REPORT NUMBER: SPNCAP-KAR-20-014

NEW CAR ASSESSMENT PROGRAM (NCAP)

SIDE IMPACT POLE TEST

VOLVO CAR CORPORATION

2020 VOLVO XC60 T5 5-DOOR MPV

NHTSA No: M20205904

PREPARED BY:

APPLUS IDIADA KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

FEBRUARY 6, 2020

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NRM-110

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Approval Date: February 6, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date:

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

Date:

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SPNCAP-KAR-20-014		

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Final Report of New Car Assessment Program Side Impact Pole Testing of a 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904	February 6, 2020 **6. Performing Organization Code** KAR

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Applus IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**11. Contract or Grant No.** DTNH22-14-D-00355L

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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 Volvo XC60 T5 5-door MPV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on January 23, 2020.

The impact velocity was 32.03 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 17.8°C. The target vehicle's maximum post-test static crush was 309 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	237.3
Resultant Lower Spine Acceleration	g	82	29
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	1825
Maximum Thoracic Rib Deflection	mm	38	19
Maximum Abdominal Rib Deflection	mm	45	26

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.

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

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	105	

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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 Volvo XC60 T5 5-door MPV. 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 Volvo XC60 T5 5-door MPV. The subject vehicle was towed into the rigid pole at an angle of 75.5° and a velocity of 32.03 km/h. The test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California on January 23, 2020. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

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

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

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

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

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

Measurement Description	Units	Driver ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC_{36})		1000	237.3
Lower Spine (T12) Resultant Acceleration	g	82	29
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1825
Maximum Thoracic Rib Deflection	mm	38*	19
Maximum Abdominal Rib Deflection	mm	45*	26

**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 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 Left Floor Sill Acceleration Y channel failed at 15.8 milliseconds. The Left A-Post at Sill Acceleration Y channel failed and no data was collected.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20205904
Model Year	2020
Make	Volvo
Model	XC60 T5
Body Style	5-Door MPV
VIN	YV4102DK1L1504211
Body Color	Denim Blue Metallic
Odometer Reading (km / mi)	8 / 5
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	FWD
Roof Rack	Yes
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

Does Owner's Manual provide instructions to turn off automatic door locks?	No

DATA FROM CERTIFICATION LABEL

Manufactured By	Volvo Car Corporation
Date of Manufacture	Oct-19
Vehicle Type	MPV

GVWR (kg)	2370
GAWR Front (kg)	1188
GAWR Rear (kg)	1220

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				430.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				89.8	*A-B*

VEHICLE SEAT TYPE

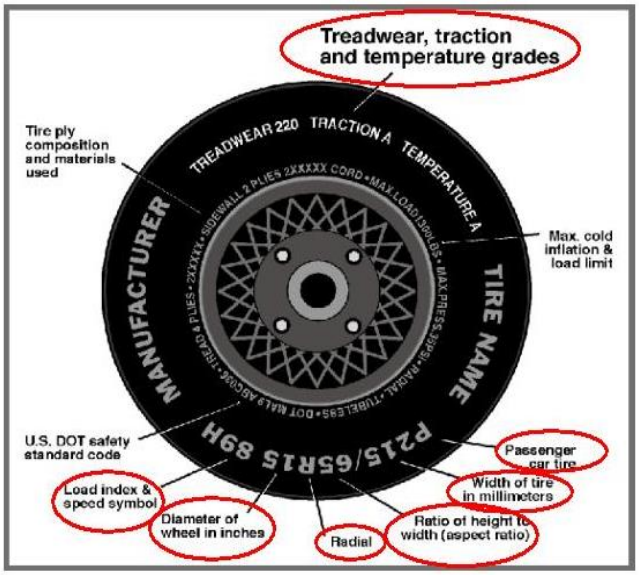
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat		Yes			Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	340	340
Cold Pressure (kPa)	240	240
Recommended Tire Size	235/55 R19	235/55 R19
Tire Size on Vehicle	235/55 R19	235/55 R19
Tire Manufacturer	Pirelli	Pirelli
Tire Model	Scorpion Zero	Scorpion Zero
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	2 Rayon, 2 Steel, 1 Polyester	2 Rayon, 2 Steel, 1 Polyester
Load Index/Speed Symbol	105V	105V
Tire Material	Rayon, Steel, Polyester	Rayon, Steel, Polyester
DOT Safety Code Left	XB08 031B 3919	XB08 031B 3919
DOT Safety Code Right	XB08 031B 3919	XB08 031B 3919

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

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	499.0	409.0		511.0	489.5		508.0	479.5	
Right	kg	507.0	398.5		489.0	457.0		504.5	460.0	
Ratio	%	55.5%	44.5%	100.0%	51.4%	48.6%	100.0%	51.9%	48.1%	100.0%
Total	kg	1006.0	807.5	1813.5	1000.0	946.5	1946.5	1012.5	939.5	1952.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1813.5	A
Actual Weight of 1 P572V ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	89.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1952.3	A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e. Calculated Test Vehicle Target Weight -4.5 kg to -9.0 kg)? ☒ **Yes** ☐ **No**

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	0.0	-0.1	-0.1	Yes
Front Passenger Sill Angle (front-to-rear)*	°	0.0	0.2	0.3	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.2	0.2	0.1	Yes
Rear Bumper-Line Angle (left-to-right)**	°	0.1	-0.1	-0.2	Yes
Vehicle CG (Aft of Front Axle)	mm	1269	1386	1372	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	1	23	10	

*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 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Spare Tire and Tools	18.5
Trunk Trim	2.0
Door Panel	3.5
Rear Door Window	2.5
Ballast / Equipment Added	110.5

Test Height Adjustable Setting (If Applicable)	Comfort

DATA SHEET NO. 2

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

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	6.9	0.0	3.5
Front Passenger Seat	7.0	0.0	3.5
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	3.5	265	Max	270	279	283
			Mid	250	259	265
			Min	230	238	247
Front Passenger Seat	3.5	262	Max	263	270	280
			Mid	246	253	262
			Min	228	236	243
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 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

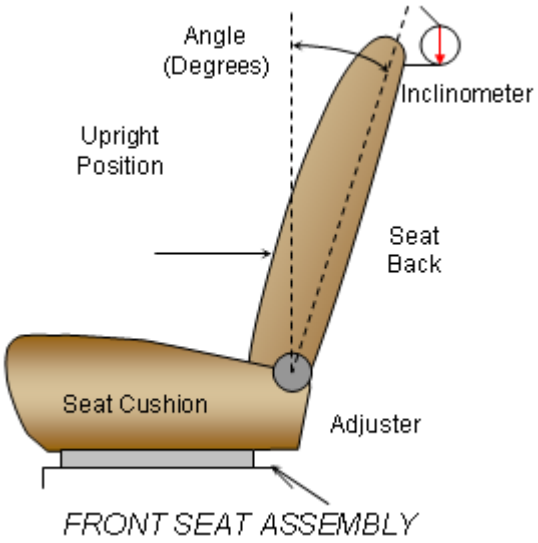
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	265		0	
Front Passenger Seat	265		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	69.2		11.7	
Front Passenger Seat	71.7		11.7	
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 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	4	M2

HEAD RESTRAINT ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

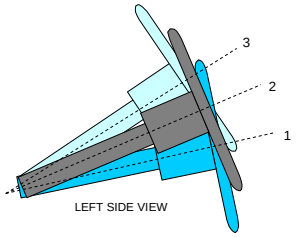
Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

STEERING COLUMN ADJUSTMENT

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

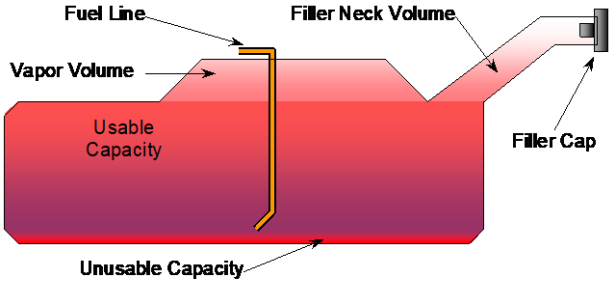
	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	20.2	69
Geometric Center - Position 2	23.1	96
Uppermost - Position 3	26.0	122
Telescoping Steering Wheel Travel		53
Test Position	23.1	96



STEERING COLUMN ASSEMBLY

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)	70.03
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	70.03
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	65.13
Actual amount of Solvent Used in Test	65.14
1/3 of Usable Capacity	23.34

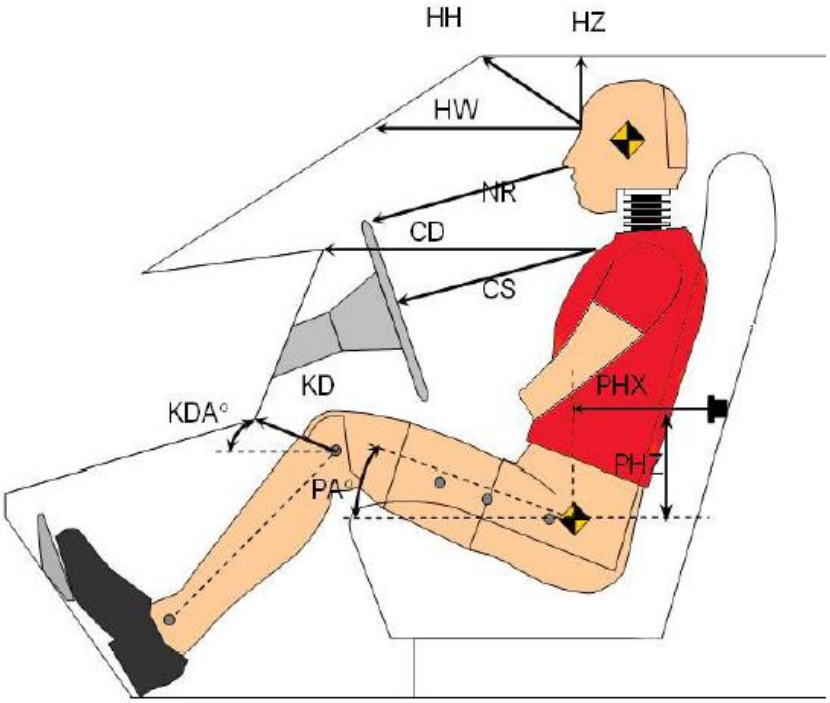
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



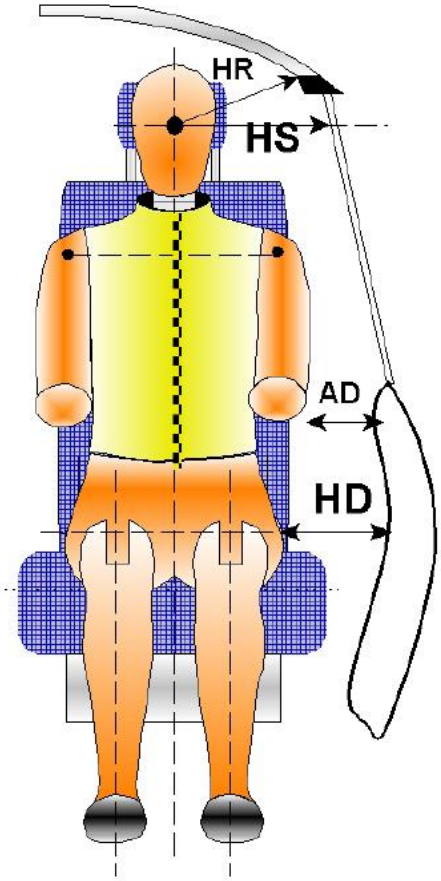
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	262	
HW	Head to Windshield	568	
HZ	Head to Roof	177	
NR	Nose to Rim	240	
CD	Chest to Dash	400	
CS	Chest to Steering Wheel	161	
KD(L)/KDA(L)°	Left Knee to Dash	144	33.7
KD(R)/KDA(R)°	Right Knee to Dash	125	28.2
PAX°	Pelvic Tilt Angle (x-axis)		19.8
PAY°	Pelvic Tilt Angle (y-axis)		0.0
PHX	Hip Point to Striker (x-axis)	323	
PHZ	Hip Point to Striker (z-axis)	138	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



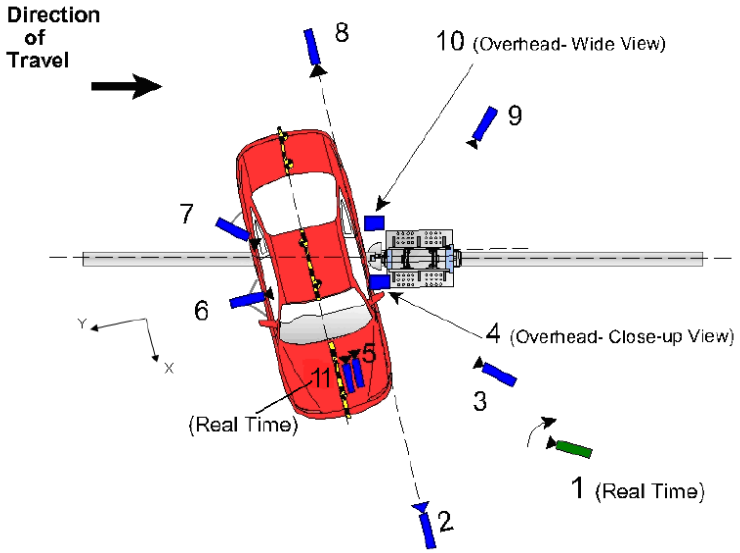
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	227
HS	Head to Side Window	mm	420
AD	Arm to Door	mm	142
HD	Hip Point to Door	mm	247

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



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

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	1.19	0.58	-1.51	8.5	1000
6	On-Board - Dummy Side View	-0.13	1.67	-1.39	8.5	1000
7	On-Board - Dummy Rear Oblique View	-1.11	1.61	-1.37	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	1.16	0.65	-1.57		30

*All measurements accurate to ±6 mm

INSTRUMENTATION

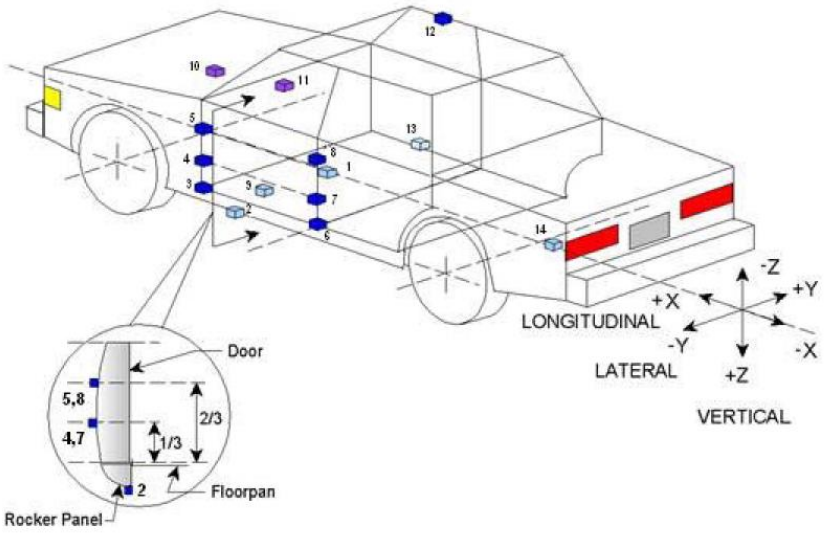
Driver Dummy Channels	19
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	45

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2050	0	-600
2	Left Floor Sill	2060	-720	-245
3	A-Pillar Sill	3210	-860	-500
4	A-Pillar Low	3230	-870	-700
5	A-Pillar Mid	3240	-880	-890
6	B-Pillar Sill	1980	-700	-500
7	B-Pillar Low	2010	-710	-700
8	B-Pillar Mid	2020	-720	-1050
9	Driver Seat Track	2200	-570	-430
10	Engine Top	3910	410	-890
11	Firewall	3580	380	-860
12	Right Roof	2190	460	-1680
13	Right Floor Sill	2650	740	-470
14	Rear Floorpan	900	0	-690

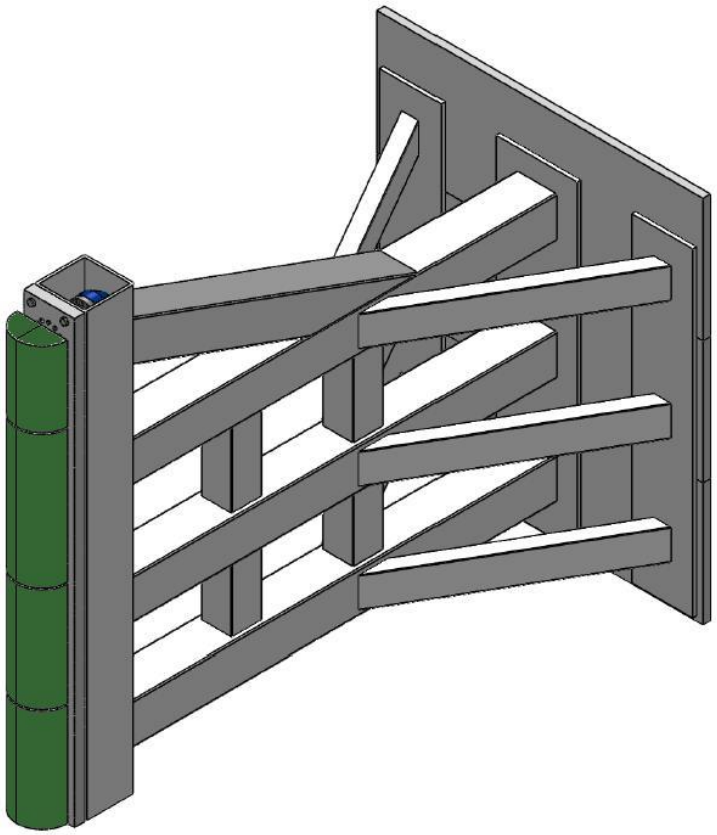
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



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

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

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	Door Panel

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 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

POST-TEST STRUCTURAL OBSERVATIONS

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

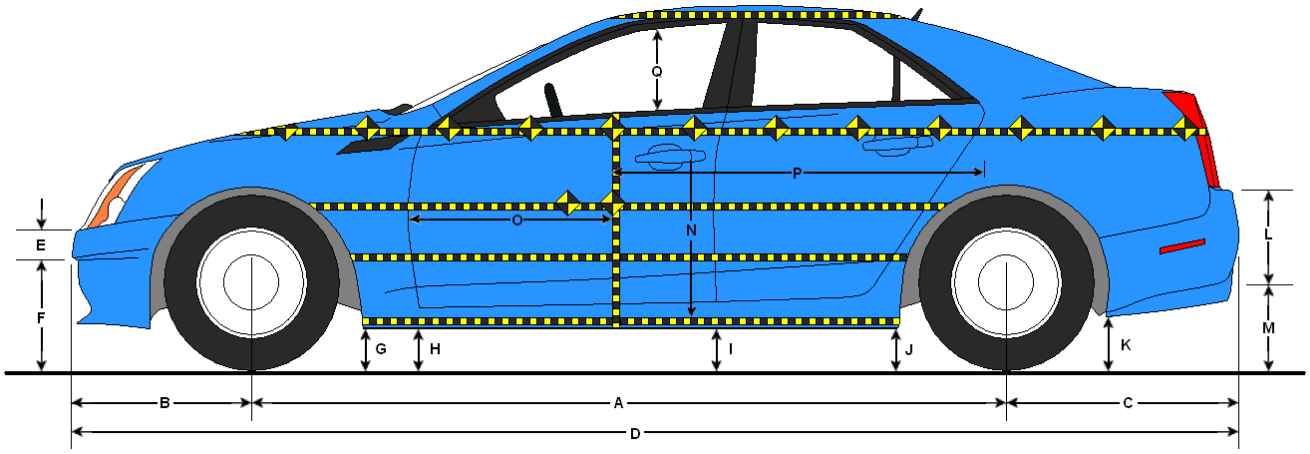
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1273
Actual Impact Point (Aft of Front Axle)	mm		1275
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-2
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.5
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.03
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.09

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

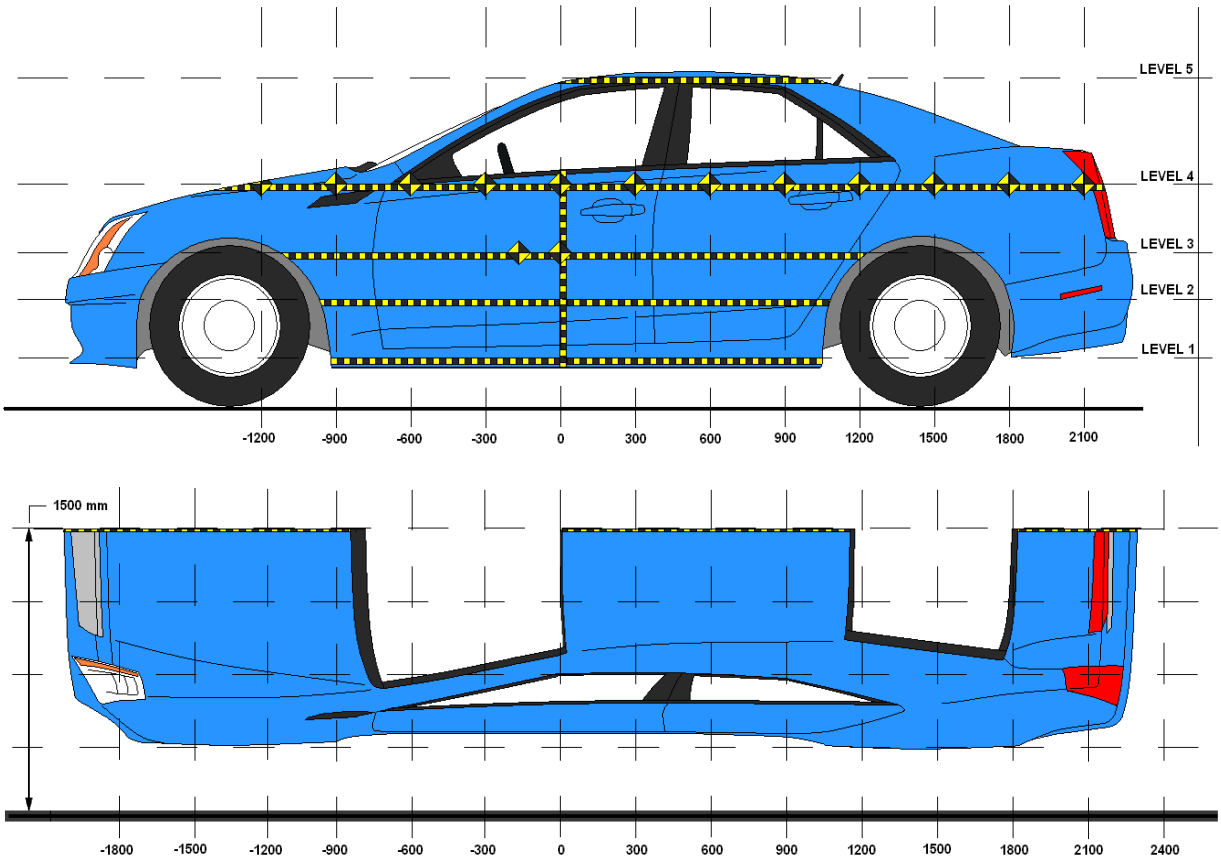
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2851	2803	-48
B	Front Axle to FSOV	874	904	30
C	Rear Axle to RSOV	966	968	2
D	Total Length at Centerline	4664	4675	11
E	Front Bumper Thickness	223	220	-3
F	Fromt Bumper Bottom to Ground	610	629	19
G	Sill Height at Front Wheel Well	387	392	5
H	Sill Height at Front Door Leading Edge	421	428	7
I	Sill Height at B-Pillar	404	420	16
J1	Sill Height at Rear Wheel Well	400	429	29
J2	Pinch Weld Height at Rear Wheel Well	334	333	-1
K	Sill Height Aft of Rear Wheel Well	441	447	6
L	Rear Bumper Thickness	281	280	-1
M	Rear Bumper Bottom to Ground	485	485	0
N	Sill Height to Bottom of Front Window Sill	729	755	26
O	Front Door Leading Edge to Impact CL	652	578	-74
P	Rear Door Trailing Edge to Impact CL	1438	1378	-60
Q	Front Window Opening	439	441	2
R	Right Side Length	3312	3322	10
S	Left Side Length	3311	3241	-70
T	Vehicle Width at B-Pillar	1901	1819	-82

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



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

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	518	258	0
2	Occupant H-Point	779	308	0
3	Mid-Door	820	309	0
4	Window Sill	1163	256	150
5	Window Top	1679	90	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

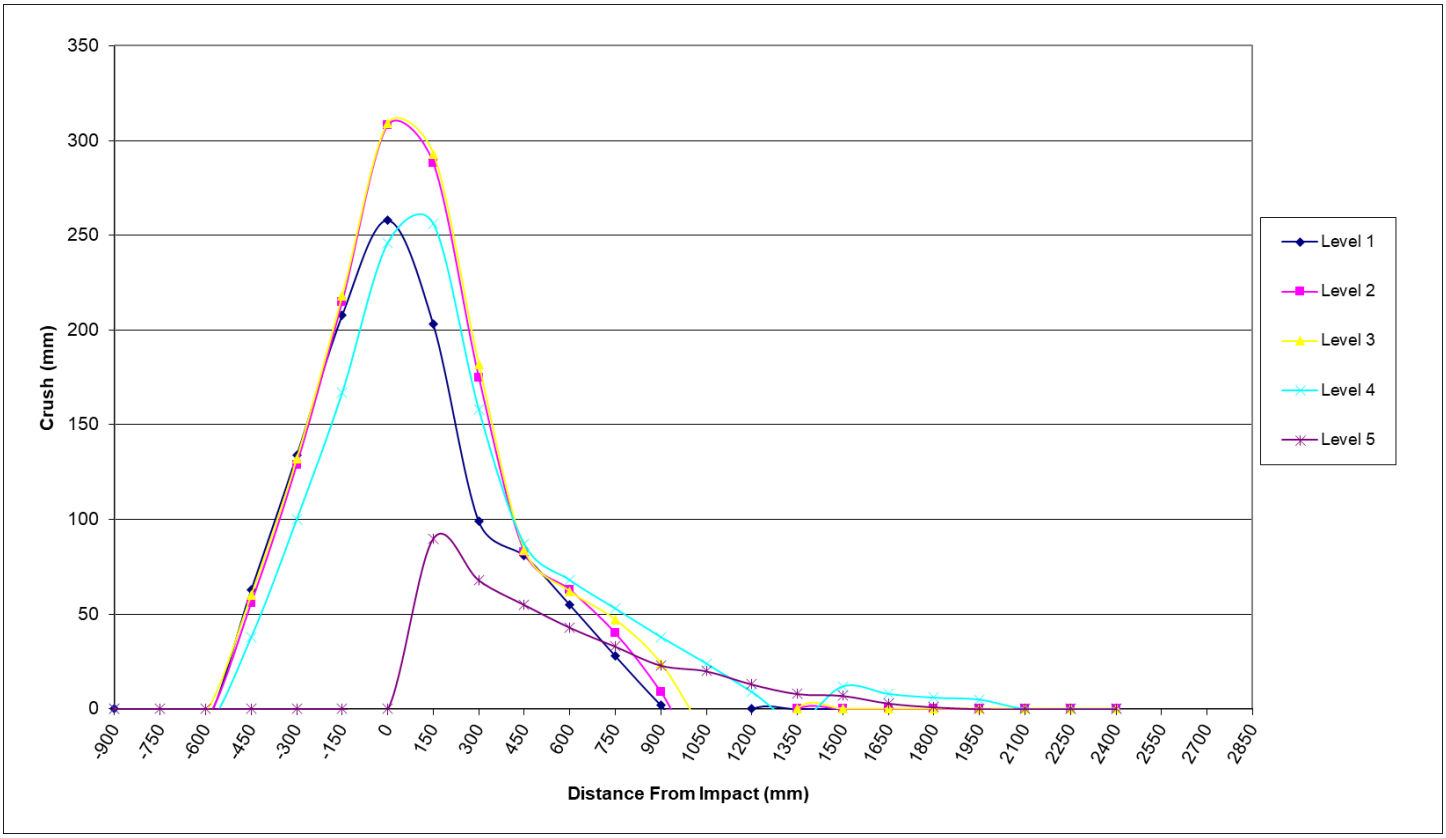
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900		552	552				542	543				-10	-9		
-750	577	561	560	662		573	553	551	654		-4	-8	-9	-8	
-600	578	563	561	653		571	557	559	643		-7	-6	-2	-10	
-450	574	563	561	646		637	619	621	684		63	56	60	38	
-300	572	563	561	577		706	692	693	677		134	129	132	100	
-150	570	563	561	633		778	778	779	800		208	215	218	167	
0	569	563	562	627		827	871	871	873		258	308	309	246	
150	569	564	562	623	890	772	852	855	879	980	203	288	293	256	90
300	570	566	563	617	892	669	741	745	775	960	99	175	182	158	68
450	573	569	565	615	896	654	652	649	702	951	81	83	84	87	55
600	576	572	568	613	899	631	635	630	681	942	55	63	62	68	43
750	579	576	572	613	899	607	616	619	666	932	28	40	47	53	33
900	582	575	573	610	902	584	584	597	648	925	2	9	24	38	23
1050	585	569	568	608	902	564	539	554	632	922	-21	-30	-14	24	20
1200		558	558	615	905		535	515	624	918		-23	-43	9	13
1350				609	908				603	916				-6	8
1500				611	907				623	914				12	7
1650				616	910				624	913				8	3
1800				623	915				629	916				6	1
1950				631					636					5	
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

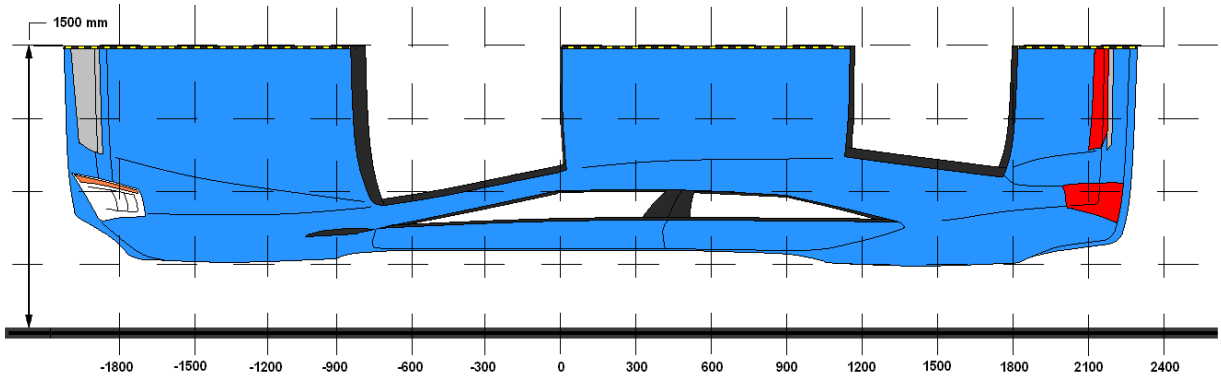


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1950	4	631	636	5
2	1350	5	908	916	8
3	750	4	613	666	53
4	300	3	563	745	182
5	-300	1	572	706	134
6	-900	3	552	543	-9

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20

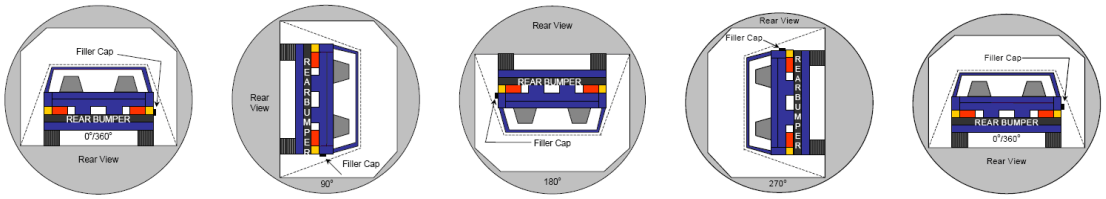
Temperature at Time of Impact: 17.8° C Test Time: 2:46 PM

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°	81	300	381
270° To 360°	78	300	378

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

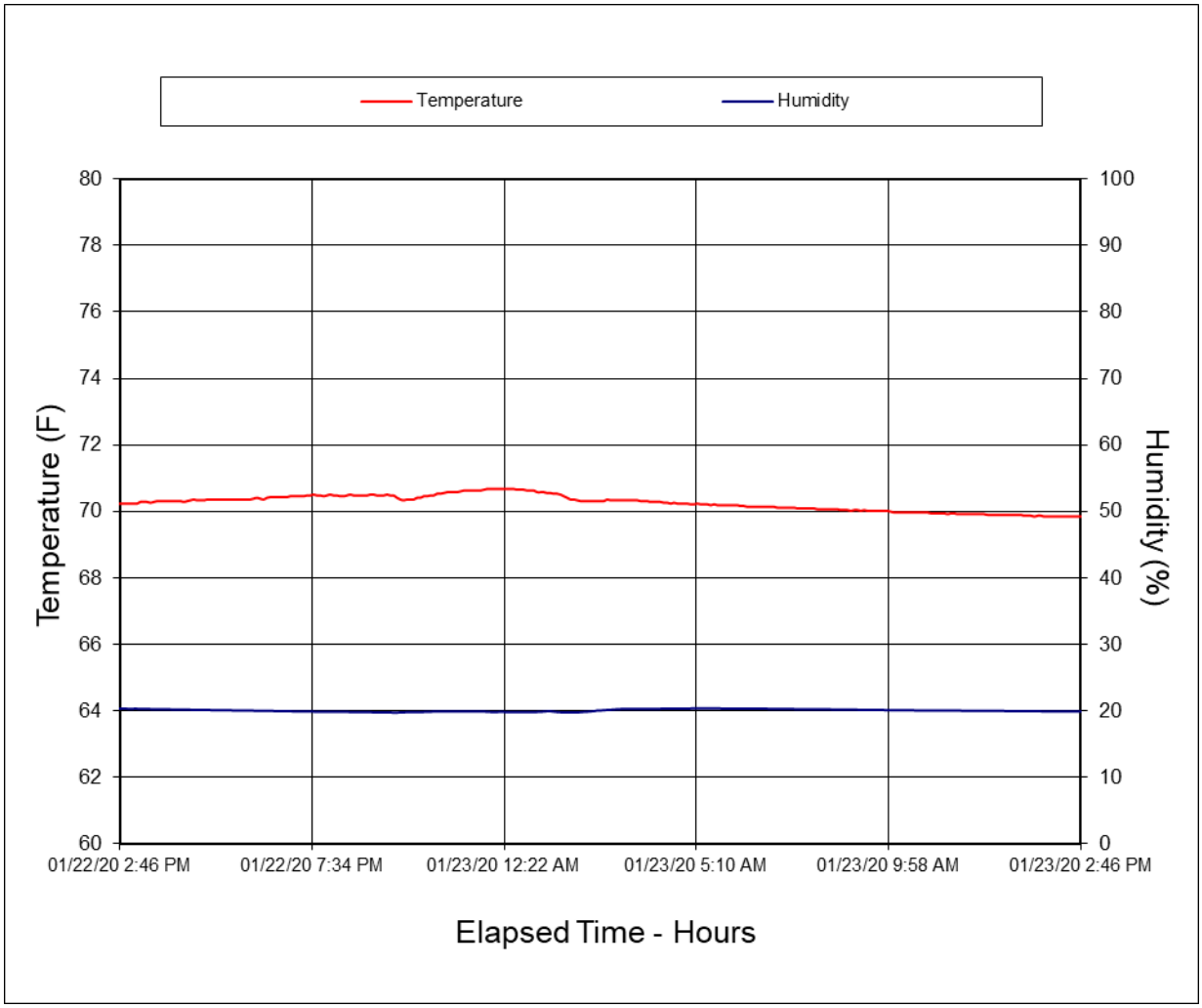
Test Phase	Spillage Location
0° To 90°	No Spillage Occurred
90° To 180°	No Spillage Occurred
180° To 270°	No Spillage Occurred
270° To 360°	No Spillage Occurred

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2020 Volvo XC60 T5 5-Door MPV NHTSA No. M20205904

Test Program: NCAP Side Pole Impact Test Test Date: 01/23/20



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

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

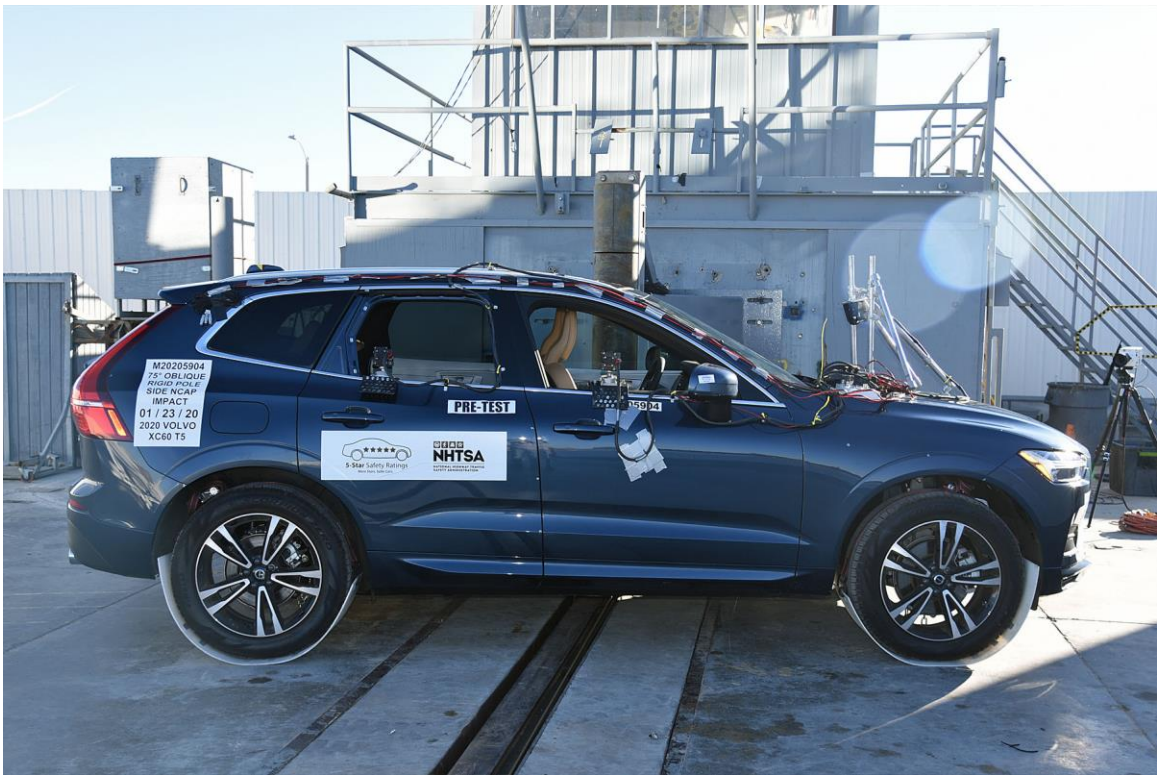


FIGURE 13. Pre-Test Right Side View of Test Vehicle

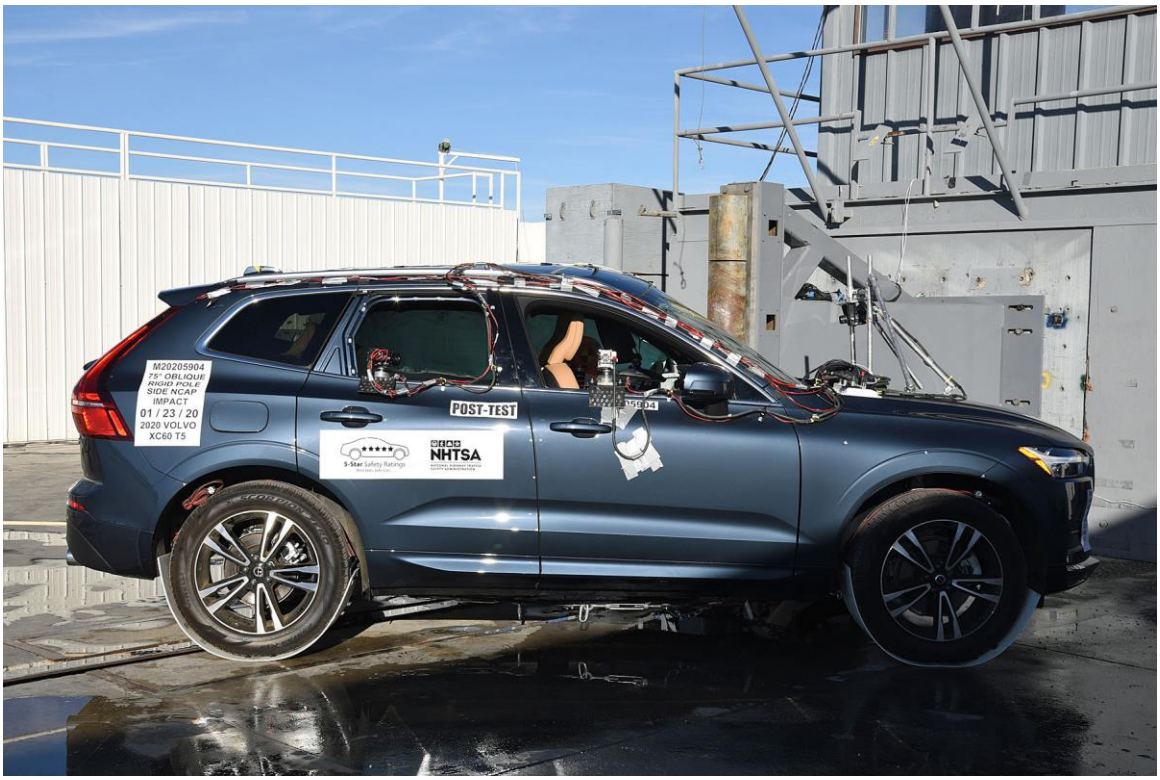


FIGURE 14. Post-Test Right Side View of Test Vehicle

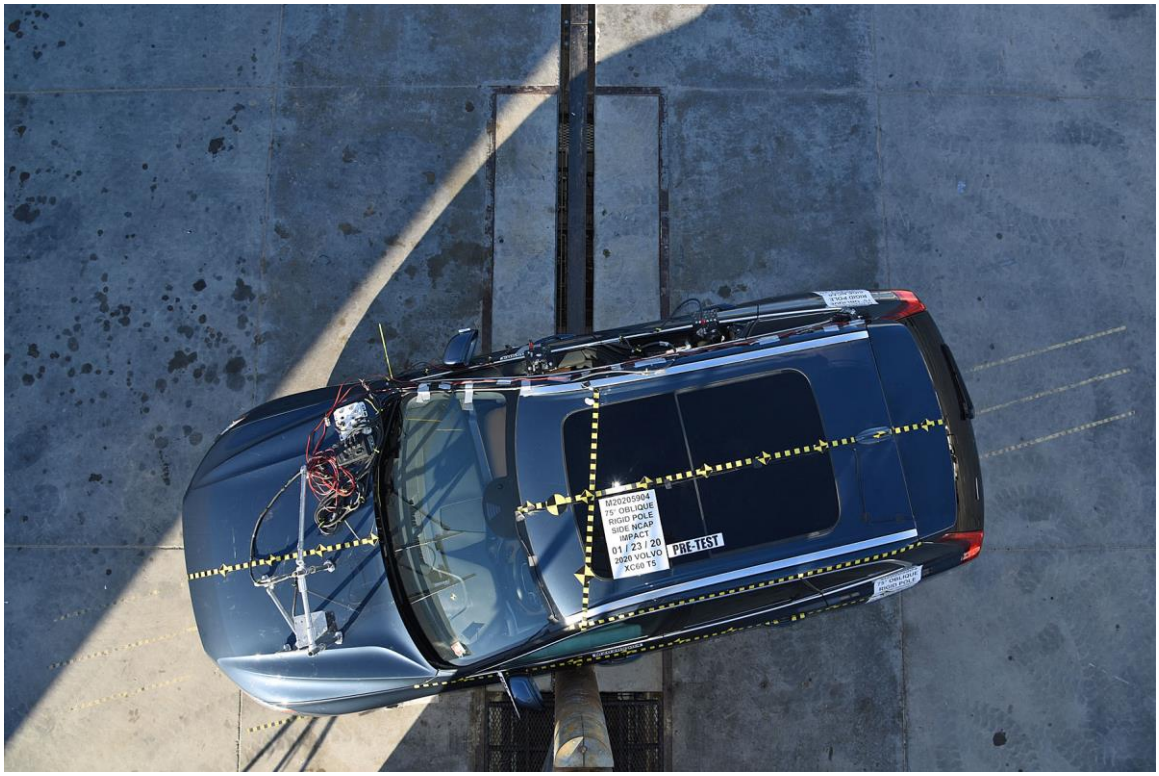


FIGURE 15. Pre-Test Overhead View of Test Area

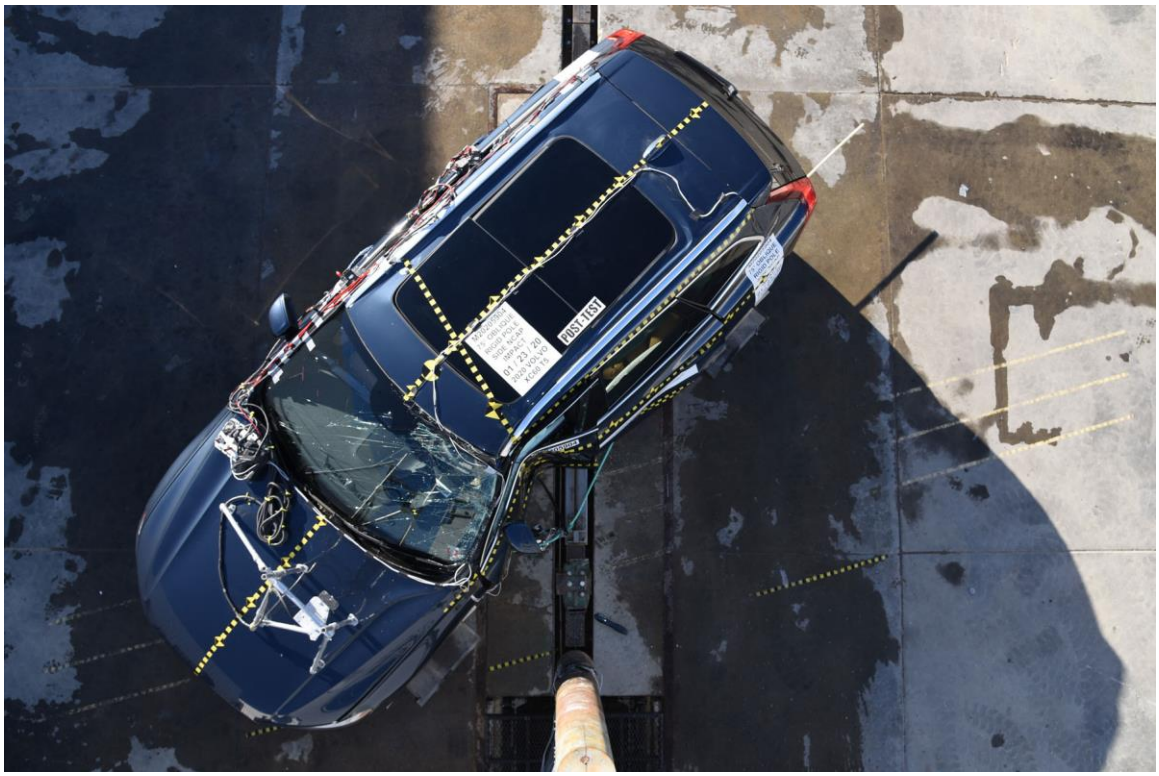


FIGURE 16. Post-Test Overhead View of Test Area

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

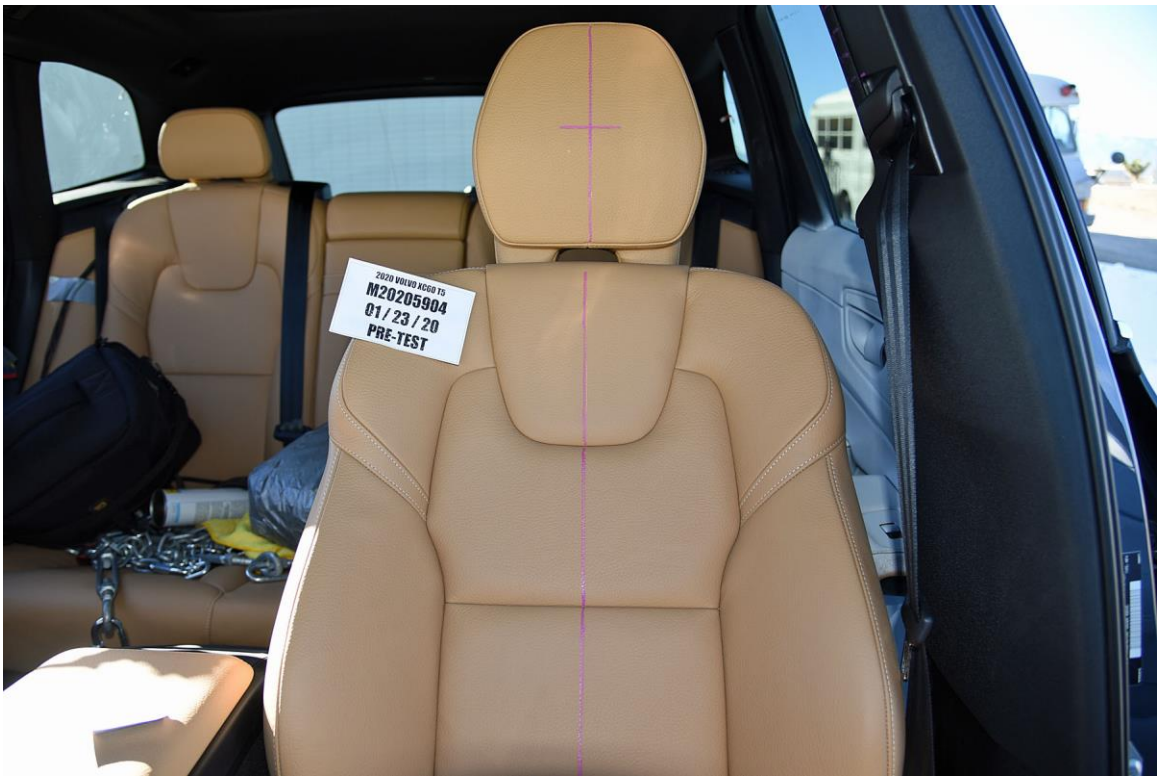


FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning

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

Photograph Not Available

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

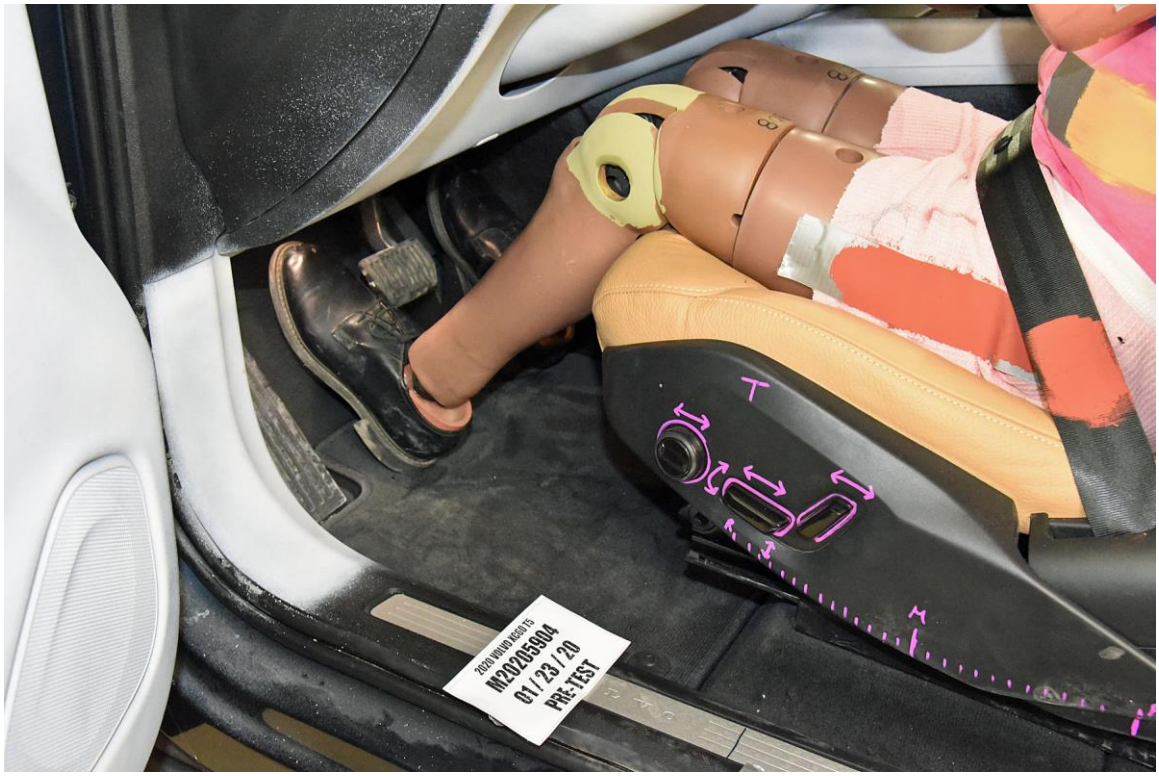


FIGURE 32. Pre-Test Placement of Dummy's Feet

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

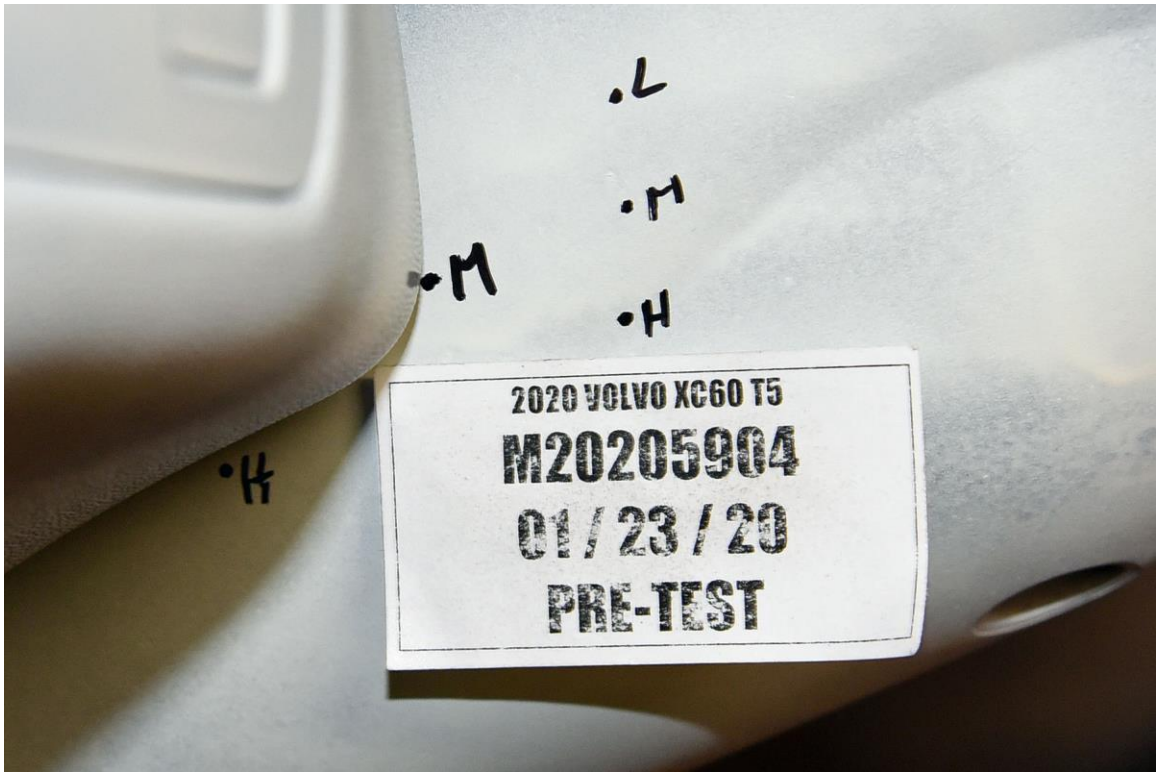


FIGURE 34. Pre-Test Left Side View of Steering Wheel

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

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

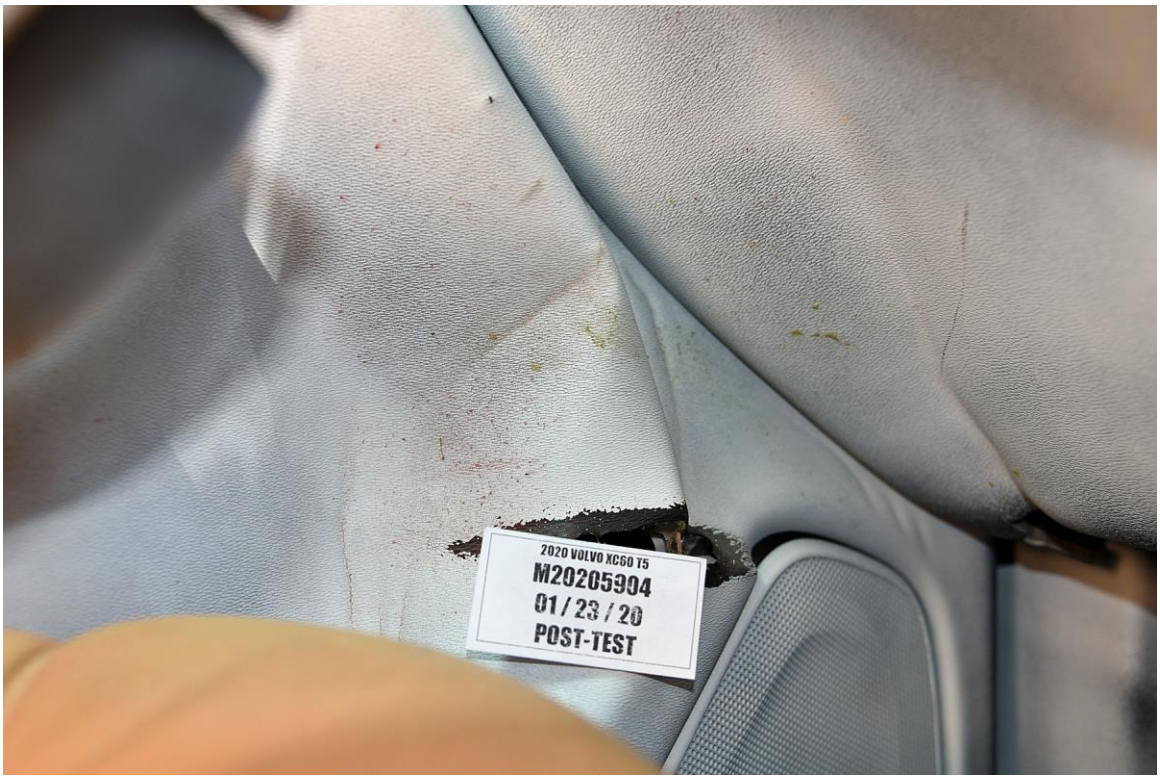


FIGURE 52. Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View

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

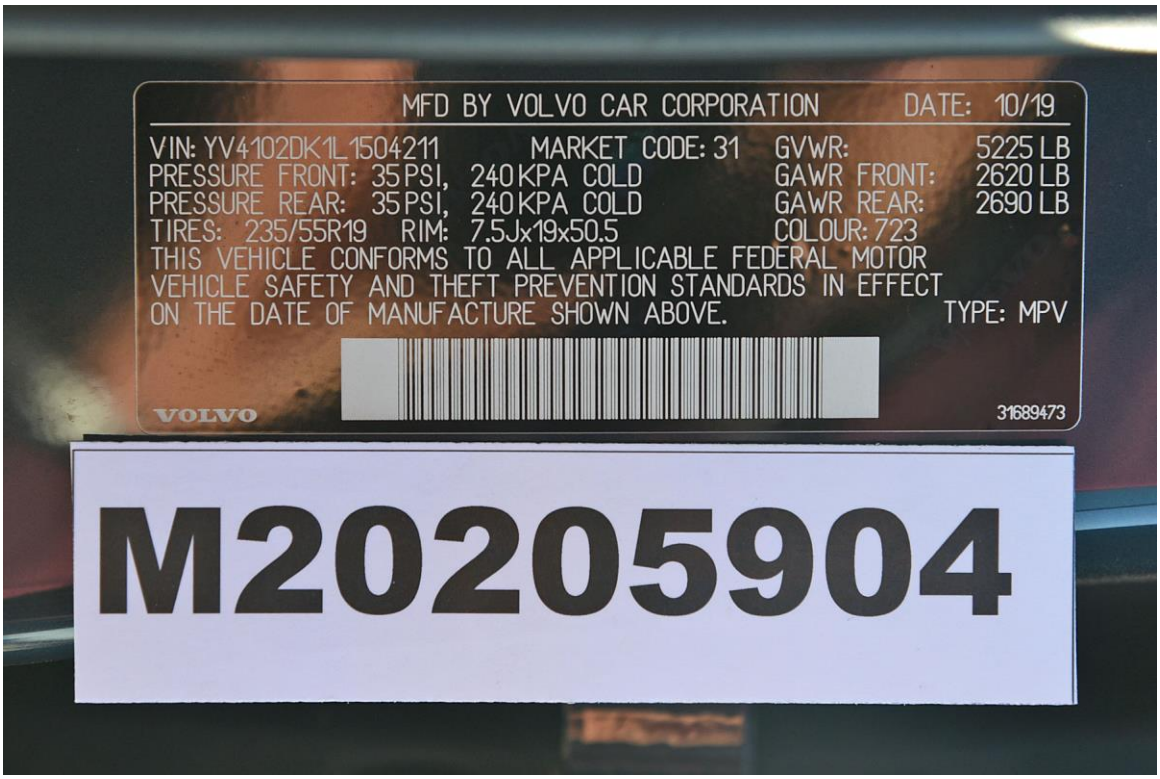


FIGURE 55. Close-Up View of Vehicle's Certification Label

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

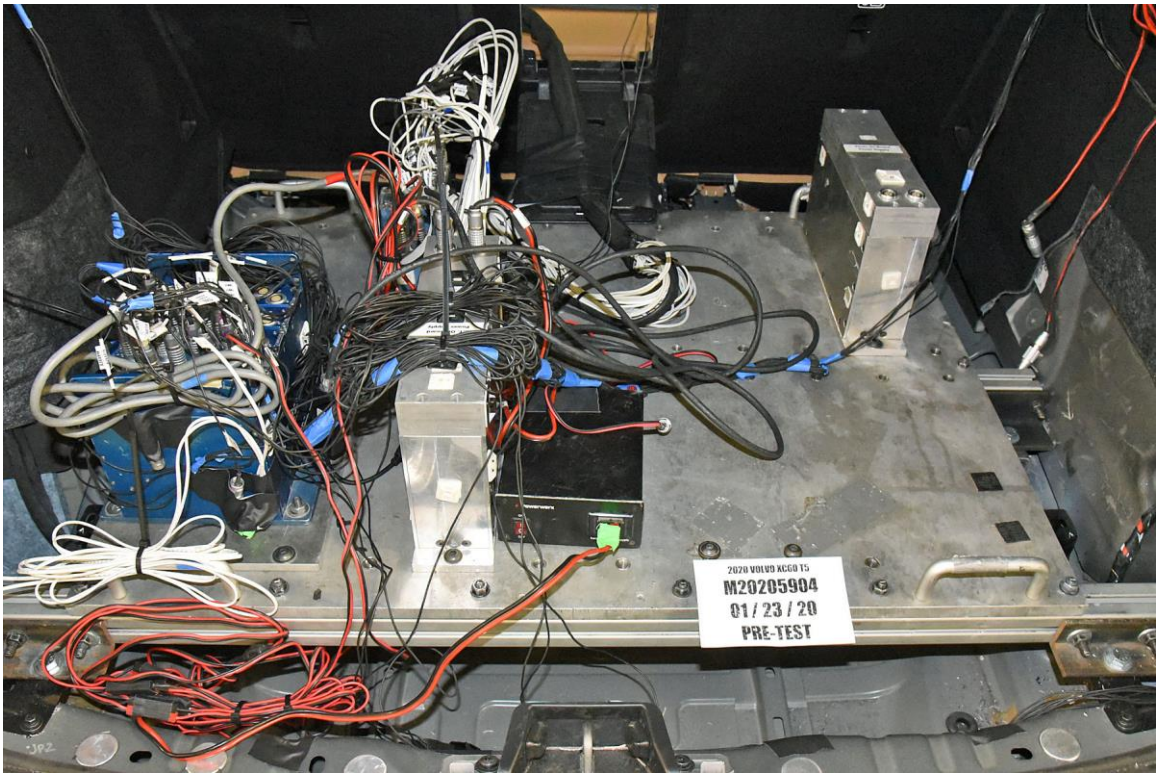


FIGURE 61. Pre-Test Ballast View

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

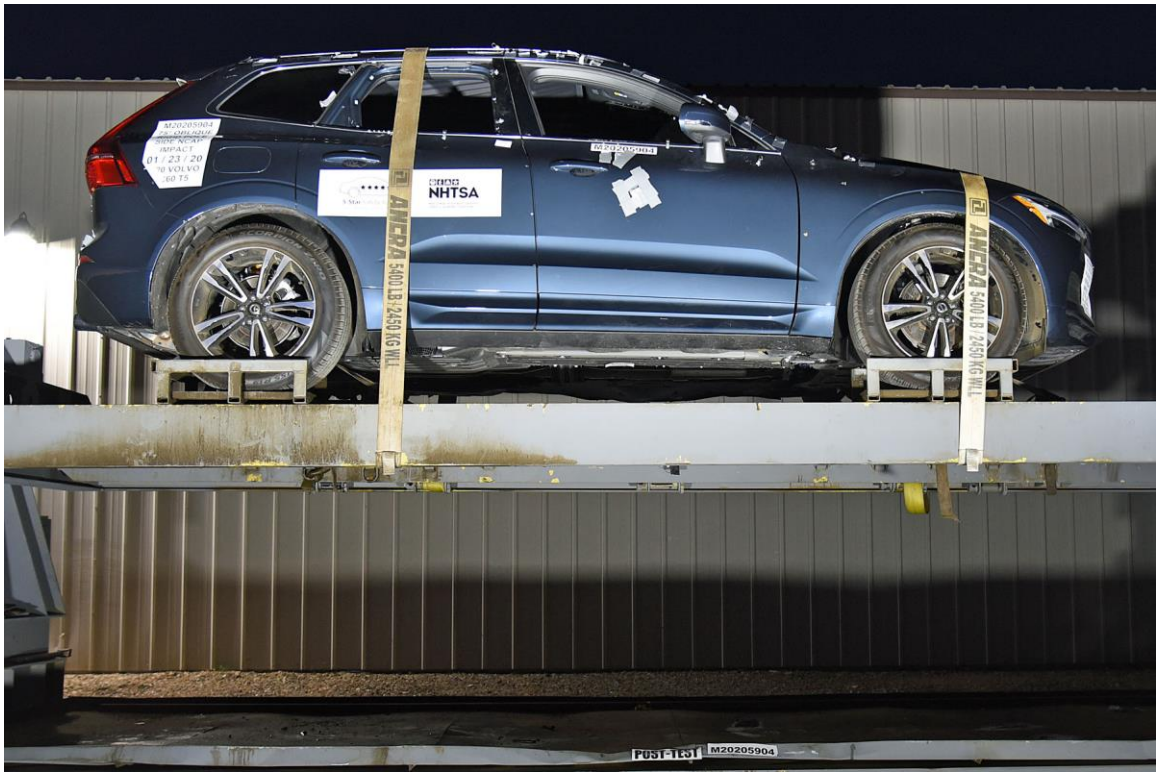


FIGURE 63. FMVSS No. 301 Static Rollover 0 Degrees

FIGURE 64. FMVSS No. 301 Static Rollover 90 Degrees

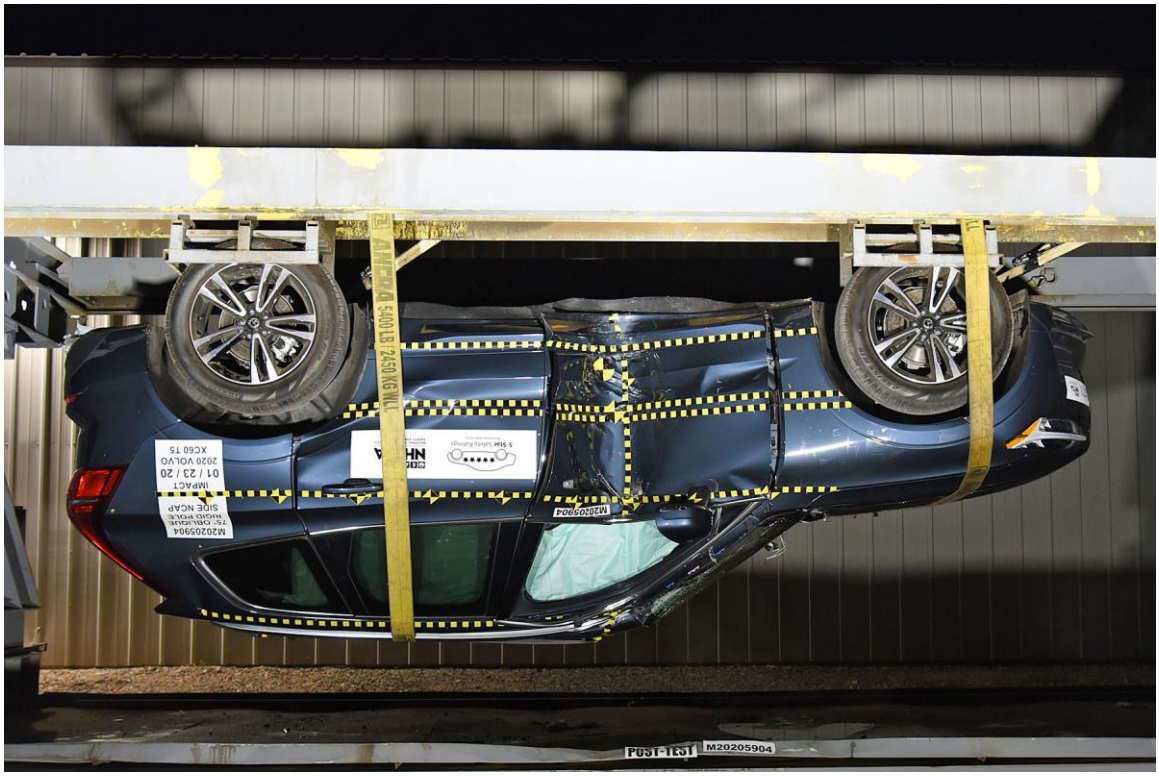


FIGURE 65. FMVSS No. 301 Static Rollover 180 Degrees

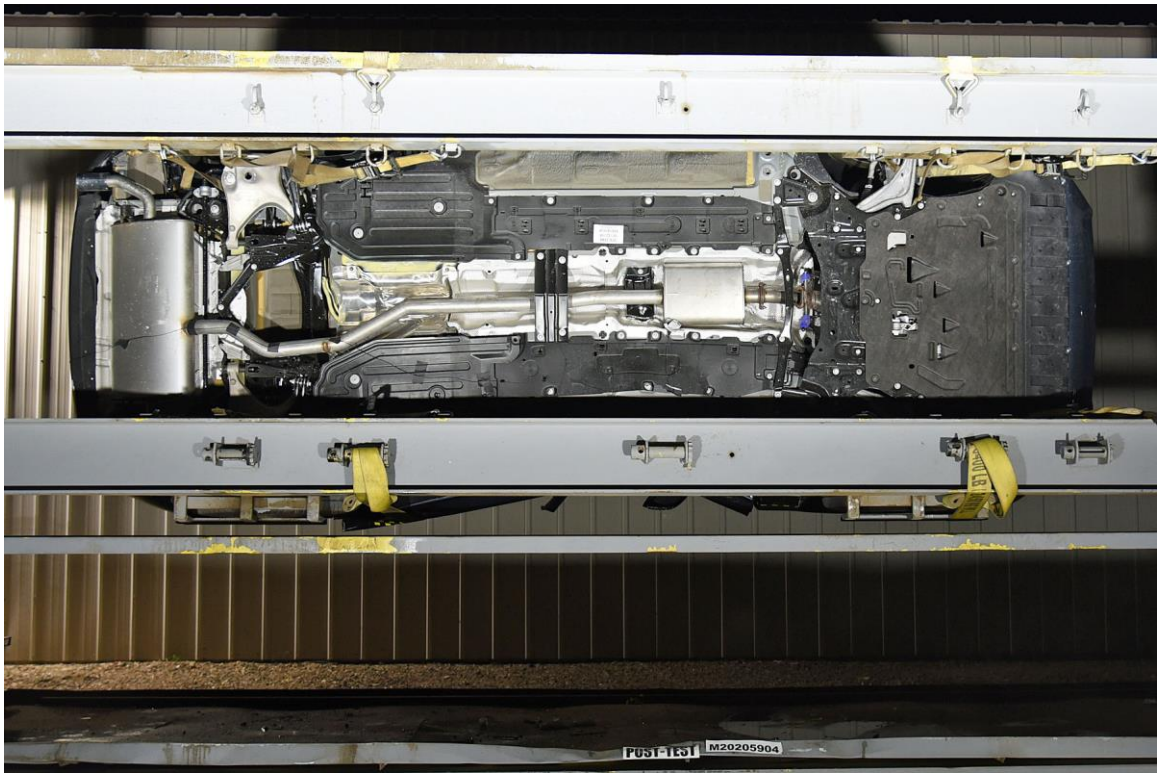


FIGURE 66. FMVSS No. 301 Static Rollover 270 Degrees

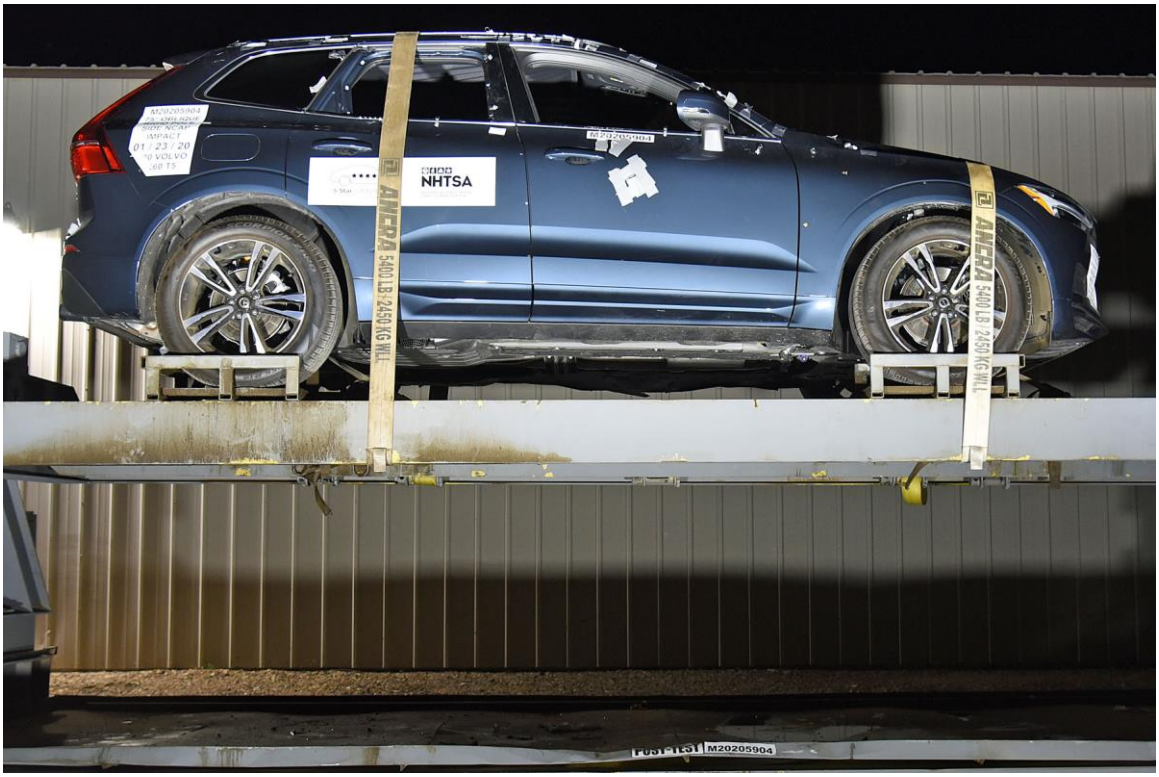


FIGURE 67. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 68. Impact Event

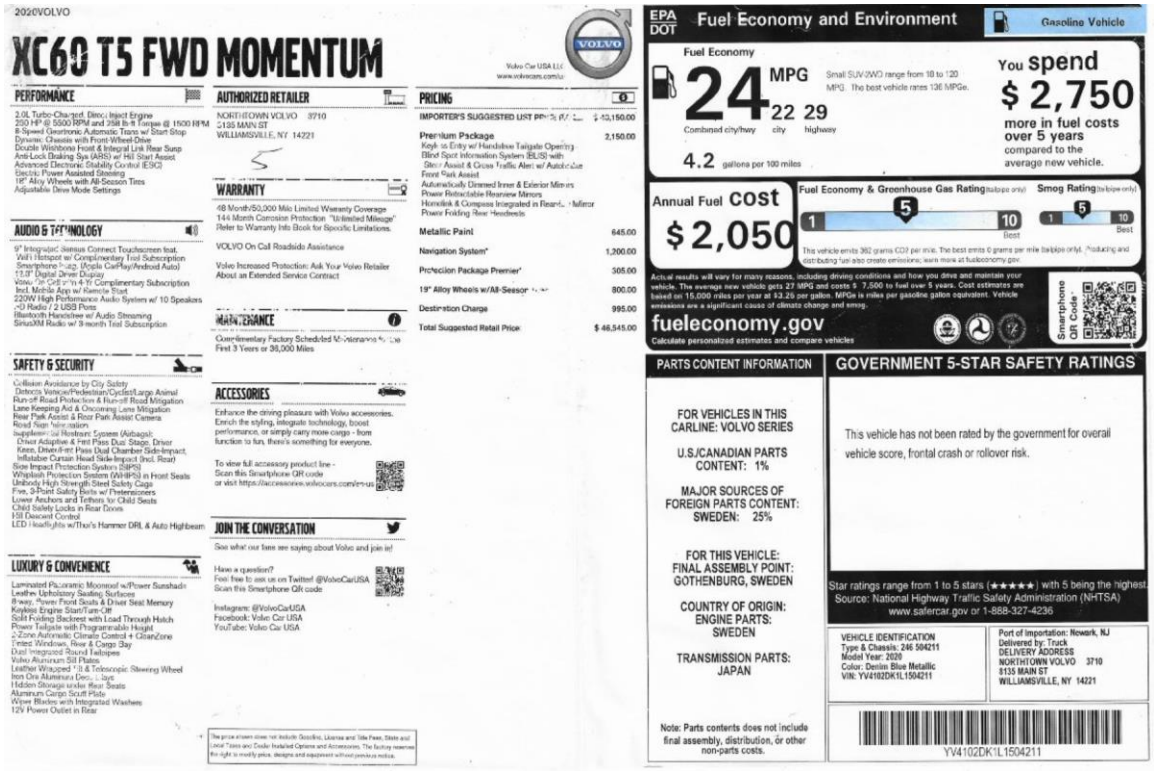


FIGURE 69. Monroney Label

Photograph Not Available

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

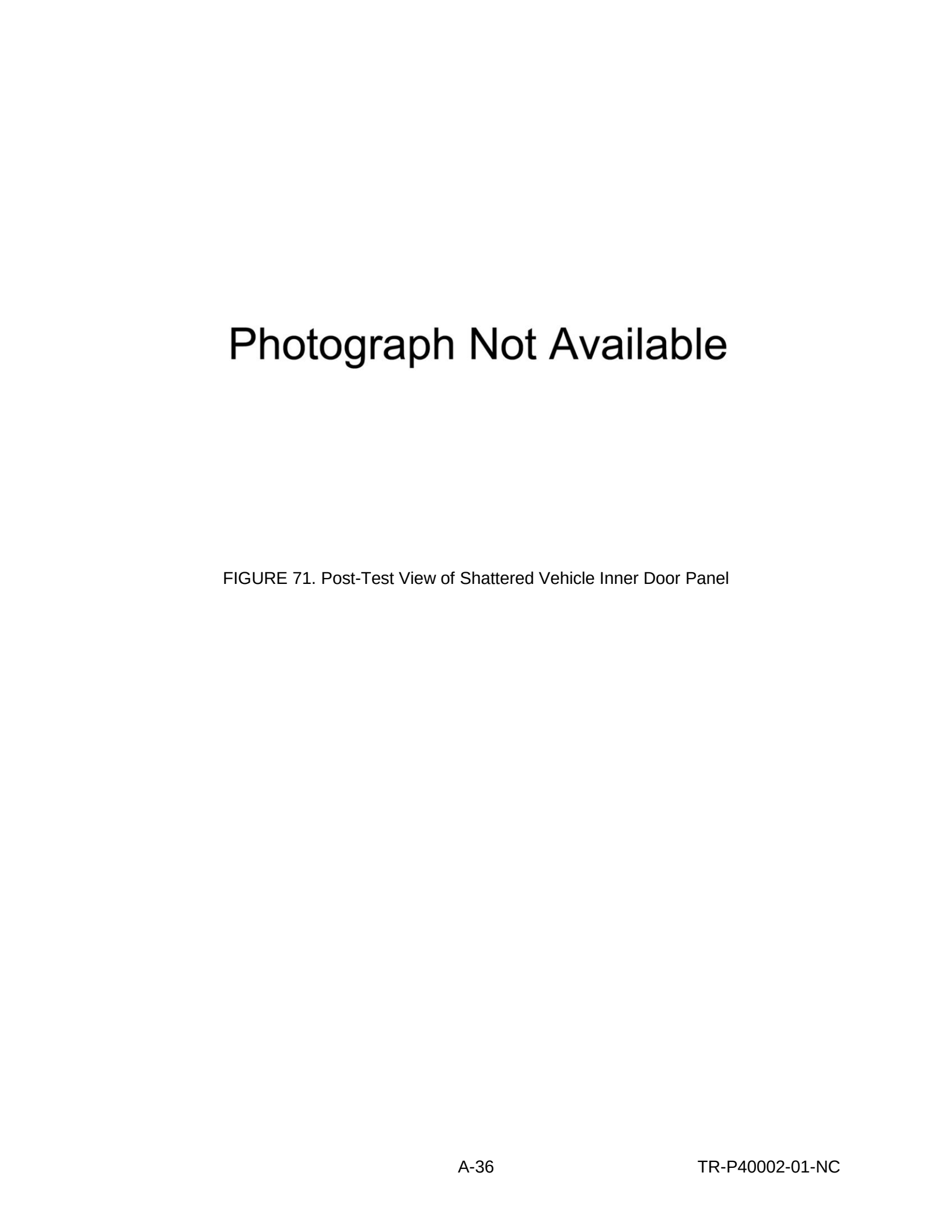


FIGURE 71. Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration Redundant (X)

Driver Head Acceleration Redundant (Y)

Driver Head Acceleration Redundant (Z)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)

Vehicle Center of Gravity Acceleration (Y)

Vehicle Center of Gravity Acceleration (Z)

Left Floor Sill Acceleration (Y)

Left A-Pillar Sill Acceleration (Y)

Left Lower A-Pillar Acceleration (Y)

Left Mid A-Pillar Acceleration (Y)

Left B-Pillar Sill Acceleration

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

Load Cell Pole Barrier #4 Force (Y)

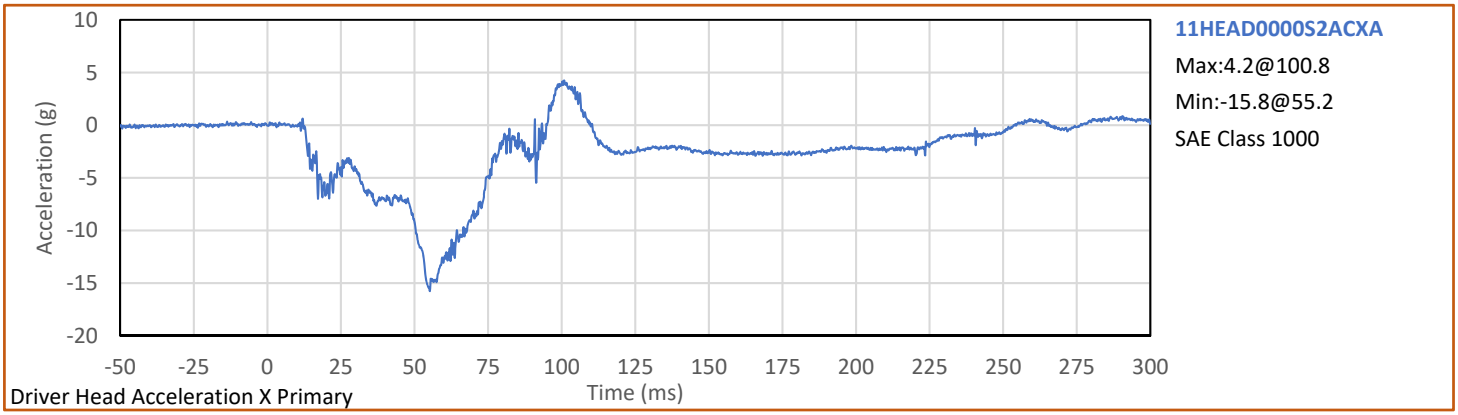
Load Cell Pole Barrier #5 Force (Y)

Load Cell Pole Barrier #6 Force (Y)

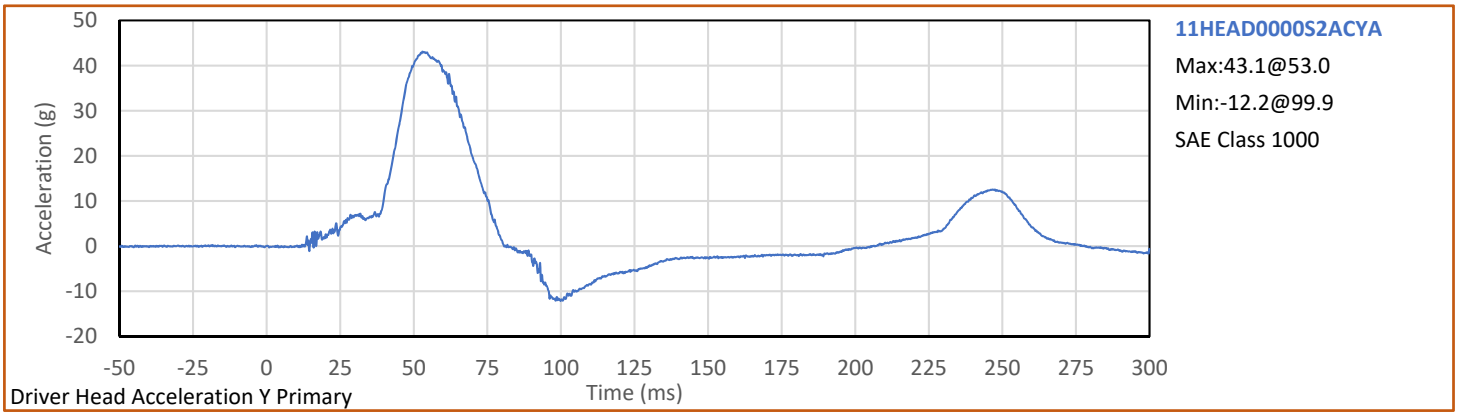
Load Cell Pole Barrier #7 Force (Y)

Load Cell Pole Barrier #8 Force (Y)

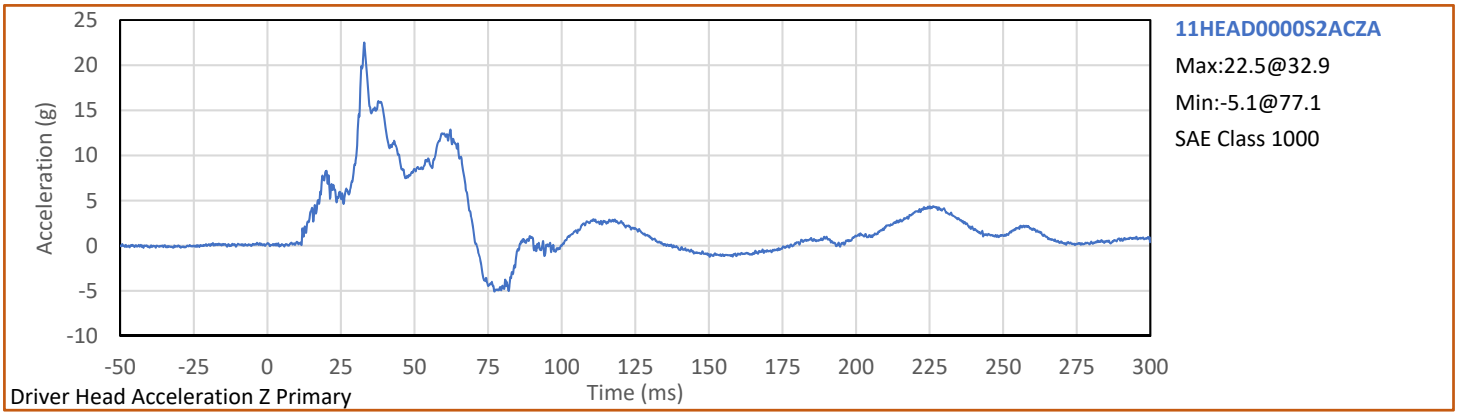
Test Vehicle:	2020 Volvo XC60 T5 5-Door MPV	NHTSA No.:	M20205904
Test Program:	NCAP Side Pole Impact Test	Test Date:	1/23/2020



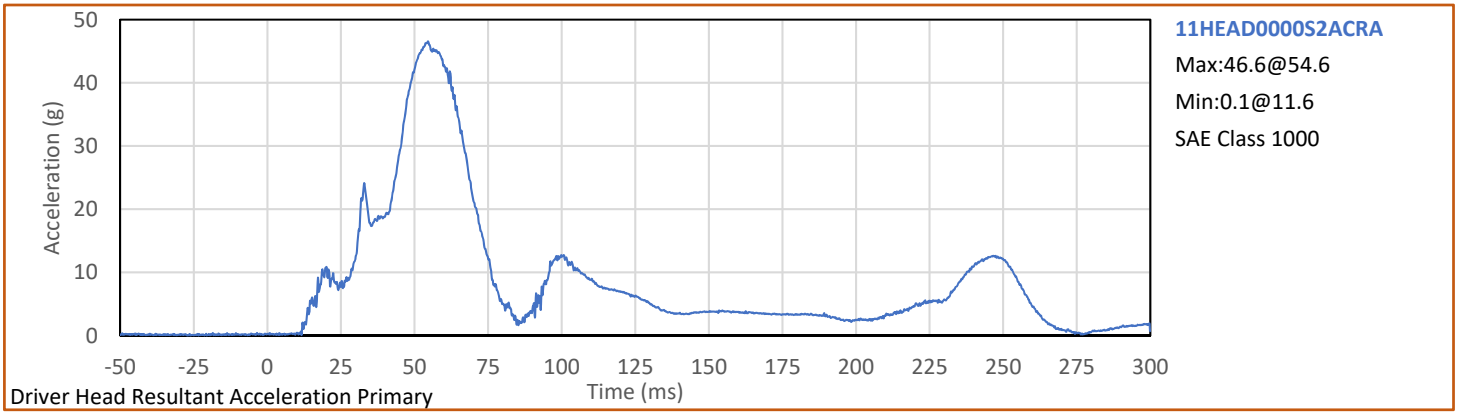
Driver Head Acceleration X Primary



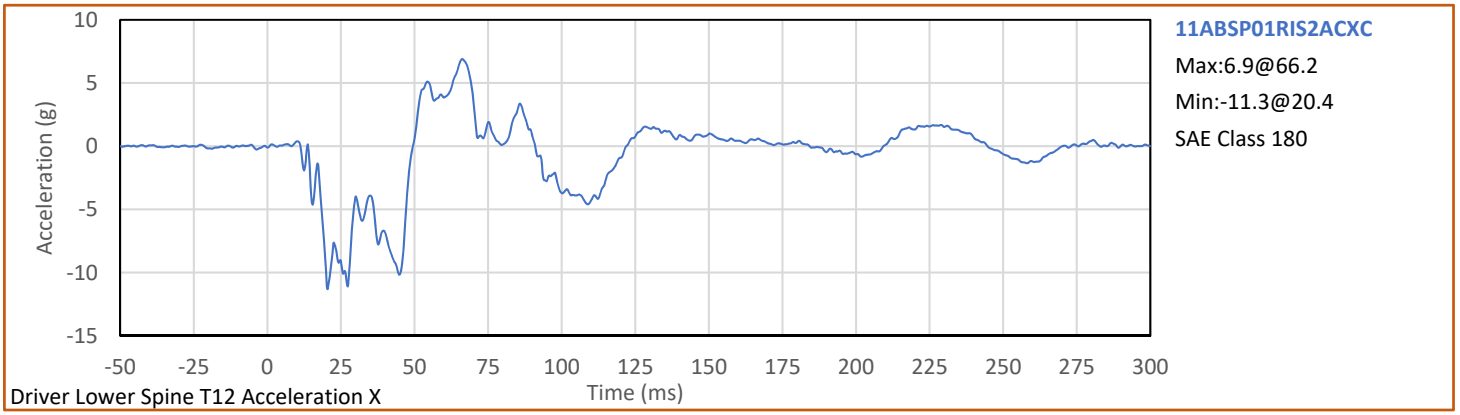
Driver Head Acceleration Y Primary



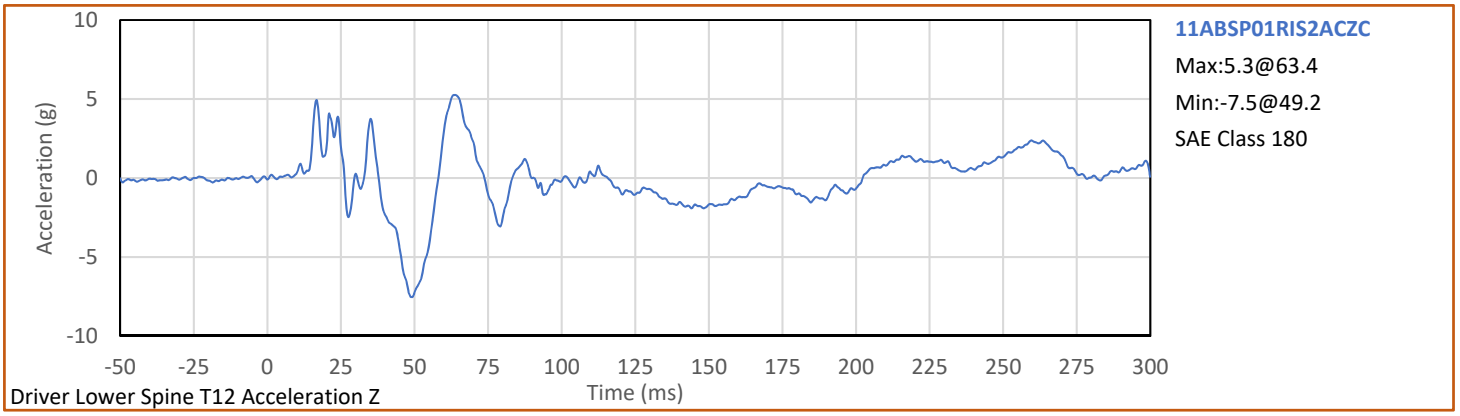
Driver Head Acceleration Z Primary

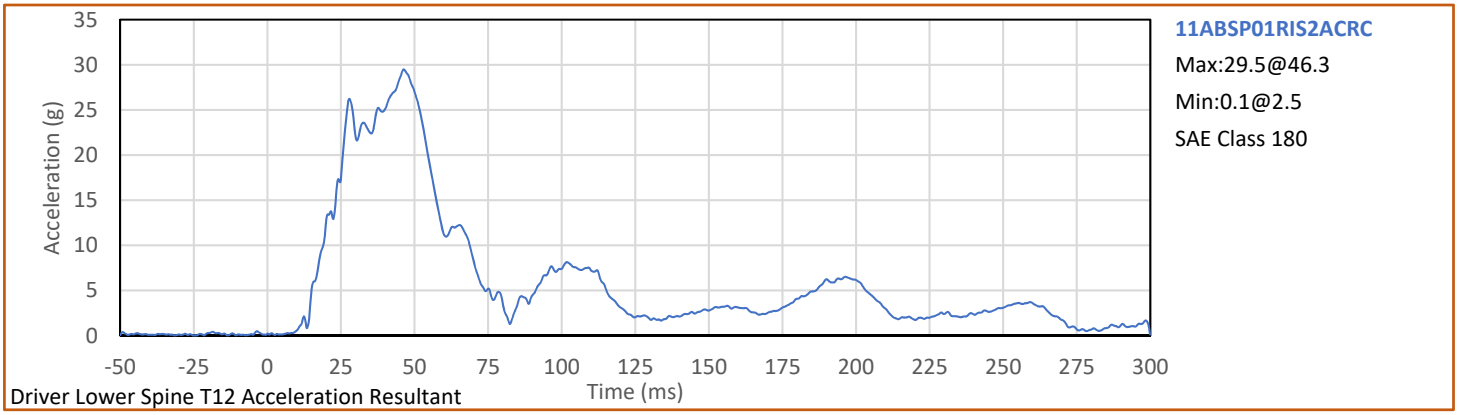


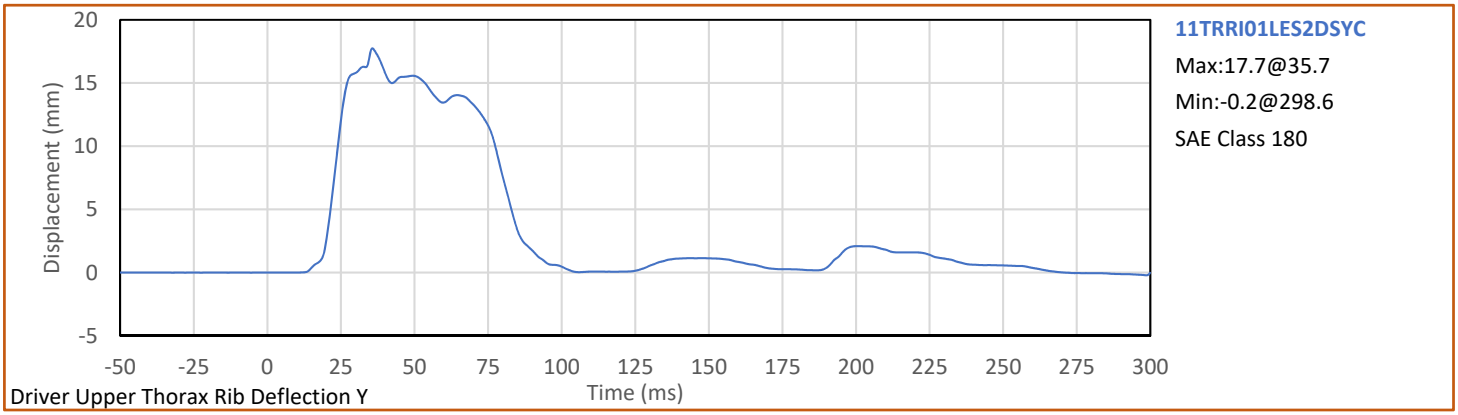
Driver Head Resultant Acceleration Primary

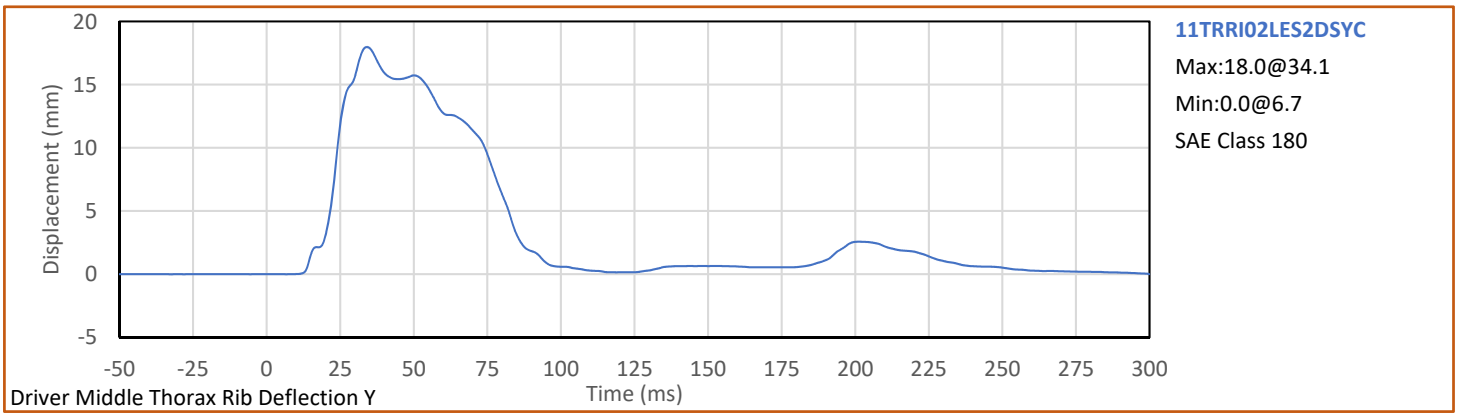

11ABSP01RIS2ACXC
Max:6.9@66.2
Min:-11.3@20.4
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration X

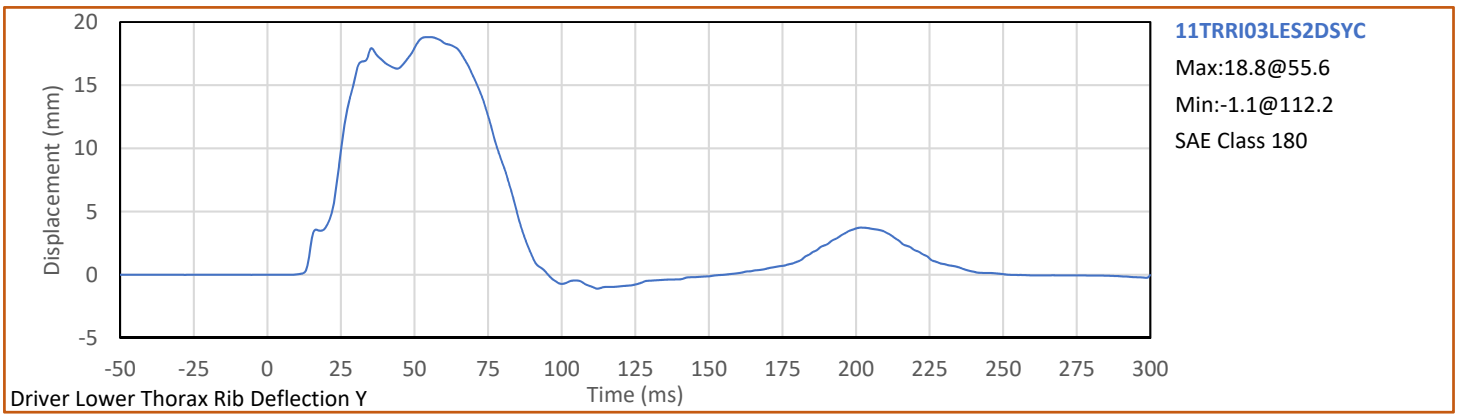

11ABSP01RIS2ACYC
Max:28.0@47.1
Min:-7.4@101.8
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Y

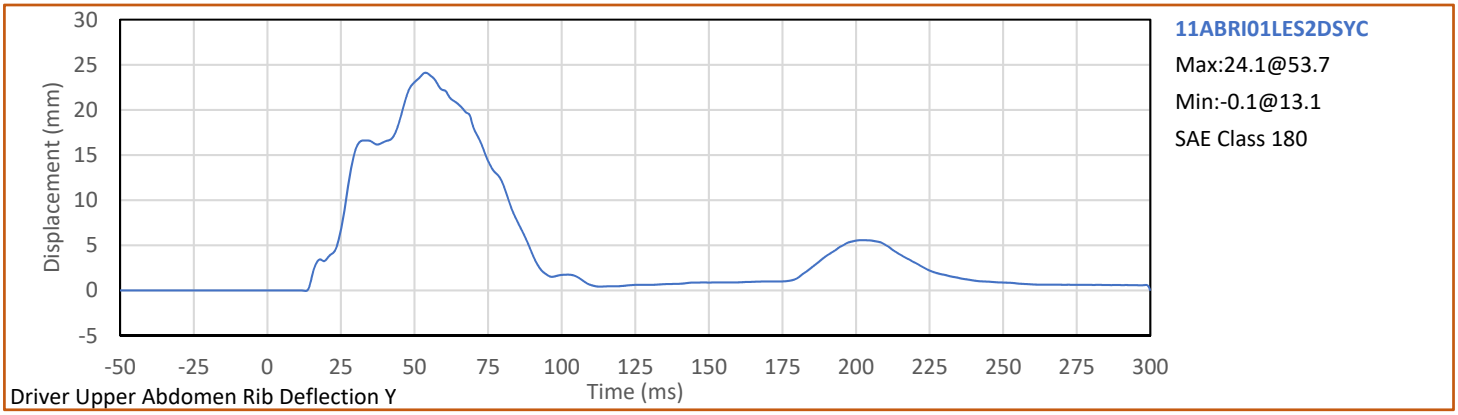

11ABSP01RIS2ACZC
Max:5.3@63.4
Min:-7.5@49.2
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Z

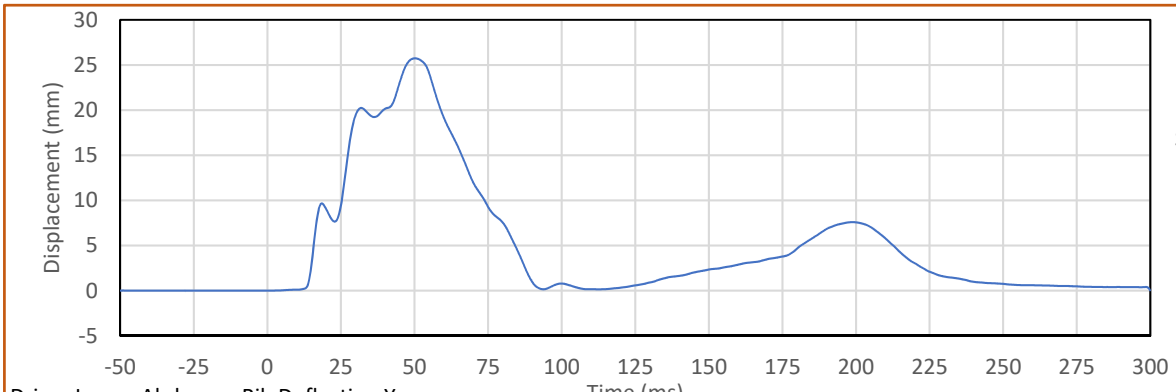

11ABSP01RIS2ACRC
Max:29.5@46.3
Min:0.1@2.5
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Resultant


Displacement (mm)
Time (ms)
Driver Upper Thorax Rib Deflection Y
11TRRI01LES2DSYC
Max:17.7@35.7
Min:-0.2@298.6
SAE Class 180


Displacement (mm)
Time (ms)
Driver Middle Thorax Rib Deflection Y
11TRRI02LES2DSYC
Max:18.0@34.1
Min:0.0@6.7
SAE Class 180

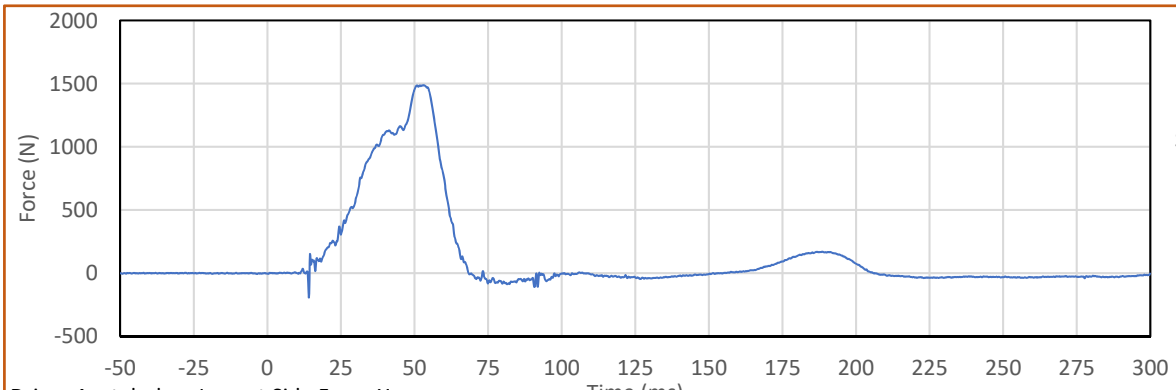

Displacement (mm)
Time (ms)
Driver Lower Thorax Rib Deflection Y
11TRRI03LES2DSYC
Max:18.8@55.6
Min:-1.1@112.2
SAE Class 180


Displacement (mm)
Time (ms)
Driver Upper Abdomen Rib Deflection Y
11ABRI01LES2DSYC
Max:24.1@53.7
Min:-0.1@13.1
SAE Class 180



Driver Lower Abdomen Rib Deflection Y

11ABRI02LES2DSYC
Max:25.7@50.2
Min:0.0@1.3
SAE Class 180



Driver Acetabulum Impact Side Force Y

11ACTBLE00S2FOYB
Max:1487.9@53.1
Min:-193.0@14.1
SAE Class 600

Driver Iliac Wing Impact Side Force Y

11ILACLE00S2FOYB
Max:487.4@47.7
Min:-55.4@91.8
SAE Class 600

Driver Combined Pelvic Force

11PELVLE00S2FOYB
Max:1825.3@50.4
Min:-160.5@91.9
SAE Class 600

APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 308 Test Date: 2020-01-10

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	44	Pass
A - Sitting Height	mm	772	788	784	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	143	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	548	Pass
K - Buttock To Knee Length	mm	514	540	521	Pass
L - Popliteal Height	mm	343	369	355	Pass
K - Knee Pivot To Floor Height	mm	392	409	400	Pass
N - Buttock Popliteal Length	mm	416	442	435	Pass
O - Chest Depth W/O Jacket	mm	195	211	208	Pass
P - Foot Length	mm	216	232	219	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	489	Pass
V - Shoulder Width	mm	341	357	347	Pass
W - Foot Width	mm	78	94	82	Pass
Y - Chest Circumference W/Jacket	mm	851	881	863	Pass
Z - Waist Circumference	mm	761	791	775	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

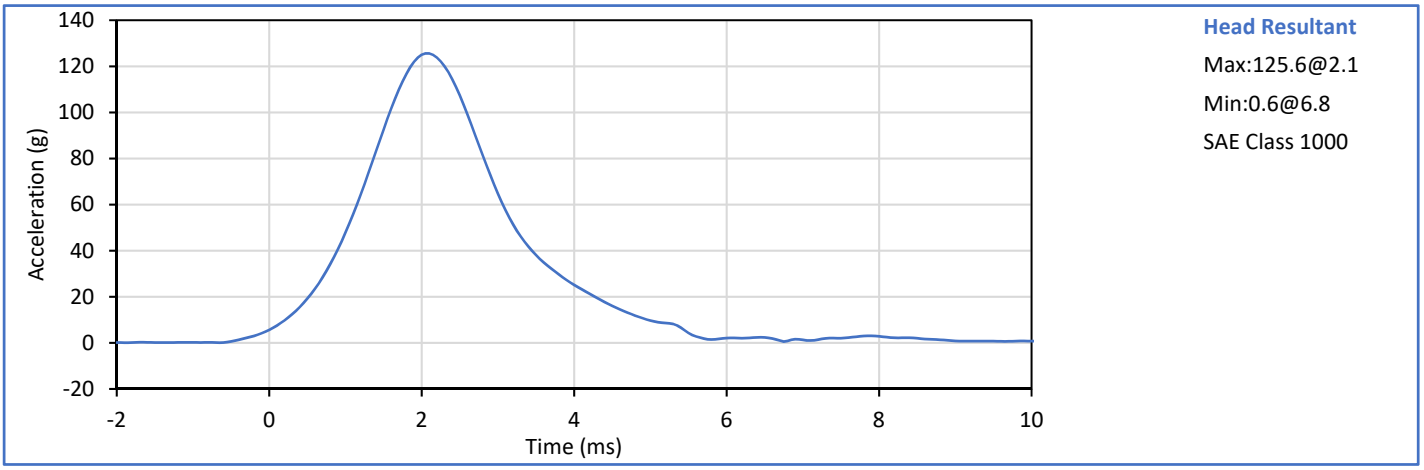
Approved By: P. Puzzuto

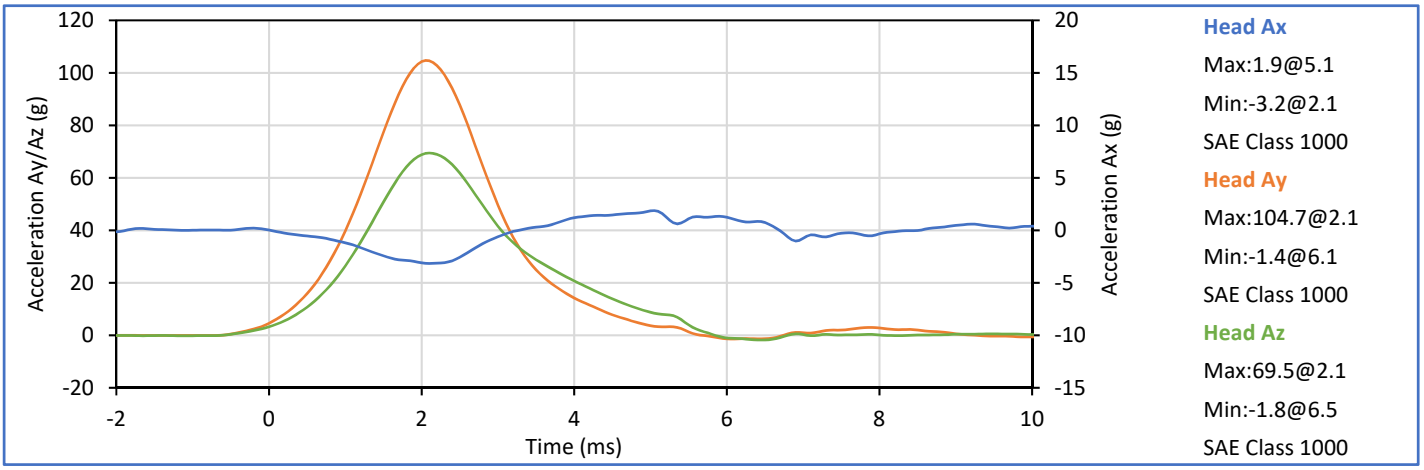
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 308 Test Date: 2020-01-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	26	Pass
Peak Resultant Acceleration	g	115.0	137.0	125.6	Pass
Peak Head Ax	g	-15.0	15.0	-3.2	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

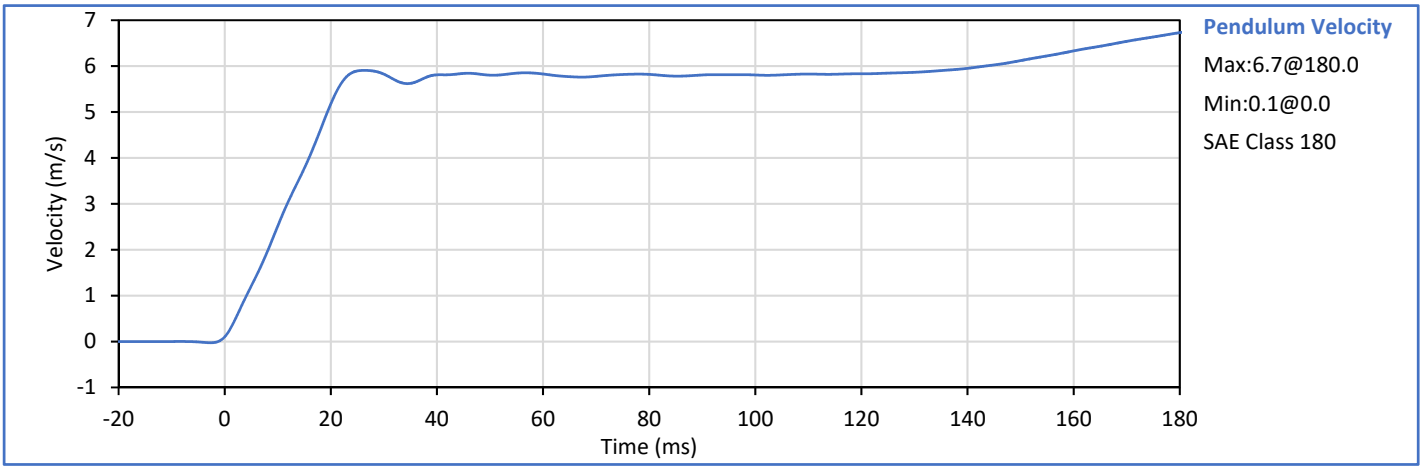
Approved By: P. Puzzuto

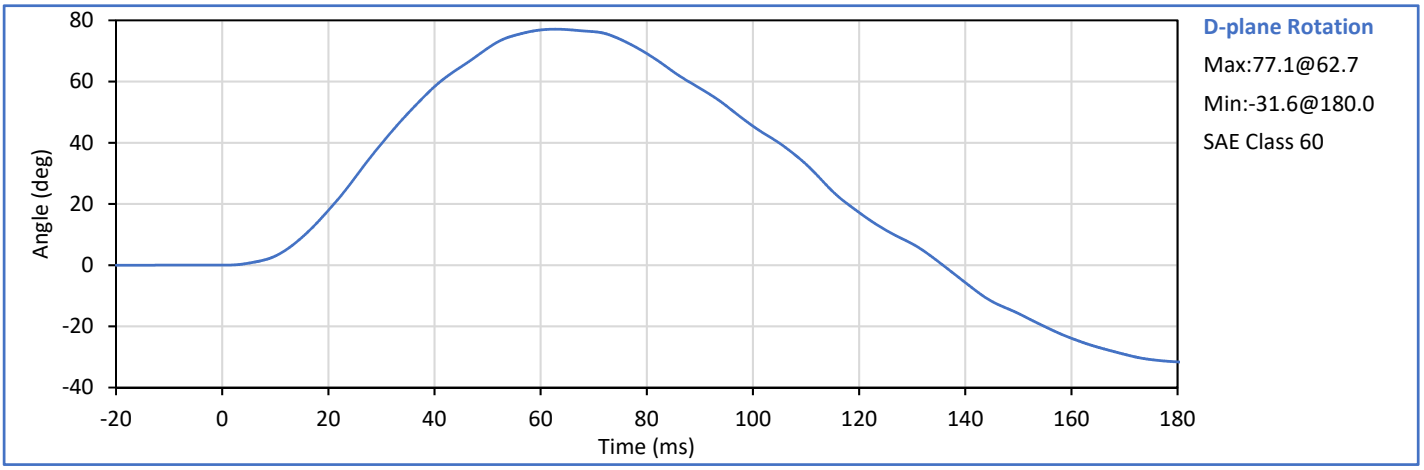
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-01-15

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	28	Pass
Pendulum Velocity	m/s	5.51	5.63	5.61	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.52	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.77	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	5.18	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.90	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.91	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	77.1	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	62.7	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-42.1	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	116.7	Pass
			Overall Test Results		Pass





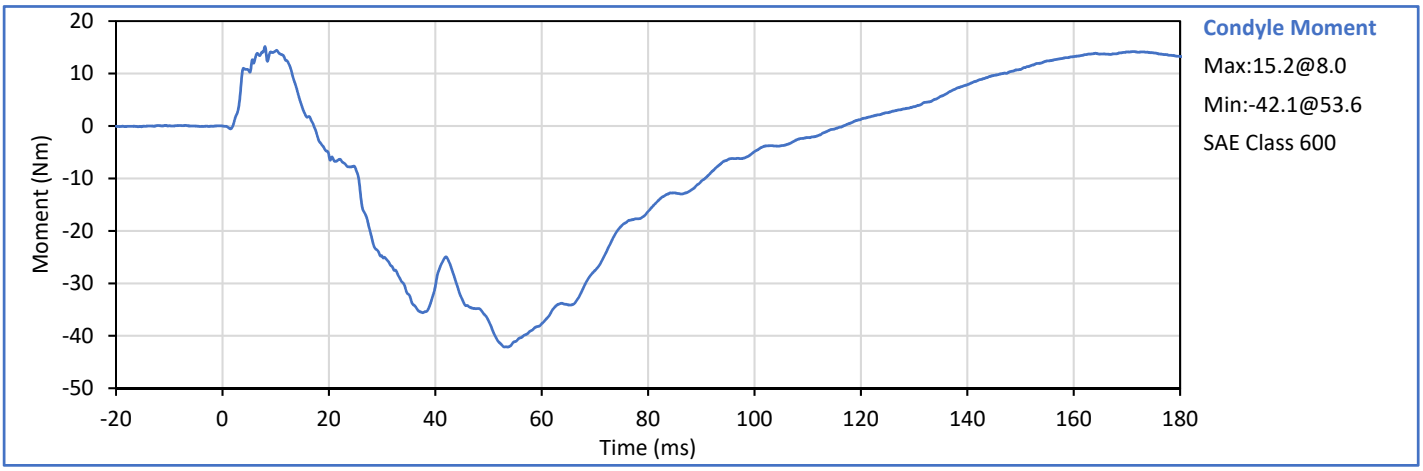
Technician: J. Hernandez

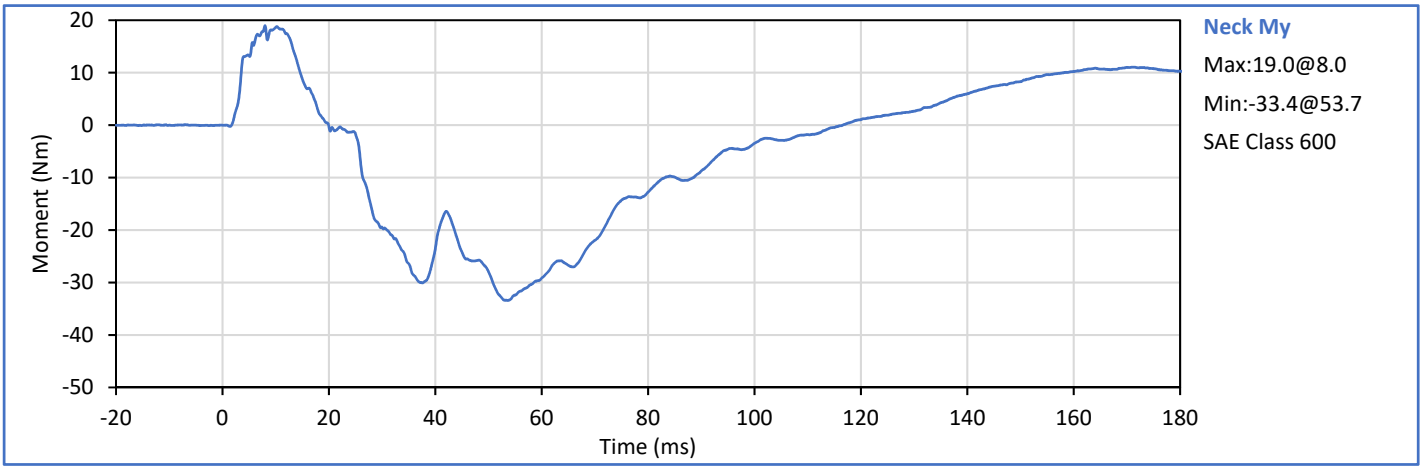
Approved By: P. Puzzuto

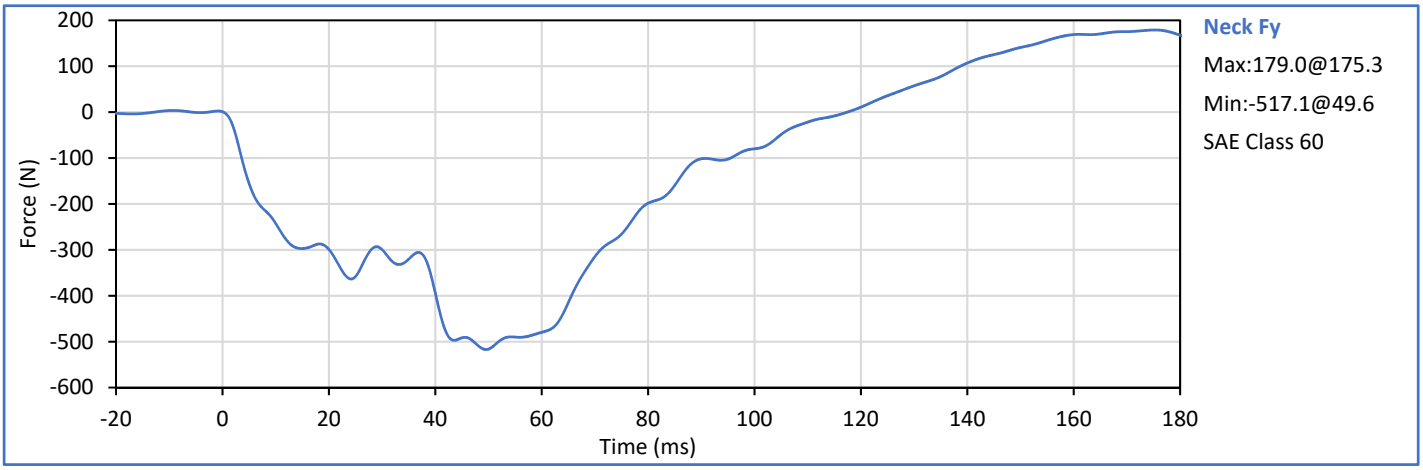
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-01-15





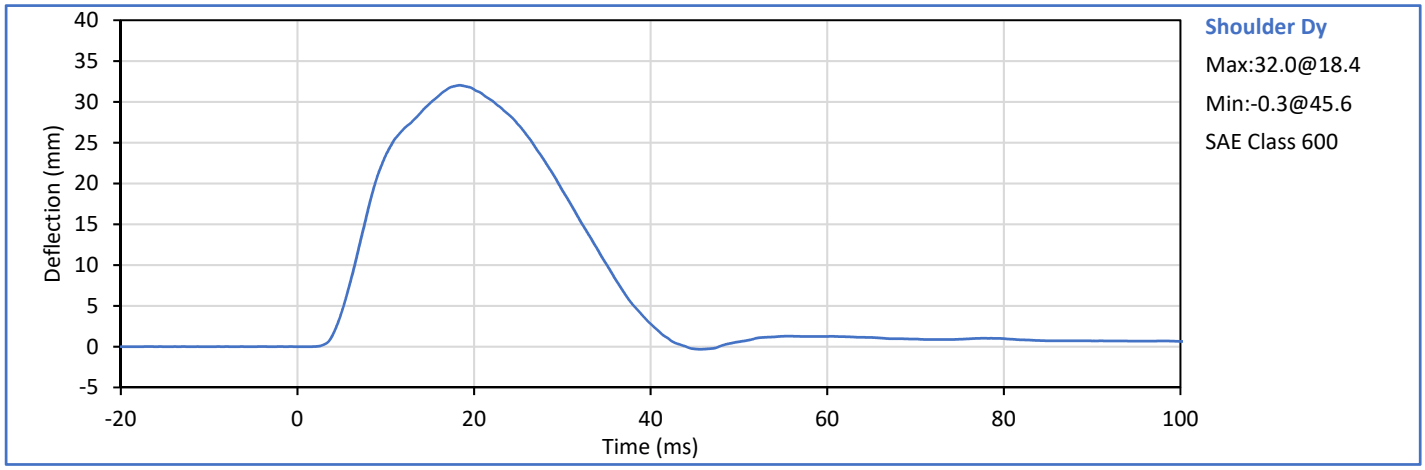


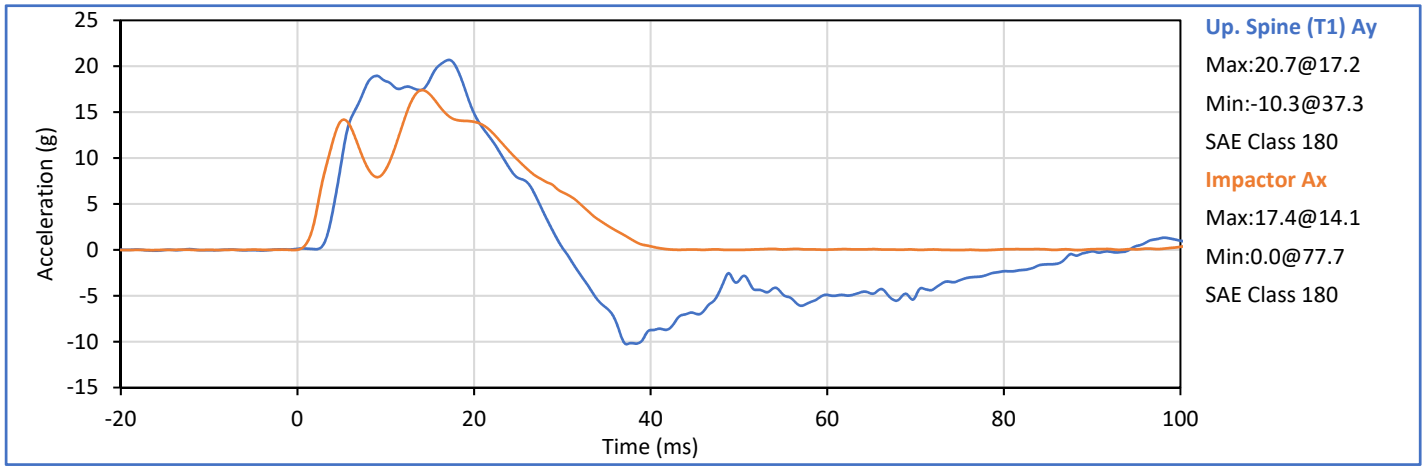
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 308 Test Date: 2020-01-10

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	4.38	Pass
Peak Shoulder Dy	mm	28.0	37.0	32.0	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	20.7	Pass
Peak Impactor Ax	g	13.0	18.0	17.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

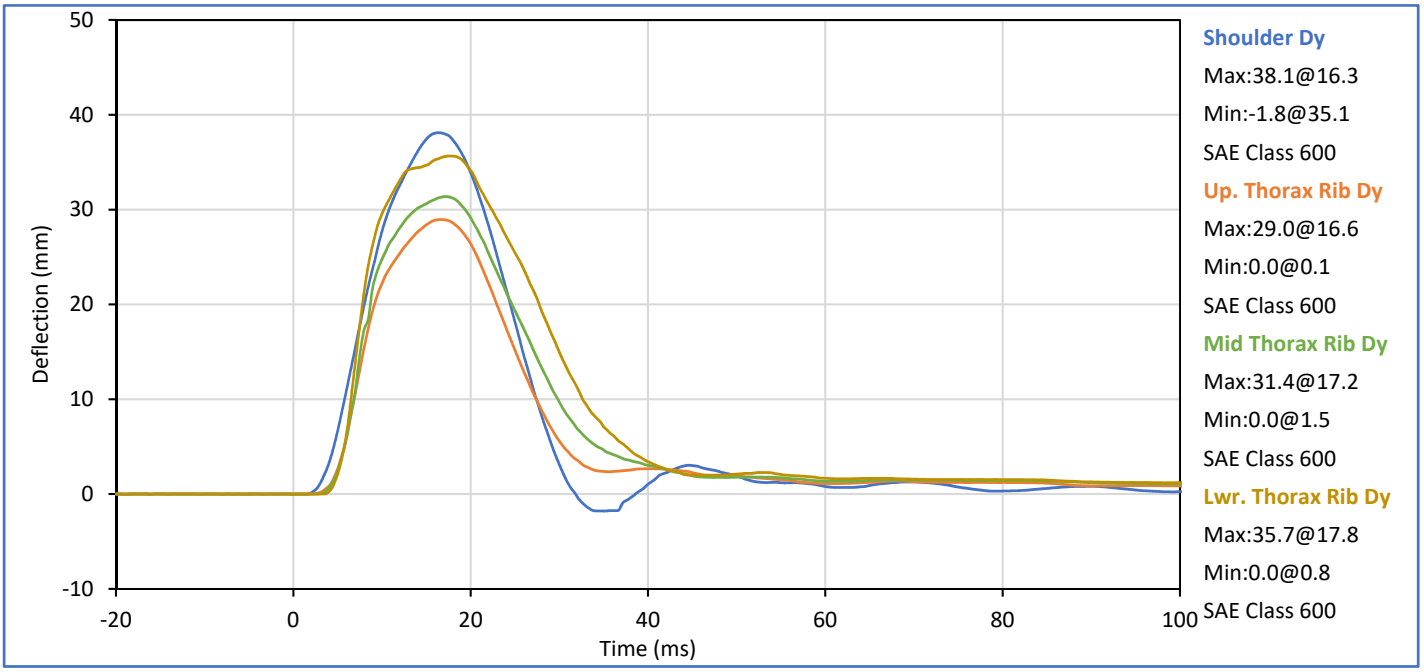
Approved By: P. Puzzuto

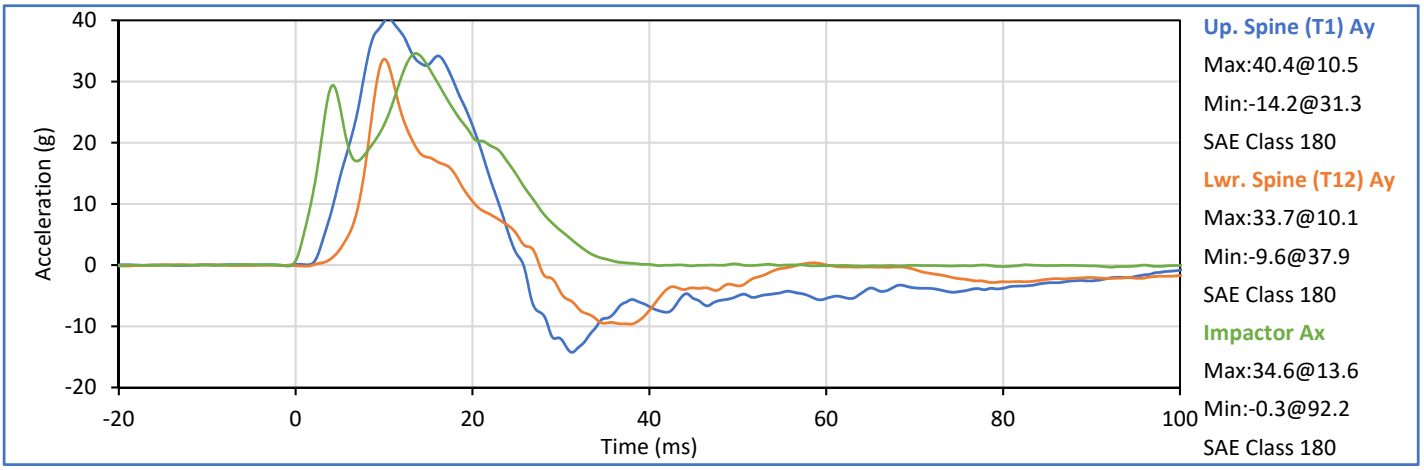
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2020-01-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.1	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.0	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.4	Pass
Peak Lower Rib Dy	mm	32.0	38.0	35.7	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	40.4	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	33.7	Pass
Peak Impactor Ax	g	30.0	36.0	34.6	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

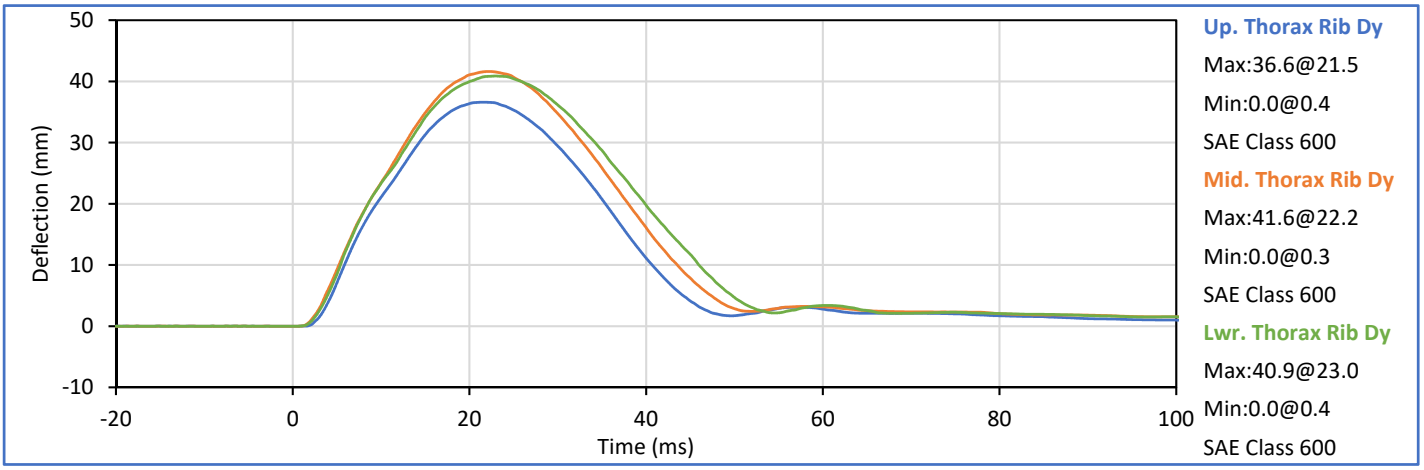
Approved By: P. Puzzuto

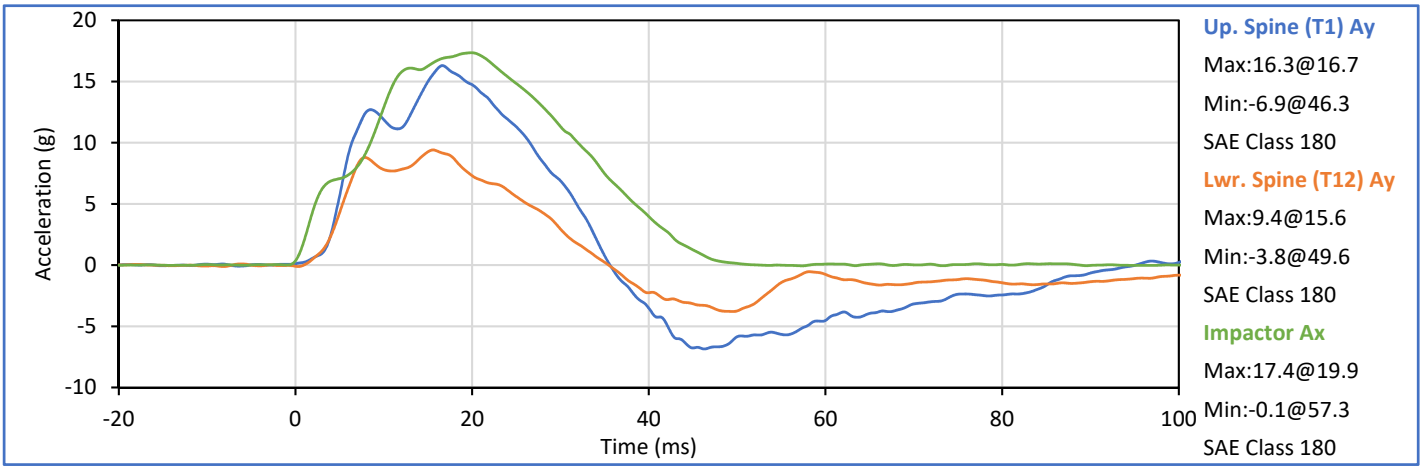
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2020-01-10

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	4.31	Pass
Peak Upper Rib Dy	mm	32.0	40.0	36.6	Pass
Peak Middle Rib Dy	mm	39.0	45.0	41.6	Pass
Peak Lower Rib Dy	mm	35.0	43.0	40.9	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	16.3	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.4	Pass
Peak Impactor Ax	g	14.0	18.0	17.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

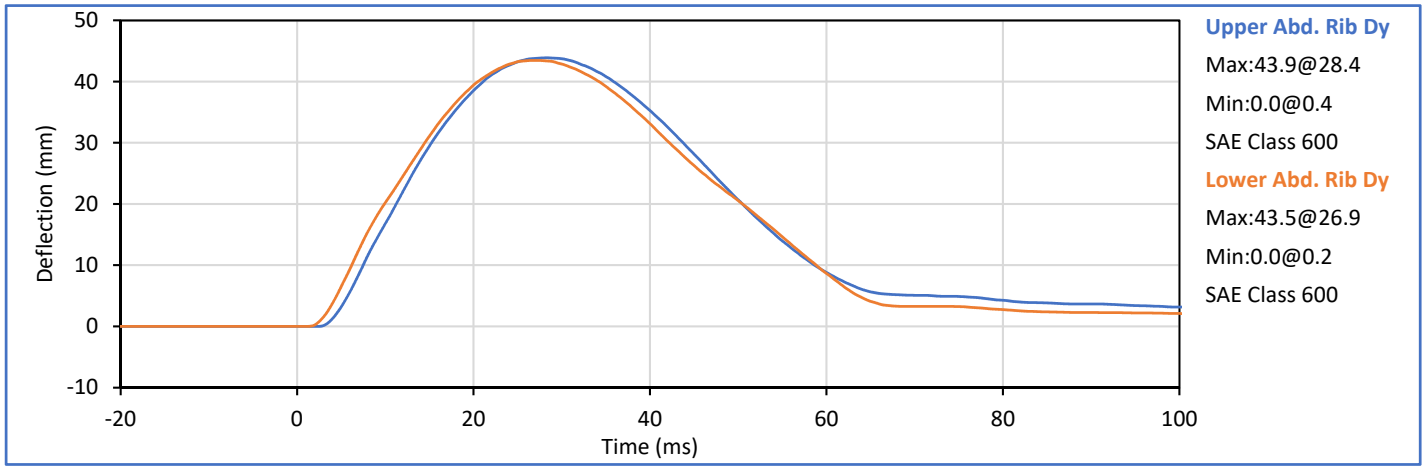
Approved By: P. Puzzuto

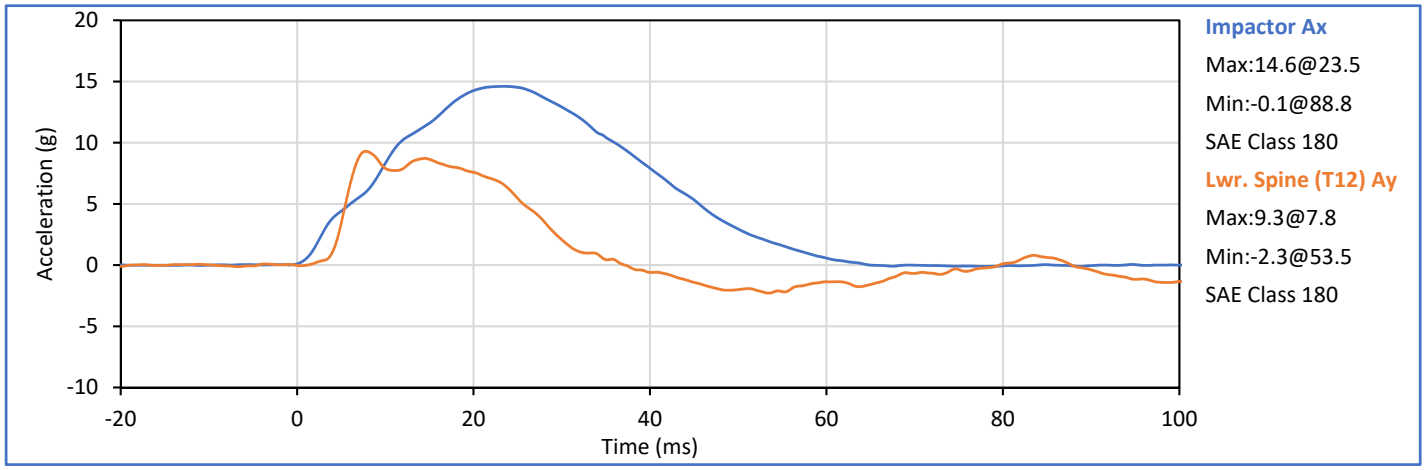
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 308 Test Date: 2020-01-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	4.20	4.40	4.35	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	43.9	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	43.5	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.3	Pass
Peak Impactor Ax	g	12.0	16.0	14.6	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

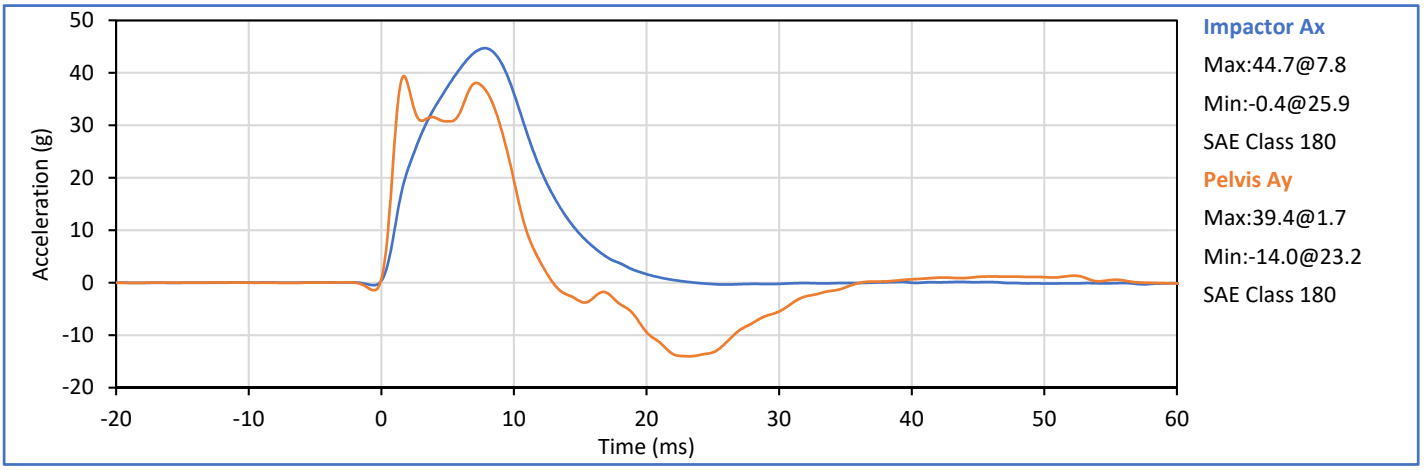
Applus IDIADA
KARCO

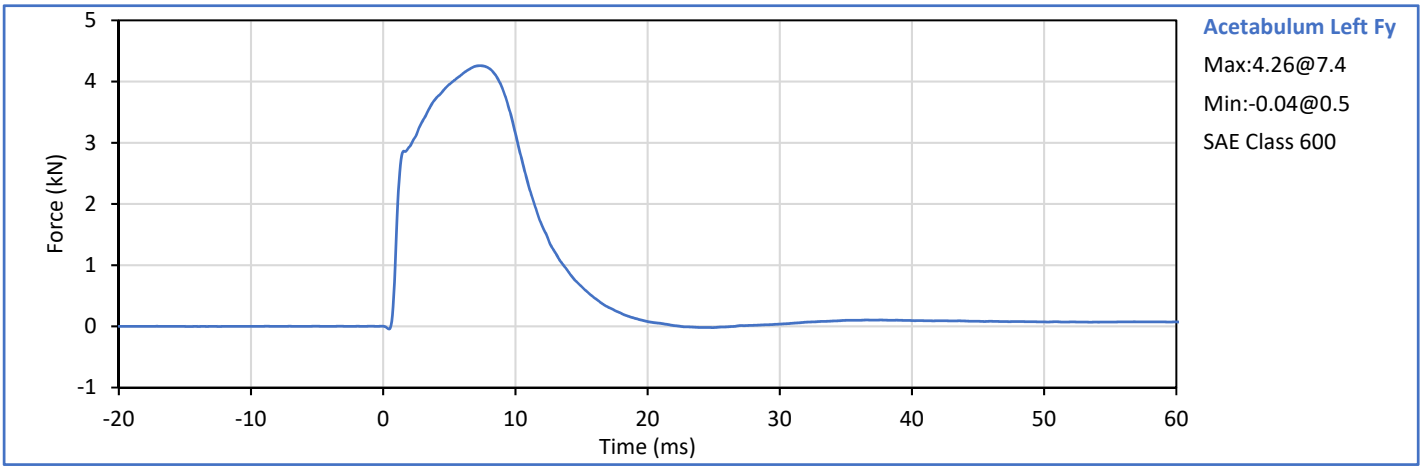
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2020-01-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	6.60	6.80	6.72	Pass
Peak Acetabulum Fy	kN	3.60	4.30	4.26	Pass
Pelvis Ay after 6ms	g	34.0	42.0	38.1	Pass
Peak Impactor Ax	g	38.0	47.0	44.7	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12297 (SACO)





Technician: J. Hernandez

Approved By: P. Puzzuto

ATD Serial No.: 308 Test Date: 2020-01-10

Pelvis Plug S/N: 12297 (SACO)

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 12297
Test Number 6681
Report Number 6696
Test Date 3/15/2018 11:58:42 AM

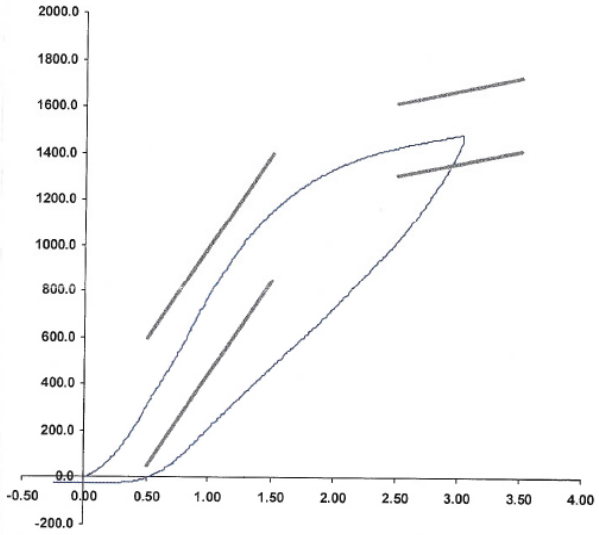
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	316.24	50.00	600.00
Force @ 1.5 mm (N)	1,151.96	850.00	1,400.00
Force @ 2.5 mm (N)	1,427.23	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,480.66	1,361.00	1,673.00

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 15-Mar-18
SACO Research

By : DC Date : 3/15/18

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

Applus IDIADA
KARCO

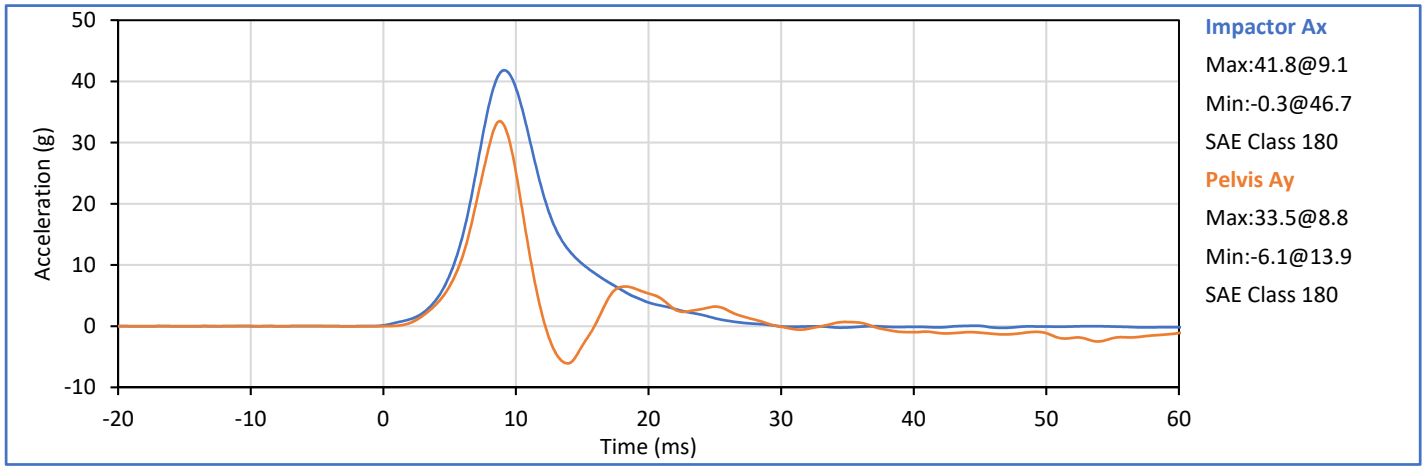
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

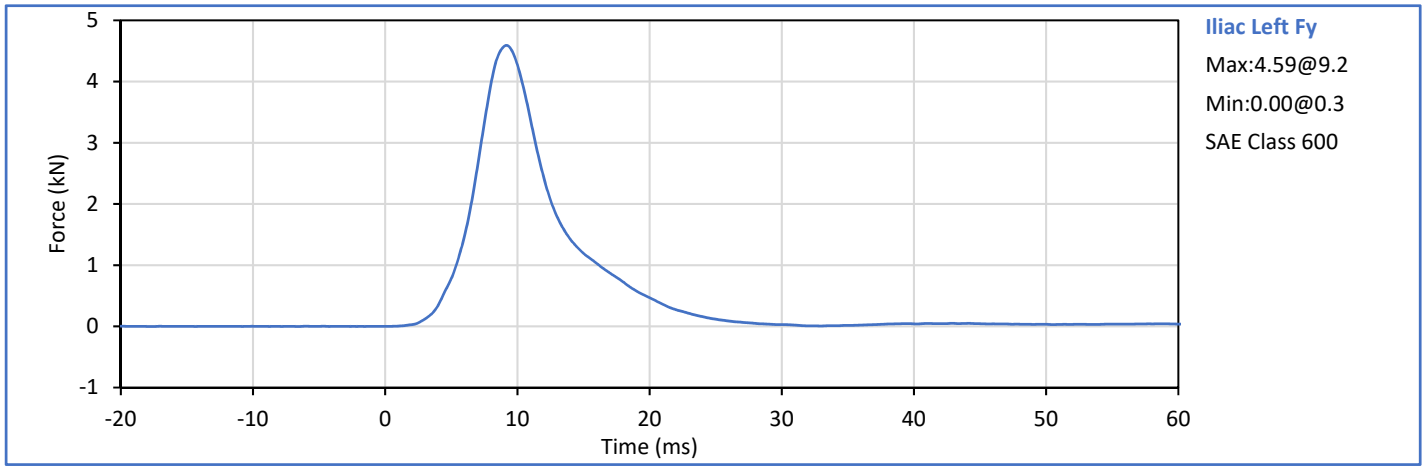
ATD Serial No.: 308 Test Date: 2020-01-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	23	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Iliac Fy	kN	4.10	5.10	4.59	Pass
Pelvis Ay after 6ms	g	28.0	39.0	33.5	Pass
Peak Impactor Ax	g	36.0	45.0	41.8	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 (SACO) *

* Plug is not impacted and remains certified





Technician: J. Hernandez

Approved By: P. Puzzuto

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

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 308 Test Date: 2020-01-28

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	29	Pass
A - Sitting Height	mm	772	788	779	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	83	Pass
D - H Point From Seatback	mm	141	151	145	Pass
E - Shoulder Pivot From Backline	mm	97	107	104	Pass
F - Thigh Clearance	mm	119	135	123	Pass
G - Head Breadth	mm	140	148	146	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	187	Pass
J - Head Circumference	mm	541	551	545	Pass
K - Buttock To Knee Length	mm	514	540	530	Pass
L - Popliteal Height	mm	343	369	351	Pass
K - Knee Pivot To Floor Height	mm	392	409	403	Pass
N - Buttock Popliteal Length	mm	416	442	438	Pass
O - Chest Depth W/O Jacket	mm	195	211	209	Pass
P - Foot Length	mm	216	232	220	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	319	Pass
R - Arm Length	mm	249	259	258	Pass
S - Knee Joint To Seatback	mm	477	493	489	Pass
V - Shoulder Width	mm	341	357	343	Pass
W - Foot Width	mm	78	94	83	Pass
Y - Chest Circumference W/Jacket	mm	851	881	863	Pass
Z - Waist Circumference	mm	761	791	770	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

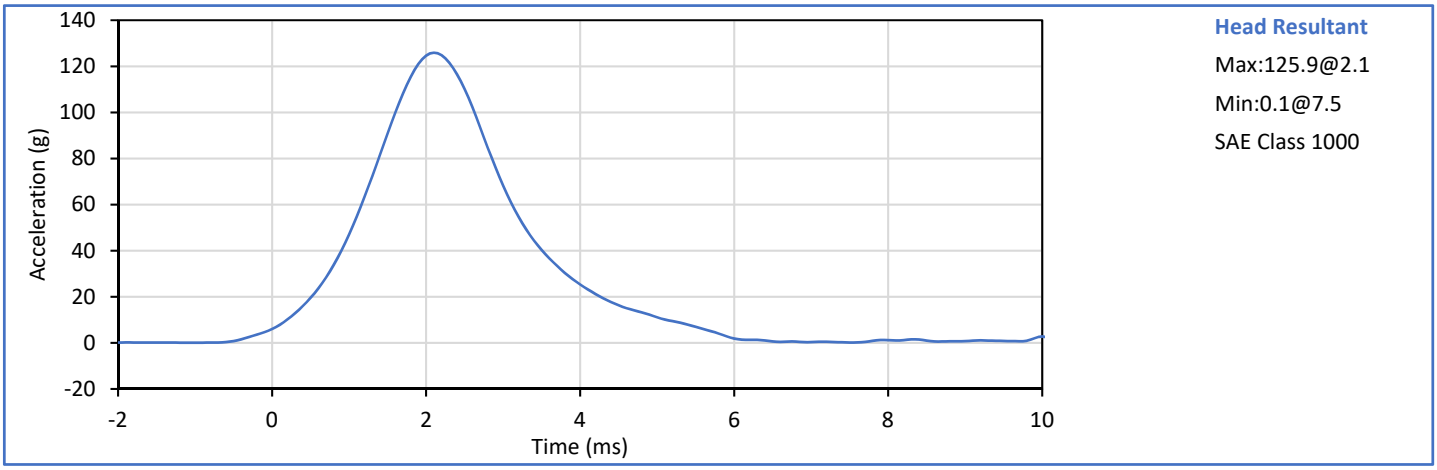
Approved By: P. Puzzuto

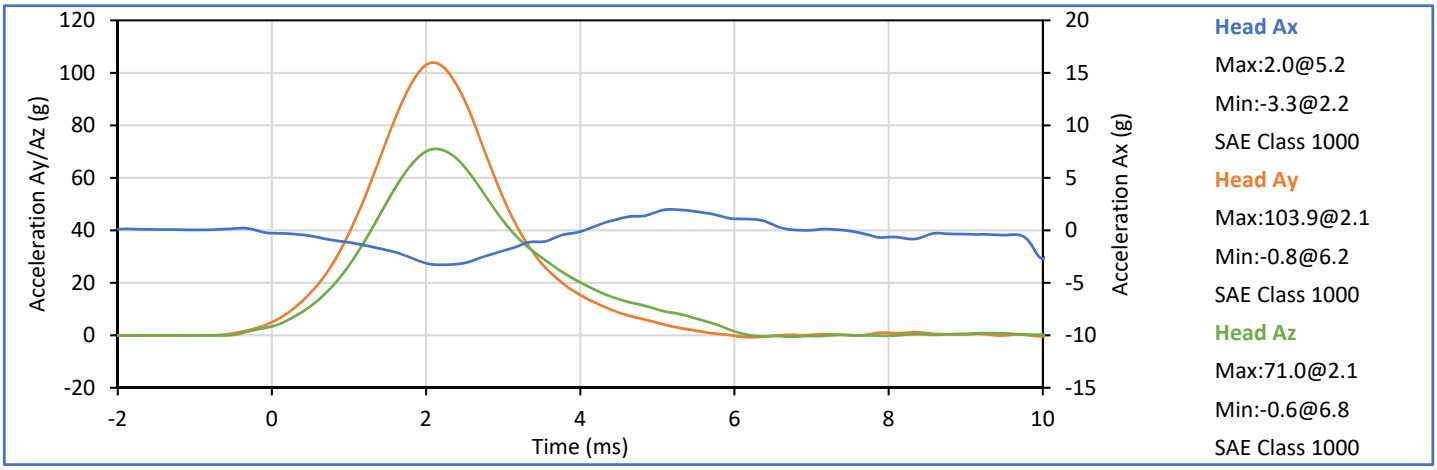
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 308 Test Date: 2020-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Peak Resultant Acceleration	g	115.0	137.0	125.9	Pass
Peak Head Ax	g	-15.0	15.0	-3.3	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





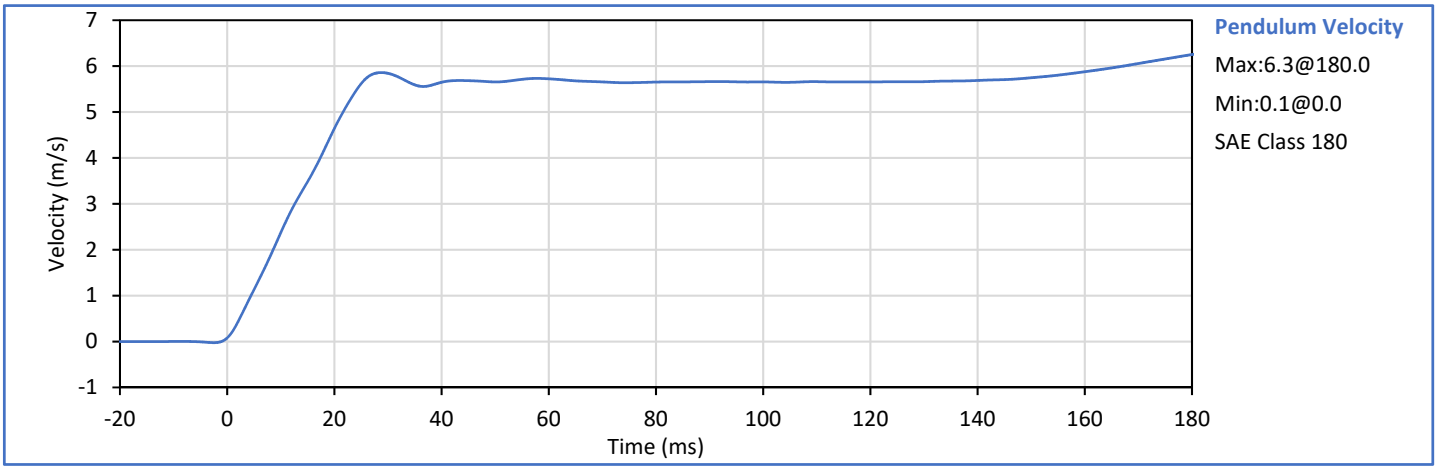
Technician: J. Hernandez Approved By: P. Puzzuto

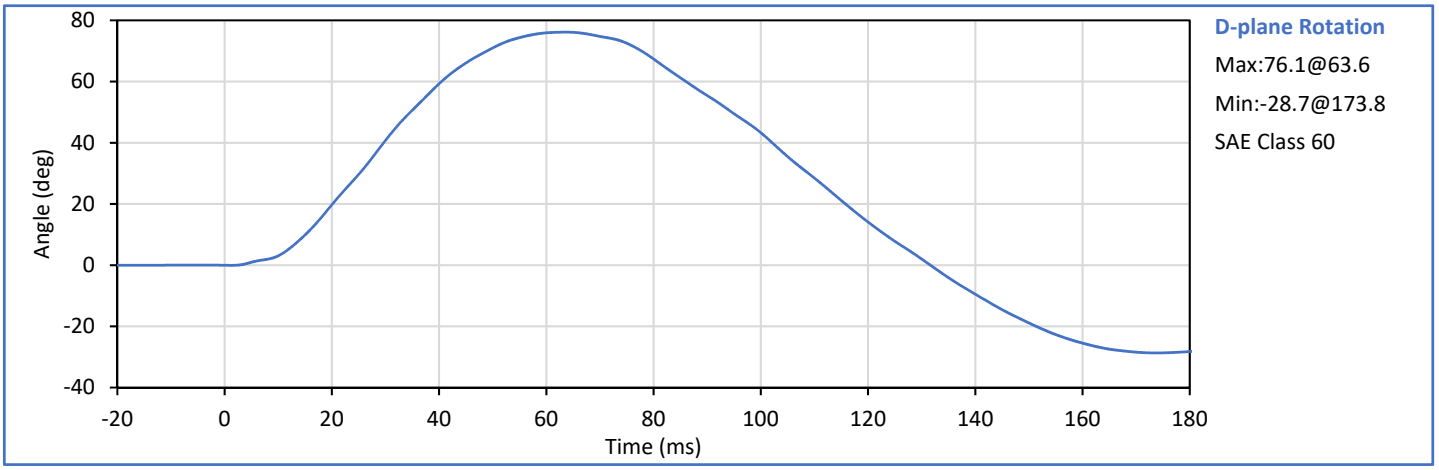
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-01-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.51	5.63	5.62	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.37	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.48	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.64	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.62	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	76.1	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	63.6	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-37.7	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	125.1	Pass
			Overall Test Results		Pass





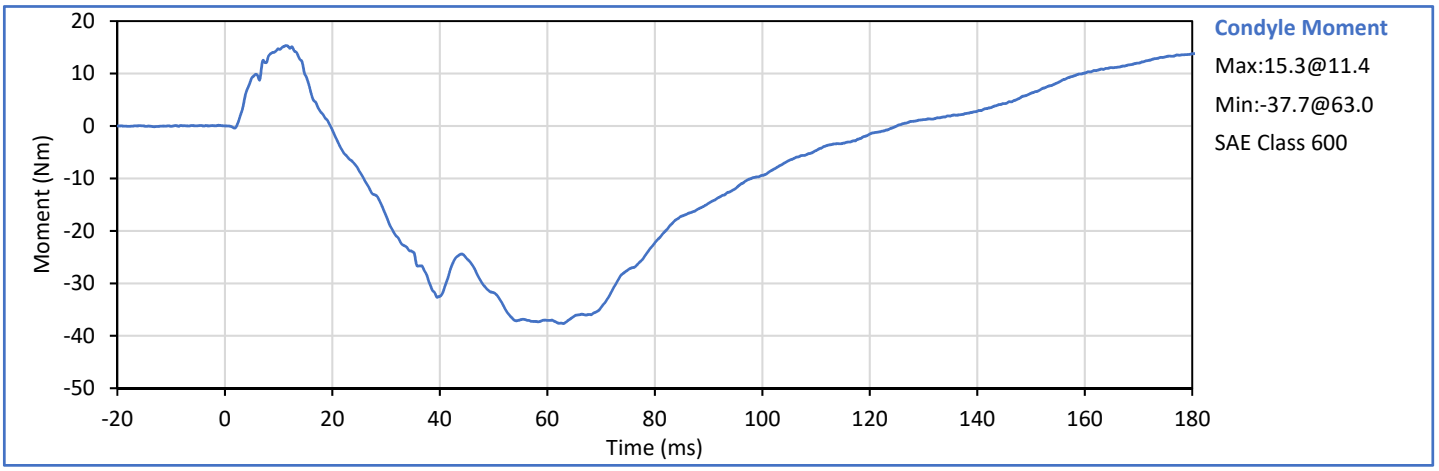
Technician: J. Hernandez

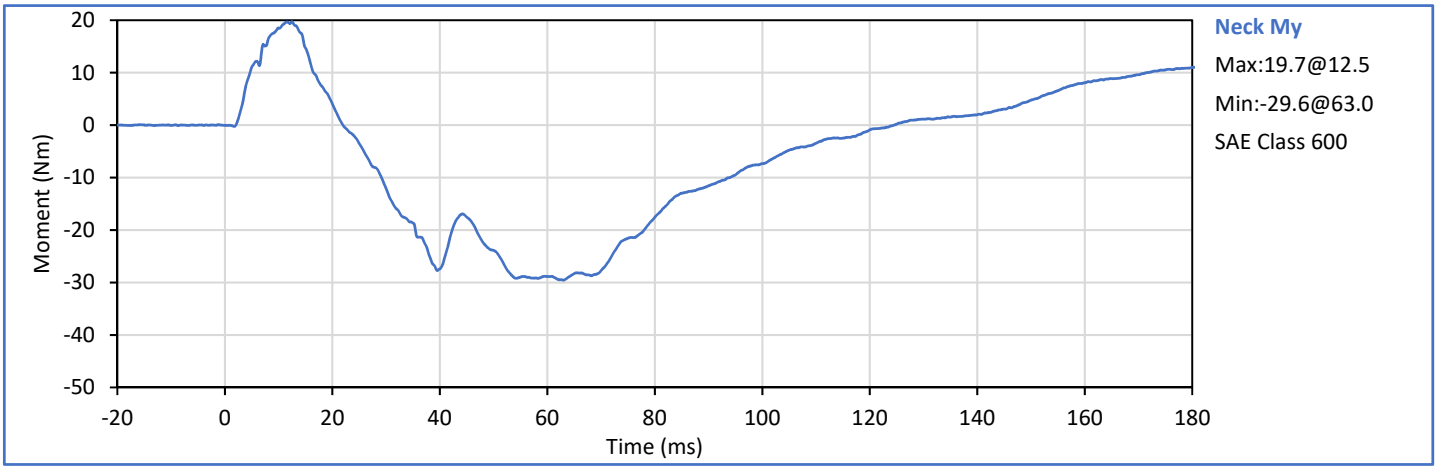
Approved By: P. Puzzuto

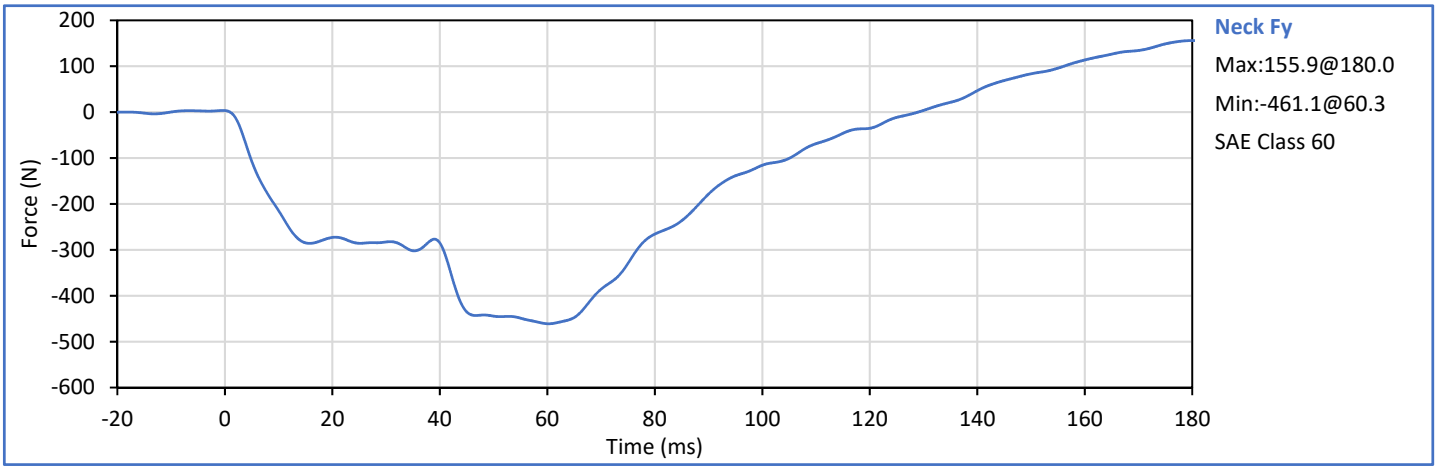
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-01-28





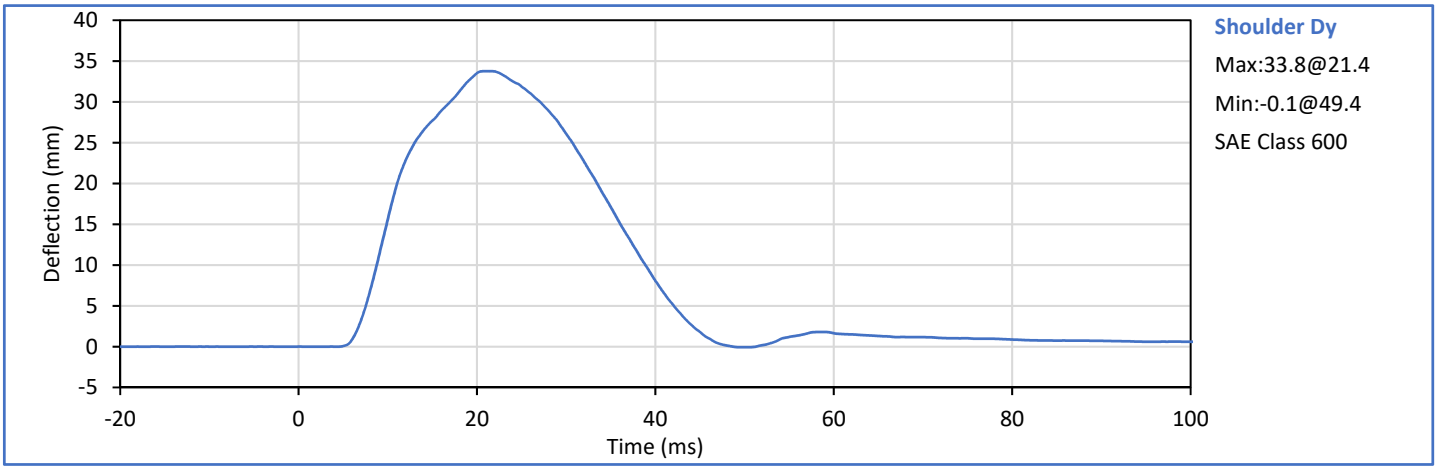


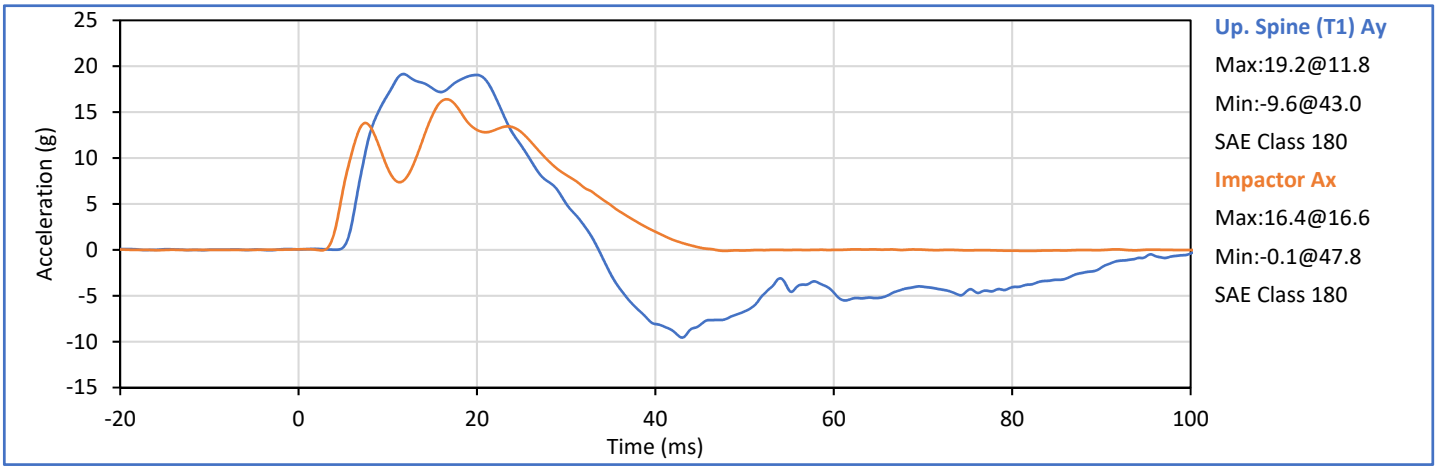
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 308 Test Date: 2020-01-30

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	21	Pass
Impactor Velocity	m/s	4.20	4.40	4.28	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.8	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	19.2	Pass
Peak Impactor Ax	g	13.0	18.0	16.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

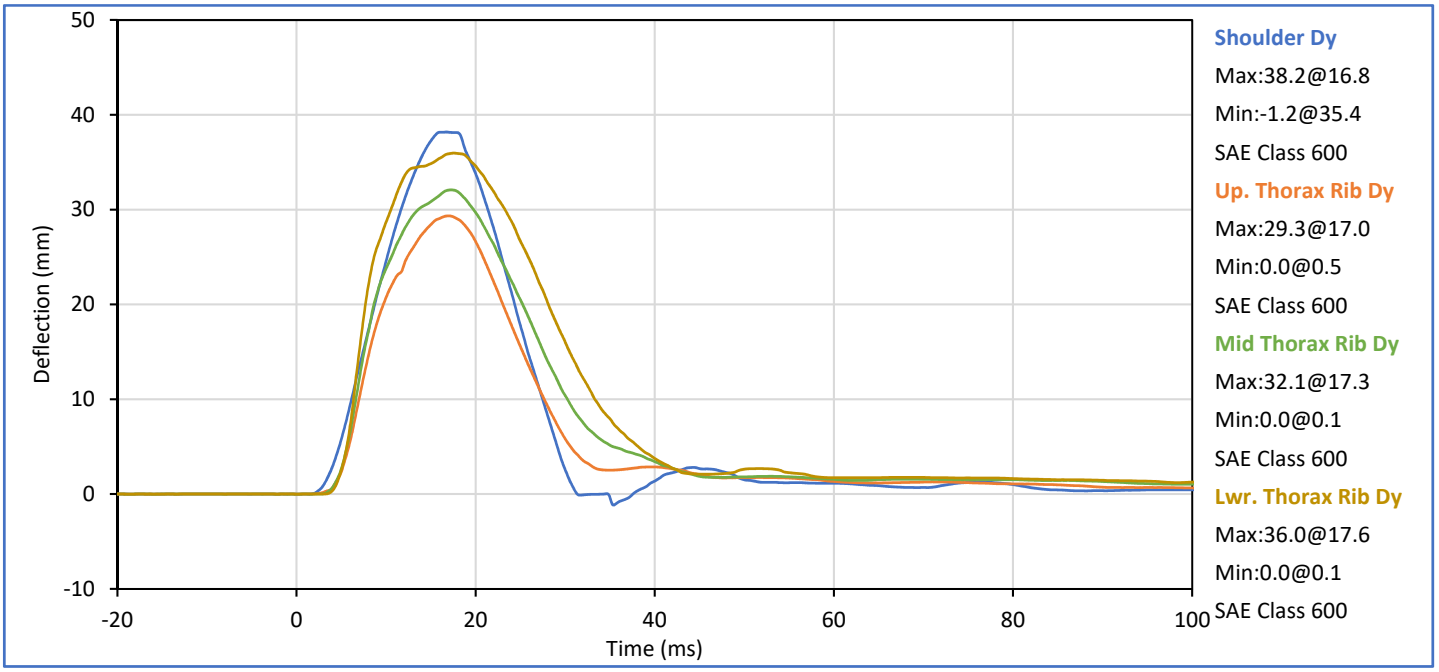
Approved By: P. Puzzuto

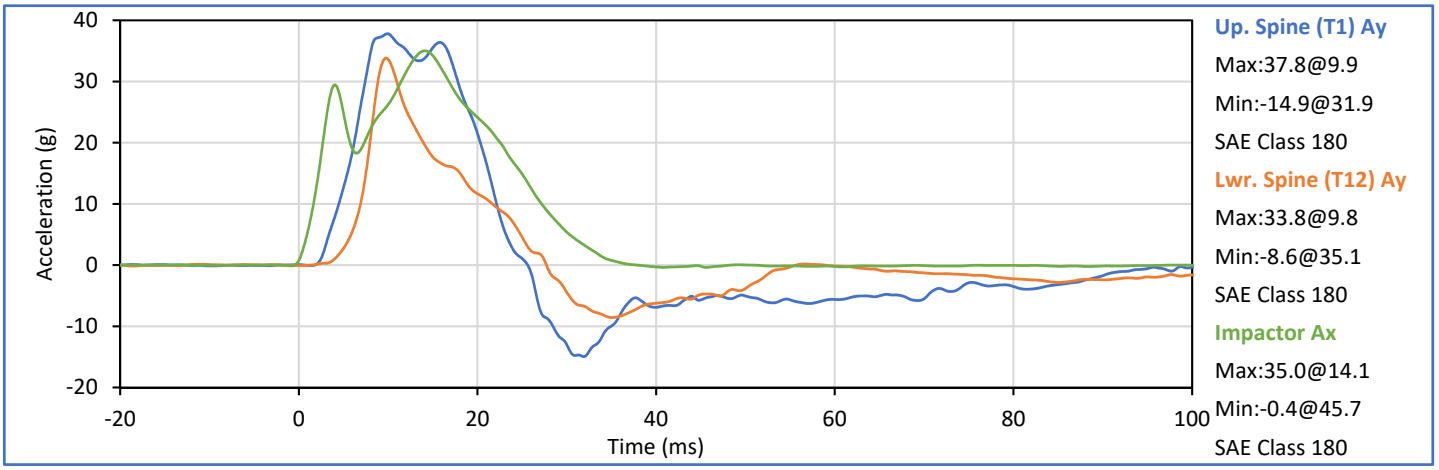
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2020-01-30

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	21	Pass
Impactor Velocity	m/s	6.60	6.80	6.65	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.2	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.3	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.1	Pass
Peak Lower Rib Dy	mm	32.0	38.0	36.0	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	37.8	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	33.8	Pass
Peak Impactor Ax	g	30.0	36.0	35.0	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

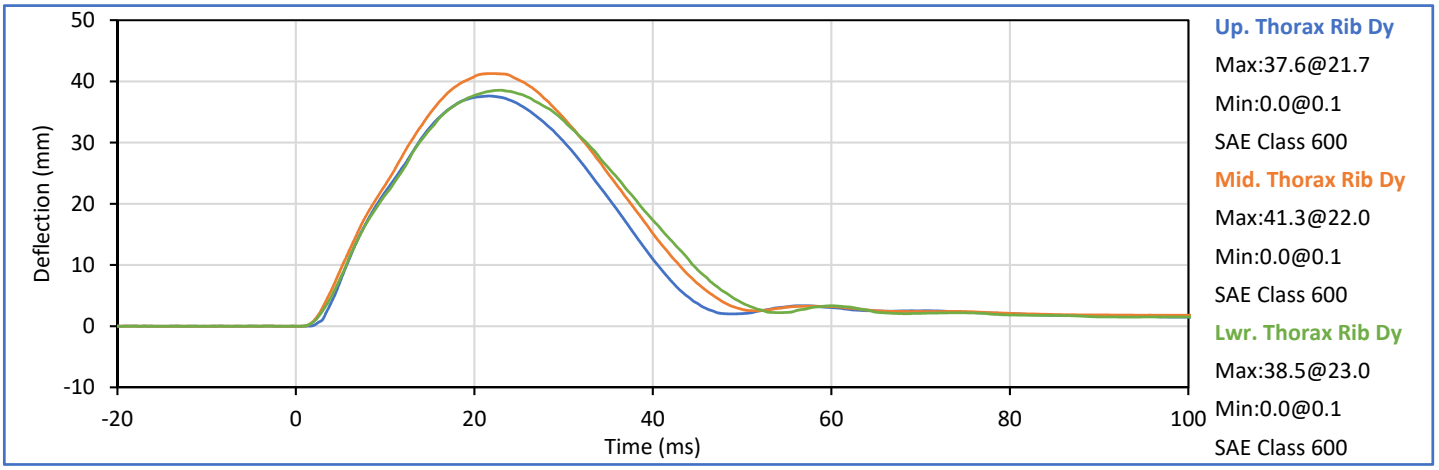
Applus IDIADA
KARCO

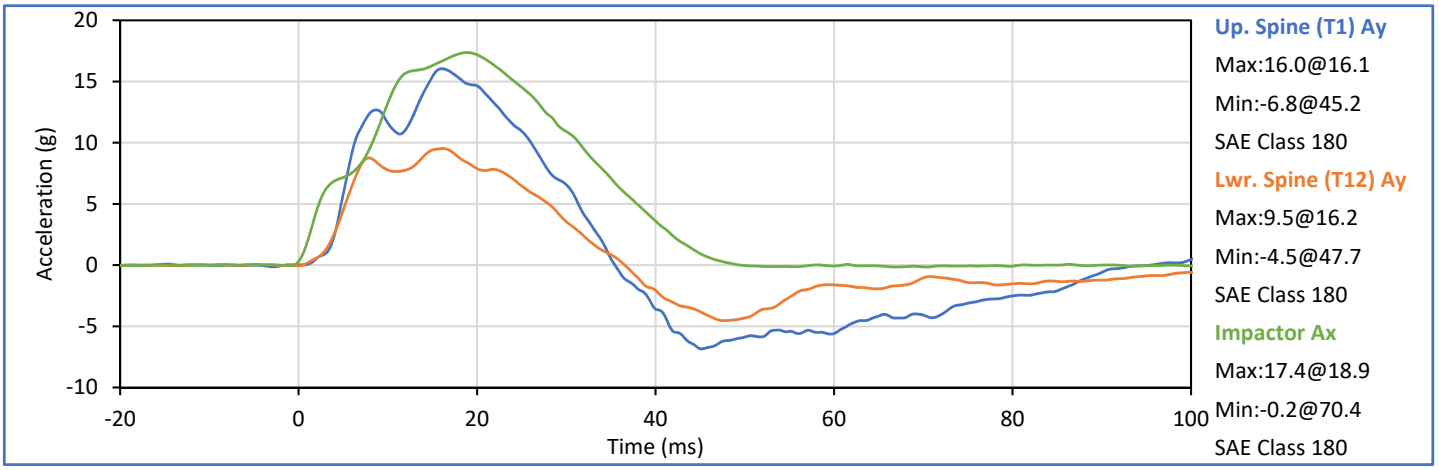
SID-IIs Small Side Impact ATD
Thorax (No Arm)

ATD Serial No.: 308

Test Date: 2020-01-30

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	21	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Rib Dy	mm	32.0	40.0	37.6	Pass
Peak Middle Rib Dy	mm	39.0	45.0	41.3	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.5	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	16.0	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.5	Pass
Peak Impactor Ax	g	14.0	18.0	17.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

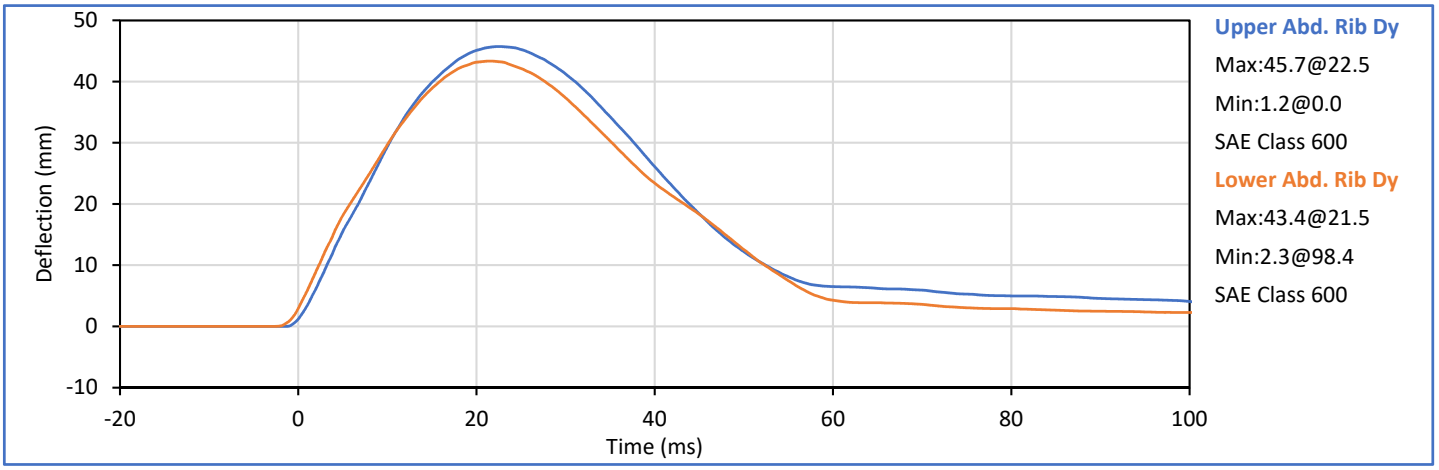
Approved By: P. Puzzuto

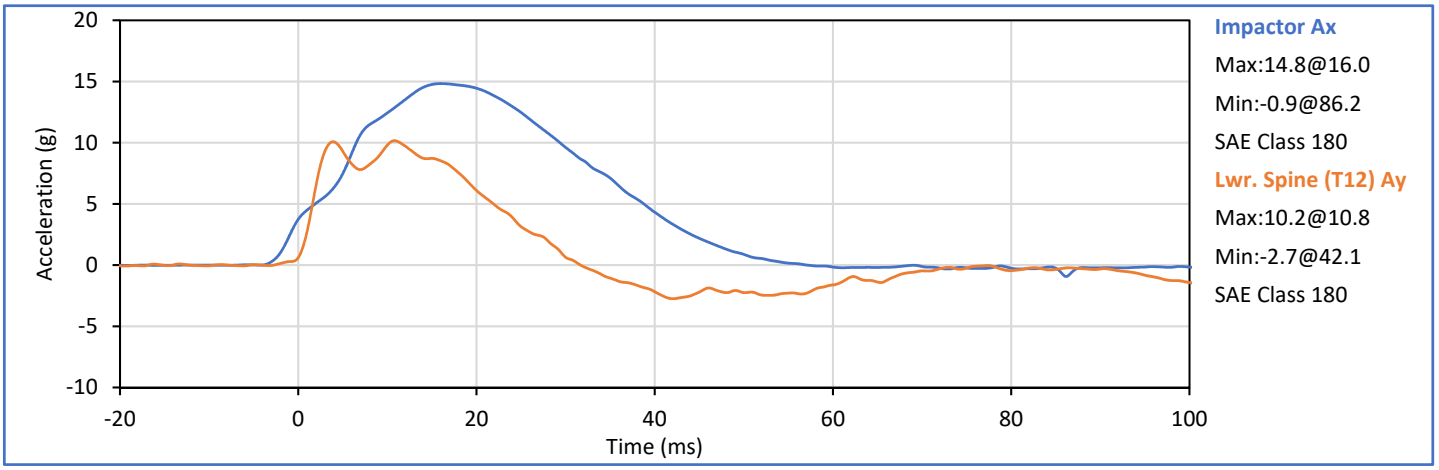
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 308 Test Date: 2020-01-30

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	45.7	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	43.4	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.2	Pass
Peak Impactor Ax	g	12.0	16.0	14.8	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

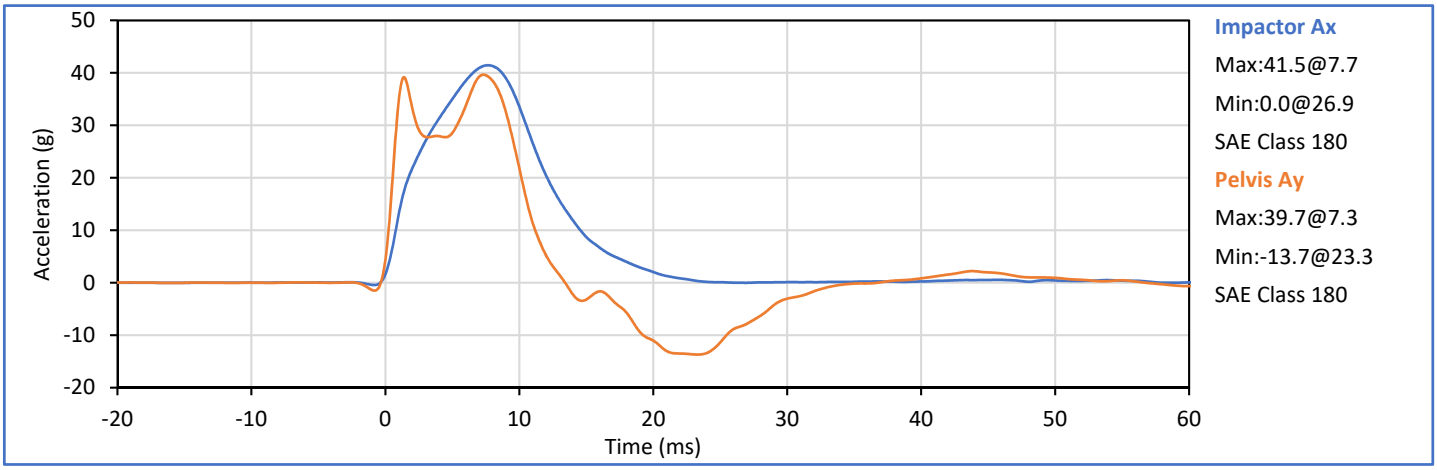
Applus IDIADA KARCO

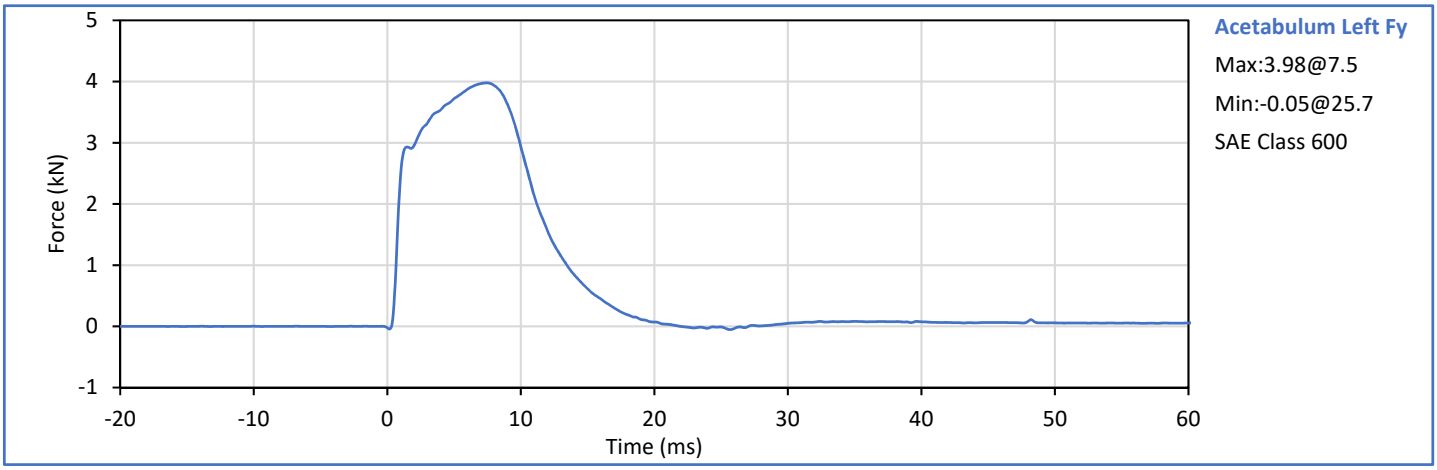
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2020-01-30

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	21	Pass
Impactor Velocity	m/s	6.60	6.80	6.73	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.98	Pass
Pelvis Ay after 6ms	g	34.0	42.0	39.7	Pass
Peak Impactor Ax	g	38.0	47.0	41.5	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 11358 (SACO)





Technician: J. Hernandez

Approved By: P. Puzzuto

ATD Serial No.: 308 Test Date: 2020-01-30

Pelvis Plug S/N: 11358 (SACO)

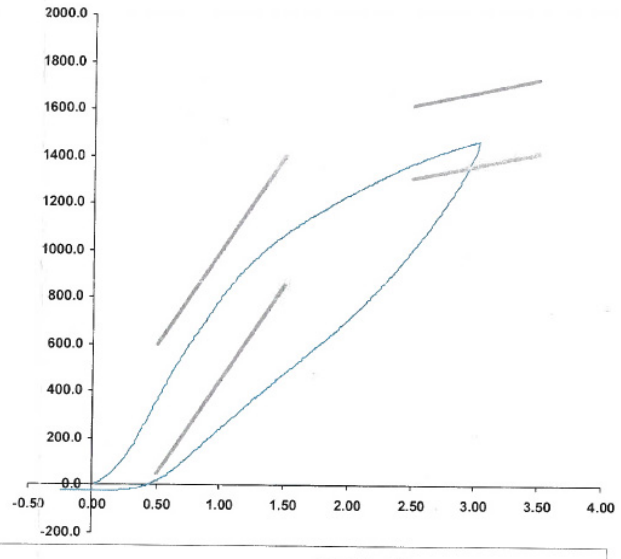
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 11358
Test Number 2750
Report Number 2747
Test Date 5/3/2016 8:06:45 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	359.78	50.00	600.00
Force @ 1.5 mm (N)	1,065.20	850.00	1,400.00
Force @ 2.5 mm (N)	1,368.92	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,462.53	1,361.00	1,673.00

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (TI240813), 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 03-May-16
SACO Research

By : DC Date : 5/3/16

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

Applus IDIADA
KARCO

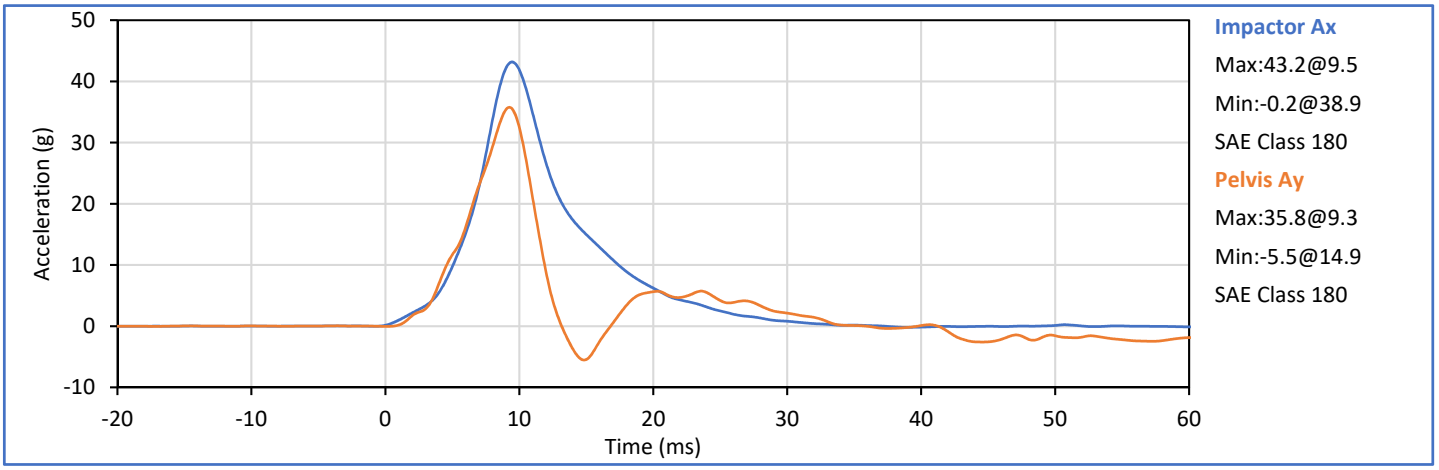
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

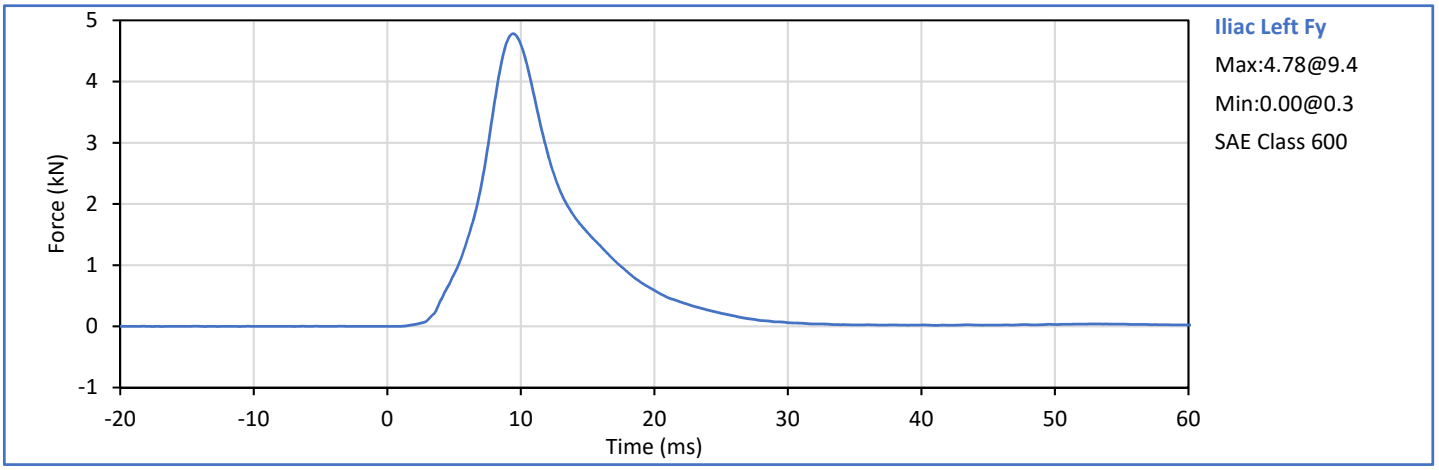
ATD Serial No.: 308 Test Date: 2020-01-29

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	4.36	Pass
Peak Iliac Fy	kN	4.10	5.10	4.78	Pass
Pelvis Ay after 6ms	g	28.0	39.0	35.8	Pass
Peak Impactor Ax	g	36.0	45.0	43.2	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 (SACO) *

* Plug is not impacted and remains certified





Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

SID-IIs ATD S/N: 308

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P63980	Endevco	7264C-2k	2020-01-02
Head Acceleration Y Primary	P58861	Endevco	7264C-2k	2020-01-02
Head Acceleration Z Primary	P51261	Endevco	7264C-2k	2020-01-02
Head Acceleration X Redundant	P58808	Endevco	7264C-2k	2020-01-02
Head Acceleration Y Redundant	P63310	Endevco	7264C-2k	2020-01-02
Head Acceleration Z Redundant	P49189	Endevco	7264C-2k	2020-01-02
Head Rotation Rate X	ARS7498	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Y	ARS7367	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Z	ARS7377	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Upper Thorax Rib Deflection Y	1249	Servo	08TCI-3725	2020-01-02
Middle Thorax Rib Deflection Y	1219	Servo	08TCI-3725	2020-01-02
Lower Thorax Rib Deflection Y	1221	Servo	08TCI-3725	2020-01-02
Upper Abdomen Rib Deflection Y	1252	Servo	08TCI-3725	2020-01-02
Lower Abdomen Rib Deflection Y	1283	Servo	08TCI-3725	2020-01-02
Lower Spine T12 Acceleration X	P52108	Endevco	7264C-2k	2020-01-02
Lower Spine T12 Acceleration Y	P63970	Endevco	7264C-2k	2020-01-02
Lower Spine T12 Acceleration Z	P51712	Endevco	7264C-2k	2020-01-02
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	Accels\10858	Endevco	757F-2k	2019-12-17
Vehicle CG Ay	Accels\A264073	MSI	52F-2000	2019-12-02
Vehicle CG Az	Accels\A265846	MSI	52F-2000	2019-12-02
Left Floor Sill Ay	Accels\A185676	MSI	52F-2000	2019-12-18
A-Pillar Sill Ay	Accels\10900	Endevco	757F-2k	2019-12-18
A-Pillar Low Ay	Accels\A267248	MSI	52F-2000	2019-12-16
A-Pillar Mid Ay	Accels\A265887	MSI	52F-2000	2019-11-25
B-Pillar Sill Ay	Accels\10836	Endevco	757F-2k	2019-12-17
B-Pillar Low Ay	Accels\10396	Endevco	757F-2k	2019-12-13
B-Pillar Mid Ay	Accels\A267278	MSI	52F-2000	2019-12-09
Driver Seat Track at H-Point Ay	Accels\A273389	MSI	52F-2000	2019-12-11
Engine Top Ax	Accels\10914	Endevco	757F-2k	2019-12-18
Engine Top Ay	Accels\10853	Endevco	757F-2k	2019-12-18
Firewall Ay	Accels\A217317	MSI	52F-2000	2019-12-02
Right Roof Ay	Accels\A208765	MSI	52F-2000	2019-12-18
Right Floor Sill Ay	Accels\10917	Endevco	757F-2k	2019-12-17
Rear Floorpan Ax	Accels\A265922	MSI	52F-2000	2019-12-29
Rear Floorpan Ay	Accels\A265914	MSI	52F-2000	2019-12-12

Table 3 - Barrier Pole Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Barrier Pole 01 Fx	19461A	Interface	1220FS-50k	2019-03-20
Barrier Pole 02 Fx	131822A	Interface	1220-FS	2019-05-07
Barrier Pole 03 Fx	131816A	Interface	1220AF-50k	2019-03-20
Barrier Pole 04 Fx	19325	Interface	1220-FS	2019-05-07
Barrier Pole 05 Fx	131827A	Interface	1220-FS	2019-05-07
Barrier Pole 06 Fx	19340	Interface	1220FS-50k	2019-03-20
Barrier Pole 07 Fx	19267	Interface	1220-FS	2019-05-07
Barrier Pole 08 Fx	19466A	Interface	1220FS-50k	2019-03-20