

REPORT NUMBER: SINCAP-KAR-19-009

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

**SUBARU CORPORATION
2019 SUBARU FORESTER 5-DOOR MPV**

NHTSA No: O20195502

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



DECEMBER 28, 2018

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NRM-110
1200 NEW JERSEY AVE, SE, ROOM W43-410
WASHINGTON, D.C. 20590**

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

Prepared By: Amjad A. Jadallah

Mr. Amjad A. Jadallah, Project Engineer
Applus IDIADA KARCO Engineering, LLC.

Reviewed By: MSD

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

Approved By: SDM

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

Approval Date: December 28, 2018

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. SINCAP-KAR-19-009	2. Government Accession No.	3. Recipient's Catalog No.
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502	5. Report Date December 28, 2018	
	6. Performing Organization Code KAR	
7. Authors Mr. Amjad A. Jadallah, Project Engineer, Applus IDIADA KARCO Mr. Steven D. Matsusaka, Engineering Manager, Applus IDIADA KARCO	8. Performing Organization Report No. TR-P38278-01-NC	
	10. Work Unit No.	
9. Performing Organization Name and Address Applus IDIADA KARCO Engineering, LLC. 9270 Holly Rd. Adelanto, CA 92301	11. Contract or Grant No. DTNH22-14-D-00355L	
	13. Type of Report and Period Covered Final Test Report, December 12 - 28, 2018	
12. Sponsoring Agency Name and Address U. S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590	14. Sponsoring Agency Code NRM-110	
	15. Supplementary Notes	

16. Abstract

A 55 / 28 km/h 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2019 Subaru Forester 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 Applus IDIADA KARCO Engineering, LLC. facility in Adelanto, California on December 12, 2018.

The impact velocity of the Moving Deformable Barrier was 61.27 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 19.4°C. The target vehicle's maximum post-test static crush was 205 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	66.2
Maximum Thoracic Rib Deflection	mm	44	16
Total Abdominal Force	N	2500	544
Pubic Symphysis Force	N	6000	1732

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	245.7
Resultant Lower Spine Acceleration	g	82	56
Total Pelvic Force (Sum of Acetubular and Iliac Forces)	N	5525	2979
Maximum Thoracic Rib Deflection	mm	38*	19
Maximum Abdominal Rib Deflection	mm	45*	15

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

* Proposed IARV

17. Key Words New Car Assessment Program (NCAP) Side Impact Moving Deformable Barrier (MDB) ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave., SE Washington, DC 20590 e-mail: tis@hhtsa.dot.gov FAX 202-493-2833	
19. Security Classification of this report UNCLASSIFIED	20. Security Classification of this page UNCLASSIFIED	21. No. of Pages 151	22. Price

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	Test Purpose and Procedure	1
2	Summary of Test Results	2
3	Occupant and Vehicle Information/Data Sheets	4
<u>Data Sheet</u>		<u>Page</u>
1	General Test and Vehicle Parameter Data	5
2	Seat, Seat Belt, Steering Wheel Adjustment, and Fuel System Data	9
3	Dummy Longitudinal Clearance Dimensions	13
4	Dummy Lateral Clearance Dimensions	14
5	Camera and Instrumentation Data	15
6	Test Vehicle Accelerometer Locations	16
7	MDB Accelerometer Locations	17
8	Post-Test Observations	18
9	MDB Summary of Results	21
10	Test Vehicle Profile Measurements	22
11	Test Vehicle Exterior Crush Measurements	23
12	MDB Exterior Static Crush Measurements	26
13	Vehicle and MDB Damage Profile Distances	27
14	FMVSS No. 301 Static Rollover Results	28
15	Dummy/Vehicle Temperature and Humidity Stabilization	29
<u>Appendix</u>		<u>Page</u>
A	Photographs	A
B	Vehicle and Dummy Response Data Plots	B
C	ATD Configuration and Performance Verification Data	C
D	Test Equipment and Instrumentation Calibration Data	D

SECTION 1
TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2019 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-00355L. The purpose of this test is to generate comparative side impact performance in a 2019 Subaru Forester 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 2019 Subaru Forester 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 61.27 km/h (38.08 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by Applus IDIADA KARCO Engineering, LLC. in Adelanto, California, on December 12, 2018. 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	66.2
Maximum Thoracic Rib Deflection	mm	44	16
Combined Abdominal Force	N	2500	544
Pubic Symphysis Force	N	6000	1732

Measurement Description	Units	Passenger ATD (SID-IIs)	
		Threshold	Result
Head Injury Criteria (HIC ₃₆)		1000	245.7
Lower Spine (T12) Resultant Acceleration	g	82	56
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2979
Maximum Thoracic Rib Deflection	mm	38*	19
Maximum Abdominal Rib Deflection	mm	45*	15

*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	Yes	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 doors on the non-struck side remained closed and latched. There was no ATD value that exceeded its limit. The Left Mid-Post Y Channel failed at 14.4 ms.

SECTION 3

OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

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: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA Number	O20195502
Model Year	2019
Make	Subaru
Model	Forester
Body Style	5-Door MPV
VIN	JF2SKACC7KH409066
Body Color	Jasper Green Metallic
Odometer Reading (km / mi)	14 / 9
Engine Displacement (L)	2.5
Type / No. of Cylinders	Horizontally Opposed 4 Cyl
Engine Placement	Longitudinal
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	No
Final Drive	AWD
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	Subaru Corporation
Date of Manufacture	Aug-18
Vehicle Type	MPV

GVWR (kg)	2223
GAWR Front (kg)	1165
GAWR Rear (kg)	1130

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				408.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				67.8	A-B

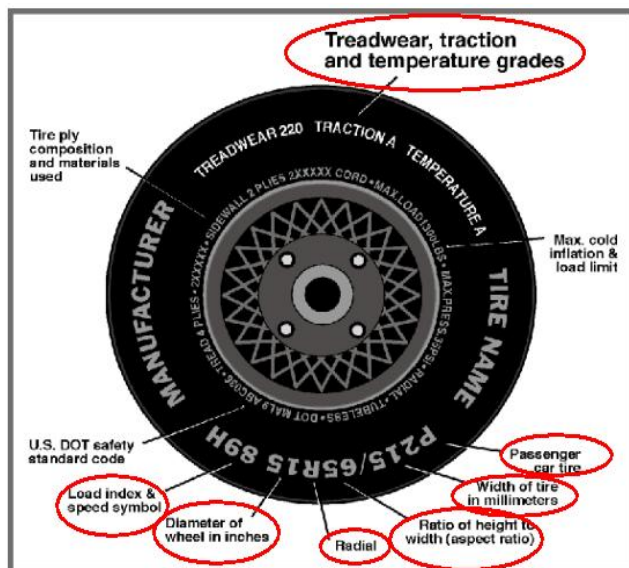
VEHICLE SEAT TYPE

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

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



Measured Parameter	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	230	220
Recommended Tire Size	P225/60R17	P225/60R17
Tire Size on Vehicle	P225/60R17	P225/60R17
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Ecopia	Ecopia
Treadwear	600	600
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	99H	99H
Tire Material	Polyester, Steel, Nylon	Polyester, Steel, Nylon
DOT Safety Code Left	ELFC DMM 3118	ELFC DMM 3118
DOT Safety Code Right	ELFC DMM 3118	ELFC DMM 3118

DATA SHEET NO. 1 ... (CONTINUED)

GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	230	230	220	220
Tire Placard	kPa	230	230	220	220
Owner's Manual	kPa	230	230	220	220
As Tested	kPa	230	230	220	220

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	455.5	344.0		493.0	430.0		496.5	428.0	
Right	kg	451.5	321.0		450.0	385.5		455.0	383.5	
Ratio	%	57.7%	42.3%	100.0%	53.6%	46.4%	100.0%	54.0%	46.0%	100.0%
Total	kg	907.0	665.0	1572.0	943.0	815.5	1758.5	951.5	811.5	1763.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1572.0	A
Actual Weight of 2 P572 ATD Used	kg	125.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	67.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1764.8	A+B+C

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

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement***
LF	mm	835	827	Yes
RF	mm	848	840	Yes
LR	mm	851	843	Yes
RR	mm	860	850	Yes
Vehicle CG (Aft of Front Axle)	mm	1230	1239	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	13	39	

***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: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Door Trim / Window	20.0
Ballast / Equipment Added	80.0

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

DATA SHEET NO. 2

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

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

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	4.0	0.0	2.0
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	2.0	214	Max			
			Mid	209	214	216
			Min			
Front Passenger Seat	Fixed	206	Max			
			Mid	203	206	210
			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: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

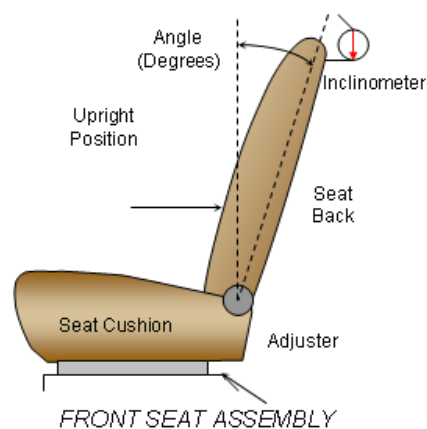
SEAT FORE/AFT POSITION

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	261	27	130.5	13
Front Passenger Seat	263	27	131.5	13
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

SEAT BACK ADJUSTMENT

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



SEAT BACK POSITION

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/ Seated Dummy	39.0	35	5.8	9
Front Passenger Seat	52.3	34	5.8	9
Front Center Seat				
Struck Side Rear Seat w/Seated Dummy	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

*Detent zero (0) is the forward most detent

DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

SEAT BELT ANCHORAGE ADJUSTMENT

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

	Total No. of Positions	Placed in Position
Driver Seat	4	M2
Rear Seat	Fixed	Fixed

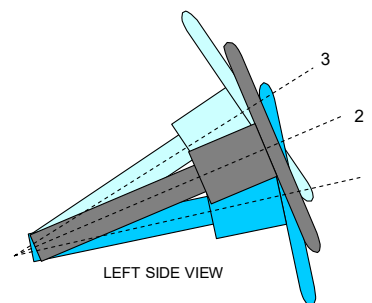
HEAD RESTRAINT ADJUSTMENT

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	3	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.



LEFT SIDE VIEW
STEERING COLUMN ASSEMBLY

	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	25.7	144
Geometric Center - Position 2	27.4	119
Uppermost - Position 3	29.1	93
Telescoping Steering Wheel Travel		51
Test Position	27.4	119

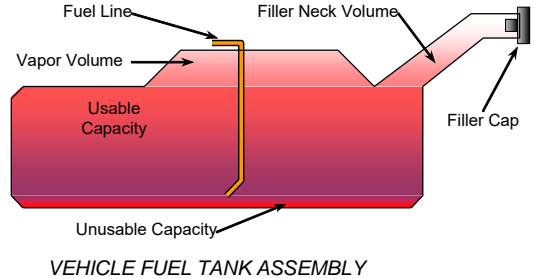
DATA SHEET NO. 2 ... (CONTINUED)

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

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

FUEL PUMP

The vehicle is equipped with an electronic fuel pump. The fuel pump operates for a few seconds after the ignition switch is turned ON. After that, the fuel pump operates only while the engine is running.



FUEL TANK CAPACITY

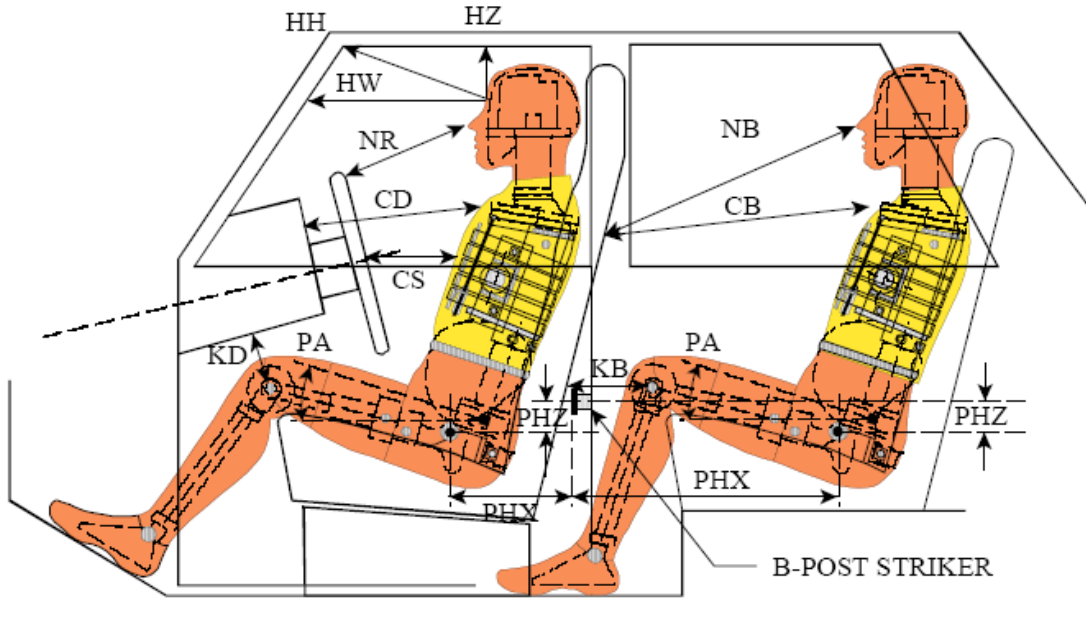
Description	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	62.83
Usable Capacity of "Optional Tank" (see Form No. 1)	
Usable Capacity of "Standard Tank" (see Owner's Manual)	62.83
Usable Capacity of "Optional Tank" (see Owner's Manual)	
93% of Usable Capacity	58.43
Actual amount of Solvent Used in Test	58.44
1/3 of Usable Capacity	20.94

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

DATA SHEET NO. 3

DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



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

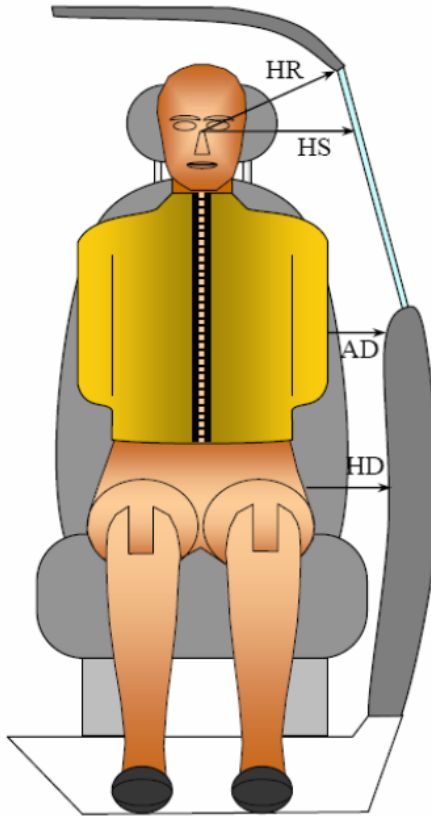
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver		Passenger	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Head to Header	390			
HW		Head to Windshield	656			
HZ	HZ	Head to Roof	211		310	
NR	NB	Nose to Rim/Seat Back	431		614	
CD	CB	Chest to Dash/Seat Back	562		600	
CS		Chest to Steering Wheel	355			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	140	22.1	335	19.4
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	140	32.3	344	7.6
PAX°	PAX°	Pelvic Tilt Angle X		14.2		20.9
	PAY°	Pelvic Tilt Angle Y		0.1		0.2
PHX	PHX	Hip Point to Striker (x-axis)	228		251	
PHZ	PHZ	Hip Point to Striker (z-axis)	187		285	

DATA SHEET NO. 4

DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



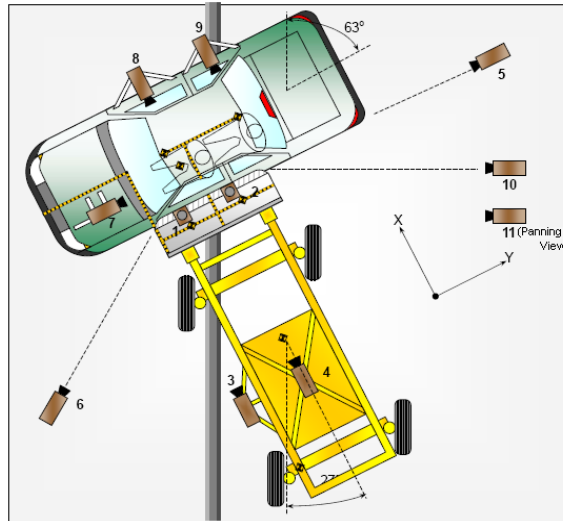
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver	Passenger
HR	Head to Side Header	mm	225	286
HS	Head to Side Window	mm	358	385
AD	Arm to Door	mm	106	180
HD	H-Point to Door	mm	159	179

DATA SHEET NO. 5

CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



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)	405	-493	704	8.5	1000
8	Driver Side (On-Board)	1820	747	409	8.5	1000
9	Passenger Side (On-Board)	1845	1623	432	8.5	1000
10	Real Time Overall				Zoom	30
11	Real Time Inrun				Zoom	30

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

*All measurements accurate to ±6 mm

INSTRUMENTATION

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

DATA SHEET NO. 6

TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

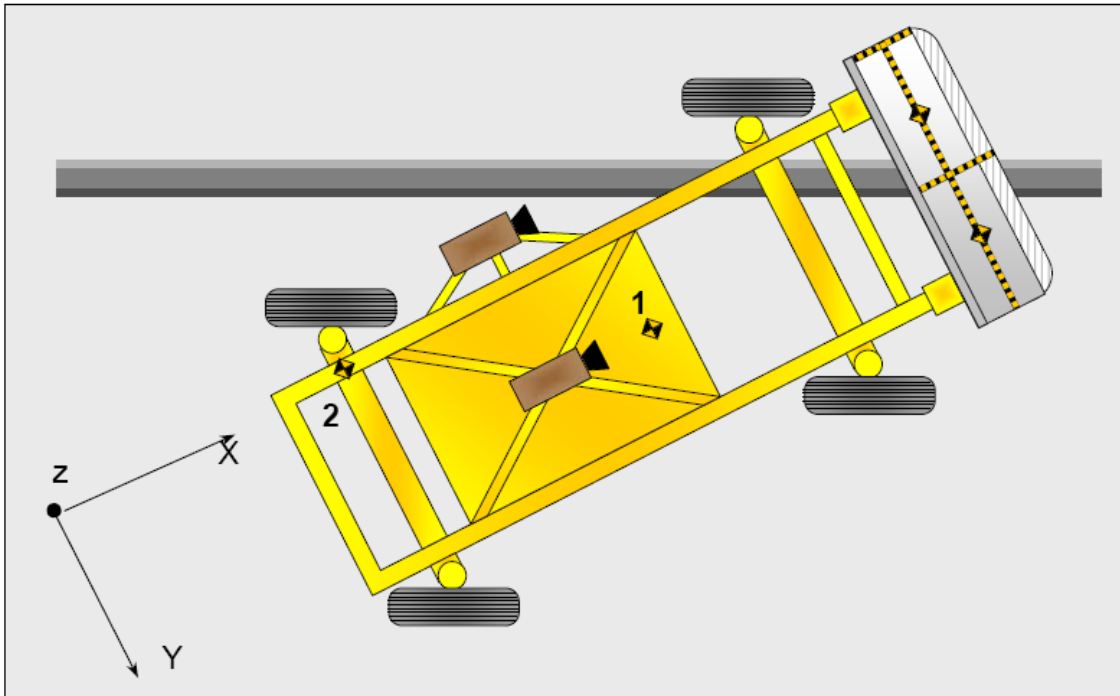
Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1940	0	480
2	Right Sill at Front Seat	2950	740	425
3	Right Sill at Rear Seat	1630	740	425
4	Left Sill at Front Door	2400	710	270
5	Left Sill at Rear Door	1600	710	270
6	A-Pillar Lower	3110	810	510
7	A-Pillar Middle	3110	810	780
8	B-Pillar Lower	2020	720	600
9	B-Pillar Middle	2310	720	900
10	Front Seat Track	1690	590	500
11	Rear Seat Structure	1690	-330	440
12	Right Rear Occupant Compartment	1690	333	440
13	Engine Block	3980	0	720
14	Rear Floorpan Above Axle	1010	0	800

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

DATA SHEET NO. 7

MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



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: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	None
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, Headrest
Left Shoulder	Curtain Airbag, Side Airbag	Door Panel
Upper Torso	Side Airbag	Door Panel
Lower Torso	Side Airbag	Door Panel
Left Hip	Door Panel	Door Panel
Left Knee	None	Door Panel

POST-TEST DOOR PERFORMANCE

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

DATA SHEET NO. 8 ... (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

DATA SHEET NO. 8 ... (CONTINUED)

POST-TEST OBSERVATIONS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side		Struck Side	
	Driver		Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No	No	
Knee Airbag	Yes	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		2672
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		392
Actual Impact Point (Aft of Front Axle)	mm		407
Horizontal Offset (+ forward / - rearward)	mm	± 50 of Intended Impact Point	-15
Vertical Offset (+ down / - up)	mm	± 20 of Intended Impact Point	17

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

MDB SPECIFICATIONS

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

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	402.0	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	61.27
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	61.21
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	89.6
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	62.6
MDB Crabbed Angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	26.9

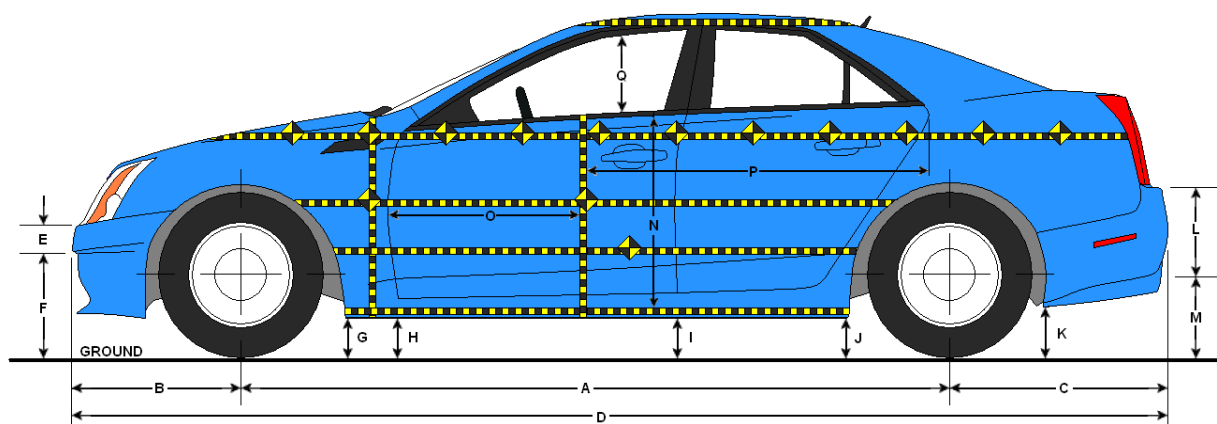
MAXIMUM STATIC CRUSH OF HONEYCOMB FACE

Vertical Location			From Centerline		Max. Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	239
B	Top of Bumper	533	800	Right	152
C	Mid Level	686	800	Left	140
D	Top of Stack	813	800	Left	132

DATA SHEET NO. 10

TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2672	2661	-11
B	Front Axle to FSOV	962	968	6
C	Rear Axle to RSOV	990	993	3
D	Total Length at Centerline	4623	4621	-2
E	Front Bumper Thickness	158	158	0
F	Front Bumper Bottom to Ground	467	496	29
G	Sill Height at Front Wheel Well	308	326	18
H	Sill Height at Front Door Leading Edge	304	305	1
I	Sill Height at B-Pillar	293	340	47
J1	Sill Height at Rear Wheel Well	303	349	46
J2	Pinch Weld Height at Rear Wheel Well	279	265	-14
K	Sill Height Aft of Rear Wheel Well	346	344	-2
L	Rear Bumper Thickness	199	200	1
M	Rear Bumper Bottom to Ground	487	485	-2
N	Sill Height to Bottom of Front Window Sill	801	760	-41
O	Front Door Leading Edge to Impact CL	772	767	-5
P	Rear Door Trailing Edge to Impact CL	1342	1324	-18
Q	Front Window Opening	486	510	24
R	Right Side Length	3224	3213	-11
S	Left Side Length	3223	3212	-11
T	Vehicle Width at B-Pillar	1816	1723	-93

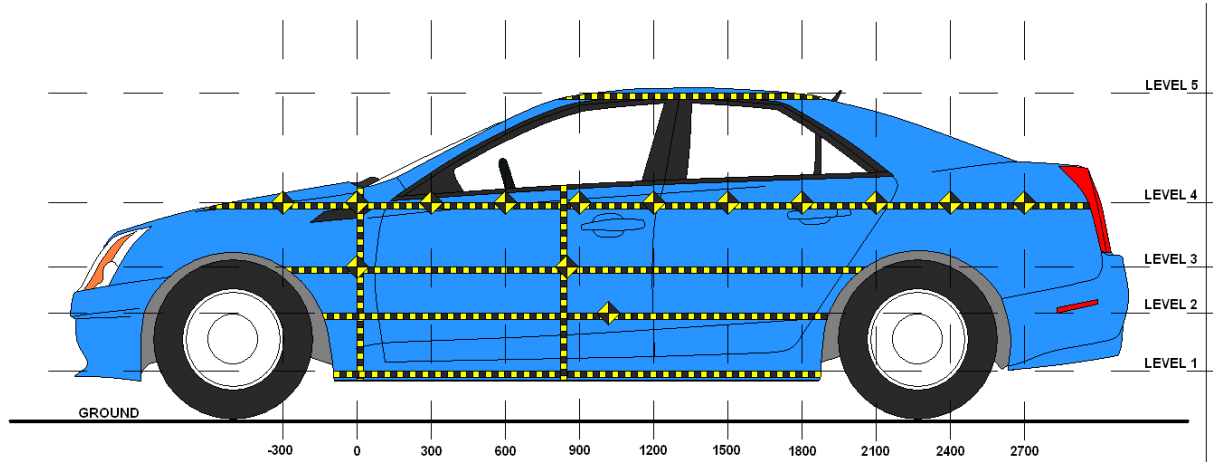
All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 11

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502

Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



LEFT SIDE VIEW

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	301	77	1350
2	Occupant H-Point	666	187	900
3	Mid-Door	714	205	1350
4	Window Sill	1063	98	1650
5	Window Top	1631	8	1200

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

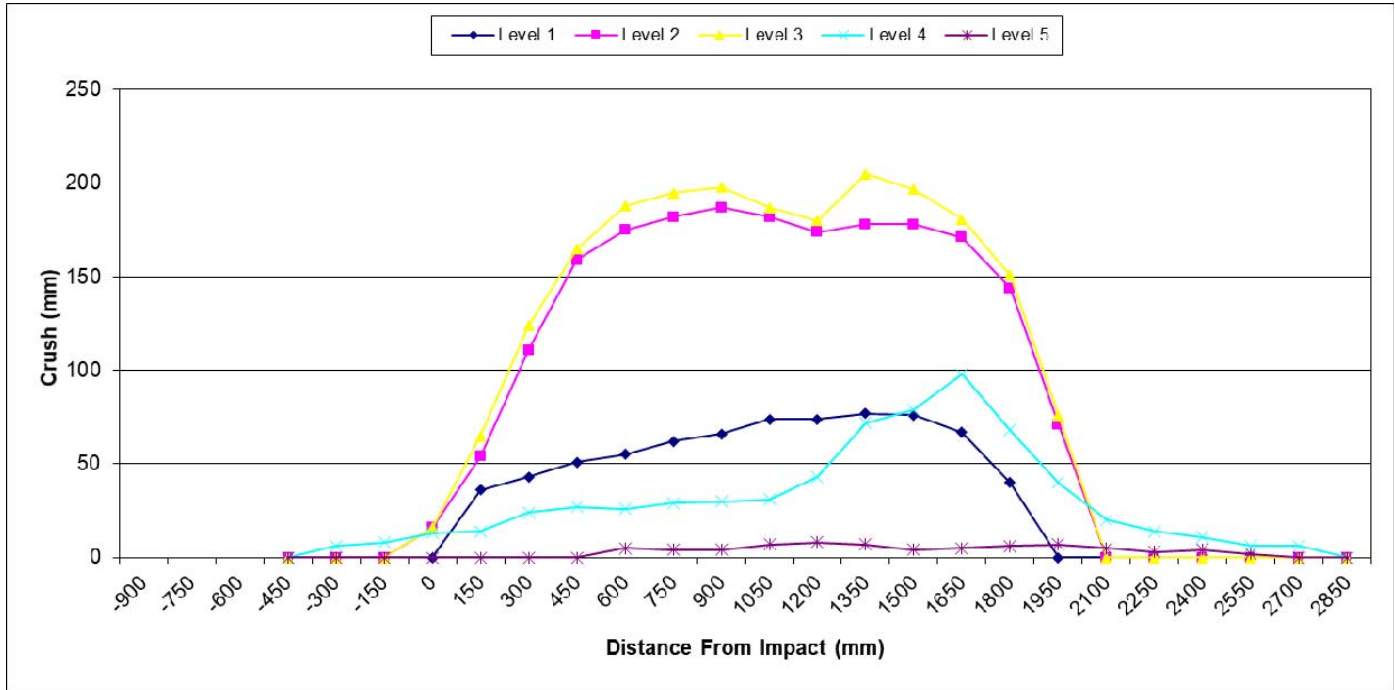
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				696					702					6	
-150				689					697					8	
0		593	597	686			609	613	699			16	16	13	
150	619	603	604	687		655	657	669	701		36	54	65	14	
300	618	606	605	608		661	717	729	632		43	111	124	24	
450	607	603	602	668		658	762	767	695		51	159	165	27	
600	603	601	599	660	891	658	776	787	686	896	55	175	188	26	5
750	599	599	597	654	884	661	781	792	683	888	62	182	195	29	4
900	597	598	596	654	886	663	785	794	684	890	66	187	198	30	4
1050	594	598	596	651	887	668	780	783	682	894	74	182	187	31	7
1200	593	598	597	646	890	667	772	777	689	898	74	174	180	43	8
1350	592	600	598	642	894	669	778	803	714	901	77	178	205	72	7
1500	597	601	600	637	898	673	779	797	716	902	76	178	197	79	4
1650	599	601	600	631	900	666	772	781	729	905	67	171	181	98	5
1800	604	598	597	627	901	644	742	748	695	907	40	144	151	68	6
1950		595	594	631	901		666	670	671	908		71	76	40	7
2100				620	903				640	908				20	5
2250				636	907				650	910				14	3
2400				633	910				644	914				11	4
2550				645	918				651	920				6	2
2700				655					661					6	
2850															

DATA SHEET NO. 11 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502

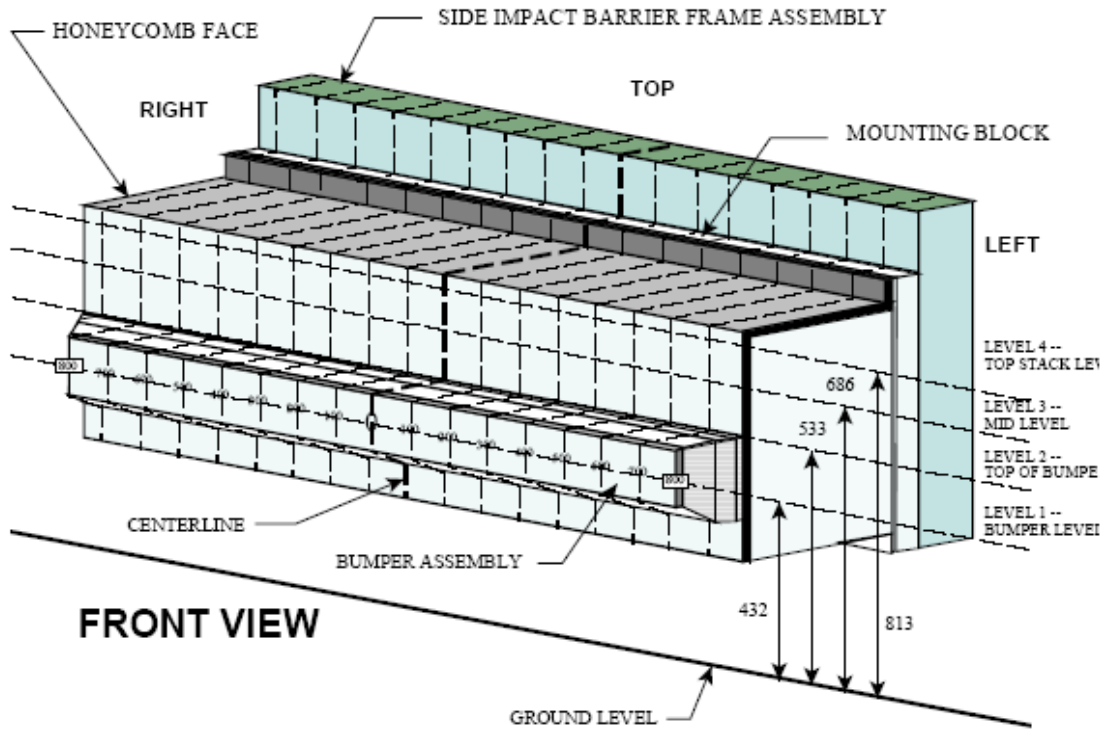
Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



DATA SHEET NO. 12

MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

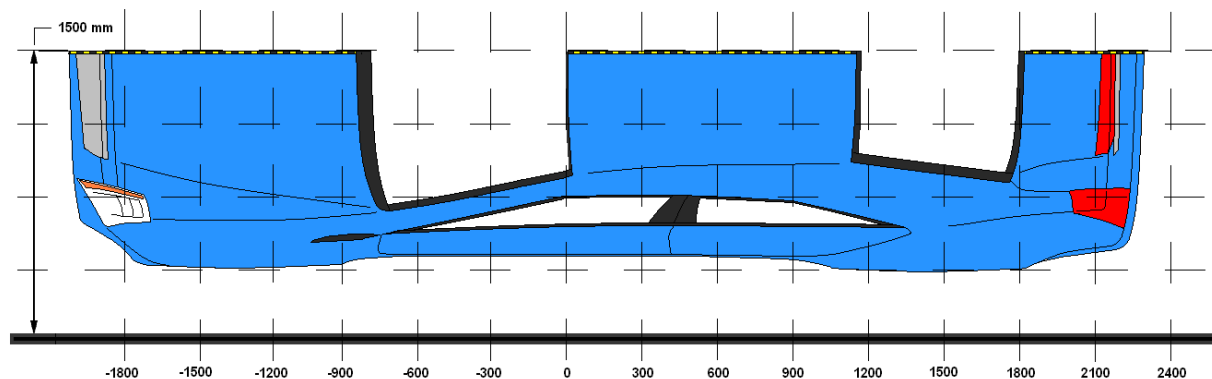
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	239	219	219	214	211	206	206	204	194	193	194	189	189	194	191	189	206
2	152	149	147	142	139	137	127	120	122	117	115	114	112	107	106	105	117
3	119	80	69	62	61	65	69	62	44	37	37	37	37	47	62	97	140
4	120	82	57	52	60	59	82	82	52	47	47	52	62	67	82	102	132

All dimensions in millimeters.

DATA SHEET NO. 13

VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502
 Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	2700	4	655	661	6
2	2100	4	620	640	20
3	1500	3	600	797	197
4	900	3	596	794	198
5	300	3	605	729	124
6	-300	4	696	702	6

MDB DAMAGE PROFILE DISTANCES

DPD	From MDB Centerline		Level	Crush (mm)
	Distance (mm)	Direction		
1	800	Left	1	206
2	500	Left	1	194
3	200	Left	1	194
4	200	Right	1	206
5	500	Right	1	214
6	800	Right	1	239

DATA SHEET NO. 14

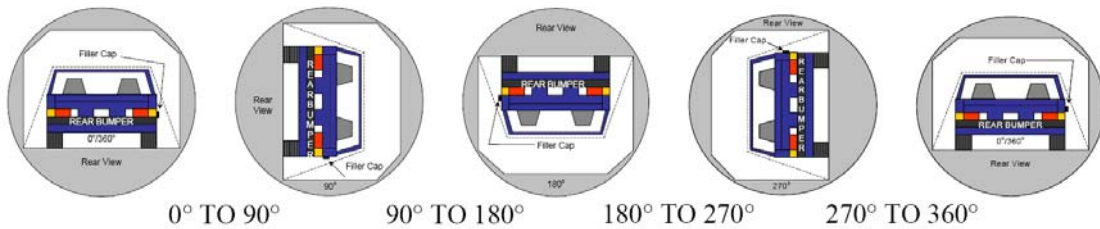
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502

Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18

Temperature at Time of Impact: 19.4 °C Test Time: 12:25 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°	79	300	379
90° To 180°	81	300	381
180° To 270°	80	300	380
270° To 360°	80	300	380

FMVSS 301 SPILLAGE TABLE

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

SOLVENT SPILLAGE LOCATION TABLE

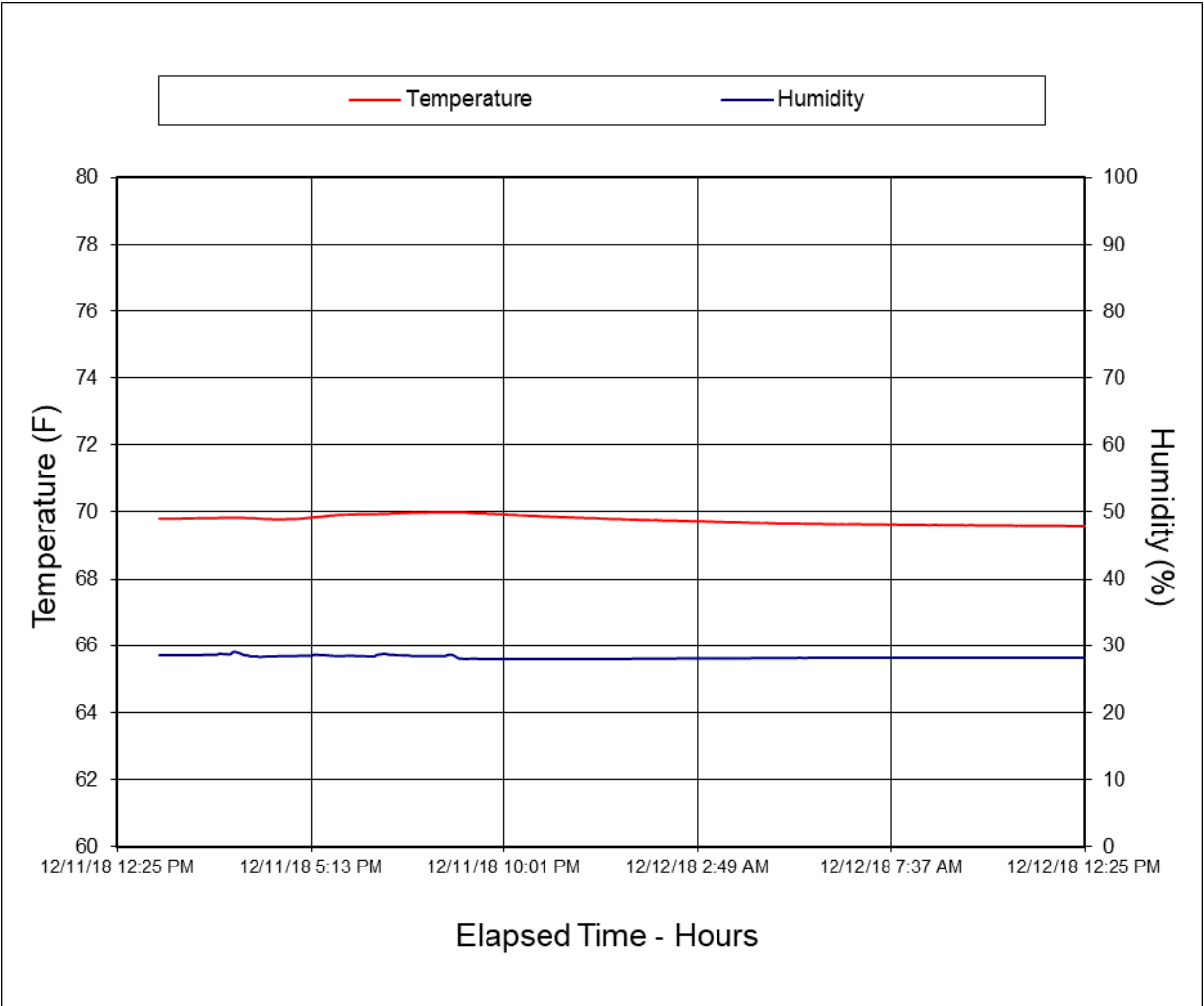
Test Phase	Spillage Location
0° To 90°	N/A
90° To 180°	N/A
180° To 270°	N/A
270° To 360°	N/A

DATA SHEET NO. 15

DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION

Test Vehicle: 2019 Subaru Forester 5-Door MPV NHTSA No. O20195502

Test Program: NCAP MDB Side Impact Test Test Date: 12/12/18



**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS

Figure		Page
1	As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle	A-1
2	As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	A-1
3	Pre-Test Frontal View of Test Vehicle	A-2
4	Post-Test Frontal View of Test Vehicle	A-2
5	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-3
6	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-3
7	Pre-Test Left Side View of Test Vehicle	A-4
8	Post-Test Left Side View of Test Vehicle	A-4
9	Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
10	Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
11	Pre-Test Rear View of Test Vehicle	A-6
12	Post-Test Rear View of Test Vehicle	A-6
13	Pre-Test Right Side View of Test Vehicle	A-7
14	Post-Test Right Side View of Test Vehicle	A-7
15	Pre-Test Overhead View of Test Area	A-8
16	Post-Test Overhead View of Test Area	A-8
17	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	A-9
18	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	A-9
19	Pre-Test Close-Up View of Impact Point Target	A-10
20	Post-Test Close-Up View of Impact Point Target	A-10
21	Pre-Test Left Front Door Latch Close-Up	A-11
22	Post-Test Left Front Door Latch Close-Up	A-11
23	Pre-Test Left Rear Door Latch Close-Up	A-12
24	Post-Test Left Rear Door Latch Close-Up	A-12
25	Pre-Test Front Close-Up View of Driver Dummy	A-13
26	Post-Test Front Close-Up View of Driver Dummy	A-13
27	Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking	A-14
28	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-14
29	Post-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-15
30	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	A-15
31	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-16
32	Pre-Test Overhead View of Driver Seat Pan Prior to Dummy Positioning	A-16
33	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-17
34	Pre-Test Placement of Driver Dummy's Feet	A-17
35	Pre-Test View of Belt Anchorage for Driver Dummy	A-18

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
36	Pre-Test Left Side View of Steering Wheel	A-18
37	View of Disengaged Parking Brake	A-19
38	Pre-Test View of Parking Brake	A-19
39	Pre-Test Close-Up Left Side View of Driver Seat Track	A-20
40	Pre-Test Close-Up Left Side View of Driver Seat Back	A-20
41	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-21
42	Pre-Test Driver Dummy and Door Clearance View	A-21
43	Post-Test Driver Dummy and Door Clearance View	A-22
44	Pre-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment	A-22
45	Post-Test Right Side View of Driver Dummy and Front Seat Occupant Compartment	A-23
46	Pre-Test Driver Inner Door Panel View	A-23
47	Post-Test Driver Inner Door Panel View Showing Driver Dummy Contact Locations	A-24
48	Post-Test Driver Dummy Close-Up Head Contact with Vehicle Interior View	A-24
49	Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View	A-25
50	Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View	A-25
51	Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View	A-26
52	Post-Test Driver Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-26
53	Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View	A-27
54	Post-Test Driver Dummy Close-Up Knee Contact View	A-27
55	Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking	A-28
56	Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-28
57	Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-29
58	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-29
59	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-30
60	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-30
61	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-31
62	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-31
63	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-32
64	Pre-Test Placement of Rear Passenger Dummy's Feet	A-32
65	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-33
66	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-33
67	Pre-Test Close-Up Left Side View of Rear Passenger Seat Back	A-34
68	Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint	A-34
69	Pre-Test Rear Passenger Dummy and Door Clearance View	A-35
70	Post-Test Rear Passenger Dummy and Door Clearance View	A-35

TABLE OF PHOTOGRAPHS ... (CONTINUED)

Figure		Page
71	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-36
72	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-36
73	Pre-Test Rear Passenger Inner Door Panel View	A-37
74	Post-Test Rear Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations	A-37
75	Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle Interior View	A-38
76	Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View	A-38
77	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View	A-39
78	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View	A-39
79	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Vehicle Interior View	A-40
80	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View	A-40
81	Post-Test Rear Passenger Dummy Close-Up Knee Contact View	A-41
82	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-41
83	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-42
84	Pre-Test Front View of MDB Impactor Face	A-42
85	Post-Test Front View of MDB Impactor Face	A-43
86	Pre-Test Top View of MDB Impactor Face	A-43
87	Post-Test Top View of MDB Impactor Face	A-44
88	Pre-Test Left Side View of MDB Impactor Face	A-44
89	Post-Test Left Side View of MDB Impactor Face	A-45
90	Pre-Test Right Side View of MDB Impactor Face	A-45
91	Post-Test Right Side View of MDB Impactor Face	A-46
92	Close-Up View of Vehicle's Certification Label	A-46
93	Close-Up View of Vehicle's Tire Information Placard or Label	A-47
94	Pre-Test Ballast View	A-47
95	Post-Test Primary and Redundant Speed Trap Read-Out	A-48
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 3/4 View of Test Vehicle



FIGURE 2. As-Delivered Left Rear 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

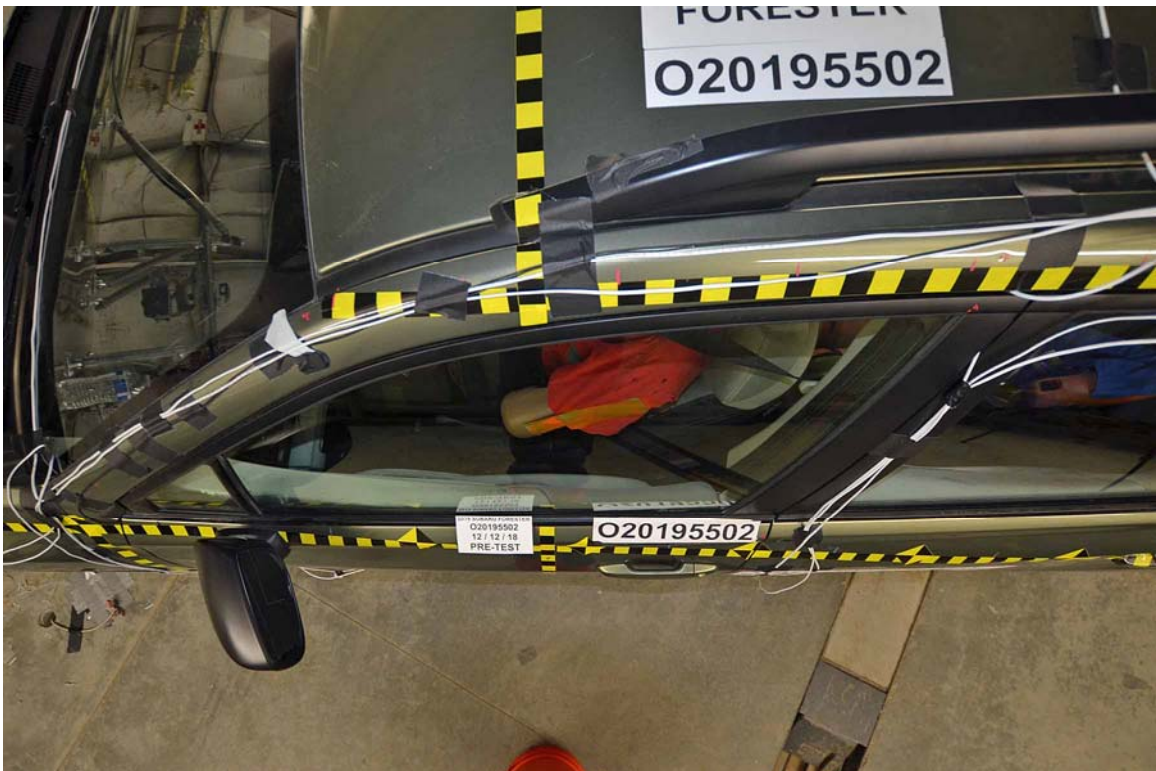


FIGURE 42. Pre-Test Driver Dummy and Door Clearance View



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

Photograph Not Applicable

No Driver Dummy Pelvis Contact with Side Airbag

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



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



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



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



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



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



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



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



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



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



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



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



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



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

Photograph Not Applicable

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 Airbags**

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 Airbags**

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



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



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



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



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



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

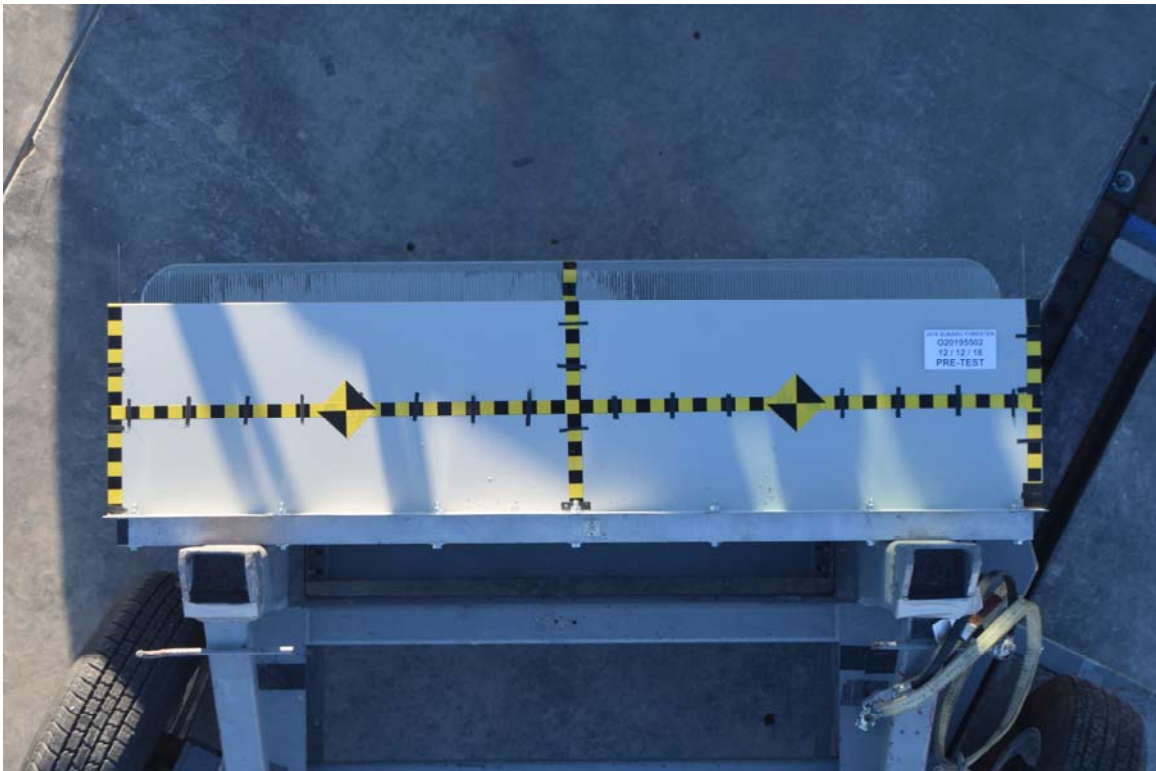


FIGURE 86. Pre-Test Top View of MDB Impactor Face



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



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



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



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



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

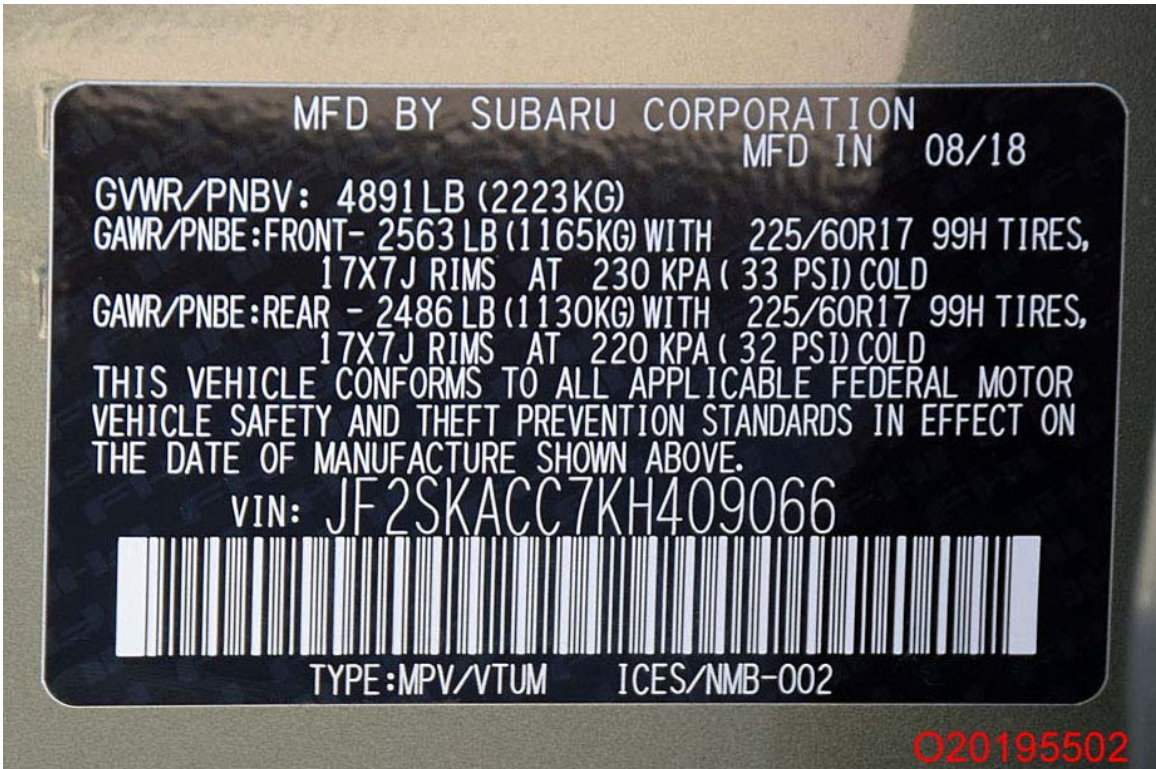


FIGURE 92. Close-Up View of Vehicle's Certification Label

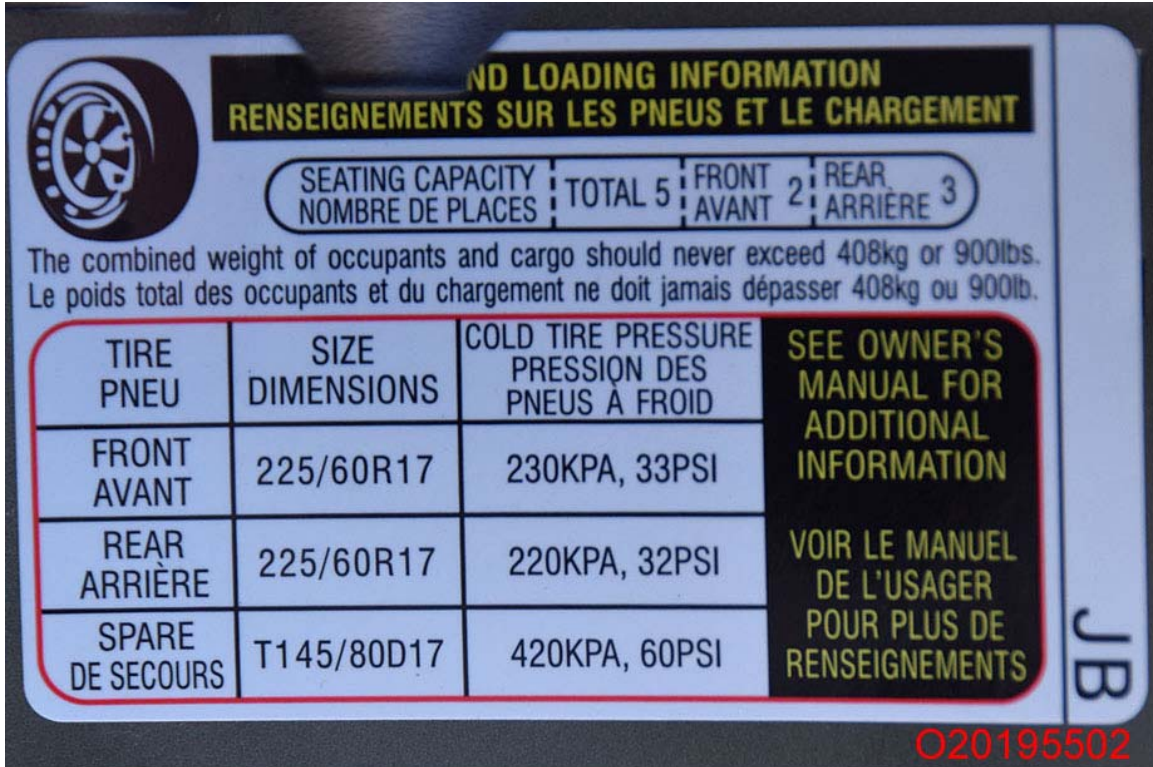


FIGURE 93. Close-Up View of Vehicle's Tire Information Placard or Label

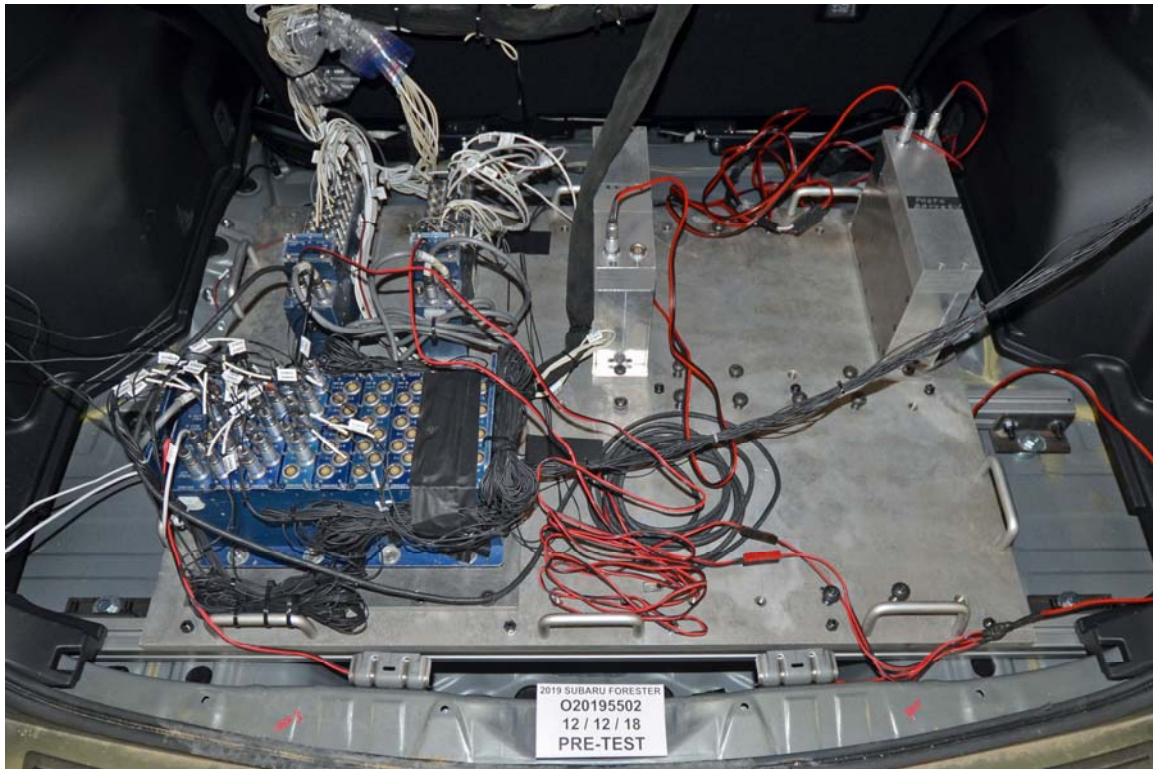


FIGURE 94. Pre-Test Ballast View



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



FIGURE 96. FMVSS No. 301 Static Rollover 0 Degrees



FIGURE 97. FMVSS No. 301 Static Rollover 90 Degrees

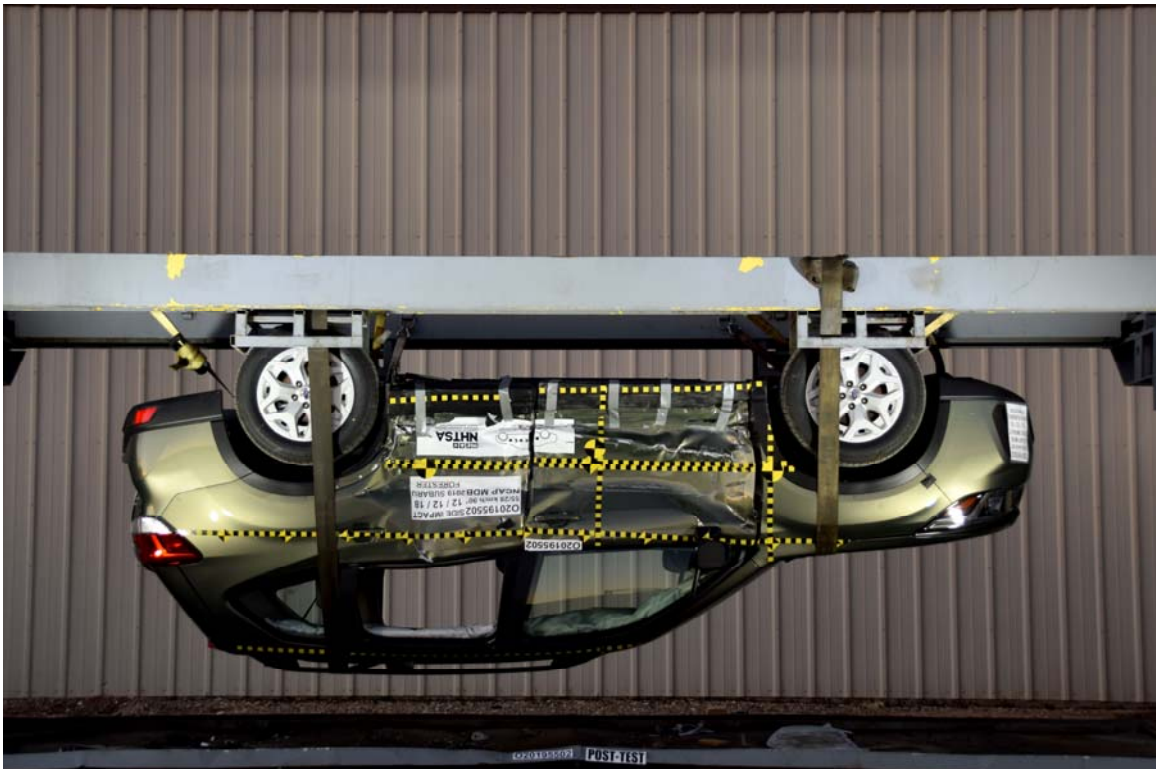


FIGURE 98. FMVSS No. 301 Static Rollover 180 Degrees

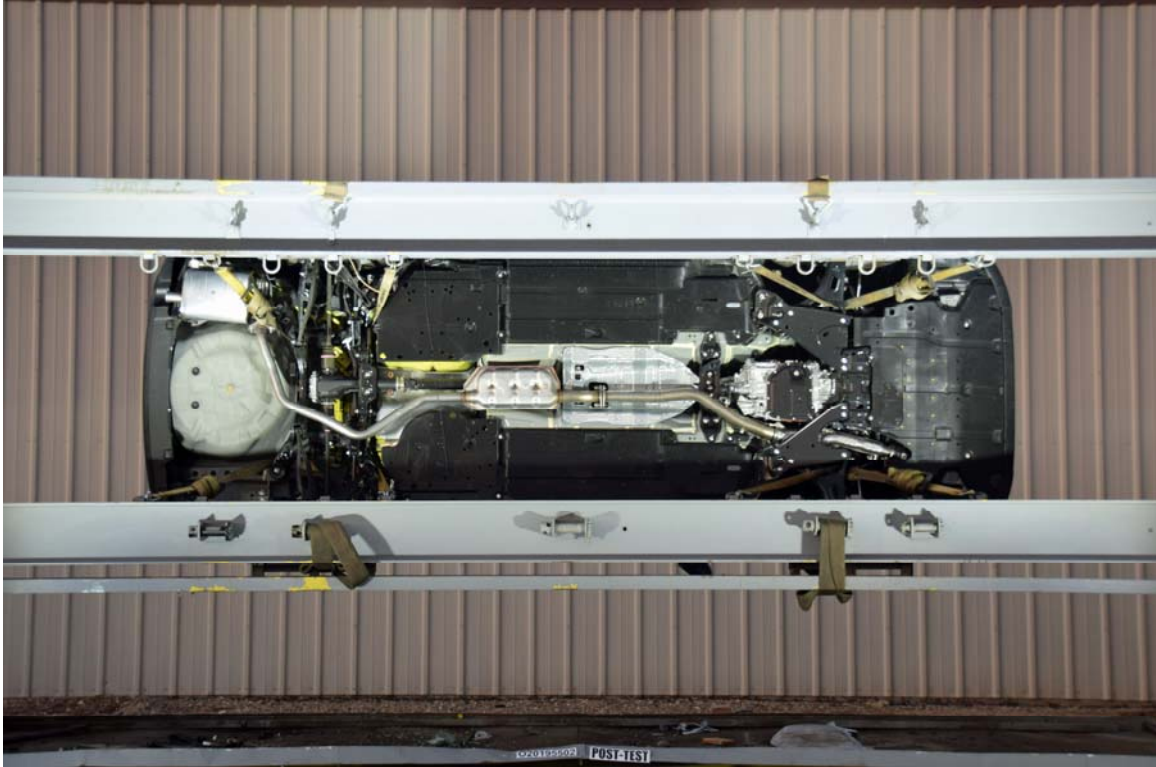


FIGURE 99. FMVSS No. 301 Static Rollover 270 Degrees

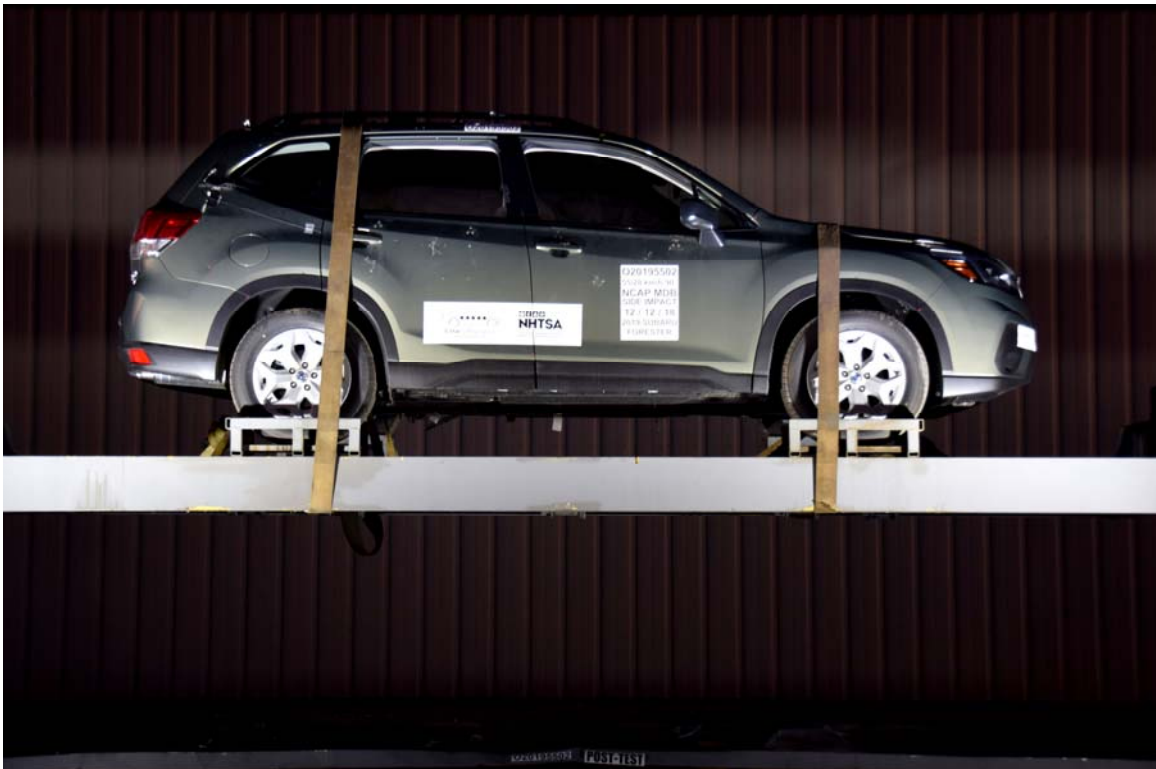


FIGURE 100. FMVSS No. 301 Static Rollover 360 Degrees



FIGURE 101. Impact Event

FORESTER VIN: JF2SKACC7KH409066
 Model/Code: 2019 SUBARU FORESTER V6
 Port/Assembly: VANCOUVER, WA
 Delivery by/Carter: TRUCK / 601-610193

SHIP TO: 401289
 KENOSHA SUBARU
 7900 120TH AVE
 KENOSHA WI 53142

SOLD TO: 401289
 KENOSHA SUBARU
 7900 120TH AVE
 KENOSHA WI 53142

GOVERNMENT 5-STAR SAFETY RATINGS

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

Frontal Crash	Driver: Not Rated Passenger: Not Rated	Not Rated
Side Crash	Front seat: Not Rated Rear seat: Not Rated	Not Rated
Rollover	Not Rated	

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

Protect Your Investment!

Subaru Added Security™
The Only Extended Service Agreement Backed By Subaru

- Protection designed to fit your driving needs, up to 10 years/100,000 miles of coverage
- Maintenance plans also available
- We use Genuine Subaru replacement parts - not the best
- We use technicians trained by Subaru - those who know your vehicle best
- Towing, rental and trip interruption benefits available
- Transferable to the next owner

Ask your sales representative for more details. Accept nothing less than Added Security!

STANDARD EQUIPMENT

SAFETY

- Symmetrical All-Wheel Drive (AWD)
- Vehicle Dynamics Control (VDC)
- SightSpeed Driver-Assist System
- 4-Wheel Anti-Lock (ABS) Disc Brakes w/ Brake Assist
- Electronic Brake-Force Distribution
- Subaru Advanced Frontal Airbag System
- Driver's Side Knee Airbag
- Front Seat Side (Pelvis/Torso) Airbags
- Side-Curtain Airbags w/ Roll-over Sensor
- Anti-Theft Alarm & Immobilizer System
- Daytime Running Lights
- Whiplash Protection Front Seats
- Safety Precaution System

PERFORMANCE AND EXTERIOR

- 2.5L Horizontally-Opposed DOHC Engine w/ Auto Start-Stop
- Inertiontronic Continuously Variable Transmission (CVT)
- 17" Steel Wheels w/ Wheel Covers
- LED Headlights
- Variable Intermittent Windshield Wipers
- Electric Power-Assisted Steering
- Roof Rack Mounting Brackets
- Folding Exterior Mirrors

COMFORT, CONVENIENCE & INTERIOR

- Automatic Climate Control w/ Air Filtration System
- 8" Infotainment System w/ CD, HD Radio & Dual USB Ports
- TARLINK Smartphone Connectivity/Apple CarPlay/Android Auto
- iPod/iPhone/USB/Bluetooth & Audio Switches
- Adaptive Cruise Control
- Power Door Locks and Dual Power Mirrors
- Remote Keyless Entry System
- Power Windows with Driver's Auto-Up/Down
- 60/40 Split Fold-Down Rear Seatback
- Multi-Function Display
- Star Vision Camera
- IVT Outlet in Dash, Console & Cargo Area
- Electronic Parking Brake w/ Auto Vehicle Hold (AVH)
- iDrive
- Automatic On/Off Headlights
- 8-Way Adjustable Driver's Seat

LIMITED WARRANTY/ROADSIDE ASSISTANCE

- Years / 36,000 Miles Basic
- Years / 60,000 Miles Powertrain
- Yrs / Unlimited Mileage Rust Perforation
- Yrs / 36,000 24/7 Roadside Assistance
- See Owner Info Kit/Warranty For Details

OPTIONAL EQUIPMENT AND OTHER ITEMS

Manufacturer's Suggested Retail Price	\$24,295.00
Exterior Color: Jasper Green Metallic	
Full Tank of Gas	INCLD
Option Package: 02	
ALLOY WHEEL PACKAGE SUGGESTED VALUE	\$1,100.00
17" Alloy Wheels	
Roof Rails - Black Finish	
ALLOY WHEEL VALUE PACKAGE DISCOUNT	-\$500.00
ALLOY WHEEL VALUE PACKAGE PRICE	\$132.00
All Weather Floor Mats	\$132.00
Rear Bumper Cover	\$118.00
Cargo Tray	\$81.00

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy 29 MPG (combined city/hwy) 26 city 33 highway
SMALL SUVs cars range from 18 to 37 MPG. The best vehicle sales 136 MPG.

You save \$500 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,300

Fuel Economy & Greenhouse Gas Rating (range only) Smog Rating (range only)

This vehicle emits 310 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Choosing and distributing fuel also creates emissions; learn more at fueleconomy.gov.

fueleconomy.gov

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:	FOR THIS VEHICLE:
U.S./CANADIAN PARTS CONTENT: 0%	FINAL ASSEMBLY POINT: OTA, GUNMA, JAPAN
MAJOR SOURCES OF FOREIGN PARTS	COUNTRY OF ORIGIN:
CONTENT: JAPAN: 85%	ENGINE: JAPAN
	TRANSMISSION: JAPAN

Destination and Delivery \$975.00

Total Suggested Retail Price \$26,201.00

THIS LABEL HAS BEEN AFFIXED PURSUANT TO FEDERAL LAW. SEE NEXT PAGE FOR FULL DISCLOSURE.

FIGURE 102. Monroney Label

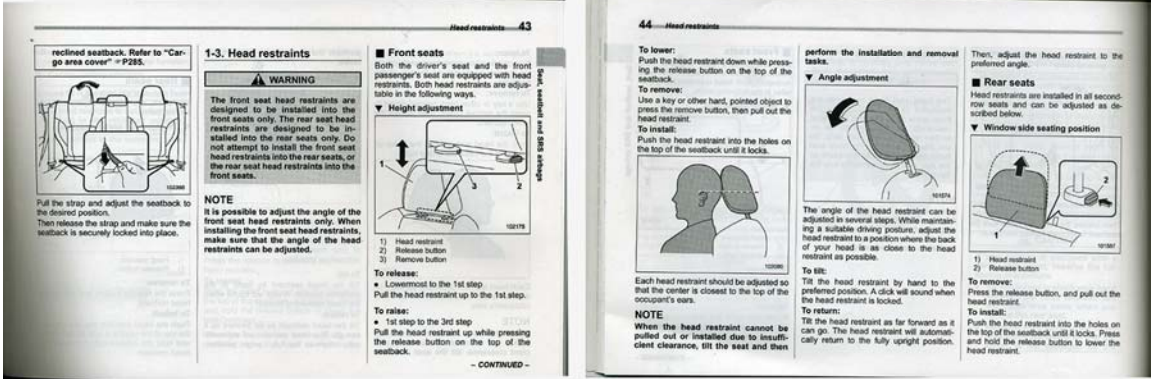


FIGURE 103. Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

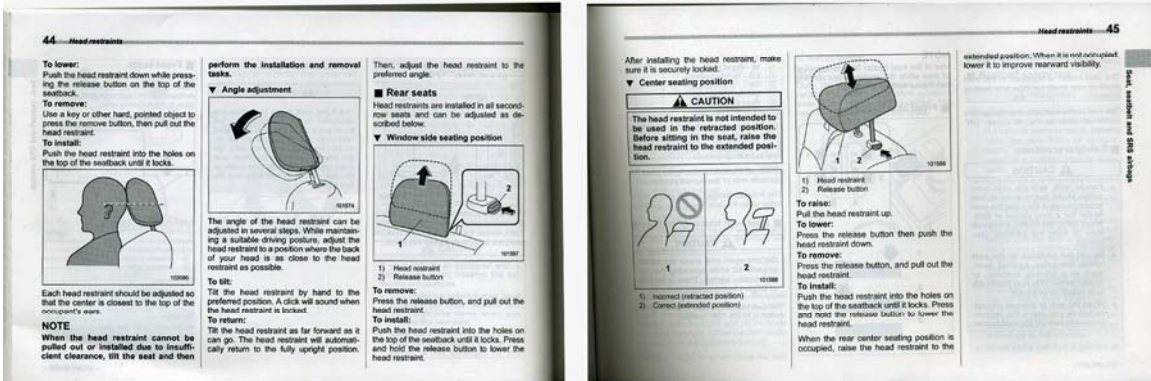


FIGURE 104. Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

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)

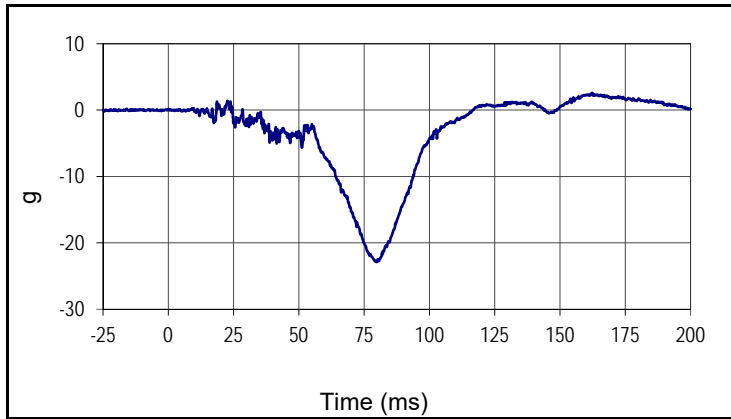
MDB Rear Acceleration (Y)

Left MDB Contact Switch

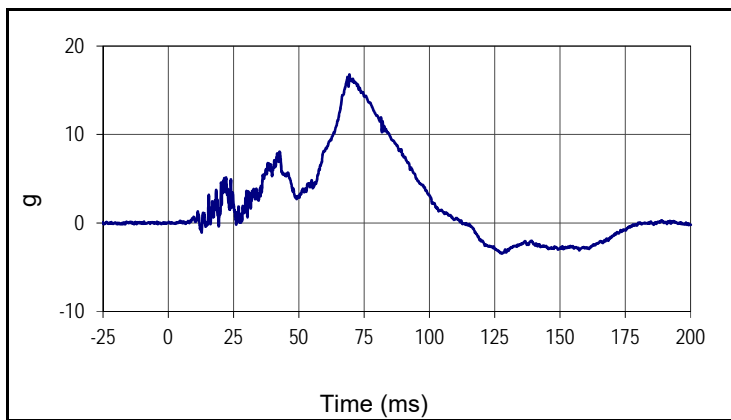
Right MDB Contact Switch

Test Vehicle: 2019 Subaru Forester 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

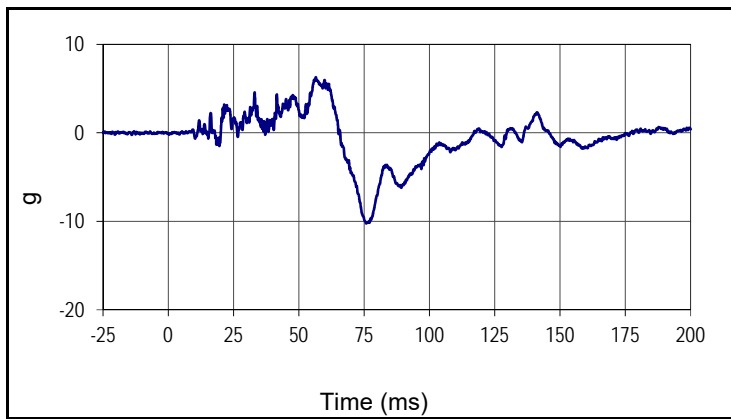
NHTSA No.: O20195502
 Test Date: 12/12/18



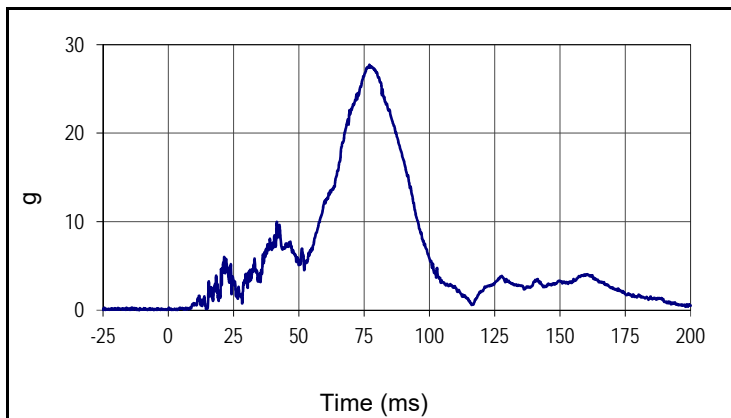
Curve Description			
Driver Head Acceleration X Primary			
Plot No.		SAE Class	Units
001		1000	g
Max	Time	Min	Time
2.6	162.3	-22.9	79.8



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
16.8	69.3	-3.5	127.7



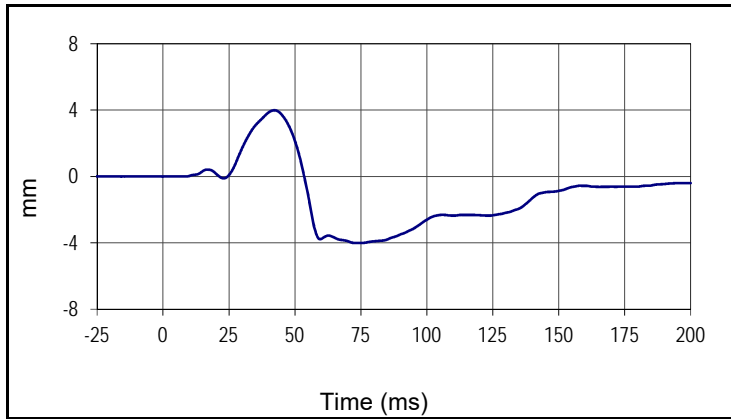
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
6.3	56.5	-10.2	75.7



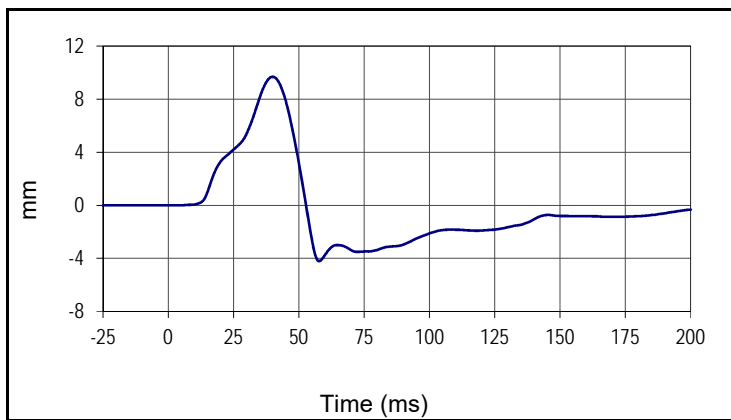
Curve Description			
Driver Head Resultant Acceleration Primary			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
27.7	77.0	0.0	3.5

Test Vehicle: 2019 Subaru Forester 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

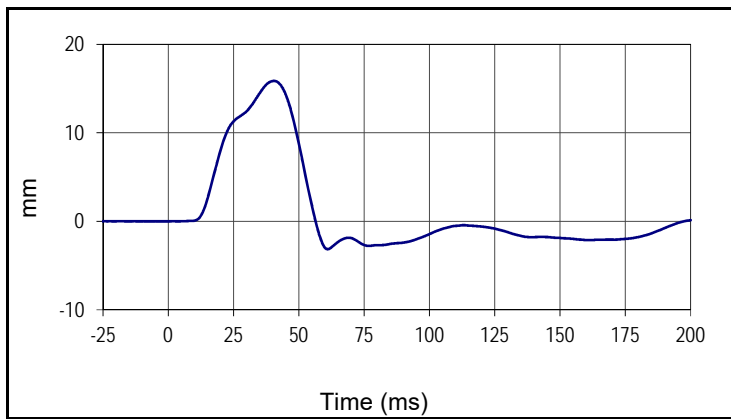
NHTSA No.: O20195502
 Test Date: 12/12/18



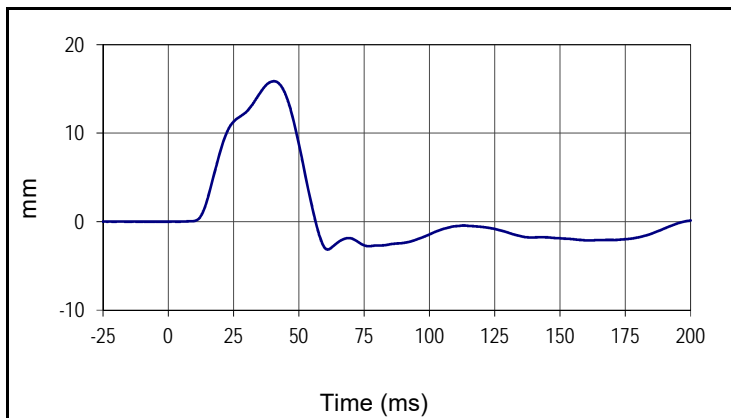
Curve Description			
Driver Upper Thorax Rib Deflection Y			
Plot No.		SAE Class	Units
005		180	mm
Max	Time	Min	Time
4.0	42.2	-4.0	74.4



Curve Description			
Driver Middle Thorax Rib Deflection Y			
Plot No.		SAE Class	Units
006		180	mm
Max	Time	Min	Time
9.7	39.9	-4.2	57.7



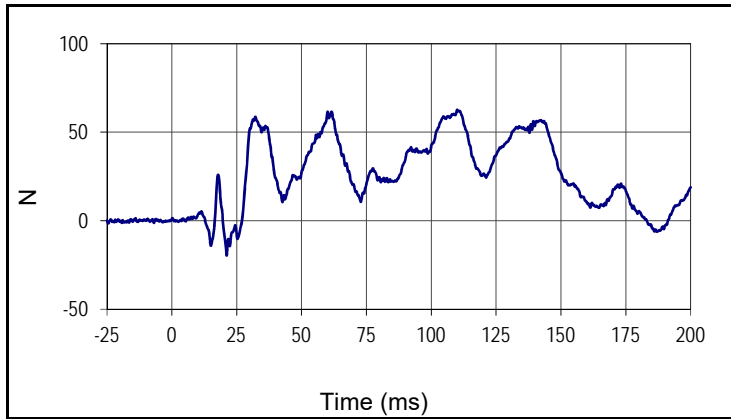
Curve Description			
Driver Lower Thorax Rib Deflection Y			
Plot No.		SAE Class	Units
007		180	mm
Max	Time	Min	Time
15.9	40.4	-3.2	61.0



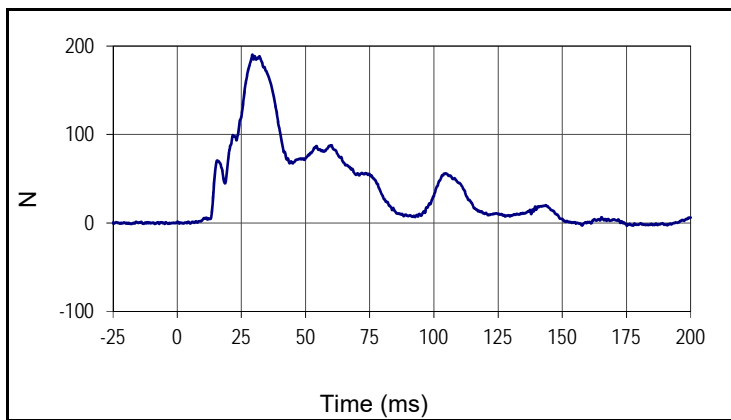
Curve Description			
Driver Thorax Rib Deflection Maximum Y			
Plot No.		SAE Class	Units
008		180	mm
Max	Time	Min	Time
15.9	40.4	-3.2	61.0

Test Vehicle: 2019 Subaru Forester 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

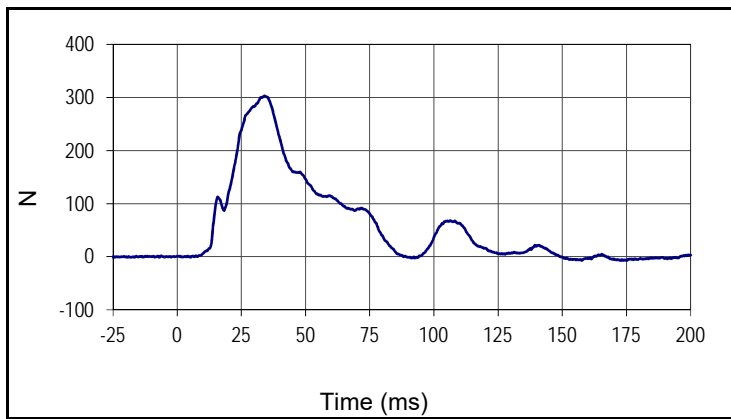
NHTSA No.: O20195502
 Test Date: 12/12/18



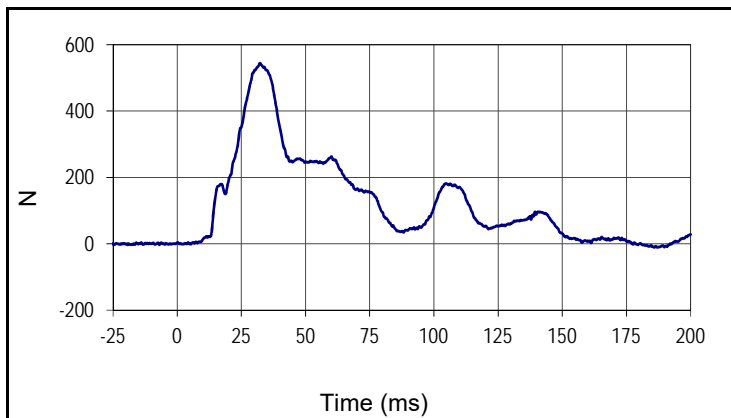
Curve Description			
Driver Anterior Abdominal Force Y			
Plot No.		SAE Class	Units
009		600	N
Max	Time	Min	Time
62.7	110.0	-19.7	21.1



Curve Description			
Driver Middle Abdominal Force Y			
Plot No.		SAE Class	Units
010		600	N
Max	Time	Min	Time
190.3	29.3	-3.0	177.5



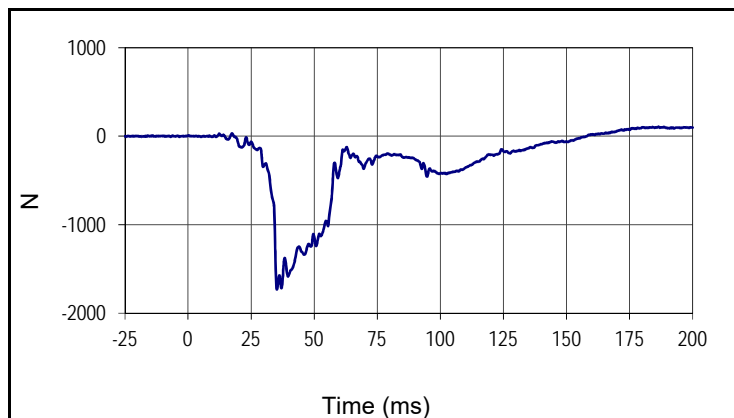
Curve Description			
Driver Posterior Abdominal Force Y			
Plot No.		SAE Class	Units
011		600	N
Max	Time	Min	Time
302.9	34.1	-7.4	172.6



Curve Description			
Driver Total Abdominal Force			
Plot No.		SAE Class	Units
012		600	N
Max	Time	Min	Time
544.5	32.2	-11.1	187.0

Test Vehicle: 2019 Subaru Forester 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

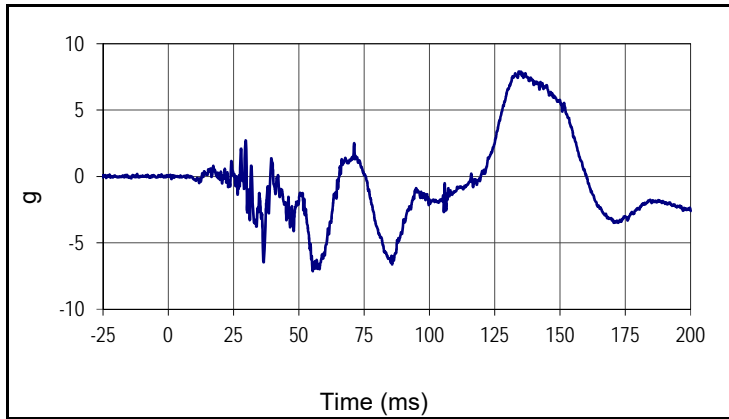
NHTSA No.: O20195502
 Test Date: 12/12/18



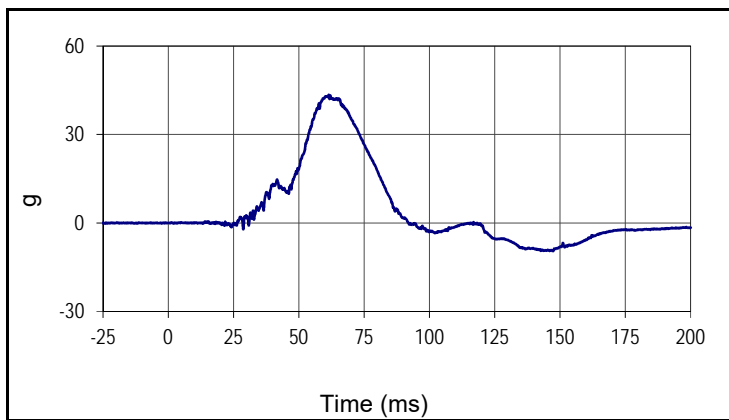
Curve Description			
Driver Pubic Symphysis Force Y			
Plot No.		SAE Class	Units
013		600	N
Max	Time	Min	Time
107.1	186.5	-1731.8	35.2

Test Vehicle: 2019 Subaru Forester 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

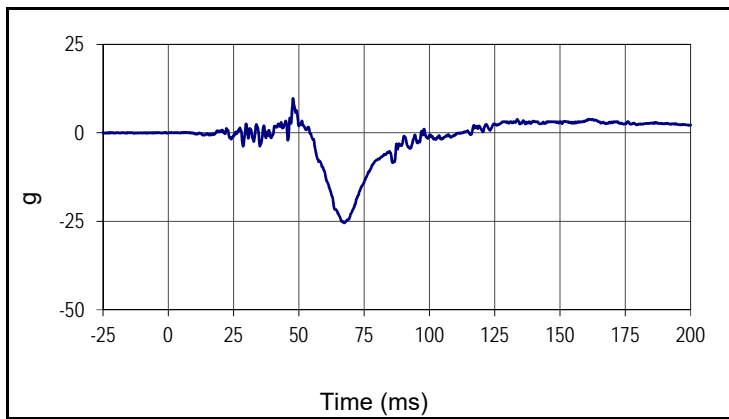
NHTSA No.: O20195502
 Test Date: 12/12/18



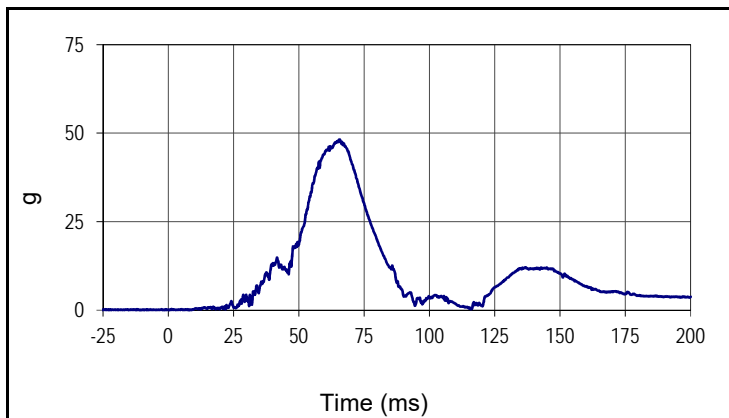
Curve Description			
Passenger Head Acceleration X Primary			
Plot No.		SAE Class	Units
014		1000	g
Max	Time	Min	Time
7.9	134.2	-7.1	55.3



Curve Description			
Passenger Head Acceleration Y Primary			
Plot No.		SAE Class	Units
015		1000	g
Max	Time	Min	Time
43.5	61.4	-9.5	147.3



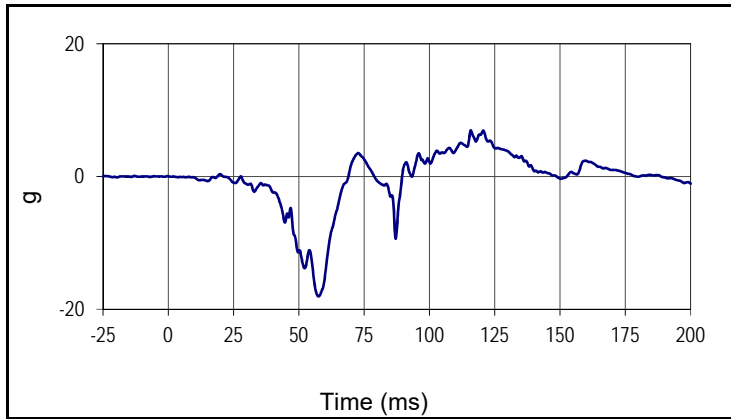
Curve Description			
Passenger Head Acceleration Z Primary			
Plot No.		SAE Class	Units
016		1000	g
Max	Time	Min	Time
9.7	47.7	-25.5	67.3



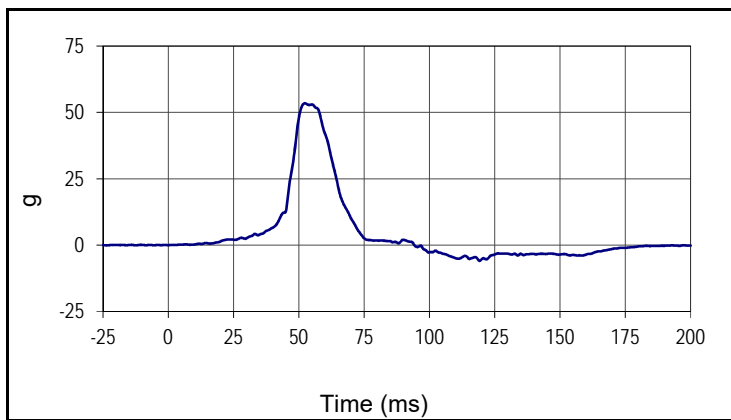
Curve Description			
Passenger Head Acceleration Resultant Primary			
Plot No.		SAE Class	Units
017		1000	g
Max	Time	Min	Time
48.2	65.4	0.0	8.0

Test Vehicle: 2019 Subaru Forester 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

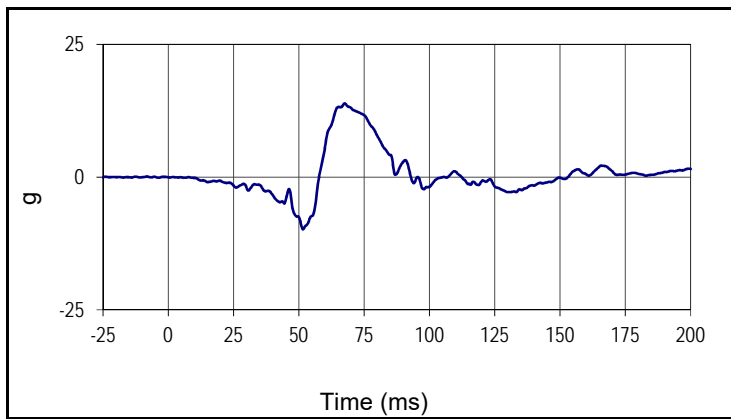
NHTSA No.: O20195502
 Test Date: 12/12/18



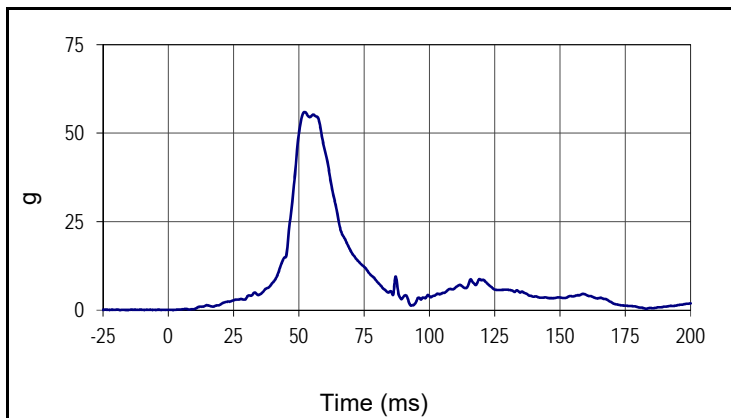
Curve Description			
Passenger Lower Spine T12 Acceleration X			
Plot No.		SAE Class	Units
018		180	g
Max	Time	Min	Time
6.9	115.8	-18.1	57.5



Curve Description			
Passenger Lower Spine T12 Acceleration Y			
Plot No.		SAE Class	Units
019		180	g
Max	Time	Min	Time
53.4	52.2	-5.9	119.2



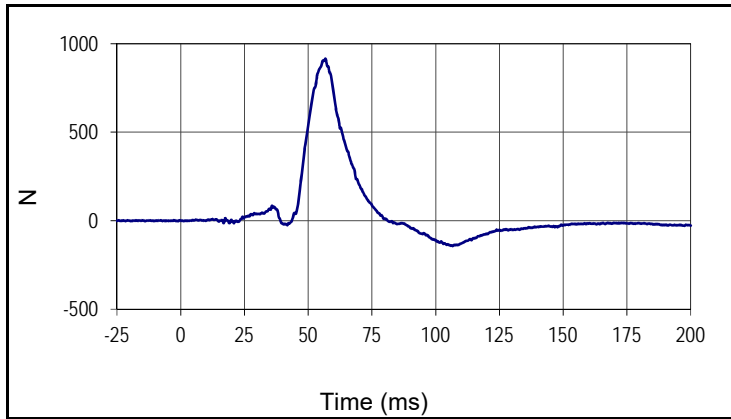
Curve Description			
Passenger Lower Spine T12 Acceleration Z			
Plot No.		SAE Class	Units
020		180	g
Max	Time	Min	Time
13.9	67.5	-9.8	51.5



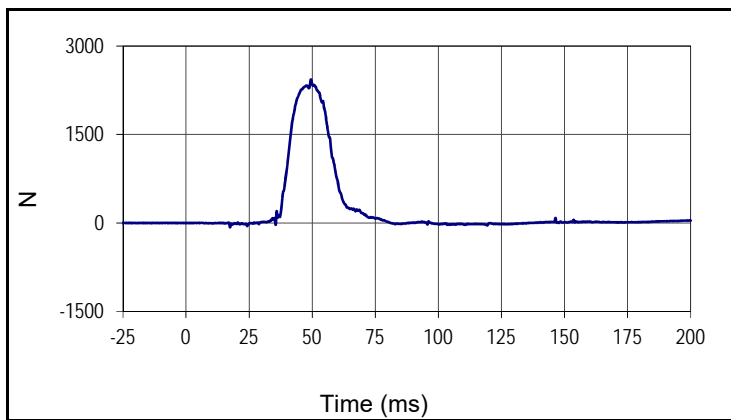
Curve Description			
Passenger Lower Spine T12 Acceleration Res.			
Plot No.		SAE Class	Units
021		180	g
Max	Time	Min	Time
56.0	52.2	0.0	1.9

Test Vehicle: 2019 Subaru Forester 5-Door MPV
 Test Program: NCAP MDB Side Impact Test

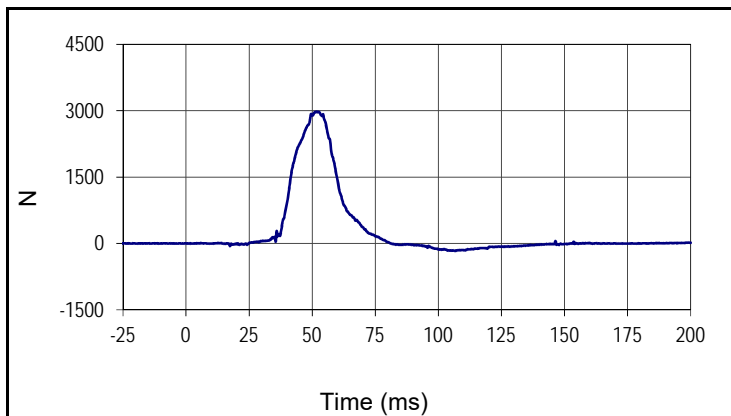
NHTSA No.: O20195502
 Test Date: 12/12/18



Curve Description			
Passenger Iliac Force on Impact Side Y			
Plot No.		SAE Class	Units
022		600	N
Max	Time	Min	Time
915.4	56.7	-143.1	106.7



Curve Description			
Passenger Acetabulum Force on Impact Side Y			
Plot No.		SAE Class	Units
023		600	N
Max	Time	Min	Time
2433.6	49.5	-71.5	17.4



Curve Description			
Passenger Total Pelvic Force			
Plot No.		SAE Class	Units
024		600	N
Max	Time	Min	Time
2978.5	51.4	-169.4	106.8

APPENDIX C
ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA

APPENDIX C
PRE-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA
LEFT SIDE CONFIGURATION




ATD Serial No.: F035

Test Date: 2018-12-04

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Relative Humidity	%	10	70	28	Pass
1 - Sitting Height	mm	900	918	906	Pass
2 - Seat to Shoulder Joint	mm	558	572	569	Pass
3 - Seat to Lower Face of Thoracic Spine Box	mm	346	356	348	Pass
4 - Seat to Hip Joint (bolt center)	mm	97	103	102	Pass
5 - Sole to Seat, Sitting	mm	433	451	439	Pass
6 - Head Width	mm	152	158	155	Pass
7 - Shoulder/Arm Width	mm	461	479	467	Pass
8 - Thorax Width	mm	322	332	326	Pass
9 - Abdomen Width	mm	273	287	282	Pass
10 - Pelvis Lap Width	mm	359	373	371	Pass
11 - Head Depth	mm	196	206	204	Pass
12 - Thorax Depth	mm	262	272	269	Pass
13 - Abdomen Depth	mm	194	204	200	Pass
14 - Pelvis Depth	mm	235	245	242	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	152	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	603	Pass
				Overall Test Results	Pass

Technician: 
 J. Hernandez

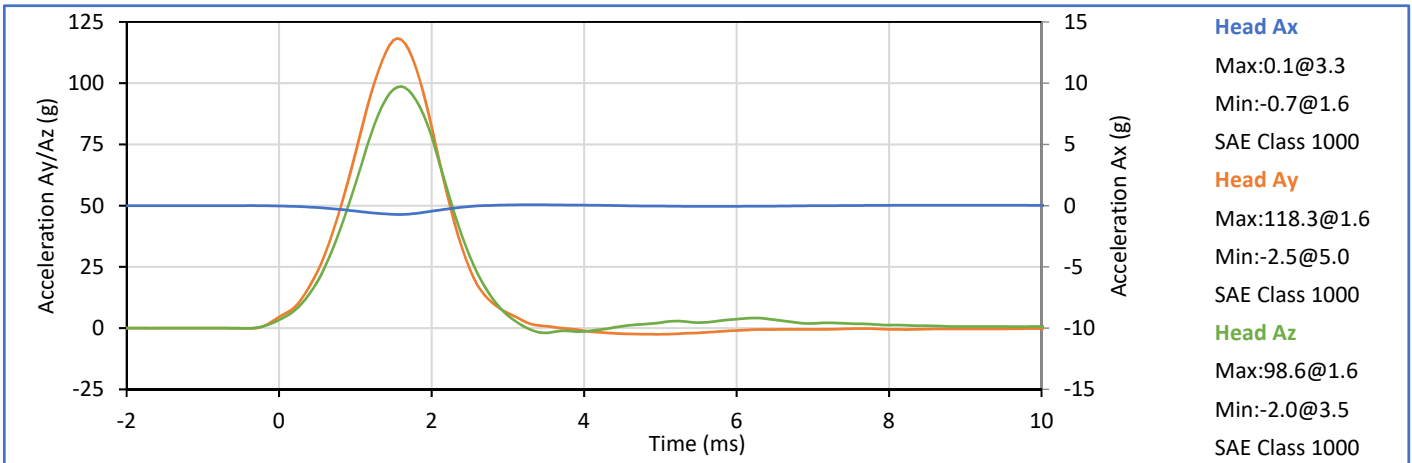
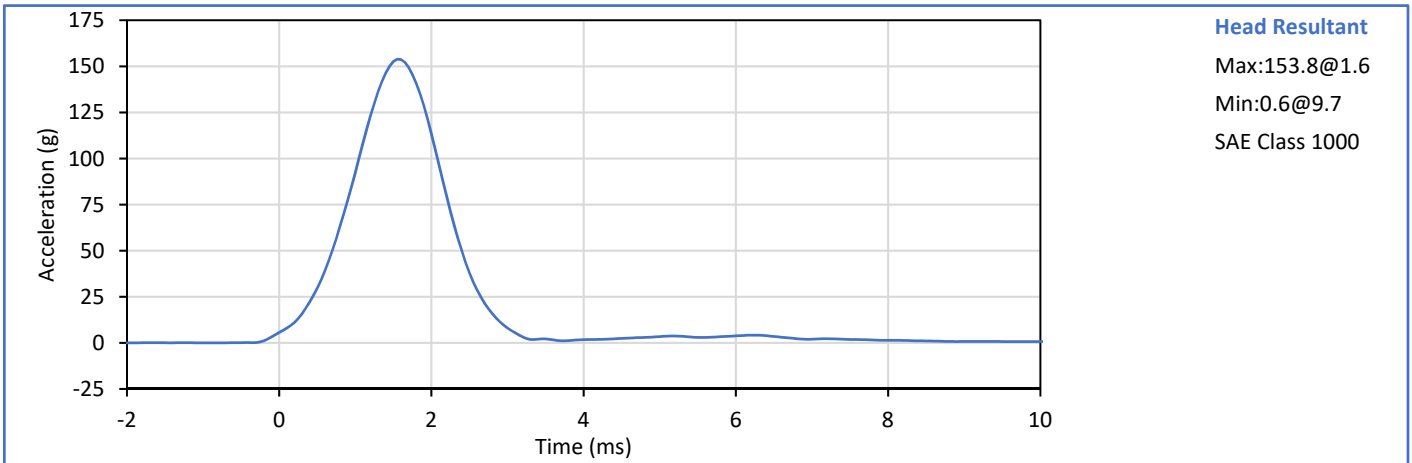
Approved By: 
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.6	Pass
Laboratory Humidity	%	10	70	22	Pass
Peak Resultant Acceleration	g	125.0	155.0	153.8	Pass
Peak Head Ax	g	-15.0	15.0	0.1	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.7	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

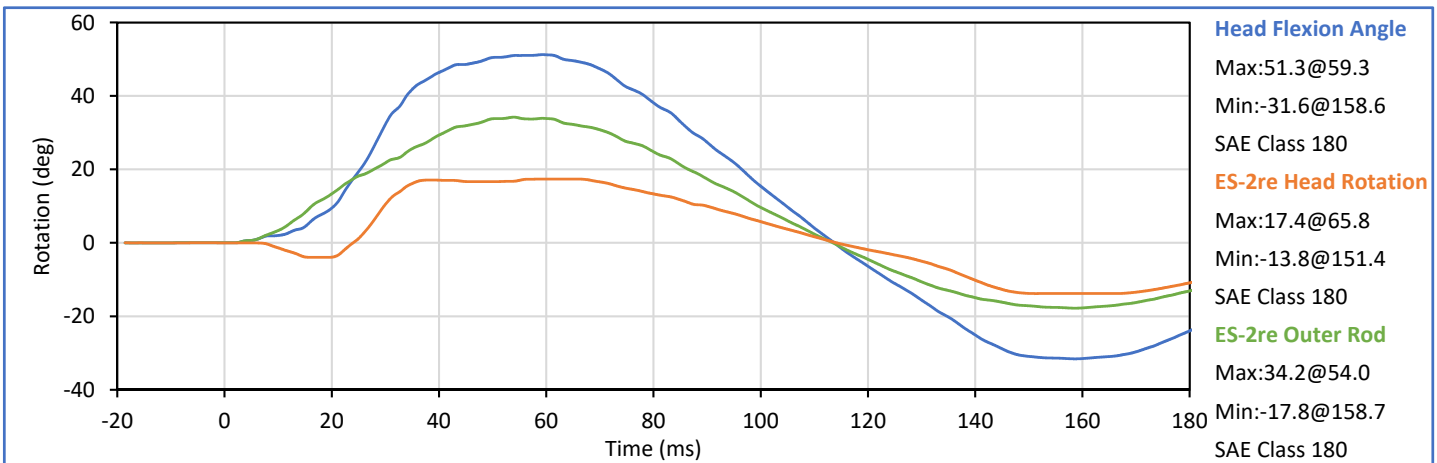
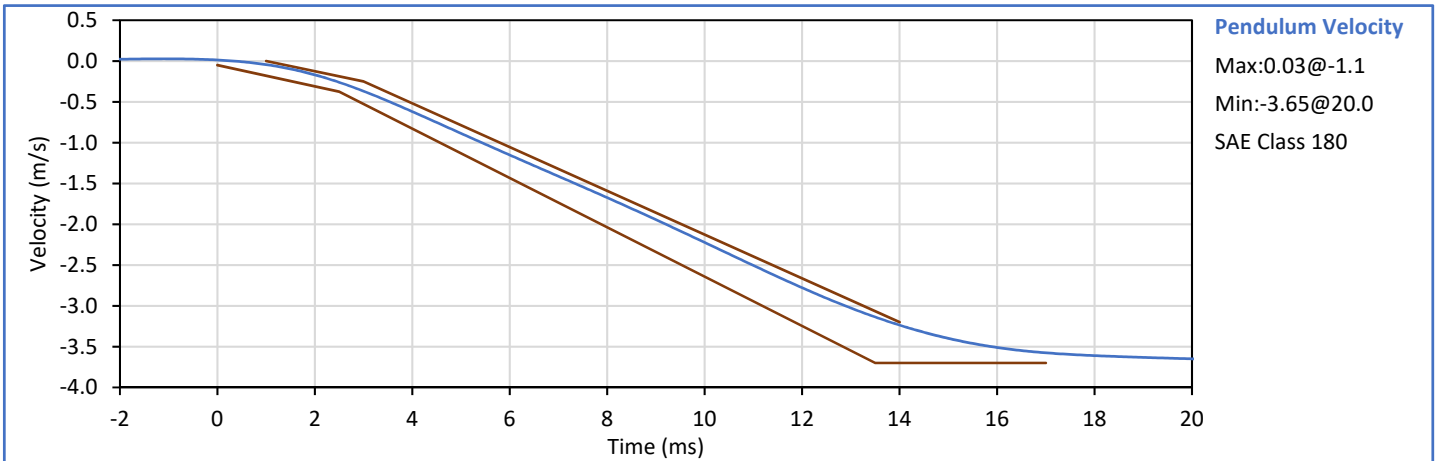
Approved By:
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	3.30	3.50	3.48	Pass
Peak Headform Flexion	deg	49.0	59.0	51.3	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	59.3	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	54.4	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

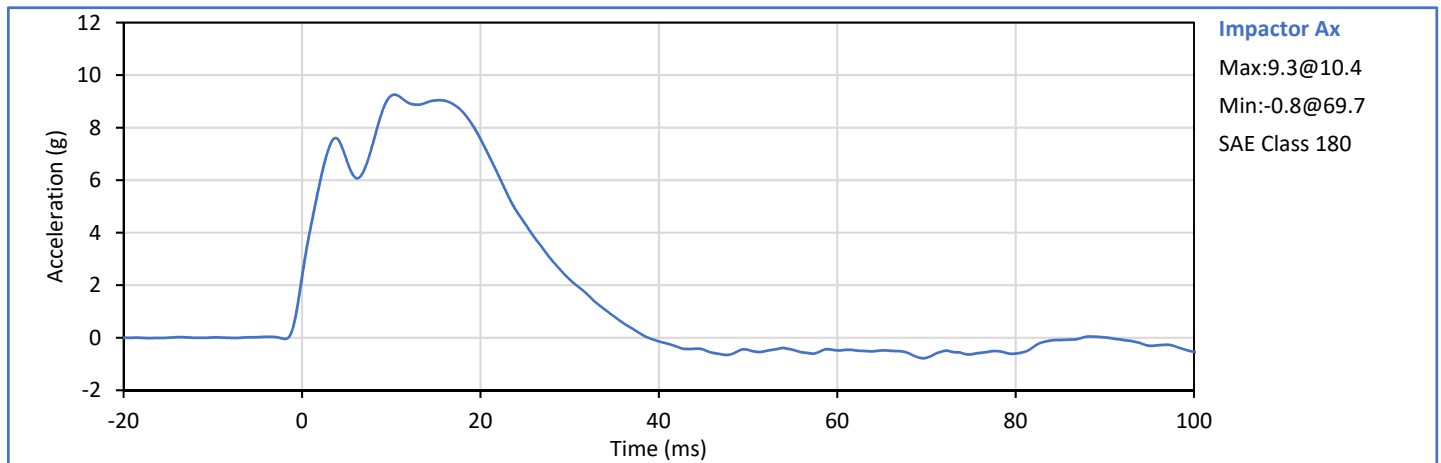
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-06

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.30	Pass
Peak Impactor Ax	g	7.5	10.5	9.3	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
J. Hernandez

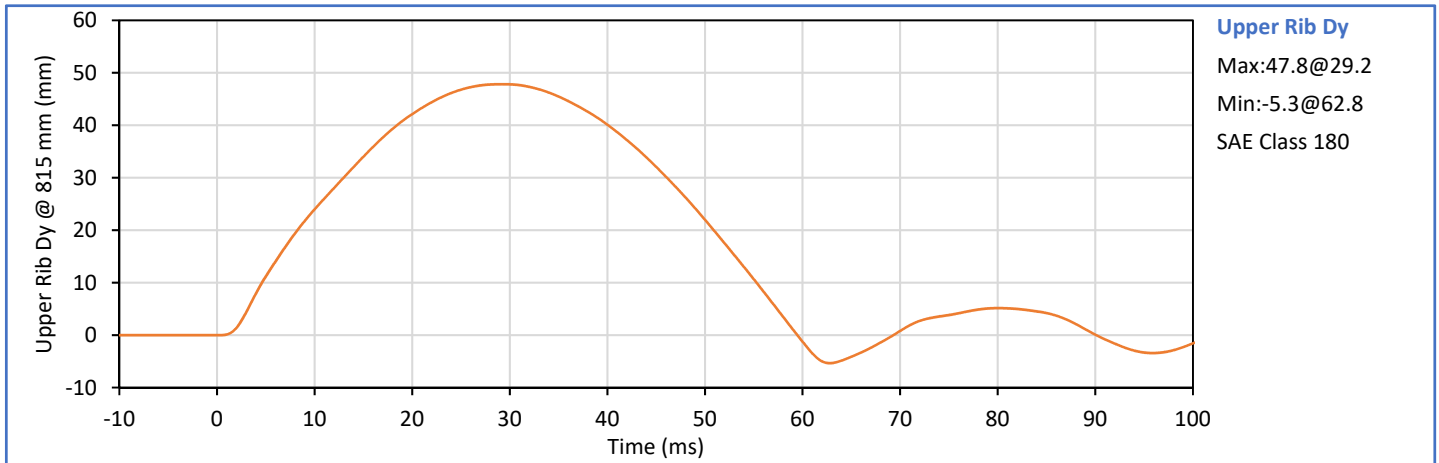
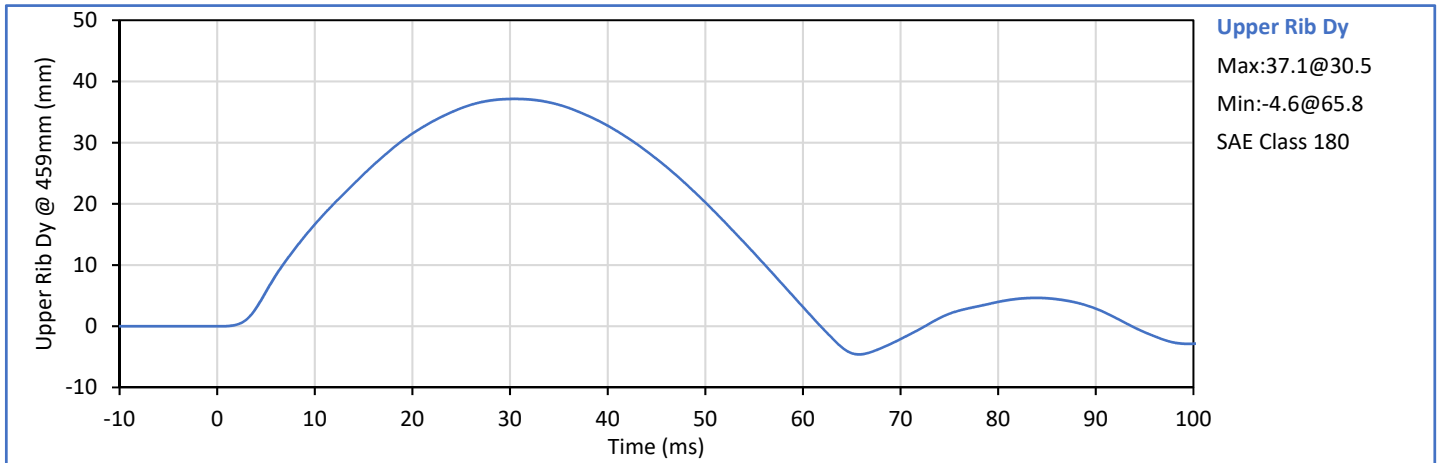
Approved By: *P. Puzzuto*
P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.6	Pass
Laboratory Humidity	%	10	70	22	Pass
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.1	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	47.8	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

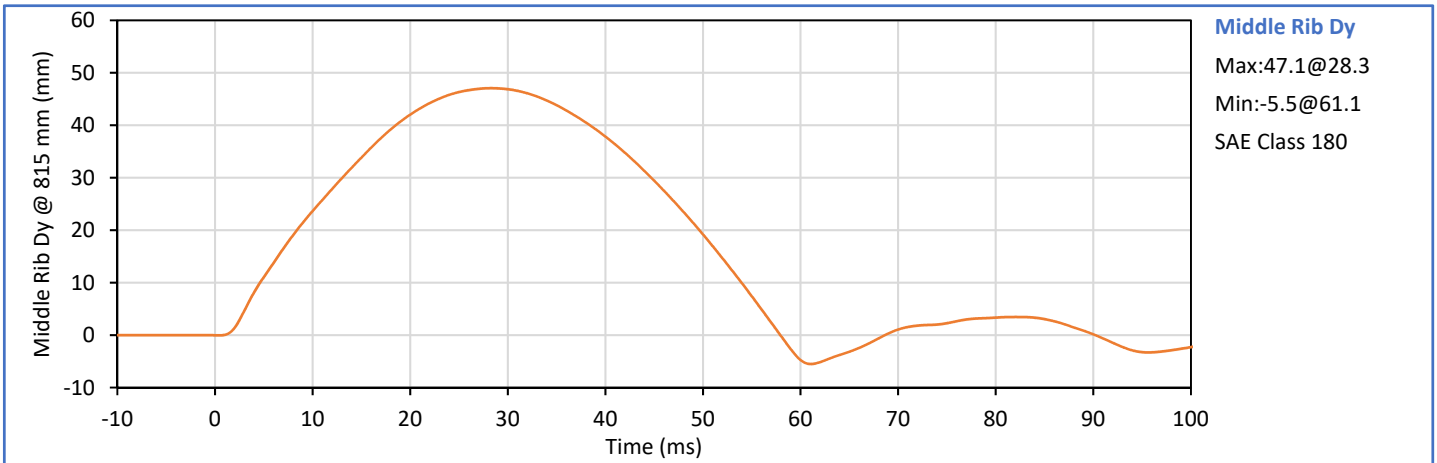
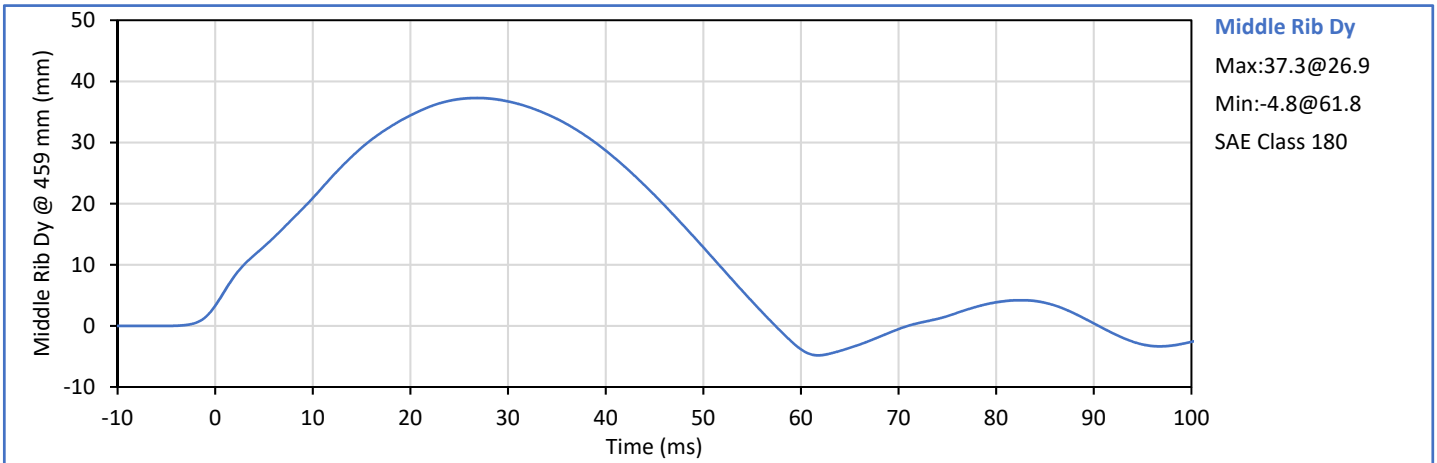
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	22	Pass
Middle Rib Dy @ 459mm	mm	36.0	40.0	37.3	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	47.1	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

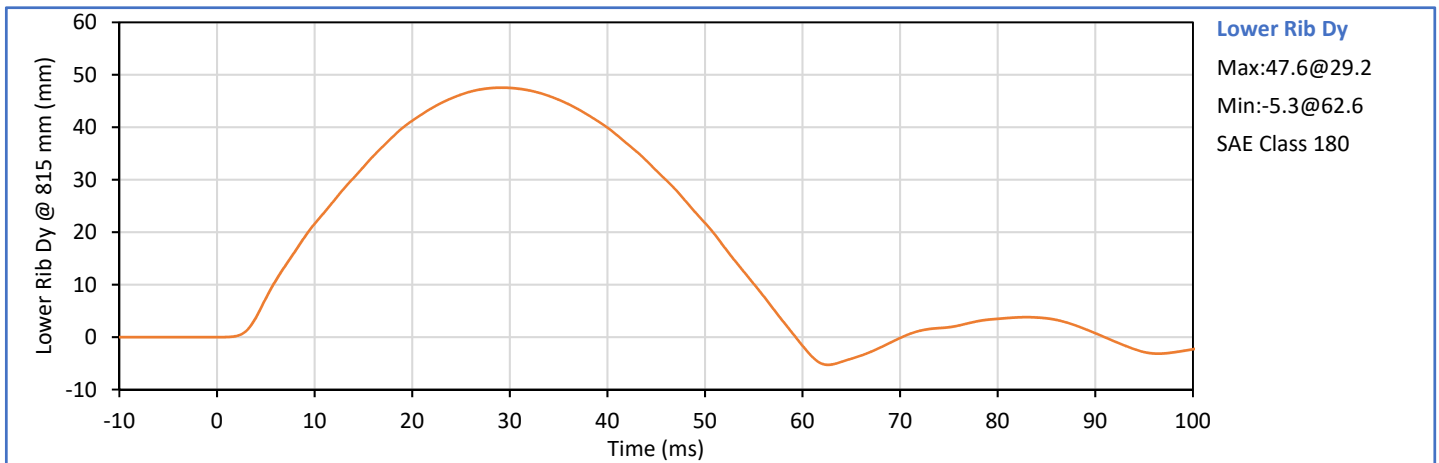
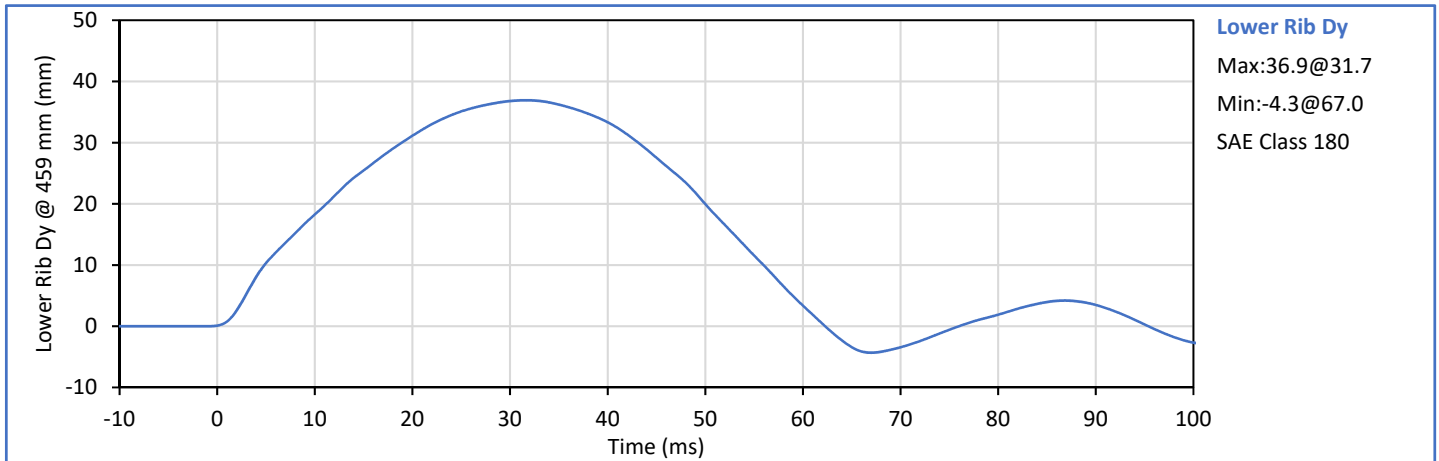
Approved By:
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-04

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	36.9	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	47.6	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

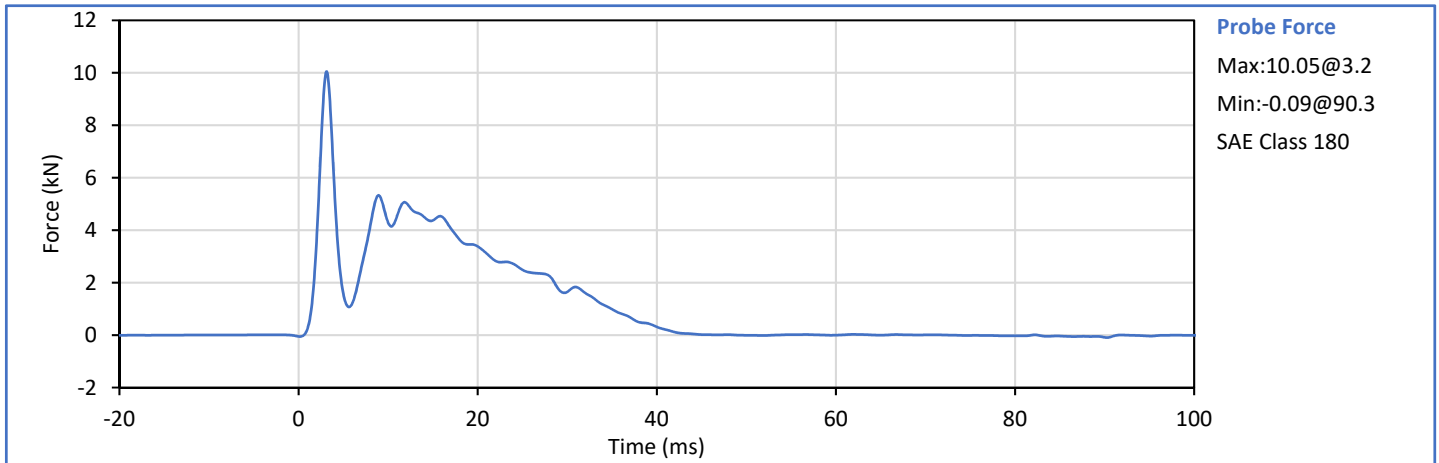
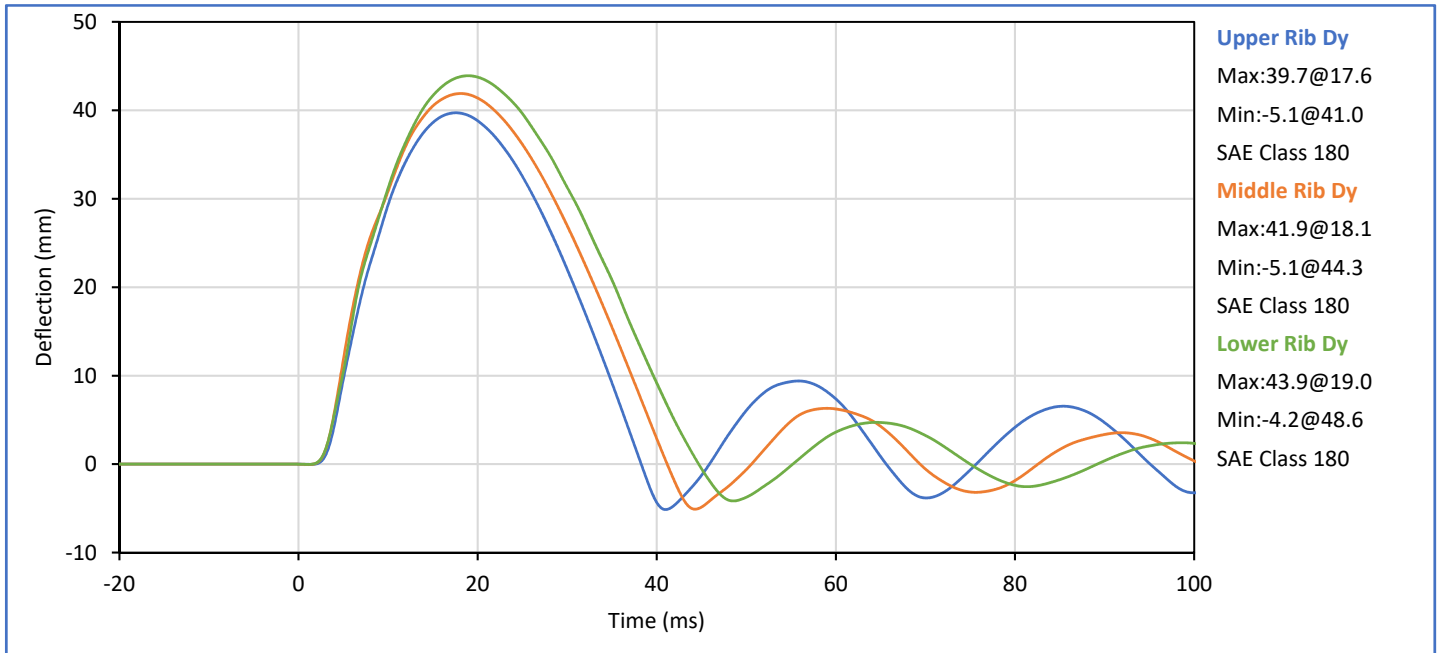
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-06

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	5.40	5.60	5.56	Pass
Peak Upper Rib Dy	mm	34.0	41.0	39.7	Pass
Peak Middle Rib Dy	mm	37.0	45.0	41.9	Pass
Peak Lower Rib Dy	mm	37.0	44.0	43.9	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.33	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

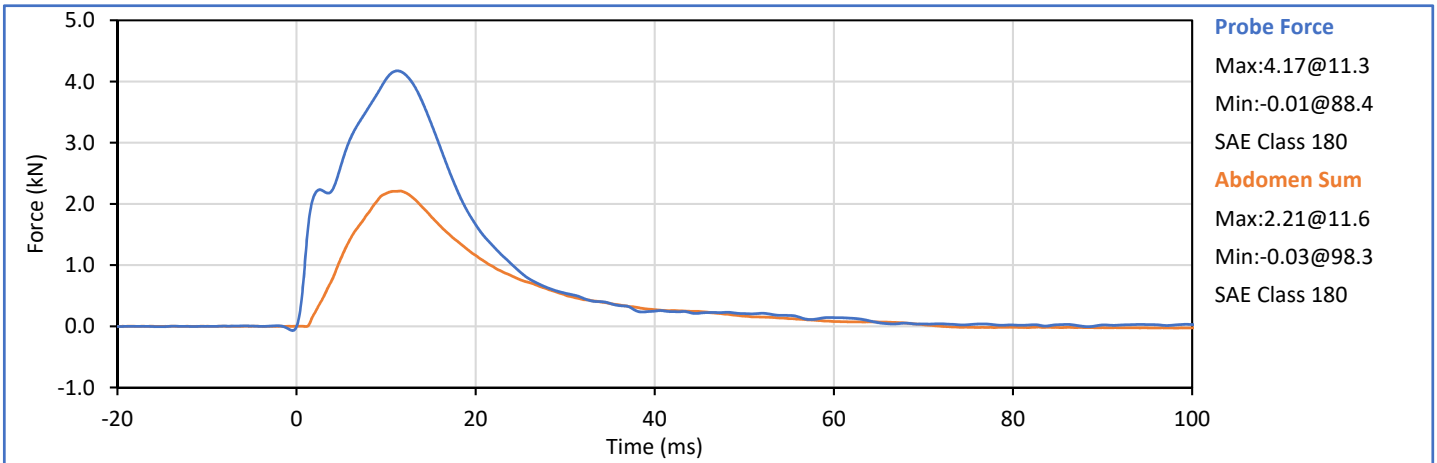
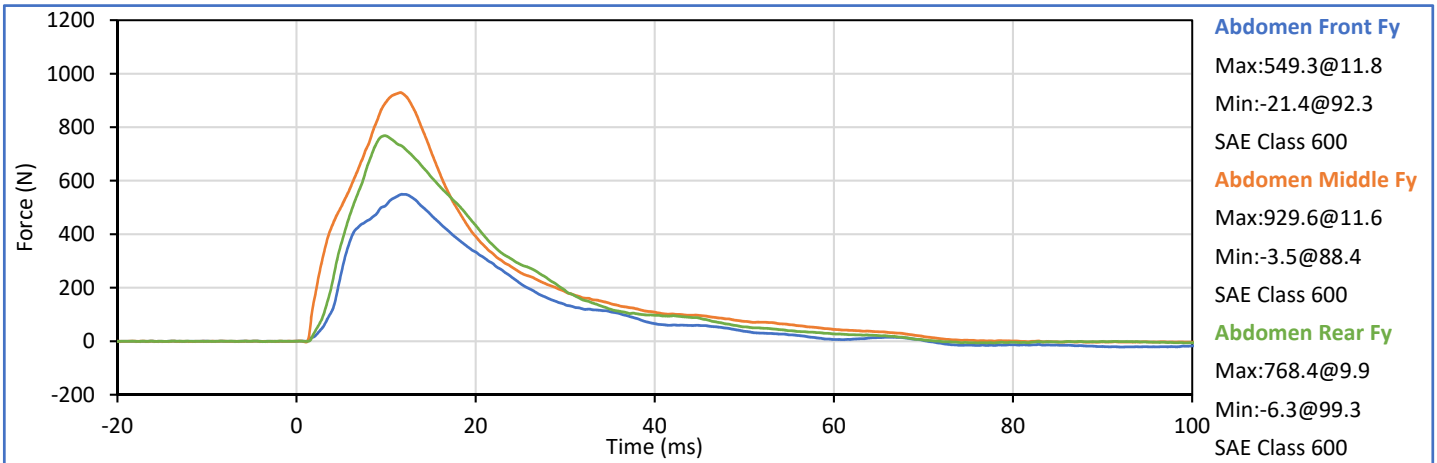
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-06

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	3.90	4.10	3.97	Pass
Peak Impactor Force	kN	4.00	4.80	4.17	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.3	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.21	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	11.6	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

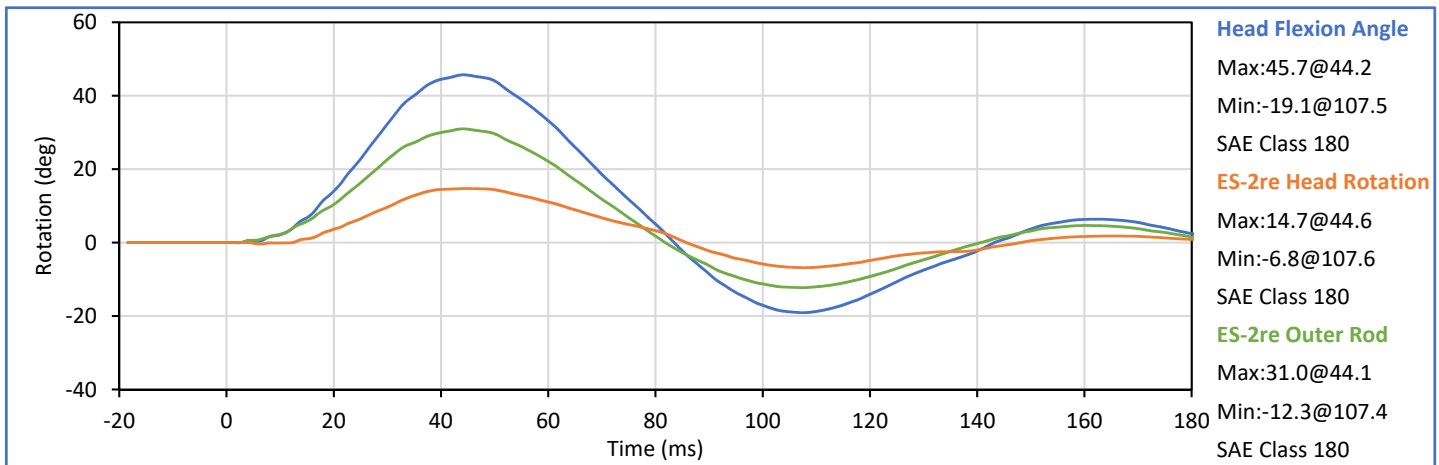
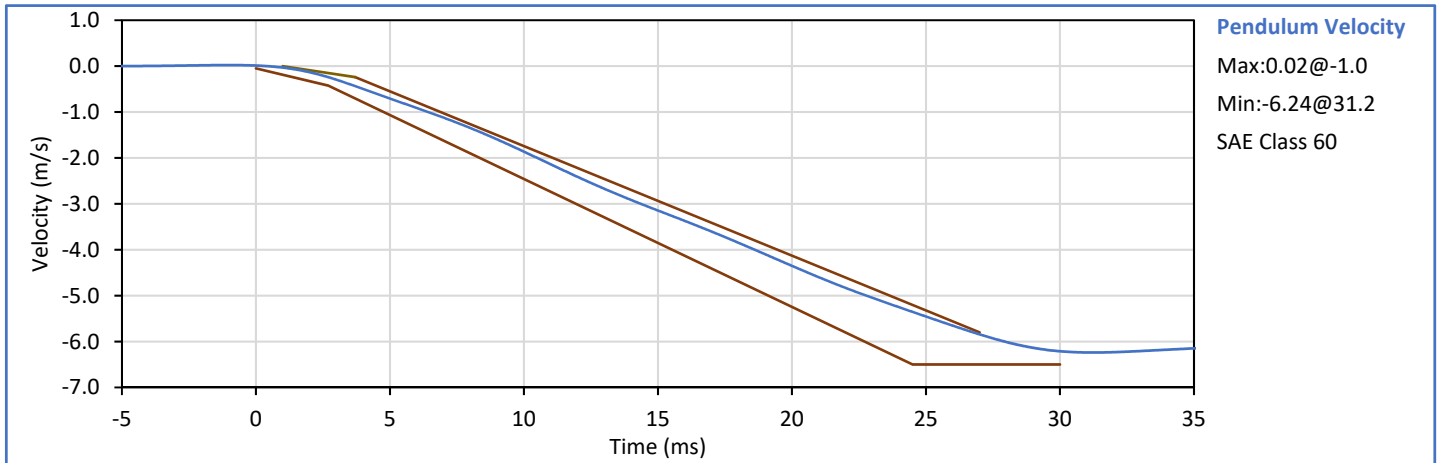
Approved By:
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-04

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	22	Pass
Pendulum Velocity	m/s	5.95	6.15	6.14	Pass
Peak Headform Flexion	deg	45.0	55.0	45.7	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	44.2	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	39.3	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

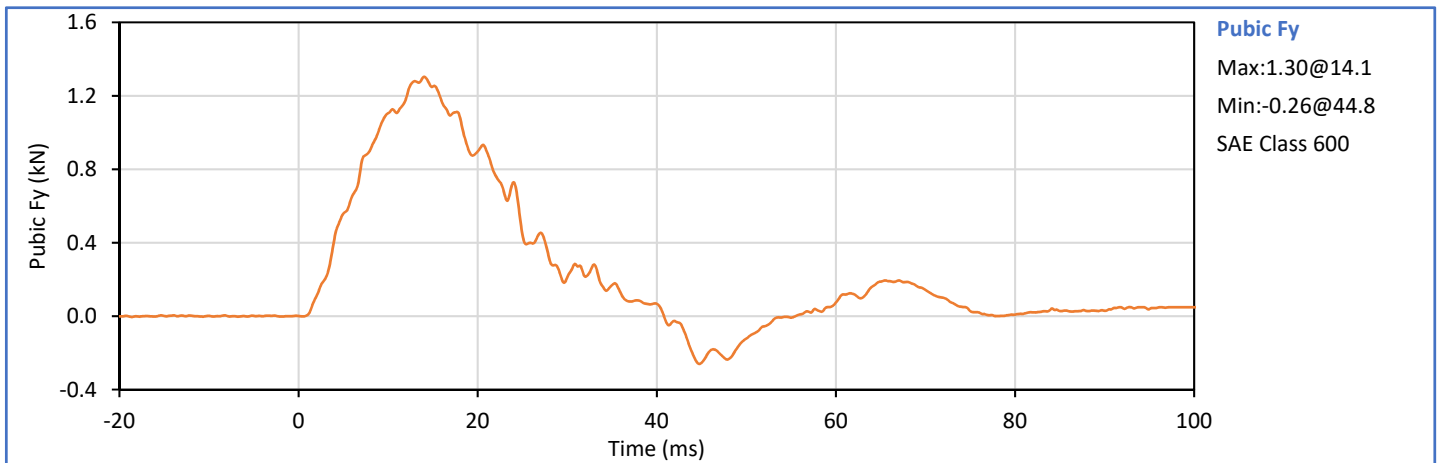
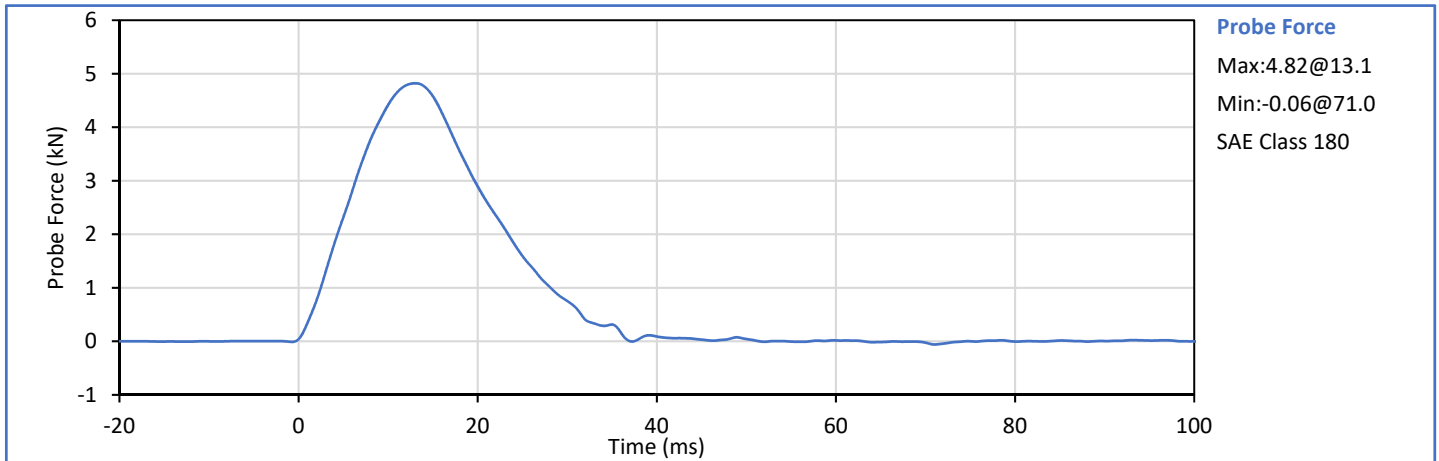
Approved By:
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-06

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.8	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	4.20	4.40	4.39	Pass
Peak Impactor Force	kN	4.70	5.40	4.82	Pass
Time of Peak Impactor Force	ms	11.8	16.1	13.1	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.30	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	14.1	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

Approved By:
 P. Puzzuto

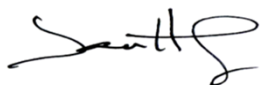



**SID-IIs Small Side Impact ATD
 External Measurements**

ATD Serial No.: 308

Test Date: 2018-11-29

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	22	Pass
A - Sitting Height	mm	772	788	782	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	83	Pass
D - H Point From Seatback	mm	141	151	149	Pass
E - Shoulder Pivot From Backline	mm	97	107	105	Pass
F - Thigh Clearance	mm	119	135	126	Pass
G - Head Breadth	mm	140	148	143	Pass
H - Head Back From Backline	mm	40	46	42	Pass
I - Head Depth	mm	178	188	186	Pass
J - Head Circumference	mm	541	551	547	Pass
K - Buttock To Knee Length	mm	514	540	524	Pass
L - Popliteal Height	mm	343	369	350	Pass
K - Knee Pivot To Floor Height	mm	392	409	398	Pass
N - Buttock Popliteal Length	mm	416	442	437	Pass
O - Chest Depth W/O Jacket	mm	195	211	207	Pass
P - Foot Length	mm	216	232	221	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	318	Pass
R - Arm Length	mm	249	259	256	Pass
S - Knee Joint To Seatback	mm	477	493	486	Pass
V - Shoulder Width	mm	341	357	345	Pass
W - Foot Width	mm	78	94	84	Pass
Y - Chest Circumference W/Jacket	mm	851	881	862	Pass
Z - Waist Circumference	mm	761	791	779	Pass
Overall Test Results					Pass

Technician: 
 J. Hernandez

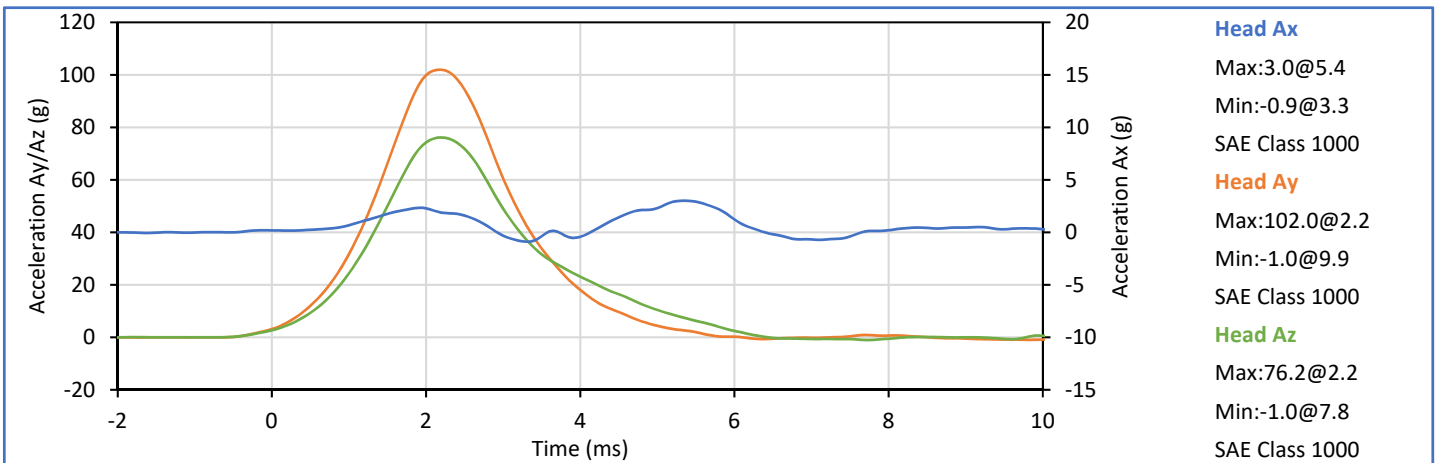
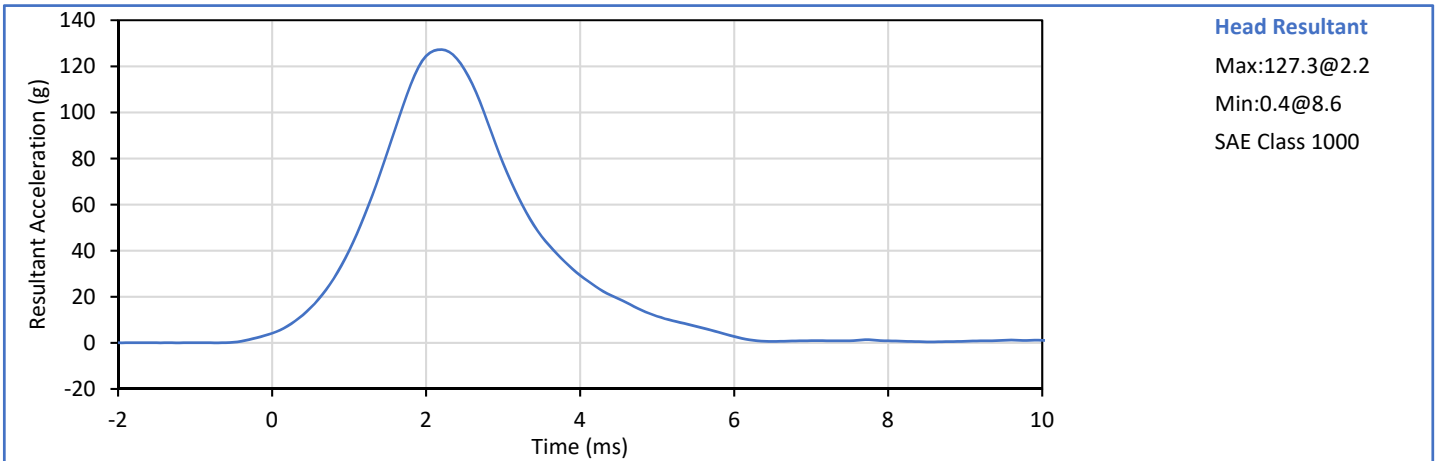
Approved By: 
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-11-29

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.6	Pass
Laboratory Humidity	%	10	70	38	Pass
Peak Resultant Acceleration	g	115.0	137.0	127.3	Pass
Peak Head Ax	g	-15.0	15.0	-0.9	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

Approved By: *P. Puzzuto*
 P. Puzzuto

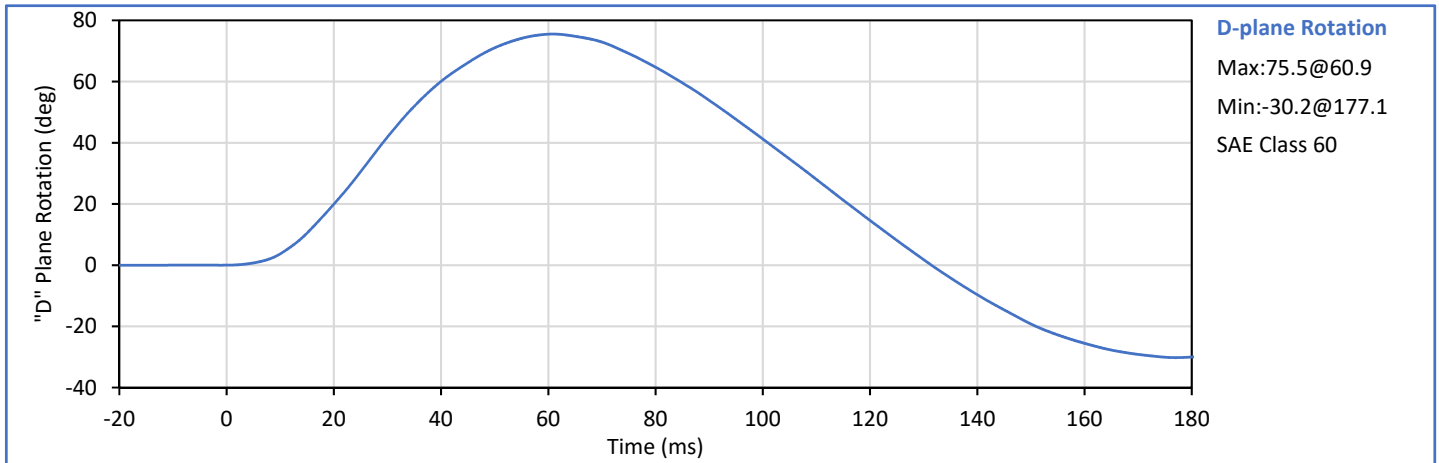
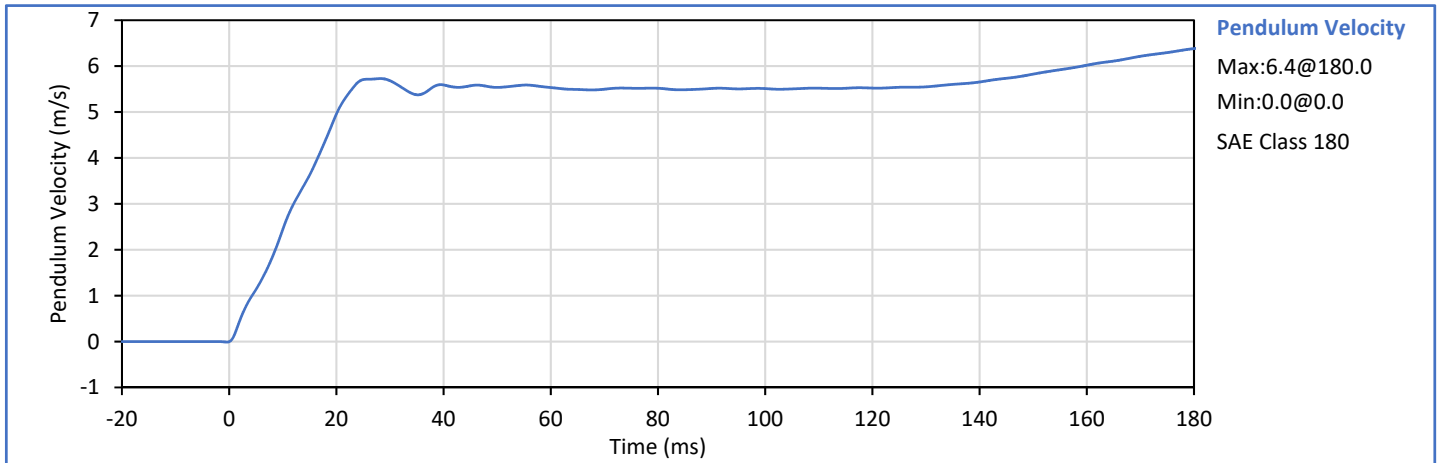


**SID-IIs Small Side Impact ATD
 Neck Flexion**


ATD Serial No.: 308

Test Date: 2018-12-03

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	25	Pass
Pendulum Velocity	m/s	5.51	5.63	5.57	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.44	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.62	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.95	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.71	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.73	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	75.5	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.9	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-43.3	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	113.4	Pass
Overall Test Results					Pass



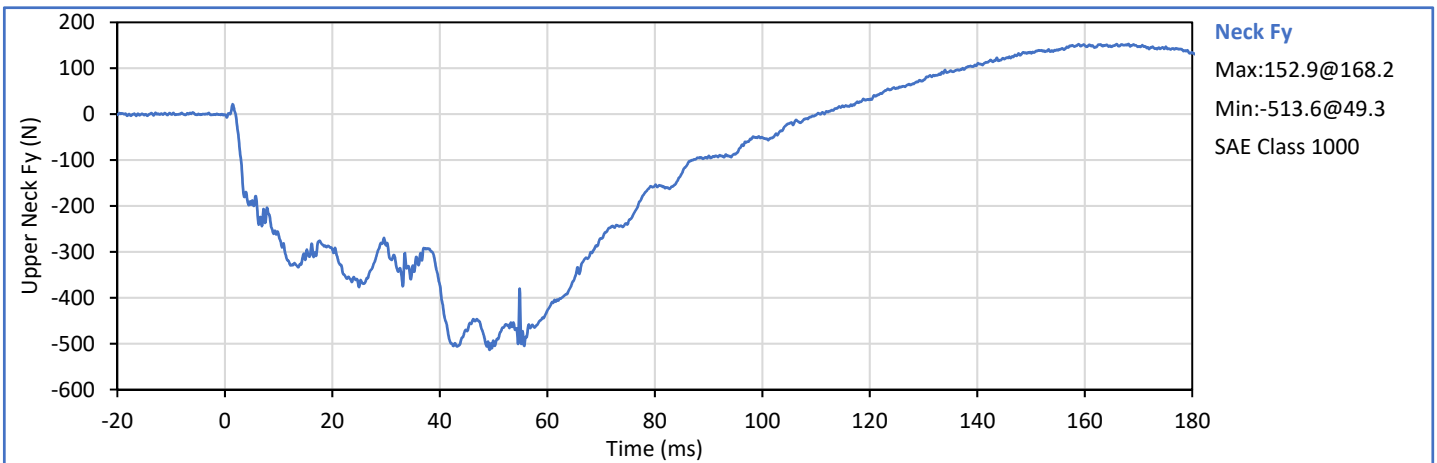
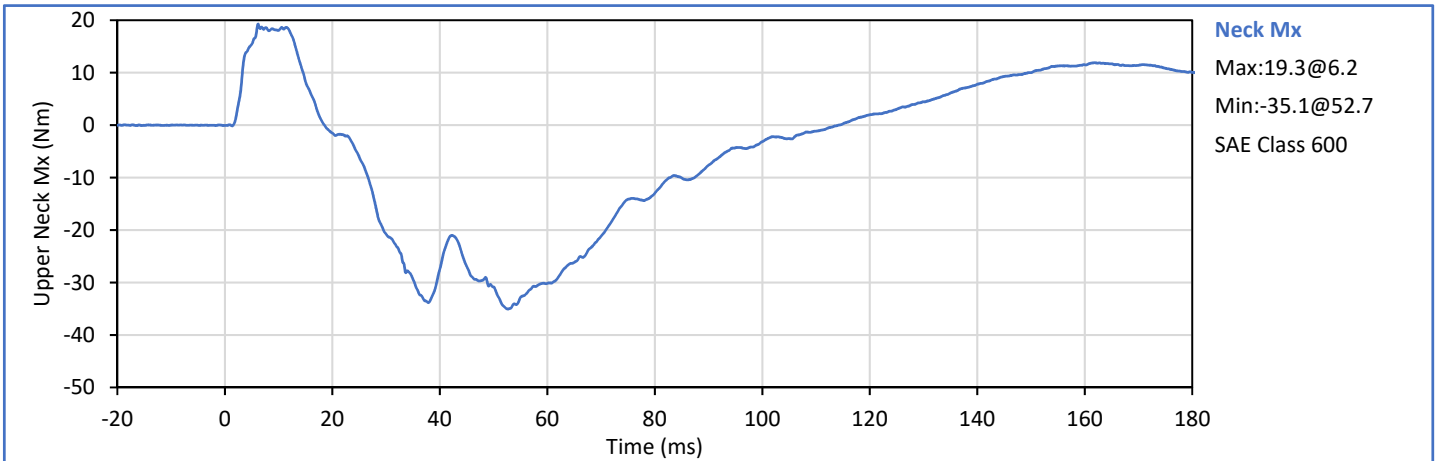
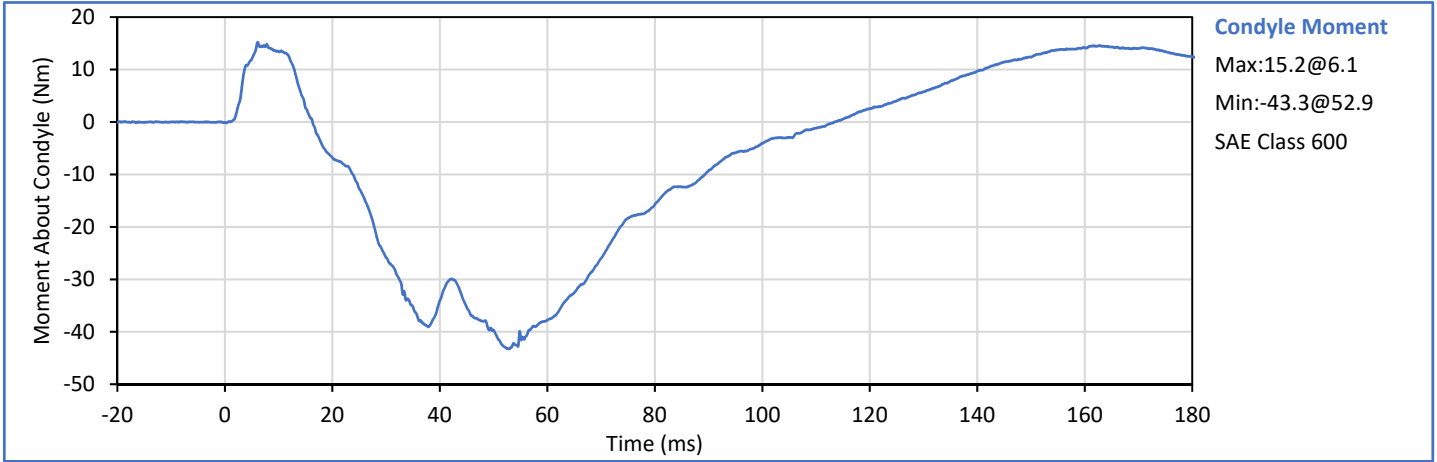
Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-03

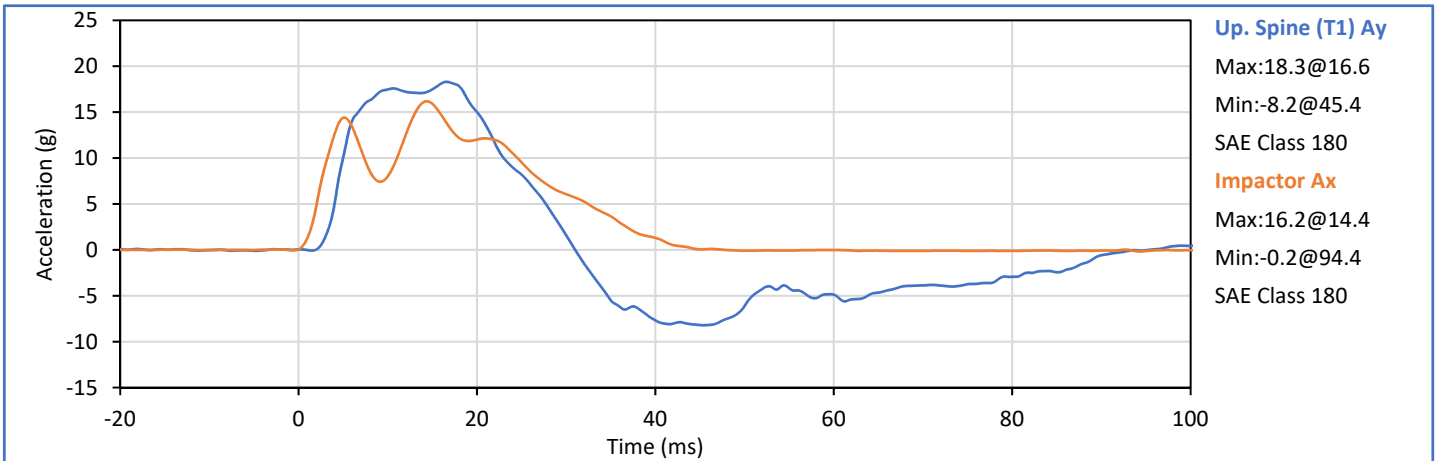
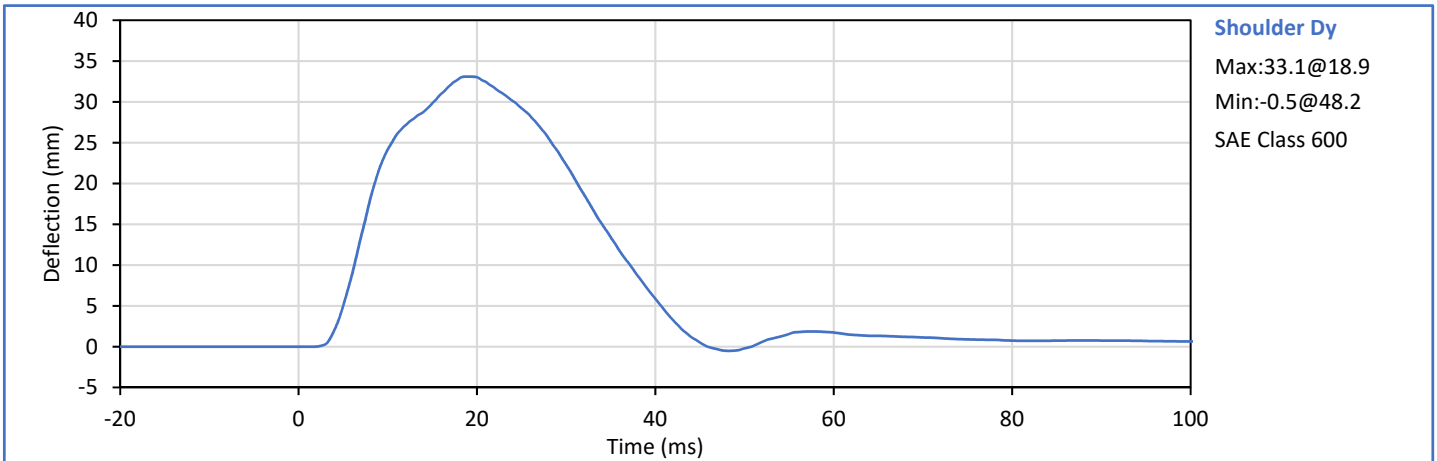




ATD Serial No.: 308

Test Date: 2018-12-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	39	Pass
Impactor Velocity	m/s	4.20	4.40	4.28	Pass
Peak Shoulder Dy	mm	28.0	37.0	33.1	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.3	Pass
Peak Impactor Ax	g	13.0	18.0	16.2	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

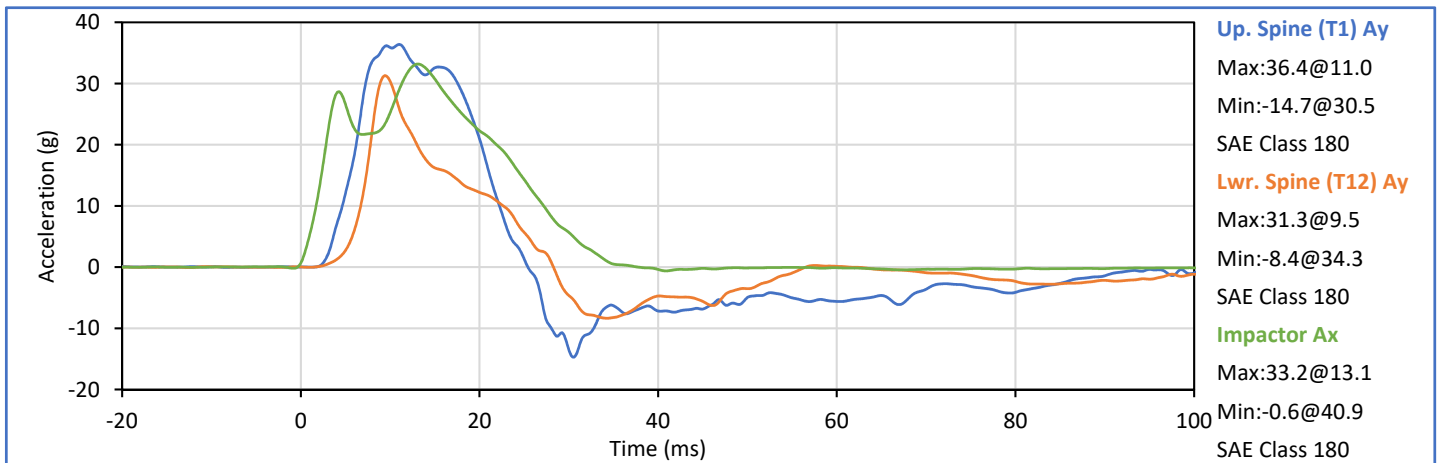
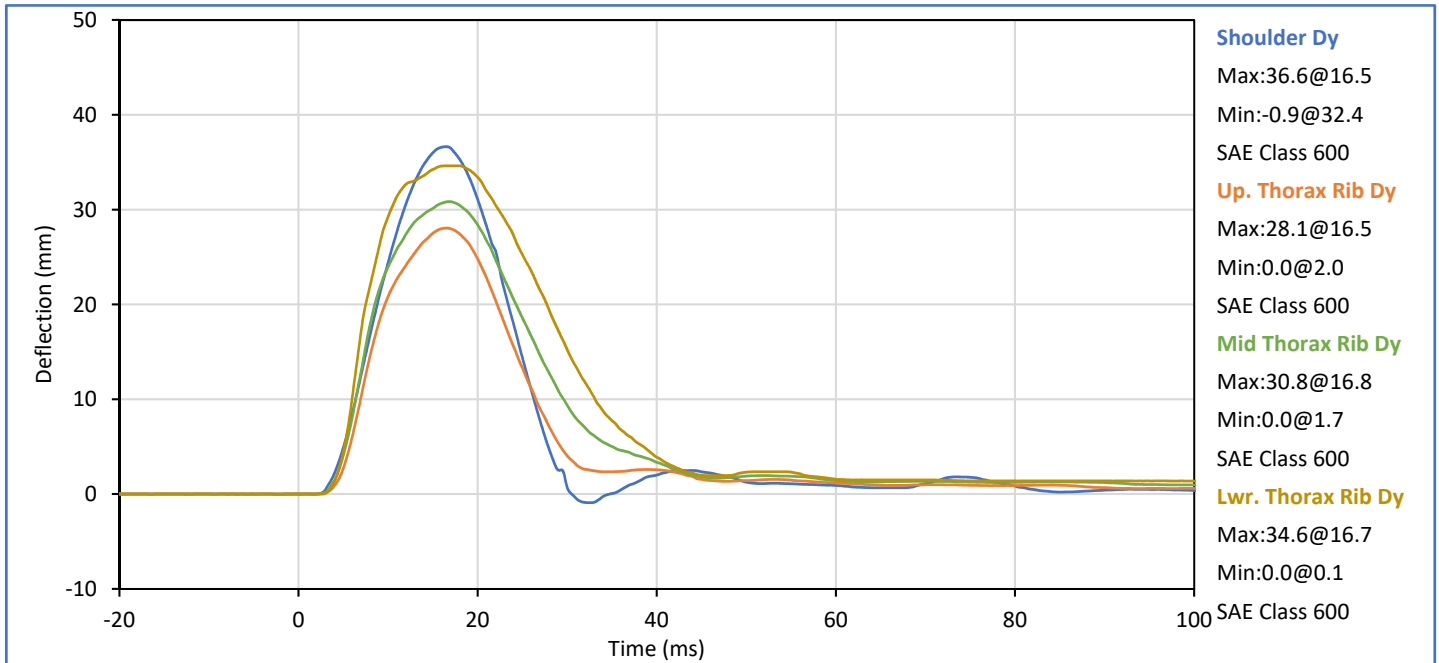
Approved By:
 P. Puzzuto

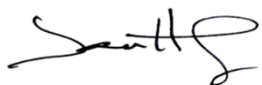



ATD Serial No.: 308

Test Date: 2018-12-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	22	Pass
Impactor Velocity	m/s	6.60	6.80	6.71	Pass
Peak Shoulder Dy	mm	31.0	40.0	36.6	Pass
Peak Upper Rib Dy	mm	25.0	32.0	28.1	Pass
Peak Middle Rib Dy	mm	30.0	36.0	30.8	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.6	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	36.4	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	31.3	Pass
Peak Impactor Ax	g	30.0	36.0	33.2	Pass
Overall Test Results					Pass



Technician: 
 J. Hernandez

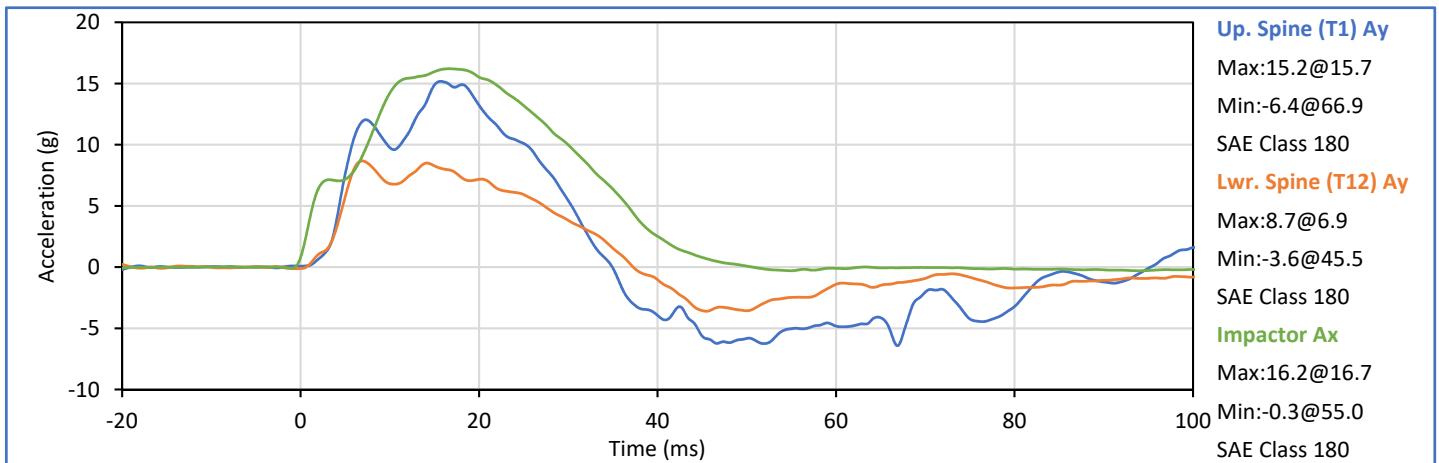
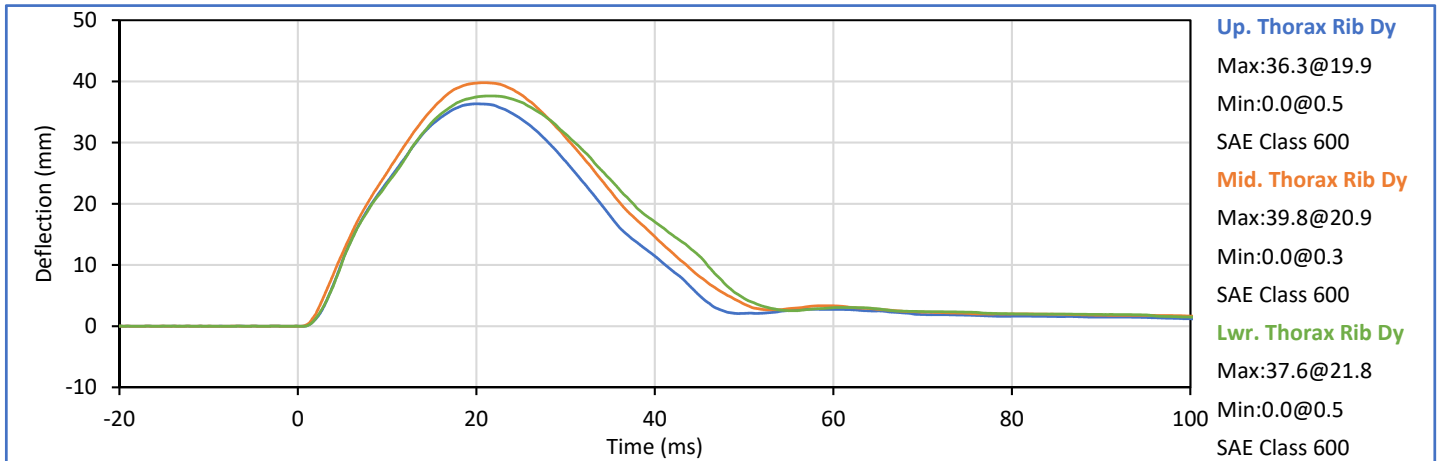
Approved By: 
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-05

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
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	36.3	Pass
Peak Middle Rib Dy	mm	39.0	45.0	39.8	Pass
Peak Lower Rib Dy	mm	35.0	43.0	37.6	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.2	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	8.7	Pass
Peak Impactor Ax	g	14.0	18.0	16.2	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

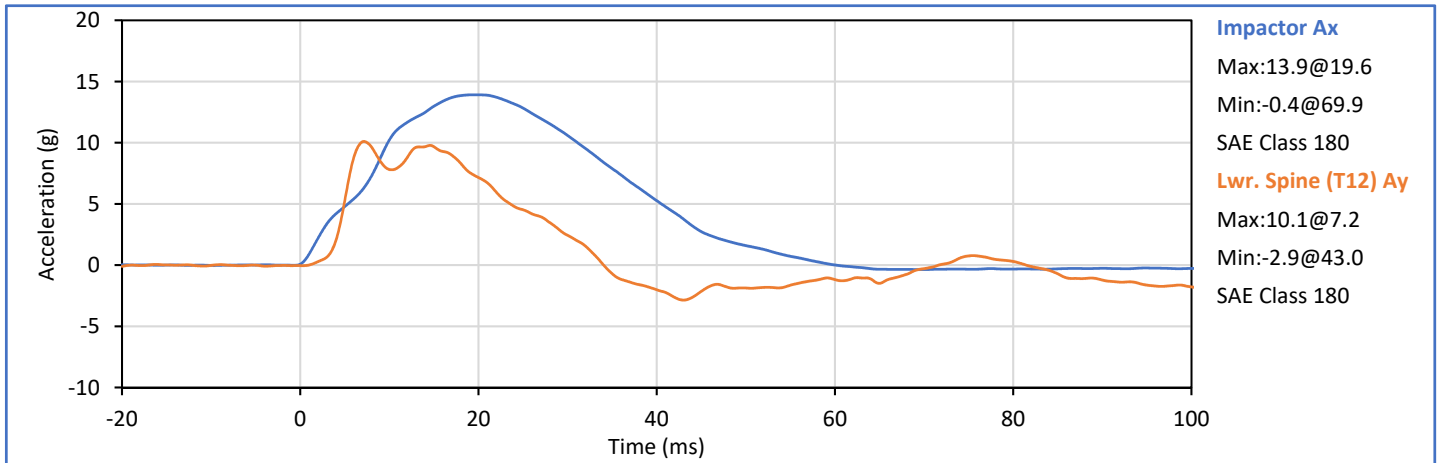
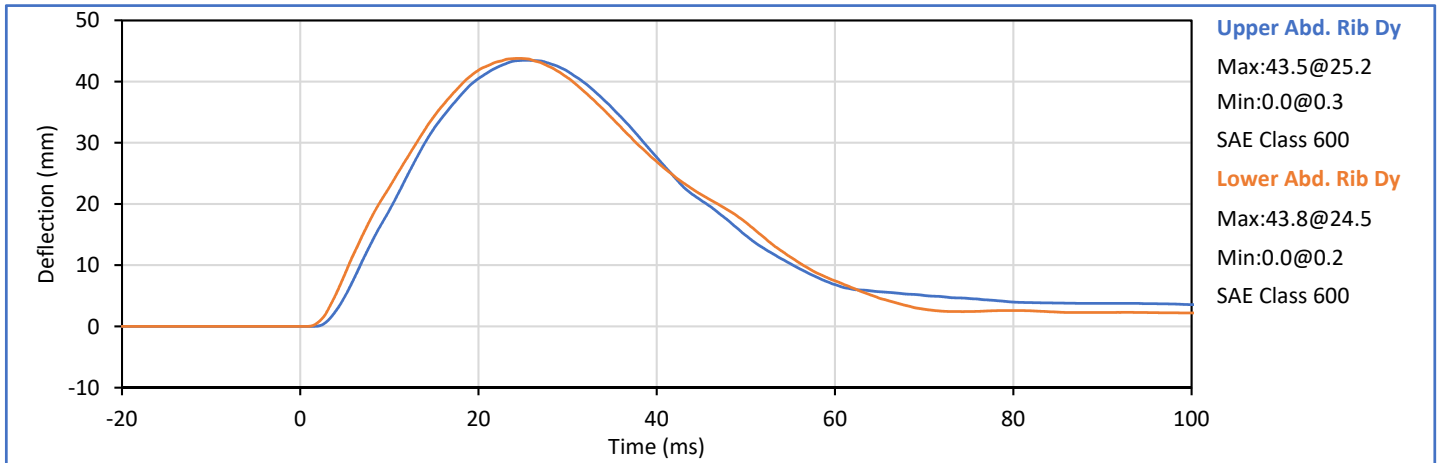
Approved By:
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-05

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
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	43.5	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	43.8	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.1	Pass
Peak Impactor Ax	g	12.0	16.0	13.9	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

Approved By:
 P. Puzzuto

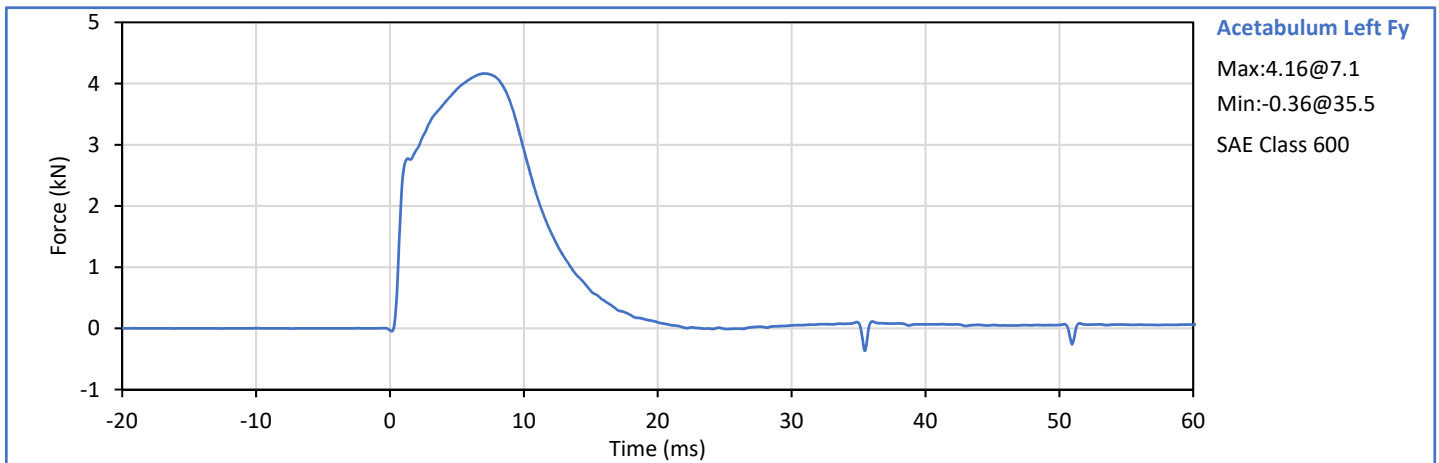
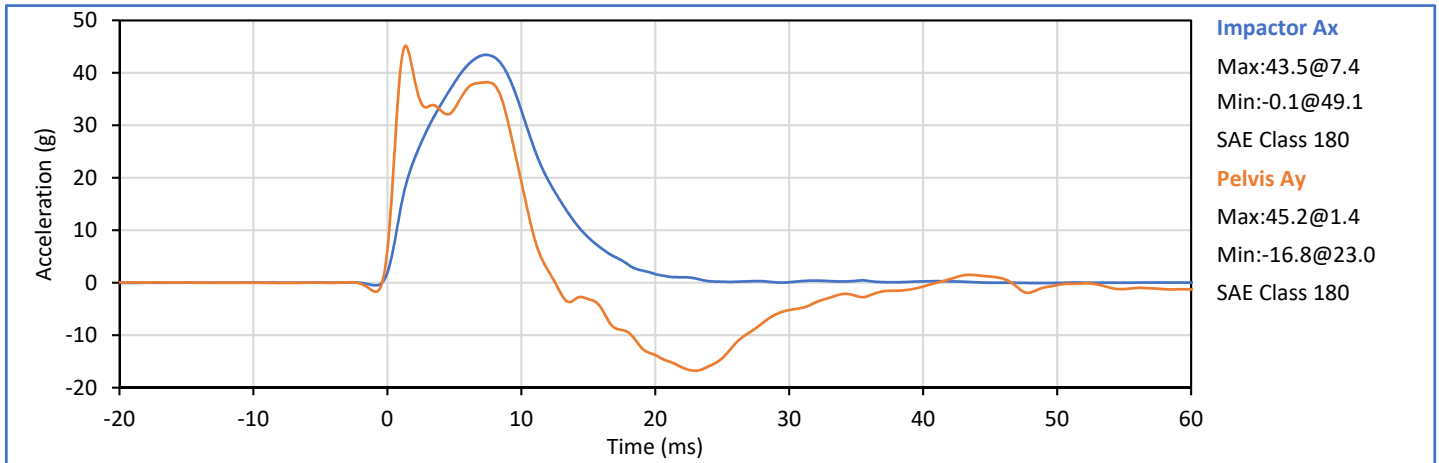


ATD Serial No.: 308

Test Date: 2018-12-05

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	6.60	6.80	6.71	Pass
Peak Acetabulum Fy	kN	3.60	4.30	4.16	Pass
Pelvis Ay after 6ms	g	34.0	42.0	38.2	Pass
Peak Impactor Ax	g	38.0	47.0	43.5	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12240 (SACO)



Technician:
 J. Hernandez

Approved By:
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-05

Pelvis Plug S/N: 12240 (SACO)



SID-IIs Pelvis Plug Certification Test

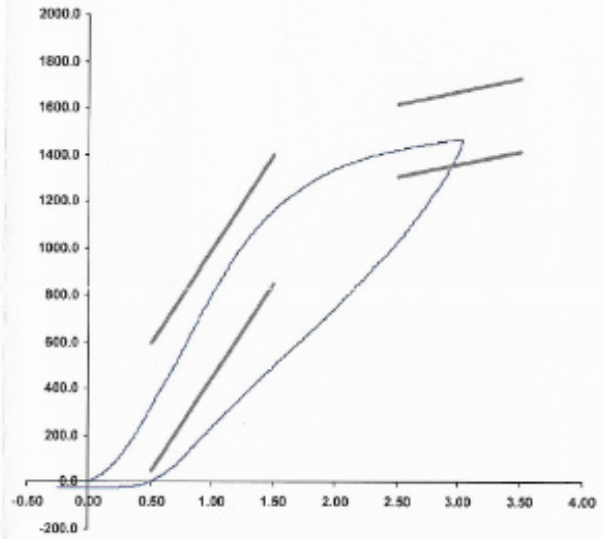
Plug S/N 12240
 Test Number 6626
 Report Number 6641
 Test Date 3/14/2018 1:06:20 PM

	Test Results	Spec. Min	Spec. Max
Force @ 0.5 mm (N)	322.20	50.00	900.00
Force @ 1.5 mm (N)	1,164.93	850.00	1,400.00
Force @ 2.5 mm (N)	1,422.42	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,468.25	1,351.00	1,673.00

Testing Machine STM-20 5985542
 Load Cell S/N (F1360947), Units (LBS) 1000
 Crosshead Speed (mm / min) or Rate 12.7
 Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4460

Template No 107 14-Mar-18
 SACO Research

By: DC Date: 3/14/18



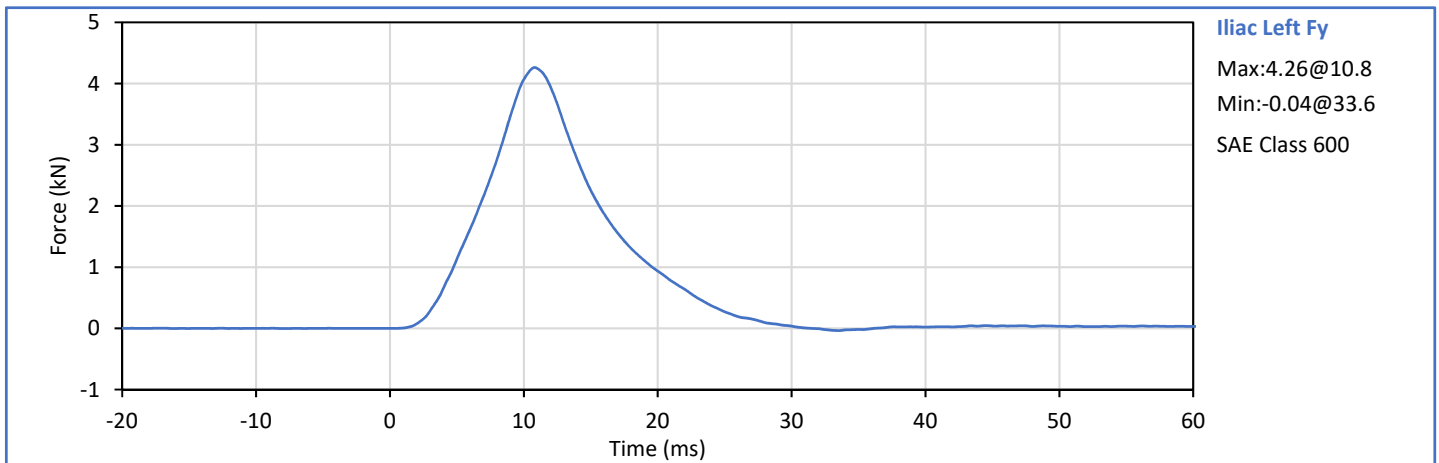
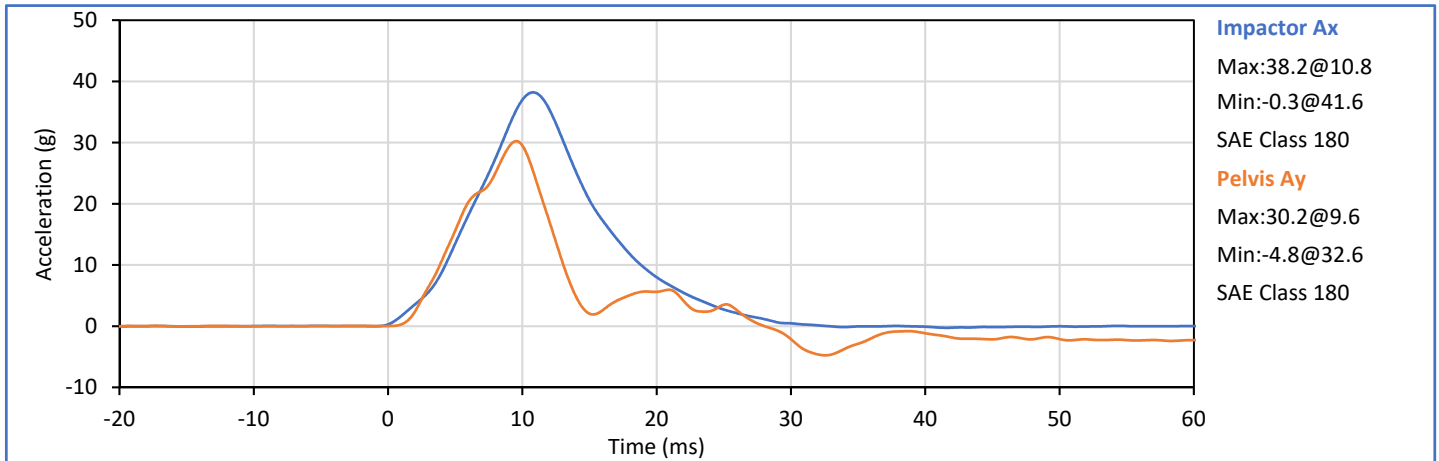
ATD Serial No.: 308

Test Date: 2018-12-05

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	44	Pass
Impactor Velocity	m/s	4.20	4.40	4.27	Pass
Peak Iliac Fy	kN	4.10	5.10	4.26	Pass
Pelvis Ay after 6ms	g	28.0	39.0	30.2	Pass
Peak Impactor Ax	g	36.0	45.0	38.2	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12228 (SACO) *

* Plug is not impacted and remains certified



Technician:
 J. Hernandez

Approved By:
 P. Puzzuto

APPENDIX C
POST-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA
LEFT SIDE CONFIGURATION



ATD Serial No.: F035

Test Date: 2018-12-14

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
1 - Sitting Height	mm	900	918	907	Pass
2 - Seat to Shoulder Joint	mm	558	572	563	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	100	Pass
5 - Sole to Seat, Sitting	mm	433	451	439	Pass
6 - Head Width	mm	152	158	154	Pass
7 - Shoulder/Arm Width	mm	461	479	469	Pass
8 - Thorax Width	mm	322	332	324	Pass
9 - Abdomen Width	mm	273	287	283	Pass
10 - Pelvis Lap Width	mm	359	373	367	Pass
11 - Head Depth	mm	196	206	201	Pass
12 - Thorax Depth	mm	262	272	269	Pass
13 - Abdomen Depth	mm	194	204	199	Pass
14 - Pelvis Depth	mm	235	245	241	Pass
15 - Back of Buttocks to Hip Joint (bolt Center)	mm	150	160	154	Pass
16 - Back of Buttocks to Front Knee	mm	597	615	604	Pass
				Overall Test Results	Pass

Technician: 
 J. Hernandez

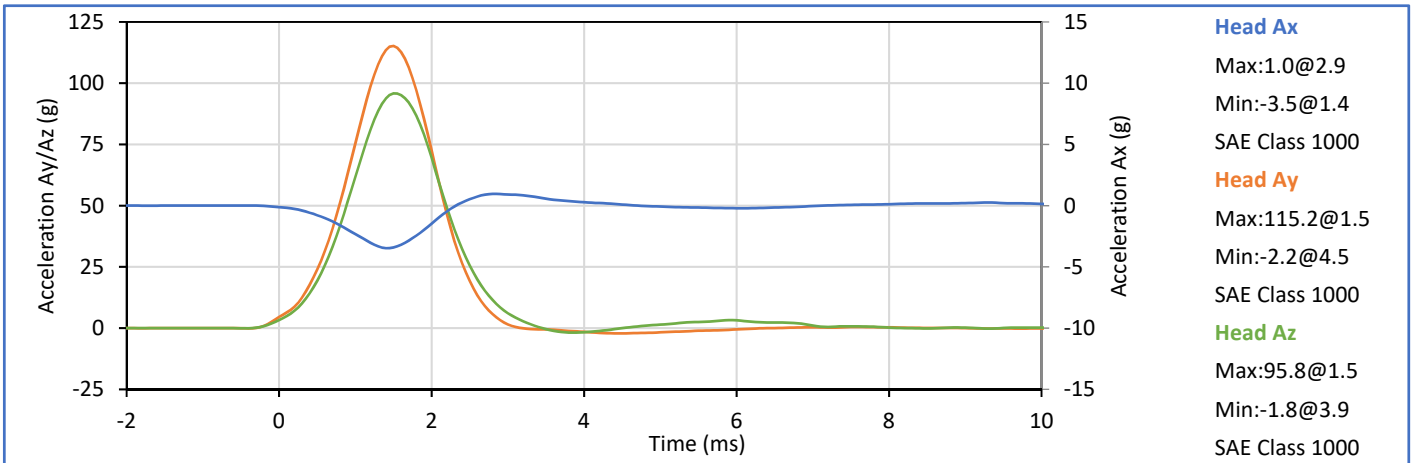
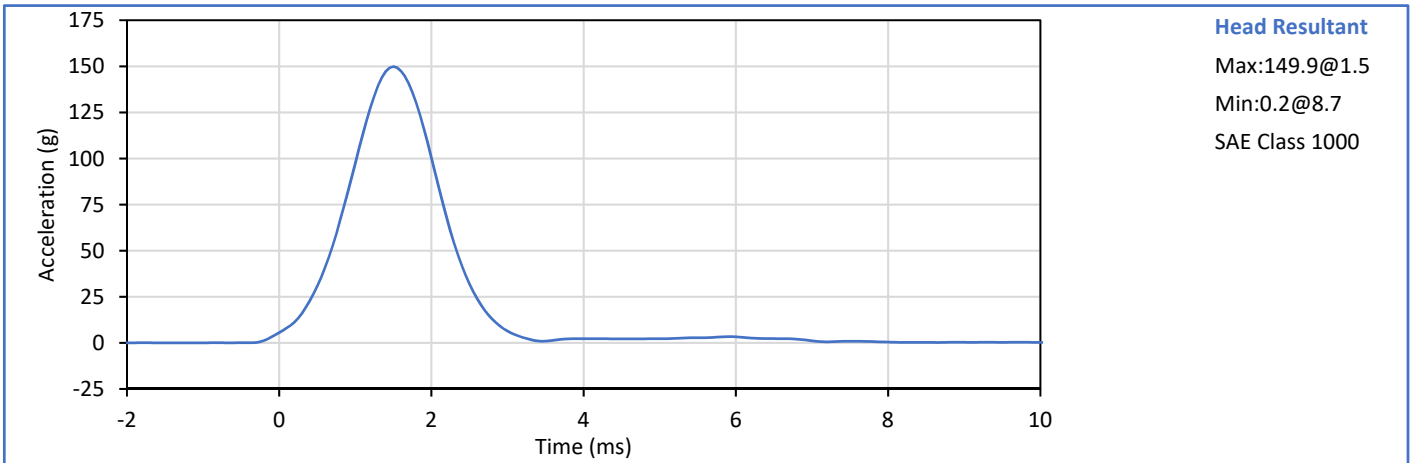
Approved By: 
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-14

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.6	Pass
Laboratory Humidity	%	10	70	30	Pass
Peak Resultant Acceleration	g	125.0	155.0	149.9	Pass
Peak Head Ax	g	-15.0	15.0	1.0	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

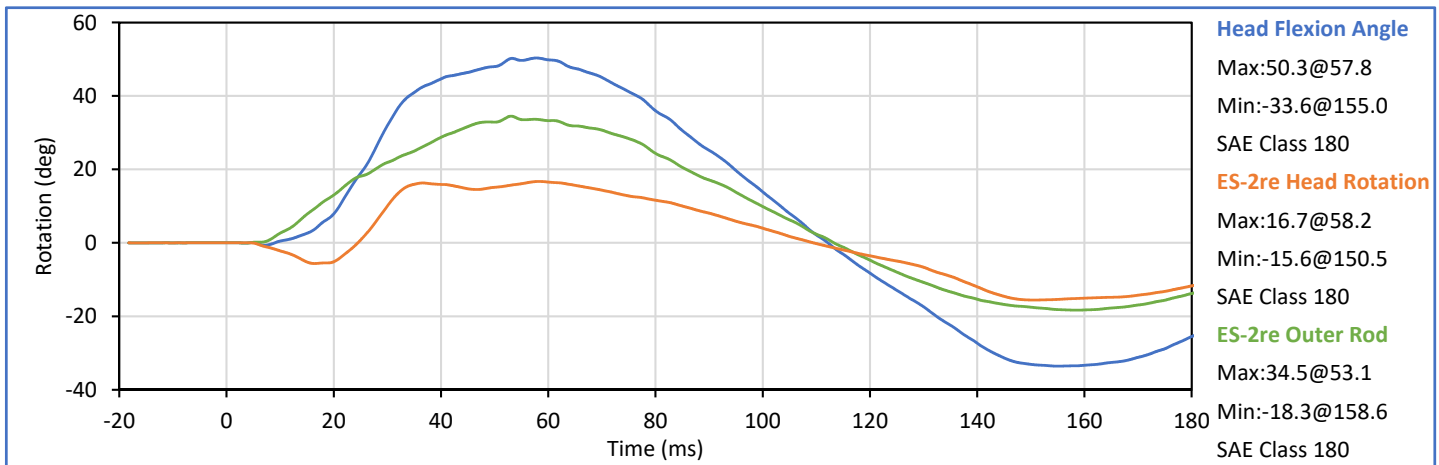
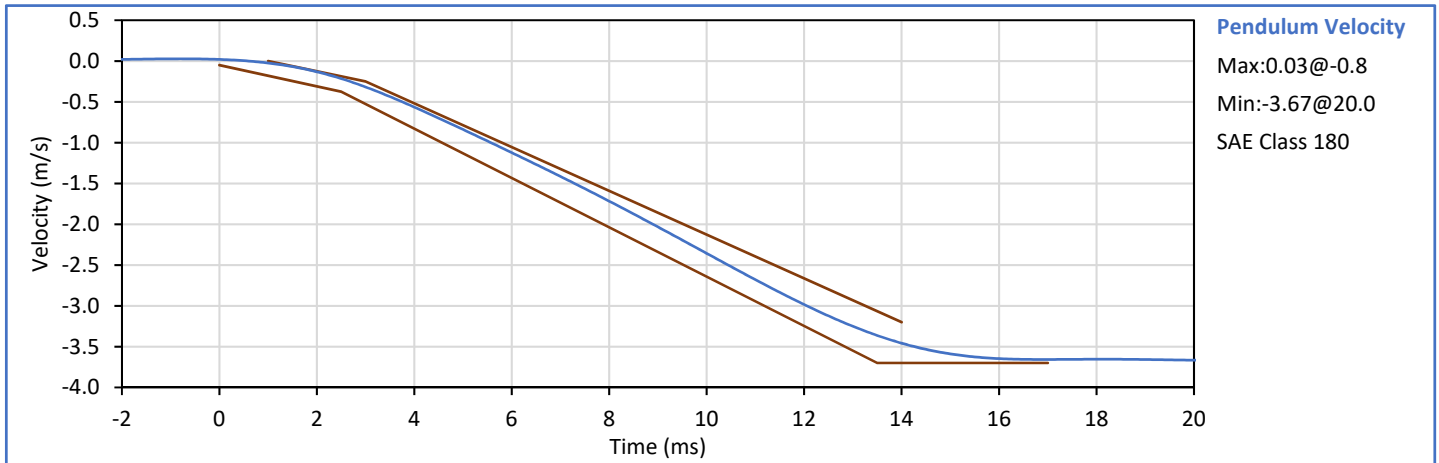
Approved By:
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-15

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	25	Pass
Pendulum Velocity	m/s	3.30	3.50	3.46	Pass
Peak Headform Flexion	deg	49.0	59.0	50.3	Pass
Time of Peak Headform Flexion	ms	54.0	66.0	57.8	Pass
Flexion Decay (Peak to zero)	ms	53.0	88.0	54.4	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

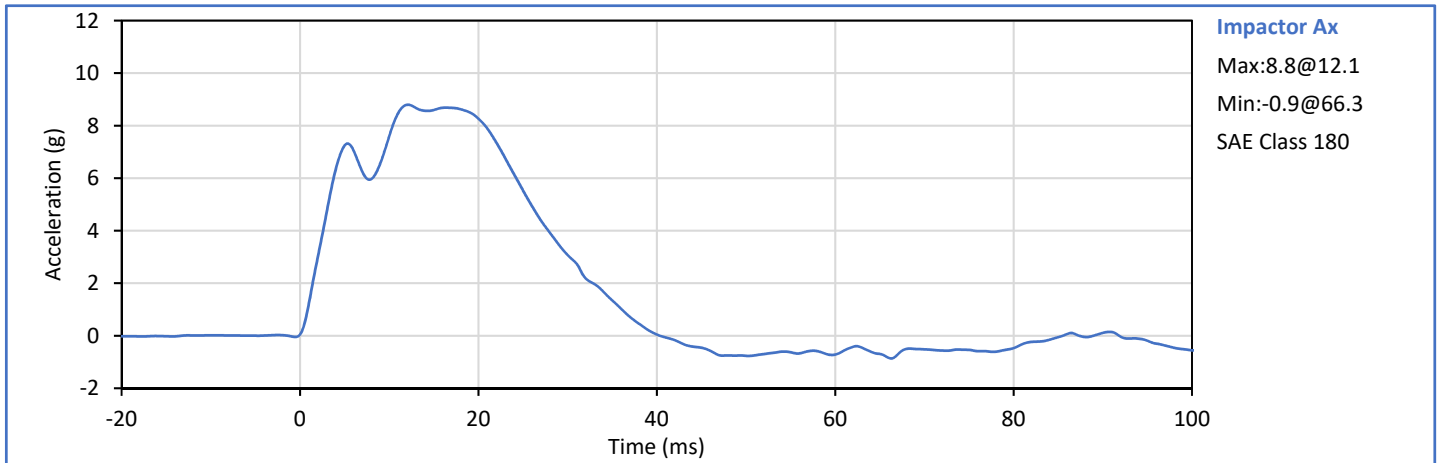
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-15

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.5	Pass
Laboratory Humidity	%	10	70	32	Pass
Impactor Velocity	m/s	4.20	4.40	4.31	Pass
Peak Impactor Ax	g	7.5	10.5	8.8	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
J. Hernandez

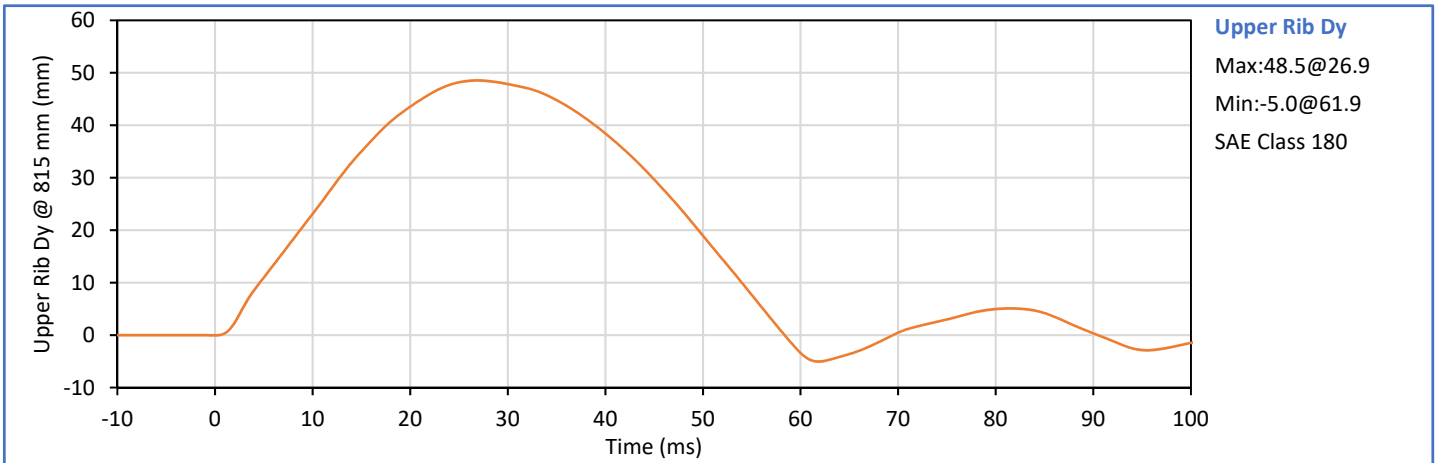
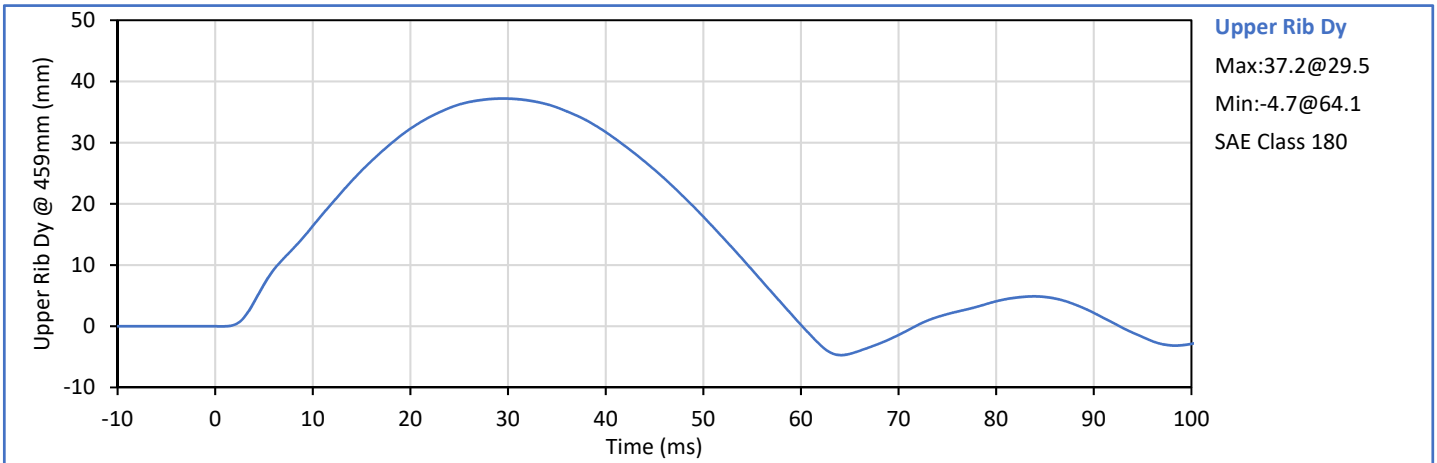
Approved By: *P. Puzzuto*
P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-15

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
Upper Rib Dy @ 459mm	mm	36.0	40.0	37.2	Pass
Upper Rib Dy @ 815mm	mm	46.0	51.0	48.5	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

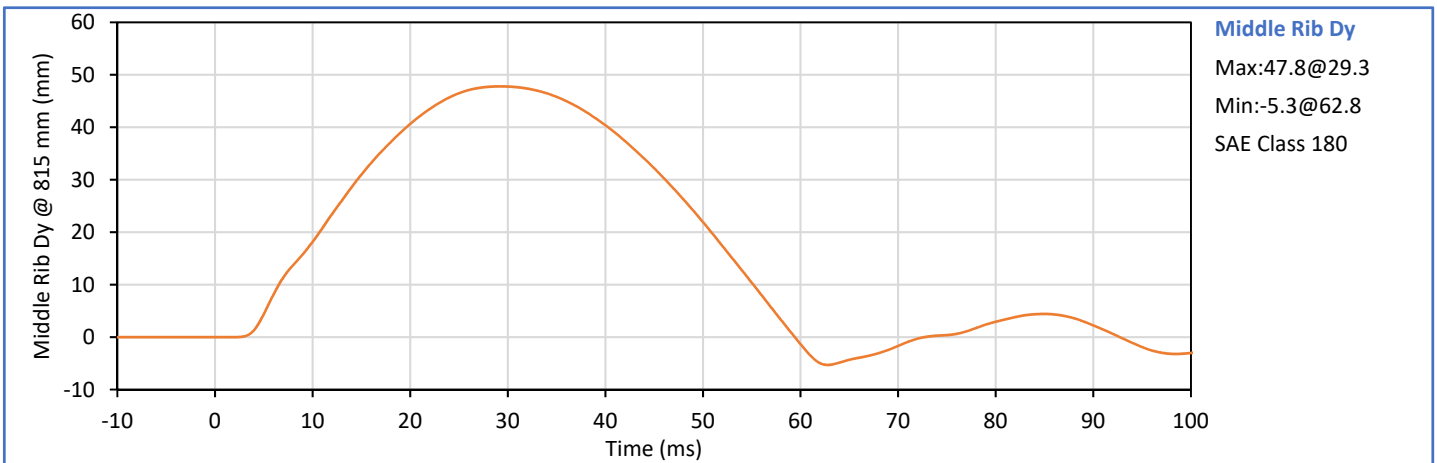
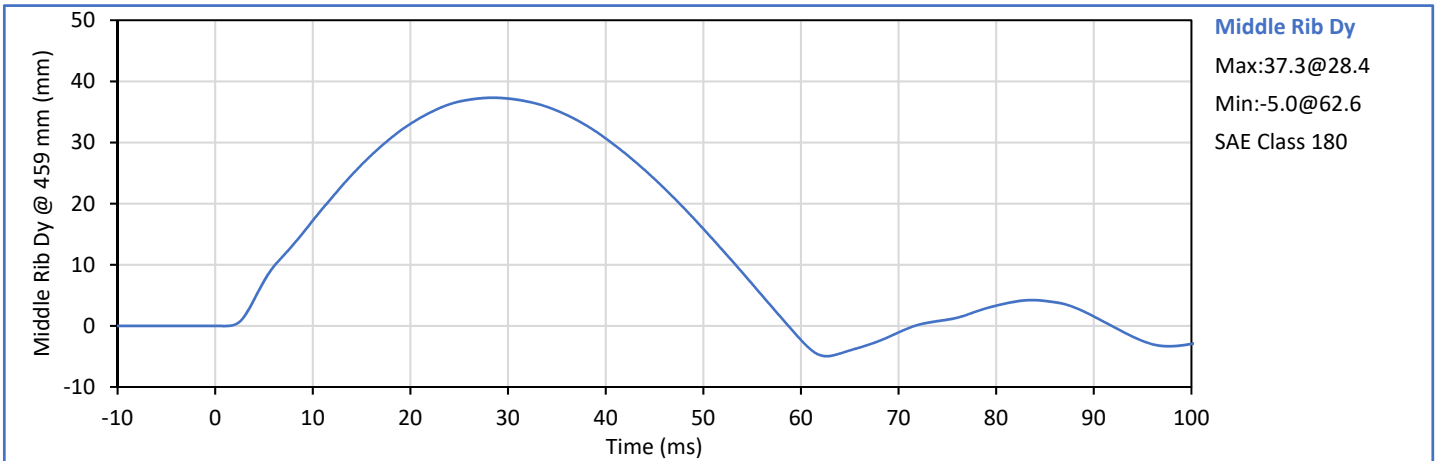
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-15

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
Middle Rib Dy @ 459mm	mm	36.0	40.0	37.3	Pass
Middle Rib Dy @ 815mm	mm	46.0	51.0	47.8	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

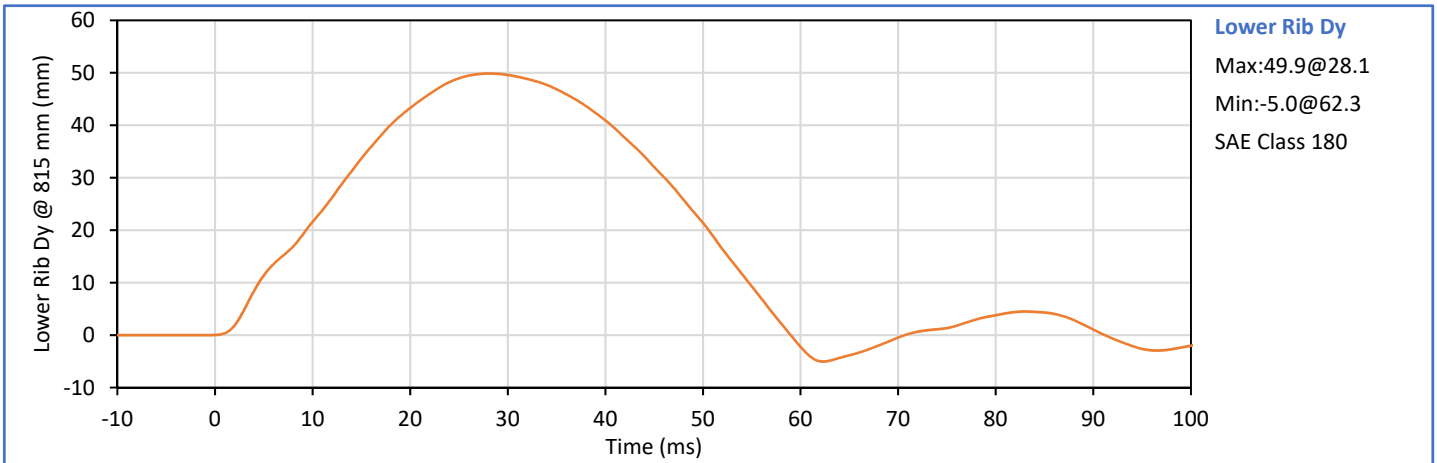
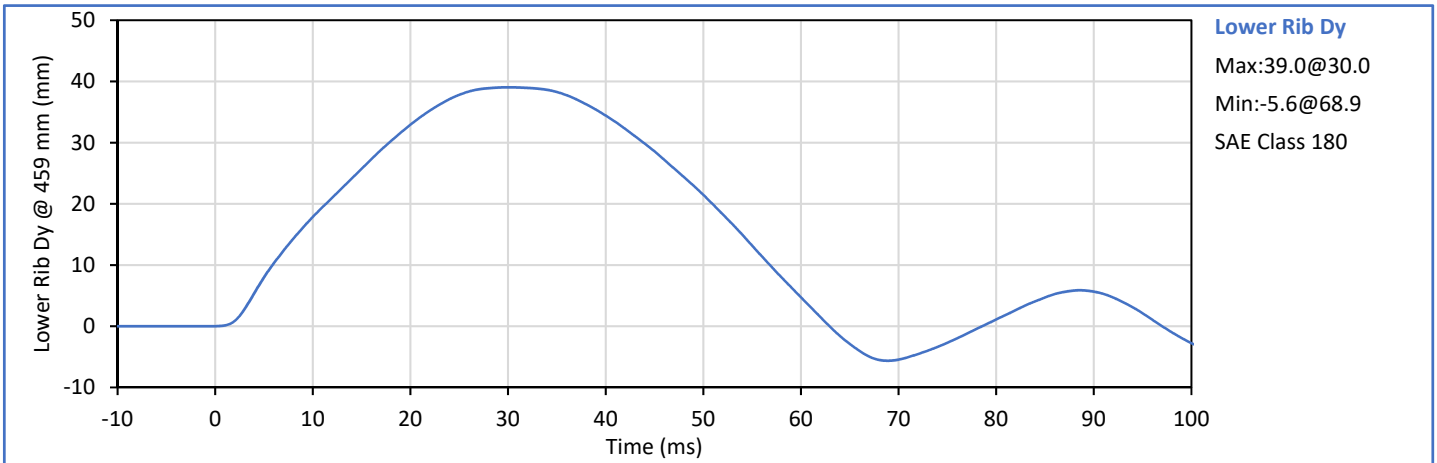
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-15

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
Lower Rib Dy @ 459mm	mm	36.0	40.0	39.0	Pass
Lower Rib Dy @ 815mm	mm	46.0	51.0	49.9	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

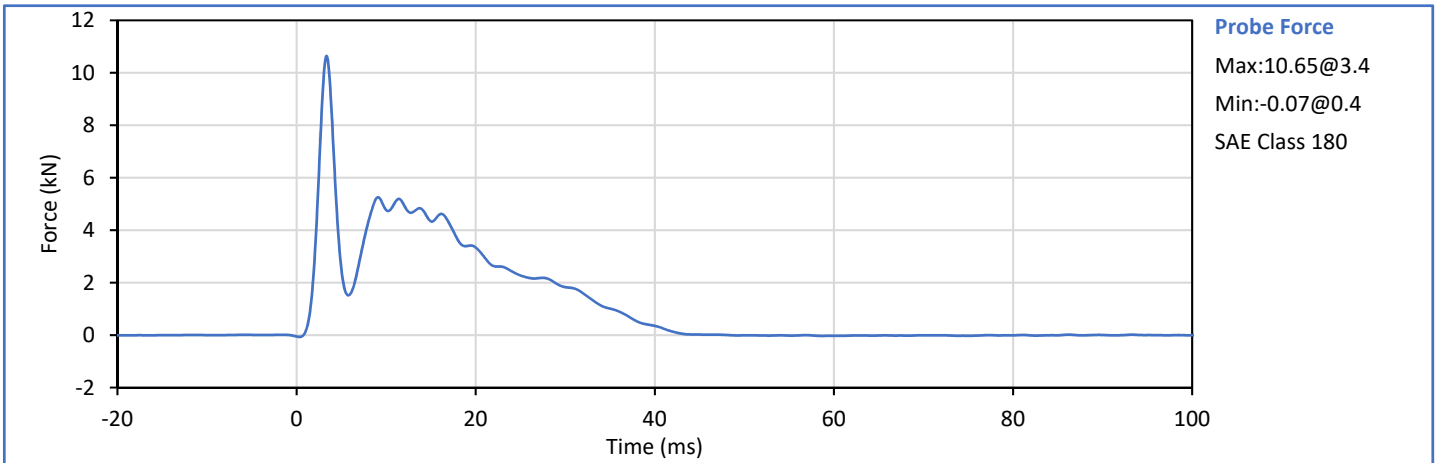
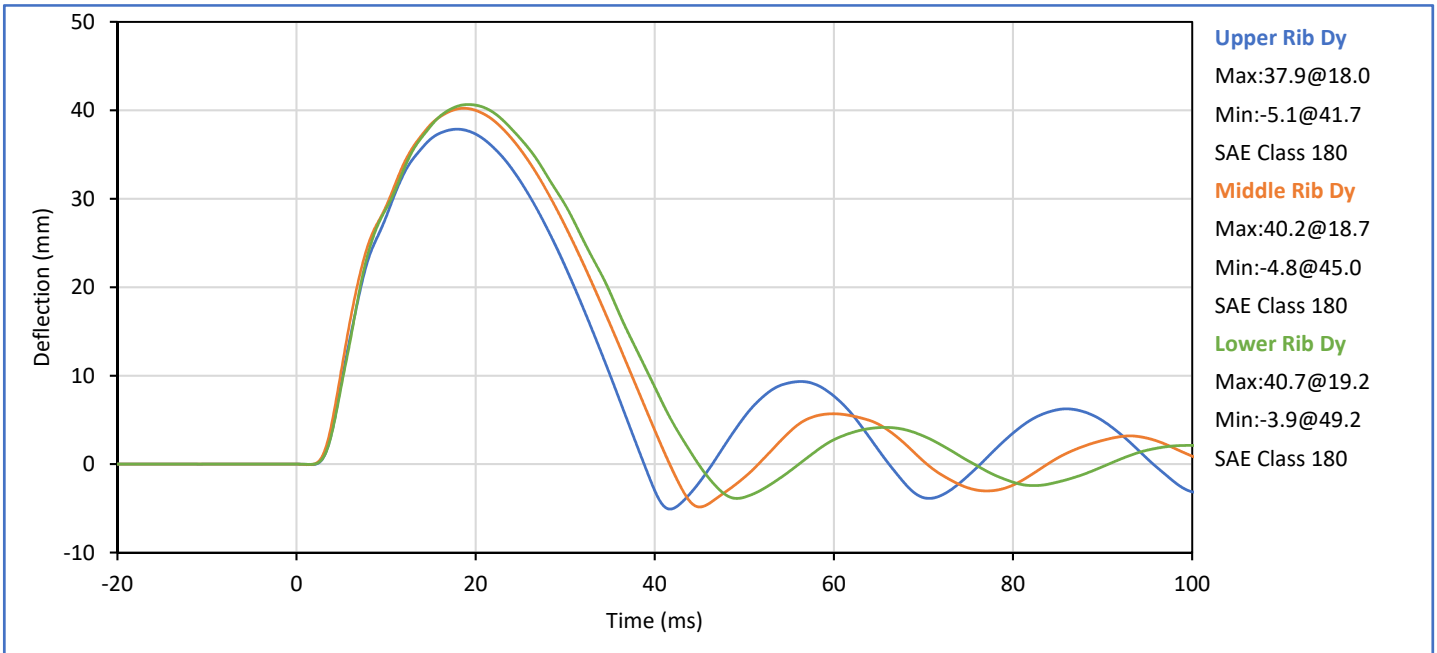
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-14

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	5.40	5.60	5.42	Pass
Peak Upper Rib Dy	mm	34.0	41.0	37.9	Pass
Peak Middle Rib Dy	mm	37.0	45.0	40.2	Pass
Peak Lower Rib Dy	mm	37.0	44.0	40.7	Pass
Peak Impactor Force After 6 ms	kN	5.10	6.20	5.26	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

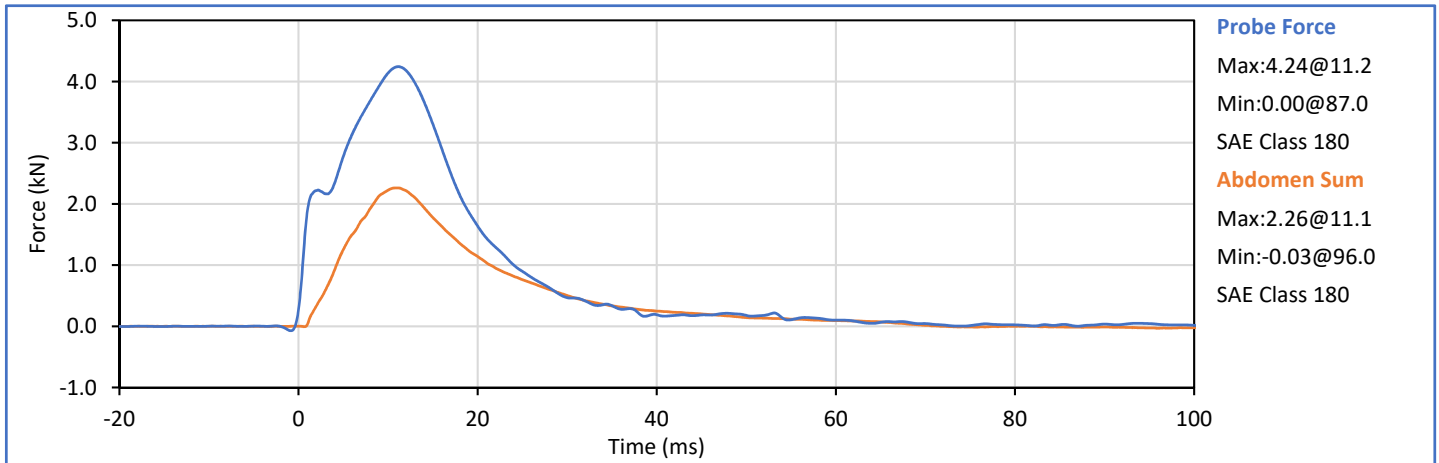
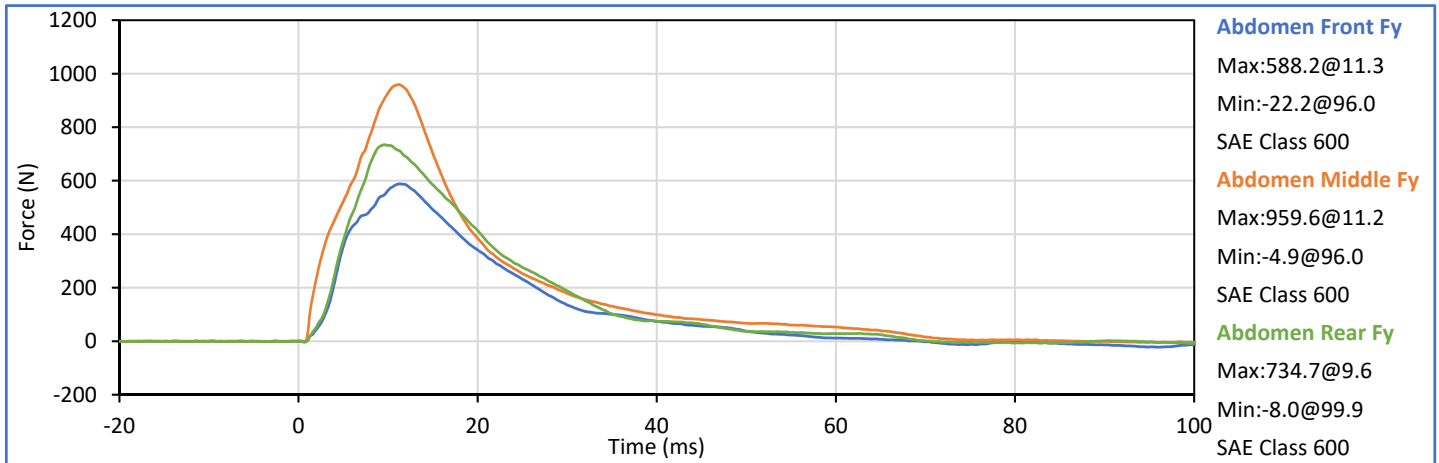
Approved By:
 P. Puzzuto

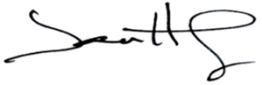



ATD Serial No.: F035

Test Date: 2018-12-14

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Humidity	%	10	70	28	Pass
Impactor Velocity	m/s	3.90	4.10	4.02	Pass
Peak Impactor Force	kN	4.00	4.80	4.24	Pass
Time of Peak Impactor Force	ms	10.6	13.0	11.2	Pass
Sum of Abdomen Forces	kN	2.20	2.70	2.26	Pass
Time of Peak Sum Abdomen Force	ms	10.0	12.3	11.1	Pass
Overall Test Results					Pass



Technician: 
 J. Hernandez

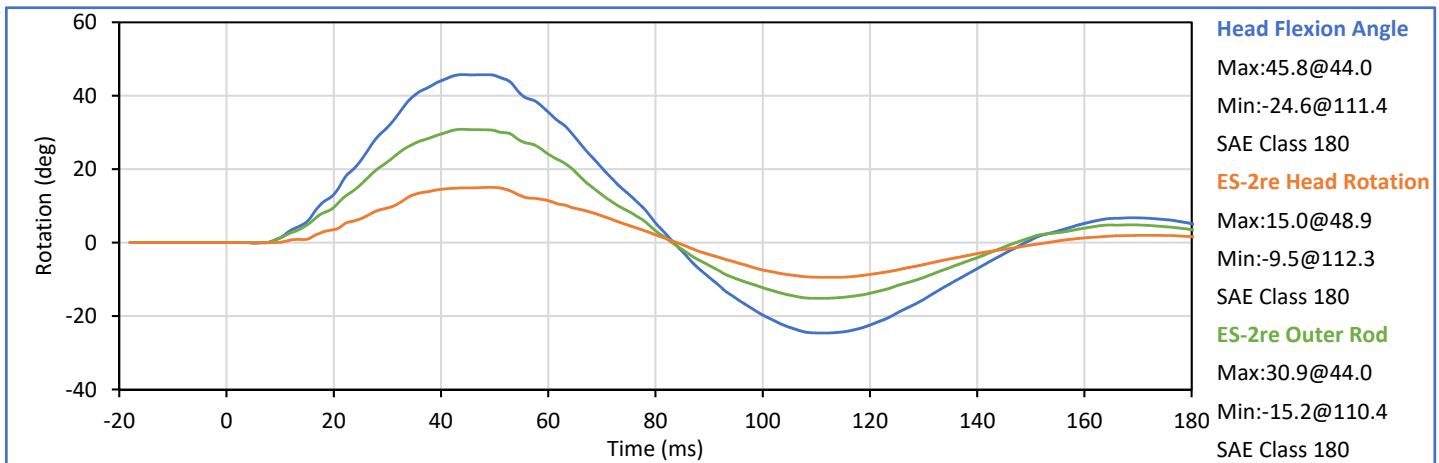
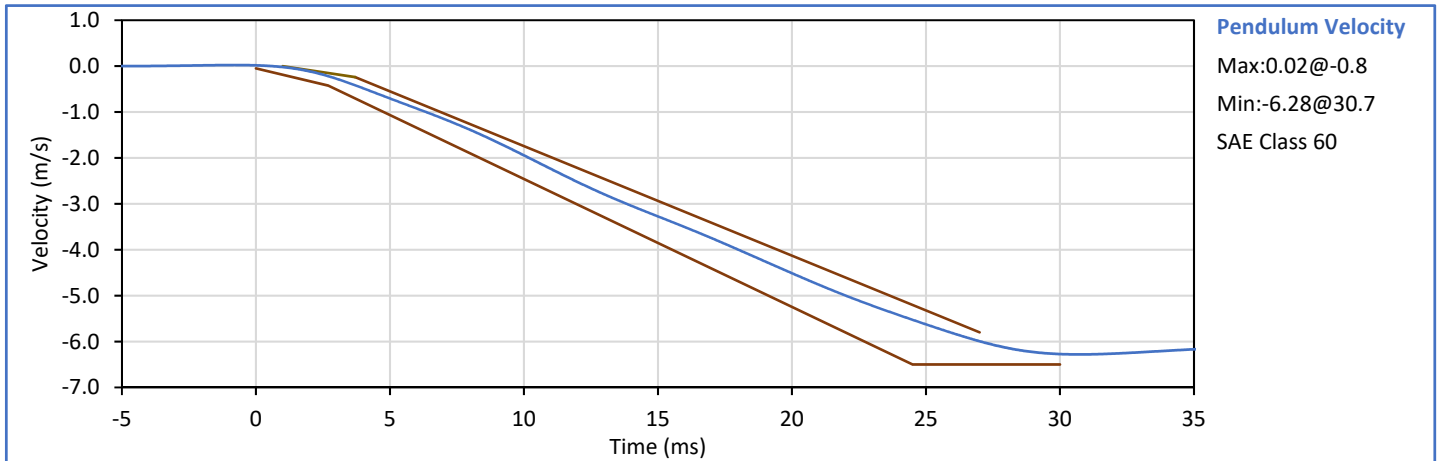
Approved By: 
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-15

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	6.10	Pass
Peak Headform Flexion	deg	45.0	55.0	45.8	Pass
Time of Peak Headform Flexion	ms	39.0	53.0	44.0	Pass
Flexion Decay (Peak to zero)	ms	37.0	57.0	39.4	Pass
Overall Test Results					Pass



Technician: *J. Hernandez*
 J. Hernandez

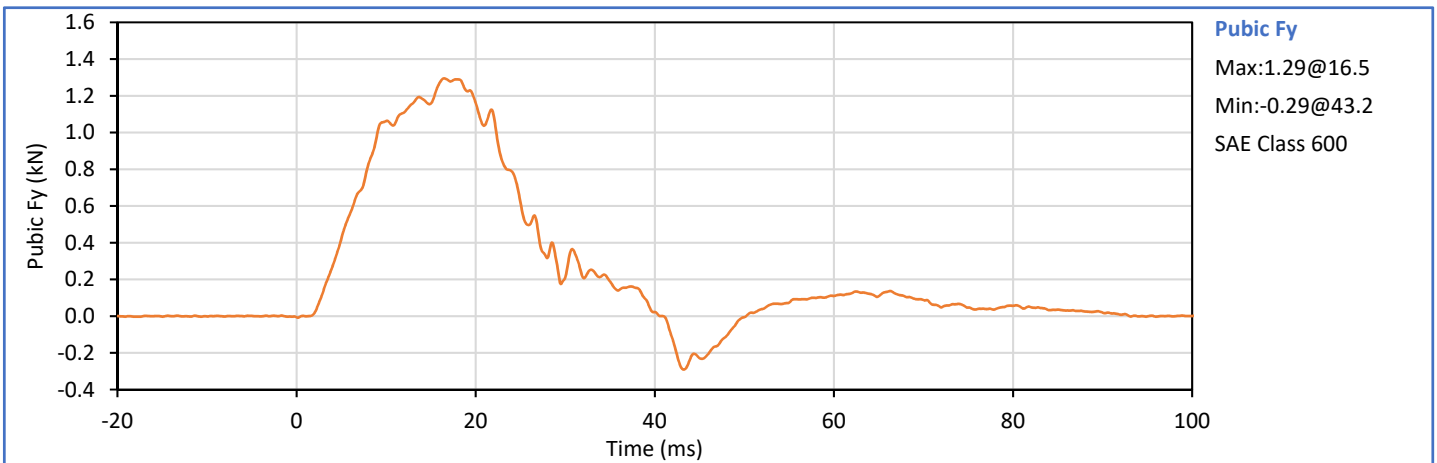
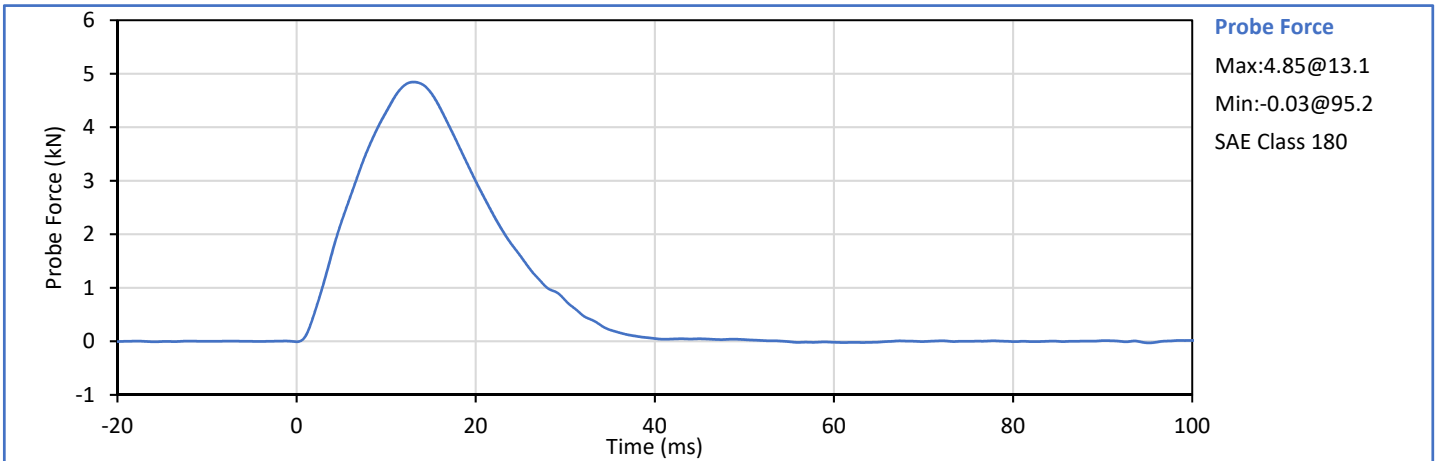
Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: F035

Test Date: 2018-12-14

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	4.35	Pass
Peak Impactor Force	kN	4.70	5.40	4.85	Pass
Time of Peak Impactor Force	ms	11.8	16.1	13.1	Pass
Pubic Symphysis Fy	kN	1.23	1.59	1.29	Pass
Time of Peak Pubic Symphysis Fy	ms	12.2	17.0	16.5	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

Approved By:
 P. Puzzuto

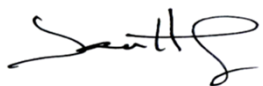



**SID-IIs Small Side Impact ATD
 External Measurements**

ATD Serial No.: 308

Test Date: 2018-12-13

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	30	Pass
A - Sitting Height	mm	772	788	778	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	106	Pass
F - Thigh Clearance	mm	119	135	127	Pass
G - Head Breadth	mm	140	148	145	Pass
H - Head Back From Backline	mm	40	46	43	Pass
I - Head Depth	mm	178	188	185	Pass
J - Head Circumference	mm	541	551	547	Pass
K - Buttock To Knee Length	mm	514	540	525	Pass
L - Popliteal Height	mm	343	369	355	Pass
K - Knee Pivot To Floor Height	mm	392	409	401	Pass
N - Buttock Popliteal Length	mm	416	442	430	Pass
O - Chest Depth W/O Jacket	mm	195	211	206	Pass
P - Foot Length	mm	216	232	225	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	318	Pass
R - Arm Length	mm	249	259	256	Pass
S - Knee Joint To Seatback	mm	477	493	488	Pass
V - Shoulder Width	mm	341	357	346	Pass
W - Foot Width	mm	78	94	86	Pass
Y - Chest Circumference W/Jacket	mm	851	881	855	Pass
Z - Waist Circumference	mm	761	791	779	Pass
Overall Test Results					Pass

Technician: 
 J. Hernandez

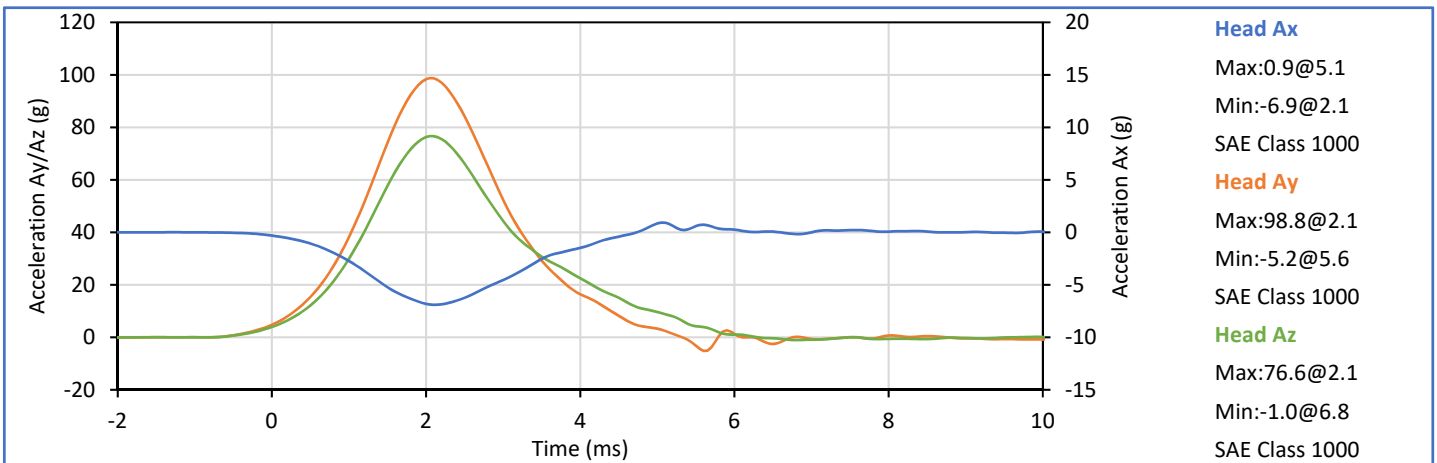
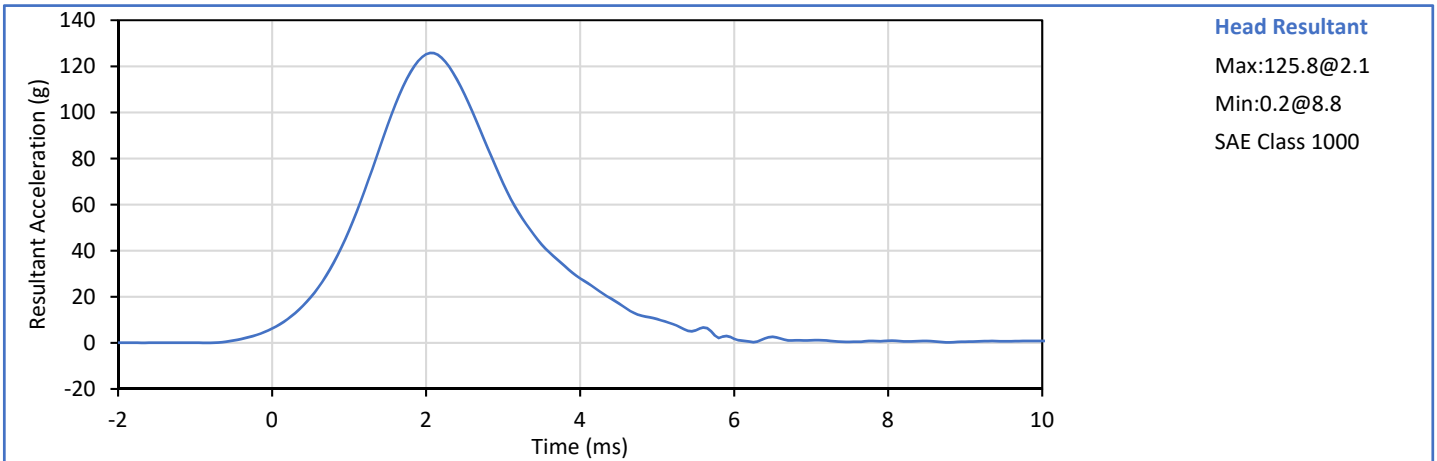
Approved By: 
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	30	Pass
Peak Resultant Acceleration	g	115.0	137.0	125.8	Pass
Peak Head Ax	g	-15.0	15.0	-6.9	Pass
Oscillations After Main Pulse	%	0.0	15.0	2.1	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

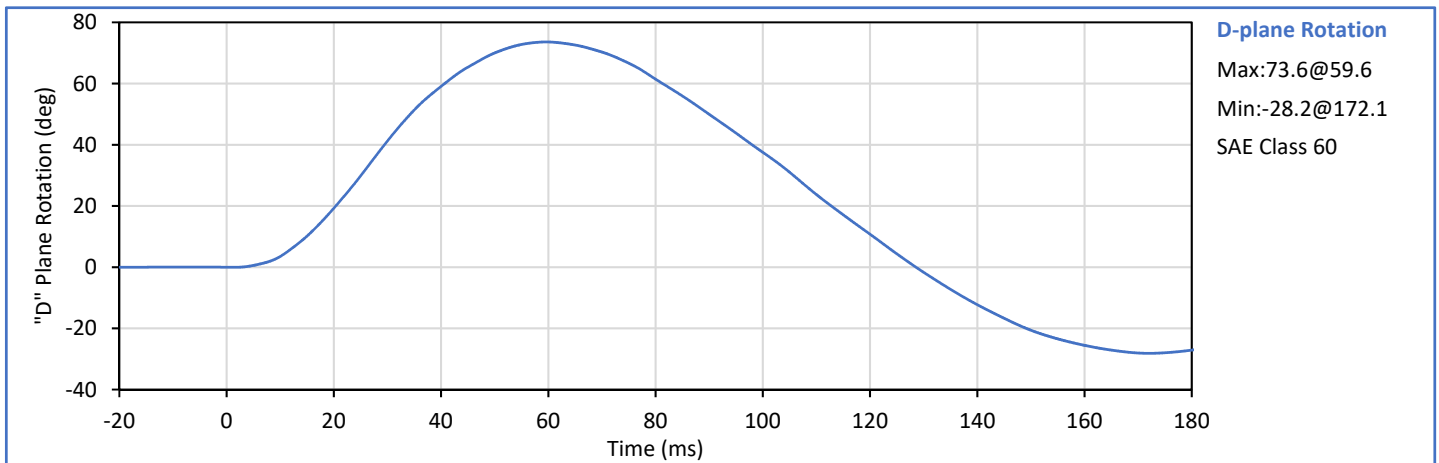
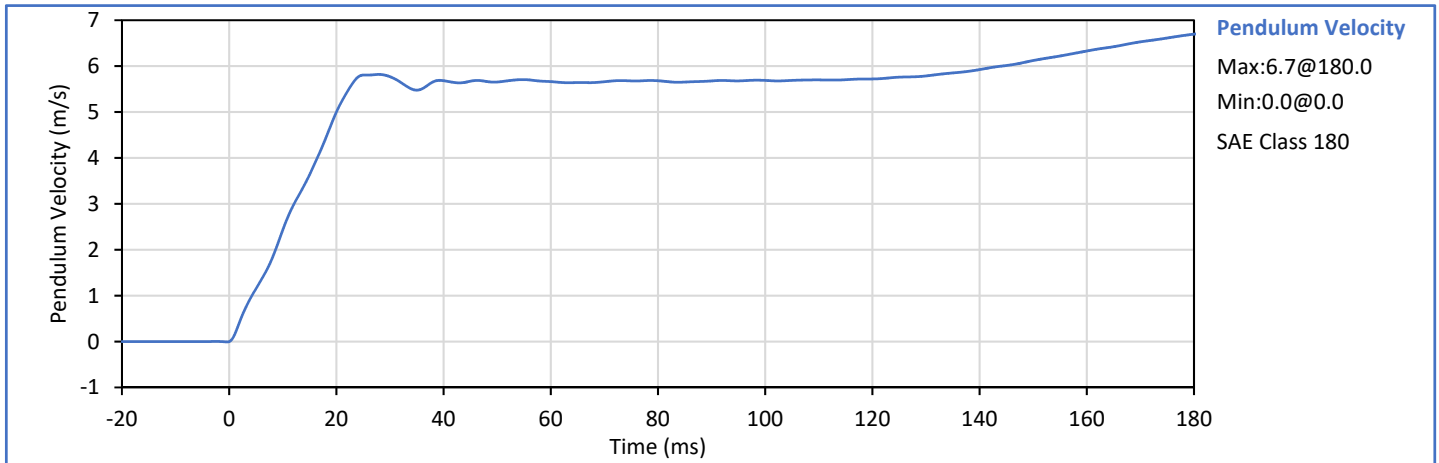
Approved By:
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-14

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
Pendulum Velocity	m/s	5.51	5.63	5.55	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.43	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.63	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	5.00	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.81	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.82	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	73.6	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	59.6	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-44.0	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	109.2	Pass
Overall Test Results					Pass



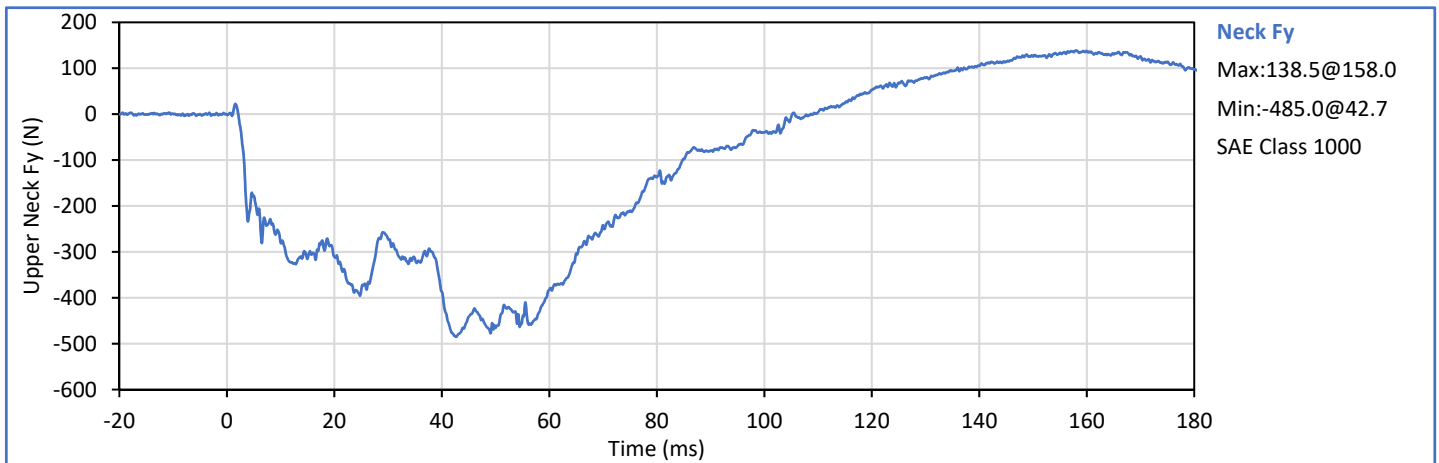
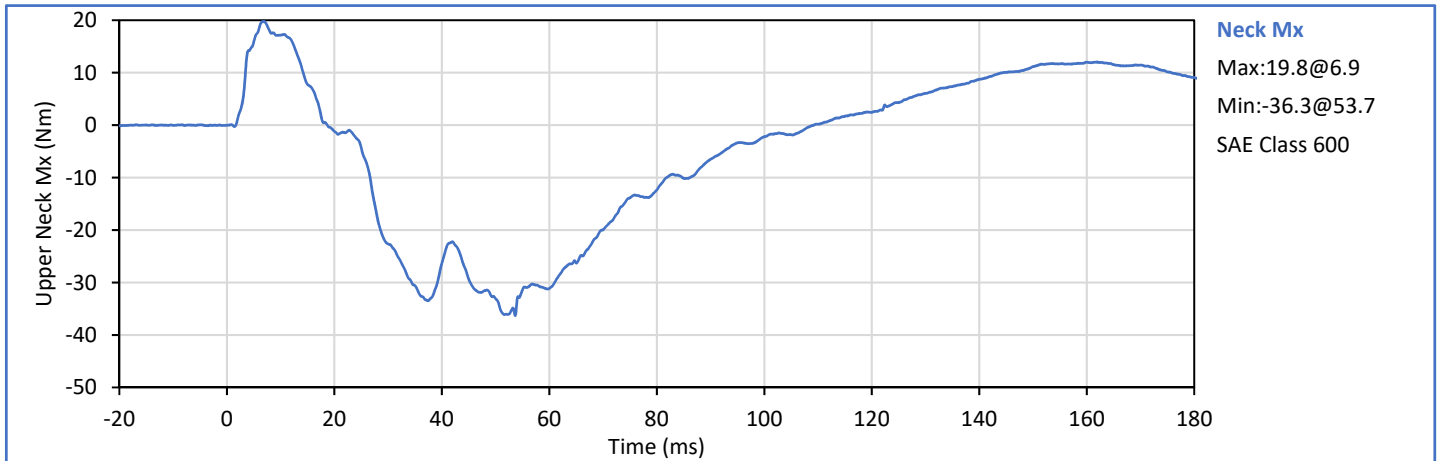
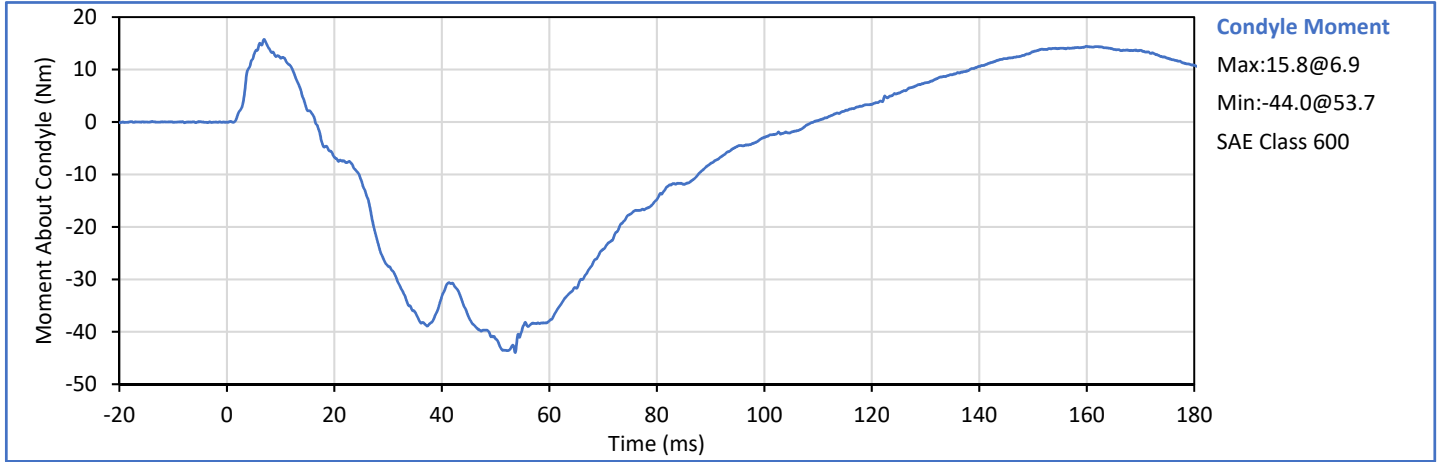
Technician: *J. Hernandez*
 J. Hernandez

Approved By: *P. Puzzuto*
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-14

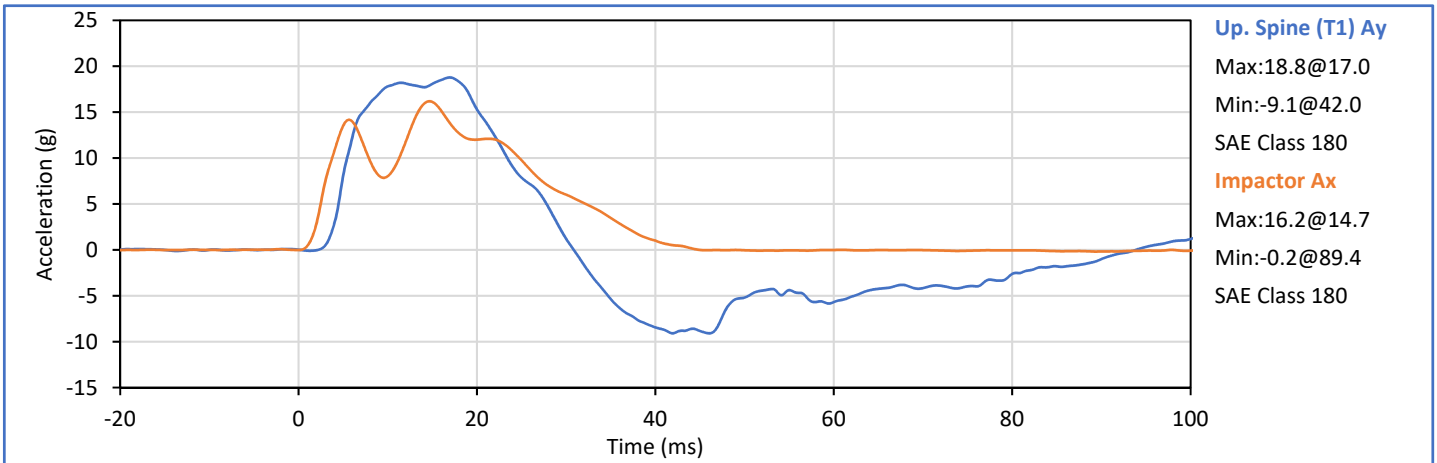
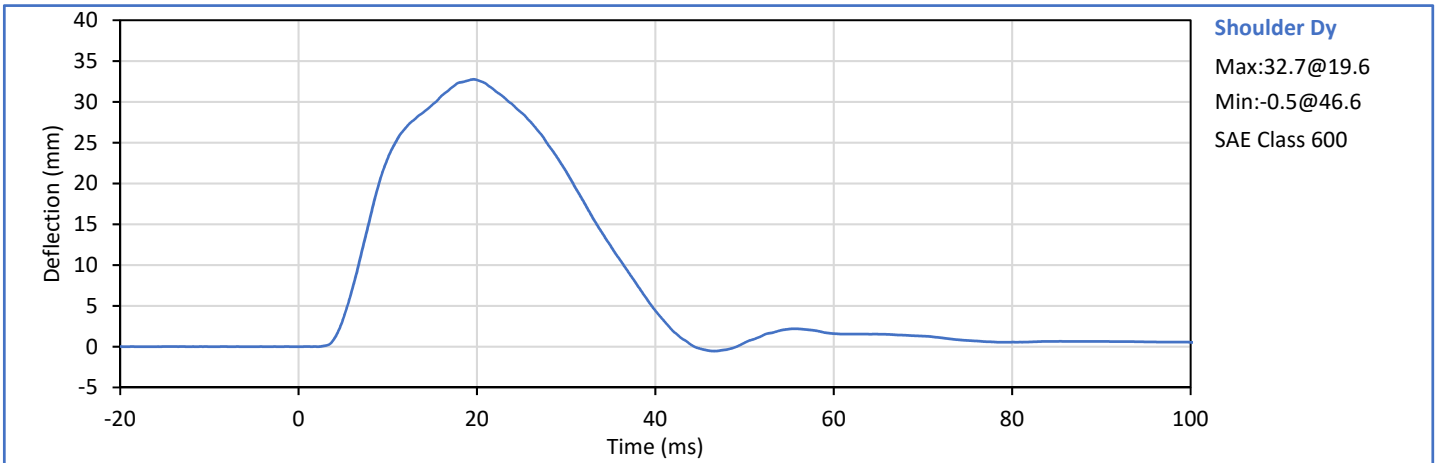




ATD Serial No.: 308

Test Date: 2018-12-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	39	Pass
Impactor Velocity	m/s	4.20	4.40	4.34	Pass
Peak Shoulder Dy	mm	28.0	37.0	32.7	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.8	Pass
Peak Impactor Ax	g	13.0	18.0	16.2	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

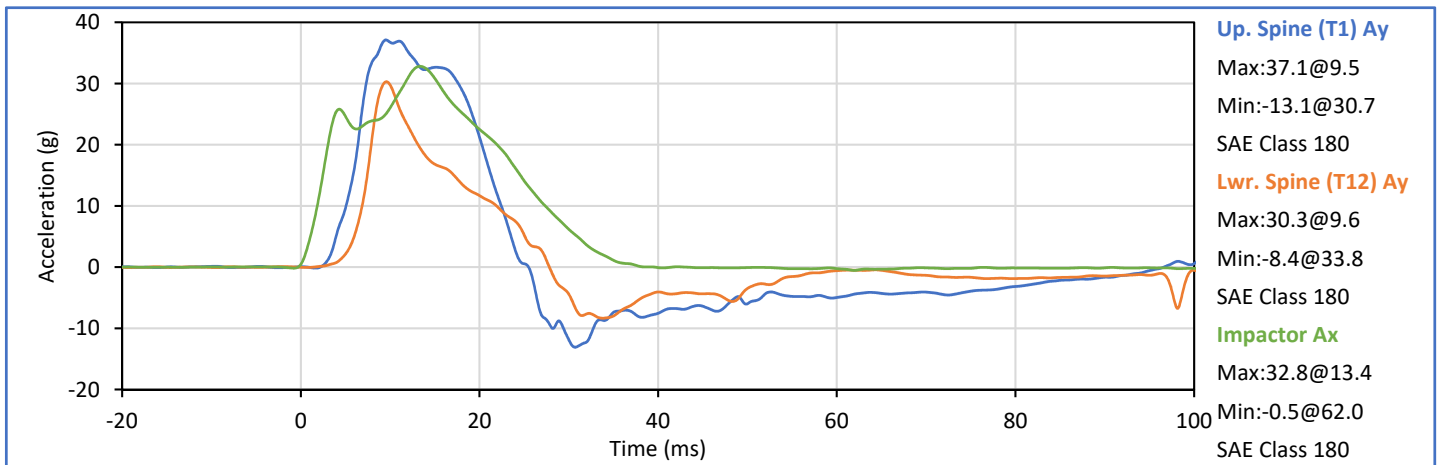
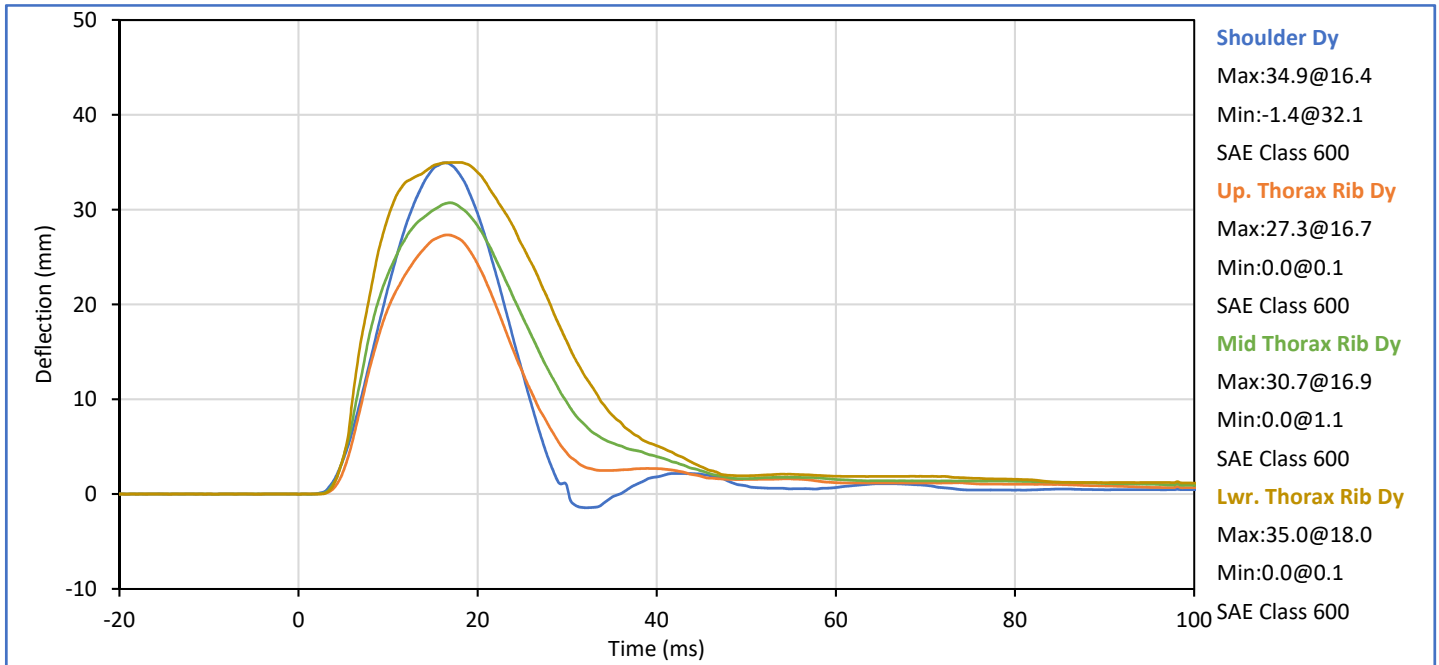
Approved By:
 P. Puzzuto

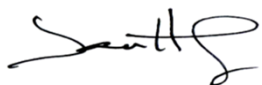



ATD Serial No.: 308

Test Date: 2018-12-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	27	Pass
Impactor Velocity	m/s	6.60	6.80	6.63	Pass
Peak Shoulder Dy	mm	31.0	40.0	34.9	Pass
Peak Upper Rib Dy	mm	25.0	32.0	27.3	Pass
Peak Middle Rib Dy	mm	30.0	36.0	30.7	Pass
Peak Lower Rib Dy	mm	32.0	38.0	35.0	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	37.1	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



Technician: 
 J. Hernandez

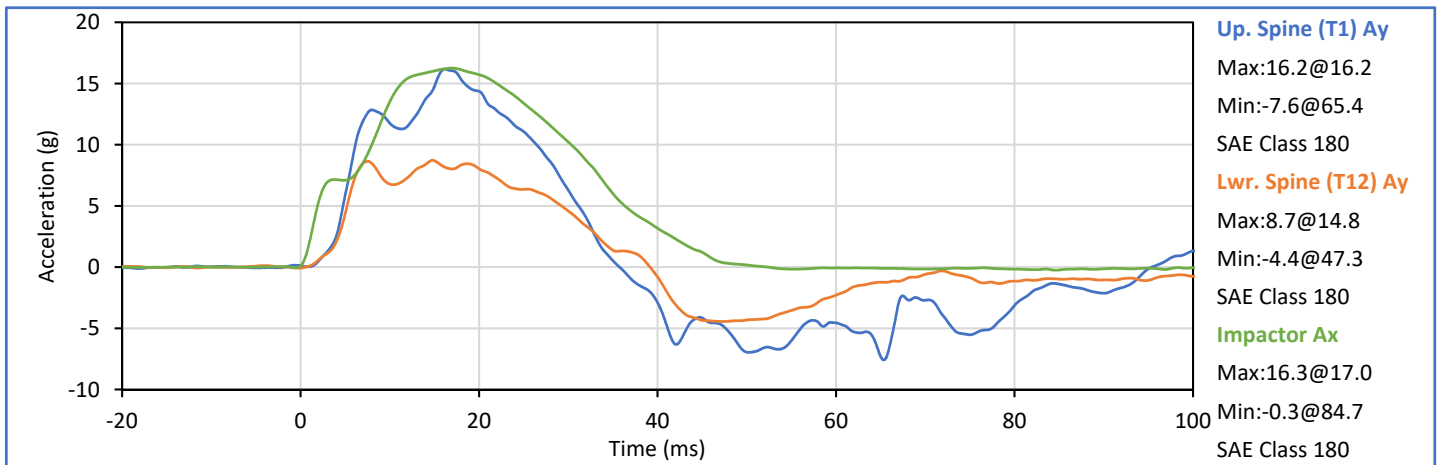
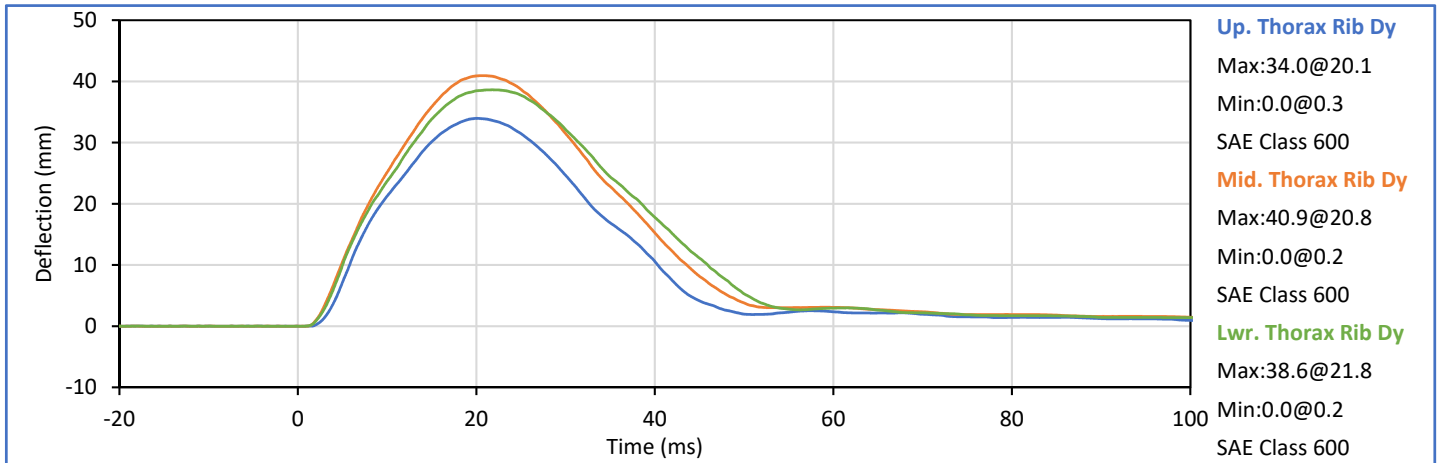
Approved By: 
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-12-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.23	Pass
Peak Upper Rib Dy	mm	32.0	40.0	34.0	Pass
Peak Middle Rib Dy	mm	39.0	45.0	40.9	Pass
Peak Lower Rib Dy	mm	35.0	43.0	38.6	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	16.2	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	8.7	Pass
Peak Impactor Ax	g	14.0	18.0	16.3	Pass
Overall Test Results					Pass



Technician:
 J. Hernandez

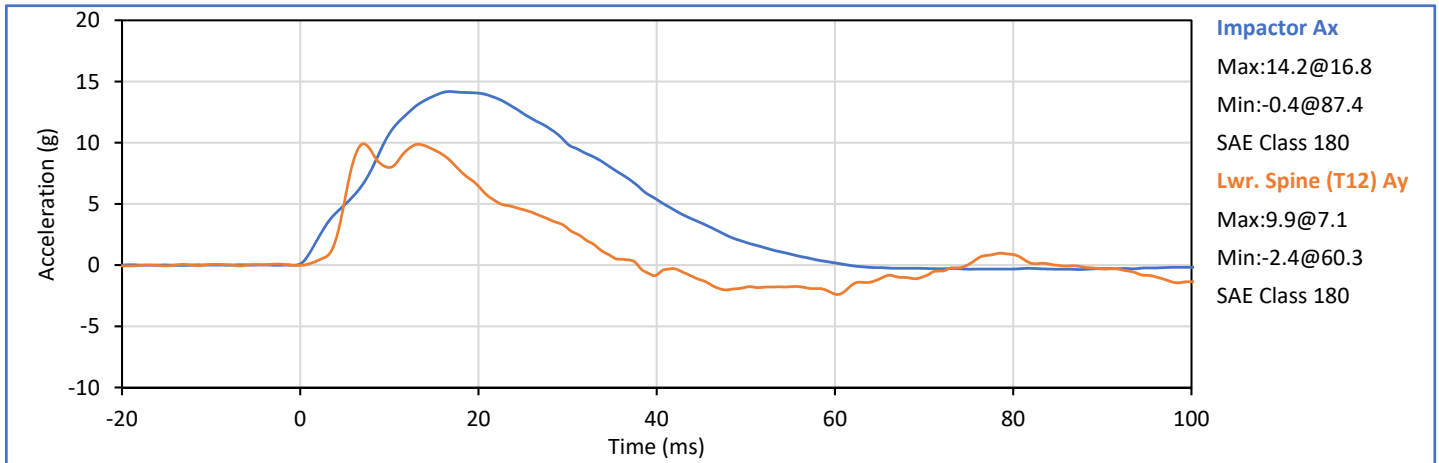
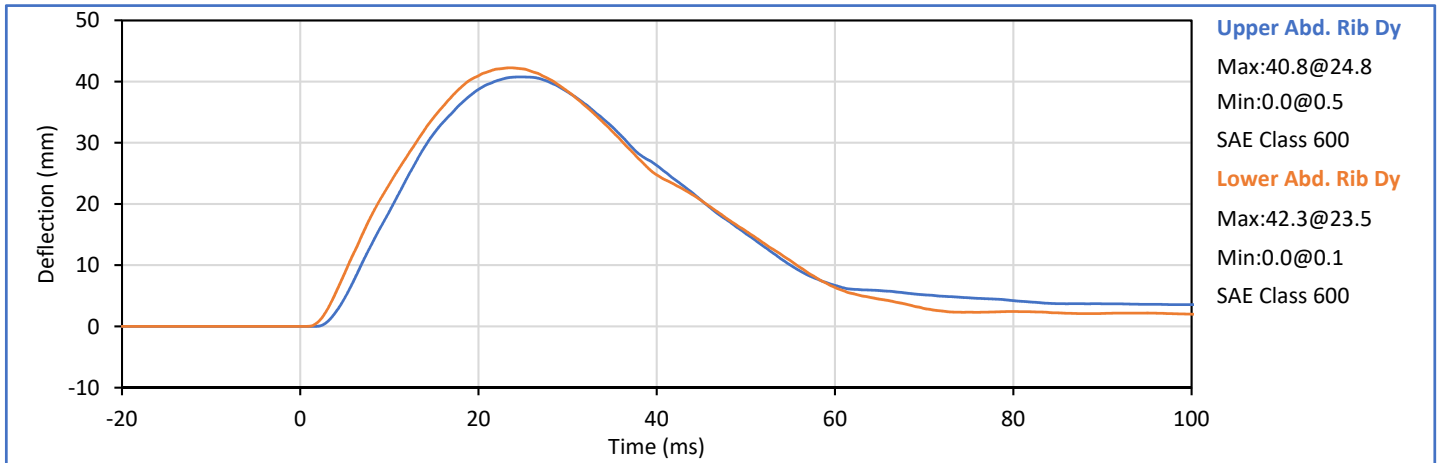
Approved By:
 P. Puzzuto

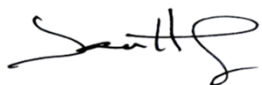



ATD Serial No.: 308

Test Date: 2018-12-13

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	40.8	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	42.3	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.9	Pass
Peak Impactor Ax	g	12.0	16.0	14.2	Pass
Overall Test Results					Pass



Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto

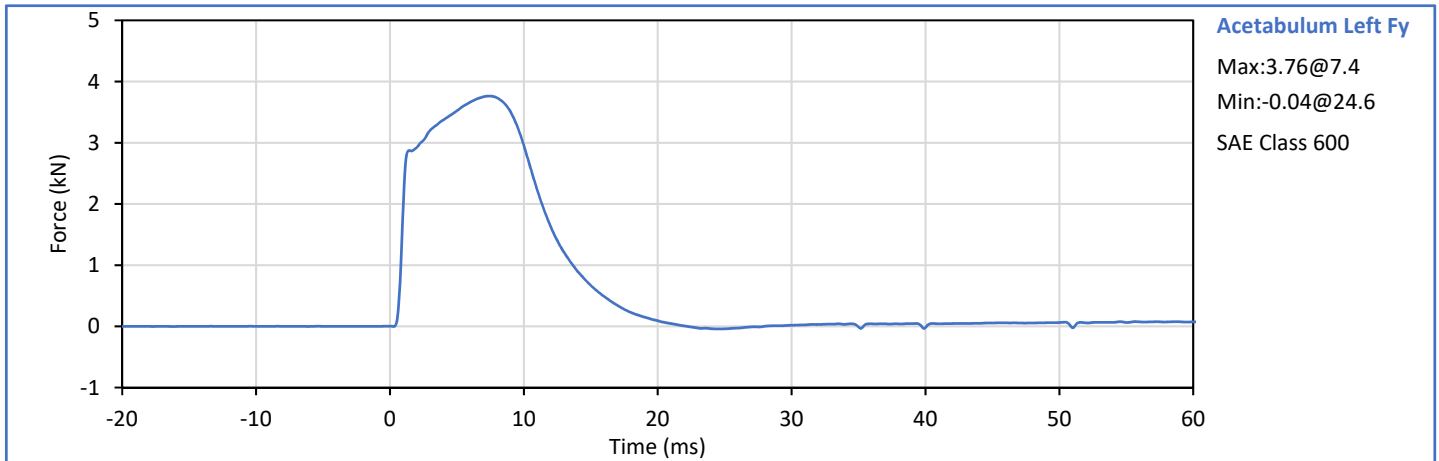
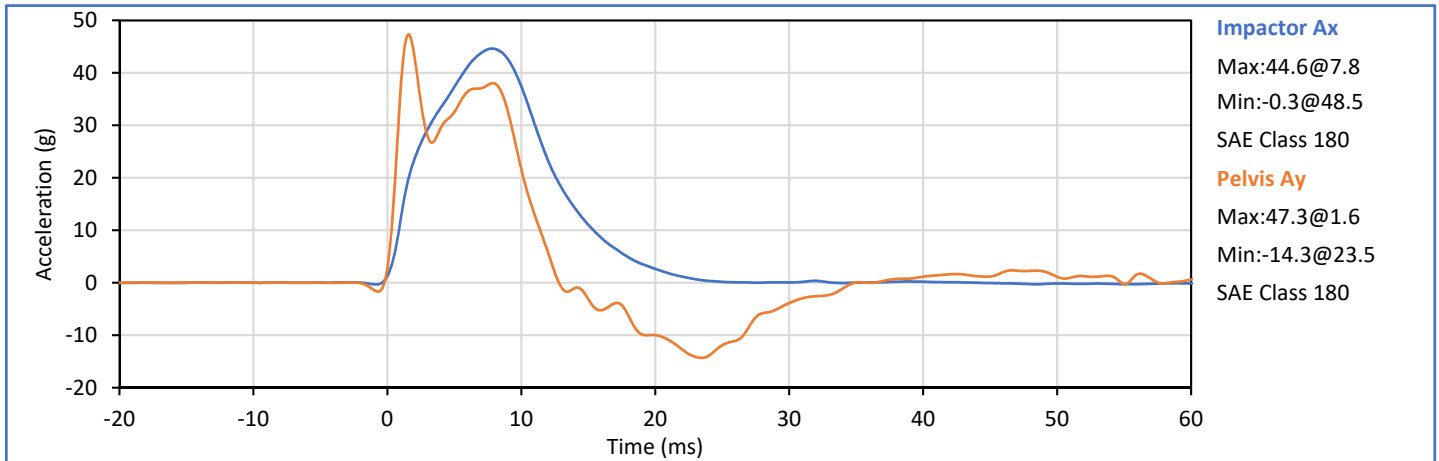


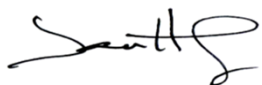
ATD Serial No.: 308


Test Date: 2018-12-14

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	6.60	6.80	6.61	Pass
Peak Acetabulum Fy	kN	3.60	4.30	3.76	Pass
Pelvis Ay after 6ms	g	34.0	42.0	38.1	Pass
Peak Impactor Ax	g	38.0	47.0	44.6	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 11401 (SACO)



Technician: 
 J. Hernandez

Approved By: 
 P. Puzzuto



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 ATD
 Pelvis Acetabulum Impact**

ATD Serial No.: 308

Test Date: 2018-12-14

Pelvis Plug S/N: 11401 (SACO)



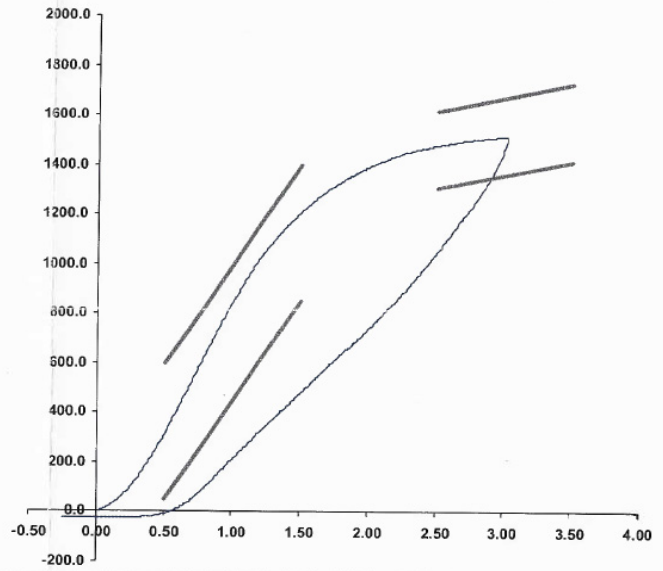
SID-IIs Pelvis Plug Certification Test

Plug S/N 11401
 Test Number 2870
 Report Number 2867
 Test Date 8/29/2016 9:31:00 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	313.63	50.00	600.00
Force @ 1.5 mm (N)	1,211.12	850.00	1,400.00
Force @ 2.5 mm (N)	1,479.41	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,516.24	1,361.00	1,673.00

Testing Machine STM-20 5965542
 Load Cell S/N (T1240813), Units (LBS) 1000
 Crosshead Speed (mm / min) or Rate 12.7
 Extension or Position Measured by XHD_100 (XHD100)
 Notes:

Force (-N) vs Extension (-mm)



Operator DC

Part Number 180-4450

Template No 107 29-Aug-16
 SACO Research

By: DC Date: 8/29/16

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



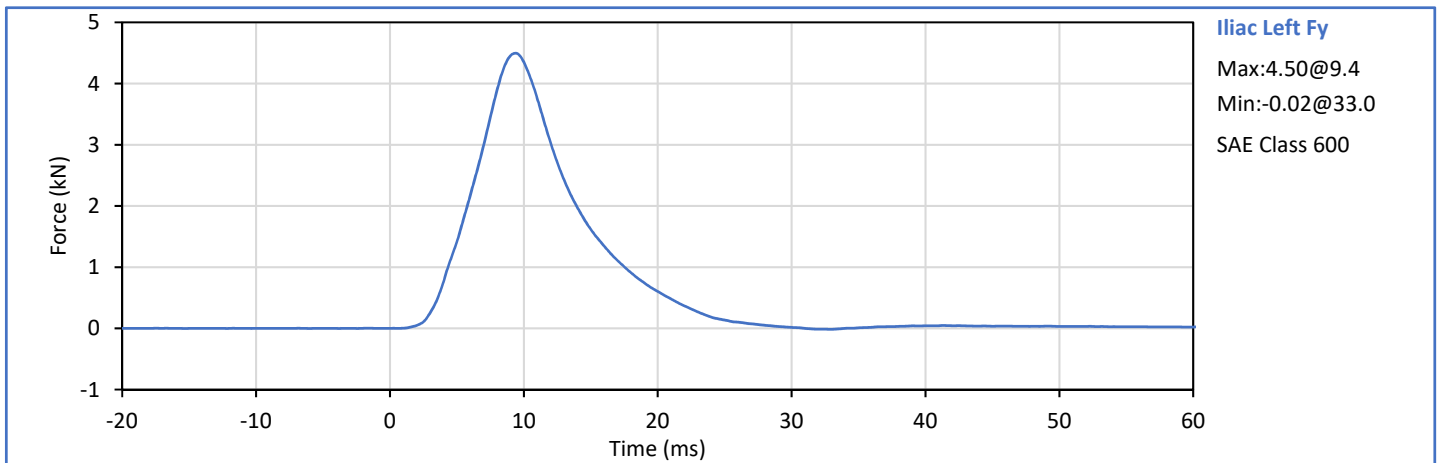
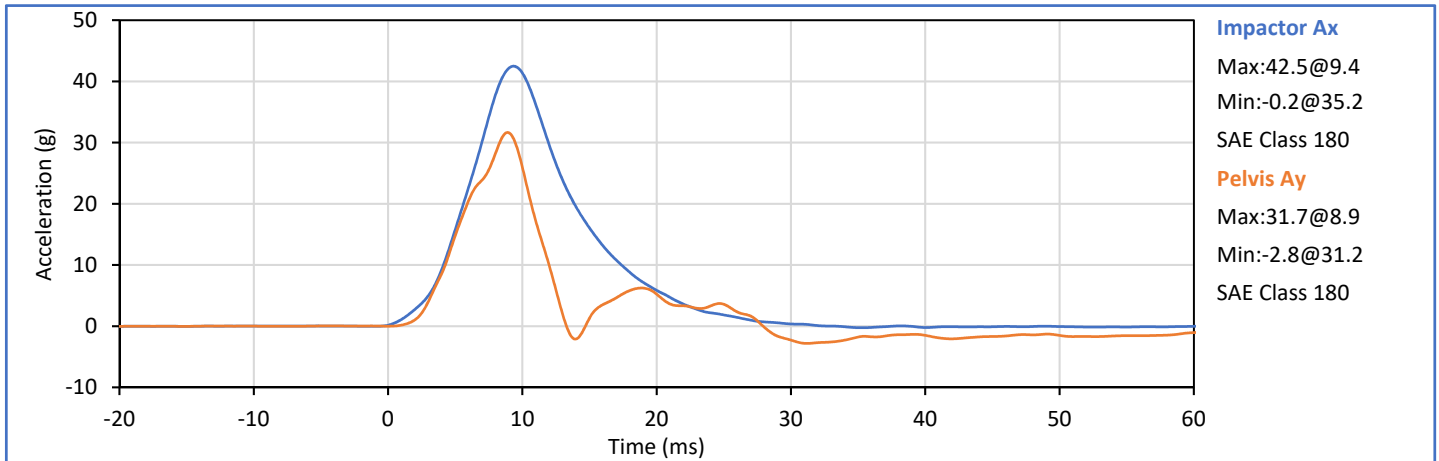
ATD Serial No.: 308

Test Date: 2018-12-14

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	30	Pass
Impactor Velocity	m/s	4.20	4.40	4.33	Pass
Peak Iliac Fy	kN	4.10	5.10	4.50	Pass
Pelvis Ay after 6ms	g	28.0	39.0	31.7	Pass
Peak Impactor Ax	g	36.0	45.0	42.5	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12228 (SACO) *

* Plug is not impacted and remains certified



Technician: *J. Hernandez*
 J. Hernandez

Approved By: *P. Puzzuto*
 P. Puzzuto

APPENDIX D
TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Position: Driver
 ATD Type: ES-2re
 ATD S\N: F035

Table 1 - Driver ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Last Cal
Head Acceleration X Primary	P58760	Endevco	7264C-2k	2018-07-25
Head Acceleration Y Primary	P58763	Endevco	7264C-2k	2018-07-25
Head Acceleration Z Primary	P52093	Endevco	7264C-2k	2018-07-25
Head Acceleration X Redundant	P52072	Endevco	7264C-2k	2018-07-25
Head Acceleration Y Redundant	P58768	Endevco	7264C-2k	2018-07-25
Head Acceleration Z Redundant	P52074	Endevco	7264C-2k	2018-07-25
Upper Thorax Rib Deflection Y	180 (ES-2 Rib)	Honeywell	F38000203	2018-07-24
Middle Thorax Rib Deflection Y	177 (ES-2 Rib)	Honeywell	F38000203	2018-07-24
Lower Thorax Rib Deflection Y	186 (ES-2 Rib)	Honeywell	F38000203	2018-07-24
Anterior Abdominal Force Y	1504 Fy	R.A. Denton	2631J	2018-10-11
Middle Abdominal Force Y	1505 Fy	R.A. Denton	2631J	2018-10-11
Posterior Abdominal Force Y	1506 Fy	R.A. Denton	2631J	2018-10-11
Lower Spine T12 Acceleration X	P45011	Endevco	7264C-2k	2018-07-25
Lower Spine T12 Acceleration Y	P58992	Endevco	7264C-2k	2018-07-25
Lower Spine T12 Acceleration Z	P51700	Endevco	7264C-2k	2018-07-25
Pubic Symphysis Force Y	DG6784 Fy	FTSS	IF-556	2018-10-11

Position: Rear Pass.
 ATD Type: SID-IIs
 ATD S\N: 308

Table 2a - Passenger ATD Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Last Cal
Head Acceleration X Primary	P63980	Endevco	7264C-2k	2018-09-14
Head Acceleration Y Primary	P58861	Endevco	7264C-2k	2018-09-14
Head Acceleration Z Primary	P51261	Endevco	7264C-2k	2018-09-14
Head Acceleration X Redundant	P58808	Endevco	7264C-2k	2018-09-14
Head Acceleration Y Redundant	P63310	Endevco	7264C-2k	2018-09-14
Head Acceleration Z Redundant	P49189	Endevco	7264C-2k	2018-09-14
Upper Thorax Rib Deflection Y	1172	Servo	08TCI-3725	2018-09-13
Middle Thorax Rib Deflection Y	1219	Servo	08TCI-3725	2018-09-13
Lower Thorax Rib Deflection Y	1221	Servo	08TCI-3725	2018-09-13
Upper Abdomen Rib Deflection Y	1252	Servo	08TCI-3725	2018-09-13
Lower Abdomen Rib Deflection Y	1283	Servo	08TCI-3725	2018-09-13
Lower Spine T12 Acceleration X	P52108	Endevco	7264C-2k	2018-09-14
Lower Spine T12 Acceleration Y	P63970	Endevco	7264C-2k	2018-09-14
Lower Spine T12 Acceleration Z	P51712	Endevco	7264C-2k	2018-09-14
Iliac Wing Impact Side Force Y	284 Fy (Iliac)	R.A. Denton	3228J	2018-06-21
Acetabulum Impact Side Force Y	272 Fy (Acetabulum)	R.A. Denton	3249J	2018-06-21

Table 1b - Passenger ATD Optional Instrumentation (Research Data Only)

Sensor Location	Sensor S\N	Mfr	Model	Last Cal
Head Rotation Rate X	ARS7498	DTS	ARS PRO-8k (2000Hz)	2017-08-10
Head Rotation Rate Y	ARS7367	DTS	ARS PRO-8k (2000Hz)	2017-08-10
Head Rotation Rate Z	ARS7377	DTS	ARS PRO-8k (2000Hz)	2017-08-10

Table 3 - Vehicle Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Last Cal
Vehicle CG Ax	10396	Endevco	757F-2k	09-04-2018
Vehicle CG Ay	10432	Endevco	757F-2k	09-04-2018
Vehicle CG Az	10431	Endevco	757F-2k	09-04-2018
Right Side Sill at Front Seat Ax	10089	Endevco	757F-2k	2018-02-12
Right Side Sill at Front Seat Ay	10247	Endevco	757F-2k	2018-03-08
Right Side Sill at Front Seat Az	10103	Endevco	757F-2k	2018-02-21
Right Side Sill at Rear Seat Ax	A254881	MSI	52F-2000	2018-06-19
Right Side Sill at Rear Seat Ay	A254883	MSI	52F-2000	2018-06-18
Right Side Sill at Rear Seat Az	A254887	MSI	52F-2000	2018-06-18
Left Side Sill at Front Seat Ay	A227260	MSI	52F-2000	2018-09-17
Left Side Sill at Rear Seat Ay	A148256	MSI	52F-2000	2018-09-26
Left Lower A-Pillar Ay	10244	Endevco	757F-2k	2018-03-08
Left Middle A-Pillar Ay	10099	Endevco	757F-2k	2018-02-21
Left Lower B-Pillar Ay	10408	Endevco	757F-2k	09-04-2018
Left Middle B-Pillar Ay	10087	Endevco	757F-2k	2018-02-12
Driver Seat Track at H-Point Ay	10242	Endevco	757F-2k	2018-03-08
Rear Seat Structure Ay	A248840	MSI	52F-2000	2018-09-15
Right Rear Occupant Comp. Ay	10117	Endevco	757F-2k	2018-02-12
Engine Block Top Ax	A185596	MSI	52F-2000	2018-09-18
Engine Block Top Ay	A226930	MSI	52F-2000	2018-09-26
Rear Floopan Above Axle Ax	10406	Endevco	757F-2k	09-05-2018
Rear Floopan Above Axle Ay	10392	Endevco	757F-2k	09-05-2018
Rear Floopan Above Axle Az	10435	Endevco	757F-2k	09-04-2018

Table 4 - Moving Deformable Barrier (MDB) Instrumentation

Sensor Location	Sensor S\N	Mfr	Model	Last Cal
MDB CG Ax	A217449	MSI	52F-2000	2018-09-17
MDB CG Ay	A224545	MSI	52F-2000	2018-09-25
MDB CG Az	A224490	MSI	52F-2000	2018-09-17
MDB Left Side at Rear Axle Ax	A224516	MSI	52F-2000	2018-09-21
MDB Left Side at Rear Axle Ay	A160734	MSI	52F-2000	2018-11-28