

REPORT NUMBER: SPNCAP-CAL-20-003

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**Nissan Motor Co., LTD.
2021 Nissan Maxima
Four Door Sedan**

NHTSA No: M20215200

**PREPARED BY:
CALSPAN CORPORATION
P.O. BOX 400
BUFFALO, NEW YORK 14225**



March 18, 2021

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**

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Date: March 18, 2021

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Date: March 18, 2021

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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16. Abstract A 32.20 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2021 Nissan Maxima four 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. This test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on January 14, 2021. The impact velocity of the vehicle was 32.19 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle was 21°C. The target vehicle's maximum post-test static crush was 376 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs) (Serial No. DG8012)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>275.281</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>41.439</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2136.740</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>22.194</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45</td> <td>20.413</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.				Measurement Description	Driver ATD (SID-IIs) (Serial No. DG8012)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	275.281	Resultant Lower Spine Acceleration	G	82	41.439	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2136.740	Maximum Thoracic Rib Deflection	mm	38	22.194	Maximum Abdomen Rib Deflection	mm	45	20.413
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY 2021 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-14-D-00352. The purpose of this test is to generate comparative side impact performance in a 2021 Nissan Maxima four door sedan. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated March 2020.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2021 Nissan Maxima four door sedan. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.19 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on January 14, 2021. Pre-test 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 March 2020. Camera locations and other pertinent camera information are included on page 3-11 in this report.

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

Head CG tri-axial accelerometers

Thorax upper, middle, and lower rib displacement potentiometers

Abdomen upper and lower rib displacement potentiometers

Lower spine tri-axial accelerometers

Iliac load cell

Acetabulum load cell

Appendix B contains the dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D identifies all serial numbers, manufacturers, and calibration dates for test equipment, dummy sensors, potentiometers, and load cells used to collect data during the test.

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

INJURY READINGS

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	275.281
Resultant Lower Spine Acceleration	g	82	41.439
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2136.740
Maximum Thoracic Rib Deflection	mm	38*	22.194
Maximum Abdominal Rib Deflection	mm	45*	20.413

*Proposed IARV

Supplemental restraint information was recorded as follows:

SUPPLEMENTAL RESTRAINT INFORMATION

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

GENERAL COMMENTS:

1. P1 serial number – DG8012

Data Anomalies:

- Left Middle B-Pillar Y Acceleration, Exceeded calibration range at 15.4 ms
- Left A-Pillar at Sill Y Acceleration, Questionable data from 55-60 ms
- Left B-Pillar at Sill Y Acceleration, Questionable data from 23-38 ms

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

Data Sheet No. 1 – General Test and Vehicle Parameter Data

Data Sheet No. 2 – Seat, Seat Belt, Steering Wheel Adjustment and Fuel Systems Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Camera and instrumentation Data

Data Sheet No. 6 – Vehicle Accelerometer Data

Data Sheet No. 7 – Rigid Pole Load Cell Data

Data Sheet No. 8 – Post-Test Observations

Data Sheet No. 9 – Test Vehicle Profile Measurements

Data Sheet No. 10 – Test Vehicle Exterior Crush Measurements

Data Sheet No. 11 – Vehicle Damage Profile Distances

Data Sheet No. 12 – FMVSS No. 301 Static Rollover Results

Data Sheet No. 13 – Dummy / Vehicle Temperature and Humidity Stabilization Data

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20215200
Model Year	2021
Make	Nissan
Model	Maxima
Body Style	Four Door Sedan
VIN	1N4AA6CV7MC502882
Body Color	Grey
Odometer Reading (km/mi)	187 miles
Engine Displacement (L)	3.5
Type / No. Cylinders	V6
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

Does owner's manual provide instructions to turn off automatic door locks?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Nissan Motor Co., LTD.
Date of Manufacture	11/20
Vehicle Type	Passenger Car

GVWR (kg)	2125
GAWR Front (kg)	1145
GAWR Rear (kg)	1000

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	-	5
Capacity Weight (VCW) (kg)				408
DSC X 68.04 kg				340.2
Cargo Weight (RCLW) (kg)				67.8

(A)

(B)

(A-B)

VEHICLE SEAT TYPE

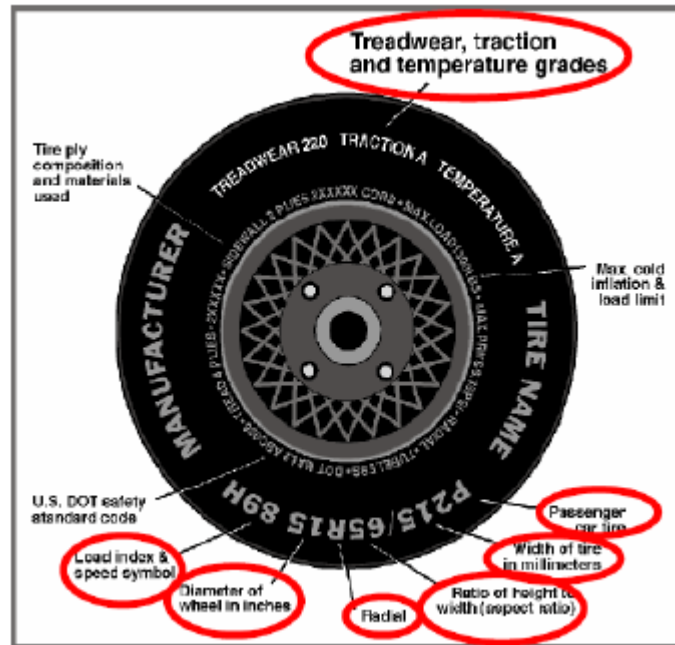
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X						X
Rear or Second Row Seat			X		X		
Third Row seat							

DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021

Collected for year, make, model, & VIN, all items circled in red, tire manufacturer and tire name.



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	230	230
Recommended Tire Size	245/45R18	245/45R18
Tire Size on Vehicle	245/45R18	245/45R18
Tire Manufacturer	Continental	Continental
Tire Model	ProContact	ProContact
Treadwear	400	400
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	96V	96V
Tire Material	Rubber	Rubber
DOT Safety Code Left	HW8UWD3E0520	HW8UWD3E0520
DOT Safety Code Right	HW8UWD3E0520	HW8UWD3E0520

DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	311	315	317	314
Tire Placard	kPa	230	230	230	230
Owner's Manual	kPa	230	230	230	230
As Tested	kPa	230	230	230	230

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	496.5	321.5		521	351		514.5	370.5	
Right	kg	503.5	309.5		512	357		510.5	349.0	
Ratio	%	61.3	38.7		59.3	40.7		58.8	41.2	
Totals	kg	1000	631	1631	1033	708	1741	1025	719.5	1744.5

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1631	(A)
Actual Weight of 1 P572V (SID-IIs) ATD Used	kg	50	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	67.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1748.8	(A+B+C)

Does the measured As Test Vehicle Weight lie within the required weight range
 (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to – 9 kg)? ☒ Yes ☐ No

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Rqmt***
Driver Door Sill Angle (front-to-rear)*	Deg	+0.25	+0.25	+0.20	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	+0.65	+0.55	+0.40	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	-0.30	-0.30	-0.15	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	-0.25	-0.25	-0.20	Yes
Vehicle CG (Aft of Front Axle)	mm	1071	1126	1142	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	2	1	12	

* ND = Nose Down (-), NU = Nose Up (+)

** LD = Left Down (-), LU = Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for Meets Requirement

DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	9
Spare Tire	16
Jack	2.5
Right Rear Passenger Window	4
Right Rear Speaker	1
Ballast / Equipment Added	27

Test Height – Adjustable Suspension Setting, if Applicable	N/A
--	-----

Test Surface Markings

	Distance from 75° Impact Location Line (mm)
Fore 25 mm target	938
Aft 25 mm target	940

DATA SHEET NO. 2
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right 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 seats should be set to the rear-most, lowest, mid-angle position.

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	19.4	11.7	15.6
Front Passenger Seat	Not Adjustable		
Front Center Seat	N/A	N/A	N/A
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	Forward- Most
Driver Seat	15.6	60	Max	56	72	88
			Mid	28	44	60
			Min	0	16	32
Front Passenger Seat	Not Adjustable		Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Front Center Seat	N/A	N/A	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Non-Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Rear Center Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-

DATA SHEET NO. 2 ... (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

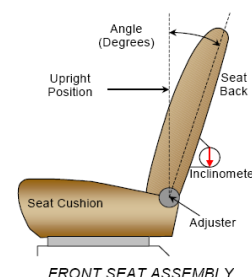
NHTSA No.: M20215200
 Test Date: 1/14/2021

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	240	N/A	0	N/A
Front Passenger Seat	240	N/A	0	N/A
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat	FIXED	FIXED	FIXED	FIXED

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck-side rear passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back are set to match the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/Seated Dummy	64.2	N/A	-0.5	N/A
Front Passenger Seat	58.6	N/A	-0.5	N/A
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat	FIXED	FIXED	FIXED	FIXED

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. Zero is defined as the uppermost detent

Seat	Total # of Positions	Placed in Position #
Driver Seat	3 (0-2)	0

HEAD RESTRAINT ADJUSTMENT

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

Seat	Total # of Positions	Placed in Position #
Driver Seat	5 (0-4)	Lowermost

DATA SHEET NO. 2 ... (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

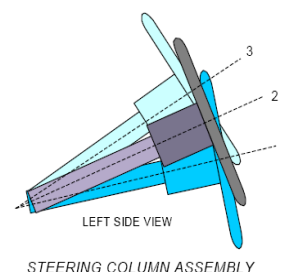
Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021

STEERING COLUMN ADJUSTMENT

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

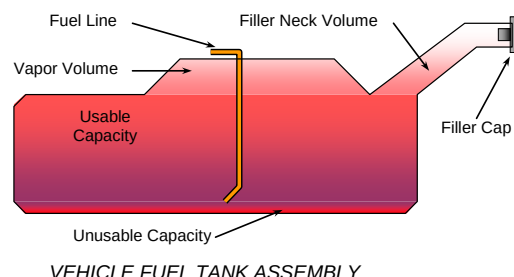
	Degrees	Fore / Aft Position (mm)
Lowermost – Position 1	20.0	
Geometric Center – Position 2	22.6	
Uppermost – Position 3	25.2	
Telescoping Steering Wheel Travel		60
Test Position	22.6	30



FUEL PUMP

Describe the fuel pump type, details about how it operates, and the location of the fuel filler neck.

The vehicle is equipped with an electric fuel pump.
The fuel filler neck is on the left side of the vehicle.
The pump creates positive pressure in the fuel lines, pushing the gasoline to the engine. See form 1 for more information.



FUEL TANK CAPACITY DATA

Description	Liters
Usable Capacity of "Standard Tank" - see Form No. 1	68.1
Usable Capacity of "Optional Tank" - see Form No. 1	N/A
Usable Capacity of "Standard Tank" - see Owner's Manual	68.0
Usable Capacity of "Optional Tank" - see Owner's Manual	N/A
93% of Usable Capacity	63.2
Actual Amount of Solvent Used in Test	63.2
1/3 of Usable Capacity	22.7

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



Yes

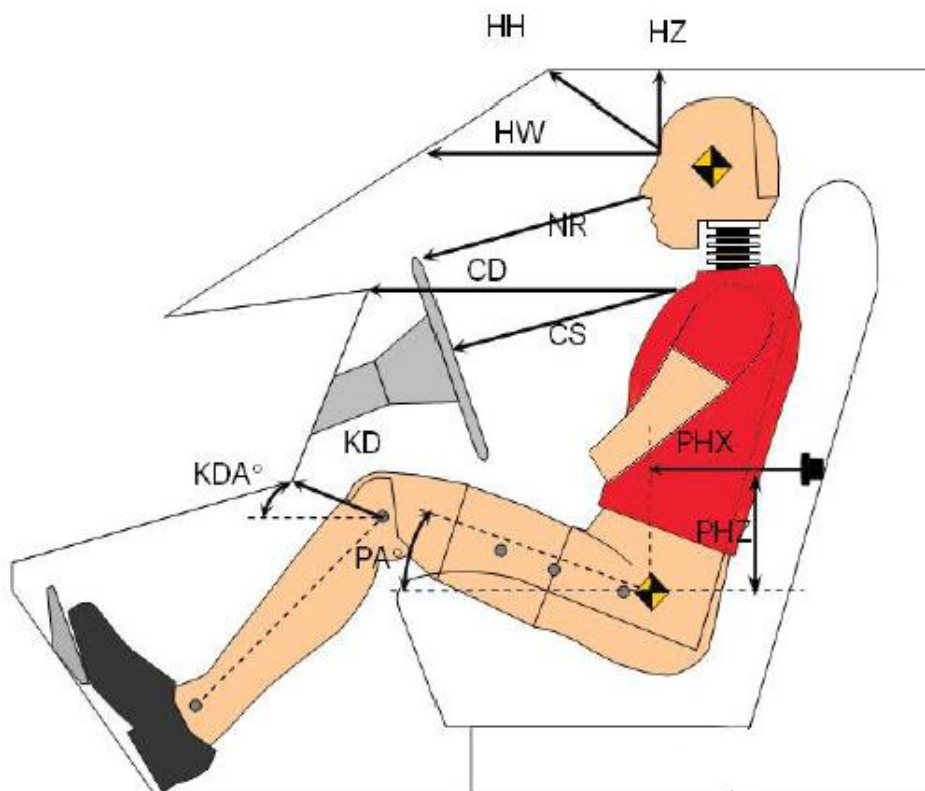


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DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021



Left Side View

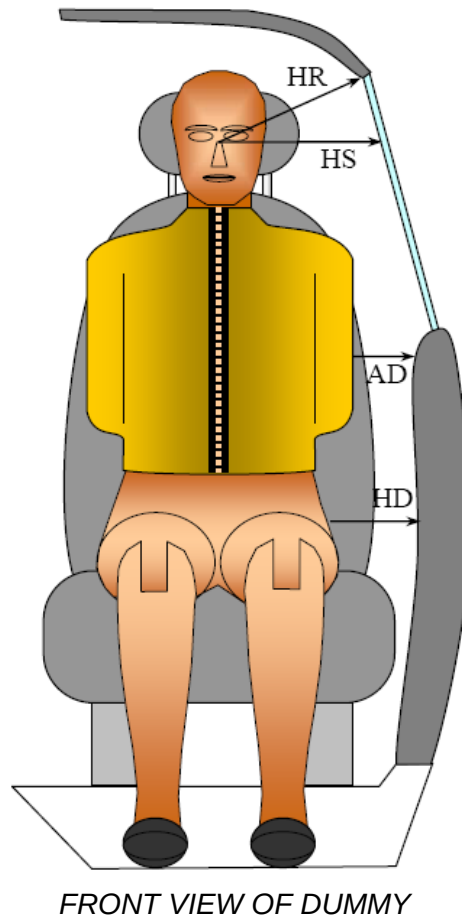
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. DG8012)	
		Length (mm)	Angle (°)
HH	Head to Header	235	
HW	Head to Windshield	530	
HZ	Head to Roof Liner	139	
NR	Nose to Rim	223	
CD	Chest to Dash	401	
CS	Chest to Steering Wheel	153	
KD(L) / KDA(L)°	Left Knee to Dash	80	19.1
KD(R) / KDA(R)°	Right Knee to Dash	95	13.8
PAX°	Pelvic Tilt Angle (X-Axis)		20.5
PAY°	Pelvic Tilt Angle (Y-Axis)		0.3
PHX	Hip Point to Striker (X-Axis)	360	
PHZ	Hip Point to Striker (Z-Axis)	58	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021



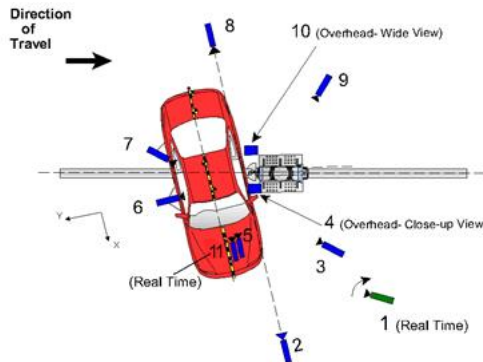
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver - Length (Serial No. DG8012)
HR	Head To Side Header	mm	215
HS	Head to Side Window	mm	350
AD	Arm to Door	mm	129
HD	Hip Point to Door	mm	168

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real-time (24 - 30 fps) pan view of impact				Zoom	60
2	Front ground level - impact view	6847	0	-1339	28	1000
3	Impact side 45° - forward pole view	4951	-1083	-1517	24	1000
4	Overhead Close-up view of impact	0	0	-9375	28	1000
5	Onboard - dummy front view				25	1000
6	Onboard - dummy side view				12.5	1000
7	Onboard - dummy rear oblique view				12.5	1000
8	Rear ground level - impact view	-7438	0	-1433	28	1000
9	Impact side 45° - rearward pole view	-4445	-4255	-1437	24	1000
10	Overhead wide - view of impact	0	0	-9375	12.5	1000
11	Real-time (24 - 30 fps) - dummy front view				Zoom	60

Notes: Reference - From Point of Impact for X and Y; from Ground for Z
+X = Forward of vehicle, +Y = Right of vehicle, +Z = Down
* All measurements accurate to ± 6 mm. Vehicle is at a 75° angle to the rigid pole.

Comments: All cameras operated as intended.

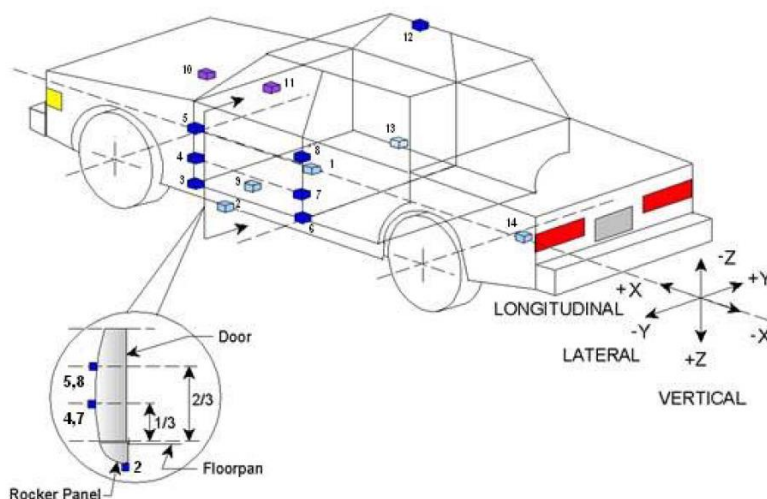
INSTRUMENTATION

Description	Number of Channels
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6 VEHICLE ACCELEROMETER DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2818	55	-41
2	Left Floor Sill	3041	-682	235
3	A-Pillar Sill	3342	-657	210
4	A-Pillar Low	3411	-651	71
5	A-Pillar Mid	3277	-603	-451
6	B-Pillar Sill	2271	-592	347
7	B-Pillar Low	2301	-675	33
8	B-Pillar Mid	2264	-673	-195
9	Driver Seat Track	2506	-555	205
10	Engine Top	3953	105	-357
11	Firewall	3820	75	-337
12	Right Roof	2360	556	-858
13	Right Floor Sill	3042	683	223
14	Rear Floorpan	1134	-13	12

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: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021

POLE BARRIER



RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	200
2	mm	590
3	mm	750
4	mm	1075
5	mm	1260
6	mm	1740
7	mm	1920
8	mm	2300

**DATA SHEET NO. 8
POST-TEST OBSERVATIONS**

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021

TEST DUMMY INFORMATION AND CONTACT POINTS

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

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 Systems 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, Width of Opening at Striker (mm)	0	0	0	0	0

POST-TEST SEAT PERFORMANCE

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

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

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar, B-Pillar, and C-Pillar Buckled
Sill Separation	Sill Separation Along Struck Side Rear Door
Windshield Damage	Cracks Throughout with Separation Along Driver A-Pillar
Side Window Damage	Cracks Throughout Driver Side Window
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

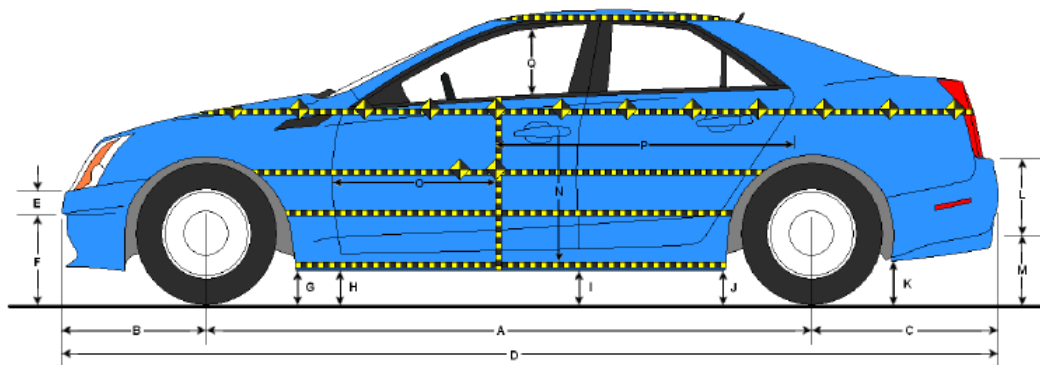
Measured Parameter	Units	Tolerance	Value
Vertical Impact Ref Line - Aft of Front Axle, Intended Impact Pt	mm		1129
Actual Impact Point - Aft of Front Axle	mm		1129
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 *	0
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75.0
Trap No. 1 Velocity - Primary	kph	31.4 to 33.0	32.19
Trap No. 2 Velocity - Redundant	kph	31.4 to 33.0	32.23

* Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

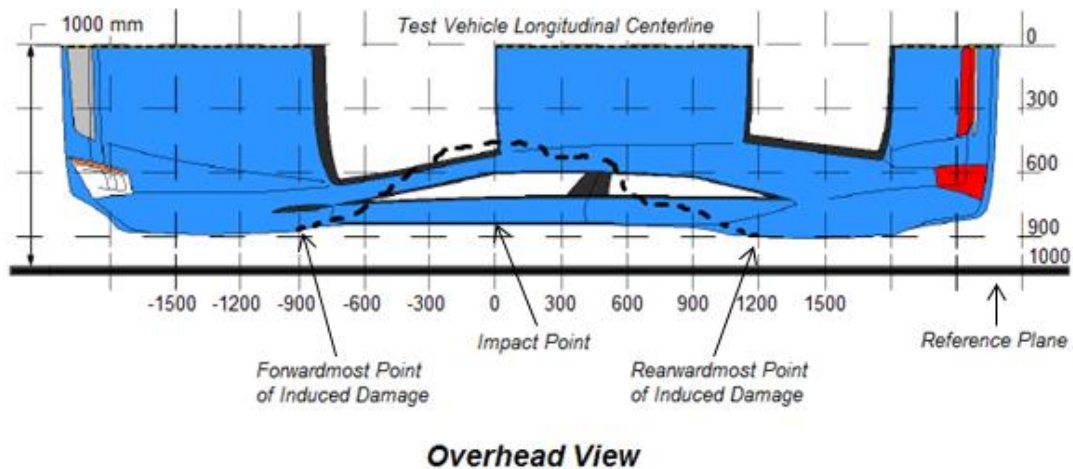
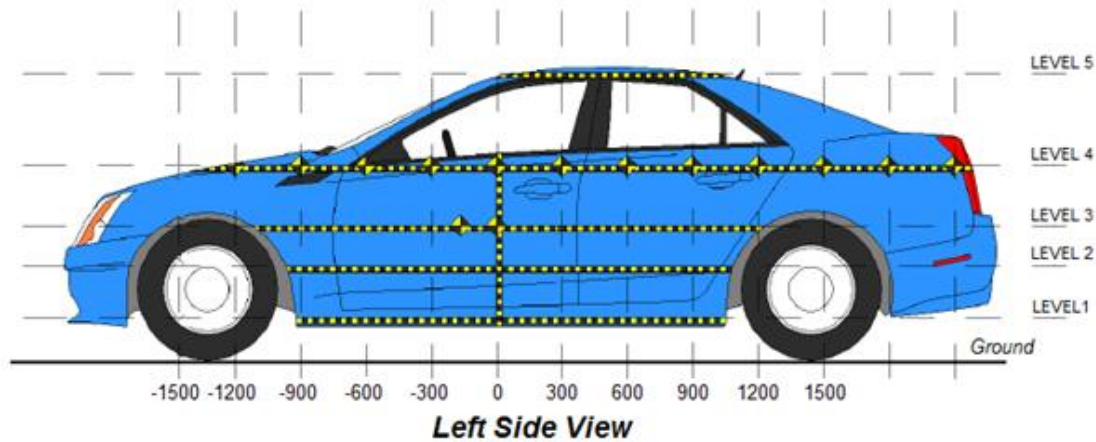
Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2768	2690	78
B	Front Axle to FSOV	1015	1073	-58
C	Rear Axle to RSOV	1116	1106	10
D	Total Length at Centerline	4898	4869	29
E	Front Bumper Thickness	197	197	0
F	Front Bumper Bottom to Ground	257	302	-45
G	Sill Height at Front Wheel Well	171	156	15
H	Sill Height at Front Door Leading Edge	175	156	19
I	Sill Height at B-Pillar	170	150	20
J1	Sill Height at Rear Wheel Well	172	231	-59
J2	Pinch Weld Height at Rear Wheel Well	192	213	-21
K	Sill Height Aft of Rear Wheel Well	205	190	15
L	Rear Bumper Thickness	132	132	0
M	Rear Bumper Bottom to Ground	450	445	5
N	Sill Height to Bottom of Front Window Sill	829	854	-25
O	Front Door Leading Edge to Impact CL	634	577	57
P	Rear Door Trailing Edge to Impact CL	1503	1415	88
Q	Front Window Opening	326	322	4
R	Right Side Length	4742	4749	-7
S	Left Side Length	4736	4691	45
T	Vehicle Width at B-Pillars	1859	1784	75
U	Front Wheel Track Width	1580	1580	0
V	Rear Wheel Track Width	1588	1586	2

* All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	247	318	0
2	Occupant Hip Point	mm	585	371	0
3	Mid - Door	mm	651	376	0
4	Window Sill	mm	962	286	0
5	Window Top	mm	1373	141	0

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 10 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

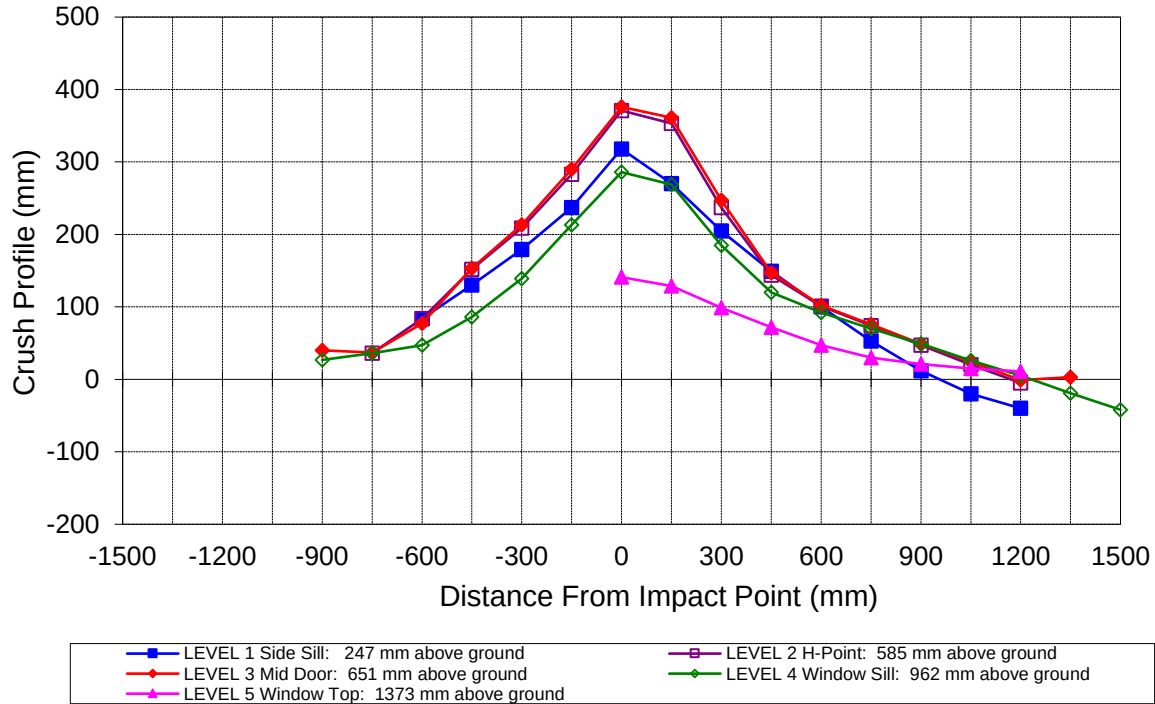
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050															
-900			931	801				891	774				40	27	
-750		928	926	805			892	889	769			36	37	36	
-600	879	922	921	804		795	838	844	757		84	84	77	47	
-450	875	923	923	801		745	771	770	715		130	152	153	86	
-300	876	925	926	804		697	716	713	665		179	209	213	139	
-150	877	927	928	812		640	644	638	599		237	283	290	213	
0	880	929	931	820	607	562	558	555	534	466	318	371	376	286	141
150	879	930	932	827	632	609	577	571	558	503	270	353	361	269	129
300	880	930	932	834	634	675	693	685	649	535	205	237	247	185	99
450	876	930	932	838	634	727	786	785	718	562	149	144	147	120	72
600	871	927	930	842	633	771	826	828	750	586	100	101	102	92	47
750	863	923	926	844	633	810	849	850	774	603	53	74	76	70	30
900	865	918	920	853	633	853	871	871	804	612	12	47	49	49	21
1050	882	914	915	866	629	902	894	891	840	614	-20	20	24	26	15
1200	900	925	922	873	614	940	930	923	868	603	-40	-5	-1	5	11
1350			933	877				930	896				3	-19	
1500				878					920					-42	

NOTE: Pre-test measurements are taken when the vehicle is in the “As Tested” weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy’s head.

DATA SHEET NO. 10 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2021 Nissan Maxima four door sedan
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
 Test Date: 1/14/2021



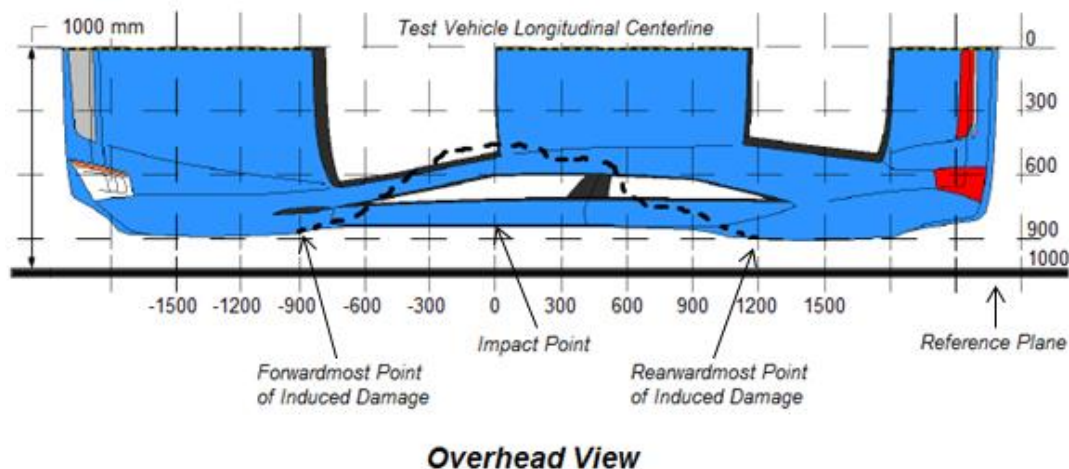
Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 11 VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021

For guidance regarding damage profile distance measurements, please refer to the latest version of the *NHTSA Test Reference Guide, Volume 1: Vehicle Tests*.



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-900	3	109	69	40
2	-450	3	230	77	153
3	0	3	445	69	376
4	450	3	215	68	147
5	900	3	129	80	49
6	1350	3	70	67	3

DATA SHEET NO. 12
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: <u>2021 Nissan Maxima four door sedan</u>	NHTSA No.: <u>M20215200</u>
Test Program: <u>NCAP Side Pole Impact Test</u>	Test Date: <u>1/14/2021</u>
Test Time: <u>11:43 AM</u>	Temperature: <u>21° C</u>

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum allowable is 1 oz.)
- B. For the 5-minute period after motion ceases: 0 oz.
 (Maximum allowable is 5 oz.)
- C. For the following 25 minutes: 0 oz.
 (Maximum allowable is 1 oz./minute)
- D. Spillage Details: No Spillage Occurred

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	67	300	367
90° to 180°	68	300	368
180° to 270°	65	300	365
270° to 360°	68	300	368

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

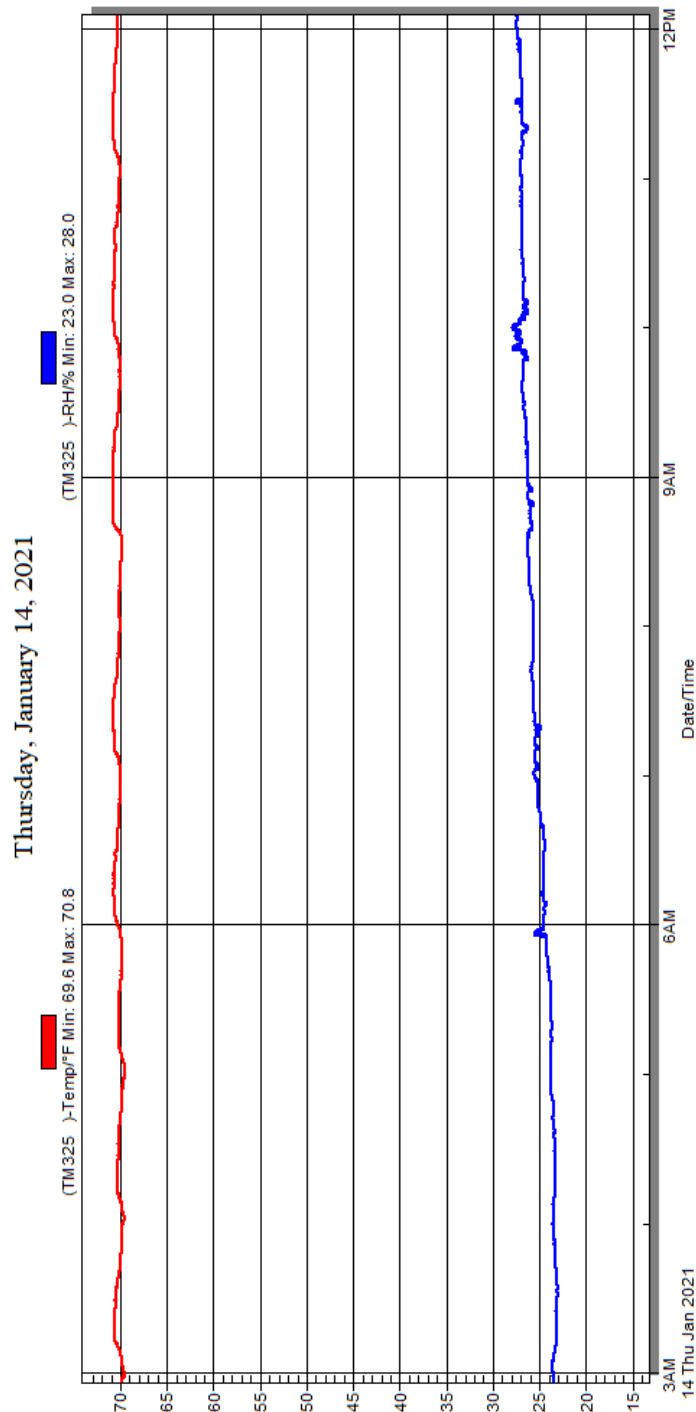
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	No Spillage Occurred
90° to 180°	No Spillage Occurred
180° to 270°	No Spillage Occurred
270° to 360°	No Spillage Occurred

DATA SHEET NO. 13
DUMMY / VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2021 Nissan Maxima four door sedan
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20215200
Test Date: 1/14/2021



Temperature and Humidity Stabilization Chart / Data for Dummies and Test Vehicle

APPENDIX A
PHOTOGRAPHS

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Figure A-1: As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



Figure A-2: As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle



Figure A-3: Pre-Test Frontal View of Test Vehicle



Figure A-4: Post-Test Frontal View of Test Vehicle



Figure A-5: Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



Figure A-6: Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle

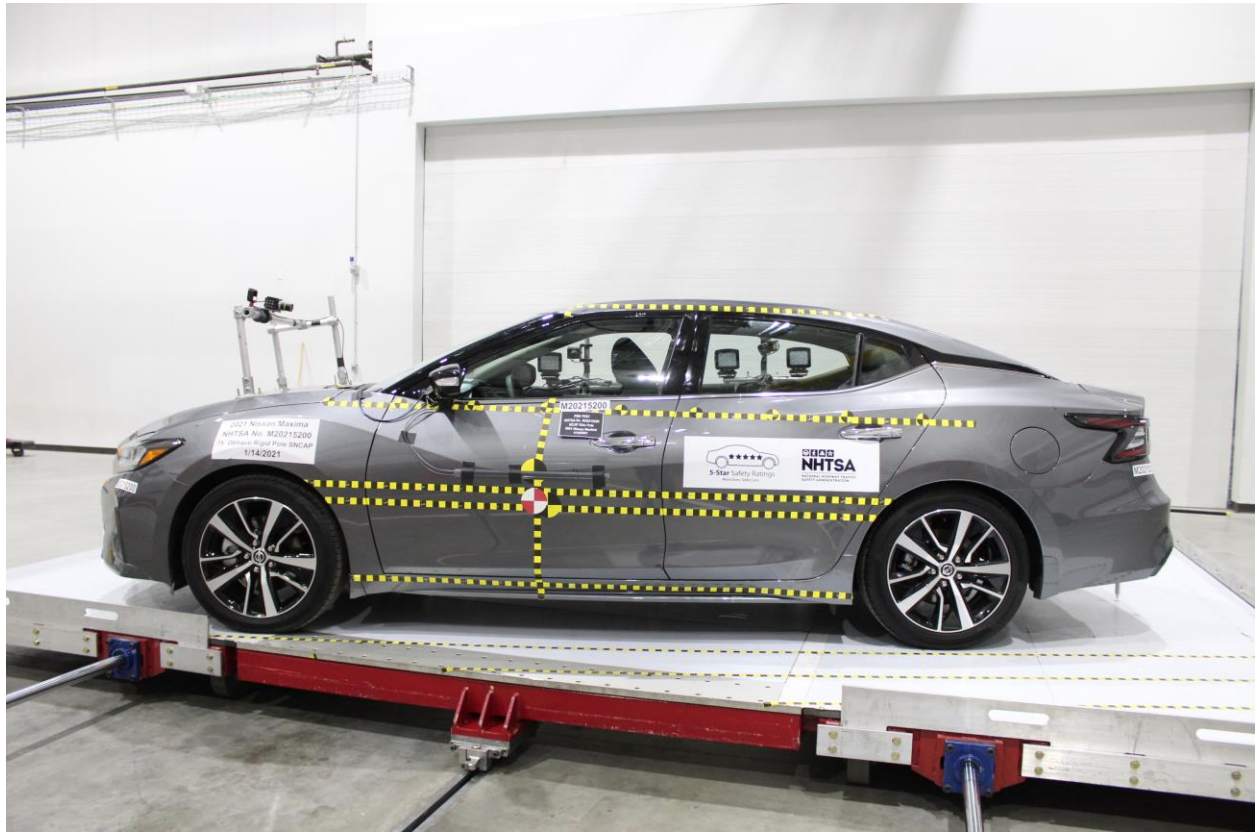


Figure A-7: Pre-Test Left Side View of Test Vehicle



Figure A-8: Post-Test Left Side View of Test Vehicle



Figure A-9: Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



Figure A-10: Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle

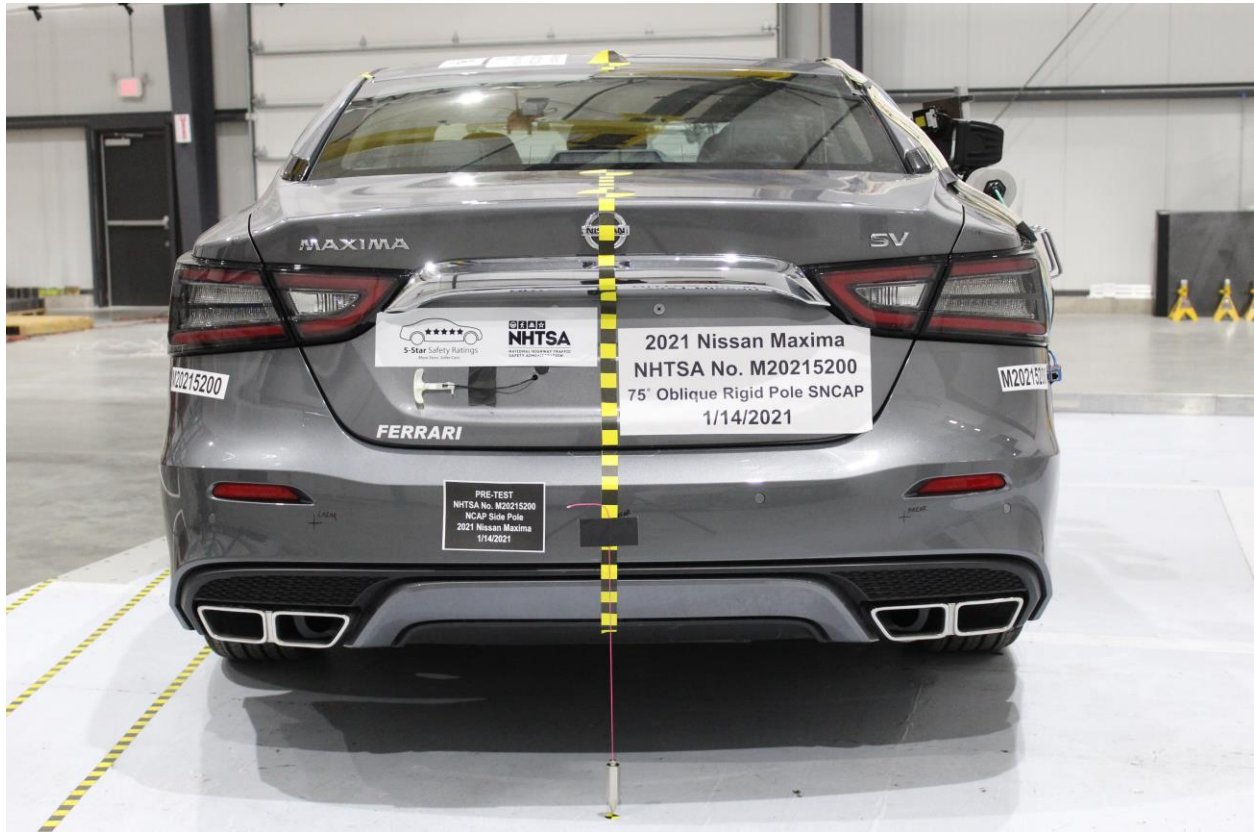


Figure A-11: Pre-Test Rear View of Test Vehicle



Figure A-12: Post-Test Rear View of Test Vehicle



Figure A-13: Pre-Test Right Side View of Test Vehicle



Figure A-14: Post-Test Right Side View of Test Vehicle



Figure A-15: Pre-Test Overhead View of Test Area

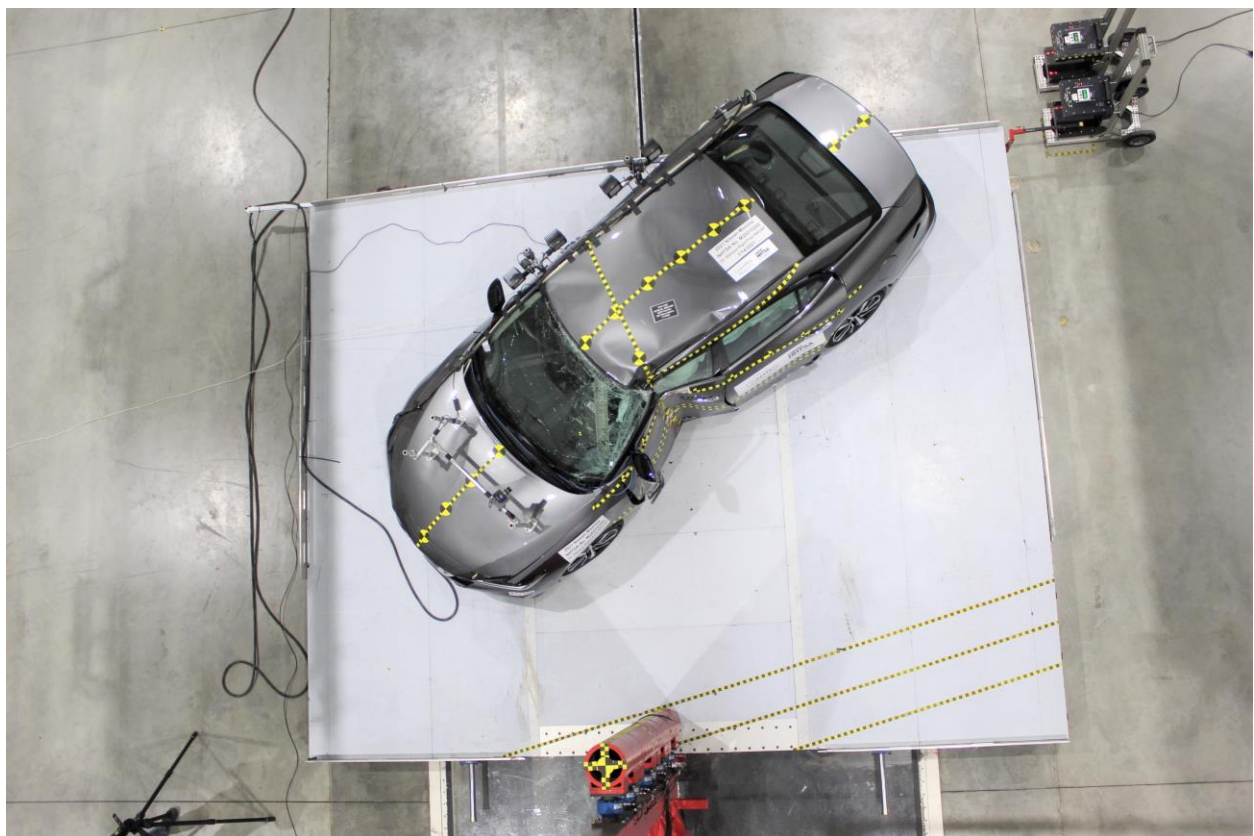


Figure A-16: Post-Test Overhead View of Test Area



Figure A-17: Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



Figure A-18: Pre-Test Right Side View of Pole Positioned Against Side of Vehicle



Figure A-19: Pre-Test Close-Up View of Impact Point Target



Figure A-20: Post-Test Close-Up View of Impact Point Target Showing Impact Location



Figure A-21: Pre-Test Front Close-Up View of Dummy Head and Chest



Figure A-22: Post-Test Front Close-Up View of Dummy



Figure A-23: Pre-Test Left Side View of Dummy Showing Belt and Chalking



Figure A-24: Pre-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-25: Post-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-26: Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



Figure A-27: Pre-Test Frontal Close-Up View of Dummy Head / Shoulders in Relation to Head Restraint



Figure A-28: Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning



Figure A-29: Pre-Test Overhead View of Dummy Thighs on Seat Pan



Figure A-30: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-31: Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level

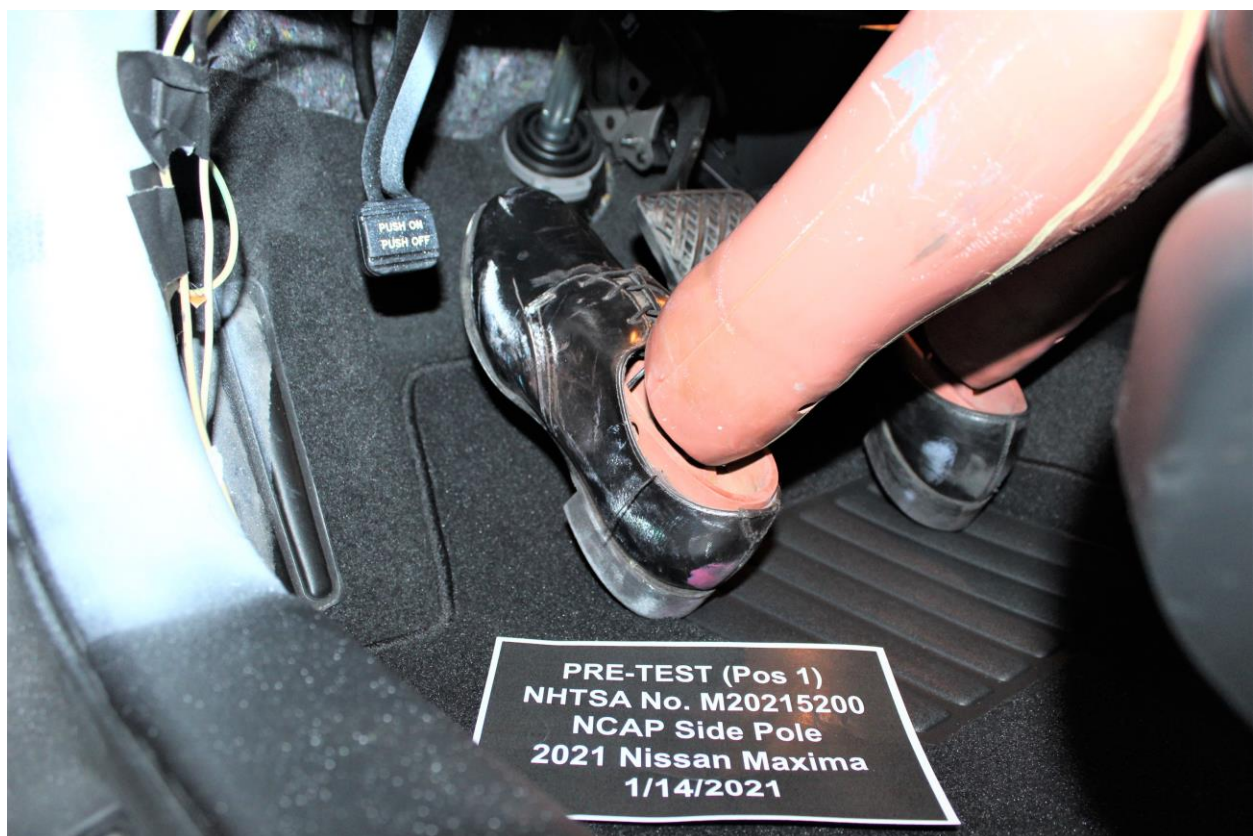


Figure A-32: Pre-Test Placement of Dummy's Feet



Figure A-33: Pre-Test View of Belt Anchorage for Dummy



Figure A-34: Pre-Test Left Side View of Steering Wheel



Figure A-35: Pre-Test View of Disengaged Parking Brake



Figure A-36: Pre-Test View of Parking Brake

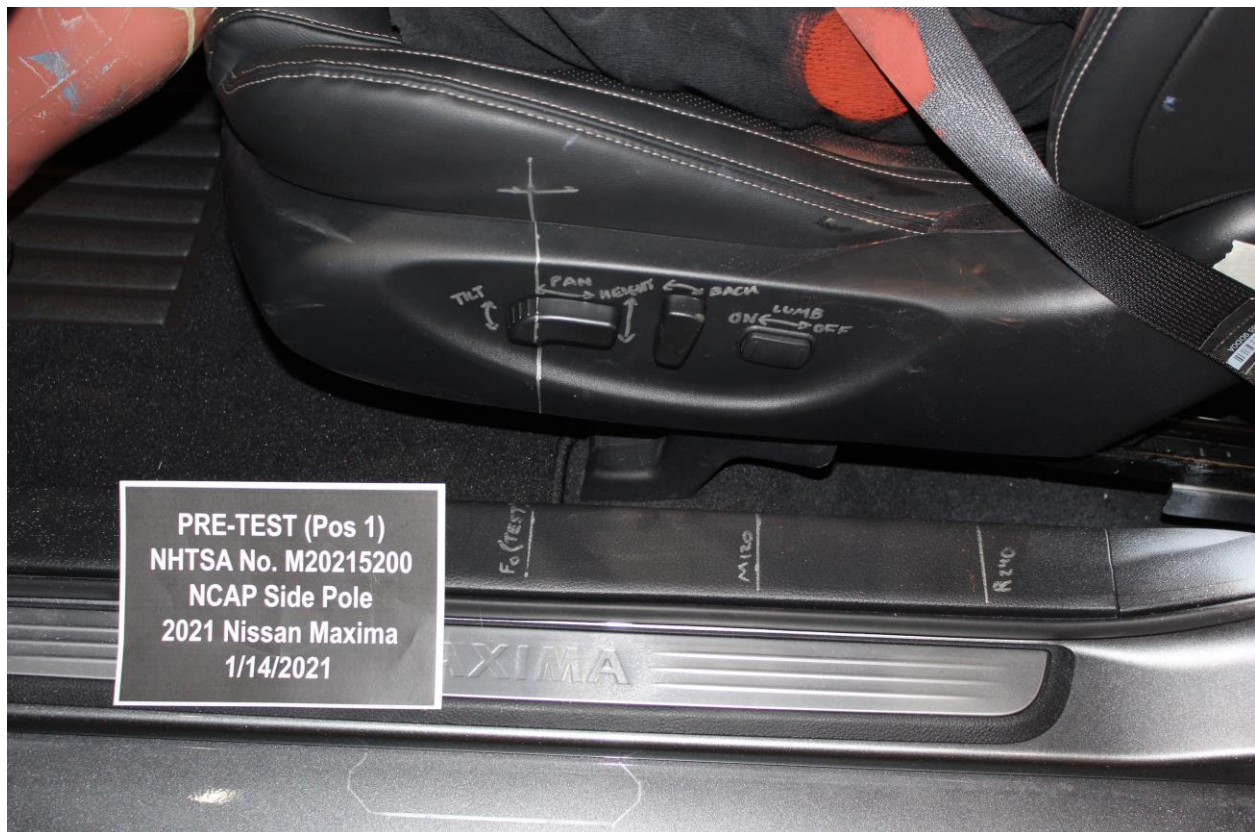


Figure A-37: Pre-Test Close-Up Left Side View of Driver Seat Track

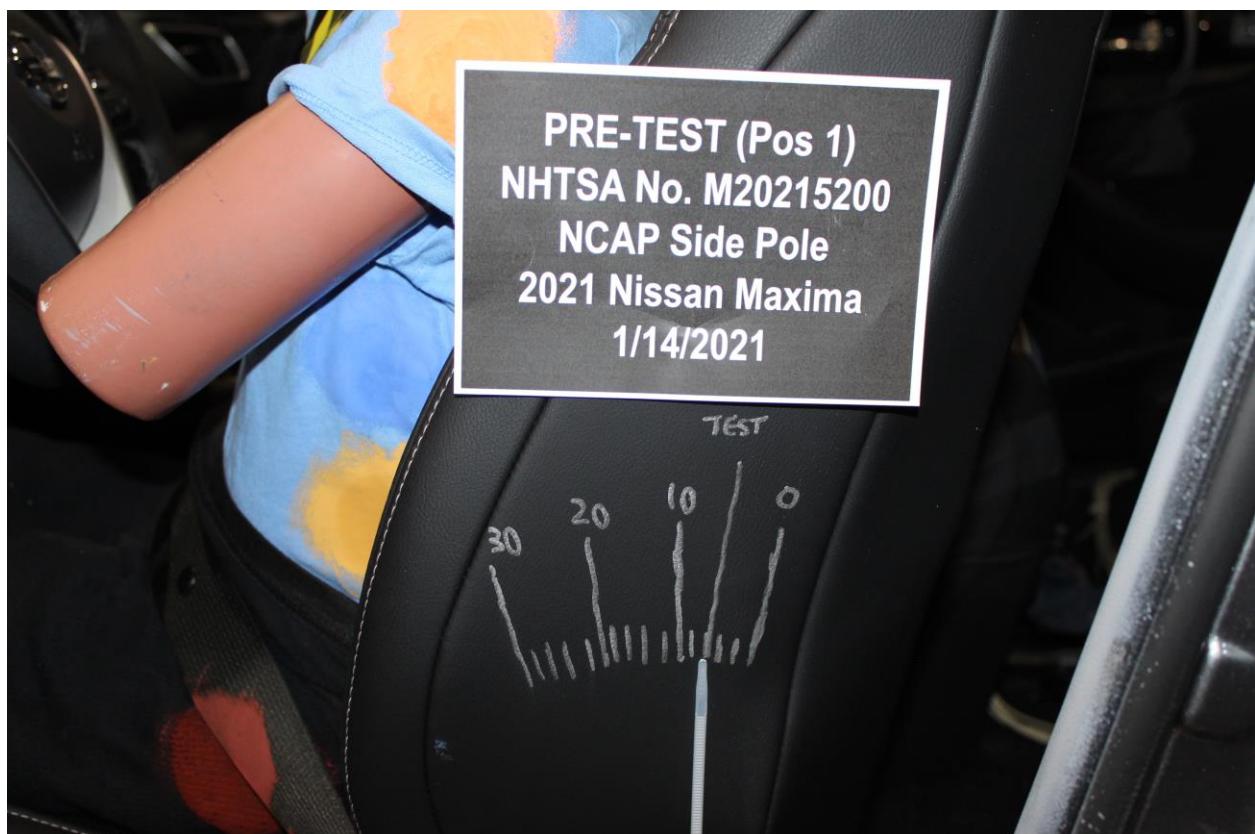


Figure A-38: Pre-Test Close-Up Left Side View of Driver Seat Back



Figure A-39: Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Figure A-40: Pre-Test Dummy and Door Clearance View



Figure A-41: Post-Test Dummy and Door Clearance View



Figure A-42: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-43: Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-44: Pre-Test Inner Door Panel View



Figure A-45: Post-Test Inner Door Panel View Showing Dummy Contact Location



Figure A-46: Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



Figure A-47: Post-Test Dummy Close-Up Head Contact with Side Airbag View



Figure A-48: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



Figure A-49: Post-Test Dummy Close-Up Torso Contact with Side Airbag View

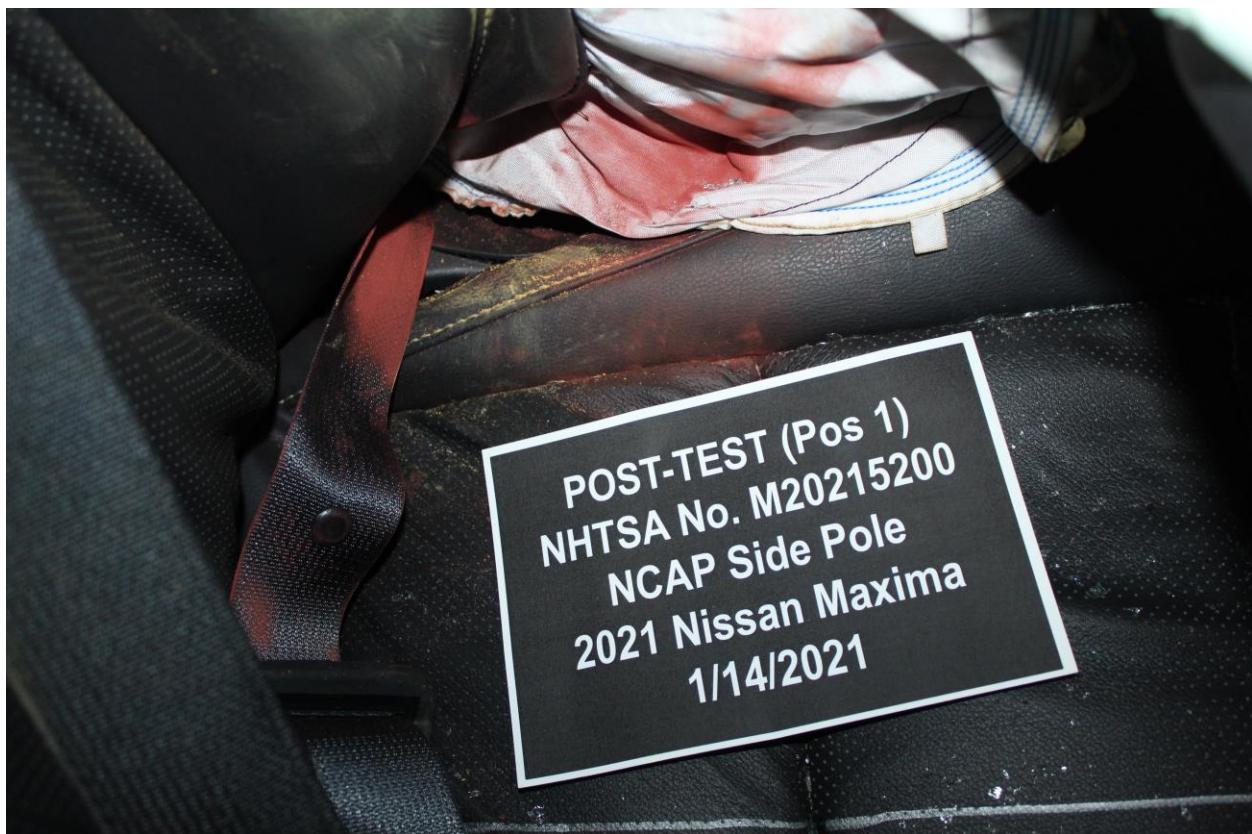


Figure A-50: Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



Figure A-51: Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View

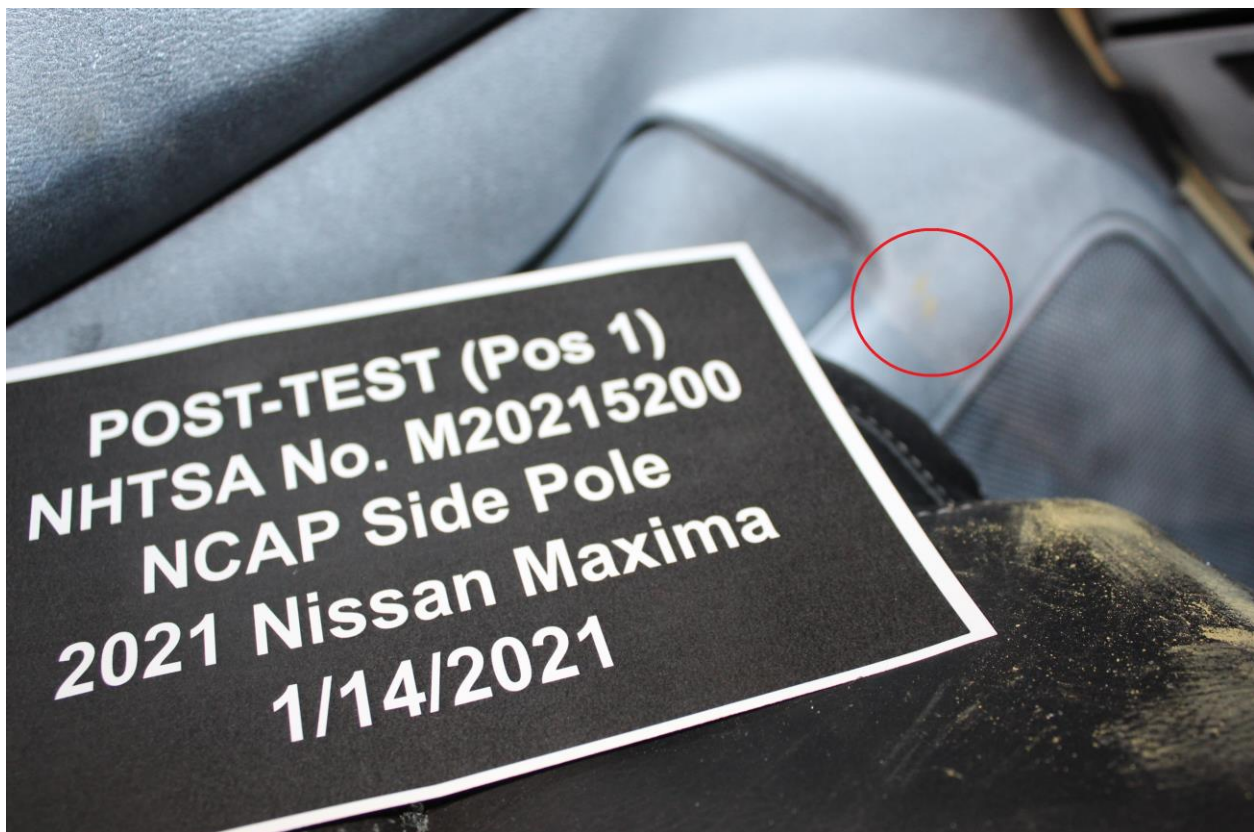


Figure A-52: Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



Figure A-53: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-54: Post-Test View of Fuel Filler Cap or Fuel Filler Neck

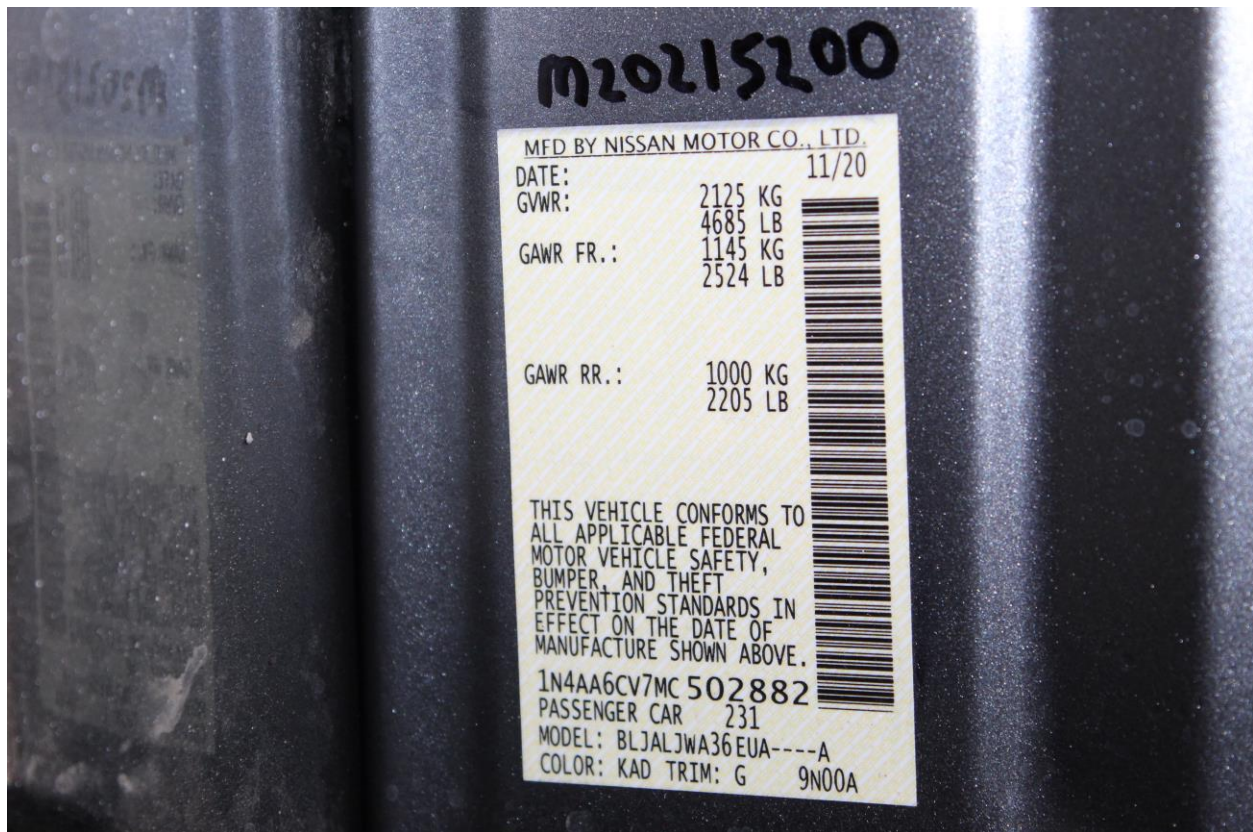


Figure A-55: Close-Up View of Vehicle's Certification Label

Photo Not Applicable

Figure A-55a: Close-Up View of Reduced Load Capacity Label



Figure A-56: Close-Up View of Vehicle's Tire Information Placard or Label

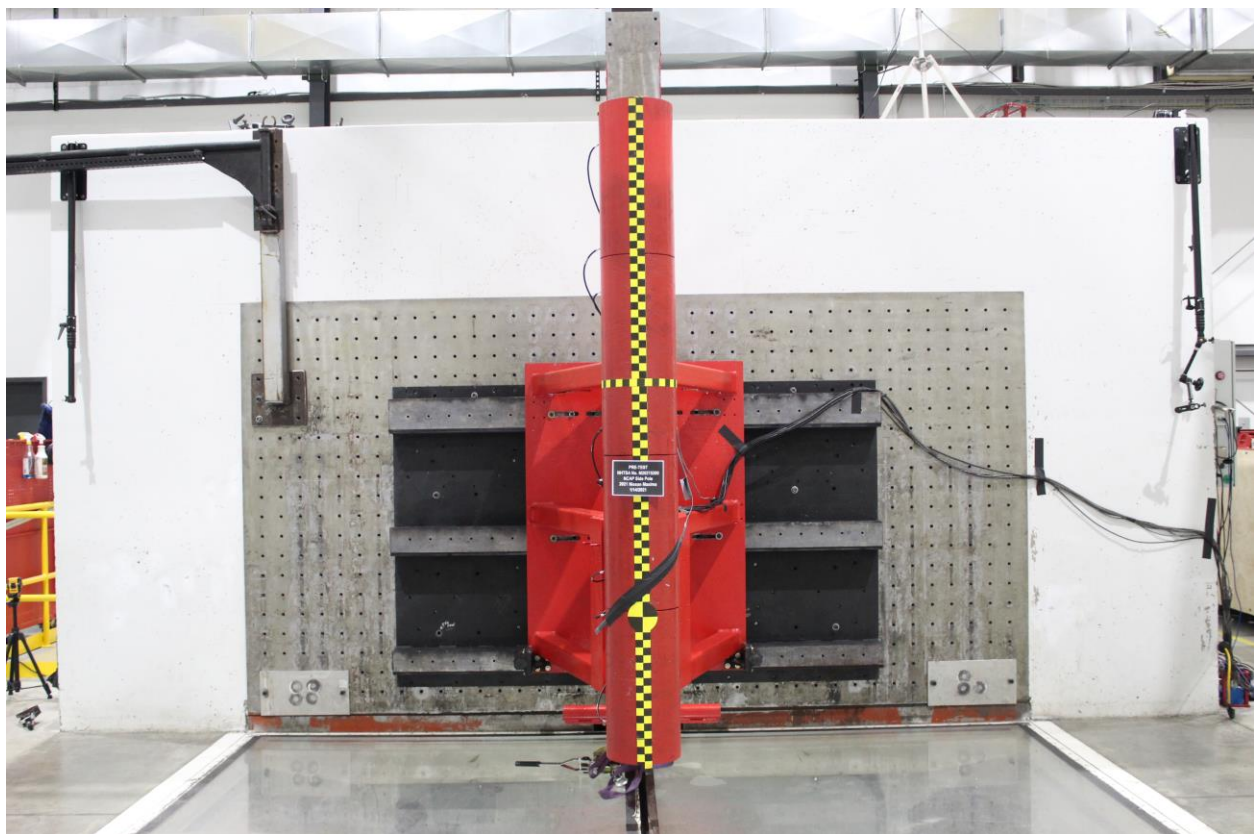


Figure A-57: Pre-Test Pole Barrier Front View

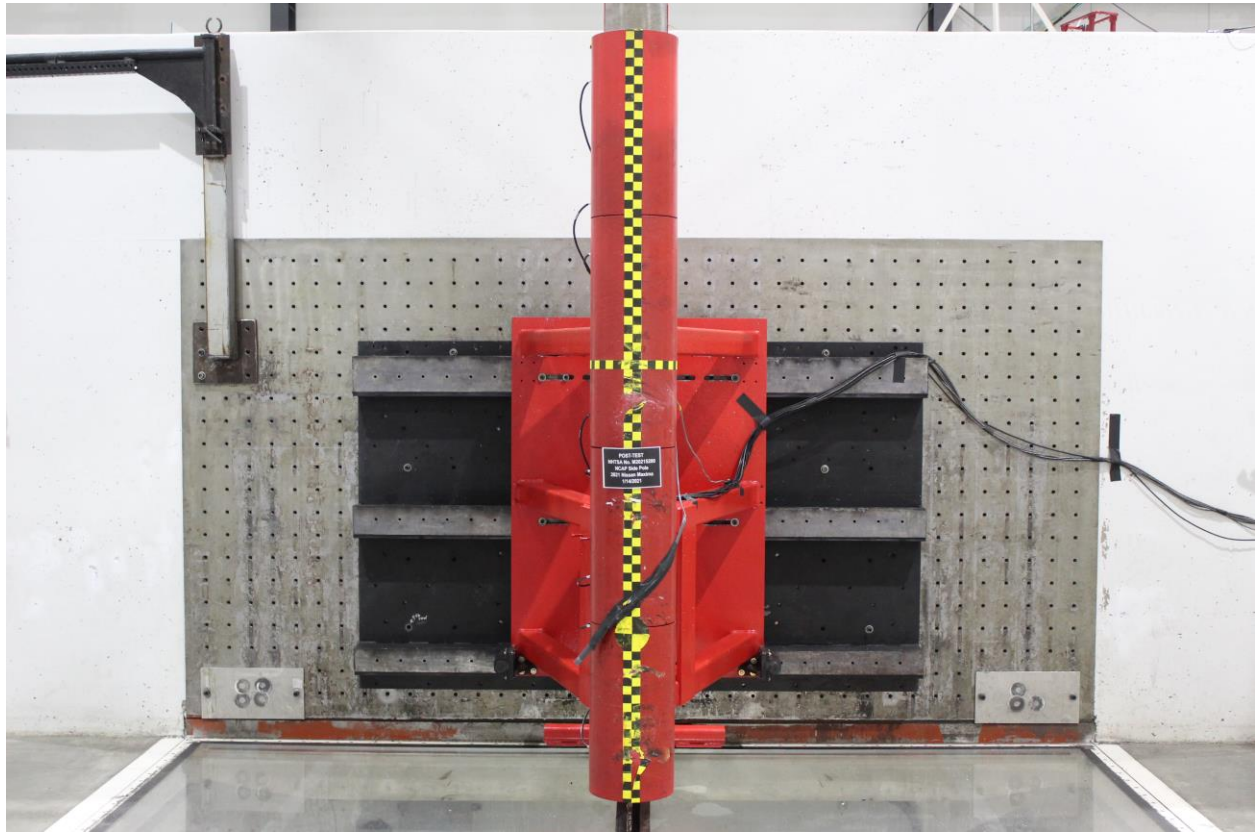


Figure A-58: Post-Test Pole Barrier Front View

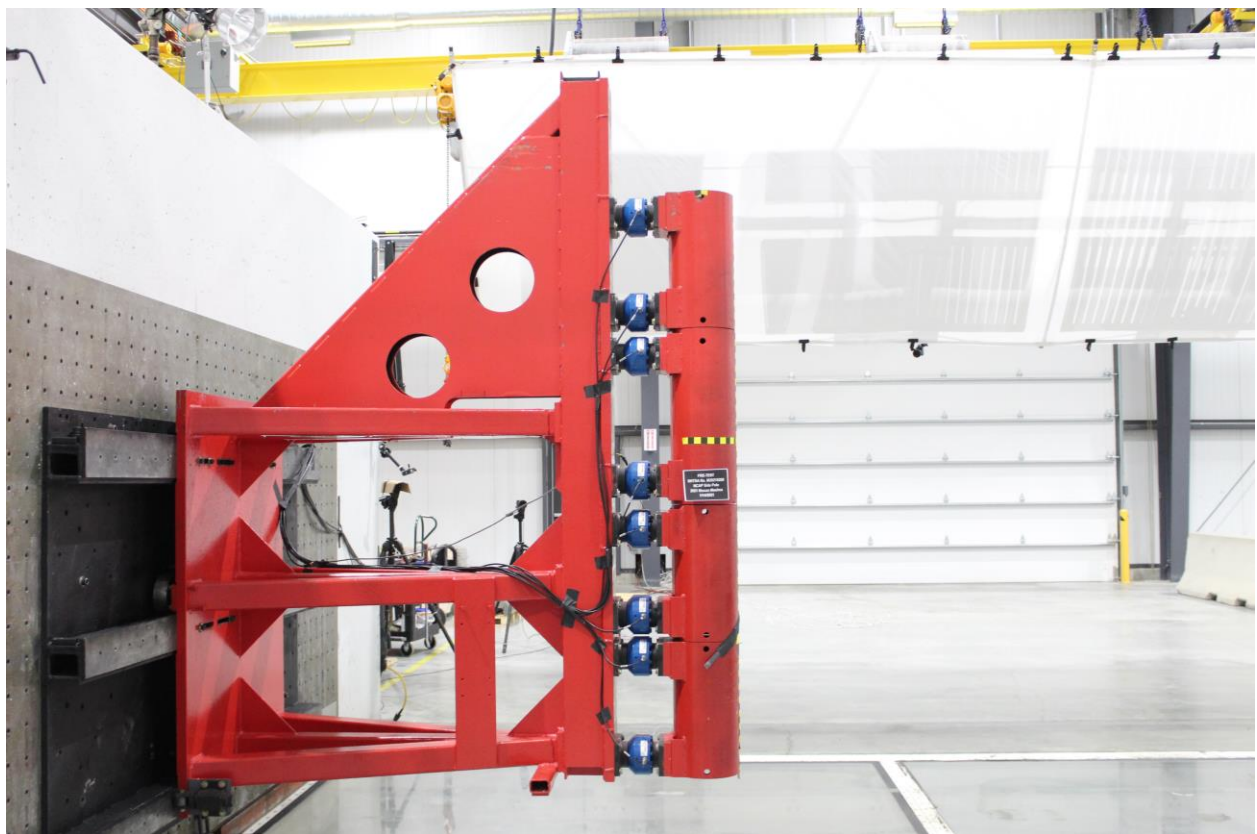


Figure A-59: Pre-Test Pole Barrier Side View

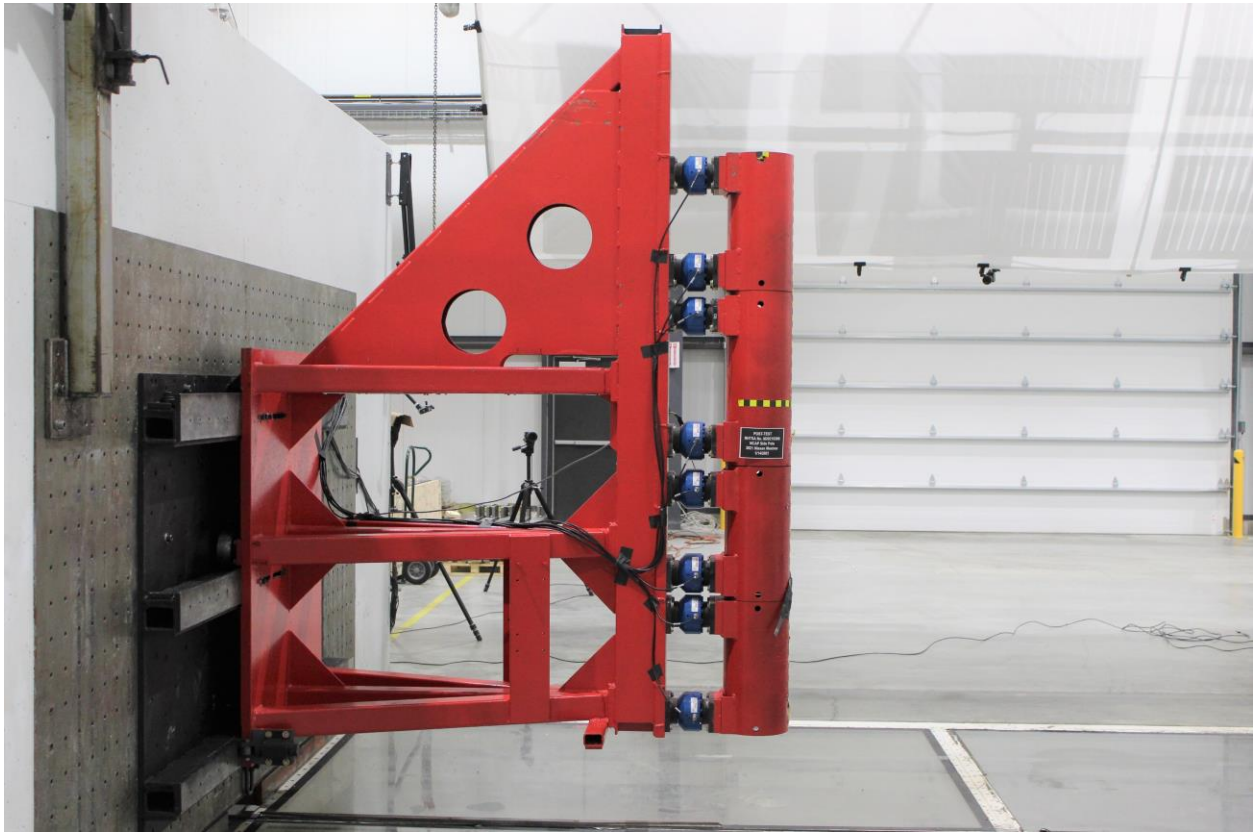


Figure A-60: Post-Test Pole Barrier Side View

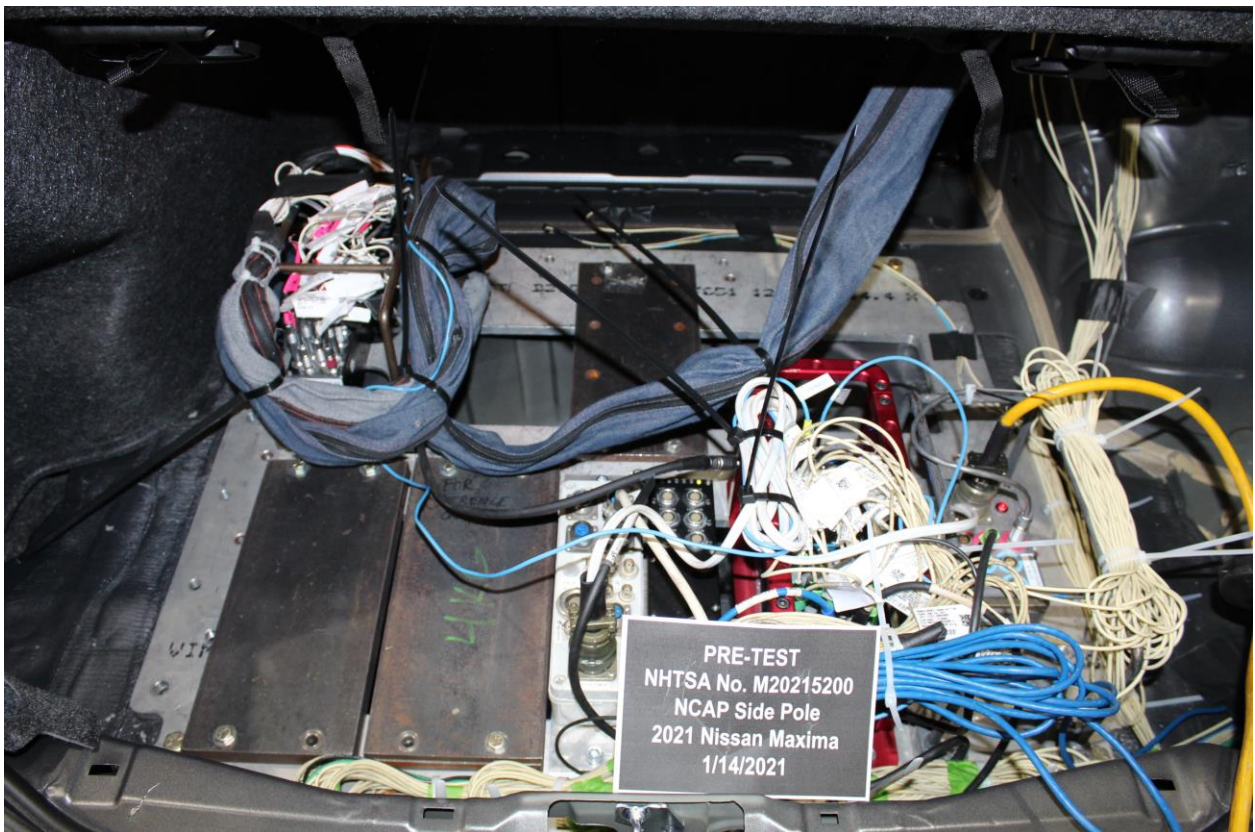


Figure A-61: Pre-Test Ballast View



Figure A-62: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-63: FMVSS No. 301 Static Rollover 0 Degrees

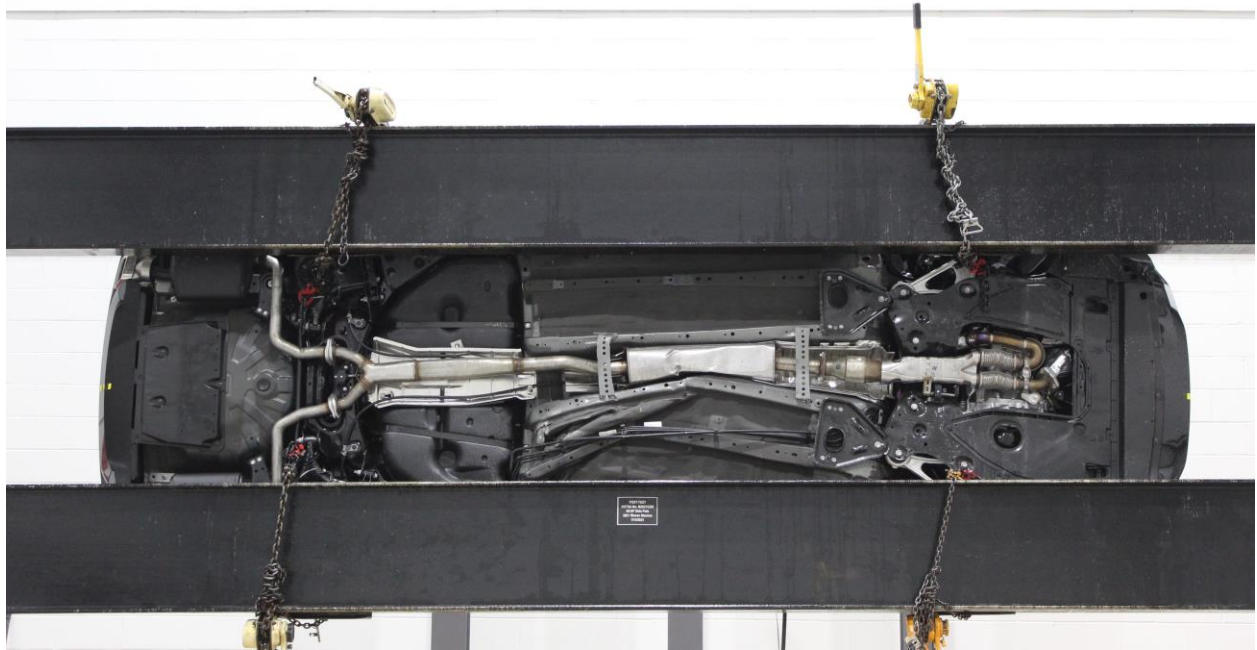


Figure A-64: FMVSS No. 301 Static Rollover 90 Degrees

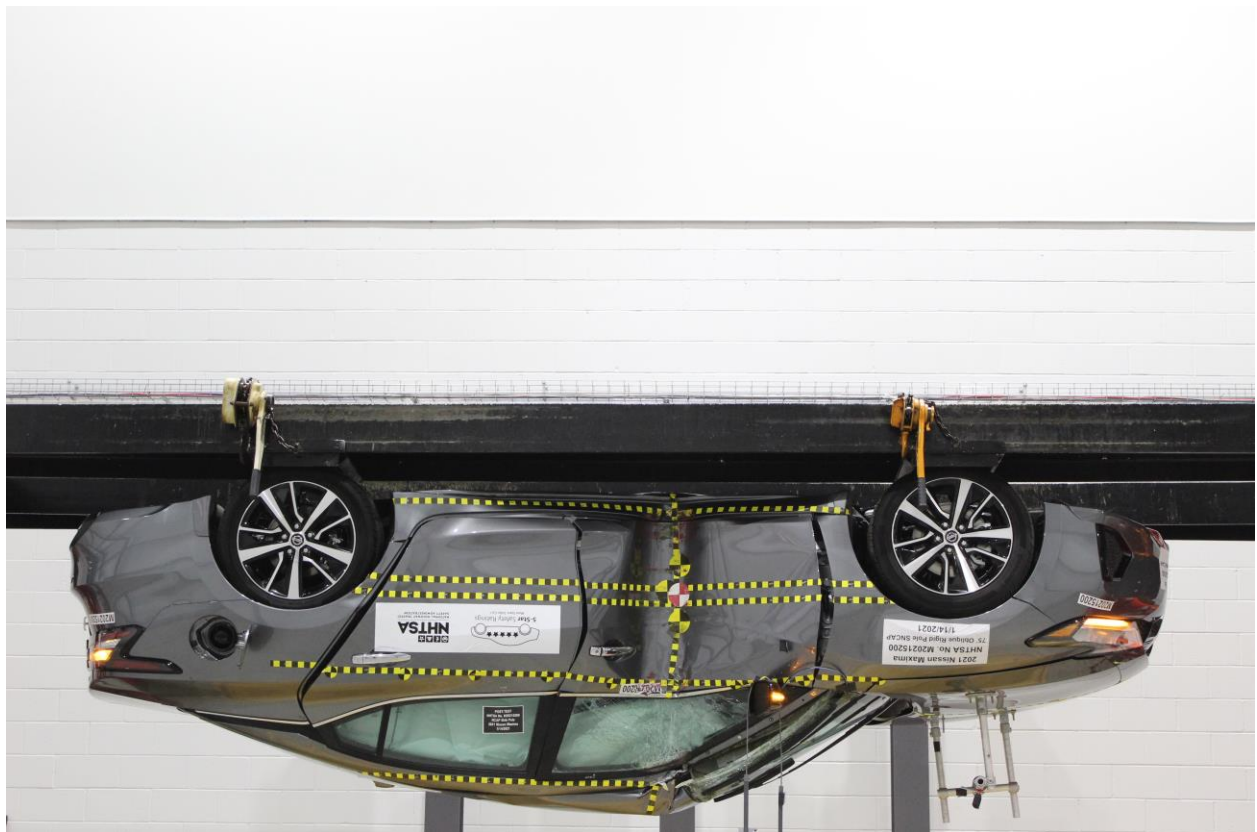


Figure A-65: FMVSS No. 301 Static Rollover 180 Degrees



Figure A-66: FMVSS No. 301 Static Rollover 270 Degrees



Figure A-67: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-68: Impact Event

2021 MAXIMA SV

Scan QR code for general model information & options

Manufacturer's Suggested Retail Base Price: \$36,990.00

Options Included by Manufacturer:

- SPLASH GUARDS: 205.00
- FLOOR MATS, TRUNK MAT, TRUNK NET, & FIRST AID KIT & BAG HOOKS: 365.00

DESTINATION CHARGES: 925.00

Total* \$38,625.00

Fuel Economy and Environment

Fuel Economy

24 MPG
combined city/hwy

20 city
30 highway

4.2 gallons per 100 miles

Annual fuel Cost
\$2,050

Fuel Economy & Greenhouse Gas Rating

5 (Best)

Smog Rating (Pass)

You spend \$2,750 more in fuel costs over 5 years compared to the average new vehicle.

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated

Frontal Crash Driver: *****, Passenger: *****

Side Crash Front seat: Not Rated, Rear seat: Not Rated

Rollover *****

DELIVERY

VEHICLE COLORS:
EXT: GUN METALLIC
INT: CHARCOAL

FINAL ASSEMBLY POINT: SMYRNA

TRANSPORT METHOD: TRUCK

DEALER: FUCILLO NISSAN, 3893 ROUTE 31, LIVERPOOL, NY 13090

DROP SHIP: FUCILLO NISSAN, 4155 STATE ROUTE 31, CLAY NY 13041

SECURITY+PLUS EXTENDED PROTECTION PLAN

The only service agreement backed by Nissan Extended Services North America. Ask your dealer for details, or call 1-800-NISSAN-1 for more information.

MECHANICAL & PERFORMANCE

- 3.5-Liter DOHC 24-Valve V6 Engine
- 300 Horsepower & 281 lb-ft Torque
- Xtronic Transmission w/Manual Shift Mode
- Drive Mode Selector (Normal & Sport)
- Integrated Dynamics-control Module (IDM)
- Active Ride Control (ARC)
- Intelligent Trace Control (ITC)
- Intelligent Engine Brake (IEB)
- 18" Machined Aluminum Alloy Wheels

COMFORT & CONVENIENCE (Con't)

- NissanConnect®
- Wi-Fi Hotspot+
- NissanConnect® Services powered by SiriusXM®
- Apple CarPlay®
- Android Auto™
- 8" Color Touch-screen Display
- Nissan Door to Door Navigation
- Bluetooth® Hands-free Phone System+
- Streaming Audio Via Bluetooth®
- Voice Recognition+
- Sirius Eyes Free+
- SiriusXM® Radio with Advanced Audio Features
- Hands-Free Text Messaging Assistant
- SiriusXM® Radio
- SiriusXM® Traffic & Travel Link+
- 6 Speakers
- Two Front Illuminated USB Connection Ports
- 1 Type-A, 1 Type-C
- Dual-Zone Automatic Temperature Control
- Rear/View Monitor (RVIM)
- Remote Engine Start w/ Intelligent Climate Control+
- 8-Way Power Driver's & 4-Way Power Front Passenger's Seat
- Driver's Seat Power Lumbar Support
- Zero Gravity Front Seats
- Satin Chrome® Faceted Finishers
- 60/40 Split Fold Down Rear Seats
- Leather-Wrapped "D-Shaped" Steering Wheel
- Nissan Intelligent Key® w/ Push Button Ignition+
- Intelligent Driver Alertness (I-DA)
- Rear Door Alert

SAFETY & SECURITY

- Automatic Emergency Braking (AEB) with Pedestrian Detection
- Rear Automatic Braking (RAB)
- Driver & Front Passenger, Side Impact, & Curtain Airbags
- Rear Outboard Side Impact Airbags
- Driver & Front Passenger Knee Airbags
- Lower Anchors & Tethers for Children (LATCH)
- Intelligent Forward Collision Warning (FCW)
- Blind Spot Warning (BSW)
- Rear Cross Traffic Alert (RCTA)
- Lane Departure Warning (LDW)
- High Beam Assist (HBA)
- 4-Wheel Anti-Lock Braking System (ABS) w/ Traction Control System (TCS)
- Electronic Brake Force Distribution (EBD) & Brake Assist (BA)
- Tire Pressure Monitoring System (TPMS) & Easy-Fill Tire Alert
- Nissan Vehicle Immobilizer System
- Vehicle Security System (VSS)

EXTERIOR

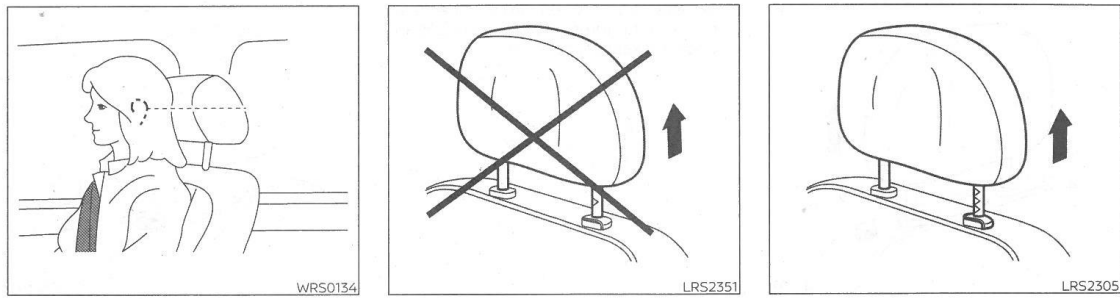
- Outside Mirrors w/ Turn Signal Indicator
- Heated Outside Mirrors
- LED Intelligent Auto. Headlights
- LED Signature Daytime Running Lights
- Rear Parking Sensors

COMFORT & CONVENIENCE

- Traffic Sign Recognition (TSR)
- Leather-Appointed Seats
- Heated Front Seats
- Intelligent Cruise Control (ICC)
- 17" Advanced Drive Assist Display (ADAD)

*Does not include dealer installed options and accessories, local taxes or license fees. This label has been applied pursuant to federal law. Do not remove prior to delivery to the ultimate purchaser.

Figure A-69: Monroney Label



ADJUST

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

For non-adjustable head restraint/headrest

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

Raise

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

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

1-10 **Safety-Seats, seat belts and supplemental restraint system**

Figure A-70: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



Figure A-71: Post-Test View of Shattered Vehicle Inner Door Panel (if applicable)

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver Dummy Instrumentation Plots

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

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.gov.

Additional Driver Dummy Instrumentation Data

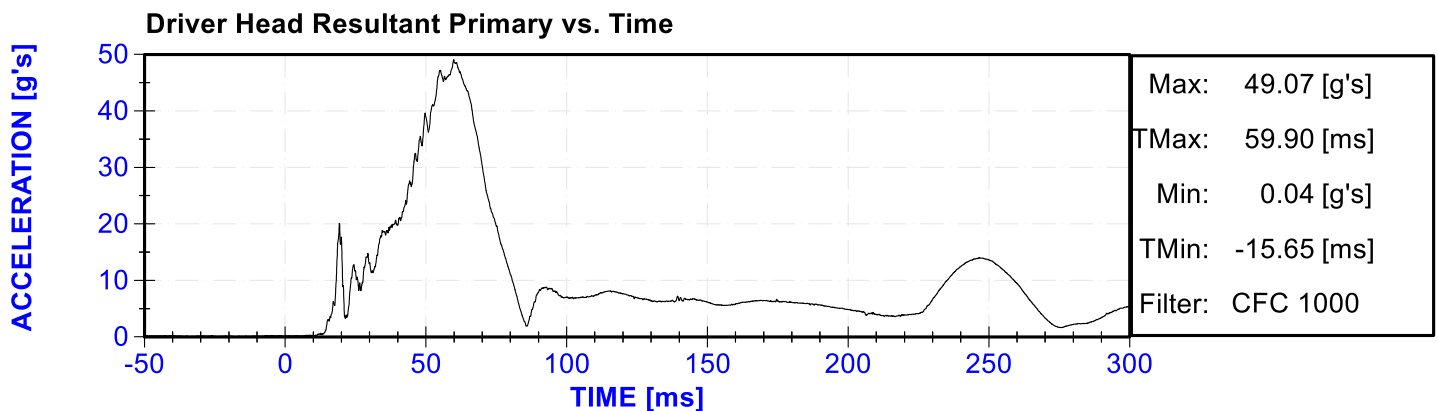
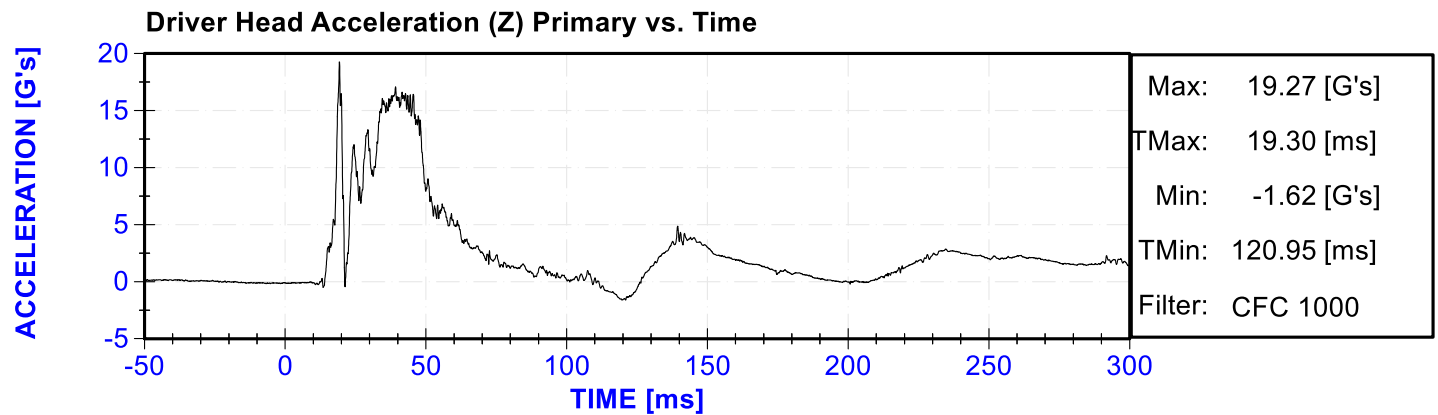
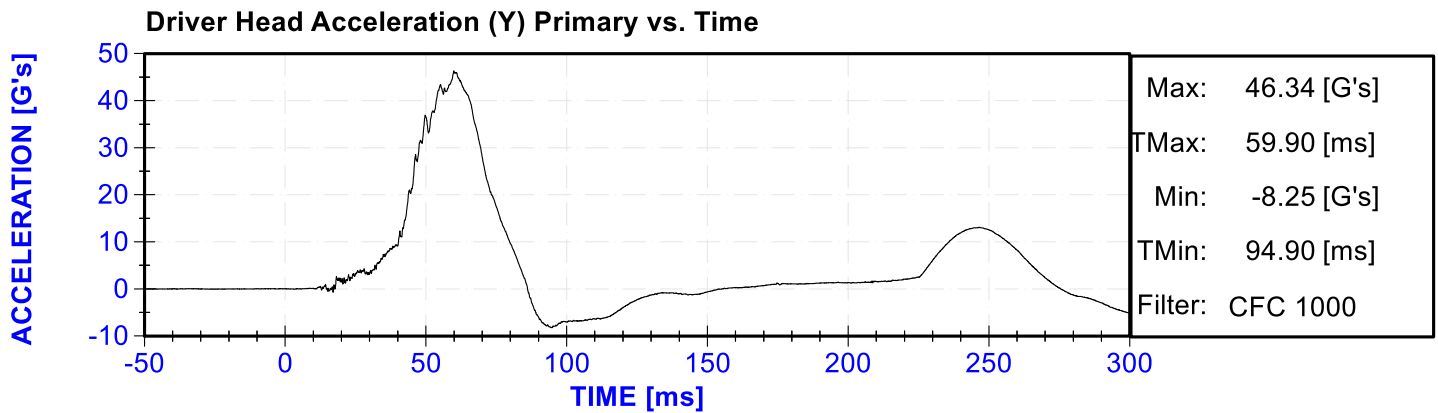
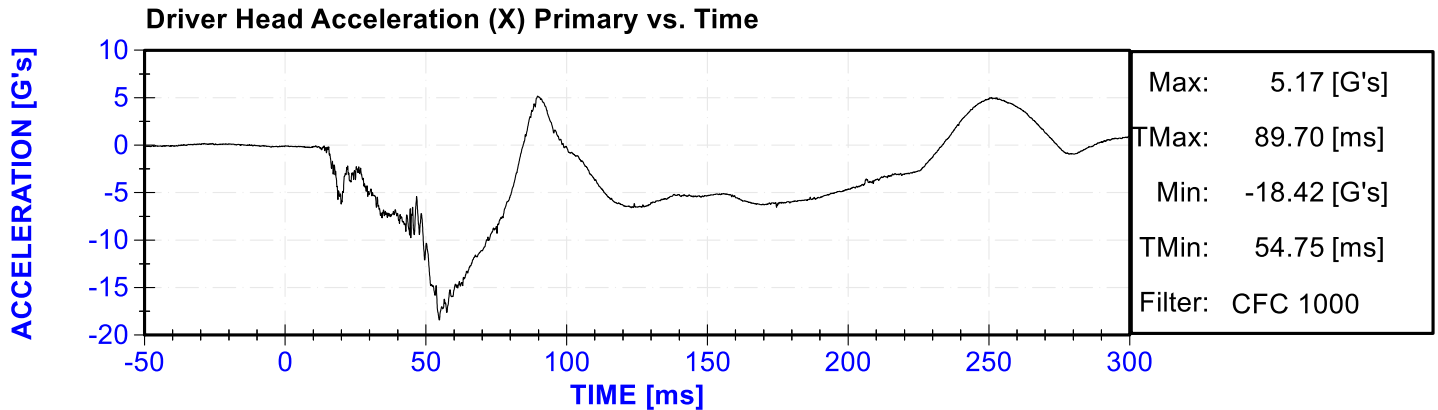
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection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

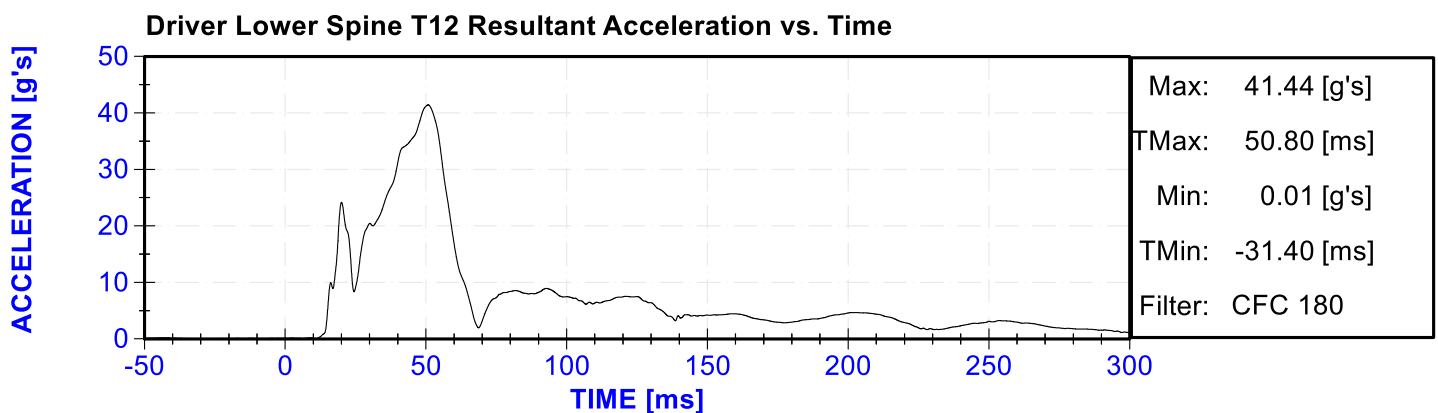
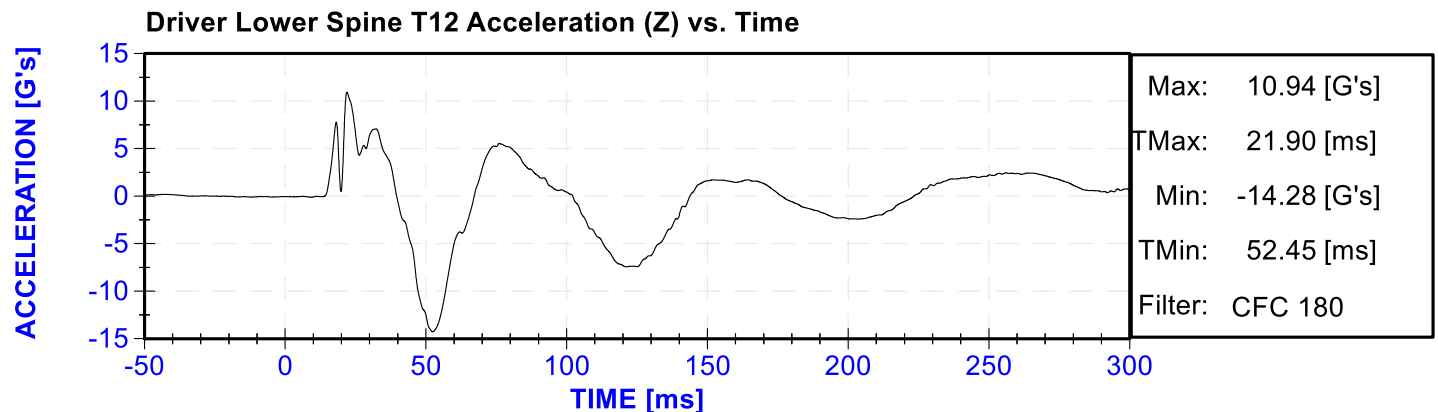
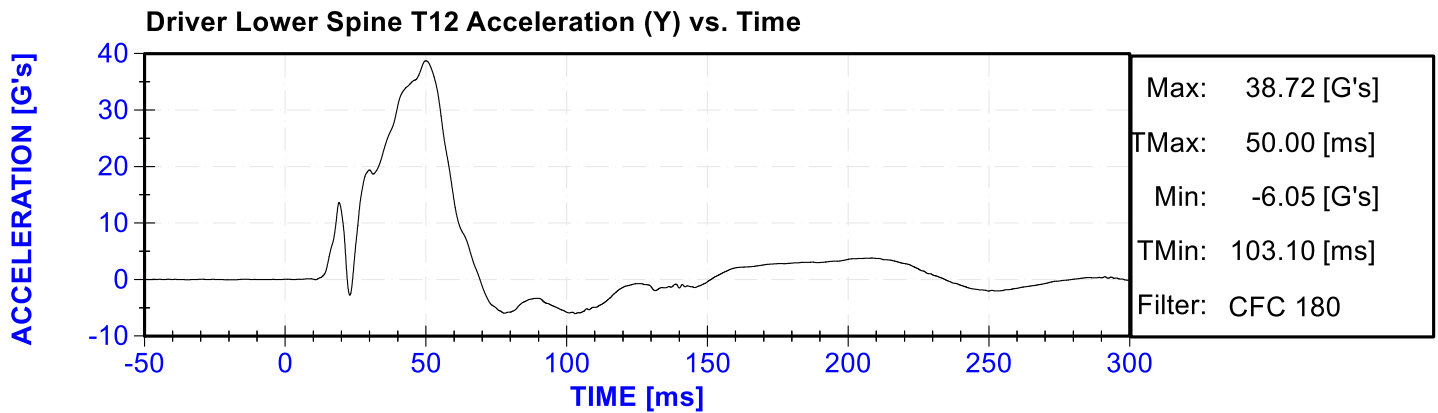
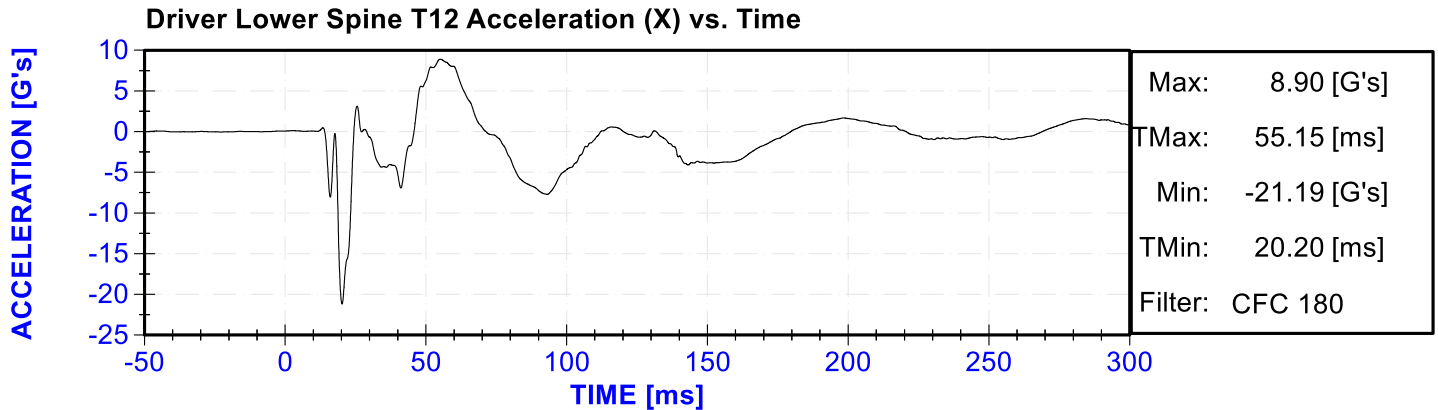
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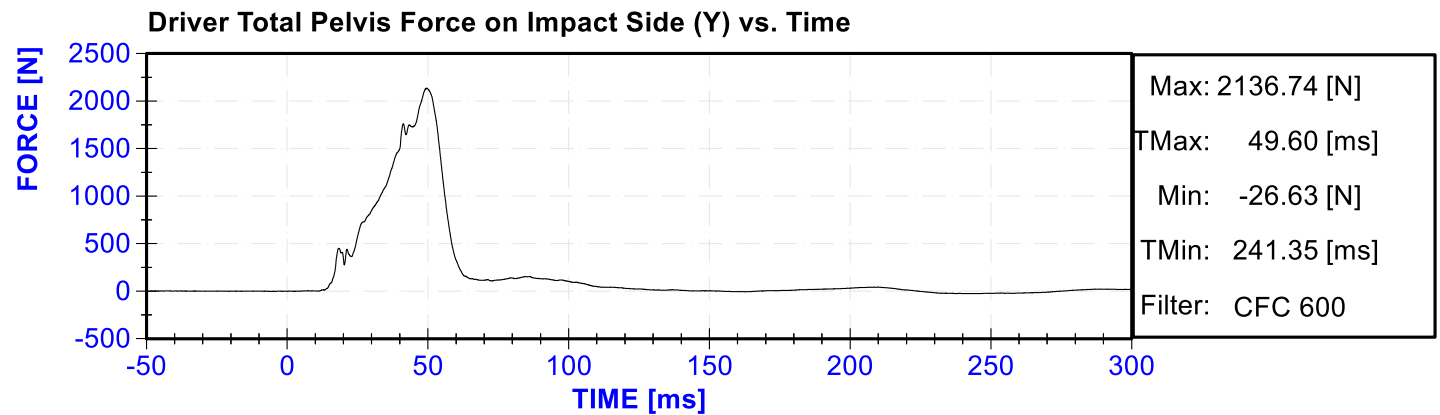
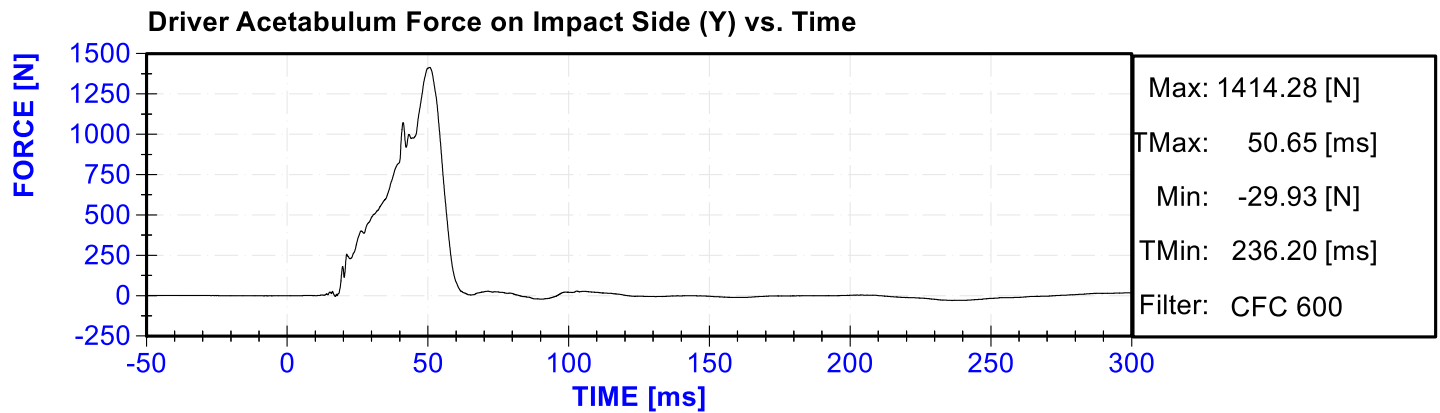
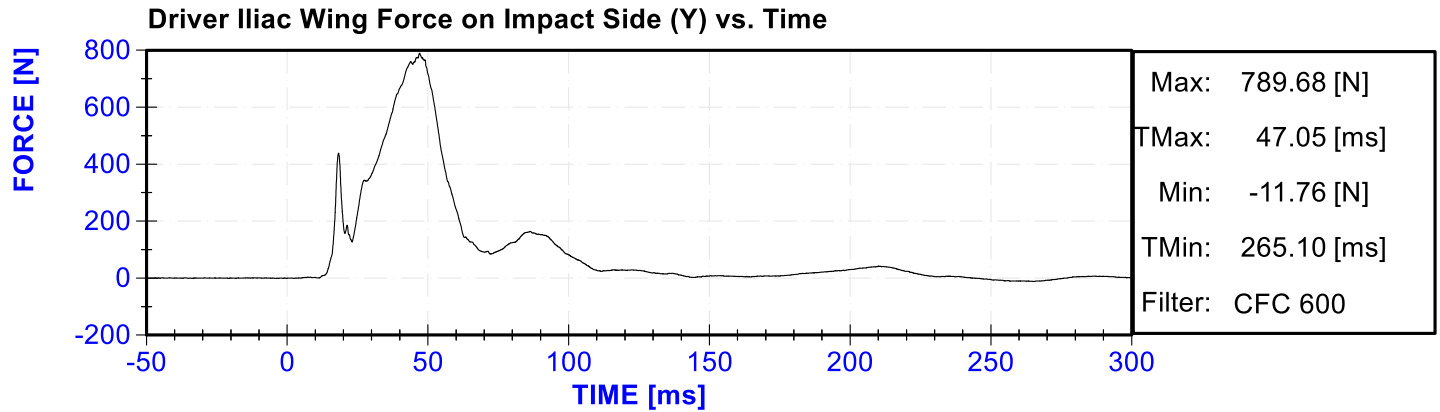
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration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







APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO: DG8012

(CONFIGURED FOR LEFT SIDE IMPACT)

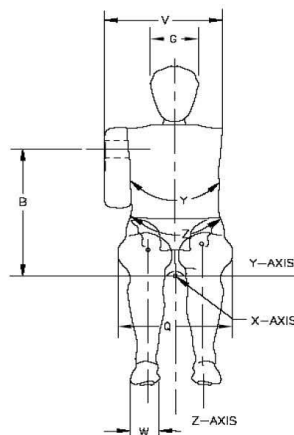
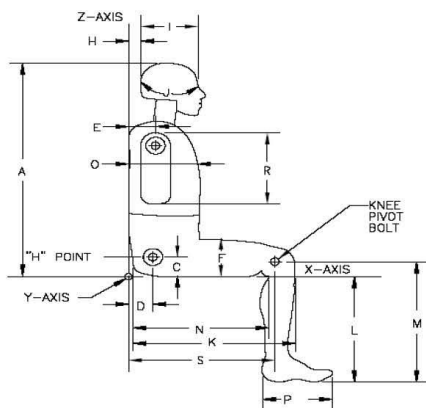


External Measurements - SID-IIs

Technician: **K. Dutton**

Date: **01/11/2021**

Dummy Serial Number: **DG8012**



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	446	Pass
C	H-point Height	79	89	83	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	143	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	184	Pass
J	Head Circumference	541	551	548	Pass
K	Buttock to Knee Length	514	540	534	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	402	Pass
N	Buttock Popliteal Length	416	442	433	Pass
O	Chest Depth w/o jacket	195	211	205	Pass
P	Foot Length	216	232	225	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	255	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	346	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	867	Pass
Z	Waist Circumference	761	791	781	Pass

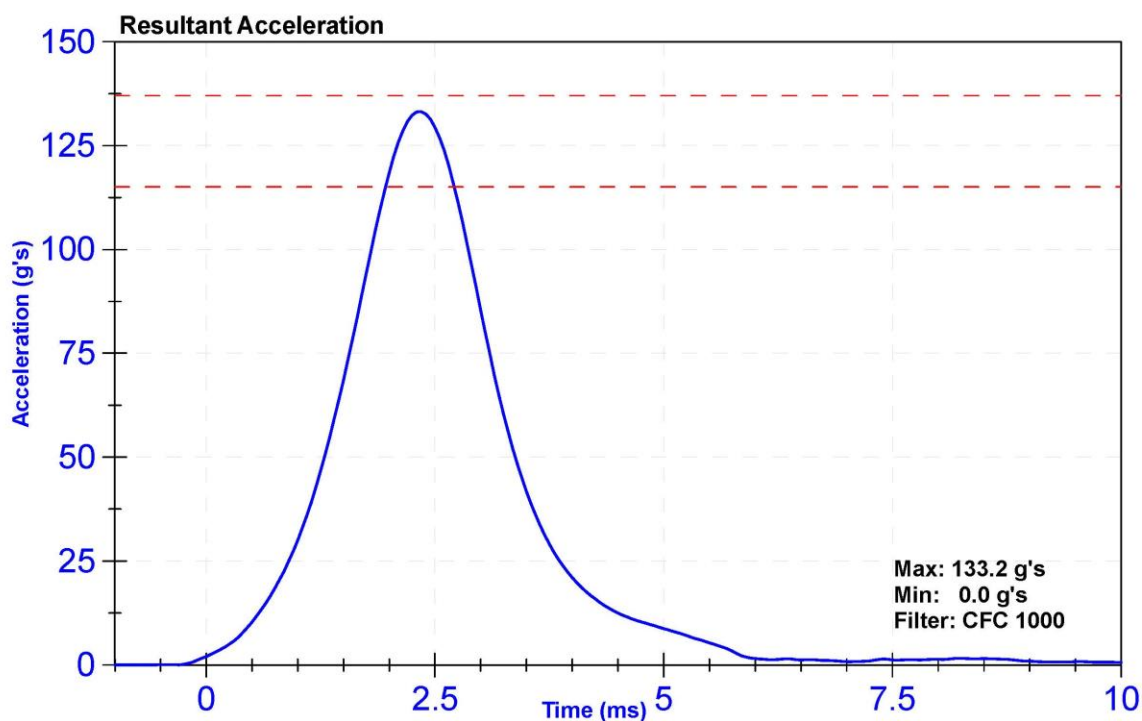
ATD Manufacturer	FTSS	Test Technician	S. Vacanti
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

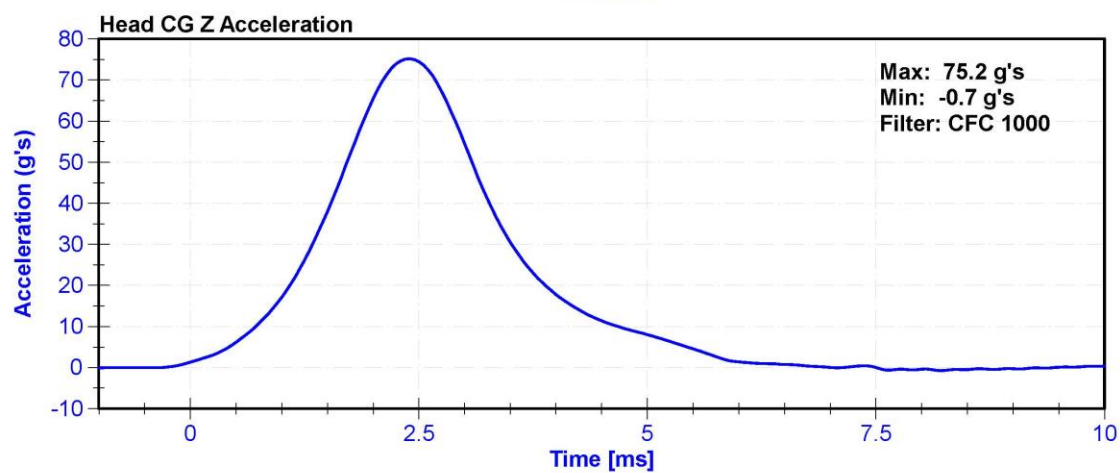
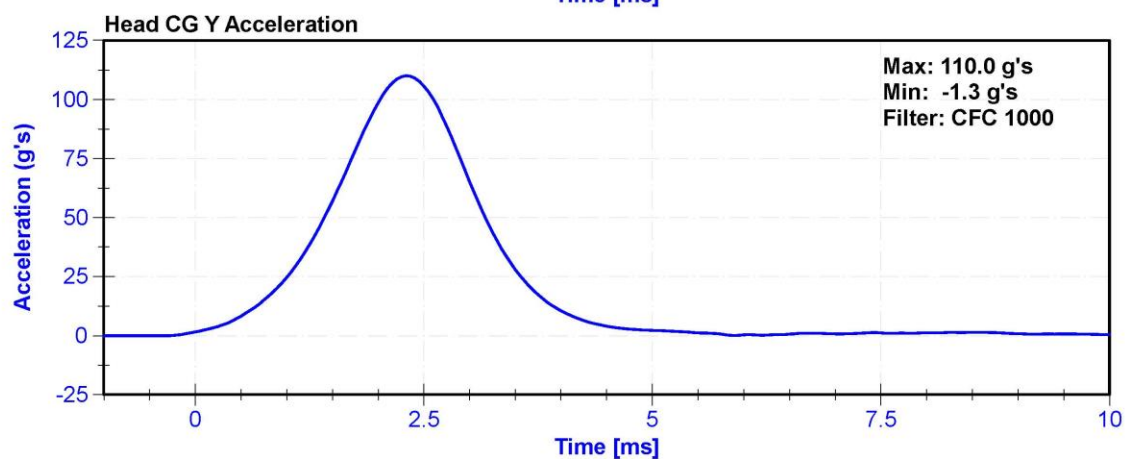
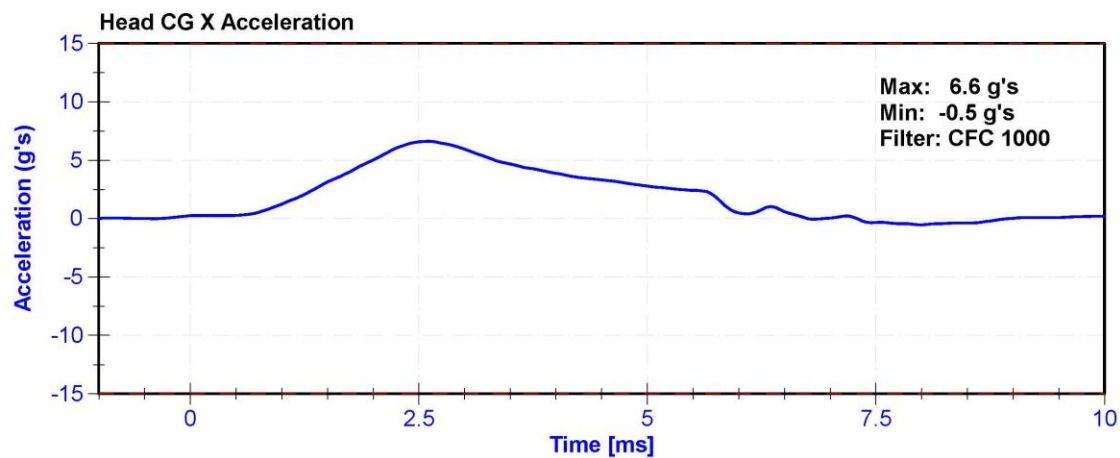
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	29	Pass
Resultant Acceleration	115	137	g's	133.2	Pass
Oscillation	0	15	%	1.1	Pass
Fore-Aft Acceleration	-15	15	g's	6.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P74788	11/5/2020	5/6/2021
Y Accelerometer	ENDEVCO 7264CT	AC-P83432	11/5/2020	5/6/2021
Z Accelerometer	ENDEVCO 7264	AC-P83319	11/5/2020	5/6/2021





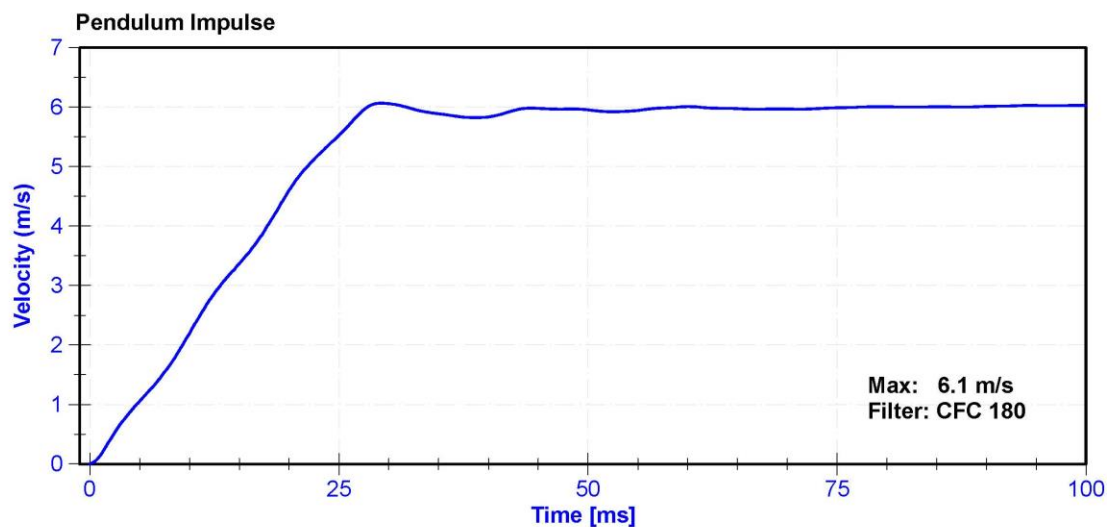
ATD Manufacturer	FTSS	Test Technician	S. Vacanti
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

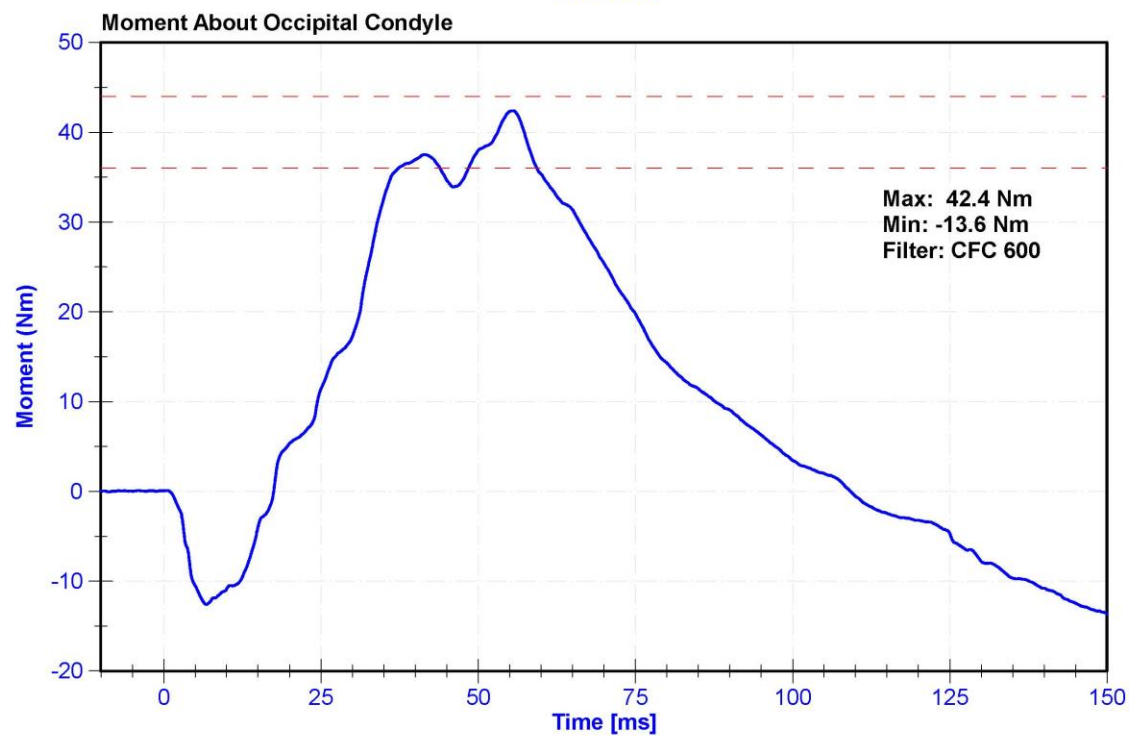
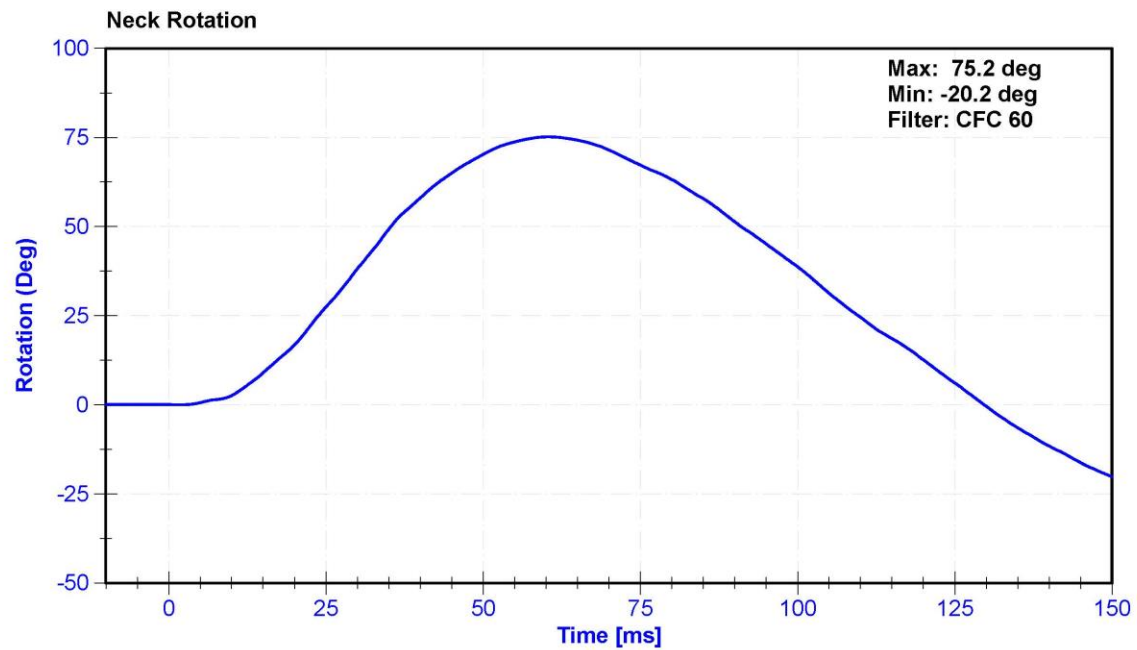
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	28	Pass
Velocity	5.51	5.63	m/s	5.584	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.20	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.37	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.60	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.52	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.06	Pass
Neck Rotation	71	81	deg	75.2	Pass
Time at Maximum Rotation	50	70	ms	60.4	Pass
Moment about the OC	36	44	Nm	42.4	Pass
Moment Decay to 0 Nm	102	126	ms	109.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C16503 Striker	2/6/2020	2/5/2021
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/6/2020	11/6/2021
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/6/2020	11/6/2021
Upper Neck Load Cell	Denton 1716	17162019 FY	3/18/2020	3/18/2021





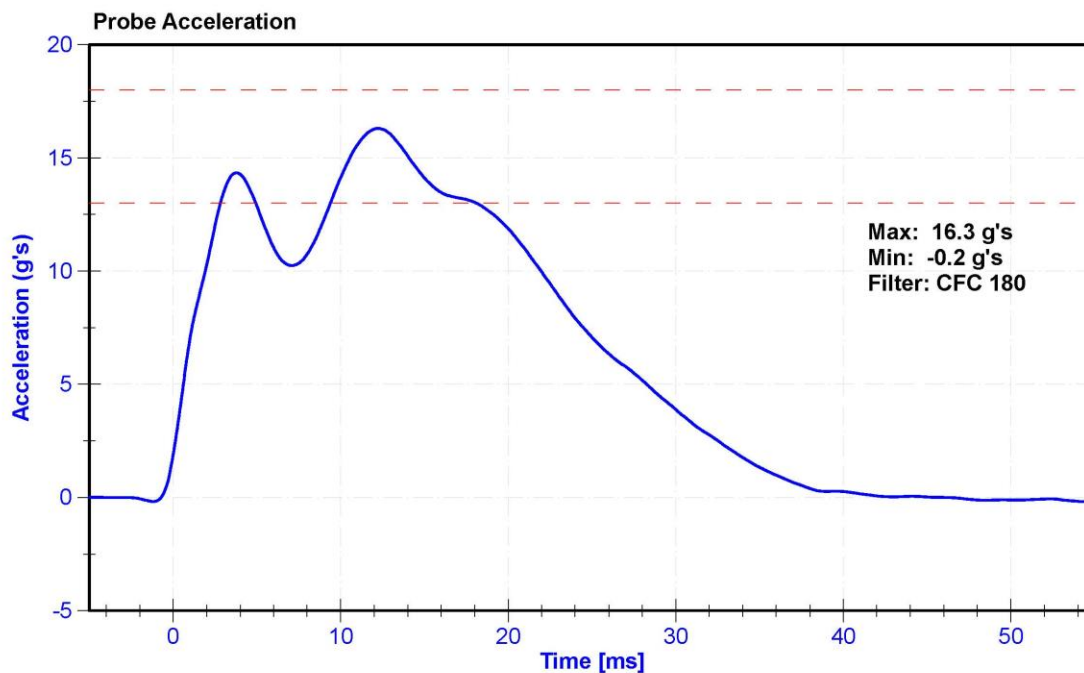
ATD Manufacturer	FTSS	Test Technician	S. Vacanti
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

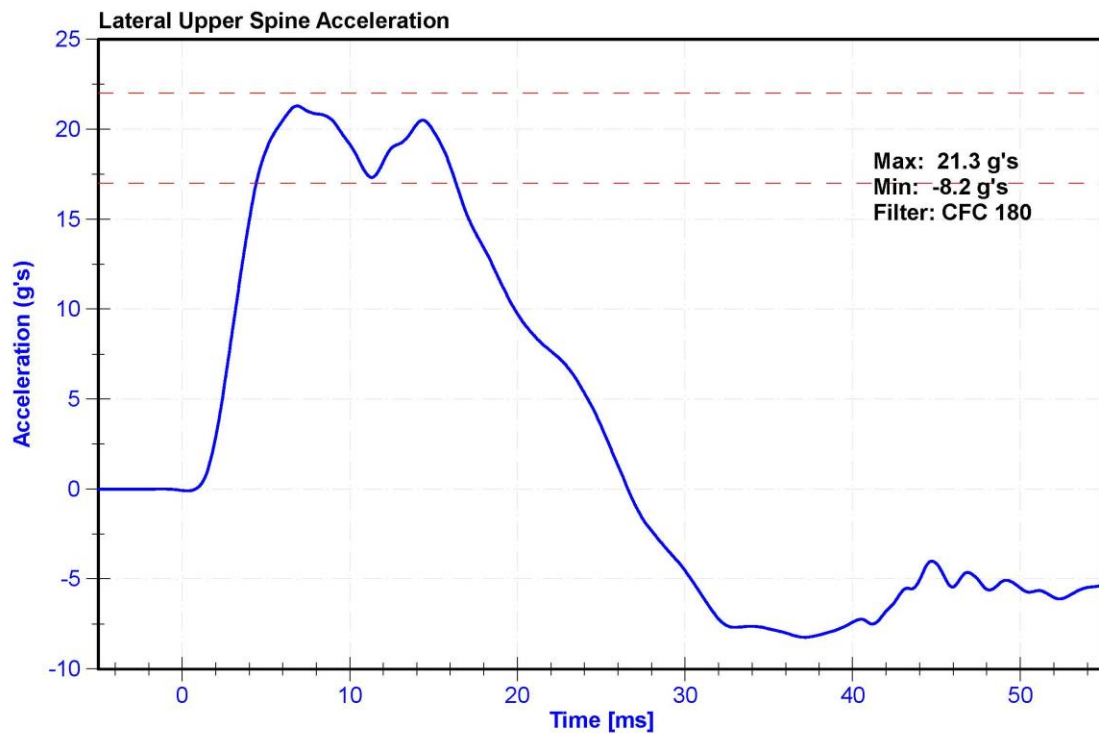
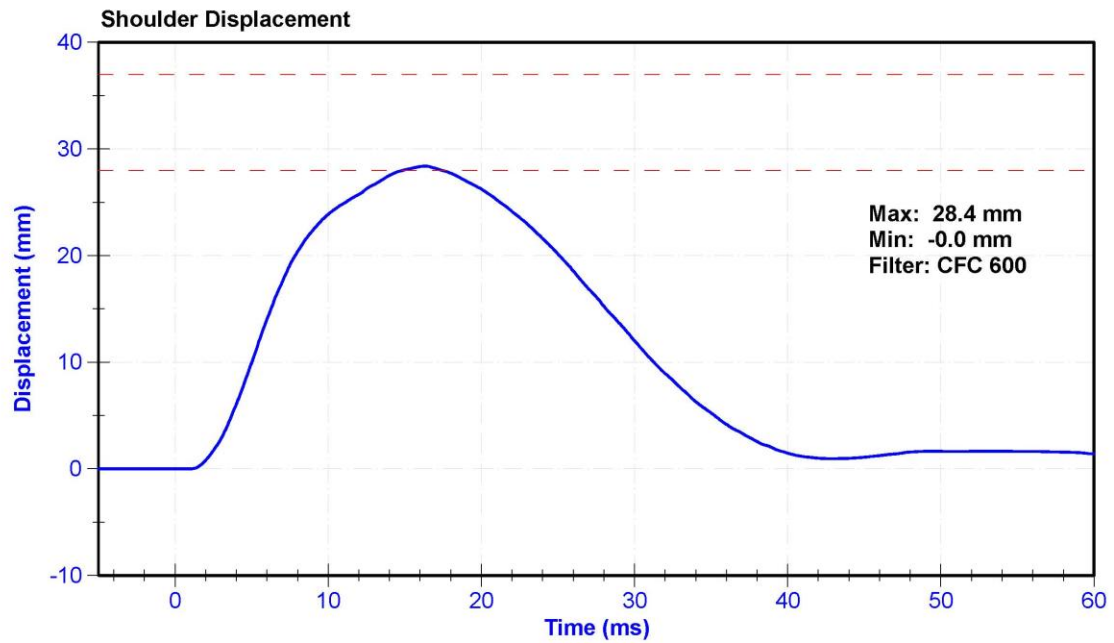
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	13	18	g's	16.3	Pass
Shoulder Deflection	28	37	mm	28.4	Pass
Lateral Upper Spine Acceleration	17	22	g's	21.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	12/2/2020	6/2/2021
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	11/5/2020	5/6/2021





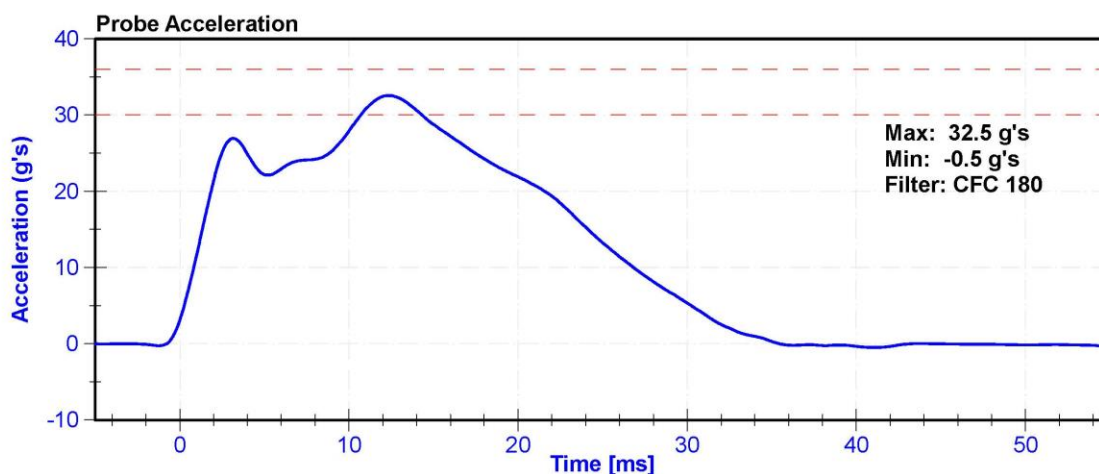
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

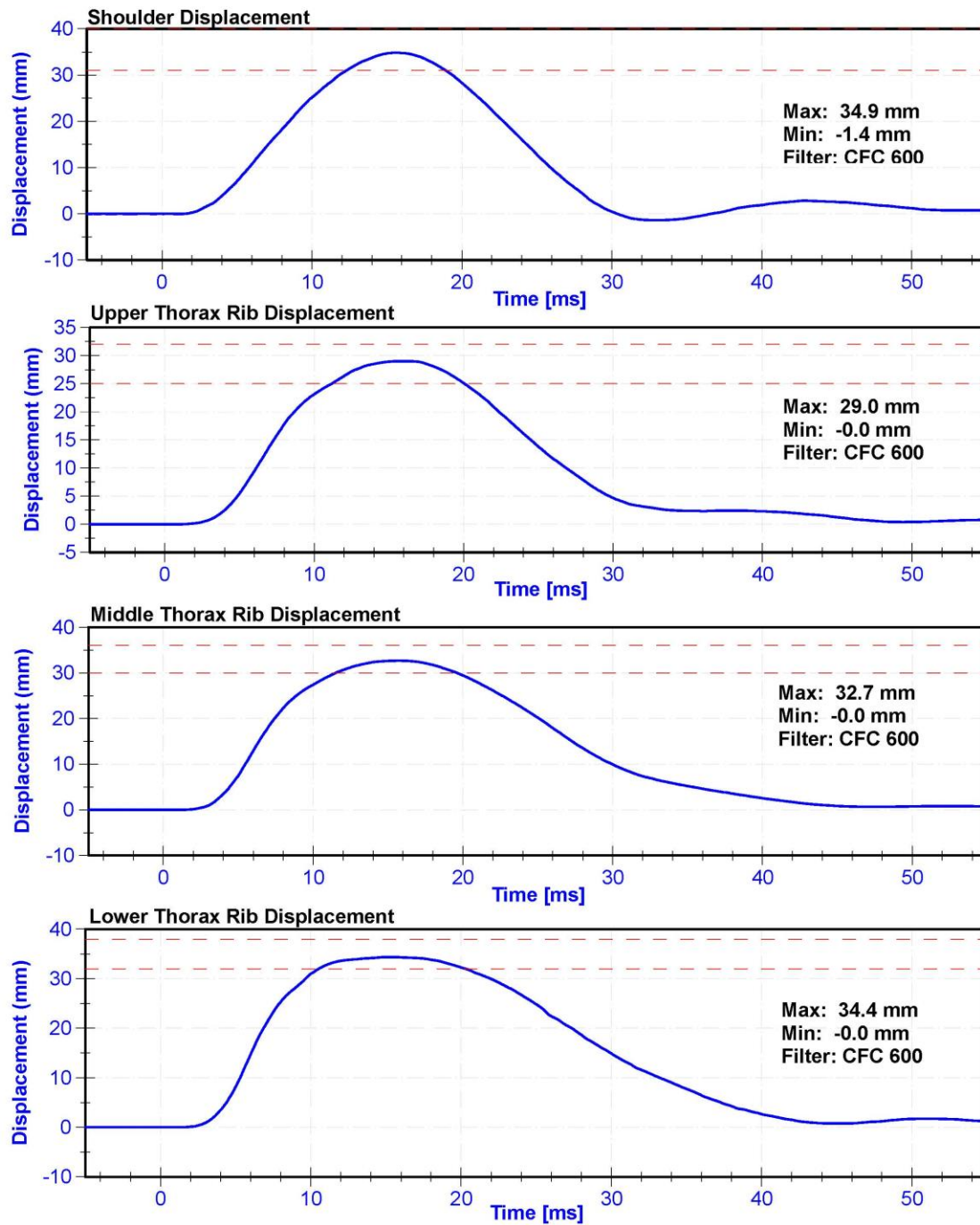
Results

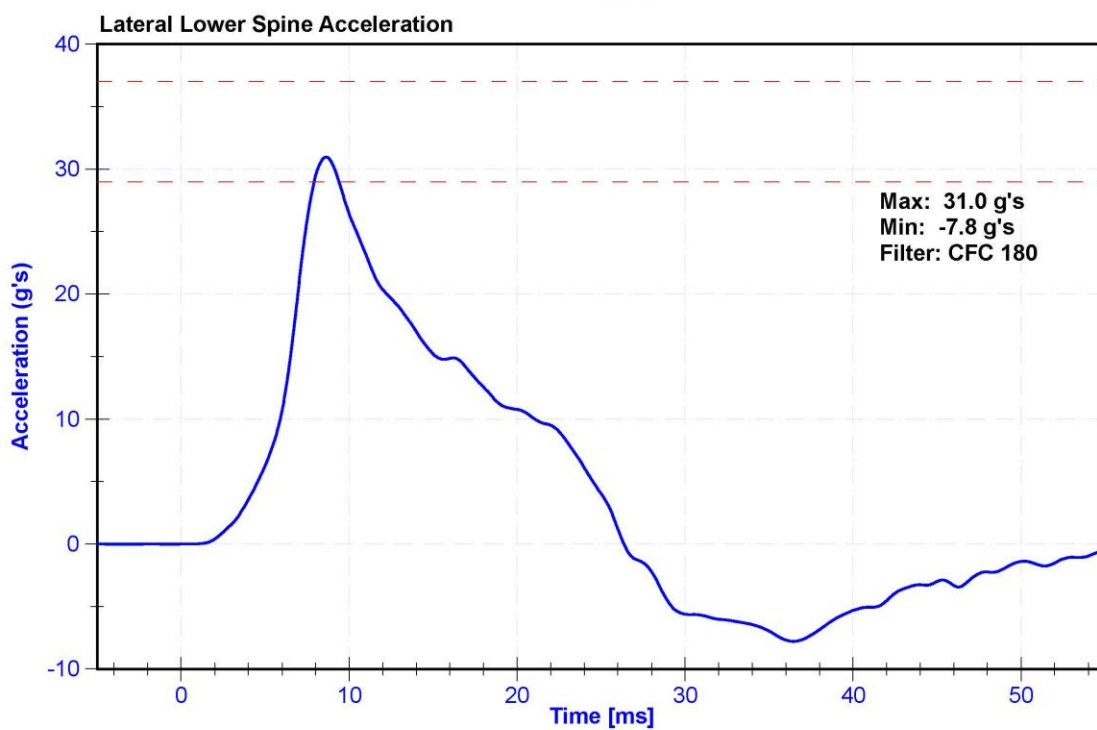
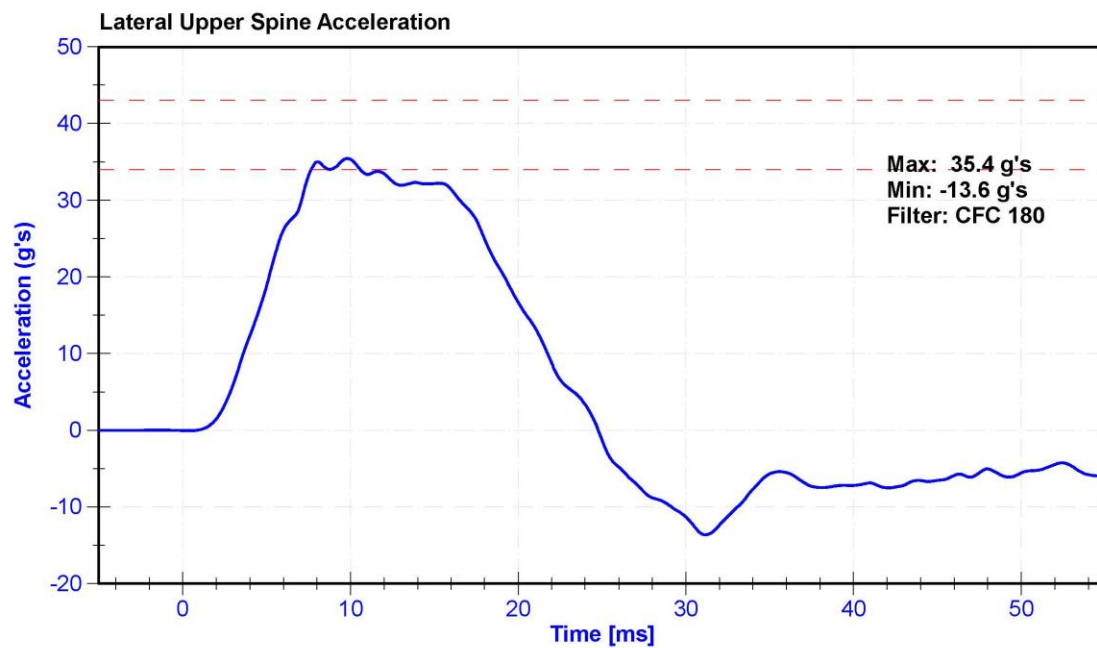
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	29.0	Pass
Velocity	6.6	6.8	m/s	6.74	Pass
Probe Acceleration after 5 ms	30	36	g's	32.5	Pass
Lateral Upper Spine Acceleration	34	43	g's	35.4	Pass
Lateral Lower Spine Acceleration	29	37	g's	31.0	Pass
Shoulder Deflection	31	40	mm	34.9	Pass
Upper Thorax Rib Deflection	25	32	mm	29.0	Pass
Mid Thorax Rib Deflection	30	36	mm	32.7	Pass
Lower Thorax Rib Deflection	32	38	mm	34.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P64148	11/5/2020	5/6/2021
Upper Spine T12 Y Accelerometer	ENDEVCO 7264C	AC-P51327	11/5/2020	5/6/2021
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	12/2/2020	6/2/2021
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	11/6/2020	5/7/2021
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	11/6/2020	5/7/2021
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	11/6/2020	5/7/2021







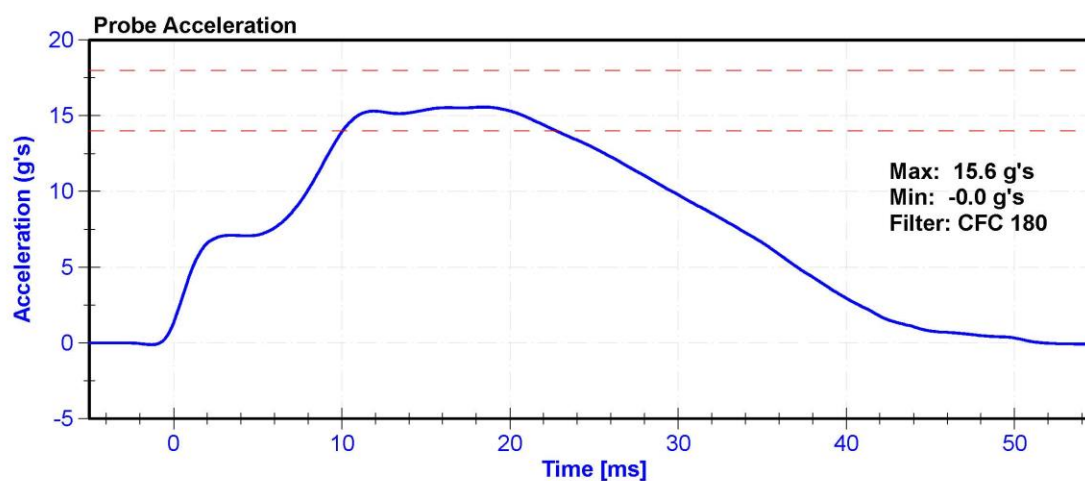
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

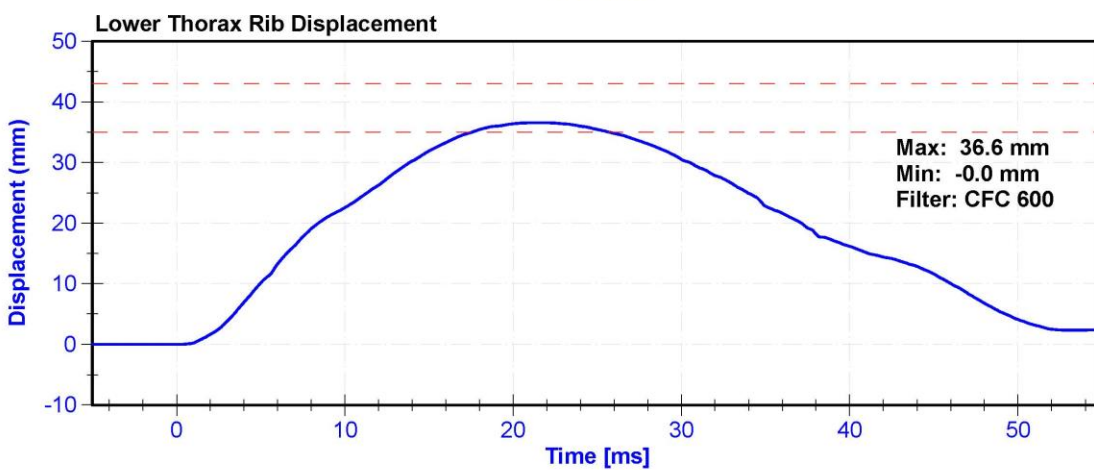
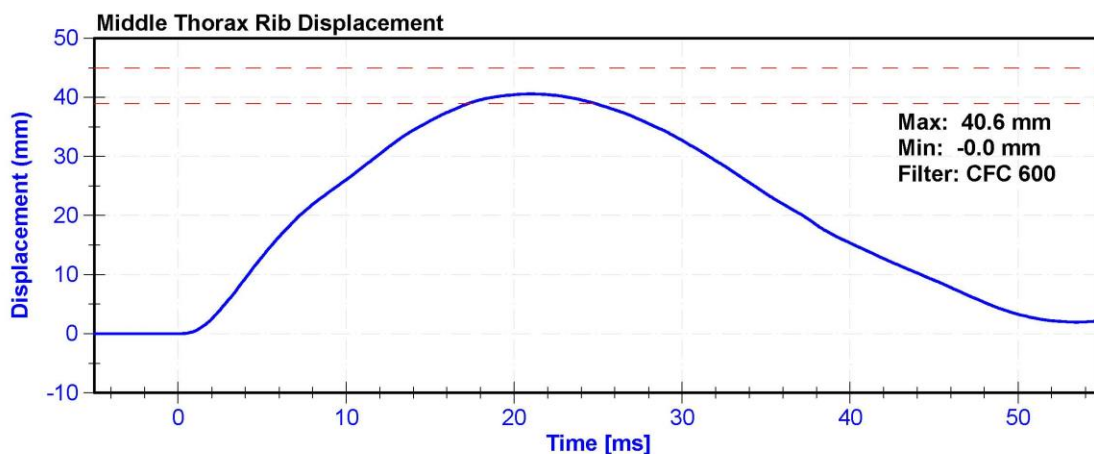
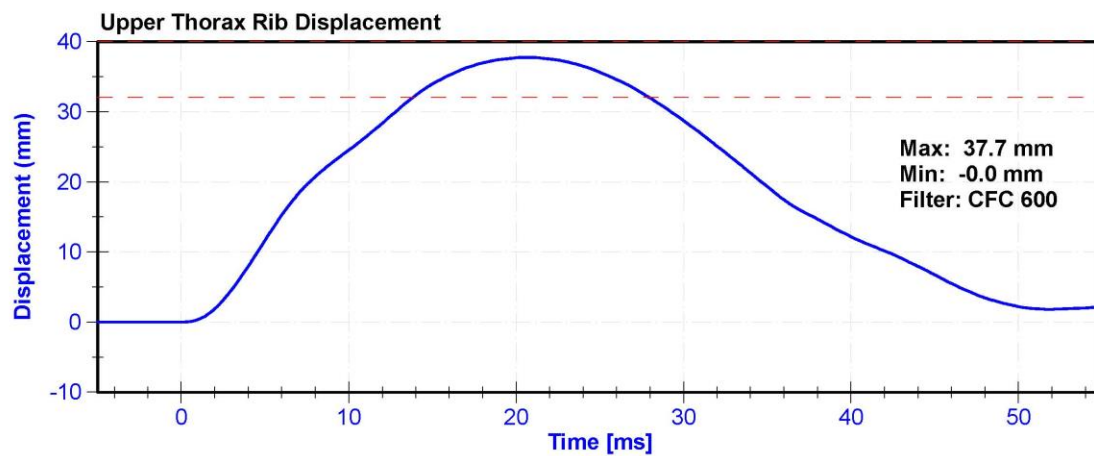
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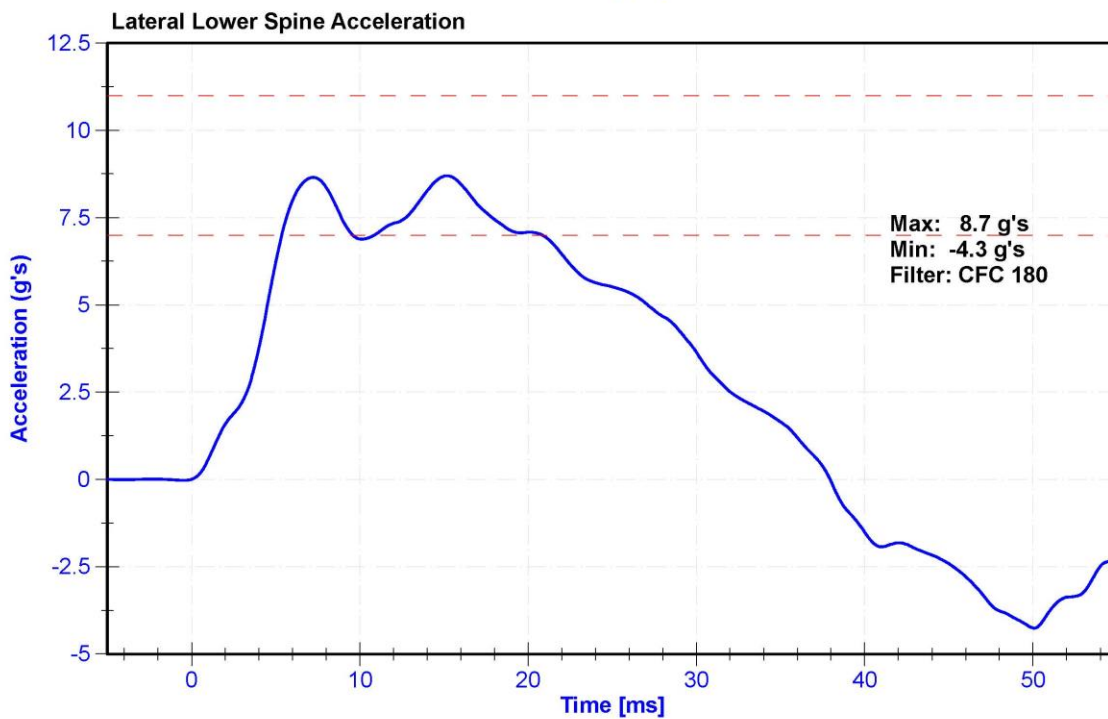
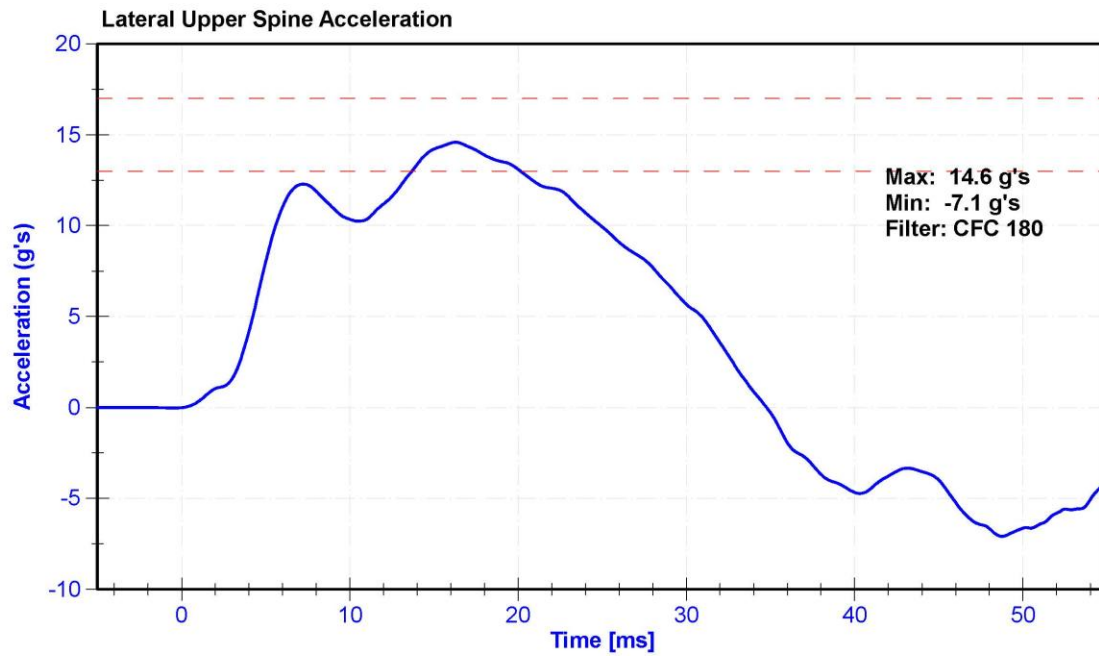
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	14	18	g's	15.6	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.6	Pass
Lateral Lower Spine Acceleration	7	11	g's	8.7	Pass
Upper Thorax Rib Deflection	32	40	mm	37.7	Pass
Middle Thorax Rib Deflection	39	45	mm	40.6	Pass
Lower Thorax Rib Deflection	35	43	mm	36.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	11/5/2020	5/6/2021
Lower Spine Y Accelerometer	ENDEVCO 7264C	AC-P51327	11/5/2020	5/6/2021
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	11/6/2020	5/7/2021
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	11/6/2020	5/7/2021
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	11/6/2020	5/7/2021







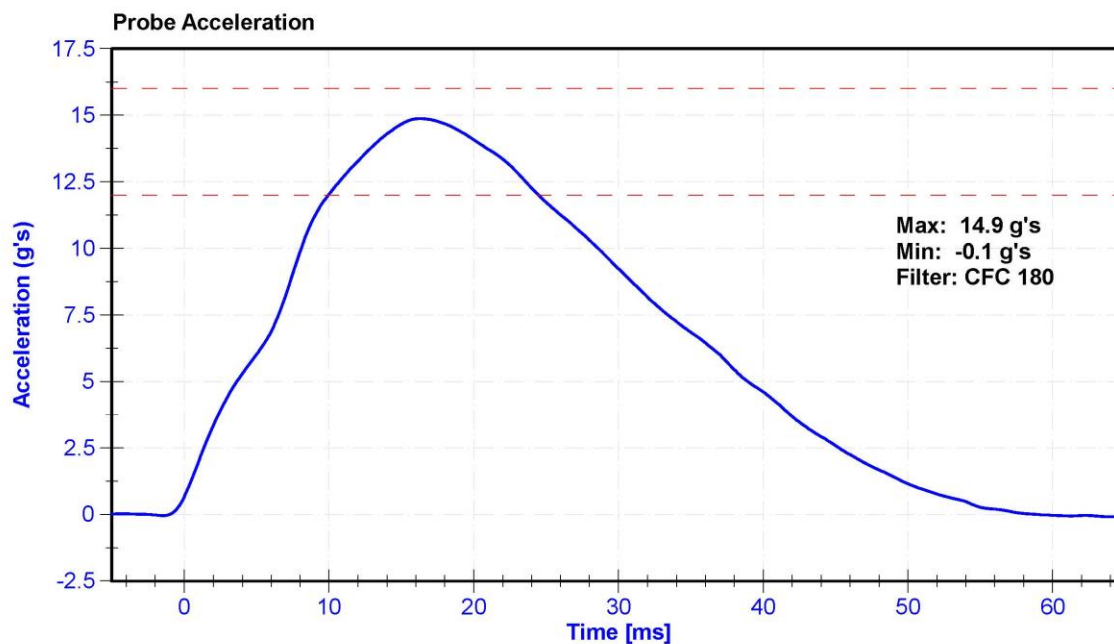
ATD Manufacturer	FTSS	Test Technician	D. Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

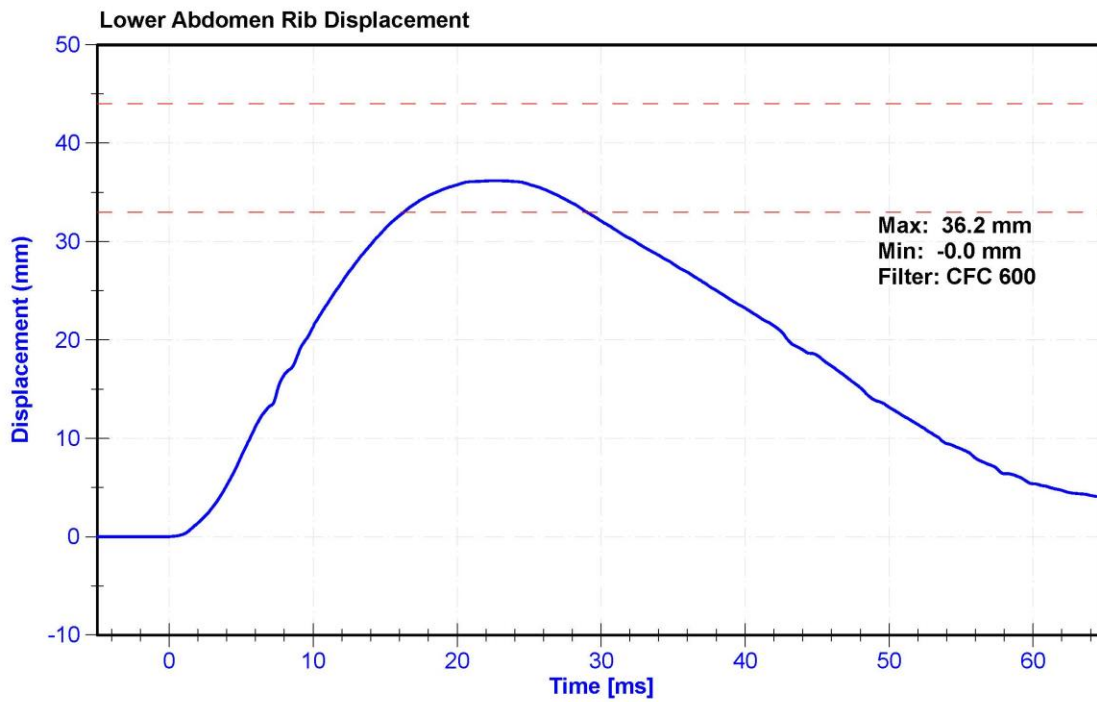
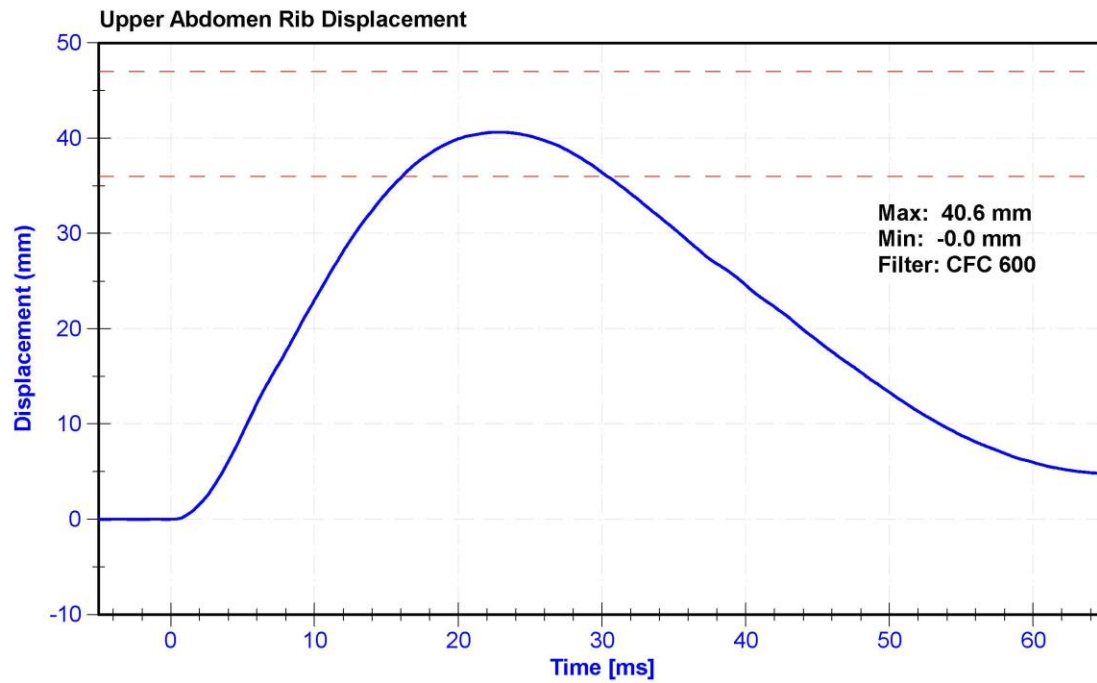
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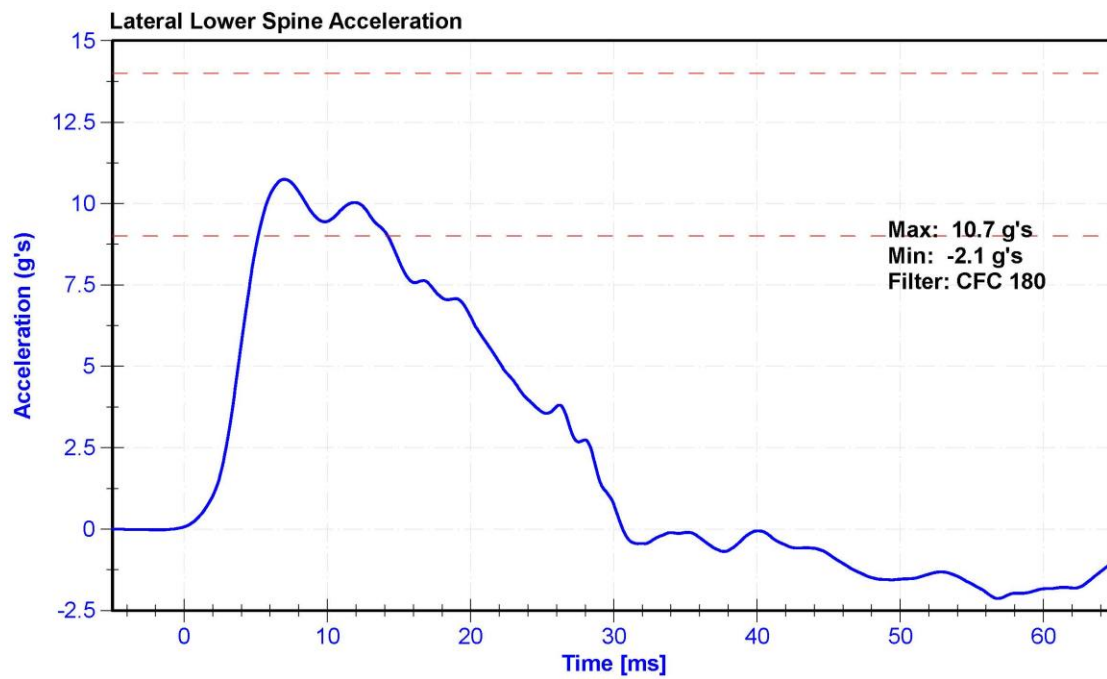
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	29.0	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	12	16	g's	14.9	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.7	Pass
Upper Abdomen Rib Deflection	36	47	mm	40.6	Pass
Lower Abdomen Rib Deflection	33	44	mm	36.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Lower Spine Y Accelerometer	ENDEVCO 7264C	AC-P51327	11/5/2020	5/6/2021
Upper Abdomen Rib Potentiometer	Servo 08TC1-3725	DS-008GFE	11/6/2020	5/7/2021
Lower Abdomen Rib Potentiometer	Servo 08TC1-3745	DS-1774GFE	11/6/2020	5/7/2021







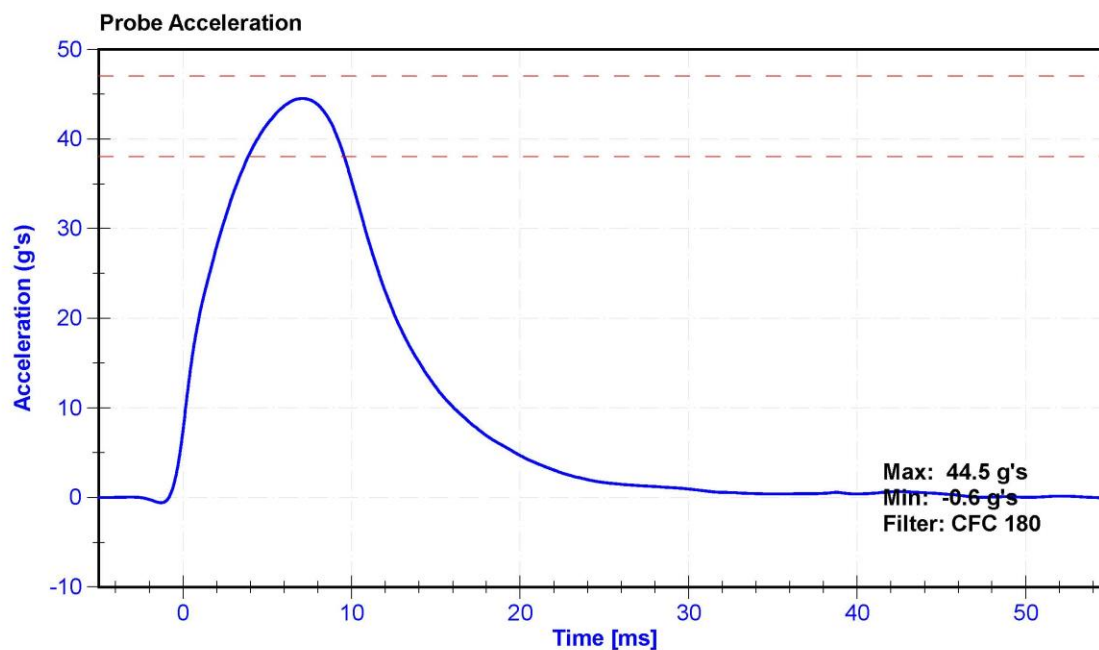
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

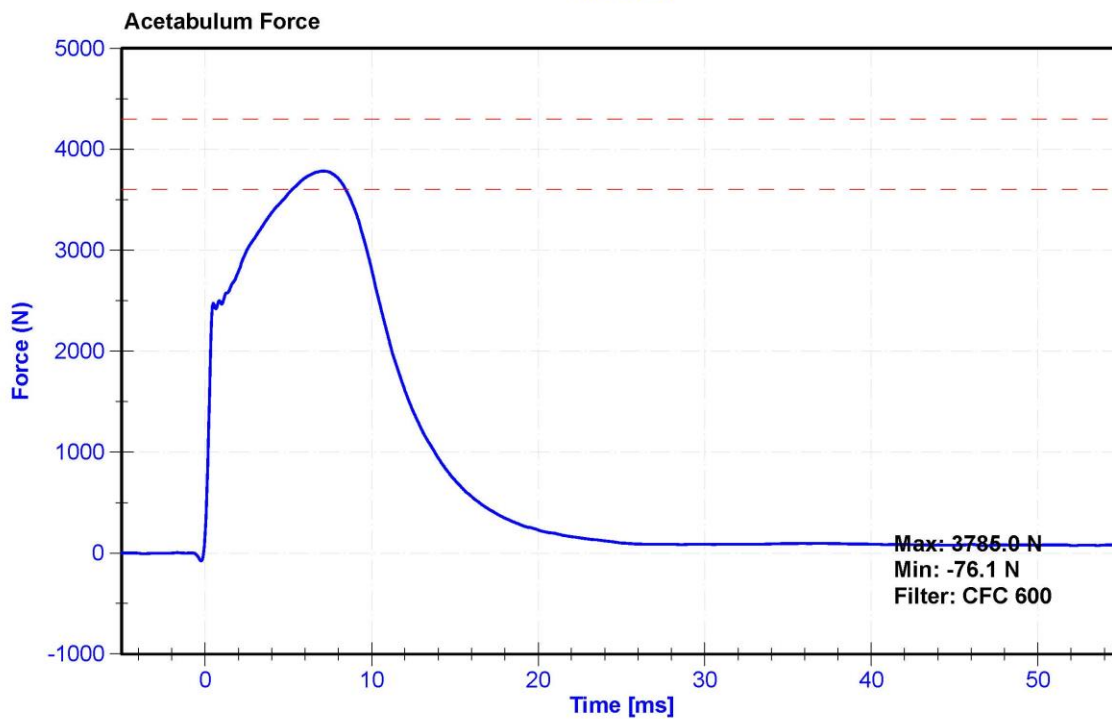
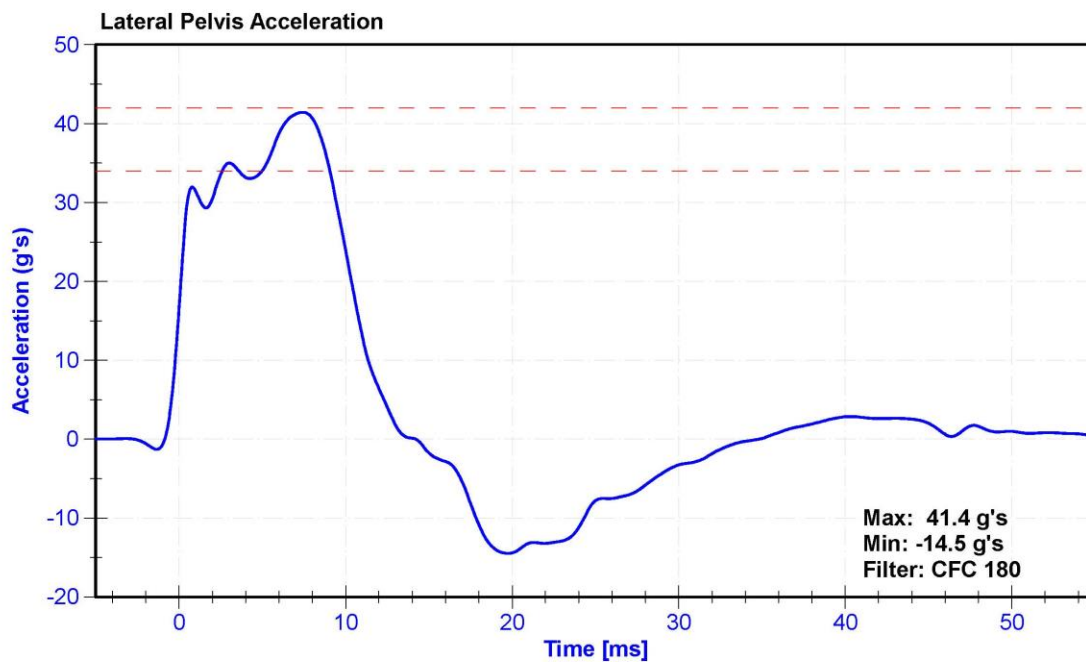
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	29	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	44.5	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.4	Pass
Acetabulum Force	3600	4300	N	3785.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Pelvis Y Accelerometer	ENDEVCO 7264C	AC-P51875	11/5/2020	5/6/2021
Acetabulum Load Cell	Denton 3249J	LC-267Fy	3/19/2020	3/19/2021
Certification Plug	SACO	13345	9/19/2019	N/A
Crash Test Plug	SACO	13527	9/23/2019	N/A







8012
NonImp
1/12/21

SID-11s Pelvis Plug Certification Test

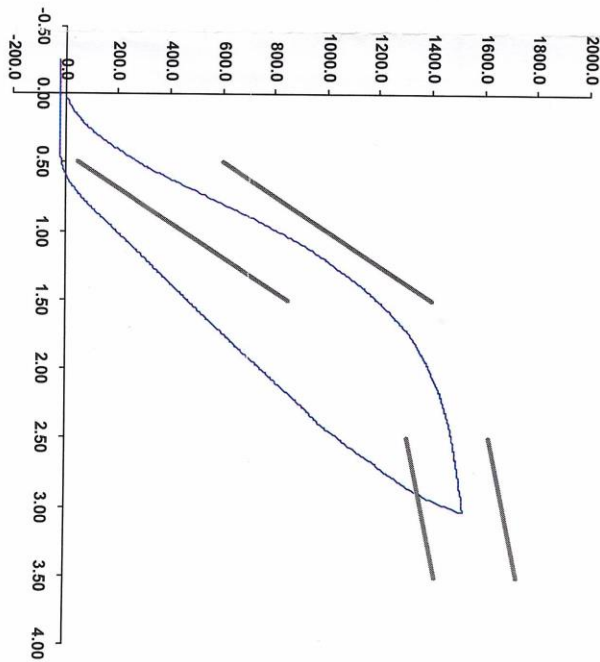
Plug S/N 13451
Test Number 11094
Report Number 11132
Test Date 9/20/2019 10:13:50 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	283.42	50.00
Force @ 1.5 mm (N)	1,197.39	850.00
Force @ 2.5 mm (N)	1,480.72	1,306.00
Force @ 3.0 mm (N)	1,523.02	1,361.00

Testing Machine STM-20 5965542
Load Cell S/N (F1360947), Units (LBS) 1000
Crosshead Speed (mm / min) or Rat 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 20-Sep-19
SACO Research

By: [Signature] Date: 9/20/2019
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-11s Pelvis Plug Certification Test

Plug S/N 13345

Test Number 10987

Report Number 11025

Test Date 9/19/2019 10:18:26 AM

8619
Cec
1/12/21

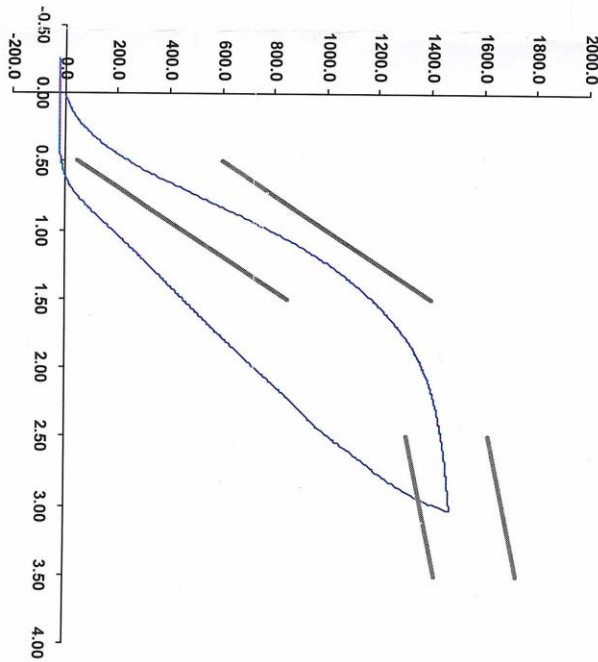
DEPT 4 unused
8619
12/17/2022

Force (-N) vs Extension (-mm)

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	250.24	50.00
Force @ 1.5 mm (N)	1,177.75	850.00
Force @ 2.5 mm (N)	1,441.80	1,306.00
Force @ 3.0 mm (N)	1,472.40	1,361.00

Testing Machine STM-20 596554;
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:



Operator

Part Number 180-4450

Template No 107 19-Sep-19
SACO Research

By: BC Date: 9/19/2019

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



SOLD
Crash
1/12/21

SID-IIs Pelvis Plug Certification Test

Plug S/N 13527

Test Number 11171

Report Number 11209

Test Date 9/23/2019 10:43:16 AM

Force (-N) vs Extension (-mm)

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	258.78	50.00
Force @ 1.5 mm (N)	1,205.31	850.00
Force @ 2.5 mm (N)	1,488.61	1,306.00
Force @ 3.0 mm (N)	1,520.46	1,361.00

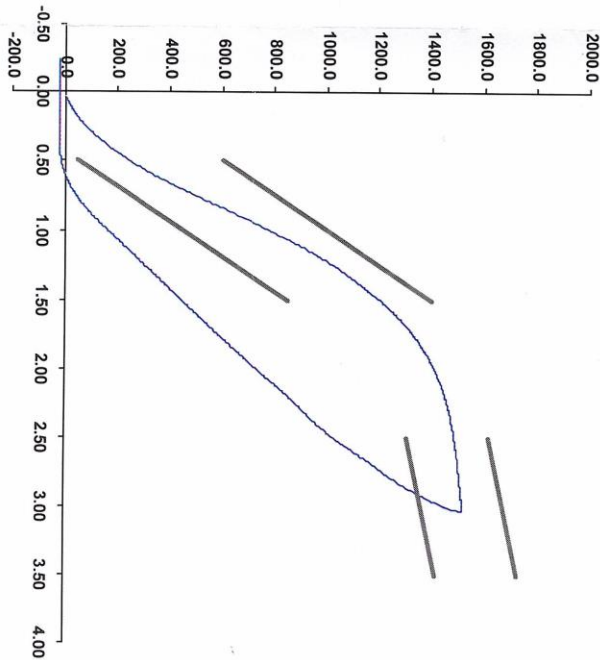
Testing Machine STM-20 5965542

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:



Operator

Part Number 180-4450

Template No 107

23-Sep-19

SACO Research

By: De

Date: 9/23/2019

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

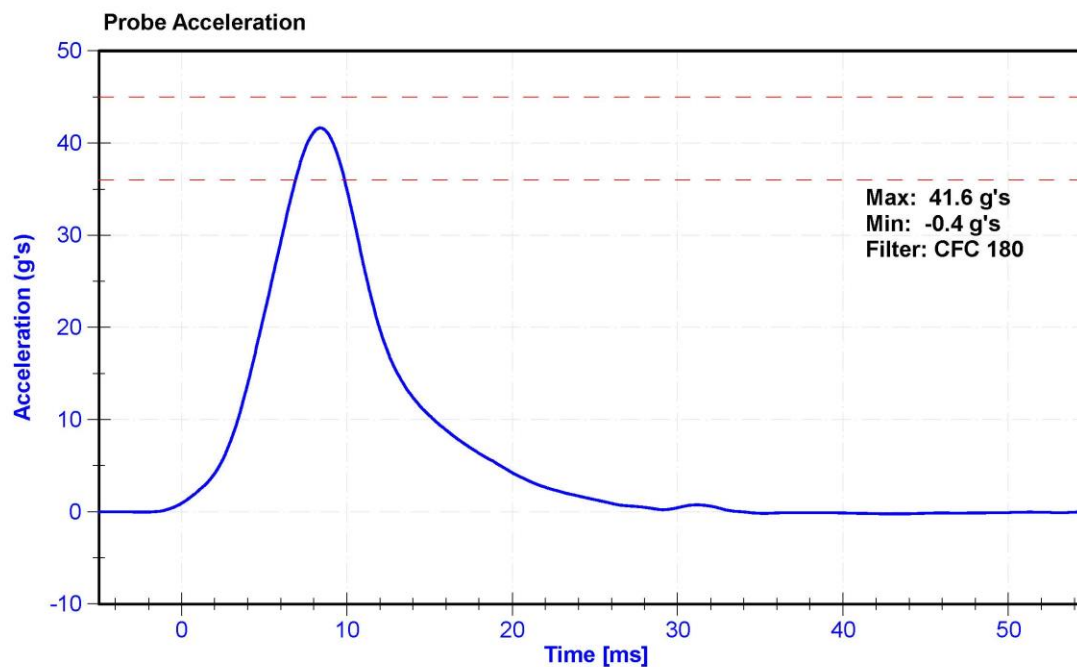
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

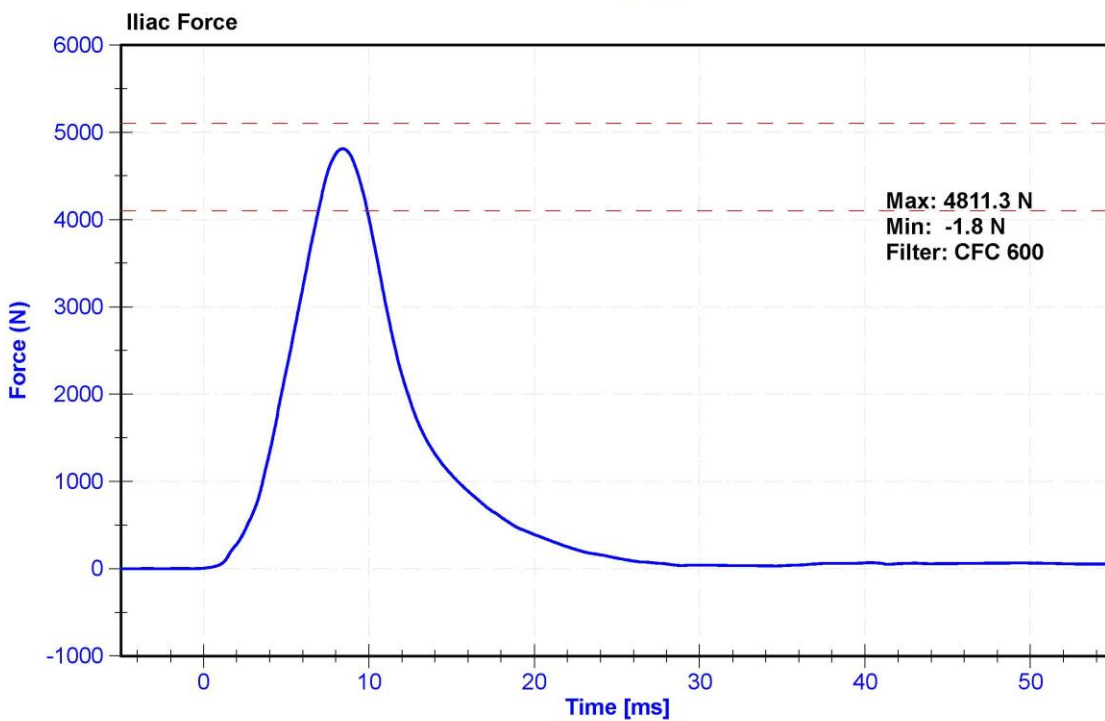
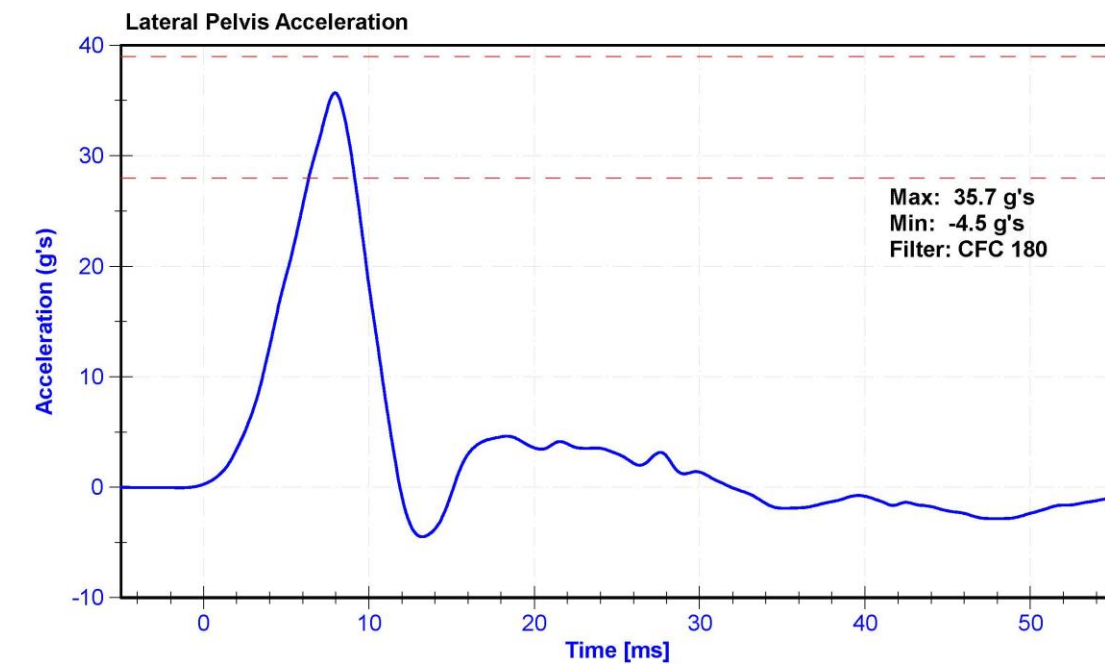
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	29.0	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	36	45	g's	41.6	Pass
Lateral Pelvis Acceleration	28	39	g's	35.7	Pass
Iliac Force	4100	5100	N	4811.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Pelvis Y Accelerometer	ENDEVCO 7264C	AC-P51875	11/5/2020	5/6/2021
Iliac Load Cell	DENTON 3228J	LC-290Fy	11/16/2020	11/16/2021





CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO: DG8012

(CONFIGURED FOR LEFT SIDE IMPACT)

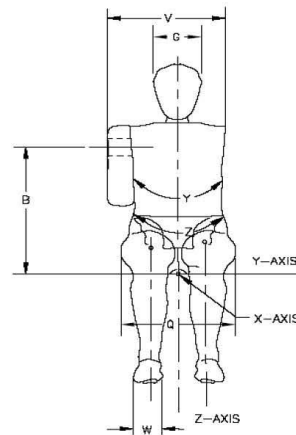
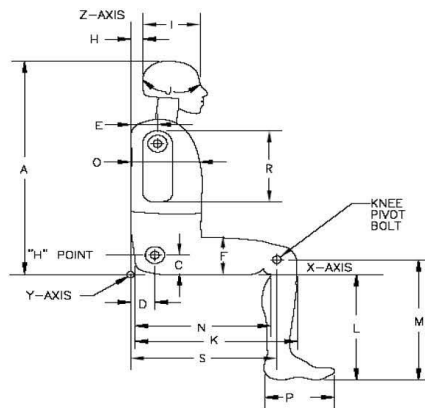


External Measurements - SID-IIs

Technician: **K. Dutton**

Date: **01/14/2021**

Dummy Serial Number: **DG8012**



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	446	Pass
C	H-point Height	79	89	83	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	184	Pass
J	Head Circumference	541	551	548	Pass
K	Buttock to Knee Length	514	540	534	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	402	Pass
N	Buttock Popliteal Length	416	442	433	Pass
O	Chest Depth w/o jacket	195	211	205	Pass
P	Foot Length	216	232	225	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	255	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	346	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	867	Pass
Z	Waist Circumference	761	791	781	Pass

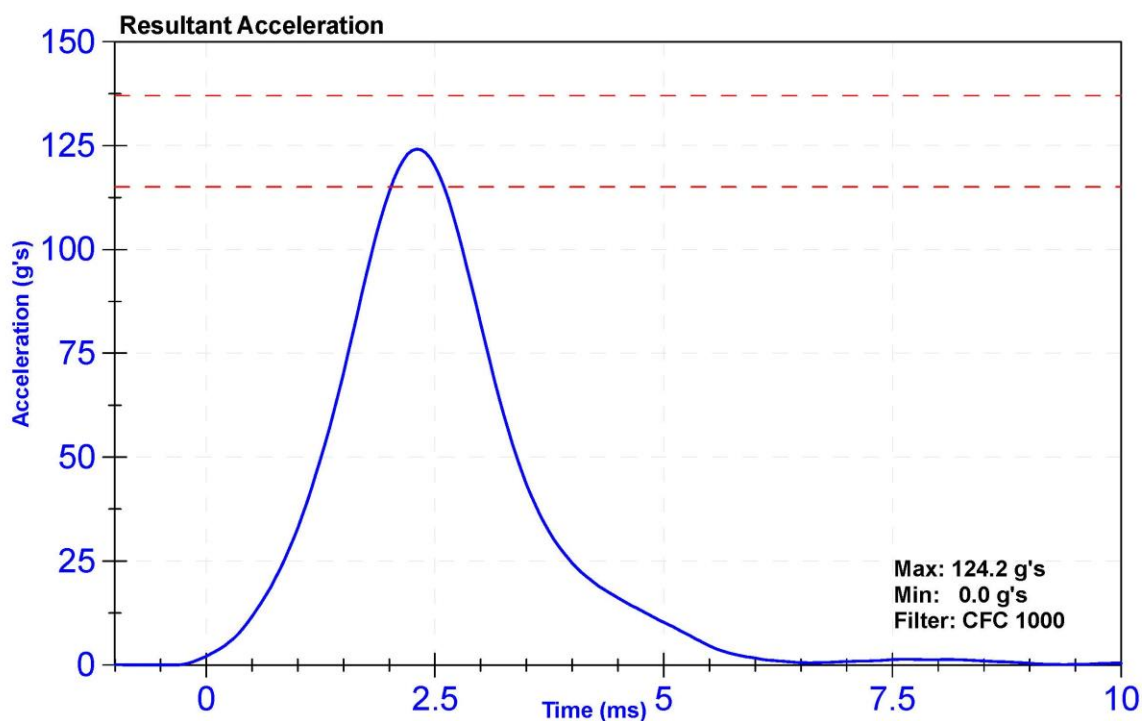
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

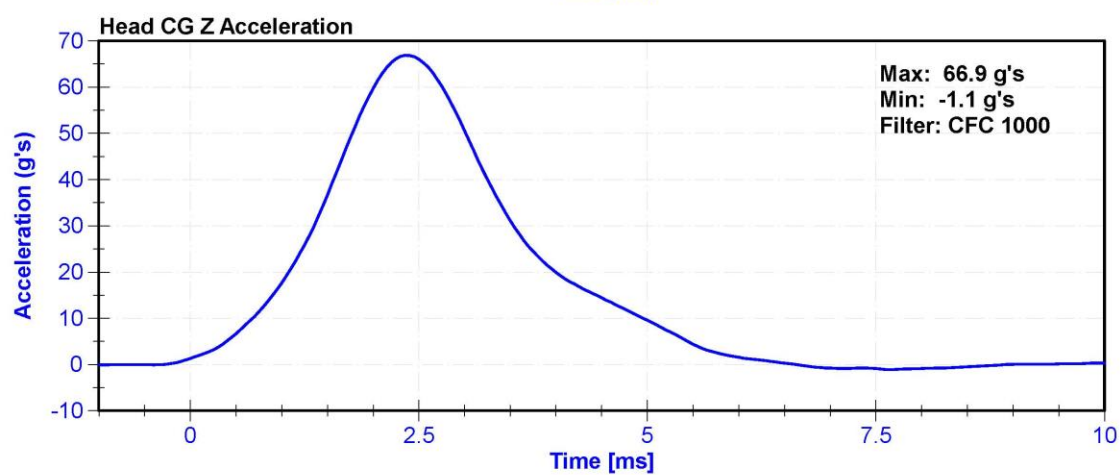
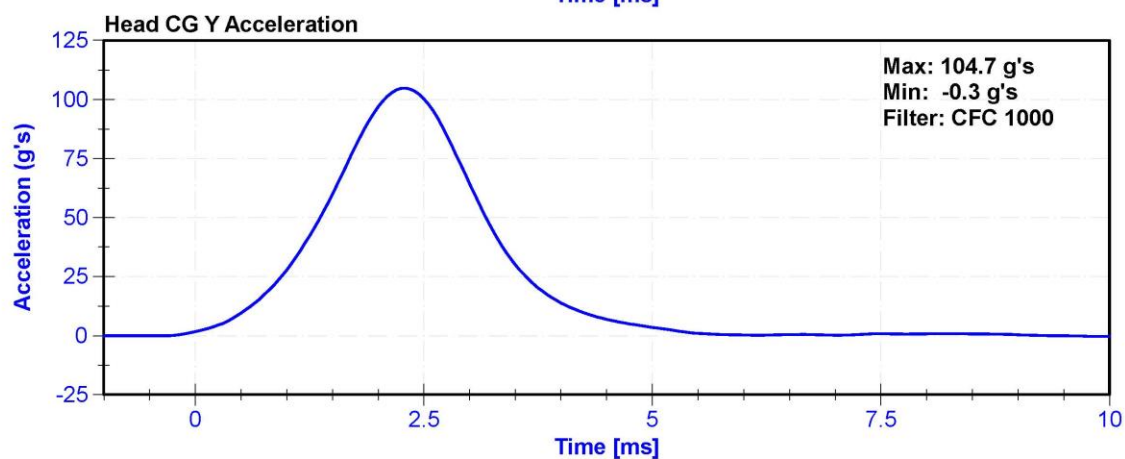
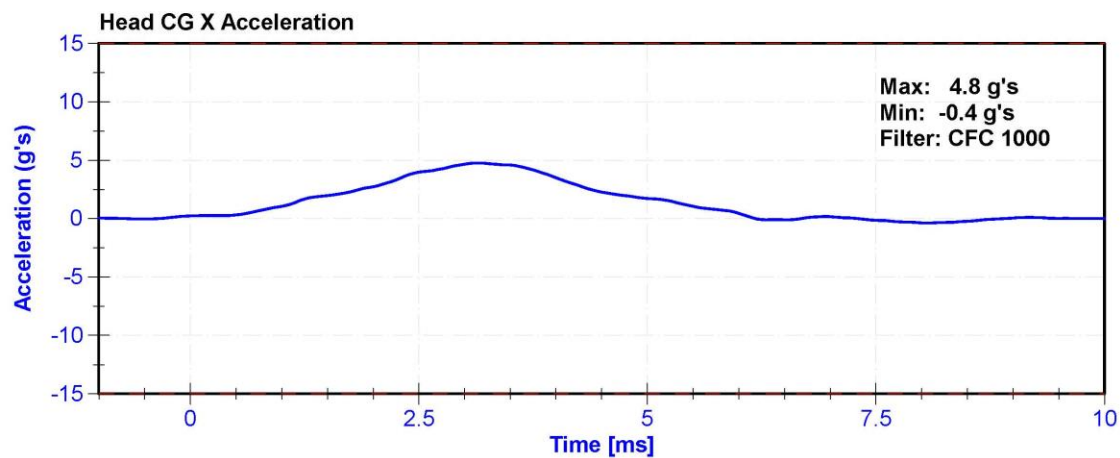
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	22.3	Pass
Resultant Acceleration	115	137	g's	124.2	Pass
Oscillation	0	15	%	1.1	Pass
Fore-Aft Acceleration	-15	15	g's	4.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P74788	11/5/2020	5/6/2021
Y Accelerometer	ENDEVCO 7264CT	AC-P83432	11/5/2020	5/6/2021
Z Accelerometer	ENDEVCO 7264	AC-P83319	11/5/2020	5/6/2021





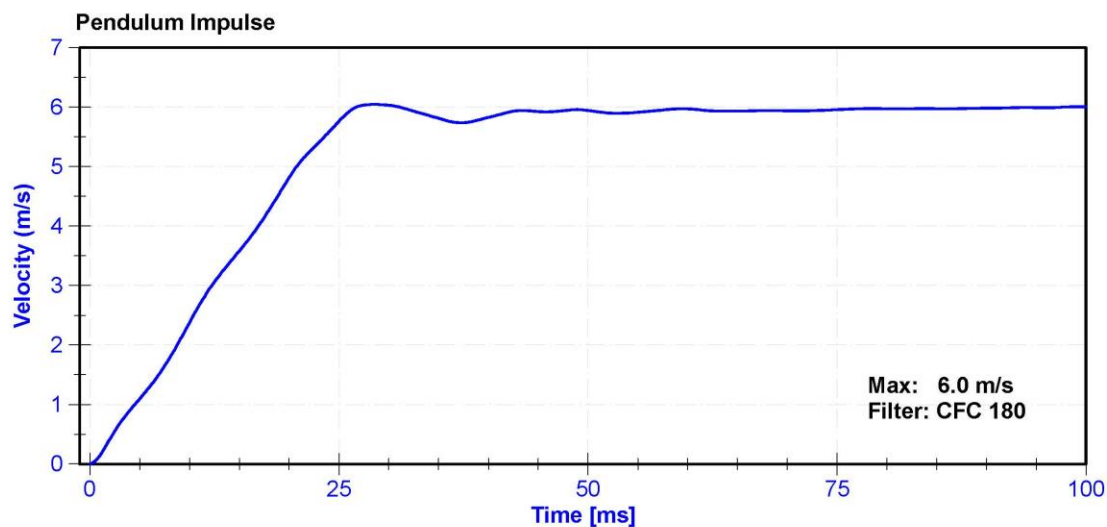
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

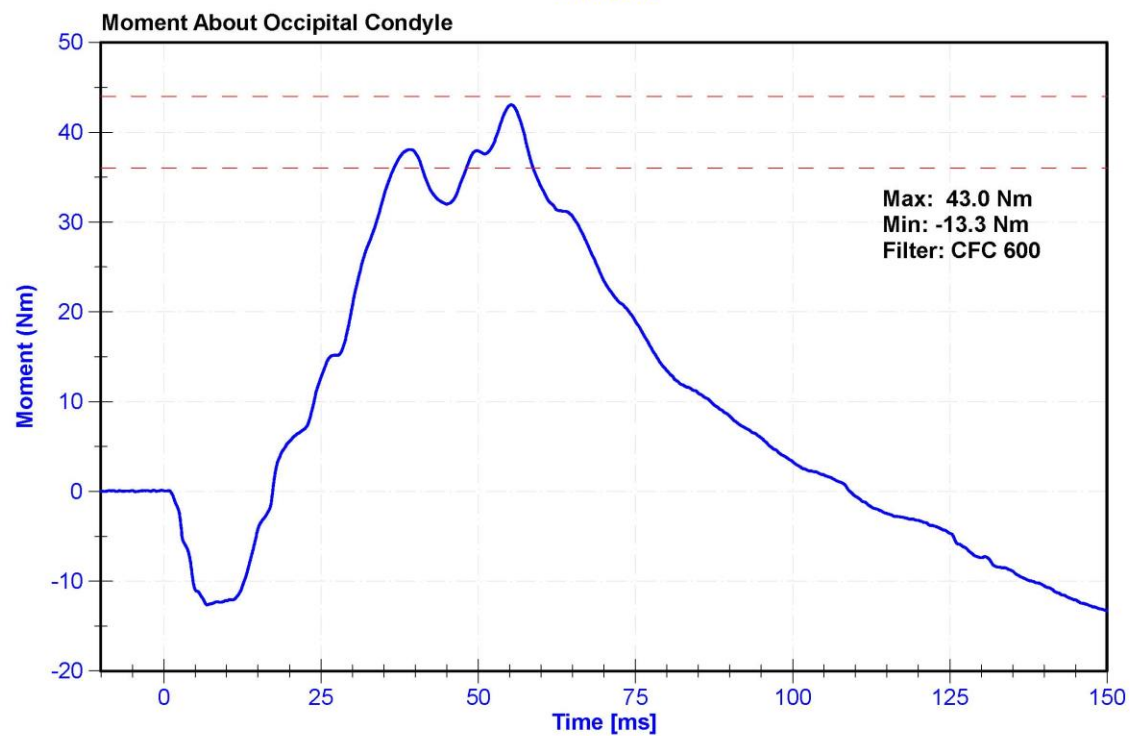
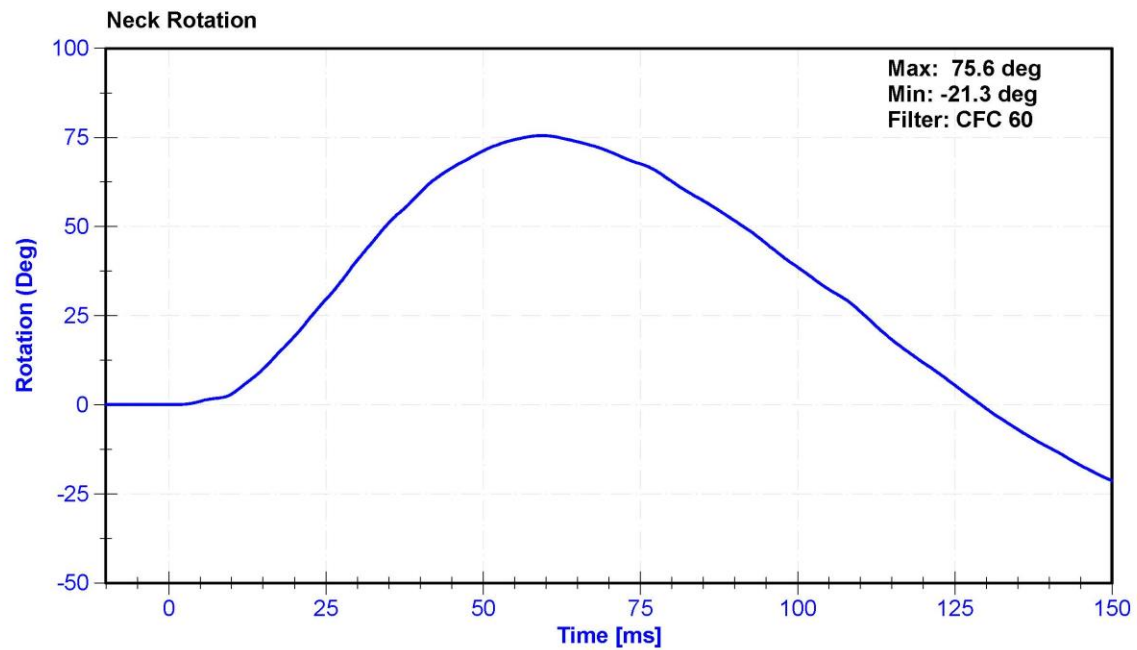
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	22.3	Pass
Velocity	5.51	5.63	m/s	5.549	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.38	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.58	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.81	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.76	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.04	Pass
Neck Rotation	71	81	deg	75.6	Pass
Time at Maximum Rotation	50	70	ms	59.3	Pass
Moment about the OC	36	44	Nm	43.0	Pass
Moment Decay to 0 Nm	102	126	ms	109.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C16503 Striker	2/6/2020	2/5/2021
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/6/2020	11/6/2021
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/6/2020	11/6/2021
Upper Neck Load Cell	Denton 1716	17162019 FY	3/18/2020	3/18/2021





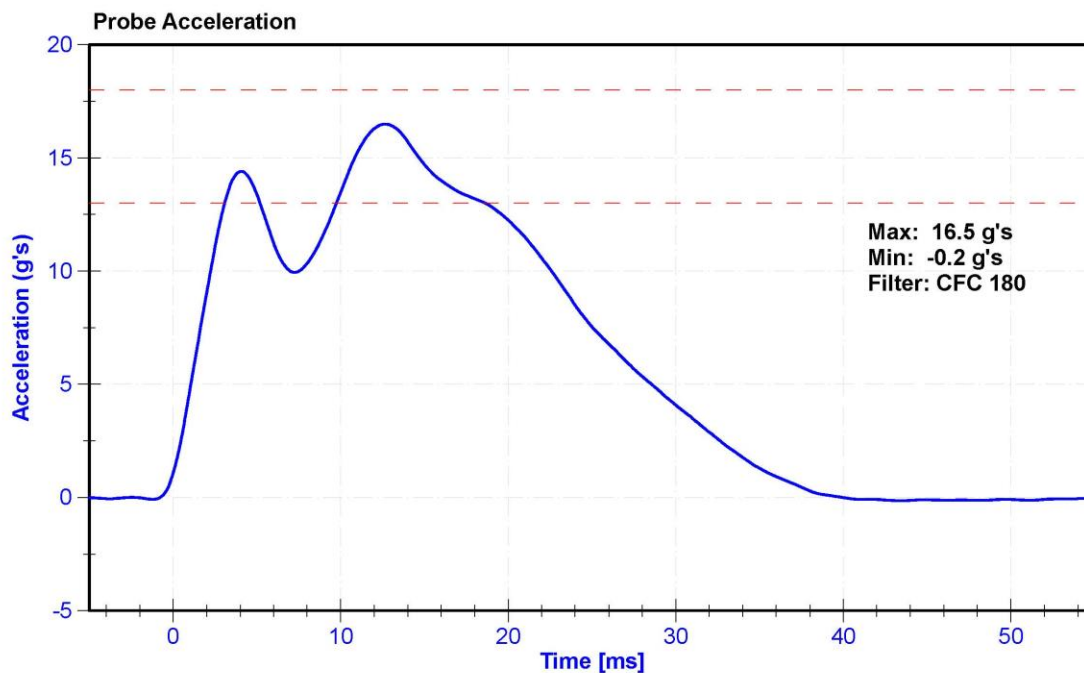
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

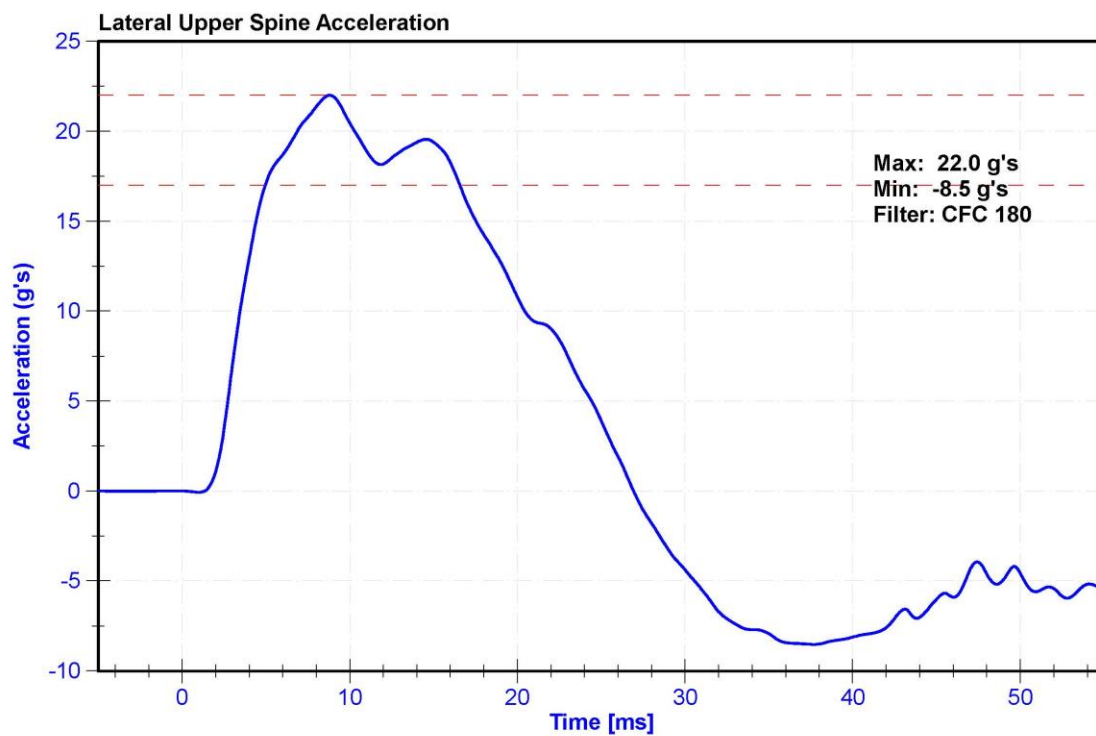
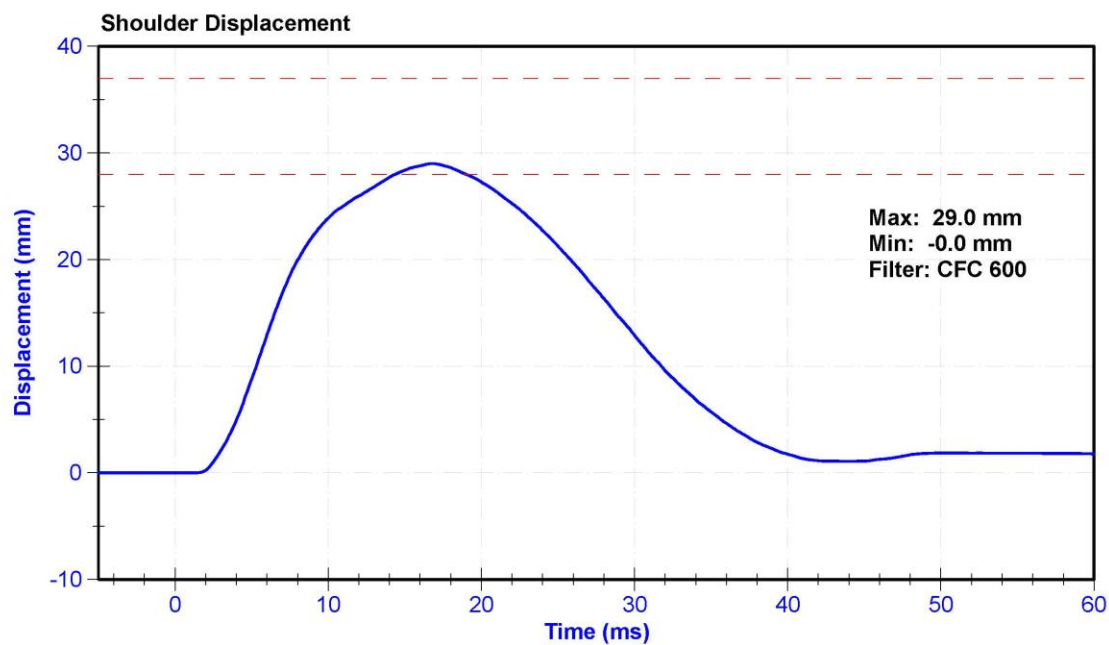
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.32	Pass
Probe Acceleration	13	18	g's	16.5	Pass
Shoulder Deflection	28	37	mm	29.0	Pass
Lateral Upper Spine Acceleration	17	22	g's	22.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	12/2/2020	6/2/2021
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	11/5/2020	5/6/2021





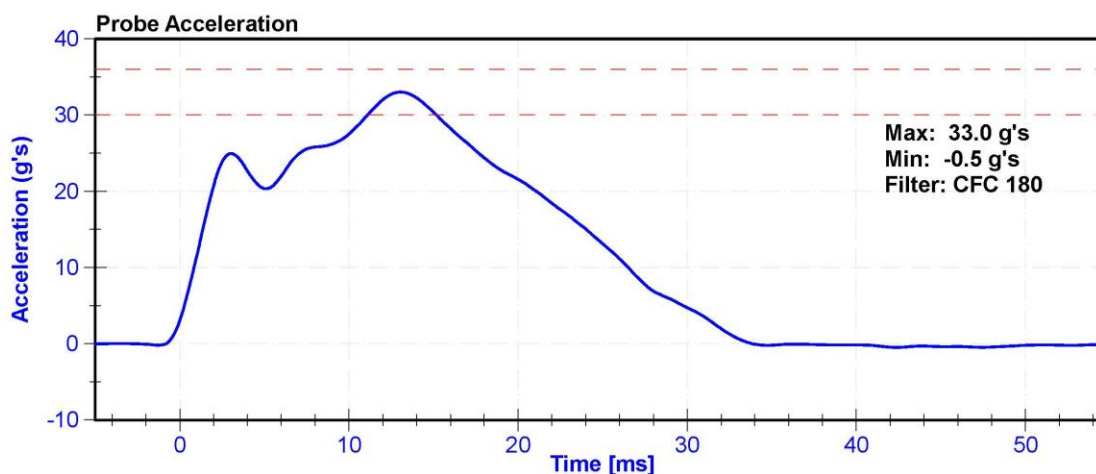
ATD Manufacturer	FTSS	Test Technician	S. Vacanti
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

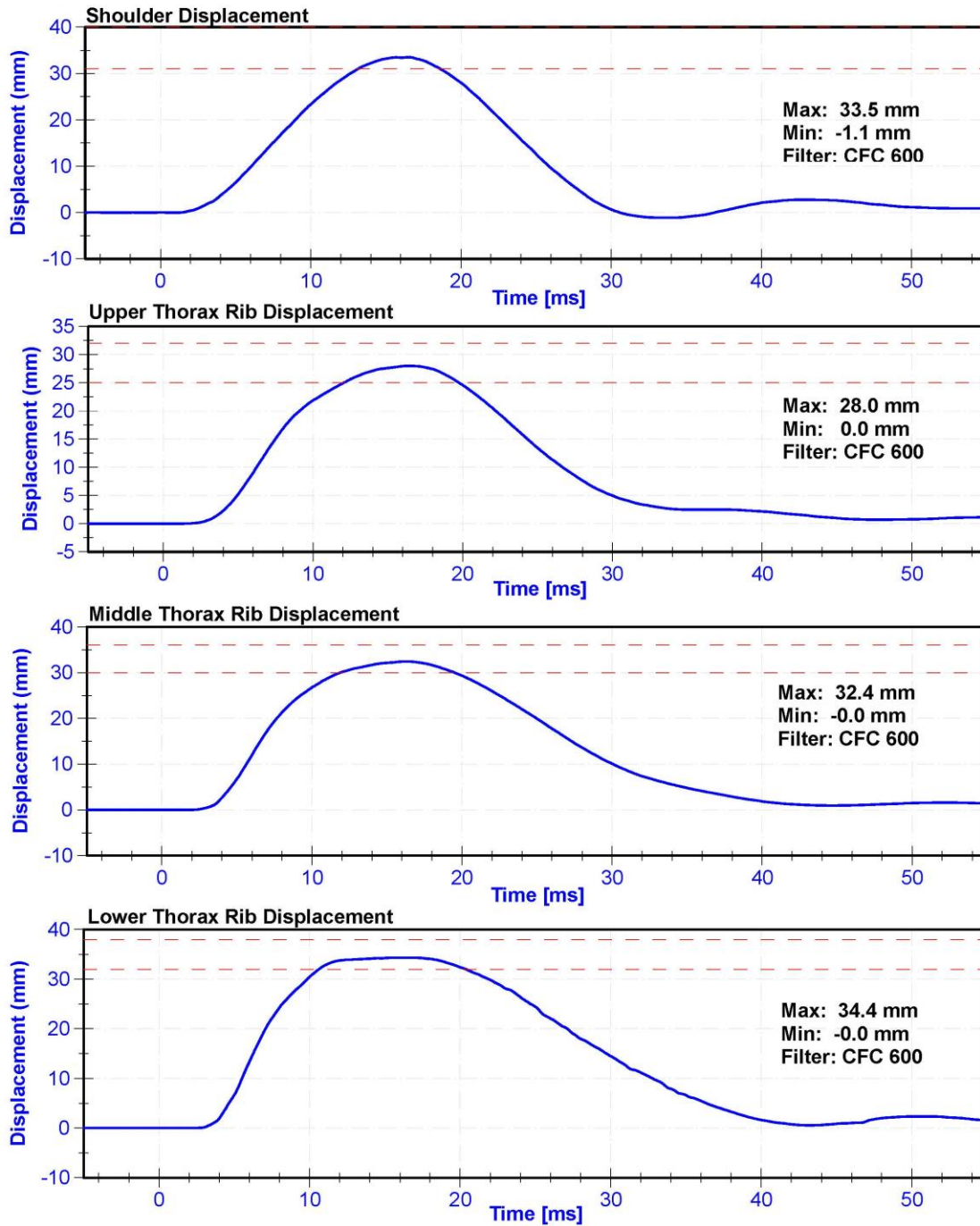
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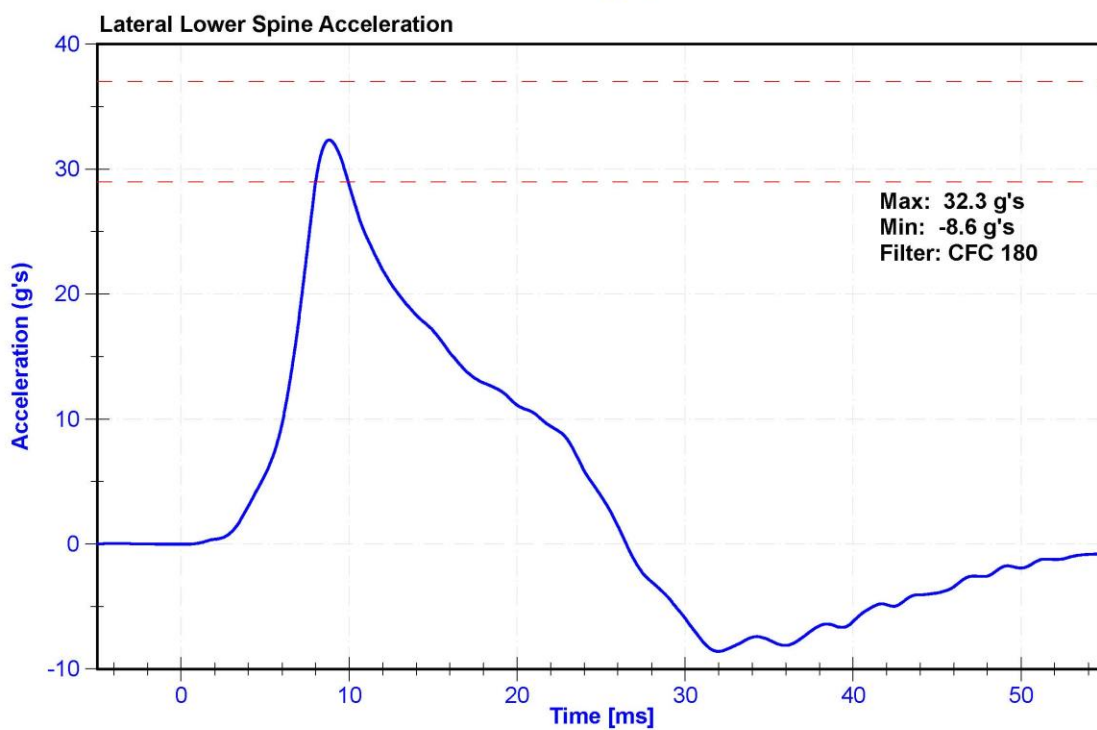
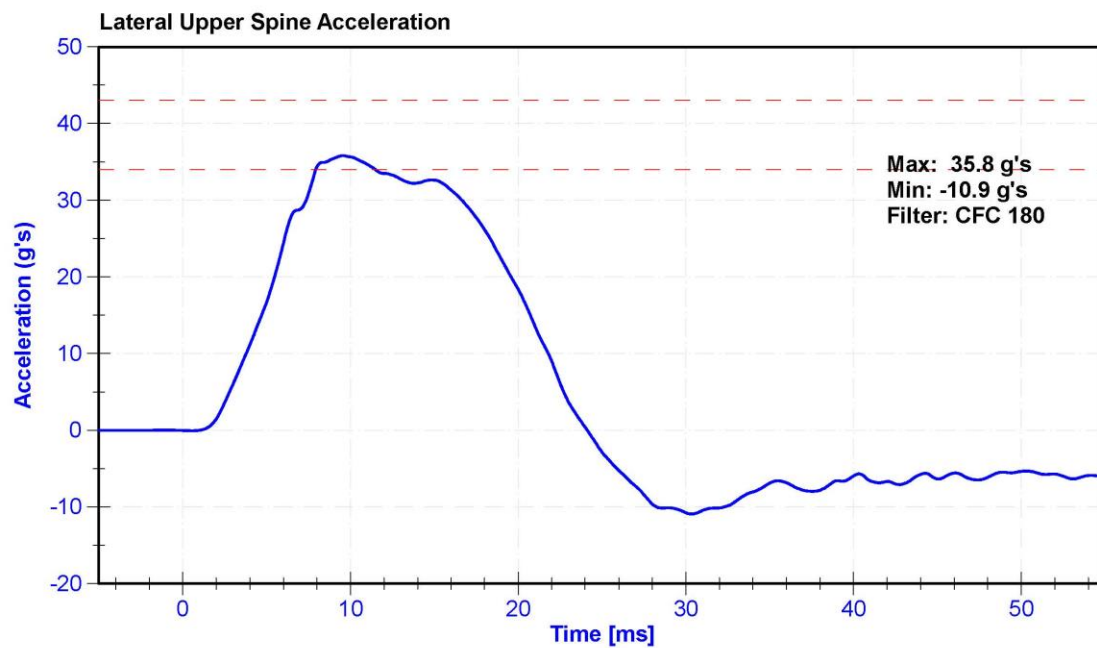
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	29	Pass
Velocity	6.6	6.8	m/s	6.68	Pass
Probe Acceleration after 5 ms	30	36	g's	33.0	Pass
Lateral Upper Spine Acceleration	34	43	g's	35.8	Pass
Lateral Lower Spine Acceleration	29	37	g's	32.3	Pass
Shoulder Deflection	31	40	mm	33.5	Pass
Upper Thorax Rib Deflection	25	32	mm	28.0	Pass
Mid Thorax Rib Deflection	30	36	mm	32.4	Pass
Lower Thorax Rib Deflection	32	38	mm	34.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P64148	11/5/2020	5/6/2021
Upper Spine T12 Y Accelerometer	ENDEVCO 7264C	AC-P51327	11/5/2020	5/6/2021
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	12/2/2020	6/2/2021
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	11/6/2020	5/7/2021
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	11/6/2020	5/7/2021
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	11/6/2020	5/7/2021







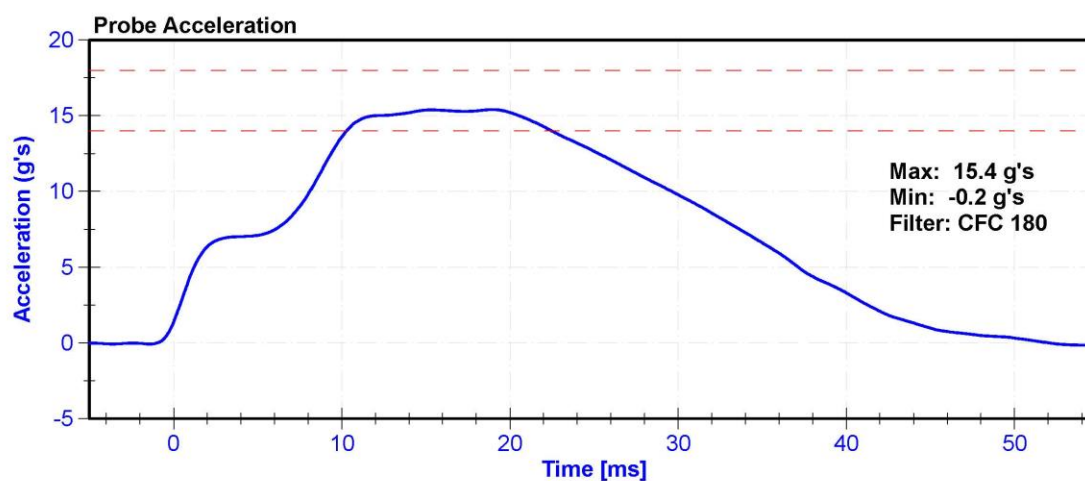
ATD Manufacturer	FTSS	Test Technician	S. Vacanti
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

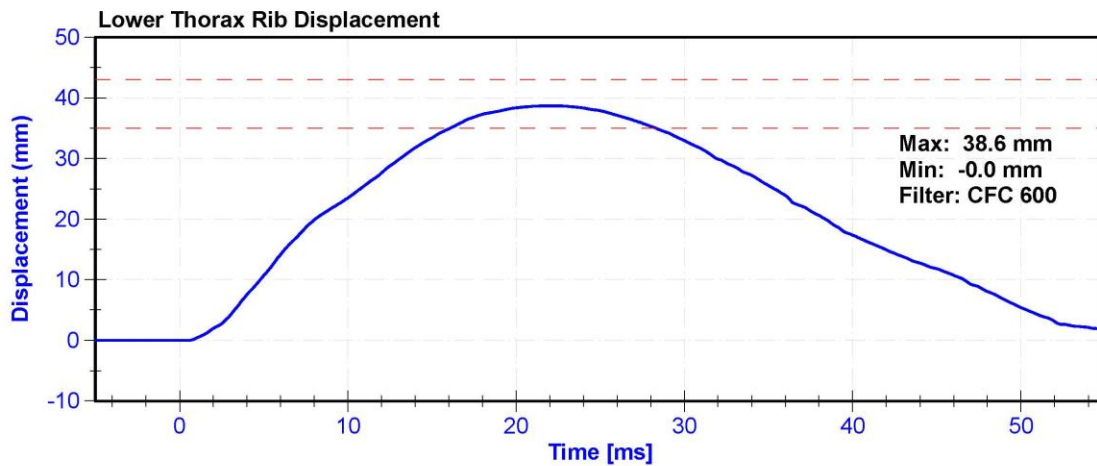
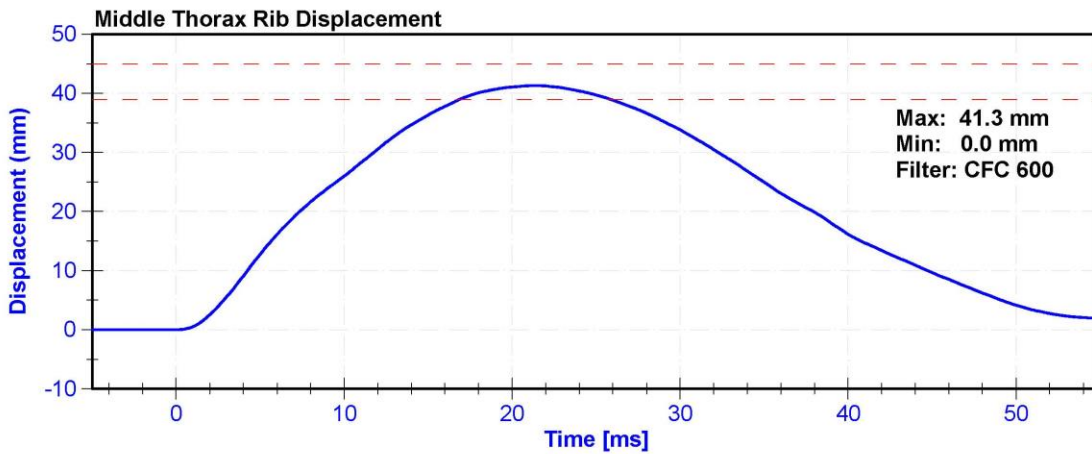
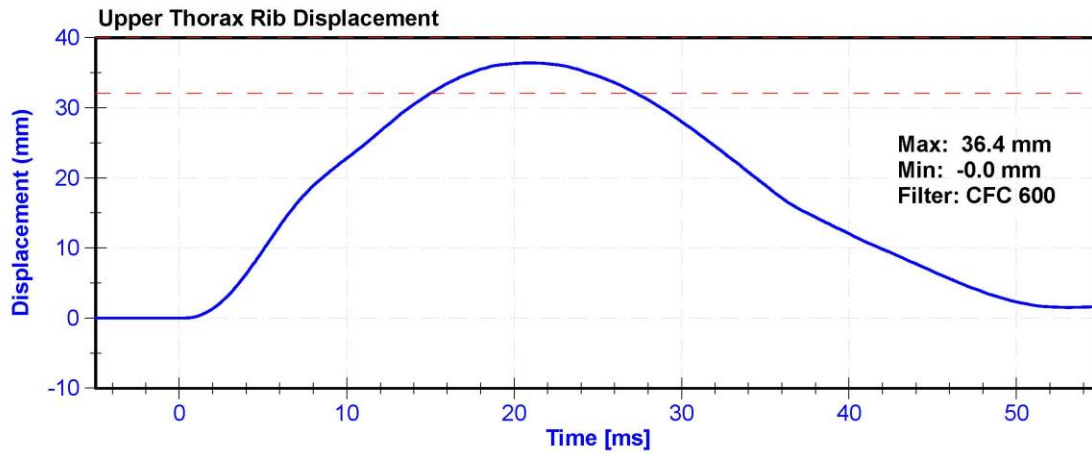
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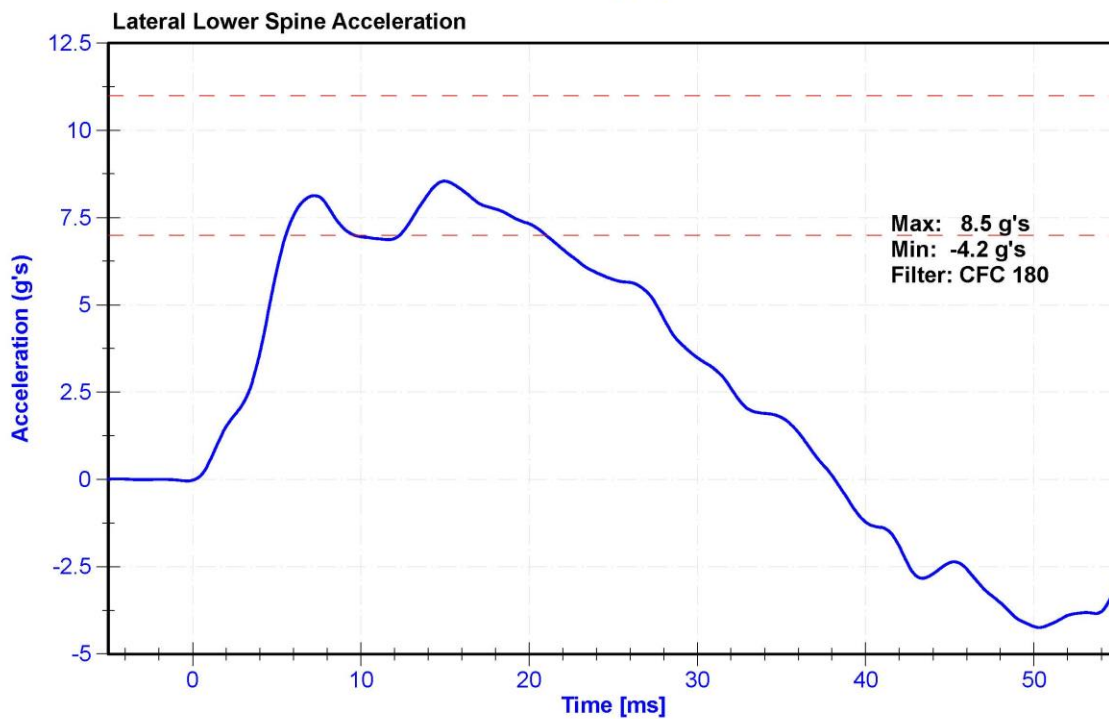
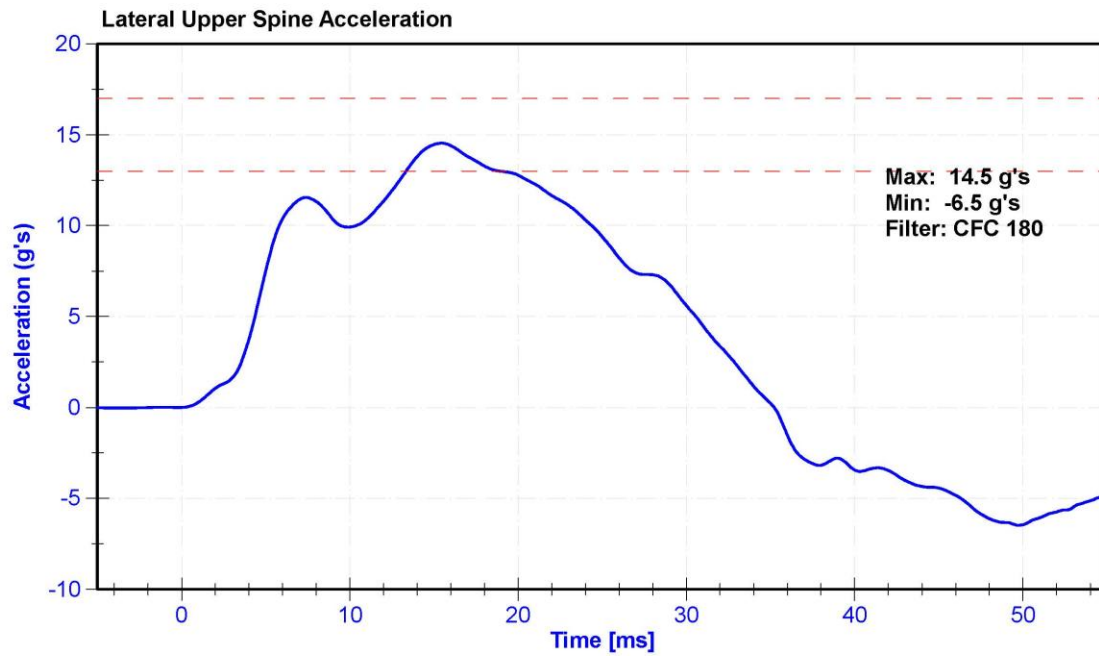
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	14	18	g's	15.4	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.5	Pass
Lateral Lower Spine Acceleration	7	11	g's	8.5	Pass
Upper Thorax Rib Deflection	32	40	mm	36.4	Pass
Middle Thorax Rib Deflection	39	45	mm	41.3	Pass
Lower Thorax Rib Deflection	35	43	mm	38.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	11/5/2020	5/6/2021
Lower Spine Y Accelerometer	ENDEVCO 7264C	AC-P51327	11/5/2020	5/6/2021
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	11/6/2020	5/7/2021
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	11/6/2020	5/7/2021
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	11/6/2020	5/7/2021







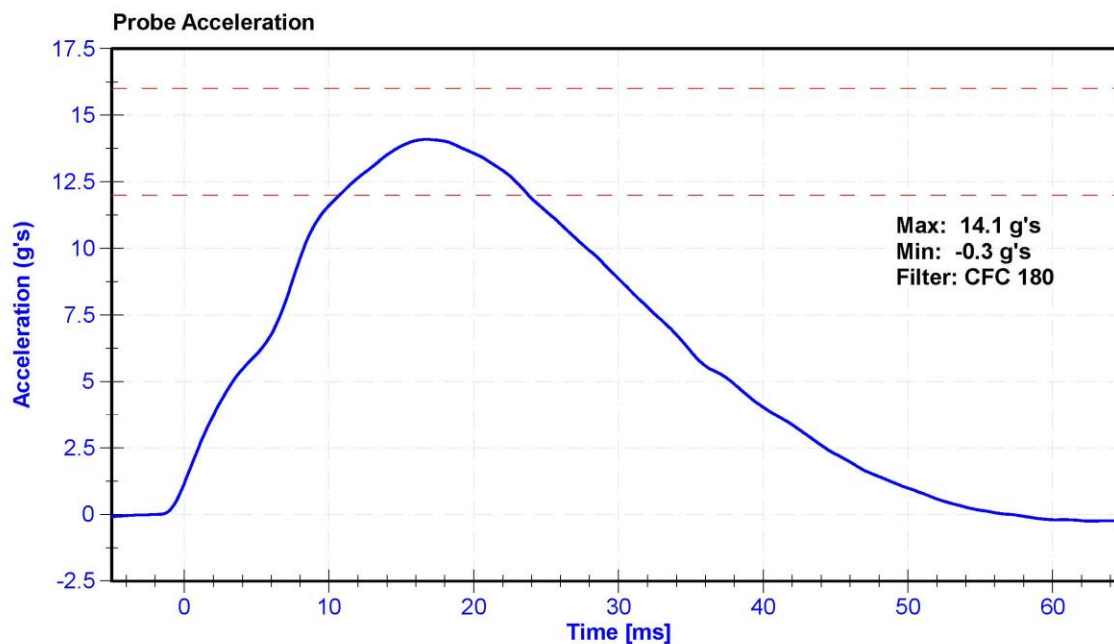
ATD Manufacturer	FTSS	Test Technician	S. Vacanti
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

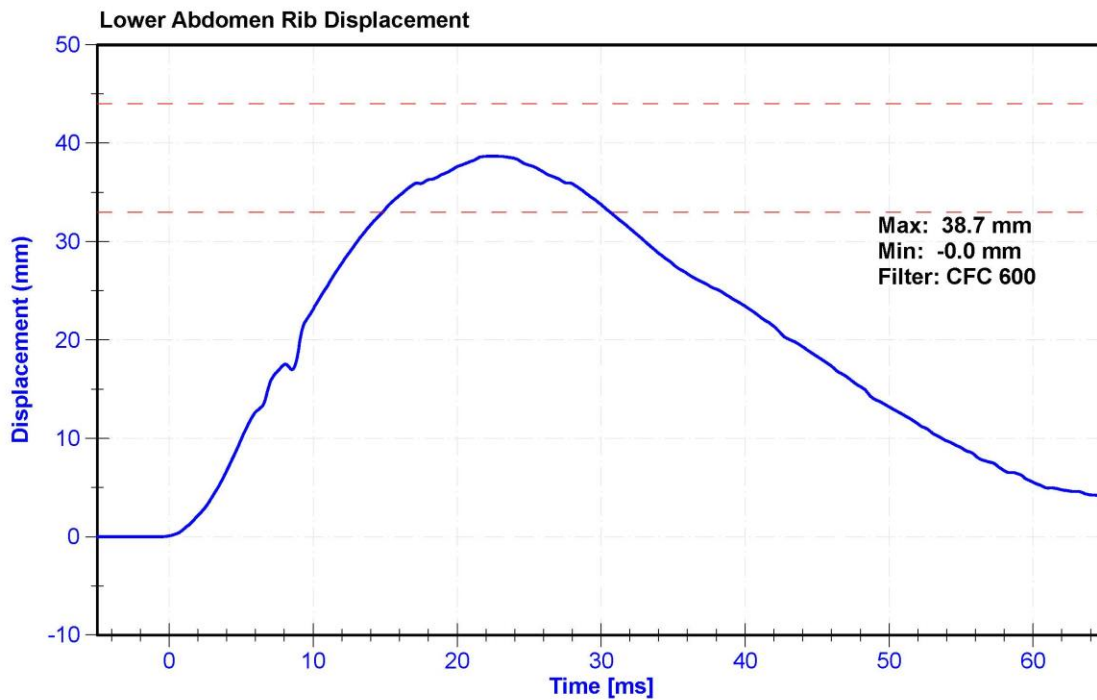
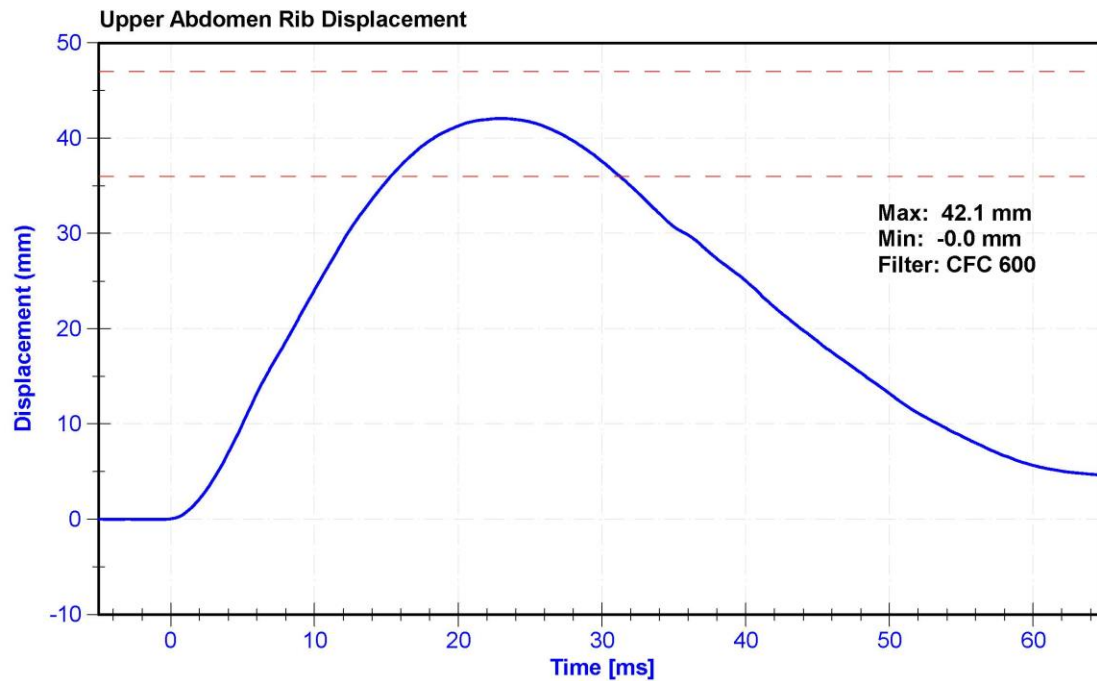
Results

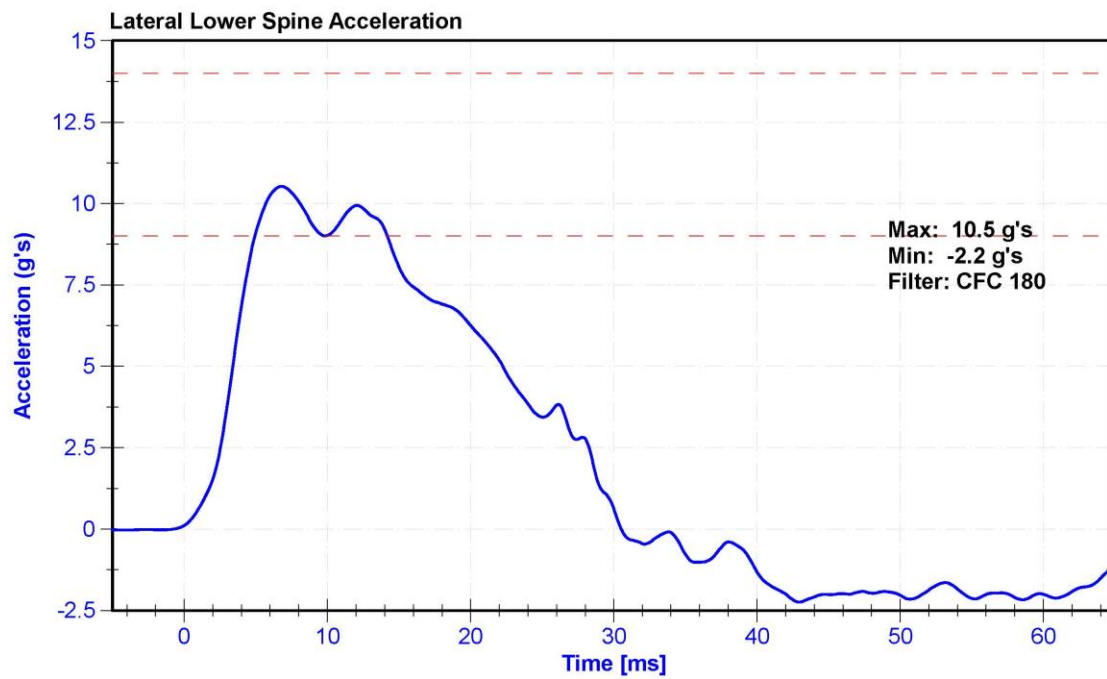
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	12	16	g's	14.1	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.5	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.1	Pass
Lower Abdomen Rib Deflection	33	44	mm	38.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Lower Spine Y Accelerometer	ENDEVCO 7264C	AC-P51327	11/5/2020	5/6/2021
Upper Abdomen Rib Potentiometer	Servo 08TC1-3725	DS-008GFE	11/6/2020	5/7/2021
Lower Abdomen Rib Potentiometer	Servo 08TC1-3745	DS-1774GFE	11/6/2020	5/7/2021







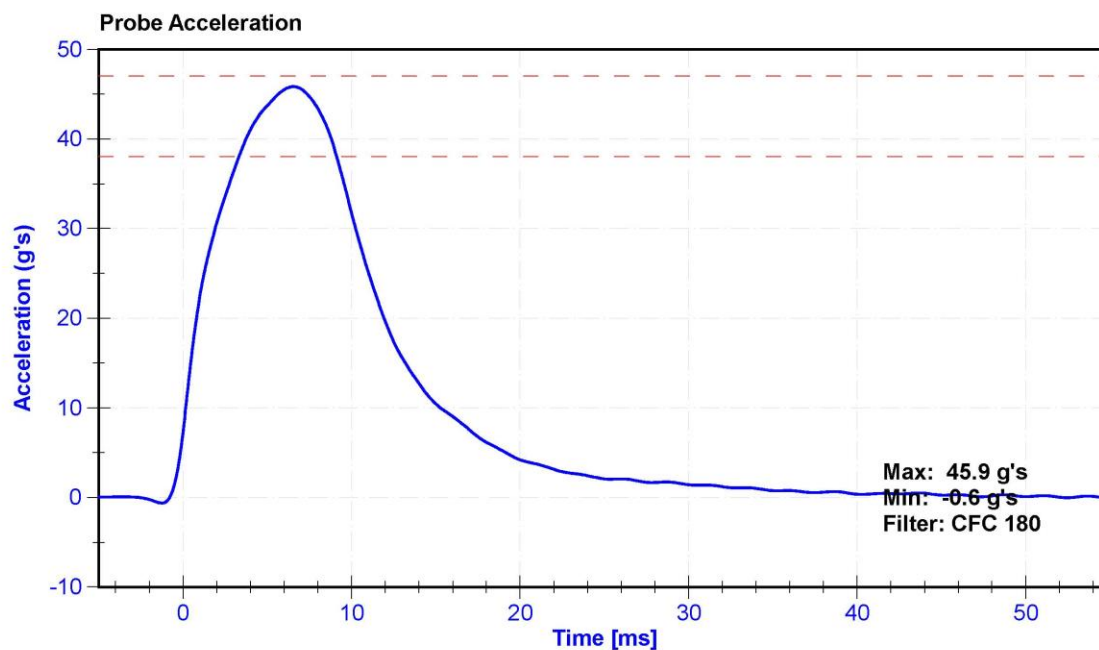
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

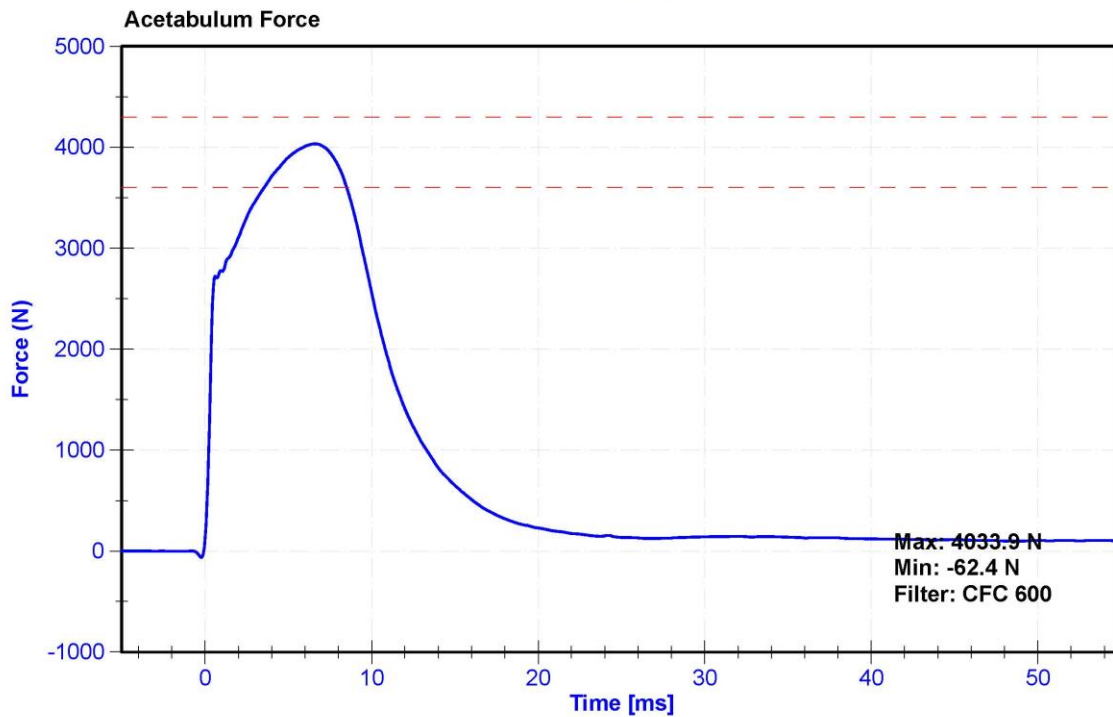
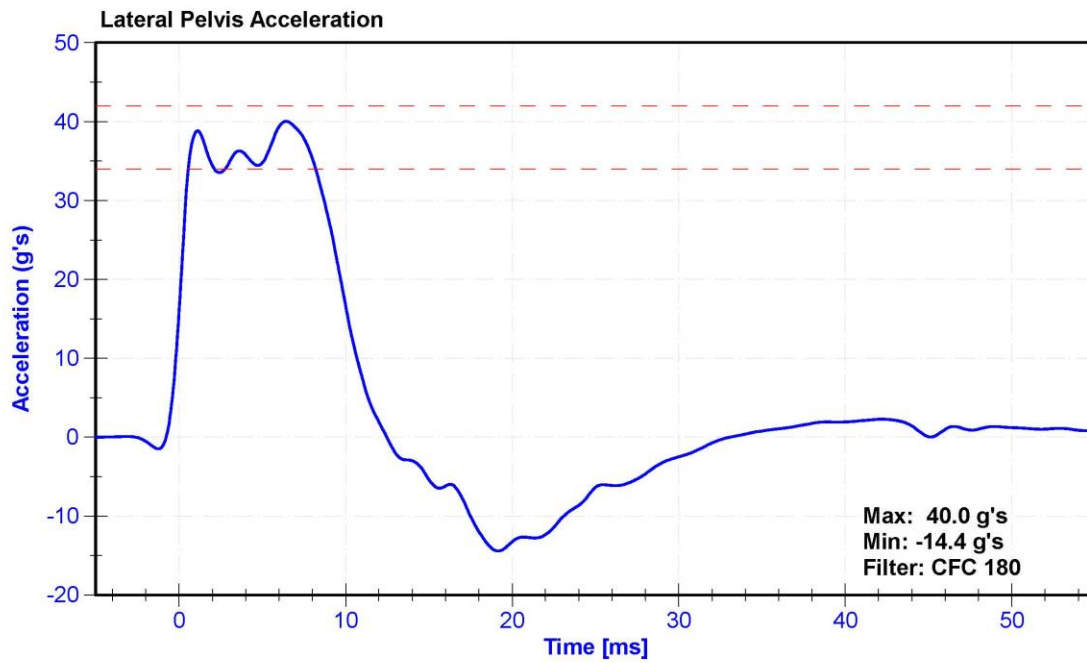
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	29	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	45.9	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	40.0	Pass
Acetabulum Force	3600	4300	N	4033.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Pelvis Y Accelerometer	ENDEVCO 7264C	AC-P51875	11/5/2020	5/6/2021
Acetabulum Load Cell	Denton 3249J	LC-267Fy	3/19/2020	3/19/2021
Certification Plug	SACO	13342	9/19/2019	N/A
Crash Test Plug	SACO	13279	8/12/2019	N/A







SID-11s Pelvis Plug Certification Test

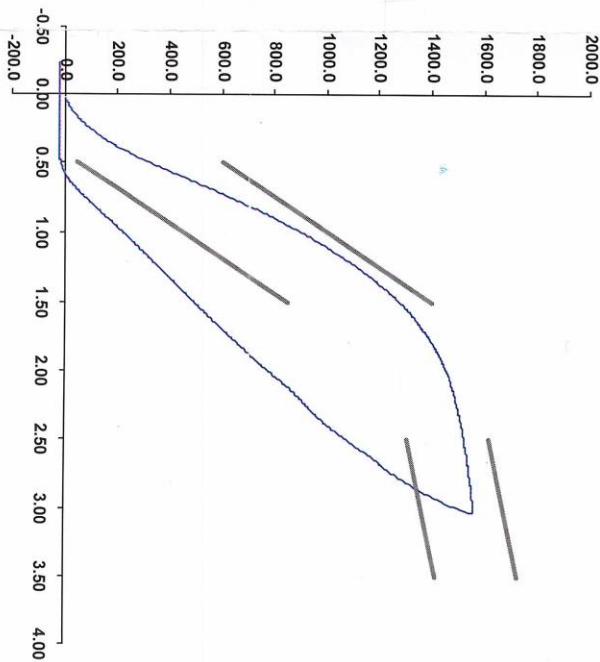
Plug S/N 13279
Test Number 10702
Report Number 10739
Test Date 8/12/2019 10:38:13 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50.00	600.00
Force @ 1.5 mm (N)	850.00	1,400.00
Force @ 2.5 mm (N)	1,305.00	1,618.00
Force @ 3.0 mm (N)	1,361.00	1,673.00

Testing Machine STM-20 596542
Load Cell S/N (F1360947), Units (LBS) 1000
Crosshead Speed (mm / min) or Rat 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107
SACO Research 12-Aug-19

By: DE Date: 8/12/2019
SACO Research 41735 Elm St. #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-11s Pelvis Plug Certification Test

Plug S/N 12958

Test Number 8292

Report Number 8322

Test Date 1/22/2019 12:34:36 PM

9012
Non-impact crash
1/14/2021

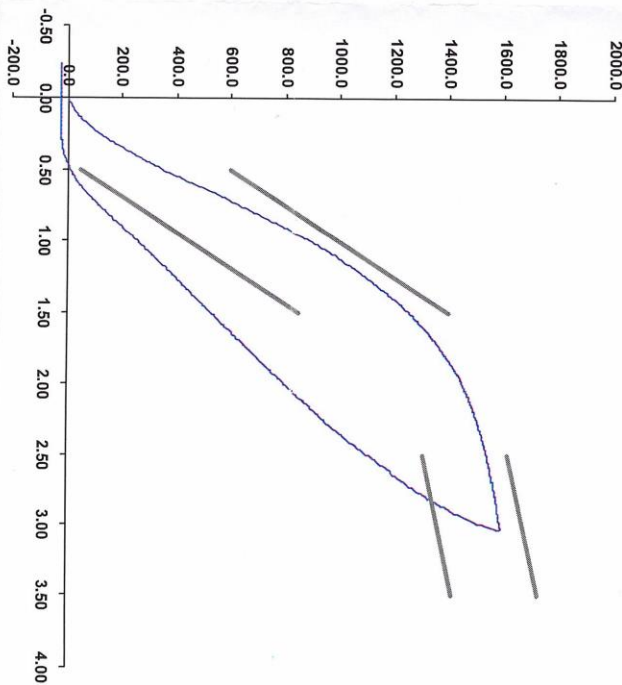
Force (-N) vs Extension (-mm)

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

Testing Machine STM-20 596542
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:



Operator

Part Number 180-4450

Template No 107 22-Jan-18
SACO Research

By: DC Date: 1/22/2019
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-11s Pelvis Plug Certification Test

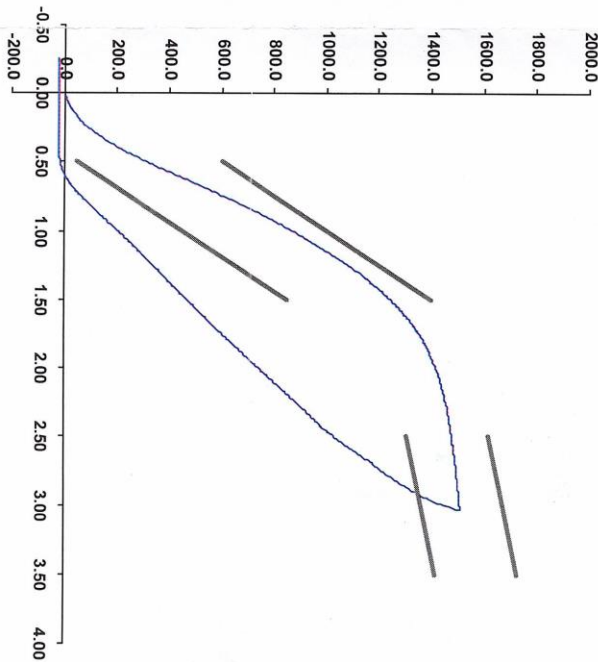
Plug S/N 13342
Test Number 10984
Report Number 11022
Test Date 9/19/2019 10:14:05 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	319.17	50.00
Force @ 1.5 mm (N)	1,247.77	850.00
Force @ 2.5 mm (N)	1,479.22	1,306.00
Force @ 3.0 mm (N)	1,512.41	1,361.00

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)



801921
cert
1/14/21

Operator

Part Number 180-4450

Template No 107 19-Sep-19
SACO Research

By: VC Date 9/19/2019
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

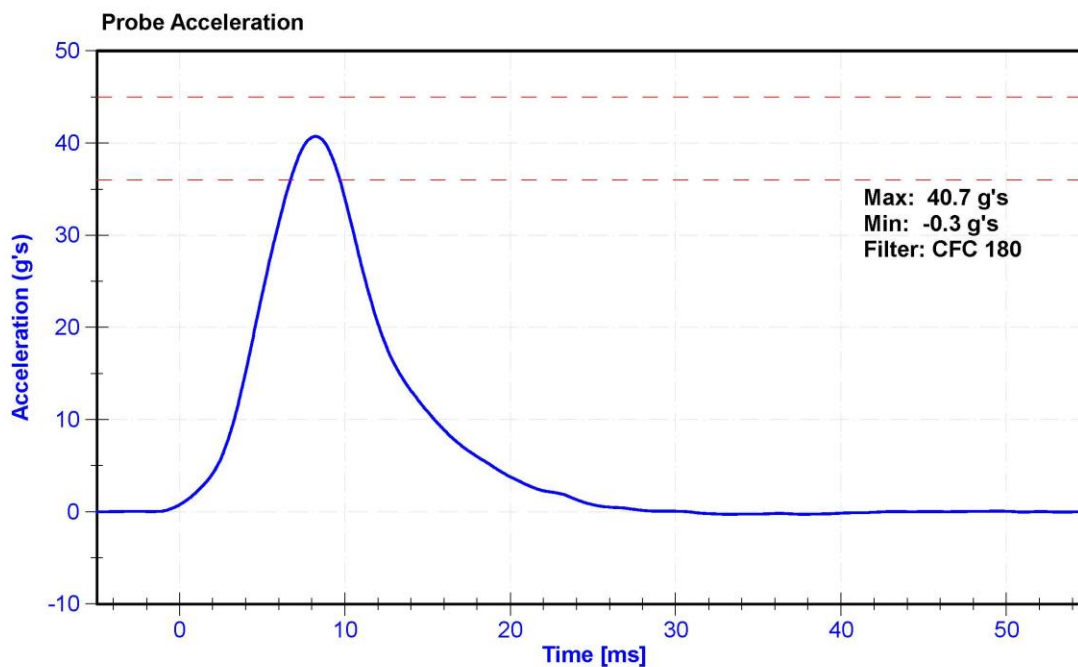
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

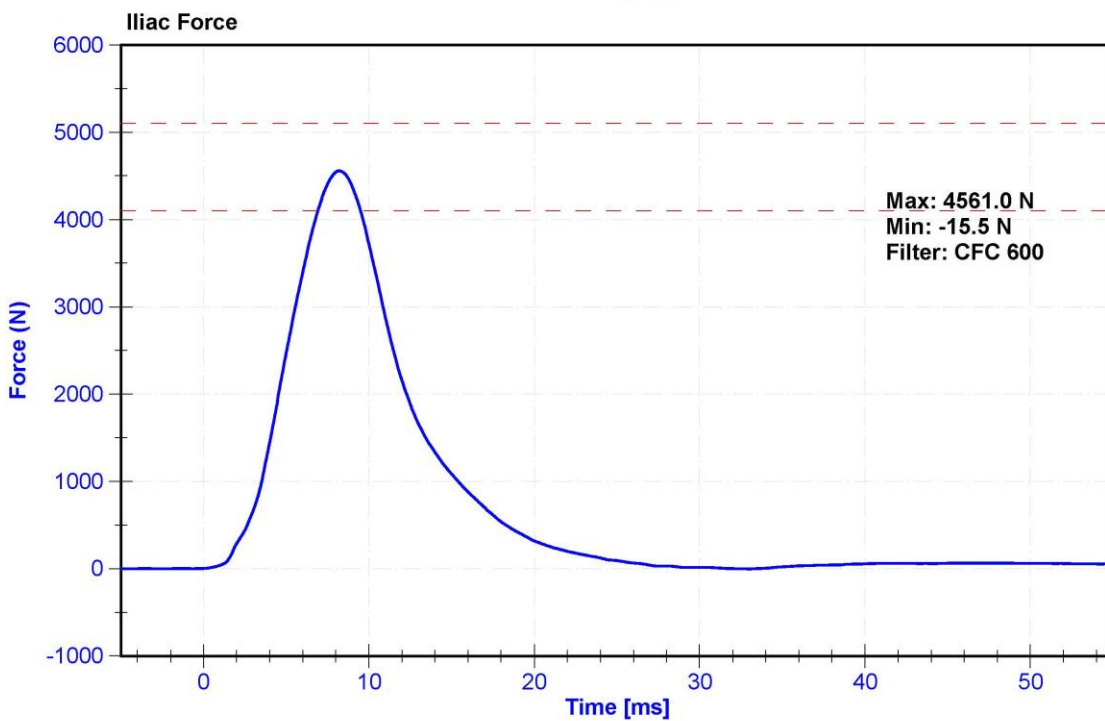
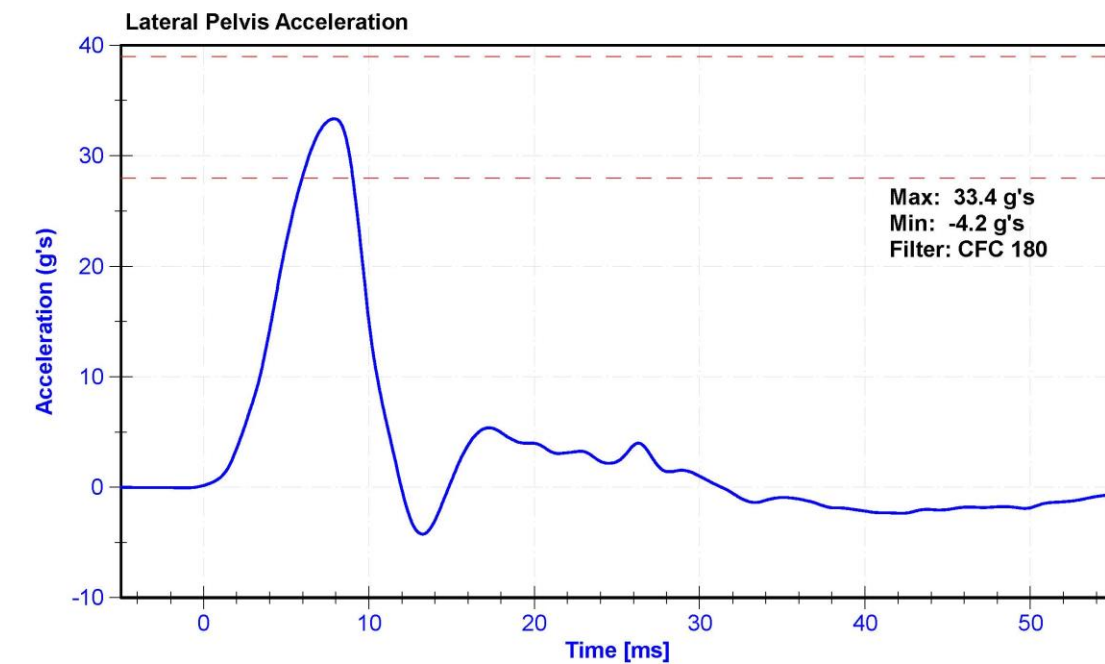
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	29.0	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	36	45	g's	40.7	Pass
Lateral Pelvis Acceleration	28	39	g's	33.4	Pass
Iliac Force	4100	5100	N	4561.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/28/2021
Pelvis Y Accelerometer	ENDEVCO 7264C	AC-P51875	11/5/2020	5/6/2021
Iliac Load Cell	DENTON 3228J	LC-290Fy	11/16/2020	11/16/2021





APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N: DG8012		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers			X	AC-P74788	ENDEVCO	11/5/2020
			Y	AC-P83432	ENDEVCO	11/5/2020
			Z	AC-P83319	ENDEVCO	11/5/2020
Head Accelerometers - Redundant			X	AC-P80334	ENDEVCO	11/5/2020
			Y	AC-P52155	ENDEVCO	11/5/2020
			Z	AC-P83322	ENDEVCO	11/5/2020
Displacement Potentiometer	Shoulder		Y			
	Thoracic Rib	Upper	Y	DS-2165GFE	Servo	11/6/2020
		Middle	Y	DS-45 GFE	Servo	11/6/2020
		Lower	Y	DS-011GFE	Servo	11/6/2020
	Abdominal Rib	Upper	Y	DS-008GFE	Servo	11/6/2020
		Lower	Y	DS-1774GFE	Servo	11/6/2020
Lower Spine Accelerometers (T12)			X	AC-P71272	ENDEVCO	11/5/2020
			Y	AC-P51327	ENDEVCO	11/5/2020
			Z	AC-P52067	ENDEVCO	11/5/2020
Acetabulum Load Cell			Y	LC-267Fy	Denton	3/19/2020
Lilac Wing Load Cell			Y	LC-290Fy	Denton	11/16/2020
Pelvis Plug (Struck Side)				13527	SACO	9/23/2019
Pelvis Plug (Non-Struck Side)				13451	SACO	9/20/2019

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A315016	Measurement Specialties 1201-1000	12/30/2020
Vehicle Center of Gravity	Y	A250360	Measurement Specialties 1201-1000	12/4/2020
Vehicle Center of Gravity	Z	A350977	Measurement Specialties 1201-1000	9/28/2020
Left Floor Sill	Y	A283650	Measurement Specialties 1201-1000	12/30/2020
A-Pillar Sill	Y	A350952	Measurement Specialties 1201-1000	11/11/2020
A-Pillar Low	Y	A315019	Measurement Specialties 1201-1000	12/30/2020
A-Pillar Mid	Y	A315714	Measurement Specialties 1201-1000	7/21/2020
B-Pillar Sill	Y	A352366	Measurement Specialties 1201-1000	9/24/2020
B-Pillar Low	Y	A350927	Measurement Specialties 1201-1000	9/26/2020
B-Pillar Mid	Y	A351009	Measurement Specialties 1201-1000	9/25/2020
Driver Seat	Y	A352372	Measurement Specialties 1201-1000	11/11/2020
Engine Top	X	A262920	Measurement Specialties 1201-1000	7/21/2020
Engine Top	Y	A280384	Measurement Specialties 1201-1000	7/27/2020
Firewall	Y	A281455	Measurement Specialties 1201-1000	7/27/2020
Right Roof	Y	A350985	Measurement Specialties 1201-1000	9/28/2020
Right Floor Sill	Y	A315906	Measurement Specialties 1201-1000	11/13/2020
Rear Floorpan	X	A350937	Measurement Specialties 1201-1000	9/25/2020
Rear Floorpan	Y	A280398	Measurement Specialties 1201-1000	7/21/2020

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	1220AF-1057559-F0	Interface	9/2/2020
Load Cell 2	1220AF-1117006-F0	Interface	9/2/2020
Load Cell 3	1220AF-1117025-F0	Interface	9/2/2020
Load Cell 4	1220AF-1117019-F0	Interface	9/2/2020
Load Cell 5	1220AF-1117011-F0	Interface	9/2/2020
Load Cell 6	1220AF-1117017-F0	Interface	9/2/2020
Load Cell 7	1220AF-1117035-F0	Interface	9/2/2020
Load Cell 8	1220AF-1117023-F0	Interface	9/2/2020