

REPORT NUMBER: SINCAP-KAR-18-007

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

**AUDI AG
2018 AUDI Q5 2.0T QUATTRO 5-DOOR MPV**

NHTSA No: M20185802

**PREPARED BY:
KARCO ENGINEERING, LLC.
9270 HOLLY ROAD
ADELANTO, CA 92301**



DECEMBER 12, 2017

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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7. Authors Mr. Amjad A. Jadallah, Project Engineer, KARCO Mr. Steven D. Matsusaka, Engineering Dept. Supervisor, KARCO		8. Performing Organization Report No. TR-P37370-01-NC
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16. Abstract

A 55 / 28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2018 Audi Q5 2.0T Quattro 5-door MPV 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 KARCO Engineering, LLC. facility in Adelanto, California on November 28, 2017.

The impact velocity of the Moving Deformable Barrier was 61.83 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 17.2° C. The target vehicle's maximum post-test static crush was 184 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	60.2
Maximum Thoracic Rib Deflection	mm	44	15
Total Abdominal Force	N	2500	437
Pubic Symphysis Force	N	6000	1239

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	184.6
Resultant Lower Spine Acceleration	g	82	53
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	3633
Maximum Thoracic Rib Deflection	mm	38*	4
Maximum Abdominal Rib Deflection	mm	45*	4

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.

* Proposed IARV

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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2018 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-00355. The purpose of this test is to generate comparative side impact performance in a 2018 Audi Q5 2.0T Quattro 5-Door MPV. 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 2018 Audi Q5 2.0T Quattro 5-Door MPV 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 61.83 km/h (38.42 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 KARCO Engineering, LLC. in Adelanto, California, on November 28, 2017. 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 11 cameras. Camera locations are included in Data Sheet No. 5 of this report.

The dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib and lower rib y-axis displacement potentiometers

Abdomen forward, middle, and rear y-axis load cells

Lower spine (12) tri-axial accelerometers

Pubic symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib and lower rib y-axis displacement potentiometers

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

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

Dummy injury readings were recorded as follows:

Measurement Description	Units	Driver ATD (ES-2re)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	60.2
Maximum Thoracic Rib Deflection	mm	44	15
Combined Abdominal Force	N	2500	437
Pubic Symphysis Force	N	6000	1239

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	184.6
Lower Spine (T12) Resultant Acceleration	g	82	53
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3633
Maximum Thoracic Rib Deflection	mm	38*	4
Maximum Abdominal Rib Deflection	mm	45*	4

*Proposed IARV

Supplemental restraint information is given below:

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	No		No	
Side Airbag 1 (Curtain)	Yes	Yes	Yes	Yes
Side Airbag 2 (Torso/Pelvis)	Yes	Yes	No	
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other	No		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 door on the non-struck side remained closed and latched. There was no ATD value that exceeded its limit.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

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	°F	°C	$=(T_f - 32)/1.8$
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: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	M20185802
Model Year	2018
Make	Audi
Model	Q5 2.0T Quattro
Body Style	5-Door MPV
VIN	WA1ANAFY2J2022784
Body Color	Matador Red Metallic
Odometer Reading (km / mi)	23 / 14
Engine Displacement (L)	2.0
Type / No. of Cylinders	Inline 4
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	7
Overdrive	Yes
Final Drive	AWD
Roof Rack	Yes
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Audi AG
Date of Manufacture	Aug-17
Vehicle Type	MPV

GVWR (kg)	2475
GAWR Front (kg)	1215
GAWR Rear (kg)	1380

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				480.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				136.0*	A-B

*A RCLW of 136.0 kg is used if the RCLW is greater than 136.0 kg for MPVs and trucks

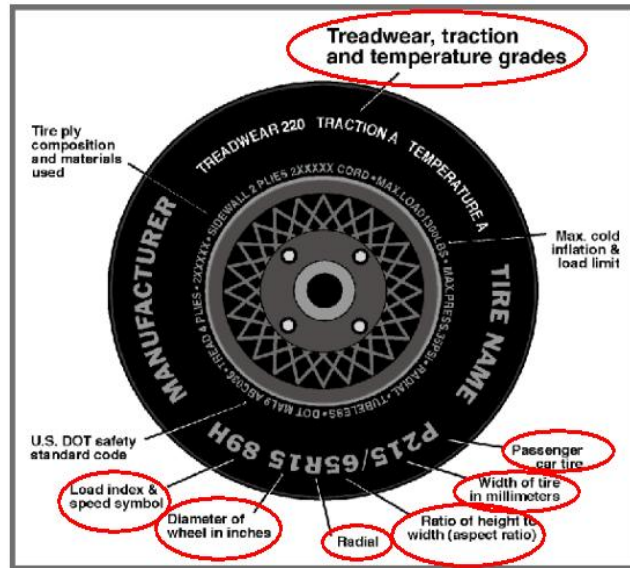
VEHICLE SEAT TYPE

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: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



Measured Parameter	Front	Rear
Max. Tire Pressure (kpa)	350	350
Cold Pressure (kPa)	240	260
Recommended Tire Size	P235/60/R18	P235/60/R18
Tire Size on Vehicle	P235/60/R18	P235/60/R18
Tire Manufacturer	Continental	Continental
Tire Model	Cross Contact	Cross Contact
Treadware	480	480
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel , 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	103H	103H
Tire Material	Polyester, Steel, Polyamide	Polyester, Steel, Polyamide
DOT Safety Code Left	P545 WC1K 1317	P545 WC1K 2117
DOT Safety Code Right	P545 WC1K 1317	P545 WC1K 2117

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	240	240	260	260
Tire Placard	kPa	240	240	260	260
Owner's Manual	kPa	240	240	260	260
As Tested	kPa	240	240	260	260

MDB TIRE SPECIFICATIONS

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

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	476.5	426.5		527.0	554.0		511.0	521.0	
Right	kg	519.0	457.0		490.0	562.5		520.0	593.0	
Ratio	%	53.0%	47.0%	100.0%	47.7%	52.3%	100.0%	48.1%	51.9%	100.0%
Total	kg	995.5	883.5	1879.0	1017.0	1116.5	2133.5	1031.0	1114.0	2145.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1879.0	A
Actual Weight of 2 P572 ATD Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	136.0	C
Calculated Vehicle Target Wt (TVTW)	kg	2140.0	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	865	860	Yes
RF	mm	864	861	Yes
LR	mm	834	837	Yes
RR	mm	852	845	Yes
Vehicle CG (Aft of Front Axle)	mm	1466	1477	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	11	11	

***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: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17**WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW**

Component Description	Weight (kg)
Trunk Trim	6.0
Spare Tire	19.5
Rear Speaker	5.0
Ballast / Equipment Added	174.0

Test Height Adjustable Setting (If Applicable)	Auto
--	------

DATA SHEET NO. 2**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA**Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17**SEAT POSITIONING**

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	8.7	0.0	4.4
Front Passenger Seat	8.8	0.0	4.4
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCR Height (mm)	SCR Height Position	SCR Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	4.4	700	Max			
			Mid	693	700	709
			Min			
Front Passenger Seat	4.4	700	Max			
			Mid	692	700	707
			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: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

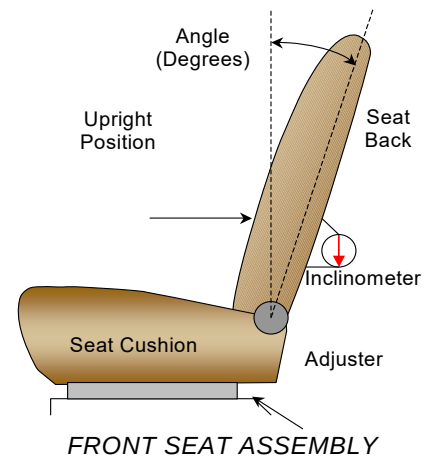
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	250		125	
Front Passenger Seat	248		124	
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 along the rear of the seatback.



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/ Seated Dummy	56.1		19.0	
Front Passenger Seat	62.6		19.0	
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	21.0	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	21.0	Fixed
Rear Center Seat	Fixed	Fixed	21.0	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: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17**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, M1,..., L from top to bottom.

	Total No. of Positions	Placed in Position
Driver Seat	4	0
Rear Seat	Fixed	Fixed

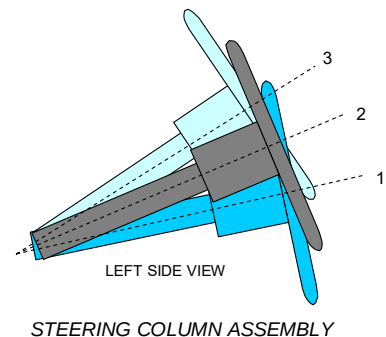
HEAD RESTRAINT ADJUSTMENT

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	5	H
Rear Seat	Fixed	Fixed

STEERING COLUMN ADJUSTMENT

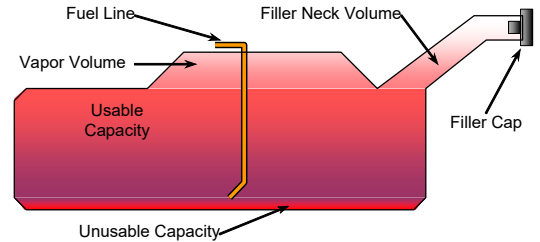
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion. The steering column for this vehicle was fixed.



	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	21.8	103.0
Geometric Center - Position 2	24.0	126.5
Uppermost - Position 3	26.2	150.0
Telescoping Steering Wheel Travel		47.0
Test Position	27.6	127.0

DATA SHEET NO. 2 ... (CONTINUED)**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA**Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPVNHTSA No. M20185802Test Program: NCAP MDB Side Impact TestTest Date: 11/28/17**FUEL PUMP**

The vehicle is equipped with an electronic fuel pump. The fuel pump starts pumping fuel when the key is in the "ON" position.



VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY

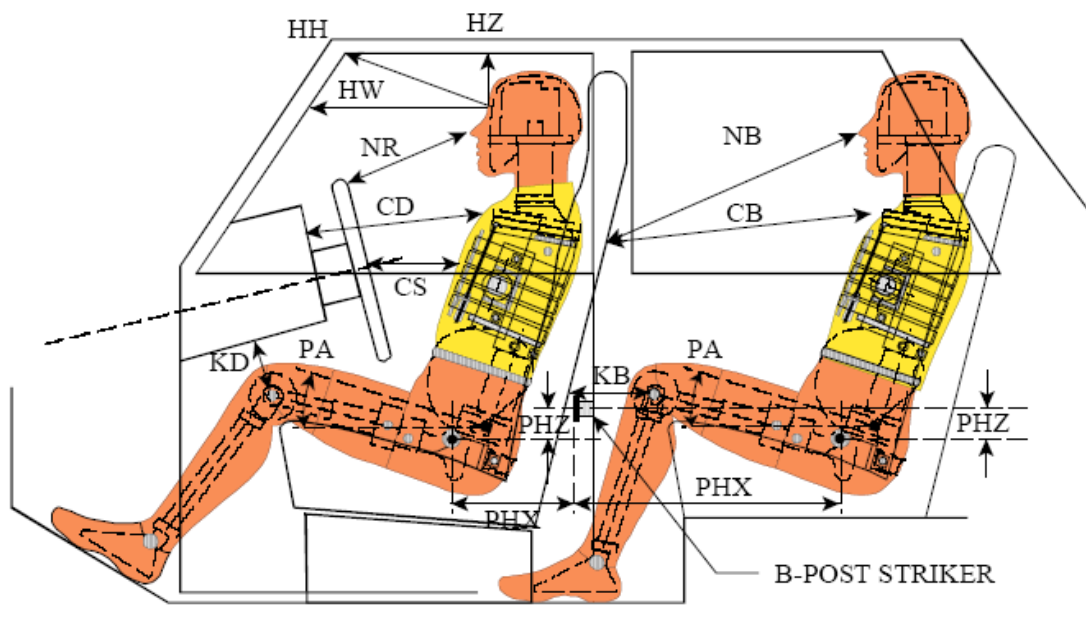
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	70.02
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	65.12
Actual amount of Solvent Used in Test	47.50
1/3 of Usable Capacity	23.34

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

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



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

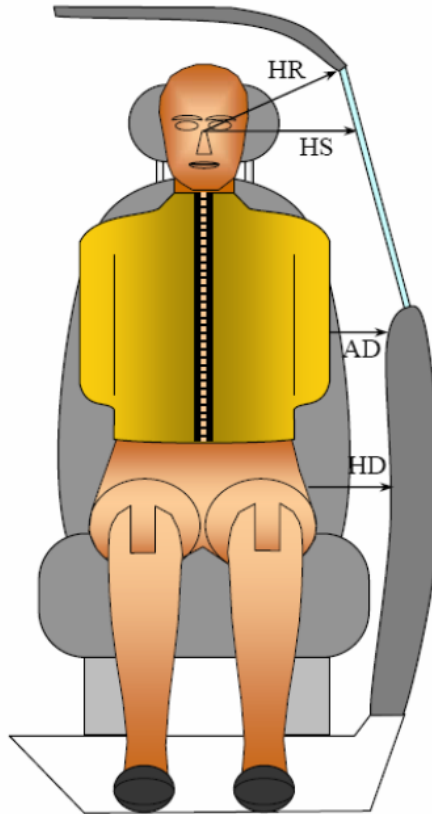
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	368			
HW		Head to Windshield	683			
HZ	HZ	Head to Roof	202		248	
NR	NB	Nose to Rim/Seat Back	414		567	
CD	CB	Chest to Dash/Seat Back	554		545	
CS		Chest to Steering Wheel	318			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	217	29.1	251	14.8
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	206	31.9	252	14.6
PAX°	PAX°	Pelvic Tilt Angle X		16.1		20.5
	PAY°	Pelvic Tilt Angle Y		0.1		0.1
PHX	PHX	Hip Point to Striker (x-axis)	131.8		236.4	
PHZ	PHZ	Hip Point to Striker (z-axis)	152.6		226.3	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



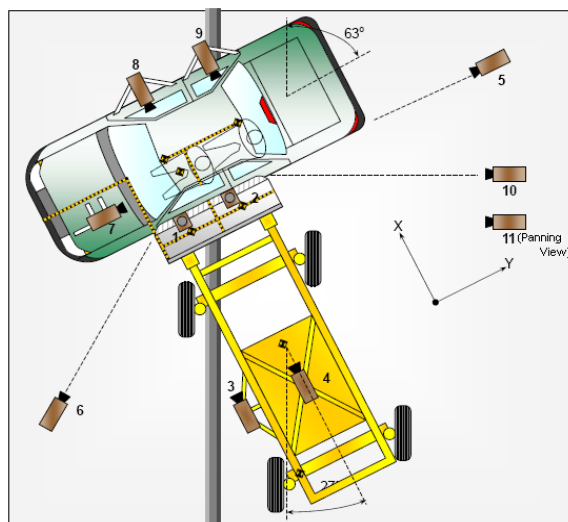
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	211	265
HS	Head to Side Window	mm	350	335
AD	Arm to Door	mm	95	125
HD	H-Point to Door	mm	170	172

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



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)	558	-145	569	13	1000
8	Driver Side (On-Board)	1634	1066	396	7	1000
9	Passenger Side (On-Board)					
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

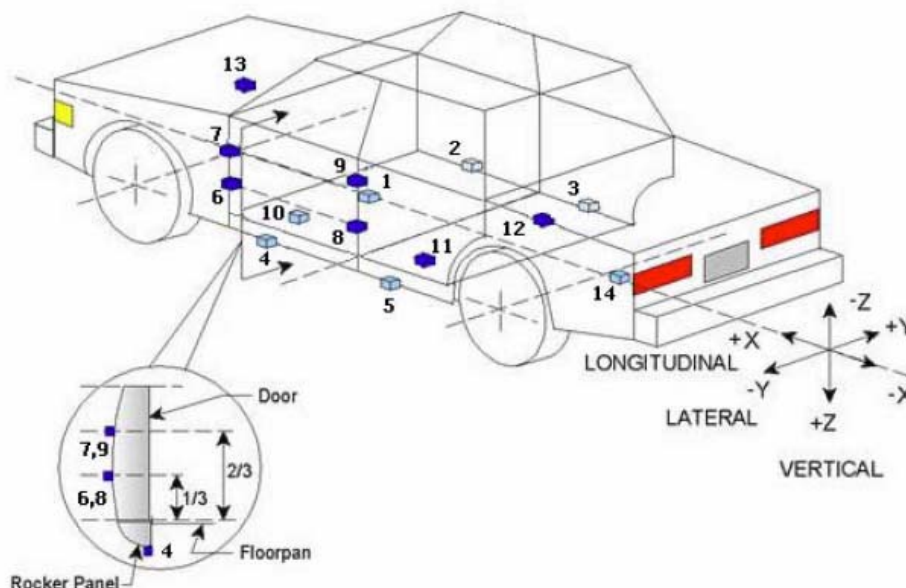
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	20
MDB Accelerometers	5
Total	57

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1847	65	564
2	Right Sill at Front Seat	2462	737	417
3	Right Sill at Rear Seat	1861	714	409
4	Left Sill at Front Door	2407	772	262
5	Left Sill at Rear Door	1476	771	261
6	A-Pillar Lower	3082	813	605
7	A-Pillar Middle	3085	813	883
8	B-Pillar Lower	1948	759	709
9	B-Pillar Middle	1948	759	949
10	Front Seat Track	2242	178	462
11	Rear Seat Structure	1788	321	463
12	Right Rear Occupant Compartment	1788	282	460
13	Engine Block	3031	169	751
14	Rear Floorpan Above Axle	925	-10	527

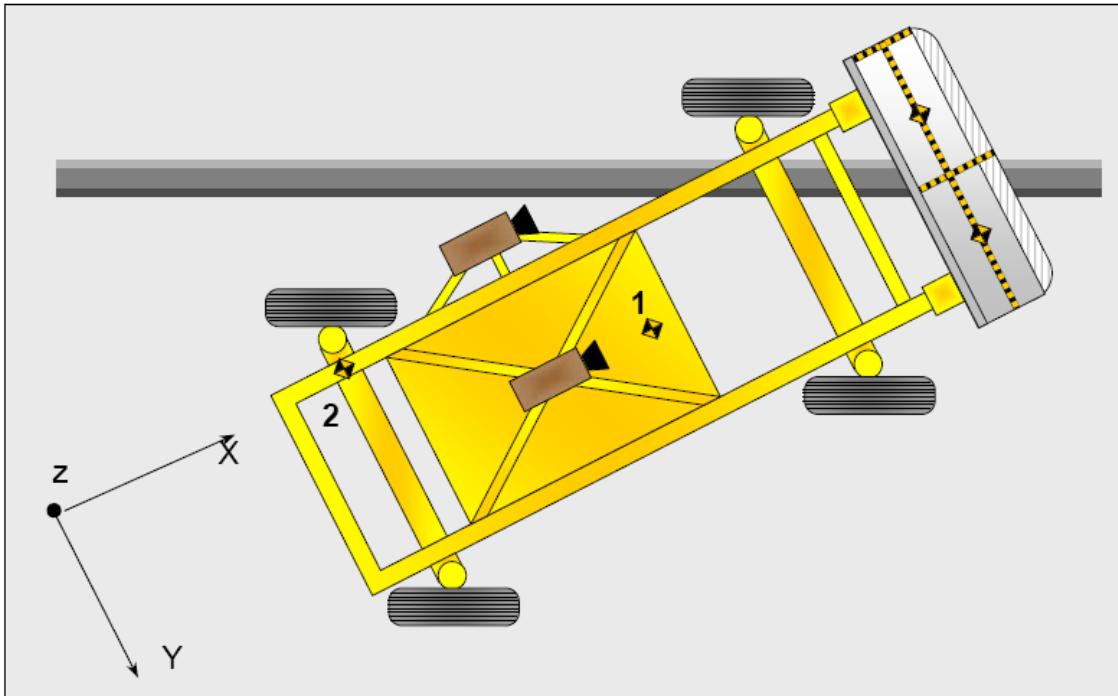
Reference: X – Rear surface of vehicle (+ forward)
 Y – Vehicle centerline (+ to right)
 Z – Ground plane (+ down)

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802

Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



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: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

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	Curtain Airbag
Back of Head	Curtain Airbag, Headrest	Curtain Airbag
Left Shoulder	Door Panel	Door Panel
Upper Torso	Door Panel	Door Panel
Lower Torso	Side Airbag	Door Panel
Left Hip	Side Airbag, Door Panel	Door Panel
Left Knee	Door Panel	None

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: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

POST-TEST SEAT PERFORMANCE

Description	Struck Side		Non-Struck Side	
	Front	Rear	Front	Rear
Seat Movement Along Seat Track	No		Yes	
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	Good
Sill Separation	No separation
Windshield Damage	None
Side Window Damage	Broken
Other Notable Effects	None

DATA SHEET NO. 8 ... (CONTINUED)**POST-TEST OBSERVATIONS**

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2823
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		471
Actual Impact Point (Aft of Front Axle)	mm		464
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	7
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	10

DATA SHEET NO. 9**MDB SUMMARY OF RESULTS**

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1251
Overall Length including Honeycomb Face	4023
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	298.0	700.0
Right	kg	377.0	290.0	667.0
Ratio	%	57.0%	43.0%	100.0%
Totals	kg	779.0	588.0	1367.0

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	61.83
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.82
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.8
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.7
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.1

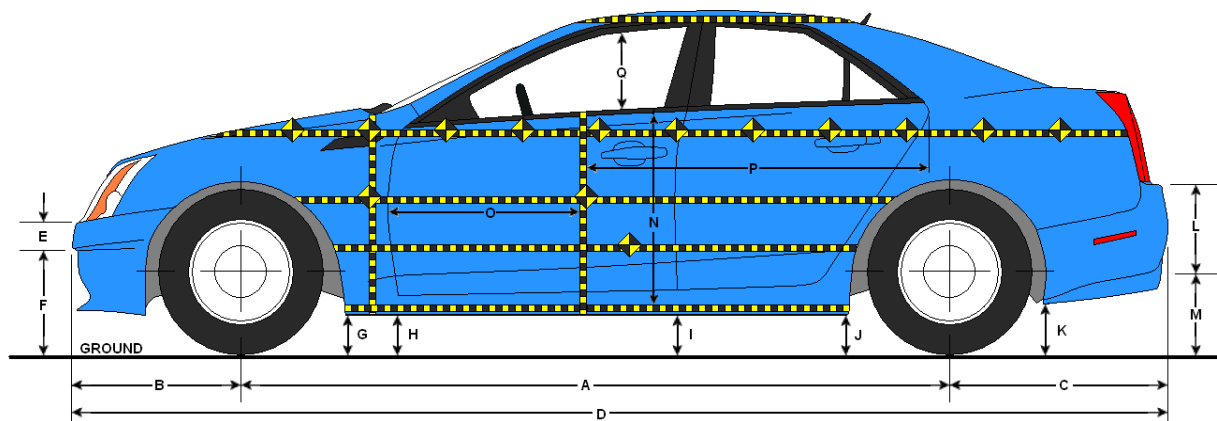
MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	700	Left	267
B	Top of Bumper	533	800	Left	189
C	Mid Level	686	800	Left	162
D	Top of Stack	813	800	Left	178

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2823	2826	3
B	Front Axle to FSOV	896	886	-10
C	Rear Axle to RSOV	940	945	5
D	Total Length at Centerline	4658	4656	-2
E	Front Bumper Thickness	387	388	1
F	Front Bumper Bottom to Ground	393	391	-2
G	Sill Height at Front Wheel Well	291	293	2
H	Sill Height at Front Door Leading Edge	288	317	29
I	Sill Height at B-Pillar	282	331	49
J1	Sill Height at Rear Wheel Well	284	274	-10
J2	Pinch Weld Height at Rear Wheel Well	247	246	-1
K	Sill Height Aft of Rear Wheel Well	286	288	2
L	Rear Bumper Thickness	167	167	0
M	Rear Bumper Bottom to Ground	465	464	-1
N	Sill Height to Bottom of Front Window Sill	766	746	-20
O	Front Door Leading Edge to Impact CL	740	734	-6
P	Rear Door Trailing Edge to Impact CL	1394	1374	-20
Q	Front Window Opening	434	445	11
R	Right Side Length	3311	3311	0
S	Left Side Length	3308	3305	-3
T	Vehicle Width at B-Pillar	1893	1815	-78

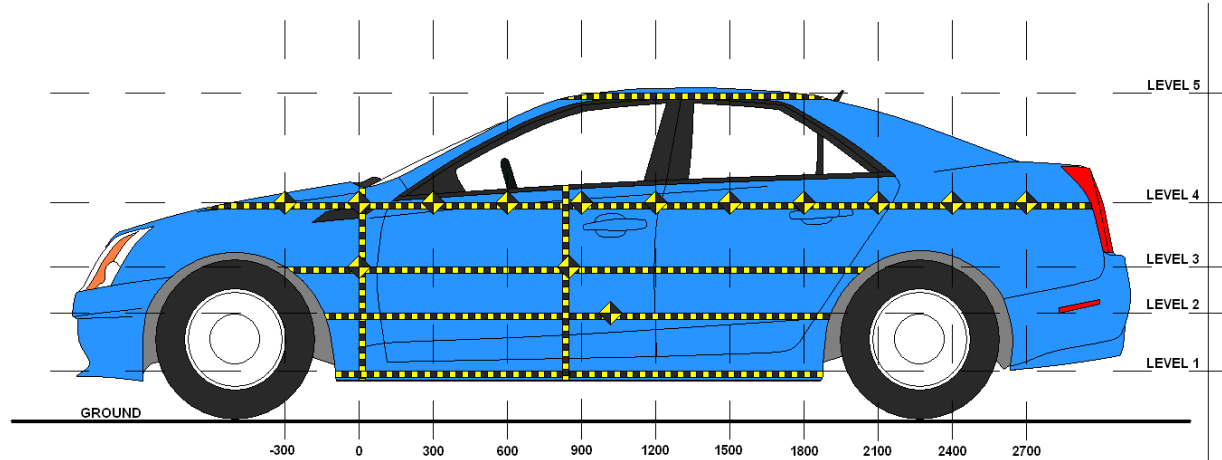
All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802

Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	328	64	1050
2	Occupant H-Point	646	175	1650
3	Mid-Door	728	184	1650
4	Window Sill	959	84	1500
5	Window Top	1587	11	1500

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802

Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17

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				603					611					8	
-300				601					609					8	
-150			558	604				570	611				12	7	
0	600	564	568	607		599	588	593	615		-1	24	25	8	
150	598	576	575	609		609	647	660	618		11	71	85	9	
300	591	577	574	607		620	672	695	630		29	95	121	23	
450	585	576	573	604		623	700	724	638		38	124	151	34	
600	581	575	572	601		625	724	734	648		44	149	162	47	
750	579	575	571	600		630	738	743	653		51	163	172	53	
900	578	575	571	599	889	635	738	738	647	900	57	163	167	48	11
1050	579	575	572	599	896	643	710	708	643	907	64	135	136	44	11
1200	581	577	574	599	902	638	690	678	635	913	57	113	104	36	11
1350	585	580	576	601	905	647	727	729	678	916	62	147	153	77	11
1500	590	583	580	602	906	651	753	758	686	917	61	170	178	84	11
1650	596	586	582	604	905	653	761	766	669	915	57	175	184	65	10
1800	598	581	581	604	902	625	738	755	669	912	27	157	174	65	10
1950		573	569	592	901		617	649	632	908		44	80	40	7
2100				567	899				574	907				7	8
2250				590	900				596	906				6	6
2400				594	904				599	909				5	5
2550				609					612					3	
2700				632					633					1	
2850				665					664					-1	

DATA SHEET NO. 11 ... (CONTINUED)

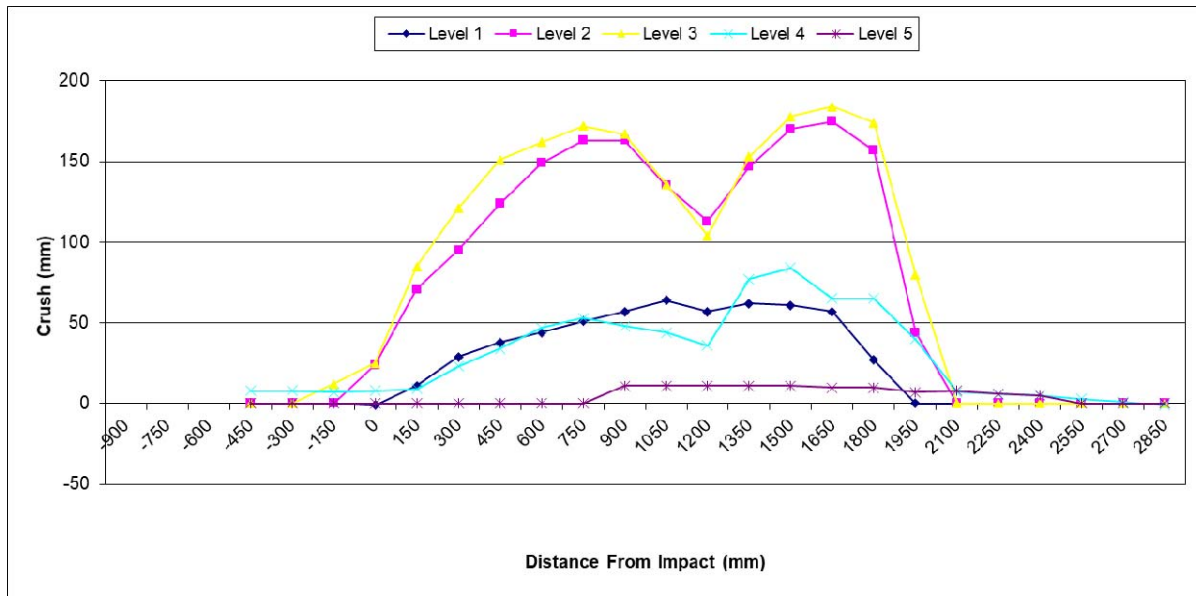
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV

NHTSA No. M20185802

Test Program: NCAP MDB Side Impact Test

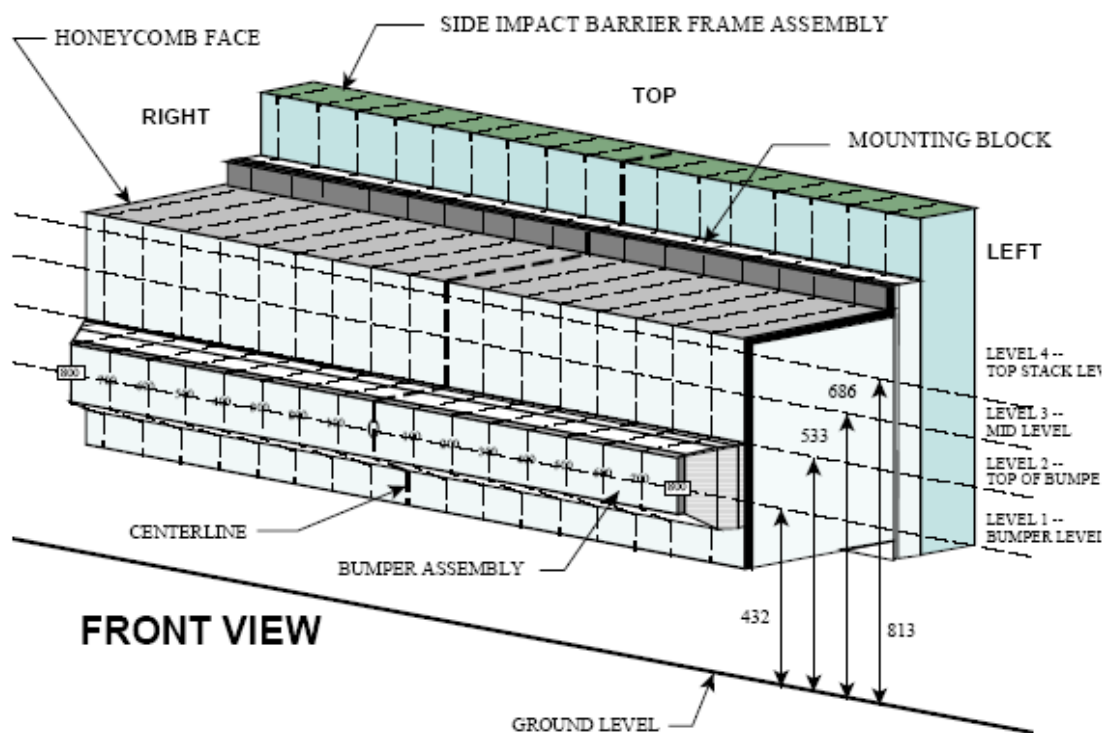
Test Date: 11/28/17



DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

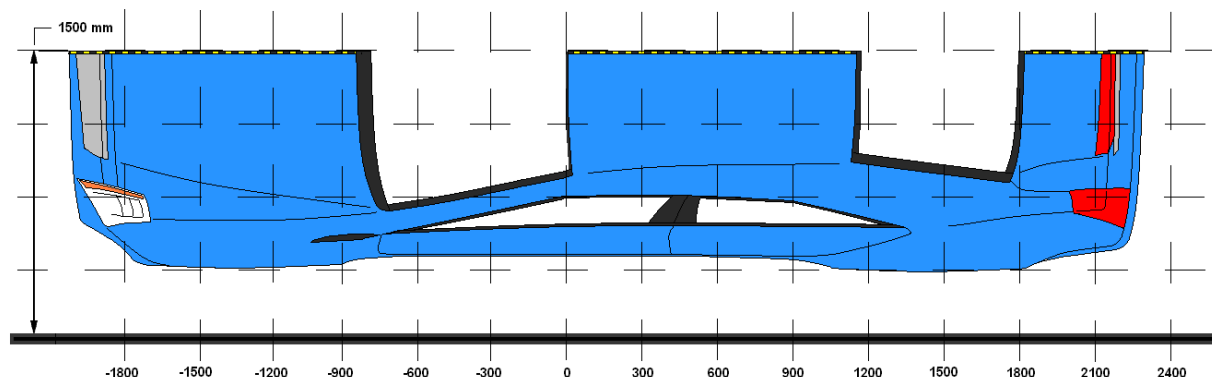
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	237	227	219	221	234	238	225	225	222	222	224	228	222	219	226	267	255
2	122	140	116	110	106	100	107	118	119	129	139	160	156	160	158	162	189
3	77	62	54	62	77	95	107	104	72	63	58	67	75	92	108	139	162
4	90	73	67	73	105	137	147	128	84	76	71	79	89	106	124	146	178

All dimensions in millimeters.

DATA SHEET NO. 13

VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2850	4	665	664	-1
2	2250	5	900	906	6
3	1500	3	580	758	178
4	900	3	571	738	167
5	150	3	575	660	85
6	-450	4	603	611	8

MDB DAMAGE PROFILE DISTANCES

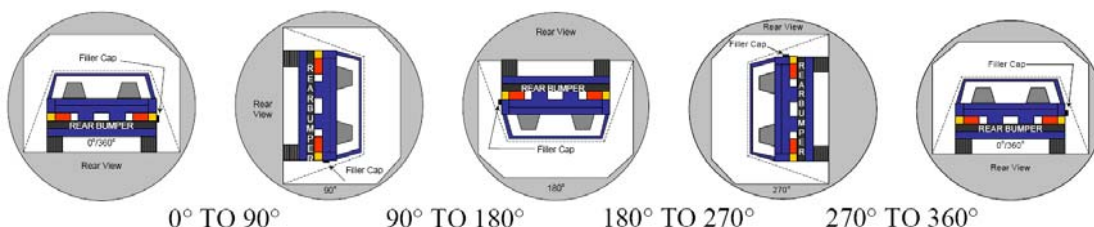
DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	255
2	500	Left	1	219
3	200	Left	1	224
4	200	Right	1	225
5	500	Right	1	225
6	800	Right	1	237

DATA SHEET NO. 14

FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV NHTSA No. M20185802
 Test Program: NCAP MDB Side Impact Test Test Date: 11/28/17
 Temperature at Time of Impact: 17.2 °C Test Time: 1:21 P.M.

- 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°	78	300	378
90° To 180°	85	300	385
180° To 270°	82	300	382
270° To 360°	78	300	378

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 15

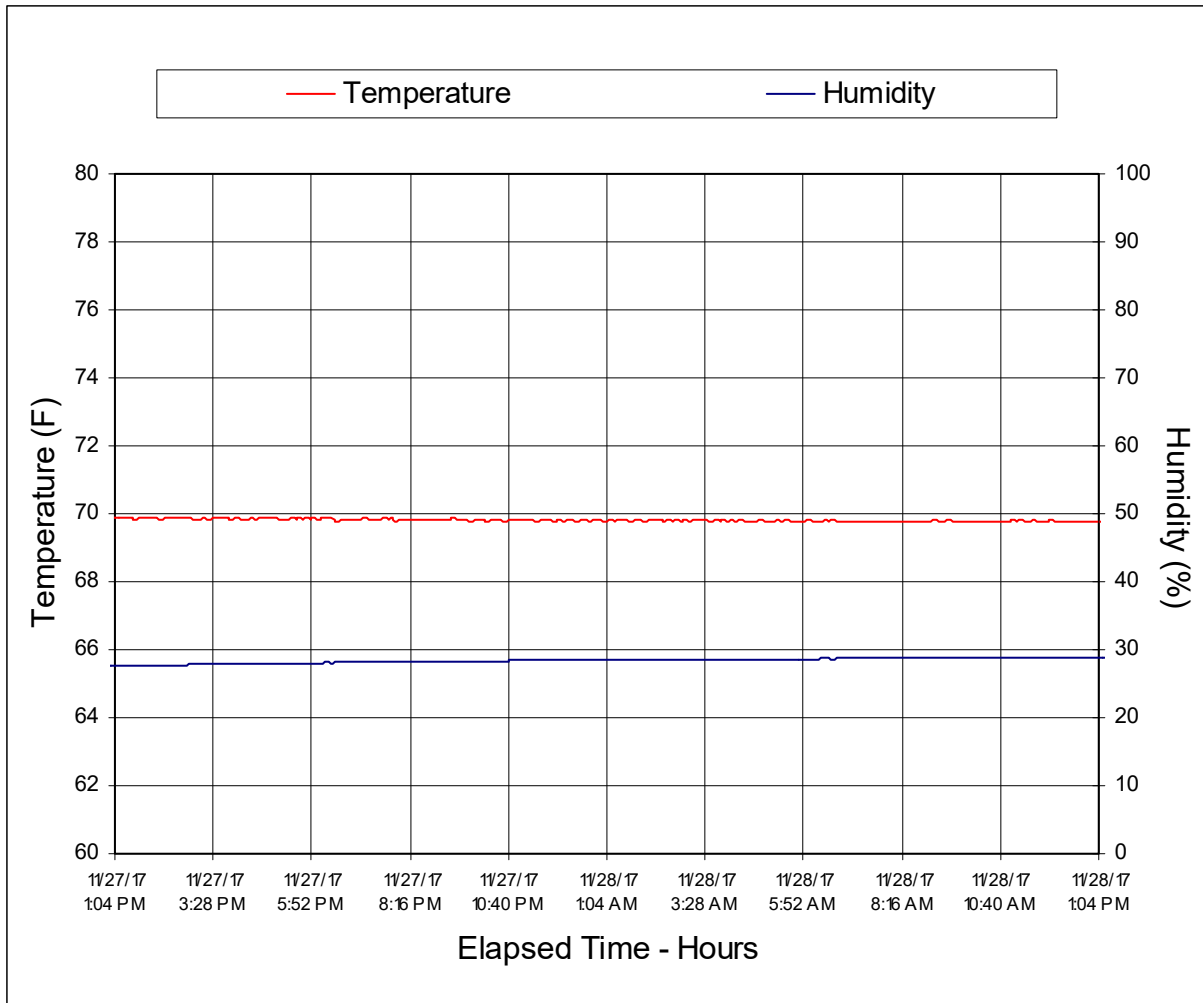
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV

NHTSA No. M20185802

Test Program: NCAP MDB Side Impact Test

Test Date: 11/28/17



APPENDIX A
PHOTOGRAPHS

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96	FMVSS No. 301 Static Rollover 0 Degrees	A-48
97	FMVSS No. 301 Static Rollover 90 Degrees	A-49
98	FMVSS No. 301 Static Rollover 180 Degrees	A-49
99	FMVSS No. 301 Static Rollover 270 Degrees	A-50
100	FMVSS No. 301 Static Rollover 360 Degrees	A-50
101	Impact Event	A-51
102	Monroney Label	A-51
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52
104	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-52



FIGURE 1. As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 2. As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle

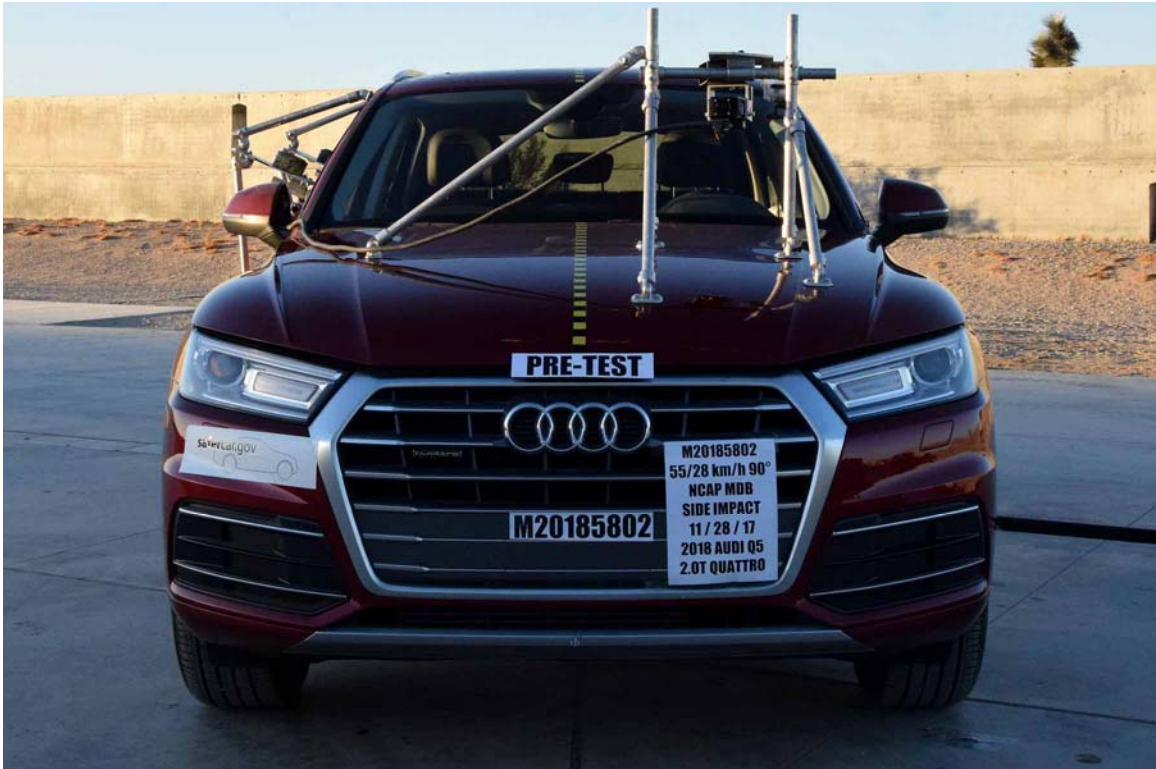


FIGURE 3. Pre-Test Frontal View of Test Vehicle

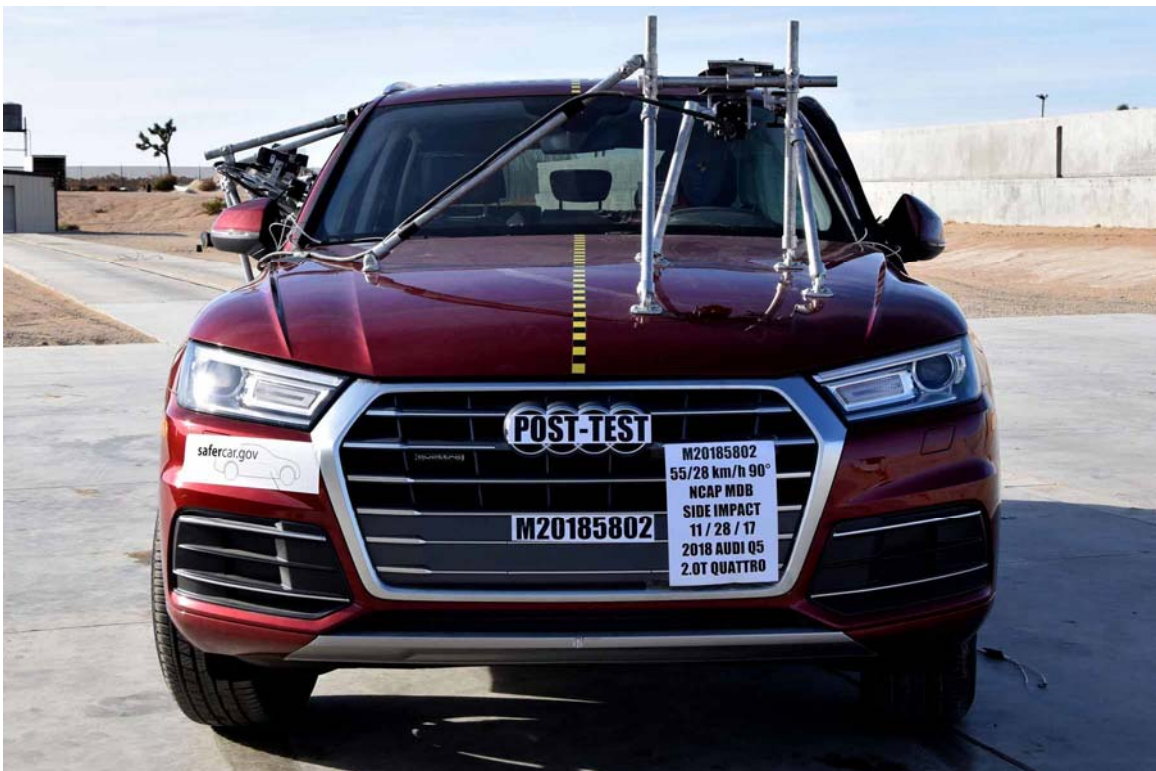


FIGURE 4. Post-Test Frontal View of Test Vehicle



FIGURE 5. Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



FIGURE 6. Post-Test Left Front $\frac{3}{4}$ 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 $\frac{3}{4}$ View of Test Vehicle



FIGURE 10. Post-Test Left Rear $\frac{3}{4}$ 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

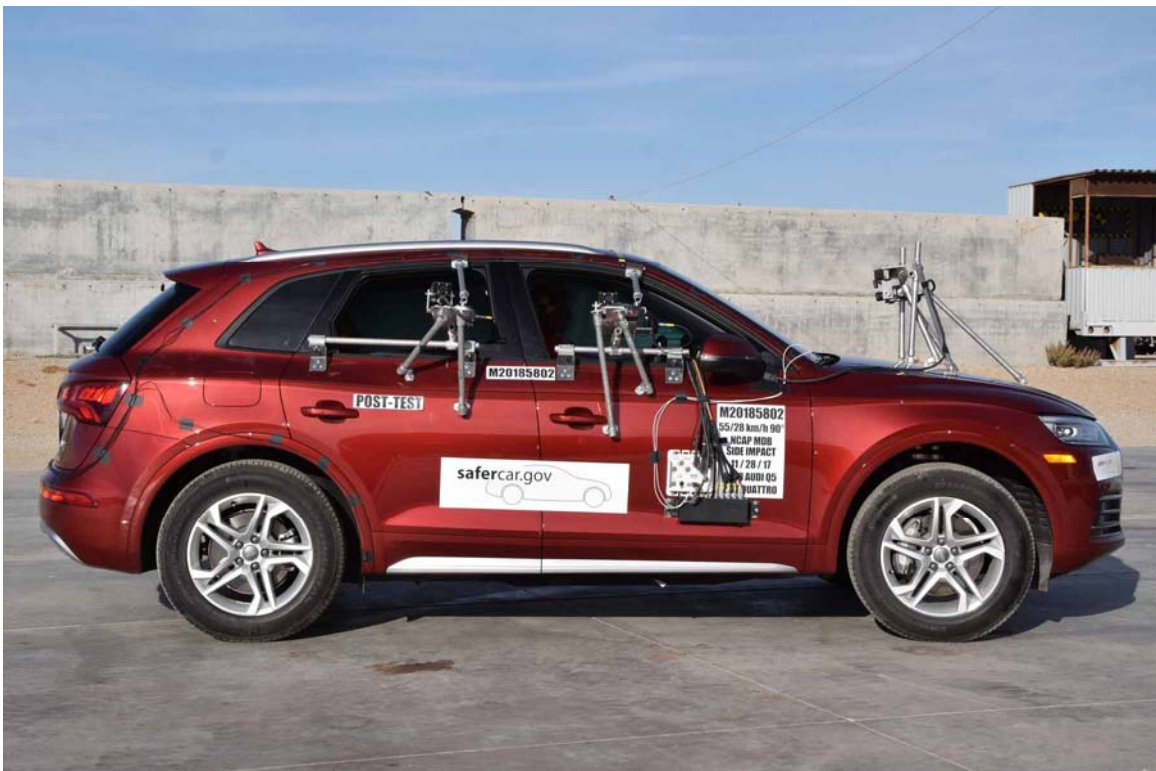


FIGURE 14. Post-Test Right Side View of Test Vehicle



FIGURE 15. Pre-Test Overhead View of Test Area

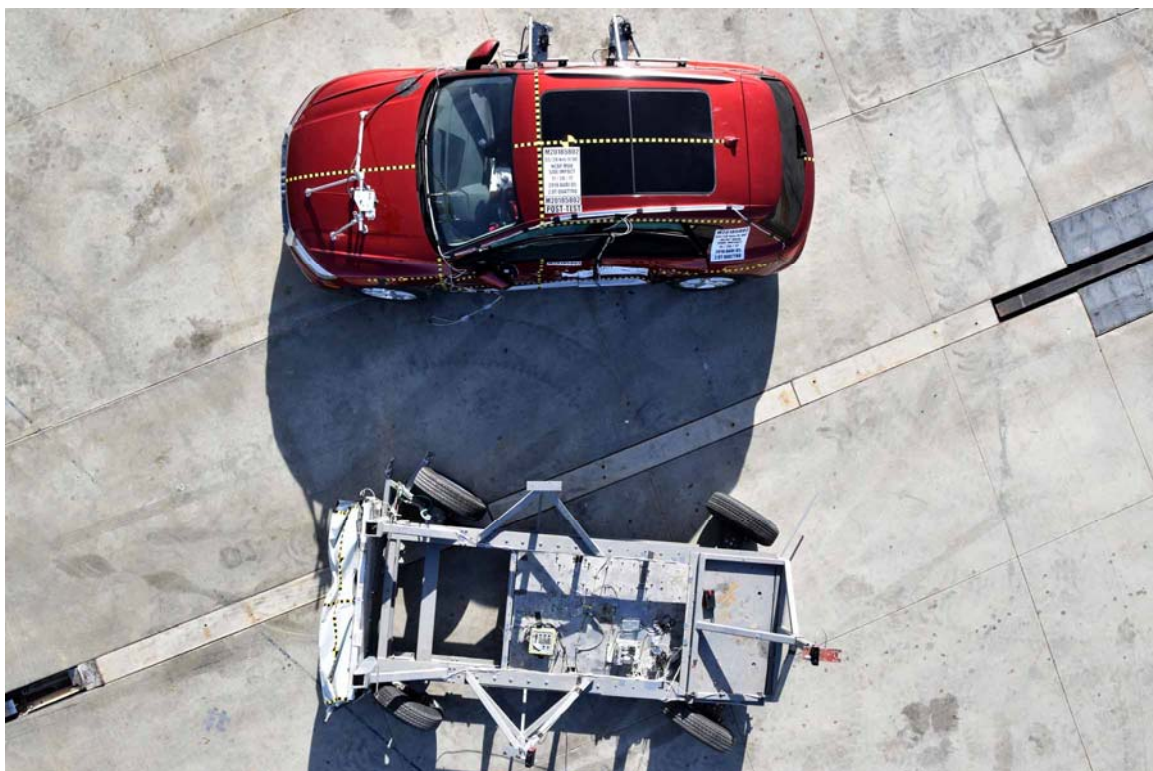


FIGURE 16. Post-Test Overhead View of Test Area



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

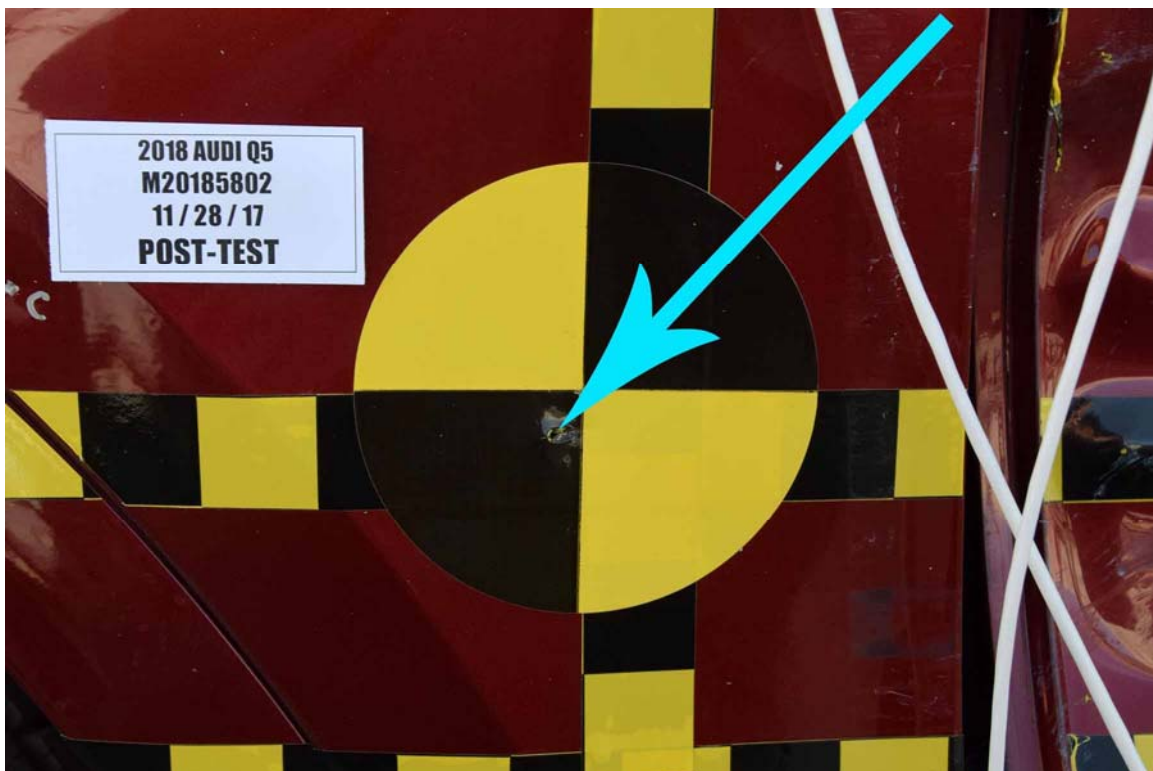


FIGURE 20. Post-Test Close-Up View of Impact Point Target



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

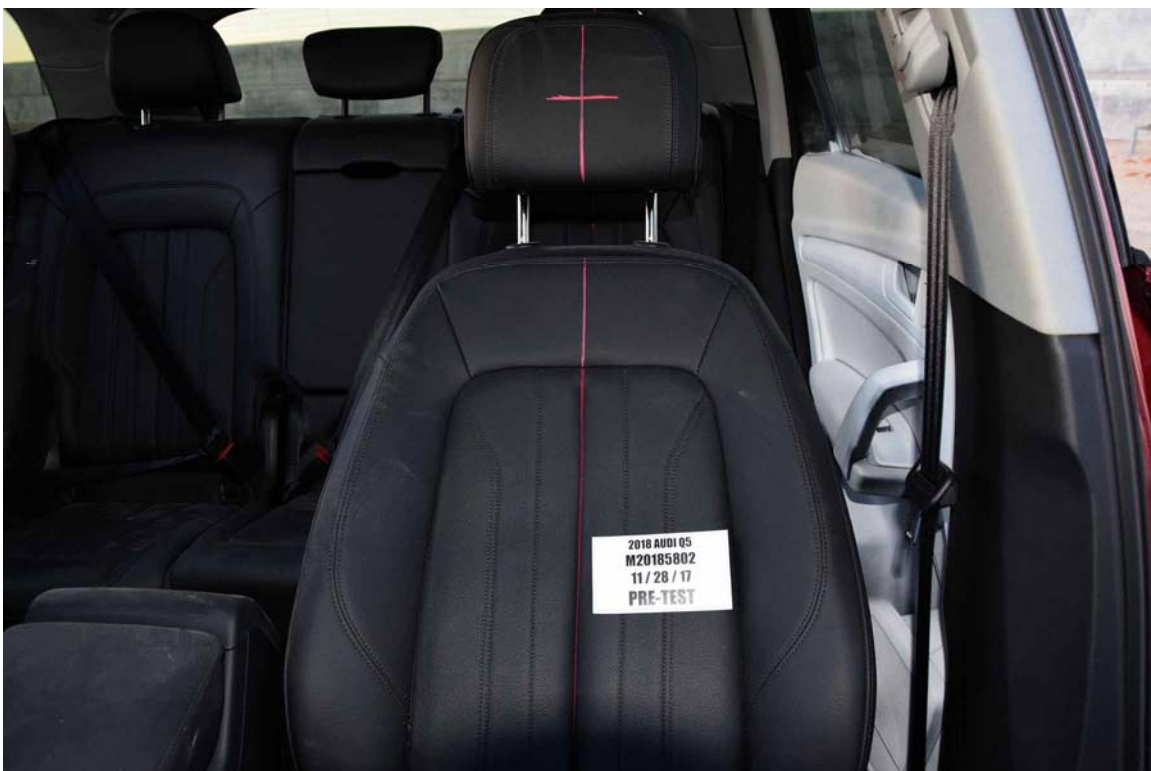


FIGURE 30. Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



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

Photograph Not Applicable

No Driver Dummy
Knee Contact

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



FIGURE 55. Pre-Test Left Side View of Rear Passenger Dummy
Showing Belt and Chalking



FIGURE 56. Pre-Test Left Side View of Rear Passenger Dummy
Shoulder and Door Top View



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

Photograph Not Applicable

Vehicle Not Equipped with
Rear Passenger Side Airbag

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



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

Photograph Not Applicable

Vehicle Not Equipped with Rear Passenger Side Airbag

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

Photograph Not Applicable

No Rear Passenger Dummy Knee Contact

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

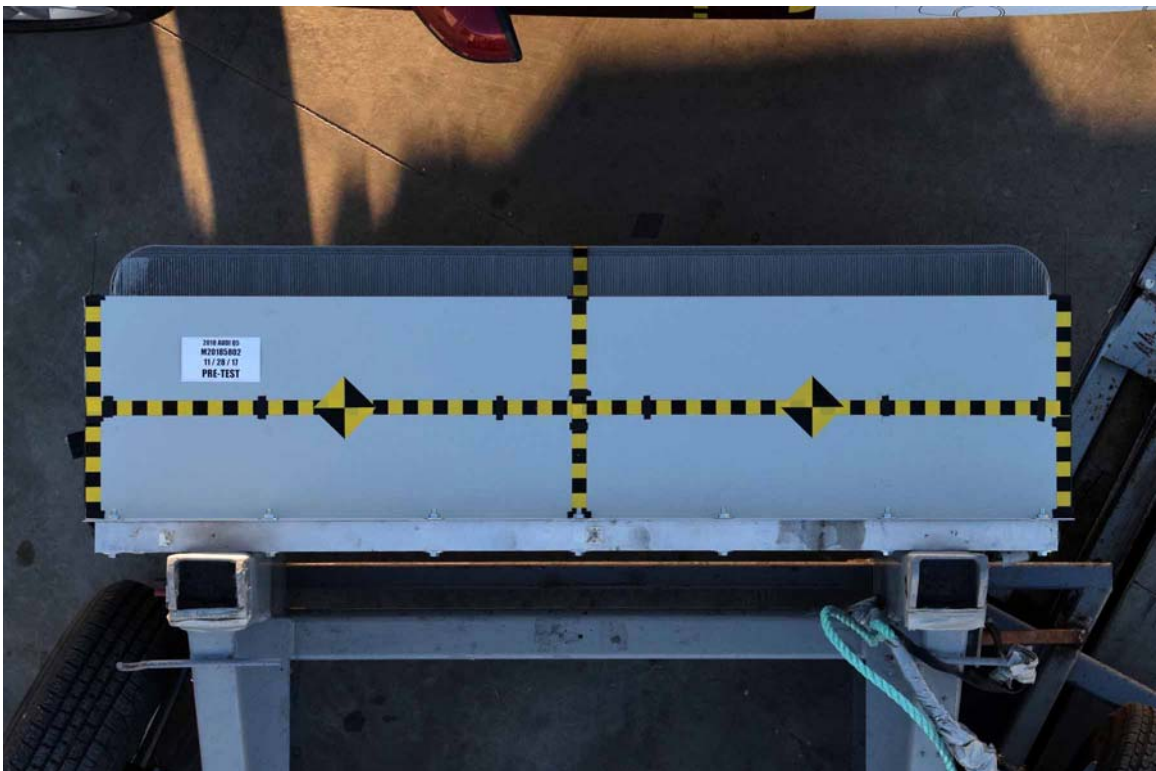


FIGURE 86. Pre-Test Top View of MDB Impactor Face



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

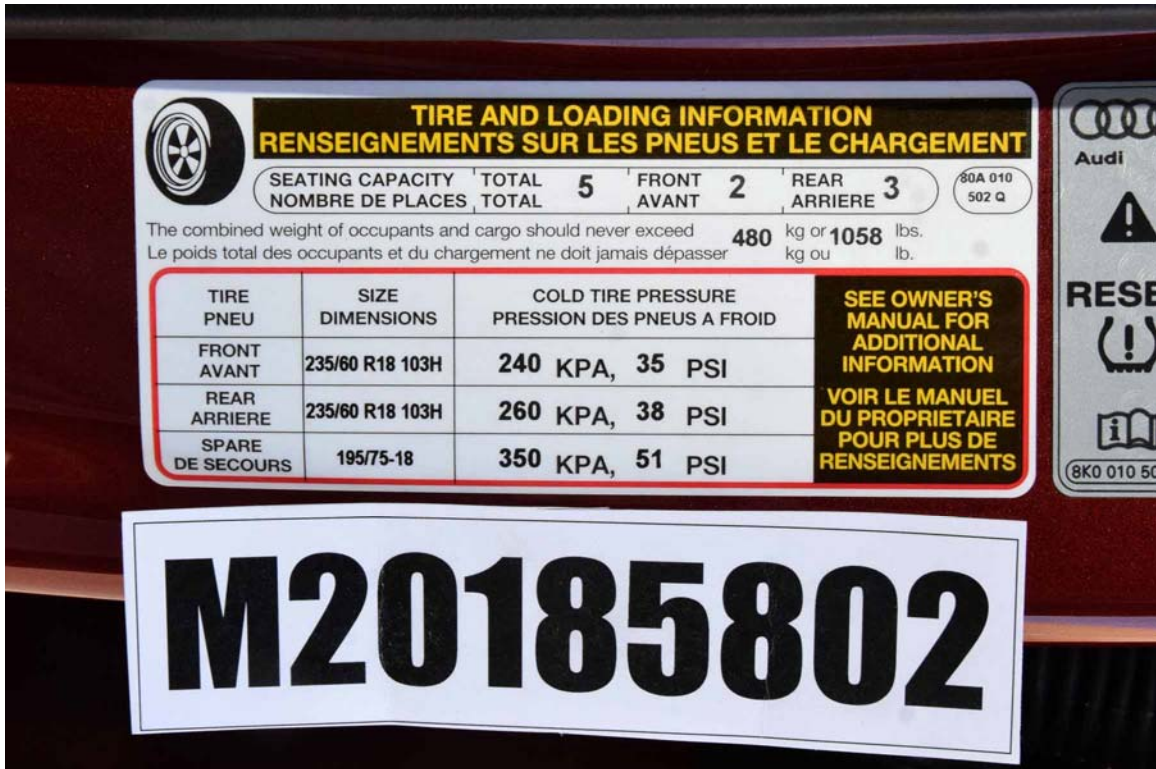


FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

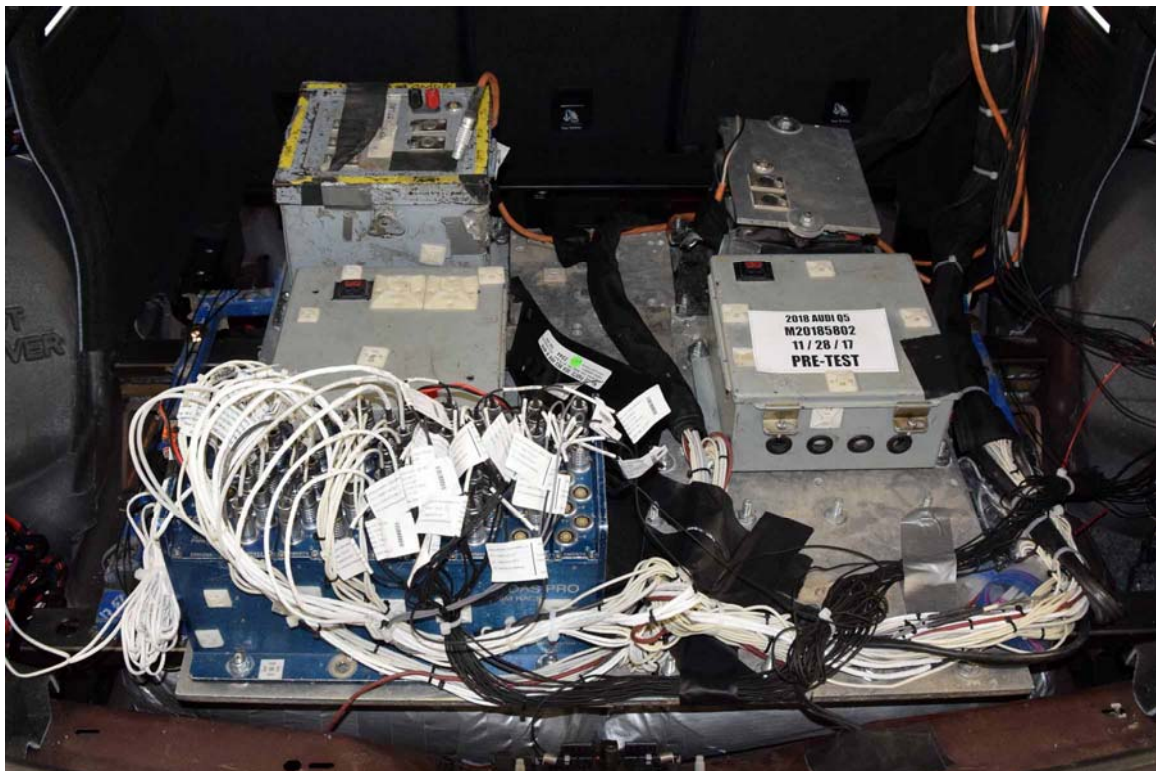


FIGURE 94. Pre-Test Ballast View



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

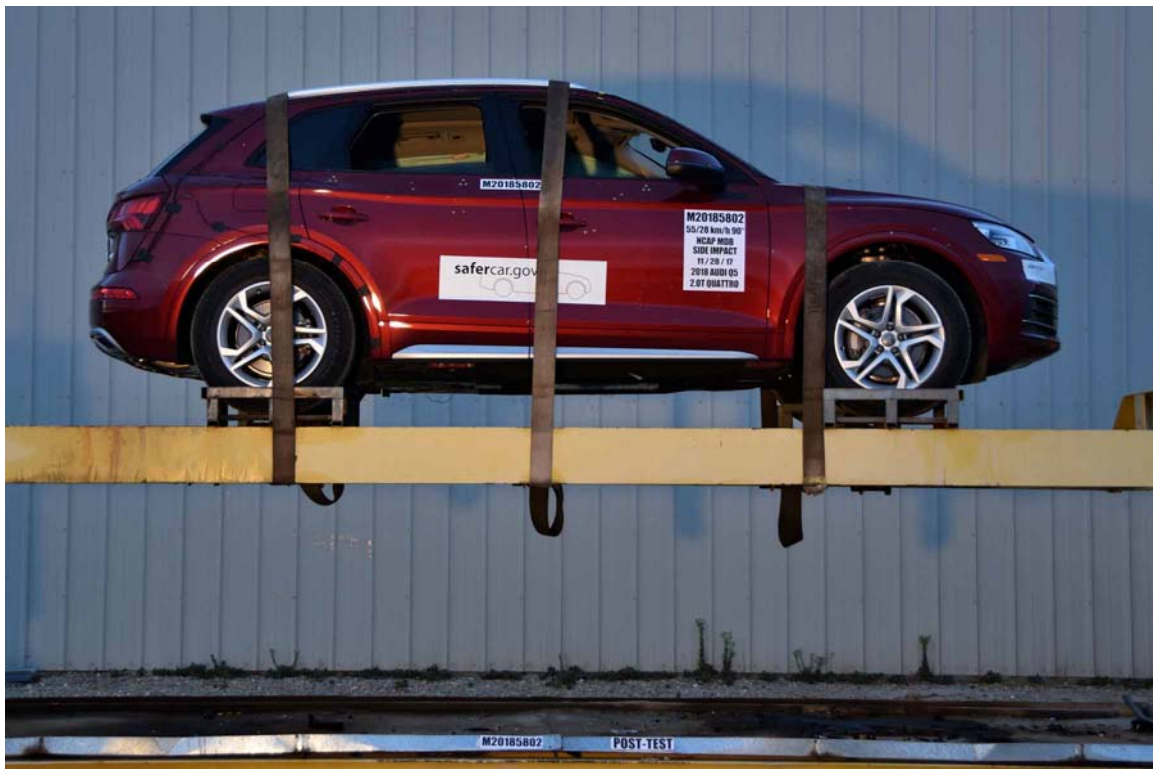


FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees



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

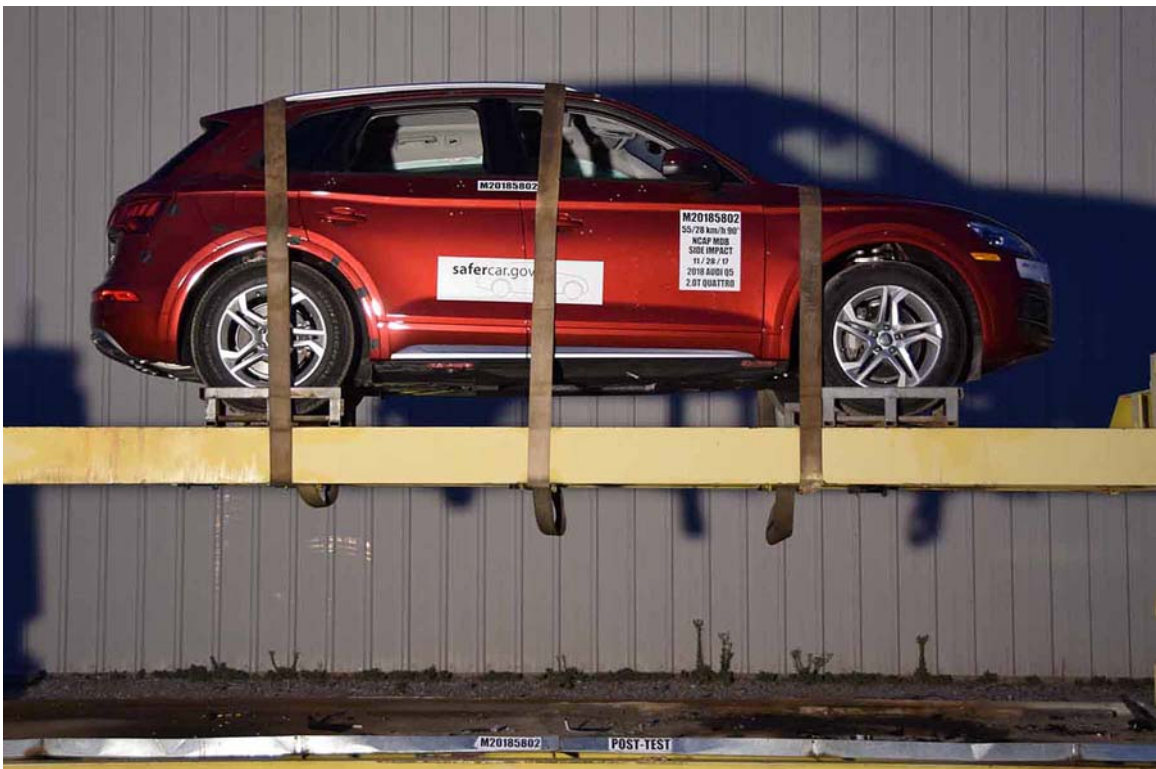


FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees



FIGURE 101. Impact Event

2018 Audi Q5 2.0T quattro S tronic



STANDARD EQUIPMENT (unless replaced by options) TECHNICAL - 2.0 TFSI 252hp / 273hp-R14 engine - quattro® all-wheel drive system - 7-speed S tronic® transmission - 18" 5-double-spoke-dynamic design wheels with 235/60 all-season tires - Energy recuperation w/ start-stop - Space-saving spare tire COMFORT/TECHNOLOGY - Audi drive select - Audi sound system - Audi sensor plus headlights - Aluminum roof rails - Auto-dimming interior mirror w/ compass - Garage door opener (HomeLink®) - Driver information system w/ trip computer, monochrome - Hill descent control - Leather seating surfaces - Power exterior mirrors, heated - Power tailgate - Preparation for mobile phone (Bluetooth®) with audio streaming - Rain & light sensor - Rear privacy glass - Sliding 40/20/40 split-folding 2nd row with adjustable recline - Three-zone automatic climate control with digital rear display - USB Audi music interface w/ Audi smartphone interface - 3-spoke multi-function steering wheel w/ shift paddles - 8-way power front seats, 4-way power lumbar for driver SAFETY/CONVENIENCE - Advanced Airbag Protection System with 6 airbags - Anti-lock Braking System (ABS) w/ Brake Assist - Audi pre sense basic (preventative occupant protection) - Audi pre sense city (low speed collision assist) - Child safety locks in rear doors, manual - Electronic Stabilization Control (ESC) w/ Offroad mode - Electronic vehicle immobilization w/ anti-theft alarm & interior motion sensor - LED Daytime Running Lights (DRLs) - LED taillights with dynamic turn signals - Lower Anchors and Tethers for Children (LATCH) - Rearview camera - Tire Pressure Monitoring System (TPMS) WARRANTY/MAINTENANCE - 4 Year/50,000 mile (whichever occurs first) New Vehicle Limited Warranty* - 12 Year Unlimited Mileage Against Corrosion Perforation - 1 Year/10,000 mile (whichever occurs first) First Scheduled Maintenance Service FREE OF CHARGE - 4 Years Roadside Assistance coverage provided by a third party supplier *Please refer to the 2018 Audi Warranty and Maintenance Booklet for complete coverage information.		MANUFACTURER'S SUGGESTED RETAIL PRICE 2018 Audi Q5 2.0T quattro S tronic \$41,500.00 PACKAGES / OPTIONS Matador Red metallic \$575.00 Black interior Included Panoramic sunroof \$1,450.00 Convenience package \$900.00 8-way power front seats with driver memory Audi advanced key Heated, auto-dim, power folding exterior mirrors w/memory SiriusXM® All Access service w/3-months trial subscription Heated front seats \$500.00 Cargo cover \$225.00 Audi Guard All-Weather Floor Mats \$200.00 USB Cables - Lightning® & micro-USB \$110.00 Front filler panel Included Destination Charge \$975.00 Total Price: \$46,435.00 Fuel, license, title fees, taxes and dealer-installed accessories are not included.		MODEL: FYBSNY VIN: WA1ANAFY2J222784 DEALER: 405A61 AUDI NORTH MIAMI 1995 NE 142ND STREET NORTH MIAMI, FL 33181 Port of Entry: JACKSONVILLE SHIP TO: 405A61 AUDI NORTH MIAMI 1995 NE 142ND STREET NORTH MIAMI, FL 33181 COMM NUM: NN5649 Transportation Method: TRUCK		GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score Not Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight. <table border="1"> <tr> <th>Frontal Crash</th> <th>Driver Passenger</th> <th>Not Rated</th> </tr> <tr> <td>Side Crash</td> <td>Front Seat Rear Seat</td> <td>Not Rated</td> </tr> <tr> <td>Rollover</td> <td></td> <td>Not Rated</td> </tr> </table> Based on the risk of rollover in a single-vehicle crash. Star ratings range from 1 to 5 stars (★ ★ ★ ★ ★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236		Frontal Crash	Driver Passenger	Not Rated	Side Crash	Front Seat Rear Seat	Not Rated	Rollover		Not Rated
Frontal Crash	Driver Passenger	Not Rated														
Side Crash	Front Seat Rear Seat	Not Rated														
Rollover		Not Rated														
PARTS CONTENT INFORMATION FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 2% FINAL ASSEMBLY POINT: SAN JOSE CHIAPA, MEXICO MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO: 75% COUNTRY OF ORIGIN: ENGINE: MEXICO TRANSMISSION: GERMANY NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION OR OTHER NON-PARTS COSTS.		EPA DOT Fuel Economy and Environment Gasoline Vehicle Fuel Economy 25 23 27 MPG combined city/hwy city highway 4 gallons per 100 miles Annual fuel cost \$1,700 Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only) 1 5 10 1 3 10 Best Worst Best Worst This vehicle emits 363 grams of CO ₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at www.epa.gov . Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$6,750 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.80 per gallon. NPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog. fuel economy.gov Calculate personalized estimates and compare vehicles Smartphone Off Code™ QR Code														

FIGURE 102. Monroney Label

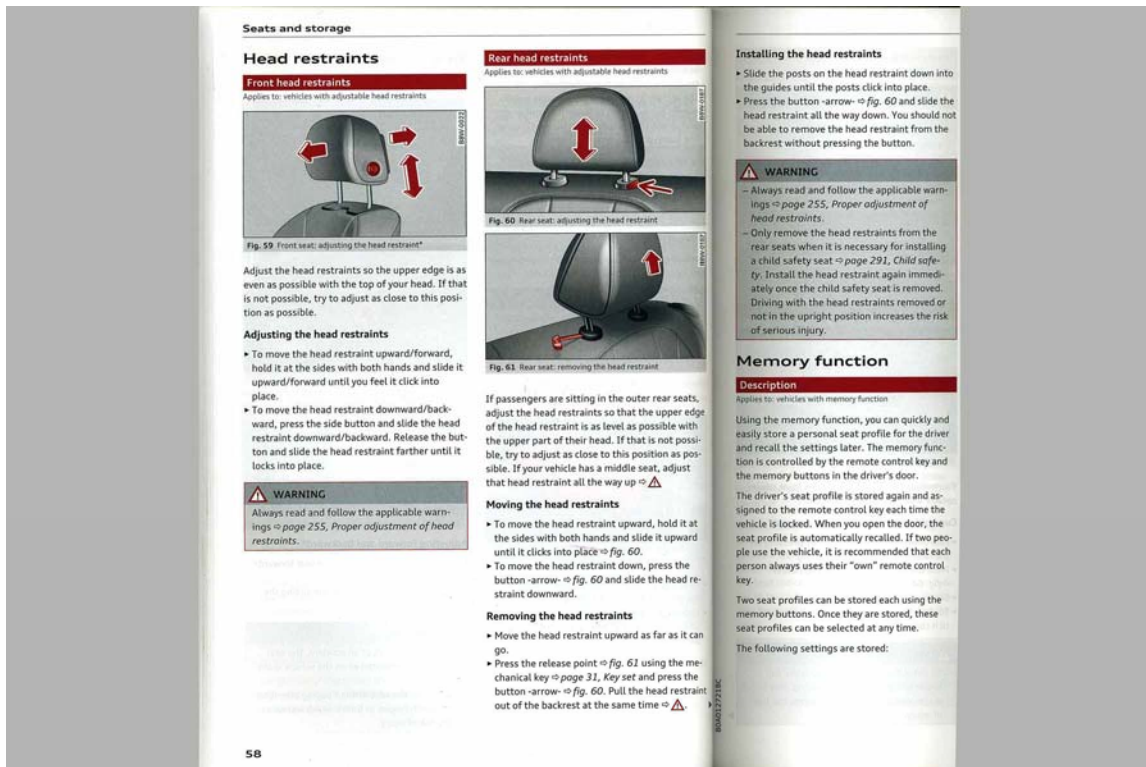


FIGURE 103. Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

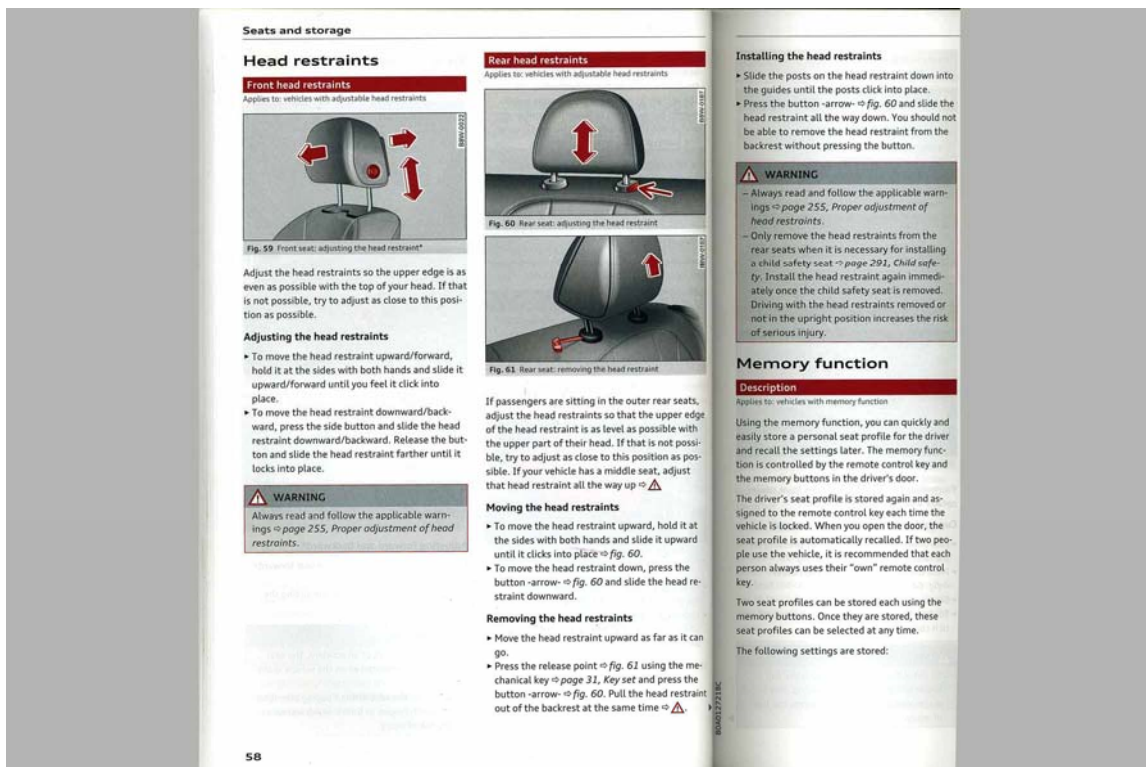


FIGURE 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

TABLE OF DATA PLOTS

Plot		Page
1	Driver Head Acceleration (X) Primary vs. Time	B-1
2	Driver Head Acceleration (Y) Primary vs. Time	B-1
3	Driver Head Acceleration (Z) Primary vs. Time	B-1
4	Driver Head Resultant Acceleration Primary vs. Time	B-1
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-2
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-2
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-2
8	Driver Thorax Rib Deflection Maximum vs. Time	B-2
9	Driver Anterior Abdominal Force (Y) vs. Time	B-3
10	Driver Middle Abdominal Force (Y) vs. Time	B-3
11	Driver Posterior Abdominal Force (Y) vs. Time	B-3
12	Driver Total Abdominal Force (Y) vs. Time	B-3
13	Driver Pubic Symphysis Force (Y) vs. Time	B-4
14	Passenger Head Acceleration (X) vs. Time Primary	B-5
15	Passenger Head Acceleration (Y) vs. Time Primary	B-5
16	Passenger Head Acceleration (Z) vs. Time Primary	B-5
17	Passenger Head Resultant Acceleration Primary vs. Time	B-5
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-6
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-6
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-6
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-6
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-7
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-7
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-7

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

Passenger Upper Thorax Rib Deflection (Y)

Passenger Middle Thorax Rib Deflection (Y)

Passenger Lower Thorax Rib Deflection (Y)

Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
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)

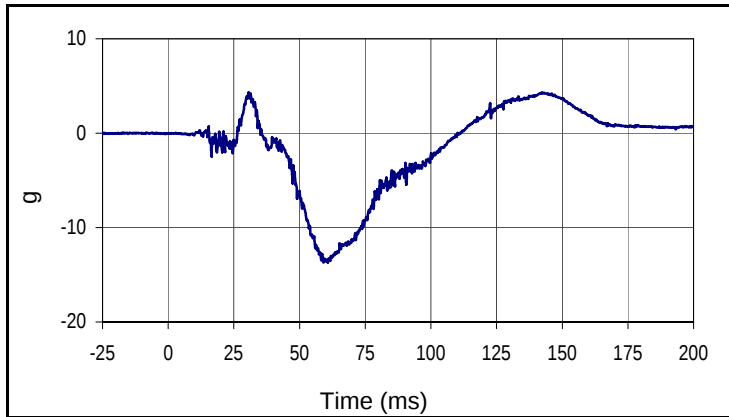
MDB Rear Acceleration (Y)

Left MDB Contact Switch

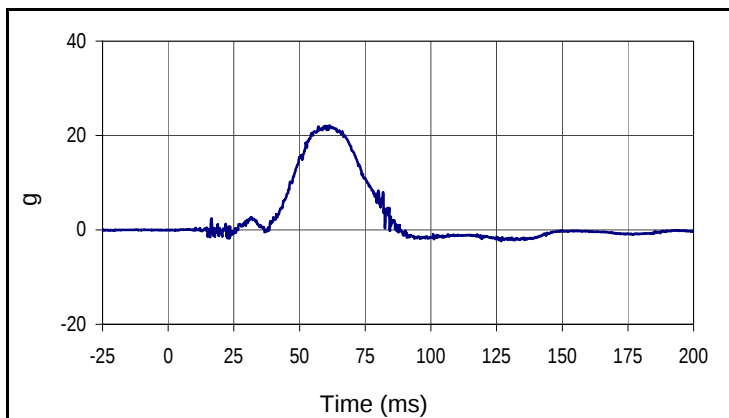
Right MDB Contact Switch

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

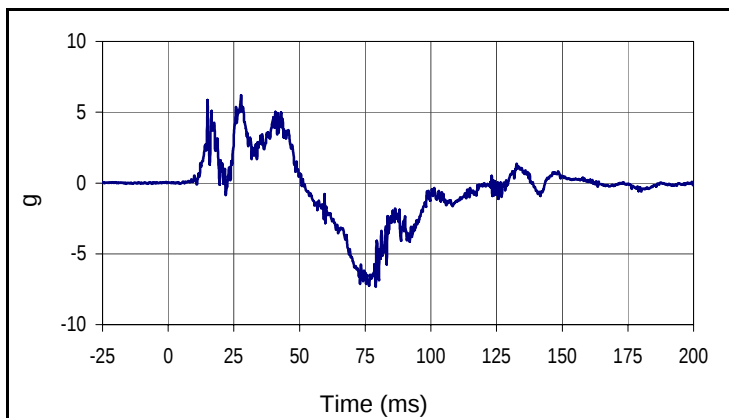
NHTSA No.: M20185802
 Test Date: 11/28/17



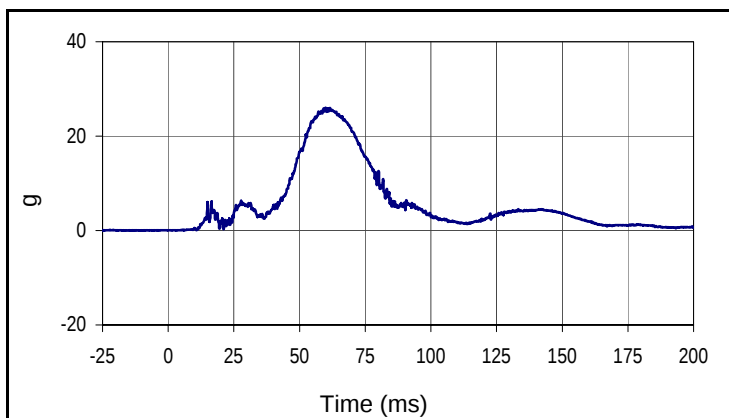
Curve Description			
Driver Head Acceleration X Primary			
Plot No.		SAE Class	Units
001		1000	g
Max	Time	Min	Time
4.3	30.6	-13.7	59.2



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
22.1	61.4	-2.3	126.8



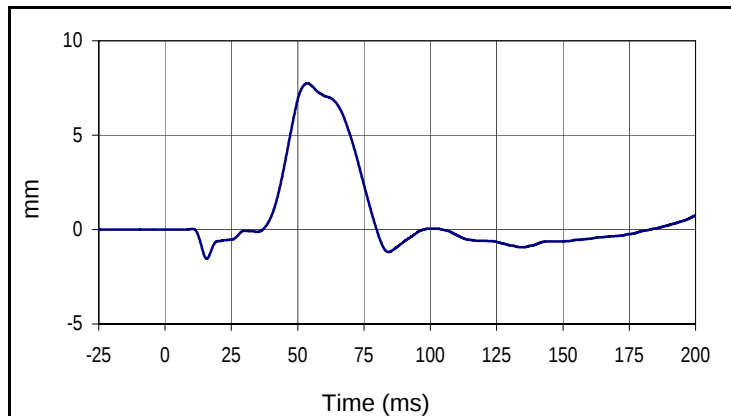
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
6.2	27.8	-7.3	79.0



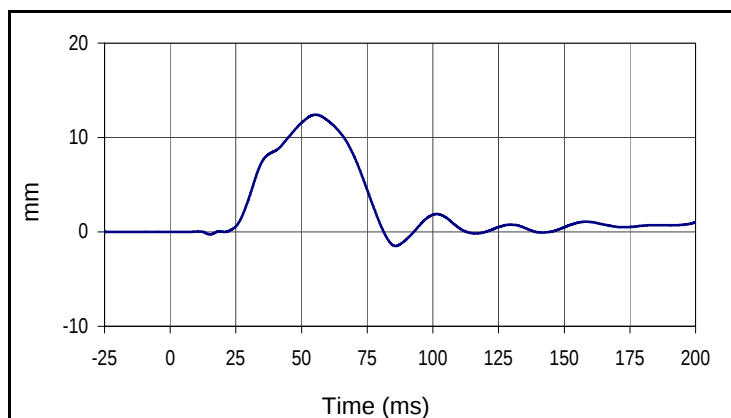
Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
26.0	59.9	0.0	3.0

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

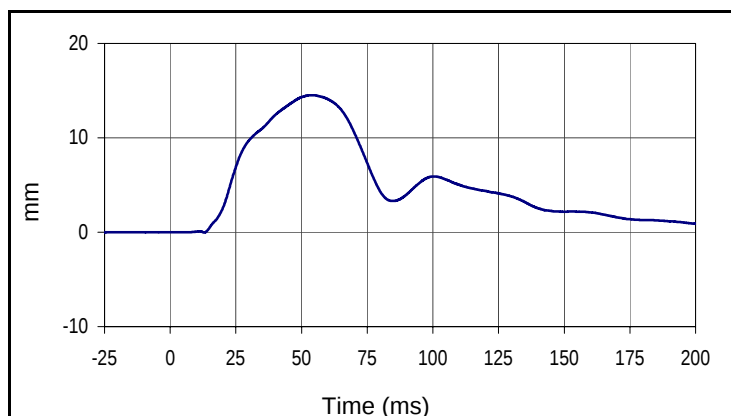
NHTSA No.: M20185802
 Test Date: 11/28/17



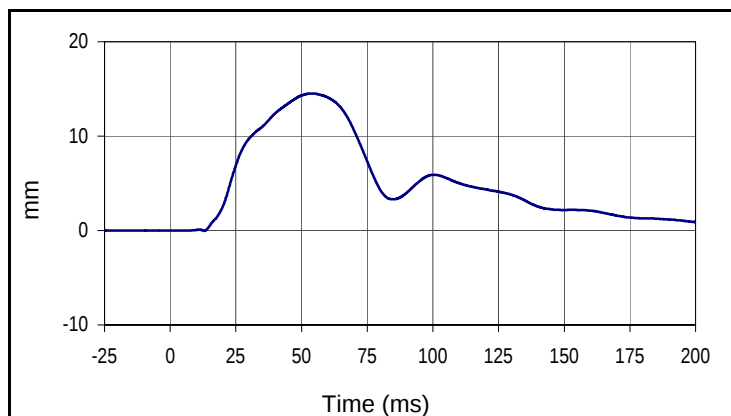
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.		SAE Class	Units
005		180	mm
Max	Time	Min	Time
7.7	53.6	-1.5	15.7



Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.		SAE Class	Units
006		180	mm
Max	Time	Min	Time
12.4	55.3	-1.5	85.8



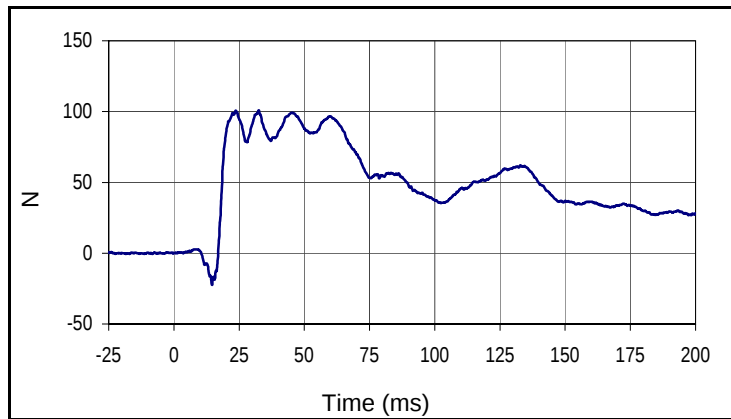
Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.		SAE Class	Units
007		180	mm
Max	Time	Min	Time
14.5	54.2	0.0	13.0



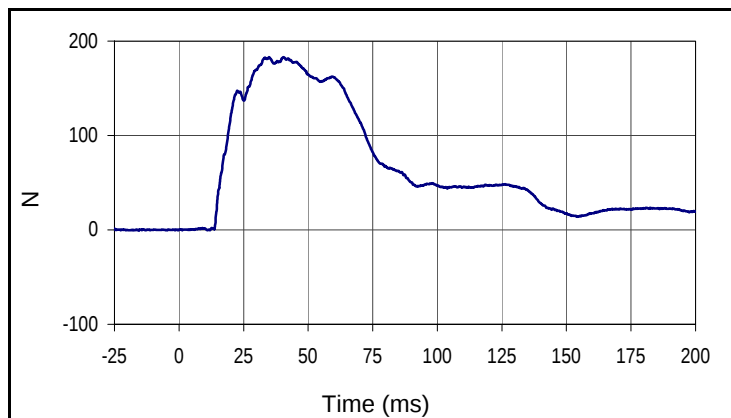
Curve Description			
Driver Thorax Rib Deflection Maximum Y			
Plot No.		SAE Class	Units
008		180	mm
Max	Time	Min	Time
14.5	54.2	0.0	13.0

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

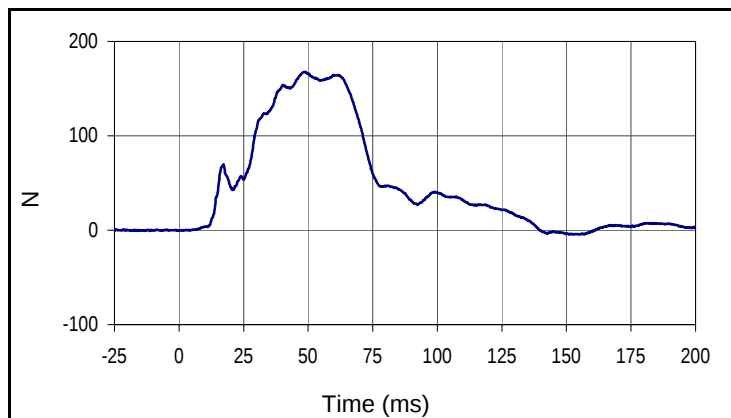
NHTSA No.: M20185802
 Test Date: 11/28/17



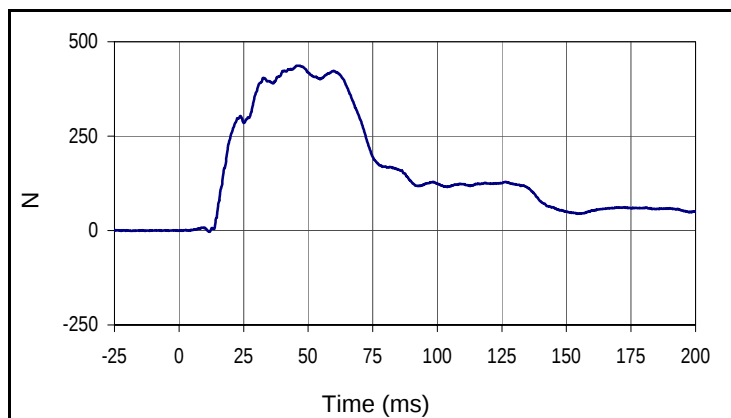
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.		SAE Class	Units
009		600	N
Max	Time	Min	Time
101.0	32.5	-22.3	14.6



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.		SAE Class	Units
010		600	N
Max	Time	Min	Time
183.1	40.5	-0.5	11.0



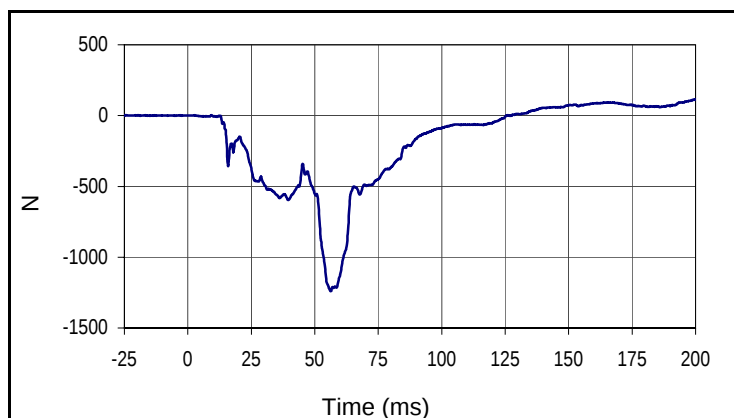
Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.		SAE Class	Units
011		600	N
Max	Time	Min	Time
167.6	48.9	-4.5	151.2



Curve Description			
Driver Total Abdominal Force			
Plot No.		SAE Class	Units
012		600	N
Max	Time	Min	Time
436.7	45.6	-3.2	11.8

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

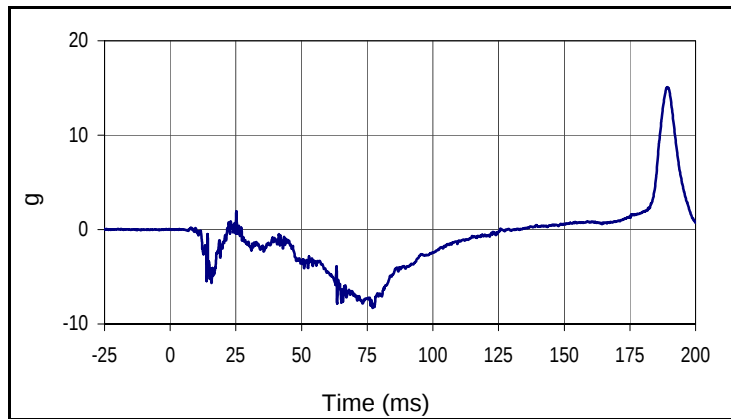
NHTSA No.: M20185802
 Test Date: 11/28/17



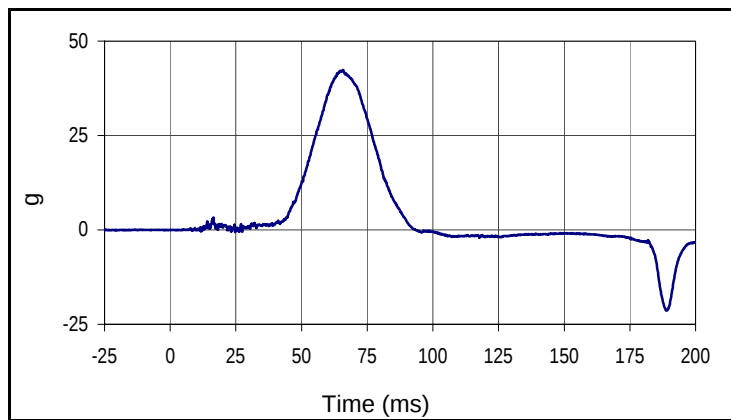
Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.		SAE Class	Units
013		600	N
Max	Time	Min	Time
113.8	200.0	-1239.4	56.3

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

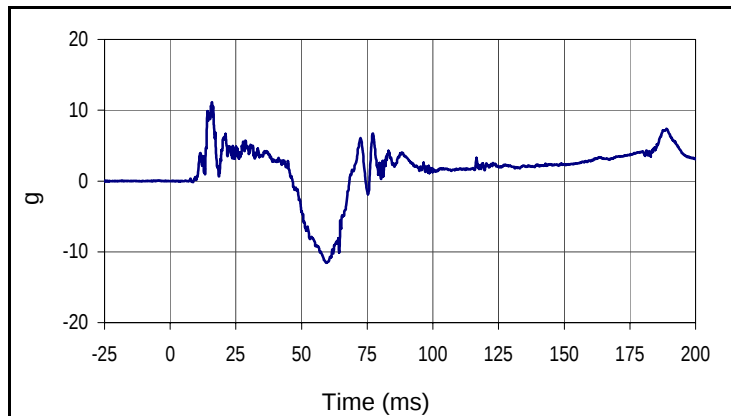
NHTSA No.: M20185802
 Test Date: 11/28/17



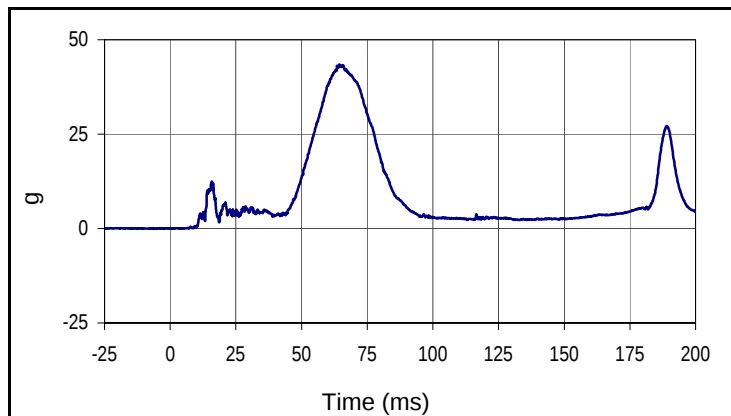
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.		SAE Class	Units
014		1000	g
Max	Time	Min	Time
15.1	189.4	-8.3	77.1



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.		SAE Class	Units
015		1000	g
Max	Time	Min	Time
42.3	65.7	-21.4	189.1



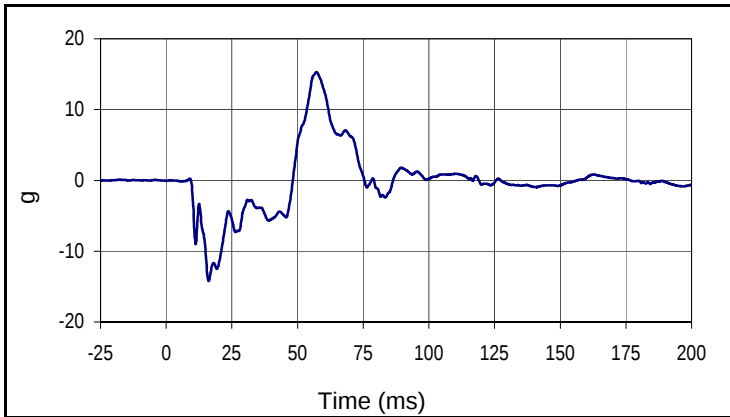
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.		SAE Class	Units
016		1000	g
Max	Time	Min	Time
11.1	15.9	-11.5	59.4



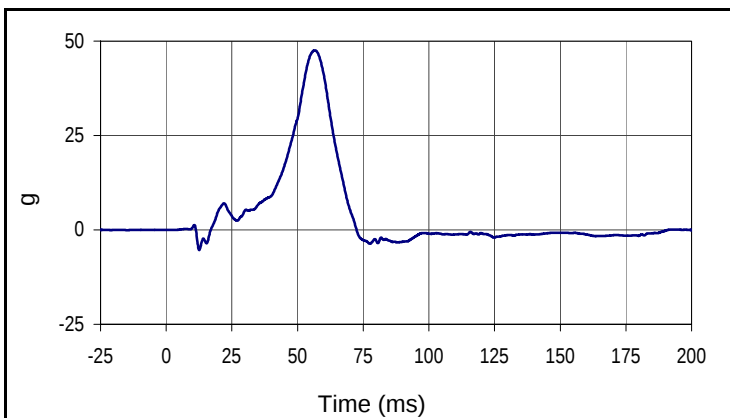
Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.		SAE Class	Units
017		1000	g
Max	Time	Min	Time
43.5	64.4	0.0	1.6

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

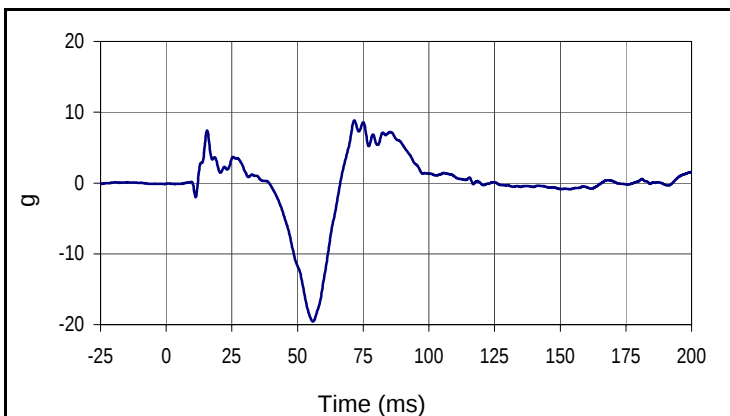
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 Test Date: 11/28/17



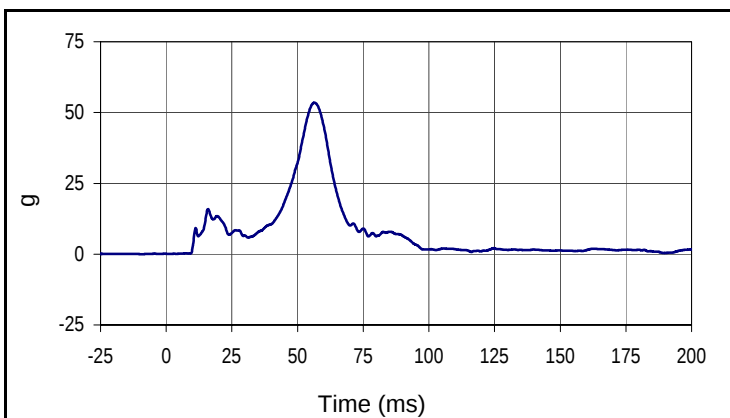
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.		SAE Class	Units
018		180	g
Max	Time	Min	Time
15.3	57.2	-14.2	16.2



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.		SAE Class	Units
019		180	g
Max	Time	Min	Time
47.6	56.6	-5.3	12.6



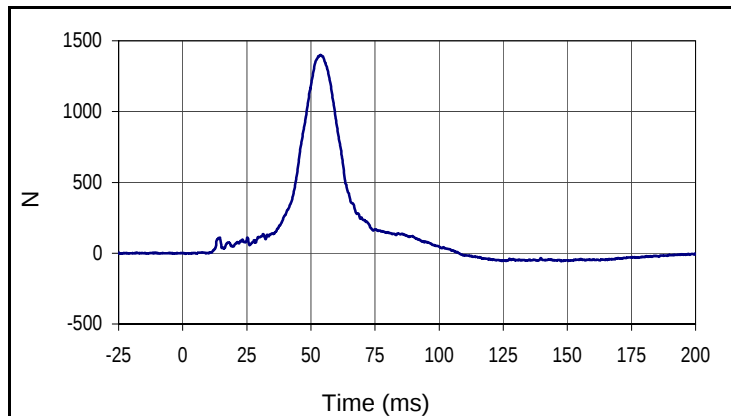
Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.		SAE Class	Units
020		180	g
Max	Time	Min	Time
8.8	71.6	-19.6	55.9



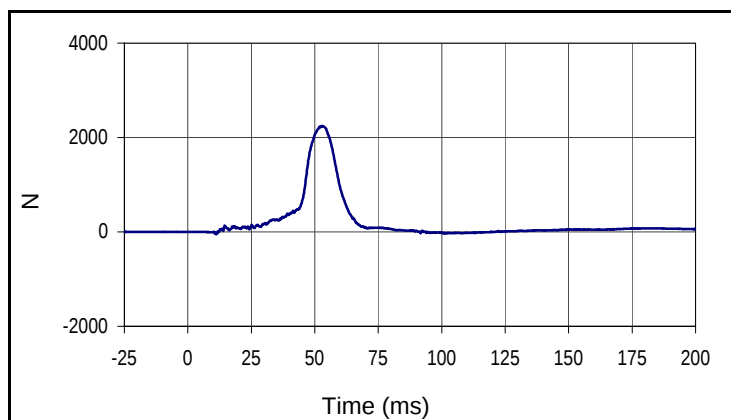
Curve Description			
Passenger Lower Spine T12 Acceleration Res.			
Plot No.		SAE Class	Units
021		180	g
Max	Time	Min	Time
53.5	56.4	0.1	0.9

Test Vehicle: 2018 Audi Q5 2.0T Quattro 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

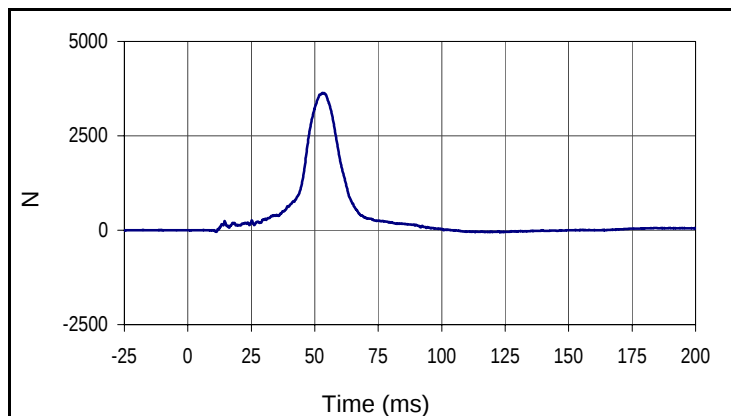
NHTSA No.: M20185802
 Test Date: 11/28/17



Curve Description			
Passenger Iliac Force on Impact Side Y			
Plot No.		SAE Class	Units
022		600	N
Max	Time	Min	Time
1399.6	53.7	-56.2	147.7



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.		SAE Class	Units
023		600	N
Max	Time	Min	Time
2243.0	53.0	-47.6	11.1



Curve Description			
Passenger Total Pelvic Force			
Plot No.		SAE Class	Units
024		600	N
Max	Time	Min	Time
3633.2	53.0	-50.2	113.2

APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA



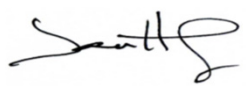
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

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

ATD Serial No.: F037

Test Date: 2017-11-13

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	33	Pass
1 - Sitting Height	mm	900	918	906	Pass
2 - Seat to Shoulder Joint	mm	558	572	564	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	102	Pass
5 - Sole to Seat, Sitting	mm	333	451	385	Pass
6 - Head Width	mm	152	158	156	Pass
7 - Shoulder/Arm Width	mm	461	479	472	Pass
8 - Thorax Width	mm	322	332	328	Pass
9 - Abdomen Width	mm	273	287	281	Pass
10 - Pelvis Lap Width	mm	359	373	364	Pass
11 - Head Depth	mm	196	206	205	Pass
12 - Thorax Depth	mm	262	272	267	Pass
13 - Abdomen Depth	mm	194	204	199	Pass
14 - Pelvis Depth	mm	235	245	243	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	155	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	601	Pass
				Overall Test Results	Pass

Technician: 

Approved By: 



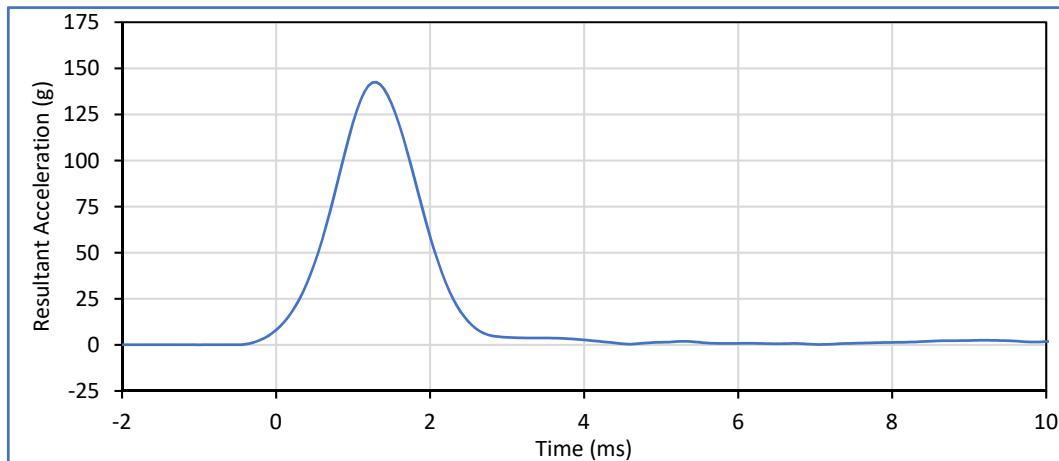
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

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

ATD Serial No.: F037

Test Date: 2017-11-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	34	Pass
Peak Resultant Acceleration	g	125.0	155.0	142.5	Pass
Peak Head Ax	g	-15.0	15.0	2.8	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results		Pass

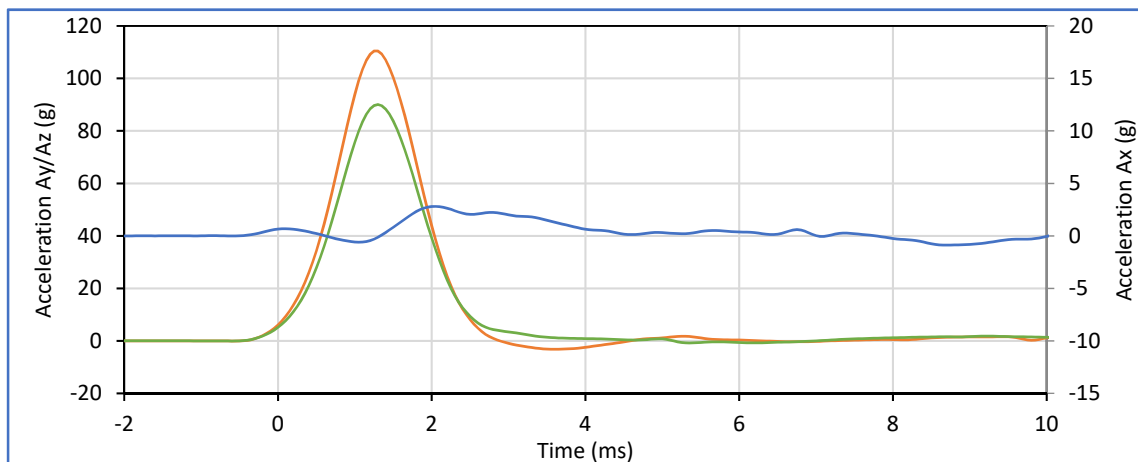


Head Resultant

Max:142.5@1.3

Min:0.2@7.1

SAE Class 1000



Head Ax

Max:2.8@2.1

Min:-0.9@8.7

SAE Class 1000

Head Ay

Max:110.4@1.3

Min:-3.2@3.6

SAE Class 1000

Head Az

Max:90.1@1.3

Min:-0.8@5.4

SAE Class 1000

Technician: Smith

Approved By: Wep

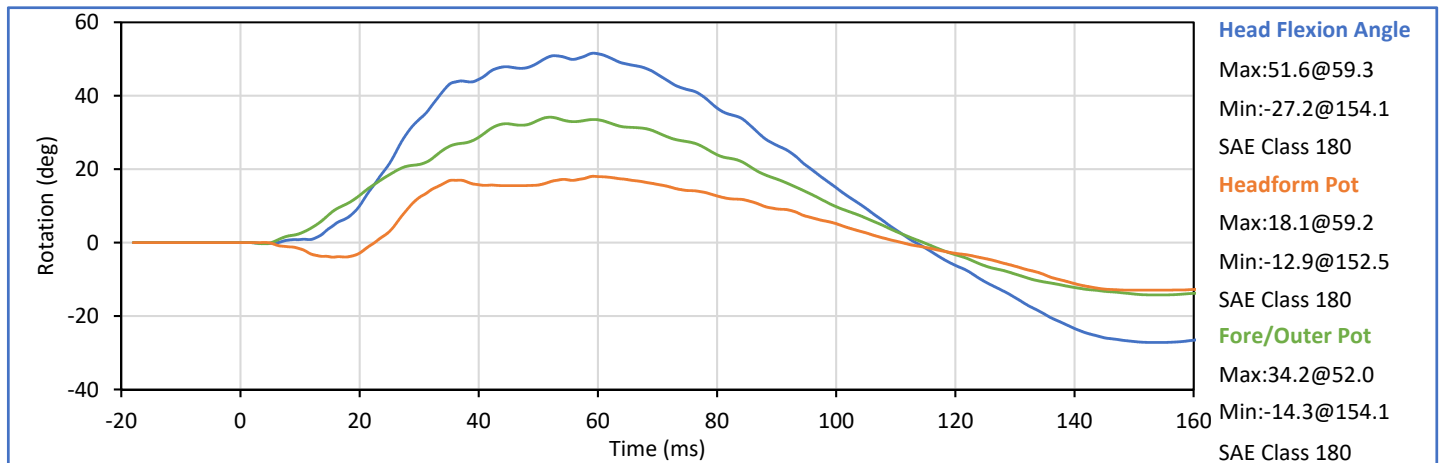
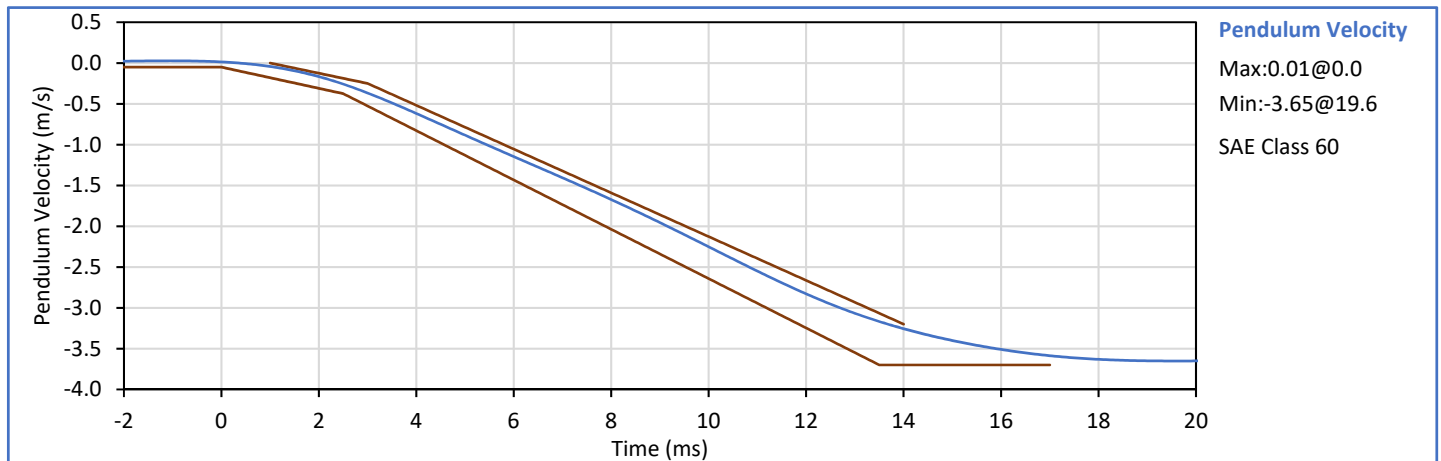


ES-2re 50th Male Side Impact ATD
Neck Flexion

ATD Serial No.: F037

Test Date: 2017-11-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Humidity	%	10	70	31	Pass
Pendulum Velocity	m/s	3.30	3.50	3.49	Pass
Peak Headform Flexion	deg	49.0	59.0	51.6	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	59.3	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	54.2	Pass
Overall Test Results					Pass



Technician: Smith

Approved By: Wep



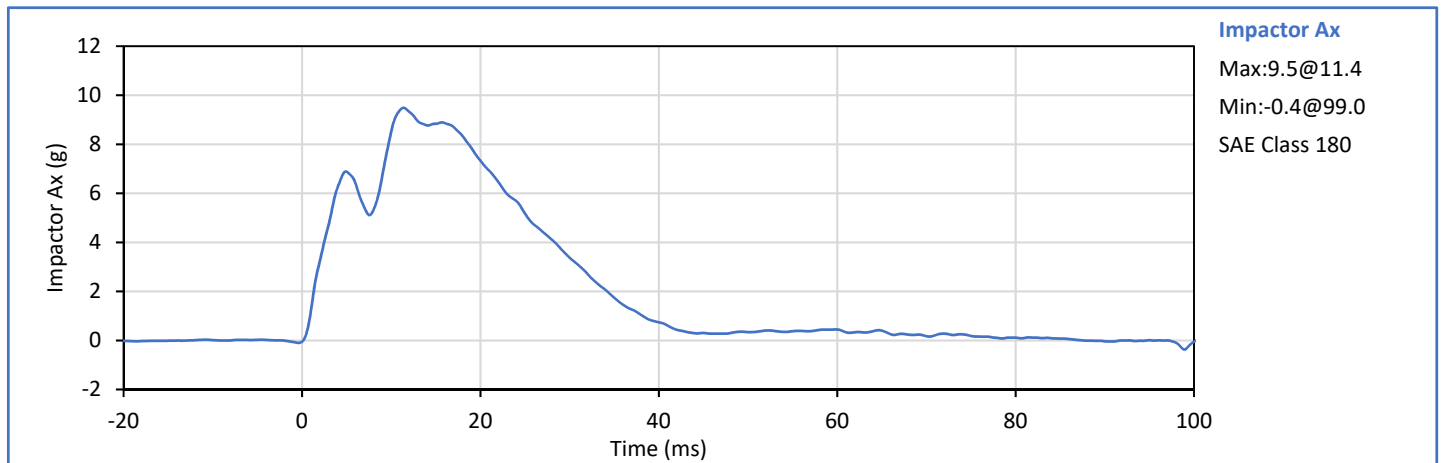
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

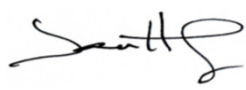
ES-2re 50th Male Side Impact ATD Shoulder Impact Test

ATD Serial No.: F037

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Humidity	%	10	70	32	Pass
Impactor Velocity	m/s	4.20	4.40	4.27	Pass
Peak Impactor Ax	g	7.5	10.5	9.9	Pass
Overall Test Results					Pass



Technician: 

Approved By: 

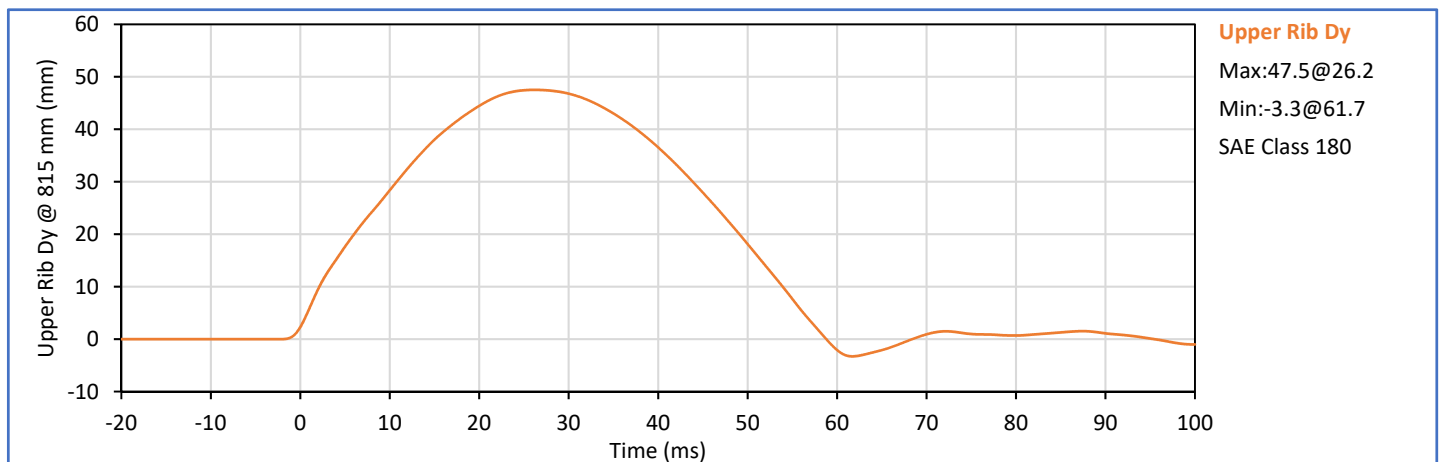
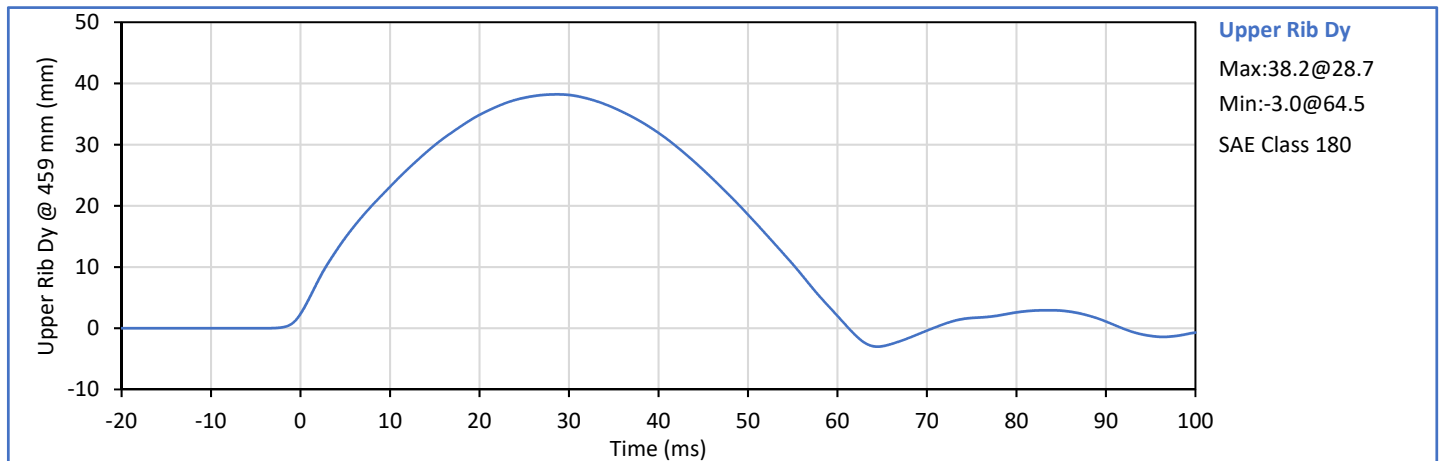


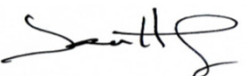
ES-2re 50th Male Side Impact ATD
Upper Rib Drop Test

ATD Serial No.: F037

Test Date: 2017-11-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	34	Pass
Upper Rib Dy @ (459mm)	mm	36.0	40.0	38.2	Pass
Upper Rib Dy @ (815mm)	mm	46.0	51.0	47.5	Pass
Overall Test Results					Pass



Technician: 

Approved By: 

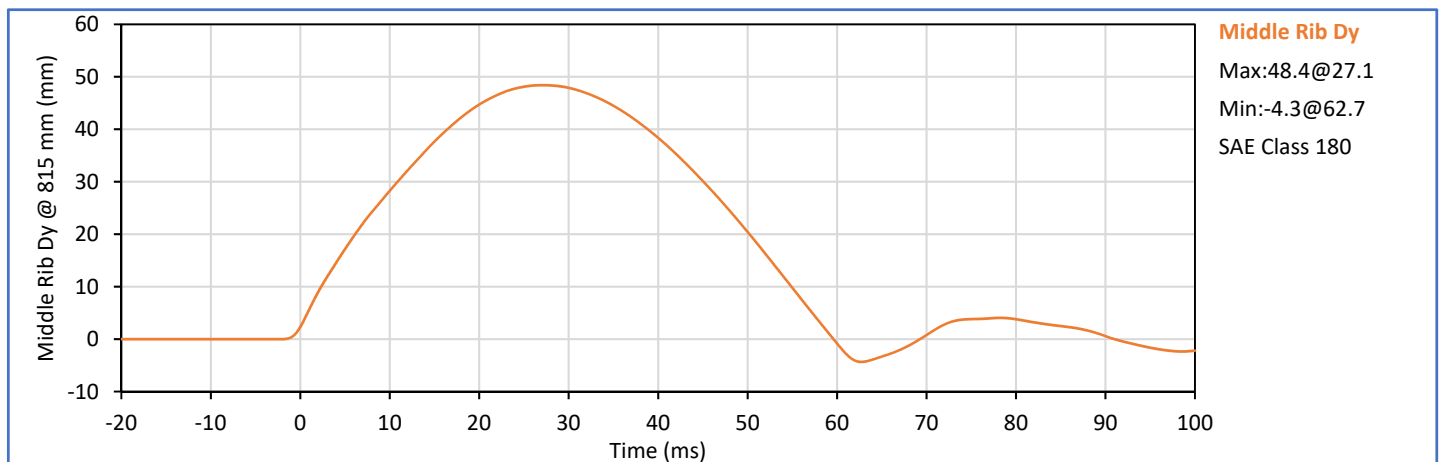
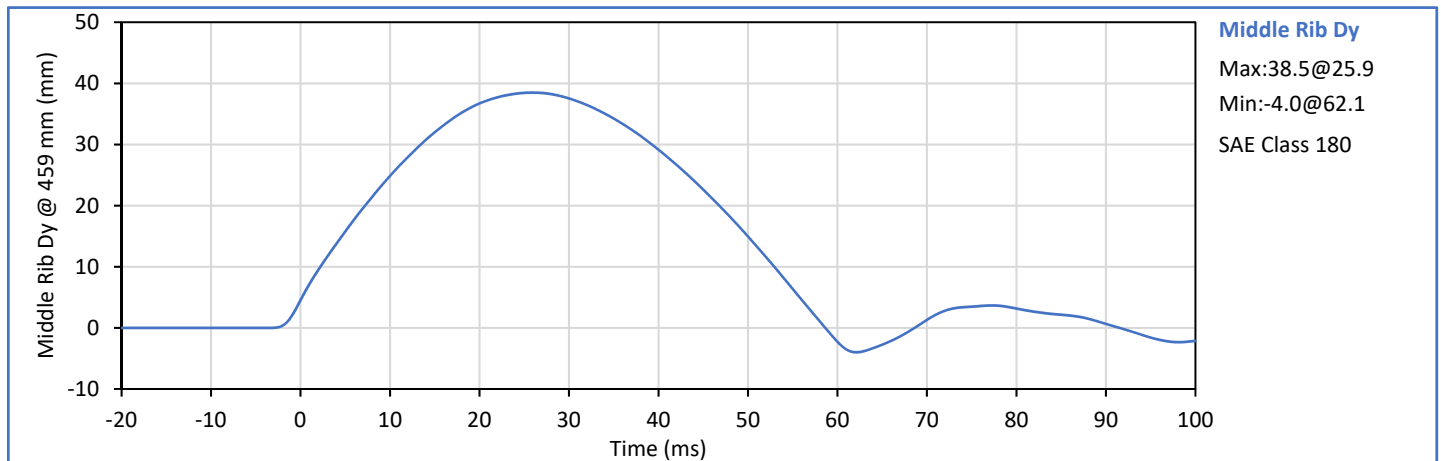


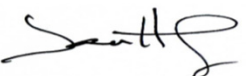
ES-2re 50th Male Side Impact ATD
Middle Rib Drop Test

ATD Serial No.: F037

Test Date: 2017-11-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	33	Pass
Middle Rib Dy @ (459mm)	mm	36.0	40.0	38.5	Pass
Middle Rib Dy @ (815mm)	mm	46.0	51.0	48.4	Pass
Overall Test Results				Pass	



Technician: 

Approved By: 



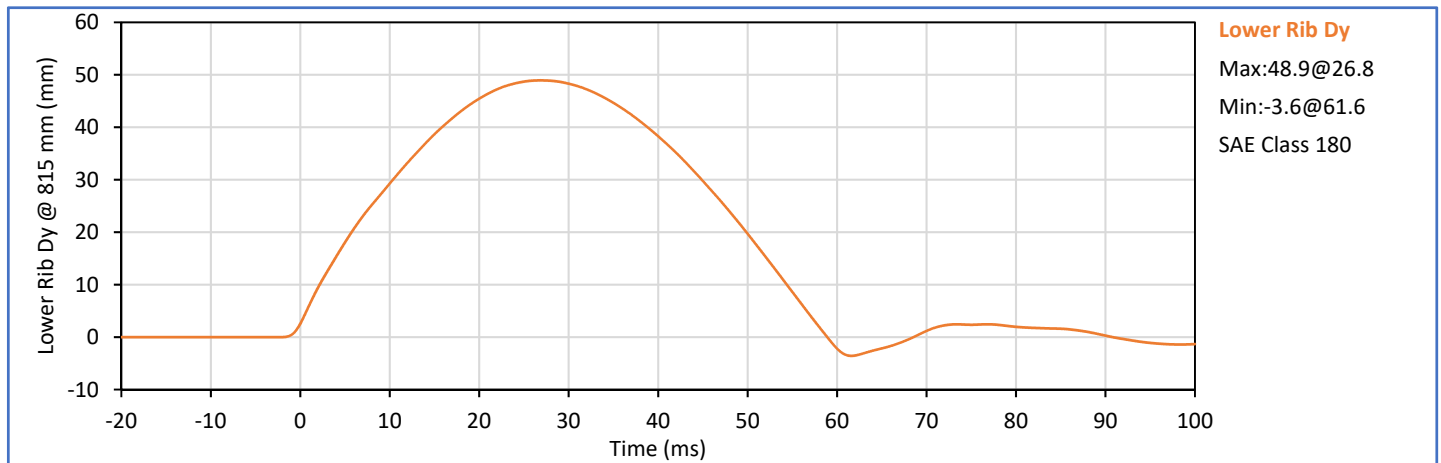
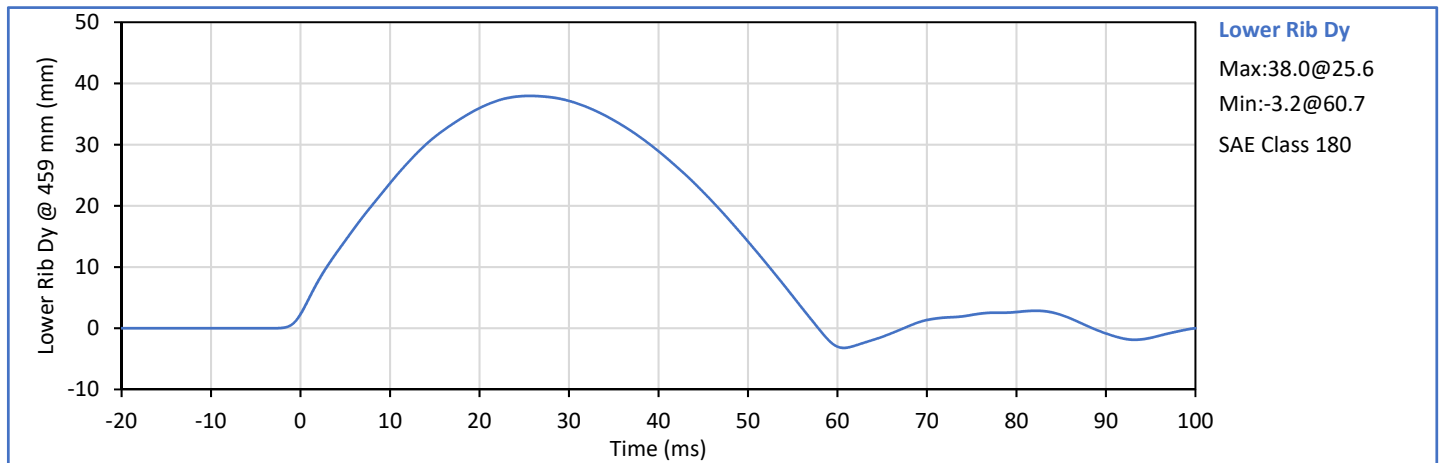
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

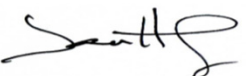
ES-2re 50th Male Side Impact ATD Lower Rib Drop Test

ATD Serial No.: F037

Test Date: 2017-11-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	34	Pass
Lower Rib Dy @ (459mm)	mm	36.0	40.0	38.0	Pass
Lower Rib Dy @ (815mm)	mm	46.0	51.0	48.9	Pass
Overall Test Results				Pass	



Technician: 

Approved By: 

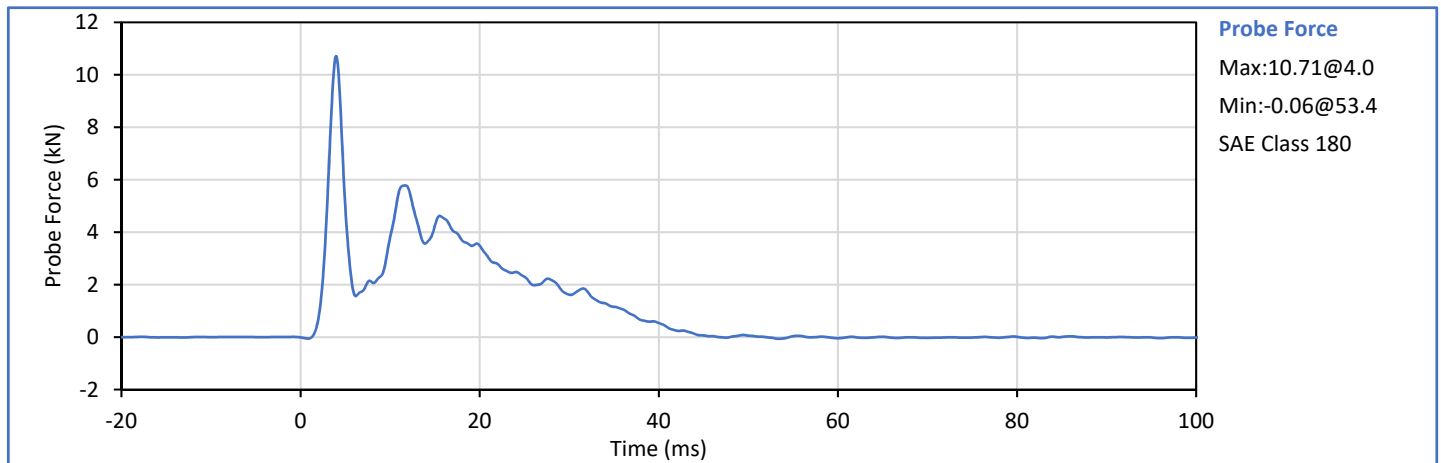
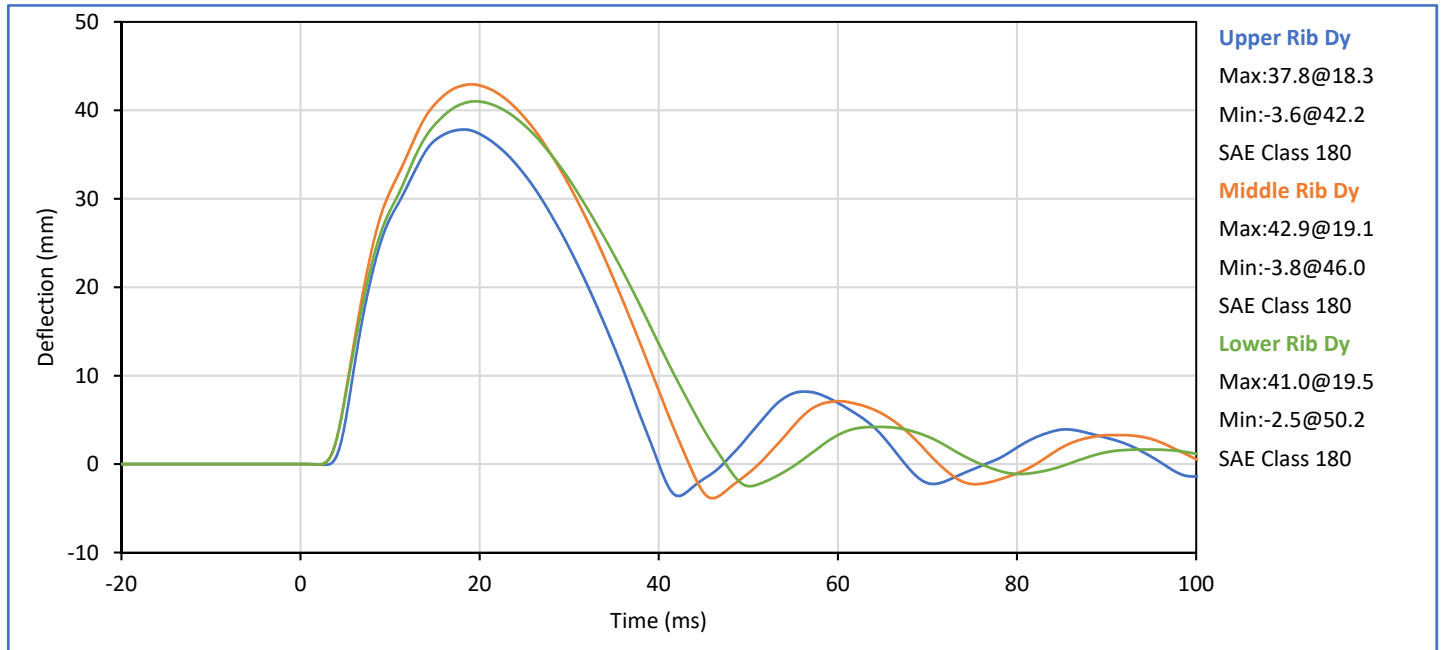


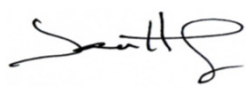
**ES-2re 50th Male Side Impact ATD
 Thorax Impact (Full Body)**

ATD Serial No.: F037

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Humidity	%	10	70	32	Pass
Impactor Velocity	m/s	5.40	5.60	5.54	Pass
Peak Upper Rib Dy	mm	34.0	41.0	37.8	Pass
Peak Middle Rib Dy	mm	37.0	45.0	42.9	Pass
Peak Lower Rib Dy	mm	37.0	44.0	41.0	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.78	Pass
Overall Test Results				Pass	Pass



Technician: 

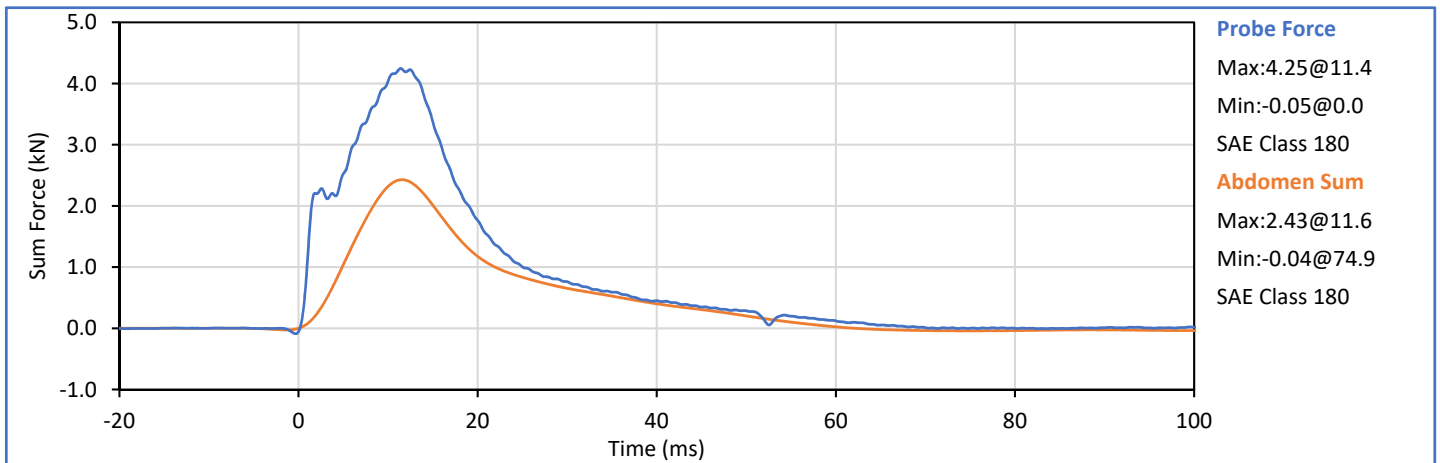
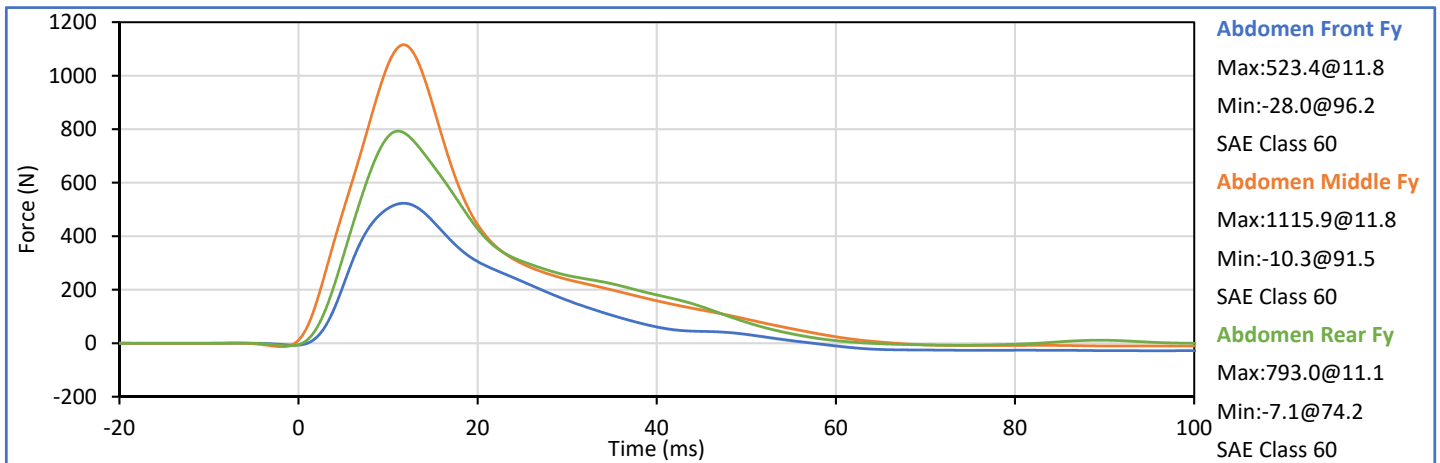
Approved By: 



ATD Serial No.: F037

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.9	Pass
Laboratory Humidity	%	10	70	32	Pass
Impactor Velocity	m/s	3.90	4.10	3.94	Pass
Peak Impactor Force	kN	4.00	4.80	4.25	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.4	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.43	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	11.6	Pass
Overall Test Results				Pass	Pass



Technician: Smith

Approved By: Wep

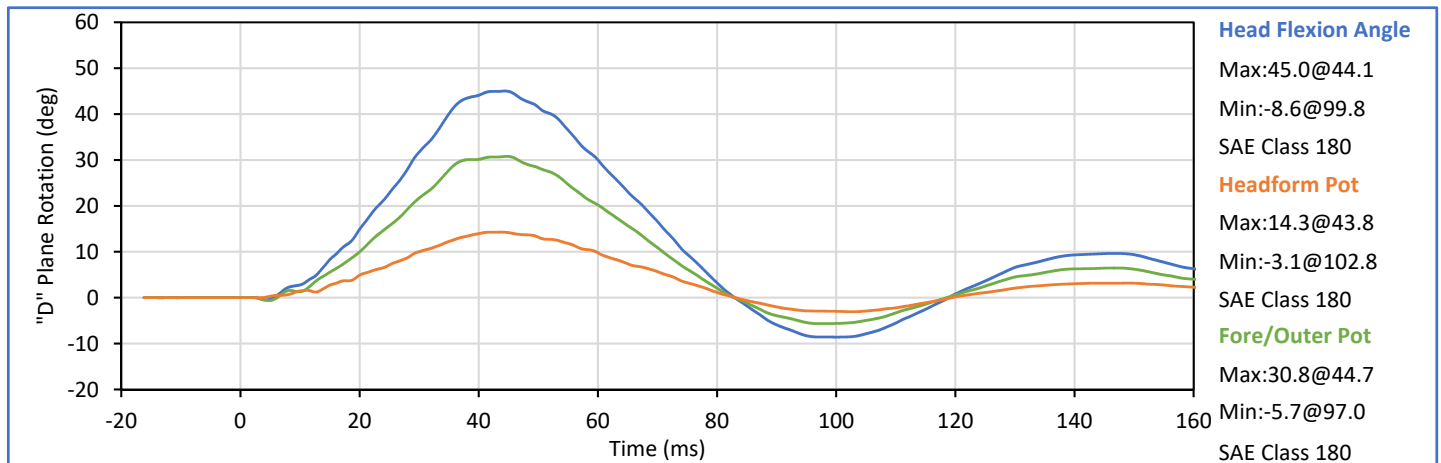
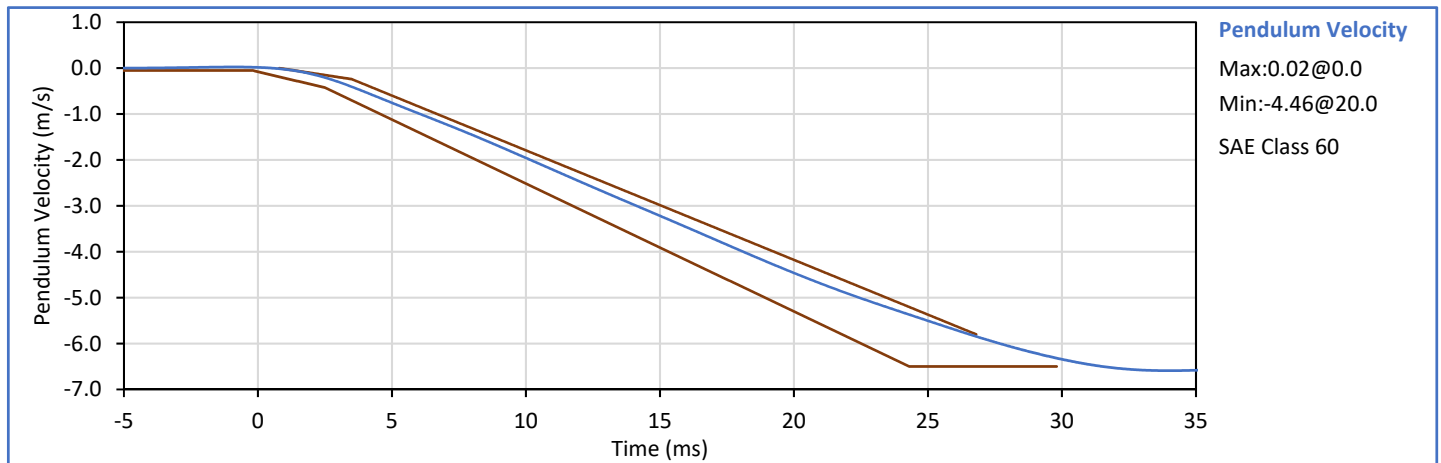


ES-2re 50th Male Side Impact ATD
Lumbar Flexion

ATD Serial No.: F037

Test Date: 2017-11-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	30	Pass
Pendulum Velocity	m/s	5.95	6.15	6.14	Pass
Peak Headform Flexion	deg	45.0	55.0	45.0	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	44.4	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	38.7	Pass
Overall Test Results					Pass



Technician: Smith

Approved By: Wep

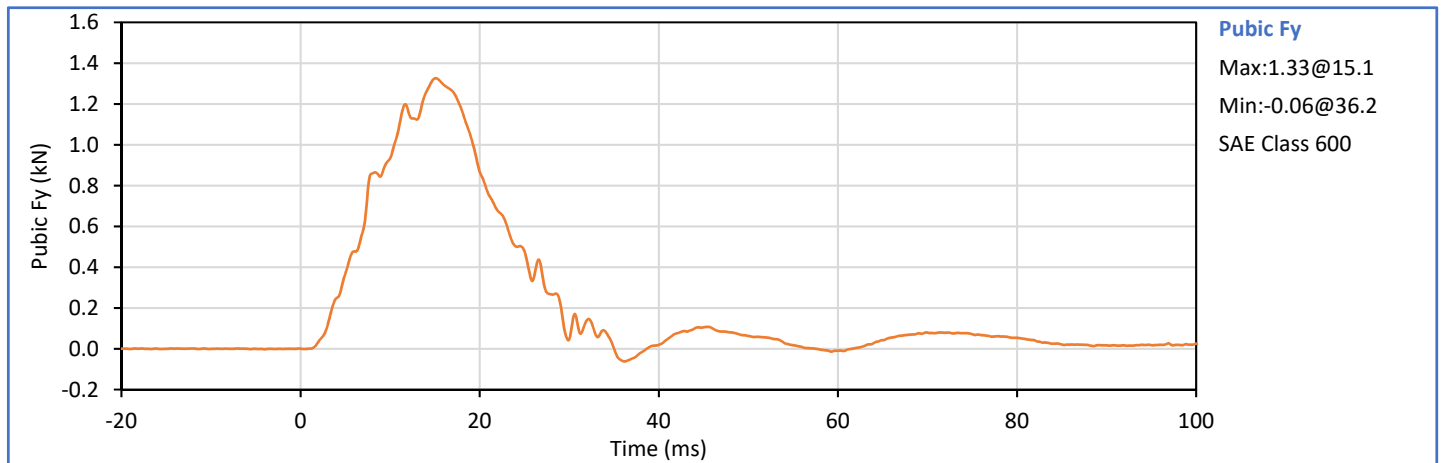
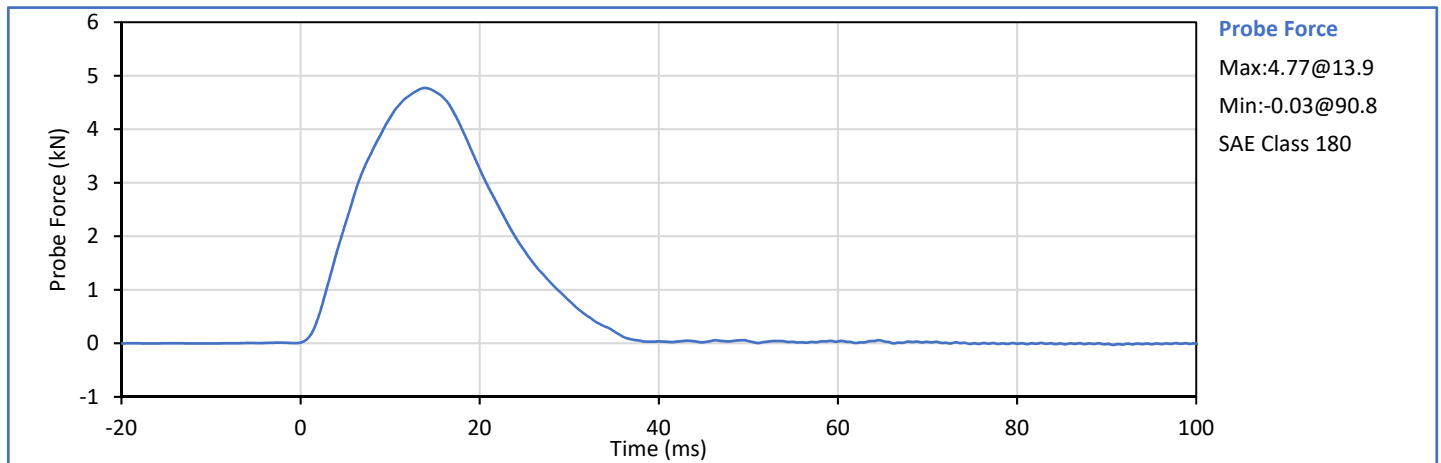


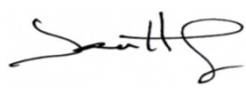
ES-2re 50th Male Side Impact ATD
Pelvis Impact

ATD Serial No.: F037

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.29	Pass
Peak Impactor Force	kN	4.70	5.40	4.77	Pass
Time of Peak Impactor Force	ms	11.8	16.1	13.9	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.33	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	15.1	Pass
Overall Test Results				Pass	Pass



Technician: 

Approved By: 

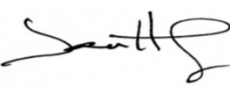


SID-IIs Small Side Impact Dummy
External Measurements

ATD Serial No.: 299

Test Date: 2017-11-07

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	33	Pass
A - Sitting Height	mm	772	788	775	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	144	Pass
E - Shoulder Pivot From Backline	mm	97	107	100	Pass
F - Thigh Clearance	mm	119	135	126	Pass
G - Head Breadth	mm	140	148	148	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	185	Pass
J - Head Circumference	mm	541	551	549	Pass
K - Buttock To Knee Length	mm	514	540	530	Pass
L - Popliteal Height	mm	343	369	357	Pass
K - Knee Pivot To Floor Height	mm	392	409	398	Pass
N - Buttock Popliteal Length	mm	416	442	431	Pass
O - Chest Depth W/O Jacket	mm	195	211	206	Pass
P - Foot Length	mm	216	232	221	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	317	Pass
R - Arm Length	mm	249	259	255	Pass
S - Knee Joint To Seatback	mm	477	493	485	Pass
V - Shoulder Width	mm	341	357	350	Pass
W - Foot Width	mm	78	94	83	Pass
Y - Chest Circumference W/Jacket	mm	851	881	864	Pass
Z - Waist Circumference	mm	761	791	774	Pass
			Overall Test Results		Pass

Technician: 

Approved By: 



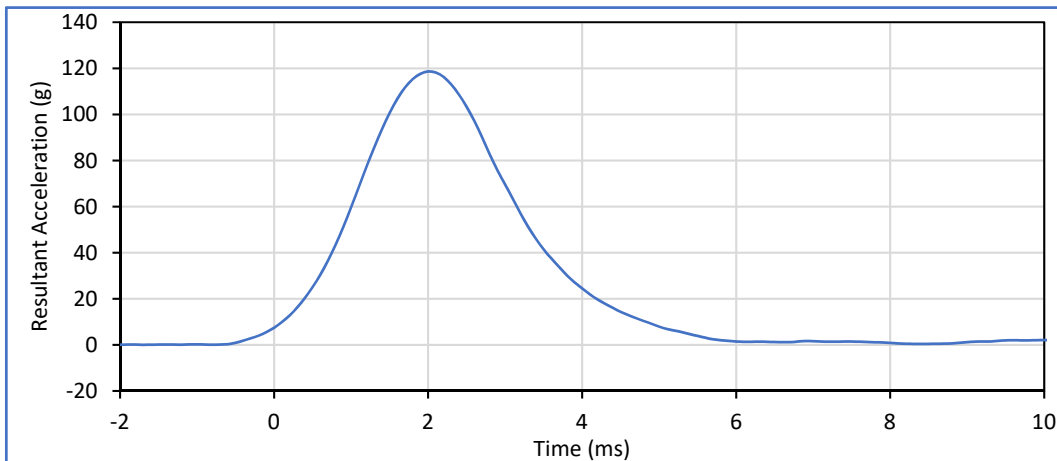
9270 Holly Road, Adelanto, CA 92301
Tel: +1 760 246 1672 Fax: +1 760 246 8112
Info@karco.com www.karco.com

SID-IIs Small Side Impact Dummy Head Drop

ATD Serial No.: 299

Test Date: 2017-11-09

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	22.2	Pass
Laboratory Humidity	%	10	70	35	Pass
Peak Resultant Acceleration	g	115.0	137.0	118.6	Pass
Peak Head Ax	g	-15.0	15.0	-1.7	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	

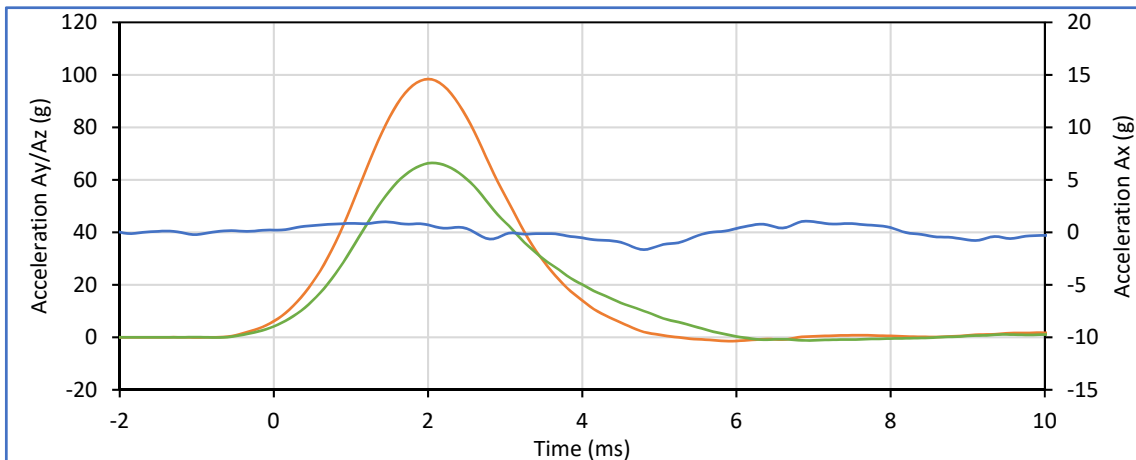


Head Resultant

Max:118.6@2.0

Min:0.4@8.4

SAE Class 1000



Head Ax

Max:1.1@6.9

Min:-1.7@4.8

SAE Class 1000

Head Ay

Max:98.4@2.0

Min:-1.4@5.9

SAE Class 1000

Head Az

Max:66.5@2.1

Min:-1.2@6.9

SAE Class 1000

Technician: Smith

Approved By: Wep

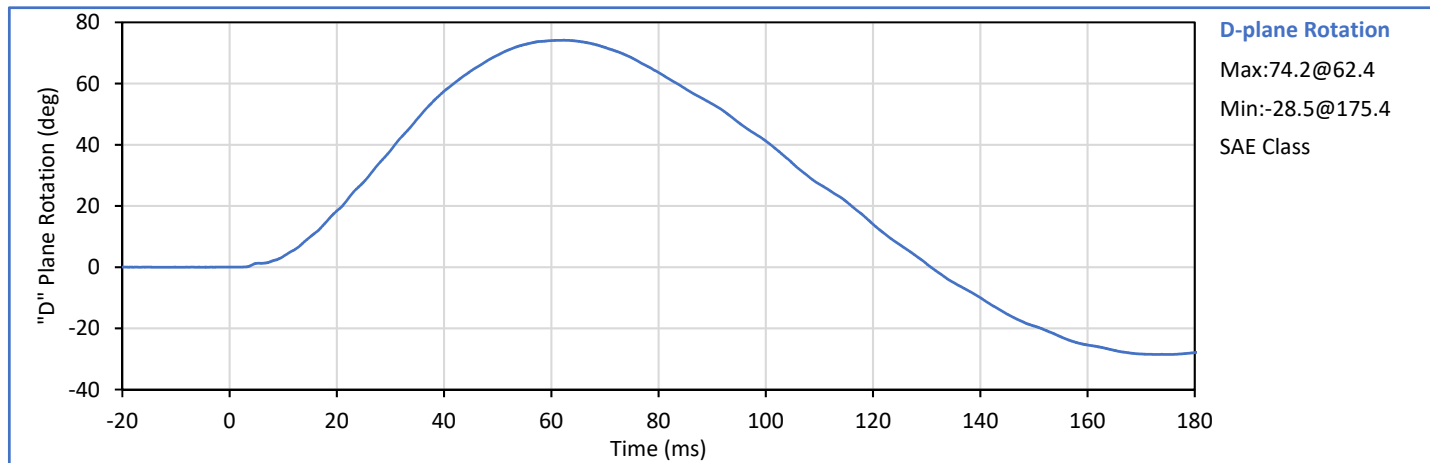
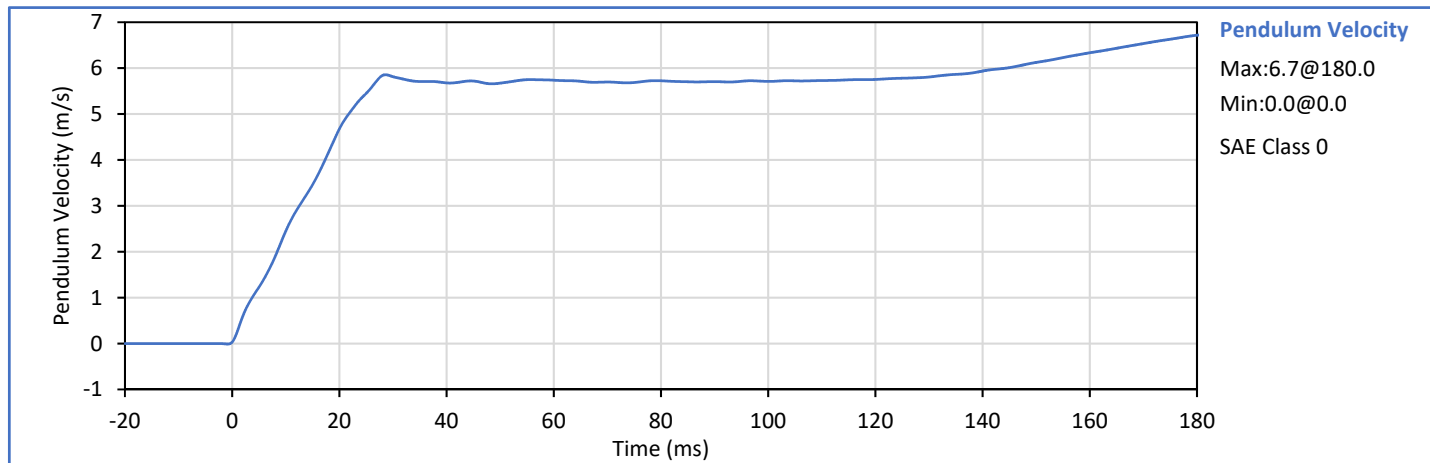


SID-IIs Small Side Impact Dummy Neck Flexion

ATD Serial No.: 299

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	29	Pass
Pendulum Velocity	m/s	5.51	5.63	5.59	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.45	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.46	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.67	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.45	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.86	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	74.2	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	62.4	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-41.2	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	113.2	Pass
Overall Test Results				Pass	



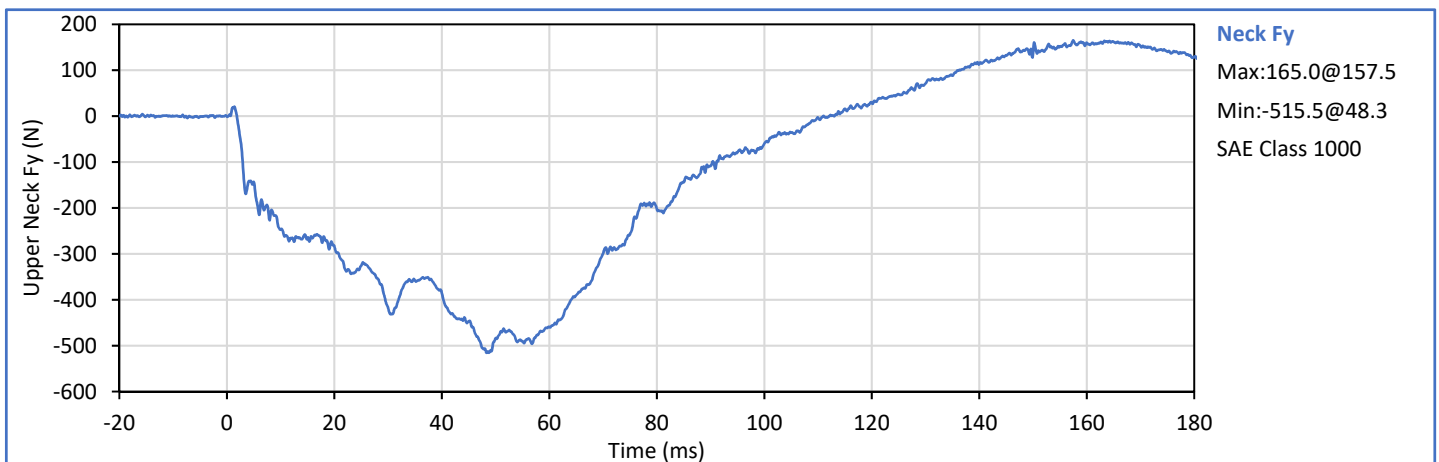
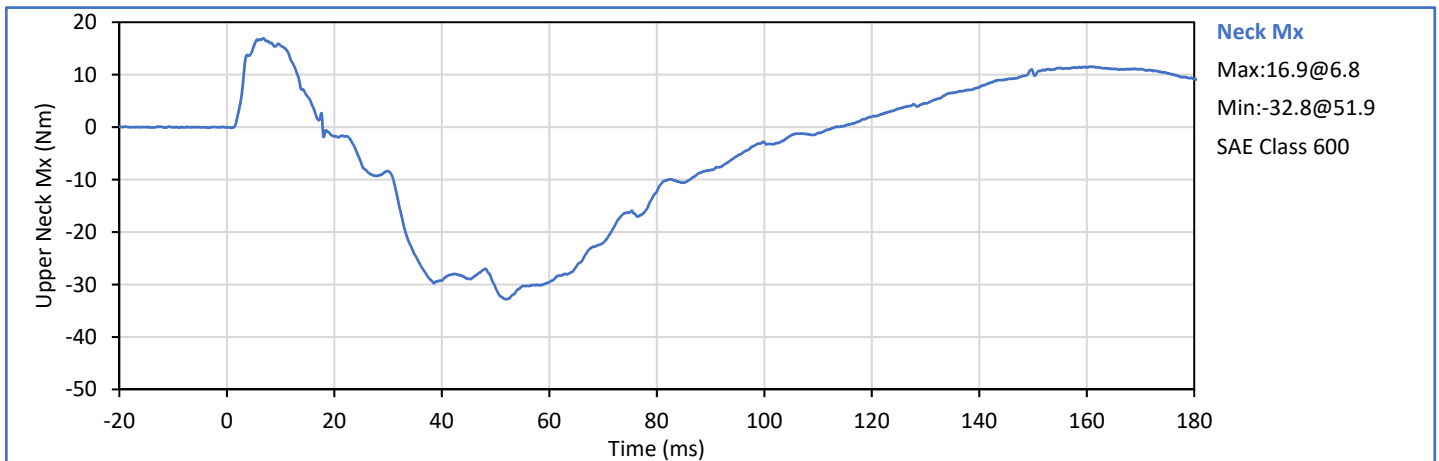
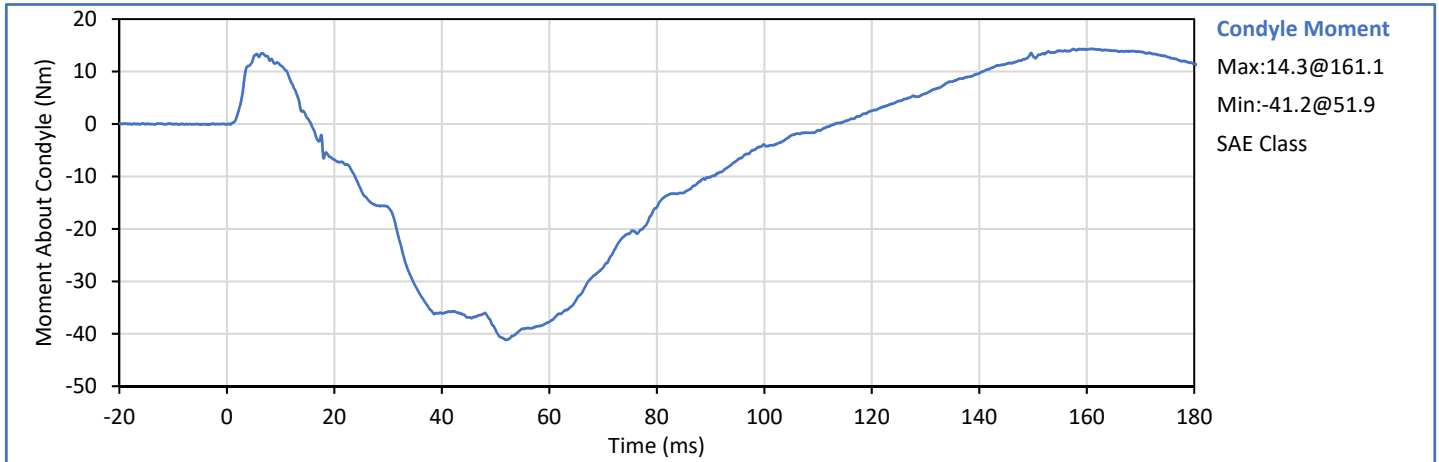
Technician:

Approved By:



ATD Serial No.: 299

Test Date: 2017-11-10



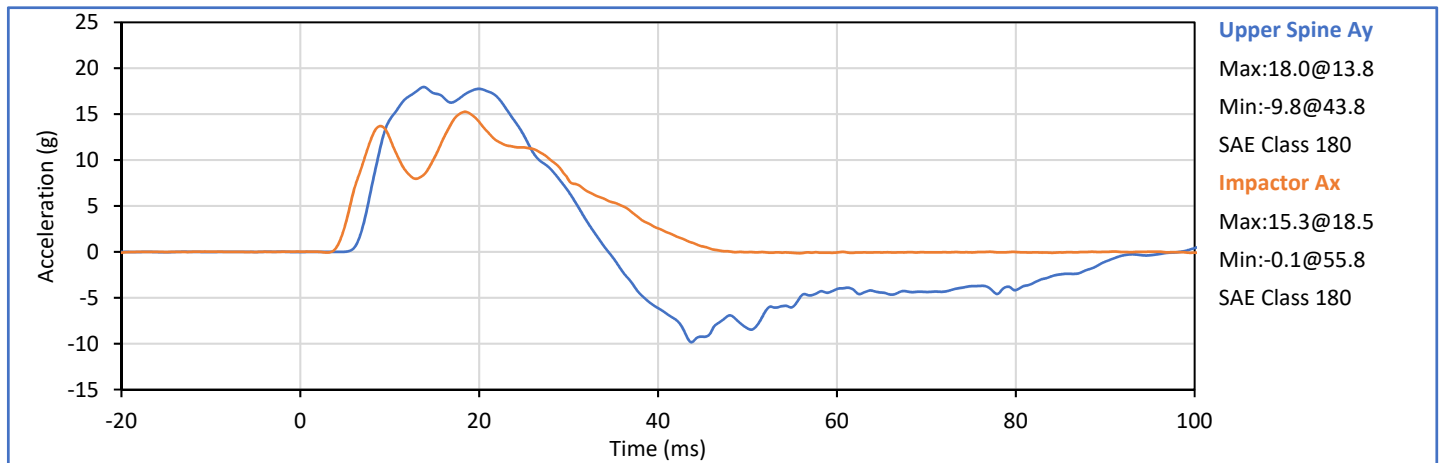
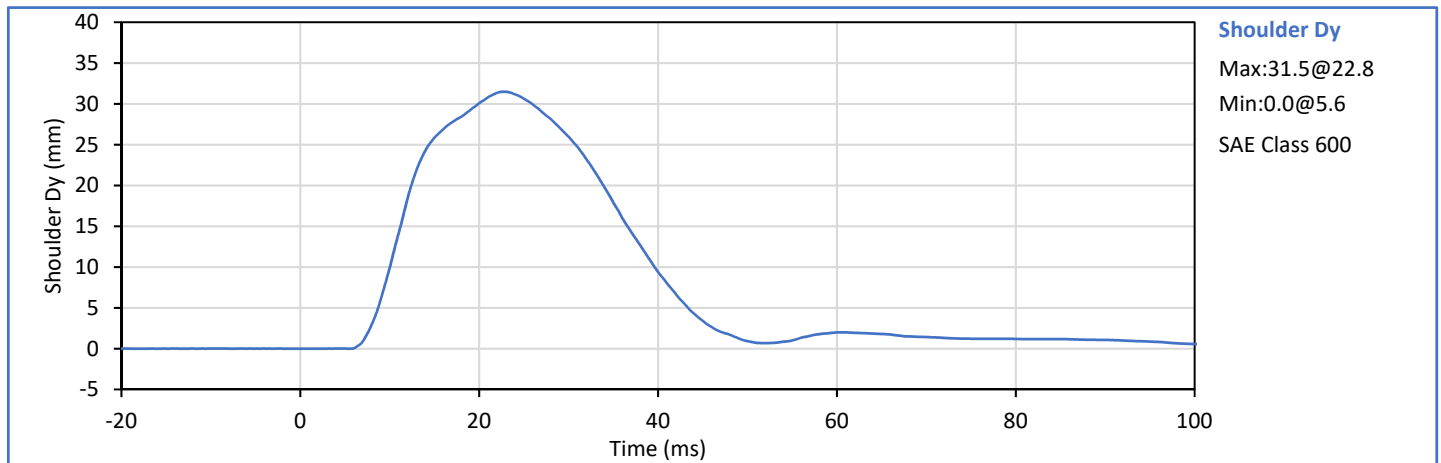


SID-IIs Small Side Impact Dummy Shoulder Impact Test

ATD Serial No.: 299

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.30	Pass
Peak Shoulder Dy	mm	28.0	37.0	31.5	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.0	Pass
Peak Impactor Ax	g	13.0	18.0	15.3	Pass
Overall Test Results					Pass



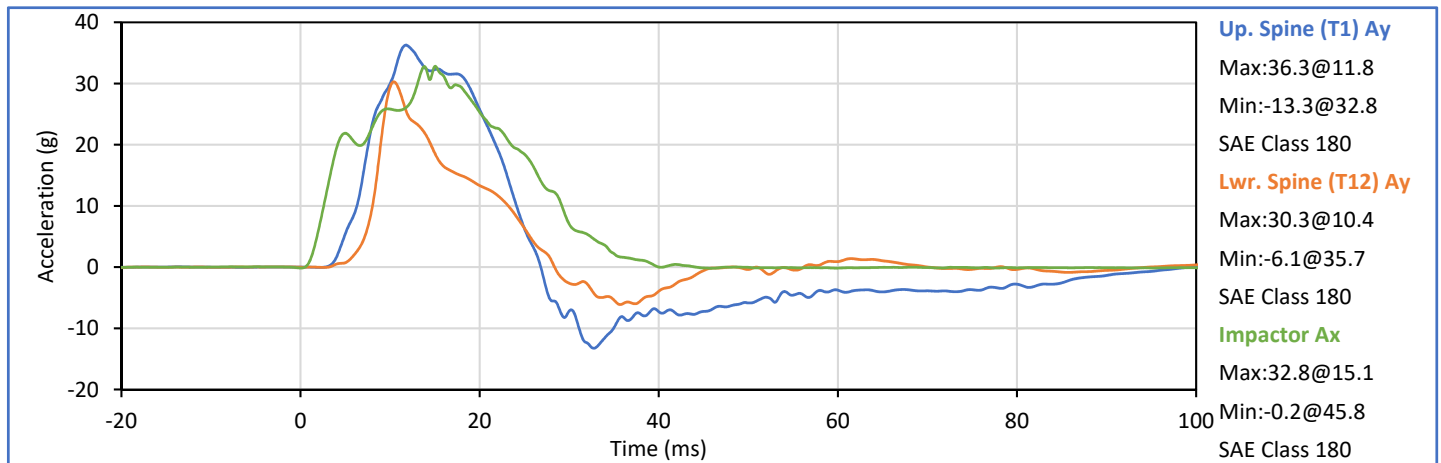
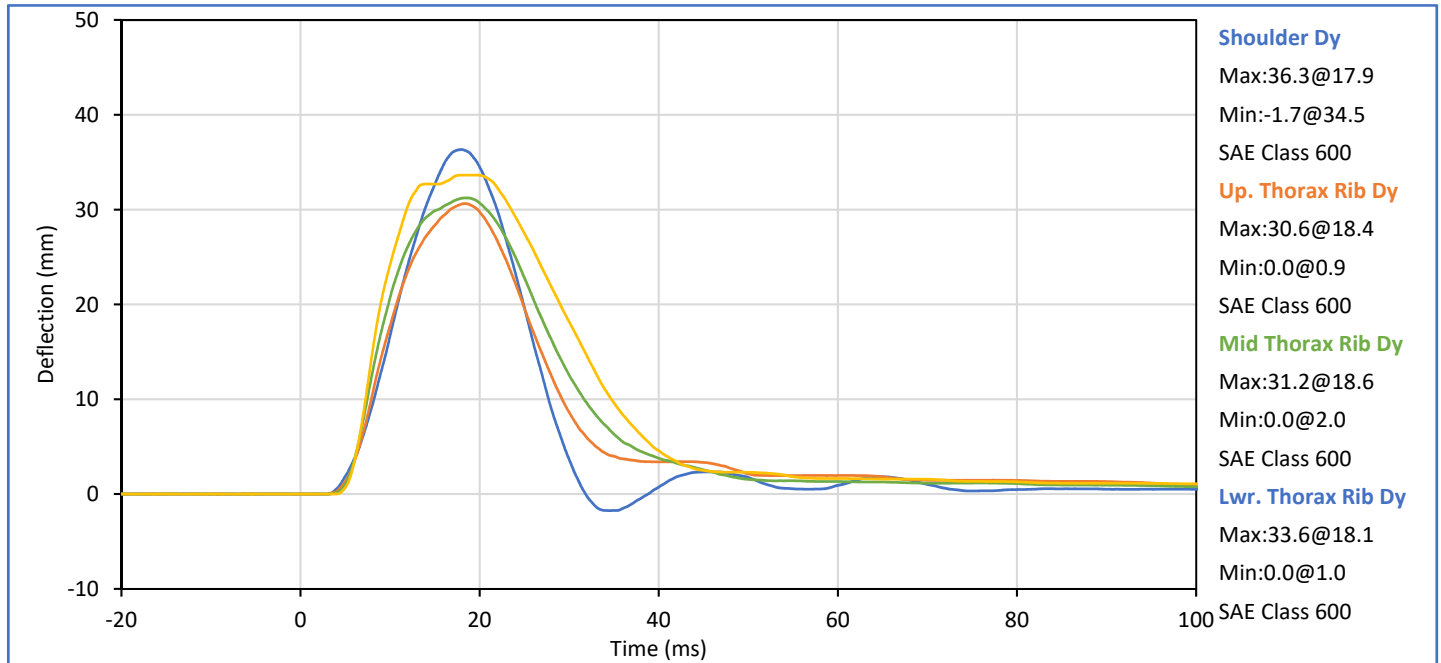
Technician: Smith

Approved By: Wep

ATD Serial No.: 299

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.8	Pass
Laboratory Humidity	%	10	70	29	Pass
Impactor Velocity	m/s	6.60	6.80	6.66	Pass
Peak Shoulder Dy	mm	31.0	40.0	36.3	Pass
Peak Upper Rib Dy	mm	25.0	32.0	30.6	Pass
Peak Middle Rib Dy	mm	30.0	36.0	31.2	Pass
Peak Lower Rib Dy	mm	32.0	38.0	33.6	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	36.3	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	30.3	Pass
Peak Impactor Ax	g	30.0	36.0	32.8	Pass
Overall Test Results				Pass	Pass



Technician: Smith

Approved By: Wep

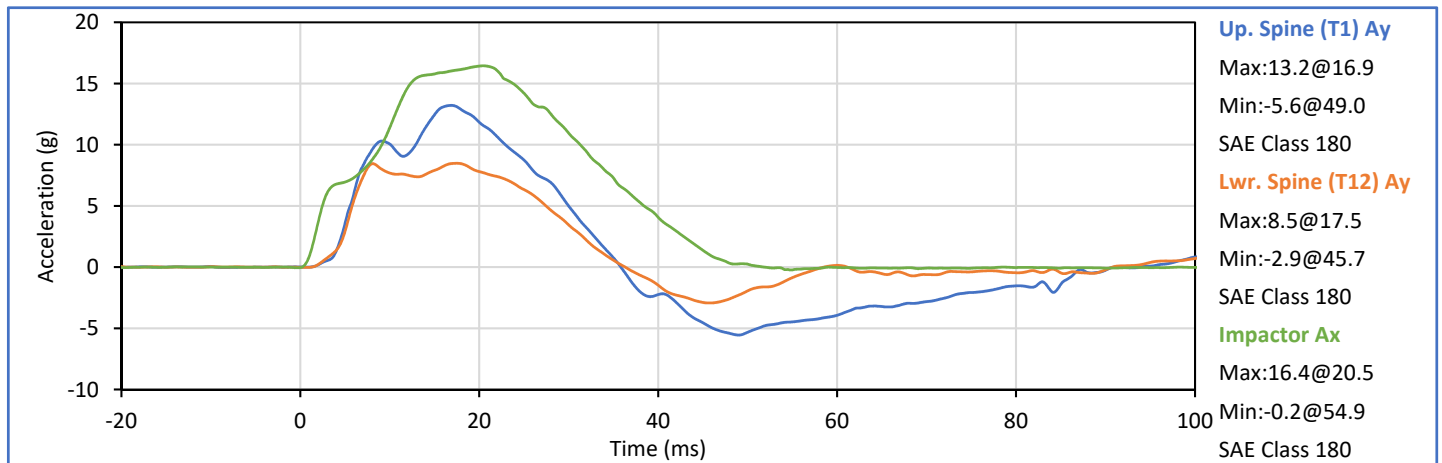
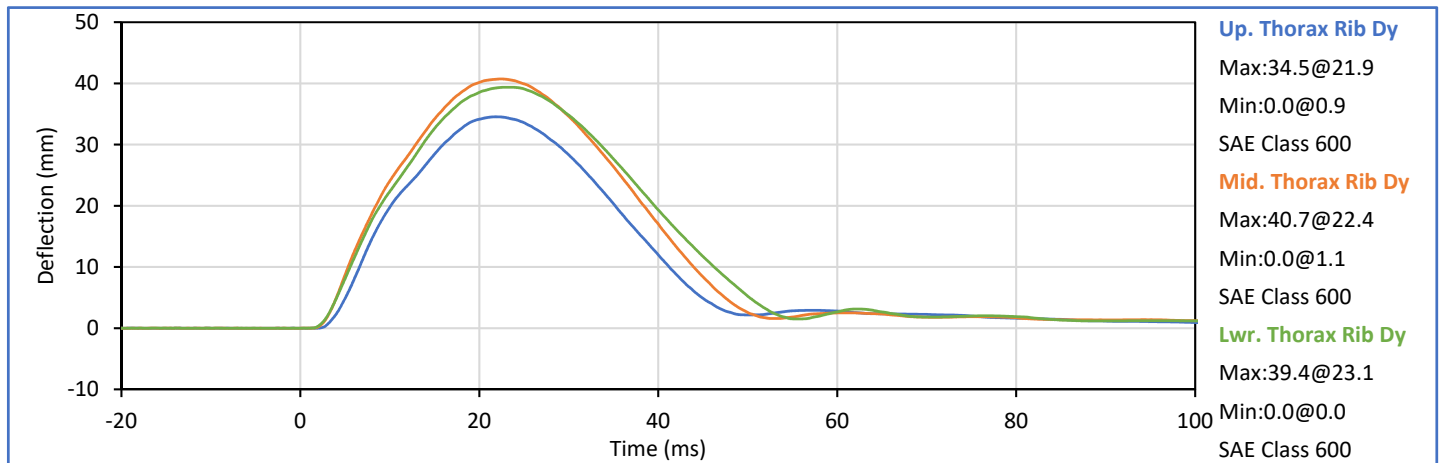


SID-IIs Small Side Impact Dummy Thorax (No Arm)

ATD Serial No.: 299

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.5	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.29	Pass
Peak Upper Rib Dy	mm	32.0	40.0	34.5	Pass
Peak Middle Rib Dy	mm	39.0	45.0	40.7	Pass
Peak Lower Rib Dy	mm	35.0	43.0	39.4	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	13.2	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	8.5	Pass
Peak Impactor Ax	g	14.0	18.0	16.4	Pass
Overall Test Results				Pass	



Technician: Smith

Approved By: Wep



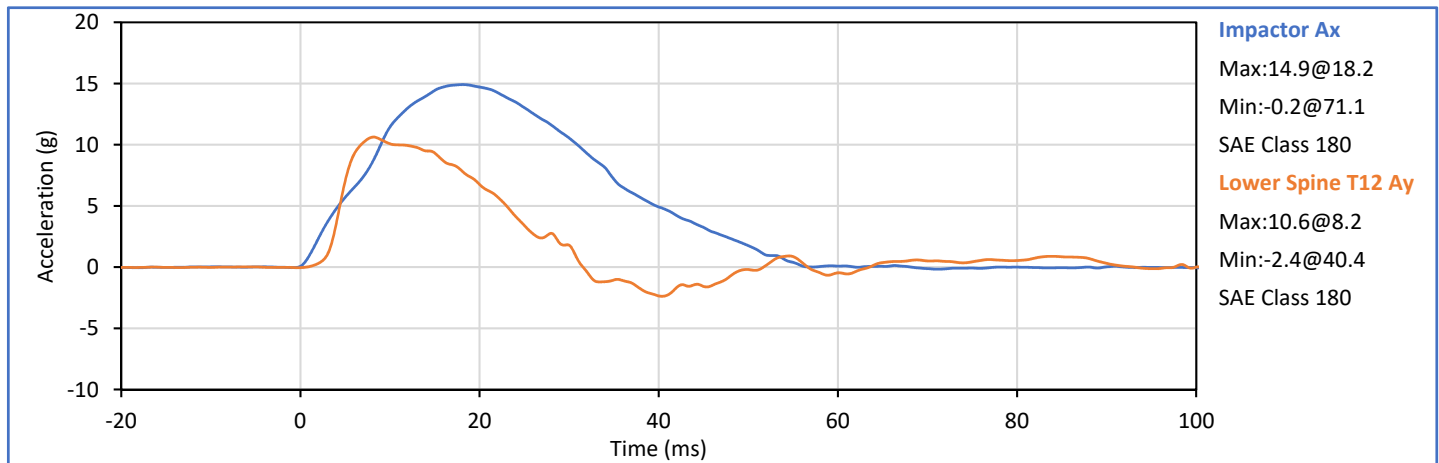
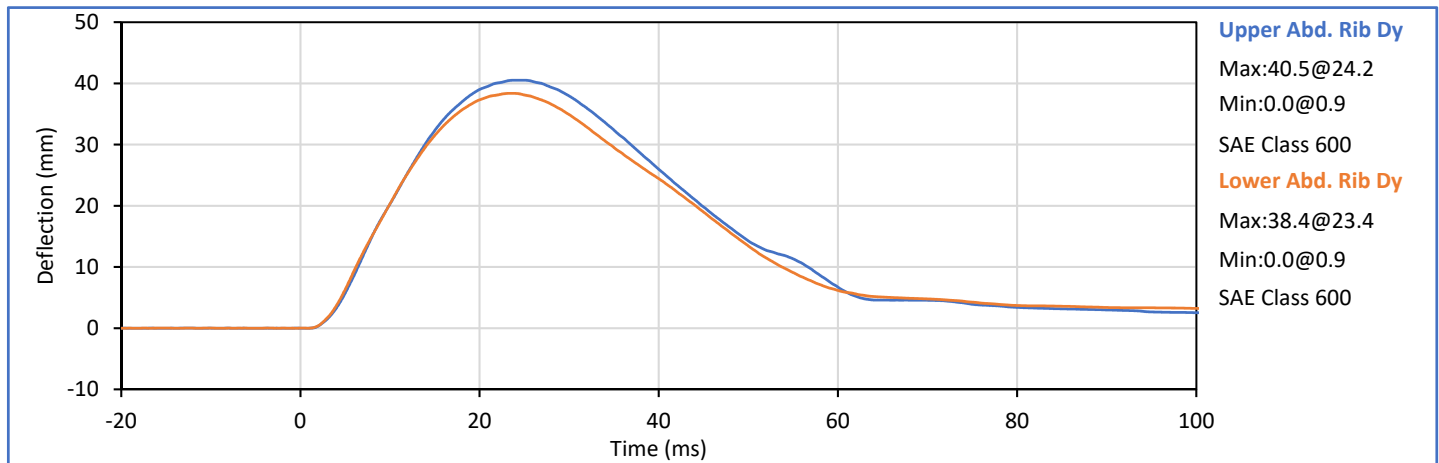
9270 Holly Road, Adelanto, CA 92301
 Tel: +1 760 246 1672 Fax: +1 760 246 8112
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SID-IIs Small Side Impact Dummy Abdomen Impact

ATD Serial No.: 299

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	40.5	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	38.4	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.6	Pass
Peak Impactor Ax	g	12.0	16.0	14.9	Pass
Overall Test Results					Pass



Technician: Smith

Approved By: Wep



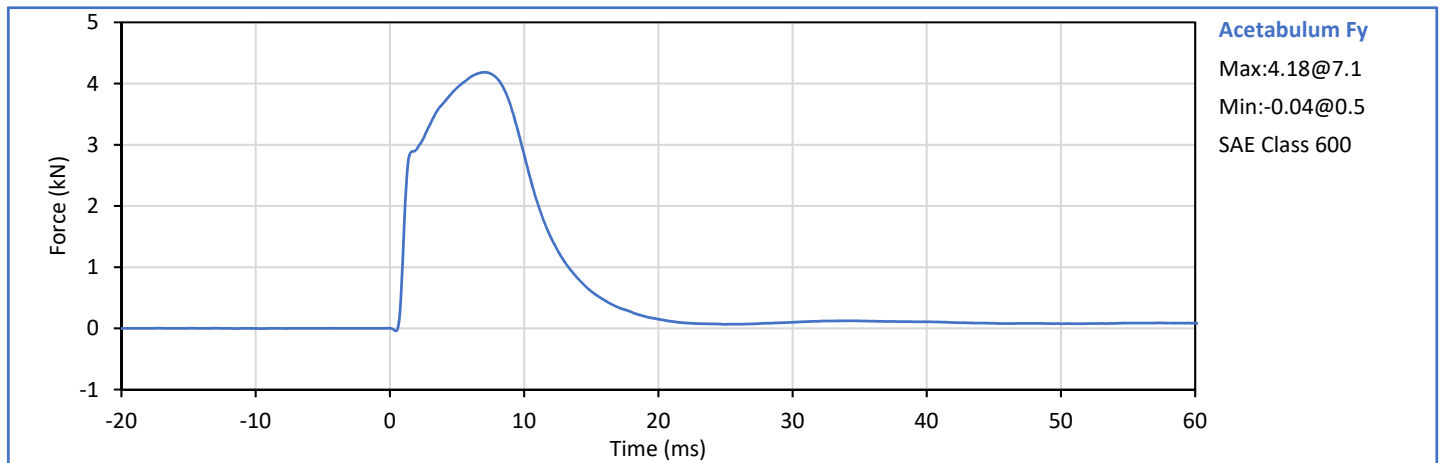
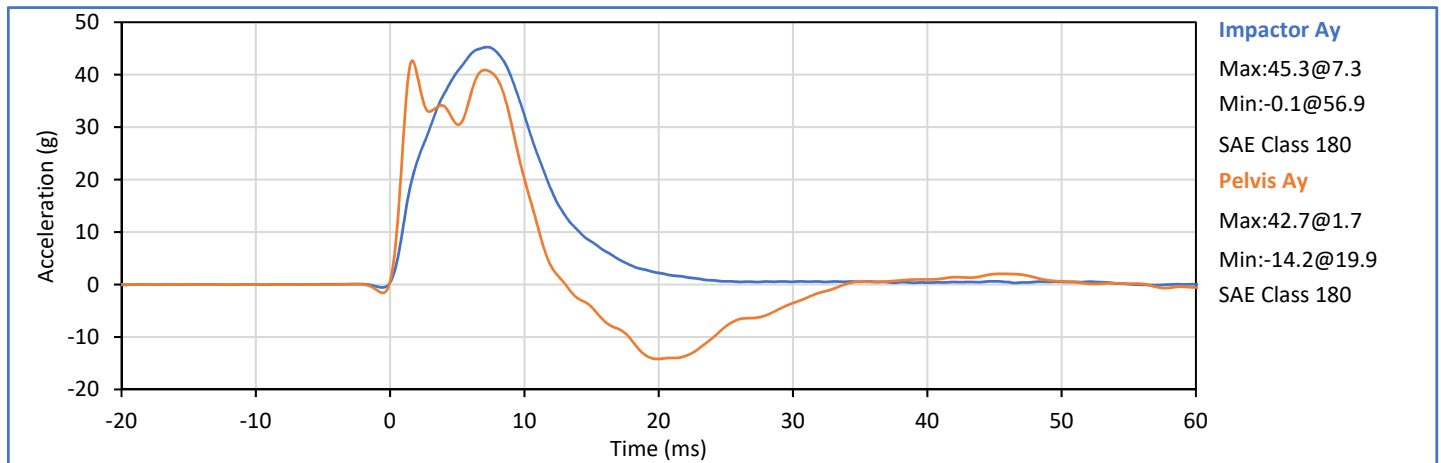
SID-IIs Small Side Impact Dummy Pelvis Acetabulum Impact

ATD Serial No.: 299

Test Date: 2017-11-10

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	22.0	Pass
Laboratory Humidity	%	10	70	33	Pass
Impactor Velocity	m/s	6.60	6.80	6.68	Pass
Peak Acetabulum Fy	kN	3.600	4.300	4.184	Pass
Pelvis Ay after 6ms	g	34.0	42.0	40.9	Pass
Peak Impactor Ax	g	38.0	47.0	45.3	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 70806 (HIS)



Technician: Smith

Approved By: Wep



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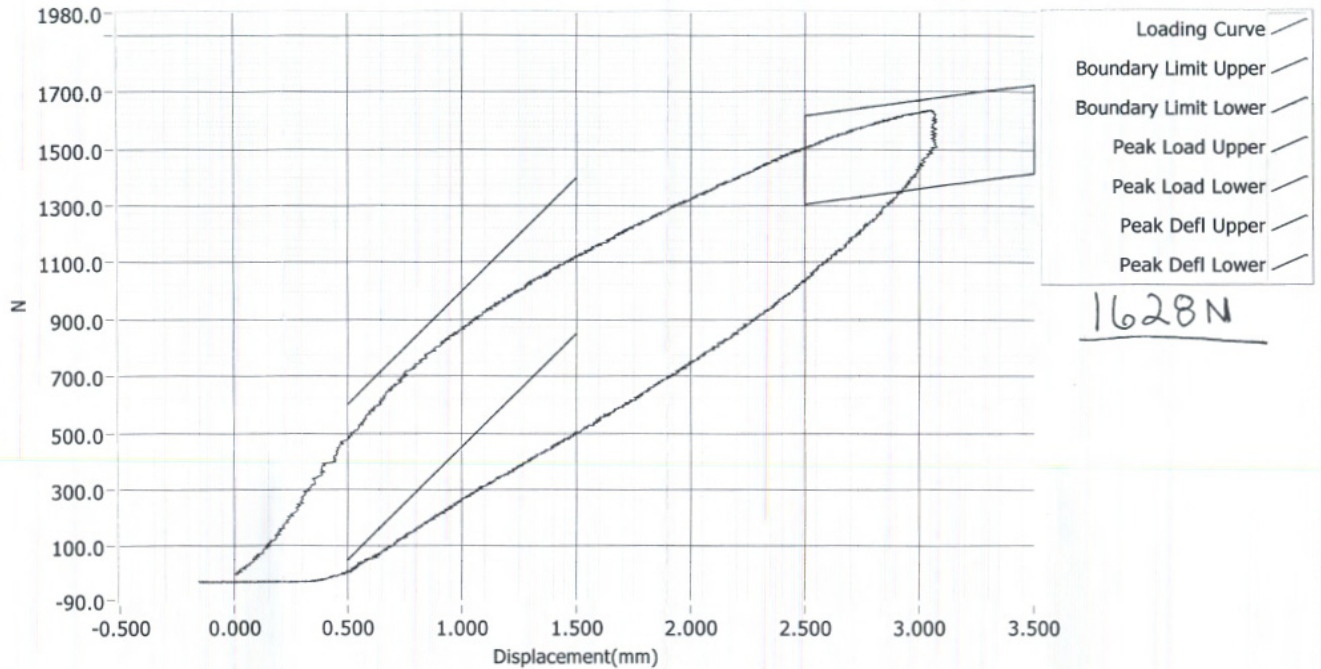
SID-IIs Small Side Impact Dummy Pelvis Acetabulum Impact

ATD Serial No.: 299

Test Date: 2017-11-10

Pelvis Plug S/N: 70806 (HIS)

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

70985

12/13/2013

10:52 PM

Cert ID

ATD Serial Number

ATD Type

N/A

SIDIIs

Current Date : 12/13/2013

Current Time : 22:52:48



SID-IIs Small Side Impact Dummy Pelvis Iliac Impact

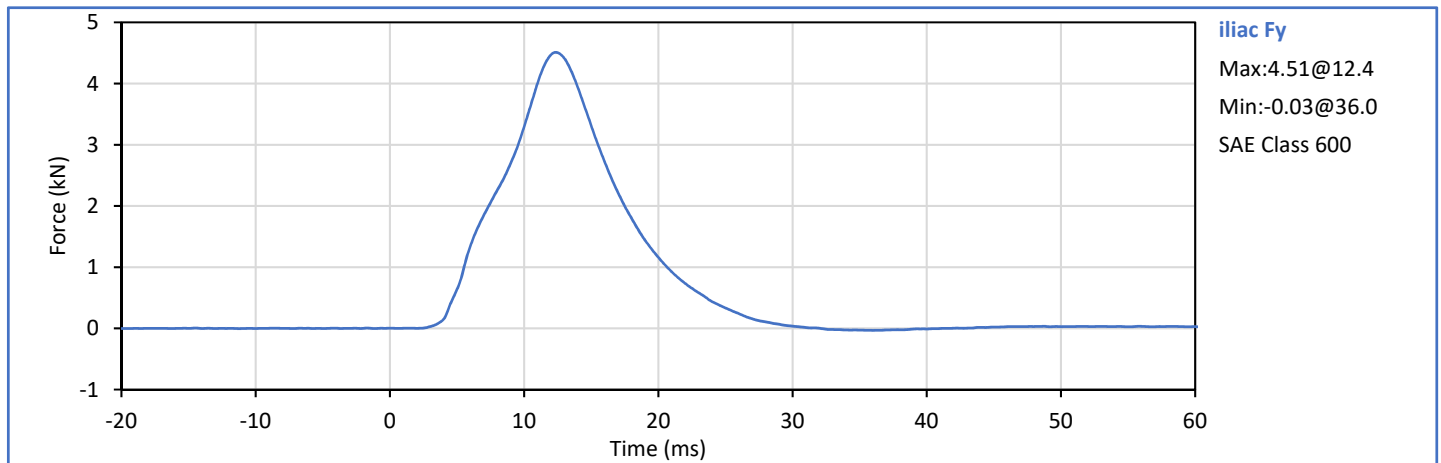
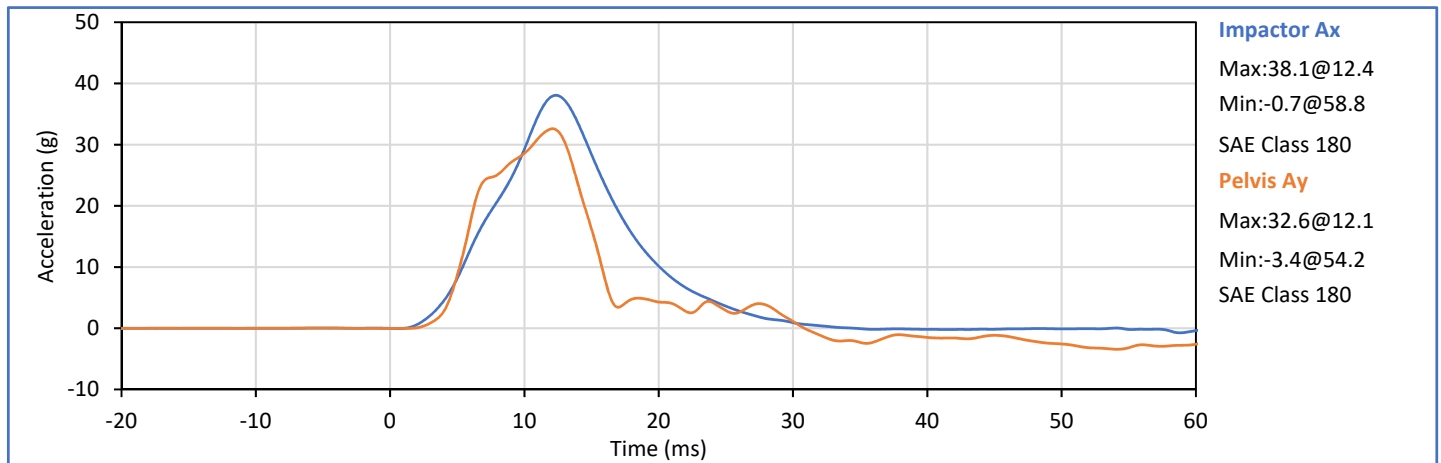
ATD Serial No.: 299

Test Date: 2017-11-11

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.5	Pass
Laboratory Humidity	%	10	70	33	Pass
Impactor Velocity	m/s	4.20	4.40	4.24	Pass
Peak Acetabulum Fy	kN	4.100	5.100	4.510	Pass
Pelvis Ay	g	28.0	39.0	32.6	Pass
Peak Impactor Ax	g	36.0	45.0	38.1	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 71052 (HIS) *

* Plug is not impacted and remains certified



Technician: Smith

Approved By: Wep

APPENDIX C
POST-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA



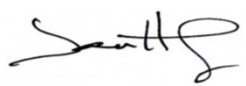
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Info@karco.com www.karco.com

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

ATD Serial No.: F037

Test Date: 2017-12-05

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	33	Pass
1 - Sitting Height	mm	900	918	906	Pass
2 - Seat to Shoulder Joint	mm	558	572	564	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	102	Pass
5 - Sole to Seat, Sitting	mm	333	451	385	Pass
6 - Head Width	mm	152	158	156	Pass
7 - Shoulder/Arm Width	mm	461	479	472	Pass
8 - Thorax Width	mm	322	332	328	Pass
9 - Abdomen Width	mm	273	287	281	Pass
10 - Pelvis Lap Width	mm	359	373	364	Pass
11 - Head Depth	mm	196	206	205	Pass
12 - Thorax Depth	mm	262	272	267	Pass
13 - Abdomen Depth	mm	194	204	199	Pass
14 - Pelvis Depth	mm	235	245	243	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	155	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	601	Pass
				Overall Test Results	Pass

Technician: 

Approved By: 



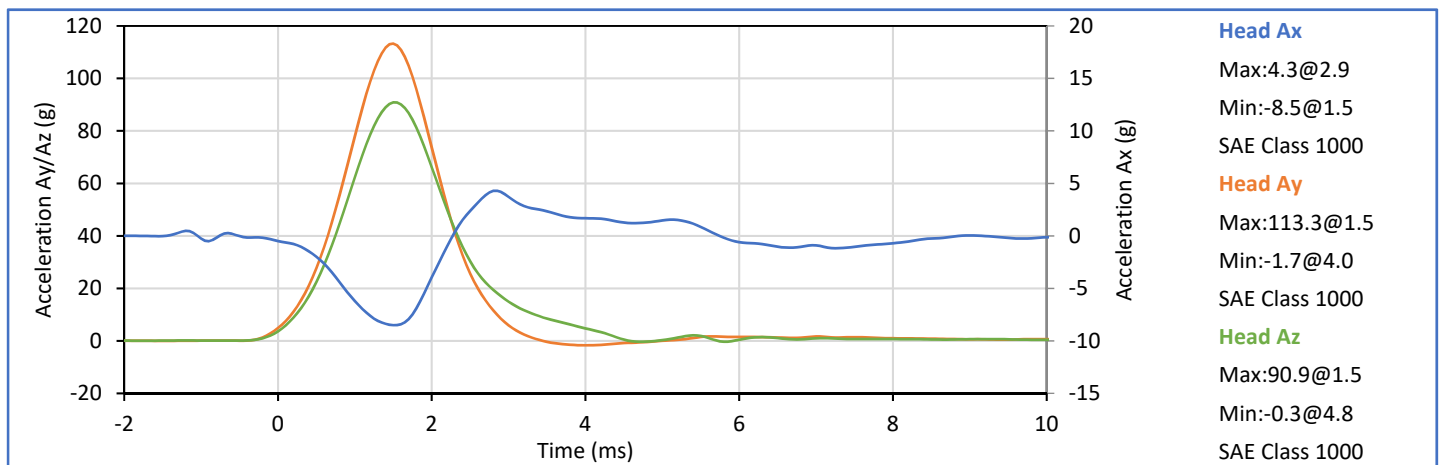
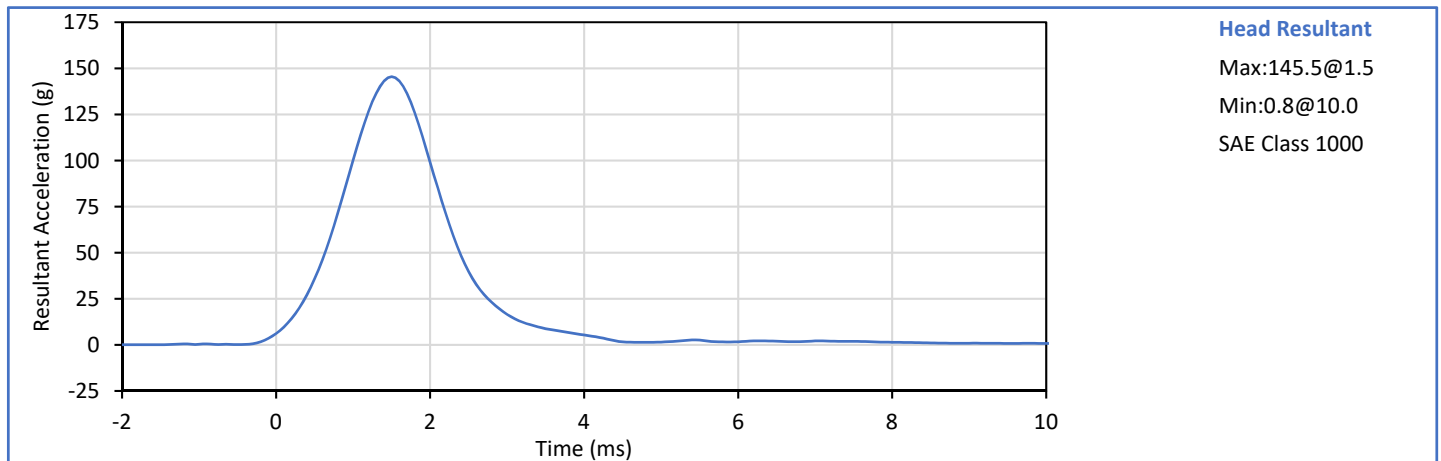
9270 Holly Road, Adelanto, CA 92301
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ES-2re 50th Male Side Impact ATD Head Drop

ATD Serial No.: F037

Test Date: 2017-11-30

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	22	Pass
Peak Resultant Acceleration	g	125.0	155.0	145.5	Pass
Peak Head Ax	g	-15.0	15.0	4.3	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.8	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	



Technician:

Approved By:

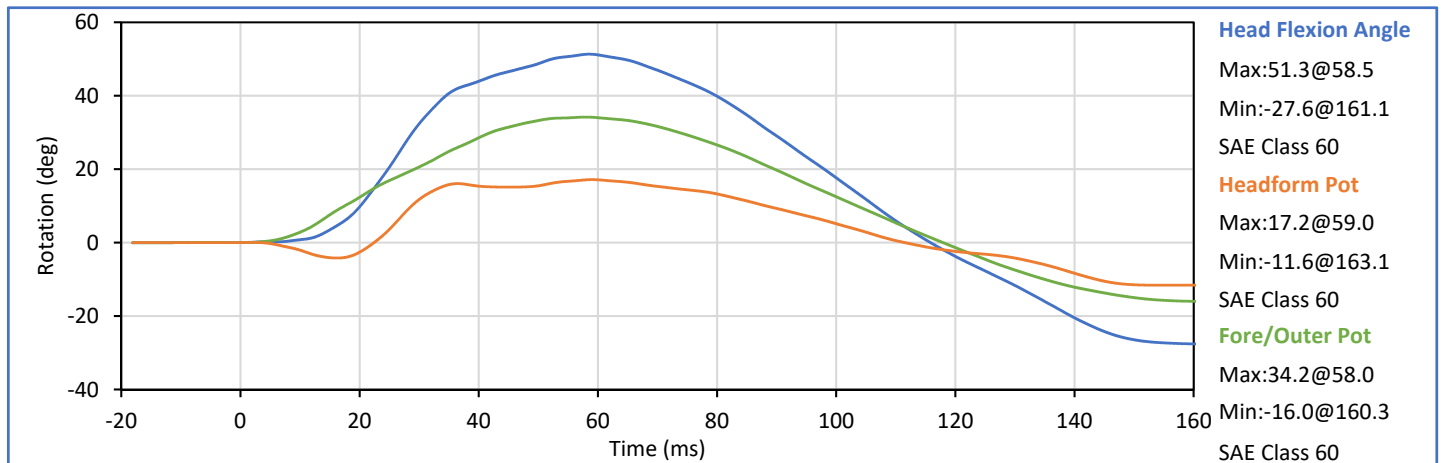
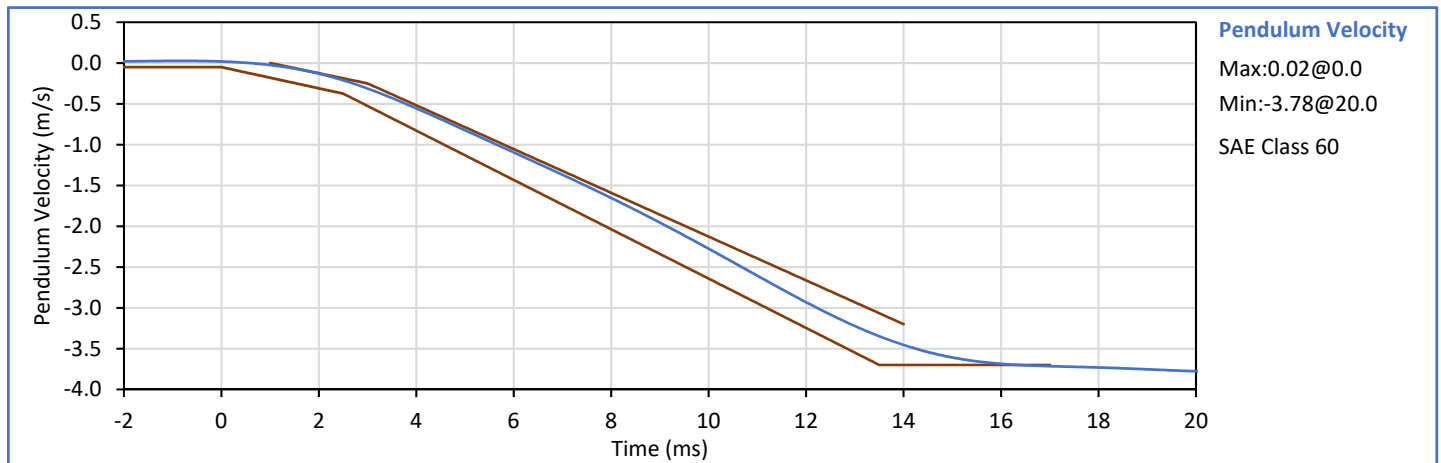


ES-2re 50th Male Side Impact ATD
Neck Flexion

ATD Serial No.: F037

Test Date: 2017-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	20	Pass
Pendulum Velocity	m/s	3.30	3.50	3.46	Pass
Peak Headform Flexion	deg	49.0	59.0	51.3	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	58.5	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	57.4	Pass
Overall Test Results					Pass



Technician: Scotty

Approved By: Wep



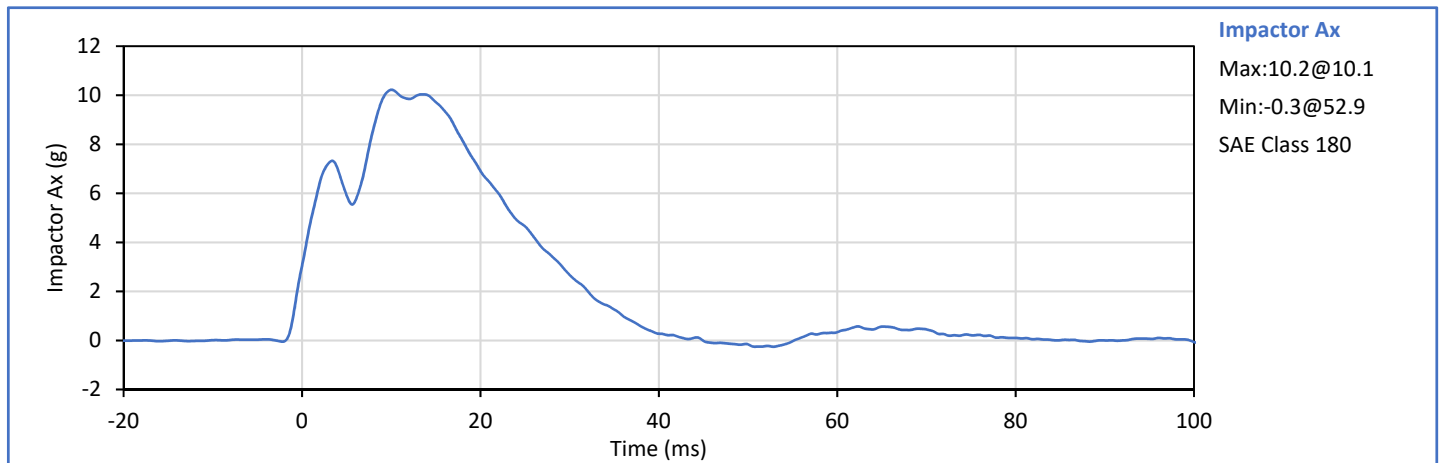
9270 Holly Road, Adelanto, CA 92301
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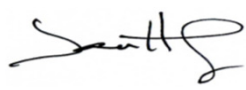
ES-2re 50th Male Side Impact ATD Shoulder Impact Test

ATD Serial No.: F037

Test Date: 2017-12-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Humidity	%	10	70	32	Pass
Impactor Velocity	m/s	4.20	4.40	4.27	Pass
Peak Impactor Ax	g	7.50	10.50	10.22	Pass
Overall Test Results					Pass



Technician: 

Approved By: 

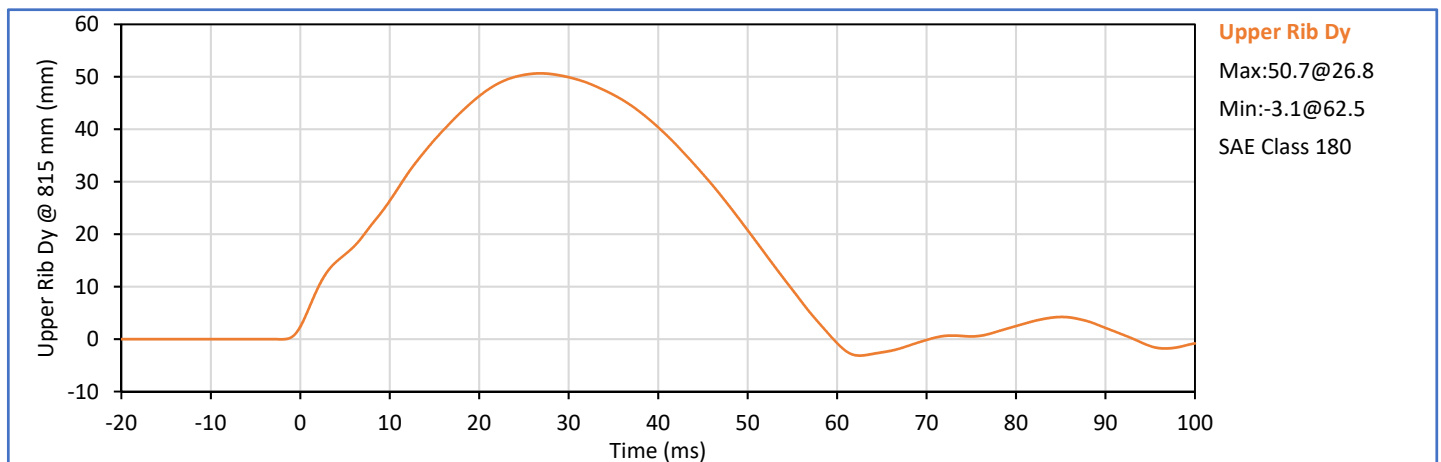
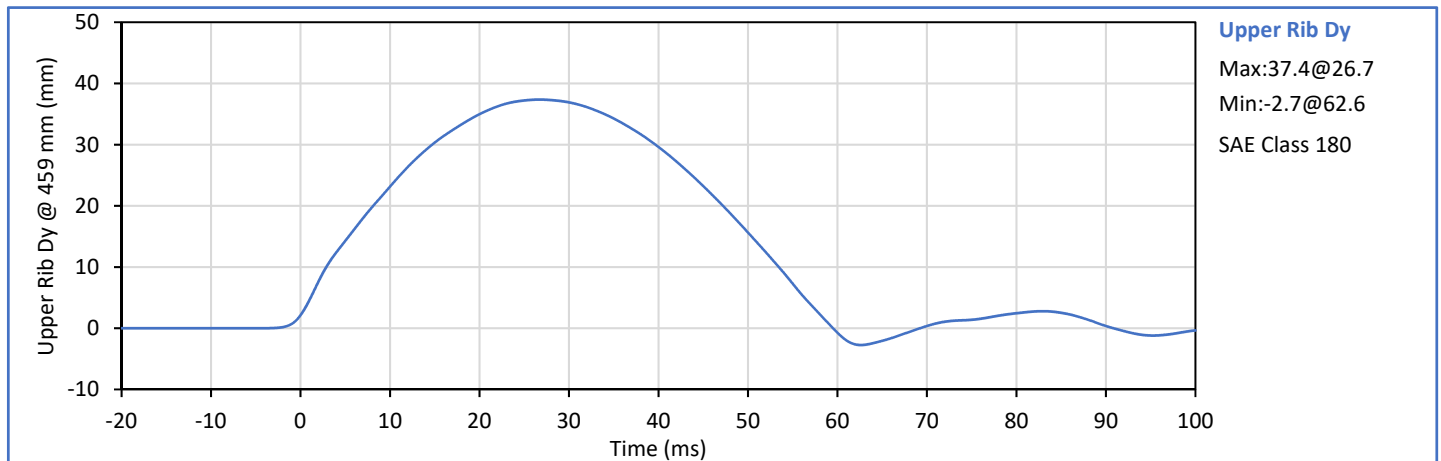


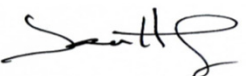
ES-2re 50th Male Side Impact ATD
Upper Rib Drop Test

ATD Serial No.: F037

Test Date: 2017-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	22	Pass
Upper Rib Dy @ (459mm)	mm	36.0	40.0	37.4	Pass
Upper Rib Dy @ (815mm)	mm	46.0	51.0	50.7	Pass
Overall Test Results				Pass	



Technician: 

Approved By: 

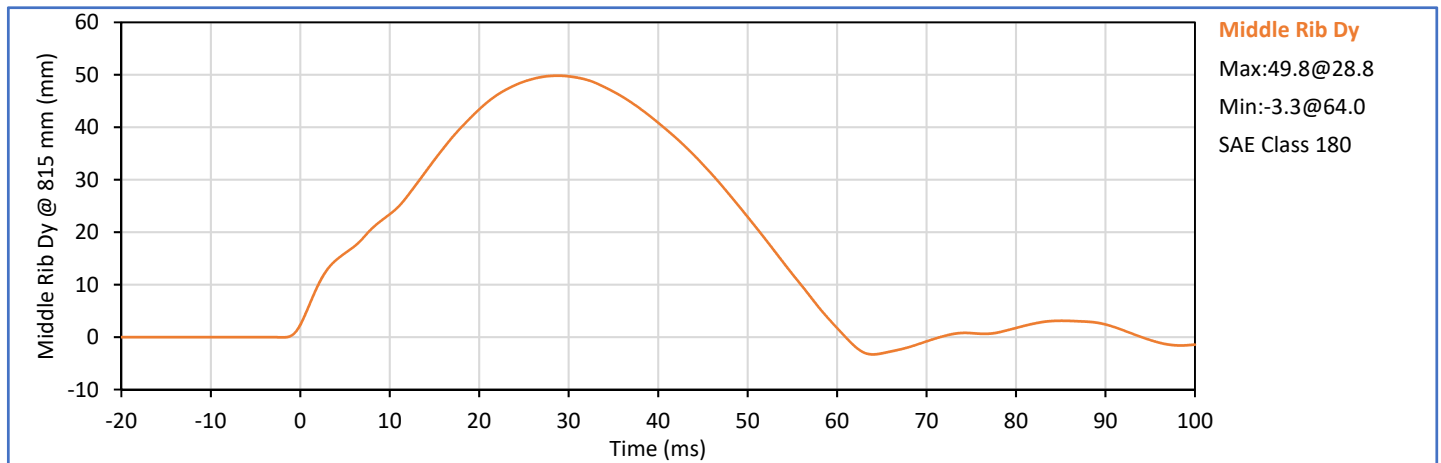
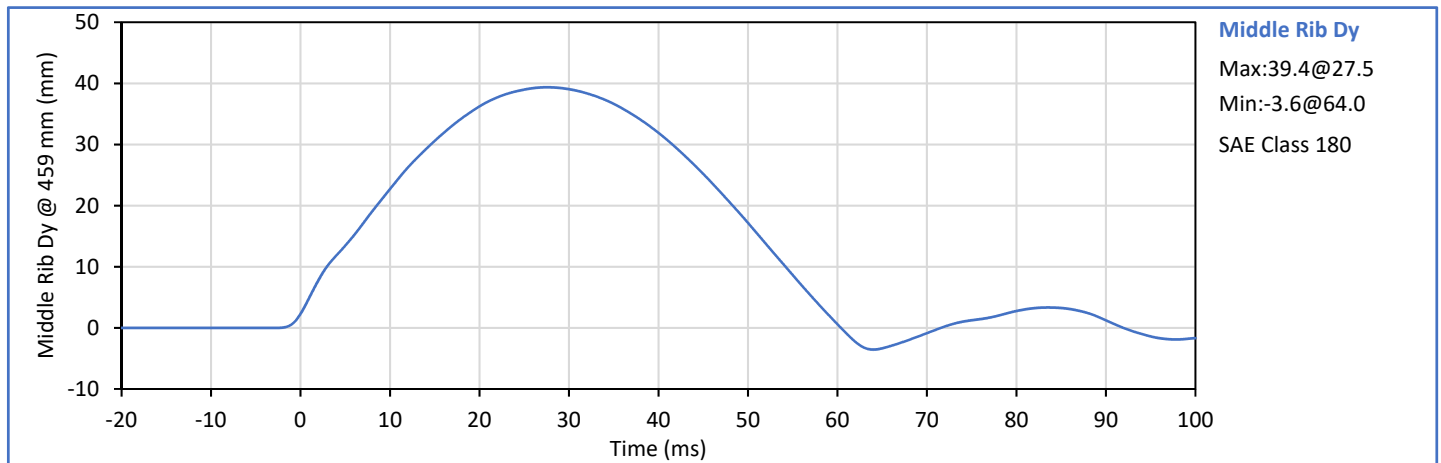


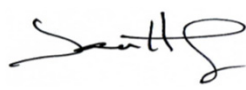
ES-2re 50th Male Side Impact ATD
Middle Rib Drop Test

ATD Serial No.: F037

Test Date: 2017-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	22	Pass
Middle Rib Dy @ (459mm)	mm	36.0	40.0	39.4	Pass
Middle Rib Dy @ (815mm)	mm	46.0	51.0	49.8	Pass
Overall Test Results					Pass



Technician: 

Approved By: 



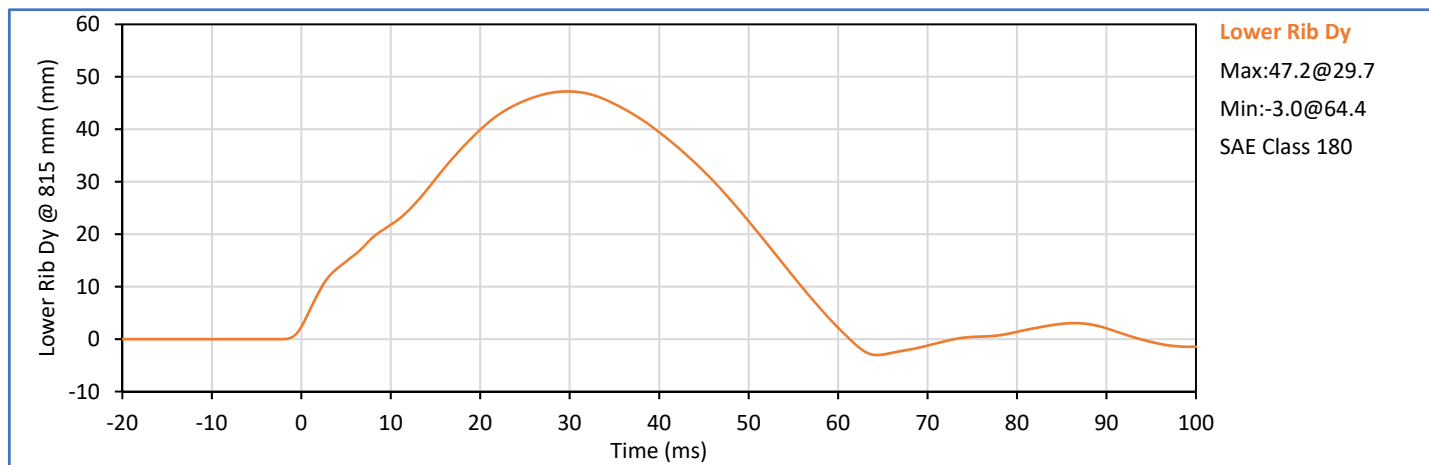
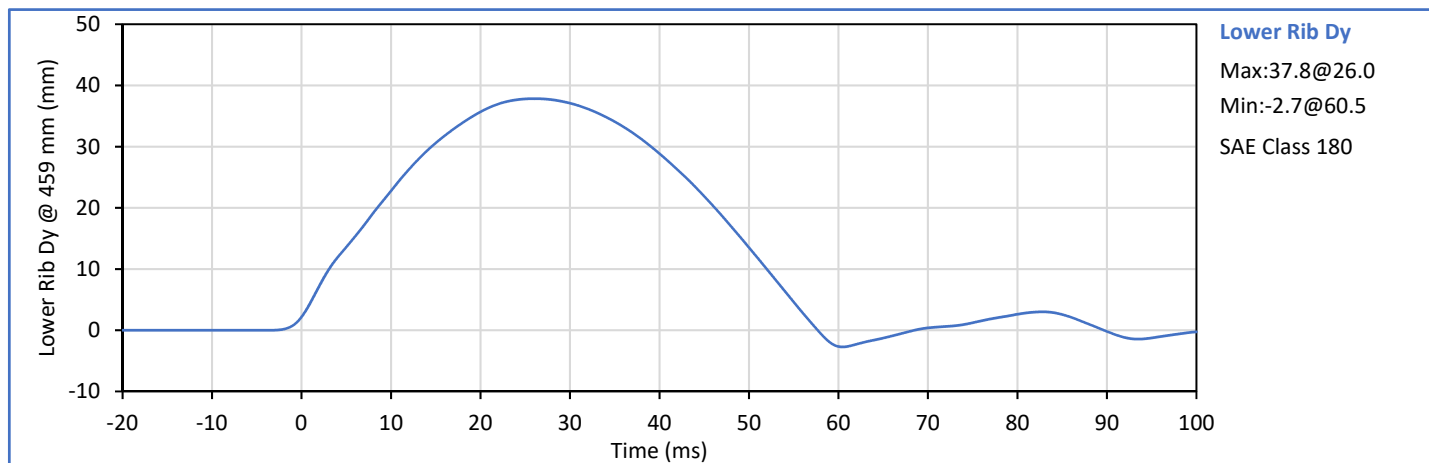
9270 Holly Road, Adelanto, CA 92301
 Tel: +1 760 246 1672 Fax: +1 760 246 8112
 Info@karco.com www.karco.com

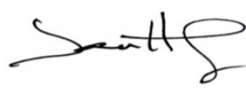
ES-2re 50th Male Side Impact ATD **Lower Rib Drop Test**

ATD Serial No.: F037

Test Date: 2017-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	22	Pass
Lower Rib Dy @ (459mm)	mm	36.0	40.0	37.8	Pass
Lower Rib Dy @ (815mm)	mm	46.0	51.0	47.2	Pass
Overall Test Results				Pass	



Technician: 

Approved By: 

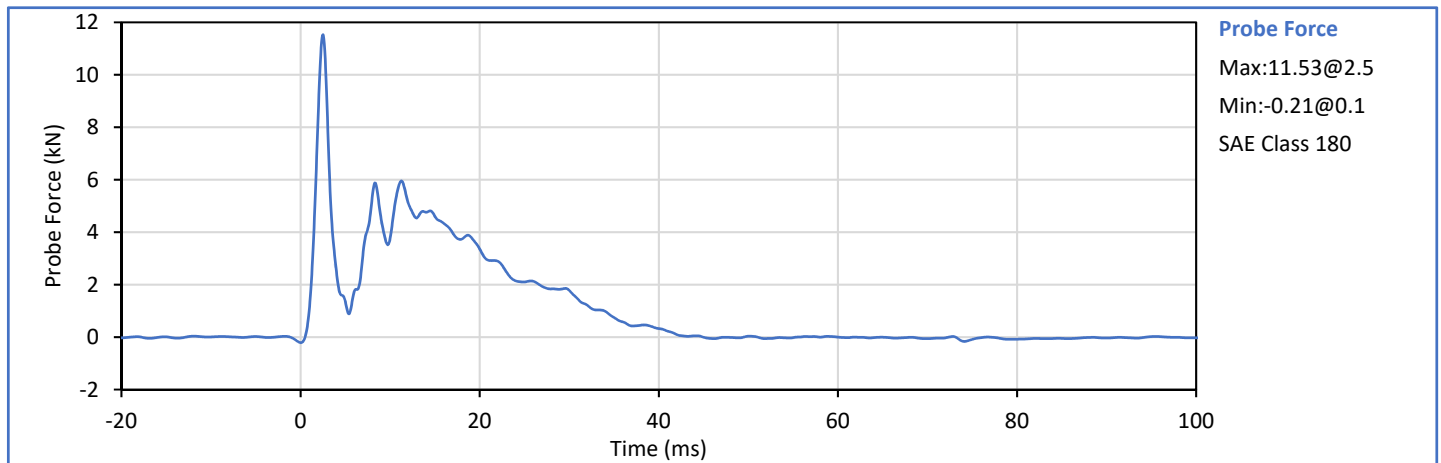
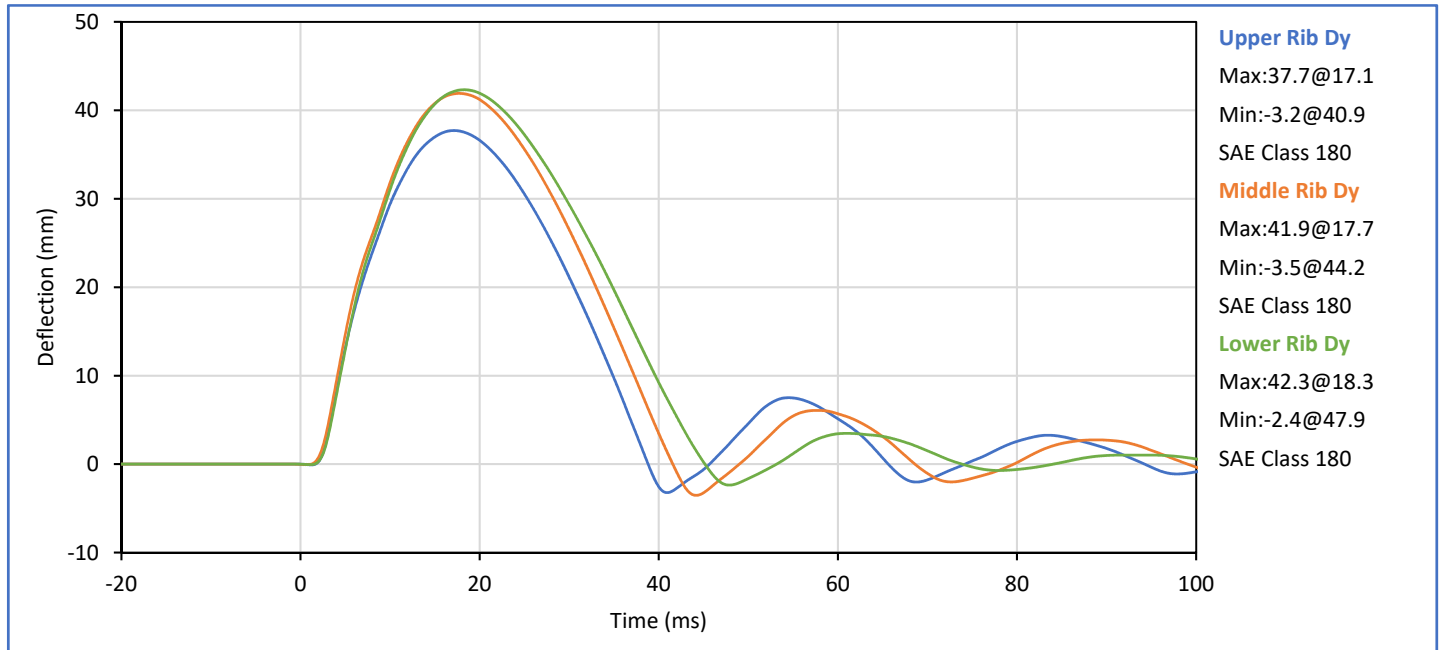


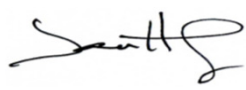
ES-2re 50th Male Side Impact ATD
Thorax Impact (Full Body)

ATD Serial No.: F037

Test Date: 2017-12-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	5.40	5.60	5.53	Pass
Peak Upper Rib Dy	mm	34.0	41.0	37.7	Pass
Peak Middle Rib Dy	mm	37.0	45.0	41.9	Pass
Peak Lower Rib Dy	mm	37.0	44.0	42.3	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.96	Pass
Overall Test Results				Pass	Pass



Technician: 

Approved By: 

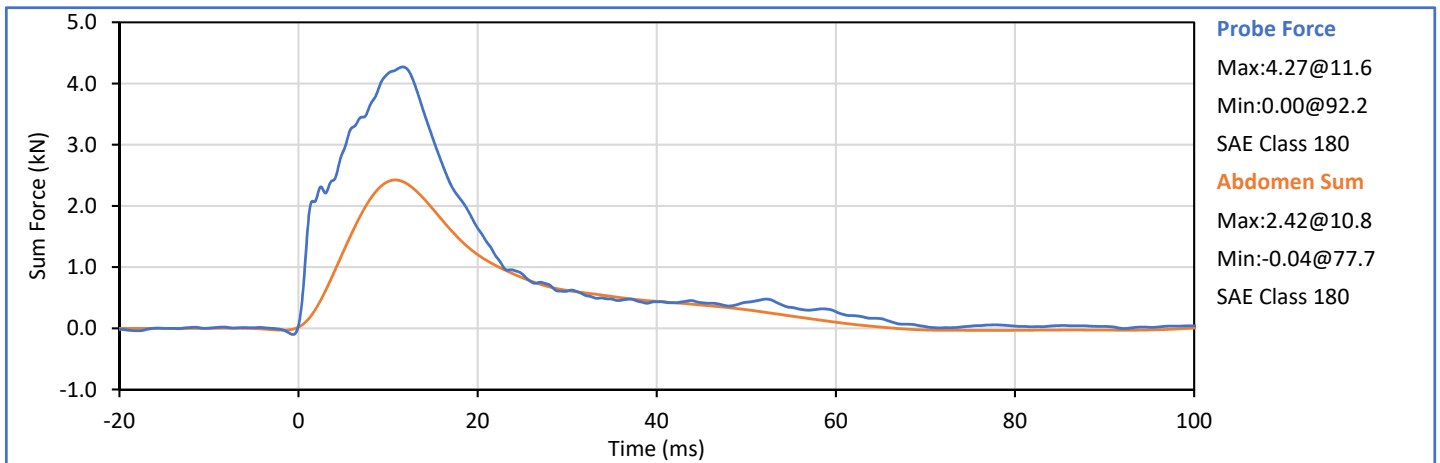
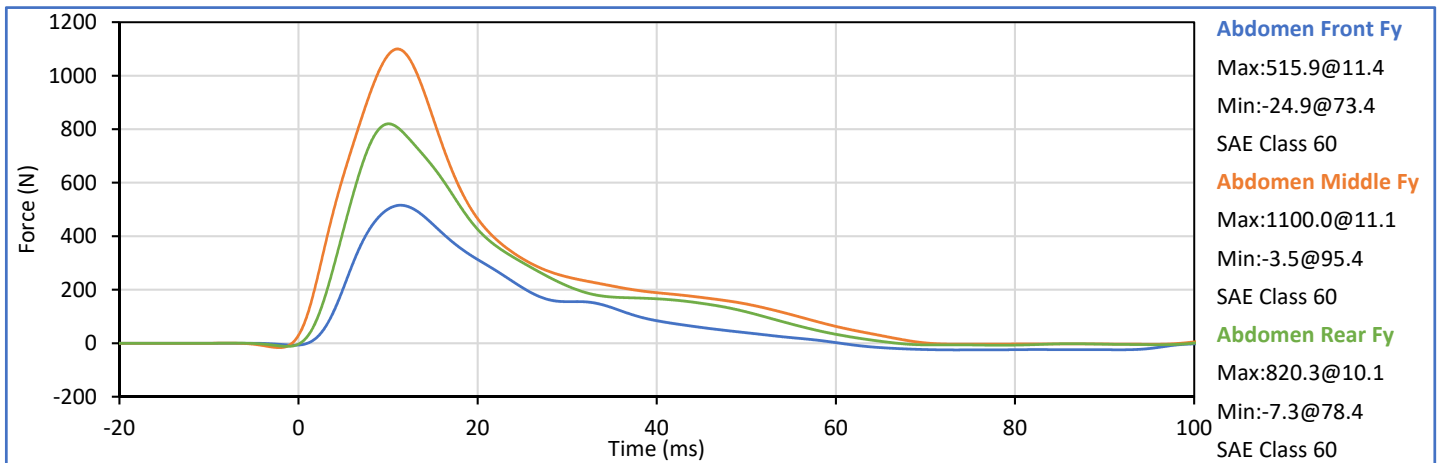


ES-2re 50th Male Side Impact ATD
Abdomen Impact

ATD Serial No.: F037

Test Date: 2017-12-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.7	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	3.90	4.10	4.03	Pass
Peak Impactor Force	kN	4.00	4.80	4.27	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.6	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.42	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	10.8	Pass
Overall Test Results				Pass	Pass



Technician: Smith

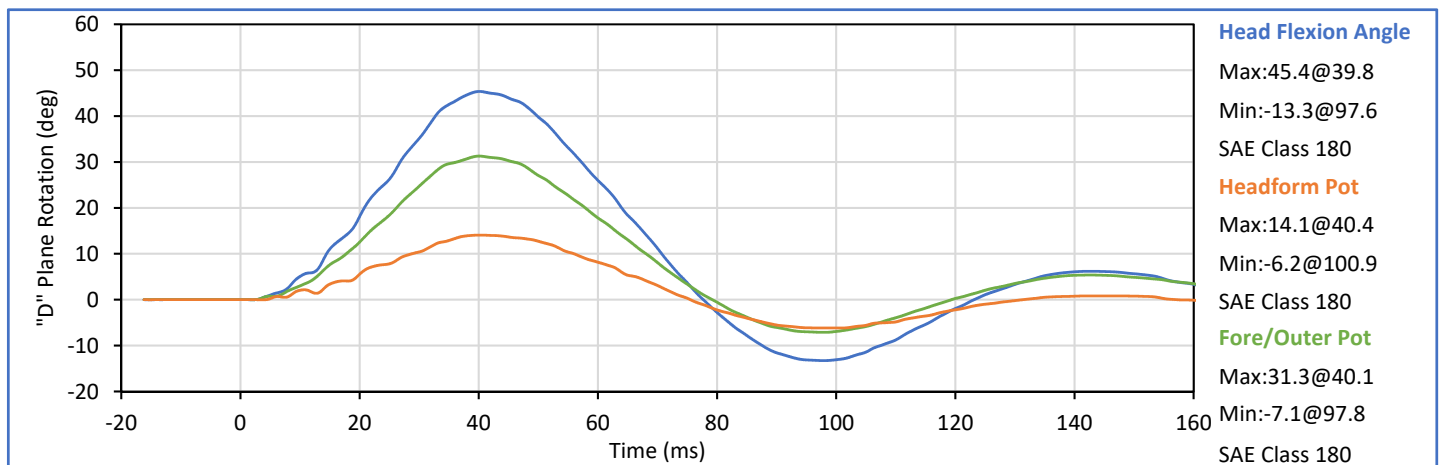
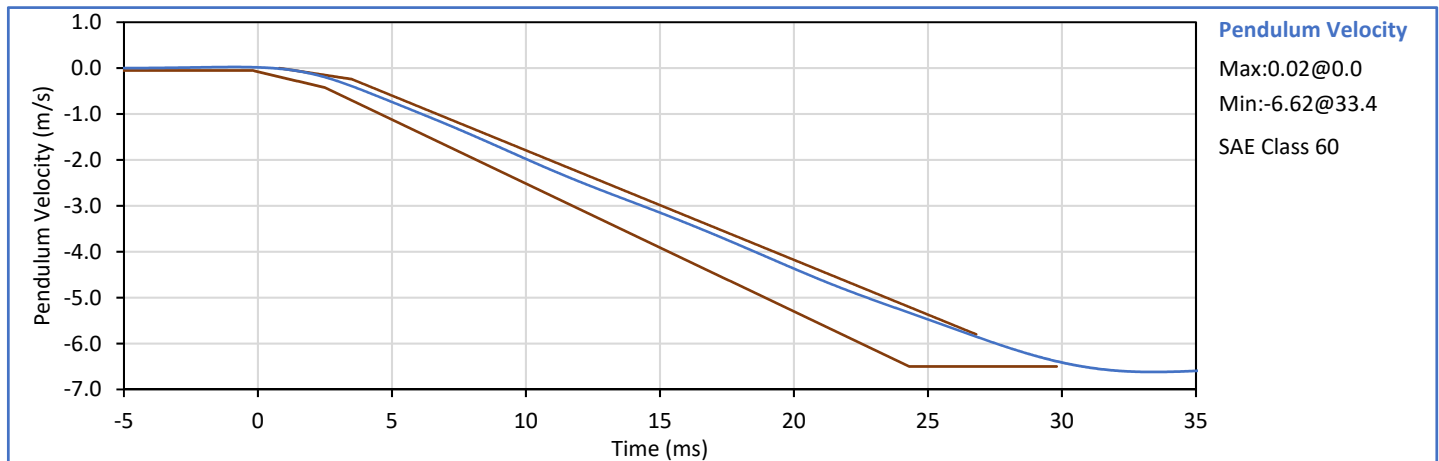
Approved By: Wep



ATD Serial No.: F037

Test Date: 2017-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	20	Pass
Pendulum Velocity	m/s	5.95	6.15	6.04	Pass
Peak Headform Flexion	deg	45.0	55.0	45.4	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	40.1	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	37.6	Pass
Overall Test Results					Pass



Technician: Scotty

Approved By: Wep

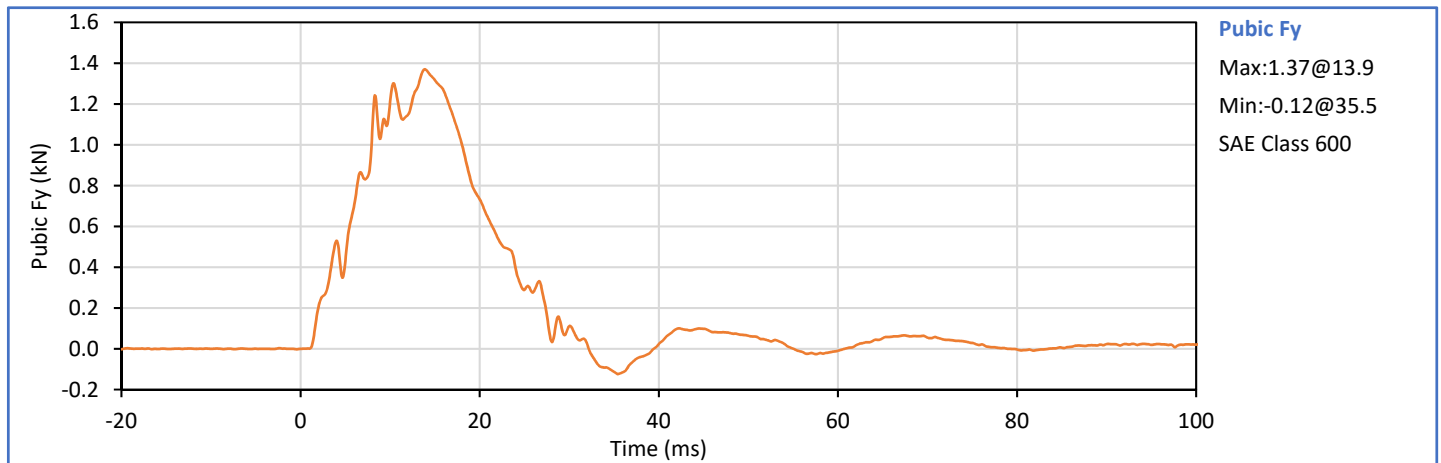
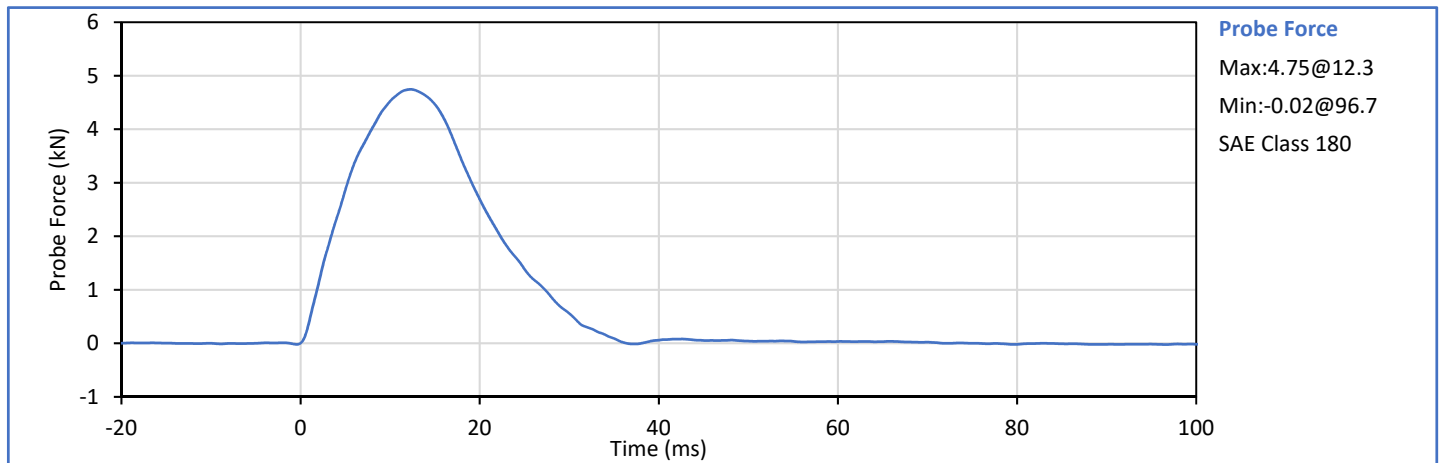


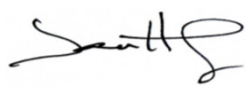
ES-2re 50th Male Side Impact ATD
Pelvis Impact

ATD Serial No.: F037

Test Date: 2017-12-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Impactor Force	kN	4.70	5.40	4.75	Pass
Time of Peak Impactor Force	ms	11.8	16.1	12.3	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.37	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	13.9	Pass
Overall Test Results				Pass	Pass



Technician: 

Approved By: 

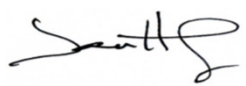


SID-IIs Small Side Impact Dummy
External Measurements

ATD Serial No.: 299

Test Date: 2017-11-28

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	33	Pass
A - Sitting Height	mm	772	788	781	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	85	Pass
D - H Point From Seatback	mm	141	151	146	Pass
E - Shoulder Pivot From Backline	mm	97	107	102	Pass
F - Thigh Clearance	mm	119	135	123	Pass
G - Head Breadth	mm	140	148	148	Pass
H - Head Back From Backline	mm	40	46	43	Pass
I - Head Depth	mm	178	188	184	Pass
J - Head Circumference	mm	541	551	548	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	397	Pass
N - Buttock Popliteal Length	mm	416	442	426	Pass
O - Chest Depth W/O Jacket	mm	195	211	202	Pass
P - Foot Length	mm	216	232	221	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	319	Pass
R - Arm Length	mm	249	259	254	Pass
S - Knee Joint To Seatback	mm	477	493	483	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	863	Pass
Z - Waist Circumference	mm	761	791	776	Pass
			Overall Test Results		Pass

Technician: 

Approved By: 

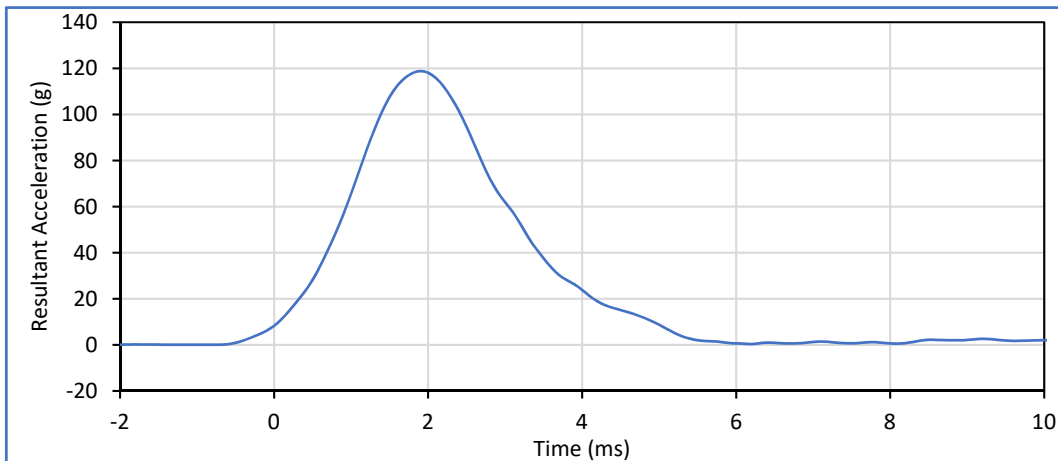


SID-IIs Small Side Impact Dummy Head Drop

ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.1	Pass
Laboratory Humidity	%	10	70	21	Pass
Peak Resultant Acceleration	g	115.0	137.0	118.8	Pass
Peak Head Ax	g	-15.0	15.0	-2.4	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
			Overall Test Results	Pass	

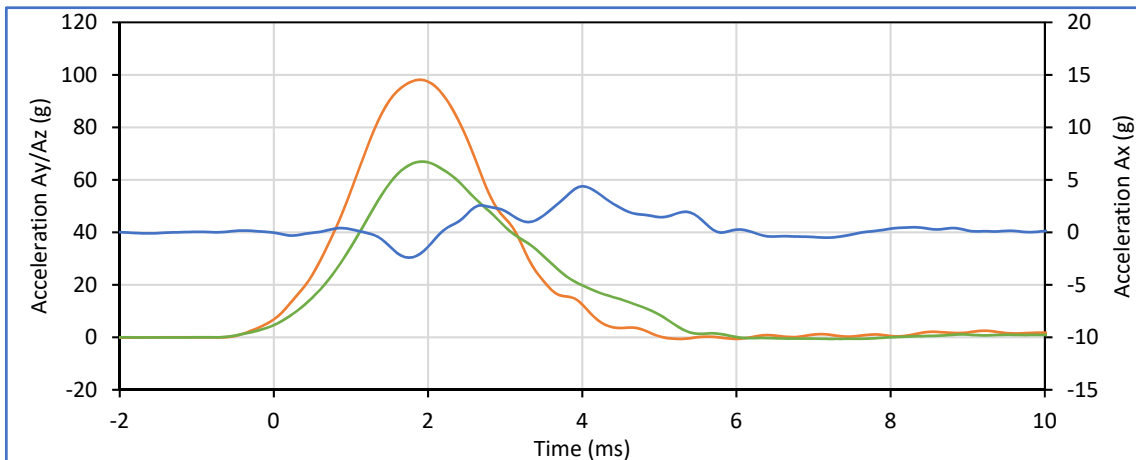


Head Resultant

Max:118.8@1.9

Min:0.3@6.2

SAE Class 1000



Head Ax

Max:4.4@4.0

Min:-2.4@1.8

SAE Class 1000

Head Ay

Max:98.1@1.9

Min:-0.6@5.3

SAE Class 1000

Head Az

Max:66.9@1.9

Min:-0.6@7.3

SAE Class 1000

Technician: Smith

Approved By: Wep

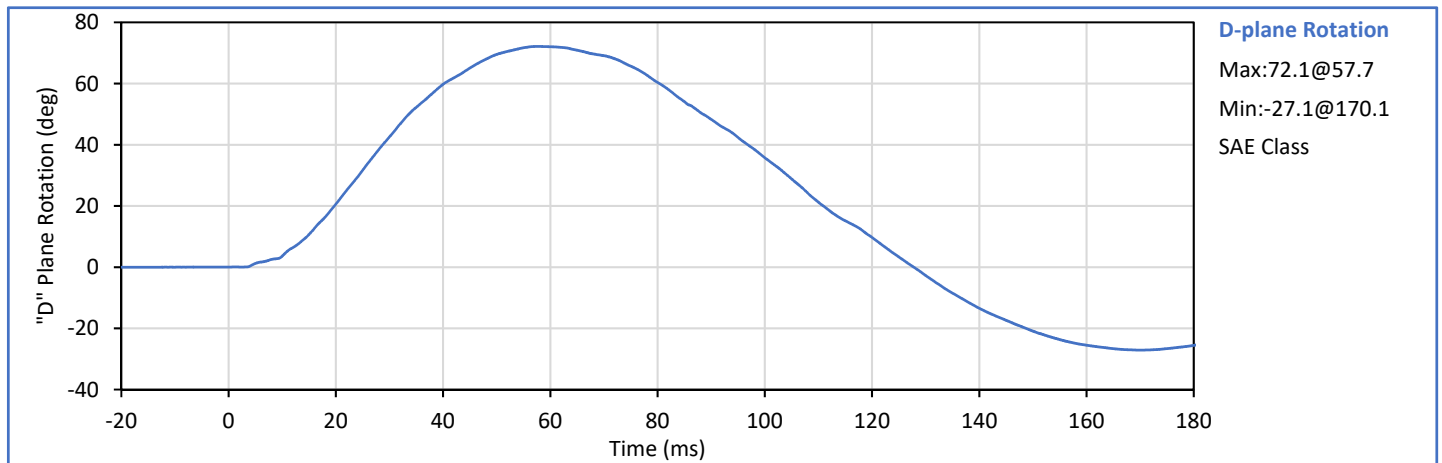
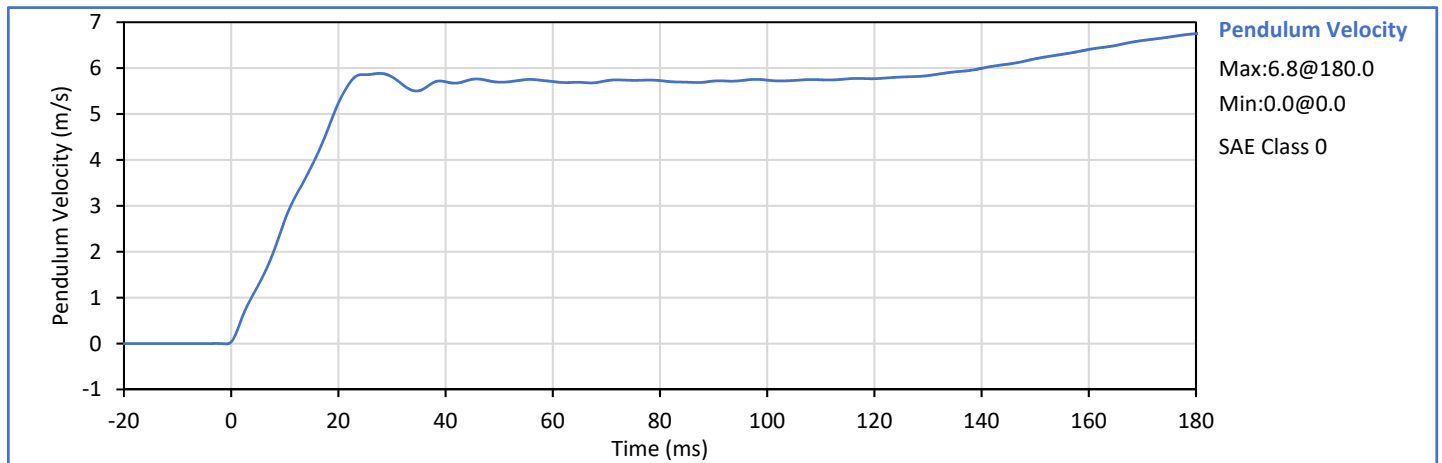


SID-IIs Small Side Impact Dummy Neck Flexion

ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	20	Pass
Pendulum Velocity	m/s	5.51	5.63	5.53	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.69	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.86	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	5.24	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.86	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.89	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	72.1	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	57.7	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-42.6	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	111.9	Pass
Overall Test Results				Pass	

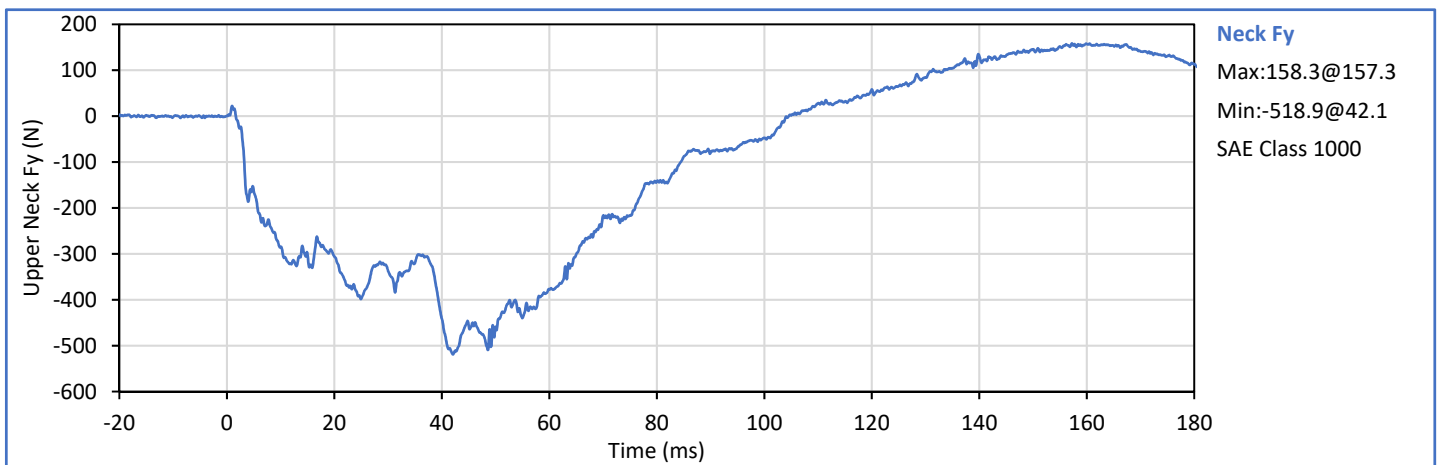
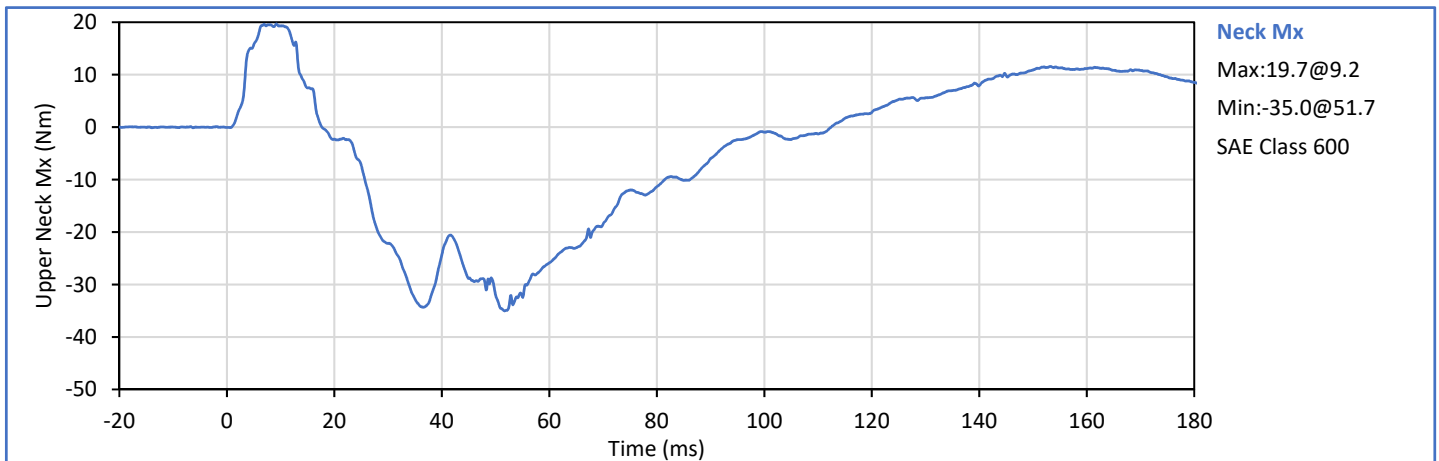
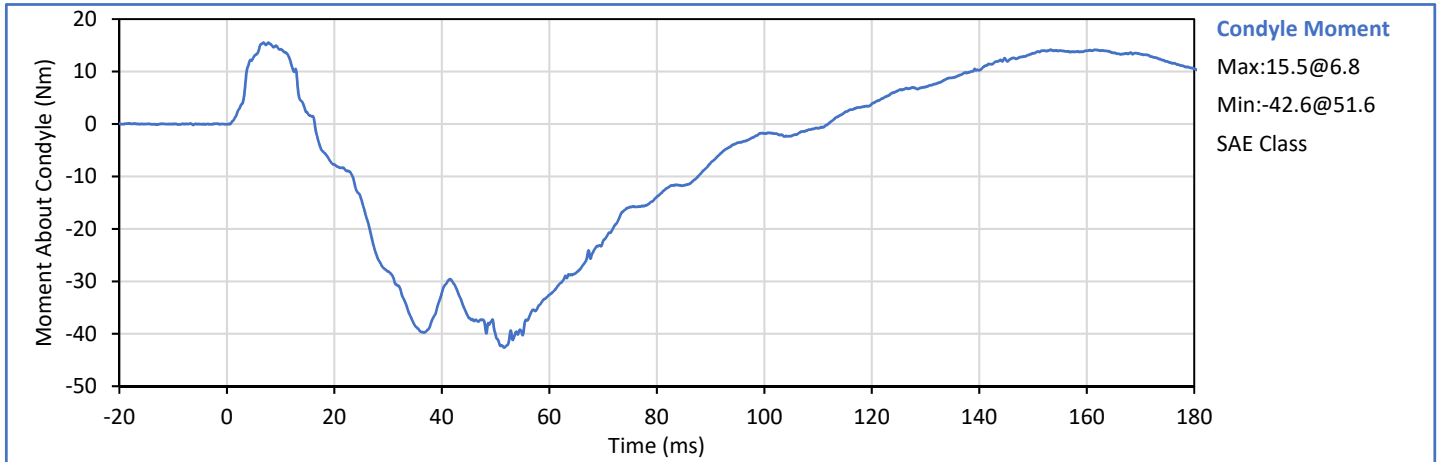


Technician: *Smith*

Approved By: *Wep*

ATD Serial No.: 299

Test Date: 2017-11-28





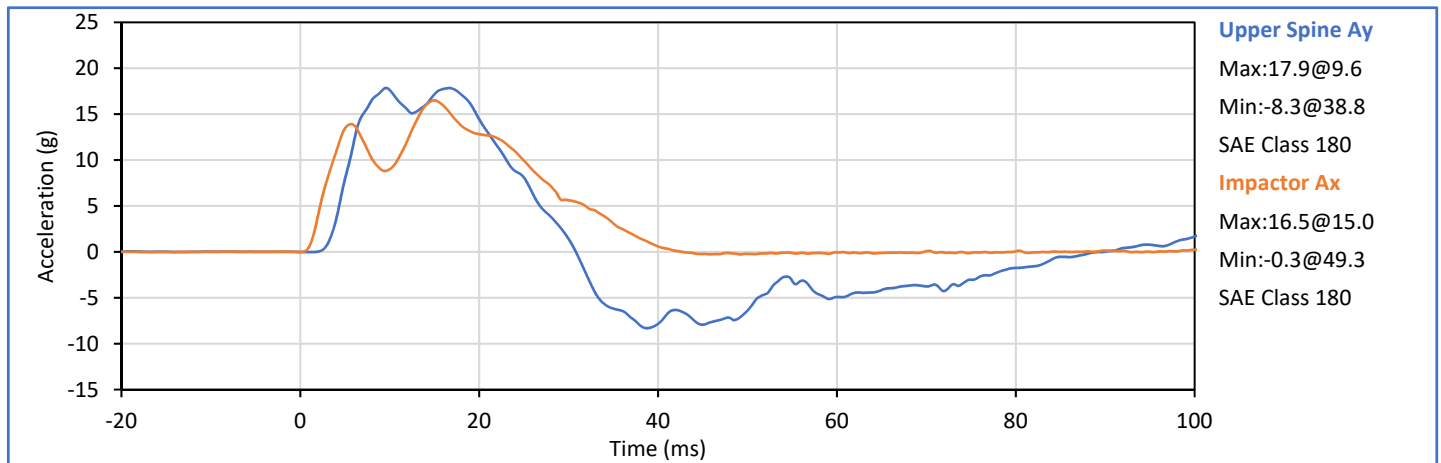
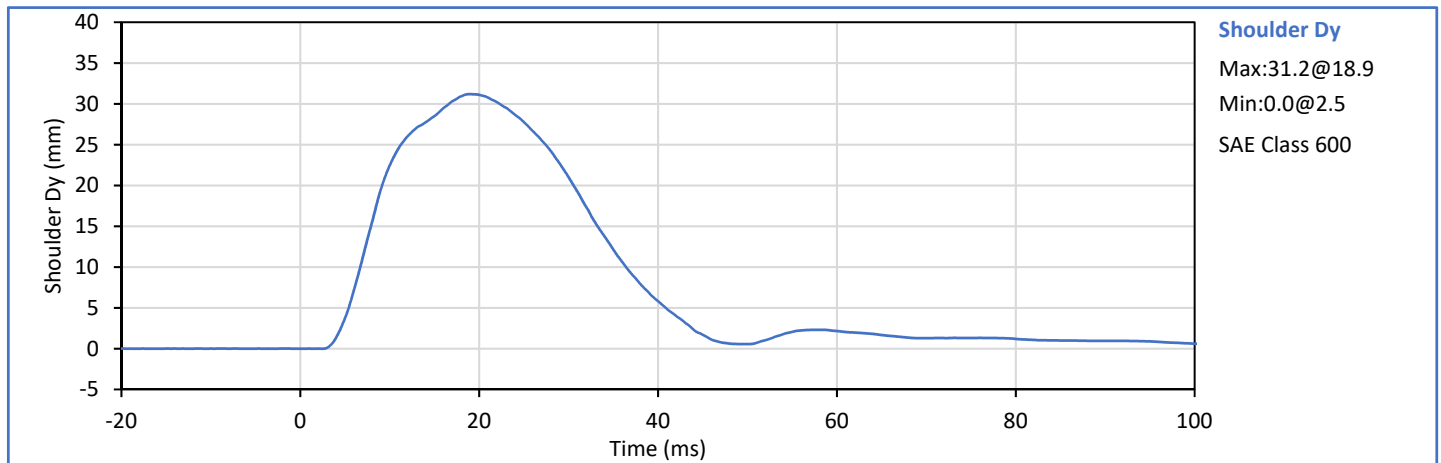
9270 Holly Road, Adelanto, CA 92301
 Tel: +1 760 246 1672 Fax: +1 760 246 8112
 Info@karco.com www.karco.com

SID-IIs Small Side Impact Dummy Shoulder Impact Test

ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.0	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Shoulder Dy	mm	28.0	37.0	31.2	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	17.9	Pass
Peak Impactor Ax	g	13.0	18.0	16.5	Pass
Overall Test Results					Pass



Technician: Smith

Approved By: Wep

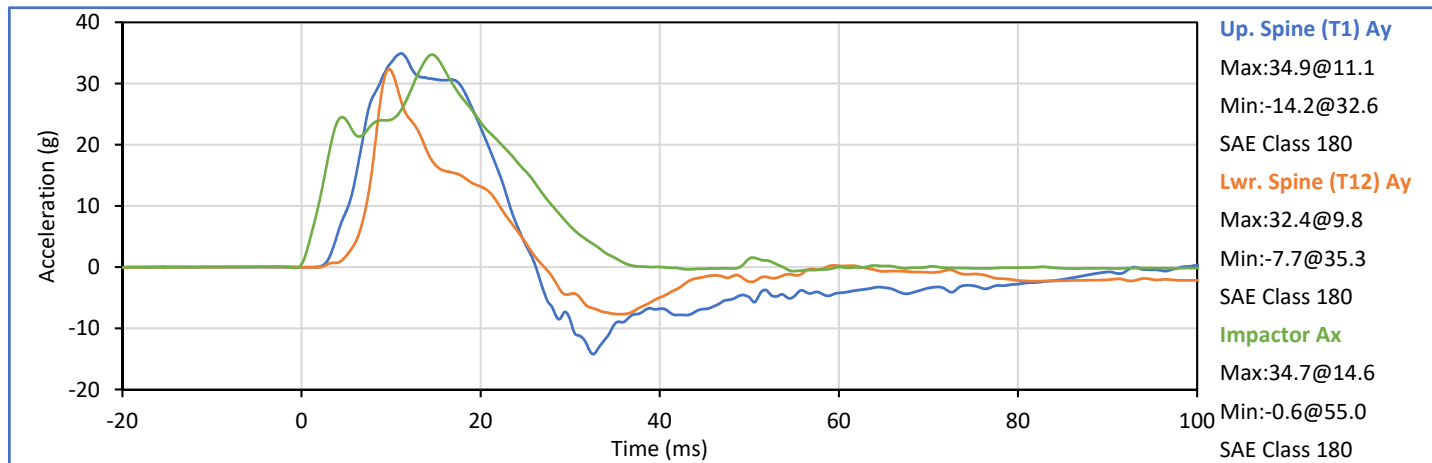
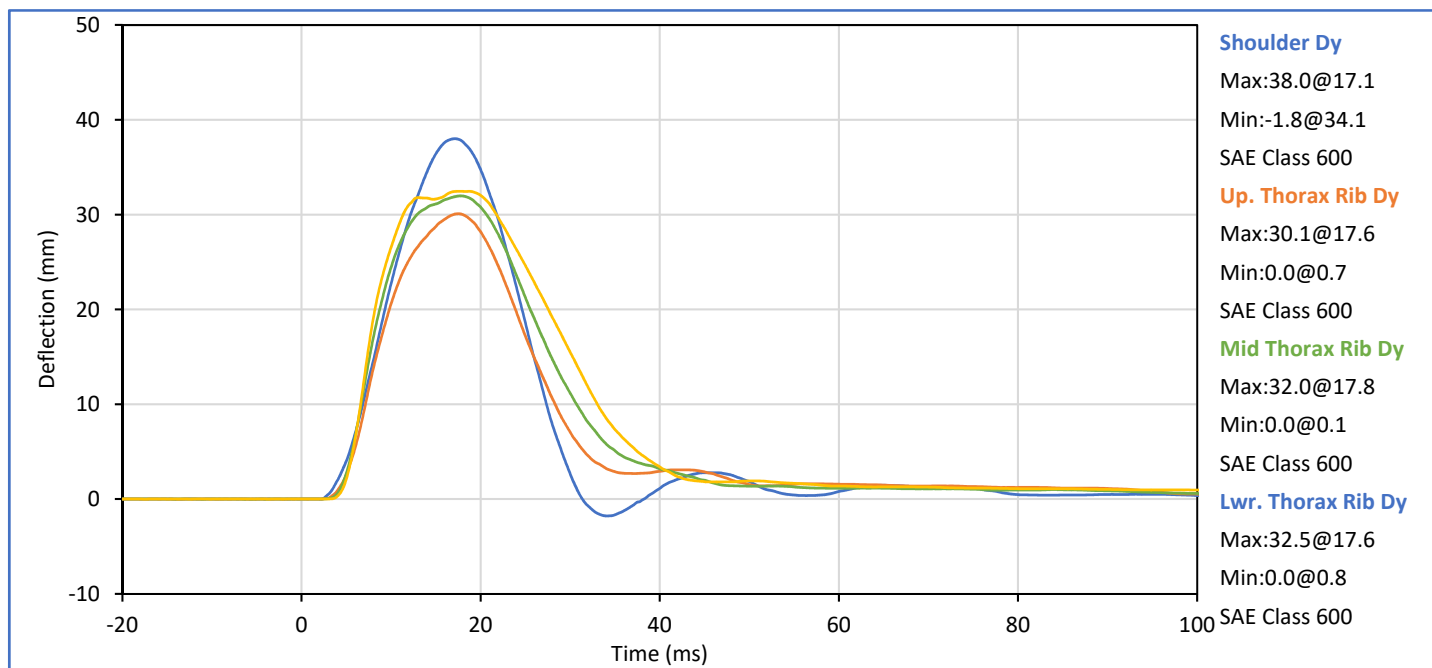


SID-IIs Small Side Impact Dummy Thorax (With Arm)

ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	6.60	6.80	6.77	Pass
Peak Shoulder Dy	mm	31.0	40.0	38.0	Pass
Peak Upper Rib Dy	mm	25.0	32.0	30.1	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.0	Pass
Peak Lower Rib Dy	mm	32.0	38.0	32.5	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	34.9	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	32.4	Pass
Peak Impactor Ax	g	30.0	36.0	34.7	Pass
Overall Test Results				Pass	Pass



Technician: Smith

Approved By: Wep

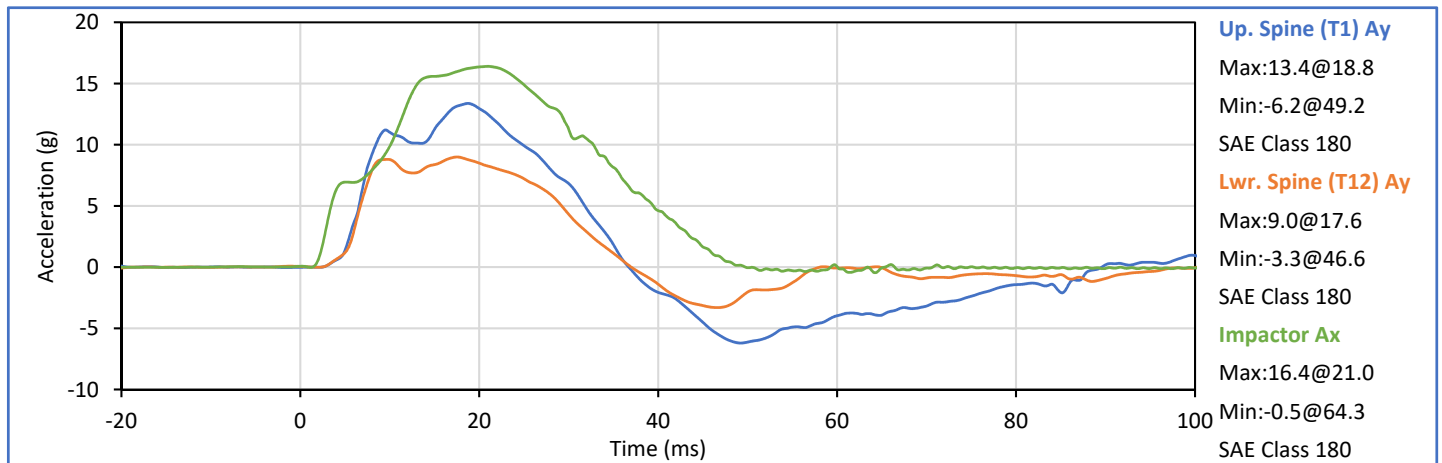
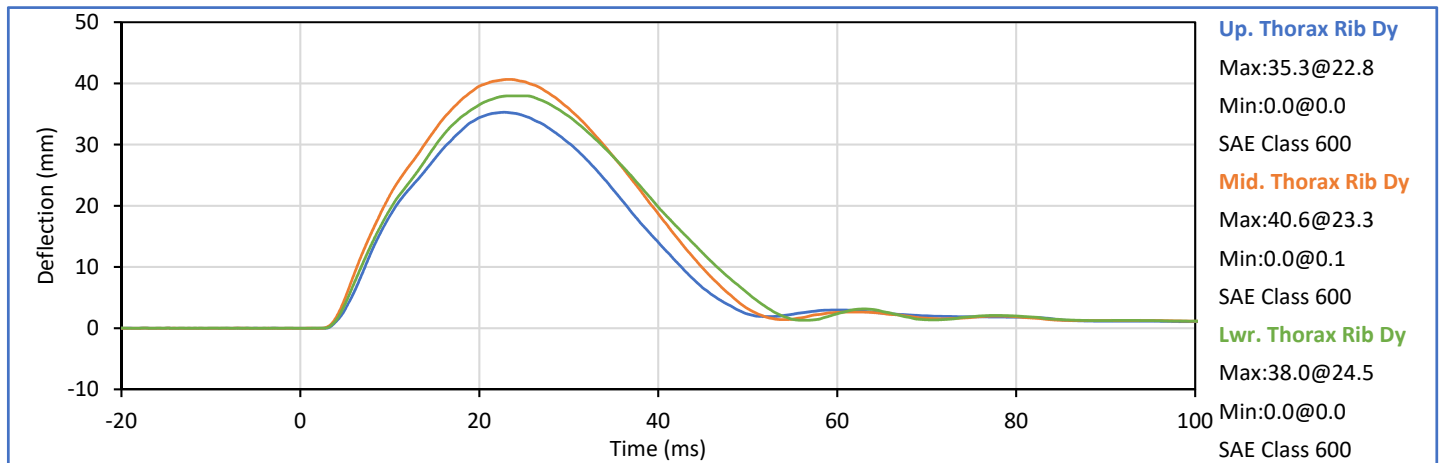


SID-IIs Small Side Impact Dummy Thorax (No Arm)

ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	20.9	Pass
Laboratory Humidity	%	10	70	22	Pass
Impactor Velocity	m/s	4.20	4.40	4.34	Pass
Peak Upper Rib Dy	mm	32.0	40.0	35.3	Pass
Peak Middle Rib Dy	mm	39.0	45.0	40.6	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.0	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	13.4	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.0	Pass
Peak Impactor Ax	g	14.0	18.0	16.4	Pass
Overall Test Results					Pass



Technician: Smith

Approved By: Wep

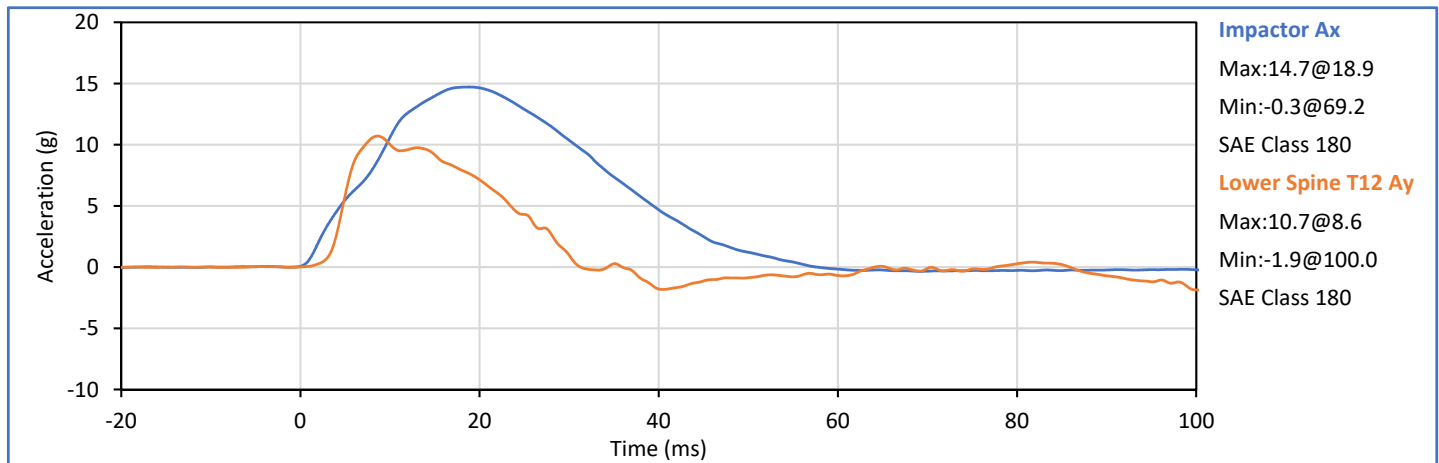
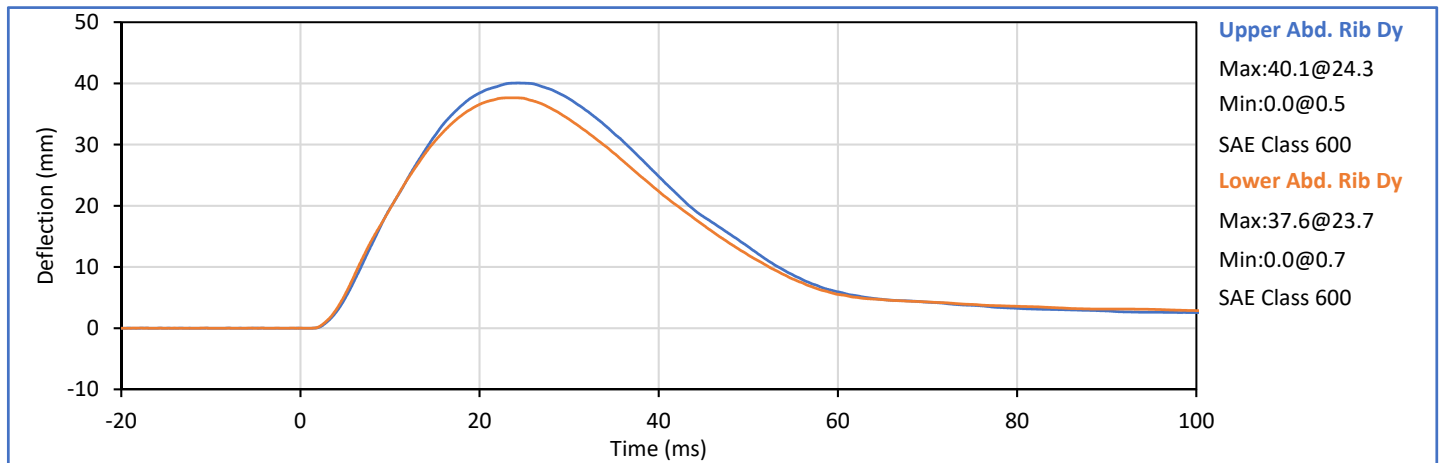


SID-IIs Small Side Impact Dummy Abdomen Impact

ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	21	Pass
Impactor Velocity	m/s	4.20	4.40	4.23	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	40.1	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	37.6	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.7	Pass
Peak Impactor Ax	g	12.0	16.0	14.7	Pass
Overall Test Results				Pass	Pass



Technician: Smith

Approved By: Wep



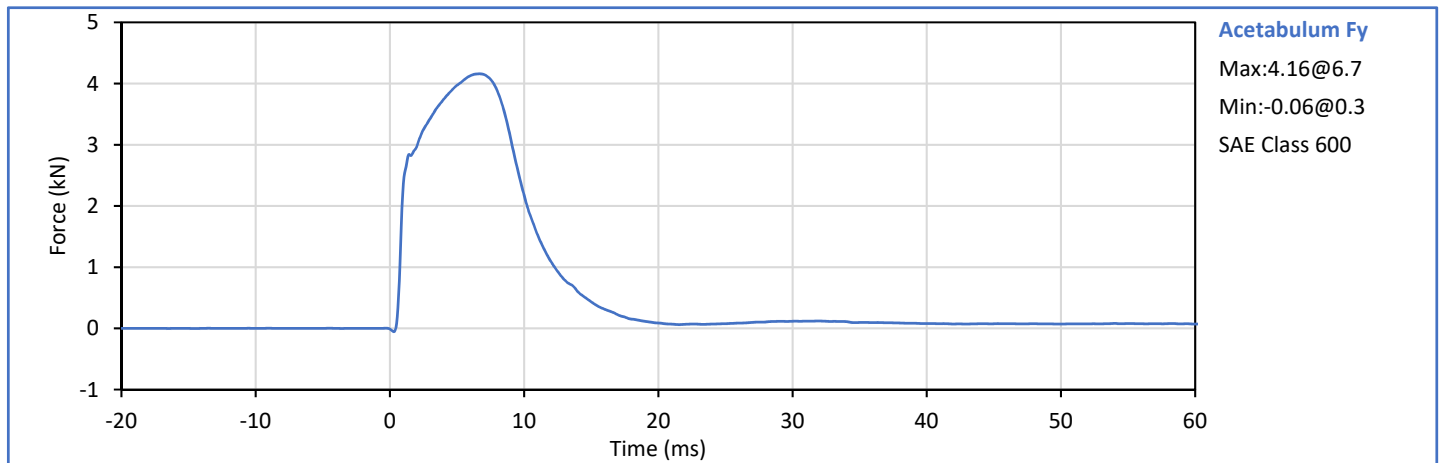
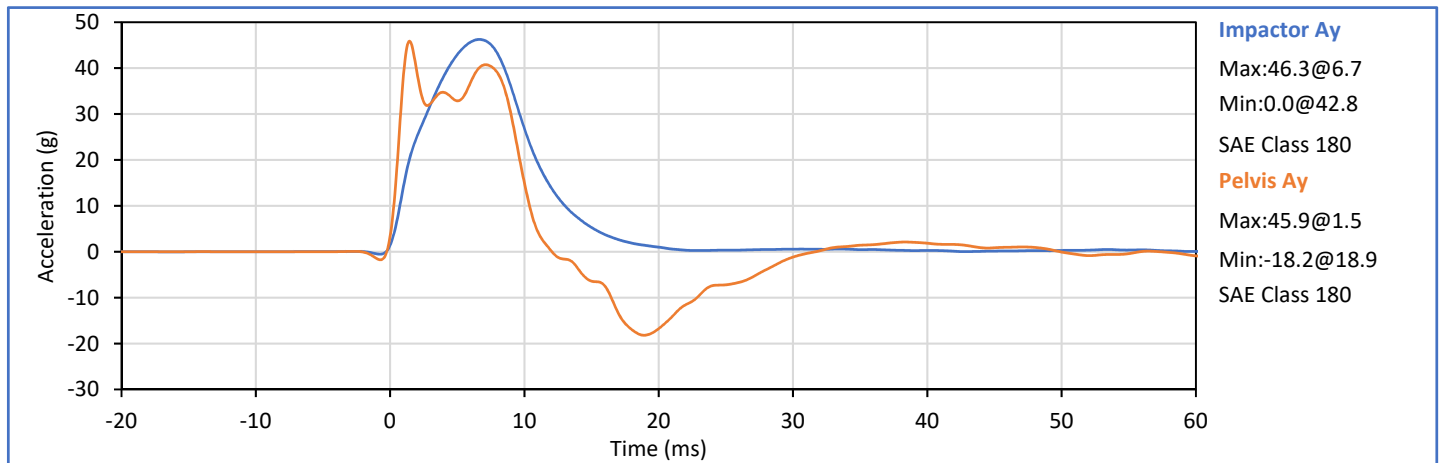
SID-IIs Small Side Impact Dummy Pelvis Acetabulum Impact

ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	6.60	6.80	6.75	Pass
Peak Acetabulum Fy	kN	3.600	4.300	4.159	Pass
Pelvis Ay after 6ms	g	34.0	42.0	40.7	Pass
Peak Impactor Ax	g	38.0	47.0	46.3	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 71134 (HIS)



Technician: *Smith*

Approved By: *Wep*



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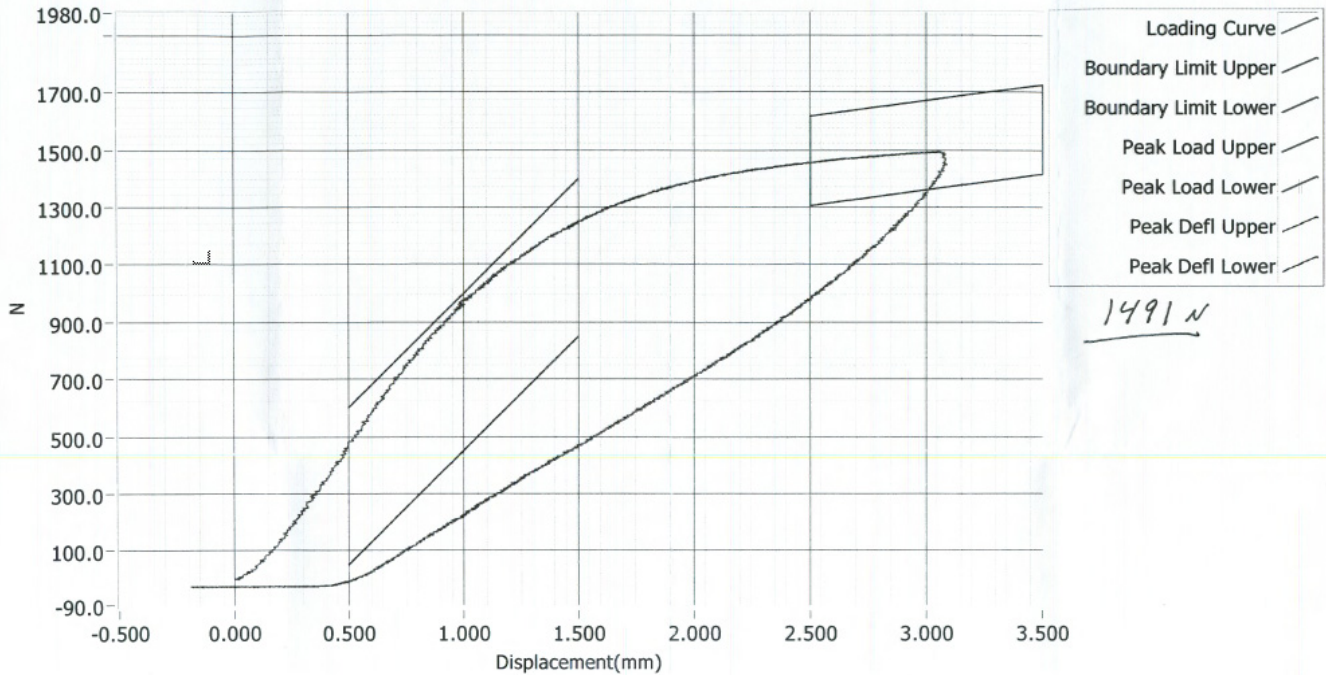
SID-IIs Small Side Impact Dummy Pelvis Acetabulum Impact

ATD Serial No.: 299

Test Date: 2017-11-28

Pelvis Plug S/N: 71134 (HIS)

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

71134

12/18/2013

9:22 PM

Cert ID

ATD Serial Number

ATD Type

N/A

SIDIIs

Current Date : 12/18/2013

Current Time : 21:22:57



SID-IIs Small Side Impact Dummy Pelvis Iliac Impact

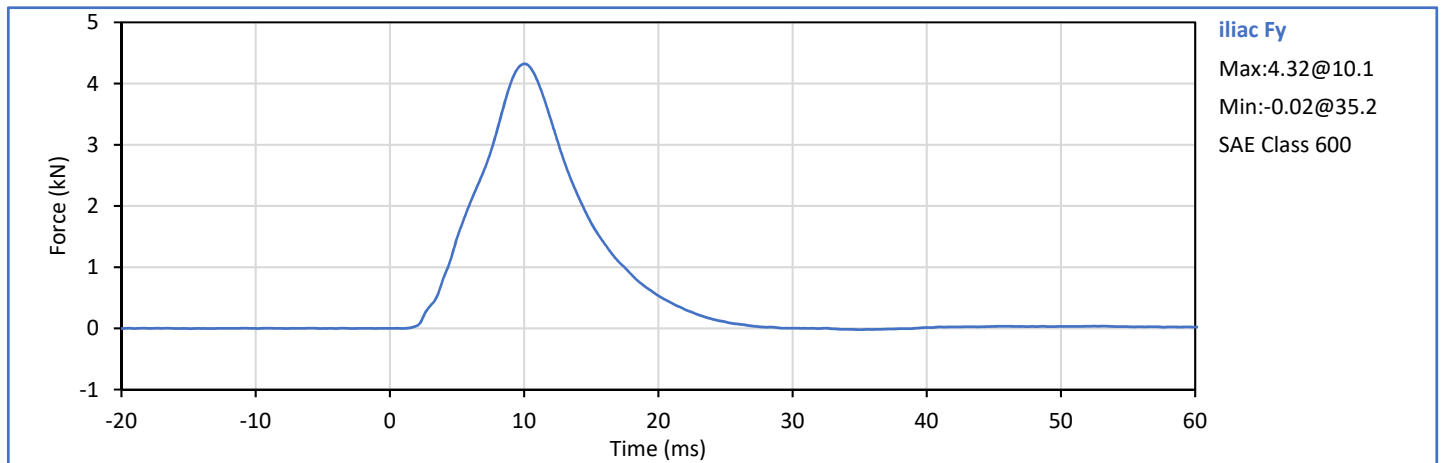
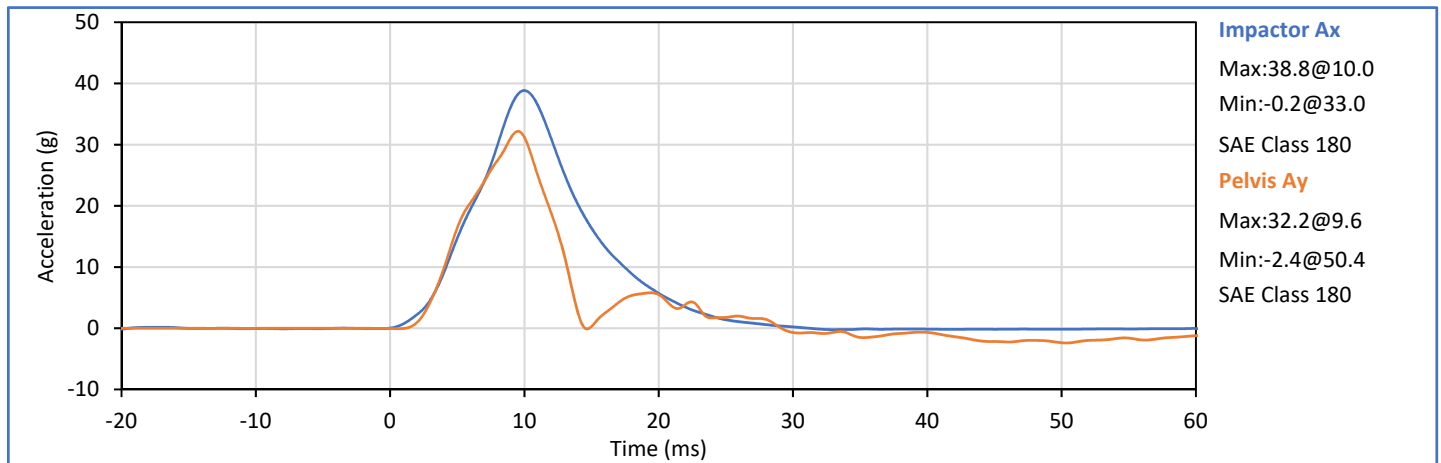
ATD Serial No.: 299

Test Date: 2017-11-28

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	20	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Acetabulum Fy	kN	4.100	5.100	4.322	Pass
Pelvis Ay	g	28.0	39.0	32.2	Pass
Peak Impactor Ax	g	36.0	45.0	38.8	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 71052 (HIS) *

* Plug is not impacted and remains certified



Technician: Smith

Approved By: Wep

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 - Driver ATD Instrumentation

Position:	Driver
ATD Type:	ES-2re
ATD S/N:	F037

Sensor Location	Sensor S/N	Mfr	Last Cal
Head Acceleration X Primary	P58858	Endevco	2017-02-21
Head Acceleration Y Primary	P58865	Endevco	2017-02-12
Head Acceleration Z Primary	P58867	Endevco	2017-02-03
Head Acceleration X Redundant	P58859	Endevco	2017-02-10
Head Acceleration Y Redundant	P58866	Endevco	2017-02-08
Head Acceleration Z Redundant	P58873	Endevco	2017-01-15
Upper Thorax Rib Deflection Y	209	Denton	2017-02-10
Middle Thorax Rib Deflection Y	210	Denton	2017-02-10
Lower Thorax Rib Deflection Y	207	Denton	2017-02-10
Anterior Abdominal Force Y	1504 Fy	Denton	2017-07-25
Middle Abdominal Force Y	1505 Fy	Denton	2017-07-25
Posterior Abdominal Force Y	1506 Fy	Denton	2017-07-25
Lower Spine T12 Acceleration X	P63856	Endevco	2017-01-15
Lower Spine T12 Acceleration Y	P50063	Endevco	2017-02-04
Lower Spine T12 Acceleration Z	P51880	Endevco	2017-01-17
Pubic Symphysis Force Y	DG6784 Fy	FTSS	2017-07-25

Table 2 - Passenger ATD Instrumentation

Position:	Rear Pass.
ATD Type:	SID-IIs
ATD S/N:	299

Sensor Location	Sensor S/N	Mfr	Last Cal
Head Acceleration X Primary	P51929	Endevco	2017-06-27
Head Acceleration Y Primary	P50086	Endevco	2017-07-25
Head Acceleration Z Primary	P51931	Endevco	2017-07-28
Head Acceleration X Redundant	P68604	Endevco	2017-07-03
Head Acceleration Y Redundant	P51934	Endevco	2017-06-28
Head Acceleration Z Redundant	P58736	Endevco	2017-07-24
Head Rotation Rate X	ARS7571	DTS	2017-06-11
Head Rotation Rate Y	ARS7316	DTS	2017-06-11
Head Rotation Rate Z	ARS7330	DTS	2017-06-11
Upper Thorax Rib Deflection Y	1143	FTSS	2017-02-08
Middle Thorax Rib Deflection Y	1160	FTSS	2017-02-09
Lower Thorax Rib Deflection Y	1213	FTSS	2017-02-09
Upper Abdomen Rib Deflection Y	1218	FTSS	2017-02-09
Lower Abdomen Rib Deflection Y	1177	FTSS	2017-02-08
Lower Spine T12 Acceleration X	04I20-Z04	Entran	2017-07-22
Lower Spine T12 Acceleration Y	06A07-R08	Entran	2017-07-31
Lower Spine T12 Acceleration Z	P58795	Endevco	2017-07-02
Acetabulum Impact Side Force Y	272 Fy	Denton	2017-07-03
Iliac Wing Impact Side Force Y	284 Fy	Denton	2017-06-27

Table 3 - Vehicle Instrumentation

Sensor Location	Sensor S/N	Mfr	Last Cal
Vehicle CG Ax	A224488	MSI	2017-03-22
Vehicle CG Ay	A224486	MSI	2017-03-22
Vehicle CG Az	A227269	MSI	2017-03-22
Right Side Sill at Front Seat Ax	A224489	MSI	2017-03-22
Right Side Sill at Front Seat Ay	A224575	MSI	2017-03-17
Right Side Sill at Front Seat Az	A224510	MSI	2017-03-22
Right Side Sill at Rear Seat Ax	A224490	MSI	2017-03-22
Right Side Sill at Rear Seat Ay	A226922	MSI	2017-04-20
Right Side Sill at Rear Seat Az	A226926	MSI	2017-04-20
Left Side Sill at Front Seat Ay	A227276	MSI	2017-04-20
Left Side Sill at Rear Seat Ay	A224572	MSI	2017-03-17
Left Lower A-Pillar Ay	A224512	MSI	2017-03-22
Left Middle A-Pillar Ay	A224565	MSI	2017-03-16
Left Lower B-Pillar Ay	A224520	MSI	2017-03-22
Left Middle B-Pillar Ay	A224483	MSI	2017-03-22
Driver Seat Track at H-Point Ay	A224500	MSI	2017-03-22
Rear Seat Structure Ay	A224529	MSI	2017-03-22
Right Rear Occupant Comp. Ay	A224516	MSI	2017-03-22
Engine Block Top Ax	A227260	MSI	2017-04-20
Engine Block Top Ay	A224532	MSI	2017-03-16
Rear Floopan Above Axle Ax	A224493	MSI	2017-03-22
Rear Floopan Above Axle Ay	A224503	MSI	2017-03-22
Rear Floopan Above Axle Az	A224491	MSI	2017-03-22

Table 4 - Moving Deformable Barrier (MDB) Instrumentation

Sensor Location	Sensor S/N	Mfr	Last Cal
MDB CG Ax	A201199	MSI	2017-10-30
MDB CG Ay	A200246	MSI	2017-10-30
MDB CG Az	A199889	MSI	2017-10-30
MDB Left Side at Rear Axle Ax	A203298	MSI	2017-10-30
MDB Left Side at Rear Axle Ay	A200229	MSI	2017-10-30