

REPORT NUMBER: SPNCAP-CAL-18-003

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

**Ford Motor Co
2018 Ford Mustang
Two Door Coupe**

NHTSA No: M20180215

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



February 9, 2018

FINAL REPORT

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

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Date: February 9, 2018

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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16. Abstract A 32.20 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2018 Ford Mustang two door coupe 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 December 11, 2017. The impact velocity of the vehicle was 32.41 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 341 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. 300)</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>513.495</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>38.613</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2897.557</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>21.803</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45</td> <td>17.359</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. 300)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	513.495	Resultant Lower Spine Acceleration	G	82	38.613	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2897.557	Maximum Thoracic Rib Deflection	mm	38	21.803	Maximum Abdomen Rib Deflection	mm	45	17.359
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY 2018 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 2018 Ford Mustang two door coupe. 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 2018 Ford Mustang two door coupe. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.41 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 11, 2017. 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	513.495
Resultant Lower Spine Acceleration	g	82	38.613
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2897.557
Maximum Thoracic Rib Deflection	mm	38*	21.803
Maximum Abdominal Rib Deflection	mm	45*	17.359

*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	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other				

GENERAL COMMENTS:

1. P1 serial number – 300

Data Anomalies:

- Driver Head CG Redundant Y Acceleration, Questionable data after 68.4ms
- Left Front Sill Y Acceleration, Questionable data after 56.1ms
- Left Sill B-Pillar Y Acceleration, Exceeded calibration range at 48.1ms
- Left A-Pillar at Sill Y, Questionable data from 37-57 ms
- Right Roof Y, Questionable data from 32-35 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: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20180215
Model Year	2018
Make	Ford
Model	Mustang
Body Style	Two Door Coupe
VIN	1FA6P8TH9J5106320
Body Color	Maroon
Odometer Reading (km/mi)	108 miles
Engine Displacement (L)	2.3
Type / No. Cylinders	I4
Engine Placement	Inline
Transmission Type	Automatic
Transmission Speeds	10-Speed
Overdrive	Yes
Final Drive	Rear Wheel Drive
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (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	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	No
Driver Load Limiter	Yes
Rear Pass. Load Limiter	No
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	10/17
Vehicle Type	Passenger

GVWR (kg)	2050
GAWR Front (kg)	1016
GAWR Rear (kg)	1061

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	2	-	4
Capacity Weight (VCW) (kg)				303
DSC X 68.04 kg				272.16
Cargo Weight (RCLW) (kg)				30.84

(A)

(B)

(A-B)

VEHICLE SEAT TYPE

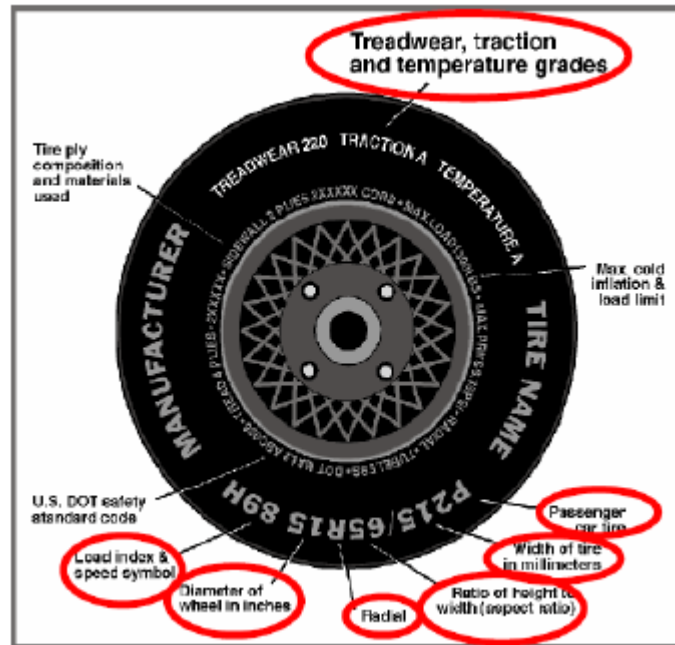
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X					X	
Rear or Second Row Seat		X			X		
Third Row seat							

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

Test Vehicle: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017

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)	220	220
Recommended Tire Size	235/55R17	235/55R17
Tire Size on Vehicle	235/55R17	235/55R17
Tire Manufacturer	Hankook	Hankook
Tire Model	Venlus SI Noble	Venlus SI Noble
Treadwear	700	700
Traction	B	B
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 2 Nylon	2 Steel, 2 Polyester, 2 Nylon
Load Index/Speed Symbol	99H	99H
Tire Material	Rubber	Rubber
DOT Safety Code Left	T23F1AH1617	T23F1AH1617
DOT Safety Code Right	T23F1AH1617	T23F1AH1617

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

Test Vehicle: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	232	232	236	234
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	413	379		409	428		433	415	
Right	kg	446	353		452	377		454	372	
Ratio	%	54	46		52	48		53	47	
Totals	kg	859	732	1591	861	805	1666	887	787	1674

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1591	(A)
Actual Weight of 1 P572V (SID-IIs) ATD Used	kg	49.9	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	30.84	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1671.74	(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	-0.49	-0.4	-0.4	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	-0.55	-0.5	-0.45	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	-0.15	-0.2	-0.2	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	0	0	-0.05	Yes
Vehicle CG (Aft of Front Axle)	mm	1250	1312	1277	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	4	4	11	

* 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: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	4
Pump Kit	2
Rear Speaker	1
Tail Light	4
Passenger Windows and door parts	9
Front Bumper Cover	10
Rear Bumper Cover	11
Ballast / Equipment Added	0

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: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017

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	20.2	15.1	17.65
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	17.65	12	Max	-	-	-
			Mid	12	12	12
			Min	-	-	-
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: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

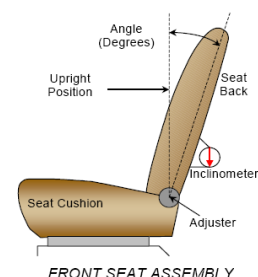
NHTSA No.: M20180215
 Test Date: 12/11/2017

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	255	38 (0-37)	0	0
Front Passenger Seat	255	38 (0-37)	0	0
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	-30 to 26.4	N/A	-3.5	N/A
Front Passenger Seat	-27 to 25.5	N/A	-3.0	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 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	Fixed	Fixed

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	Lowest

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

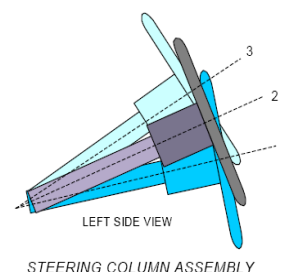
Test Vehicle: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017

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.

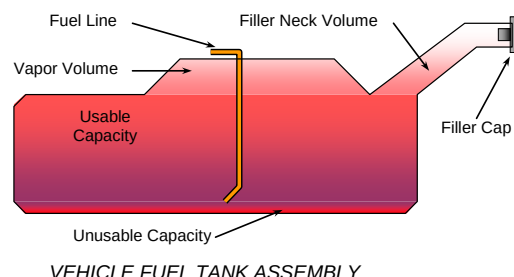
		Degrees	Fore / Aft Position (mm)
Lowermost	– Position 1	17.7	
Geometric Center	– Position 2	20.55	
Uppermost	– Position 3	23.4	
Telescoping Steering Wheel Travel			44
Test Position		20.6	22



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	58.6
Usable Capacity of "Optional Tank" - see Form No. 1	N/A
Usable Capacity of "Standard Tank" - see Owner's Manual	58.6
Usable Capacity of "Optional Tank" - see Owner's Manual	N/A
93% of Usable Capacity	54.4
Actual Amount of Solvent Used in Test	54.4
1/3 of Usable Capacity	19.5

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

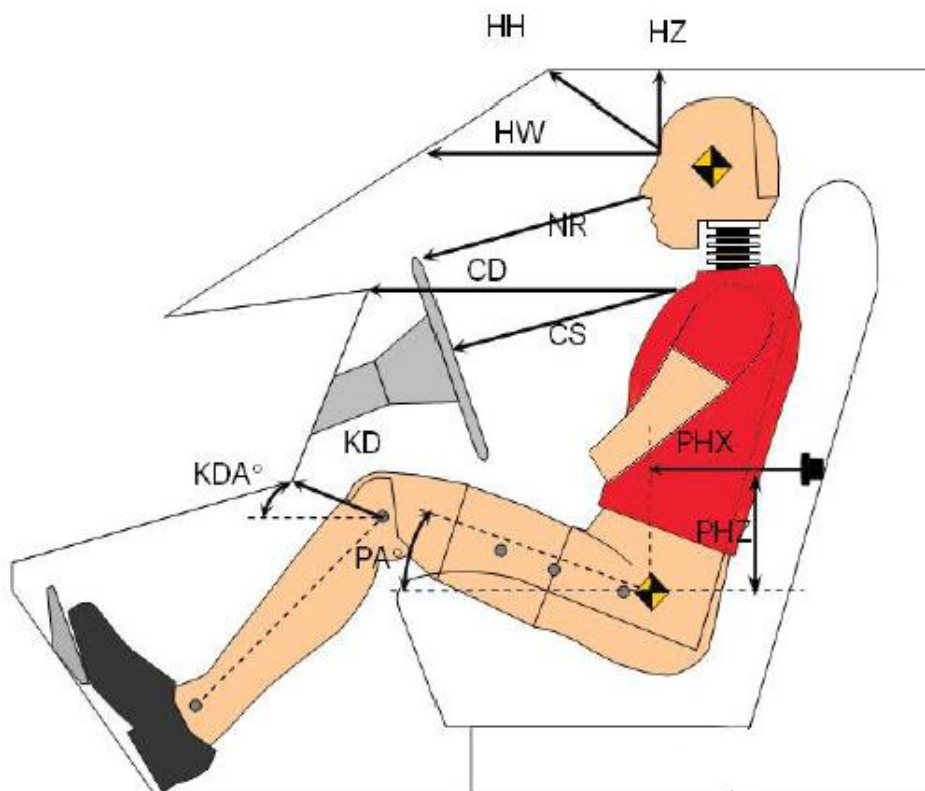


No

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017



Left Side View

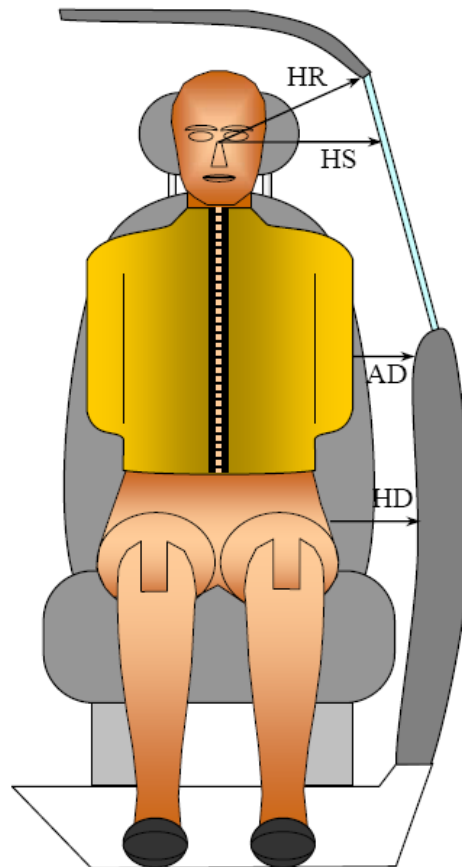
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. 300)	
		Length (mm)	Angle (°)
HH	Head to Header	230	
HW	Head to Windshield	510	
HZ	Head to Roof Liner	160	
NR	Nose to Rim	196	
CD	Chest to Dash	408	
CS	Chest to Steering Wheel	166	
KD(L) / KDA(L)°	Left Knee to Dash	147	21.5
KD(R) / KDA(R)°	Right Knee to Dash	147	18.2
PAX°	Pelvic Tilt Angle (X-Axis)		20.8
PAY°	Pelvic Tilt Angle (Y-Axis)		0.3
PHX	Hip Point to Striker (X-Axis)	589	
PHZ	Hip Point to Striker (Z-Axis)	199	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017



FRONT VIEW OF DUMMY

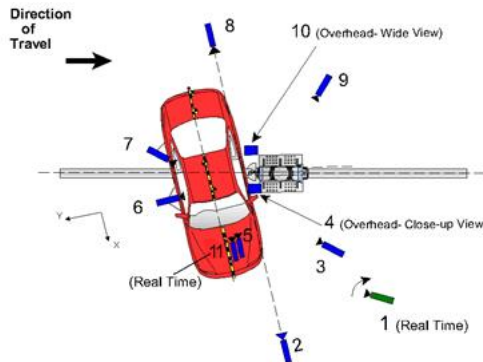
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver - Length (Serial No. 300)
HR	Head To Side Header	mm	228
HS	Head to Side Window	mm	369
AD	Arm to Door	mm	169
HD	Hip Point to Door	mm	158

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017



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	-8991	0	-1551	24	1000
3	Impact side 45° - forward pole view	-1966	4709	-1950	24	1000
4	Overhead Close-up view of impact	0	0	-5203	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	8732	0	-1603	24	1000
9	Impact side 45° - rearward pole view	-2167	4041	-1910	24	1000
10	Overhead wide - view of impact	-80	305	-5203	14	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: Onboard camera's trigger control malfunctioned and did not operate during the impact event.

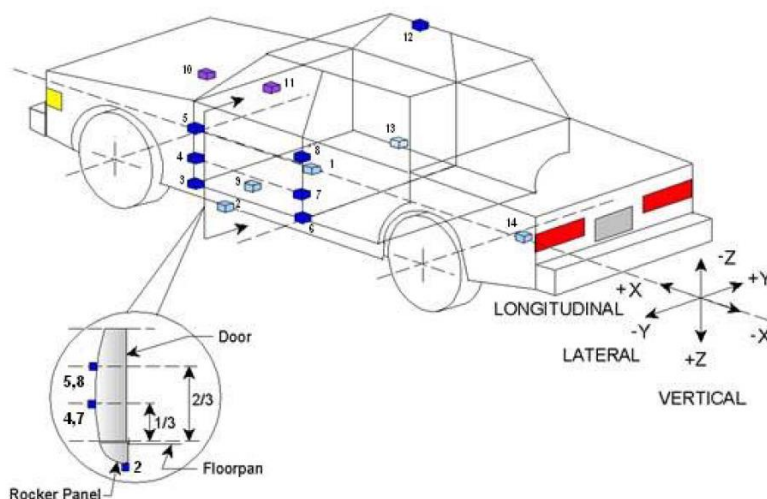
INSTRUMENTATION

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: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2734	-3	-184
2	Left Floor Sill	2718	-667	100
3	A-Pillar Sill	3115	-648	46
4	A-Pillar Low	3134	-676	-149
5	A-Pillar Mid	2911	-645	-612
6	B-Pillar Sill	1987	-591	187
7	B-Pillar Low	1898	-678	-198
8	B-Pillar Mid	1813	-681	-467
9	Driver Seat Track	2407	-562	96
10	Engine Top	4021	-52	-391
11	Firewall	3388	160	-394
12	Right Roof	2071	590	-953
13	Right Floor Sill	2684	665	104
14	Rear Floorpan	1036	41	-137

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

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017

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: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017

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
Upper Torso	Seatback & Torso/Pelvis Airbag
Lower Torso	Seatback
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	N/A	Yes	N/A	Yes
Total Separation from Vehicle at Hinges or Latches	No	N/A	No	N/A	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	N/A	No	N/A	No
Disengaged from Latched Position	No	N/A	No	N/A	No
Latch Separated from Striker	No	N/A	No	N/A	No
Jammed Shut	Yes	N/A	No	N/A	No
If Door Opened at Striker, Width of Opening at Striker (mm)	0	N/A	0	N/A	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: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar Buckled
Sill Separation	None
Windshield Damage	Cracks throughout with separation along driver A-Pillar and hood line
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	No	N/A
Seat Belt Pretensioner	Yes	Yes	No	N/A
Seat Belt Load Limiter	Yes	Yes	No	N/A
Other				

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

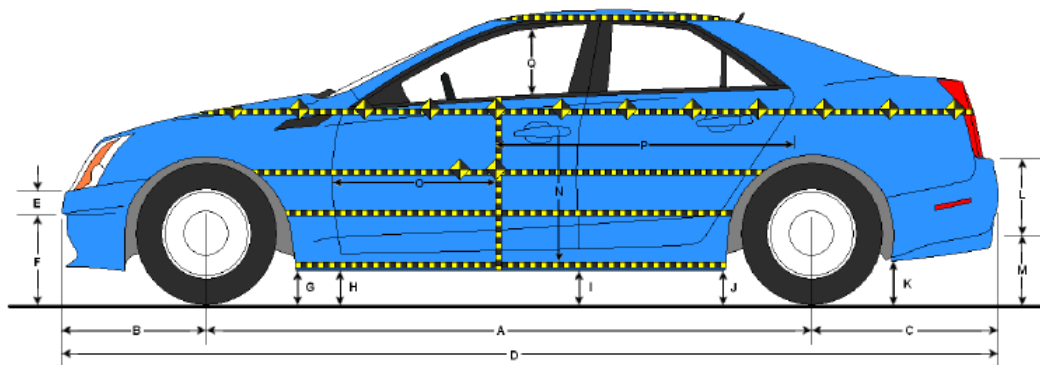
Measured Parameter	Units	Tolerance	Value
Vertical Impact Ref Line - Aft of Front Axle, Intended Impact Pt	mm		1335
Actual Impact Point - Aft of Front Axle	mm		1325
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 *	+10
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75.0
Trap No. 1 Velocity - Primary	kph	31.4 to 33.0	32.41
Trap No. 2 Velocity - Redundant	kph	31.4 to 33.0	32.31

* Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Ford Mustang two door coupe
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
Test Date: 12/11/2017



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

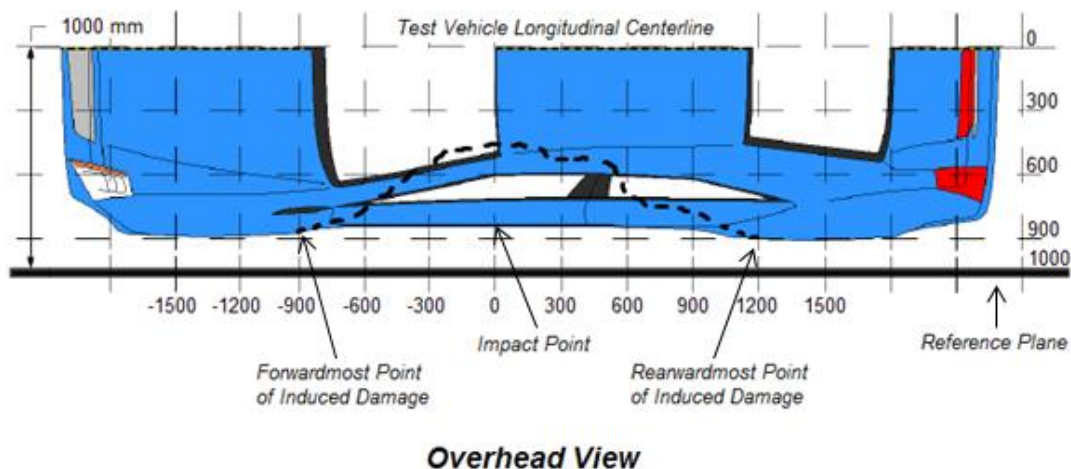
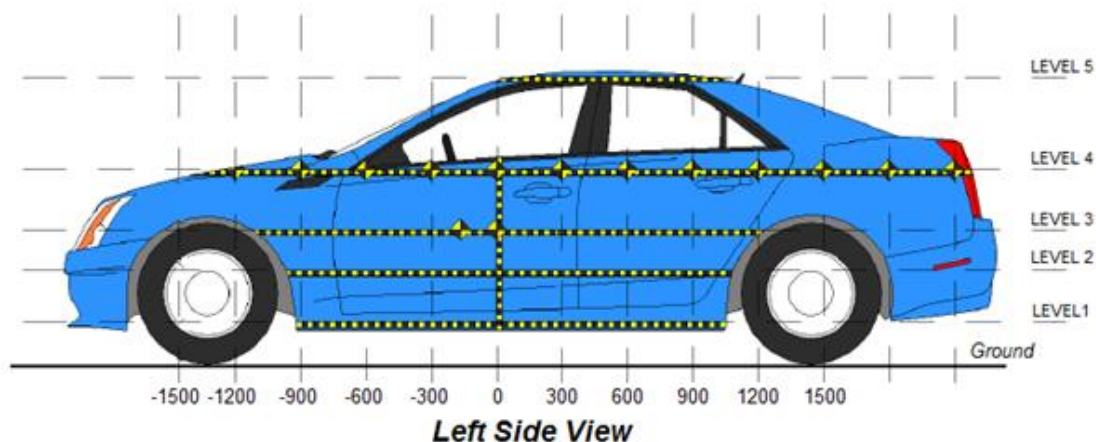
Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2717	2673	44
B	Front Axle to FSOV	951	1002	-51
C	Rear Axle to RSOV	1124	1114	10
D	Total Length at Centerline	4792	4789	3
E	Front Bumper Thickness	130	130	0
F	Front Bumper Bottom to Ground	404	435	-31
G	Sill Height at Front Wheel Well	146	176	-30
H	Sill Height at Front Door Leading Edge	143	135	8
I	Sill Height at B-Pillar	143	137	6
J1	Sill Height at Rear Wheel Well	148	164	-16
J2	Pinch Weld Height at Rear Wheel Well	150	157	-7
K	Sill Height Aft of Rear Wheel Well	407	402	5
L	Rear Bumper Thickness	115	115	0
M	Rear Bumper Bottom to Ground	402	393	9
N	Sill Height to Bottom of Front Window Sill	-731	-781	50
O	Front Door Leading Edge to Impact CL	542	484	58
P	Rear Door Trailing Edge to Impact CL	722	668	54
Q	Front Window Opening	-283	-245	-38
R	Right Side Length	4701	4729	-28
S	Left Side Length	4704	4700	4
T	Vehicle Width at B-Pillars	1821	1765	56

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

DATA SHEET NO. 10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	261	306	0
2	Occupant Hip Point	mm	501	327	0
3	Mid - Door	mm	660	341	0
4	Window Sill	mm	954	240	0
5	Window Top	mm	1291	97	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: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

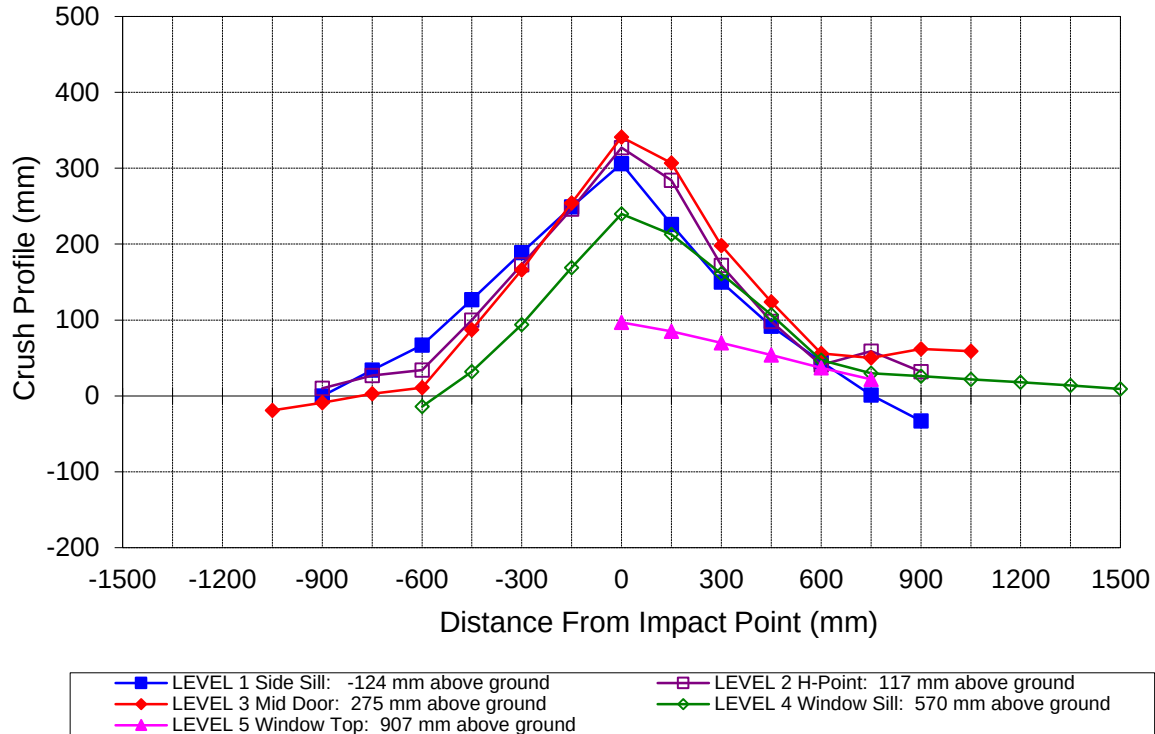
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050			940					959					-19		
-900	906	932	929			906	922	938			0	10	-9		
-750	881	909	924			847	882	921			34	27	3		
-600	876	903	922	797		809	869	911	811		67	34	11	-14	
-450	873	902	922	806		746	802	835	774		127	100	87	32	
-300	872	902	921	812		683	729	755	718		189	173	166	94	
-150	871	901	920	820		622	655	666	651		249	246	254	169	
0	870	899	918	825	627	564	572	577	585	530	306	327	341	240	97
150	866	898	916	827	639	640	614	609	614	554	226	284	307	213	85
300	868	895	913	826	635	718	723	715	665	565	150	172	198	161	70
450	872	893	910	824	629	780	795	786	717	575	92	98	124	107	54
600	869	892	907	820	619	824	851	851	773	582	45	41	56	47	37
750	870	900	906	811	590	869	841	856	781	568	1	59	50	30	22
900	897	927	920	804		930	895	858	778		-33	32	62	26	
1050			945	812				886	790				59	22	
1200				853					835					18	
1350				854					840					14	
1500				847					838					9	

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: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017



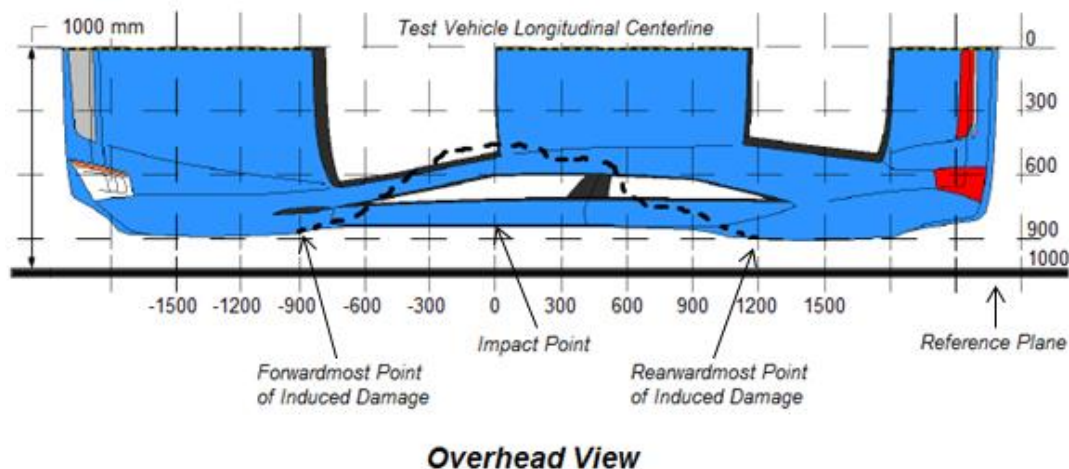
Vehicle Exterior Crush Measurements - Visual Representation

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

Test Vehicle: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017

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	-1050	3	41	60	-19
2	-630	3	87	78	9
3	-210	3	298	80	218
4	210	3	349	85	264
5	630	3	148	93	55
6	1050	3	114	55	59

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

Test Vehicle: <u>2018 Ford Mustang two door coupe</u>	NHTSA No.: <u>M20180215</u>
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>12/11/2017</u>
Test Time: <u>10:25 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°	69	300	369
90° to 180°	65	300	365
180° to 270°	62	300	362
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

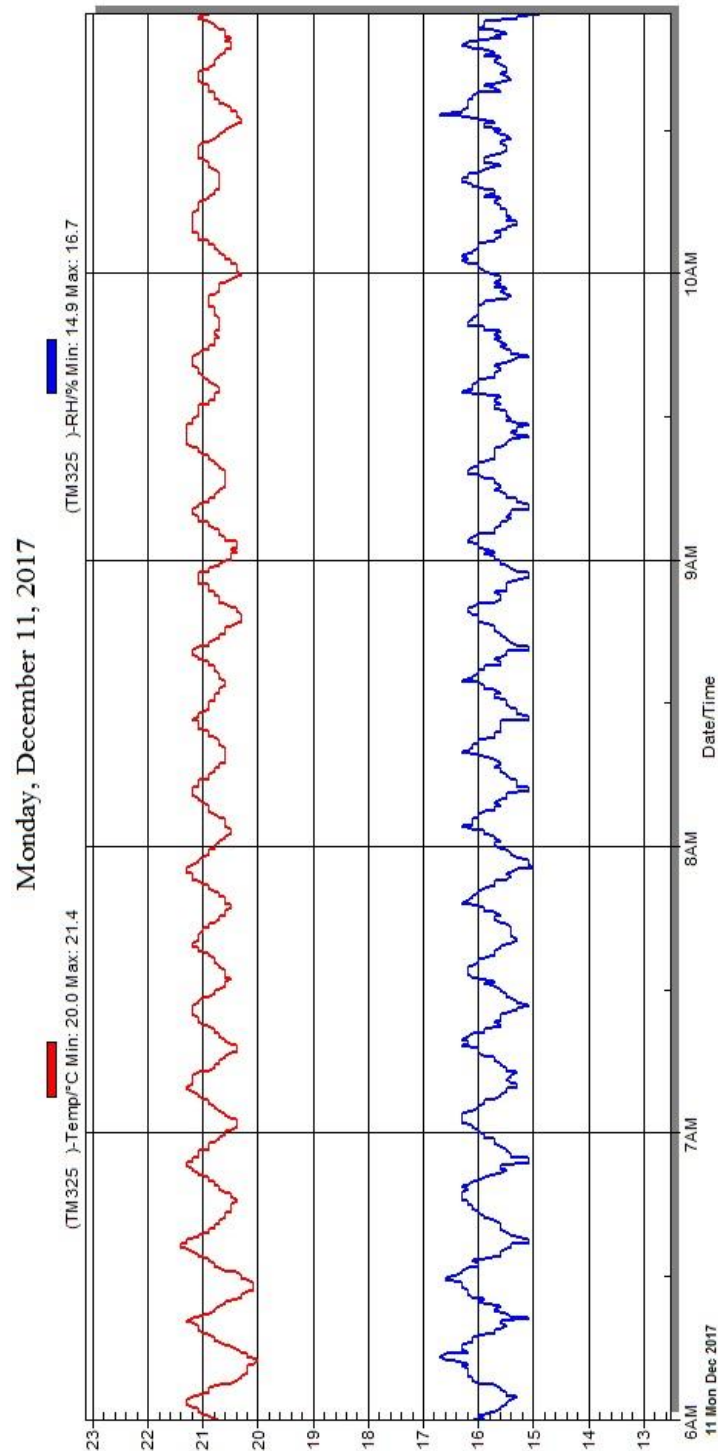
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2018 Ford Mustang two door coupe
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20180215
 Test Date: 12/11/2017



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

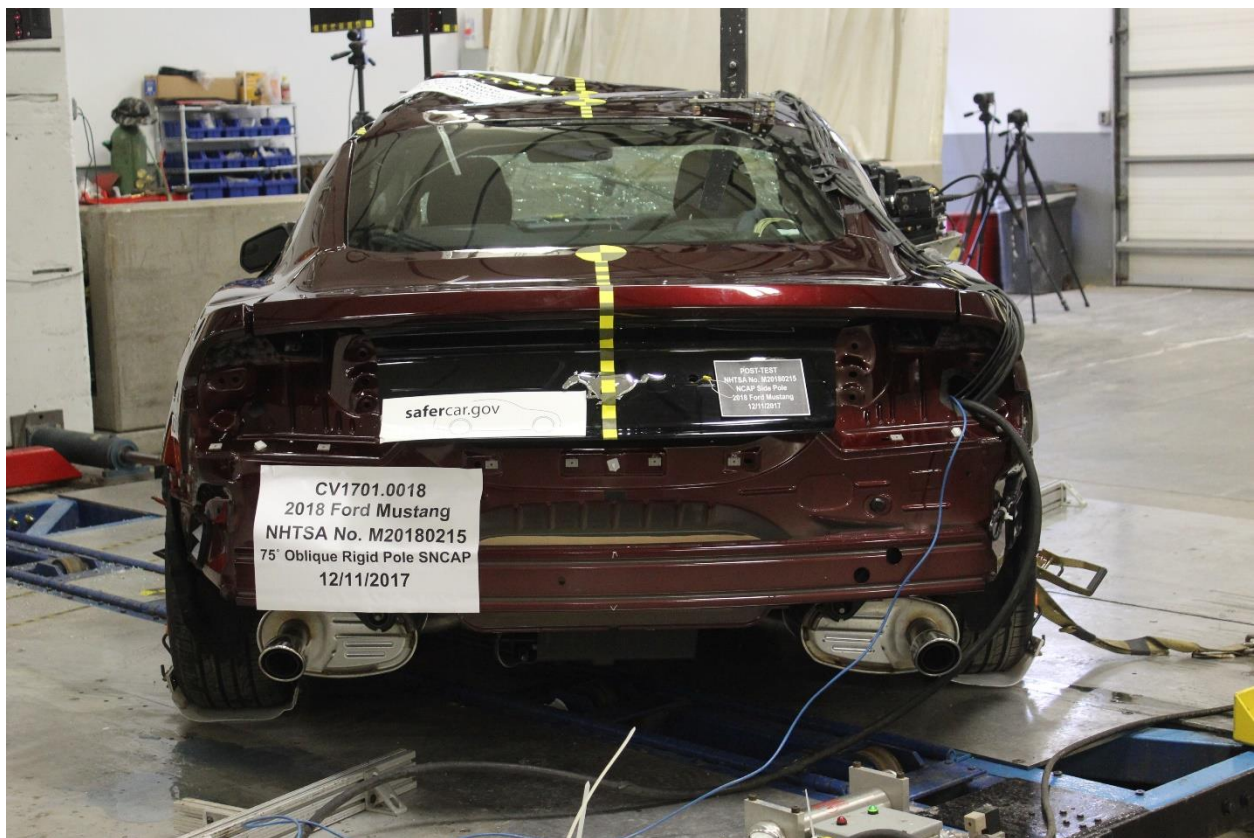


Figure A-12: Post-Test Rear View of Test Vehicle



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

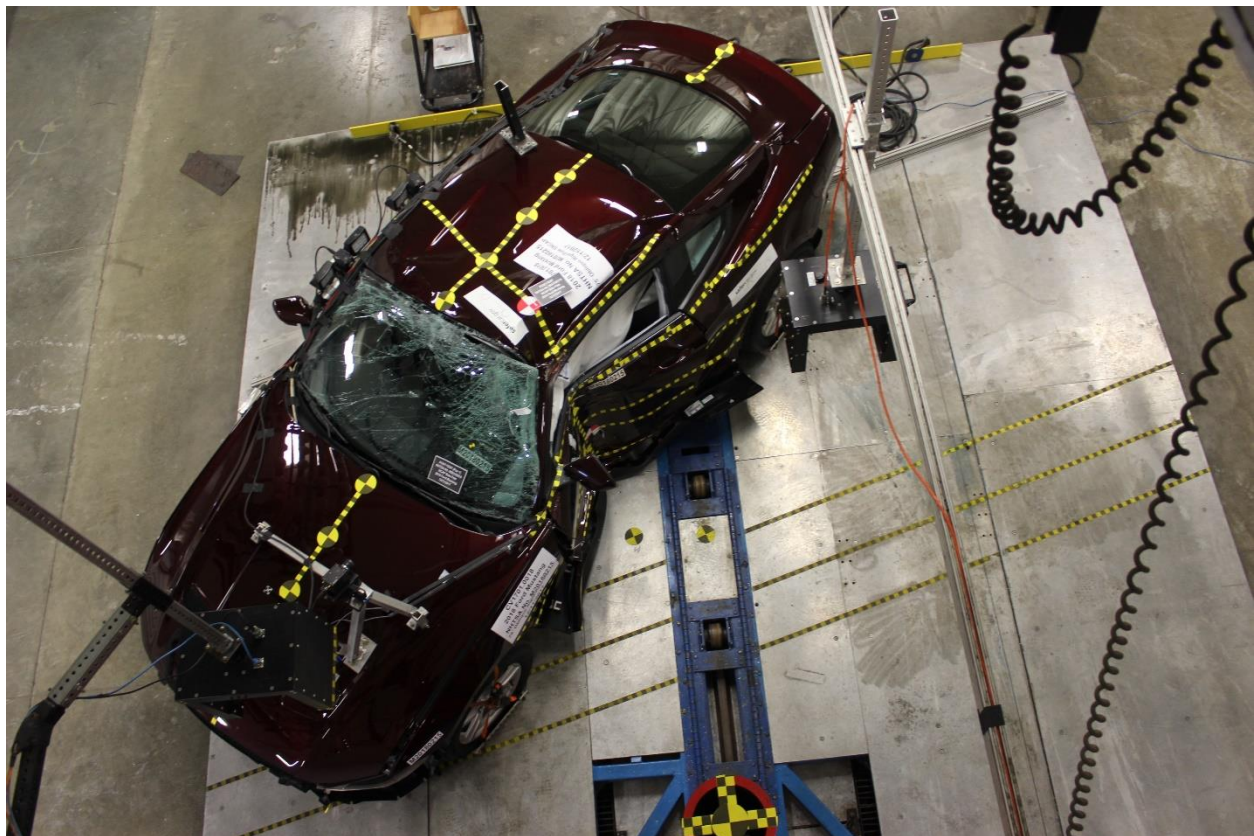


Figure A-16: Post-Test Overhead View of Test Area



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

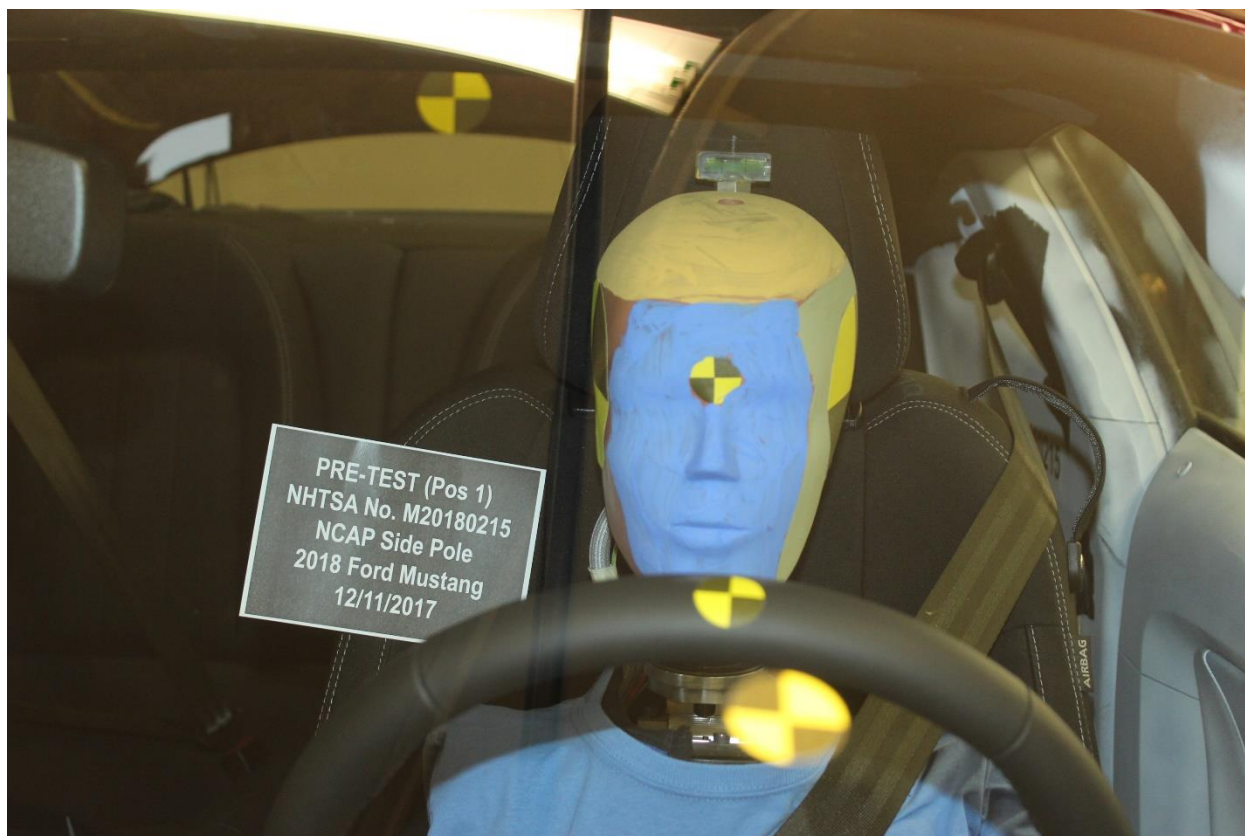


Figure A-21: Pre-Test Front Close-Up View of Dummy Head and Chest



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

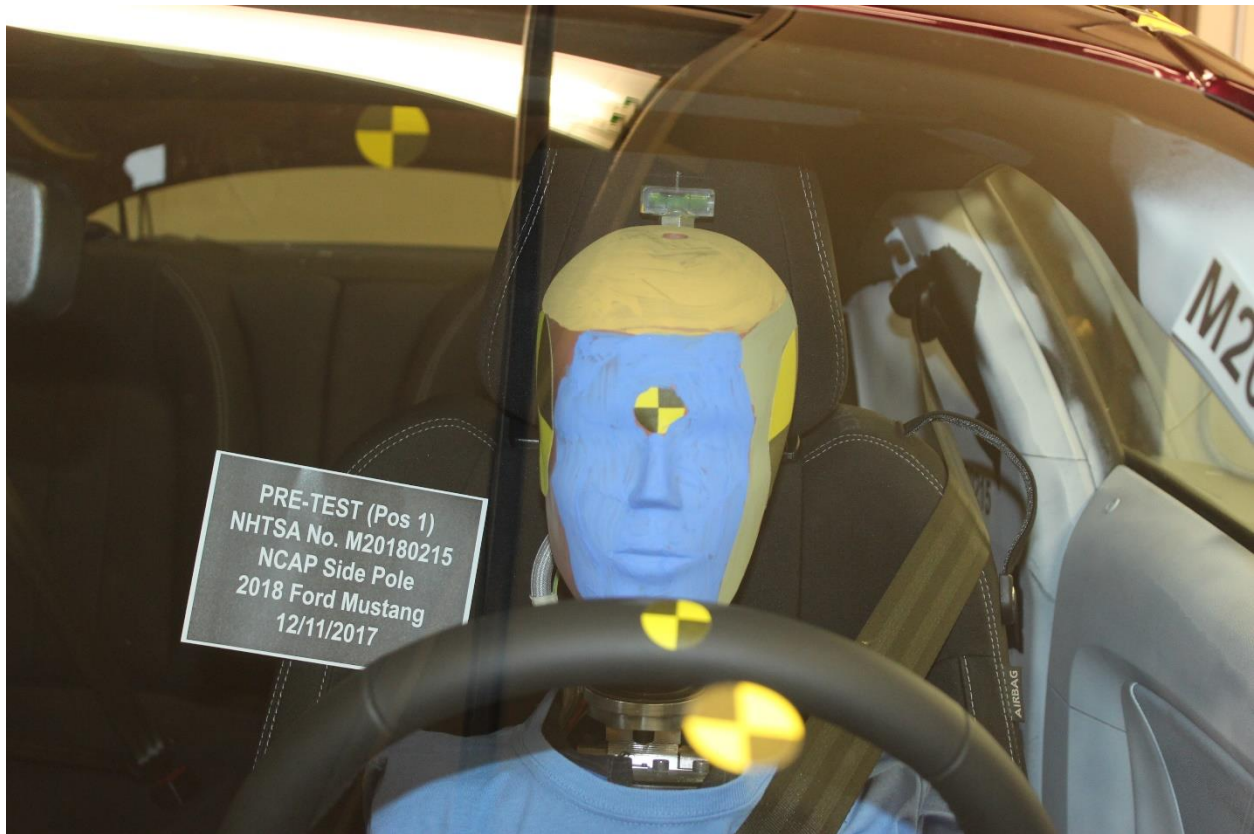


Figure A-27: Pre-Test Frontal Close-Up View of Dummy Head / Shoulders in Relation to Head Restraint



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

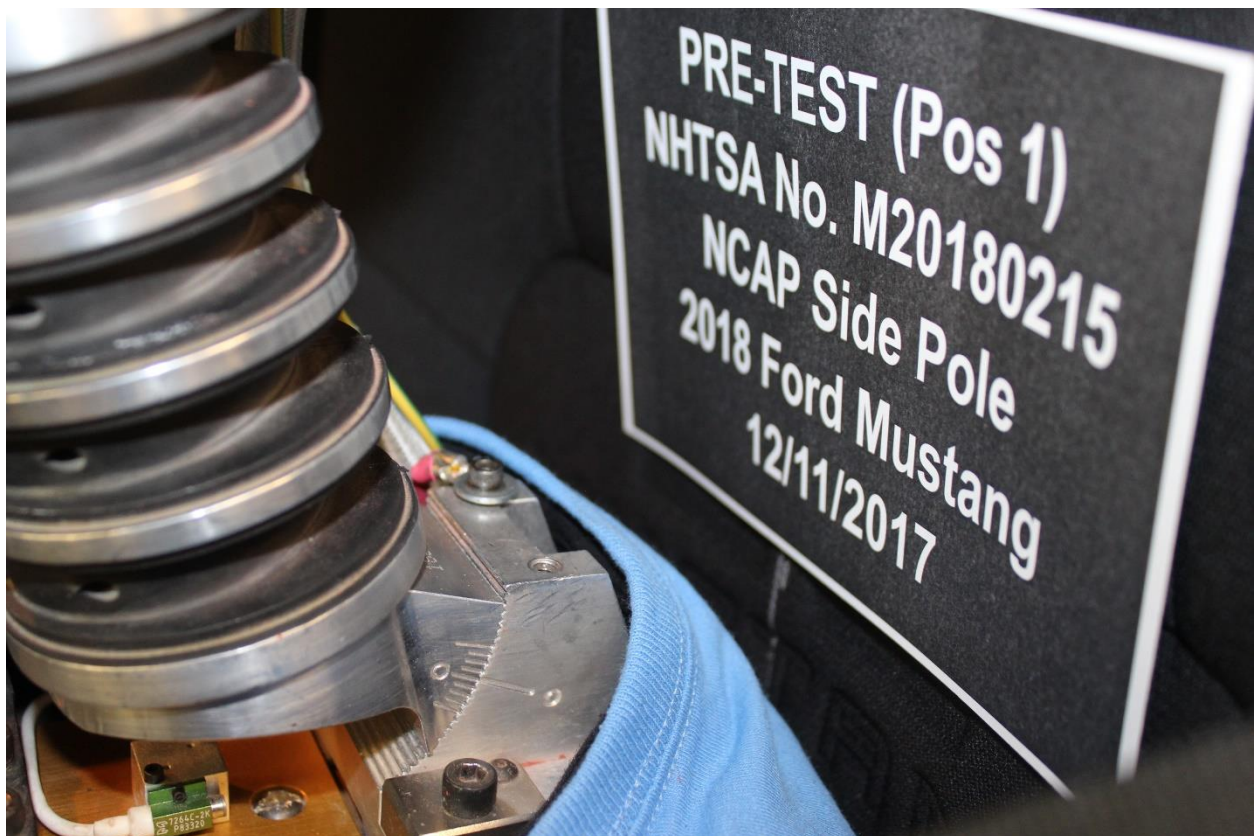


Figure A-30: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket

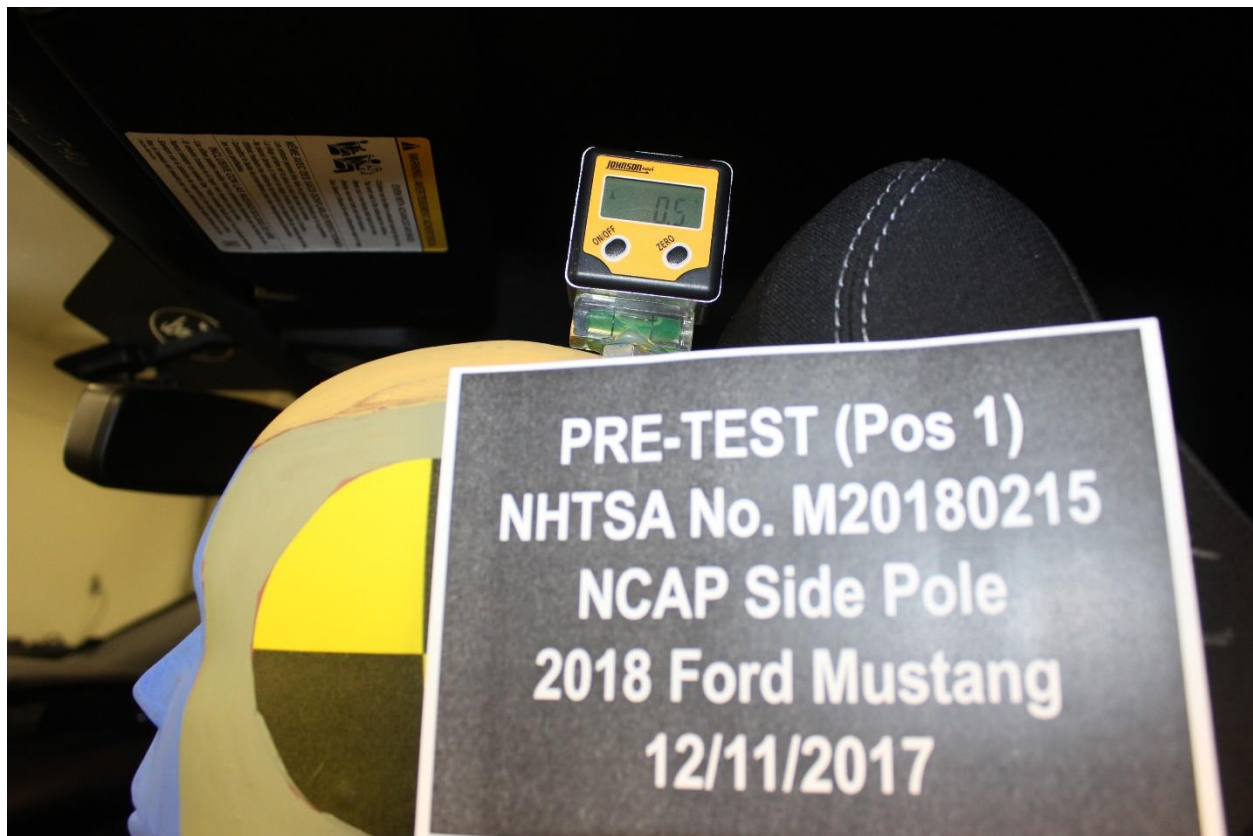


Figure A-31: Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level



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

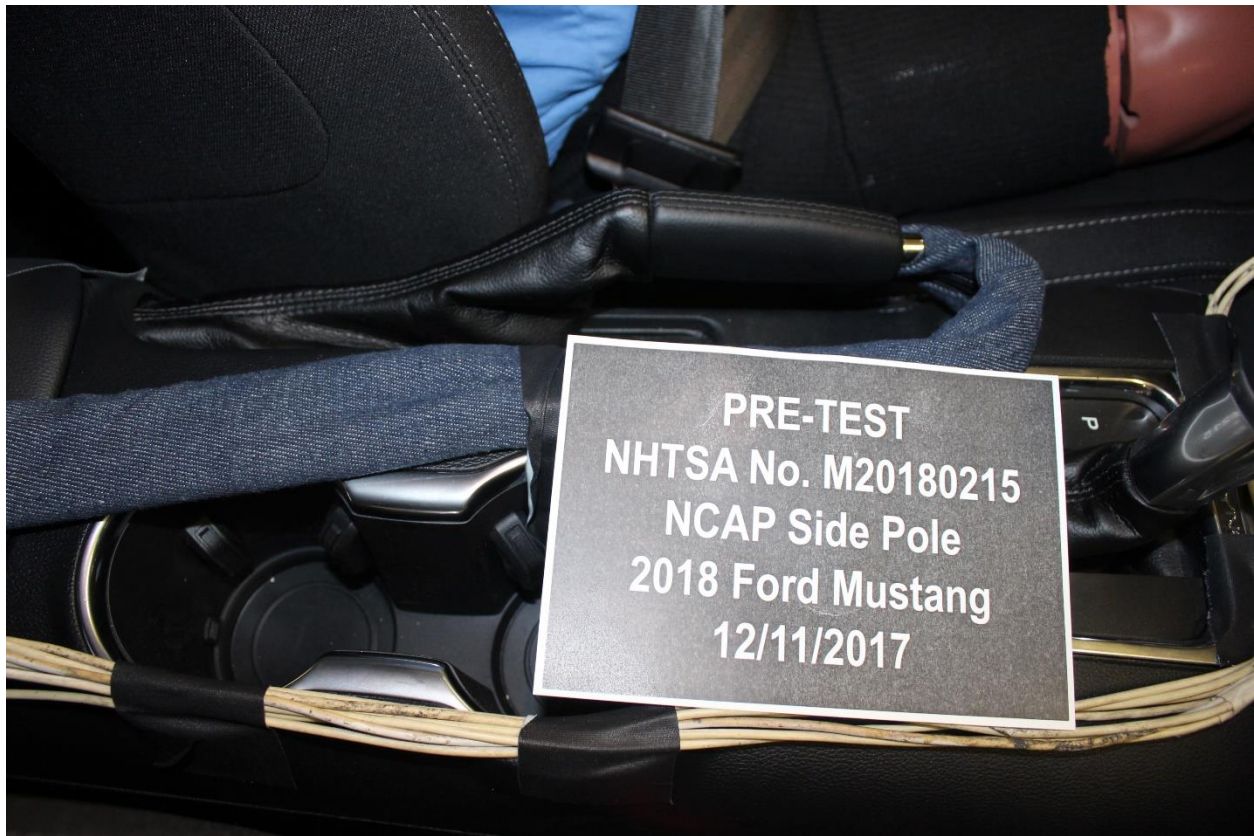


Figure A-35: Pre-Test View of Disengaged Parking Brake



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

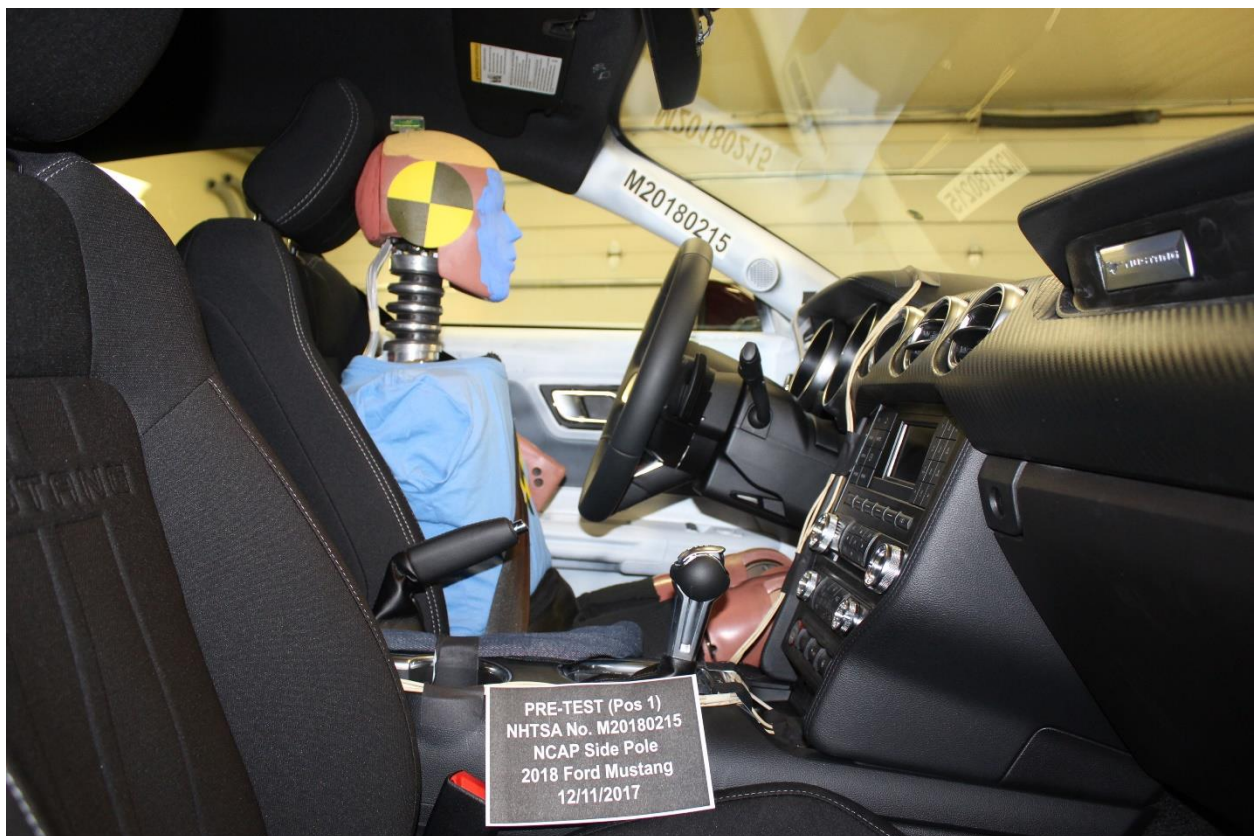


Figure A-42: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



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

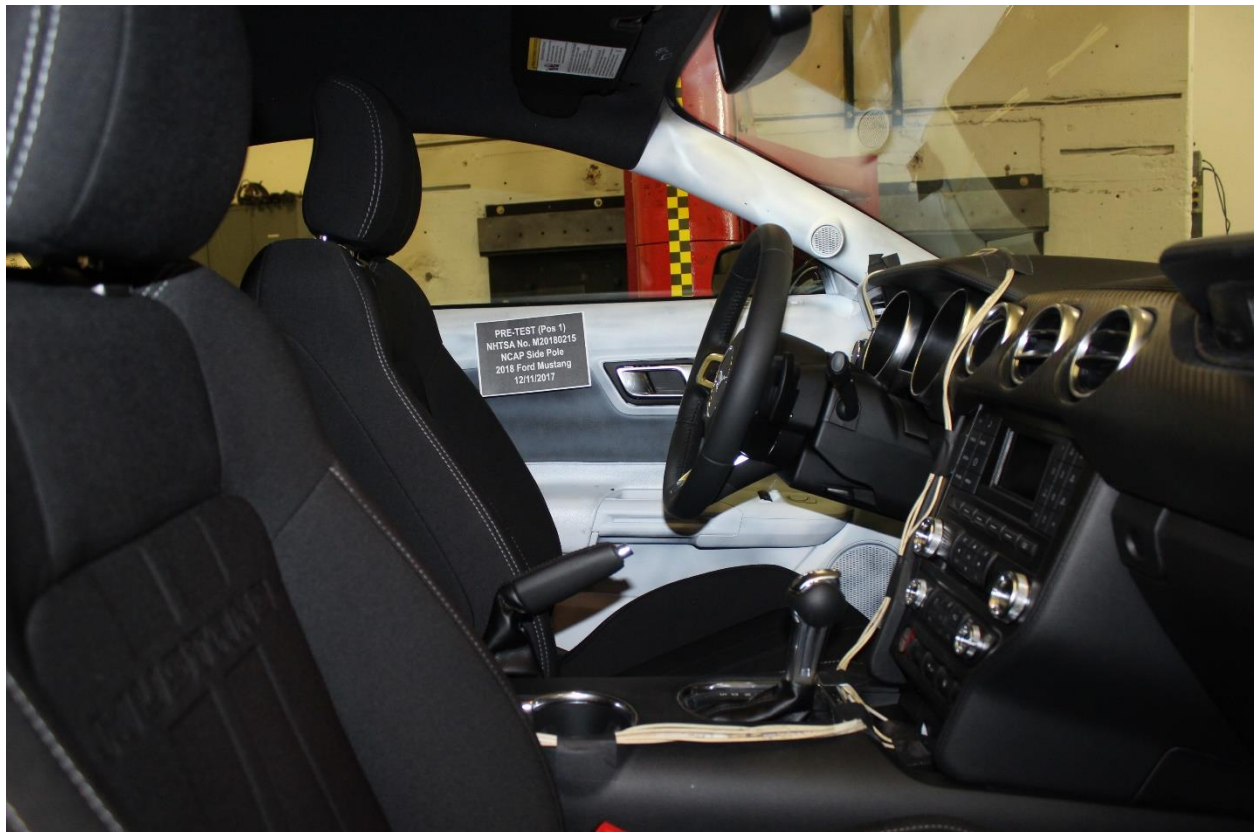


Figure A-44: Pre-Test Inner Door Panel View



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

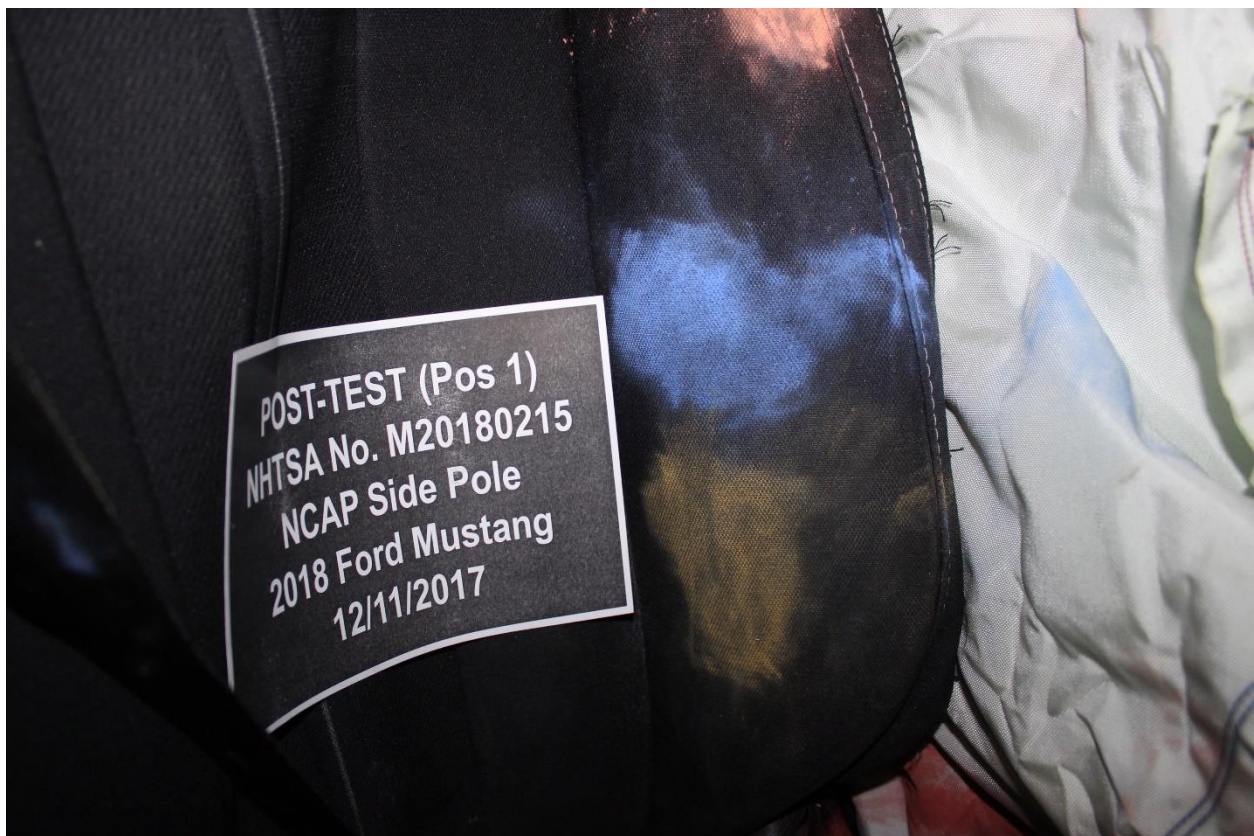


Figure A-48: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View

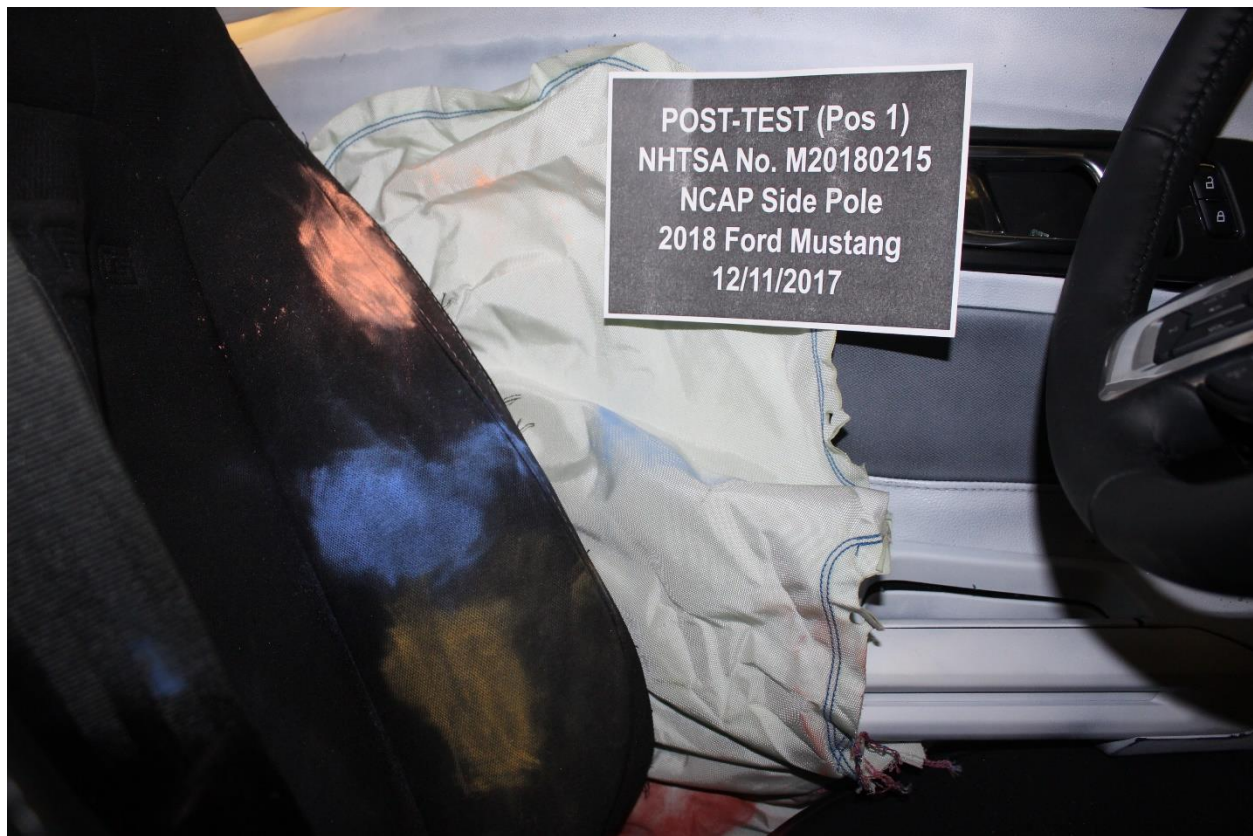


Figure A-49: Post-Test Dummy Close-Up Torso Contact with Side Airbag View



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

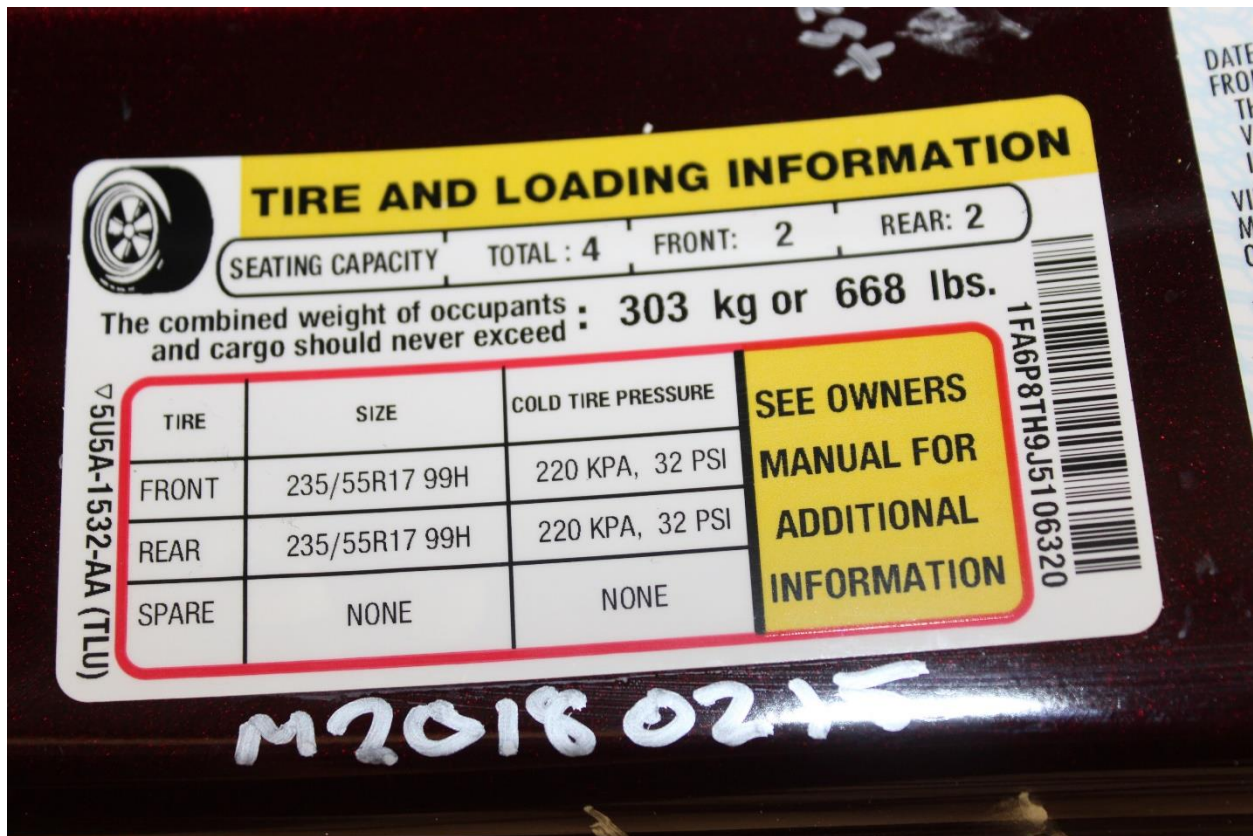


Figure A-56: Close-Up View of Vehicle's Tire Information Placard or Label



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



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

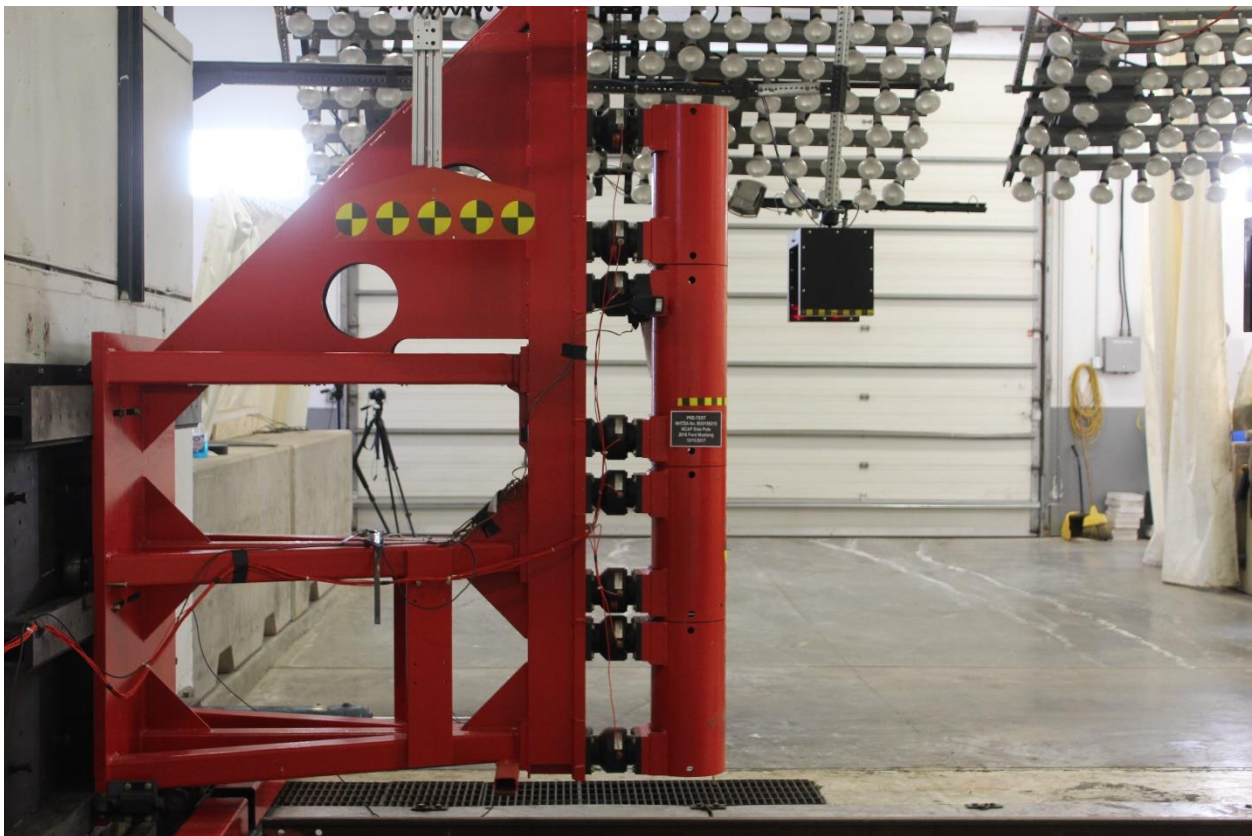


Figure A-59: Pre-Test Pole Barrier Side View



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

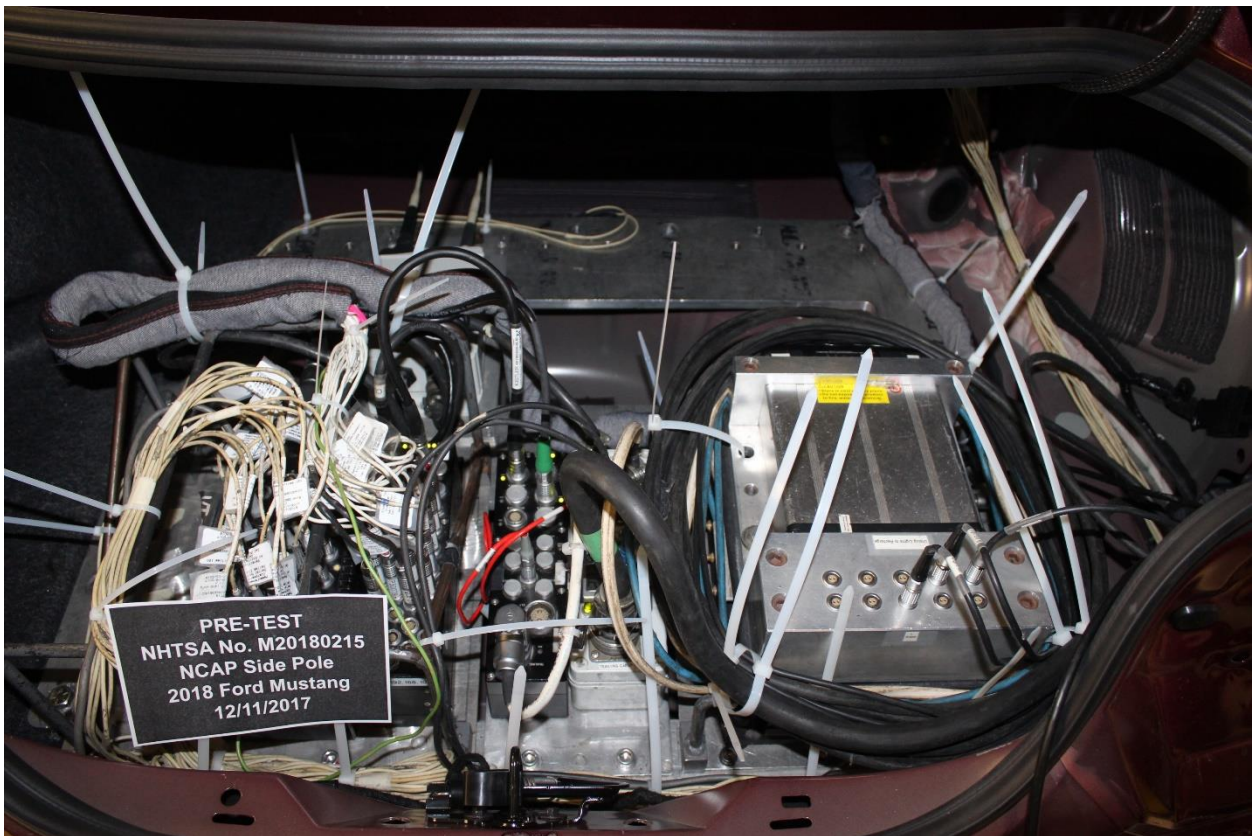


Figure A-61: Pre-Test Ballast View



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

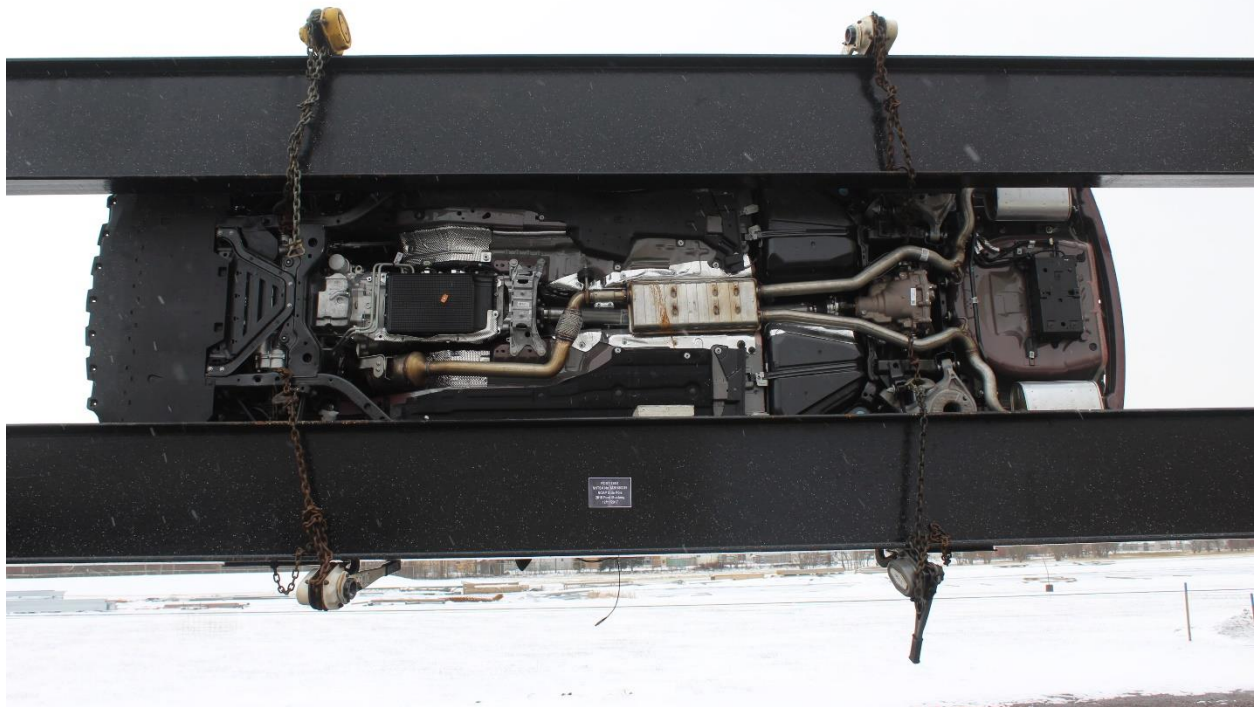


Figure A-66: FMVSS No. 301 Static Rollover 270 Degrees



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



Figure A-68: Impact Event

MUSTANG 2018 ECOBOOST COUPE 4-PASSENGER SPORTS CAR 2.0L ECOBOOST 10-SPEED AUTOMATIC TRANS		J5 106320 EXTERIOR: ROYAL CRIMSON MET TINTED CC INTERIOR: EBONY CLOTH BUCKET SEATS		EPA DOT Fuel Economy and Environment 25 MPG combined city/hwy 4.0 gallons per 100 miles 21 city 32 highway Subcompact Cars range from 15 to 124 MPG. The best vehicle rates 130 MPG. You spend \$500 more in fuel costs over 5 years compared to the average new vehicle.	
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE EXTERIOR: - DUAL EXHAUST SYSTEM - EASY FUEL CAPLESS FILLER - HEADLAMPS - AUTOLAMP (ON/OFF) - HEADLAMPS - LED WITH SIGNATURE LIGHTING - HOOD VENT - MIRRORS - MAN-FOLD POWER W/ INTEGRATED BLIND SPOT - TAILLAMPS - LED W/ SEQUENTIAL TURN SIGNAL - WIPERS - INTERMITTENT INTERIOR: - TOUCH UP/DOWN DR/PASS WIN - AUTO-DM REARVIEW MIRROR - CENTER CONSOLE W/ ARMREST - CLOTH SEATING SURFACES - CRUISE CONTROL - DUAL ILLUM VANTY MIRRORS - FRONT FLOOR MATS - LEATHER WRAPPED STR WHEEL - W/ CLIMATE AND AUDIO CONTROL - MANUAL A/C, SINGLE ZONE - POWER LOCKS AND WINDOWS - SMART CHARGING USB PORT (2) - SPLIT FOLD REAR SEAT - TILT/TELESCOPE STR COLUMN - WINDOWS - GLOBAL OPEN FUNCTIONAL: 4.2" LED CTR STACK SCREEN - AM/FM SINGLE CD/MP3 PLAYER - ELECTRONIC PARK ASSIST STEER - INDEPENDENT REAR SUSP - INTELLIGENT ACCESS W/ PUSH BUTTON START - LIMITED SLIP REAR AXLE - MYKEY® - REAR VIEW CAMERA - SYNCR WITH APPLINK® - TRACK APPS™ SAFETY/SECURITY: - ADVANCED TRAC ESC - AIRBAG - DRIVER/PASS KNEE - AIRBAGS - DUAL STAGE FRONT - AIRBAGS - FRONT SEAT - MONITORED SIDE IMPACT - AIRBAGS - SIDE AIR CURTAIN - DOWN TIRE PRESS MONIT SYS - LATCH CHILD SAFETY SYSTEM - PERIMETER ALARM - SECURELOCK PASS ANTI THEFT - SOS POST CRASH ALERT SYS WARRANTY: 3YR/50,000 BUMPER TO BUMPER 5YR/60,000 POWERTRAIN 5YR/60,000 ROADSIDE ASSIST		Annual fuel Cost \$1,450 Fuel Economy & Greenhouse Gas Rating (in town only) (city only) (hwy only) 5 (in town only) 5 (city only) 5 (hwy only) This vehicle emits 303 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and transporting fuel also create emissions. Learn more at fuelconomy.gov. Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle rate 27.7 MPG and emits 385 g/mi. Cost estimates are based on 15,000 miles per year at \$2.40 per gallon. EPA's is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog. fuelconomy.gov Calculate personalized estimates and compare vehicles			
INCLUDED ON THIS VEHICLE (MSRP) EQUIPMENT GROUP 100A OPTIONAL EQUIPMENT/OTHER 2018 MODEL YEAR ROYAL CRIMSON MET TINTED CC 395.00 17 SPARKLE SILVER ALUM WHL 1,595.00 10-SPEED AUTOMATIC TRANS NO CHARGE 50 STATE EMISSIONS NO CHARGE 3.15 RATIO LIMITED SLIP AXLE NO CHARGE		PRICE INFORMATION (MSRP) BASE PRICE \$25,585.00 TOTAL OPTIONS/OTHER 1,590.00 TOTAL VEHICLE & OPTIONS/OTHER DESTINATION & DELIVERY 27,575.00		GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score Not Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight. Frontal Crash Driver Not Rated Passenger Not Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight. Side Crash Front seat Not Rated Rear seat Not Rated Based on the risk of injury in a side impact. Rollover ★★★★★ Based on the risk of rollover in a single-vehicle crash. Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236	
SOLD TO: Blake Alexander Ford, Inc. 2288 Old Turnpike Lewisburg PA 17837 SHIP TO: OTHER THAN SOLD TO SHIP THROUGH:		RAMP ONE CT51 RAMP TWO CONVOY		DEALER NO.: 16E 457 FINAL ASSEMBLY PLANT: FLAT ROCK ITEM #: 16-Z000 OIT 2 CONVOY HK161 N RA 2X 815 001655 10 16 17	
TOTAL MSRP \$28,475.00		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.		GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score Not Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight. Frontal Crash Driver Not Rated Passenger Not Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight. Side Crash Front seat Not Rated Rear seat Not Rated Based on the risk of injury in a side impact. Rollover ★★★★★ Based on the risk of rollover in a single-vehicle crash. Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236	

Figure A-69: Monroney Label

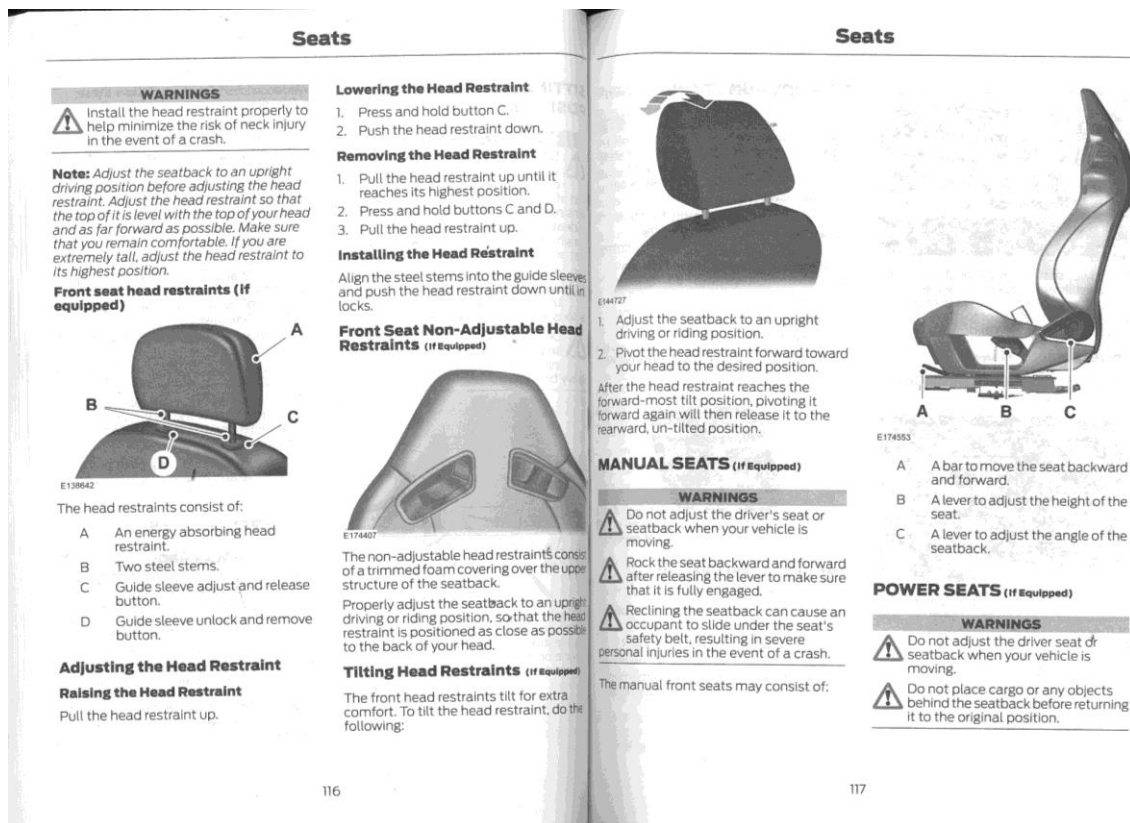


Figure A-70: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



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.dot.gov.

Additional Driver Dummy Instrumentation Data

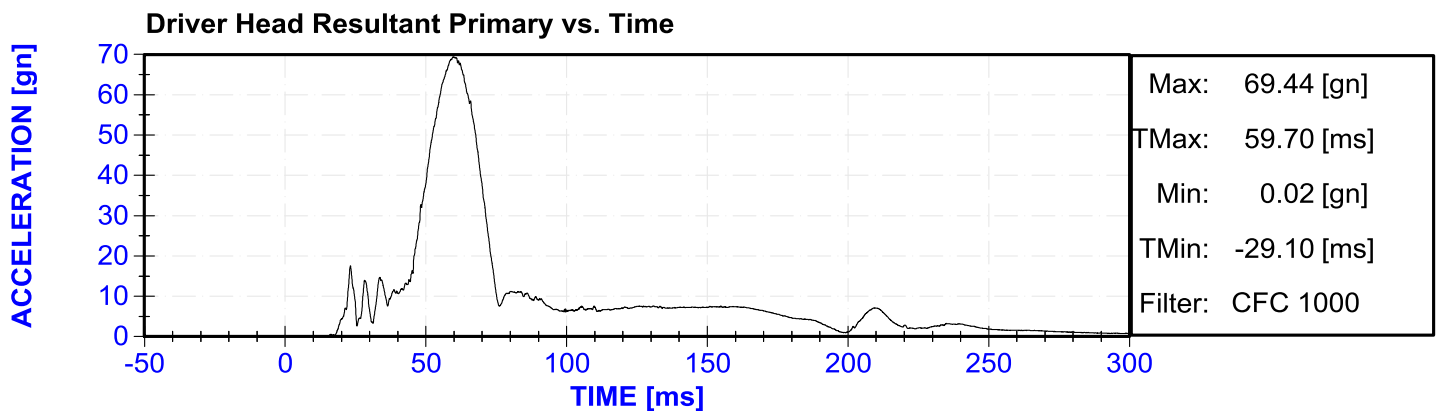
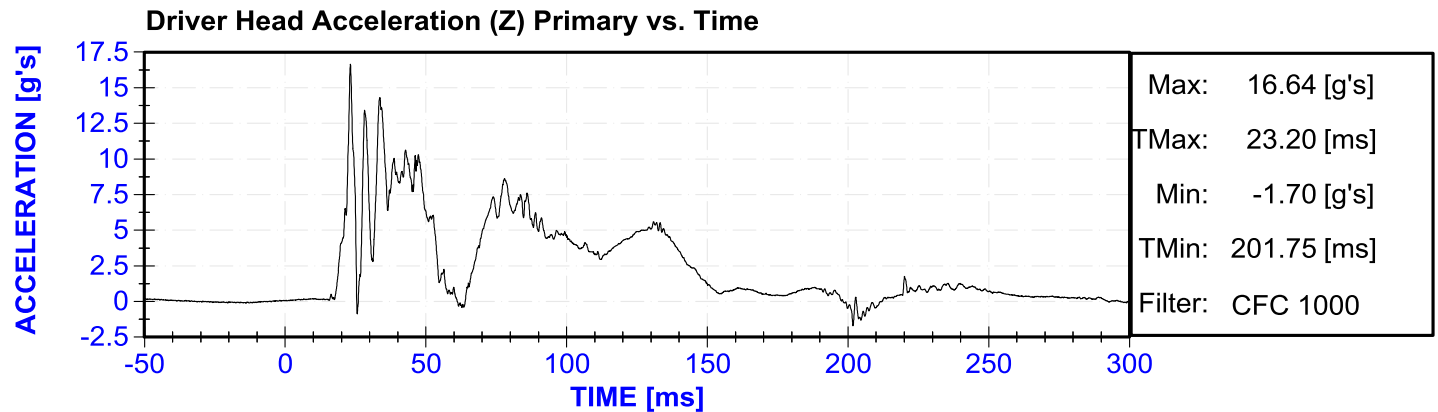
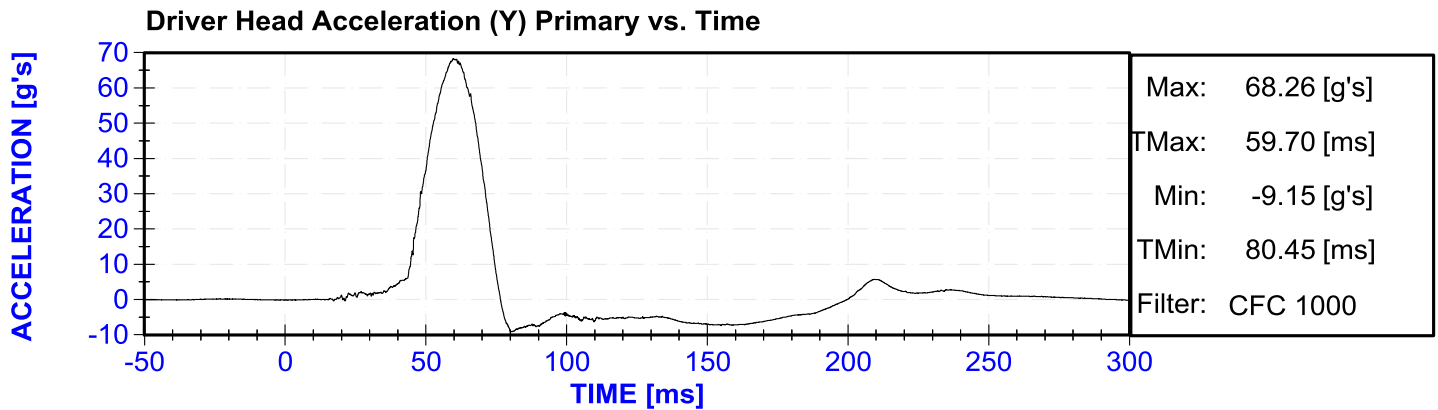
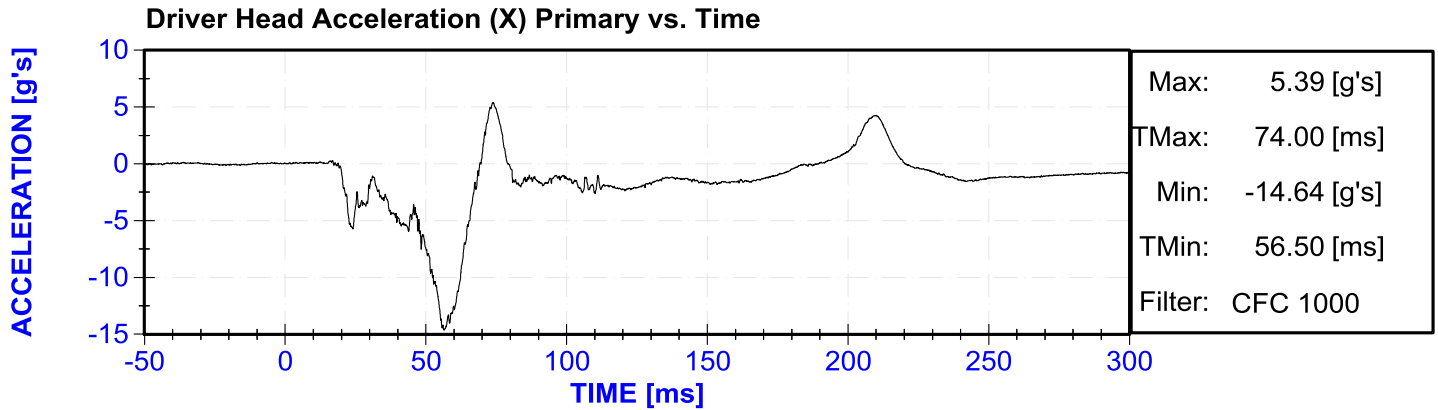
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection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

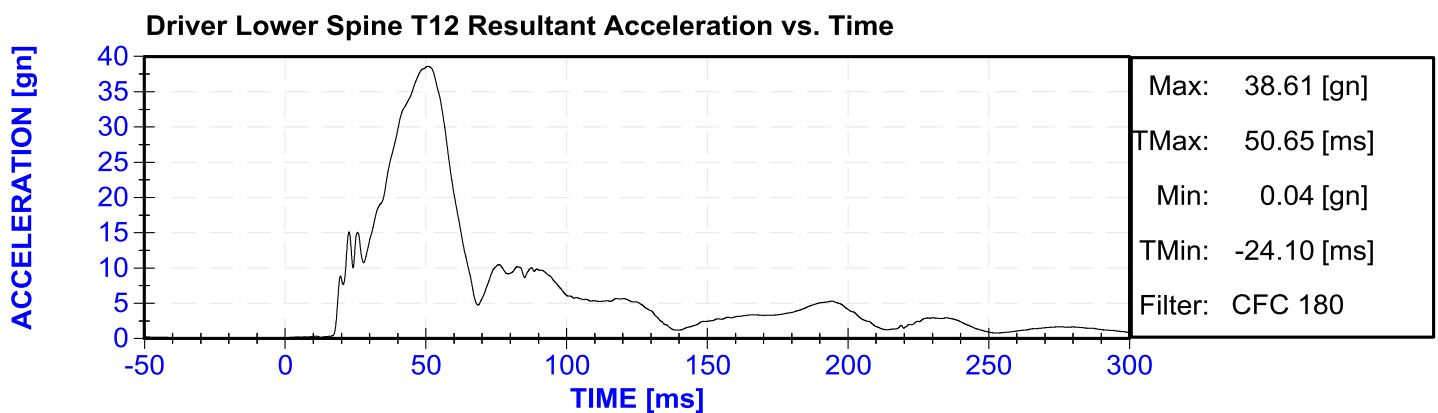
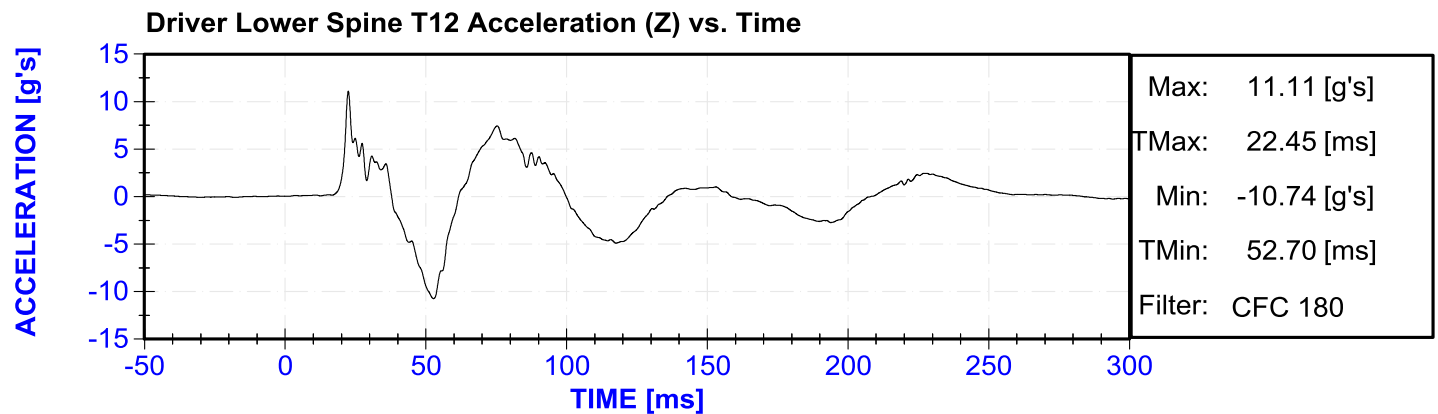
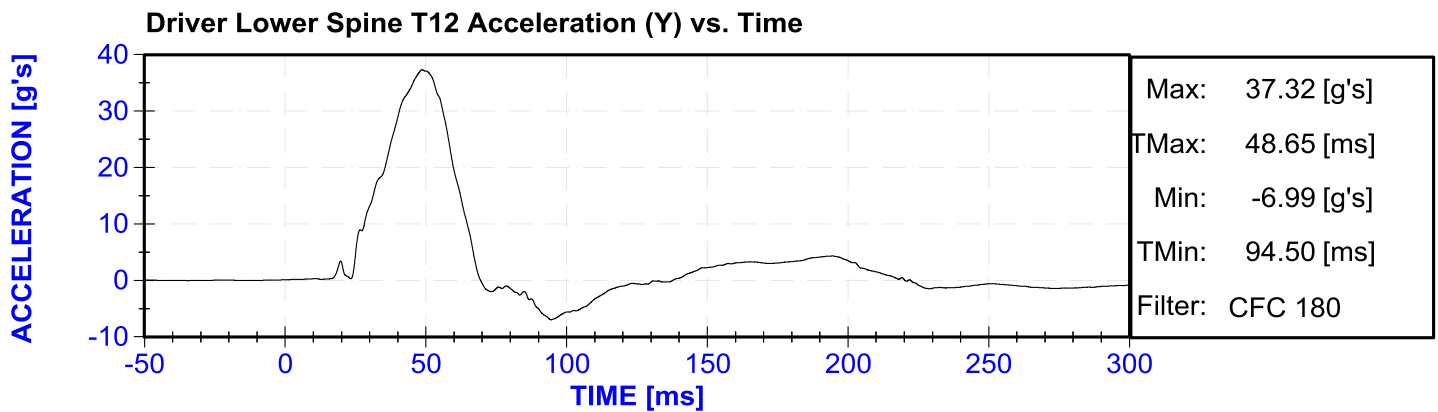
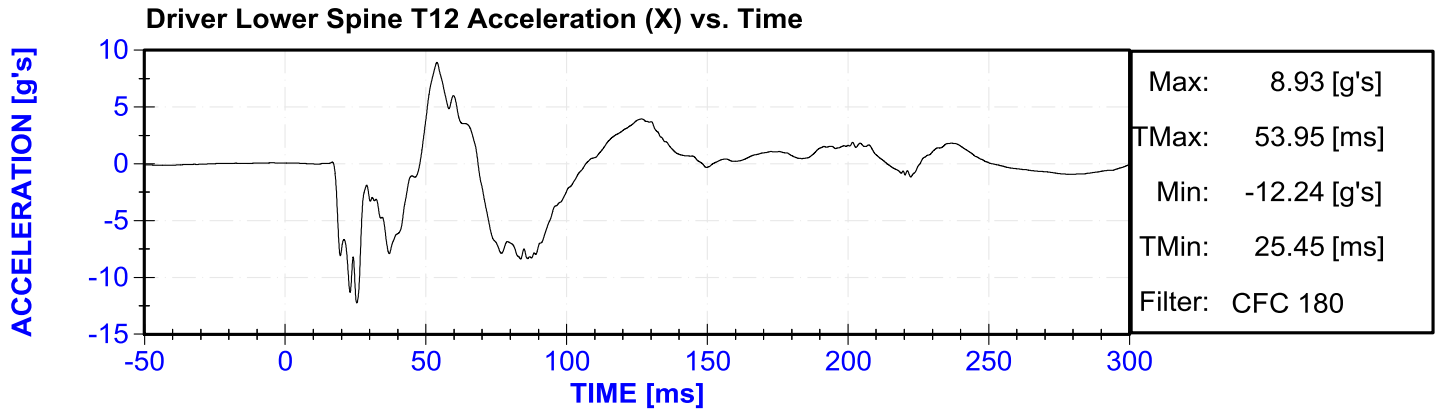
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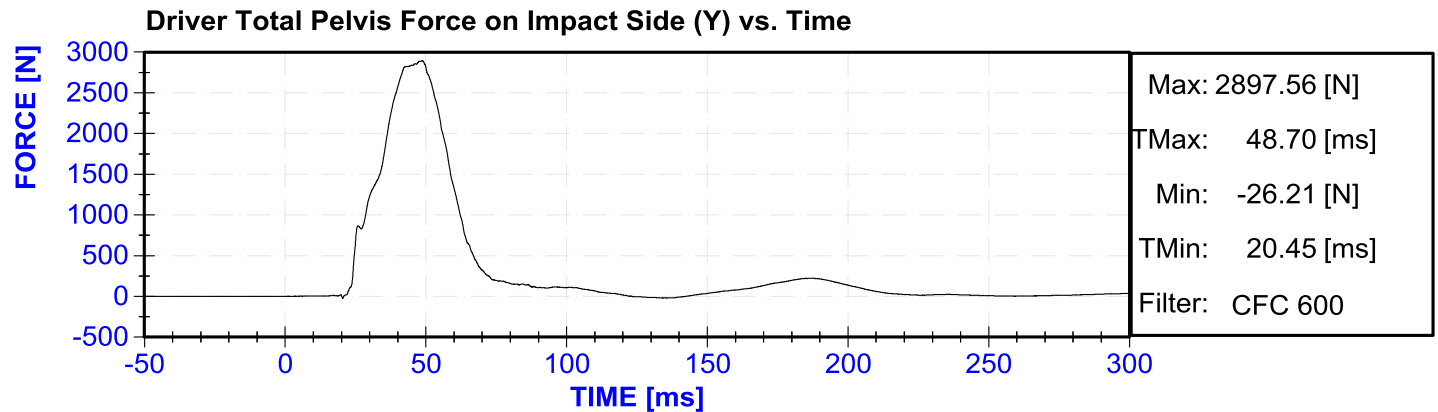
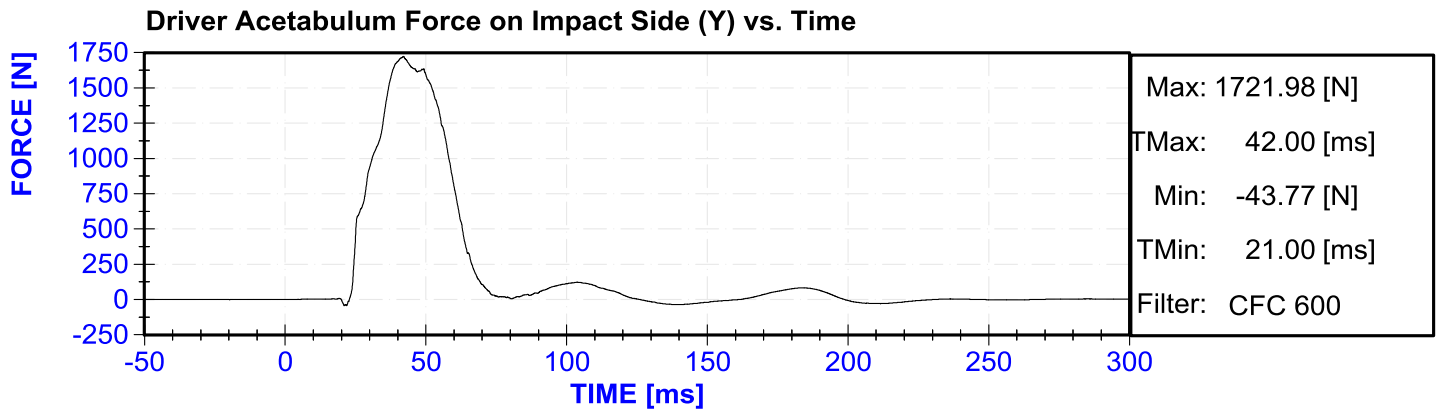
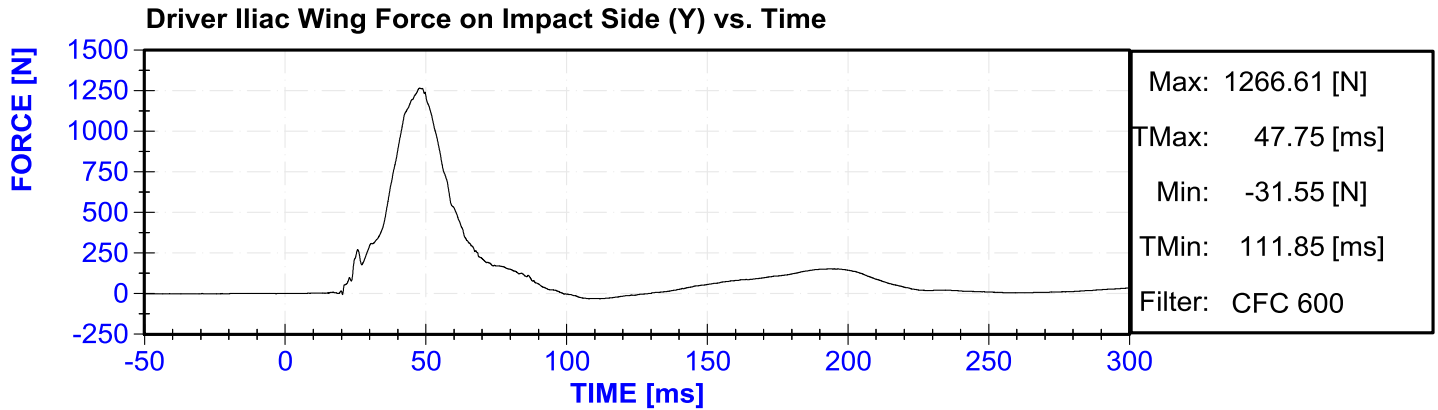
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (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: 300

(CONFIGURED FOR LEFT SIDE IMPACT)

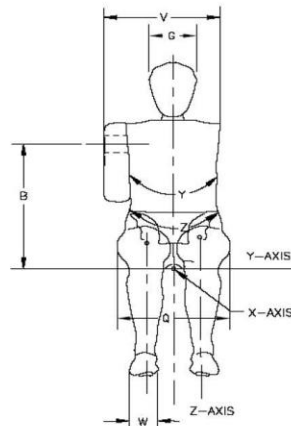
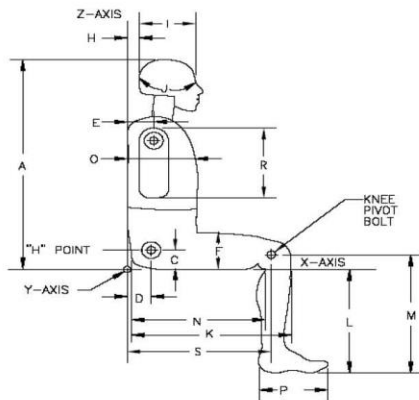


External Measurements - SID-IIs

Technician: K. Brogan

Date: 12/8/2017

Dummy Serial Number: 300



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	781	Pass
B	Shoulder Pivot Height	437	453	446	Pass
C	H-point Height	79	89	86	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	122	Pass
G	Head Breadth	140	148	145	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	182	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	536	Pass
L	Popliteal Height	343	369	356	Pass
M	Knee Pivot to floor height	392	409	402	Pass
N	Buttock Popliteal Length	416	442	435	Pass
O	Chest Depth w/o jacket	195	211	205	Pass
P	Foot Length	216	232	221	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	251	Pass
S	Knee Joint to seatback	477	493	485	Pass
V	Shoulder Width	341	357	351	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	870	Pass
Z	Waist Circumference	761	791	772	Pass

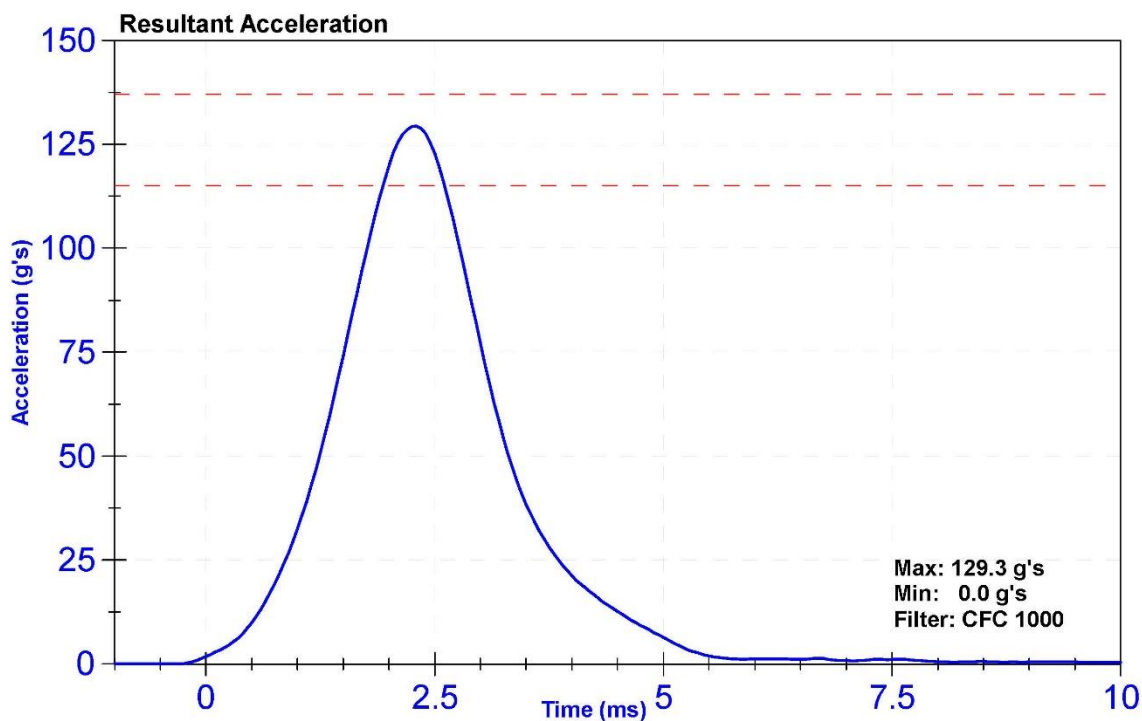
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ATD Serial Number	300	Laboratory Supervisor	K. Brogan

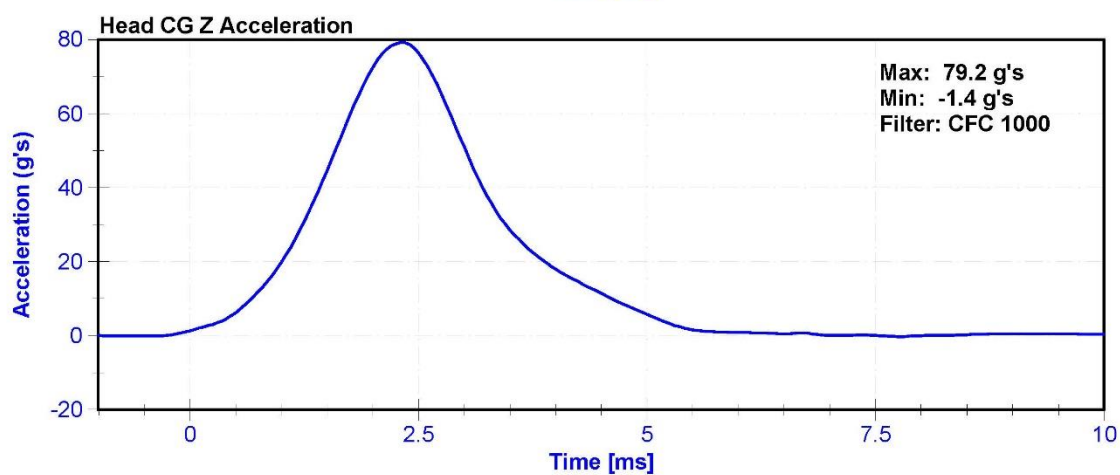
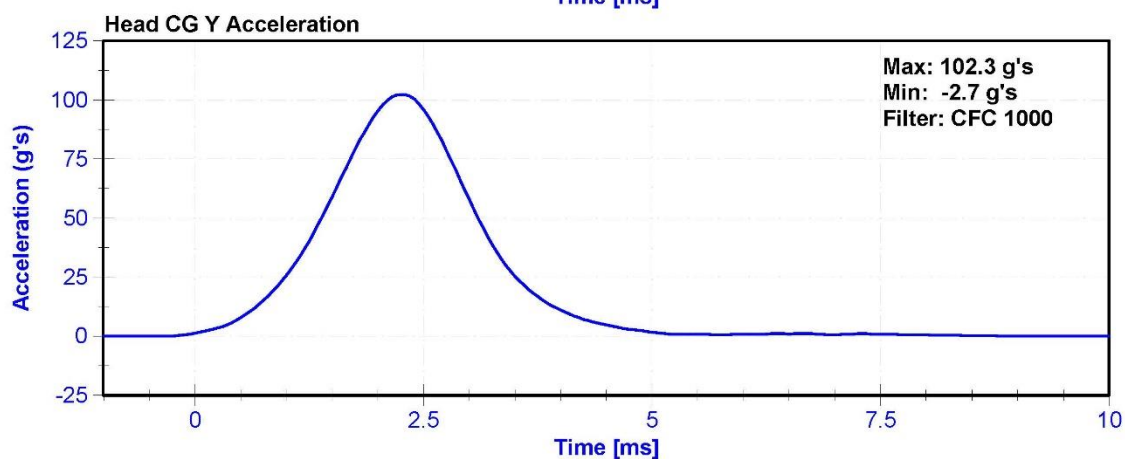
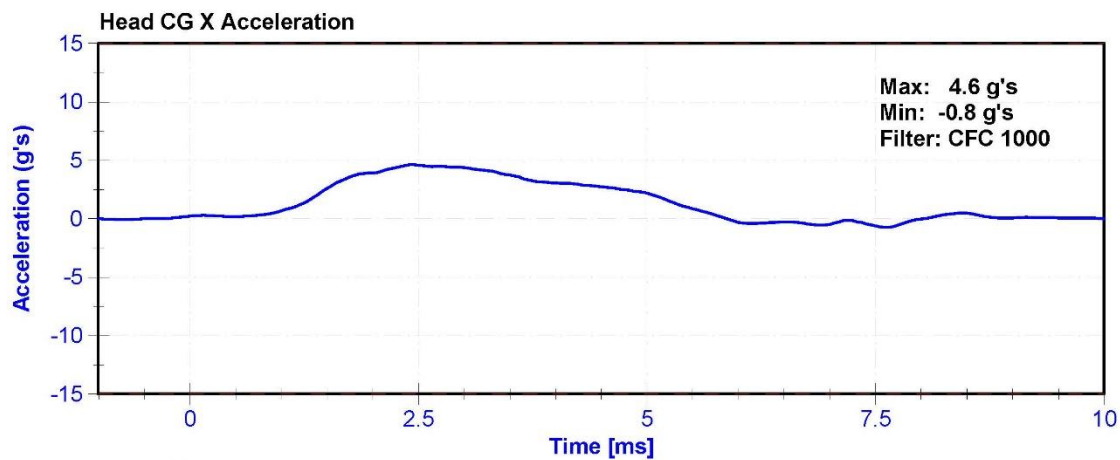
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	32.5	Pass
Resultant Acceleration	115	137	g's	129.3	Pass
Oscillation	0	15	%	2.2	Pass
Fore-Aft Acceleration	-15	15	g's	4.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58777	9/28/2017	3/29/2018
Y Accelerometer	ENDEVCO 7264CT	AC-P59018	9/28/2017	3/29/2018
Z Accelerometer	ENDEVCO 7264	AC-P79189	9/28/2017	3/29/2018





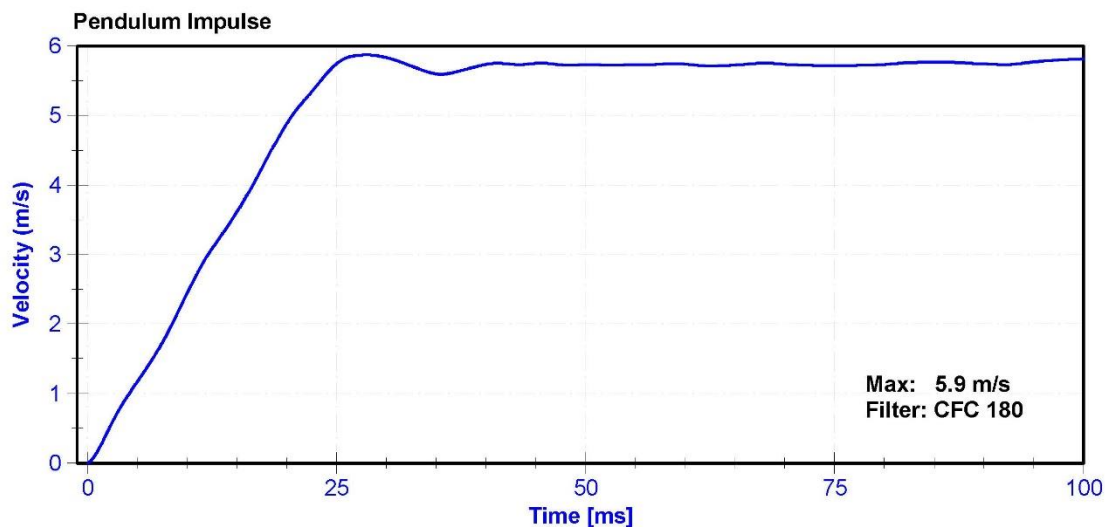
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

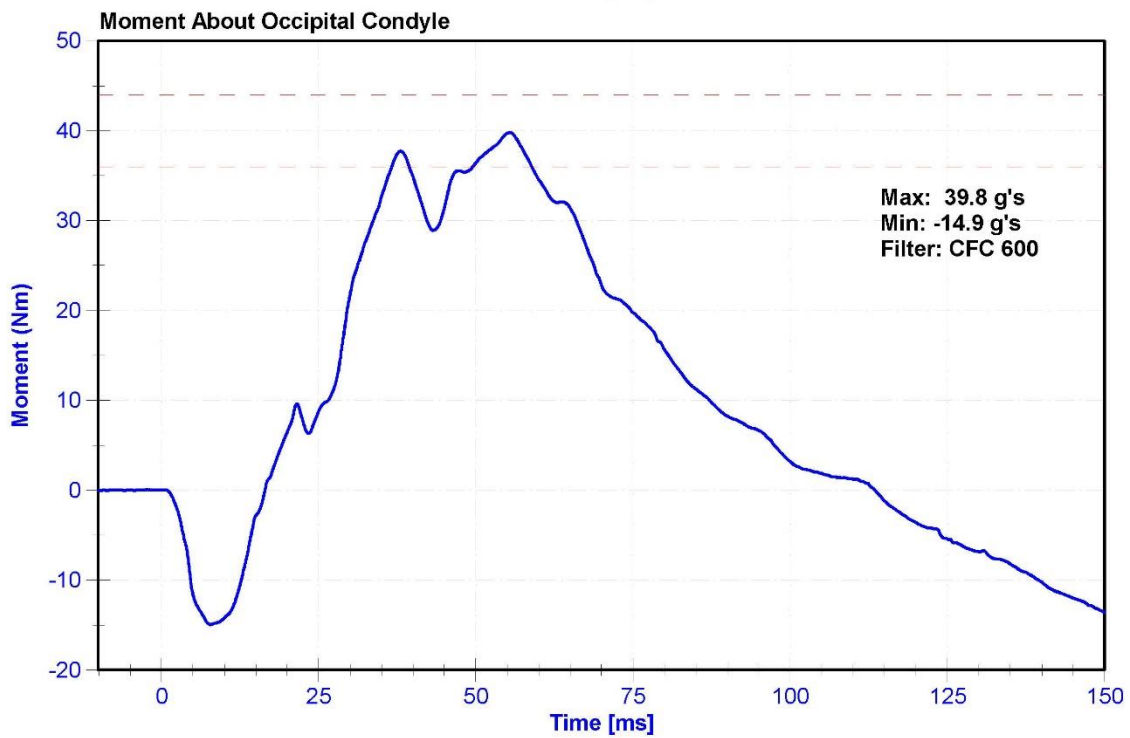
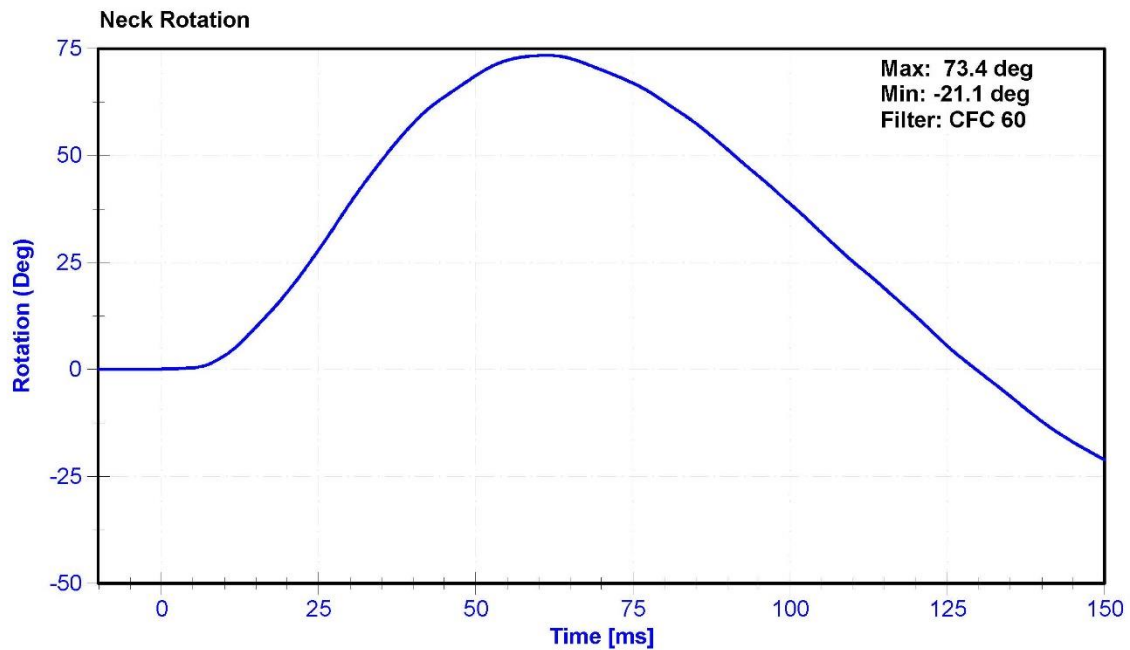
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	30.9	Pass
Velocity	5.51	5.63	m/s	5.620	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.44	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.62	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.88	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.75	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.87	Pass
Neck Rotation	71	81	deg	73.4	Pass
Time at Maximum Rotation	50	70	ms	61.3	Pass
Moment about the OC	36	44	Nm	39.8	Pass
Moment Decay to 0 Nm	102	126	ms	113.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/11/2017	5/11/2018
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	10/27/2017	10/27/2018
Condyle Potentiometer	Denton 78051-342	DS-185Pend	10/27/2017	10/27/2018
Upper Neck Load Cell	Denton 1716	LC-1872 FY	7/26/2017	7/26/2018





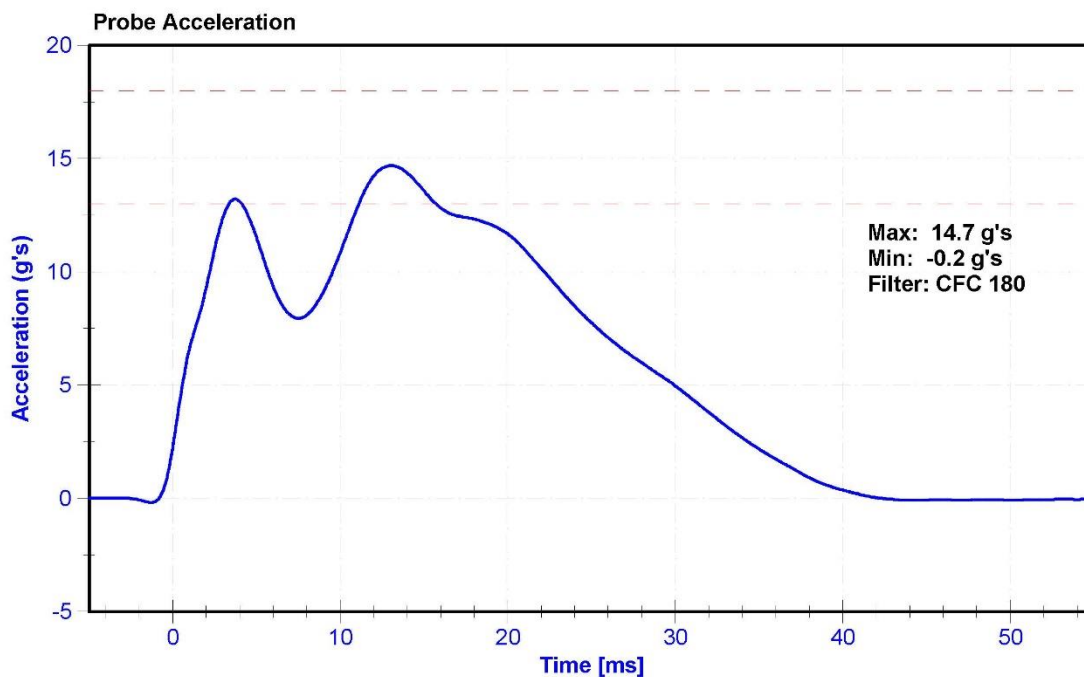
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ATD Serial Number	300	Laboratory Supervisor	K. Brogan

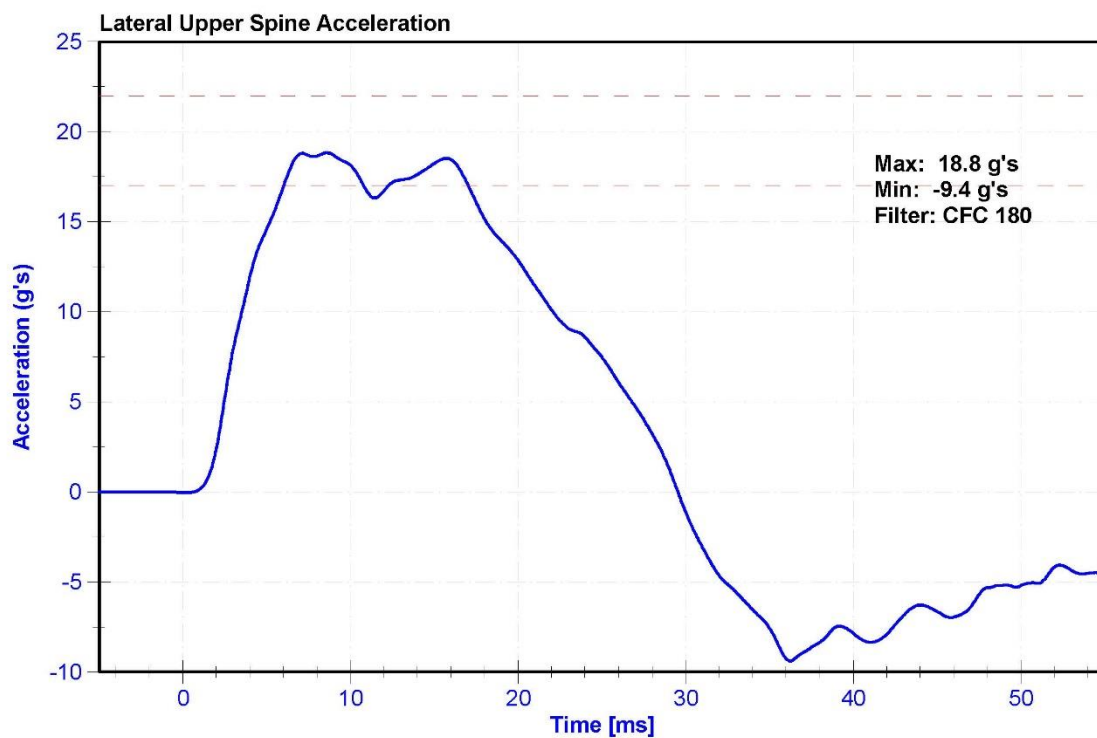
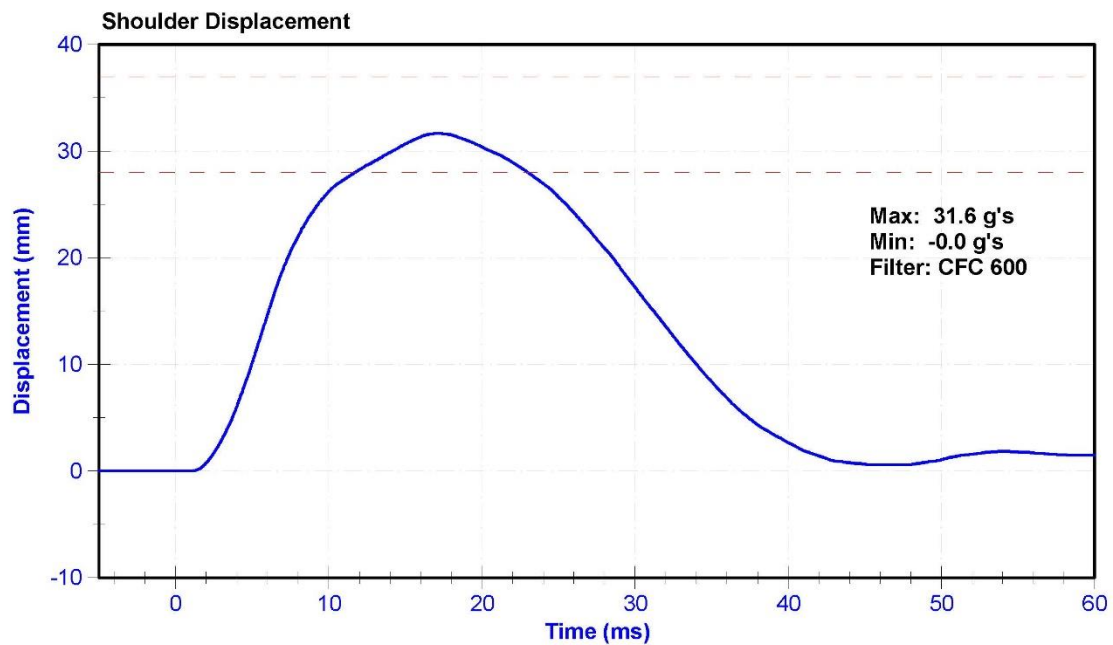
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	32.5	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	13	18	g's	14.7	Pass
Shoulder Deflection	28	37	mm	31.6	Pass
Lateral Upper Spine Acceleration	17	22	g's	18.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Shoulder Potentiometer	Servo 08TC1-3725	DS-1063GFE	9/27/2017	9/27/2018
Upper Spine Y Accelerometer	ENDEVCO 7264	AC-P83320	9/27/2017	3/28/2018





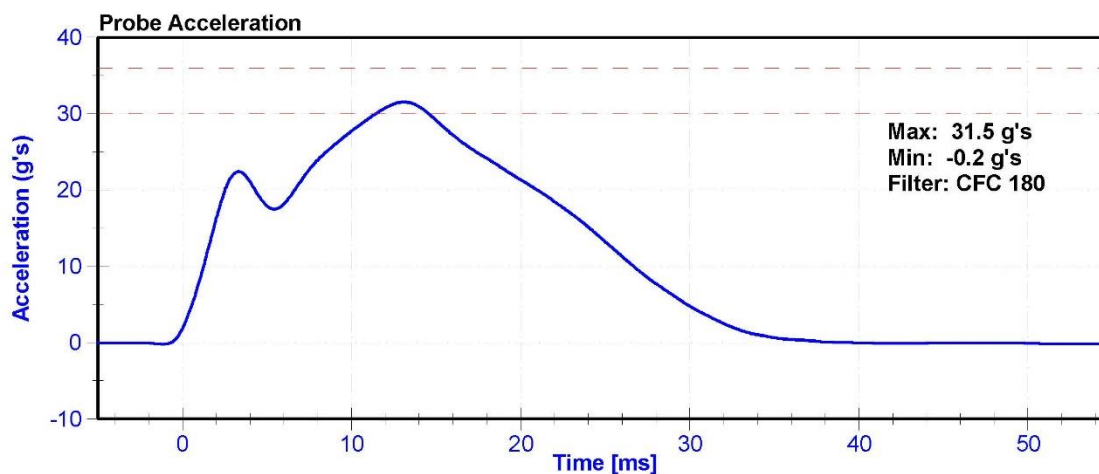
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

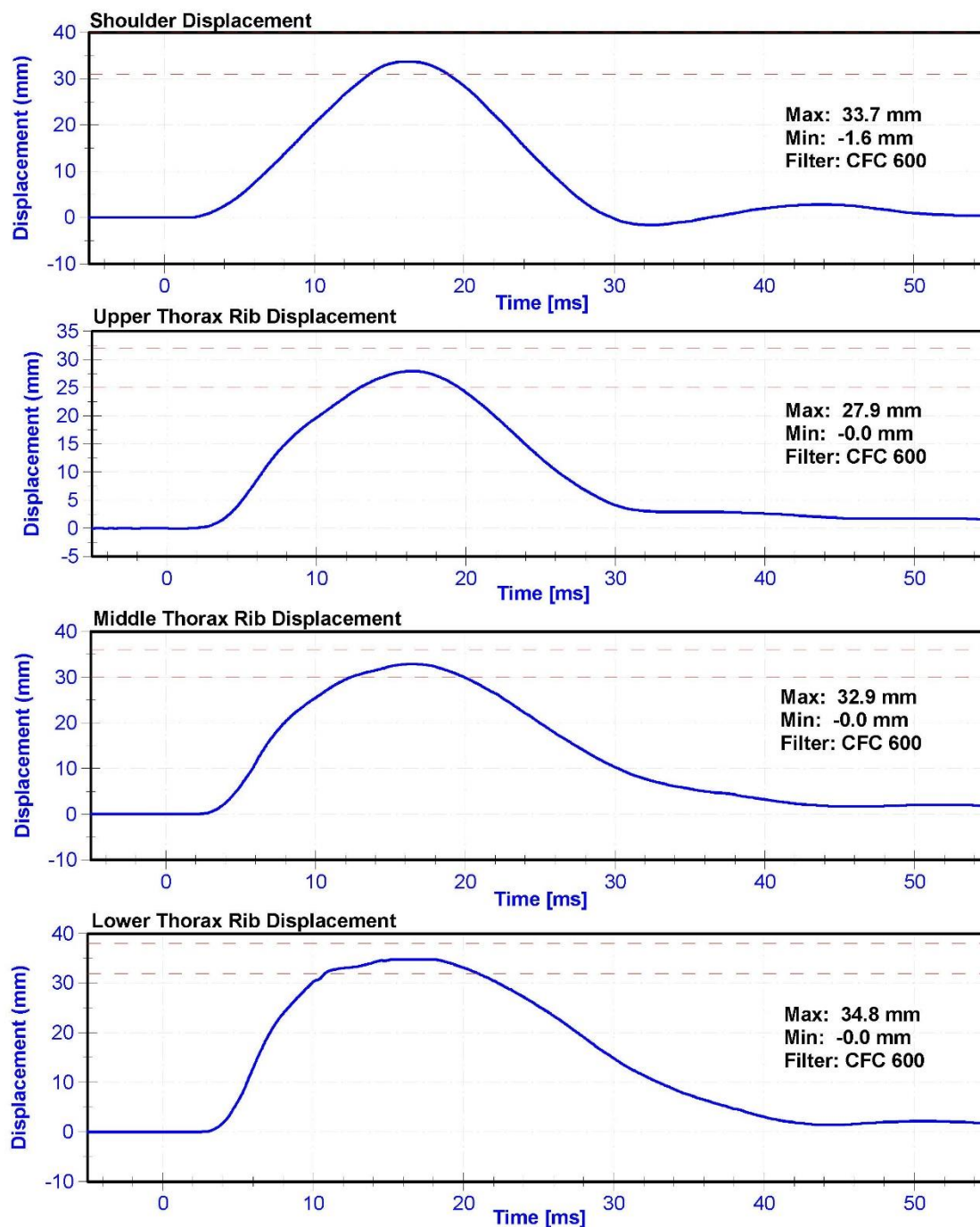
Results

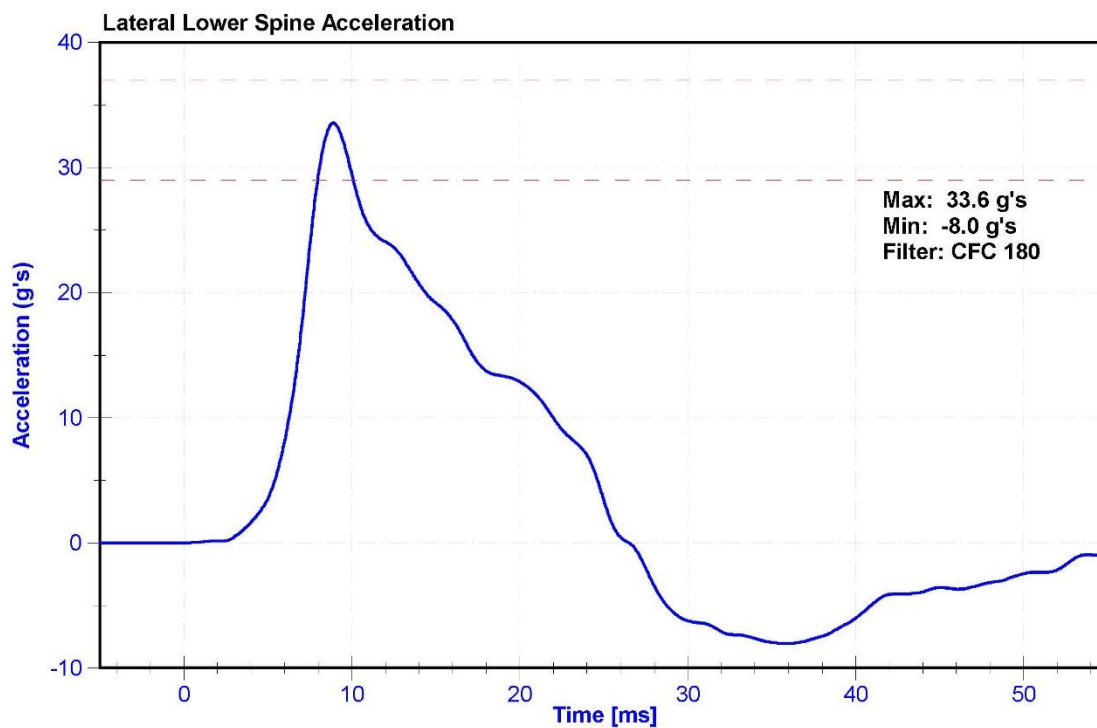
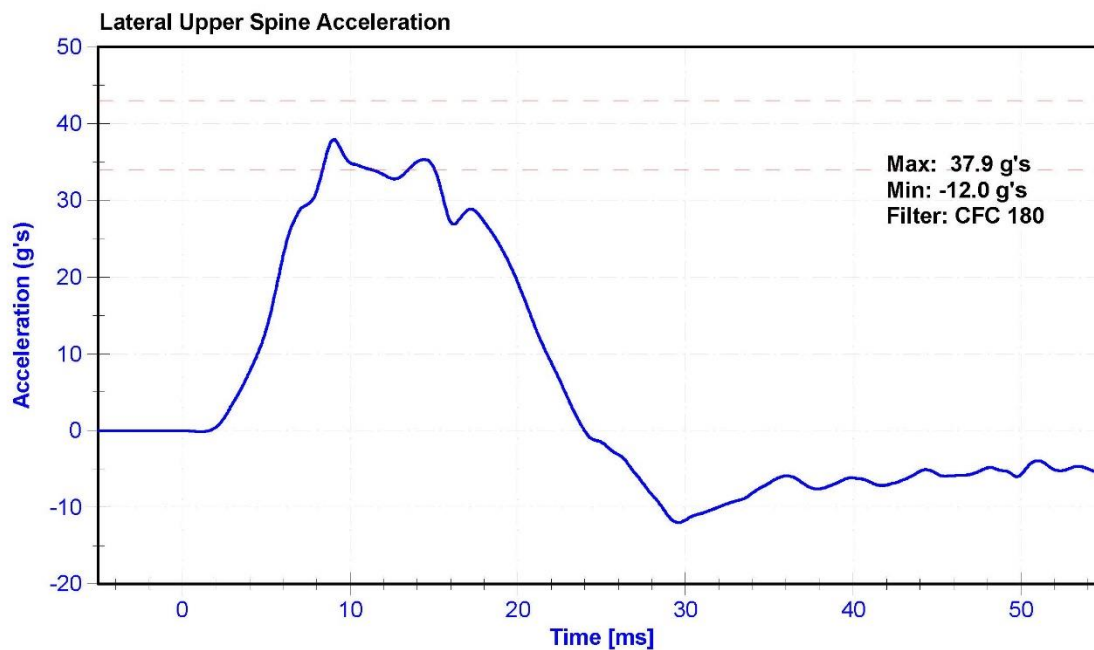
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	32.2	Pass
Velocity	6.6	6.8	m/s	6.71	Pass
Probe Acceleration after 5 ms	30	36	g's	31.5	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.9	Pass
Lateral Lower Spine Acceleration	29	37	g's	33.6	Pass
Shoulder Deflection	31	40	mm	33.7	Pass
Upper Thorax Rib Deflection	25	32	mm	27.9	Pass
Mid Thorax Rib Deflection	30	36	mm	32.9	Pass
Lower Thorax Rib Deflection	32	38	mm	34.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Upper Spine T1 Y Accelerometer	ENDEVCO 7264	AC-P83320	9/27/2017	3/28/2018
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P64147	9/27/2017	3/28/2018
Shoulder Potentiometer	Servo 08TC1-3725	DS-1063GFE	9/27/2017	9/27/2018
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1151GFE	9/27/2017	9/27/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	9/27/2017	9/27/2018







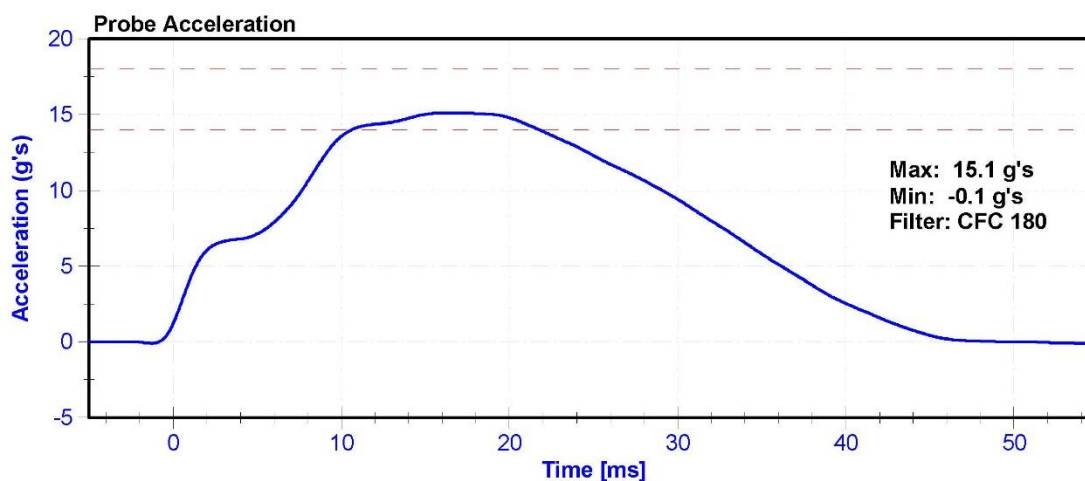
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

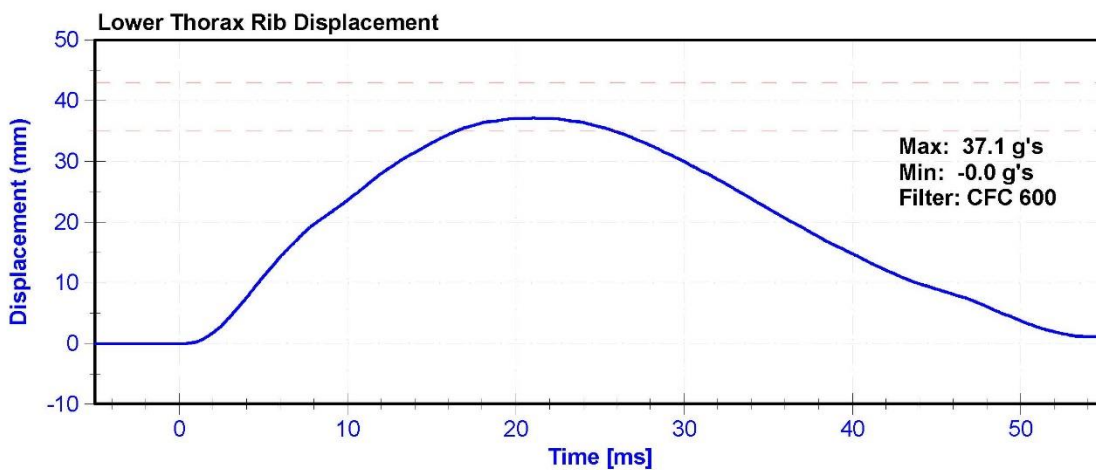
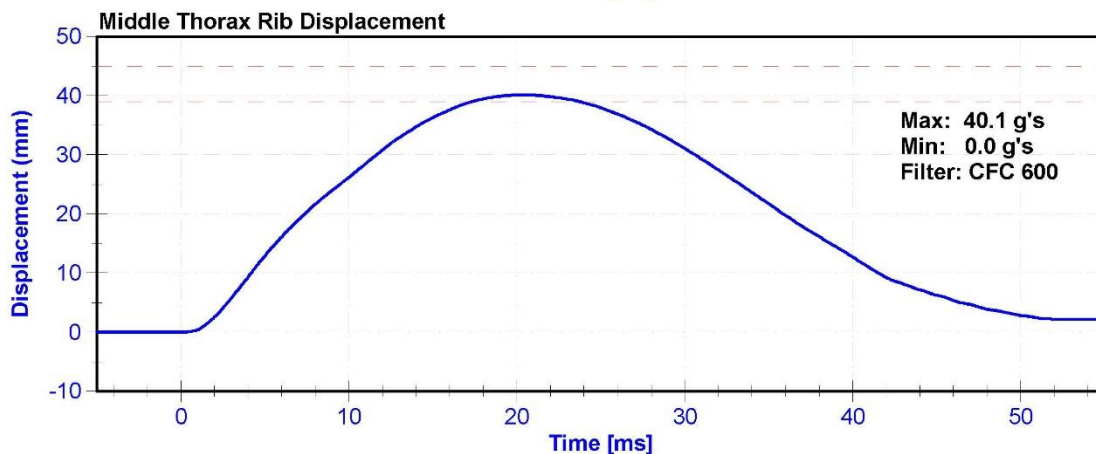
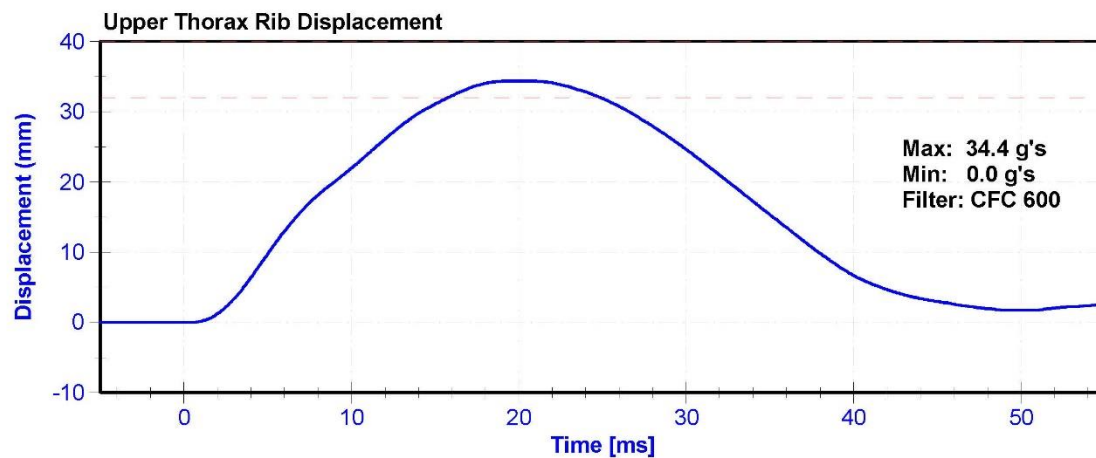
Results

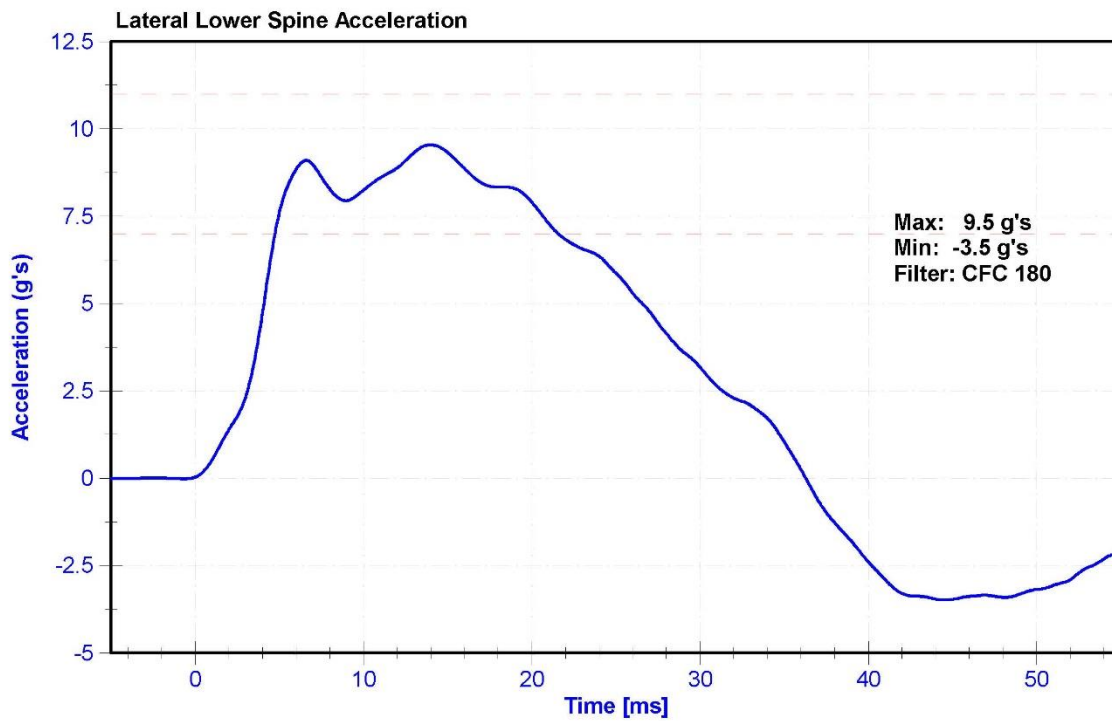
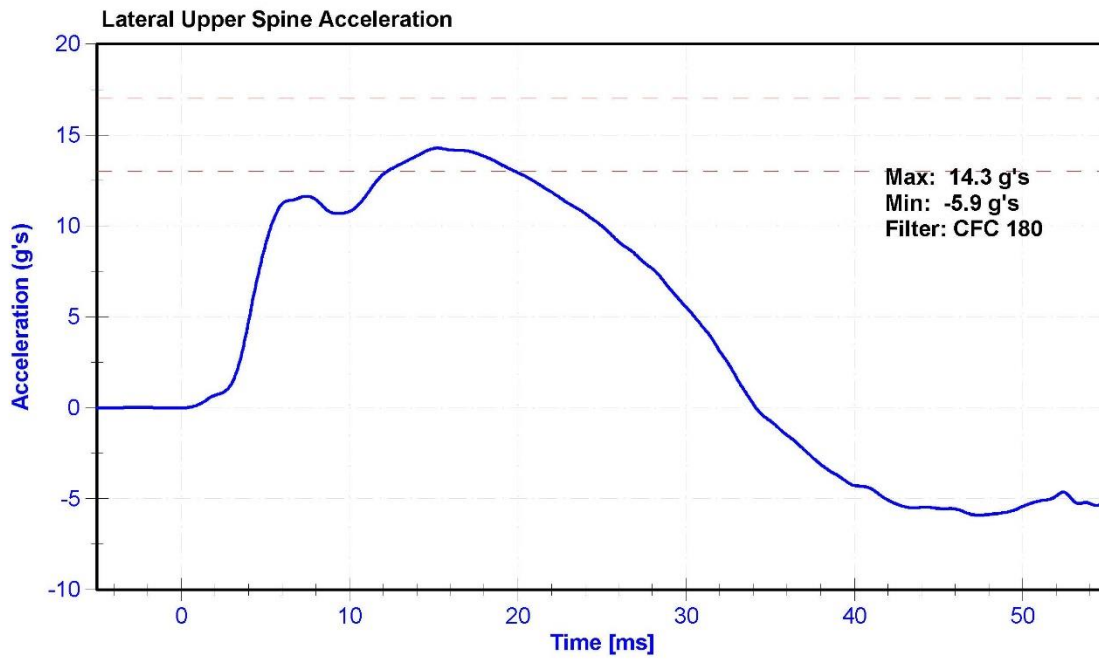
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	33.4	Pass
Velocity	4.2	4.4	m/s	4.34	Pass
Probe Acceleration	14	18	g's	15.1	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.3	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.5	Pass
Upper Thorax Rib Deflection	32	40	mm	34.4	Pass
Middle Thorax Rib Deflection	39	45	mm	40.1	Pass
Lower Thorax Rib Deflection	35	43	mm	37.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Upper Spine Y Accelerometer	ENDEVCO 7264	AC-P83320	9/27/2017	3/28/2018
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	9/27/2017	3/28/2018
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1151GFE	9/27/2017	9/27/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	9/27/2017	9/27/2018







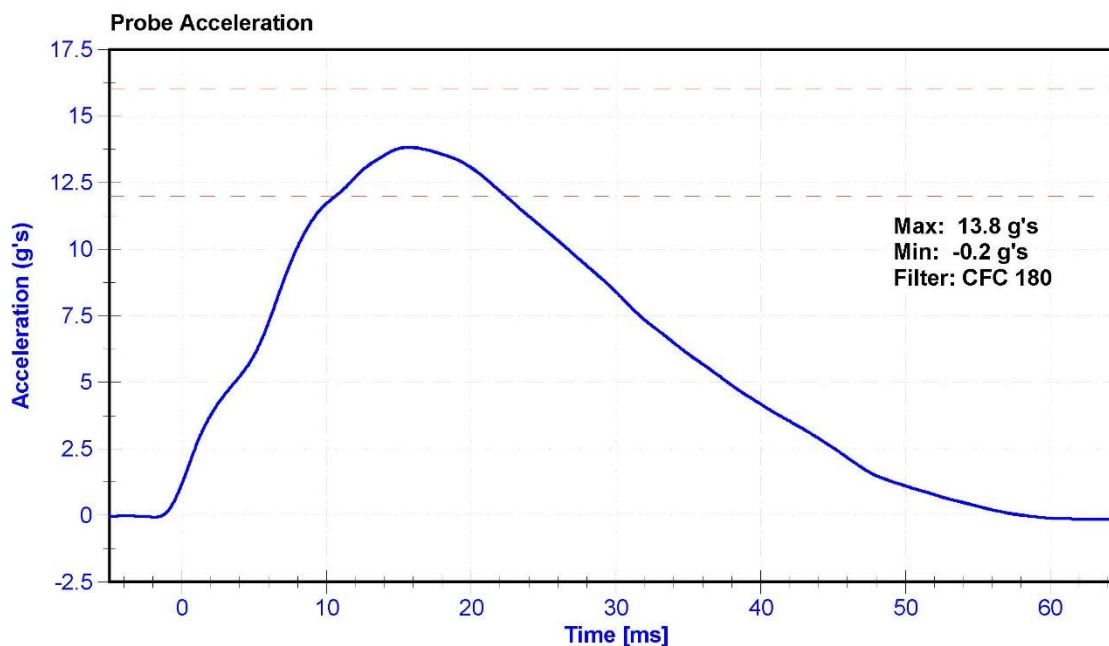
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

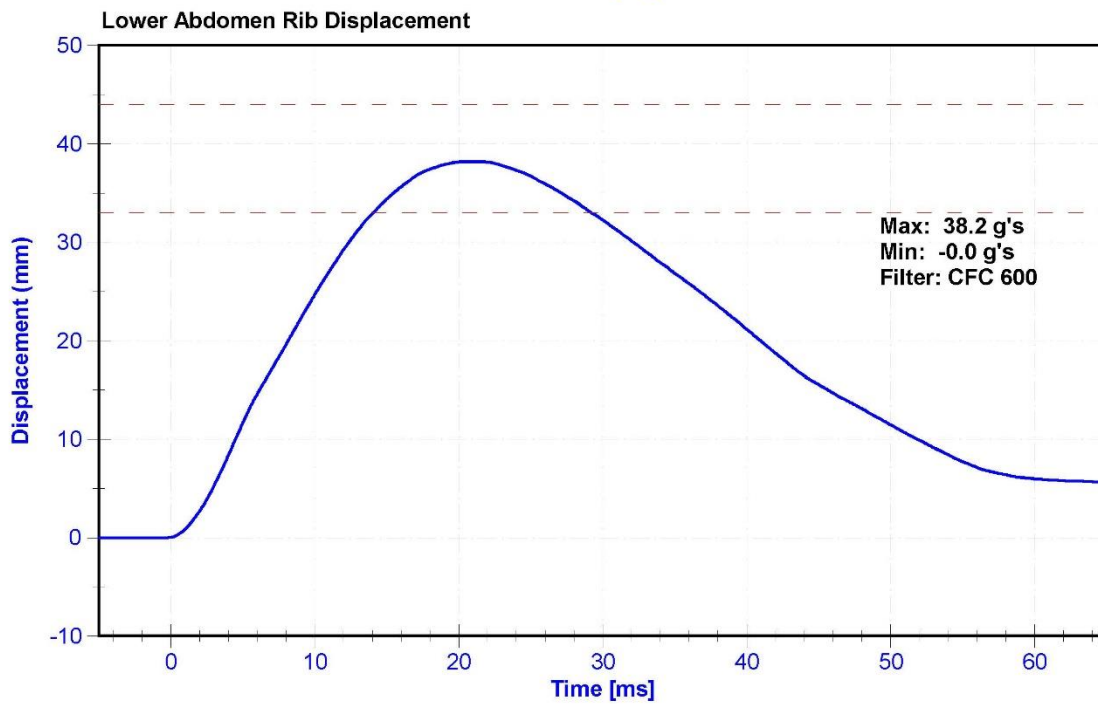
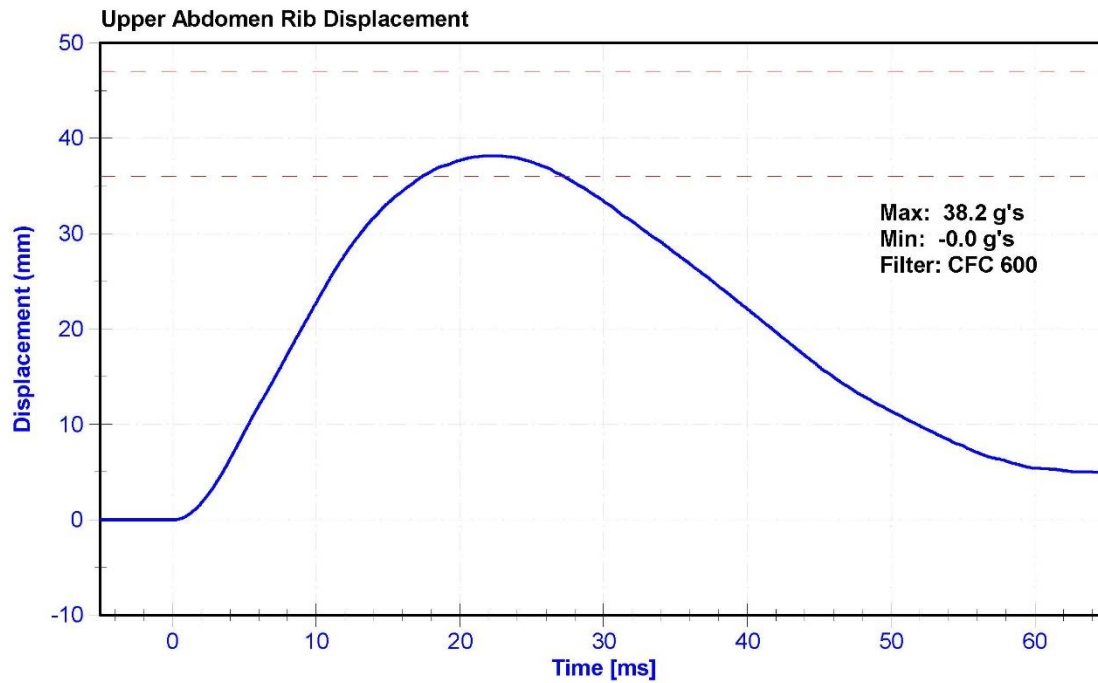
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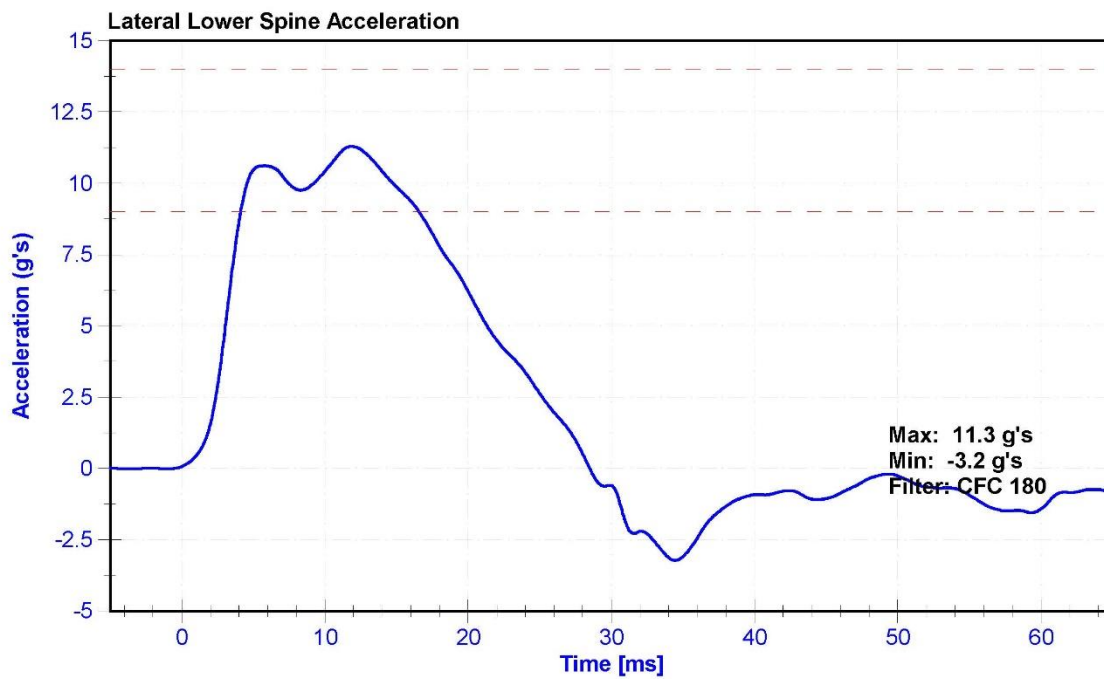
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	32.6	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	12	16	g's	13.8	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.3	Pass
Upper Abdomen Rib Deflection	36	47	mm	38.2	Pass
Lower Abdomen Rib Deflection	33	44	mm	38.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	9/27/2017	3/28/2018
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-308GFE	9/27/2017	9/27/2018
Lower Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-307GFE	9/27/2017	9/27/2018







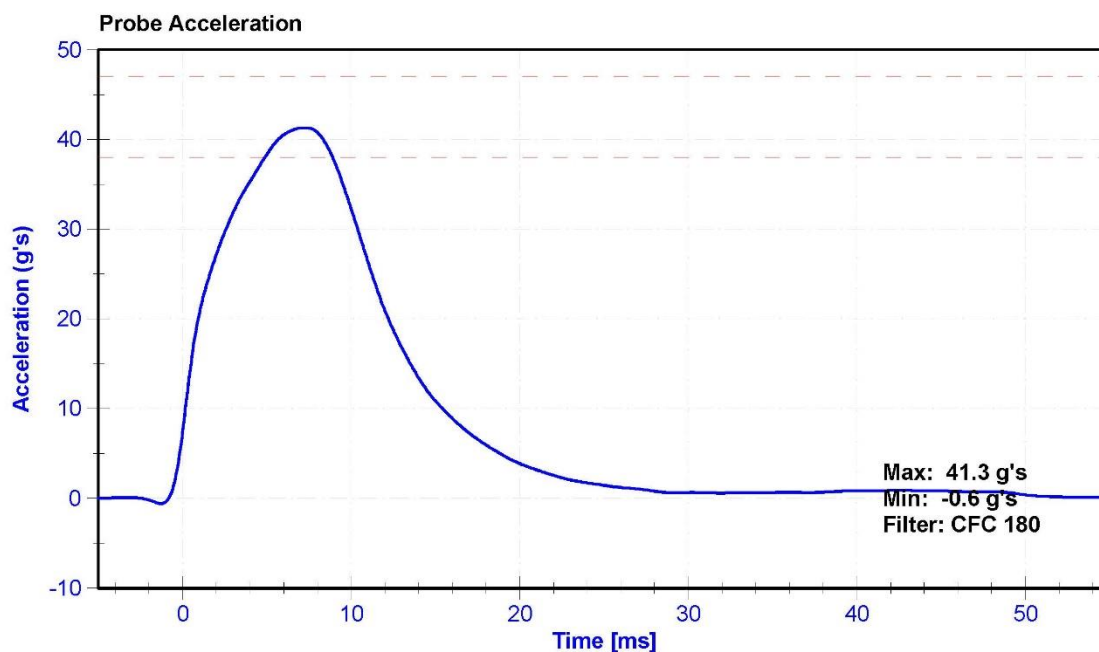
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

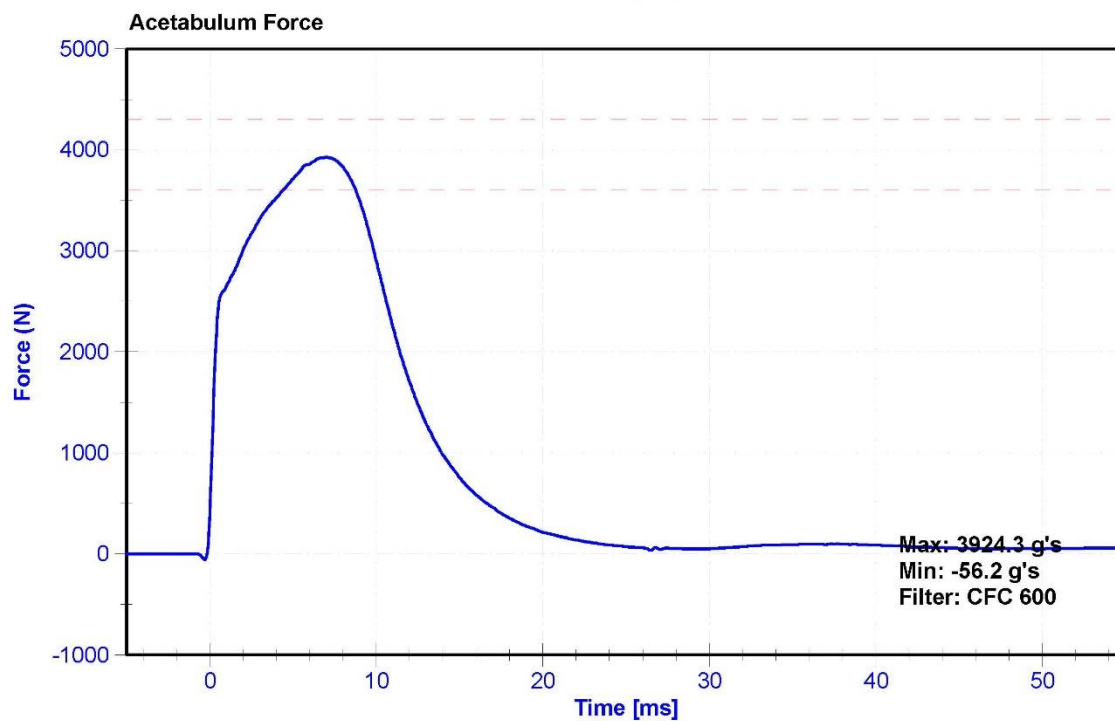
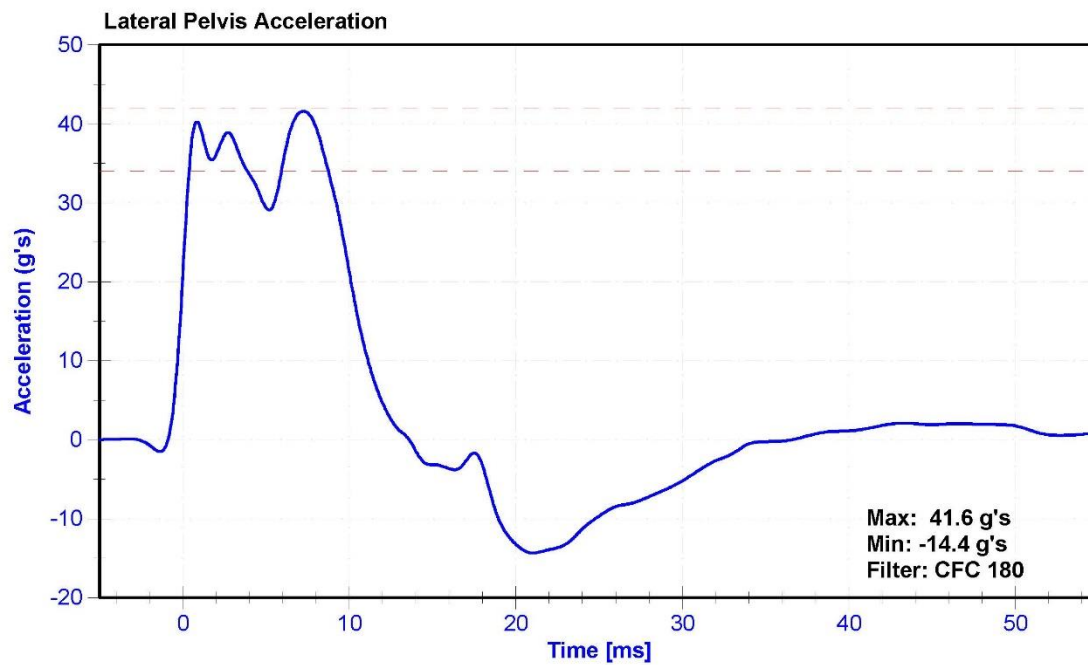
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	31.5	Pass
Velocity	6.6	6.8	m/s	6.63	Pass
Probe Acceleration	38	47	g's	41.3	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.6	Pass
Acetabulum Force	3600	4300	N	3924.3	Pass

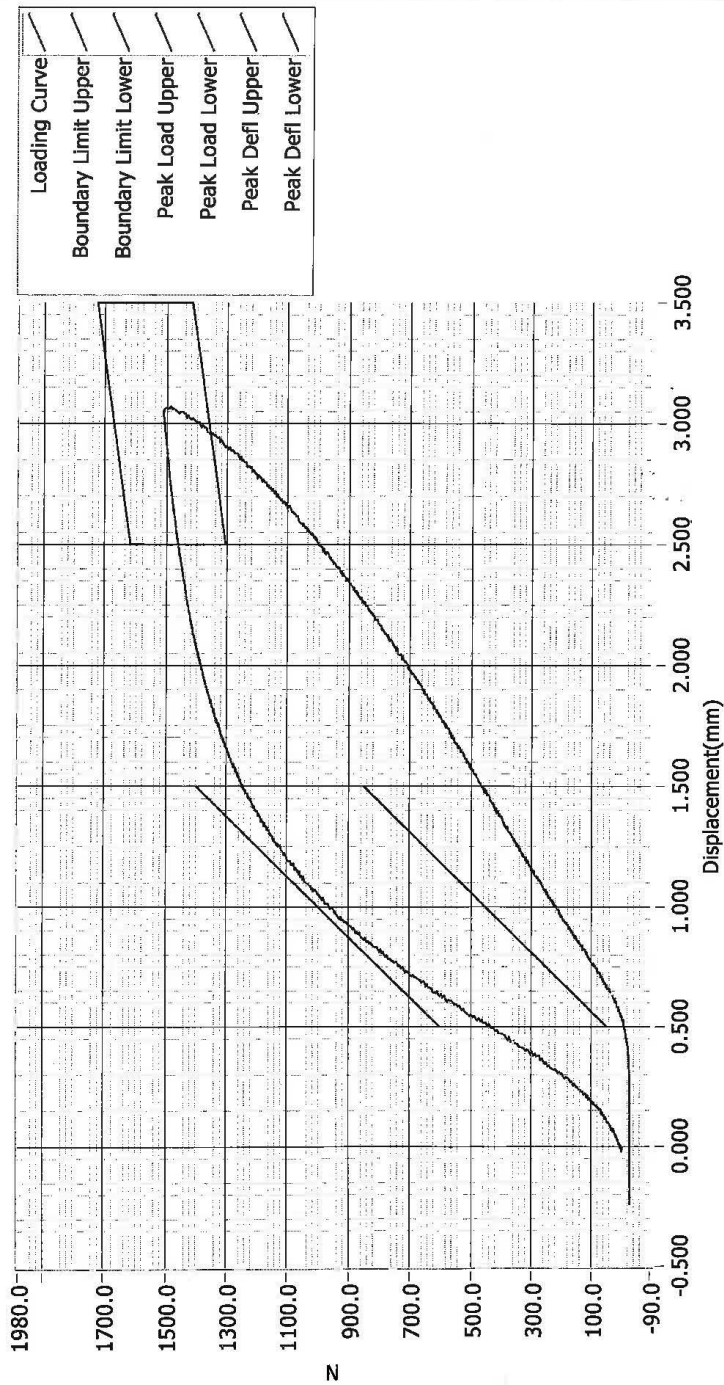
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P79602	9/27/2017	3/28/2018
Acetabulum Load Cell	DENTON 3249J	LC-275Fy	6/20/2017	6/20/2018
Certification Plug	Humanetics	65068	4/5/2013	N/A
Crash Test Plug	Humanetics	65070	4/5/2013	N/A





Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

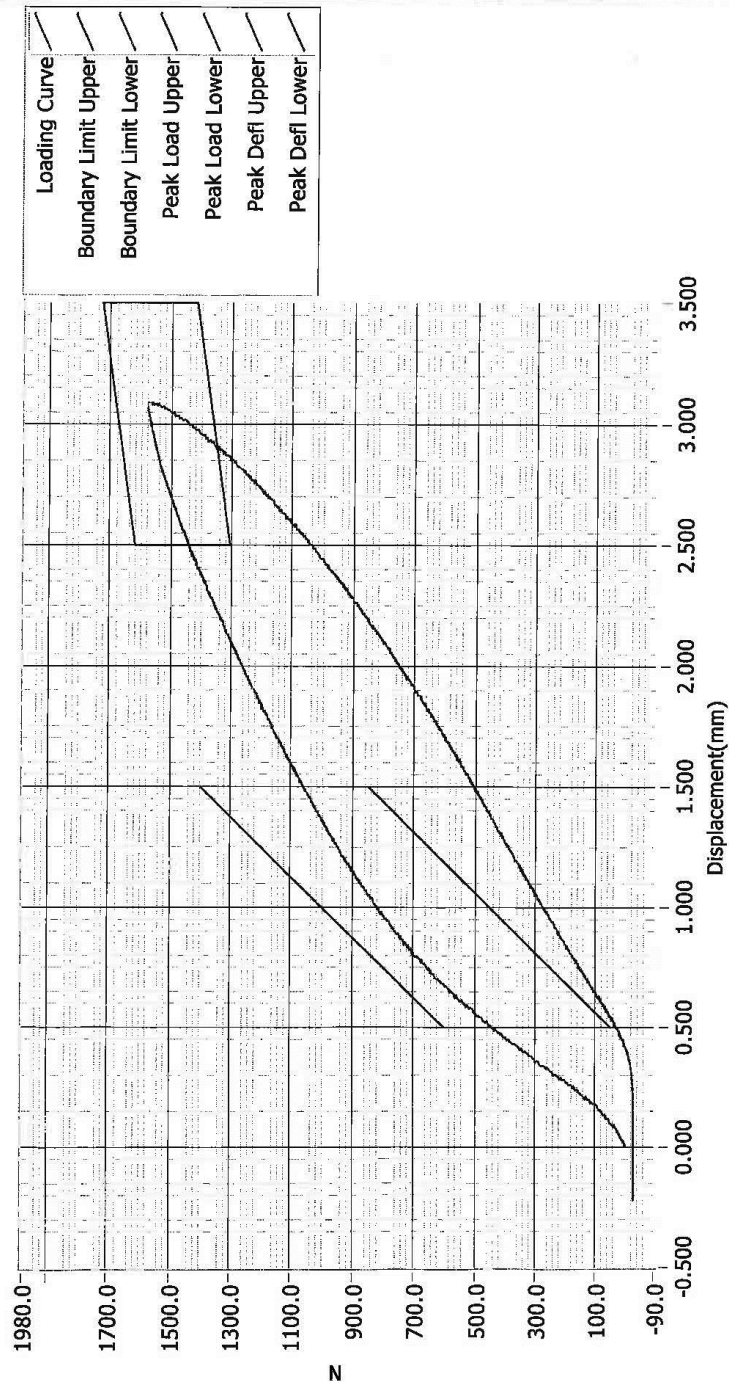
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<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

Cert 12/7/17

Current Date : 4/5/2013 Current Time : 20:59:22

CRASH 12/11/17

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
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Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

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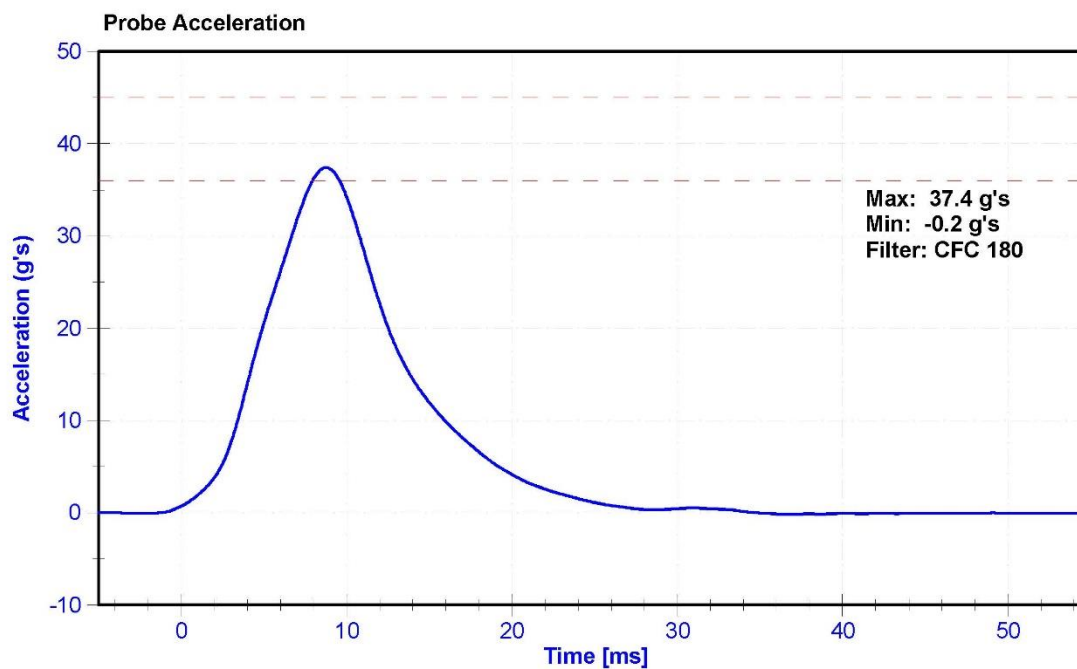
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

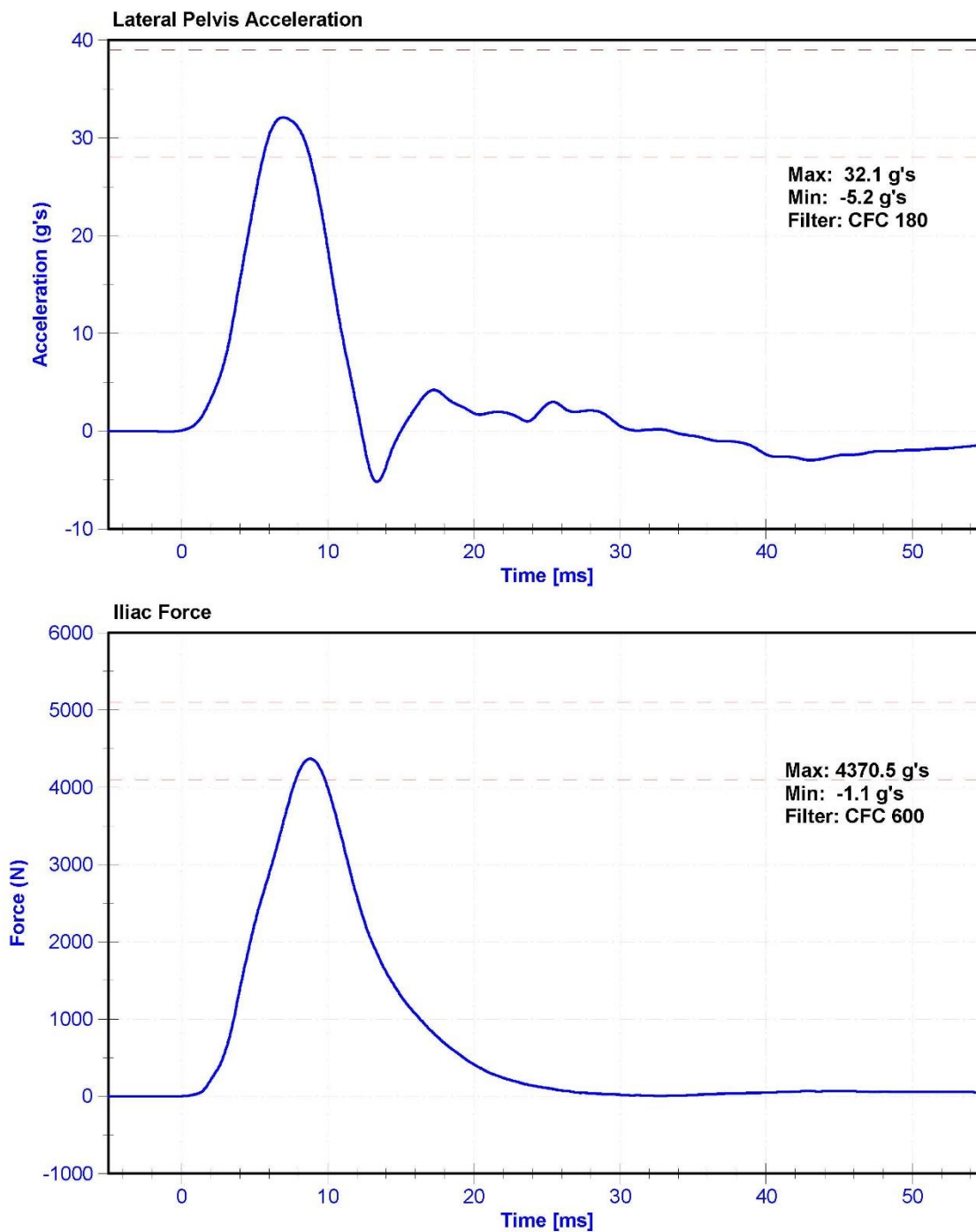
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	33.5	Pass
Velocity	4.2	4.4	m/s	4.38	Pass
Probe Acceleration	36	45	g's	37.4	Pass
Lateral Pelvis Acceleration	28	39	g's	32.1	Pass
Iliac Force	4100	5100	N	4370.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P79602	9/27/2017	3/28/2018
Iliac Load Cell	DENTON 3228J	LC-279Fy	6/21/2017	6/21/2018





CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO: 300

(CONFIGURED FOR LEFT SIDE IMPACT)

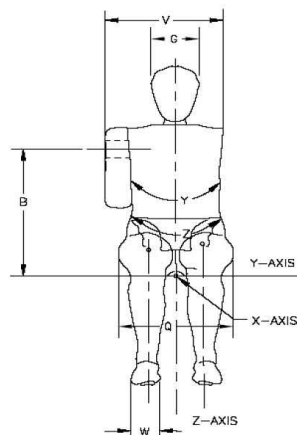
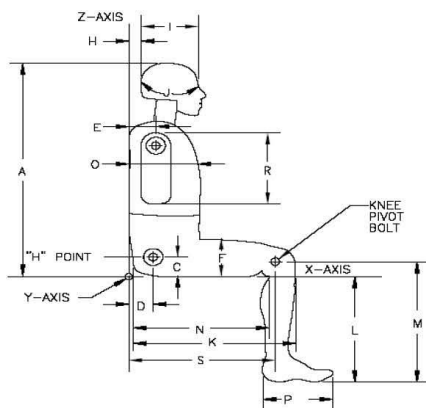


External Measurements - SID-IIs

Technician: S. McCloskey

Date: 12/14/2017

Dummy Serial Number: 300



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	779	Pass
B	Shoulder Pivot Height	437	453	444	Pass
C	H-point Height	79	89	87	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	104	Pass
F	Thigh Clearance	119	135	123	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	182	Pass
J	Head Circumference	541	551	548	Pass
K	Buttock to Knee Length	514	540	535	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	404	Pass
N	Buttock Popliteal Length	416	442	434	Pass
O	Chest Depth w/o jacket	195	211	206	Pass
P	Foot Length	216	232	221	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	252	Pass
S	Knee Joint to seatback	477	493	485	Pass
V	Shoulder Width	341	357	350	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	873	Pass
Z	Waist Circumference	761	791	770	Pass

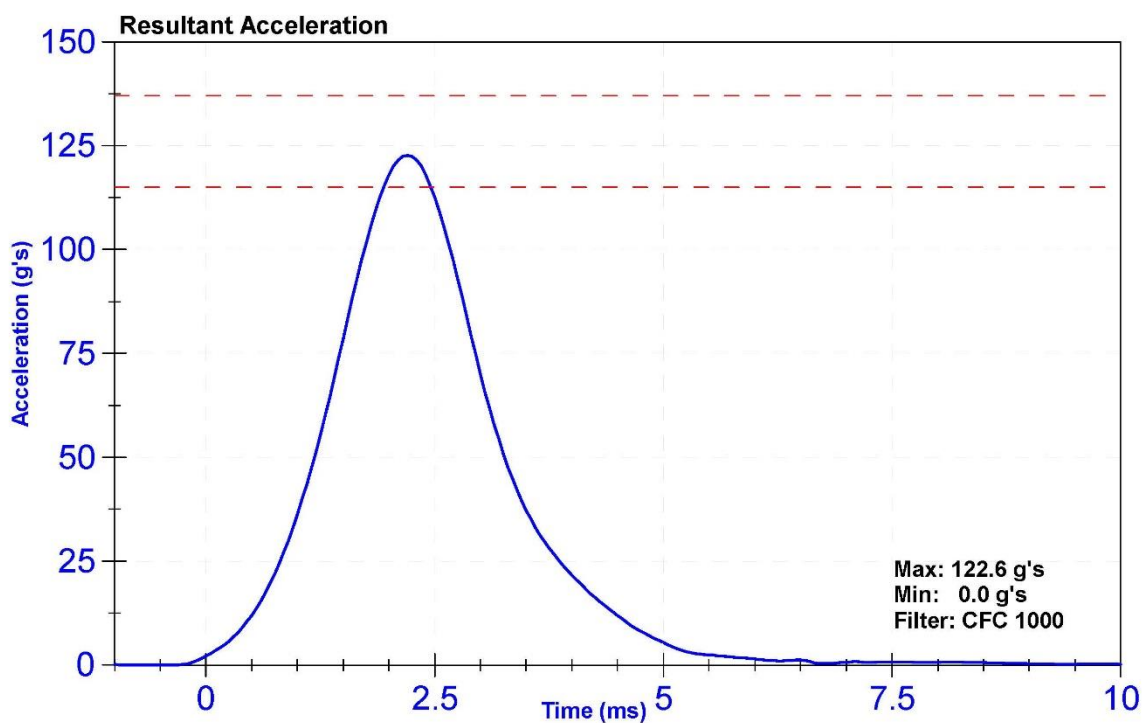
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

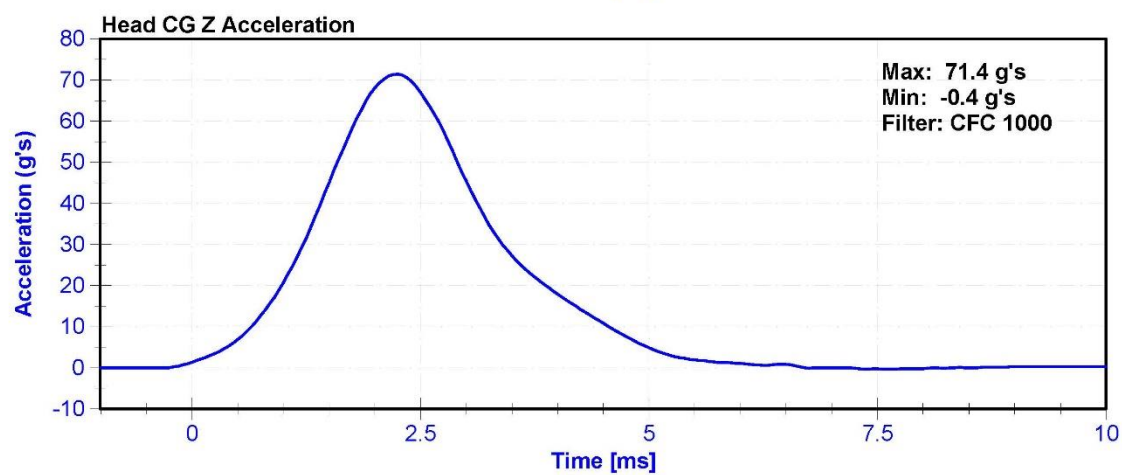
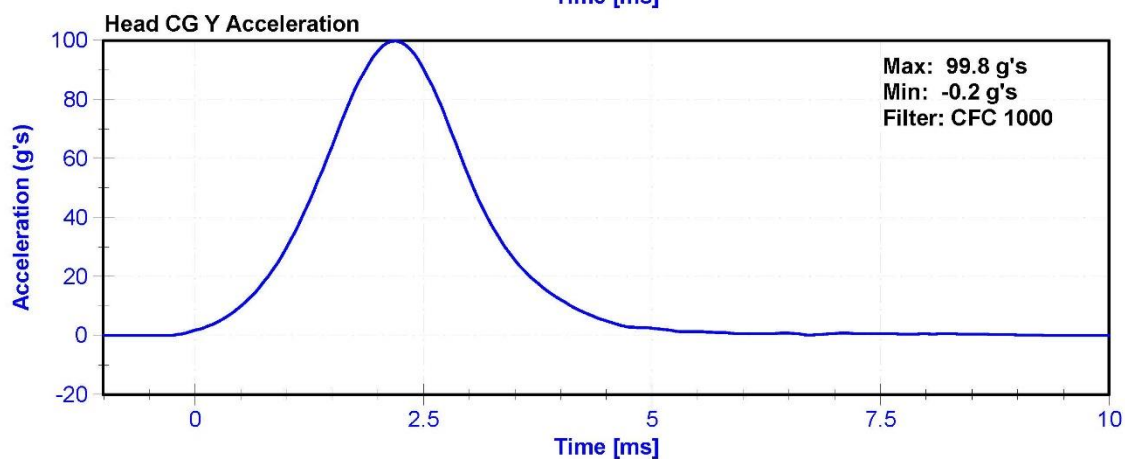
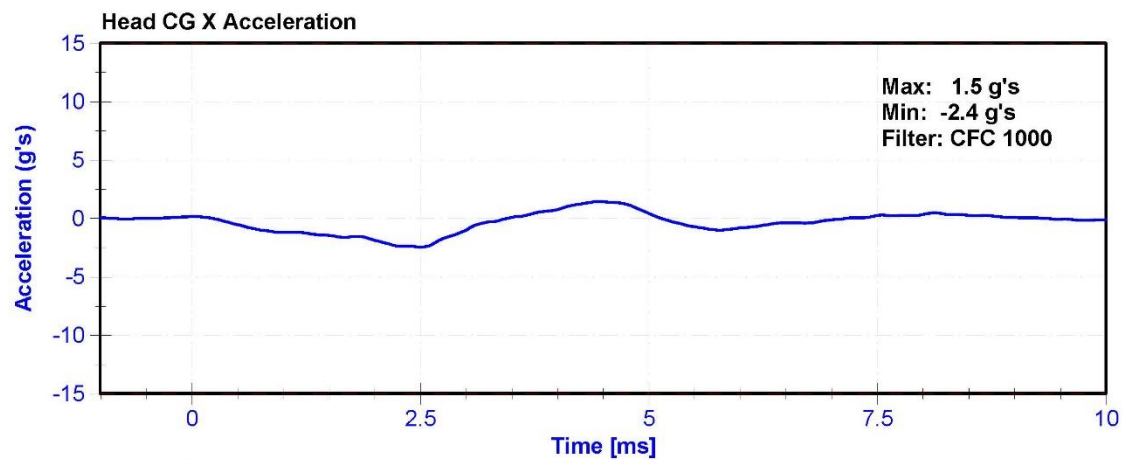
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	28.1	Pass
Resultant Acceleration	115	137	g's	122.6	Pass
Oscillation	0	15	%	1.0	Pass
Fore-Aft Acceleration	-15	15	g's	-2.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58777	9/28/2017	3/29/2018
Y Accelerometer	ENDEVCO 7264CT	AC-P59018	9/28/2017	3/29/2018
Z Accelerometer	ENDEVCO 7264	AC-P79189	9/28/2017	3/29/2018





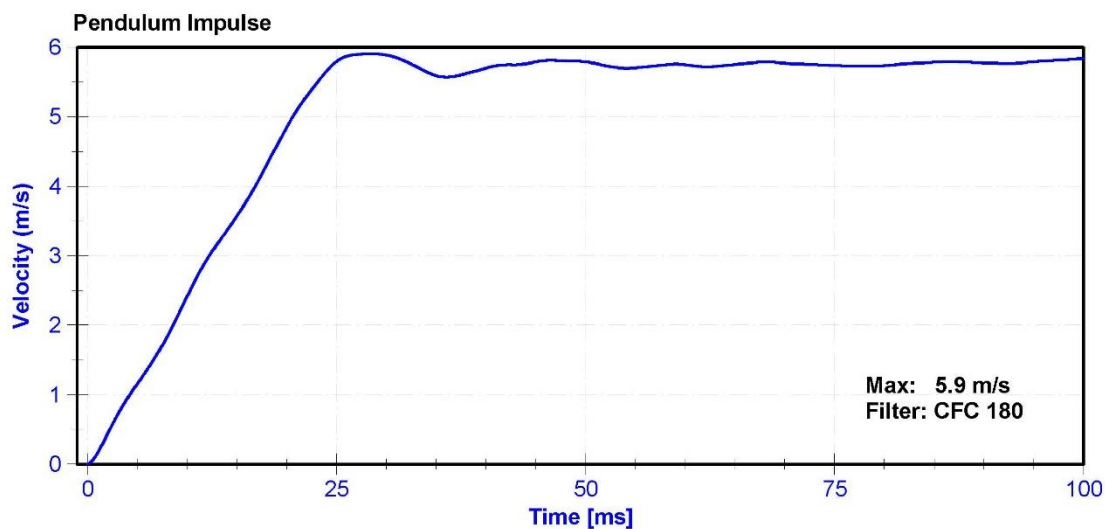
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

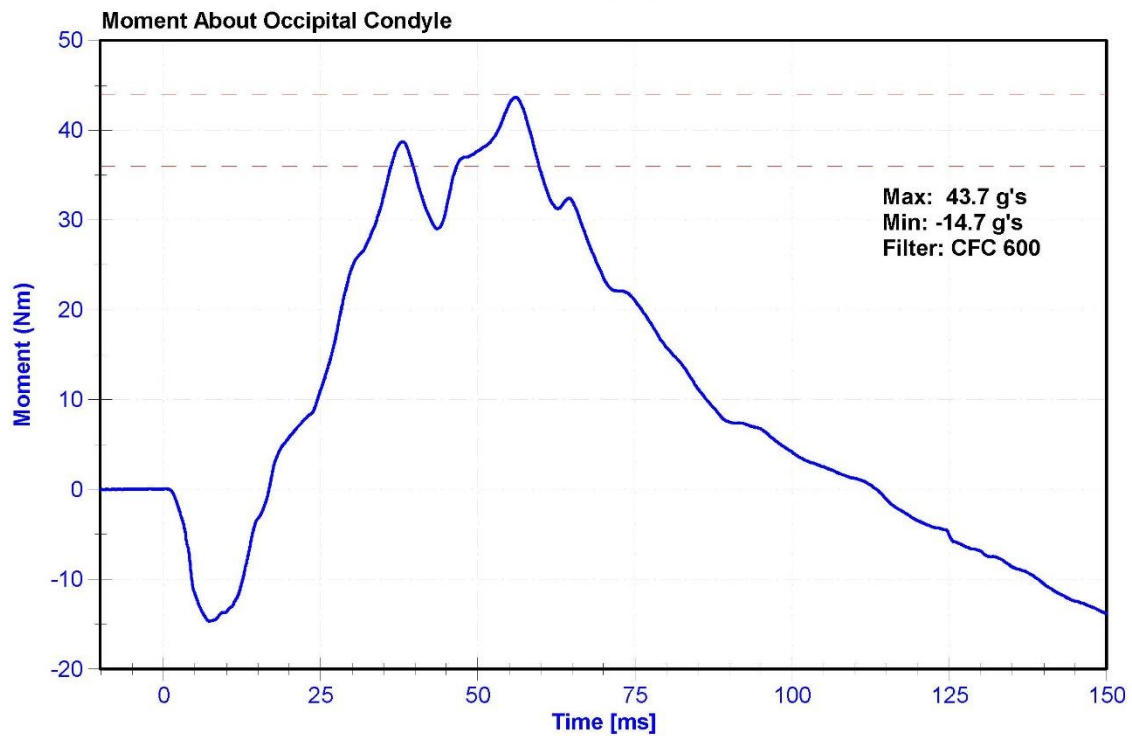
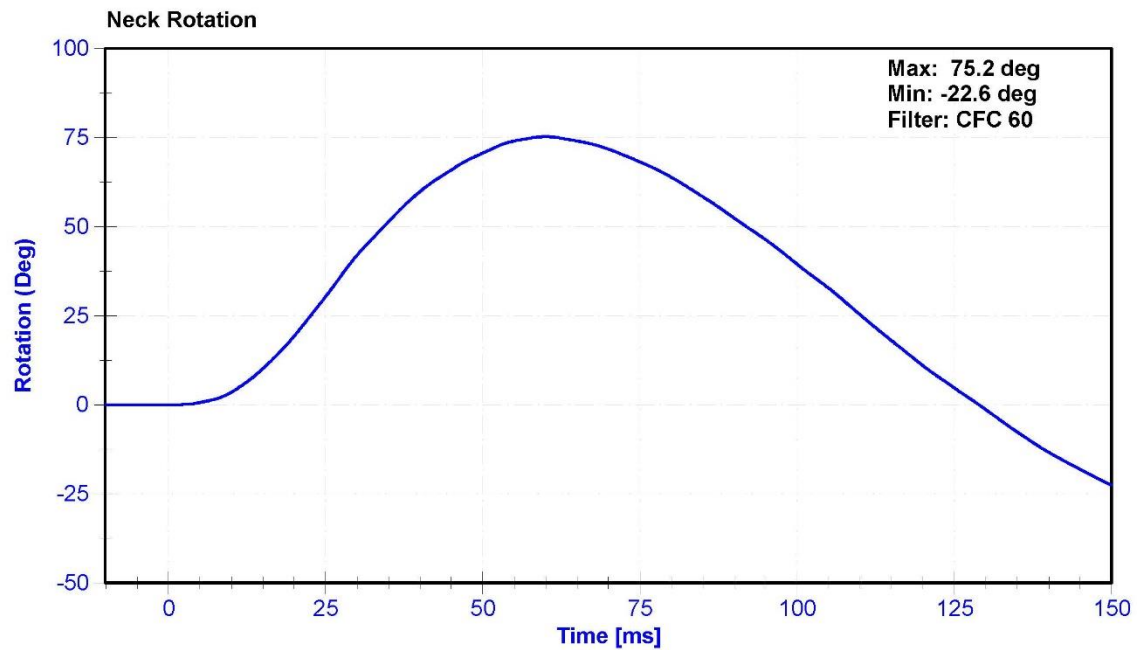
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	28.1	Pass
Velocity	5.51	5.63	m/s	5.620	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.41	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.57	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.85	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.80	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.91	Pass
Neck Rotation	71	81	deg	75.2	Pass
Time at Maximum Rotation	50	70	ms	60.0	Pass
Moment about the OC	36	44	Nm	43.7	Pass
Moment Decay to 0 Nm	102	126	ms	113.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/11/2017	5/11/2018
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	10/27/2017	10/27/2018
Condyle Potentiometer	Denton 78051-342	DS-185Pend	10/27/2017	10/27/2018
Upper Neck Load Cell	Denton 1716	LC-1872 FY	7/26/2017	7/26/2018





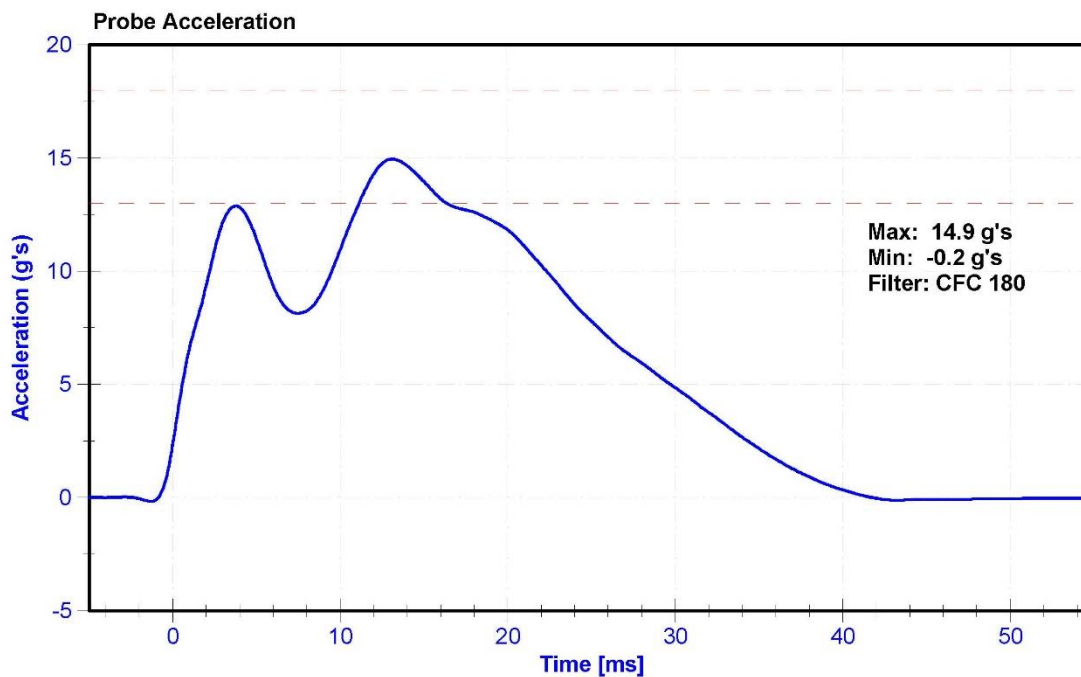
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

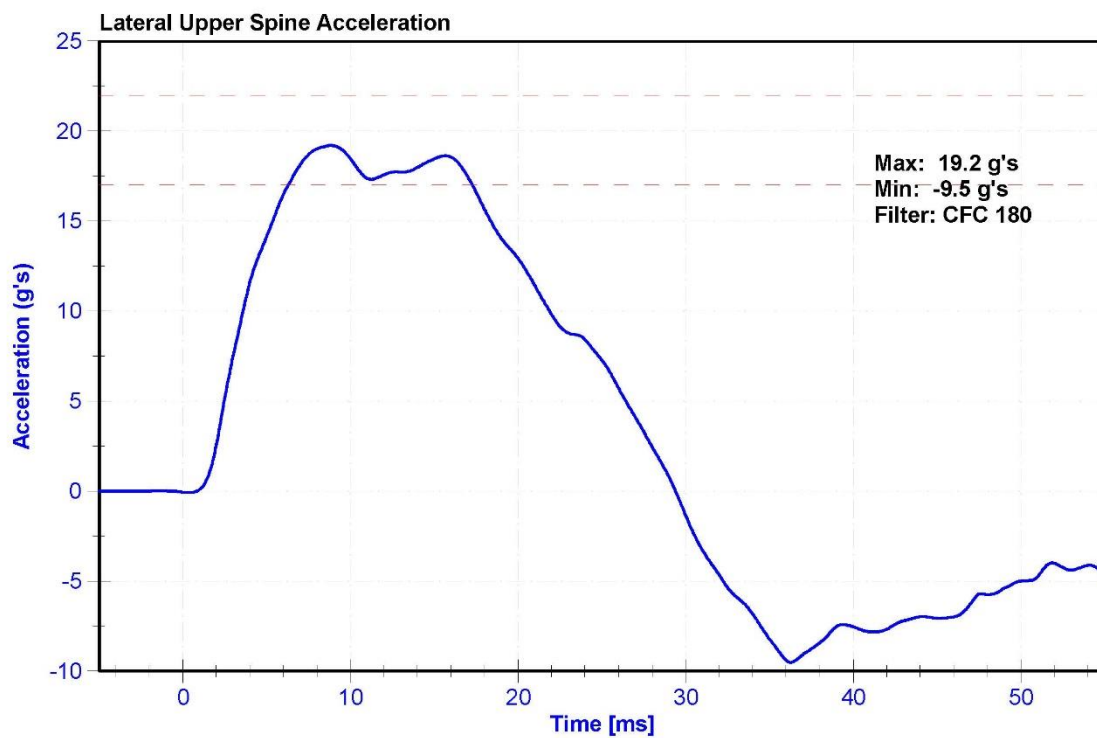
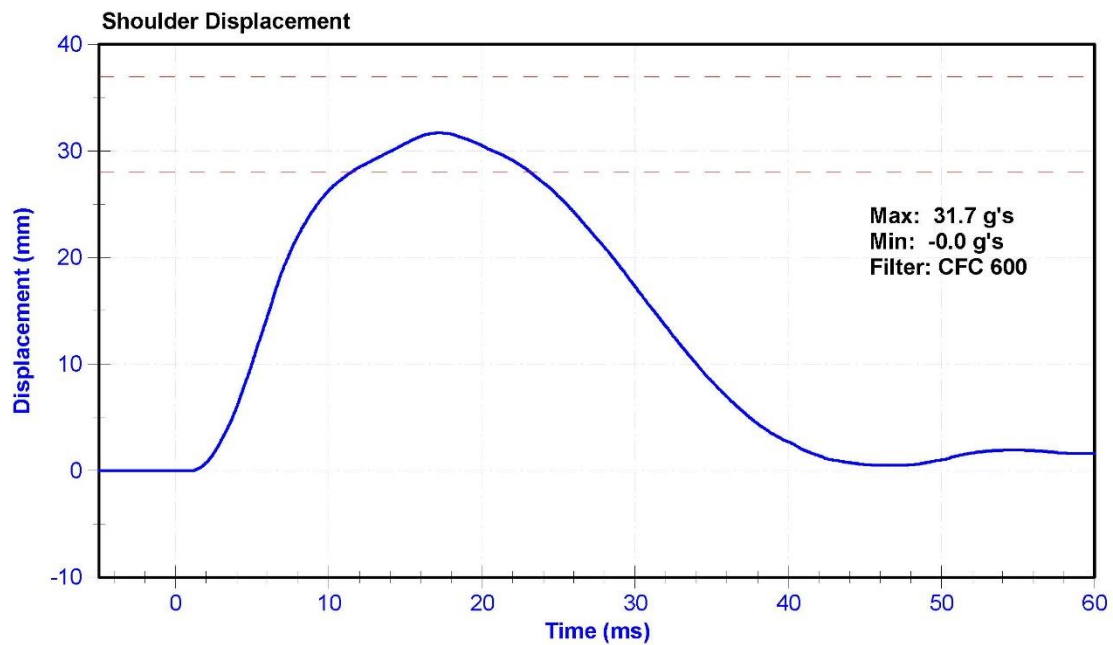
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	26	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	13	18	g's	14.9	Pass
Shoulder Deflection	28	37	mm	31.7	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Shoulder Potentiometer	Servo 08TC1-3725	DS-1063GFE	9/27/2017	9/27/2018
Upper Spine Y Accelerometer	ENDEVCO 7264	AC-P83320	9/27/2017	3/28/2018





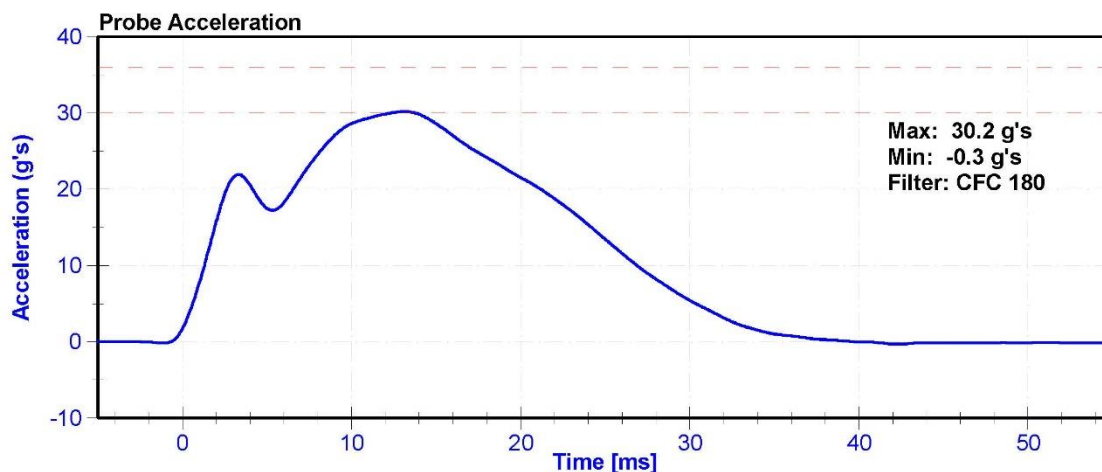
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

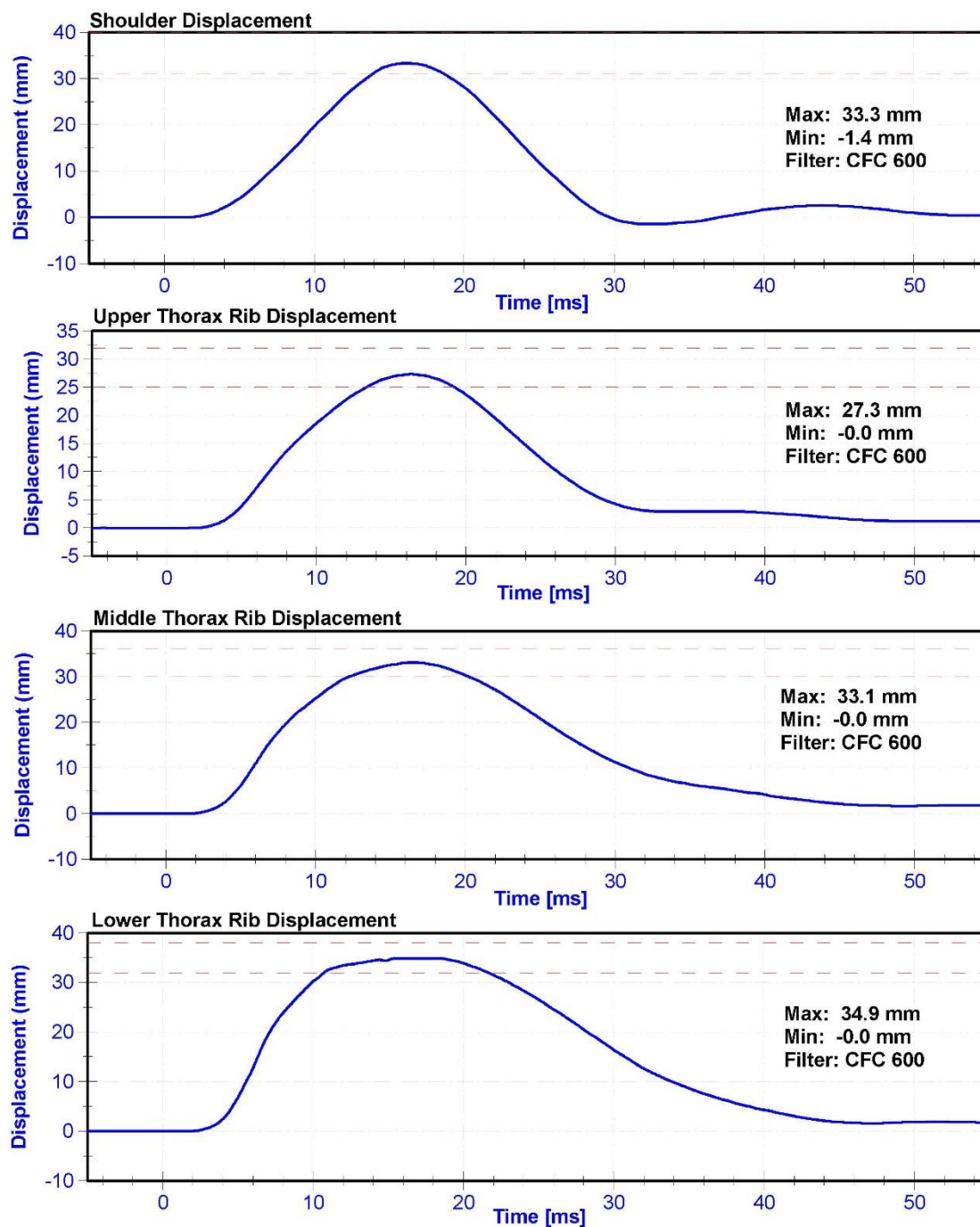
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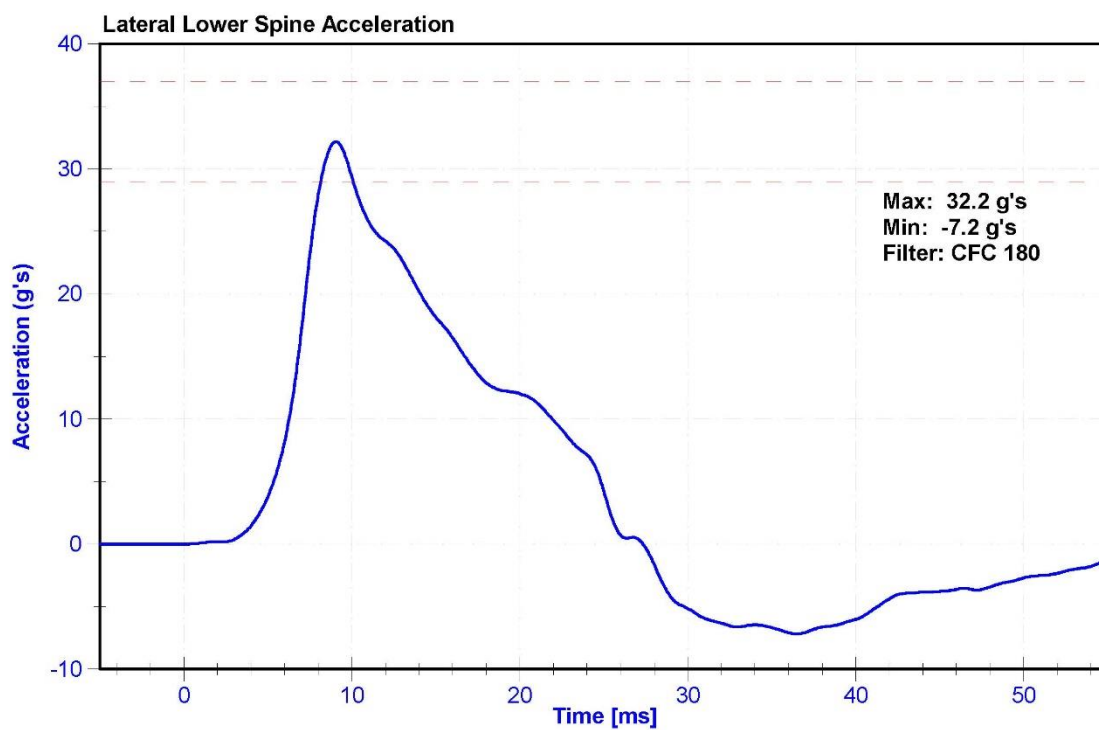
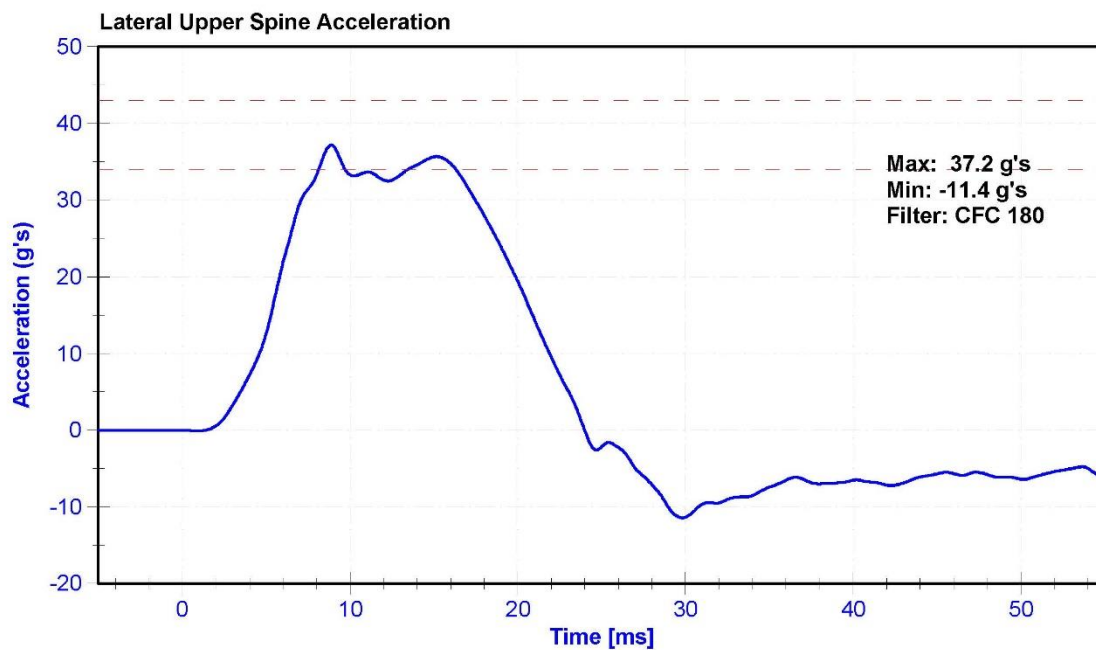
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	26.5	Pass
Velocity	6.6	6.8	m/s	6.73	Pass
Probe Acceleration after 5 ms	30	36	g's	30.2	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.2	Pass
Lateral Lower Spine Acceleration	29	37	g's	32.2	Pass
Shoulder Deflection	31	40	mm	33.3	Pass
Upper Thorax Rib Deflection	25	32	mm	27.3	Pass
Mid Thorax Rib Deflection	30	36	mm	33.1	Pass
Lower Thorax Rib Deflection	32	38	mm	34.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Upper Spine T1 Y Accelerometer	ENDEVCO 7264	AC-P83320	9/27/2017	3/28/2018
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P64147	9/27/2017	3/28/2018
Shoulder Potentiometer	Servo 08TC1-3725	DS-1063GFE	9/27/2017	9/27/2018
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1151GFE	9/27/2017	9/27/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	9/27/2017	9/27/2018







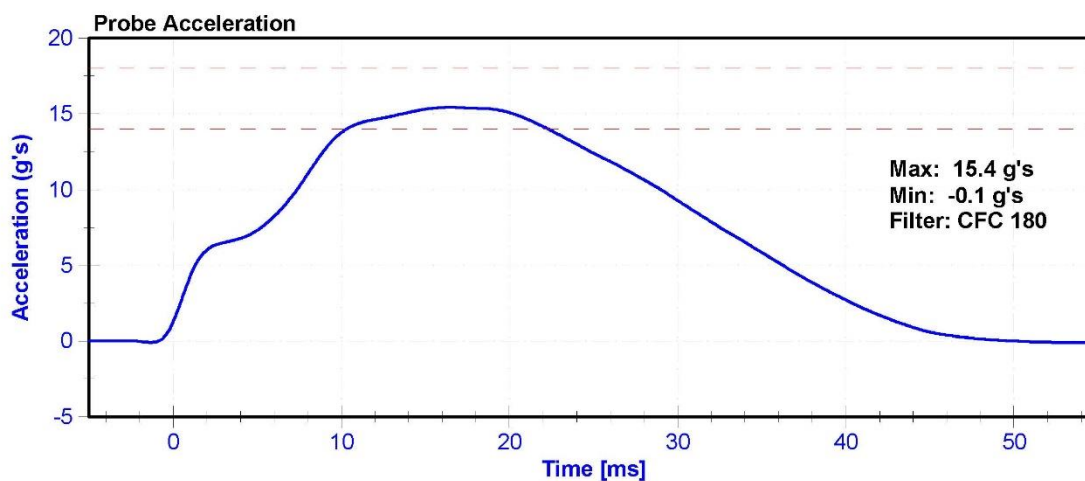
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

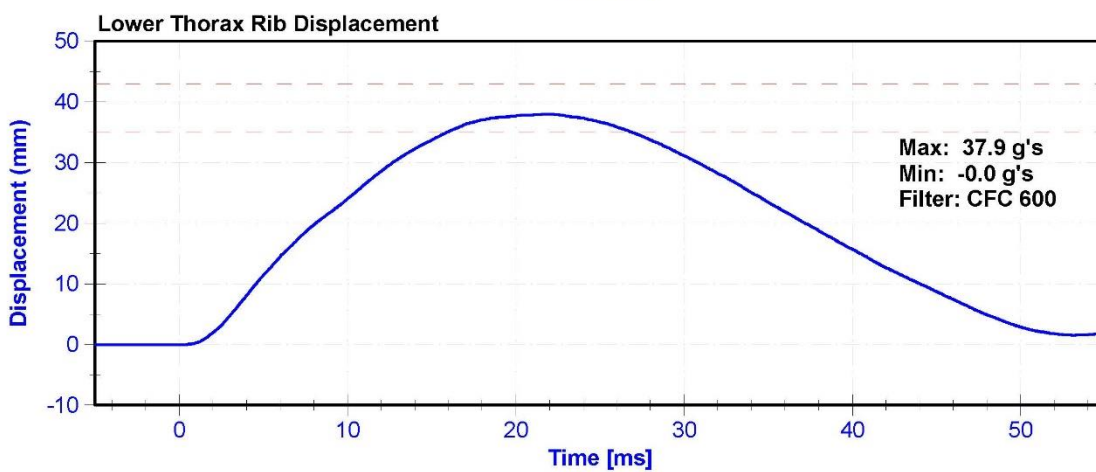
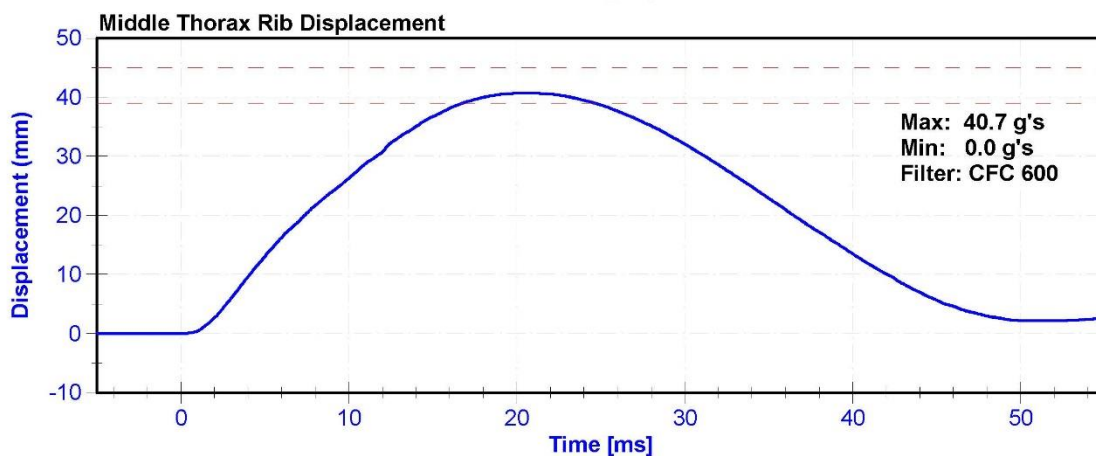
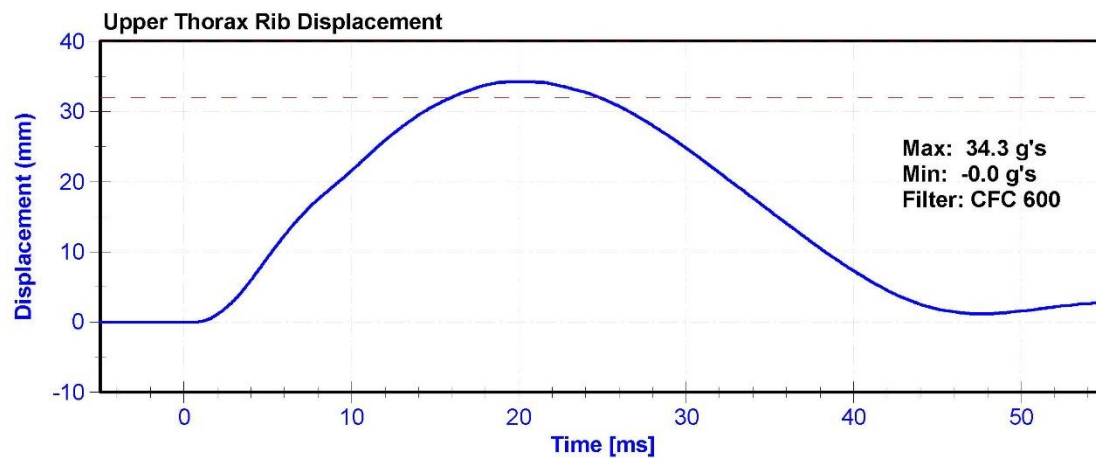
Results

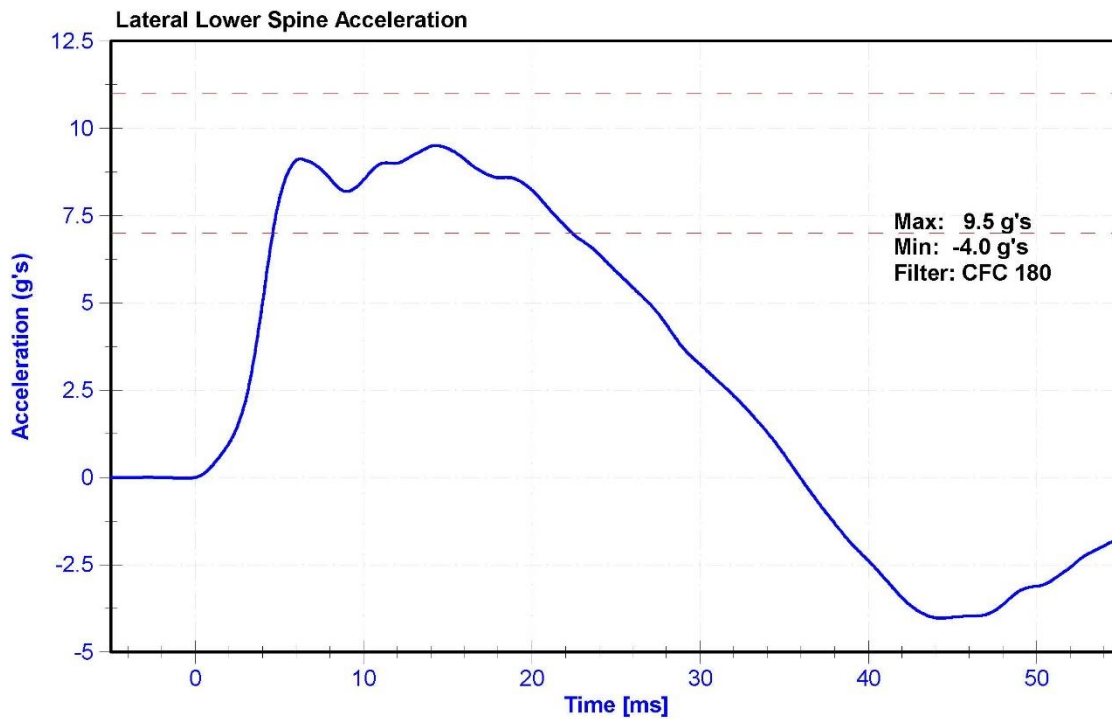
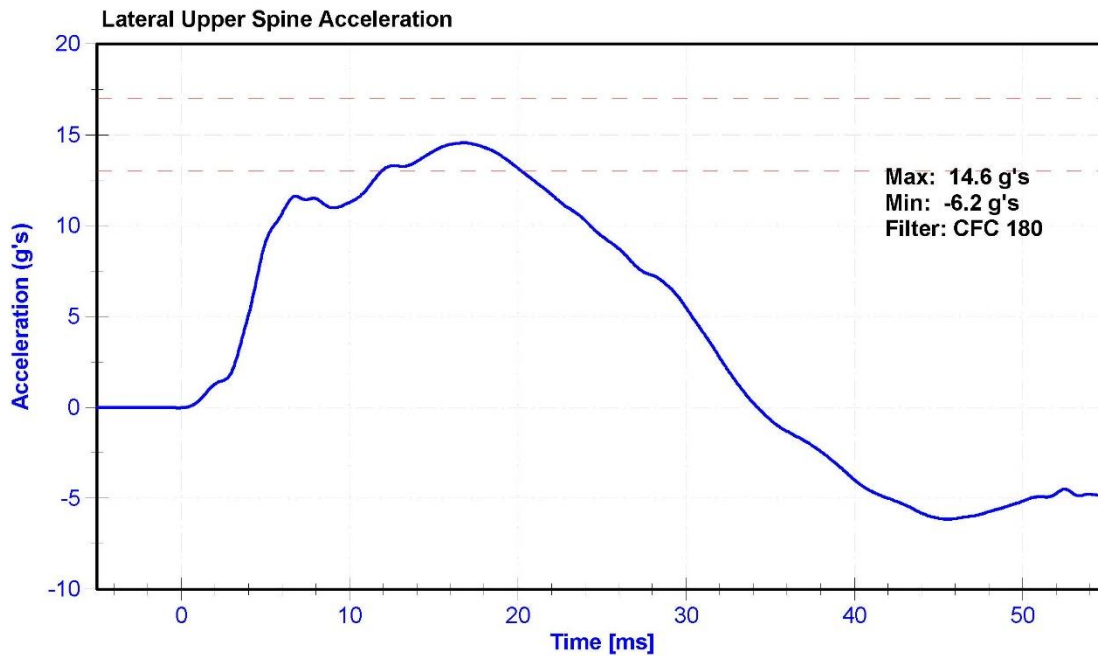
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	33.4	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	14	18	g's	15.4	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.6	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.5	Pass
Upper Thorax Rib Deflection	32	40	mm	34.3	Pass
Middle Thorax Rib Deflection	39	45	mm	40.7	Pass
Lower Thorax Rib Deflection	35	43	mm	37.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Upper Spine Y Accelerometer	ENDEVCO 7264	AC-P83320	9/27/2017	3/28/2018
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	9/27/2017	3/28/2018
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1151GFE	9/27/2017	9/27/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	9/27/2017	9/27/2018







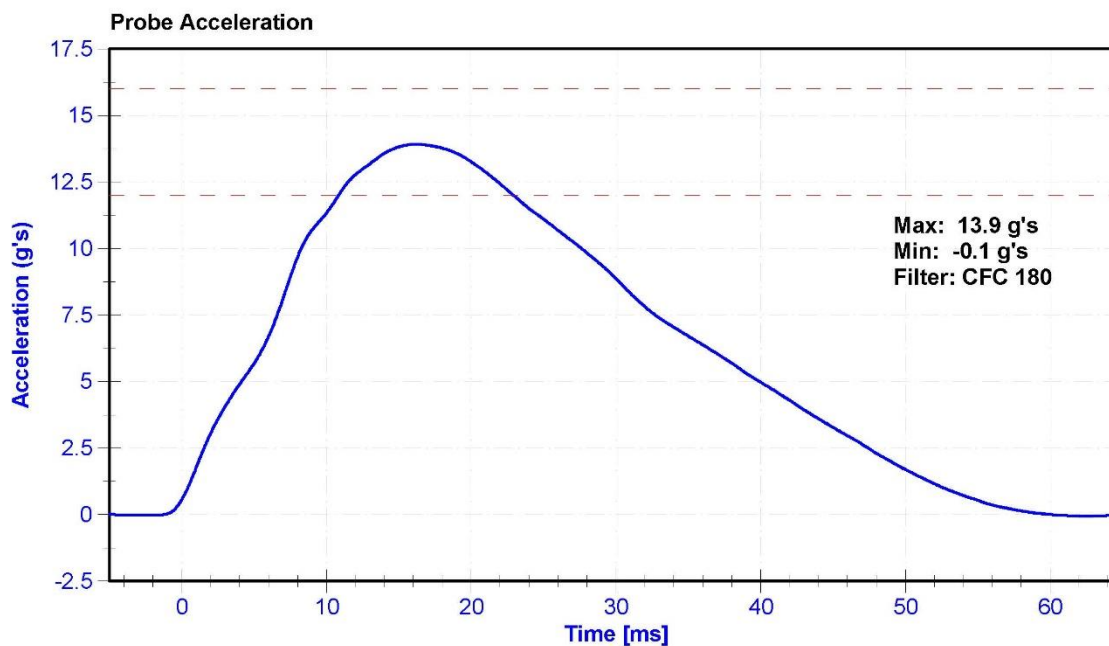
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

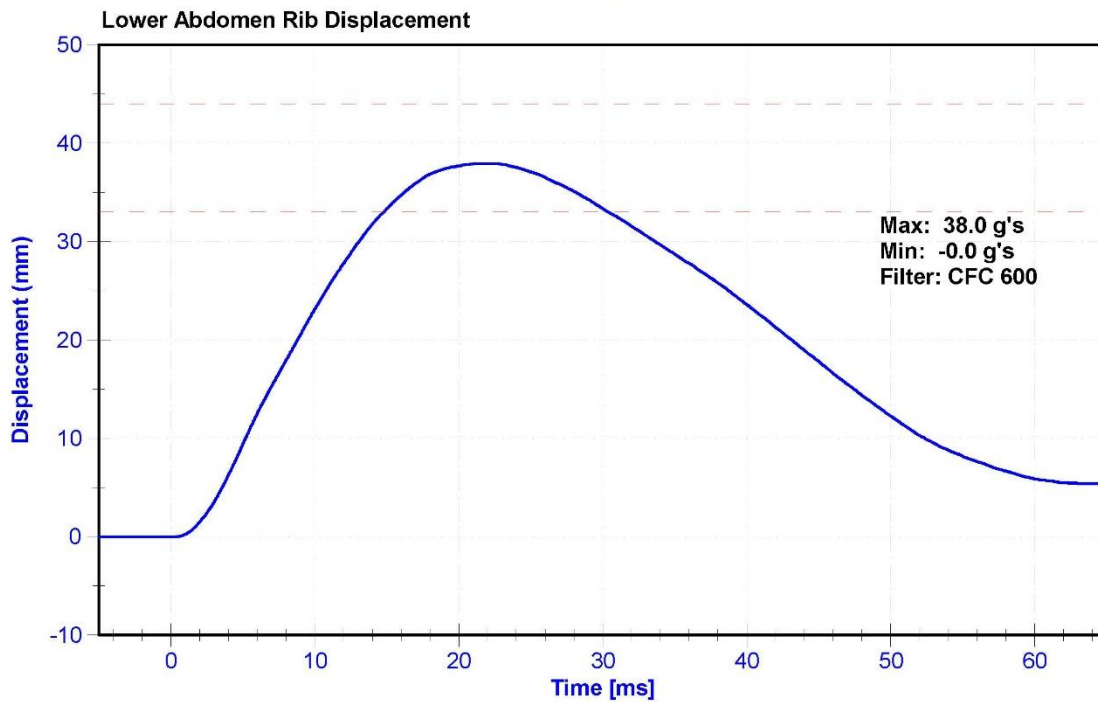
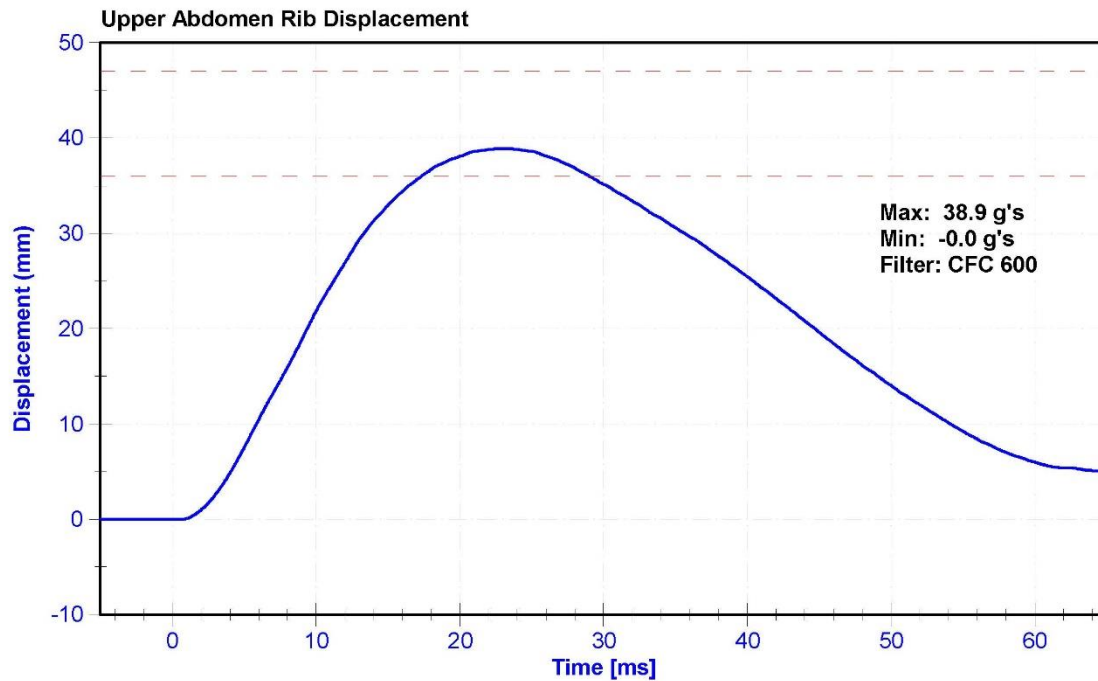
Results

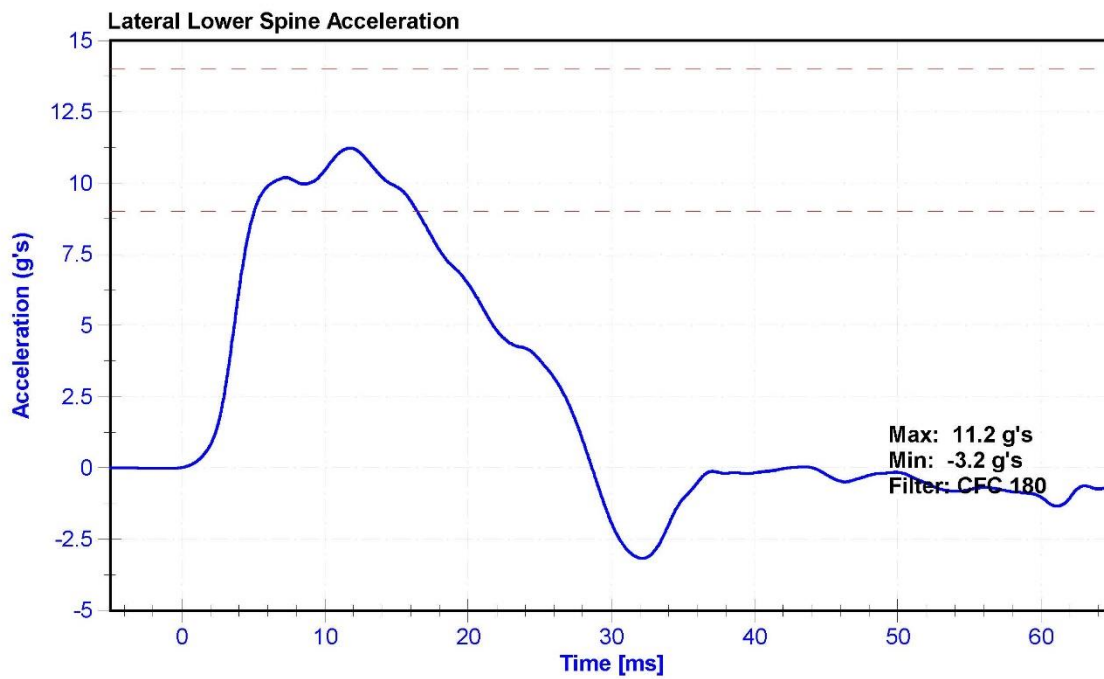
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	26.0	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	12	16	g's	13.9	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.2	Pass
Upper Abdomen Rib Deflection	36	47	mm	38.9	Pass
Lower Abdomen Rib Deflection	33	44	mm	38.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	9/27/2017	3/28/2018
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-308GFE	9/27/2017	9/27/2018
Lower Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-307GFE	9/27/2017	9/27/2018







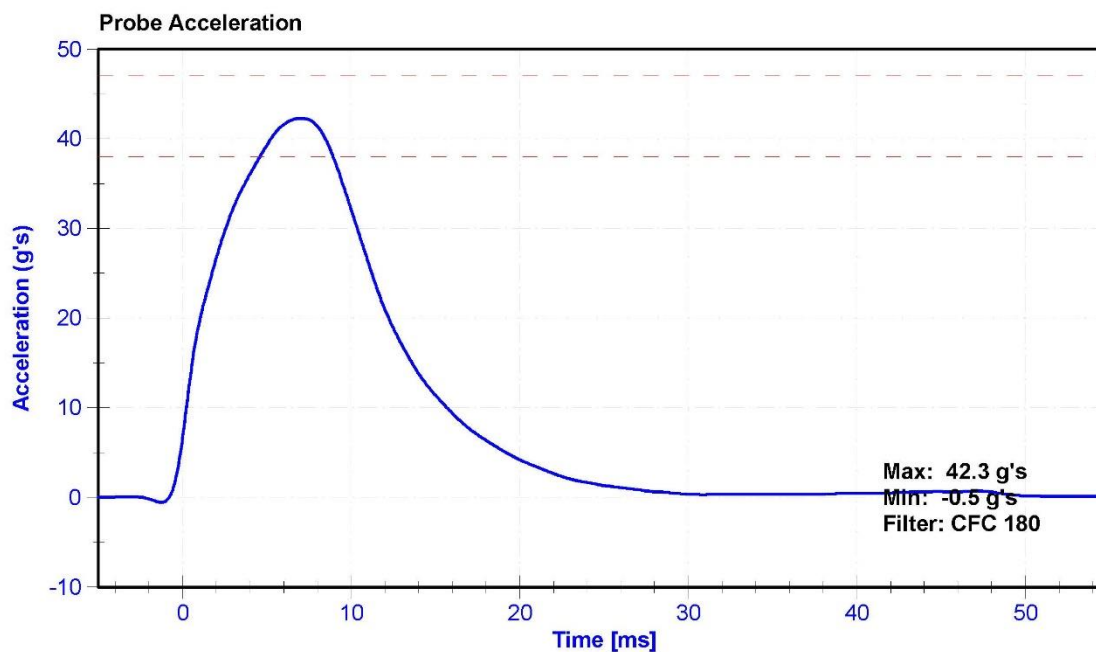
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

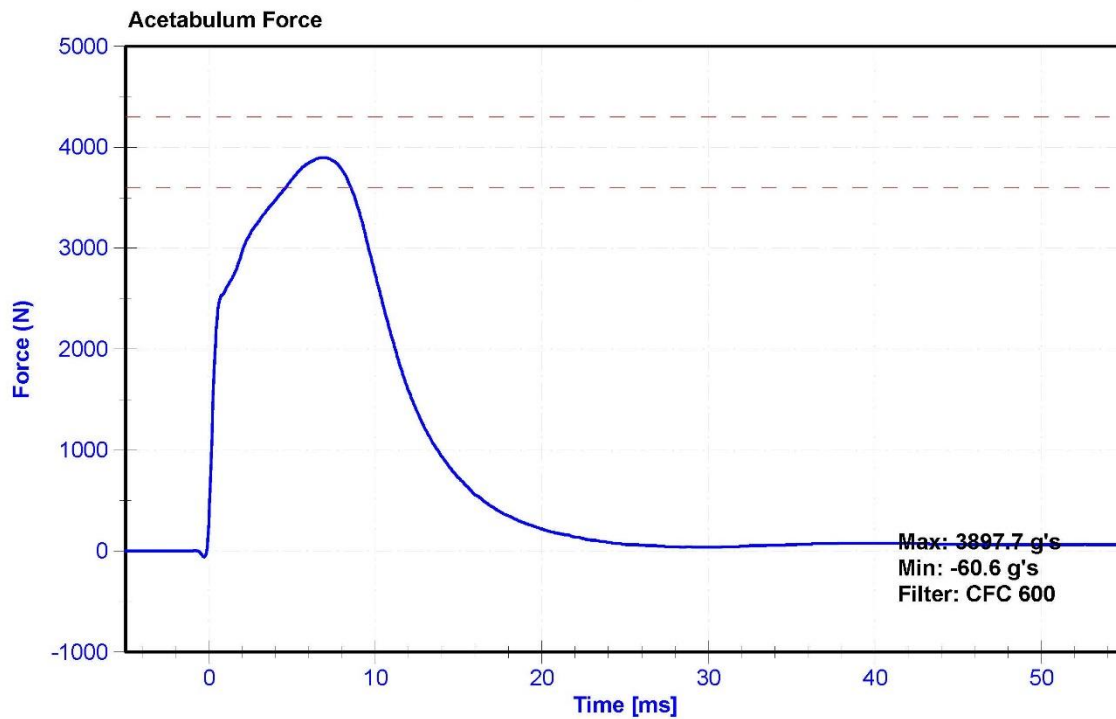
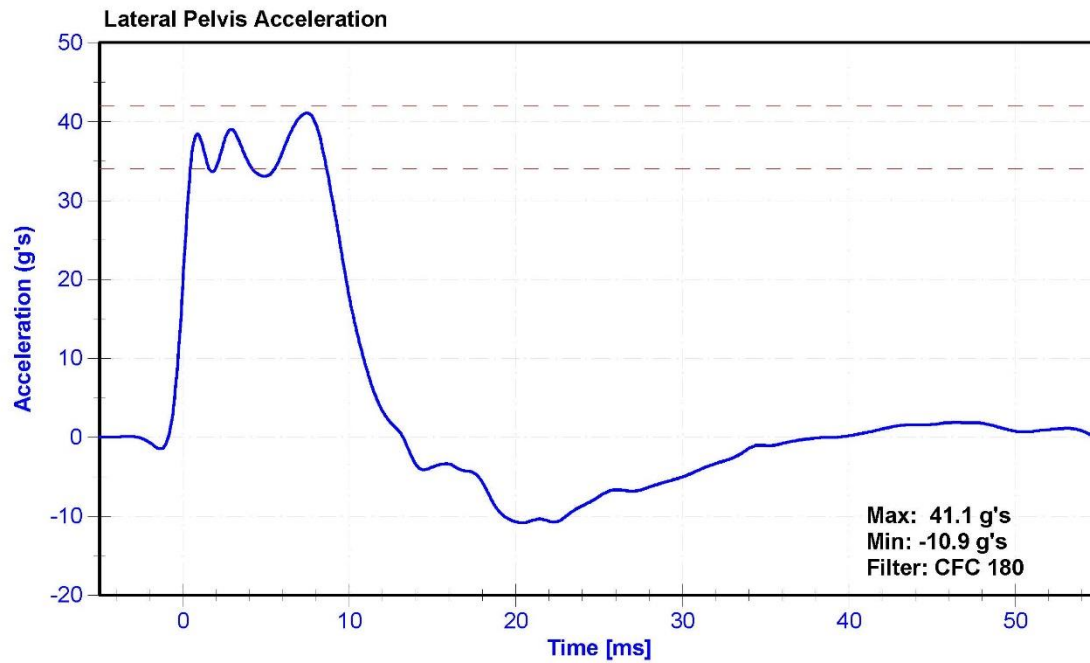
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	26	Pass
Velocity	6.6	6.8	m/s	6.64	Pass
Probe Acceleration	38	47	g's	42.3	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.1	Pass
Acetabulum Force	3600	4300	N	3897.7	Pass

Transducer Calibrations

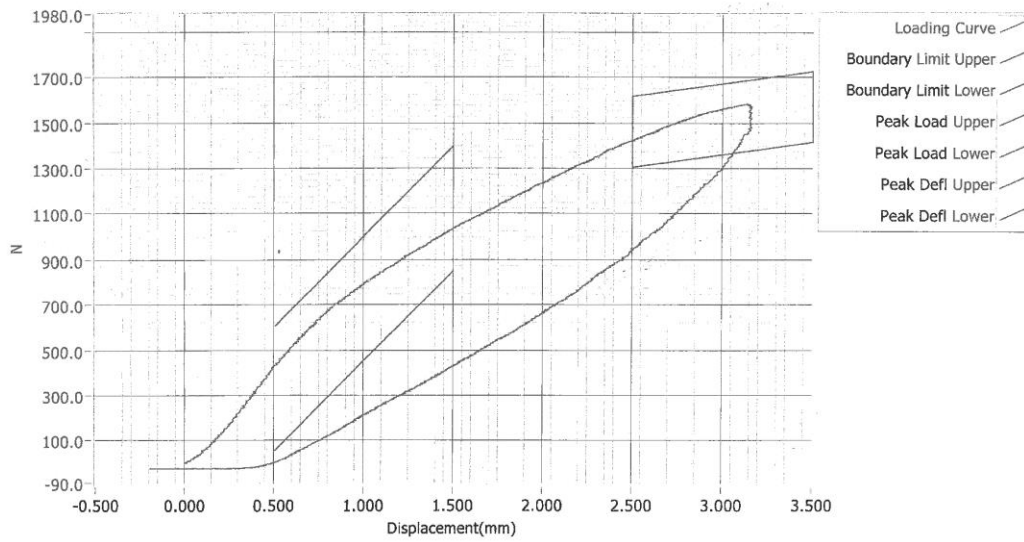
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P79602	9/27/2017	3/28/2018
Acetabulum Load Cell	DENTON 3249J	LC-275Fy	6/20/2017	6/20/2018
Certification Plug	Humanetics	80961	11/25/14	N/A
Crash Test Plug	Humanetics	80688	11/20/14	N/A





certification - 2

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

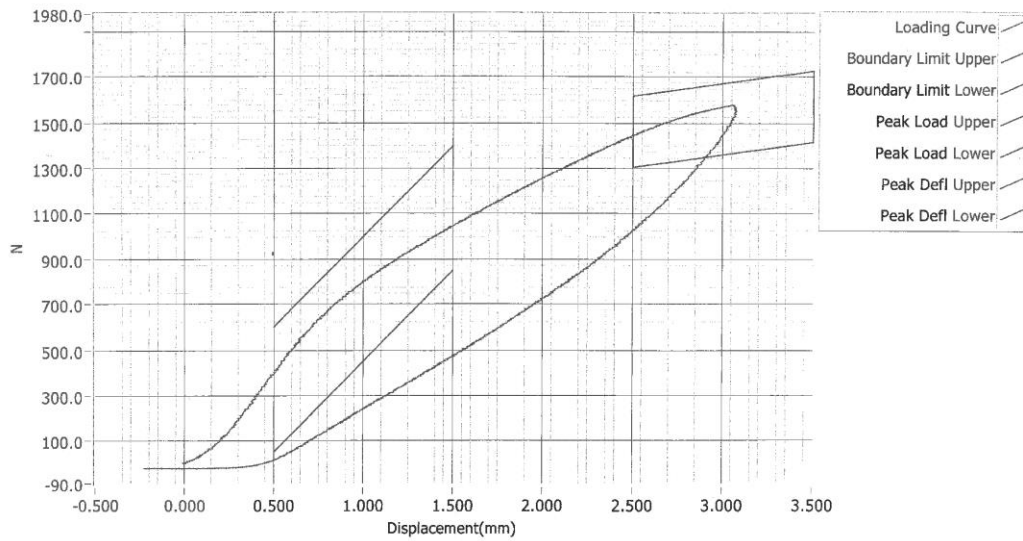
<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
	80961	11/25/2014	9:33 AM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

Current Date : 11/25/2014

Current Time : 09:34:30

CRASH

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

<u>Test ID</u>	<u>Part Serial Number</u>	<u>Test Date</u>	<u>Test Time</u>
	80688	11/20/2014	8:25 PM
<u>Cert ID</u>	<u>ATD Serial Number</u>	<u>ATD Type</u>	
	N/A	SIDIIs	

Current Date : 11/20/2014

Current Time : 20:27:47

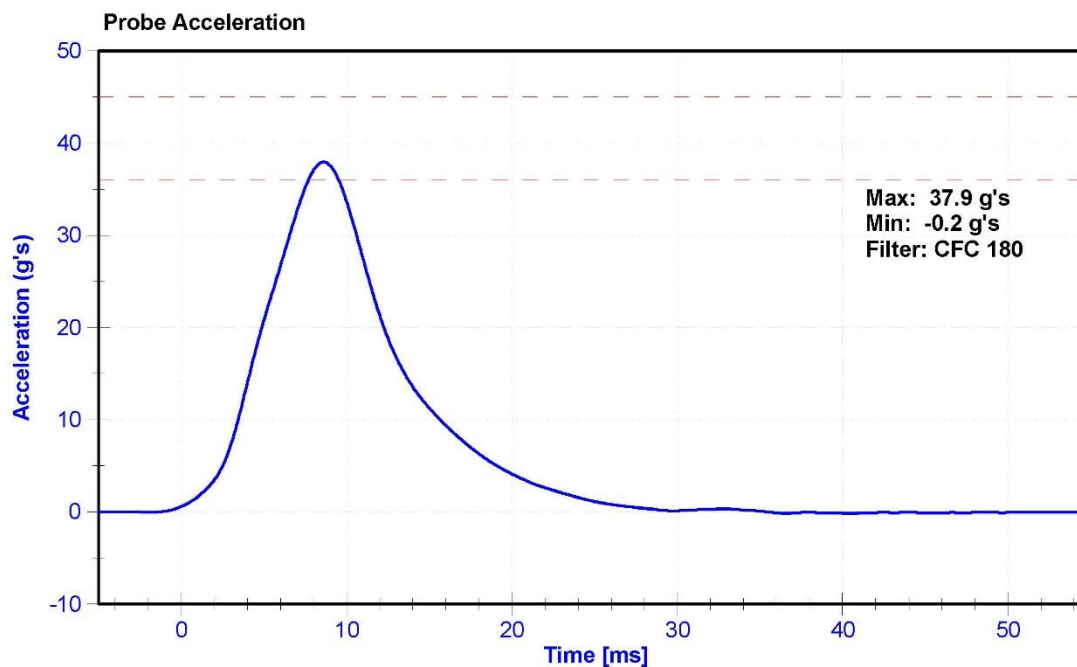
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	S. McCloskey

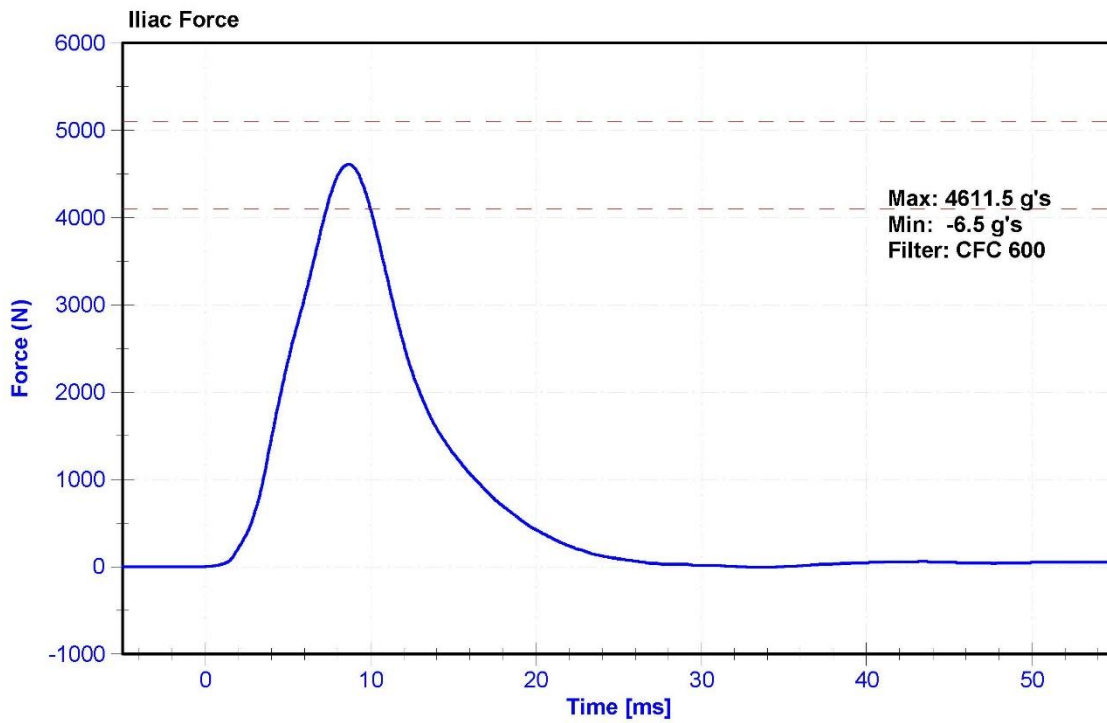
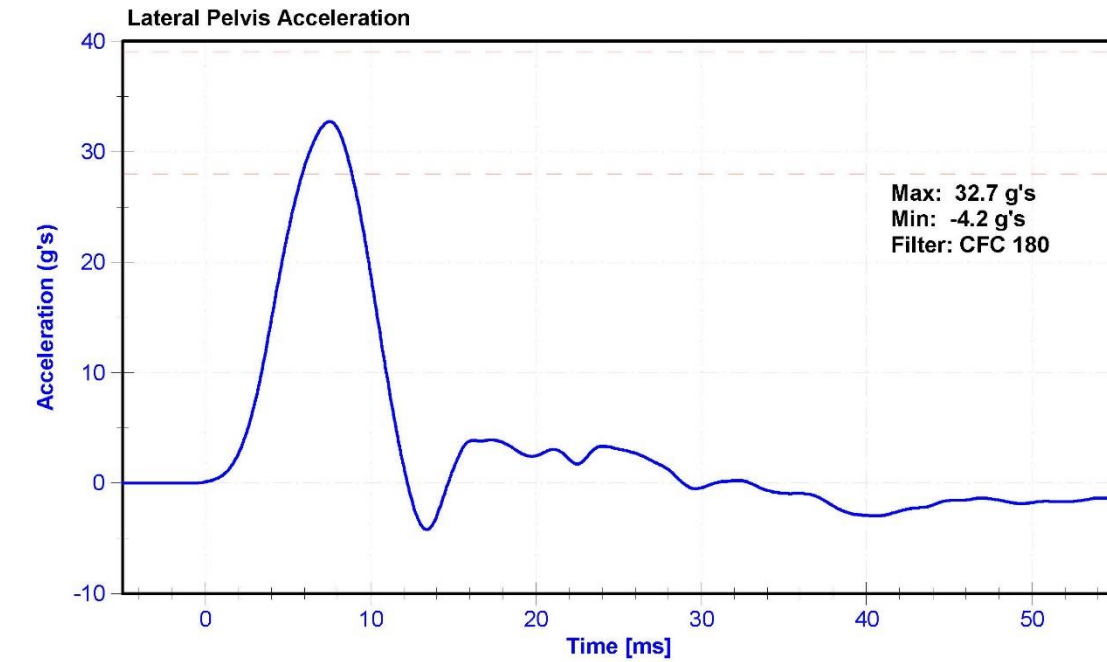
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	23.9	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	36	45	g's	37.9	Pass
Lateral Pelvis Acceleration	28	39	g's	32.7	Pass
Iliac Force	4100	5100	N	4611.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P79602	9/27/2017	3/28/2018
Iliac Load Cell	DENTON 3228J	LC-279Fy	6/21/2017	6/21/2018





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-P58777	ENDEVCO	9/28/2017
			Y	AC-P59018	ENDEVCO	9/28/2017
			Z	AC-P79189	ENDEVCO	9/28/2017
Head Accelerometers - Redundant			X	AC-P52095	ENDEVCO	9/28/2017
			Y	AC-P58986	ENDEVCO	9/28/2017
			Z	AC-P68057	ENDEVCO	9/28/2017
Displacement Potentiometer	Shoulder		Y			
	Thoracic Rib	Upper	Y	DS-451GFE	Servo	9/27/2017
		Middle	Y	DS-1151GFE	Servo	9/27/2017
		Lower	Y	DS-1156GFE	Servo	9/27/2017
	Abdominal Rib	Upper	Y	DS-308GFE	Servo	9/27/2017
		Lower	Y	DS-307GFE	Servo	9/27/2017
Lower Spine Accelerometers (T12)			X	AC-P58883	ENDEVCO	9/27/2017
			Y	AC-P64147	ENDEVCO	9/27/2017
			Z	AC-P58786	ENDEVCO	9/27/2017
Acetabulum Load Cell			Y	LC-275Fy	Denton	6/20/2017
Lilac Wing Load Cell			Y	LC-279Fy	Denton	6/21/2017
Pelvis Plug (Struck Side)				65070	Humanetics	4/5/2013
Pelvis Plug (Non-Struck Side)						

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	AC-A156950	MSI 1201	9/26/2017
Vehicle Center of Gravity	Y	AC-A184924	MSI 1201-1000	9/26/2017
Vehicle Center of Gravity	Z	AC-A197026	MSI 1201-1000	9/26/2017
Left Floor Sill	Y	AC-A197031	MSI 1201-1000	12/5/2017
A-Pillar Sill	Y	AC-A229244	MSI 1201-1000	11/27/2017
A-Pillar Low	Y	AC-A192206	Measurement Specialties	11/27/2017
A-Pillar Mid	Y	AC-A197017	MSI 1201-1000	11/27/2017
B-Pillar Sill	Y	AC-A228326	MSI 1201-1000	10/23/2017
B-Pillar Low	Y	AC-A213655	MSI 1201-1000	10/23/2017
B-Pillar Mid	Y	AC-A184511	MSI 1201-1000	10/23/2017
Driver Seat	Y	AC-A217552	MSI 1201-1000	10/3/2017
Engine Top	X	AC-A189596	MSI 1201-1000	10/12/2017
Engine Top	Y	AC-A197057	MSI 1201-1000	11/20/2017
Firewall	Y	AC-A197014	MSI 1201-1000	11/20/2017
Right Roof	Y	AC-A192202	Measurement Specialties	10/17/2017
Right Floor Sill	Y	AC-A192225	Measurement Specialties	12/5/2017
Rear Floorpan	X	AC-A197018	MSI 1201-1000	8/25/2017
Rear Floorpan	Y	AC-A228323	MSI 1201-1000	9/27/2017

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	LC-18879	Interface 1220-FS	6/19/2017
Load Cell 2	LC-18852	Interface 1220-FS	6/19/2017
Load Cell 3	LC-46955	Interface 1220-FS	6/19/2017
Load Cell 4	LC-18882	Interface 1220-FS	6/19/2017
Load Cell 5	LC-18864	Interface 1220-FS	6/19/2017
Load Cell 6	LC-18847	Interface 1220-FS	6/19/2017
Load Cell 7	LC-62086	Interface 1220-FS	6/19/2017
Load Cell 8	LC-46962	Interface 1220-FS	6/19/2017