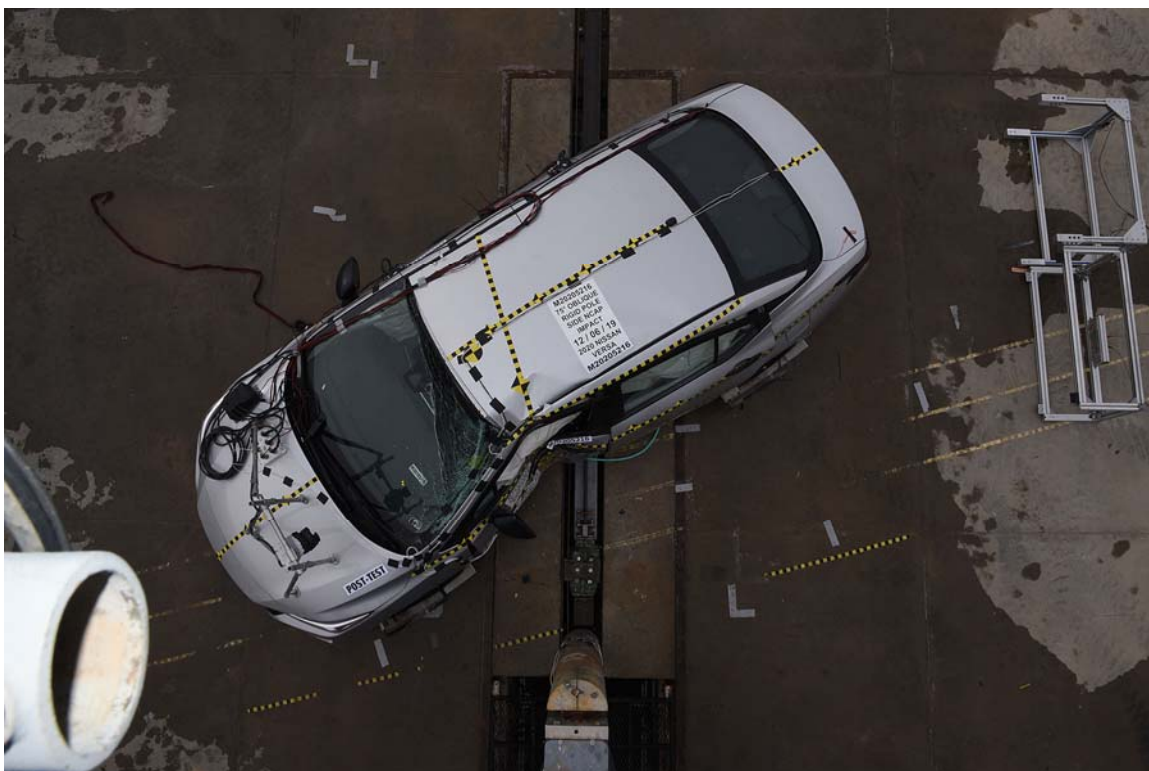


FIGURE 16. Post-Test Overhead View of Test Area



FIGURE 17. Pre-Test Left Side View of 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



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

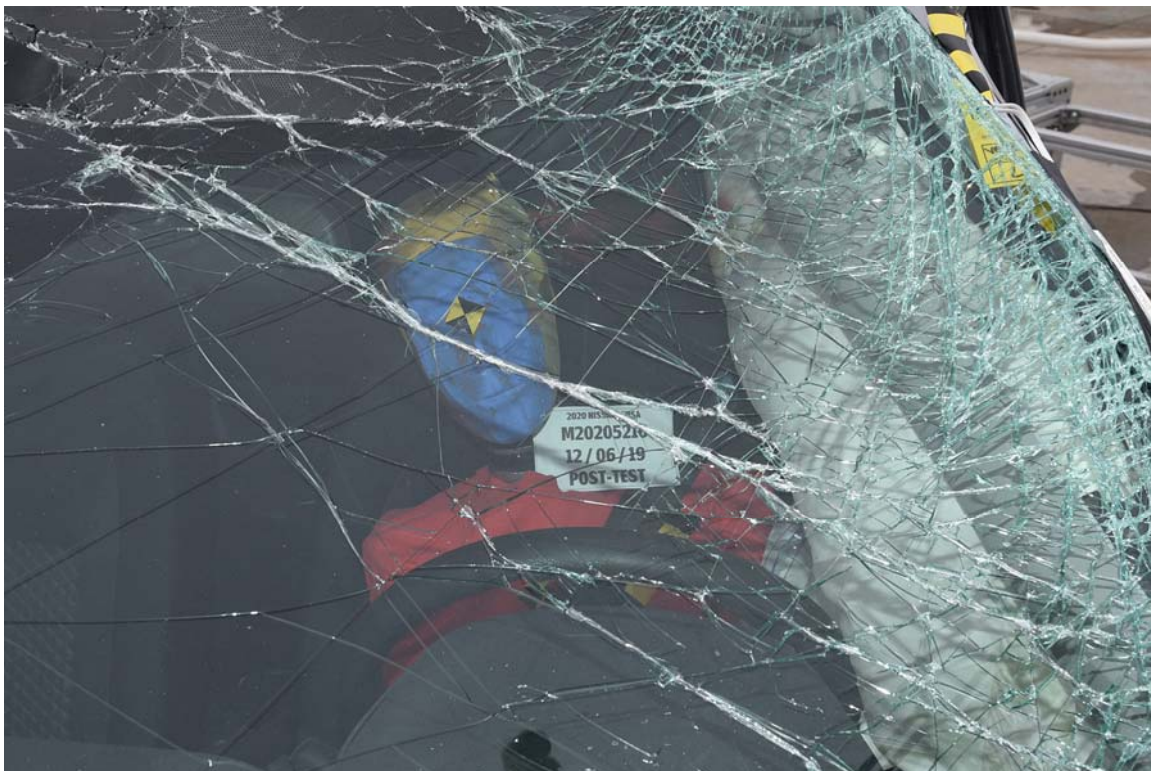


FIGURE 22. Post-Test Front Close-Up View of Dummy



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



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

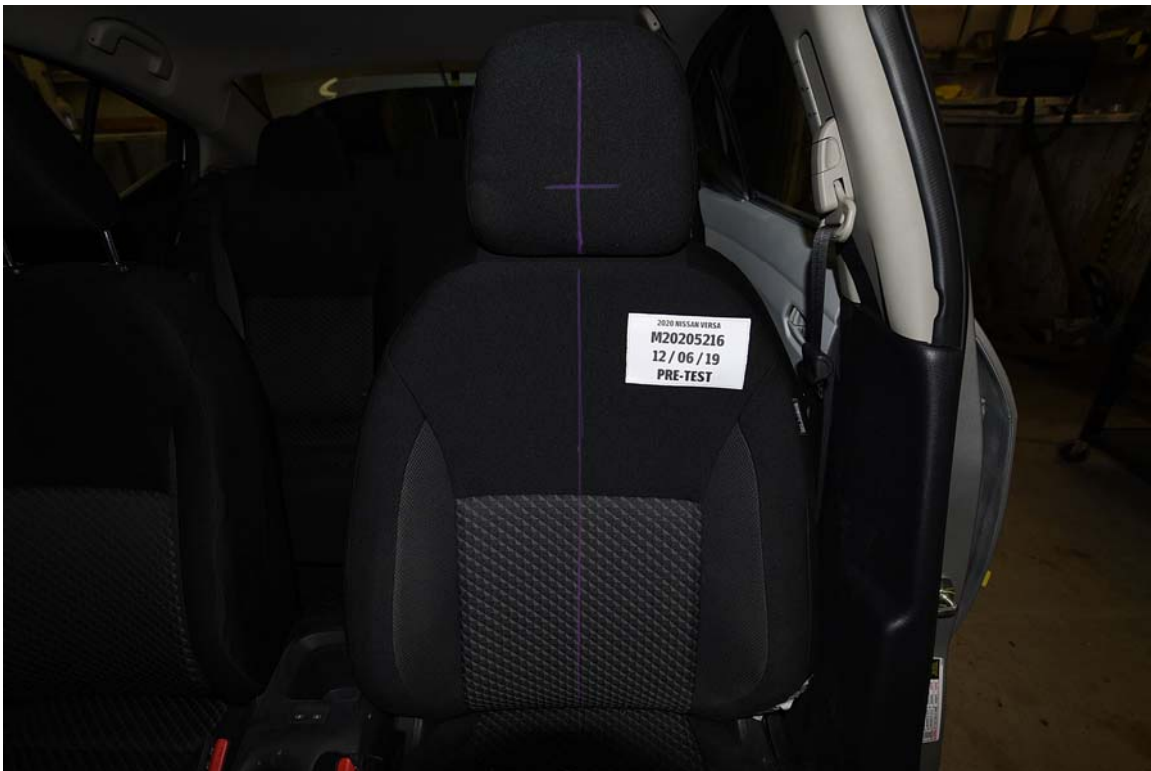


FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



FIGURE 27. Pre-Test Frontal Close-Up View of



FIGURE 28. Pre-Test Overhead View of Seat Pan Prior to Dummy Positioning



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



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

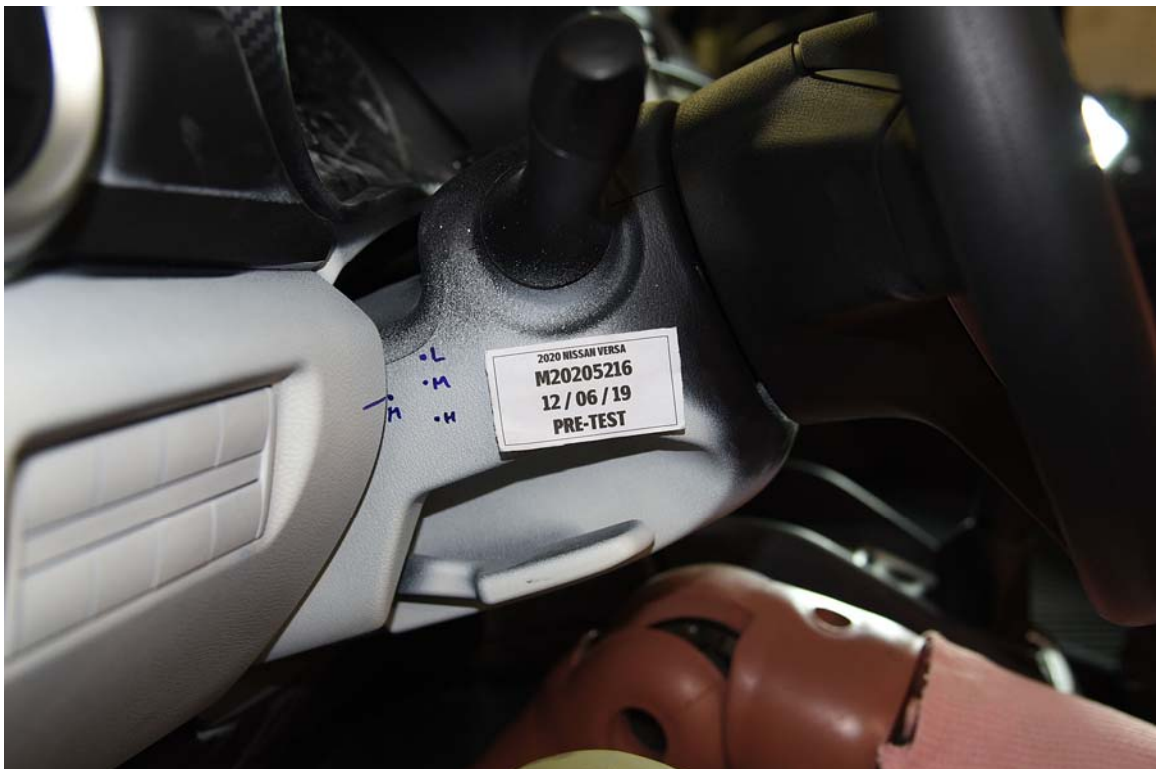


FIGURE 34. Pre-Test Left Side View of Steering Wheel

Photograph Not Available

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



FIGURE 40. Pre-Test Dummy and Door Clearance View

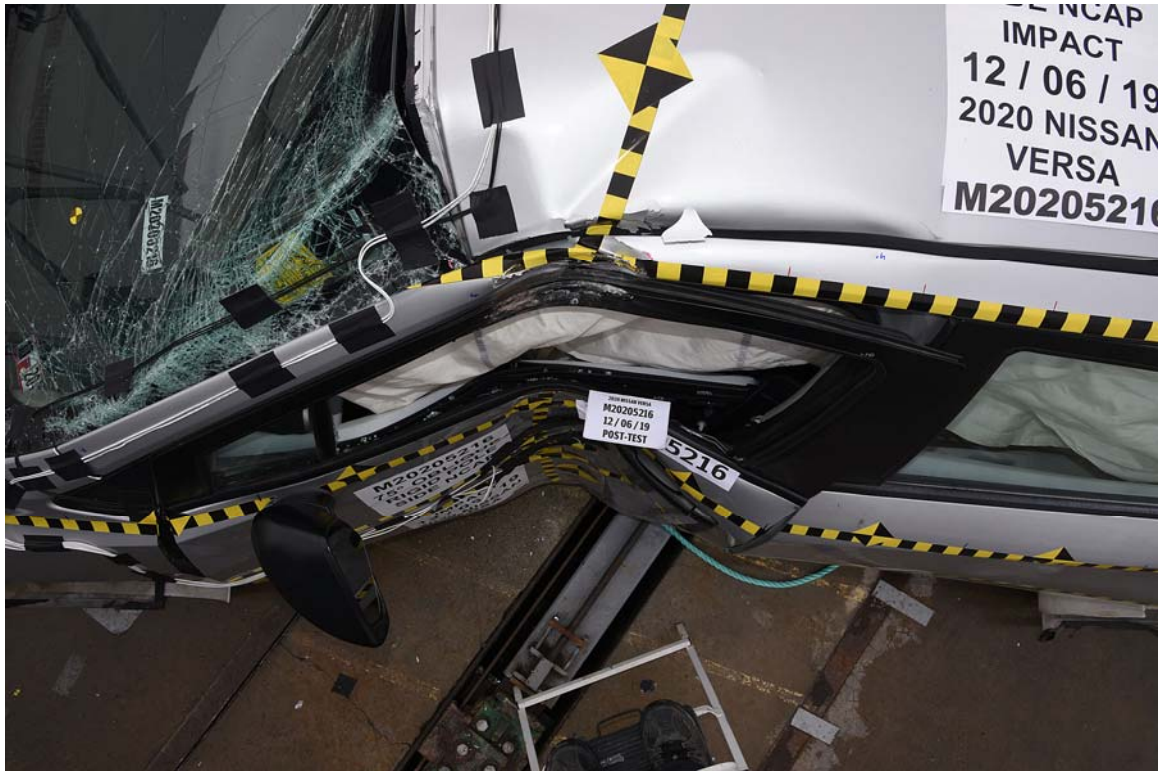


FIGURE 41. Post-Test Dummy and Door Clearance View



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



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

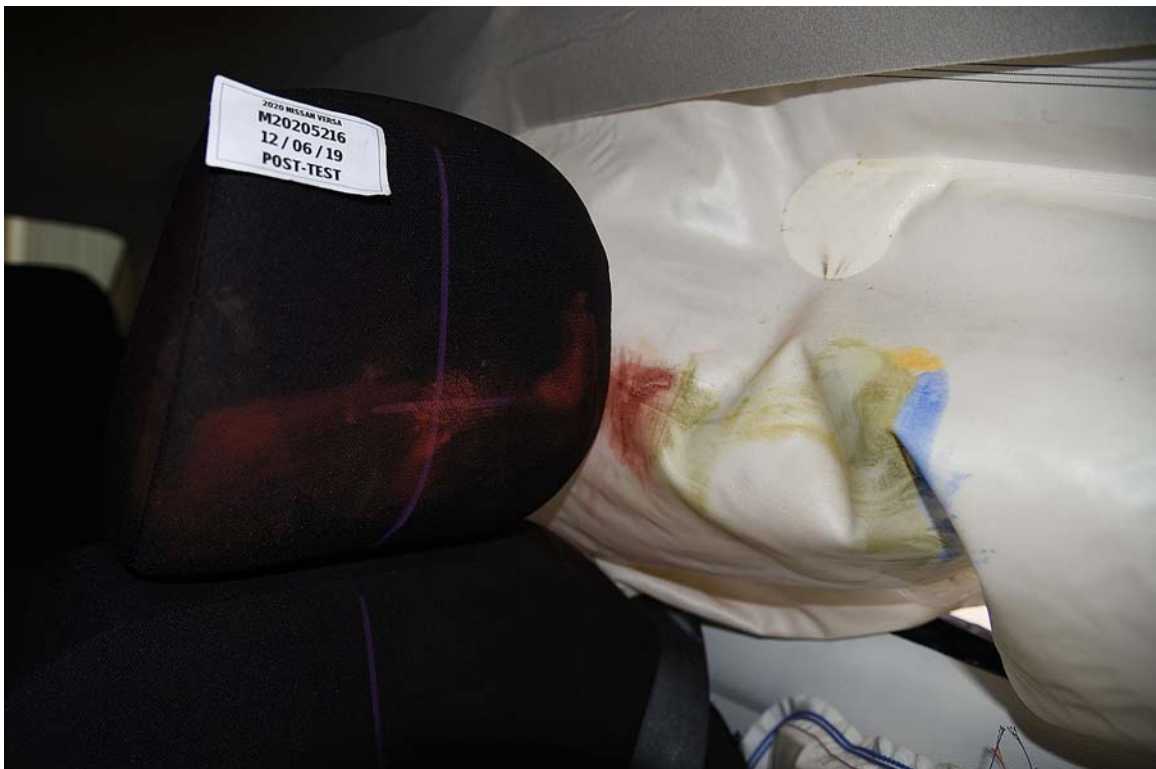


FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



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



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

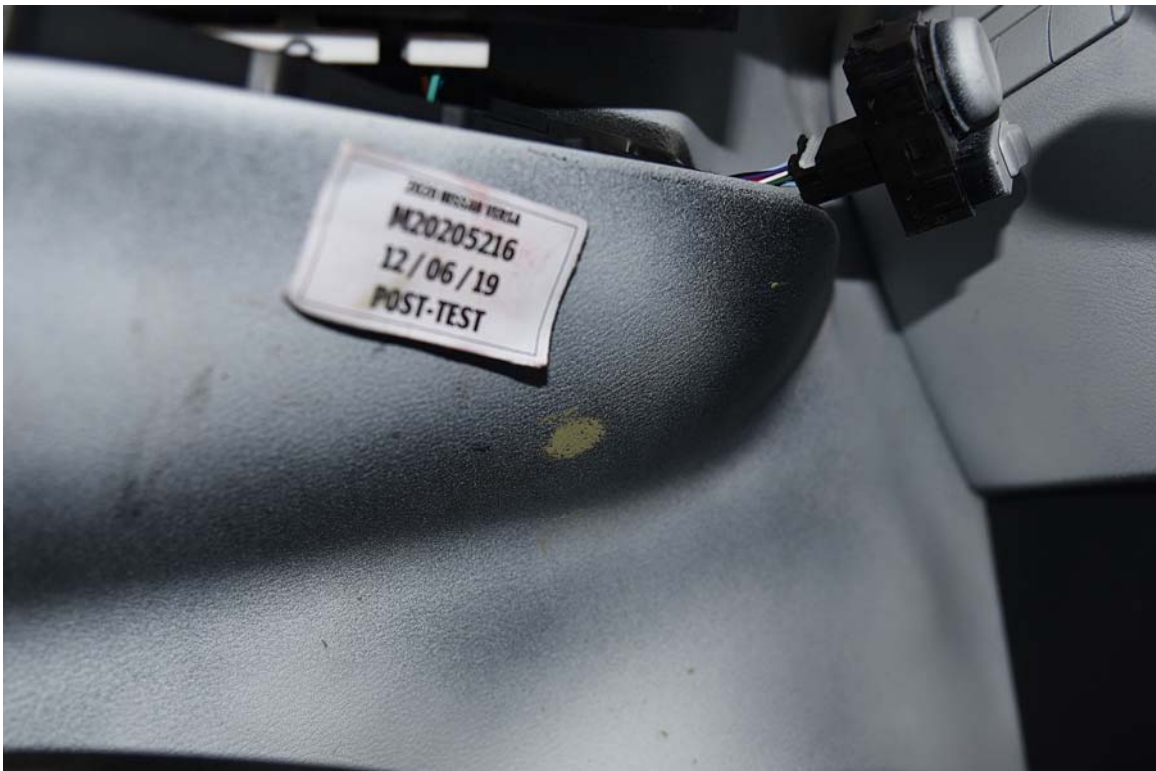


FIGURE 52. Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



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

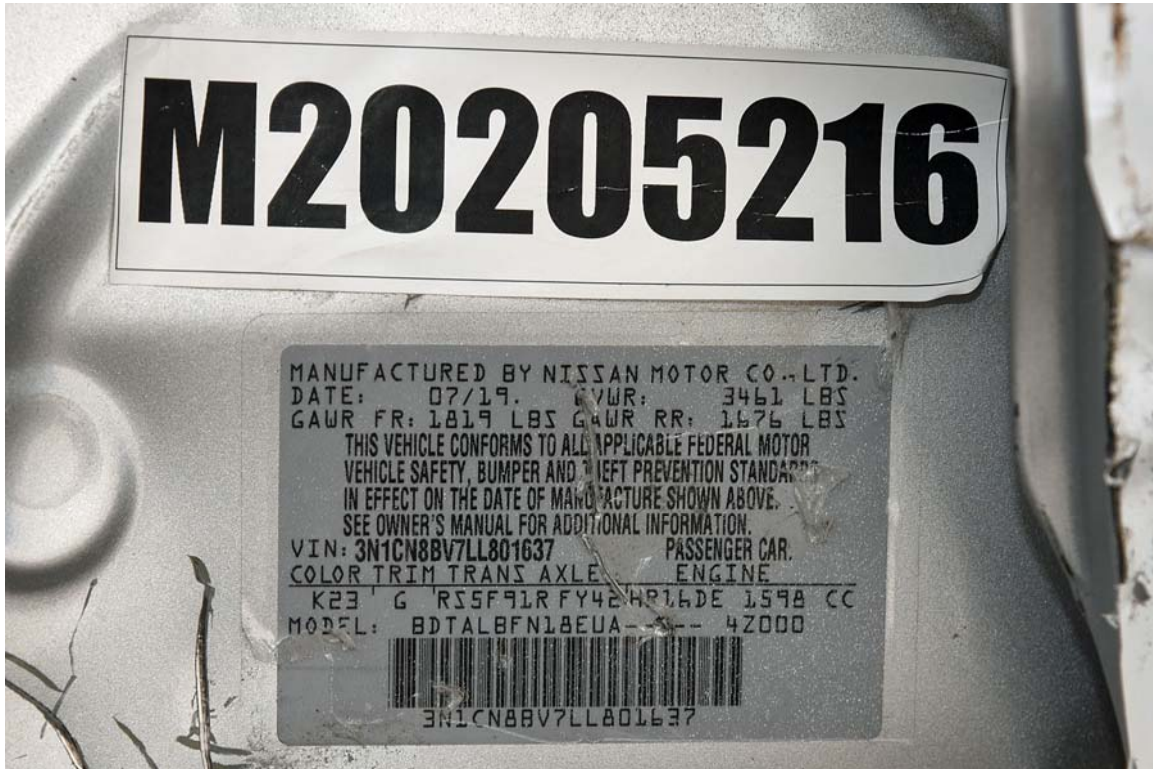


FIGURE 55. Close-Up View of Vehicle's Certification Label



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



FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees



FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees



FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees



FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees



FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees



FIGURE 68. Impact Event

2020 NISSAN VERSA

S 5 SPEED MANUAL

Scan QR code for general model information & options

Manufacturer's Suggested Retail Base Price: \$14,730.00

Options Included by Manufacturer: SPLASH GUARDS, CARPETED FLOOR MATS, 235.00, 135.00

DESTINATION CHARGES: 895.00

Total: \$16,015.00

Standard Equipment Included at No Extra Charge

Mechanical & Performance

- 1.8L D01C 16 Valve 4-Cylinder Engine
- 5-Speed Manual Transmission
- Hill Start Assist
- Front Disc/Rear Drum Brakes

Safety & Security

- Automatic Emergency Braking (AEB) with Pedestrian Detection
- Rear Automatic Braking (RAB)
- Lane Departure Warning (LDW)
- High Beam Assist (HBA)
- Rear/View Monitor
- Nissan Advanced Air Bag System (AEB) with Driver and Passenger Dual-Sage Supplemental Front Impact Air Bags
- Seat-Mounted Driver and Front Passenger Side-Impact Supplemental Air Bags
- Side-Impact Supplemental Air Bags
- Driver and Front Passenger Knee Air Bags
- Front and Rear Seat Belts with Front Restraints and Load Limiters
- Anti-Lock Braking System (ABS)
- Vehicle Dynamic Control System (VDC)
- Traction Control System (TCS)
- Tire Pressure Monitoring System (TPMS) with Easy-Fill Tire Alert
- LATCH System (Lower Anchors and Tethers for Children)
- Nissan Vehicle Immobilizer System

Comfort & Convenience

- Power Windows w/ Driver's One-Touch Auto Up/Down
- Power Door Locks w/ Speed Sensing
- Auto-Locking Cruise Control
- Illuminated Steering Wheel Controls for Audio and Cruise Control
- Manual Climate Control
- Manual Tilt/Telescoping Steering Wheel
- First Brake Variable Intervent
- Windshield Wipers with Mist Cycle
- Manual Rearview Mirror
- Auto On/Off Headlamps with Delay Timer
- Rear Window Defogger with Timer
- Remote Keyless Entry w/ 2-Door Locks including lock/unlock and trunk release
- Push Button Start

Comfort & Convenience (cont.)

- 5-Passenger Seating Capacity
- 6-Way Manually Adjustable Driver Seat
- Height-Adjustable Front Head Restraints
- 60/40 Split Fold
- 7" Color Touchscreen Display Audio System
- Bluetooth® Hands-Free Phone System
- Streaming Audio via Bluetooth®
- Interface for iPod® and Other Compatible Devices
- Hands-Free Text Messaging Assistant
- 6.1" 800MHz/Google Assistant™ Voice Recognition
- AM/FM with RDS, MP3 and Aux-In
- 4 Speakers
- (1) 12-volt DC Power Outlet and (3) USB Ports (2-Charge Only)

Exterior

- 15" Steel Wheels with Full Wheel Covers
- Temporary Spare Tire
- Hasson Headlamps
- Black Resin Power Adjusting Exterior Mirrors
- Black Resin Door Handles

REPLACES STANDARD EQUIPMENT

For more information, see Dealer, owner's manual, or www.nissanusa.com/connect

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

Fuel Economy and Environment

Fuel Economy

30 MPG combined city/hwy

27 city 35 highway

3.3 gallons per 100 miles

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

Annual fuel cost \$1,350

Fuel Economy & Greenhouse Gas Rating

1 7 10 1 7

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score

Frontal Crash: Not Rated

Driver Passenger: Not Rated

Side Crash: Not Rated

Rollover: Not Rated

DELIVERY

VEHICLE COLORS: EXTERIOR: SILVER

FINAL ASSEMBLY POINT: AQUAS/ADV. J.M.E.

TRANSPORT METHOD: TRUCK

DEALER: ASSESS OFF NISSAN

3289 ROUTE 611

BARTONSVILLE PA

18321

Security+Plus Extended Protection Plan

The only service agreement backed by Nissan Extended Services North America! Ask your dealer for details, or call 1-800-NISSAN-1 for more information.

FIGURE 69. Monroney Label

HEAD RESTRAINTS/HEADRESTS

WARNING

Head restraints/headrests supplement the other vehicle safety systems. They may provide additional protection against injury in certain rear-end collisions. Adjustable head restraints/headrests must be adjusted properly as specified in this section. Check the adjustment after someone else uses the seat. Do not attach anything to the head restraint/headrest stalks or remove the head restraint/headrest. Do not use the seat if the head restraint/headrest has been removed, if the head restraint/headrest was removed, reinstalled and properly adjusted the head restraint/headrest before an occupant uses the seating position. Failure to follow these instructions can reduce the effectiveness of the head restraints/headrests. This may increase the risk of serious injury or death in a collision.

The illustration shows the seating positions equipped with head restraints/headrests.

- Indicates the seating position is equipped with a head restraint.
- Indicates the seating position is not equipped with a head restraint or headrest (if applicable).
- Your vehicle is equipped with a head restraint/headrest that may be integrated, adjustable or non-adjustable.

1-6 Safety—Seats, seat belts and supplemental restraint system

ADJUSTABLE HEAD RESTRAINT/HEADREST COMPONENTS

1. Removable head restraint/headrest

2. Multiple notches

3. Lock knob

4. Stalks

ADJUST

For adjustable head restraint/headrest, adjust the head restraint/headrest so the center is level with the center of your ears if your ear position is set higher than the recommended alignment, place the head restraint/headrest at the highest position.

INSTALL

- Align the head restraint/headrest stalks with the holes in the seat. Make sure that the head restraint/headrest is facing the correct direction. The stalk with the notch (indicated ①) must be installed in the hole with the lock knob ②.
- Push and hold the lock knob and push the head restraint/headrest down.
- Properly adjust the head restraint/headrest before an occupant uses the seating position.

ADJUST

For adjustable head restraint/headrest, adjust the head restraint/headrest so the center is level with the center of your ears if your ear position is set higher than the recommended alignment, place the head restraint/headrest at the highest position.

REMOVE

Use the following procedure to remove the head restraint/headrest:

1. Pull the head restraint/headrest up to the highest position.
2. Push and hold the lock knob.
3. Remove the head restraint/headrest from the seat.
4. Store the head restraint/headrest properly in a secure place so it is not loose in the vehicle.

1-7 Safety—Seats, seat belts and supplemental restraint system

NON-ADJUSTABLE HEAD RESTRAINT/HEADREST COMPONENTS

1. Removable head restraint/headrest

2. Single notch

3. Lock knob

4. Stalks

ADJUST

For non-adjustable head restraint/headrest, make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

INSTALL

- Align the head restraint/headrest stalks with the holes in the seat. Make sure that the head restraint/headrest is facing the correct direction. The stalk with the notch (indicated ①) must be installed in the hole with the lock knob ②.
- Push and hold the lock knob and push the head restraint/headrest down.
- Properly adjust the head restraint/headrest before an occupant uses the seating position.

ADJUST

For non-adjustable head restraint/headrest, make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

REMOVE

Use the following procedure to remove the head restraint/headrest:

1. Pull the head restraint/headrest up to the highest position.
2. Push and hold the lock knob.
3. Remove the head restraint/headrest from the seat.
4. Store the head restraint/headrest properly in a secure place so it is not loose in the vehicle.

1-8 Safety—Seats, seat belts and supplemental restraint system

ADJUSTABLE HEAD RESTRAINT/HEADREST COMPONENTS

1. Removable head restraint/headrest

2. Multiple notches

3. Lock knob

4. Stalks

ADJUST

For adjustable head restraint/headrest, adjust the head restraint/headrest so the center is level with the center of your ears if your ear position is set higher than the recommended alignment, place the head restraint/headrest at the highest position.

INSTALL

- Align the head restraint/headrest stalks with the holes in the seat. Make sure that the head restraint/headrest is facing the correct direction. The stalk with the notch (indicated ①) must be installed in the hole with the lock knob ②.
- Push and hold the lock knob and push the head restraint/headrest down.
- Properly adjust the head restraint/headrest before an occupant uses the seating position.

ADJUST

For adjustable head restraint/headrest, adjust the head restraint/headrest so the center is level with the center of your ears if your ear position is set higher than the recommended alignment, place the head restraint/headrest at the highest position.

REMOVE

Use the following procedure to remove the head restraint/headrest:

1. Pull the head restraint/headrest up to the highest position.
2. Push and hold the lock knob.
3. Remove the head restraint/headrest from the seat.
4. Store the head restraint/headrest properly in a secure place so it is not loose in the vehicle.

1-9 Safety—Seats, seat belts and supplemental restraint system

FIGURE 70. Head Restraint Use and Adjustment

Photograph Not Applicable

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

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary	B-1
2	Driver Head Acceleration (Y) Primary	B-1
3	Driver Head Acceleration (Z) Primary	B-1
4	Driver Head Acceleration Primary Resultant	B-1
5	Driver Lower Spine T12 Acceleration (X)	B-2
6	Driver Lower Spine T12 Acceleration (Y)	B-2
7	Driver Lower Spine T12 Acceleration (Z)	B-2
8	Driver Lower Spine T12 Acceleration Resultant	B-2
9	Driver Upper Thorax Rib Deflection (Y)	B-3
10	Driver Middle Thorax Rib Deflection (Y)	B-3
11	Driver Lower Thorax Rib Deflection (Y)	B-3
12	Driver Upper Abdomen Rib Deflection (Y)	B-3
13	Driver Lower Abdomen Rib Deflection (Y)	B-4
14	Driver Acetabulum Force on Impact Side (Y)	B-4
15	Driver Iliac Wing Force on Impact Side (Y)	B-4
16	Driver Total Pelvis Force on Impact Side (Y)	B-4

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)

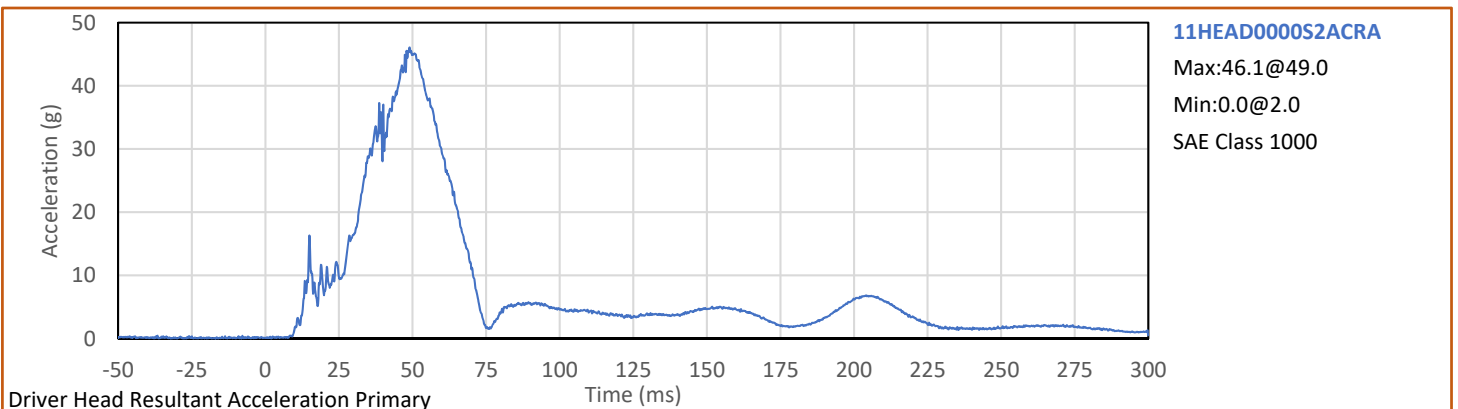
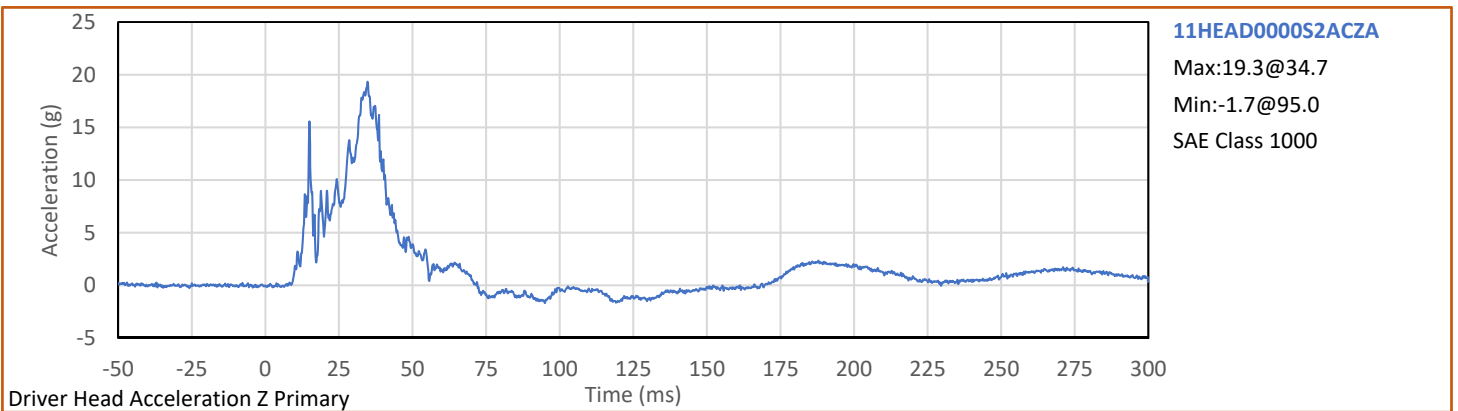
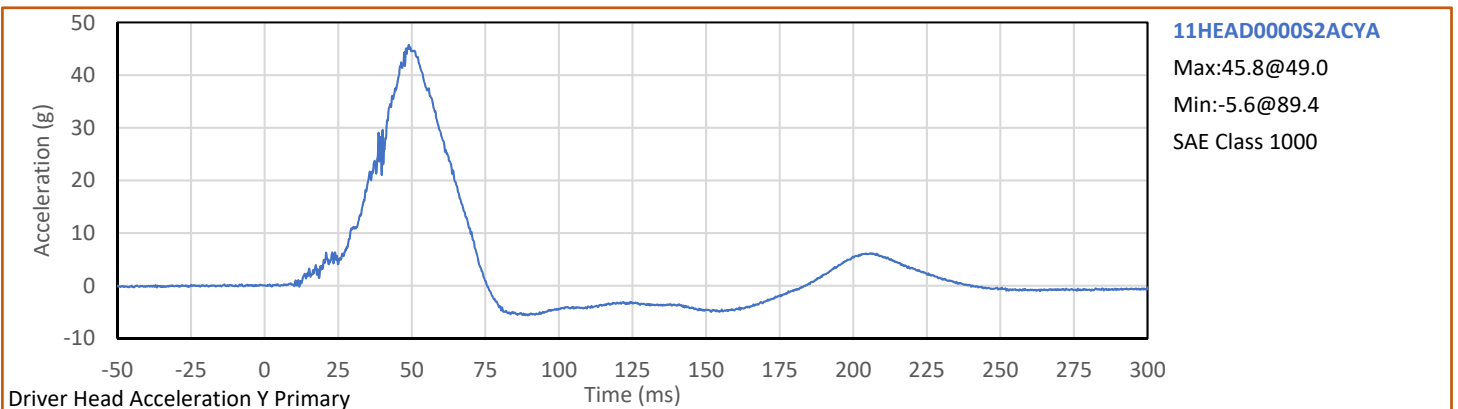
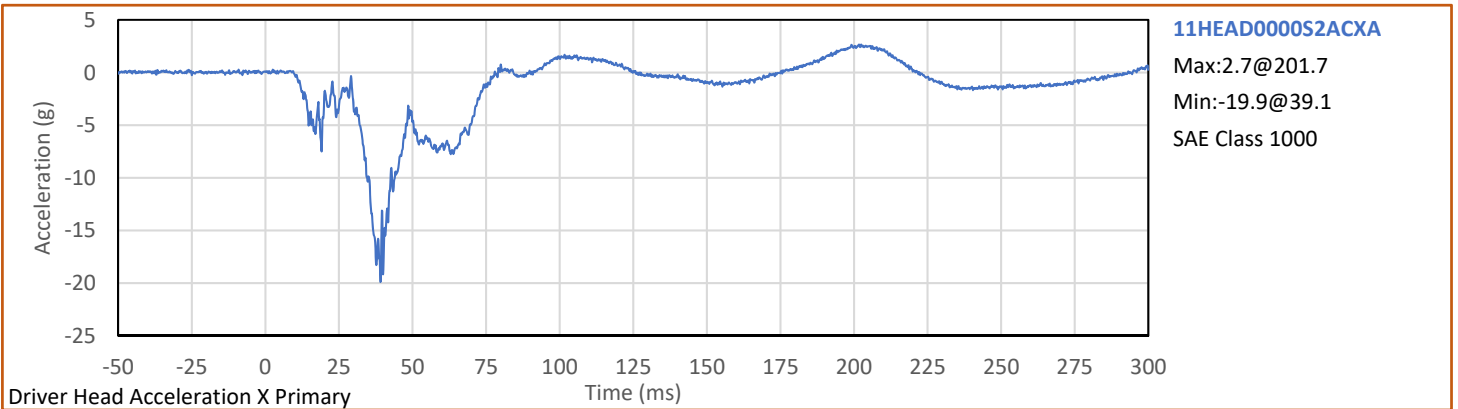
Driver Head Acceleration Redundant (Z)

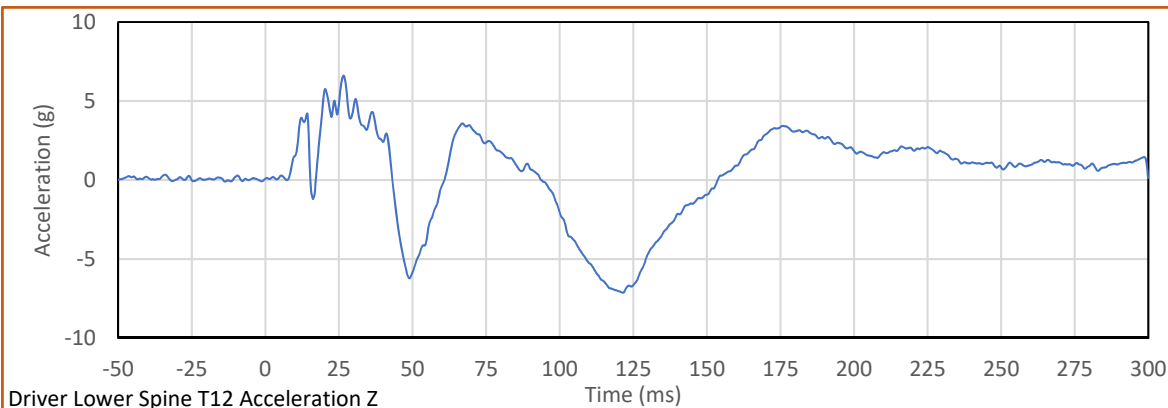
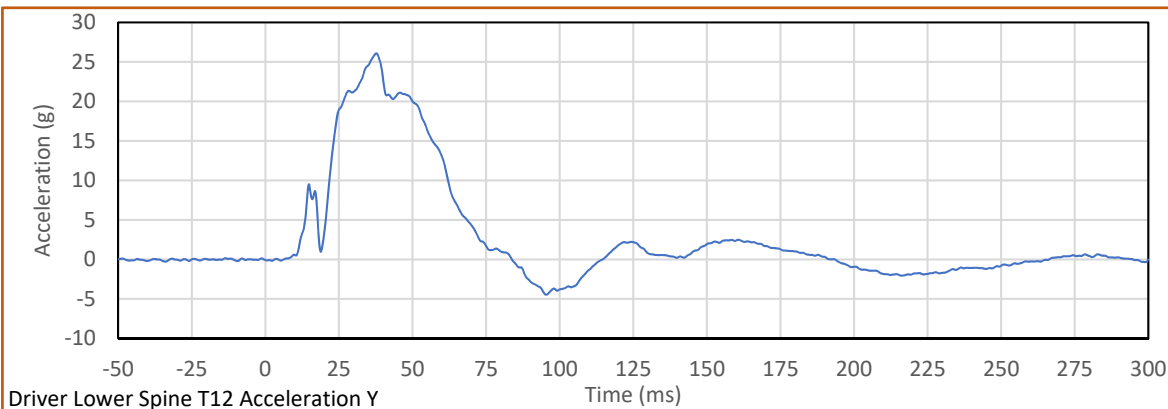
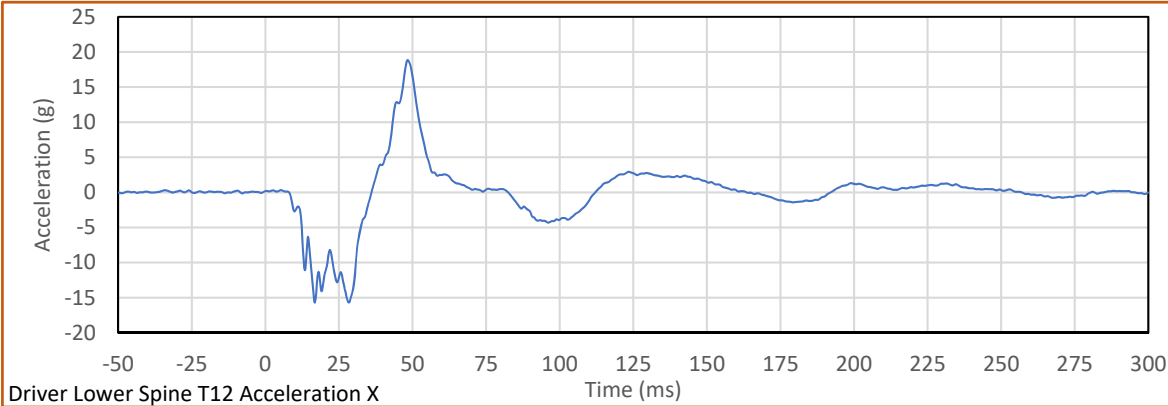
Vehicle Instrumentation Data

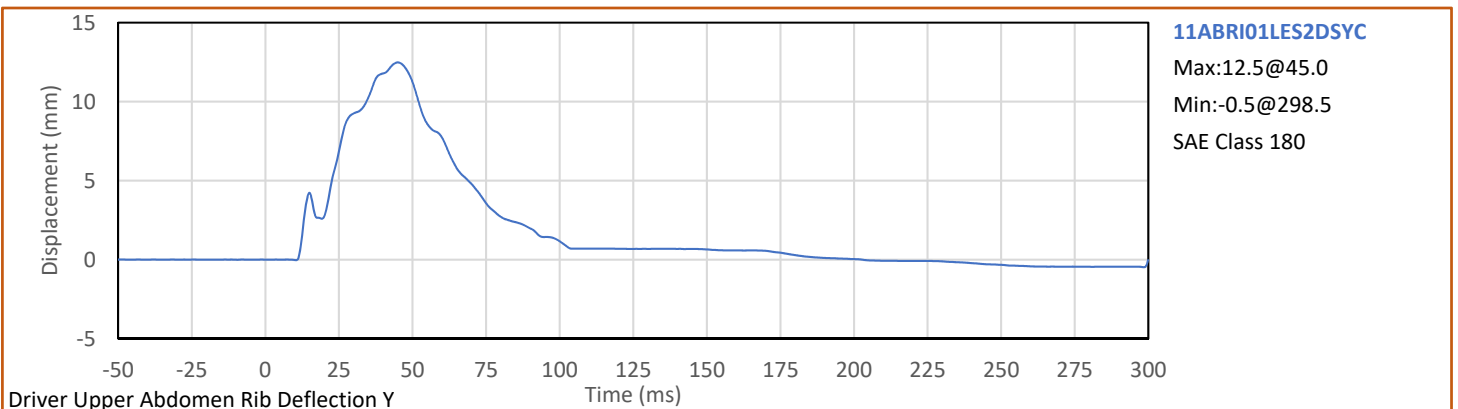
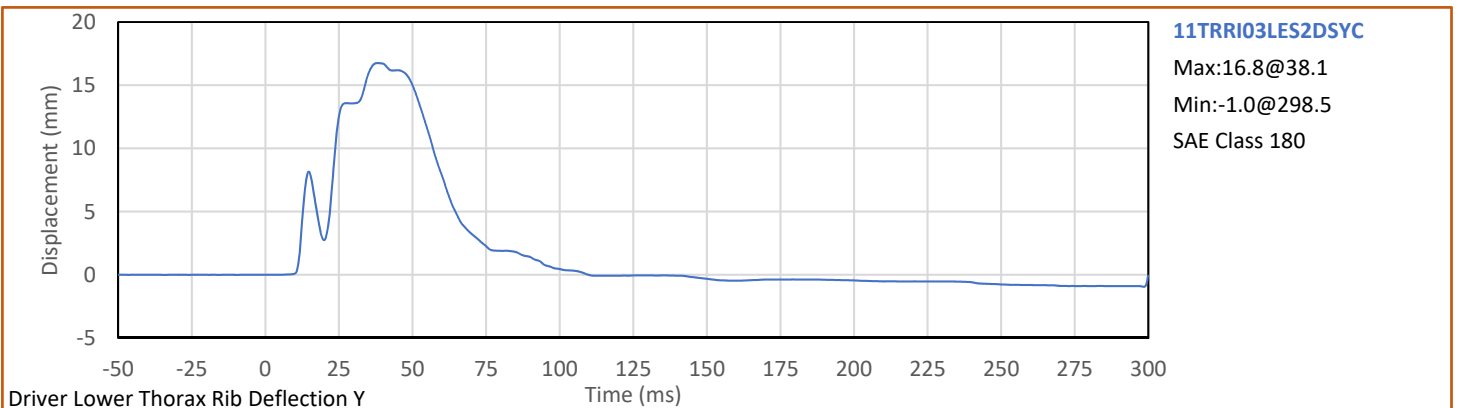
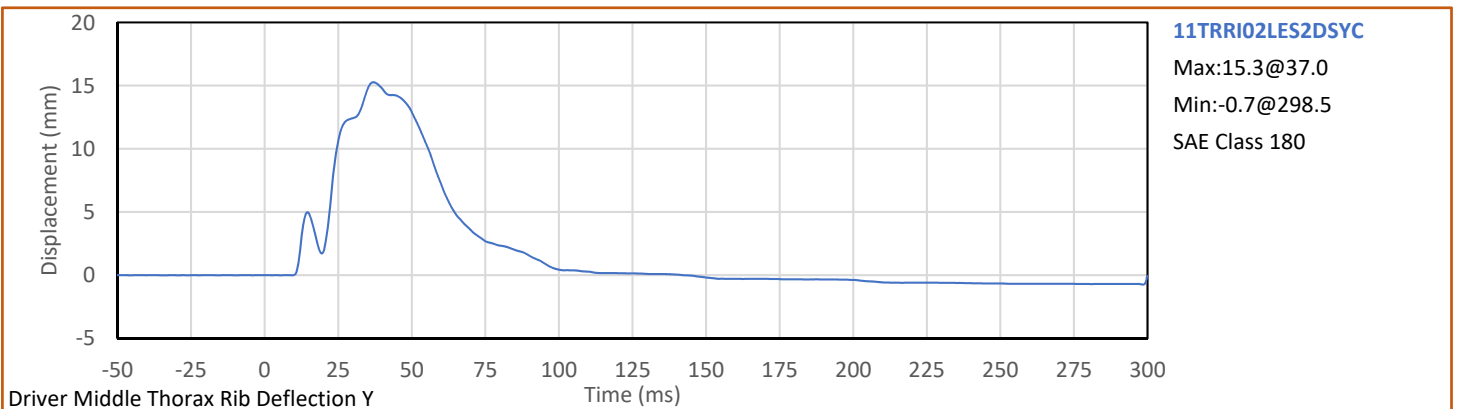
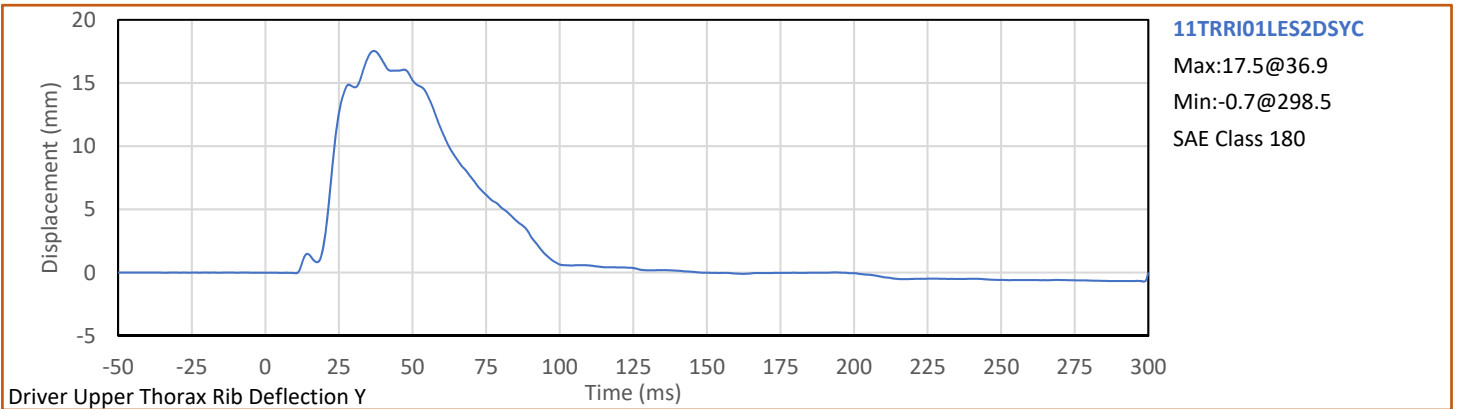
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration
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)

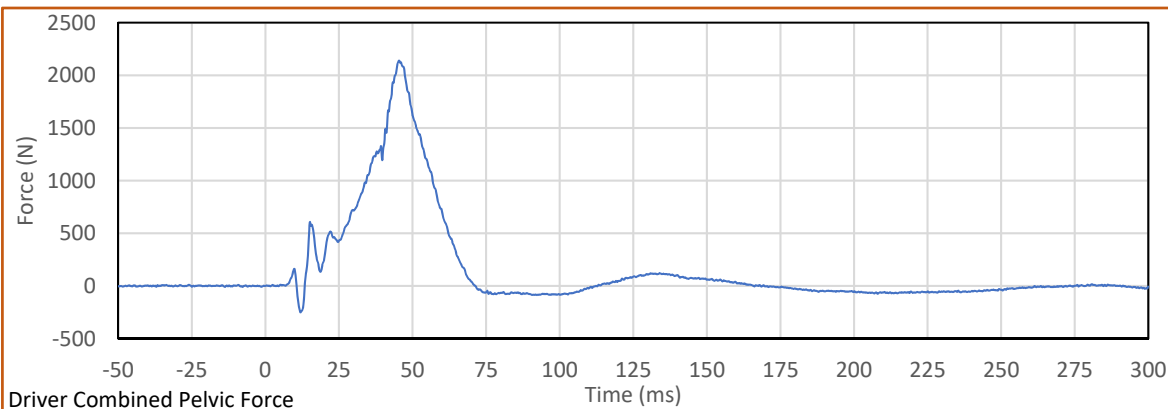
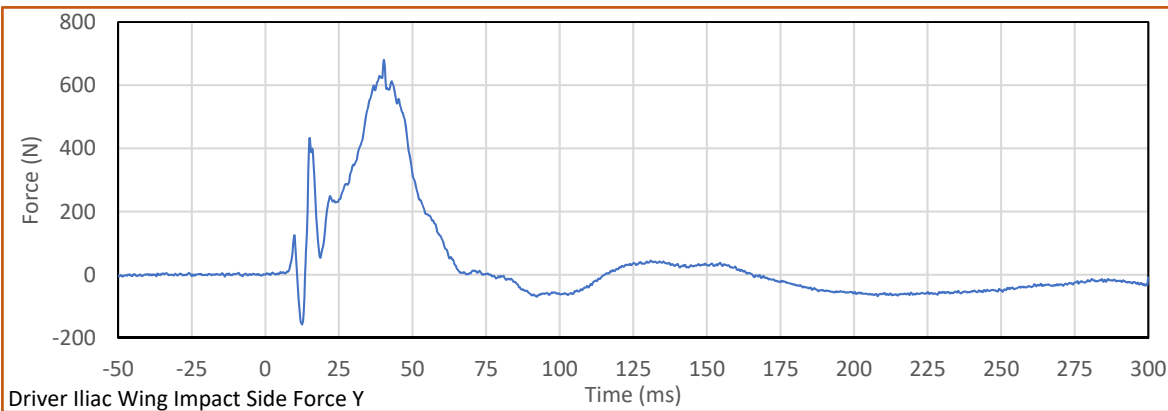
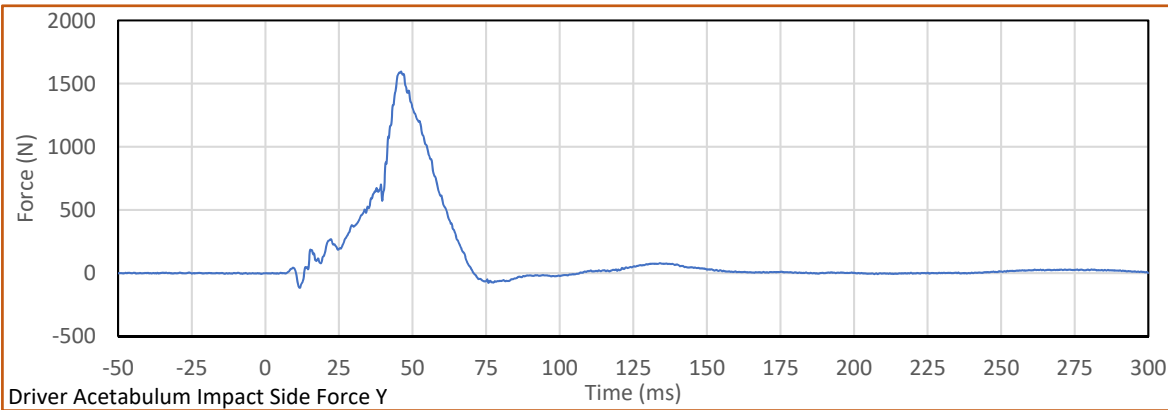
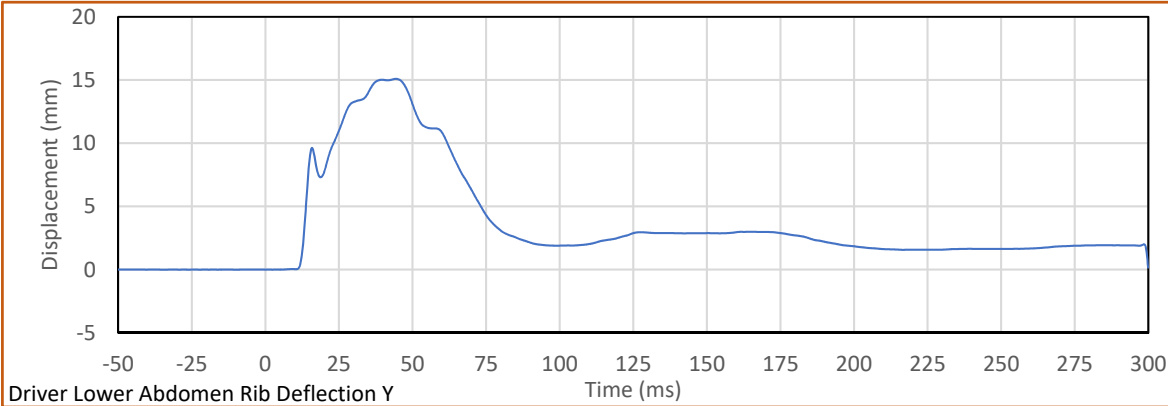
Pole Instrumentation Data

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)









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: 308

ATD Serial No.: 308

Test Date: 2019-11-14

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	25	Pass
A - Sitting Height	mm	772	788	778	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	82	Pass
D - H Point From Seatback	mm	141	151	148	Pass
E - Shoulder Pivot From Backline	mm	97	107	102	Pass
F - Thigh Clearance	mm	119	135	124	Pass
G - Head Breadth	mm	140	148	145	Pass
H - Head Back From Backline	mm	40	46	41	Pass
I - Head Depth	mm	178	188	187	Pass
J - Head Circumference	mm	541	551	547	Pass
K - Buttock To Knee Length	mm	514	540	526	Pass
L - Popliteal Height	mm	343	369	360	Pass
K - Knee Pivot To Floor Height	mm	392	409	397	Pass
N - Buttock Popliteal Length	mm	416	442	436	Pass
O - Chest Depth W/O Jacket	mm	195	211	208	Pass
P - Foot Length	mm	216	232	223	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	320	Pass
R - Arm Length	mm	249	259	253	Pass
S - Knee Joint To Seatback	mm	477	493	488	Pass
V - Shoulder Width	mm	341	357	350	Pass
W - Foot Width	mm	78	94	83	Pass
Y - Chest Circumference W/Jacket	mm	851	881	871	Pass
Z - Waist Circumference	mm	761	791	780	Pass
			Overall Test Results		Pass

Technician:



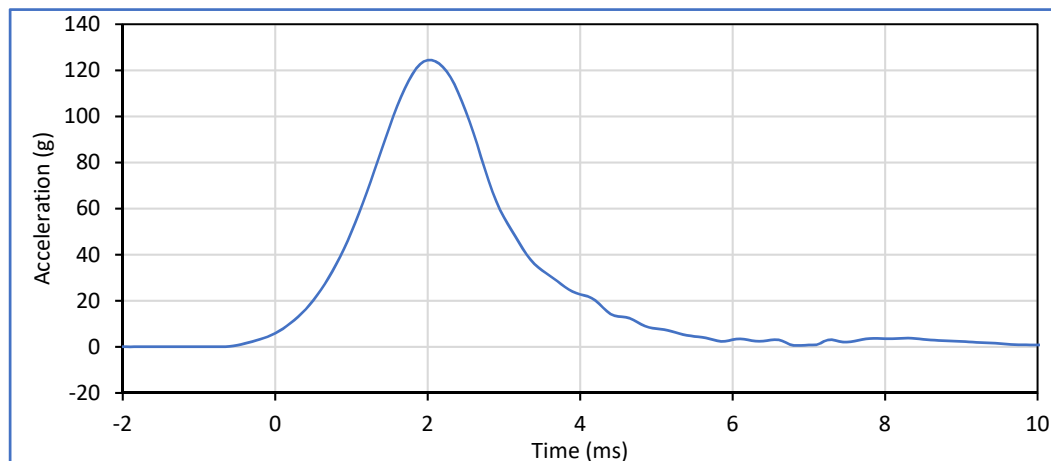
J. Hernandez

Approved By:



P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Peak Resultant Acceleration	g	115.0	137.0	124.4	Pass
Peak Head Ax	g	-15.0	15.0	-4.1	Pass
Oscillations After Main Pulse	%	0.0	15.0	3.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass

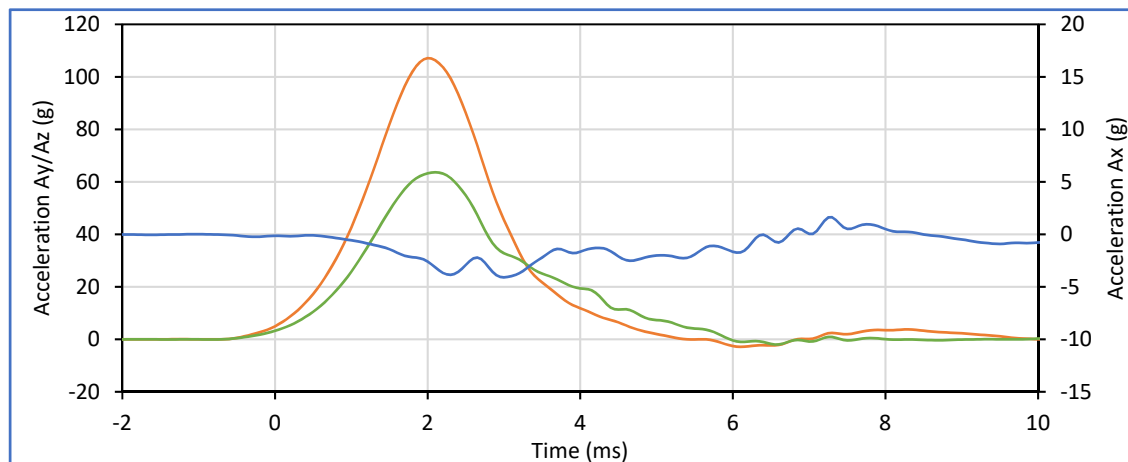


Head Resultant

Max:124.4@2.1

Min:0.6@6.9

SAE Class 1000



Head Ax

Max:1.6@7.3

Min:-4.1@3.0

SAE Class 1000

Head Ay

Max:107.1@2.0

Min:-2.8@6.1

SAE Class 1000

Head Az

Max:63.6@2.1

Min:-2.0@6.6

SAE Class 1000

Technician:

J. Hernandez

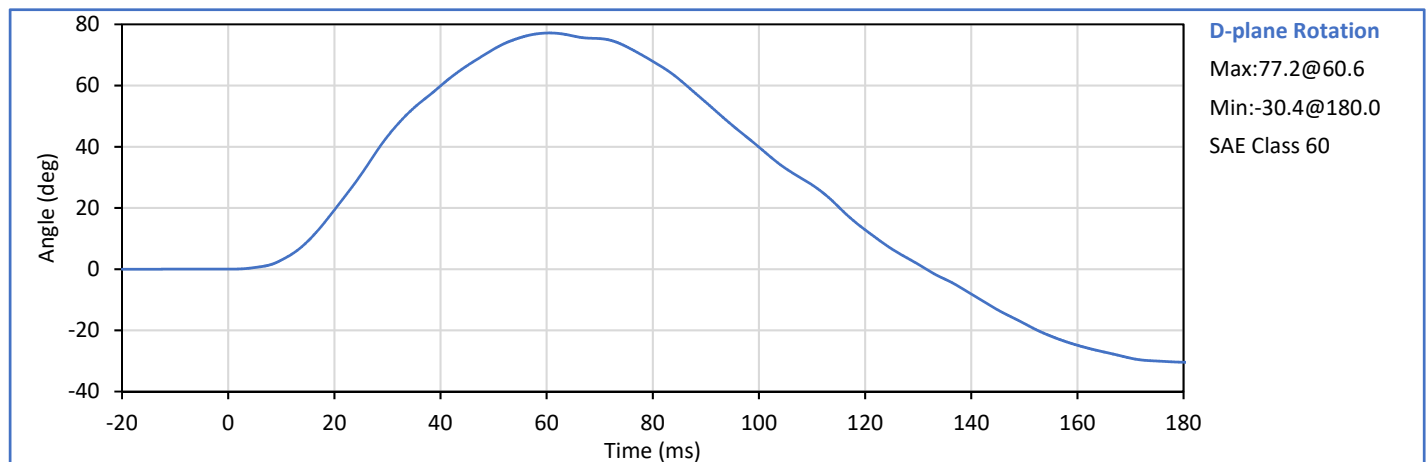
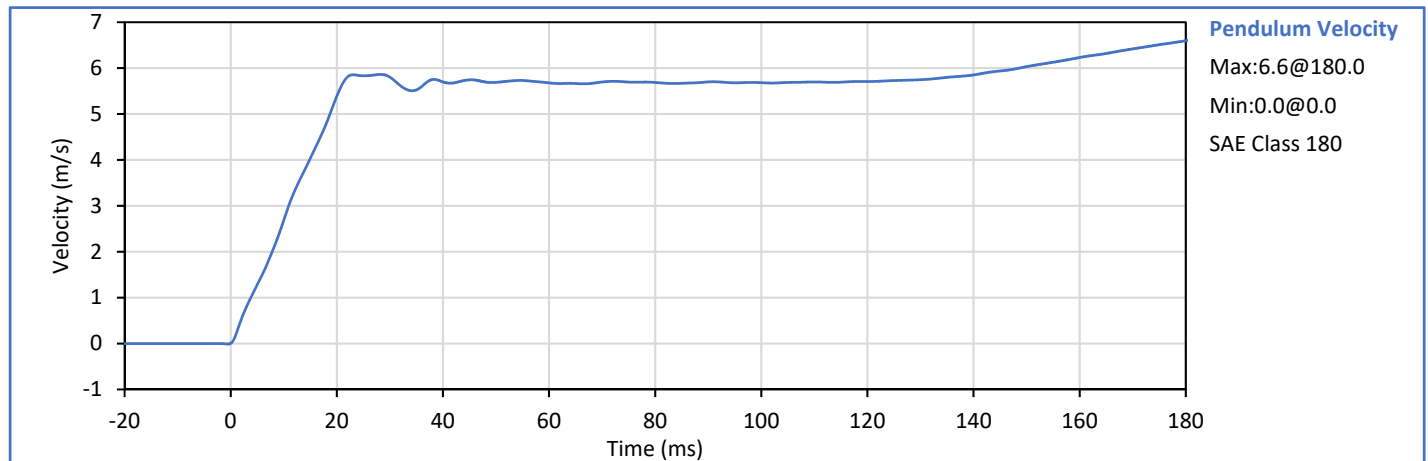
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Pendulum Velocity	m/s	5.51	5.63	5.62	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.69	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	4.03	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	5.39	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.83	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.86	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	77.2	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.6	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-43.7	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	113.2	Pass
Overall Test Results				Pass	



Technician:

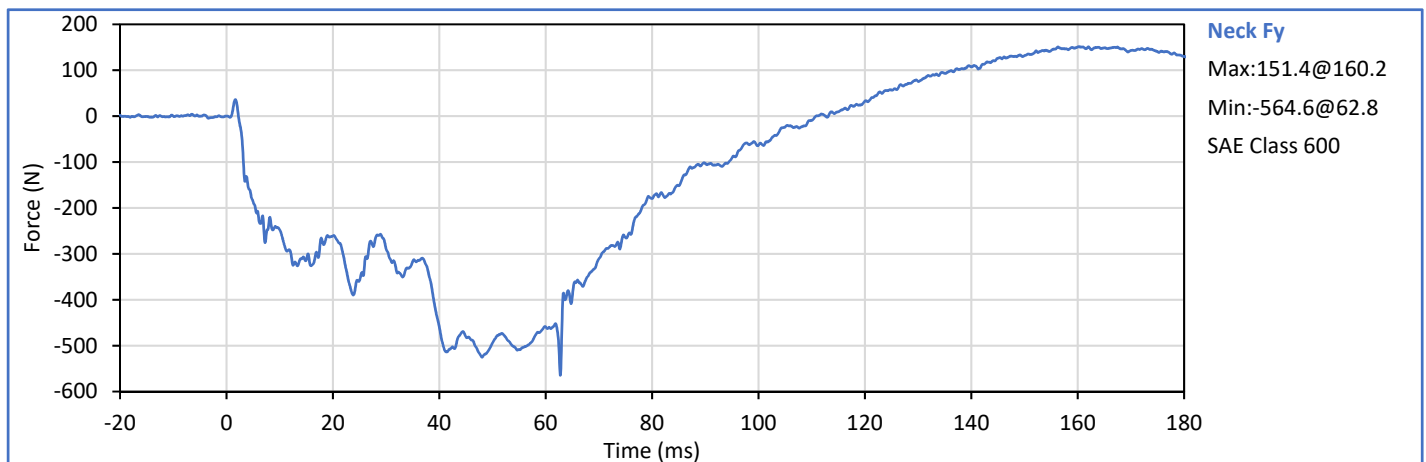
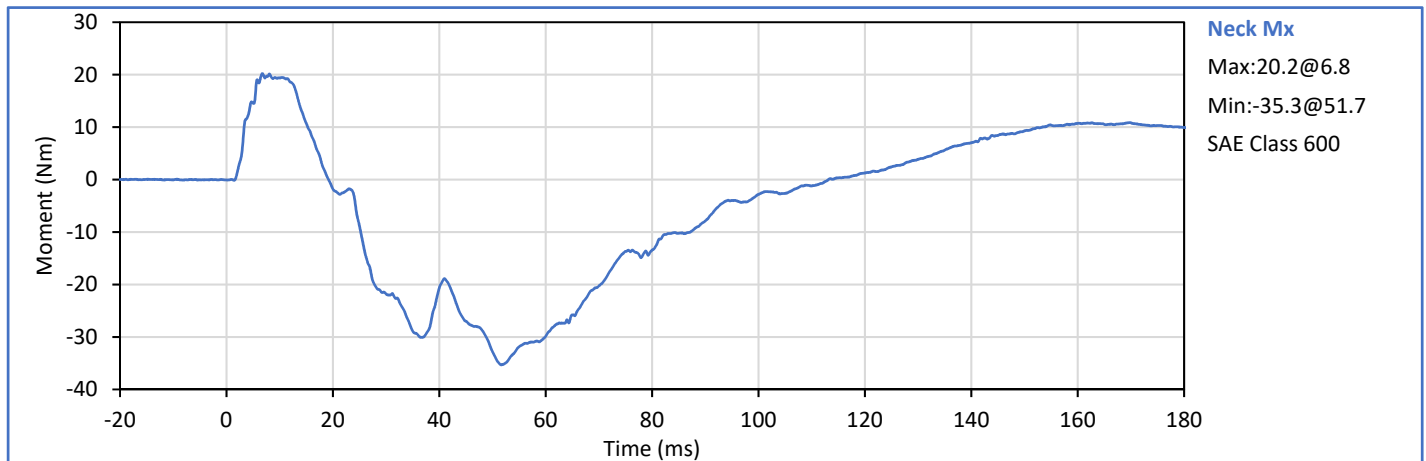
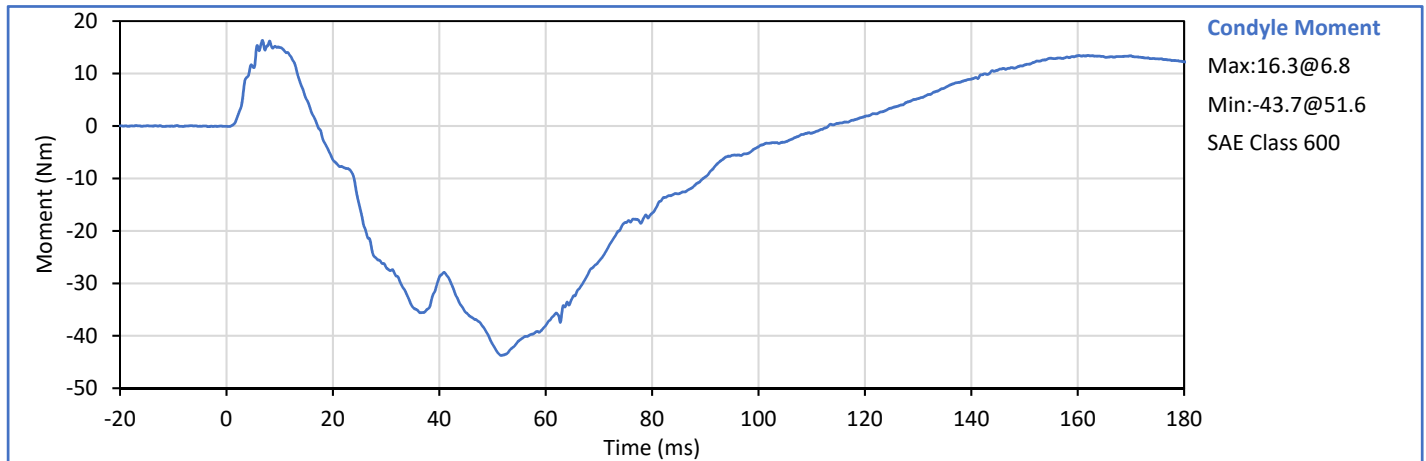
J. Hernandez

J. Hernandez

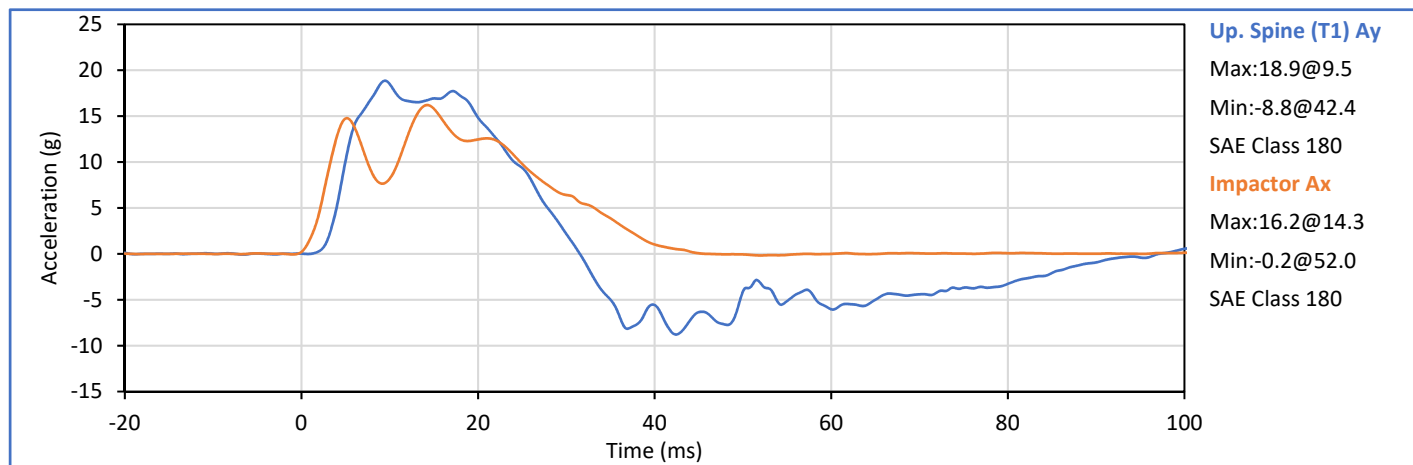
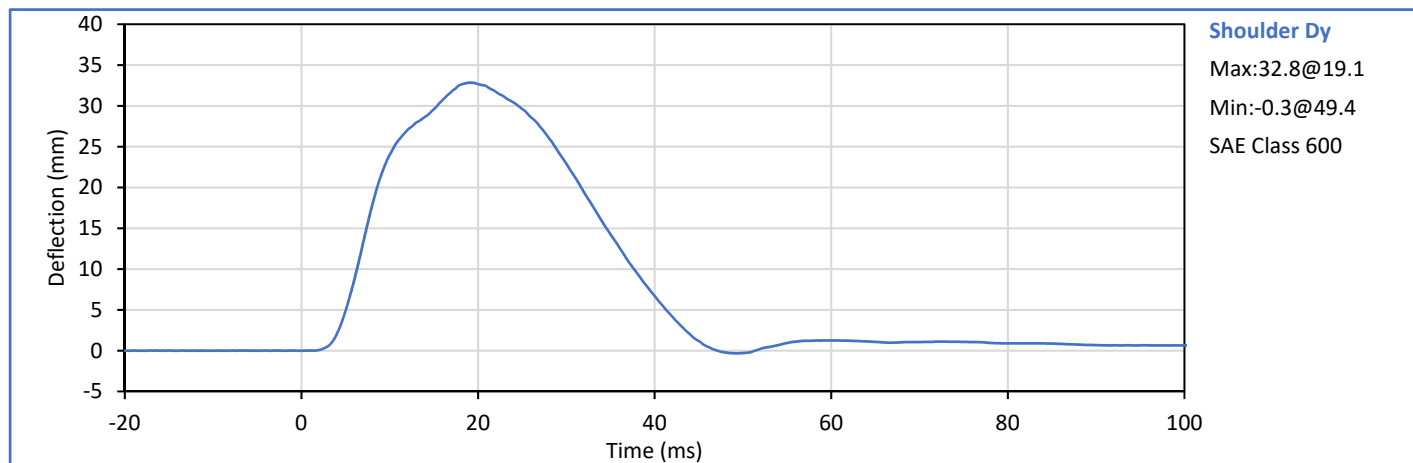
Approved By:

P. Puzzuto

P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.27	Pass
Peak Shoulder Dy	mm	28.0	37.0	32.8	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.9	Pass
Peak Impactor Ax	g	13.0	18.0	16.2	Pass
Overall Test Results					Pass



Technician:

J. Hernandez

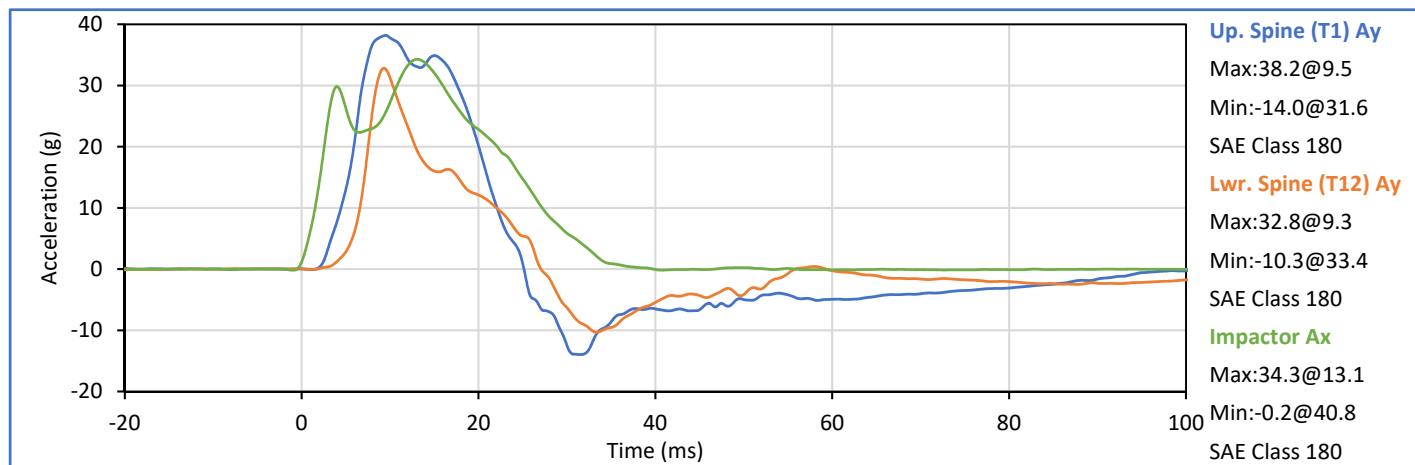
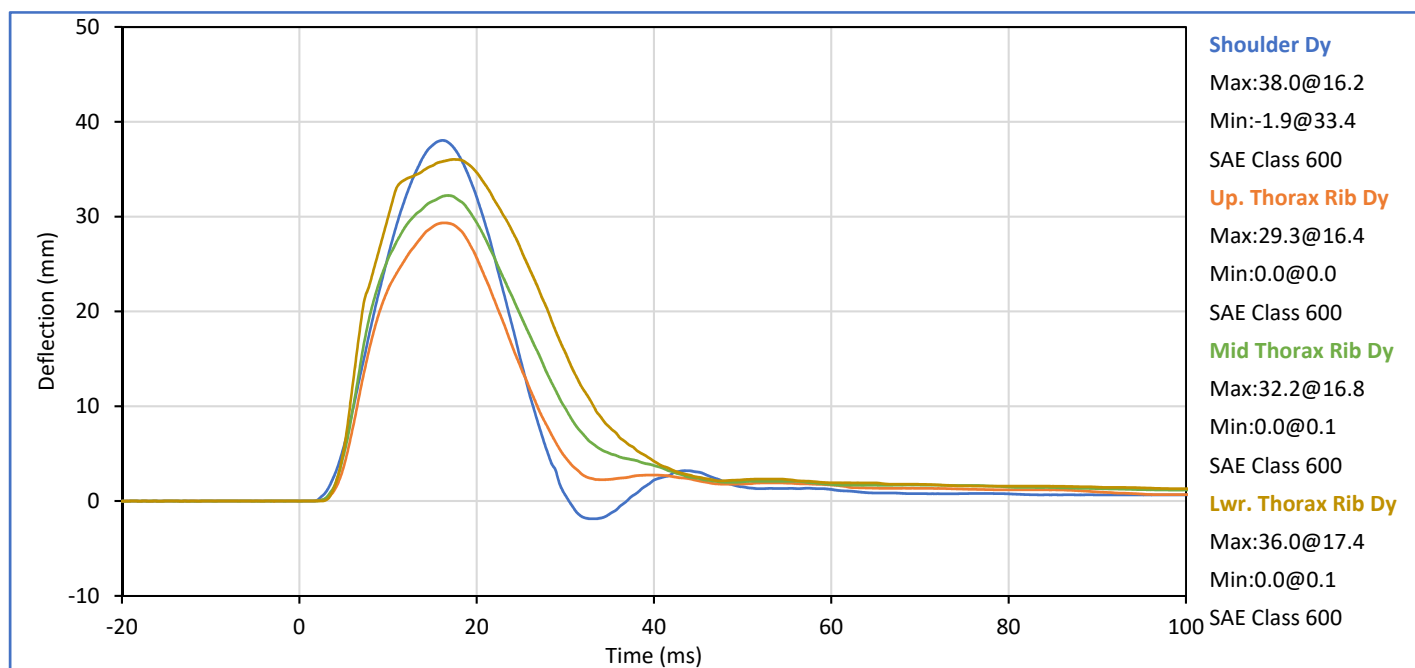
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.0	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.3	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.2	Pass
Peak Lower Rib Dy	mm	32.0	38.0	36.0	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	38.2	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	32.8	Pass
Peak Impactor Ax	g	30.0	36.0	34.3	Pass
Overall Test Results				Pass	



Technician:

J. Hernandez

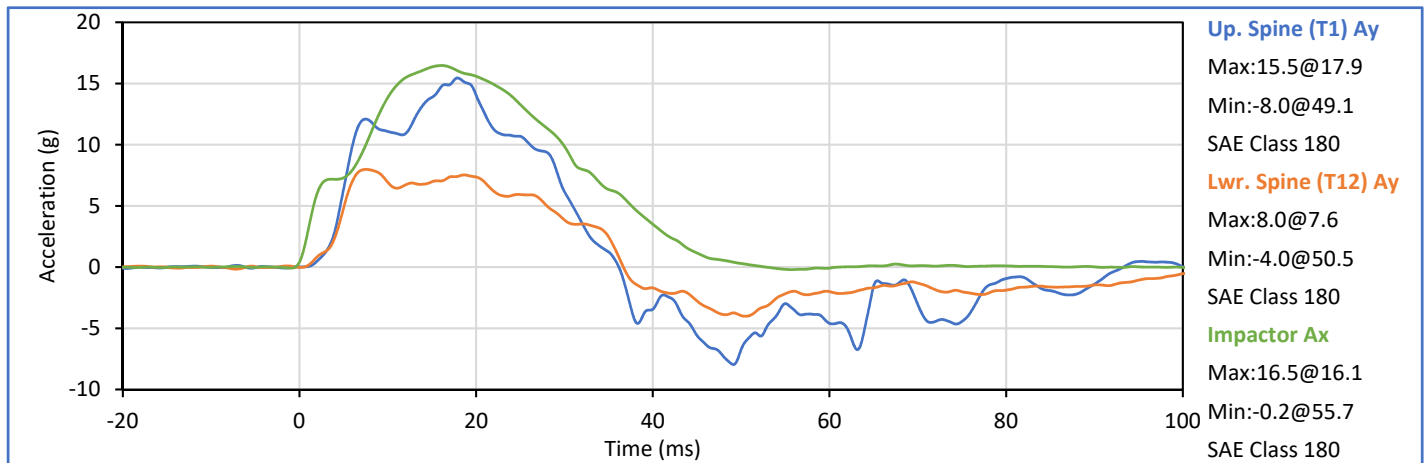
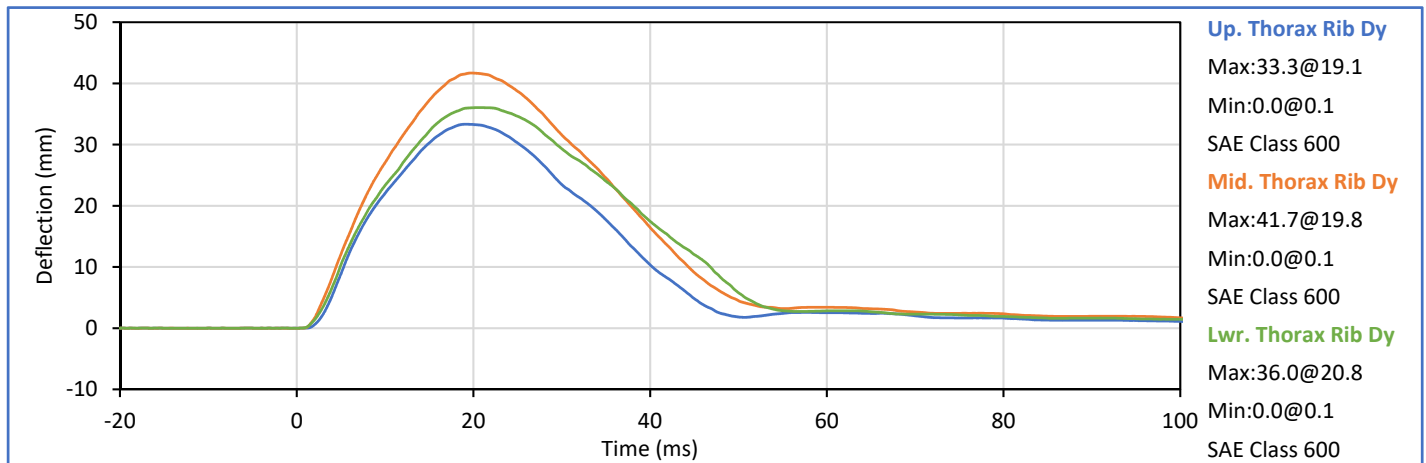
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Impactor Velocity	m/s	4.20	4.40	4.29	Pass
Peak Upper Rib Dy	mm	32.0	40.0	33.3	Pass
Peak Middle Rib Dy	mm	39.0	45.0	41.7	Pass
Peak Lower Rib Dy	mm	35.0	43.0	36.0	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.5	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	8.0	Pass
Peak Impactor Ax	g	14.0	18.0	16.5	Pass
Overall Test Results				Pass	Pass



Technician:

J. Hernandez

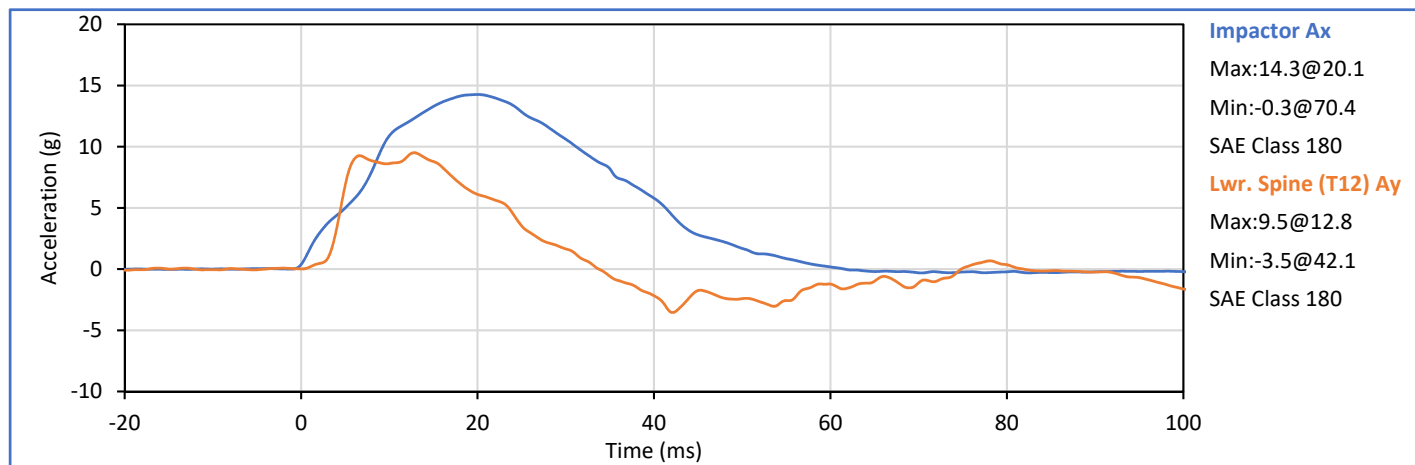
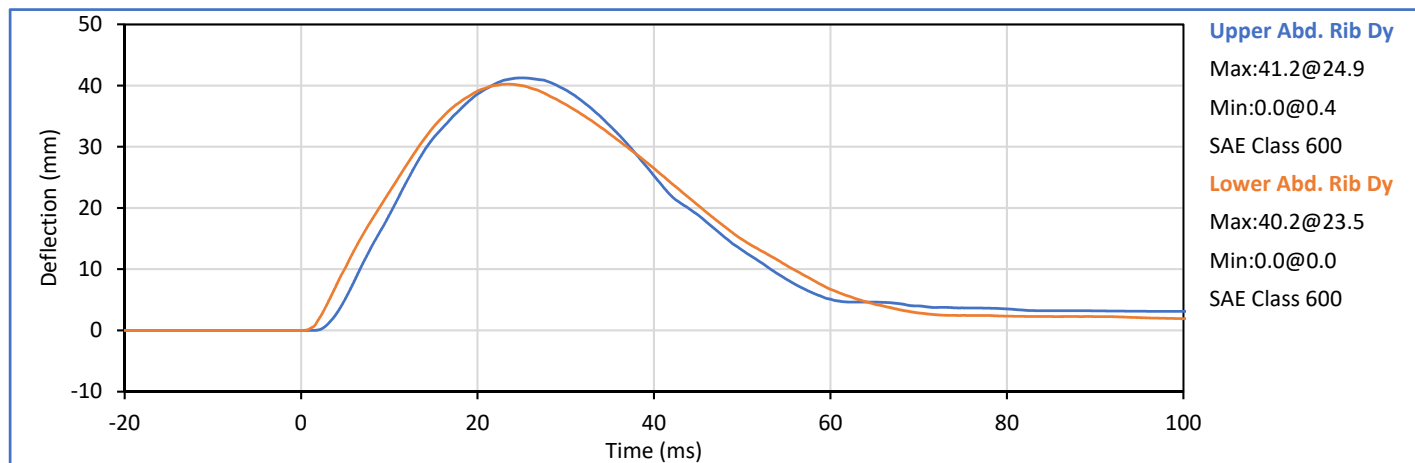
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	41.2	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	40.2	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.5	Pass
Peak Impactor Ax	g	12.0	16.0	14.3	Pass
Overall Test Results				Pass	



Technician:

J. Hernandez

J. Hernandez

Approved By:

P. Puzzuto

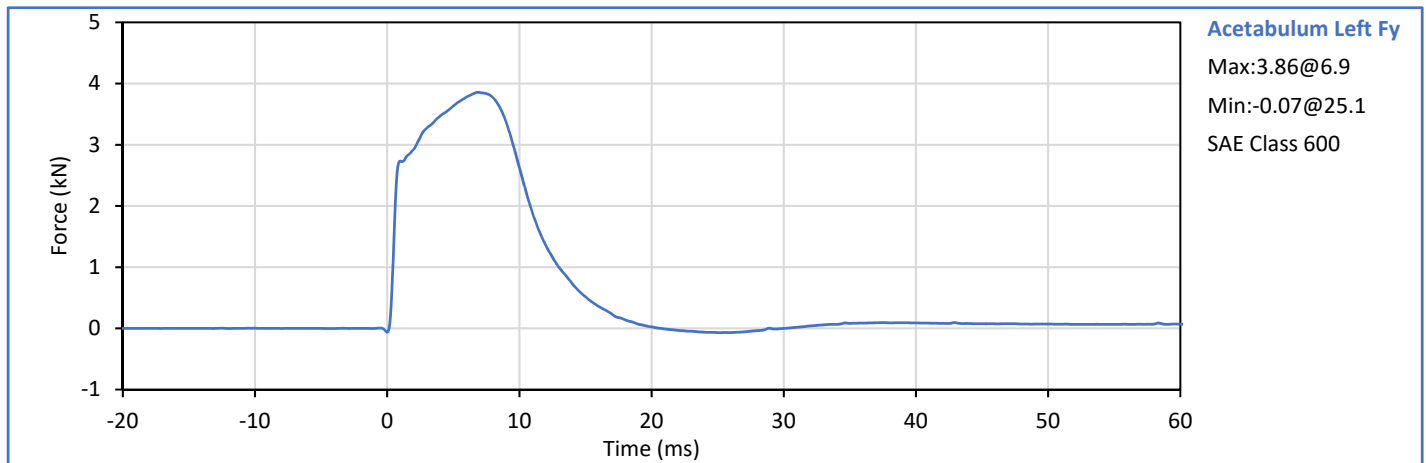
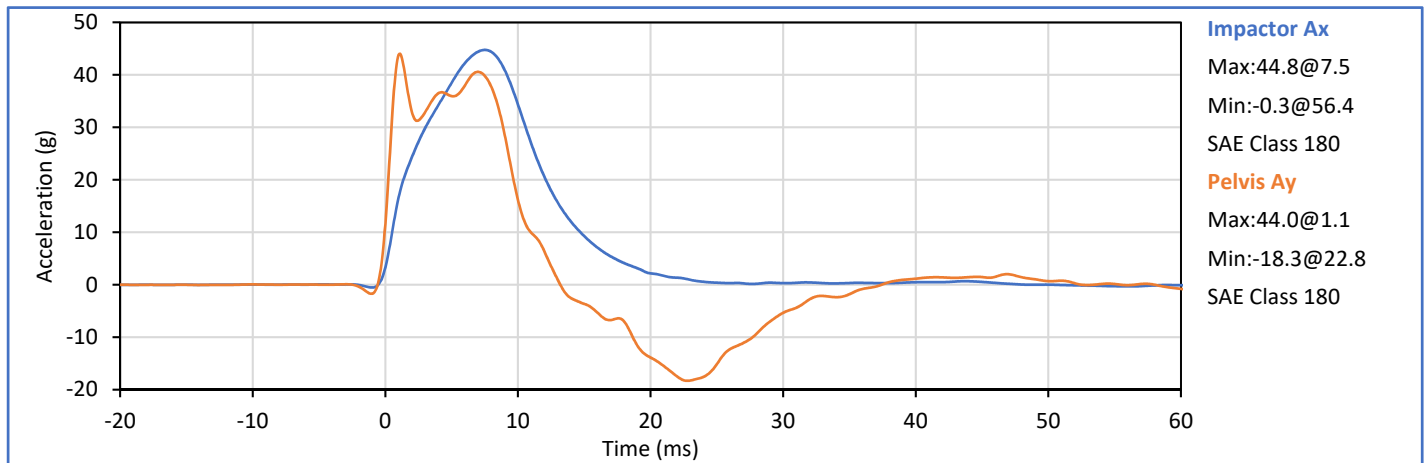
P. Puzzuto

ATD Serial No.: 308

Test Date: 2019-11-15

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Impactor Velocity	m/s	6.60	6.80	6.72	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.86	Pass
Pelvis Ay after 6ms	g	34.0	42.0	40.6	Pass
Peak Impactor Ax	g	38.0	47.0	44.8	Pass
Overall Test Results				Pass	Pass

Pelvis Plug S/N: 11608 (SACO)



Technician:

J. Hernandez

J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

ATD Serial No.: 308

Test Date: 2019-11-15

Pelvis Plug S/N: 11608 (SACO)



SID-IIs Pelvis Plug Certification Test

Plug S/N 11608

Test Number 3151

Report Number 3144

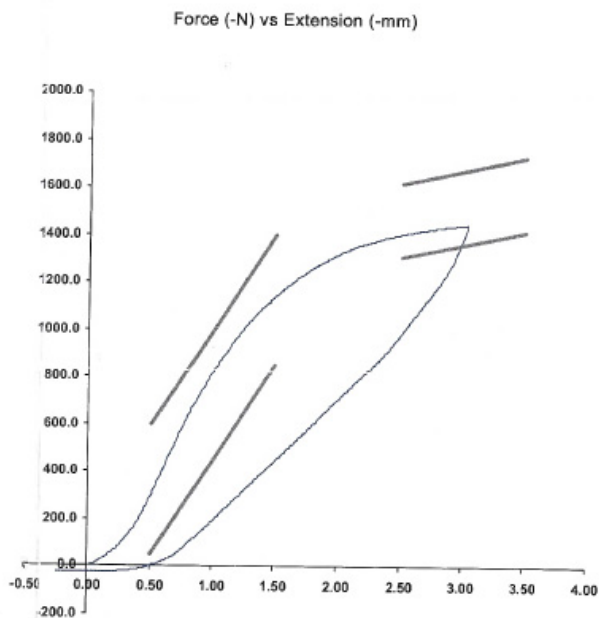
Test Date 10/4/2016 1:24:47 PM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	296.75	50.00 600.00
Force @ 1.5 mm (N)	1,141.41	850.00 1,400.00
Force @ 2.5 mm (N)	1,402.61	1,306.00 1,618.00
Force @ 3.0 mm (N)	1,442.49	1,361.00 1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (T1240813), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:



Operator DC

Part Number 180-4450

Template No 107 04-Oct-16
SACO Research

By: DC

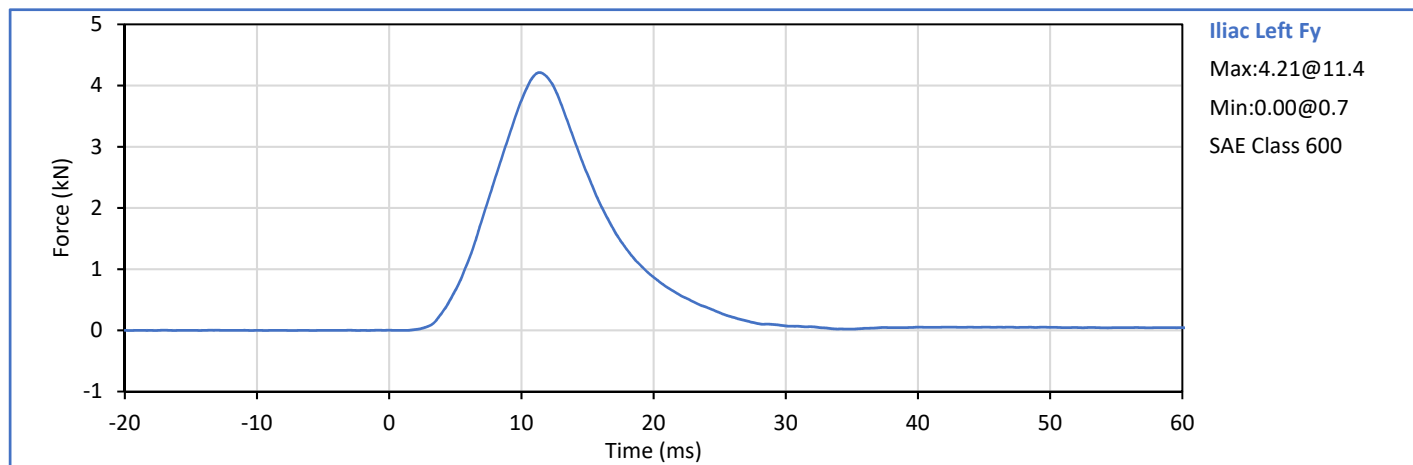
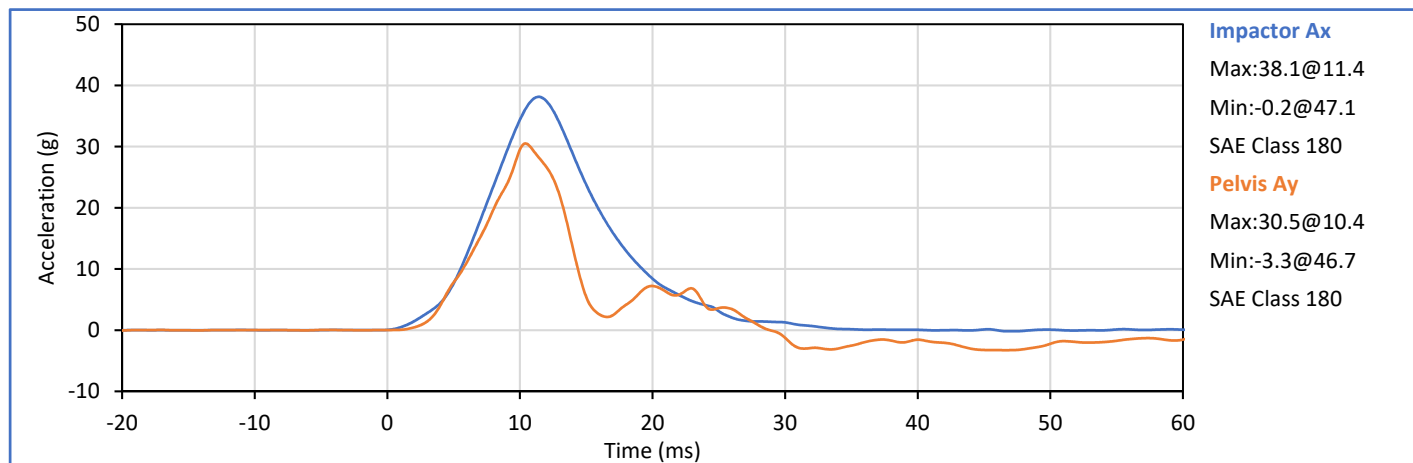
Date: 10/4/16

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

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	24	Pass
Impactor Velocity	m/s	4.20	4.40	4.34	Pass
Peak Iliac Fy	kN	4.10	5.10	4.21	Pass
Pelvis Ay after 6ms	g	28.0	39.0	30.5	Pass
Peak Impactor Ax	g	36.0	45.0	38.1	Pass
Overall Test Results				Pass	

Pelvis Plug S/N: 12228 (SACO) *

* Plug is not impacted and remains certified



Technician:

J. Hernandez

J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

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

ATD Serial No.: 308

Test Date: 2019-12-10

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
A - Sitting Height	mm	772	788	778	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	84	Pass
D - H Point From Seatback	mm	141	151	147	Pass
E - Shoulder Pivot From Backline	mm	97	107	102	Pass
F - Thigh Clearance	mm	119	135	125	Pass
G - Head Breadth	mm	140	148	142	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	183	Pass
J - Head Circumference	mm	541	551	545	Pass
K - Buttock To Knee Length	mm	514	540	523	Pass
L - Popliteal Height	mm	343	369	351	Pass
K - Knee Pivot To Floor Height	mm	392	409	403	Pass
N - Buttock Popliteal Length	mm	416	442	435	Pass
O - Chest Depth W/O Jacket	mm	195	211	206	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	258	Pass
S - Knee Joint To Seatback	mm	477	493	488	Pass
V - Shoulder Width	mm	341	357	348	Pass
W - Foot Width	mm	78	94	89	Pass
Y - Chest Circumference W/Jacket	mm	851	881	867	Pass
Z - Waist Circumference	mm	761	791	781	Pass
				Overall Test Results	Pass

Technician:



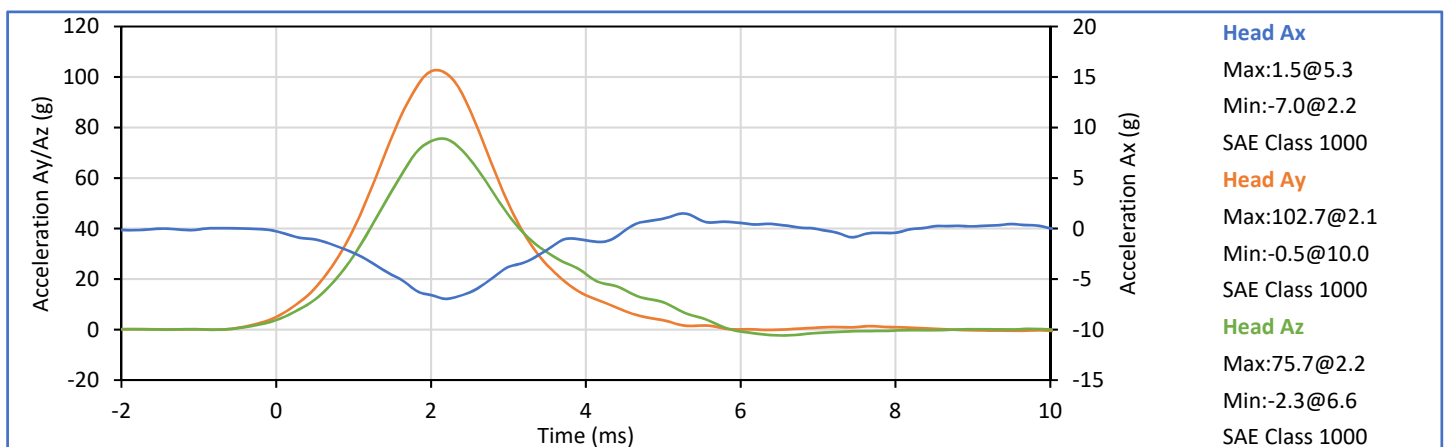
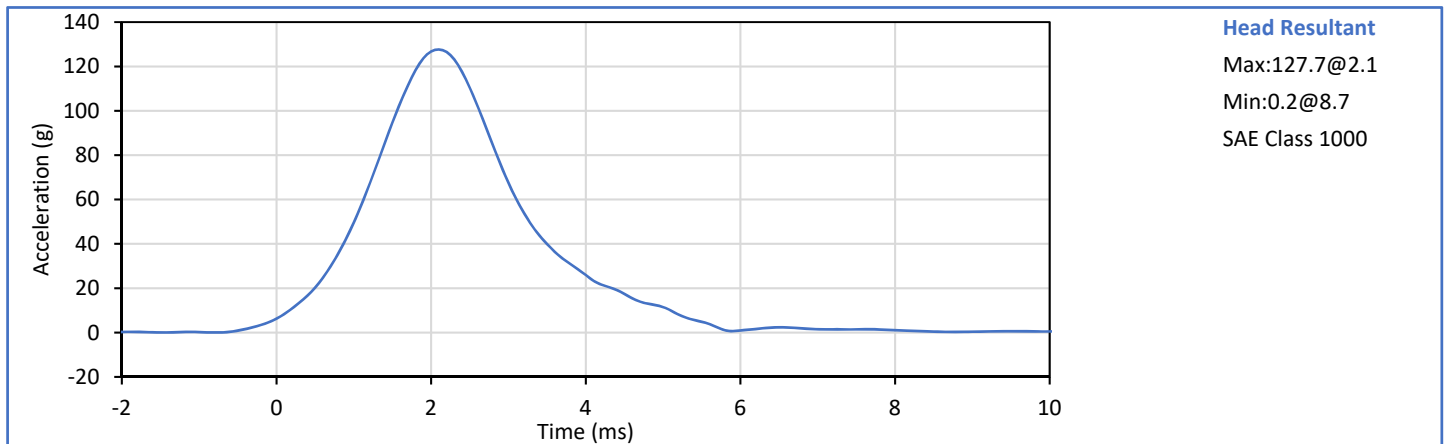
J. Hernandez

Approved By:



P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	39	Pass
Peak Resultant Acceleration	g	115.0	137.0	127.7	Pass
Peak Head Ax	g	-15.0	15.0	-7.0	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass



Technician:

[Signature]

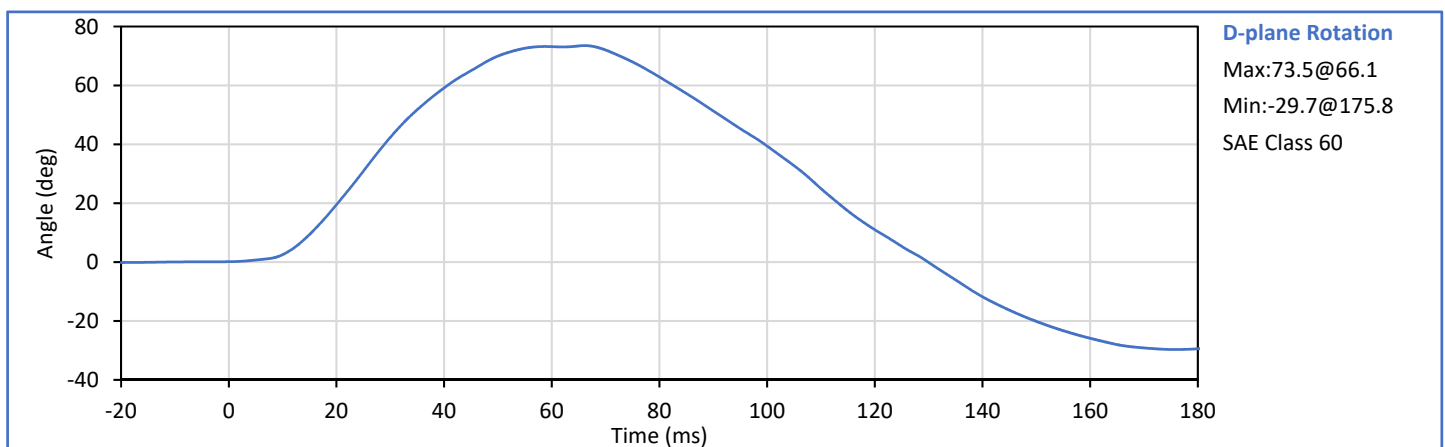
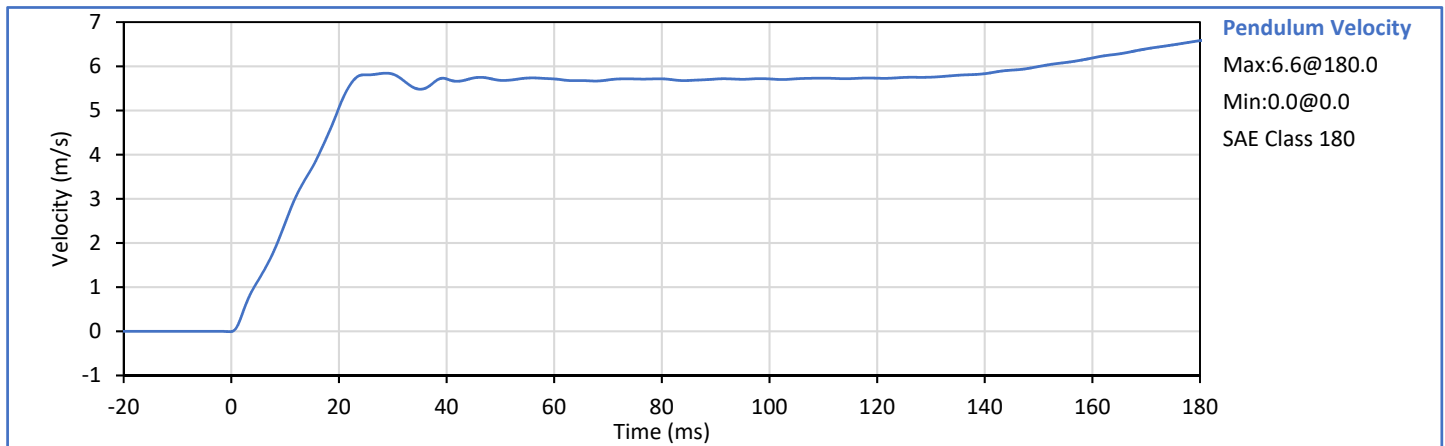
J. Hernandez

Approved By:

[Signature]

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	34	Pass
Pendulum Velocity	m/s	5.51	5.63	5.59	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.45	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.70	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	5.06	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.81	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	73.5	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	66.1	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-41.7	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	111.2	Pass
Overall Test Results				Pass	Pass



Technician:

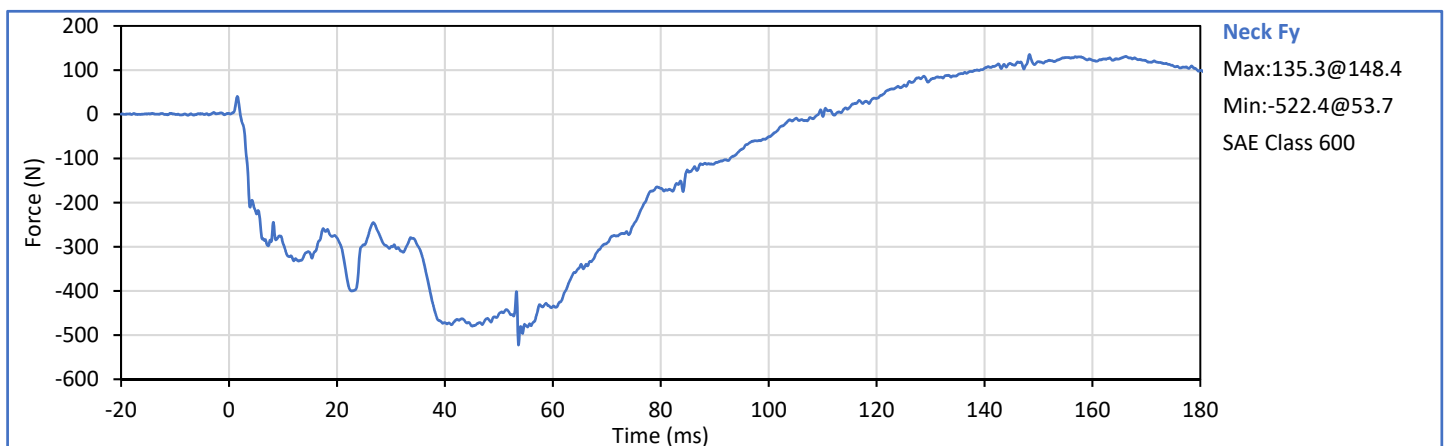
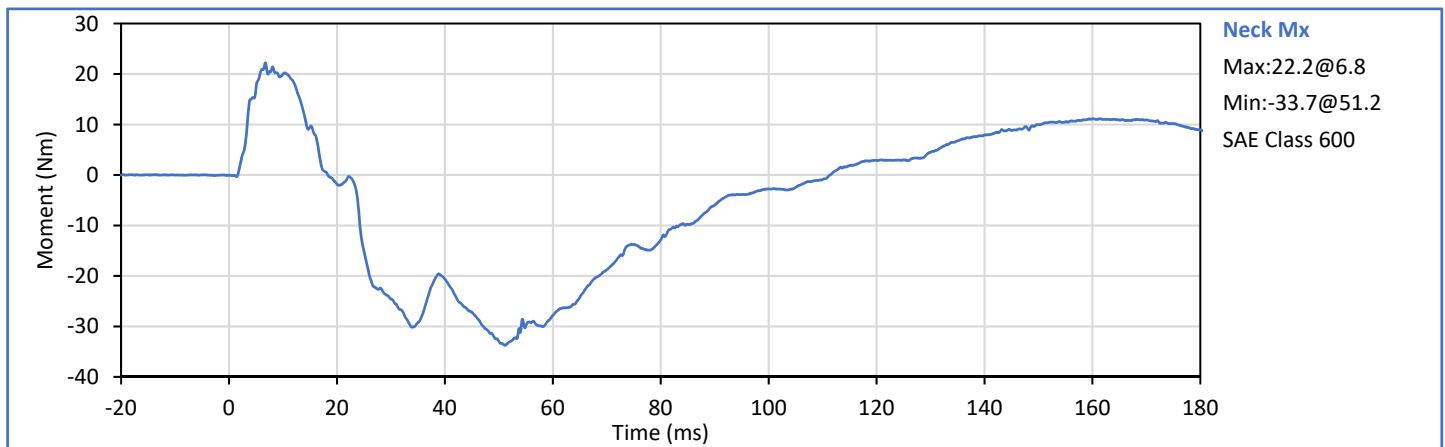
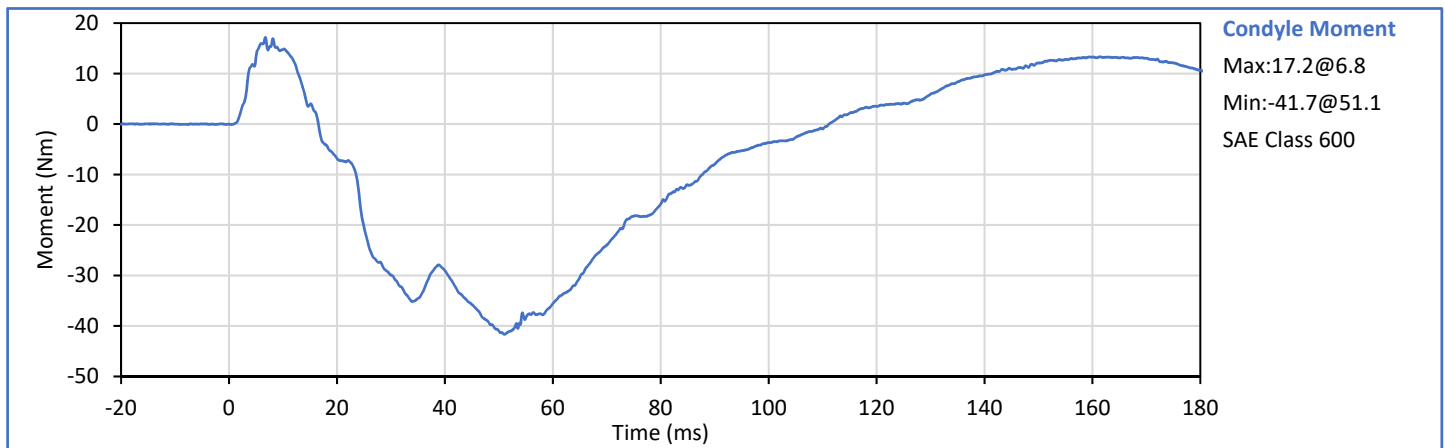
J. Hernandez

J. Hernandez

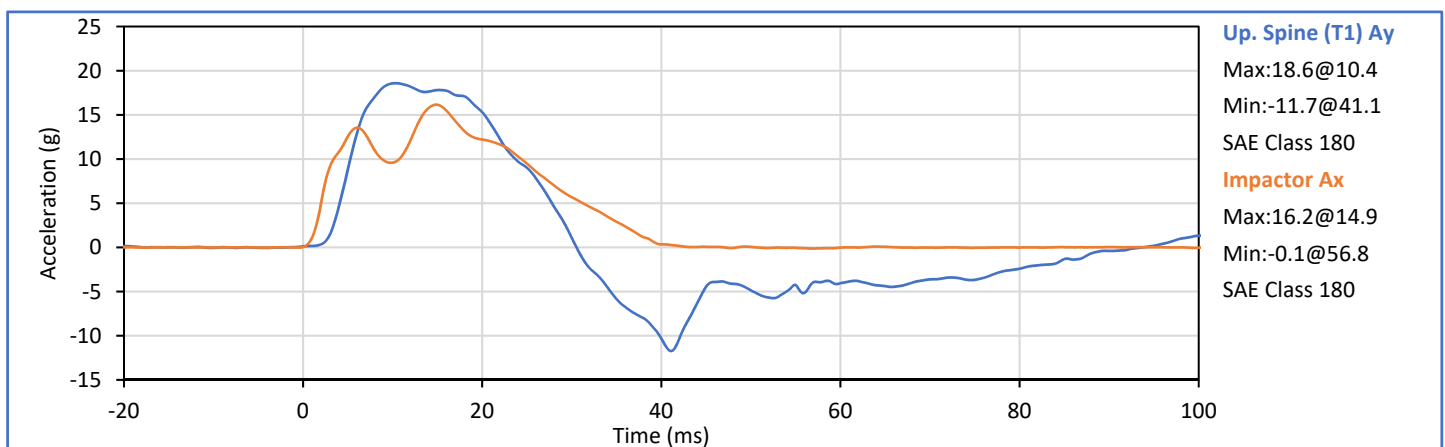
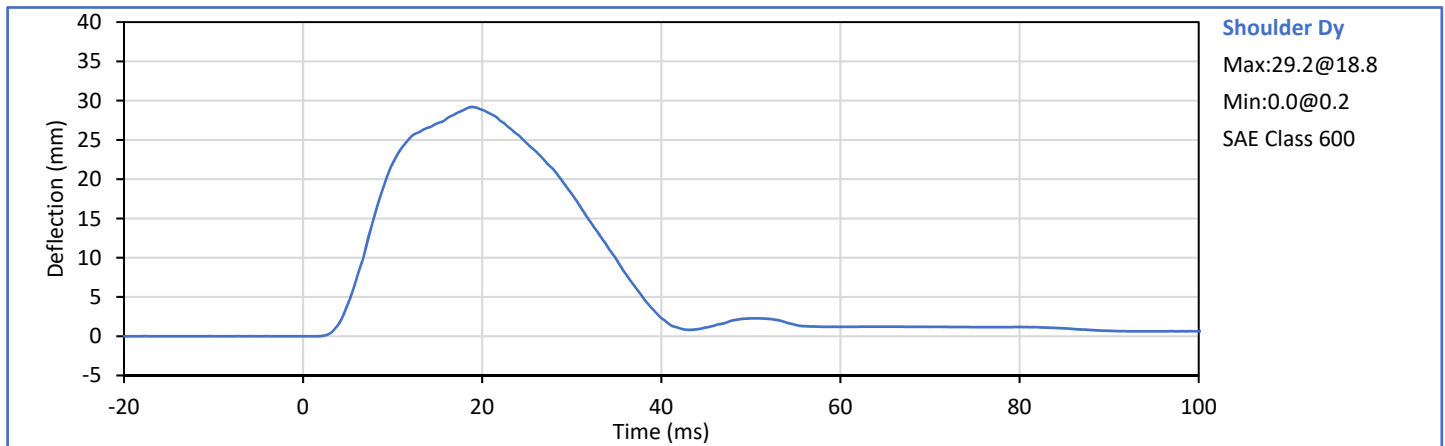
Approved By:

P. Puzzuto

P. Puzzuto



Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Shoulder Dy	mm	28.0	37.0	29.2	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.6	Pass
Peak Impactor Ax	g	13.0	18.0	16.2	Pass
Overall Test Results					Pass



Technician:

J. Hernandez

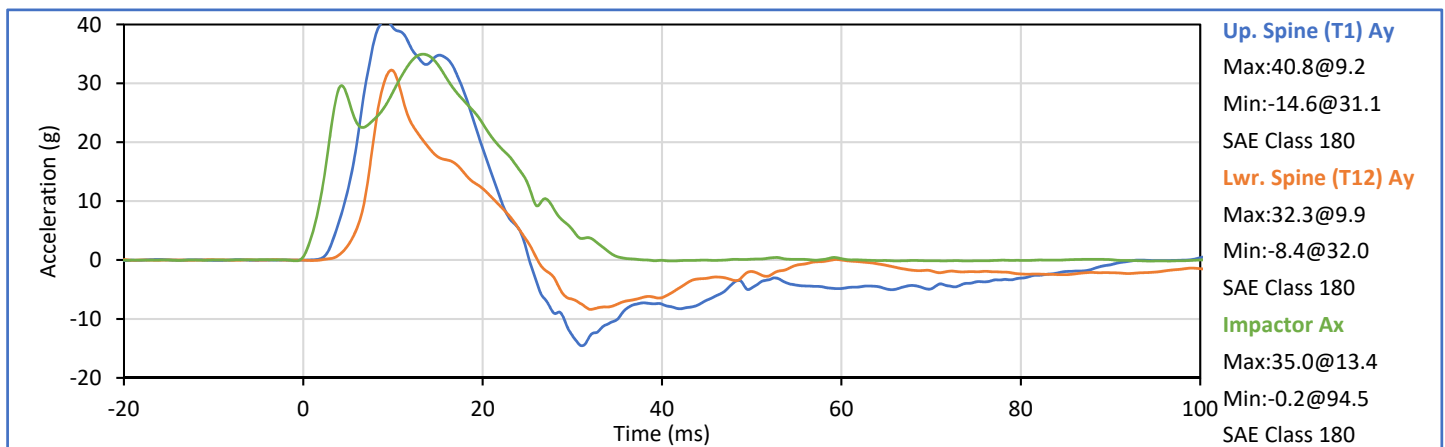
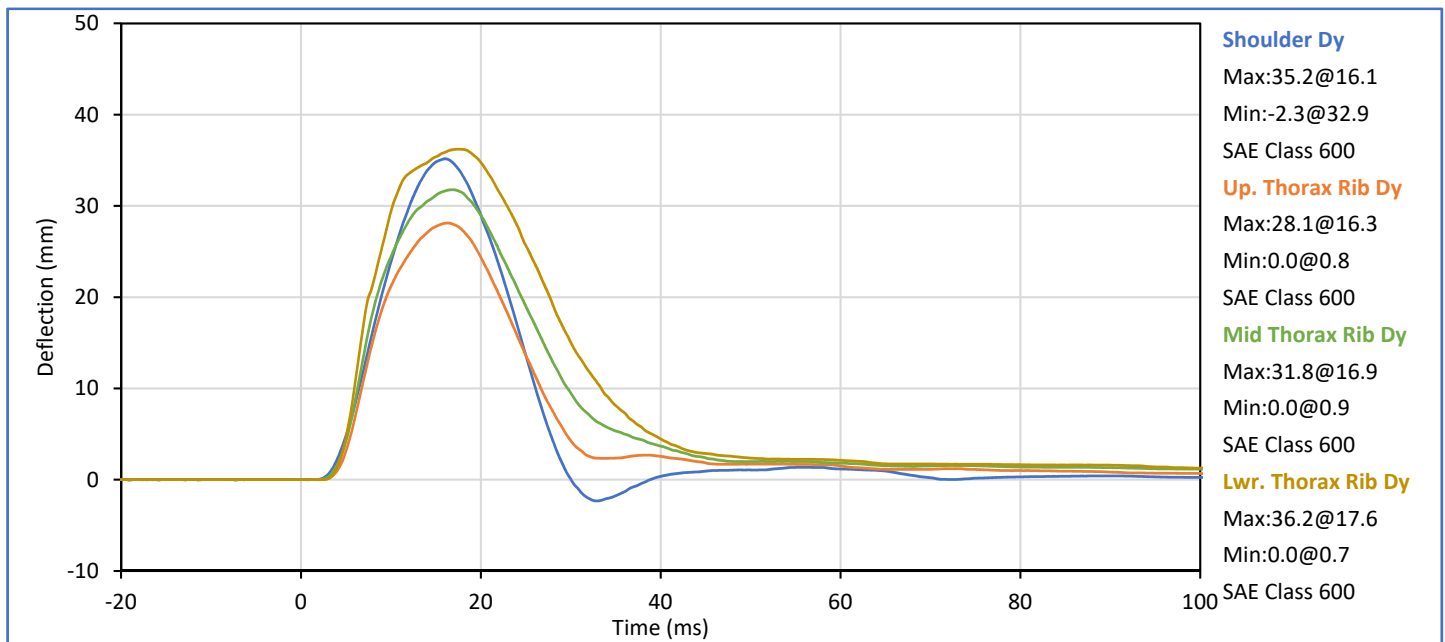
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	6.60	6.80	6.66	Pass
Peak Shoulder Dy	mm	31.0	40.0	35.2	Pass
Peak Upper Rib Dy	mm	25.0	32.0	28.1	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.8	Pass
Peak Lower Rib Dy	mm	32.0	38.0	36.2	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	40.8	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	32.3	Pass
Peak Impactor Ax	g	30.0	36.0	35.0	Pass
Overall Test Results				Pass	Pass



Technician:

J. Hernandez

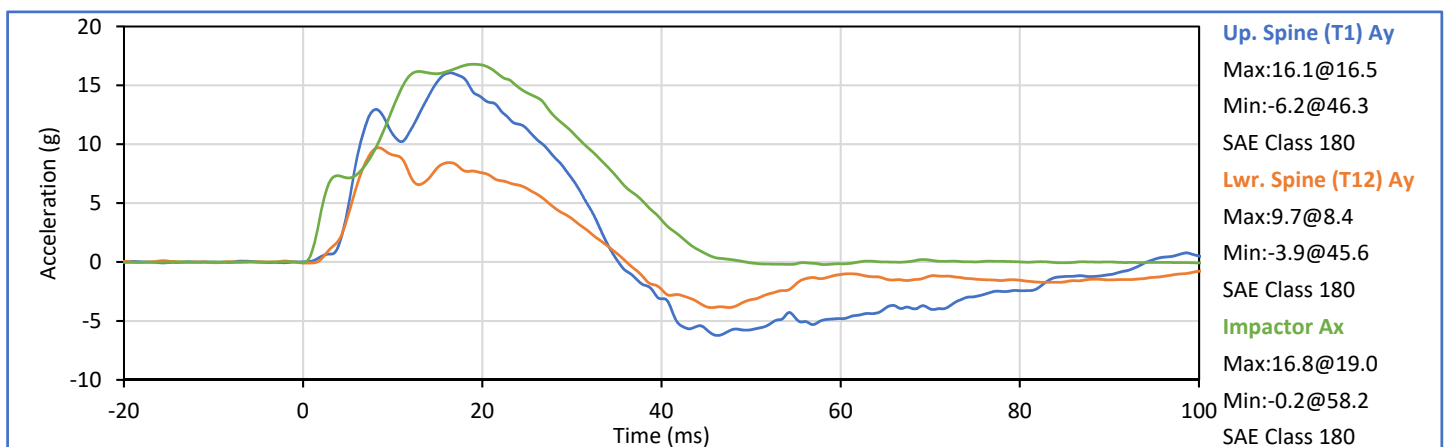
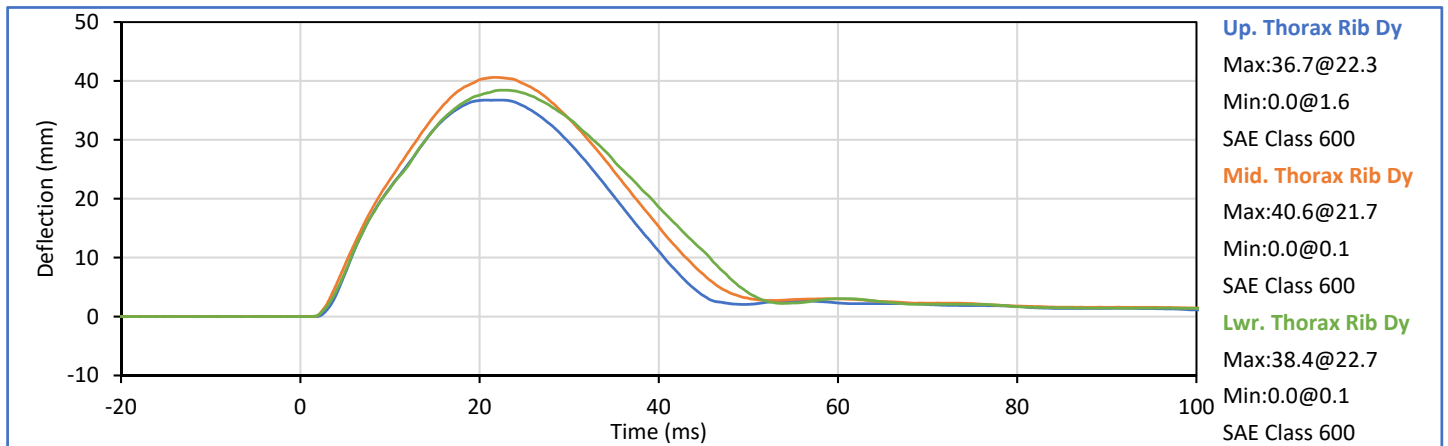
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	36.7	Pass
Peak Middle Rib Dy	mm	39.0	45.0	40.6	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.4	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	16.1	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.7	Pass
Peak Impactor Ax	g	14.0	18.0	16.8	Pass
Overall Test Results				Pass	Pass



Technician:

J. Hernandez

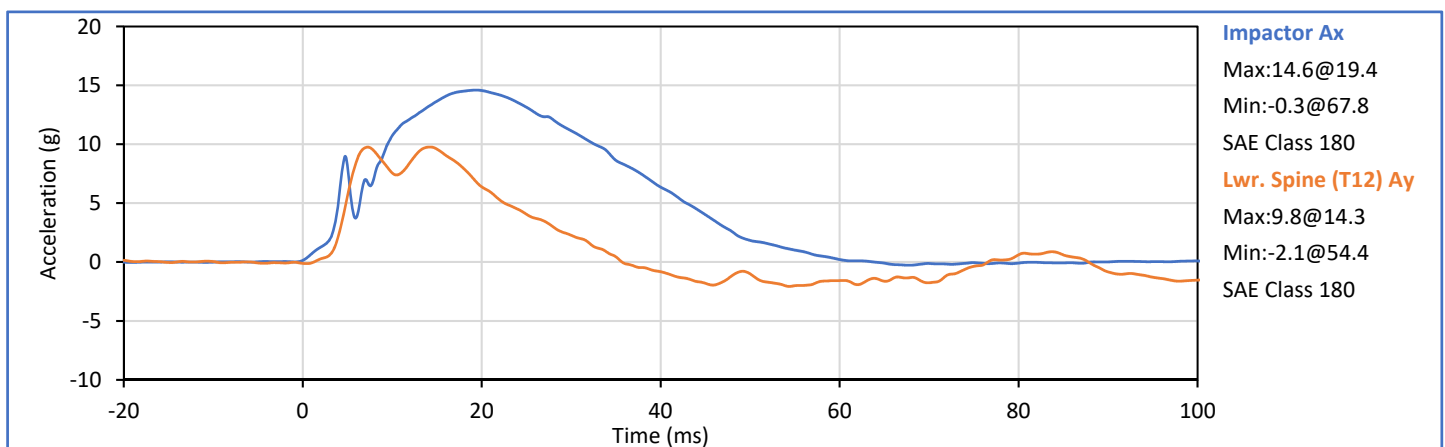
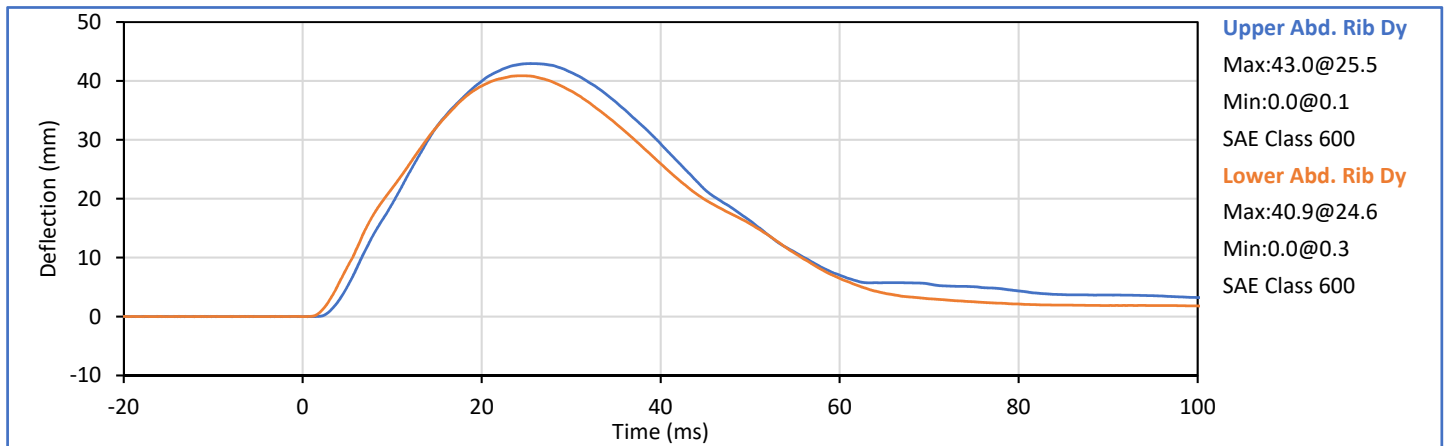
J. Hernandez

Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	4.20	4.40	4.34	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	43.0	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	40.9	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.8	Pass
Peak Impactor Ax	g	12.0	16.0	14.6	Pass
Overall Test Results					Pass



Technician:

J. Hernandez

J. Hernandez

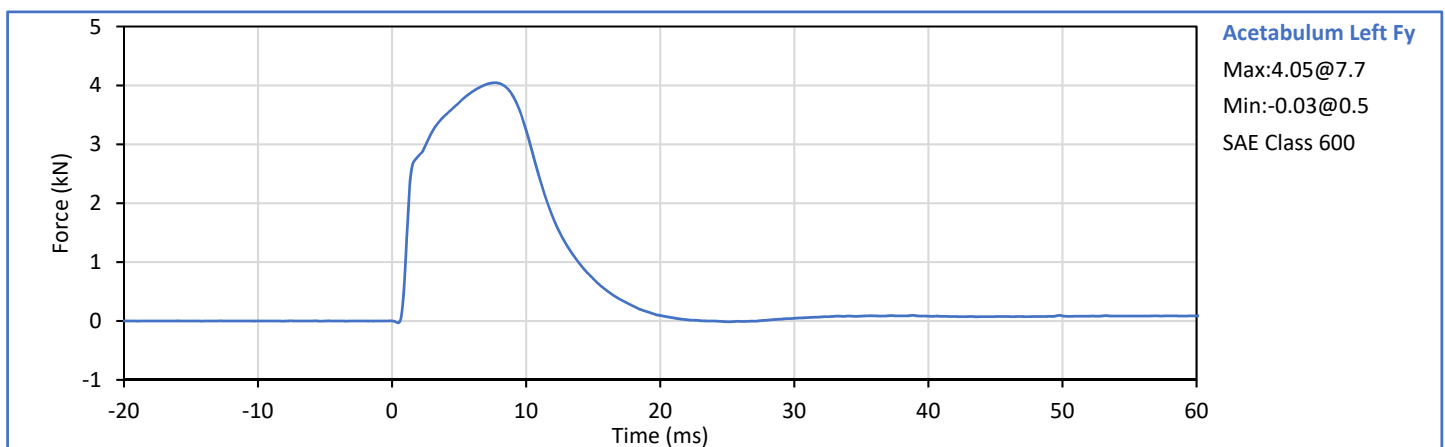
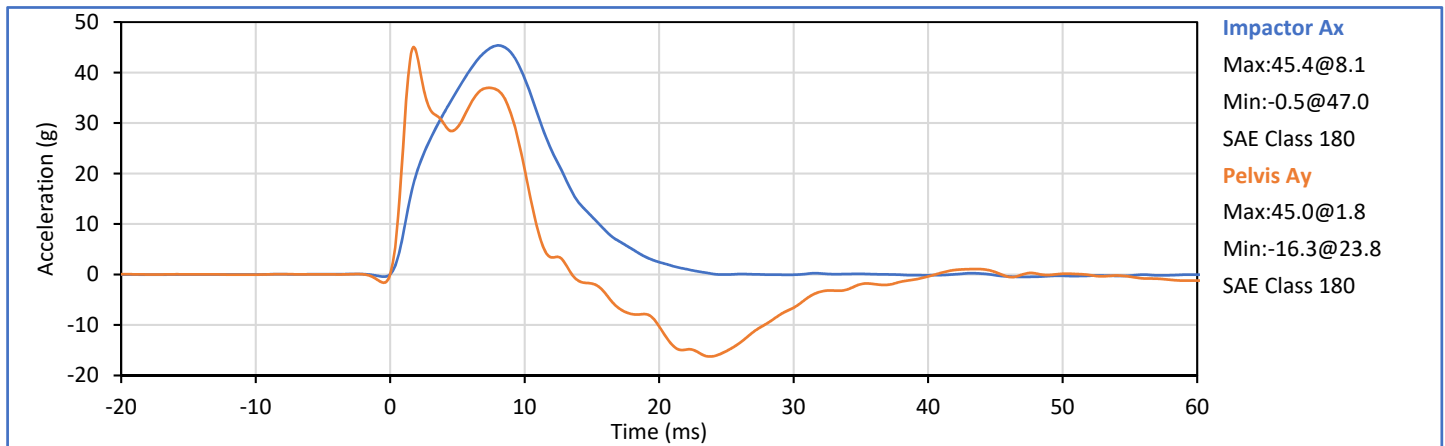
Approved By:

P. Puzzuto

P. Puzzuto

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	6.60	6.80	6.72	Pass
Peak Acetabulum Fy	kN	3.60	4.30	4.05	Pass
Pelvis Ay after 6ms	g	34.0	42.0	37.0	Pass
Peak Impactor Ax	g	38.0	47.0	45.4	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 11709 (SACO)



Technician:

[Signature]

J. Hernandez

Approved By:

[Signature]

P. Puzzuto



SID-IIs Pelvis Plug Certification Test

Plug S/N 11709

Test Number 3451

Report Number 3444

Test Date 3/27/2017 12:48:00 PM

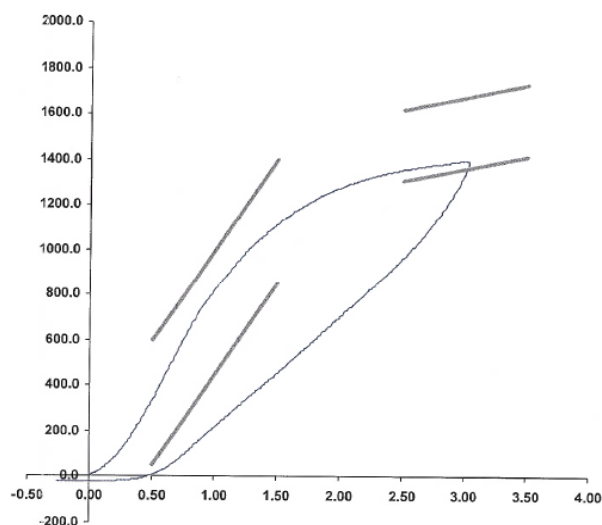
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Force @ 0.5 mm (N)	329.53	50.00	600.00
Force @ 1.5 mm (N)	1,108.85	850.00	1,400.00
Force @ 2.5 mm (N)	1,353.03	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,393.10	1,361.00	1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (T1240813), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator DC

Part Number 180-4450

Template No 107 27-Mar-17

SACO Research

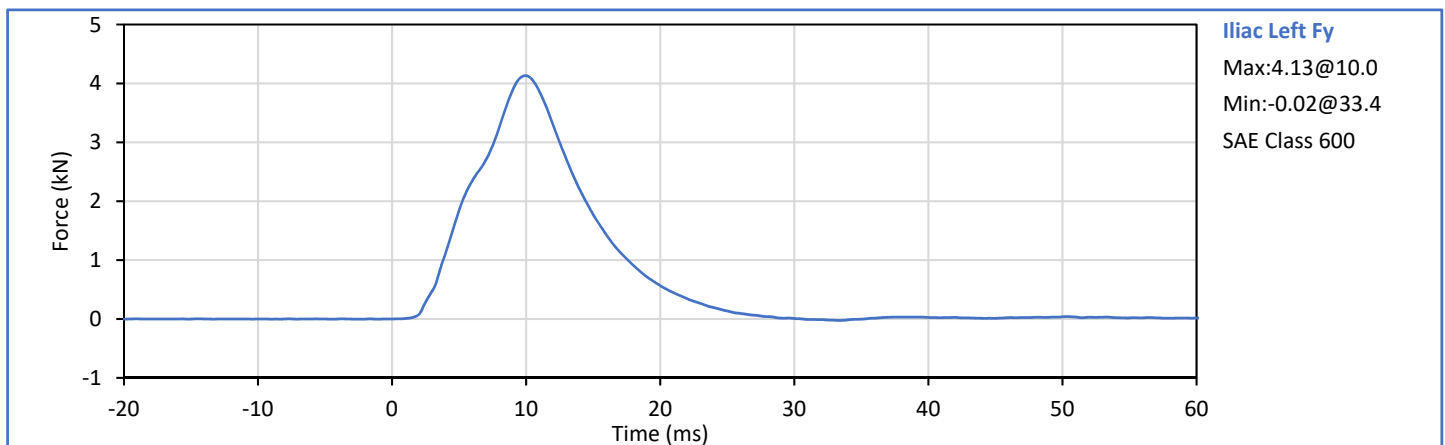
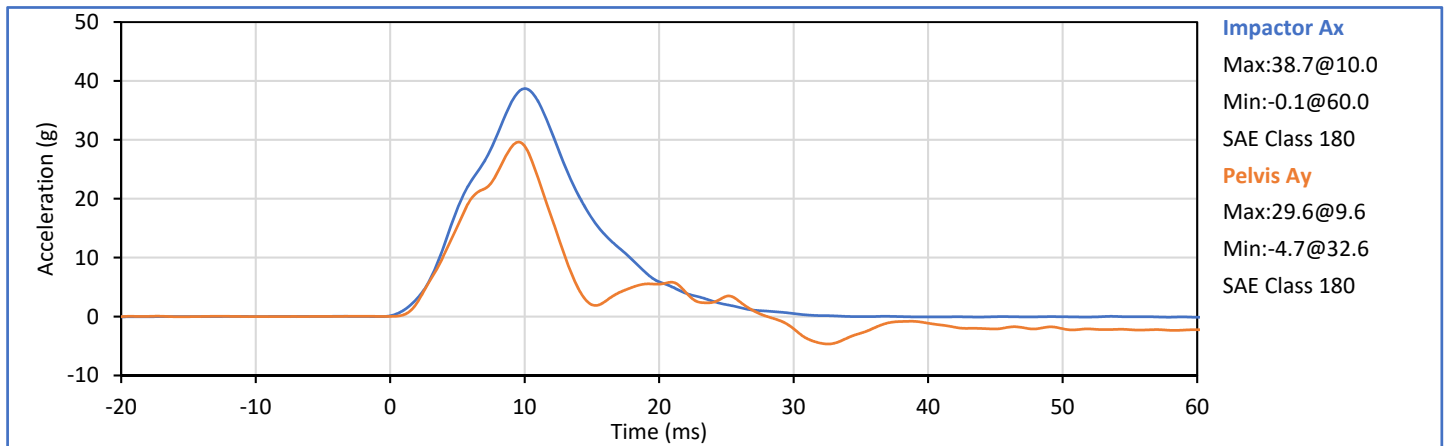
By: DC Date: 3/27/17

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

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	43	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Iliac Fy	kN	4.10	5.10	4.13	Pass
Pelvis Ay after 6ms	g	28.0	39.0	29.6	Pass
Peak Impactor Ax	g	36.0	45.0	38.7	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12228 (SACO) *

* Plug is not impacted and remains certified



Technician:

[Signature]

J. Hernandez

Approved By:

[Signature]

P. Puzzuto

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P63980	Endevco	7264C-2k	2019-10-31
Head Acceleration Y Primary	P58861	Endevco	7264C-2k	2019-10-31
Head Acceleration Z Primary	P51261	Endevco	7264C-2k	2019-10-31
Head Acceleration X Redundant	P58808	Endevco	7264C-2k	2019-10-31
Head Acceleration Y Redundant	P63310	Endevco	7264C-2k	2019-10-31
Head Acceleration Z Redundant	P49189	Endevco	7264C-2k	2019-10-31
Head Rotation Rate X	ARS7498	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Y	ARS7367	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Z	ARS7377	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Upper Thorax Rib Deflection Y	1172	Servo	08TCI-3725	2019-10-31
Middle Thorax Rib Deflection Y	1219	Servo	08TCI-3725	2019-10-31
Lower Thorax Rib Deflection Y	1221	Servo	08TCI-3725	2019-10-31
Upper Abdomen Rib Deflection Y	1252	Servo	08TCI-3725	2019-10-31
Lower Abdomen Rib Deflection Y	1283	Servo	08TCI-3725	2019-10-31
Lower Spine T12 Acceleration X	P52108	Endevco	7264C-2k	2019-10-31
Lower Spine T12 Acceleration Y	P63970	Endevco	7264C-2k	2019-10-31
Lower Spine T12 Acceleration Z	P51712	Endevco	7264C-2k	2019-10-31
Iliac Wing Impact Side Force Y	289 Fy (Iliac)	R.A. Denton	3228J	2019-10-17
Acetabulum Impact Side Force Y	277 Fy (Acetabulum)	R.A. Denton	3249J	2019-10-07

Table 2 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	10863	Endevco	757F-2k	2019-10-14
Vehicle CG Ay	10438	Endevco	757F-2k	2019-11-25
Vehicle CG Az	10431	Endevco	757F-2k	2019-10-14
Left Floor Sill Ay	10432	Endevco	757F-2k	2019-10-15
A-Pillar Sill Ay	10435	Endevco	757F-2k	2019-11-25
A-Pillar Low Ay	10436	Endevco	757F-2k	2019-10-16
A-Pillar Mid Ay	10421	Endevco	757F-2k	2019-11-07
B-Pillar Sill Ay	10422	Endevco	757F-2k	2019-10-14
B-Pillar Low Ay	10423	Endevco	757F-2k	2019-10-15
B-Pillar Mid Ay	10419	Endevco	757F-2k	2019-10-15
Driver Seat Track at H-Point Ay	10109	Endevco	757F-2k	2019-11-27
Engine Top Ax	10117	Endevco	757F-2k	2019-10-11
Engine Top Ay	10248	Endevco	757F-2k	2019-10-11
Firewall Ay	A224516	MSI	52F-2000	2019-11-08
Right Roof Ay	A224564	MSI	52F-2000	2019-10-11
Right Floor Sill Ay	A224577	MSI	52F-2000	2019-10-11
Rear Floorpan Ax	A247080	MSI	52F-2000	2019-11-25
Rear Floorpan Ay	A248840	MSI	52F-2000	2019-10-14

Table 3 - Rigid Pole Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Load Cell Pole Barrier #1 Force Y	131822A	Interface	1220-FS	2019-05-07
Load Cell Pole Barrier #2 Force Y	132304A	Interface	1220-FS	2019-05-07
Load Cell Pole Barrier #3 Force Y	19477	Interface	1220-FS	2019-05-07
Load Cell Pole Barrier #4 Force Y	19325	Interface	1220-FS	2019-05-07
Load Cell Pole Barrier #5 Force Y	131827A	Interface	1220-FS	2019-05-07
Load Cell Pole Barrier #6 Force Y	132302A	Interface	1220-FS	2019-05-07
Load Cell Pole Barrier #7 Force Y	19267	Interface	1220-FS	2019-05-07
Load Cell Pole Barrier #8 Force Y	19321	Interface	1220-FS	2019-05-07