

**REPORT NUMBER: SPNCAP-KAR-18-022  
NEW CAR ASSESSMENT PROGRAM (NCAP)  
SIDE IMPACT POLE TEST**

**TESLA, INC.  
2018 TESLA MODEL 3 LONG RANGE RWD 4-DOOR SEDAN**

**NHTSA No: O20185001**

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



**SEPTEMBER 6, 2018**

**FINAL REPORT**

**PREPARED FOR:  
U.S. DEPARTMENT OF TRANSPORTATION  
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION  
OFFICE OF CRASHWORTHINESS STANDARDS  
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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: September 6, 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

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<b>4. Title and Subtitle</b> Final Report of New Car Assessment Program Side Impact Pole Testing of 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001		<b>5. Report Date</b> September 6, 2018																												
		<b>6. Performing Organization Code</b> KAR																												
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		<b>15. Supplementary Notes</b>																												
<b>16. Abstract</b> A 32.20 km/h 75° rigid pole side NCAP impact test was conducted on the subject 2018 Tesla Model 3 Long Range RWD 4-door sedan in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. The test was conducted at the KARCO Engineering, LLC. facility in Adelanto, California on August 22, 2018.  The impact velocity was 32.08 km/h and the outside ambient temperature at the struck (driver's) side of the vehicle was 36.7°C. The target vehicle's maximum post-test static crush was 174 mm located at level 3. The test vehicle's occupant performance data is as follows:																														
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 35%;">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th style="width: 15%;">Units</th> <th style="width: 15%;">Threshold</th> <th style="width: 35%;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC<sub>36</sub>)</td> <td></td> <td style="text-align: center;">1000</td> <td style="text-align: center;">384.3</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">g</td> <td style="text-align: center;">82</td> <td style="text-align: center;">41</td> </tr> <tr> <td>Total Pelvic Force (Sum of Acetabular and Iliac Forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">2478</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">38</td> <td style="text-align: center;">23</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">45</td> <td style="text-align: center;">28</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (SID-IIs)			Units	Threshold	Result	Head Injury Criteria (HIC <sub>36</sub> )		1000	384.3	Resultant Lower Spine Acceleration	g	82	41	Total Pelvic Force (Sum of Acetabular and Iliac Forces)	N	5525	2478	Maximum Thoracic Rib Deflection	mm	38	23	Maximum Abdominal Rib Deflection	mm	45	28
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The front struck side door of the vehicle was jammed shut and did not separate from the body at the hinges or latches. The remaining doors did not open during the side impact event.																														
<b>17. Key Words</b> New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		<b>18. Distribution Statement</b> Copies of this report are available from: National Highway Traffic Safety Admin. Technical Information Services Division, NPO-411 1200 New Jersey Ave., SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																												
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**SECTION 1**  
**TEST PURPOSE AND PROCEDURE**

This side impact test is part of the MY 2018 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-00355L. The purpose of this test is to generate comparative side impact performance in a 2018 Tesla Model 3 Long Range RWD 4-door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure date October 2015.

## **SECTION 2**

### **SUMMARY OF TEST RESULTS**

A rigid pole side impact test was conducted on a 2018 Tesla Model 3 Long Range RWD 4-door sedan. The subject vehicle was towed into the rigid pole at an angle of 75.3° and a velocity of 32.08 km/h. The test was conducted by KARCO Engineering, LLC. in Adelanto, California on August 22, 2018. Pre- and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated October 2015. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) was instrumented accordingly:

- Primary and Redundant Head CG tri-axial accelerometers
- Thorax upper, middle and lower rib displacement potentiometers
- Abdomen upper and lower rib displacement potentiometers
- Lower spine (12) tri-axial accelerometers
- Iliac load cell
- Acetabulum load cell

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

Injury readings for the SID-IIs dummy were recorded as follows:

Measurement Description	Units	Passenger ATD (SID-IIs)	
		IARV	Result
Head Injury Criteria (HIC <sub>36</sub> )		1000	384.3
Lower Spine (T12) Resultant Acceleration	g	82	41
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2478
Maximum Thoracic Rib Deflection	mm	38*	23
Maximum Abdominal Rib Deflection	mm	45*	28

\*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	No
Seat Belt Load Limiter	Yes	Yes	Yes	No

### GENERAL COMMENTS

The front door on the struck side of the vehicle was jammed shut. There was no separation at the hinges or latches. The left rear, and non-struck side doors remained closed and latched. There were no ATD values that exceeded limits.

The NHTSA number in the placards used in Appendix A of this report are listed incorrectly with the first character as the numeral zero "0" instead of the letter "O".

### SECTION 3

#### OCCUPANT AND VEHICLE INFORMATION/DATA SHEETS

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

#### 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 <sup>2</sup>	kPa	6.895
Temperature	General Use	°F	°C	$=(T_f - 32)/1.8$
Force	Dynamic Forces	lbf	N	4.448
Moment	Torque	lbf-ft	N•m	1.355

**DATA SHEET NO. 1**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA Number	O20185001
Model Year	2018
Make	Tesla
Model	Model 3 Long Range RWD
Body Style	4-Door Sedan
VIN	5YJ3E1EAXJF061252
Body Color	Black
Odometer Reading (km / mi)	117 / 73
Engine Displacement (L)	N/A
Type / No. of Cylinders	Electric
Engine Placement	Rear Transverse
Transmission Type	Automatic
Transmission Speeds	1
Overdrive	No
Final Drive	RWD
Roof Rack	No
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	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	Tesla, Inc
Date of Manufacture	Jul-18
Vehicle Type	Passenger Car

GVWR (kg)	2180
GAWR Front (kg)	1110
GAWR Rear (kg)	1257

**VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION**

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity	2	3		5	
Capacity Weight (VCW) (kg)				405.0	A
DSC x 68.04 (kg)				340.2	B
Cargo Weight (RCLW) (kg)				64.8	A-B

**VEHICLE SEAT TYPE**

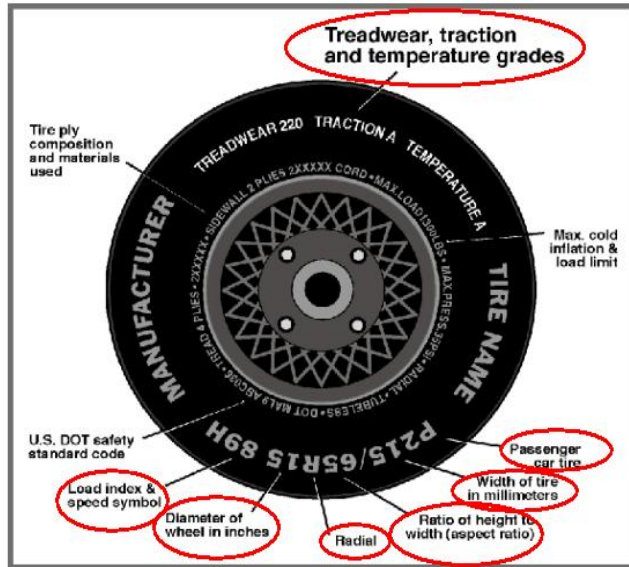
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						w/ Lever	w/ Knob
Front Seat	Yes					Yes	
Rear or Second Row Seat			Yes		Yes		
Third Row Seat							

**DATA SHEET NO. 1 ... (CONTINUED)**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



Measured Parameter	Front	Front
Max. Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	290	290
Recommended Tire Size	P235/40/R19	P235/40/R19
Tire Size on Vehicle	P235/40/R19	P235/40/R19
Tire Manufacturer	Continental	Continental
Tire Model	Pro Contact	Pro Contact
Treadware	400	400
Traction Grade	A	A
Temperature Grade	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	1 Rayon, 2 Steel, 1 Polyamide	1 Rayon, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	96W	96W
Tire Material	Rayon, Steel, Polyamide	Rayon, Steel, Polyamide
DOT Safety Code Left	AF18 WD4H 0118	AF18 WD4H 0118
DOT Safety Code Right	AF18 WD4H 0118	AF18 WD4H 0118

**DATA SHEET NO. 1 ... (CONTINUED)**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001  
 Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**TIRE PRESSURES**

	Units	LF	RF	LR	RR
As Delivered	kPa	290	290	290	290
Tire Placard	kPa	290	290	290	290
Owner's Manual	kPa	290	290	290	290
As Tested	kPa	290	290	290	290

**TEST VEHICLE AXLE WEIGHTS**

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	429.0	447.0		434.0	515.0		439.5	499.0	
Right	kg	425.0	466.0		427.0	497.0		423.0	517.5	
Ratio	%	48.3%	51.7%	100.0%	46.0%	54.0%	100.0%	45.9%	54.1%	100.0%
Total	kg	854.0	913.0	1767.0	861.0	1012.0	1873.0	862.5	1016.5	1879.0

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1767.0	A
Actual Weight of 1 P572V ATD Used	kg	49.0	B
Rated Cargo/Luggage Wt (RCLW)	kg	64.8	C
Calculated Vehicle Target Wt (TVTW)	kg	1880.8	A+B+C

Does the measured As Tested Vehicle Weight lie within the required weight range (i.e.

Calculated Test Vehicle Target Weight -4.5 kg to -9.0 kg)?  Yes  No

**TEST VEHICLE ATTITUDE AND CG**

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Requirement***
Driver Door Sill Angle (front-to-rear)*	°	-0.5	0.3	0.3	Yes
Front Passenger Sill Angle (front-to-rear)*	°	-2.0	-1.5	-1.4	Yes
Front Bumper-Line Angle (left-to-right)**	°	-0.5	0.5	0.7	Yes
Rear Bumper-Line Angle (left-to-right)**	°	0.6	0.5	0.5	Yes
Vehicle CG (Aft of Front Axle)	mm	1488	1556	1557	
Vehicle CG (Left (+)/Right (-) from Longitudinal Centerline)	mm	-7	11	-1	

\*ND=Nose Down (-), NU=Nose Up (+) \*\*LD=Left Down (-), LU=Left Up (+)

\*\*\*The "As Tested" vehicle attitude angle measurements must be within "As Delivered" and the "Fully Loaded" vehicle attitude measurements at each location. Indicate "Yes" or "No" for "Meets Requirement"

**DATA SHEET NO. 1 ... (CONTINUED)**

**GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW**

Component Description	Weight (kg)
Trunk Trim	20.0
Non-Struck Side Door Panels	7.0
Non-Struck Side Windows	7.5
Ballast / Equipment Added	93.0

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

**DATA SHEET NO. 2**

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

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**SEAT POSITIONING**

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

**SCRL ANGLE RANGE**

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	10.4	0.0	5.2
Front Passenger Seat	10.8	0.0	5.4
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

**SEAT HEIGHT AND ANGLE**

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid Fore/Aft	Forwardmost
Driver Seat	5.2	533	Max	527	540	551
			Mid	508	521	533
			Min	488	501	514
Front Passenger Seat	5.4	538	Max	530	542	558
			Mid	512	524	538
			Min	493	505	518
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Max	Fixed	Fixed	Fixed
			Mid	Fixed	Fixed	Fixed
			Min	Fixed	Fixed	Fixed

**DATA SHEET NO. 2 ... (CONTINUED)**

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

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

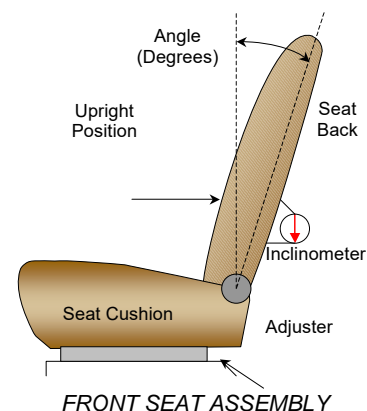
**SEAT FORE/AFT POSITION**

Seat	Total Fore/Aft Travel		Test Position From Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260		0	
Front Passenger Seat	260		0	
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

\*Detent zero (0) is the forward most detent

**SEAT BACK ADJUSTMENT**

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



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degree	Detent*
Driver Seat w/Seated Dummy	57.2		9.8	
Front Passenger Seat	57.4		9.8	
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: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**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, M1, ..., L from top to bottom.

	Total No. of Positions	Placed in Position
Driver Seat	3	H

**HEAD RESTRAINT ADJUSTMENT**

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

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

**DATA SHEET NO. 2 ... (CONTINUED)**

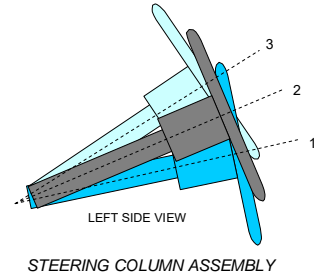
**SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT, AND FUEL SYSTEM DATA**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**STEERING COLUMN ADJUSTMENT**

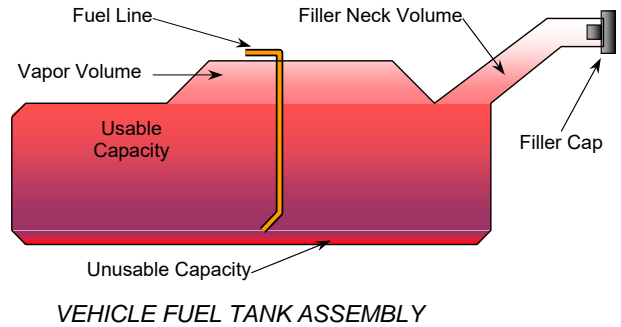
Steering wheel and column adjustments are made so that the steering wheel hub is at the center of the geometric locus it describes when it moves through its full range of motion.



	Degrees	Fore-Aft Position (mm)
Lowermost - Position 1	15.9	299
Geometric Center - Position 2	18.4	328
Uppermost - Position 3	20.9	356
Telescoping Steering Wheel Travel		57
Test Position	18.4	328

**FUEL PUMP**

The vehicle is electric and is not equipped with a fuel system.



**FUEL TANK CAPACITY**

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

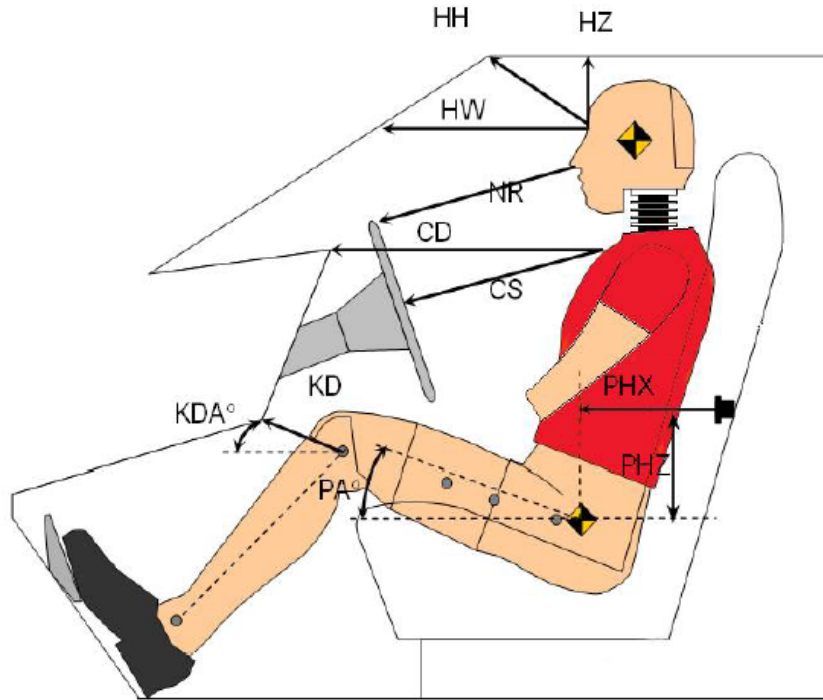
Is the Actual Amount of Solvent Used in the test equal to 93% ± 1% of the Usable Capacity stated in the Form No. 1?  Yes  No

### DATA SHEET NO. 3

#### DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



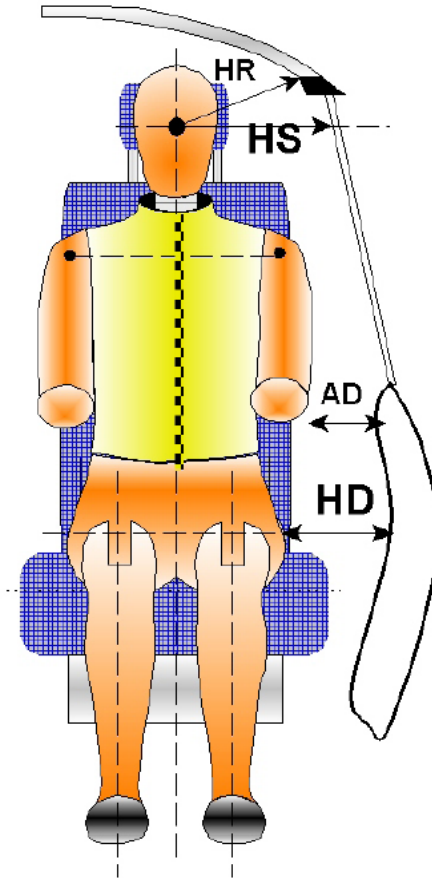
Driver Code	Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	248	
HW	Head to Windshield	587	
HZ	Head to Roof	163	
NR	Nose to Rim	207	
CD	Chest to Dash	433	
CS	Chest to Steering Wheel	153	
KD(L)/KDA(L)°	Left Knee to Dash	182	38.7
KD(R)/KDA(R)°	Right Knee to Dash	160	49.5
PAX°	Pelvic Tilt Angle (x-axis)		20.3
PAY°	Pelvic Tilt Angle (y-axis)		0.2
PHX	Hip Point to Striker (x-axis)	314	
PHZ	Hip Point to Striker (z-axis)	109	

## DATA SHEET NO. 4

### DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



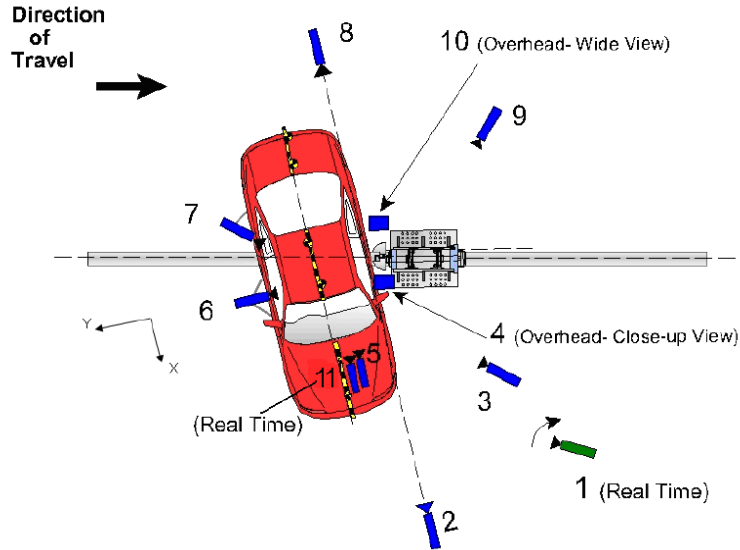
Code	Measurement Description	Units	Driver
HR	Head to Side Header	mm	275
HS	Head to Side Window	mm	385
AD	Arm to Door	mm	154
HD	Hip Point to Door	mm	167

## DATA SHEET NO. 5

### CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



Reference from Point of Impact for X and Y; from Ground for Z):  
 +X = Forward of Vehicle, +Y = Right of Vehicle, +Z = Down

Camera No.	View	Coordinates (m)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real Time Pan View of Impact	8.89	46.57	-3.04		30
2	Front Ground Level - Impact View	8.34	-0.05	-0.93	24	1000
3	Impact Side 45° - Forward Pole View	4.10	-2.15	-1.15	8.5	1000
4	Overhead Close-Up View of Impact	0.00	0.00	-5.79	12.5	1000
5	On-Board - Dummy Front View	1.18	0.56	-1.52	8.5	1000
6	On-Board - Dummy Side View	0.03	1.74	-1.24	8.5	1000
7	On-Board - Dummy Rear Oblique View	-0.82	1.73	-1.29	8.5	1000
8	Rear Ground Level - Impact View	-6.12	-6.23	-0.96	24	1000
9	Impact Side 45° - Rearward Pole View	-8.02	0.04	-1.01	35	1000
10	Overhead Wide View of Impact	-0.06	0.22	-5.79	14	1000
11	Real Time Dummy Front View	1.20	0.53	-1.51		30

\*All measurements accurate to ±6 mm

### INSTRUMENTATION

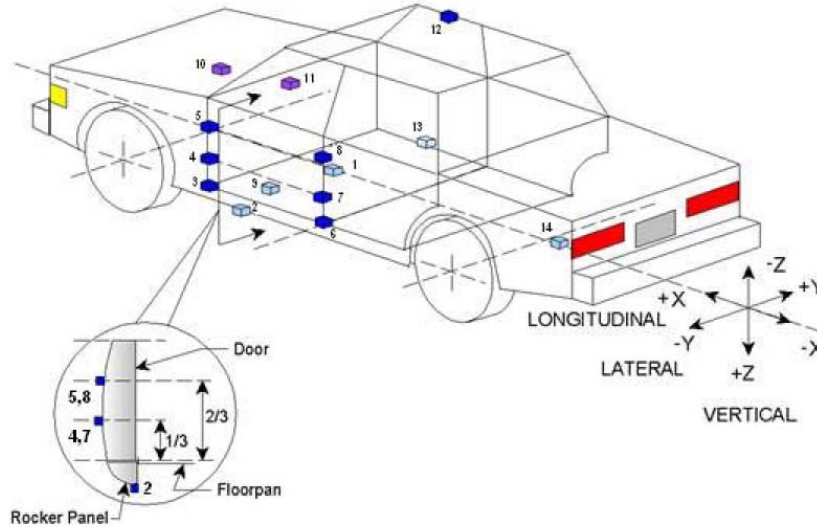
Driver Dummy Channels	19
Vehicle Structure Accelerometers	18
Pole Load Cells	8
<b>Total</b>	<b>45</b>

**DATA SHEET NO. 6**

**TEST VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



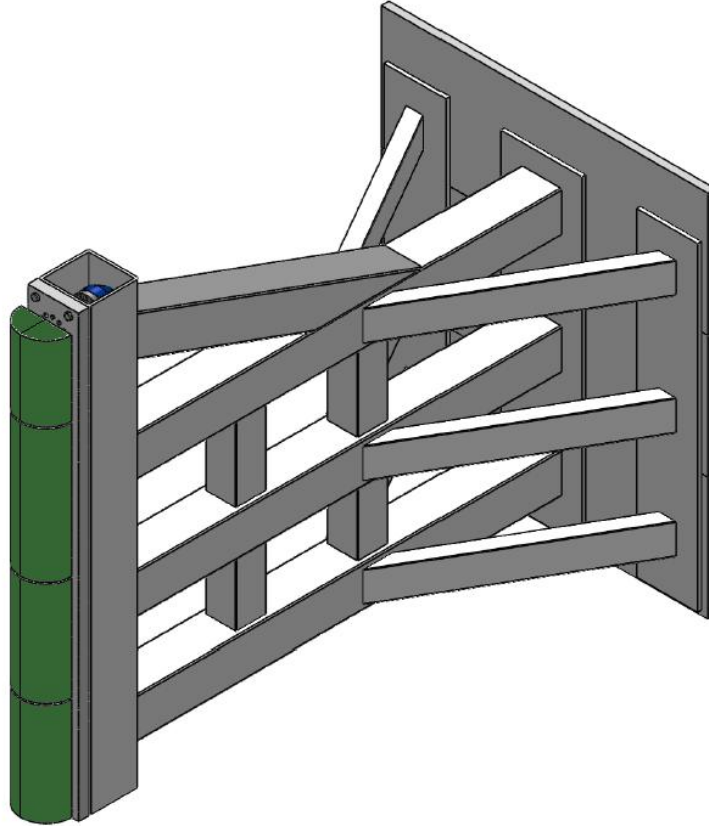
Loc. No.	Sensor Description	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	1980	0	-208
2	Left Floor Sill	2170	-800	-210
3	A-Pillar Sill	3220	-705	-280
4	A-Pillar Low	3220	-710	-330
5	A-Pillar Mid	3220	-710	-480
6	B-Pillar Sill	2010	-690	-308
7	B-Pillar Low	2012	-692	-550
8	B-Pillar Mid	2012	-692	-600
9	Driver Seat Track	2230	-590	-350
10	Engine Top	3650	65	-570
11	Firewall	3790	510	-770
12	Right Roof	2050	600	-1415
13	Right Floor Sill	2435	700	-350
14	Rear Floorpan	1830	5	-765

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

**DATA SHEET NO. 7**  
**RIGID POLE LOAD CELL DATA**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



ID	Units	Height From Ground
1	mm	87
2	mm	468
3	mm	648
4	mm	978
5	mm	1168
6	mm	1651
7	mm	1816
8	mm	2057

**DATA SHEET NO. 8**

**POST-TEST OBSERVATIONS**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**TEST DUMMY INFORMATION AND CONTACT POINTS**

Dummy Body Part	Driver SID-IIs Dummy
Face	Curtain Airbag
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag, Headrest, Seatback
Left Shoulder	Curtain Airbag, Side Airbag
Upper Torso	Side Airbag, Seat
Lower Torso	Side Airbag, Seat
Left Hip	Door Panel, Side Airbag, Seat
Left Knee	Door Panel

**POST-TEST DOOR PERFORMANCE**

Description	Struck Side		Non-Struck Side		Rear Hatch/Other Door
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	Yes	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge System Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	No	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

**POST-TEST SEAT PERFORMANCE**

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

**POST-TEST STRUCTURAL OBSERVATIONS**

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

**DATA SHEET NO. 8 ... (CONTINUED)****POST-TEST OBSERVATIONS**Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

Restraint Type	Struck Side Driver		Struck Side 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	No
Seat Belt Load Limiter	Yes	Yes	Yes	No

**IMPACT POINT LOCATION DATA**

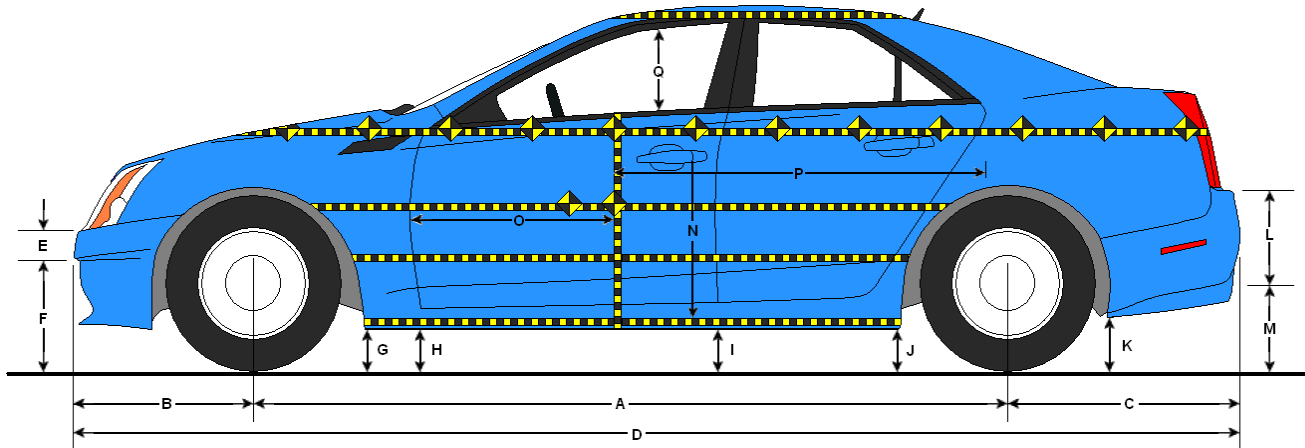
Measured Parameter	Units	Tolerance	Value
Vertical Impact Reference Line (Aft of Front Axle)(Intended Impact Point)	mm		1224
Actual Impact Point (Aft of Front Axle)	mm		1239
Horizontal Offset (+ forward / - rearward)	mm	± 38 of Intended Impact Point	-15
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	°	75 ± 3	75.3
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.08
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.11

## DATA SHEET NO. 9

### TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



#### LEFT SIDE VIEW

All measurements in mm with tolerance of  $\pm 3$ mm

#### VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

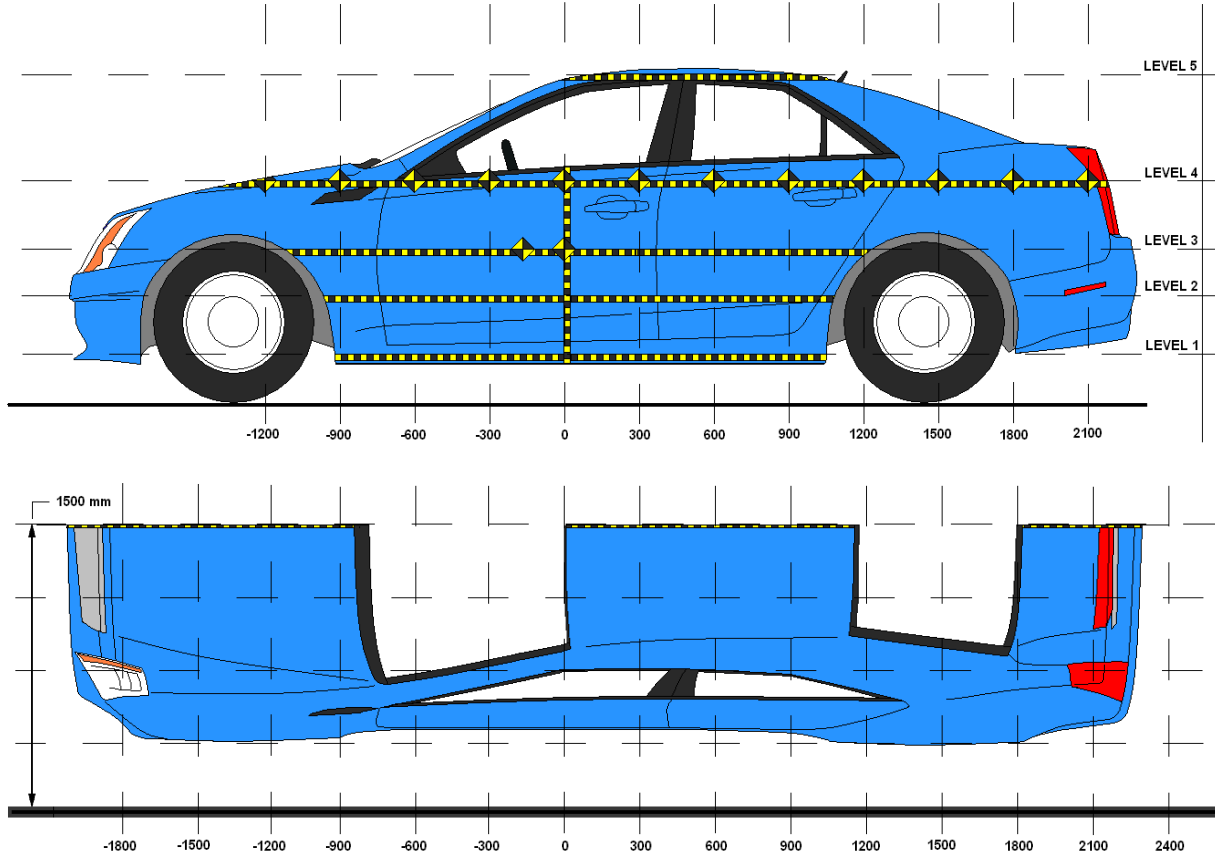
Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2879	2859	-20
B	Front Axle to FSOV	834	848	14
C	Rear Axle to RSOV	970	974	4
D	Total Length at Centerline	4654	4681	27
E	Front Bumper Thickness	247	248	1
F	Front Bumper Bottom to Ground	358	339	-19
G	Sill Height at Front Wheel Well	234	221	-13
H	Sill Height at Front Door Leading Edge	240	224	-16
I	Sill Height at B-Pillar	266	251	-15
J1	Sill Height at Rear Wheel Well	234	235	1
J2	Pinch Weld Height at Rear Wheel Well	168	165	-3
K	Sill Height Aft of Rear Wheel Well	310	310	0
L	Rear Bumper Thickness	194	196	2
M	Rear Bumper Bottom to Ground	437	436	-1
N	Sill Height to Bottom of Front Window Sill	630	654	24
O	Front Door Leading Edge to Impact CL	686	663	-23
P	Rear Door Trailing Edge to Impact CL	1555	1540	-15
Q	Front Window Opening	419	409	-10
R	Right Side Length	3386	3392	6
S	Left Side Length	3381	3364	-17
T	Vehicle Width at B-Pillar	1829	1833	4

**DATA SHEET NO. 10**

**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



**NOTE:** All measurements in mm with tolerance of  $\pm 3\text{mm}$

**MAXIMUM EXTERIOR CRUSH MEASUREMENTS**

Level	Description	Height Above Ground (mm)	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	281	126	0
2	Occupant H-Point	551	159	0
3	Mid-Door	634	174	0
4	Window Sill	919	123	0
5	Window Top	1396	26	150

**DATA SHEET NO. 10 ... (CONTINUED)**

**TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

**EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL**

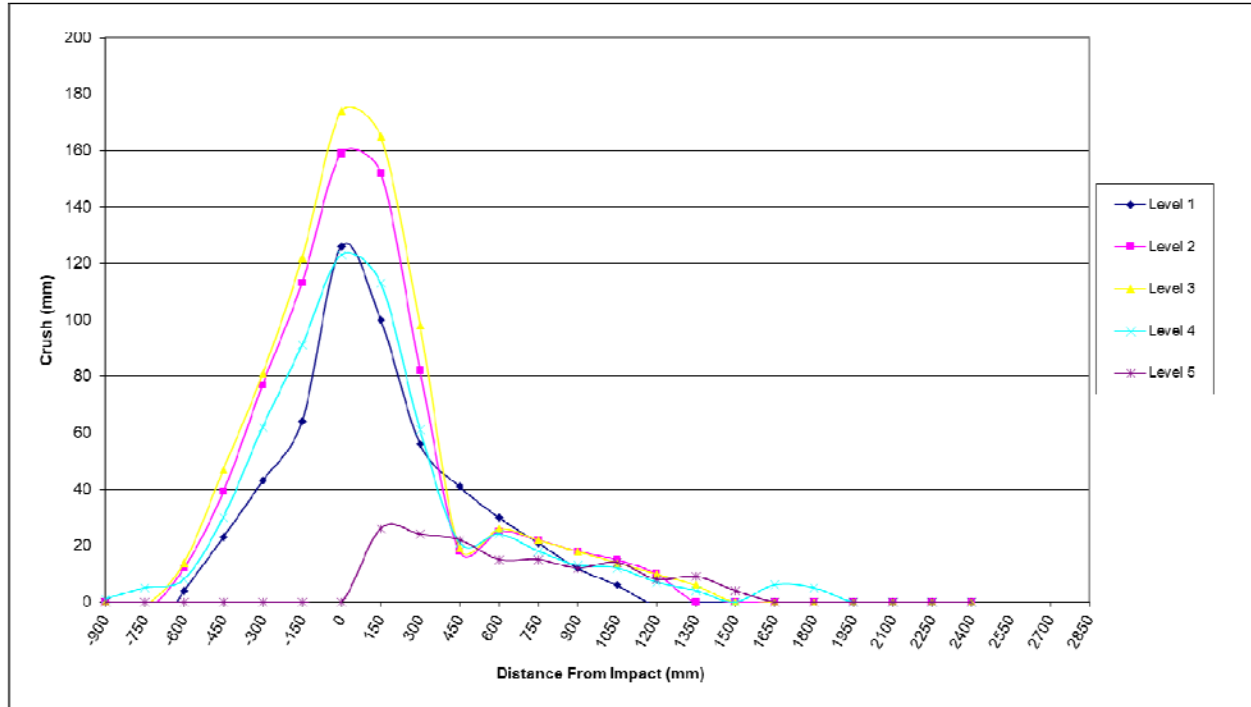
	Pre-Test (mm)					Post-Test (mm)					Difference (mm)				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900			575	709				575	710				0	1	
-750	618	595	596	691		603	592	595	696		-15	-3	-1	5	
-600	636	606	603	683		640	618	617	691		4	12	14	8	
-450	641	609	603	675		664	648	650	705		23	39	47	30	
-300	641	608	602	668		684	685	683	730		43	77	81	62	
-150	641	608	601	662		705	721	723	753		64	113	122	91	
0	639	608	599	655		765	767	773	778		126	159	174	123	
150	638	608	598	652	855	738	760	763	765	881	100	152	165	113	26
300	637	607	597	649	858	693	689	695	710	882	56	82	98	61	24
450	635	606	596	650	861	676	624	615	671	883	41	18	19	21	22
600	633	607	597	647	869	663	632	623	671	884	30	25	26	24	15
750	631	606	597	649	873	652	628	619	667	888	21	22	22	18	15
900	629	605	597	651	880	641	623	615	664	892	12	18	18	13	12
1050	626	602	596	649	885	632	617	610	661	899	6	15	14	12	14
1200	614	592	591	642	897	613	602	601	649	905	-1	10	10	7	8
1350			578	637	911			584	641	920			6	4	9
1500				638	930				638	934				0	4
1650				643					649					6	
1800				657					662					5	
1950															
2100															
2250															
2400															
2550															
2700															
2850															

DATA SHEET NO. 10 ... (CONTINUED)

TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

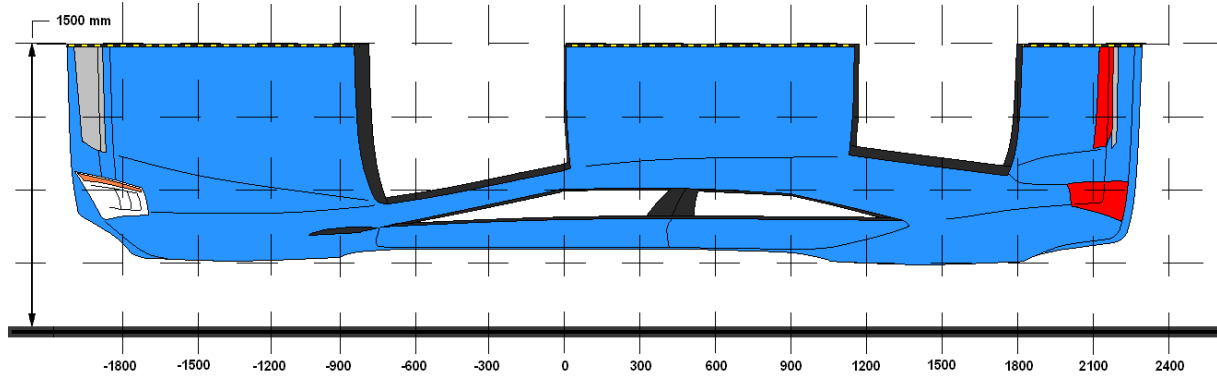


**DATA SHEET NO. 11**

**VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Crush (mm)
1	1800	4	657	662	5
2	1200	3	591	601	10
3	750	3	597	619	22
4	150	3	598	763	165
5	-300	3	602	683	81
6	-900	4	709	710	1

**DATA SHEET NO. 12**

**FMVSS NO. 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

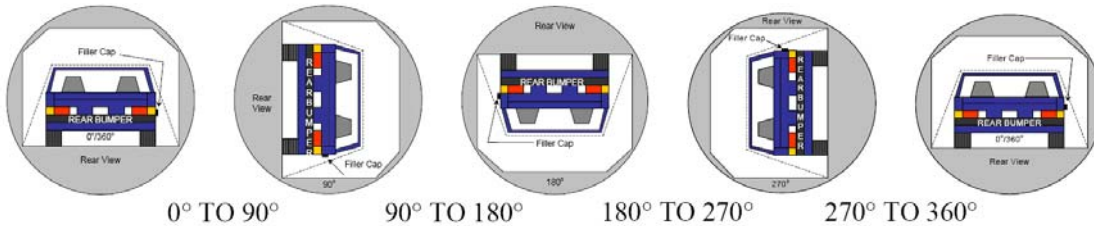
Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18

Temperature at Time of Impact: 36.7° C

Test Time: 1:00 PM

- A. From impact until vehicle motion ceases: 0 oz.  
(Maximum allowable = 1 oz.)
- B. For the 5 minute period after motion ceases: 0 oz.  
(Maximum allowable = 5 oz.)
- C. For the following 25 minutes: 0 oz.  
(Maximum allowable = 1 oz./minute)

D. Spillage Details: This vehicle is electric and did not contain Stoddard Solvent.  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_



**SOLVENT COLLECTION TIME TABLE IN SECONDS**

Test Phase	Rotation Time	Hold Time	Total Time
0° To 90°			
90° To 180°			
180° To 270°			
270° To 360°			

**FMVSS 301 SPILLAGE TABLE**

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

**SOLVENT SPILLAGE LOCATION TABLE**

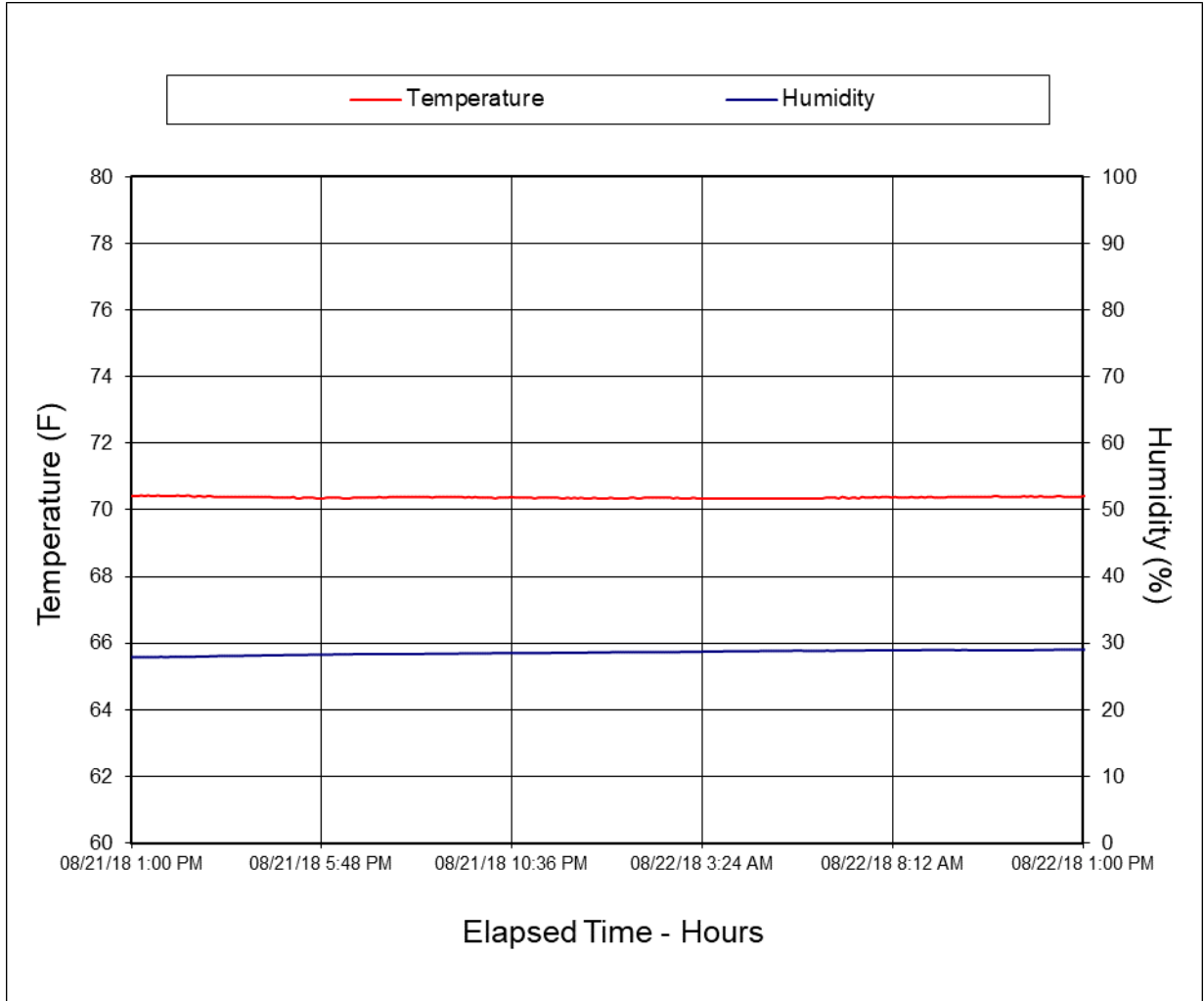
Test Phase	Spillage Location
0° To 90°	
90° To 180°	
180° To 270°	
270° To 360°	

**DATA SHEET NO. 13**

**DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION**

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan NHTSA No. O20185001

Test Program: NCAP Side Pole Impact Test Test Date: 08/22/18



**APPENDIX A  
PHOTOGRAPHS**

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



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



FIGURE 3. Pre-Test Frontal View of Test Vehicle



FIGURE 4. Post-Test Frontal View of Test Vehicle



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



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



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



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



FIGURE 9. Pre-Test Left Rear  $\frac{3}{4}$  View of Test Vehicle



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



FIGURE 11. Pre-Test Rear View of Test Vehicle



FIGURE 12. Post-Test Rear View of Test Vehicle



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



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



FIGURE 15. Pre-Test Overhead View of Test Area

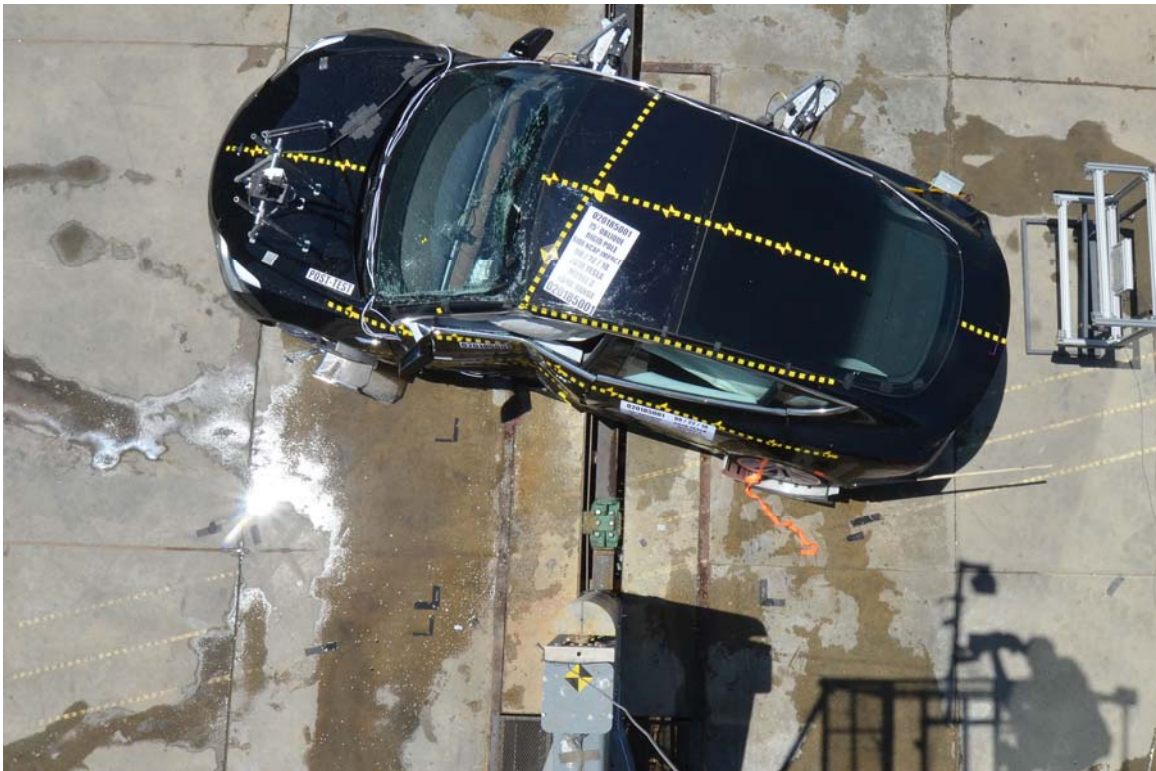


FIGURE 16. Post-Test Overhead View of Test Area





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



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



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



FIGURE 22. Post-Test Front Close-Up View of Dummy



FIGURE 23. Pre-Test Left Side View of Dummy Showing Belt and Chalking



FIGURE 24. Pre-Test Left Side View of Dummy Shoulder and Door Top View



FIGURE 25. Post-Test Left Side View of Dummy Shoulder and Door Top View



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



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



FIGURE 28. Pre-Test Overhead View of Seat Pan Prior to Dummy Positioning



FIGURE 29. Pre-Test Overhead View of Dummy Thighs on Seat Pan

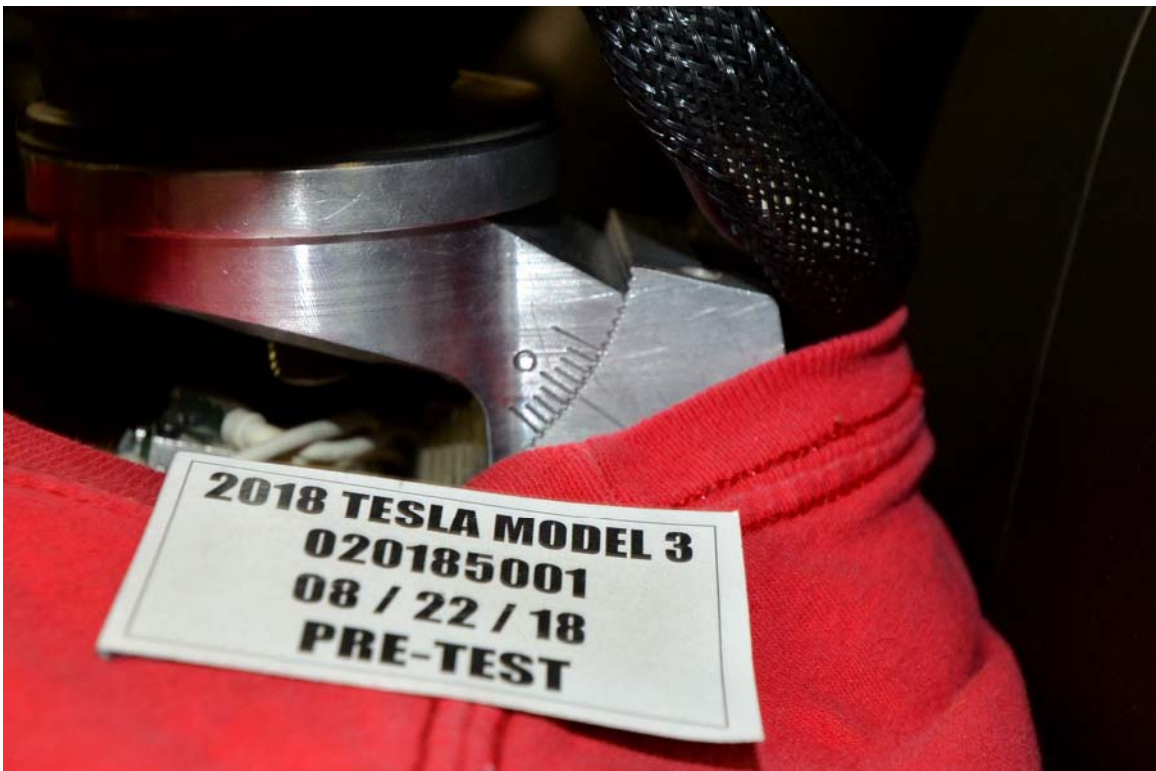


FIGURE 30. Pre-Test Left Side View of Dummy's Neck  
Showing Position of Adjustable Neck Bracket



FIGURE 31. Pre-Test Left Side View of Dummy's Head  
Showing Dummy's Head is Level



FIGURE 32. Pre-Test Placement of Dummy's Feet



FIGURE 33. Pre-Test View of Belt Anchorage for Dummy



FIGURE 34. Pre-Test Left Side View of Steering Wheel

**Photograph Not Applicable**

FIGURE 35. View of Disengaged Parking Brake

**Photograph Not Applicable**

FIGURE 36. Pre-Test View of Parking Brake



FIGURE 37. Pre-Test Close-Up Left Side View of Driver Seat Track



FIGURE 38. Pre-Test Close-Up Left Side View of Driver Seat Back



FIGURE 39. Pre-Test Close-Up View of Driver Seat Back or Head Restraint



FIGURE 40. Pre-Test Dummy and Door Clearance View



FIGURE 41. Post-Test Dummy and Door Clearance View



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



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



FIGURE 44. Pre-Test Inner Door Panel View



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



FIGURE 46. Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



FIGURE 47. Post-Test Dummy Close-Up Head Contact With Side Airbag View



FIGURE 48. Post-Test Dummy Close-Up Torso Contact With Vehicle Interior View



FIGURE 49. Post-Test Dummy Close-Up Torso Contact With Side Airbag View



FIGURE 50. Post-Test Dummy Close-Up Pelvis Contact With Vehicle Interior View



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



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



FIGURE 53. Pre-Test Fuel Filler Cap – Charge Port View



FIGURE 54. Post-Test Fuel Filler Cap – Charge Port View

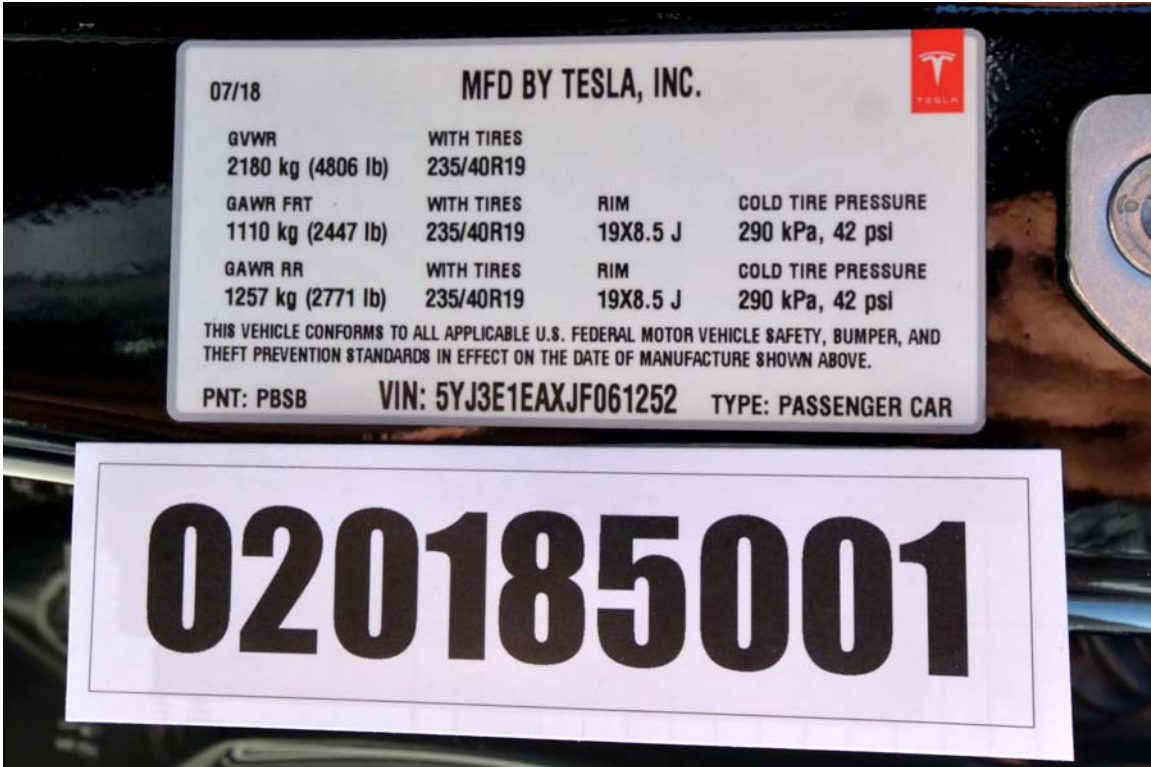


FIGURE 55. Close-Up View of Vehicle's Certification Label

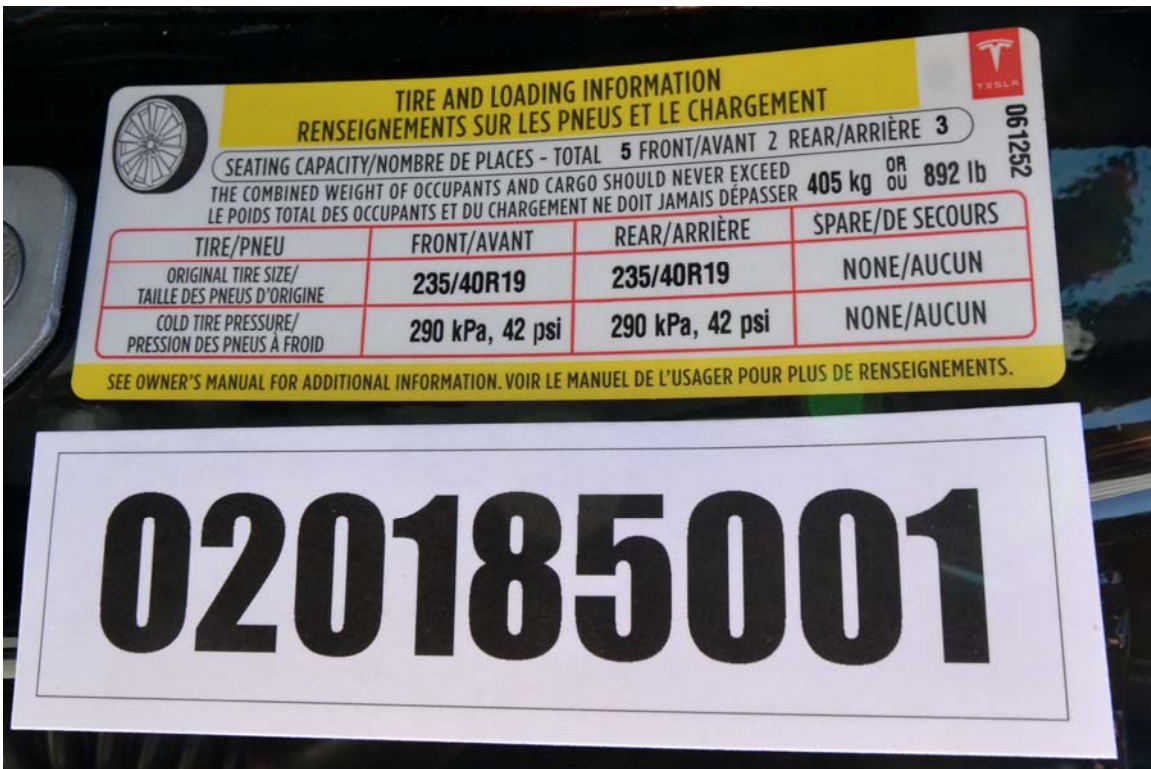


FIGURE 56. Close-Up View of Vehicle's Tire Information Placard or Label



FIGURE 57. Pre-Test Pole Barrier Front View



FIGURE 58. Post-Test Pole Barrier Front View



FIGURE 59. Pre-Test Pole Barrier Side View



FIGURE 60. Post-Test Pole Barrier Side View



FIGURE 61. Pre-Test Ballast View



FIGURE 62. Post-Test Primary and Redundant Speed Trap Read-Out



FIGURE 63. FMVSS No. 305 Static Rollover 0 Degrees



FIGURE 64. FMVSS No. 305 Static Rollover 90 Degrees



FIGURE 65. FMVSS No. 305 Static Rollover 180 Degrees

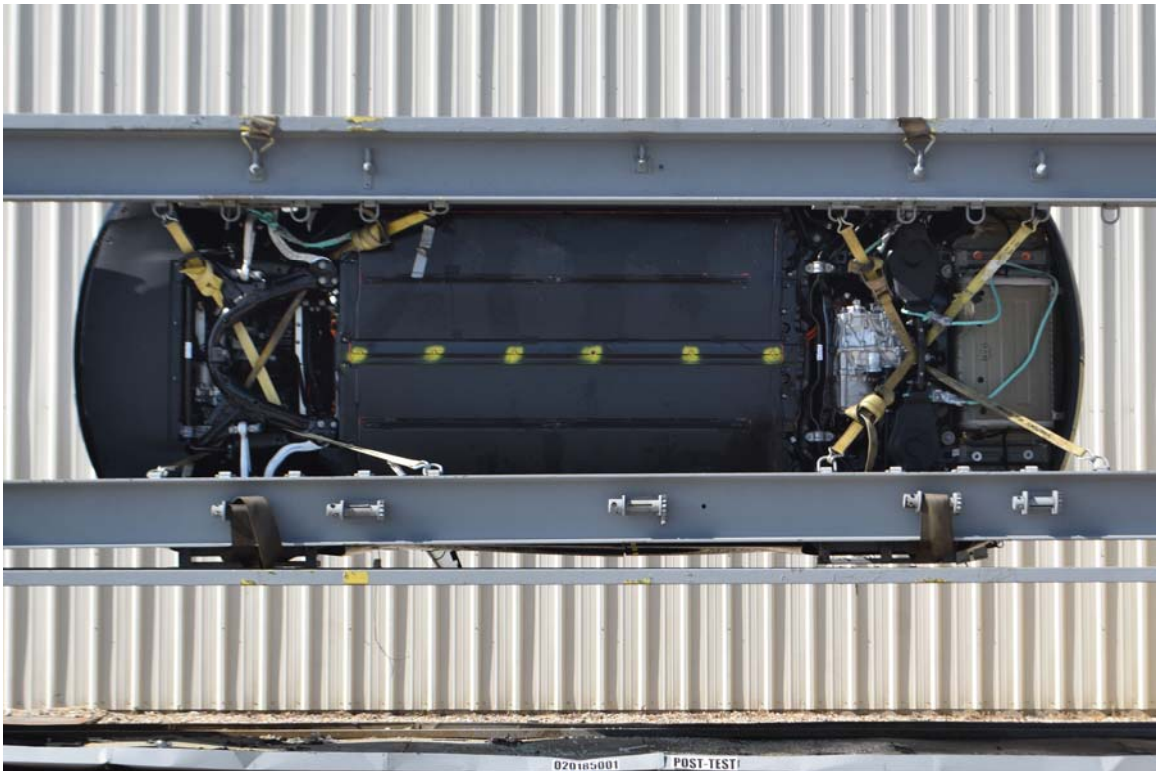


FIGURE 66. FMVSS No. 305 Static Rollover 270 Degrees



FIGURE 67. FMVSS No. 305 Static Rollover 360 Degrees



FIGURE 68. Impact Event

# TESLA Model 3 Long Range

Vehicle Identification Number: SYJ3E1EAXJF061252  
 Date Of Manufacture: 07/2018  
 Transportation Method: Truck  
 Delivered to: TESLA MOTORS, INC. Fremont, California, USA

STANDARD FEATURES		AS CONFIGURED	
<b>TECHNICAL</b> Three phase, six pole, internal permanent magnet motor Drive inverter with regenerative braking system Microprocessor controlled, lithium-ion battery Onboard charger and mobile connector 120 volt, 240 volt and J1772 charging adapters <b>SAFETY</b> Seven cameras, forward radar and twelve ultrasonic sensors Six front row and two side curtain airbags Three-point safety belts with belt-reminders for driver and four passengers Two LATCH (Lower Anchors and Tethers for Children) attachments in second row Electronic stability and traction control Four wheel antilock disc brakes with electronic parking brake Child safety locks and manual cargo door release mechanisms Anti-Theft Alarm System	<b>INTERIOR</b> 15 inch capacitive touchscreen Onboard maps and navigation WiFi and Mobile network connectivity FM and Internet streaming radio Hands free talking with Bluetooth Voice activated controls High definition backup camera One touch power windows Dual zone climate control 12 volt power outlet and two USB ports for media and power <b>EXTERIOR</b> Full LED lighting	Model 3 INCLUDED Long Range Rear Wheel Drive \$49,000 Premium Interior INCLUDED Solid Black Paint INCLUDED 19" Wheels \$1,500 Premium Black INCLUDED	
<b>GOVERNMENT 5-STAR SAFETY RATINGS</b> This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash, or rollover risk. Source: National Highway Traffic Safety Administration (NHTSA) <a href="http://www.safercar.gov">www.safercar.gov</a> or 1-888-327-4236		<b>PARTS CONTENT INFORMATION</b> FOR THIS VEHICLE: US/CANADIAN PARTS CONTENT: 50% MAJOR SOURCES OF FOREIGN PARTS CONTENT MEXICO: 25% Note: Parts content does not include final assembly, distribution or other non-parts costs. FOR THIS VEHICLE: FINAL ASSEMBLY POINT: FREMONT, CA COUNTRY OF ORIGIN: MOTOR ASSEMBLY: USA GEARBOX/TRANSMISSION: USA <b>ADDITIONAL ASSEMBLY INFORMATION</b> FOR THIS VEHICLE: BATTERY FINAL ASSEMBLY POINT: FREMONT, CA, USA ON-BOARD CHARGER FINAL ASSEMBLY POINT: FREMONT, CA, USA	
		<b>EPA DOT Fuel Economy and Environment</b> Electric Vehicle Fuel Economy: 130 MPGe (combined city/hwy), 136 city, 123 highway, 26 kWh per 100 miles You save \$4,250 in fuel costs over 5 years compared to the average new vehicle. Annual fuel cost: \$500 Fuel Economy & Greenhouse Gas Rating: 10 (Best) Smog Rating: 10 (Best) Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPGe and costs \$5,750 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at 0.13 per kWh for MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog. fueleconomy.gov Calculate personalized estimates and compare vehicles	

FIGURE 69. Monroney Label

### Front and Rear Seats

#### Folding Rear Seats

Model 3 has a split rear seat that can fold forward.

Before folding, remove items from the seats and the rear foot well. To allow the rear seat backs to fold completely flat, you may need to move the front seats forward.



To fold a rear seat, pull the corresponding lever and fold the seat forward.



#### Raising Rear Seats

Before raising a rear seat, make sure that the seat belts are not trapped behind the backrest.

Pull the seat back upward until it locks into place.

To confirm that the seat back is locked in the upright position, try pulling it forward.

**Warning:** Always ensure the seat backs are locked in their upright position. Failure to do so increases the risk of injury.

#### Head Supports

The front seats and outer rear seats include integrated head supports that are not adjustable.

The rear center seat includes an adjustable head support that can be raised, lowered, or removed. The head support should always be raised and locked into position (so that the center is aligned with the center of the ears) when occupied by a passenger that is not in a child safety seat.



The head support in the rear center seat should always be lowered when a seat belt retained child safety seat is installed. See Raising/Lowering the Rear Center Head Support on page 4.


**Warning:** Ensure that all head supports are positioned correctly before sitting in, or operating, Model 3 to minimize the risk of severe injury or death in the event of a collision.

### Front and Rear Seats

#### Raising/Lowering the Rear Center Head Support

To raise the head support, lift it until you hear it click into place. Push down on the head support to ensure that it is secure.

To lower the head support, press and hold the button on the outer base of the right post and press the head support down.



#### Seat Heaters

The front seats are equipped with heating pads that operate at three levels from 3 (highest) to 1 (lowest).

**Warning:** To avoid burns resulting from prolonged use, individuals who have peripheral neuropathy, or whose capacity to feel pain is limited because of diabetes, age, neurological injury, or some other condition, should exercise caution when using the climate control system and seat heaters.

#### Seat Covers

**Warning:** Do not use seat covers on Model 3. Doing so could restrict deployment of the seat-mounted side air bags if a collision occurs. It can also reduce the accuracy of the occupant detection system.

#### Removing/Installing the Rear Center Head Support

To remove the head support:

- Raise the head support (see Raising/Lowering the Rear Center Head Support on page 4).
- Press and hold the button on the outer base of the right post.
- Insert a short, flat object (such as a small flathead screwdriver) into the opening on the inside base of the left post and pull the head support upwards.



To install the head support:

- With the front of the head support facing forward, insert both posts into the corresponding holes on the backrest.
- Press down on the head support until you hear it click into place.
- Pull up on the head support to ensure that it is secure.

**Warning:** Ensure that the head support is installed properly before anyone occupies the rear center seat. Failure to do so increases the risk of injury or death if a collision occurs.

FIGURE 70. 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	B-1
2	Driver Head Acceleration (Y) Primary	B-1
3	Driver Head Acceleration (Z) Primary	B-1
4	Driver Head Acceleration Primary Resultant	B-1
5	Driver Lower Spine T12 Acceleration (X)	B-2
6	Driver Lower Spine T12 Acceleration (Y)	B-2
7	Driver Lower Spine T12 Acceleration (Z)	B-2
8	Driver Lower Spine T12 Acceleration Resultant	B-2
9	Driver Iliac Wing Force on Impact Side (Y)	B-3
10	Driver Acetabulum Force on Impact Side (Y)	B-3
11	Driver Total Pelvis Force on Impact Side (Y)	B-3

**The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at**

**[www.NHTSA.dot.gov](http://www.NHTSA.dot.gov)**

### **Additional Driver Dummy Instrumentation Data**

Driver Head Acceleration Redundant (X)  
Driver Head Acceleration Redundant (Y)  
Driver Head Acceleration Redundant (Z)  
Driver Upper Thorax Rib Deflection (Y)  
Driver Middle Thorax Rib Deflection (Y)  
Driver Lower Thorax Rib Deflection (Y)  
Driver Upper Abdomen Rib Deflection (Y)  
Driver Lower Abdomen Rib Deflection (Y)

### **Vehicle Instrumentation Data**

Vehicle Center of Gravity Acceleration (X)  
Vehicle Center of Gravity Acceleration (Y)  
Vehicle Center of Gravity Acceleration (Z)  
Left Floor Sill Acceleration (Y)  
Left A-Pillar Sill Acceleration (Y)  
Left Lower A-Pillar Acceleration (Y)  
Left Mid A-Pillar Acceleration (Y)

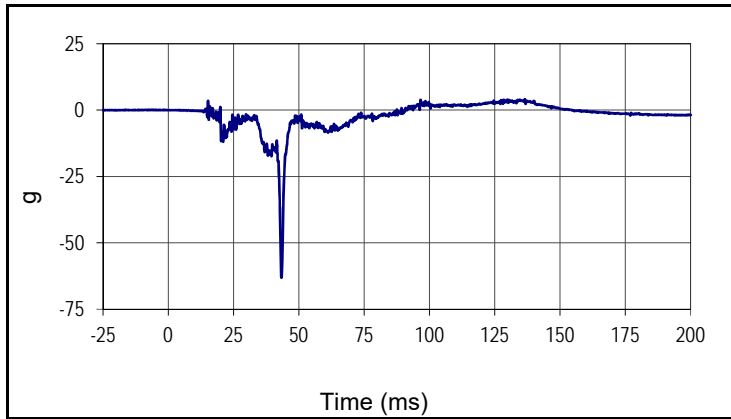
Left B-Pillar Sill Acceleration  
Left Lower B-Pillar Acceleration (Y)  
Left Mid B-Pillar Acceleration (Y)  
Driver Seat Track at Dummy Hip Point Acceleration (Y)  
Engine Top Acceleration (X)  
Engine Top Acceleration (Y)  
Firewall Center Acceleration (Y)  
Right Roof at Vertical Impact Reference Line Acceleration (Y)  
Right Sill at Vertical Impact Reference Line Acceleration (Y)  
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)  
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

#### **Pole Instrumentation Data**

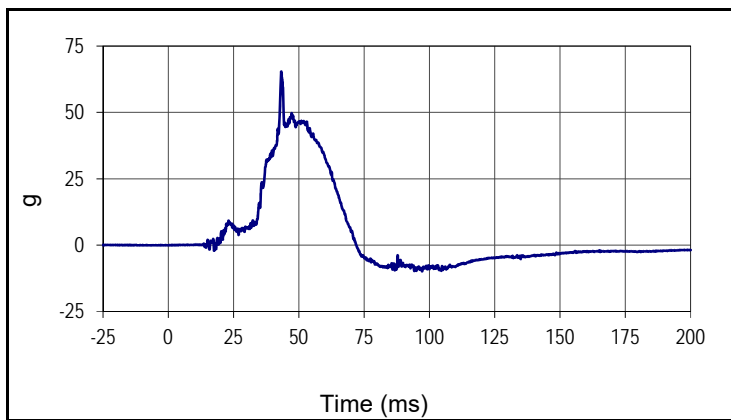
Load Cell Pole Barrier #1 Force (Y)  
Load Cell Pole Barrier #2 Force (Y)  
Load Cell Pole Barrier #3 Force (Y)  
Load Cell Pole Barrier #4 Force (Y)  
Load Cell Pole Barrier #5 Force (Y)  
Load Cell Pole Barrier #6 Force (Y)  
Load Cell Pole Barrier #7 Force (Y)  
Load Cell Pole Barrier #8 Force (Y)

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan  
 Test Program: NCAP Side Pole Impact Test

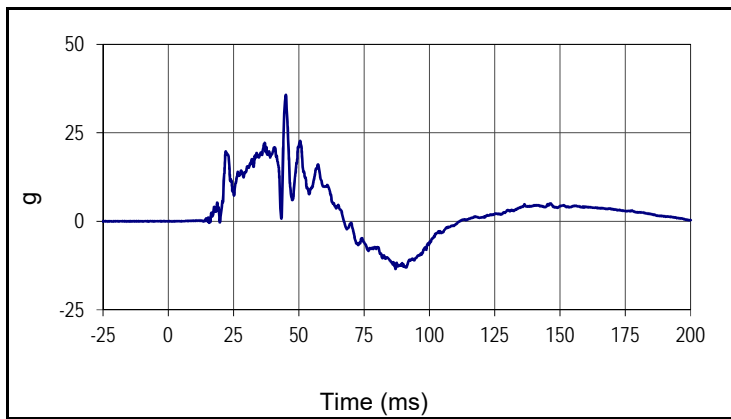
Test Date: 8/22/2018  
 NHTSA No.: O20185001



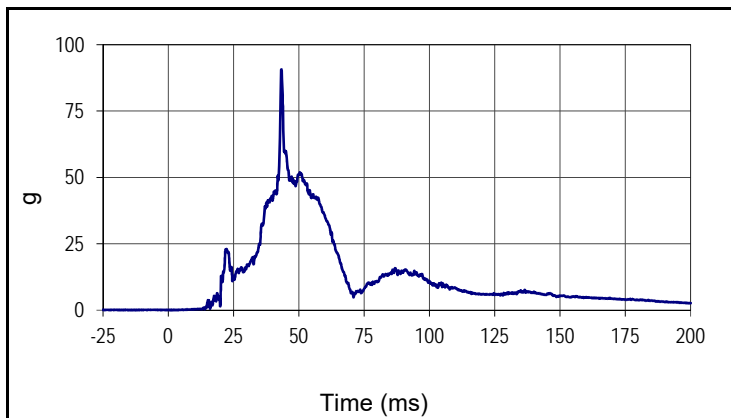
Curve Description			
Driver Head Acceleration X Primary			
Plot No.		SAE Class	Units
001		1000	g
Max	Time	Min	Time
4.1	136.5	-63.2	43.3



Curve Description			
Driver Head Acceleration Y Primary			
Plot No.		SAE Class	Units
002		1000	g
Max	Time	Min	Time
65.4	43.2	-9.8	97.2



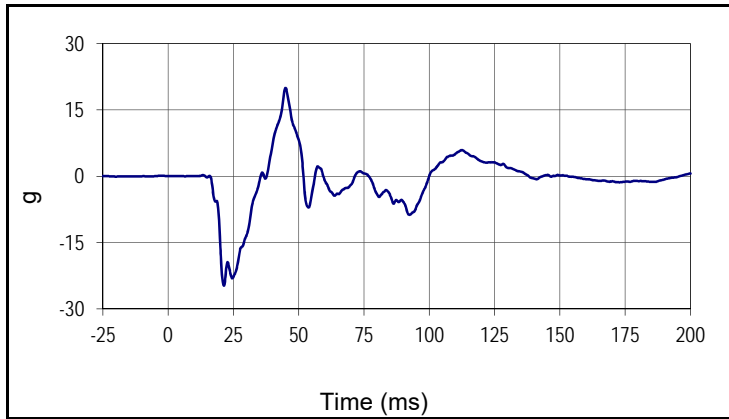
Curve Description			
Driver Head Acceleration Z Primary			
Plot No.		SAE Class	Units
003		1000	g
Max	Time	Min	Time
35.7	45.0	-13.5	87.0



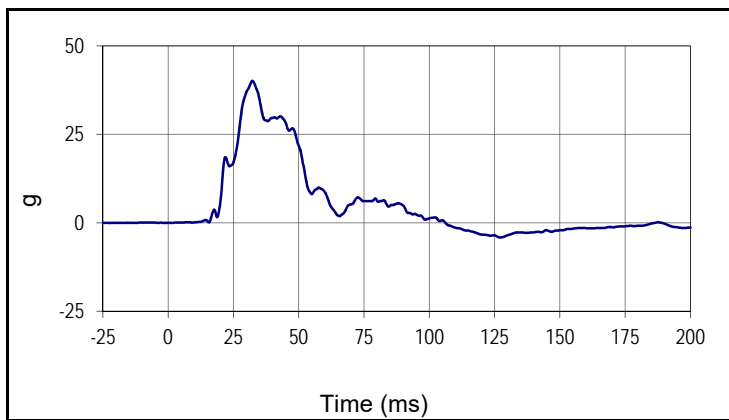
Curve Description			
Driver Head Acceleration Primary Resultant			
Plot No.		SAE Class	Units
004		1000	g
Max	Time	Min	Time
90.7	43.3	0.0	3.4

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan  
 Test Program: NCAP Side Pole Impact Test

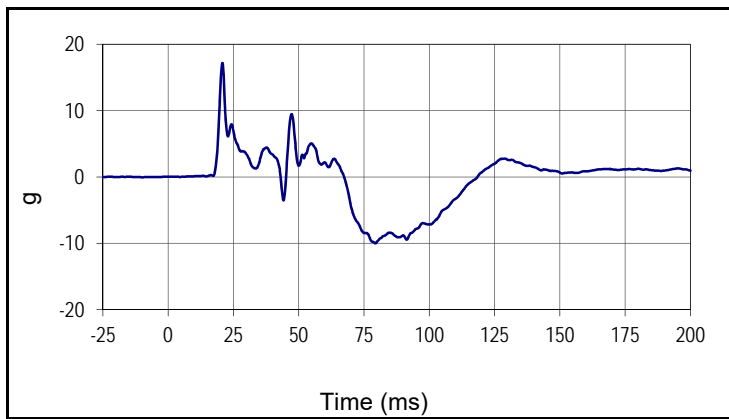
Test Date: 8/22/2018  
 NHTSA No.: O20185001



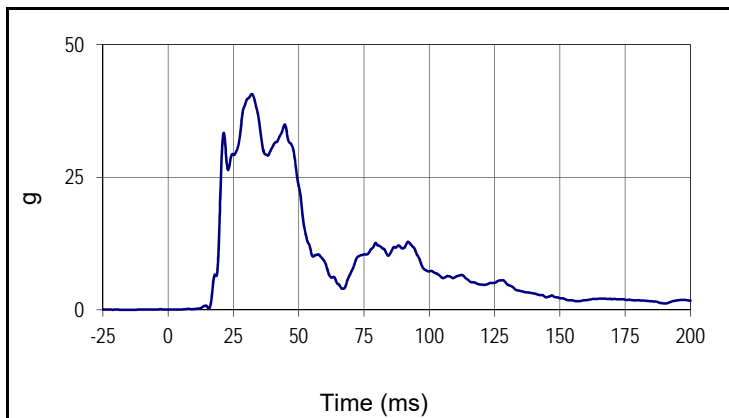
Curve Description			
Driver Lower Spine T12 Acceleration X			
Plot No.		SAE Class	Units
005		180	g
Max	Time	Min	Time
20.0	45.0	-24.7	21.4



Curve Description			
Driver Lower Spine T12 Acceleration Y			
Plot No.		SAE Class	Units
006		180	g
Max	Time	Min	Time
40.1	32.2	-4.1	127.0



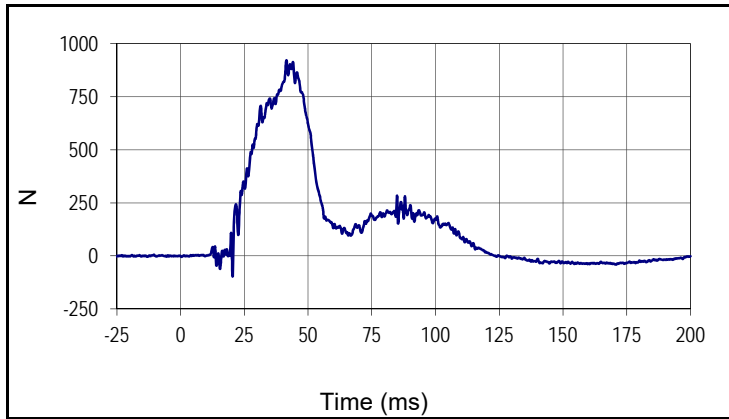
Curve Description			
Driver Lower Spine T12 Acceleration Z			
Plot No.		SAE Class	Units
007		180	g
Max	Time	Min	Time
17.2	20.8	-10.0	79.3



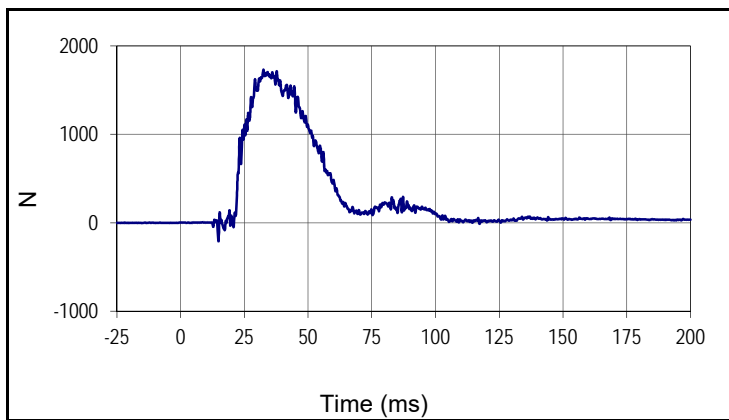
Curve Description			
Driver Lower Spine T12 Acceleration Resultant			
Plot No.		SAE Class	Units
008		180	g
Max	Time	Min	Time
40.7	32.0	0.1	4.7

Test Vehicle: 2018 Tesla Model 3 Long Range RWD 4-Door Sedan  
 Test Program: NCAP Side Pole Impact Test

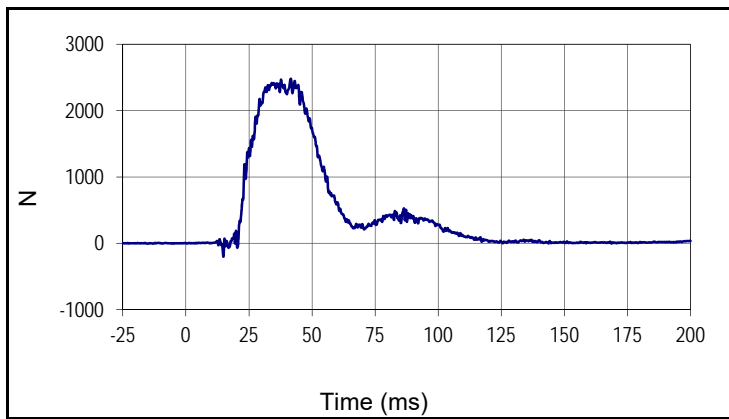
Test Date: 8/22/2018  
 NHTSA No.: O20185001



Curve Description			
Driver Iliac Wing Force on Impact Side Y			
Plot No.		SAE Class	Units
009		600	N
Max	Time	Min	Time
921.5	41.5	-97.0	20.4



Curve Description			
Driver Acetabulum Force on Impact Side Y			
Plot No.		SAE Class	Units
010		600	N
Max	Time	Min	Time
1731.6	32.5	-207.9	14.9



Curve Description			
Driver Total Pelvic Force on Impact Side Y			
Plot No.		SAE Class	Units
011		600	N
Max	Time	Min	Time
2478.1	41.6	-200.6	14.9

**APPENDIX C**  
**ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

**APPENDIX C**  
**PRE-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

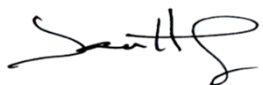



**SID-IIs Small Side Impact Dummy**  
**External Measurements**

ATD Serial No.: 308

Test Date: 2018-07-31

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Relative Humidity	%	10	70	40	Pass
A - Sitting Height	mm	772	788	781	Pass
B - Shoulder Pivot Height	mm	437	453	450	Pass
C - Hpoint Height	mm	79	89	84	Pass
D - H Point From Seatback	mm	141	151	145	Pass
E - Shoulder Pivot From Backline	mm	97	107	101	Pass
F - Thigh Clearance	mm	119	135	129	Pass
G - Head Breadth	mm	140	148	147	Pass
H - Head Back From Backline	mm	40	46	44	Pass
I - Head Depth	mm	178	188	184	Pass
J - Head Circumference	mm	541	551	549	Pass
K - Buttock To Knee Length	mm	514	540	525	Pass
L - Popliteal Height	mm	343	369	353	Pass
K - Knee Pivot To Floor Height	mm	392	409	404	Pass
N - Buttock Popliteal Length	mm	416	442	427	Pass
O - Chest Depth W/O Jacket	mm	195	211	206	Pass
P - Foot Length	mm	216	232	228	Pass
Q - Hip Breadth (W/Pelvic Plugs)	mm	313	323	315	Pass
R - Arm Length	mm	249	259	253	Pass
S - Knee Joint To Seatback	mm	477	493	484	Pass
V - Shoulder Width	mm	341	357	350	Pass
W - Foot Width	mm	78	94	88	Pass
Y - Chest Circumference W/Jacket	mm	851	881	869	Pass
Z - Waist Circumference	mm	761	791	783	Pass
<b>Overall Test Results</b>					<b>Pass</b>

Technician:   
 J. Hernandez

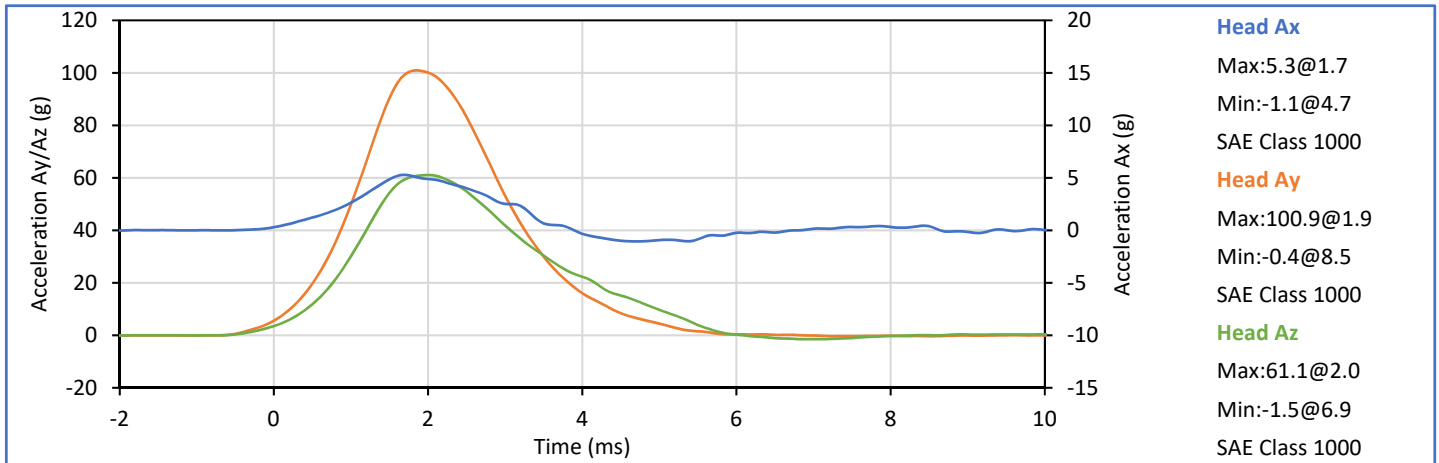
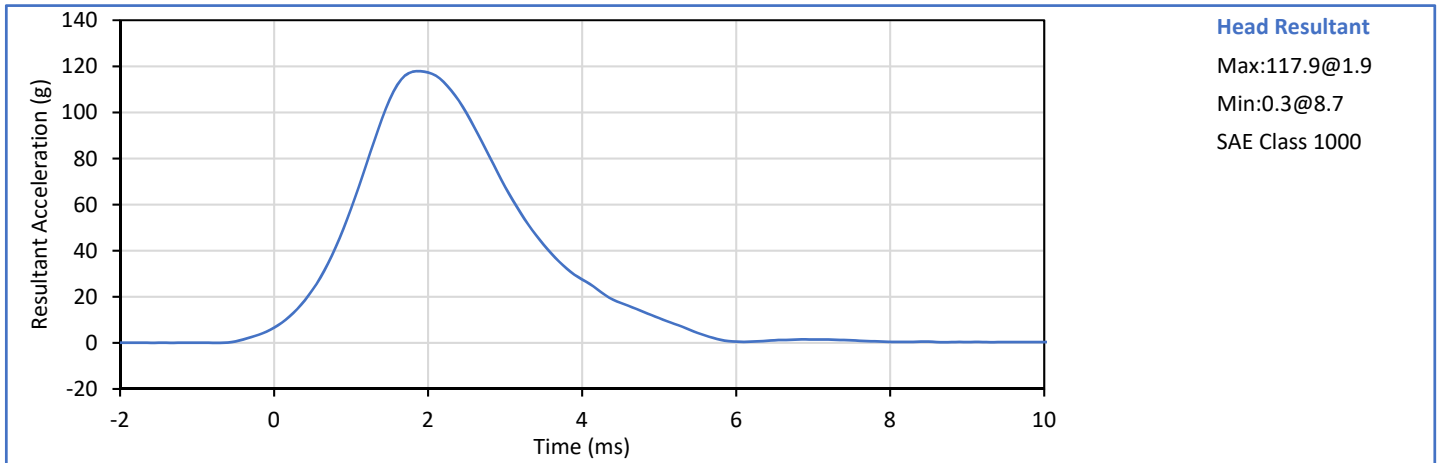
Approved By:   
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-07-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.4	Pass
Laboratory Humidity	%	10	70	15	Pass
Peak Resultant Acceleration	g	115.0	137.0	117.9	Pass
Peak Head Ax	g	-15.0	15.0	-1.1	Pass
Oscillations After Main Pulse	%	0.0	15.0	1.3	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
 T. Lowman

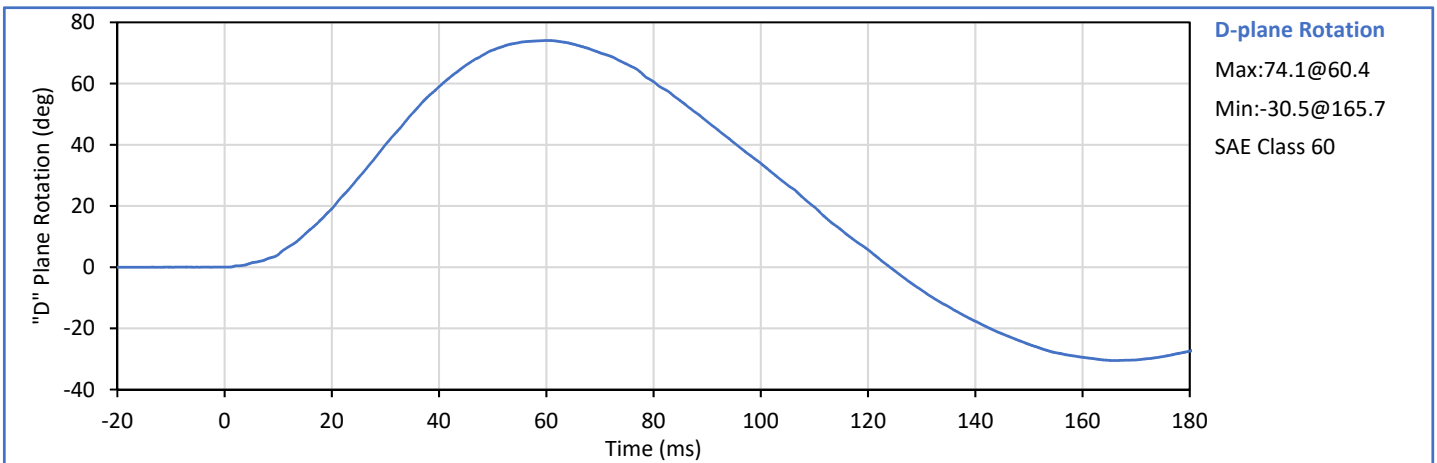
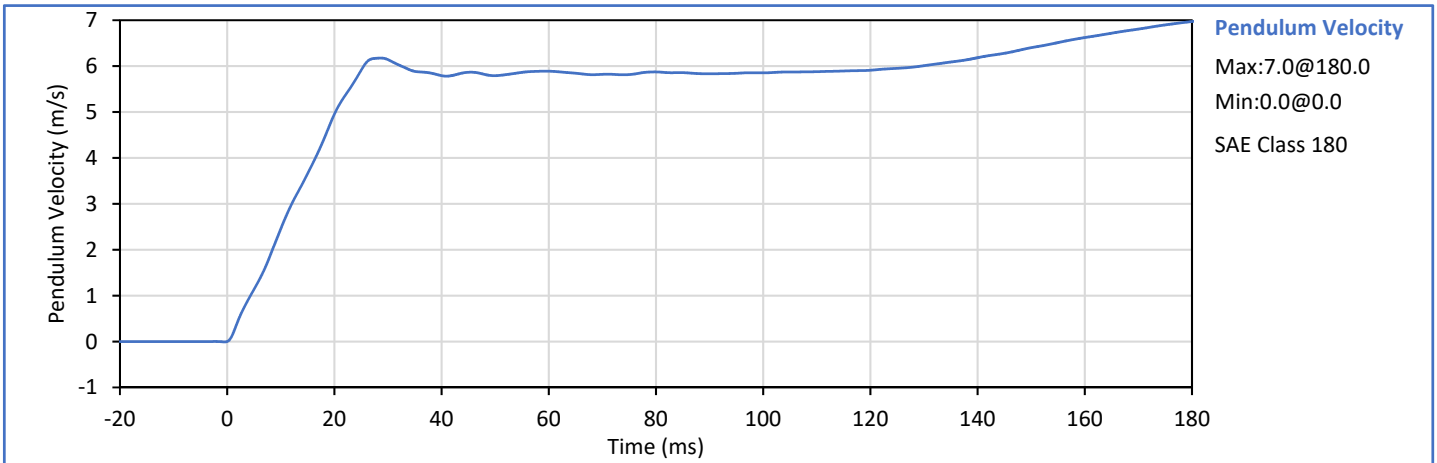
Approved By:   
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-08-02

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	40	Pass
Pendulum Velocity	m/s	5.51	5.63	5.62	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.45	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.66	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	5.91	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	6.18	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	74.1	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	60.4	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-43.2	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	106.7	Pass
<b>Overall Test Results</b>					<b>Pass</b>



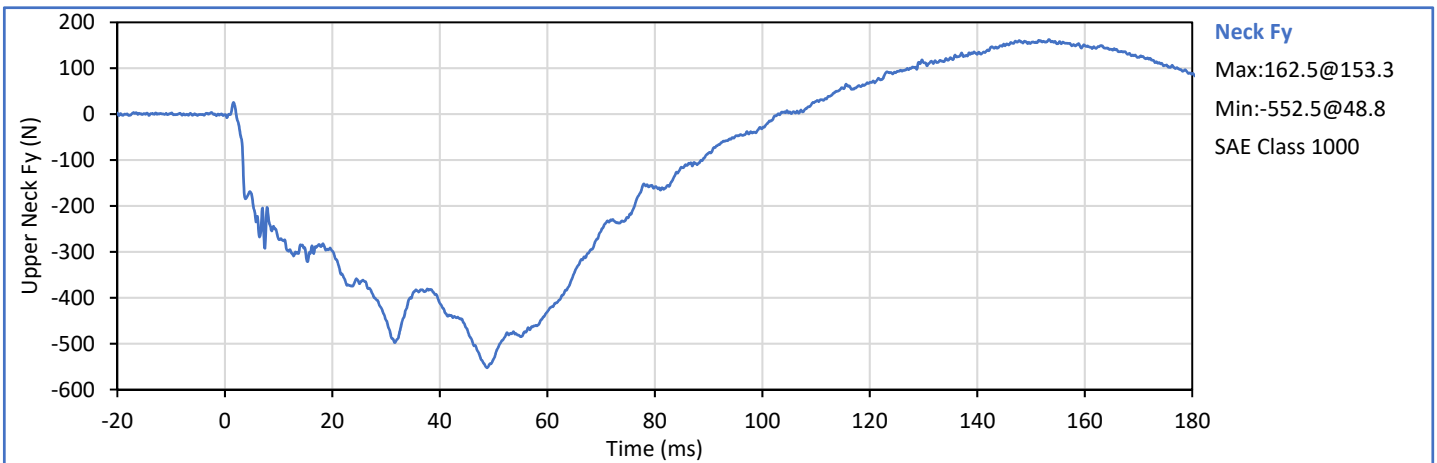
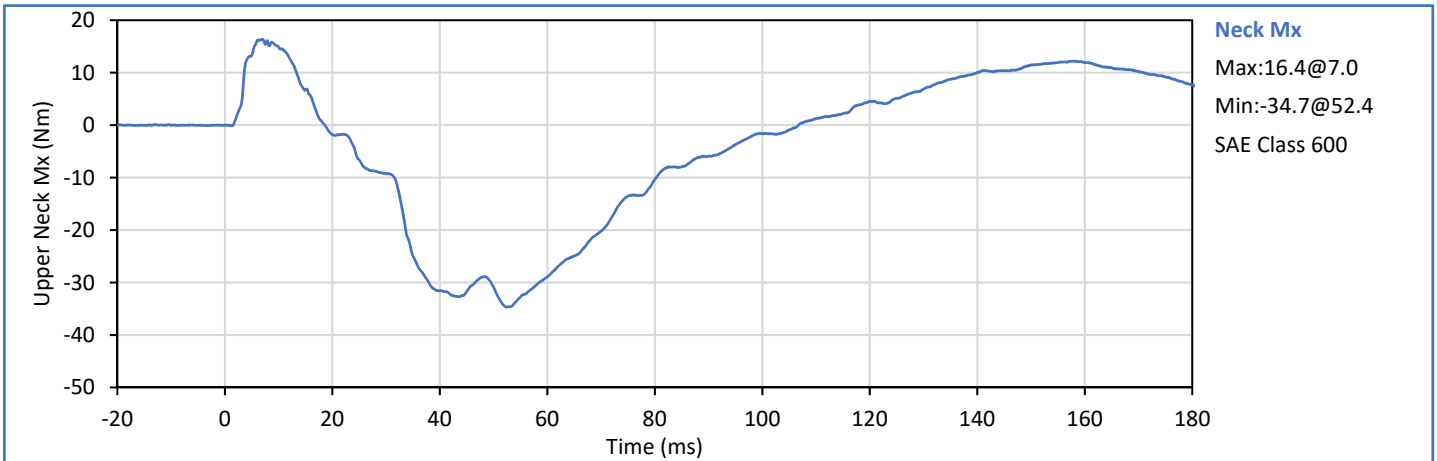
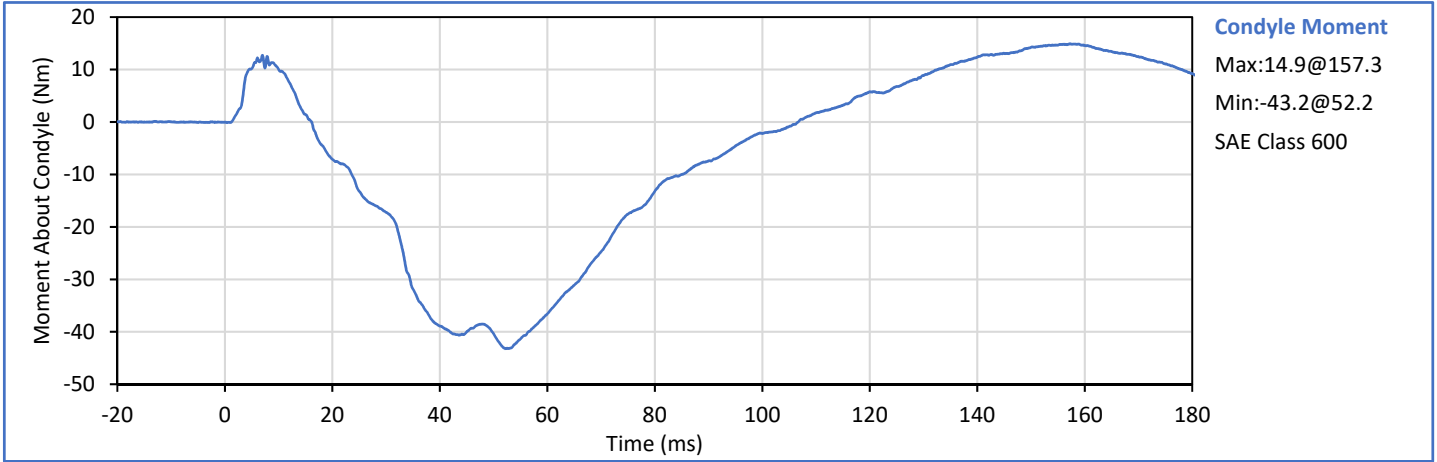
Technician: *J. Hernandez*  
 J. Hernandez

Approved By: *P. Puzzuto*  
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-08-02

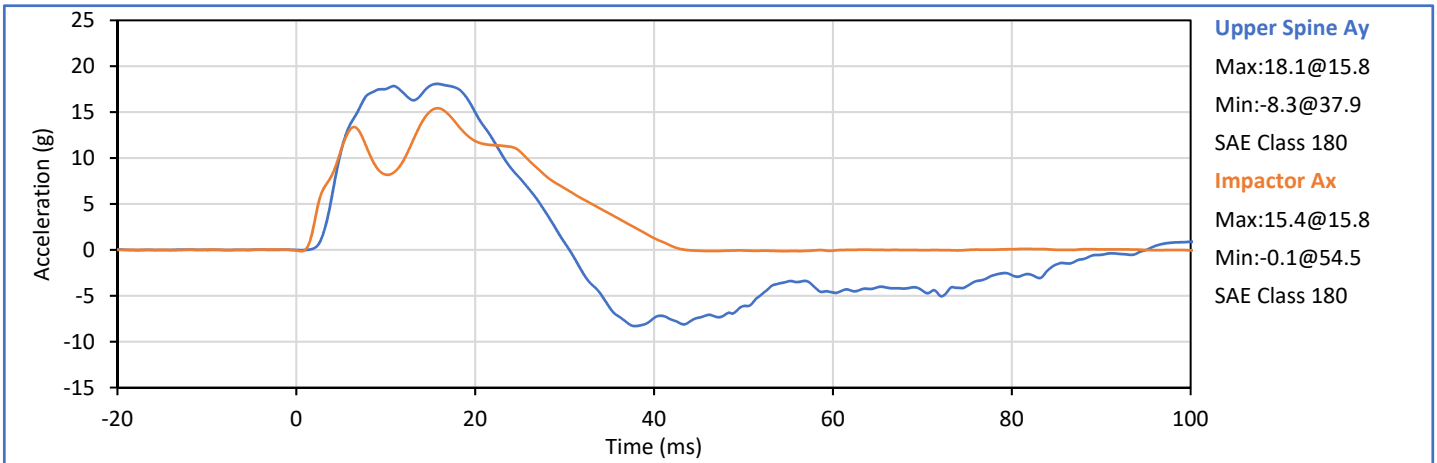
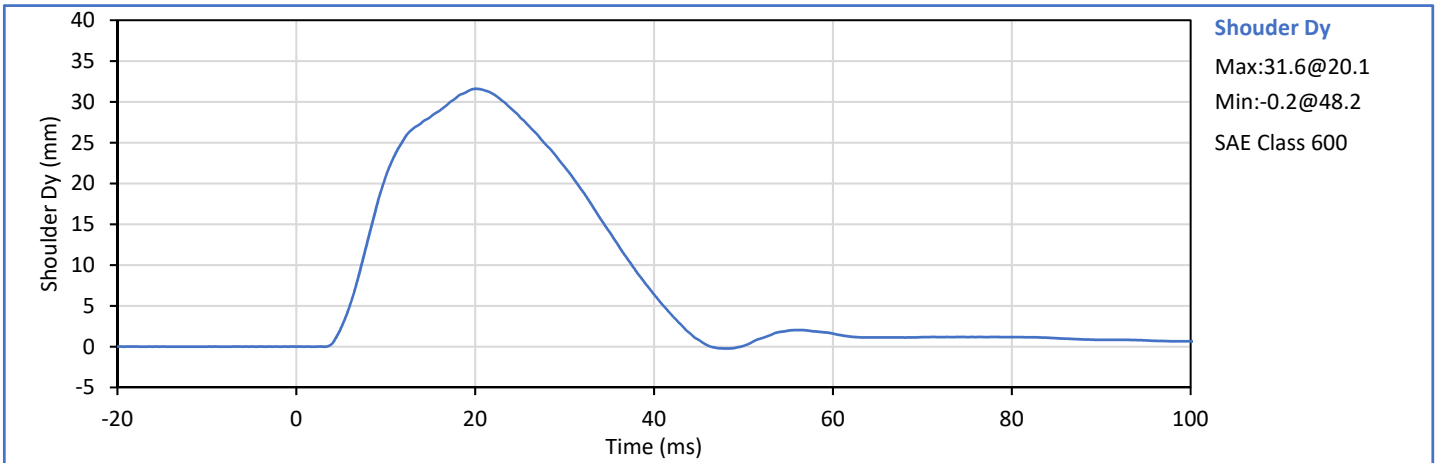


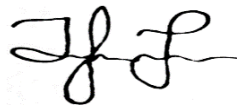



ATD Serial No.: 308

Test Date: 2018-07-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.25	Pass
Peak Shoulder Dy	mm	28.0	37.0	31.6	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.1	Pass
Peak Impactor Ax	g	13.0	18.0	15.4	Pass
Overall Test Results					Pass



Technician:   
 T Lowman

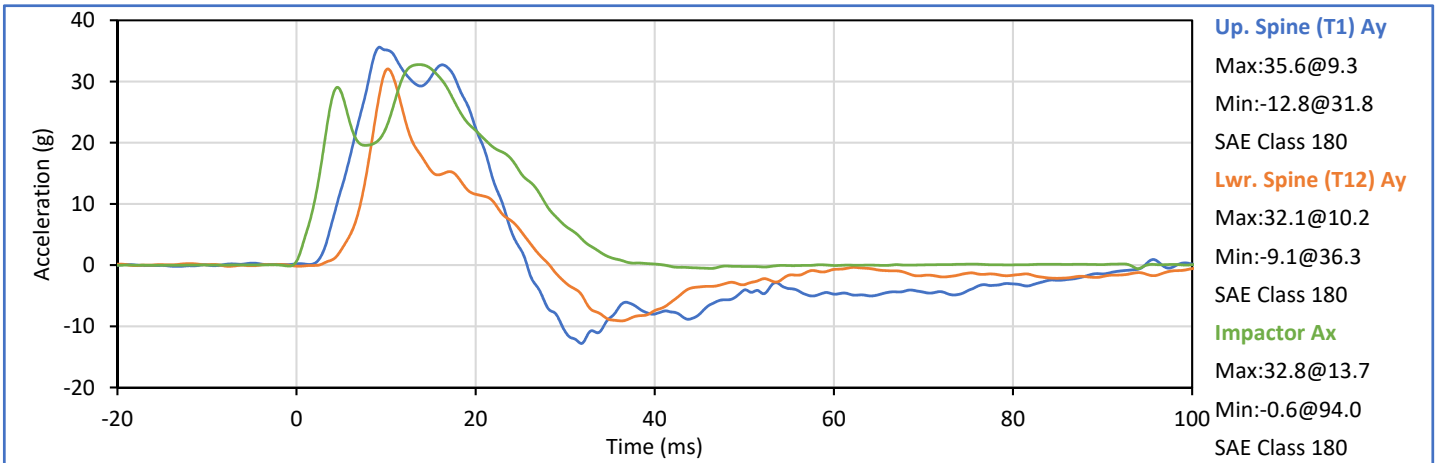
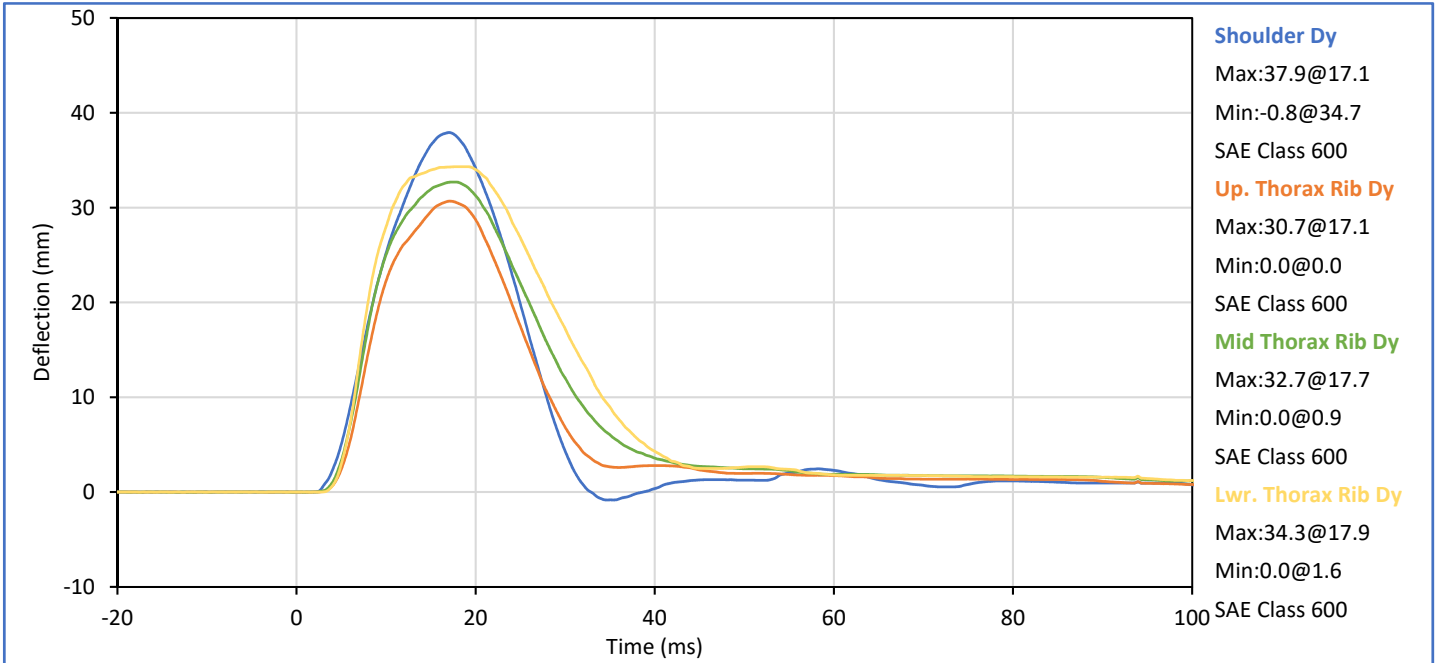
Approved By:   
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-07-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	6.60	6.80	6.65	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.9	Pass
Peak Upper Rib Dy	mm	25.0	32.0	30.7	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.7	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.3	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	35.6	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	32.1	Pass
Peak Impactor Ax	g	30.0	36.0	32.8	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
 J. Hernandez

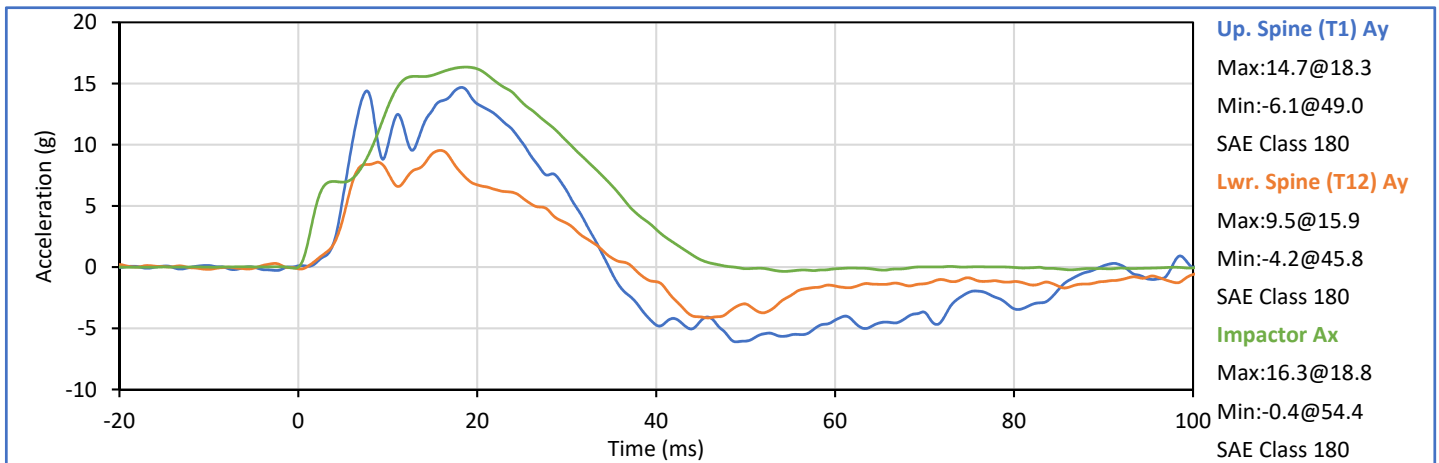
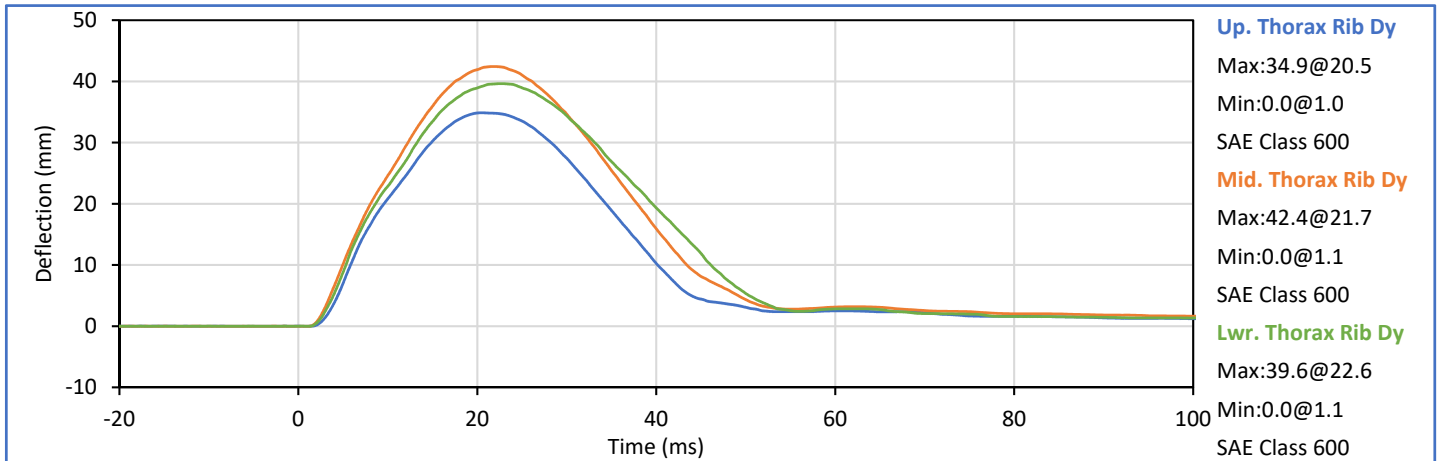
Approved By:   
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-07-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	Pass
Laboratory Humidity	%	10	70	41	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Rib Dy	mm	32.0	40.0	34.9	Pass
Peak Middle Rib Dy	mm	39.0	45.0	42.4	Pass
Peak Lower Rib Dy	mm	35.0	43.0	39.6	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	14.7	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.5	Pass
Peak Impactor Ax	g	14.0	18.0	16.3	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
 J. Hernandez

Approved By:   
 P. Puzzuto

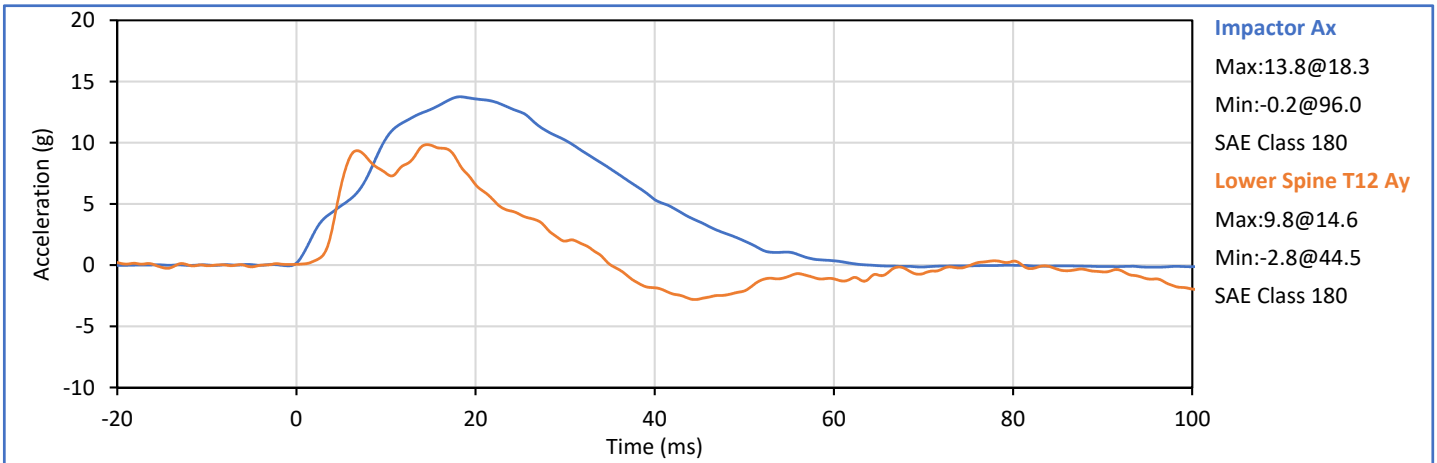
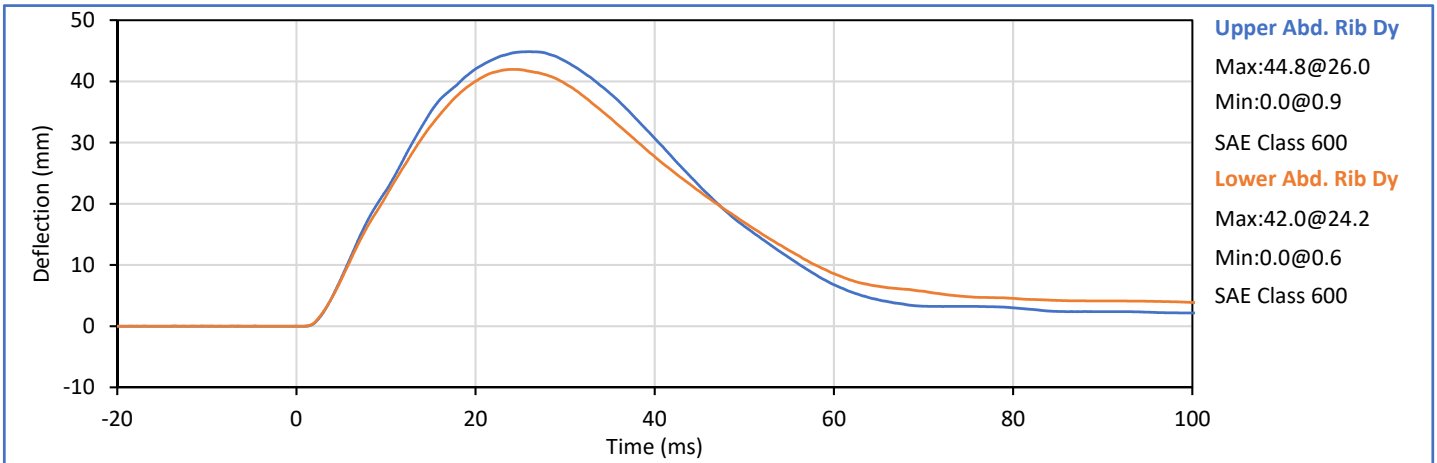


**SID-IIs Small Side Impact Dummy**  
**Abdomen Impact**

ATD Serial No.: 308

Test Date: 2018-07-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.3	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	44.8	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	42.0	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	9.8	Pass
Peak Impactor Ax	g	12.0	16.0	13.8	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician: *J. Hernandez*  
 J. Hernandez

Approved By: *P. Puzzuto*  
 P. Puzzuto

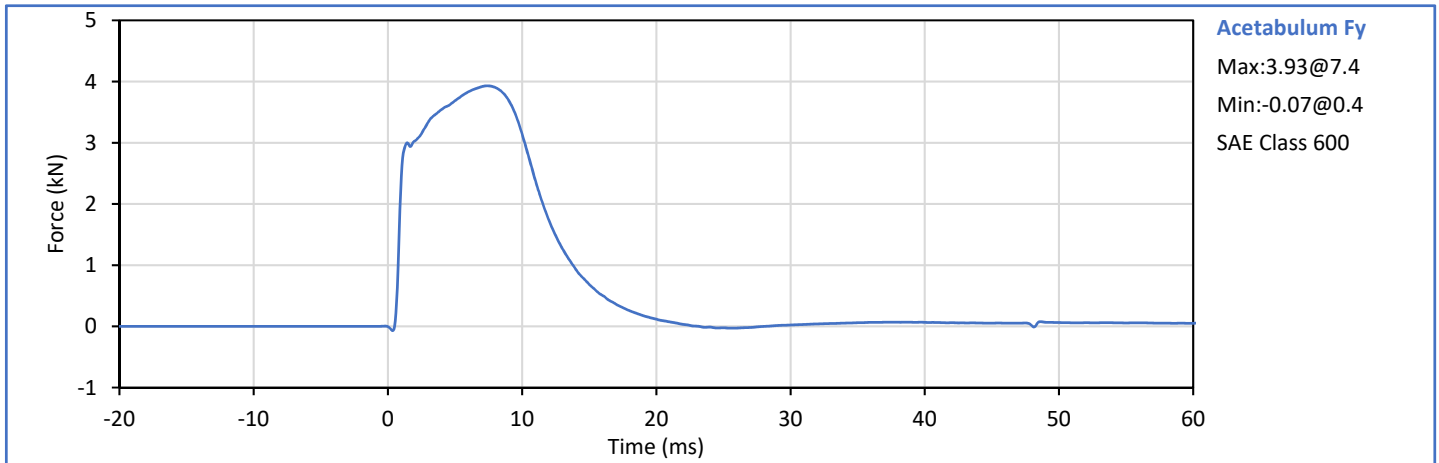
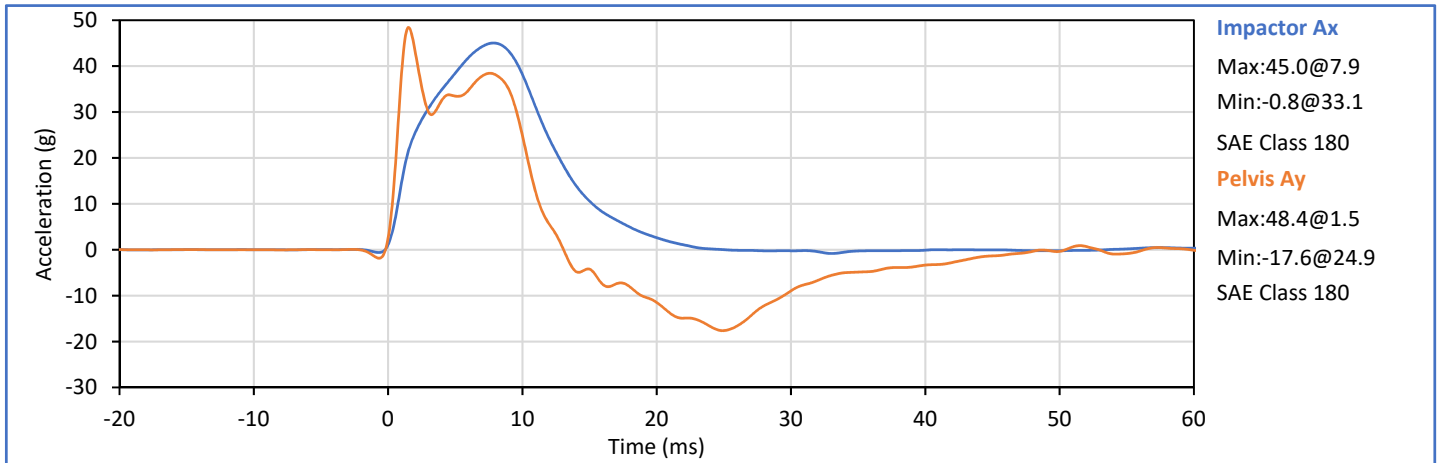


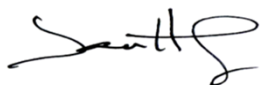
ATD Serial No.: 308


Test Date: 2018-07-31

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	6.60	6.80	6.79	Pass
Peak Acetabulum Fy	kN	3.600	4.300	3.931	Pass
Pelvis Ay after 6ms	g	34.0	42.0	38.5	Pass
Peak Impactor Ax	g	38.0	47.0	45.0	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 11189 (SACO)



Technician:   
 J. Hernandez

Approved By:   
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-07-31

Pelvis Plug S/N: 11189 (SACO)



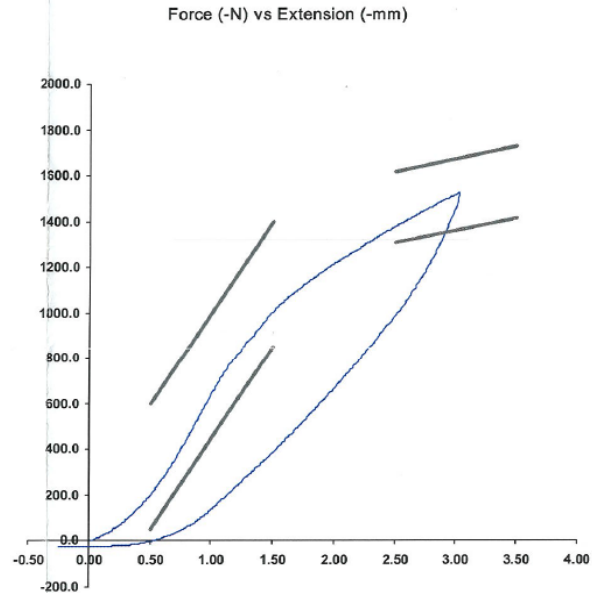
**SID-IIs Pelvis Plug Certification Test**

Plug S/N 11189  
 Test Number 3192  
 Report Number 3185  
 Test Date 11/15/2016 11:53:04 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	199.48	50.00	600.00
Force @ 1.5 mm (N)	1,010.65	850.00	1,400.00
Force @ 2.5 mm (N)	1,379.09	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,518.94	1,361.00	1,673.00

Testing Machine STM-20 5965542  
 Load Cell S/N (TI240813), Units (LBS) 1000  
 Crosshead Speed (mm / min ) or Rate 12.7  
 Extension or Position Measured by XHD\_100 ( XHD100 )

Notes:



Operator DC

Part Number 180-4450

Template No 107 15-Nov-16  
 SACO Research

By: DC Date: 11/15/16



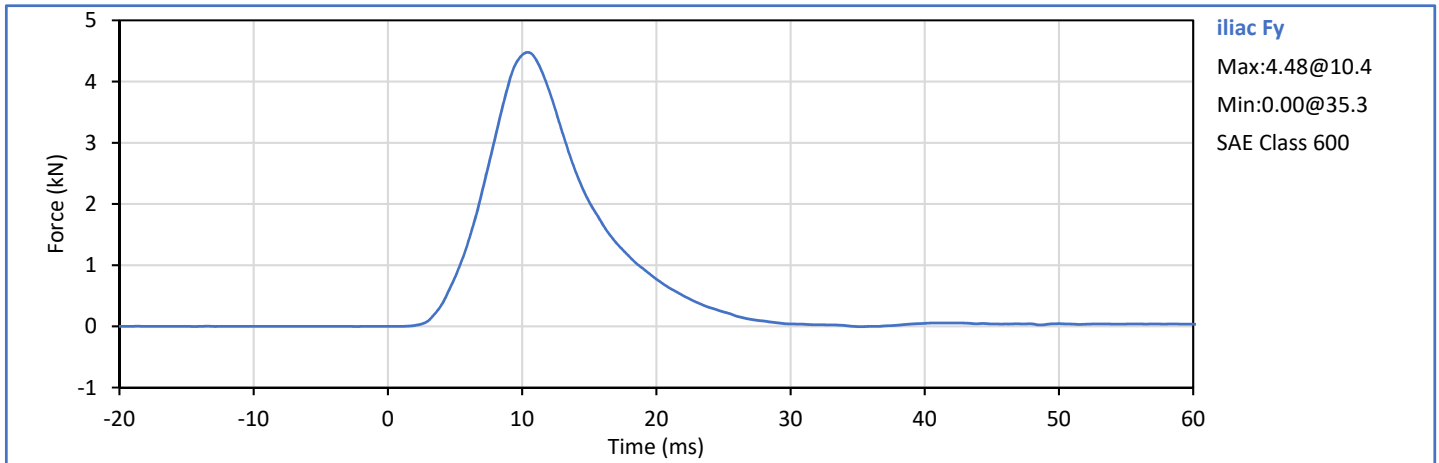
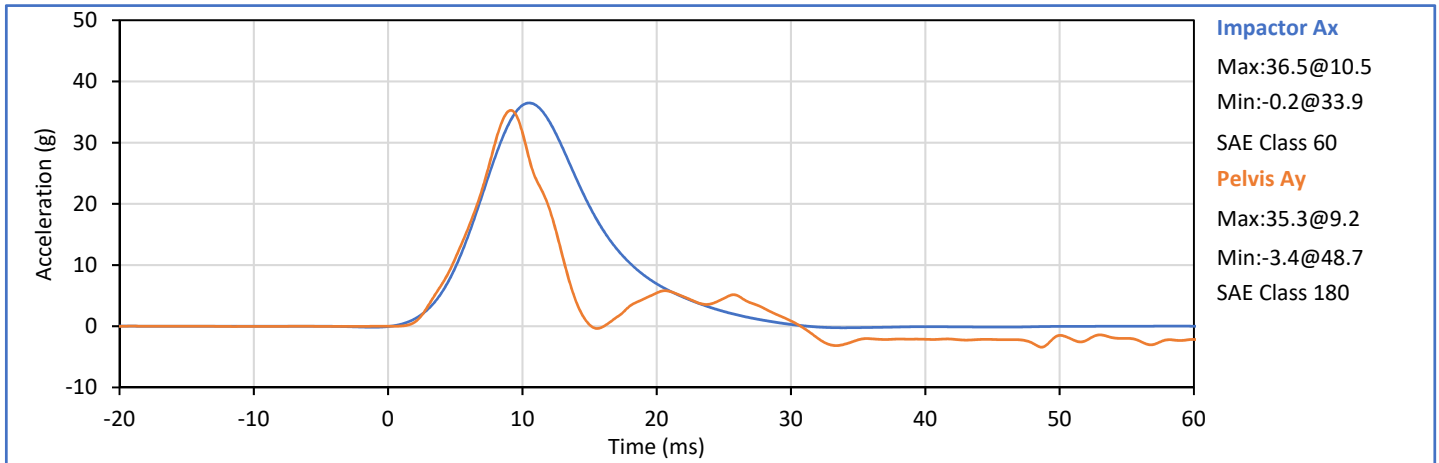
ATD Serial No.: 308

Test Date: 2018-08-02

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.25	Pass
Peak Acetabulum Fy	kN	4.100	5.100	4.477	Pass
Pelvis Ay	g	28.0	39.0	35.3	Pass
Peak Impactor Ax	g	36.0	45.0	36.5	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 71052 (HIS) \*

\* Plug is not impacted and remains certified



Technician: J. Hernandez

Approved By: P. Puzzuto

**APPENDIX C**  
**POST-TEST ATD CONFIGURATION AND PERFORMANCE VERIFICATION DATA**

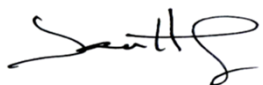



**SID-IIs Small Side Impact Dummy**  
**External Measurements**

ATD Serial No.: 308

Test Date: 2018-08-24

Tested Parameter	Units	Spec Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.2	Pass
Laboratory Relative Humidity	%	10	70	44	Pass
A - Sitting Height	mm	772	788	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

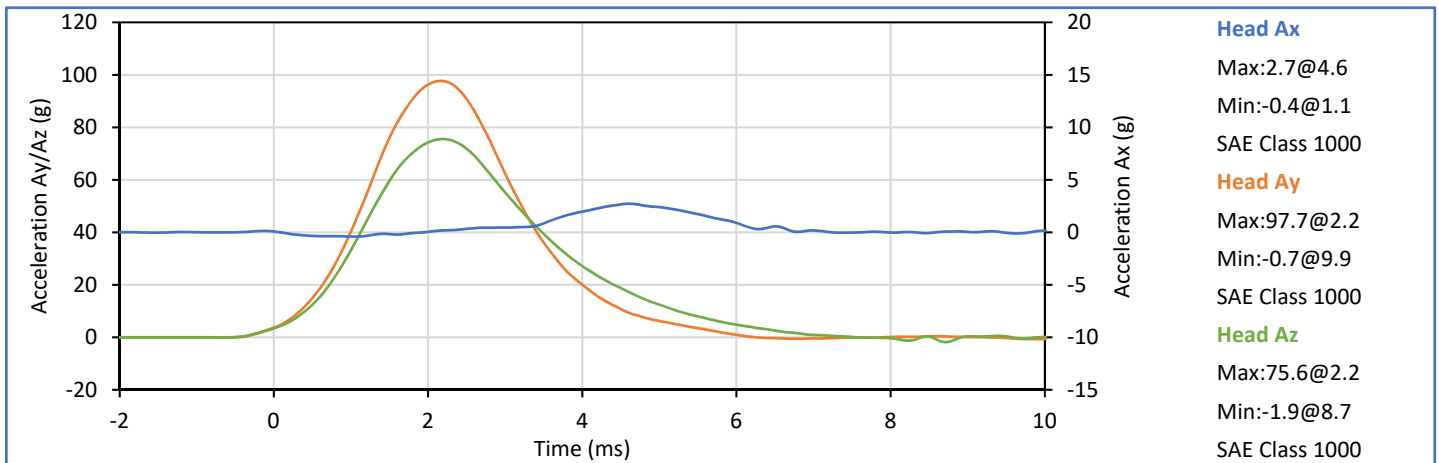
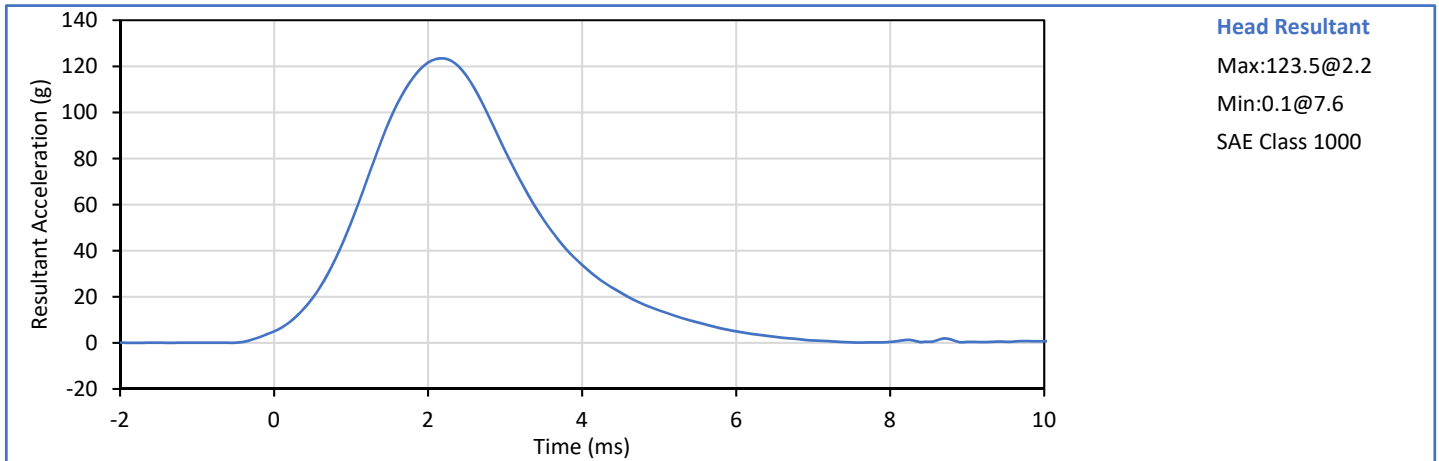
Approved By:   
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-08-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	18.9	25.6	21.2	Pass
Laboratory Humidity	%	10	70	40	Pass
Peak Resultant Acceleration	g	115.0	137.0	123.5	Pass
Peak Head Ax	g	-15.0	15.0	-0.4	Pass
Oscillations After Main Pulse	%	0.0	15.0	3.2	Pass
Is Acceleration Unimodal?	Yes/No	Yes		Yes	Pass
Overall Test Results					Pass



Technician:   
 J. Hernandez

Approved By:   
 P. Puzzuto

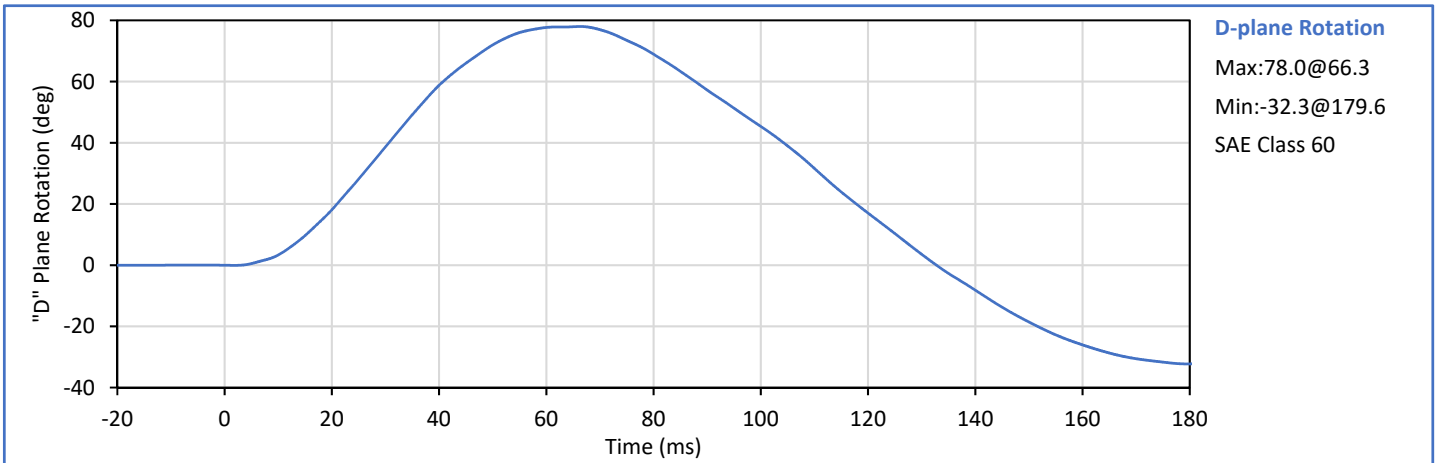
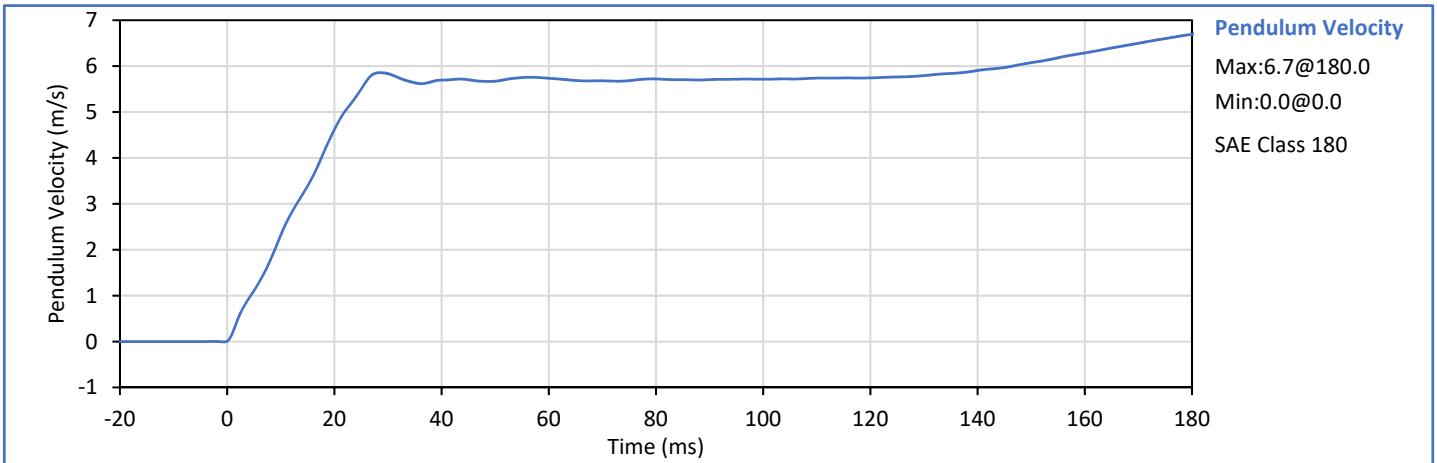


**SID-IIs Small Side Impact Dummy  
 Neck Flexion**

ATD Serial No.: 308

Test Date: 2018-08-27

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.4	Pass
Laboratory Humidity	%	10	70	34	Pass
Pendulum Velocity	m/s	5.51	5.63	5.61	Pass
Pendulum Decel at 10 ms	m/s	2.20	2.80	2.32	Pass
Pendulum Decel at 15 ms	m/s	3.30	4.10	3.39	Pass
Pendulum Decel at 20 ms	m/s	4.40	5.40	4.61	Pass
Pendulum Decel at 25 ms	m/s	5.40	6.10	5.50	Pass
Pendulum Decel from 25-100 ms	m/s	5.50	6.20	5.86	Pass
Peak "D" Plane Rotation	deg	71.0	81.0	78.0	Pass
Time of Peak "D" Plane Rotation	ms	50.0	70.0	66.3	Pass
Peak Occ. Condyle Moment	Nm	-44.0	-36.0	-41.8	Pass
Time of Moment Decay to 0 Nm	ms	102.0	126.0	115.5	Pass
<b>Overall Test Results</b>					<b>Pass</b>



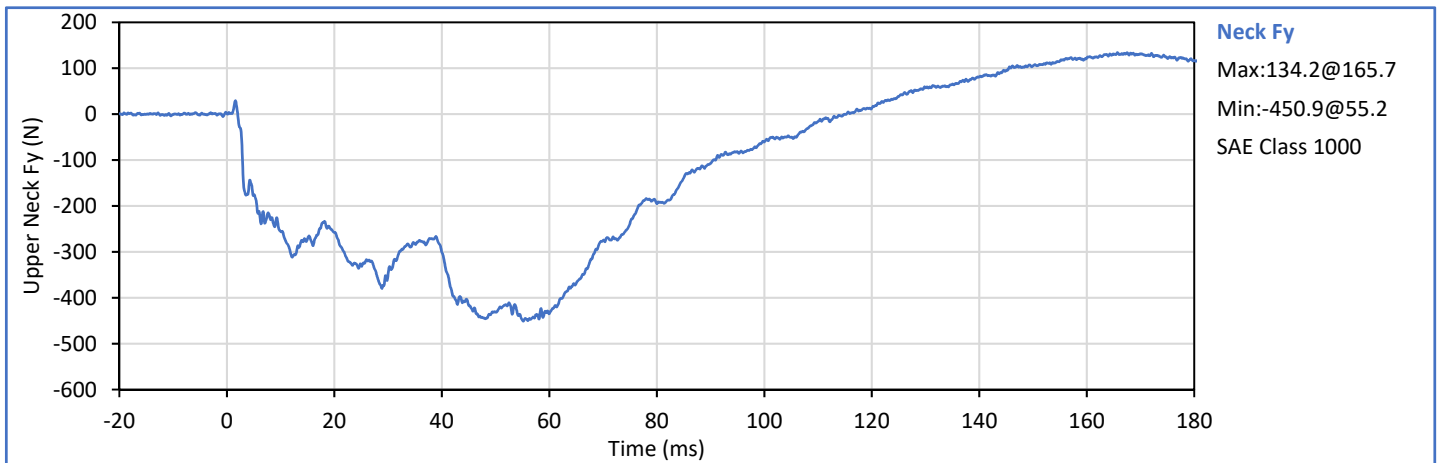
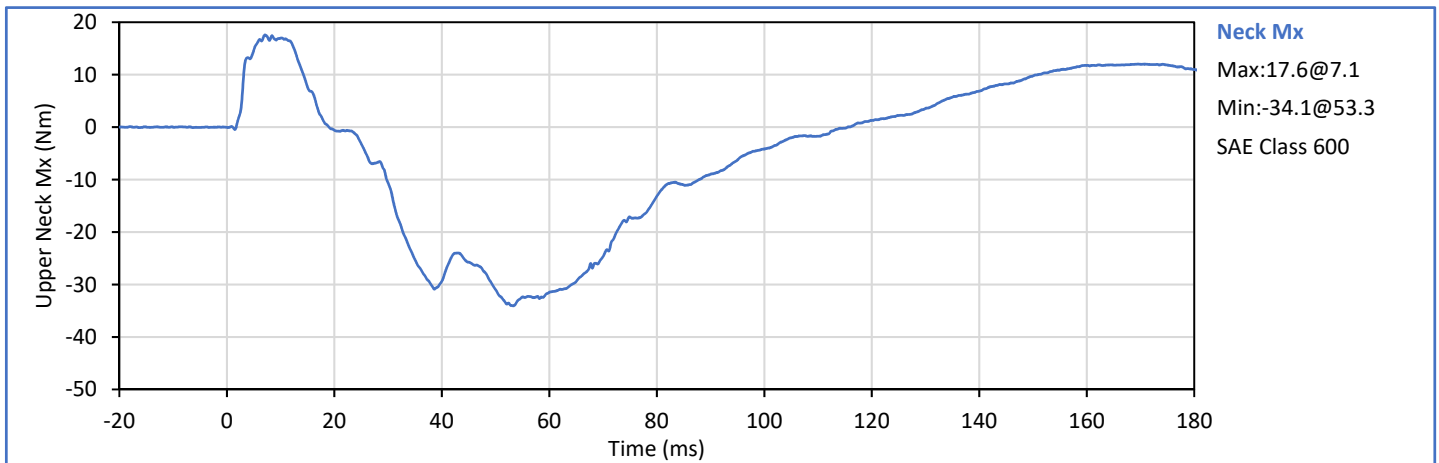
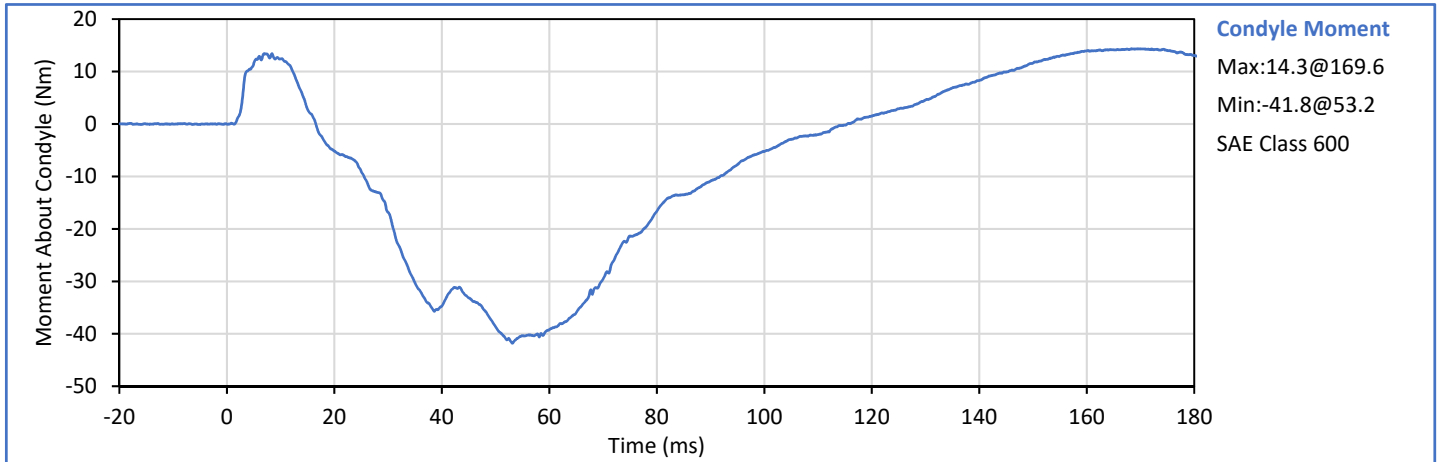
Technician: *J. Hernandez*  
 J. Hernandez

Approved By: *P. Puzzuto*  
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-08-27

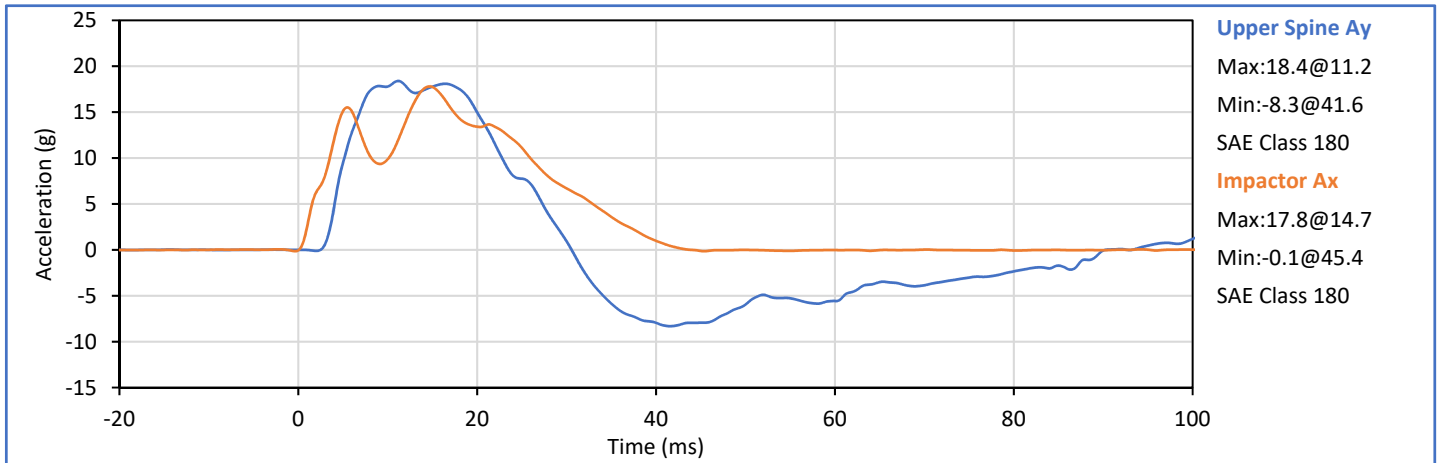
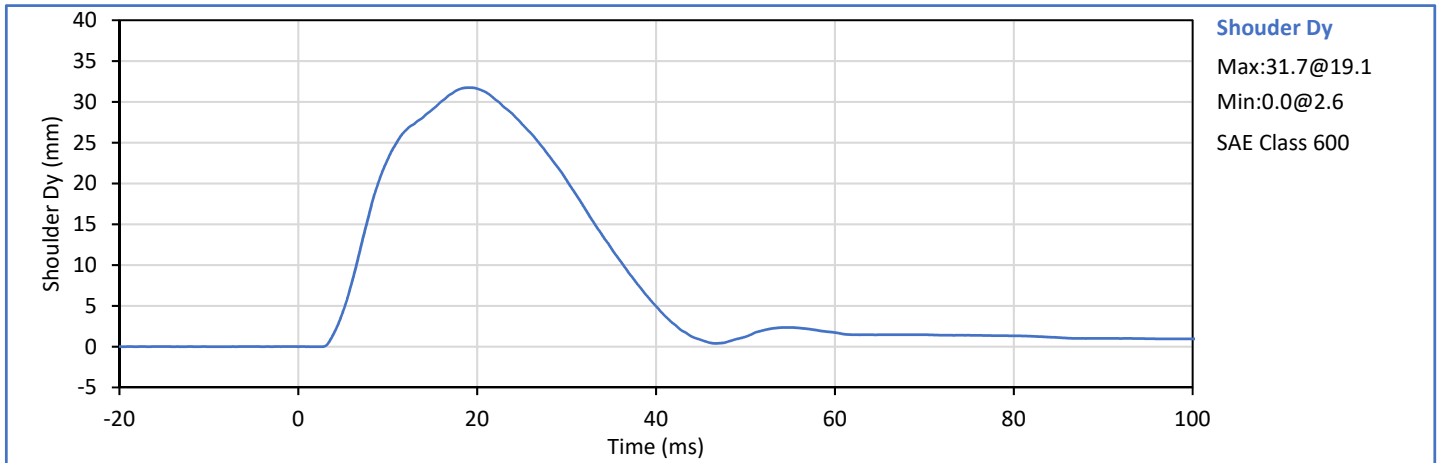




ATD Serial No.: 308

Test Date: 2018-08-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	39	Pass
Impactor Velocity	m/s	4.20	4.40	4.28	Pass
Peak Shoulder Dy	mm	28.0	37.0	31.7	Pass
Peak Upper Spine (T1) Ay	g	17.0	22.0	18.4	Pass
Peak Impactor Ax	g	13.0	18.0	17.8	Pass
Overall Test Results					Pass



Technician:   
 J. Hernandez

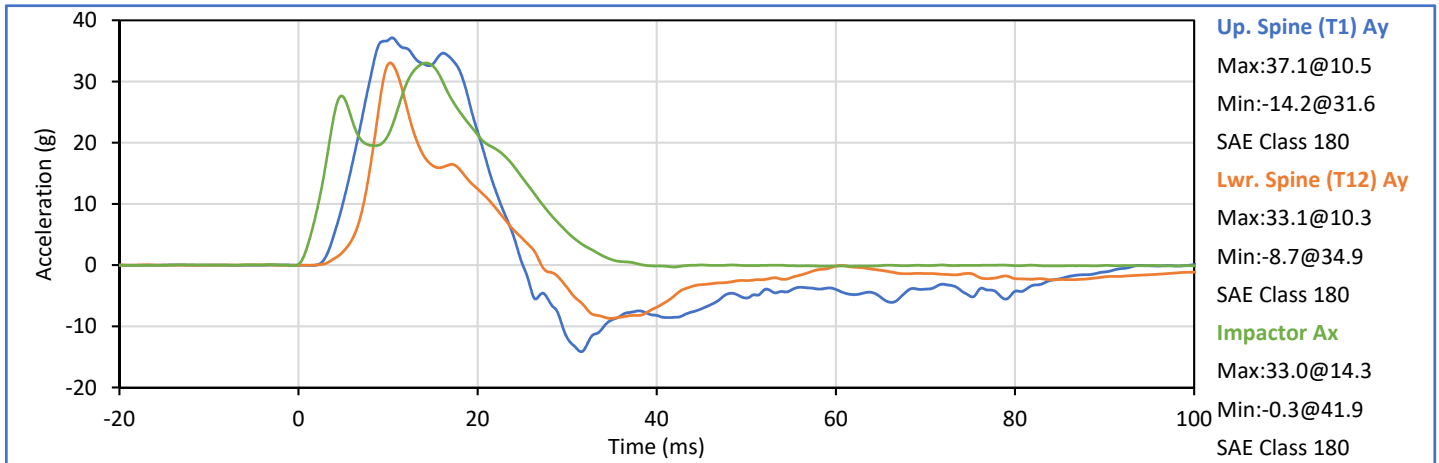
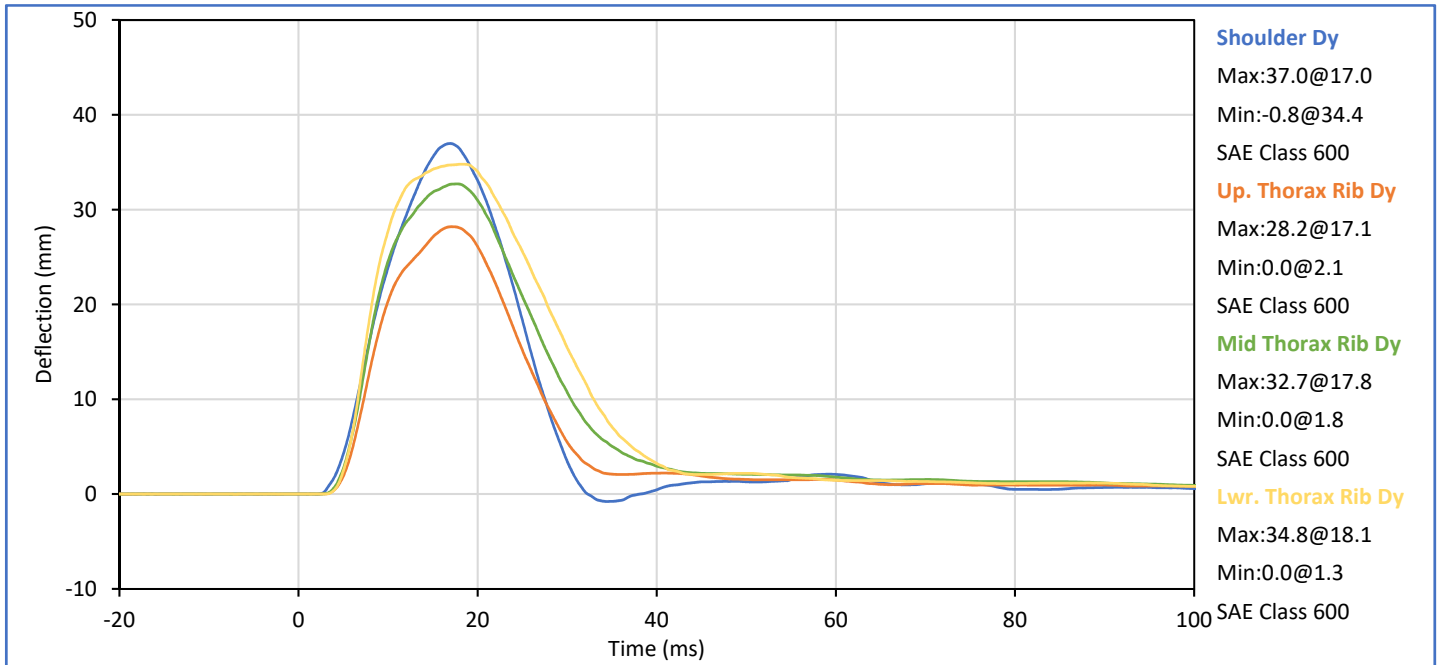
Approved By:   
 P. Puzzuto

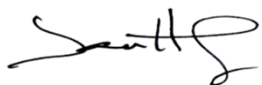



ATD Serial No.: 308

Test Date: 2018-08-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	42	Pass
Impactor Velocity	m/s	6.60	6.80	6.65	Pass
Peak Shoulder Dy	mm	31.0	40.0	37.0	Pass
Peak Upper Rib Dy	mm	25.0	32.0	28.2	Pass
Peak Middle Rib Dy	mm	30.0	36.0	32.7	Pass
Peak Lower Rib Dy	mm	32.0	38.0	34.8	Pass
Peak Upper Spine (T1) Ay	g	34.0	43.0	37.1	Pass
Peak Lower Spine (T12) Ay	g	29.0	37.0	33.1	Pass
Peak Impactor Ax	g	30.0	36.0	33.0	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
 J. Hernandez

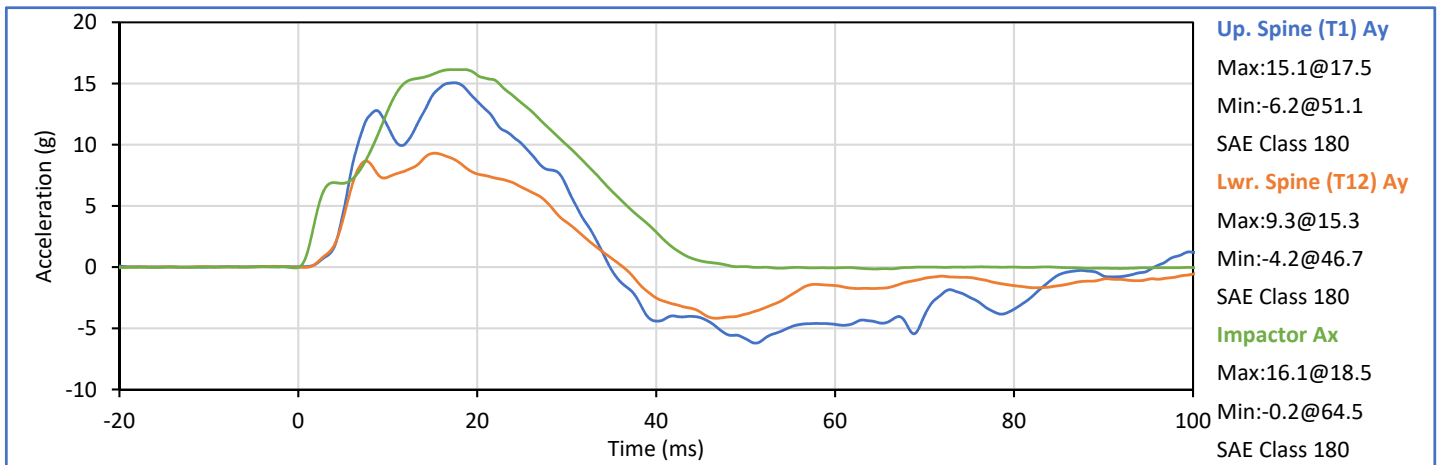
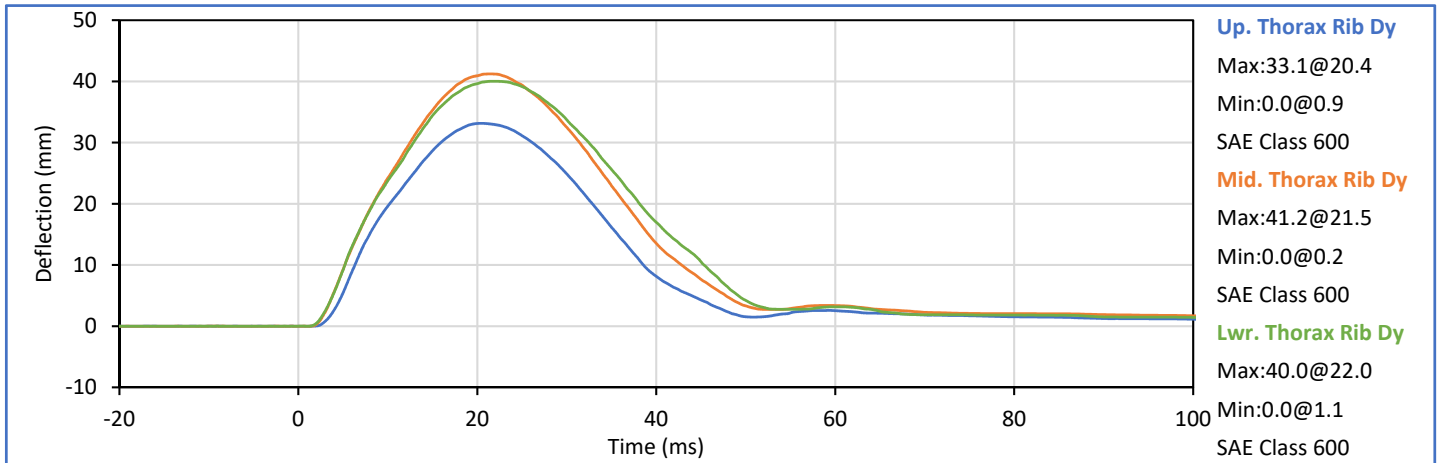
Approved By:   
 P. Puzzuto



ATD Serial No.: 308

Test Date: 2018-08-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.23	Pass
Peak Upper Rib Dy	mm	32.0	40.0	33.1	Pass
Peak Middle Rib Dy	mm	39.0	45.0	41.2	Pass
Peak Lower Rib Dy	mm	35.0	43.0	40.0	Pass
Peak Upper Spine (T1) Ay	g	13.0	17.0	15.1	Pass
Peak Lower Spine (T12) Ay	g	7.0	11.0	9.3	Pass
Peak Impactor Ax	g	14.0	18.0	16.1	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
 J. Hernandez

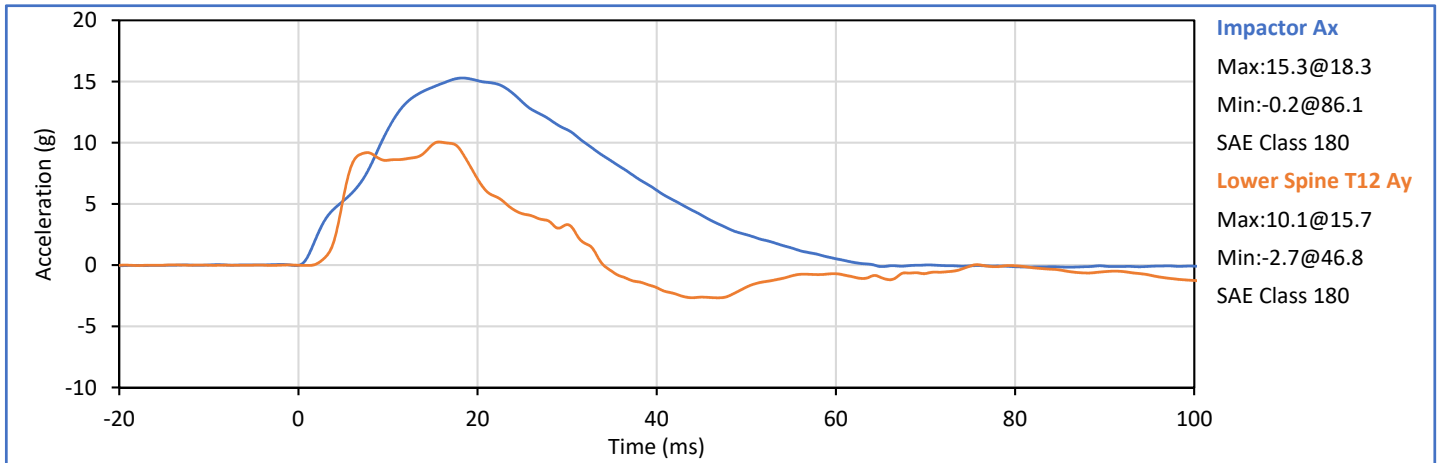
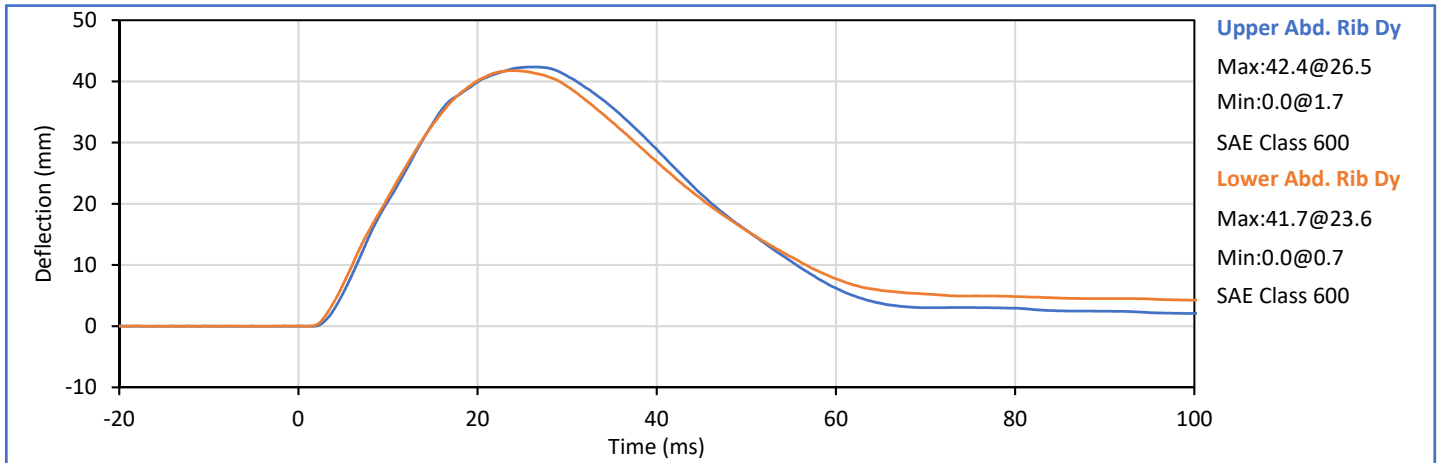
Approved By:   
 P. Puzzuto

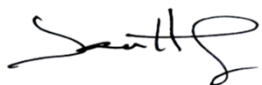



ATD Serial No.: 308

Test Date: 2018-08-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	40	Pass
Impactor Velocity	m/s	4.20	4.40	4.32	Pass
Peak Upper Abdomen Rib Dy	mm	36.0	47.0	42.4	Pass
Peak Lower Abdomen Rib Dy	mm	33.0	44.0	41.7	Pass
Peak Lower Spine T12 Ay	mm	9.0	14.0	10.1	Pass
Peak Impactor Ax	g	12.0	16.0	15.3	Pass
<b>Overall Test Results</b>					<b>Pass</b>



Technician:   
 J. Hernandez

Approved By:   
 P. Puzzuto



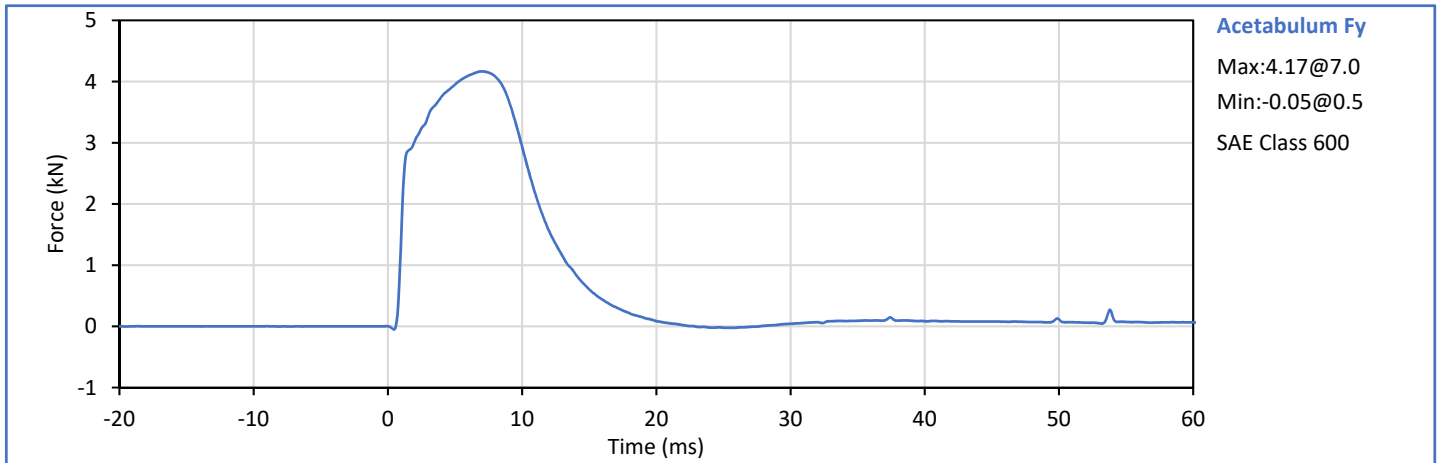
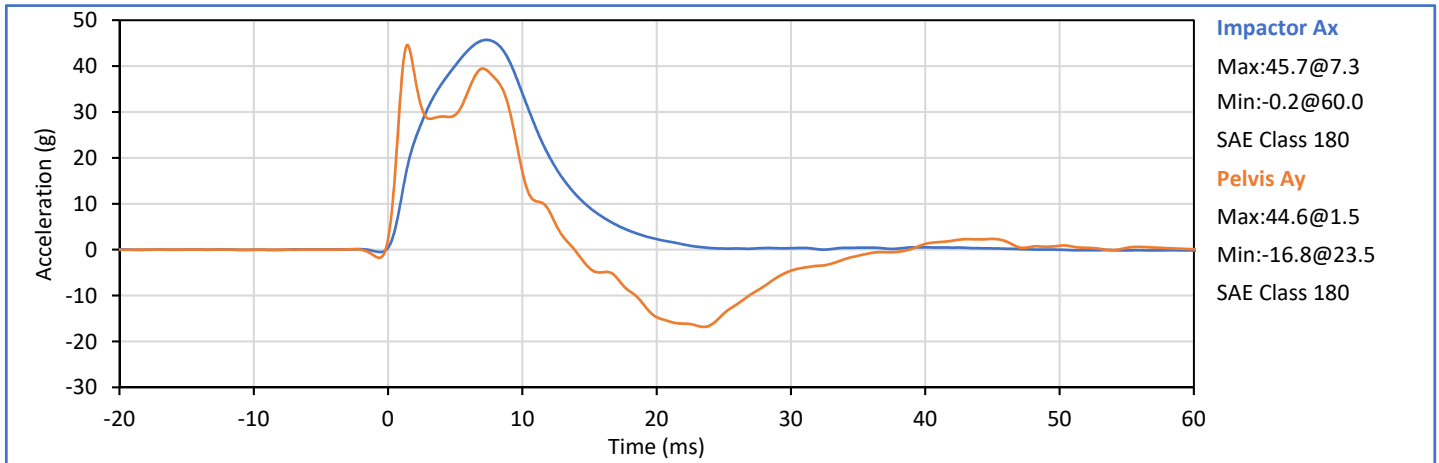
**SID-IIs Small Side Impact Dummy**  
**Pelvis Acetabulum Impact**

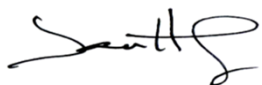
ATD Serial No.: 308


Test Date: 2018-08-24

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	6.72	Pass
Peak Acetabulum Fy	kN	3.60	4.30	4.17	Pass
Pelvis Ay after 6ms	g	34.0	42.0	39.5	Pass
Peak Impactor Ax	g	38.0	47.0	45.7	Pass
Overall Test Results					Pass

Pelvis Plug S/N: 12264 (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 Dummy**  
**Pelvis Acetabulum Impact**

ATD Serial No.: 308

Test Date: 2018-08-24

Pelvis Plug S/N: 12264 (SACO)



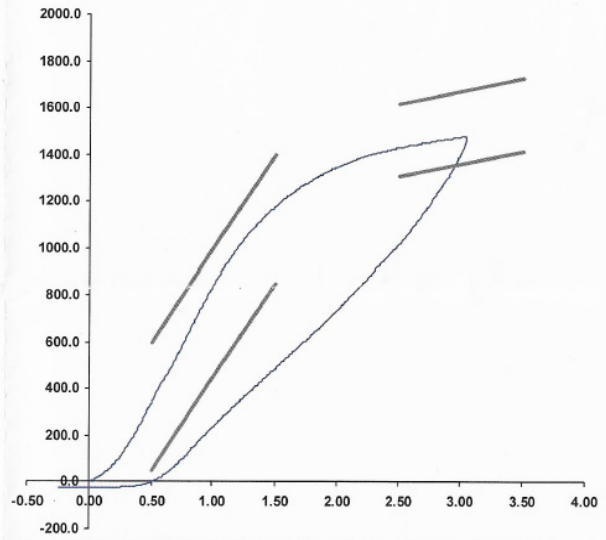
**SID-IIs Pelvis Plug Certification Test**

Plug S/N 12264  
 Test Number 6649  
 Report Number 6664  
 Test Date 3/15/2018 10:54:47 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	347.10	50.00	600.00
Force @ 1.5 mm (N)	1,180.35	850.00	1,400.00
Force @ 2.5 mm (N)	1,429.80	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,476.17	1,361.00	1,673.00

Testing Machine STM-20 5965542  
 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 180-4450

Template No 107 15-Mar-18  
 SACO Research

By: DC Date: 3/15/18  
 SACO Research 41735 Elm St, #401 Murrieta, CA 92582 Tel 310-694-2082 FAX



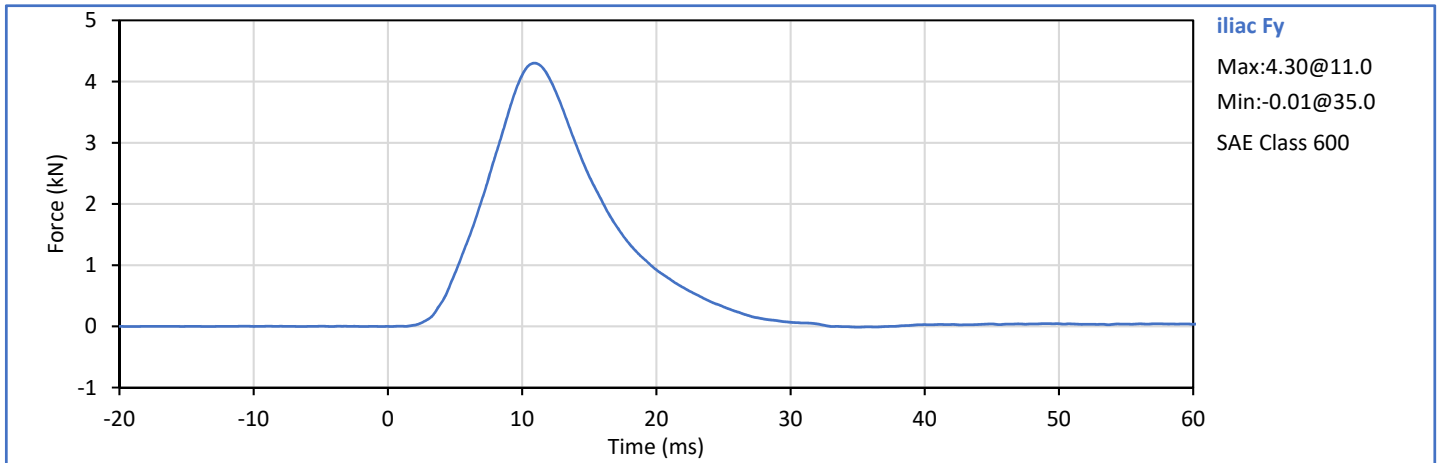
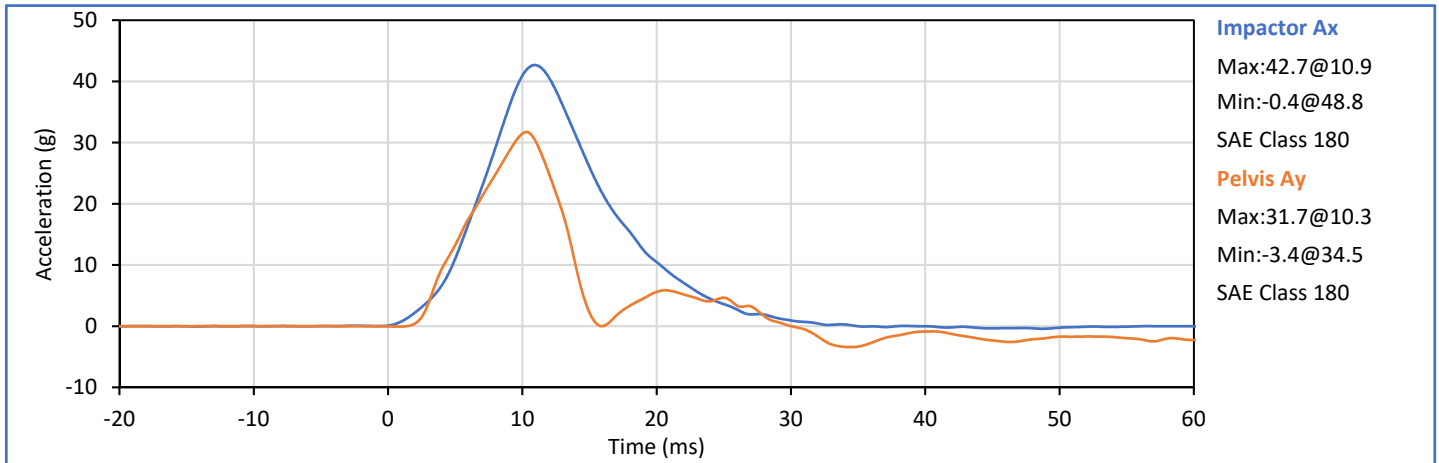
ATD Serial No.: 308

Test Date: 2018-08-24

Tested Parameter	Units	Spec. Low	Spec. High	Result	Pass/Fail
Laboratory Temperature	°C	20.6	22.2	21.1	Pass
Laboratory Humidity	%	10	70	44	Pass
Impactor Velocity	m/s	4.20	4.40	4.28	Pass
Peak Acetabulum Fy	kN	4.10	5.10	4.30	Pass
Pelvis Ay after 6ms	g	28.0	39.0	31.7	Pass
Peak Impactor Ax	g	36.0	45.0	42.7	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 D**  
**TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA**

**Table 1 - Driver ATD Instrumentation**

Position: Driver  
 ATD Type: SID-IIs  
 ATD S/N: 308

Sensor Location	Sensor S/N	Mfr	Last Cal
Head Acceleration X Primary	P63980	Endevco	2018-08-08
Head Acceleration Y Primary	P58861	Endevco	2018-08-08
Head Acceleration Z Primary	P51261	Endevco	2018-08-08
Head Acceleration X Redundant	P58808	Endevco	2018-08-08
Head Acceleration Y Redundant	P63310	Endevco	2018-08-08
Head Acceleration Z Redundant	P49189	Endevco	2018-08-08
Head Rotation Rate X	ARS7498	DTS	2018-06-11
Head Rotation Rate Y	ARS7367	DTS	2018-06-11
Head Rotation Rate Z	ARS7377	DTS	2018-06-11
Upper Thorax Rib Deflection Y	1172	FTSS	2018-08-15
Middle Thorax Rib Deflection Y	1219	FTSS	2018-08-15
Lower Thorax Rib Deflection Y	1221	FTSS	2018-08-15
Upper Abdomen Rib Deflection Y	1252	FTSS	2018-08-15
Lower Abdomen Rib Deflection Y	1283	FTSS	2018-08-15
Lower Spine T12 Acceleration X	P52108	Entran	2018-08-16
Lower Spine T12 Acceleration Y	P63970	Entran	2018-08-16
Lower Spine T12 Acceleration Z	P51712	Endevco	2018-08-16
Acetabulum Impact Side Force Y	277 Fy	Denton	2018-07-03
Iliac Wing Impact Side Force Y	289 Fy	Denton	2018-06-27

**Table 2 - Vehicle Instrumentation**

Sensor Location	Sensor S/N	Mfr	Last Cal
Vehicle CG Ax	A248858	MSI	2018-08-14
Vehicle CG Ay	A248863	MSI	2018-08-14
Vehicle CG Az	A248848	MSI	2018-06-05
Left Floor Sill Ay	A224567	MSI	2018-08-13
A-Pillar Sill Ay	A227260	MSI	2018-06-26
A-Pillar Low Ay	A226925	MSI	2018-07-10
A-Pillar Mid Ay	A224488	MSI	2018-06-18
B-Pillar Sill Ay	A224568	MSI	2018-06-22
B-Pillar Low Ay	A227288	MSI	2018-06-20
B-Pillar Mid Ay	A224535	MSI	2018-06-18
Driver Seat Track at H-Point Ay	A224516	MSI	2018-06-18
Engine Top Ax	A212048	MSI	2018-06-05
Engine Top Ay	A212049	MSI	2018-06-18
Firewall Ay	A224524	MSI	2018-06-22
Right Roof Ay	A208760	MSI	2018-07-19
Right Floor Sill Ay	A227262	MSI	2018-07-19
Rear Floorpan Ax	A248855	MSI	2018-07-06
Rear Floorpan Ay	A224504	MSI	2018-06-20

**Table 3 - Rigid Pole Instrumentation**

Sensor Location	Sensor S/N	Mfr	Last Cal
Load Cell Pole Barrier #1 Fx	131822A	Interface	2018-05-07
Load Cell Pole Barrier #2 Fx	132304A	Interface	2018-05-07
Load Cell Pole Barrier #3 Fx	19477	Interface	2018-05-07
Load Cell Pole Barrier #4 Fx	19325	Interface	2018-05-07
Load Cell Pole Barrier #5 Fx	131827A	Interface	2018-05-07
Load Cell Pole Barrier #6 Fx	132302A	Interface	2018-05-07
Load Cell Pole Barrier #7 Fx	19267	Interface	2018-05-07
Load Cell Pole Barrier #7 Fx	19321	Interface	2018-05-07