REPORT NUMBER: SINCAP-KAR-20-019

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

NISSAN MOTOR CO., LTD.

2020 NISSAN KICKS 5-DOOR SUV

NHTSA No: M20205202

PREPARED BY:

APPLUS IDIADA KARCO ENGINEERING, LLC.

9270 HOLLY ROAD

ADELANTO, CA 92301

MARCH 12, 2020

FINAL REPORT

PREPARED FOR:

U.S. DEPARTMENT OF TRANSPORTATION

NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION

OFFICE OF CRASHWORTHINESS STANDARDS

MAIL CODE: NRM-110

1200 NEW JERSEY AVE, SE, ROOM W43-410

WASHINGTON, D.C. 20590

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof. If trade or manufacturers' names or products are mentioned, it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared By: _____

Mr. Robert S. Ramos, Program Manager
Applus IDIADA KARCO Engineering, LLC.

Reviewed By: _____

Mr. Michael L. Dunlap, Director of Operations
Applus IDIADA KARCO Engineering, LLC.

Approved By: _____

Mr. Steven D. Matsusaka, Engineering Manager
Applus IDIADA KARCO Engineering, LLC.

Approval Date: March 12, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

_____

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

Date: _____

_____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No.	2. Government Accession No.	3. Recipient's Catalog No.
SINCAP-KAR-20-019		

4. Title and Subtitle	5. Report Date
Final Report of New Car Assessment Program Side Impact MDB Testing of a 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202	March 12, 2020 **6. Performing Organization Code** KAR
7. Authors Mr. Robert S. Ramos, Program Manager, Applus IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus IDIADA KARCO	**8. Performing Organization Report No.** TR-P40045-01-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-110) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590	**13. Type of Report and Period Covered** Final Test Report, February 27 - March 12, 2020 **14. Sponsoring Agency Code** NRM-110

15. Supplementary Notes

16. Abstract

A 55 / 28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2020 Nissan Kicks 5-door SUV in accordance with the specifications of the Office of Crash Worthiness 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 27, 2020.

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 20.6°C. The target vehicle's maximum post-test static crush was 210 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	138.9
Maximum Thoracic Rib Deflection	mm	44	24
Total Abdominal Force	N	2500	766
Pubic Symphysis Force	N	6000	1542

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC_{36})		1000	317.5
Resultant Lower Spine Acceleration	g	82	47
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	2298
Maximum Thoracic Rib Deflection	mm	38*	18
Maximum Abdominal Rib Deflection	mm	45*	20

Both the left front driver and left rear passenger doors were jammed shut. The doors on the struck side of the vehicle did not separate from the body at the hinges or latches. The opposite side doors did not open during the side impact event.

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 Room W43-410 Washington, DC 20590

19. Security Classification of this report	20. Security Classification of this page	21. No. of Pages	22. Price
UNCLASSIFIED	UNCLASSIFIED	154	

** Proposed IARV*

TABLE OF CONTENTS

SECTION 1
TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2020 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-00355L. The purpose of this test is to generate comparative side impact performance in a 2020 Nissan Kicks 5-Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated October 2015.

SECTION 2
SUMMARY OF TEST RESULTS

A 2020 Nissan Kicks 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 (38.48 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 27, 2020. 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 October 2015. The side impact event was documented by 10 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	138.9
Maximum Thoracic Rib Deflection	mm	44	24
Combined Abdominal Force	N	2500	766
Pubic Symphysis Force	N	6000	1542

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC_{36})		1000	317.5
Lower Spine (T12) Resultant Acceleration	g	82	47
Total Pelvic Force (sum of acetabular and iliac forces	N	5525	2298
Maximum Thoracic Rib Deflection	mm	38*	18
Maximum Abdominal Rib Deflection	mm	45*	20

**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	Yes	No	
Knee Airbag	Yes	Yes	No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	
Seat Belt Load Limiter	Yes	Yes	No	

GENERAL COMMENTS

The doors on the struck side of the vehicle remained closed and latched. There was no separation at the hinges or latches. The doors on the non-struck side remained closed and latched. There was no ATD value that exceeded its limit. The Driver Seat Track Acceleration Y channel failed at 41.6 milliseconds. The Left Lower B-Post Acceleration Y and the Left Mid B-Post Acceleration Y channels were not installed on the vehicle.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

CONVERSION FACTORS

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

DATA SHEET NO. 1

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20205202
Model Year	2020
Make	Nissan
Model	Kicks
Body Style	5-Door SUV
VIN	3N1CP5BV2LL484746
Body Color	Gun Metallic
Odometer Reading (km / mi)	153 / 95
Engine Displacement (L)	1.6
Type / No. of Cylinders	4 Cylinder
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	No
Final Drive	FWD
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., LTD.
Date of Manufacture	Nov-19
Vehicle Type	Passenger Car

GVWR (kg)	1640
GAWR Front (kg)	870
GAWR Rear (kg)	770

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				385.0	*A*
DSC x 68.04 (kg)				340.2	*B*
Cargo Weight (RCLW) (kg)				44.8	*A-B*

VEHICLE SEAT TYPE

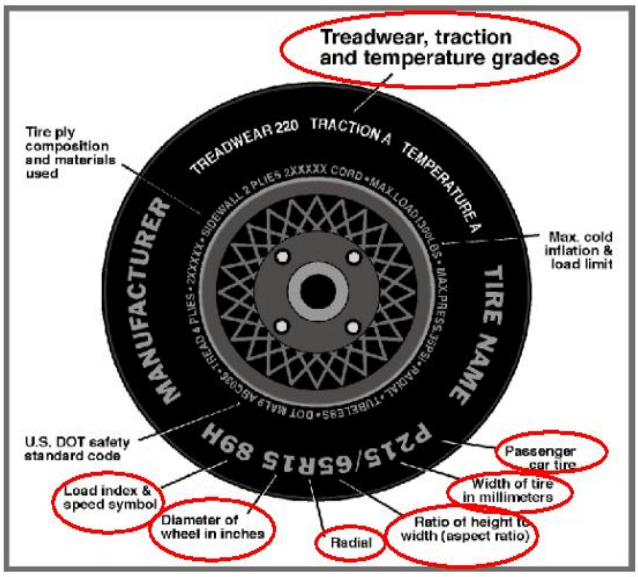
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	205/60 R16	205/60 R16
Tire Size on Vehicle	205/60 R16	205/60 R16
Tire Manufacturer	Firestone	Firestone
Tire Model	FT140	FT140
Treadware	560	560
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	92H	92H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	V6XW FT0 4419	V6XW FT0 4419
DOT Safety Code Right	V6XW FT0 4419	V6XW FT0 4419

DATA SHEET NO. 1 … (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	220	220	220	220
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/60R16	P205/60R16	P205/60R16	P205/60R16	P205/60R16
Tire Pressure	kPa	230 ± 21	230	230	230	230

TEST VEHICLE AXLE WEIGHTS

		As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
	Units	Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	381.0	244.5		415.0	331.0		415.5	333.5	
Right	kg	363.5	233.5		370.0	268.5		374.0	271.5	
Ratio	%	60.9%	39.1%	100.0%	56.7%	43.3%	100.0%	56.6%	43.4%	100.0%
Total	kg	744.5	478.0	1222.5	785.0	599.5	1384.5	789.5	605.0	1394.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1222.5	A
Actual Weight of 2 P572 ATD Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	44.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1392.3	A+B+C

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

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	793	803	Yes
RF	mm	810	809	Yes
LR	mm	794	788	Yes
RR	mm	810	807	Yes
Vehicle CG (Aft of Front Axle)	mm	1136	1134	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	56	58	

***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: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Spare Tire and Tools	18.0
Trim	2.0
Ballast / Equipment Added	57.0

Test Height Adjustable Setting (If Applicable)	N/A

DATA SHEET NO. 2

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

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

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	3.3	0.0	1.7
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	1.7	258	Max			
			Mid	250	258	265
			Min			
Front Passenger Seat	Fixed	255	Max			
			Mid	247	255	262
			Min			
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

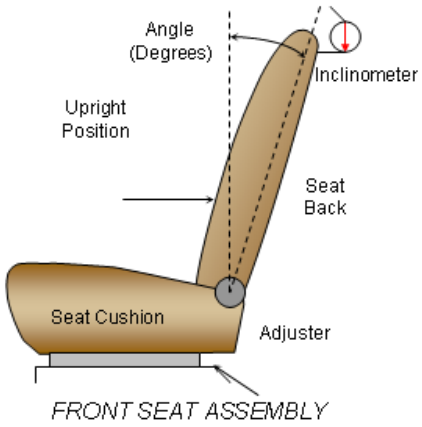
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	240	25	120	12
Front Passenger Seat	240	25	120	12
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

The driver's seat back is positioned 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 using the outboard head restraint post.



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/ Seated Dummy	58.4	32	4.4	4
Front Passenger Seat	59.1	32	4.4	4
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

DATA SHEET NO. 2 … (CONTINUED)

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

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	4	H
Rear Seat	Fixed	Fixed

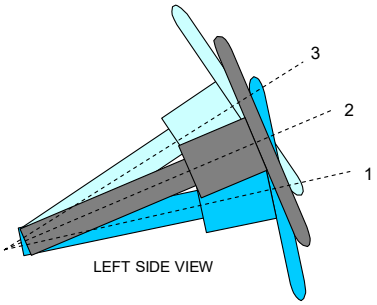
HEAD RESTRAINT ADJUSTMENT

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	Highest
Rear Seat	Fixed	Fixed

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

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	24.3	88
Geometric Center - Position 2	26.2	106
Uppermost - Position 3	28.0	123
Telescoping Steering Wheel Travel		35
Test Position	26.2	106

DATA SHEET NO. 2 … (CONTINUED)

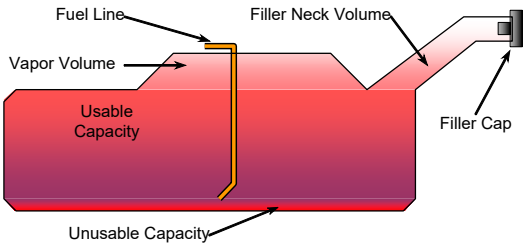
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

FUEL PUMP

The vehicle is equipped with an electronic fuel pump. The fuel pump normally operates when the vehicle's electrical system is activated. The fuel pump operates approximately 1 second after the ignition is switched to "ON", while the engine is running, and approximately for 1.5 seconds after the engine stops running.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	40.88
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	40.88
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	38.02
Actual amount of Solvent Used in Test	38.00
1/3 of Usable Capacity	13.63

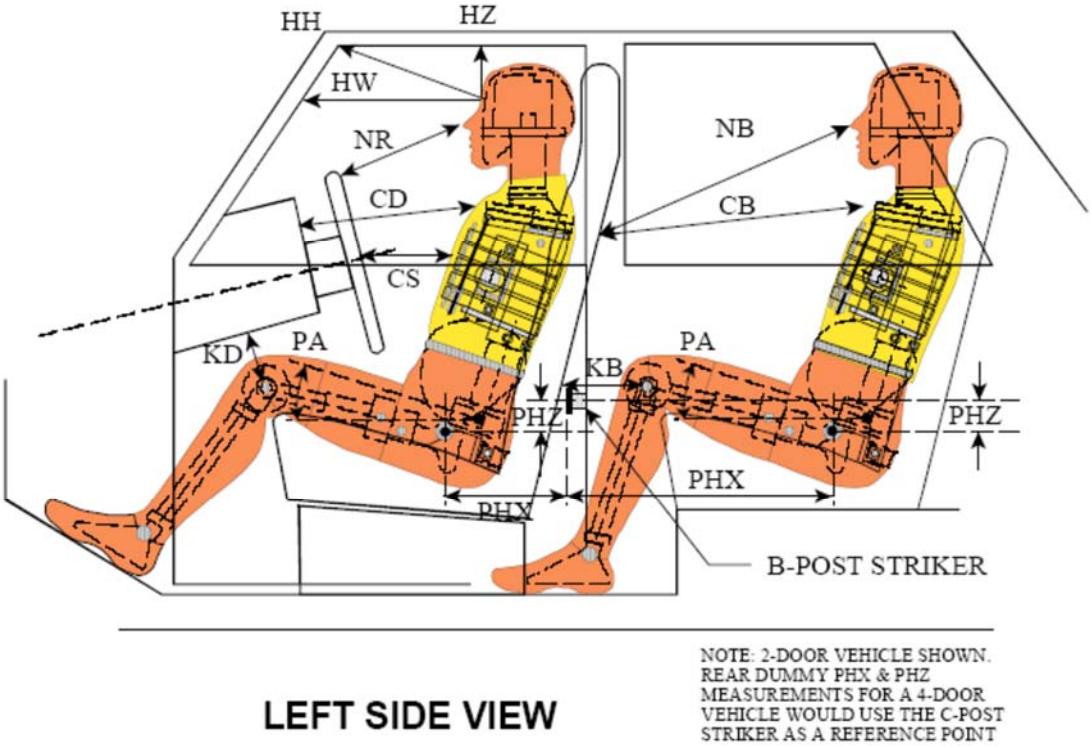
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1? ☒ **Yes** ☐ **No**

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



LEFT SIDE VIEW

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

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

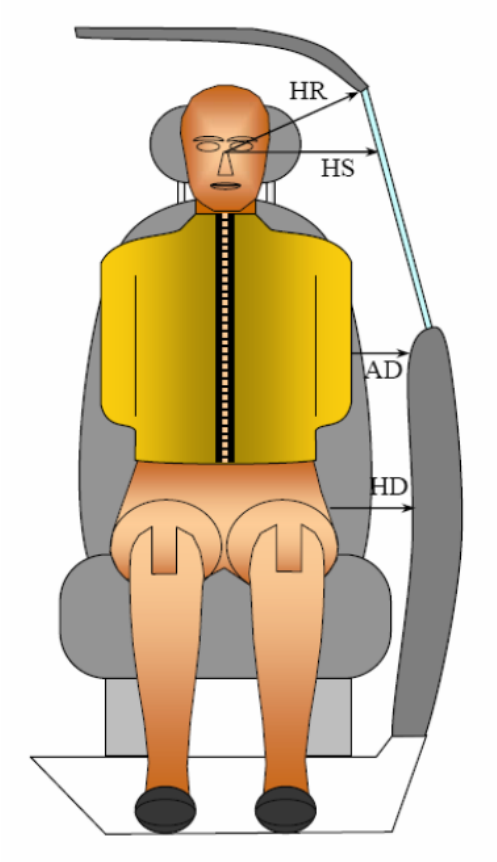
Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (º)	Length (mm)	Angle (º)
HH		Head to Header	395			
HW		Head to Windshield	604			
HZ	HZ	Head to Roof	170		265	
NR	NB	Nose to Rim/Seat Back	472		547	
CD	CB	Chest to Dash/Seat Back	563		526	
CS		Chest to Steering Wheel	378			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	145	30.0	245	6.8
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	125	34.6	240	7.3
PAX°	PAX°	Pelvic Tilt Angle X		15.5		20.9
	PAY°	Pelvic Tilt Angle Y		0.0		0.2
PHX	PHX	Hip Point to Striker (x-axis)	167		284	
PHZ	PHZ	Hip Point to Striker (z-axis)	69		253	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

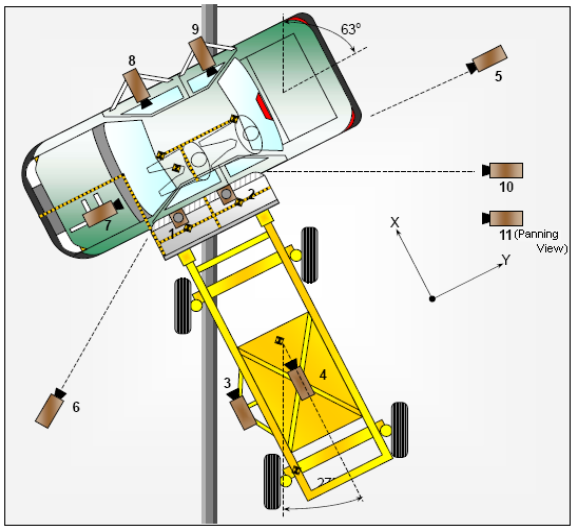
Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	190	236
HS	Head to Side Window	mm	370	340
AD	Arm to Door	mm	67	136
HD	H-Point to Door	mm	115	181

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



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)	484	-125	703	6	1000
8	Driver Side (On-Board)	1575	764	400	6	1000
9	Passenger Side (On-Board)	1580	1453	450	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

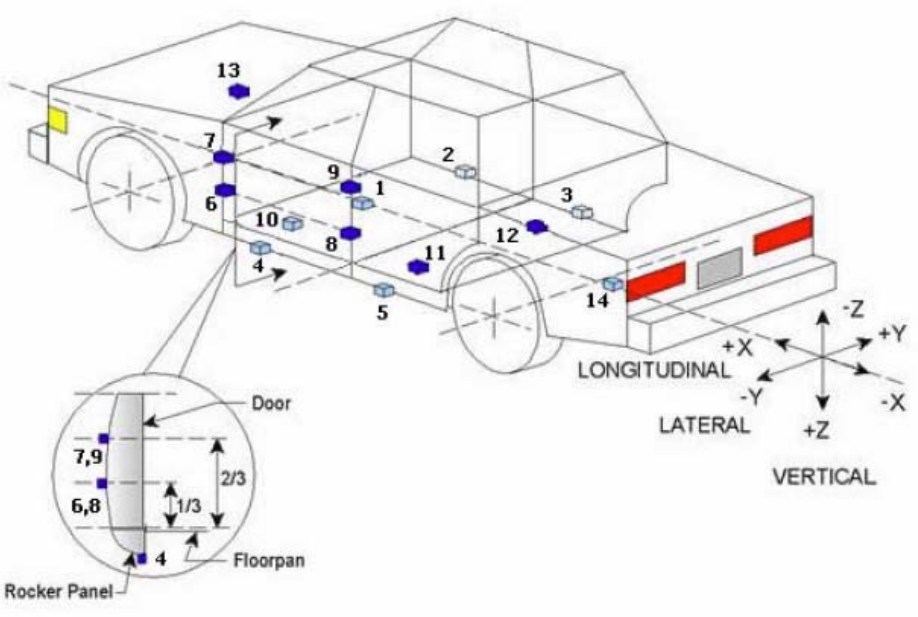
Driver Dummy Channels	16
Passenger Dummy Channels	19
Vehicle Structure Accelerometers	21
MDB Channels	7
Total	63

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1780	0	-390
2	Right Sill at Front Seat	2245	675	-380
3	Right Sill at Rear Seat	1420	690	-390
4	Left Sill at Front Door	2300	-700	-200
5	Left Sill at Rear Door	1650	-720	-210
6	A-Pillar Lower	2925	-760	-450
7	A-Pillar Middle	2960	-780	-870
8	B-Pillar Lower	N/A	N/A	N/A
9	B-Pillar Middle	N/A	N/A	N/A
10	Front Seat Track	2010	-550	-435
11	Rear Seat Structure	1610	-325	-370
12	Right Rear Occupant Compartment	1610	325	-375
13	Engine Block	3200	410	-775
14	Rear Floorpan Above Axle	970	0	-800

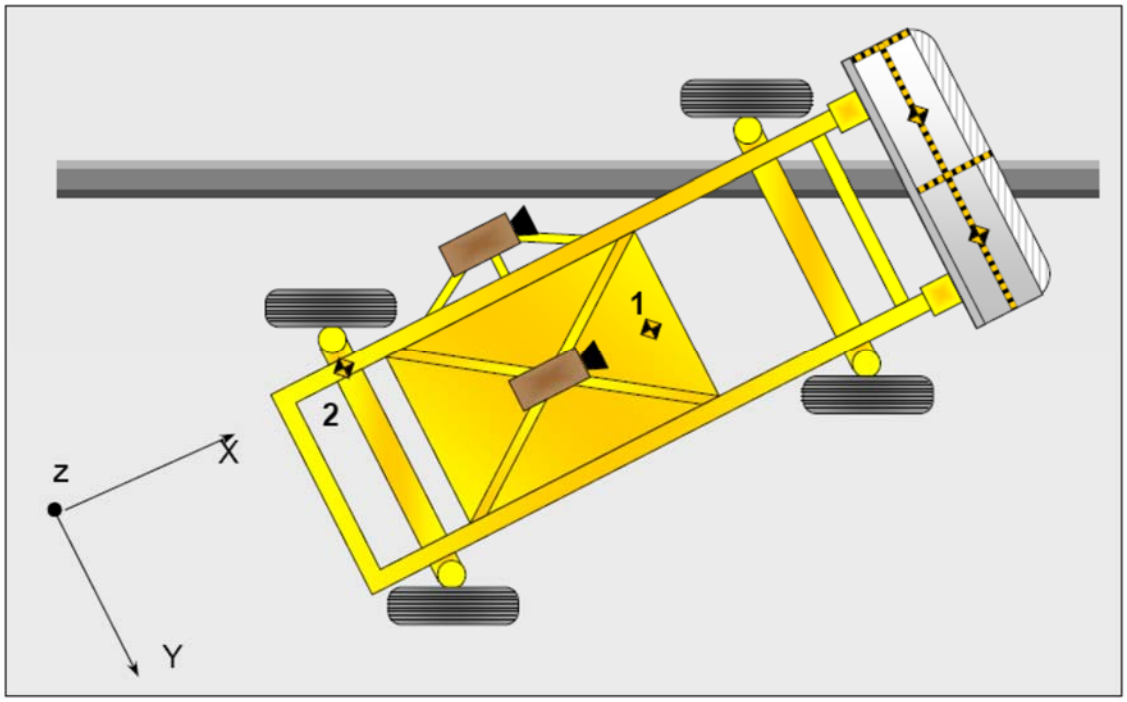
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



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: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

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, Side Header	Curtain Airbag
Left Side of Head	Curtain Airbag, Side Header	Curtain Airbag
Back of Head	Curtain Airbag, Side Header, Headrest	Curtain Airbag, Headrest, Center Seat Back
Left Shoulder	Curtain Airbag	Curtain Airbag, Seat Airbag
Upper Torso	Side Airbag, Seat	Side Airbag, Seat
Lower Torso	Side Airbag, Seat	Side Airbag, Seat
Left Hip	Side Airbag, Door Panel, Seat	Seat Airbag, Door Panel
Left Knee	Door Panel, Knee Airbag	Door Panel

POST-TEST DOOR PERFORMANCE

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No		No	
Seat Disengagement from Floor Pan	No		No	
Seat Back Movement from Initial Position	No		No	
Seat Back Collapse	No		No	

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 … (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2619
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		367
Actual Impact Point (Aft of Front Axle)	mm		369
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	-2
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	6

DATA SHEET NO. 9

MDB SUMMARY OF RESULTS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

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	61.91
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.5
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.5

MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

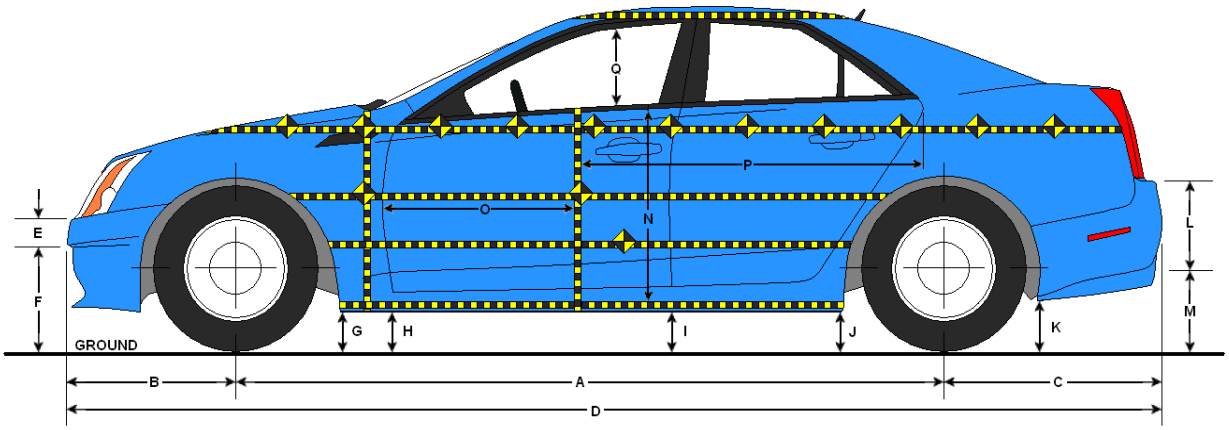
Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	215
B	Top of Bumper	533	800	Right	95
C	Mid Level	686	800	Right	96
D	Top of Stack	813	800	Right	100

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2619	2614	-5
B	Front Axle to FSOV	876	866	-10
C	Rear Axle to RSOV	789	787	-2
D	Total Length at Centerline	4284	4267	-17
E	Front Bumper Thickness	85	85	0
F	Fromt Bumper Bottom to Ground	569	577	8
G	Sill Height at Front Wheel Well	427	440	13
H	Sill Height at Front Door Leading Edge	419	431	12
I	Sill Height at B-Pillar	399	418	19
J1	Sill Height at Rear Wheel Well	423	443	20
J2	Pinch Weld Height at Rear Wheel Well	399	411	12
K	Sill Height Aft of Rear Wheel Well	572	574	2
L	Rear Bumper Thickness	141	139	-2
M	Rear Bumper Bottom to Ground	677	683	6
N	Sill Height to Bottom of Front Window Sill	695	647	-48
O	Front Door Leading Edge to Impact CL	779	775	-4
P	Rear Door Trailing Edge to Impact CL	1386	1387	1
Q	Front Window Opening	406	436	30
R	Right Side Length	3148	3153	5
S	Left Side Length	3147	3139	-8
T	Vehicle Width at B-Pillar	1716	1637	-79

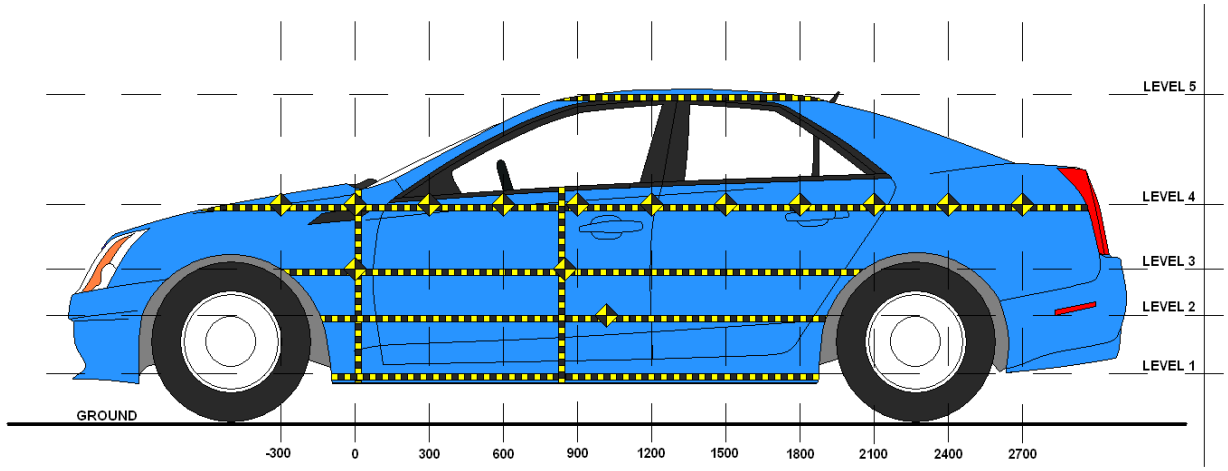
All measurements in mm with tolerance of ± 3mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



LEFT SIDE VIEW

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	406	3	750
2	Occupant H-Point	774	199	300
3	Mid-Door	824	210	450
4	Window Sill	1041	146	750
5	Window Top	1676	4	1050

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

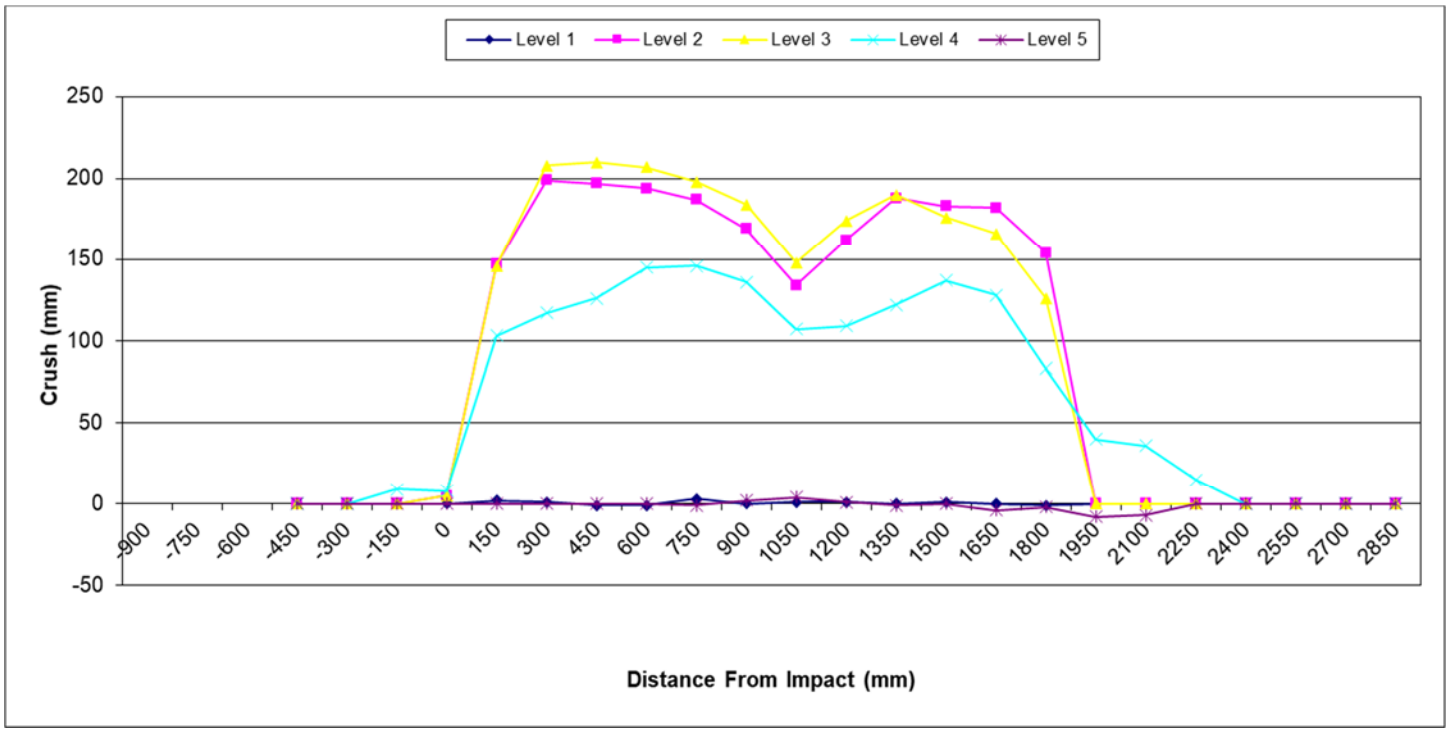
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150				682					691					9	
0	644	626	625	685		644	631	630	693		0	5	5	8	
150	672	625	626	674		674	772	772	777		2	147	146	103	
300	675	626	625	664		676	825	833	781		1	199	208	117	
450	676	627	625	656		675	824	835	782		-1	197	210	126	
600	676	629	626	647		675	823	833	792		-1	194	207	145	
750	673	631	628	641	935	676	818	826	787	934	3	187	198	146	-1
900	674	634	631	621	929	674	803	815	757	931	0	169	184	136	2
1050	673	638	635	627	925	674	772	783	734	929	1	134	148	107	4
1200	672	641	638	639	929	673	803	812	748	930	1	162	174	109	1
1350	673	644	641	643	930	673	832	831	765	929	0	188	190	122	-1
1500	673	638	639	648	930	674	821	815	785	930	1	183	176	137	0
1650	674	626	627	653	936	674	808	793	781	932	0	182	166	128	-4
1800	666	616	616	650	939	665	770	742	733	937	-1	154	126	83	-2
1950				640	947				680	939				40	-8
2100				627	953				663	946				36	-7
2250				630					645					15	
2400															
2550															
2700															
2850															

DATA SHEET NO. 11 … (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

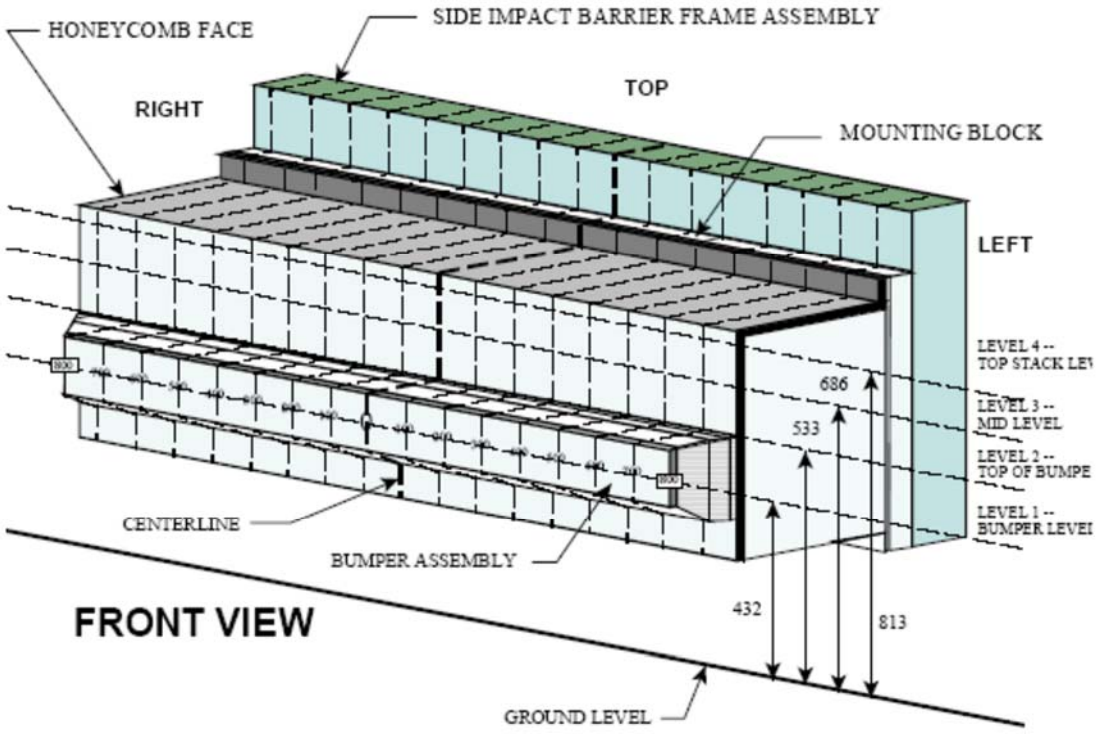


DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



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	215	203	201	200	195	198	200	193	191	184	186	181	181	170	173	171	188
2	95	90	89	83	78	79	81	87	83	76	74	71	69	70	71	72	73
3	96	55	38	24	29	28	47	73	59	37	27	24	21	24	28	33	73
4	100	61	41	33	40	62	90	74	48	39	34	34	37	47	56	62	83

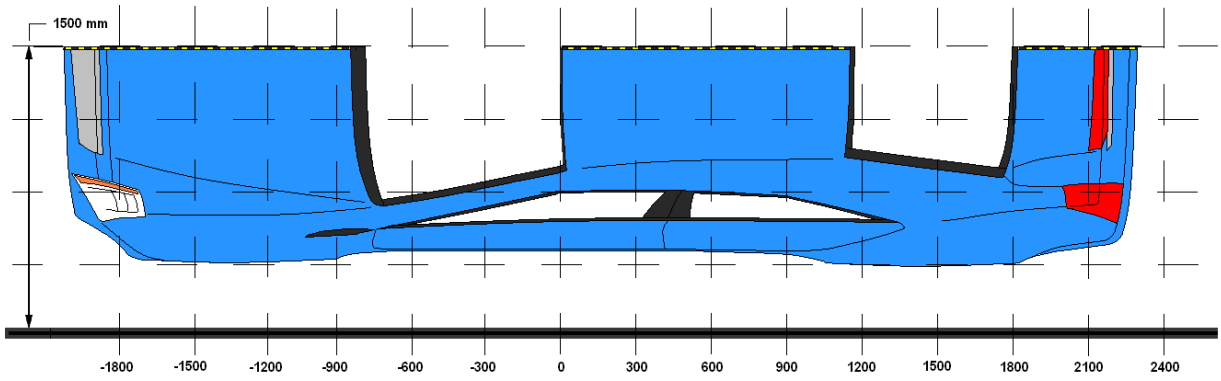
All dimensions in millimeters.

DATA SHEET NO. 13

VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2250	4	630	645	15
2	1800	2	616	770	154
3	1350	3	641	831	190
4	750	3	628	826	198
5	300	2	625	833	208
6	-150	4	682	691	9

MDB DAMAGE PROFILE DISTANCES

DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	188
2	500	Left	1	170
3	200	Left	1	186
4	200	Right	1	200
5	500	Right	1	200
6	800	Right	1	215

DATA SHEET NO. 14

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20

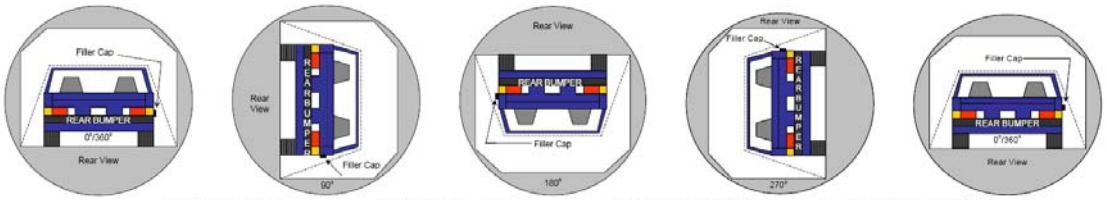
Temperature at Time of Impact: 20.6 °C Test Time: 2:26 PM

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

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

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

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



SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°	84	300	384
90° To 180°	81	300	381
180° To 270°	78	300	378
270° To 360°	79	300	379

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

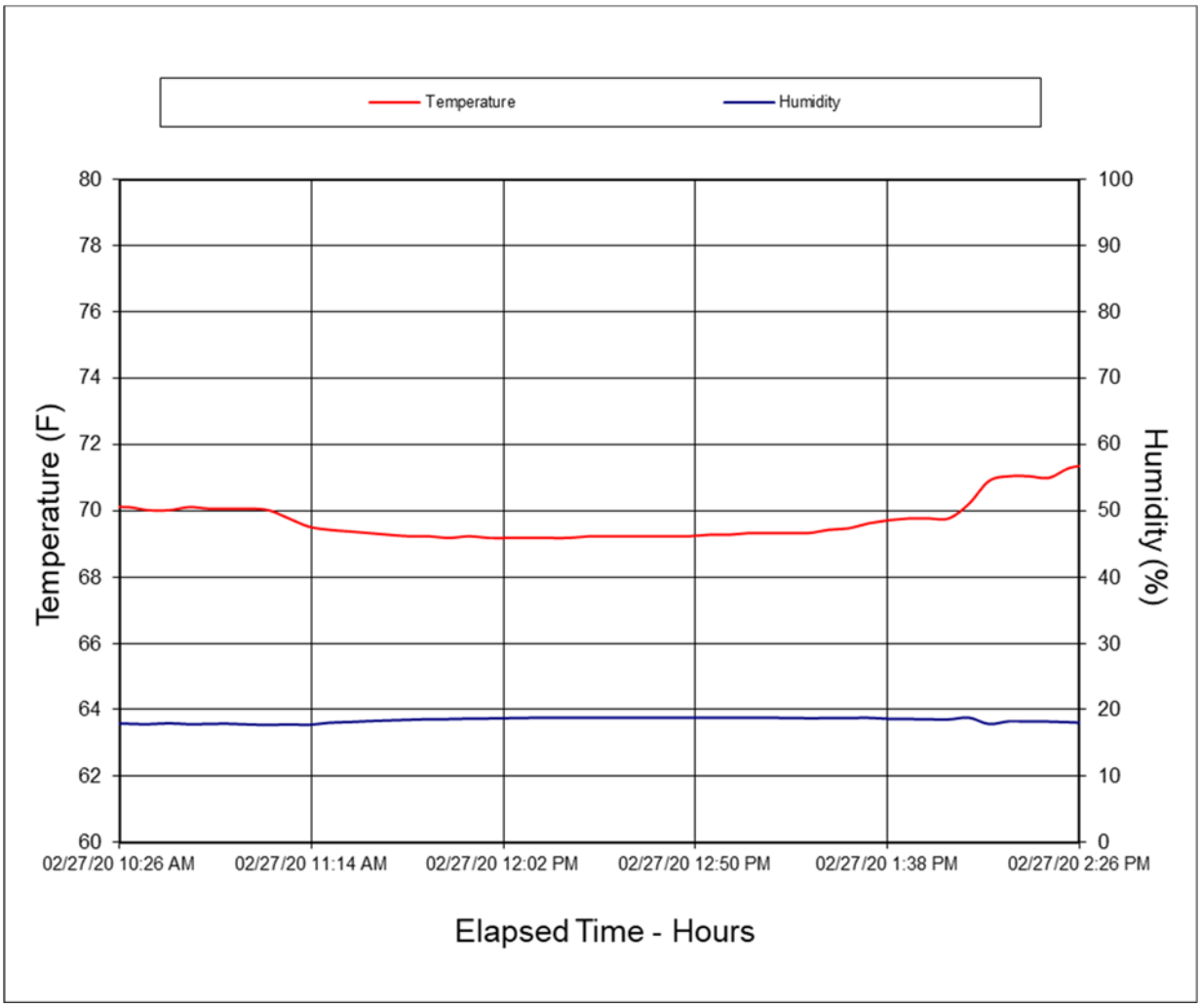
Test Phase	Spillage Location
0° To 90°	N/A
90° To 180°	N/A
180° To 270°	N/A
270° To 360°	N/A

DATA SHEET NO. 15

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2020 Nissan Kicks 5-Door SUV NHTSA No. M20205202

Test Program: NCAP MDB Side Impact Test Test Date: 02/27/20



APPENDIX A

PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

TABLE OF PHOTOGRAPHS … (CONTINUED)

TABLE OF PHOTOGRAPHS … (CONTINUED)

FIGURE 1. As-Delivered Right Front ¾ View of Test Vehicle

FIGURE 2. As-Delivered Left Rear ¾ View of Test Vehicle

FIGURE 3. Pre-Test Frontal View of Test Vehicle

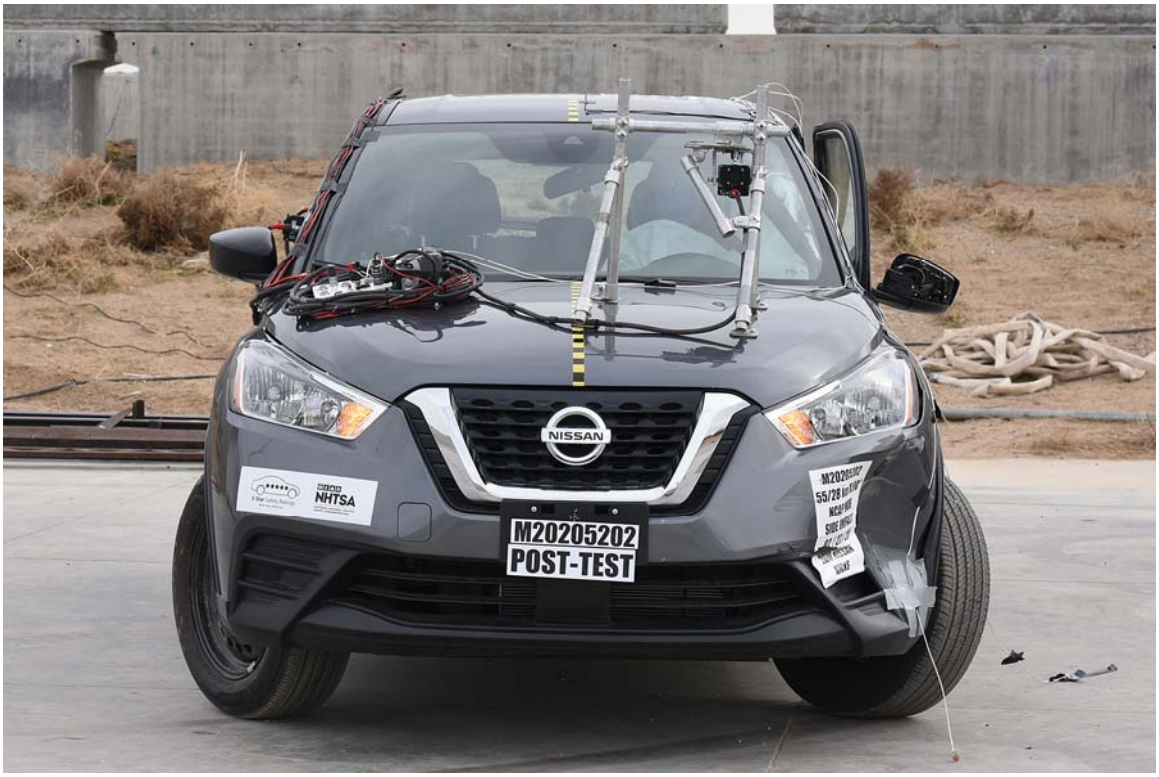


FIGURE 4. Post-Test Frontal View of Test Vehicle

FIGURE 5. Pre-Test Left Front ¾ View of Test Vehicle

FIGURE 6. Post-Test Left Front ¾ View of Test Vehicle

FIGURE 7. Pre-Test Left Side View of Test Vehicle

FIGURE 8. Post-Test Left Side View of Test Vehicle

FIGURE 9. Pre-Test Left Rear ¾ View of Test Vehicle

FIGURE 10. Post-Test Left Rear ¾ View of Test Vehicle

FIGURE 11. Pre-Test Rear View of Test Vehicle

FIGURE 12. Post-Test Rear View of Test Vehicle

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

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

FIGURE 15. Pre-Test Overhead View of Test Area

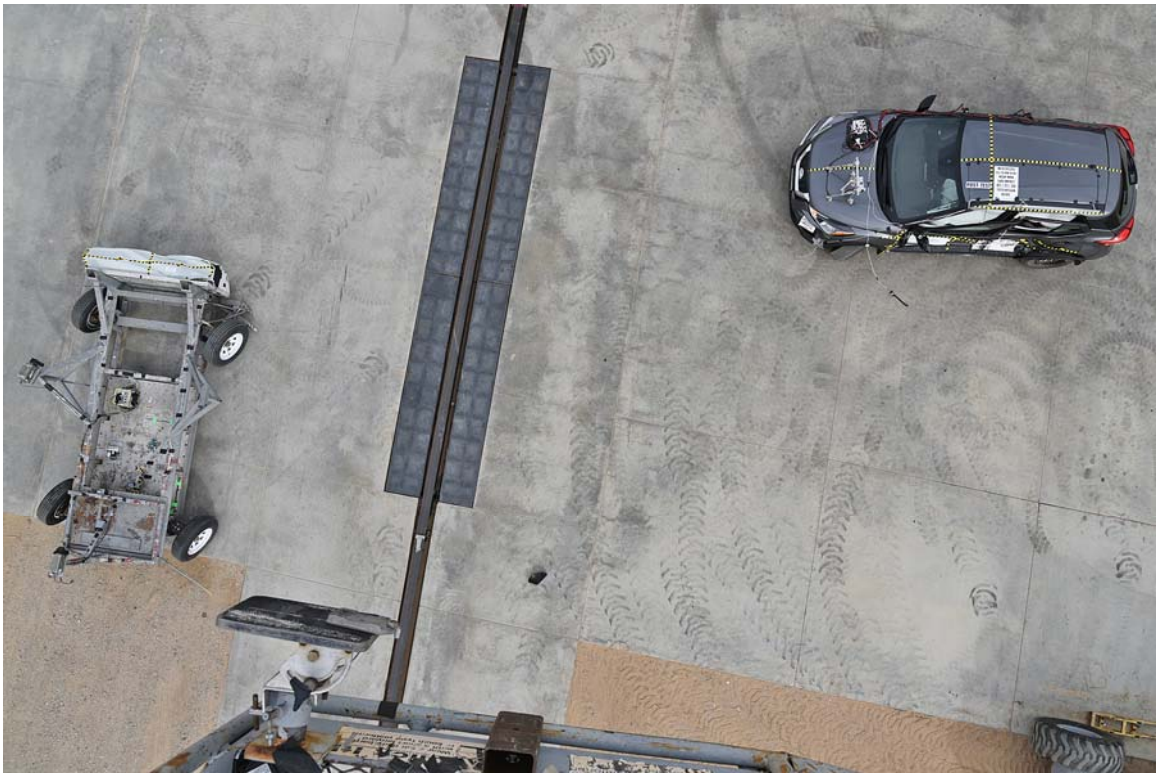


FIGURE 16. Post-Test Overhead View of Test Area

FIGURE 17. Pre-Test Left Side View of 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

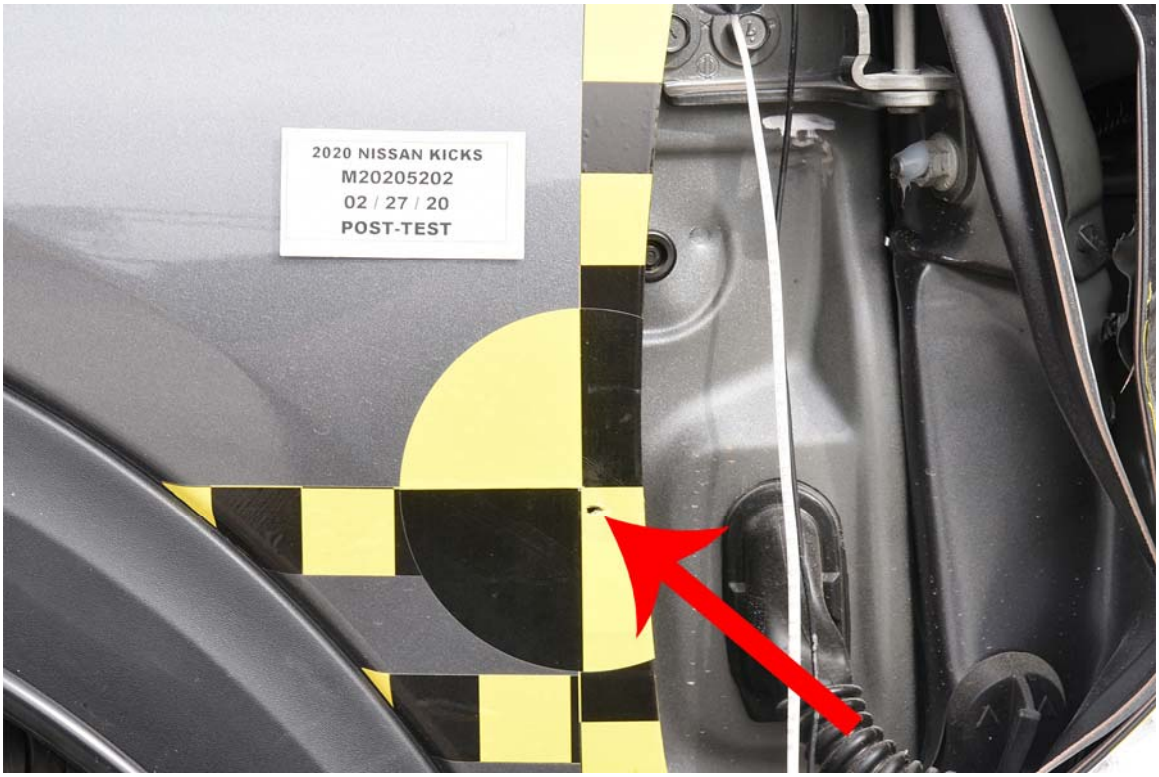


FIGURE 20. Post-Test Close-Up View of Impact Point Target

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

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

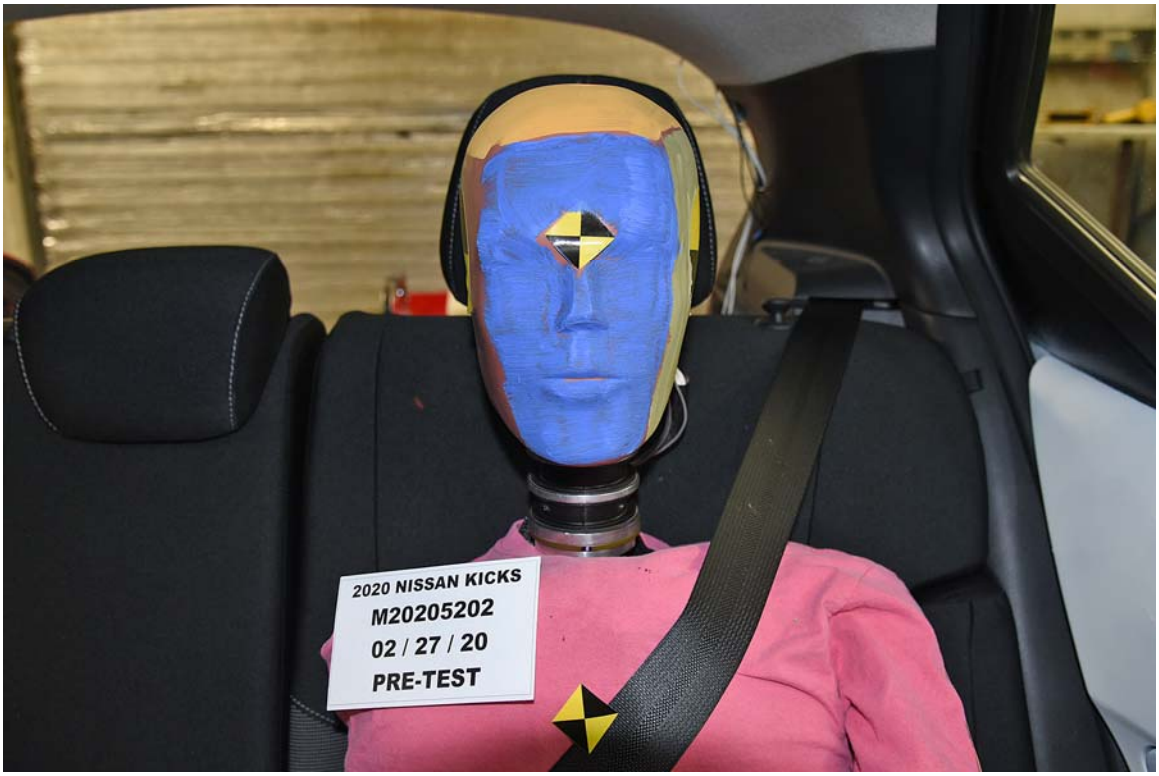


FIGURE 59. Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

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

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

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

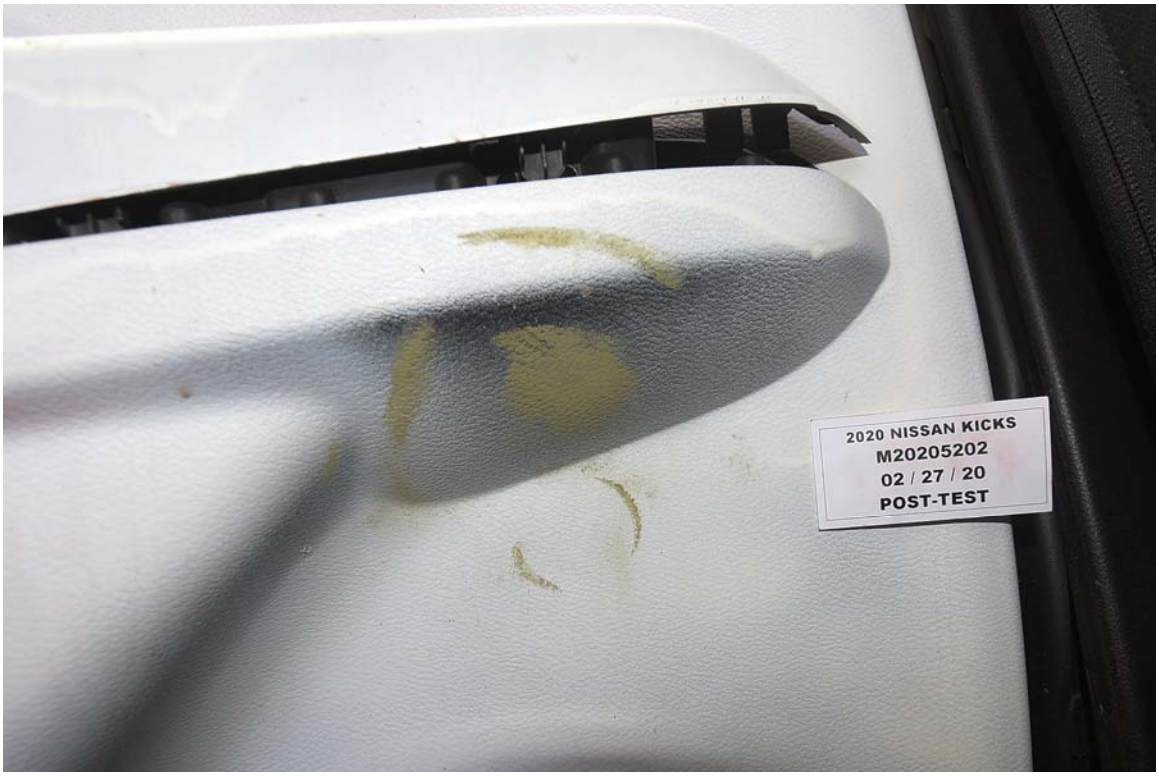


FIGURE 81. Post-Test Rear Passenger Dummy Close-Up Knee Contact View

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

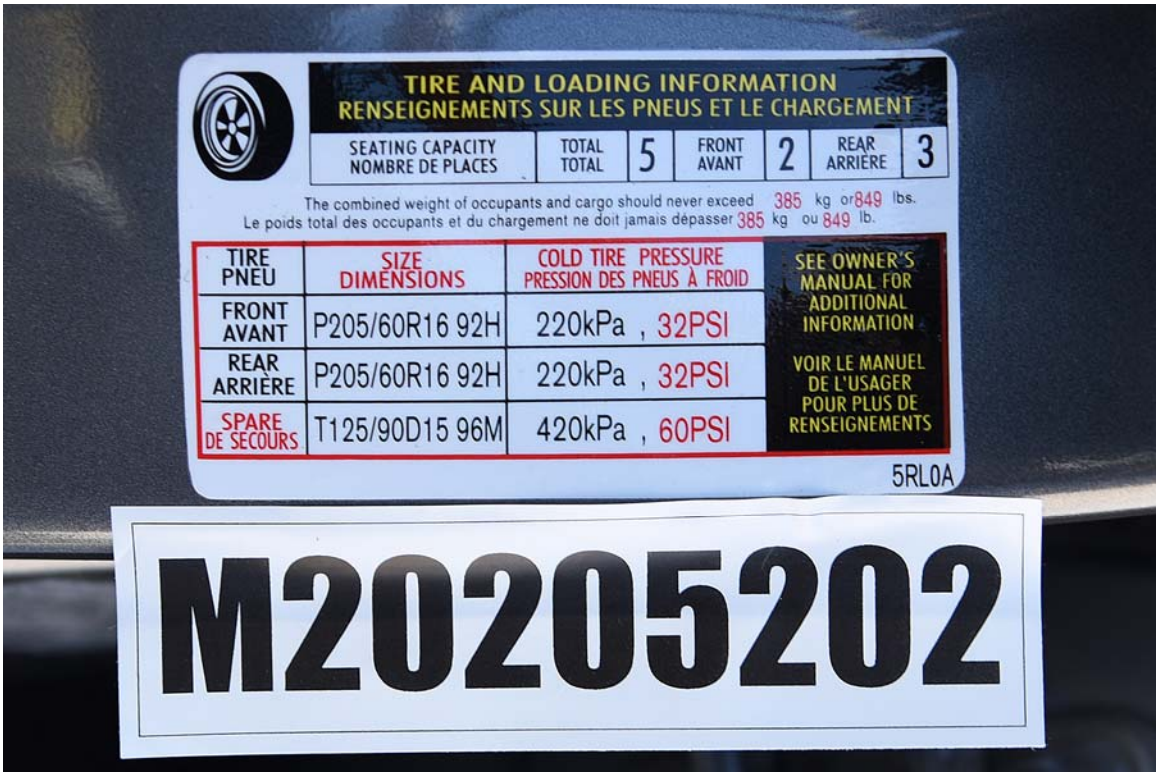


FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

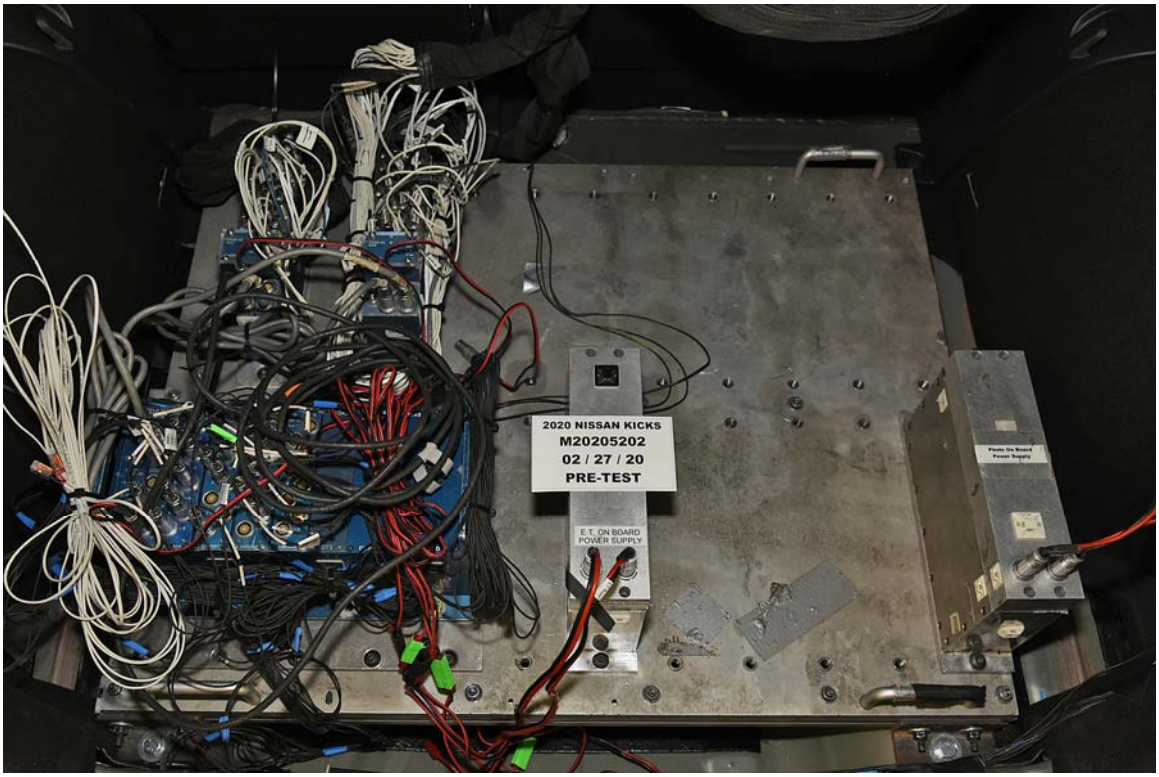


FIGURE 94. Pre-Test Ballast View

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

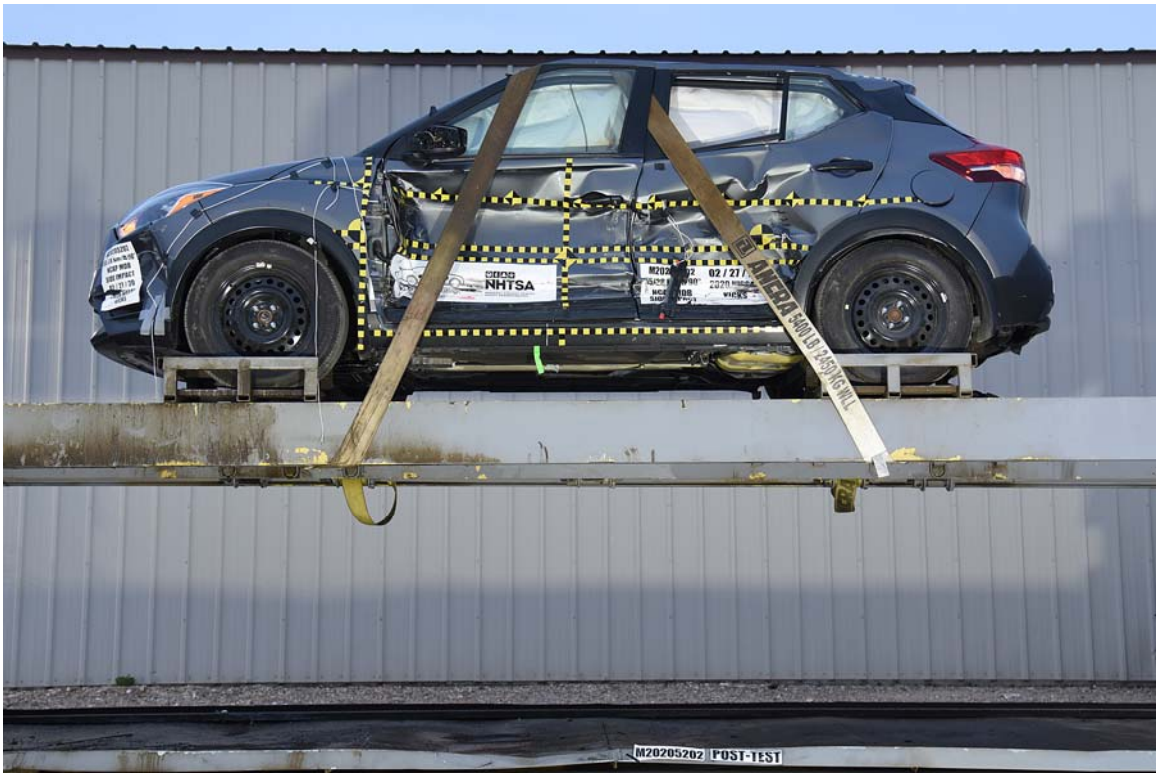


FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees

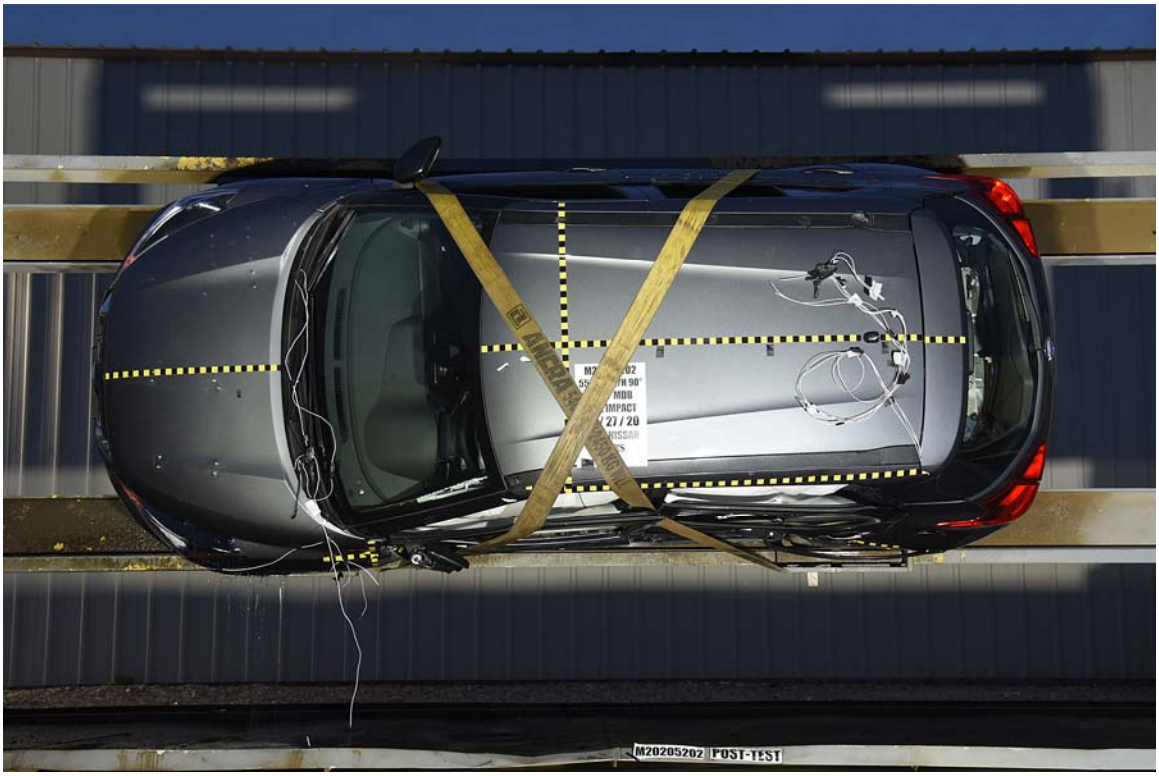


FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

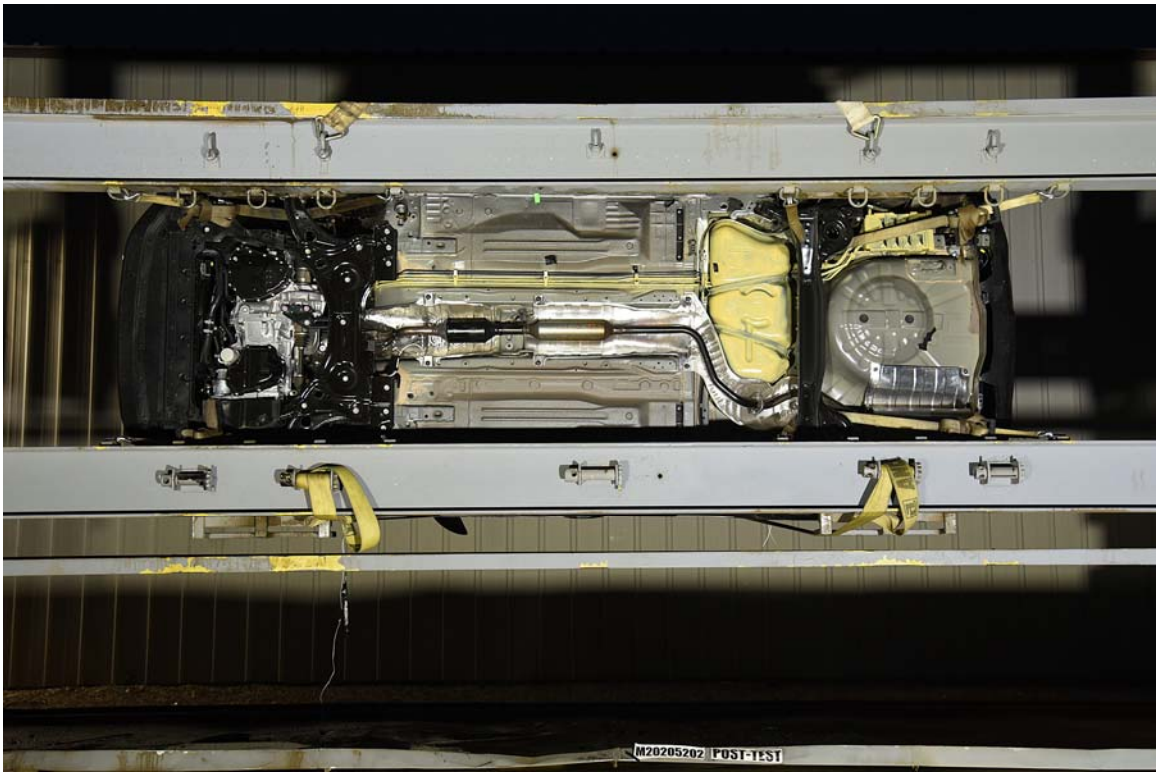
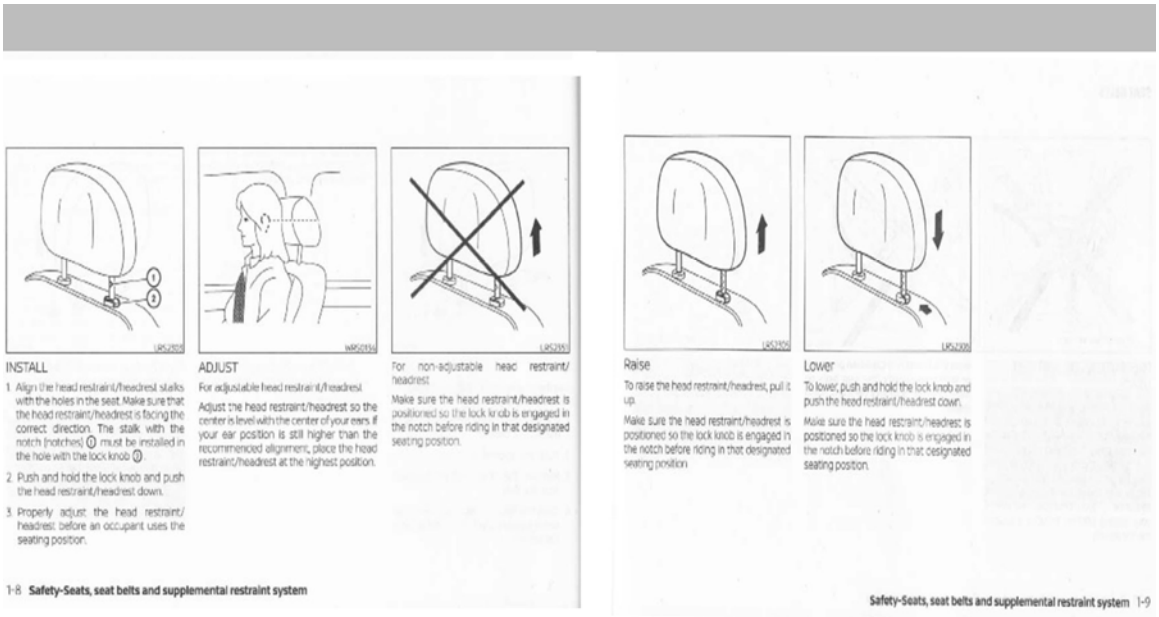


FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees

FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees

FIGURE 101. Impact Event

FIGURE 102. Monroney Label



INSTALL

1. Align the head restraint/headrest stalks with the holes in the seat. Make sure that the head restraint/headrest is facing the correct direction. The stalk with the notch (notches) ① must be installed in the hole with the lock knob ②.
2. Push and hold the lock knob and push the head restraint/headrest down.
3. Properly adjust the head restraint/headrest before an occupant uses the seating position.

ADJUST

For adjustable head restraint/headrest

Adjust the head restraint/headrest so the center is level with the center of your ears. If your ear position is still higher than the recommended alignment, place the head restraint/headrest at the highest position.

For non-adjustable head restraint/headrest

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

Raise

To raise the head restraint/headrest, pull it up.

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

Lower

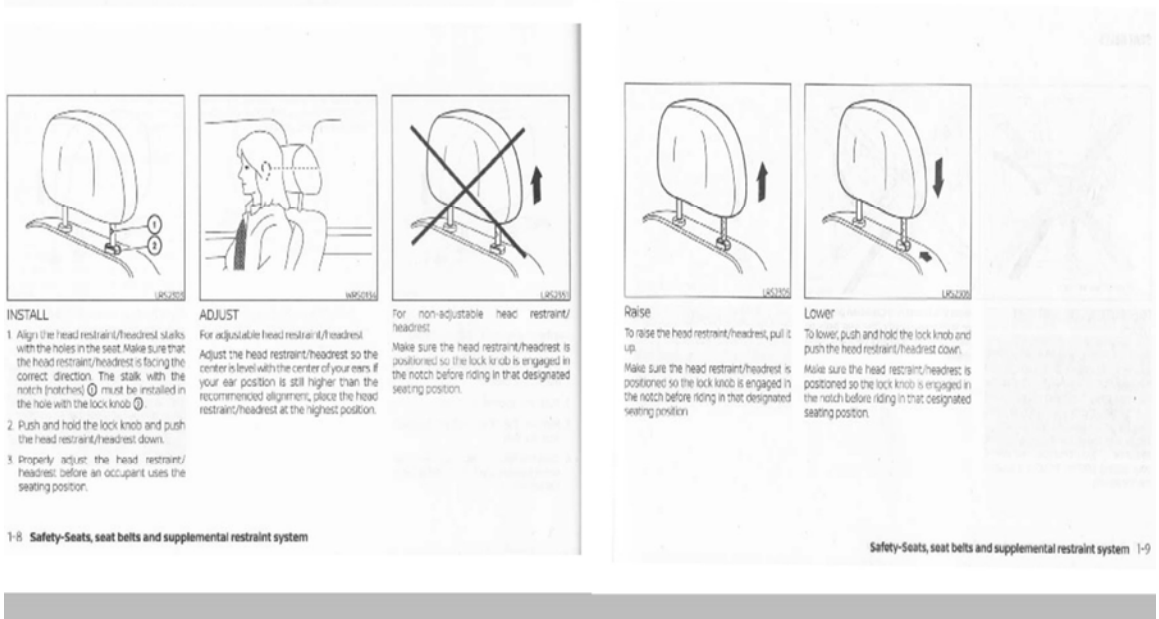
To lower, push and hold the lock knob and push the head restraint/headrest down.

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

1-8 **Safety-Seats, seat belts and supplemental restraint system**

Safety-Seats, seat belts and supplemental restraint system 1-9

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



INSTALL

1. Align the head restraint/headrest stalks with the holes in the seat. Make sure that the head restraint/headrest is facing the correct direction. The stalk with the notch (notches) ① must be installed in the hole with the lock knob ②.
2. Push and hold the lock knob and push the head restraint/headrest down.
3. Properly adjust the head restraint/headrest before an occupant uses the seating position.

ADJUST

For adjustable head restraint/headrest

Adjust the head restraint/headrest so the center is level with the center of your ears. If your ear position is still higher than the recommended alignment, place the head restraint/headrest at the highest position.

For non-adjustable head restraint/headrest

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

Raise

To raise the head restraint/headrest, pull it up.

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

Lower

To lower, push and hold the lock knob and push the head restraint/headrest down.

Make sure the head restraint/headrest is positioned so the lock knob is engaged in the notch before riding in that designated seating position.

1-8 **Safety-Seats, seat belts and supplemental restraint system**

Safety-Seats, seat belts and supplemental restraint system 1-9

FIGURE 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

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

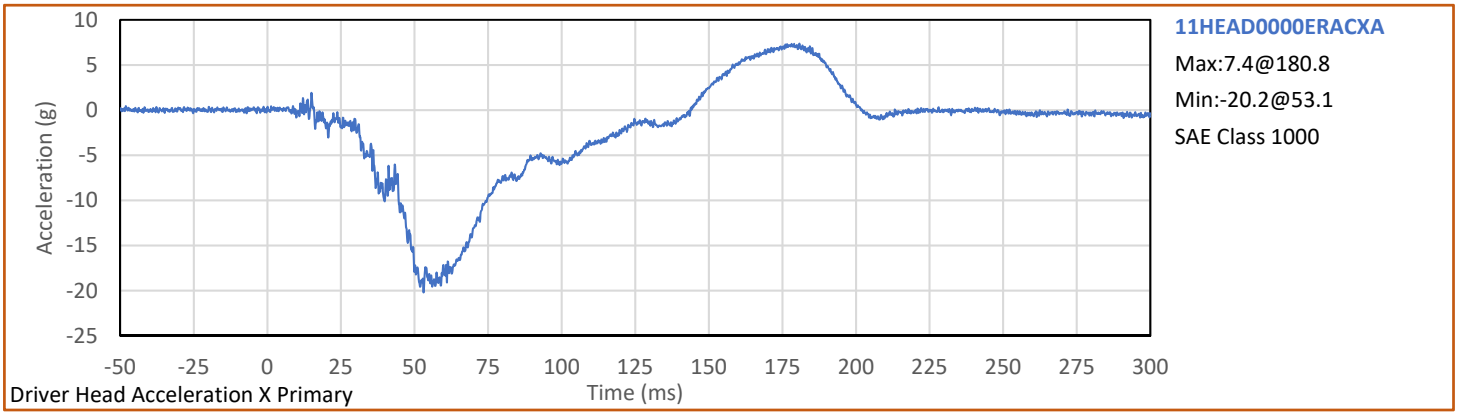
MDB Rear Acceleration (X)

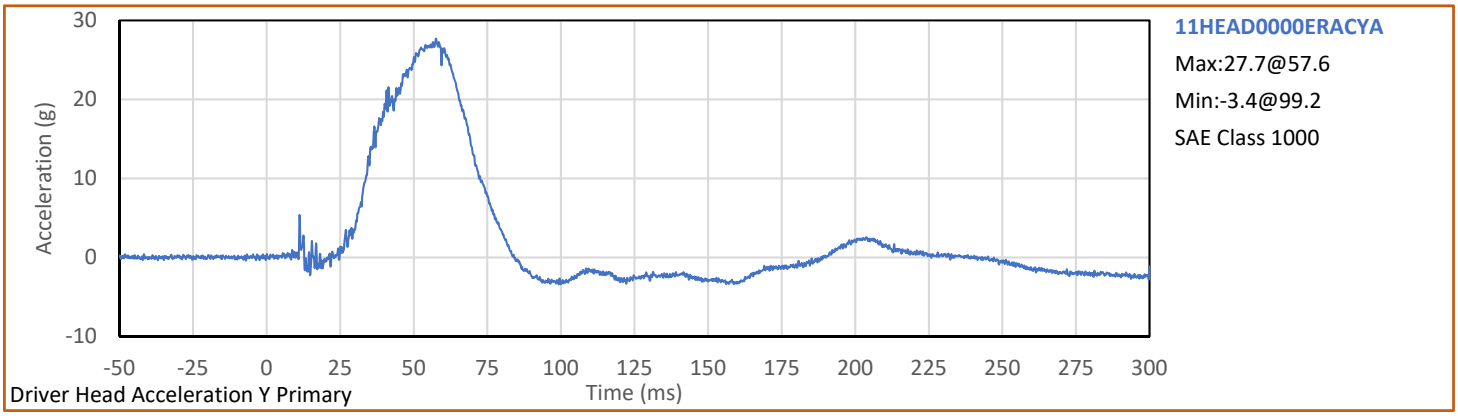
MDB Rear Acceleration (Y)

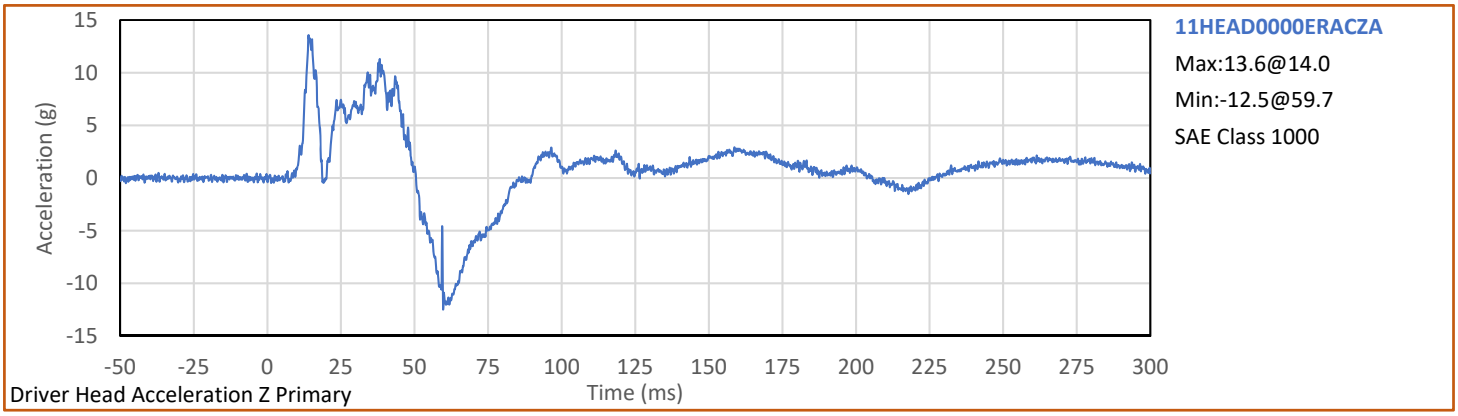
Left MDB Contact Switch

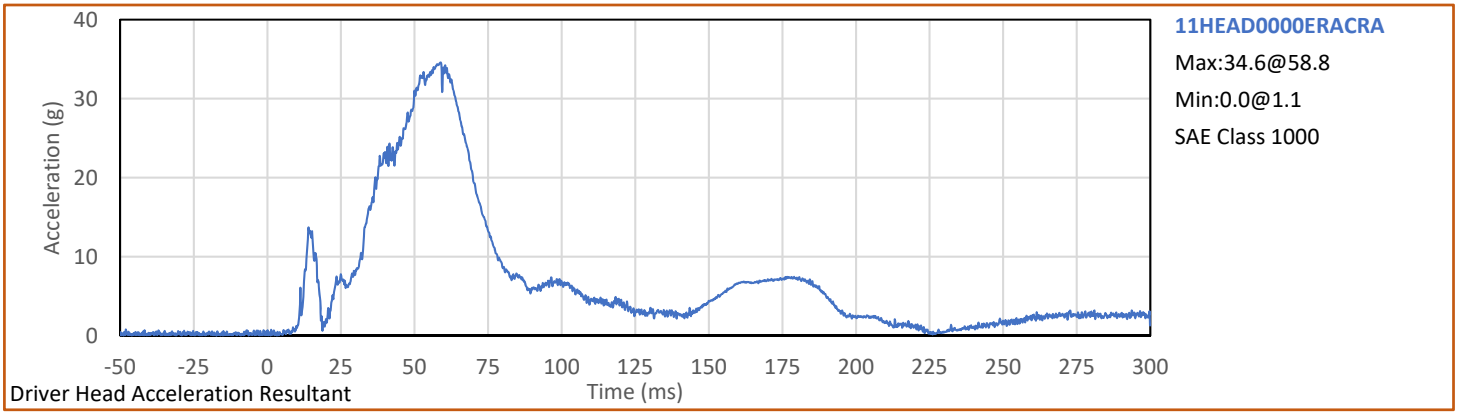
Right MDB Contact Switch

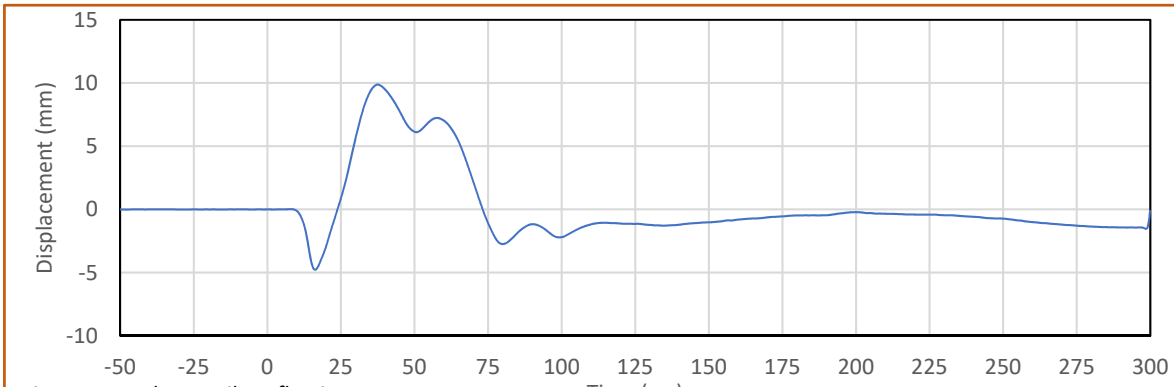
Test Vehicle:	2020 Nissan Kicks 5-Door SUV	NHTSA No.:	M20205202
Test Program:	NCAP MDB Side Impact Test	Test Date:	2/27/2020





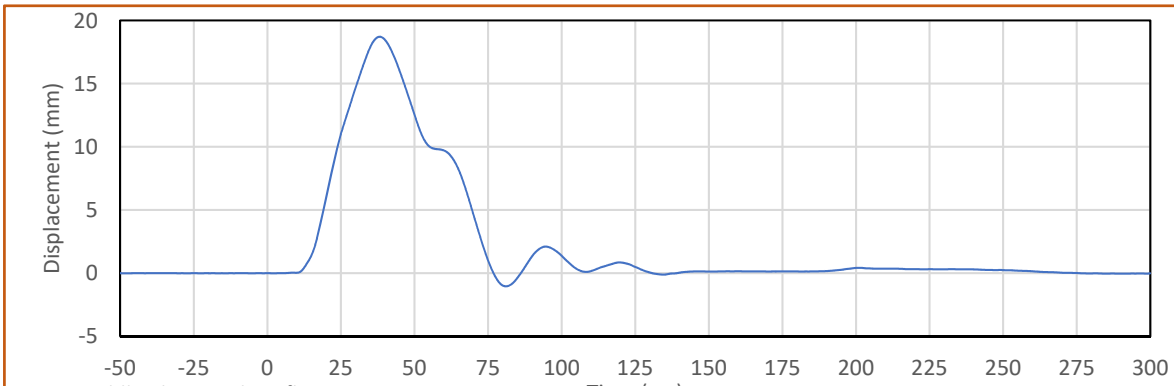






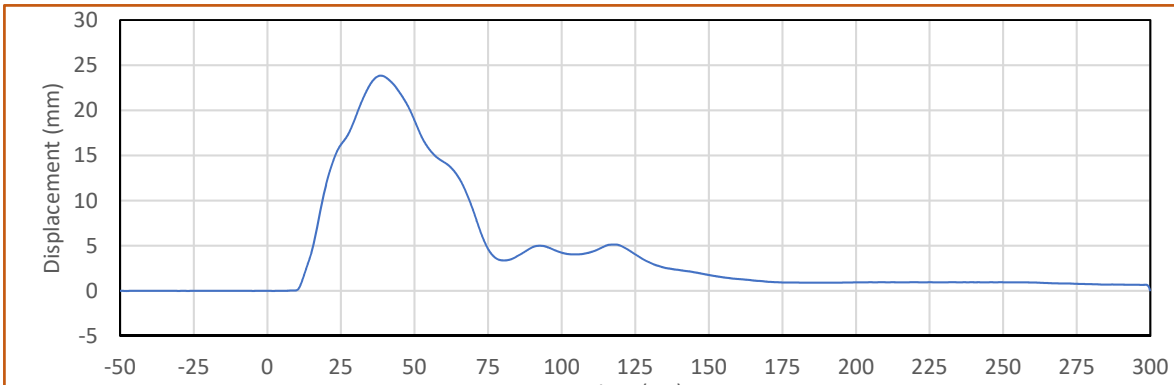
Driver Upper Thorax Rib Deflection Y

11RIBSLEUPERDSYC
Max:9.9@37.5
Min:-4.8@16.2
SAE Class 180



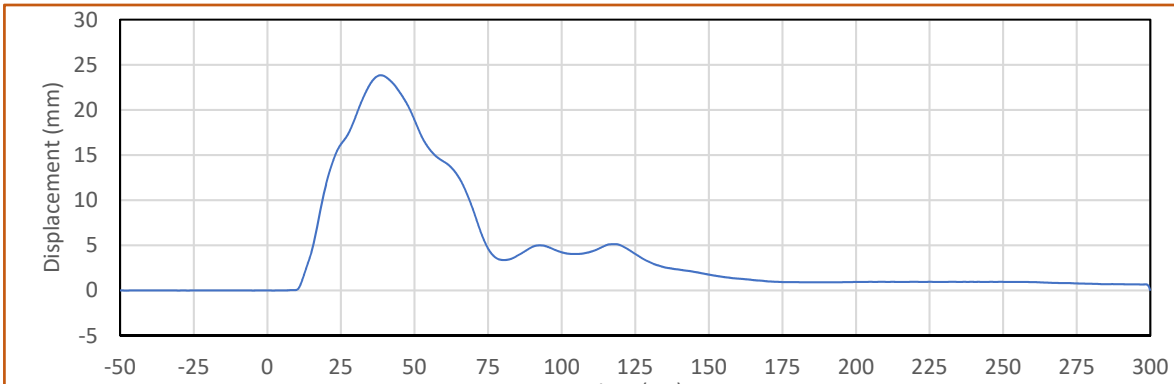
Driver Middle Thorax Rib Deflection Y

11RIBSLEMIERDSYC
Max:18.7@38.2
Min:-1.0@81.1
SAE Class 180



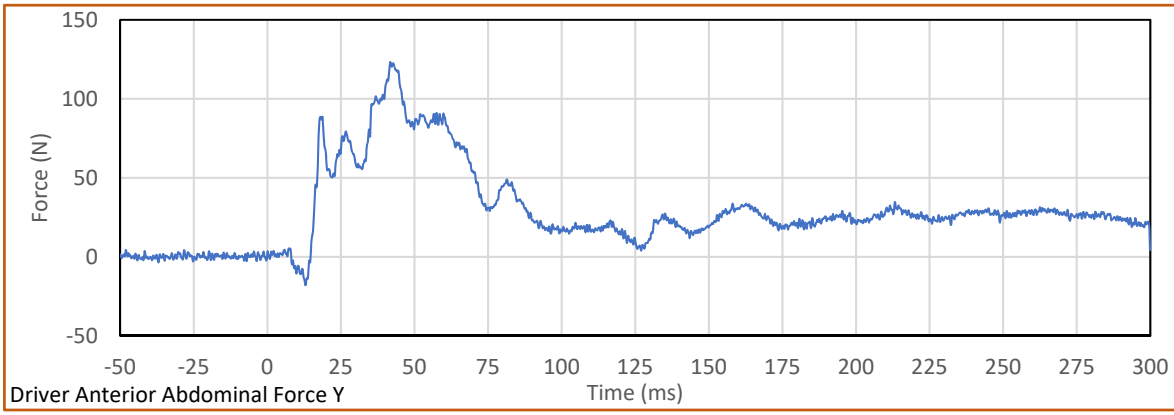
Driver Lower Thorax Rib Deflection Y

11RIBSLELOERDSYC
Max:23.8@38.5
Min:0.0@2.0
SAE Class 180

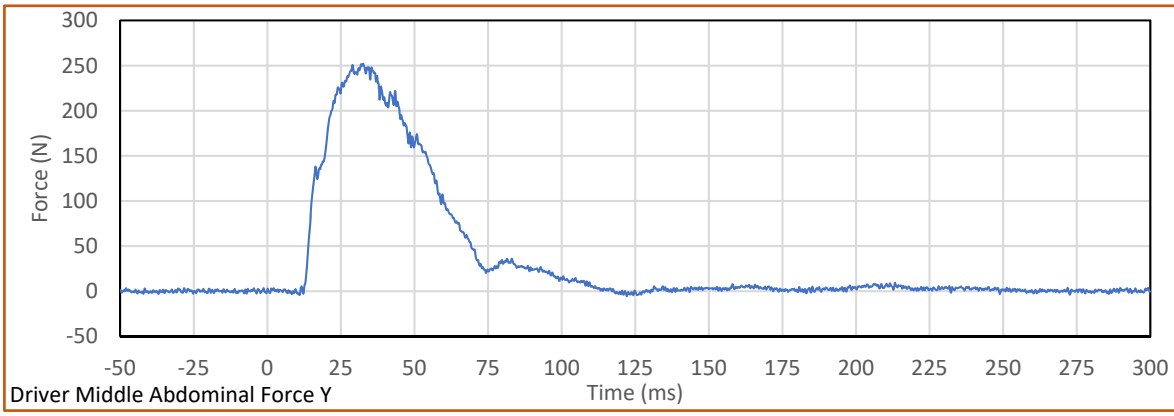


(Maximum) Driver Lower Thorax Rib Deflection Y

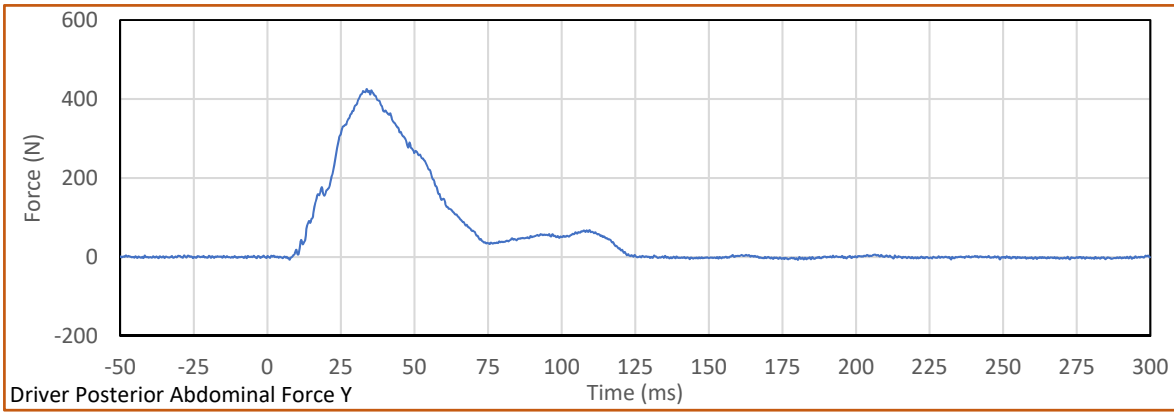
11RIBSLELOERDSYC
Max:23.8@38.5
Min:0.0@2.0
SAE Class 180



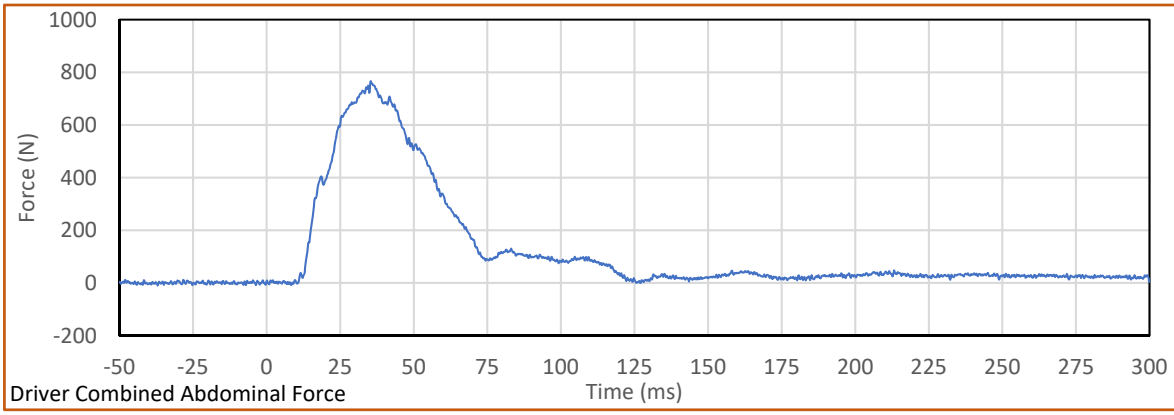
11ABDOLEFRERFOYB
Max:123.4@41.8
Min:-18.0@13.0
SAE Class 600



11ABDOLEMIERFOYB
Max:251.9@32.6
Min:-5.5@122.2
SAE Class 600

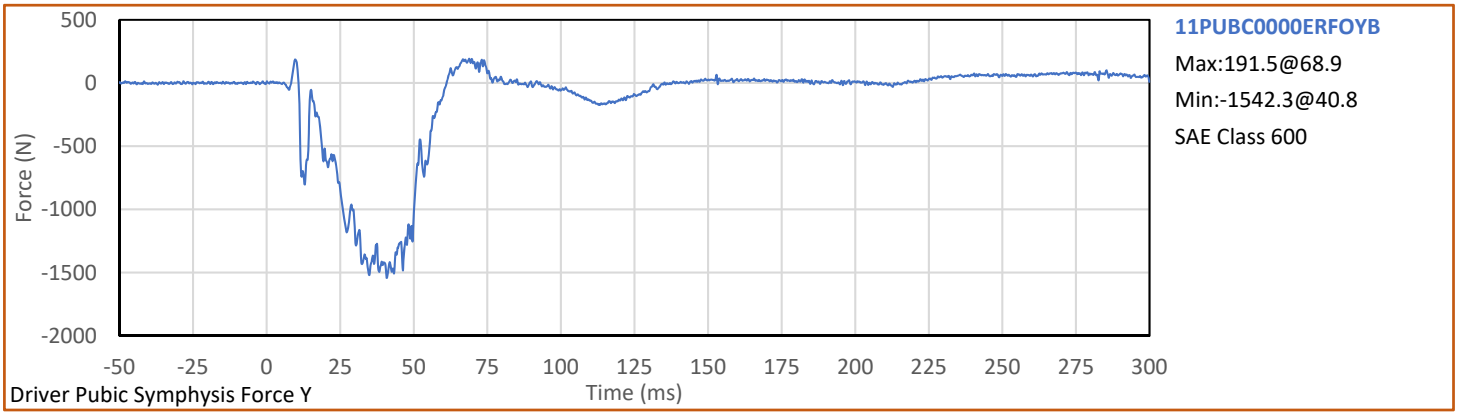


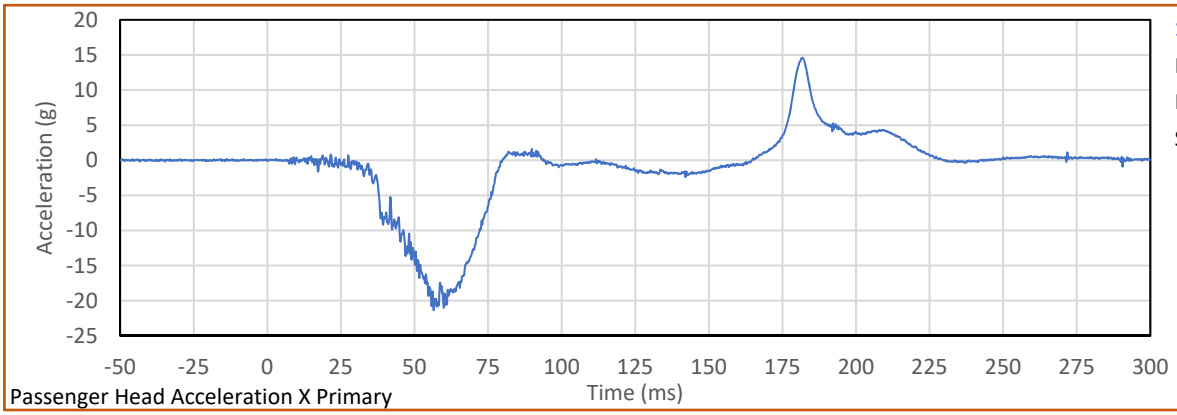
11ABDOLEREERFOYB
Max:425.3@33.8
Min:-7.1@180.3
SAE Class 600



11ABDOLESUERFOYB
Max:766.4@35.4
Min:-7.7@8.3
SAE Class 600

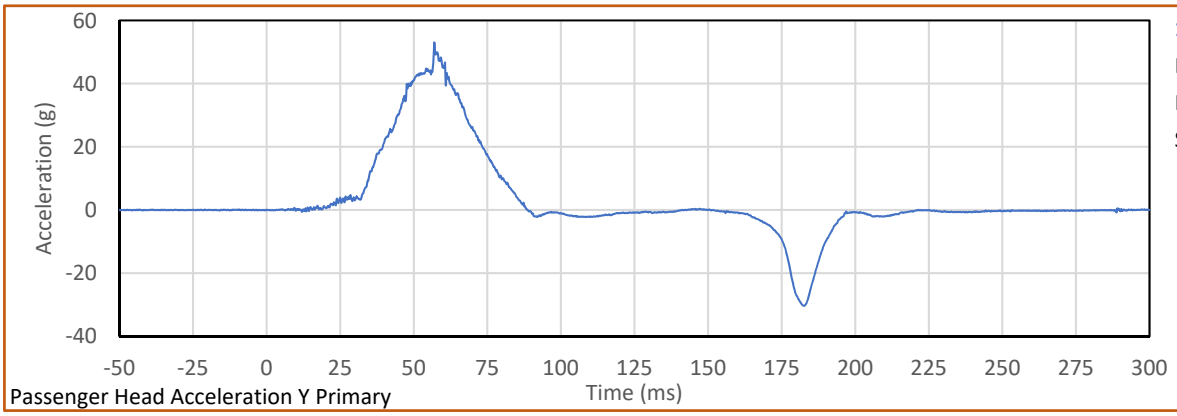
Test Vehicle:	2020 Nissan Kicks 5-Door SUV	NHTSA No.:	M20205202
Test Program:	NCAP MDB Side Impact Test	Test Date:	2/27/2020





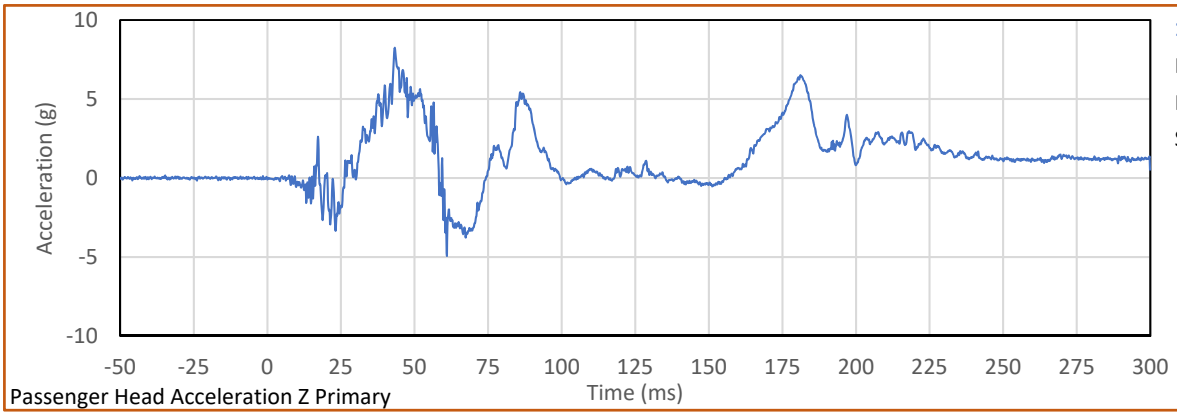
14HEAD0000S2ACXA
Max:14.6@181.8
Min:-21.4@56.5
SAE Class 1000

Passenger Head Acceleration X Primary



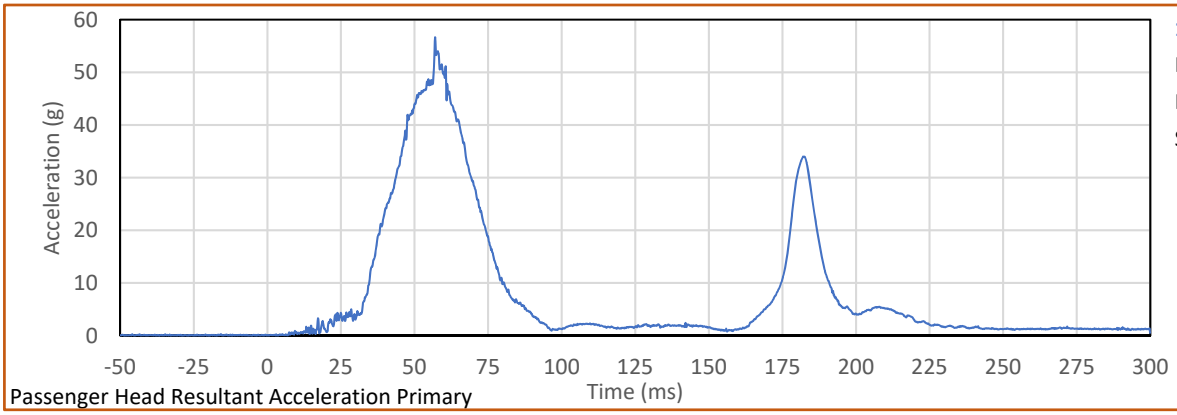
14HEAD0000S2ACYA
Max:53.0@57.0
Min:-30.4@182.6
SAE Class 1000

Passenger Head Acceleration Y Primary



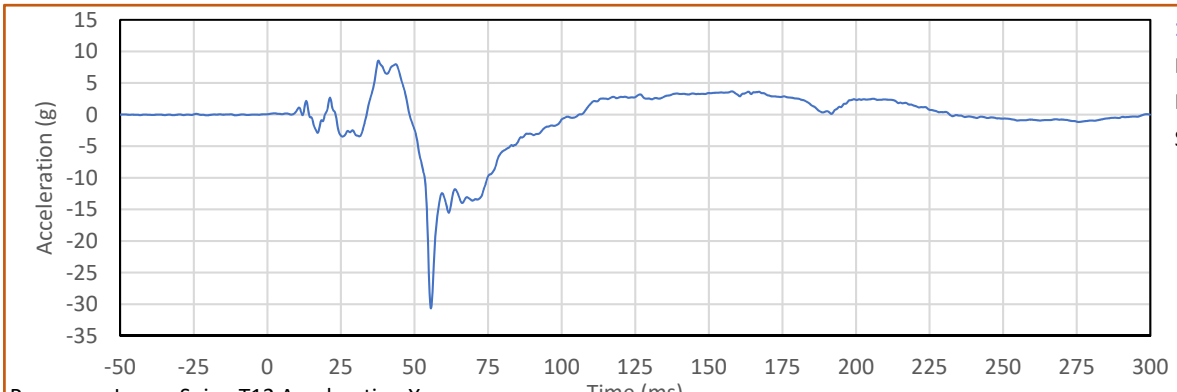
14HEAD0000S2ACZA
Max:8.2@43.3
Min:-4.9@61.0
SAE Class 1000

Passenger Head Acceleration Z Primary



14HEAD0000S2ACRA
Max:56.7@57.0
Min:0.0@3.8
SAE Class 1000

Passenger Head Resultant Acceleration Primary



Passenger Lower Spine T12 Acceleration X

14ABSP01RIS2ACXC
Max:8.5@37.7
Min:-30.7@55.6
SAE Class 180

Passenger Lower Spine T12 Acceleration Y

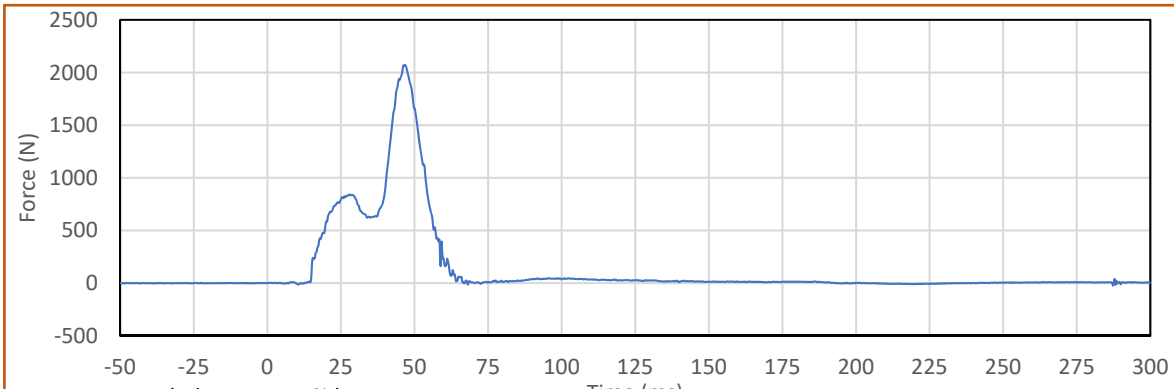
14ABSP01RIS2ACYC
Max:29.7@56.1
Min:-3.3@196.3
SAE Class 180

Passenger Lower Spine T12 Acceleration Z

14ABSP01RIS2ACZC
Max:22.1@55.3
Min:-5.6@26.3
SAE Class 180

Passenger Lower Spine T12 Acceleration Resultant

14ABSP01RIS2ACRC
Max:47.3@55.5
Min:0.1@0.1
SAE Class 180



Passenger Acetabulum Impact Side Force Y

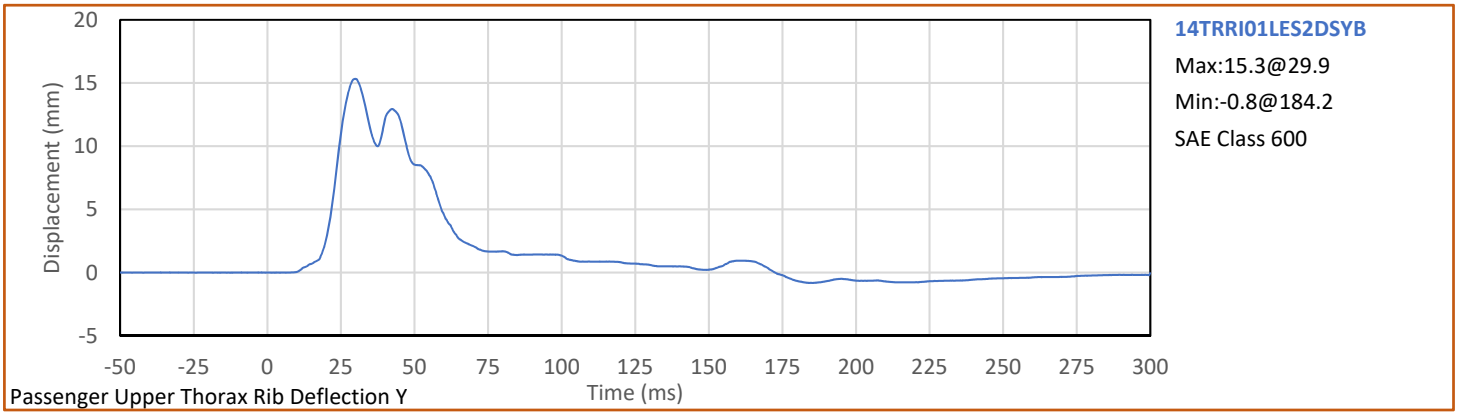
14ACTBLE00S2FOYB
Max:2071.3@46.8
Min:-24.2@287.3
SAE Class 600

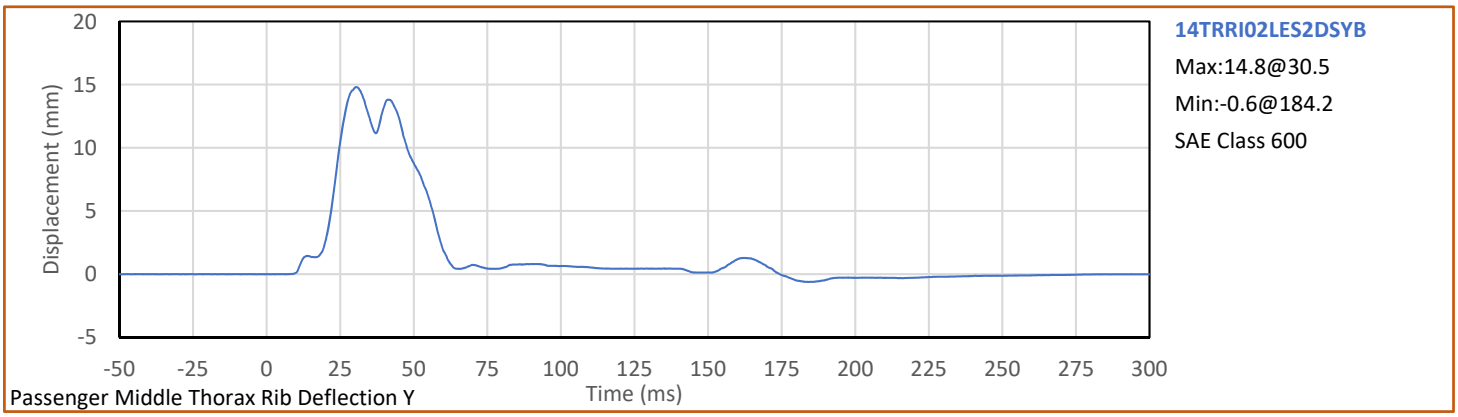
Passenger Iliac Wing Impact Side Force Y

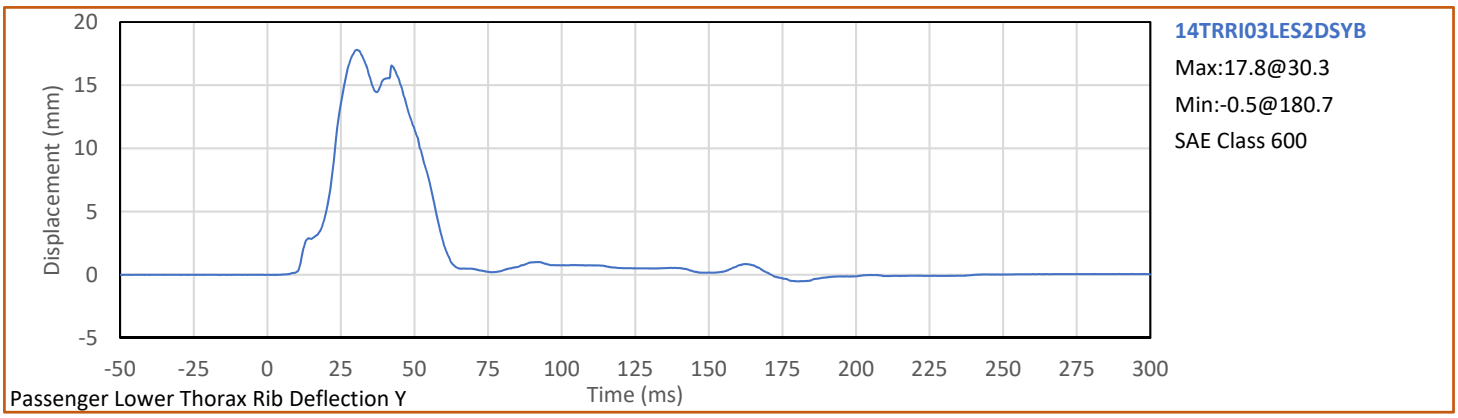
14ILACLE00S2FOYB
Max:400.0@27.8
Min:-3.8@5.3
SAE Class 600

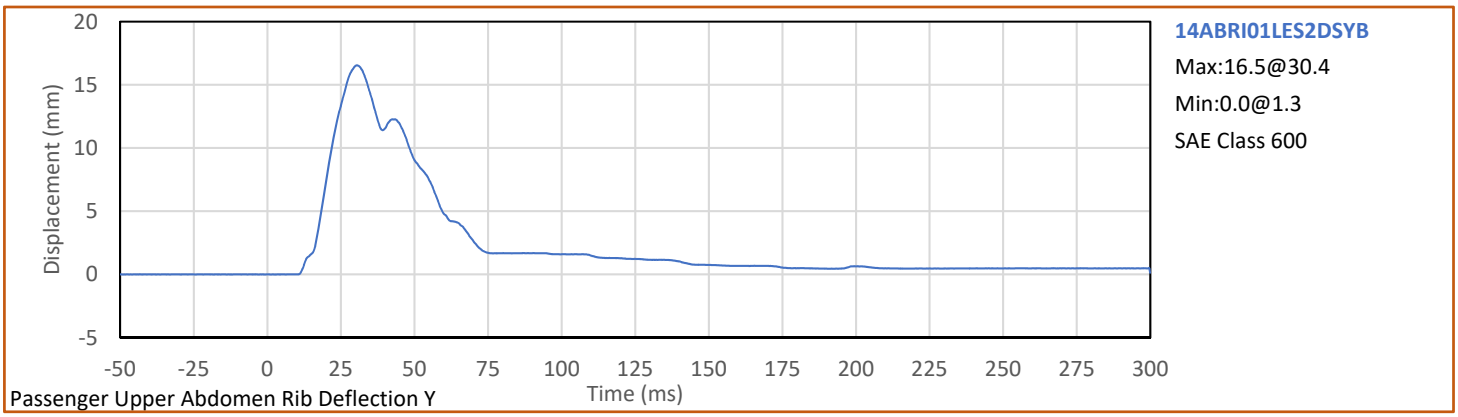
Passenger Combined Pelvic Force

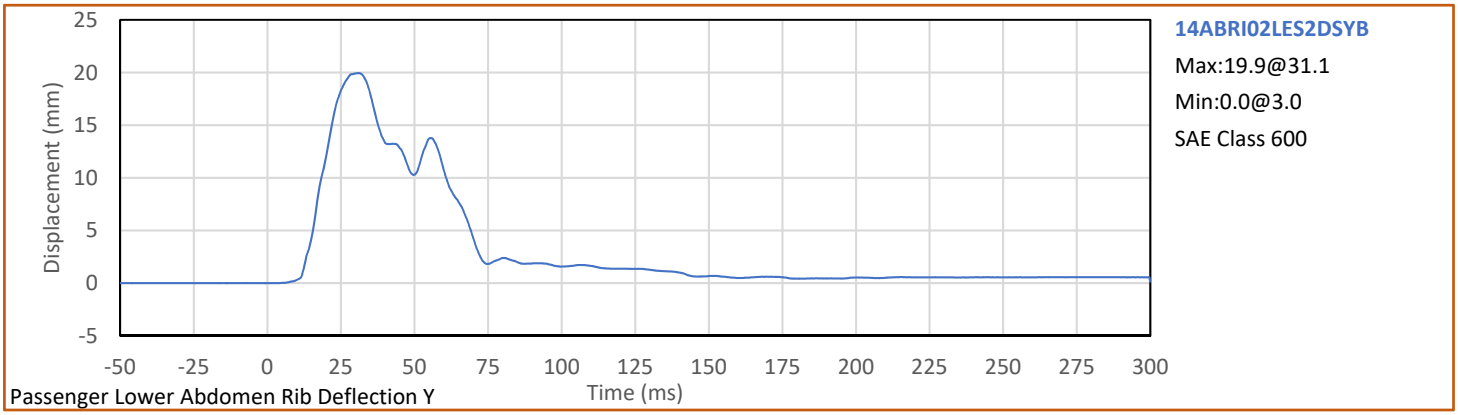
14PELVLE00S2FOYB
Max:2297.8@46.3
Min:-17.1@287.3
SAE Class 600


Displacement (mm)
Time (ms)
Passenger Upper Thorax Rib Deflection Y
14TRRI01LES2DSYB
Max:15.3@29.9
Min:-0.8@184.2
SAE Class 600


Displacement (mm)
Time (ms)
Passenger Middle Thorax Rib Deflection Y
14TRRI02LES2DSYB
Max:14.8@30.5
Min:-0.6@184.2
SAE Class 600


Displacement (mm)
Time (ms)
Passenger Lower Thorax Rib Deflection Y
14TRRI03LES2DSYB
Max:17.8@30.3
Min:-0.5@180.7
SAE Class 600


Displacement (mm)
Time (ms)
Passenger Upper Abdomen Rib Deflection Y
14ABRI01LES2DSYB
Max:16.5@30.4
Min:0.0@1.3
SAE Class 600



Passenger Lower Abdomen Rib Deflection 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: F035

Applus IDIADA KARCO

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

ATD Serial No.: F035

Test Date: 2020-02-26

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	27	Pass
1 - Sitting Height	mm	900	918	906	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	100	Pass
5 - Sole to Seat, Sitting	mm	433	451	440	Pass
6 - Head Width	mm	152	158	156	Pass
7 - Shoulder/Arm Width	mm	461	479	469	Pass
8 - Thorax Width	mm	322	332	324	Pass
9 - Abdomen Width	mm	273	287	279	Pass
10 - Pelvis Lap Width	mm	359	373	369	Pass
11 - Head Depth	mm	196	206	200	Pass
12 - Thorax Depth	mm	262	272	266	Pass
13 - Abdomen Depth	mm	194	204	199	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	609	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

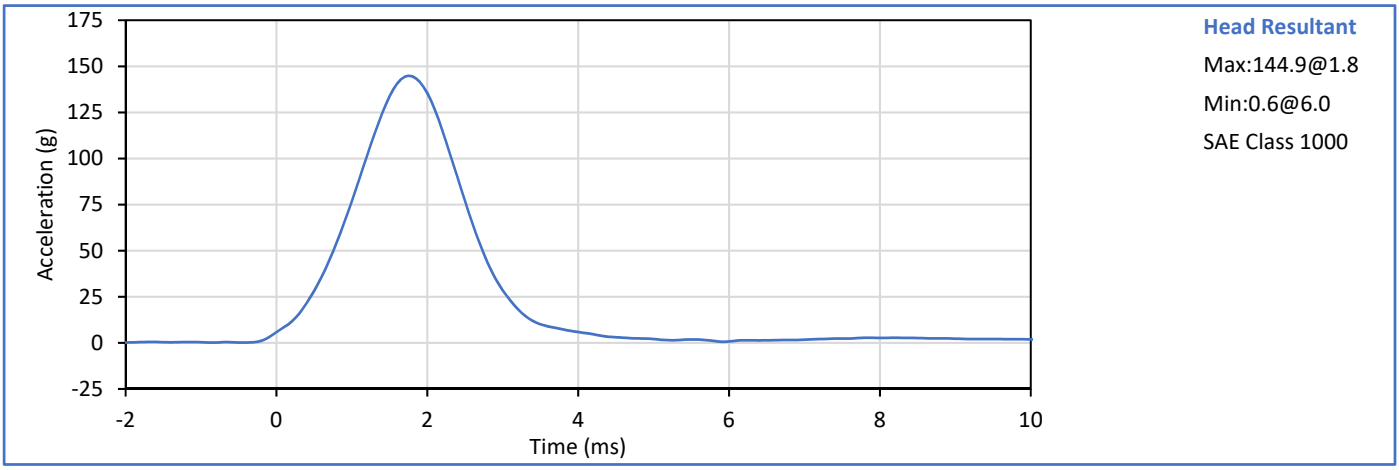
Approved By: P. Puzzuto

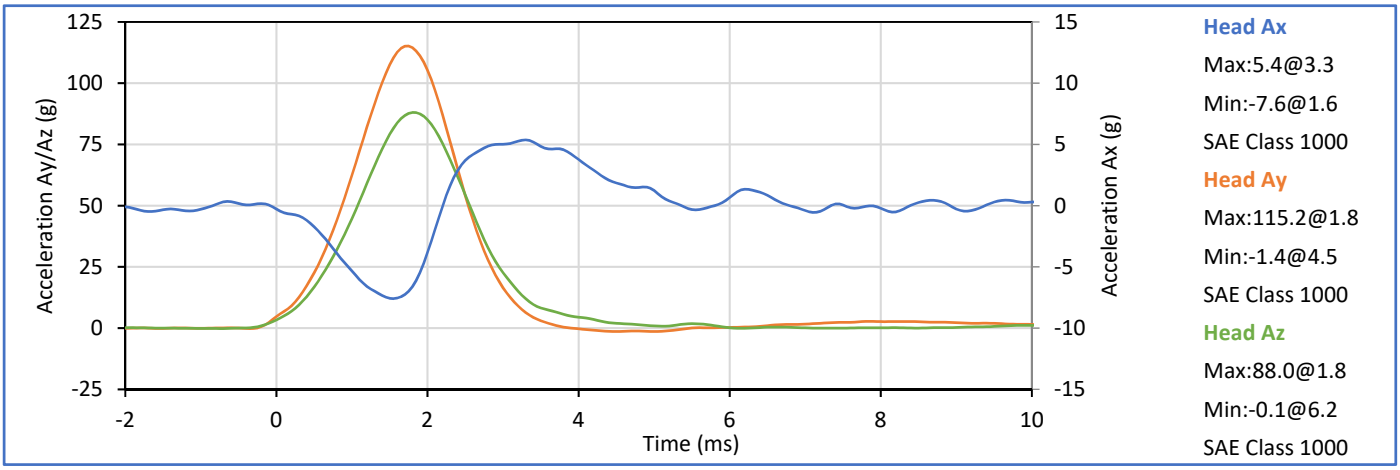
Applus IDIADA KARCO

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

ATD Serial No.: F035 Test Date: 2020-02-26

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	20.6	Pass
Laboratory Relative Humidity	%	10	70	20	Pass
Peak Resultant Acceleration	g	125.0	155.0	144.9	Pass
Peak Head Ax	g	-15.0	15.0	5.4	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

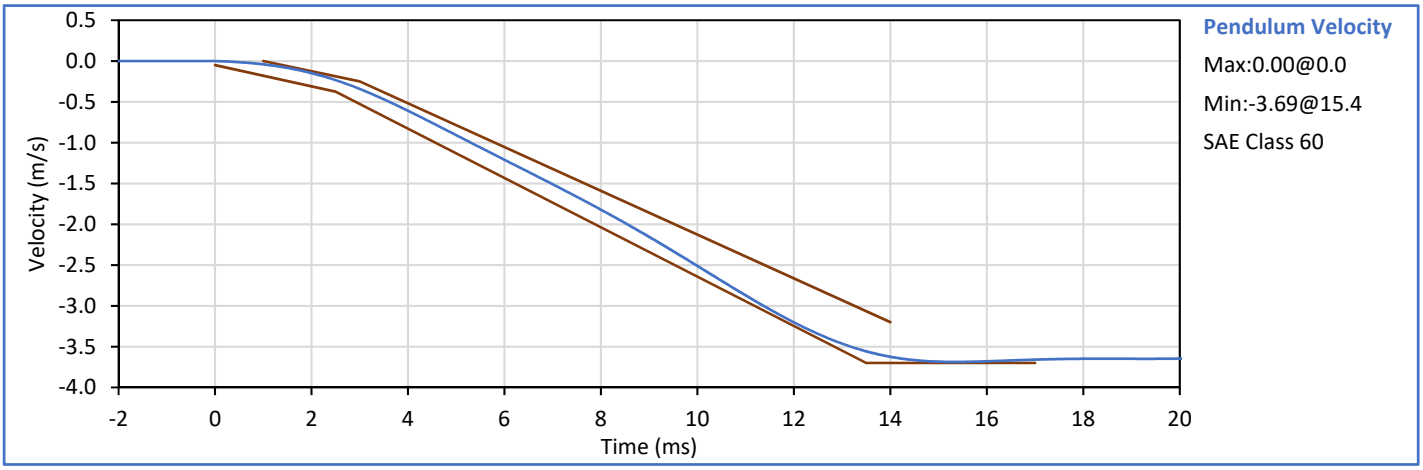
Approved By: P. Puzzuto

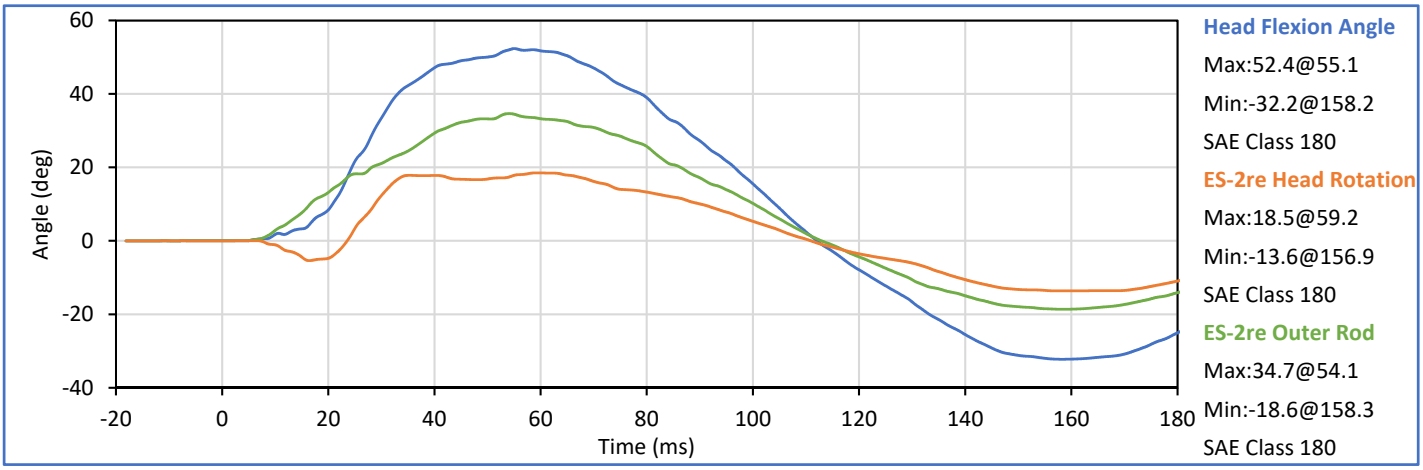
Applus IDIADA
KARCO

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

ATD Serial No.: F035 Test Date: 2020-02-26

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	3.40	Pass
Peak Headform Flexion	deg	49.0	59.0	52.4	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	55.1	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	57.0	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

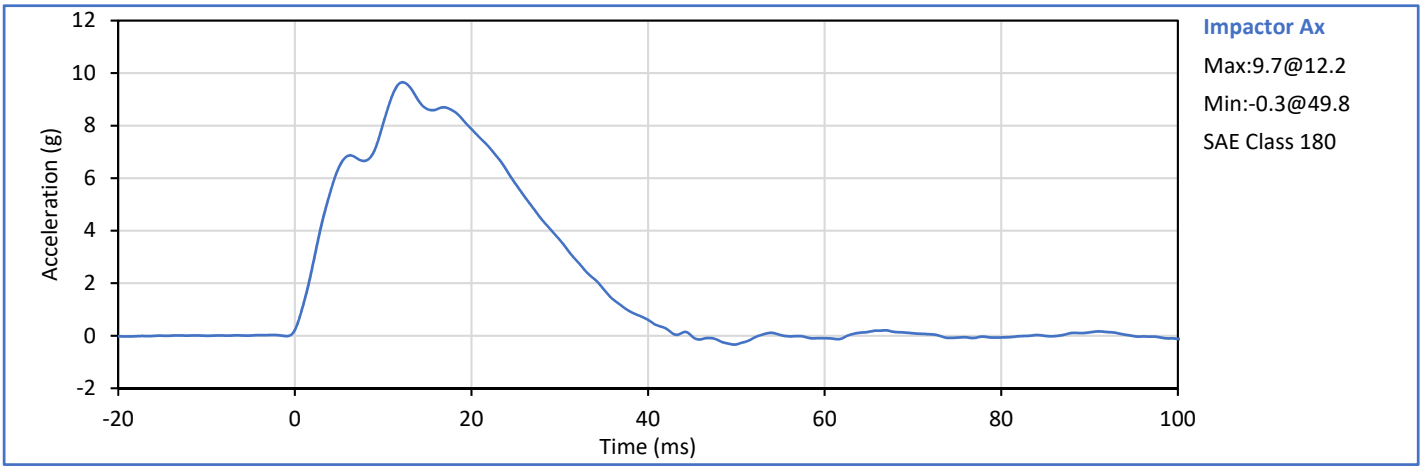
Applus IDIADA KARCO

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

ATD Serial No.: F035

Test Date: 2020-02-26

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	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.36	Pass
Peak Impactor Ax	g	7.5	10.5	9.7	Pass
			Overall Test Results		Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

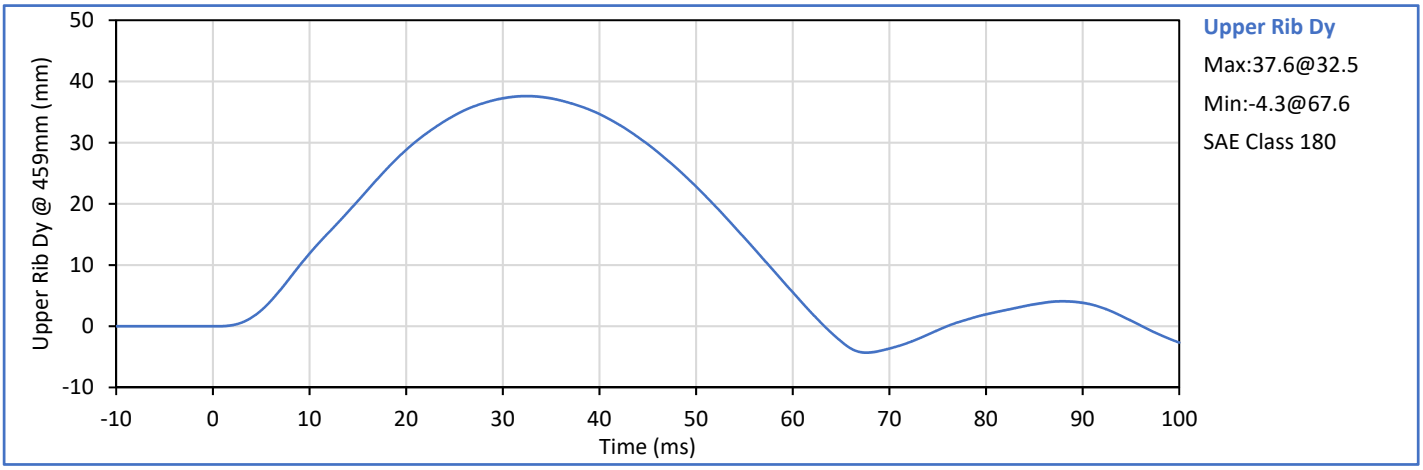
Applus IDIADA KARCO

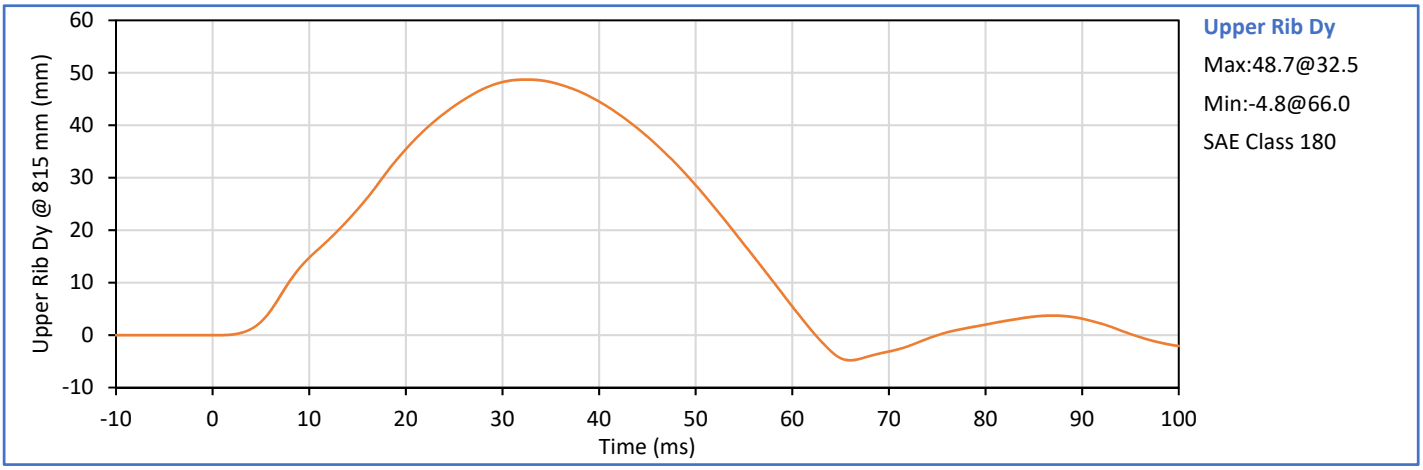
ES-2re 50th Male Side Impact ATD
Upper Rib Drop Test

ATD Serial No.: F035

Test Date: 2020-02-26

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
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.6	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	48.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

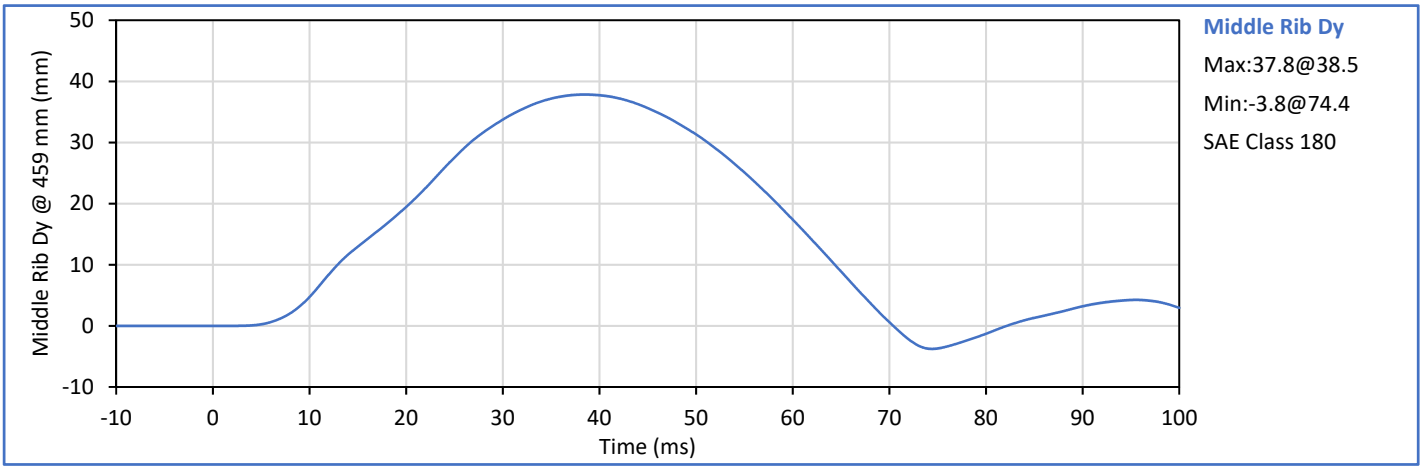
Applus IDIADA KARCO

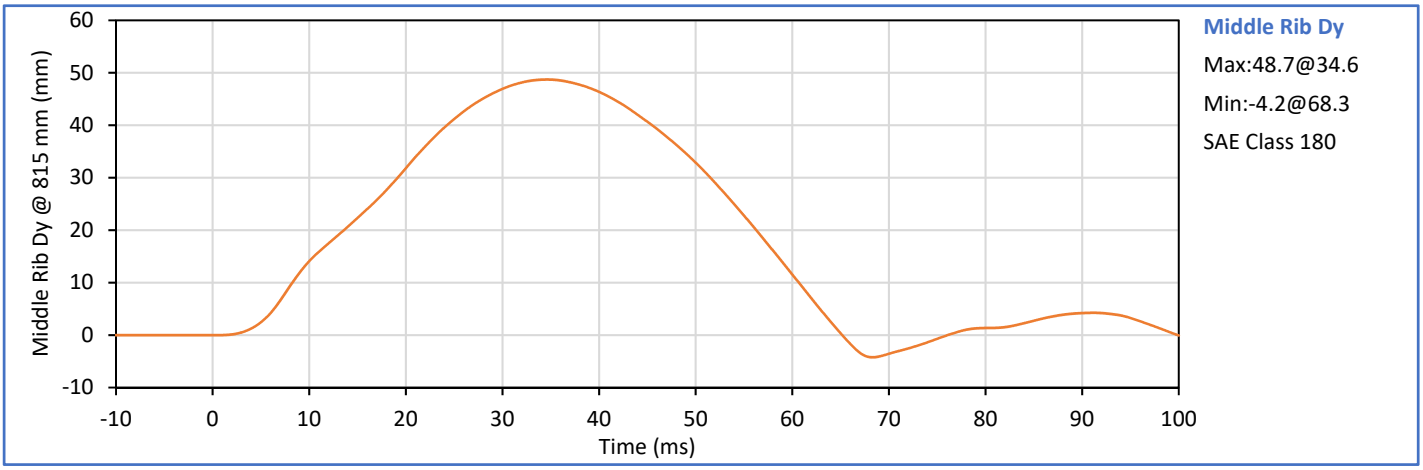
ES-2re 50th Male Side Impact ATD
Middle Rib Drop Test

ATD Serial No.: F035

Test Date: 2020-02-26

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
Middle Rib Dy @ 459mm	mm	36.0	40.0	37.8	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	48.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

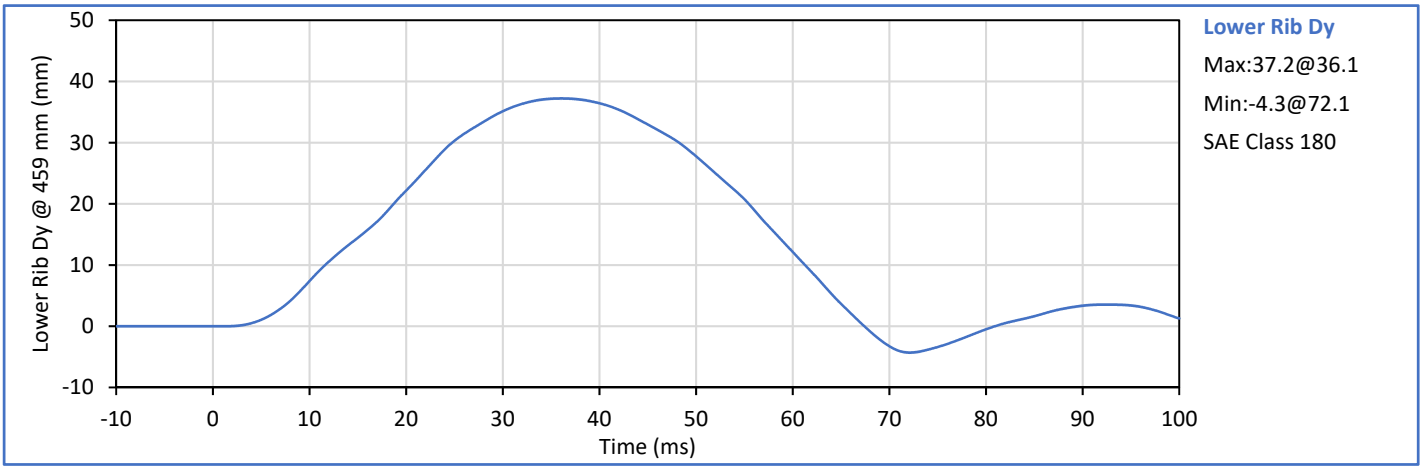
Applus IDIADA KARCO

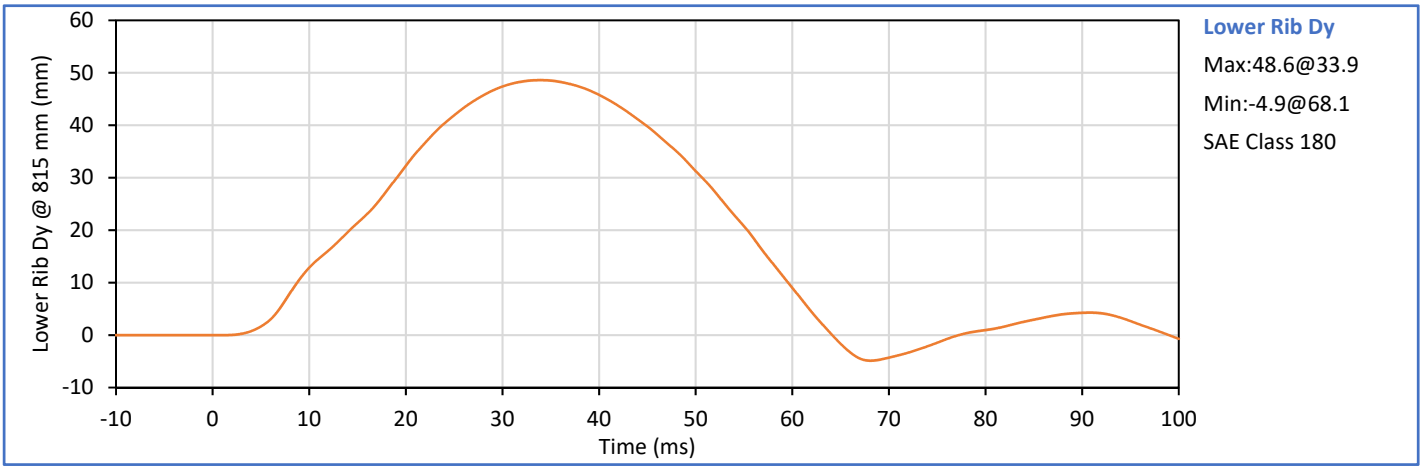
ES-2re 50th Male Side Impact ATD
Lower Rib Drop Test

ATD Serial No.: F035

Test Date: 2020-02-26

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
Lower Rib Dy @ 459mm	mm	36.0	40.0	37.2	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	48.6	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

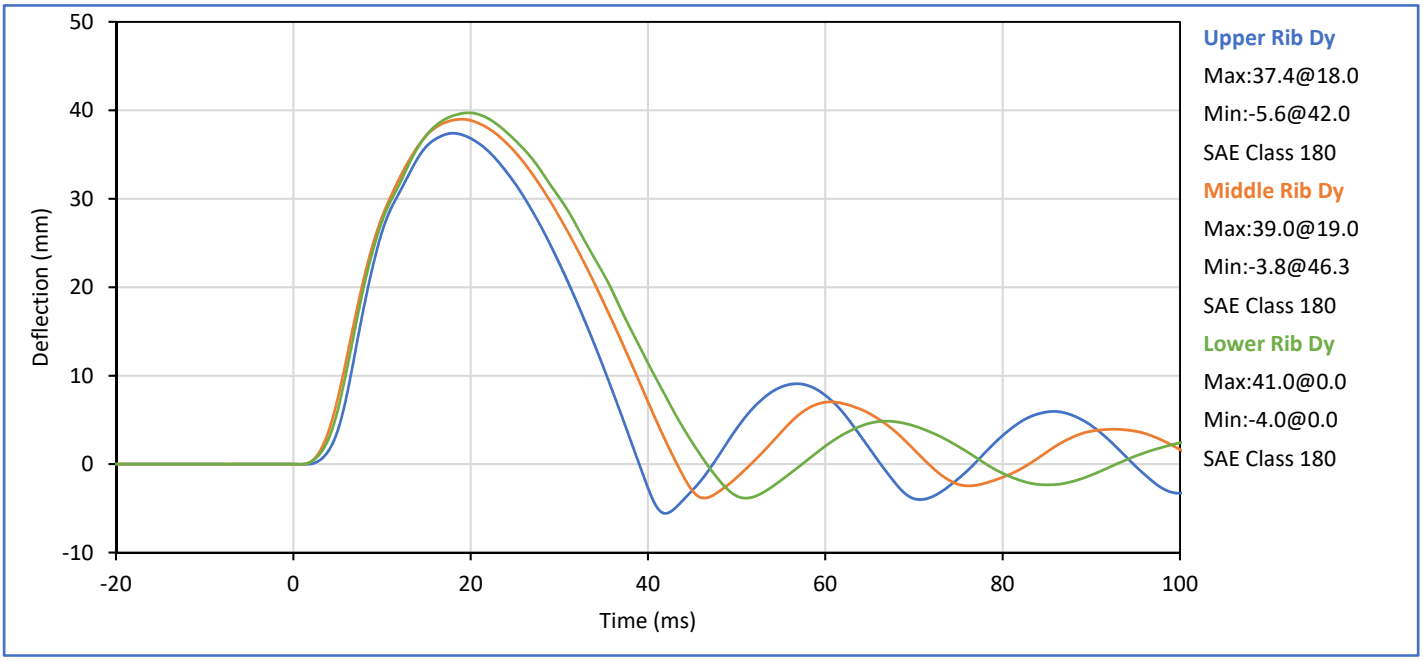
Approved By: P. Puzzuto

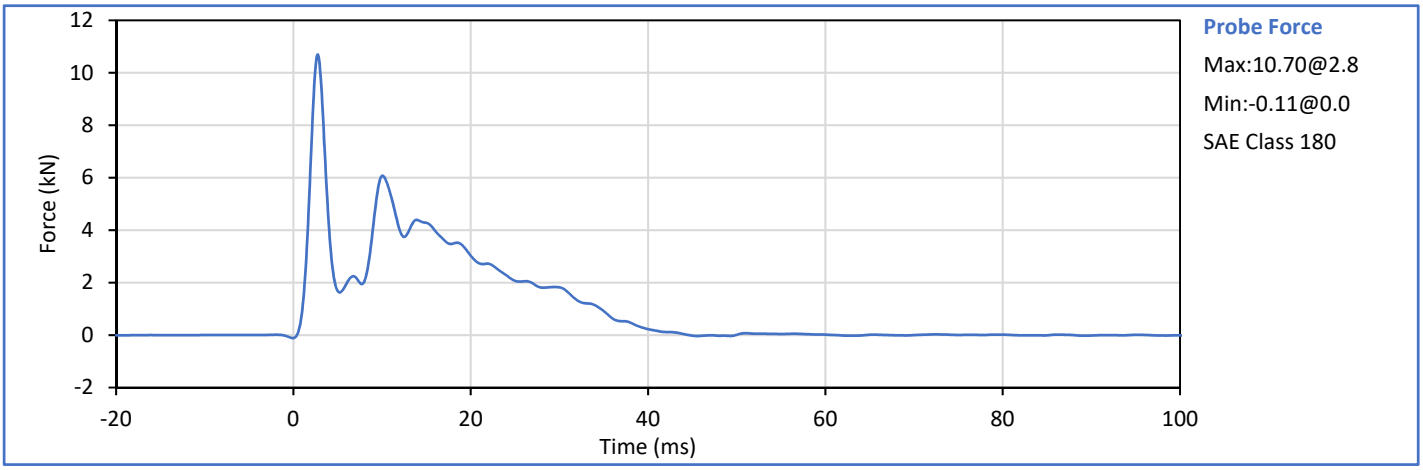
Applus IDIADA
KARCO

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

ATD Serial No.: F035 Test Date: 2020-02-26

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	27	Pass
Impactor Velocity	m/s	5.40	5.60	5.52	Pass
Peak Upper Rib Dy	mm	34.0	41.0	37.4	Pass
Peak Middle Rib Dy	mm	37.0	45.0	39.0	Pass
Peak Lower Rib Dy	mm	37.0	44.0	39.7	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	6.08	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

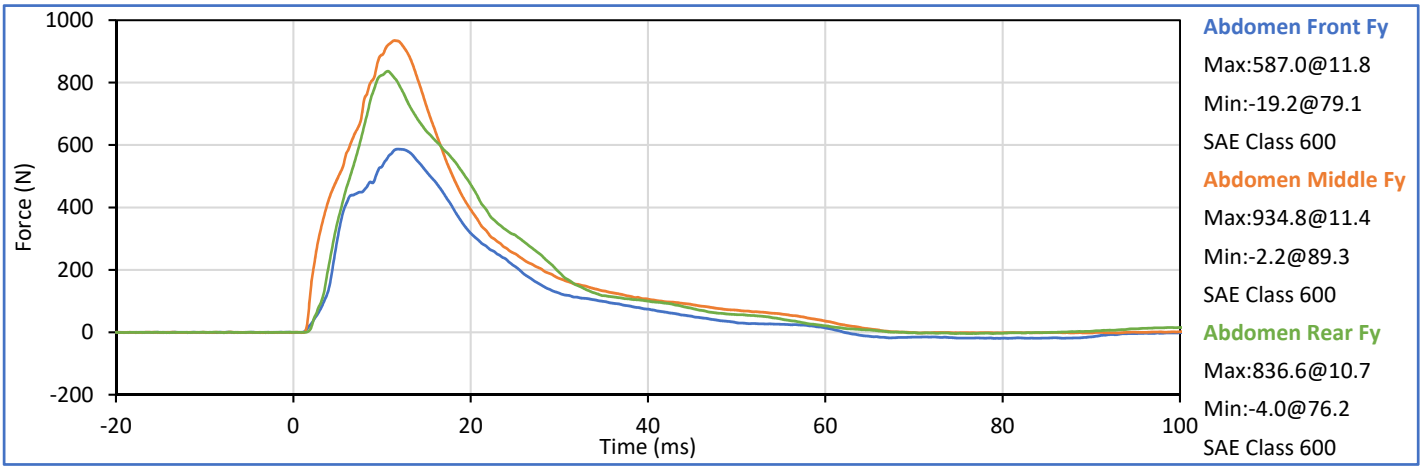
Approved By: P. Puzzuto

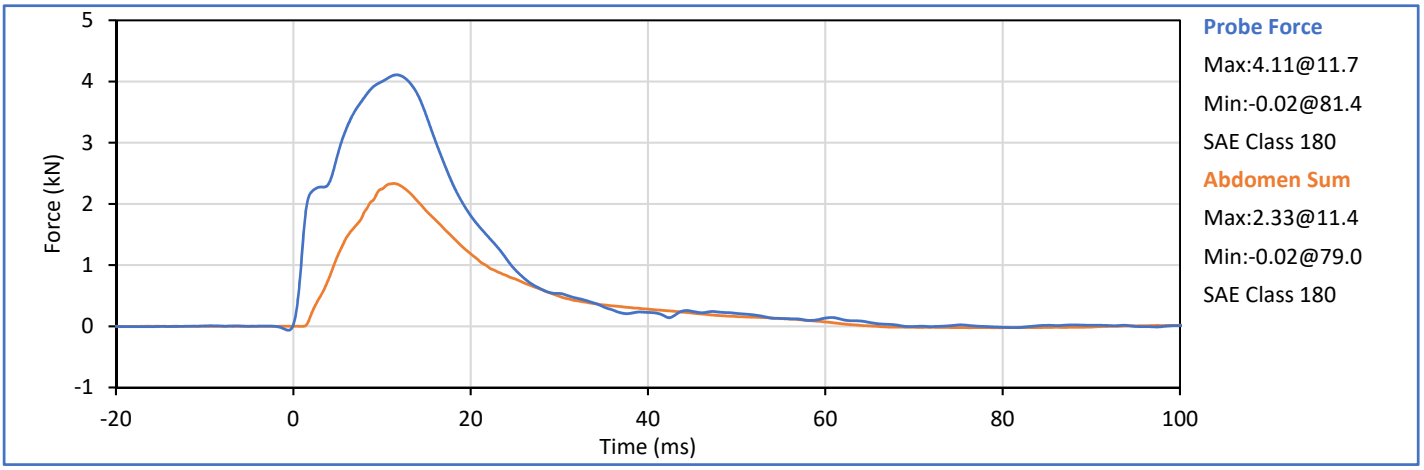
Applus IDIADA
KARCO

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

ATD Serial No.: F035 Test Date: 2020-02-26

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
Impactor Velocity	m/s	3.90	4.10	4.01	Pass
Peak Impactor Force	kN	4.00	4.80	4.11	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.7	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.33	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	11.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

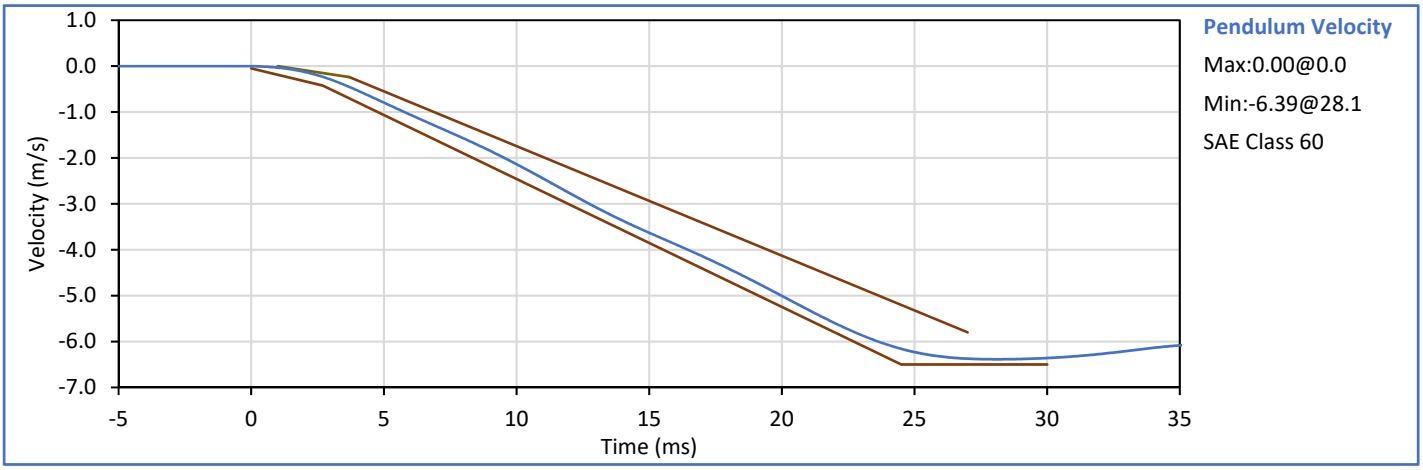
Applus IDIADA KARCO

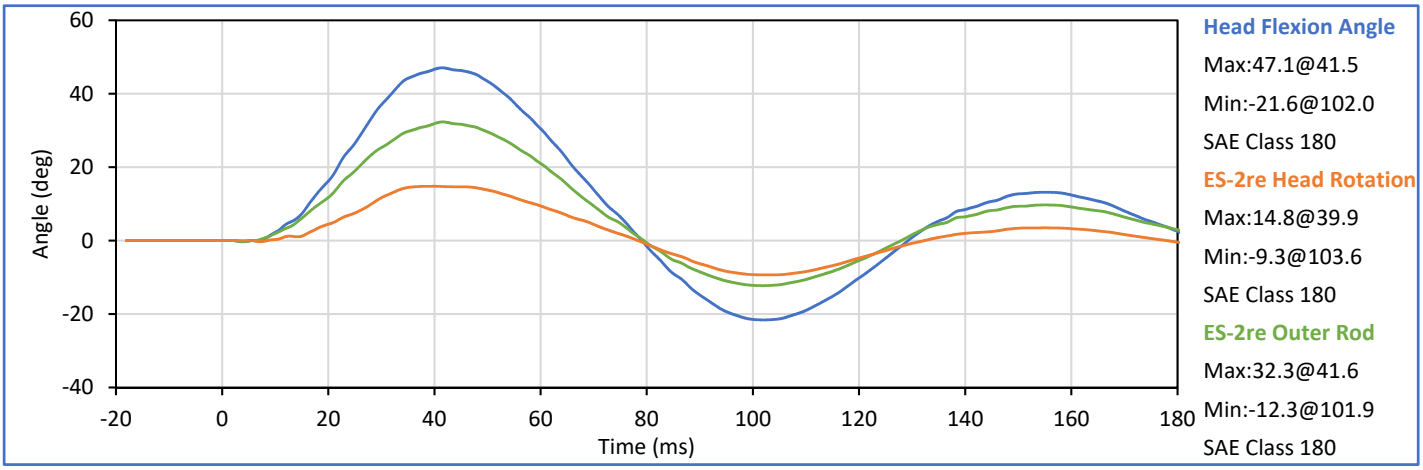
ES-2re 50th Male Side Impact ATD
Lumbar Spine Flexion

ATD Serial No.: F035

Test Date: 2020-02-26

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	5.95	6.15	6.08	Pass
Peak Headform Flexion	deg	45.0	55.0	47.1	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	41.5	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	37.6	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

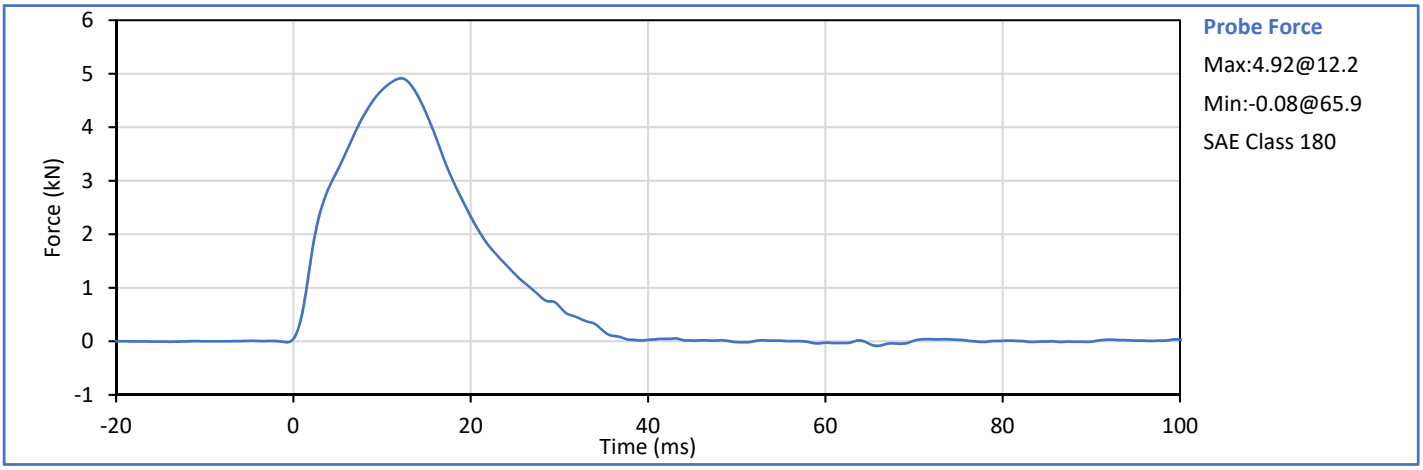
Approved By: P. Puzzuto

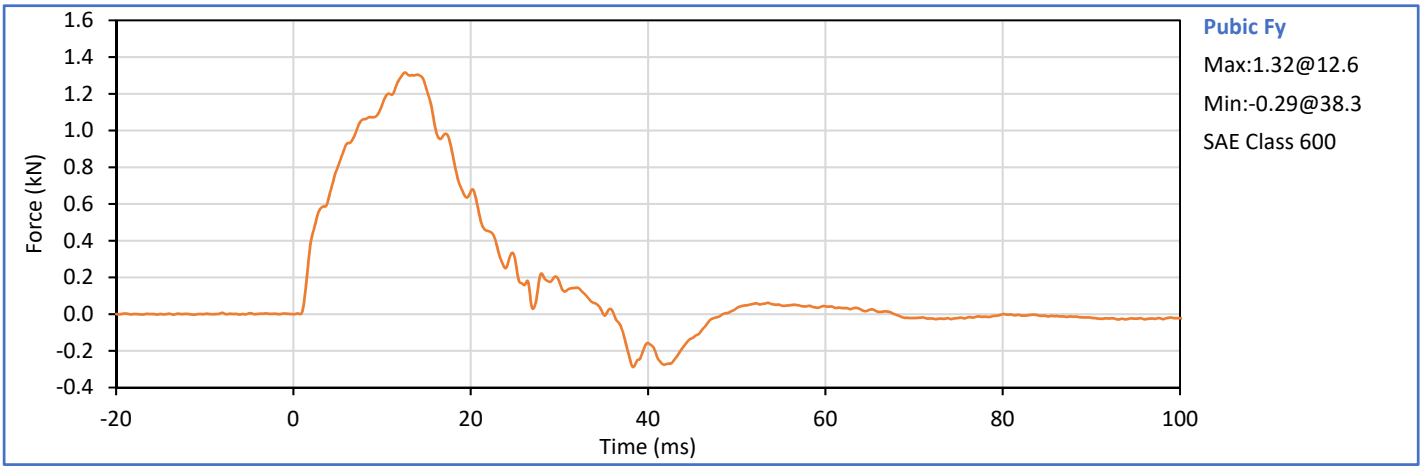
Applus IDIADA KARCO

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

ATD Serial No.: F035 Test Date: 2020-02-26

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	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Force	kN	4.70	5.40	4.92	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.2	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.32	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	12.6	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
S/N: 308

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 308 Test Date: 2020-02-24

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	779	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	86	Pass
D - H Point From Seatback	mm	141	151	150	Pass
E - Shoulder Pivot From Backline	mm	97	107	105	Pass
F - Thigh Clearance	mm	119	135	130	Pass
G - Head Breadth	mm	140	148	142	Pass
H - Head Back From Backline	mm	40	46	42	Pass
I - Head Depth	mm	178	188	186	Pass
J - Head Circumference	mm	541	551	544	Pass
K - Buttock To Knee Length	mm	514	540	523	Pass
L - Popliteal Height	mm	343	369	355	Pass
K - Knee Pivot To Floor Height	mm	392	409	400	Pass
N - Buttock Popliteal Length	mm	416	442	433	Pass
O - Chest Depth W/O Jacket	mm	195	211	204	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	254	Pass
S - Knee Joint To Seatback	mm	477	493	486	Pass
V - Shoulder Width	mm	341	357	347	Pass
W - Foot Width	mm	78	94	85	Pass
Y - Chest Circumference W/Jacket	mm	851	881	871	Pass
Z - Waist Circumference	mm	761	791	777	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

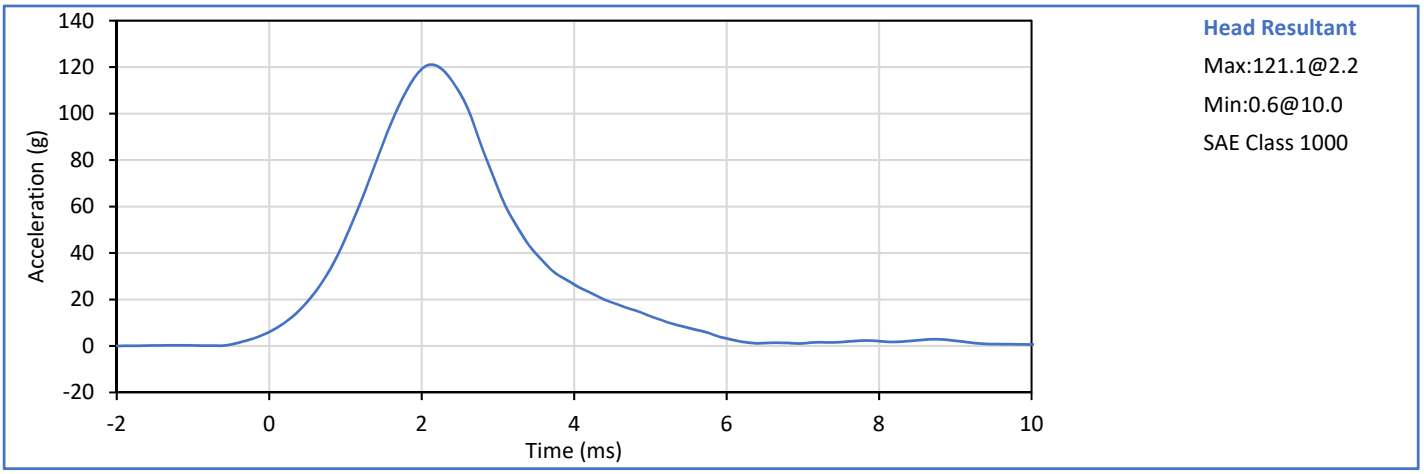
Approved By: P. Puzzuto

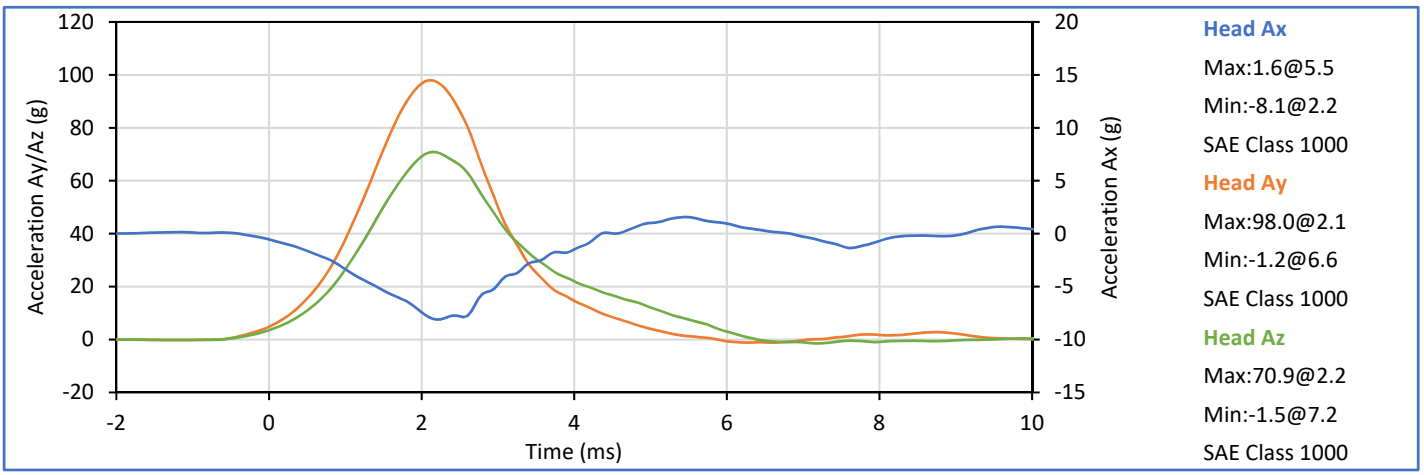
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 308 Test Date: 2020-02-25

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	20.6	Pass
Laboratory Humidity	%	10	70	28	Pass
Peak Resultant Acceleration	g	115.0	137.0	121.1	Pass
Peak Head Ax	g	-15.0	15.0	-8.1	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.4	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

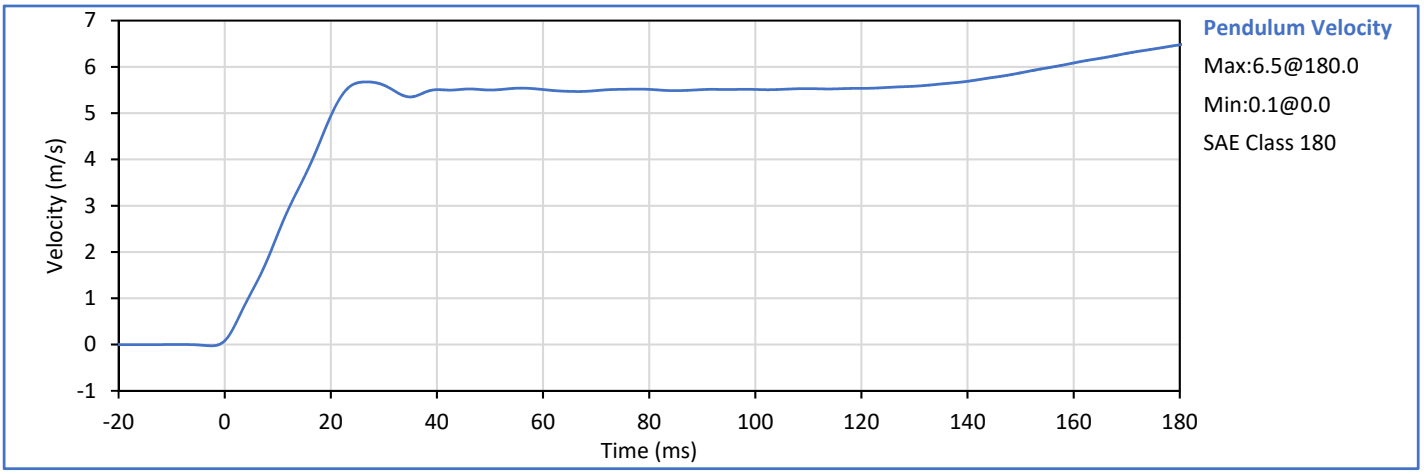
Approved By: P. Puzzuto

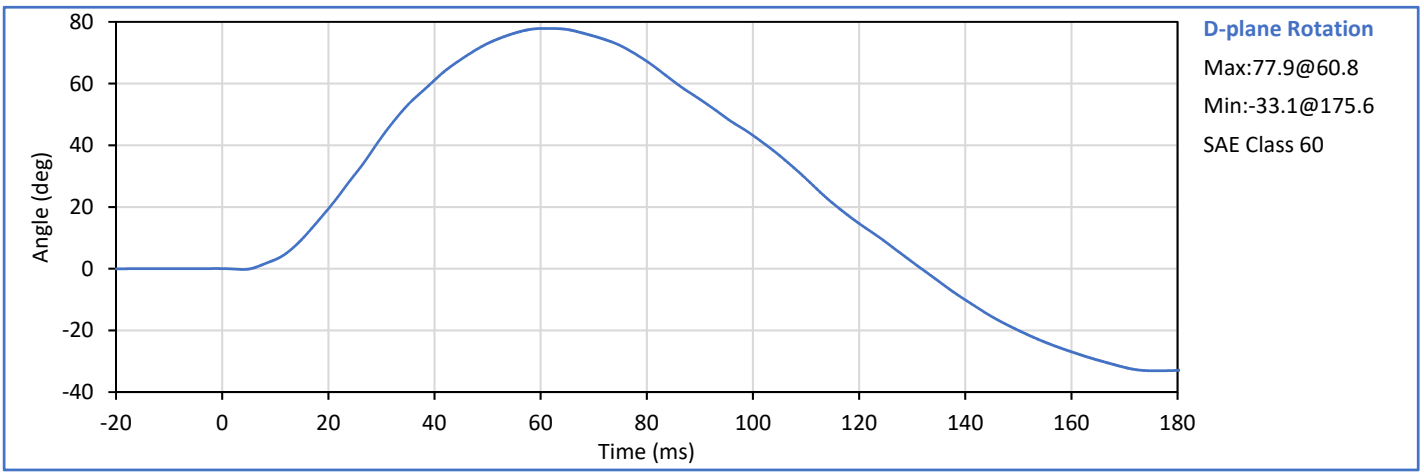
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-02-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	34	Pass
Pendulum Velocity	m/s	5.51	5.63	5.61	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.39	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.62	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.94	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.65	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.68	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	77.9	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.8	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-43.4	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	114.4	Pass
			Overall Test Results		Pass





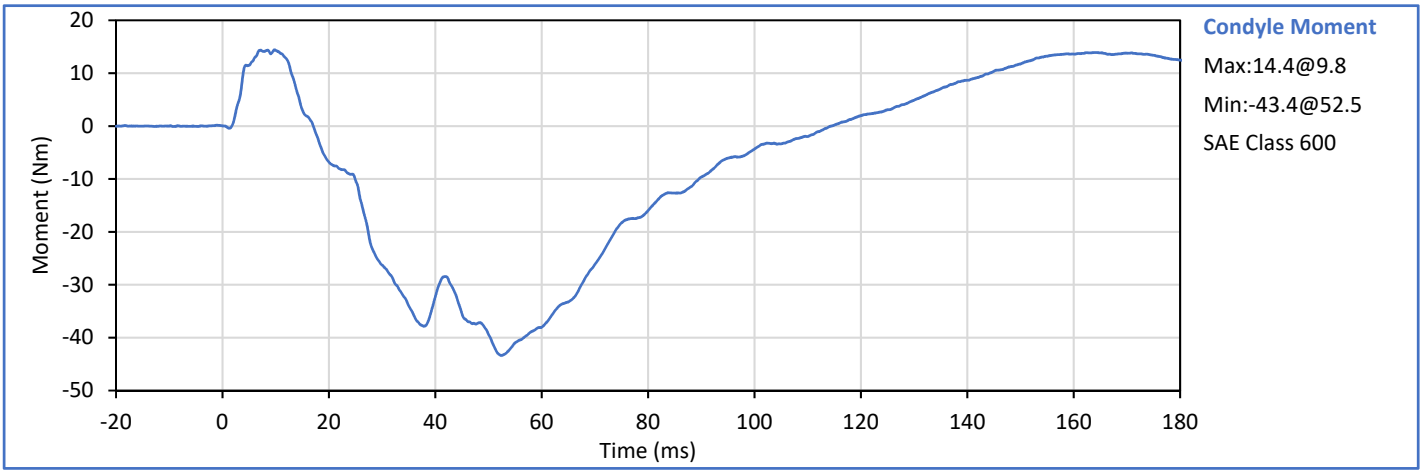
Technician: J. Hernandez

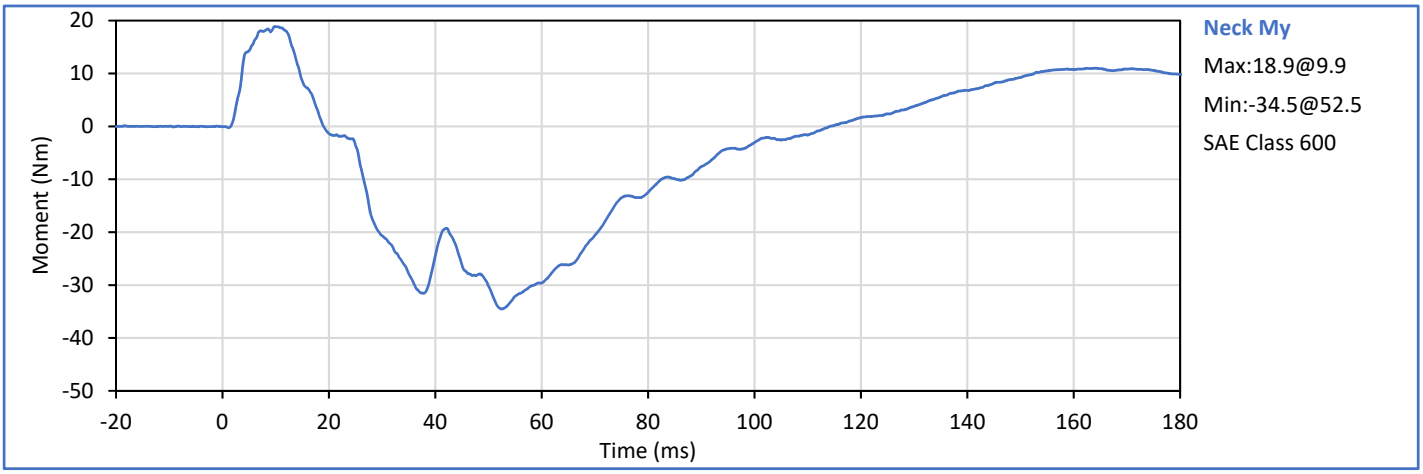
Approved By: P. Puzzuto

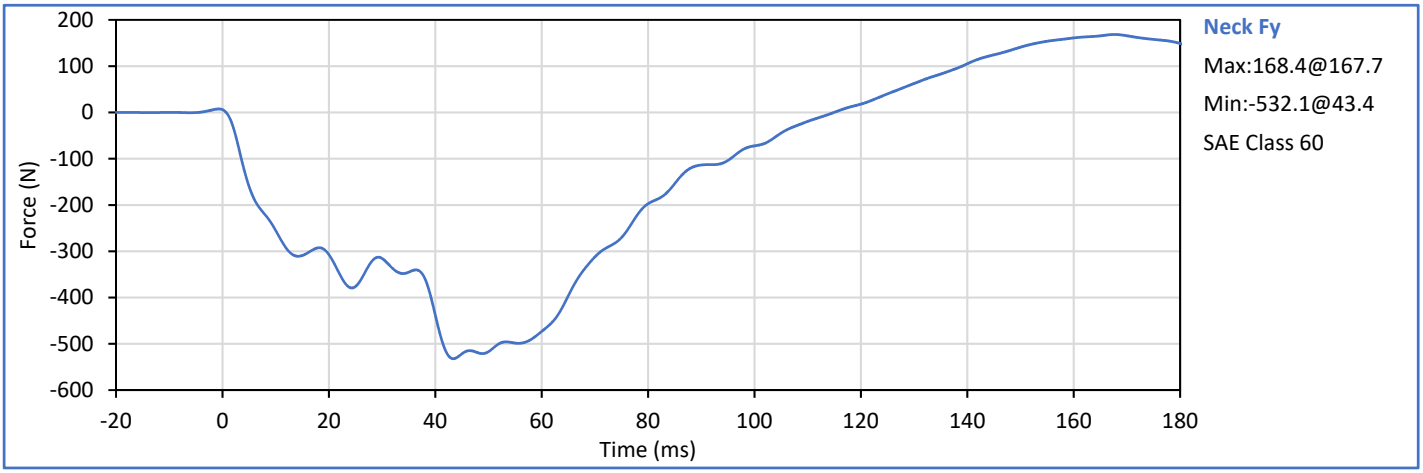
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-02-04





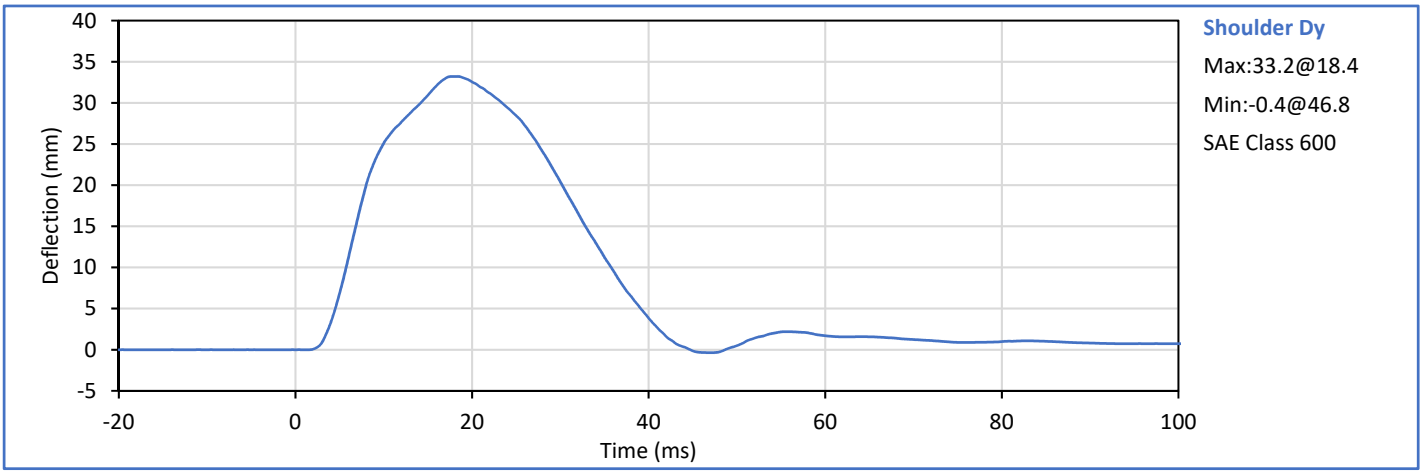


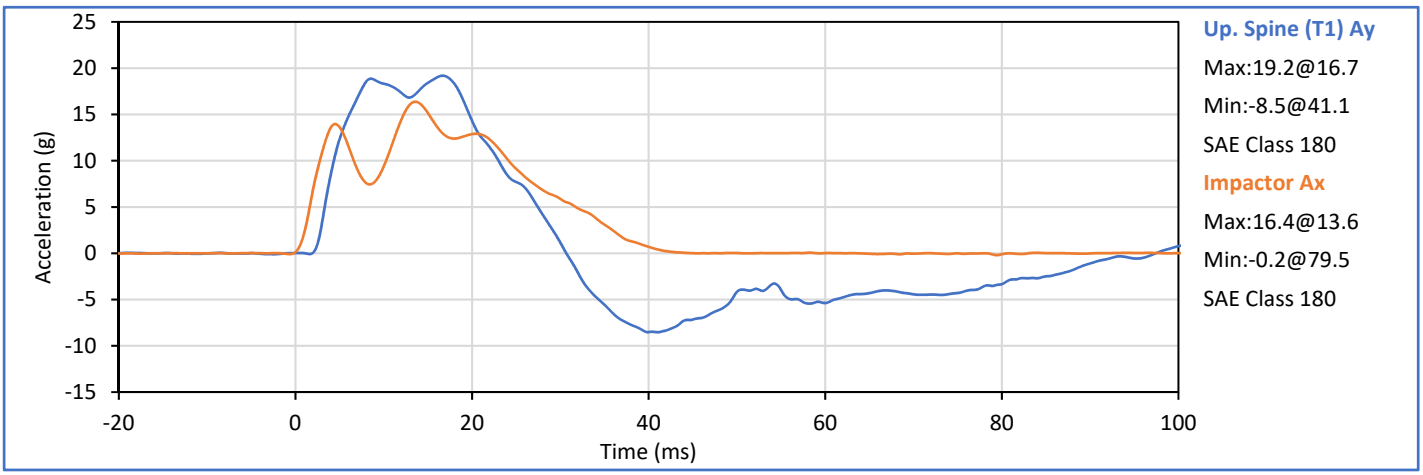
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 308 Test Date: 2020-02-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	32	Pass
Impactor Velocity	m/s	4.20	4.40	4.28	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.2	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	19.2	Pass
Peak Impactor Ax	g	13.0	18.0	16.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

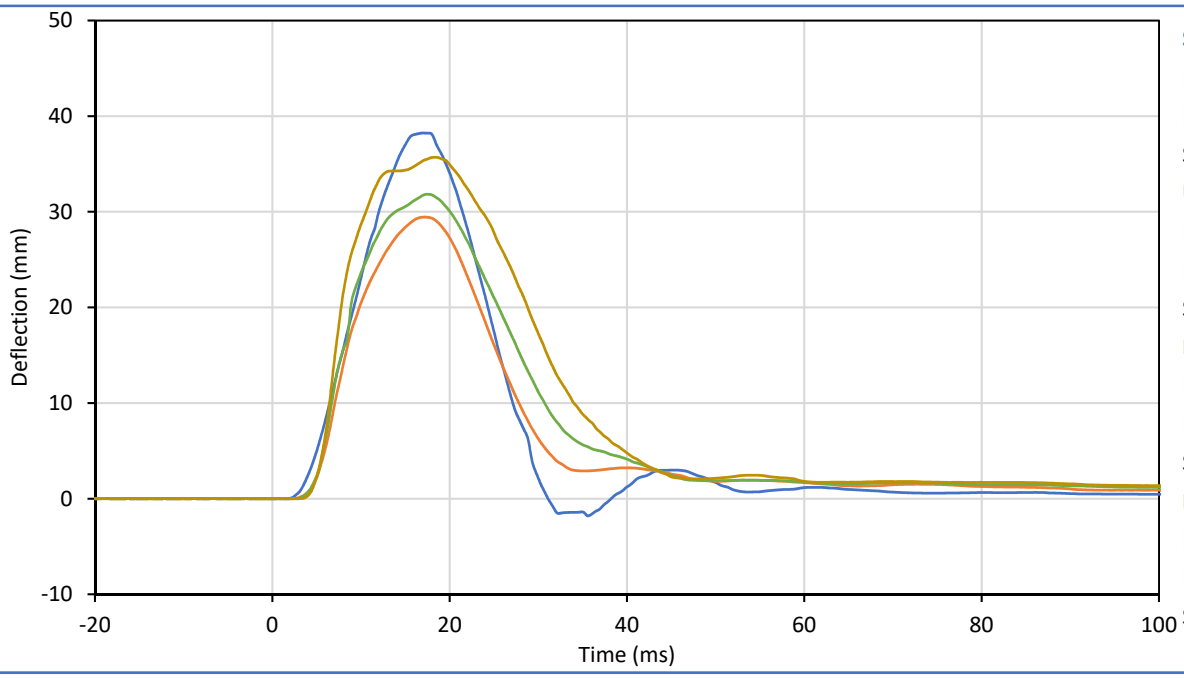
Approved By: P. Puzzuto

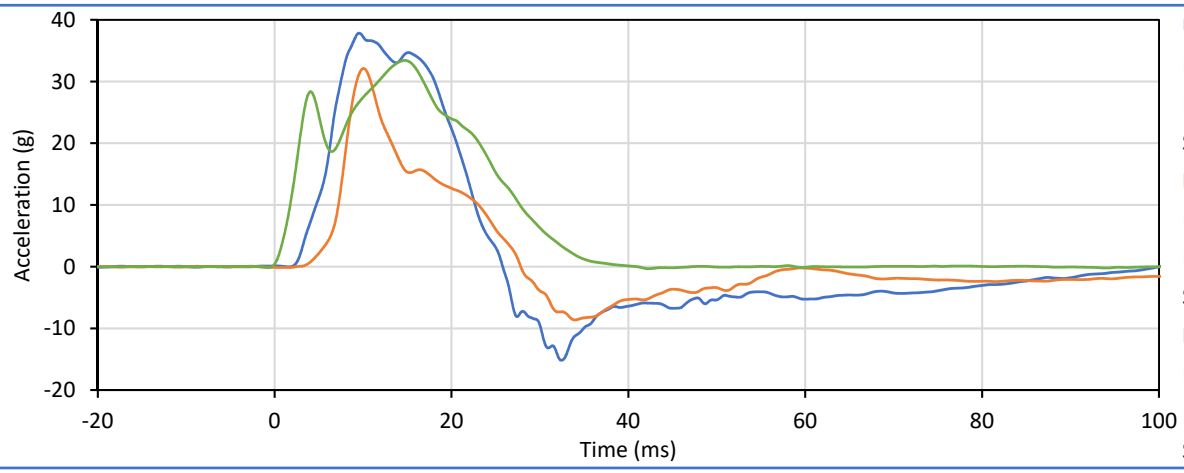
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2020-02-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	31	Pass
Impactor Velocity	m/s	6.60	6.80	6.70	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.2	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.4	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.8	Pass
Peak Lower Rib Dy	mm	32.0	38.0	35.7	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	37.8	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	32.1	Pass
Peak Impactor Ax	g	30.0	36.0	33.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

C-17

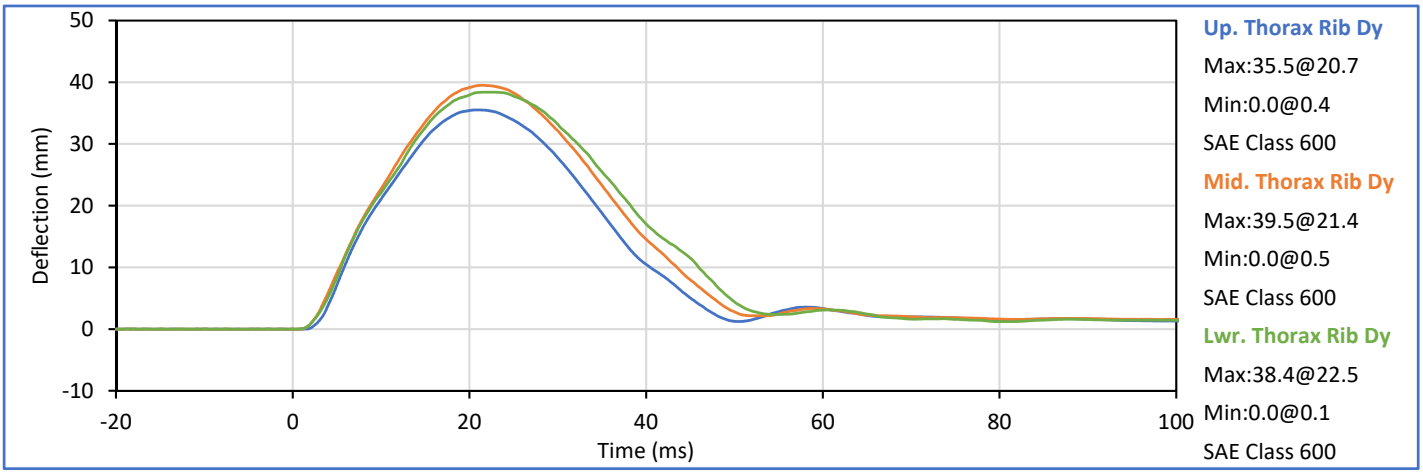
TR-P40045-01-NC

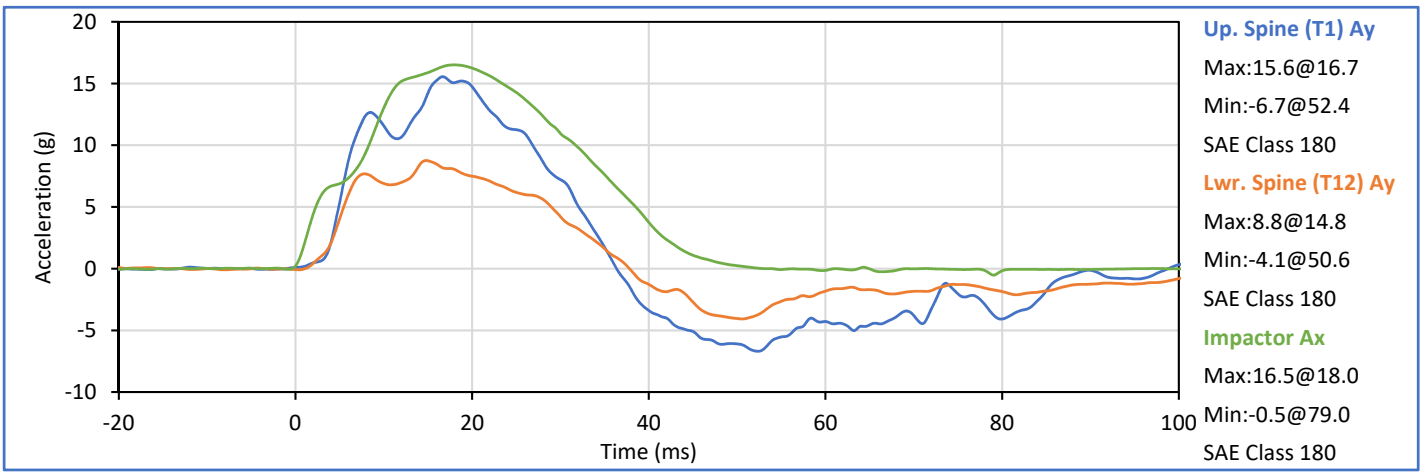
Applus IDIADA
KARCO

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

ATD Serial No.: 308 Test Date: 2020-02-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	31	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Rib Dy	mm	32.0	40.0	35.5	Pass
Peak Middle Rib Dy	mm	39.0	45.0	39.5	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.4	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.6	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	8.8	Pass
Peak Impactor Ax	g	14.0	18.0	16.5	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

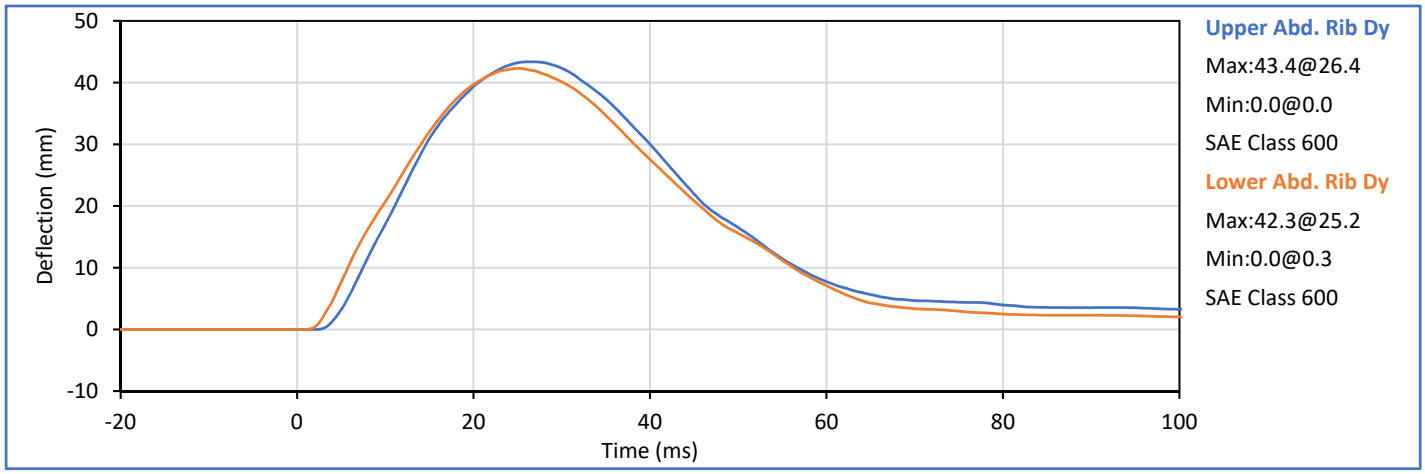
Approved By: P. Puzzuto

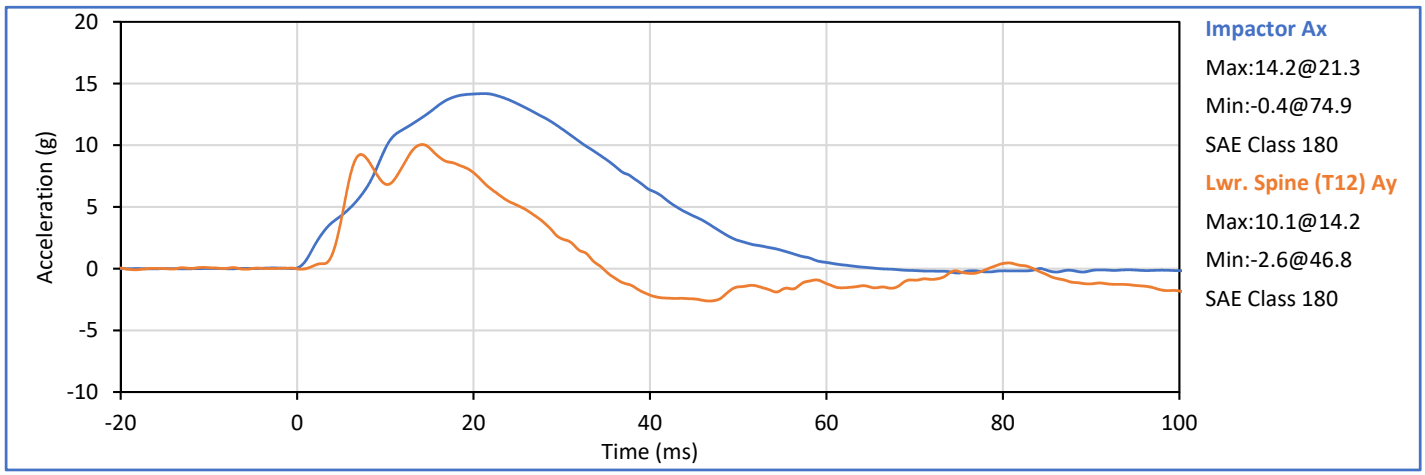
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 308 Test Date: 2020-02-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	32	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	43.4	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	42.3	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.1	Pass
Peak Impactor Ax	g	12.0	16.0	14.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

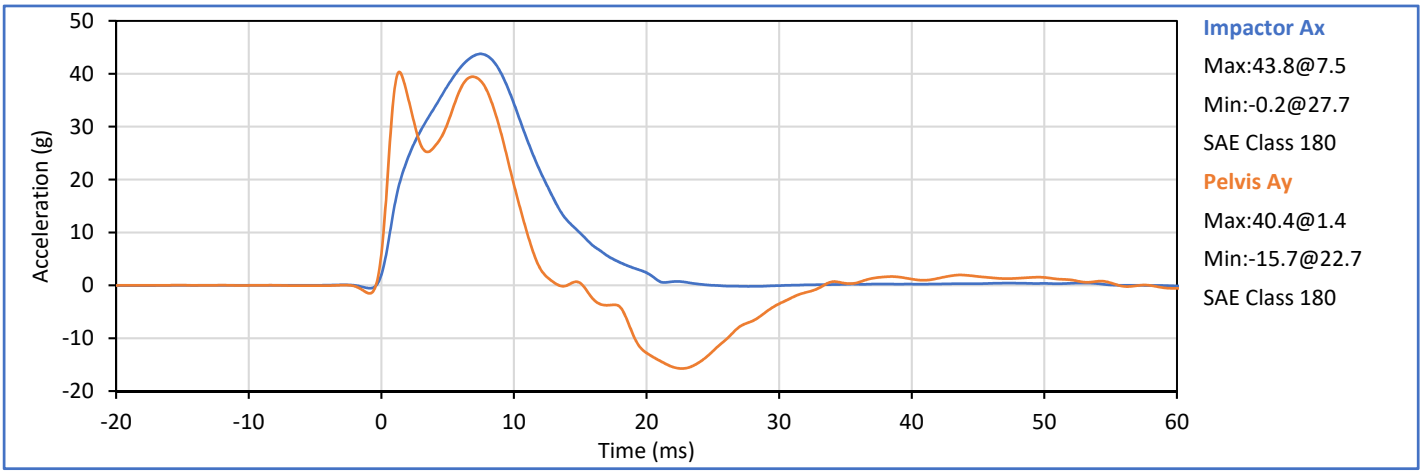
Applus IDIADA
KARCO

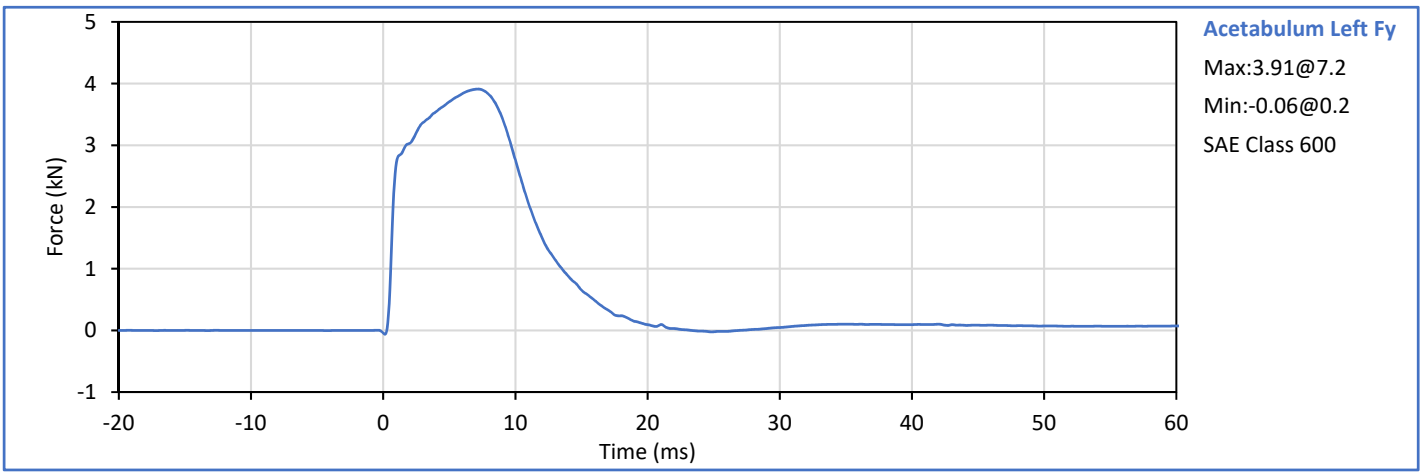
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2020-02-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	31	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.91	Pass
Pelvis Ay after 6ms	g	34.0	42.0	39.5	Pass
Peak Impactor Ax	g	38.0	47.0	43.8	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 11381





Technician: J. Hernandez

Approved By: P. Puzzuto

C-20

TR-P40045-01-NC

SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2020-02-24

Pelvis Plug S/N: 11381

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 11381
Test Number 2850
Report Number 2847
Test Date 8/29/2016 9:06:54 AM

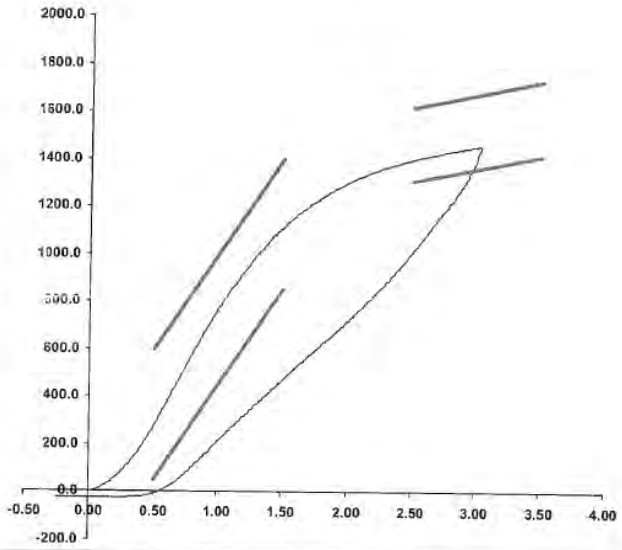
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	281.94	50.00	600.00
Force @ 1.5 mm (N)	1,111.77	850.00	1,400.00
Force @ 2.5 mm (N)	1,398.09	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,454.04	1,361.00	1,673.00

Testing Machine STM-20 5965542
Load Cell S/N (TI240813), Units (LBS) 1000

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

Notes:

Force (-N) vs Extension (-mm)



Operator DC

Part Number 180-4450

Template No 107 29-Aug-16
SACO Research

By DC Date : 8/29/16

SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2062 FAX

Applus IDIADA
KARCO

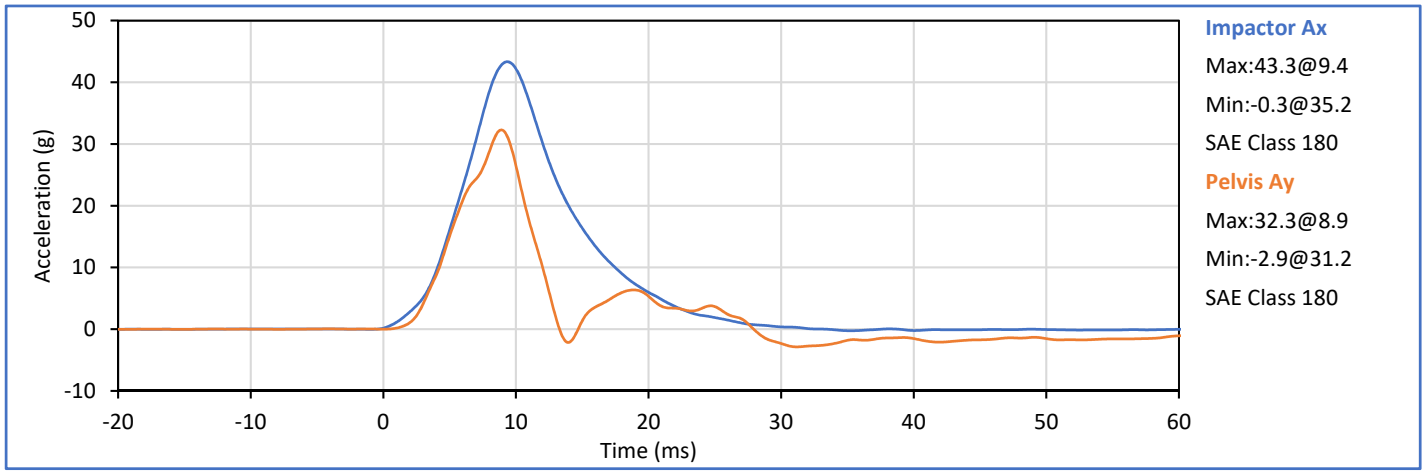
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

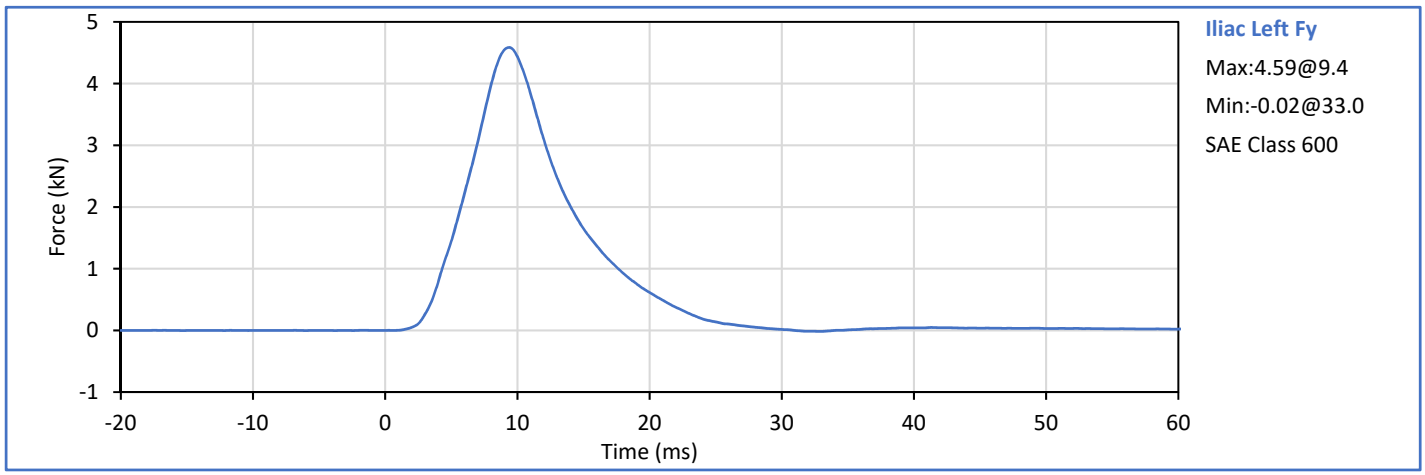
ATD Serial No.: 308 Test Date: 2020-02-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	31	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Iliac Fy	kN	4.10	5.10	4.59	Pass
Pelvis Ay after 6ms	g	28.0	39.0	32.3	Pass
Peak Impactor Ax	g	36.0	45.0	43.3	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 (SACO) *

* Plug is not impacted and remains certified





Technician: J. Hernandez

Approved By: P. Puzzuto

C-22

TR-P40045-01-NC

APPENDIX C
Post-Test ATD Qualification and Performance Verification
ES-2re 50th Male Side Impact ATD, Left Side Configuration
S/N: F035

Applus IDIADA KARCO

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

ATD Serial No.: F035

Test Date: 2020-03-03

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	32	Pass
1 - Sitting Height	mm	900	918	905	Pass
2 - Seat to Shoulder Joint	mm	558	572	565	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	352	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	101	Pass
5 - Sole to Seat, Sitting	mm	433	451	444	Pass
6 - Head Width	mm	152	158	155	Pass
7 - Shoulder/Arm Width	mm	461	479	469	Pass
8 - Thorax Width	mm	322	332	326	Pass
9 - Abdomen Width	mm	273	287	276	Pass
10 - Pelvis Lap Width	mm	359	373	368	Pass
11 - Head Depth	mm	196	206	200	Pass
12 - Thorax Depth	mm	262	272	266	Pass
13 - Abdomen Depth	mm	194	204	200	Pass
14 - Pelvis Depth	mm	235	245	243	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	606	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

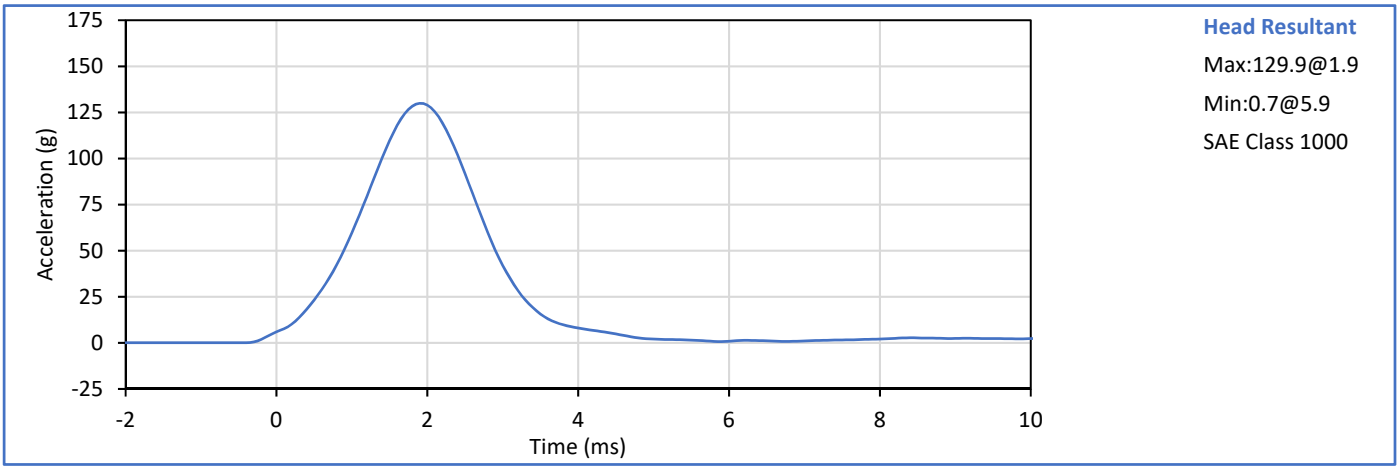
Approved By: P. Puzzuto

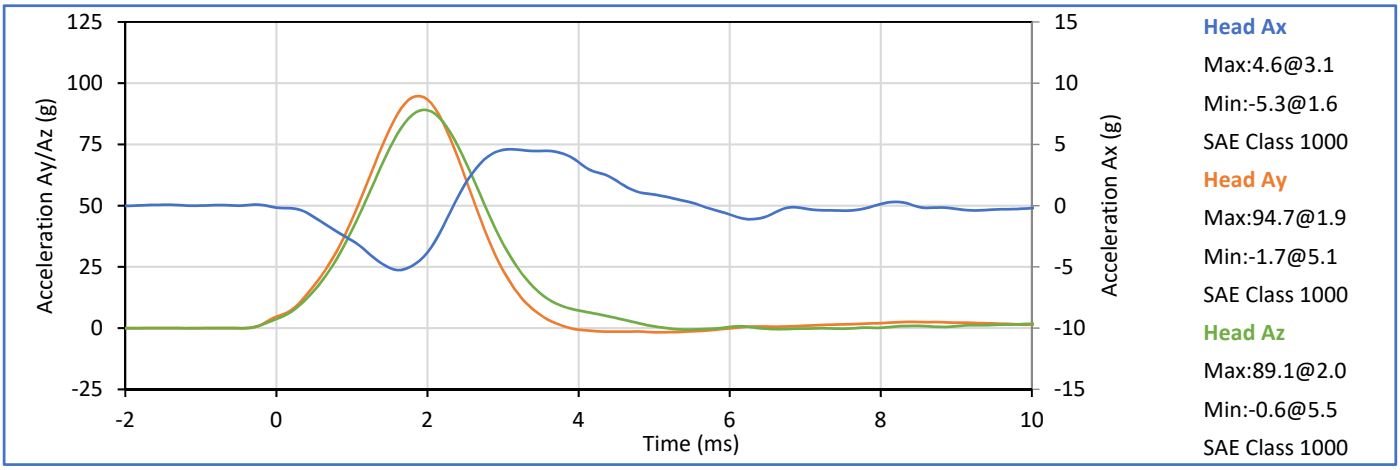
Applus IDIADA KARCO

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

ATD Serial No.: F035 Test Date: 2020-03-03

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
Peak Resultant Acceleration	g	125.0	155.0	129.9	Pass
Peak Head Ax	g	-15.0	15.0	4.6	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

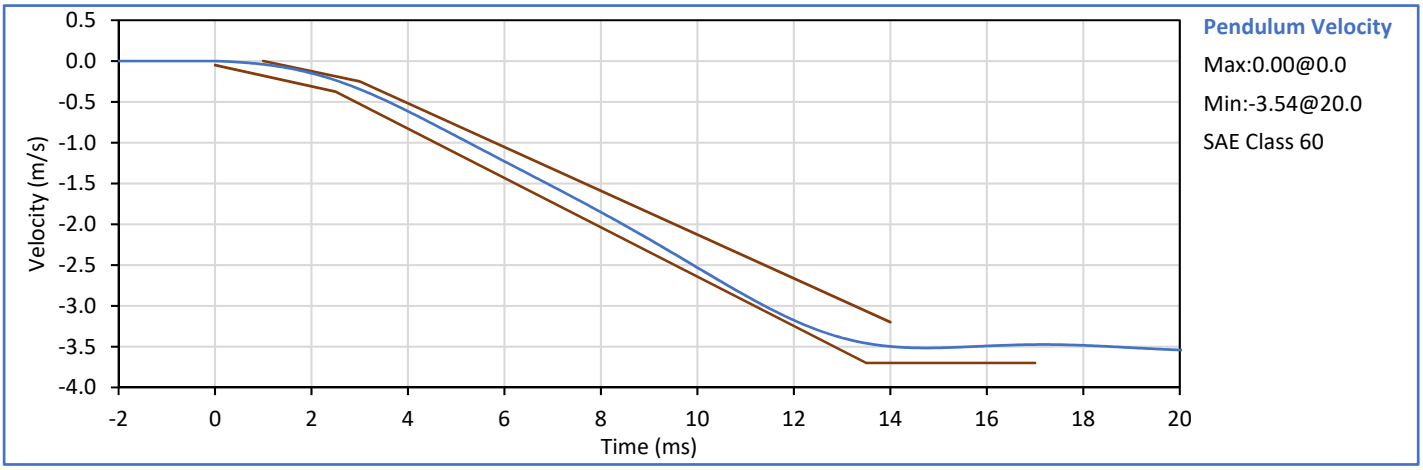
Applus IDIADA
KARCO

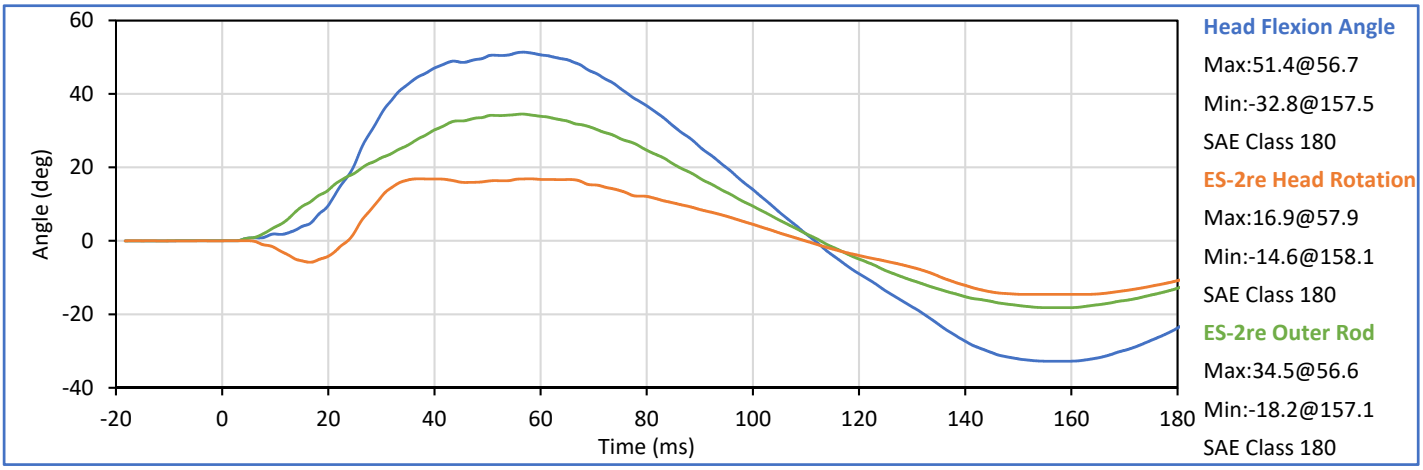
ES-2re 50th Male Side Impact ATD
Neck Flexion

ATD Serial No.: F035

Test Date: 2020-03-04

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	3.49	Pass
Peak Headform Flexion	deg	49.0	59.0	51.4	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	56.7	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	55.0	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

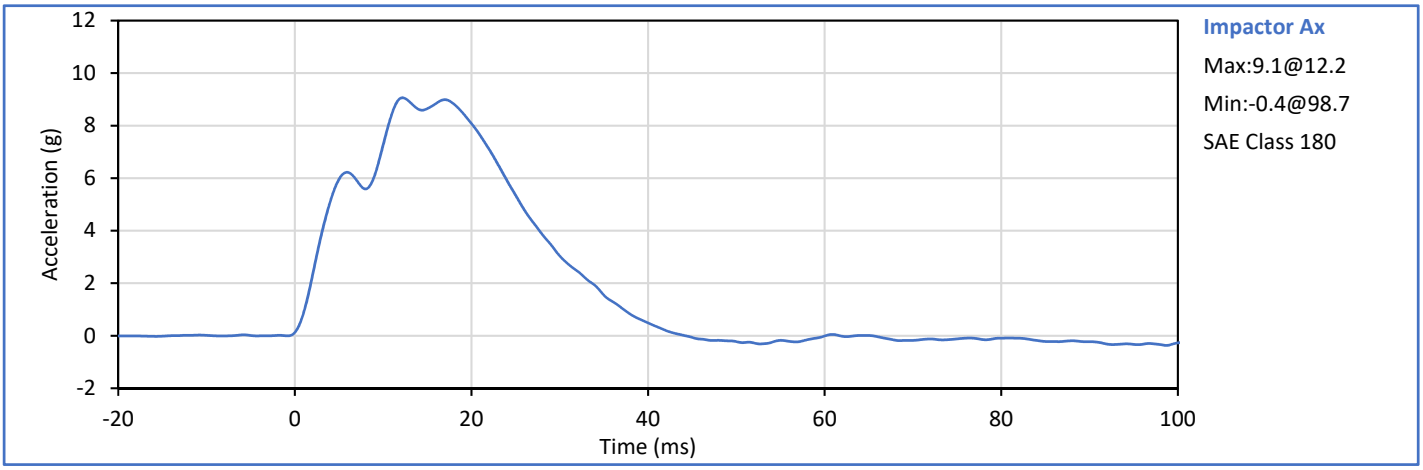
Applus IDIADA KARCO

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

ATD Serial No.: F035

Test Date: 2020-03-03

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	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Ax	g	7.5	10.5	9.1	Pass
			Overall Test Results		Pass



Technician: J. Hernandez

Approved By: P. Puzzuto

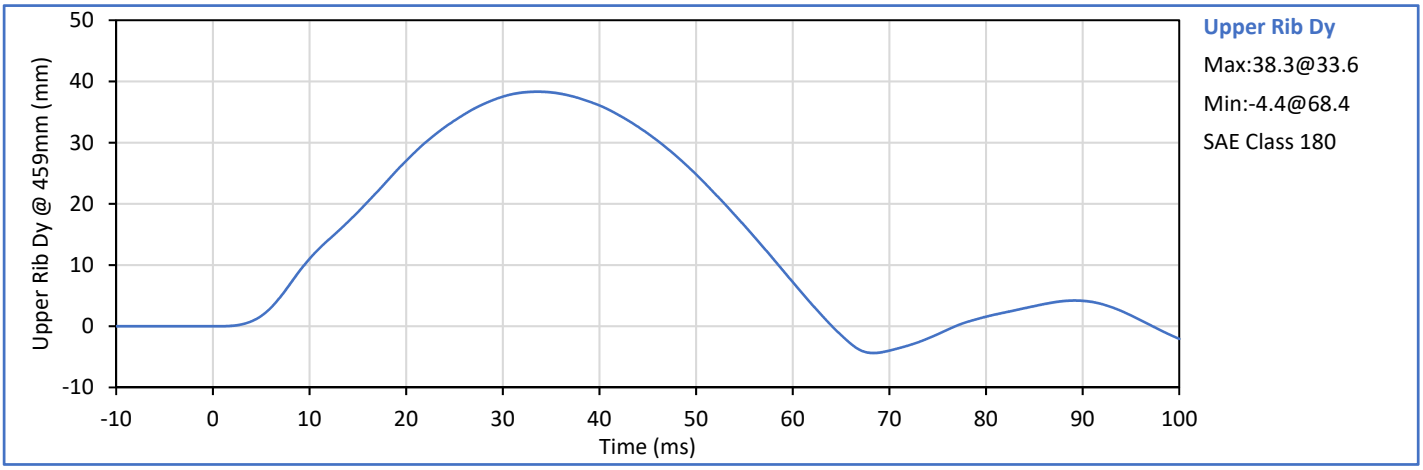
Applus IDIADA KARCO

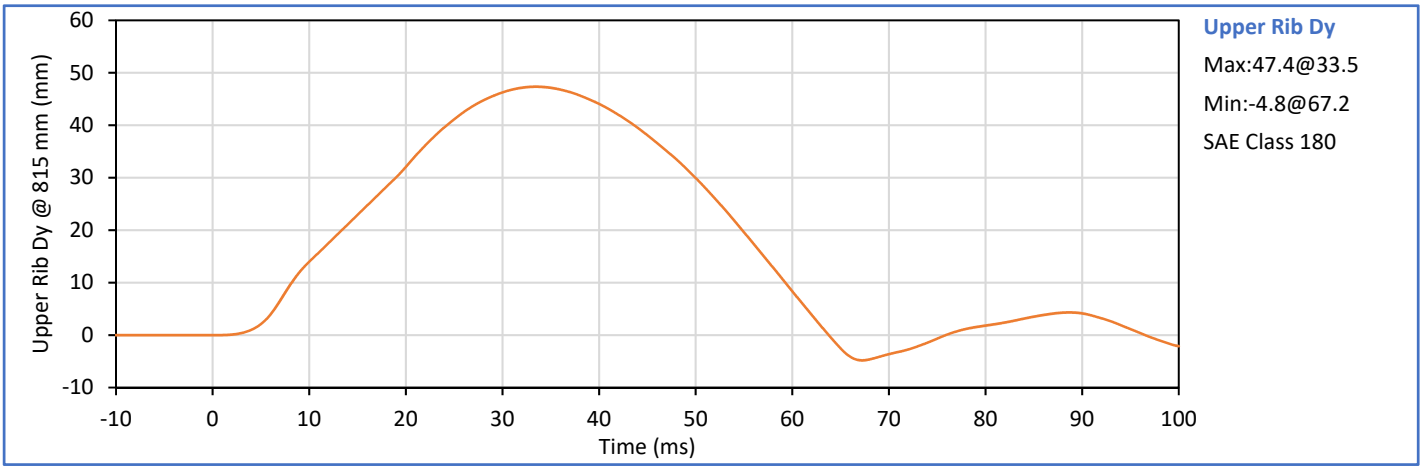
ES-2re 50th Male Side Impact ATD
Upper Rib Drop Test

ATD Serial No.: F035

Test Date: 2020-03-03

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	30	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	38.3	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	47.4	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

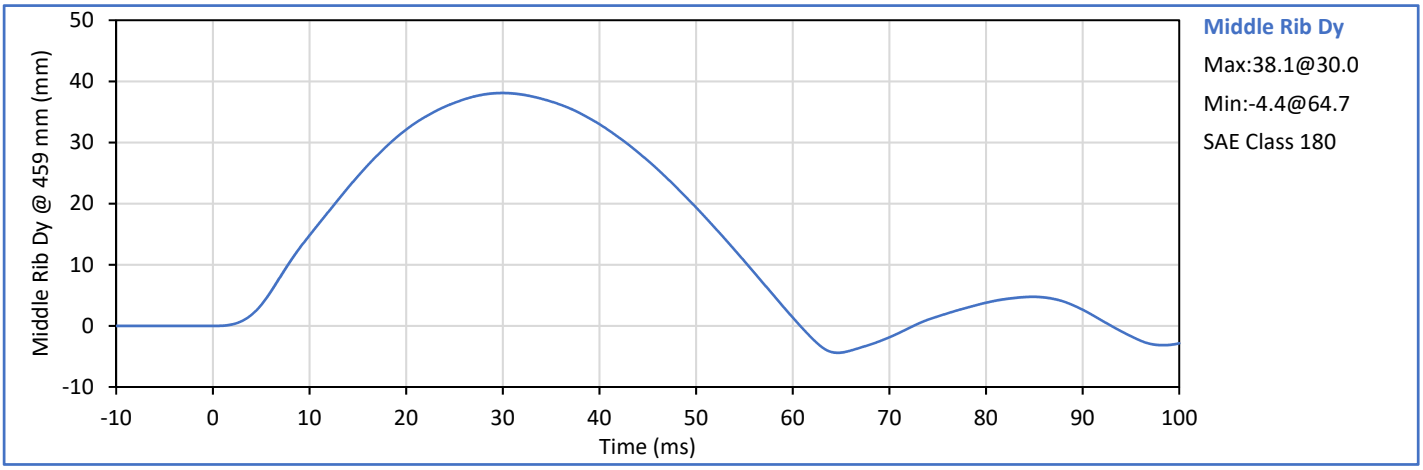
Applus IDIADA KARCO

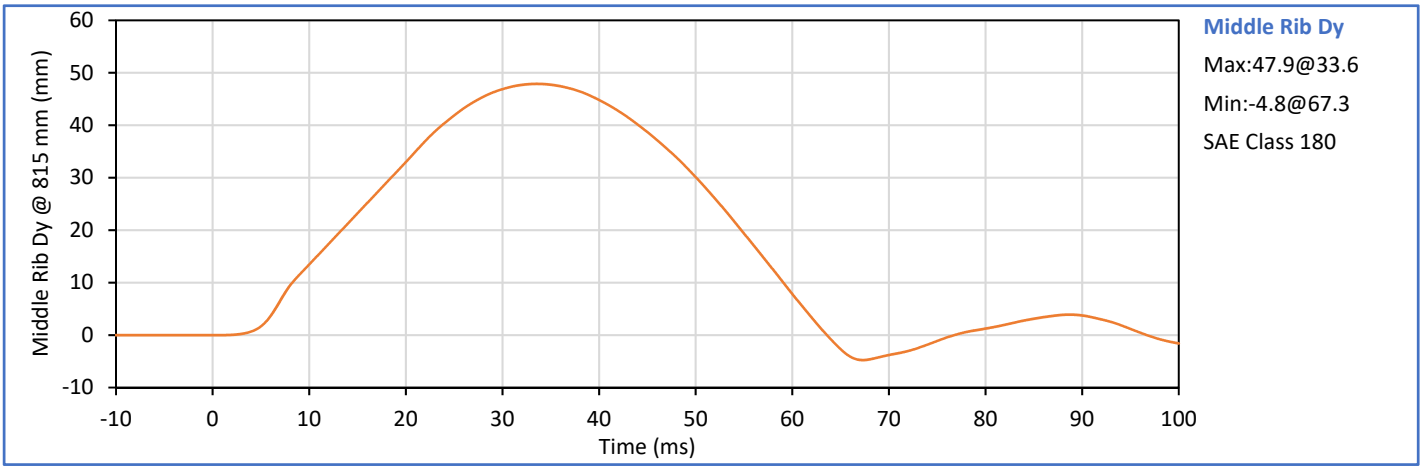
ES-2re 50th Male Side Impact ATD
Middle Rib Drop Test

ATD Serial No.: F035

Test Date: 2020-03-03

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	33	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	38.1	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	47.9	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

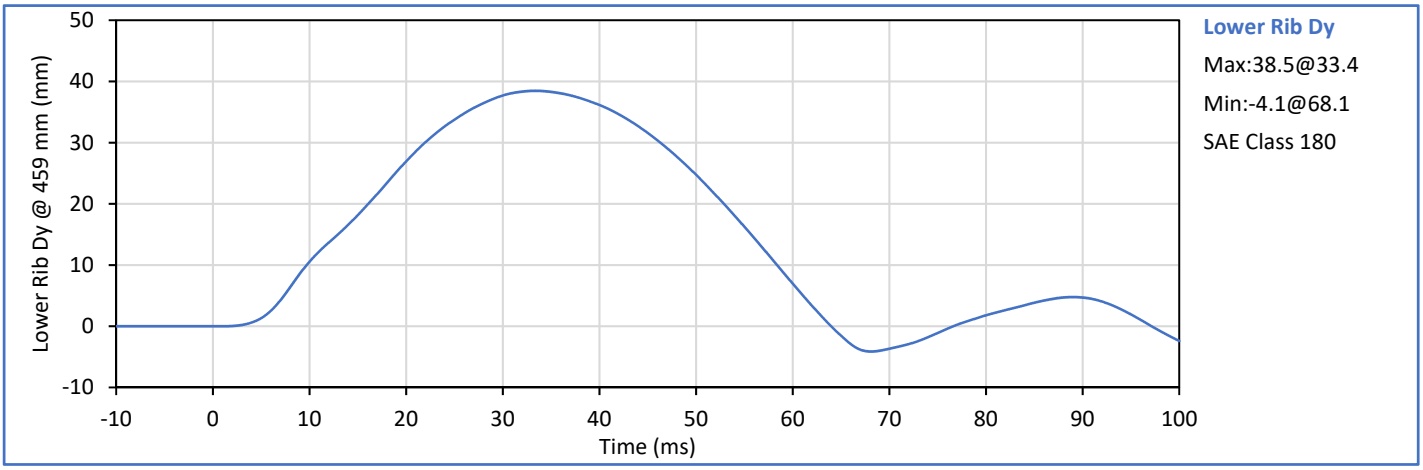
Applus IDIADA
KARCO

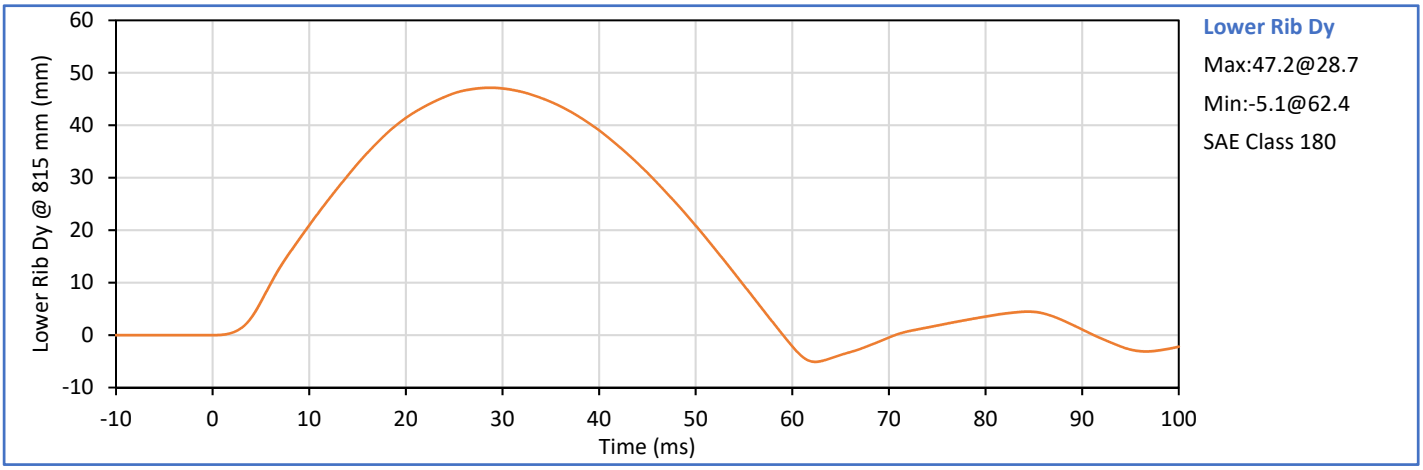
ES-2re 50th Male Side Impact ATD
Lower Rib Drop Test

ATD Serial No.: F035

Test Date: 2020-03-03

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	33	Pass
Lower Rib Dy @ 459mm	mm	36.0	40.0	38.5	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	47.2	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

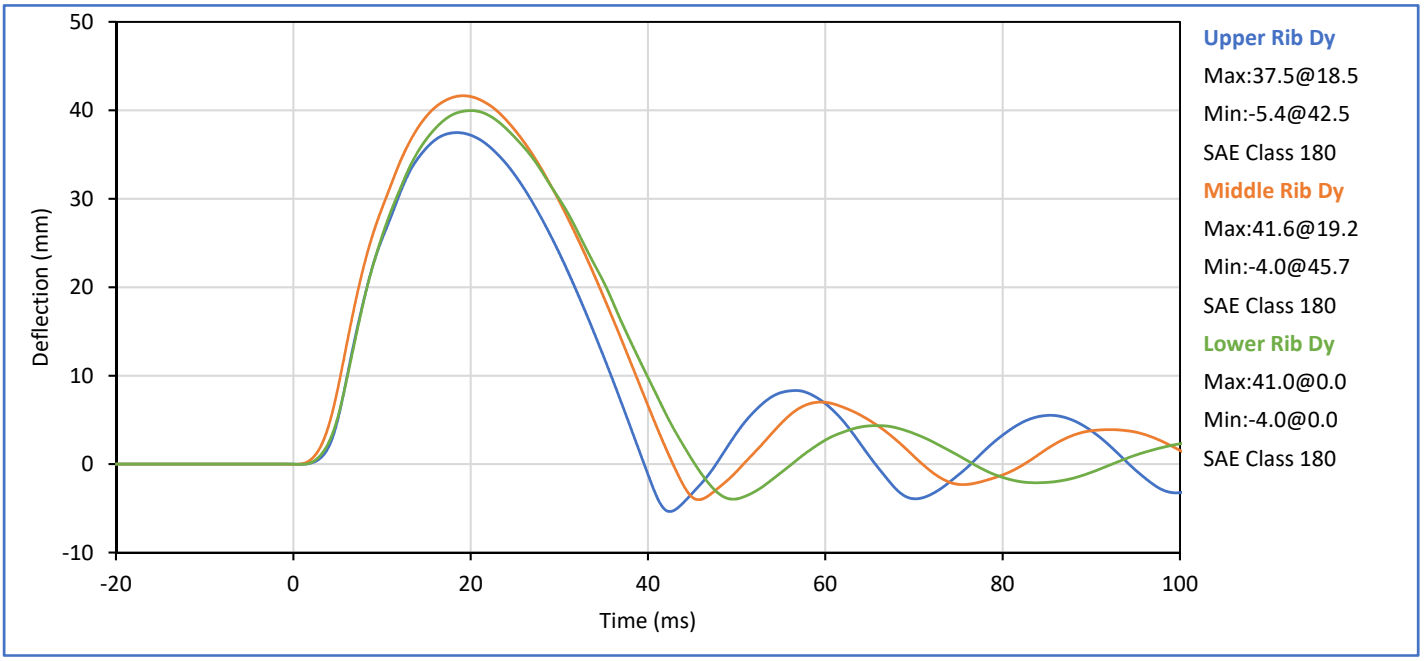
Approved By: P. Puzzuto

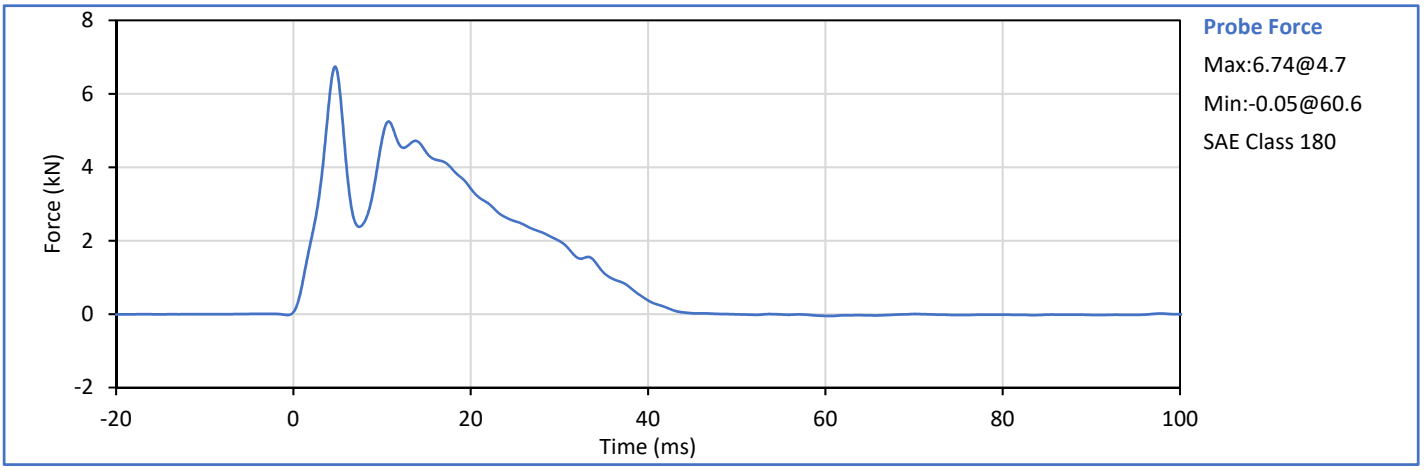
Applus IDIADA
KARCO

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

ATD Serial No.: F035 Test Date: 2020-03-03

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	30	Pass
Impactor Velocity	m/s	5.40	5.60	5.51	Pass
Peak Upper Rib Dy	mm	34.0	41.0	37.5	Pass
Peak Middle Rib Dy	mm	37.0	45.0	41.6	Pass
Peak Lower Rib Dy	mm	37.0	44.0	40.0	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.25	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

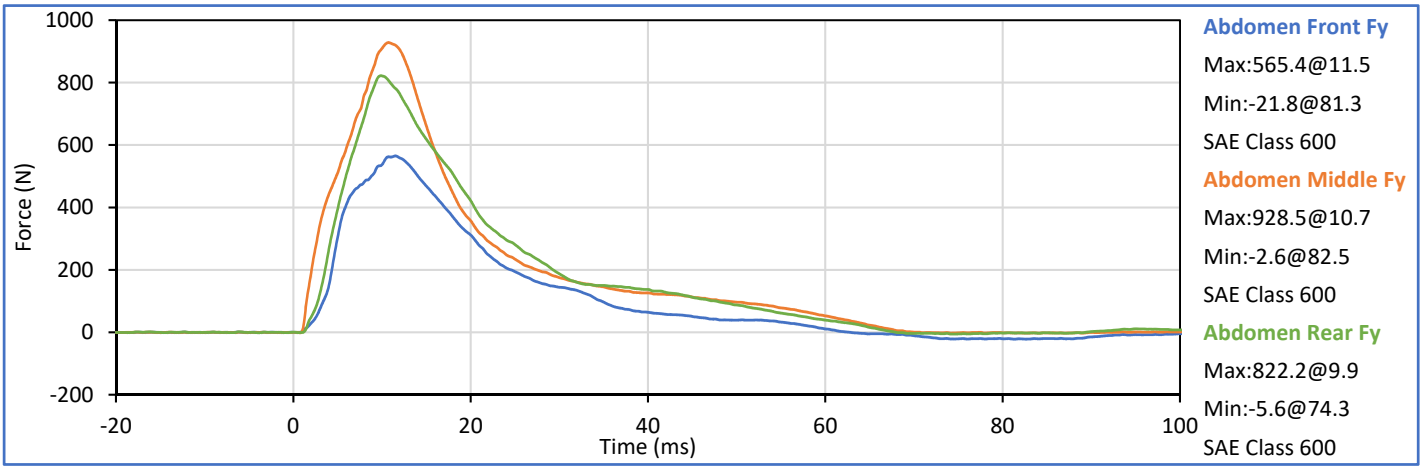
Approved By: P. Puzzuto

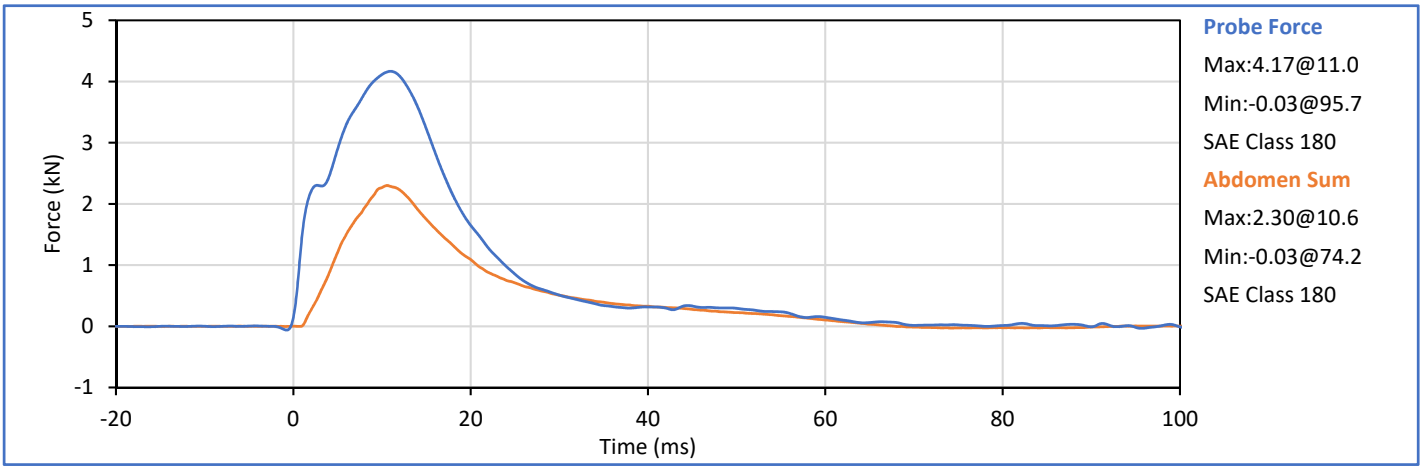
Applus IDIADA
KARCO

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

ATD Serial No.: F035 Test Date: 2020-03-03

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	30	Pass
Impactor Velocity	m/s	3.90	4.10	4.01	Pass
Peak Impactor Force	kN	4.00	4.80	4.17	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.0	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.30	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.6	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

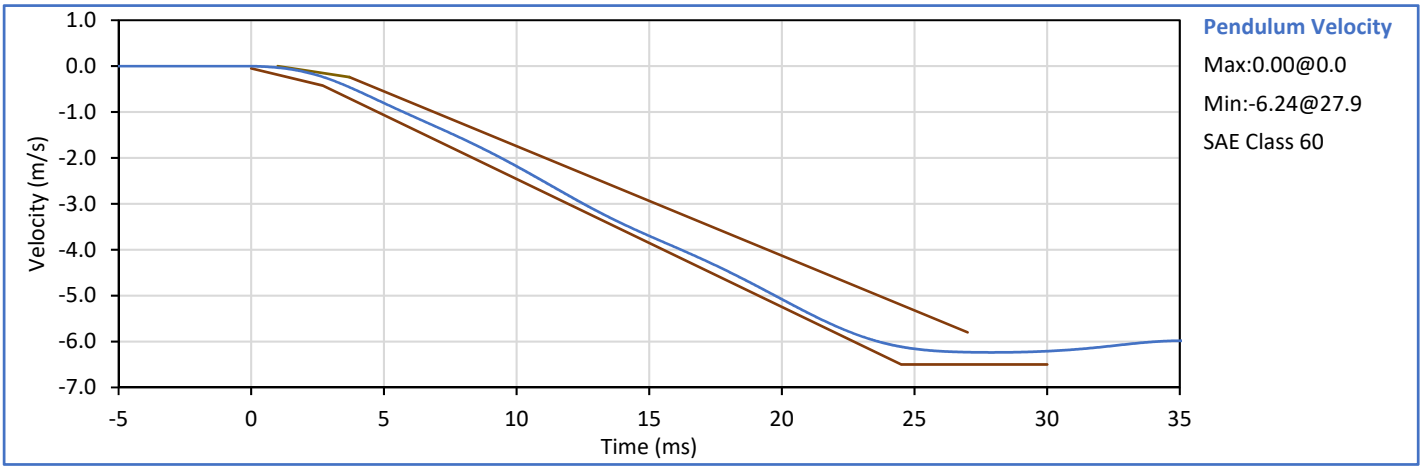
Applus IDIADA
KARCO

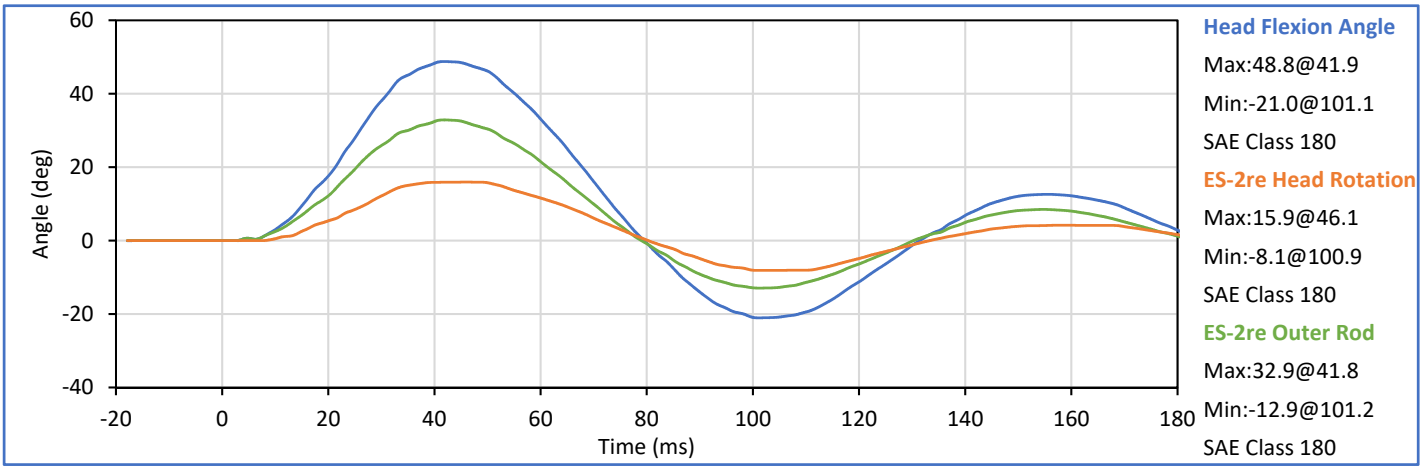
ES-2re 50th Male Side Impact ATD
Lumbar Spine Flexion

ATD Serial No.: F035

Test Date: 2020-03-04

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	5.95	6.15	6.12	Pass
Peak Headform Flexion	deg	45.0	55.0	48.8	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	41.9	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	37.6	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

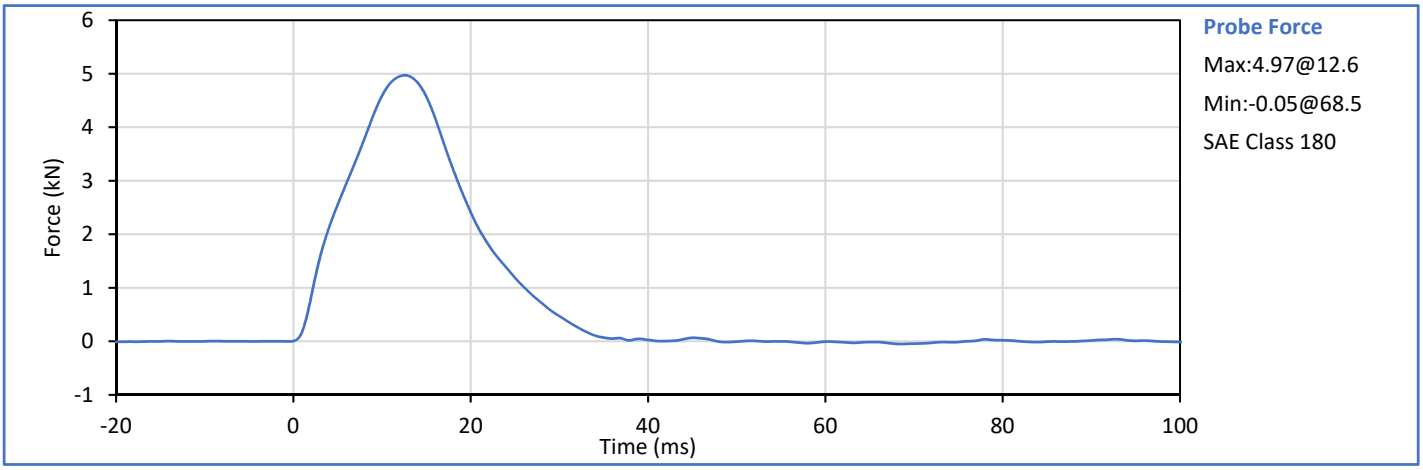
Approved By: P. Puzzuto

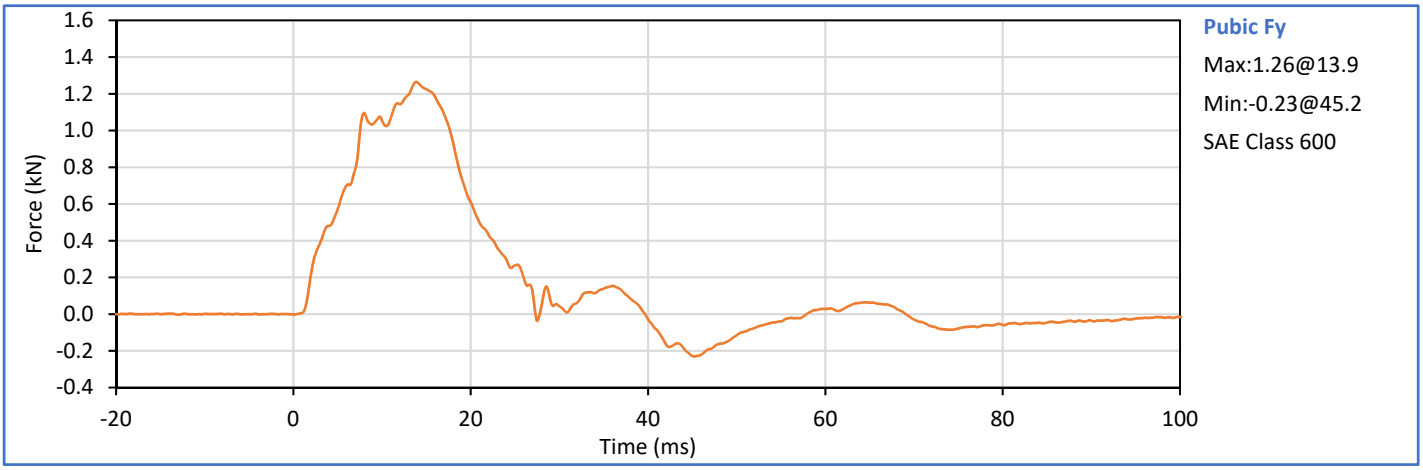
Applus IDIADA KARCO

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

ATD Serial No.: F035 Test Date: 2020-03-03

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	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Force	kN	4.70	5.40	4.97	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.6	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.26	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	13.9	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
S/N: 308

Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
External Measurements

ATD Serial No.: 308 Test Date: 2020-02-28

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	26	Pass
A - Sitting Height	mm	772	788	783	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	84	Pass
D - H Point From Seatback	mm	141	151	146	Pass
E - Shoulder Pivot From Backline	mm	97	107	103	Pass
F - Thigh Clearance	mm	119	135	124	Pass
G - Head Breadth	mm	140	148	145	Pass
H - Head Back From Backline	mm	40	46	43	Pass
I - Head Depth	mm	178	188	187	Pass
J - Head Circumference	mm	541	551	545	Pass
K - Buttock To Knee Length	mm	514	540	531	Pass
L - Popliteal Height	mm	343	369	350	Pass
K - Knee Pivot To Floor Height	mm	392	409	399	Pass
N - Buttock Popliteal Length	mm	416	442	429	Pass
O - Chest Depth W/O Jacket	mm	195	211	209	Pass
P - Foot Length	mm	216	232	222	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	316	Pass
R - Arm Length	mm	249	259	257	Pass
S - Knee Joint To Seatback	mm	477	493	486	Pass
V - Shoulder Width	mm	341	357	347	Pass
W - Foot Width	mm	78	94	81	Pass
Y - Chest Circumference W/Jacket	mm	851	881	861	Pass
Z - Waist Circumference	mm	761	791	774	Pass
			Overall Test Results		Pass

Technician: J. Hernandez

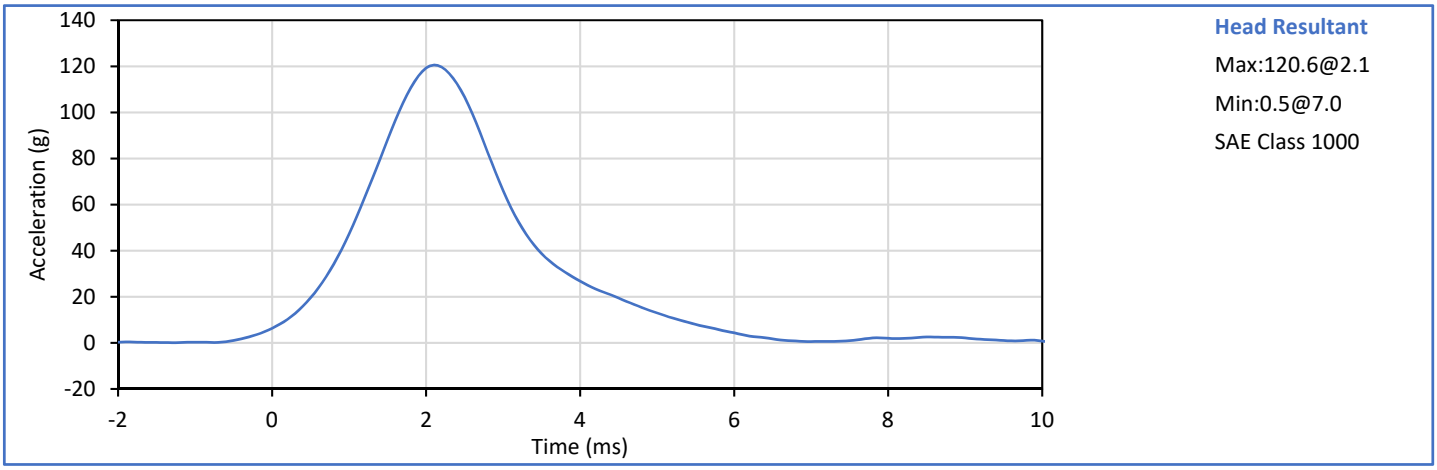
Approved By: P. Puzzuto

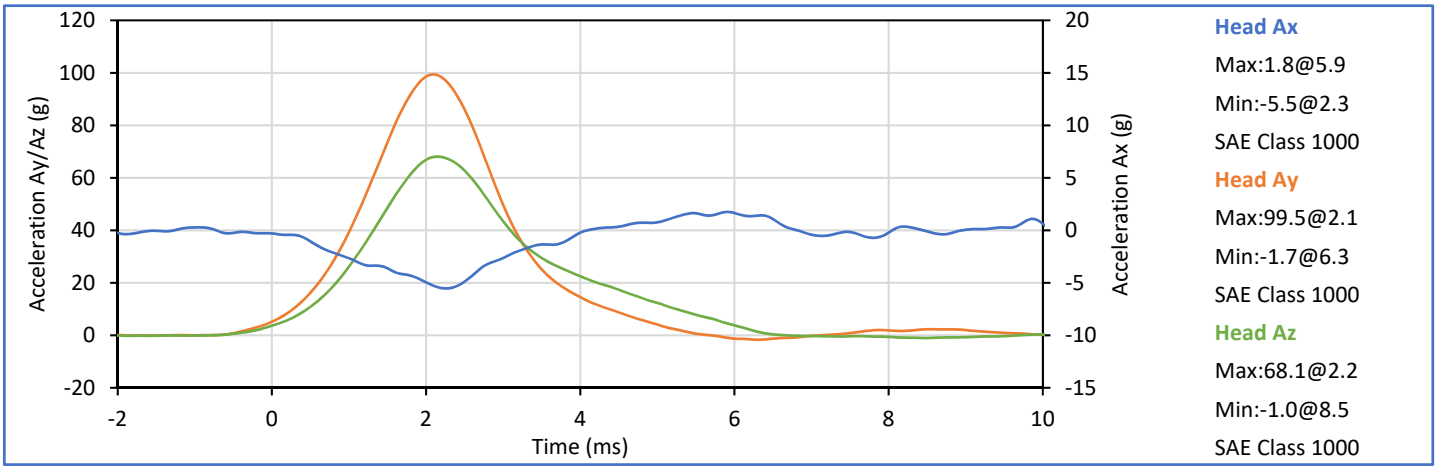
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Head Drop

ATD Serial No.: 308 Test Date: 2020-02-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	20.6	Pass
Laboratory Humidity	%	10	70	26	Pass
Peak Resultant Acceleration	g	115.0	137.0	120.6	Pass
Peak Head Ax	g	-15.0	15.0	-5.5	Pass
Oscillations After Main Pulse	%	0.0	15.0	3.0	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass





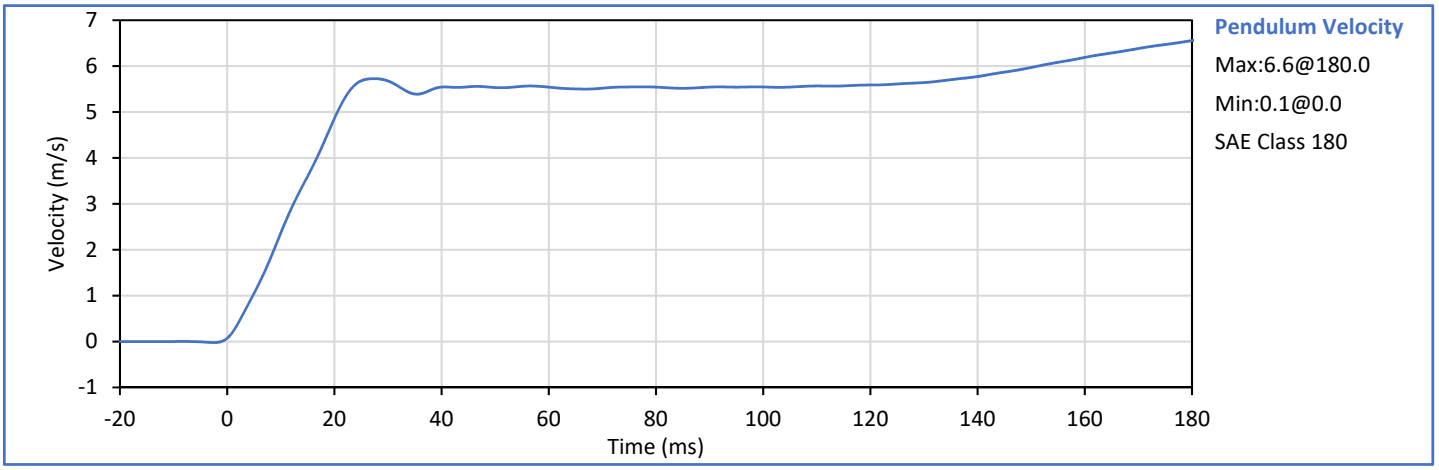
Technician: J. Hernandez Approved By: P. Puzzuto

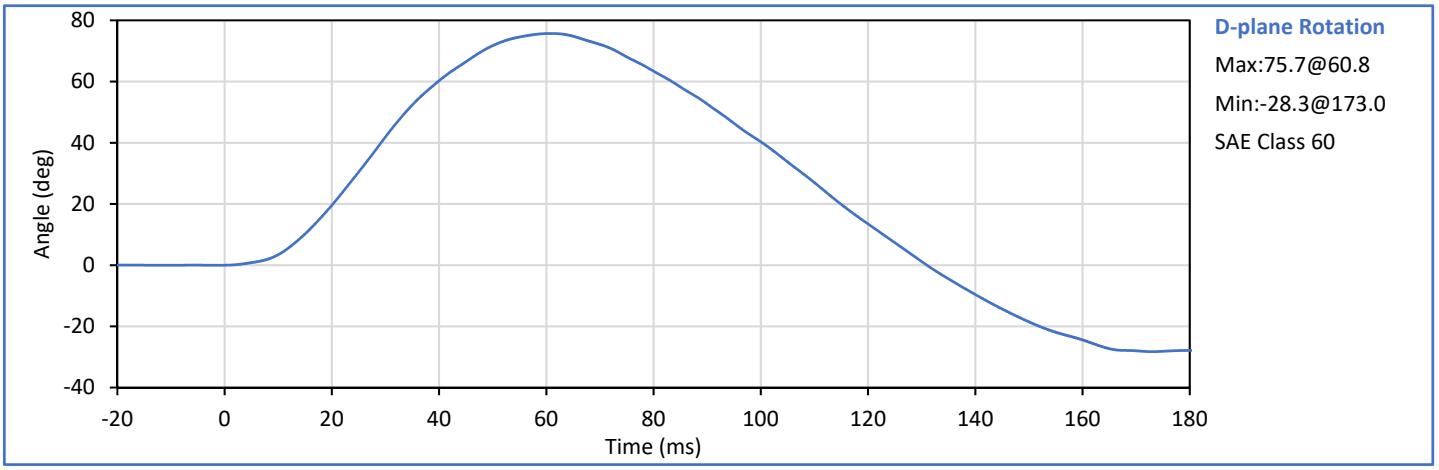
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-02-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Pendulum Velocity	m/s	5.51	5.63	5.63	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.36	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.60	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.86	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.68	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.73	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	75.7	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.8	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-43.2	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	112.6	Pass
			Overall Test Results		Pass



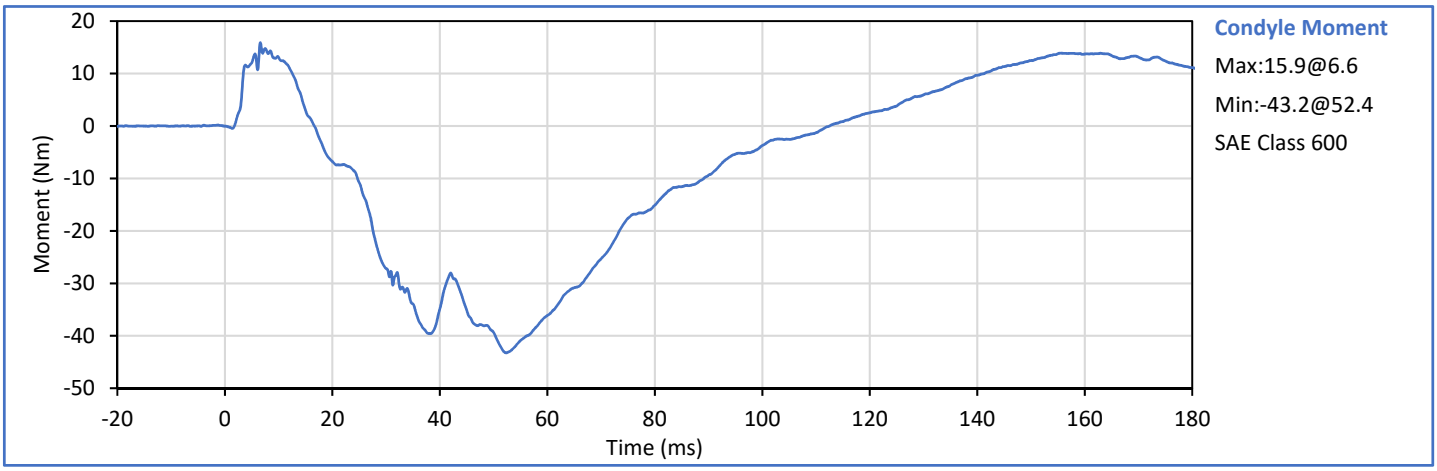


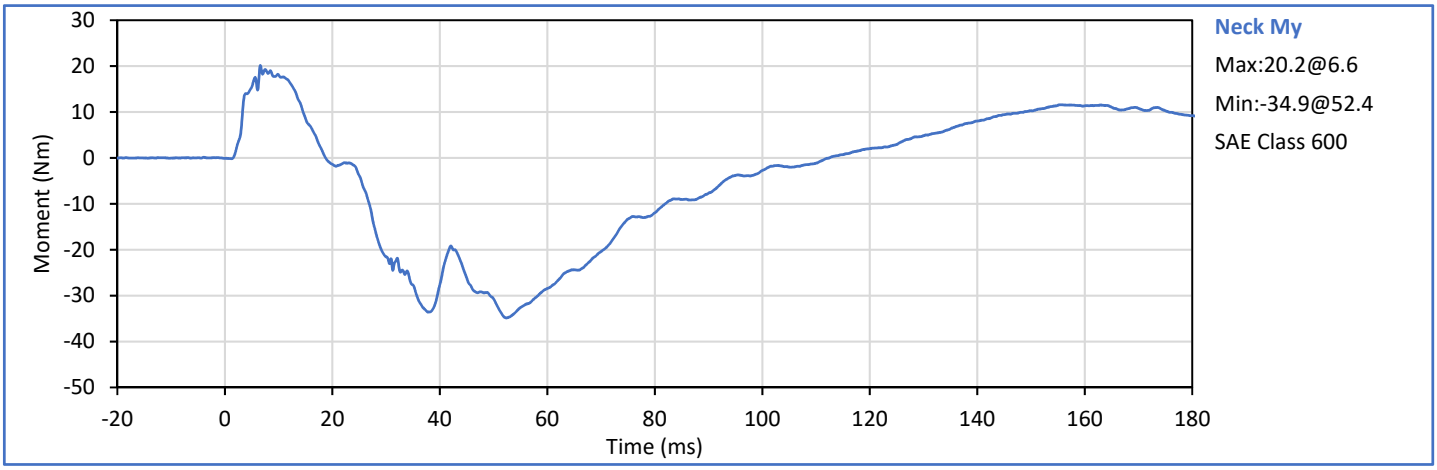
Technician: J. Hernandez

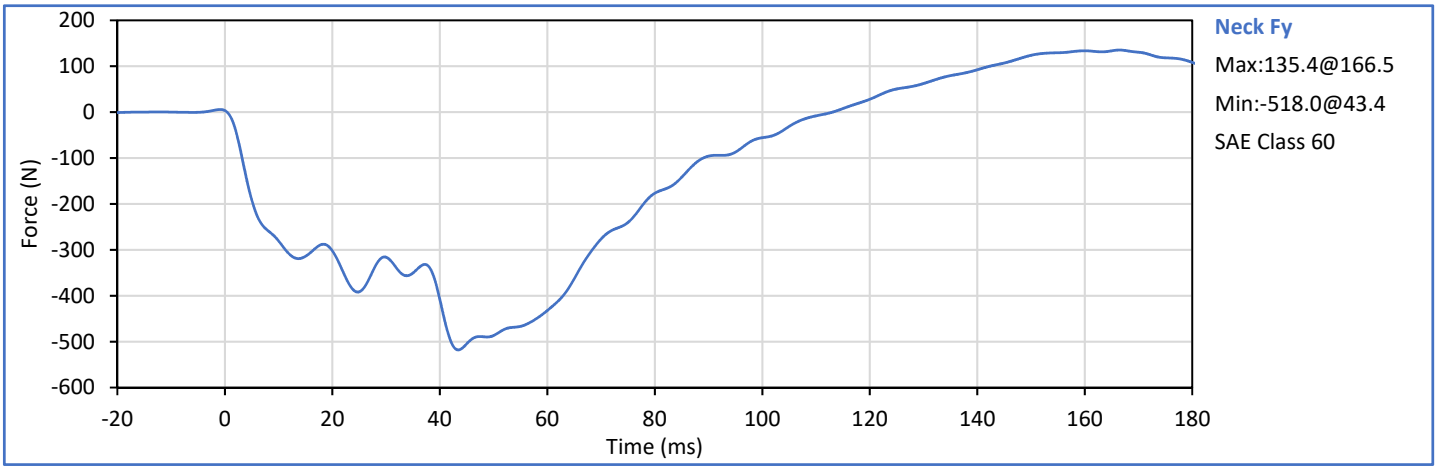
Approved By: P. Puzzuto

SID-IIs Small Side Impact ATD
Neck Flexion

ATD Serial No.: 308 Test Date: 2020-02-28





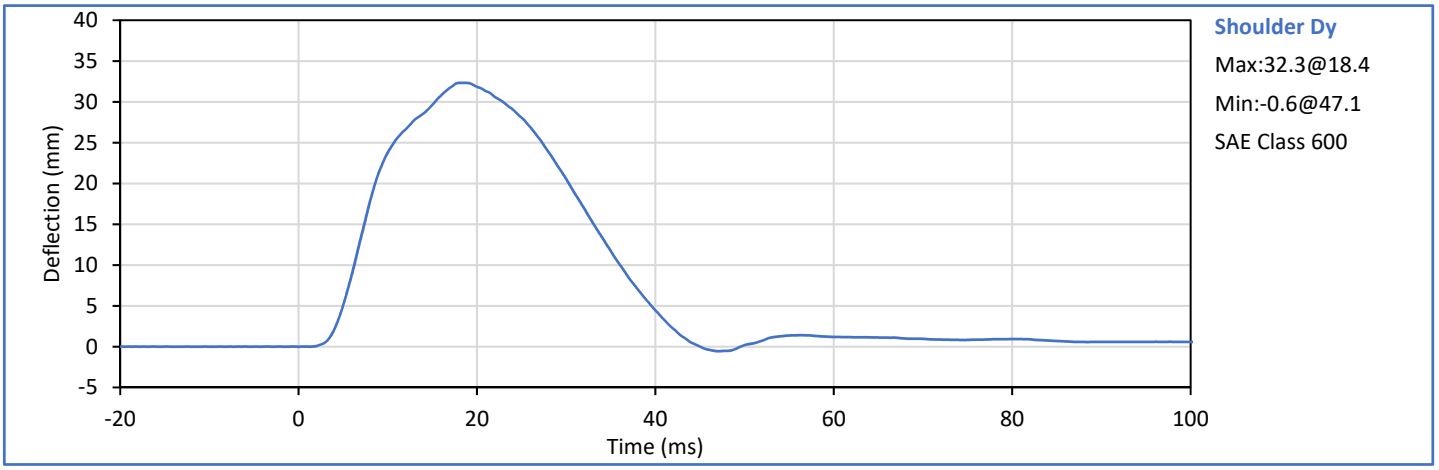


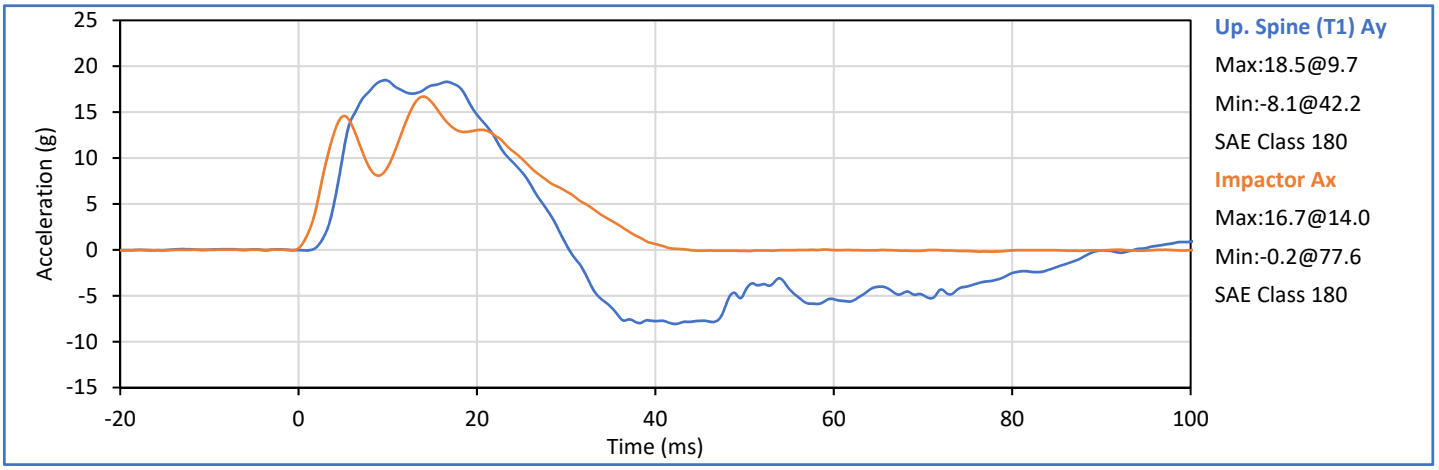
Applus IDIADA KARCO

SID-IIs Small Side Impact ATD
Shoulder Impact Test

ATD Serial No.: 308 Test Date: 2020-03-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Shoulder Dy	mm	28.0	37.0	32.3	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.5	Pass
Peak Impactor Ax	g	13.0	18.0	16.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

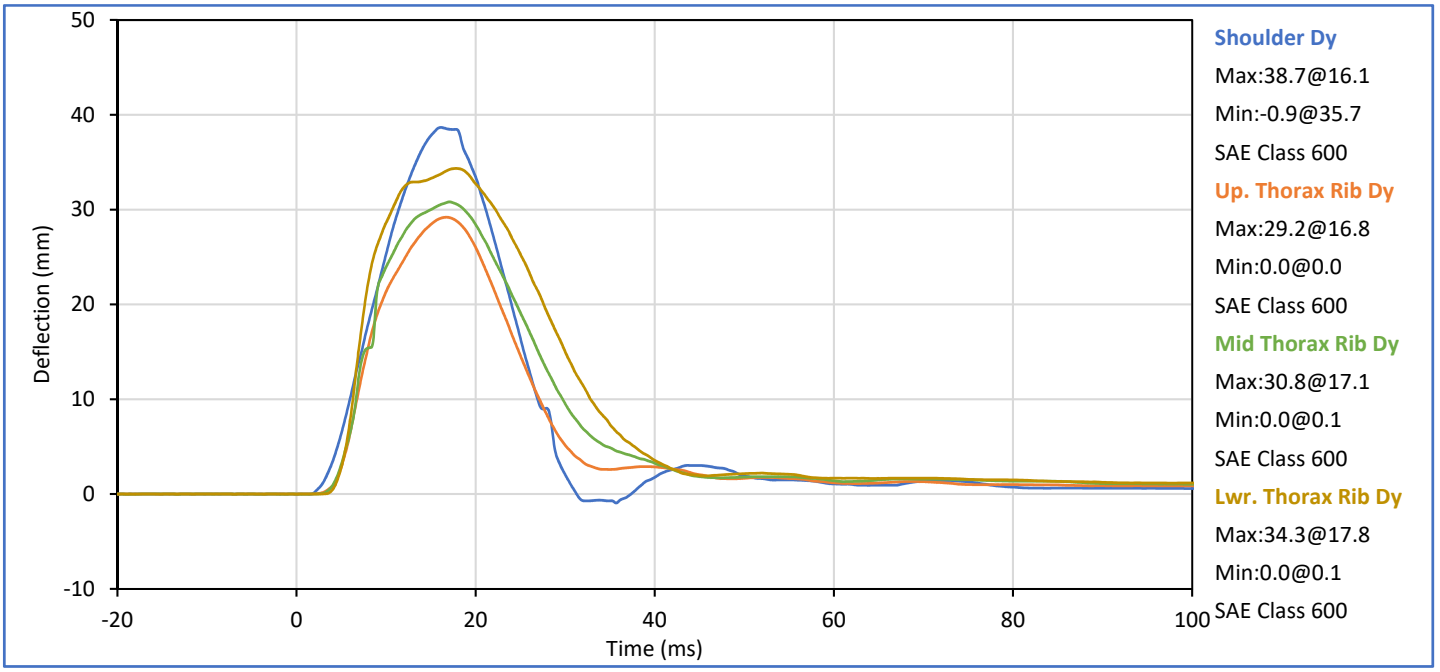
Approved By: P. Puzzuto

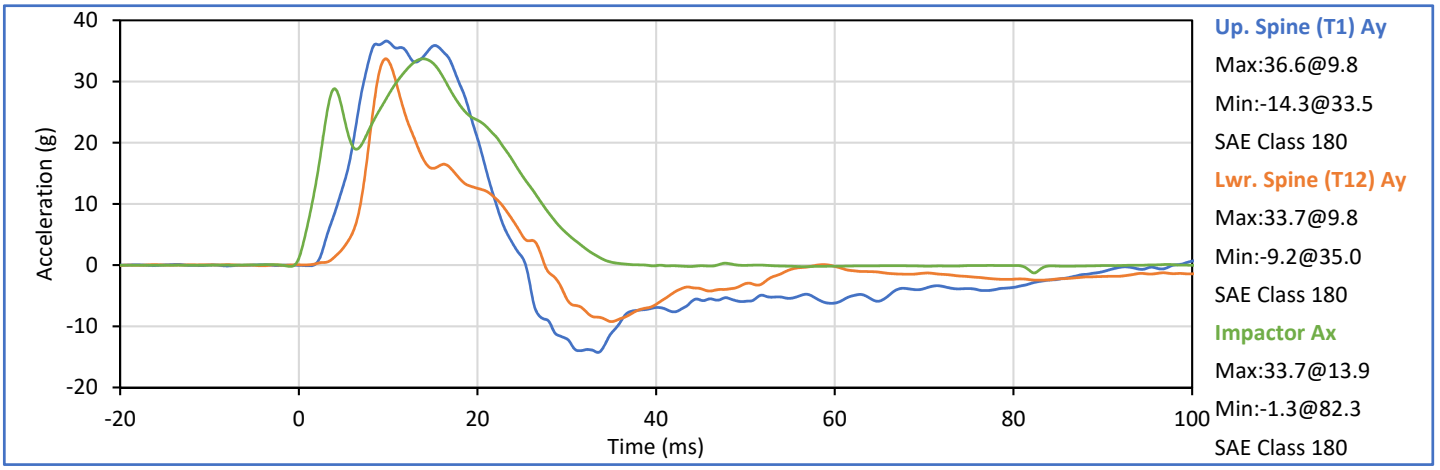
Applus IDIADA KARCO

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

ATD Serial No.: 308 Test Date: 2020-03-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	6.60	6.80	6.67	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.7	Pass
Peak Upper Rib Dy	mm	25.0	32.0	29.2	Pass
Peak Middle Rib Dy	mm	30.0	36.0	30.8	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.3	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	36.6	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	33.7	Pass
Peak Impactor Ax	g	30.0	36.0	33.7	Pass
			Overall Test Results		Pass





Technician: J. Hernandez Approved By: P. Puzzuto

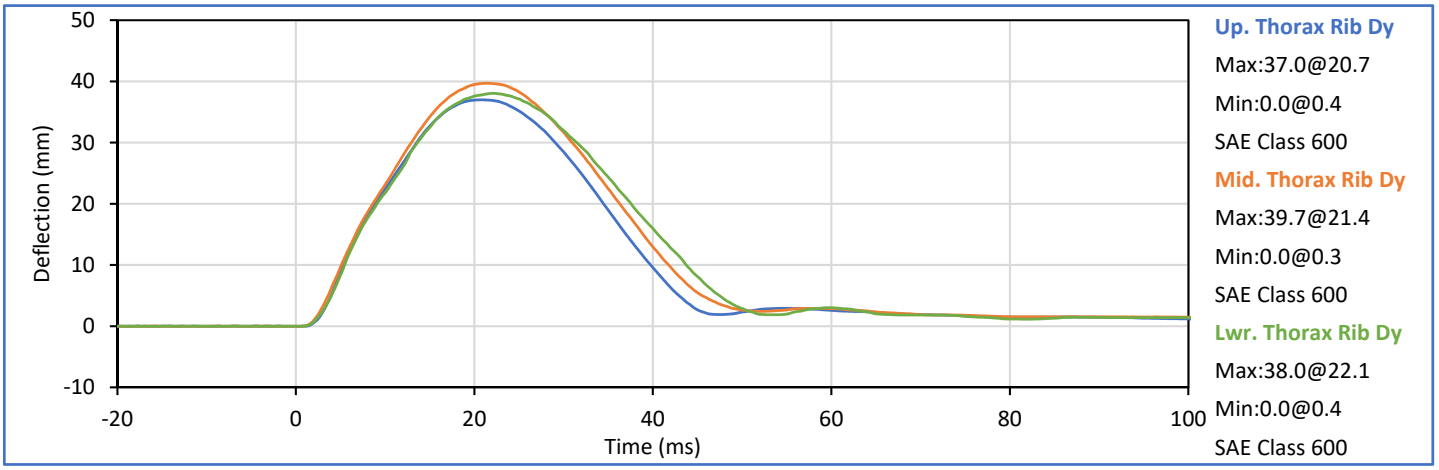
Applus IDIADA
KARCO

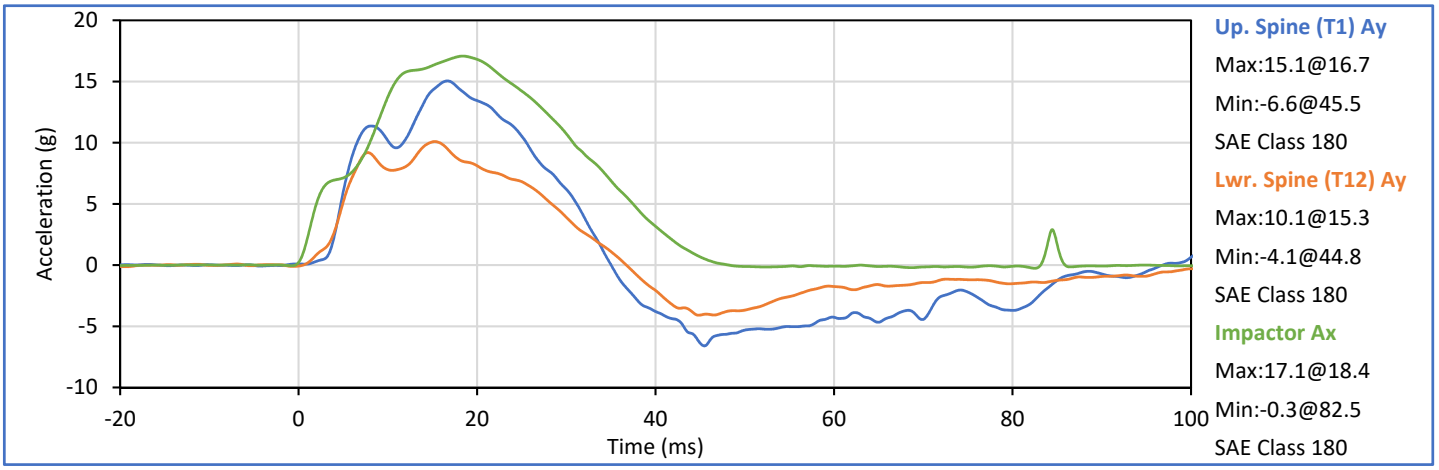
SID-IIs Small Side Impact ATD
Thorax (No Arm)

ATD Serial No.: 308

Test Date: 2020-03-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	37.0	Pass
Peak Middle Rib Dy	mm	39.0	45.0	39.7	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.0	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.1	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	10.1	Pass
Peak Impactor Ax	g	14.0	18.0	17.1	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

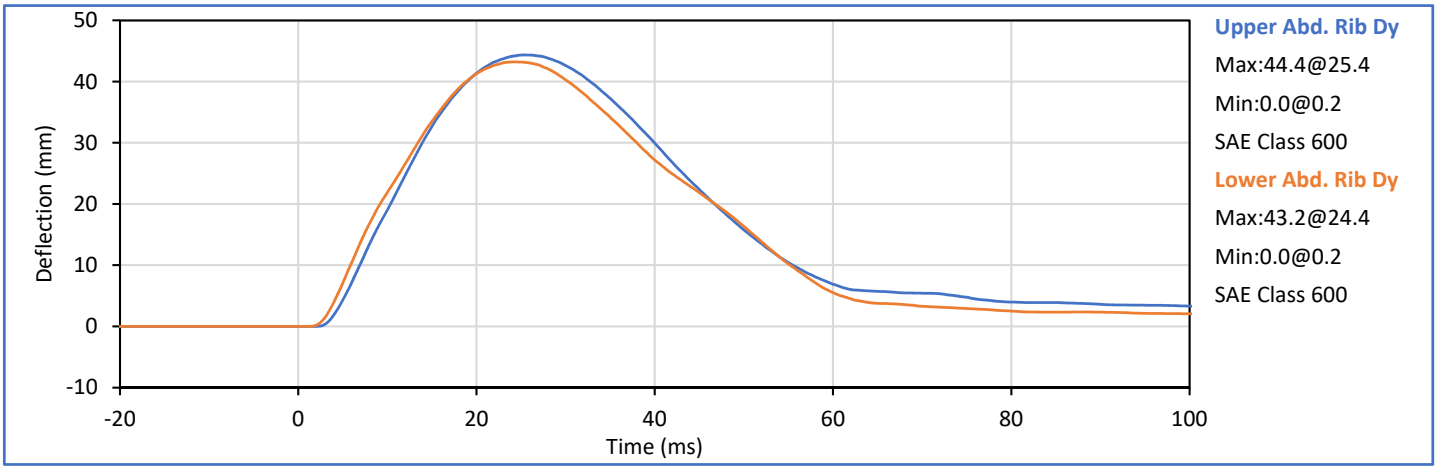
Approved By: P. Puzzuto

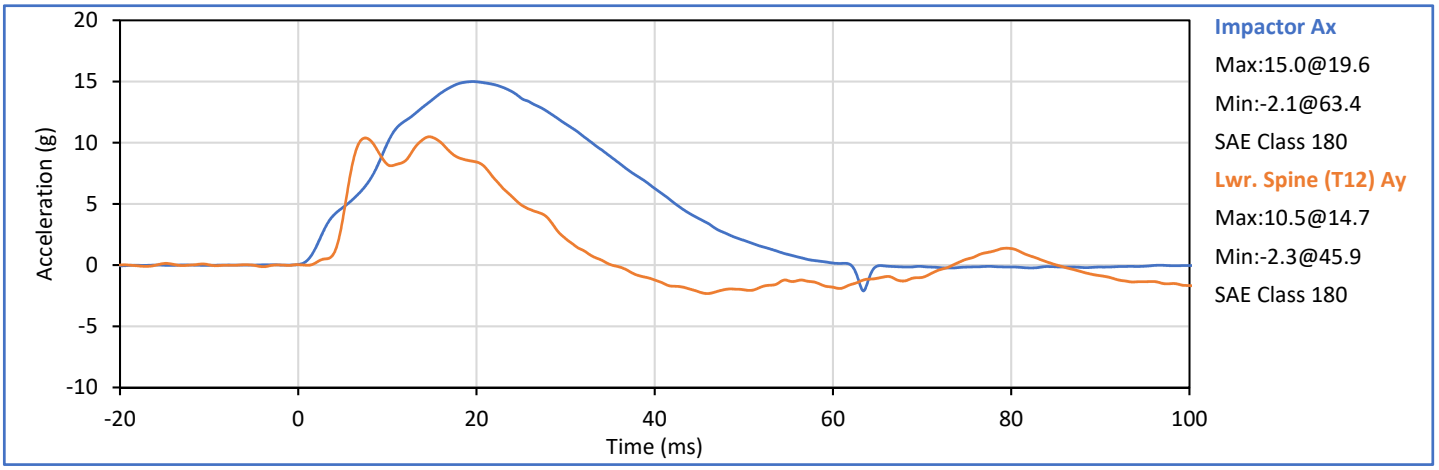
Applus IDIADA
KARCO

SID-IIs Small Side Impact ATD
Abdomen Impact

ATD Serial No.: 308 Test Date: 2020-03-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	44.4	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	43.2	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.5	Pass
Peak Impactor Ax	g	12.0	16.0	15.0	Pass
			Overall Test Results		Pass





Technician: J. Hernandez

Approved By: P. Puzzuto

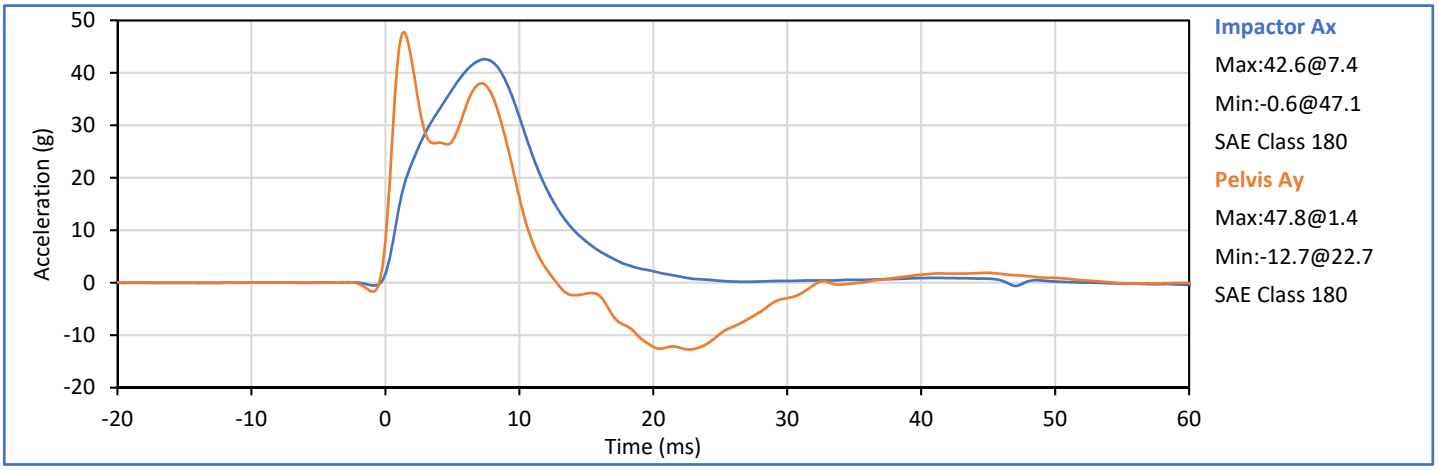
Applus IDIADA KARCO

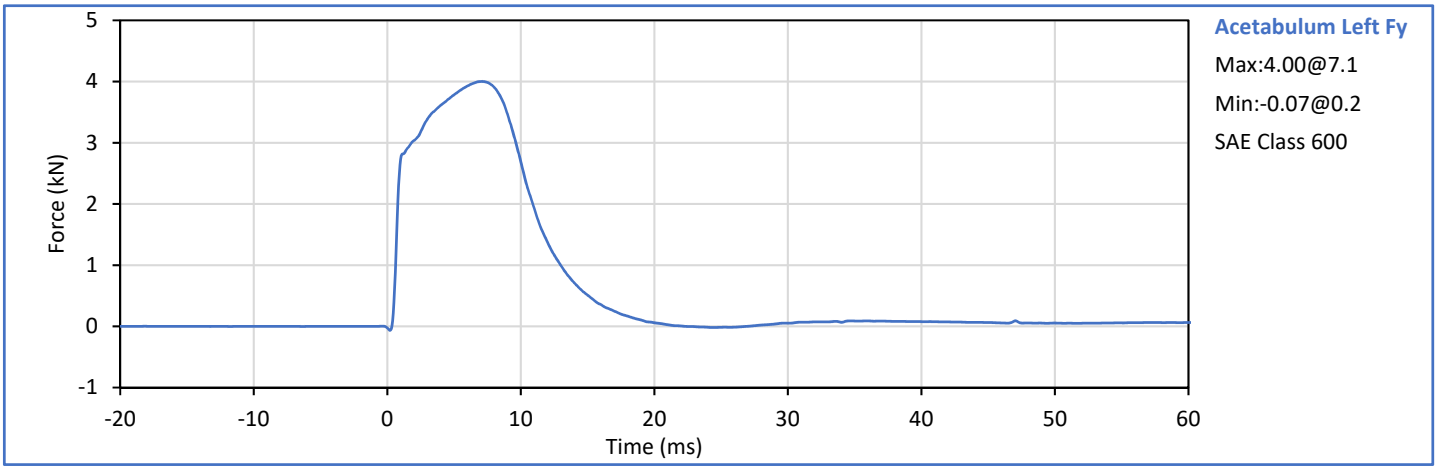
SID-IIs Small Side Impact ATD
Pelvis Acetabulum Impact

ATD Serial No.: 308 Test Date: 2020-03-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	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	4.00	Pass
Pelvis Ay after 6ms	g	34.0	42.0	38.0	Pass
Peak Impactor Ax	g	38.0	47.0	42.6	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 13445





Technician: J. Hernandez

Approved By: P. Puzzuto

ATD Serial No.: 308 Test Date: 2020-03-04

Pelvis Plug S/N: 13445

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 13445
Test Number 11088
Report Number 11126
Test Date 9/20/2019 8:43:38 AM

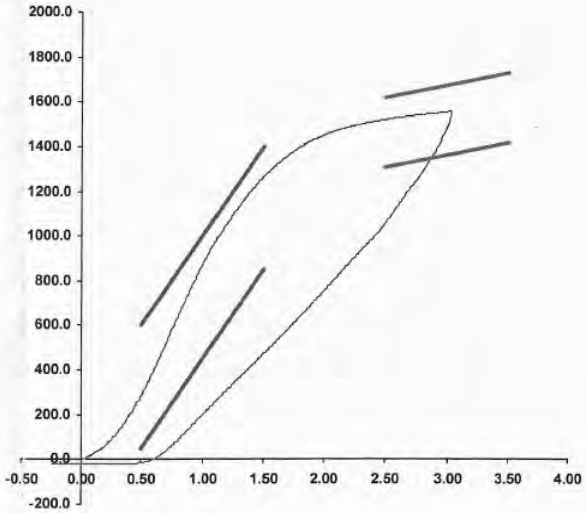
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	293.91	50.00	600.00
Force @ 1.5 mm (N)	1,273.98	850.00	1,400.00
Force @ 2.5 mm (N)	1,522.14	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,558.54	1,361.00	1,673.00

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 20-Sep-19
SACO Research

By : DC Date : 9/20/2019

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

Applus IDIADA KARCO

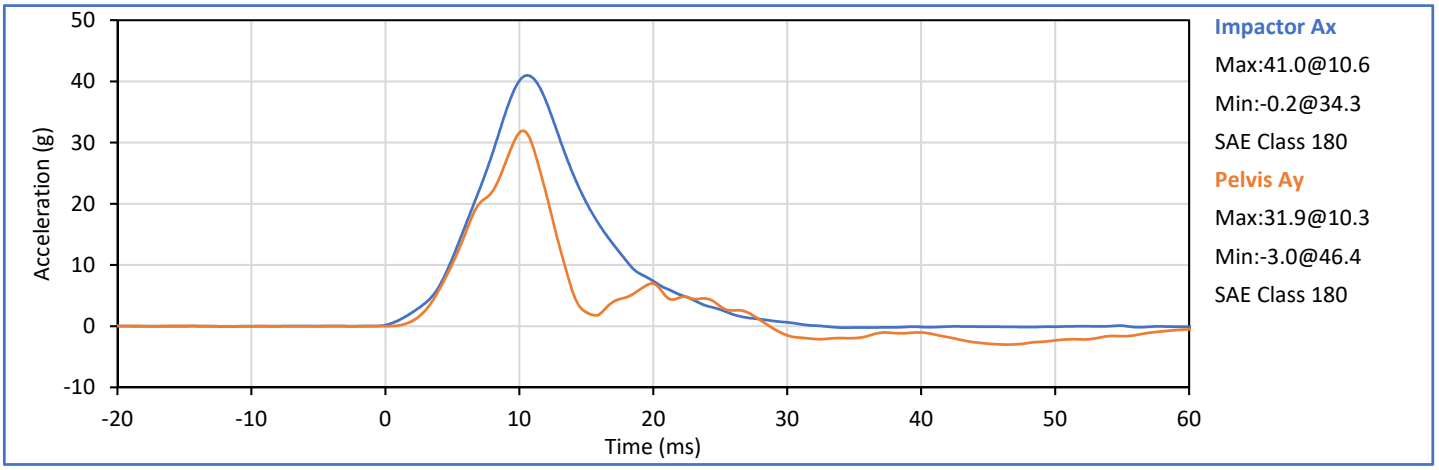
SID-IIs Small Side Impact ATD
Pelvis Iliac Impact

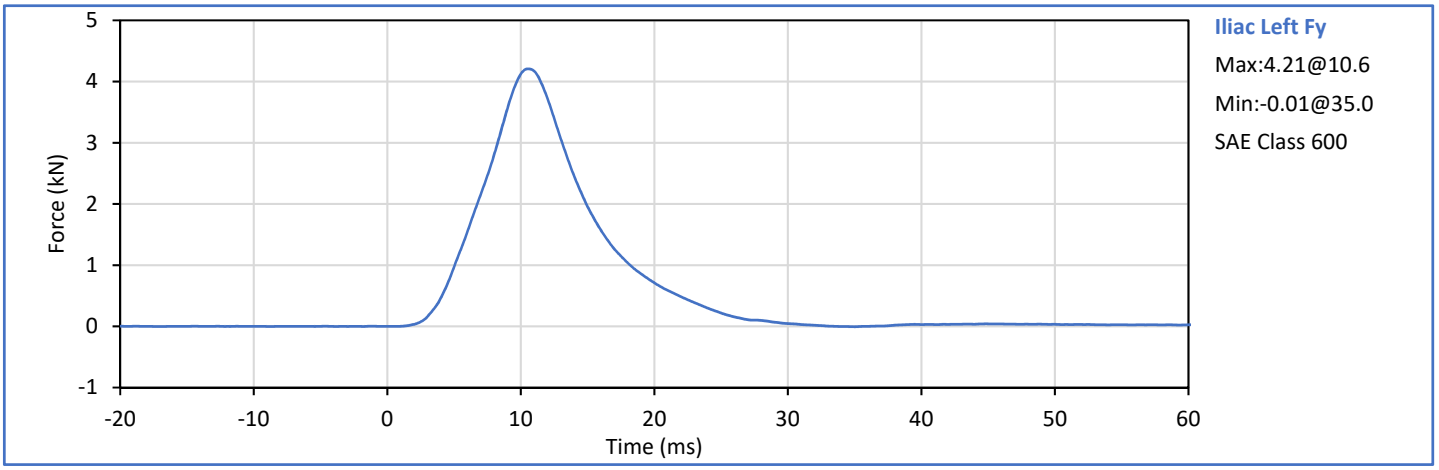
ATD Serial No.: 308 Test Date: 2020-03-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Iliac Fy	kN	4.10	5.10	4.21	Pass
Pelvis Ay after 6ms	g	28.0	39.0	31.9	Pass
Peak Impactor Ax	g	36.0	45.0	41.0	Pass
			Overall Test Results		Pass

Pelvis Plug S/N: 12228 *

* Plug is not impacted and remains certified





Technician: J. Hernandez

Approved By: P. Puzzuto

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

ES-2re ATD S/N: F035

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P58760	Endevco	7264C-2k	2019-12-18
Head Acceleration Y Primary	P58763	Endevco	7264C-2k	2019-12-18
Head Acceleration Z Primary	P52093	Endevco	7264C-2k	2019-12-18
Head Acceleration X Redundant	P52072	Endevco	7264C-2k	2019-12-18
Head Acceleration Y Redundant	P58768	Endevco	7264C-2k	2019-12-18
Head Acceleration Z Redundant	P52074	Endevco	7264C-2k	2019-12-18
Upper Thorax Rib Deflection Y	180 (ES-2 Rib)	Honeywell	F38000203	2019-11-04
Middle Thorax Rib Deflection Y	177 (ES-2 Rib)	Honeywell	F38000203	2019-11-04
Lower Thorax Rib Deflection Y	186 (ES-2 Rib)	Honeywell	F38000203	2019-11-04
Anterior Abdominal Force Y	1514 Fy	R.A. Denton	2631J	2020-01-07
Middle Abdominal Force Y	1510 Fy	R.A. Denton	2631J	2020-01-07
Posterior Abdominal Force Y	1515 Fy	R.A. Denton	2631J	2020-01-07
Lower Spine T12 Acceleration X	P63850	Endevco	7264C-2KTZ	2020-01-07
Lower Spine T12 Acceleration Y	P51278	Endevco	7264C-2KTZ	2020-01-07
Lower Spine T12 Acceleration Z	P51696	Endevco	7264C-2KTZ	2020-01-07
Pubic Symphysis Force Y	506 Fy	R.A. Denton	3096JFL	2020-01-06

SID-IIs ATD S/N: 308

Table 2 - Left Rear Passenger ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Head Acceleration X Primary	P63980	Endevco	7264C-2k	2020-01-02
Head Acceleration Y Primary	P58861	Endevco	7264C-2k	2020-01-02
Head Acceleration Z Primary	P51261	Endevco	7264C-2k	2020-01-02
Head Acceleration X Redundant	P58808	Endevco	7264C-2k	2020-01-02
Head Acceleration Y Redundant	P63310	Endevco	7264C-2k	2020-01-02
Head Acceleration Z Redundant	P49189	Endevco	7264C-2k	2020-01-02
Head Rotation Rate X	ARS7498	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Y	ARS7367	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Head Rotation Rate Z	ARS7377	DTS	ARS PRO-8k (2000Hz)	2019-07-08
Upper Thorax Rib Deflection Y	1249	Servo	08TCI-3725	2020-01-02
Middle Thorax Rib Deflection Y	1219	Servo	08TCI-3725	2020-01-02
Lower Thorax Rib Deflection Y	1221	Servo	08TCI-3725	2020-01-02
Upper Abdomen Rib Deflection Y	1252	Servo	08TCI-3725	2020-01-02
Lower Abdomen Rib Deflection Y	1283	Servo	08TCI-3725	2020-01-02
Lower Spine T12 Acceleration X	P52108	Endevco	7264C-2k	2020-01-02
Lower Spine T12 Acceleration Y	P63970	Endevco	7264C-2k	2020-01-02
Lower Spine T12 Acceleration Z	P51712	Endevco	7264C-2k	2020-01-02
Iliac Wing Impact Side Force Y	289 Fy (Iliac)	R.A. Denton	3228J	2019-10-17
Acetabulum Impact Side Force Y	277 Fy (Acetabulum)	R.A. Denton	3249J	2019-10-07

Table 3 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
Vehicle CG Ax	10912	Endevco	757F-2k	2019-12-18
Vehicle CG Ay	A247326	MSI	52F-2000	2019-12-16
Vehicle CG Az	10409	Endevco	757F-2k	2019-12-09
Right Side Sill at Front Seat Ax	10886	Endevco	757F-2k	2019-12-18
Right Side Sill at Front Seat Ay	10884	Endevco	757F-2k	2019-12-17
Right Side Sill at Front Seat Az	A254885	MSI	52F-2000	2019-12-09
Right Side Sill at Rear Seat Ax	A273026	MSI	52F-2000	2019-11-27
Right Side Sill at Rear Seat Ay	A273392	MSI	52F-2000	2019-12-13
Right Side Sill at Rear Seat Az	A273033	MSI	52F-2000	2019-12-13
Left Side Sill at Front Seat Ay	A265888	MSI	52F-2000	2019-12-13
Left Side Sill at Rear Seat Ay	A265900	MSI	52F-2000	2019-12-16
Left Lower A-Pillar Ay	A265849	MSI	52F-2000	2019-12-12
Left Middle A-Pillar Ay	A265871	MSI	52F-2000	2019-12-12
Left Lower B-Pillar Ay	Not Installed			
Left Middle B-Pillar Ay	Not Installed			
Driver Seat Track at H-Point Ay	A265950	MSI	52F-2000	2019-12-16
Rear Seat Structure Ay	A160350	MSI	52F-2000	2019-11-25
Right Rear Occupant Comp. Ay	A145910	MSI	52F-2000	2019-12-18
Engine Block Top Ax	A273415	MSI	52F-2000	2019-12-04
Engine Block Top Ay	11164	Endevco	757F-2k	2019-12-17
Rear Floopan Above Axle Ax	A273397	MSI	52F-2000	2019-12-02
Rear Floopan Above Axle Ay	A273022	MSI	52F-2000	2019-12-02
Rear Floopan Above Axle Az	A273384	MSI	52F-2000	2019-12-02

Table 4 - Moving Deformable Barrier (MDB) Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Cal Date
MDB CG Ax	A265905	MSI	52F-2000	2019-12-09
MDB CG Ay	A254840	MSI	52F-2000	2019-12-09
MDB CG Az	A265892	MSI	52F-2000	2019-12-09
MDB Left Side at Rear Axle Ax	A273028	MSI	52F-2000	2019-11-25
MDB Left Side at Rear Axle Ay	A273442	MSI	52F-2000	2019-11-25