REPORT NUMBER: SideNCAPPole-KAR-21-001

NEW CAR ASSESSMENT PROGRAM (NCAP)

SIDE IMPACT POLE TEST

MERCEDES-BENZ U.S. INTERNATIONAL INC.

2021 MERCEDES-BENZ GLE350 5-DOOR SUV

NHTSA No: M20214308

PREPARED BY:

APPLUS IDIADA KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

FEBRUARY 9, 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

WASHINGTON, D.C. 20590

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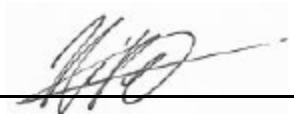
Prepared By: 

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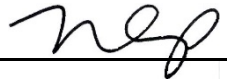
Reviewed By: 

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Approval Date: February 9, 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-21-001		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact Pole Testing of a 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308	February 9, 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-P40401-01-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, January 25, 2021- February 9, 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 GLE350 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 January 25, 2021.

The impact velocity was 32.84 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 12.8°C. The target vehicle's maximum post-test static crush was 294 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	263.6
Resultant Lower Spine Acceleration	g	82	35
Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	2737
Maximum Thoracic Rib Deflection	mm	38	21
Maximum Abdominal Rib Deflection	mm	45	23

The struck side door at the front of the vehicle was jammed shut and did not separate from the hinges. The left front door unlatched at the striker, the door opening was 85mm. 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	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 GLE350 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 GLE350 5-Door SUV. The subject vehicle was towed into the rigid pole at an angle of 74.6° and a velocity of 32.84 km/h. The test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California on January 25, 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	263.6
Lower Spine (T12) Resultant Acceleration	g	82	35
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2737
Maximum Thoracic Rib Deflection	mm	38*	21
Maximum Abdominal Rib Deflection	mm	45*	23

**Proposed IARV*

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	Yes	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 were jammed shut and no separation occurred at the hinges. The left front (driver's) door separated at the striker, the opening width at the striker was 85mm. The remaining doors remained closed and latched.

- FLOOR SILL AY, Channel failed at 16.0 ms
- LEFT MID A-POST AY, Channel failed at 44.0 ms
- LEFT B-POST at SILL AY, Channel failed at 45.0 ms
- DRIVER SEAT TRACK AY, Channel failed at 40.0 ms
- RIGHT ROOF AY, Channel Failed at 36.5 ms

SECTION 2

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

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 GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20214308
Model Year	2021
Make	Mercedes-Benz
Model	GLE350
Body Style	5-Door SUV
VIN	4JGFB4JBXMA350257
Body Color	Silver Metallic
Odometer Reading (km / mi)	11 / 7
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4-Cylinder
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	9
Overdrive	Yes
Final Drive	RWD
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	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 U.S. International Inc.
Date of Manufacture	Oct-20
Vehicle Type	SUV

GVWR (kg)	2750
GAWR Front (kg)	1300
GAWR Rear (kg)	1550

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				432.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				91.8	*A-B*

VEHICLE SEAT TYPE

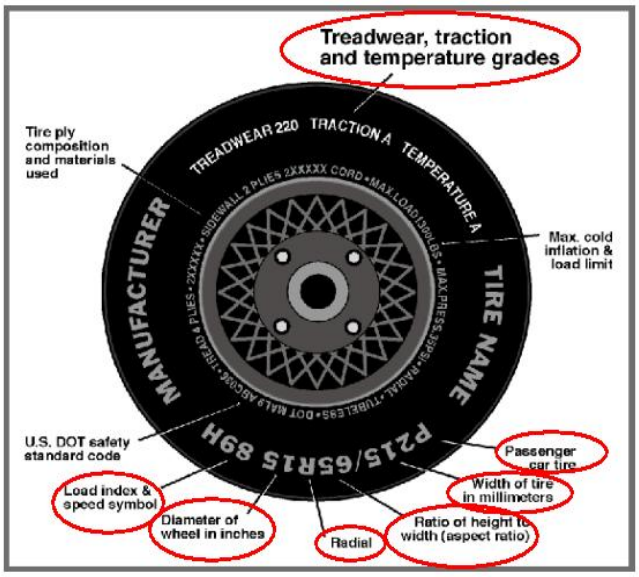
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	260	300
Recommended Tire Size	P275/50 R20	P275/50 R20
Tire Size on Vehicle	P275/50 R20	P275/50 R20
Tire Manufacturer	Cooper	Cooper
Tire Model	Discover SRX LE	Discover SRX LE
Treadware	600	600
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	1 Nylon, 2 Steel, 2 Polyester	1 Nylon, 2 Steel, 2 Polyester
Load Index/Speed Symbol	109H	109H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	U93U IMN 4020	U93U IMN 4020
DOT Safety Code Right	U93U IMN 4020	U93U IMN 4020

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	260	260	300	300
Tire Placard	kPa	260	260	300	300
Owner's Manual	kPa	260	260	300	300
As Tested	kPa	260	260	300	300

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	541.0	535.0		542.5	615.5		540.0	618.0	
Right	kg	546.0	512.0		540.0	570.0		546.0	570.0	
Ratio	%	50.9%	49.1%	100.0%	47.7%	52.3%	100.0%	47.8%	52.2%	100.0%
Total	kg	1087.0	1047.0	2134.0	1082.5	1185.5	2268.0	1086.0	1188.0	2274.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2134.0	A
Actual Weight of 1 SID II-s ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	91.8	C
Calculated Vehicle Target Wt (TVTW)	kg	2274.8	A+B+C

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

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.3	0.5	0.5	Yes
Front Passenger Sill Angle (front-to-rear)*	°	0.8	0.6	0.1	Yes
Front Bumper-Line Angle (left-to-right)**	°	0.4	0.2	0.1	Yes
Rear Bumper-Line Angle (left-to-right)**	°	0.0	0.0	0.0	Yes
Vehicle CG (Aft of Front Axle)	mm	1467	1563	1562	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	7	18	16	

*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 GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

Test Height Adjustable Setting (If Applicable)	

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Truck Trim	3.0
Spare Tire	12.0
Spare Tire Tools	6.0
Rear Shades	1.0

TEST SURFACE MARKINGS

	Distance from 75° Impact Location Line (mm)
Fore 25 mm target	87.0
Aft 25 mm target	87.0

DATA SHEET NO. 2

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

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

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	7.0	0.0	3.5
Front Passenger Seat	7.1	0.0	3.6
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	310	Max	335	345	358
			Mid	300	310	323
			Min	265	275	288
Front Passenger Seat	3.6	309	Max	330	336	352
			Mid	301	309	324
			Min	271	282	295
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 GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

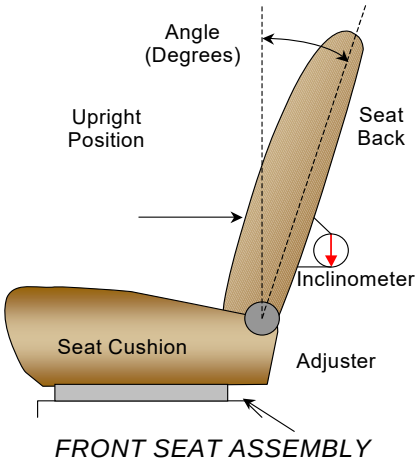
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	233	N/A	0	N/A
Front Passenger Seat	265	N/A	0	N/A
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	76.6	N/A	8.7	N/A
Front Passenger Seat	74.4	N/A	7.0	N/A
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

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	4	H

HEAD RESTRAINT ADJUSTMENT

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

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

DATA SHEET NO. 2 … (CONTINUED)

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

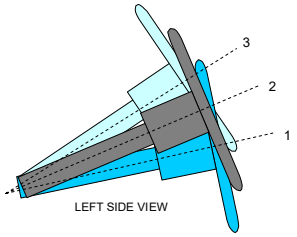
Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

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.

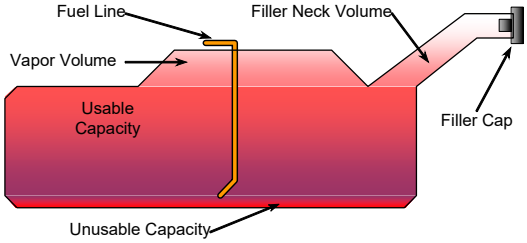
	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	20.7	100
Geometric Center - Position 2	22.8	128
Uppermost - Position 3	25.0	155
Telescoping Steering Wheel Travel		55
Test Position	22.8	128



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)	85.17
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	85.17
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	79.23
Actual amount of Solvent Used in Test	79.23
1/3 of Usable Capacity	28.39

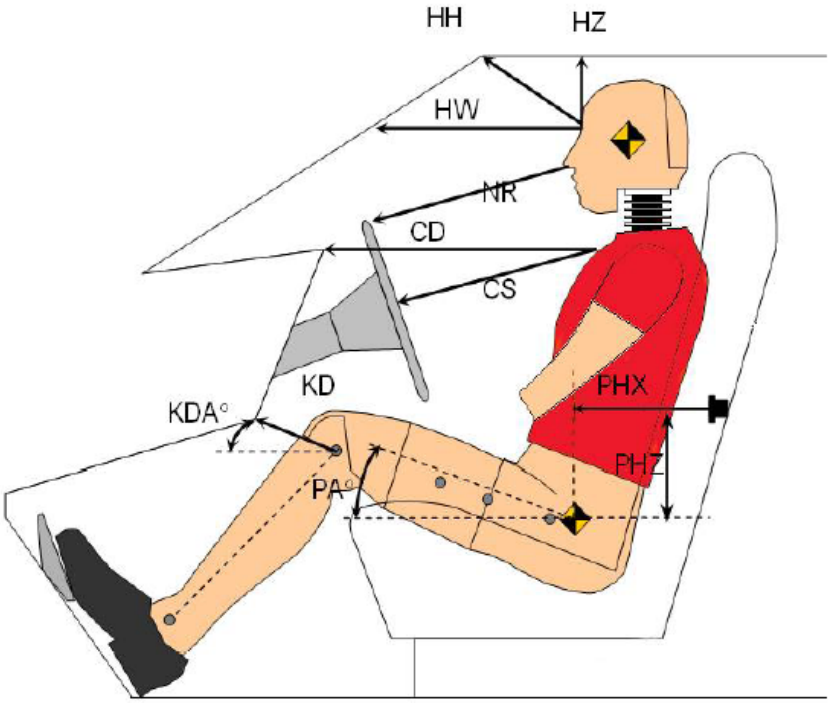
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



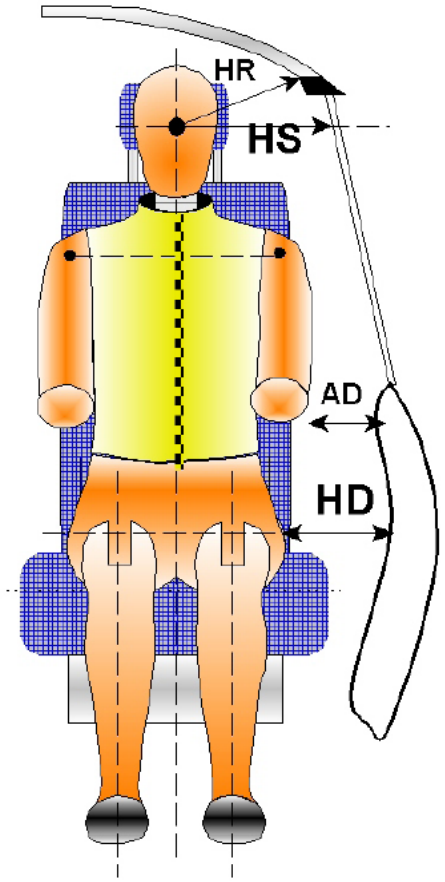
Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	325	
HW	Head to Windshield	664	
HZ	Head to Roof	202	
NR	Nose to Rim	235	
CD	Chest to Dash	510	
CS	Chest to Steering Wheel	174	
KD(L)/KDA(L)°	Left Knee to Dash	118	37.2
KD(R)/KDA(R)°	Right Knee to Dash	80	40.5
PAX°	Pelvic Tilt Angle (x-axis)		20.6
PAY°	Pelvic Tilt Angle (y-axis)		0.0
PHX	Hip Point to Striker (x-axis)	315	
PHZ	Hip Point to Striker (z-axis)	113	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



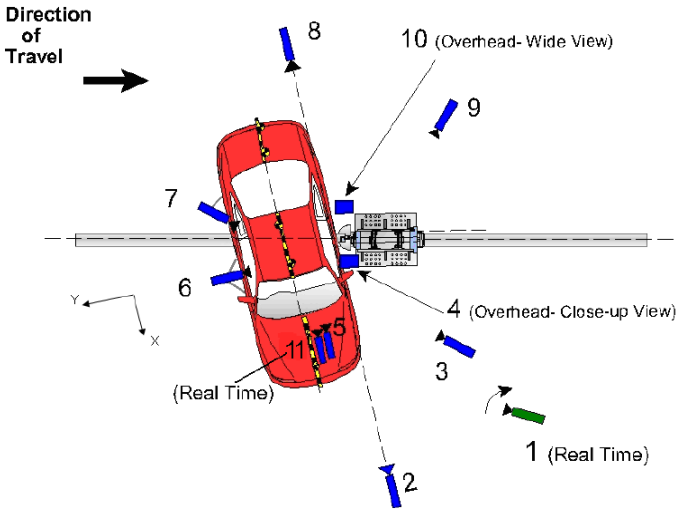
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	253
HS	Head to Side Window	mm	377
AD	Arm to Door	mm	156
HD	Hip Point to Door	mm	178

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



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	1.33	-0.30	0.58	8.5	1000
6	On-Board - Dummy Side View	0.63	-1.66	0.36	8.5	1000
7	On-Board - Dummy Rear Oblique View	-0.69	-1.63	0.40	8.5	1000
8	Rear Ground Level - Impact View	-1.30	1.68	-1.26	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.24	0.58	-1.42		30

*All measurements accurate to ±6 mm

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

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

INSTRUMENTATION

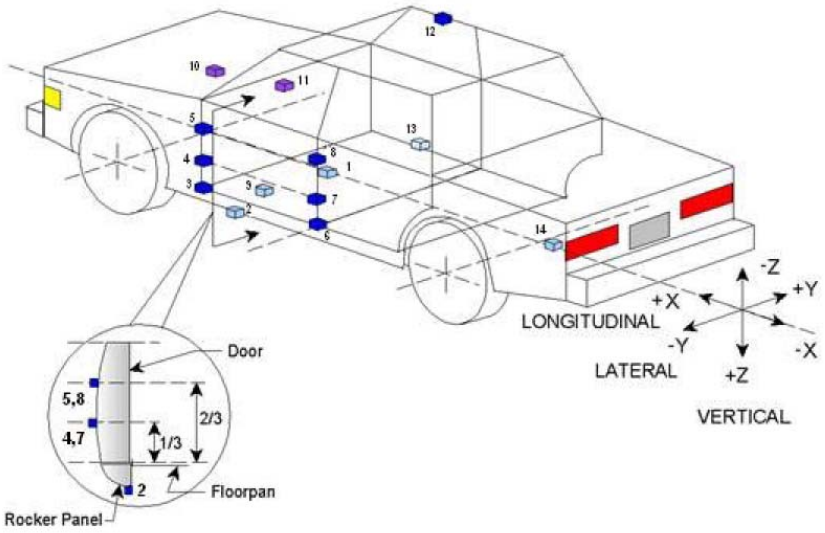
Driver Dummy Channels	19
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	45

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	790	0	160
2	Left Floor Sill	980	370	170
3	A-Pillar Sill	1290	310	130
4	A-Pillar Low	1290	320	270
5	A-Pillar Mid	1290	330	450
6	B-Pillar Sill	1300	340	140
7	B-Pillar Low	1300	340	220
8	B-Pillar Mid	1300	340	460
9	Driver Seat Track	990	190	150
10	Engine Top	1620	0	450
11	Firewall	1370	170	440
12	Right Roof	820	250	650
13	Right Floor Sill	1100	350	170
14	Rear Floorpan	300	0	180

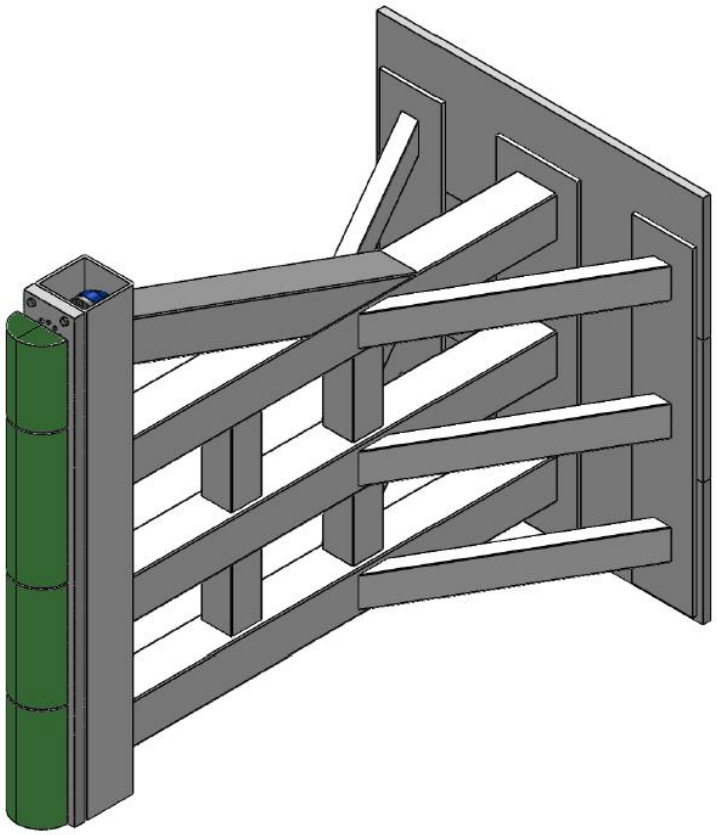
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

RIGID POLE LOAD CELL DATA

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



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 GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	Yes	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	Yes	No	No	No	No
Latch Separated from Striker	Yes	No	No	No	No
Jammed Shut	Yes	No	No	No	No
If Door Opened at Striker, Record Width of Opening at Striker (mm)	85	0	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 GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

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	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes

IMPACT POINT LOCATION DATA

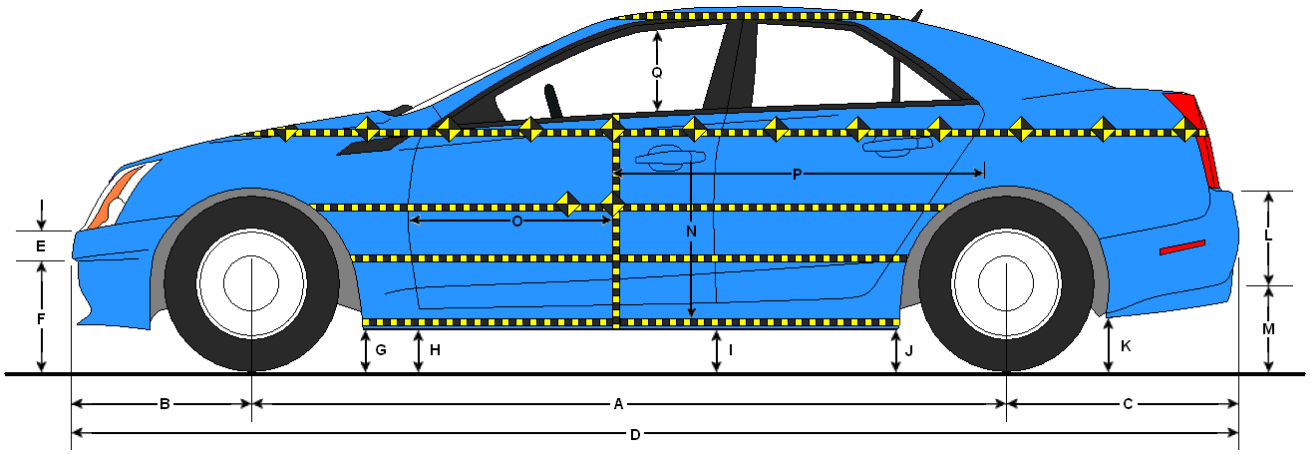
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1265
Actual Impact Point (Aft of Front Axle)	mm		1273
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-8
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	74.6
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.84
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.82

DATA SHEET NO. 9

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



LEFT SIDE VIEW

All measurements in mm with tolerance of ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

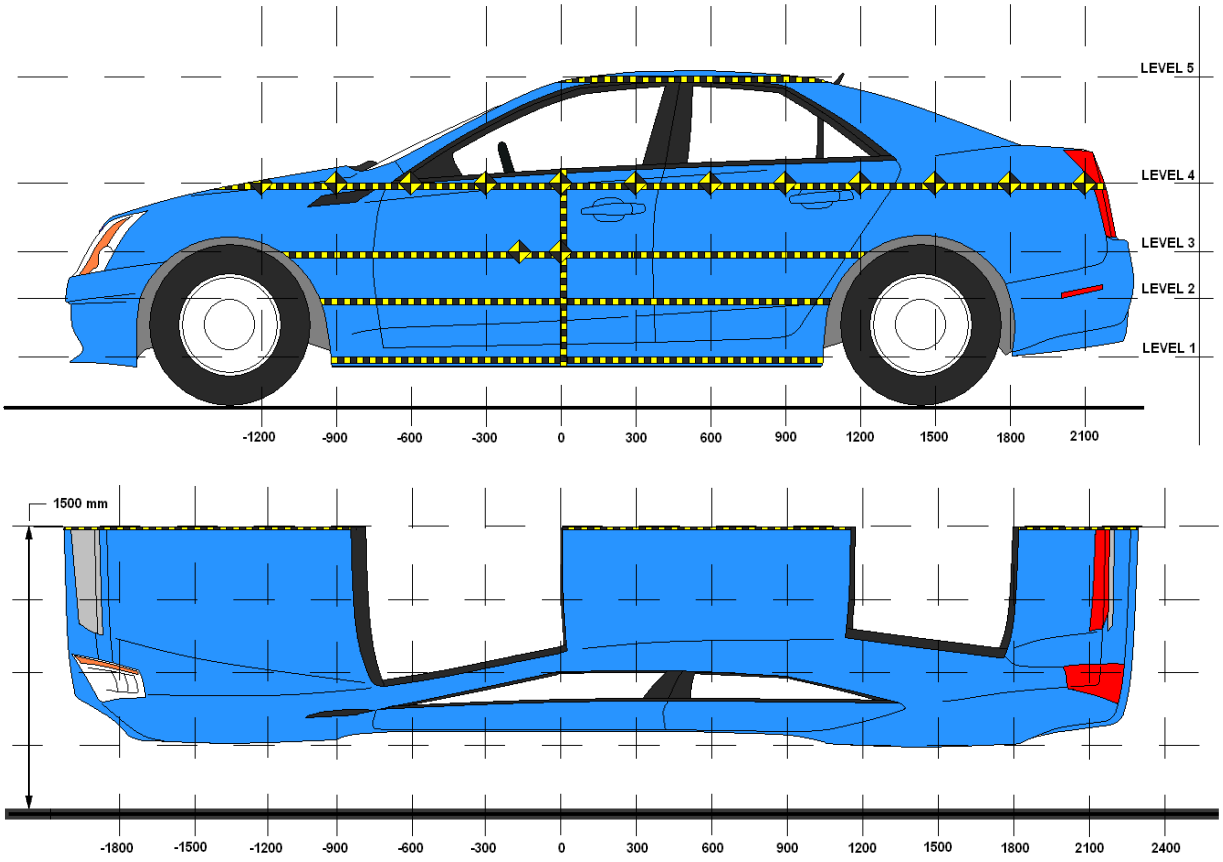
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2990	2950	-40
B	Front Axle to FSOV	928	954	26
C	Rear Axle to RSOV	1007	1022	15
D	Total Length at Centerline	4925	4926	1
E	Front Bumper Thickness	411	412	1
F	Fromt Bumper Bottom to Ground	402	405	3
G	Sill Height at Front Wheel Well	340	345	5
H	Sill Height at Front Door Leading Edge	340	339	-1
I	Sill Height at B-Pillar	369	363	-6
J1	Sill Height at Rear Wheel Well	302	324	22
J2	Pinch Weld Height at Rear Wheel Well	276	285	9
K	Sill Height Aft of Rear Wheel Well	379	383	4
L	Rear Bumper Thickness	179	180	1
M	Rear Bumper Bottom to Ground	534	535	1
N	Sill Height to Bottom of Front Window Sill	780	809	29
O	Front Door Leading Edge to Impact CL	653	606	-47
P	Rear Door Trailing Edge to Impact CL	1639	1562	-77
Q	Front Window Opening	474	481	7
R	Right Side Length	3568	3578	10
S	Left Side Length	3568	3503	-65
T	Vehicle Width at B-Pillar	1932	1862	-70

DATA SHEET NO. 10

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



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	416	254	0
2	Occupant H-Point	778	292	0
3	Mid-Door	830	294	0
4	Window Sill	1098	243	0
5	Window Top	1699	91	150

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

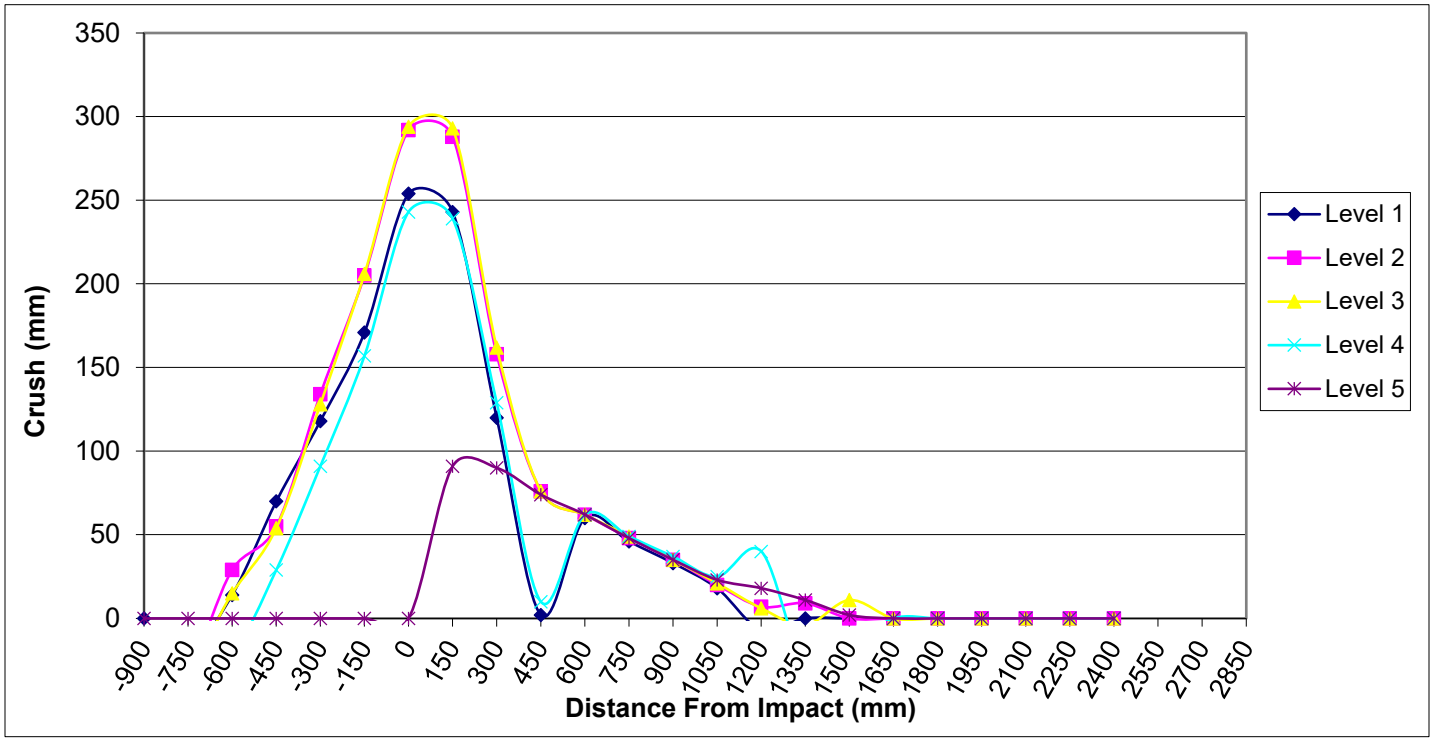
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900		525	528	616			500	501	591			-25	-27	-25	
-750	565	535	537	605		546	506	508	584		-19	-29	-29	-21	
-600	577	542	540	602		591	571	555	582		14	29	15	-20	
-450	580	543	541	599		650	598	595	628		70	55	54	29	
-300	582	544	541	594		700	678	669	685		118	134	128	91	
-150	583	544	540	591		754	749	746	748		171	205	206	157	
0	583	544	540	586		837	836	834	829		254	292	294	243	
150	583	545	541	588	830	826	833	834	827	921	243	288	293	239	91
300	583	546	543	581	838	703	704	705	710	928	120	158	162	129	90
450	582	547	544	582	842	584	623	620	592	916	2	76	76	10	74
600	582	548	546	583	845	642	610	608	645	907	60	62	62	62	62
750	582	549	547	583	848	628	597	596	632	896	46	48	49	49	48
900	580	549	548	581	850	613	584	583	618	885	33	35	35	37	35
1050	576	547	546	577	854	594	567	567	602	877	18	20	21	25	23
1200	570	538	539	545	856	563	545	545	585	874	-7	7	6	40	18
1350		528	532	567	858		537	528	539	869		9	-4	-28	11
1500			495	565	862			506	548	864			11	-17	2
1650															
1800															
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

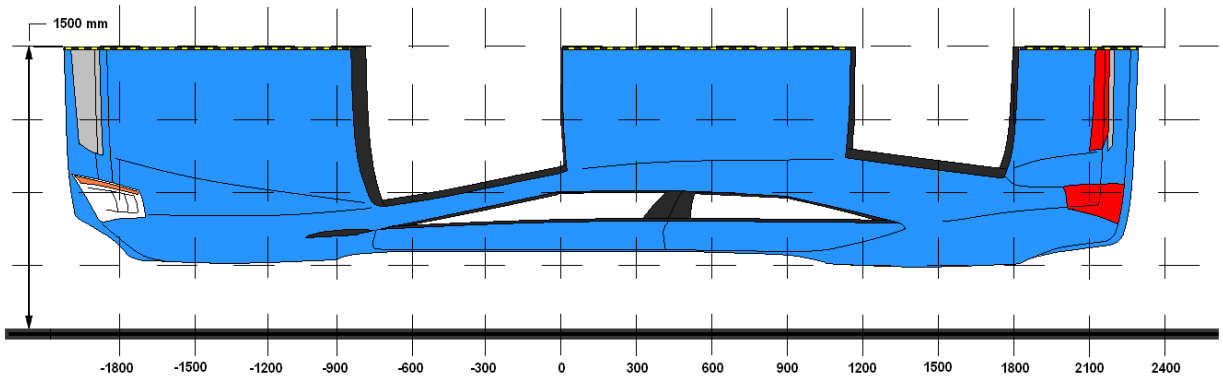


DATA SHEET NO. 11

VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1500	3	495	506	11
2	900	4	581	618	37
3	450	2	547	623	76
4	0	3	540	834	294
5	-450	1	580	650	70
6	-900	2	525	500	-25

DATA SHEET NO. 12

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21

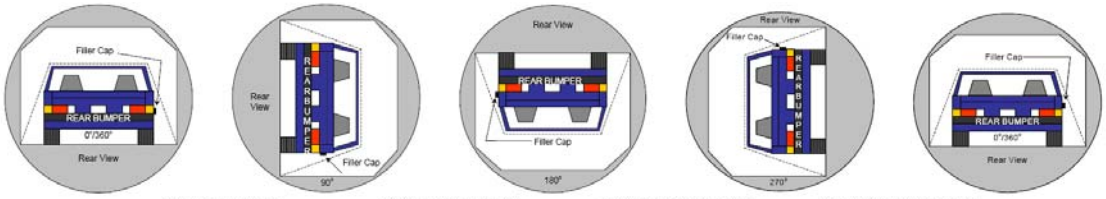
Temperature at Time of Impact: 12.8° C Test Time: 3:02 PM

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

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

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

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



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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	81	300	381
90° To 180°	80	300	380
180° To 270°	82	302	384
270° To 360°	81	300	381

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

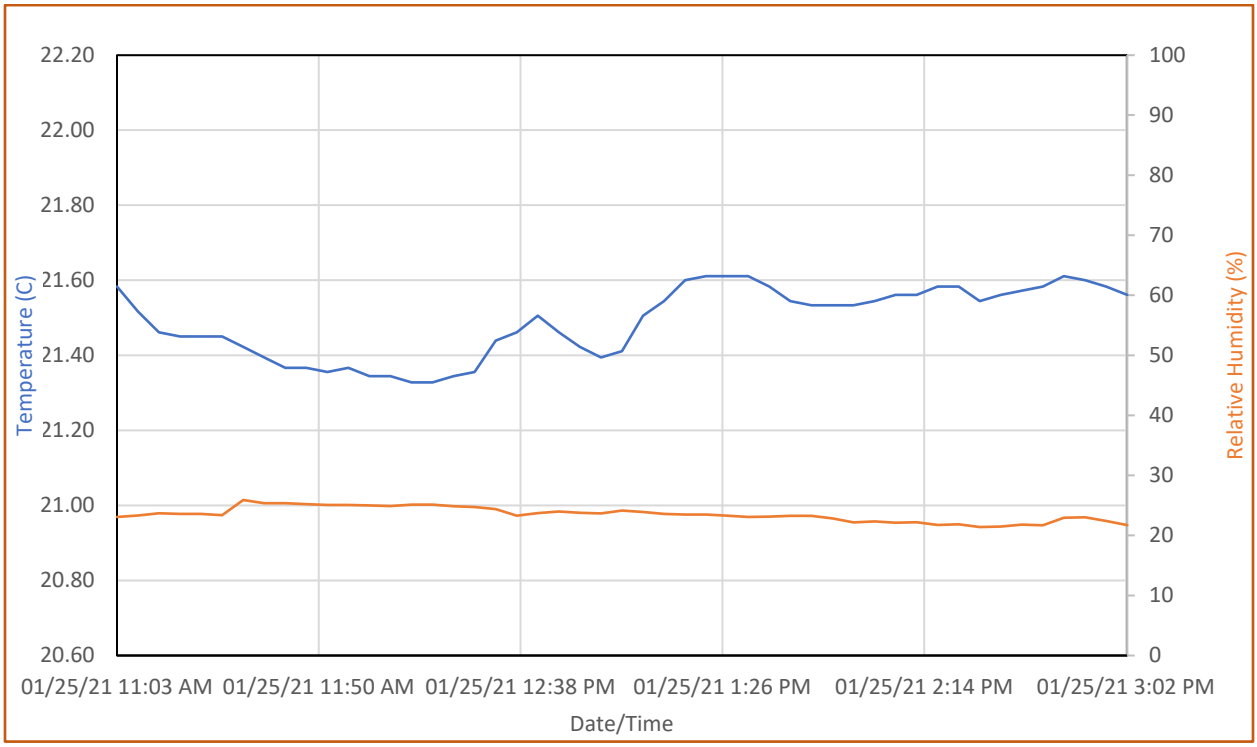
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 13

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2021 Mercedes-Benz GLE350 5-Door SUV NHTSA No. M20214308

Test Program: NCAP Side Pole Impact Test Test Date: 01/25/21



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

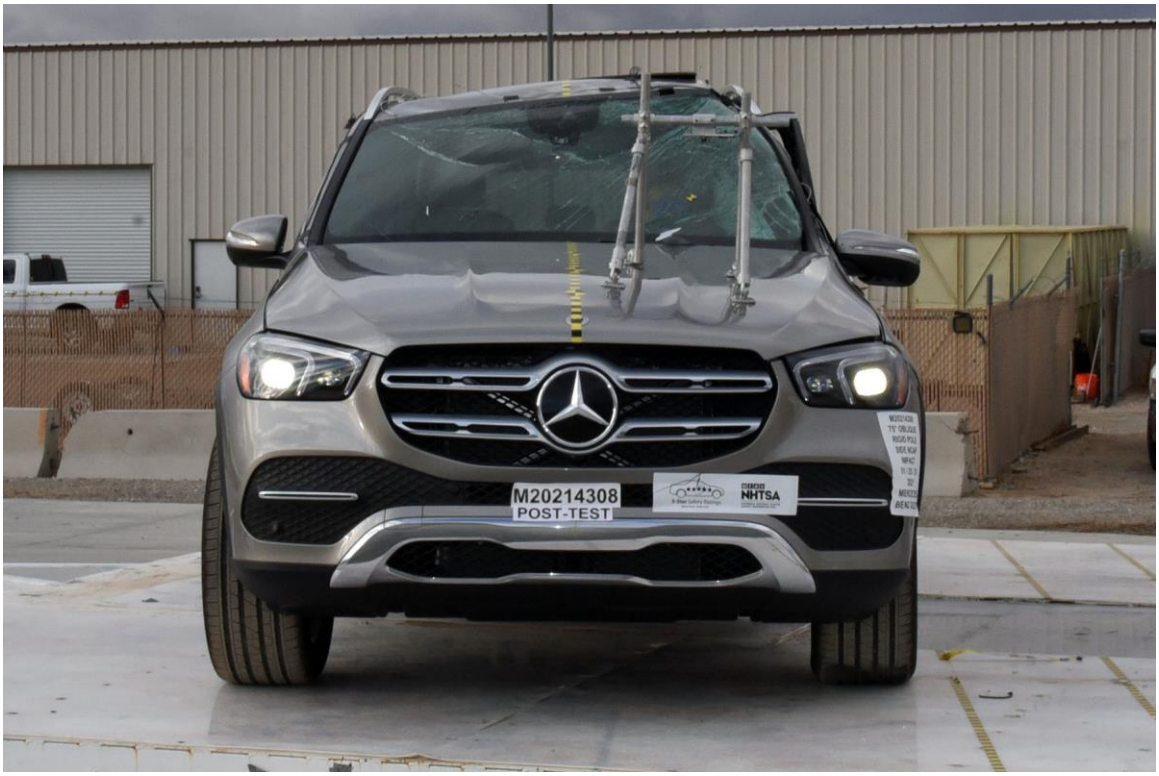


FIGURE 4. Post-Test Frontal View of Test Vehicle

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

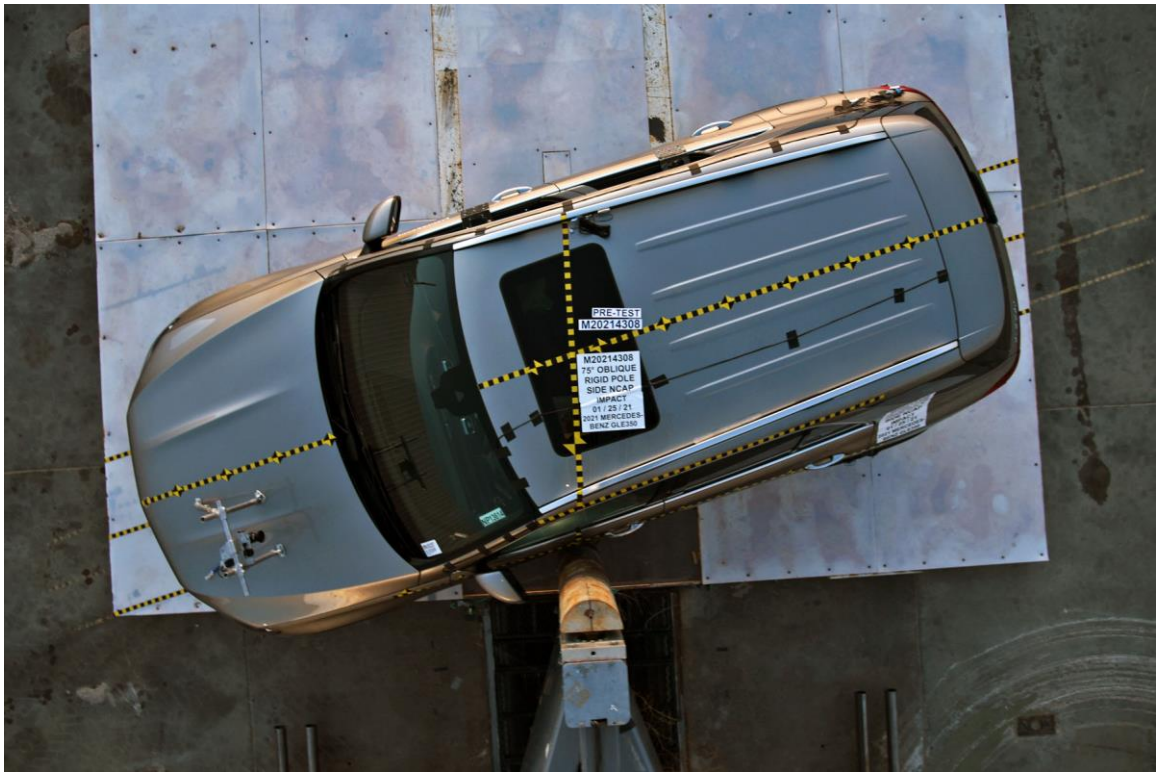


FIGURE 15. Pre-Test Overhead View of Test Area

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

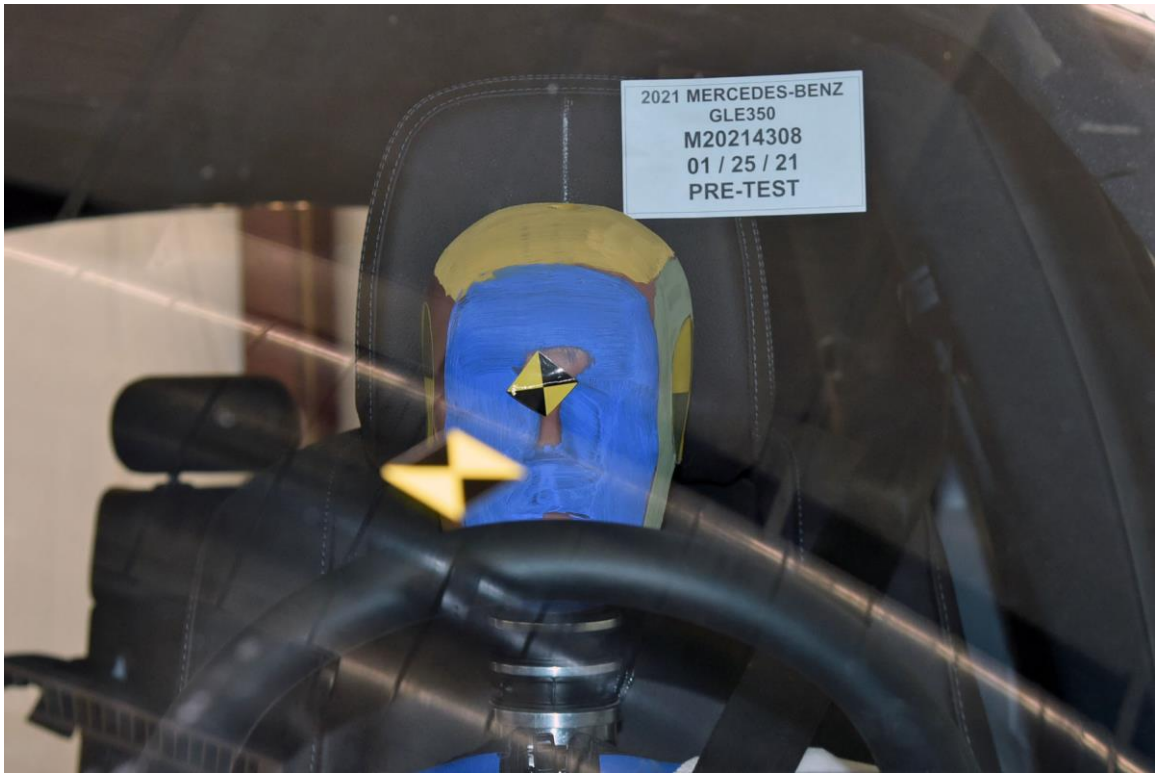


FIGURE 21. Pre-Test Front Close-Up View of Dummy Head and Chest

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

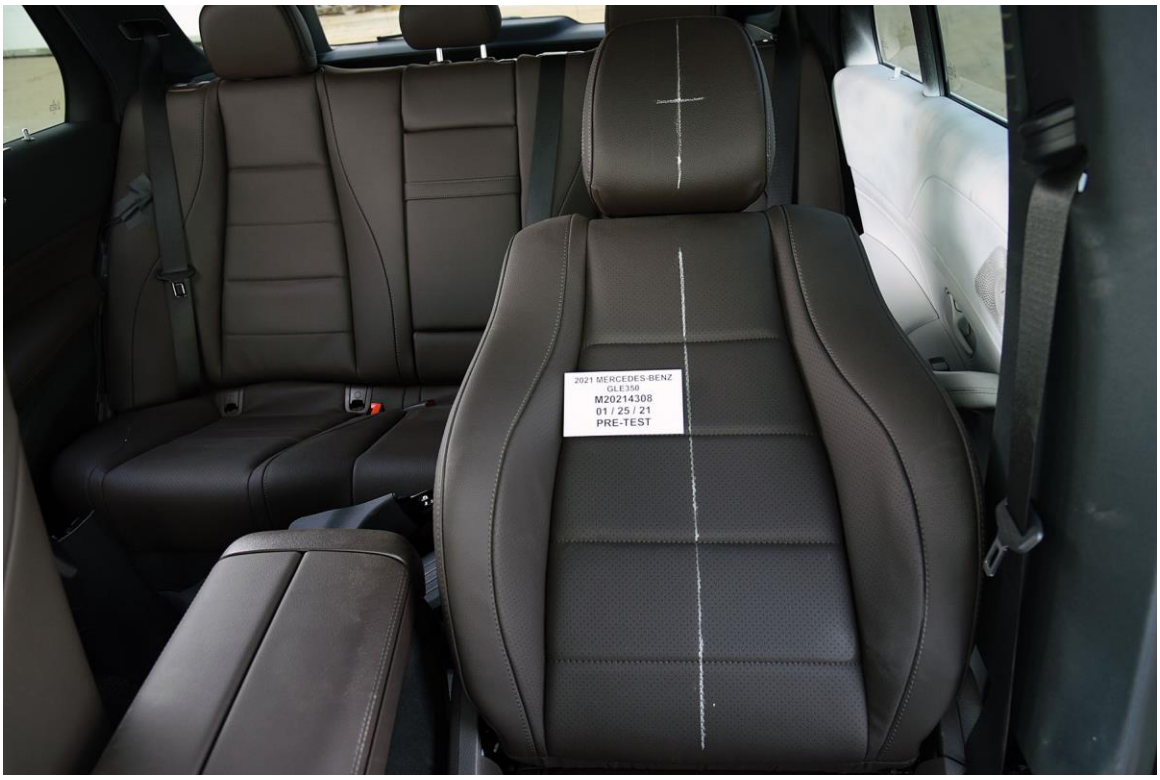


FIGURE 26. Pre-Test Frontal View of Seat Back Prior to Dummy Positioning

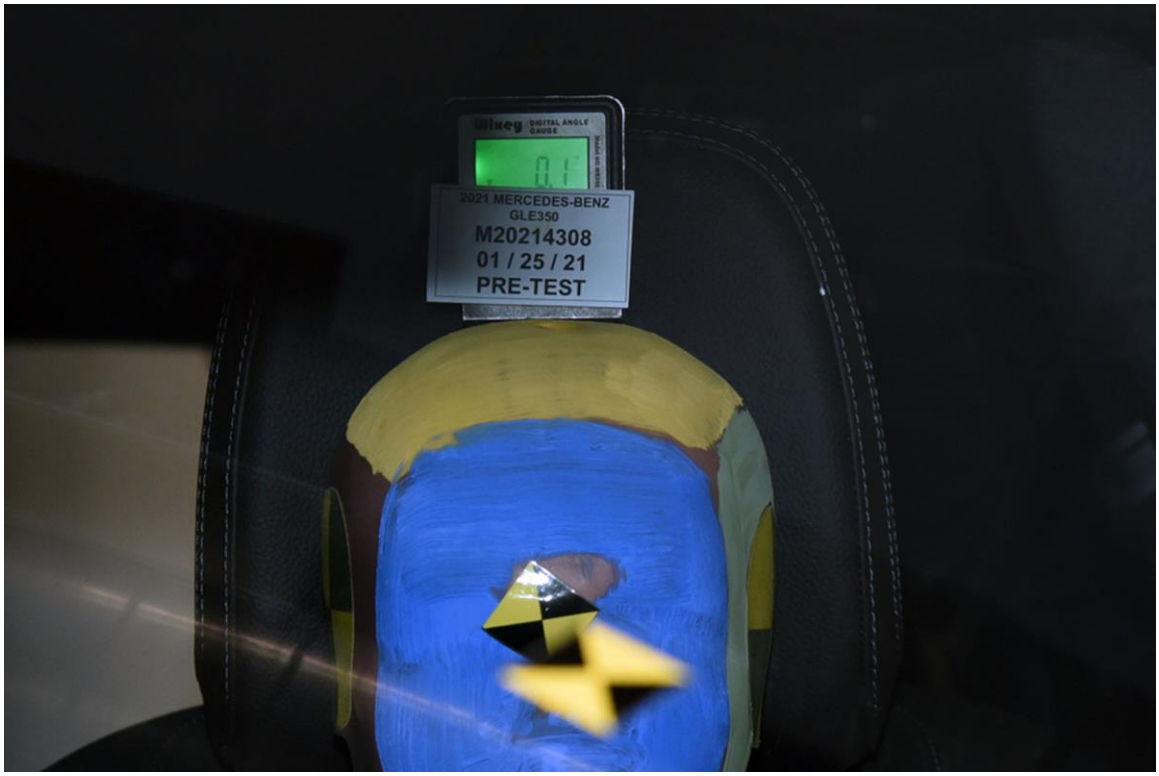


FIGURE 27. Pre-Test Frontal Close-Up View of
Dummy Head and Shoulders in Relation to Head Restraint

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

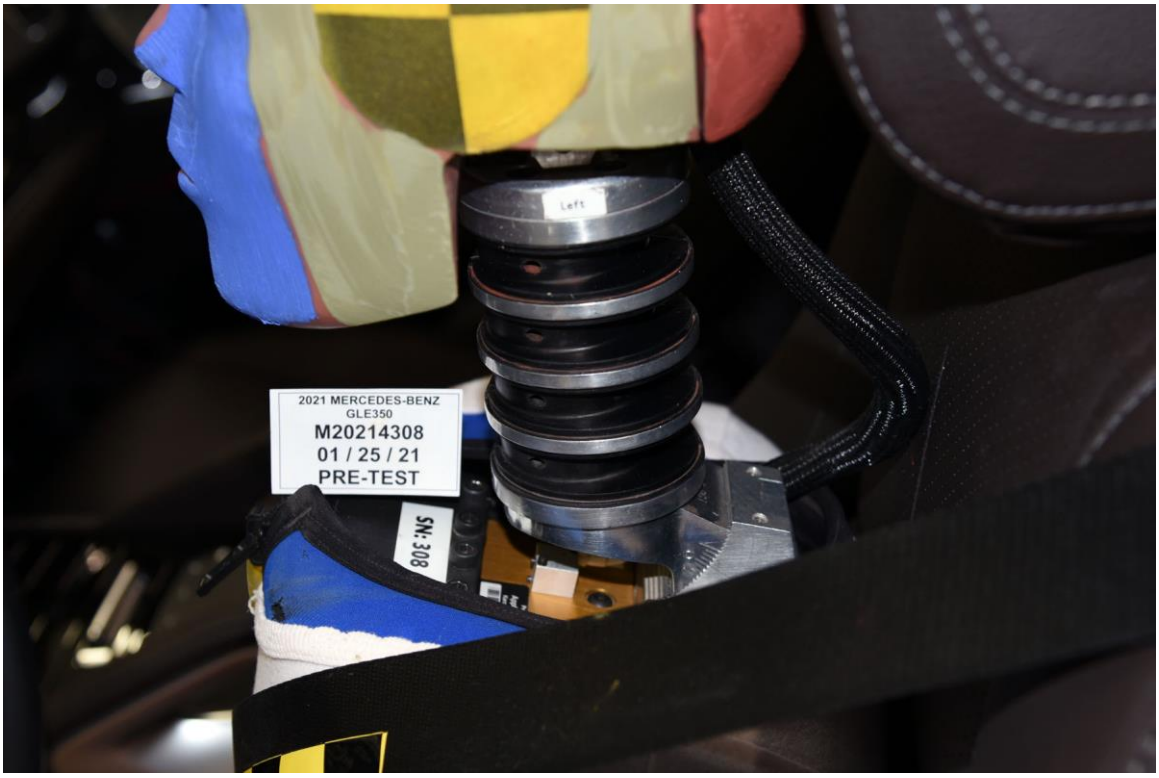


FIGURE 30. Pre-Test Left Side View of Dummy's Neck
Showing Position of Adjustable Neck Bracket

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

Photograph Not Available

FIGURE 41. Post-Test Dummy and Door Clearance View

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

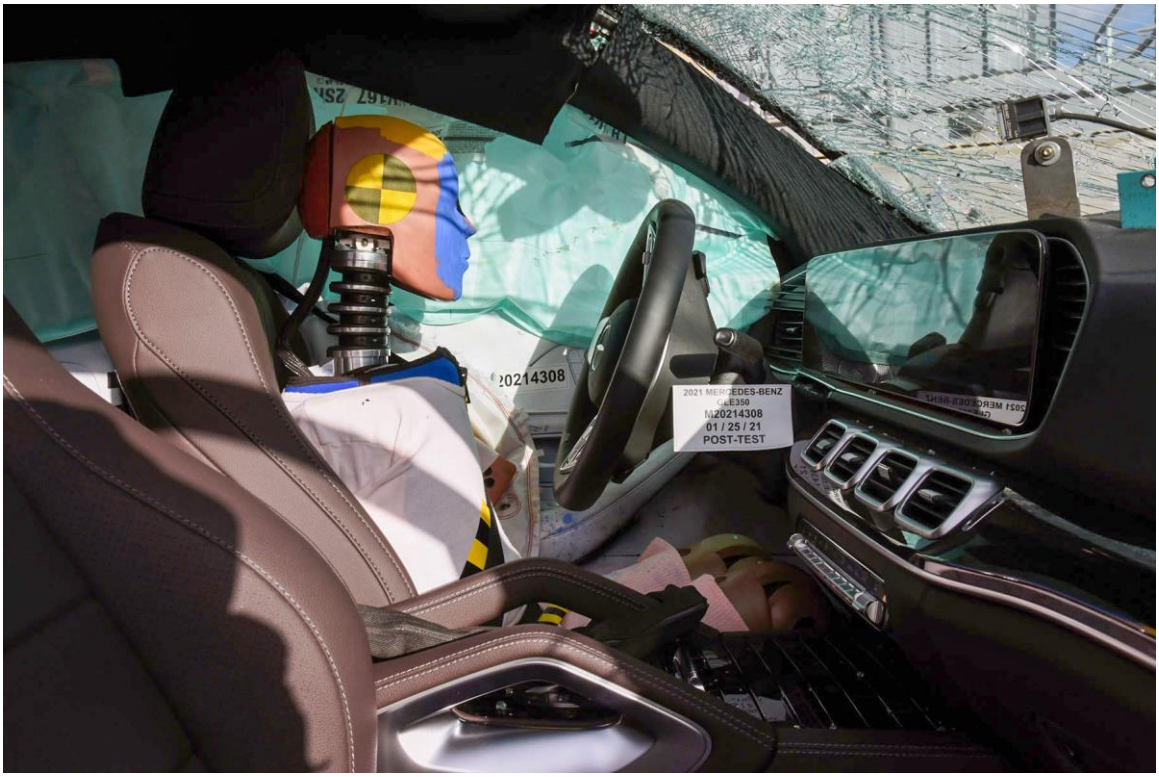


FIGURE 43. Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment

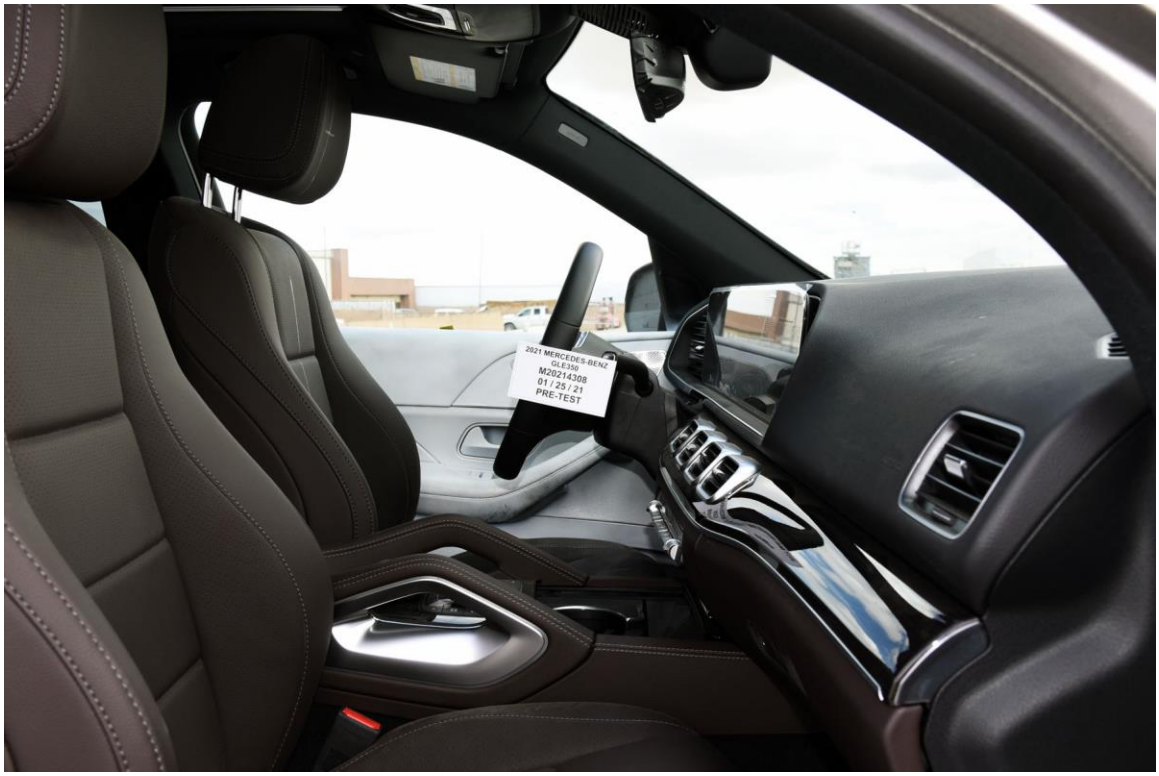


FIGURE 44. Pre-Test Inner Door Panel View

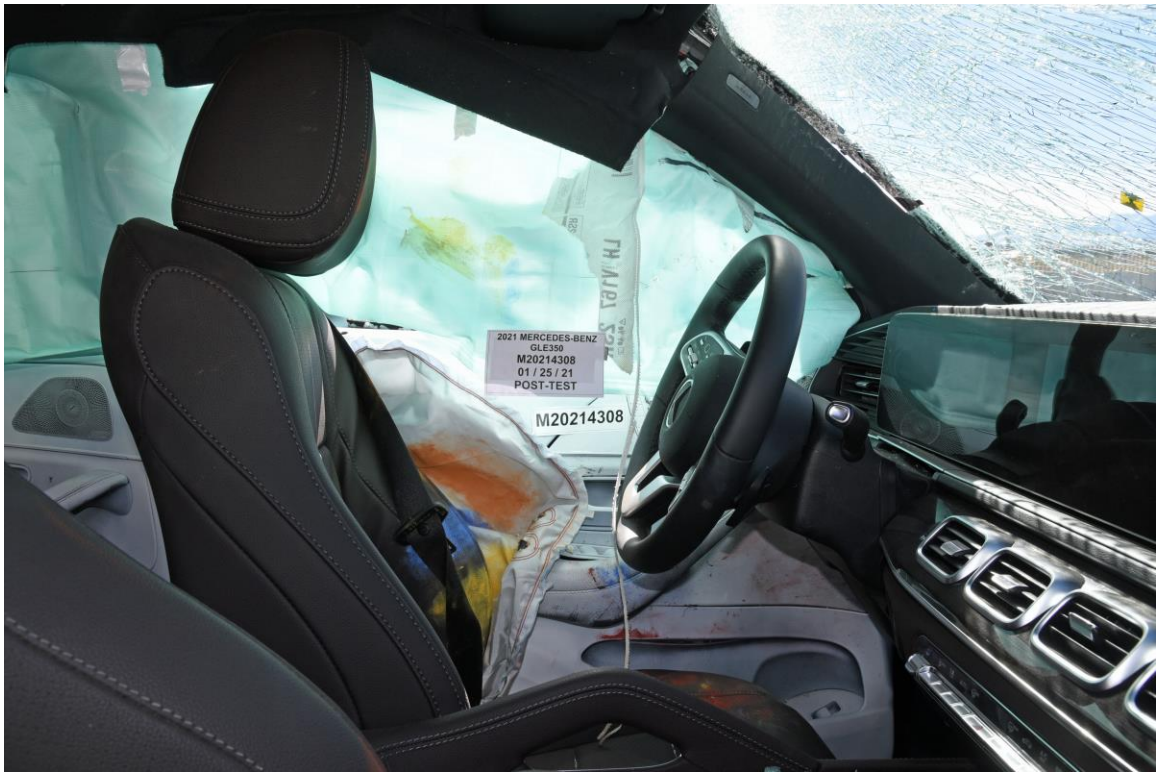


FIGURE 45. Post-Test Inner Door Panel View Showing Dummy Contact Locations

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

Photograph Not Applicable

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

Photograph Not Applicable

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

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

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

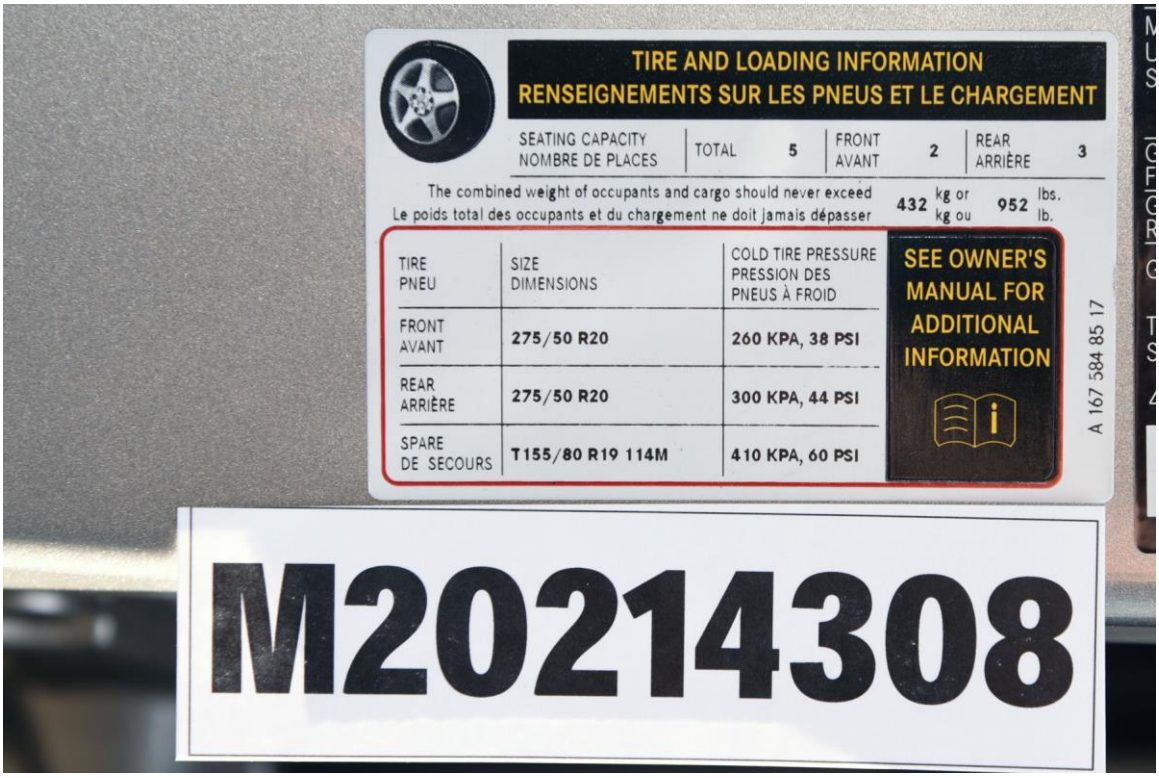


FIGURE 58. Close-Up View of Vehicle's Tire Information Placard or Label

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

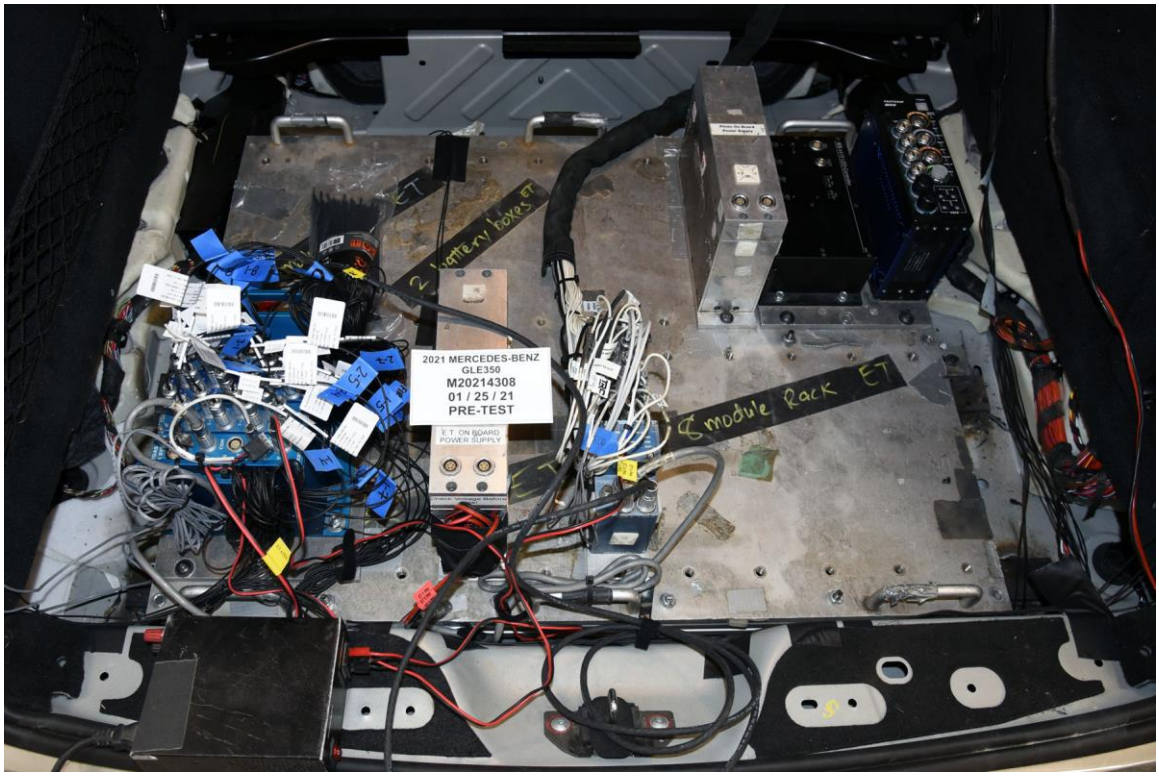


FIGURE 63. Pre-Test Ballast View

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

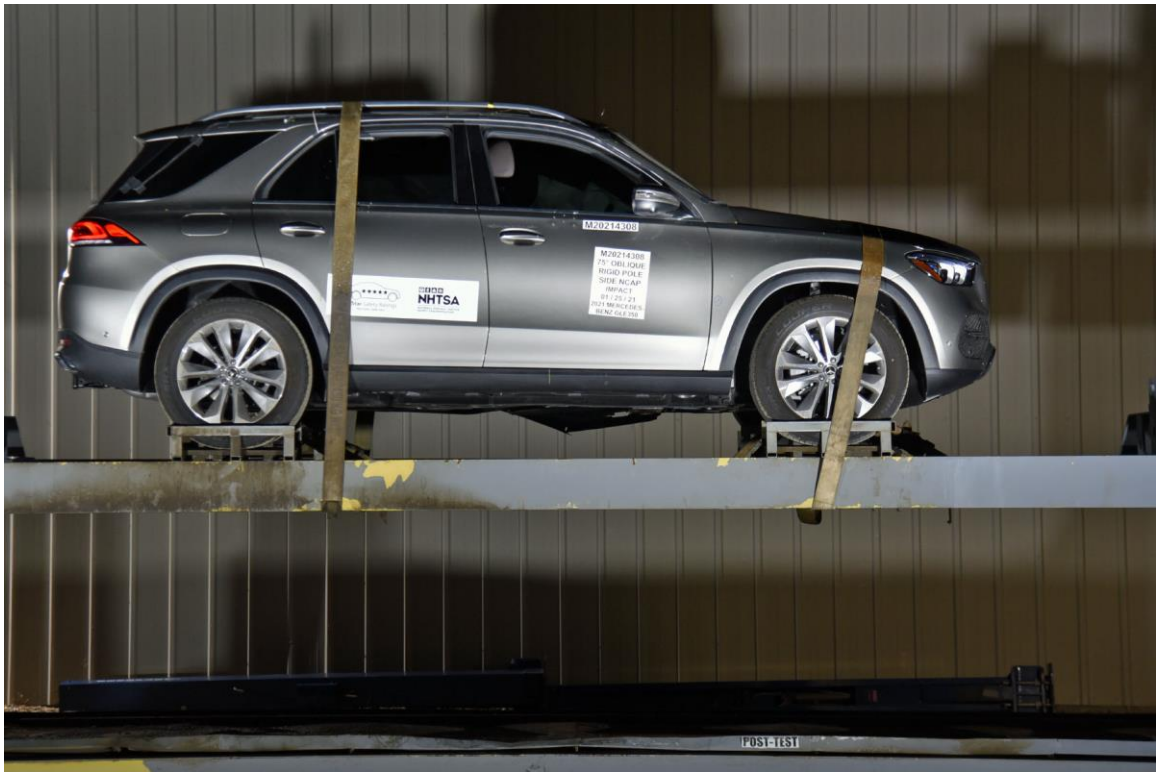


FIGURE 65. FMVSS No. 301 Static Rollover 0 Degrees

FIGURE 66. FMVSS No. 301 Static Rollover 90 Degrees

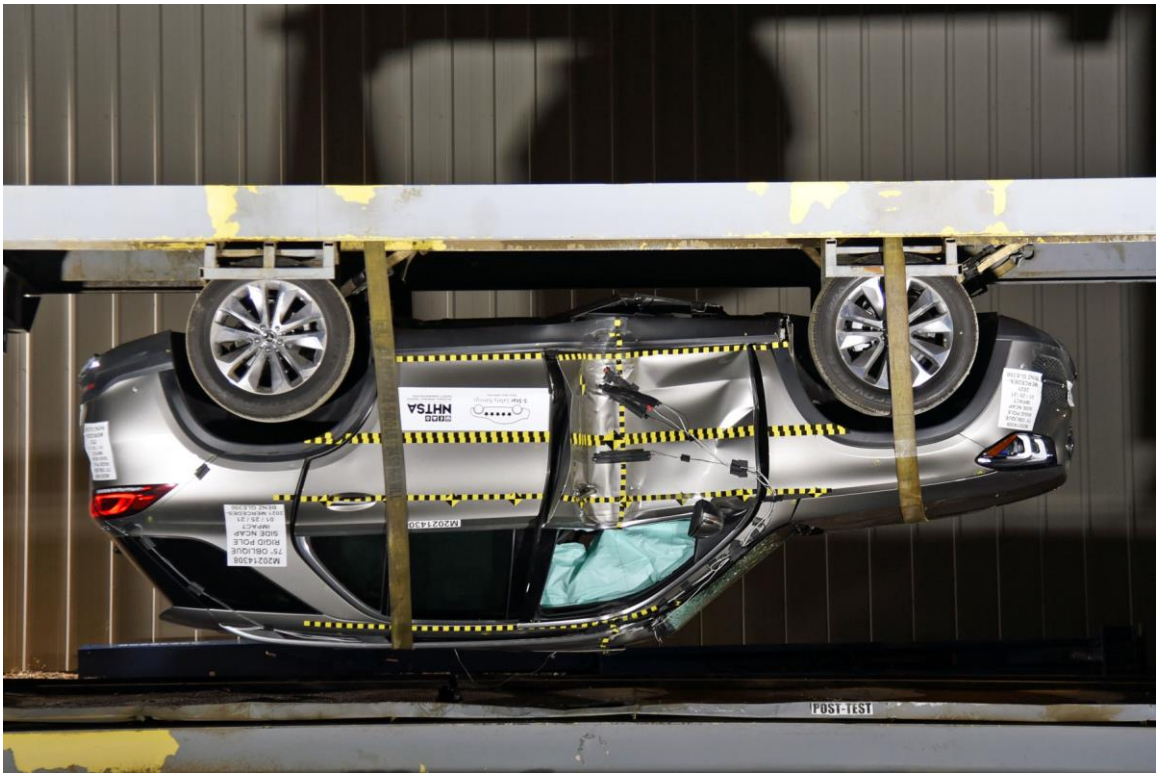


FIGURE 67. FMVSS No. 301 Static Rollover 180 Degrees

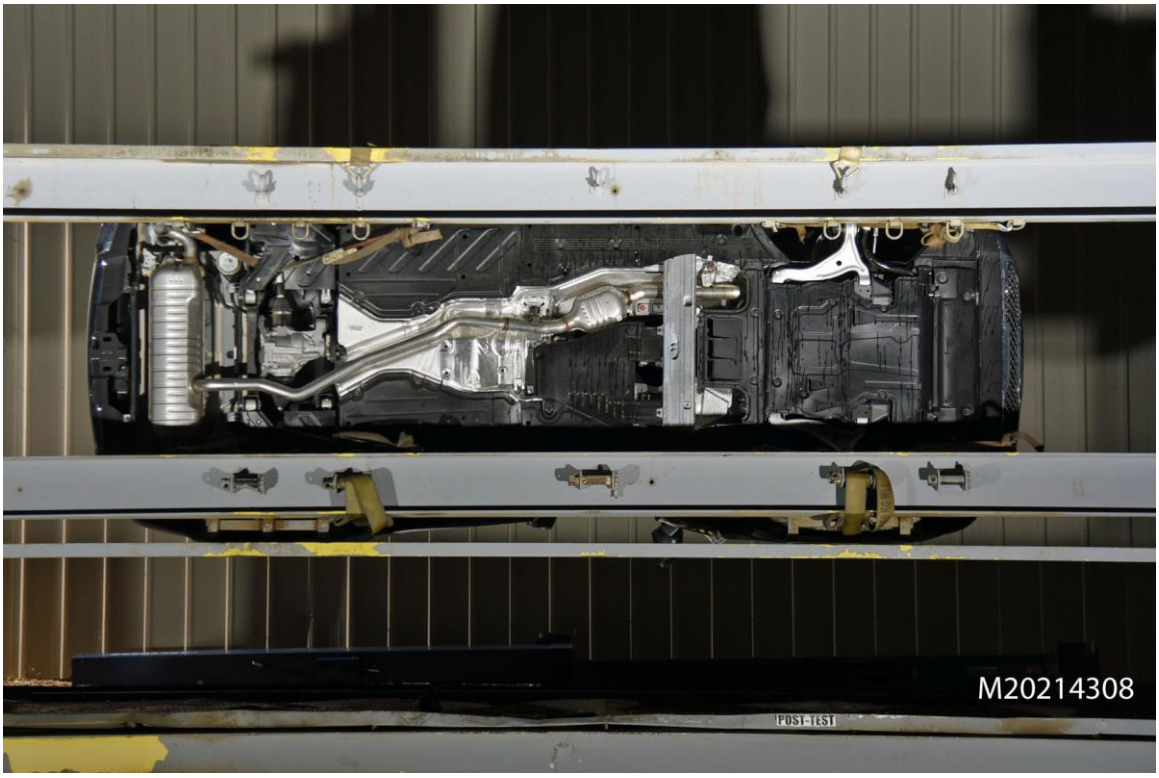


FIGURE 68. FMVSS No. 301 Static Rollover 270 Degrees

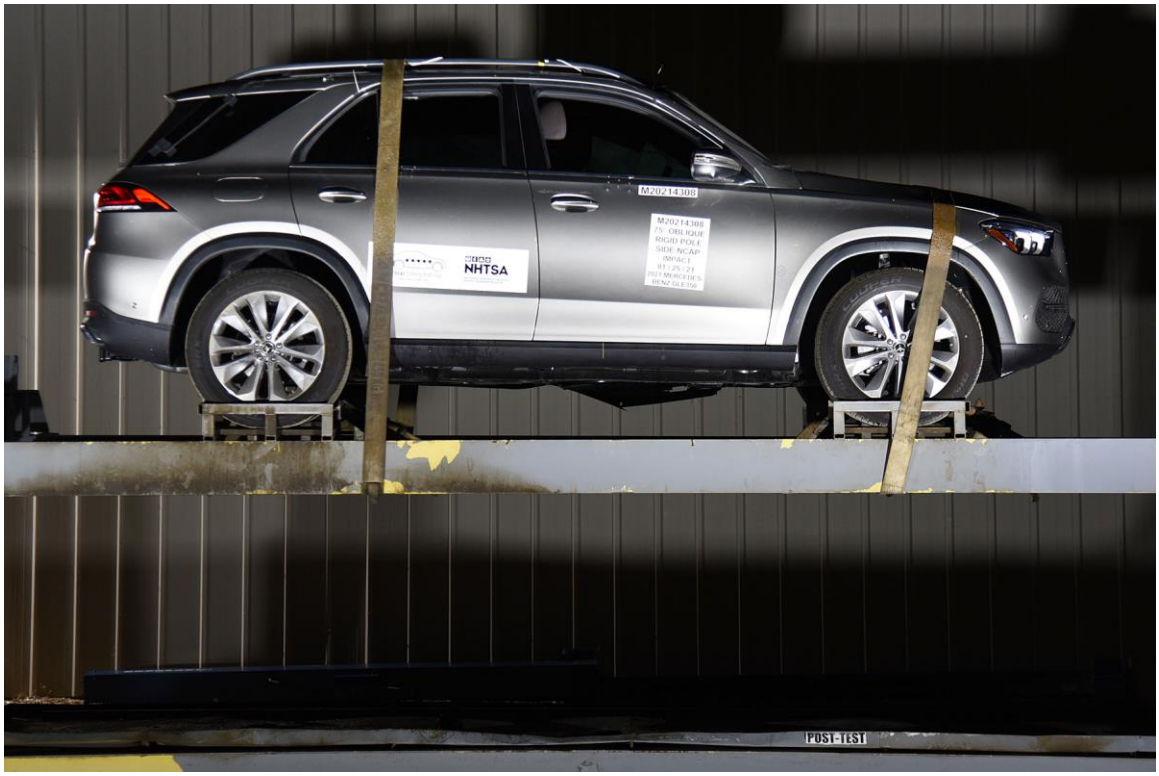
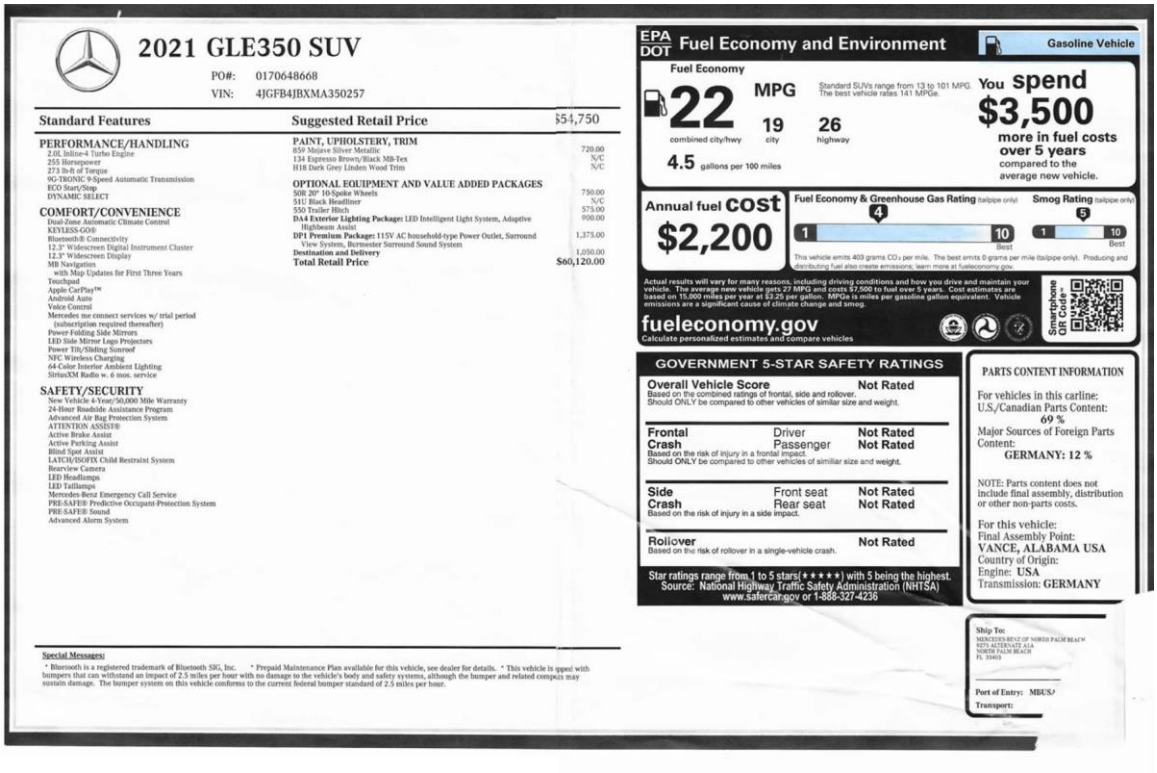


FIGURE 69. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 70. Impact Event



2021 GLE350 SUV

PO#: 0170648668
VIN: 4JGFB4JBXMA350257

Standard Features	Suggested Retail Price	$54,750
PERFORMANCE/HANDLING	PAINT, UPHOLSTERY, TRIM	
2.0L Inline-4 Turbo Engine	859 Mojave Silver Metallic	720.00
255 Horsepower	134 Espresso Brown/Black MB-Tex	N/C
273 lb-ft of Torque	H18 Dark Grey Linden Wood Trim	N/C
9G-TRONIC 9-Speed Automatic Transmission	**OPTIONAL EQUIPMENT AND VALUE ADDED PACKAGES**	
ECO Start/Stop	50R 20" 10-Spoke Wheels	750.00
DYNAMIC SELECT	51U Black Headliner	N/C
COMFORT/CONVENIENCE	550 Trailer Hitch	575.00
Dual-Zone Automatic Climate Control	**DA4 Exterior Lighting Package:** LED Intelligent Light System, Adaptive Highbeam Assist	900.00
KEYLESS-GO®	**DP1 Premium Package:** 115V AC household-type Power Outlet, Surround View System, Burmester Surround Sound System	1,375.00
Bluetooth® Connectivity	**Destination and Delivery**	1,050.00
12.3" Widescreen Digital Instrument Cluster	**Total Retail Price**	$60,120.00
12.3" Widescreen Display		
MB Navigation		
with Map Updates for First Three Years		
Touchpad		
Apple CarPlay™		
Android Auto		
Voice Control		
Mercedes me connect services w/ trial period (subscription required thereafter)		
Power-Folding Side Mirrors		
LED Side Mirror Logo Projectors		
Power Tilt/Sliding Sunroof		
NFC Wireless Charging		
64-Color Interior Ambient Lighting		
SiriusXM Radio w. 6 mos. service		
SAFETY/SECURITY		
New Vehicle 4-Year/50,000 Mile Warranty		
24-Hour Roadside Assistance Program		
Advanced Air Bag Protection System		
ATTENTION ASSIST®		
Active Brake Assist		
Active Parking Assist		
Blind Spot Assist		
LATCH/ISOFIX Child Restraint System		
Rearview Camera		
LED Headlamps		
LED Taillamps		
Mercedes-Benz Emergency Call Service		
PRE-SAFE® Predictive Occupant Protection System		
PRE-SAFE® Sound		
Advanced Alarm System		

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 spec'd 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

22 MPG combined city/hwy — 19 city — 26 highway

4.5 gallons per 100 miles

Standard SUVs range from 13 to 101 MPG. The best vehicle rates 141 MPGe.

You spend **$3,500** more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost **$2,200**

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 4 (1 — 10 Best)

Smog Rating (tailpipe only): 5 (1 — 10 Best)

This vehicle emits 403 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions; learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs $7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $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 Link

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score — Not Rated
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash (Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar 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: **69 %**
Major Sources of Foreign Parts Content: **GERMANY: 12 %**

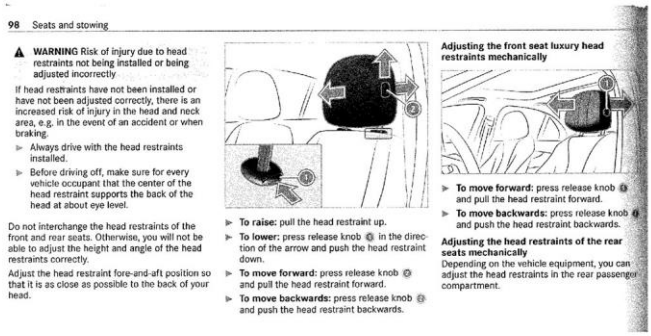
NOTE: Parts content does not include final assembly, distribution or other non-parts costs.

For this vehicle:
Final Assembly Point: **VANCE, ALABAMA USA**
Country of Origin:
Engine: **USA**
Transmission: **GERMANY**

Ship To:
MERCEDES-BENZ OF NORTH PALM BEACH
5275 ALTERNATE A1A
NORTH PALM BEACH
FL 33403

Port of Entry: MBUS/
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.

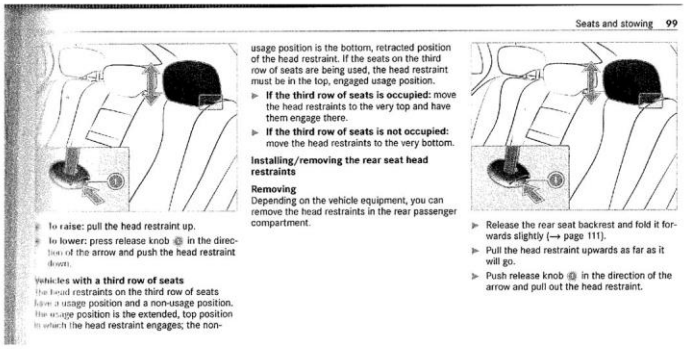
- **To raise:** pull the head restraint up.
- **To lower:** press release knob ⓒ in the direction of the arrow and push the head restraint down.
- **To move forward:** press release knob ⓒ and pull the head restraint forward.
- **To move backwards:** press release knob ⓒ and push the head restraint backwards.

Adjusting the front seat luxury head restraints mechanically

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

Photograph Not Applicable

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 Redundant (X)

Driver Head Acceleration Redundant (Y)

Driver Head Acceleration Redundant (Z)

Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)

Vehicle Center of Gravity Acceleration (Y)

Vehicle Center of Gravity Acceleration (Z)

Left Floor Sill Acceleration (Y)

Left A-Pillar Sill Acceleration (Y)

Left Lower A-Pillar Acceleration (Y)

Left Mid A-Pillar Acceleration (Y)

Left B-Pillar Sill Acceleration

Left Lower B-Pillar Acceleration (Y)

Left Mid B-Pillar Acceleration (Y)

Driver Seat Track at Dummy Hip Point Acceleration (Y)

Engine Top Acceleration (X)

Engine Top Acceleration (Y)

Firewall Center Acceleration (Y)

Right Roof at Vertical Impact Reference Line Acceleration (Y)

Right Sill at Vertical Impact Reference Line Acceleration (Y)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)

Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)

Load Cell Pole Barrier #2 Force (Y)

Load Cell Pole Barrier #3 Force (Y)

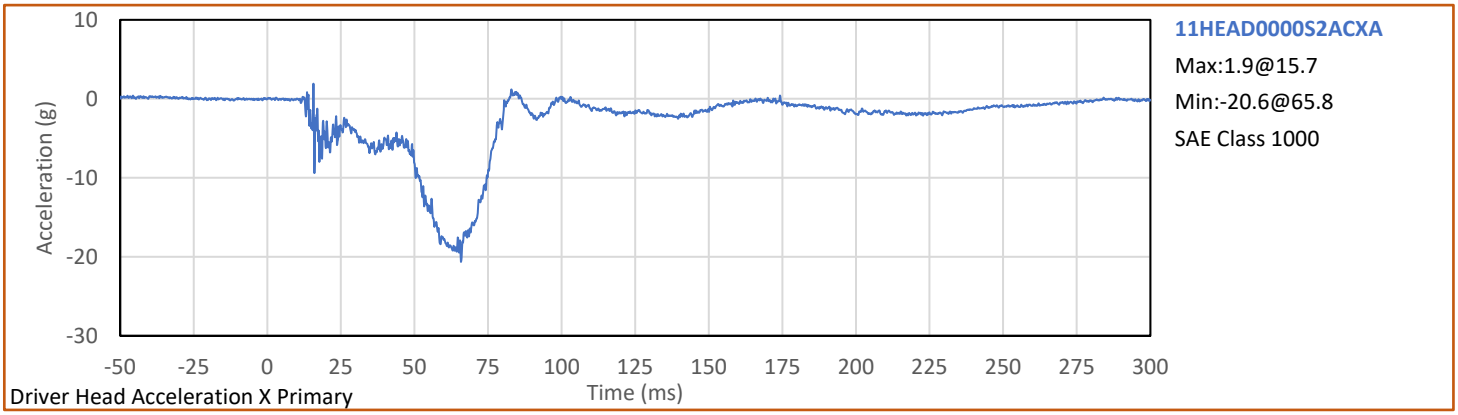
Load Cell Pole Barrier #4 Force (Y)

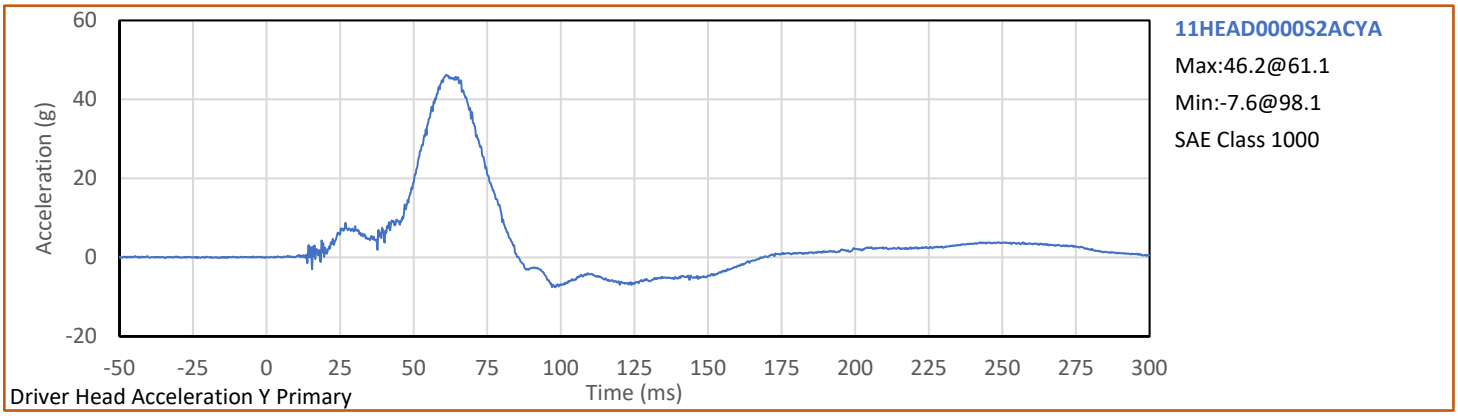
Load Cell Pole Barrier #5 Force (Y)

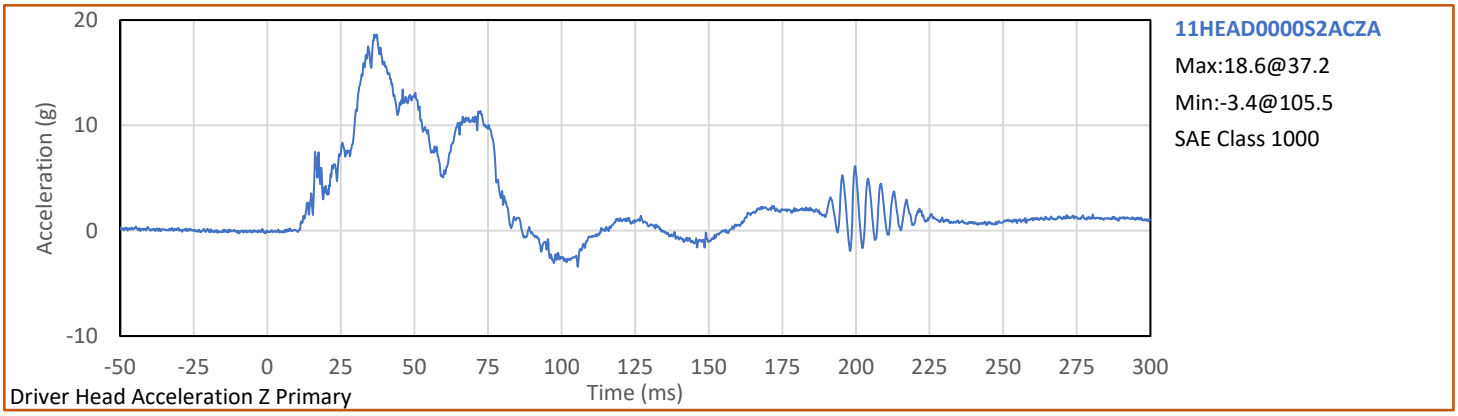
Load Cell Pole Barrier #6 Force (Y)

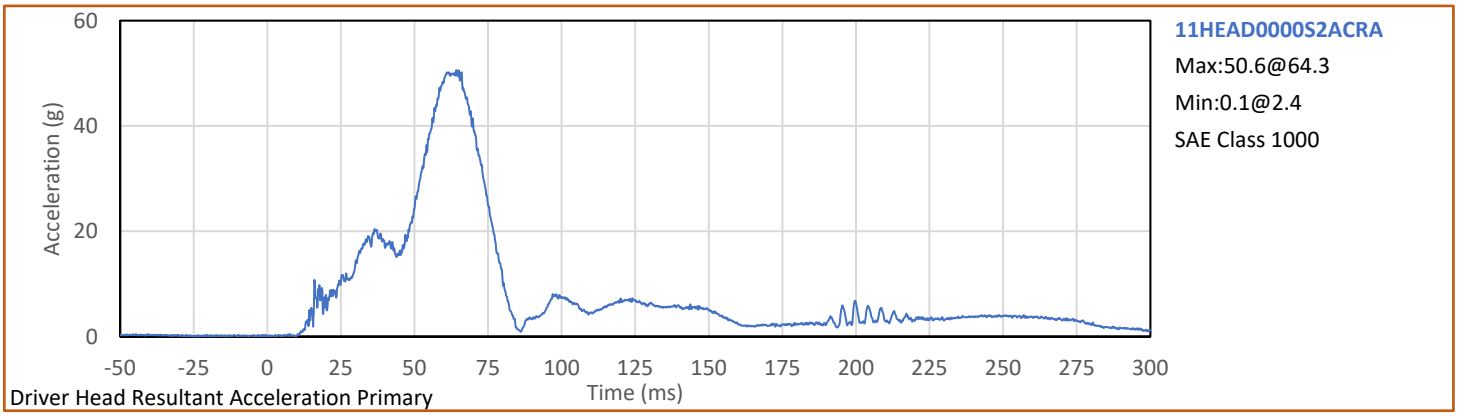
Load Cell Pole Barrier #7 Force (Y)

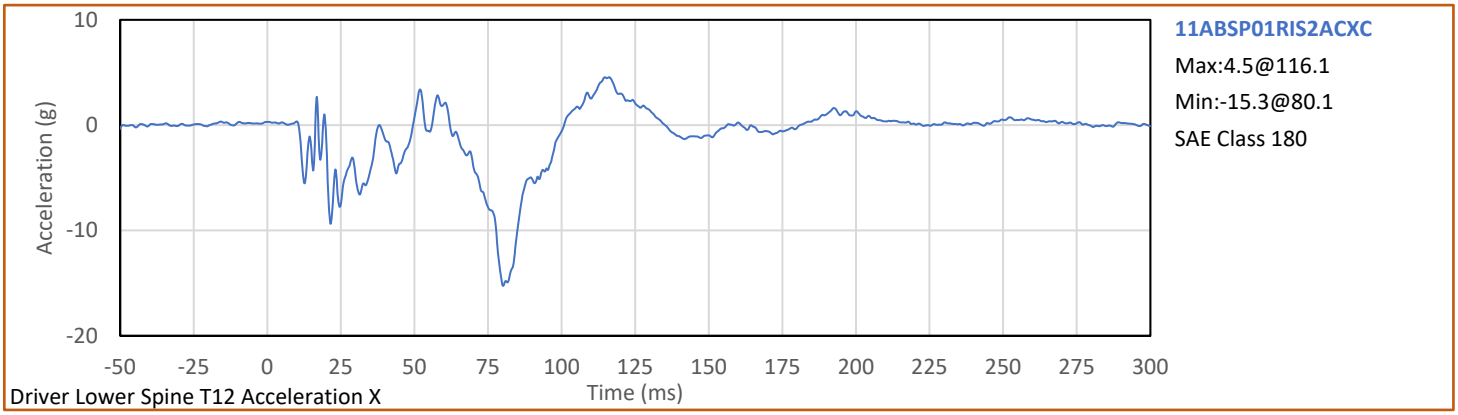
Load Cell Pole Barrier #8 Force (Y)

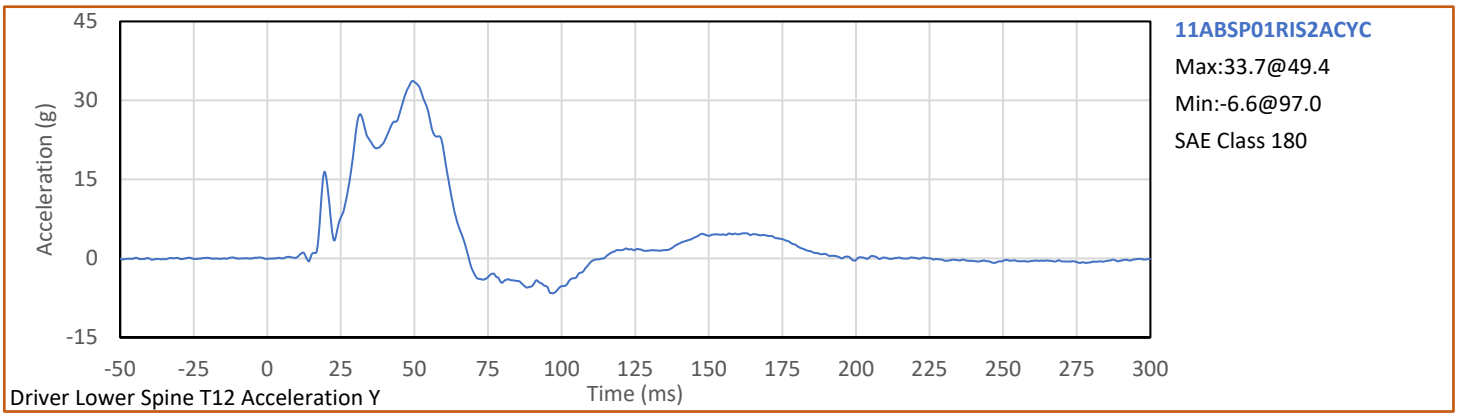

Acceleration (g)
Time (ms)
Driver Head Acceleration X Primary
11HEAD0000S2ACXA
Max:1.9@15.7
Min:-20.6@65.8
SAE Class 1000

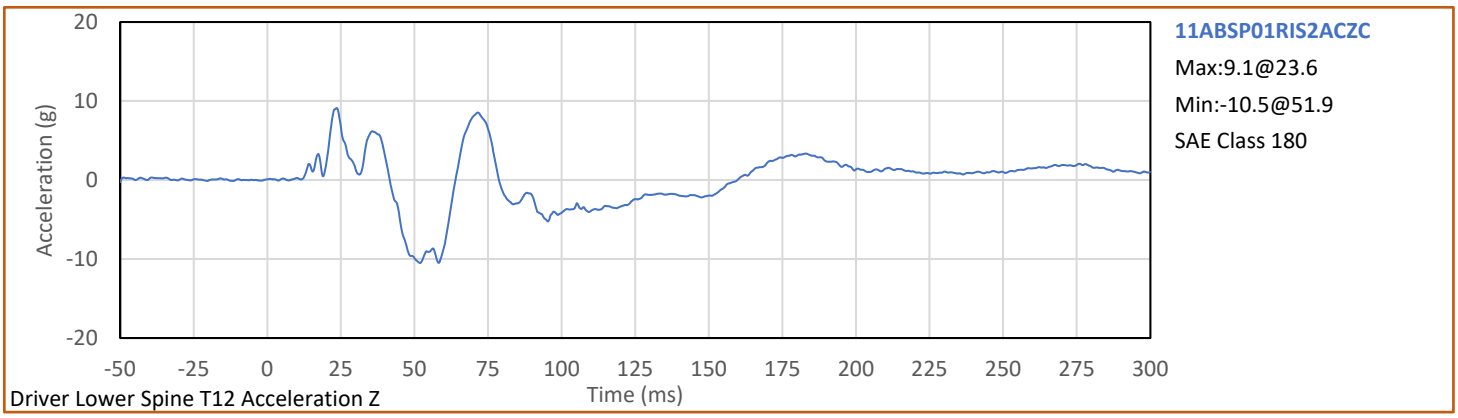

Acceleration (g)
Time (ms)
Driver Head Acceleration Y Primary
11HEAD0000S2ACYA
Max:46.2@61.1
Min:-7.6@98.1
SAE Class 1000

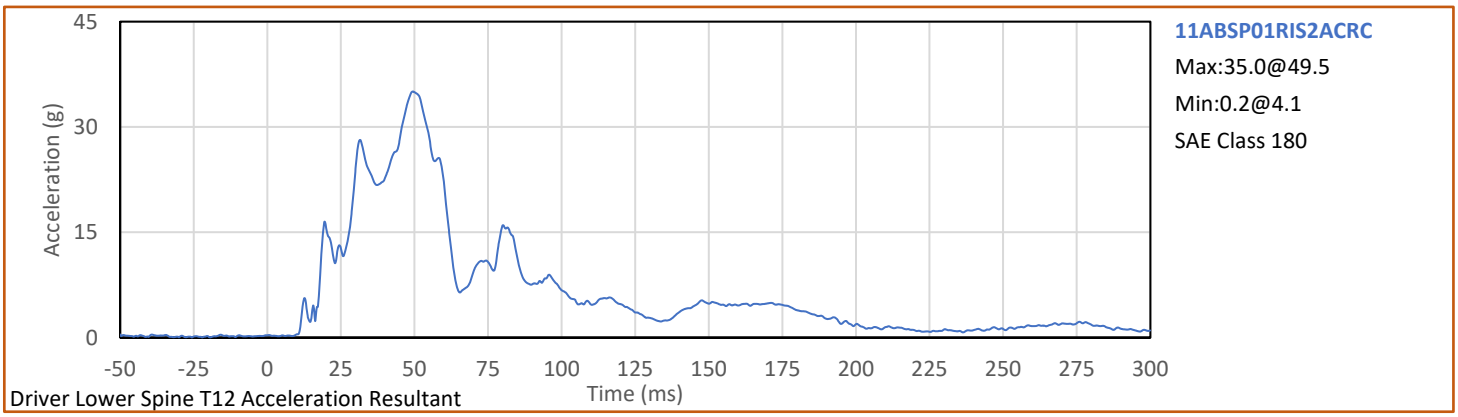

Acceleration (g)
Time (ms)
Driver Head Acceleration Z Primary
11HEAD0000S2ACZA
Max:18.6@37.2
Min:-3.4@105.5
SAE Class 1000

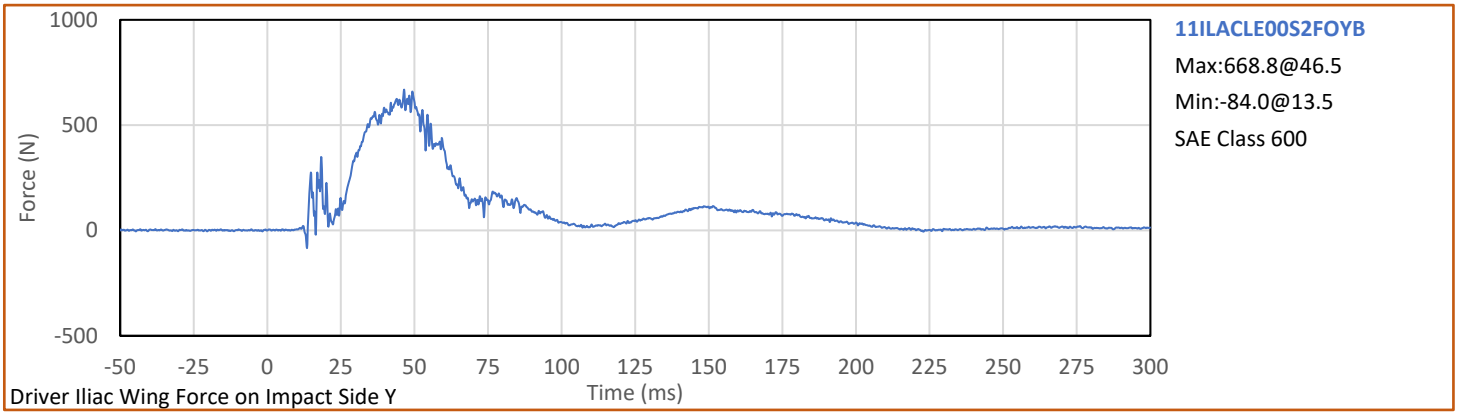

Acceleration (g)
Time (ms)
Driver Head Resultant Acceleration Primary
11HEAD0000S2ACRA
Max:50.6@64.3
Min:0.1@2.4
SAE Class 1000


11ABSP01RIS2ACXC
Max:4.5@116.1
Min:-15.3@80.1
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration X


11ABSP01RIS2ACYC
Max:33.7@49.4
Min:-6.6@97.0
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Y

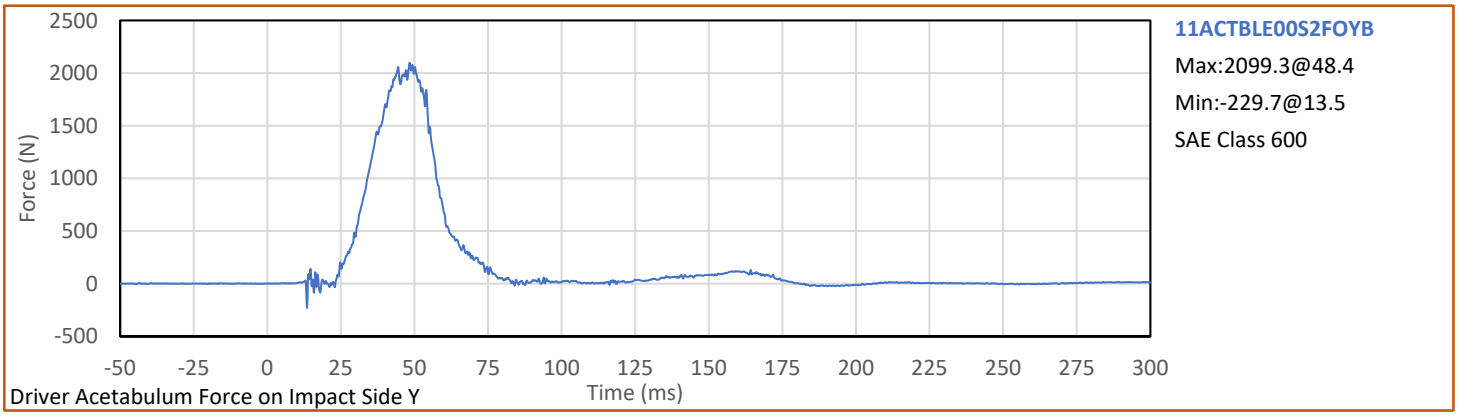

11ABSP01RIS2ACZC
Max:9.1@23.6
Min:-10.5@51.9
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Z


11ABSP01RIS2ACRC
Max:35.0@49.5
Min:0.2@4.1
SAE Class 180
Acceleration (g)
Time (ms)
Driver Lower Spine T12 Acceleration Resultant



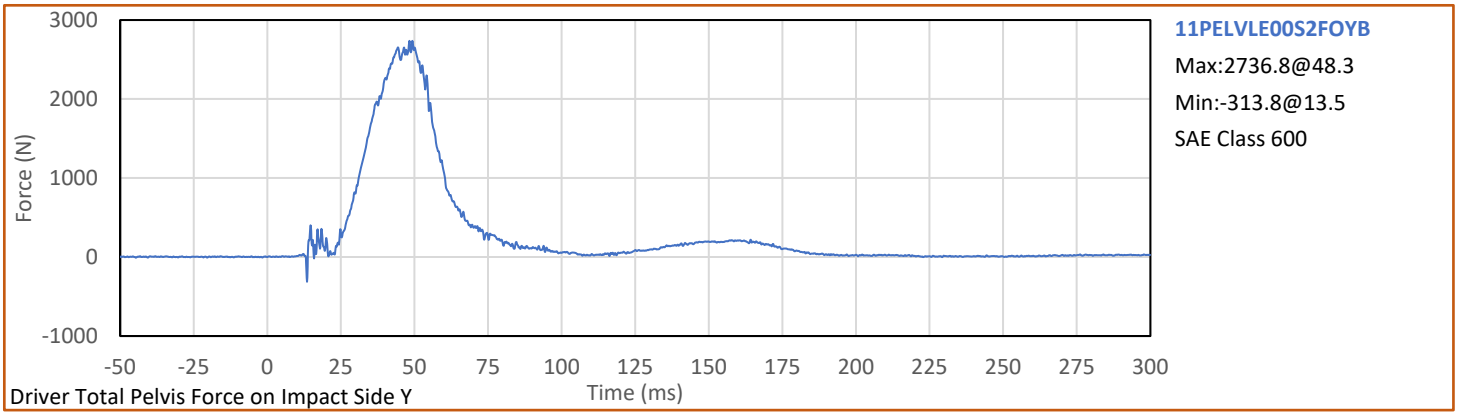
11ILACLE00S2FOYB
Max:668.8@46.5
Min:-84.0@13.5
SAE Class 600

Driver Iliac Wing Force on Impact Side Y



11ACTBLE00S2FOYB
Max:2099.3@48.4
Min:-229.7@13.5
SAE Class 600

Driver Acetabulum Force on Impact Side Y



11PELVLE00S2FOYB
Max:2736.8@48.3
Min:-313.8@13.5
SAE Class 600

Driver Total Pelvis Force on Impact Side Y

APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

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

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 308 Test Date: 2021-01-18

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

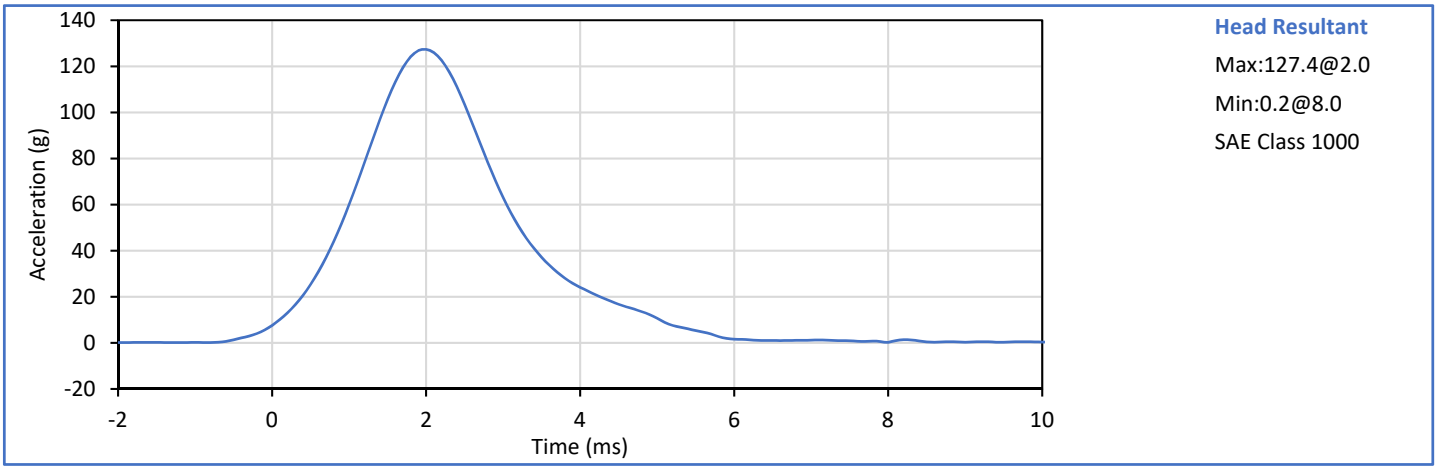
Approved By: P. Puzzuto

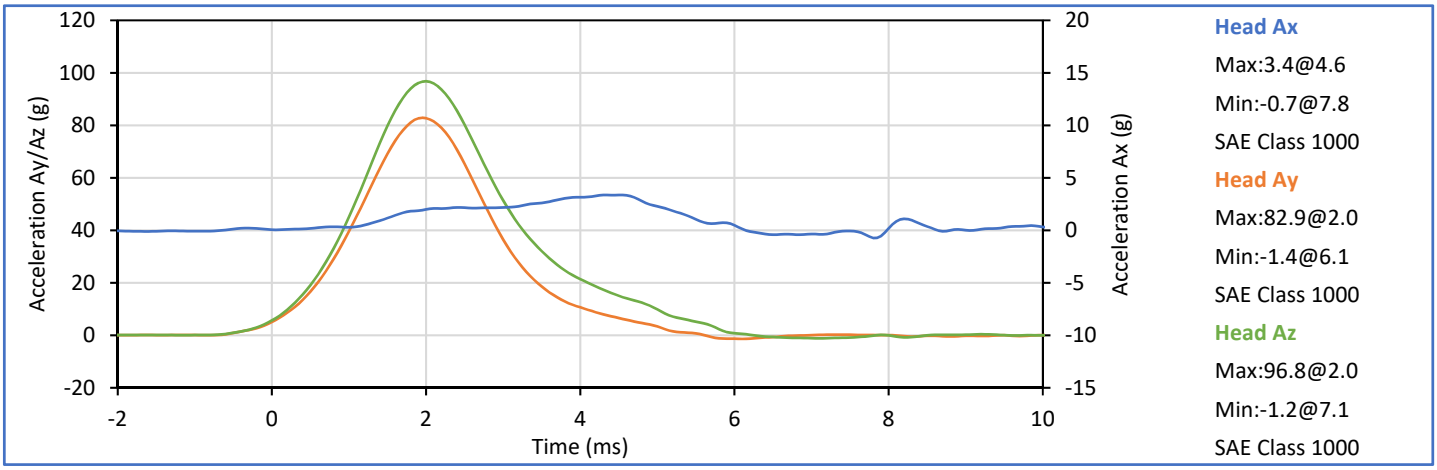
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 308 Test Date: 2021-01-18

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Humidity	%	10	70	21	Pass
Peak Resultant Acceleration	g	115.0	137.0	127.4	Pass
Peak Head Ax	g	-15.0	15.0	-0.9	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

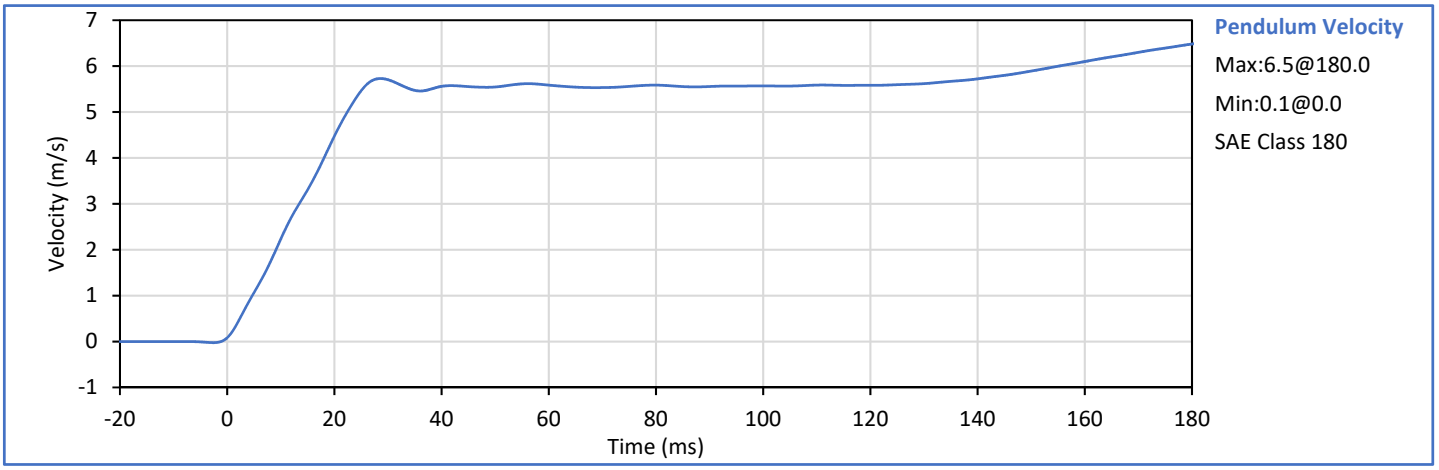
Approved By: P. Puzzuto

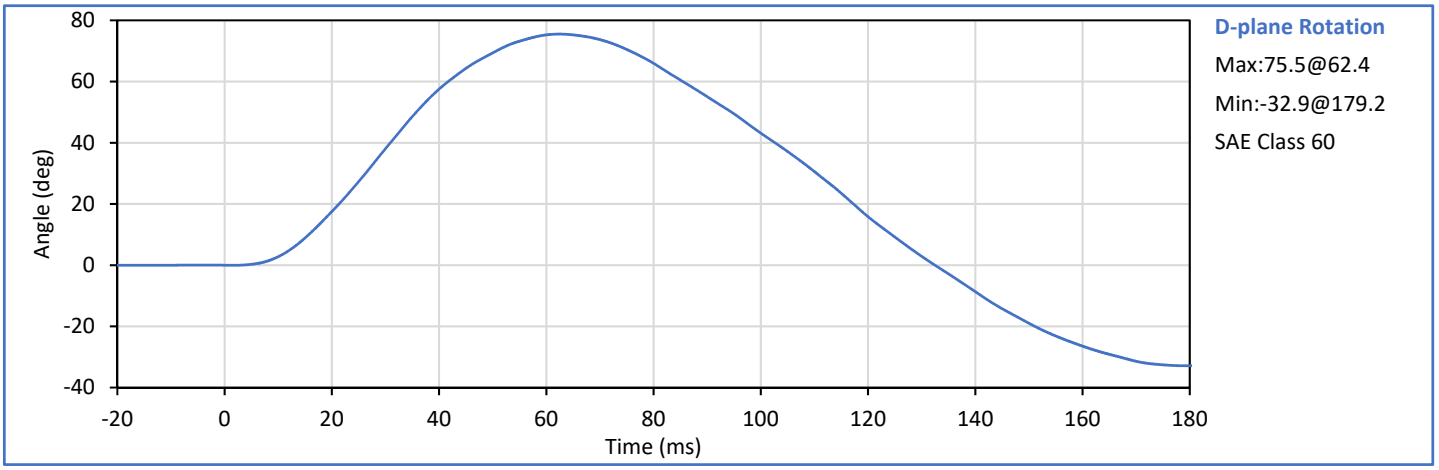
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2021-01-20

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	26	Pass
Pendulum Velocity	m/s	5.51	5.63	5.60	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.23	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.30	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.47	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.46	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.73	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	75.5	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	62.4	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-41.7	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	115.9	Pass
			Overall Test Results		Pass



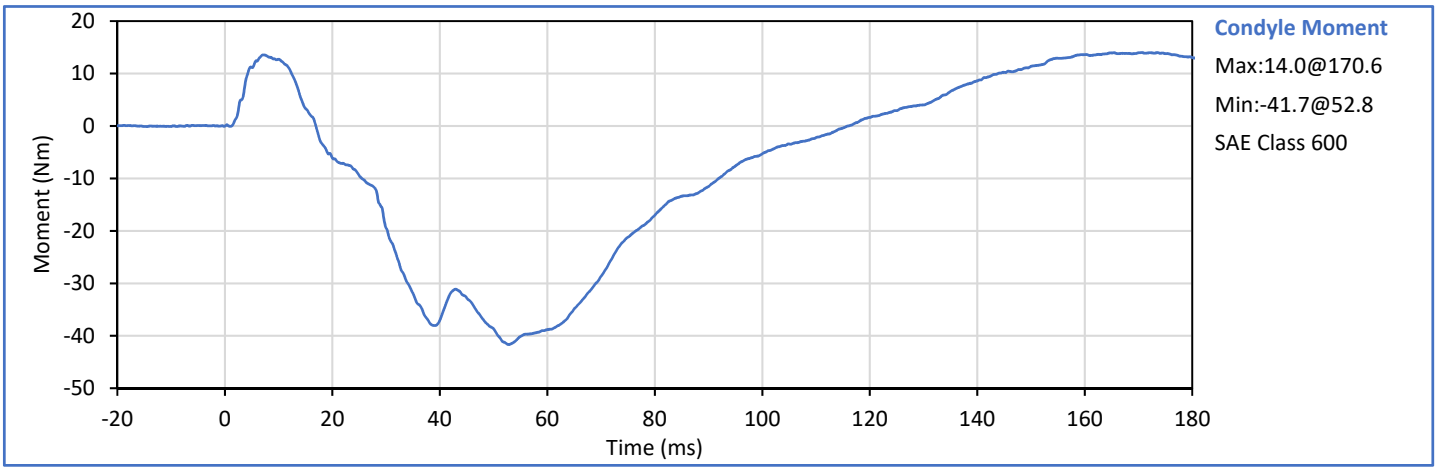


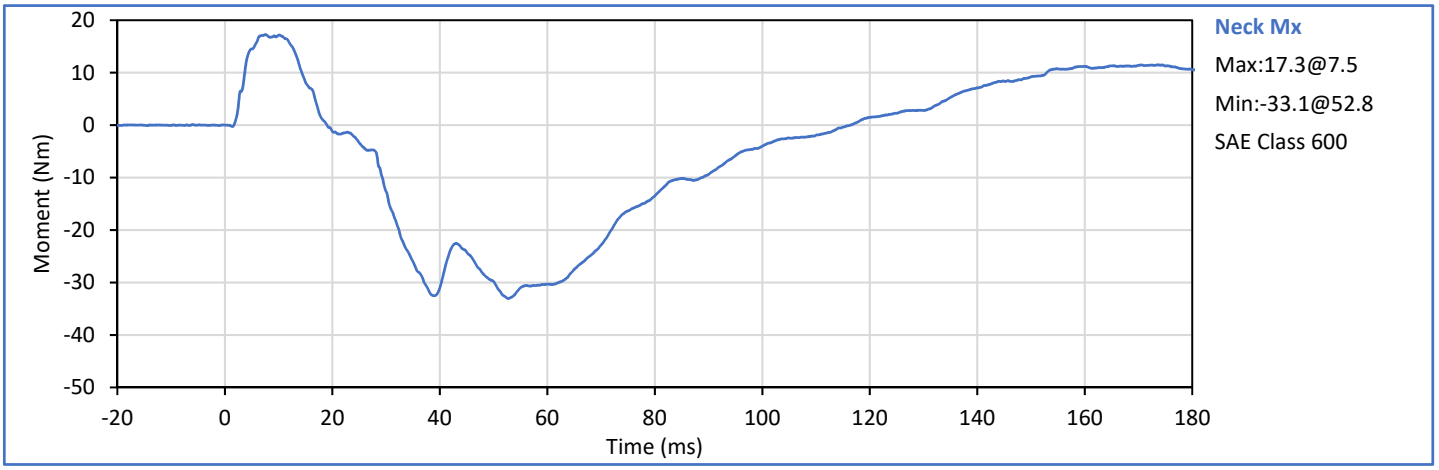
Technician: J. Hernandez

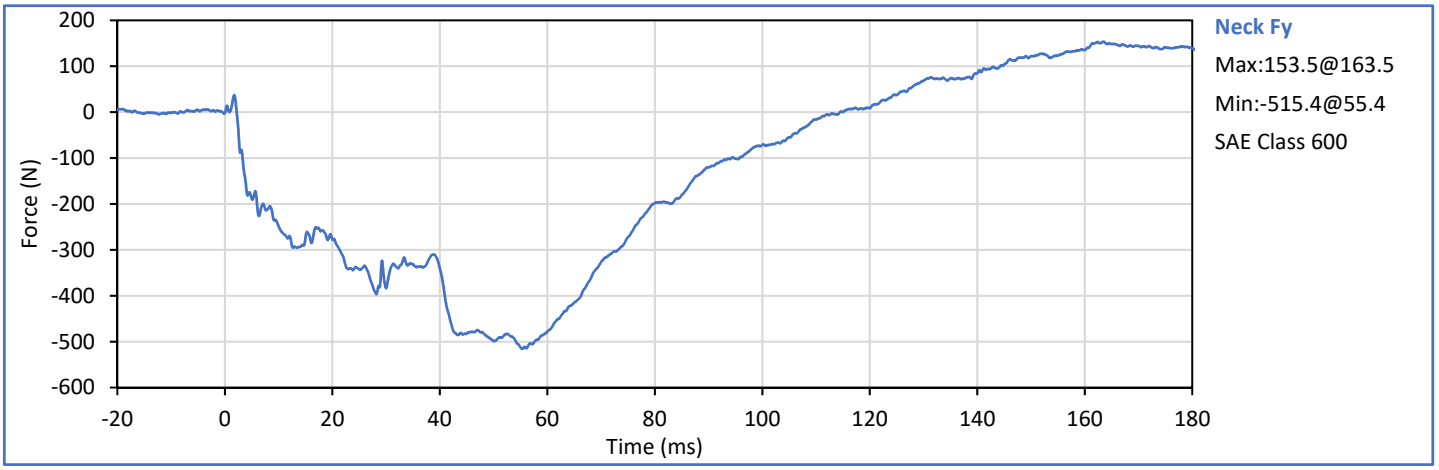
Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2021-01-20





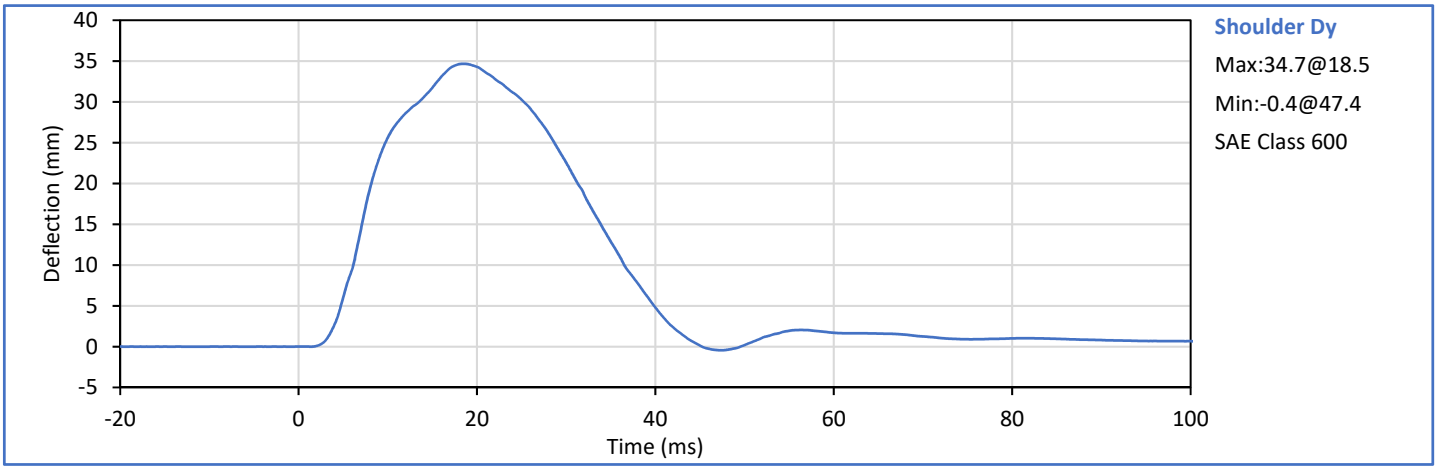


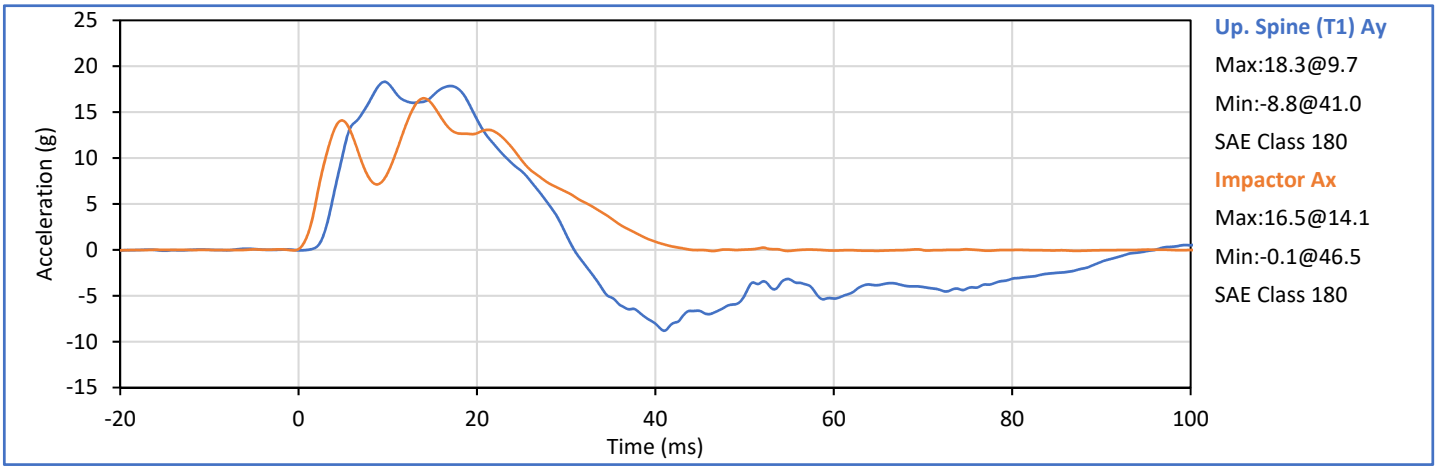
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 308 Test Date: 2021-01-21

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
Impactor Velocity	m/s	4.20	4.40	4.30	Pass
Peak Shoulder Dy	mm	28.0	37.0	34.7	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.3	Pass
Peak Impactor Ax	g	13.0	18.0	16.5	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

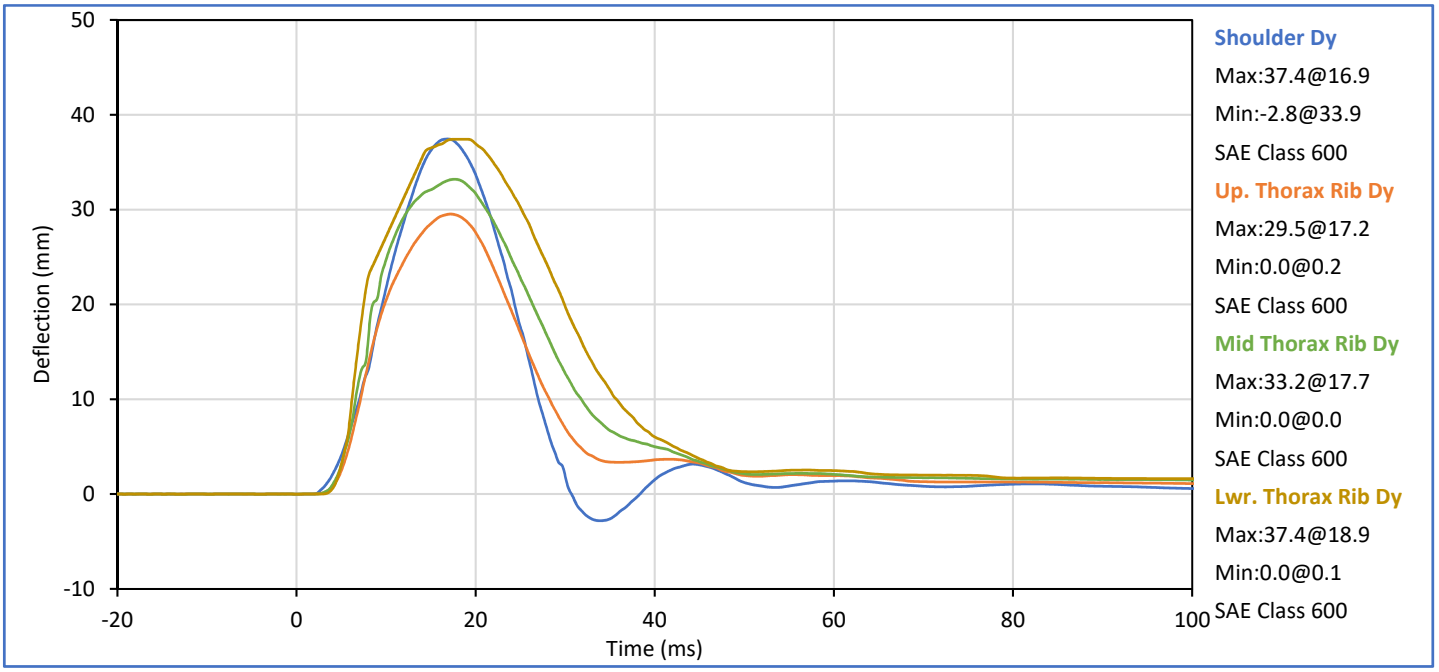
Approved By: P. Puzzuto

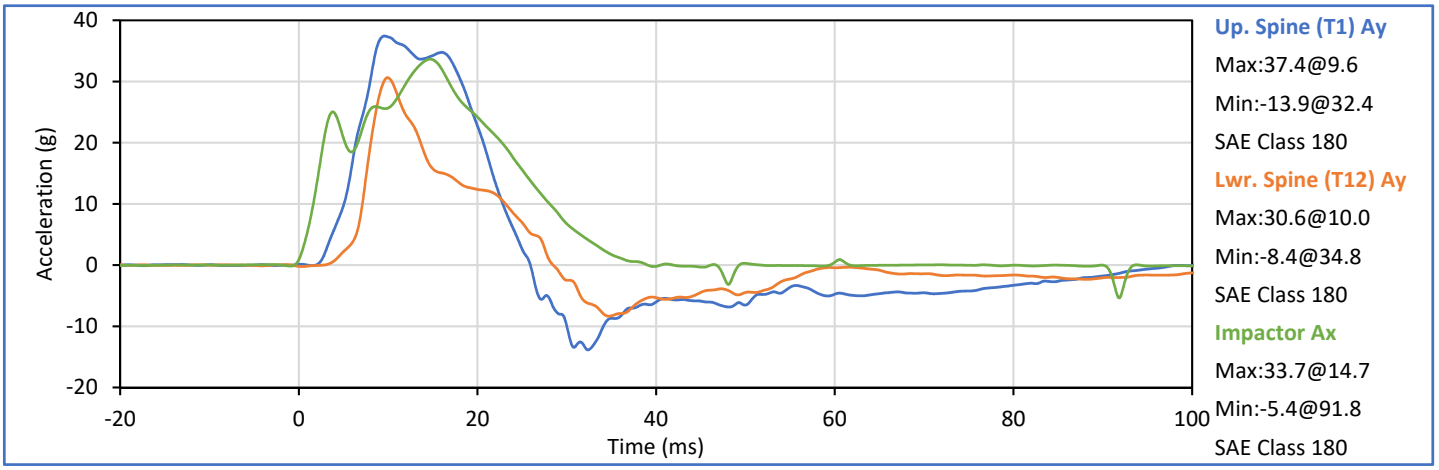
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2021-01-21

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
Impactor Velocity	m/s	6.60	6.80	6.65	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.4	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.5	Pass
Peak Middle Rib Dy	mm	30.0	36.0	33.2	Pass
Peak Lower Rib Dy	mm	32.0	38.0	37.4	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	37.4	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	30.6	Pass
Peak Impactor Ax	g	30.0	36.0	33.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

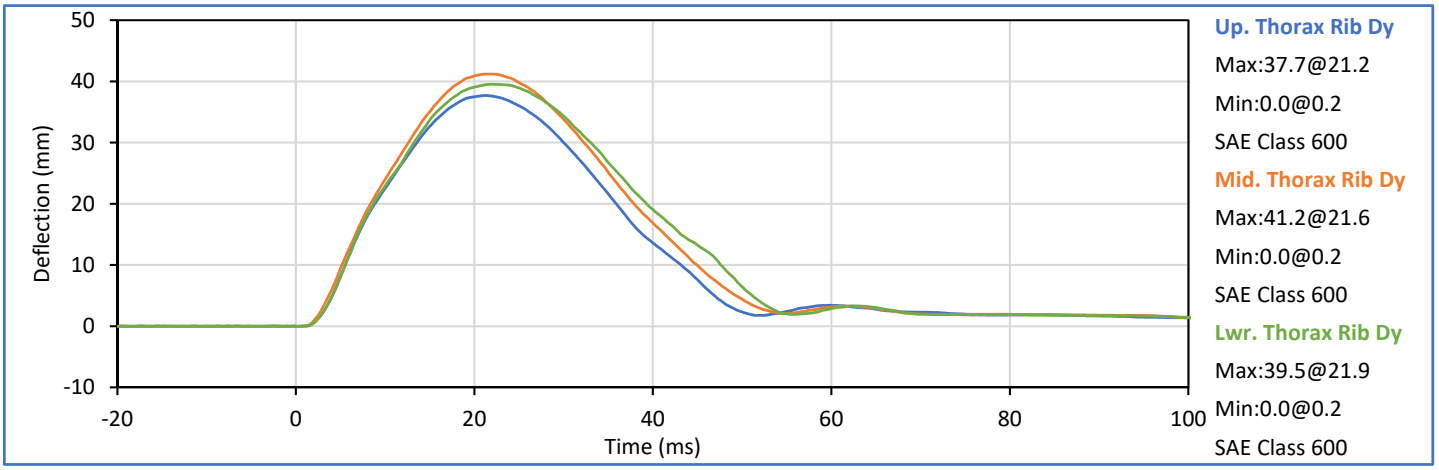
Approved By: P. Puzzuto

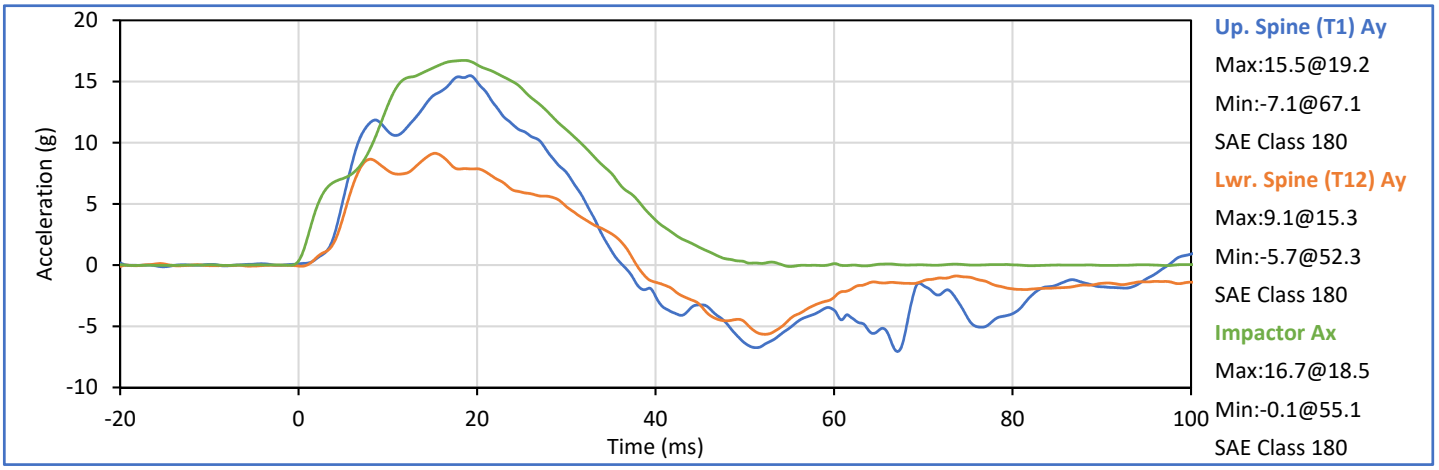
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2021-01-21

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	4.23	Pass
Peak Upper Rib Dy	mm	32.0	40.0	37.7	Pass
Peak Middle Rib Dy	mm	39.0	45.0	41.2	Pass
Peak Lower Rib Dy	mm	35.0	43.0	39.5	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.5	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.1	Pass
Peak Impactor Ax	g	14.0	18.0	16.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

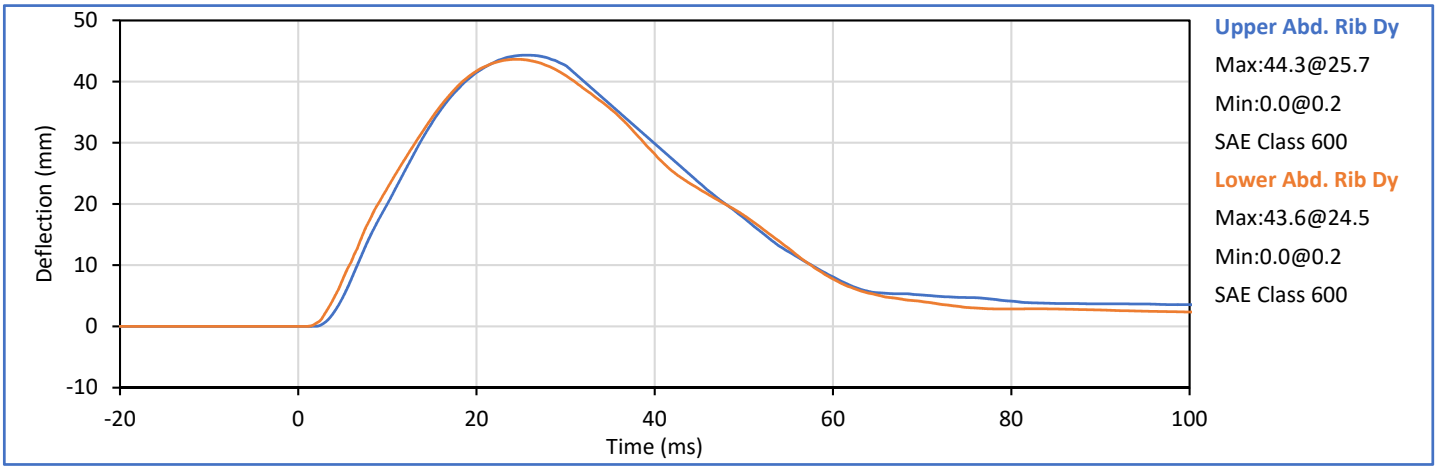
Approved By: P. Puzzuto

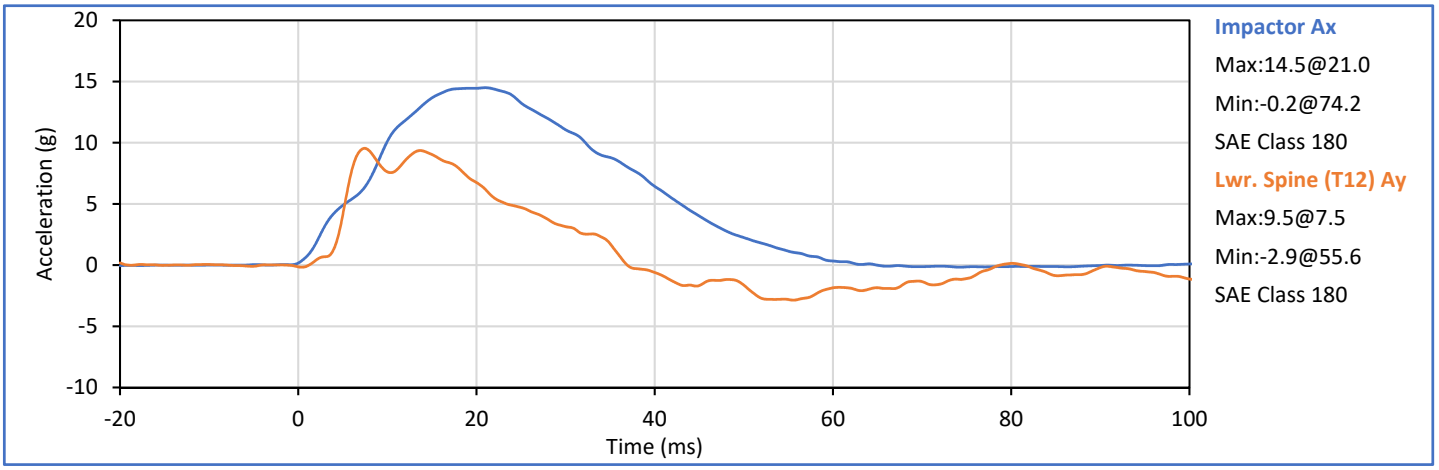
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 308 Test Date: 2021-01-21

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	4.34	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	44.3	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	43.6	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.5	Pass
Peak Impactor Ax	g	12.0	16.0	14.5	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

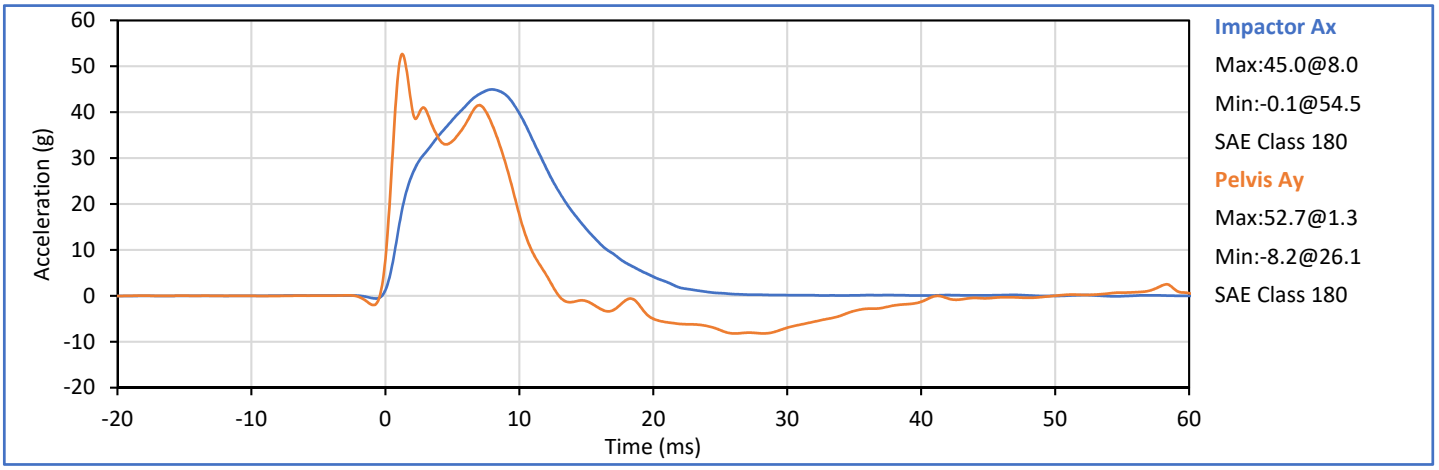
Applus IDIADA KARCO

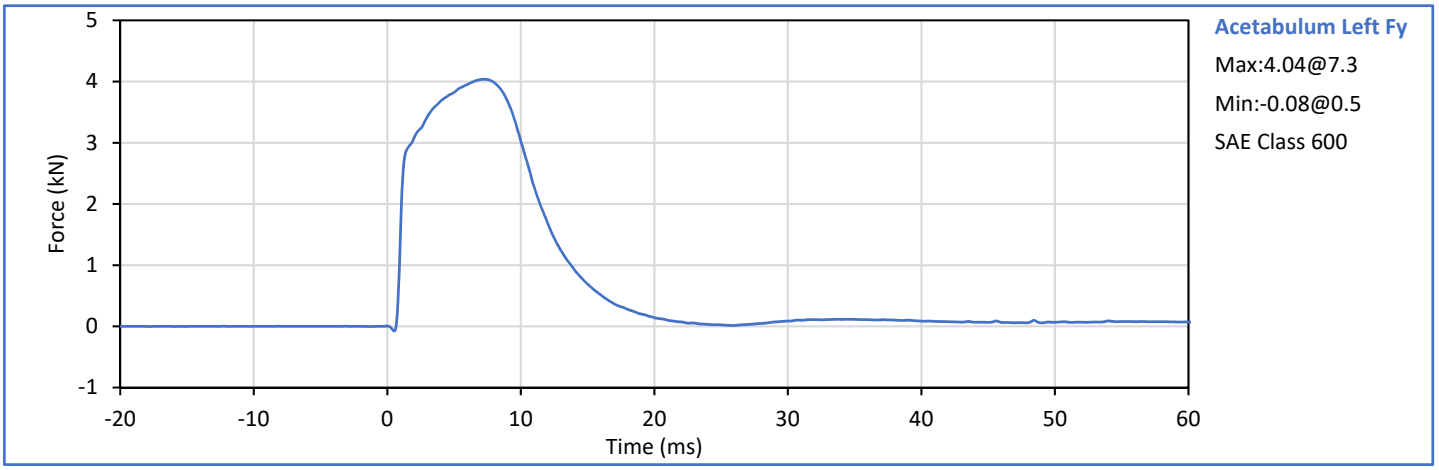
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2021-01-21

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	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	4.04	Pass
Pelvis Ay after 6ms	g	34.0	42.0	41.5	Pass
Peak Impactor Ax	g	38.0	47.0	45.0	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 11805





Technician: J. Hernandez

Approved By: P. Puzzuto

ATD Serial No.: 308 Test Date: 2021-01-21

Pelvis Plug S/N: 11805

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 11805
Test Number 5915
Report Number 5931
Test Date 1/22/2018 12:58:26 PM

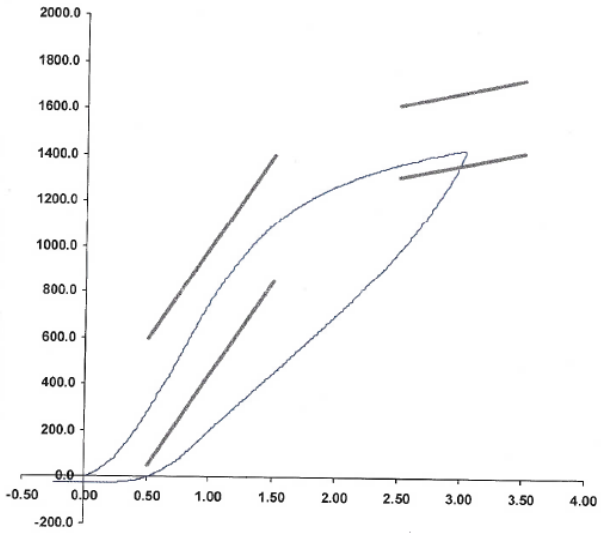
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	286.58	50.00	600.00
Force @ 1.5 mm (N)	1,101.76	850.00	1,400.00
Force @ 2.5 mm (N)	1,363.11	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,425.47	1,361.00	1,673.00

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 22-Jan-18
SACO Research

By : DC Date : 1/22/18

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

Applus IDIADA
KARCO

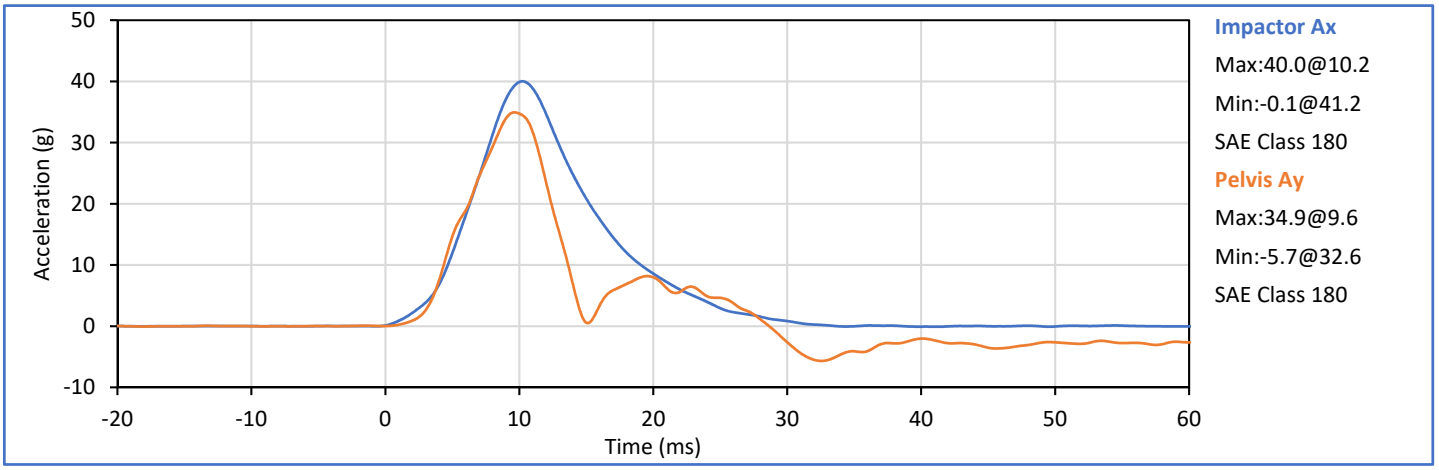
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

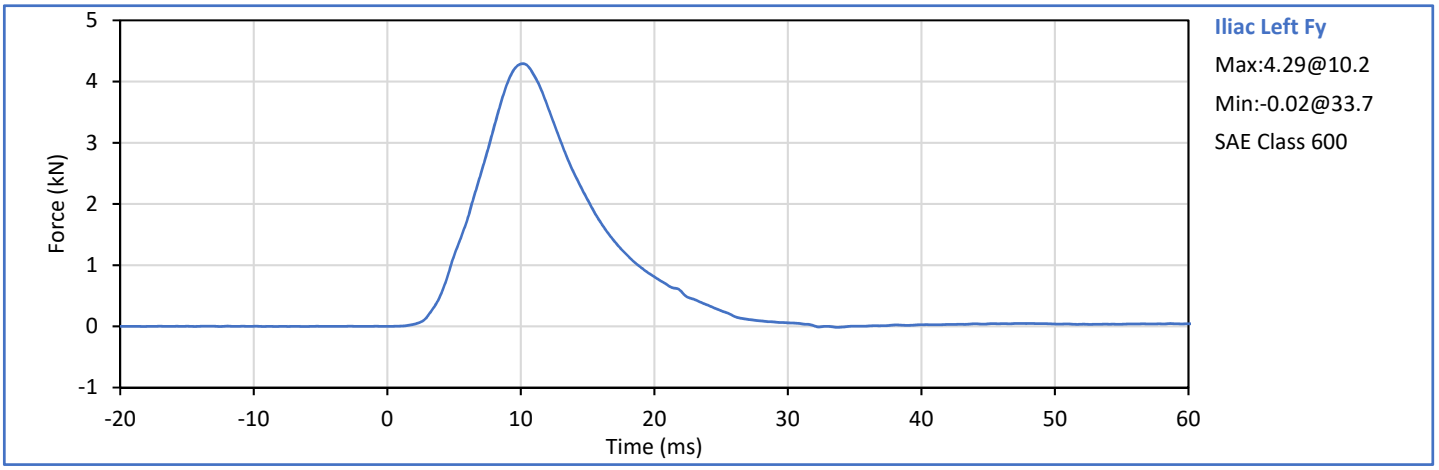
ATD Serial No.: 308 Test Date: 2021-01-21

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	4.30	Pass
Peak Iliac Fy	kN	4.10	5.10	4.29	Pass
Pelvis Ay after 6ms	g	28.0	39.0	34.9	Pass
Peak Impactor Ax	g	36.0	45.0	40.0	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: 2021-01-27

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

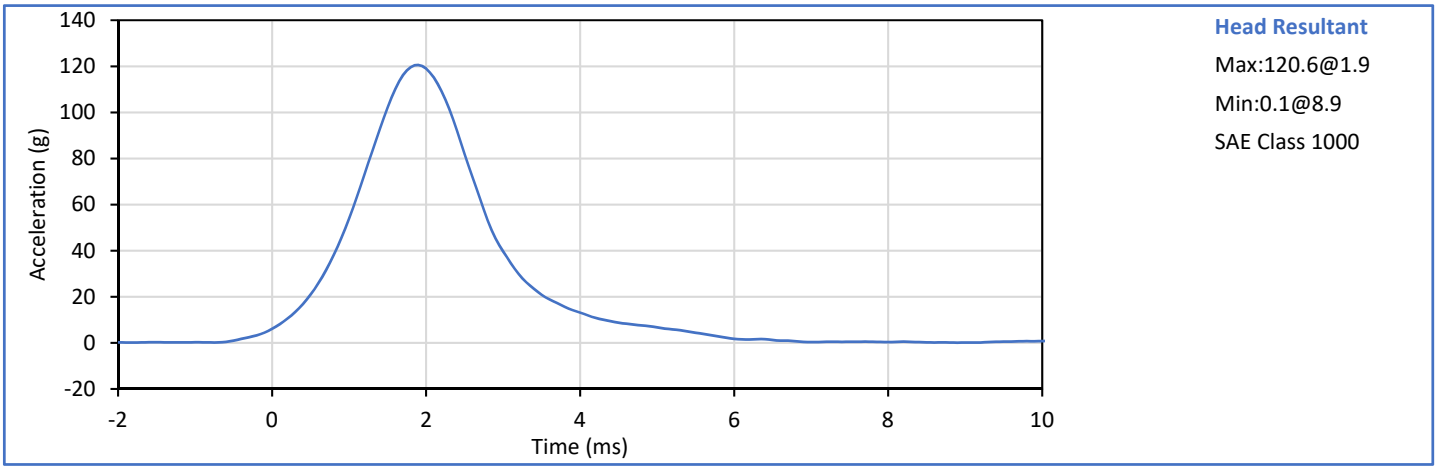
Approved By: P. Puzzuto

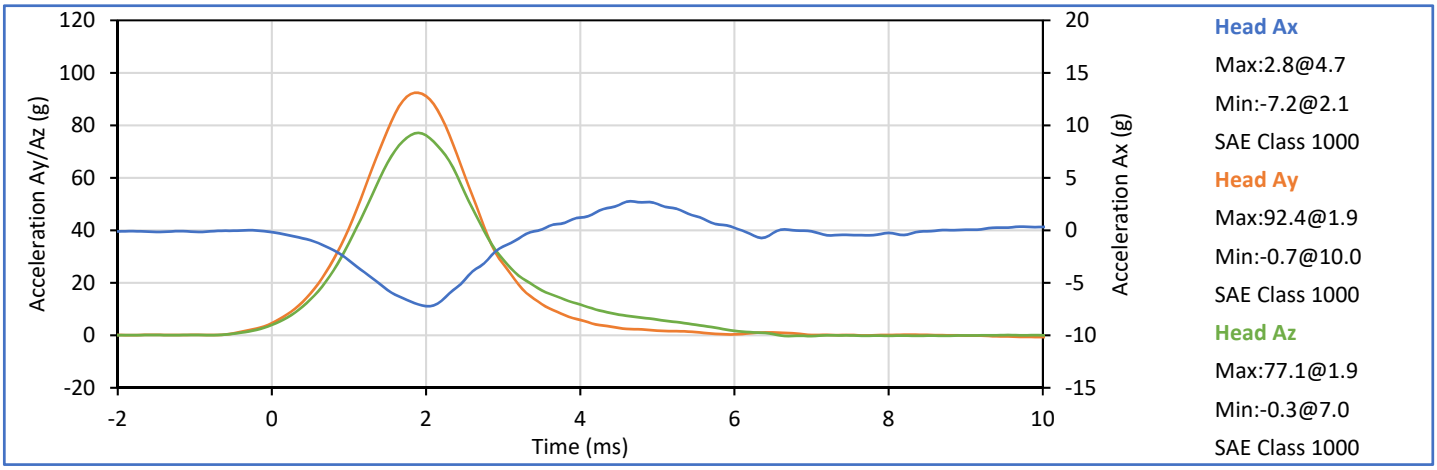
Applus IDIADA KARCO

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

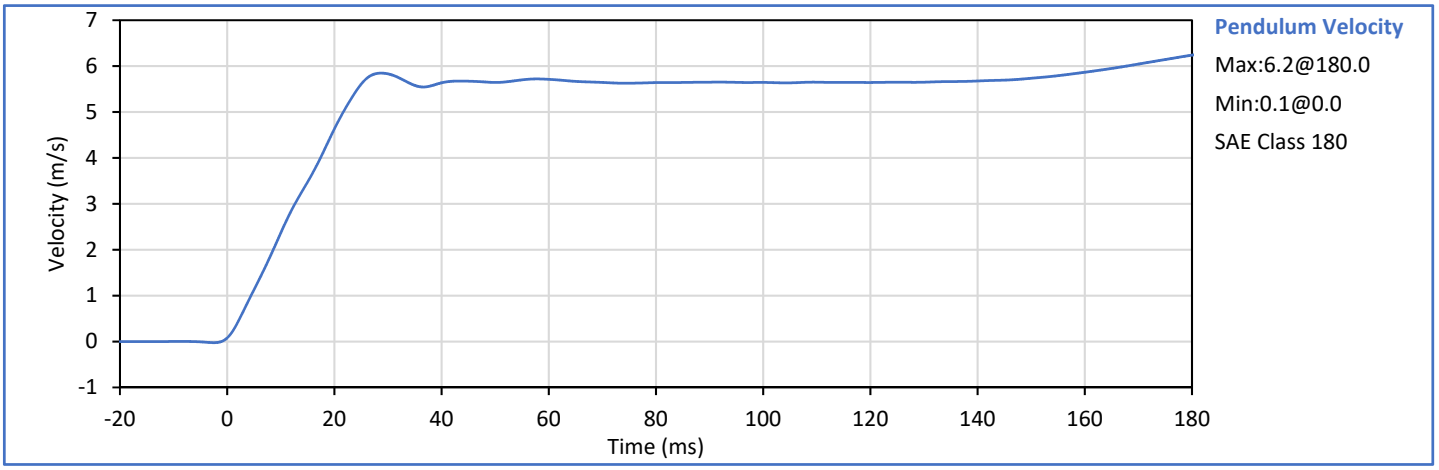
Approved By: P. Puzzuto

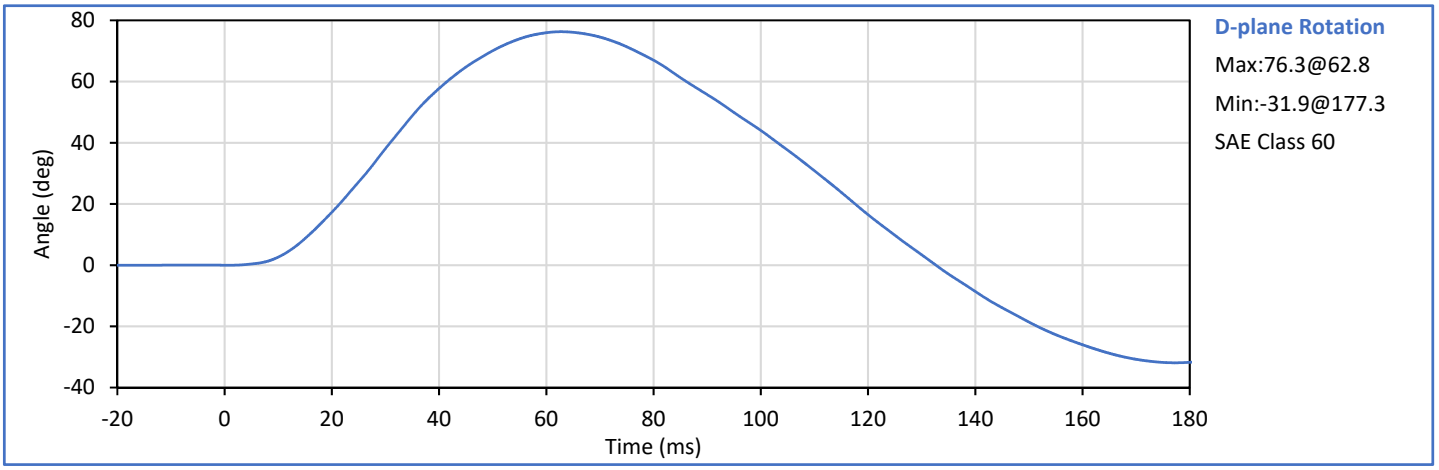
Applus IDIADA KARCO

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





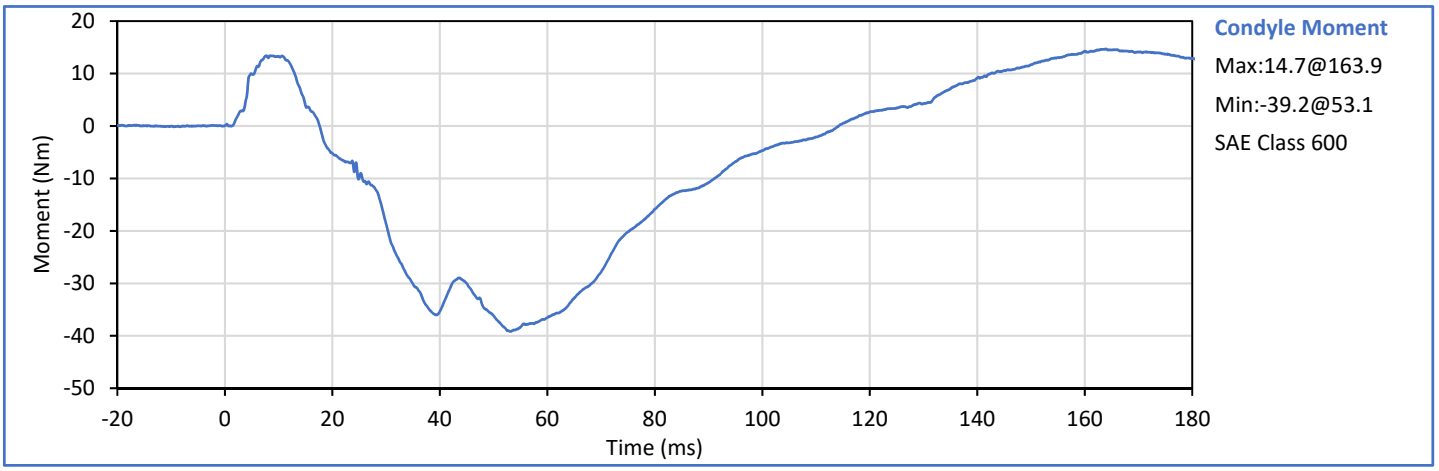
Technician: J. Hernandez

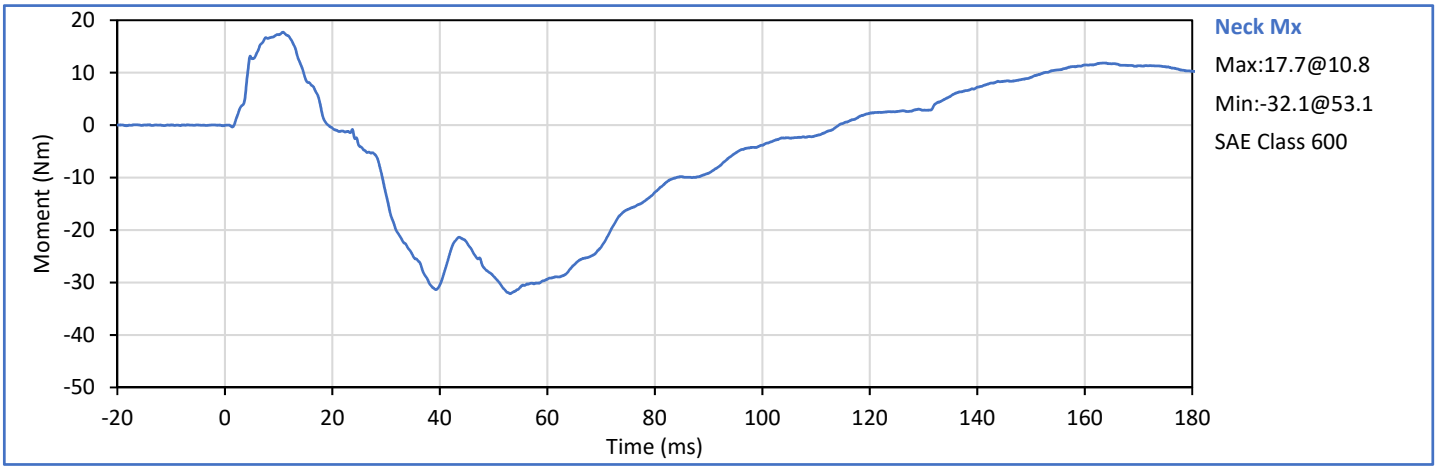
Approved By: P. Puzzuto

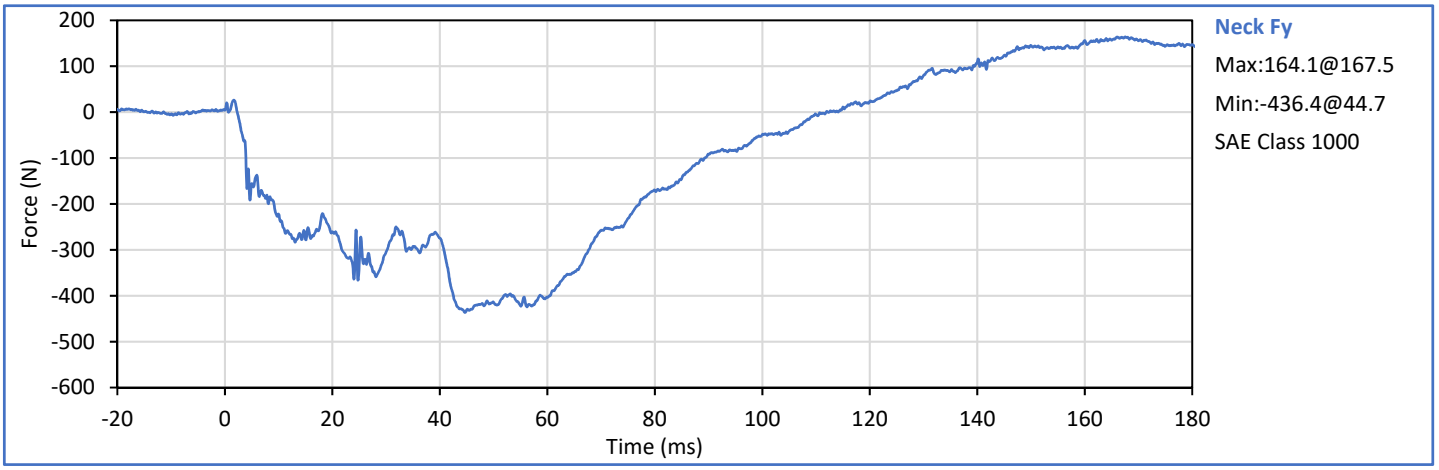
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

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





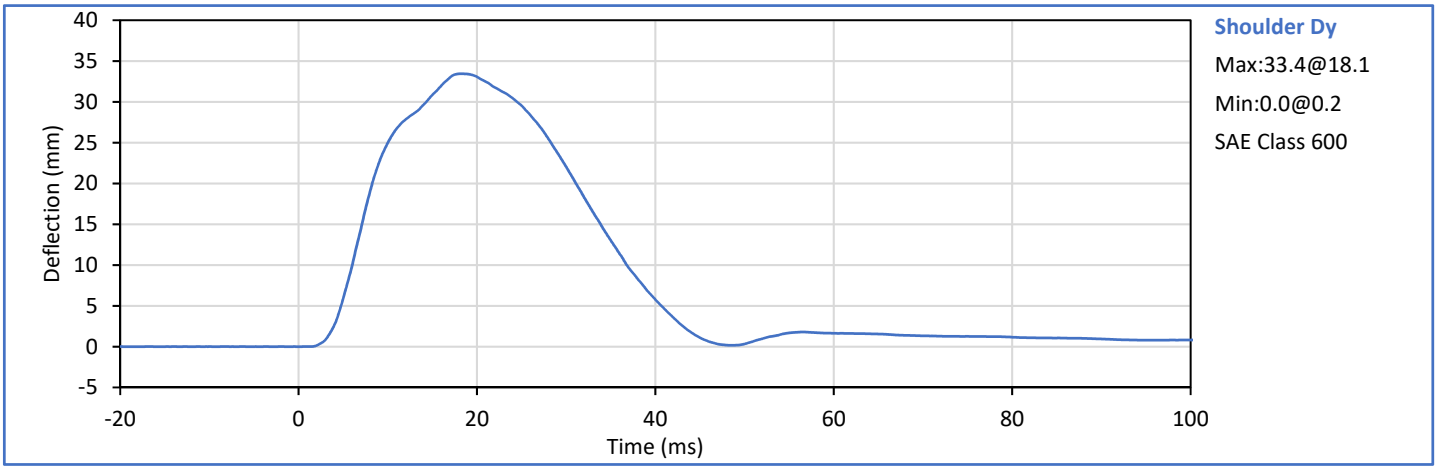


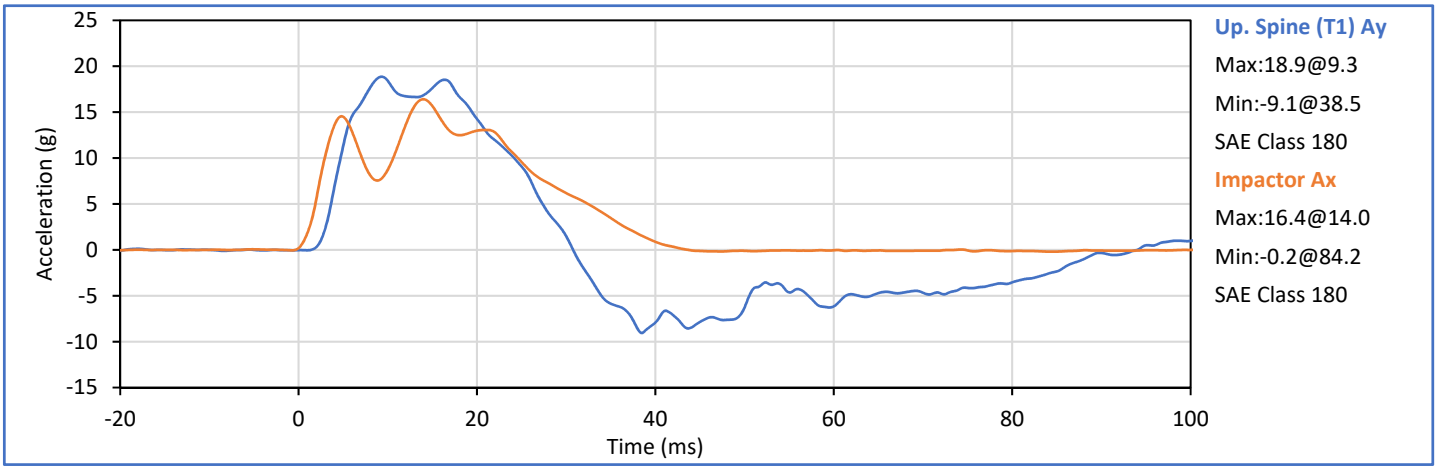
Applus IDIADA
KARCO

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

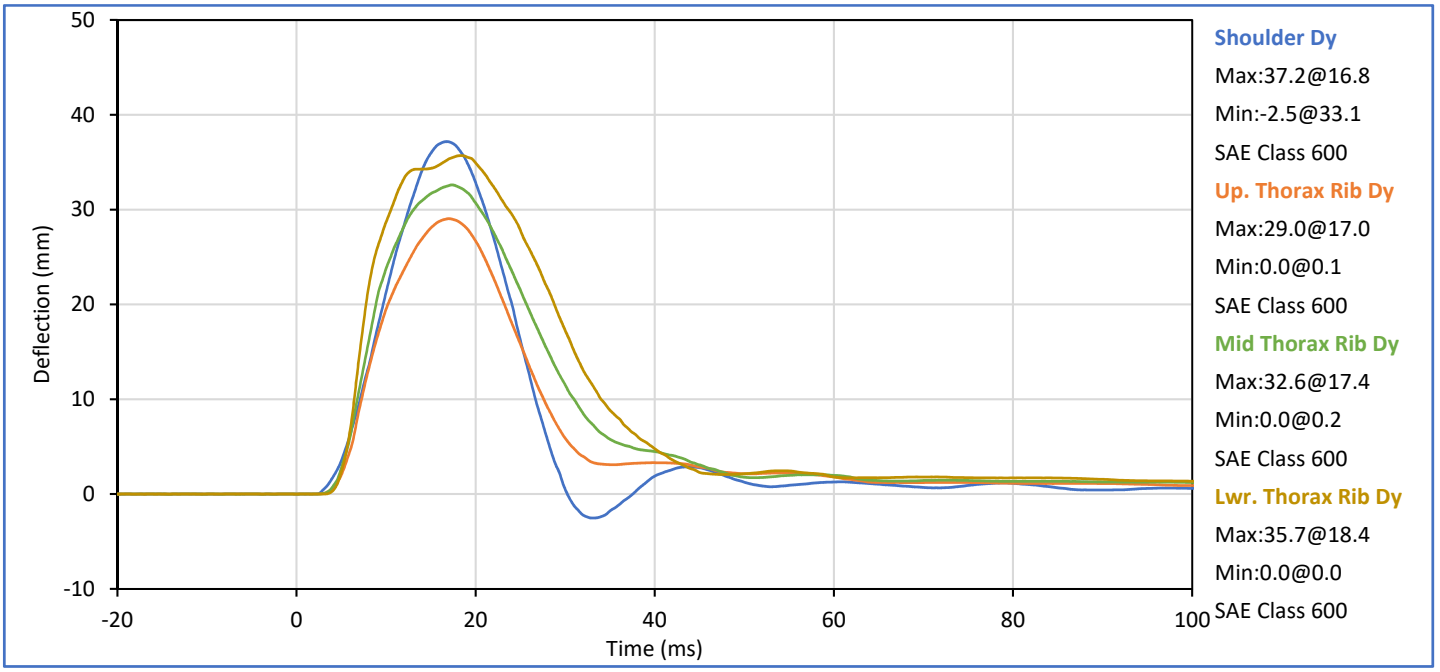
Approved By: P. Puzzuto

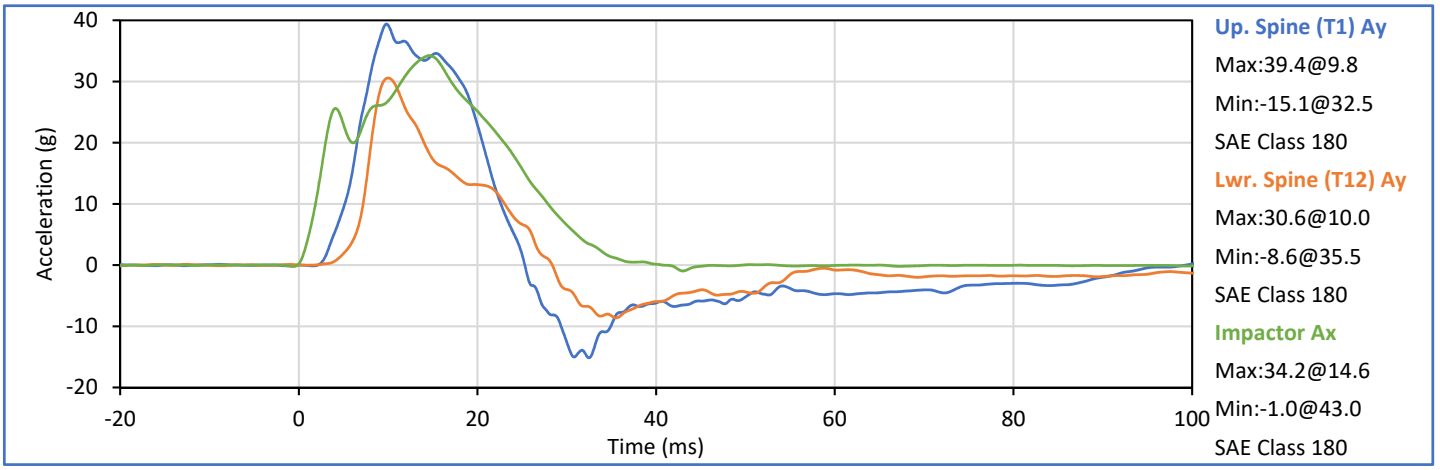
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2021-01-08

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

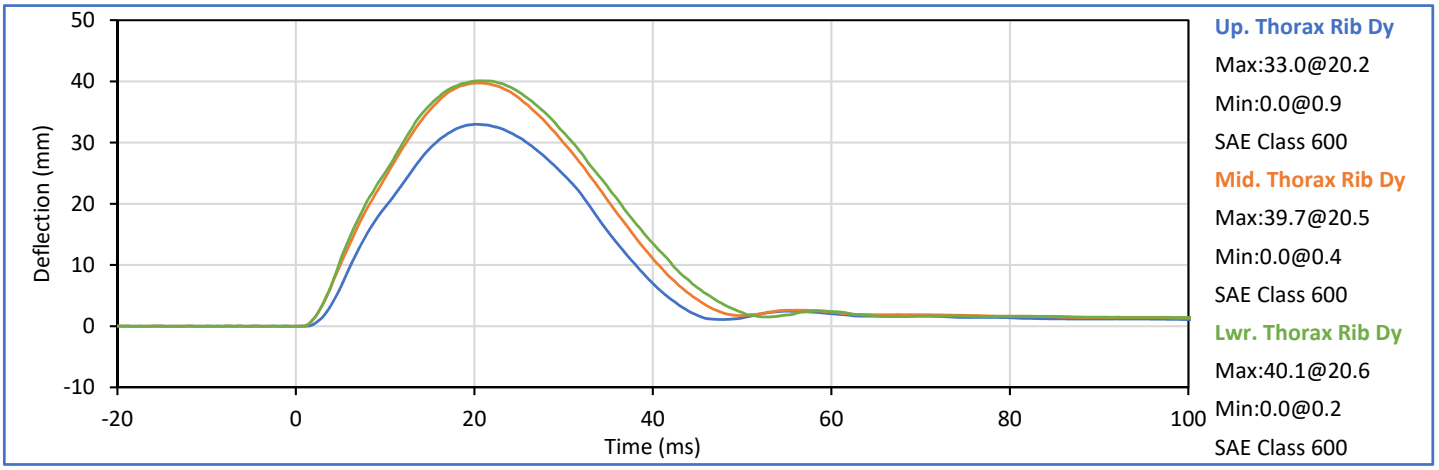
Applus IDIADA
KARCO

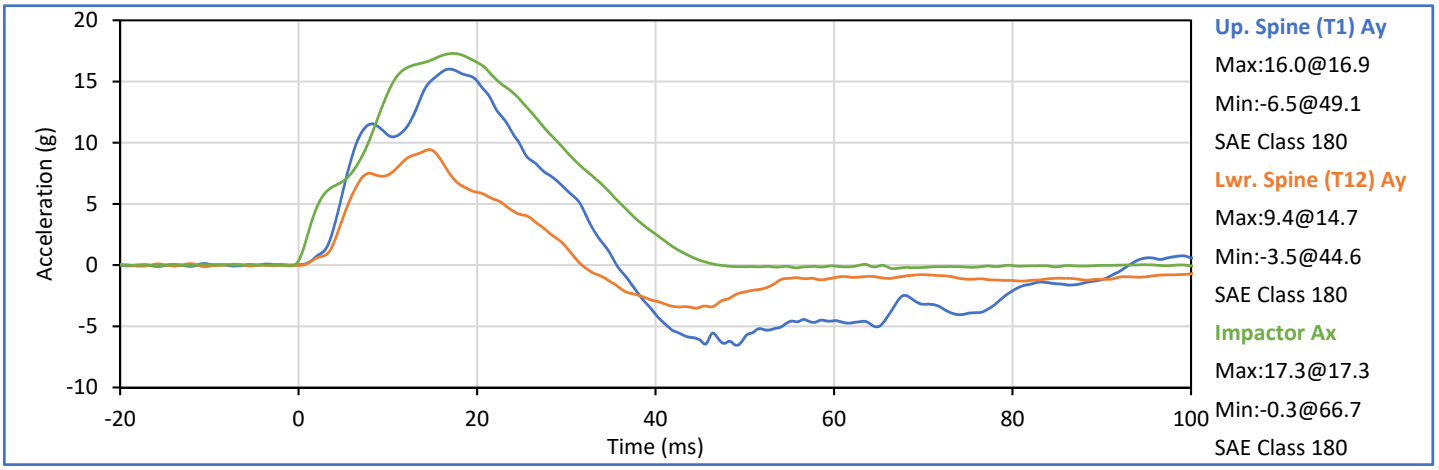
SID-IIs Small Side Impact ATD
Thorax (No Arm)

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

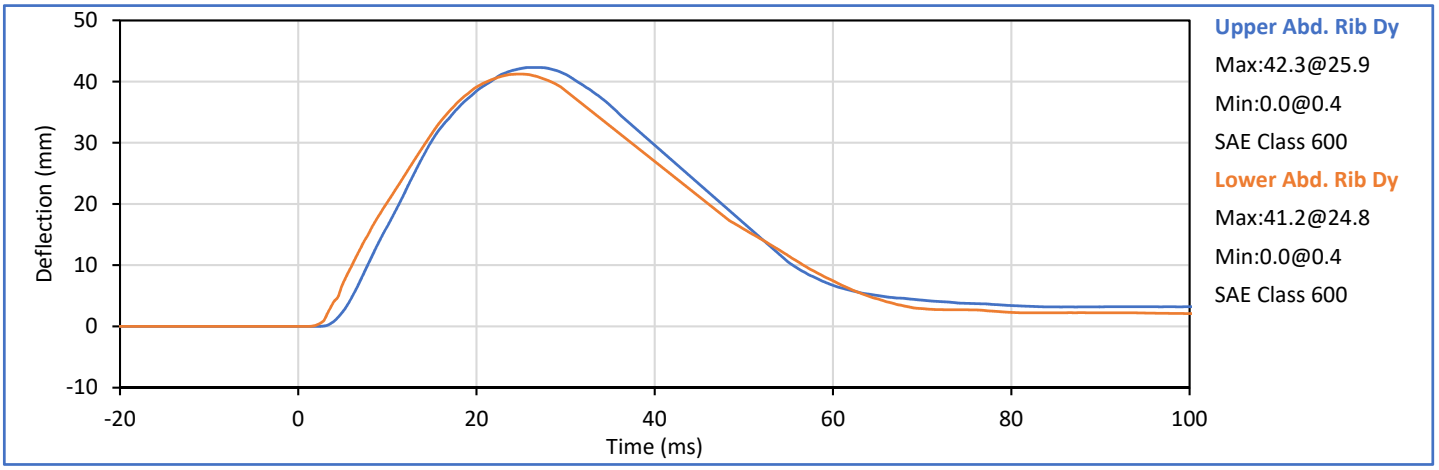
Approved By: P. Puzzuto

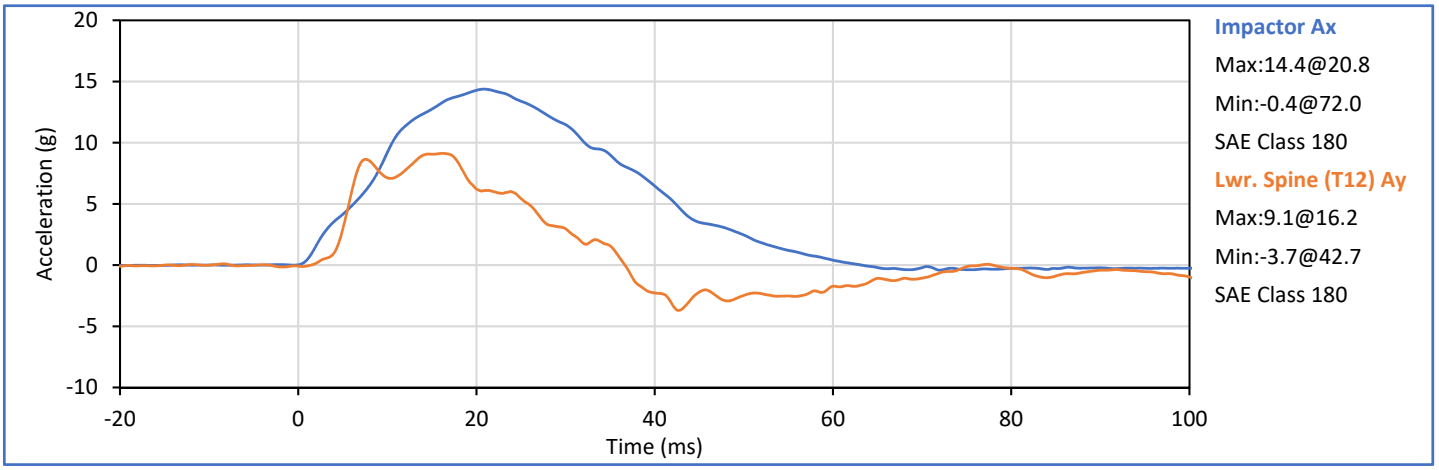
Applus IDIADA KARCO

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

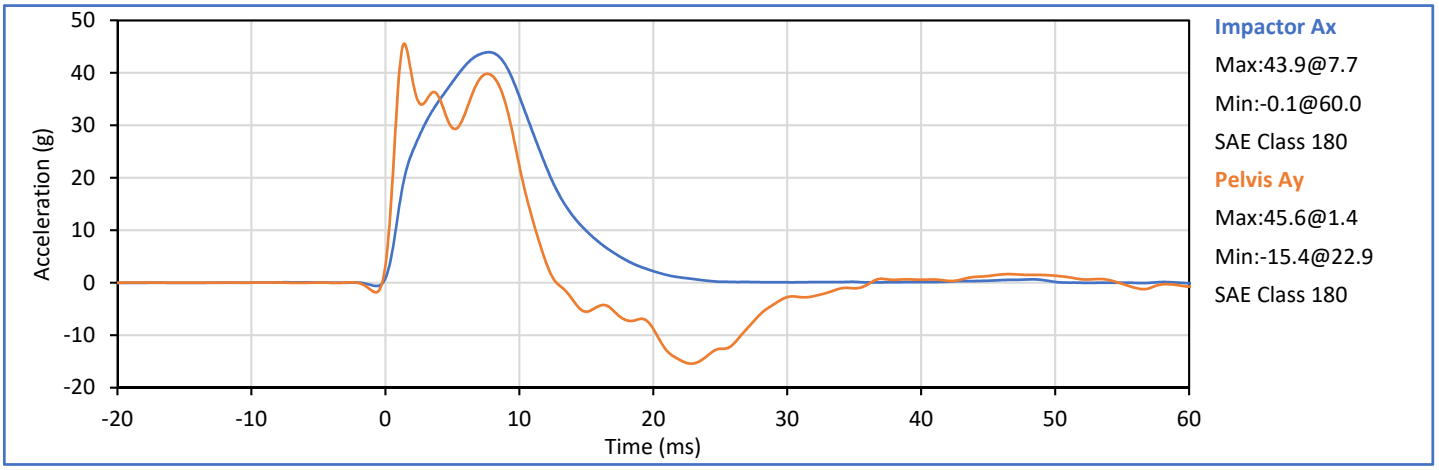
Applus IDIADA
KARCO

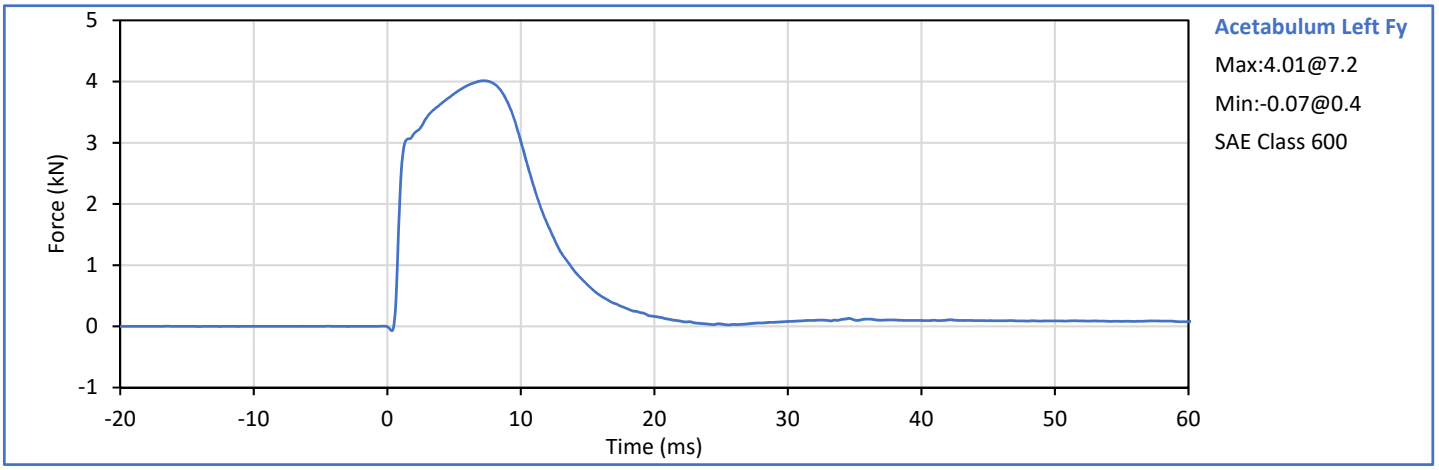
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

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

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

Pelvis Plug S/N: 13005

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

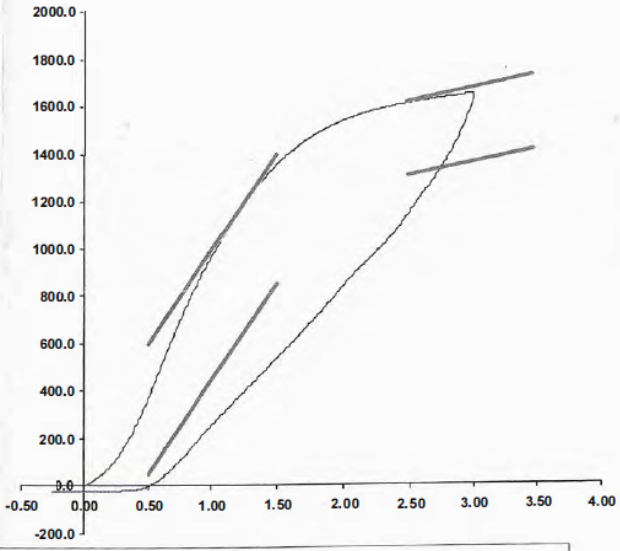
Plug S/N 13005
Test Number 10302
Report Number 10337
Test Date 7/19/2019 11:43:53 AM

	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

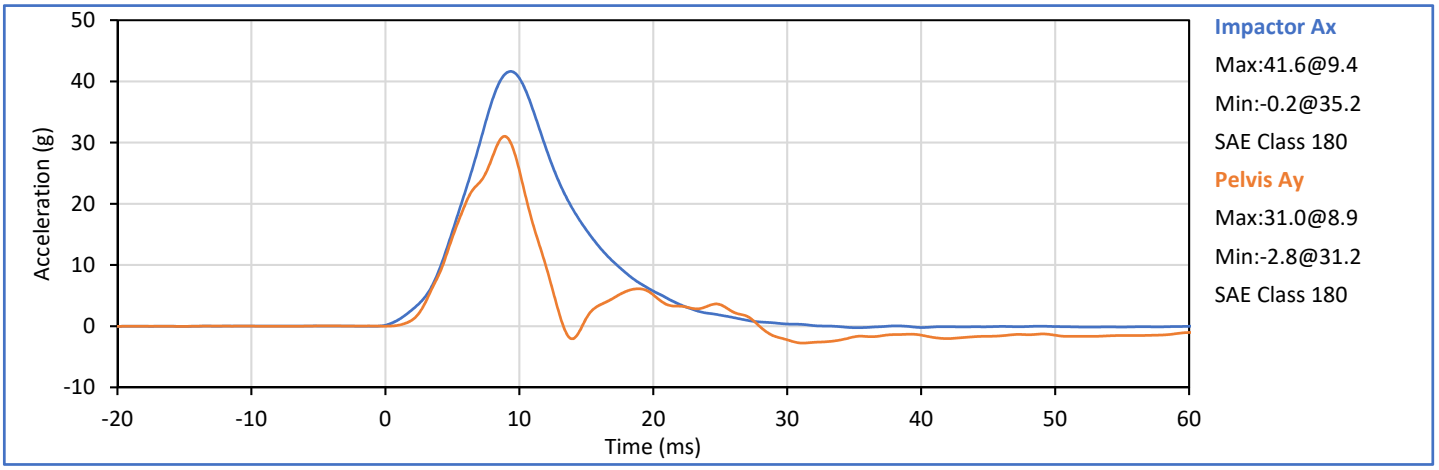
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

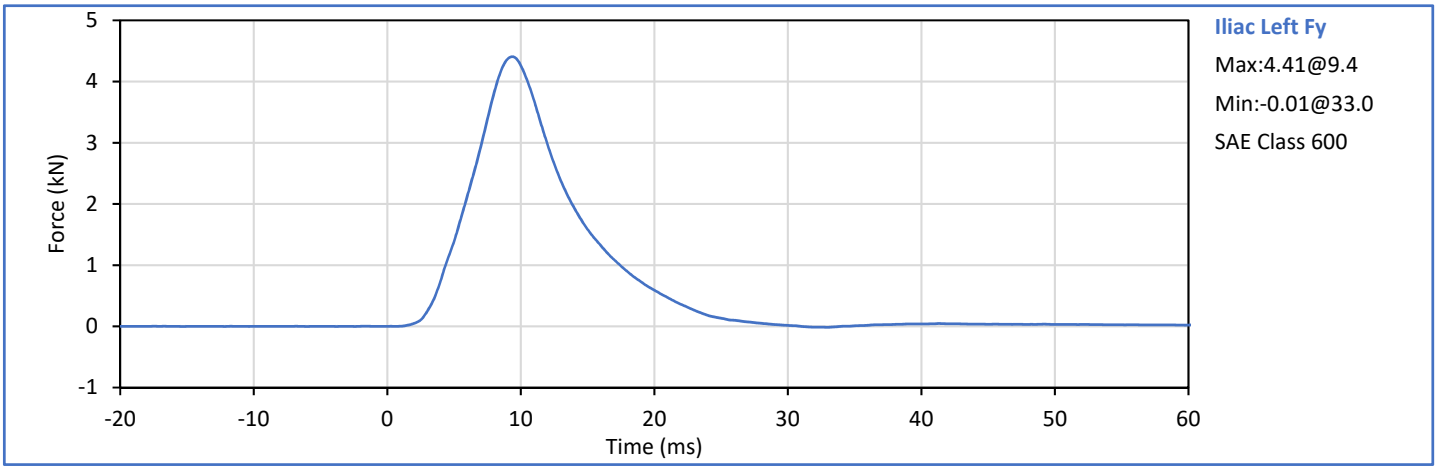
ATD Serial No.: 308 Test Date: 2021-01-29

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 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	ARS4062	DTS	ARS PRO-18k (2kHz)	2020-08-04
Head Rotation Rate Y	ARS5968	DTS	ARS PRO-18k (2kHz)	2020-08-04
Head Rotation Rate Z	ARS11283	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	A356463	MSI	52F-2k	2020-09-15
Vehicle CG Ay	A354886	MSI	52F-2k	2020-09-16
Vehicle CG Az	A361474	MSI	52F-2k	2020-10-21
Left Floor Sill Ay	A358545	MSI	52F-2k	2020-09-20
A-Pillar Sill Ay	A358541	MSI	52F-2k	2020-09-20
A-Pillar Low Ay	A358740	MSI	52F-2k	2020-09-27
A-Pillar Mid Ay	A356304	MSI	52F-2k	2020-09-16
B-Pillar Sill Ay	A356474	MSI	52F-2k	2020-09-15
B-Pillar Low Ay	A361346	MSI	52F-2k	2020-10-21
B-Pillar Mid Ay	A361338	MSI	52F-2k	2020-10-21
Driver Seat Track at H-Point Ay	A358494	MSI	52F-2k	2020-09-18
Engine Top Ax	A358558	MSI	52F-2k	2020-09-20
Engine Top Ay	A358738	MSI	52F-2k	2020-09-22
Firewall Ay	A356476	MSI	52F-2k	2020-09-15
Right Roof Ay	A361339	MSI	52F-2k	2020-10-21
Right Floor Sill Ay	A361332	MSI	52F-2k	2020-10-21
Rear Floorpan Ax	A361341	MSI	52F-2k	2020-10-21
Rear Floorpan Ay	A356468	MSI	52F-2k	2020-09-15

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