

REPORT NUMBER: SPNCAP-CAL-20-003

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

**Ford Motor Co.
2020 Ford Escape Hybrid
SUV**

NHTSA No: M20200201

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



May 5, 2020

FINAL REPORT

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

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Prepared by: Vanessa Hansen
Vanessa Hansen, Operations Manager

Date: May 5, 2020

Approved by: Edward Dutton
Edward Dutton, Director

Date: May 5, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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16. Abstract A 32.20 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2020 Ford Escape Hybrid SUV 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 7, 2020. The impact velocity of the vehicle was 32.36 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 288 mm located at level 3. The test vehicle's occupant performance data is as follows:		14. Sponsoring Agency Code NRM-110																												
<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>344.007</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>31.547</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2056.777</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>22.252</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45</td> <td>22.353</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (SID-IIs) (Serial No. DG8012)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	344.007	Resultant Lower Spine Acceleration	G	82	31.547	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2056.777	Maximum Thoracic Rib Deflection	mm	38	22.252	Maximum Abdomen Rib Deflection	mm	45	22.353
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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.																														
17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave. SE Washington, D.C. 20590 e-mail: tis@nhtsa.gov FAX: 202-493-2833																												
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY 2020 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 2020 Ford Escape Hybrid SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2020 Ford Escape Hybrid SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.36 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on January 7, 2020. 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 October 2015. 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	344.007
Resultant Lower Spine Acceleration	g	82	31.547
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2056.777
Maximum Thoracic Rib Deflection	mm	38*	22.252
Maximum Abdominal Rib Deflection	mm	45*	22.353

*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:

- Front Seat Track Y Acceleration, Exceeded calibration range at 51.7 ms
- Left Sill B-Pillar Y Acceleration, Exceeded calibration range and saturated at 21 ms
- Load Cell Pole Barrier #8 Fy, Questionable data throughout
- Vehicle Acceleration, Questionable data spikes at 53ms
- Left A-Pillar at Sill Y Acceleration, Questionable Data

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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20200201
Model Year	2020
Make	Ford
Model	Escape
Body Style	SUV
VIN	1FMCU0DZ6LUA45432
Body Color	Silver
Odometer Reading (km/mi)	7.7 miles
Engine Displacement (L)	2.5
Type / No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	I-VCT
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	Ford Motor Co.
Date of Manufacture	11/19
Vehicle Type	MPV

GVWR (kg)	2077
GAWR Front (kg)	1134
GAWR Rear (kg)	1007

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	N/A	5	
Capacity Weight (VCW) (kg)				412	(A)
DSC X 68.04 kg				340.2	(B)
Cargo Weight (RCLW) (kg)				71.8	(A-B)

VEHICLE SEAT TYPE

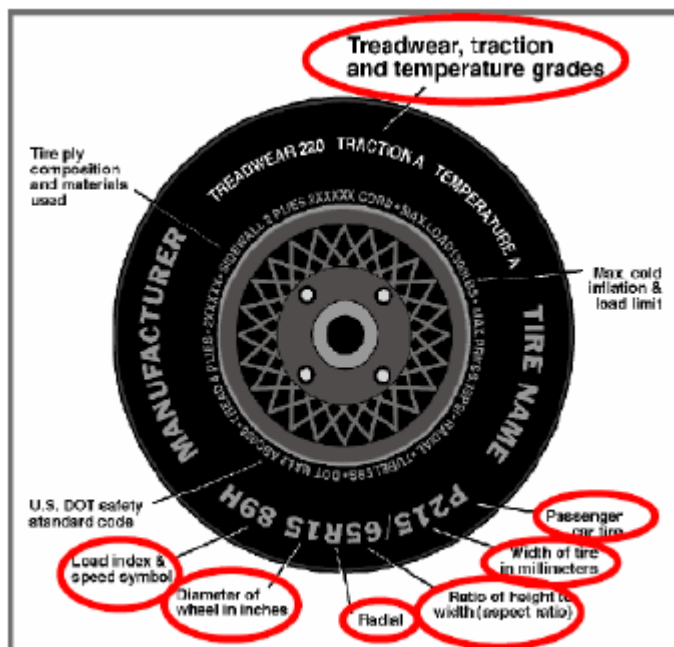
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X						X
Rear or Second Row Seat			X			X	
Third Row seat							

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

Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

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)	300	300
Cold Pressure (kPa)	230	230
Recommended Tire Size	225/55R19	225/55R19
Tire Size on Vehicle	225/55R19	225/55R19
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Ecopia	Ecopia
Treadwear	700	700
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyester	1 Polyester, 2 Steel, 1 Polyester
Load Index/Speed Symbol	99H	99H
Tire Material	Rubber	Rubber
DOT Safety Code Left	7XEFEC24319	7XEFEC24319
DOT Safety Code Right	7XEFEC24319	7XEFEC24319

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

Test Vehicle: 2020 Ford Escape Hybrid SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
Test Date: 1/7/2020

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	228	230	231	230
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	494	331		510.5	370		521	381	
Right	kg	476	346		503	378		483	389	
Ratio	%	59	41		57.5	42.5		57	43	
Totals	kg	970	677	1647	1013.5	748	1761.5	1004	770	1774

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1647	(A)
Actual Weight of 1 P572V (SID-IIs) ATD Used	kg	50	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	71.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1768.8	(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	-1.4	-1.5	-1.6	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	+0.5	+0.7	+0.7	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	-1.6	-1.5	-1.5	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	-1.3	-1.2	-1.1	Yes
Vehicle CG (Aft of Front Axle)	mm	1114	1150	1176	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	2	0	13	

* 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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	10
Spare Tire	12
Jack	3
Passenger Windows and door parts	5
Ballast / Equipment Added	52.2

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

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

Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

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	20.8	10.7	15.8
Front Passenger Seat	17.6	12.3	15.0
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	15.8	29	Max	48	50.5	53
			Mid	24	26.5	29
			Min	0	2.5	5
Front Passenger Seat	15	21	Max	-	-	-
			Mid	11	18	21
			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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

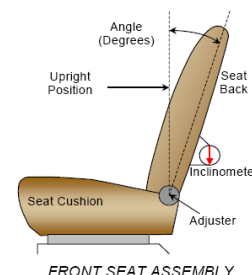
NHTSA No.: M20200201
 Test Date: 1/7/2020

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	255	N/A	0	N/A
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	160	16 (0-15)	160	15
Non-Struck Side Rear Seat	160	16 (0-15)	160	15
Rear Center Seat	160	16 (0-15)	160	15

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	61	N/A	-7.0	N/A
Front Passenger Seat	61.4	N/A	-6.8	N/A
Front Center Seat	N/A	N/A	N/A	N/A
Struck Side Rear Seat	12.2	7 (0-6)	2.4	0
Non-Struck Side Rear Seat	12	7 (0-6)	2.4	0
Rear Center Seat	12.2	7 (0-6)	2.4	0

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	4	0 – Uppermost

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	3	Lowermost

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

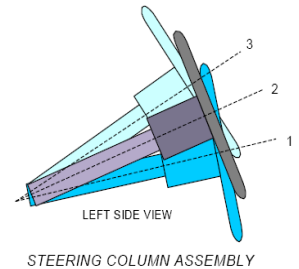
Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

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.

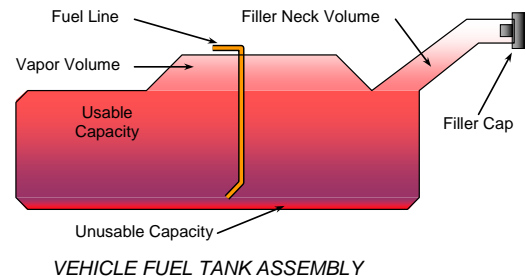
	Degrees	Fore / Aft Position (mm)
Lowermost – Position 1	21.6	
Geometric Center – Position 2	23.8	
Uppermost – Position 3	26	
Telescoping Steering Wheel Travel		55
Test Position	23.8	27.5



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	53.7
Usable Capacity of "Optional Tank" - see Form No. 1	N/A
Usable Capacity of "Standard Tank" - see Owner's Manual	53.7
Usable Capacity of "Optional Tank" - see Owner's Manual	N/A
93% of Usable Capacity	49.9
Actual Amount of Solvent Used in Test	49.9
1/3 of Usable Capacity	17.9

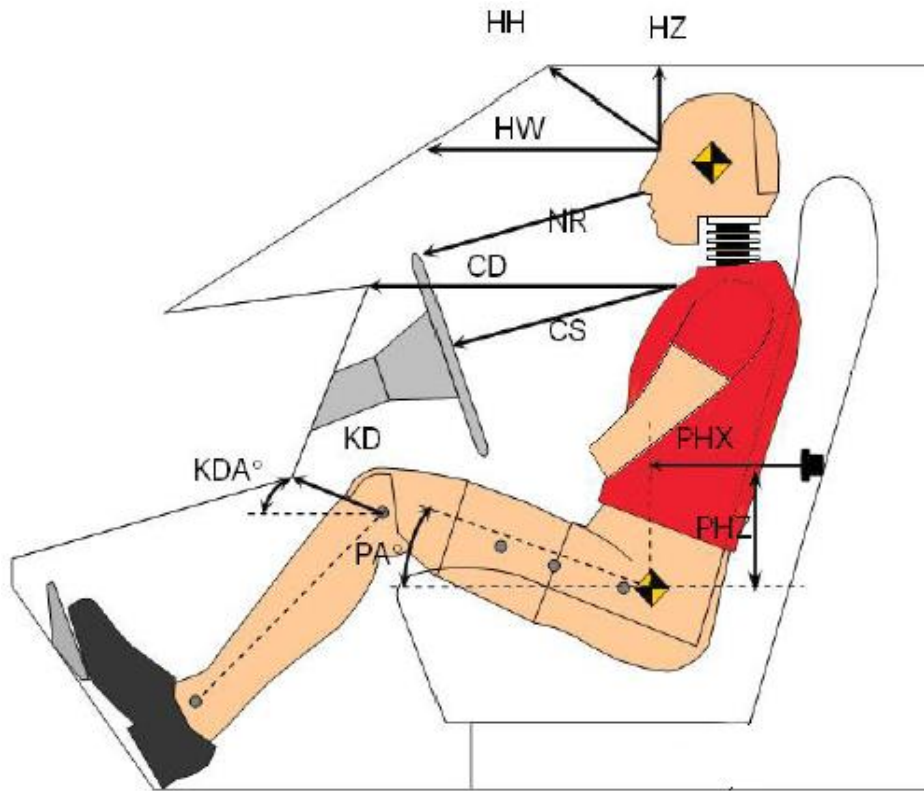
Is the Actual Amount of Solvent Used in the test equal to 93% ±1% of the Usable Capacity stated in Form No. 1?

Yes No

**DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020



Left Side View

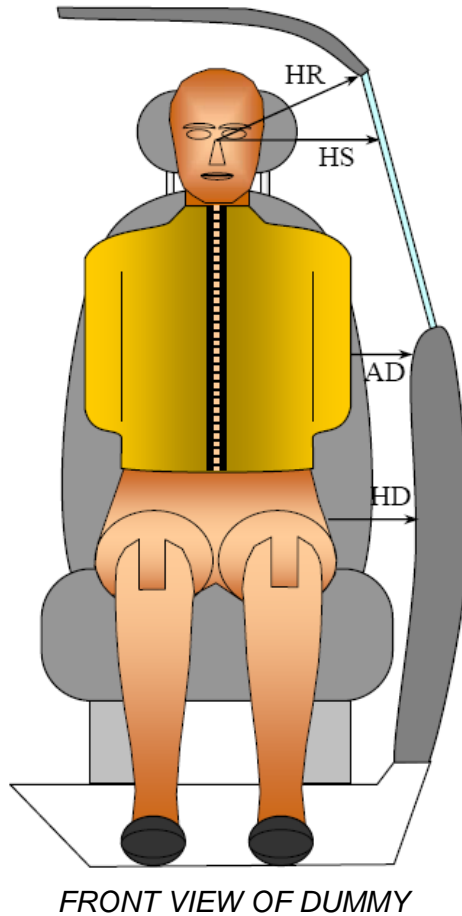
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. DG8012)	
		Length (mm)	Angle (°)
HH	Head to Header	278	
HW	Head to Windshield	603	
HZ	Head to Roof Liner	212	
NR	Nose to Rim	220	
CD	Chest to Dash	393	
CS	Chest to Steering Wheel	180	
KD(L) / KDA(L)°	Left Knee to Dash	132	21.4
KD(R) / KDA(R)°	Right Knee to Dash	134	15.8
PAX°	Pelvic Tilt Angle (X-Axis)		20.9
PAY°	Pelvic Tilt Angle (Y-Axis)		0.3
PHX	Hip Point to Striker (X-Axis)	332	
PHZ	Hip Point to Striker (Z-Axis)	100	

**DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020



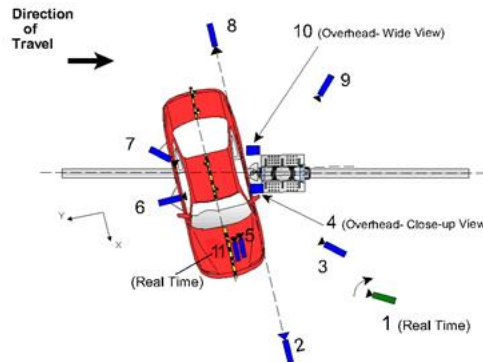
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver - Length (Serial No. DG8012)
HR	Head To Side Header	mm	273
HS	Head to Side Window	mm	392
AD	Arm to Door	mm	158
HD	Hip Point to Door	mm	162

**DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA**

Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020



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	7379	0	-1413	28	1000
3	Impact side 45° - forward pole view	5425	-1131	-1417	24	1000
4	Overhead Close-up view of impact	0	0	-9264	24	1000
5	Onboard - dummy front view				25	1000
6	Onboard - dummy side view				12.5	1000
7	Onboard - dummy rear oblique view				8	1000
8	Rear ground level - impact view	-7969	0	-1424	28	1000
9	Impact side 45° - rearward pole view	-3780	-3957	-1334	24	1000
10	Overhead wide - view of impact	0	0	-9264	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.

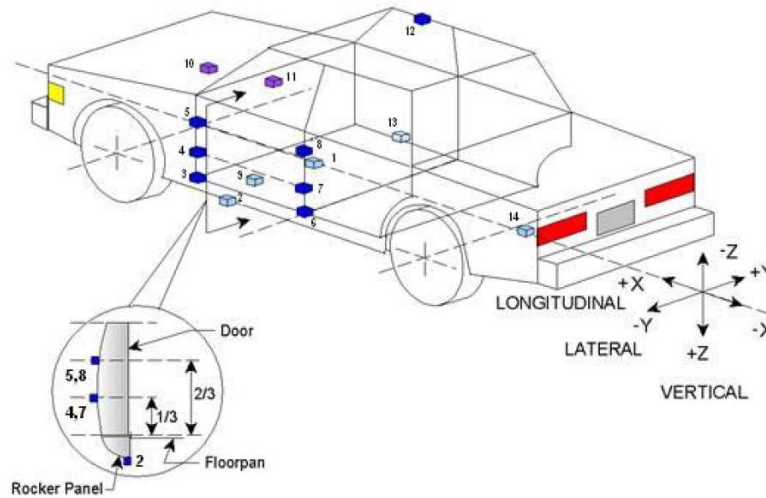
INSTRUMENTATION

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: 2020 Ford Escape Hybrid SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
Test Date: 1/7/2020



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2525	33	-16
2	Left Floor Sill	2834	-656	204
3	A-Pillar Sill	2997	-665	-538
4	A-Pillar Low	3062	-630	166
5	A-Pillar Mid	3116	-629	6
6	B-Pillar Sill	2024	-682	-395
7	B-Pillar Low	2144	-681	157
8	B-Pillar Mid	2067	-688	-173
9	Driver Seat Track	2274	-555	163
10	Engine Top	3701	249	-237
11	Firewall	3402	285	-136
12	Right Roof	2165	657	-987
13	Right Floor Sill	2880	662	202
14	Rear Floorpan	983	-8	59

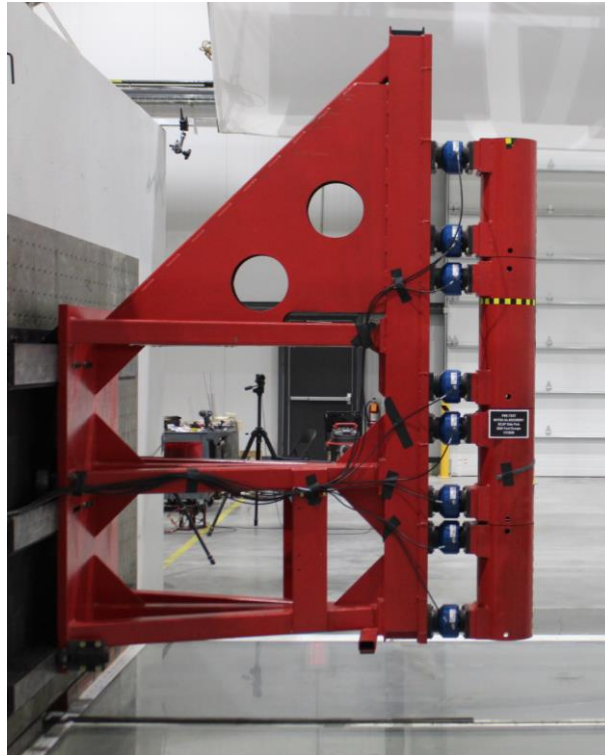
Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

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

Test Vehicle: 2020 Ford Escape Hybrid SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
Test Date: 1/7/2020

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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

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	Seatback, Torso/Pelvis Airbag, Driver Door
Upper Torso	Seatback & Torso/Pelvis Airbag
Lower Torso	Seatback & Torso/Pelvis Airbag
Left Hip	Seat pan & 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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar & B-Pillar Buckling
Sill Separation	None
Windshield Damage	Cracks Throughout
Side Window Damage	Driver Window Shattered
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

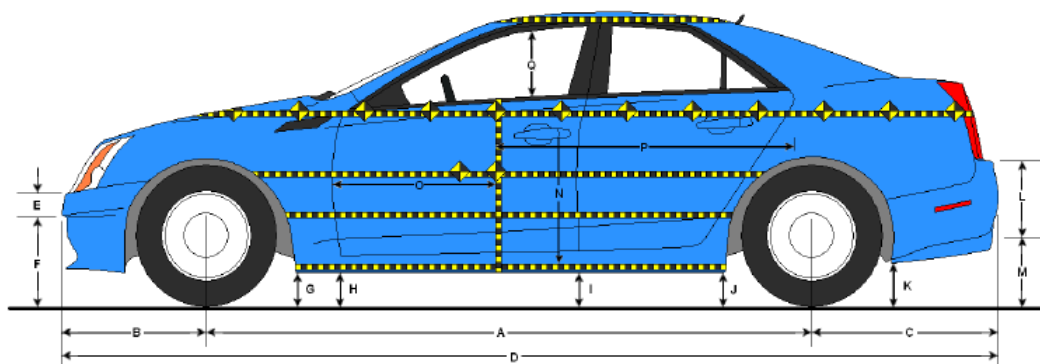
Measured Parameter	Units	Tolerance	Value
Vertical Impact Ref Line - Aft of Front Axle, Intended Impact Pt	mm		1075
Actual Impact Point - Aft of Front Axle	mm		1080
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 *	-5
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75.0
Trap No. 1 Velocity - Primary	kph	31.4 to 33.0	32.36
Trap No. 2 Velocity - Redundant	kph	31.4 to 33.0	32.37

* Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Ford Escape Hybrid SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
Test Date: 1/7/2020



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

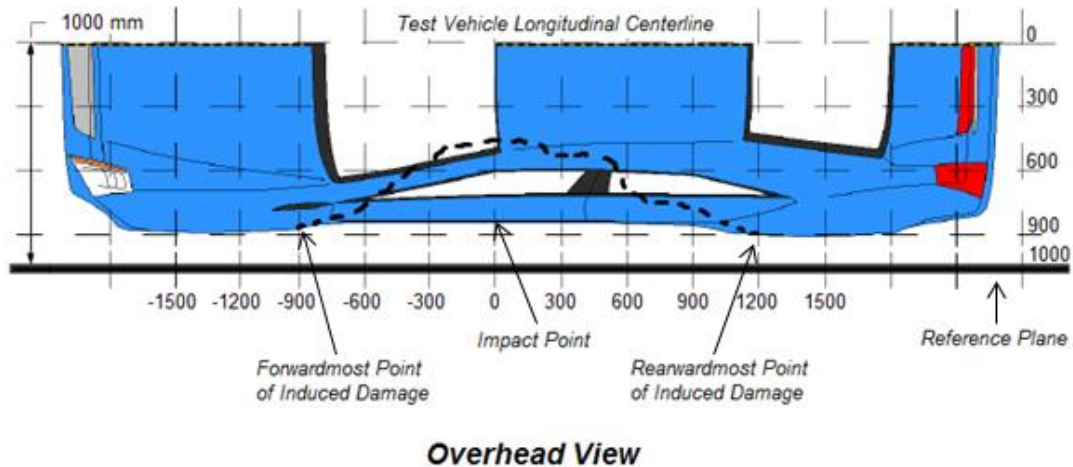
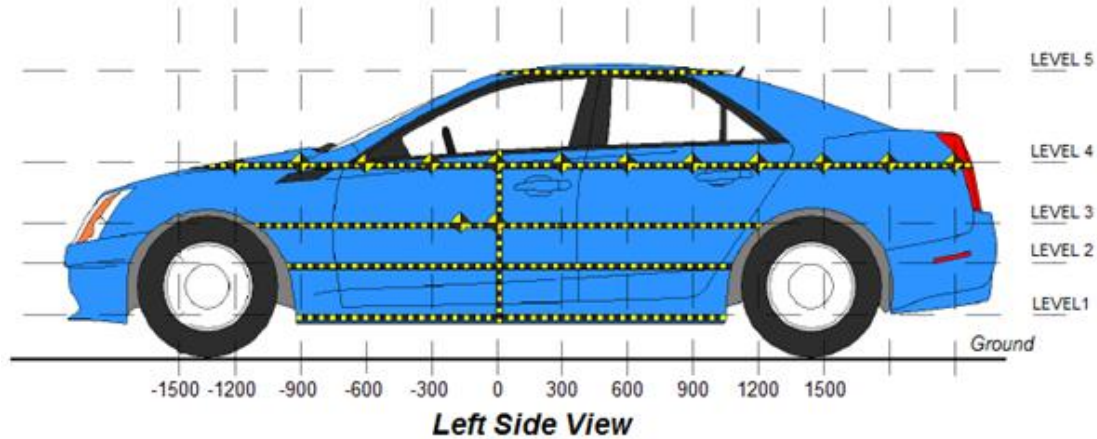
Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2709	2655	54
B	Front Axle to FSOV	972	988	-16
C	Rear Axle to RSOV	907	921	-14
D	Total Length at Centerline	4588	4563	25
E	Front Bumper Thickness	170	170	0
F	Front Bumper Bottom to Ground	293	310	-17
G	Sill Height at Front Wheel Well	230	221	9
H	Sill Height at Front Door Leading Edge	232	216	16
I	Sill Height at B-Pillar	242	239	3
J1	Sill Height at Rear Wheel Well	252	268	-16
J2	Pinch Weld Height at Rear Wheel Well	249	260	-11
K	Sill Height Aft of Rear Wheel Well	304	304	0
L	Rear Bumper Thickness	145	145	0
M	Rear Bumper Bottom to Ground	445	438	7
N	Sill Height to Bottom of Front Window Sill	869	869	0
O	Front Door Leading Edge to Impact CL	625	551	74
P	Rear Door Trailing Edge to Impact CL	1506	1444	62
Q	Front Window Opening	383	365	18
R	Right Side Length	4454	4444	10
S	Left Side Length	4457	4405	52
T	Vehicle Width at B-Pillars	1808	1750	58

* All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	355	266	0
2	Occupant Hip Point	mm	669	276	0
3	Mid - Door	mm	729	288	0
4	Window Sill	mm	1020	280	150
5	Window Top	mm	1590	98	150

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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

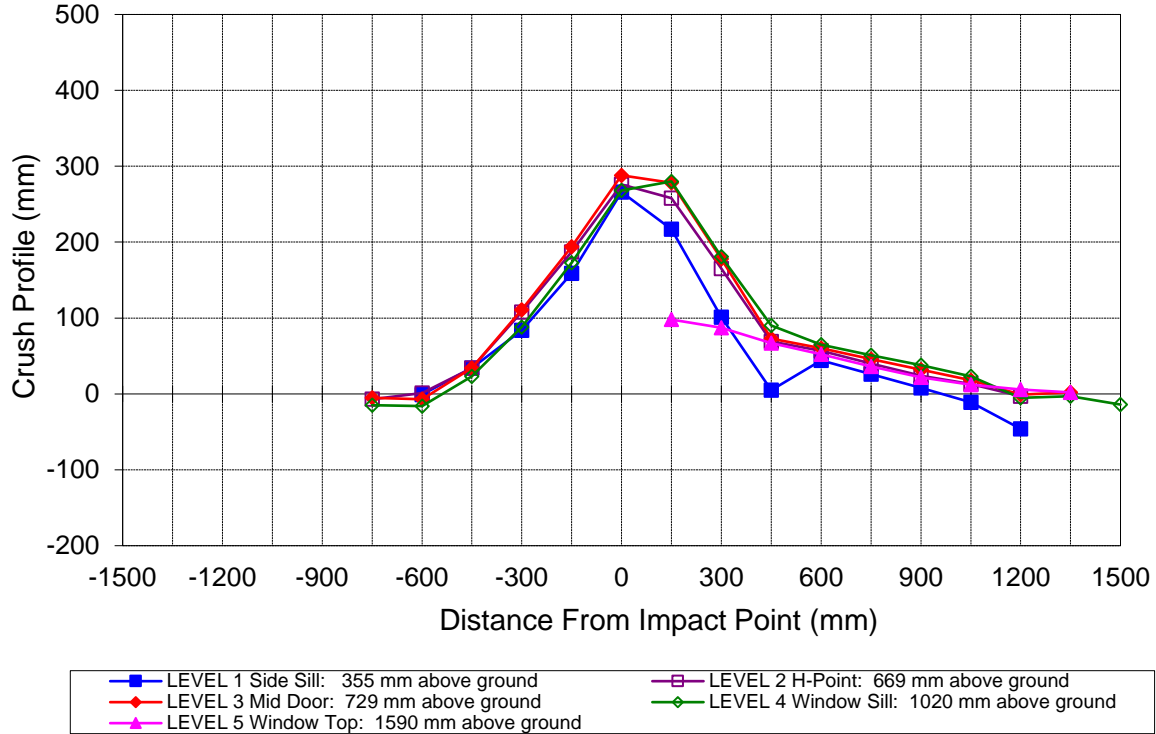
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050															
-900															
-750		921	926	843			928	931	858			-7	-5	-15	
-600	893	920	920	849		894	919	927	865		-1	1	-7	-16	
-450	894	910	913	858		860	876	879	835		34	34	34	23	
-300	894	902	909	866		810	794	798	778		84	108	111	88	
-150	891	896	906	873		732	709	712	700		159	187	194	173	
0	890	890	902	879		624	614	614	611		266	276	288	268	
150	887	885	898	884	628	670	627	620	604	530	217	258	278	280	98
300	885	881	894	890	646	784	716	716	709	559	101	165	178	181	87
450	883	878	890	894	647	878	809	817	804	580	5	69	73	90	67
600	882	877	887	895	645	838	820	827	830	593	44	57	60	65	52
750	879	878	886	897	639	853	838	840	846	603	26	40	46	51	36
900	876	883	891	898	633	868	859	859	860	611	8	24	32	38	22
1050	873	897	901	895	621	884	884	883	872	609	-11	13	18	23	12
1200	868	915	915	892	607	914	918	916	897	601	-46	-3	-1	-5	6
1350			919	923	580			917	926	578			2	-3	2
1500				889					903					-14	

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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020



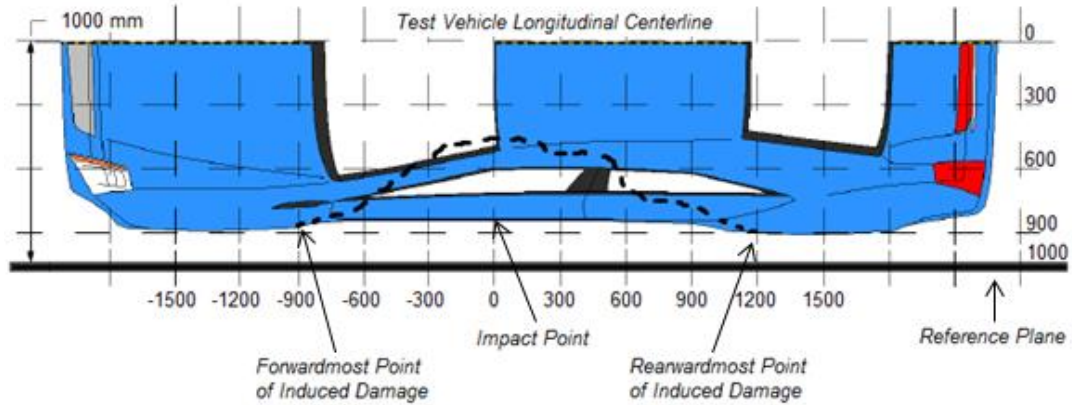
Vehicle Exterior Crush Measurements - Visual Representation

**DATA SHEET NO. 11
VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020

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



Overhead View

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-750	3	69	74	-5
2	-330	3	186	90	96
3	90	3	382	100	282
4	510	3	179	111	68
5	930	3	136	107	29
6	1350	3	83	81	2

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

Test Vehicle:	<u>2020 Ford Escape Hybrid SUV</u>	NHTSA No.:	<u>M20200201</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>1/7/2020</u>
Test Time:	<u>8:12 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°	72	300	372
90° to 180°	64	300	364
180° to 270°	64	300	364
270° to 360°	66	300	366

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

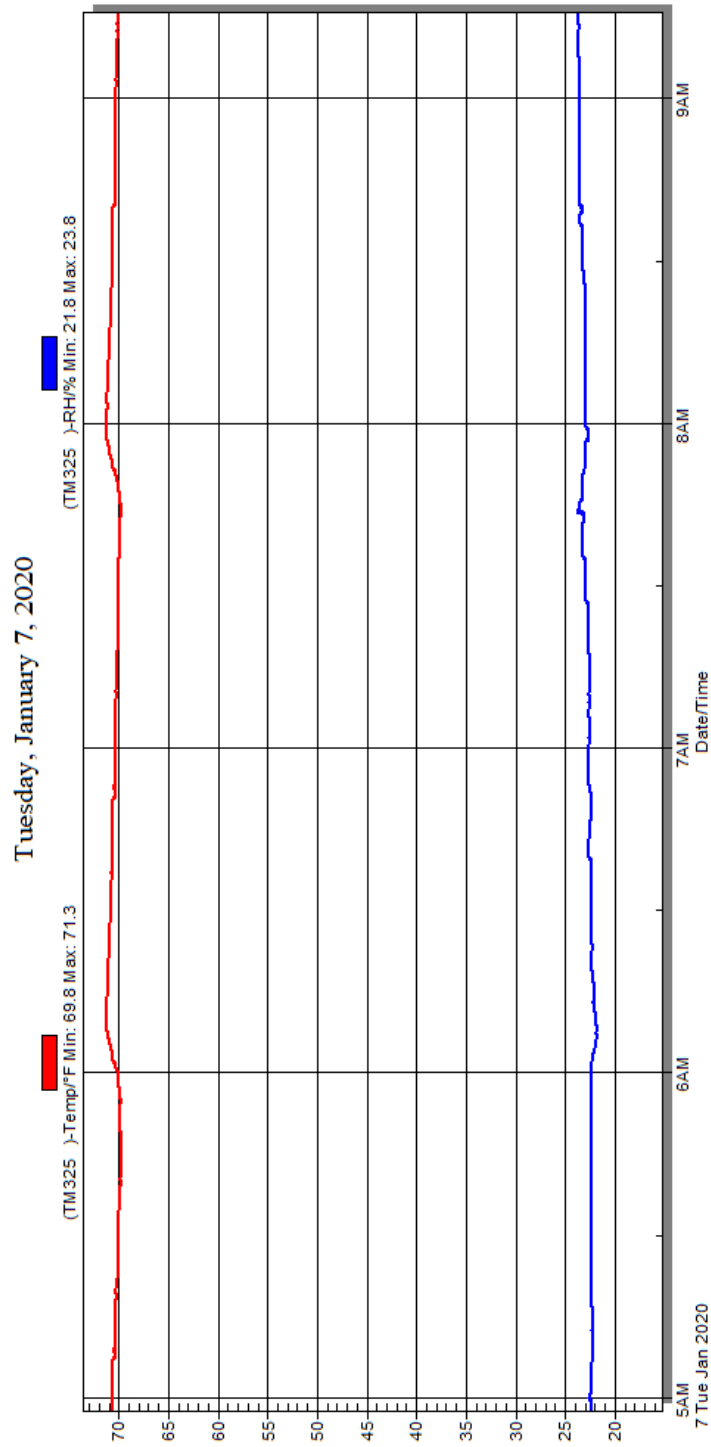
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2020 Ford Escape Hybrid SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20200201
 Test Date: 1/7/2020



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

APPENDIX A
PHOTOGRAPHS

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M20200201

Figure A-1: As Delivered Right Front ¾ View of Test Vehicle



M20200201

Figure A-2: As Delivered Left Rear ¾ 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 3/4 View of Test Vehicle



Figure A-10: Post-Test Left Rear 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

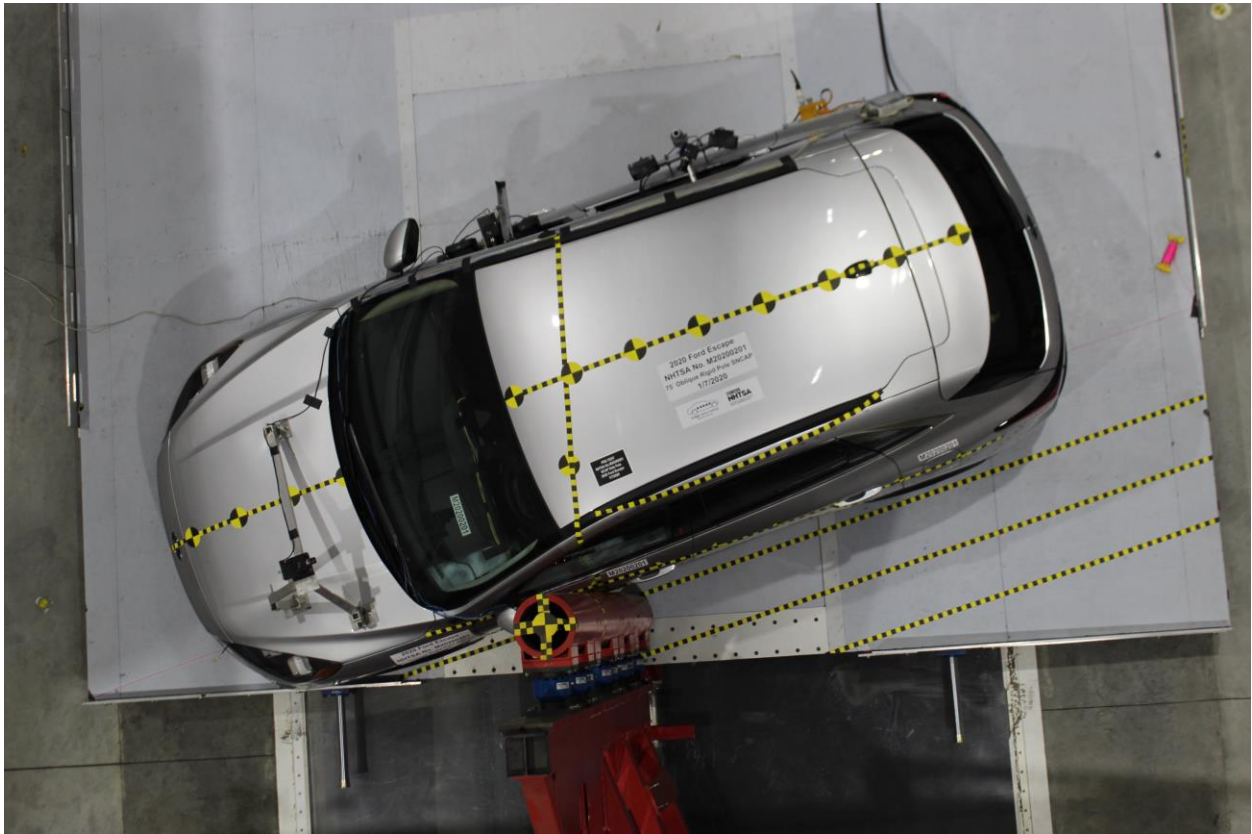


Figure A-15: Pre-Test Overhead View of Test Area

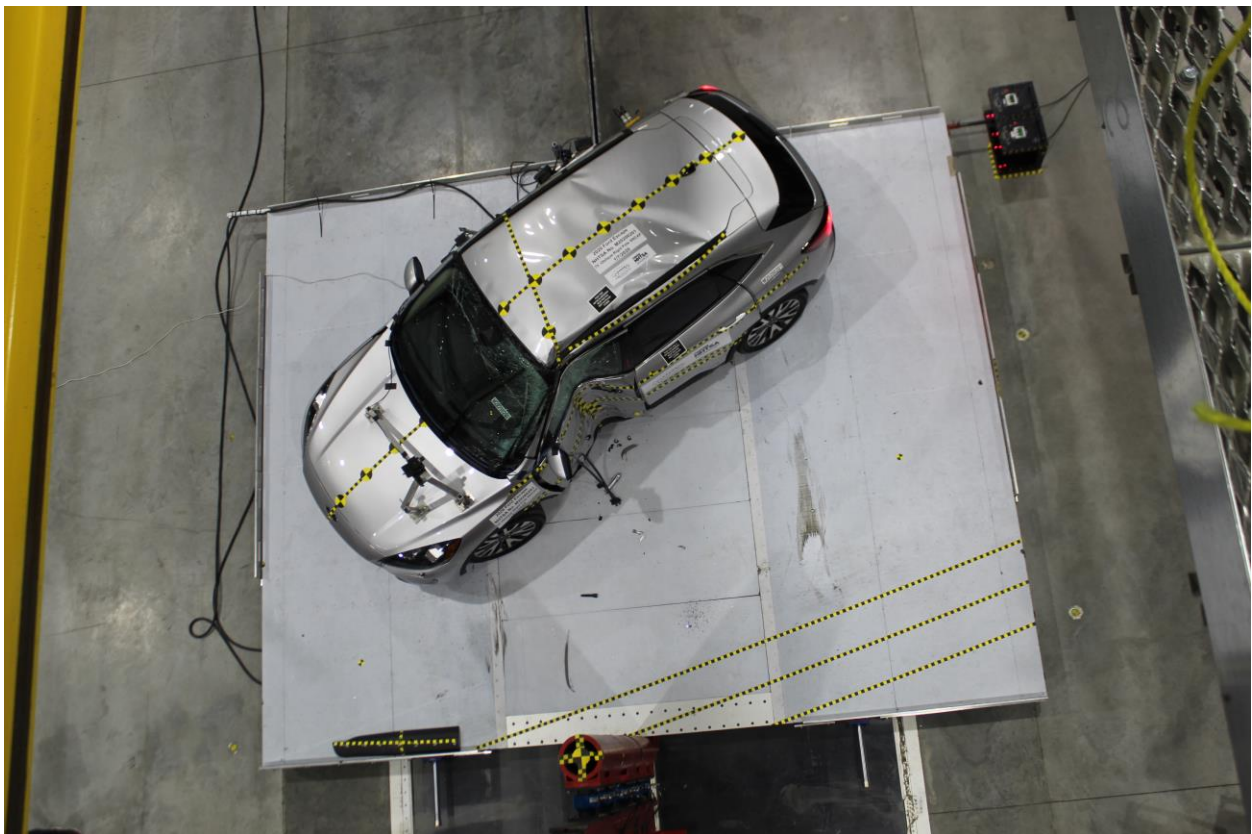


Figure A-16: Post-Test Overhead View of Test Area



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

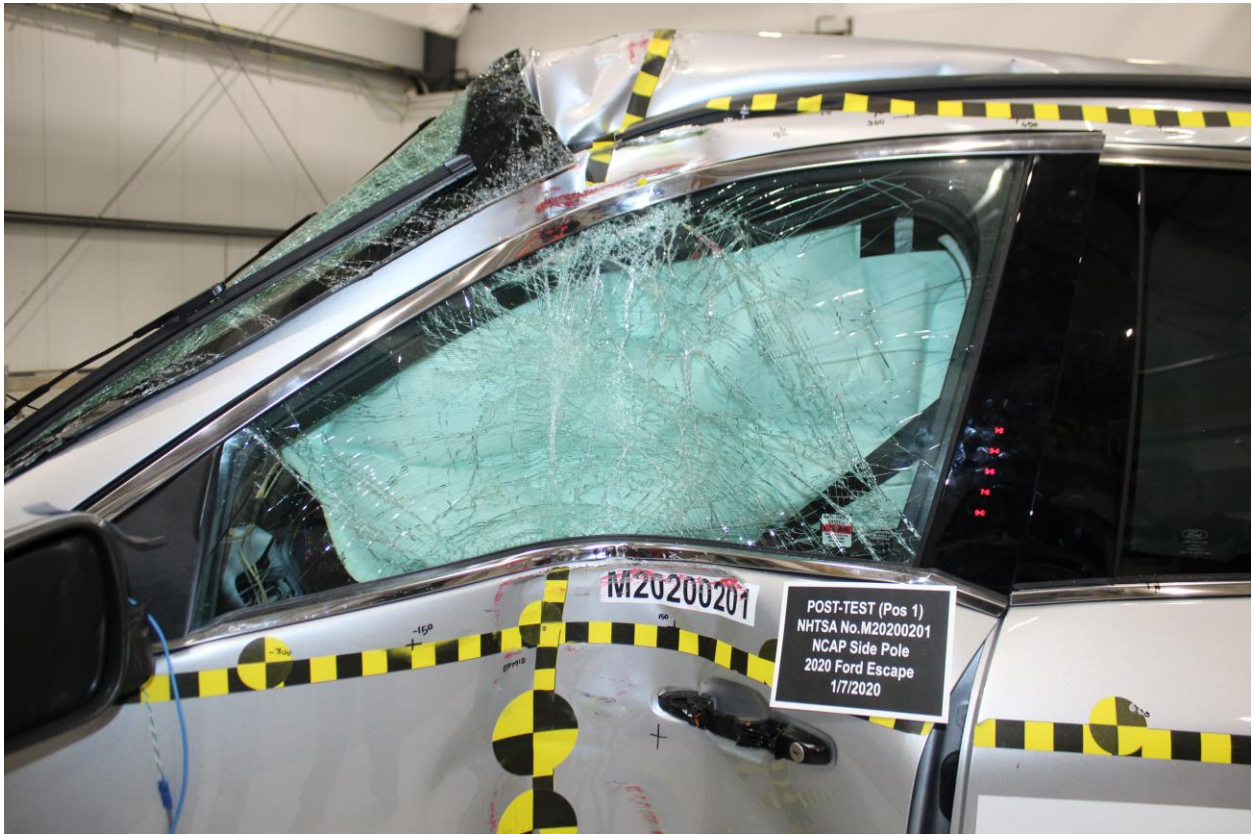


Figure A-25: Post-Test Left Side View of Dummy Shoulder and Door Top View



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

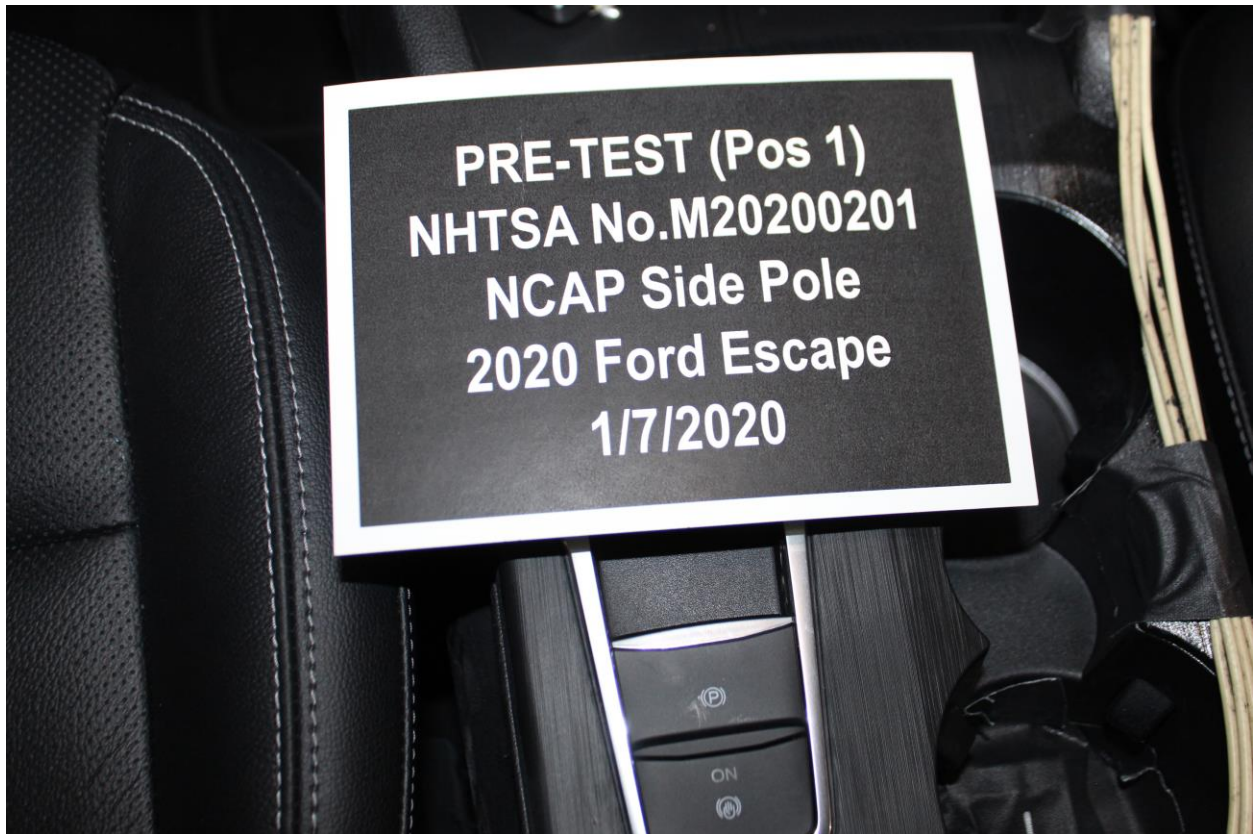


Figure A-35: Pre-Test View of Disengaged Parking Brake

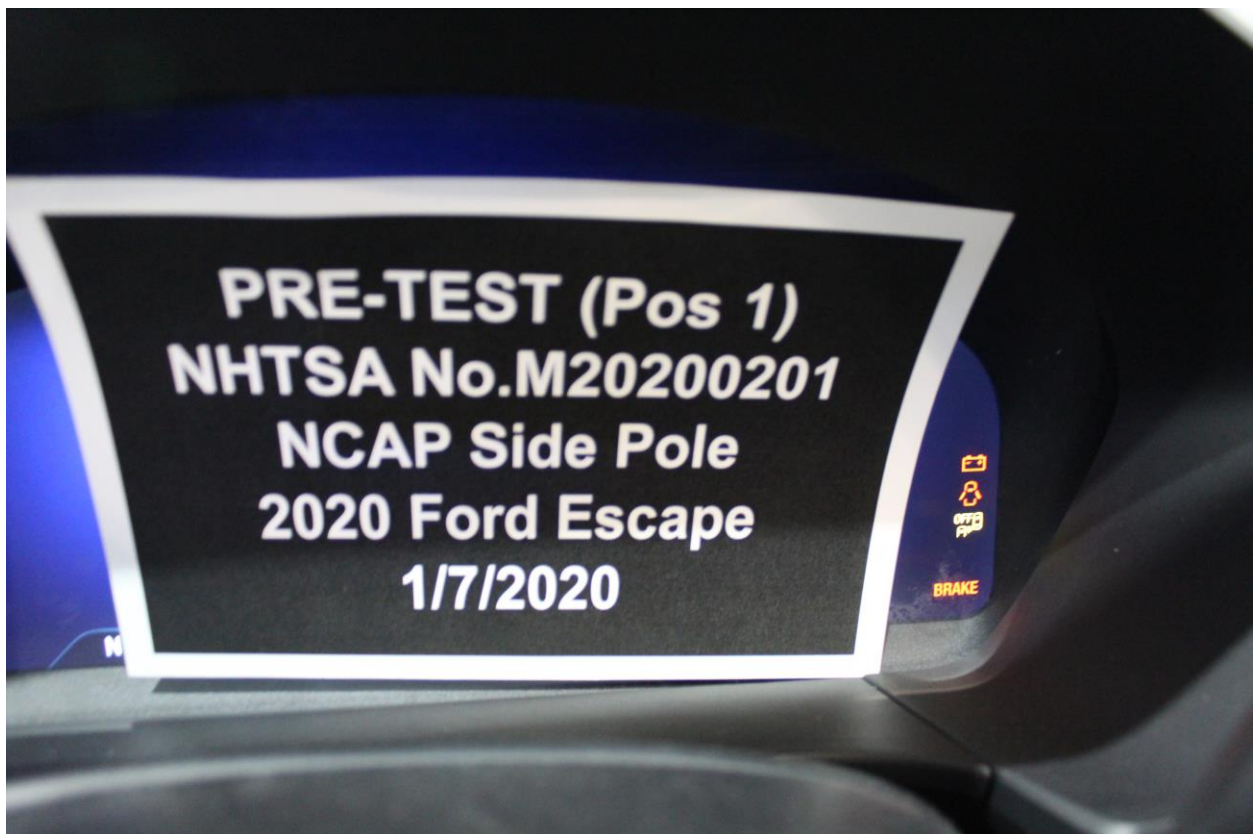


Figure A-36: Pre-Test View of Parking Brake



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

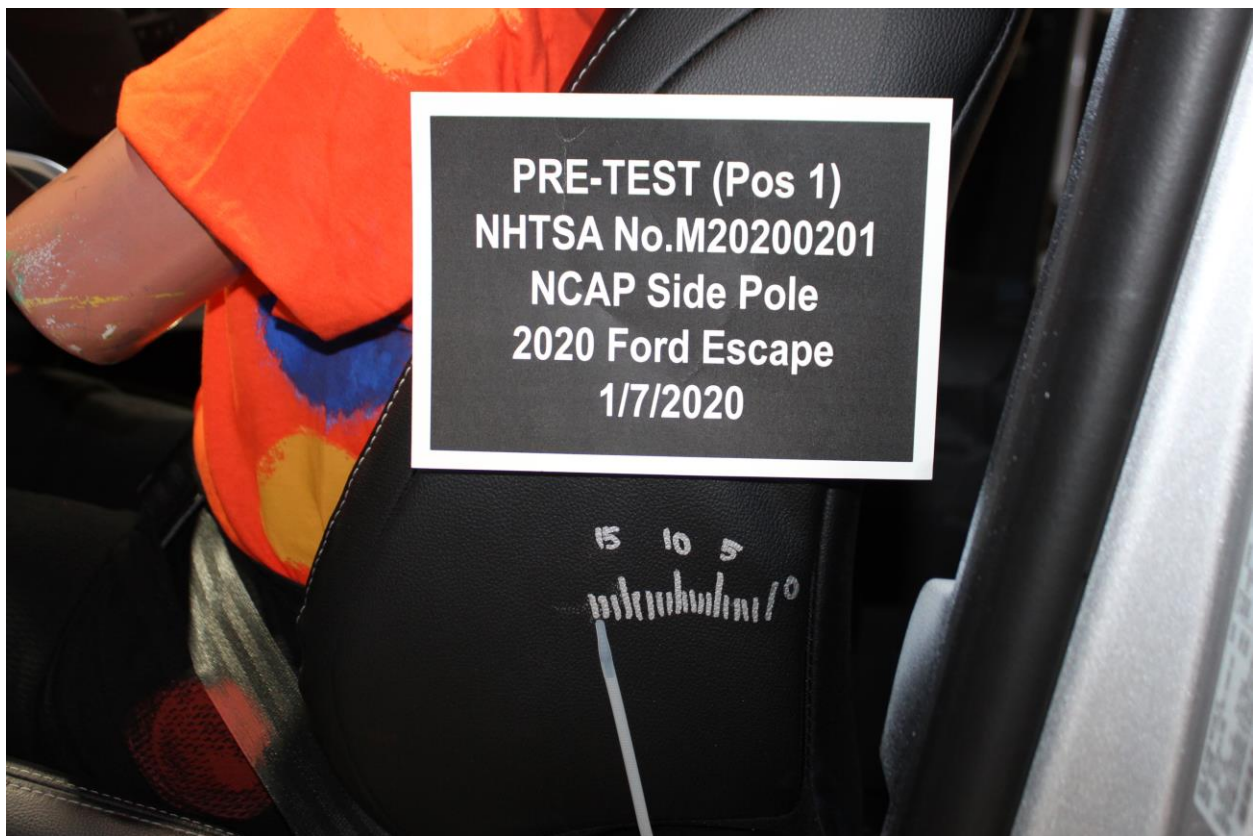


Figure A-38: Pre-Test Close-Up Left Side View of Driver Seat Back



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

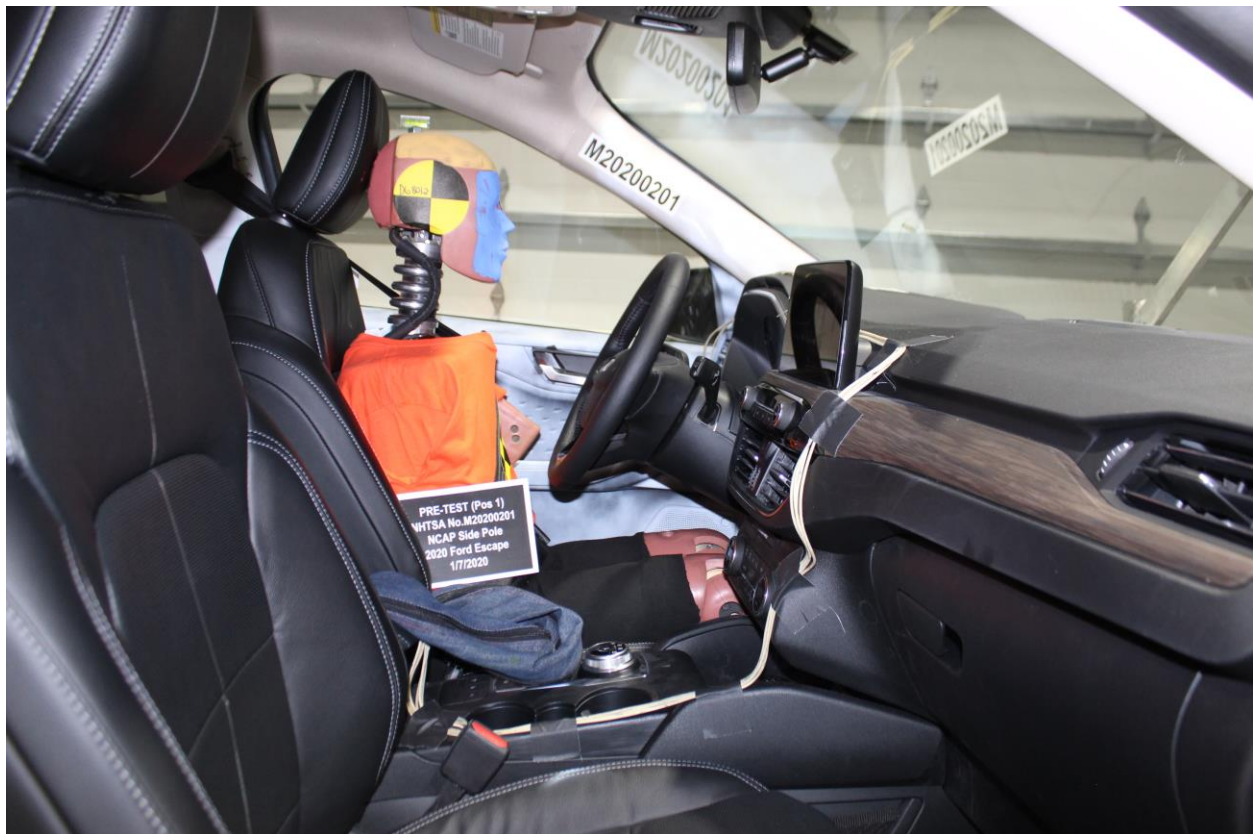


Figure A-42: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



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

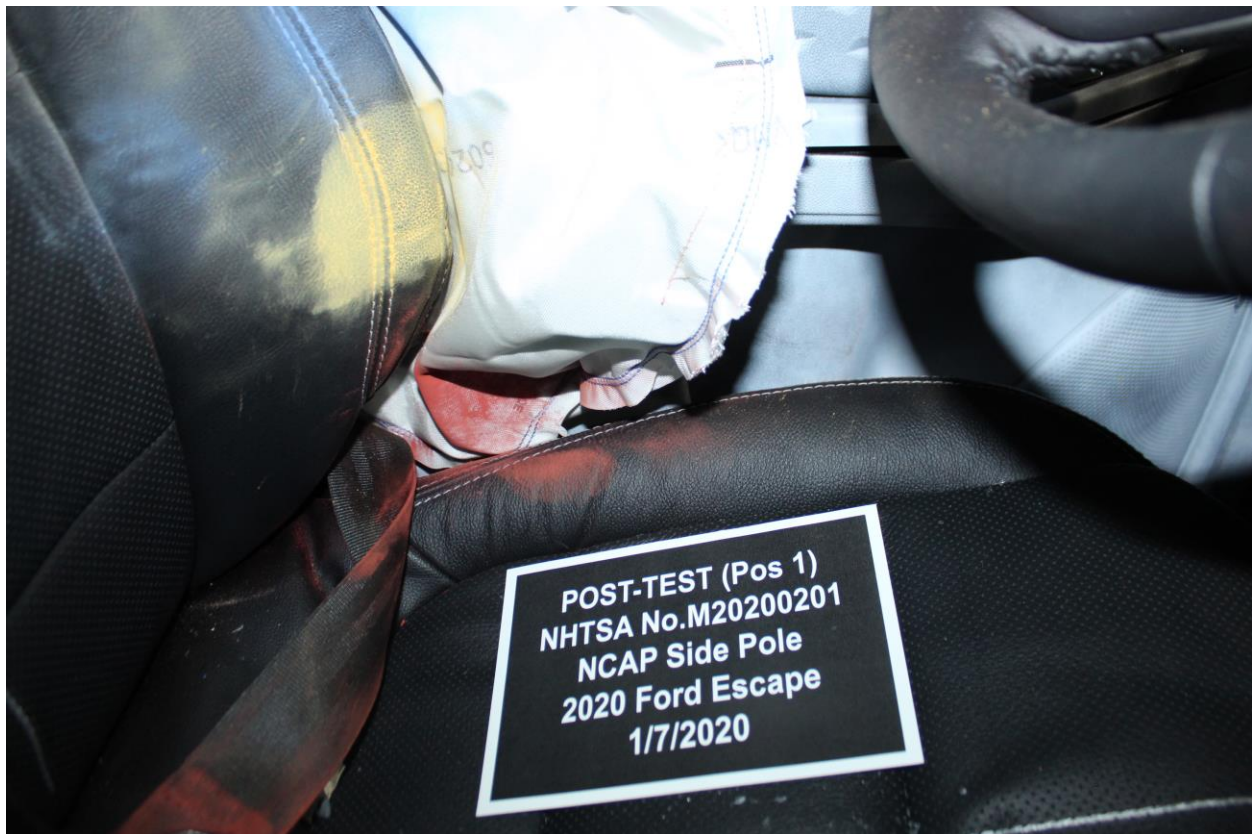


Figure A-50: Post-Test Dummy Close-Up Pelvis Contact with Vehicle Interior View



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

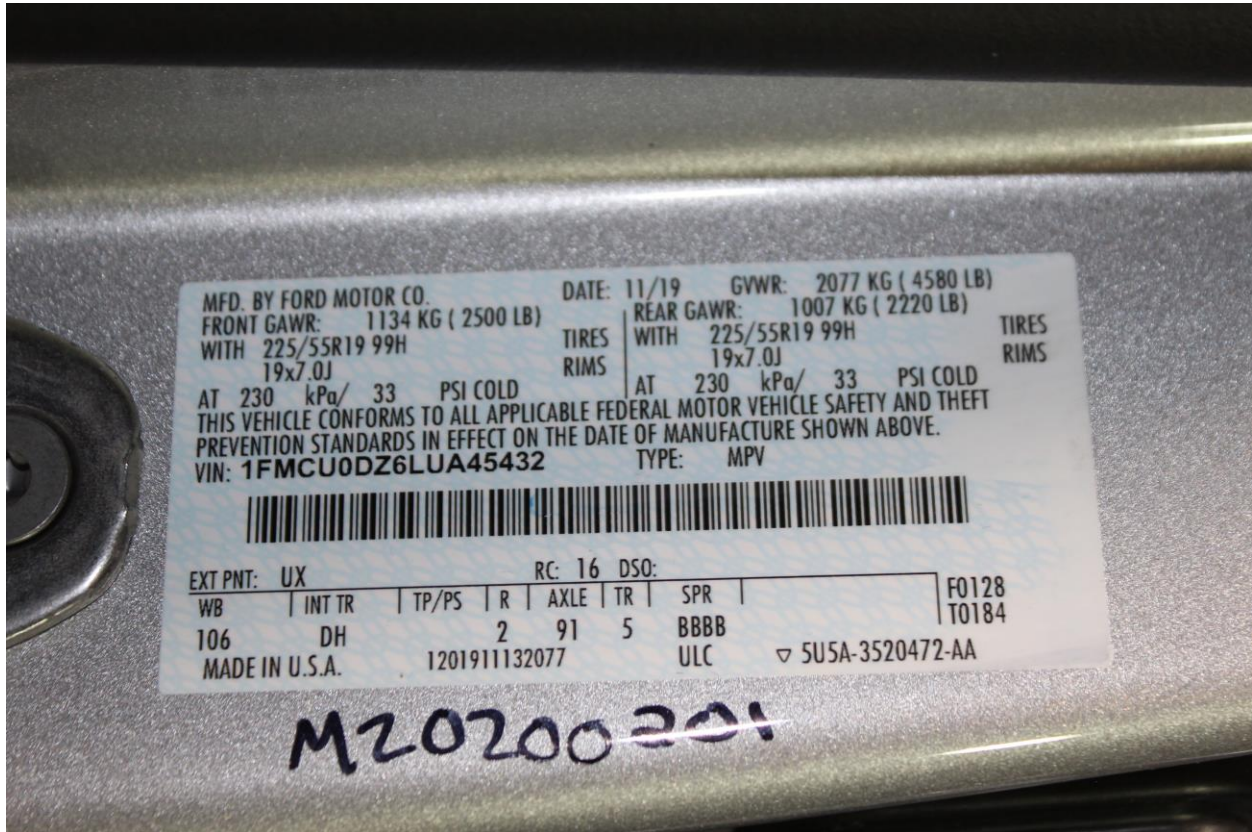


Figure A-55: Close-Up View of Vehicle's Certification Label

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

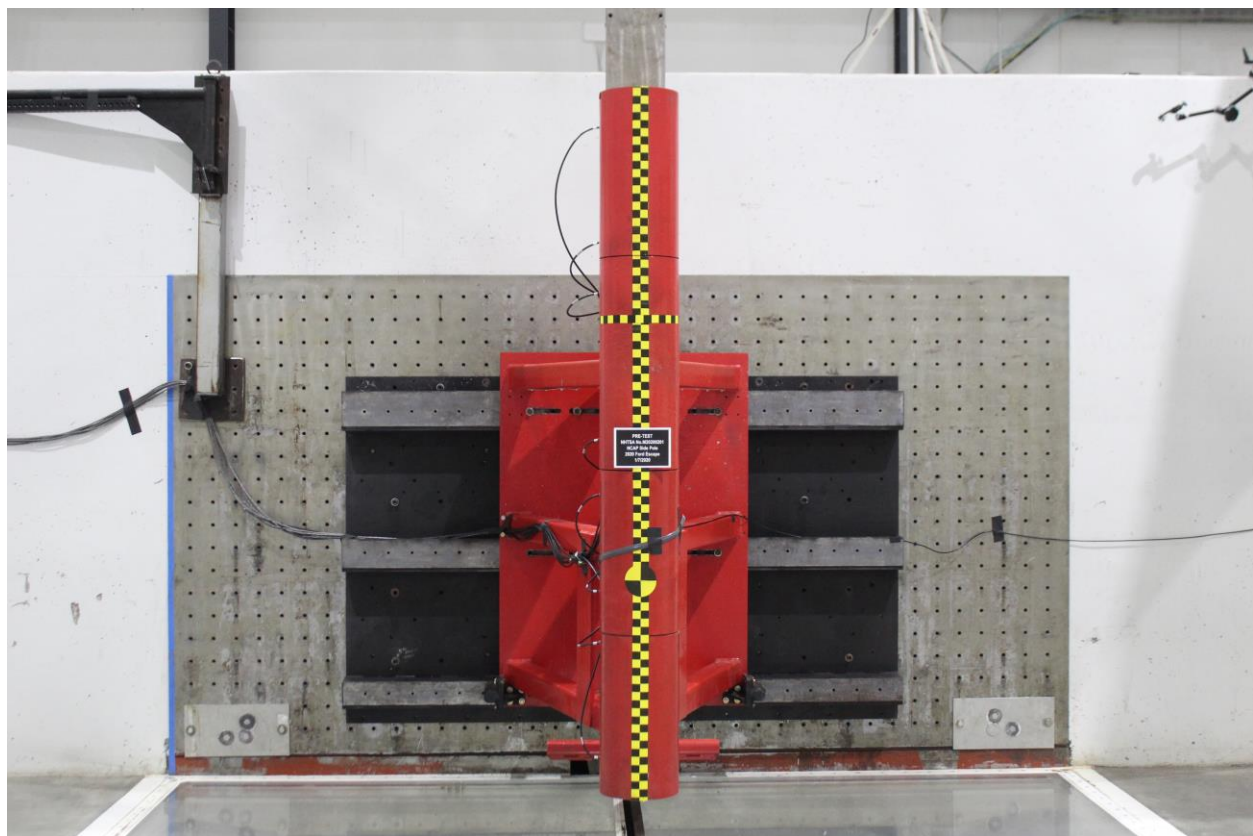


Figure A-57: Pre-Test Pole Barrier Front View

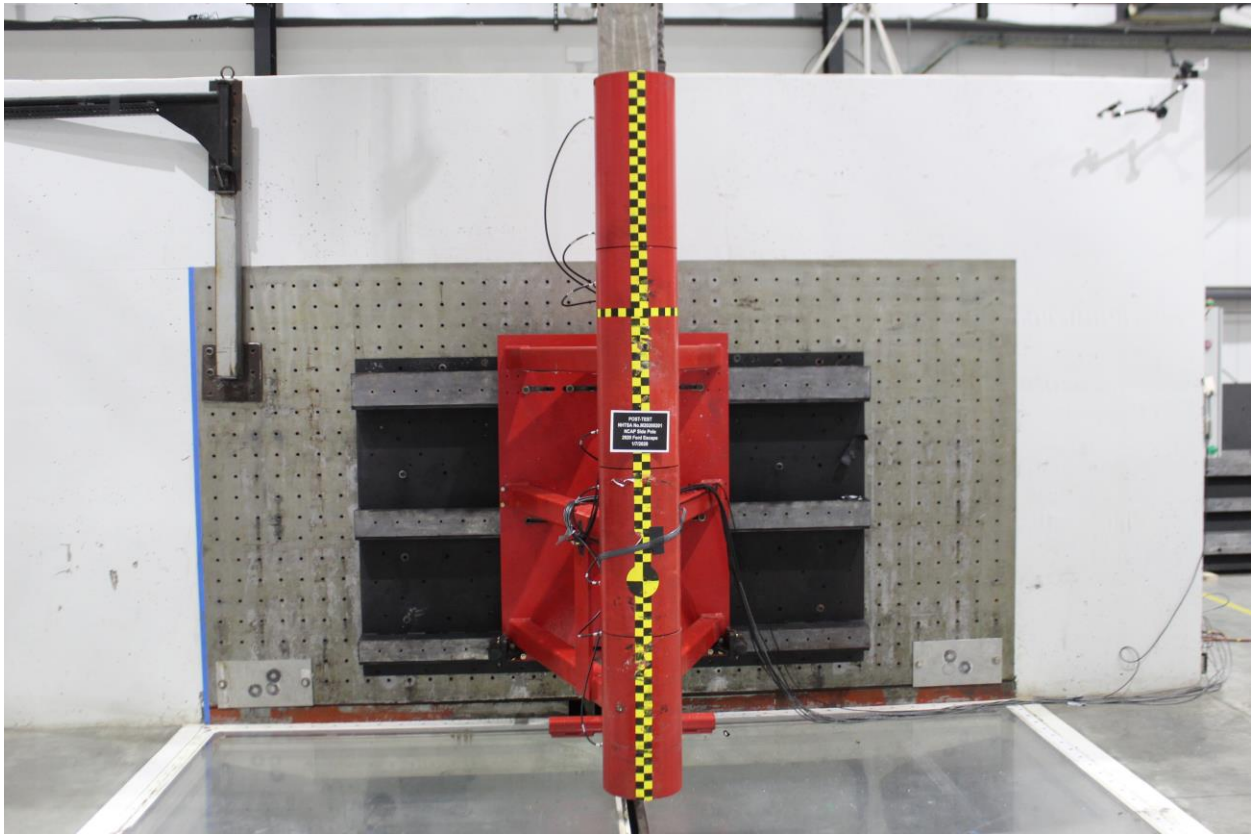


Figure A-58: Post-Test Pole Barrier Front View

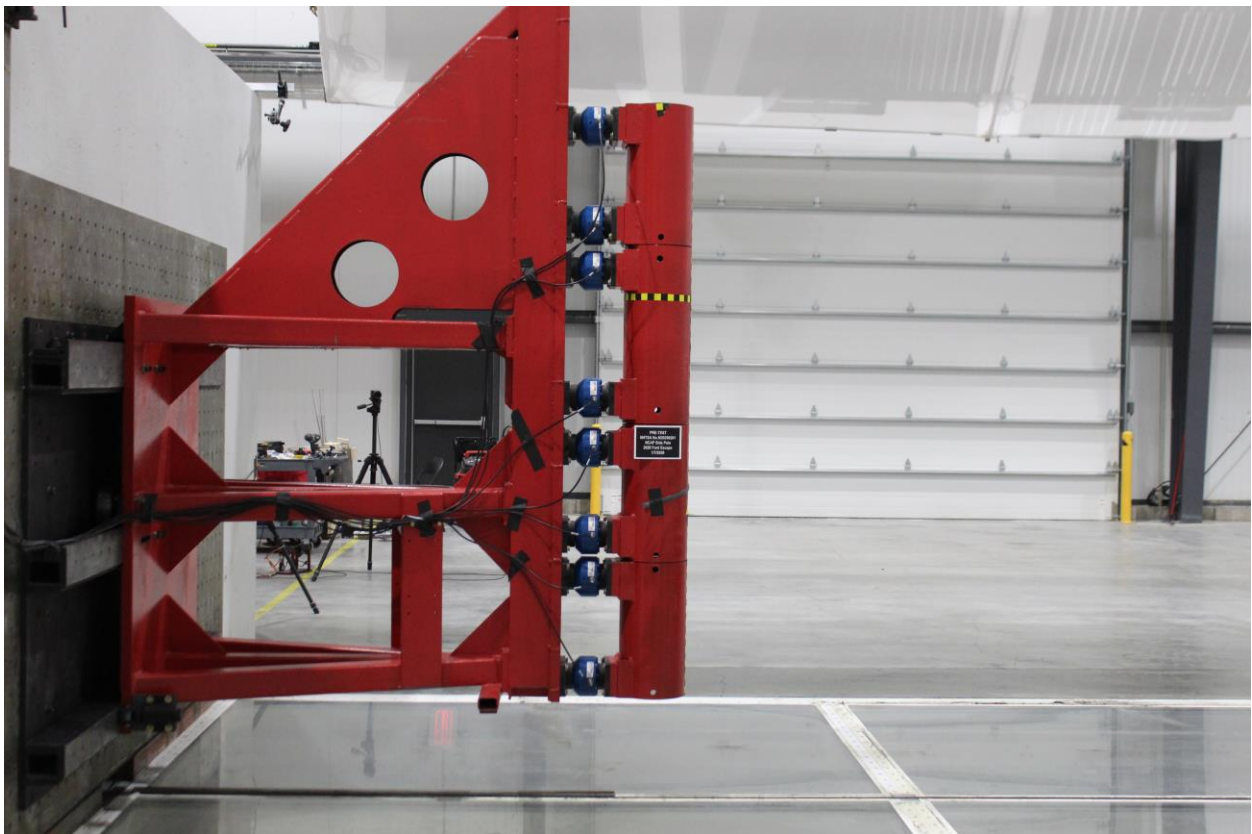


Figure A-59: Pre-Test Pole Barrier Side View

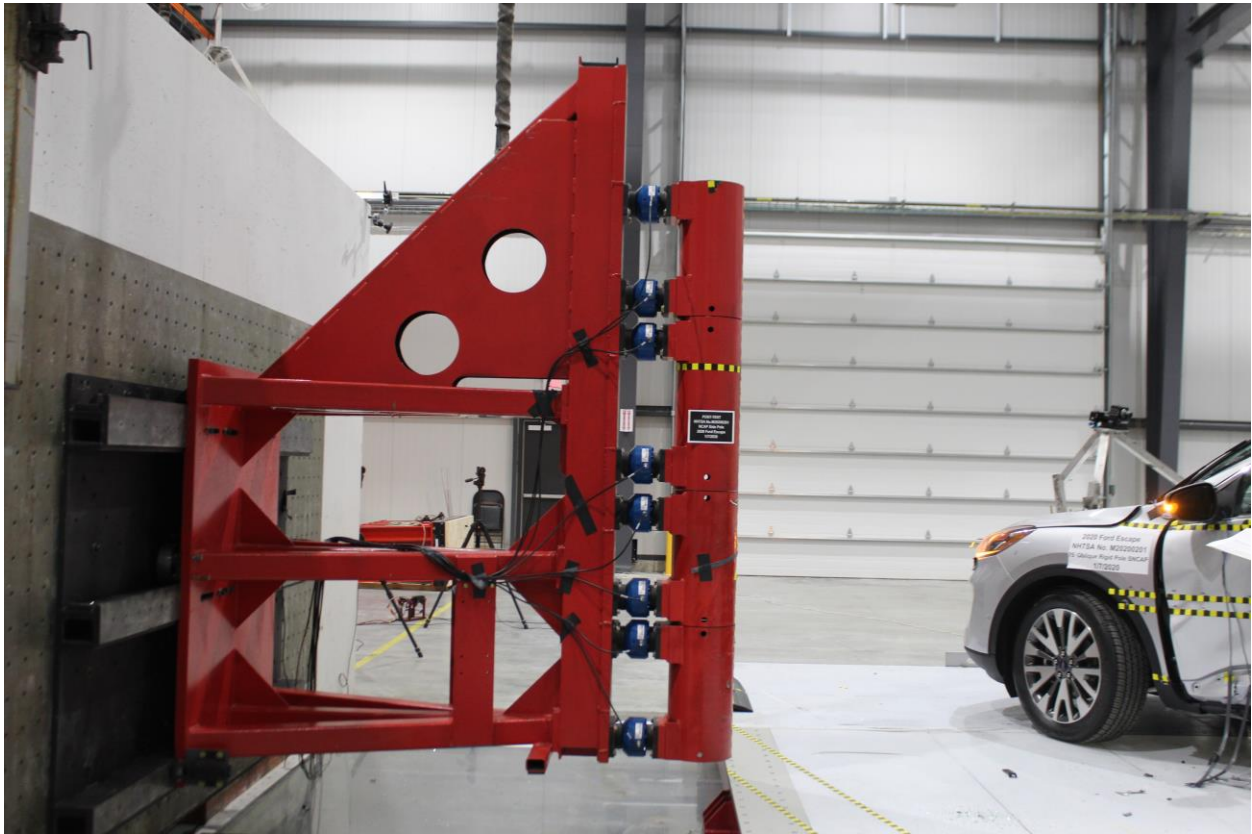


Figure A-60: Post-Test Pole Barrier Side View

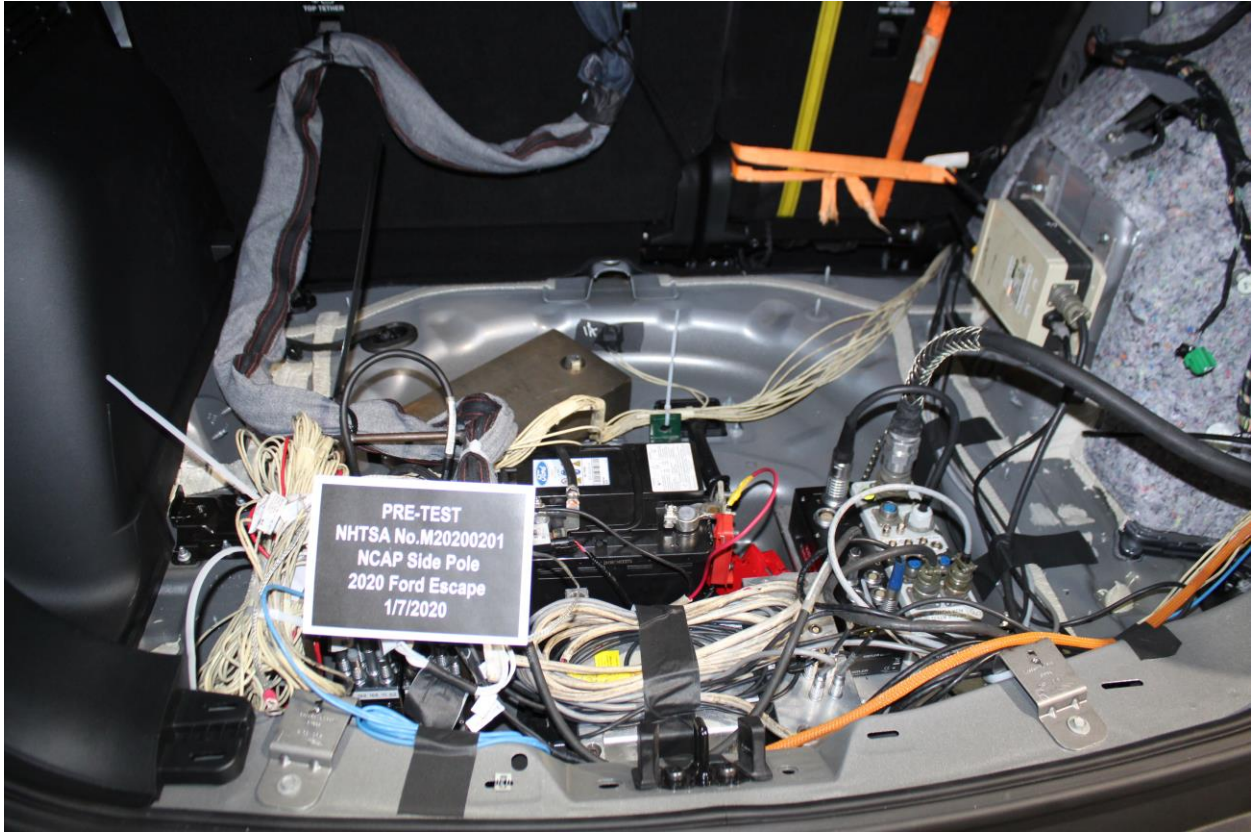


Figure A-61: Pre-Test Ballast View



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



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

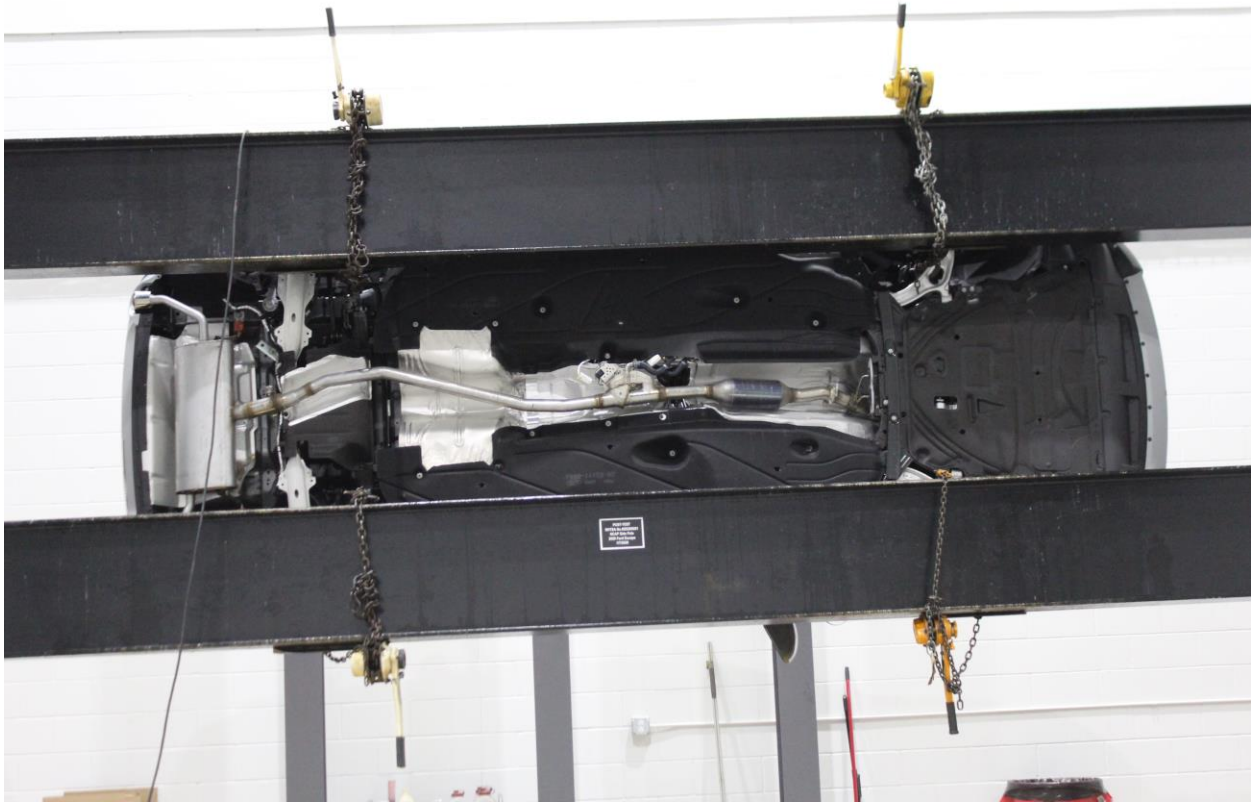


Figure A-64: FMVSS No. 301 Static Rollover 90 Degrees

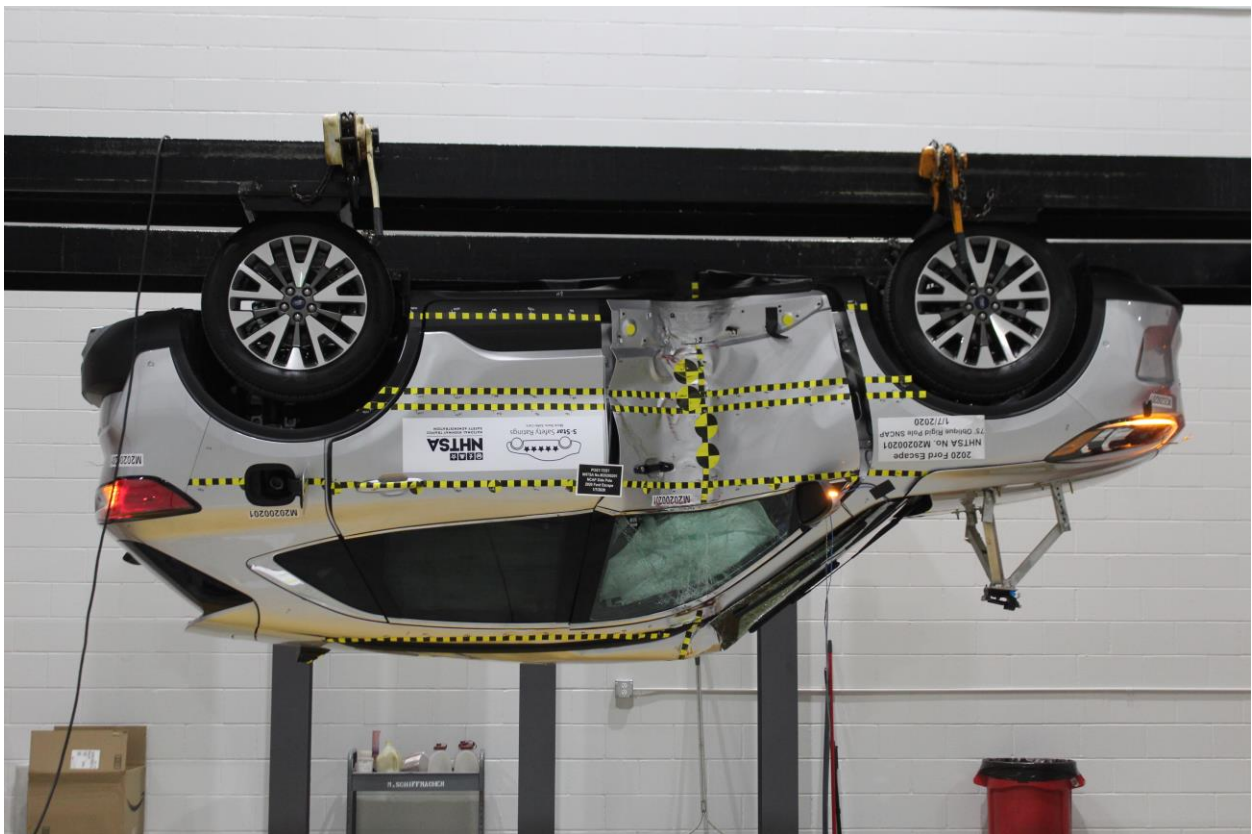


Figure A-65: FMVSS No. 301 Static Rollover 180 Degrees



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

VEHICLE DESCRIPTION		LU A45432		EPA DOT Fuel Economy and Environment		Gasoline Vehicle	
<p>ESCAPE FWD</p> <p>2020 ESCAPE TITANIUM FWD 100.7" WHEELBASE 2.5L I-VCT ATK I-4 HYB ENG ECVT TRANSMISSION</p>		<p>EXTERIOR INCOAT SILVER METALLIC</p> <p>INTERIOR EBONY BLACK LEATHER SEATS</p>		<p>Fuel Economy</p> <p>41 MPG combined city/hwy</p> <p>44 city 37 highway</p> <p>2.4 gallons per 100 miles</p>		<p>You Save \$2,500 in fuel costs over 5 years compared to the average new vehicle.</p>	
<p>STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE</p> <p>EXTERIOR</p> <ul style="list-style-type: none"> ACTIVE GRILLE SHUTTERS EASY FUEL® CAPLESS FILLER FOG LAMPS-LED HEADLAMPS - AUTO LED LED SIGNATURE LIGHTING LIFTGATE - HANDS-FREE MIRRORS - HTD/PWR GLASS/ MAN-FOLD/TURN SIGNALS PRIVACY GLASS - REAR DOORS REAR INT WIPER/WASH/DFRST REAR SPOILER ROOF RACK SIDE RAILS TAILLAMPS-LED WIPERS - RAIN-SENSING <p>INTERIOR</p> <ul style="list-style-type: none"> 1 TOUCH UP/DOWN FRT/RR WIN ADAPTIVE CRUISE CONTROL WITH LANE CENTERING AMBIENT LIGHT/LLUM ENTRY AUTO-DIM REARVIEW MIRROR CARPETED FLOOR MATS DUAL ZONE AUTO CLIMATE CTL LEATHER TRIMMED SEATS W/ 10 WAY HTD DRVS WAY HTD PA LEATHER WRAPPED STR WHEEL SMART CHARGING USB PORT(2) SPLIT FOLD/DLDR REAR SEAT STEERING: HTD W/IL,CRUISE & AUDIO CONTROLS, TL7/TLE <p>FUNCTIONAL</p> <ul style="list-style-type: none"> ACTIVE PARK ASSIST 2.0 BAO SOUND SYSTEM, 10 SPKR EVASIVE STEERING ASSIST FORD CO-PILOT360™ FORDPASS™ CONNECT 4GM-FI HOTSPOT TELEMATICS MODEM INTELLIGENT ACCESS W/PUSH BUTTON START PEDESTRIAN ALERT SOUNDER REAR VIEW CAMERA REMOTE START SYSTEM REVERSE SENSING SYSTEM SYNCHRS BY SCION W/APPLINK UNIVER GARAGE DOOR OPENER VOICE ACTIVATED NAVIGATION <p>SAFETY/SECURITY</p> <ul style="list-style-type: none"> ADVANCETRAC WITH RSCB AIRBAG - DRIVER KNEE AIRBAGS - DUAL STAGE FRONT AIRBAGS - FRONT SEAT MOUNTED SIDE IMPACT AIRBAGS - SAFETY CANOPY® LATCH CHILD SAFETY SYSTEM PERIMETER ALARM 50S POST-CRASH ALERT SYS™ TIRE PRESSURE MONIT SYS <p>WARRANTY</p> <ul style="list-style-type: none"> 5 YR/60,000 BUMPER/BUMPER 5 YR/60,000 ROADSIDE ASSIST 8 YR/100,000 HYBRID UNCLUE COMPONENTS 				<p>Annual fuel cost \$1,000</p> <p>Fuel Economy & Greenhouse Gas Rating (passenger only)</p> <p>Smog Rating (passenger only)</p> <p>This vehicle emits 220 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fuelconomy.gov</p>			
<p>INCLUDED ON THIS VEHICLE EQUIPMENT GROUP 400A</p> <p>225/55R19 99H A/S BSW TIRES 19" MACHINED-ALUMINUM WHEELS FRONT LICENSE PLATE BRACKET</p> <p>NO CHARGE</p>		<p>PRICE INFORMATION</p> <p>BASE PRICE \$33,400.00</p> <p>TOTAL OPTIONS/OTHER \$1,195.00</p> <p>TOTAL VEHICLE & OPTIONS/OTHER DESTINATION & DELIVERY \$34,595.00</p>		<p>GOVERNMENT 5-STAR SAFETY RATINGS</p> <p>Overall Vehicle Score Not Rated</p> <p>Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</p> <p>Frontal Crash Driver Not Rated, Passenger Not Rated</p> <p>Side Crash Front seat Not Rated, Rear seat Not Rated</p> <p>Rollover Not Rated</p> <p>Based on the risk of rollover in a single-vehicle crash.</p> <p>Star ratings range from 1 to 5 stars (★ ★ ★ ★ ★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4238</p>			
<p>SOLD TO</p> <p>Kindle Ford P.O. BOX 730 Cape May Court House NJ 08210</p>		<p>RAMP ONE</p> <p>RA5R</p>		<p>FINAL ASSEMBLY PLANT</p> <p>LOUISVILLE</p>		<p>TOTAL MSRP \$34,595.00</p>	
<p>SHIP TO (IF OTHER THAN SOLD TO)</p> <p>Kindle Ford 16 443 Cape May Court House NJ 08210</p>		<p>RAMP TWO</p> <p>RAIL</p>		<p>METHOD OF FINANCING</p> <p>RAIL</p>		<p>ITEM #</p> <p>16-S003 Q/T 2</p>	
<p>SHIP THROUGH</p> <p>This label is affixed pursuant to the Federal Automobile Information Disclosure Act, Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.</p>		<p>FORD CREDIT</p> <p>KL061 N RB 2X 025 006868 11 06 19</p>		<p>Whether you decide to lease or finance your vehicle, you'll find the choices that are right for you. See your dealer for details or visit www.ford.com/finance.</p>			
<p>1FMCU0DZ8LU445432</p>				<p>WARNING: Operating, servicing and maintaining a passenger vehicle, pickup truck, van, or off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, oil, antifreeze, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to www.P65Warnings.ca.gov/passenger-vehicle.</p>			
<p>FORD PROTECT</p> <p>Insist on Ford Protect! The only extended service plan fully backed by Ford and honored at every Ford dealership in the U.S., Canada and Mexico. See your Ford dealer or visit www.FordOwner.com.</p>				<p>SCAN TO GET UPDATES TO NEWS</p> <p>Get 5 Star News, Alerts, Tips & More</p>			

Figure A-69: Monroney Label

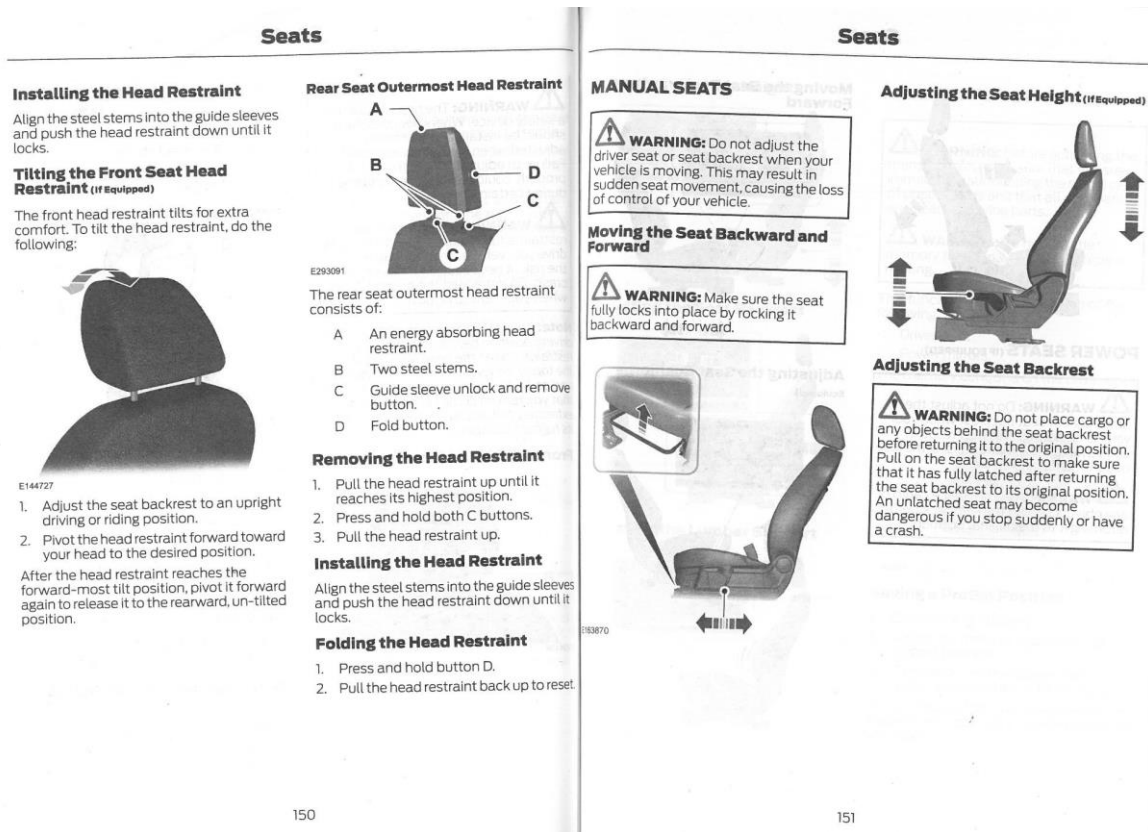


Figure A-70: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

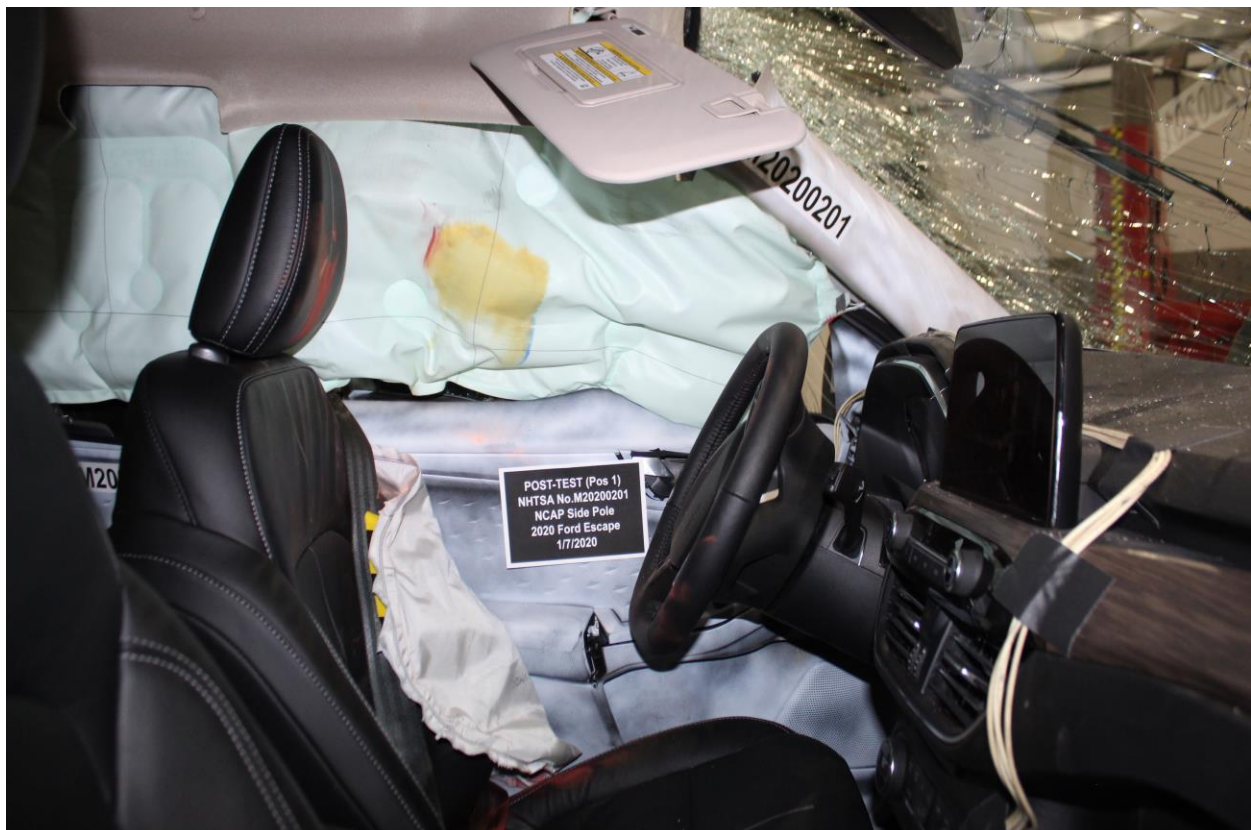


Figure A-71: Post-Test View of Shattered Vehicle Inner Door Panel (if applicable)

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

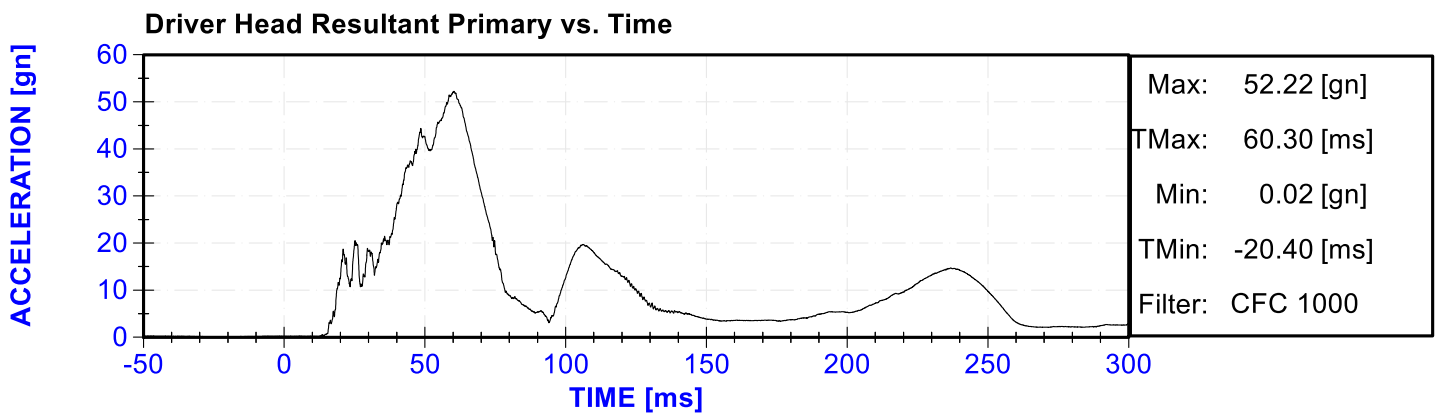
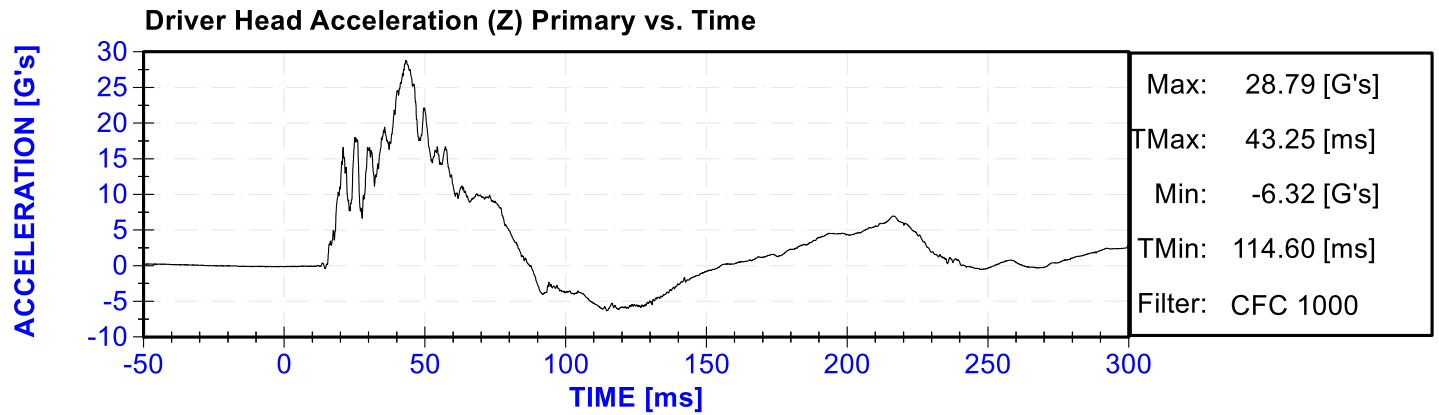
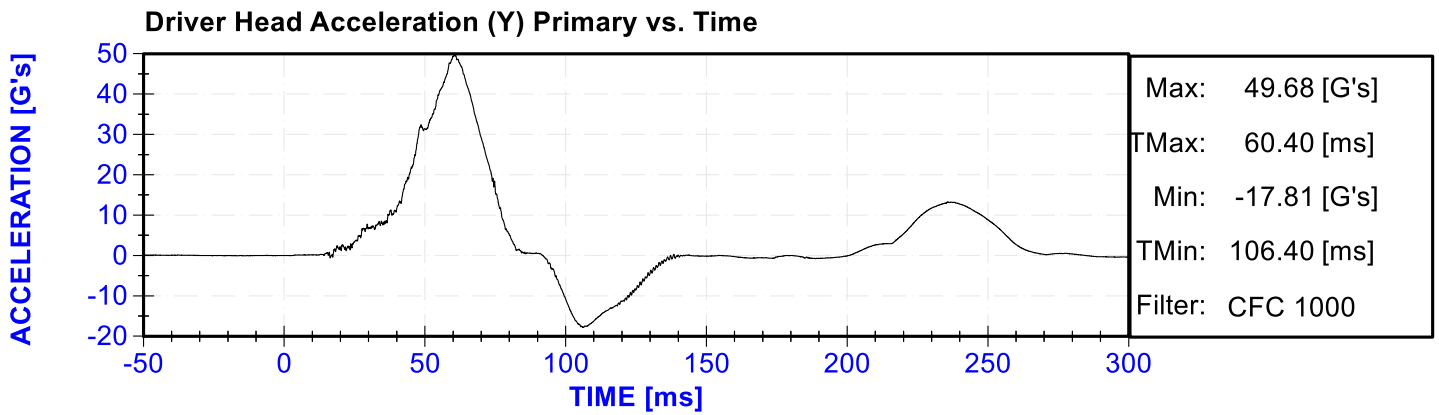
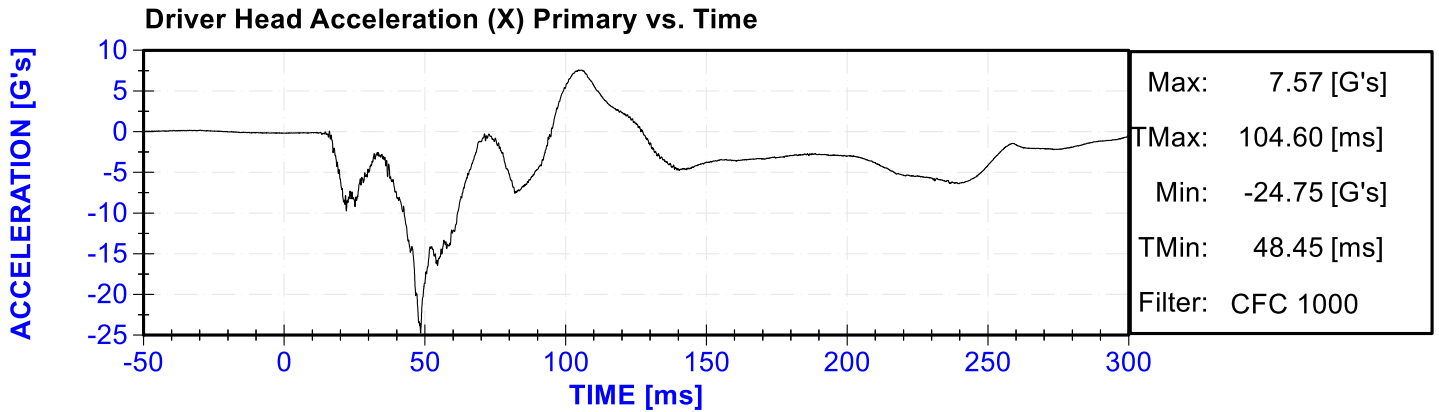
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection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

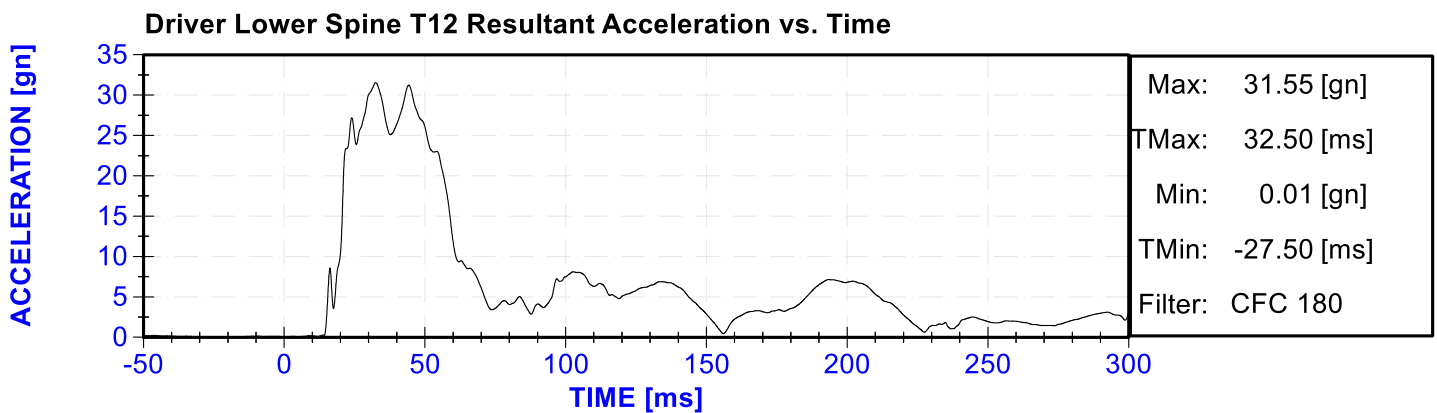
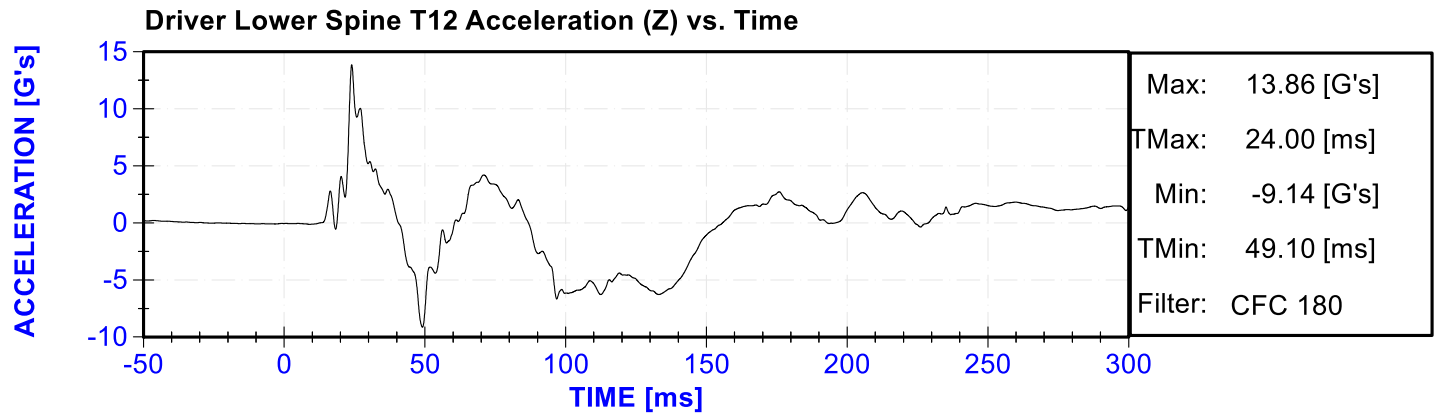
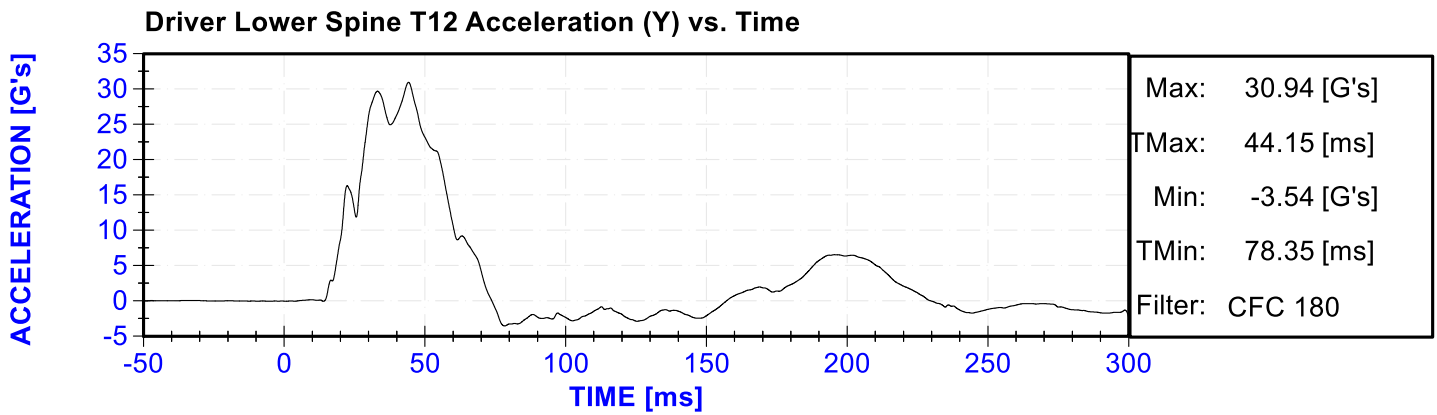
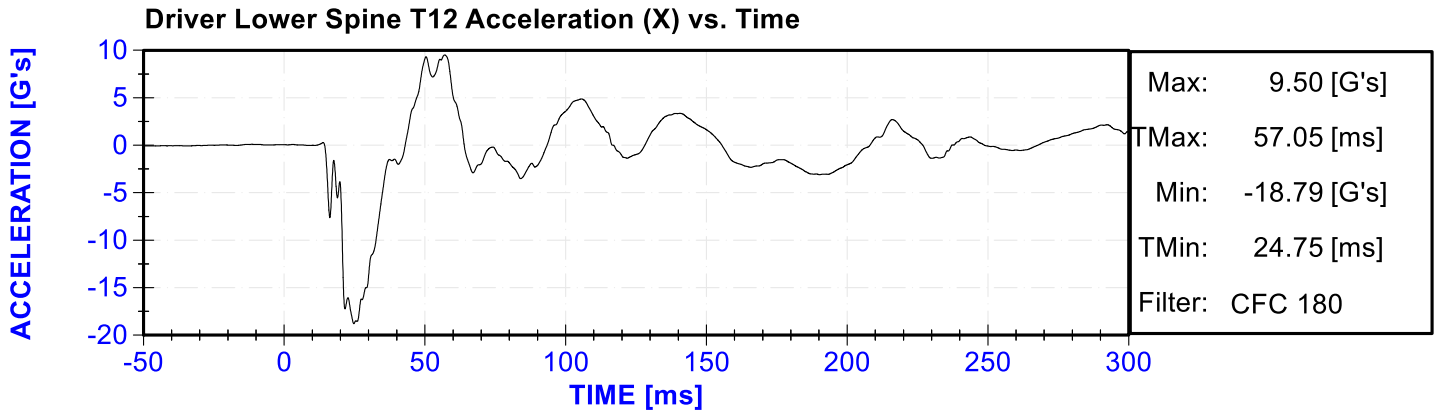
Vehicle Instrumentation Data

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 (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)

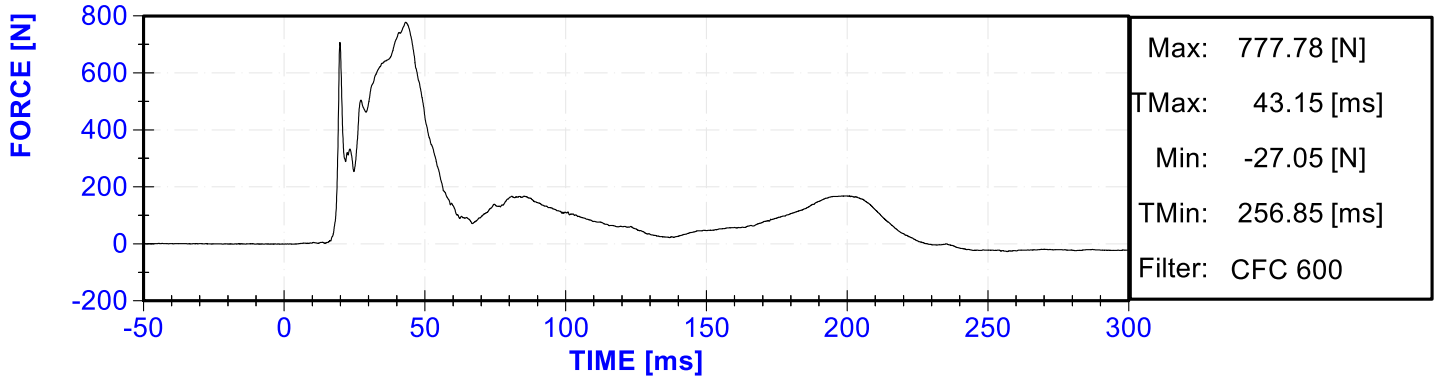
Pole Instrumentation Data

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)

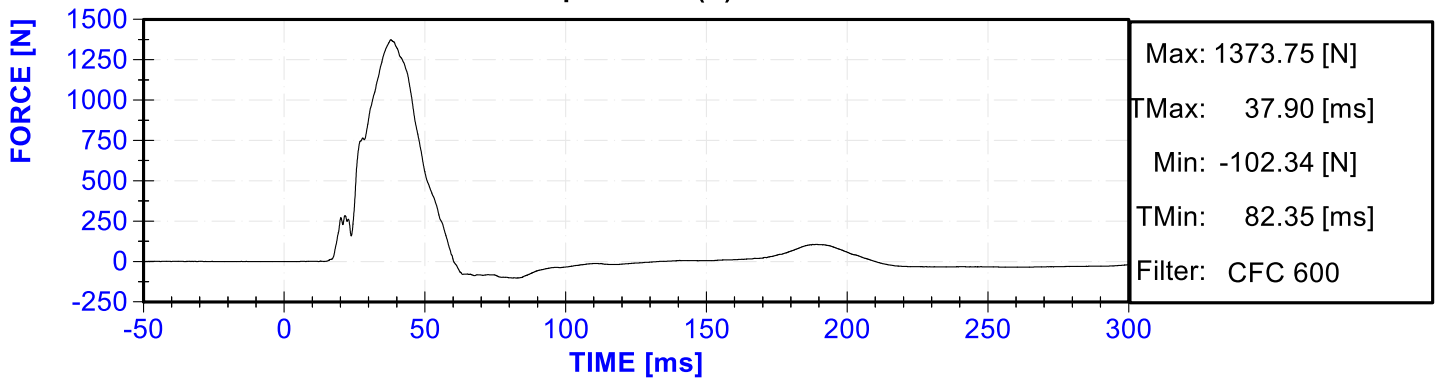




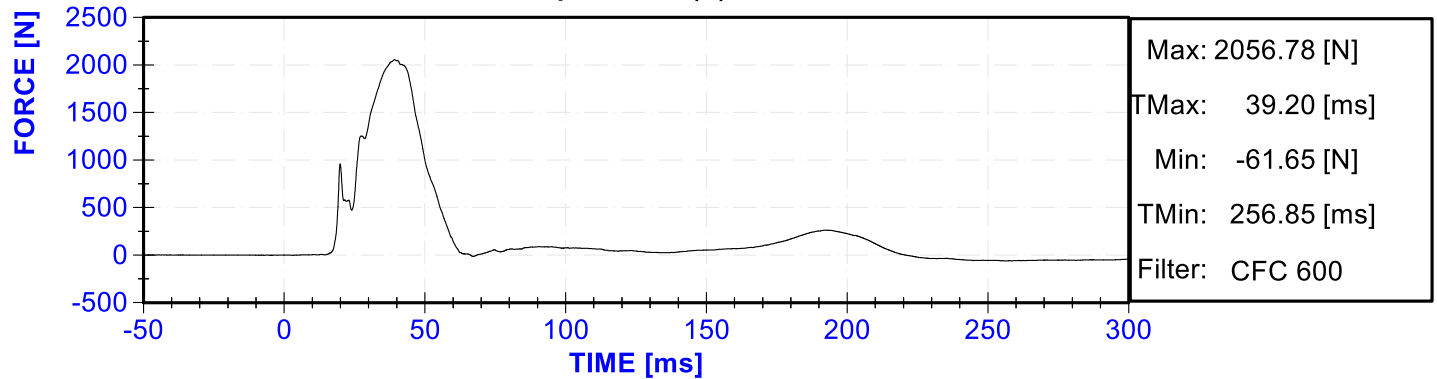
Driver Iliac Wing Force on Impact Side (Y) vs. Time



Driver Acetabulum Force on Impact Side (Y) vs. Time



Driver Total Pelvis Force on Impact Side (Y) vs. Time



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)

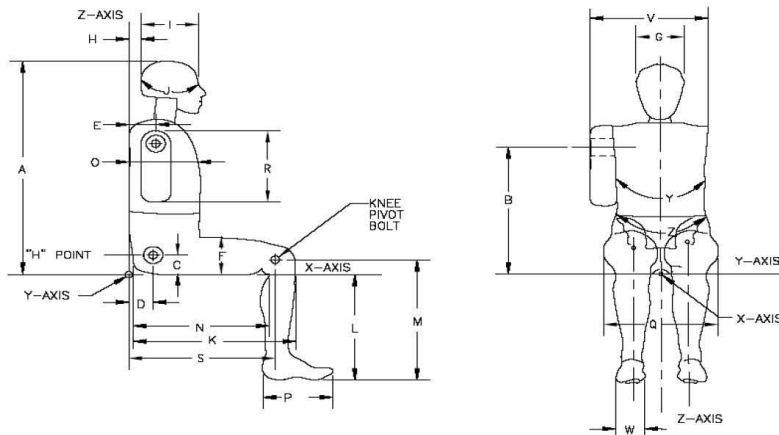


External Measurements - SID-IIs

Technician: K. Dutton

Date: 12/02/2019

Dummy Serial Number: DG8012



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	779	Pass
B	Shoulder Pivot Height	437	453	446	Pass
C	H-point Height	79	89	85	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	44	Pass
I	Head Depth	178	188	185	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	532	Pass
L	Popliteal Height	343	369	355	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	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	345	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	867	Pass
Z	Waist Circumference	761	791	781	Pass

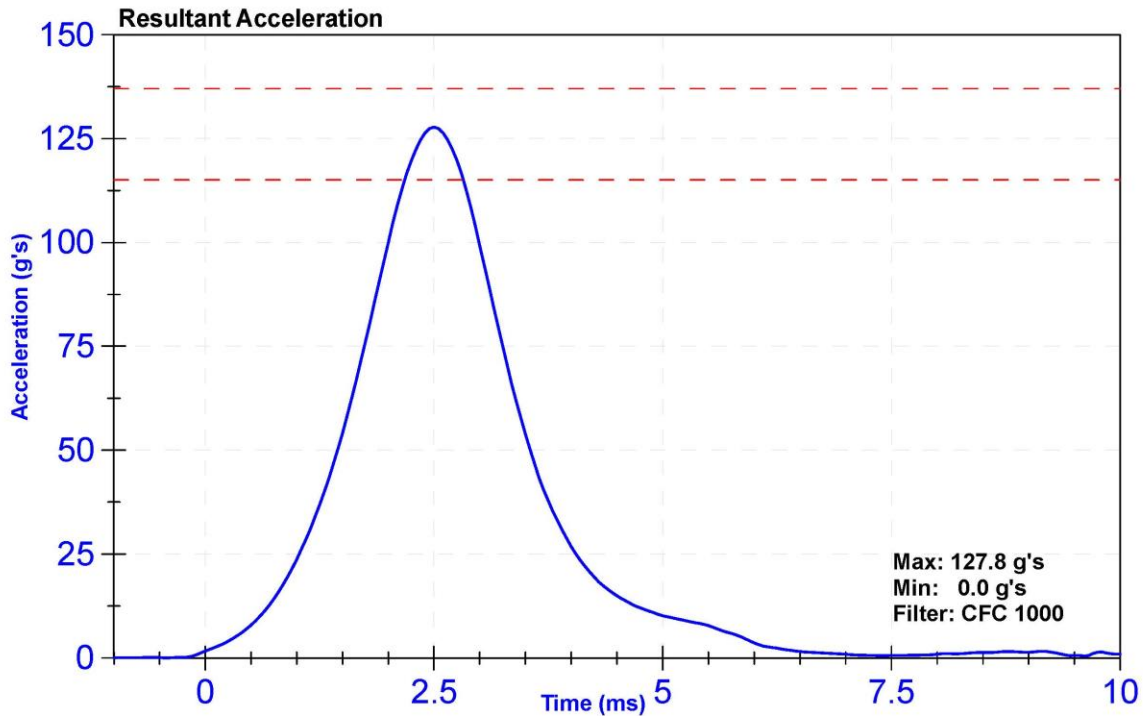
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

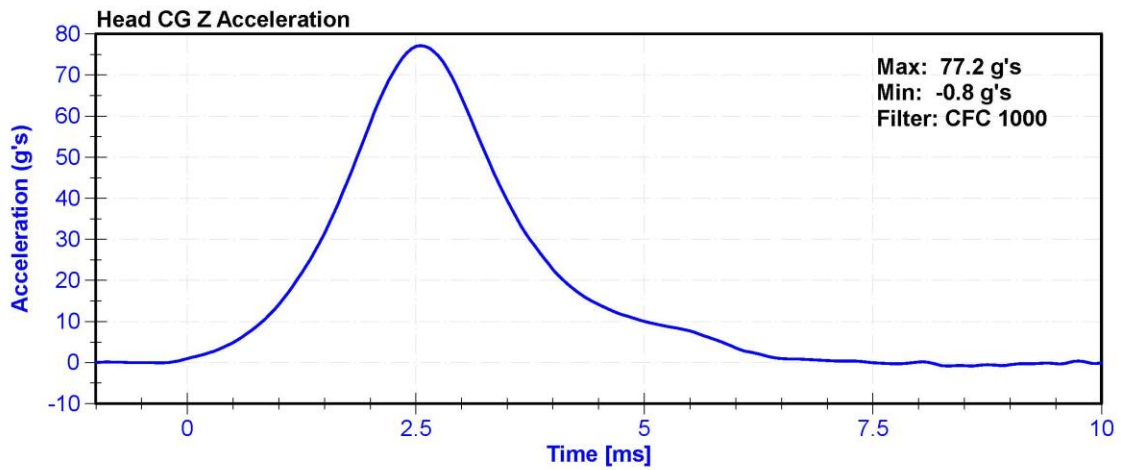
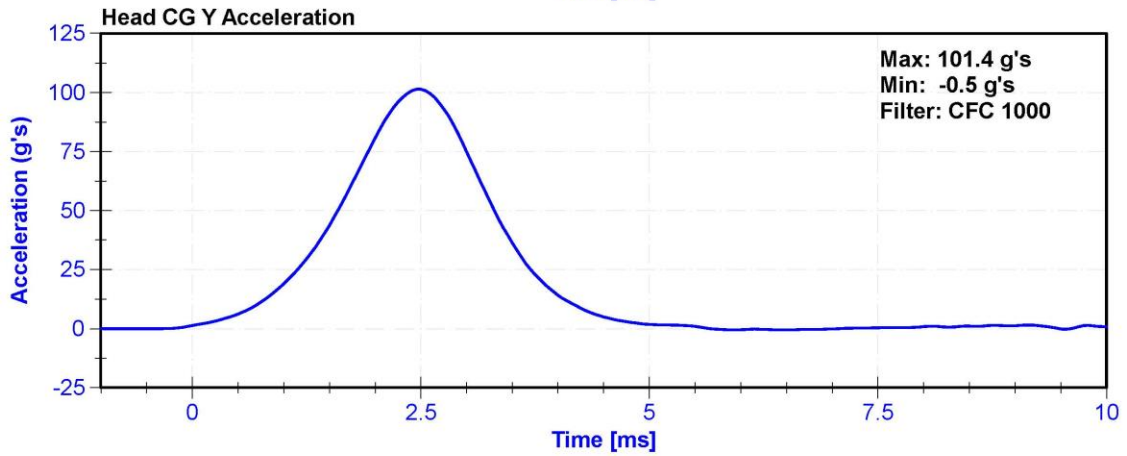
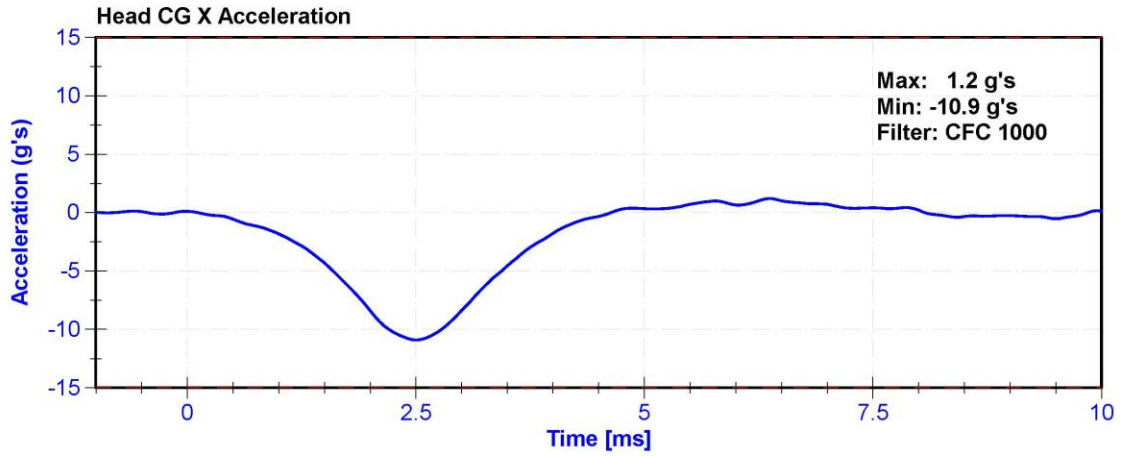
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	25.4	Pass
Resultant Acceleration	115	137	g's	127.8	Pass
Oscillation	0	15	%	1.2	Pass
Fore-Aft Acceleration	-15	15	g's	-10.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P74788	10/28/2019	4/28/2020
Y Accelerometer	Endevco	P83432	10/28/2019	4/28/2020
Z Accelerometer	Endevco	P83319	10/28/2019	4/28/2020





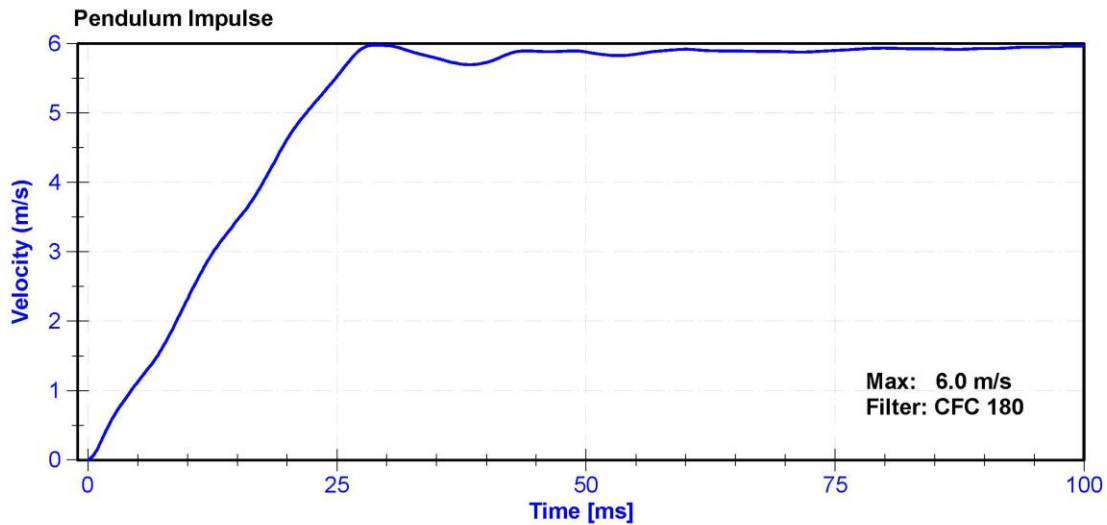
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

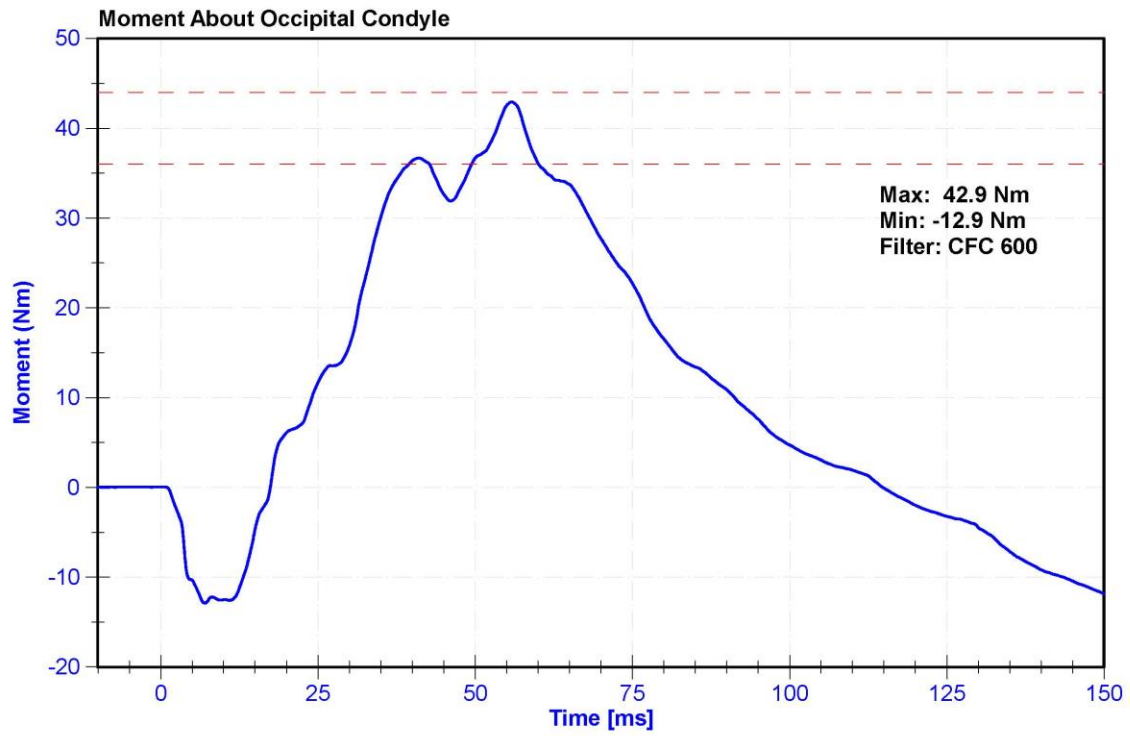
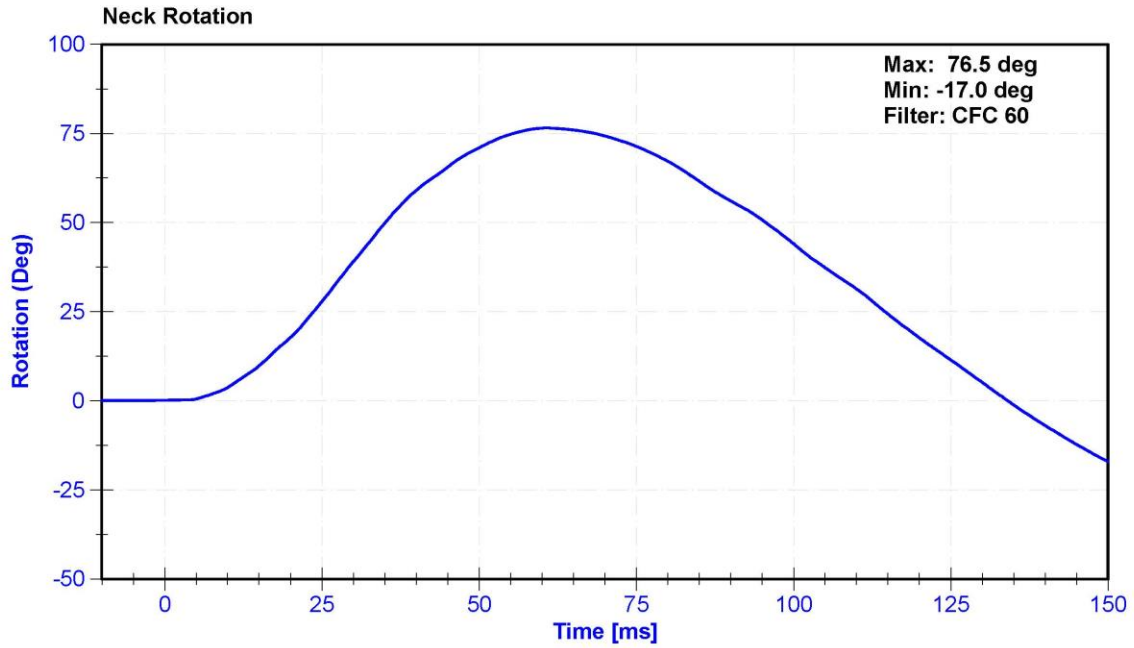
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	26	Pass
Velocity	5.51	5.63	m/s	5.549	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.32	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.46	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.62	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	5.98	Pass
Neck Rotation	71	81	deg	76.5	Pass
Time at Maximum Rotation	50	70	ms	60.7	Pass
Moment about the OC	36	44	Nm	42.9	Pass
Moment Decay to 0 Nm	102	126	ms	114.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/29/2019	1/29/2020
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/4/2019	11/3/2020
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/4/2019	11/3/2020
Upper Neck Load Cell	Denton 1716A	LC-2192Fy	6/20/2019	6/19/2020





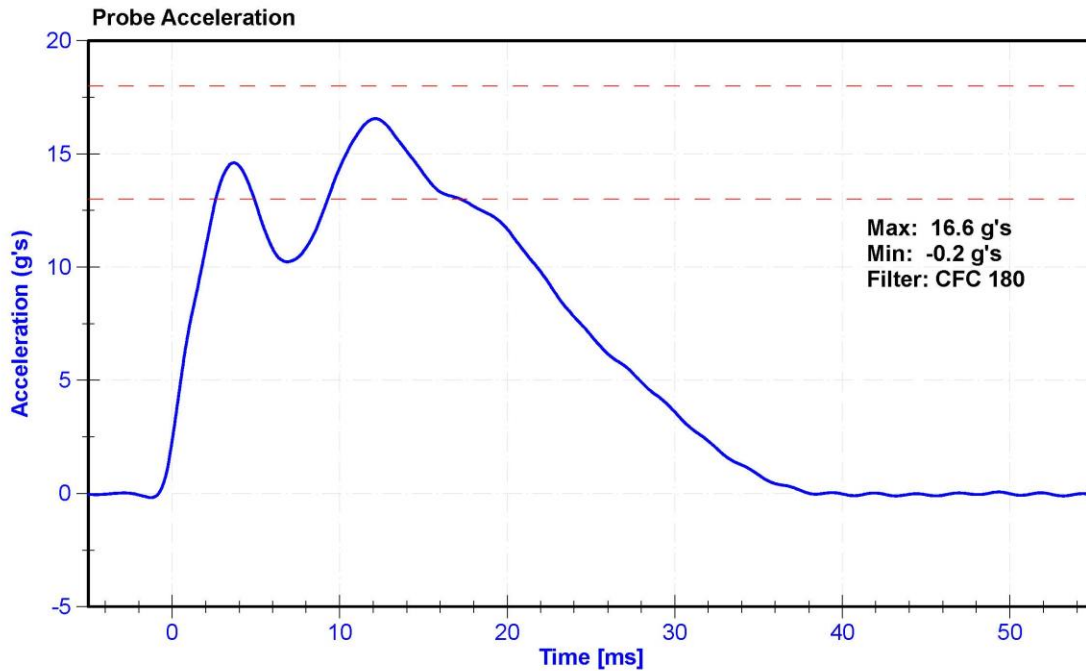
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

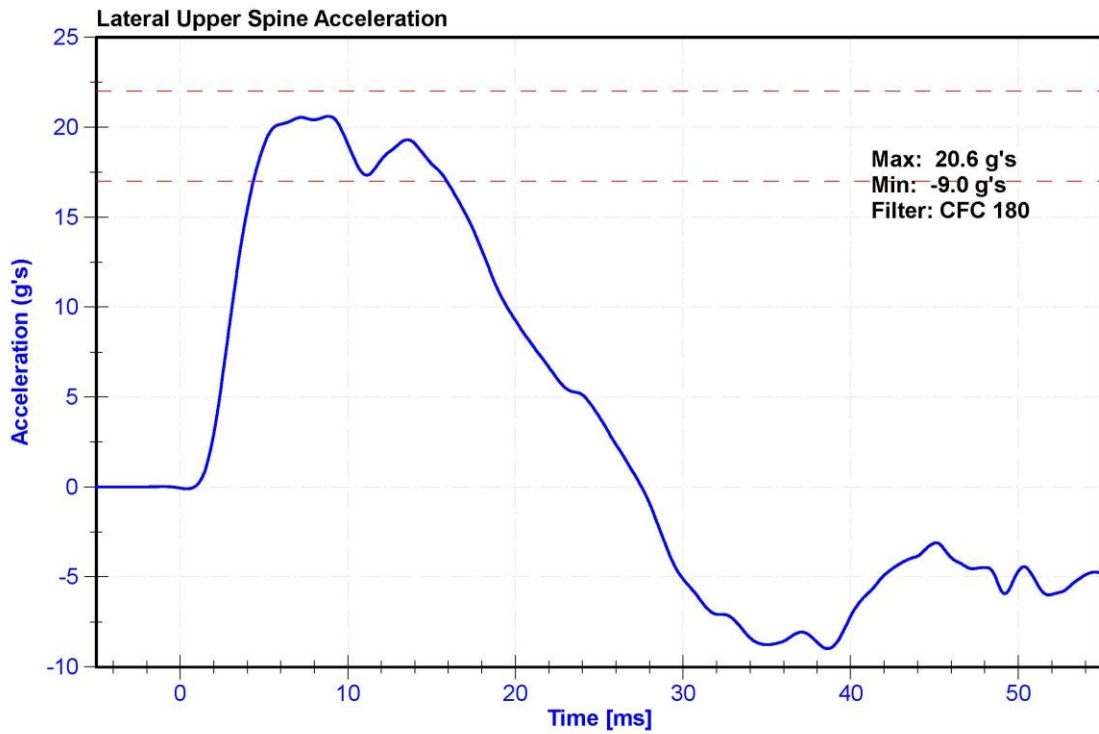
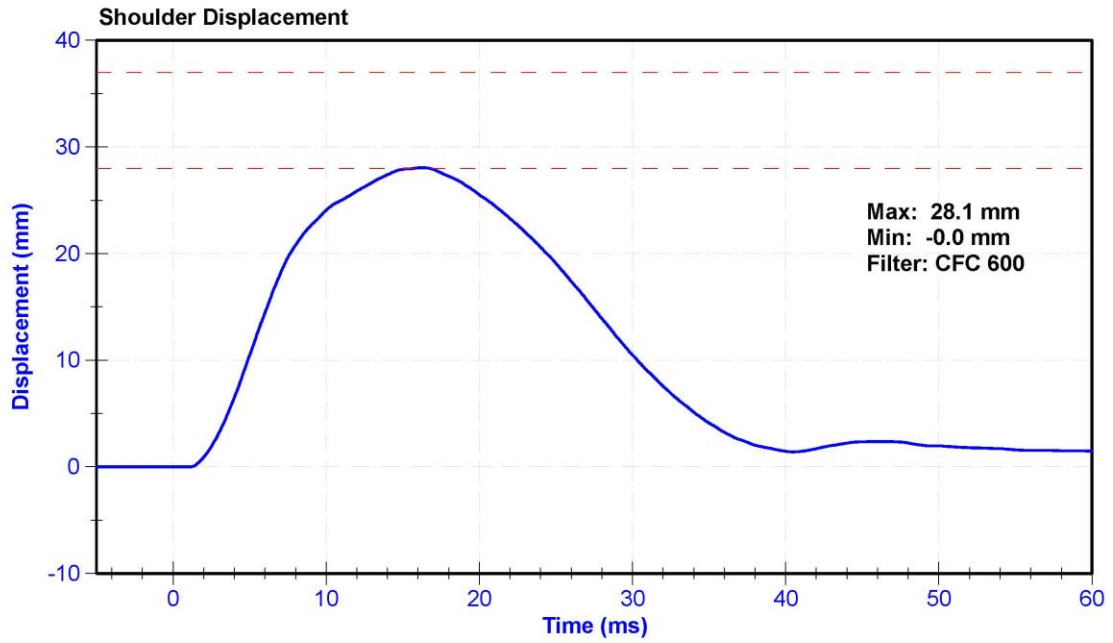
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	25.2	Pass
Velocity	4.2	4.4	m/s	4.38	Pass
Probe Acceleration	13	18	g's	16.6	Pass
Shoulder Deflection	28	37	mm	28.1	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	10/28/2019	4/27/2020
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	10/28/2019	4/27/2020





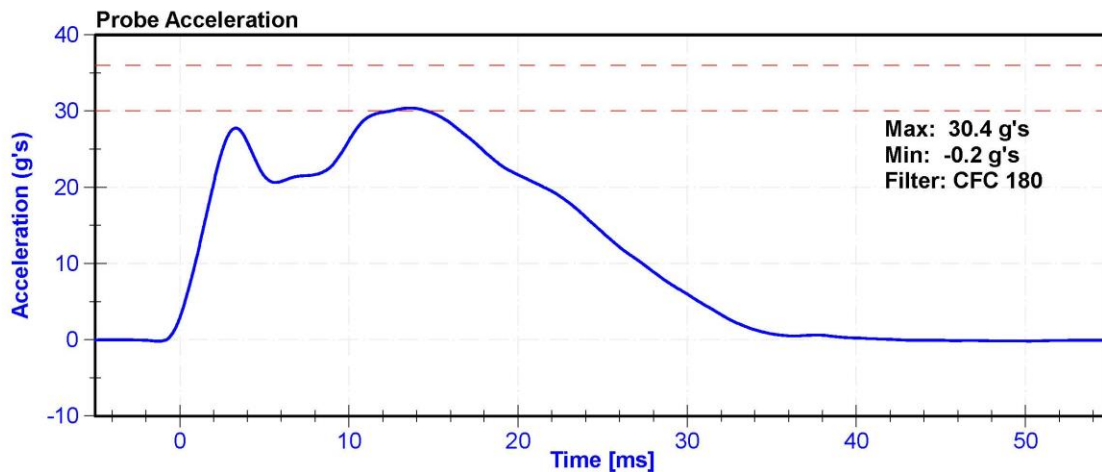
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ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

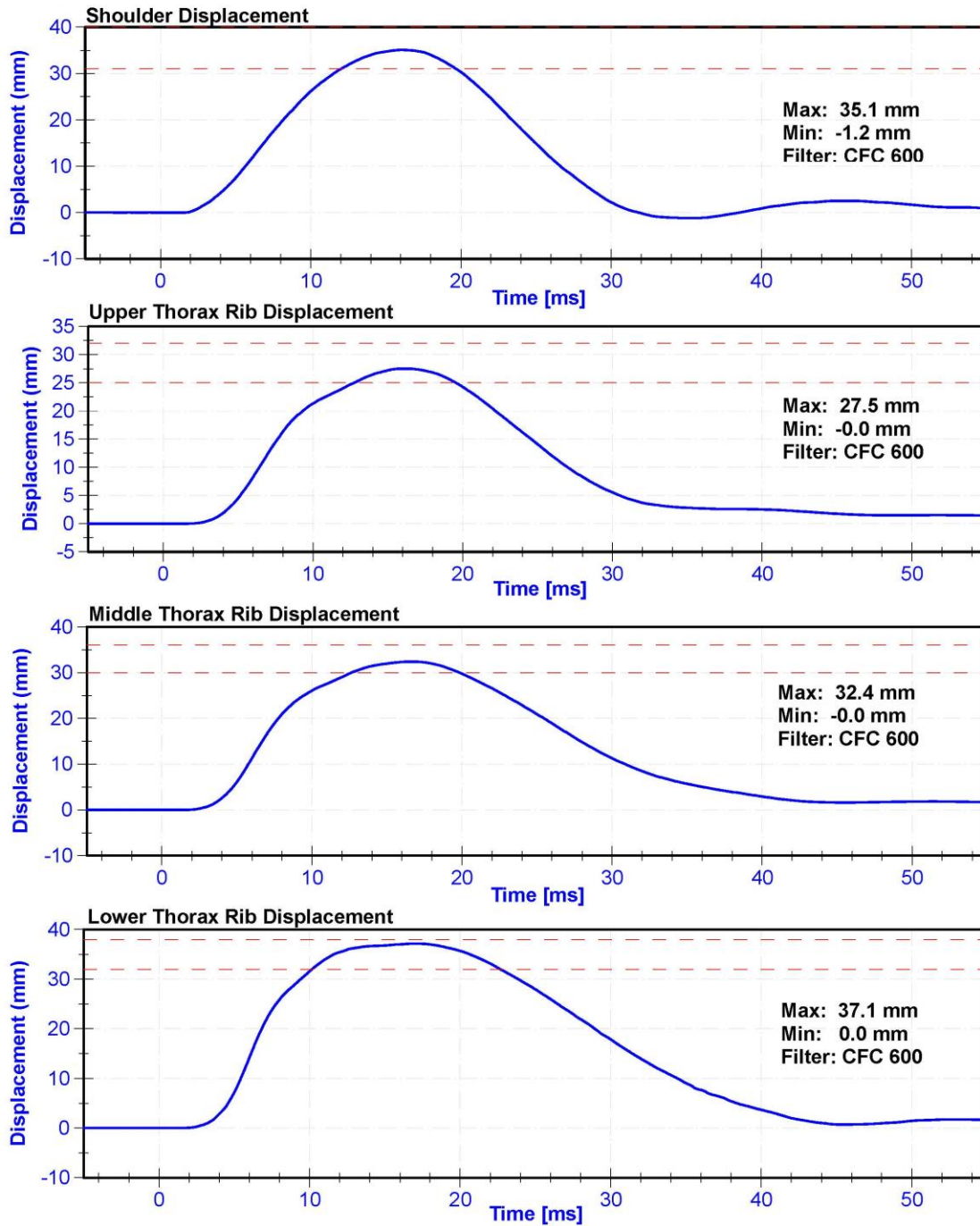
Results

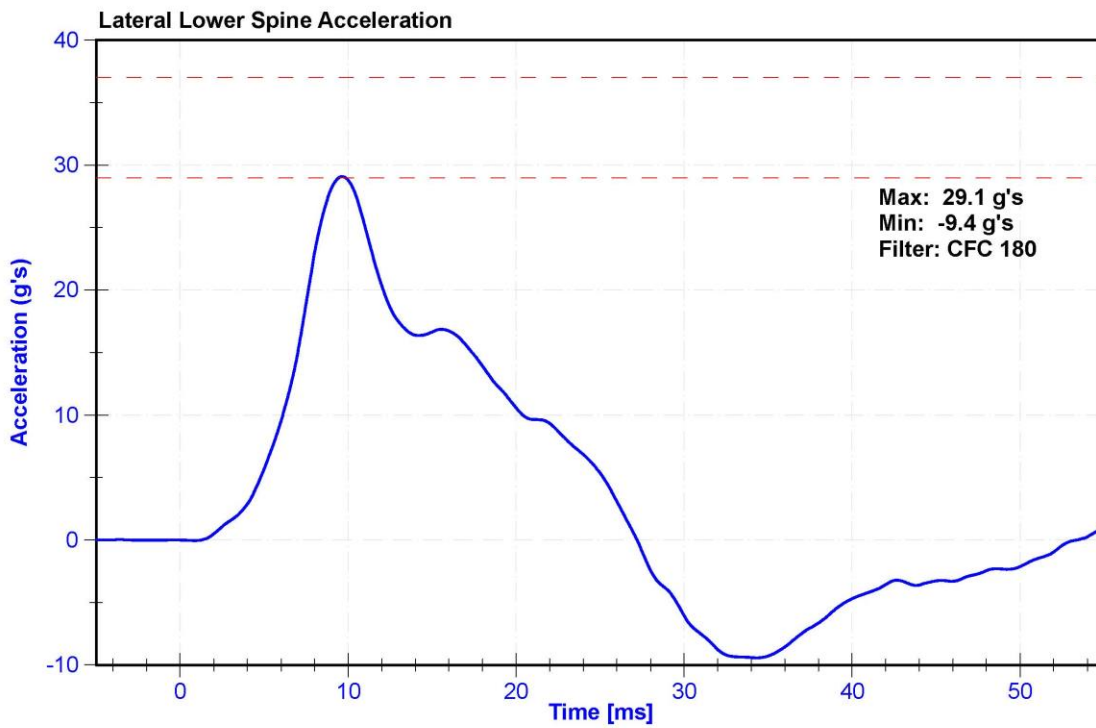
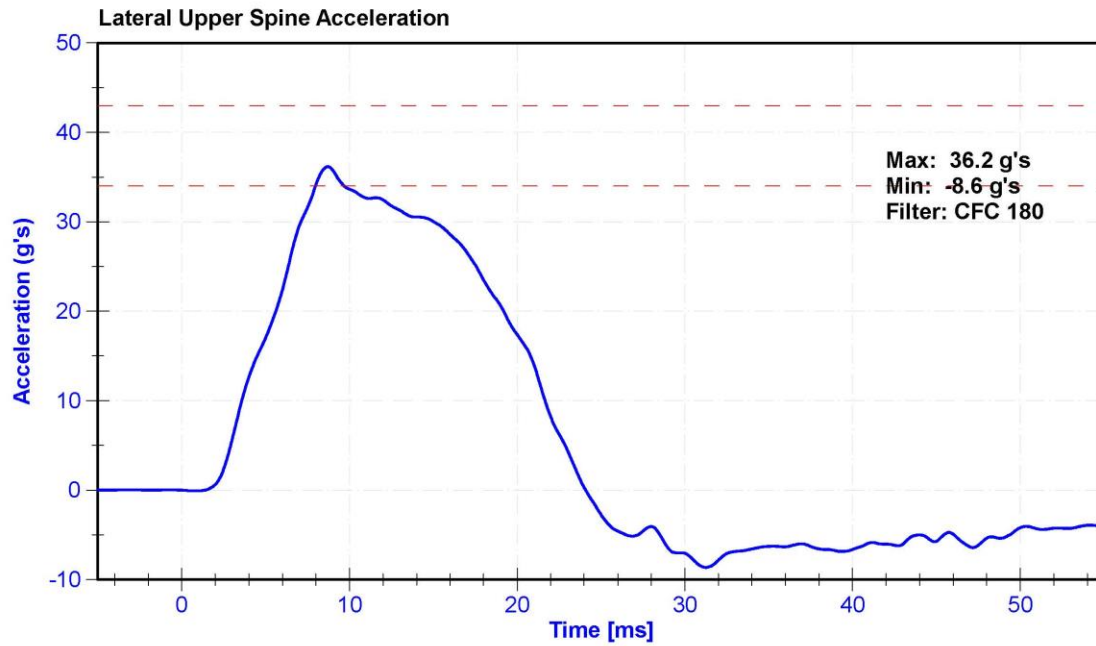
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	25.4	Pass
Velocity	6.6	6.8	m/s	6.73	Pass
Probe Acceleration after 5 ms	30	36	g's	30.4	Pass
Lateral Upper Spine Acceleration	34	43	g's	36.2	Pass
Lateral Lower Spine Acceleration	29	37	g's	29.1	Pass
Shoulder Deflection	31	40	mm	35.1	Pass
Upper Thorax Rib Deflection	25	32	mm	27.5	Pass
Mid Thorax Rib Deflection	30	36	mm	32.4	Pass
Lower Thorax Rib Deflection	32	38	mm	37.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P64148	10/28/2019	4/27/2020
Upper Spine T12 Y Accelerometer	ENDEVCO 7264CT	AC-P51327	9/30/2019	3/31/2020
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	10/28/2019	4/27/2020
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	10/28/2019	4/27/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	10/28/2019	4/27/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	10/28/2019	4/27/2020







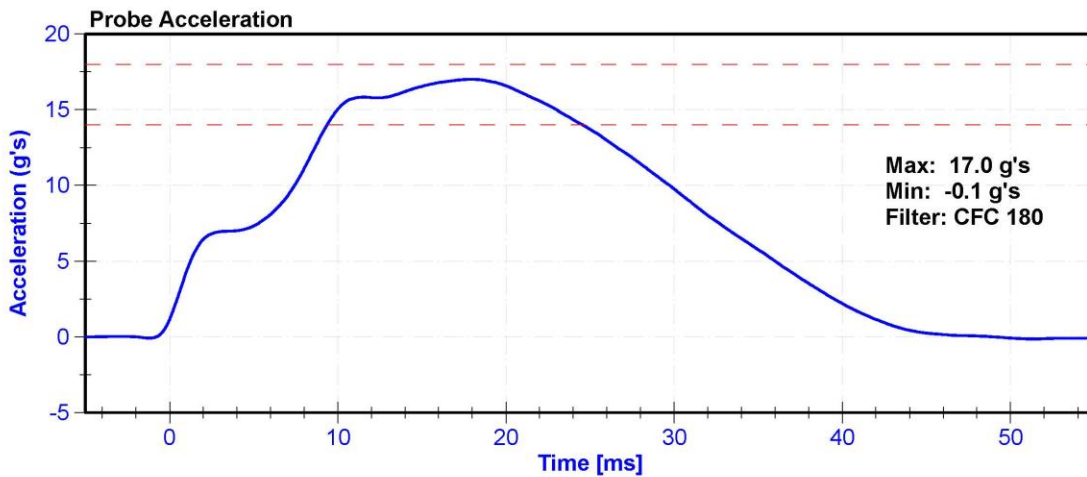
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG-8012	Laboratory Supervisor	K. Brogan

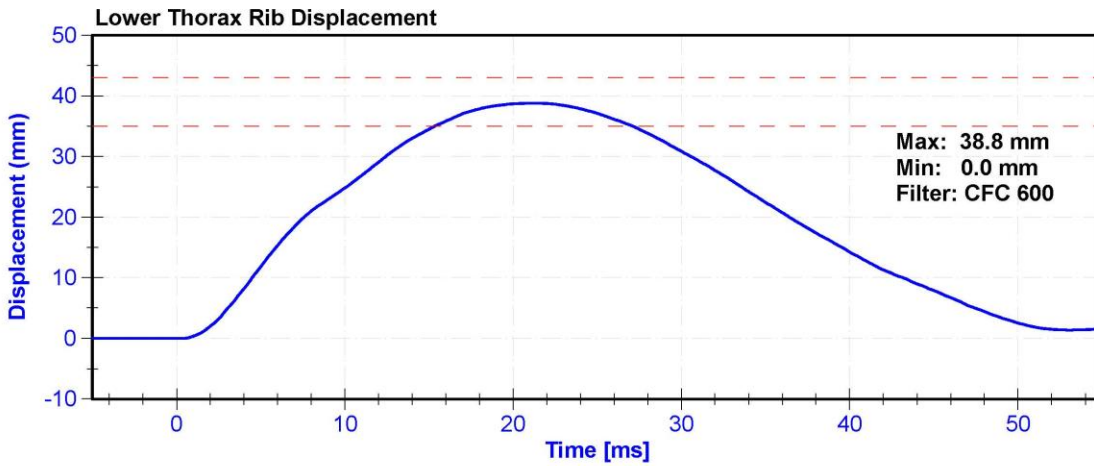
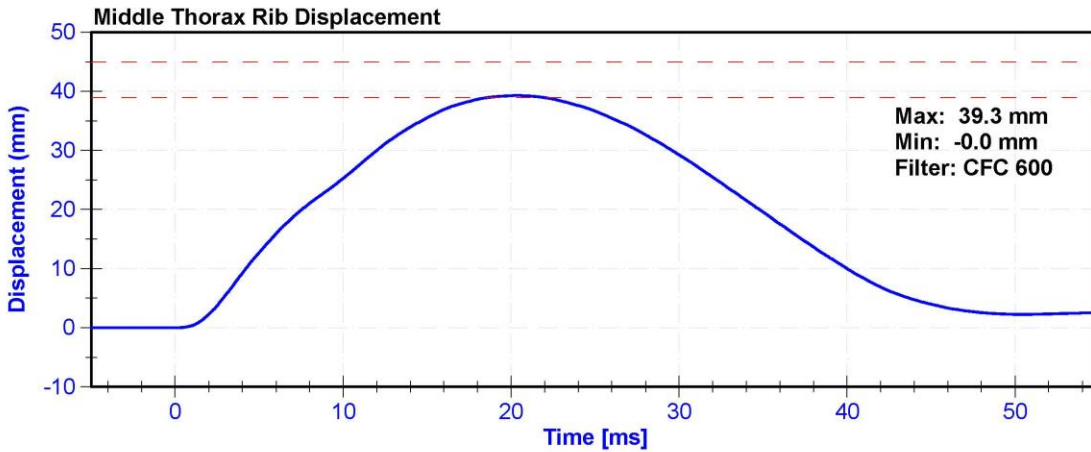
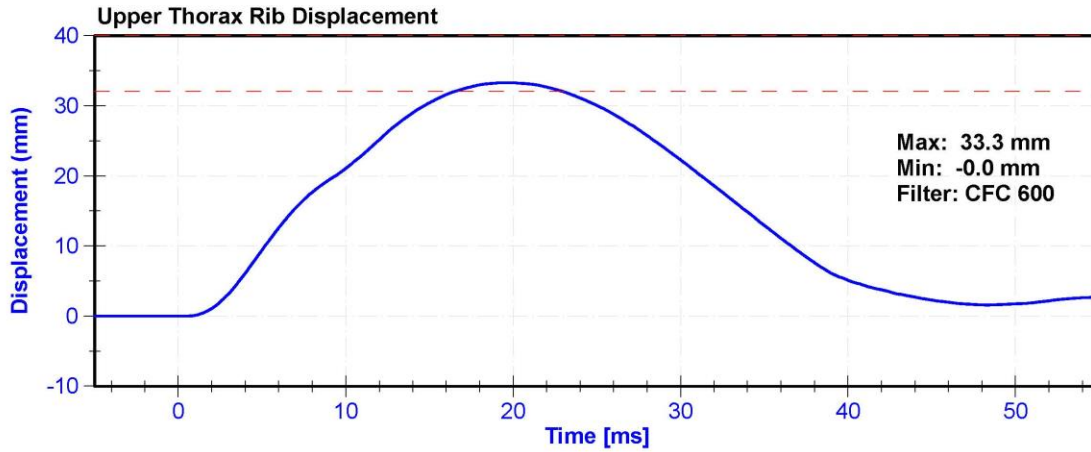
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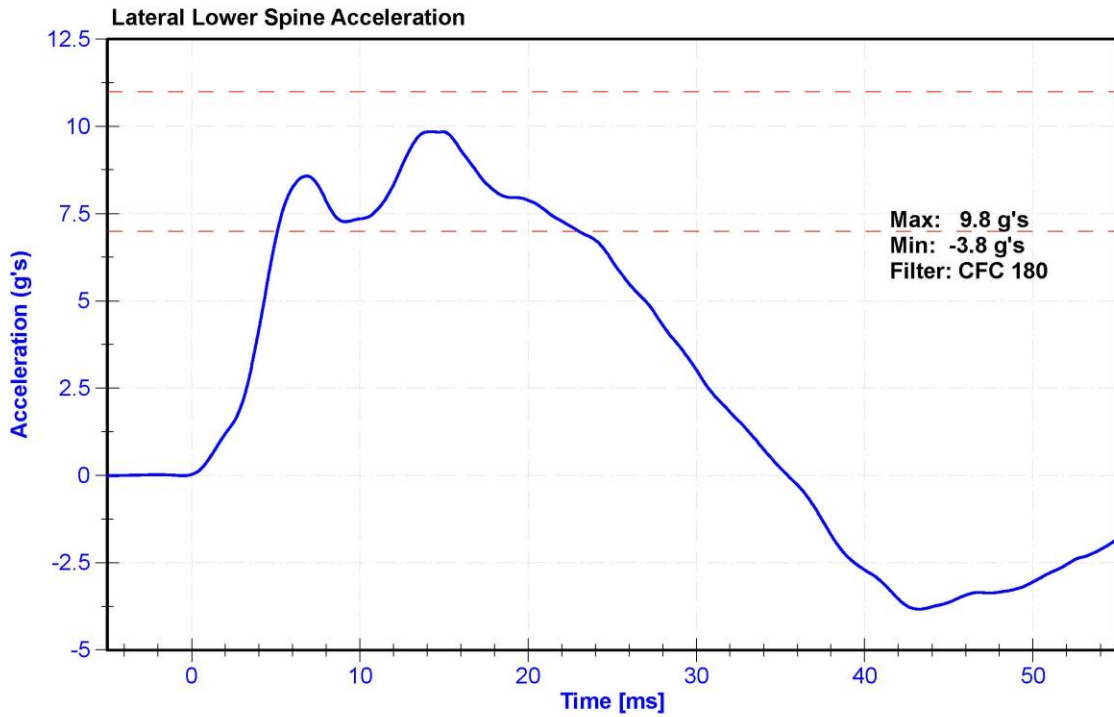
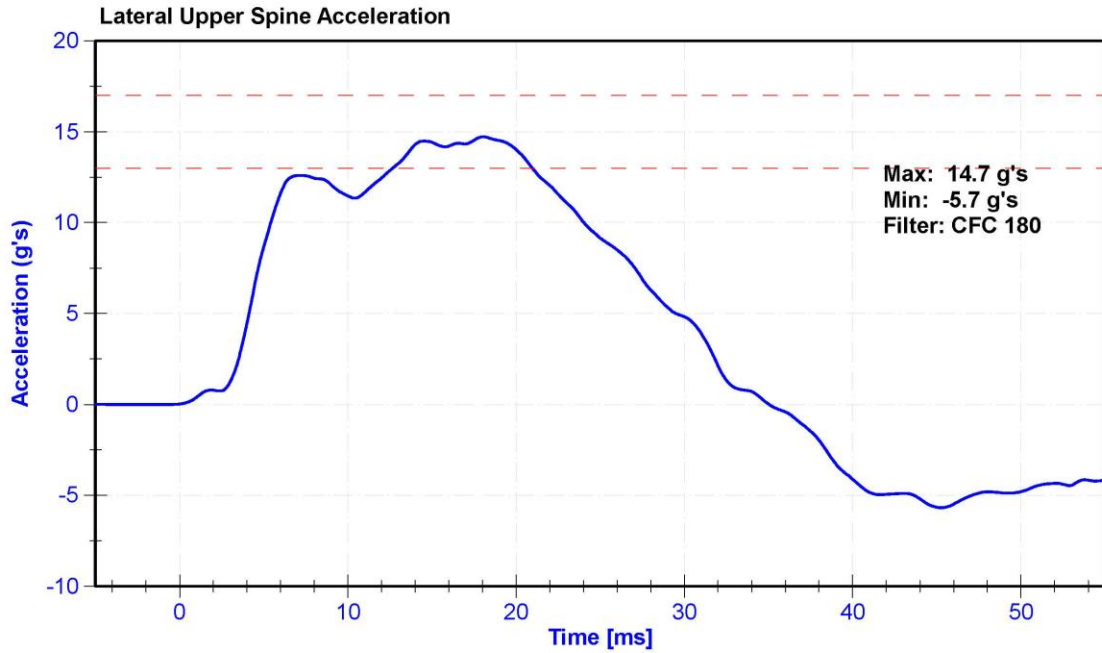
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Probe Acceleration	14	18	g's	17.0	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.7	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.8	Pass
Upper Thorax Rib Deflection	32	40	mm	33.3	Pass
Middle Thorax Rib Deflection	39	45	mm	39.3	Pass
Lower Thorax Rib Deflection	35	43	mm	38.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	10/28/2019	4/27/2020
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51327	9/30/2019	3/31/2020
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	10/28/2019	4/27/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	10/28/2019	4/27/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	10/28/2019	4/27/2020







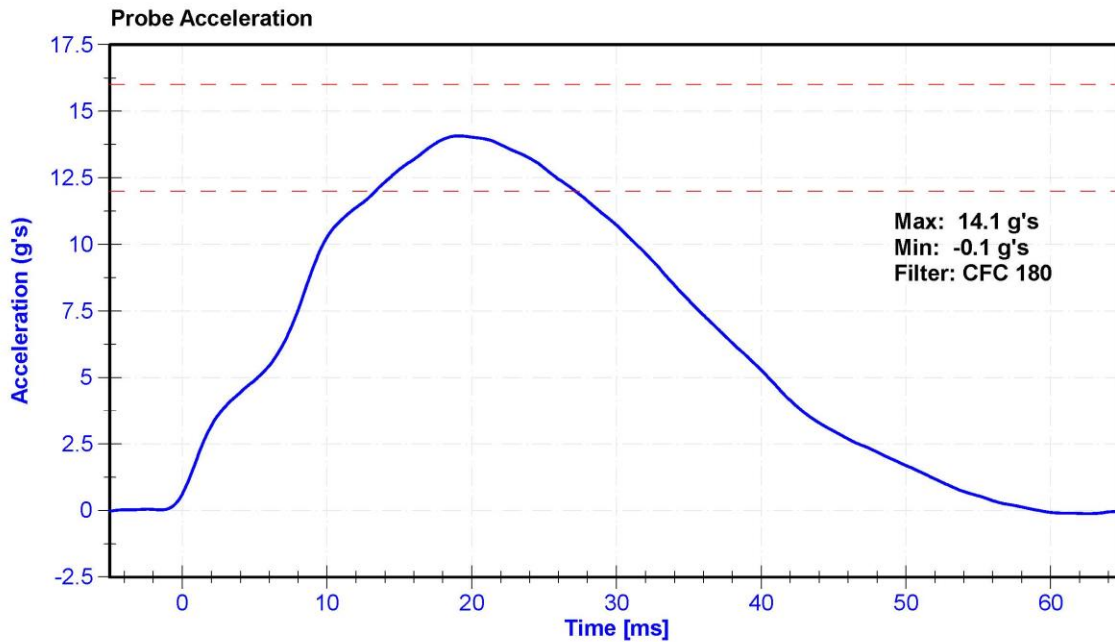
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

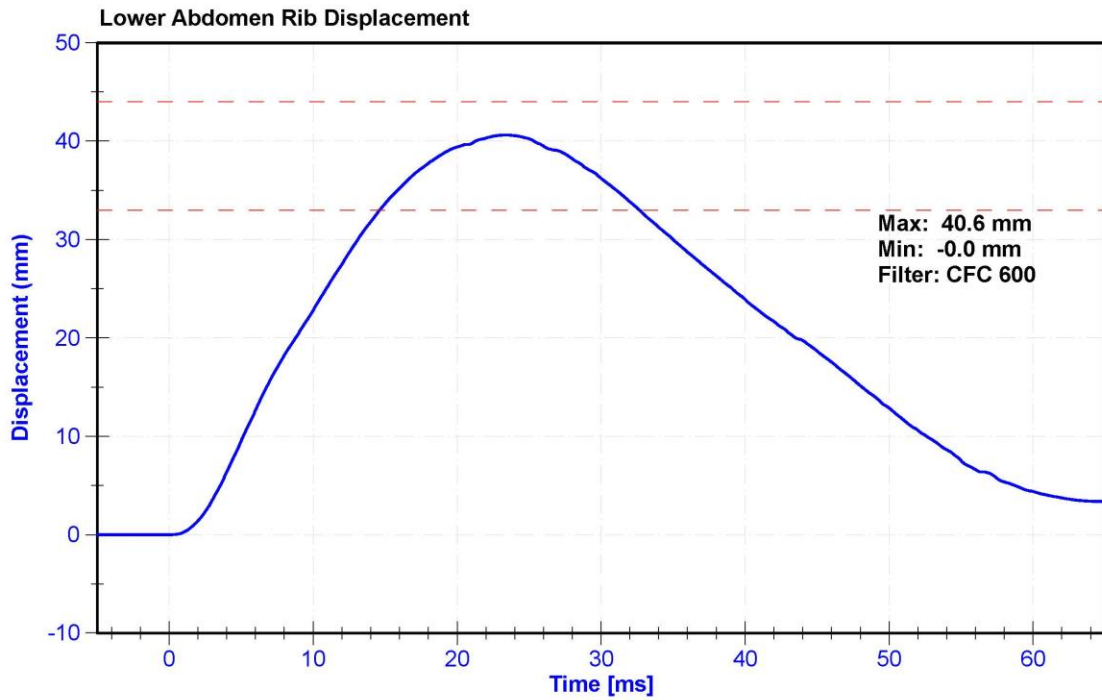
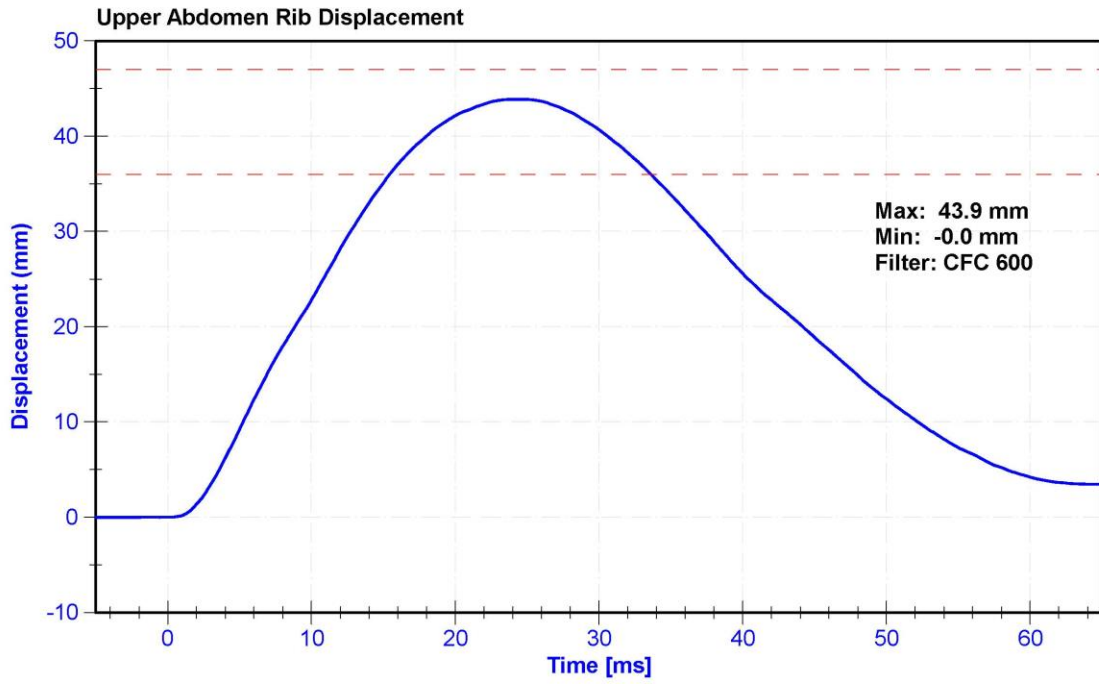
Results

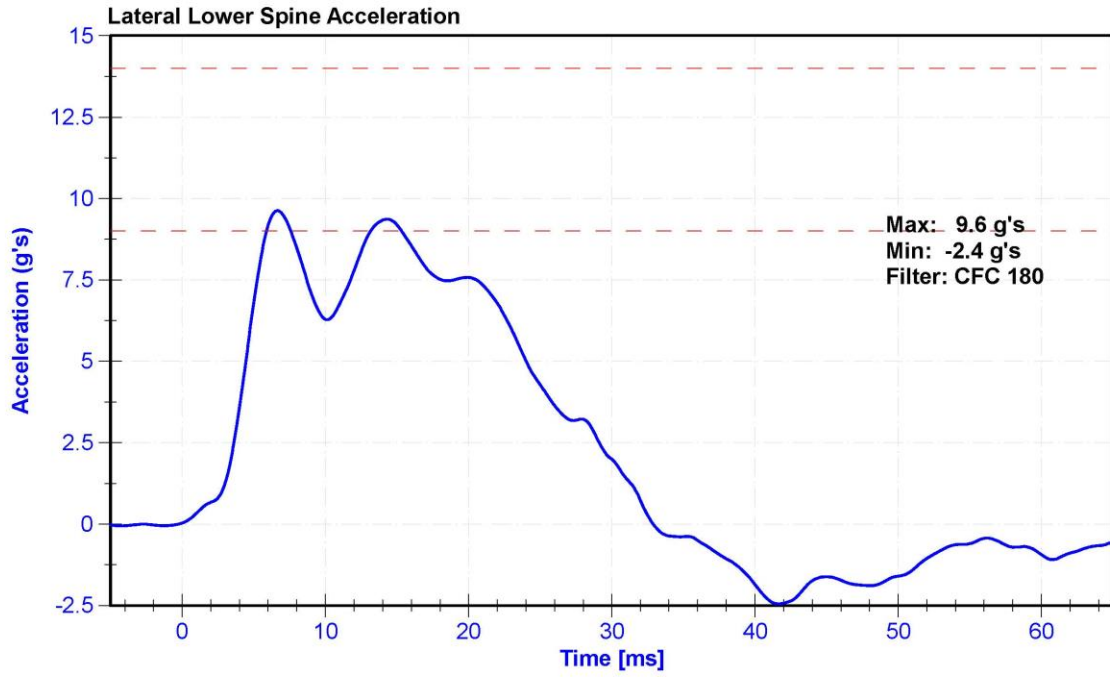
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	29.0	Pass
Velocity	4.2	4.4	m/s	4.20	Pass
Probe Acceleration	12	16	g's	14.1	Pass
Lateral Lower Spine Acceleration	9	14	g's	9.6	Pass
Upper Abdomen Rib Deflection	36	47	mm	43.9	Pass
Lower Abdomen Rib Deflection	33	44	mm	40.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51327	9/30/2019	3/31/2020
Upper Abdomen Rib Potentiometer	Servo 08TC1-3725	DS-008GFE	10/28/2019	4/27/2020
Lower Abdomen Rib Potentiometer	Servo 08TC1-3745	DS-1774GFE	10/28/2019	4/27/2020







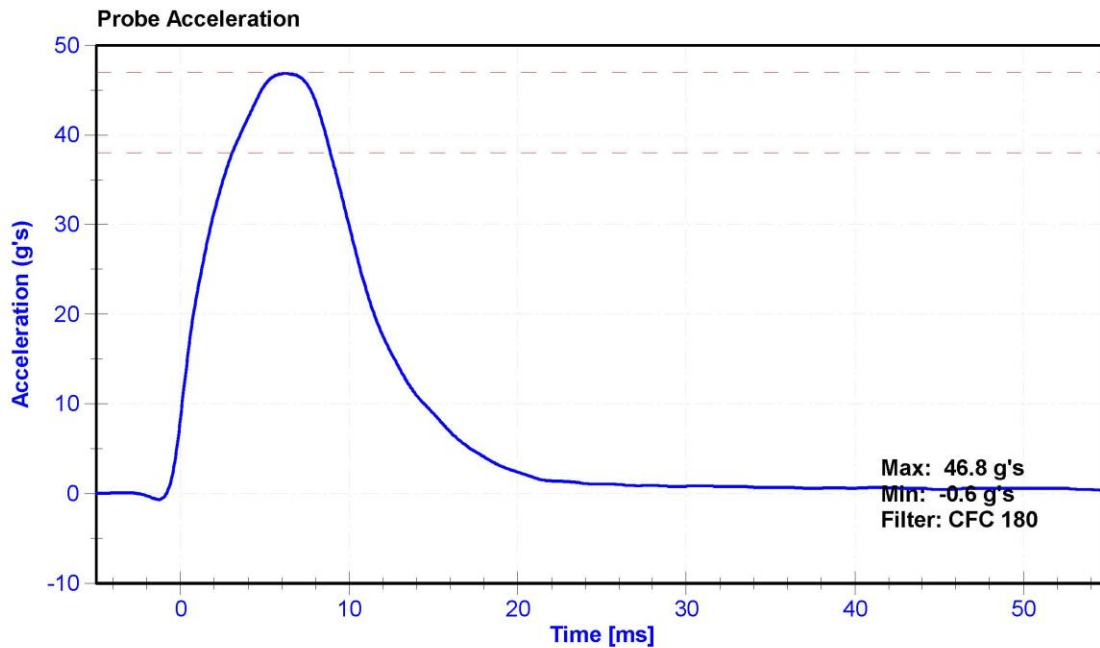
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

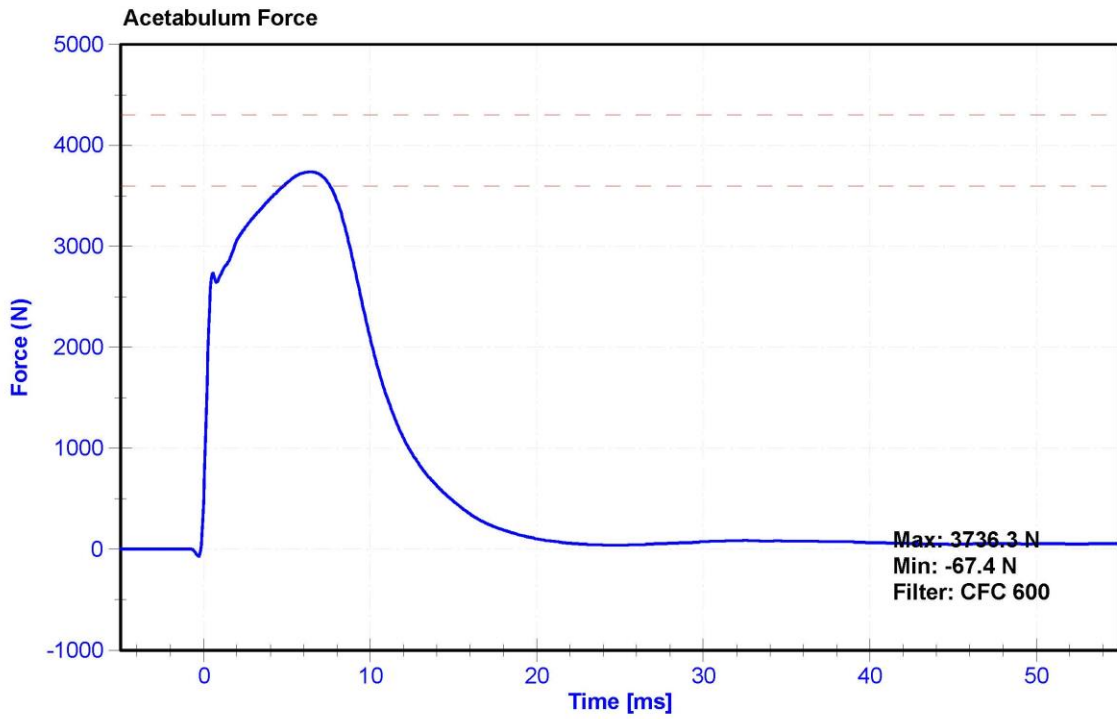
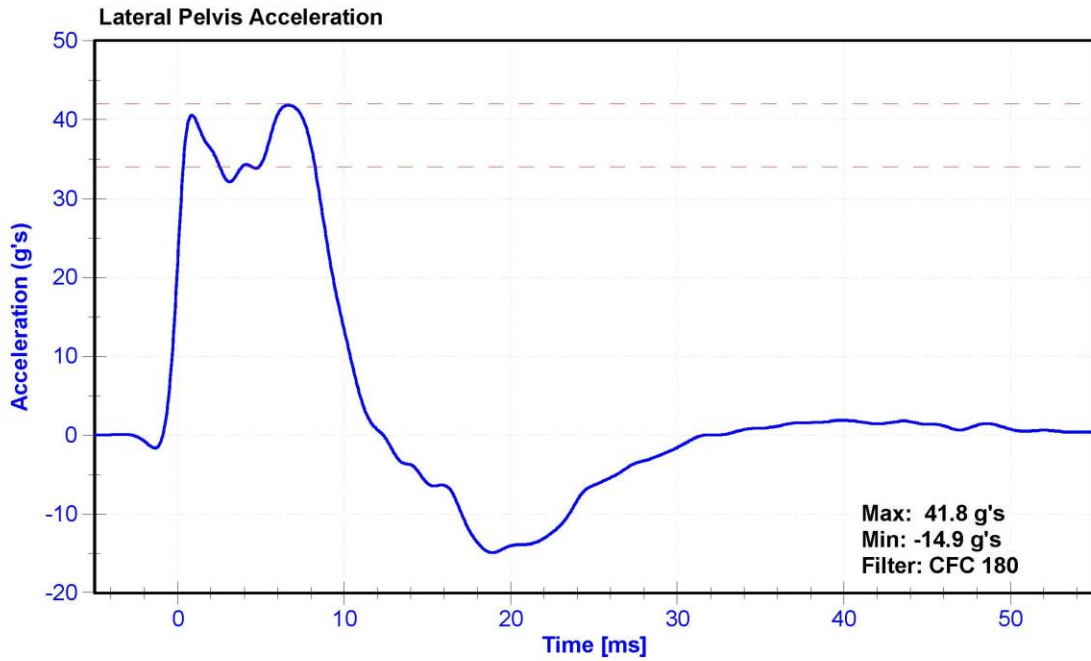
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	35.4	Pass
Velocity	6.6	6.8	m/s	6.61	Pass
Probe Acceleration	38	47	g's	46.8	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.8	Pass
Acetabulum Force	3600	4300	N	3736.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51875	10/28/2019	4/27/2020
Acetabulum Load Cell	Denton 3249J	LC-4986Fy	6/14/2019	6/13/2020
Certification Plug	SACO	11658	10/20/2017	N/A
Crash Test Plug	SACO	11717	3/27/2017	N/A







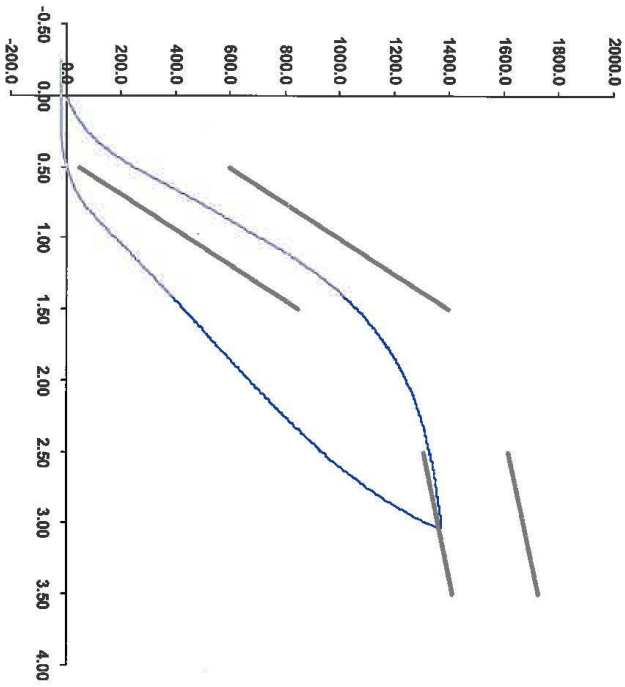
cert

SID-lls Pelvis Plug Certification Test

Plug S/N 11658
Test Number 5243
Report Number 5255
Test Date 10/20/2017 1:21:18 PM

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)	1,300.00	1,618.00
Force @ 3.0 mm (N)	1,361.00	1,673.00

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



Operator DC
Part Number 180-4450

Template No 107 20-Oct-17
SACO Research

By:  Date: 10/17/17
SACO Research 41735 Elm St, #401 Murietta, CA 92562 Tel 310-694-2082 FAX



Crash

SID-IIs Pelvis Plug Certification Test

Plug S/N 11717

Test Number 3459

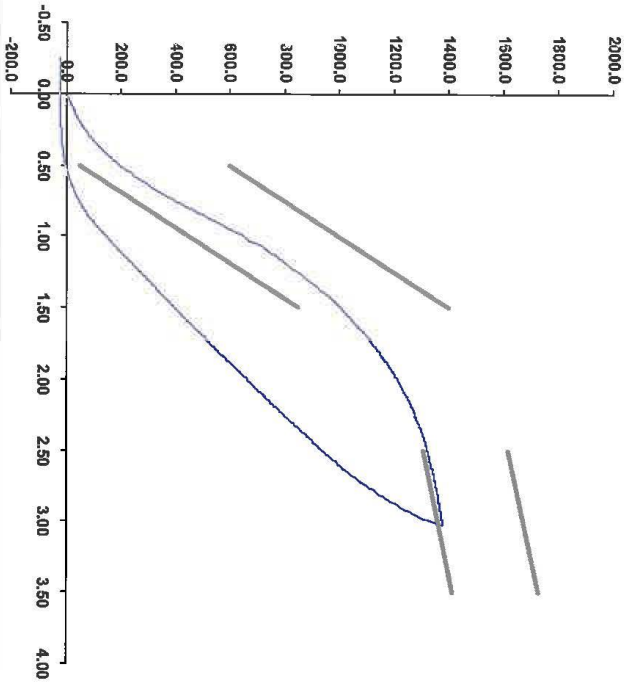
Report Number 3452

Test Date 3/27/2017 12:56:29 PM

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 8985642
 Load Cell S/N (T1240R13), Units (LBS) 1000
 Crosshead Speed (mm / min) or Rate 12.7
 Extension or Position Measured by XHD_100 (XHD100)



Operator DC

Part Number 180-4450

Template No 107 27-Mar-17
 SACO Research

By: DC Date: 3/27/17
 SACO Research 41735 Elm St #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

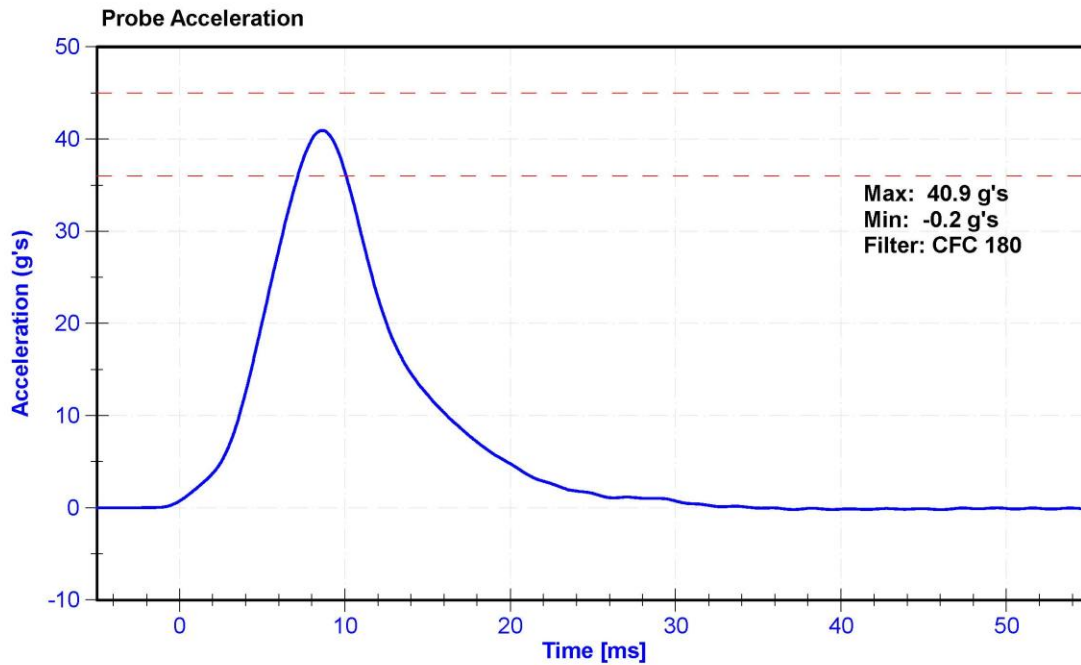
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

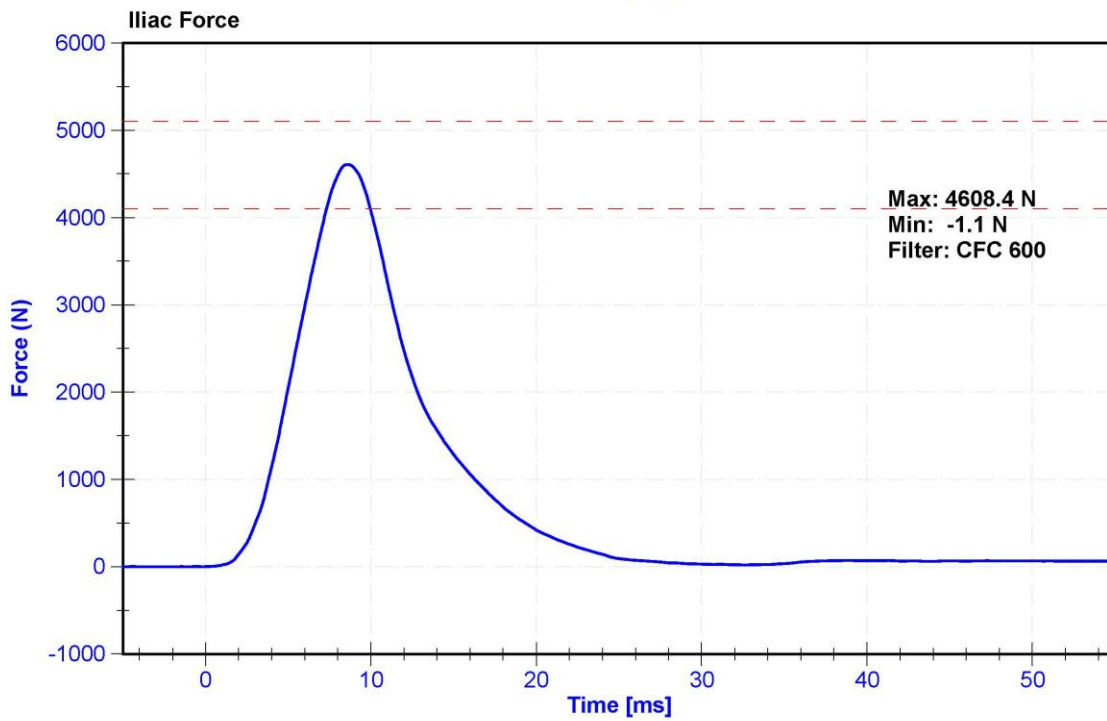
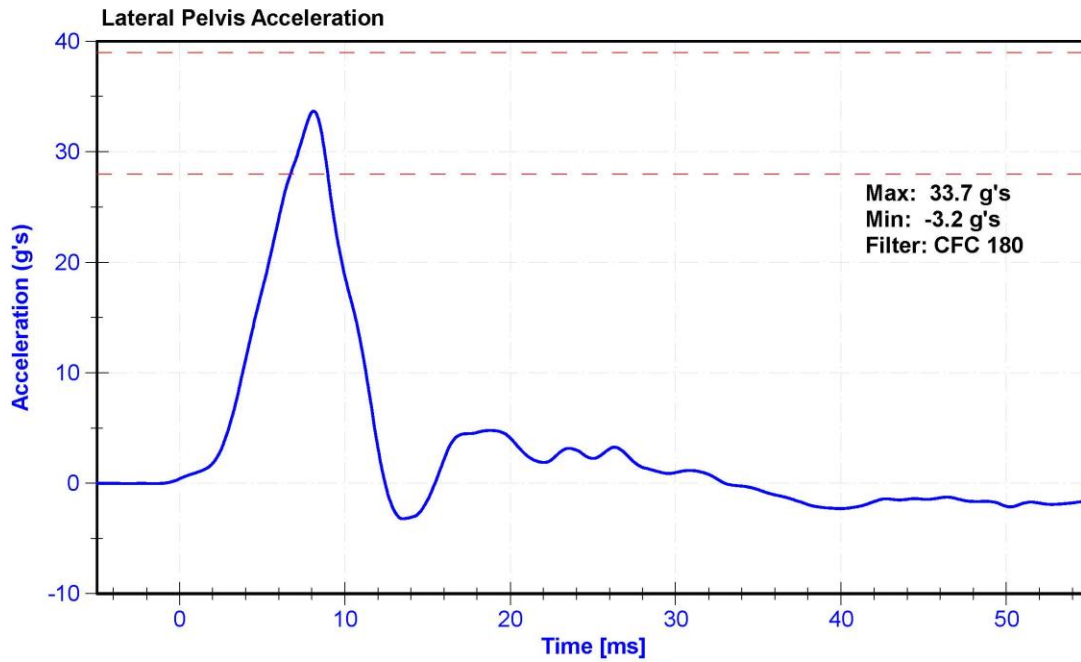
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	26.0	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	36	45	g's	40.9	Pass
Lateral Pelvis Acceleration	28	39	g's	33.7	Pass
Iliac Force	4100	5100	N	4608.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51875	10/28/2019	4/27/2020
Iliac Load Cell	DENTON 3228J	LC-290Fy	9/25/2019	9/24/2020





CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO: DG8012

(CONFIGURED FOR LEFT SIDE IMPACT)

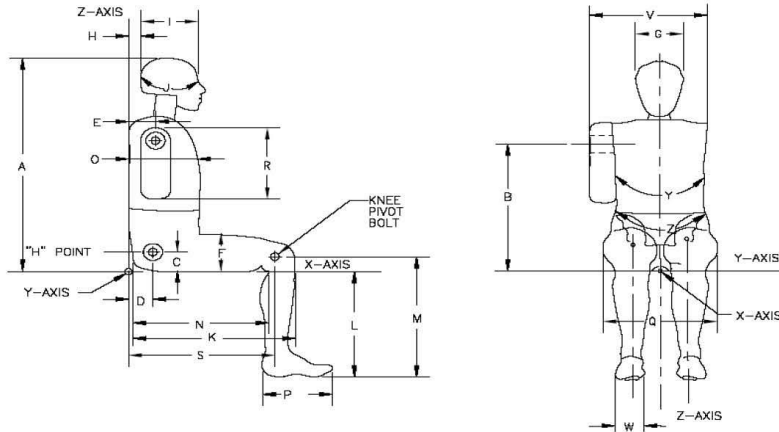


External Measurements - SID-IIs

Technician: K. Dutton

Date: 01/07/2020

Dummy Serial Number: DG8012



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	779	Pass
B	Shoulder Pivot Height	437	453	446	Pass
C	H-point Height	79	89	85	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	126	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	185	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	532	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	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	345	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	867	Pass
Z	Waist Circumference	761	791	781	Pass

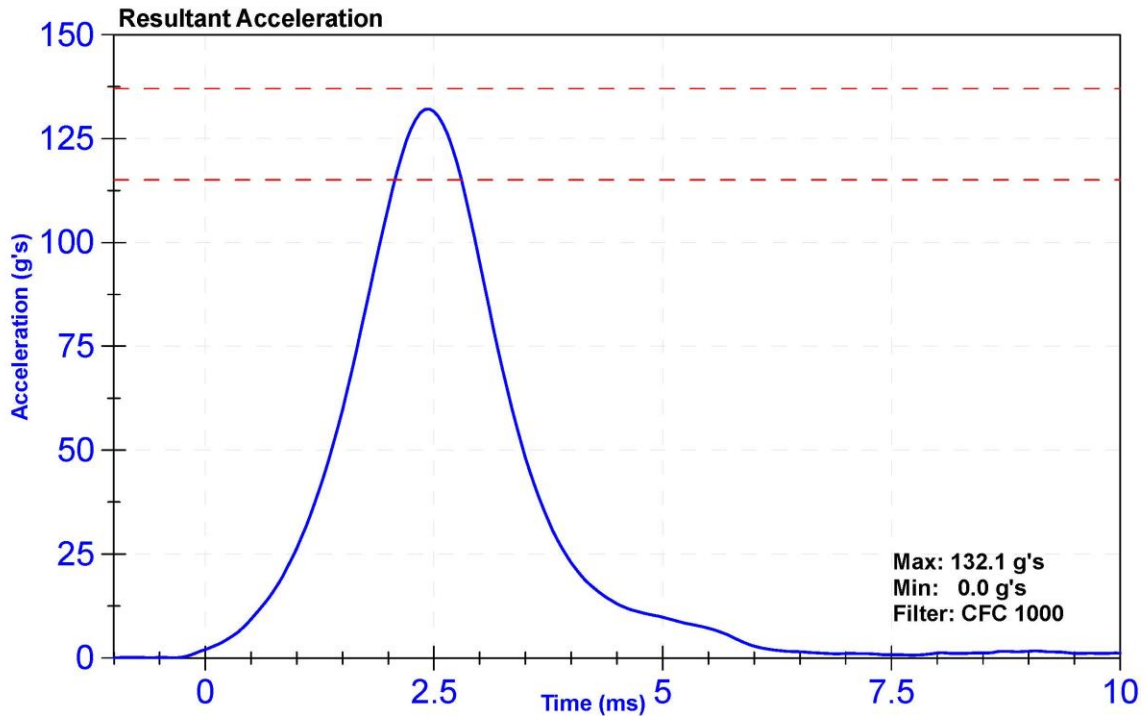
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

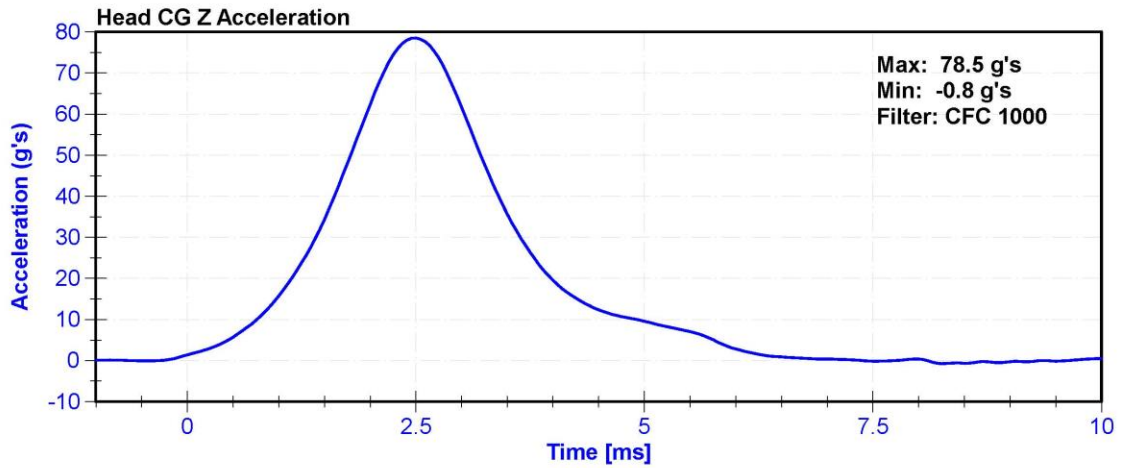
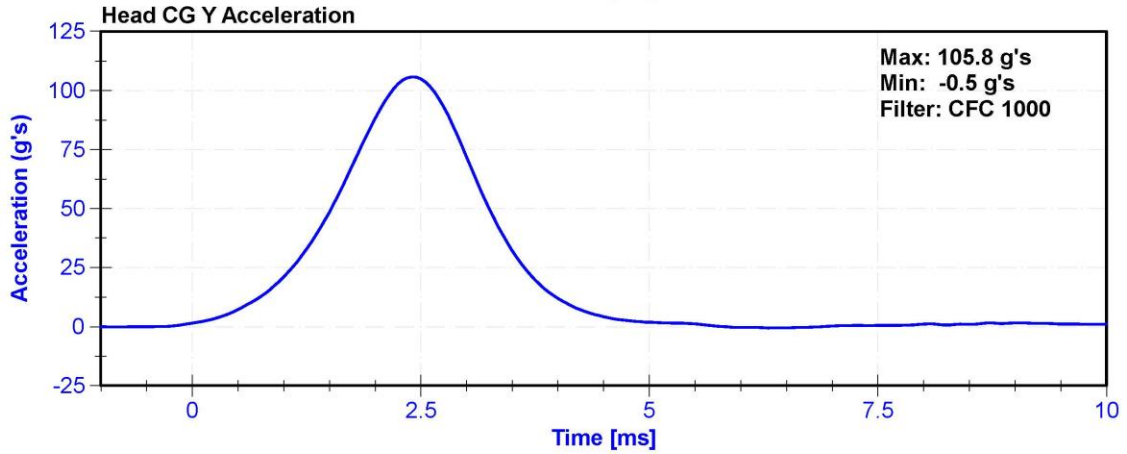
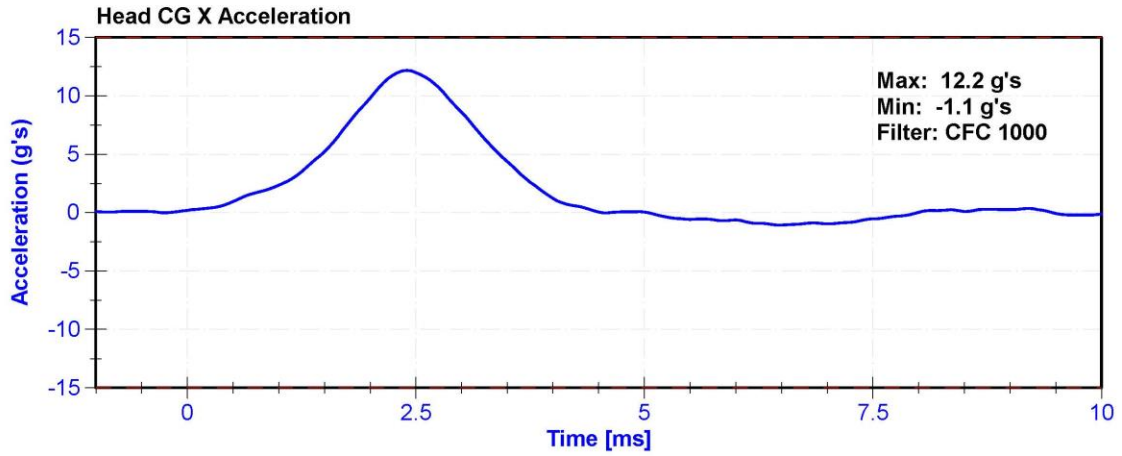
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	26.7	Pass
Resultant Acceleration	115	137	g's	132.1	Pass
Oscillation	0	15	%	1.2	Pass
Fore-Aft Acceleration	-15	15	g's	12.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P74788	10/28/2019	4/28/2020
Y Accelerometer	Endevco	P83432	10/28/2019	4/28/2020
Z Accelerometer	Endevco	P83319	10/28/2019	4/28/2020





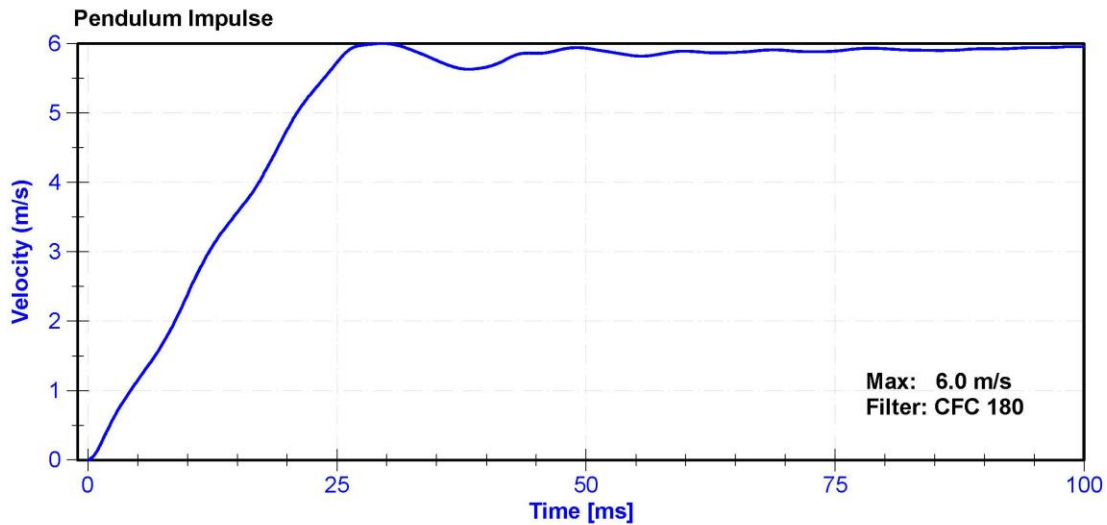
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

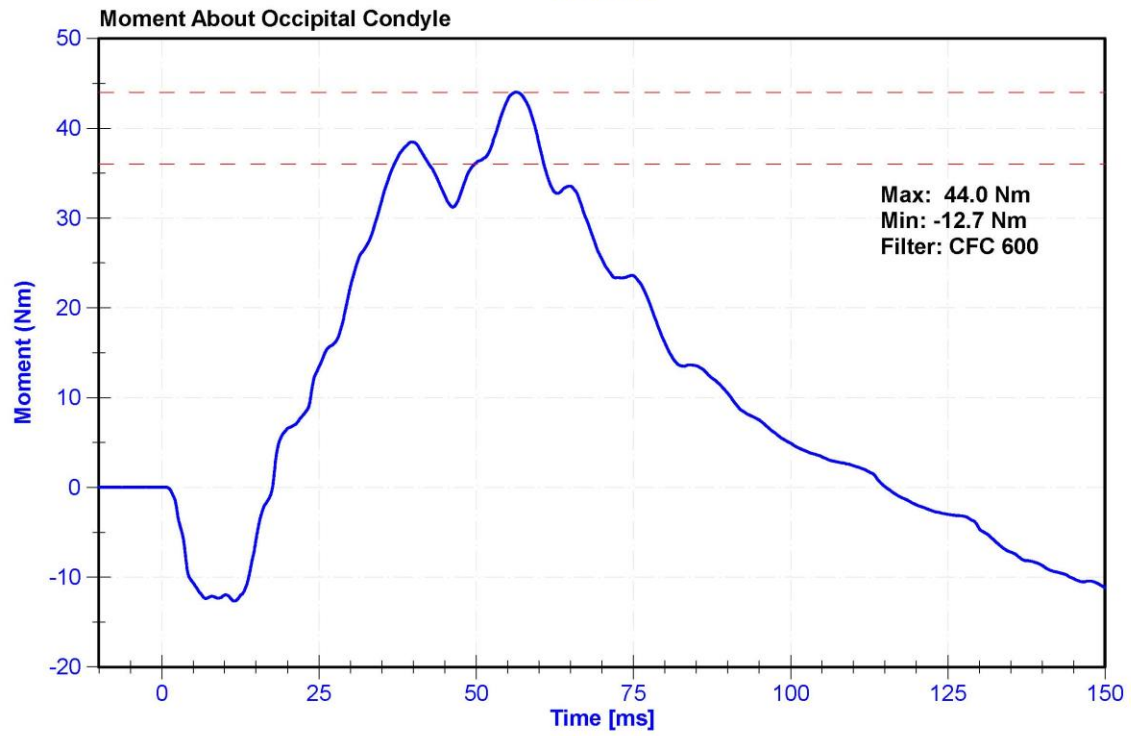
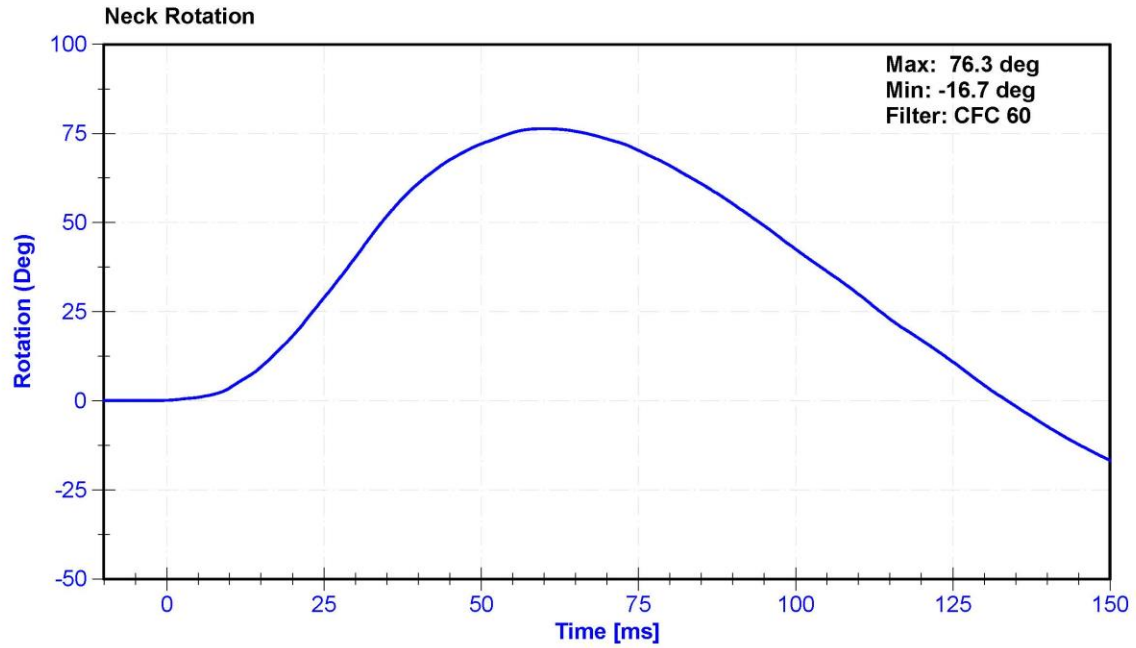
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	26.7	Pass
Velocity	5.51	5.63	m/s	5.514	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.38	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.57	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.75	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.73	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.00	Pass
Neck Rotation	71	81	deg	76.3	Pass
Time at Maximum Rotation	50	70	ms	59.9	Pass
Moment about the OC	36	44	Nm	44.0	Pass
Moment Decay to 0 Nm	102	126	ms	115.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/29/2019	1/29/2020
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/4/2019	11/3/2020
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/4/2019	11/3/2020
Upper Neck Load Cell	Denton 1716A	LC-2192Fy	6/20/2019	6/19/2020





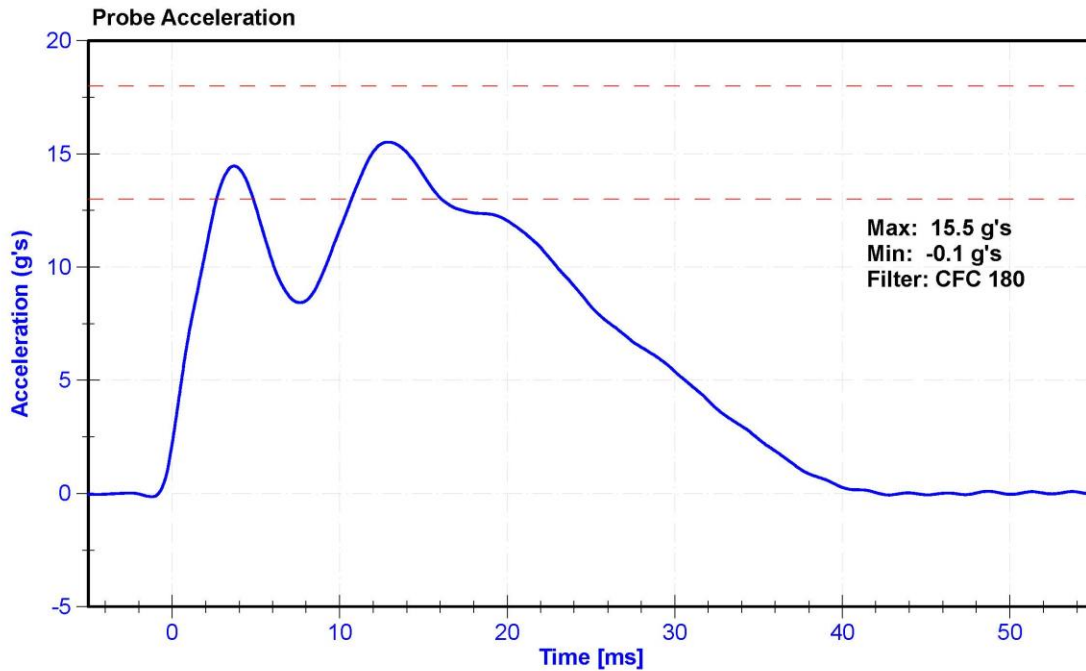
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

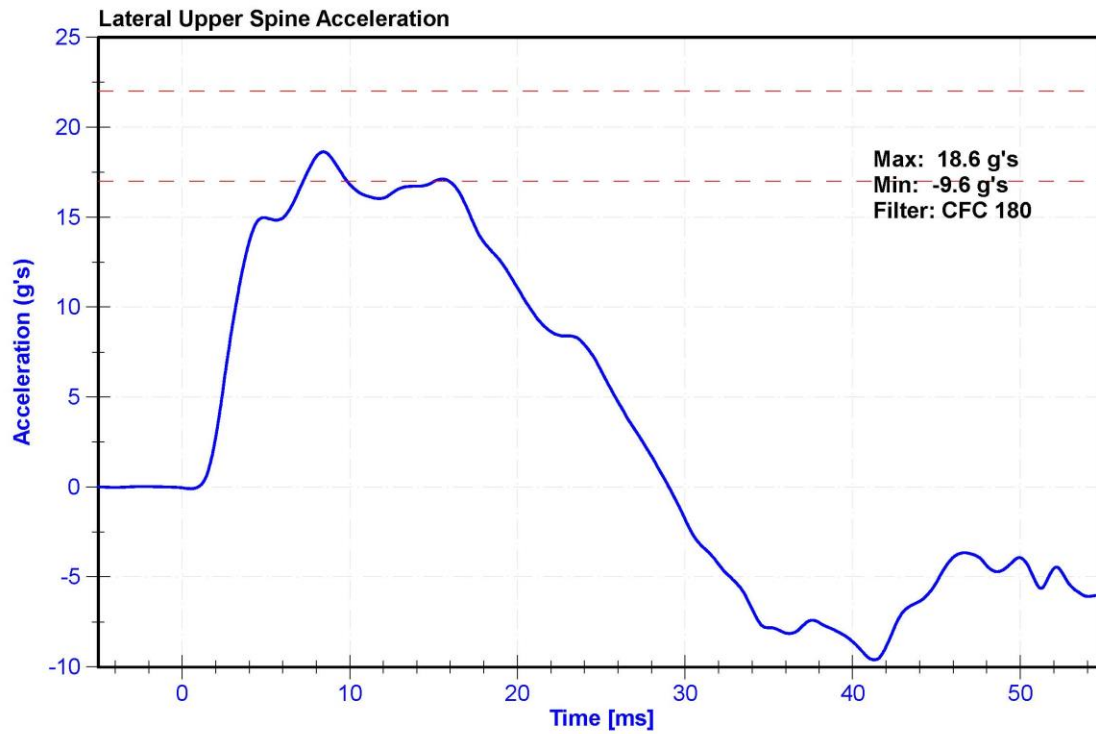
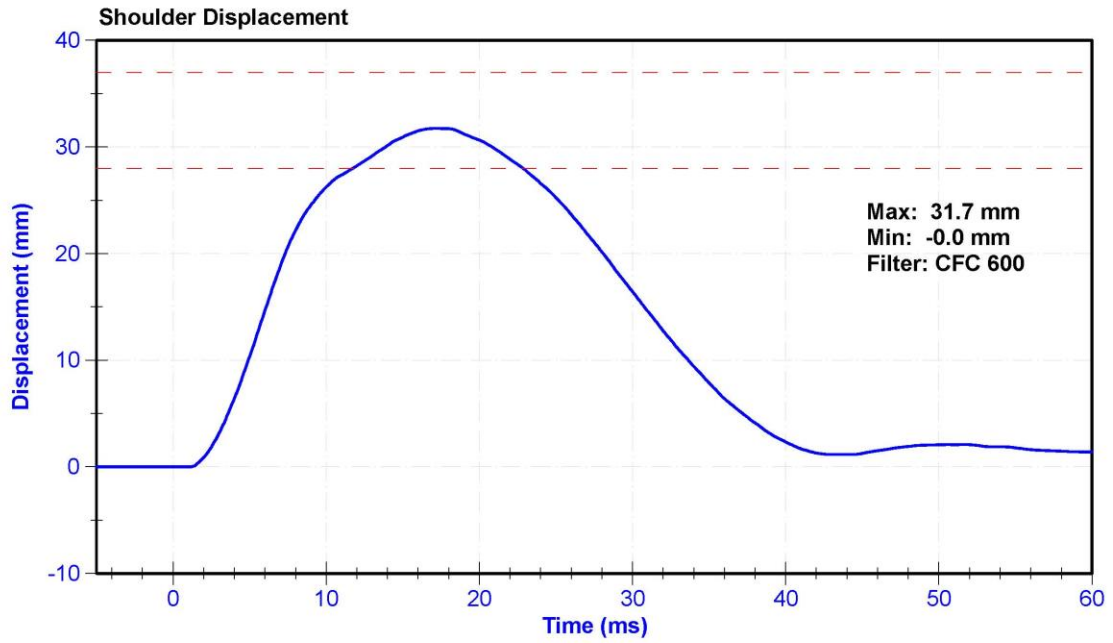
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	17.4	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	13	18	g's	15.5	Pass
Shoulder Deflection	28	37	mm	31.7	Pass
Lateral Upper Spine Acceleration	17	22	g's	18.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	10/28/2019	4/27/2020
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	10/28/2019	4/27/2020





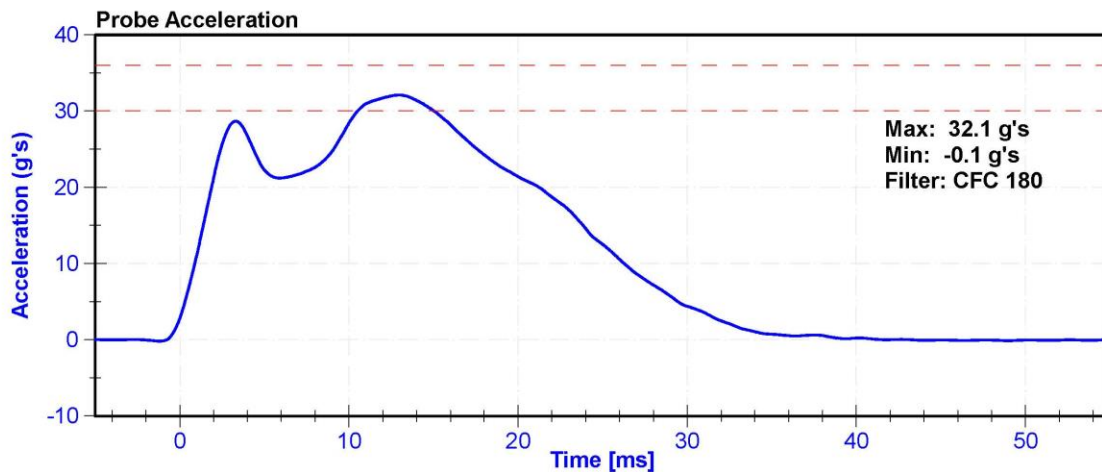
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

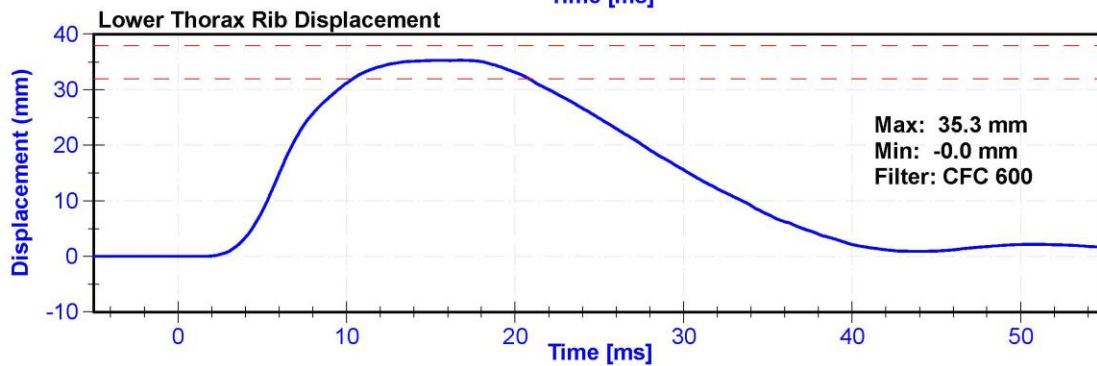
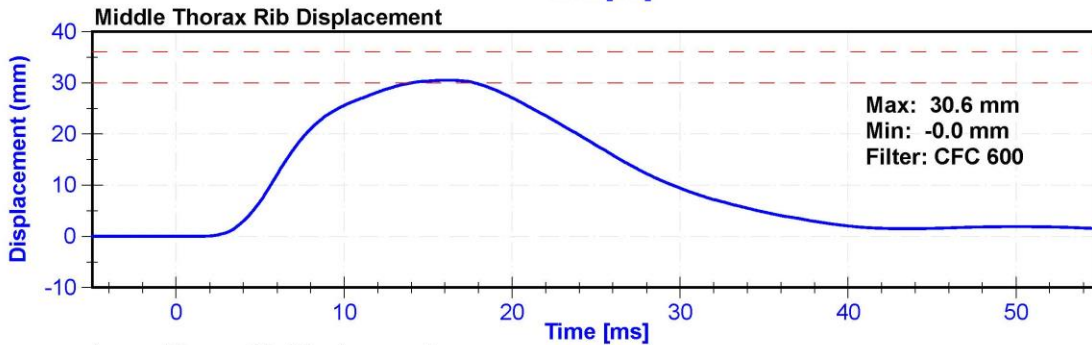
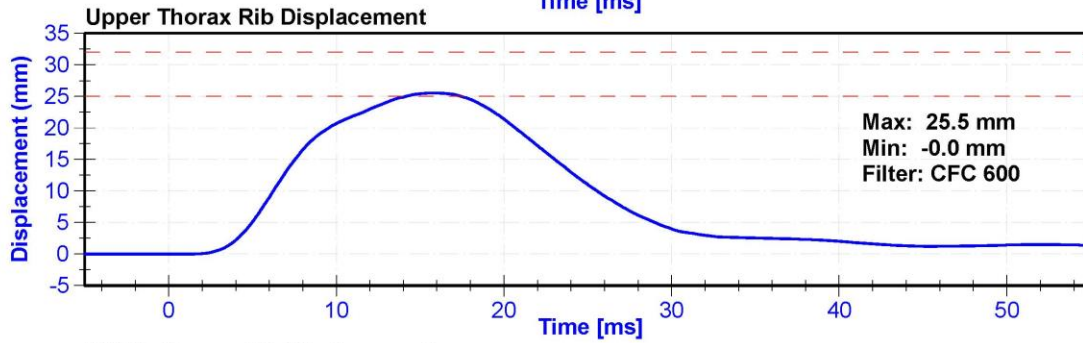
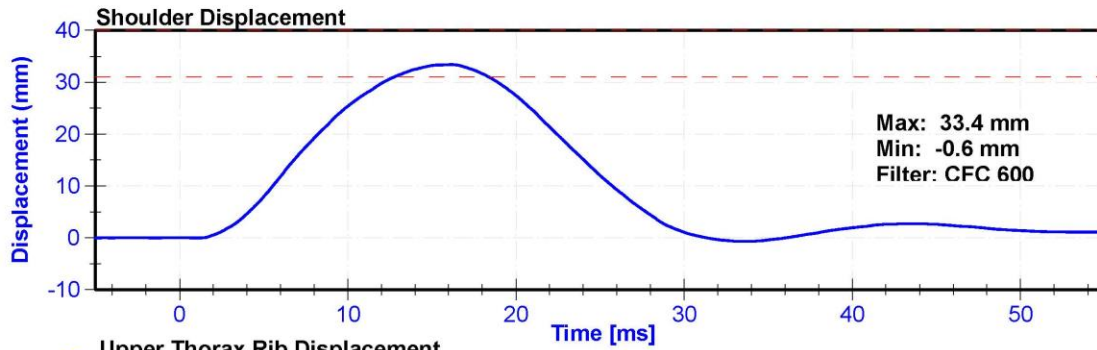
Results

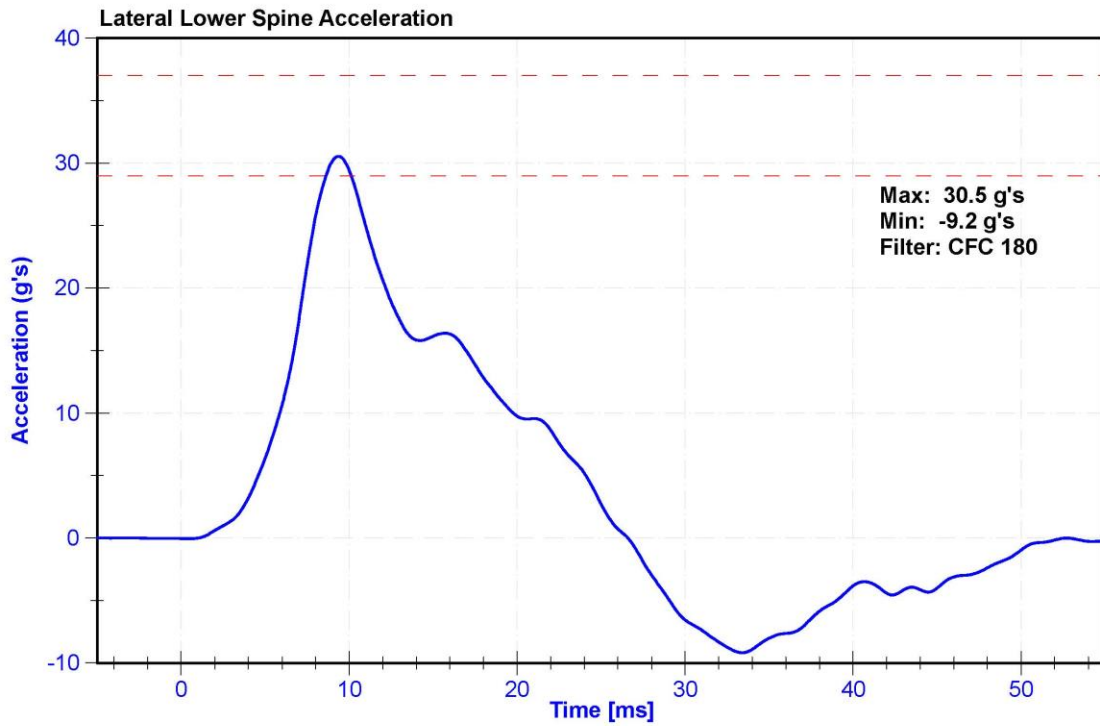
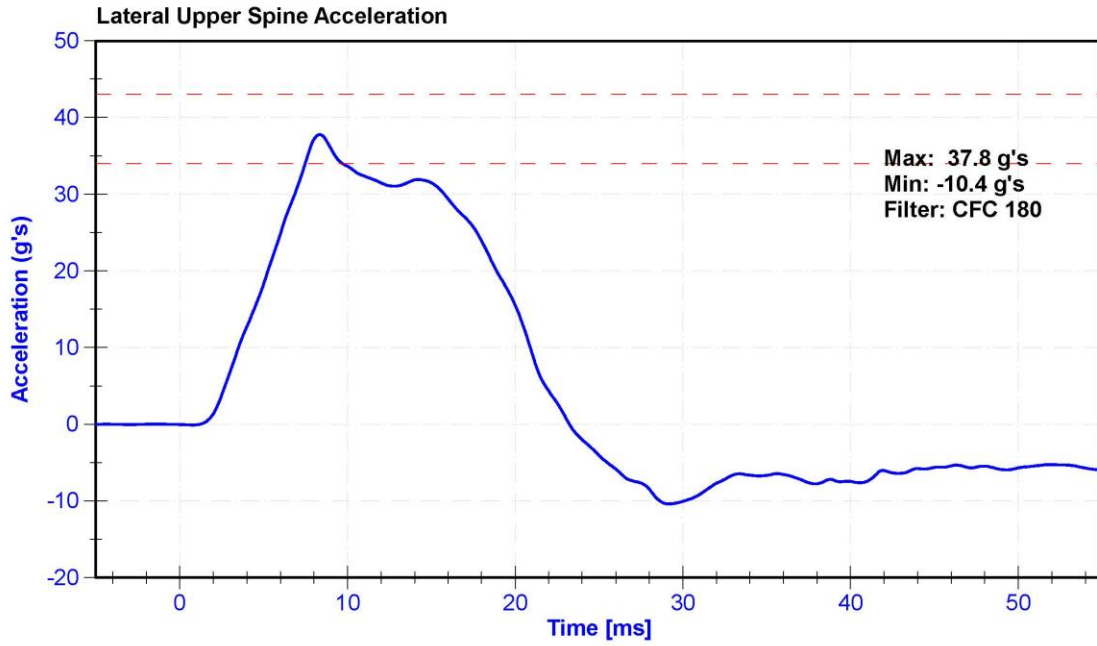
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	16.6	Pass
Velocity	6.6	6.8	m/s	6.71	Pass
Probe Acceleration after 5 ms	30	36	g's	32.1	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.8	Pass
Lateral Lower Spine Acceleration	29	37	g's	30.5	Pass
Shoulder Deflection	31	40	mm	33.4	Pass
Upper Thorax Rib Deflection	25	32	mm	25.5	Pass
Mid Thorax Rib Deflection	30	36	mm	30.6	Pass
Lower Thorax Rib Deflection	32	38	mm	35.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P64148	10/28/2019	4/27/2020
Upper Spine T12 Y Accelerometer	ENDEVCO 7264CT	AC-P51327	9/30/2019	3/31/2020
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	10/28/2019	4/27/2020
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	10/28/2019	4/27/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	10/28/2019	4/27/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	10/28/2019	4/27/2020







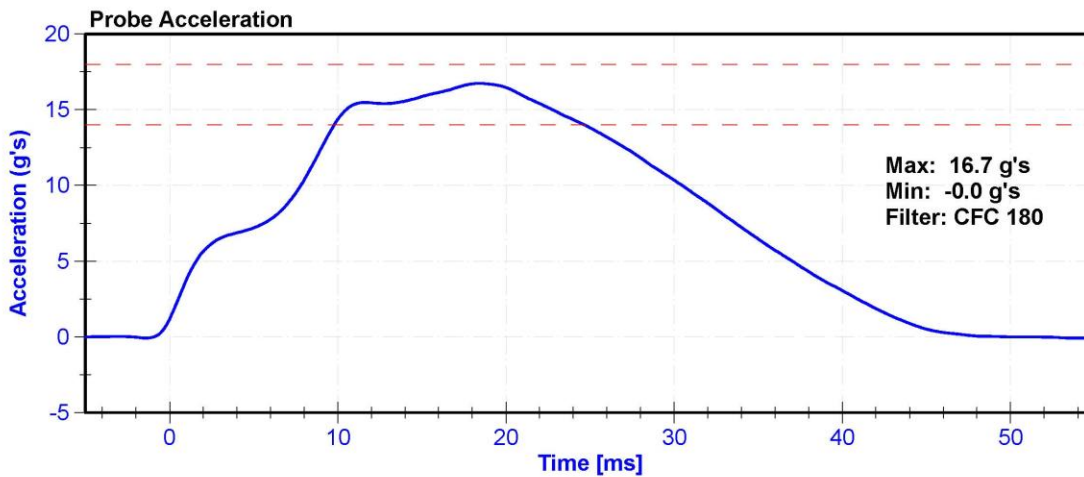
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

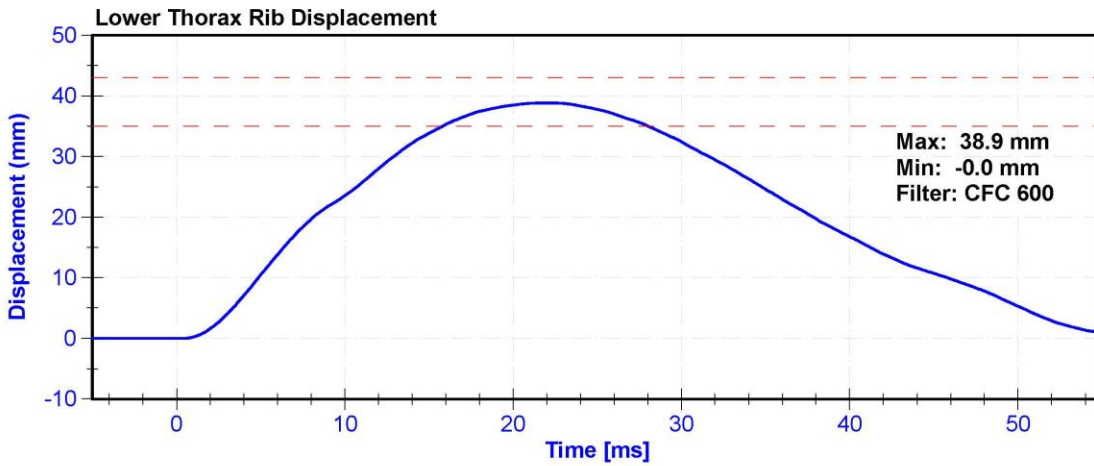
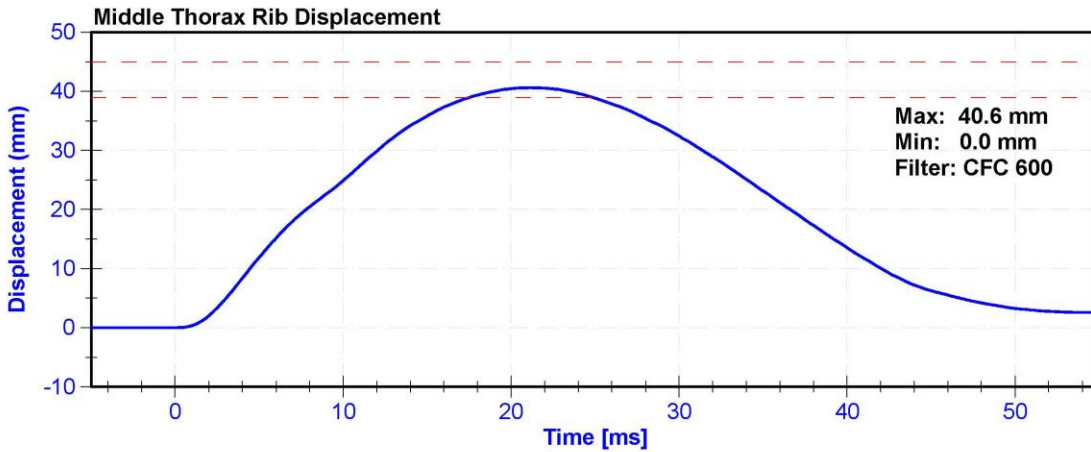
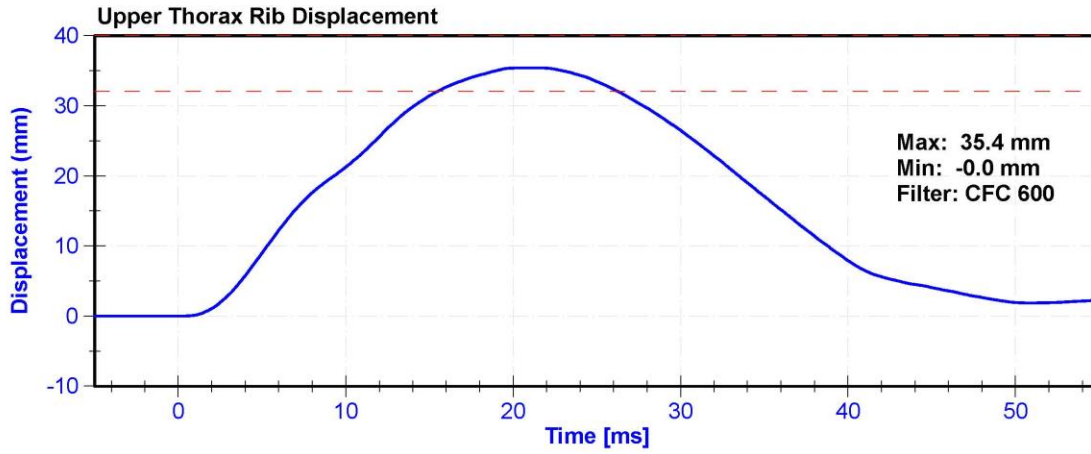
Results

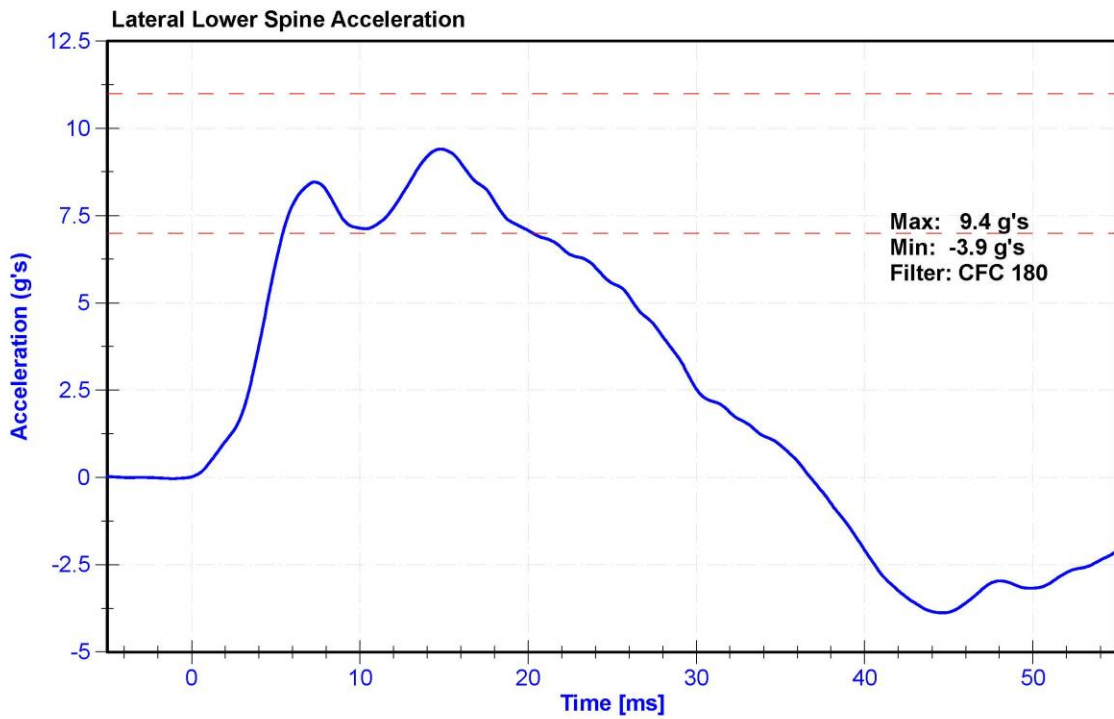
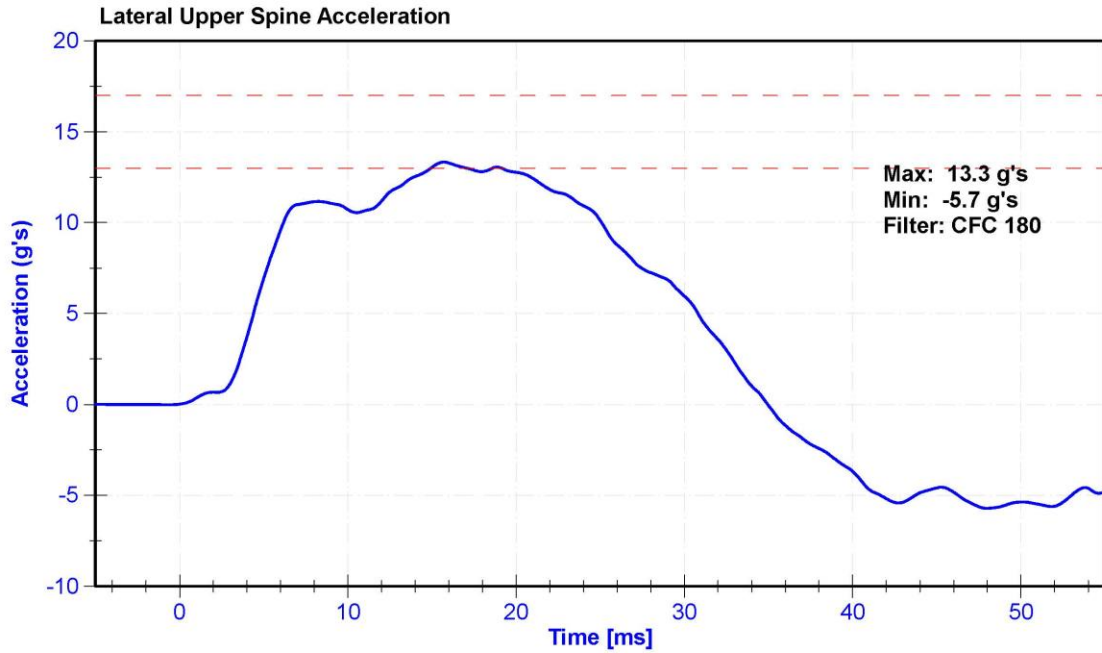
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	15.6	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	14	18	g's	16.7	Pass
Lateral Upper Spine Acceleration	13	17	g's	13.3	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.4	Pass
Upper Thorax Rib Deflection	32	40	mm	35.4	Pass
Middle Thorax Rib Deflection	39	45	mm	40.6	Pass
Lower Thorax Rib Deflection	35	43	mm	38.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P64148	10/28/2019	4/27/2020
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51327	9/30/2019	3/31/2020
Upper Thorax Rib Potentiometer	Servo 1246	DS-2165GFE	10/28/2019	4/27/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	10/28/2019	4/27/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	10/28/2019	4/27/2020







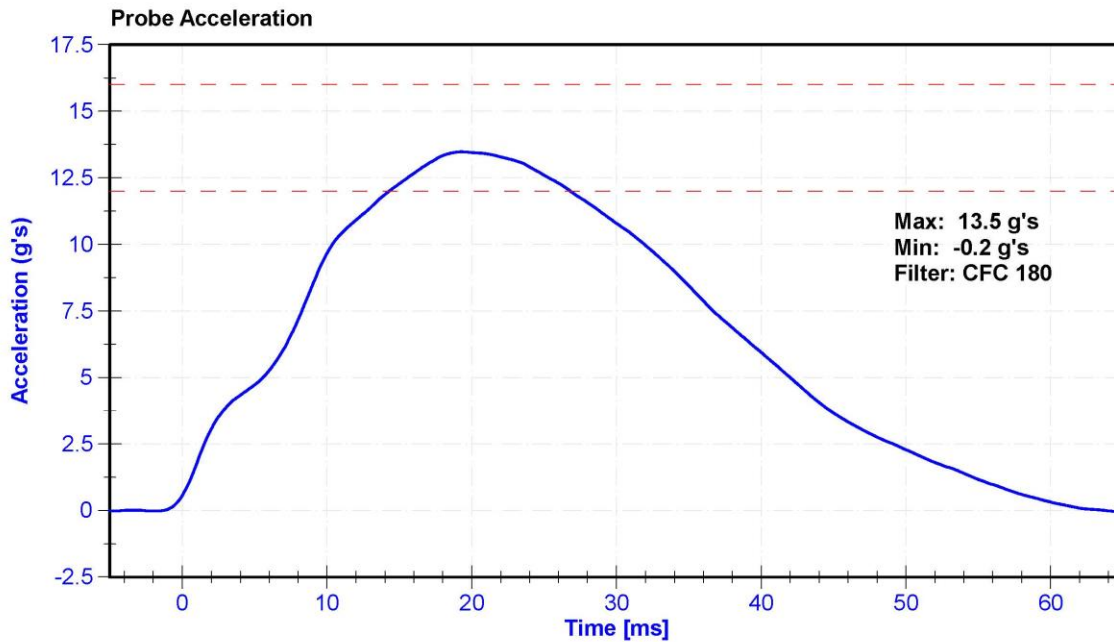
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

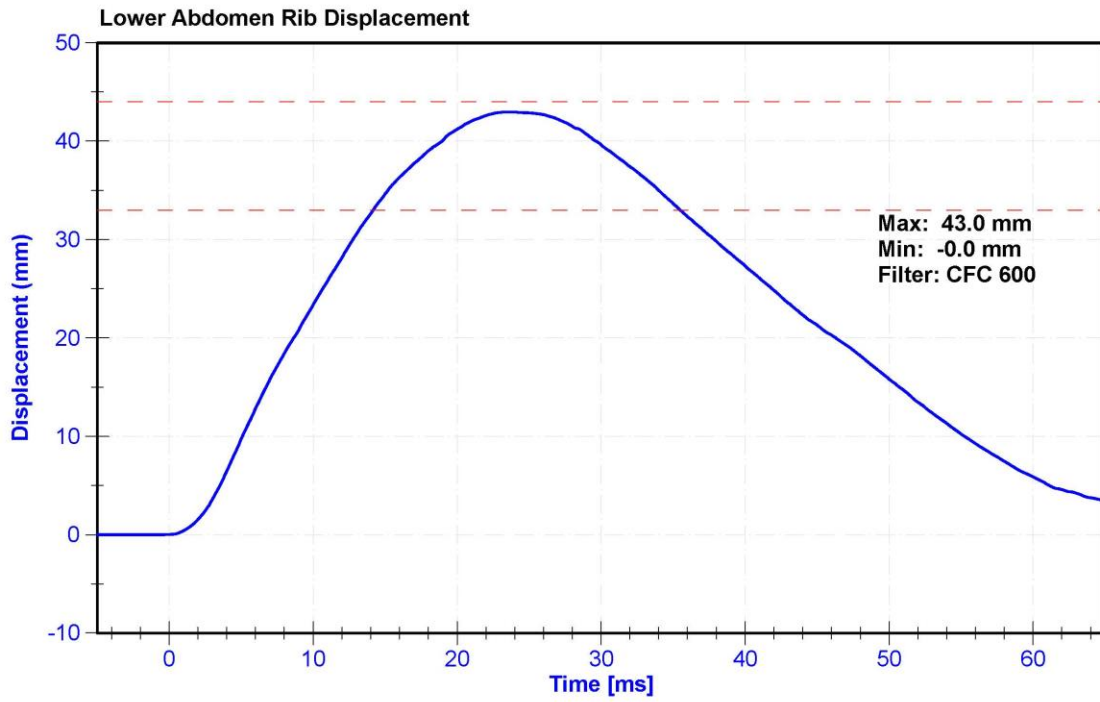
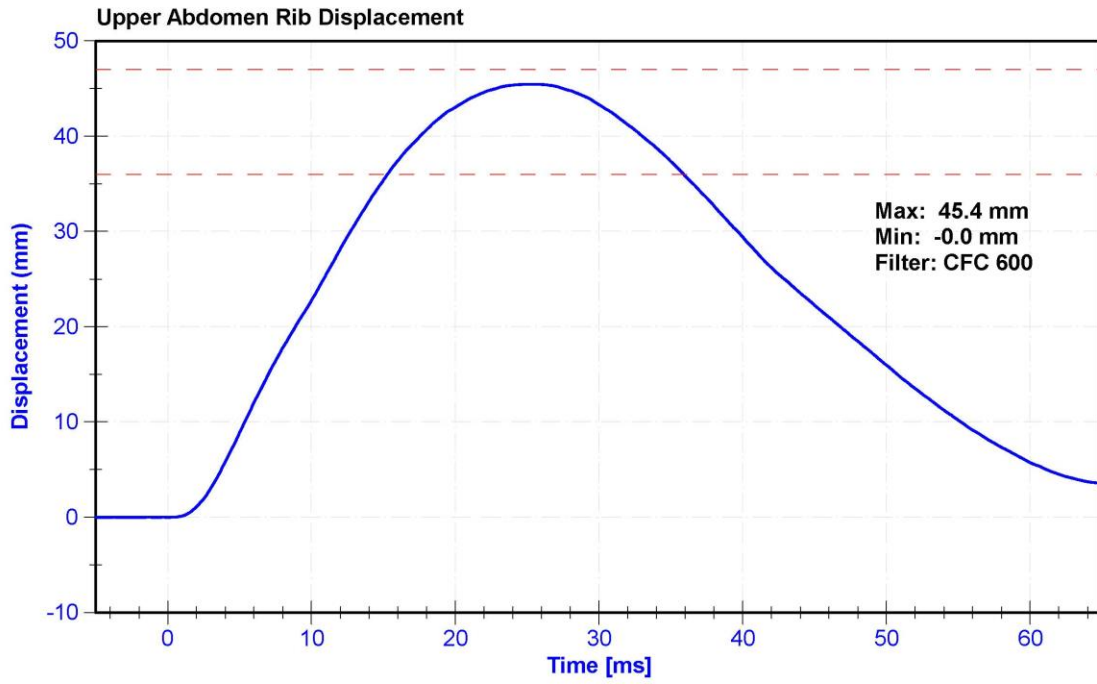
Results

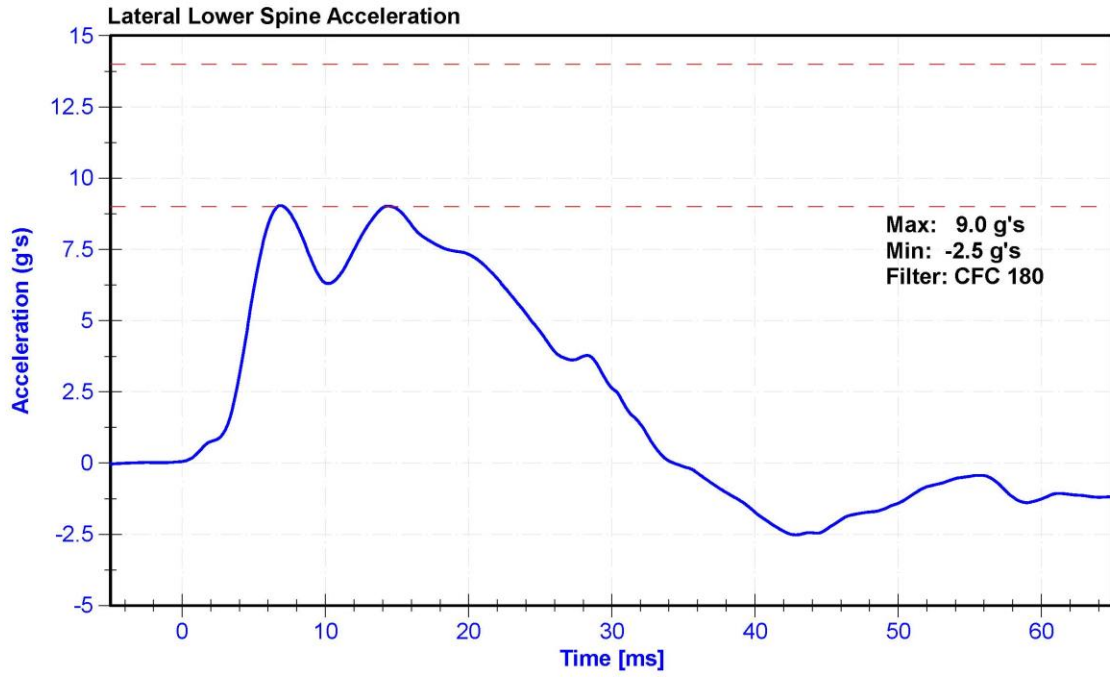
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	15.7	Pass
Velocity	4.2	4.4	m/s	4.22	Pass
Probe Acceleration	12	16	g's	13.5	Pass
Lateral Lower Spine Acceleration	9	14	g's	9.0	Pass
Upper Abdomen Rib Deflection	36	47	mm	45.4	Pass
Lower Abdomen Rib Deflection	33	44	mm	43.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Lower Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51327	9/30/2019	3/31/2020
Upper Abdomen Rib Potentiometer	Servo 08TC1-3725	DS-008GFE	10/28/2019	4/27/2020
Lower Abdomen Rib Potentiometer	Servo 08TC1-3745	DS-1774GFE	10/28/2019	4/27/2020







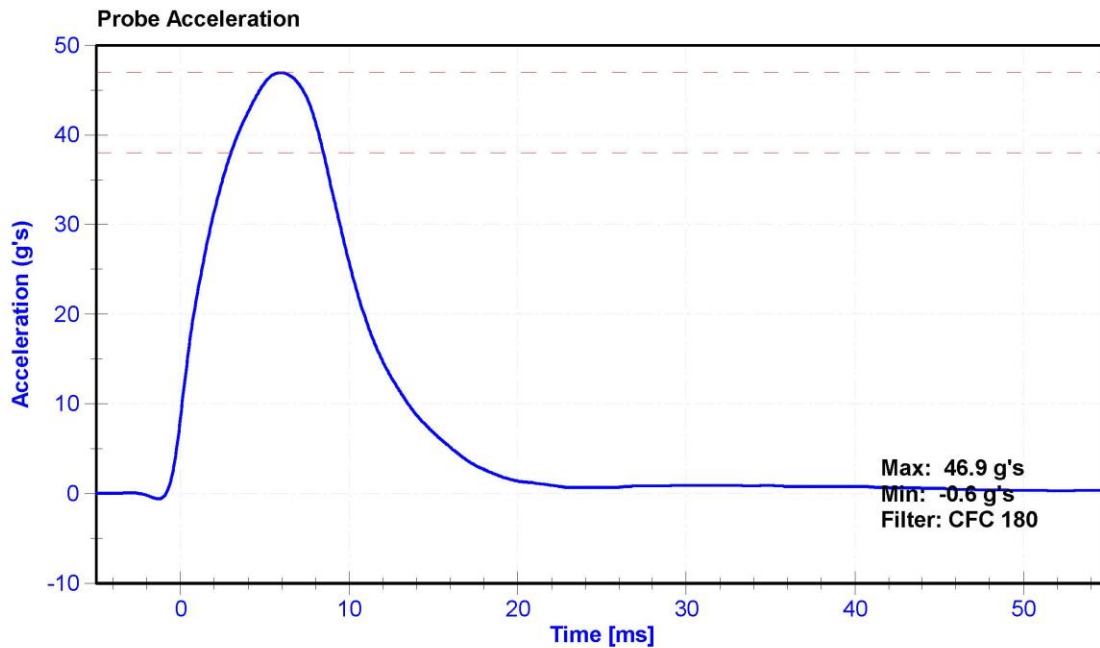
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

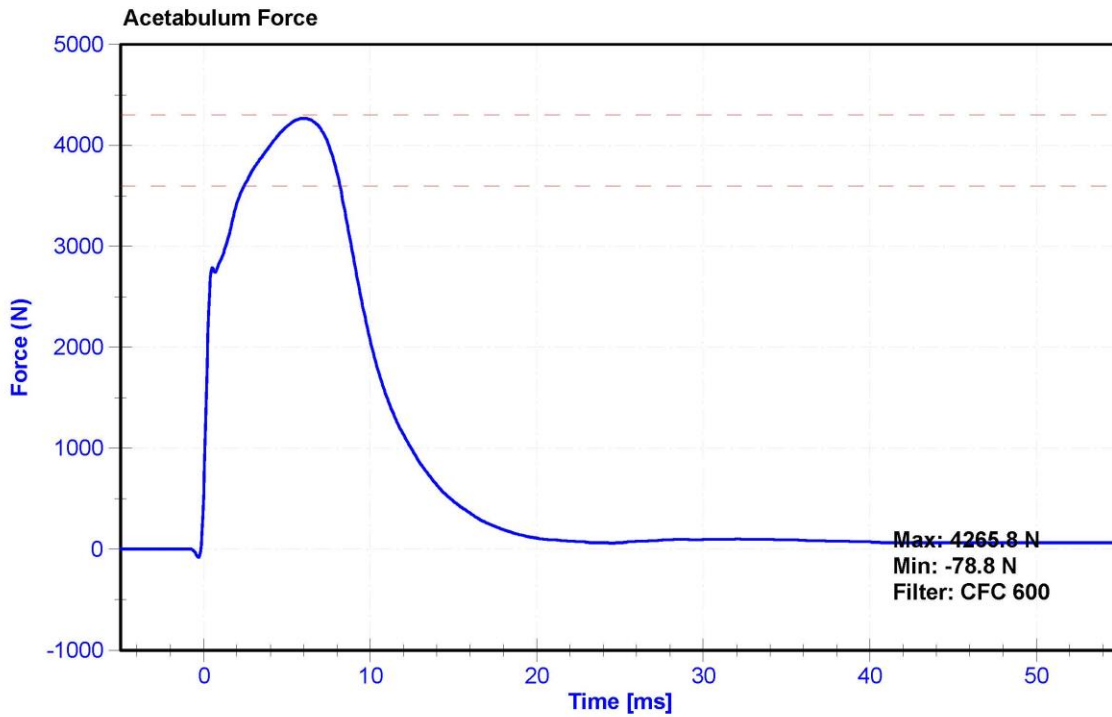
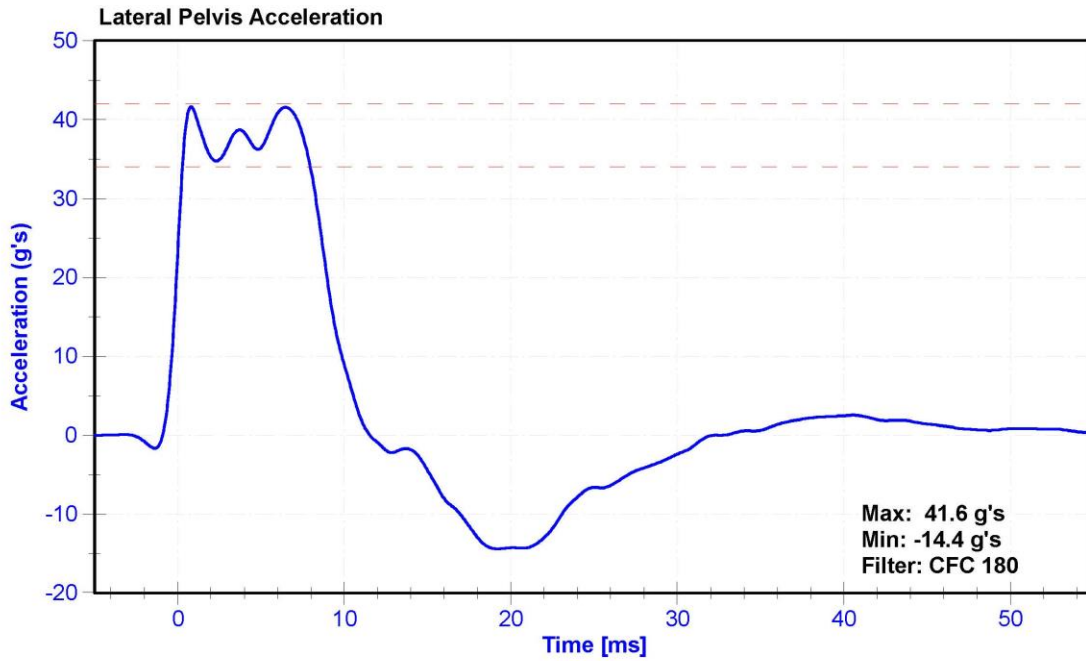
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	16.3	Pass
Velocity	6.6	6.8	m/s	6.61	Pass
Probe Acceleration	38	47	g's	46.9	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.6	Pass
Acetabulum Force	3600	4300	N	4265.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51875	10/28/2019	4/27/2020
Acetabulum Load Cell	Denton 3249J	LC-4986Fy	6/14/2019	6/13/2020
Certification Plug	SACO	12587	10-3-2018	N/A
Crash Test Plug	SACO	12603	10-3-2018	N/A







SID-lls Pelvis Plug Certification Test

Plug S/N 12603

Test Number 7533

Report Number 7548

Test Date 10/3/2018 10:44:06 AM

1-7-20
CRESL
DeBOM

Force @ 0.5 mm (N)
Force @ 1.5 mm (N)
Force @ 2.5 mm (N)
Force @ 3.0 mm (N)

307.97
1,233.93
1,512.87
1,566.19

Test Results

Spec Min

Spec Max

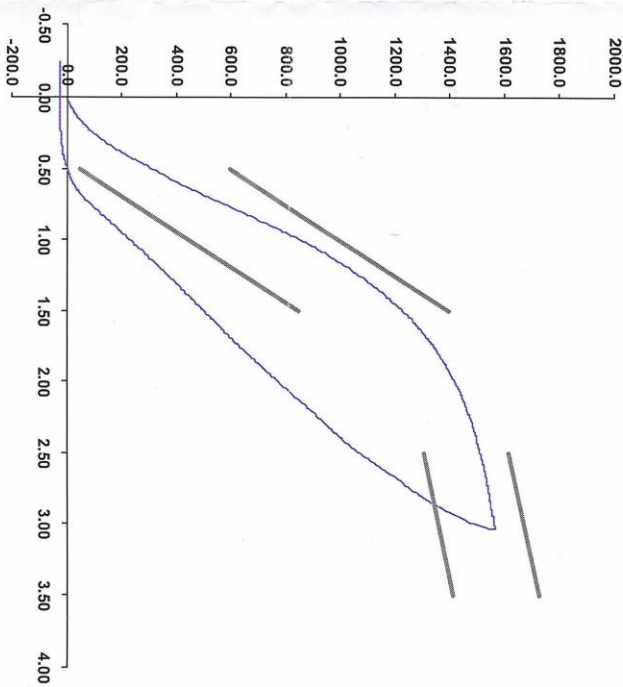
50.00
850.00
1,306.00
1,361.00

600.00
1,400.00
1,618.00
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:



Operator

Part Number 180-4450

Template No 107 03-Oct-18
SACO Research

By: DC Date: 10/3/18

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



1-7-25

Cell 1

8012

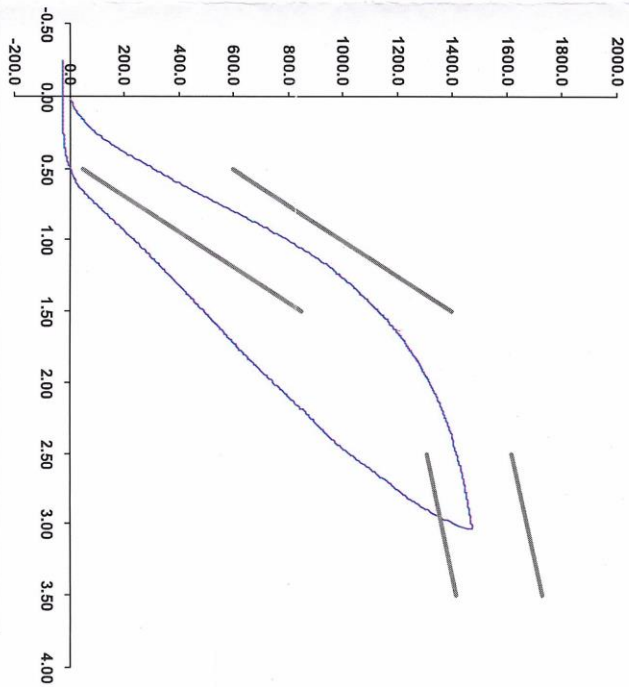
Force (-N) vs Extension (-mm)

SID-IIs Pelvis Plug Certification Test

Plug S/N 12587
Test Number 7517
Report Number 7532
Test Date 10/3/2018 10:23:32 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)	1,306.00	1,618.00
Force @ 3.0 mm (N)	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)



Operator

Part Number 180-4450

Template No 107 03-Oct-18
SACO Research

By: SC Date: 10/3/18
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

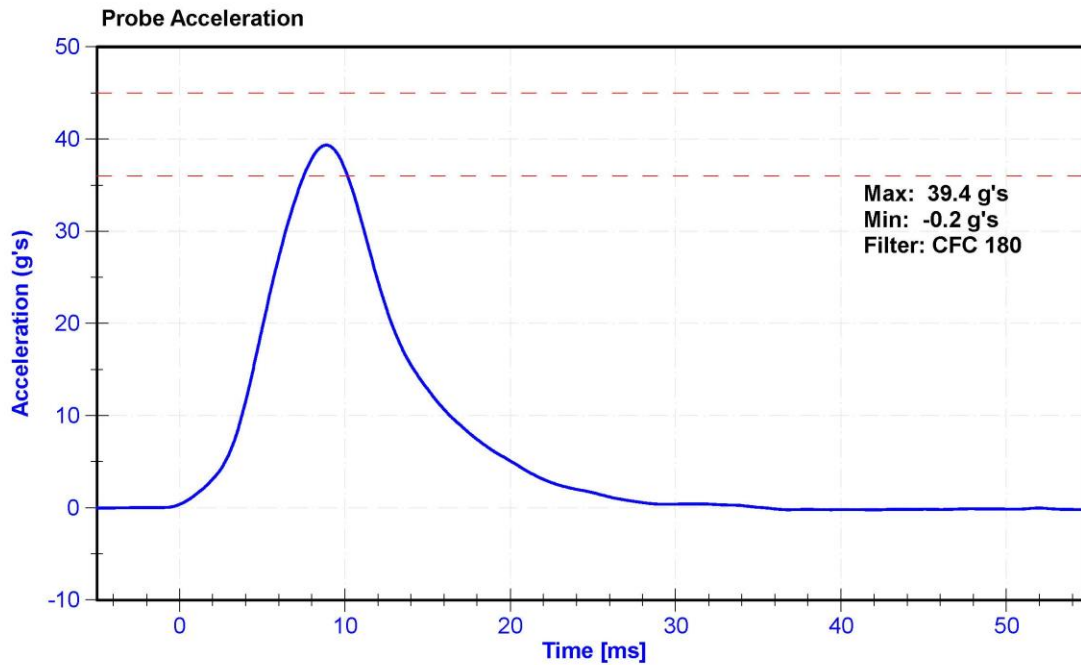
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

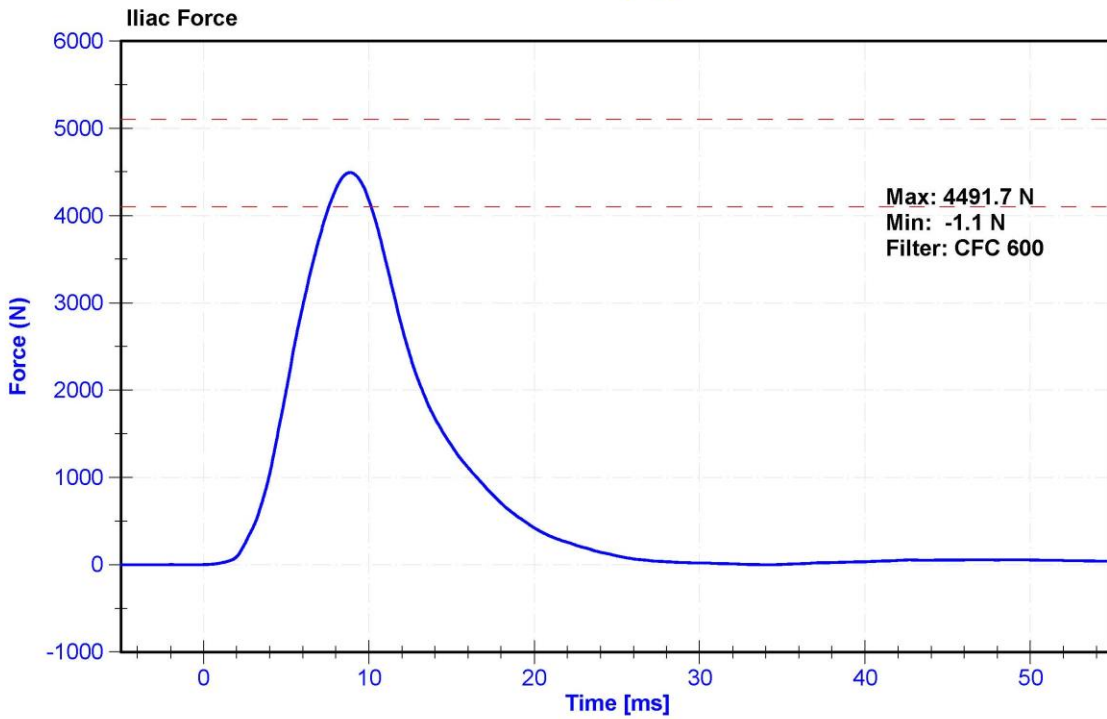
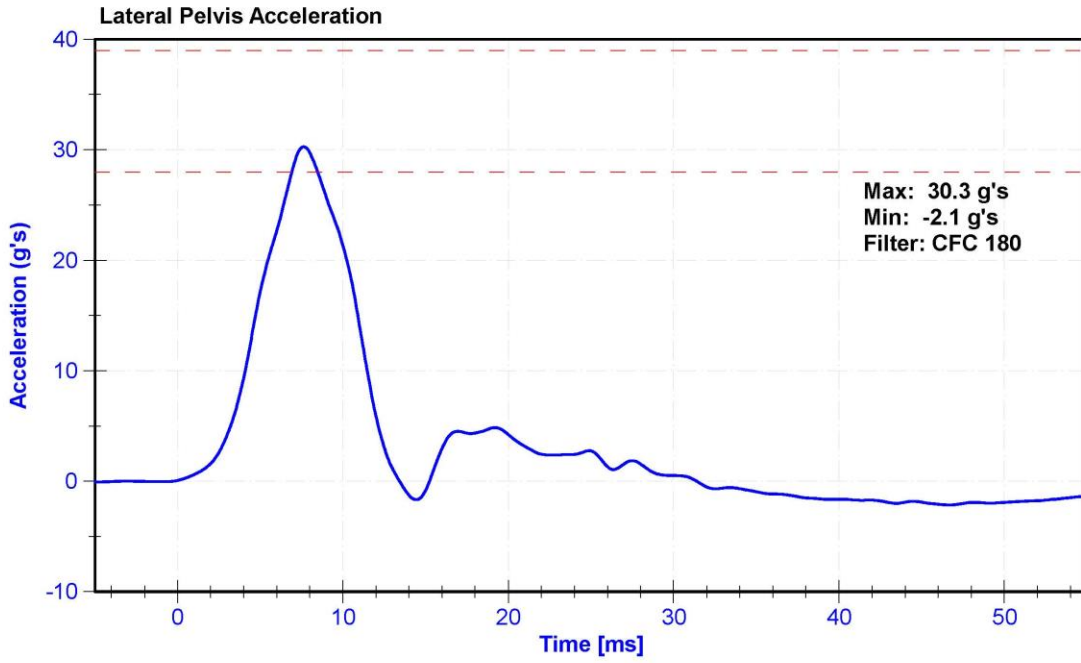
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	16.3	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	36	45	g's	39.4	Pass
Lateral Pelvis Acceleration	28	39	g's	30.3	Pass
Iliac Force	4100	5100	N	4491.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	9/27/2019	3/27/2020
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51875	10/28/2019	4/27/2020
Iliac Load Cell	DENTON 3228J	LC-290Fy	9/25/2019	9/24/2020





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	10/28/2019	
		Y	AC-P83432	ENDEVCO	10/28/2019	
		Z	AC-P83319	ENDEVCO	10/28/2019	
Head Accelerometers - Redundant		X	AC-P80334	ENDEVCO	10/28/2019	
		Y	AC-P63841	ENDEVCO	10/28/2019	
		Z	AC-P83322	ENDEVCO	10/28/2019	
Displacement Potentiometer	Shoulder		Y			
	Thoracic Rib	Upper	Y	DS-2165GFE	Servo	10/28/2019
		Middle	Y	DS-45 GFE	Servo	10/28/2019
		Lower	Y	DS-011GFE	Servo	10/28/2019
	Abdominal Rib	Upper	Y	DS-008GFE	Servo	10/28/2019
		Lower	Y	DS-1774GFE	Servo	10/28/2019
Lower Spine Accelerometers (T12)		X	AC-P52040	ENDEVCO	9/30/2019	
		Y	AC-P51327	ENDEVCO	9/30/2019	
		Z	AC-P52067	ENDEVCO	9/30/2019	
Acetabulum Load Cell		Y	LC-4986Fy	Denton	6/14/2019	
Lilac Wing Load Cell		Y	LC-290Fy	Denton	9/25/2019	
Pelvis Plug (Struck Side)			-	-	-	
Pelvis Plug (Non-Struck Side)						

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	AC-A222646	MSI	10/9/2019
Vehicle Center of Gravity	Y	AC-A247197	MSI	10/18/2019
Vehicle Center of Gravity	Z	AC-A280210	MSI	11/12/2019
Left Floor Sill	Y	AC-A280004	MSI	11/12/2019
A-Pillar Sill	Y	AC-A250384	MSI	12/17/2019
A-Pillar Low	Y	AC-A250347	MSI	10/31/2019
A-Pillar Mid	Y	AC-A280190	MSI	12/17/2019
B-Pillar Sill	Y	AC-A280951	MSI	11/5/2019
B-Pillar Low	Y	AC-A280192	MSI	10/15/2019
B-Pillar Mid	Y	AC-A280180	MSI	11/5/2019
Driver Seat	Y	A282663	MSI	7/10/2019
Engine Top	X	AC-A280846	MSI	9/10/2019
Engine Top	Y	AC-A280877	MSI	9/5/2019
Firewall	Y	AC-A280890	MSI	12/17/2019
Right Roof	Y	AC-A255979	MSI	9/17/2019
Right Floor Sill	Y	AC-A280339	MSI	8/20/2019
Rear Floorpan	X	AC-A281036	MSI	12/5/2019
Rear Floorpan	Y	A284984	MSI	12/5/2019

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	LC_1117012	Interface	10/16/2019
Load Cell 2	LC_1117020	Interface	10/25/2019
Load Cell 3	LC_1117025	Interface	10/25/2019
Load Cell 4	LC_1117019	Interface	10/25/2019
Load Cell 5	LC_1117011	Interface	10/25/2019
Load Cell 6	LC_1117017	Interface	10/25/2019
Load Cell 7	LC_1117035	Interface	10/25/2019
Load Cell 8	LC_1117006	Interface	10/7/2019