REPORT NUMBER: SideNCAPPole-KAR-21-006

NEW CAR ASSESSMENT PROGRAM (NCAP)

SIDE IMPACT POLE TEST

MERCEDES-BENZ AG STUTTGART

2021 MERCEDES-BENZ GLB250 5-DOOR SUV

NHTSA No: M20214304

PREPARED BY:

APPLUS IDIADA KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

August 11, 2021

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NRM-100

1200 NEW JERSEY AVE, SE, ROOM W43-410

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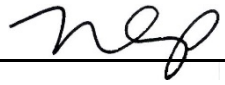
Reviewed By: 

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Approval Date: August 11, 2021

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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SideNCAPPole-KAR-21-006		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing of a 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304	August 11, 2021 **6. Performing Organization Code** KAR
7. Authors Mr. Neeraj N. Patel, Project Engineer, Applus IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus IDIADA KARCO	**8. Performing Organization Report No.** TR-P40398-01-NC
9. Performing Organization Name and Address Applus IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	**10. Work Unit No.** **11. Contract or Grant No.** DTNH22-14-D-00355L
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-100) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590	**13. Type of Report and Period Covered** Final Test Report, February 5, 2021 - August 11 , 2021 **14. Sponsoring Agency Code** NRM-100

15. Supplementary Notes

16. Abstract

A 32.2 km/h 75° rigid pole side NCAP impact test was conducted on the subject 2021 Mercedes-Benz GLB250 5-Door SUV 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 February 5, 2021.

The impact velocity was 32.18 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 14.4°C. The target vehicle's maximum post-test static crush was 300 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	467.7
Resultant Lower Spine Acceleration	g	82	57
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	3813
Maximum Thoracic Rib Deflection	mm	38	38
Maximum Abdominal Rib Deflection	mm	45	32

The struck side doors at the front and rear of the vehicle was jammed shut and did not separate from the hinges. There was no separation of the latches.

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	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	104	

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SECTION 1
TEST PURPOSE AND SUMMARY OF TEST

PURPOSE

This side impact test is part of the MY 2021 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 2021 Mercedes-Benz GLB250 5-Door SUV. 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 2021 Mercedes-Benz GLB250 5-Door SUV. The subject vehicle was towed into the rigid pole at an angle of 74.4° and a velocity of 32.18 km/h. The test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California on February 5, 2021. Pre-test 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	467.7
Lower Spine (T12) Resultant Acceleration	g	82	57
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3813
Maximum Thoracic Rib Deflection	mm	38*	38
Maximum Abdominal Rib Deflection	mm	45*	32

**Proposed IARV*

Supplemental restraint information is given below:

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

GENERAL COMMENTS:

- VEHICLE CG AX, channel failed at 67.5 ms
- VEHICLE CG AY, channel failed at 67.5 ms
- VEHICLE CG AZ, channel failed at 67.5 ms
- LEFT B-POST AT SILL AY, channel failed at 35.0 ms

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

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: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20214304
Model Year	2021
Make	Mercedes-Benz
Model	GLB250
Body Style	5-Door SUV
VIN	W1N4M4GB5MW081173
Body Color	Silver Metallic
Odometer Reading (km / mi)	6 / 4
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4-Cylinder
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	8
Overdrive	Yes
Final Drive	FWD
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	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	No

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Mercedes-Benz AG Stuttgart
Date of Manufacture	Oct-20
Vehicle Type	SUV

GVWR (kg)	2145
GAWR Front (kg)	1155
GAWR Rear (kg)	1040

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				420.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				79.8	*A-B*

VEHICLE SEAT TYPE

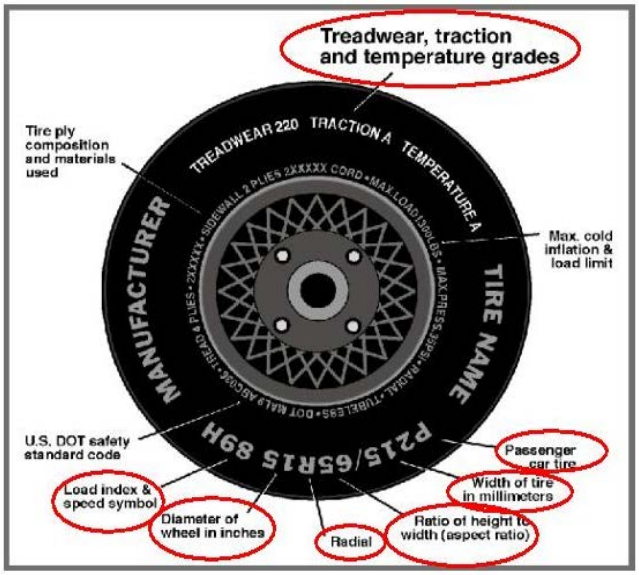
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes			Yes	
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	290	290
Recommended Tire Size	P235/55 R18	P235/55 R18
Tire Size on Vehicle	P235/55 R18	P235/55 R18
Tire Manufacturer	Continental	Continental
Tire Model	ProContact GX SSR	ProContact GX SSR
Treadware	500	500
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Rayon	1 Rayon
Tire Plies Body	1 Rayon, 2 Steel, 1 Polyamide	1 Rayon, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	100H	100H
Tire Material	Rayon, Steel, Polyamide	Rayon, Steel, Polyamide
DOT Safety Code Left	A33L WXX4 1020	A33L WXX4 1020
DOT Safety Code Right	A33L WXX4 1020	A33L WXX4 1020

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

TIRE PRESSURES

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	472.5	366.0		506.5	437.5		513.5	435.5	
Right	kg	500.0	323.0		486.0	354.0		493.0	348.0	
Ratio	%	58.5%	41.5%	100.0%	55.6%	44.4%	100.0%	56.2%	43.8%	100.0%
Total	kg	972.5	689.0	1661.5	992.5	791.5	1784.0	1006.5	783.5	1790.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1661.5	A
Actual Weight of 1 SID II-s ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	79.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1790.3	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)*	°	-0.6	0.1	-0.5	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-0.1	0.1	0.1	Yes
Front Bumper-Line Angle (left-to-right)**	°	-0.3	0.3	-0.1	Yes
Rear Bumper-Line Angle (left-to-right)**	°	-0.1	0.3	0.3	Yes
Vehicle CG (Aft of Front Axle)	mm	1173	1255	1238	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	7	46	48	

*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: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

Test Height Adjustable Setting (If Applicable)	

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Rear Trim	3.5

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm target	70
Aft 25 mm target	71

DATA SHEET NO. 2

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

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

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	8.8	0.0	4.4
Front Passenger Seat	8.8	0.0	4.4
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	4.4	248	Max	250	260	265
			Mid	233	240	248
			Min	215	220	230
Front Passenger Seat	4.4	243	Max	252	255	260
			Mid	234	240	243
			Min	215	225	225
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: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

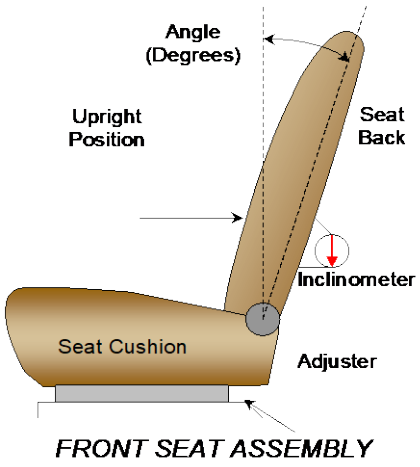
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	N/A	0	N/A
Front Passenger Seat	263	N/A	0	N/A
Front Center Seat				
Struck Side Rear Seat	141	15	141	15
Non-Struck Side Rear Seat	140	15	140	15
Rear Center Seat				

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front passenger's seat back is positioned in a similar manner to the driver's seat. The struck side rear passenger seat back is positioned in accordance with the information provided by the manufacturer in Form 1 for the 5th percentile female dummy in a Side NCAP MDB Test. The rear center and non-struck side rear passenger's seat back is set to match the struck side rear seat back. Seat back angle is measured using a flat bar along the seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	65.8	N/A	16.2	N/A
Front Passenger Seat	64.1	N/A	16.2	N/A
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	39.0	7	15.0	2
Non-Struck Side Rear Seat	40.8	7	14.7	2
Rear Center Seat				

*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: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	3	H

HEAD RESTRAINT ADJUSTMENT

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

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

DATA SHEET NO. 2 … (CONTINUED)

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

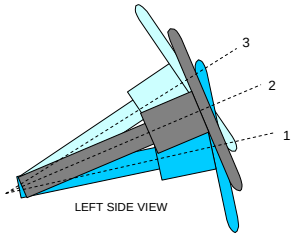
Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

STEERING COLUMN ADJUSTMENT

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

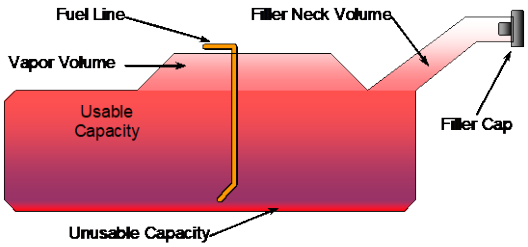
	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	20.4	80
Geometric Center - Position 2	22.9	107.5
Uppermost - Position 3	25.4	135
Telescoping Steering Wheel Travel		55
Test Position	22.9	107.5



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)	60.00
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	60.00
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	55.80
Actual amount of Solvent Used in Test	55.80
1/3 of Usable Capacity	20.00

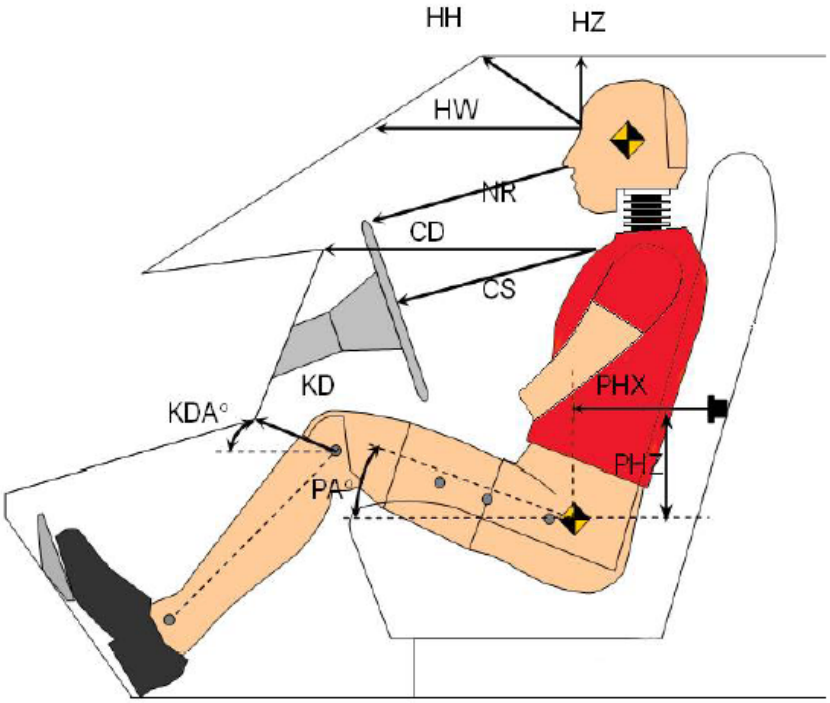
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



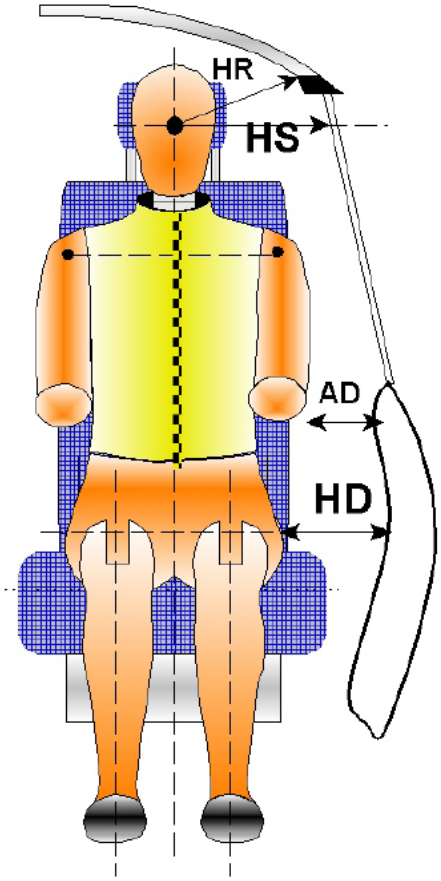
Driver Code	Description	Driver	
		Length (mm)	Angle (º)
HH	Head to Header	329	
HW	Head to Windshield	645	
HZ	Head to Roof	242	
NR	Nose to Rim	260	
CD	Chest to Dash	458	
CS	Chest to Steering Wheel	174	
KD(L)/KDA(L)°	Left Knee to Dash	122	30.3
KD(R)/KDA(R)°	Right Knee to Dash	107	35.9
PAX°	Pelvic Tilt Angle (x-axis)		20.6
PAY°	Pelvic Tilt Angle (y-axis)		0.0
PHX	Hip Point to Striker (x-axis)	322	
PHZ	Hip Point to Striker (z-axis)	168	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



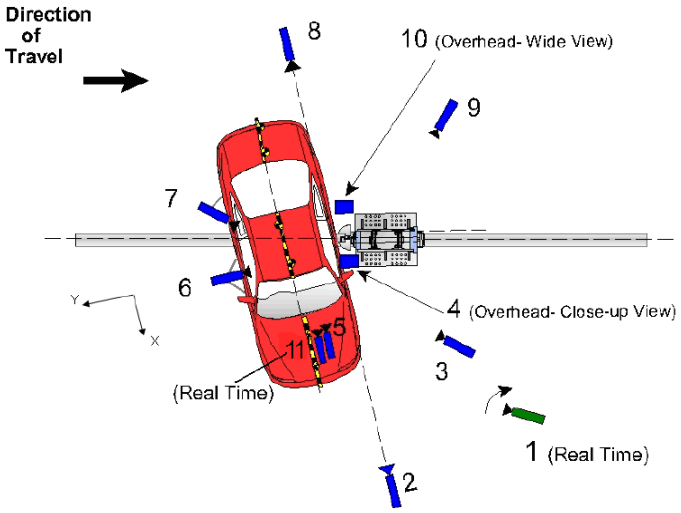
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	276
HS	Head to Side Window	mm	373
AD	Arm to Door	mm	148
HD	Hip Point to Door	mm	162

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



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

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	-0.81	0.44	1.45	8	1000
6	On-Board - Dummy Side View	-2.09	-0.75	1.12	8	1000
7	On-Board - Dummy Rear Oblique View	-2.89	-0.73	1.17	6	1000
8	Rear Ground Level - Impact View	-1.30	1.68	-1.26	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	-0.76	0.48	1.41		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

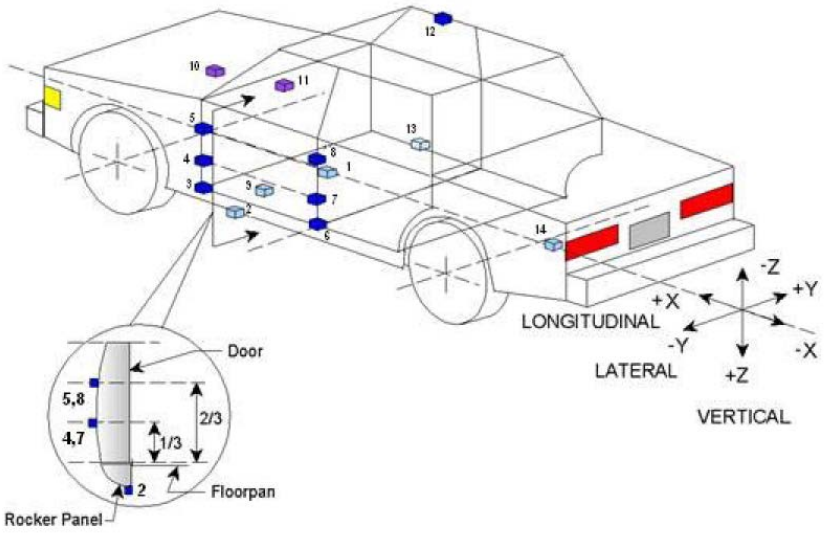
Driver Dummy Channels	19
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	45

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1000	0	160
2	Left Floor Sill	810	-310	180
3	A-Pillar Sill	570	-310	100
4	A-Pillar Low	570	-320	270
5	A-Pillar Mid	570	-330	460
6	B-Pillar Sill	1020	-340	110
7	B-Pillar Low	1020	-350	290
8	B-Pillar Mid	1020	-360	450
9	Driver Seat Track	890	-150	270
10	Engine Top	400	110	400
11	Firewall	520	90	420
12	Right Roof	880	210	650
13	Right Floor Sill	1210	0	170
14	Rear Floorpan	1480	0	220

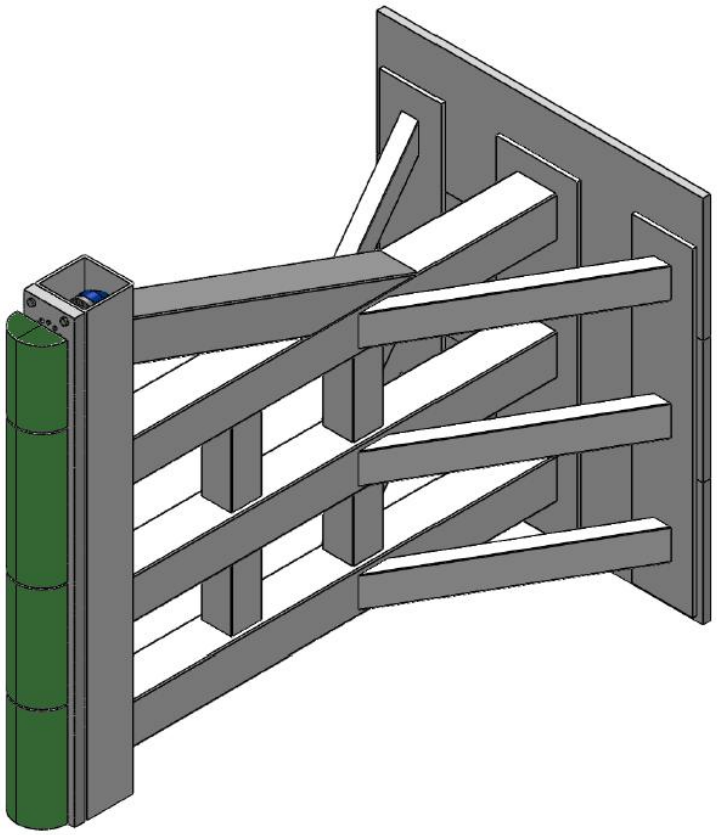
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



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: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

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, Seat back
Back of Head	Curtain Airbag, Headrest, Seat back
Left Shoulder	Torso-Pelvis Airbag
Upper Torso	Torso-Pelvis Airbag
Lower Torso	Torso-Pelvis Airbag
Left Hip	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	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: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

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	

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

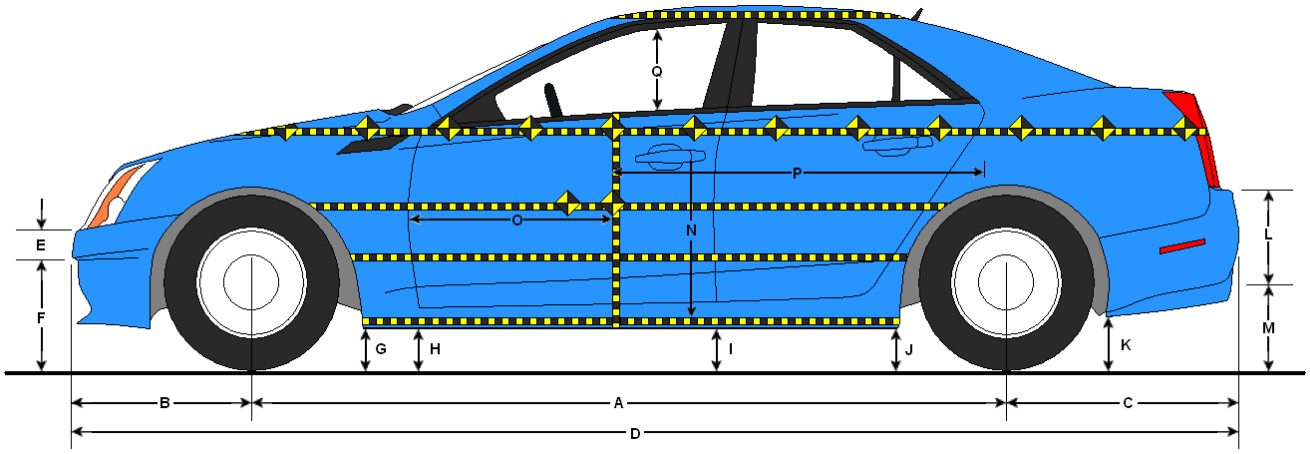
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1165
Actual Impact Point (Aft of Front Axle)	mm		1171
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-6
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.4
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.18
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.20

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

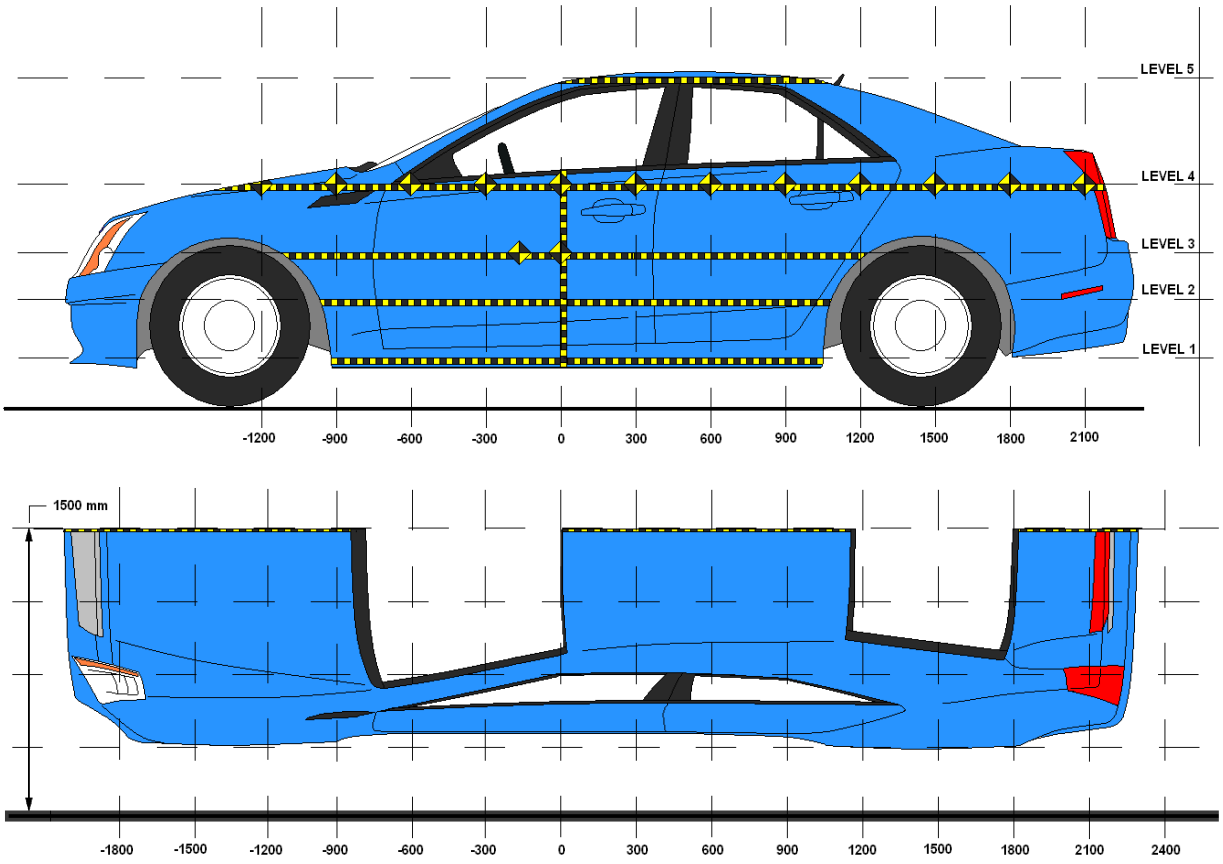
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2828	2749	-79
B	Front Axle to FSOV	902	963	61
C	Rear Axle to RSOV	901	897	-4
D	Total Length at Centerline	4618	4609	-9
E	Front Bumper Thickness	93	94	1
F	Fromt Bumper Bottom to Ground	505	493	-12
G	Sill Height at Front Wheel Well	260	233	-27
H	Sill Height at Front Door Leading Edge	262	235	-27
I	Sill Height at B-Pillar	252	255	3
J1	Sill Height at Rear Wheel Well	248	263	15
J2	Pinch Weld Height at Rear Wheel Well	210	212	2
K	Sill Height Aft of Rear Wheel Well	342	338	-4
L	Rear Bumper Thickness	219	218	-1
M	Rear Bumper Bottom to Ground	399	399	0
N	Sill Height to Bottom of Front Window Sill	734	777	43
O	Front Door Leading Edge to Impact CL	635	552	-83
P	Rear Door Trailing Edge to Impact CL	1473	1382	-91
Q	Front Window Opening	440	445	5
R	Right Side Length	3427	3440	13
S	Left Side Length	3424	3330	-94
T	Vehicle Width at B-Pillar	1807	1751	-56

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



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	310	254	0
2	Occupant H-Point	632	297	0
3	Mid-Door	680	300	0
4	Window Sill	1026	265	0
5	Window Top	1555	107	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

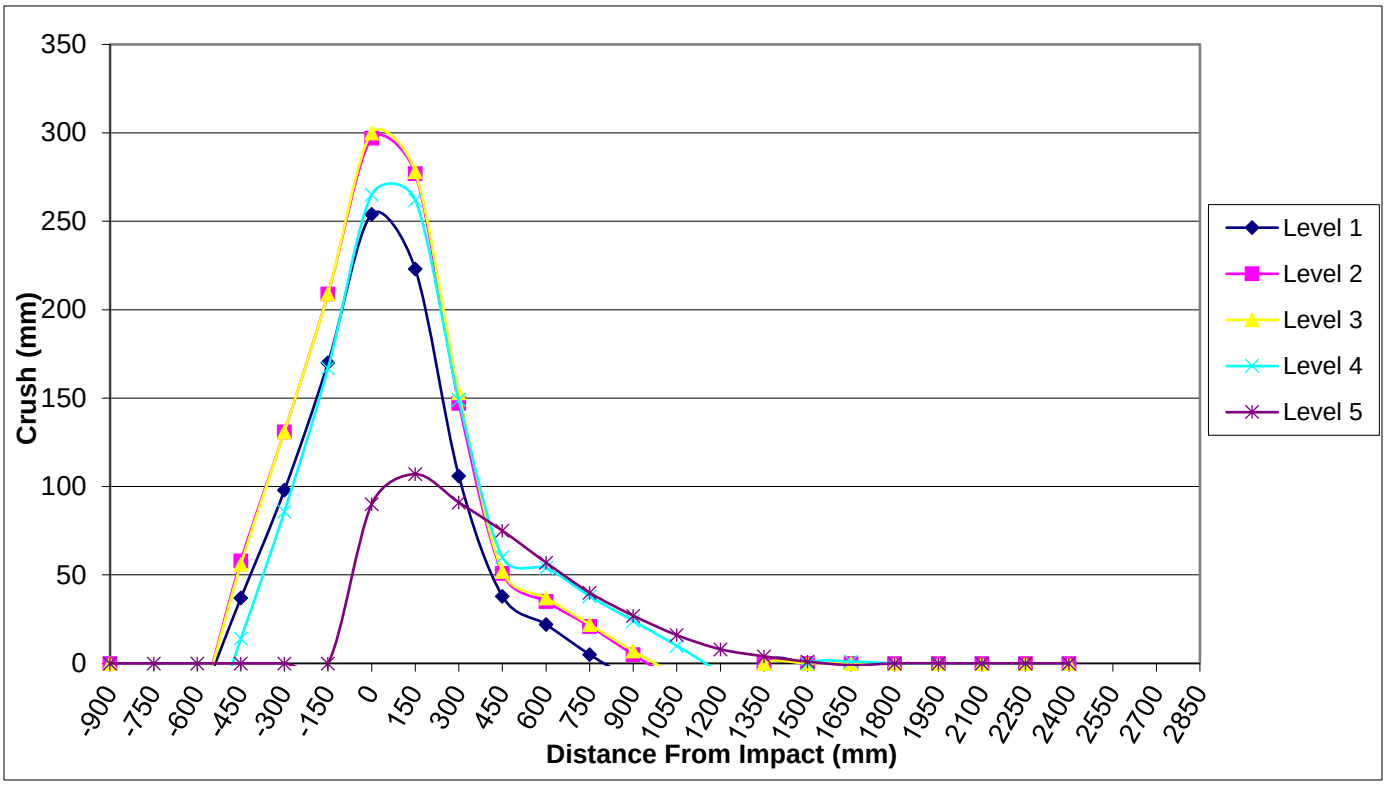
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750	626	588	587	696		568	524	524	629		-58	-64	-63	-67	
-600	633	605	603	683		610	578	576	629		-23	-27	-27	-54	
-450	628	606	606	679		665	664	662	693		37	58	56	14	
-300	628	606	607	673		726	737	738	759		98	131	131	86	
-150	628	607	607	666		798	816	816	833		170	209	209	167	
0	631	608	608	658	873	885	905	908	923	963	254	297	300	265	90
150	632	608	609	653	876	855	885	887	915	983	223	277	278	262	107
300	632	609	610	651	881	738	756	763	800	972	106	147	153	149	91
450	630	608	610	649	887	668	659	662	709	962	38	51	52	60	75
600	632	608	610	647	893	654	643	647	701	950	22	35	37	54	57
750	634	608	610	646	899	639	629	632	684	939	5	21	22	38	40
900	634	608	610	645	904	624	613	617	669	931	-10	5	7	24	27
1050	634	604	604	644	908	607	594	597	654	924	-27	-10	-7	10	16
1200	621	592	592	657	913	578	568	570	652	921	-43	-24	-22	-5	8
1350				635	917				617	921				-18	4
1500				629	921				629	922				0	1
1650				629	925				630	924				1	-1
1800															
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

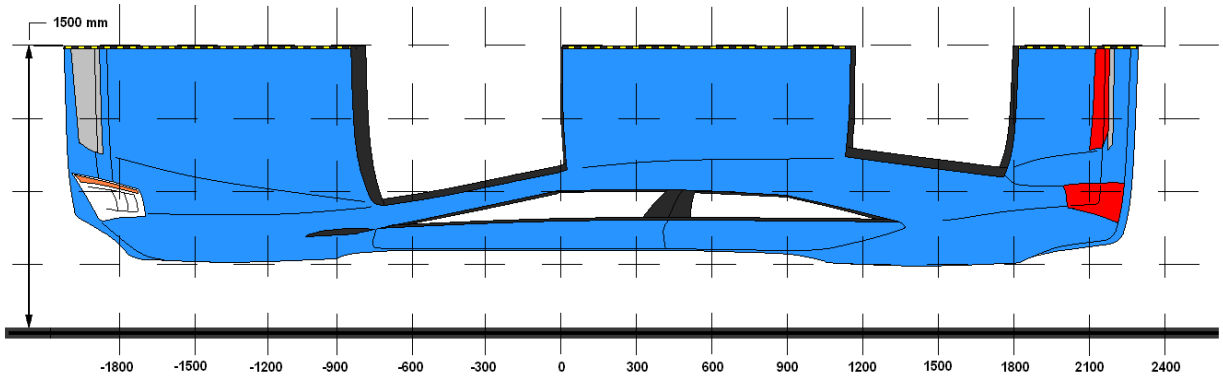


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1650	4	629	630	1
2	1200	5	913	921	8
3	750	5	899	939	40
4	150	3	609	887	278
5	-300	3	607	738	131
6	-750	1	626	568	-58

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21

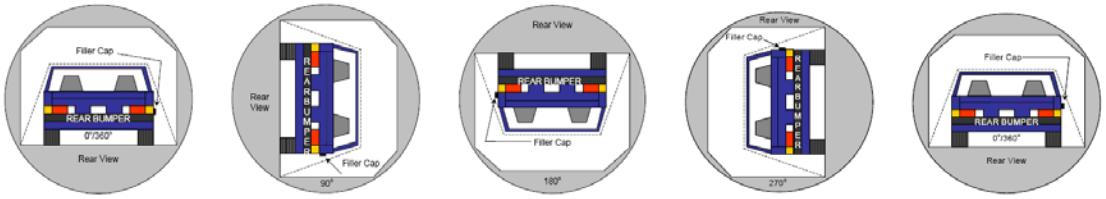
Temperature at Time of Impact: 14.4° C Test Time: 11:00 AM

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°	82	300	382
90° To 180°	97	300	397
180° To 270°	80	300	380
270° To 360°	100	300	400

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

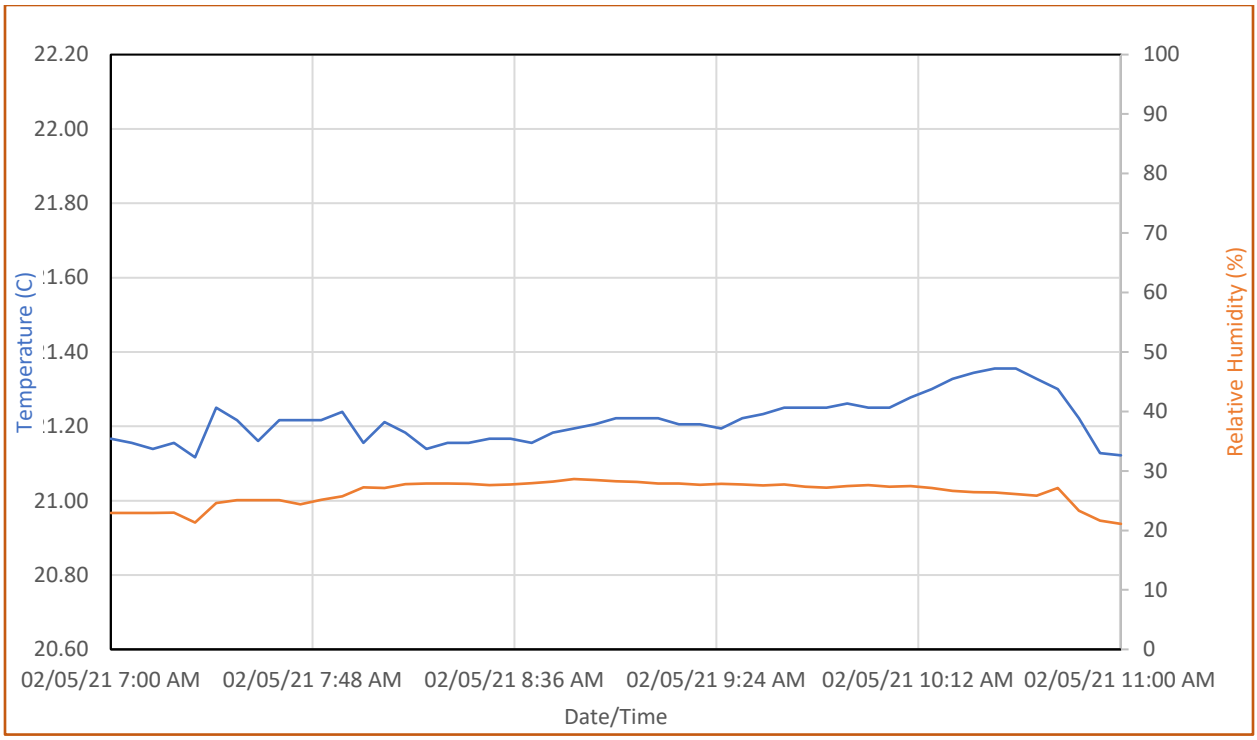
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214304

Test Program: NCAP Side Pole Impact Test Test Date: 02/05/21



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

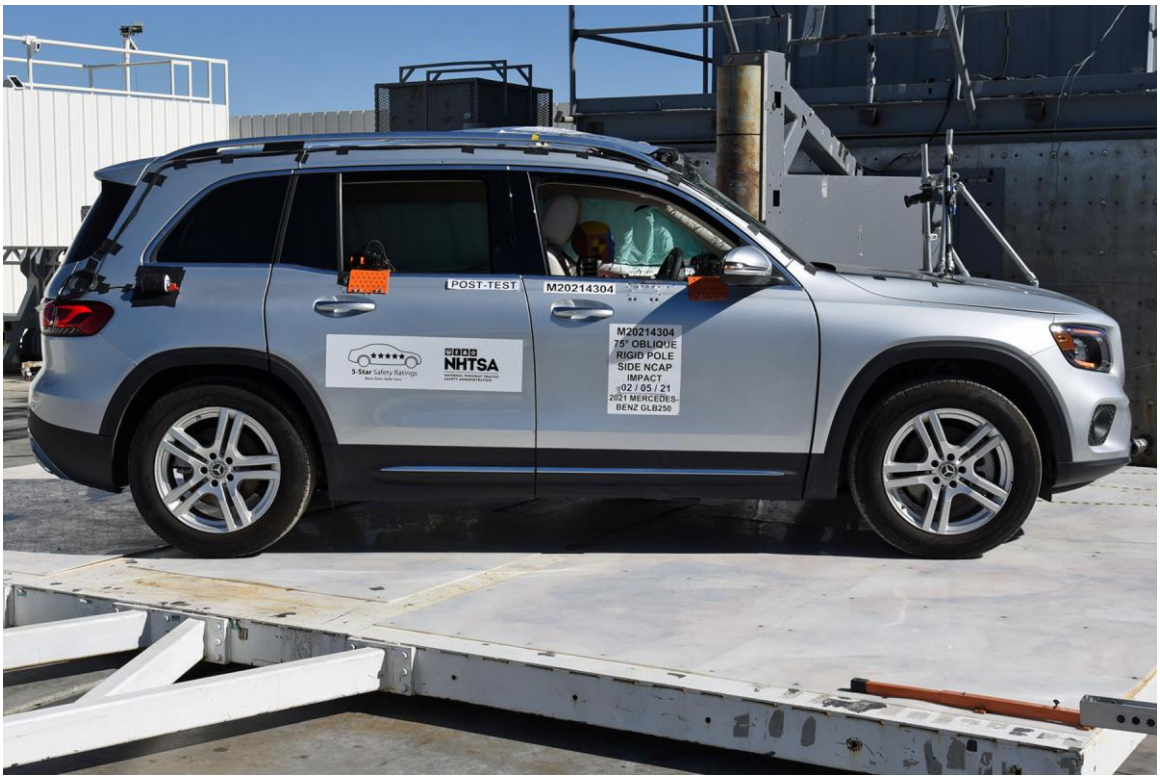


FIGURE 14. Post-Test Right Side View of Test Vehicle

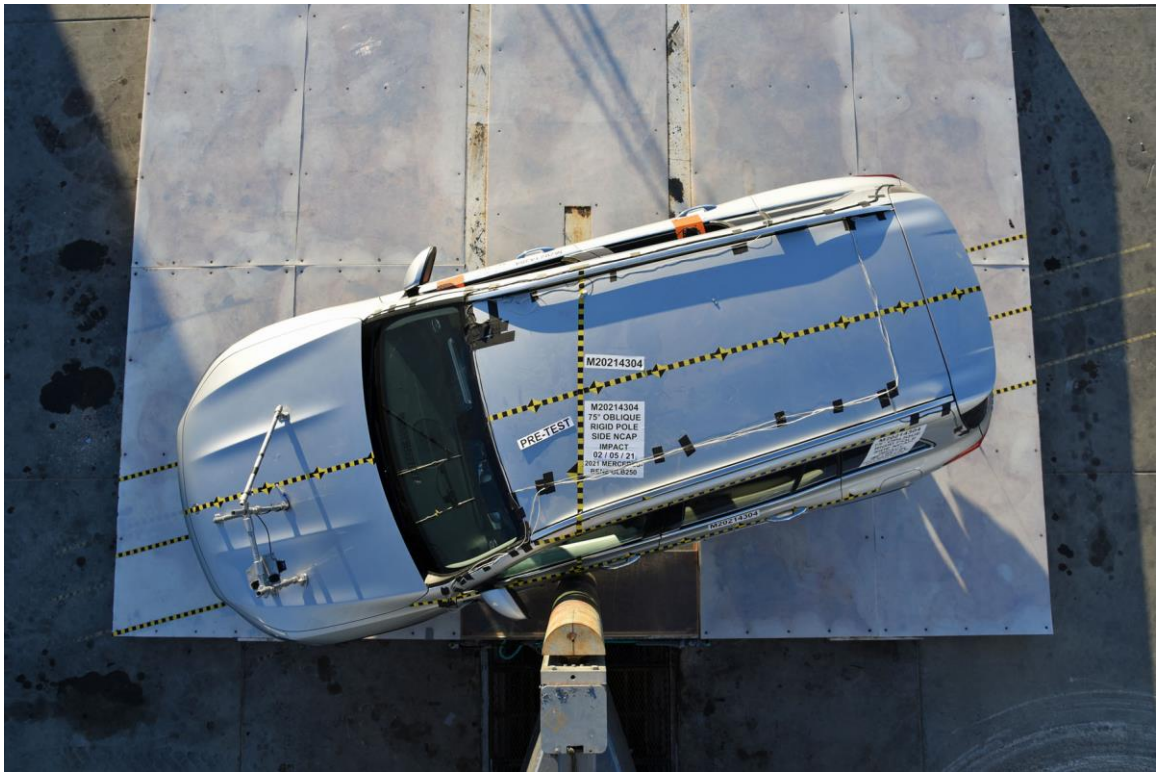


FIGURE 15. Pre-Test Overhead View of Test Area

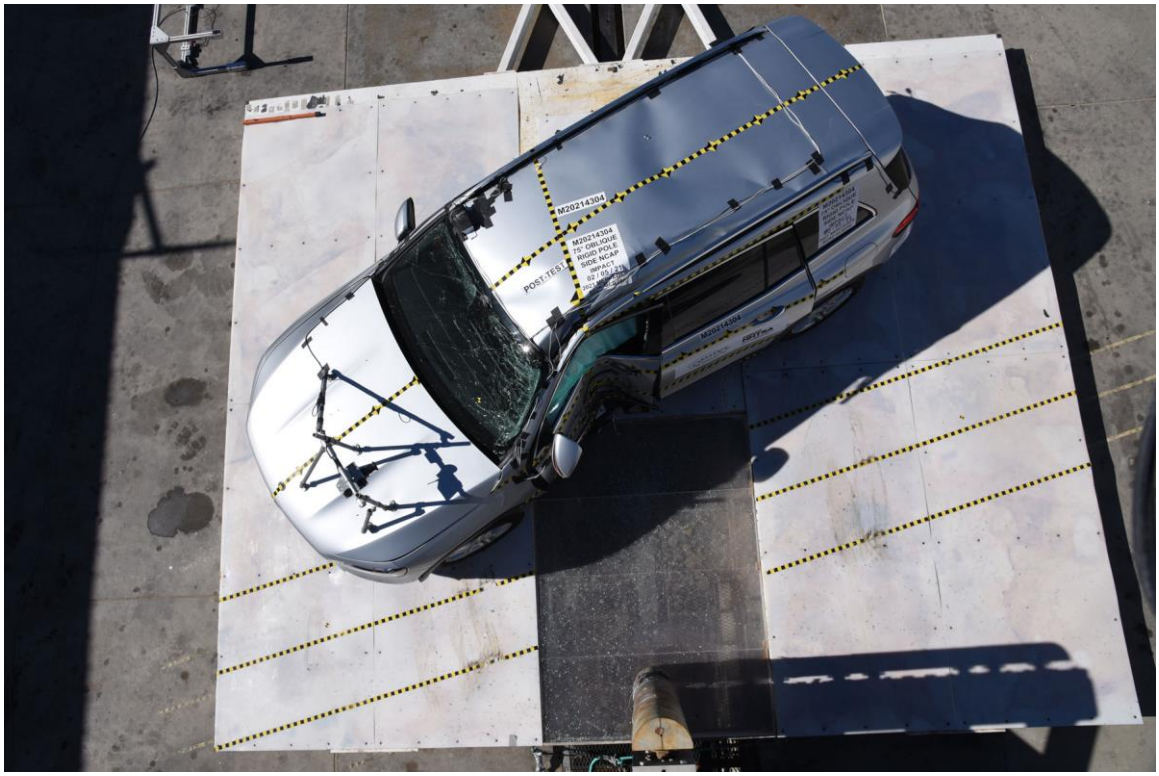


FIGURE 16. Post-Test Overhead View of Test Area

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

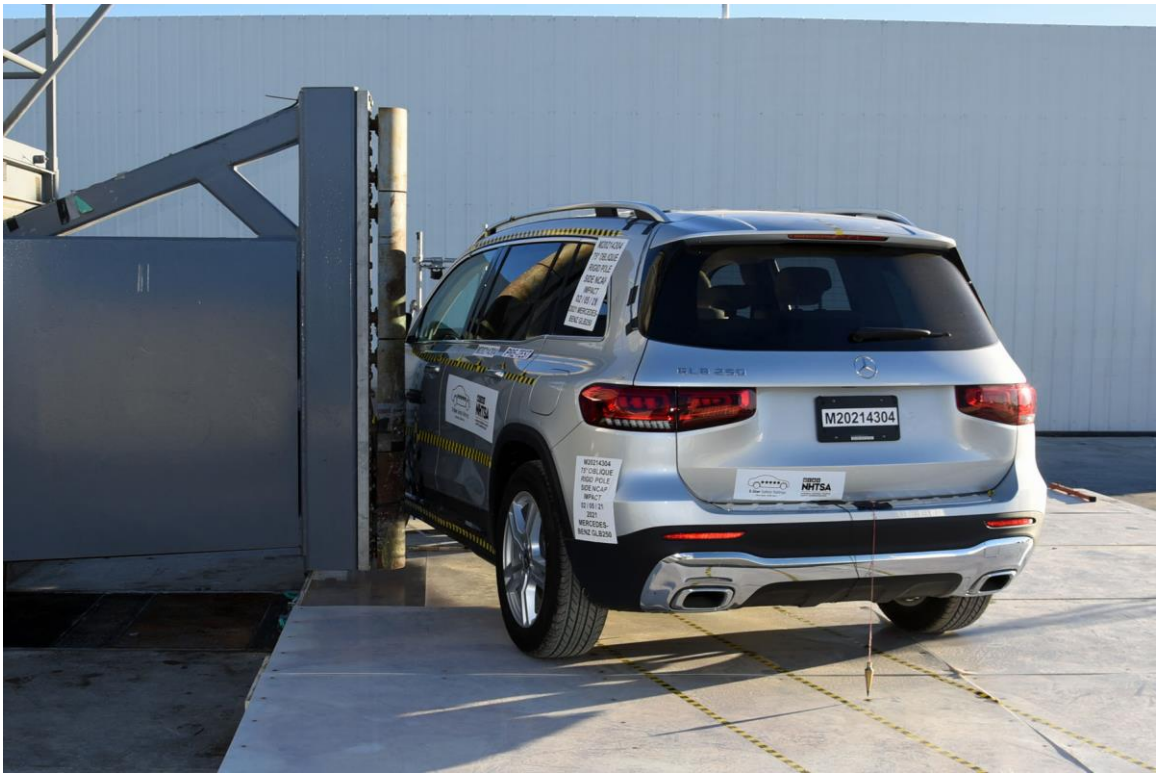


FIGURE 18. Pre-Test Right Side View of Pole Positioned Against Side of Vehicle

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

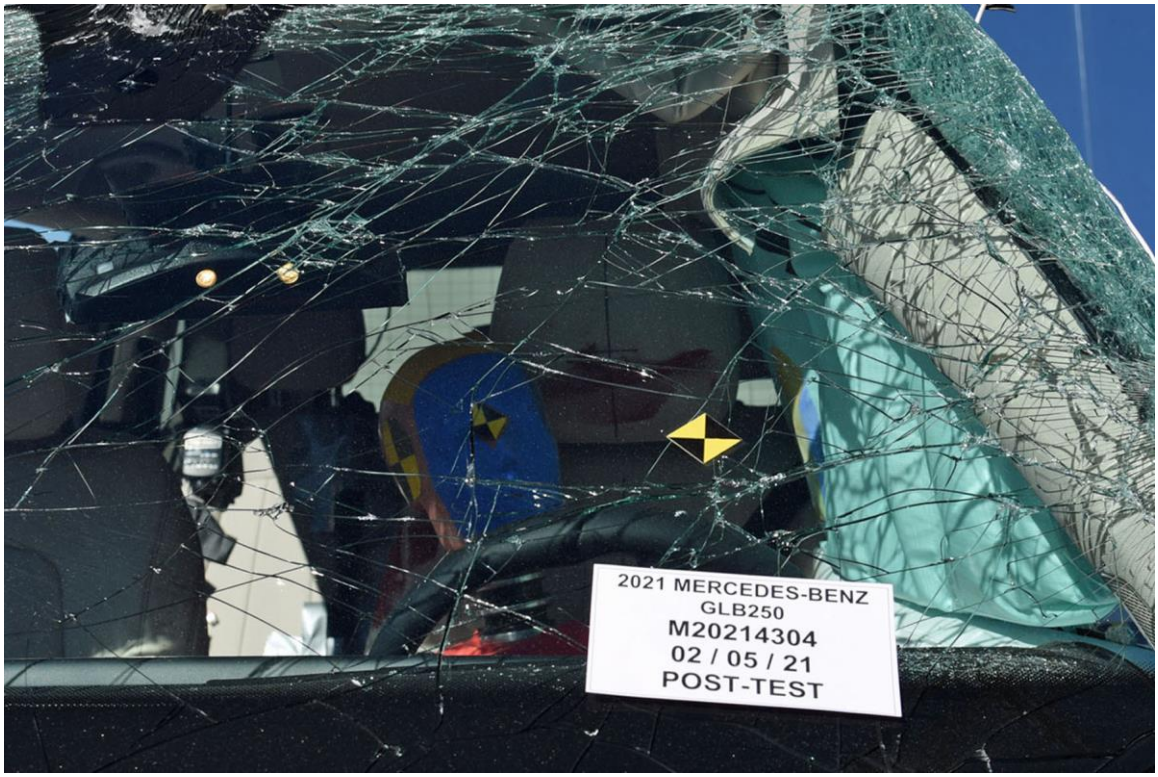


FIGURE 22. Post-Test Front Close-Up View of Dummy

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

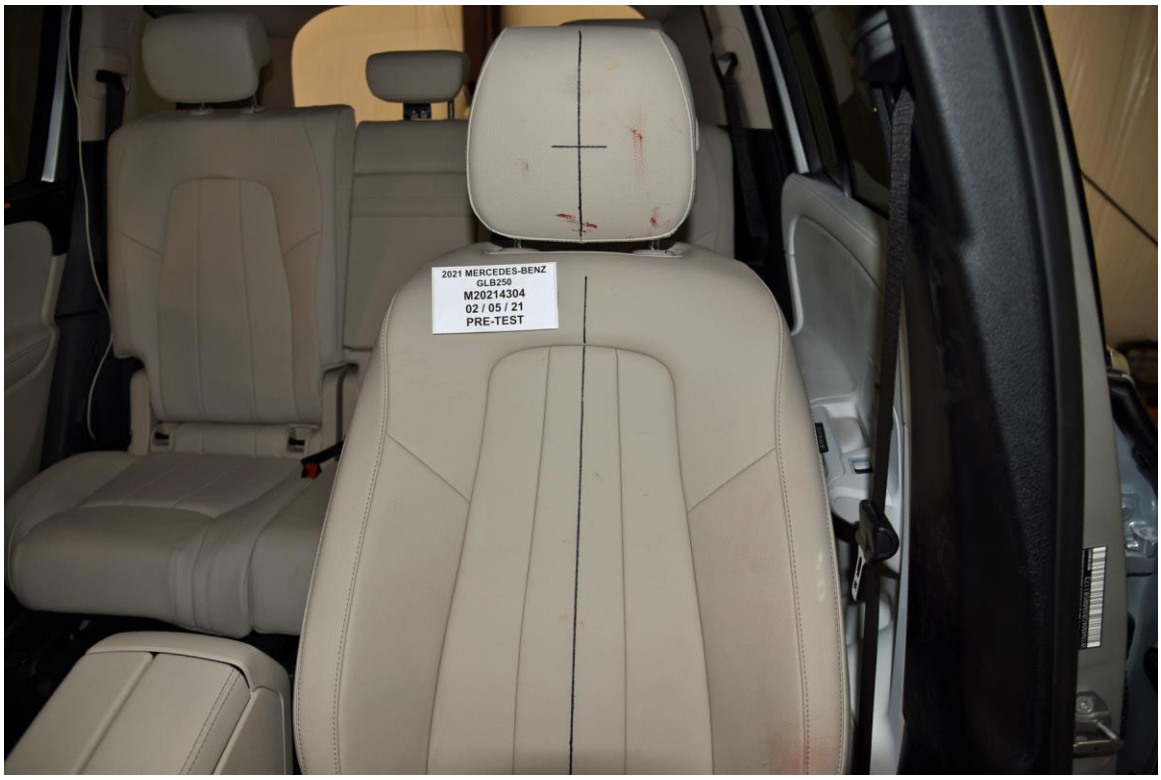


FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning

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

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

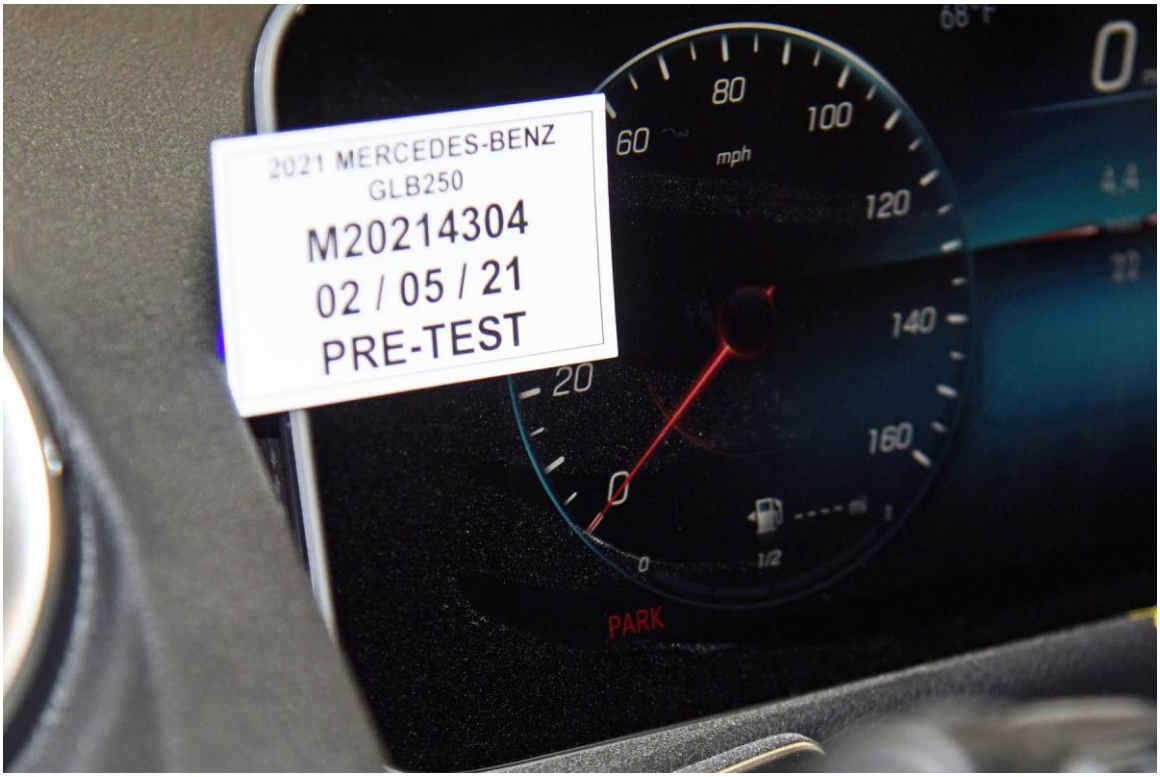


FIGURE 36. Pre-Test View of Parking Brake

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

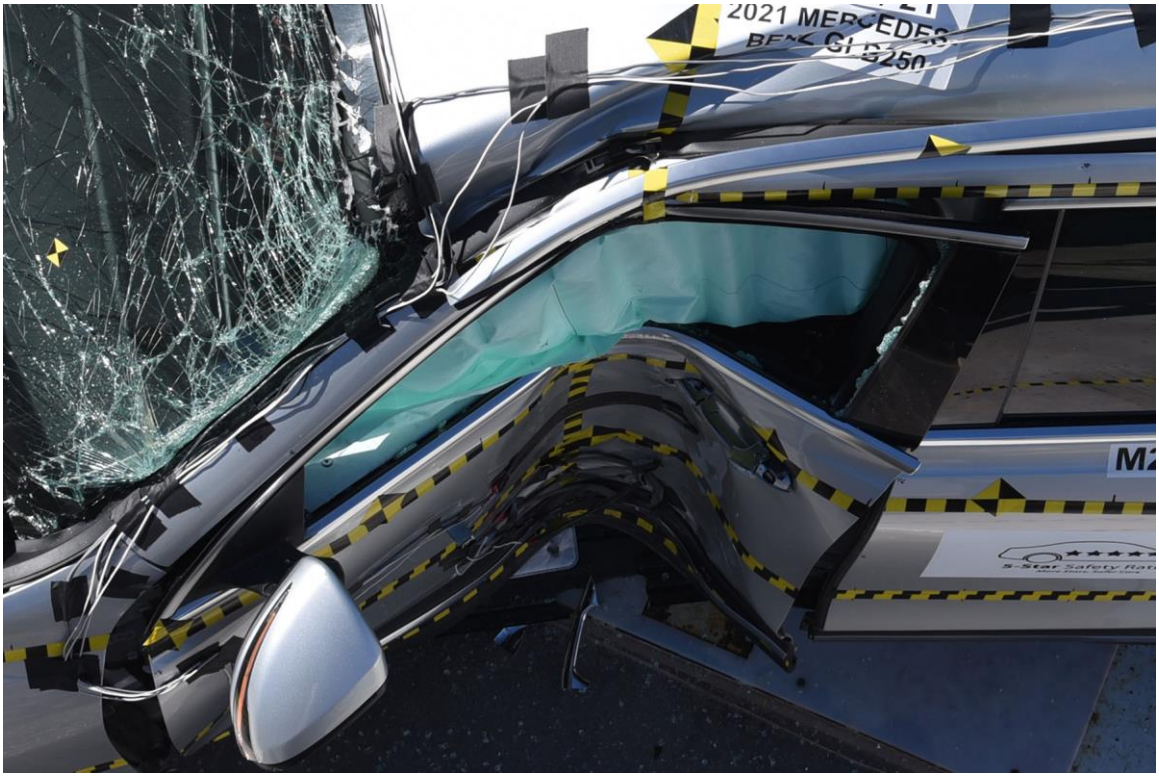


FIGURE 41. Post-Test Dummy and Door Clearance View

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

Photograph Not Available

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

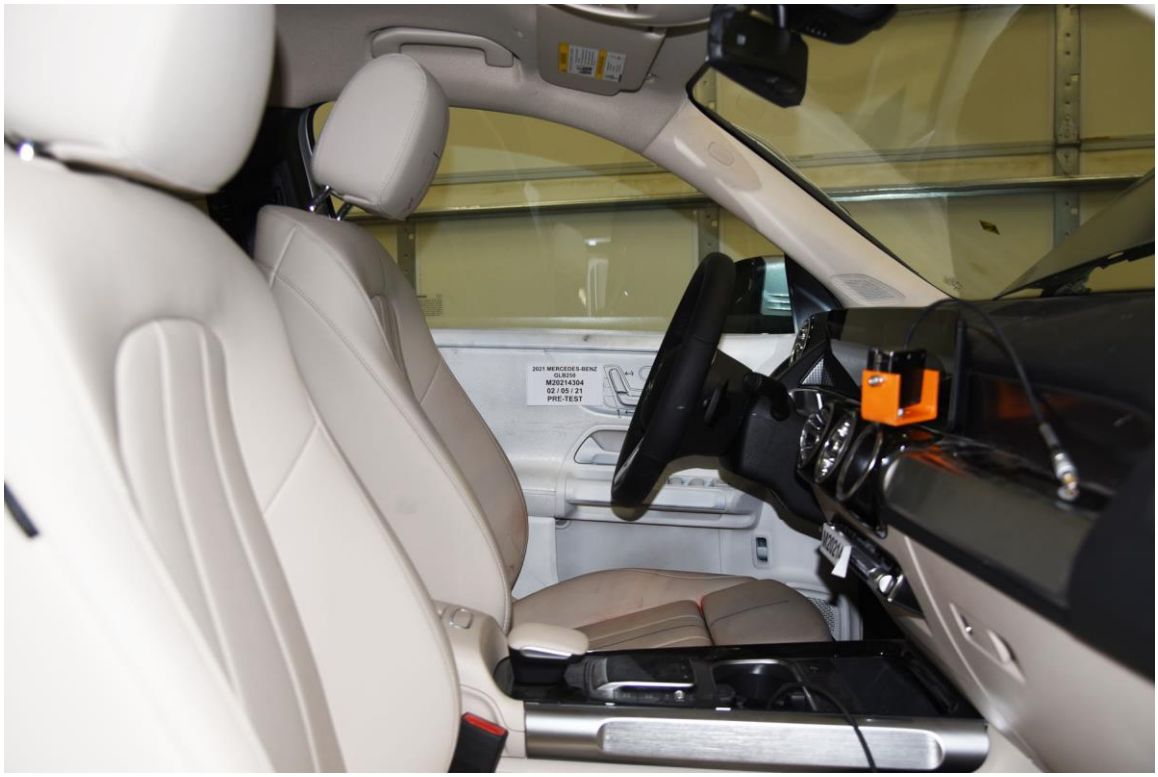


FIGURE 44. Pre-Test Inner Door Panel View

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

Photograph Not Applicable

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

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

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

Photograph Not Available

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

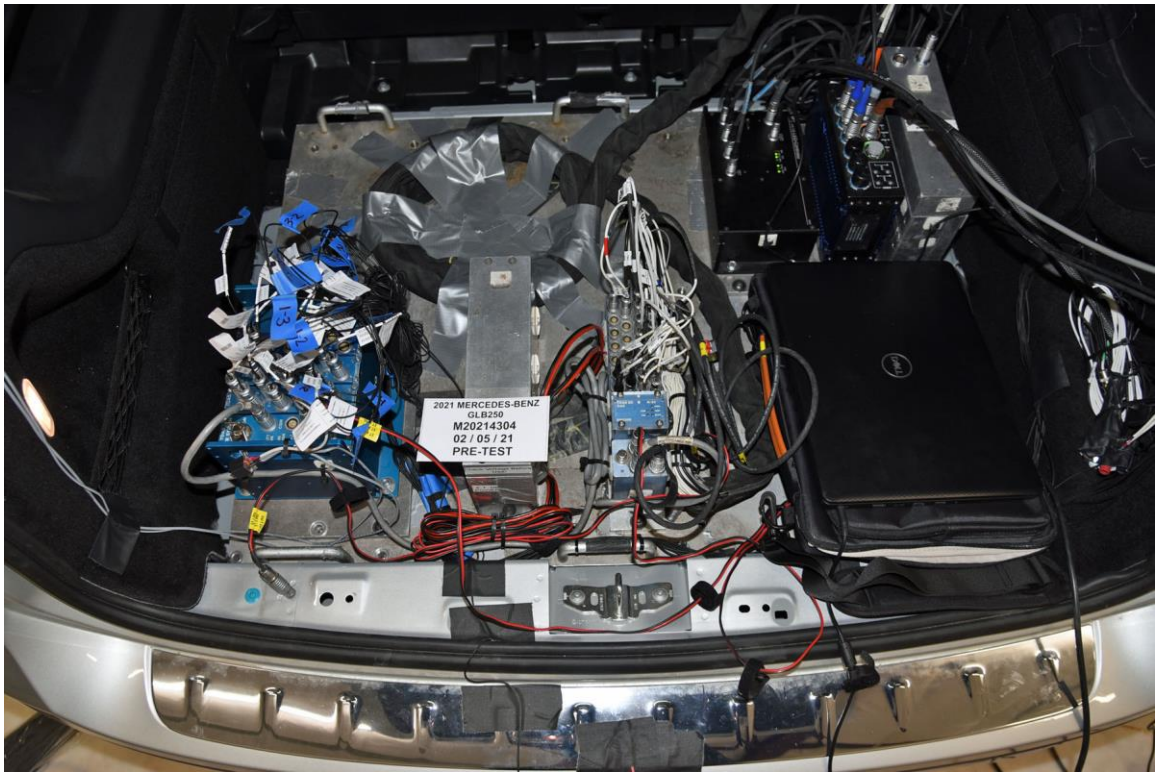


FIGURE 63. Pre-Test Ballast View

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

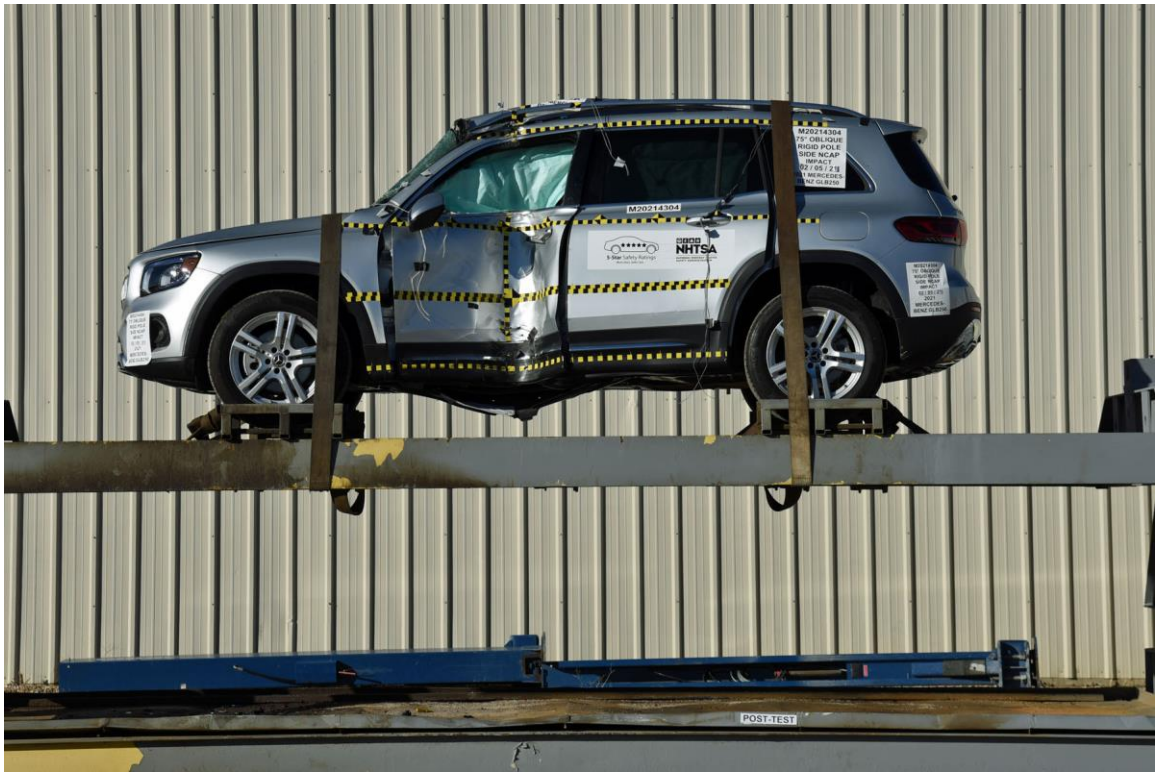


FIGURE 65. FMVSS No. 301 Static Rollover 0 Degrees

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

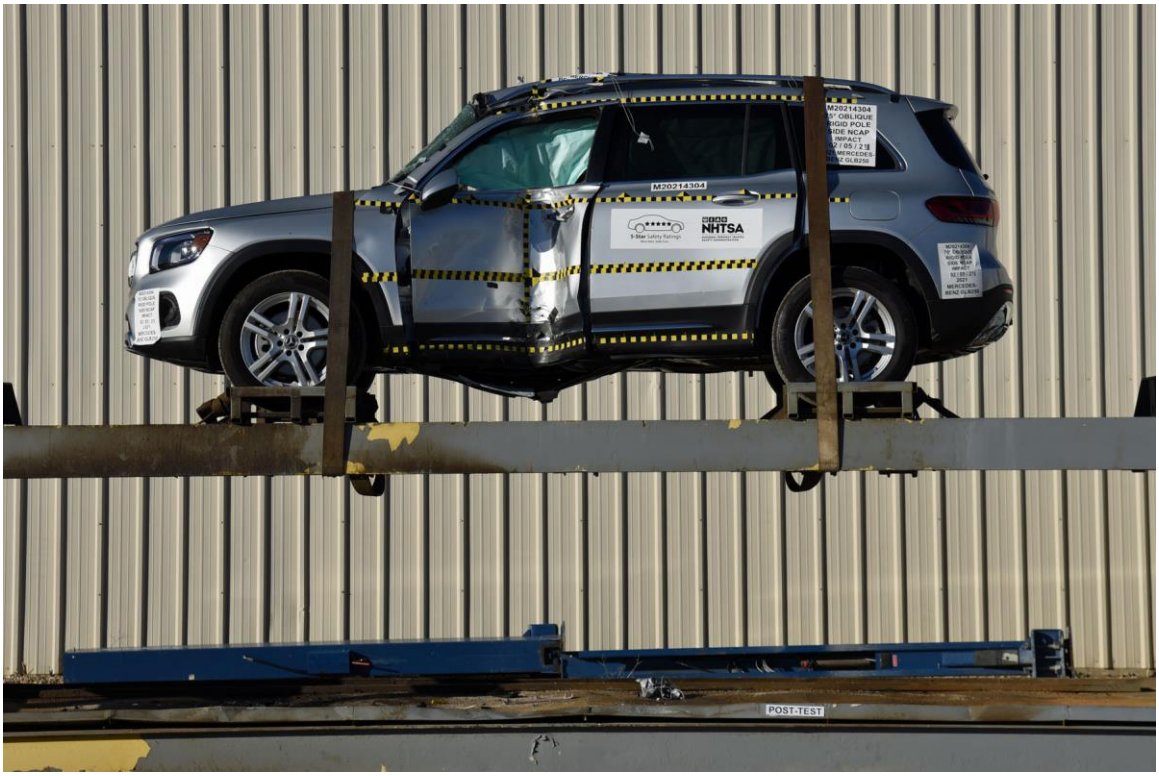
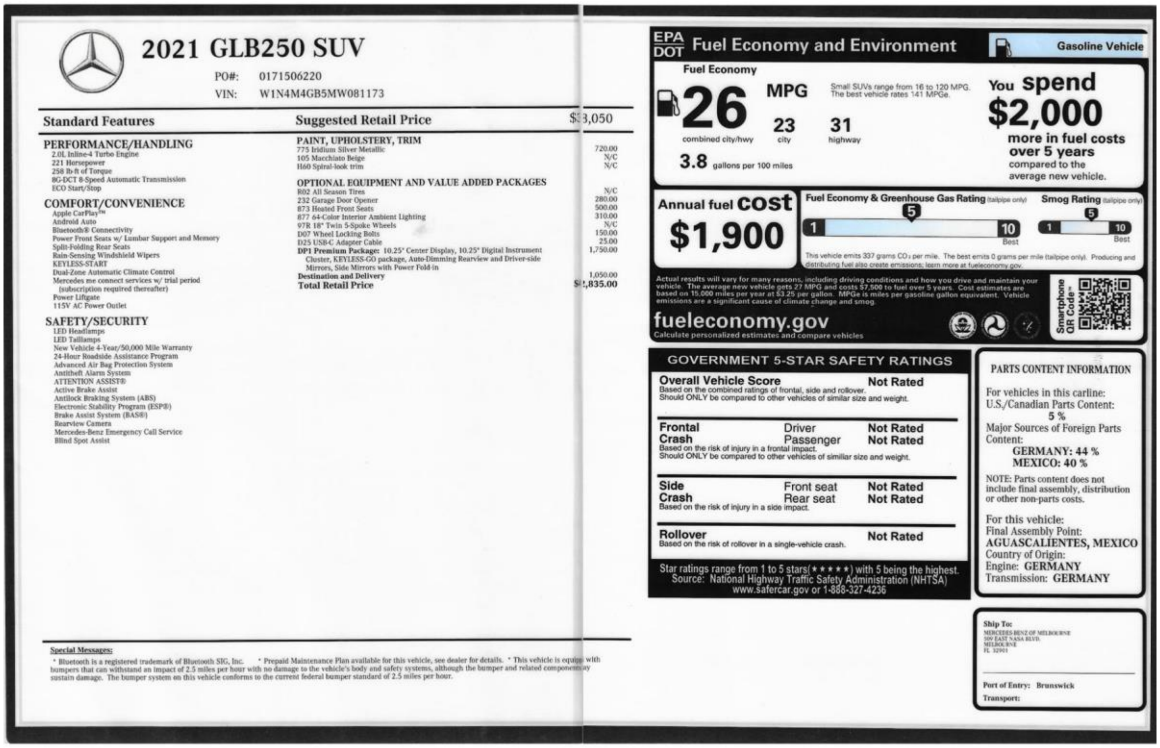


FIGURE 69. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 70. Impact Event



2021 GLB250 SUV

PO#: 0171506220
VIN: W1N4M4GB5MW081173

Standard Features

PERFORMANCE/HANDLING
2.0L Inline-4 Turbo Engine
221 Horsepower
258 lb-ft of Torque
8G-DCT 8-Speed Automatic Transmission
ECO Start/Stop

COMFORT/CONVENIENCE
Apple CarPlay™
Android Auto
Bluetooth® Connectivity
Power Front Seats w/ Lumbar Support and Memory
Split-Folding Rear Seats
Rain-Sensing Windshield Wipers
KEYLESS-START
Dual-Zone Automatic Climate Control
Mercedes me connect services w/ trial period (subscription required thereafter)
Power Liftgate
115V AC Power Outlet

SAFETY/SECURITY
LED Headlamps
LED Taillamps
New Vehicle 4-Year/50,000 Mile Warranty
24-Hour Roadside Assistance Program
Advanced Air Bag Protection System
Antitheft Alarm System
ATTENTION ASSIST®
Active Brake Assist
Antilock Braking System (ABS)
Electronic Stability Program (ESP®)
Brake Assist System (BAS®)
Rearview Camera
Mercedes-Benz Emergency Call Service
Blind Spot Assist

Suggested Retail Price	$[illegible]3,050
PAINT, UPHOLSTERY, TRIM	
775 Iridium Silver Metallic	720.00
105 Macchiato Beige	N/C
H60 Spiral-look trim	N/C
OPTIONAL EQUIPMENT AND VALUE ADDED PACKAGES	
R02 All Season Tires	N/C
232 Garage Door Opener	280.00
873 Heated Front Seats	500.00
877 64-Color Interior Ambient Lighting	310.00
97R 18" Twin 5-Spoke Wheels	N/C
D07 Wheel Locking Bolts	150.00
D25 USB-C Adapter Cable	25.00
DP1 Premium Package: 10.25" Center Display, 10.25" Digital Instrument Cluster, KEYLESS-GO package, Auto-Dimming Rearview and Driver-side Mirrors, Side Mirrors with Power Fold-in	1,750.00
Destination and Delivery	1,050.00
Total Retail Price	$[illegible],835.00

Special Messages:
* Bluetooth is a registered trademark of Bluetooth SIG, Inc. * Prepaid Maintenance Plan available for this vehicle, see dealer for details. * This vehicle is equipped with bumpers that can withstand an impact of 2.5 miles per hour with no damage to the vehicle's body and safety systems, although the bumper and related components may sustain damage. The bumper system on this vehicle conforms to the current federal bumper standard of 2.5 miles per hour.

EPA DOT **Fuel Economy and Environment** — Gasoline Vehicle

Fuel Economy
26 MPG combined city/hwy — 23 city — 31 highway
3.8 gallons per 100 miles
Small SUVs range from 16 to 120 MPG. The best vehicle rates 141 MPGe.

You spend $2,000 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost $1,900

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 5 (1–10 Best)
Smog Rating (tailpipe only): 5 (1–10 Best)

This vehicle emits 337 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.25 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles
Smartphone QR Code™

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.		Not Rated
Frontal Crash Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similiar size and weight.	Driver	Not Rated
	Passenger	Not Rated
Side Crash Based on the risk of injury in a side impact.	Front seat	Not Rated
	Rear seat	Not Rated
Rollover Based on the risk of rollover in a single-vehicle crash.		Not Rated

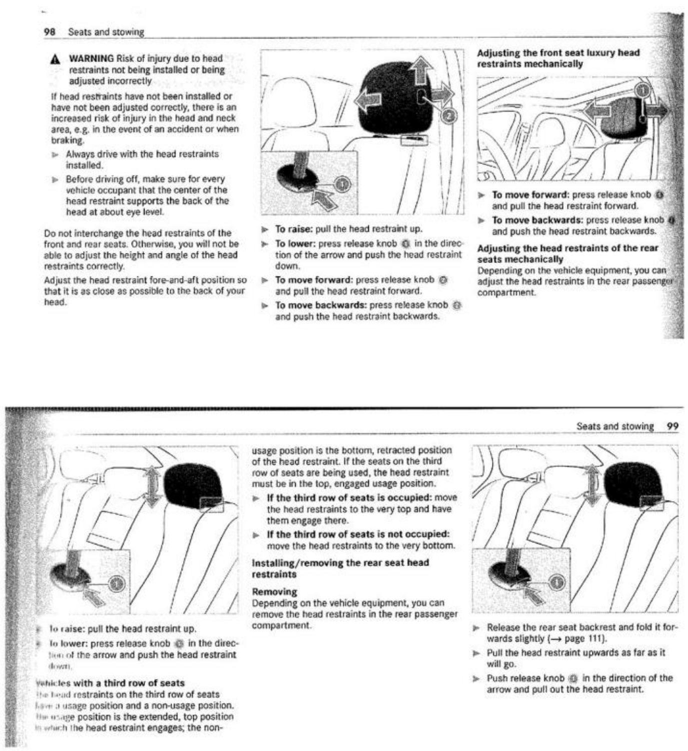
Star ratings range from 1 to 5 stars(★★★★★) with 5 being the highest.
Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION
For vehicles in this carline:
U.S./Canadian Parts Content: 5 %
Major Sources of Foreign Parts Content:
GERMANY: 44 %
MEXICO: 40 %
NOTE: Parts content does not include final assembly, distribution or other non-parts costs.
For this vehicle:
Final Assembly Point: AGUASCALIENTES, MEXICO
Country of Origin:
Engine: GERMANY
Transmission: GERMANY

Ship To:
MERCEDES-BENZ OF MELBOURNE
509 EAST NASA BLVD.
MELBOURNE
FL 32901

Port of Entry: Brunswick
Transport:

FIGURE 71. Monroney Label



98 Seats and stowing

WARNING Risk of injury due to head restraints not being installed or being adjusted incorrectly

If head restraints have not been installed or have not been adjusted correctly, there is an increased risk of injury in the head and neck area, e.g. in the event of an accident or when braking.

- Always drive with the head restraints installed.
- Before driving off, make sure for every vehicle occupant that the center of the head restraint supports the back of the head at about eye level.

Do not interchange the head restraints of the front and rear seats. Otherwise, you will not be able to adjust the height and angle of the head restraints correctly.

Adjust the head restraint fore-and-aft position so that it is as close as possible to the back of your head.

- **To raise:** pull the head restraint up.
- **To lower:** press release knob ① in the direction of the arrow and push the head restraint down.
- **To move forward:** press release knob ② and pull the head restraint forward.
- **To move backwards:** press release knob ② and push the head restraint backwards.

Adjusting the front seat luxury head restraints mechanically

- **To move forward:** press release knob ① and pull the head restraint forward.
- **To move backwards:** press release knob ① and push the head restraint backwards.

Adjusting the head restraints of the rear seats mechanically

Depending on the vehicle equipment, you can adjust the head restraints in the rear passenger compartment.

Seats and stowing 99

- **To raise:** pull the head restraint up.
- **To lower:** press release knob ① in the direction of the arrow and push the head restraint down.

Vehicles with a third row of seats

The head restraints on the third row of seats have a usage position and a non-usage position. The usage position is the extended, top position in which the head restraint engages; the non-usage position is the bottom, retracted position of the head restraint. If the seats on the third row of seats are being used, the head restraint must be in the top, engaged usage position.

- **If the third row of seats is occupied:** move the head restraints to the very top and have them engage there.
- **If the third row of seats is not occupied:** move the head restraints to the very bottom.

Installing/removing the rear seat head restraints

Removing

Depending on the vehicle equipment, you can remove the head restraints in the rear passenger compartment.

- Release the rear seat backrest and fold it forwards slightly (→ page 111).
- Pull the head restraint upwards as far as it will go.
- Push release knob ① in the direction of the arrow and pull out the head restraint.

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

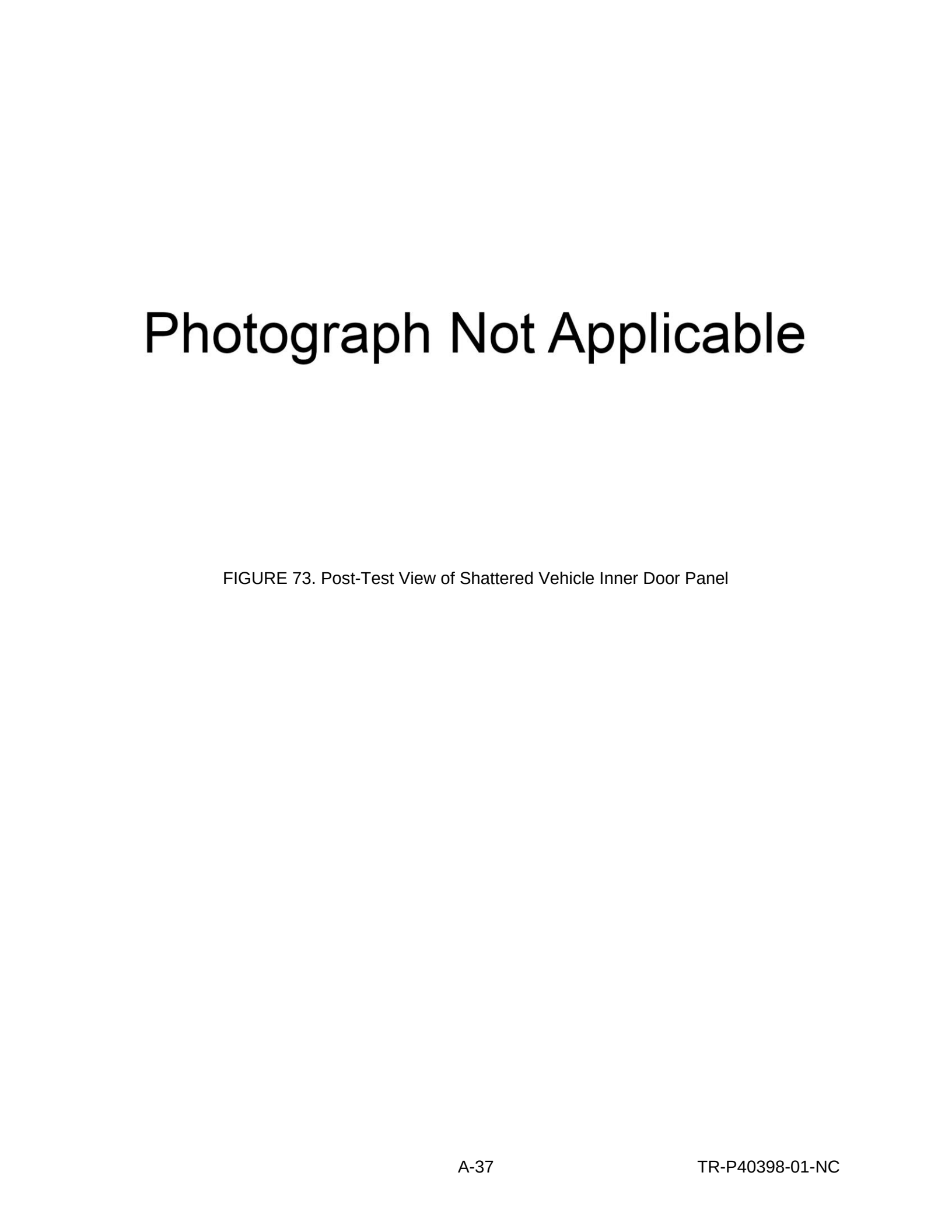


FIGURE 73. Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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 (X) Redundant

Driver Head Acceleration (Y) Redundant

Driver Head Acceleration (Z) Redundant

Driver Upper Thorax Rib Deflection (Y)

Driver Middle Thorax Rib Deflection (Y)

Driver Lower Thorax Rib Deflection (Y)

Driver Upper Abdomen Rib Deflection (Y)

Driver Lower Abdomen Rib Deflection (Y)

Driver Head Rotational Acceleration (X) (when applicable)

Driver Head Rotational Acceleration (Y) (when applicable)

Driver Head Rotational Acceleration (Z) (when applicable)

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)

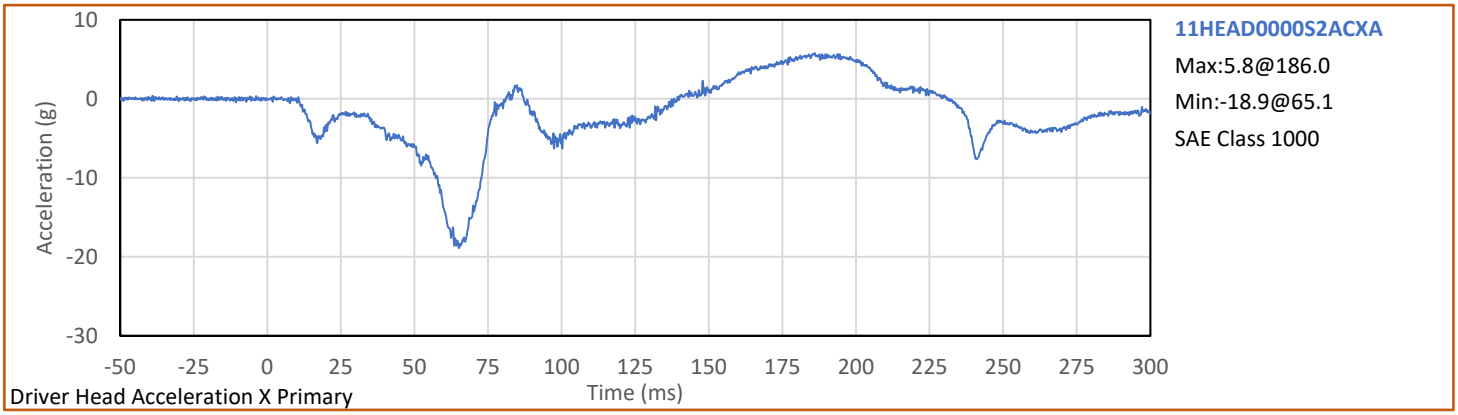
Load Cell Pole Barrier #4 Force (Y)

Load Cell Pole Barrier #5 Force (Y)

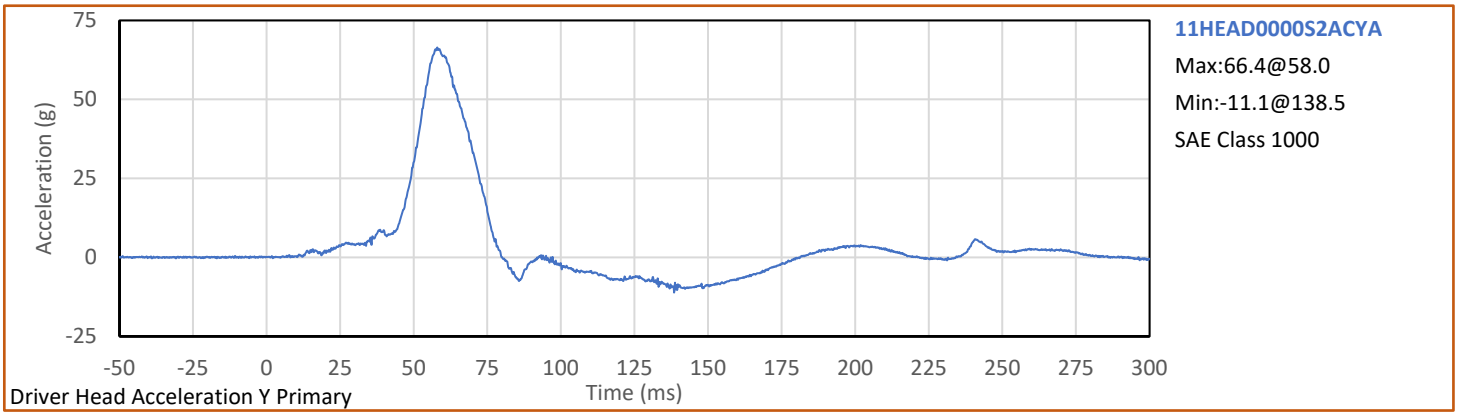
Load Cell Pole Barrier #6 Force (Y)

Load Cell Pole Barrier #7 Force (Y)

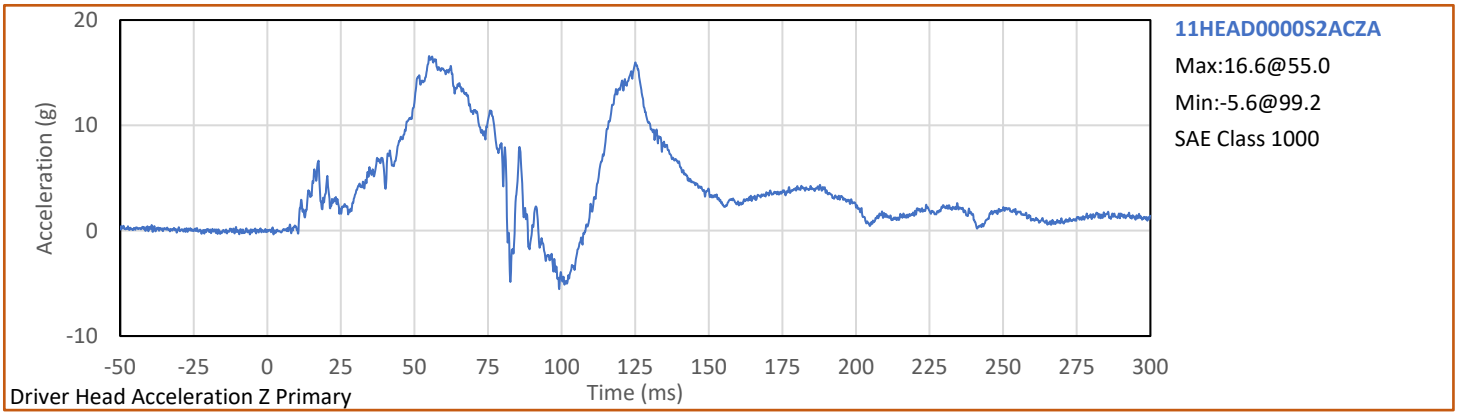
Load Cell Pole Barrier #8 Force (Y)



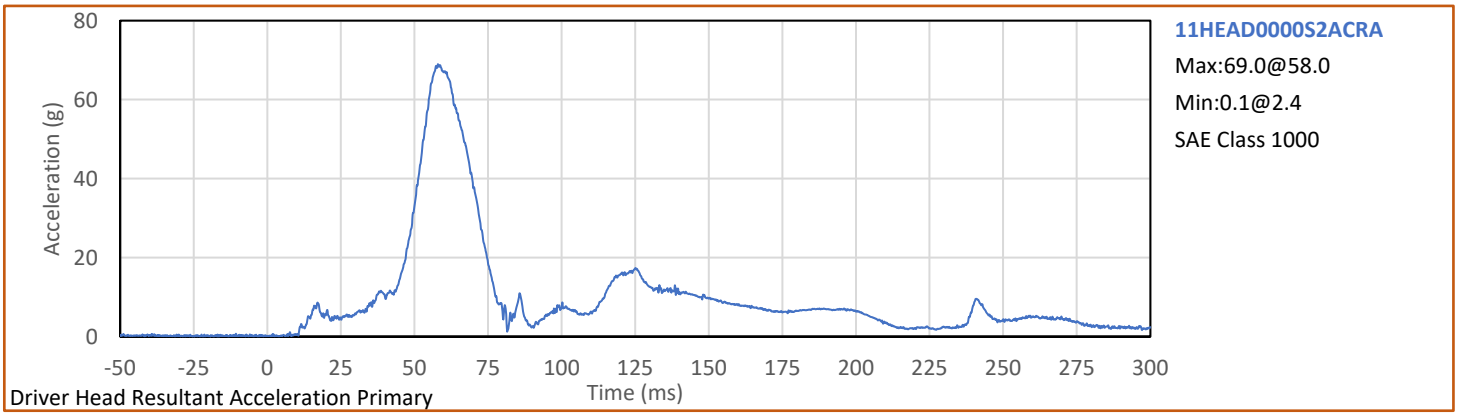
Driver Head Acceleration X Primary



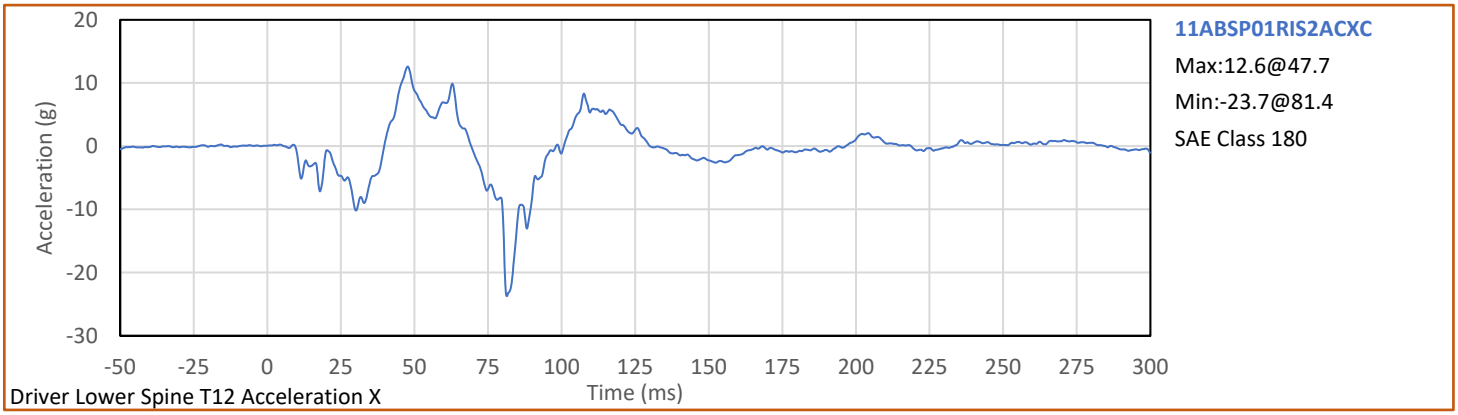
Driver Head Acceleration Y Primary

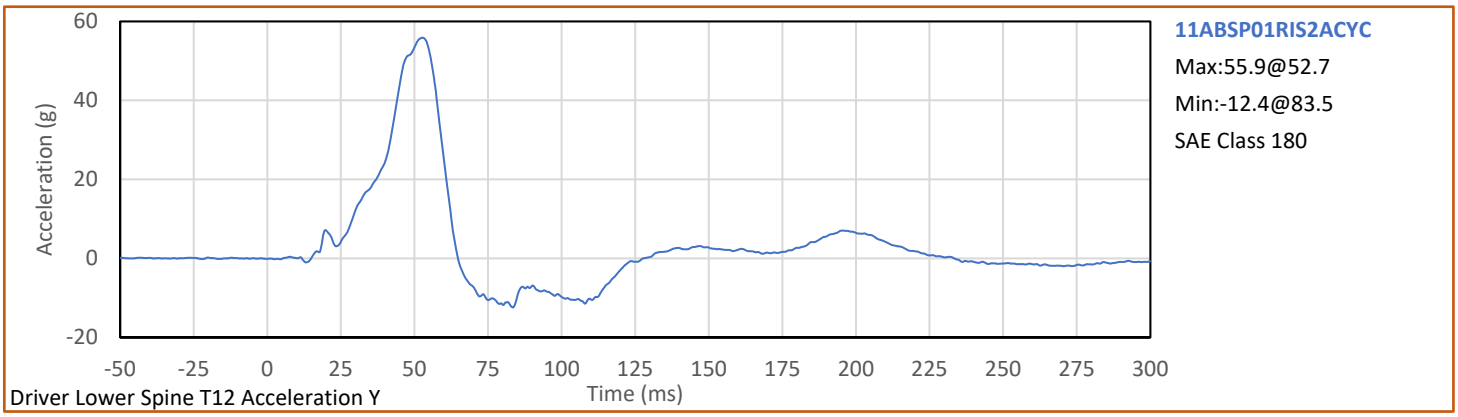


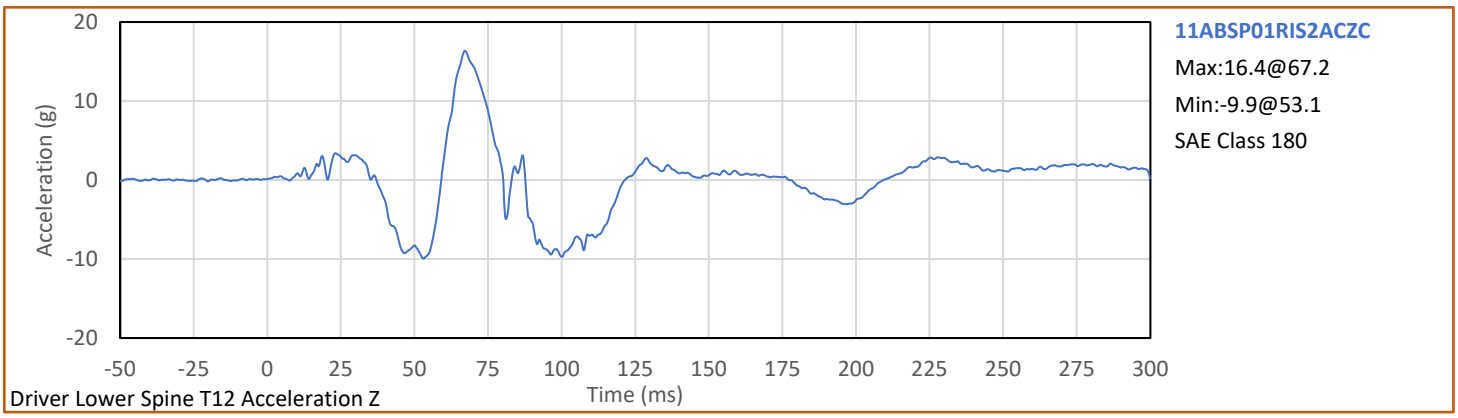
Driver Head Acceleration Z Primary

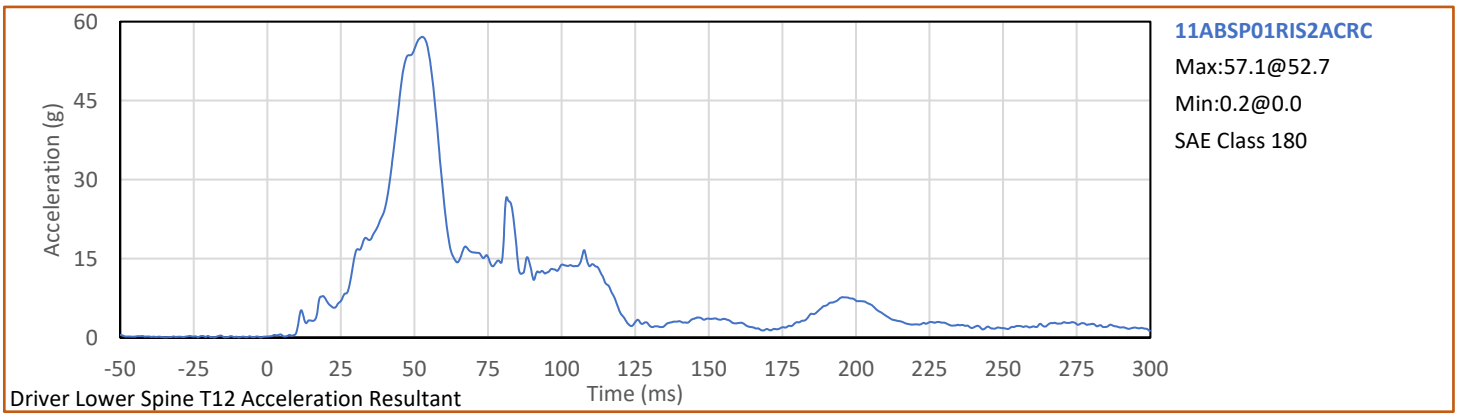


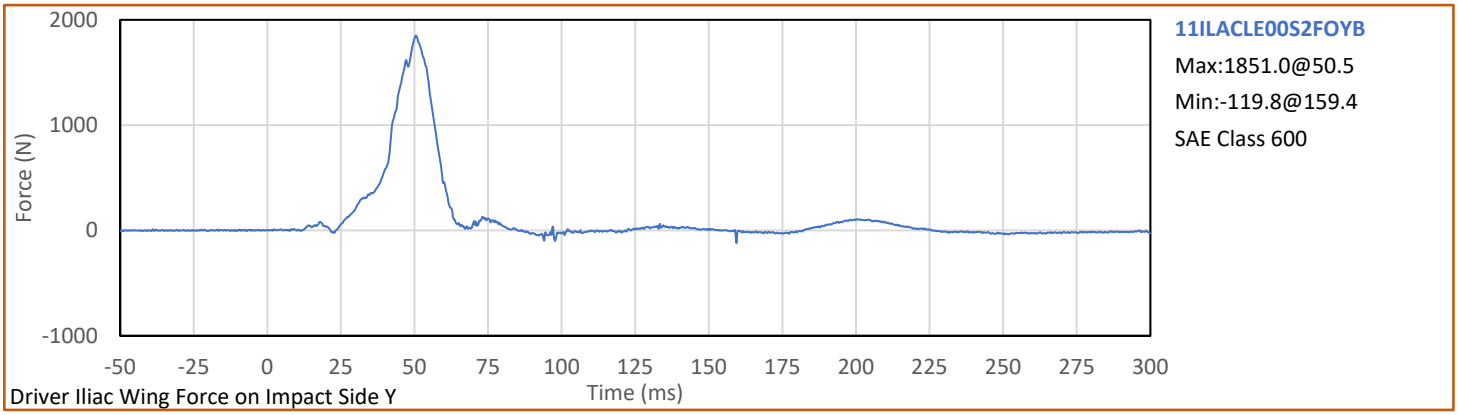
Driver Head Resultant Acceleration Primary


Acceleration (g)
Time (ms)
11ABSP01RIS2ACXC
Max:12.6@47.7
Min:-23.7@81.4
SAE Class 180
Driver Lower Spine T12 Acceleration X


Acceleration (g)
Time (ms)
11ABSP01RIS2ACYC
Max:55.9@52.7
Min:-12.4@83.5
SAE Class 180
Driver Lower Spine T12 Acceleration Y

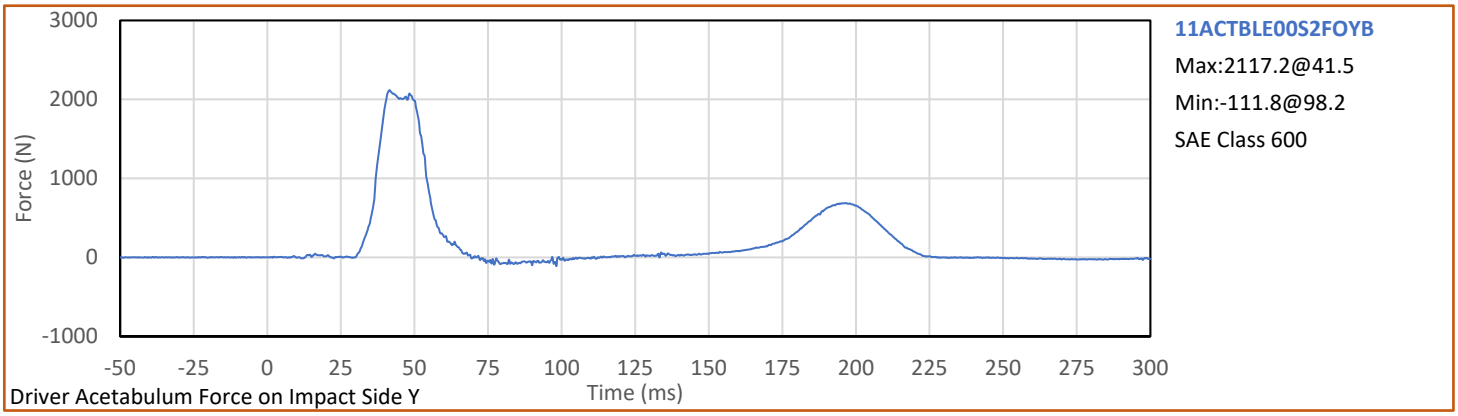

Acceleration (g)
Time (ms)
11ABSP01RIS2ACZC
Max:16.4@67.2
Min:-9.9@53.1
SAE Class 180
Driver Lower Spine T12 Acceleration Z


Acceleration (g)
Time (ms)
11ABSP01RIS2ACRC
Max:57.1@52.7
Min:0.2@0.0
SAE Class 180
Driver Lower Spine T12 Acceleration Resultant



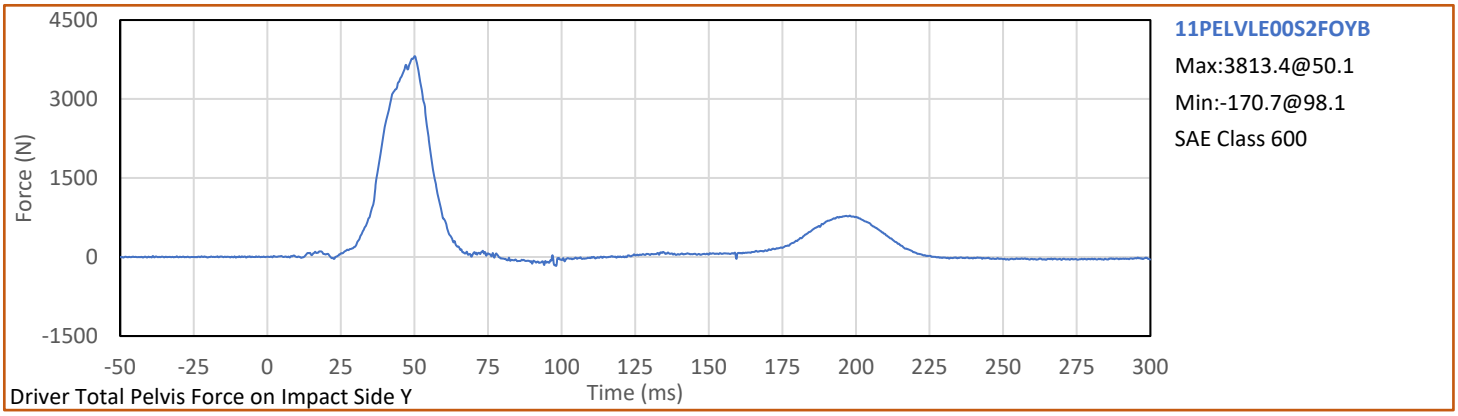
Driver Iliac Wing Force on Impact Side Y

11ILACLE00S2FOYB
Max:1851.0@50.5
Min:-119.8@159.4
SAE Class 600



Driver Acetabulum Force on Impact Side Y

11ACTBLE00S2FOYB
Max:2117.2@41.5
Min:-111.8@98.2
SAE Class 600



Driver Total Pelvis Force on Impact Side Y

11PELVLE00S2FOYB
Max:3813.4@50.1
Min:-170.7@98.1
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: 2021-01-27

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	44	Pass
A - Sitting Height	mm	772	788	782	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	83	Pass
D - H Point From Seatback	mm	141	151	149	Pass
E - Shoulder Pivot From Backline	mm	97	107	105	Pass
F - Thigh Clearance	mm	119	135	126	Pass
G - Head Breadth	mm	140	148	143	Pass
H - Head Back From Backline	mm	40	46	42	Pass
I - Head Depth	mm	178	188	186	Pass
J - Head Circumference	mm	541	551	547	Pass
K - Buttock To Knee Length	mm	514	540	524	Pass
L - Popliteal Height	mm	343	369	350	Pass
K - Knee Pivot To Floor Height	mm	392	409	398	Pass
N - Buttock Popliteal Length	mm	416	442	437	Pass
O - Chest Depth W/O Jacket	mm	195	211	207	Pass
P - Foot Length	mm	216	232	221	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	318	Pass
R - Arm Length	mm	249	259	256	Pass
S - Knee Joint To Seatback	mm	477	493	486	Pass
V - Shoulder Width	mm	341	357	345	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	862	Pass
Z - Waist Circumference	mm	761	791	779	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

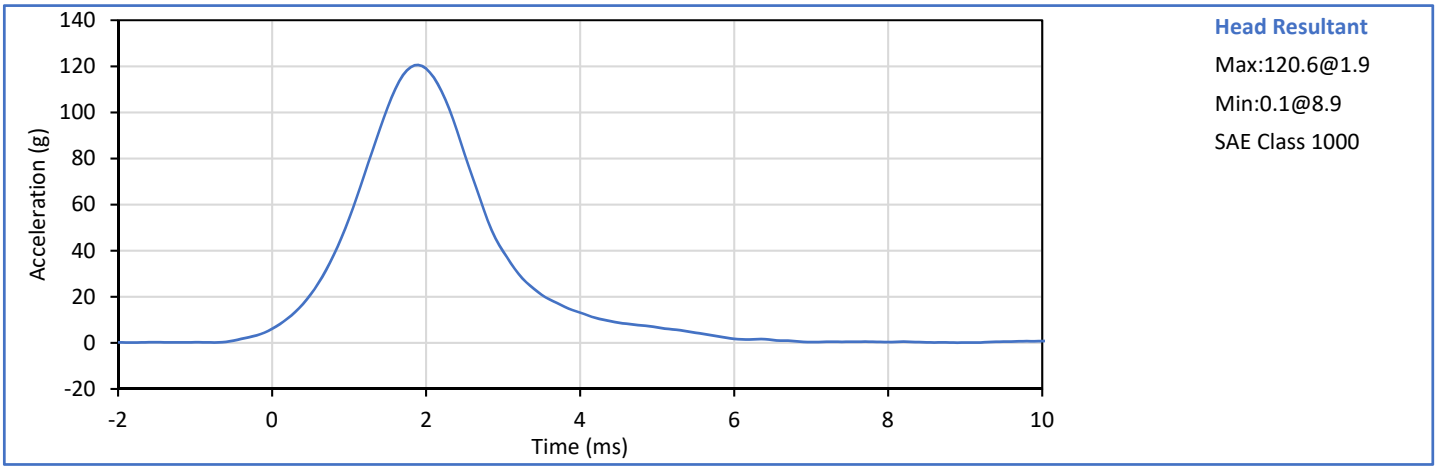
Approved By: P. Puzzuto

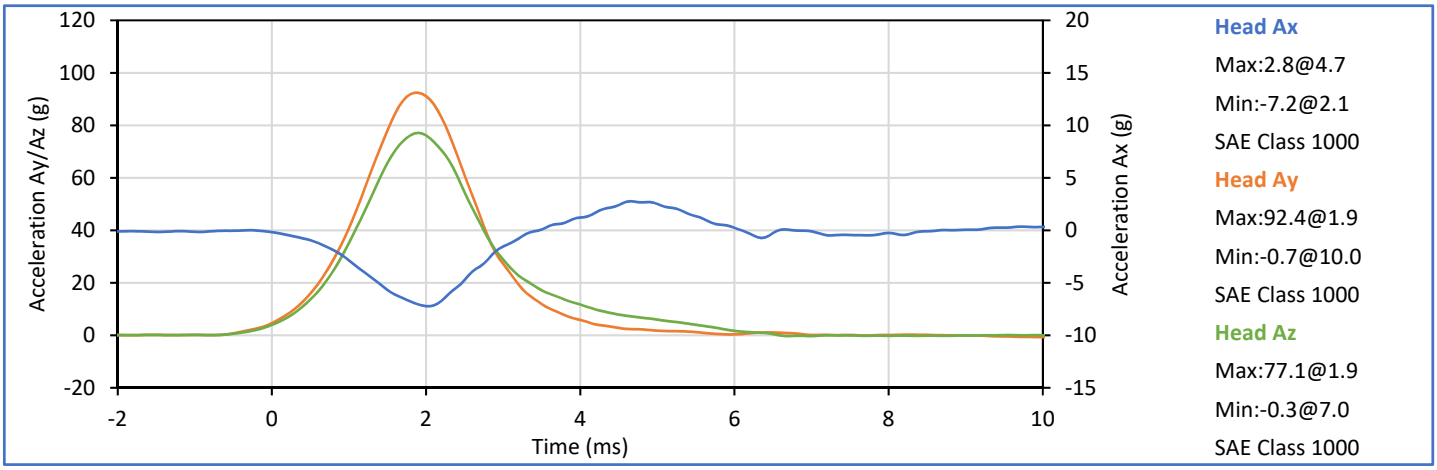
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 308 Test Date: 2021-01-27

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.4	Pass
Laboratory Humidity	%	10	70	18	Pass
Peak Resultant Acceleration	g	115.0	137.0	120.6	Pass
Peak Head Ax	g	-15.0	15.0	-7.2	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





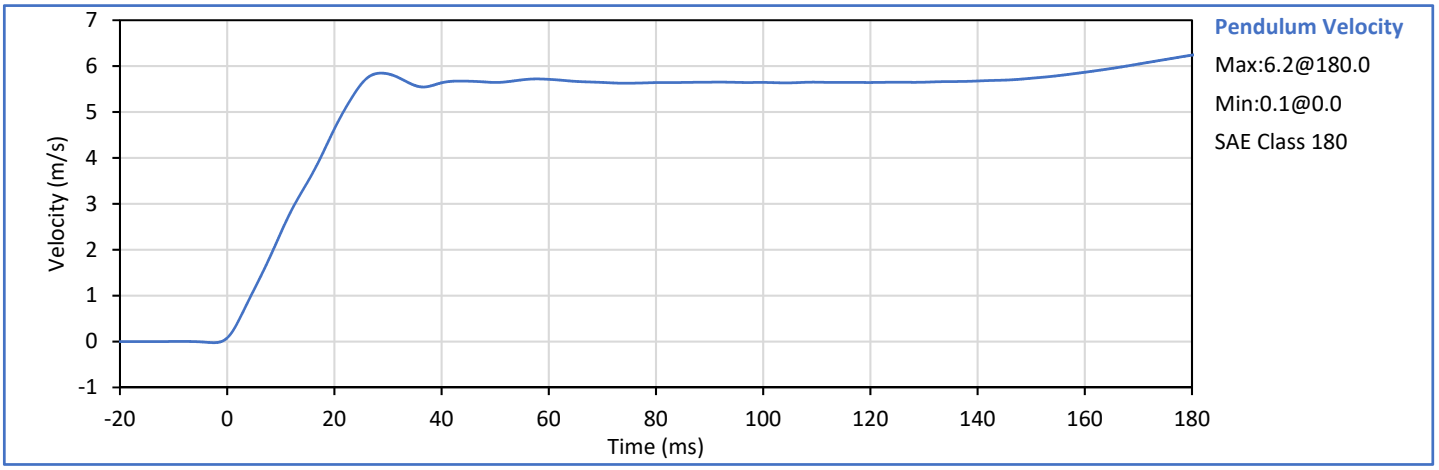
Technician: J. Hernandez Approved By: P. Puzzuto

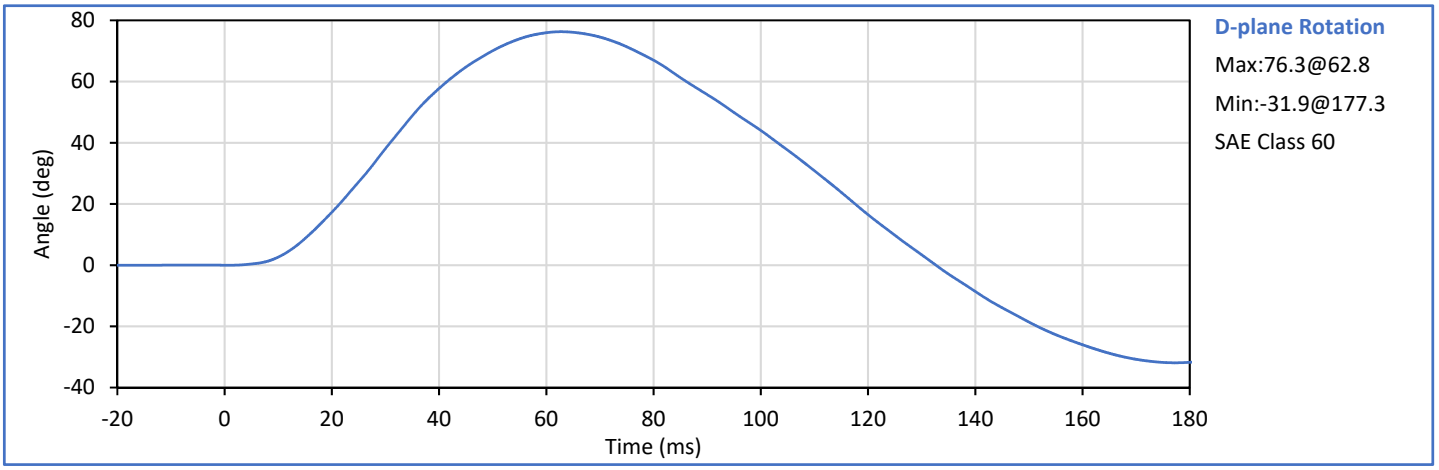
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	34	Pass
Pendulum Velocity	m/s	5.51	5.63	5.60	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	3.47	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.63	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.61	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.85	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	76.3	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	62.8	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-39.2	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	114.3	Pass
			Overall Test Results		Pass



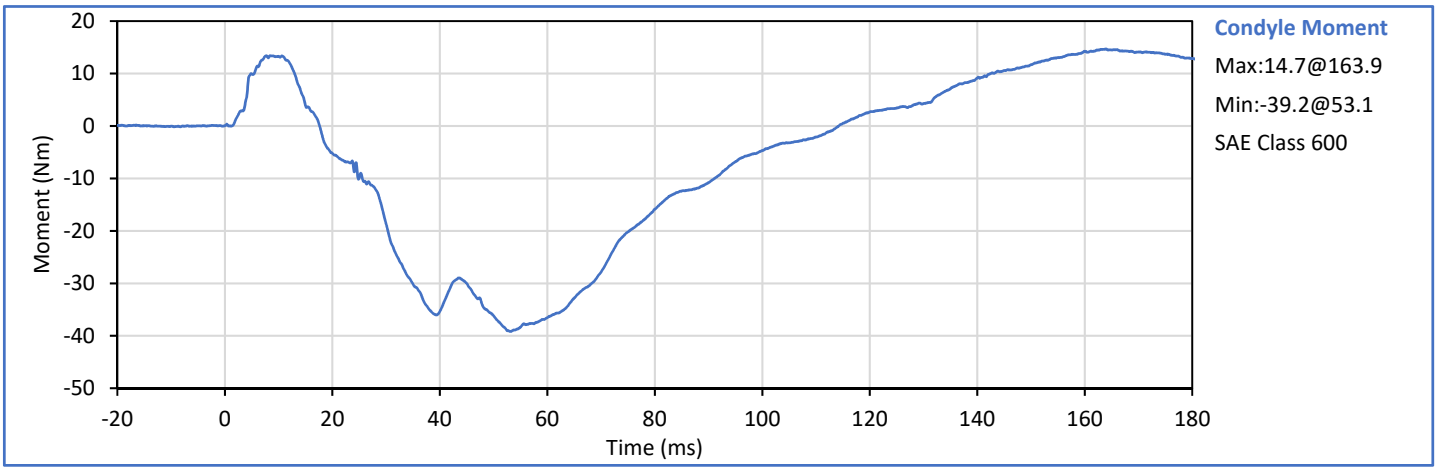


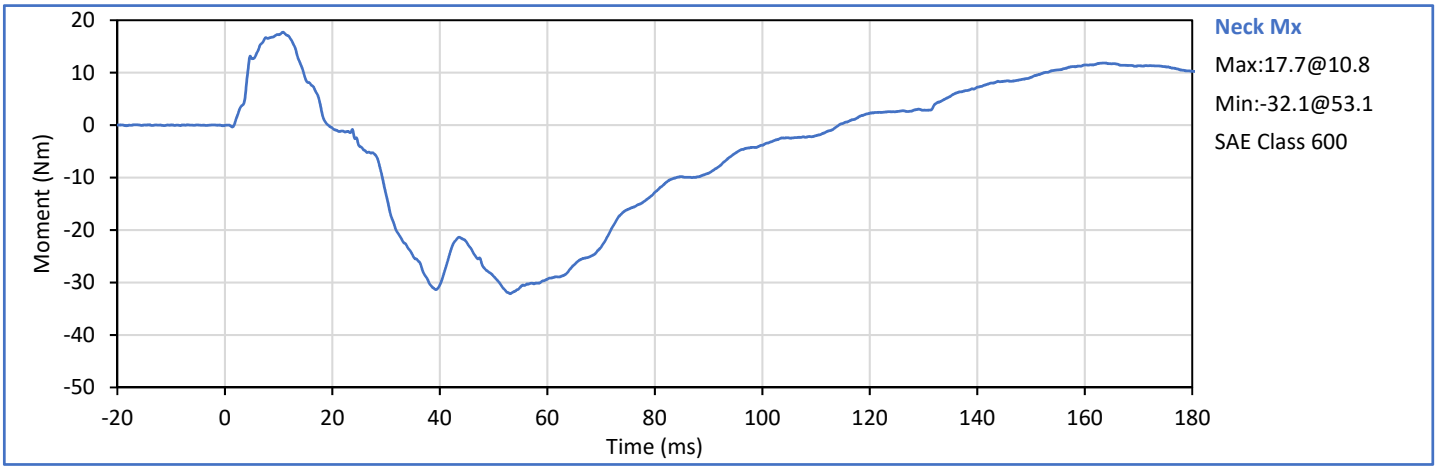
Technician: J. Hernandez

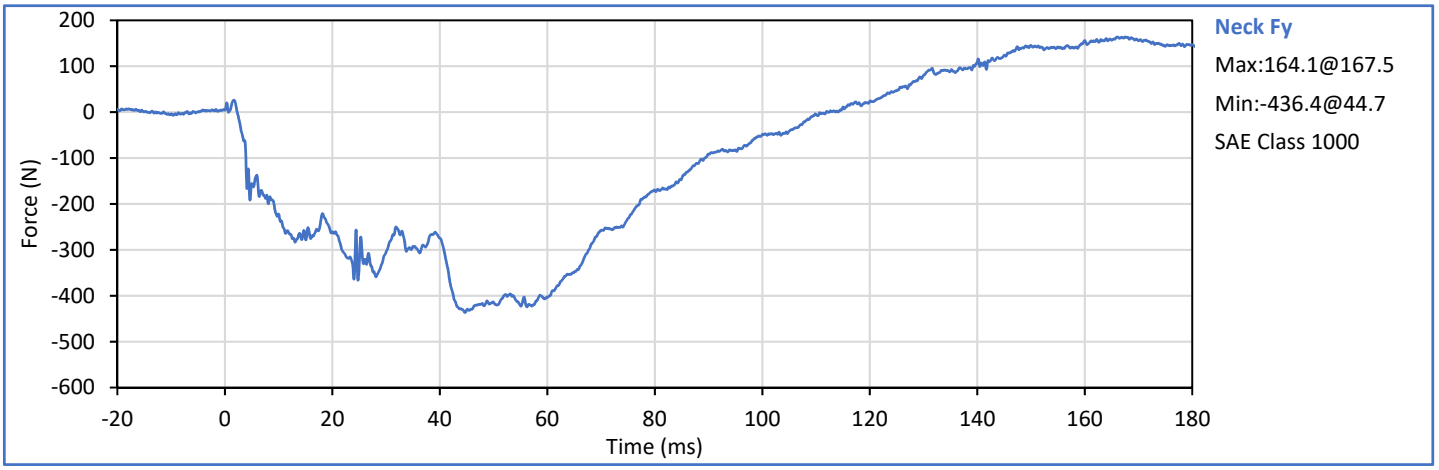
Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2021-01-29





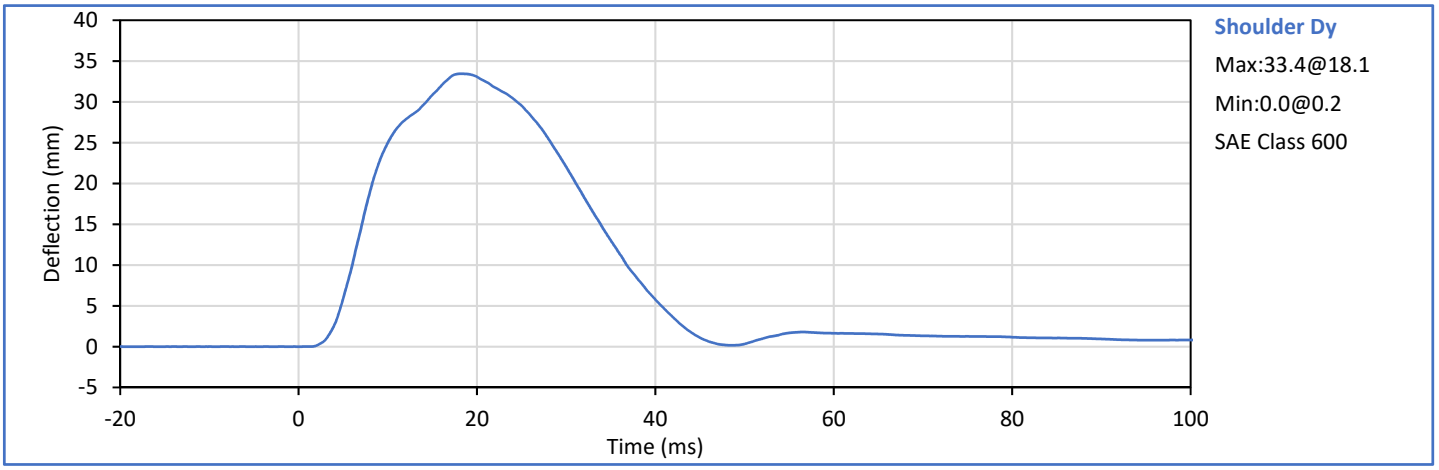


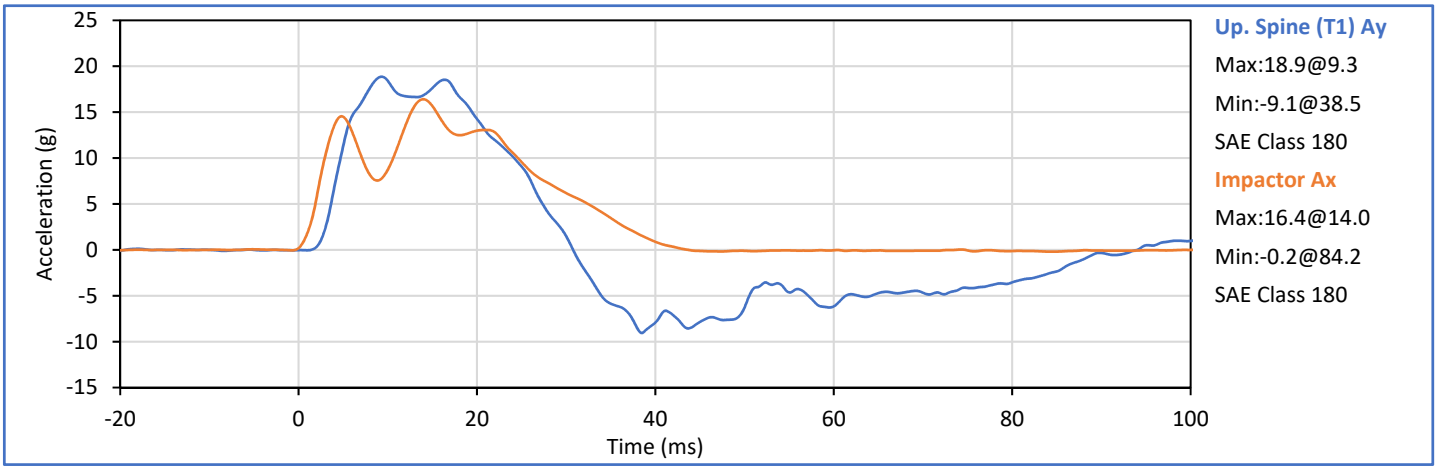
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 308 Test Date: 2021-01-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.4	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.9	Pass
Peak Impactor Ax	g	13.0	18.0	16.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

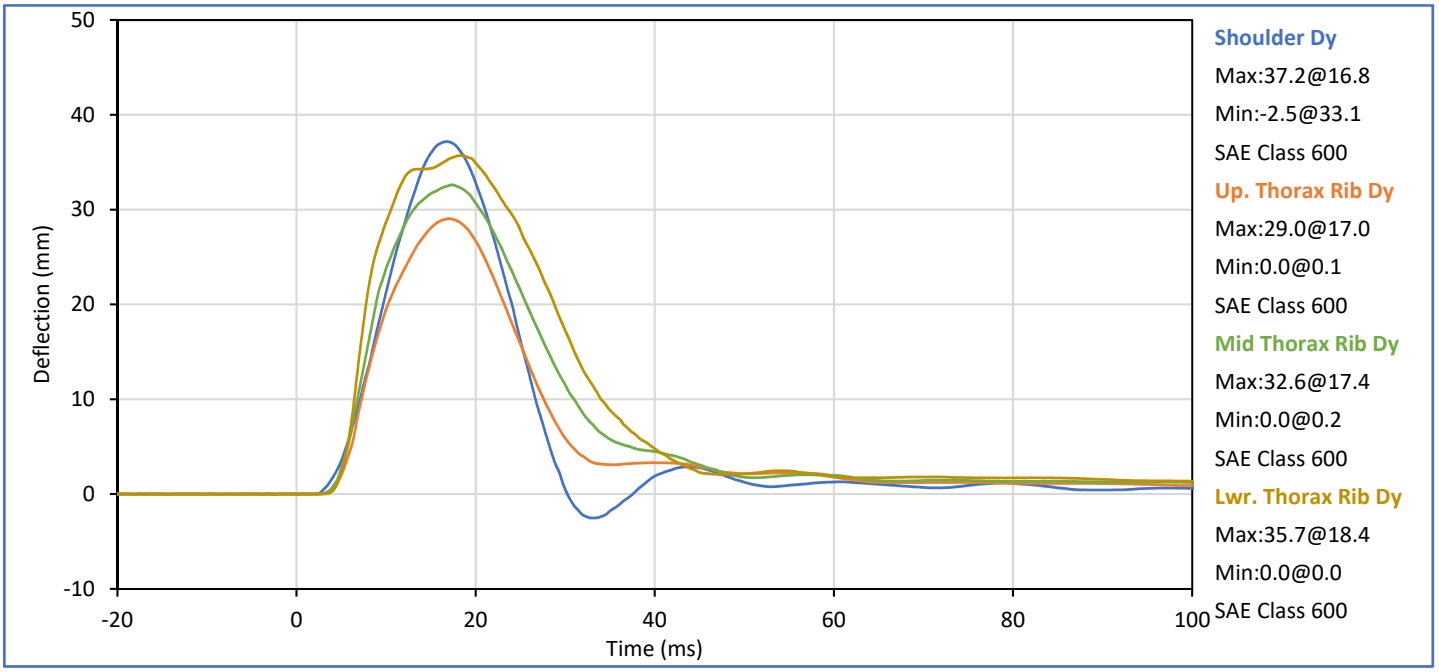
Approved By: P. Puzzuto

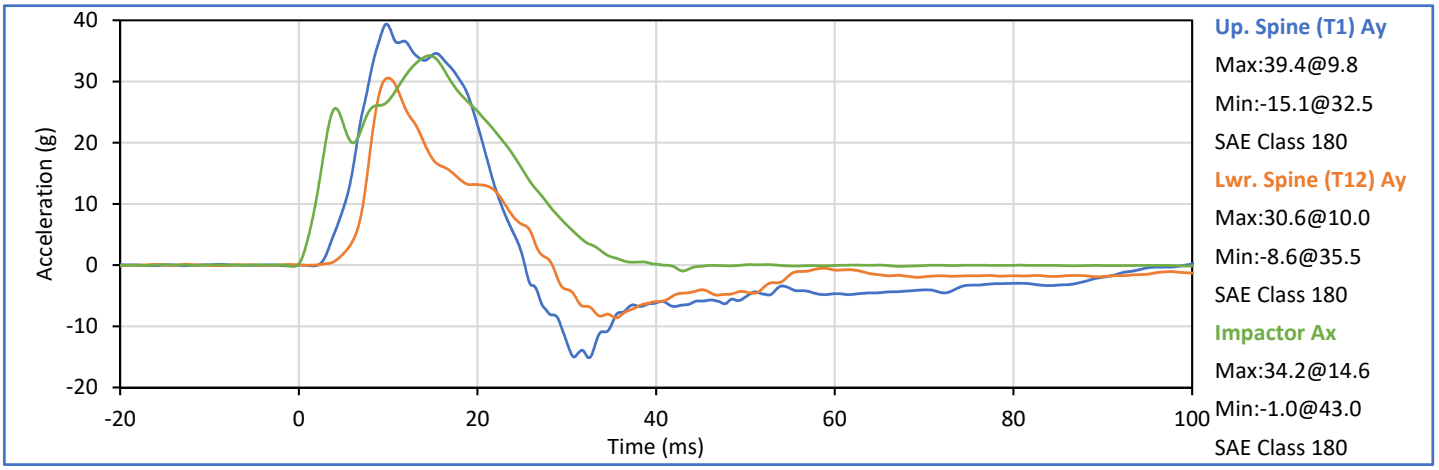
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2021-01-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	6.60	6.80	6.70	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.2	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.0	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.6	Pass
Peak Lower Rib Dy	mm	32.0	38.0	35.7	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	39.4	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	30.6	Pass
Peak Impactor Ax	g	30.0	36.0	34.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

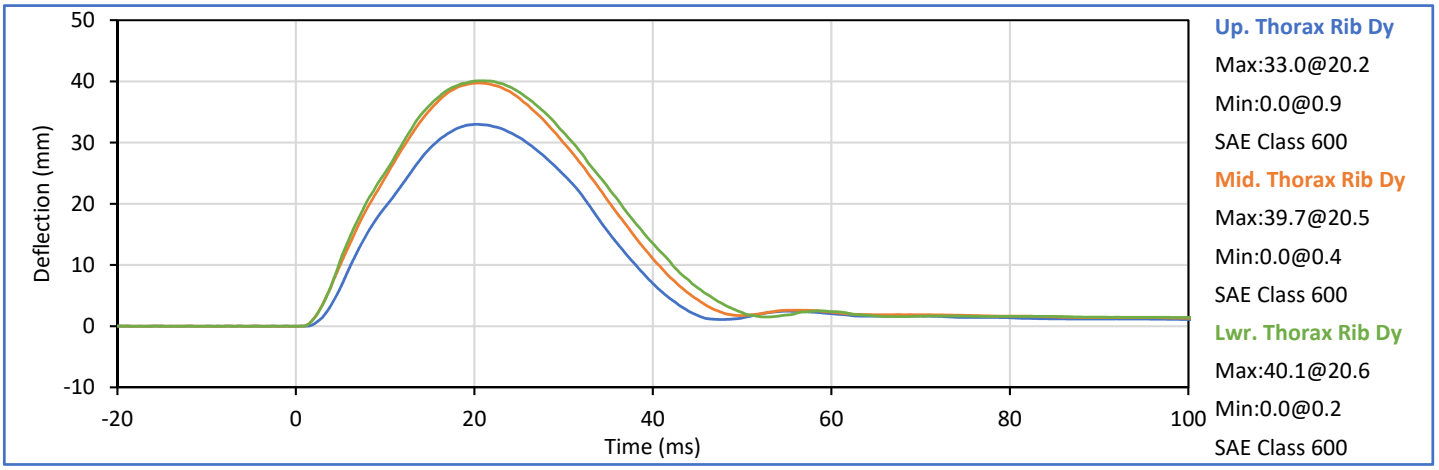
Approved By: P. Puzzuto

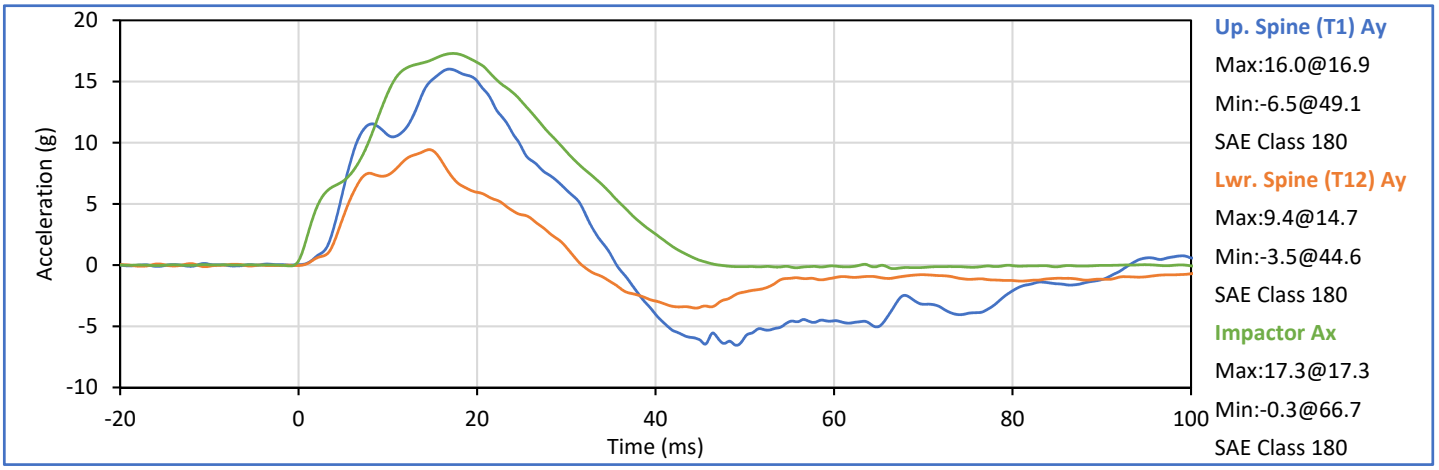
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2021-01-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	26	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Rib Dy	mm	32.0	40.0	33.0	Pass
Peak Middle Rib Dy	mm	39.0	45.0	39.7	Pass
Peak Lower Rib Dy	mm	35.0	43.0	40.1	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	16.0	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.4	Pass
Peak Impactor Ax	g	14.0	18.0	17.3	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

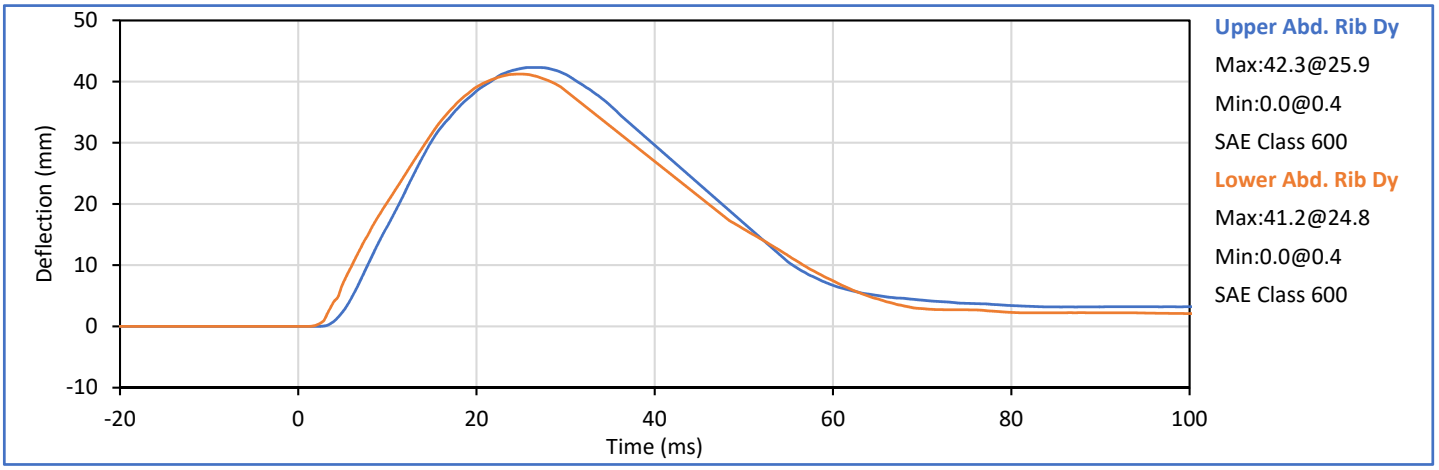
Approved By: P. Puzzuto

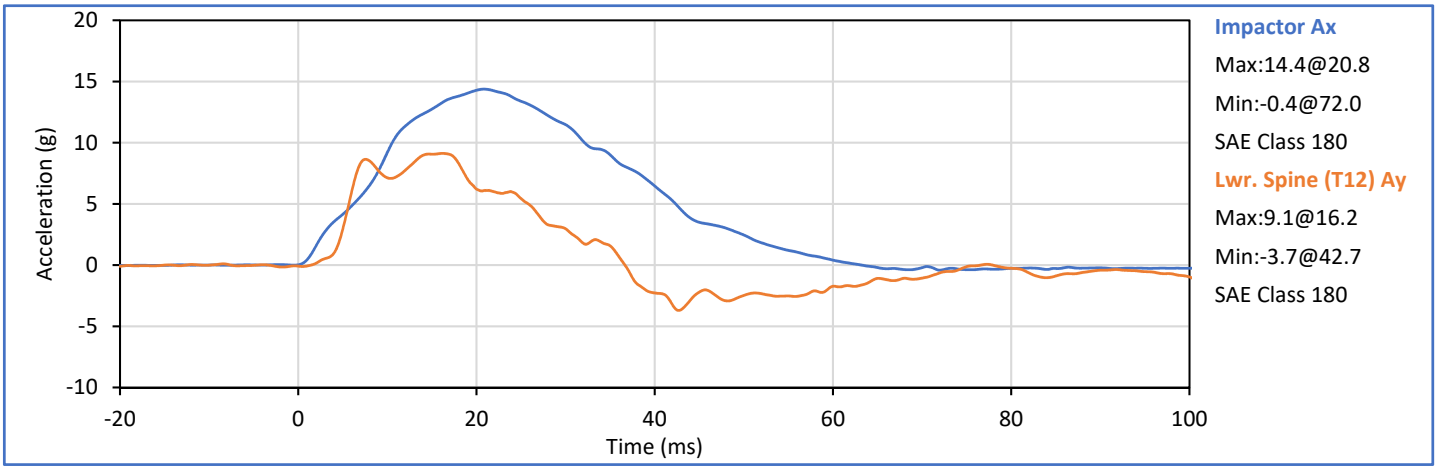
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 308 Test Date: 2021-01-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	42.3	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	41.2	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.1	Pass
Peak Impactor Ax	g	12.0	16.0	14.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

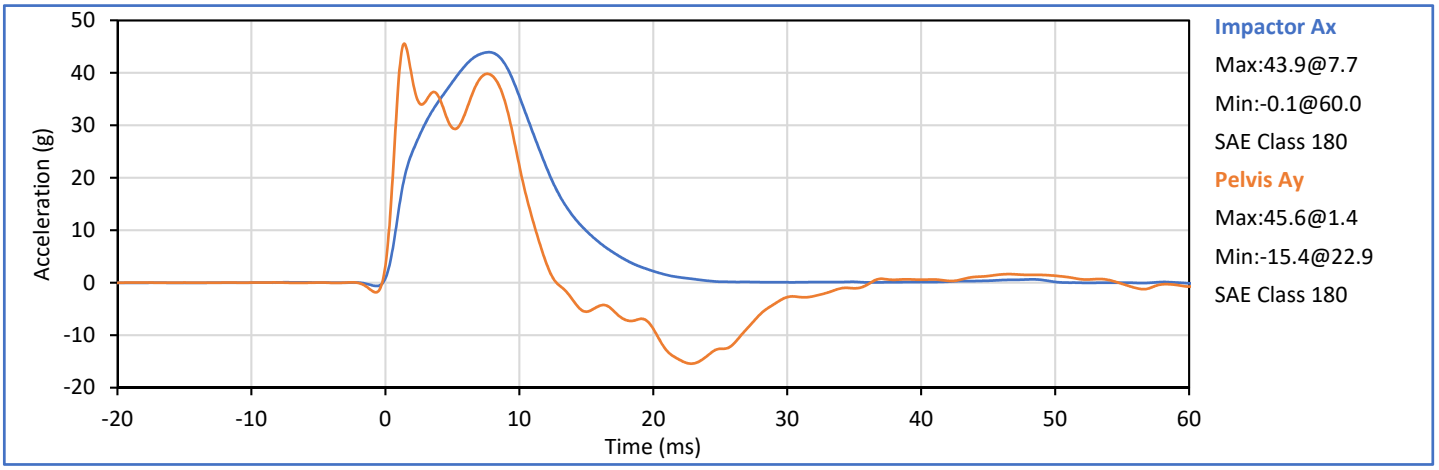
Applus IDIADA
KARCO

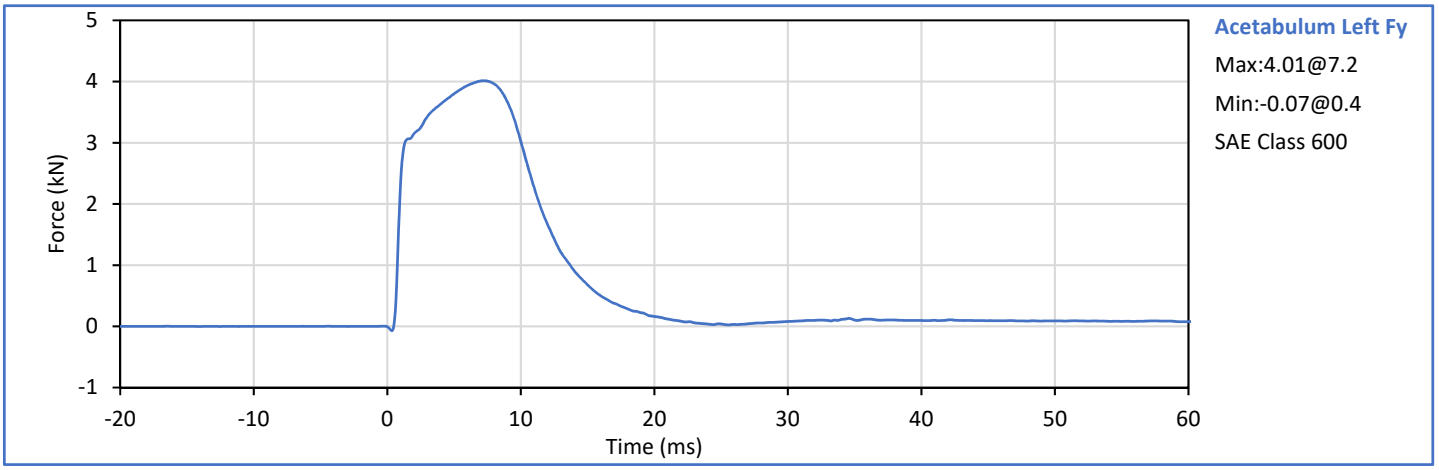
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2021-01-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	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	4.01	Pass
Pelvis Ay after 6ms	g	34.0	42.0	39.8	Pass
Peak Impactor Ax	g	38.0	47.0	43.9	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13005





Technician: J. Hernandez

Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2021-01-28

Pelvis Plug S/N: 13005

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

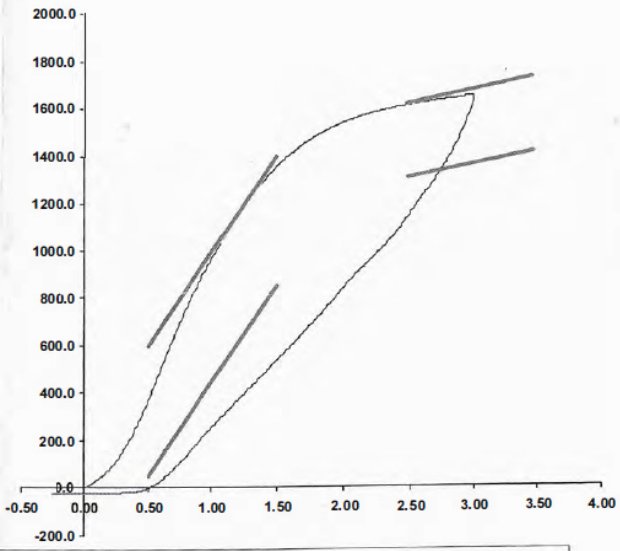
Plug S/N 13005
Test Number 10302
Report Number 10337
Test Date 7/19/2019 11:43:53 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	375.75	50.00	600.00
Force @ 1.5 mm (N)	1,364.18	850.00	1,400.00
Force @ 2.5 mm (N)	1,609.71	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,647.98	1,361.00	1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000
Preload Value (-N) 22.24
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 19-Jul-19
SACO Research

By : DC Date : 7/19/2019

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

Applus IDIADA
KARCO

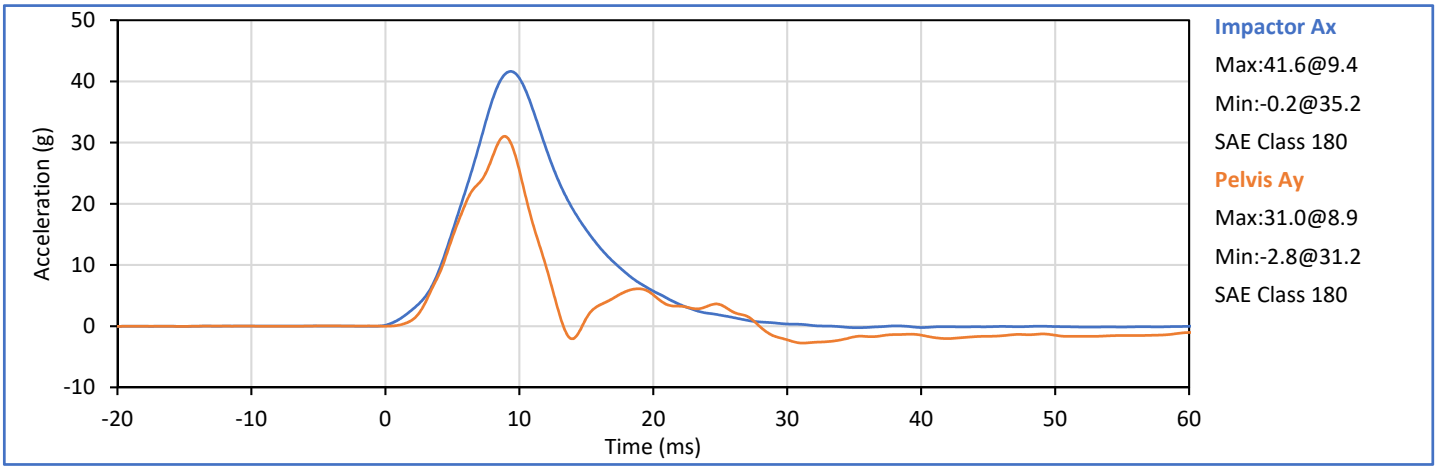
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

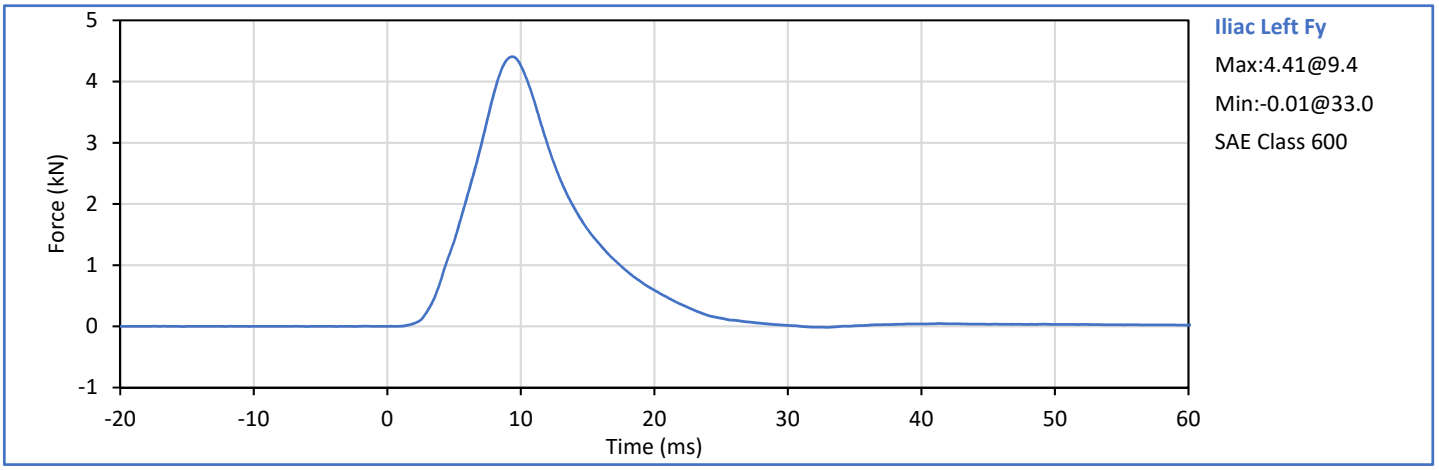
ATD Serial No.: 308 Test Date: 2021-01-29

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	4.31	Pass
Peak Iliac Fy	kN	4.10	5.10	4.41	Pass
Pelvis Ay after 6ms	g	28.0	39.0	31.0	Pass
Peak Impactor Ax	g	36.0	45.0	41.6	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 *

* Plug is not impacted and remains certified





Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX 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: 2021-02-07

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
A - Sitting Height	mm	772	788	785	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	146	Pass
E - Shoulder Pivot From Backline	mm	97	107	106	Pass
F - Thigh Clearance	mm	119	135	130	Pass
G - Head Breadth	mm	140	148	143	Pass
H - Head Back From Backline	mm	40	46	42	Pass
I - Head Depth	mm	178	188	188	Pass
J - Head Circumference	mm	541	551	547	Pass
K - Buttock To Knee Length	mm	514	540	526	Pass
L - Popliteal Height	mm	343	369	352	Pass
K - Knee Pivot To Floor Height	mm	392	409	404	Pass
N - Buttock Popliteal Length	mm	416	442	438	Pass
O - Chest Depth W/O Jacket	mm	195	211	202	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	255	Pass
S - Knee Joint To Seatback	mm	477	493	480	Pass
V - Shoulder Width	mm	341	357	350	Pass
W - Foot Width	mm	78	94	89	Pass
Y - Chest Circumference W/Jacket	mm	851	881	862	Pass
Z - Waist Circumference	mm	761	791	775	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

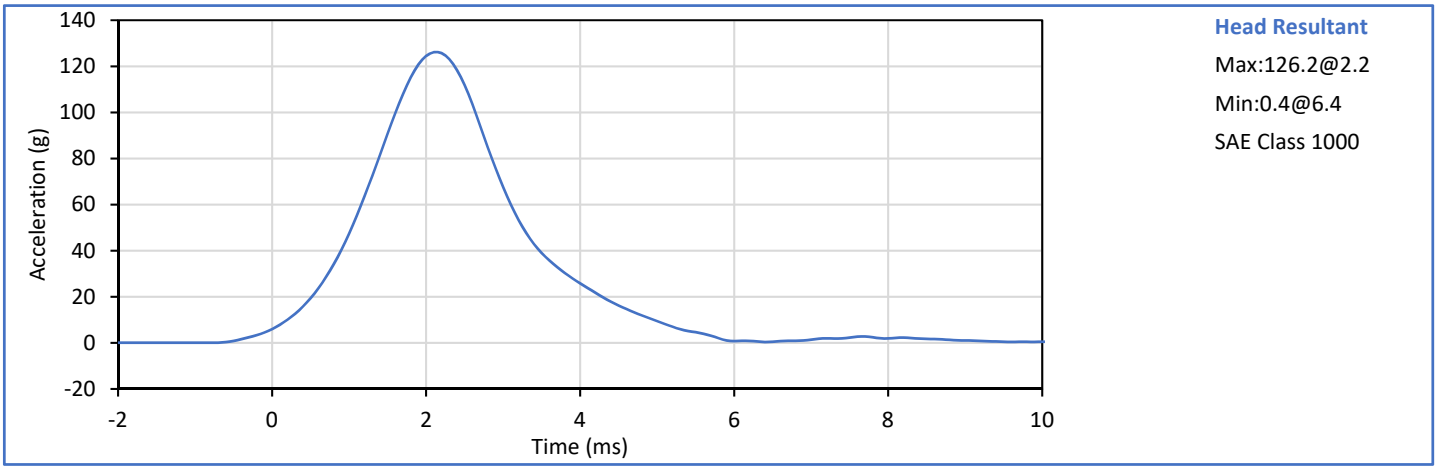
Approved By: P. Puzzuto

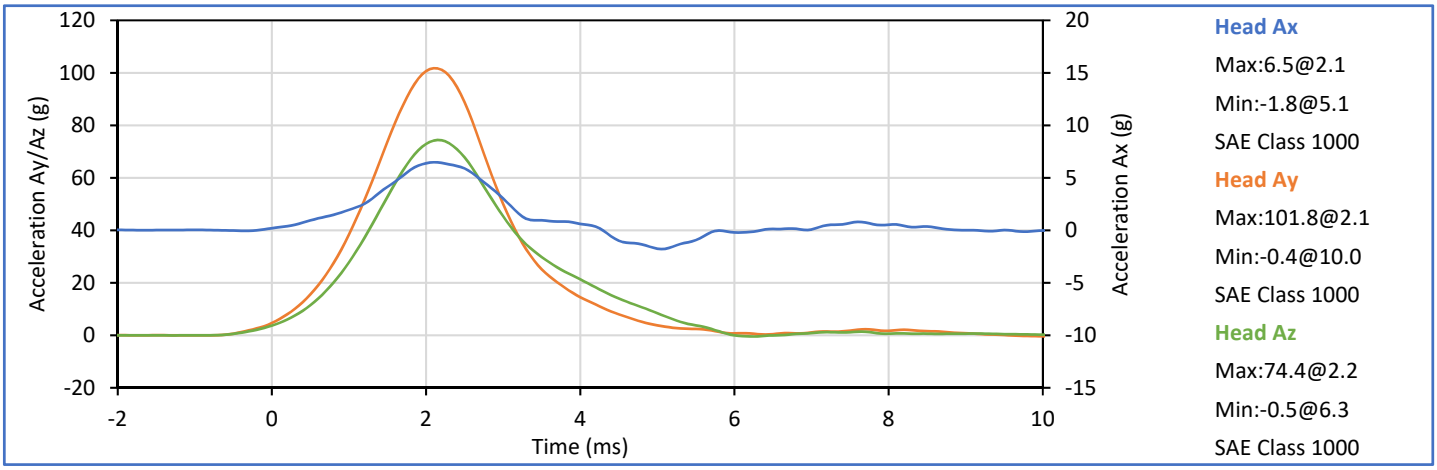
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 308 Test Date: 2021-02-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	40	Pass
Peak Resultant Acceleration	g	115.0	137.0	126.2	Pass
Peak Head Ax	g	-15.0	15.0	-1.8	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

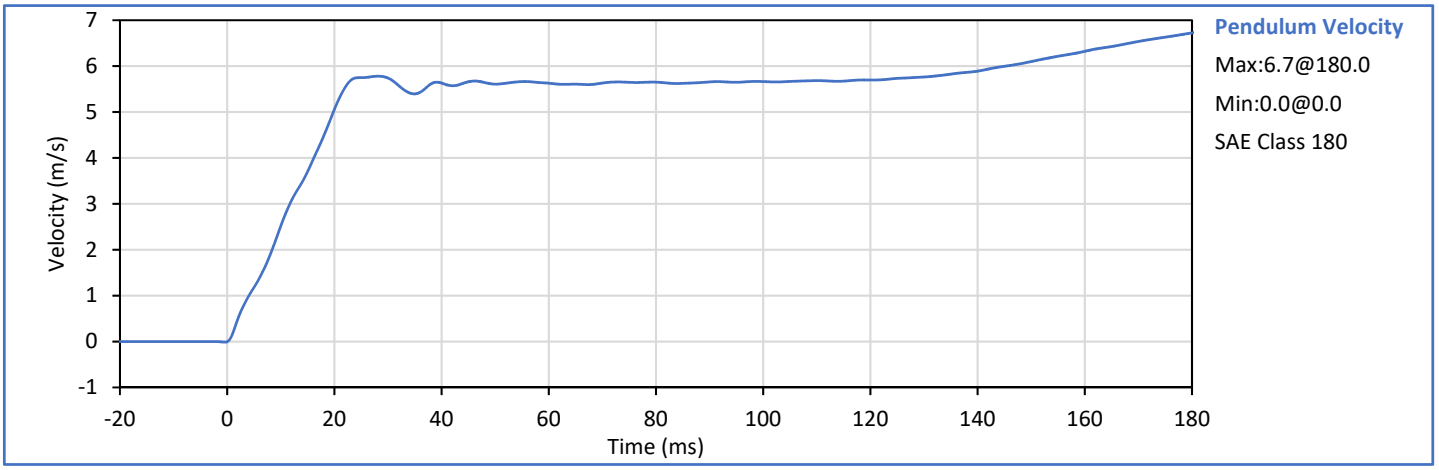
Approved By: P. Puzzuto

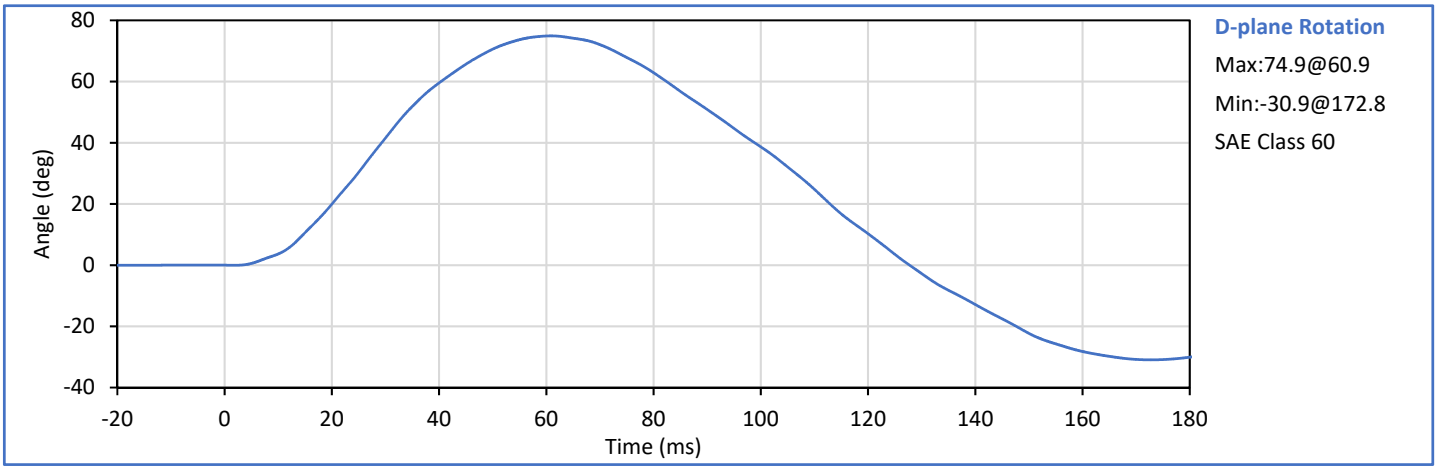
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2021-02-08

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
Pendulum Velocity	m/s	5.51	5.63	5.58	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	3.70	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	5.05	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.75	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.78	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	74.9	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.9	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-43.6	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	110.3	Pass
			Overall Test Results		Pass



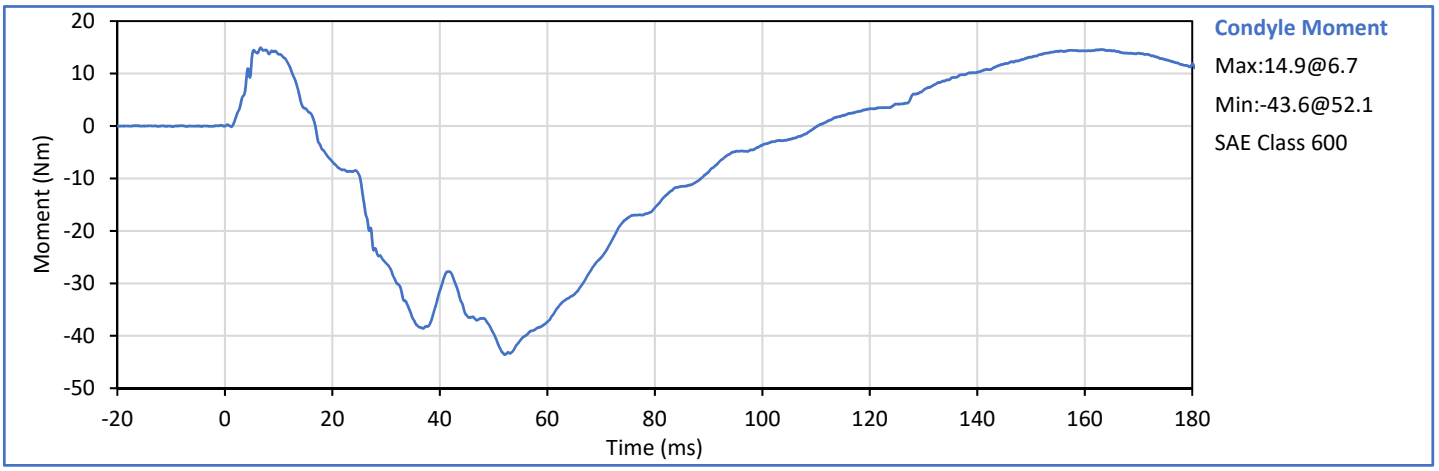


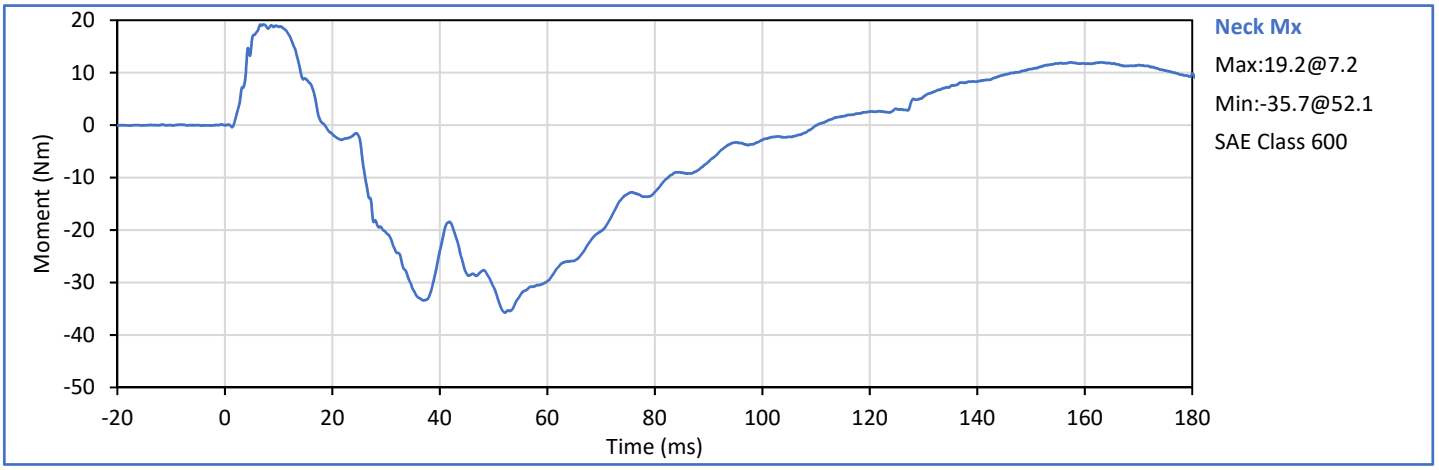
Technician: J. Hernandez

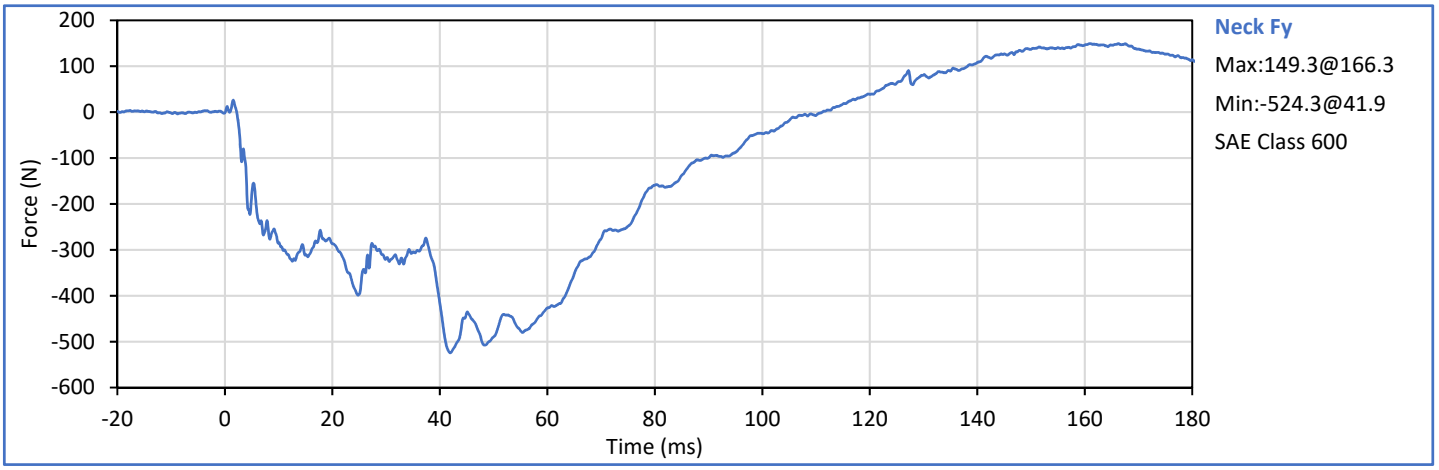
Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2021-02-08





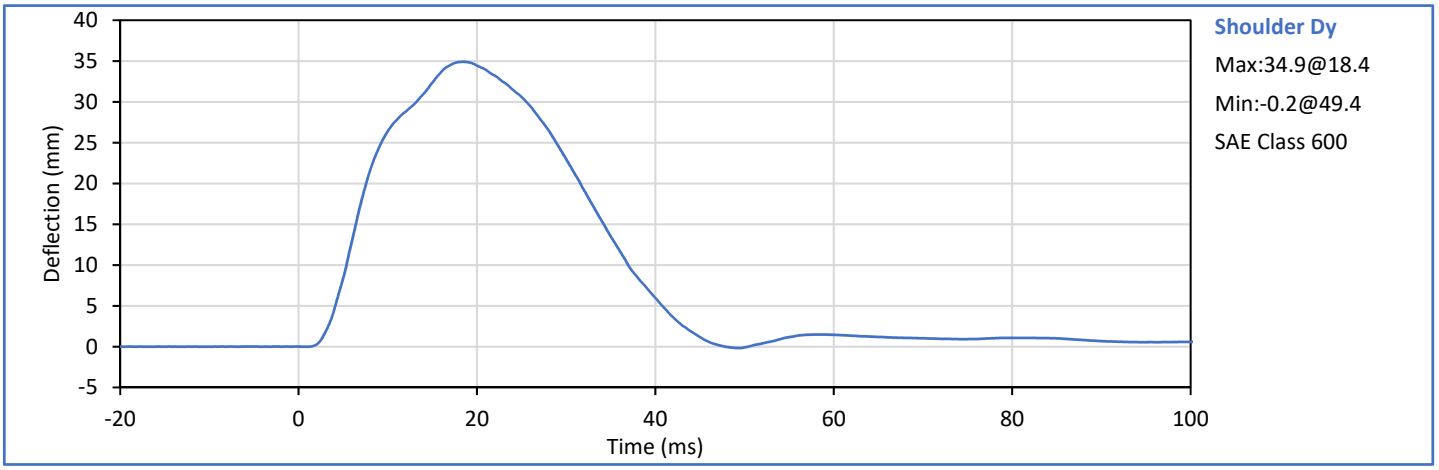


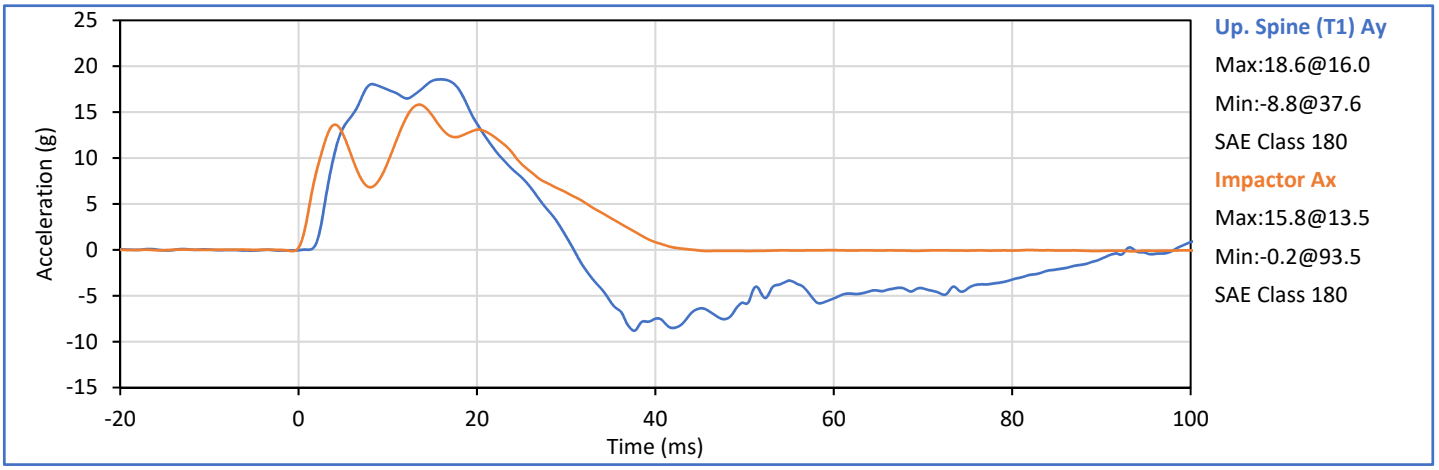
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 308 Test Date: 2021-02-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Shoulder Dy	mm	28.0	37.0	34.9	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.6	Pass
Peak Impactor Ax	g	13.0	18.0	15.8	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

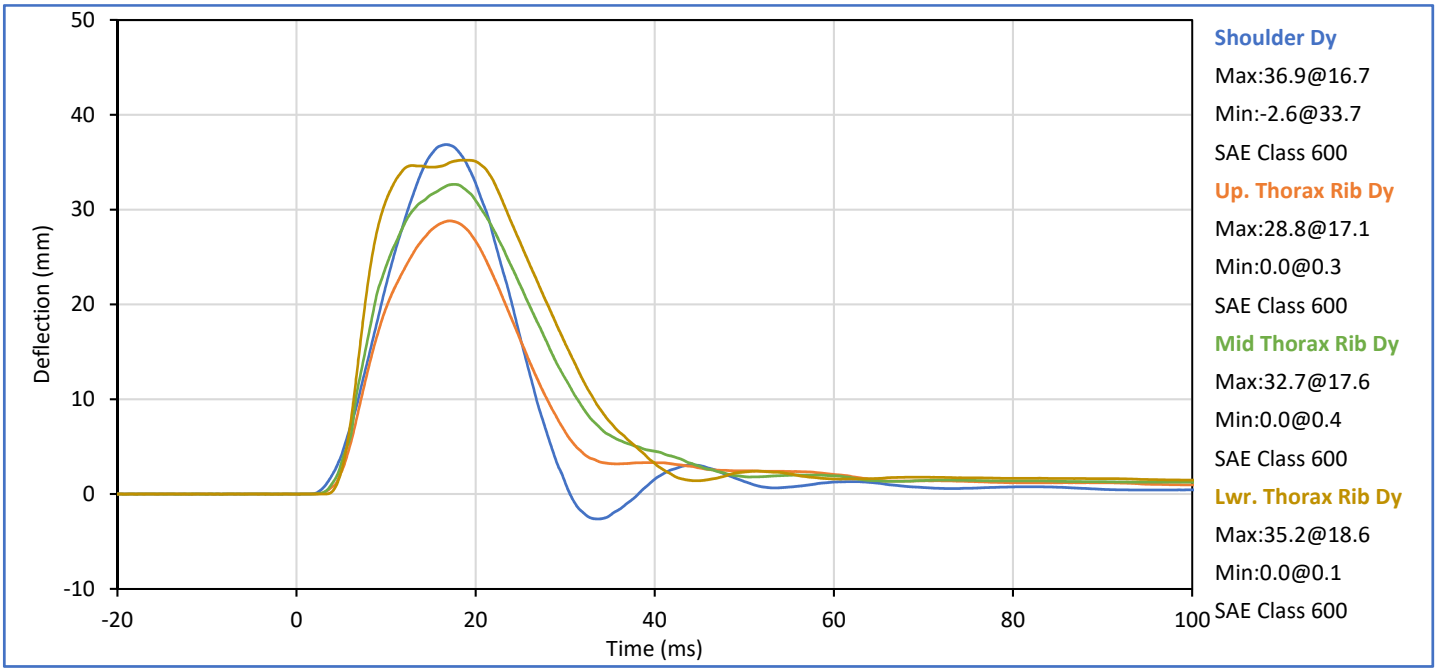
Approved By: P. Puzzuto

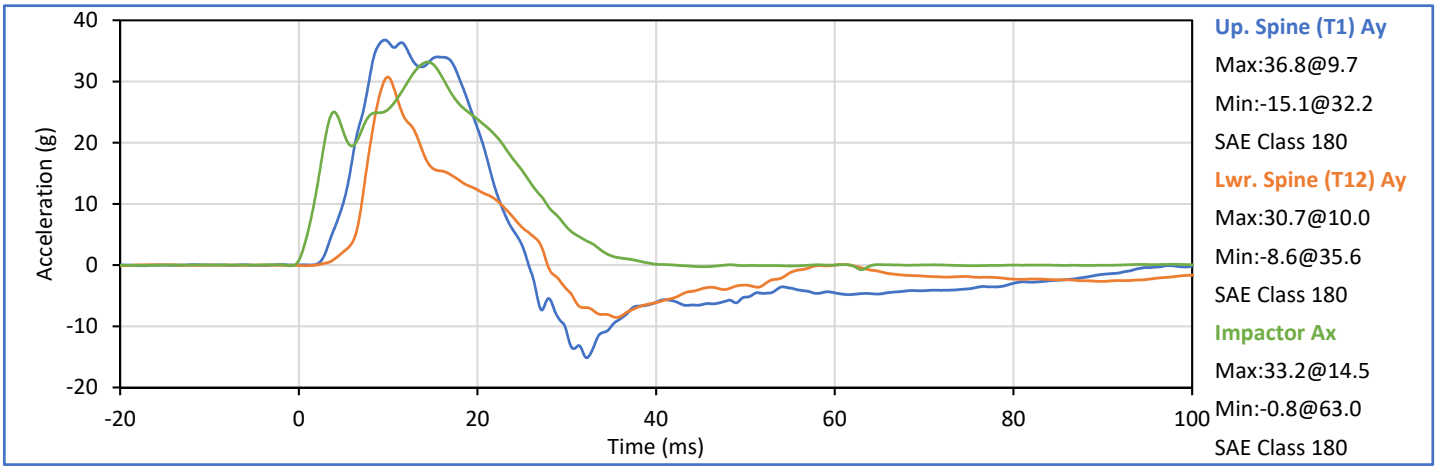
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2021-02-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	6.60	6.80	6.66	Pass
Peak Shoulder Dy	mm	31.0	40.0	36.9	Pass
Peak Upper Rib Dy	mm	25.0	32.0	28.8	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.7	Pass
Peak Lower Rib Dy	mm	32.0	38.0	35.2	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	36.8	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	30.7	Pass
Peak Impactor Ax	g	30.0	36.0	33.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

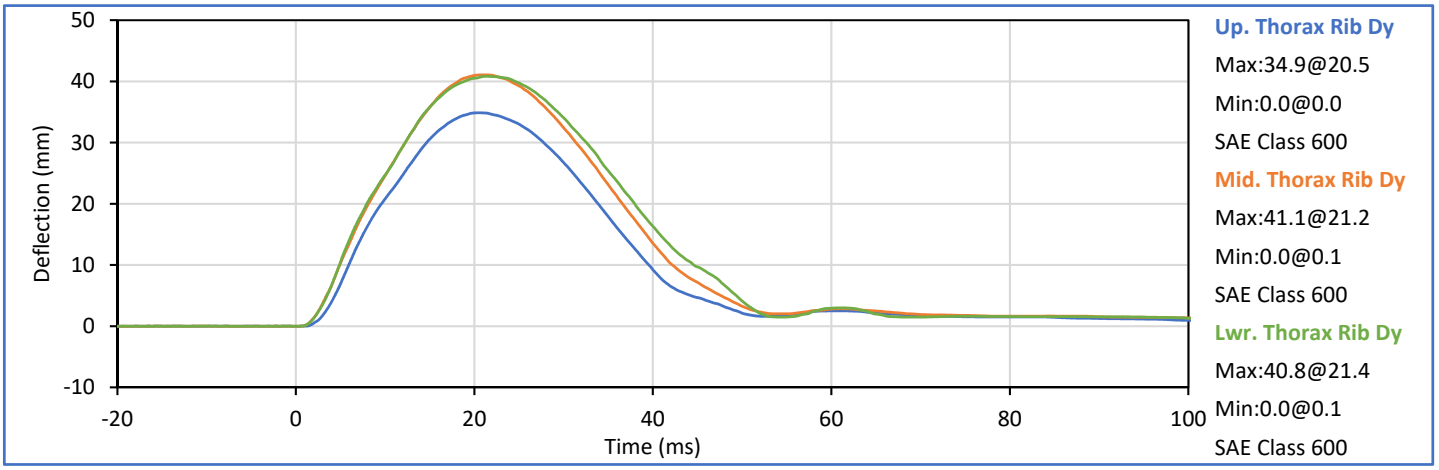
Applus IDIADA
KARCO

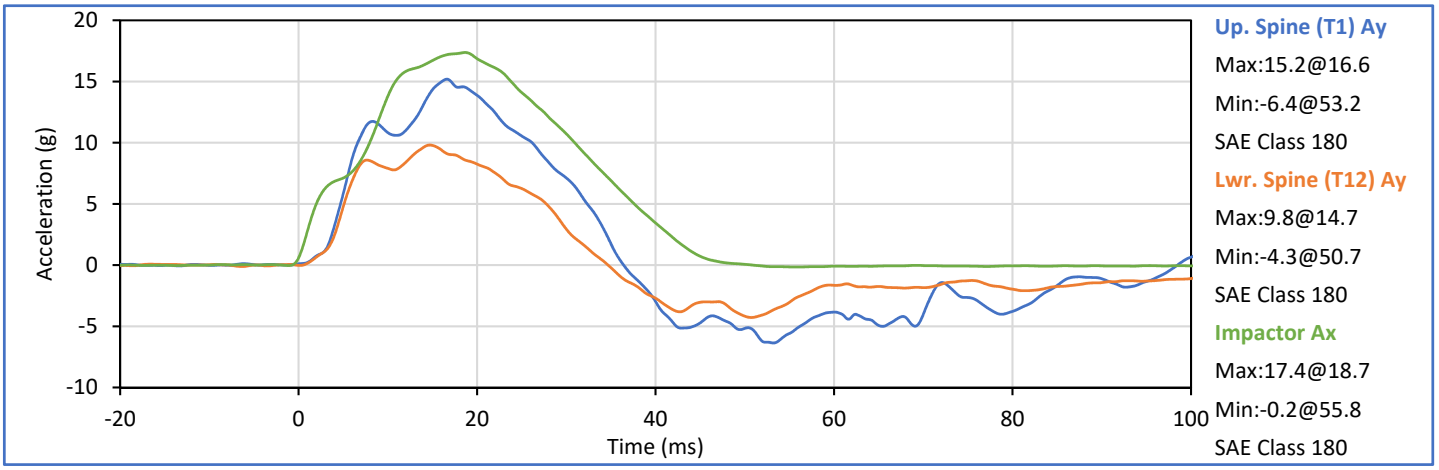
SID-IIs Small Side Impact ATD
Thorax (No Arm)

ATD Serial No.: 308

Test Date: 2021-02-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	34.9	Pass
Peak Middle Rib Dy	mm	39.0	45.0	41.1	Pass
Peak Lower Rib Dy	mm	35.0	43.0	40.8	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.2	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.8	Pass
Peak Impactor Ax	g	14.0	18.0	17.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

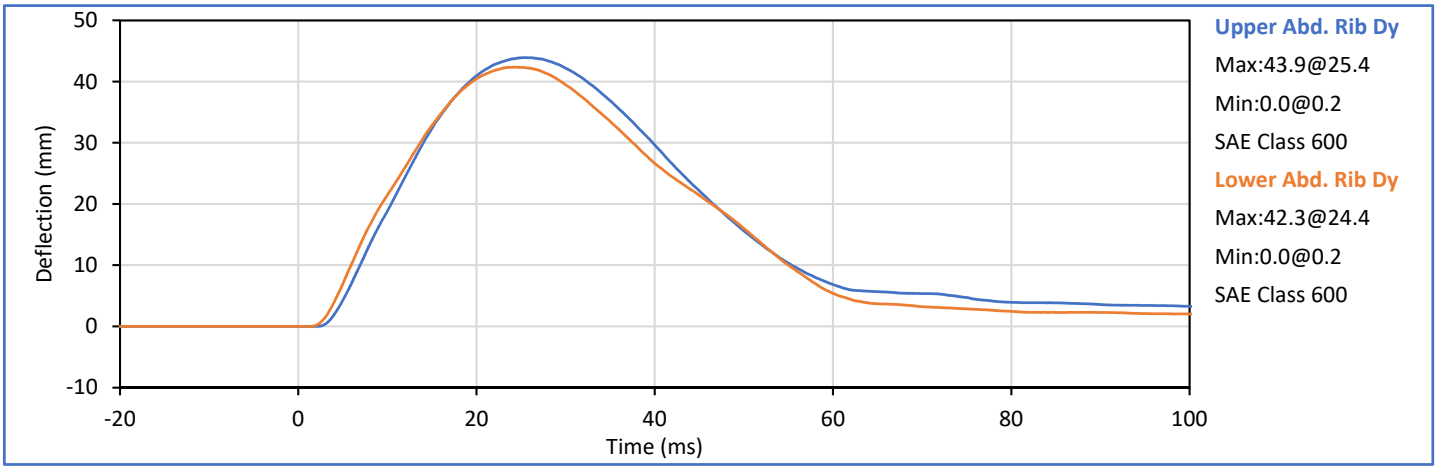
Approved By: P. Puzzuto

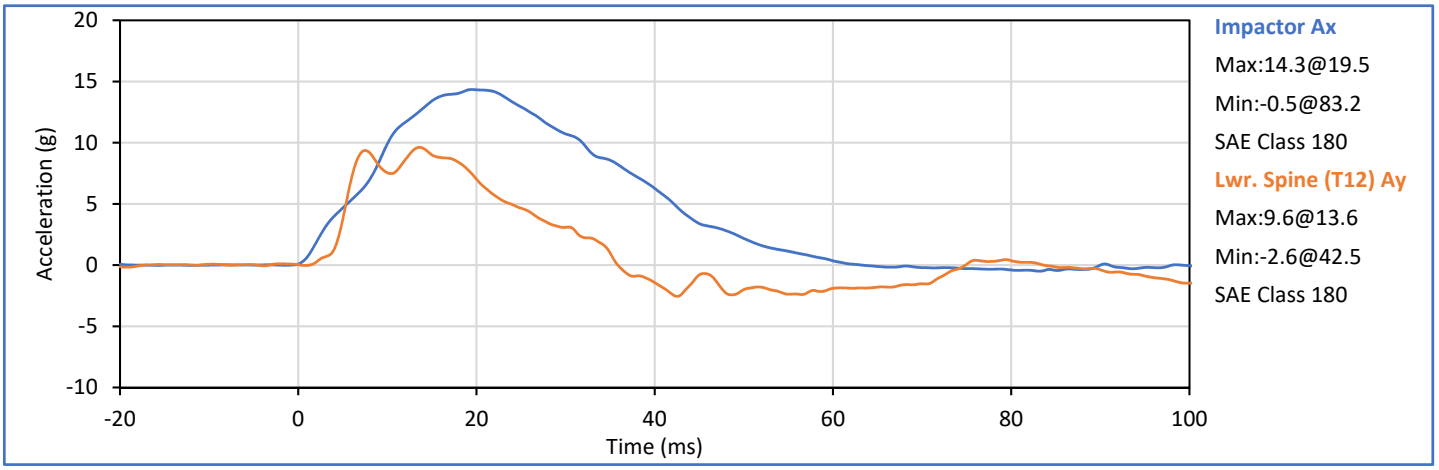
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 308 Test Date: 2021-02-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	43.9	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	42.3	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.6	Pass
Peak Impactor Ax	g	12.0	16.0	14.3	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

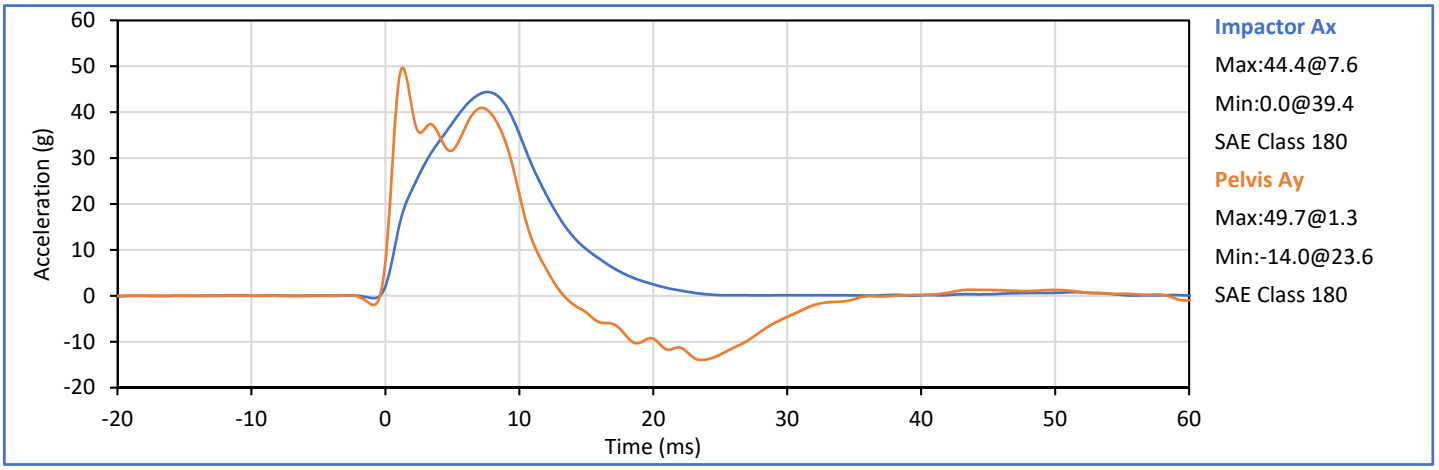
Applus IDIADA KARCO

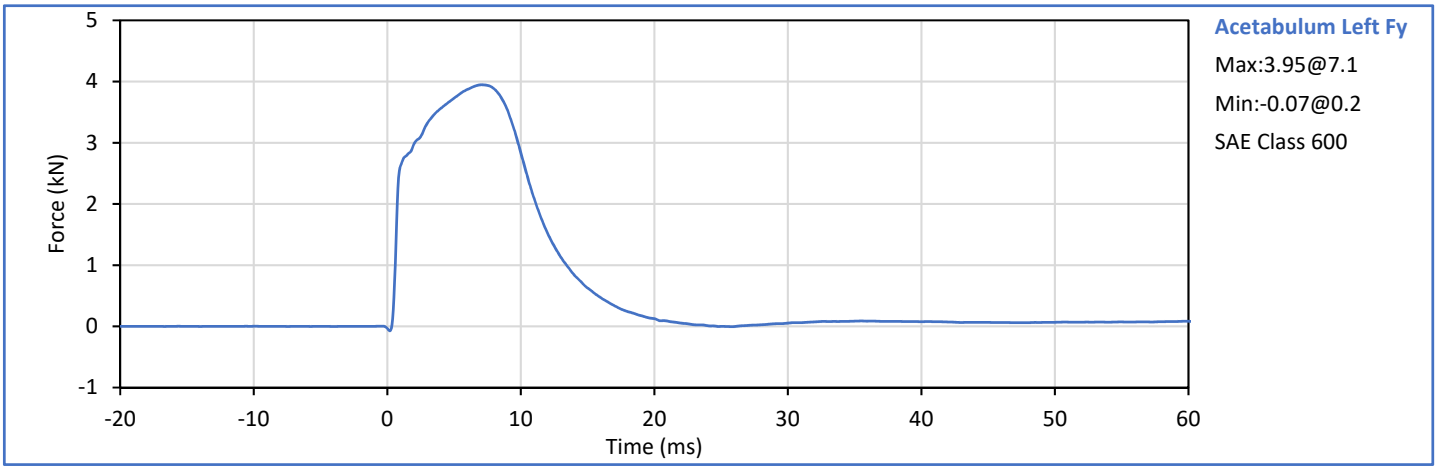
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2021-02-10

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	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.95	Pass
Pelvis Ay after 6ms	g	34.0	42.0	41.0	Pass
Peak Impactor Ax	g	38.0	47.0	44.4	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13906





Technician: J. Hernandez

Approved By: P. Puzzuto

ATD Serial No.: 308 Test Date: 2021-02-10

Pelvis Plug S/N: 13906

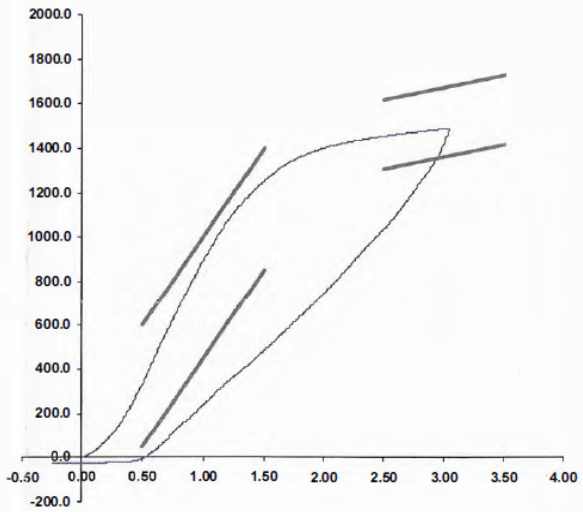
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13906
Test Number 13380
Report Number 13425
Test Date 5/20/2020 8:36:51 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	342.95	50.00	600.00
Force @ 1.5 mm (N)	1,255.61	850.00	1,400.00
Force @ 2.5 mm (N)	1,453.61	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,487.53	1,361.00	1,673.00

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000
Preload Value (-N) 22.24
Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

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

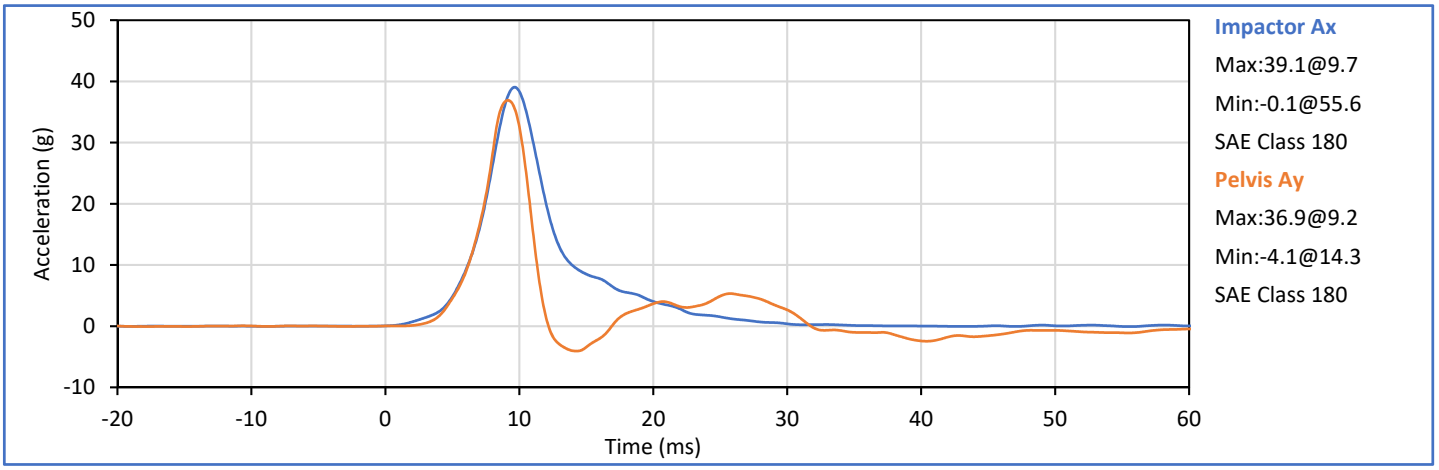
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

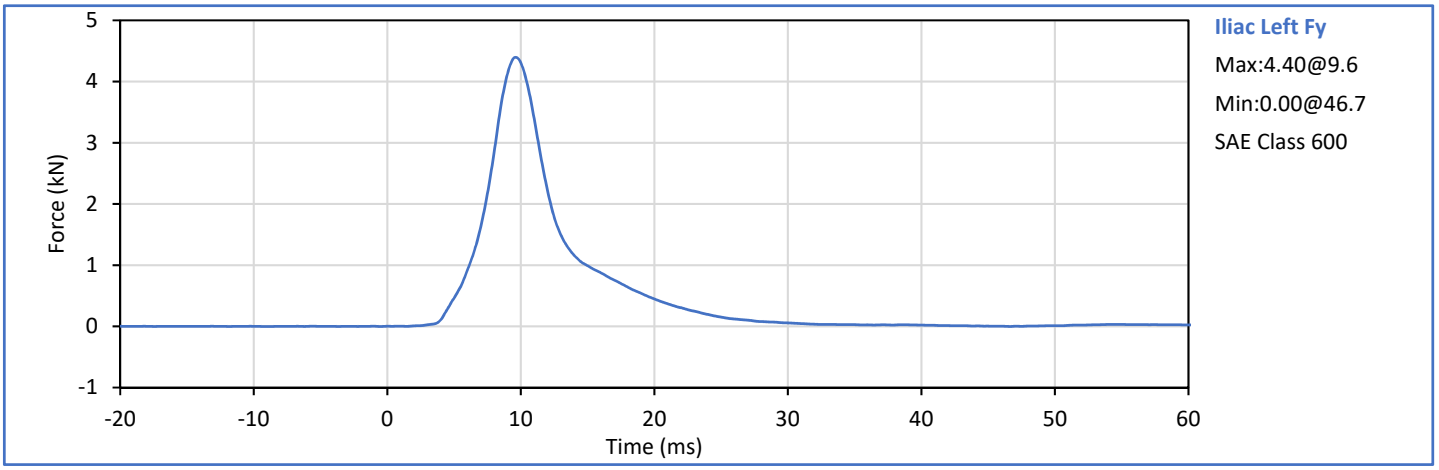
ATD Serial No.: 308 Test Date: 2021-02-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	44	Pass
Impactor Velocity	m/s	4.20	4.40	4.28	Pass
Peak Iliac Fy	kN	4.10	5.10	4.40	Pass
Pelvis Ay after 6ms	g	28.0	39.0	36.9	Pass
Peak Impactor Ax	g	36.0	45.0	39.1	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 *

* Plug is not impacted and remains certified





Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

SID-IIs ATD S/N: 308

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P63980	Endevco	7264C-2k	2021-01-06
Head Acceleration Y Primary	P58861	Endevco	7264C-2k	2021-01-06
Head Acceleration Z Primary	P51261	Endevco	7264C-2k	2021-01-06
Head Acceleration X Redundant	P58808	Endevco	7264C-2k	2021-01-06
Head Acceleration Y Redundant	P63310	Endevco	7264C-2k	2021-01-06
Head Acceleration Z Redundant	P49189	Endevco	7264C-2k	2021-01-06
Head Rotation Rate X	ARS11393	DTS	ARS PRO-18k (2kHz)	2020-08-04
Head Rotation Rate Y	ARS13119	DTS	ARS PRO-18k (2kHz)	2020-08-04
Head Rotation Rate Z	ARS13586	DTS	ARS PRO-18k (2kHz)	2020-08-04
Upper Thorax Rib Deflection Y	1249	Servo	08TCI-3725	2021-01-05
Middle Thorax Rib Deflection Y	1219	Servo	08TCI-3725	2021-01-05
Lower Thorax Rib Deflection Y	1221	Servo	08TCI-3725	2021-01-05
Upper Abdomen Rib Deflection Y	1252	Servo	08TCI-3725	2021-01-05
Lower Abdomen Rib Deflection Y	1283	Servo	08TCI-3725	2021-01-05
Lower Spine T12 Acceleration X	P52108	Endevco	7264C-2k	2021-01-06
Lower Spine T12 Acceleration Y	P63970	Endevco	7264C-2k	2021-01-06
Lower Spine T12 Acceleration Z	P51712	Endevco	7264C-2k	2021-01-06
Iliac Wing Impact Side Force Y	272 Fy (Iliac)	R.A. Denton	3228J	2020-07-17
Acetabulum Impact Side Force Y	260 Fy (Acetabulum)	R.A. Denton	3249J	2020-07-17

Table 2 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	A358554	MSI	52F-2k	2020-09-20
Vehicle CG Ay	A356295	MSI	52F-2k	2020-09-16
Vehicle CG Az	A361473	MSI	52F-2k	2020-10-21
Left Floor Sill Ay	A361482	MSI	52F-2k	2020-10-21
A-Pillar Sill Ay	A358747	MSI	52F-2k	2020-09-22
A-Pillar Low Ay	A358555	MSI	52F-2k	2020-09-20
A-Pillar Mid Ay	A358745	MSI	52F-2k	2020-09-22
B-Pillar Sill Ay	A358481	MSI	52F-2k	2020-09-18
B-Pillar Low Ay	A358697	MSI	52F-2k	2020-09-21
B-Pillar Mid Ay	A358737	MSI	52F-2k	2020-09-22
Driver Seat Track at H-Point Ay	A358550	MSI	52F-2k	2020-09-20
Engine Top Ax	A356480	MSI	52F-2k	2020-09-15
Engine Top Ay	A361347	MSI	52F-2k	2020-10-21
Firewall Ay	A358736	MSI	52F-2k	2020-09-27
Right Roof Ay	A358748	MSI	52F-2k	2020-09-22
Right Floor Sill Ay	A358704	MSI	52F-2k	2020-09-21
Rear Floorpan Ax	A361343	MSI	52F-2k	2020-10-21
Rear Floorpan Ay	A361349	MSI	52F-2k	2020-10-21

Table 3 - Barrier Pole Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Barrier Pole 01 Fx	19461A	Interface	1220FS-50k	2020-03-18
Barrier Pole 02 Fx	131822A	Interface	1220AF-50k	2020-03-18
Barrier Pole 03 Fx	131816A	Interface	1220AF-50k	2020-03-18
Barrier Pole 04 Fx	19325	Interface	1220FS-50k	2020-03-18
Barrier Pole 05 Fx	131827A	Interface	1220AF-50k	2020-03-18
Barrier Pole 06 Fx	19340	Interface	1220FS-50k	2020-03-18
Barrier Pole 07 Fx	19267	Interface	1220FS-50k	2020-03-18
Barrier Pole 08 Fx	19466A	Interface	1220FS-50k	2020-03-18