REPORT NUMBER: SideNCAPMDB-KAR-21-004

NEW CAR ASSESSMENT PROGRAM (NCAP)
MOVING DEFORMABLE BARRIER SIDE IMPACT TEST

MERCEDES-BENZ U.S. INTERNATIONAL INC.

2021 MERCEDES-BENZ GLB250 5-DOOR SUV

NHTSA No: M20214305

PREPARED BY:

APPLUS+ IDIADA KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

JULY 12, 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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Approval Date: July 12, 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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SideNCAPMDB-KAR-21-004		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact MDB Testing of a 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305	July 12, 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-P40399-01-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 2, 2021 - July 12, 2021 **14. Sponsoring Agency Code** NRM-100

15. Supplementary Notes

16. Abstract

A 61.9 km/h 90° Moving Deformable Barrier NCAP Side 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 Test Procedure for the generation of consumer information on vehicle side crash protection. The test was conducted at the Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on February 2, 2021.

The impact velocity of the Moving Deformable Barrier was 61.92 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 21.1°C. The target vehicle's maximum post-test static crush was 191 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	113.3
Maximum Thoracic Rib Deflection	mm	44	15
Total Abdominal Force	N	2500	548
Pubic Symphysis Force	N	6000	1276

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	196.4
Resultant Lower Spine Acceleration	g	82	41
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	2607
Maximum Thoracic Rib Deflection	mm	38*	12
Maximum Abdominal Rib Deflection	mm	45*	25

Both struck side doors were jammed shut and did not separate from the body at the hinges or latches. The opposite side doors did not open during the side impact event.

17. Key Words	18. Distribution Statement
New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs	Copies of this report are available from: National Highway Traffic Safety Admin. Technical Reference 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	152	

**Proposed IARV*

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SECTION 1
TEST PURPOSE AND PROCEDURE

This moving deformable barrier 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 dated March 2020.

SECTION 2
SUMMARY OF TEST RESULTS

A 2021 Mercedes-Benz GLB250 5-Door SUV was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 61.92 km/h (38.41 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California, on February 2, 2021. Pre- and post-test photographs of the test vehicle, the MDB and the dummy (ES-2re and SID-IIs) are included in Appendix A of this report.

The dummies were placed in the driver and left rear designated seating position according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated March 2020. The side impact event was documented by 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)
Primary and redundant head CG tri-axial accelerometers
Chest upper rib, middle rib and lower rib y-axis displacement potentiometers
Abdomen forward, middle, and rear y-axis load cells
Lower spine (12) tri-axial accelerometers
Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)
Primary and redundant head CG tri-axial accelerometers
Chest upper rib, middle rib and lower rib y-axis displacement potentiometers
Abdomen upper rib and lower rib y-axis displacement potentiometers
Lower spine (12) tri-axial accelerometers
Acetabulum and iliac wing y-axis load cells

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 of this report contains the test equipment and instrumentation calibration data.

Dummy injury readings were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	113.3
Maximum Thoracic Rib Deflection	mm	44	15
Combined Abdominal Force	N	2500	548
Pubic Symphysis Force	N	6000	1276

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	196.4
Lower Spine (T12) Resultant Acceleration	g	82	41
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	2607
Maximum Thoracic Rib Deflection	mm	38*	12
Maximum Abdominal Rib Deflection	mm	45*	25

**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

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

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. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20214305
Model Year	2021
Make	Mercedes-Benz
Model	GLB250
Body Style	5-Door SUV
VIN	W1N4M4GBXMW079032
Body Color	Silver Metallic
Odometer Reading (km / mi)	23 / 14
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 U.S. International Inc.
Date of Manufacture	20-Oct
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**

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

VEHICLE SEAT TYPE

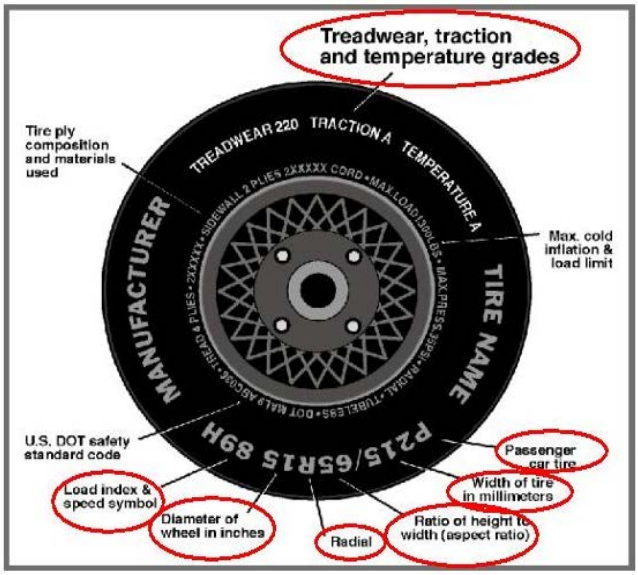
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable w/ Lever	Adjustable w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



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	100 H	100 H
Tire Material	Rayon, Steel, Polyamide	Rayon, Steel, Polyamide
DOT Safety Code Left	A33L WXX4 1220	A33L WXX4 1220
DOT Safety Code Right	A33L WXX4 1220	A33L WXX4 1220

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

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

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21	200	200	200	200

TEST VEHICLE AXLE WEIGHTS

		As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
	Units	Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	494.0	340.0		537.0	452.5		536.0	456.0	
Right	kg	482.5	351.5		511.5	363.5		513.5	366.0	
Ratio	%	58.5%	41.5%		56.2%	43.8%		56.1%	43.9%	
Total	kg	976.5	691.5	1668.0	1048.5	816.0	1864.5	1049.5	822.0	1871.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1668.0	A
Actual Weight of 2 P572 ATD Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	79.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1872.8	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	Fully Loaded	As Tested	Meets Requirement***
LF	mm	863	864	Yes
RF	mm	872	871	Yes
LR	mm	872	872	Yes
RR	mm	875	874	Yes
Vehicle CG (Aft of Front Axle)	mm	1241	1236	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	47	48	

***The “As Tested” vehicle attitude measurements must be equal to or within ±10 mm of the “Fully Loaded” vehicle attitude measurements at each wheel well. 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. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

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 63° Impact Angle Line (mm)
Fore 25 mm target	0
Aft 25 mm target	0
Pre-Impact Angle Line	63°

Parallel Track Target	X Location (mm)	Y Location (mm)
A	0	0
B	1355	689
C	1355	3756
D	0	3059

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. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	8.2	0.0	4.1
Front Passenger Seat	8.7	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	4.1	210	Max	230	240	245
			Mid	215	225	229
			Min	200	210	213
Front Passenger Seat	4.4	223	Max	255	262	265
			Mid	239	243	248
			Min	222	223	230
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. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

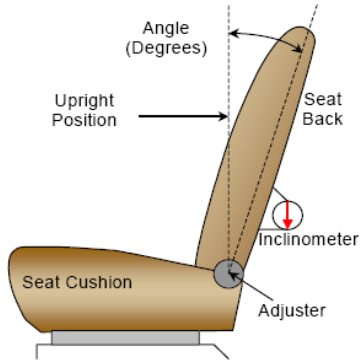
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	262		130	
Front Passenger Seat	262		131	
Front Center Seat				
Struck Side Rear Seat	140	16	70	8
Non-Struck Side Rear Seat	142	15	71	8
Rear Center Seat				

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The right front passenger's seat back is positioned in a similar manner as the driver's seat back. The struck side rear seat back is fixed. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck side rear seat back. Seat back angle is measured with a flat edge along the seat back.



FRONT SEAT ASSEMBLY

SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/ Seated Dummy	63.9		21.0	
Front Passenger Seat	64.5		13.0	
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	41.5	7	15.0	2
Non-Struck Side Rear Seat	31.4	7	15.0	3
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. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

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
Rear Seat	Fixed	Fixed

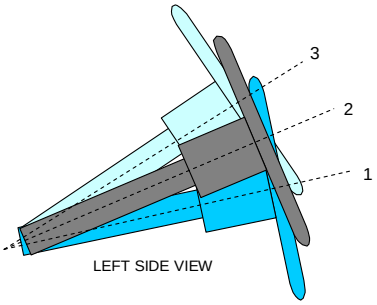
HEAD RESTRAINT ADJUSTMENT

The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger'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	H
Rear Seat	5	L

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.



STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore-Aft Position (mm)
Lowermost Position, No. 1	20.8	80
Geometric Center Position, No. 2	23.1	110
Uppermost Position, No. 3	25.3	140
Telescoping Steering Wheel Travel		60
Test Position	23.1	110

DATA SHEET NO. 2 … (CONTINUED)

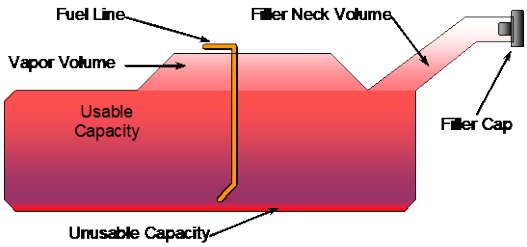
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

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

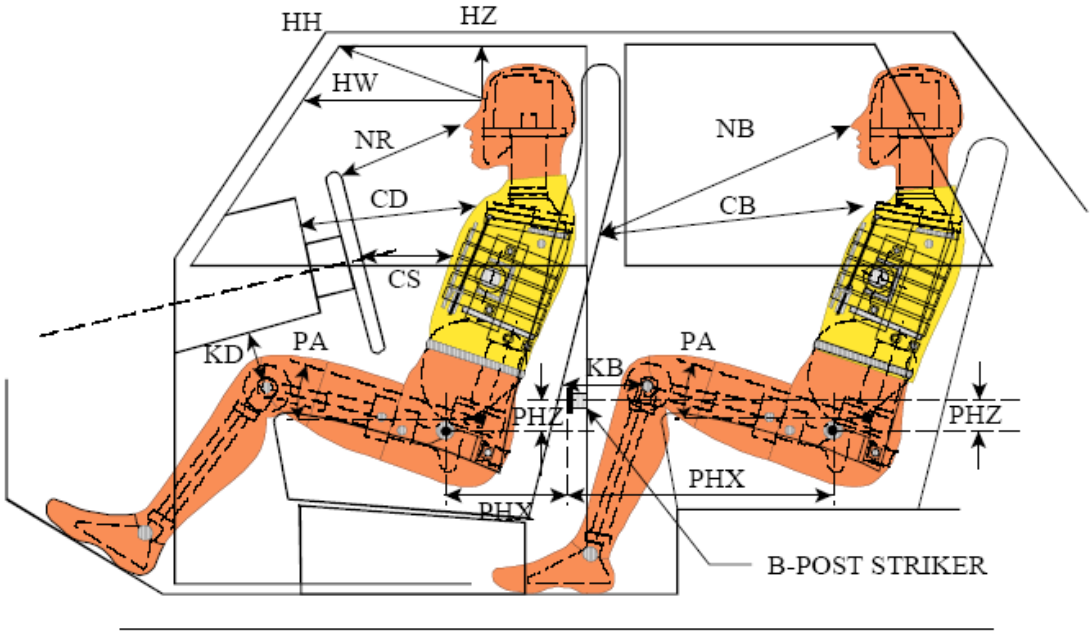
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



NOTE: 2-DOOR VEHICLE SHOWN. REAR DUMMY PHX & PHZ MEASUREMENTS FOR A 4-DOOR VEHICLE WOULD USE THE C-POST STRIKER AS A REFERENCE POINT

LEFT SIDE VIEW

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

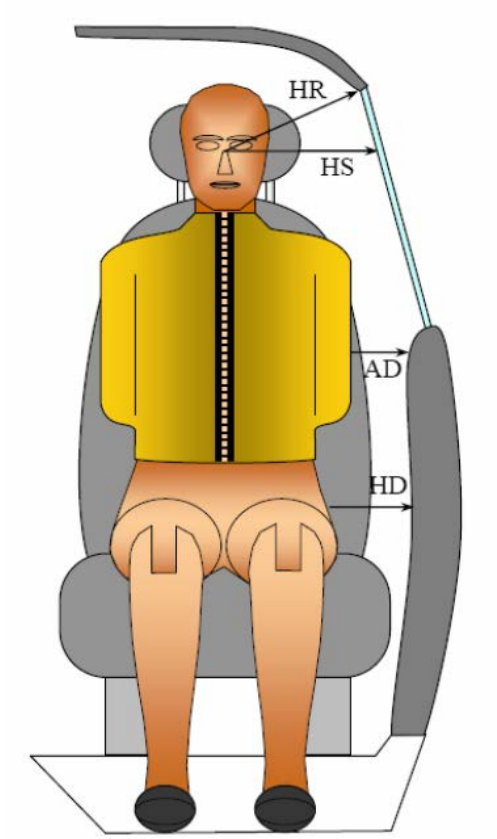
Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (º)	Length (mm)	Angle (º)
HH		Head to Header	481			
HW		Head to Windshield	634			
HZ	HZ	Head to Roof	263		296	
NR	NB	Nose to Rim/Seat Back	470		478	
CD	CB	Chest to Dash/Seat Back	668		474	
CS		Chest to Steering Wheel	476			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	198	27.5	303	1.5
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	171	26.5	307	6.3
PAX°	PAX°	Pelvic Tilt Angle X		20.2		18.2
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (x-axis)	154		204	
PHZ	PHZ	Hip Point to Striker (z-axis)	202		154	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

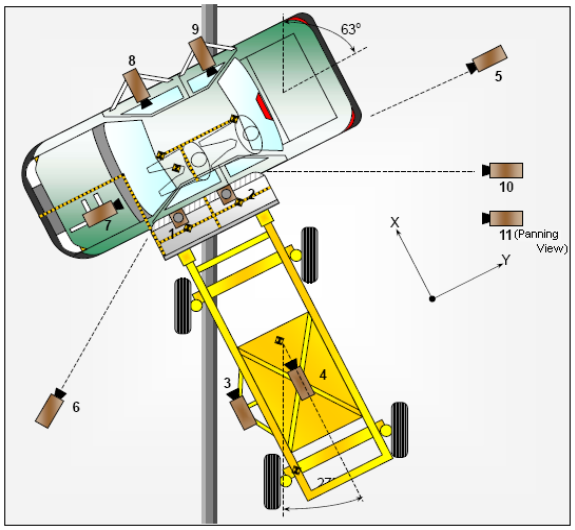
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	252	258
HS	Head to Side Window	mm	353	348
AD	Arm to Door	mm	96	147
HD	H-Point to Door	mm	168	152

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



CAMERA LOCATIONS AND DATA

No.	View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	1220	2287	-5486	14	1000
2	Overhead Close-Up	609	2287	-5102	35	1000
3	Left Impact Point (MDB)	-2134	0	-1143	25	1000
4	Side Overall (MDB)	-3912	838	-1829	12.5	1000
5	Rear	-64	2485	-1348	85	1000
6	Left Front	-2266	-3564	-1475	24	1000
7	Driver Front (On-Board)	-1009	357	1426	8	1000
8	Driver Side (On-Board)	-2071	-754	1117	8	1000
9	Passenger Side (On-Board)	-3031	-755	1156	6	1000
10	Real Time Overall				Zoom	30
11	Real Time Inrun				Zoom	30

Reference: Impact Point Projected to Ground; +X = To Front of MDB, +Y = To Right of MDB, +Z = Down

*All measurements accurate to ±6 mm

INSTRUMENTATION

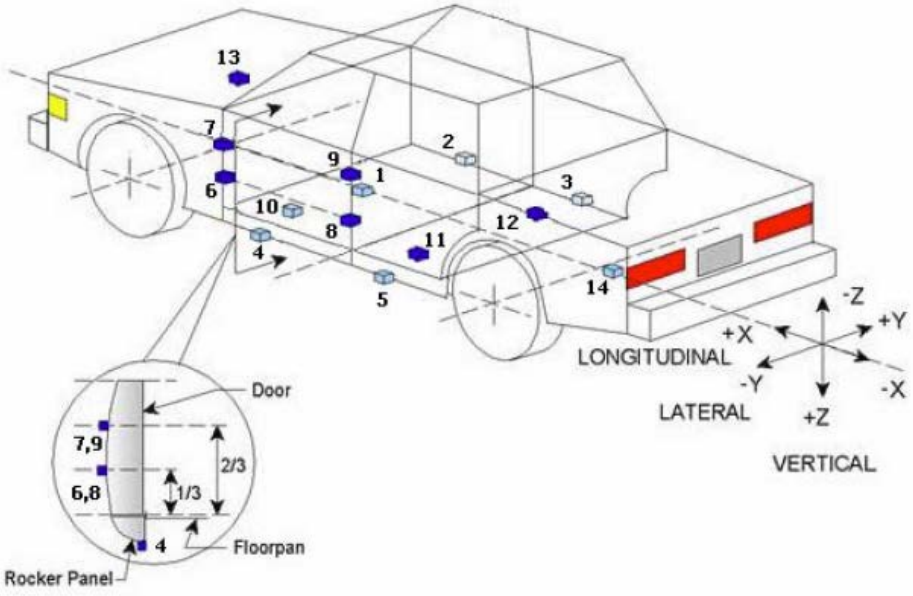
Driver Dummy Channels	16
Passenger Dummy Channels	19
Vehicle Structure Accelerometers	23
MDB Channels	5
Total	63

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1030	100	400
2	Right Sill at Front Seat	850	290	240
3	Right Sill at Rear Seat	1290	300	260
4	Left Sill at Front Door	570	310	160
5	Left Sill at Rear Door	1000	320	170
6	A-Pillar Lower	580	330	290
7	A-Pillar Middle	580	330	380
8	B-Pillar Lower	990	310	220
9	B-Pillar Middle	990	310	450
10	Front Seat Track	880	220	150
11	Rear Seat Structure	1120	150	180
12	Right Rear Occupant Compartment	1130	140	170
13	Engine Block	370	130	330
14	Rear Floorpan Above Axle	1540	0	300

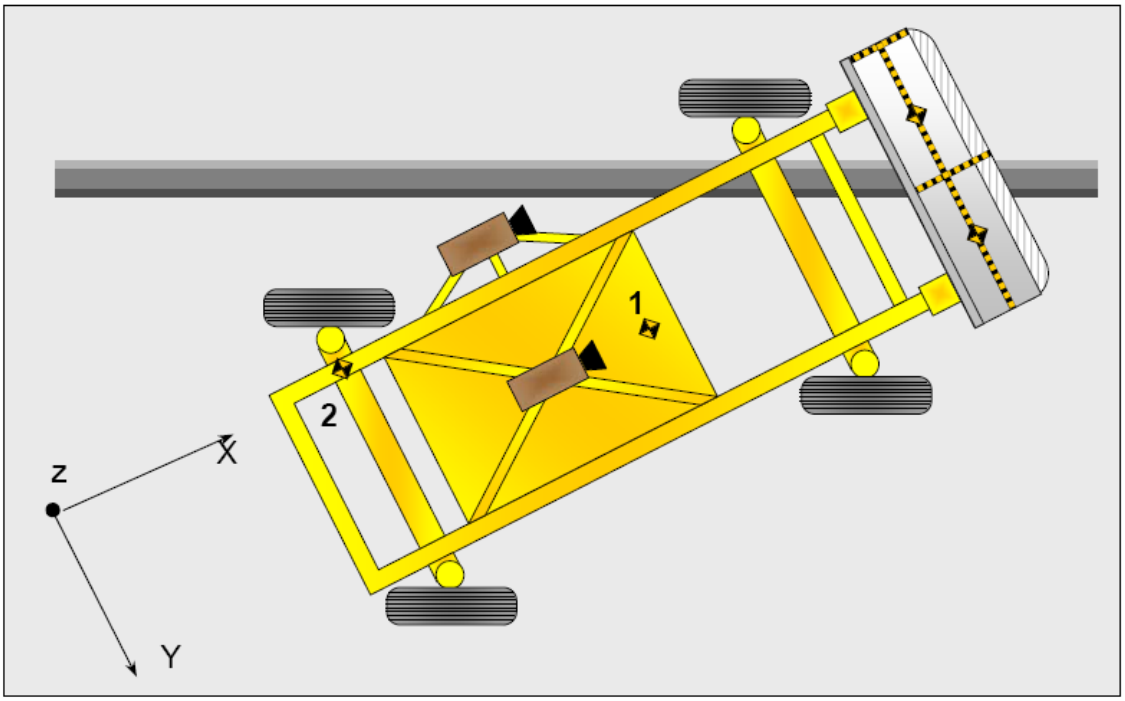
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



MDB ACCELEROMETER LOCATIONS

Loc. No.	Accelerometer Location	Measurement		
		X	Y	Z
1	MDB CG	-1195	0	-430
2	MDB Rear	-2642	-593	-608

Reference: X – Face of MDB (+ forward)
Y – MDB centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 8

POST-TEST OBSERVATIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	Curtain Airbag
Top of Head	Curtain Airbag, Headliner	Curtain Airbag, Headliner
Left Side of Head	Curtain Airbag	Curtain Airbag, Headliner
Back of Head	Curtain Airbag, Headrest, Headliner	Headliner, Headrest
Left Shoulder	Door Panel	Door Panel
Upper Torso	Torso-Pelvis Airbag	Door Panel
Lower Torso	Torso-Pelvis Airbag	Door Panel
Left Hip	Door Panel	Door Panel
Left Knee	Door Panel	Door Panel

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear
	Front	Rear	Front	Rear	Hatch/Other
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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Good
Sill Separation	No separation
Windshield Damage	None
Side Window Damage	Broken
Other Notable Effects	None

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

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
Vehicle Wheelbase	mm		2825
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		431
Actual Impact Point (Aft of Front Axle)	mm		436
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	-5
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	4

DATA SHEET NO. 9

MDB SUMMARY OF RESULTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1251
Overall Length including Honeycomb Face	4115
Wheel Base of Framework Carriage	2595
CG location aft of Front Axle	1118

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	402.0	297.5	699.5
Right	kg	377.0	290.0	667.0
Ratio	%	57.0%	43.0%	100.0%
Totals	kg	779.0	587.5	1366.5

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.92
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.00
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.5
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.2
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.3

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

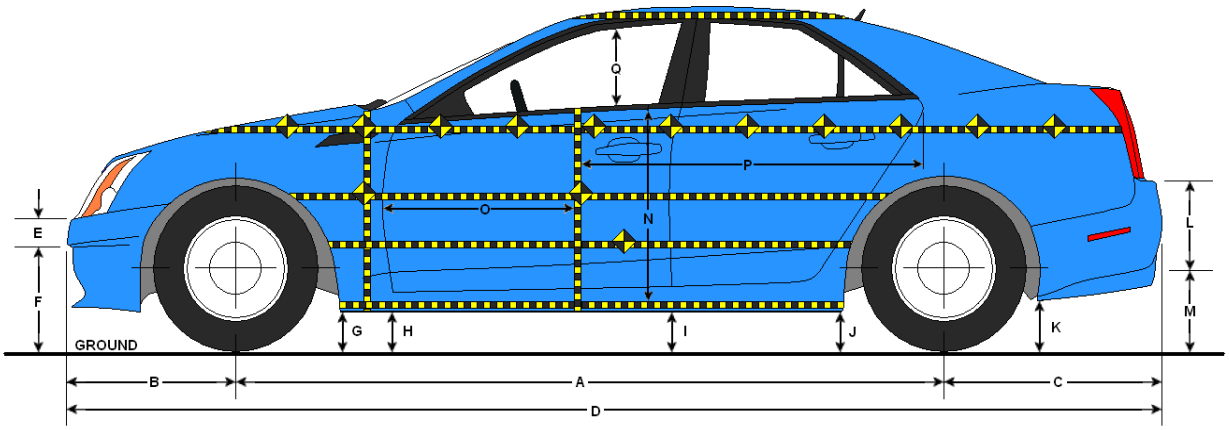
Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Left	236
B	Top of Bumper	533	800	Left	144
C	Mid Level	686	800	Left	147
D	Top of Stack	813	800	Left	186

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2825	2807	-18
B	Front Axle to FSOV	905	916	11
C	Rear Axle to RSOV	905	910	5
D	Total Length at Centerline	4635	4633	-2
E	Front Bumper Thickness	96	95	-1
F	Fromt Bumper Bottom to Ground	504	504	0
G	Sill Height at Front Wheel Well	307	304	-3
H	Sill Height at Front Door Leading Edge	296	294	-2
I	Sill Height at B-Pillar	302	355	53
J1	Sill Height at Rear Wheel Well	319	383	64
J2	Pinch Weld Height at Rear Wheel Well	241	246	5
K	Sill Height Aft of Rear Wheel Well	392	385	-7
L	Rear Bumper Thickness	221	219	-2
M	Rear Bumper Bottom to Ground	449	442	-7
N	Sill Height to Bottom of Front Window Sill	730	656	-74
O	Front Door Leading Edge to Impact CL	756	739	-17
P	Rear Door Trailing Edge to Impact CL	1358	1345	-13
Q	Front Window Opening	443	456	13
R	Right Side Length	3424	3426	2
S	Left Side Length	3424	3415	-9
T	Vehicle Width at B-Pillar	1810	1728	-82

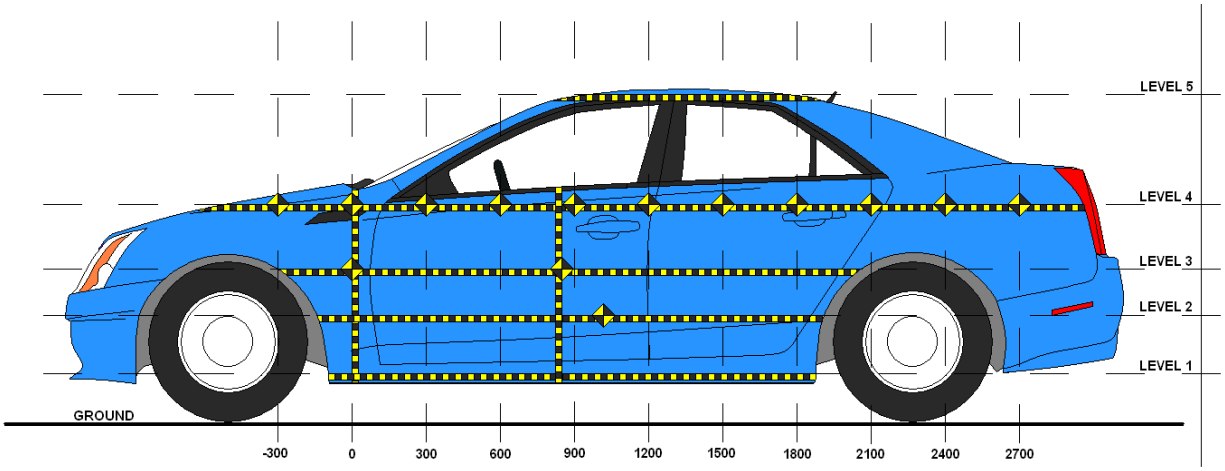
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



LEFT SIDE VIEW

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	286	23	1050
2	Occupant H-Point	657	187	1800
3	Mid-Door	708	191	1800
4	Window Sill	1029	76	1650
5	Window Top	1598	-1	1350

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

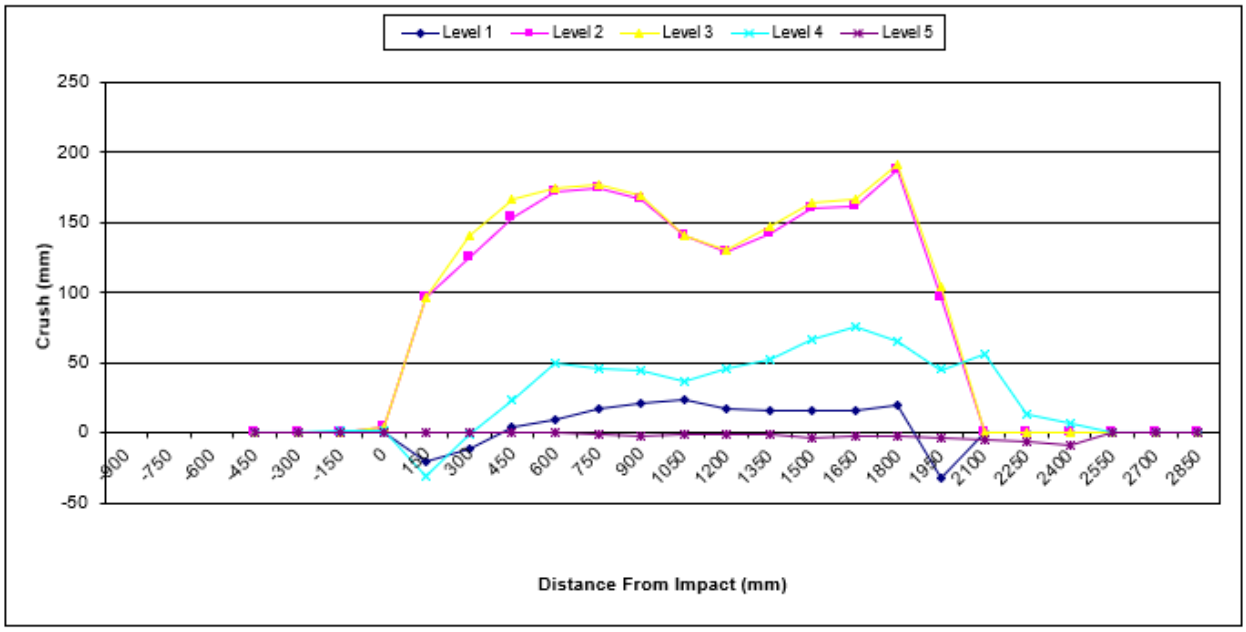
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150				692					694					2	
0	635	592	593	678		635	596	597	680		0	4	4	2	
150	638	609	607	668		617	706	704	637		-21	97	97	-31	
300	640	611	610	657		628	736	750	656		-12	125	140	-1	
450	640	611	611	654		644	764	777	677		4	153	166	23	
600	642	612	613	650		651	784	788	700		9	172	175	50	
750	643	613	614	648	879	660	788	791	694	878	17	175	177	46	-1
900	643	615	616	644	882	664	782	785	688	879	21	167	169	44	-3
1050	643	616	617	651	886	666	757	758	687	885	23	141	141	36	-1
1200	643	616	617	640	893	660	745	747	686	892	17	129	130	46	-1
1350	646	616	617	641	899	662	758	764	693	898	16	142	147	52	-1
1500	647	617	618	640	904	663	777	782	706	900	16	160	164	66	-4
1650	645	617	618	641	910	661	779	785	717	908	16	162	167	76	-2
1800	643	613	613	635	915	663	800	804	700	912	20	187	191	65	-3
1950	636	601	601	615	919	603	698	705	660	915	-33	97	104	45	-4
2100				633	922				689	917				56	-5
2250				626	926				639	920				13	-6
2400				625	930				631	921				6	-9
2550															
2700															
2850															

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

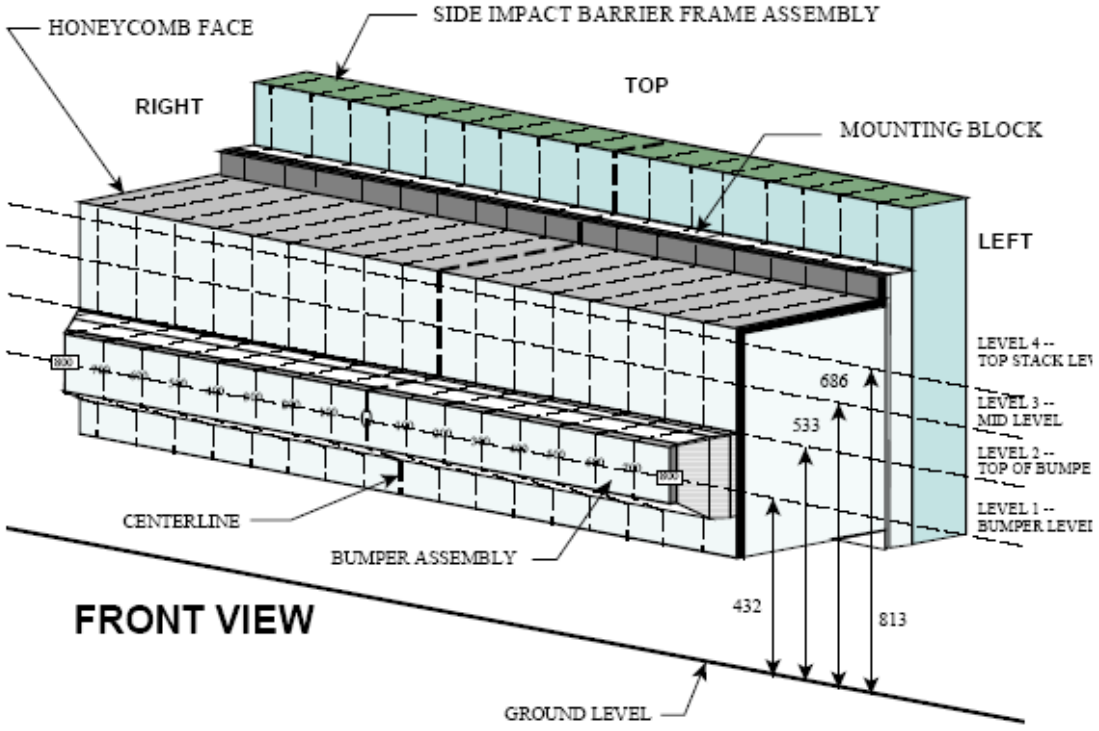


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	228	216	215	206	206	211	225	215	211	210	216	219	211	213	206	206	236
2	128	128	128	127	119	107	123	117	102	119	127	128	127	127	127	134	144
3	71	64	67	74	82	94	114	119	89	72	59	56	61	70	84	114	147
4	82	64	64	74	89	107	134	149	112	94	84	74	79	89	116	154	186

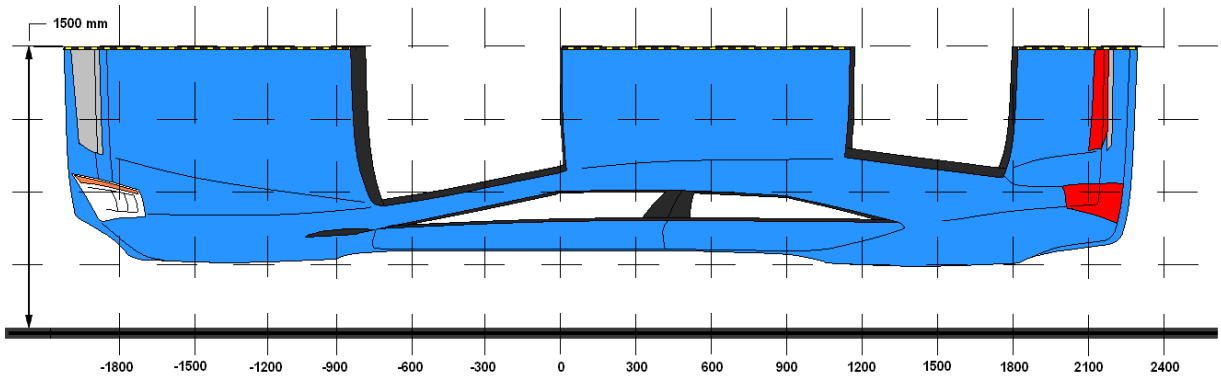
All dimensions in millimeters.

DATA SHEET NO. 13

VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2400	4	625	631	6
2	1950	3	601	705	104
3	1350	3	617	764	147
4	900	3	616	785	169
5	300	3	610	750	140
6	-150	4	692	694	2

MDB DAMAGE PROFILE DISTANCES

DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	236
2	500	Left	1	213
3	200	Left	1	216
4	200	Right	1	225
5	500	Right	1	206
6	800	Right	1	228

DATA SHEET NO. 14

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21

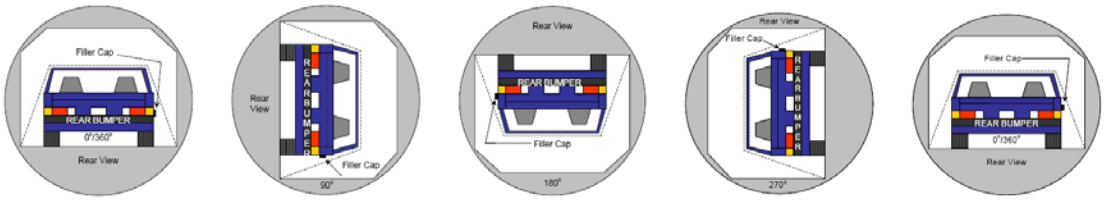
Temperature at Time of Impact: 21.1°C Test Time: 3:13 PM

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

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

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

D. Spillage Details: _____



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°	80	300	380
90° To 180°	80	300	380
180° To 270°	80	300	380
270° To 360°	80	300	380

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

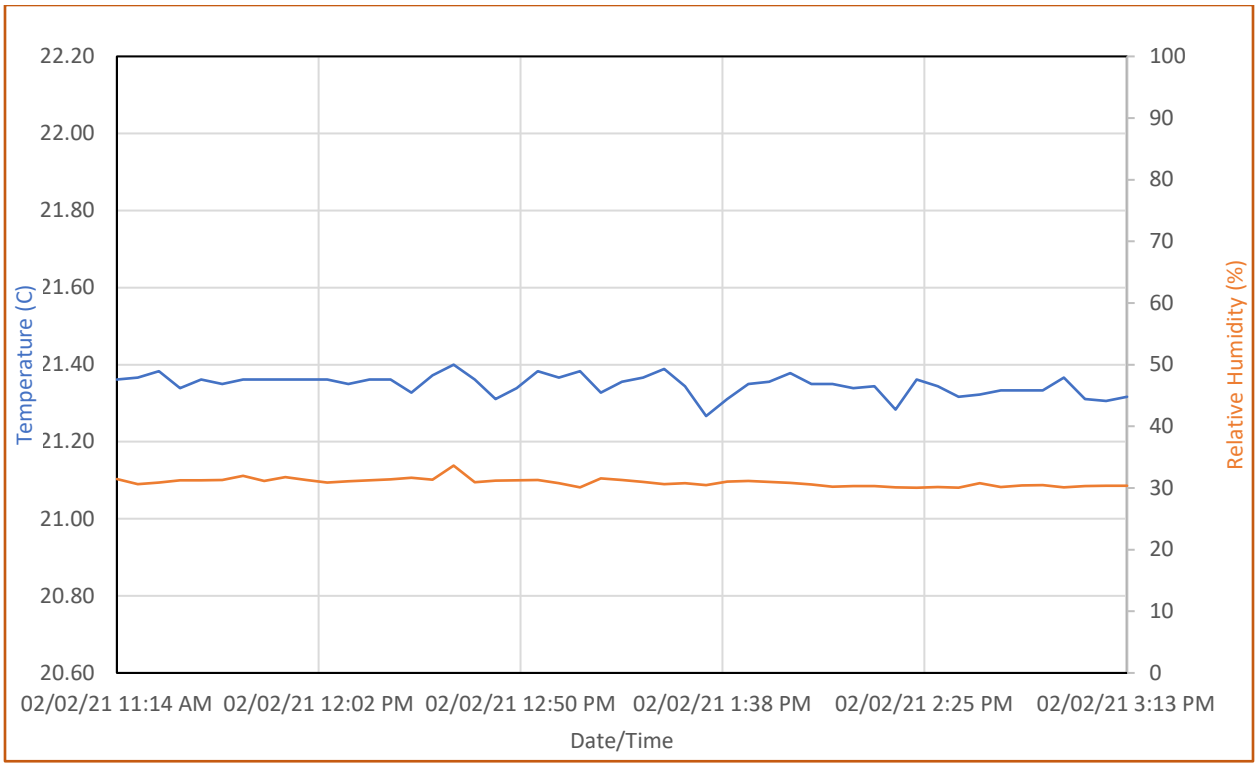
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

DATA SHEET NO. 15

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2021 Mercedes-Benz GLB250 5-Door SUV NHTSA No. M20214305

Test Program: NCAP MDB Side Impact Test Test Date: 02/02/21



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

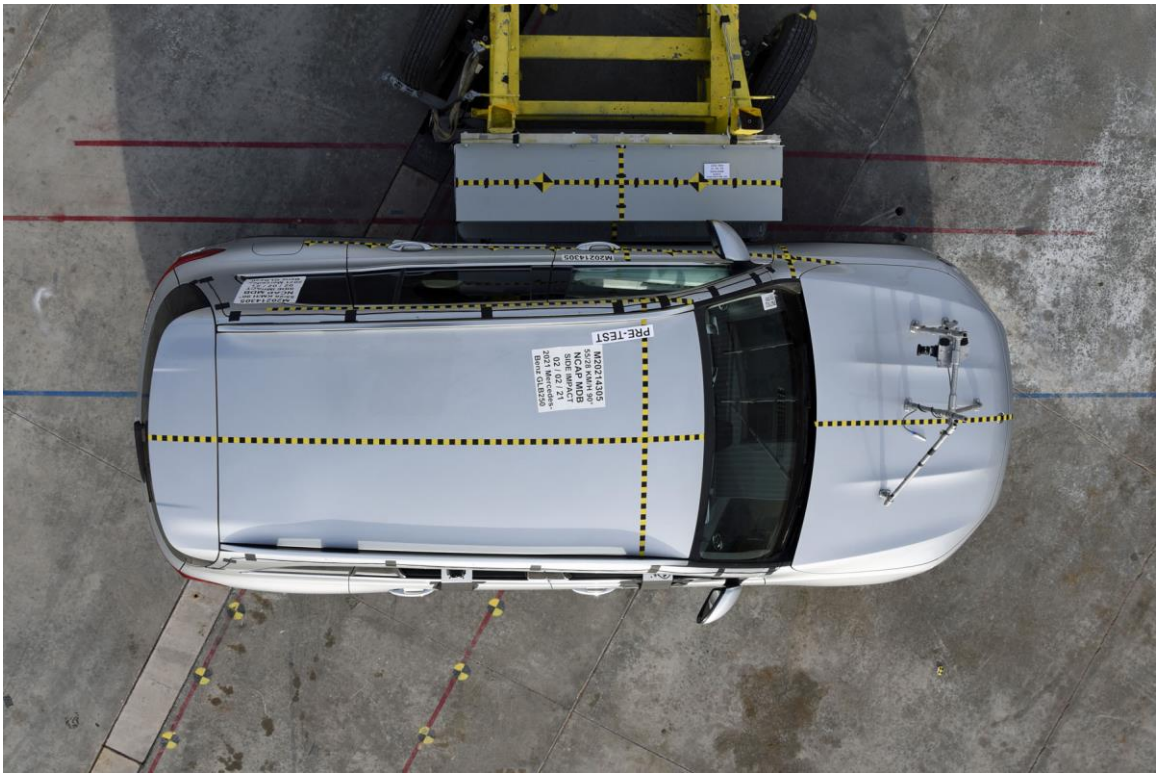


FIGURE 15. Pre-Test Overhead View of Test Area

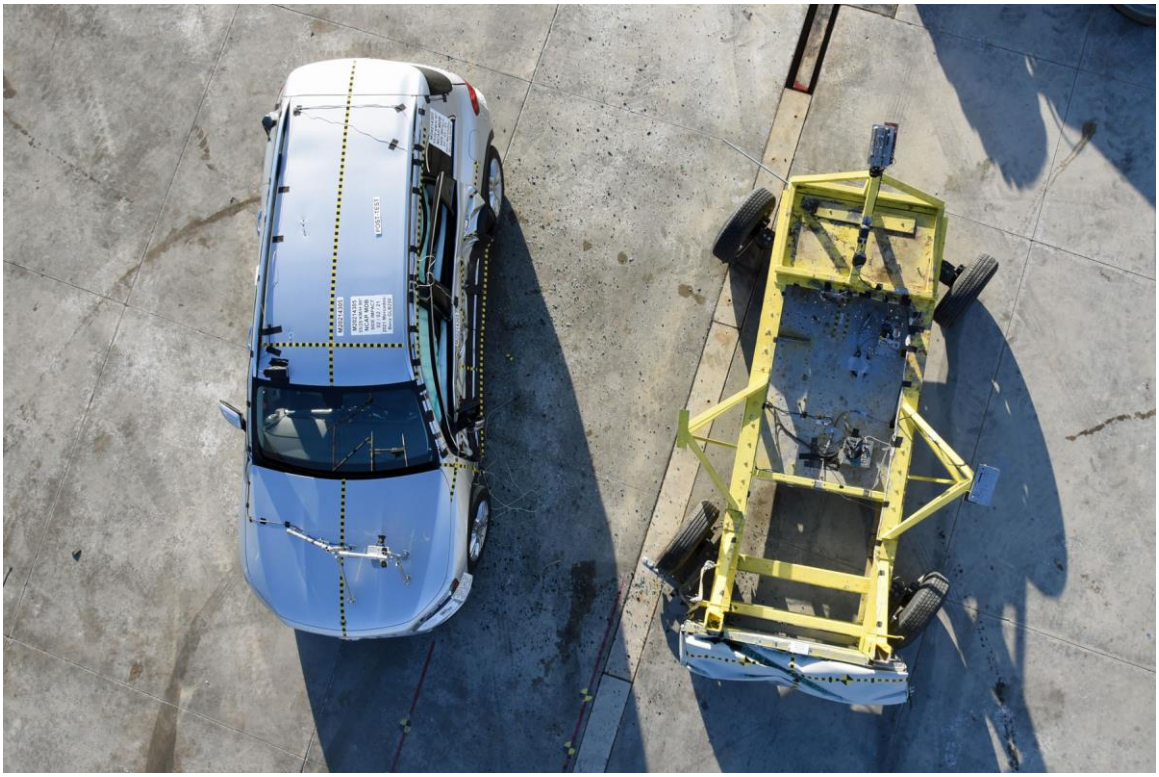


FIGURE 16. Post-Test Overhead View of Test Area

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

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

FIGURE 19. Pre-Test Close-Up View of Impact Point Target

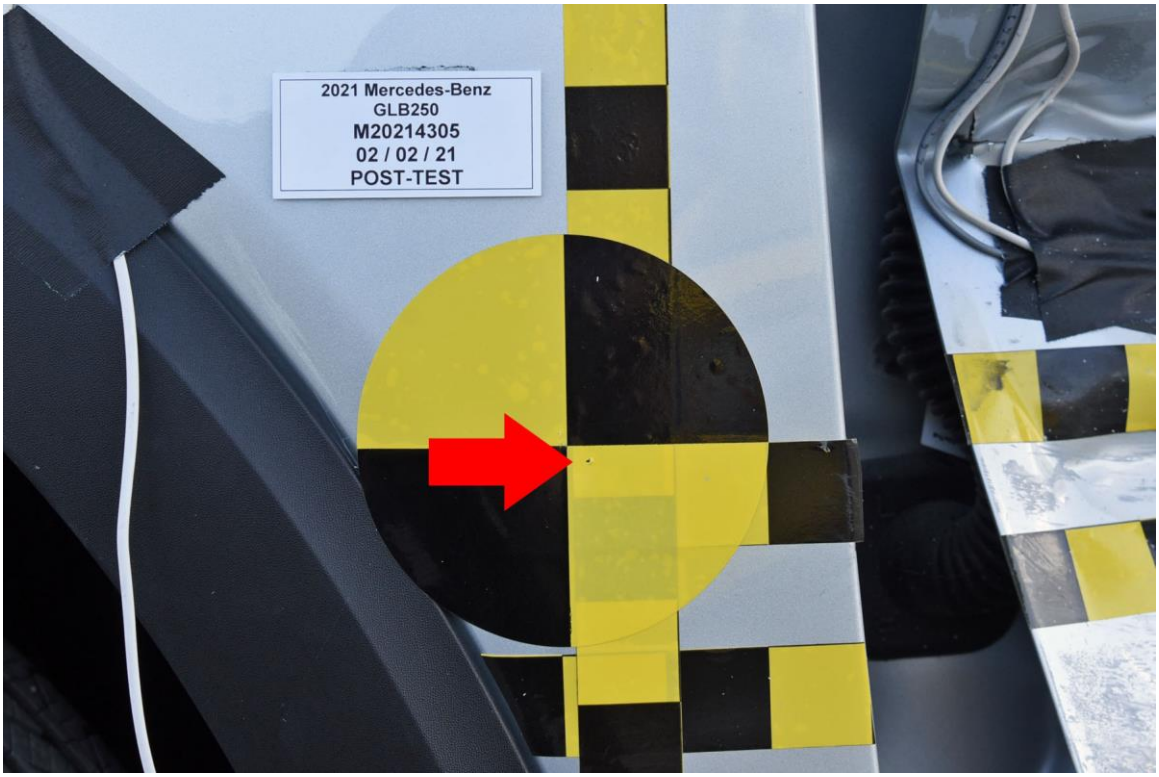


FIGURE 20. Post-Test Close-Up View of Impact Point Target

FIGURE 21. Pre-Test Left Front Door Latch Close-Up

FIGURE 22. Post-Test Left Front Door Latch Close-Up

FIGURE 23. Pre-Test Left Rear Door Latch Close-Up

FIGURE 24. Post-Test Left Rear Door Latch Close-Up

FIGURE 25. Pre-Test Front Close-Up View of Driver Dummy

FIGURE 26. Post-Test Front Close-Up View of Driver Dummy

FIGURE 27. Pre-Test Left Side View of Driver Dummy
Showing Belt and Chalking

FIGURE 28. Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View

FIGURE 29. Post-Test Left Side View of Driver Dummy Shoulder and Door Top View

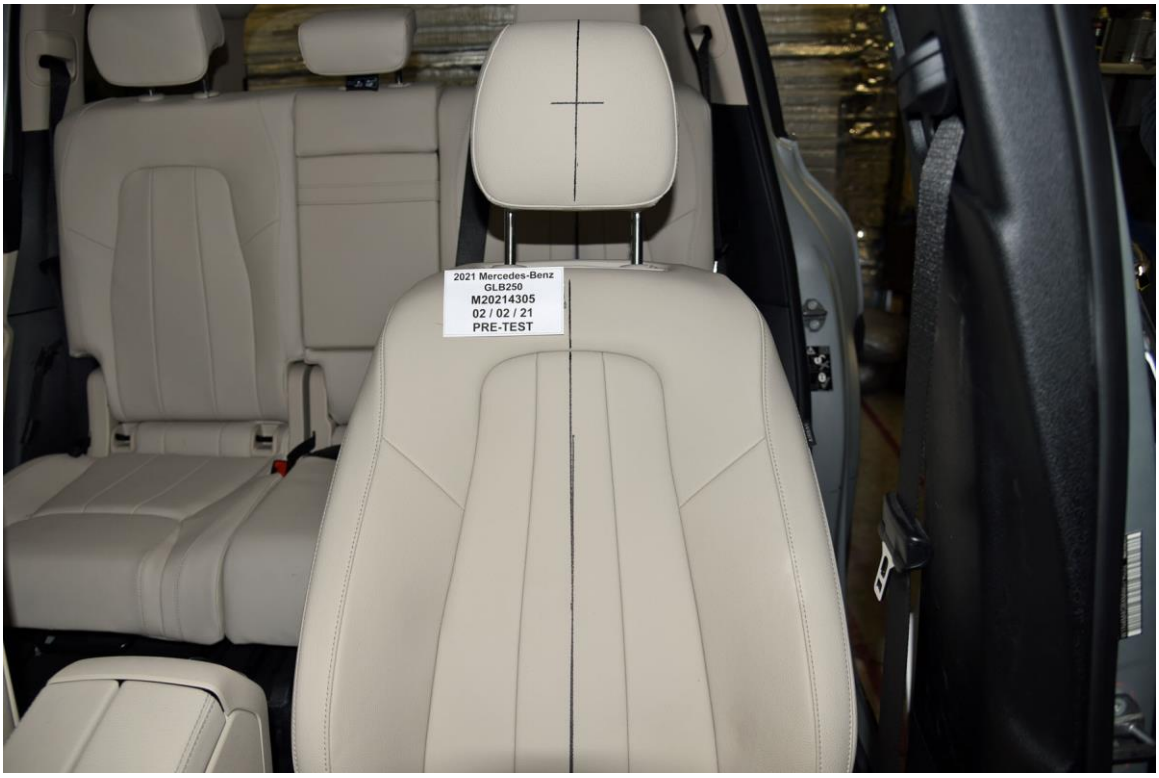


FIGURE 30. Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning

FIGURE 31. Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint

FIGURE 32. Pre-Test Overhead View of Driver Seat Pan Prior to Dummy Positioning

FIGURE 33. Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan

FIGURE 34. Pre-Test Placement of Driver Dummy's Feet

FIGURE 35. Pre-Test View of Belt Anchorage for Driver Dummy

FIGURE 36. Pre-Test Left Side View of Steering Wheel

FIGURE 37. View of Disengaged Parking Brake

FIGURE 38. Pre-Test View of Parking Brake

FIGURE 39. Pre-Test Close-Up Left Side View of Driver Seat Track

FIGURE 40. Pre-Test Close-Up Left Side View of Driver Seat Back

FIGURE 41. Pre-Test Close-Up View of Driver Seat Back or Head Restraint

FIGURE 42. Pre-Test Driver Dummy and Door Clearance View

FIGURE 43. Post-Test Driver Dummy and Door Clearance View

FIGURE 44. Pre-Test Right Side View of Driver Dummy
and Front Seat Occupant Compartment

FIGURE 45. Post-Test Right Side View of Driver Dummy
and Front Seat Occupant Compartment

FIGURE 46. Pre-Test Driver Inner Door Panel View

FIGURE 47. Post-Test Driver Inner Door Panel View
Showing Driver Dummy Contact Locations

FIGURE 48. Post-Test Driver Dummy Close-Up Head Contact
with Vehicle Interior View

FIGURE 49. Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

FIGURE 50. Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View

FIGURE 51. Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View

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

Photograph Not Applicable

FIGURE 53. Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View

FIGURE 54. Post-Test Driver Dummy Close-Up Knee Contact View

FIGURE 55. Pre-Test Left Side View of Rear Passenger Dummy

Showing Belt and Chalking

FIGURE 56. Pre-Test Left Side View of Rear Passenger Dummy

Shoulder and Door Top View

FIGURE 57. Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View

FIGURE 58. Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning

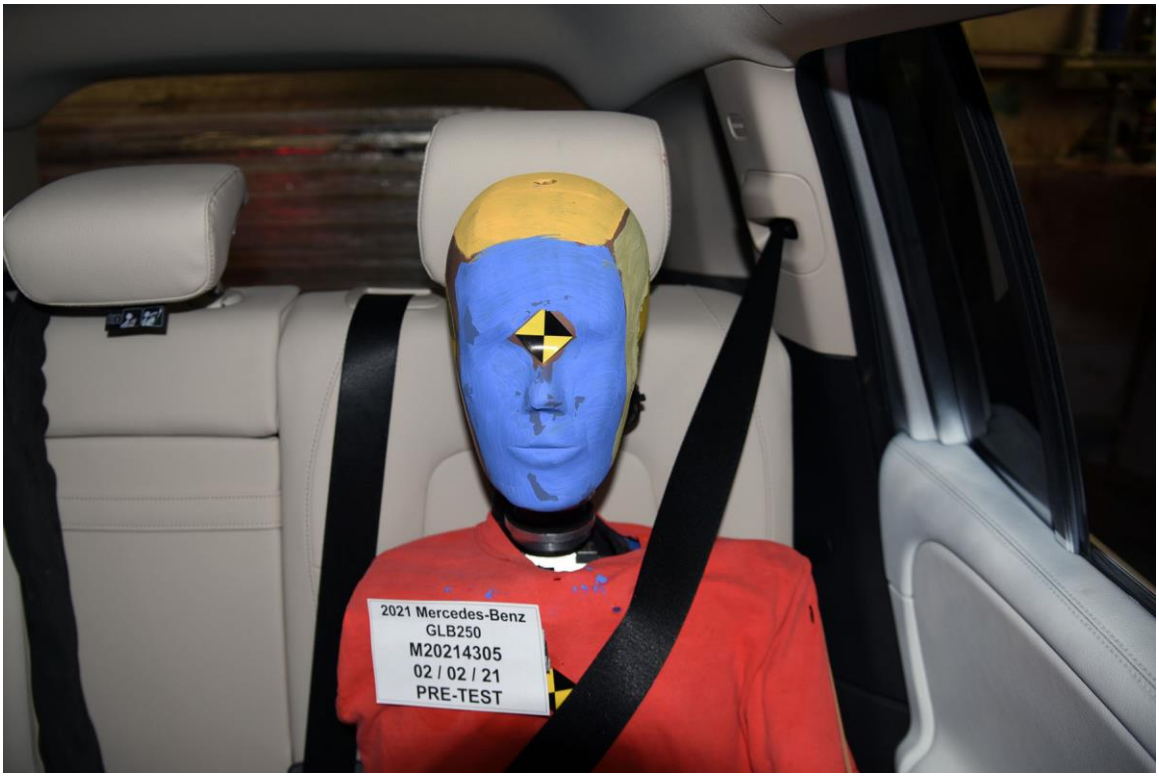


FIGURE 59. Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

FIGURE 60. Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning

FIGURE 61. Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

FIGURE 62. Pre-Test View of Rear Passenger Dummy's Neck
Showing Position of Adjustable Neck Bracket

FIGURE 63. Pre-Test View of Rear Passenger Dummy's Head

Showing Dummy’s Head is Level

FIGURE 64. Pre-Test Placement of Rear Passenger Dummy's Feet

FIGURE 65. Pre-Test View of Belt Anchorage for Rear Passenger Dummy

FIGURE 66. Pre-Test Close-Up Left Side View of Rear Passenger Seat Track

FIGURE 67. Pre-Test Close-Up Left Side View of Rear Passenger Seat Back

FIGURE 68. Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint

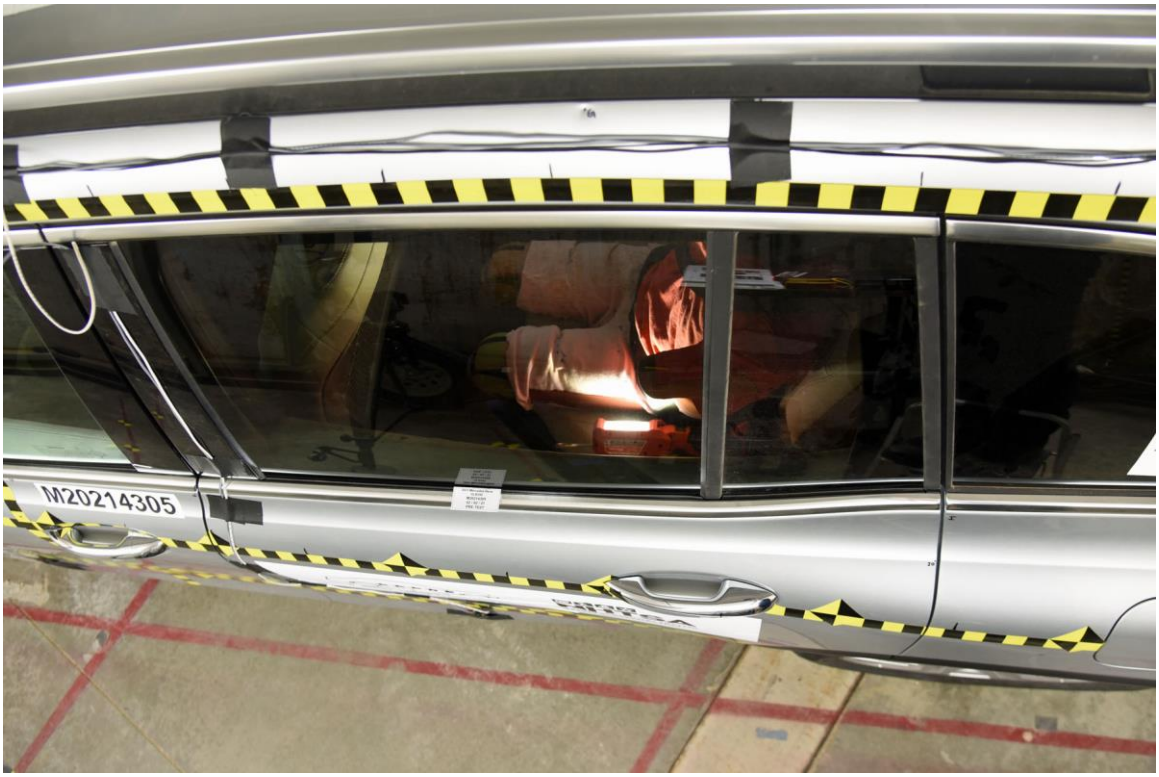


FIGURE 69. Pre-Test Rear Passenger Dummy and Door Clearance View

FIGURE 70. Post-Test Rear Passenger Dummy and Door Clearance View

FIGURE 71. Pre-Test Right Side View of Rear Passenger Dummy
and Rear Seat Occupant Compartment

FIGURE 72. Post-Test Right Side View of Rear Passenger Dummy
and Rear Seat Occupant Compartment

FIGURE 73. Pre-Test Rear Passenger Inner Door Panel View

FIGURE 74. Post-Test Rear Passenger Inner Door Panel View
Showing Rear Passenger Dummy Contact Locations

FIGURE 75. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Vehicle Interior View

FIGURE 76. Post-Test Rear Passenger Dummy Close-Up
Head Contact with Side Airbag View

FIGURE 77. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Vehicle Interior View

Photograph Not Applicable

FIGURE 78. Post-Test Rear Passenger Dummy Close-Up
Torso Contact with Side Airbag View

FIGURE 79. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Vehicle Interior View

Photograph Not Applicable

FIGURE 80. Post-Test Rear Passenger Dummy Close-Up
Pelvis Contact with Side Airbag View

FIGURE 81. Post-Test Rear Passenger Dummy Close-Up Knee Contact View

FIGURE 82. Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 83. Post-Test View of Fuel Filler Cap or Fuel Filler Neck

FIGURE 84. Pre-Test Front View of MDB Impactor Face

FIGURE 85. Post-Test Front View of MDB Impactor Face

FIGURE 86. Pre-Test Top View of MDB Impactor Face

FIGURE 87. Post-Test Top View of MDB Impactor Face

FIGURE 88. Pre-Test Left Side View of MDB Impactor Face

FIGURE 89. Post-Test Left Side View of MDB Impactor Face

FIGURE 90. Pre-Test Right Side View of MDB Impactor Face

FIGURE 91. Post-Test Right Side View of MDB Impactor Face

FIGURE 92. Close-Up View of Vehicle's Certification Label

NHTSA Number Should Read M20214305

FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

NHTSA Number Should Read M20214305

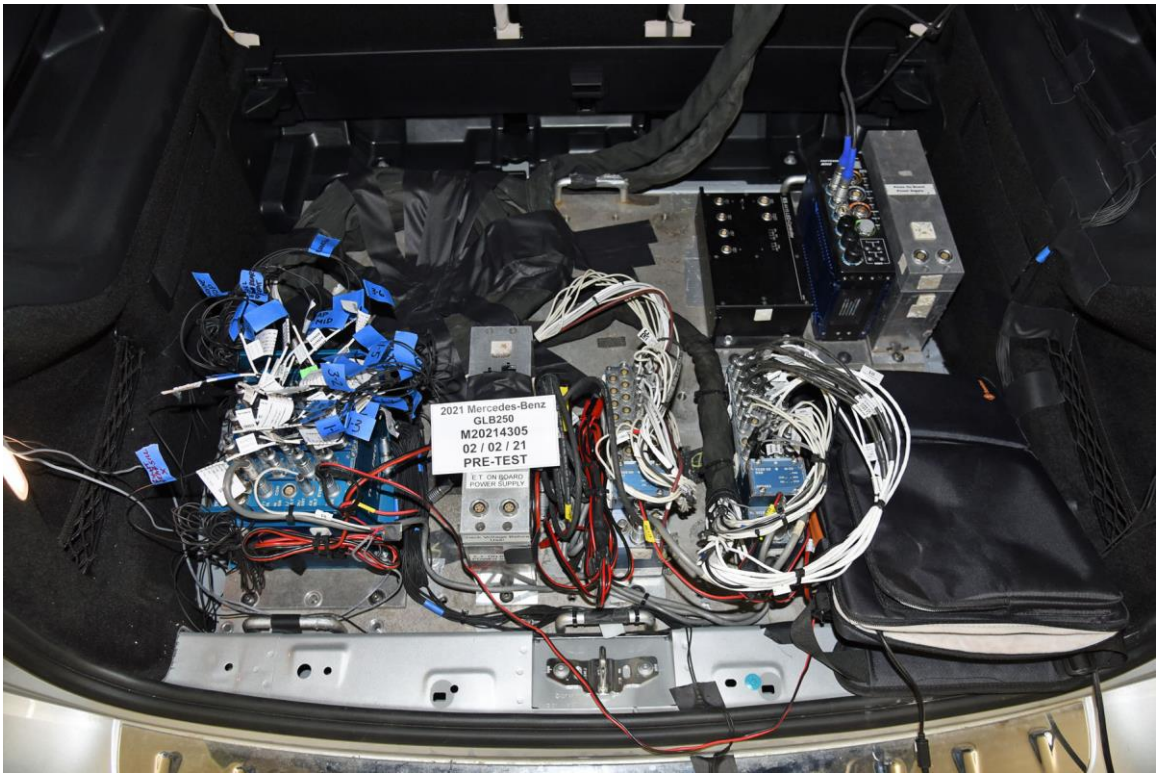


FIGURE 94. Pre-Test Ballast View

FIGURE 95. Post-Test Primary and Redundant Speed Trap Read-Out

FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees

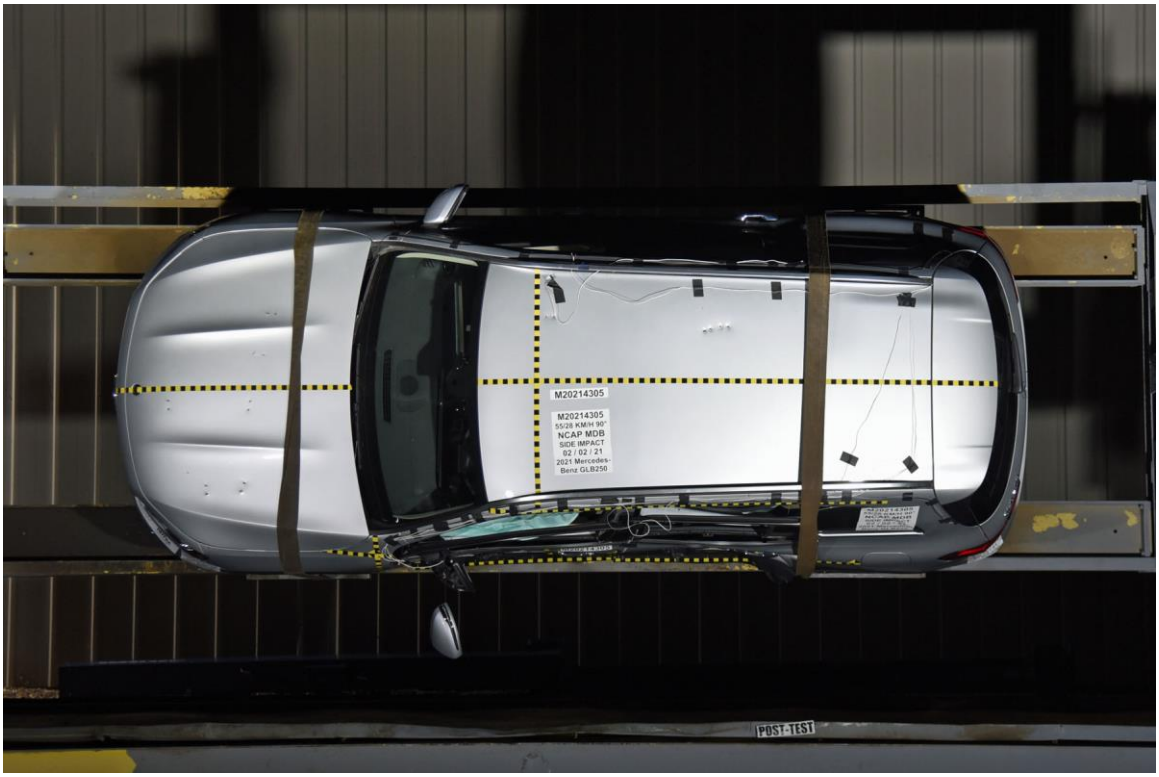


FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

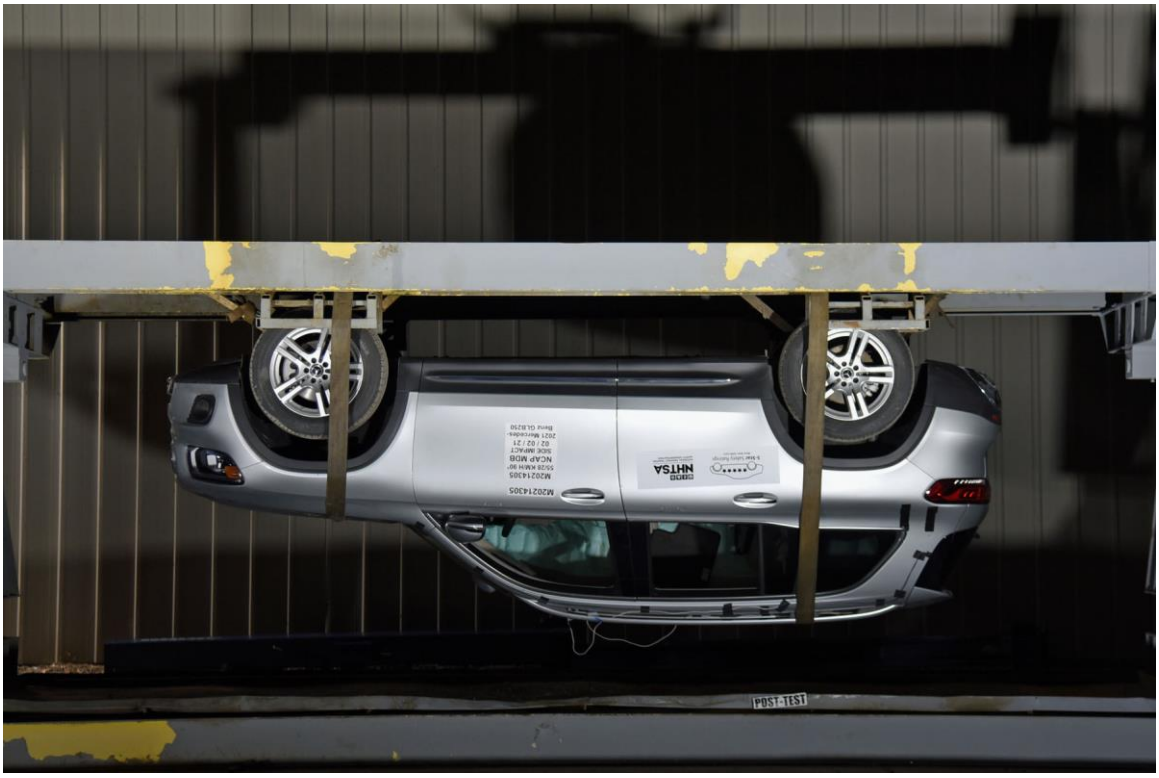


FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

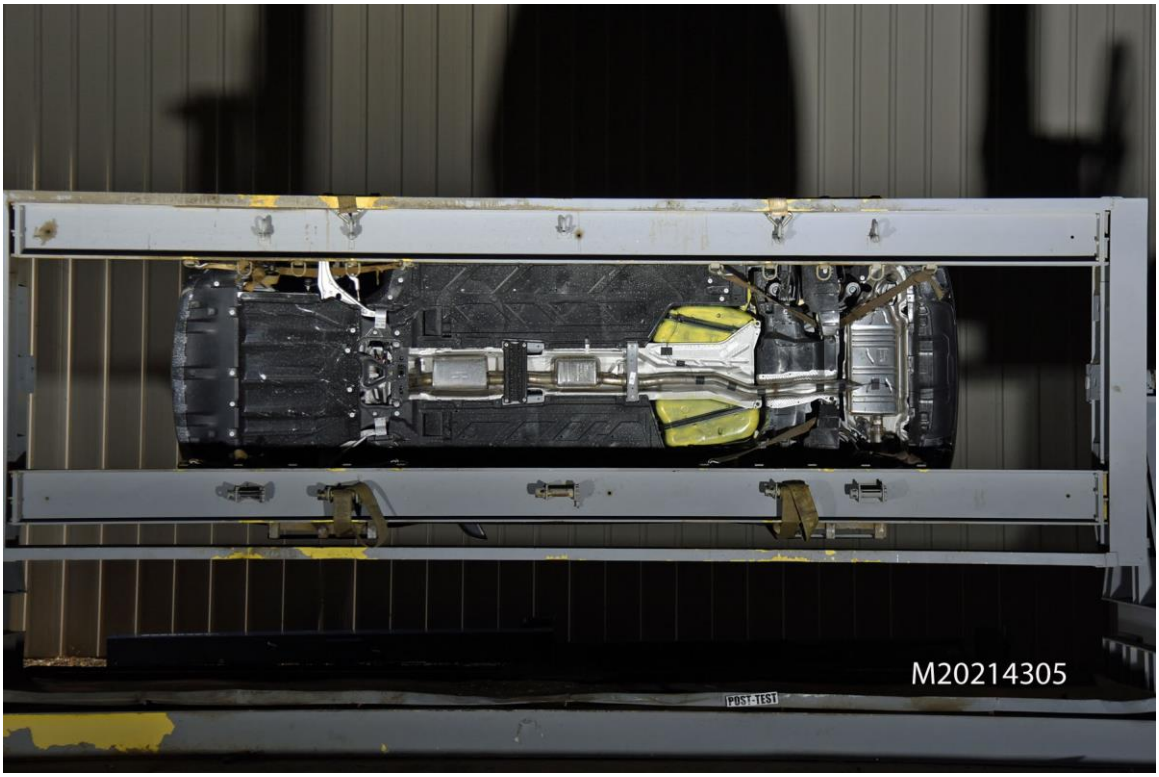


FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees

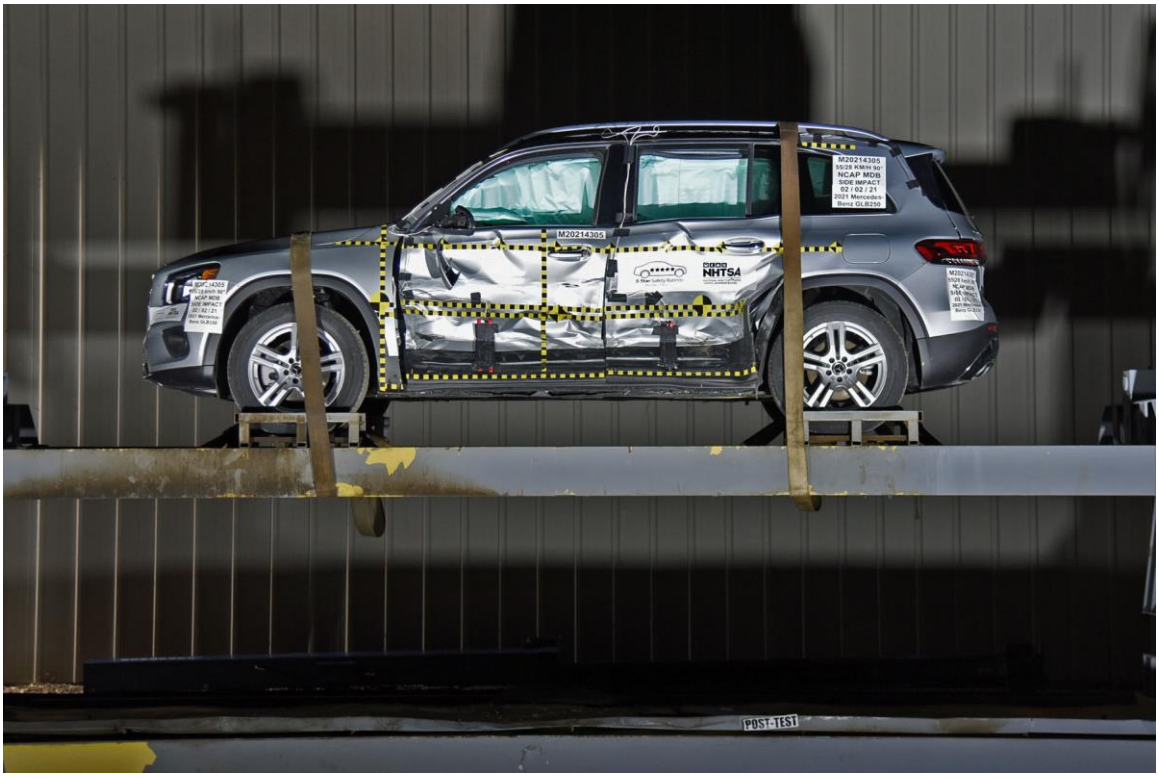
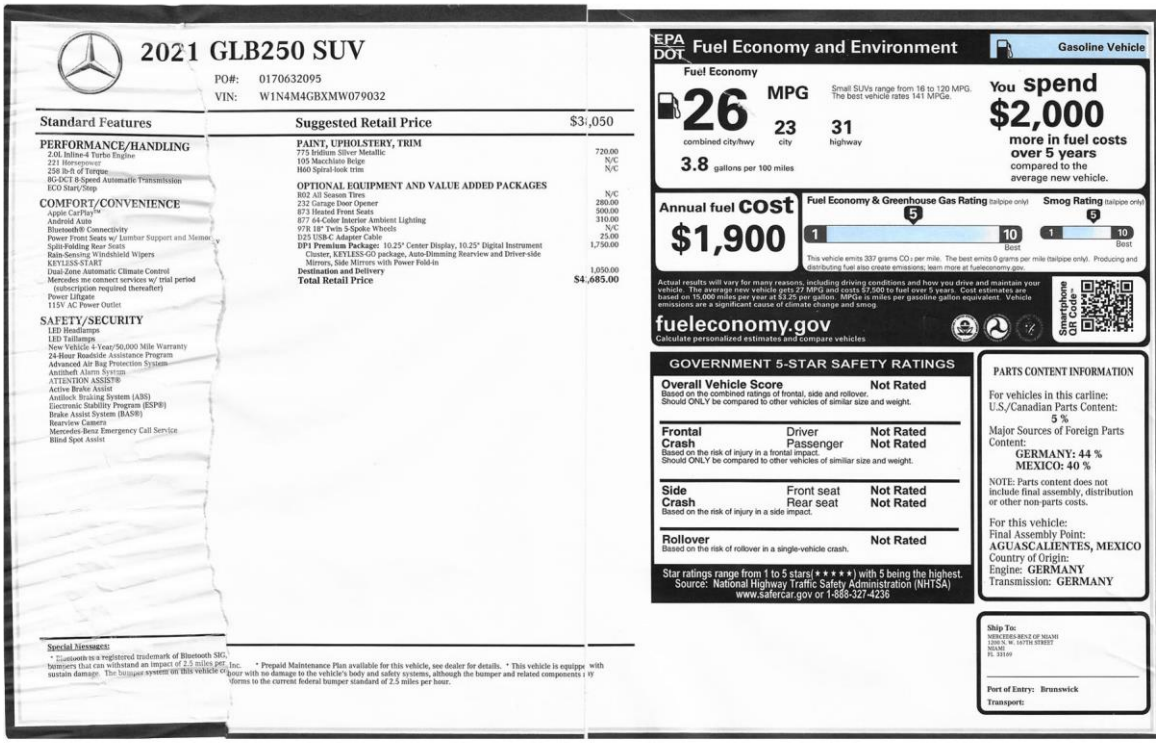


FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 101. Impact Event



2021 GLB250 SUV

PO#: 0170632095

VIN: W1N4M4GBXMW079032

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 $3[illegible],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
802 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
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 $4,685.00

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 Best, 10)
Smog Rating (tailpipe only) 5 (1 Best, 10)

This vehicle emits 337 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 QR Code™

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 — Driver: Not Rated; Passenger: Not Rated
Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.

Side Crash — Front seat: Not Rated; Rear seat: Not Rated
Based on the risk of injury in a side impact.

Rollover: Not Rated
Based on the risk of rollover in a single-vehicle crash.

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 MIAMI
16701 N.W. 16TH STREET
MIAMI
FL 33169

Port of Entry: Brunswick
Transport:

FIGURE 102. Monroney Label

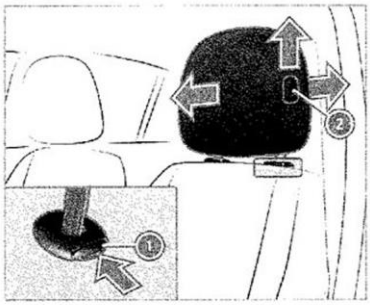
WARNING Risk of injury due to head restraints not being installed or being adjusted incorrectly

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.

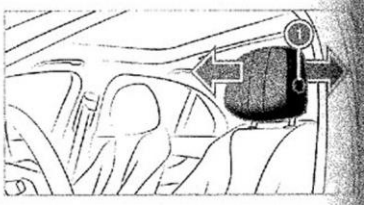
Do not interchange the head restraints of the front and rear seats. Otherwise, you will not be able to adjust the height and angle of the head restraints correctly.

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

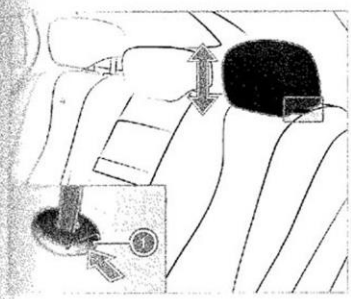


- **To move forward:** press release knob and pull the head restraint forward.
- **To move backwards:** press release knob and push the head restraint backwards.

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.

FIGURE 103. Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



- **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

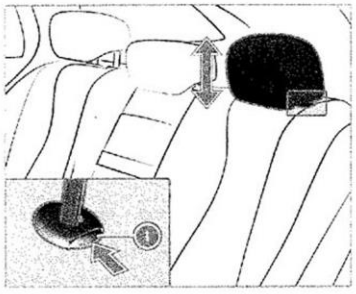
The head restraints on the third row of seats have a usage position and a non-usage position. The usage position is the extended, top position in which the head restraint engages; the non-usage position is the bottom, retracted position of the head restraint. If the seats on the third row of seats are 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 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

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

Additional Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)

Driver Lower Spine T12 Acceleration (Y)

Driver Lower Spine T12 Acceleration (Z)

Driver Head Acceleration Redundant (X)

Driver Head Acceleration Redundant (Y)

Driver Head Acceleration Redundant (Z)

Passenger Head Acceleration Redundant (X)

Passenger Head Acceleration Redundant (Y)

Passenger 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)

Right Side Sill at Front Seat Acceleration (X)

Right Side Sill at Front Seat Acceleration (Y)

Right Side Sill at Front Seat Acceleration (Z)

Right Side Sill at Rear Seat Acceleration (X)

Right Side Sill at Rear Seat Acceleration (Y)

Right Side Sill at Rear Seat Acceleration (Z)

Left Side Sill at Front Seat Acceleration (Y)

Left Side Sill at Rear Seat Acceleration (Y)

Lower A-Post Acceleration (Y)

Middle A-Post Acceleration (Y)

Lower B-Post Acceleration (Y)

Middle B-Post Acceleration (Y)

Front Seat Track Acceleration (Y)

Rear Seat Structure Acceleration (Y)

Right Rear Occupant Compartment Acceleration (Y)

Engine Block (X)

Engine Block (Y)

Rear Floorpan Above Axle Acceleration (X)

Rear Floorpan Above Axle Acceleration (Y)

Rear Floorpan Above Axle Acceleration (Z)

MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)

MDB Center of Gravity Acceleration (Y)

MDB Center of Gravity Acceleration (Z)

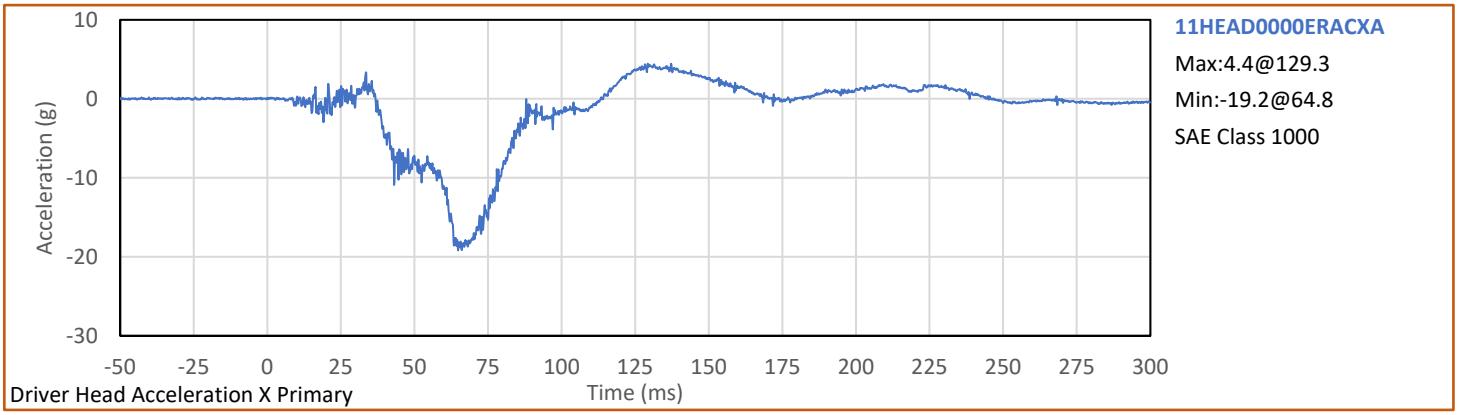
MDB Rear Acceleration (X)

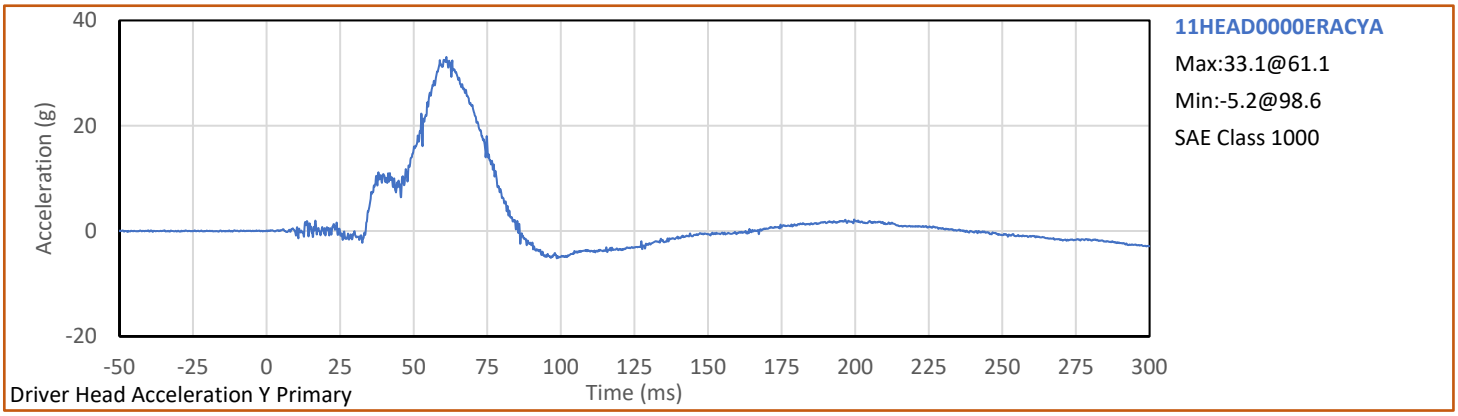
MDB Rear Acceleration (Y)

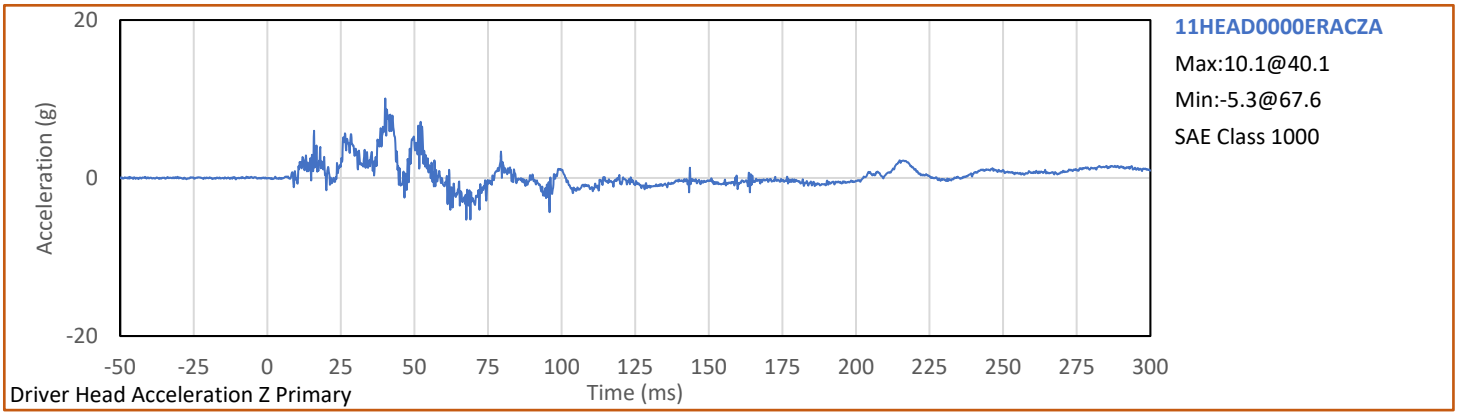
Left MDB Contact Switch

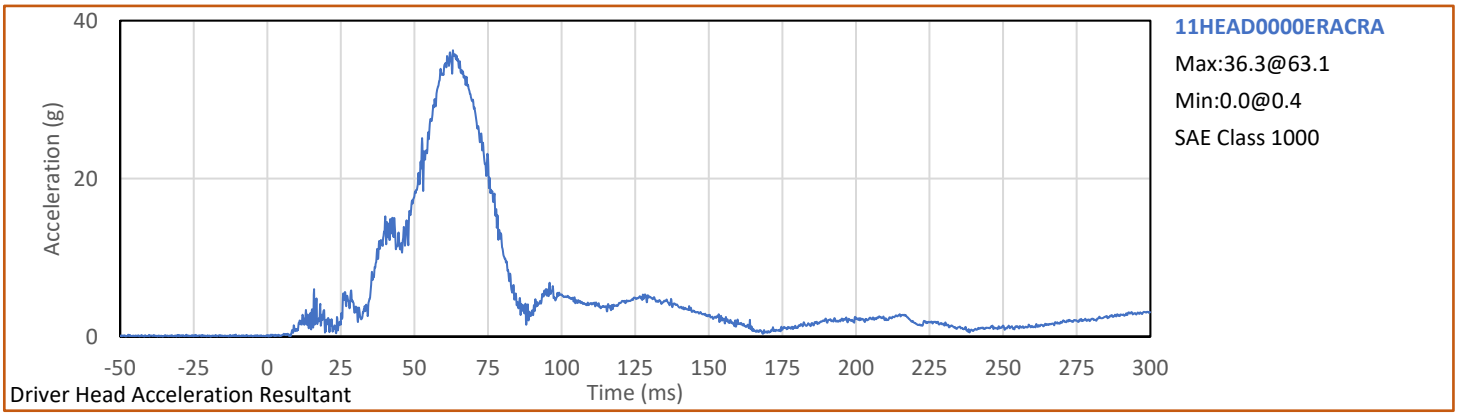
Right MDB Contact Switch

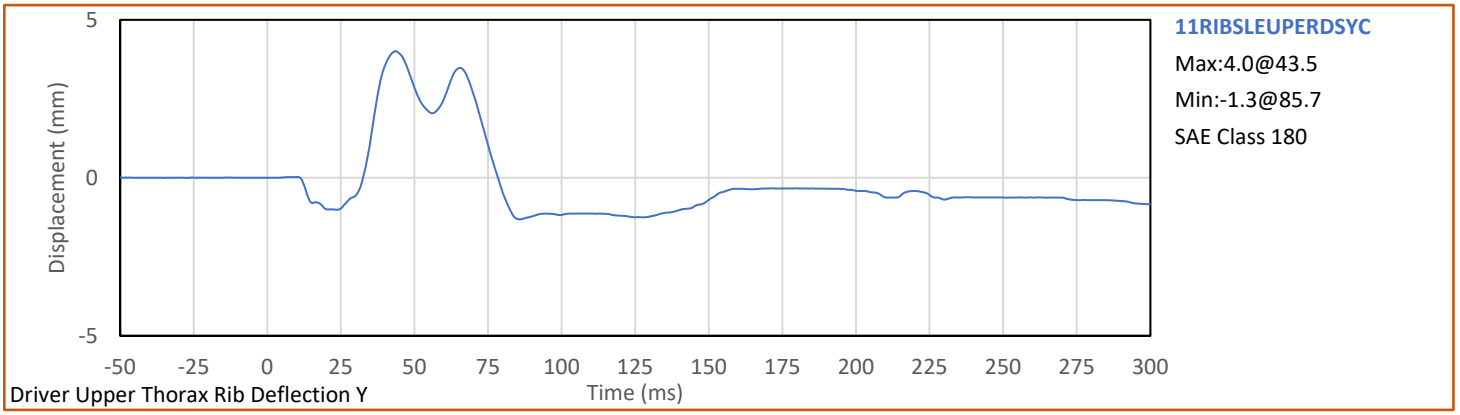
Test Vehicle:	2021 Mercedes-Benz GLB250 5-Door SUV	NHTSA No.:	M20214305
Test Program:	NCAP MDB Side Impact Test	Test Date:	2/2/2021

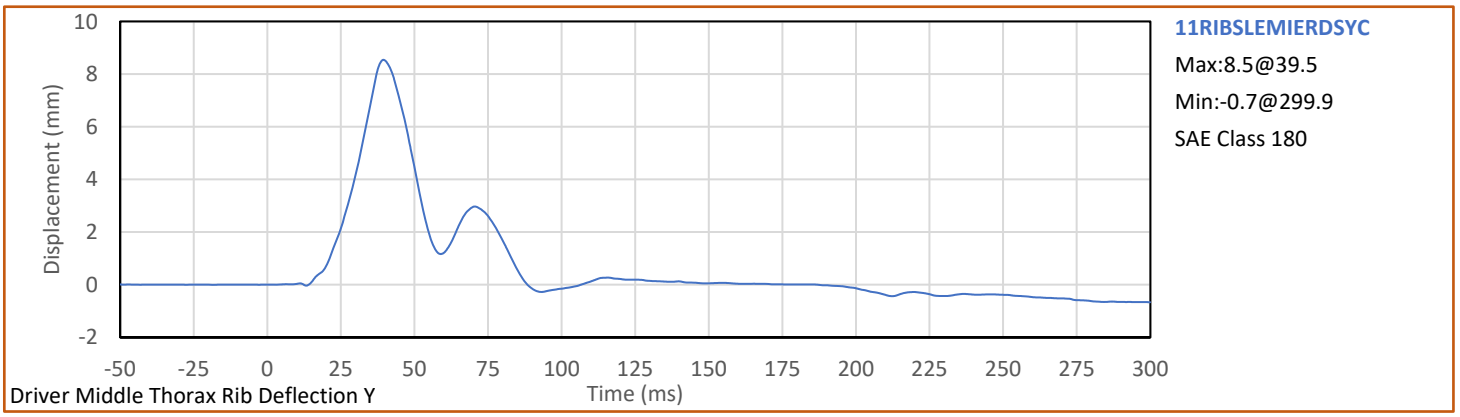


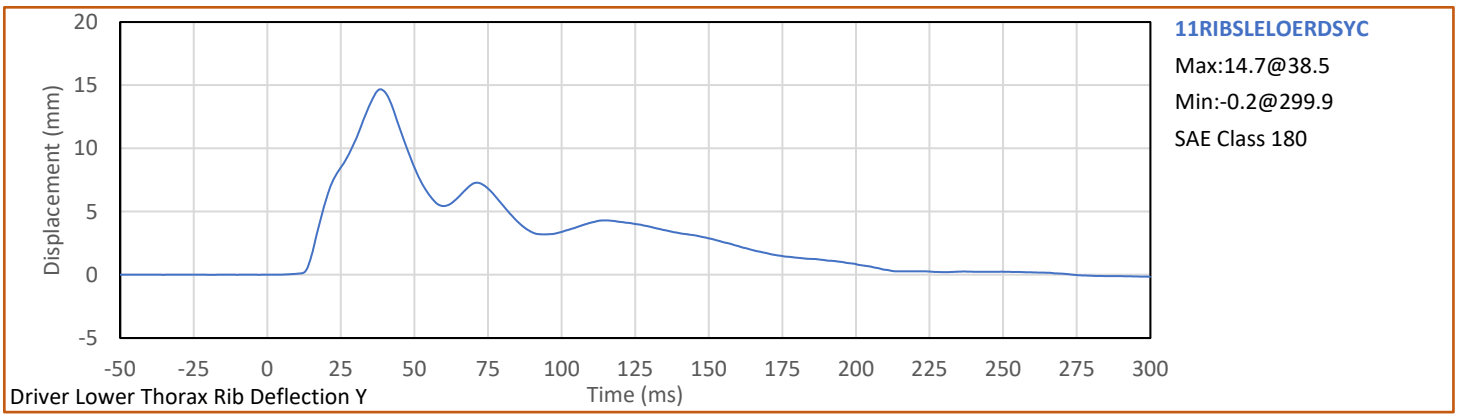


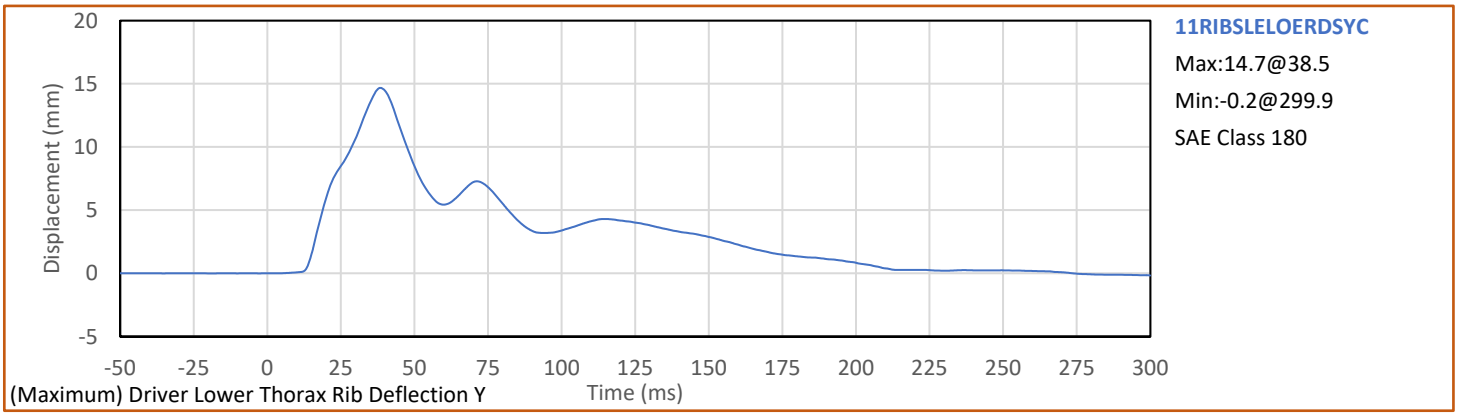


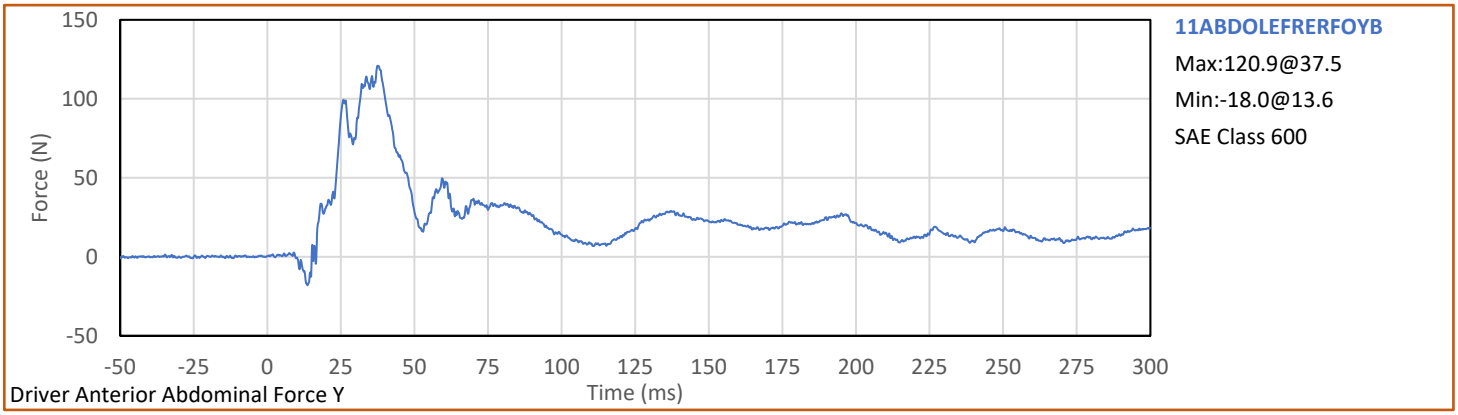


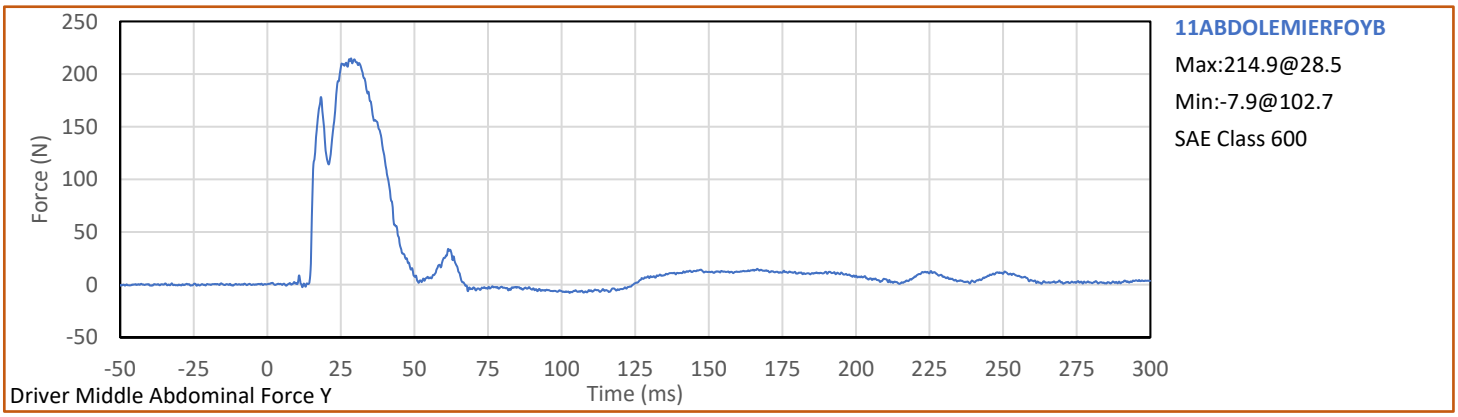

Displacement (mm)
Time (ms)
Driver Upper Thorax Rib Deflection Y
11RIBSLEUPERDSYC
Max:4.0@43.5
Min:-1.3@85.7
SAE Class 180

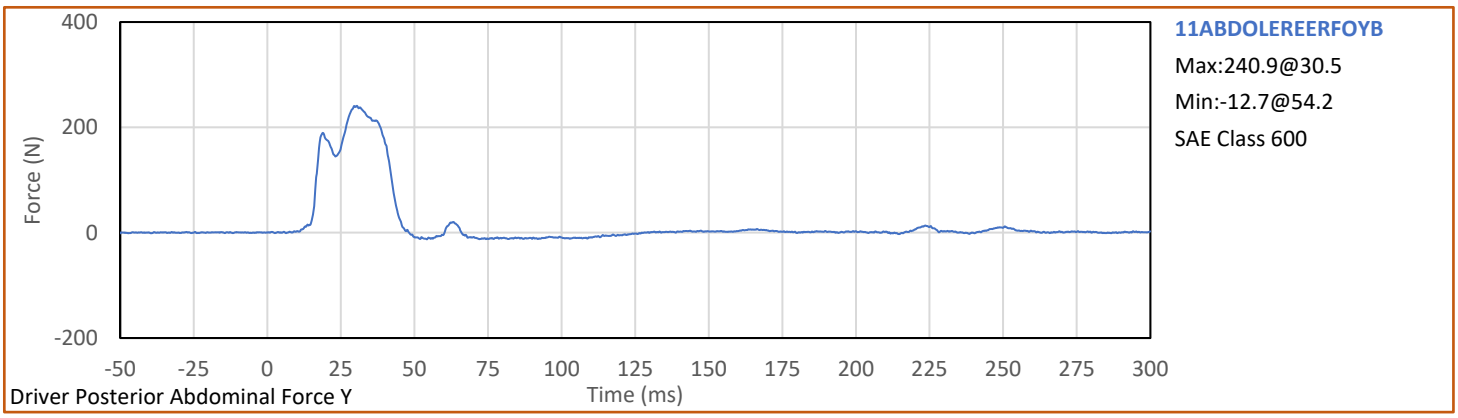

Displacement (mm)
Time (ms)
Driver Middle Thorax Rib Deflection Y
11RIBSLEMIERDSYC
Max:8.5@39.5
Min:-0.7@299.9
SAE Class 180

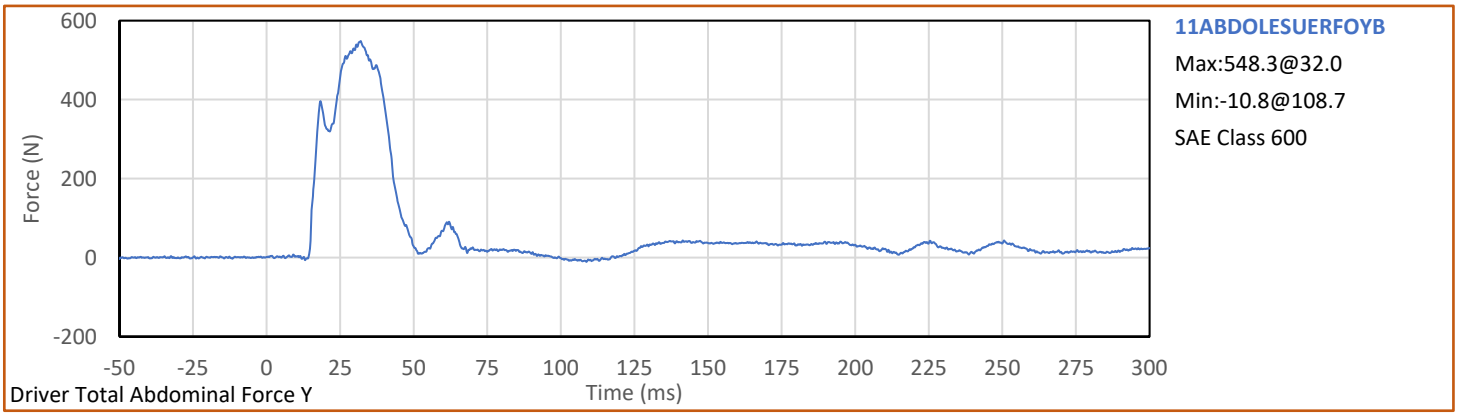

Displacement (mm)
Time (ms)
Driver Lower Thorax Rib Deflection Y
11RIBSLELOERDSYC
Max:14.7@38.5
Min:-0.2@299.9
SAE Class 180

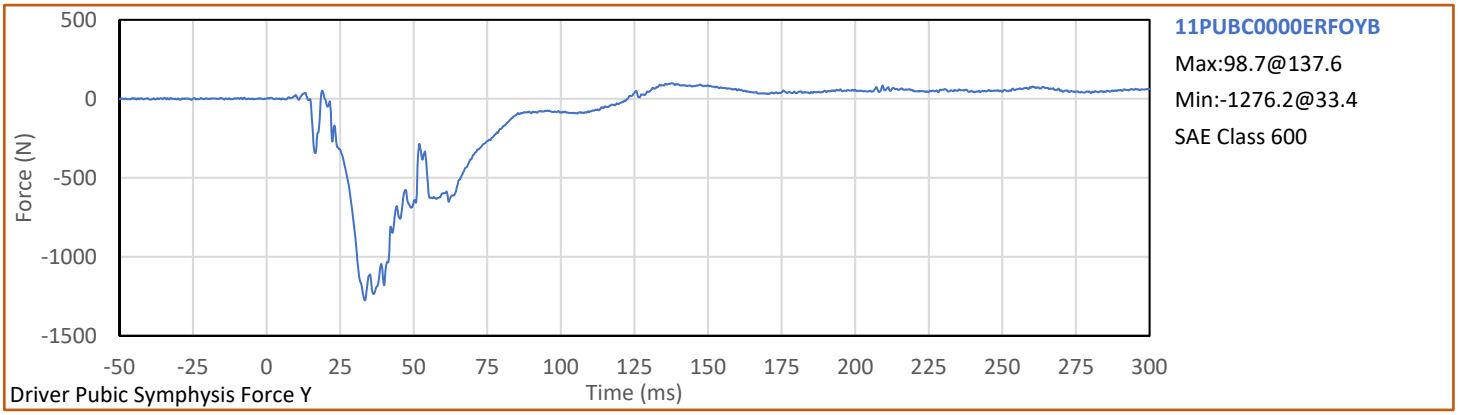

Displacement (mm)
Time (ms)
(Maximum) Driver Lower Thorax Rib Deflection Y
11RIBSLELOERDSYC
Max:14.7@38.5
Min:-0.2@299.9
SAE Class 180

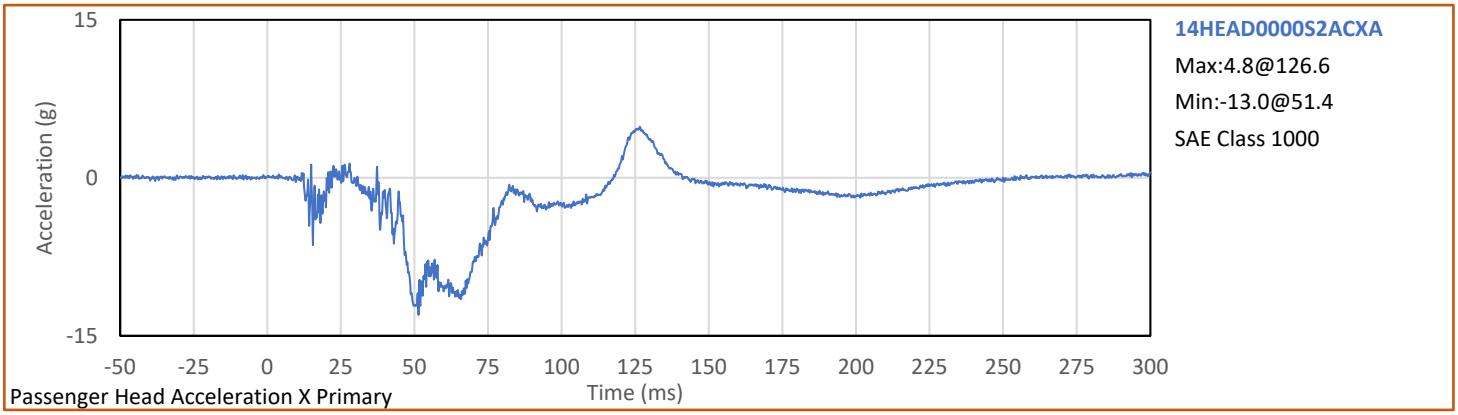

Force (N)
Time (ms)
Driver Anterior Abdominal Force Y
11ABDOLEFRERFOYB
Max:120.9@37.5
Min:-18.0@13.6
SAE Class 600


Force (N)
Time (ms)
Driver Middle Abdominal Force Y
11ABDOLEMIERFOYB
Max:214.9@28.5
Min:-7.9@102.7
SAE Class 600


Force (N)
Time (ms)
Driver Posterior Abdominal Force Y
11ABDOLEREERFOYB
Max:240.9@30.5
Min:-12.7@54.2
SAE Class 600

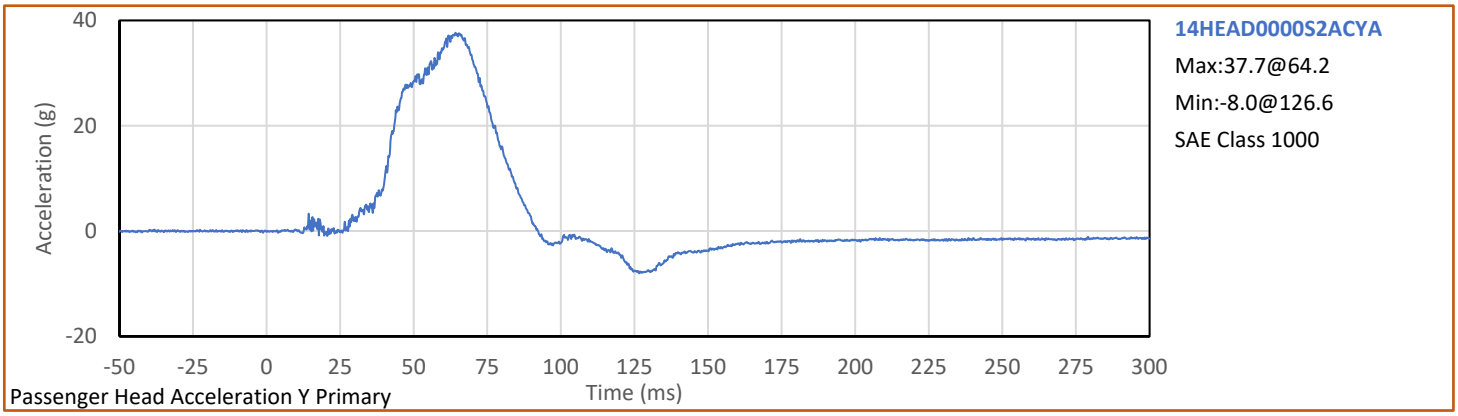

Force (N)
Time (ms)
Driver Total Abdominal Force Y
11ABDOLESUERFOYB
Max:548.3@32.0
Min:-10.8@108.7
SAE Class 600


500
0
-500
-1000
-1500
Force (N)
-50
-25
0
25
50
75
100
125
150
175
200
225
250
275
300
Time (ms)
Driver Pubic Symphysis Force Y
11PUBC0000ERFOYB
Max:98.7@137.6
Min:-1276.2@33.4
SAE Class 600



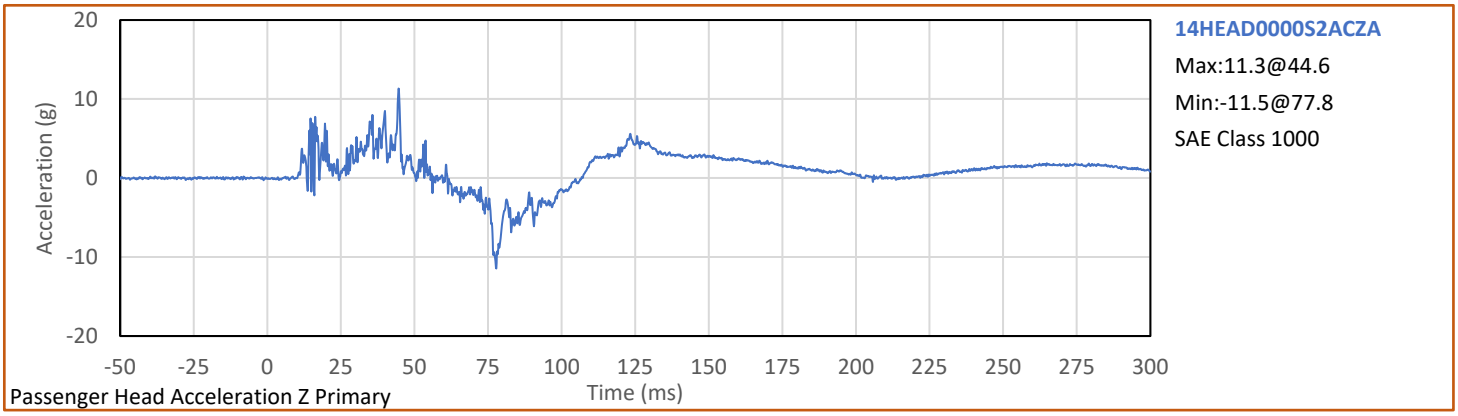
Passenger Head Acceleration X Primary

14HEAD0000S2ACXA
Max:4.8@126.6
Min:-13.0@51.4
SAE Class 1000



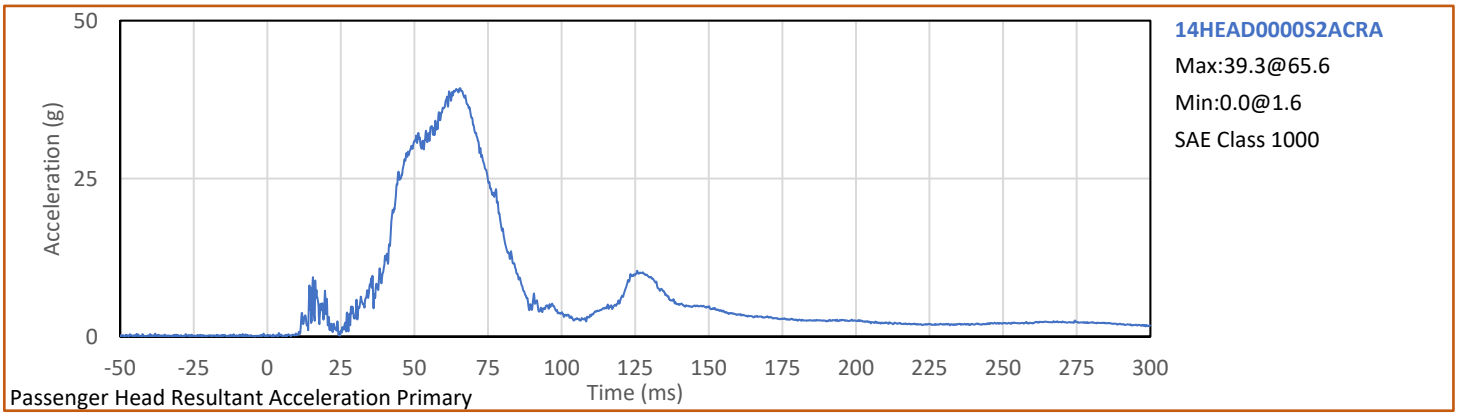
Passenger Head Acceleration Y Primary

14HEAD0000S2ACYA
Max:37.7@64.2
Min:-8.0@126.6
SAE Class 1000



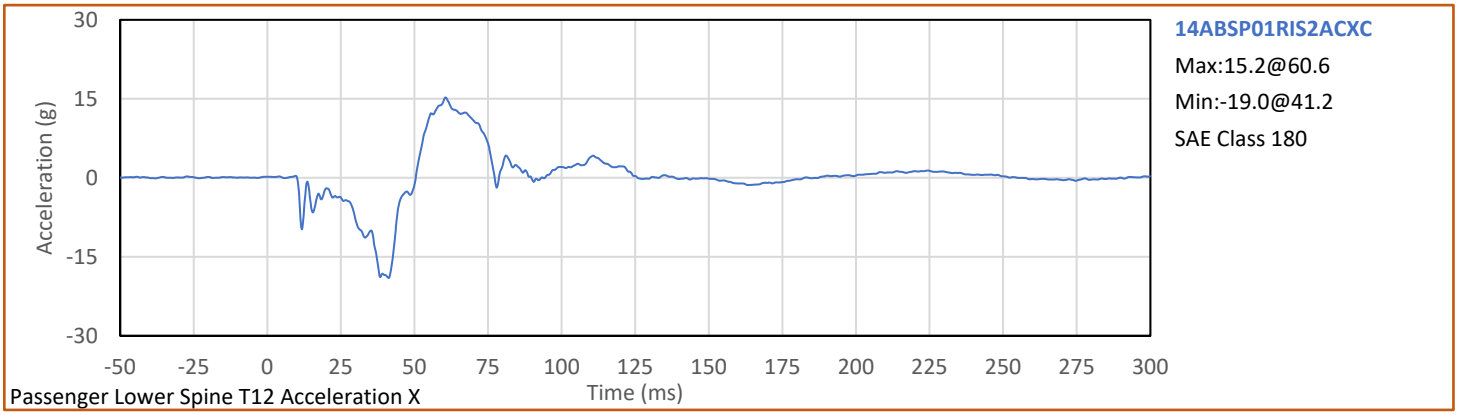
Passenger Head Acceleration Z Primary

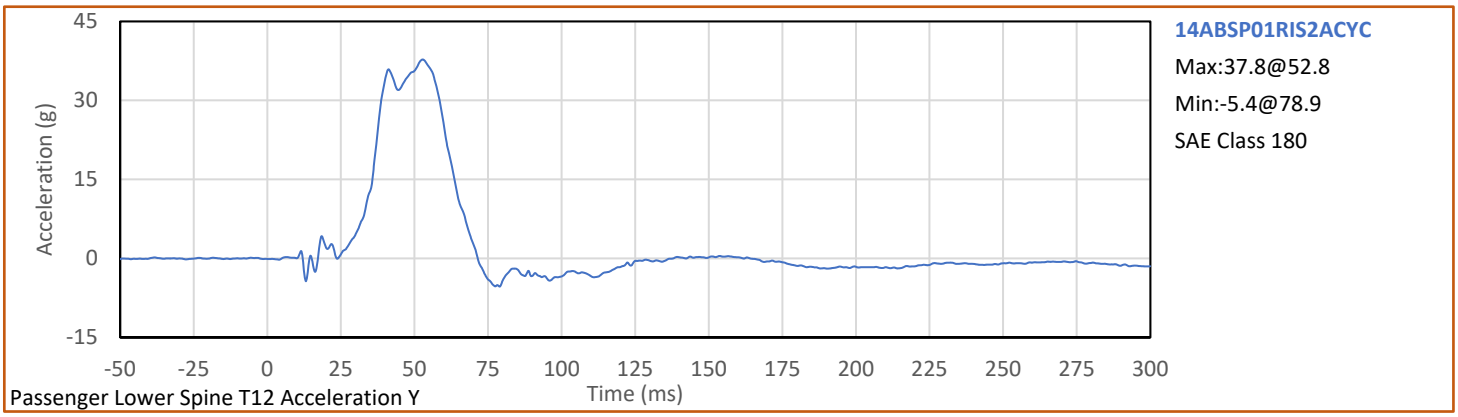
14HEAD0000S2ACZA
Max:11.3@44.6
Min:-11.5@77.8
SAE Class 1000

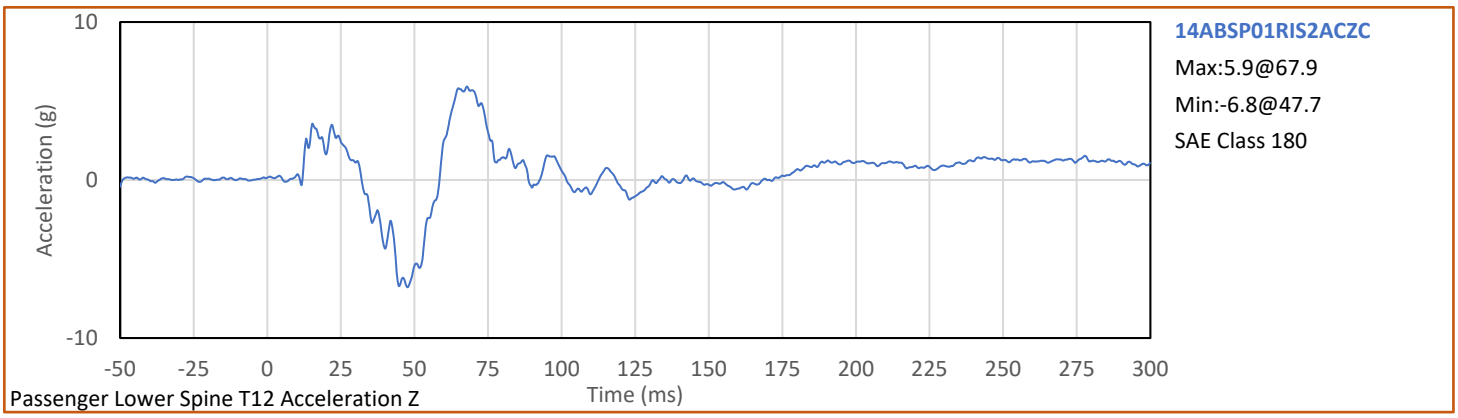


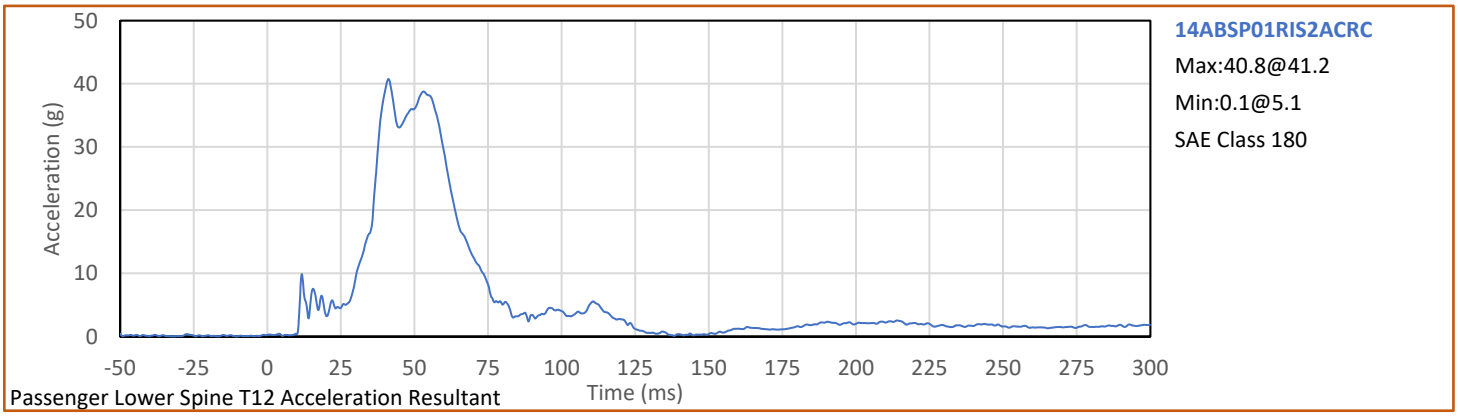
Passenger Head Resultant Acceleration Primary

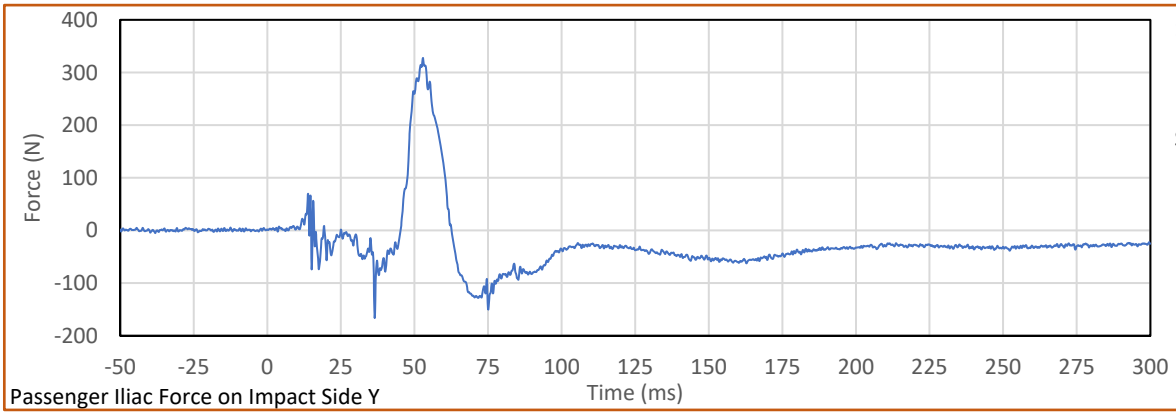
14HEAD0000S2ACRA
Max:39.3@65.6
Min:0.0@1.6
SAE Class 1000


14ABSP01RIS2ACXC
Max:15.2@60.6
Min:-19.0@41.2
SAE Class 180
Acceleration (g)
Time (ms)
Passenger Lower Spine T12 Acceleration X


14ABSP01RIS2ACYC
Max:37.8@52.8
Min:-5.4@78.9
SAE Class 180
Acceleration (g)
Time (ms)
Passenger Lower Spine T12 Acceleration Y

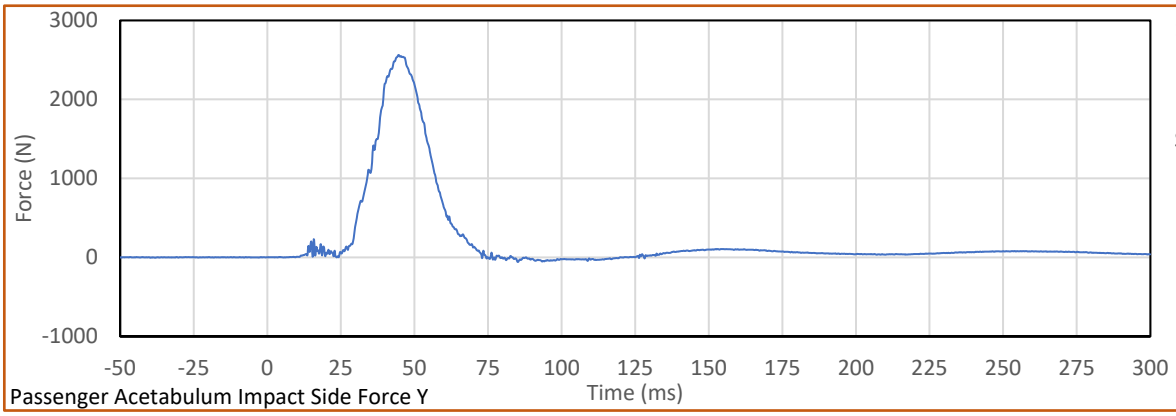

14ABSP01RIS2ACZC
Max:5.9@67.9
Min:-6.8@47.7
SAE Class 180
Acceleration (g)
Time (ms)
Passenger Lower Spine T12 Acceleration Z


14ABSP01RIS2ACRC
Max:40.8@41.2
Min:0.1@5.1
SAE Class 180
Acceleration (g)
Time (ms)
Passenger Lower Spine T12 Acceleration Resultant



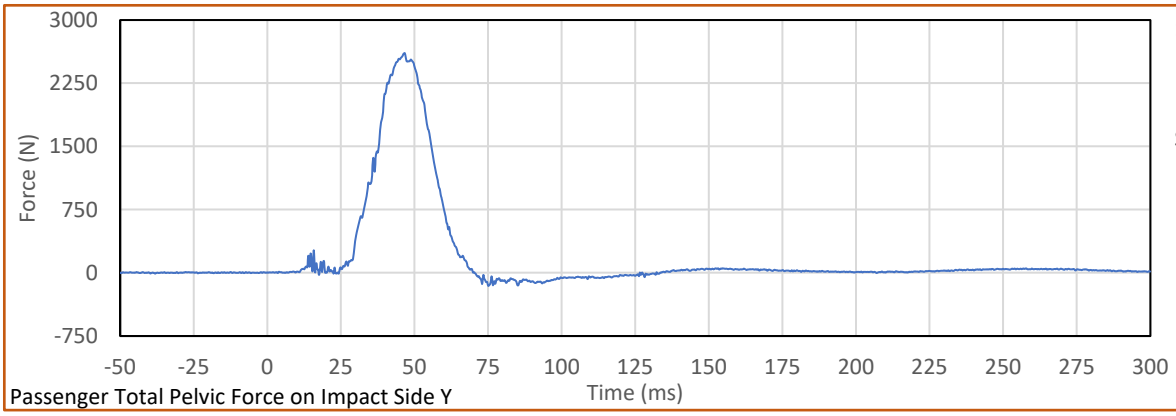
14ILACLE00S2FOYB
Max:327.6@52.9
Min:-166.5@36.5
SAE Class 600

Passenger Iliac Force on Impact Side Y



14ACTBLE00S2FOYB
Max:2562.5@44.6
Min:-58.9@85.1
SAE Class 600

Passenger Acetabulum Impact Side Force Y



14PELVLE00S2FOYB
Max:2607.2@46.7
Min:-157.1@75.1
SAE Class 600

Passenger Total Pelvic Force on Impact Side Y

APPENDIX C

ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
Pre-Test ATD Qualification and Performance Verification
ES-2re 50th Male Side Impact ATD, Left Side Configuration
S/N: F037

Applus IDIADA
KARCO

ES-2re 50th Male Side Impact ATD
External Measurements

ATD Serial No.: F037 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 Relative Humidity	%	10	70	32	Pass
1 - Sitting Height	mm	900	918	909	Pass
2 - Seat to Shoulder Joint	mm	558	572	565	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	350	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	101	Pass
5 - Sole to Seat, Sitting	mm	433	451	443	Pass
6 - Head Width	mm	152	158	156	Pass
7 - Shoulder/Arm Width	mm	461	479	475	Pass
8 - Thorax Width	mm	322	332	326	Pass
9 - Abdomen Width	mm	273	287	277	Pass
10 - Pelvis Lap Width	mm	359	373	365	Pass
11 - Head Depth	mm	196	206	200	Pass
12 - Thorax Depth	mm	262	272	268	Pass
13 - Abdomen Depth	mm	194	204	198	Pass
14 - Pelvis Depth	mm	235	245	240	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	158	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	613	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

Approved By: P. Puzzuto

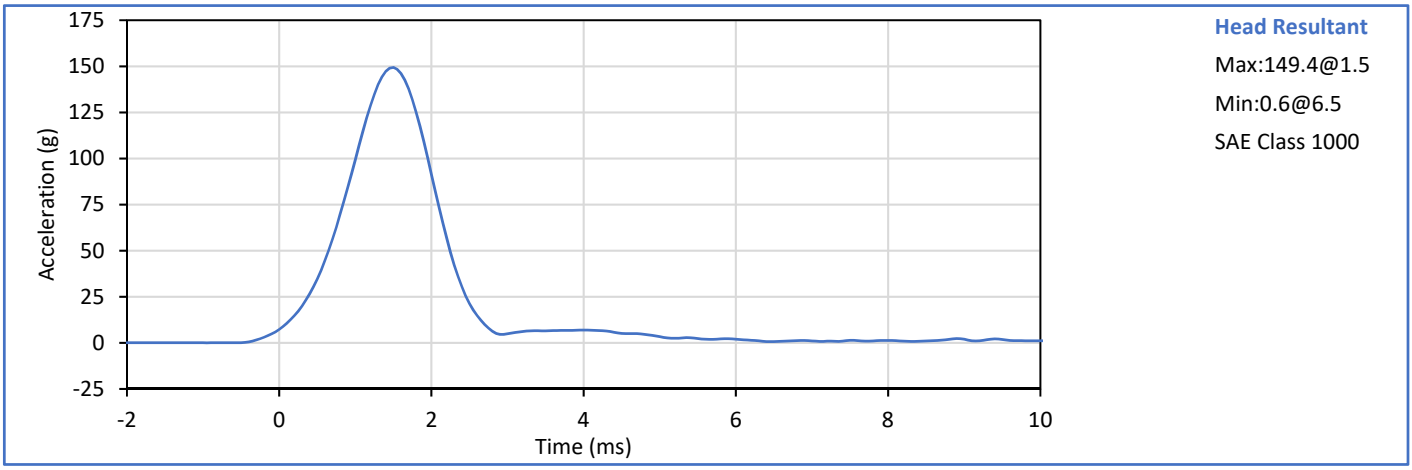
Applus IDIADA
KARCO

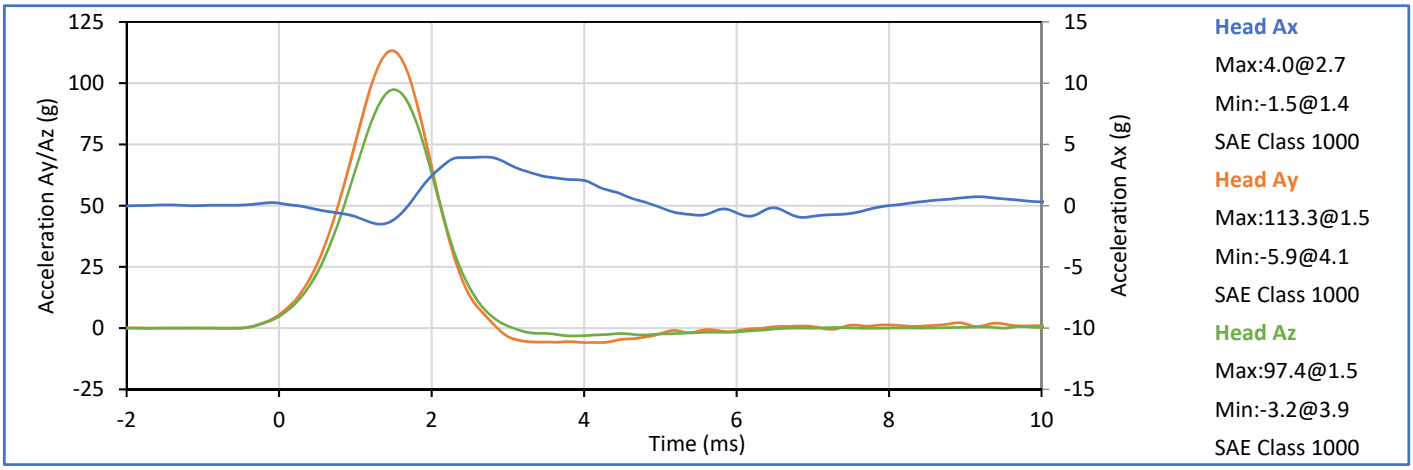
ES-2re 50th Male Side Impact ATD
Head Drop

ATD Serial No.: F037

Test Date: 2021-02-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Relative Humidity	%	10	70	27	Pass
Peak Resultant Acceleration	g	125.0	155.0	149.4	Pass
Peak Head Ax	g	-15.0	15.0	4.0	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.6	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

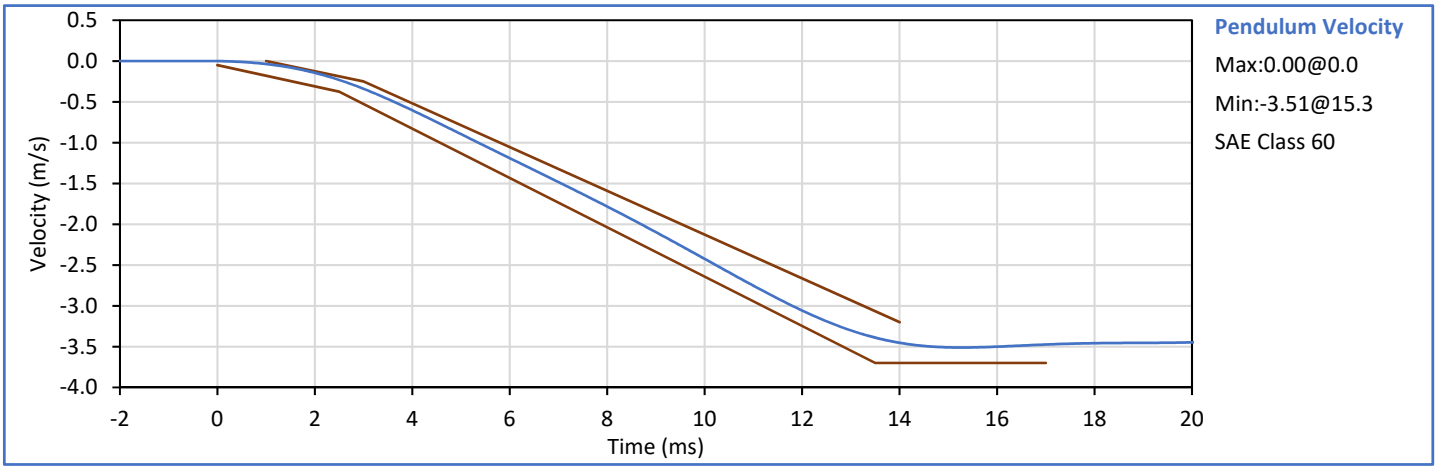
Applus IDIADA
KARCO

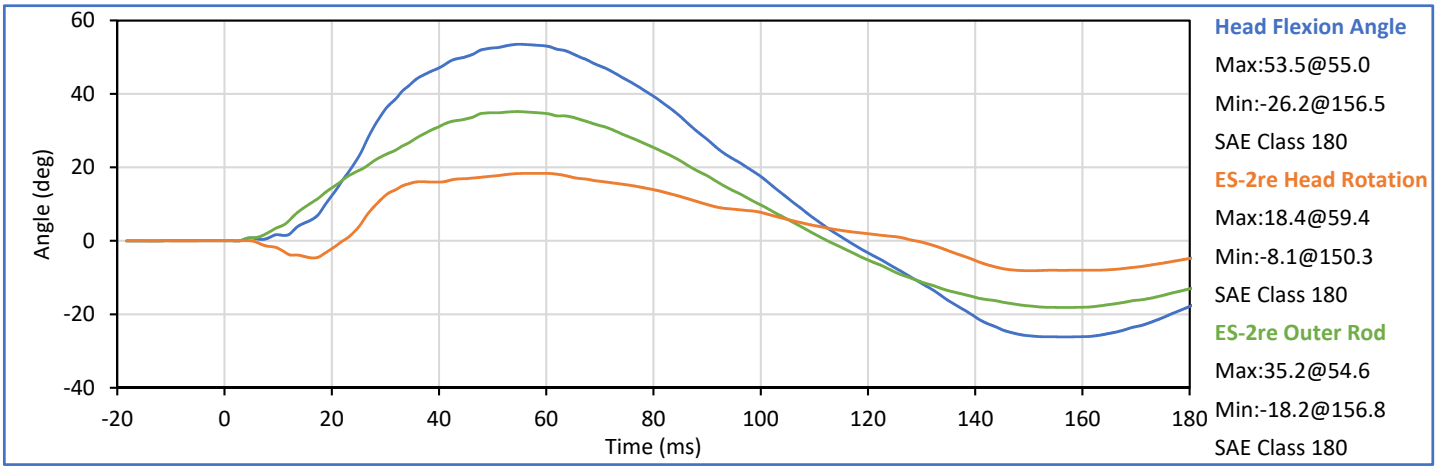
ES-2re 50th Male Side Impact ATD
Neck Flexion

ATD Serial No.: F037

Test Date: 2021-02-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Pendulum Velocity	m/s	3.30	3.50	3.44	Pass
Peak Headform Flexion	deg	49.0	59.0	53.5	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	55.0	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	61.3	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

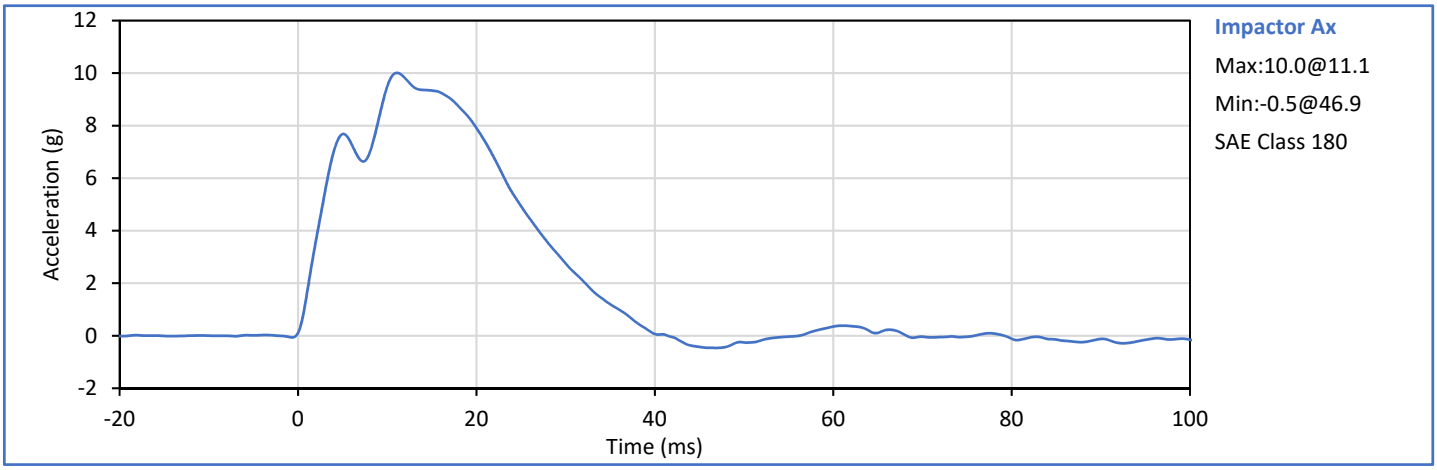
Applus IDIADA
KARCO

ES-2re 50th Male Side Impact ATD
Shoulder Impact Test

ATD Serial No.: F037

Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Impactor Ax	g	7.5	10.5	10.0	Pass
			Overall Test Results		Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

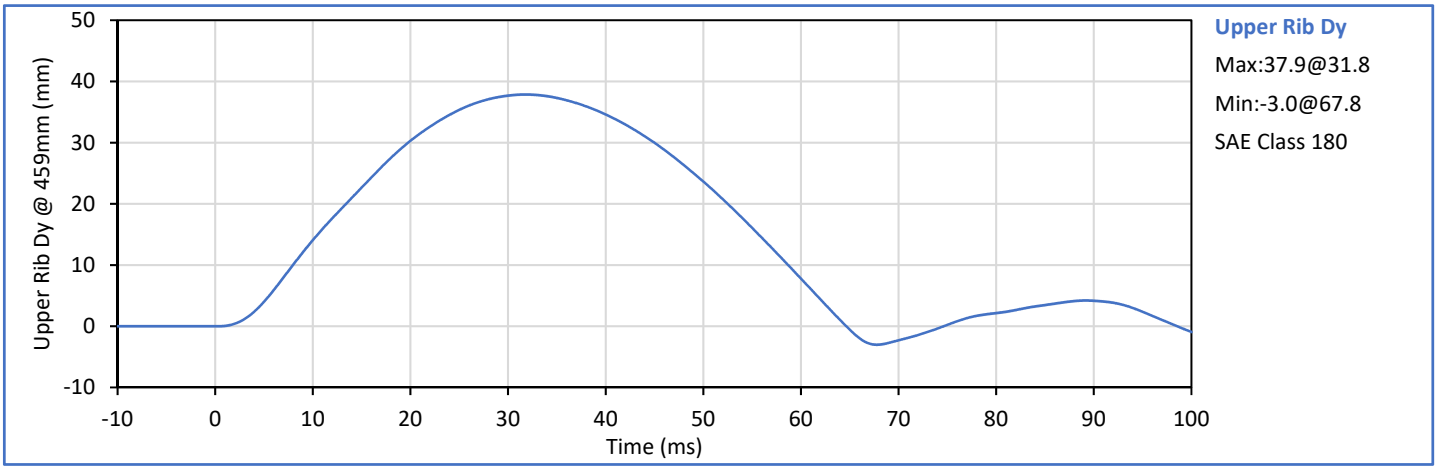
Applus IDIADA
KARCO

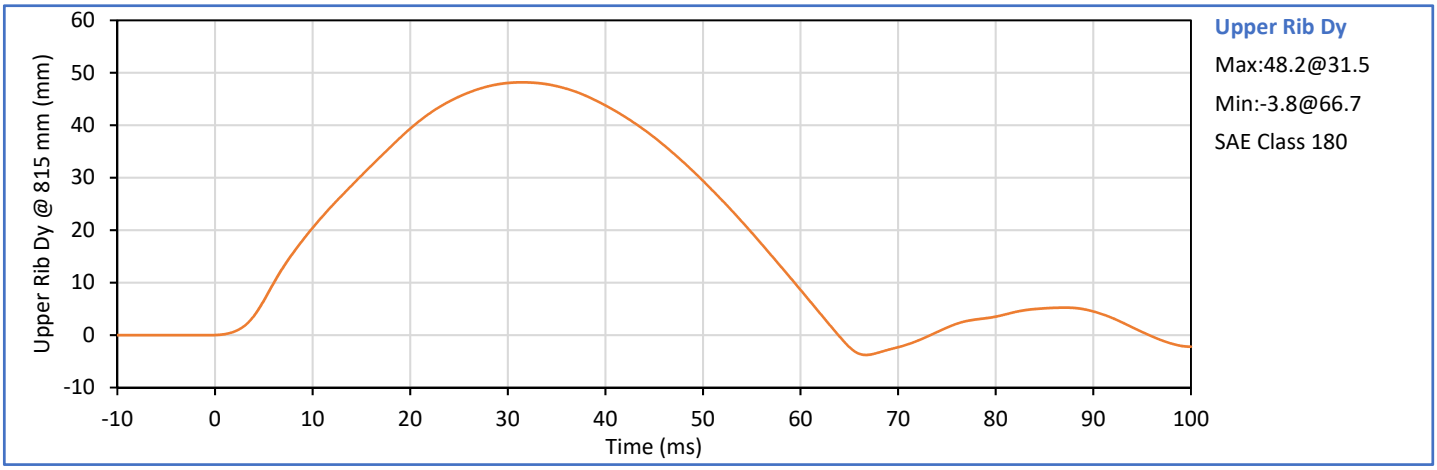
ES-2re 50th Male Side Impact ATD
Upper Rib Drop Test

ATD Serial No.: F037

Test Date: 2021-02-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.9	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	48.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

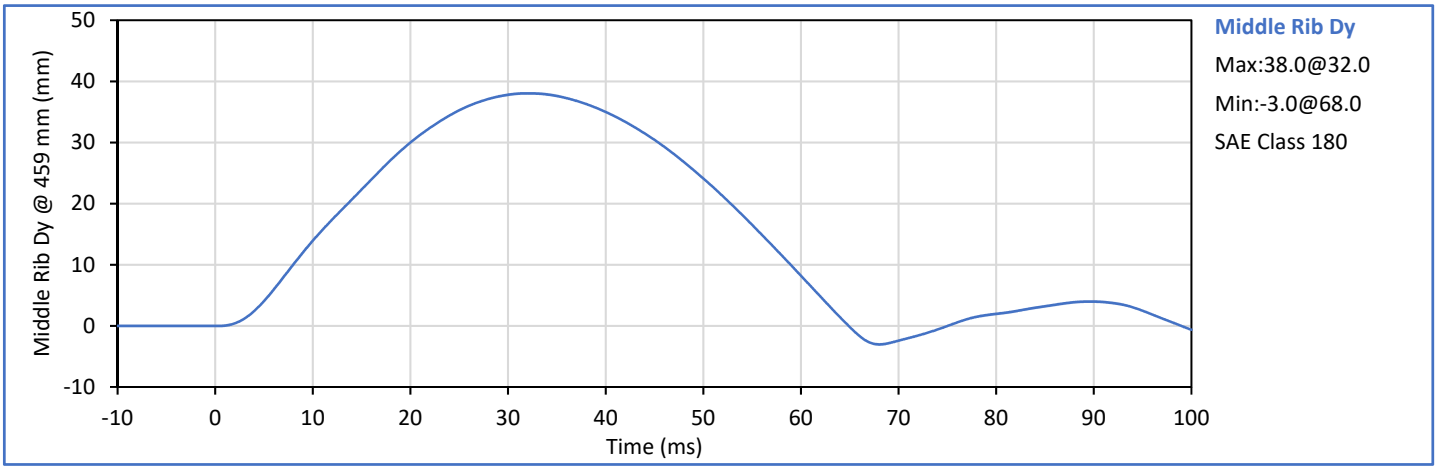
Applus IDIADA KARCO

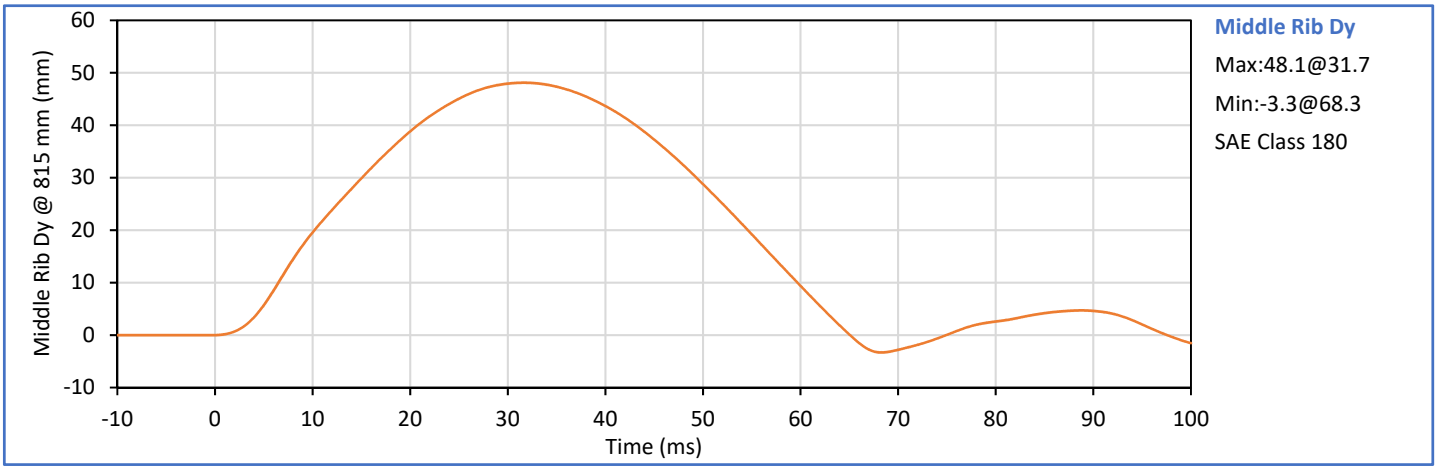
ES-2re 50th Male Side Impact ATD
Middle Rib Drop Test

ATD Serial No.: F037

Test Date: 2021-02-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	38.0	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	48.1	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

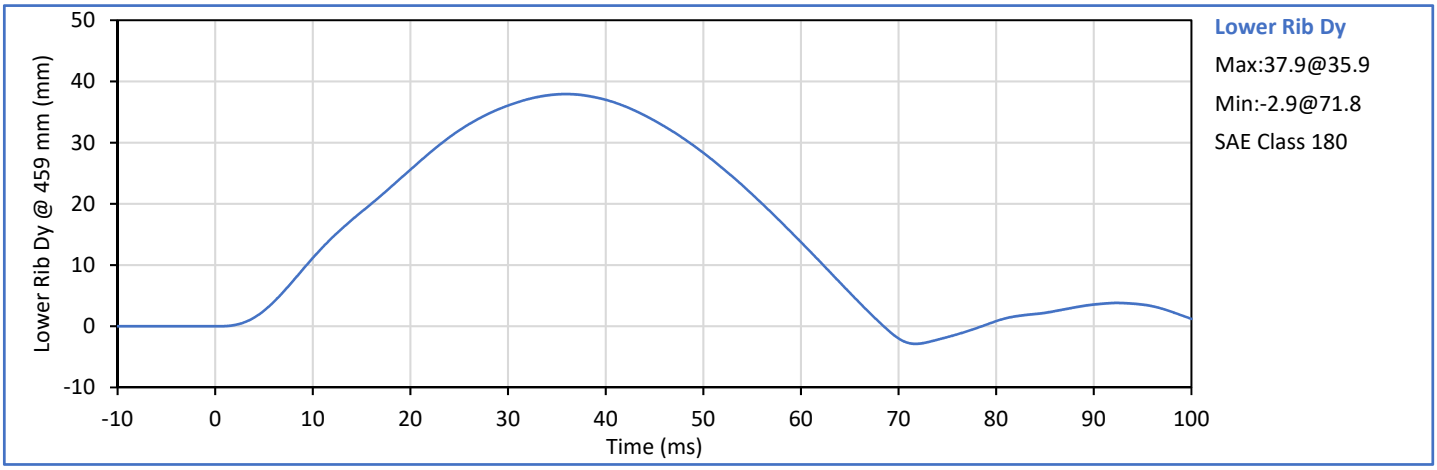
Applus IDIADA
KARCO

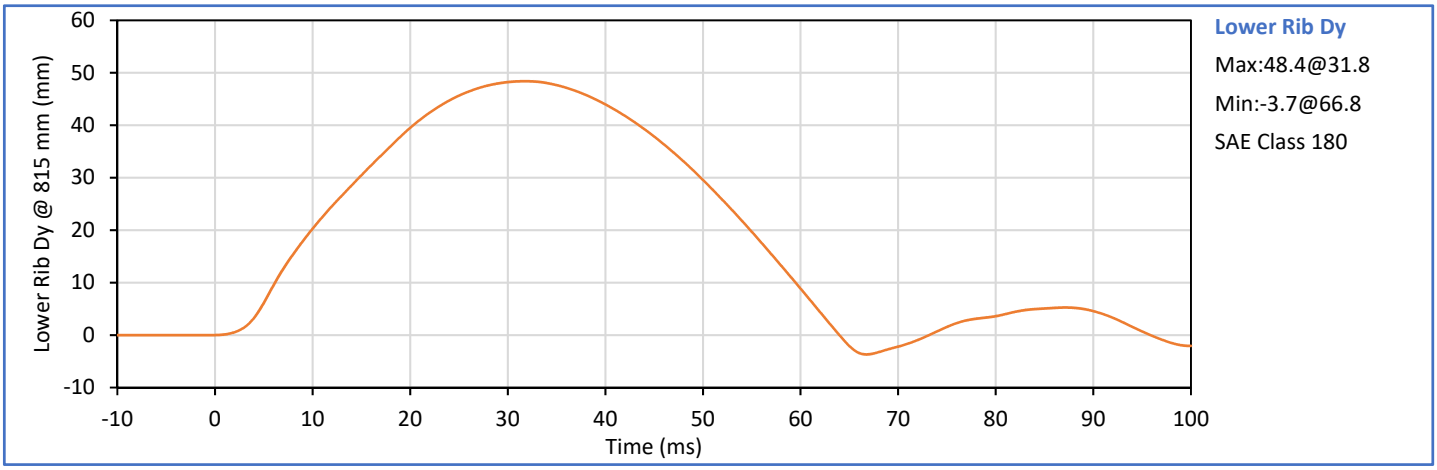
ES-2re 50th Male Side Impact ATD
Lower Rib Drop Test

ATD Serial No.: F037

Test Date: 2021-02-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Lower Rib Dy @ 459mm	mm	36.0	40.0	37.9	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	48.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

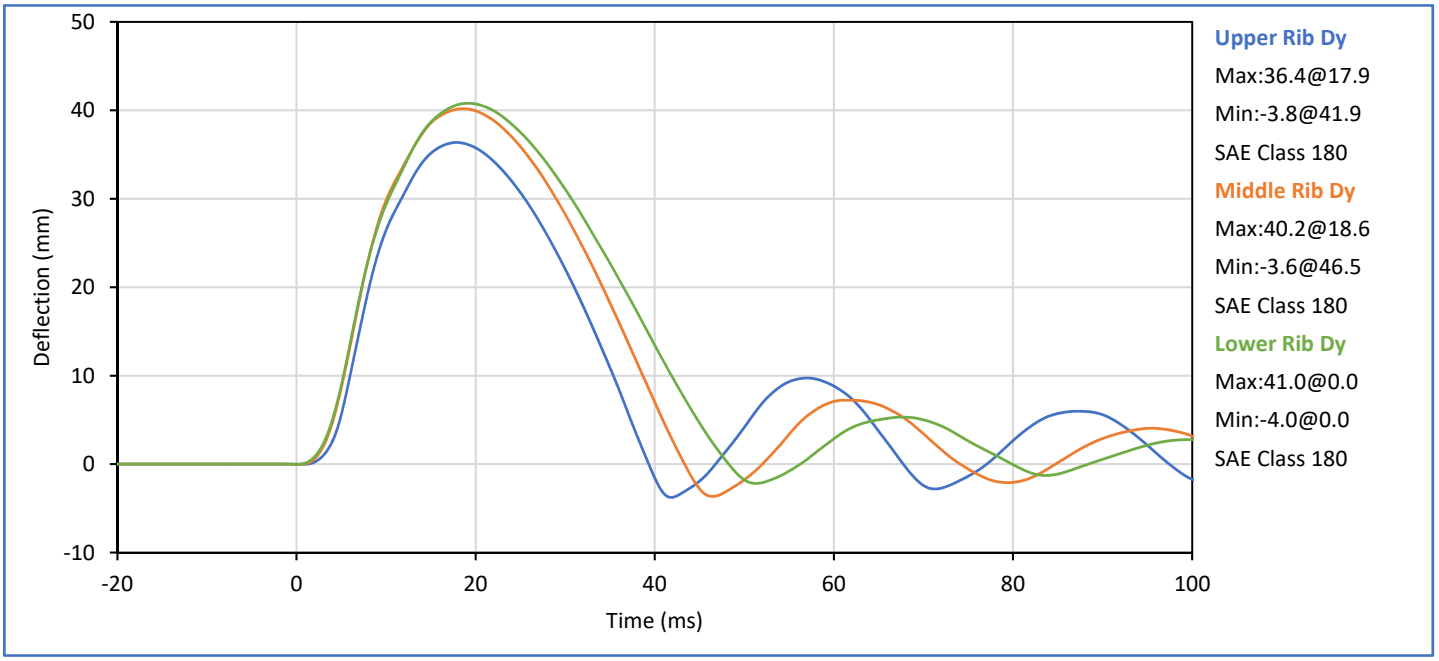
Applus IDIADA
KARCO

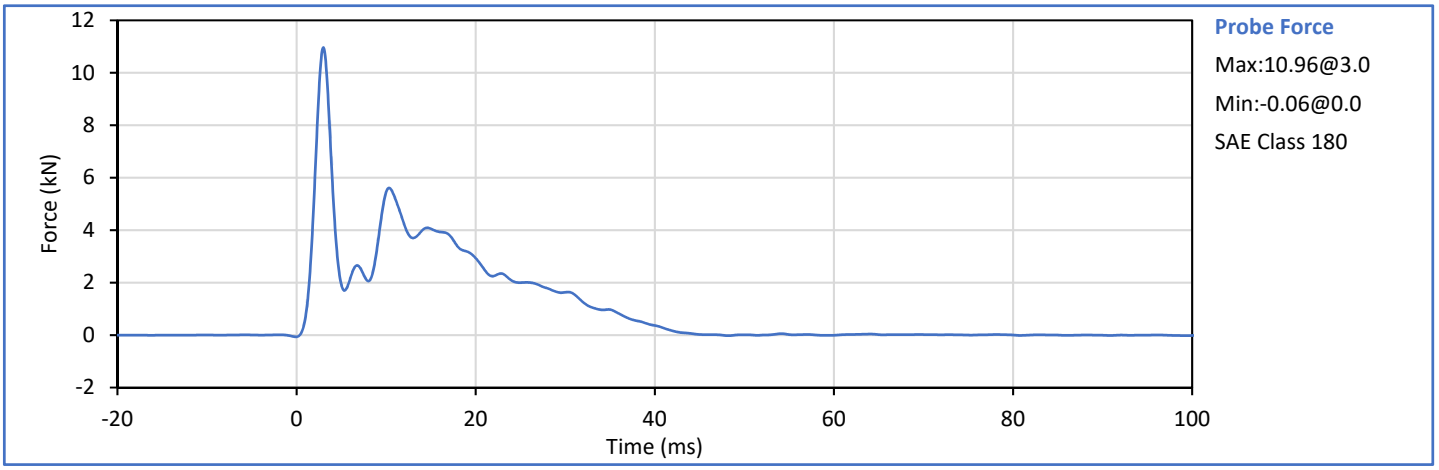
ES-2re 50th Male Side Impact ATD
Thorax Impact (Full Body)

ATD Serial No.: F037

Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	5.40	5.60	5.43	Pass
Peak Upper Rib Dy	mm	34.0	41.0	36.4	Pass
Peak Middle Rib Dy	mm	37.0	45.0	40.2	Pass
Peak Lower Rib Dy	mm	37.0	44.0	40.8	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.61	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

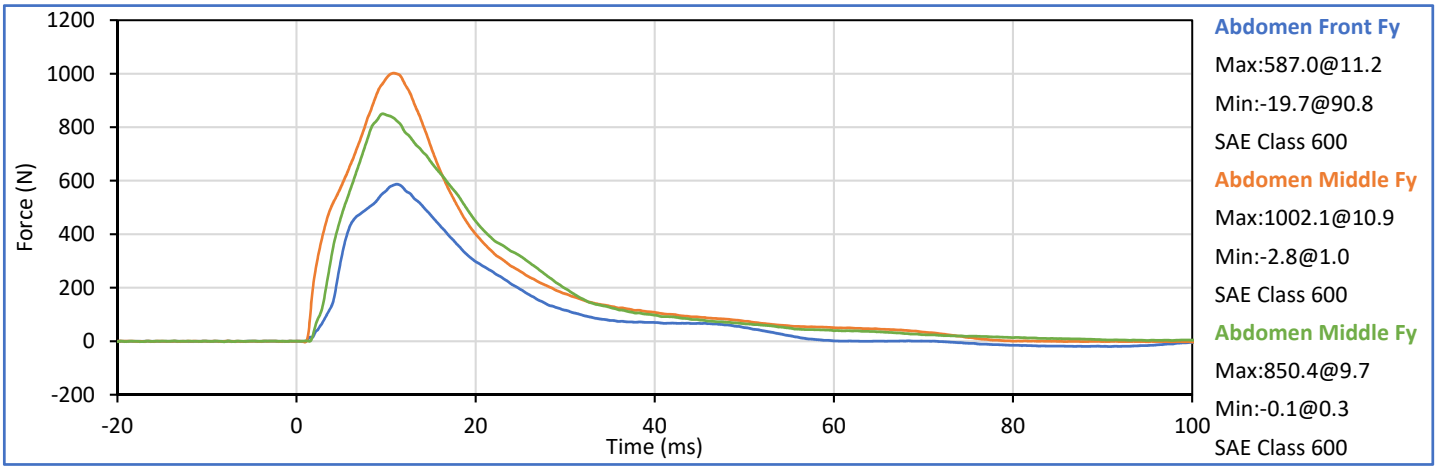
Approved By: P. Puzzuto

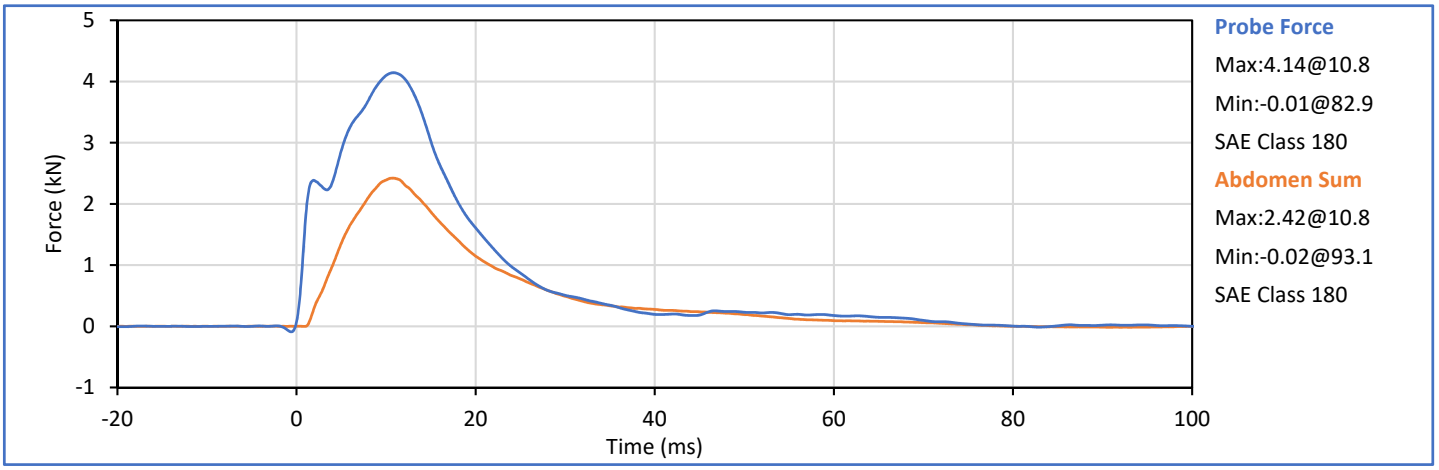
Applus IDIADA KARCO

ES-2re 50th Male Side Impact ATD
Abdomen Impact

ATD Serial No.: F037 Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	3.90	4.10	4.06	Pass
Peak Impactor Force	kN	4.00	4.80	4.14	Pass
Time of Peak Impactor Force	ms	10.6	13.0	10.8	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.42	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.8	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

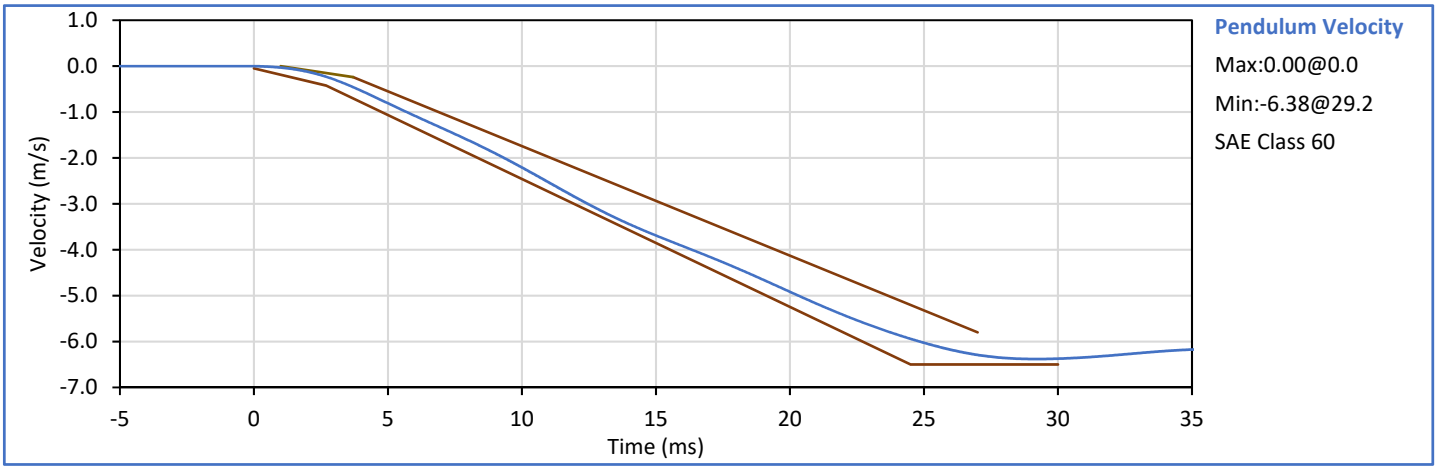
Applus IDIADA
KARCO

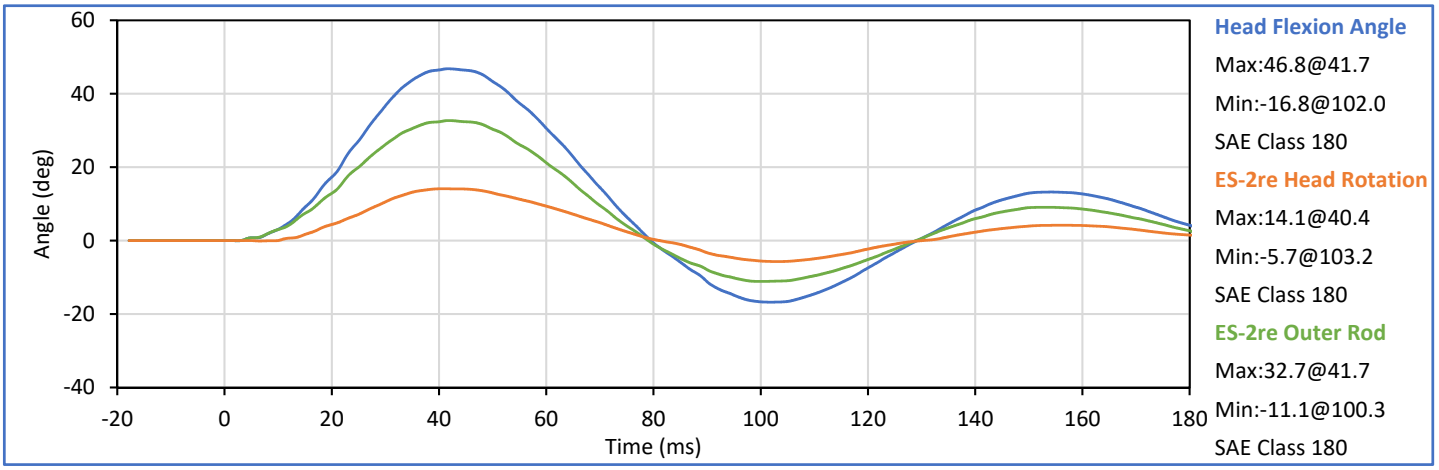
ES-2re 50th Male Side Impact ATD
Lumbar Spine Flexion

ATD Serial No.: F037

Test Date: 2021-02-01

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
Pendulum Velocity	m/s	5.95	6.15	6.07	Pass
Peak Headform Flexion	deg	45.0	55.0	46.8	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	41.7	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	37.9	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

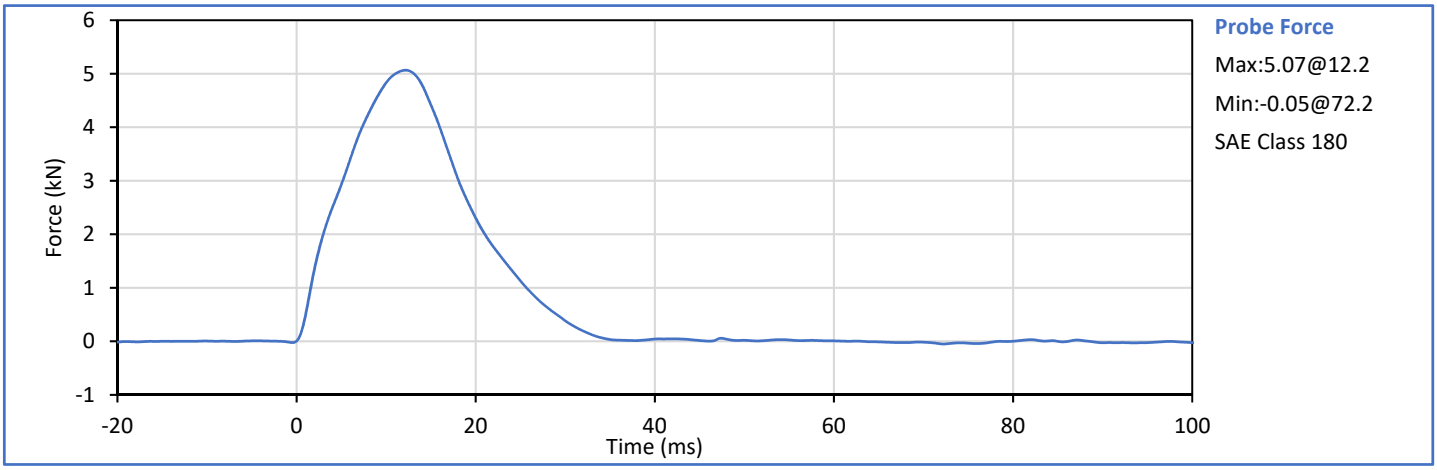
Applus IDIADA
KARCO

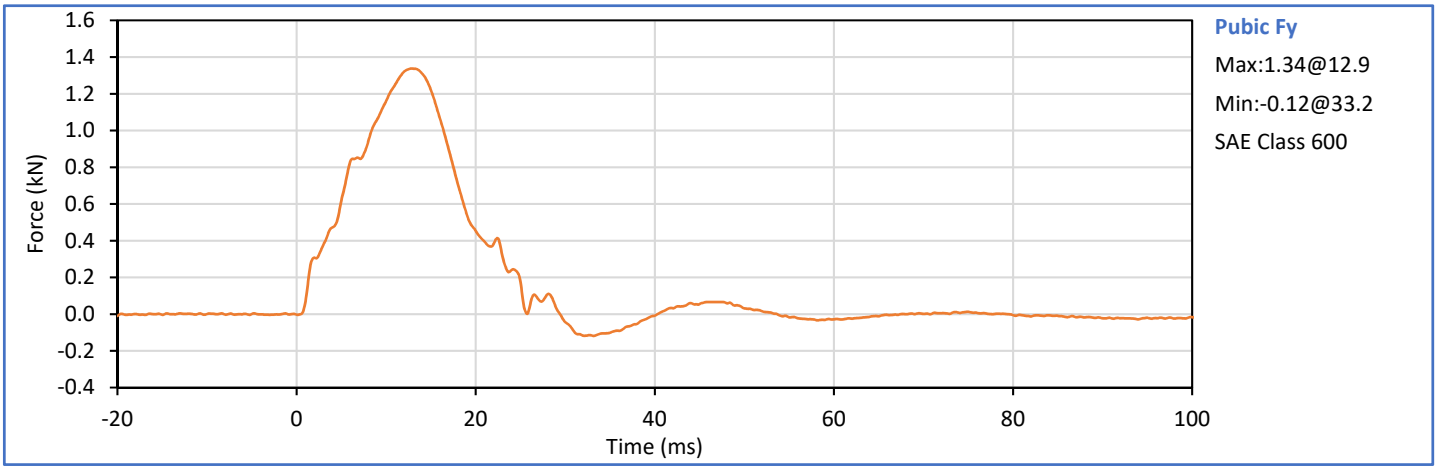
ES-2re 50th Male Side Impact ATD
Pelvis Impact

ATD Serial No.: F037

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 Relative Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Impactor Force	kN	4.70	5.40	5.07	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.2	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.34	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	12.9	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

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

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 299 Test Date: 2021-01-29

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	781	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	82	Pass
D - H Point From Seatback	mm	141	151	146	Pass
E - Shoulder Pivot From Backline	mm	97	107	106	Pass
F - Thigh Clearance	mm	119	135	128	Pass
G - Head Breadth	mm	140	148	145	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	185	Pass
J - Head Circumference	mm	541	551	545	Pass
K - Buttock To Knee Length	mm	514	540	530	Pass
L - Popliteal Height	mm	343	369	347	Pass
K - Knee Pivot To Floor Height	mm	392	409	402	Pass
N - Buttock Popliteal Length	mm	416	442	436	Pass
O - Chest Depth W/O Jacket	mm	195	211	201	Pass
P - Foot Length	mm	216	232	222	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	320	Pass
R - Arm Length	mm	249	259	253	Pass
S - Knee Joint To Seatback	mm	477	493	489	Pass
V - Shoulder Width	mm	341	357	349	Pass
W - Foot Width	mm	78	94	89	Pass
Y - Chest Circumference W/Jacket	mm	851	881	870	Pass
Z - Waist Circumference	mm	761	791	782	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

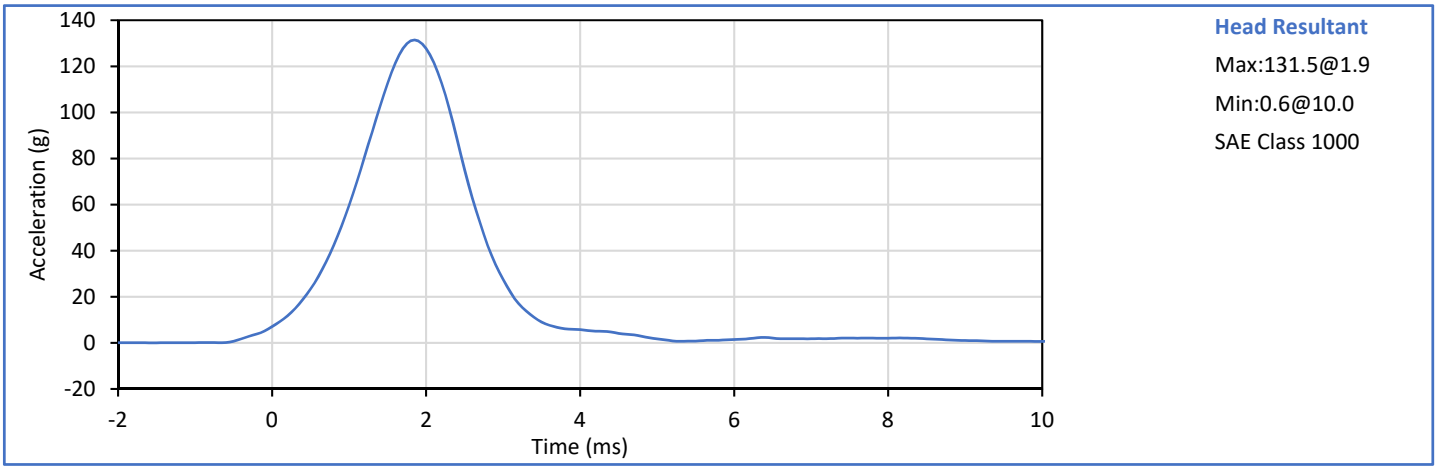
Approved By: P. Puzzuto

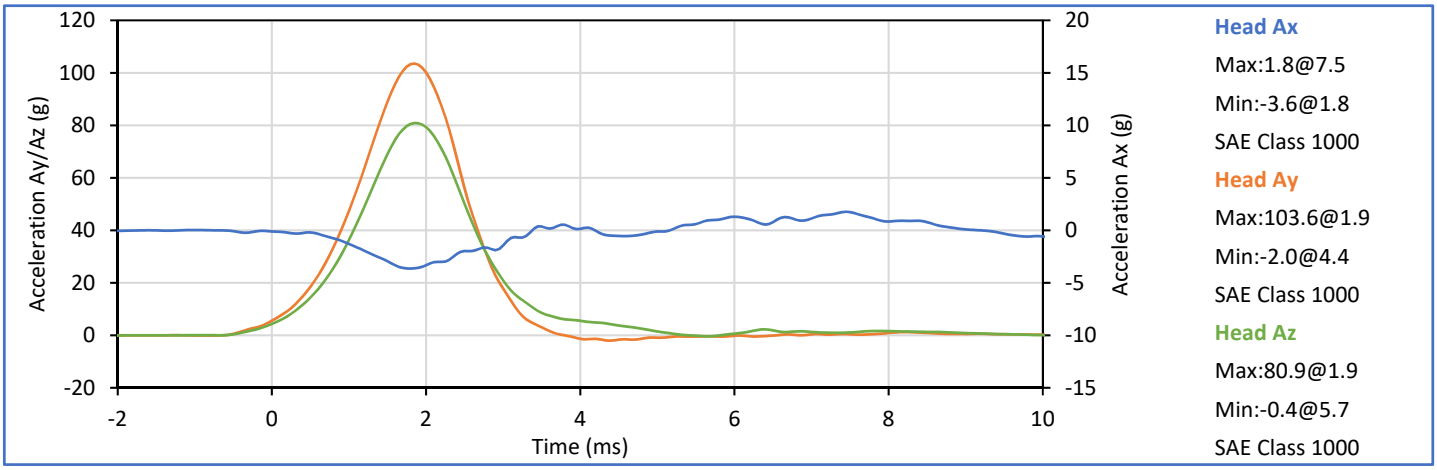
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 299 Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.7	Pass
Laboratory Humidity	%	10	70	27	Pass
Peak Resultant Acceleration	g	115.0	137.0	131.5	Pass
Peak Head Ax	g	-15.0	15.0	-3.6	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

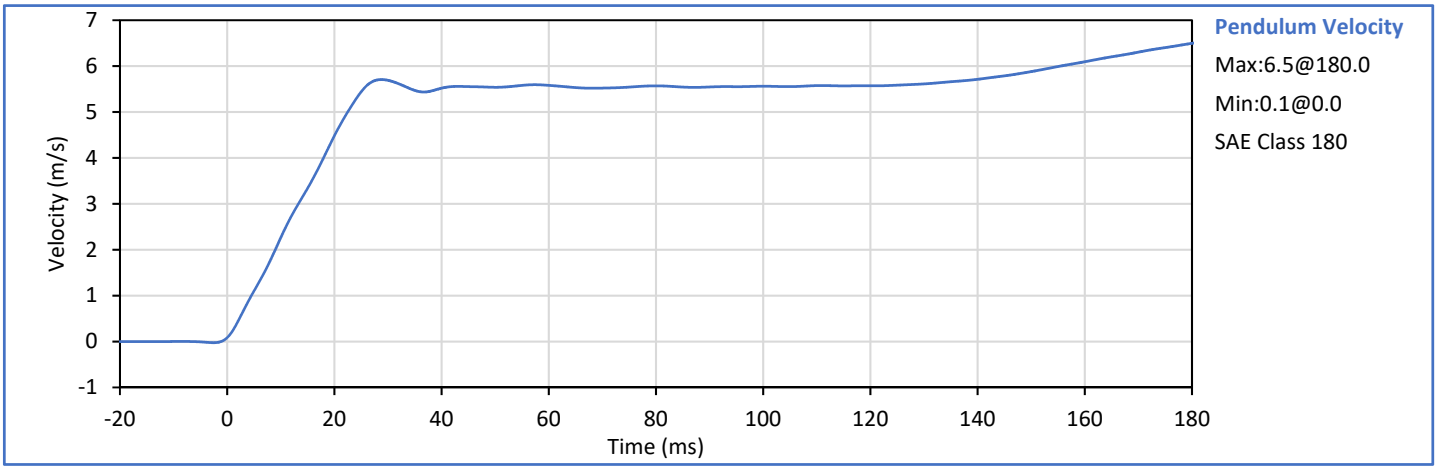
Approved By: P. Puzzuto

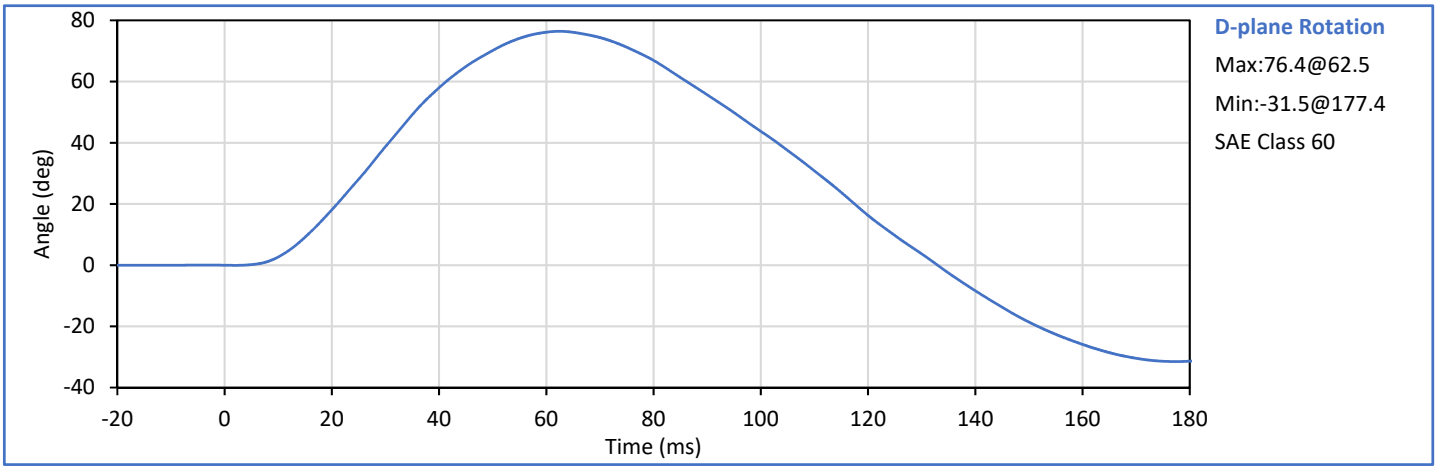
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	29	Pass
Pendulum Velocity	m/s	5.51	5.63	5.59	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.26	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.34	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.48	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.44	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.71	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	76.4	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	62.5	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-39.0	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	114.2	Pass
			Overall Test Results		Pass





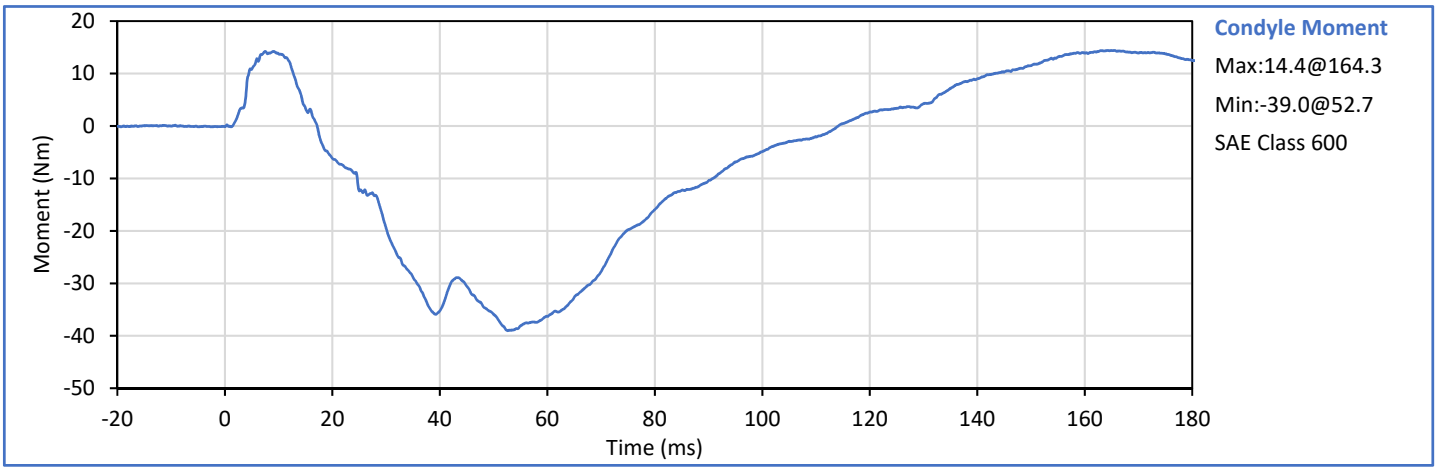
Technician: J. Hernandez

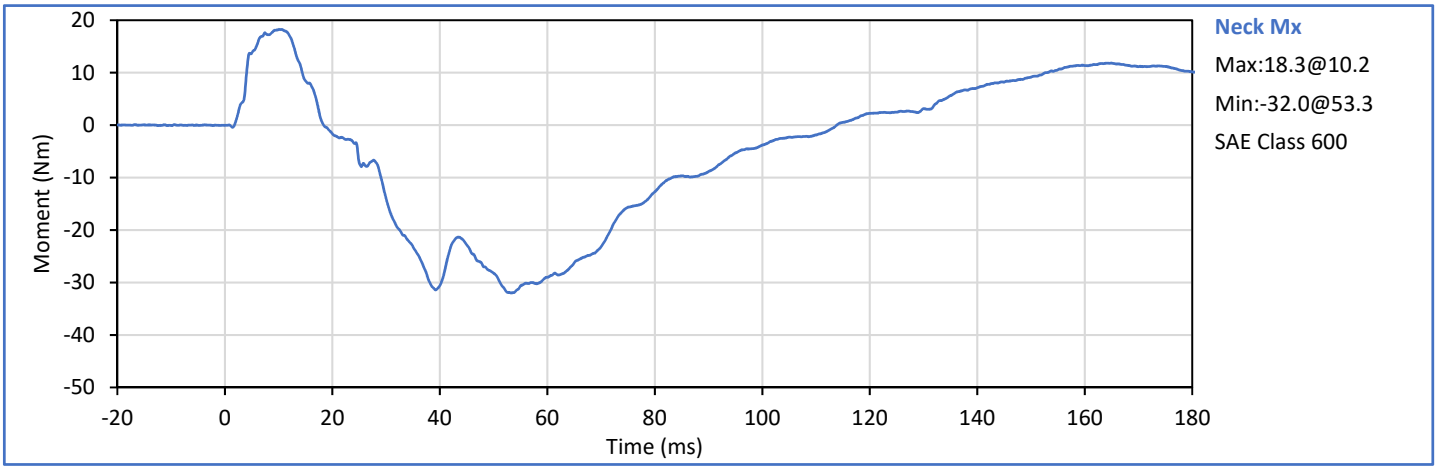
Approved By: P. Puzzuto

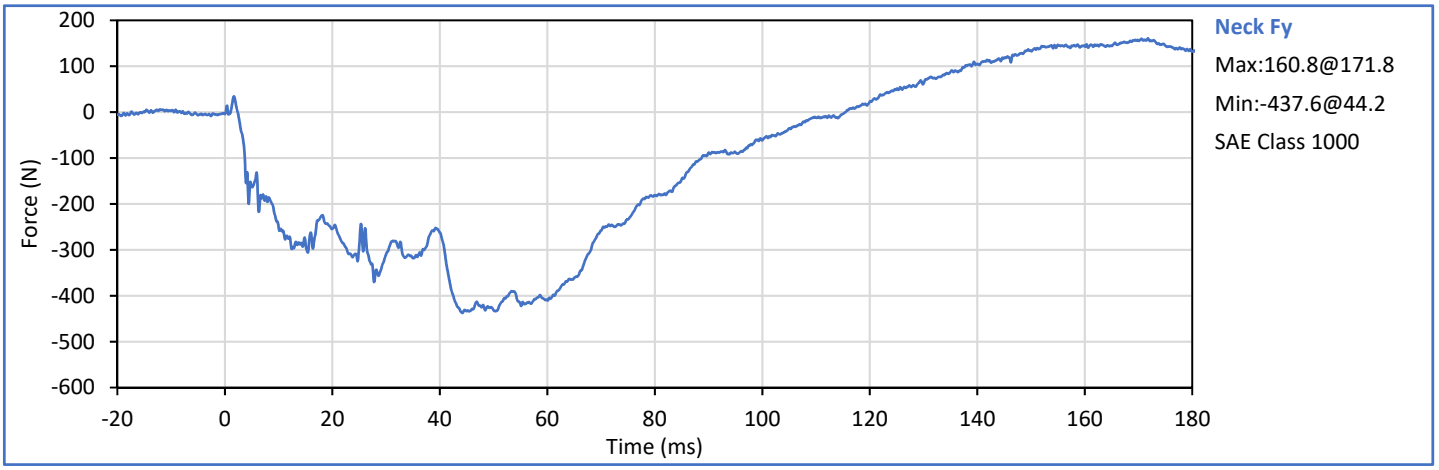
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2021-01-29





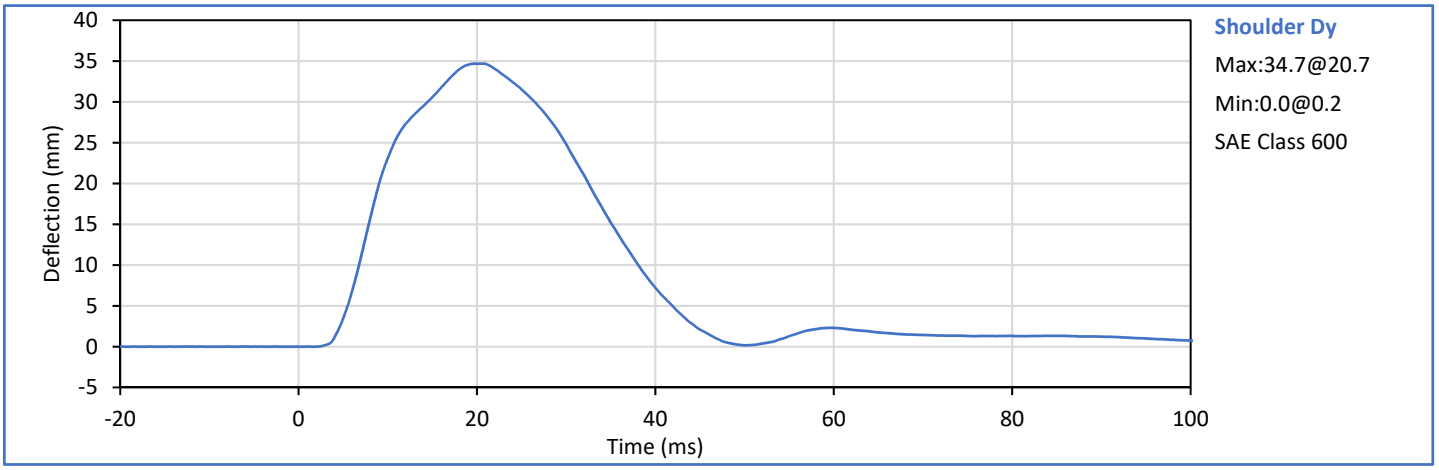


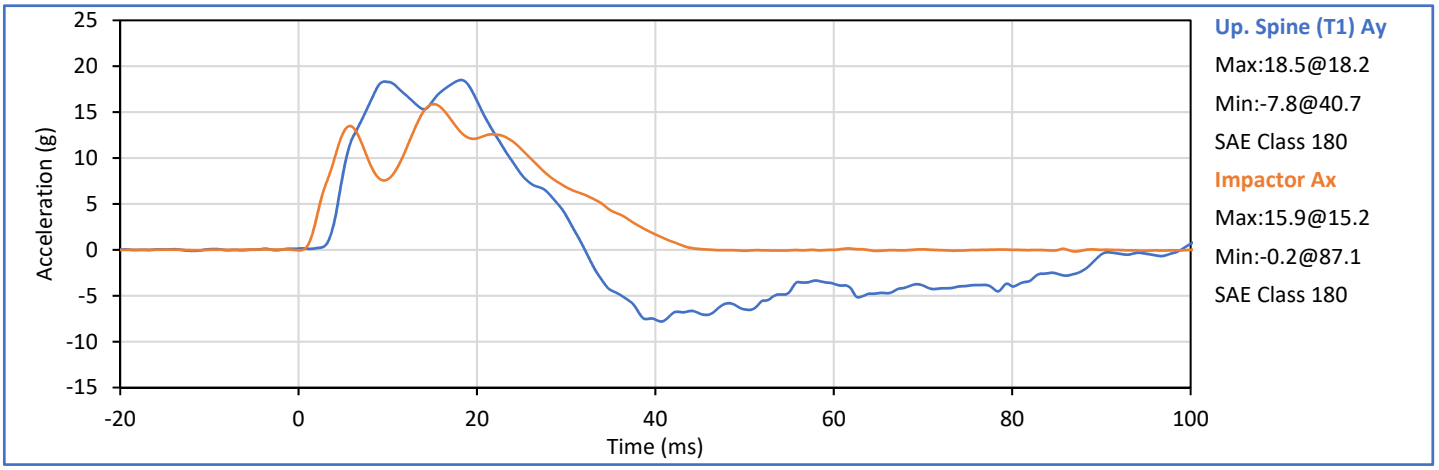
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 299 Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Shoulder Dy	mm	28.0	37.0	34.7	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.5	Pass
Peak Impactor Ax	g	13.0	18.0	15.9	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

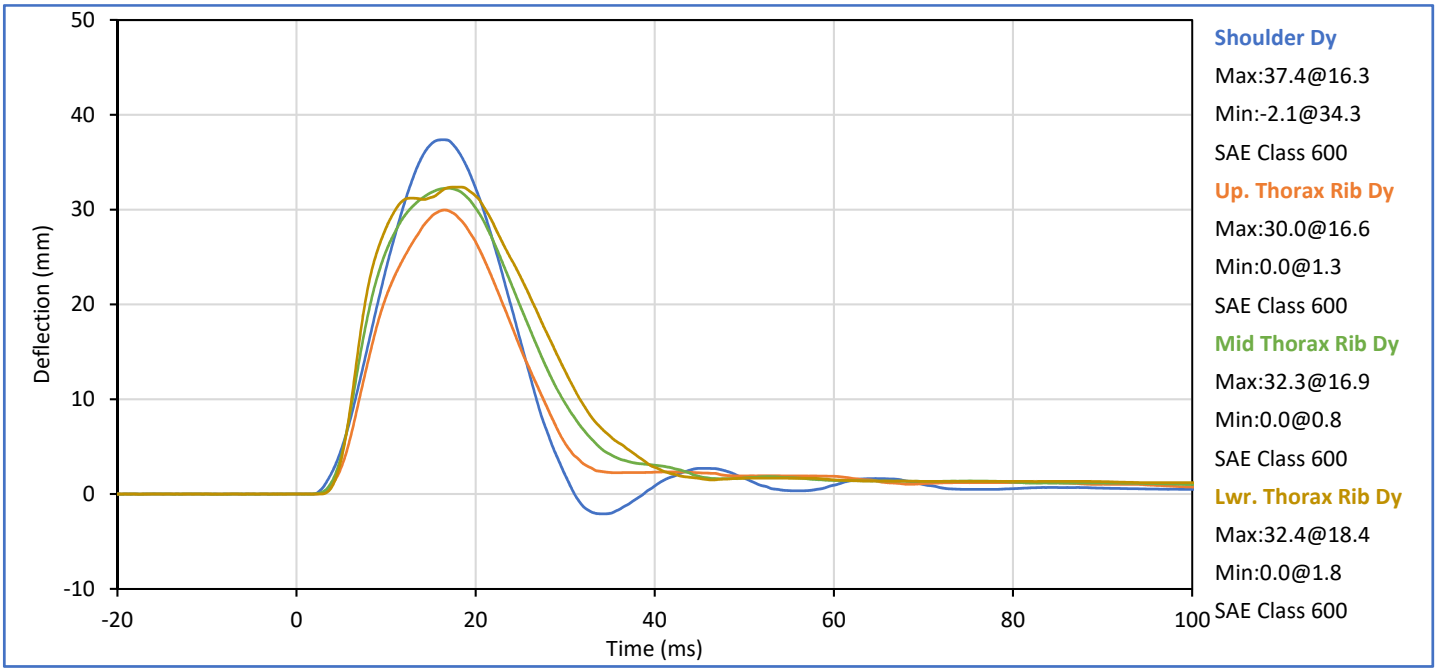
Approved By: P. Puzzuto

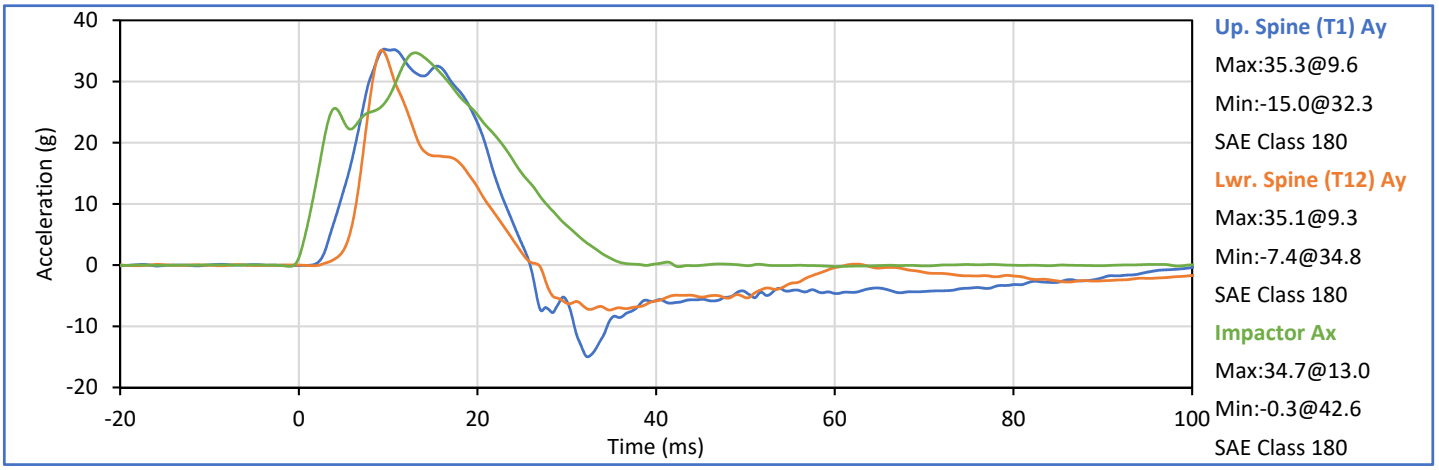
Applus IDIADA
KARCO

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

ATD Serial No.: 299 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	29	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.4	Pass
Peak Upper Rib Dy	mm	25.0	32.0	30.0	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.3	Pass
Peak Lower Rib Dy	mm	32.0	38.0	32.4	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	35.3	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	35.1	Pass
Peak Impactor Ax	g	30.0	36.0	34.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

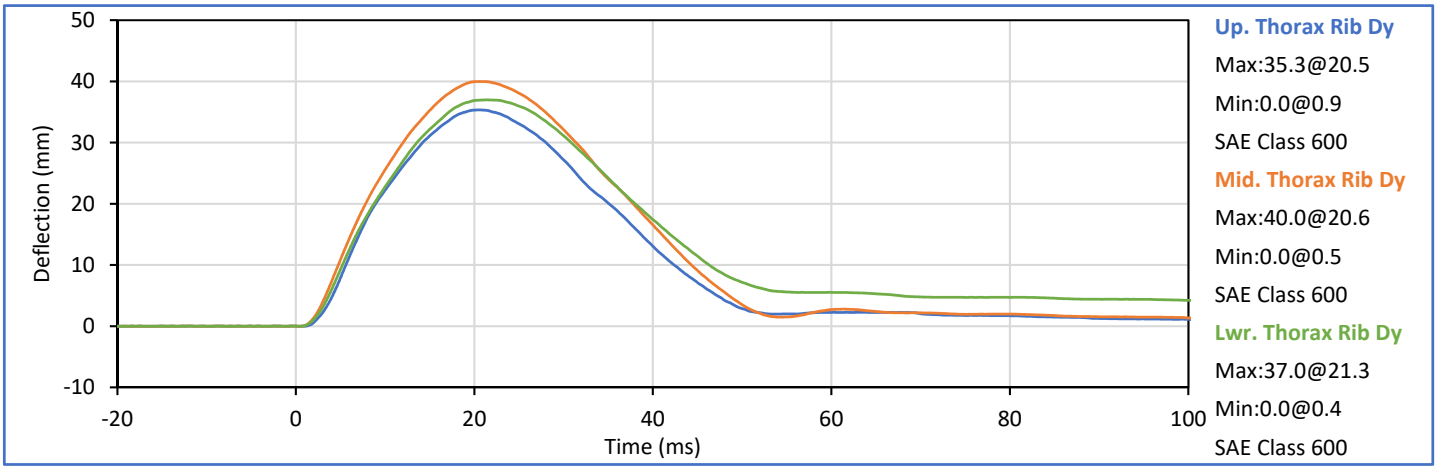
Approved By: P. Puzzuto

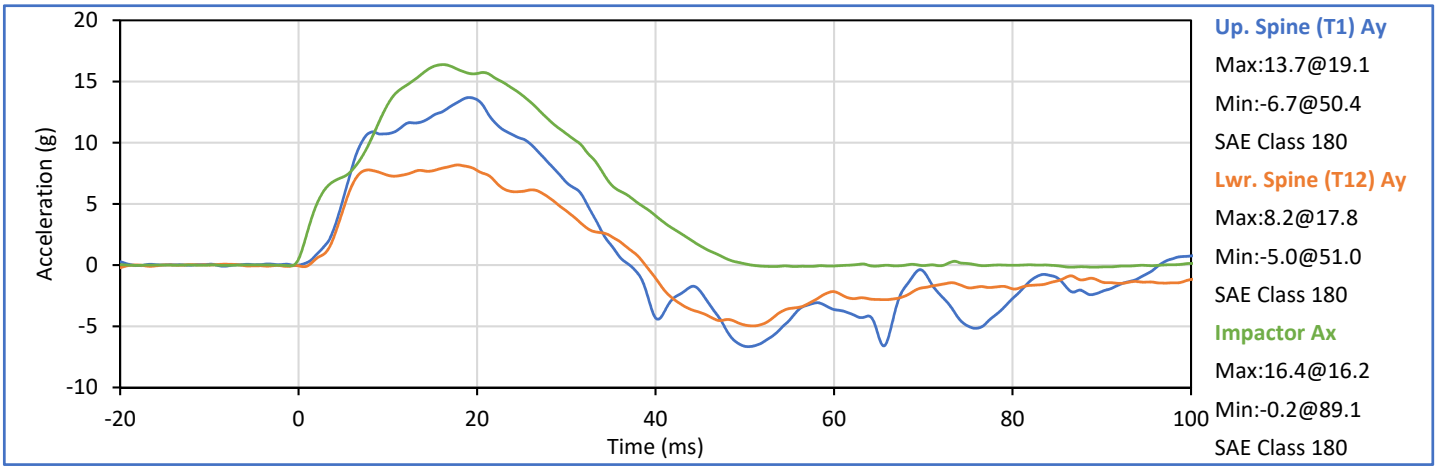
Applus IDIADA
KARCO

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

ATD Serial No.: 299 Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	35.3	Pass
Peak Middle Rib Dy	mm	39.0	45.0	40.0	Pass
Peak Lower Rib Dy	mm	35.0	43.0	37.0	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	13.7	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	8.2	Pass
Peak Impactor Ax	g	14.0	18.0	16.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

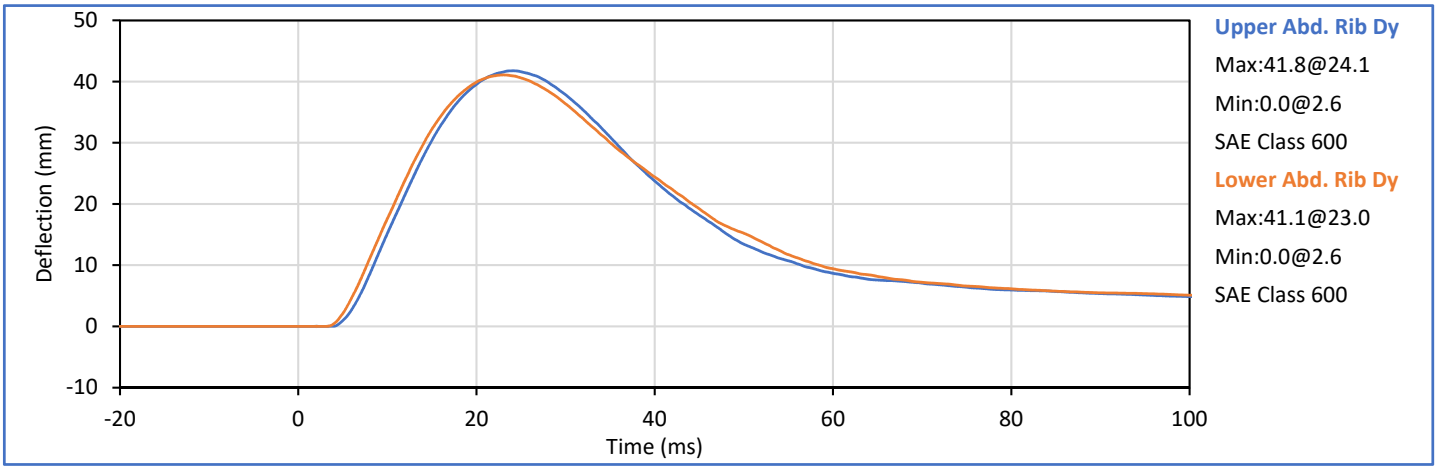
Approved By: P. Puzzuto

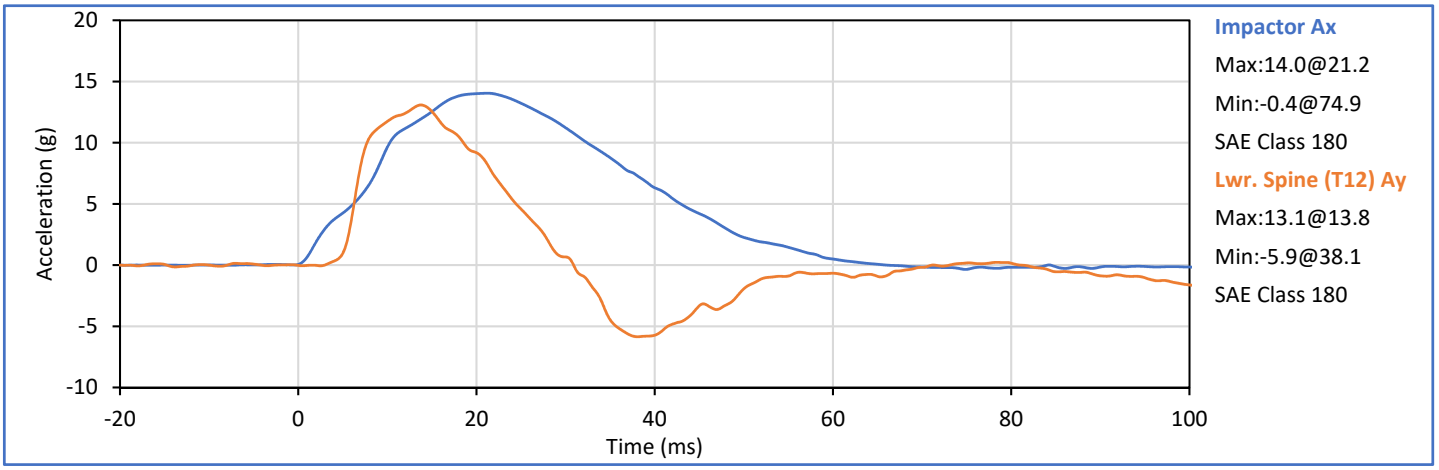
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 299 Test Date: 2021-01-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	41.8	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	41.1	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	13.1	Pass
Peak Impactor Ax	g	12.0	16.0	14.0	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

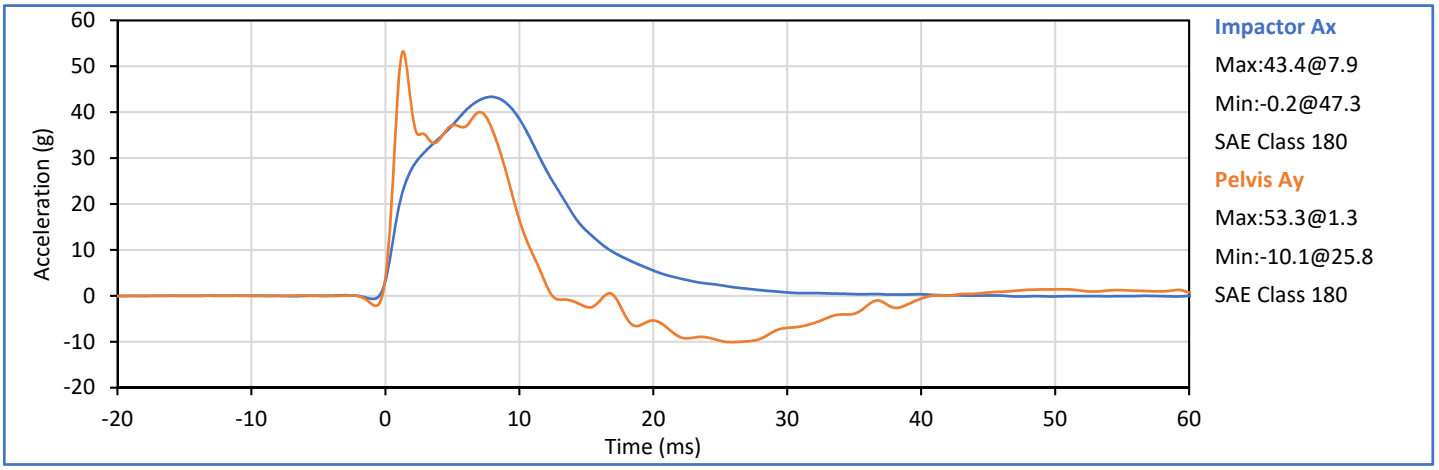
Applus IDIADA
KARCO

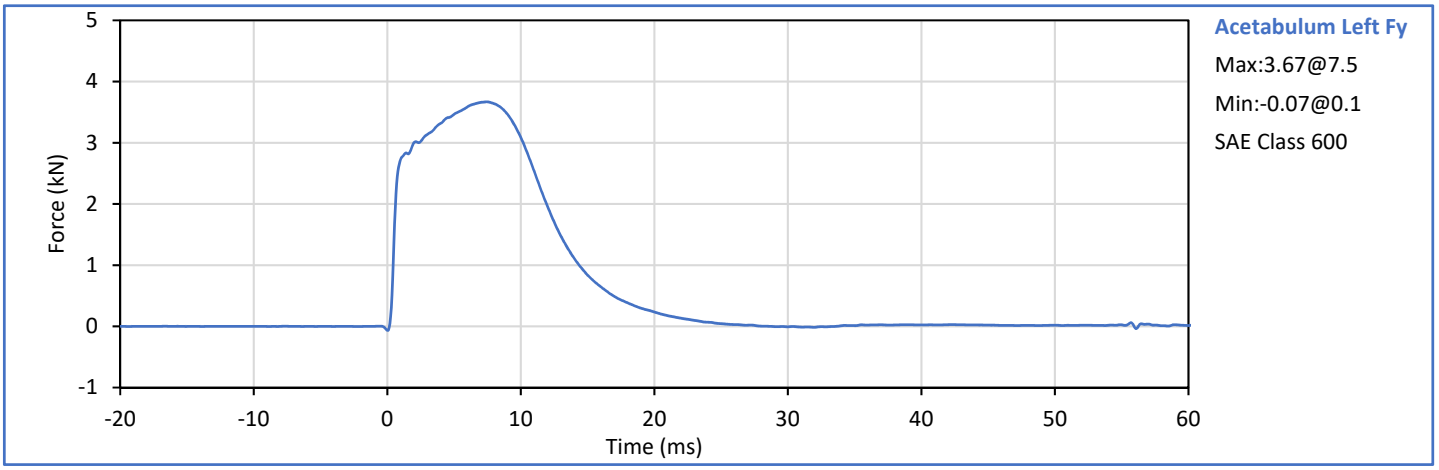
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 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	26	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.67	Pass
Pelvis Ay after 6ms	g	34.0	42.0	40.0	Pass
Peak Impactor Ax	g	38.0	47.0	43.4	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13666





Technician: J. Hernandez

Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2021-01-29

Pelvis Plug S/N: 13666

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13666
Test Number 11314
Report Number 11352
Test Date 9/26/2019 12:53:41 PM

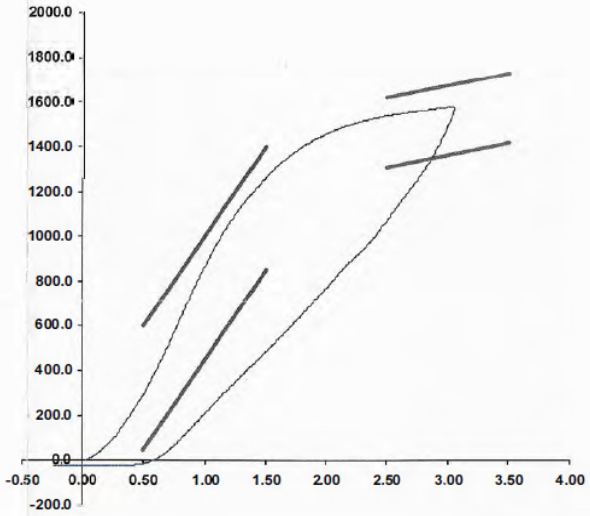
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	297.34	50.00	600.00
Force @ 1.5 mm (N)	1,265.99	850.00	1,400.00
Force @ 2.5 mm (N)	1,538.68	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,576.03	1,361.00	1,673.00

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

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

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 26-Sep-19
SACO Research

By : DC Date : 9/26/2019

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

Applus IDIADA
KARCO

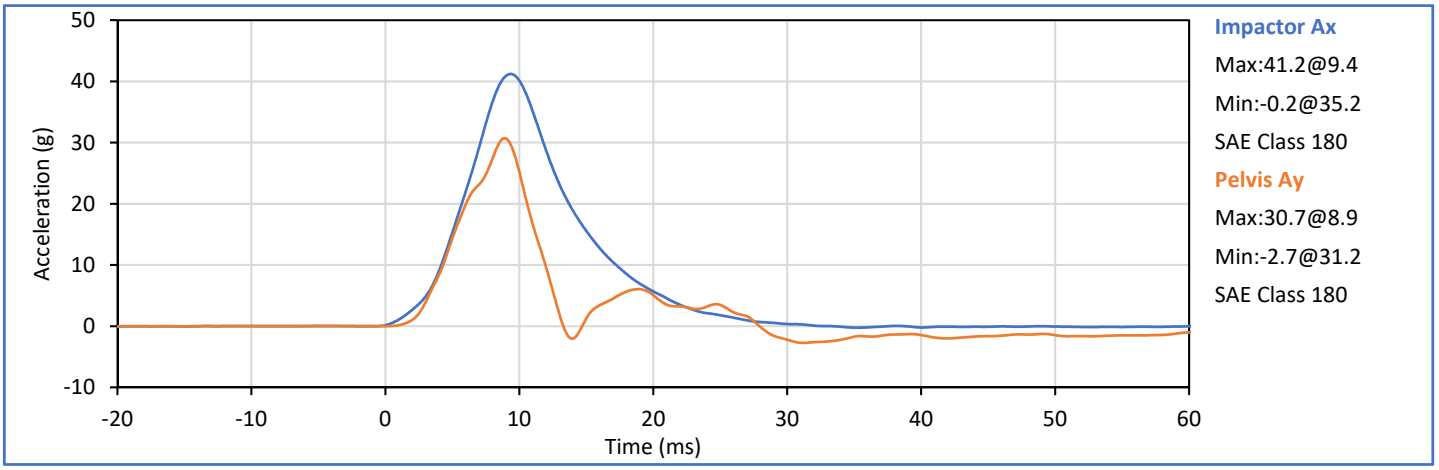
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

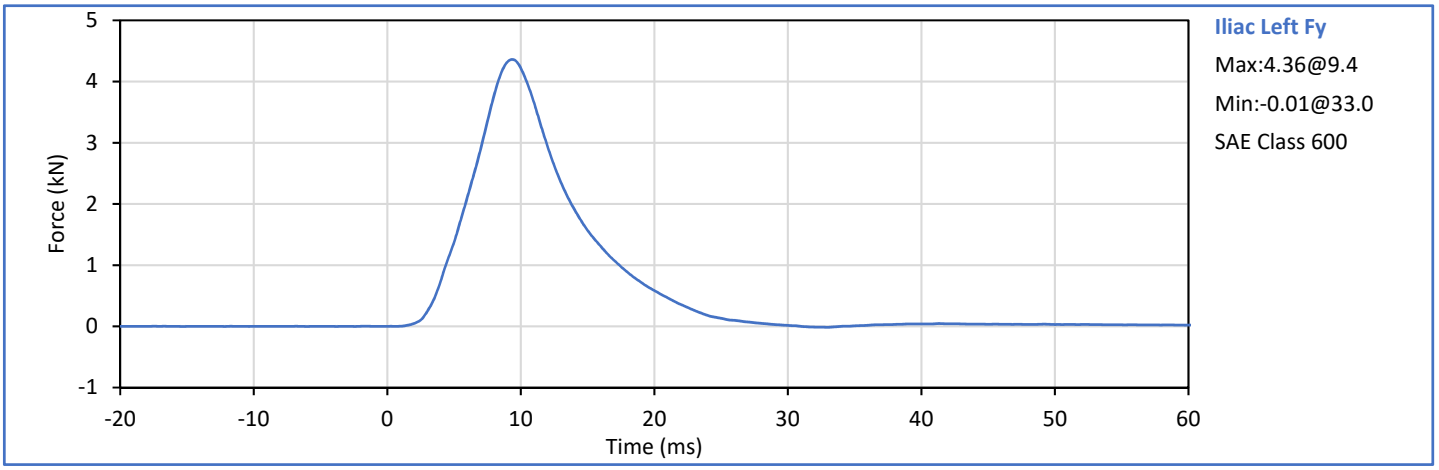
ATD Serial No.: 299 Test Date: 2021-02-01

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	4.31	Pass
Peak Iliac Fy	kN	4.10	5.10	4.36	Pass
Pelvis Ay after 6ms	g	28.0	39.0	30.7	Pass
Peak Impactor Ax	g	36.0	45.0	41.2	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
ES-2re 50th Male Side Impact ATD, Left Side Configuration
S/N: F037

Applus IDIADA
KARCO

ES-2re 50th Male Side Impact ATD
External Measurements

ATD Serial No.: F037 Test Date: 2021-02-03

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
1 - Sitting Height	mm	900	918	907	Pass
2 - Seat to Shoulder Joint	mm	558	572	567	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	350	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	99	Pass
5 - Sole to Seat, Sitting	mm	433	451	447	Pass
6 - Head Width	mm	152	158	157	Pass
7 - Shoulder/Arm Width	mm	461	479	474	Pass
8 - Thorax Width	mm	322	332	327	Pass
9 - Abdomen Width	mm	273	287	278	Pass
10 - Pelvis Lap Width	mm	359	373	369	Pass
11 - Head Depth	mm	196	206	203	Pass
12 - Thorax Depth	mm	262	272	269	Pass
13 - Abdomen Depth	mm	194	204	198	Pass
14 - Pelvis Depth	mm	235	245	242	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	159	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	612	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

Approved By: P. Puzzuto

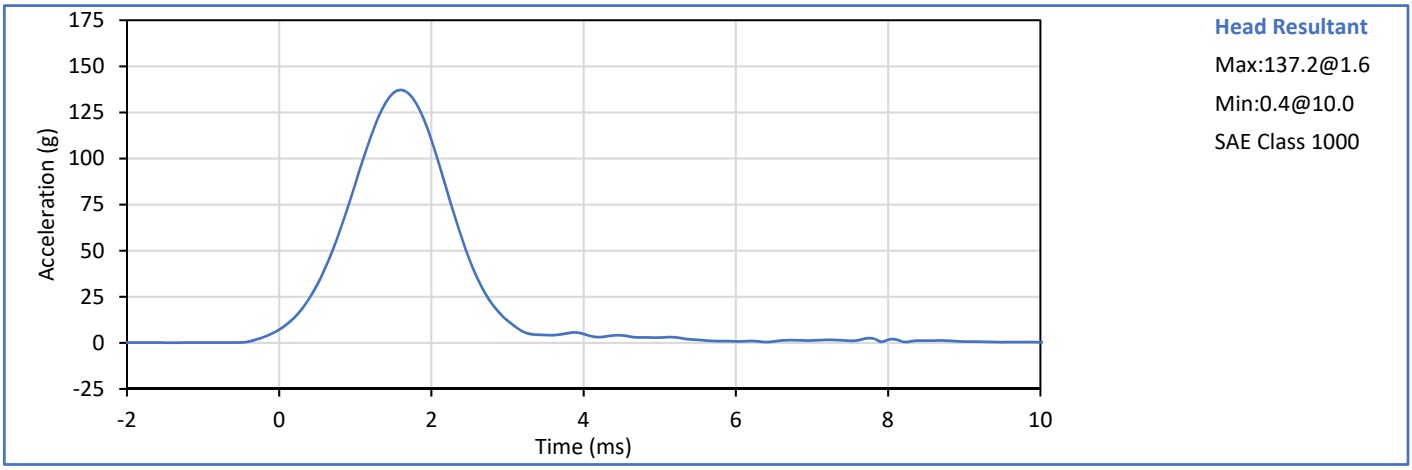
Applus IDIADA
KARCO

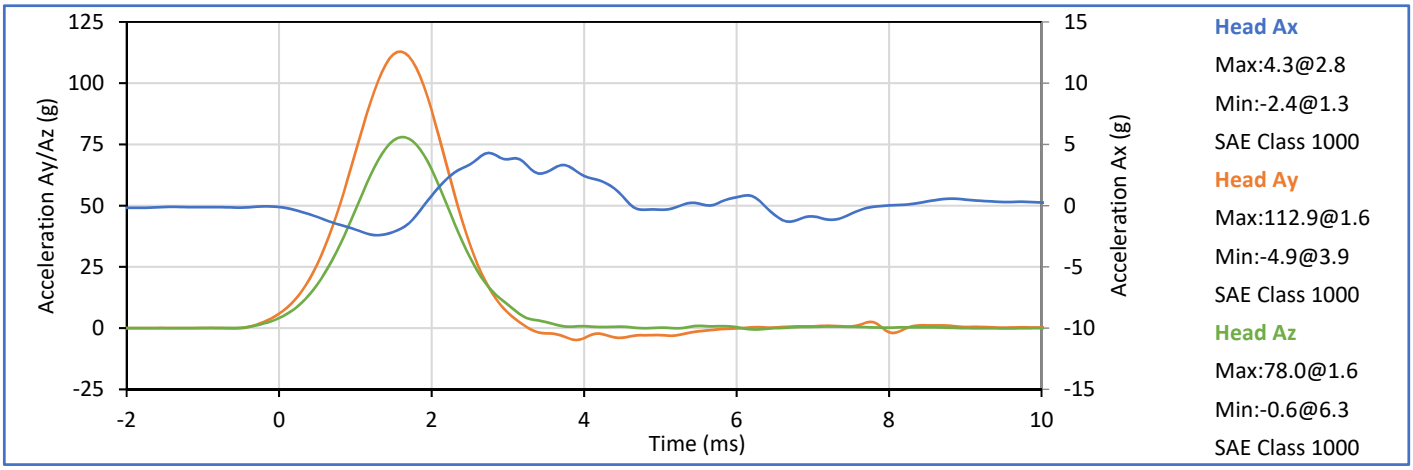
ES-2re 50th Male Side Impact ATD
Head Drop

ATD Serial No.: F037

Test Date: 2021-02-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	32	Pass
Peak Resultant Acceleration	g	125.0	155.0	137.2	Pass
Peak Head Ax	g	-15.0	15.0	4.3	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

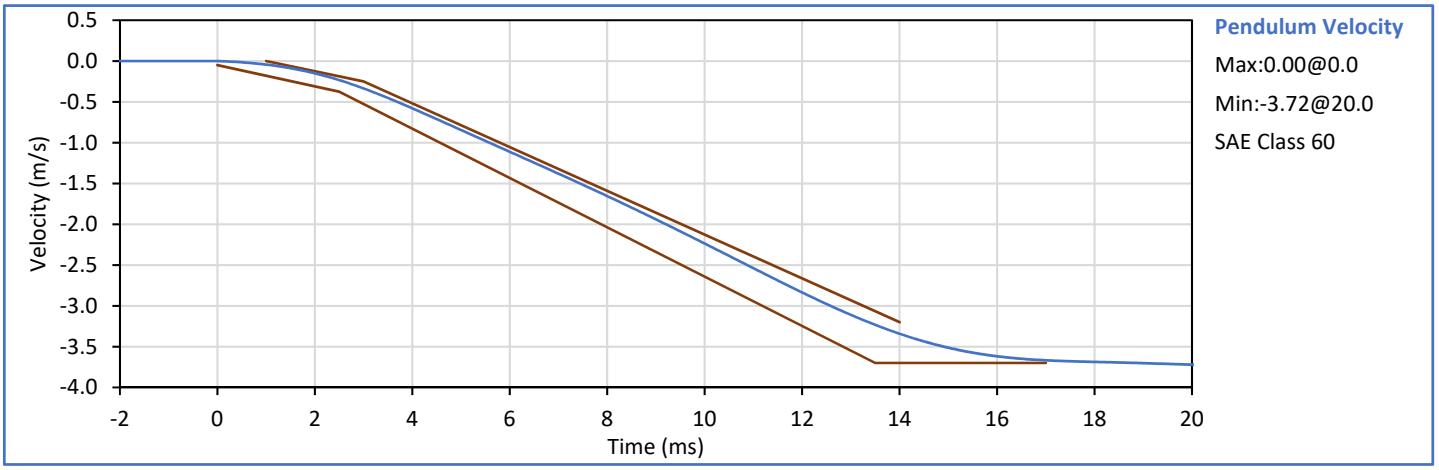
Applus IDIADA
KARCO

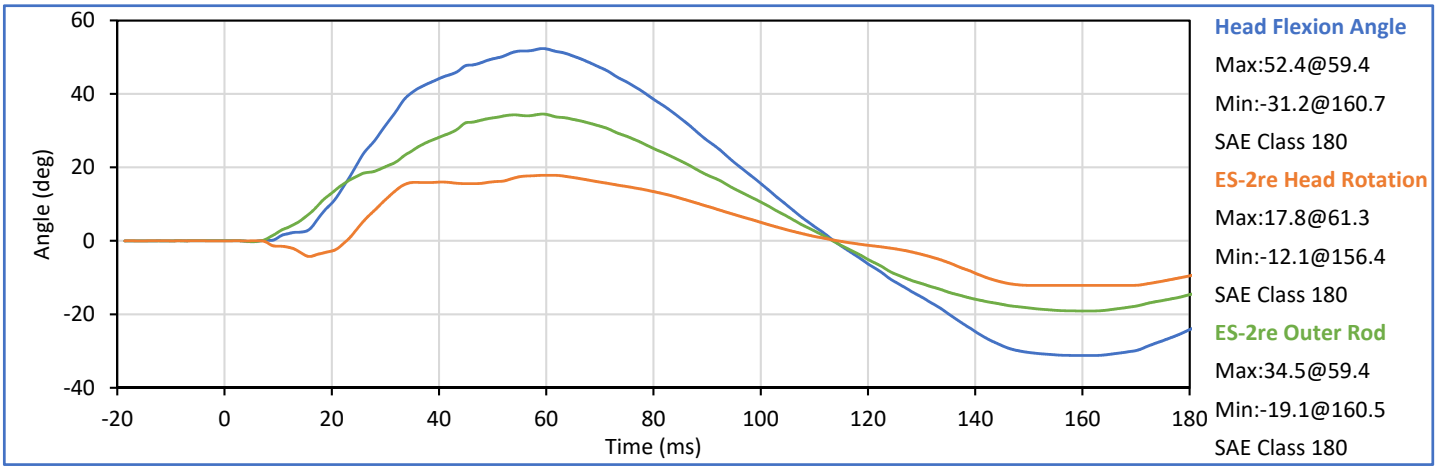
ES-2re 50th Male Side Impact ATD
Neck Flexion

ATD Serial No.: F037

Test Date: 2021-02-04

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	27	Pass
Pendulum Velocity	m/s	3.30	3.50	3.43	Pass
Peak Headform Flexion	deg	49.0	59.0	52.4	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	59.4	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	54.3	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

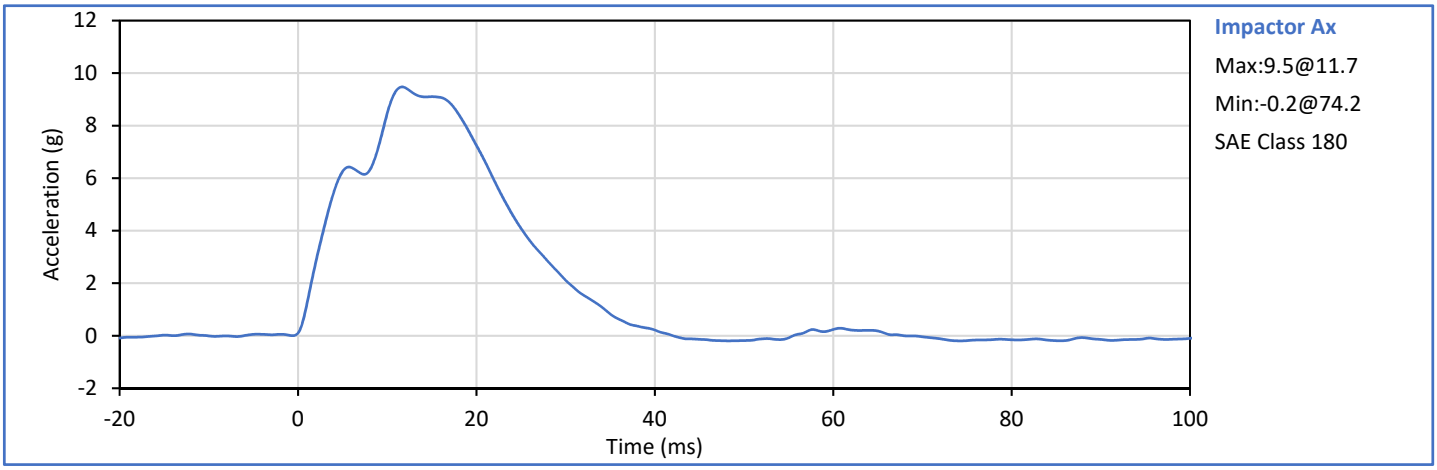
Applus IDIADA KARCO

ES-2re 50th Male Side Impact ATD
Shoulder Impact Test

ATD Serial No.: F037

Test Date: 2021-02-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Ax	g	7.5	10.5	9.5	Pass
			Overall Test Results		Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

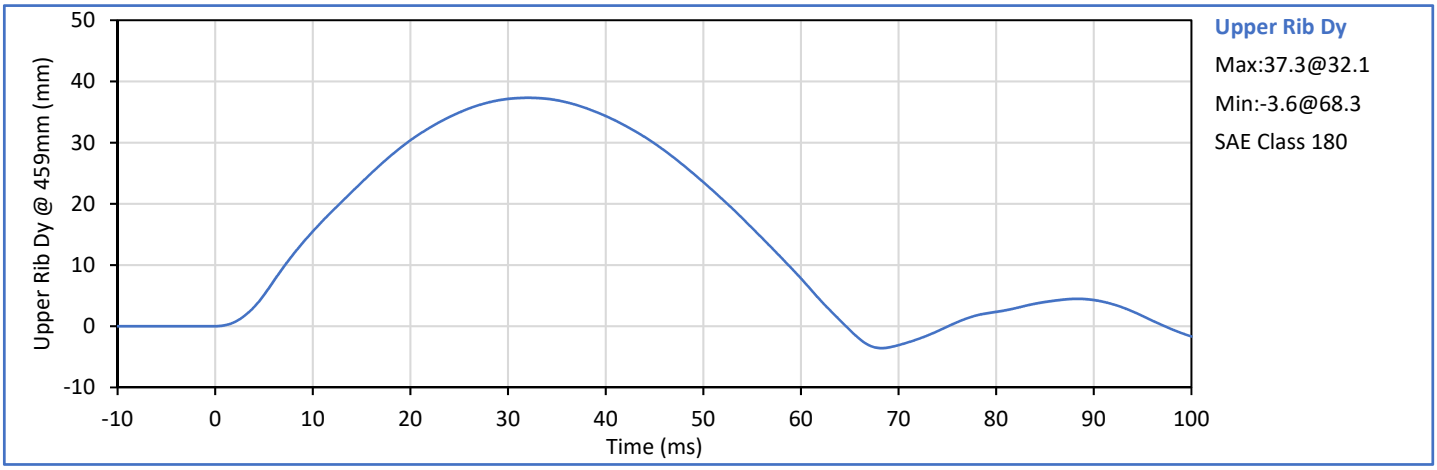
Applus IDIADA
KARCO

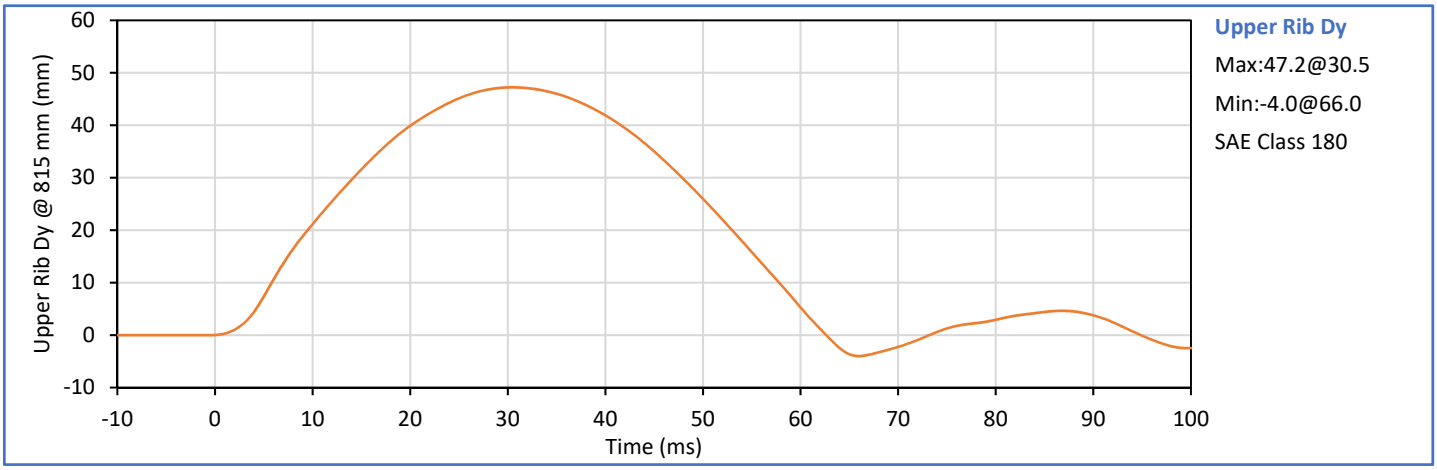
ES-2re 50th Male Side Impact ATD
Upper Rib Drop Test

ATD Serial No.: F037

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 Relative Humidity	%	10	70	24	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.3	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	47.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

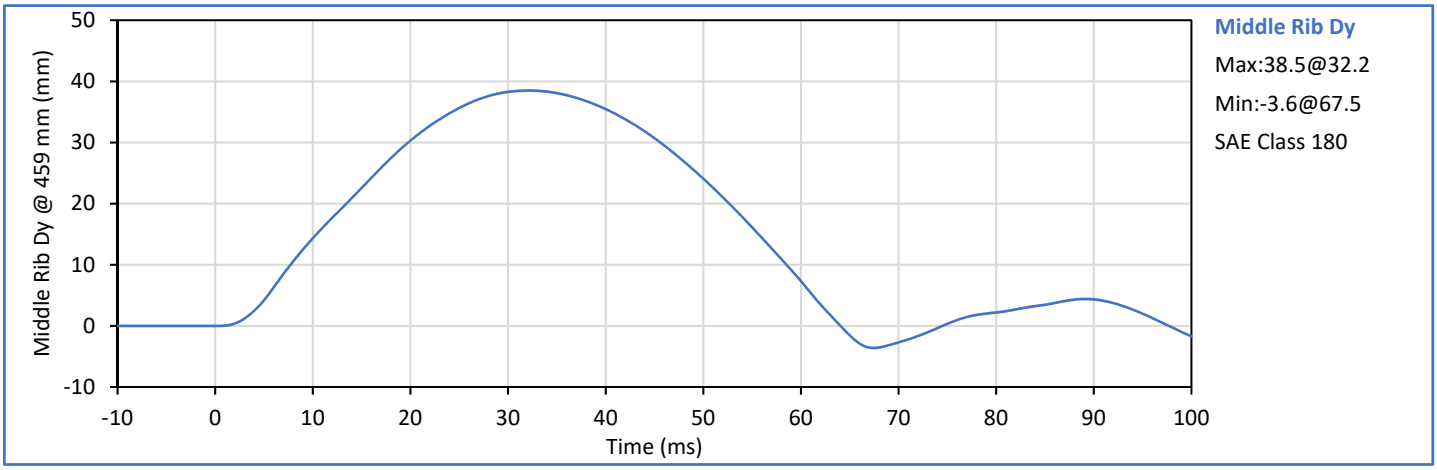
Applus IDIADA
KARCO

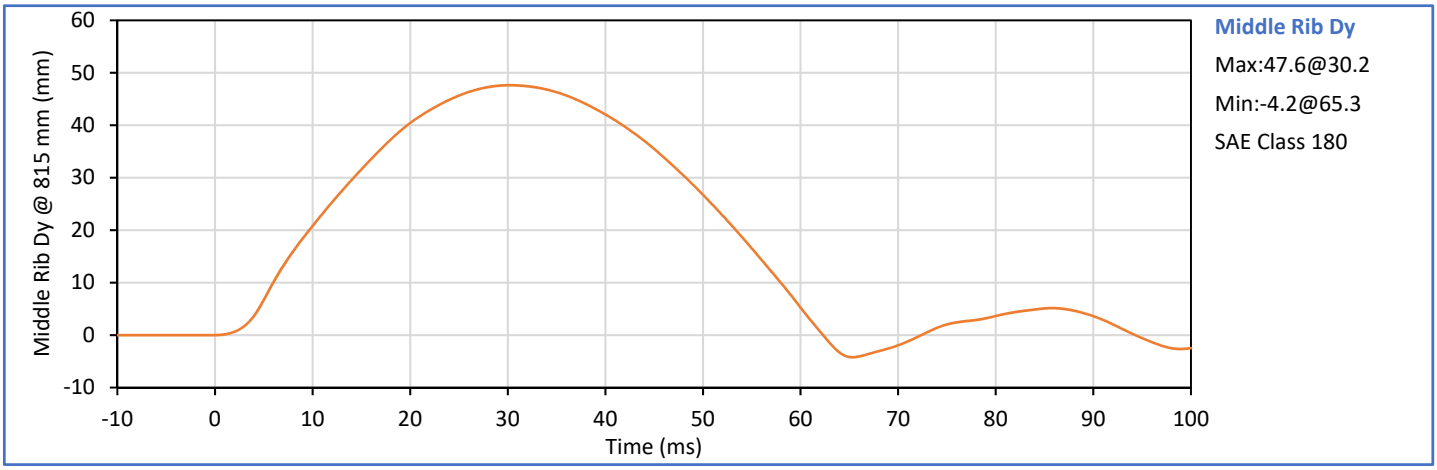
ES-2re 50th Male Side Impact ATD
Middle Rib Drop Test

ATD Serial No.: F037

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 Relative Humidity	%	10	70	24	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	38.5	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	47.6	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

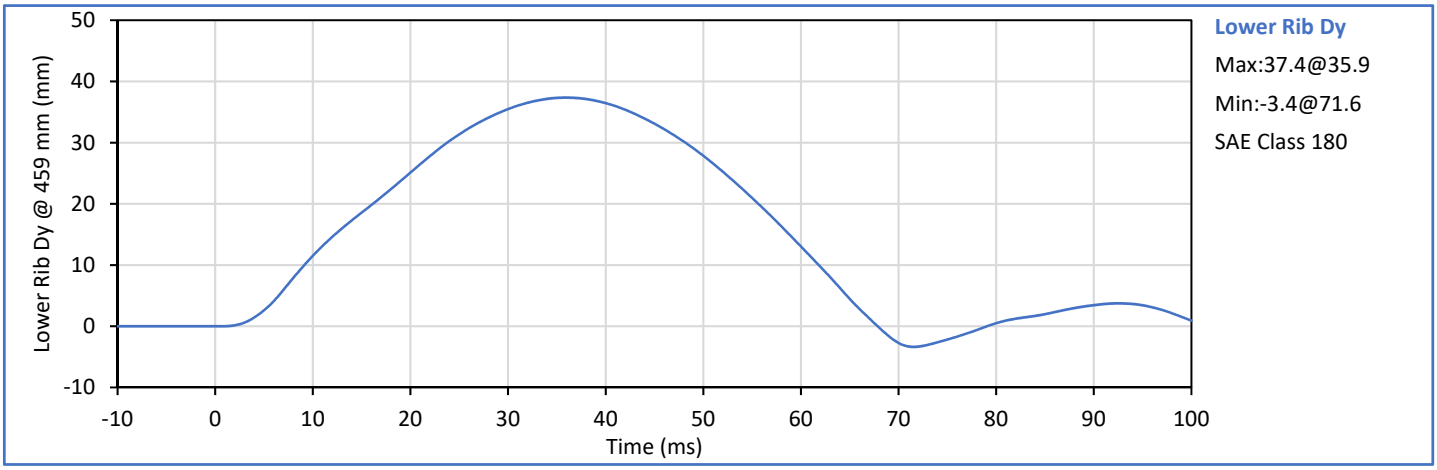
Applus IDIADA
KARCO

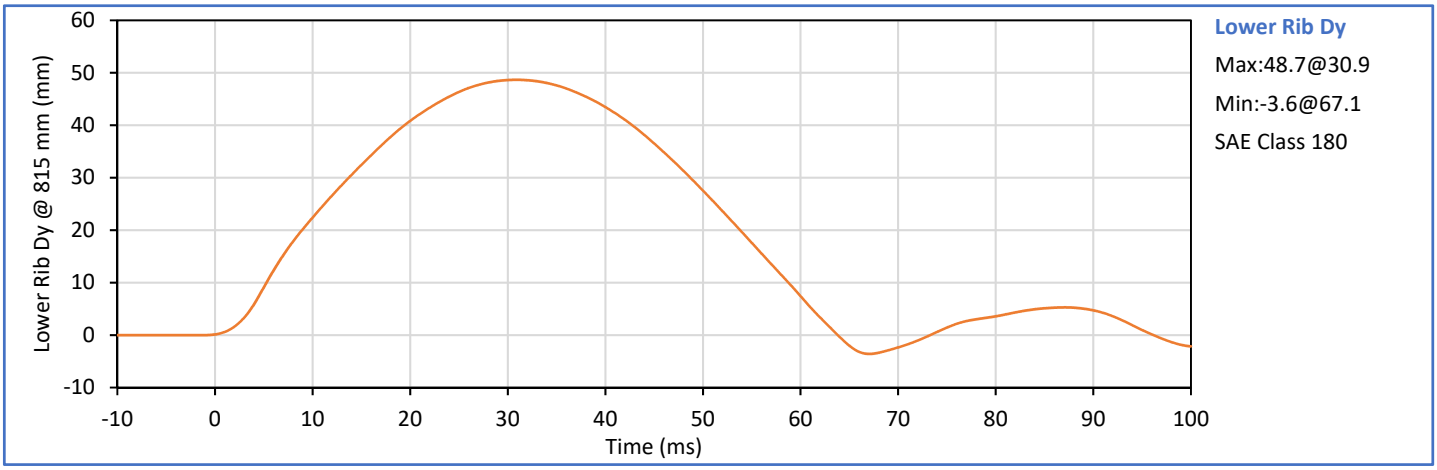
ES-2re 50th Male Side Impact ATD
Lower Rib Drop Test

ATD Serial No.: F037

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 Relative Humidity	%	10	70	24	Pass
Lower Rib Dy @ 459mm	mm	36.0	40.0	37.4	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	48.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

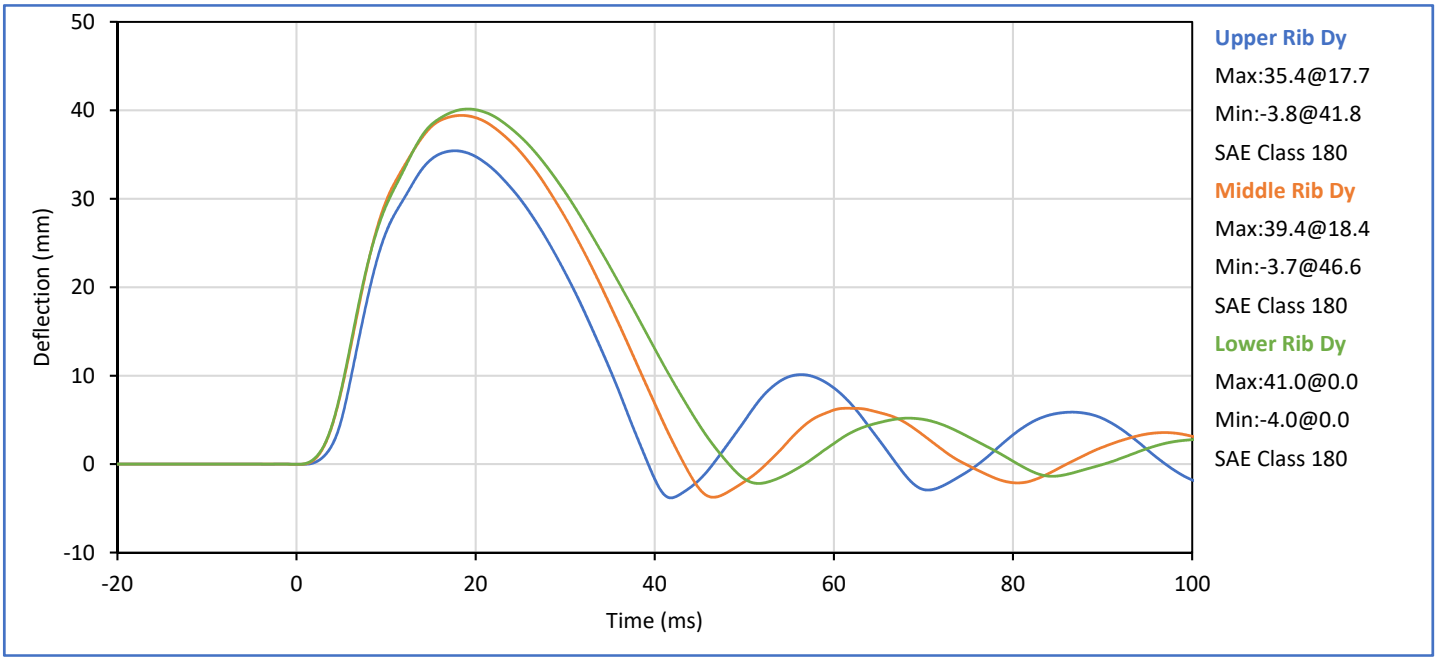
Applus IDIADA
KARCO

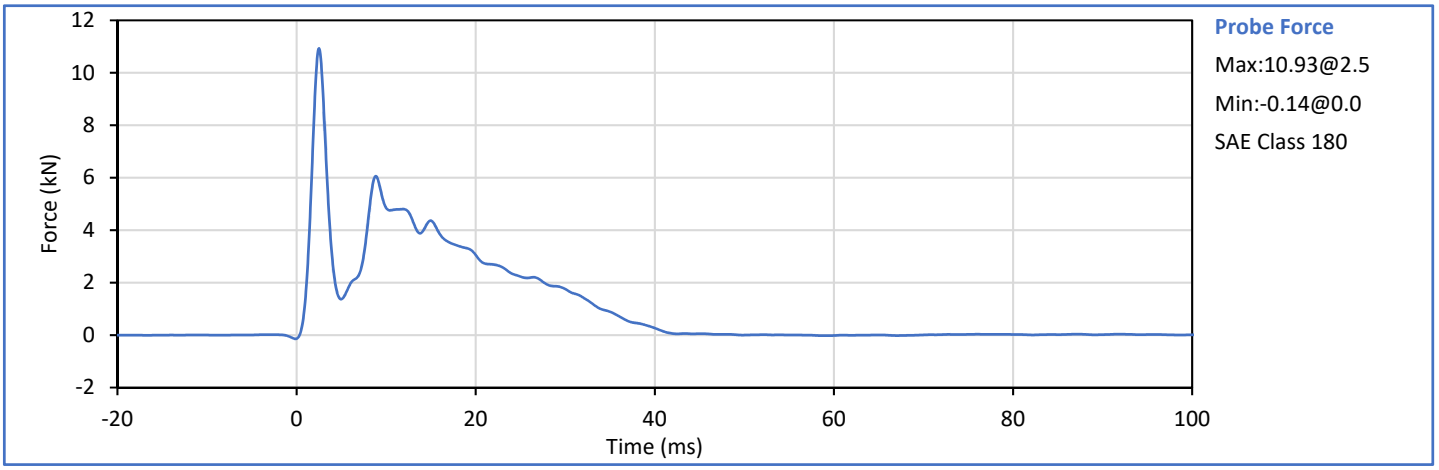
ES-2re 50th Male Side Impact ATD
Thorax Impact (Full Body)

ATD Serial No.: F037

Test Date: 2021-02-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	19	Pass
Impactor Velocity	m/s	5.40	5.60	5.51	Pass
Peak Upper Rib Dy	mm	34.0	41.0	35.4	Pass
Peak Middle Rib Dy	mm	37.0	45.0	39.4	Pass
Peak Lower Rib Dy	mm	37.0	44.0	40.1	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	6.06	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

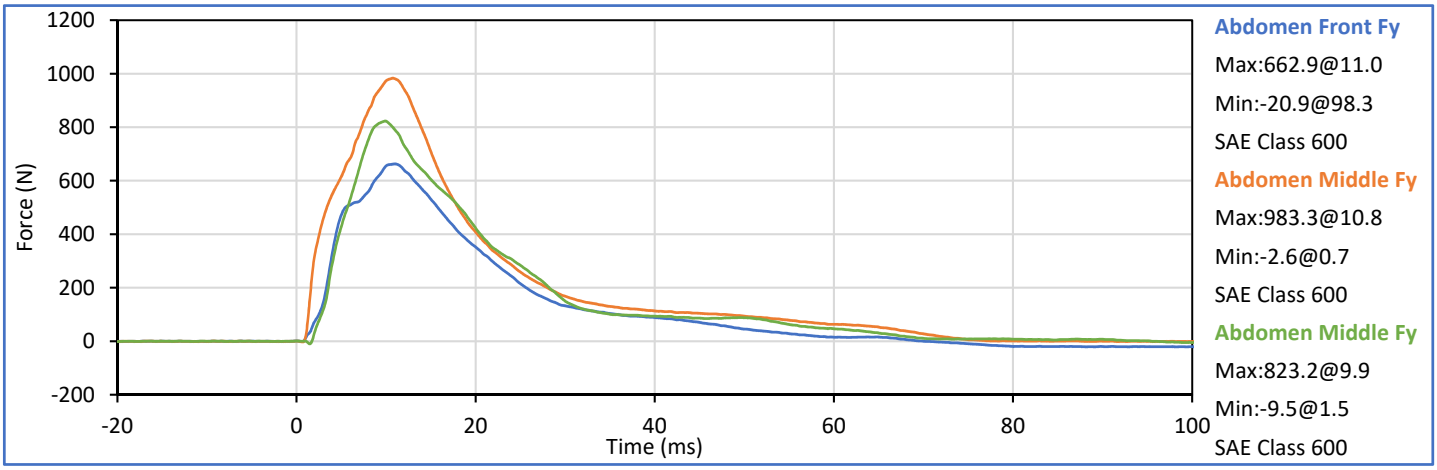
Approved By: P. Puzzuto

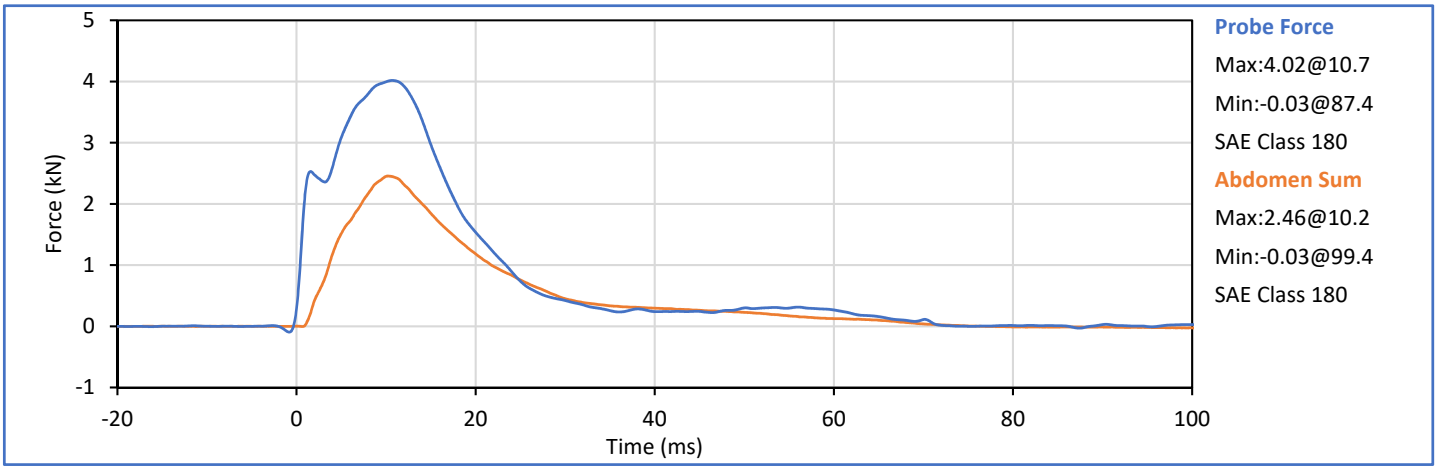
Applus IDIADA KARCO

ES-2re 50th Male Side Impact ATD
Abdomen Impact

ATD Serial No.: F037 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 Relative Humidity	%	10	70	19	Pass
Impactor Velocity	m/s	3.90	4.10	4.03	Pass
Peak Impactor Force	kN	4.00	4.80	4.02	Pass
Time of Peak Impactor Force	ms	10.6	13.0	10.7	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.46	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

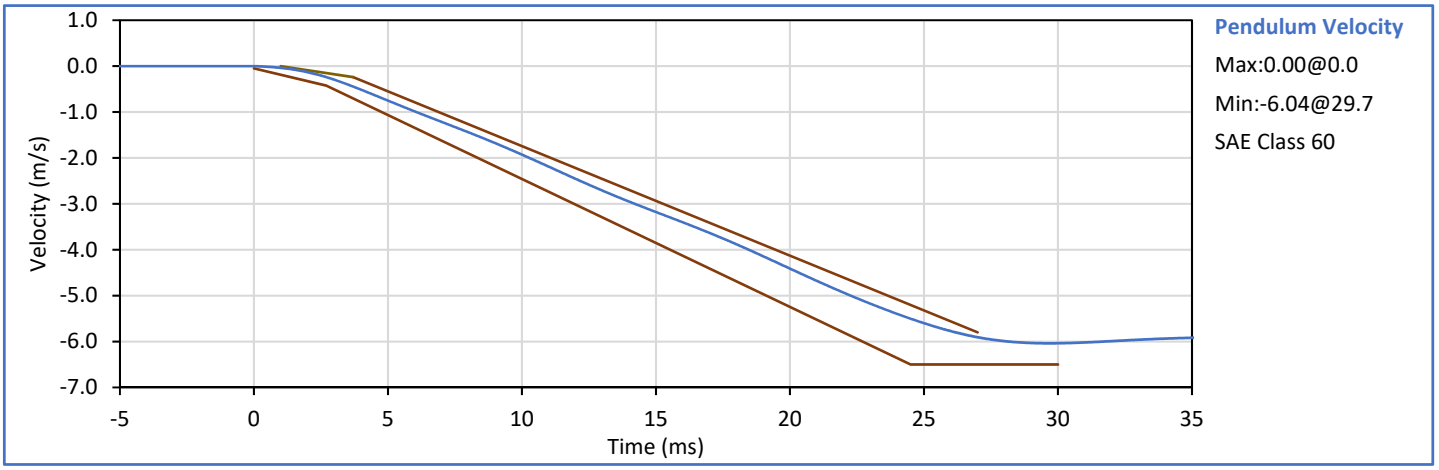
Applus IDIADA
KARCO

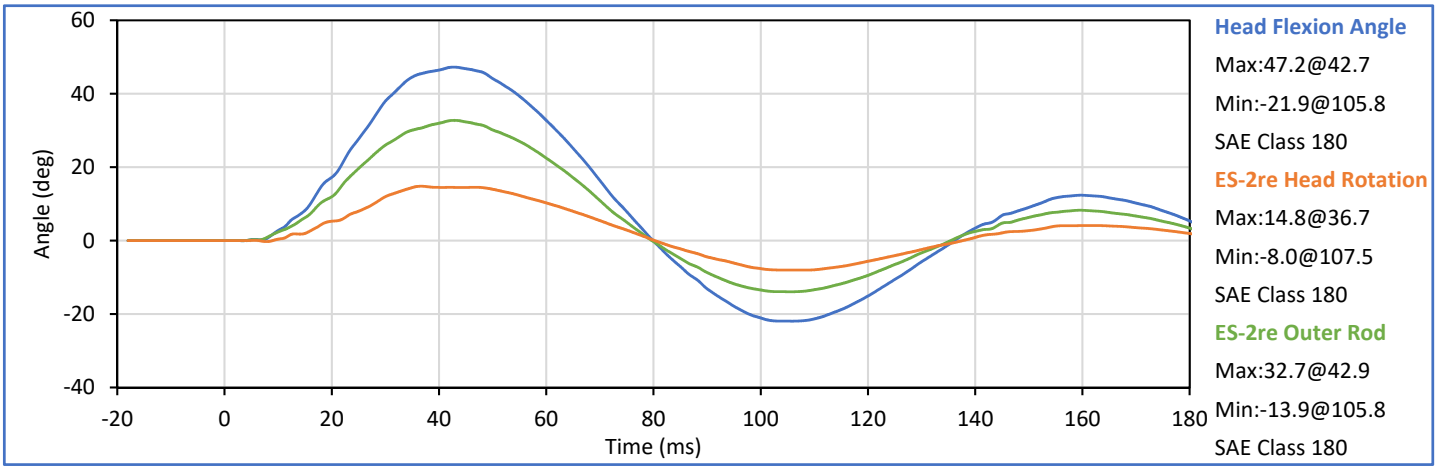
ES-2re 50th Male Side Impact ATD
Lumbar Spine Flexion

ATD Serial No.: F037

Test Date: 2021-02-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	26	Pass
Pendulum Velocity	m/s	5.95	6.15	6.11	Pass
Peak Headform Flexion	deg	45.0	55.0	47.2	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	42.7	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	37.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

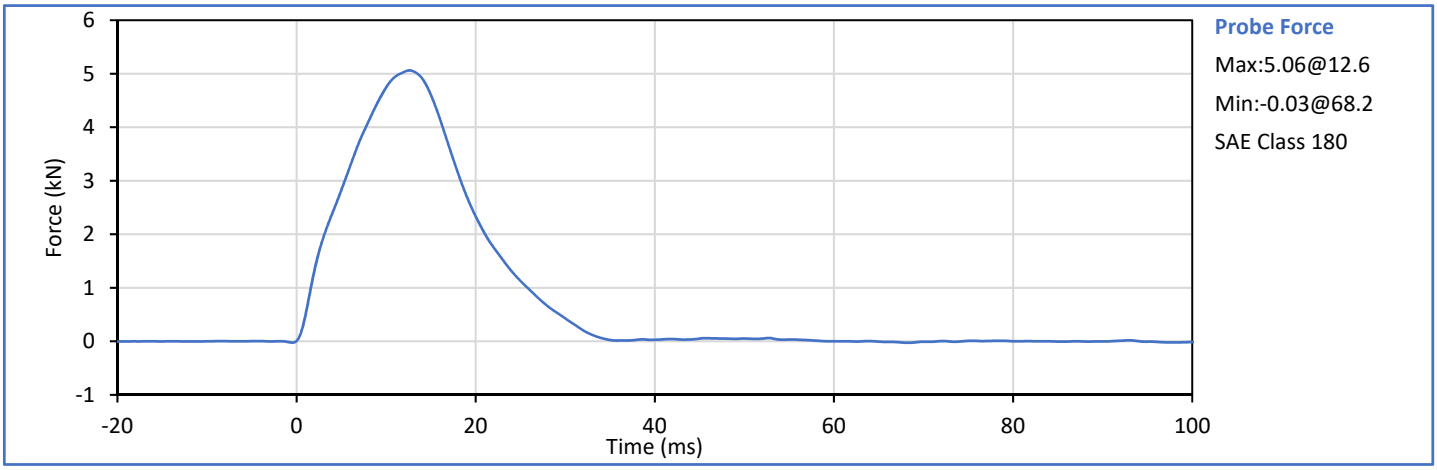
Applus IDIADA
KARCO

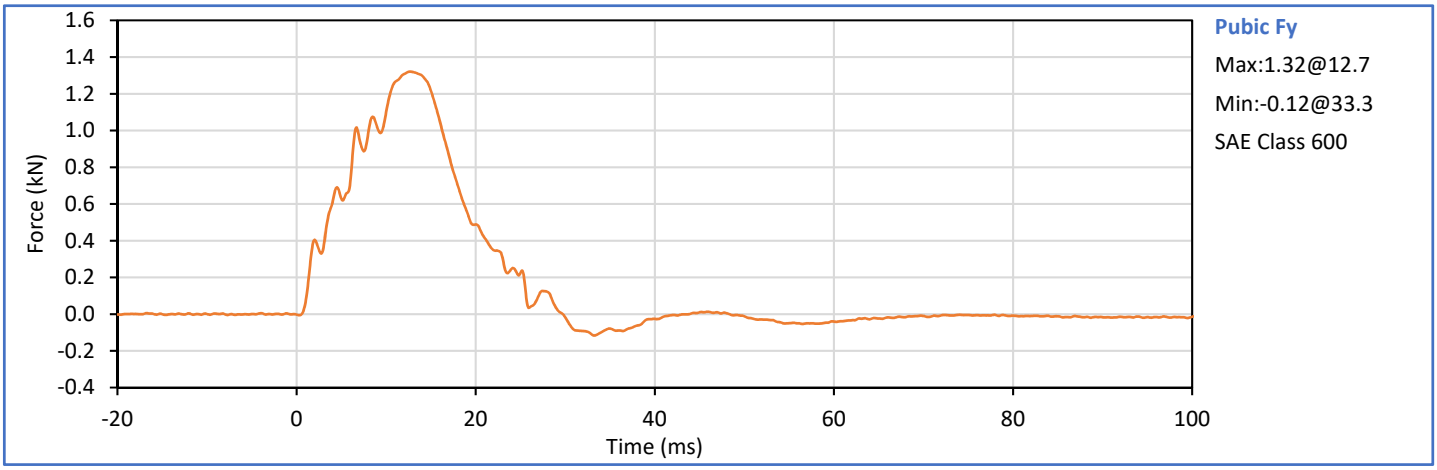
ES-2re 50th Male Side Impact ATD
Pelvis Impact

ATD Serial No.: F037

Test Date: 2021-02-08

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Relative Humidity	%	10	70	18	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Force	kN	4.70	5.40	5.06	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.6	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.32	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	12.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

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

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 299 Test Date: 2021-02-05

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	784	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	83	Pass
D - H Point From Seatback	mm	141	151	145	Pass
E - Shoulder Pivot From Backline	mm	97	107	100	Pass
F - Thigh Clearance	mm	119	135	125	Pass
G - Head Breadth	mm	140	148	141	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	185	Pass
J - Head Circumference	mm	541	551	545	Pass
K - Buttock To Knee Length	mm	514	540	534	Pass
L - Popliteal Height	mm	343	369	355	Pass
K - Knee Pivot To Floor Height	mm	392	409	398	Pass
N - Buttock Popliteal Length	mm	416	442	439	Pass
O - Chest Depth W/O Jacket	mm	195	211	205	Pass
P - Foot Length	mm	216	232	218	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	317	Pass
R - Arm Length	mm	249	259	255	Pass
S - Knee Joint To Seatback	mm	477	493	485	Pass
V - Shoulder Width	mm	341	357	353	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	865	Pass
Z - Waist Circumference	mm	761	791	775	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

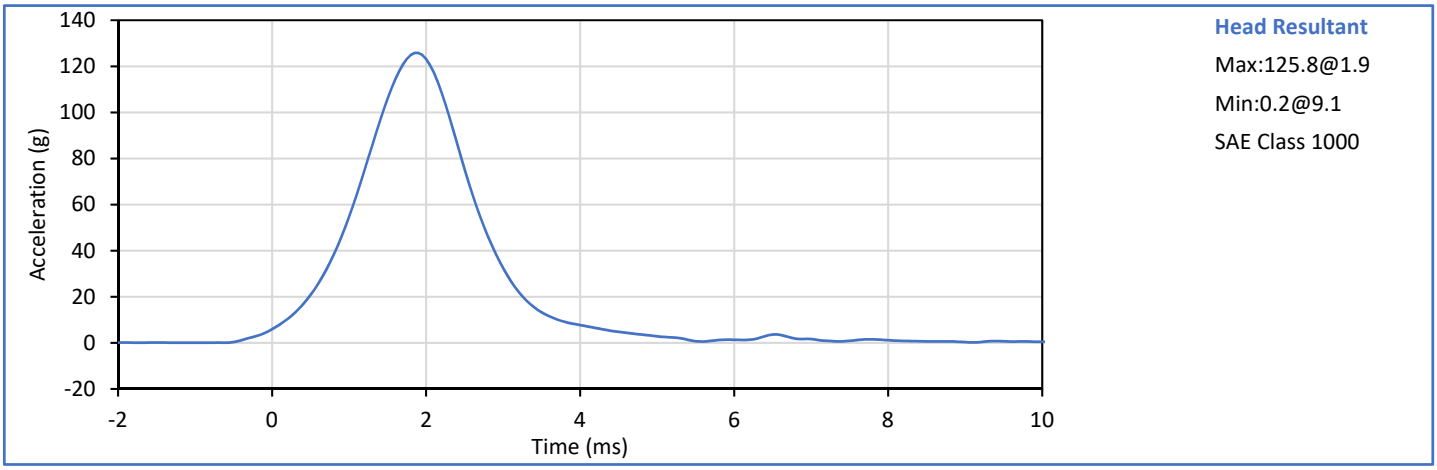
Approved By: P. Puzzuto

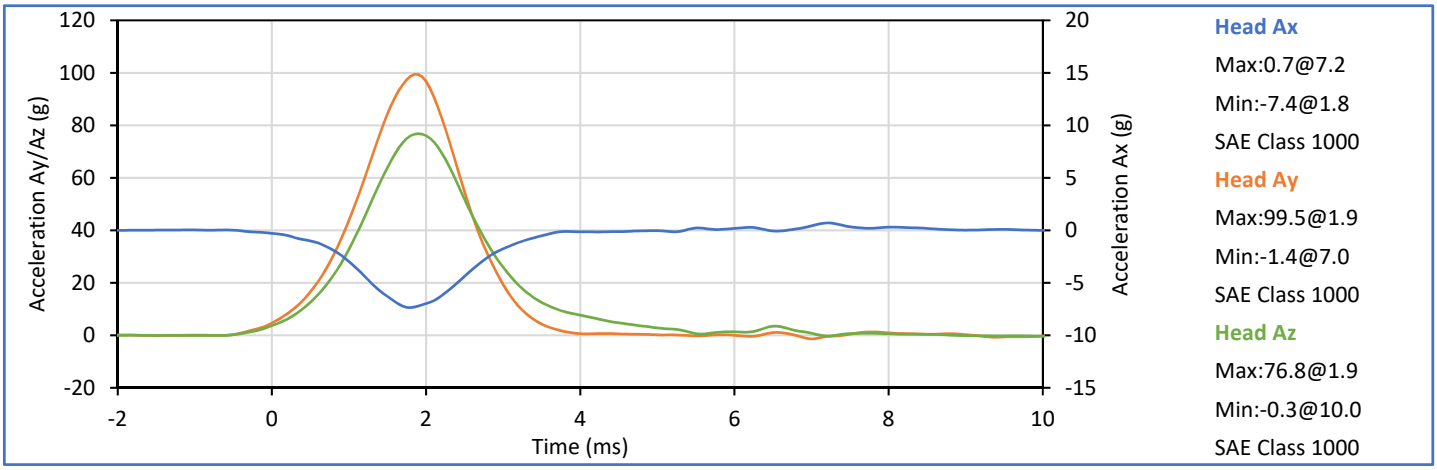
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 299 Test Date: 2021-02-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	25	Pass
Peak Resultant Acceleration	g	115.0	137.0	125.8	Pass
Peak Head Ax	g	-15.0	15.0	-7.4	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.9	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

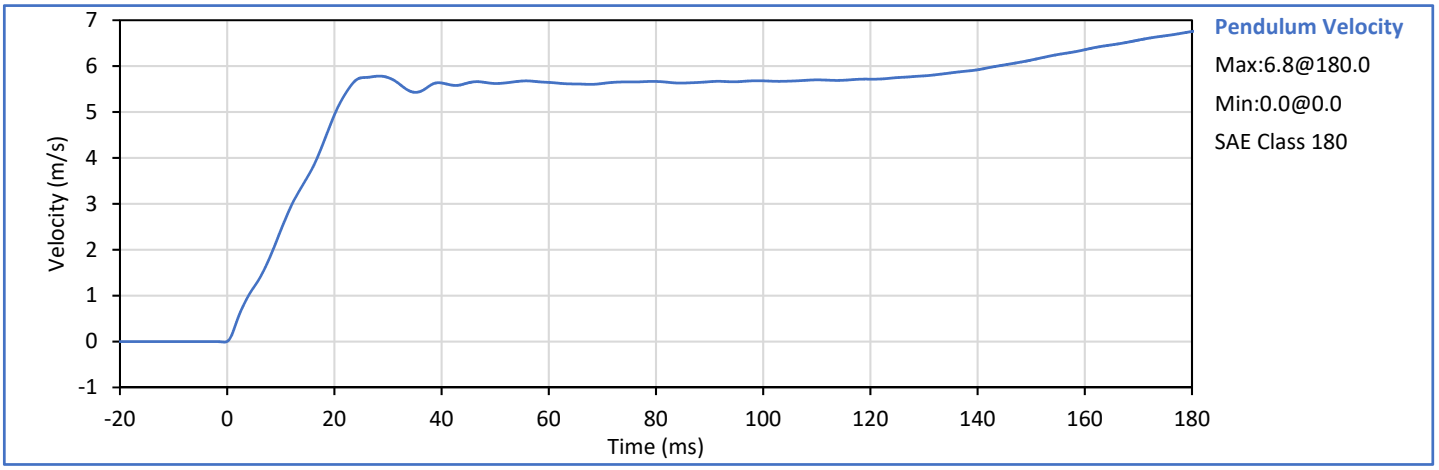
Approved By: P. Puzzuto

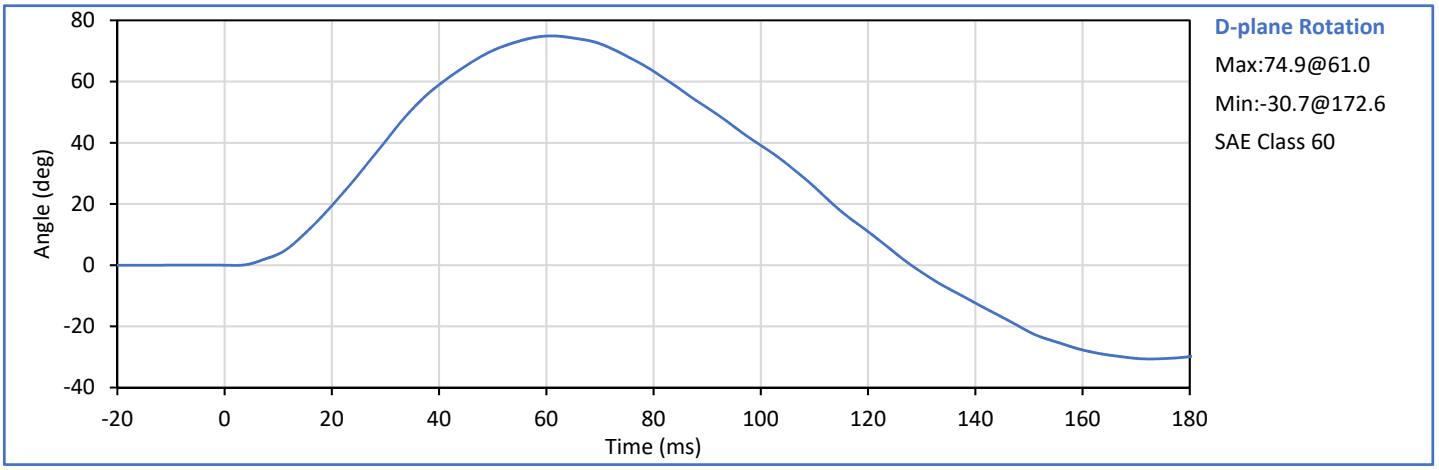
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 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	28	Pass
Pendulum Velocity	m/s	5.51	5.63	5.56	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.42	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.59	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.93	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	61.0	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-42.4	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	111.0	Pass
			Overall Test Results		Pass



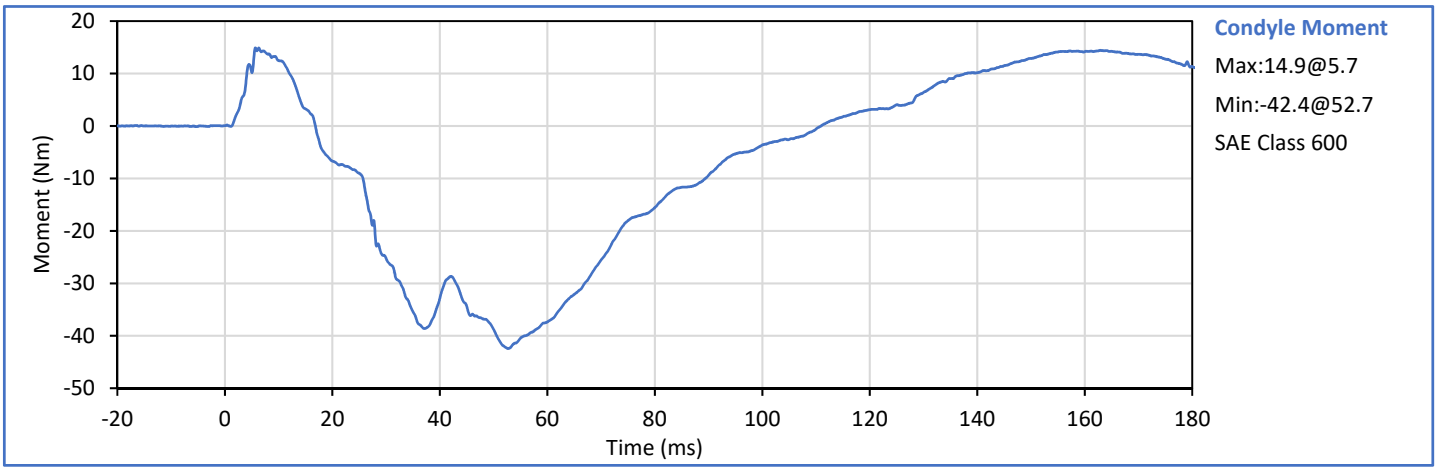


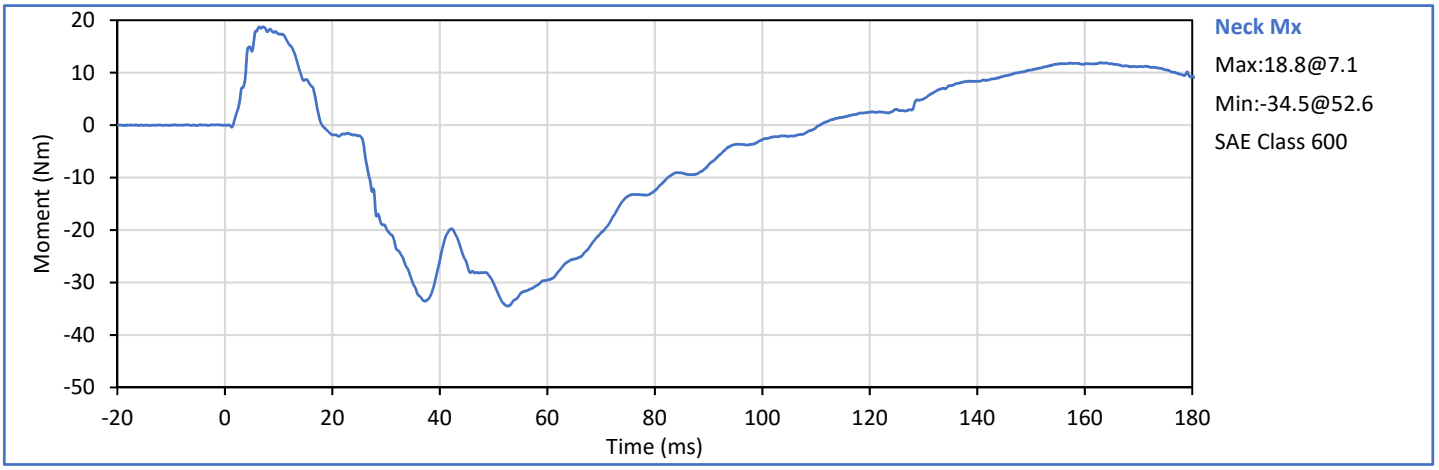
Technician: J. Hernandez

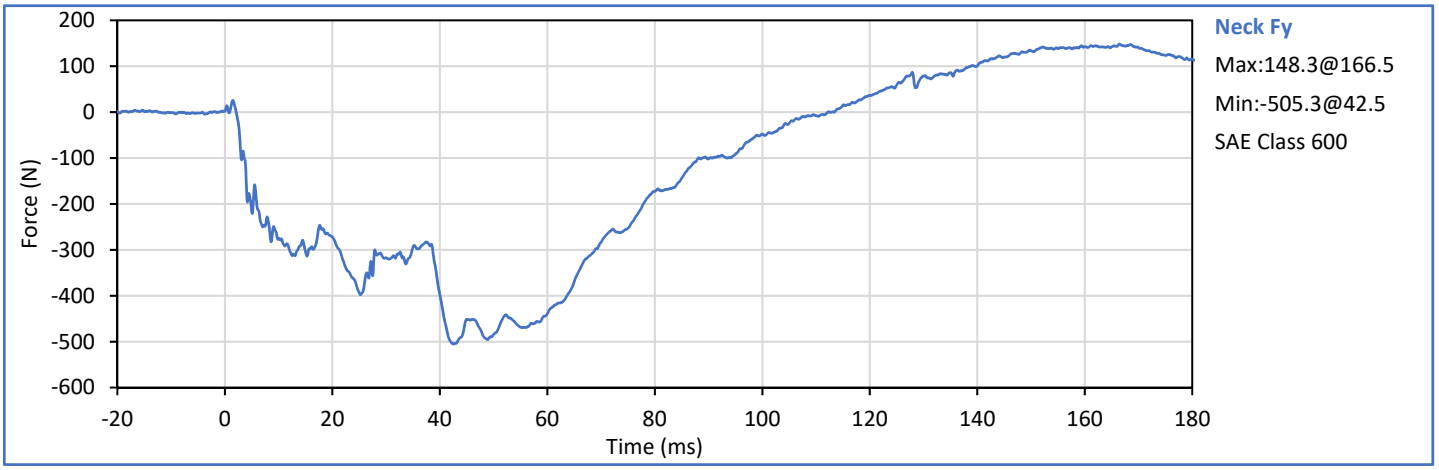
Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 299 Test Date: 2021-02-08





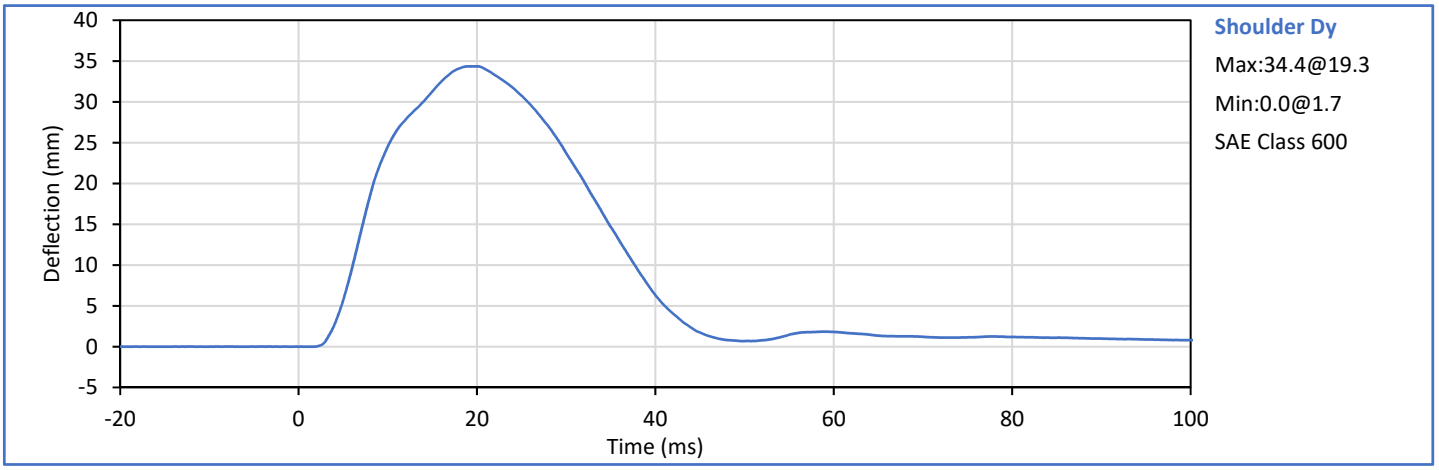


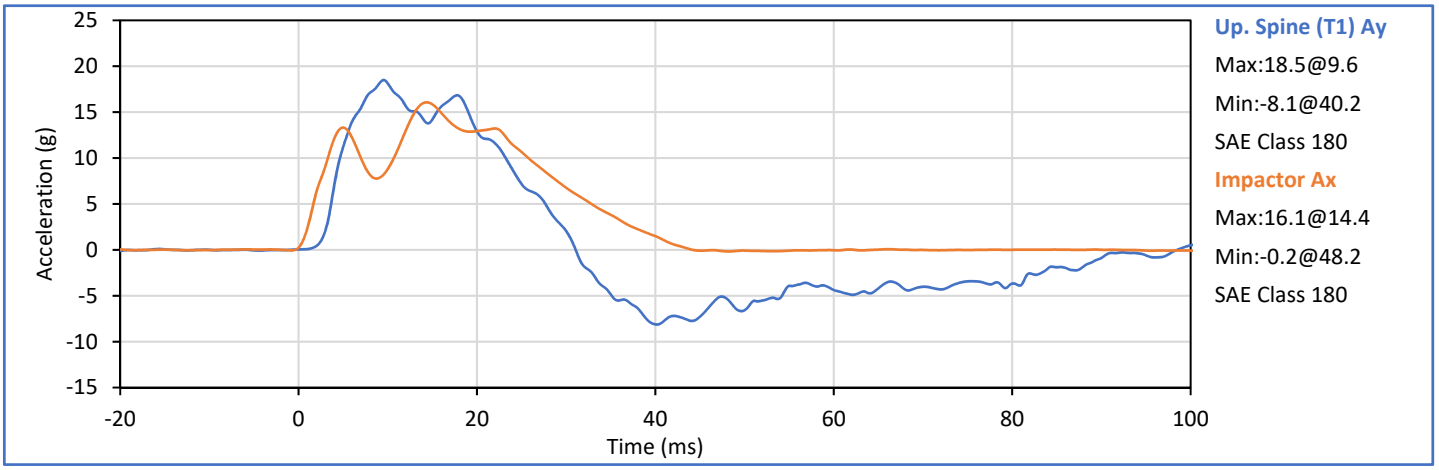
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 299 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	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.35	Pass
Peak Shoulder Dy	mm	28.0	37.0	34.4	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.5	Pass
Peak Impactor Ax	g	13.0	18.0	16.1	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

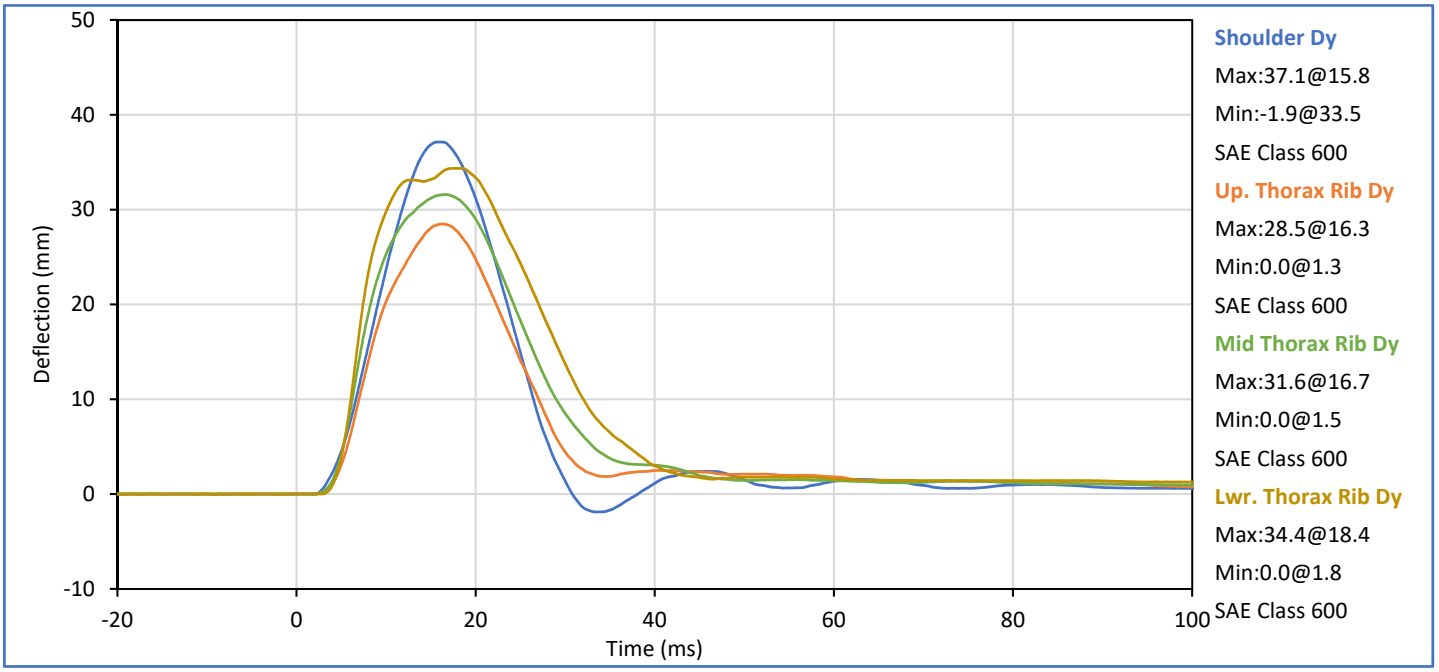
Approved By: P. Puzzuto

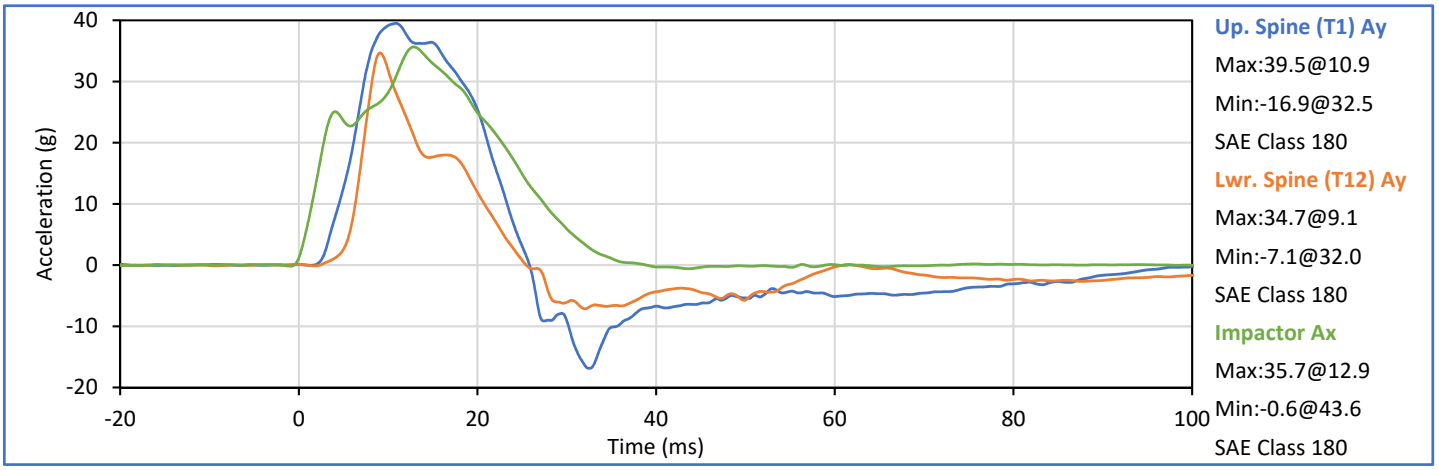
Applus IDIADA
KARCO

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

ATD Serial No.: 299 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	20	Pass
Impactor Velocity	m/s	6.60	6.80	6.77	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.1	Pass
Peak Upper Rib Dy	mm	25.0	32.0	28.5	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.6	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.4	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	39.5	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	34.7	Pass
Peak Impactor Ax	g	30.0	36.0	35.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

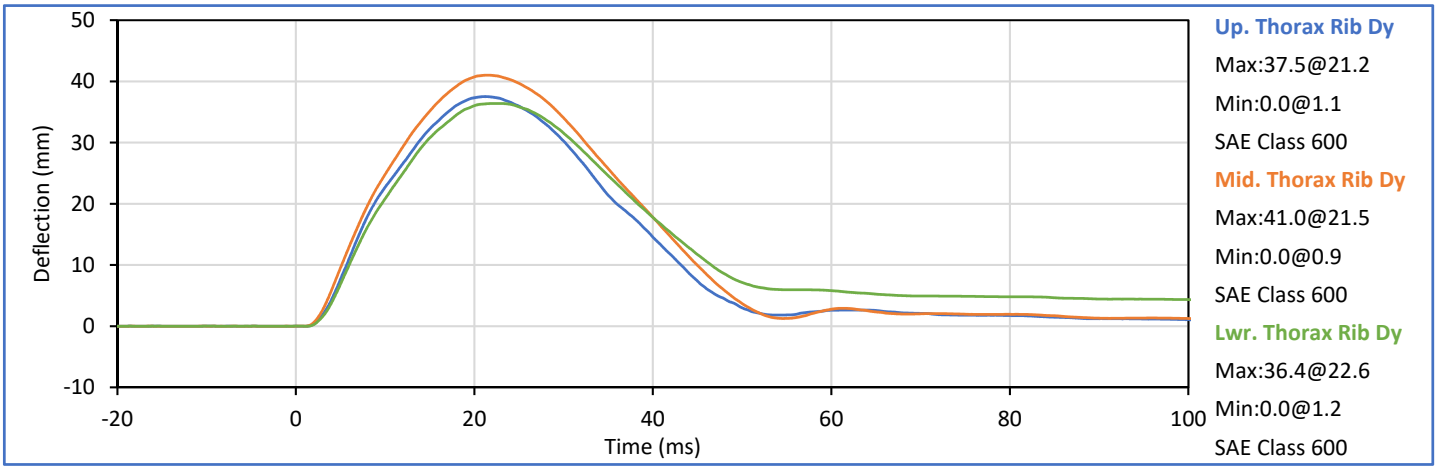
Applus IDIADA
KARCO

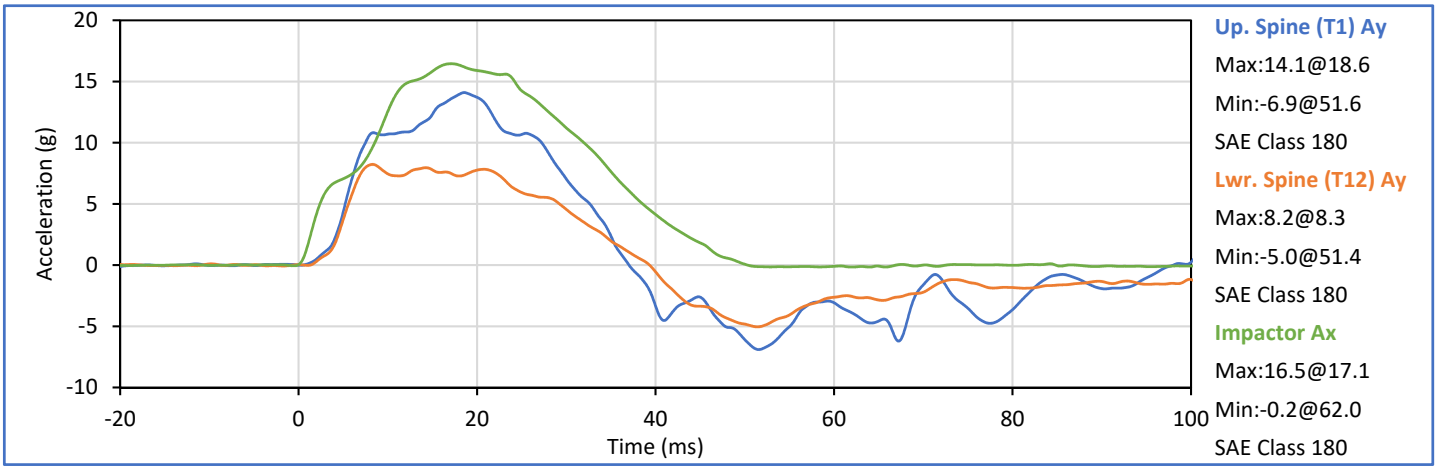
SID-IIs Small Side Impact ATD
Thorax (No Arm)

ATD Serial No.: 299

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	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Rib Dy	mm	32.0	40.0	37.5	Pass
Peak Middle Rib Dy	mm	39.0	45.0	41.0	Pass
Peak Lower Rib Dy	mm	35.0	43.0	36.4	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	14.1	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	8.2	Pass
Peak Impactor Ax	g	14.0	18.0	16.5	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

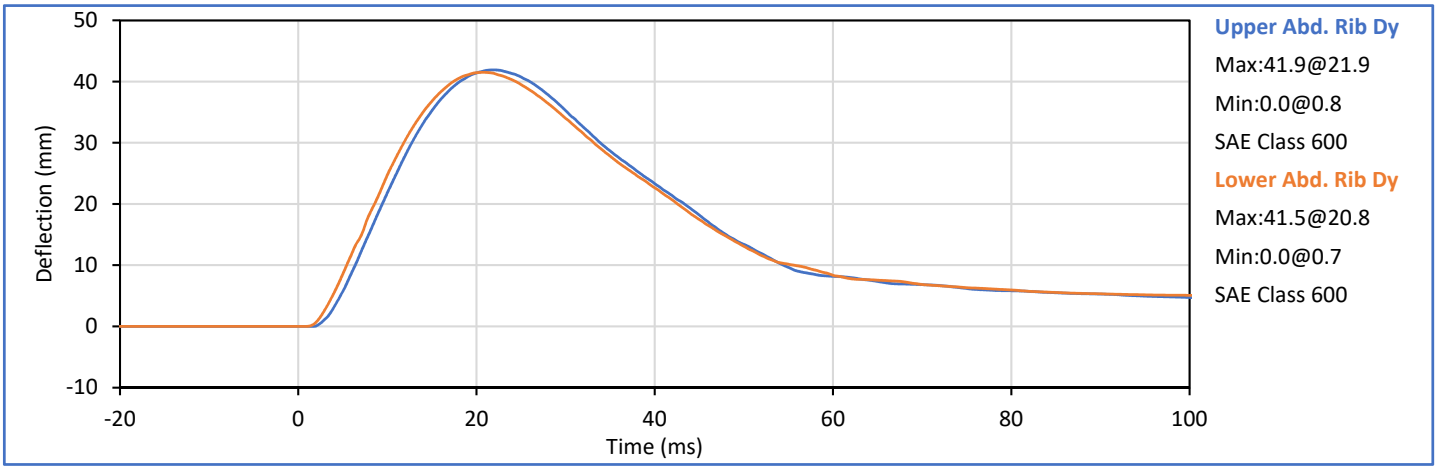
Approved By: P. Puzzuto

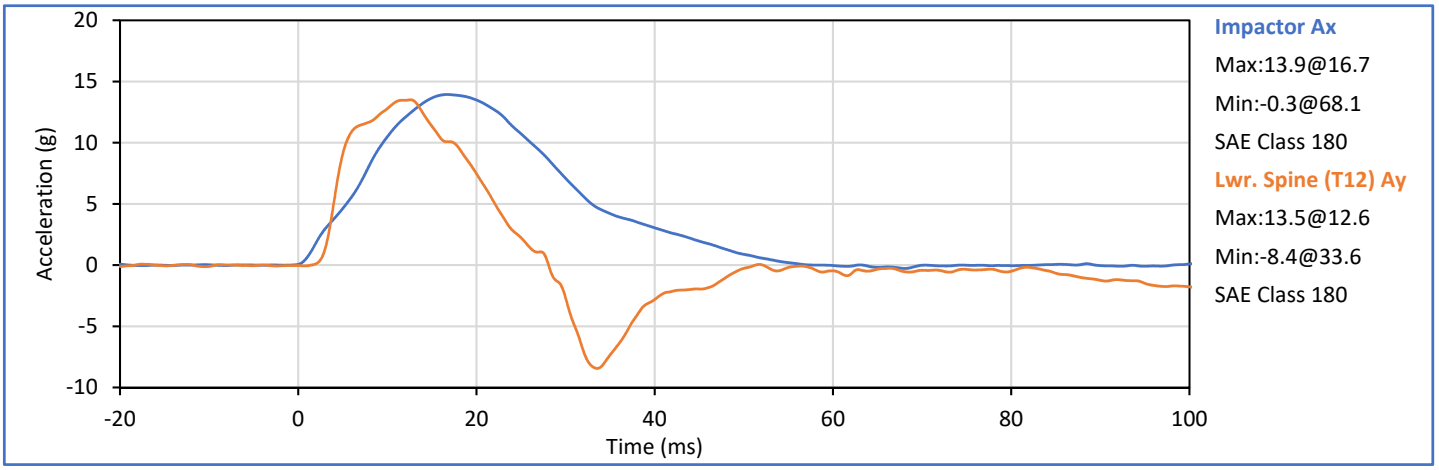
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 299 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	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.37	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	41.9	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	41.5	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	13.5	Pass
Peak Impactor Ax	g	12.0	16.0	13.9	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

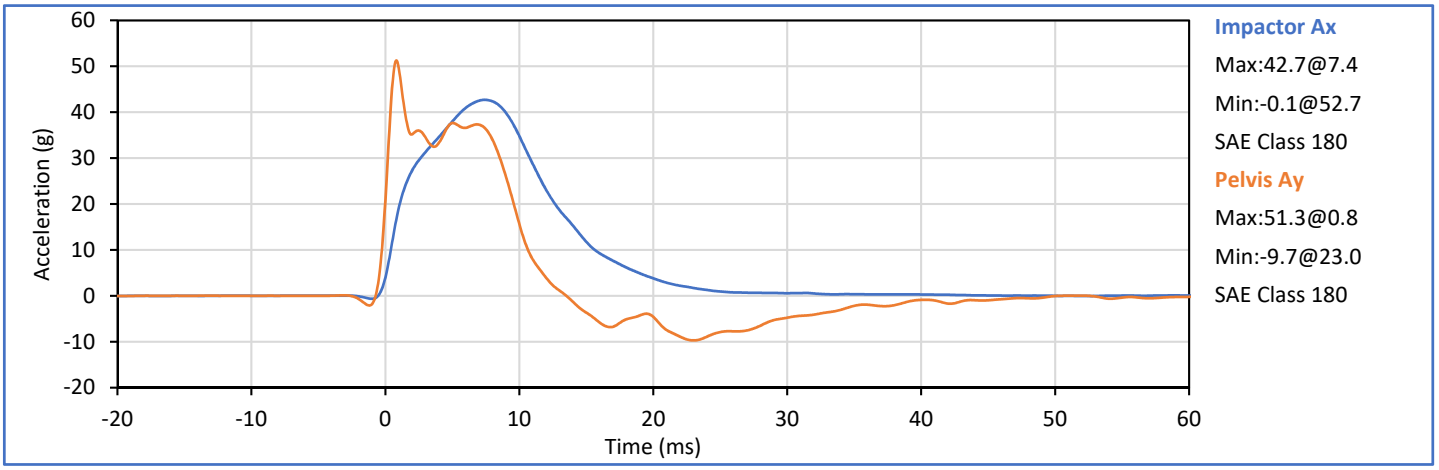
Applus IDIADA KARCO

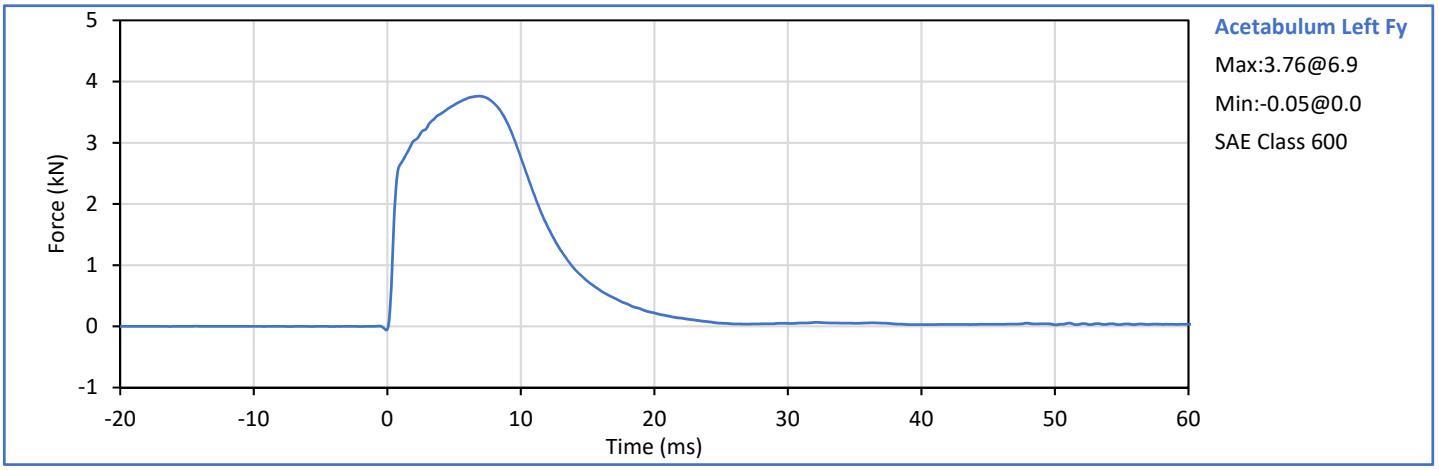
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2021-02-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	6.60	6.80	6.72	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.76	Pass
Pelvis Ay after 6ms	g	34.0	42.0	37.3	Pass
Peak Impactor Ax	g	38.0	47.0	42.7	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 14190





Technician: J. Hernandez

Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 299 Test Date: 2021-02-09

Pelvis Plug S/N: 14190

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 14190
Test Number 14228
Report Number 14273
Test Date 6/28/2020 1:19:09 PM

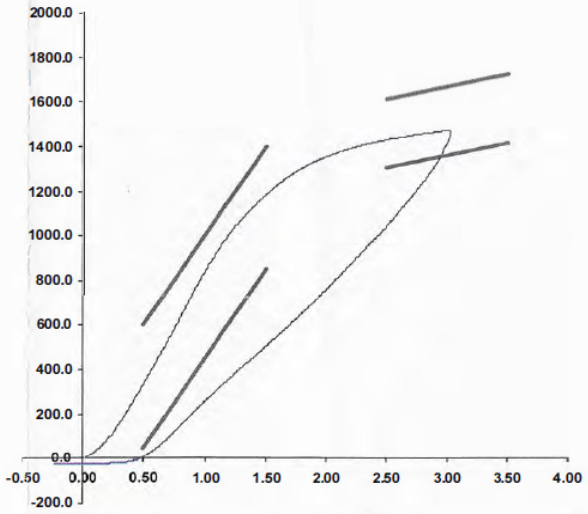
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	339.28	50.00	600.00
Force @ 1.5 mm (N)	1,184.11	850.00	1,400.00
Force @ 2.5 mm (N)	1,428.92	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,468.90	1,361.00	1,673.00

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 28-Jun-20
SACO Research

By : DC Date : 6-28-2020

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

Applus IDIADA
KARCO

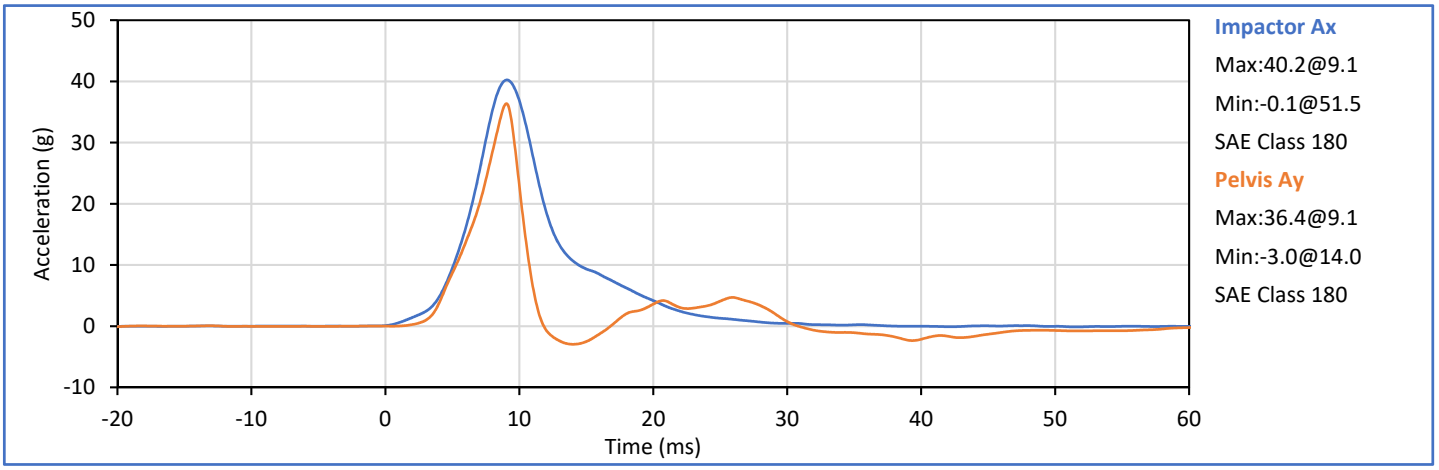
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

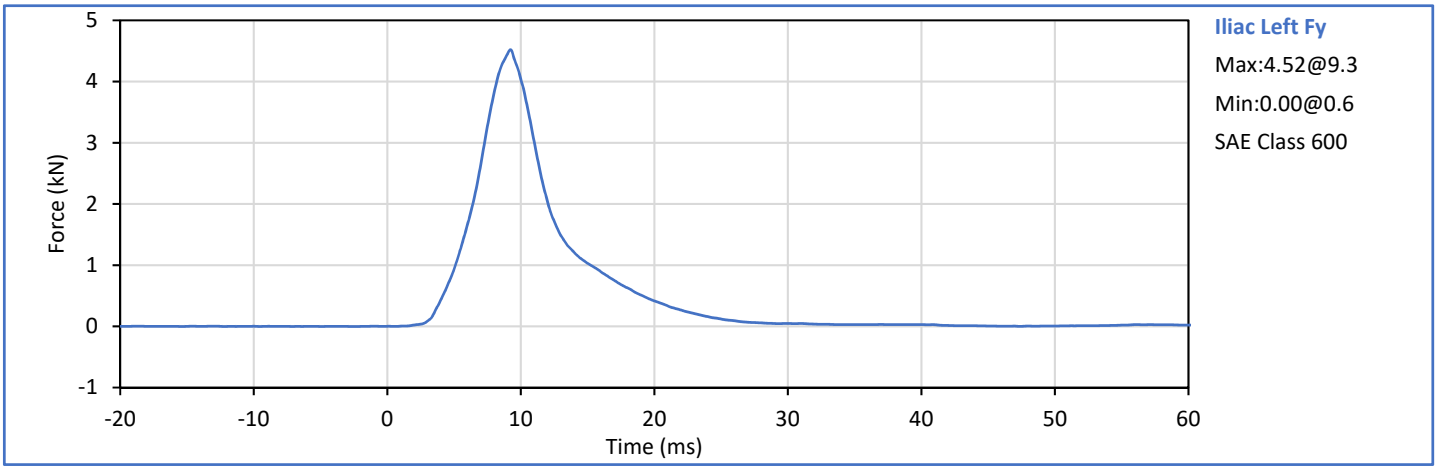
ATD Serial No.: 299 Test Date: 2021-02-09

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	4.52	Pass
Pelvis Ay after 6ms	g	28.0	39.0	36.4	Pass
Peak Impactor Ax	g	36.0	45.0	40.2	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

ES-2re ATD S/N: F037

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P58858	Endevco	7264C-2k	2021-01-13
Head Acceleration Y Primary	P58865	Endevco	7264C-2k	2021-01-13
Head Acceleration Z Primary	P58867	Endevco	7264C-2k	2021-01-13
Head Acceleration X Redundant	P58859	Endevco	7264C-2k	2021-01-13
Head Acceleration Y Redundant	P58866	Endevco	7264C-2k	2021-01-13
Head Acceleration Z Redundant	P58873	Endevco	7264C-2k	2021-01-13
Upper Thorax Rib Deflection Y	209 (ES-2 Rib)	Honeywell	F38000203	2021-01-13
Middle Thorax Rib Deflection Y	210 (ES-2 Rib)	Honeywell	F38000203	2021-01-13
Lower Thorax Rib Deflection Y	207 (ES-2 Rib)	Honeywell	F38000203	2021-01-13
Anterior Abdominal Force Y	1504 Fy	R.A. Denton	2631J	2020-02-17
Middle Abdominal Force Y	1505 Fy	R.A. Denton	2631J	2020-02-17
Posterior Abdominal Force Y	1506 Fy	R.A. Denton	2631J	2020-02-17
Lower Spine T12 Acceleration X	P63856	Endevco	7264C-2k	2021-01-13
Lower Spine T12 Acceleration Y	P50063	Endevco	7264C-2k	2021-01-13
Lower Spine T12 Acceleration Z	P51880	Endevco	7264C-2k	2021-01-13
Pubic Symphysis Force Y	DG6784 Fy	FTSS	IF-556	2020-02-17

SID-IIs ATD S/N: 299

Table 2 - Left Rear Passenger ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P51929	Endevco	7264C-2k	2021-01-13
Head Acceleration Y Primary	P50086	Endevco	7264C-2k	2021-01-13
Head Acceleration Z Primary	P51931	Endevco	7264C-2k	2021-01-13
Head Acceleration X Redundant	P68604	Endevco	7264C-2k	2021-01-13
Head Acceleration Y Redundant	P51934	Endevco	7264C-2k	2021-01-13
Head Acceleration Z Redundant	P58736	Endevco	7264C-2k	2021-01-13
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	1143	Servo	08TCI-3725	2021-01-19
Middle Thorax Rib Deflection Y	1075	Servo	08TCI-3725	2021-01-19
Lower Thorax Rib Deflection Y	1213	Servo	08TCI-3725	2021-01-19
Upper Abdomen Rib Deflection Y	1218	Servo	08TCI-3725	2021-01-19
Lower Abdomen Rib Deflection Y	1177	Servo	08TCI-3725	2021-01-19
Lower Spine T12 Acceleration X	P58761	Endevco	7264C-2k	2021-01-13
Lower Spine T12 Acceleration Y	P50077	Endevco	7264C-2k	2021-01-13
Lower Spine T12 Acceleration Z	P58795	Endevco	7264C-2k	2021-01-13
Iliac Wing Impact Side Force Y	289 Fy (Iliac)	R.A. Denton	3228J	2021-01-18
Acetabulum Impact Side Force Y	277 Fy (Acetabulum)	R.A. Denton	3249J	2021-01-18

Table 3 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	A356451	MSI	52F-2k	2020-09-15
Vehicle CG Ay	A354839	MSI	52F-2k	2020-09-08
Vehicle CG Az	A356475	MSI	52F-2k	2020-09-15
Right Side Sill at Front Seat Ax	A356448	MSI	52F-2k	2020-09-15
Right Side Sill at Front Seat Ay	A356449	MSI	52F-2k	2020-09-15
Right Side Sill at Front Seat Az	A356444	MSI	52F-2k	2020-09-15
Right Side Sill at Rear Seat Ax	A358709	MSI	52F-2k	2020-09-21
Right Side Sill at Rear Seat Ay	A354858	MSI	52F-2k	2020-09-08
Right Side Sill at Rear Seat Az	A354828	MSI	52F-2k	2020-09-08
Left Side Sill at Front Seat Ay	A361466	MSI	52F-2k	2020-10-21
Left Side Sill at Rear Seat Ay	A361481	MSI	52F-2k	2020-10-21
Left Lower A-Pillar Ay	A356321	MSI	52F-2k	2020-09-15
Left Middle A-Pillar Ay	A356281	MSI	52F-2k	2020-09-15
Left Lower B-Pillar Ay	A356322	MSI	52F-2k	2020-09-15
Left Middle B-Pillar Ay	A354809	MSI	52F-2k	2020-09-11
Driver Seat Track at H-Point Ay	A361337	MSI	52F-2k	2020-10-21
Rear Seat Structure Ay	A361480	MSI	52F-2k	2020-10-21
Right Rear Occupant Comp. Ay	A361464	MSI	52F-2k	2020-10-21
Engine Block Top Ax	A356476	MSI	52F-2k	2020-09-15
Engine Block Top Ay	A356255	MSI	52F-2k	2020-09-16
Rear Floopan Above Axle Ax	A356313	MSI	52F-2k	2020-09-15
Rear Floopan Above Axle Ay	A356488	MSI	52F-2k	2020-09-16
Rear Floopan Above Axle Az	A354813	MSI	52F-2k	2020-09-11

Table 4 - Moving Deformable Barrier (MDB) Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
MDB CG Ax	A356461	MSI	52F-2k	2020-09-15
MDB CG Ay	A354835	MSI	52F-2k	2020-09-08
MDB CG Az	A354807	MSI	52F-2k	2020-09-11
MDB Left Side at Rear Axle Ax	A354865	MSI	52F-2k	2020-09-08
MDB Left Side at Rear Axle Ay	A354852	MSI	52F-2k	2020-09-08