REPORT NUMBER: SideNCAPPole-KAR-22-009

NEW CAR ASSESSMENT PROGRAM (NCAP)

SIDE IMPACT POLE TEST

TOYOTA MOTOR MANUFACTURING, TEXAS, INC

2022 TOYOTA TUNDRA CREWMAX 4X2 4-DOOR TRUCK

NHTSA No: M20225104

PREPARED BY:

APPLUS IDIADA KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

NOVEMBER 11, 2022

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

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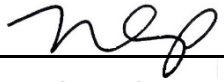
Approved By: 

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Approval Date: November 11, 2022

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

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Final Report of New Car Assessment Program Side Impact Pole Testing of a 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104	November 11, 2022
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7. Authors Mr. Matthew J. Angeles, Project Engineer, Applus IDIADA KARCO Engineering, LLC Mr. Alex Beltran, Engineering Manager, Applus IDIADA KARCO Engineering, LLC	**8. Performing Organization Report No.** TR-P4222701-NC
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15. Supplementary Notes

16. Abstract

A 32.2 km/h 75° rigid pole side NCAP impact test was conducted on the subject 2022 Toyota Tundra CrewMax 4X2 4-door truck 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 October 28, 2022.

The impact velocity was 32.05 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 18.9°C. The target vehicle's maximum post-test static crush was 257 mm located at level 3. 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	448.801
Resultant Lower Spine Acceleration	g	82	33.149
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3337.965
Maximum Thoracic Rib Deflection	mm	38	22.236
Maximum Abdominal Rib Deflection	mm	45	25.111

The struck side doors and the front non-struck door of the vehicle were jammed shut and did not separate from the body at the hinges or latches. The remaining door 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. Office of Crashworthiness Standards (NRM-100) 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
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SECTION 1
TEST PURPOSE AND SUMMARY OF TEST

PURPOSE

This side impact test is part of the 2022 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number 693JJ920D000015. The purpose of this test is to generate comparative side impact performance in a 2022 Toyota Tundra CrewMax 4X2 4-Door Truck. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure date March 2020.

SUMMARY

A rigid pole side impact test was conducted on a 2022 Toyota Tundra CrewMax 4X2 4-door truck. The subject vehicle was towed into the rigid pole at an angle of 76.3° and a velocity of 32.05 km/h. The test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California on October 28, 2022. 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 March 2020. 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	448.801
Lower Spine (T12) Resultant Acceleration	g	82	33.149
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3337.965
Maximum Thoracic Rib Deflection	mm	38*	22.236
Maximum Abdominal Rib Deflection	mm	45*	25.111

**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	No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

GENERAL COMMENTS

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

- Left Rear Sill Ay, Channel Failed at 53.0 ms

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

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: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20225104
Model Year	2022
Make	Toyota
Model	Tundra CrewMax 4X2
Body Style	4-Door Truck
VIN	5TFLA5ABXNX015319
Body Color	White
Odometer Reading (km / mi)	285 / 177
Engine Displacement (L)	3.5
Type / No. of Cylinders	V6
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	10
Overdrive	Yes
Final Drive	RWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	Yes
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	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	Yes

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Motor Manufcaturing, Texas, Inc.
Date of Manufacture	Aug-22
Vehicle Type	Truck

GVWR (kg)	3170
GAWR Front (kg)	1850
GAWR Rear (kg)	1750

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				635.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				136.0	*A-B**

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

VEHICLE SEAT TYPE

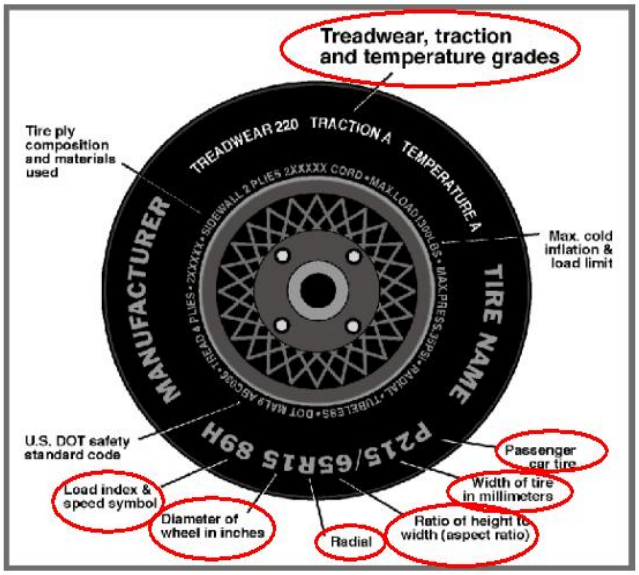
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	265/70R18	265/70R18
Tire Size on Vehicle	265/70R18	265/70R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Dueler H/T	Dueler H/T
Treadware	520	520
Traction Grade	A	A
Temperature Grade	Bridgestone	Bridgestone
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	116T	116T
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	17X H4DHT1 1322	17X H4DHT1 1322
DOT Safety Code Right	17X H4DHT1 1322	17X H4DHT1 1322

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	240	240	240	240
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	660.5	524.0		673.0	603.0		705.5	592.0	
Right	kg	695.5	536.5		702.0	616.5		699.5	604.5	
Ratio	%	56.1%	43.9%	100.0%	53.0%	47.0%	100.0%	54.0%	46.0%	100.0%
Total	kg	1356.0	1060.5	2416.5	1375.0	1219.5	2594.5	1405.0	1196.5	2601.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2416.5	A
Actual Weight of 1 SID II-s ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	136.0	C
Calculated Vehicle Target Wt (TVTW)	kg	2601.5	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)*	°	1.2	0.3	0.1	Yes
Front Passenger Sill Angle (front-to-rear)*	°	0.9	1.5	1.9	Yes
Front Bumper-Line Angle (left-to-right)**	°	-0.5	0.7	0.9	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.2	0.3	0.4	Yes
Vehicle CG (Aft of Front Axle)	mm	1627	1743	1705	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	-17	-14	-2	

*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: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
N/A	N/A

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm target	0
Aft 25 mm target	0

DATA SHEET NO. 2

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

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

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	Fixed	Fixed	Fixed
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	Fixed	839	Max			
			Mid	837	838	839
			Min			
Front Passenger Seat	Fixed	839	Max			
			Mid	837	838	839
			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: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

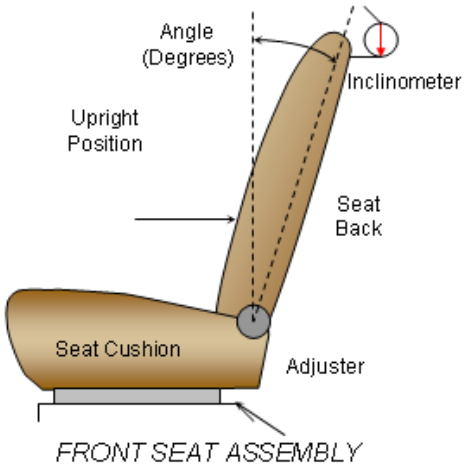
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	26	0	0
Front Passenger Seat	260	26	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 using an inclinometer along the bottom of the headrest post.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	51.6	26	3.7	21
Front Passenger Seat	52.0	26	N/A	N/A
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

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	3	H

DATA SHEET NO. 2 … (CONTINUED)

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

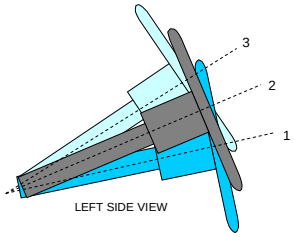
Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

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.

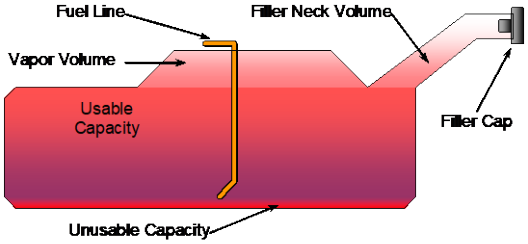
	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	64.1	89
Geometric Center - Position 2	66.4	115.5
Uppermost - Position 3	68.7	142
Telescoping Steering Wheel Travel		59
Test Position	66.4	115.5



STEERING COLUMN ASSEMBLY

FUEL PUMP

The vehicle is equipped with an electric fuel pump. The pump will work at "ignition on" until pressure in the system has reached working pressure in the system; then it will stop pumping fuel until the engine has been started.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	121.89
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)*	
Usable Capacity of "Optional Tank" (see Owner's Manual)*	
93% of Usable Capacity	113.36
Actual amount of Solvent Used in Test	113.36
1/3 of Usable Capacity	40.63

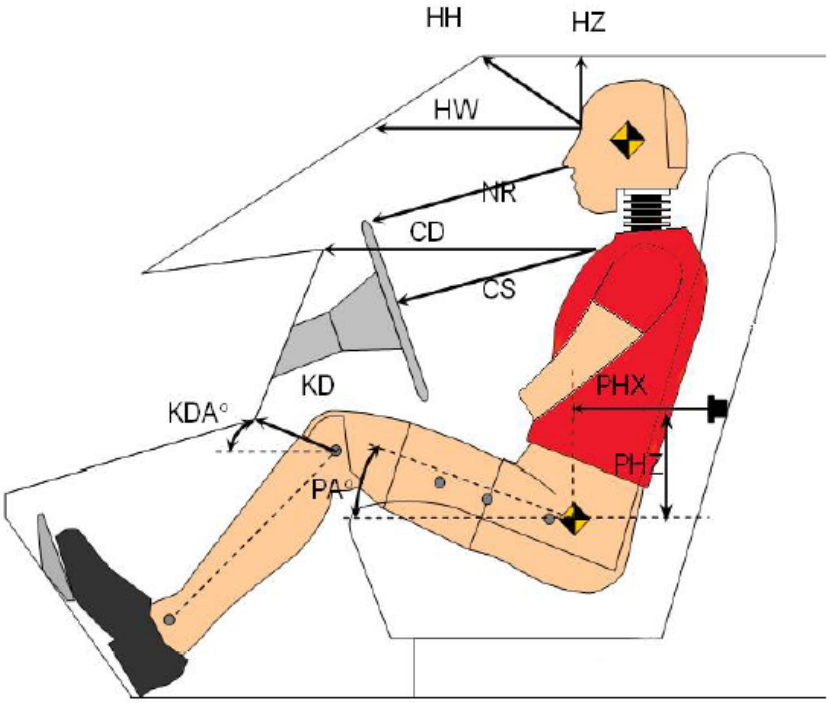
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



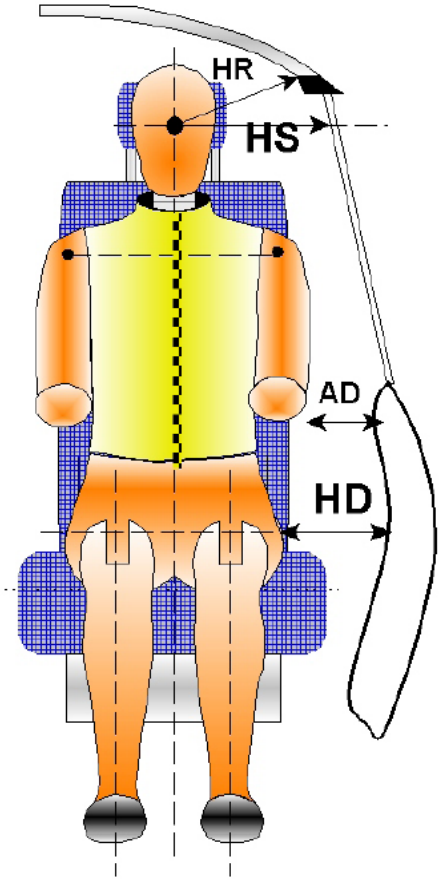
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	371	
HW	Head to Windshield	690	
HZ	Head to Roof	310	
NR	Nose to Rim	322	
CD	Chest to Dash	469	
CS	Chest to Steering Wheel	199	
KD(L)/KDA(L)°	Left Knee to Dash	117	36.3
KD(R)/KDA(R)°	Right Knee to Dash	112	34.5
PAX°	Pelvic Tilt Angle (x-axis)		21.9
PAY°	Pelvic Tilt Angle (y-axis)		1.7
PHX	Hip Point to Striker (x-axis)	369	
PHZ	Hip Point to Striker (z-axis)	149	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



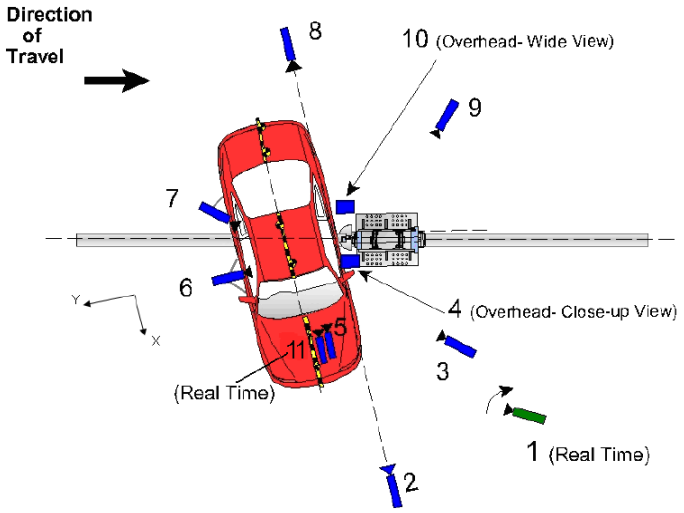
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	316
HS	Head to Side Window	mm	410
AD	Arm to Door	mm	182
HD	Hip Point to Door	mm	252

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



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	35	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	25	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	35	1000
5	On-Board - Dummy Front View	1.34	-0.53	-1.57	8	1000
6	On-Board - Dummy Side View	0.06	0.73	-1.32	6	1000
7	On-Board - Dummy Rear Oblique View	-0.97	0.70	-1.36	6	1000
8	Rear Ground Level - Impact View	-1.30	1.68	-1.26	35	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	25	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	15	1000
11	Real Time Dummy Front View	1.34	-0.52	-1.56		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

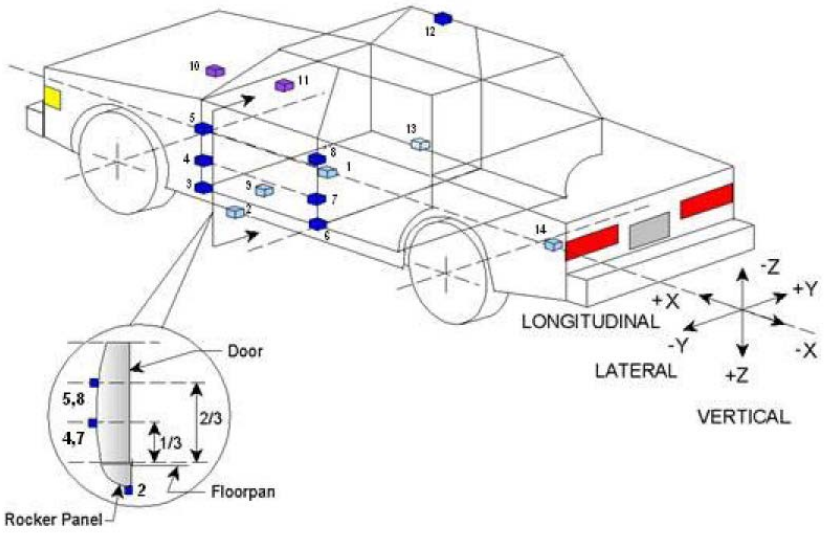
Driver Dummy Channels	19
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	45

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2924	0	-734
2	Left Floor Sill	3711	-846	-455
3	A-Pillar Sill	4285	980	-671
4	A-Pillar Low	4285	980	-854
5	A-Pillar Mid	4285	980	-1181
6	B-Pillar Sill	3210	771	-615
7	B-Pillar Low	3210	771	-989
8	B-Pillar Mid	3210	771	-1248
9	Driver Seat Track	3247	215	-687
10	Engine Top	4952	0	-1087
11	Firewall	4466	463	-891
12	Right Roof	3420	512	-610
13	Right Floor Sill	3009	813	-888
14	Rear Floorpan	1252	0	-888

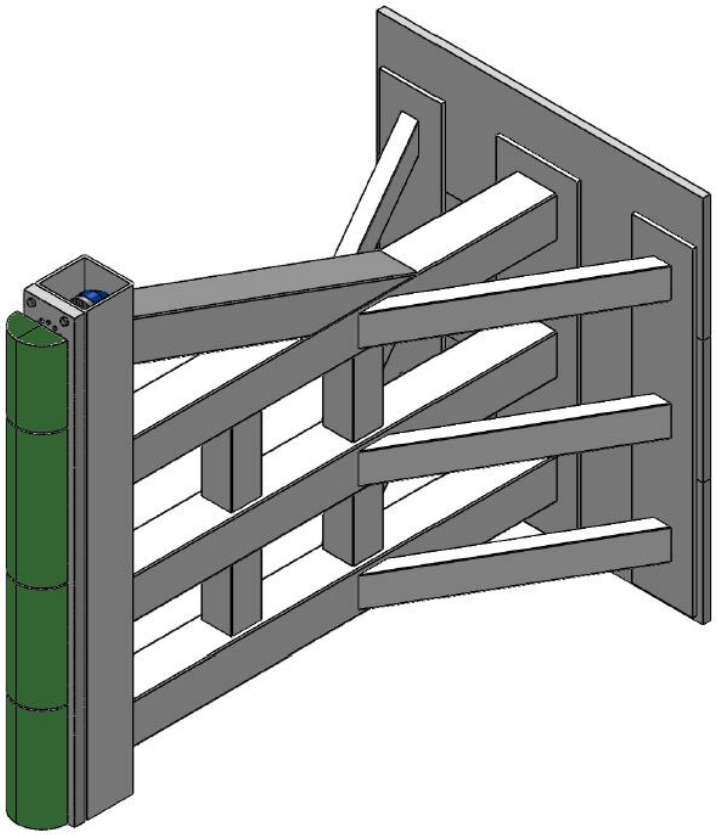
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



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: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

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	Headrest, Seatback, Curtain Airbag
Left Shoulder	Torso/Pelvis Airbag, Seatback Bolster, Curtain Airbag
Upper Torso	Seatback Bolster
Lower Torso	Seatback Bolster
Left Hip	Torso/Pelvis Airbag, Seat Cushion Bolster, Seatback Bolster
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	No	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	Yes	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: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	None
Windshield Damage	Broken
Side Window Damage	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	No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

IMPACT POINT LOCATION DATA

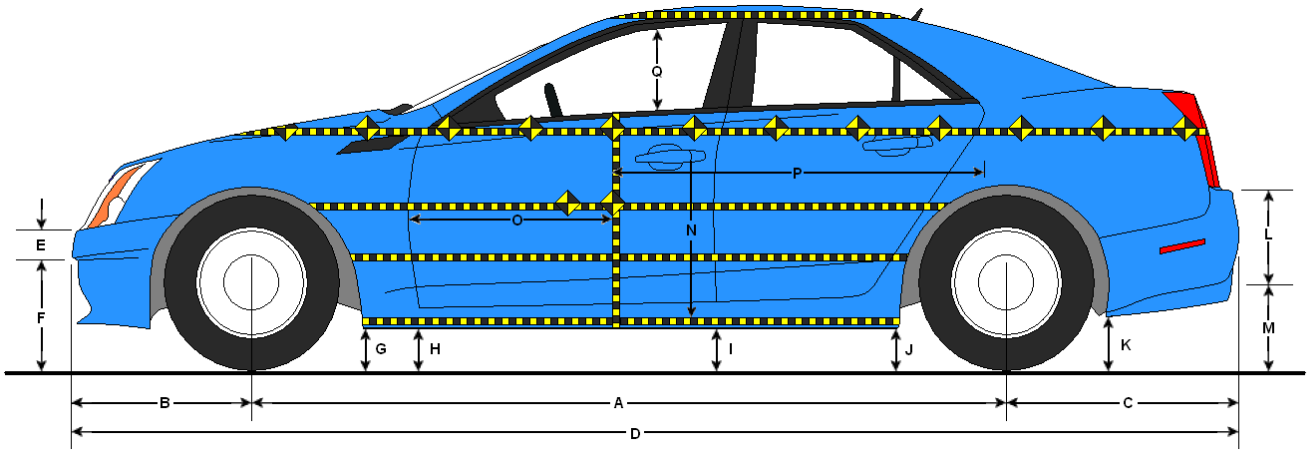
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1324
Actual Impact Point (Aft of Front Axle)	mm		1327
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-3
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	76.3
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.05
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.07

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

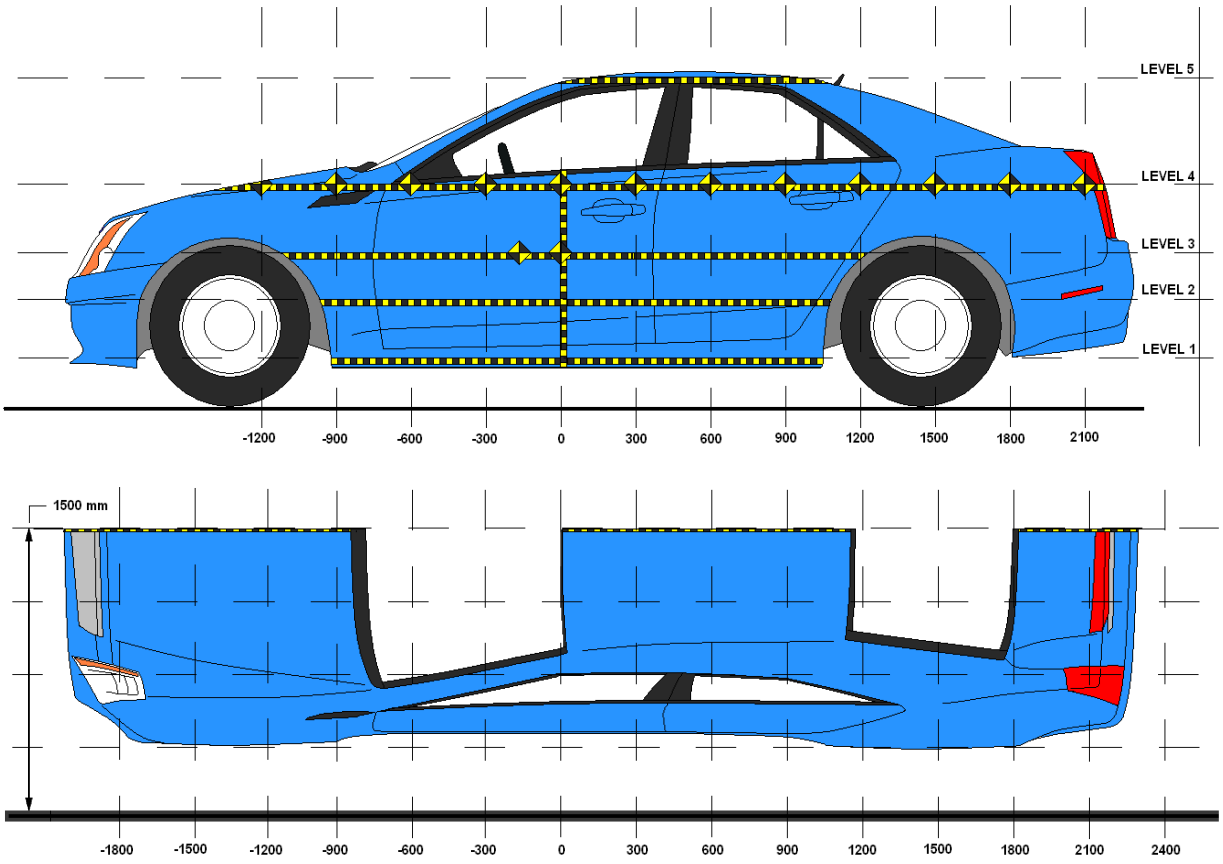
Code	Description	Pre-Test	Post-Test	Change
A	Wheelbase	3708	3688	-20
B	Front Axle to FSOV	967	896	-71
C	Rear Axle to RSOV	1230	1287	57
D	Total Length at Centerline	5904	5871	-33
E	Front Bumper Thickness	142	144	2
F	Fromt Bumper Bottom to Ground	394	423	29
G	Sill Height at Front Wheel Well	357	387	30
H	Sill Height at Front Door Leading Edge	435	467	32
I	Sill Height at B-Pillar	438	501	63
J1	Sill Height at Rear Wheel Well	408	516	108
J2	Pinch Weld Height at Rear Wheel Well	386	444	58
K	Sill Height Aft of Rear Wheel Well	557	719	162
L	Rear Bumper Thickness	201	196	-5
M	Rear Bumper Bottom to Ground	480	555	75
N	Sill Height to Bottom of Front Window Sill	725	775	50
O	Front Door Leading Edge to Impact CL	708	655	-53
P	Rear Door Trailing Edge to Impact CL	1571	1443	-128
Q	Front Window Opening	515	538	23
R	Right Side Length	5455	4668	-787
S	Left Side Length	5450	5200	-250
T	Vehicle Width at B-Pillar	1898	1803	-95

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



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	475	204	0
2	Occupant H-Point	870	252	0
3	Mid-Door	906	257	0
4	Window Sill	1243	233	0
5	Window Top	1824	81	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

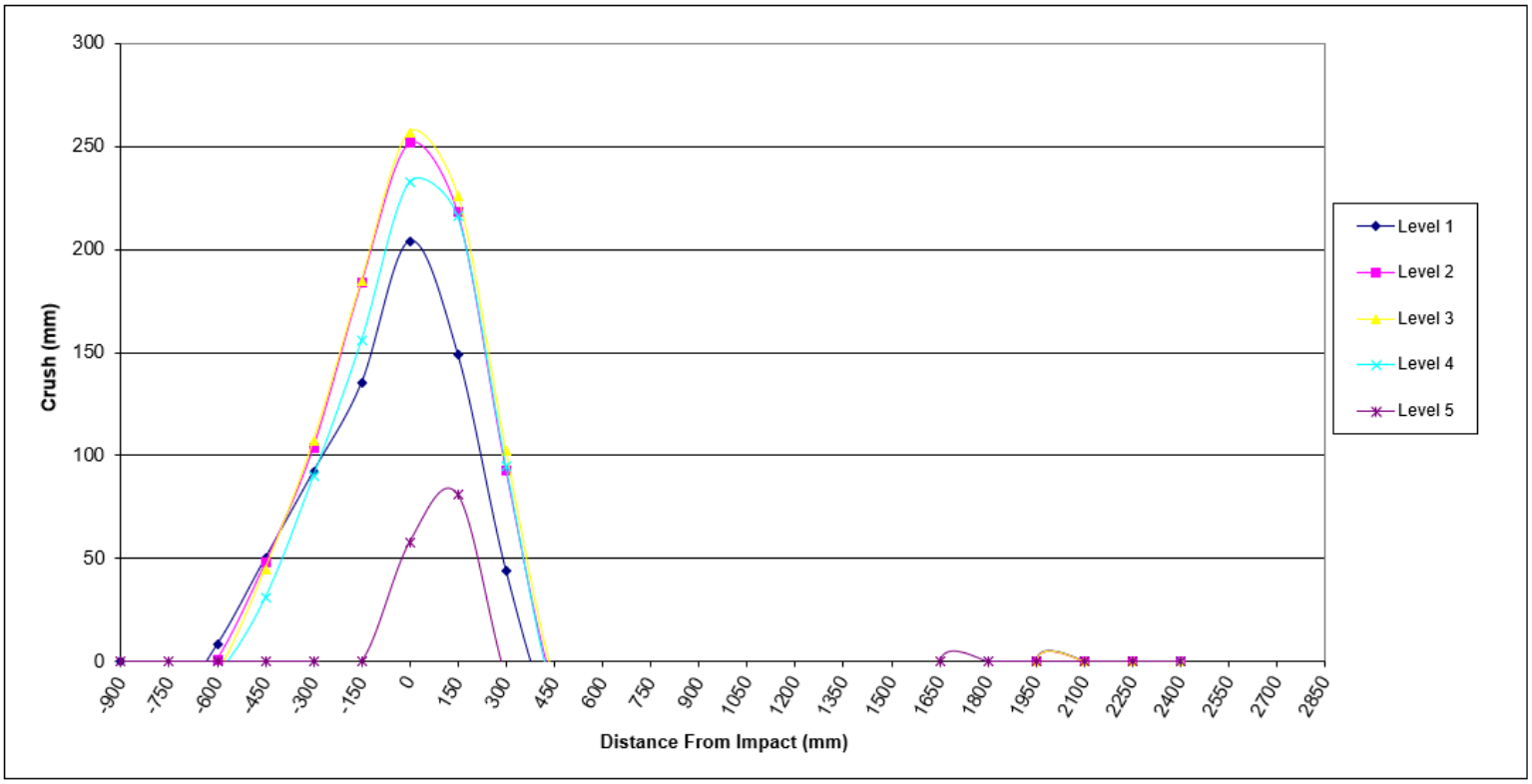
	Pre-Test (mm)					Post-Test (mm)					Crush (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900		480	489	559			457	458	539			-23	-31	-20	
-750	527	491	492	560		506	464	456	540		-21	-27	-36	-20	
-600	553	503	502	564		561	504	496	558		8	1	-6	-6	
-450	556	519	517	568		606	567	562	599		50	48	45	31	
-300	558	527	523	567		650	631	630	657		92	104	107	90	
-150	559	528	523	566		694	712	708	722		135	184	185	156	
0	560	528	523	562	823	764	780	780	795	881	204	252	257	233	58
150	561	528	524	561	821	710	746	750	777	902	149	218	226	216	81
300	562	530	525	559	821	606	623	627	654	813	44	93	102	95	-8
450	563	531	526	560	822	533	518	518	542	758	-30	-13	-8	-18	-64
600	563	533	527	559	826	526	489	486	505	791	-37	-44	-41	-54	-35
750	565	535	530	560	828	497	462	460	474	757	-68	-73	-70	-86	-71
900	568	538	532	560	829	467	434	461	445	731	-101	-104	-71	-115	-98
1050	570	541	535	562	831	437	406	435	416	714	-133	-135	-100	-146	-117
1200	573	543	538	563	835	408	379	409	388	710	-165	-164	-129	-175	-125
1350	576	546	541	565	838	378	352	383	360	697	-198	-194	-158	-205	-141
1500	579	544	542	568	842	349	317	359	333	684	-230	-227	-183	-235	-158
1650	585	562	559	568		337	320	328	356		-248	-242	-231	-212	
1800	559	532	532	560		246	233	333	277		-313	-299	-199	-283	
1950				565					256					-309	
2100				571					243					-328	
2250				575					236					-339	
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

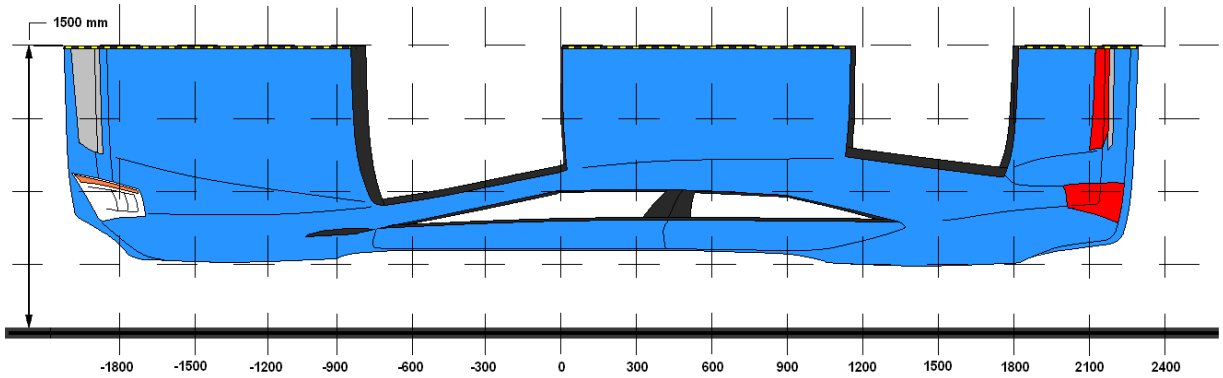


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2250	4	575	236	-339
2	1650	1	585	337	-248
3	1050	4	562	416	-146
4	300	3	525	627	102
5	-300	3	523	708	185
6	-900	3	489	458	-31

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022

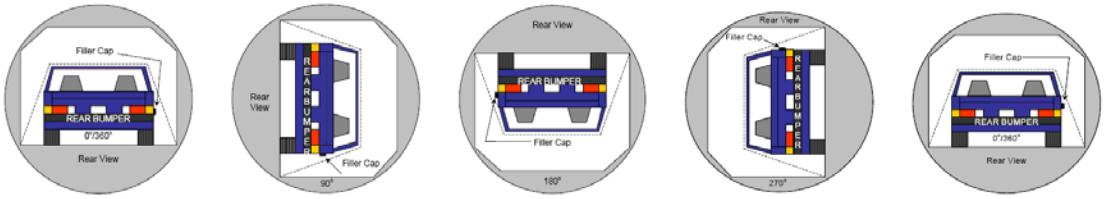
Temperature at Time of Impact: 18.9° C Test Time: 4:56 PM

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°	83	300	383
90° To 180°	81	300	381
180° To 270°	83	300	383
270° To 360°	80	300	380

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

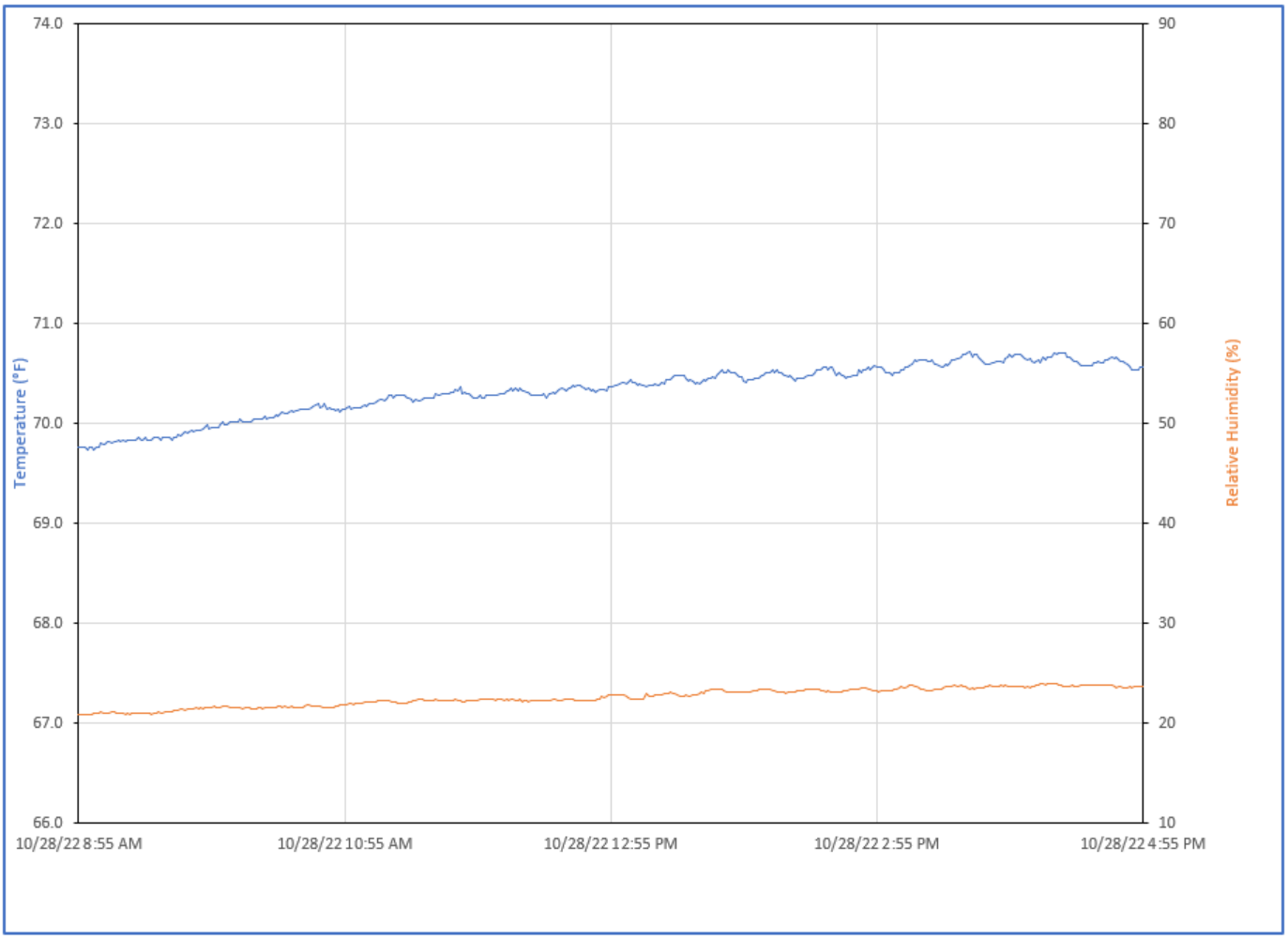
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2022 Toyota Tundra CrewMax 4X2 4-Door Truck NHTSA No. M20225104

Test Program: NCAP Side Pole Impact Test Test Date: 10/28/2022



APPENDIX A

PHOTOGRAPHS

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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

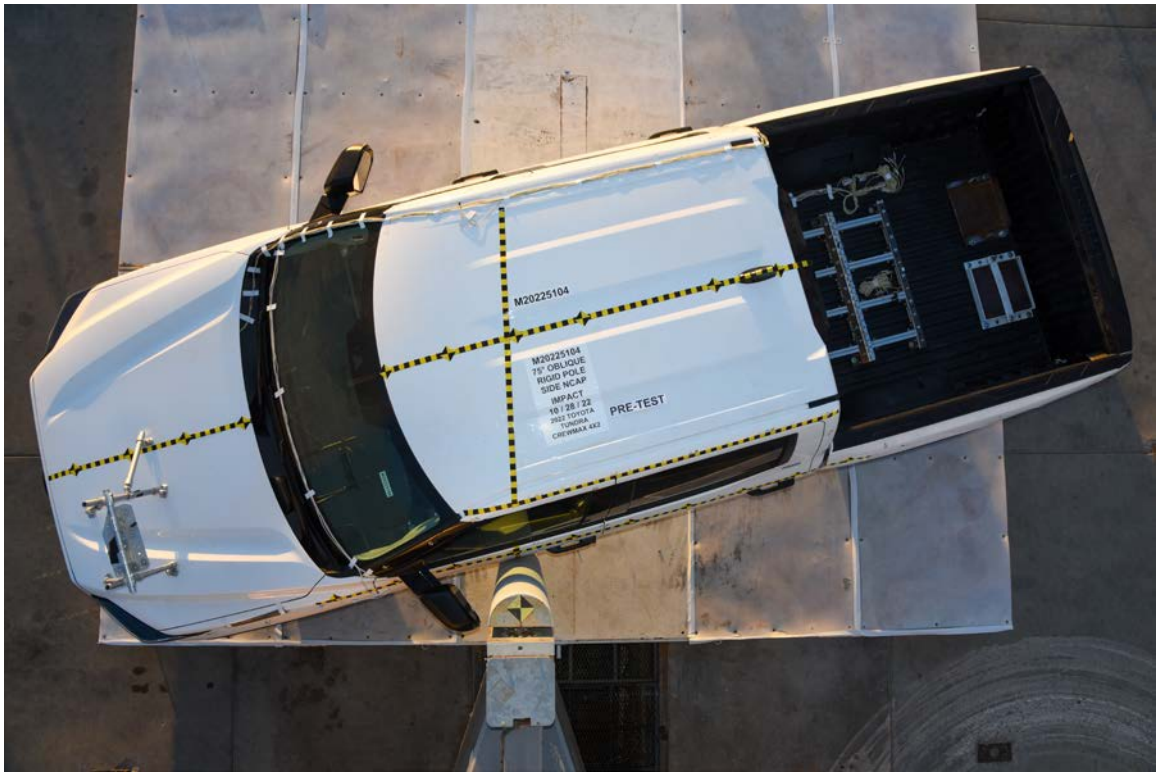

FIGURE 15. Pre-Test Overhead View of Test Area

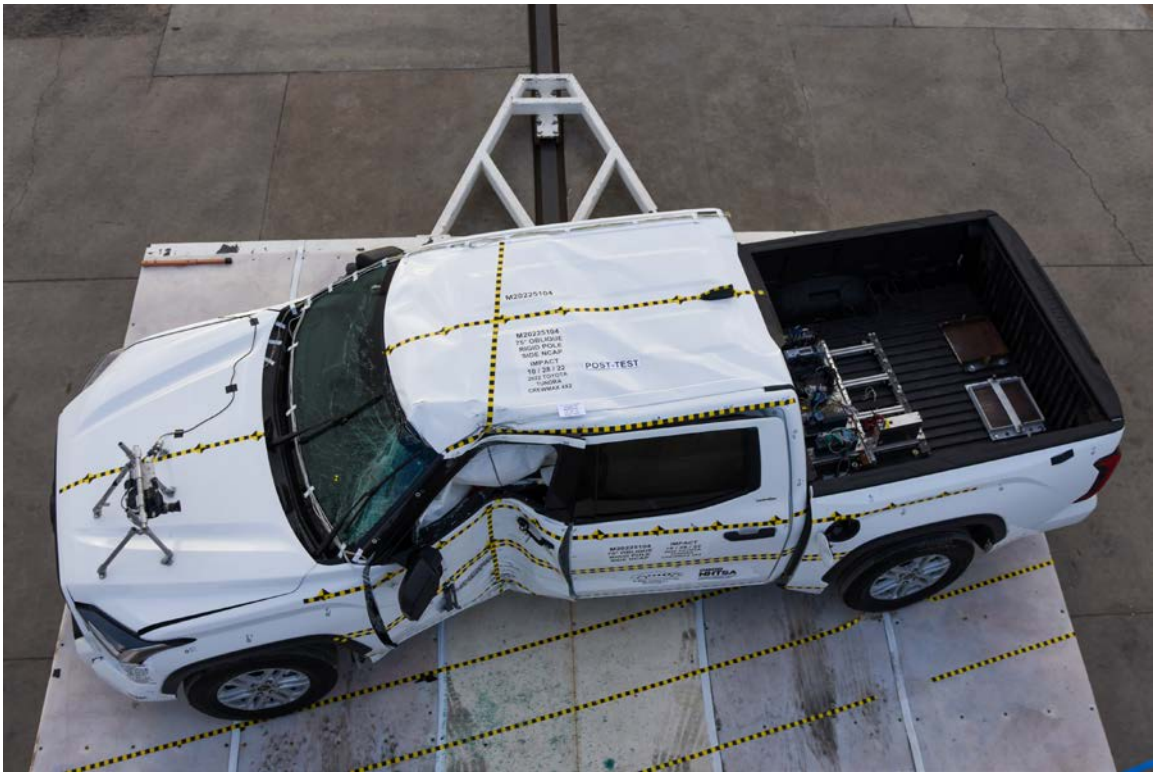

FIGURE 16. Post-Test Overhead View of Test Area

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

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

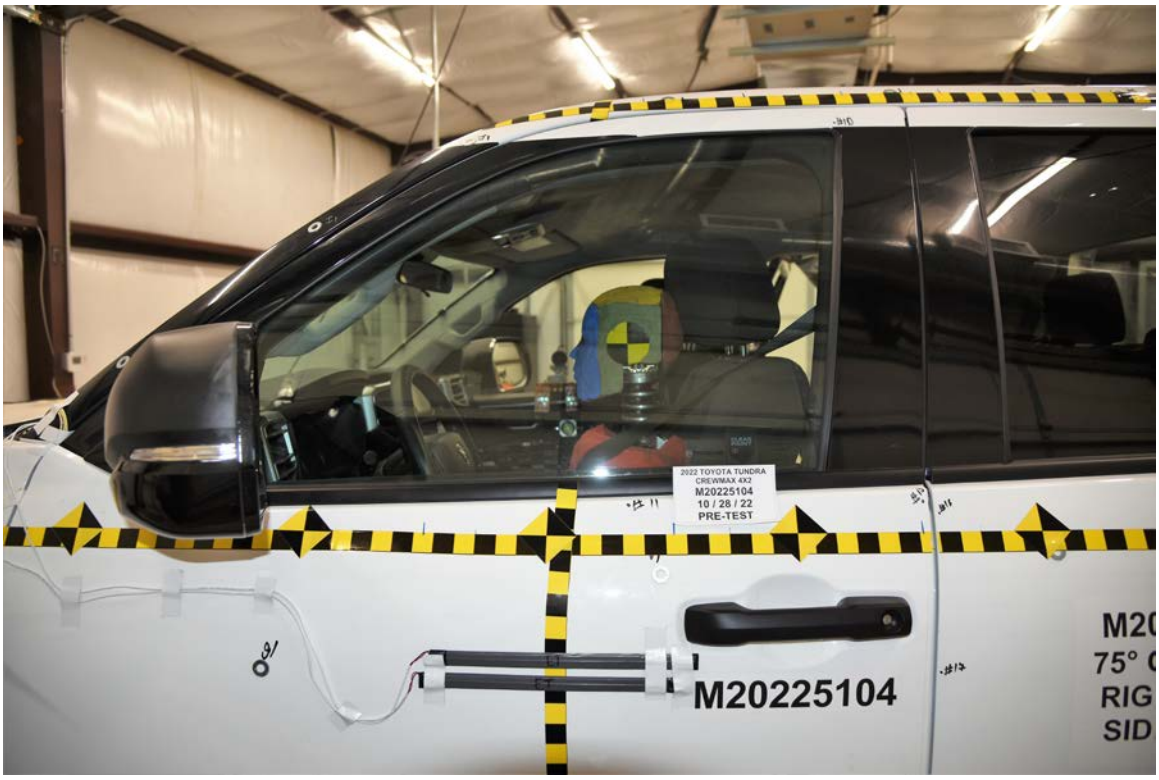

FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and Door Top View

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
Dummy Head and Shoulders in Relation to Head Restraint

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

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

Photograph Not Available

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

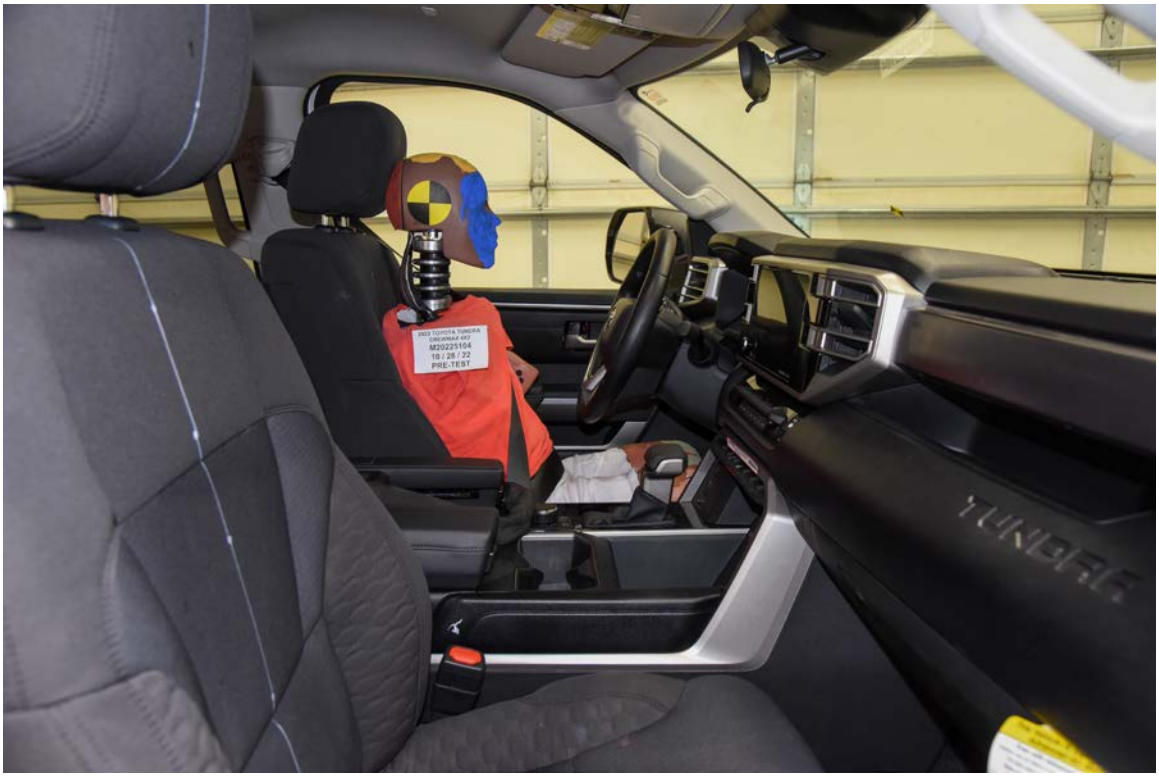

FIGURE 42. Pre-Test Right Side View of Dummy and
Front Seat of Occupant Compartment

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

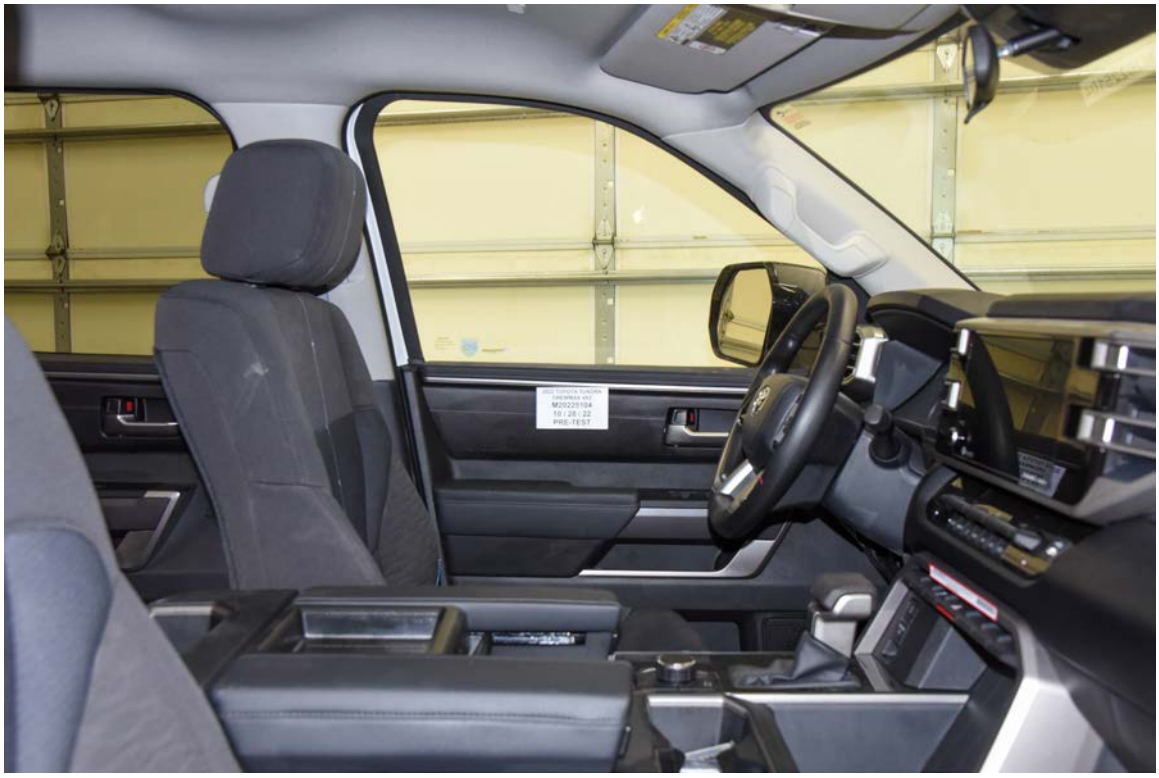

FIGURE 44. Pre-Test Inner Door Panel View

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

Photograph Not Applicable

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

Photograph Not Applicable

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

FIGURE 53. Post-Test Right Side View of Dummy and Rear Seat of Occupant Compartment

Photograph Not Applicable

FIGURE 54. Pre-Test Inner Rear Passenger Torso Airbag Deployment View

FIGURE 55. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 56. Post-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 57. Close-Up View of Vehicle's Certification Label

FIGURE 58. Close-Up View of Vehicle's Tire Information Placard or Label

FIGURE 59. Pre-Test Pole Barrier Front View

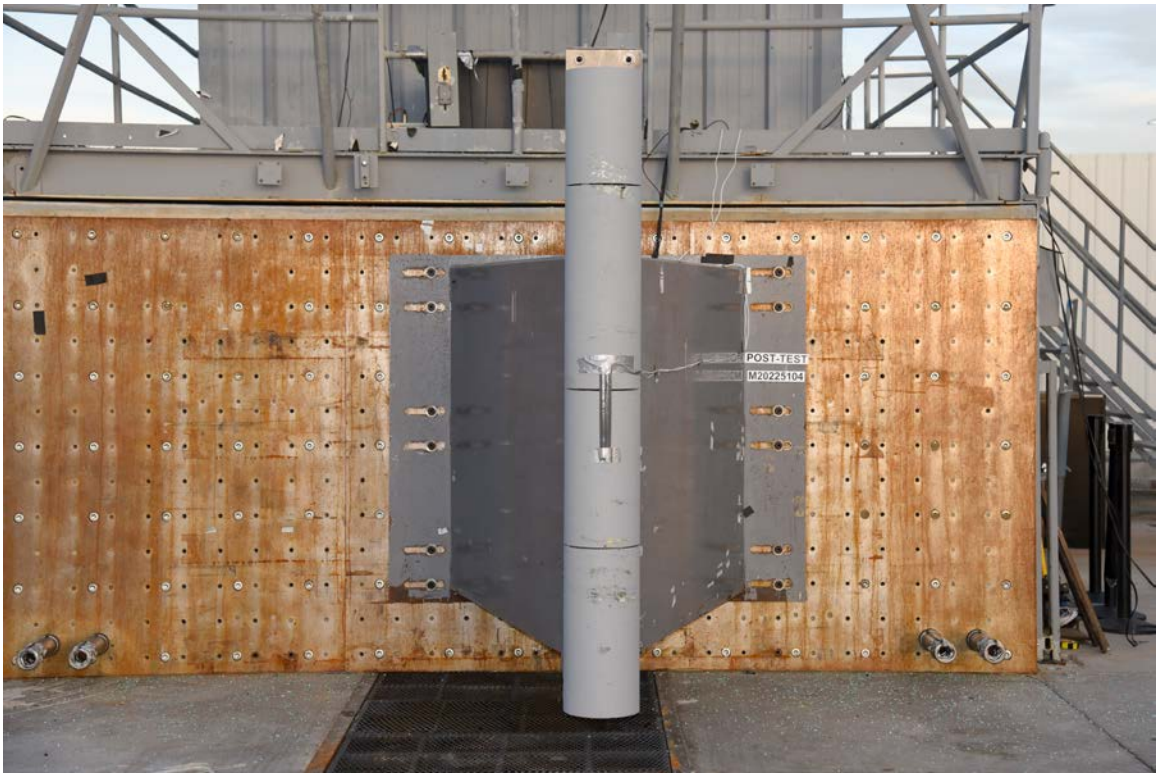

FIGURE 60. Post-Test Pole Barrier Front View

FIGURE 61. Pre-Test Pole Barrier Side View

FIGURE 62. Post-Test Pole Barrier Side View

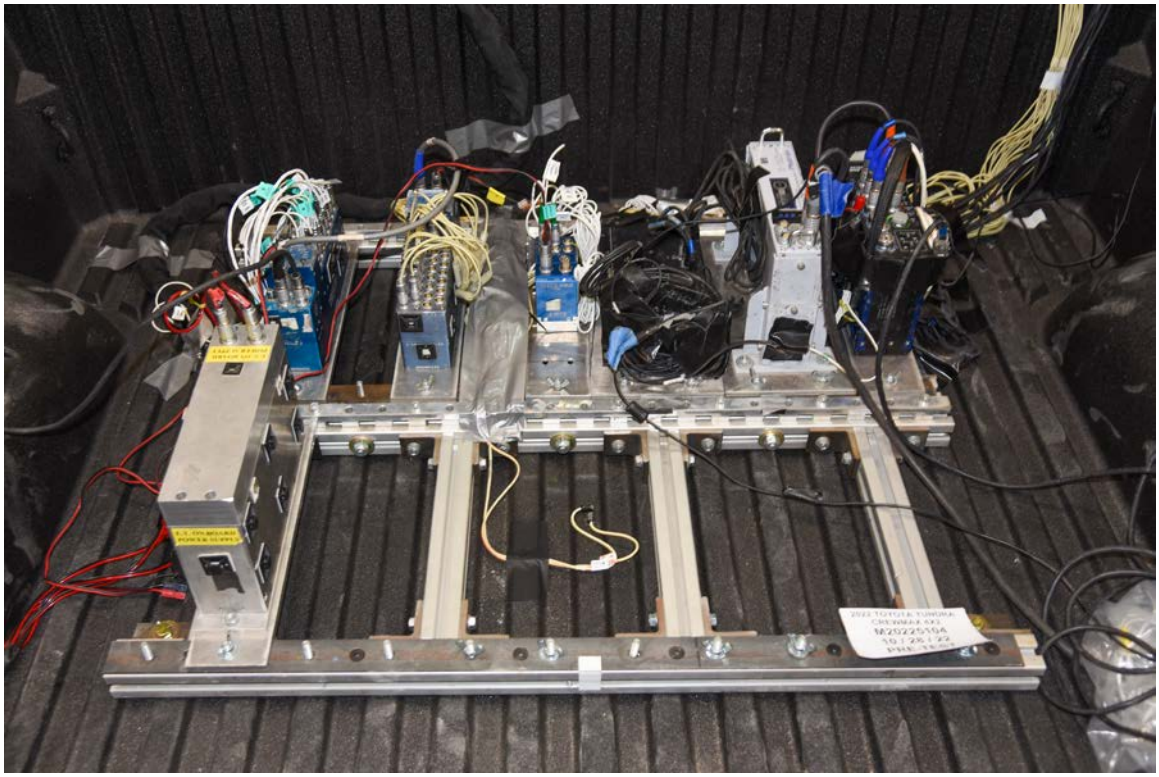

FIGURE 63. Pre-Test Ballast View

FIGURE 64. Post-Test Primary and Redundant Speed Trap Read-Out

FIGURE 65. FMVSS No. 301 Static Rollover 0 Degrees

FIGURE 66. FMVSS No. 301 Static Rollover 90 Degrees

FIGURE 67. FMVSS No. 301 Static Rollover 180 Degrees

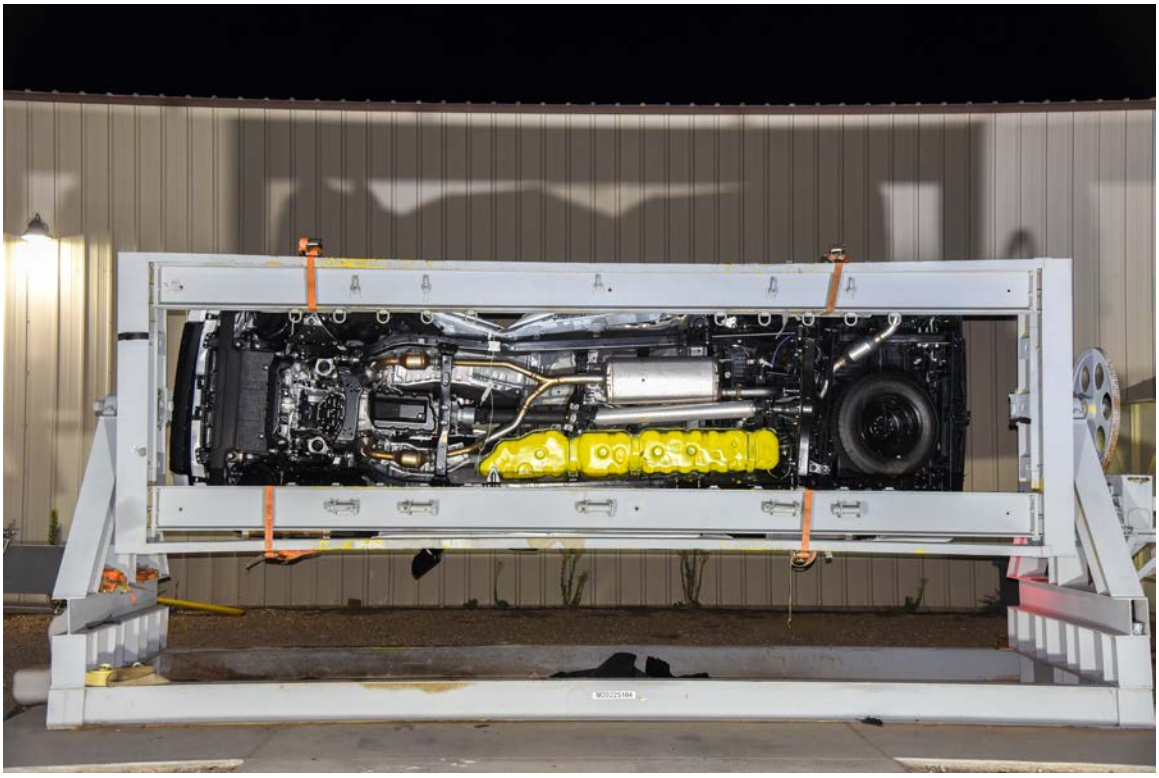

FIGURE 68. FMVSS No. 301 Static Rollover 270 Degrees

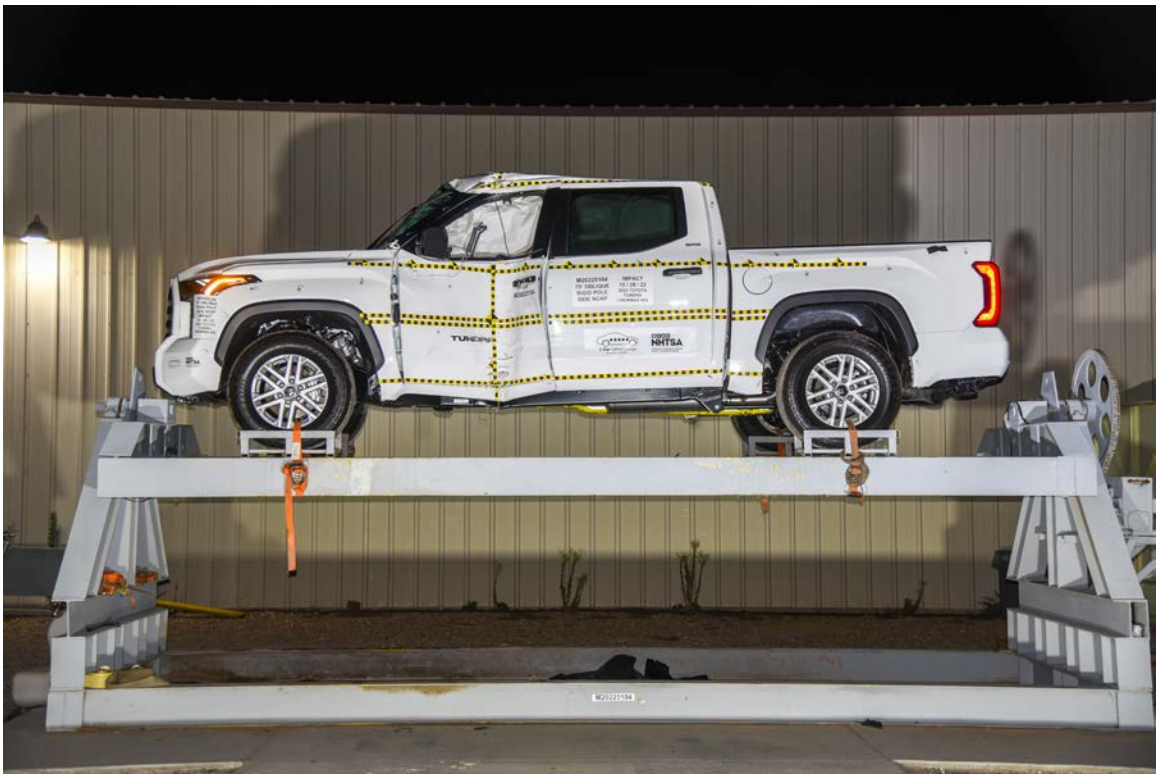

FIGURE 69. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 70. Impact Event

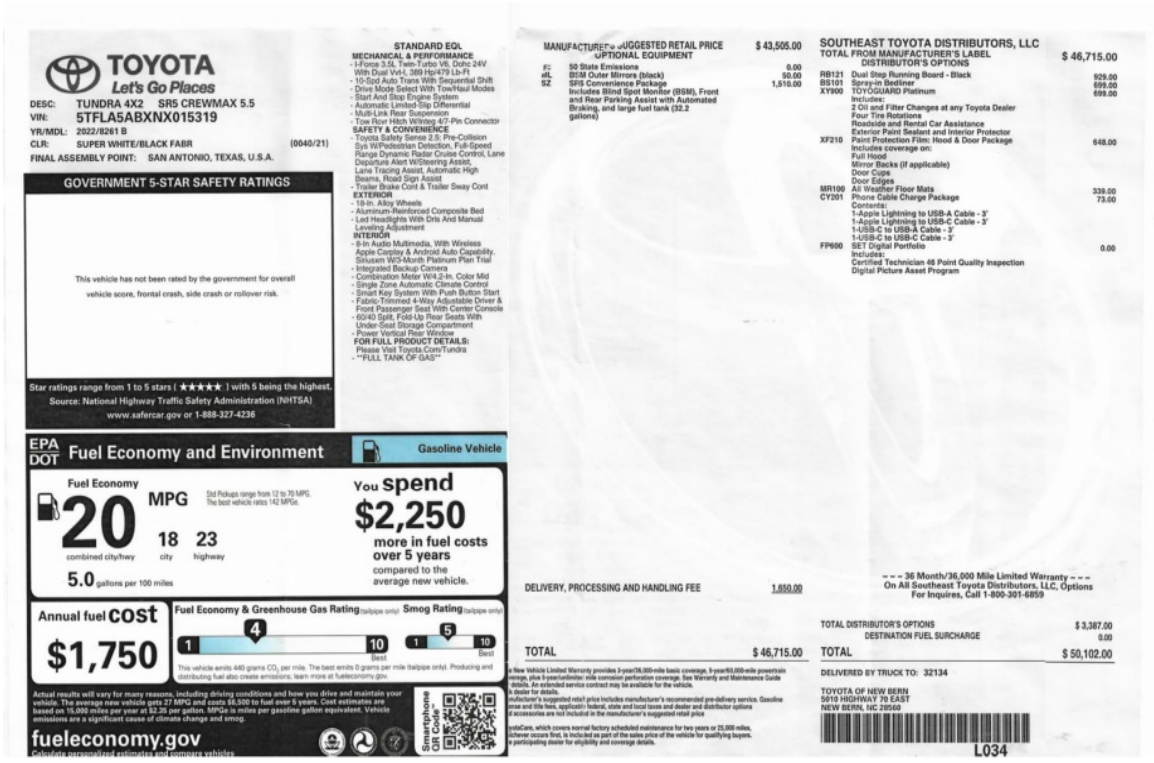

FIGURE 71. Monroney Label

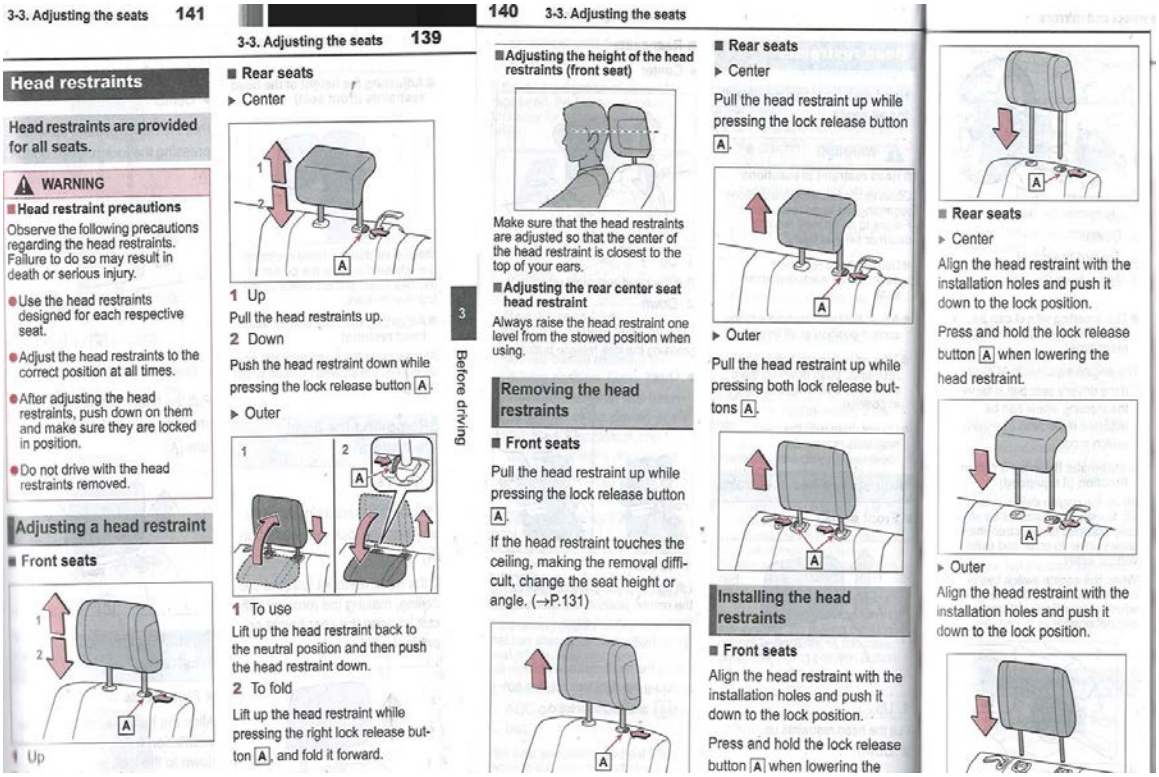

FIGURE 72. Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

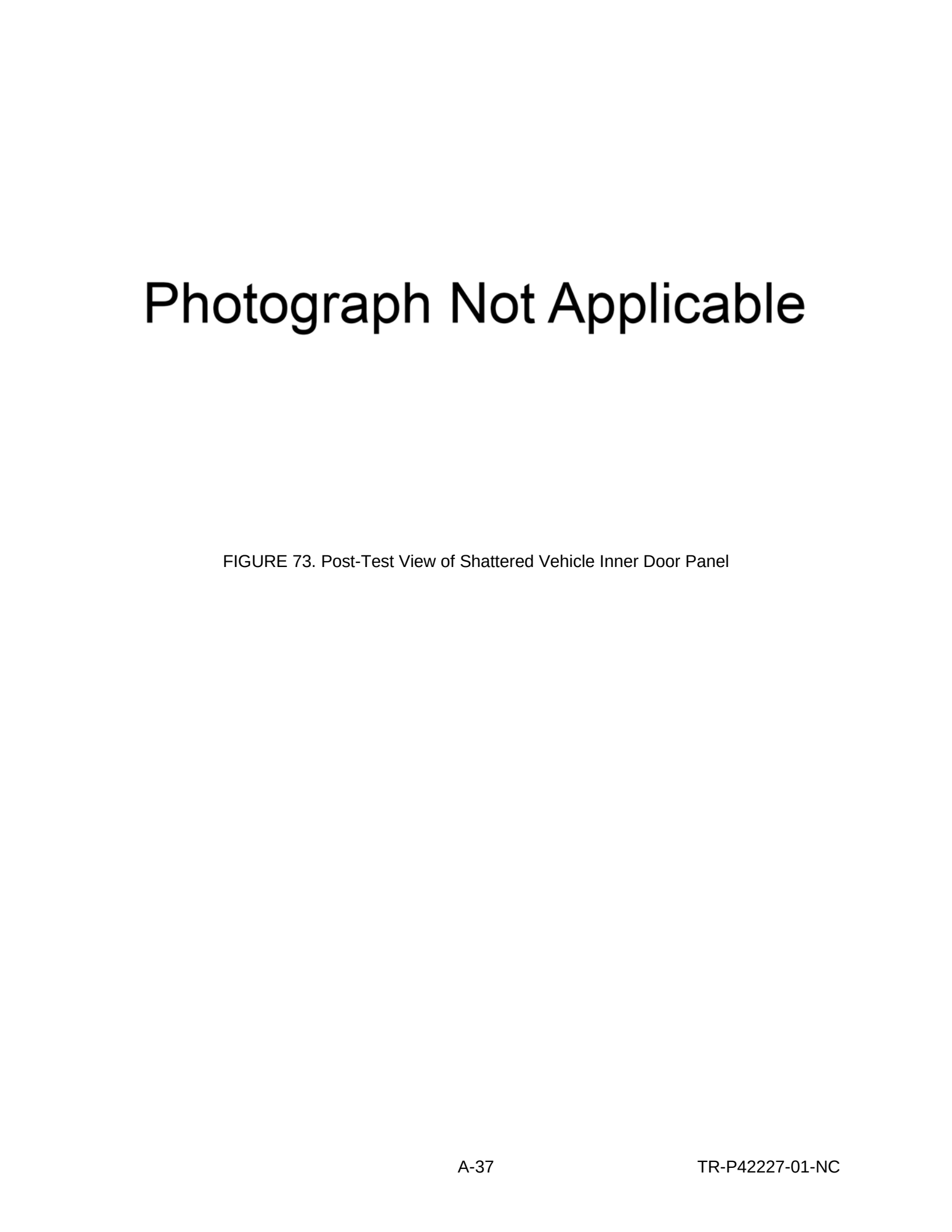

FIGURE 73. Post-Test View of Shattered Vehicle Inner Door Panel

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
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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)

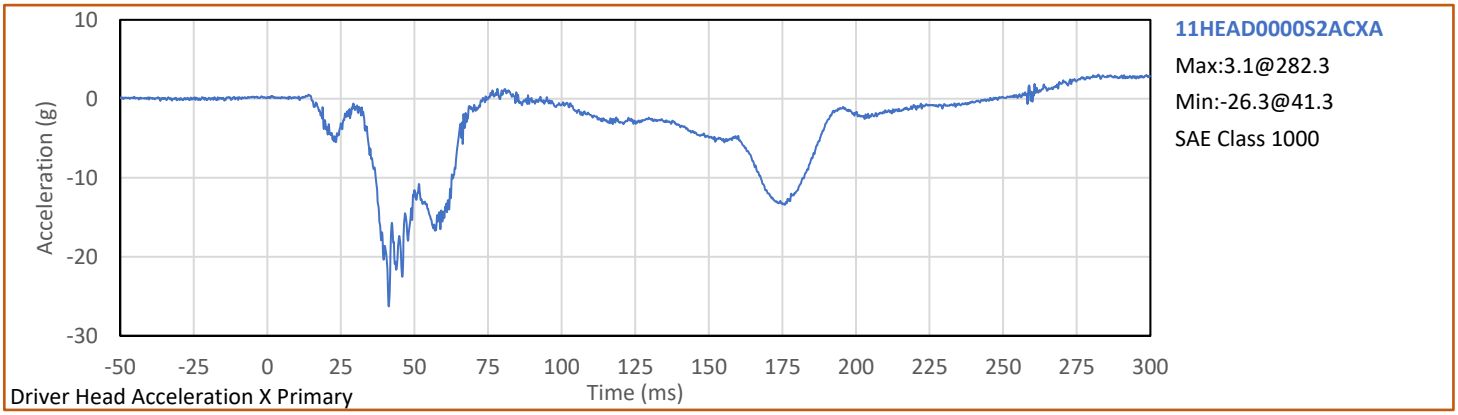
Load Cell Pole Barrier #4 Force (Y)

Load Cell Pole Barrier #5 Force (Y)

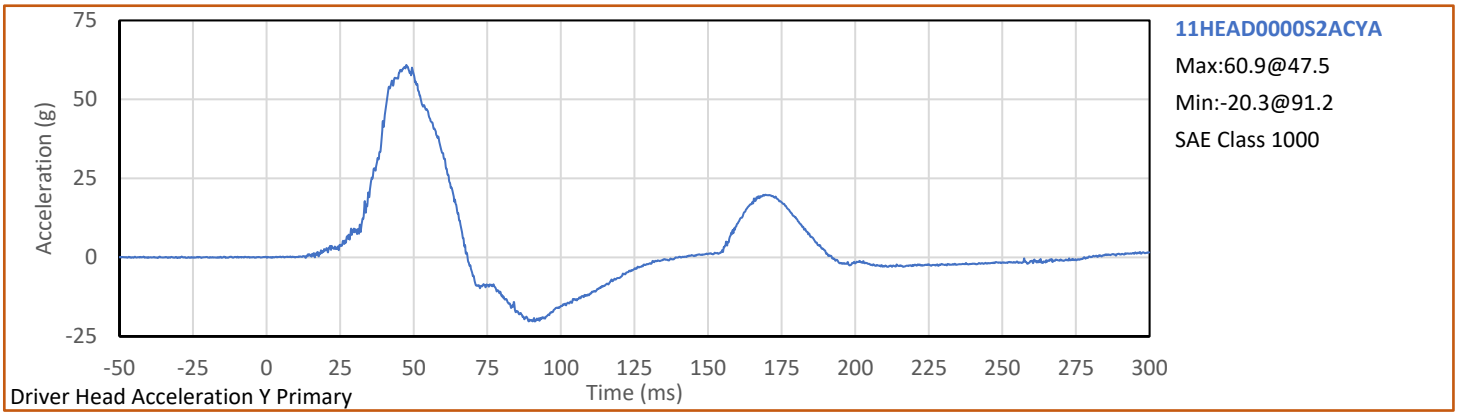
Load Cell Pole Barrier #6 Force (Y)

Load Cell Pole Barrier #7 Force (Y)

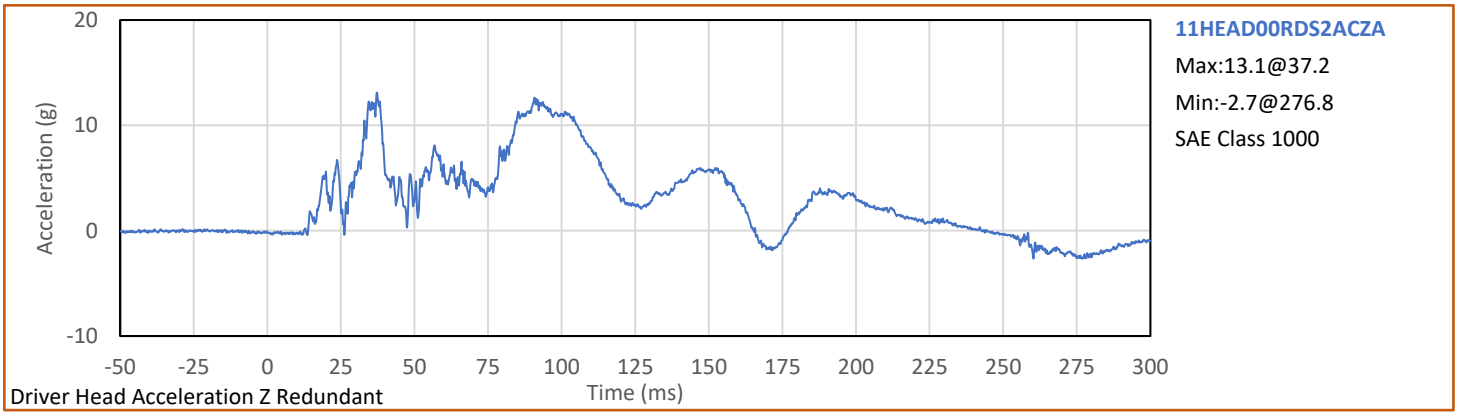
Load Cell Pole Barrier #8 Force (Y)



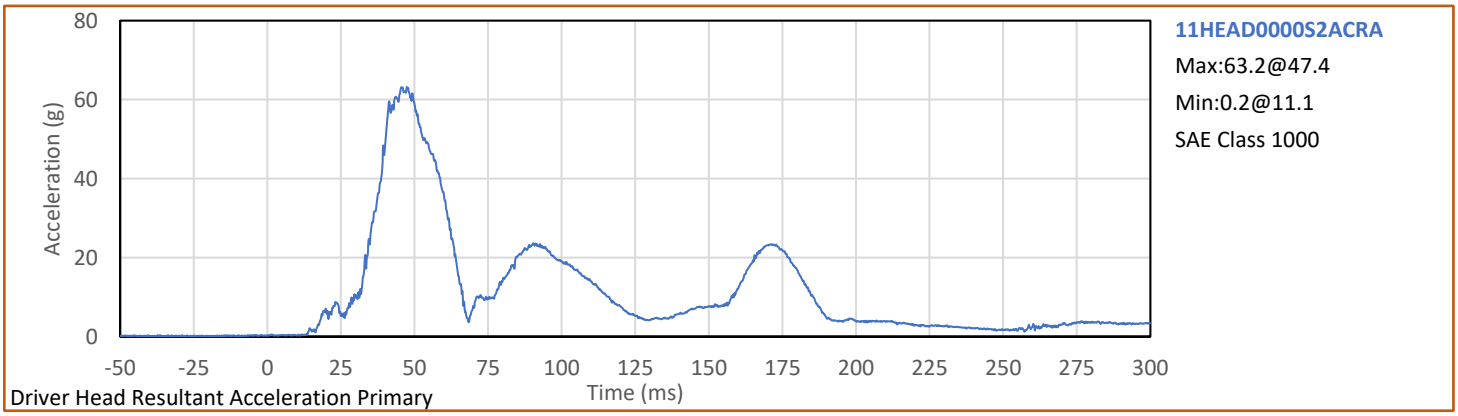
Driver Head Acceleration X Primary



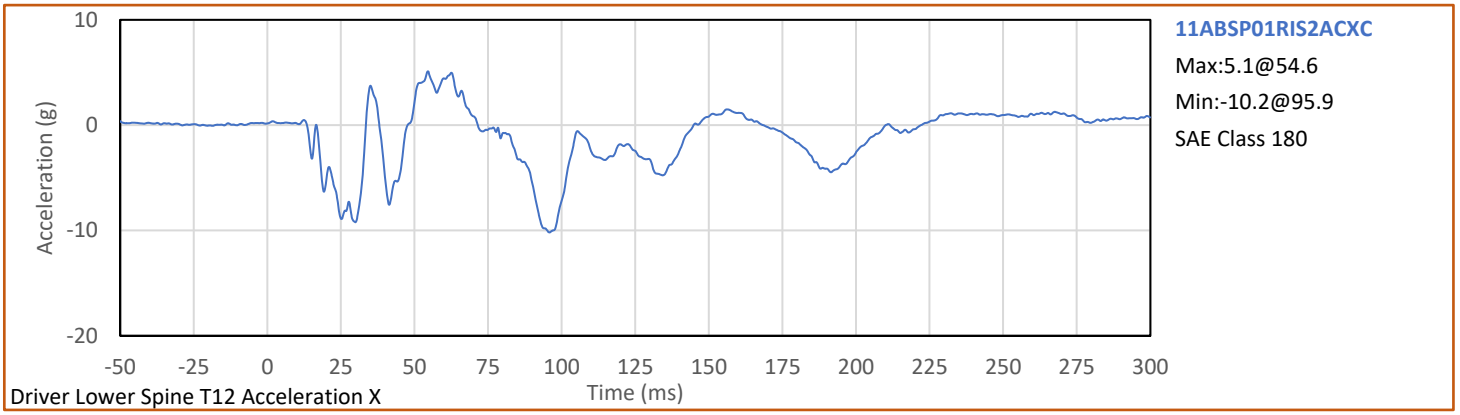
Driver Head Acceleration Y Primary



Driver Head Acceleration Z Redundant



Driver Head Resultant Acceleration Primary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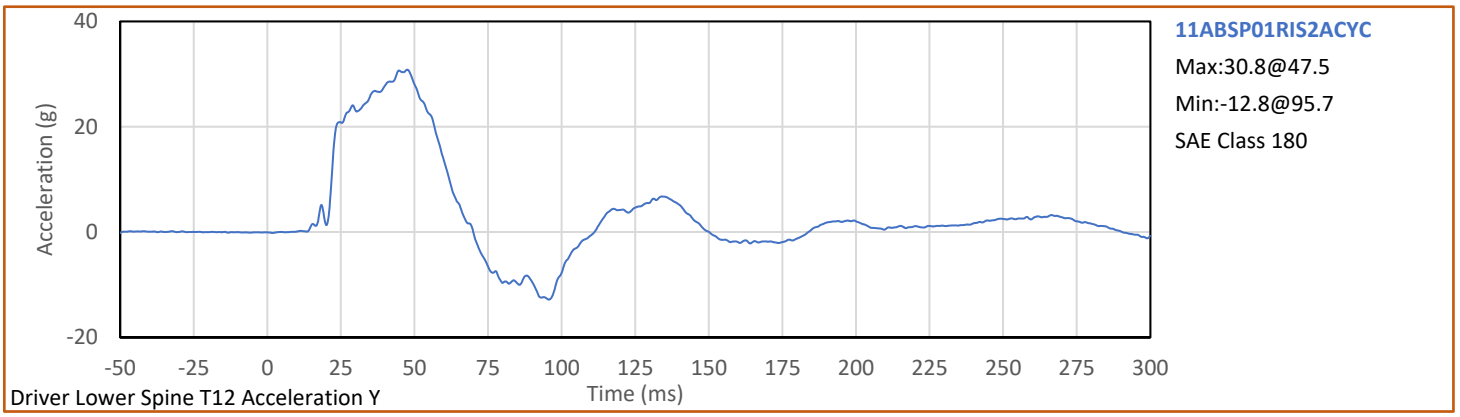
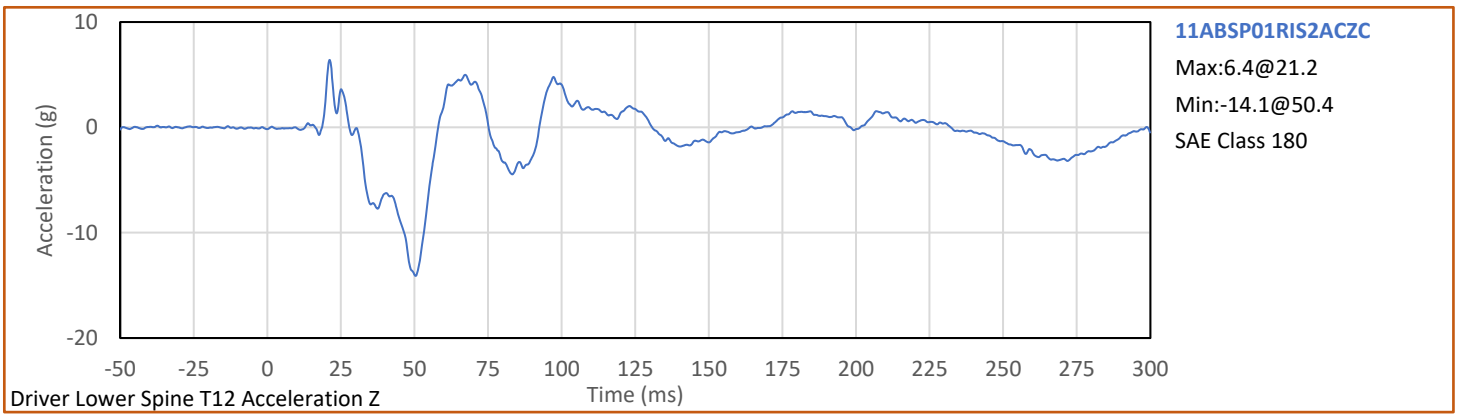
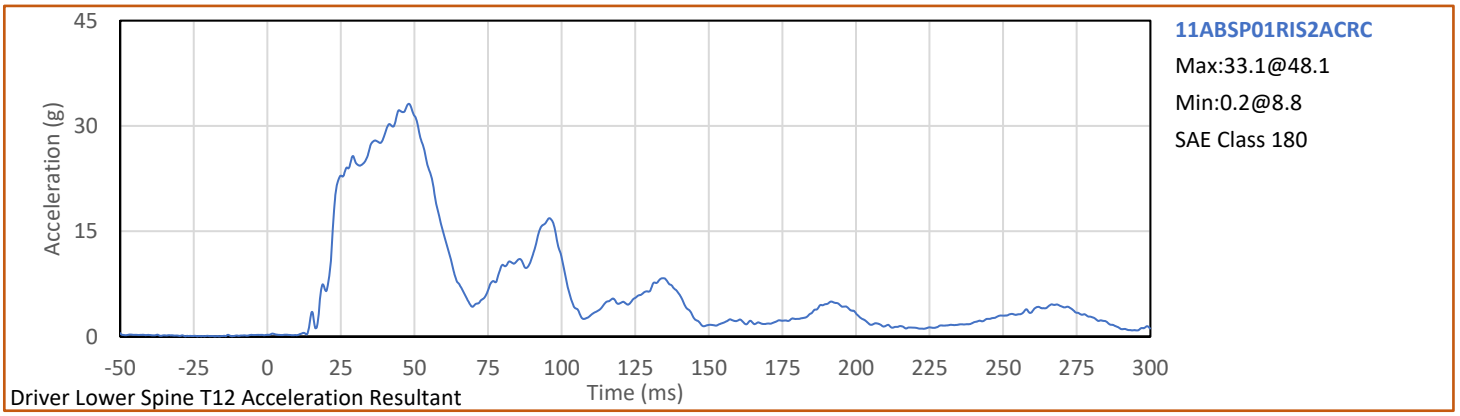
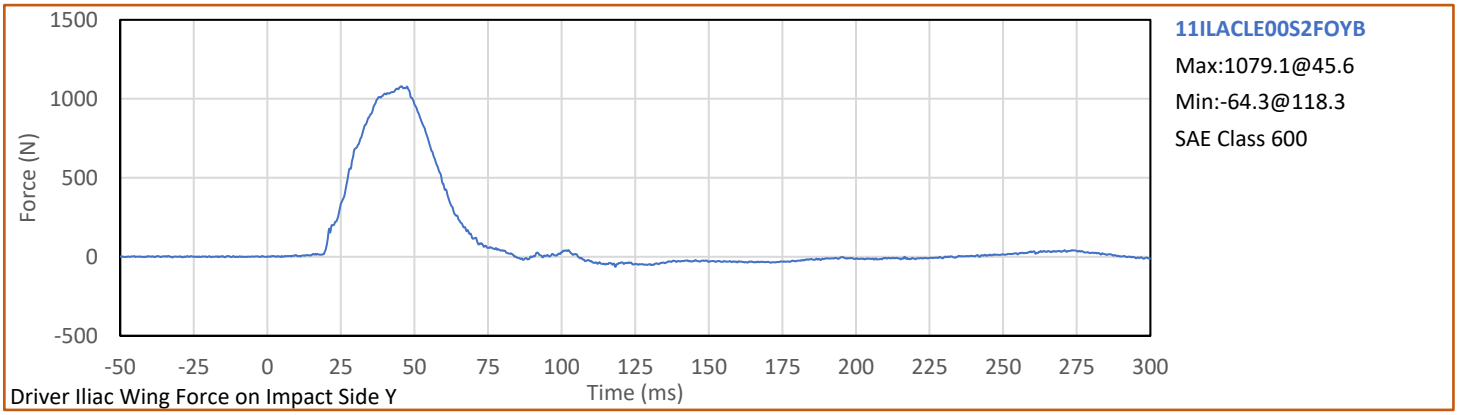
Max:5.1@54.6
Min:-10.2@95.9
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration X

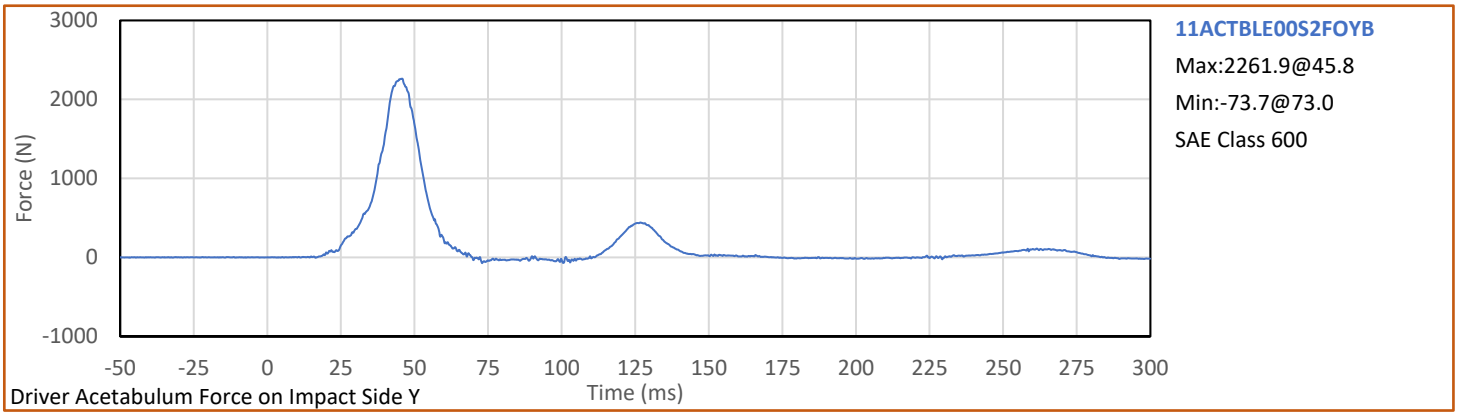

11ABSP01RIS2ACYC
Max:30.8@47.5
Min:-12.8@95.7
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Y


11ABSP01RIS2ACZC
Max:6.4@21.2
Min:-14.1@50.4
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Z

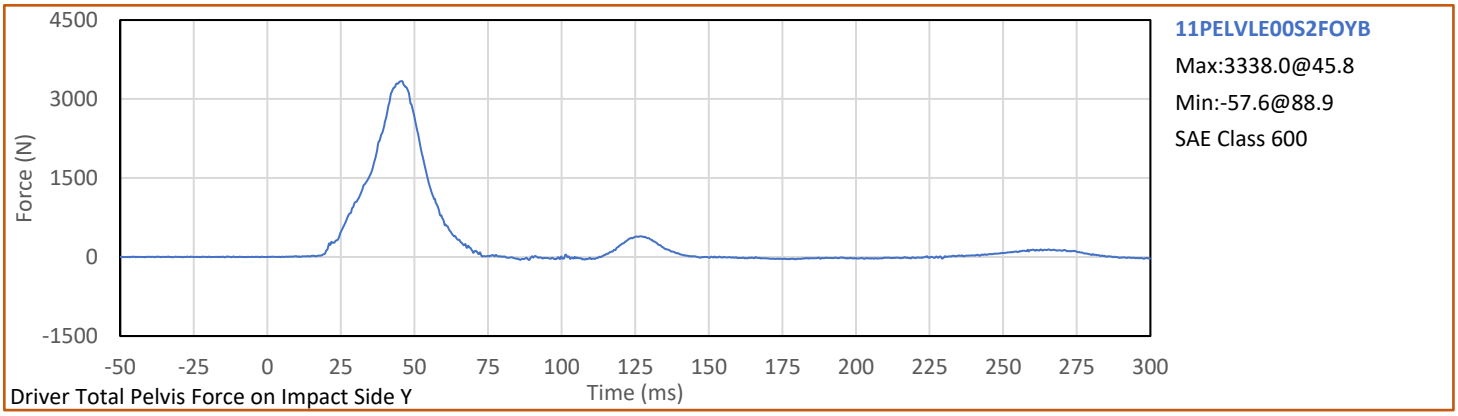

11ABSP01RIS2ACRC
Max:33.1@48.1
Min:0.2@8.8
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Resultant



Driver Iliac Wing Force on Impact Side Y



Driver Acetabulum Force on Impact Side Y



Driver Total Pelvis Force on Impact Side Y

APPENDIX C

ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

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	2022-10-06
Head Acceleration Y Primary	P50086	Endevco	7264C-2k	2022-10-06
Head Acceleration Z Primary	P51931	Endevco	7264C-2k	2022-10-06
Head Acceleration X Redundant	P68604	Endevco	7264C-2k	2022-10-06
Head Acceleration Y Redundant	P51934	Endevco	7264C-2k	2022-10-06
Head Acceleration Z Redundant	P58736	Endevco	7264C-2k	2022-10-06
Head Rotation Rate X	ARS7342	DTS	ARS PRO-8k (2kHz)	2022-03-15
Head Rotation Rate Y	ARS7473	DTS	ARS PRO-8k (2kHz)	2022-03-15
Head Rotation Rate Z	ARS7548	DTS	ARS PRO-8k (2kHz)	2022-03-15
Upper Thorax Rib Deflection Y	1143	Servo	08TCI-3725	2022-10-12
Middle Thorax Rib Deflection Y	1075	Servo	08TCI-3725	2022-10-10
Lower Thorax Rib Deflection Y	1213	Servo	08TCI-3725	2022-10-10
Upper Abdomen Rib Deflection Y	1218	Servo	08TCI-3725	2022-10-10
Lower Abdomen Rib Deflection Y	1177	Servo	08TCI-3725	2022-10-10
Lower Spine T12 Acceleration X	P58761	Endevco	7264C-2k	2022-10-10
Lower Spine T12 Acceleration Y	P50077	Endevco	7264C-2k	2022-10-10
Lower Spine T12 Acceleration Z	P58795	Endevco	7264C-2k	2022-10-10
Iliac Wing Impact Side Force Y	284 (Iliac)	R.A. Denton	3228J	2022-03-30
Acetabulum Impact Side Force Y	272 (Acetabulum)	R.A. Denton	3249J	2022-03-30

Table 2 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	M11184	Endevco	758H-2k	2022-10-11
Vehicle CG Ay	M11096	Endevco	758H-2k	2022-10-03
Vehicle CG Az	M11177	Endevco	758H-2k	2022-10-07
Left Floor Sill Ay	M11275	Endevco	758H-2k	2022-10-11
A-Pillar Sill Ay	M11179	Endevco	758H-2k	2022-10-10
A-Pillar Low Ay	M11101	Endevco	758H-2k	2022-10-03
A-Pillar Mid Ay	M11210	Endevco	758H-2k	2022-10-10
B-Pillar Sill Ay	M11198	Endevco	758H-2k	2022-10-07
B-Pillar Low Ay	M11037	Endevco	758H-2k	2022-10-10
B-Pillar Mid Ay	M11040	Endevco	758H-2k	2022-10-07
Driver Seat Track at H-Point Ay	M11107	Endevco	758H-2k	2022-10-10
Engine Top Ax	M11164	Endevco	758H-2k	2022-10-10
Engine Top Ay	M11135	Endevco	758H-2k	2022-10-07
Firewall Ay	M11277	Endevco	758H-2k	2022-10-12
Right Roof Ay	M11155	Endevco	758H-2k	2022-10-07
Right Floor Sill Ay	M11075	Endevco	758H-2k	2022-10-11
Rear Floorpan Ax	M11171	Endevco	758H-2k	2022-10-10
Rear Floorpan Ay	M11259	Endevco	758H-2k	2022-10-11

Table 3 - Barrier Pole Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Barrier Pole 01 Fx	19461A	Interface	1220FS-50k	2021-11-04
Barrier Pole 02 Fx	131822A	Interface	1220AF-50k	2021-11-04
Barrier Pole 03 Fx	131816A	Interface	1220AF-50k	2021-11-04
Barrier Pole 04 Fx	19325	Interface	1220AF-50k	2021-11-04
Barrier Pole 05 Fx	131827A	Interface	1220AF-50k	2021-11-04
Barrier Pole 06 Fx	19340	Interface	1220AF-50k	2021-11-05
Barrier Pole 07 Fx	19267	Interface	1220AF-50k	2021-11-05
Barrier Pole 08 Fx	19466A	Interface	1220AF-50k	2021-11-05

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 299 Test Date: 2022-09-09

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
A - Sitting Height	mm	772	788	776	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	86	Pass
D - H Point From Seatback	mm	141	151	146	Pass
E - Shoulder Pivot From Backline	mm	97	107	104	Pass
F - Thigh Clearance	mm	119	135	130	Pass
G - Head Breadth	mm	140	148	144	Pass
H - Head Back From Backline	mm	40	46	43	Pass
I - Head Depth	mm	178	188	183	Pass
J - Head Circumference	mm	541	551	544	Pass
K - Buttock To Knee Length	mm	514	540	527	Pass
L - Popliteal Height	mm	343	369	350	Pass
K - Knee Pivot To Floor Height	mm	392	409	398	Pass
N - Buttock Popliteal Length	mm	416	442	427	Pass
O - Chest Depth W/O Jacket	mm	195	211	203	Pass
P - Foot Length	mm	216	232	225	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	319	Pass
R - Arm Length	mm	249	259	254	Pass
S - Knee Joint To Seatback	mm	477	493	486	Pass
V - Shoulder Width	mm	341	357	353	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	860	Pass
Z - Waist Circumference	mm	761	791	776	Pass
			Overall Test Results		Pass

Technician: G. Holguin

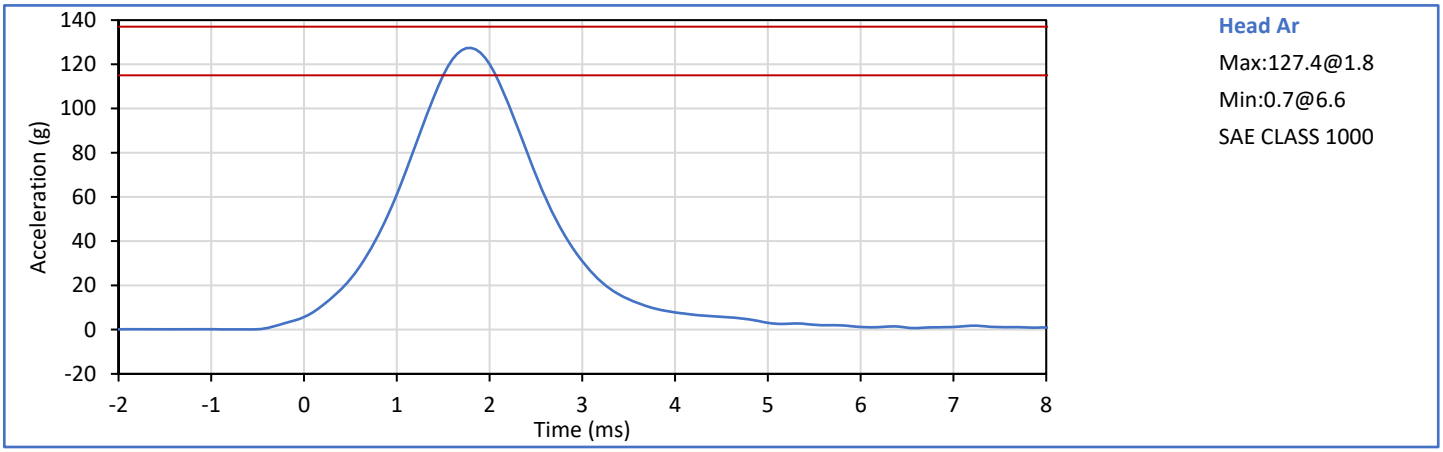
Approved By: J. Hernandez

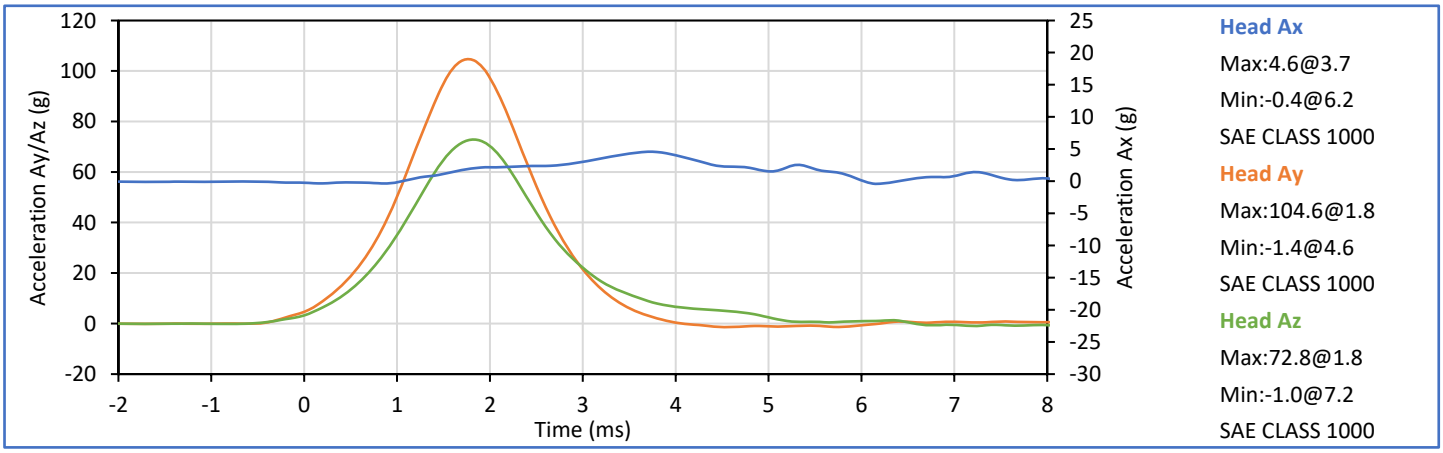
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 299 Test Date: 2022-09-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	39	Pass
Peak Resultant Acceleration	g	115.0	137.0	127.4	Pass
Peak Head Ax	g	-15.0	15.0	4.6	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

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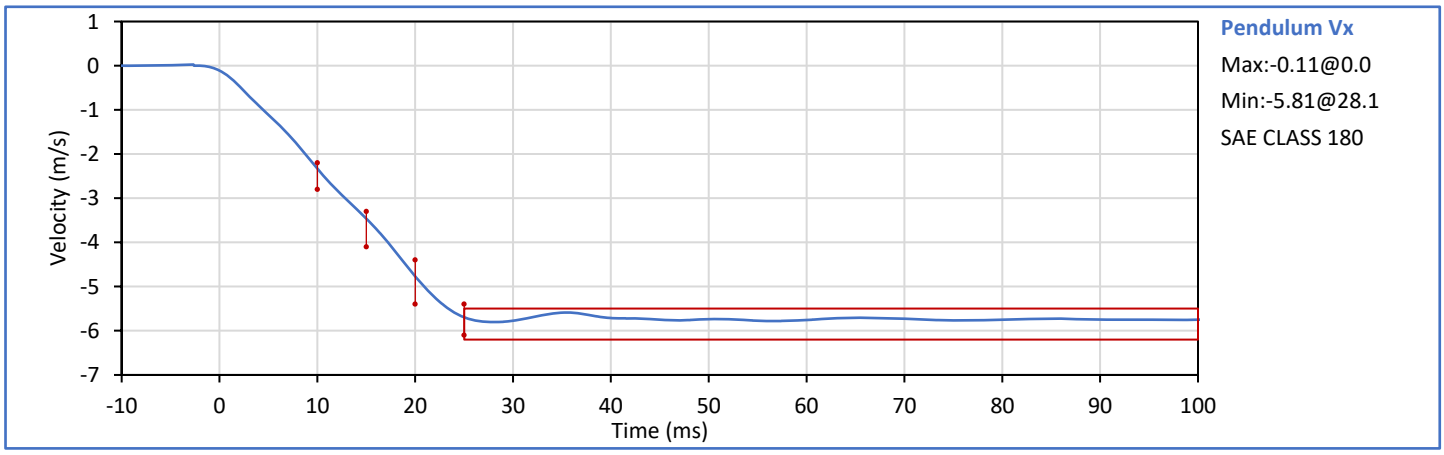
SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2022-09-09

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	45	Pass
Pendulum Velocity	m/s	5.51	5.63	5.56	Pass
Pendulum Decel at 10 ms	m/s	-2.80	-2.20	-2.33	Pass
Pendulum Decel at 15 ms	m/s	-4.10	-3.30	-3.46	Pass
Pendulum Decel at 20 ms	m/s	-5.40	-4.40	-4.77	Pass
Pendulum Decel at 25 ms	m/s	-6.10	-5.40	-5.70	Pass
Pendulum Decel from 25-100 ms	m/s	-6.20	-5.50	-5.81/-5.59	Pass
Peak "D" Plane Rotation	deg	-81.0	-71.0	-72.7	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	62.2	Pass
Peak Occ. Condyle Moment	Nm	36.0	44.0	40.9	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	115.8	Pass
			Overall Test Results		Pass



Technician: G. Holguin

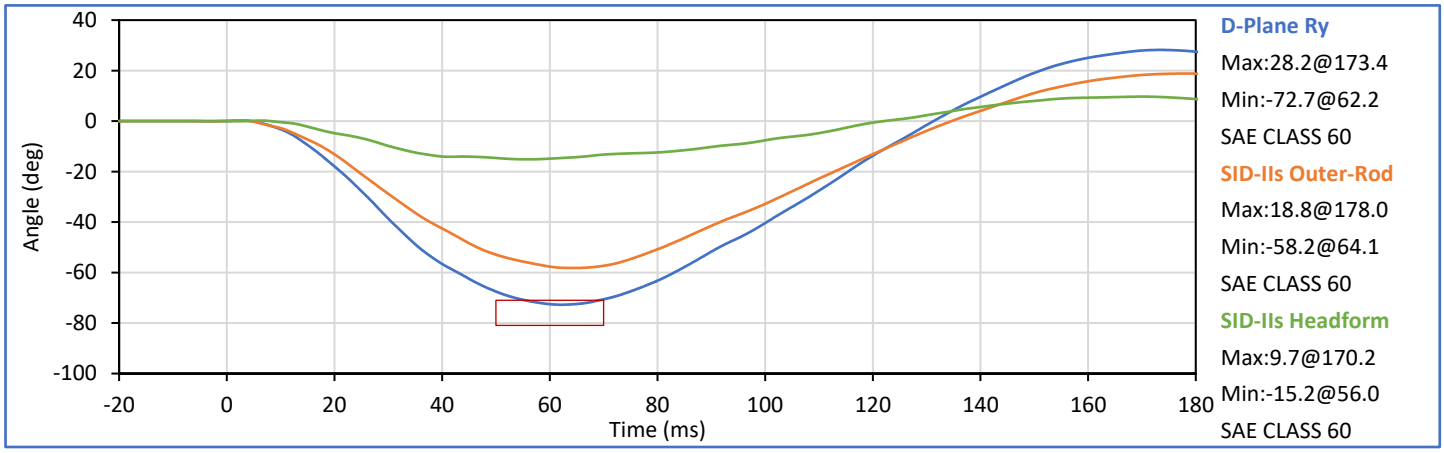
Approved By: J. Hernandez

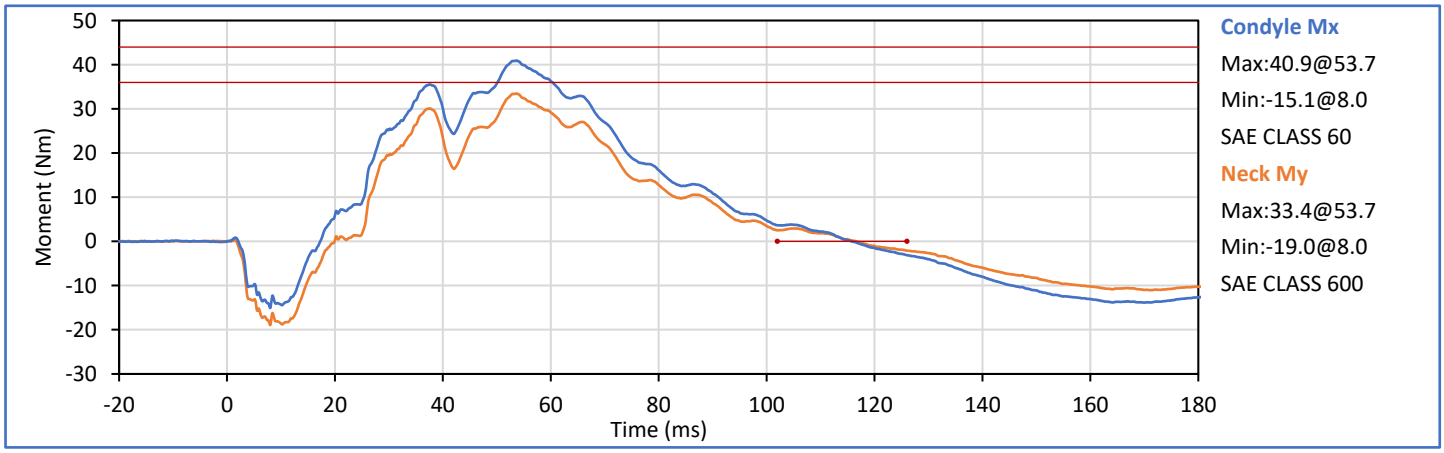
Applus IDIADA KARCO

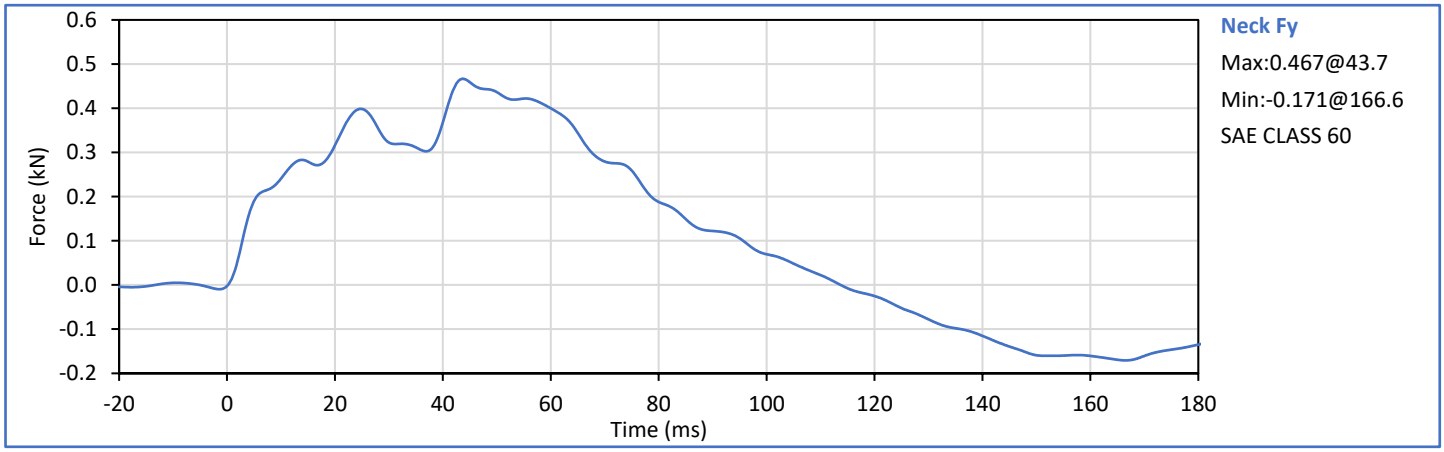
ATD Serial No.: 299

SID-IIs Small Side Impact ATD
Neck Flexion

Test Date: 2022-09-09





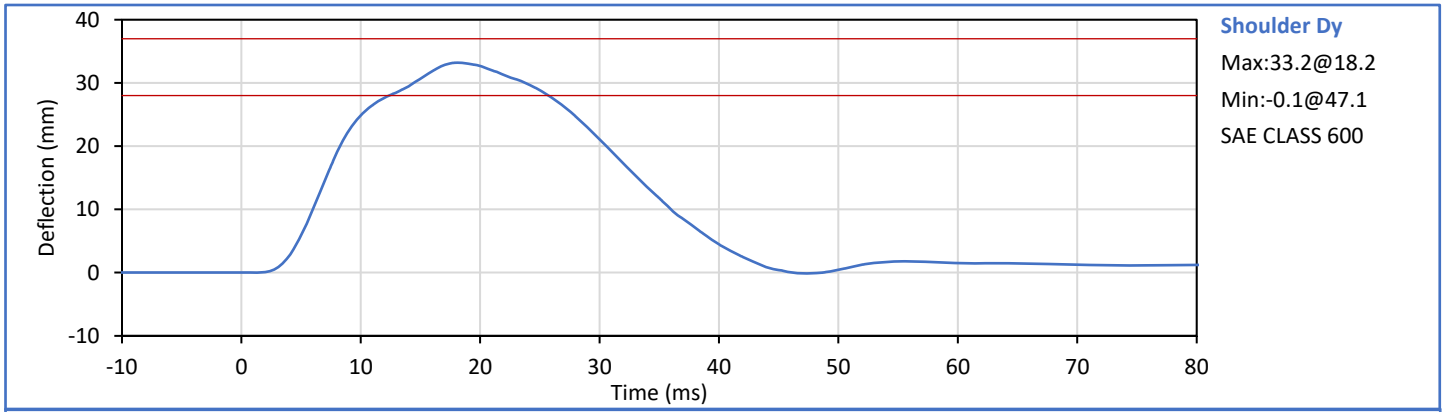


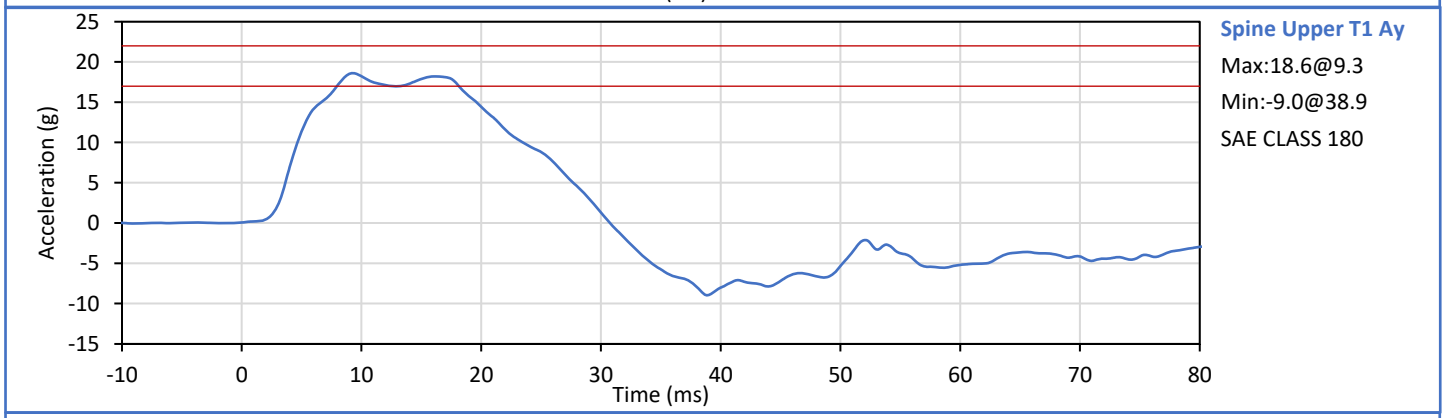
Applus IDIADA KARCO

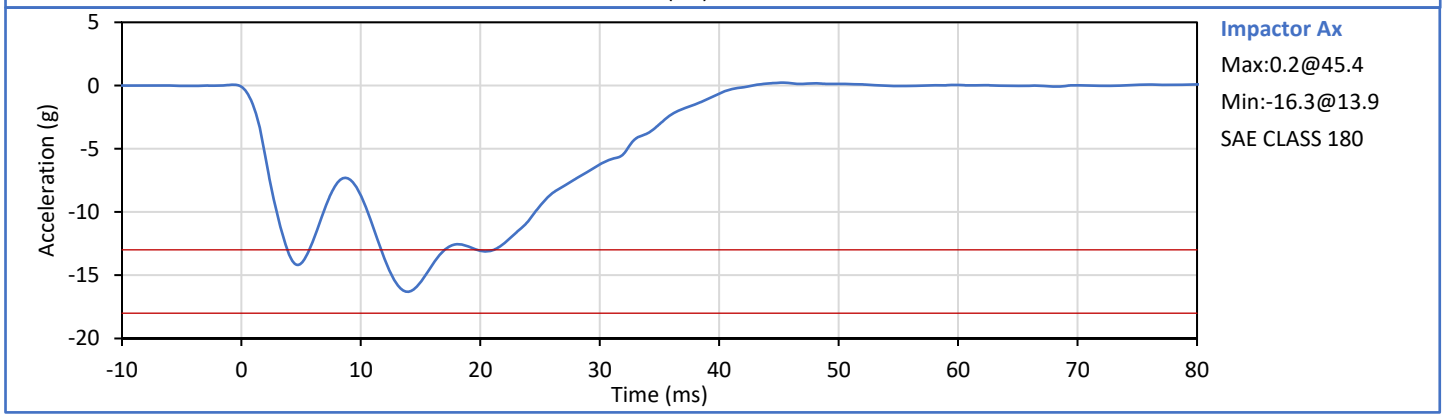
SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 299 Test Date: 2022-09-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.2	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.6	Pass
Peak Impactor Ax	g	-18.0	-13.0	-16.3	Pass
			Overall Test Results		Pass







Technician: G. Holguin

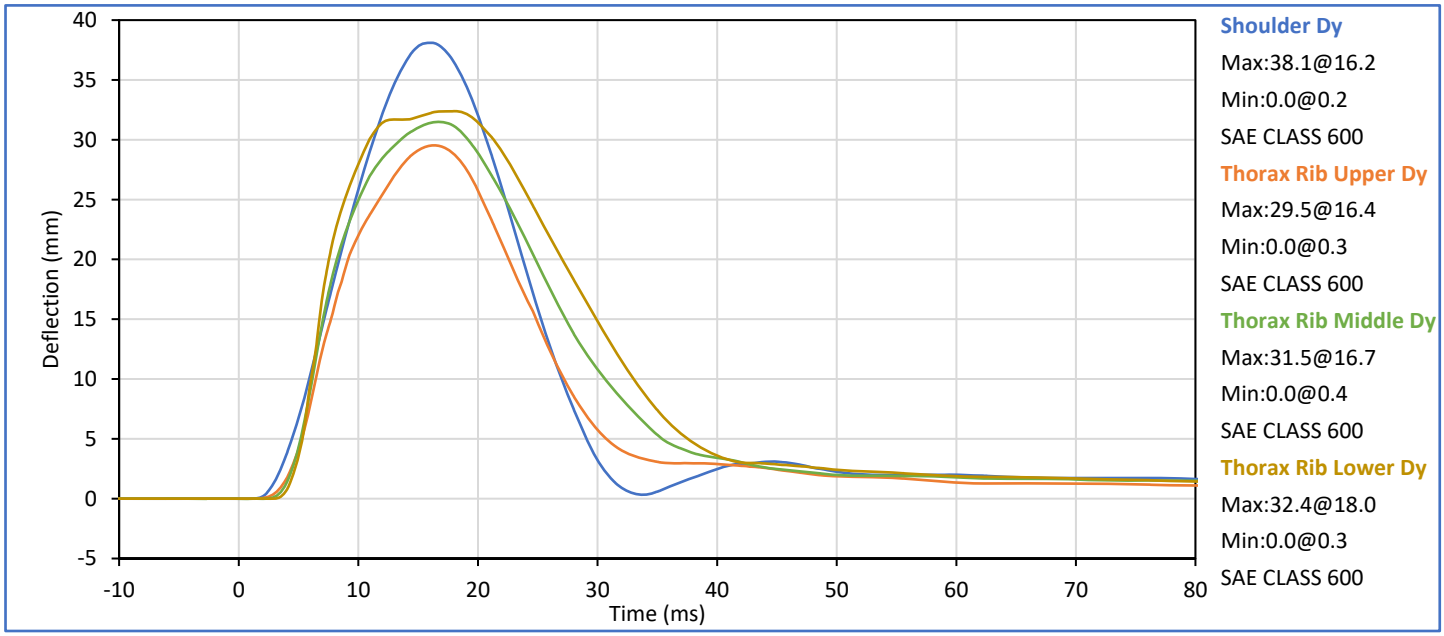
Approved By: J. Hernandez

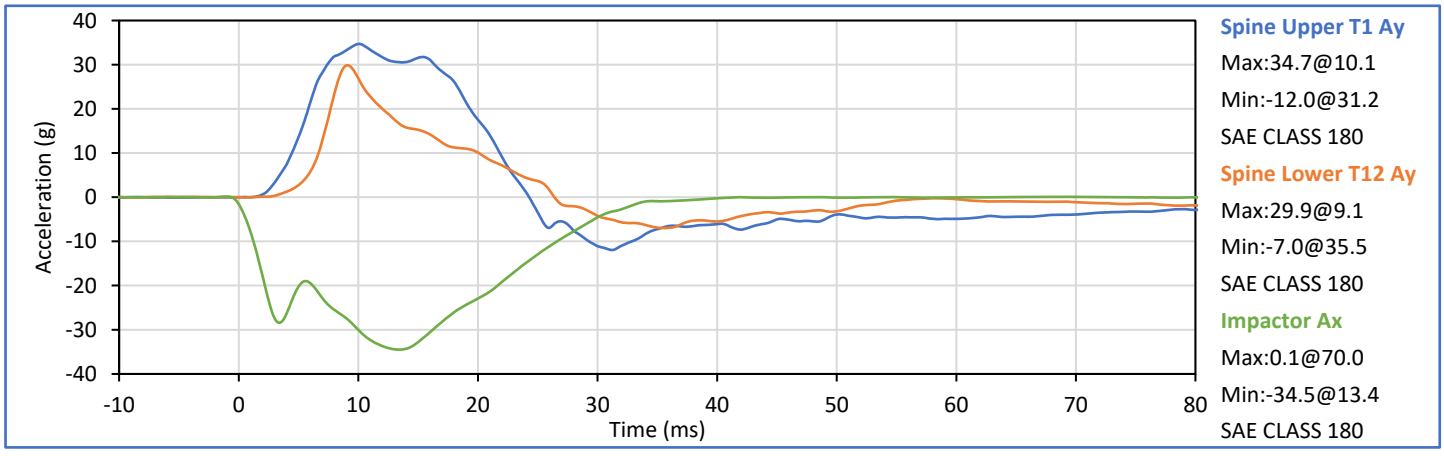
Applus IDIADA KARCO

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

ATD Serial No.: 299 Test Date: 2022-09-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	6.60	6.80	6.66	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.1	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.5	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.5	Pass
Peak Lower Rib Dy	mm	32.0	38.0	32.4	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	34.7	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	29.9	Pass
Peak Impactor Ax	g	-36.0	-30.0	-34.5	Pass
			Overall Test Results		Pass





Technician: G. Holguin

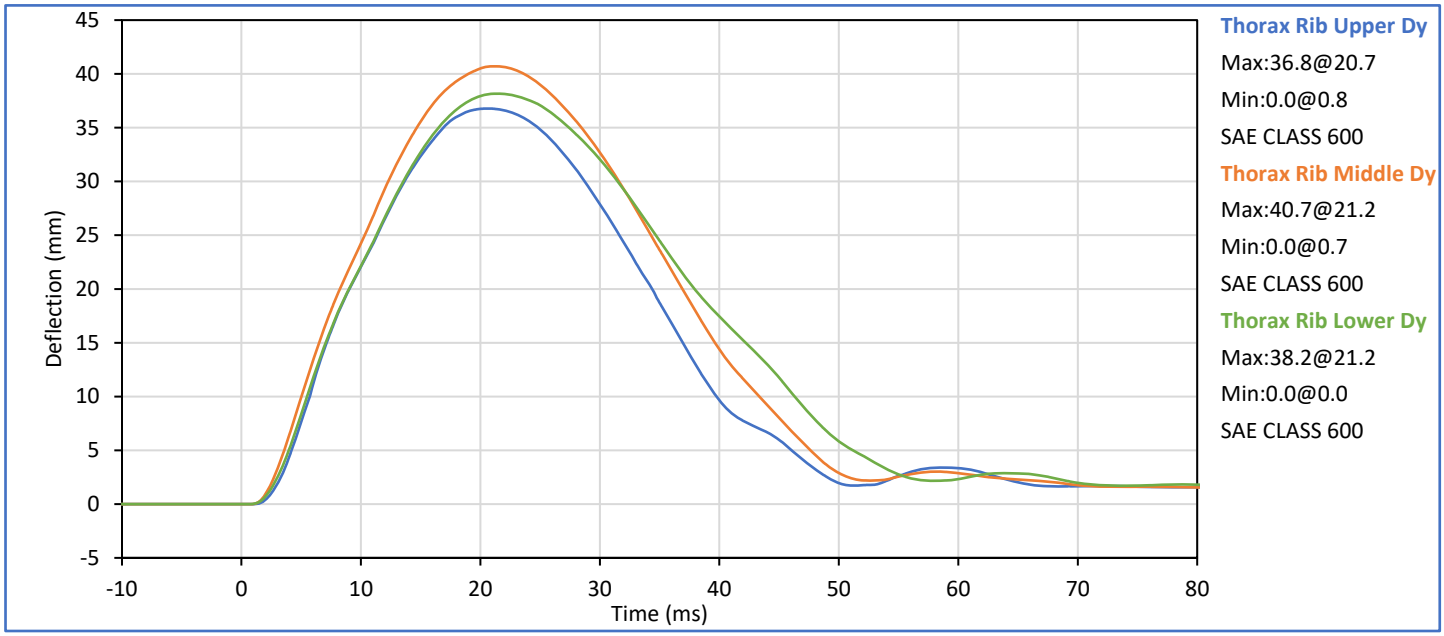
Approved By: J. Hernandez

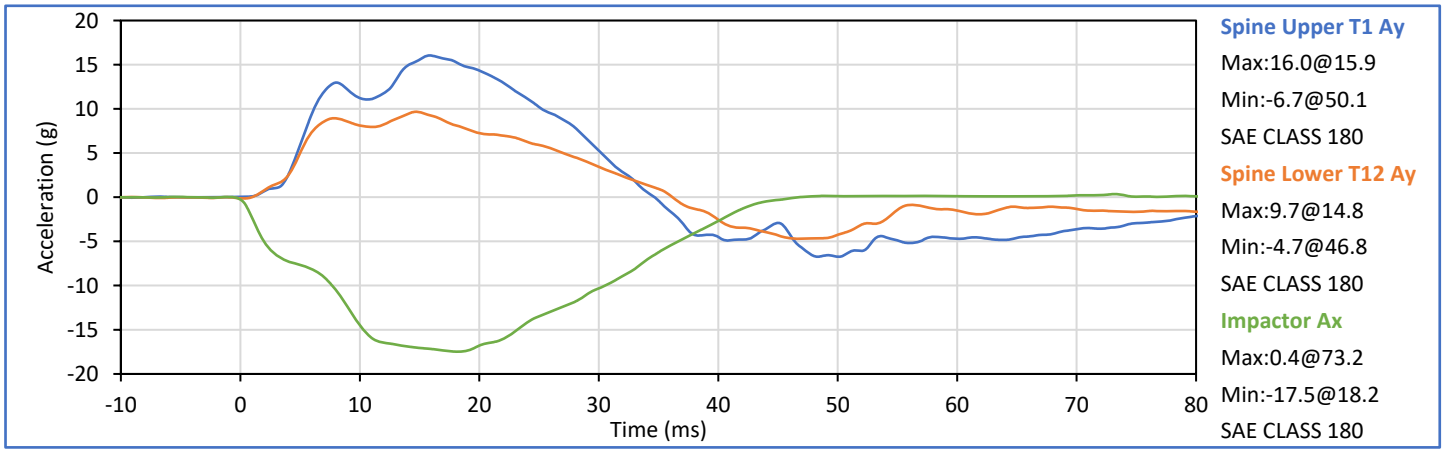
Applus IDIADA KARCO

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

ATD Serial No.: 299 Test Date: 2022-09-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Thorax Rib Upper Dy	mm	32.0	40.0	36.8	Pass
Peak Thorax Rib Middle Dy	mm	39.0	45.0	40.7	Pass
Peak Thorax Rib Lower Dy	mm	35.0	43.0	38.2	Pass
Peak Spine Upper T1 Ay	g	13.0	17.0	16.0	Pass
Peak Spine Lower T12 Ay	g	7.0	11.0	9.7	Pass
Peak Impactor Ax	g	-18.0	-14.0	-17.5	Pass
			Overall Test Results		Pass





Technician: G. Holguin

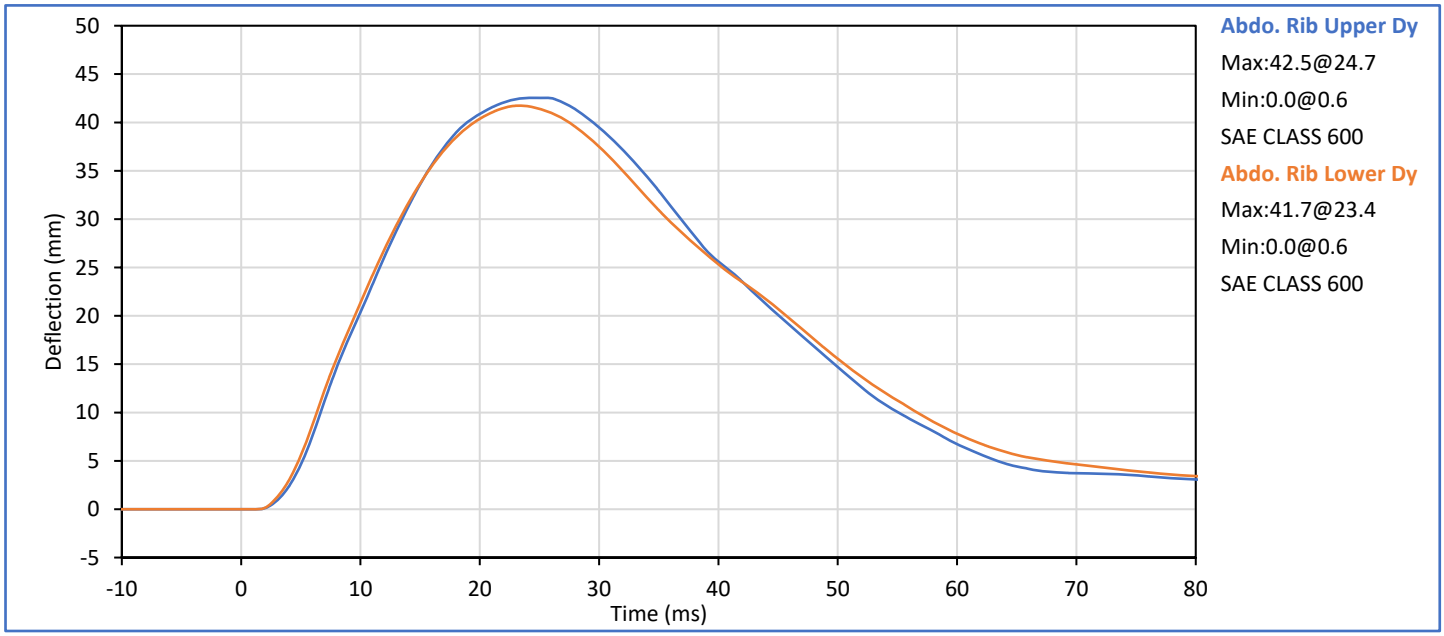
Approved By: J. Hernandez

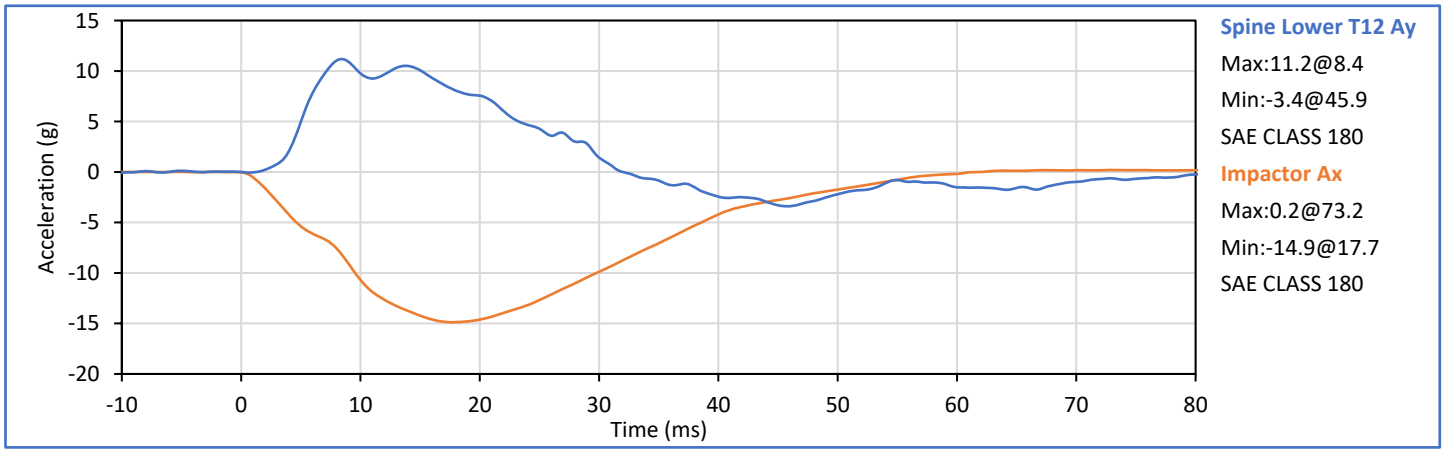
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 299 Test Date: 2022-09-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Relative Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	42.5	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	41.7	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	11.2	Pass
Peak Impactor Ax	g	-16.0	-12.0	-14.9	Pass
			Overall Test Results		Pass





Technician: G. Holguin

Approved By: J. Hernandez

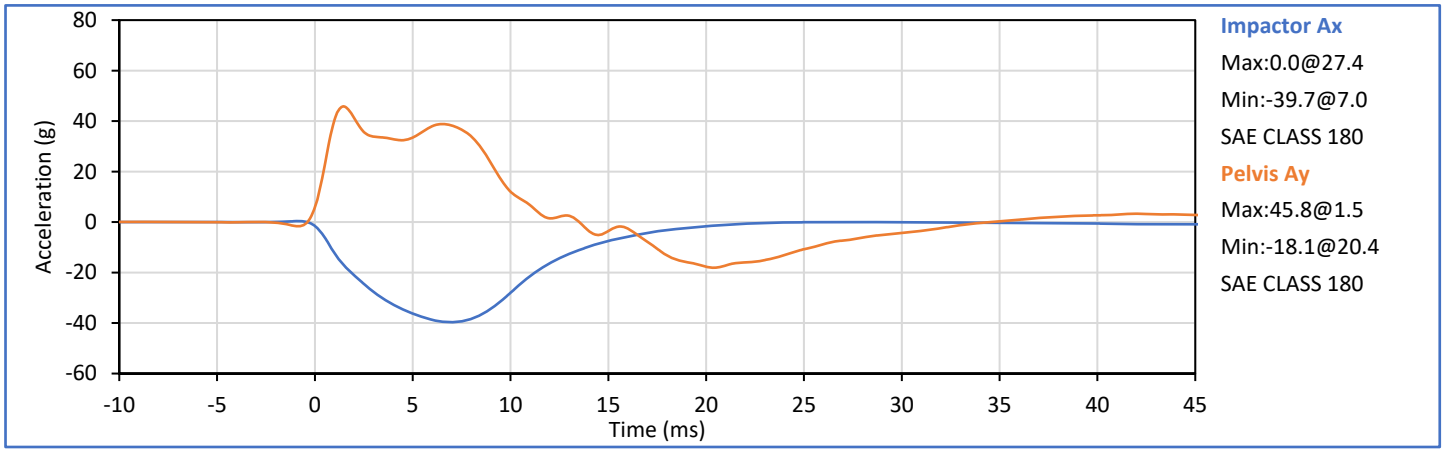
Applus IDIADA KARCO

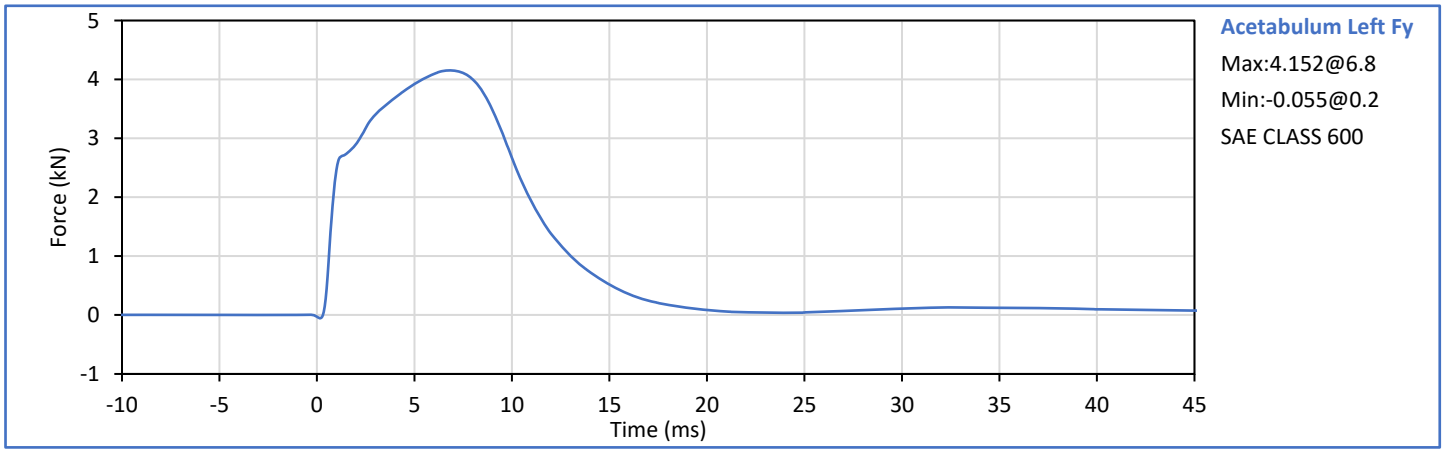
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2022-09-12

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	39	Pass
Impactor Velocity	m/s	6.60	6.80	6.72	Pass
Peak Acetabulum Fy	kN	3.60	4.30	4.15	Pass
Pelvis Ay after 6ms	g	34.0	42.0	38.8	Pass
Peak Impactor Ax	g	-47.0	-38.0	-39.7	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13944





Technician: G. Holguin

Approved By: J. Hernandez

ATD Serial No.: 299 Test Date: 2022-09-12

Pelvis Plug S/N: 13944

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13944
Test Number 13418
Report Number 13463
Test Date 5/20/2020 10:22:29 PM

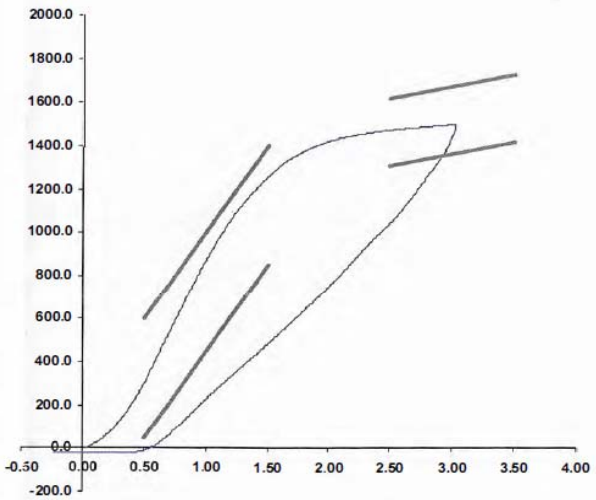
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	308.67	50.00	600.00
Force @ 1.5 mm (N)	1,257.12	850.00	1,400.00
Force @ 2.5 mm (N)	1,470.42	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,496.75	1,361.00	1,673.00

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

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

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 20-May-20
SACO Research

By : DC Date : 5/20/2020

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

Applus IDIADA KARCO

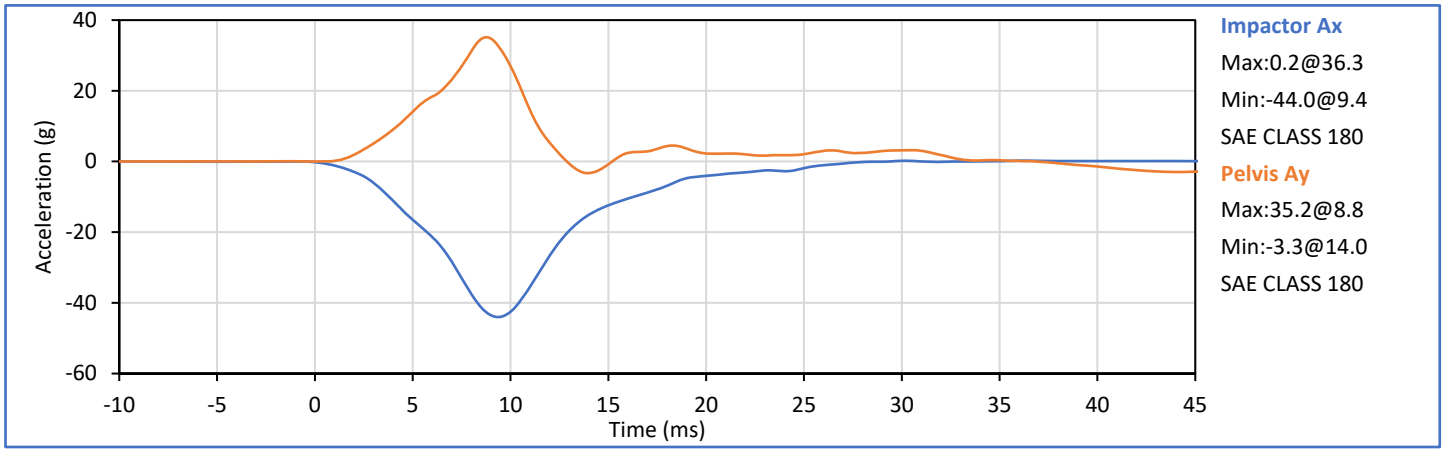
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

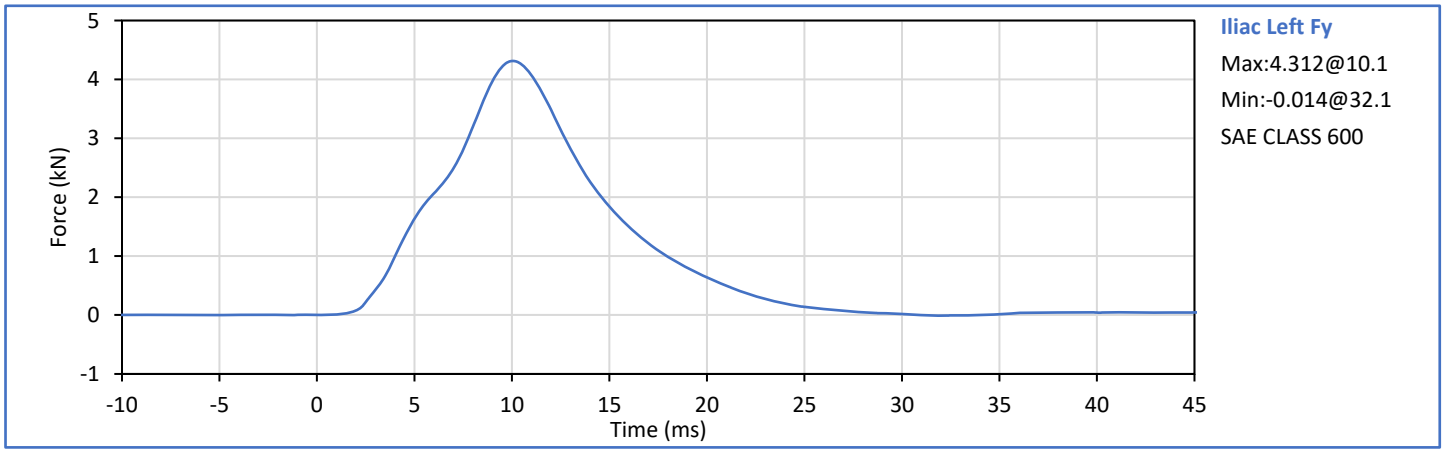
ATD Serial No.: 299 Test Date: 2022-09-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Iliac Fy	kN	4.10	5.10	4.31	Pass
Peak Pelvis Ay	g	28.0	39.0	34.7	Pass
Peak Impactor Ax	g	-45.0	-36.0	-44.0	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 *

* Plug is not impacted and remains certified





Technician: G. Holguin

Approved By: J. Hernandez

APPENDIX C
Post-Test ATD Qualification and Performance Verification
SID-IIs Small Side Impact ATD, Left Side Configuration
S/N: 299

Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 299 Test Date: 2022-10-31

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
A - Sitting Height	mm	772	788	778	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	87	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	144	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	182	Pass
J - Head Circumference	mm	541	551	543	Pass
K - Buttock To Knee Length	mm	514	540	525	Pass
L - Popliteal Height	mm	343	369	352	Pass
K - Knee Pivot To Floor Height	mm	392	409	399	Pass
N - Buttock Popliteal Length	mm	416	442	427	Pass
O - Chest Depth W/O Jacket	mm	195	211	201	Pass
P - Foot Length	mm	216	232	223	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	321	Pass
R - Arm Length	mm	249	259	253	Pass
S - Knee Joint To Seatback	mm	477	493	487	Pass
V - Shoulder Width	mm	341	357	354	Pass
W - Foot Width	mm	78	94	88	Pass
Y - Chest Circumference W/Jacket	mm	851	881	866	Pass
Z - Waist Circumference	mm	761	791	769	Pass
			Overall Test Results		Pass

Technician: G. Fuentes

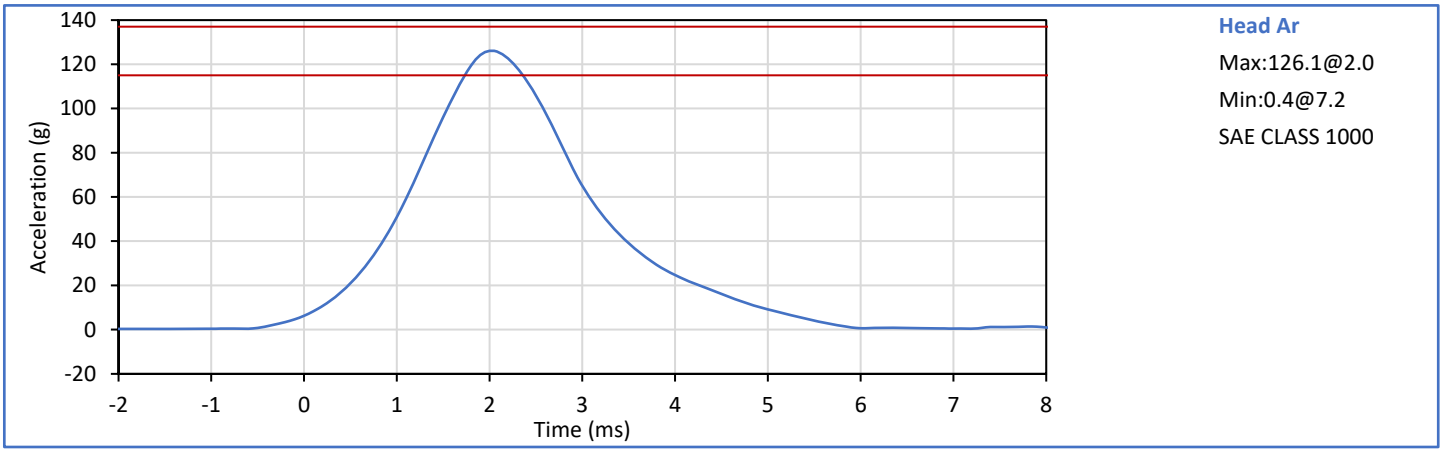
Approved By: J. Hernandez

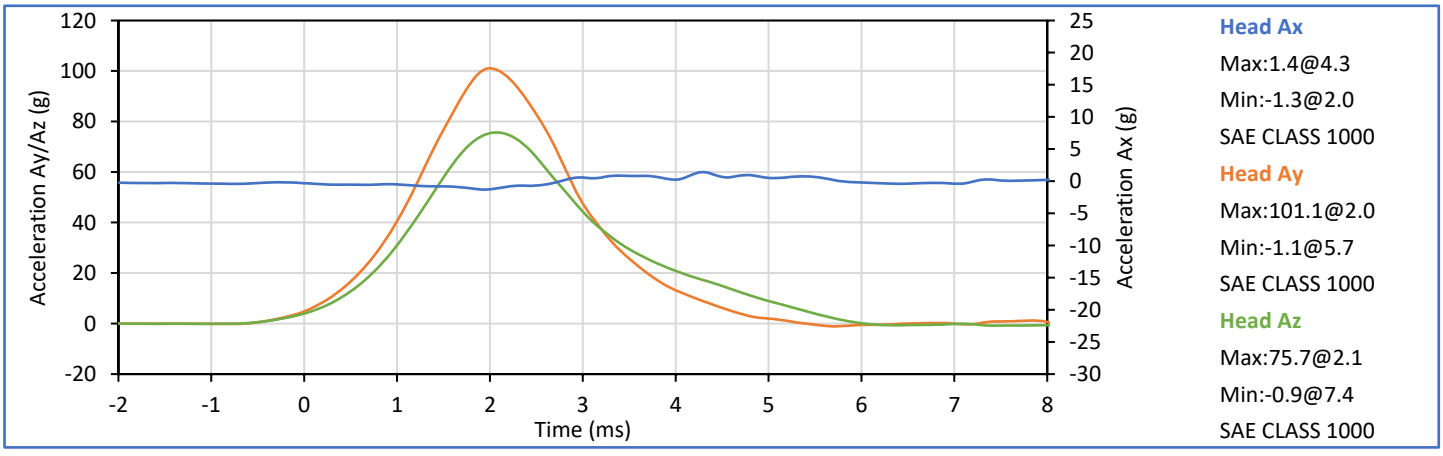
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 299 Test Date: 2022-11-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Peak Resultant Acceleration	g	115.0	137.0	126.1	Pass
Peak Head Ax	g	-15.0	15.0	1.4	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: G. Fuentes

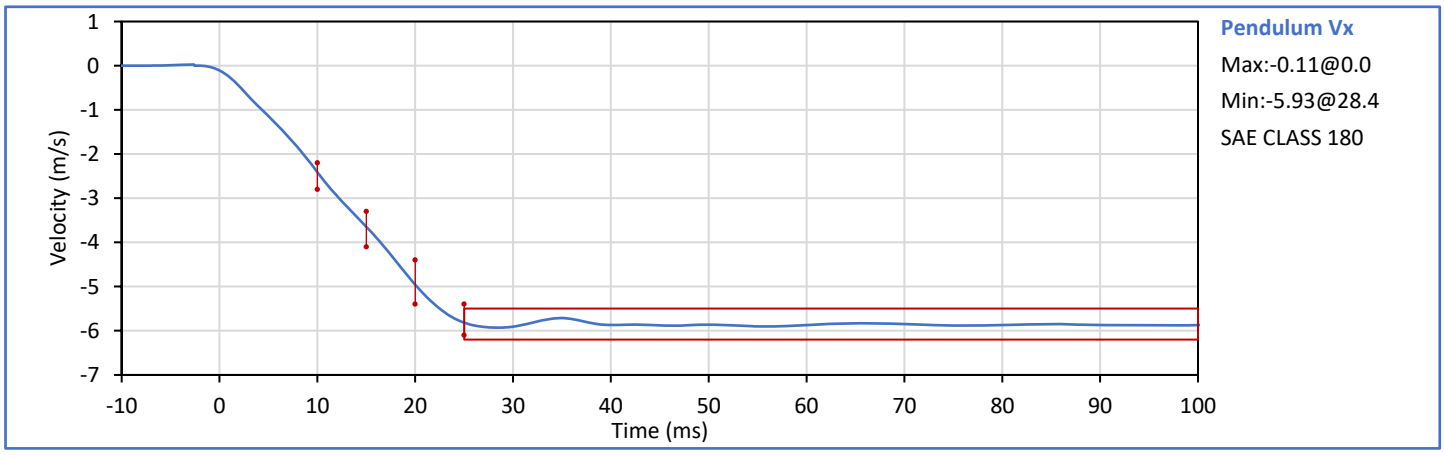
Approved By: J. Hernandez

Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2022-11-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.51	5.63	5.56	Pass
Pendulum Decel at 10 ms	m/s	-2.80	-2.20	-2.41	Pass
Pendulum Decel at 15 ms	m/s	-4.10	-3.30	-3.65	Pass
Pendulum Decel at 20 ms	m/s	-5.40	-4.40	-4.96	Pass
Pendulum Decel at 25 ms	m/s	-6.10	-5.40	-5.82	Pass
Pendulum Decel from 25-100 ms	m/s	-6.20	-5.50	-5.93/-5.72	Pass
Peak "D" Plane Rotation	deg	-81.0	-71.0	-76.3	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.8	Pass
Peak Occ. Condyle Moment	Nm	36.0	44.0	42.5	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	114.4	Pass
			Overall Test Results		Pass



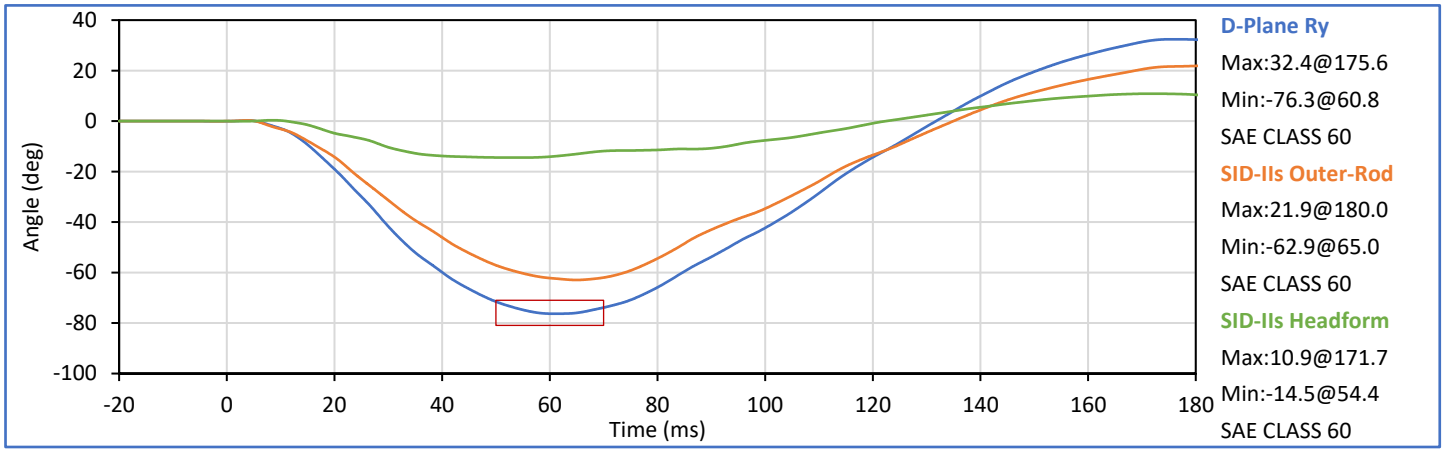
Technician: G. Fuentes

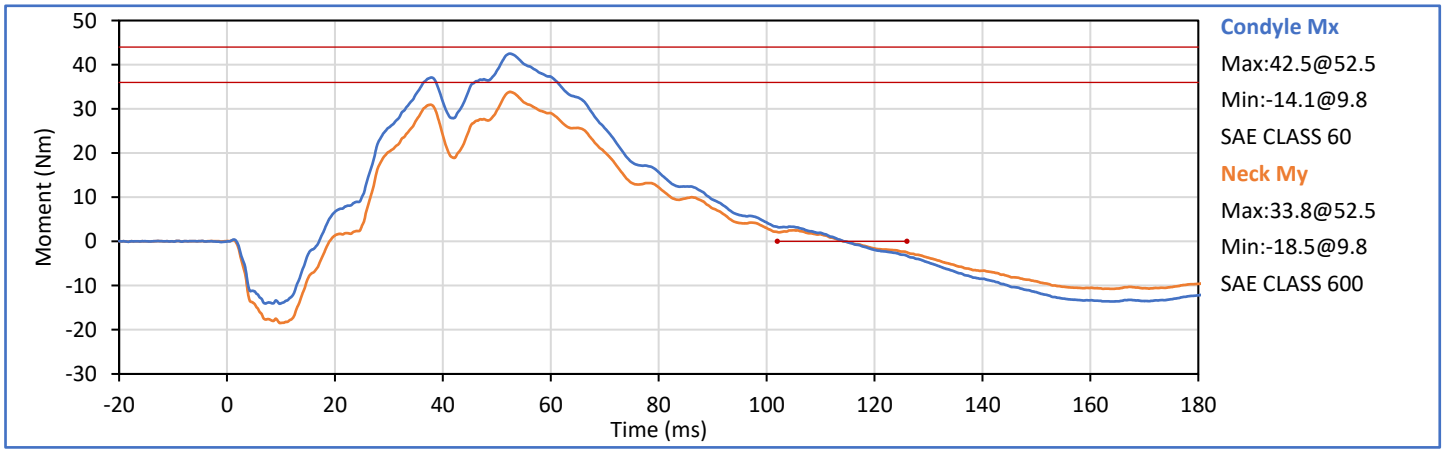
Approved By: J. Hernandez

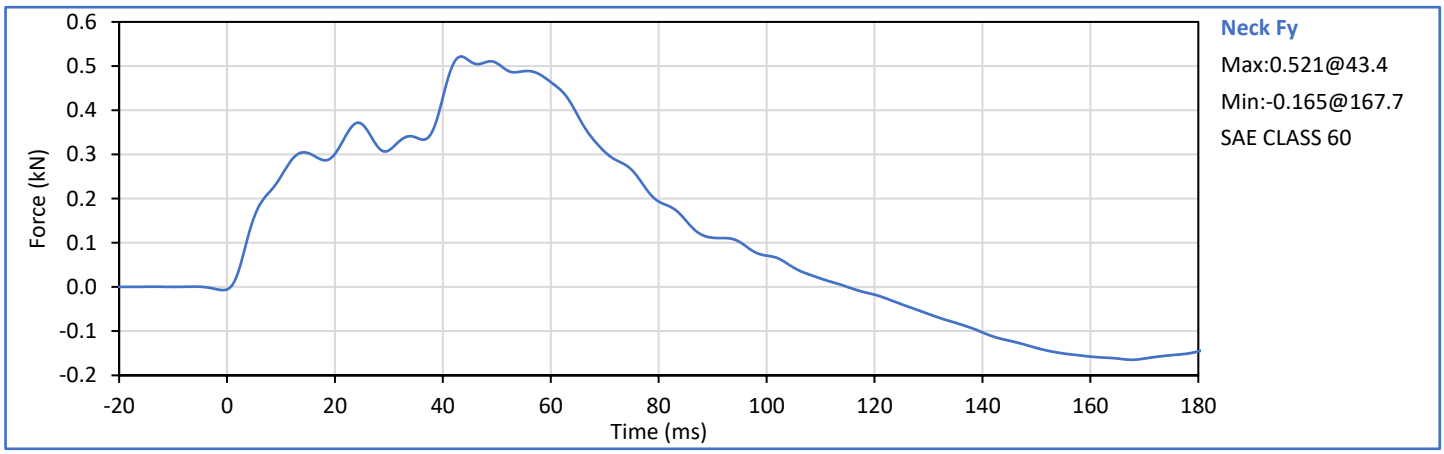
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2022-11-01





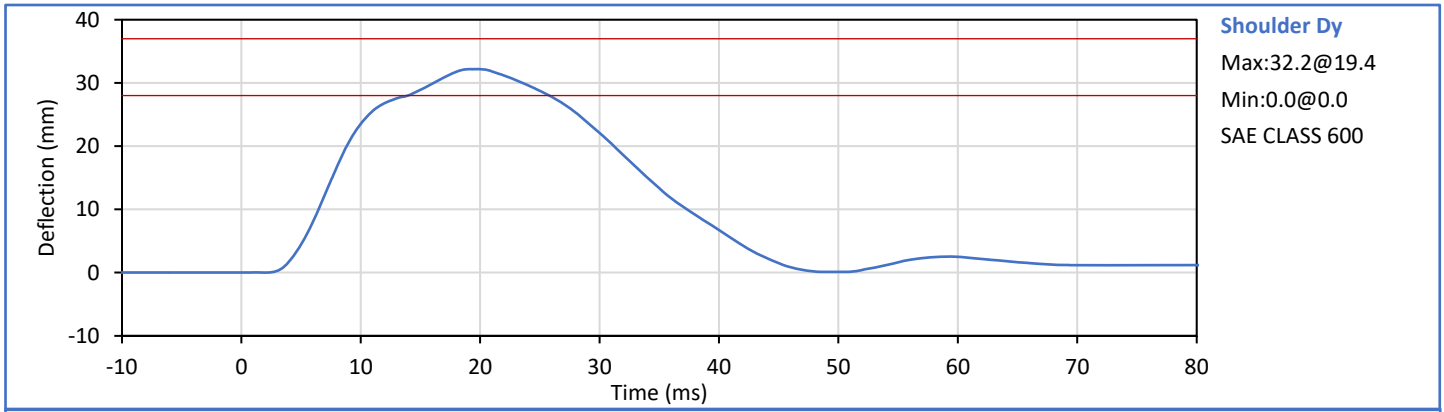


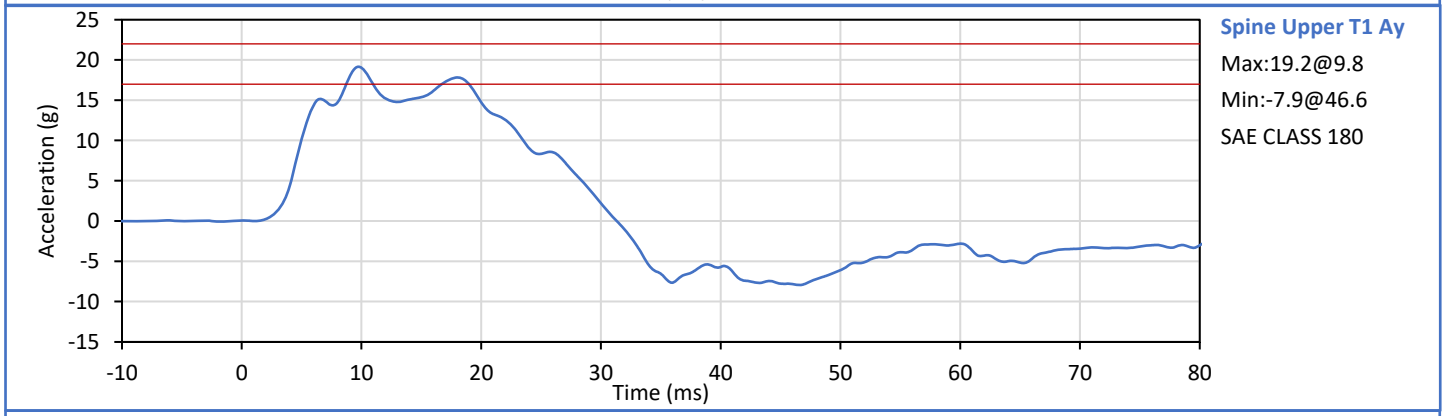
Applus IDIADA KARCO

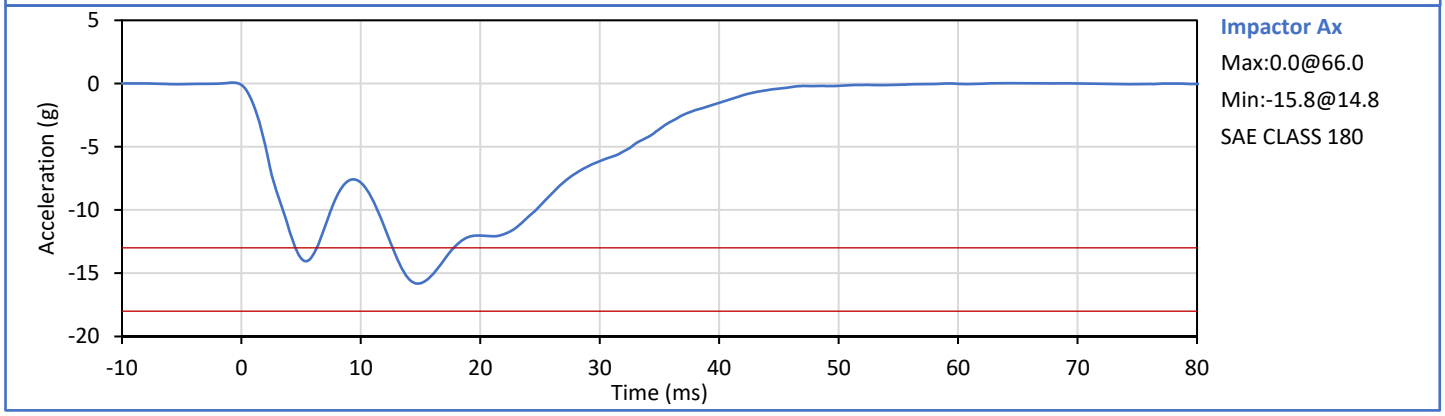
SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 299 Test Date: 2022-10-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.29	Pass
Peak Shoulder Dy	mm	28.0	37.0	32.2	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	19.2	Pass
Peak Impactor Ax	g	-18.0	-13.0	-15.8	Pass
			Overall Test Results		Pass







Technician: G. Fuentes

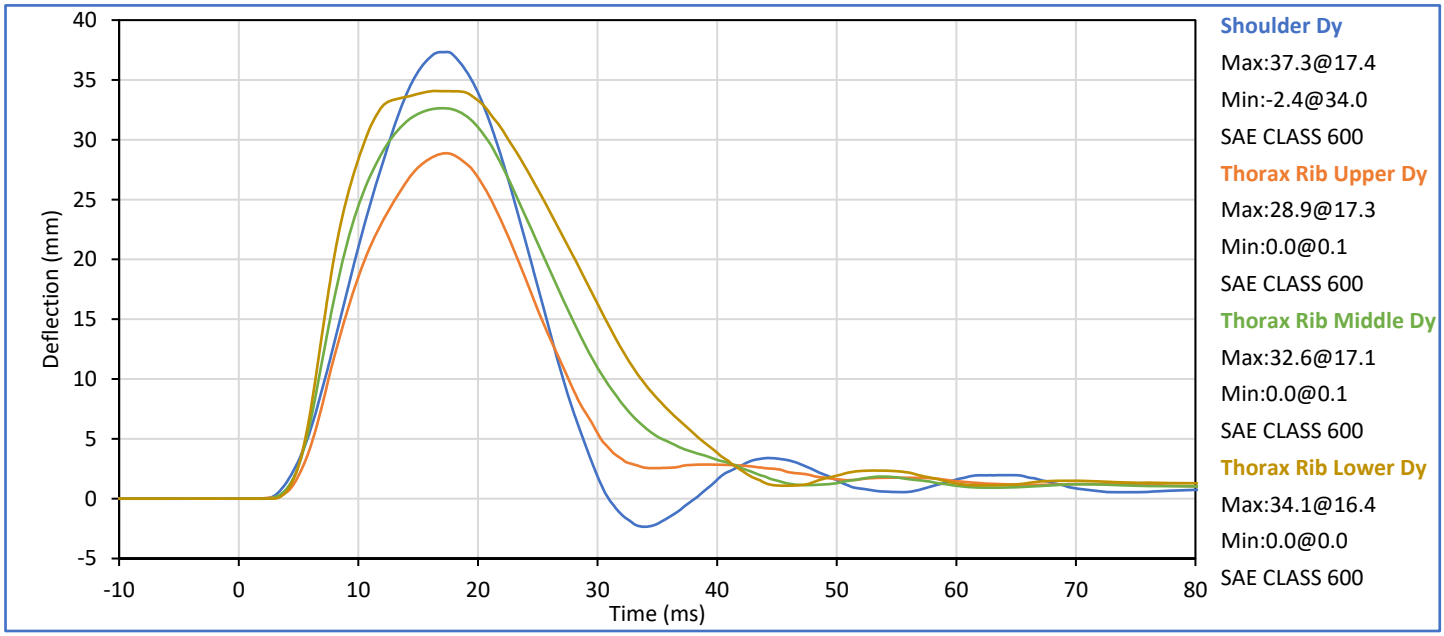
Approved By: J. Hernandez

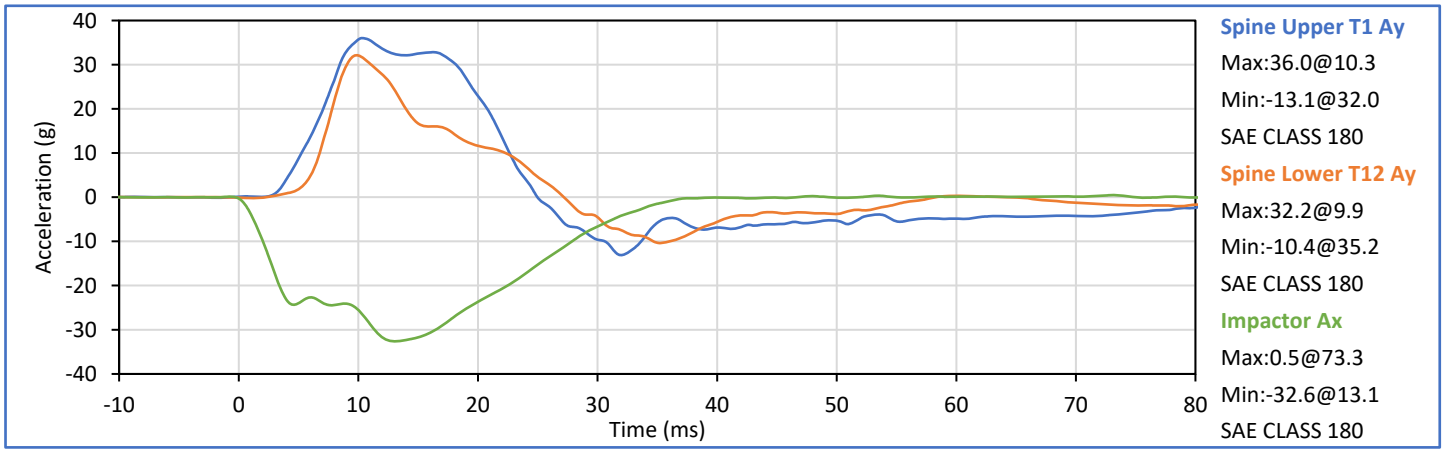
Applus IDIADA KARCO

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

ATD Serial No.: 299 Test Date: 2022-10-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	6.60	6.80	6.66	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.3	Pass
Peak Upper Rib Dy	mm	25.0	32.0	28.9	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.6	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.1	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	36.0	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	32.2	Pass
Peak Impactor Ax	g	-36.0	-30.0	-32.6	Pass
			Overall Test Results		Pass





Technician: G. Fuentes

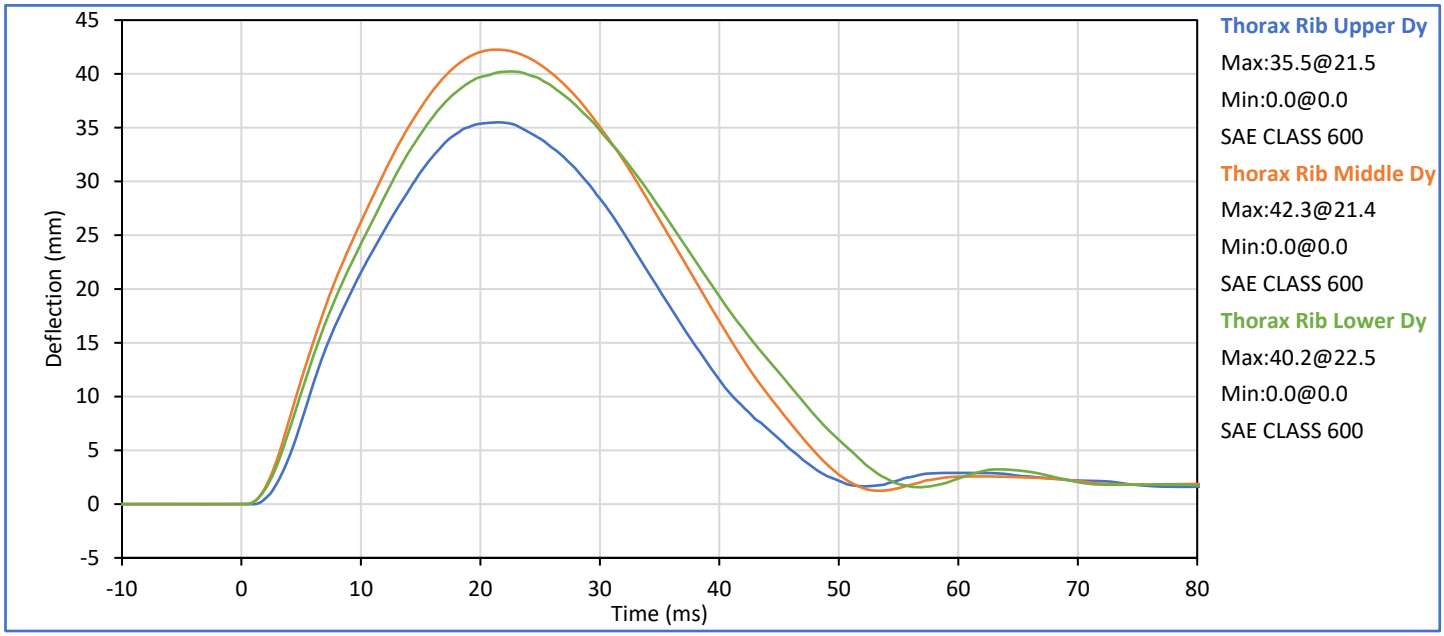
Approved By: J. Hernandez

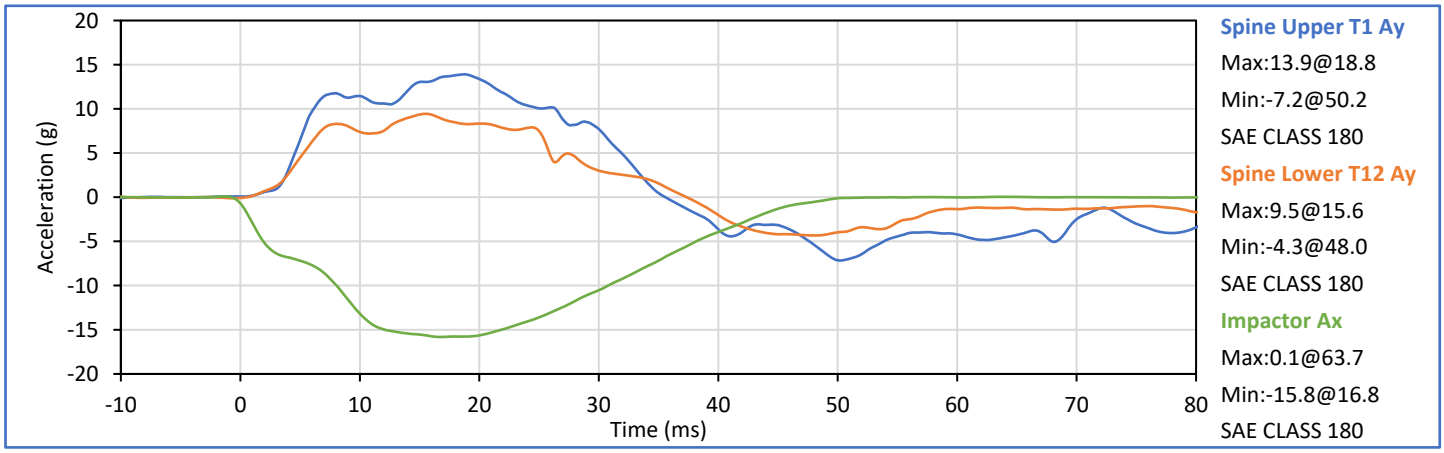
Applus IDIADA KARCO

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

ATD Serial No.: 299 Test Date: 2022-10-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Thorax Rib Upper Dy	mm	32.0	40.0	35.5	Pass
Peak Thorax Rib Middle Dy	mm	39.0	45.0	42.3	Pass
Peak Thorax Rib Lower Dy	mm	35.0	43.0	40.2	Pass
Peak Spine Upper T1 Ay	g	13.0	17.0	13.9	Pass
Peak Spine Lower T12 Ay	g	7.0	11.0	9.5	Pass
Peak Impactor Ax	g	-18.0	-14.0	-15.8	Pass
			Overall Test Results		Pass





Technician: G. Fuentes

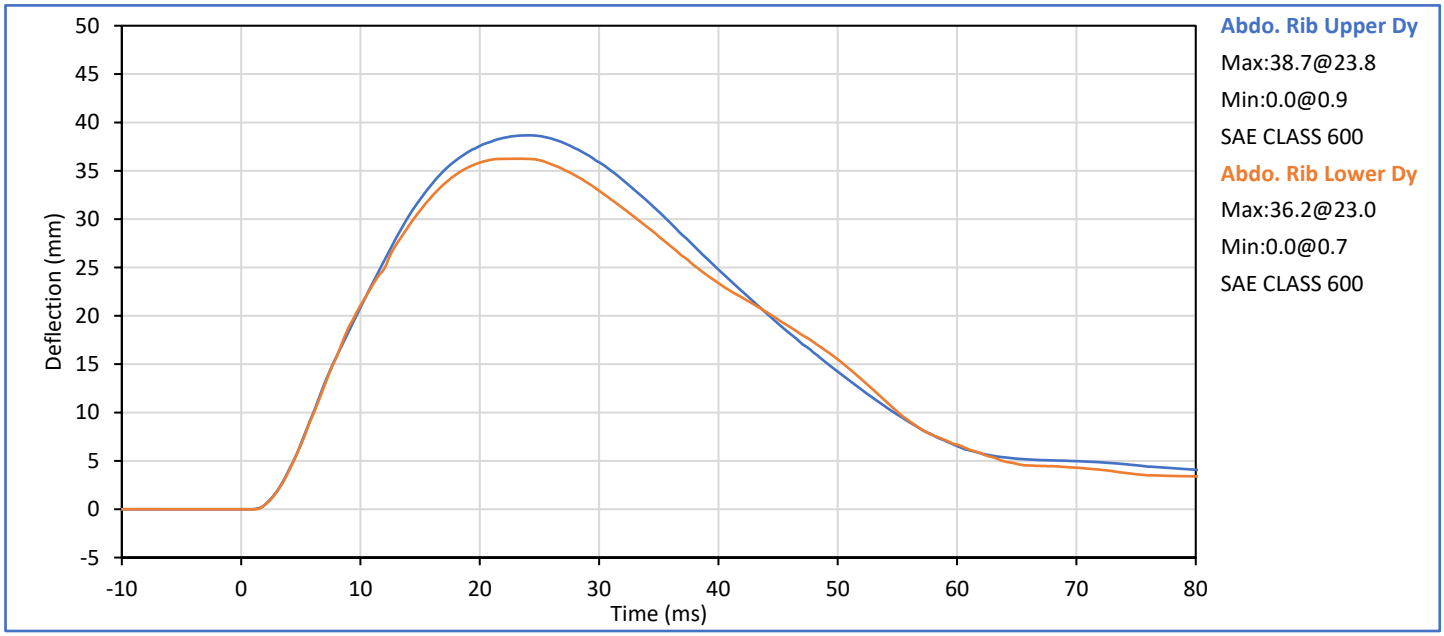
Approved By: J. Hernandez

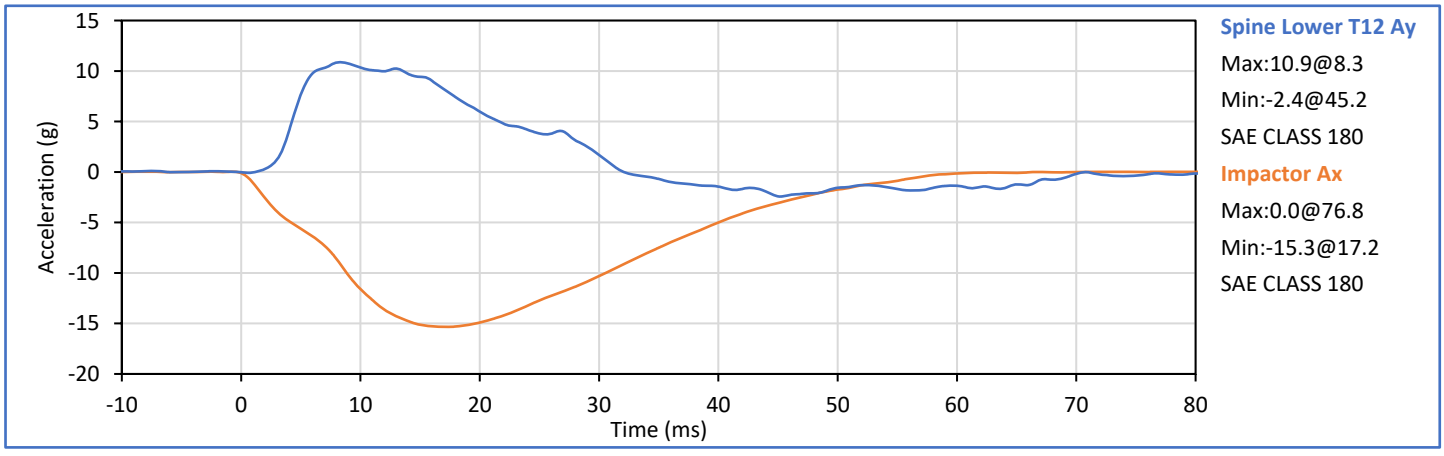
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 299 Test Date: 2022-10-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.30	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	38.7	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	36.2	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.9	Pass
Peak Impactor Ax	g	-16.0	-12.0	-15.3	Pass
			Overall Test Results		Pass





Technician: G. Fuentes

Approved By: J. Hernandez

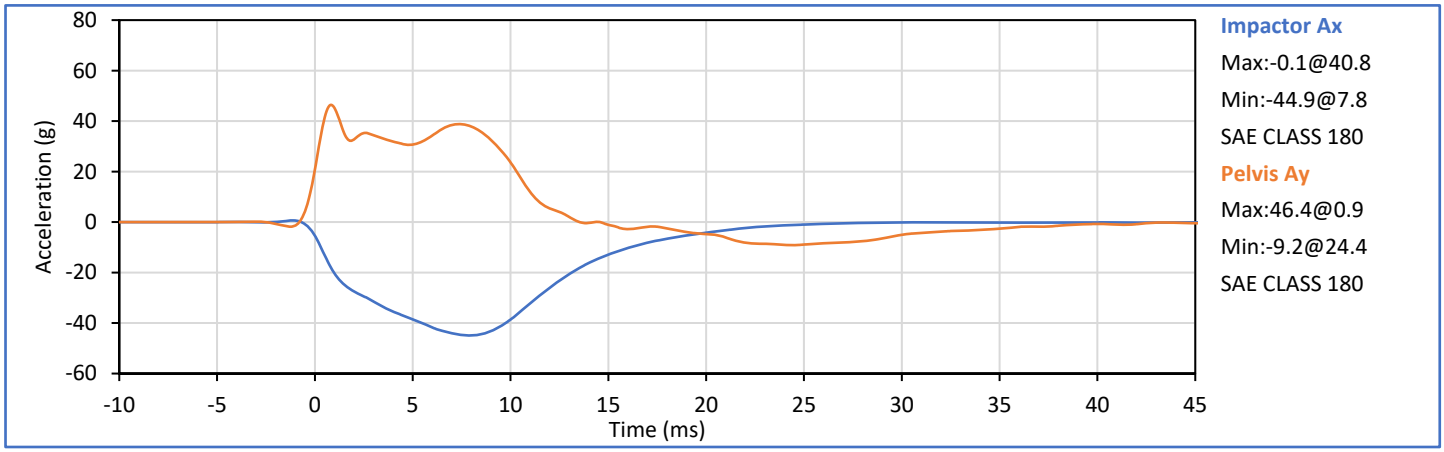
Applus IDIADA KARCO

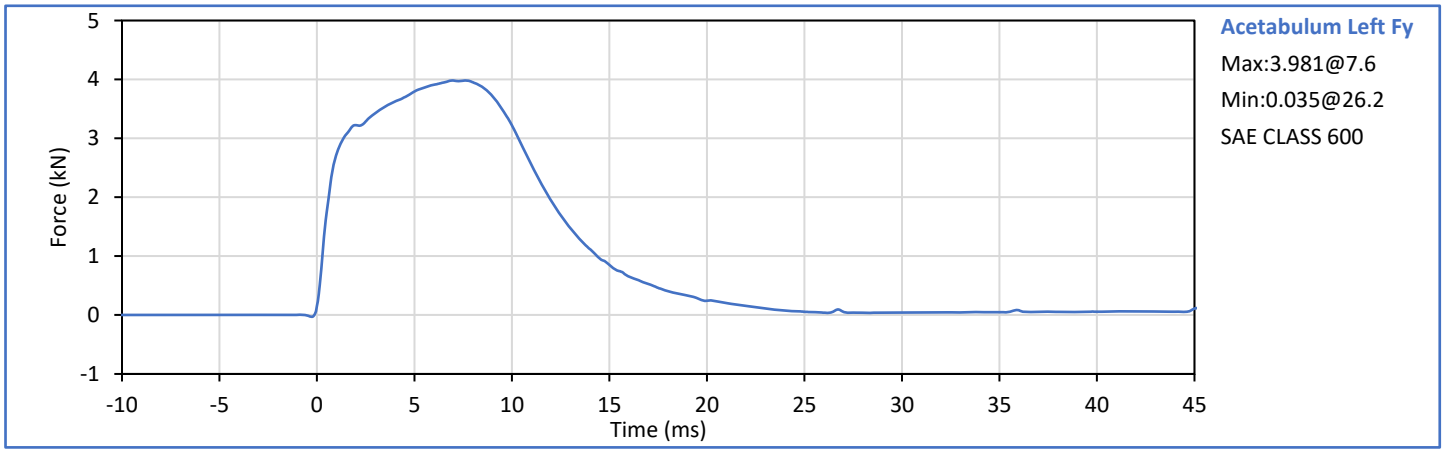
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2022-10-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	6.60	6.80	6.72	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.98	Pass
Pelvis Ay after 6ms	g	34.0	42.0	38.8	Pass
Peak Impactor Ax	g	-47.0	-38.0	-44.9	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13944





Technician: G. Fuentes

Approved By: J. Hernandez

ATD Serial No.: 299 Test Date: 2022-10-31

Pelvis Plug S/N: 13944

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13944
Test Number 13418
Report Number 13463
Test Date 5/20/2020 10:22:29 PM

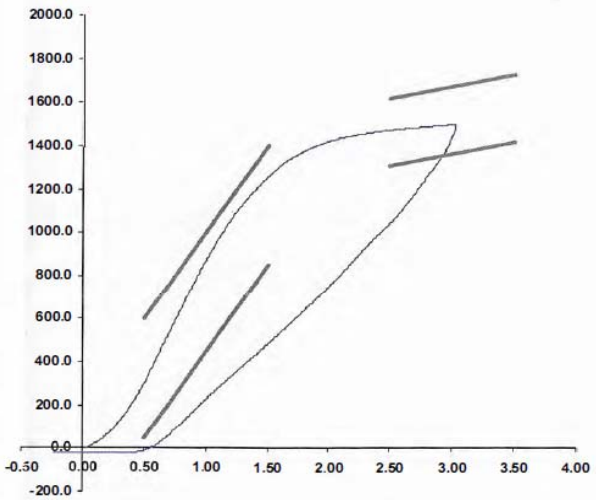
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	308.67	50.00	600.00
Force @ 1.5 mm (N)	1,257.12	850.00	1,400.00
Force @ 2.5 mm (N)	1,470.42	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,496.75	1,361.00	1,673.00

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

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

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 20-May-20
SACO Research

By : DC Date : 5/20/2020

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

Applus IDIADA KARCO

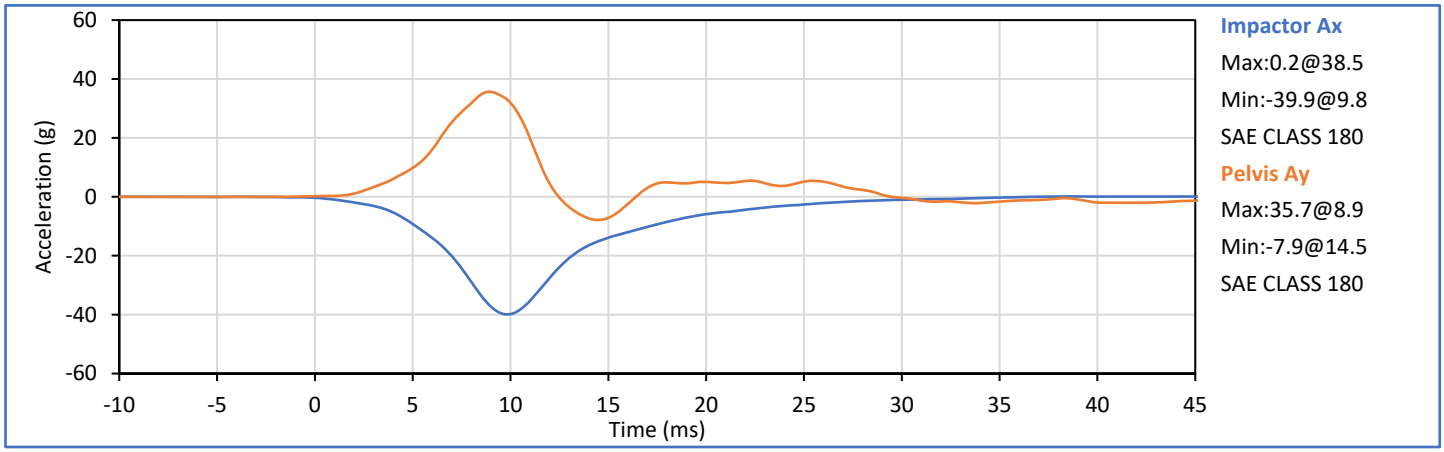
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

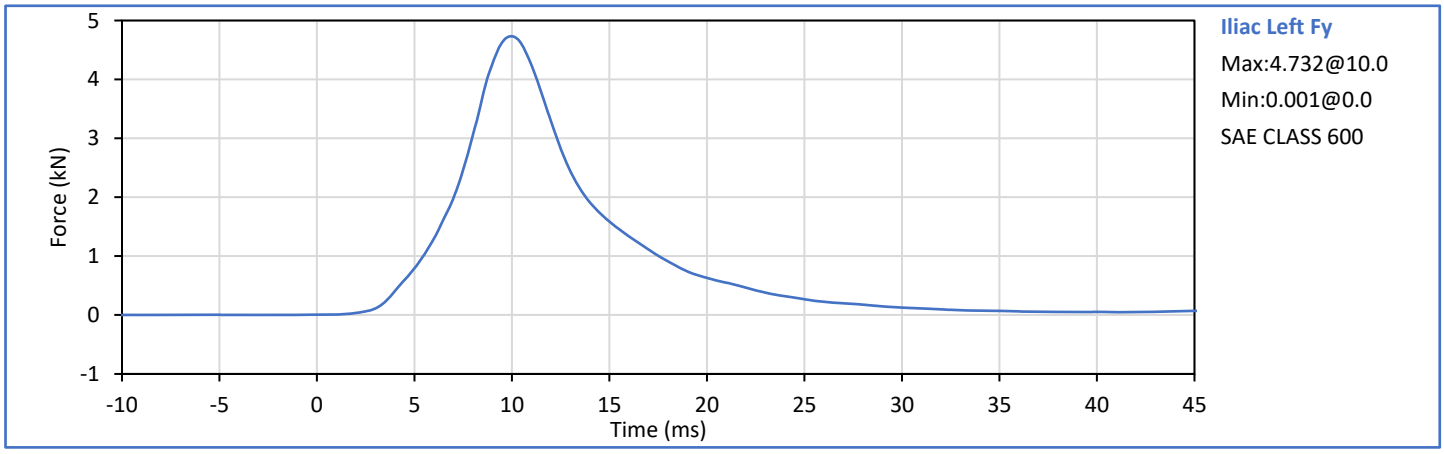
ATD Serial No.: 299 Test Date: 2022-10-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Iliac Fy	kN	4.10	5.10	4.73	Pass
Peak Pelvis Ay	g	28.0	39.0	34.7	Pass
Peak Impactor Ax	g	-45.0	-36.0	-39.9	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 *

* Plug is not impacted and remains certified





Technician: G. Fuentes

Approved By: J. Hernandez

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA