

REPORT NUMBER: SINCAP-CAL-18-005

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

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

NHTSA No: M20180216

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



February 7, 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 7, 2018

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Transportation Test Operations

Date: February 7, 2018

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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15. Supplementary Notes																																																					
16. Abstract A 55/28, (61.90kph / 38.5 mph), 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2018 Ford Mustang Two Door Coupe in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 12, 2017. The impact velocity of the Moving Deformable Barrier (MDB) was 62.02 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle at the time of impact was 21°C. The target vehicle's maximum post-test static crush was 166mm 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 (ES-2re)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>117.218</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>44</td> <td>17.091</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>632.133</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1153.249</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>422.453</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td>G</td> <td>82</td> <td>57.882</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3296.632</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>38.018</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45*</td> <td>17.544</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (ES-2re)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	117.218	Maximum Thoracic Rib Deflection	mm	44	17.091	Total Abdominal Force	N	2500	632.133	Pubic Symphysis Force	N	6000	1153.249	Measurement Description	Passenger ATD (SID-IIs)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	422.453	Lower Spine Resultant Acceleration	G	82	57.882	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3296.632	Maximum Thoracic Rib Deflection	mm	38*	38.018	Maximum Abdominal Rib Deflection	mm	45*	17.544
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* Proposed IARV 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.		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave. SE Washington, D.C. 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																																																			
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	19. Security Class. (of this report) UNCLASSIFIED	20. Security Class. (of this page) UNCLASSIFIED	21. No. of Pages 188 22. Price																																																		

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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2018 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-14-D-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 Laboratory Test Procedure dated October 2015.

SECTION 2

SUMMARY OF TEST RESULTS

A 2018 Ford Mustang Two Door Coupe was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.02 km/h. The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Calspan Corporation's Transportation Test Operations Center in Buffalo, New York on December 12, 2017. Pre-test and post-test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated October 2015. The side impact event was documented by 9 high-speed and 2 real-time cameras. Camera locations are included in this report.

The Dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen forward, middle, and rear y-axis load cells

Lower spine (T12) tri-axial accelerometers

Public symphysis y-axis load cell

PASSENGER ATD (SID-IIs)

Primary and redundant head CG tri-axial accelerometers

Chest upper rib, middle rib, and lower rib y-axis displacement potentiometers

Abdomen upper rib and lower rib y-axis displacement potentiometers

Lower spine (T12) tri-axial accelerometers

Acetabulum and iliac wing y-axis load cells

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

DUMMY INJURY VALUES

Measurement Description	Driver ATD (ES-2re)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	117.218
Maximum Thorax Rib Deflection	mm	44	17.091
Combined Abdominal Force	N	2500	632.133
Pubic Symphysis Force	N	6000	1153.249

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	422.453
Lower Spine (T12) Resultant Acceleration	G	82	57.882
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3296.632
Maximum Thoracic Rib Deflection	mm	38*	38.018
Maximum Abdominal Rib Deflection	mm	45*	17.544

*Proposed IARV

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 Airbag	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 – F034
2. P4 serial number – DG8012

Data Anomalies:

The following channel was questionable for

- Left A-Pillar Lower Y Acceleration, Exceeded calibration range at 5.56ms & 11.7ms
- Left Front Sill Y Acceleration, Questionable data after 16.2ms

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 System 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 – Test Vehicle Accelerometer Locations

Data Sheet No. 7 – MDB Accelerometer Locations

Data Sheet No. 8 – Post-Test Observations

Data Sheet No. 9 – MDB Summary of Results

Data Sheet No. 10 – Test Vehicle Profile Measurements

Data Sheet No. 11 – Test Vehicle Exterior Crush Measurements

Data Sheet No. 12 – MDB Exterior Static Crush Measurements

Data Sheet No. 13 – Vehicle and MDB Damage Profile Distances

Data Sheet No. 14 – FMVSS No. 301 Static Rollover Results

Data Sheet No. 15 – 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 MDB Impact Test

NHTSA No.: M20180216
Test Date: 12/12/2017

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20180216	Traction Control System (TCS)	Yes
Model Year	2018	Auto-Leveling System	No
Make	Ford	Automatic Door Locks (ADL)	Yes
Model	Mustang	Power Window Auto-Reverse	No
Body Style	Two Door Coupe	Other Optional Feature	-
VIN	1FA6P8TH0J5100910	Driver Front Airbag	Yes
Body Color	Yellow	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	180 miles	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.3	Driver Torso Airbag	No
Type/No. Cylinders	I4	Driver Torso/Pelvis Airbag	Yes
Engine Placement	Inline	Driver Pelvis Airbag	No
Transmission Type	Manual	Driver Knee Airbag	Yes
Transmission Speeds	6-Speed	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head/Torso Airbag	No
Final Drive	Rear Wheel Drive	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso/Pelvis Airbag	No
Sunroof/T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioners	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioners	No
Power Seats	No	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	Yes	Rear Pass. Load Limiter	No
		Other Safety Restraint	-

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Ford Motor Co.	GVWR (kg)	2050
Date of Manufacture	10/17	GAWR Front (kg)	1016
Vehicle Type	Passenger	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	(A)
DSC X 68.04 kg				272.16	(B)
Cargo Weight (RCLW) (kg)				30.84	(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							

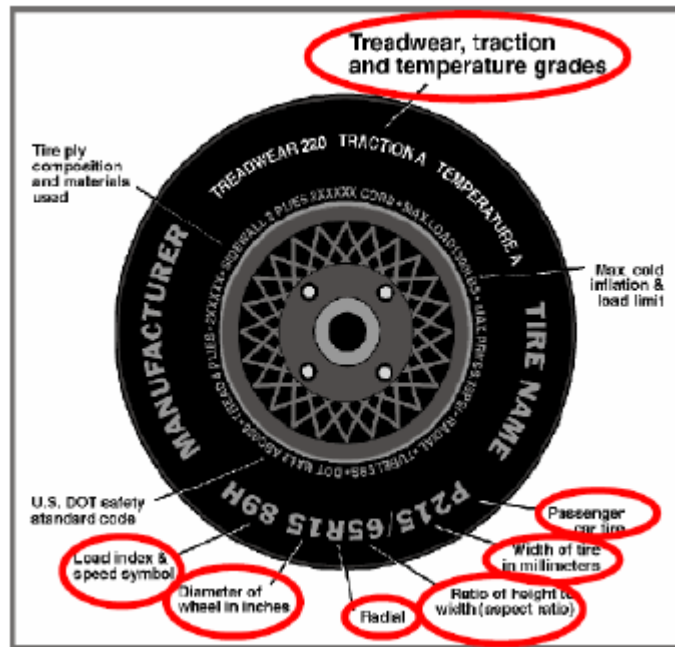
DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle:	2018 Ford Mustang Two Door Coupe
Test Program:	NCAP Side MDB Impact Test

NHTSA No.: M20180216
Test Date: 12/12/2017

VEHICLE TIRE INFORMATION

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



TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	220	220
Recommended Tire Size	255/40ZR19	255/40ZR19
Tire Size on Vehicle	255/40ZR19	255/40ZR19
Tire Manufacturer	Pirelli	Pirelli
Tire Model	P Zero Nero	P Zero Nero
Treadwear	400	400
Traction	AA	AA
Temperature Grade	A	A
Tire Plies Sidewall	2 Rayon	2 Rayon
Tire Plies Body	2 Rayon, 2 Steel, 1 Polyamide	2 Rayon, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	96W	96W
Tire Material	Rubber	Rubber
DOT Safety Code Left	UNVLP9523917	UNVLP9523917
DOT Safety Code Right	UNVLP9523917	UNVLP9523917

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

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	266	266	266	266
Tire Placard	kPa	220	220	220	220
Owner's Manual	kPa	220	220	220	220
As Tested	kPa	220	220	220	220

MDB TIRE SPECIFICATIONS

	Units	Requirement	LF	RF	LR	RR
Tire Size		P205/75R15	P205/75R15	P205/75R15	P205/75R15	P205/75R15
Tire Pressure	kPa	200 ± 21	207	207	207	207

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	402	402		428	478		440	476	
Right	kg	450	354		448	405		458	402	
Ratio	%	53	47		50	50		51	49	
Totals	kg	852	756	1608	876	883	1759	898	878	1776

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1608	(A)
Sum of Actual Weight of 1 ES2re and 1 P572 ATD (SID-IIs)	kg	127	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	30.84	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1765.84	(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	Fully Loaded	As Tested	Meets Requirement**
LF	mm	723	728	Yes
RF	mm	730	733	Yes
RR	mm	725	724	Yes
LR	mm	720	714	Yes
Vehicle CG (Aft of Front Axle)	mm	1344	1365	
Vehicle CG (Left+)/Right(-) from Longitudinal Centerline)	mm	26	25	

*** The "As Tested" vehicle attitude measurements must be equal to or within ± 10mm of the "Fully Loaded" vehicle attitude measurements at each wheel well. Indicate "Yes" or "No" for "Meets Requirements".

Test height adjustable suspension setting, if applicable: N/A

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

Test Vehicle:	<u>2018 Ford Mustang Two Door Coupe</u>	NHTSA No.:	<u>M20180216</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>12/12/2017</u>

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	4
Pump Kit	2
Rear Speaker	1
Tail Lights	4
Passenger Side Windows	6
Rear Bumper Fascia	10
Front Bumper Fascia	9
Ballast / Equipment Added	0

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

Test Vehicle: <u>2018 Ford Mustang Two Door Coupe</u>	NHTSA No.: <u>M20180216</u>	
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>12/12/2017</u>	

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	20.3	15.2	17.75
Front Passenger Seat	Not Adjustable		
Front Center Seat*			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed

**if applicable*

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRП Height (mm)	SCRП Height Position	SCRП Height (mm)		
				Rearmost	Mid- Fore/Aft	Forward- Most
Driver Seat	17.75	15	Max	-	-	-
			Mid	15	15	15
			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	-	-	-

**if applicable*

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

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017

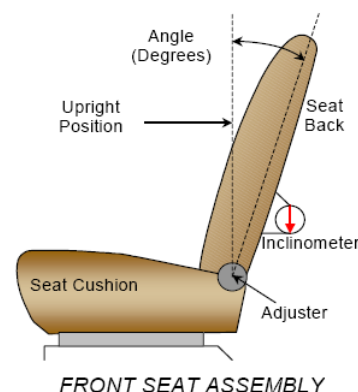
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	255	38 (0-37)	130	19
Front Passenger Seat	255	38 (0-37)	130	19
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

**if applicable*

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. 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 seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/ Seated Dummy	-28.1 to 29.8	N/A	3.1	N/A
Front Passenger Seat	-27.6 to 30.4	N/A	2.7	N/A
Front Center Seat*	N/A	N/A	N/A	N/A
Struck Side Rear Seat w/ Seated Dummy	FIXED	FIXED	FIXED	FIXED
Non-Struck Side Rear Seat	FIXED	FIXED	FIXED	FIXED
Rear Center Seat*	FIXED	FIXED	FIXED	FIXED

**if applicable*

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

Test Vehicle: 2018 Ford Mustang Two Door Coupe

NHTSA No.:

M20180216

Test Program: NCAP Side MDB Impact Test

Test Date:

12/12/2017

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. For this test zero is defined as the uppermost position.

	Total # of Positions	Placed in Position #
Driver Seat	Fixed	Fixed
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

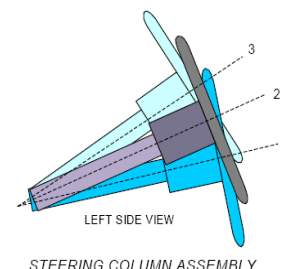
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	3	Uppermost
Rear Seat	N/A	N/A

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.

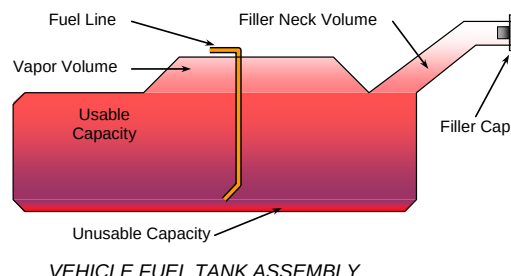
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	17.6	
Geometric Center – Position 2	20.45	
Uppermost – Position 3	23.3	
Telescoping Steering Wheel Travel		44
Test Position	20.4	22



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.



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

Test Vehicle:	<u>2018 Ford Mustang Two Door Coupe</u>	NHTSA No.:	<u>M20180216</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>12/12/2017</u>

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	58.67
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	58.67
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	54.56
Actual Amount of Solvent Used in Test	54.56
1/3 of Usable Capacity	19.55

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

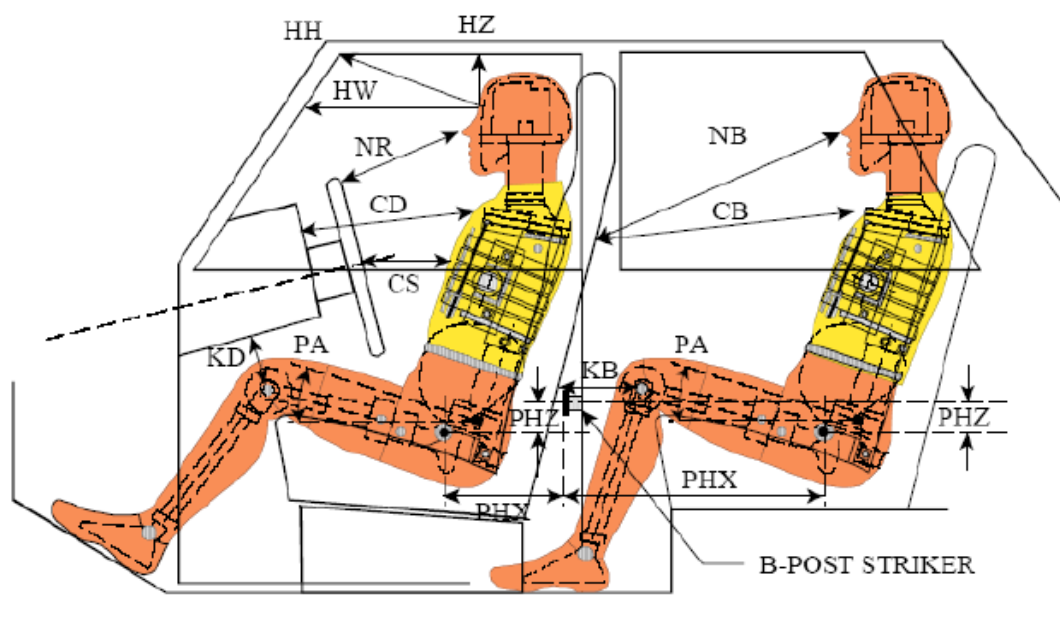
NHTSA No.:

M20180216

Test Program: NCAP Side MDB Impact Test

Test Date:

12/12/2017



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

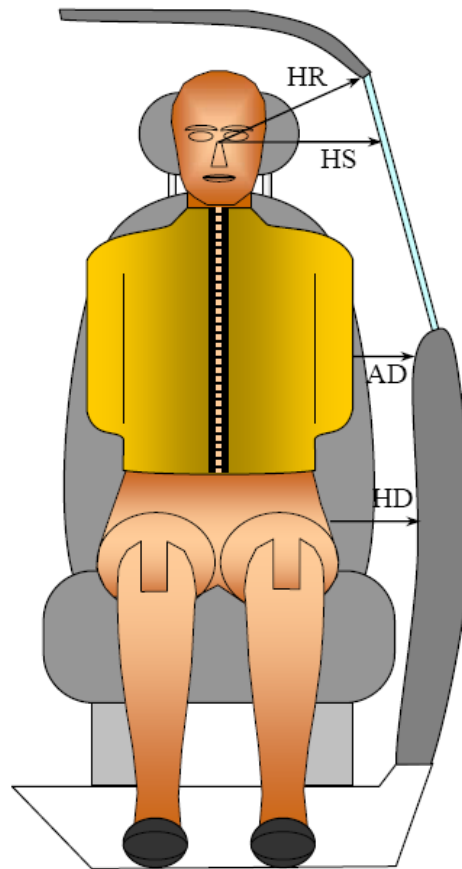
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver (Serial No. F034)		Passenger (Serial No. DG8012)	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	346			
HW		Header to Windshield	542			
HZ	HZ	Head to Roof Liner	160		178	
NR	NB	Nose to Rim/Seat Back	398		470	
CD	CB	Chest to Dash/Seat Back	561		452	
CS		Chest to Steering Wheel	334			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	237	25.7	169	18.8
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	230	26.2	159	19.3
PAX°	PAX°	Pelvic Tilt Angle X		25.3		27.6
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (X-Axis)	443		340	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	216		197	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017



FRONT VIEW OF DUMMY

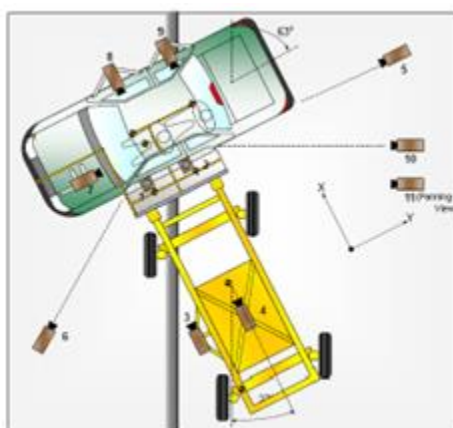
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F034)	Passenger (Serial No. DG8012)
HR	Head to Side Header	mm	190	208
HS	Head to Side Window	mm	323	388
AD	Arm to Door	mm	116	147
HD	Hip Point to Door	mm	168	145

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	315	1085	-5305	14	1000
2	Overhead Close-up	0	890	-5305	24	1000
3	Left Impact Point (MDB)	-1470	0	-847	25	1000
4	Side Overall (MDB)	-1140	838	-1587	12.5	1000
5	Rear	405	9888	-1166	24	1000
6	Left Front	-3090	-1963	-1323	24	1000
7	Driver Front (OB)				25	1000
8	Driver Side (OB)				12.5	1000
9	Passenger Side (OB)				12.5	1000
10	Real-time Left Rear				Zoom	60
11	Real-time In run				Zoom	60

Notes: *Reference: Impact Point projected to Ground*
 +X = To Front of MDB, +Y = To Right of MDB, +Z = Down
 *All measurements accurate to ± 6 mm.

If applicable, explain why camera(s) did not operate as intended: All cameras operated normally

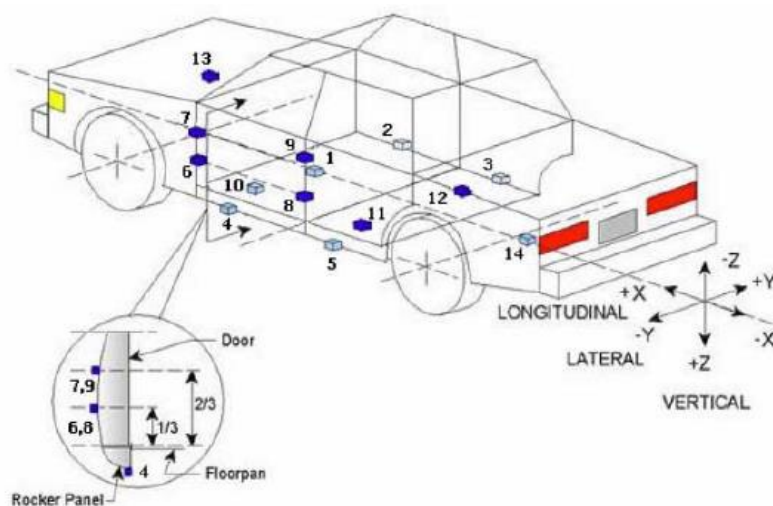
INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	23
MDB Accelerometers	7
Total	62

DATA SHEET NO. 6 **TEST VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2018 Ford Mustang Two Door Coupe
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
Test Date: 12/12/2017



TEST VEHICLE ACCELEROMETER LOCATIONS

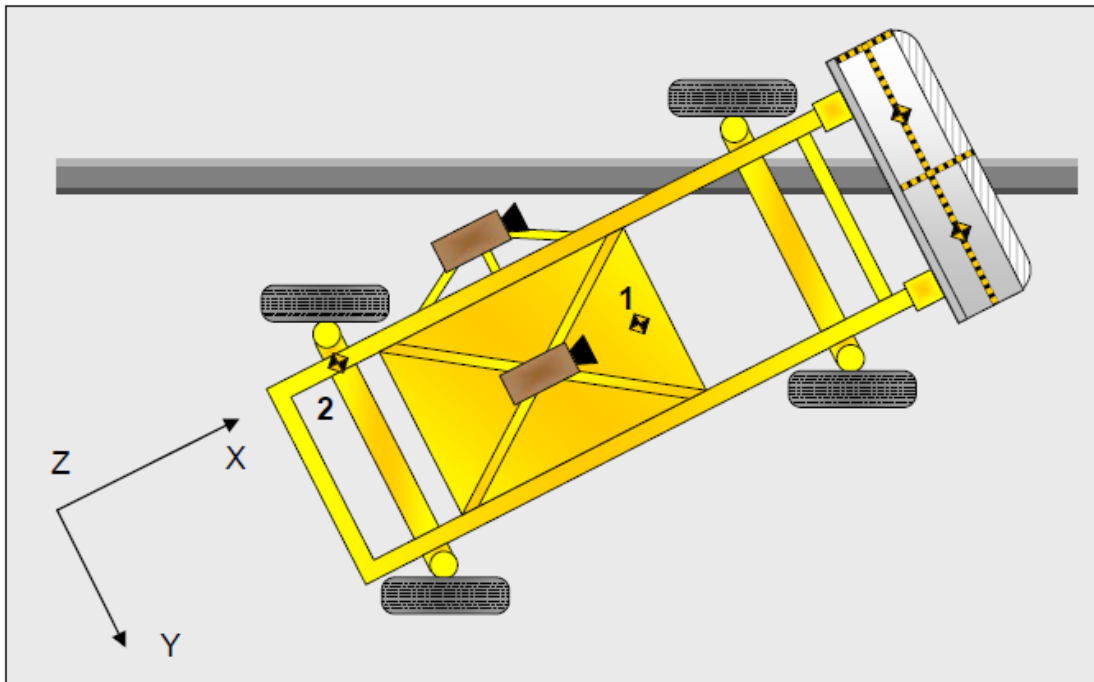
No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2736	-4	-163
2	Right Sill at Front Seat	2684	669	121
3	Right Sill at Rear Seat	2018	658	51
4	Left Sill at Front Door	2675	-668	114
5	Left Sill at Rear Door	1982	-661	66
6	A-Post Lower	3117	-677	-139
7	A-Post Middle	2915	-650	-586
8	B-Post Lower	1899	-684	-189
9	B-Post Middle	1812	-690	-470
10	Front Seat Track	2315	-621	140
11	Rear Seat Structure	1863	-366	13
12	Rt. Rear Occ. Compartment	2026	362	183
13	Engine Block	4014	-40	-375
14	Rear Above Axle	1000	4	-128

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

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017



MDB ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	MDB CG	1859	0	-330
2	MDB Rear	386	-660	-660

Reference: X – Face of MDB (+ forward)
 Y – MDB centerline (+ to right)
 Z – Ground plane (+ down)

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2018 Ford Mustang Two Door Coupe
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
Test Date: 12/12/2017

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Side Headliner	Curtain Airbag
Top of Head	Side Headliner	Side Headliner & Seatback
Left Side of Head	Side Headliner	Curtain Airbag & C-Pillar
Back of Head	Side Headliner & Headrest	Curtain Airbag, C-Pillar & Seatback
Left Shoulder	Curtain Airbag	Passenger Door
Upper Torso	Seatback & Torso/Pelvis Airbag	Passenger Door
Lower Torso	Seatback	Passenger Door
Left Hip	Torso/Pelvis Airbag	Seat Pan
Left Knee	Driver Door	Passenger 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

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	B-Pillar Buckled
Sill Separation	None
Windshield Damage	None
Side Window Damage	Driver Window Shattered
Other Notable Effects	None

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

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017

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

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2715
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		419
Actual Impact Point (Aft of Frontal Axle)	mm		430
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	-11
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	0

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2018 Ford Mustang Two Door Coupe
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
Test Date: 12/12/2017

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1,250
Overall Length Including Honeycomb Frame	4,120
Wheelbase of Framework Carriage	2,600
CG Location of Front Axle	1,120

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	392.5	297.5	690.0
Right	kg	386.0	291.5	677.5
Ratio	%	57.4%	42.6%	100.0%
Totals	kg	778.5	589.0	1367.5

SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.10 to 62.70	62.02
Trap No. 2 Velocity (Redundant)	km/h	61.10 to 62.70	61.96
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.0

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	600	Right	258
B	Top of Bumper	533	700	Right	215
C	Mid-Level	686	700	Right	179
D	Top of Stack	813	700	Right	194

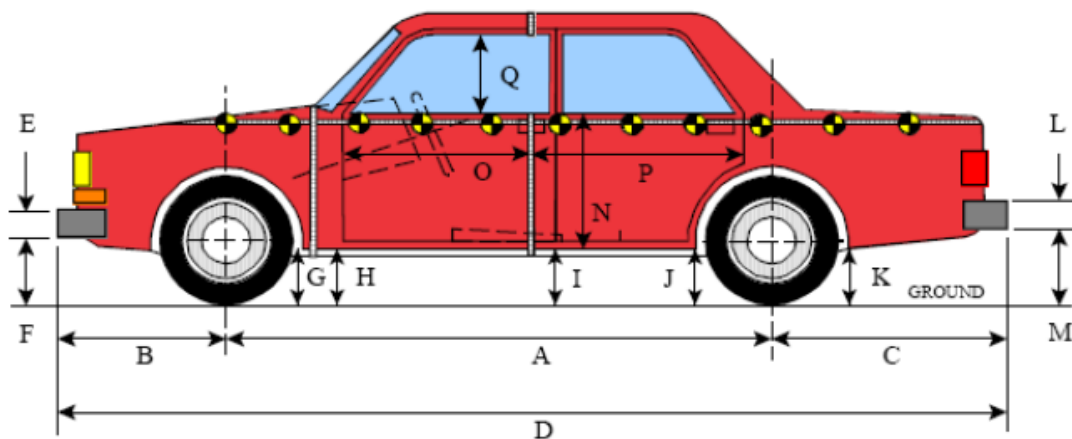
DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2018 Ford Mustang Two Door Coupe

NHTSA No.: M20180216

Test Program: NCAP Side MDB Impact Test

Test Date: 12/12/2017



LEFT SIDE VIEW

All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2715	2709	-6
B	Front Axle to FSOV	947	977	30
C	Rear Axle to RSOV	1125	1128	3
D	Total Length at Centerline	4791	4814	23
E	Front Bumper Thickness	120	120	0
F	Front Bumper Bottom to Ground	396	426	30
G	Sill Height at Front Wheel Well	141	156	15
H	Sill Height at Front Door Leading Edge	142	151	9
I	Sill Height at B Pillar	142	154	12
J1	Sill Height at Rear Wheel Well	148	157	9
J2	Pinch Weld Height at Rear Wheel Well	140	153	13
K	Sill Height Aft of Rear Wheel Well	400	404	4
L	Rear Bumper Thickness	120	120	0
M	Rear Bumper Bottom to Ground	396	393	-3
N	Sill Height to Window Bottom of Front Window Sill	741	750	9
O	Front Door Leading Edge to Impact CL	440	440	0
P	Rear Door Trailing Edge to Impact CL	829	819	-10
Q	Front Window Opening	332	311	-21
R	Right Side Length	4702	4721	19
S	Left Side Length	4701	4711	10
T	Maximum Vehicle Width	1821	1742	-79

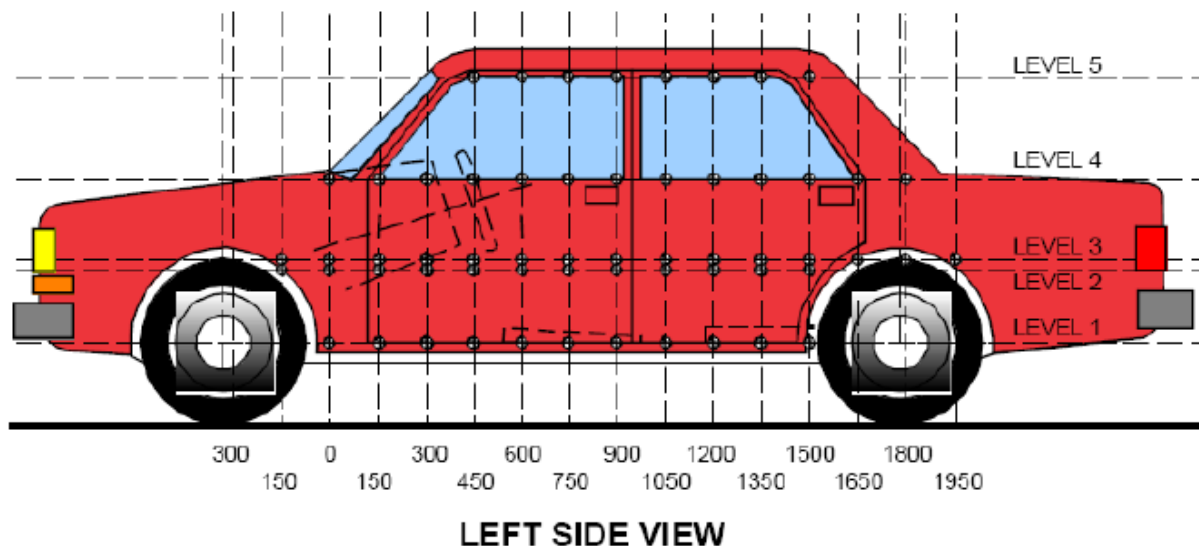
DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Ford Mustang Two Door Coupe

NHTSA No.: M20180216

Test Program: NCAP Side MDB Impact Test

Test Date: 12/12/2017



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	270	28	0
2	Driver Hip Point	mm	495	132	300
3	Mid-Door	mm	665	166	1050
4	Window Sill	mm	955	26	1200
5	Window Top	mm	1294	-8	1650

*window top level bent outward from original position

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. 11 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

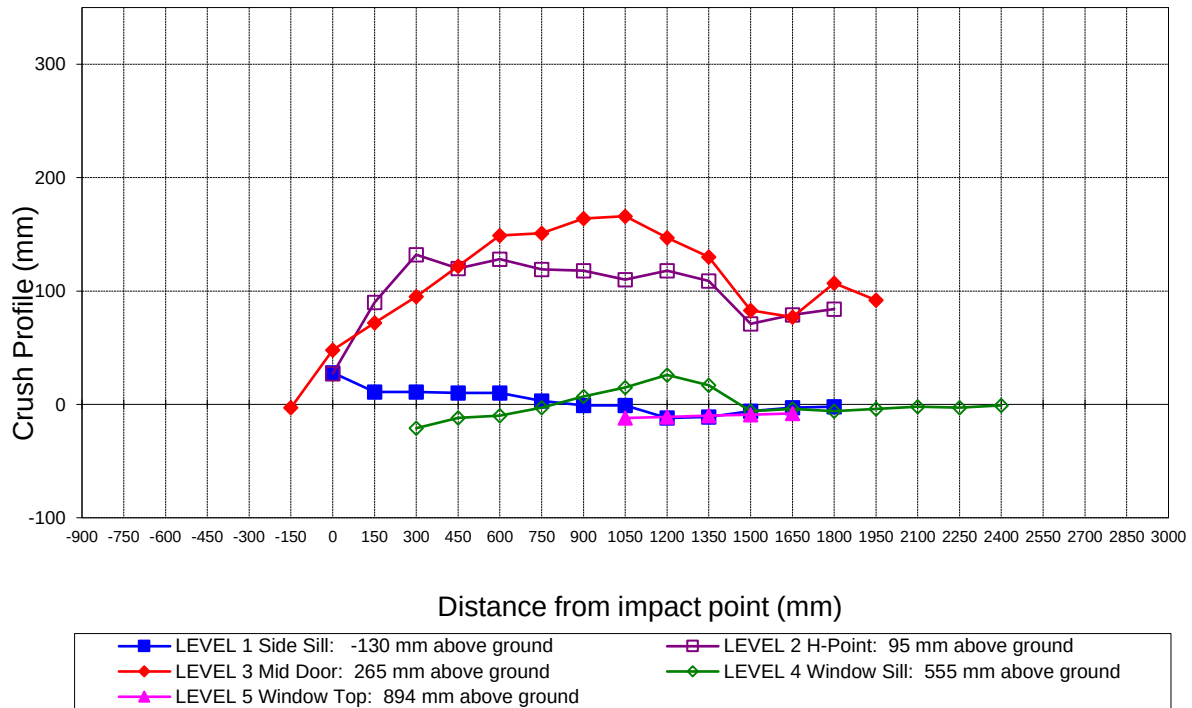
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			934					937					-3		
0	903	926	926			875	899	875			28	27	51		
150	881	904	919			870	814	847			11	90	72		
300	877	897	919	793		866	765	824	814		11	132	95	-21	
450	876	897	919	804		866	777	797	816		10	120	122	-12	
600	879	897	919	812		869	769	770	822		10	128	149	-10	
750	874	896	917	821		871	777	766	824		3	119	151	-3	
900	873	895	916	826		874	777	752	819		-1	118	164	7	
1050	872	893	914	828	639	873	783	748	813	651	-1	110	166	15	-12
1200	868	891	912	829	639	880	773	765	803	650	-12	118	147	26	-11
1350	868	890	909	828	635	879	781	779	811	645	-11	109	130	17	-10
1500	867	889	907	825	630	873	818	824	831	639	-6	71	83	-6	-9
1650	869	896	905	820	618	872	817	828	824	626	-3	79	77	-4	-8
1800	891	924	919	814		893	840	812	820		-2	84	107	-6	
1950			945	832				853	836				92	-4	
2100				861					863					-2	
2250				861					864					-3	
2400				857					858					-1	
2550															
2700															
2850															
3000															

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 test based on an estimated impact point.

DATA SHEET NO. 11 (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017

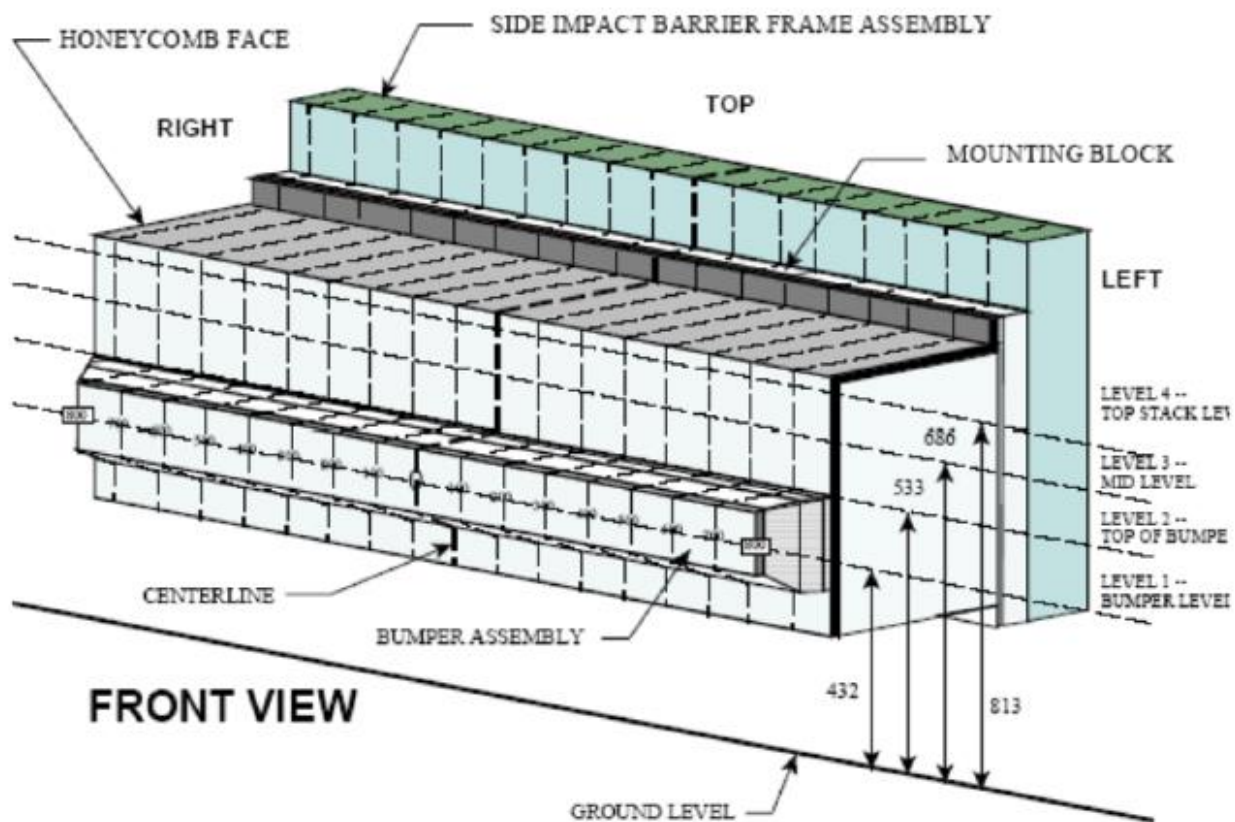


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

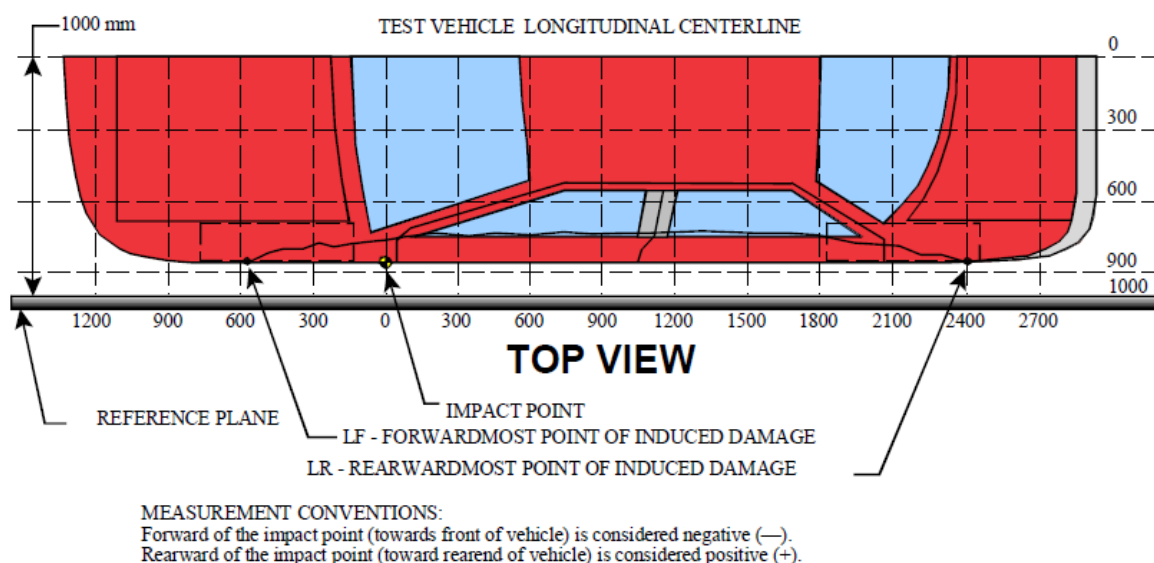
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	251	253	258	240	209	192	181	177	176	176	175	175	175	190	195	186	184
2	206	215	211	173	149	137	131	128	127	124	124	124	124	127	136	137	134
3	151	179	172	118	82	60	47	42	41	40	42	51	67	99	133	129	139
4	176	194	175	135	94	53	40	49	59	72	79	88	115	158	193	183	190

DATA SHEET NO. 13 **MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017

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	-150	3	63	66	-3
2	270	3	171	81	90
3	690	3	232	82	150
4	1110	3	245	87	158
5	1530	3	175	93	82
6	1950	3	147	55	92

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)*
1	800 mm left of center	1	184
2	480 mm left of center	1	187
3	160 mm left of center	1	175
4	160 mm right of center	1	179
5	480 mm right of center	1	206
6	800 mm right of center	1	251

DATA SHEET NO. 14
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: <u>2018 Ford Mustang Two Door Coupe</u>	NHTSA No.: <u>M20180216</u>
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>12/12/2017</u>

Test Time: <u>12:00 PM</u>	Temperature: <u>21°C</u>
----------------------------	--------------------------

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

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	71	300	371
90° to 180°	64	300	364
180° to 270°	64	300	364
270° to 360°	63	300	363

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

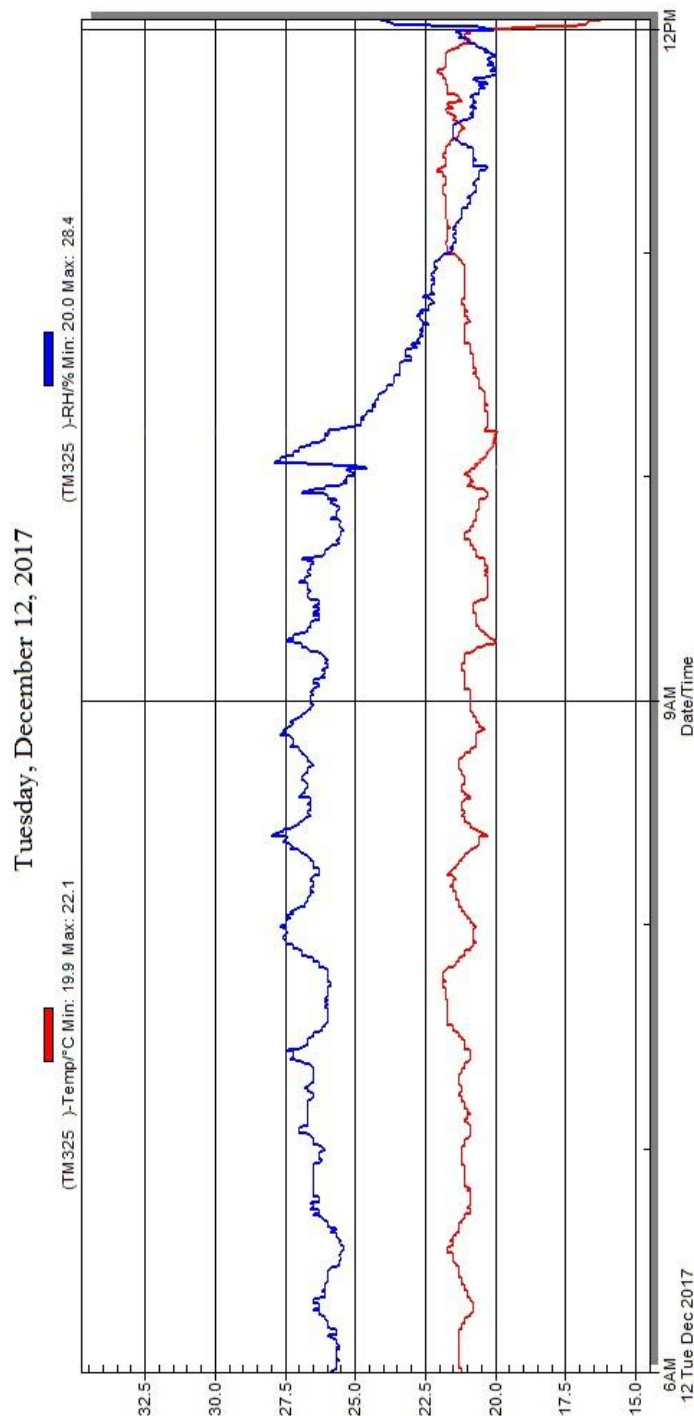
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 15
DUMMY/VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2018 Ford Mustang Two Door Coupe
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20180216
 Test Date: 12/12/2017



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 3/4 View of Test Vehicle



Figure A-2: As-Delivered Left Rear 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

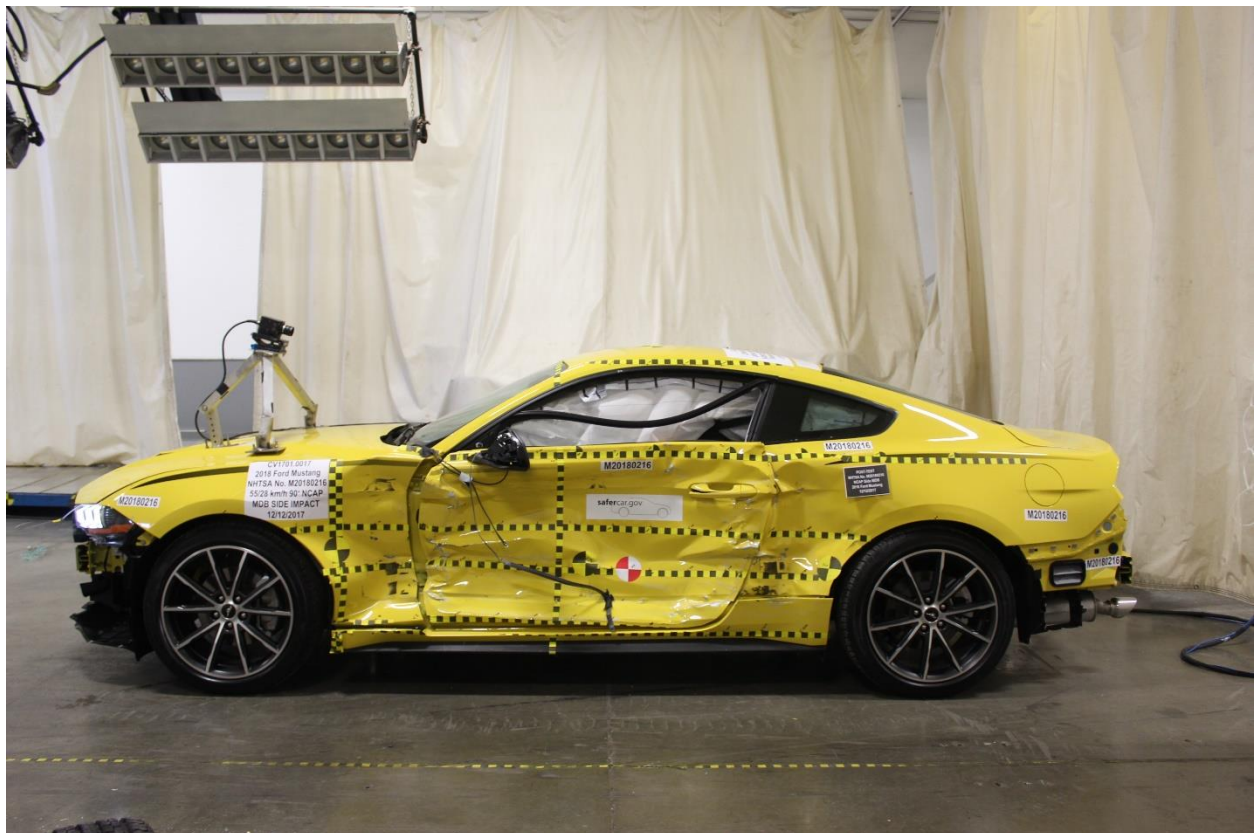


Figure A-8: Post-Test Left Side View of Test Vehicle



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

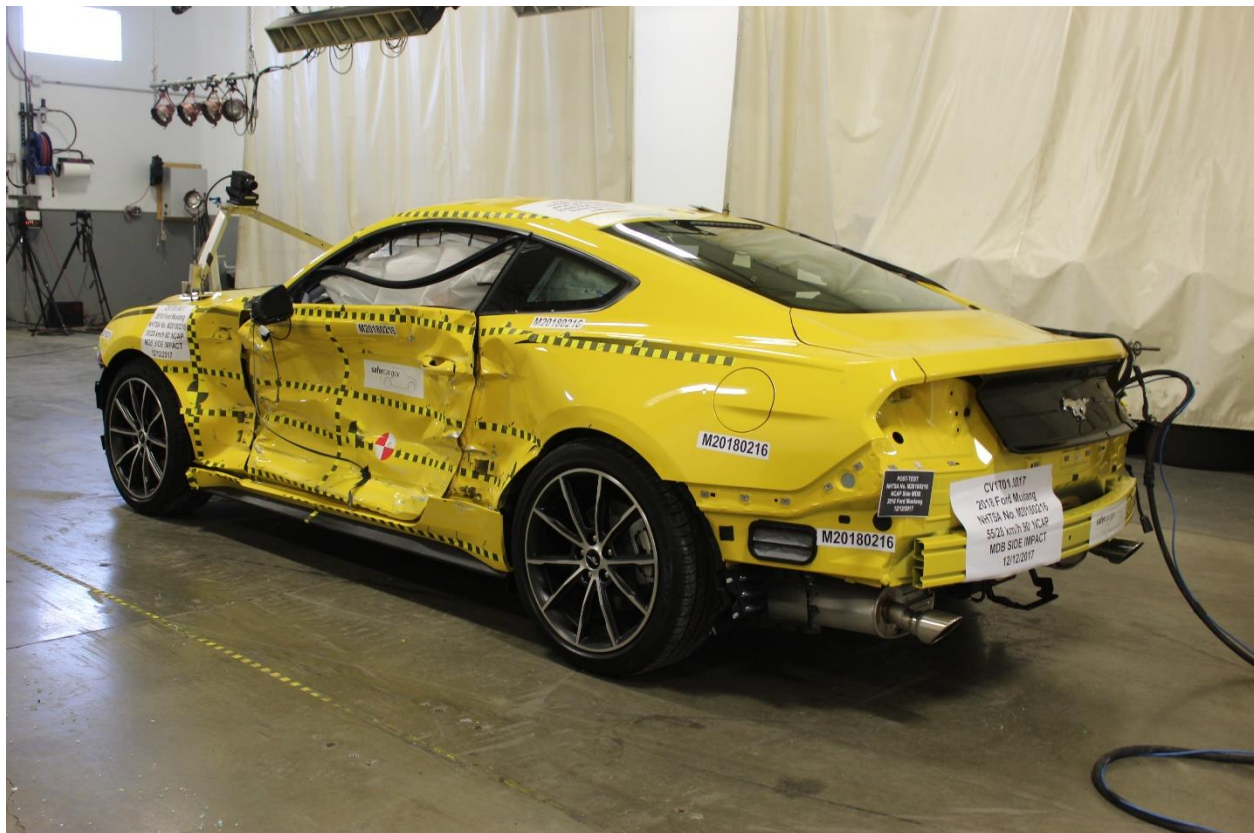


Figure A-10: Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



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



Figure A-12: Post-Test Rear Side 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 the Test Area



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



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



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



Figure A-21: Pre-Test Left Front Door Latch Close-Up



Figure A-22: Post-Test Left Front Door Latch Close-Up

Photo Not Applicable

Figure A-23: Pre-Test Left Rear Door Latch Close-Up

Photo Not Applicable

Figure A-24: Post-Test Left Rear Door Latch Close-Up



Figure A-25: Pre-Test Front Close-up View of Driver Dummy



Figure A-26: Post-Test Front Close-up View of Driver Dummy



Figure A-27: Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking



Figure A-28: Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



Figure A-29: Post-Test Left Side View of Driver Dummy Shoulder and Door Top View

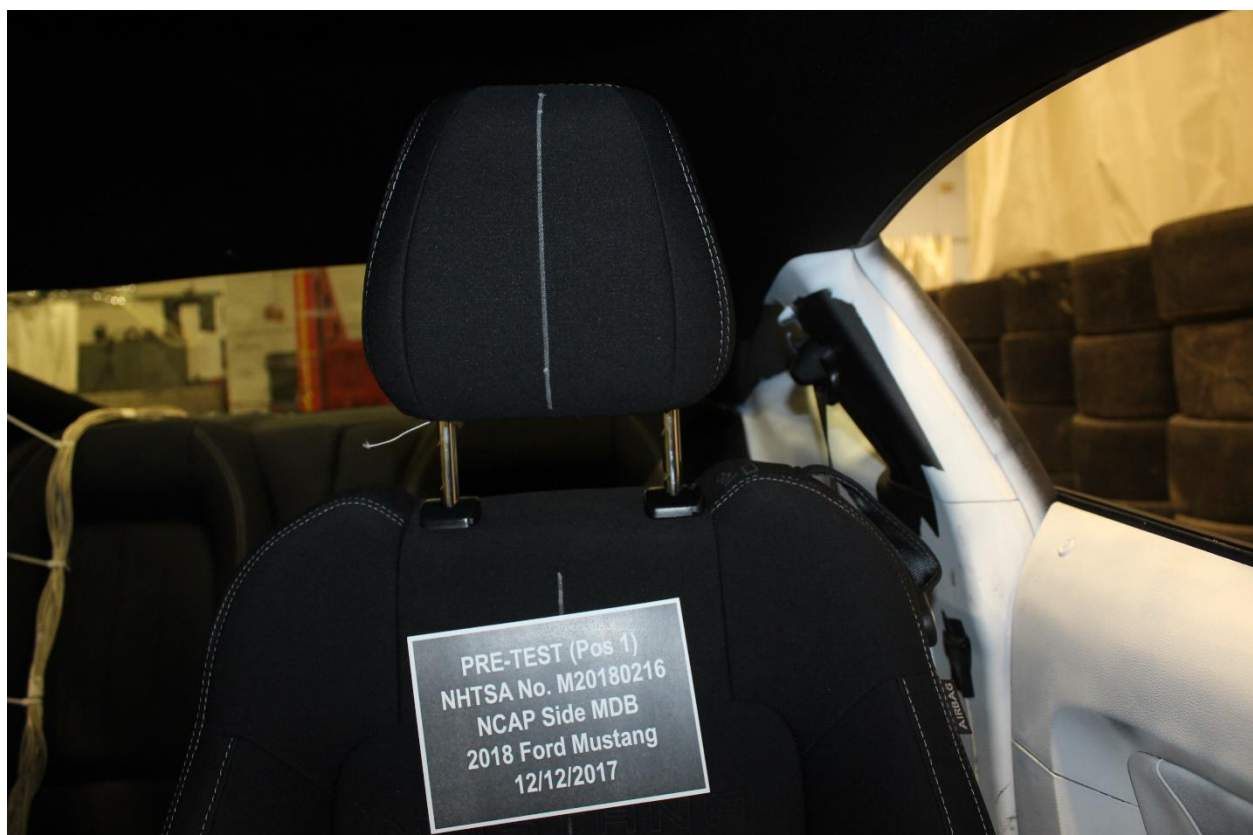


Figure A-30: Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



Figure A-31: Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



Figure A-32: Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



Figure A-34: Pre-Test Placement of Driver Dummy's Feet



Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy



Figure A-36: Pre-Test Left Side View of Steering Wheel



Figure A-37: View of Disengaged Parking Brake



Figure A-38: Pre-Test View of Parking Brake



Figure A-39: Pre-test Close-Up Left Side View of Driver Seat Track



Figure A-40: Pre-Test Close-Up Left Side View of Driver Seat Back



Figure A-41: Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Figure A-42: Pre-Test Driver Dummy and Door Clearance View



Figure A-43: Post-Test Driver Dummy and Door Clearance View

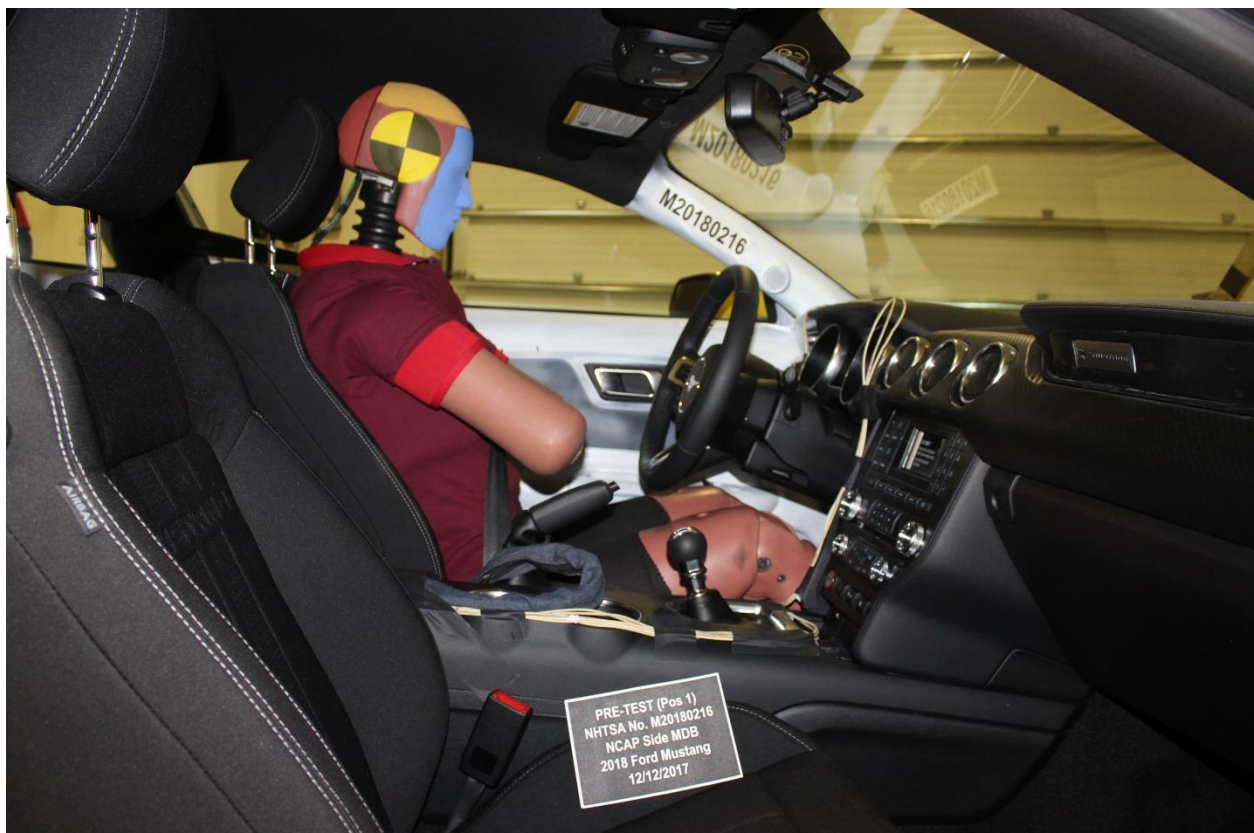


Figure A-44: Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Figure A-45: Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Figure A-46: Pre-Test Driver Inner Door Panel View



Figure A-47: Post-Test Driver Inner Door Panel View



Figure A-48: Post-Test Driver Dummy Close-Up Head Contact with Vehicle View

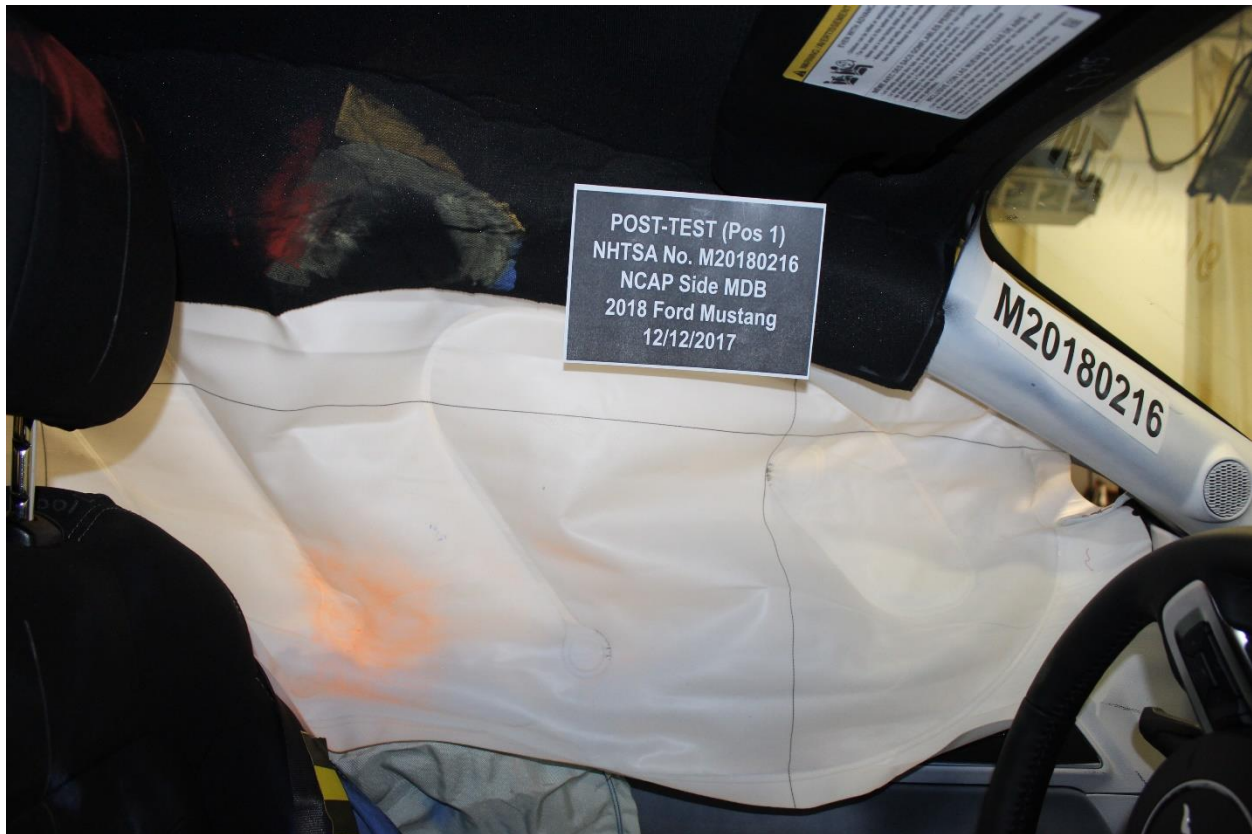


Figure A-49: Post-Test Driver Dummy Close-Up Head Contact with Side Airbag View

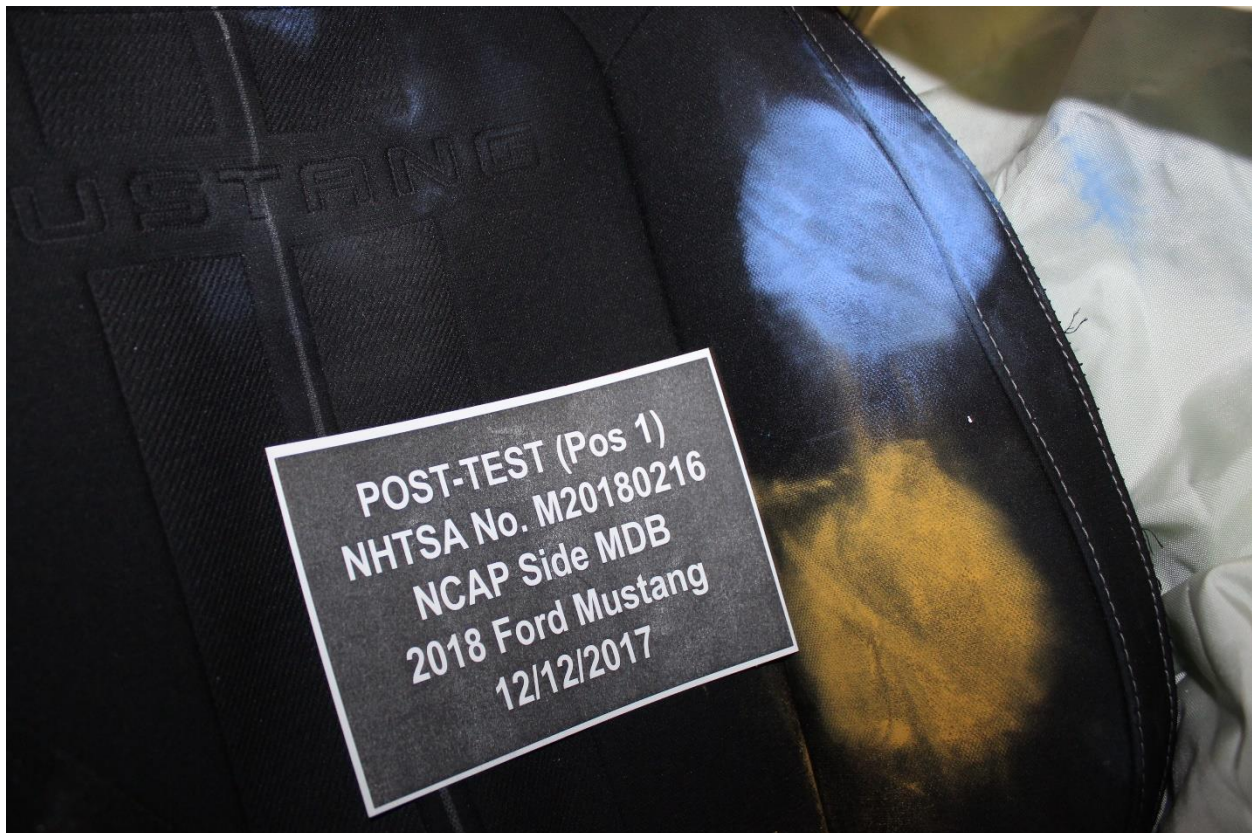


Figure A-50: Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View



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

Photo Not Applicable

Figure A-52: Post-Test Driver Dummy Close-Up Pelvis Contact View



Figure A-53: Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View

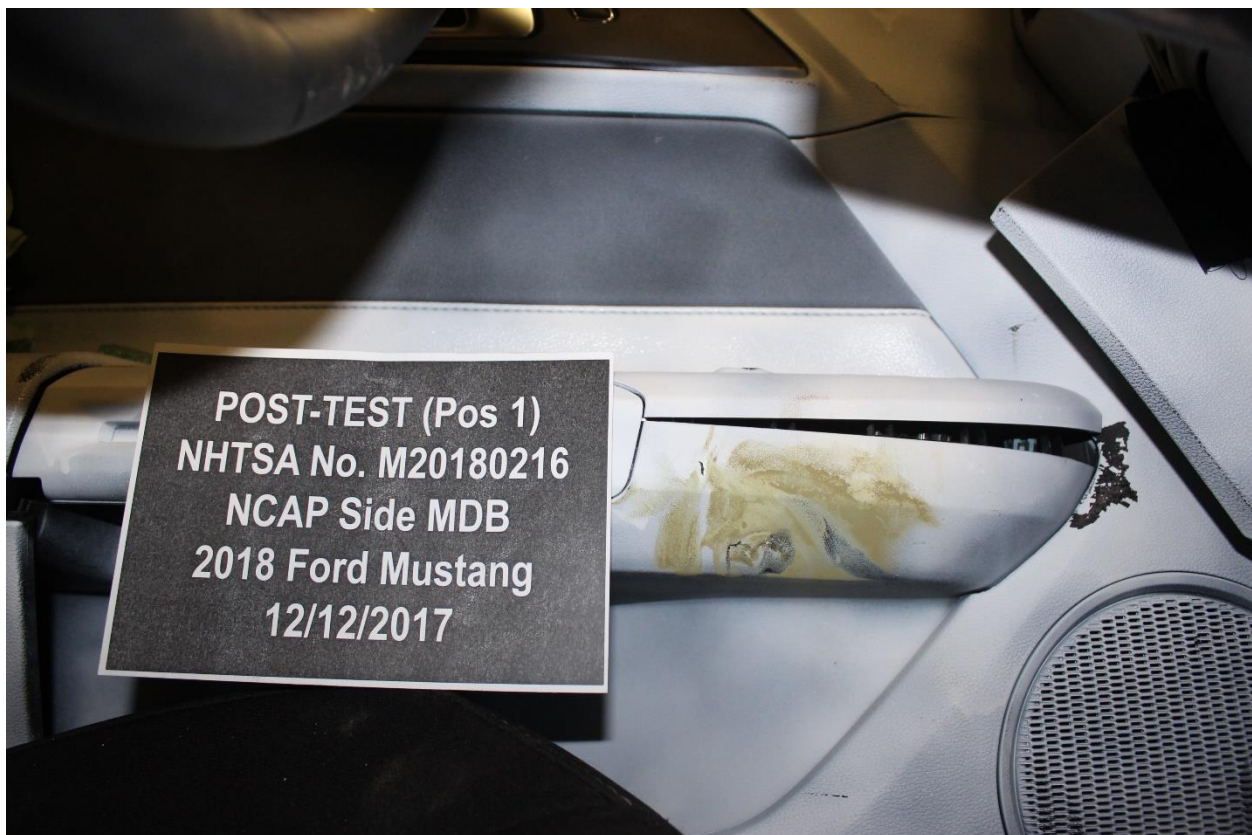


Figure A-54: Post-Test Driver Dummy Close-Up Knee Contact View

Photo Not Applicable

Figure A-55: Pre-Test Left Side View of Passenger Dummy Showing Belt and Chalking



Figure A-56: Pre-Test Left Side View of Passenger Dummy Shoulder and Door Top View



Figure A-57: Post-Test Left Side View of Passenger Dummy Shoulder and Door Top View



Figure A-58: Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning

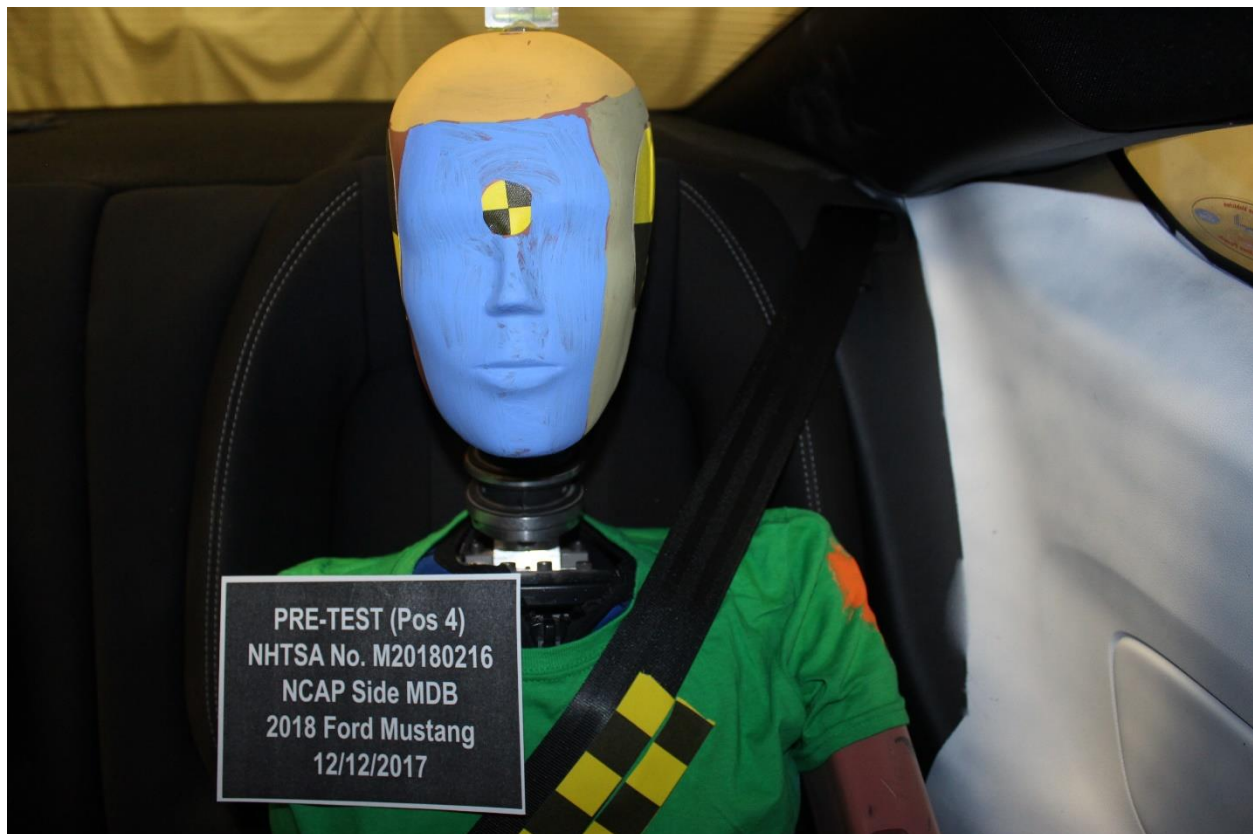


Figure A-59: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Figure A-60: Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning



Figure A-61: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

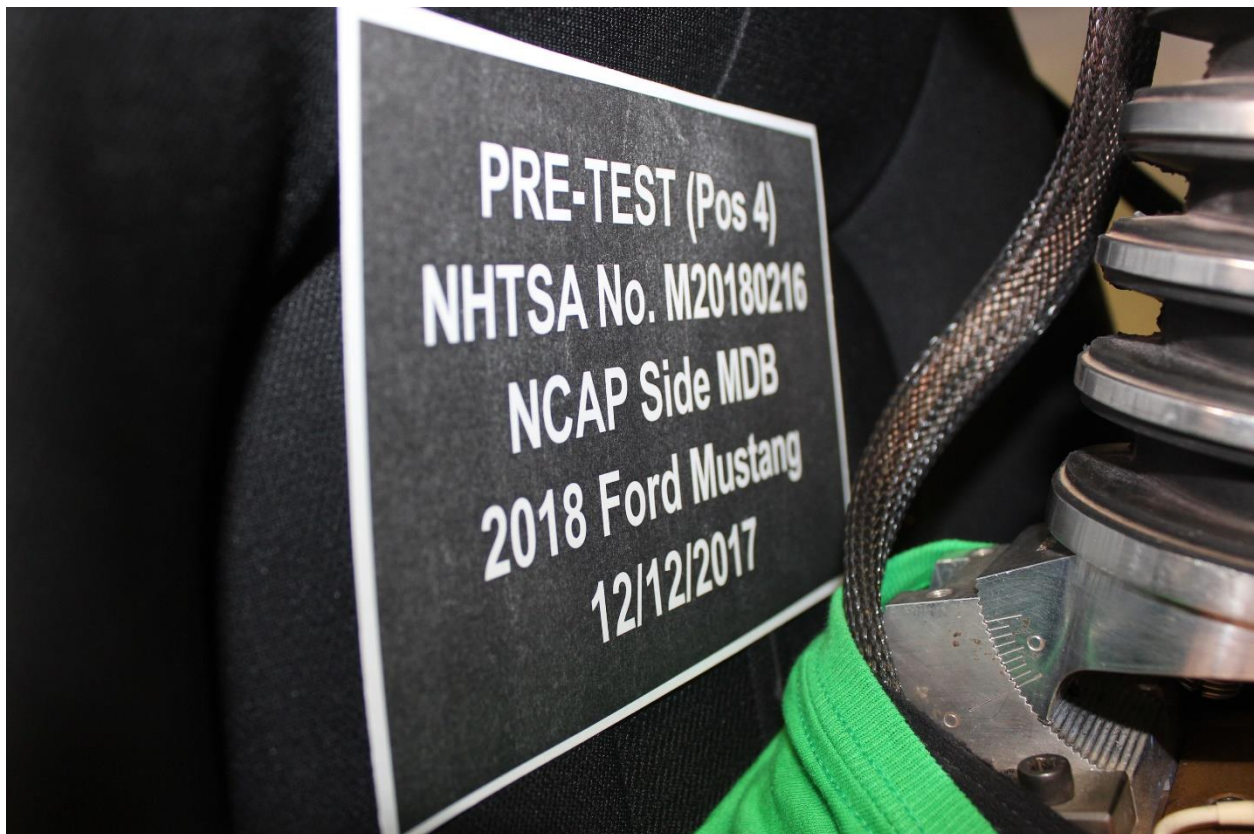


Figure A-62: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-63: Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



Figure A-64: Pre-Test Placement of Rear Passenger Dummy's Feet



Figure A-65: Pre-Test View of Belt Anchorage for Rear Passenger Dummy

Photo Not Applicable

Figure A-66: Pre-Test Close-Up Left Side View of Rear Passenger Seat Track

Photo Not Applicable

Figure A-67: Pre-Test Close-Up Left Side View of Rear Passenger Seat Back

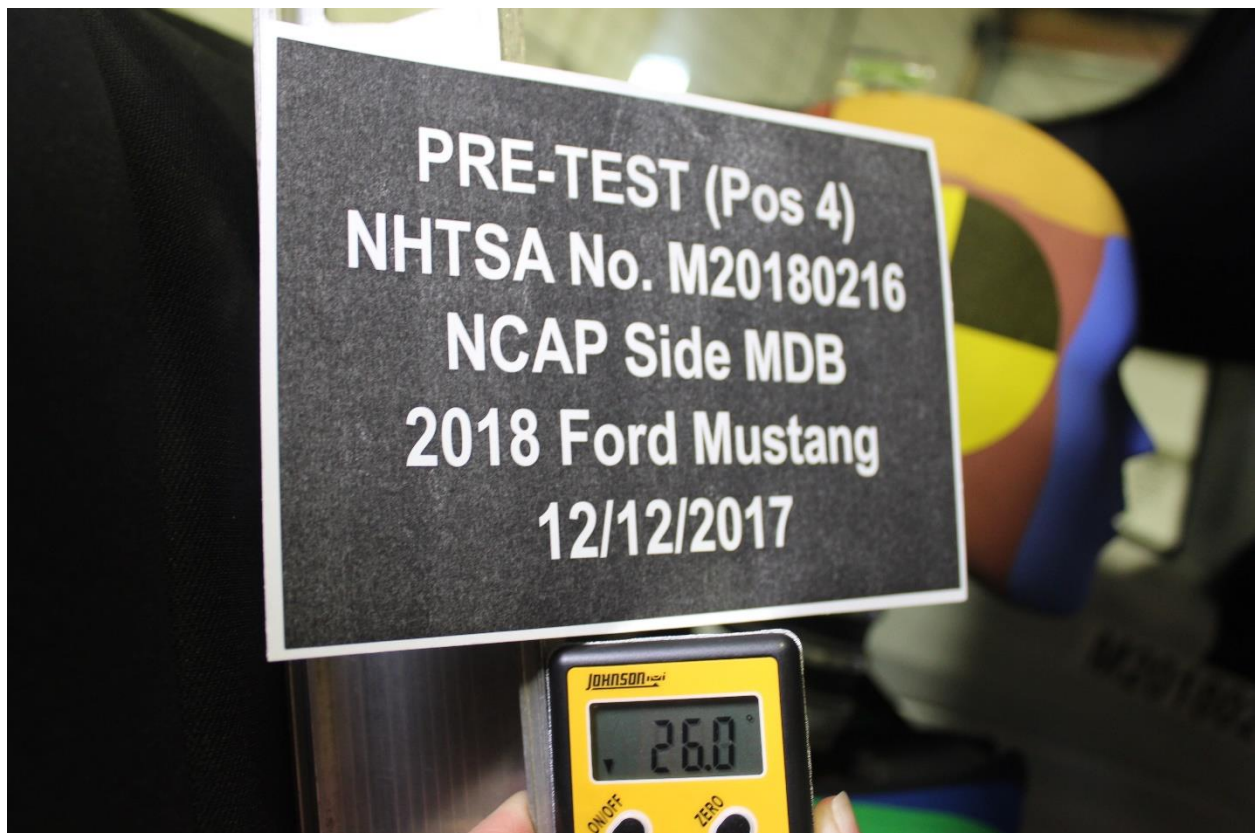


Figure A-68: Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



Figure A-69: Pre-Test Passenger Dummy and Door Clearance View



Figure A-70: Post-Test Passenger Dummy and Door Clearance View



Figure A-71: Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-72: Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-73: Pre-Test Passenger Inner Door Panel View



Figure A-74: Post-Test Passenger Inner Door Panel View



Figure A-75: Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



Figure A-76: Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View

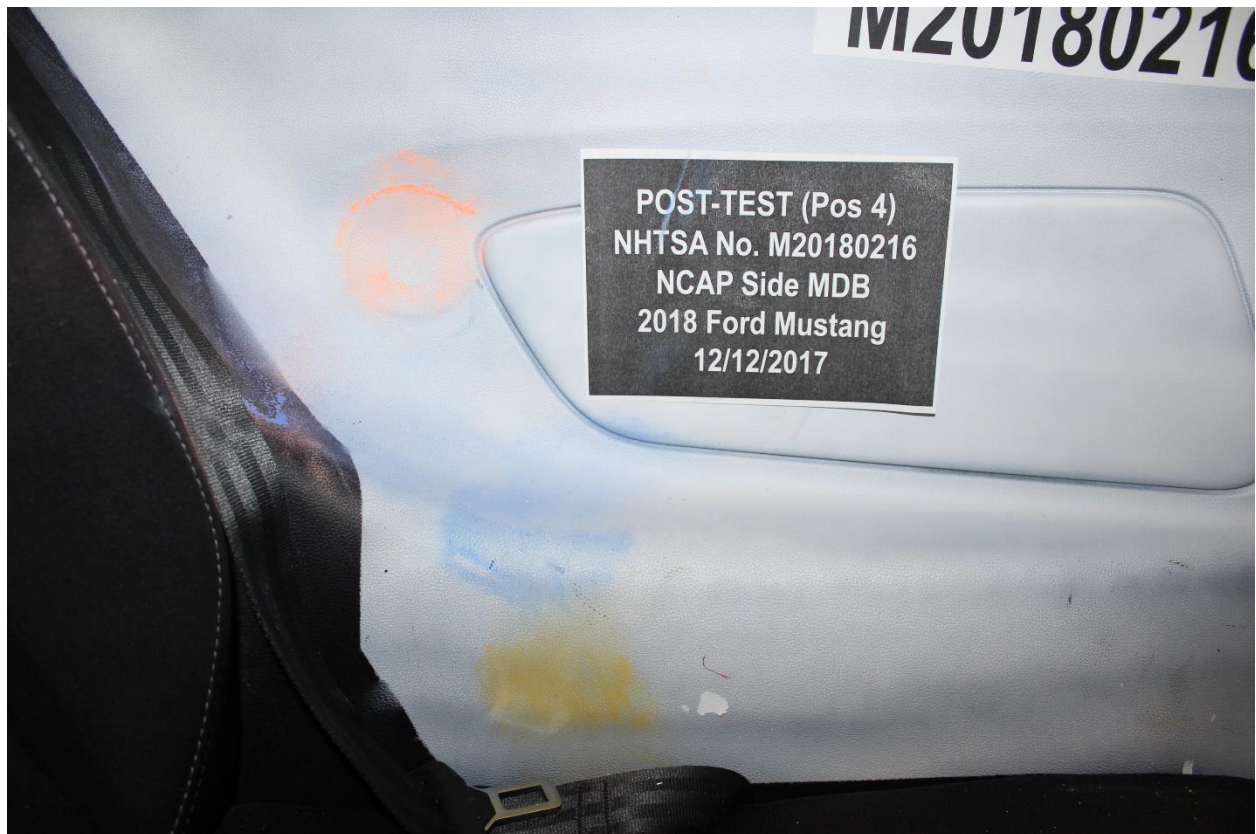


Figure A-77: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View

Photo Not Applicable

Figure A-78: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View



Figure A-79: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View

Photo Not Applicable

Figure A-80: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-81: Post-Test Rear Passenger Dummy Close-Up Knee Contact View



Figure A-82: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-83: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-84: Pre-Test Front View of MDB Impactor Face



Figure A-85: Post-Test Front View of MDB Impactor Face



Figure A-86: Pre-Test Top View of MDB Impactor Face



Figure A-87: Post-Test Top View of MDB Impactor Face



Figure A-88: Pre-Test Left Side View of MDB Impactor Face



Figure A-89: Post-Test Left Side View of MDB Impactor Face



Figure A-90: Pre-Test Right Side View of MDB Impactor Face



Figure A-91: Post-Test Right Side View of MDB Impactor Face



Figure A-92: Close-Up View of Vehicle's Certification Label



Figure A-93: Close-Up View of Vehicle's Tire Information Placard or Label



Figure A-94: Pre-Test Ballast View



Figure A-95: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-96: FMVSS No. 301 Static Rollover 0 Degrees

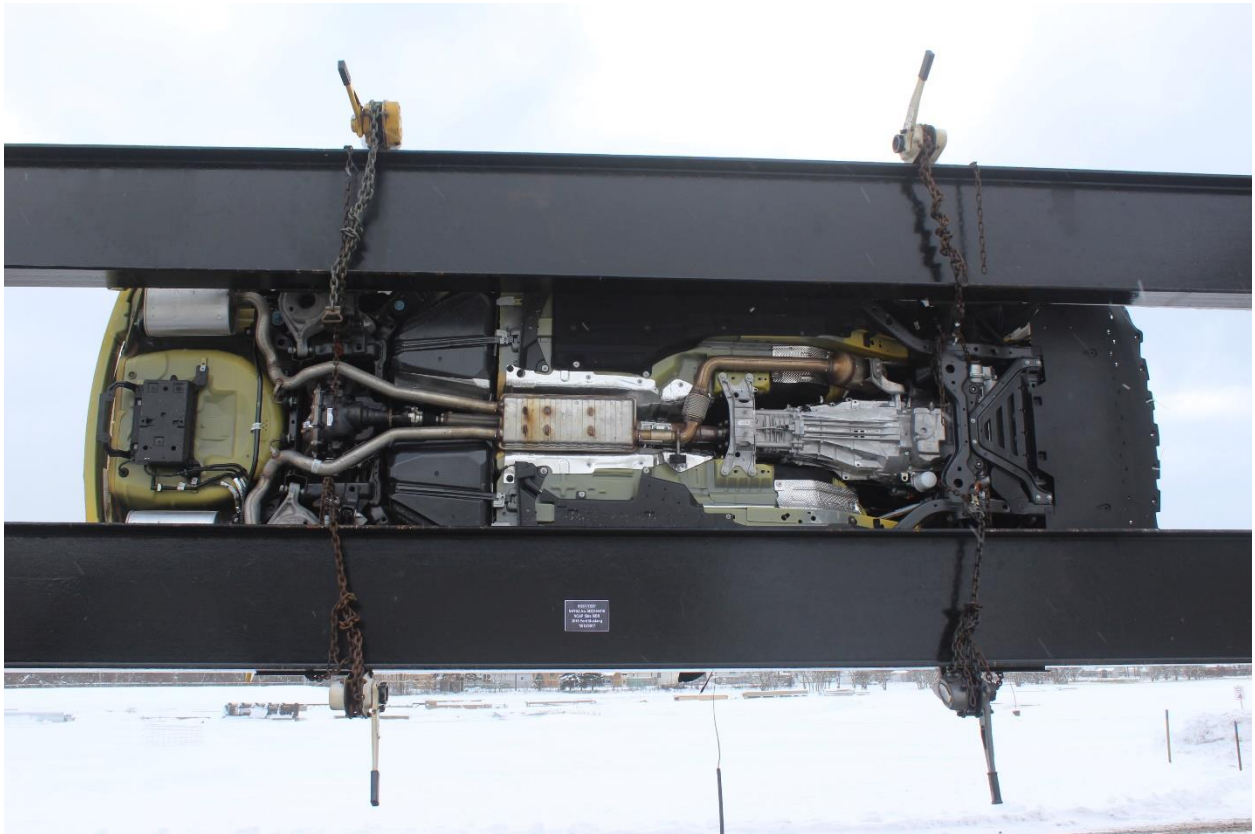


Figure A-97: FMVSS No. 301 Static Rollover 90 Degrees

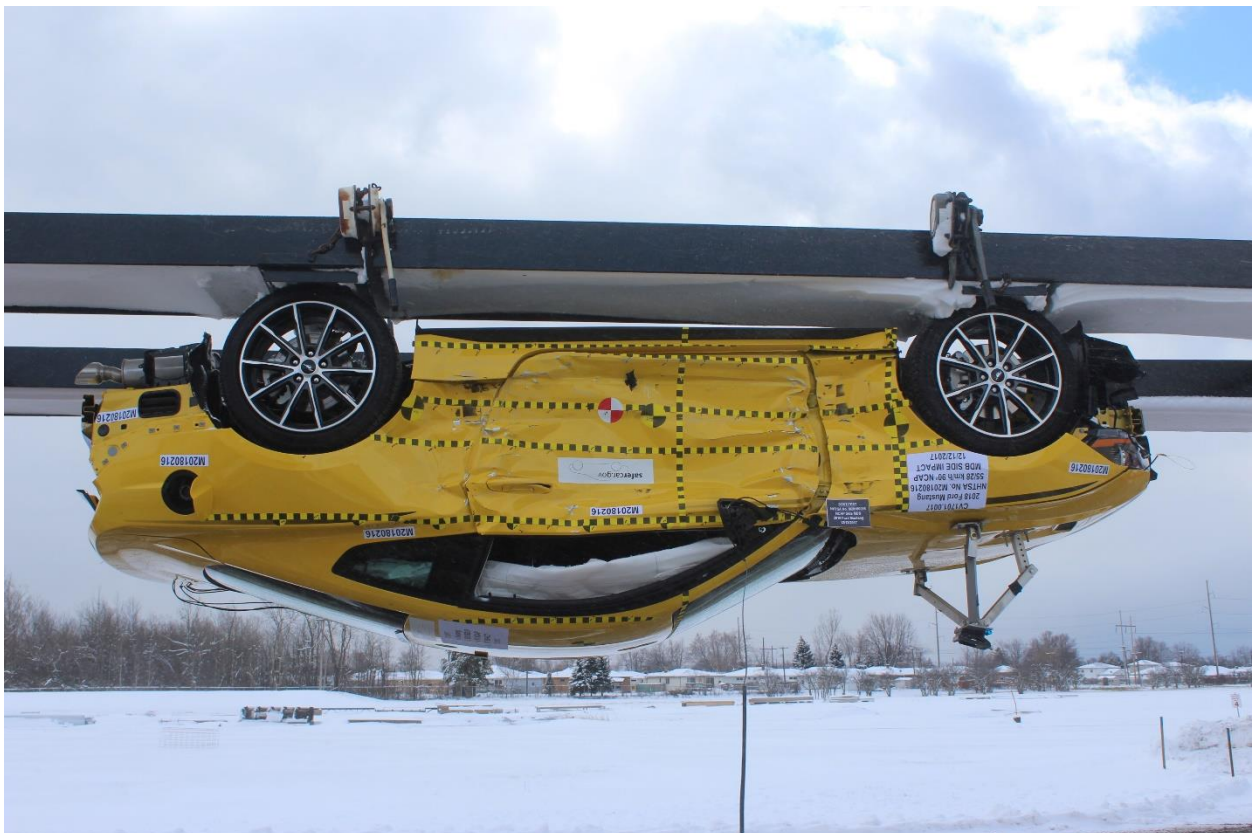


Figure A-98: FMVSS No. 301 Static Rollover 180 Degrees



Figure A-99: FMVSS No. 301 Static Rollover 270 Degrees



Figure A-100: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-101: Impact Event

Ford		VEHICLE DESCRIPTION		J5 100910		EPA DOT Fuel Economy and Environment		Gasoline Vehicle	
Go Further ford.com		MUSTANG 2018 ECOBOOST COUPE 4-PASSENGER SPORTS CAR 2.3L ECOBOOST 6-SPEED MANUAL TRANSMISSION		EXTERIOR TRIPLE YELLOW TRI-COAT INTERIOR EBONY CLOTH BUCKET SEATS		Fuel Economy 25 MPG 21 city 31 highway 4.0 gallons per 100 miles Subcompact Cars range from 16 to 24 MPG. The best vehicle rates 136 MPG.		You spend \$500 more in fuel costs over 5 years compared to the average new vehicle.	
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE						Annual fuel cost \$1,450 Fuel Economy & Greenhouse Gas Rating 5 (Best) This vehicle emits 267 grams CO ₂ per mile. The best emits 6 grams per mile (tailpipe only). Producing and distributing fuel also cause emissions. See more at fueleconomy.gov.			
EXTERIOR • DUAL EXHAUST SYSTEM • EASY FUEL CAPLESS FILLER • HEADLAMPS - AUTO LAMP (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 • 1 TOUCH UP/DOWN DRIVPASS WIN • AUTO-DIM REARVIEW MIRROR • CENTER CONSOLE W/ ARMREST • CLOTH SEATING SURFACES • CRUISE CONTROL • DUAL LLUM VANITY MIRRORS • FRONT FLOOR MATS • LEATHER WRAPPED STR WHEEL W/ CRUISE AND AUDIO CONTROL • MANUAL A/C, SINGLE ZONE • POWER LOCKS AND WINDOWS • SMART CHARGING USB PORT (2) • SPLIT FOLD REAR SEAT • TILT/TELESCOPE 8TH COLUMN • WINDOWS - GLOBAL OPEN		FUNCTIONAL • 4.2" LCD CTR STACK SCREEN • AM/FM SINGLE CD/MP3 PLAYER • ELECTRONIC PWR ASST STEER • INDEPENDENT REAR SUSPEN • INTELLIGENT ACCESS W/ PUSH BUTTON START • LIMITED SLIP REAR AXLE • MYKEY® • REAR VIEW CAMERA • SYNC® WITH APPLE LINK® • TRACK APPS™		SAFETY/SECURITY • ADVANCETRAC ESC • AIRBAG - DRIVER/PASS KNEE • AIRBAGS - DUAL STAGE FRONT • AIRBAGS - FRONT SEAT • MOUNTED SIDE IMPACT • AIRBAGS - SIDE AIR CURTAIN • INDY TIRE PRESS MONIT SYS • LATCH CHILD SAFETY SYSTEM • PERIMETER ALARM • SECURILOCK PASS ANTI THEFT • SOS POST CRASH ALERT SYS		WARRANTY • 3YR/50,000 BUMPER TO BUMPER • 5YR/60,000 POWERTRAIN • 5YR/60,000 ROADSIDE ASSIST	
INCLUDED ON THIS VEHICLE EQUIPMENT GROUP 100A 2018 MODEL YEAR TRIPLE YELLOW TRI-COAT P235/40R19 W-RATED TIRE WHEEL & STRIPE PACKAGE SIDE STRIPE 19 MACH ALUM DARK TARN WHEEL EBONY TIRE STRIPE FRONT LICENSE PLATE BRACKET 90 STATE EMISSIONS		PRICE INFORMATION BASE PRICE \$25,585.00 TOTAL OPTIONS/OTHER 1,390.00 TOTAL VEHICLE & OPTIONS/OTHER 26,975.00 DESTINATION & DELIVERY 900.00 TOTAL MSRP \$27,875.00		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 Side Crash Front seat Not Rated, Rear seat Not Rated Rollover ★★★★★ 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: Fucillo Ford, Inc. P.O. BOX 87 Adams NY 13605		13V 670 RAMP ONE CA3M RAMP TWO FINAL ASSEMBLY PLANT FLAT ROCK		DEALER NO. 13V 570 ITEM # 13-H001 O/T 2		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.			
SHIP TO (IF OTHER THAN SOLD TO) SHIP THROUGH		METHOD OF TRANS. CONVOY		HK051 N RA2X 815 001186 10 05 17		Barcode: 1FA6P8TH0J5100910 QR Code: 1FA6P8TH0J5100910 to 48009 Scan this code to experience this vehicle or text 1FA6P8TH0J5100910 to 48009 or Visit ford.com/windowsticker Standard messaging & data plan rates may apply.			

Figure A-102: Monroney Label

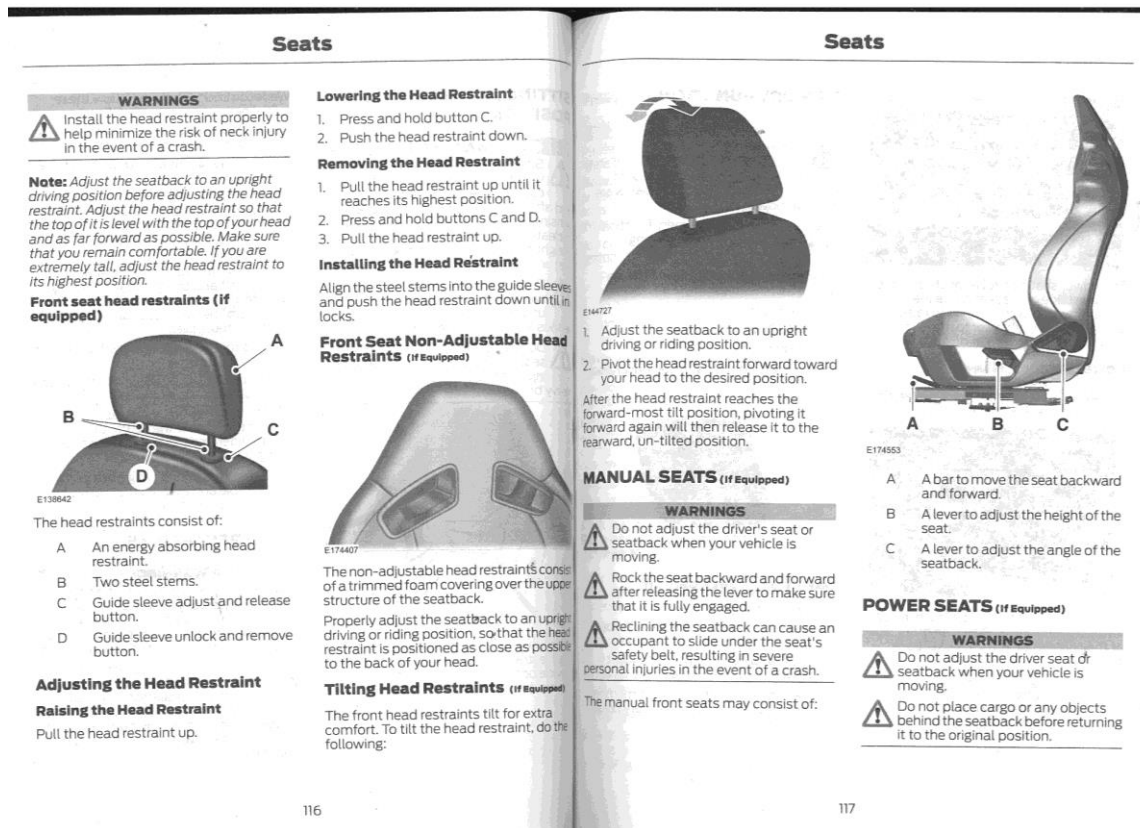


Figure A-103: Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

Photo Not Applicable

Figure A-104: Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual-Rear Restraints Not Adjustable

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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1	Driver Head Acceleration (X) Primary vs. Time	B-5
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3	Driver Head Acceleration (Z) Primary vs. Time	B-5
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5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-6
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-6
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-6
8	Driver Thorax Rib Deflection Maximum vs. Time	B-6
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10	Driver Middle Abdominal Force (Y) vs. Time	B-7
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14	Passenger Head Acceleration (X) vs. Time Primary	B-8
15	Passenger Head Acceleration (Y) vs. Time Primary	B-8
16	Passenger Head Acceleration (Z) vs. Time Primary	B-8
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18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-9
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-9
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-9
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-10
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-10
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-10
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-10

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 & Passenger Dummy Instrumentation Data

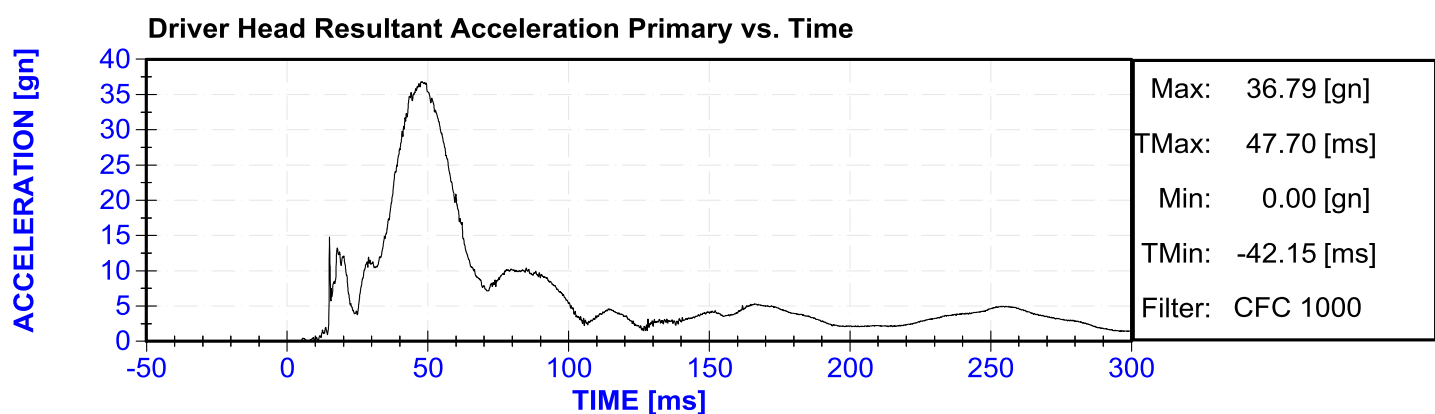
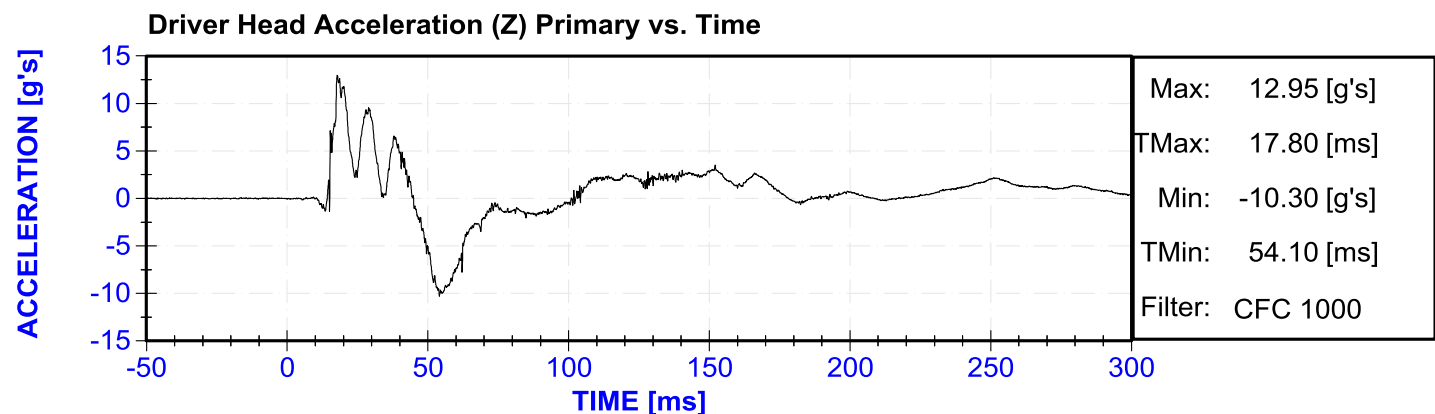
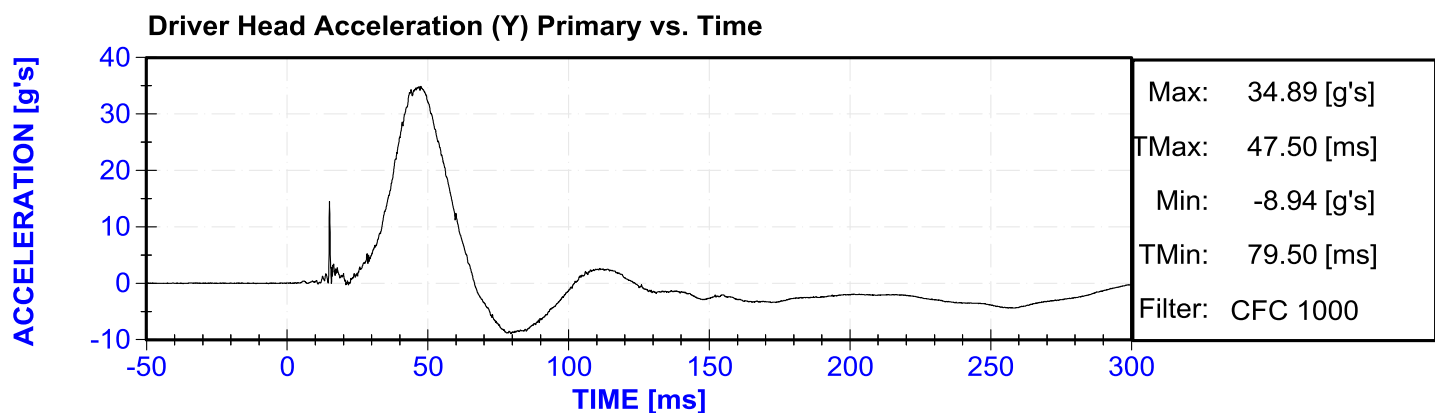
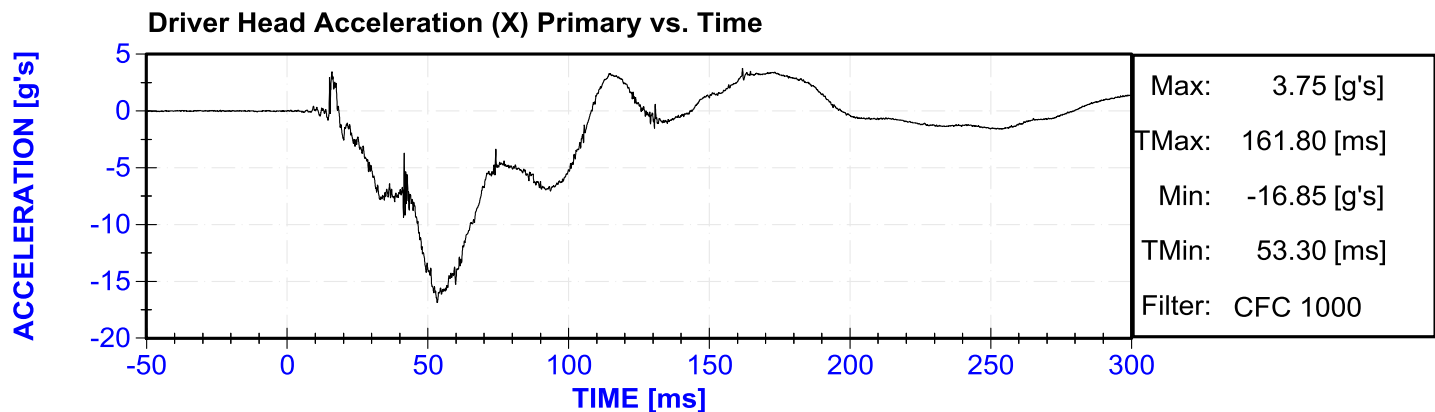
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Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
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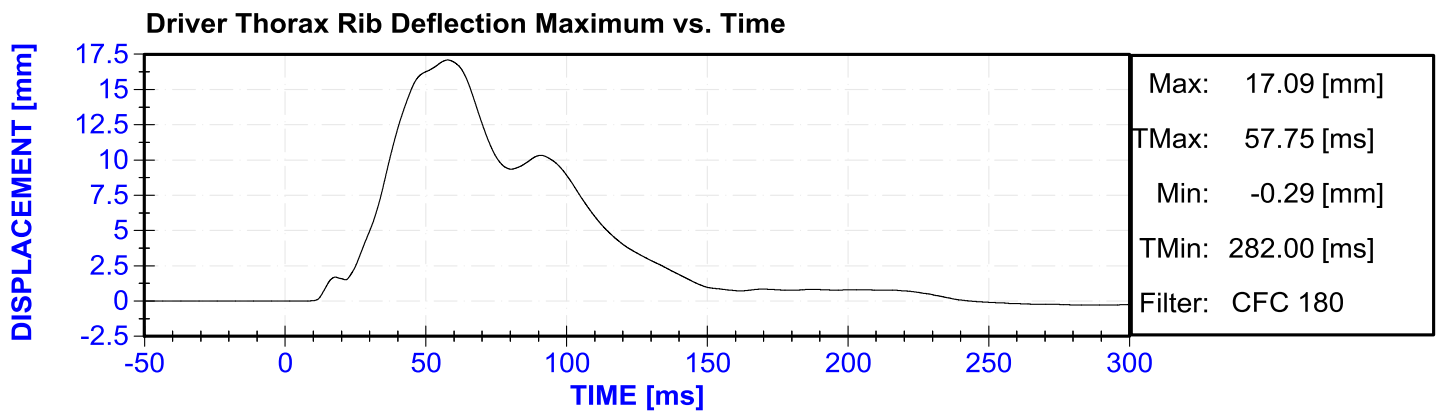
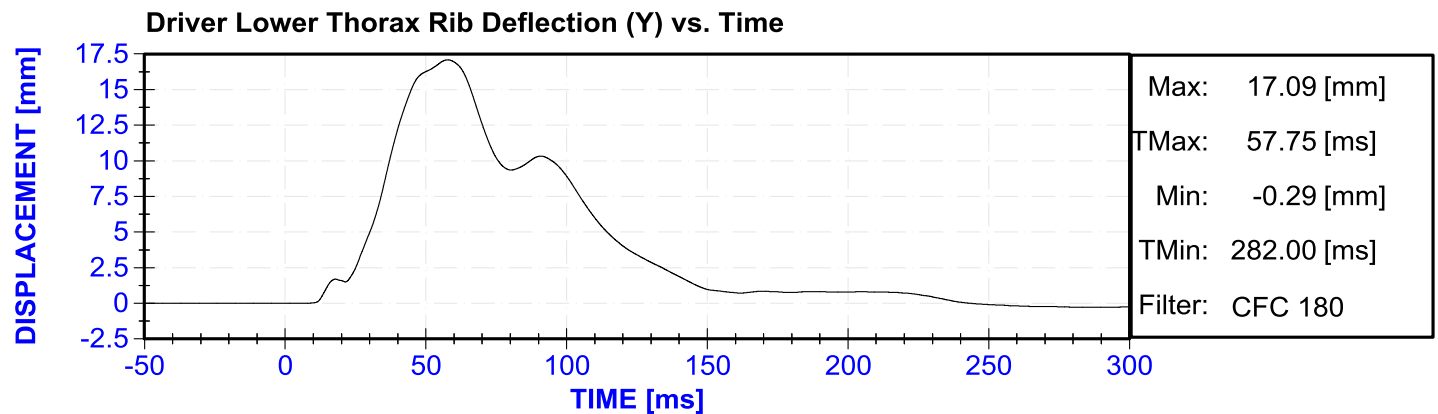
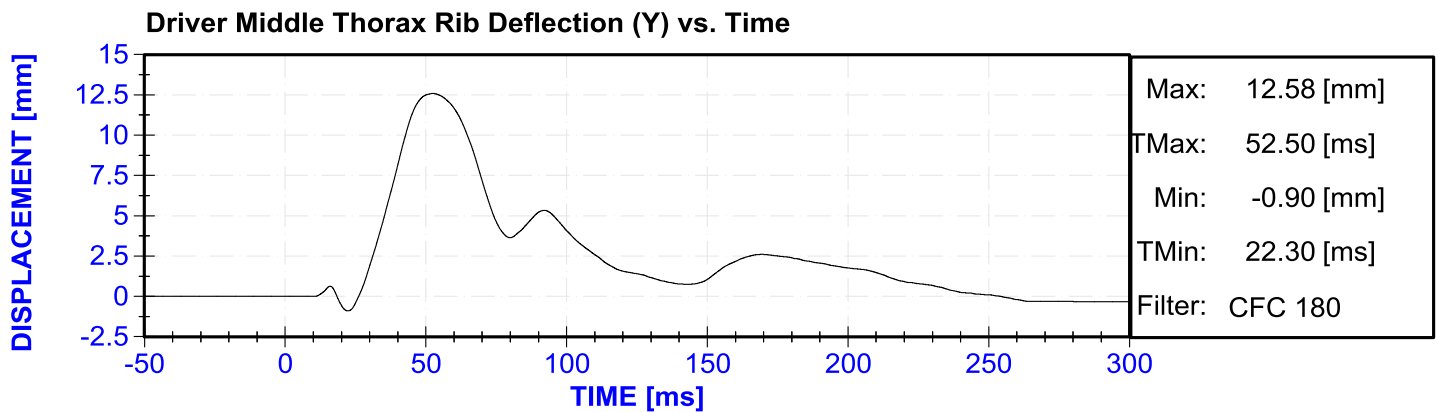
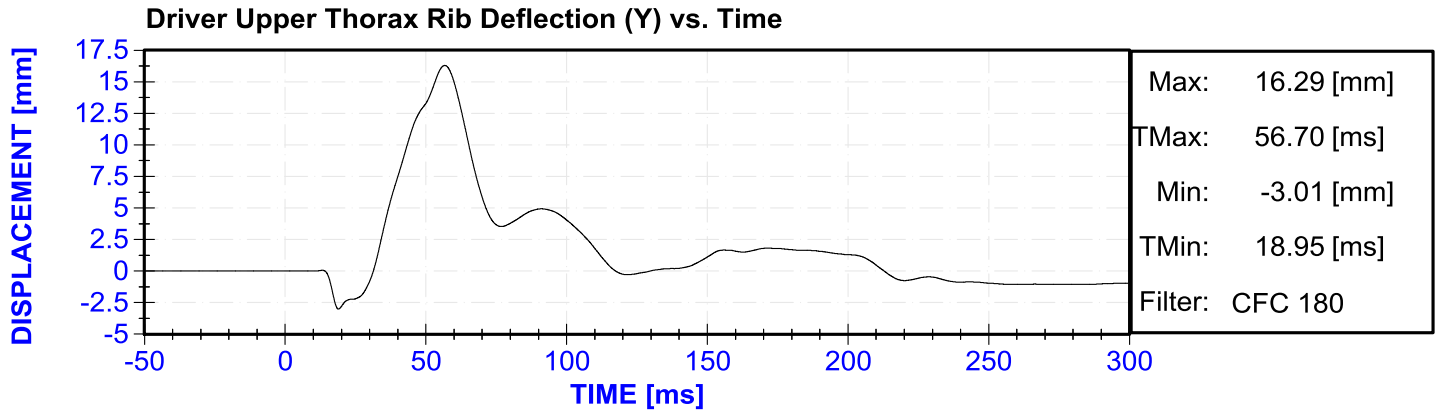
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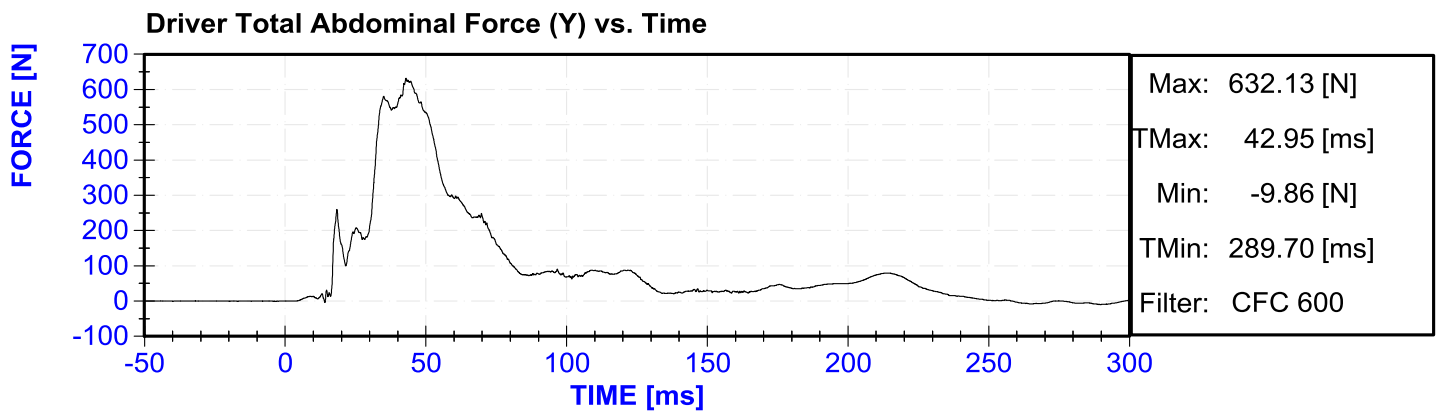
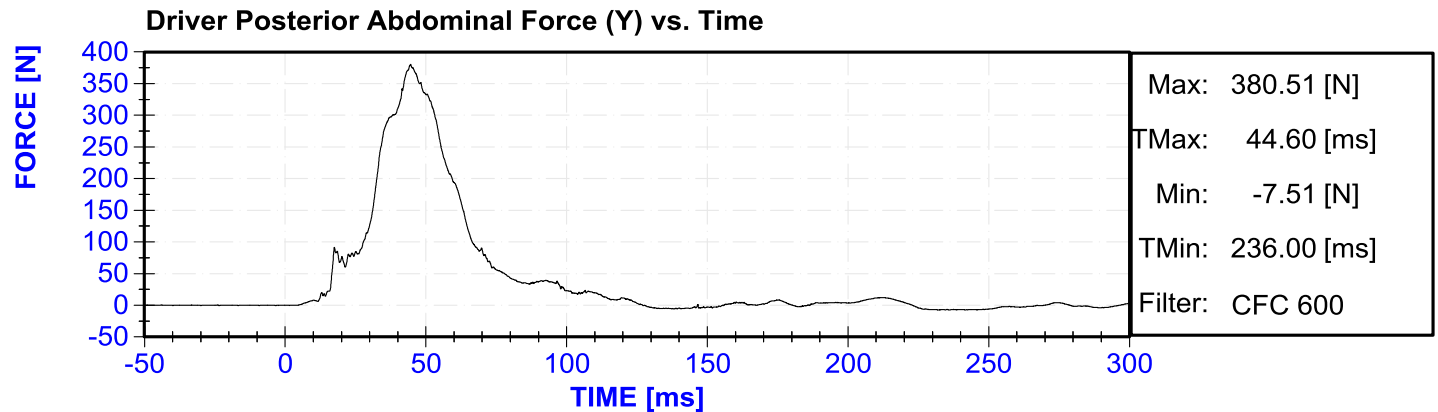
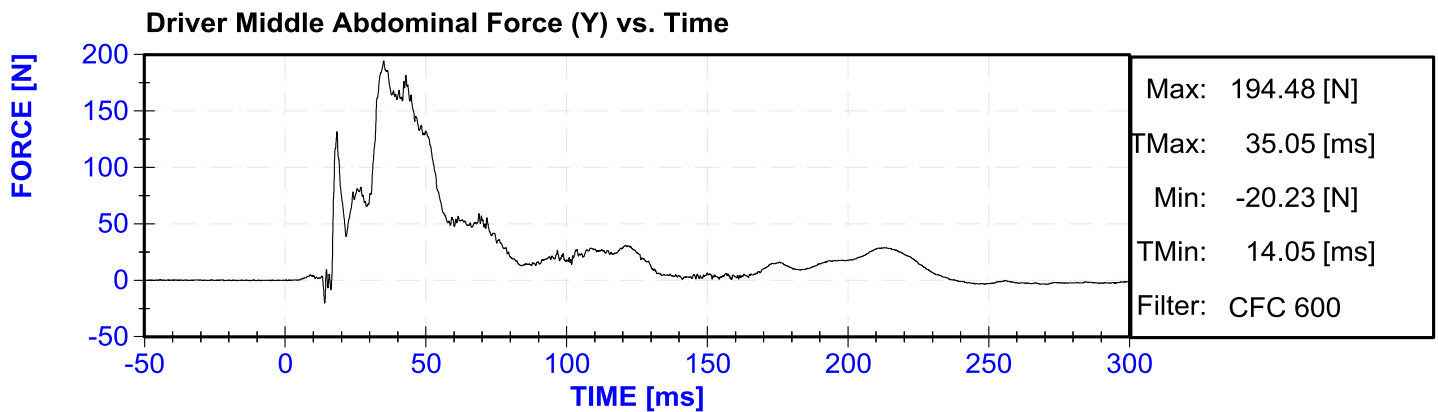
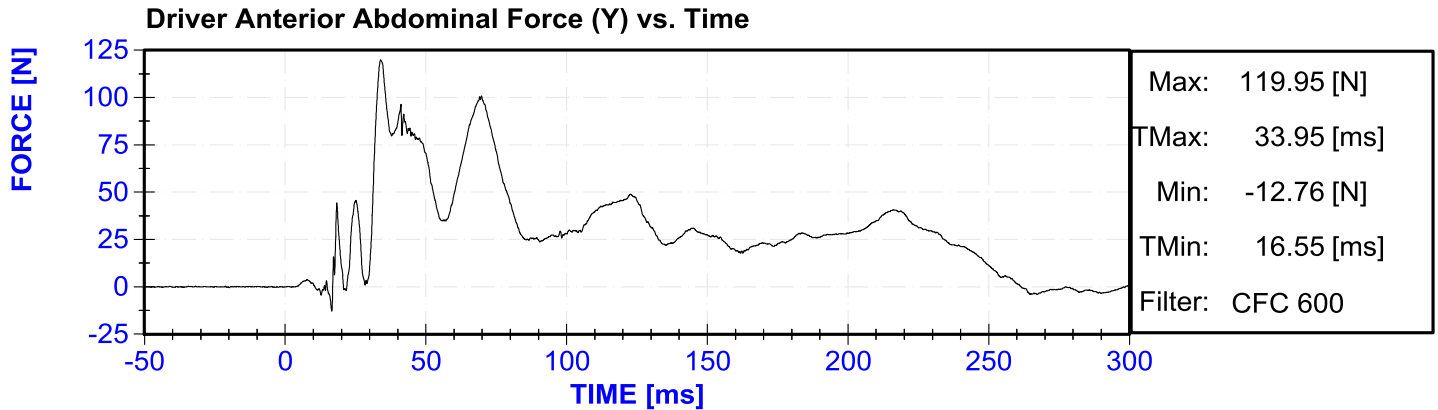
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Vehicle Center of Gravity Acceleration (Z)
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Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Lower A-Post Acceleration (Y)
Middle A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Middle B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)
Rear Seat Structure Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Engine Block (X)
Engine Block (Y)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)

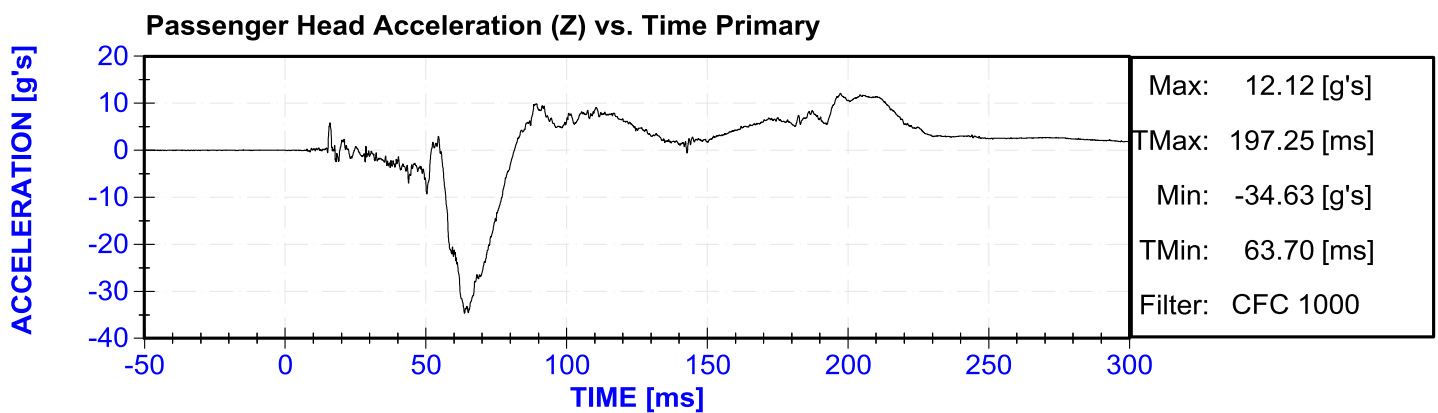
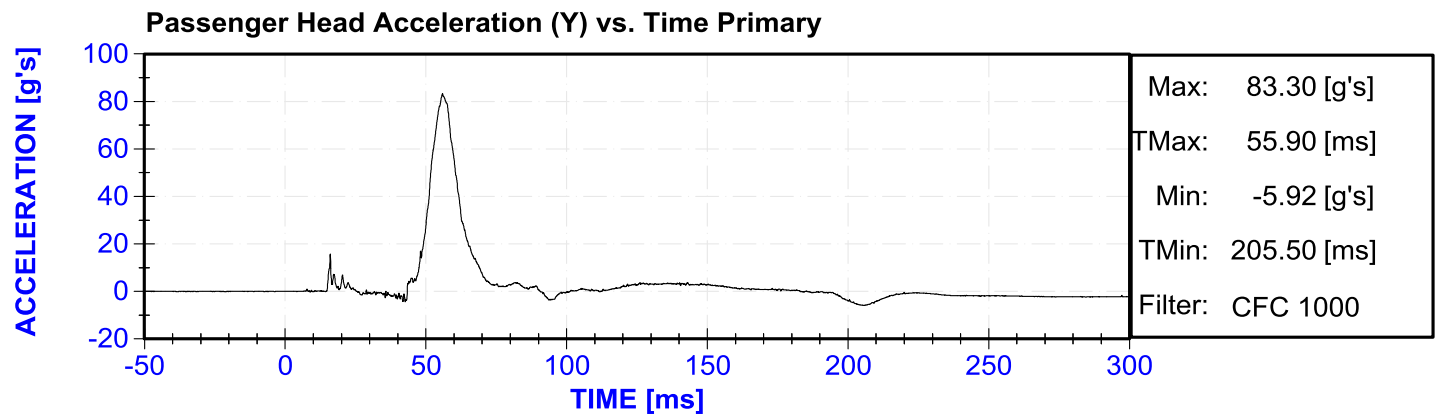
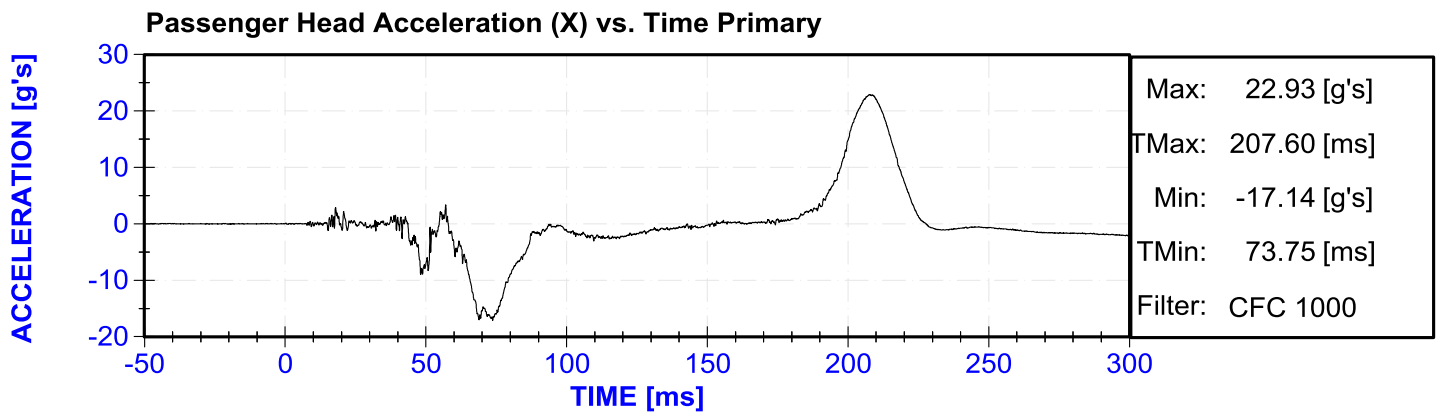
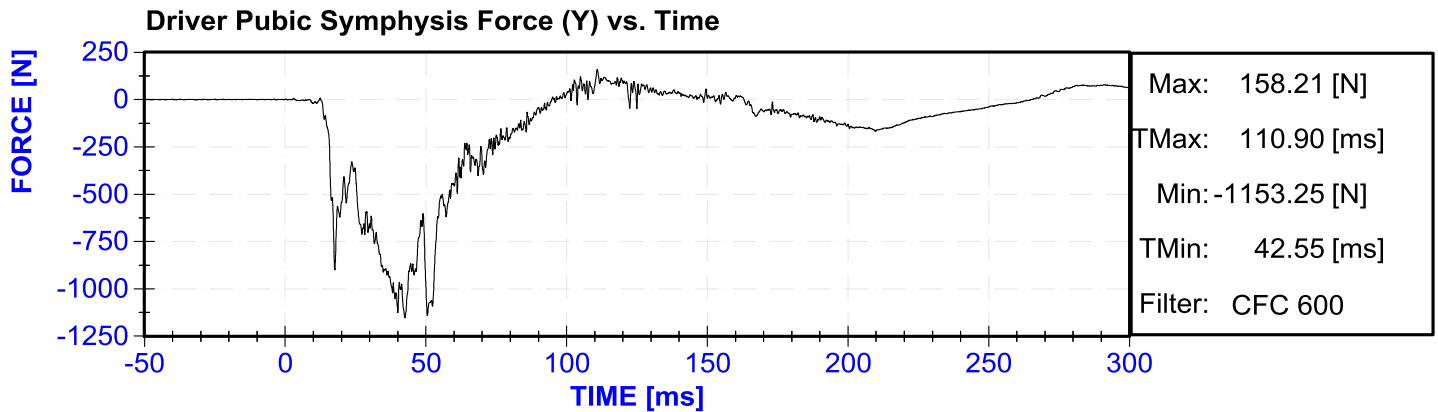
MDB Instrumentation Data

MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

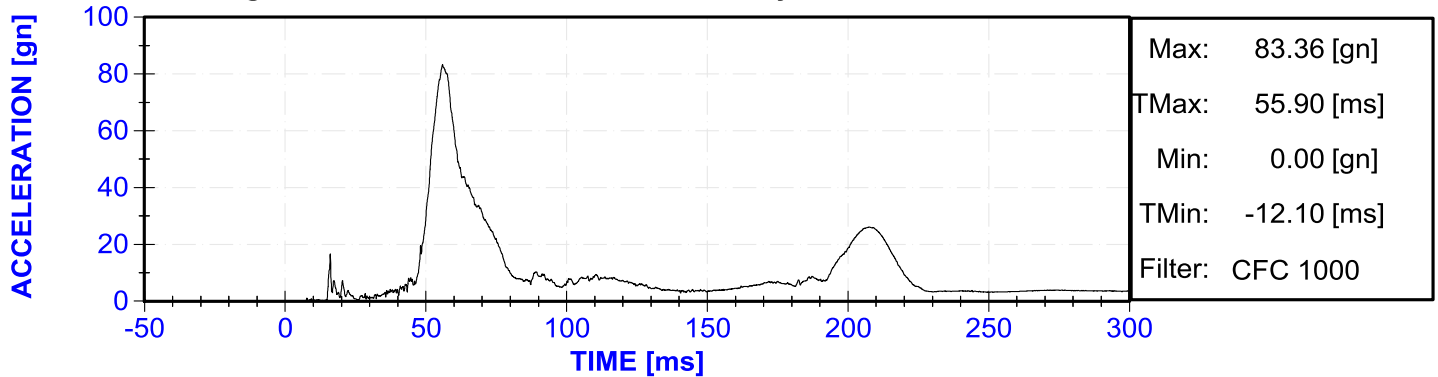




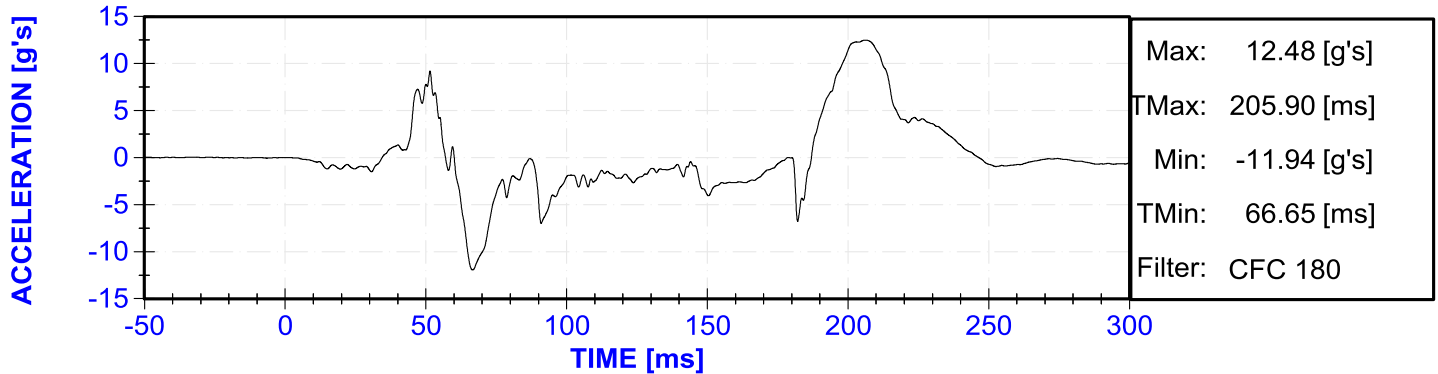




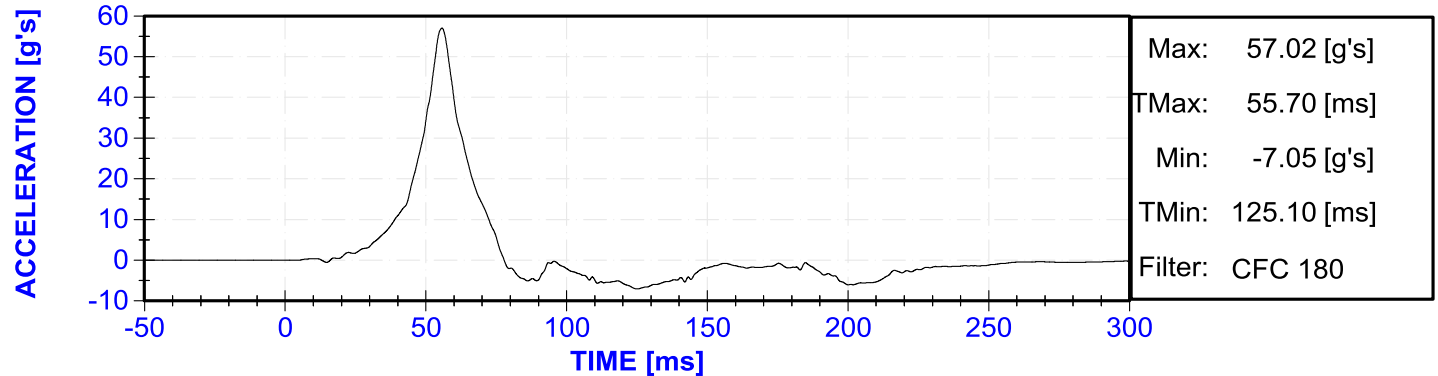
Passenger Head Resultant Acceleration Primary vs. Time



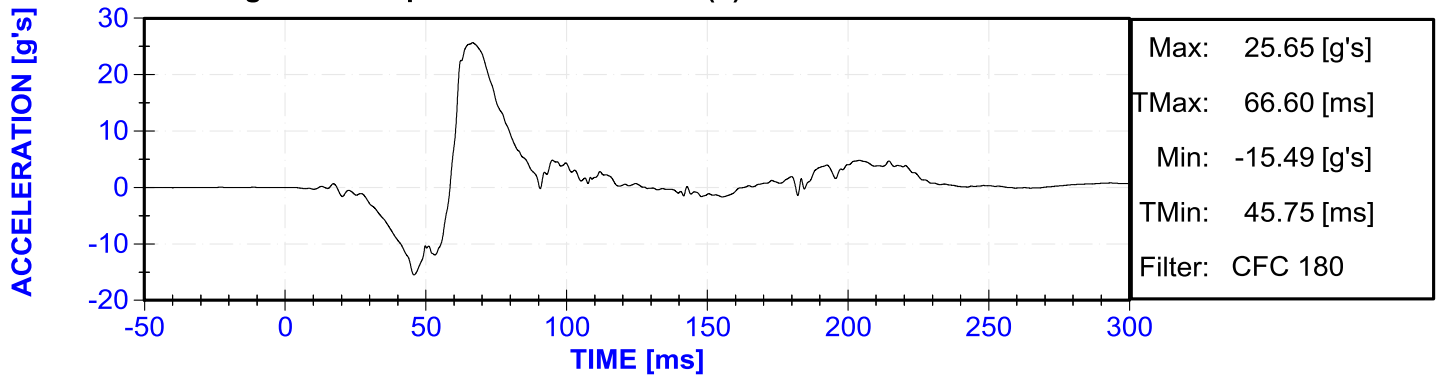
Passenger Lower Spine T12 Acceleration (X) vs. Time

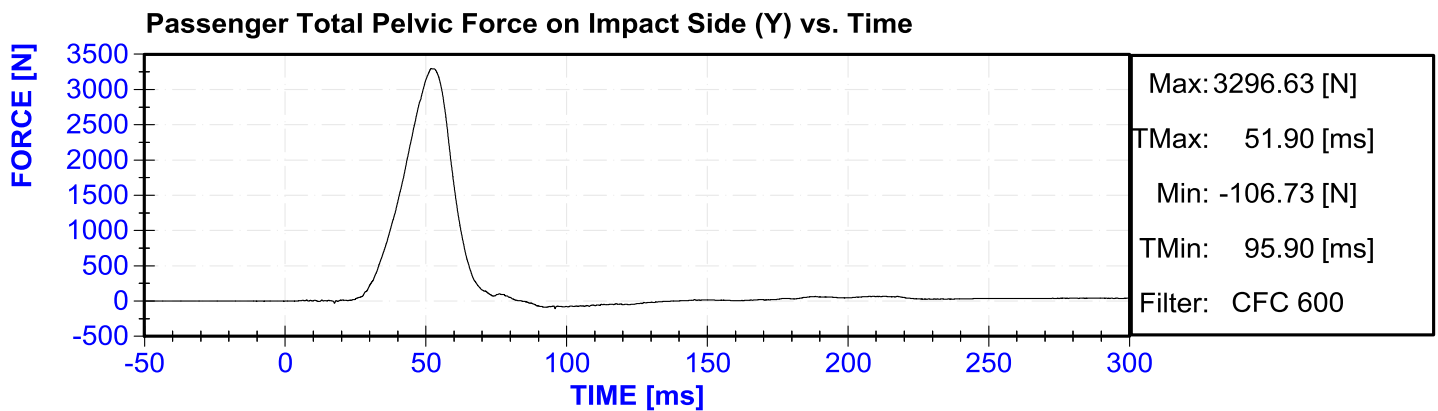
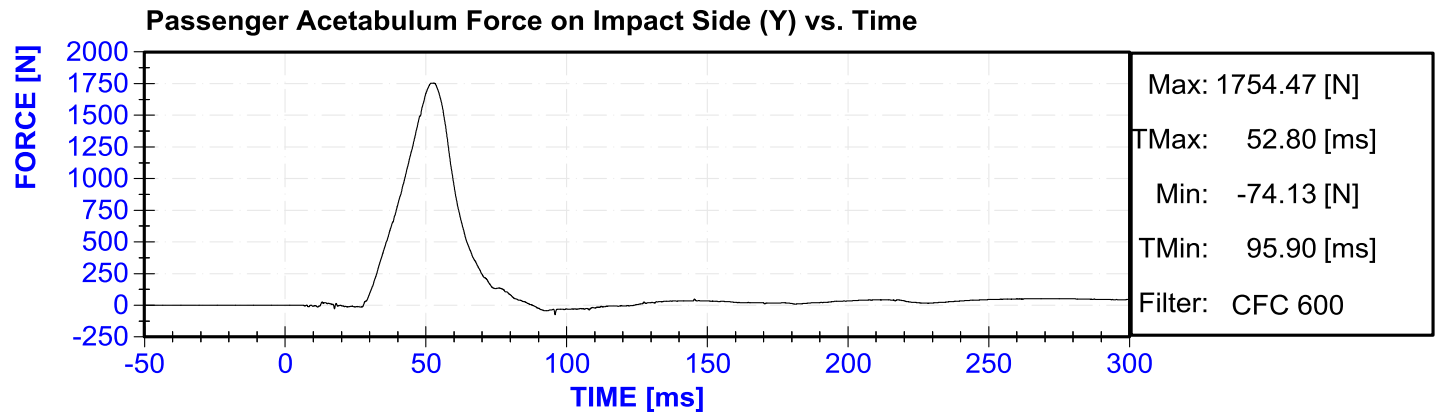
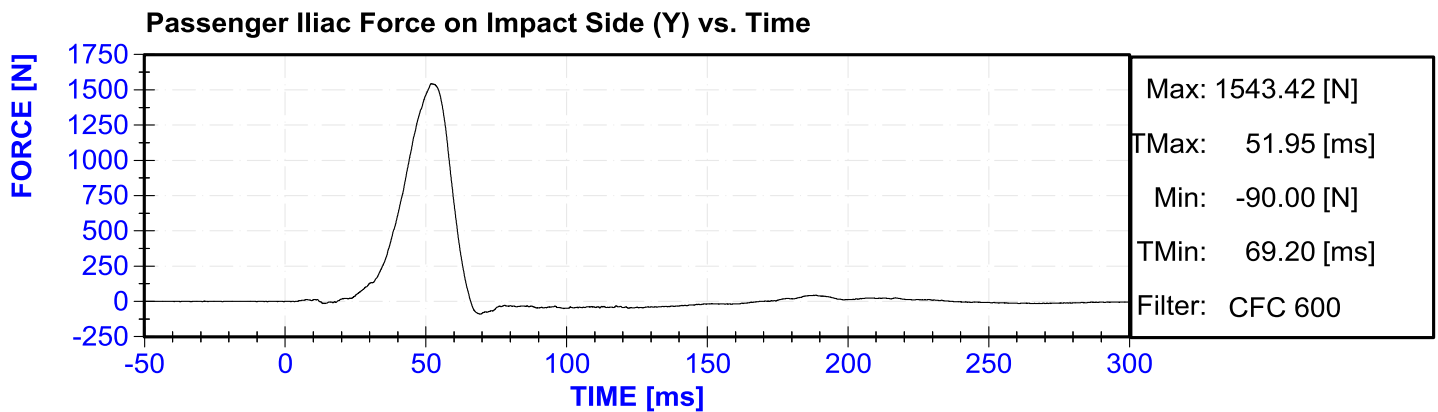
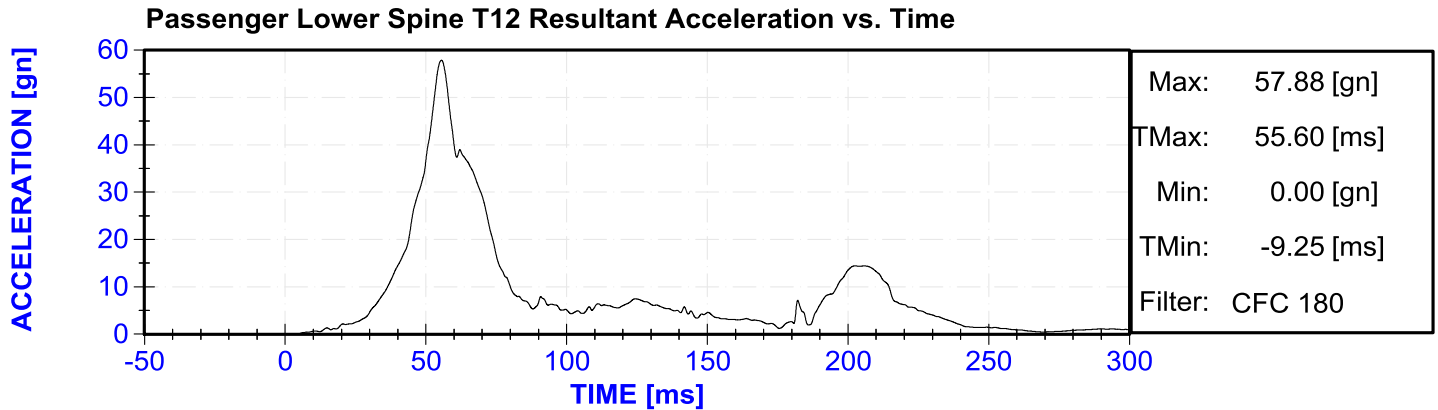


Passenger Lower Spine T12 Acceleration (Y) vs. Time



Passenger Lower Spine T12 Acceleration (Z) vs. Time





APPENDIX C

DUMMY PERFORMANCE CALIBRATION TEST DATA

CALIBRATION TEST RESULTS

PRE-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

SERIAL NO: F034

(CONFIGURED FOR LEFT SIDE IMPACT)

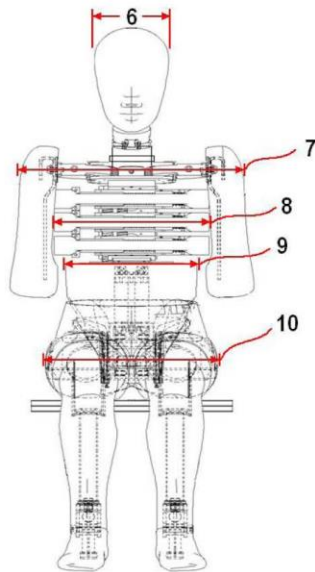


External Measurements - EuroSID-2re

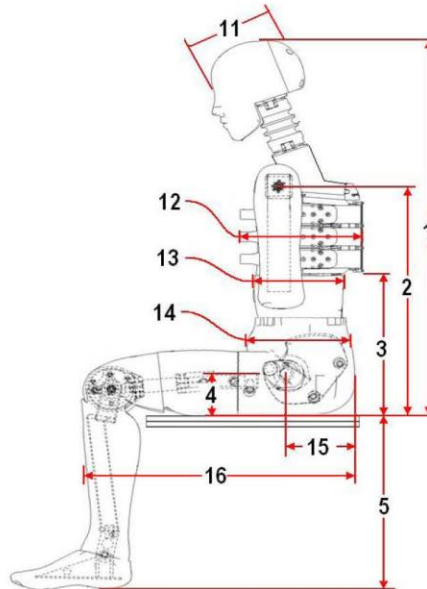
Technician: K. Brogan

Date: 12/8/2017

Dummy Serial Number: F034



FRONT VIEW



SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	913	Pass
2	Seat to Shoulder Joint	558	572	565	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	350	Pass
4	Seat to Hip Joint (center of bolt)	97	103	100	Pass
5	Sole to Seat, Sitting	333	451	420	Pass
6	Head Width	152	158	154	Pass
7	Shoulder/Arm Width	461	479	469	Pass
8	Thorax Width	322	332	326	Pass
9	Abdomen Width	273	287	282	Pass
10	Pelvis Lap Width	359	373	367	Pass
11	Head Depth	196	206	202	Pass
12	Thorax Depth	262	272	268	Pass
13	Abdomen Depth	194	204	199	Pass
14	Pelvis Depth	235	245	241	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	154	Pass
16	Back of Buttocks to Front Knee	597	615	600	Pass

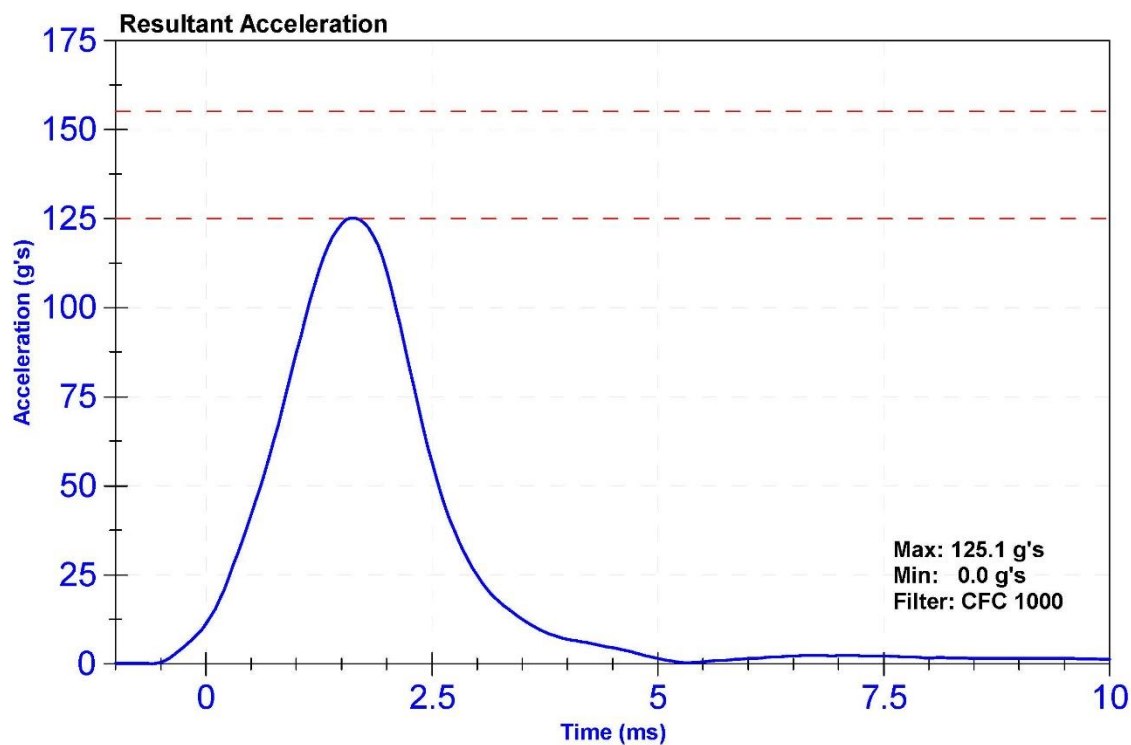
ATD Manufacturer	DP6741	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

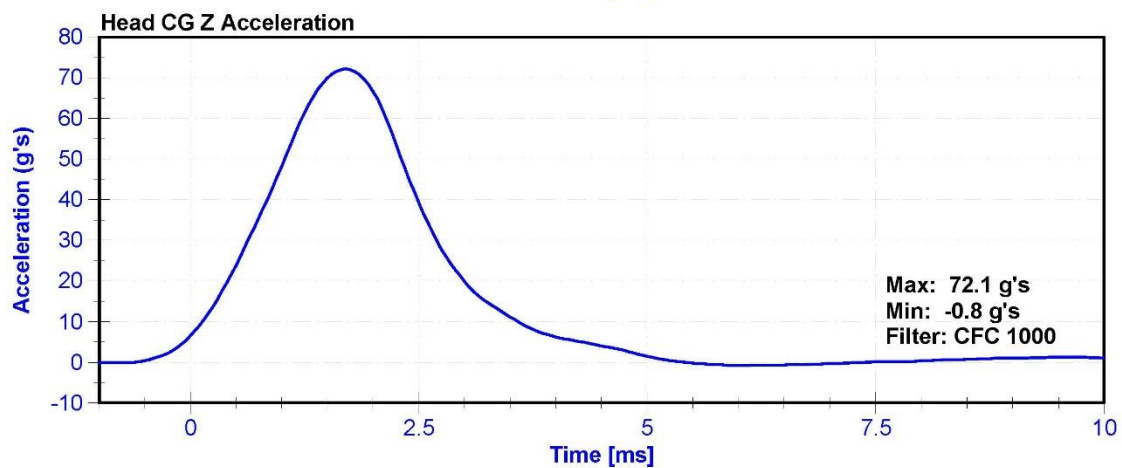
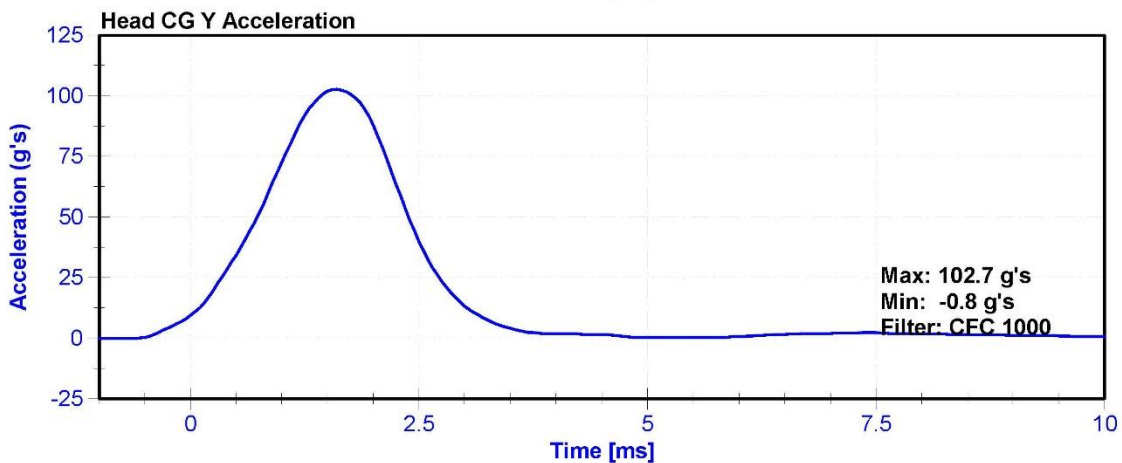
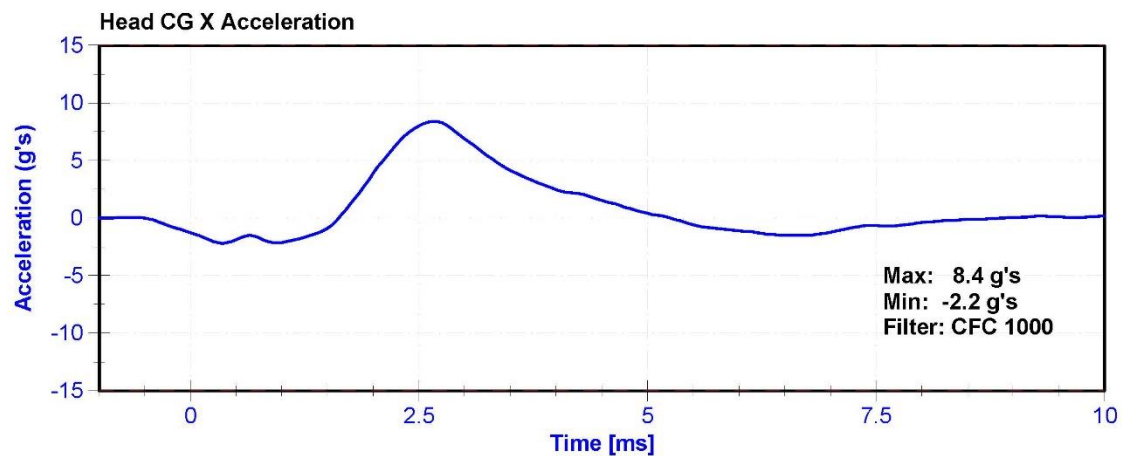
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	31.4	Pass
Resultant Acceleration	125	155	g's	125.1	Pass
Oscillation	0	15	%	1.91	Pass
Fore-Aft Acceleration	-15	15	g's	8.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58904	10/24/2017	4/24/2018
Y Accelerometer	ENDEVCO 7264CT	AC-P58911	10/24/2017	4/24/2018
Z Accelerometer	ENDEVCO 7264CT	AC-P58776	10/24/2017	4/24/2018





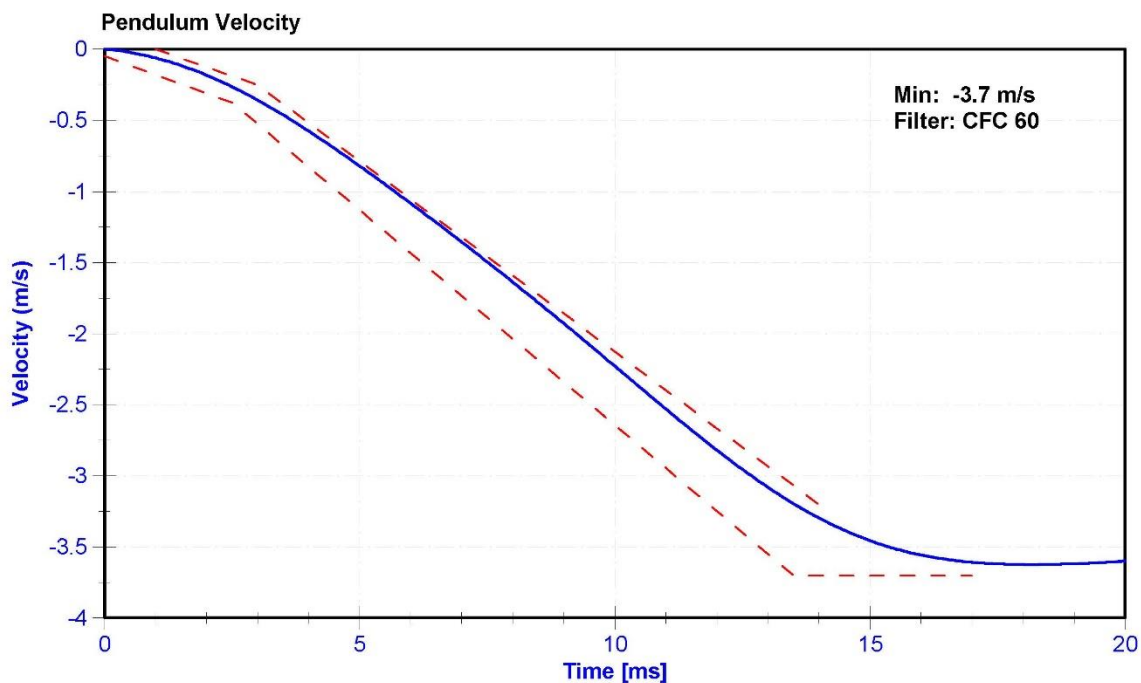
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	F034	Laboratory Supervisor	M. Goehle

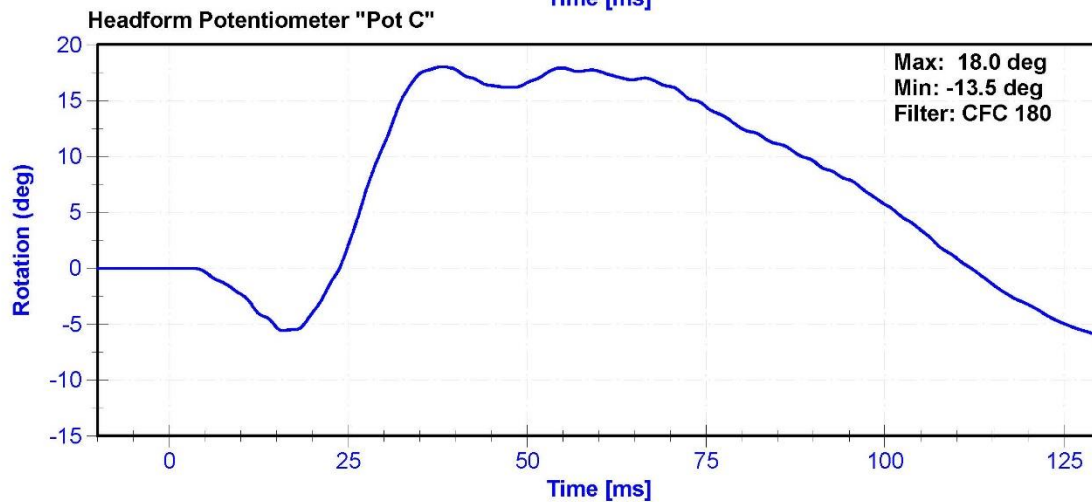
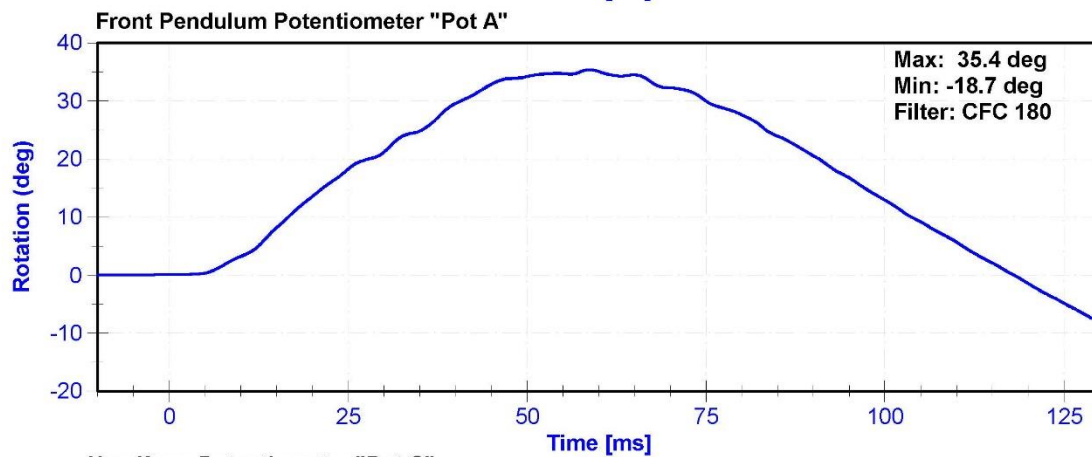
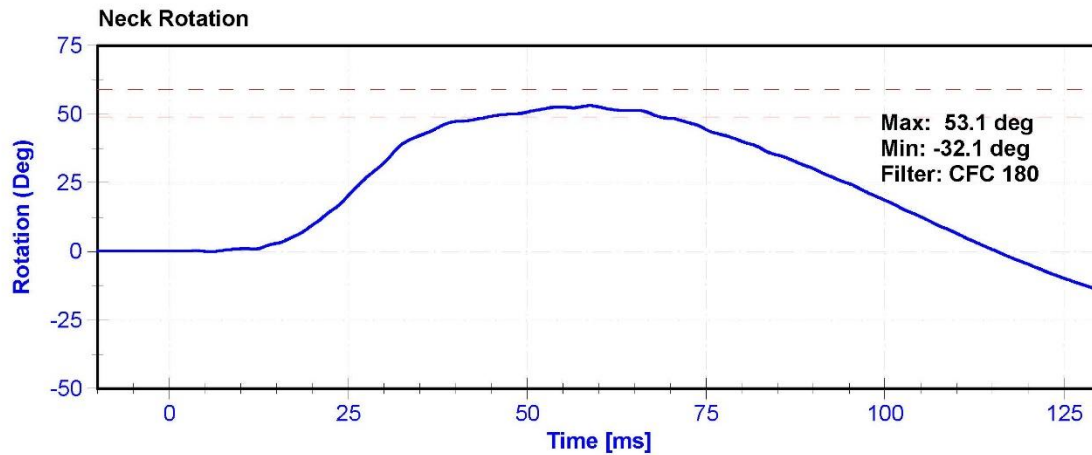
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22	Pass
Humidity	10	70	%	27.2	Pass
Velocity	3.3	3.5	m/s	3.40	Pass
Lateral Neck Rotation	49	59	deg	53.1	Pass
Time at Maximum Rotation	54	66	ms	58.8	Pass
Time of Rotation Decay from Maximum	53	88	ms	56.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/11/2017	5/11/2018
Front Pendulum Potentiometer	SP22G	DS-094	10/30/2017	10/30/2018
Headform Potentiometer	SP22G	DS-095	10/30/2017	10/30/2018





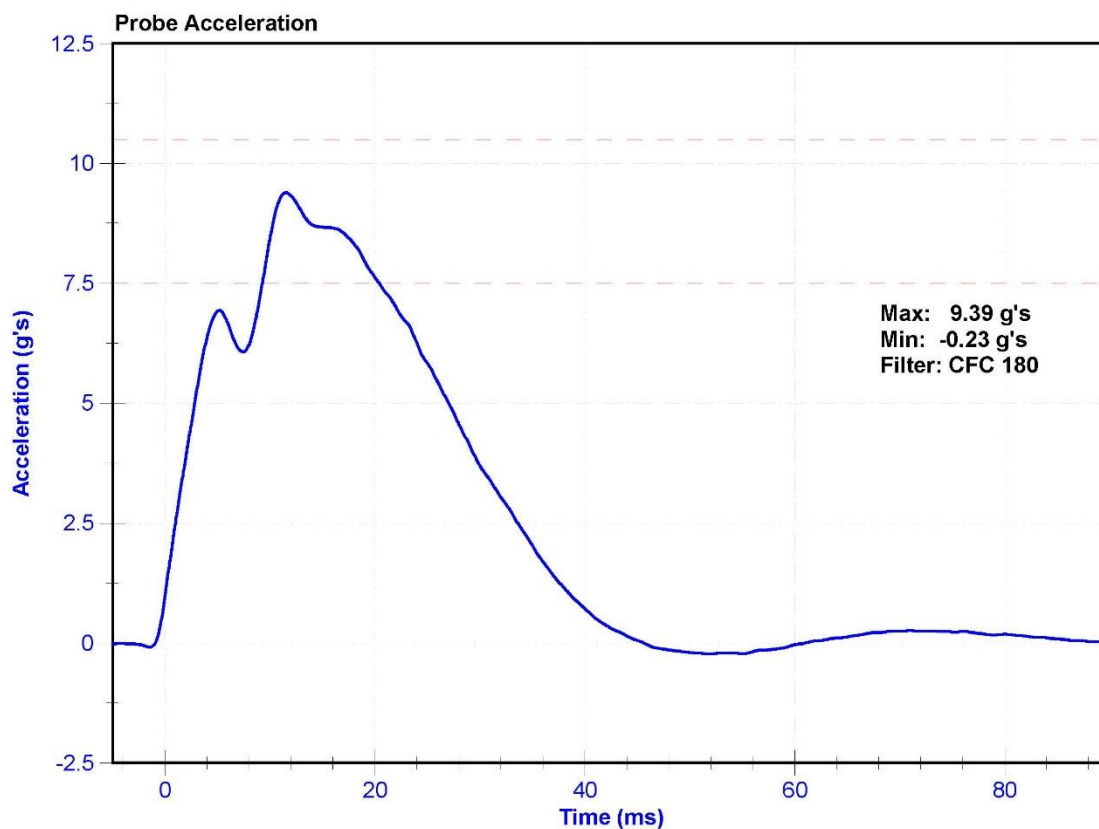
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	30.7	Pass
Velocity	4.2	4.4	m/s	4.23	Pass
Probe Acceleration	7.5	10.5	g's	9.39	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018



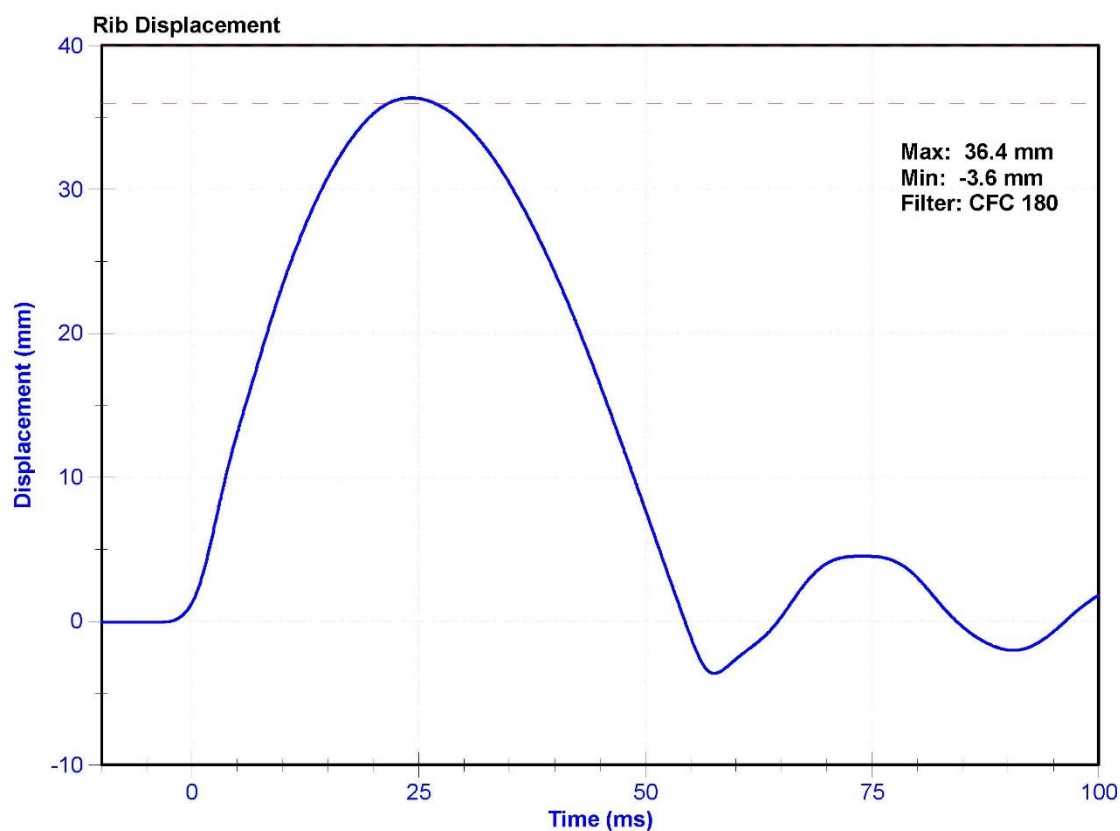
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	30.0	Pass
Rib Displacement	36	40	mm	36.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	9/27/2017	9/27/2018



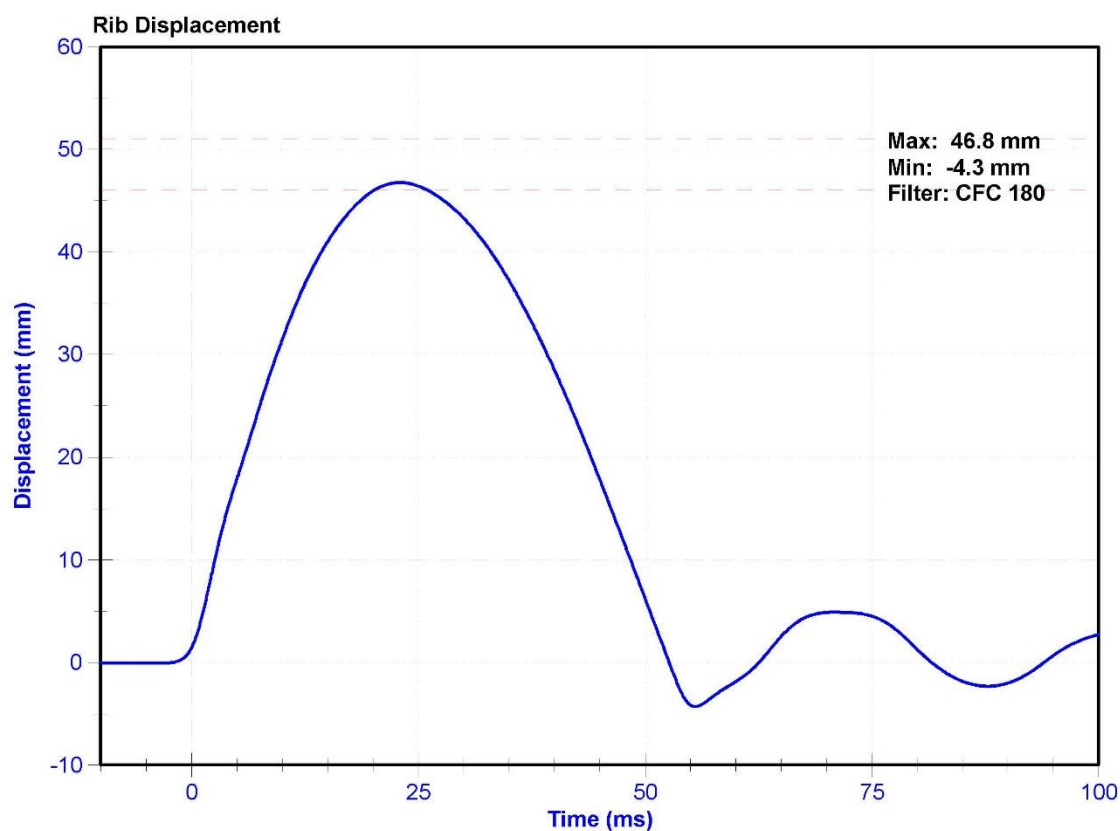
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	30.2	Pass
Rib Displacement	46	51	mm	46.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	9/27/2017	9/27/2018



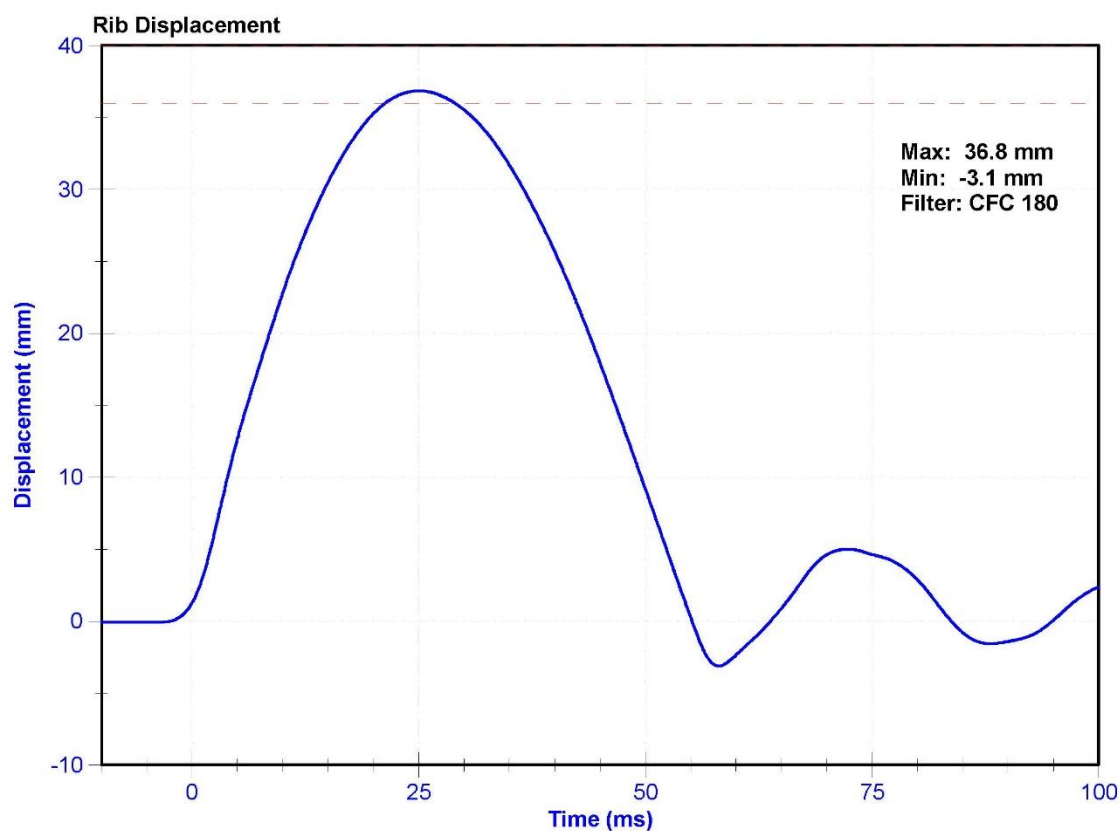
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	30.0	Pass
Rib Displacement	36	40	mm	36.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	9/27/2017	9/27/2018



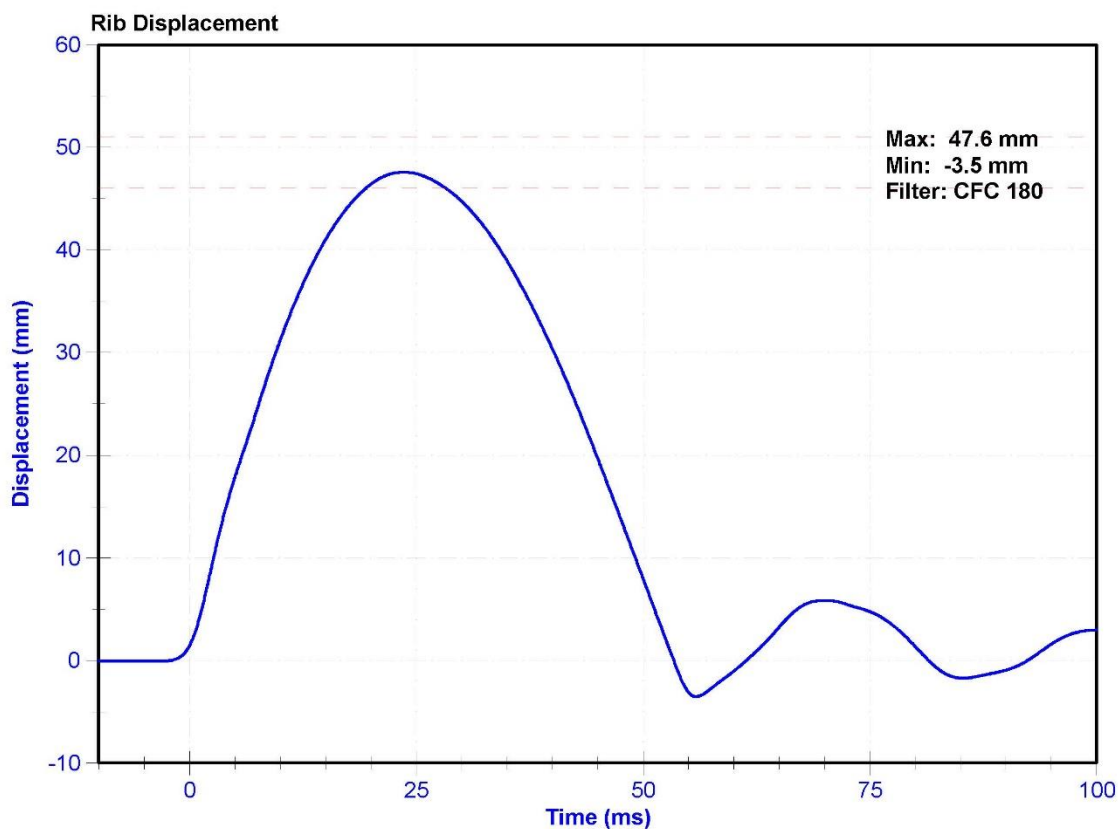
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	30.0	Pass
Rib Displacement	46	51	mm	47.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	9/27/2017	9/27/2018



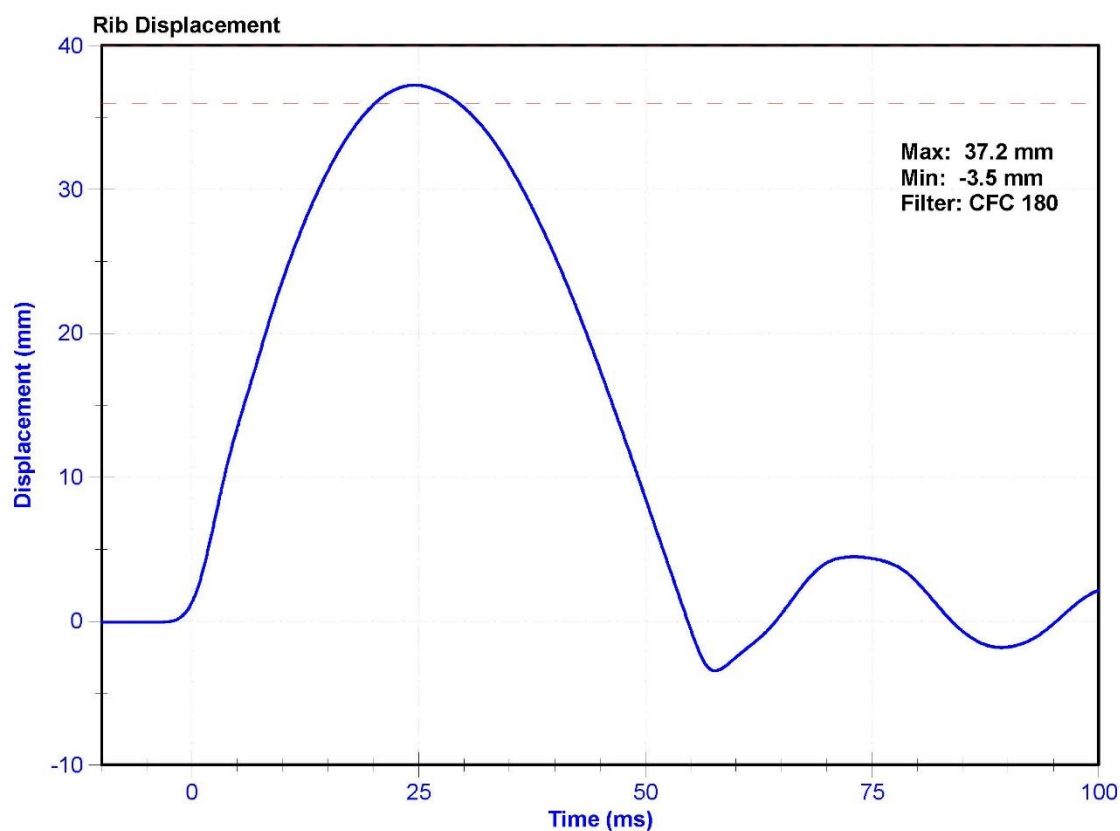
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	F034	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	37.8	Pass
Rib Displacement	36	40	mm	37.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	9/27/2017	9/27/2018



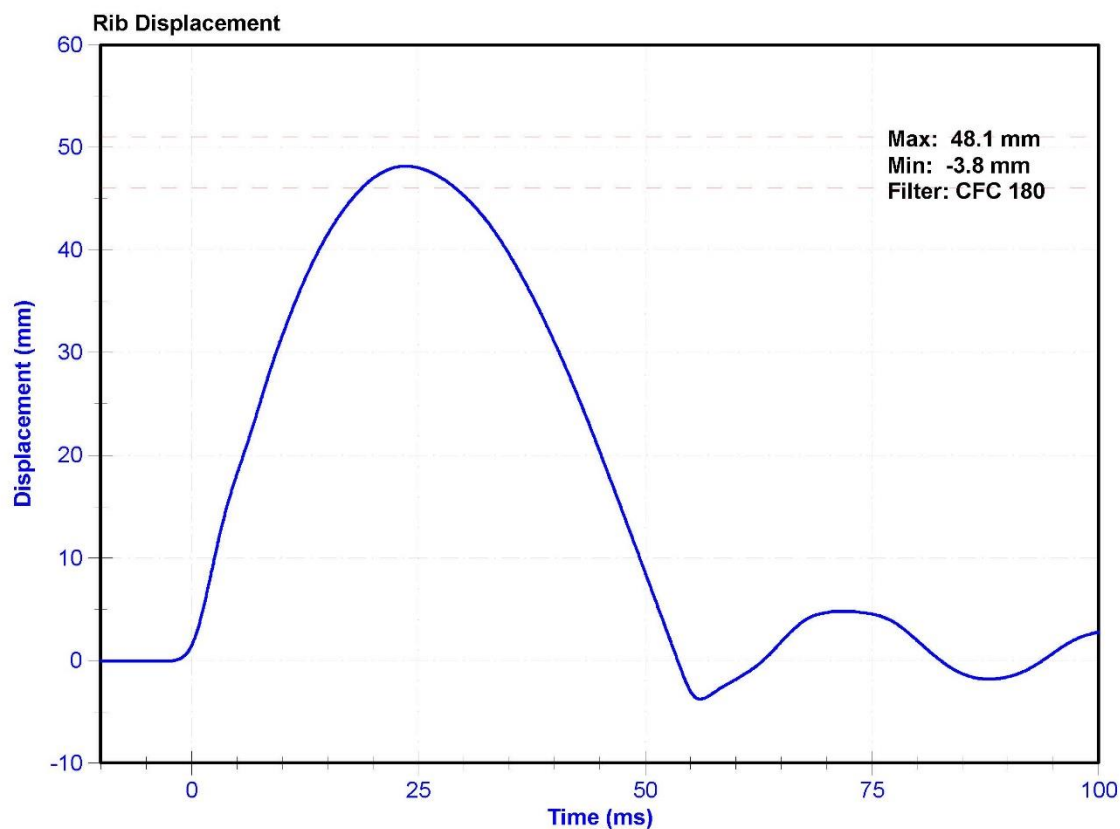
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	30.0	Pass
Rib Displacement	46	51	mm	48.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	9/27/2017	9/27/2018



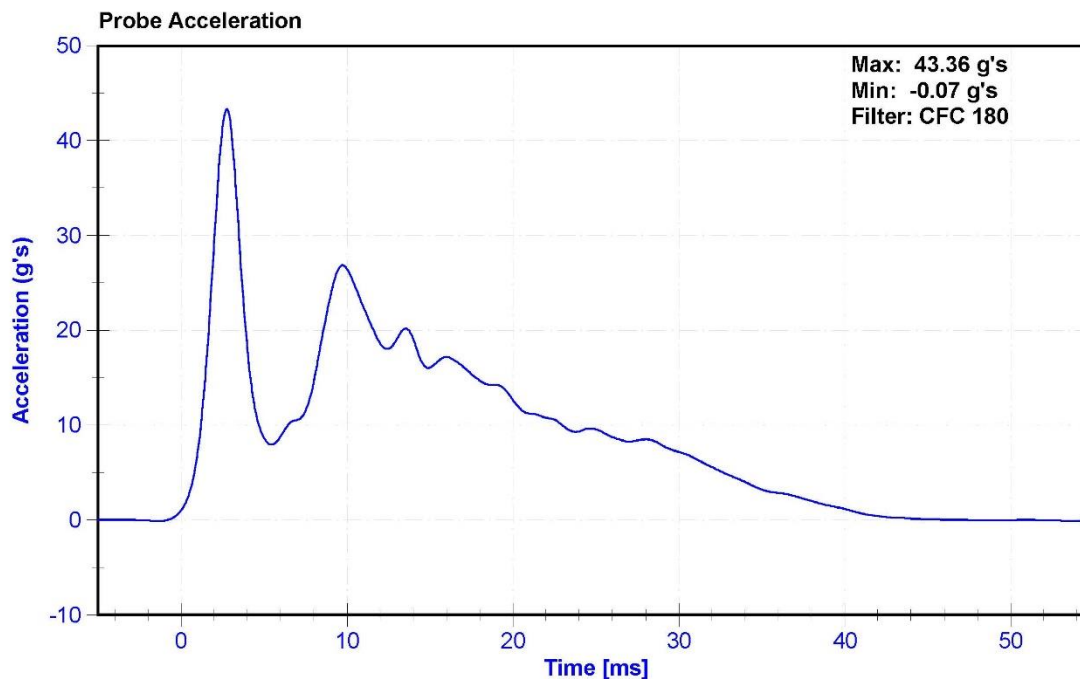
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

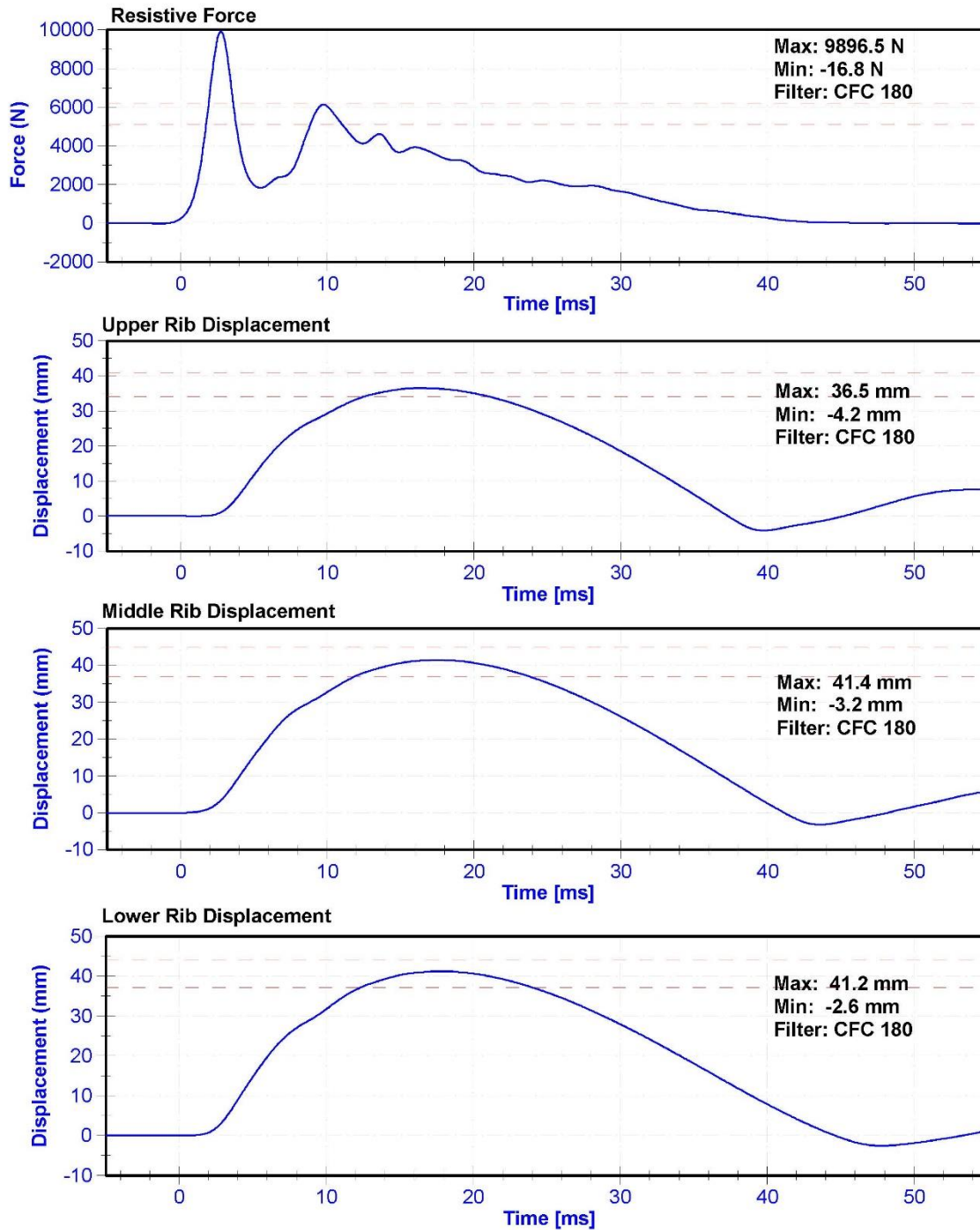
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	30.5	Pass
Velocity	5.4	5.6	m/s	5.58	Pass
Resistive Force after 6ms	5100	6200	N	6127.9	Pass
Upper Thorax Rib Deflection	34	41	mm	36.5	Pass
Mid Thorax Rib Deflection	37	45	mm	41.4	Pass
Lower Thorax Rib Deflection	37	44	mm	41.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Upper Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	9/27/2017	9/27/2018
Lower Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	9/27/2017	9/27/2018





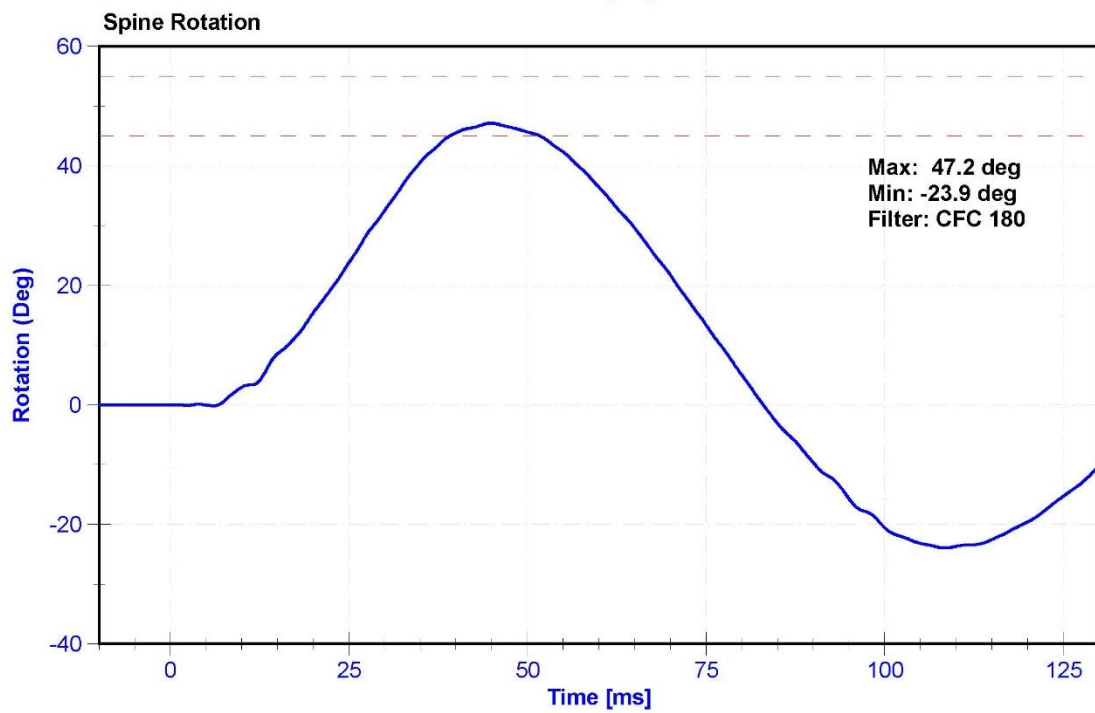
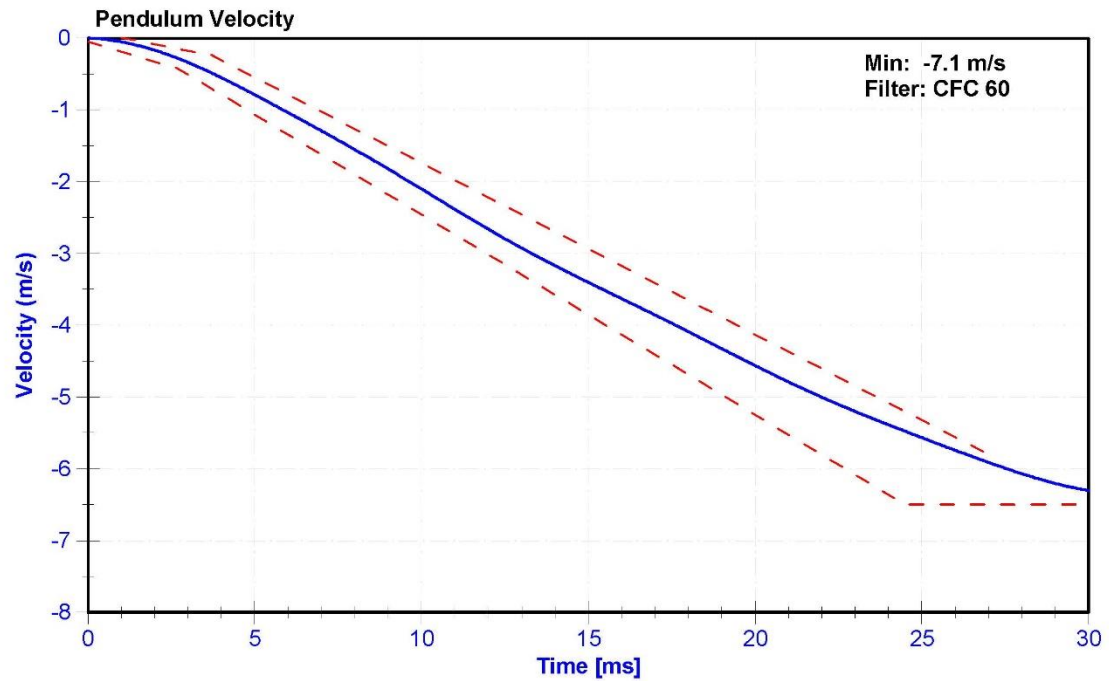
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

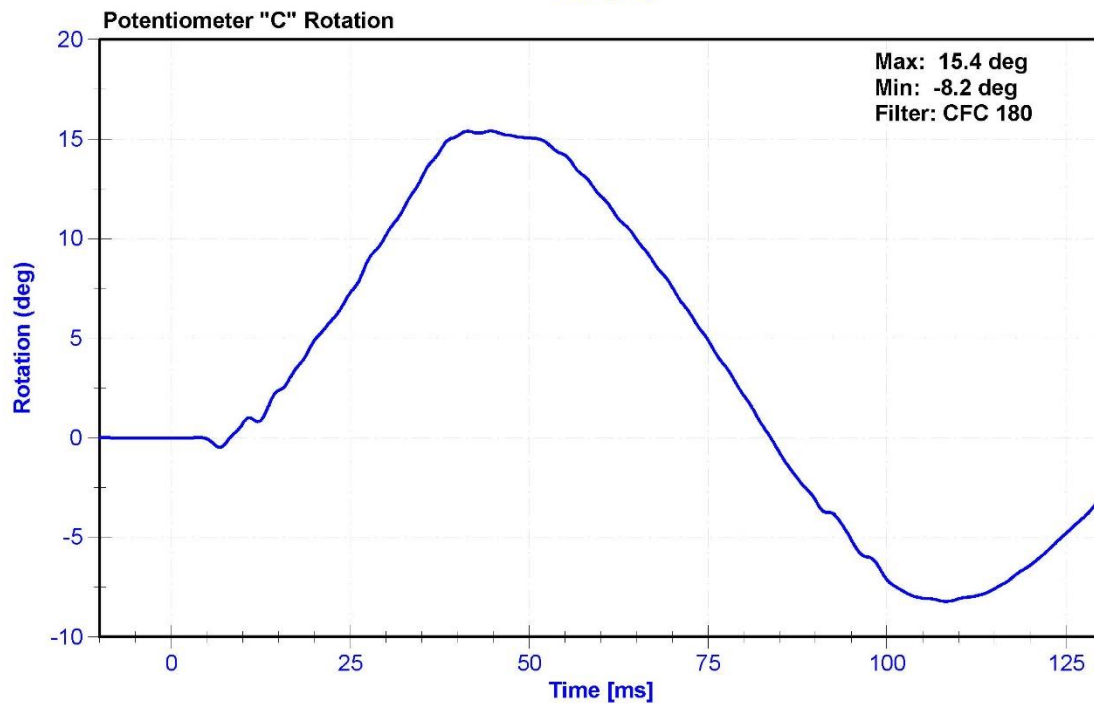
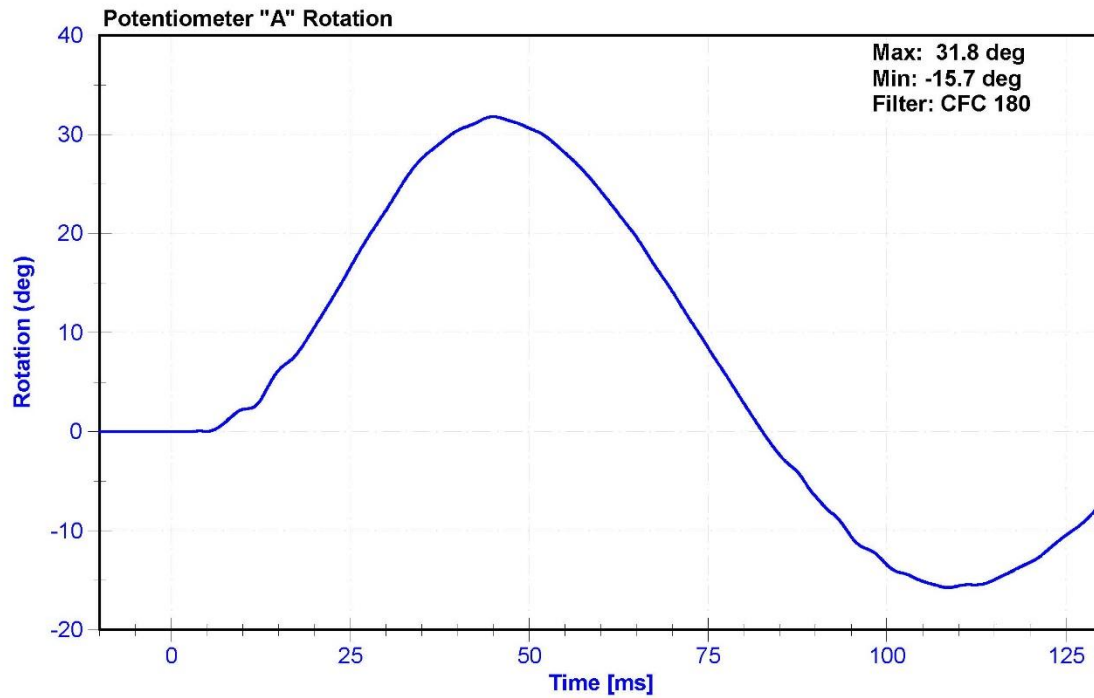
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.3	Pass
Velocity	5.95	6.15	m/s	6.113	Pass
Lateral Spine Rotation	45	55	deg	47.2	Pass
Time at Maximum Rotation	39	53	ms	44.8	Pass
Time of Decay to Zero Degrees	37	57	ms	38.2	Pass
Pulse within Corridor?	-	-	-		

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/11/2017	5/11/2018
Pendulum "A" Potentiometer	SP22G	DS-094	10/30/2017	10/30/2018
Condyle "B" Potentiometer	SP22G	DS-095	10/30/2017	10/30/2018





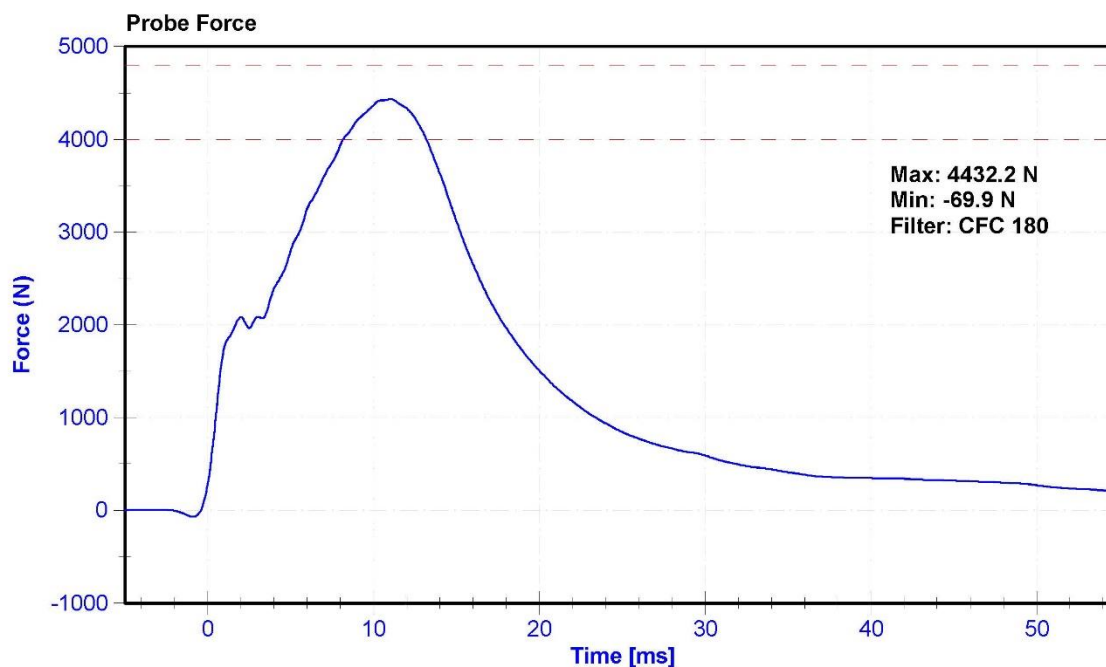
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

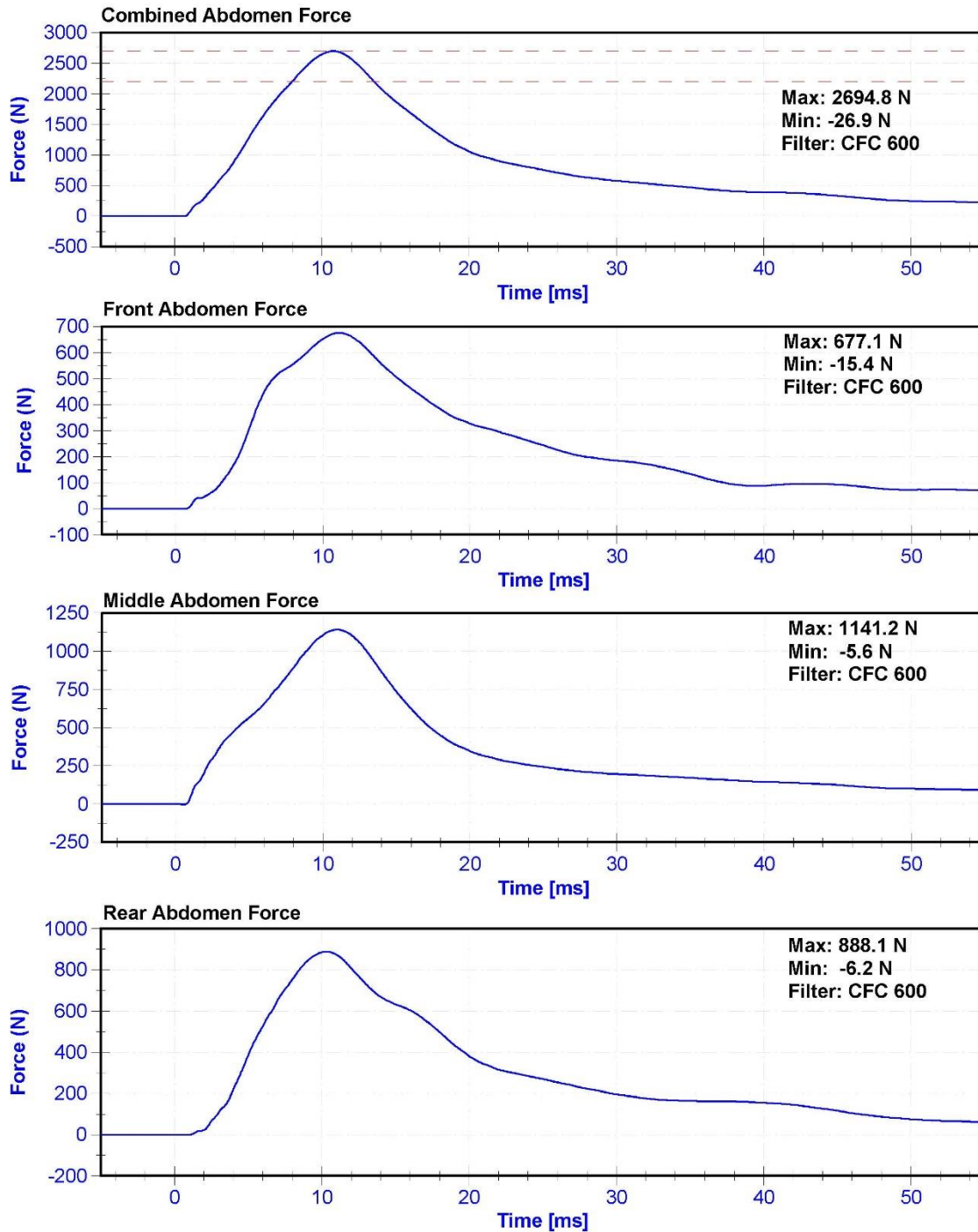
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	29.6	Pass
Velocity	3.9	4.1	m/s	4.07	Pass
Combined Abdomen Force	2200	2700	N	2694.8	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	10.75	Pass
Resistive Probe Force	4000	4800	N	4432.2	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.05	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Front Abdomen Load Cell	DENTON 2631	LC-1512	6/5/2017	6/5/2018
Middle Abdomen Load Cell	DENTON 2631	LC-1526	6/5/2017	6/5/2018
Rear Abdomen Load Cell	DENTON 2631	LC-1516	6/5/2017	6/5/2018





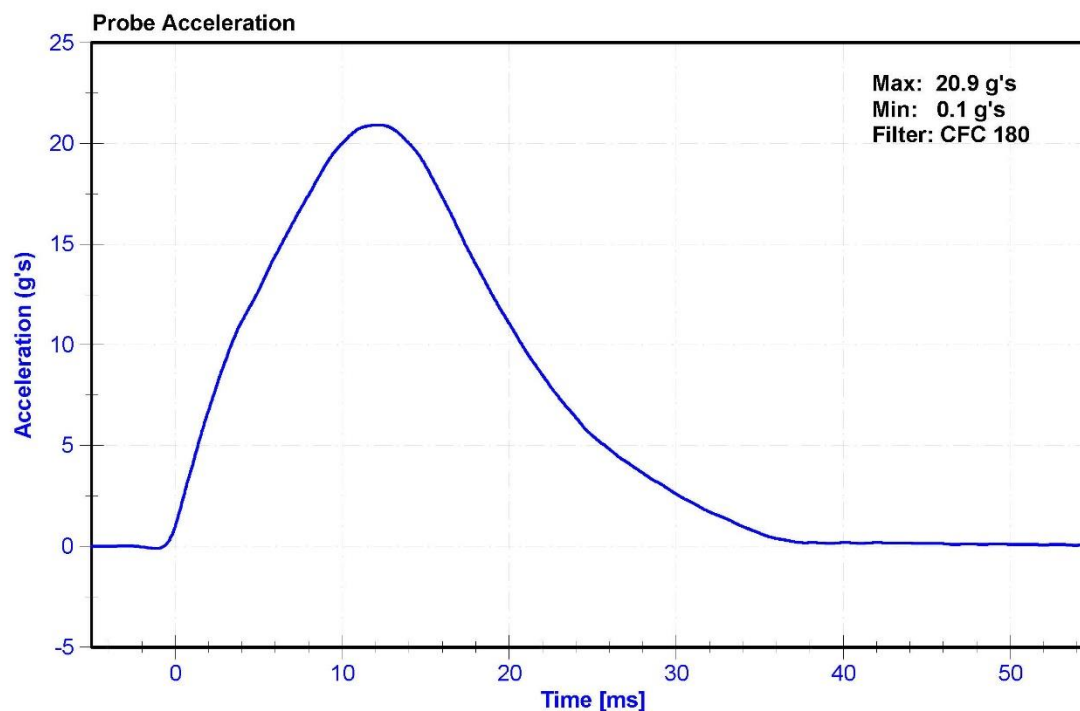
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	F034	Laboratory Supervisor	M. Goehle

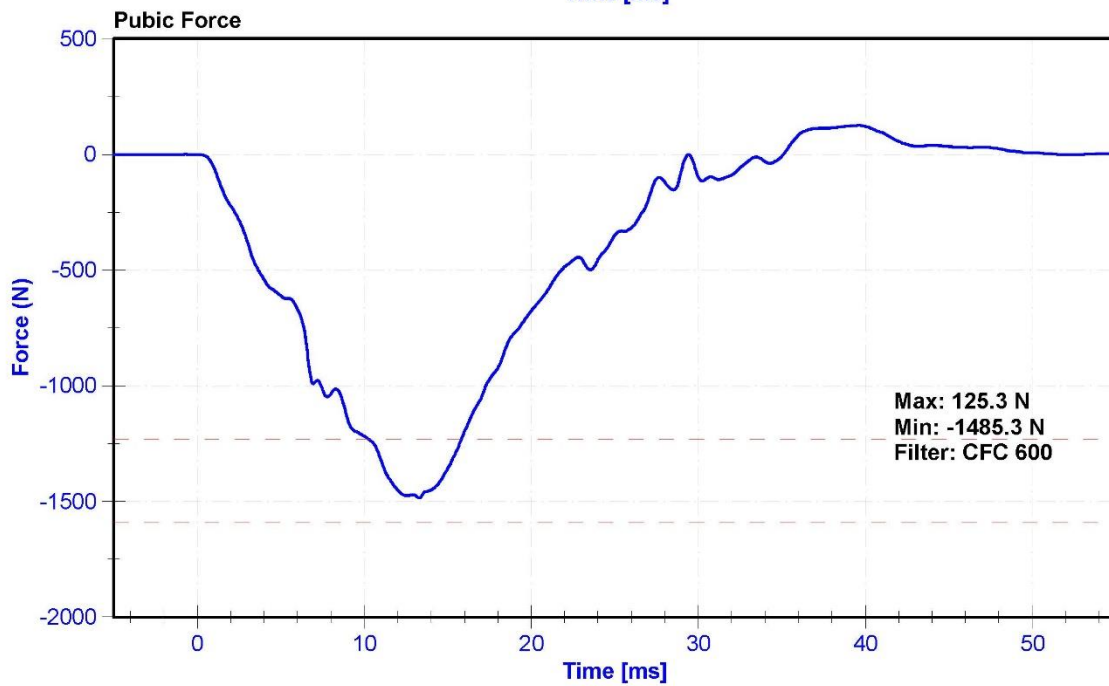
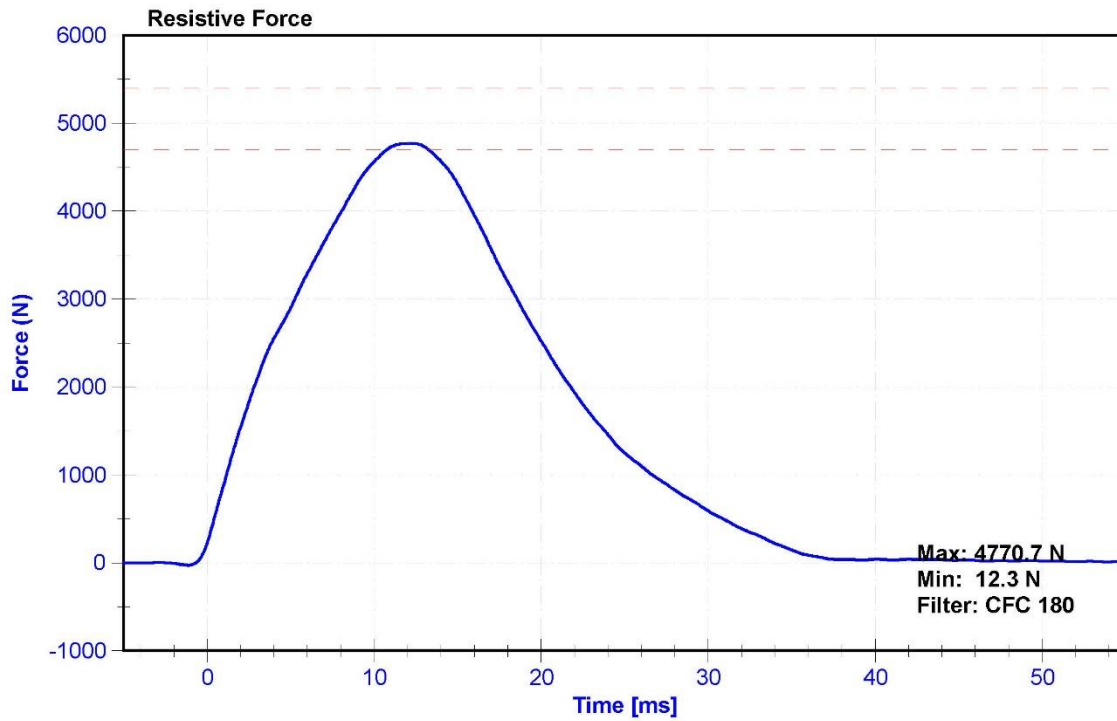
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	29.8	Pass
Velocity	4.2	4.4	m/s	4.38	Pass
Resistive Force	4700	5400	N	4770.7	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.30	Pass
Pubic Force	-1590	-1230	N	-1485.3	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.30	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pubic Load Cell	Denton 3096JFL	LC-465Fy	6/6/2017	6/6/2018





CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: DG8012

(CONFIGURED FOR LEFT SIDE IMPACT)

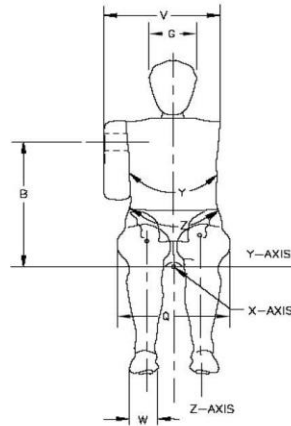
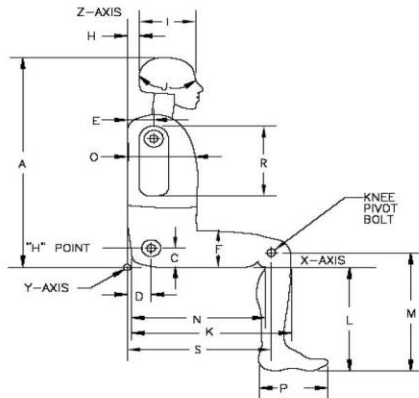


External Measurements - SID-IIs

Technician: K. Brogan

Date: 12/12/2017

Dummy Serial Number: DG8012



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	444	Pass
C	H-point Height	79	89	86	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	102	Pass
F	Thigh Clearance	119	135	128	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	547	Pass
K	Buttock to Knee Length	514	540	529	Pass
L	Popliteal Height	343	369	350	Pass
M	Knee Pivot to floor height	392	409	400	Pass
N	Buttock Popliteal Length	416	442	428	Pass
O	Chest Depth w/o jacket	195	211	205	Pass
P	Foot Length	216	232	220	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	320	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	486	Pass
V	Shoulder Width	341	357	346	Pass
W	Foot Width	78	94	86	Pass
Y	Chest Circumference w/jacket	851	881	860	Pass
Z	Waist Circumference	761	791	771	Pass

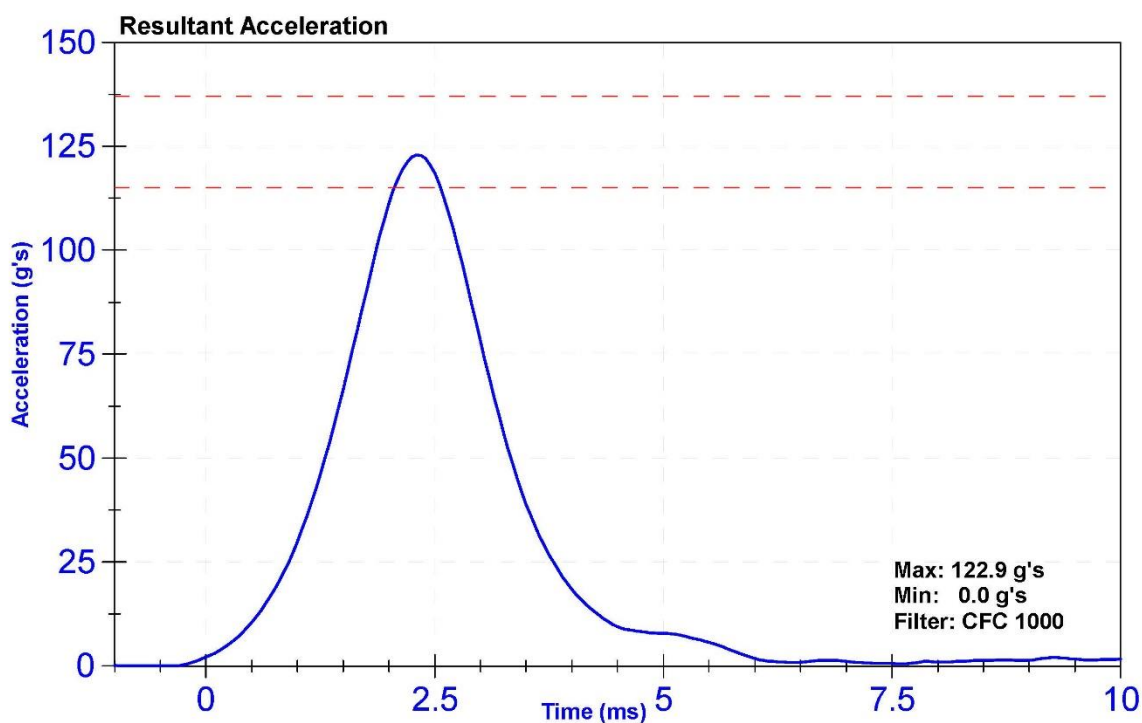
ATD Manufacturer	FTSS	Test Technician	S. Keller
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

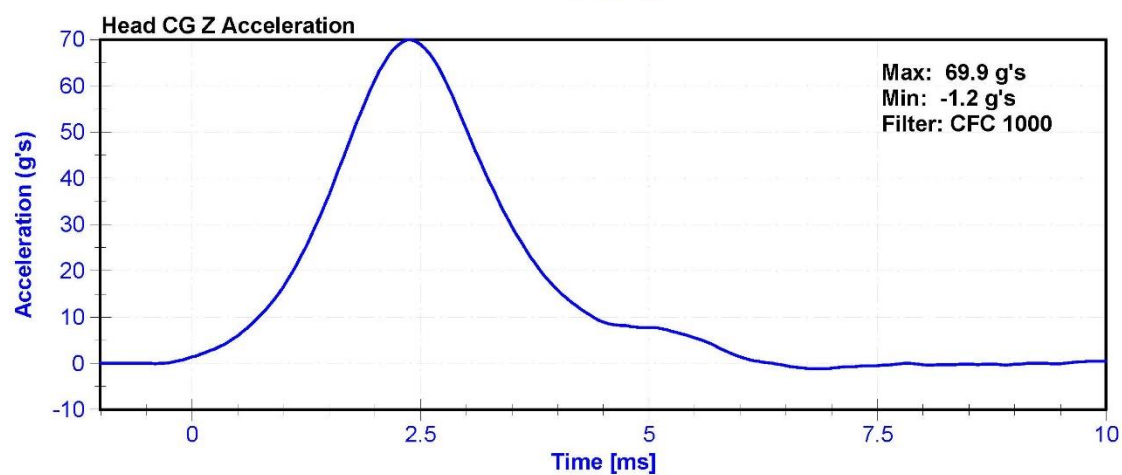
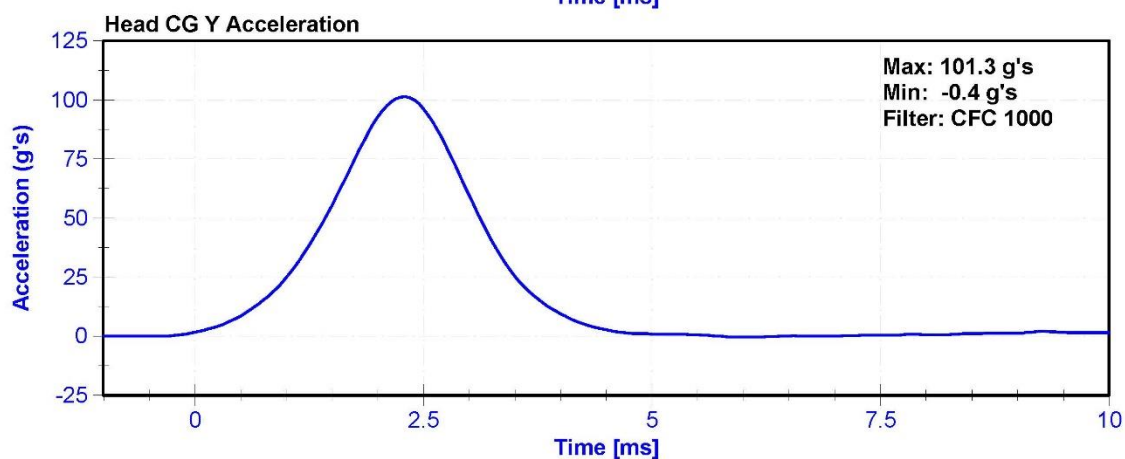
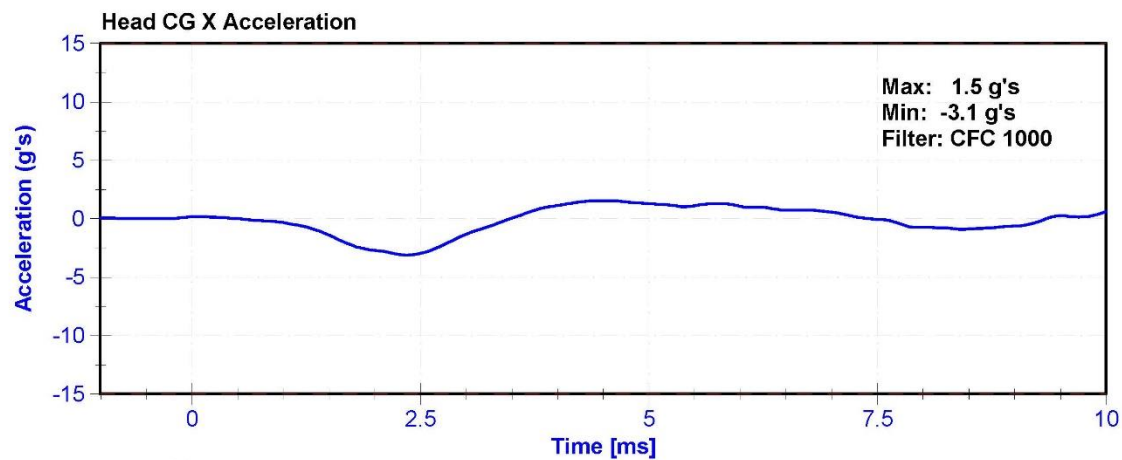
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	30.8	Pass
Resultant Acceleration	115	137	g's	122.9	Pass
Oscillation	0	15	%	6.4	Pass
Fore-Aft Acceleration	-15	15	g's	-3.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P51685	10/31/2017	5/1/2018
Y Accelerometer	ENDEVCO 7264CT	AC-P51682	10/31/2017	5/1/2018
Z Accelerometer	ENDEVCO 7264CT	AC-P51699	10/31/2017	5/1/2018





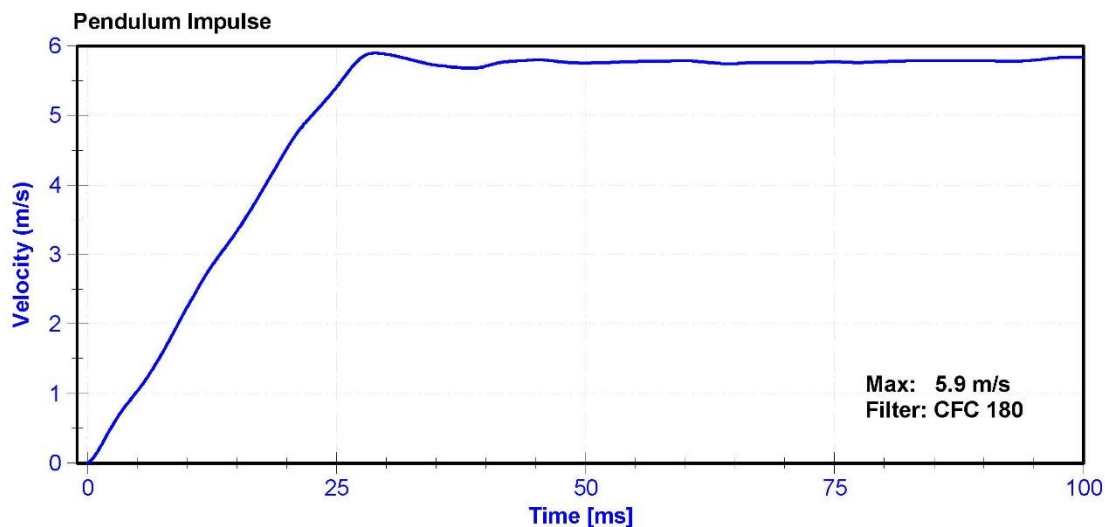
ATD Manufacturer	FTSS	Test Technician	S. Keller
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

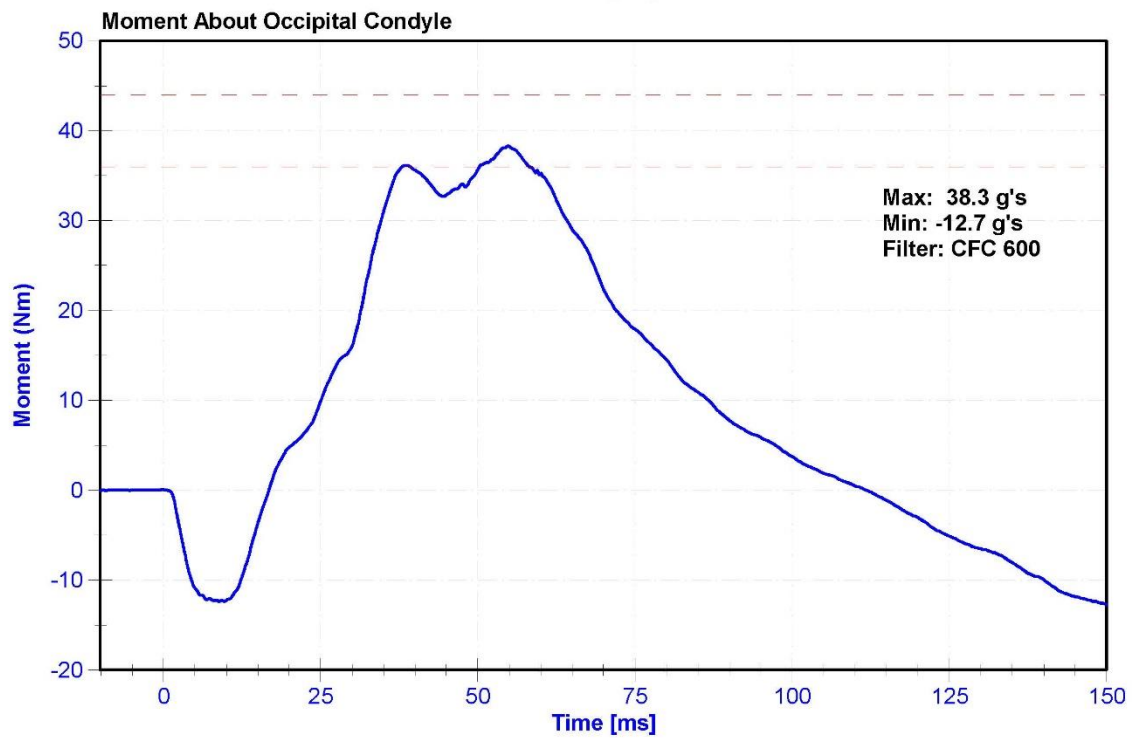
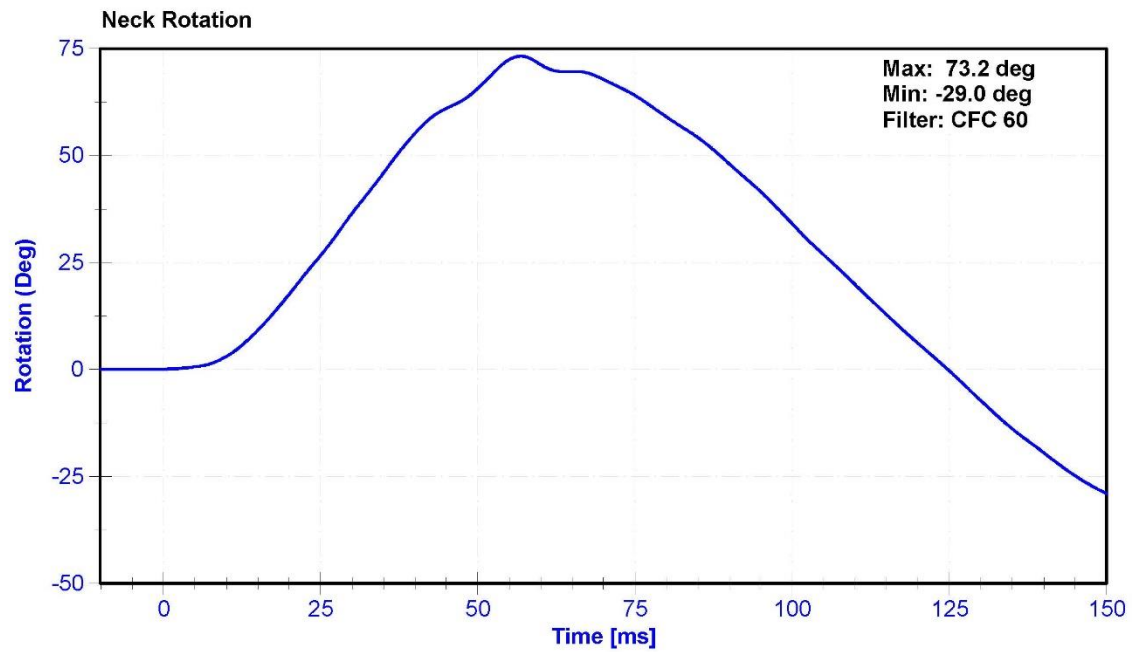
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	29.3	Pass
Velocity	5.51	5.63	m/s	5.620	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.24	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.34	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.52	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.41	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.90	Pass
Neck Rotation	71	81	deg	73.2	Pass
Time at Maximum Rotation	50	70	ms	56.9	Pass
Moment about the OC	36	44	Nm	38.3	Pass
Moment Decay to 0 Nm	102	126	ms	111.8	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





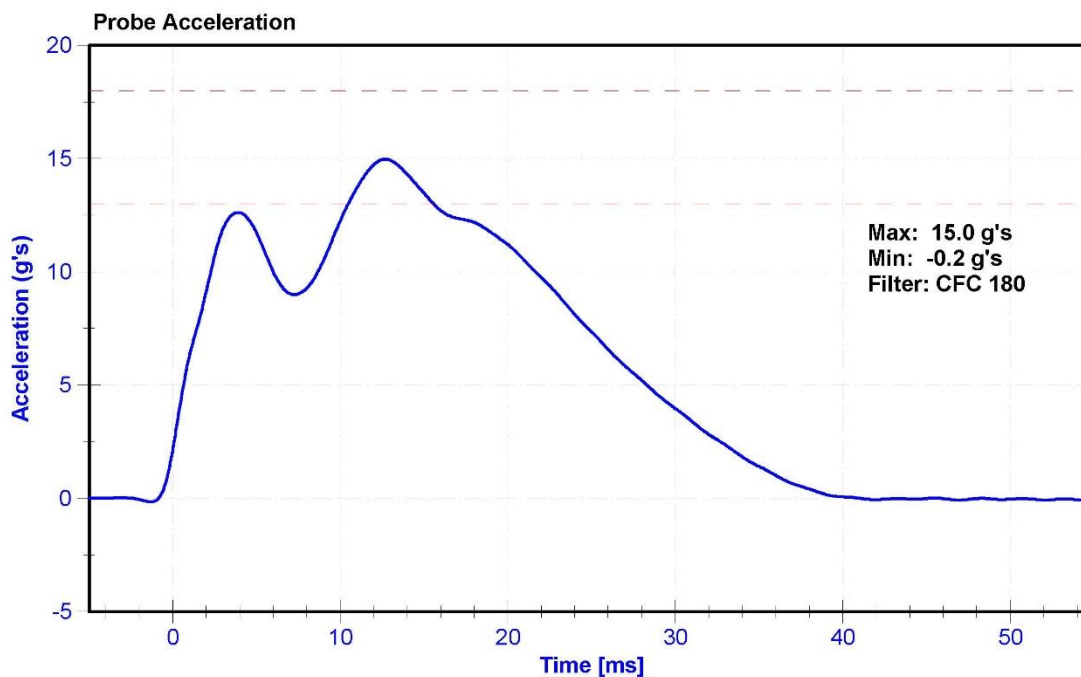
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

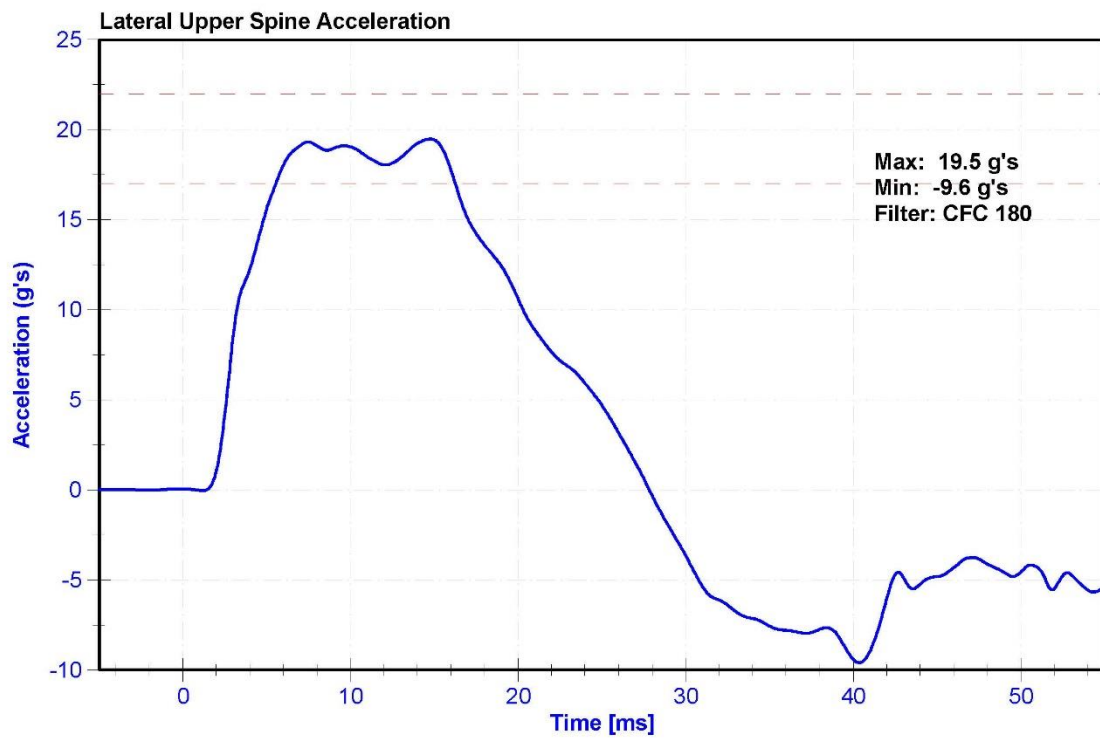
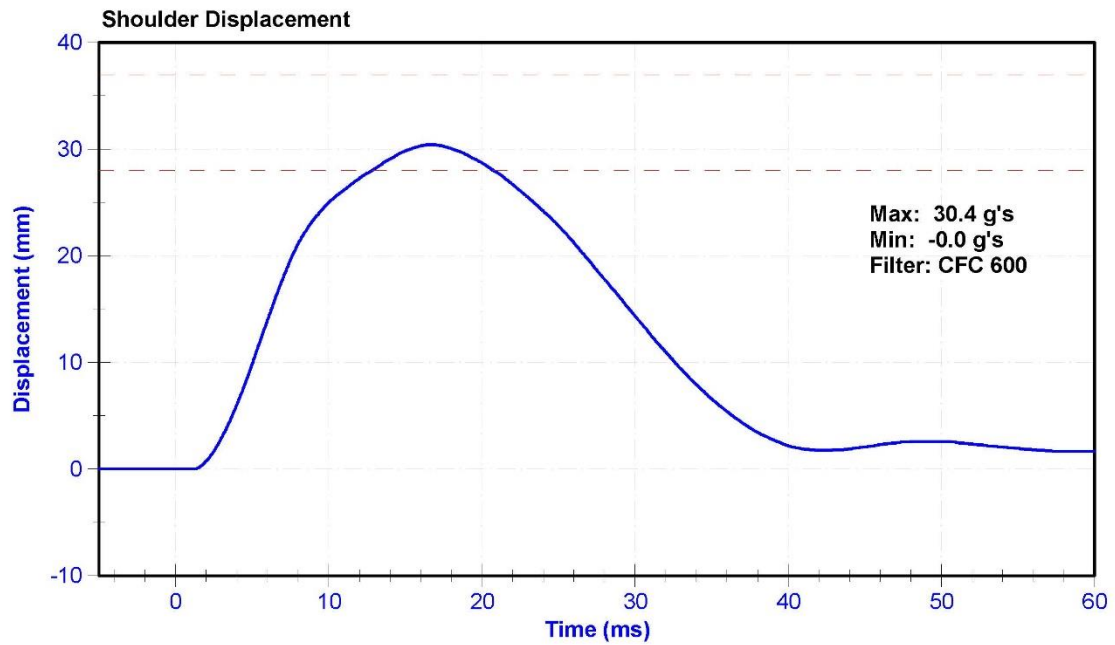
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	30	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	13	18	g's	15.0	Pass
Shoulder Deflection	28	37	mm	30.4	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	9/27/2017	9/27/2018
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63561	10/31/2017	5/1/2018





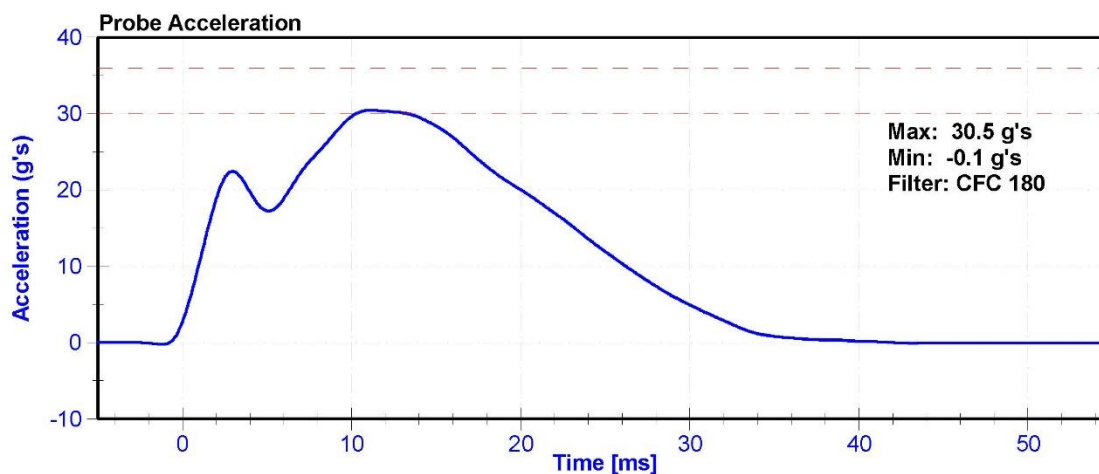
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

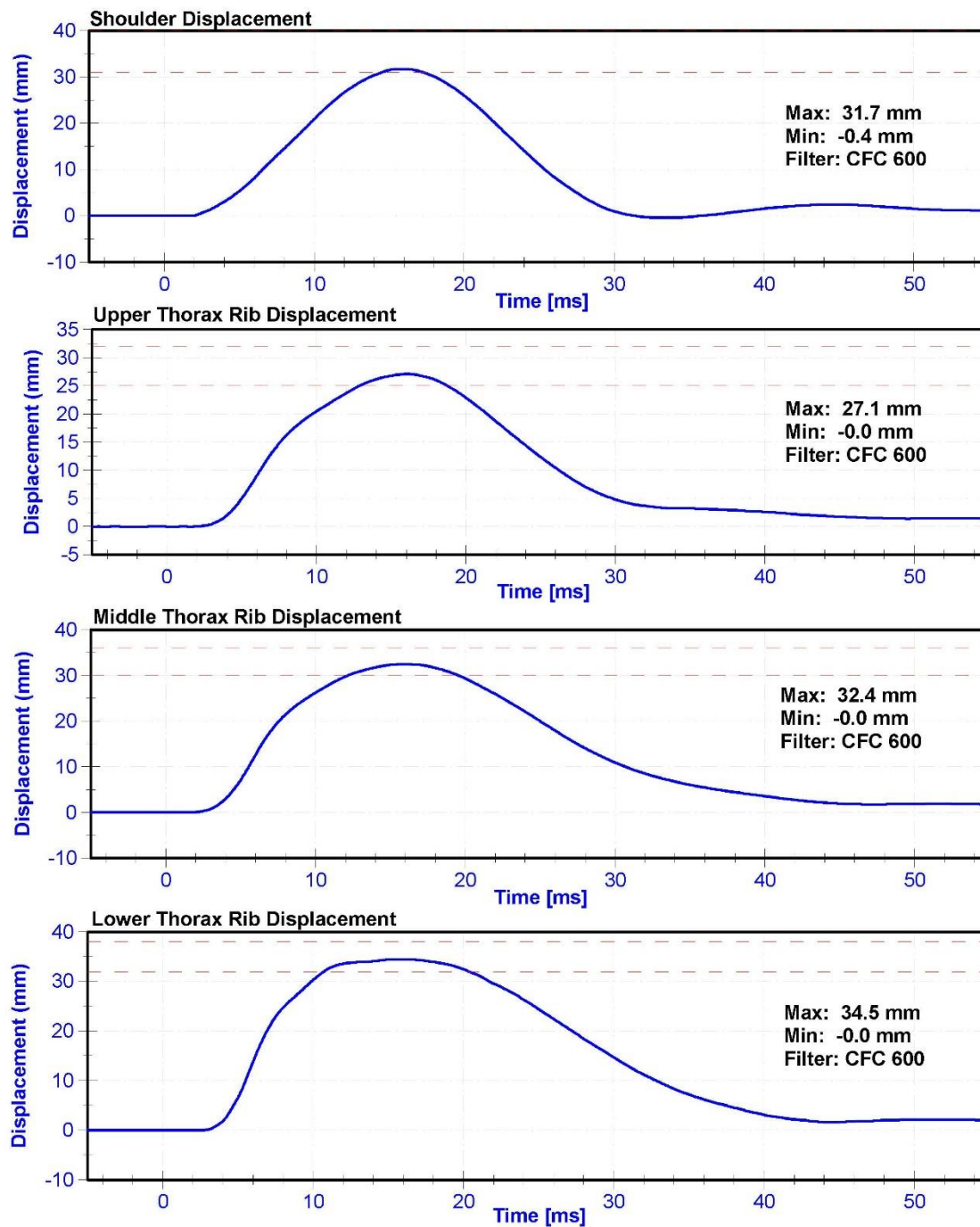
Results

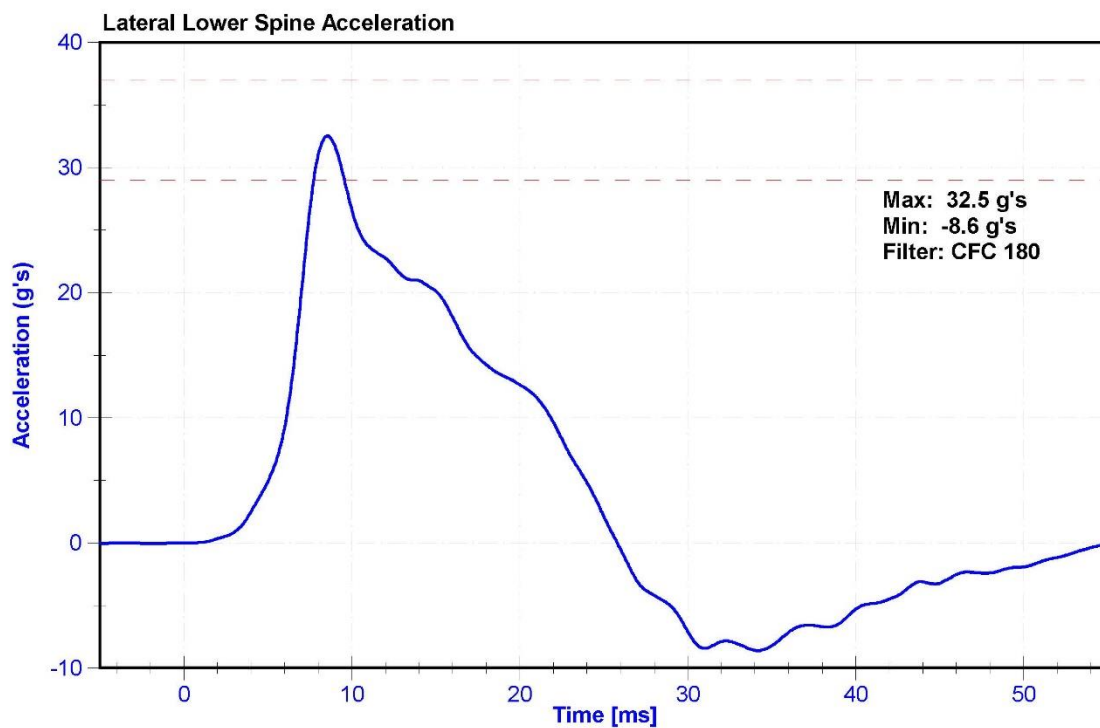
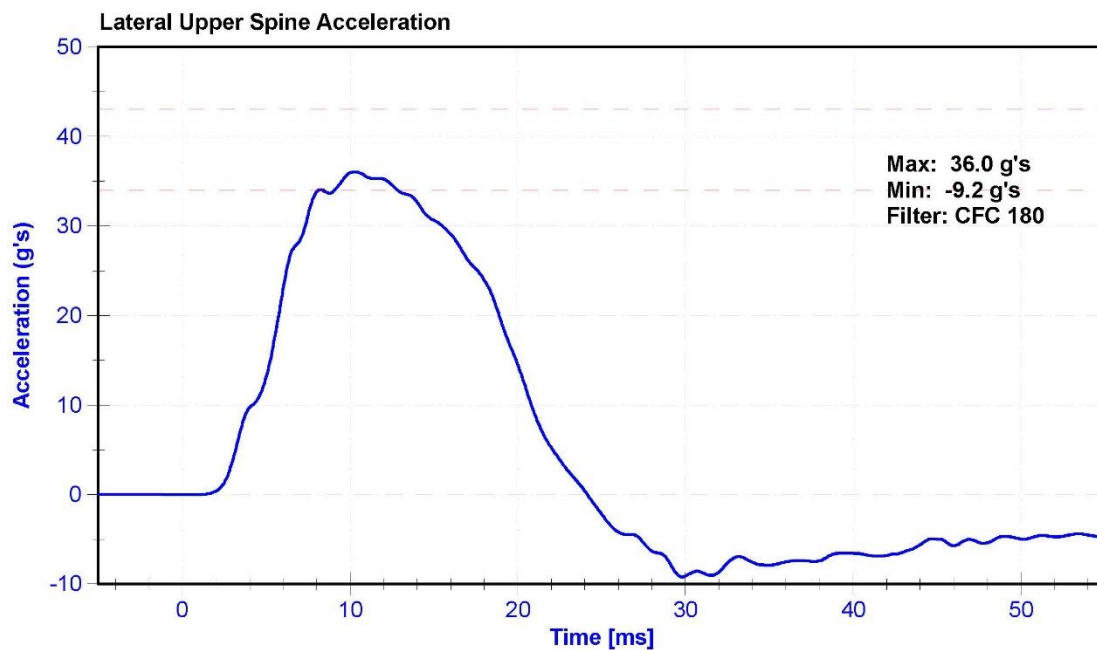
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	31.8	Pass
Velocity	6.6	6.8	m/s	6.68	Pass
Probe Acceleration after 5 ms	30	36	g's	30.5	Pass
Lateral Upper Spine Acceleration	34	43	g's	36.0	Pass
Lateral Lower Spine Acceleration	29	37	g's	32.5	Pass
Shoulder Deflection	31	40	mm	31.7	Pass
Upper Thorax Rib Deflection	25	32	mm	27.1	Pass
Mid Thorax Rib Deflection	30	36	mm	32.4	Pass
Lower Thorax Rib Deflection	32	38	mm	34.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P63561	10/31/2017	5/1/2018
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P83319	10/31/2017	5/1/2018
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	9/27/2017	9/27/2018
Upper Thorax Rib Potentiometer	Servo 08TC1-3621	DS-808GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	12/11/2017	12/11/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	9/27/2017	9/27/2018







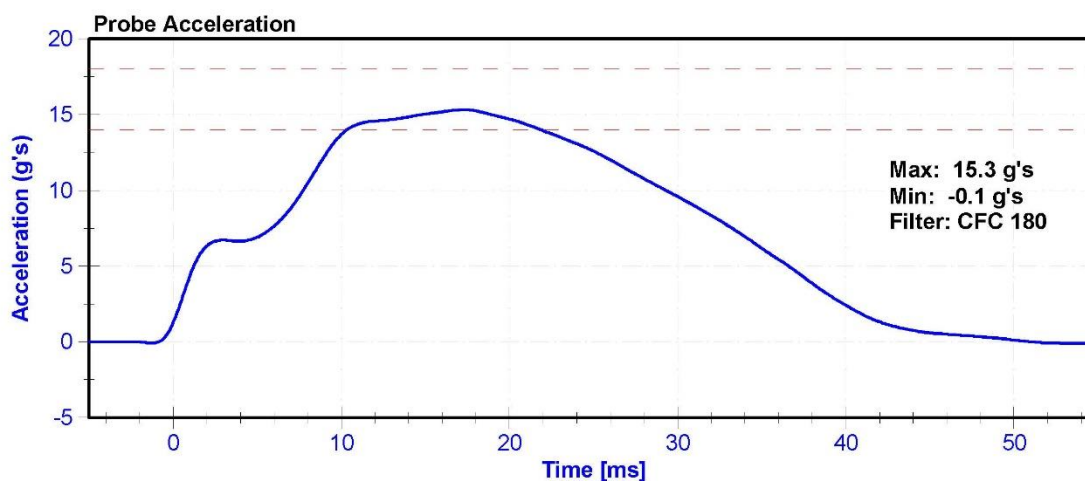
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

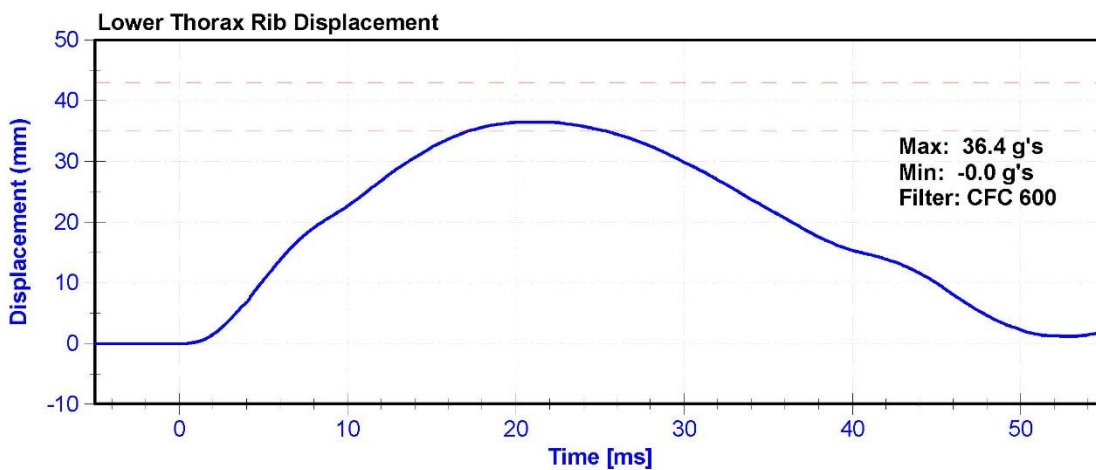
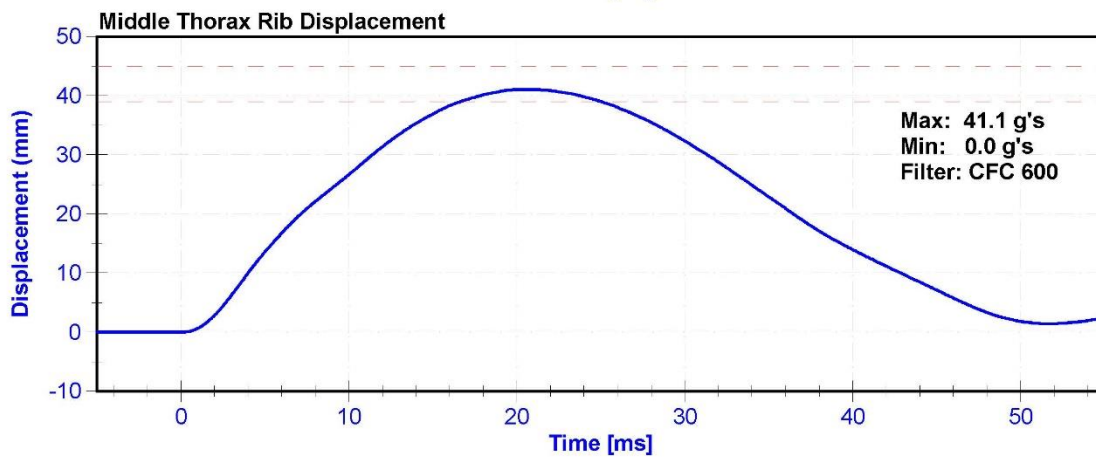
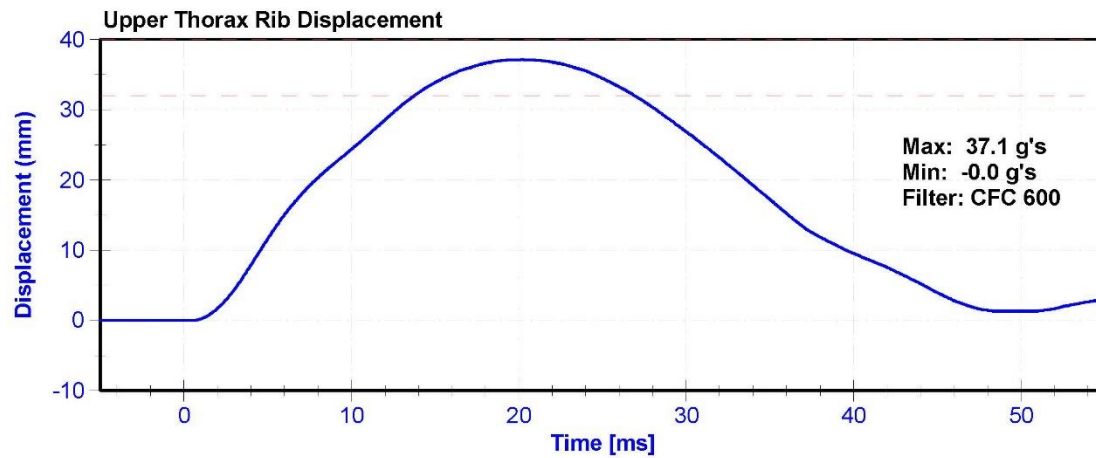
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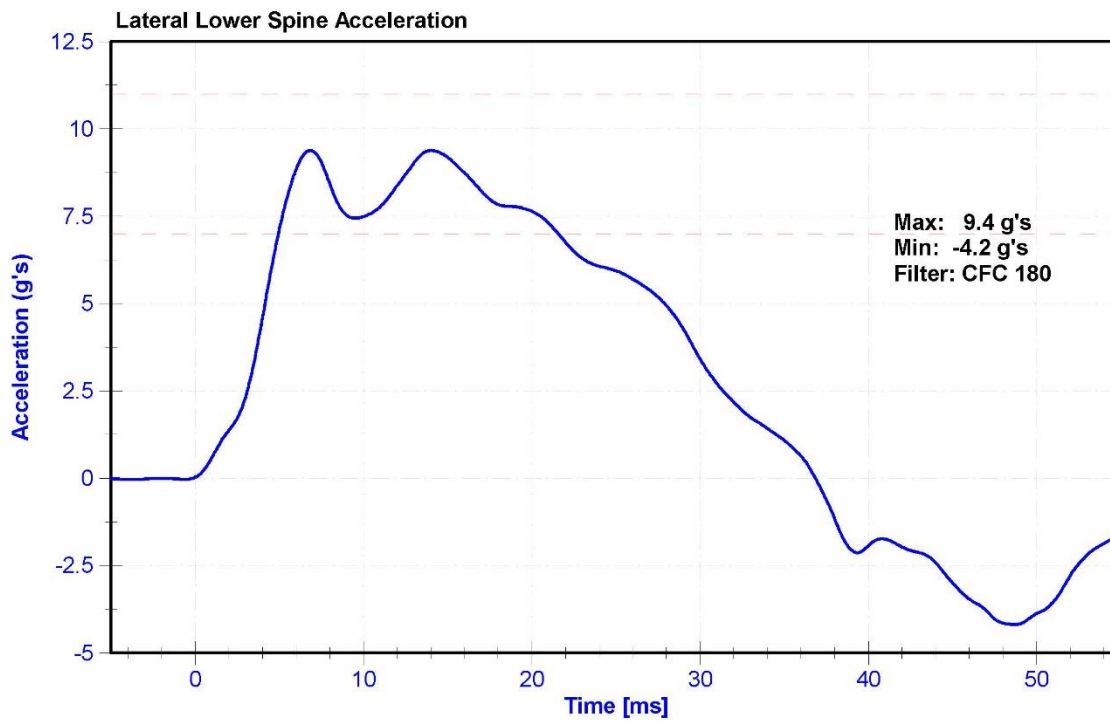
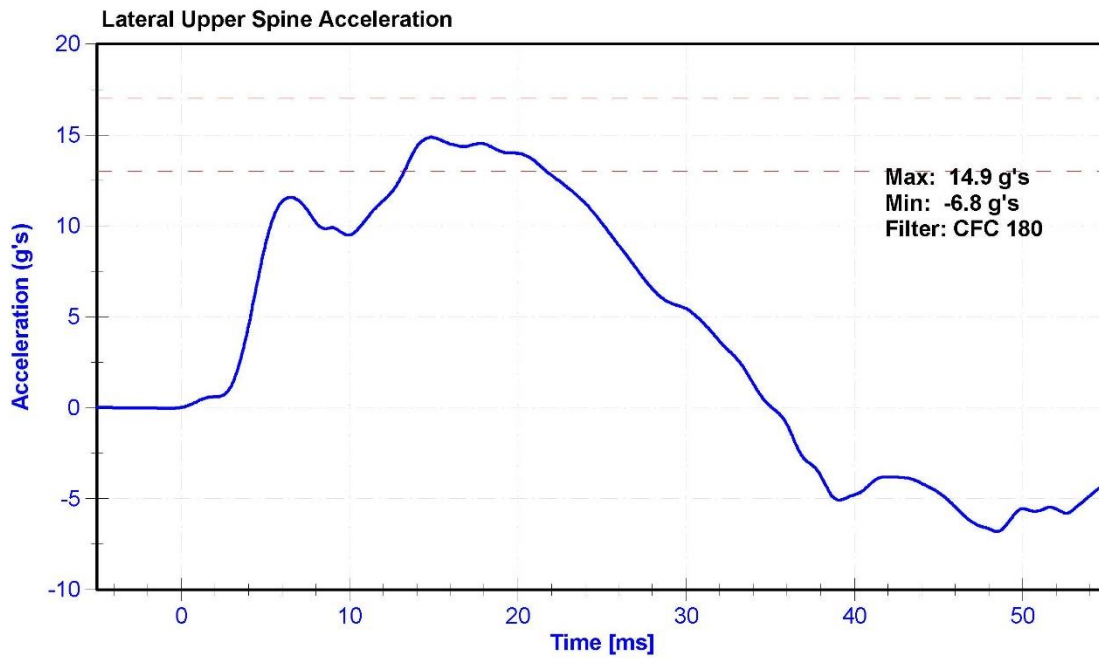
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	31.8	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	14	18	g's	15.3	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.9	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.4	Pass
Upper Thorax Rib Deflection	32	40	mm	37.1	Pass
Middle Thorax Rib Deflection	39	45	mm	41.1	Pass
Lower Thorax Rib Deflection	35	43	mm	36.4	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 7264CT	AC-P63561	10/31/2017	5/1/2018
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P83319	10/31/2017	5/1/2018
Upper Thorax Rib Potentiometer	Servo 08TC1-3621	DS-808GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	12/11/2017	12/11/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	9/27/2017	9/27/2018







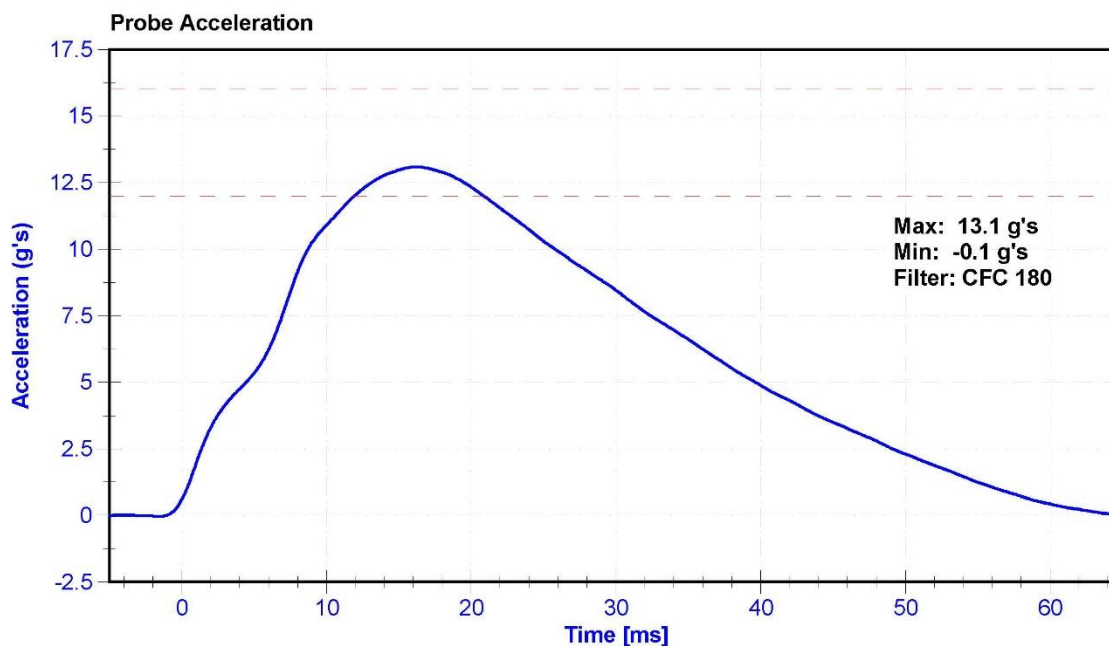
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

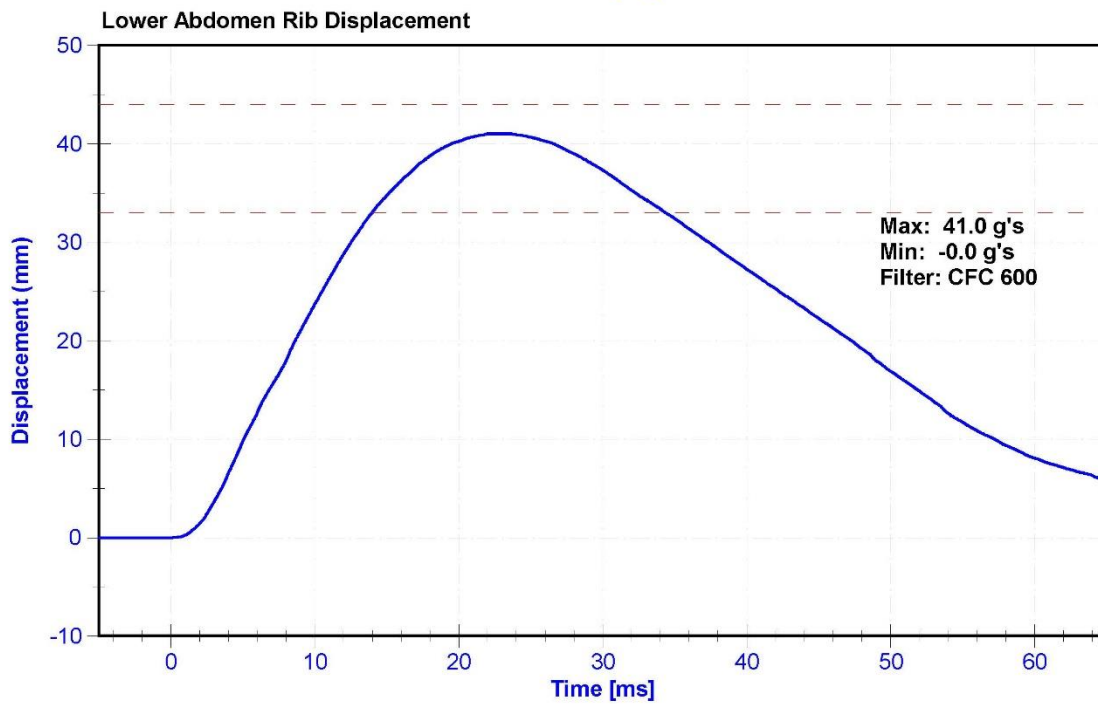
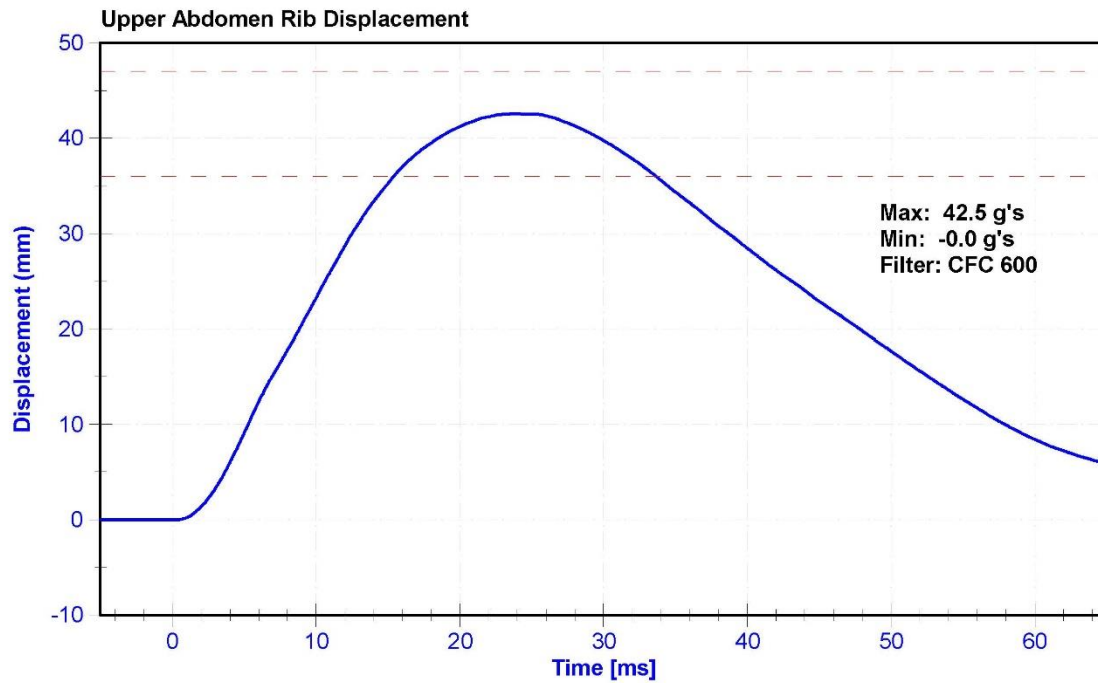
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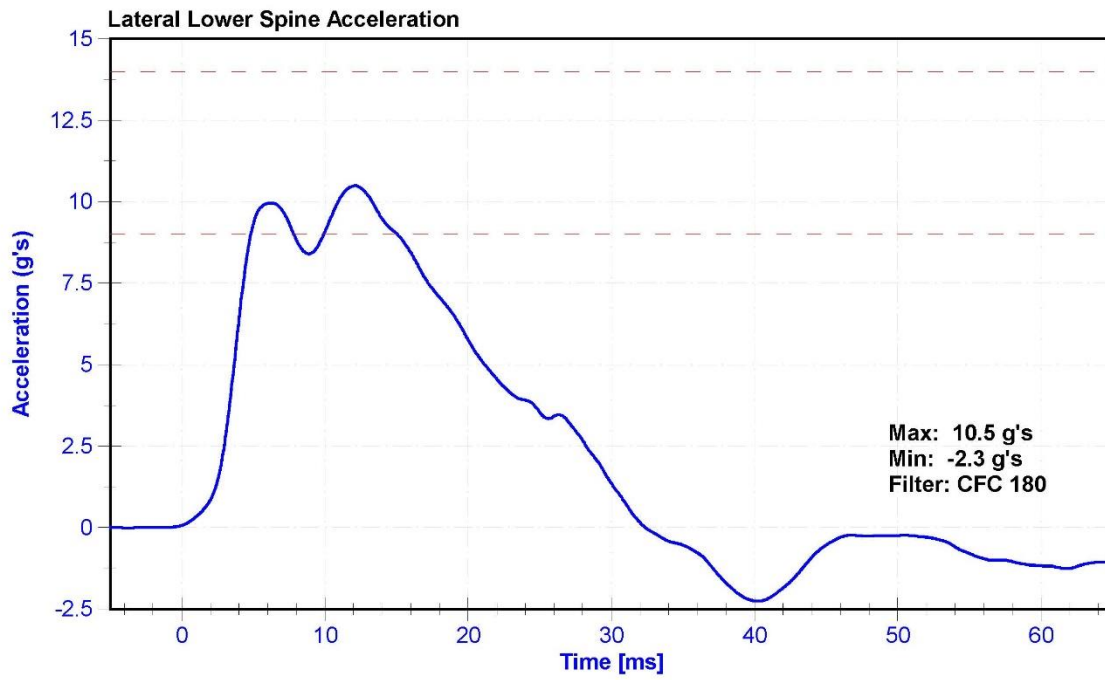
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	31.3	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	12	16	g's	13.1	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.5	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.5	Pass
Lower Abdomen Rib Deflection	33	44	mm	41.0	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-P83319	10/31/2017	5/1/2018
Upper Abdomen Rib Potentiometer	Servo 08TC1-3725	DS-008GFE	9/27/2017	9/27/2018
Lower Abdomen Rib Potentiometer	Servo 08TC1-3745	DS-1774GFE	9/27/2017	9/27/2018







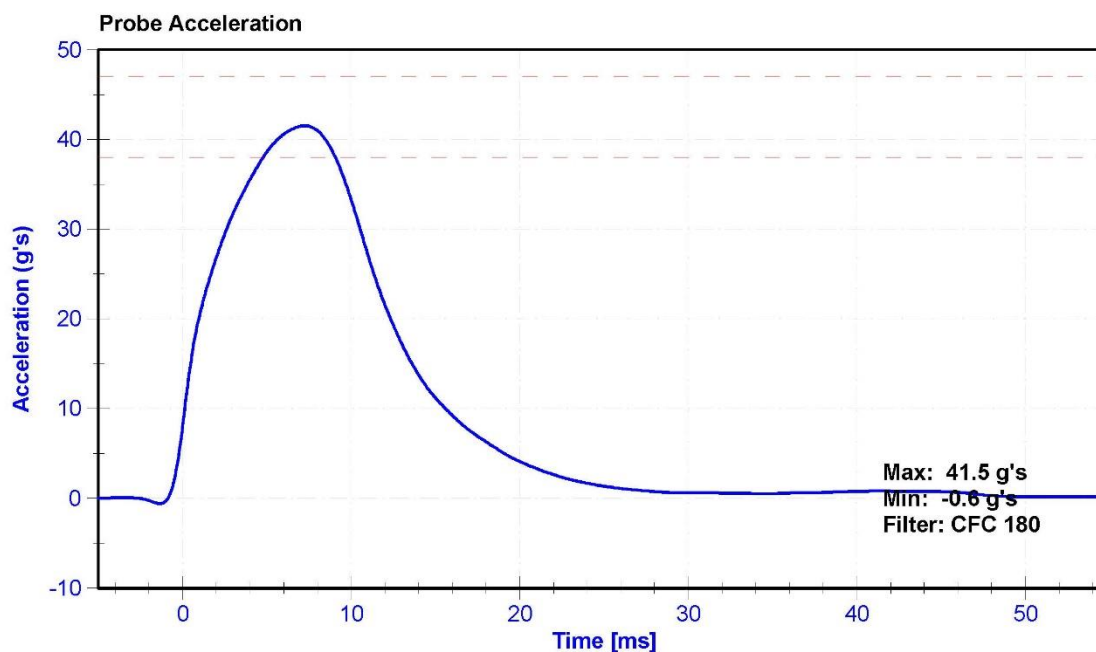
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

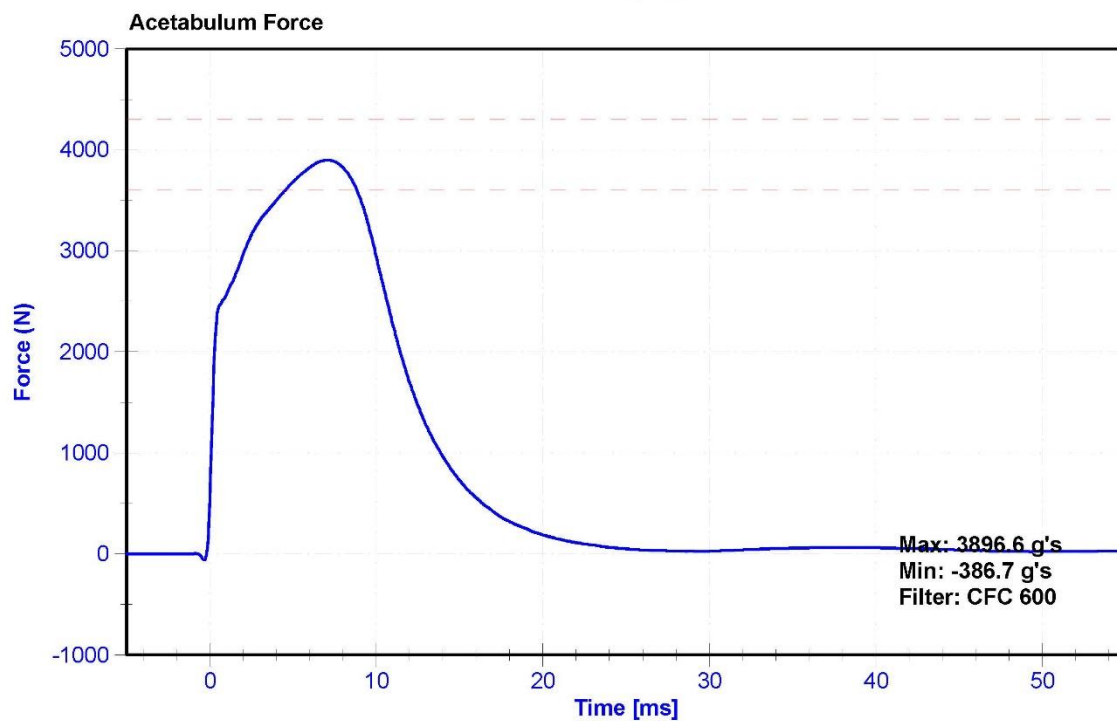
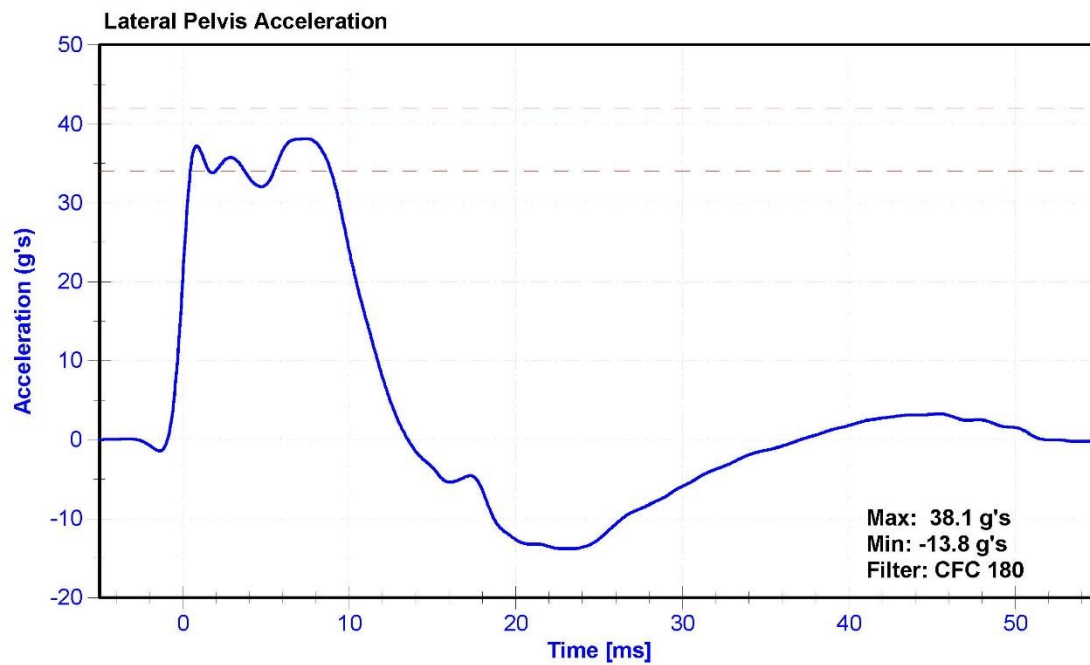
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	36.5	Pass
Velocity	6.6	6.8	m/s	6.61	Pass
Probe Acceleration	38	47	g's	41.5	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	38.1	Pass
Acetabulum Force	3600	4300	N	3896.6	Pass

Transducer Calibrations

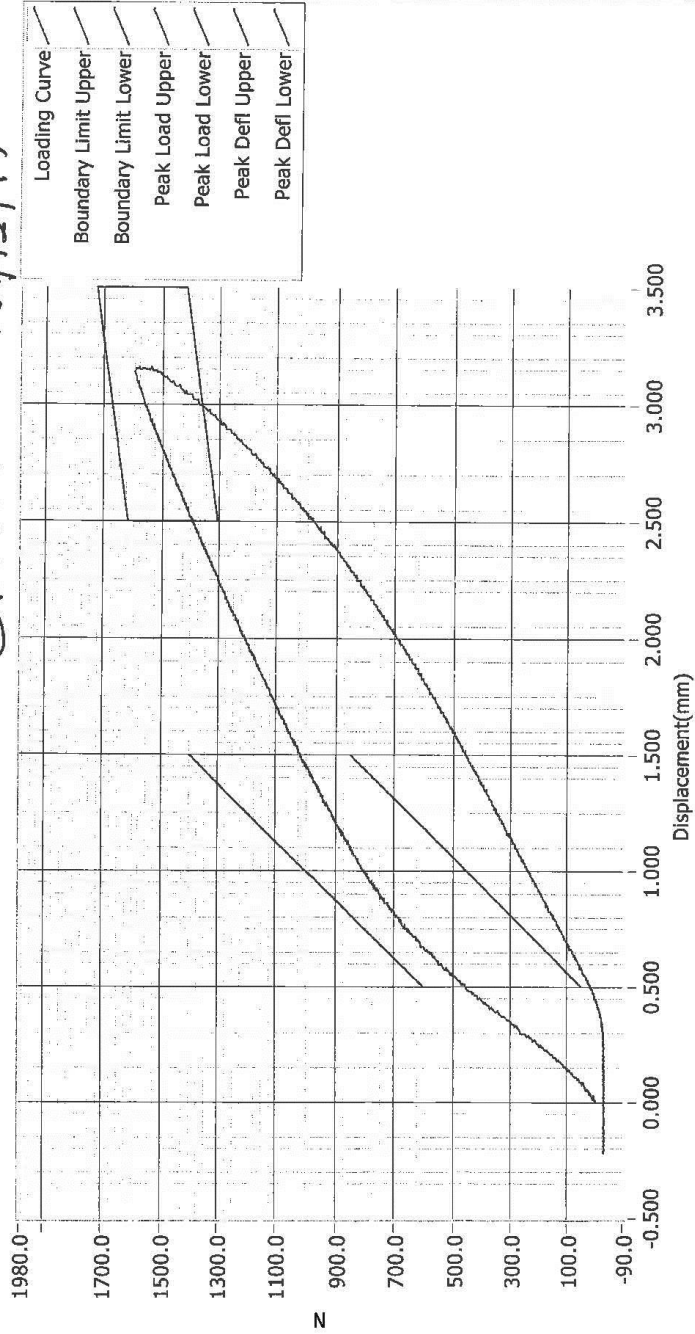
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51875	10/31/2017	5/1/2018
Acetabulum Load Cell	Denton 3249J	LC-267Fy	6/6/2017	6/6/2018
Certification Plug	Humanetics	65063	04/05/2013	N/A
Crash Test Plug	Humanetics	80890	11/25/2014	N/A





Resultant Data - SIDIIs Plug Compression

CLASH 12/12/17



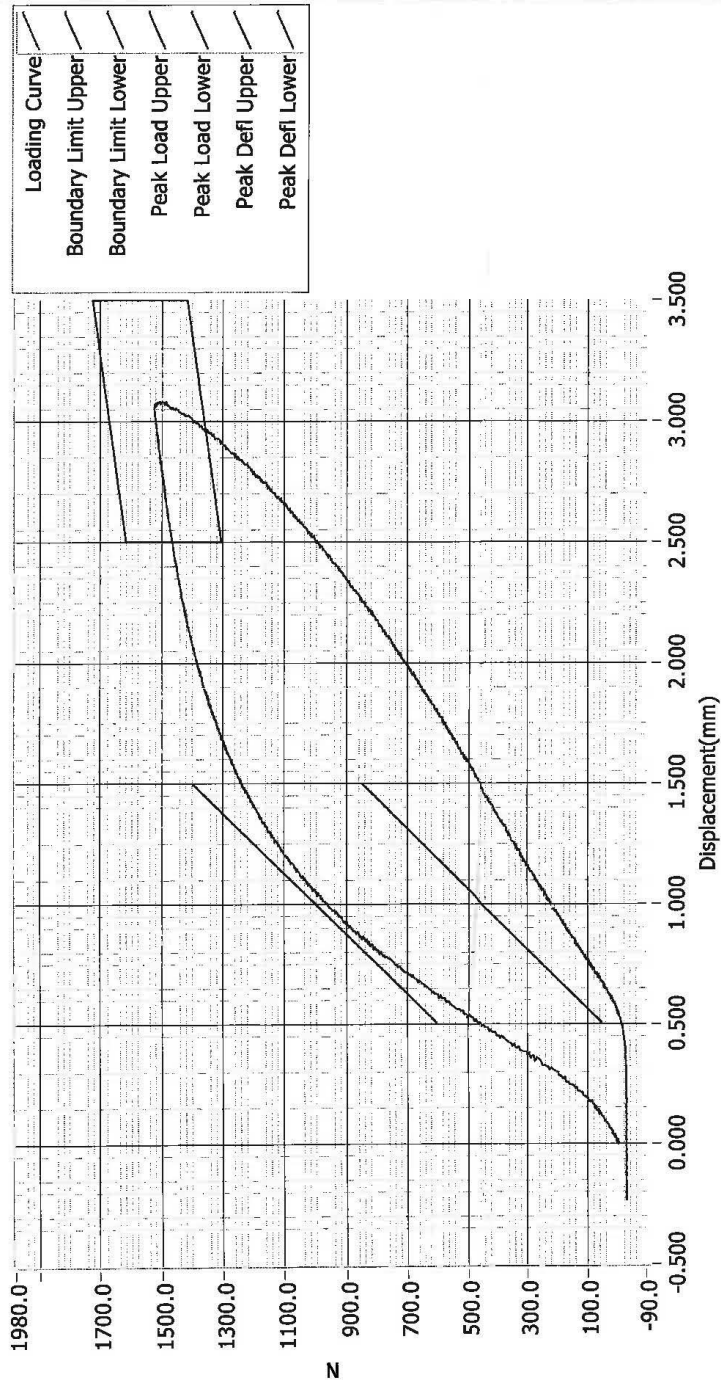
ATD Calibration Lab

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

Current Date : 11/25/2014 Current Time : 06:30:19

CERT 12/11/15

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	65063	4/5/2013	8:52 PM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 4/5/2013 Current Time : 20:53:09

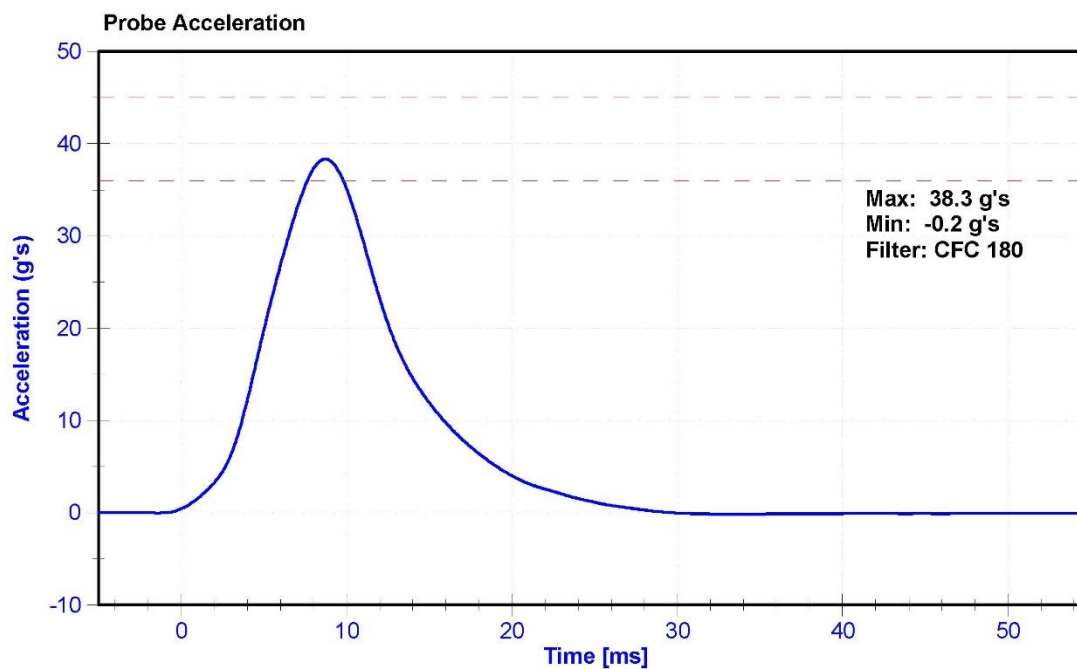
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

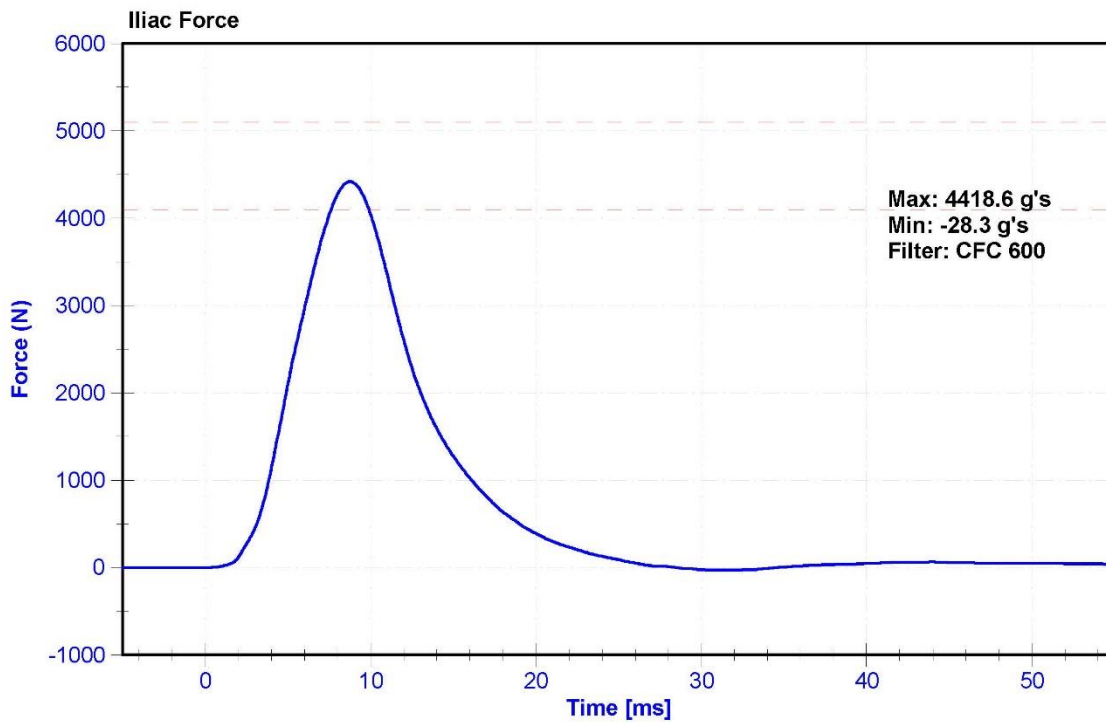
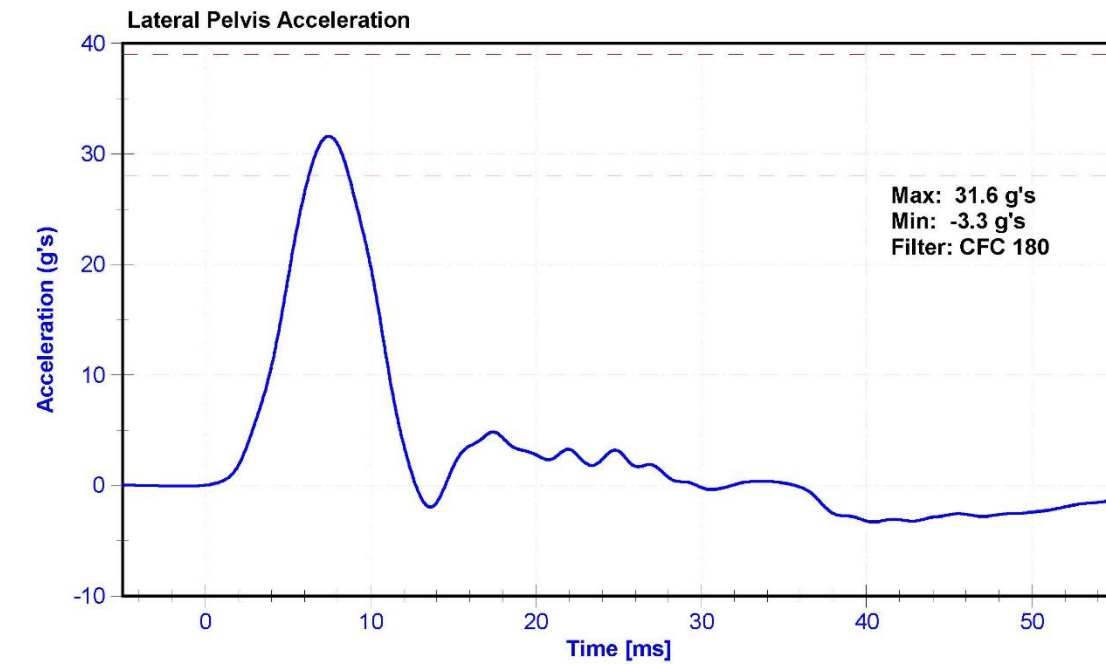
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	30.3	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	36	45	g's	38.3	Pass
Lateral Pelvis Acceleration	28	39	g's	31.6	Pass
Iliac Force	4100	5100	N	4418.6	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-P51875	10/31/2017	5/1/2018
Iliac Load Cell	DENTON 3228J	LC-281Fy	6/6/2017	6/6/2018





CALIBRATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

SERIAL NO: F034

(CONFIGURED FOR LEFT SIDE IMPACT)

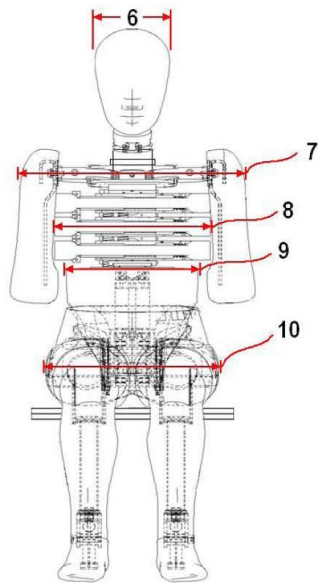


External Measurements - EuroSID-2re

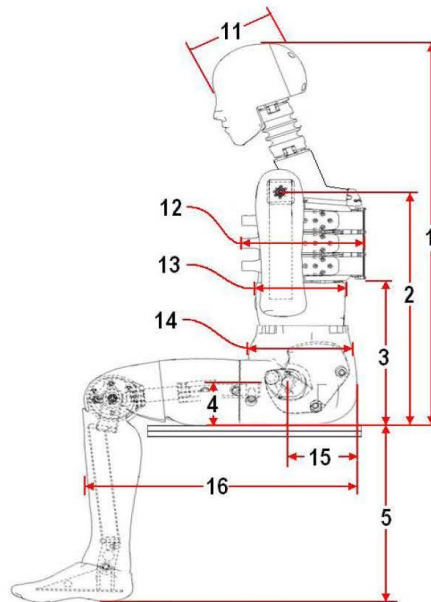
Technician: S. McCloskey

Date: 12/14/2017

Dummy Serial Number: F034



FRONT VIEW



SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	912	Pass
2	Seat to Shoulder Joint	558	572	565	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	352	Pass
4	Seat to Hip Joint (center of bolt)	97	103	100	Pass
5	Sole to Seat, Sitting	333	451	420	Pass
6	Head Width	152	158	154	Pass
7	Shoulder/Arm Width	461	479	468	Pass
8	Thorax Width	322	332	325	Pass
9	Abdomen Width	273	287	282	Pass
10	Pelvis Lap Width	359	373	370	Pass
11	Head Depth	196	206	202	Pass
12	Thorax Depth	262	272	268	Pass
13	Abdomen Depth	194	204	199	Pass
14	Pelvis Depth	235	245	241	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	155	Pass
16	Back of Buttocks to Front Knee	597	615	600	Pass

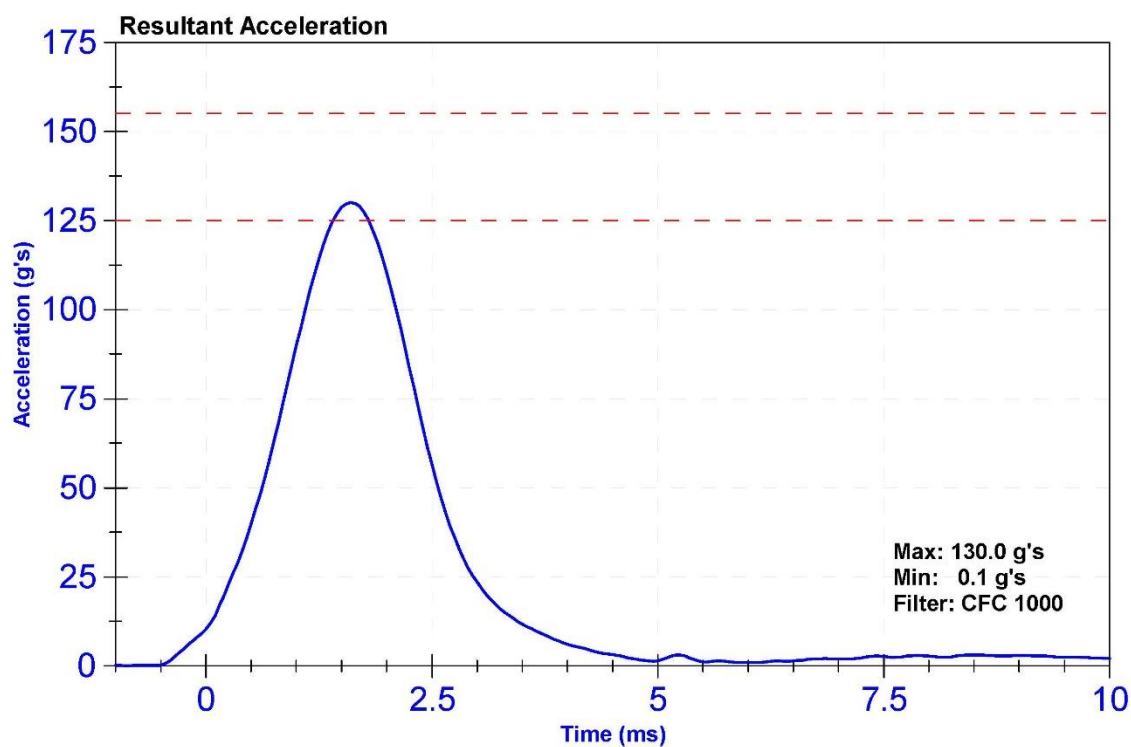
ATD Manufacturer	DP6741	Test Technician	M.Hartung
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

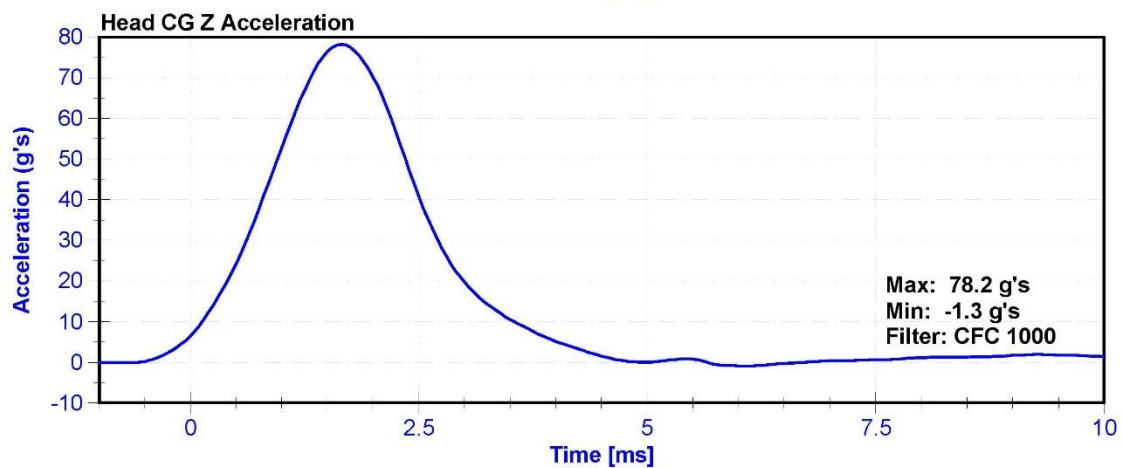
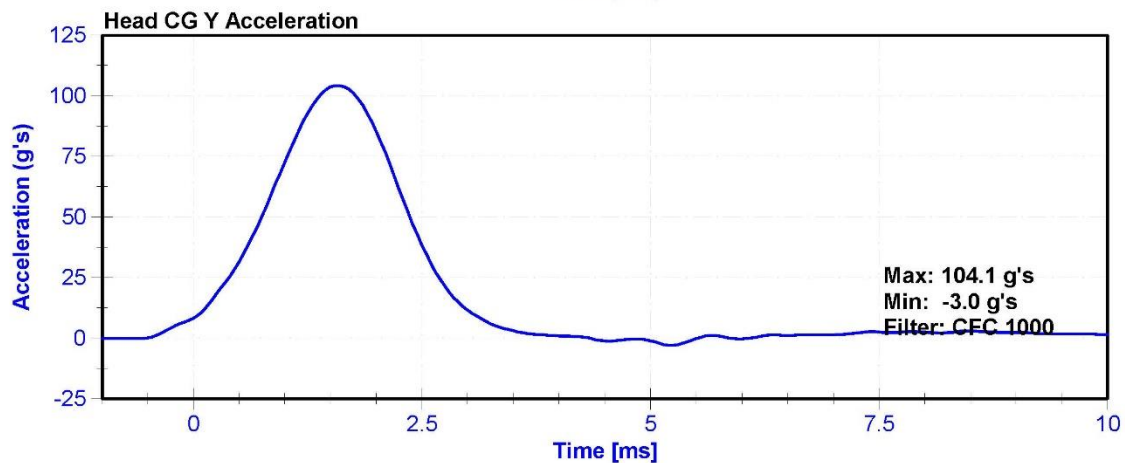
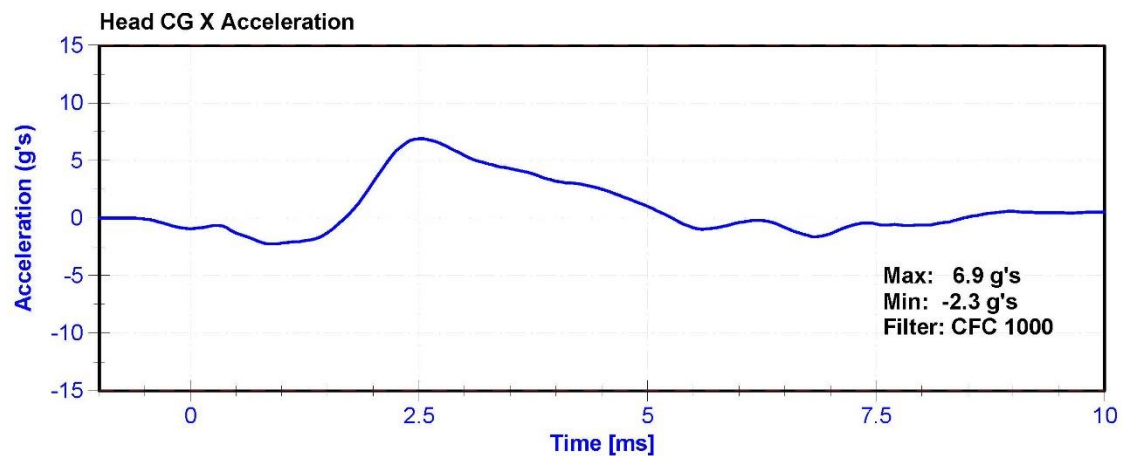
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	22.7	Pass
Resultant Acceleration	125	155	g's	130.0	Pass
Oscillation	0	15	%	2.39	Pass
Fore-Aft Acceleration	-15	15	g's	6.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58904	10/24/2017	4/24/2018
Y Accelerometer	ENDEVCO 7264CT	AC-P58911	10/24/2017	4/24/2018
Z Accelerometer	ENDEVCO 7264CT	AC-P58776	10/24/2017	4/24/2018





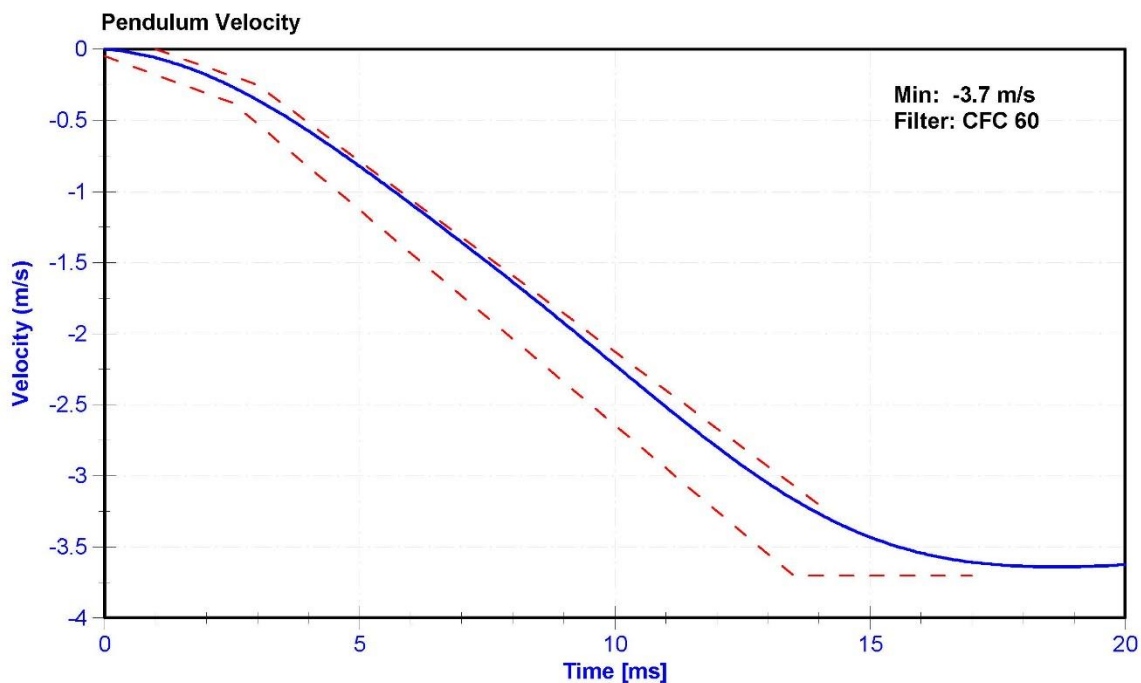
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

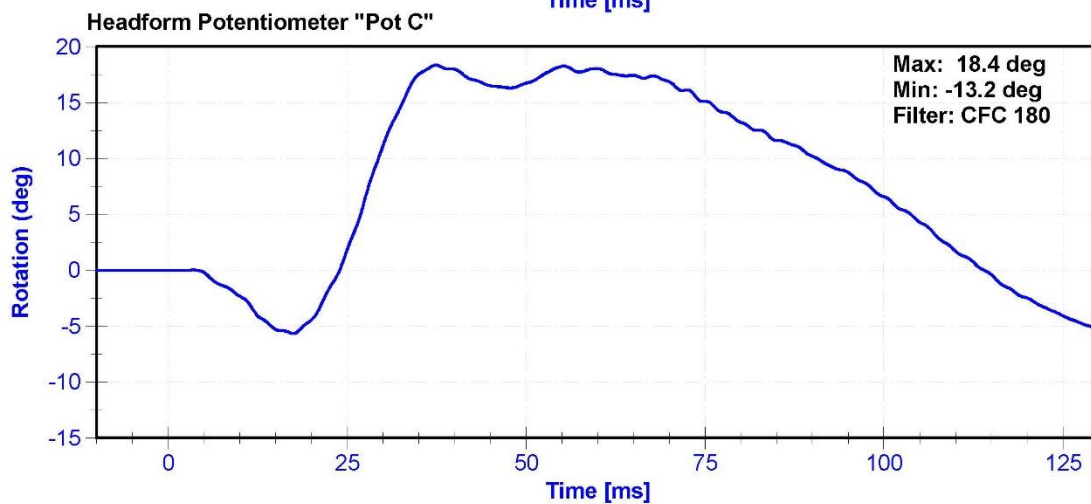
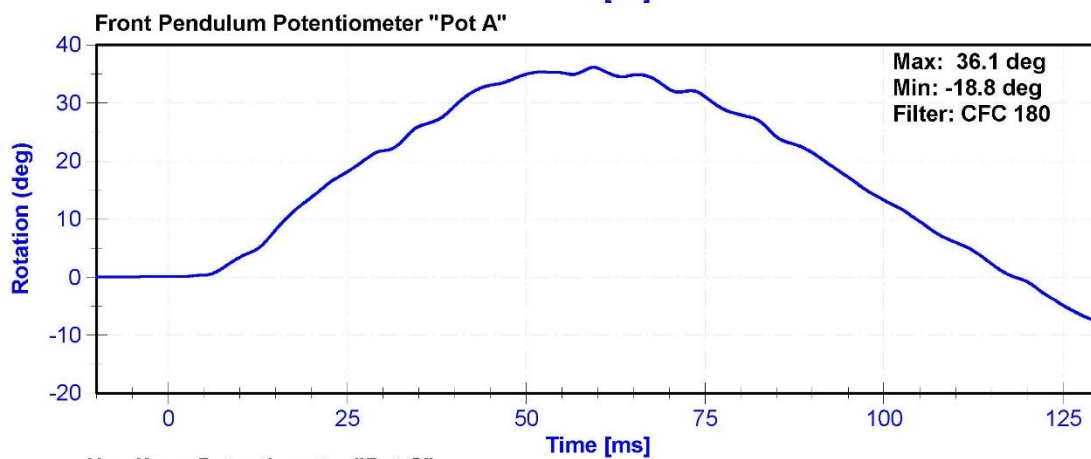
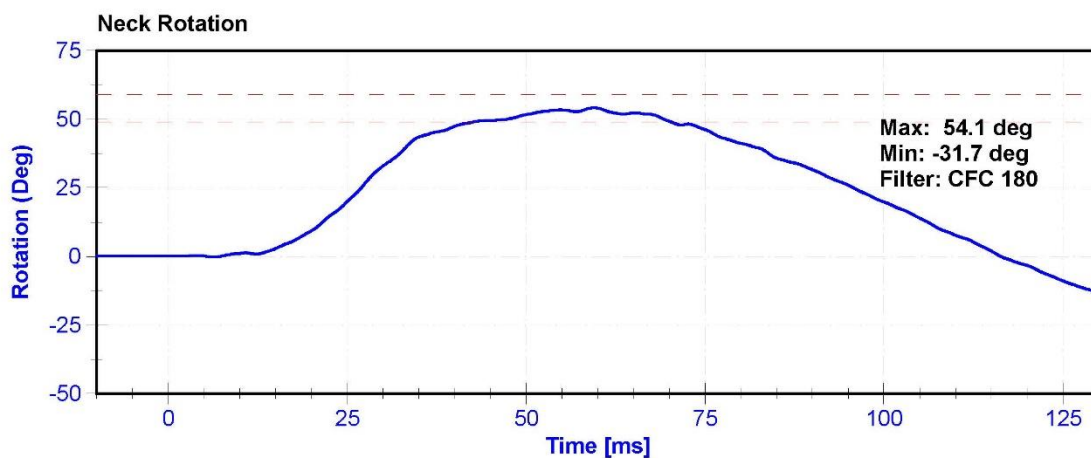
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	22.8	Pass
Velocity	3.3	3.5	m/s	3.42	Pass
Lateral Neck Rotation	49	59	deg	54.1	Pass
Time at Maximum Rotation	54	66	ms	59.5	Pass
Time of Rotation Decay from Maximum	53	88	ms	56.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/11/2017	5/11/2018
Front Pendulum Potentiometer	SP22G	DS-094	10/30/2017	10/30/2018
Headform Potentiometer	SP22G	DS-095	10/30/2017	10/30/2018





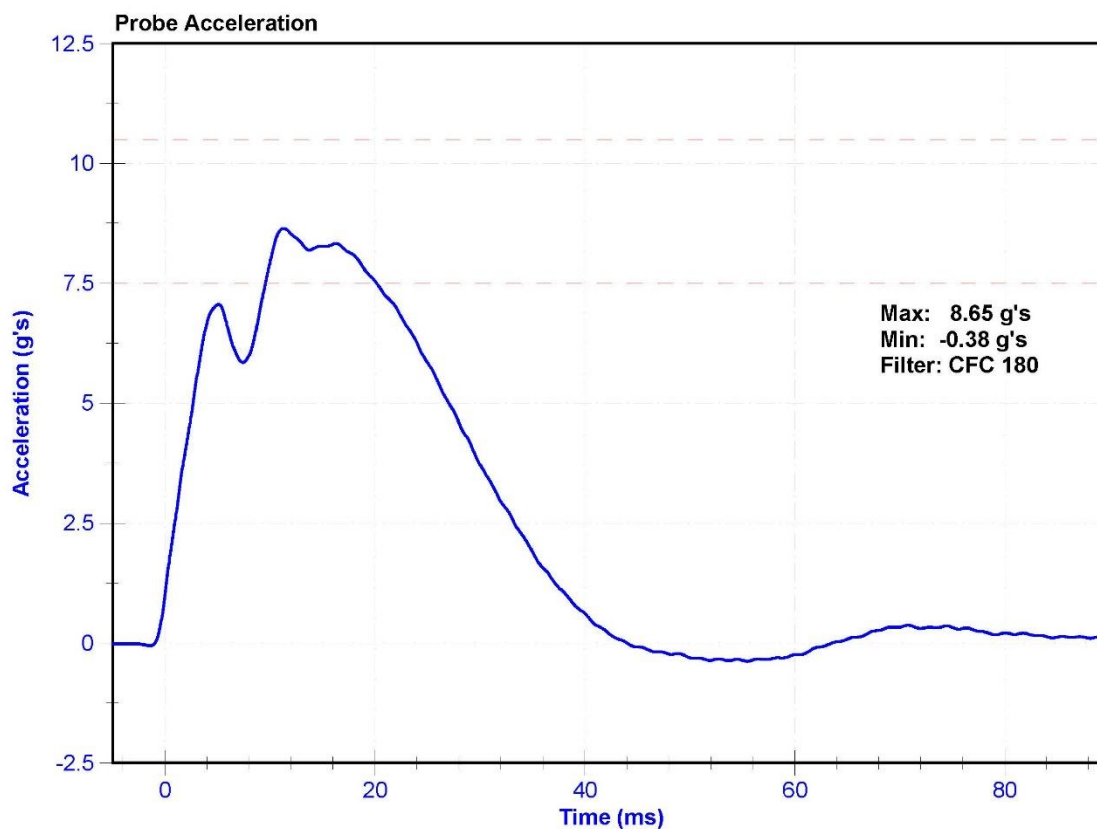
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	21.7	Pass
Velocity	4.2	4.4	m/s	4.22	Pass
Probe Acceleration	7.5	10.5	g's	8.65	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018



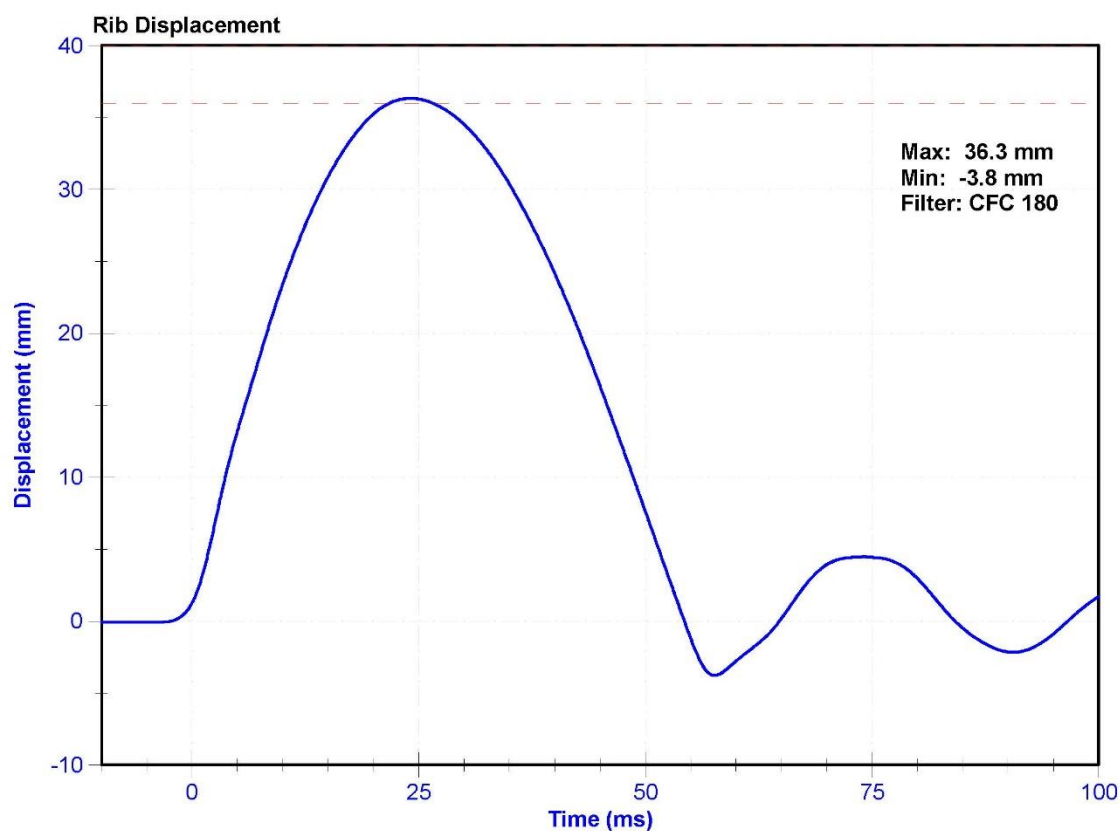
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	27.0	Pass
Rib Displacement	36	40	mm	36.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	9/27/2017	9/27/2018



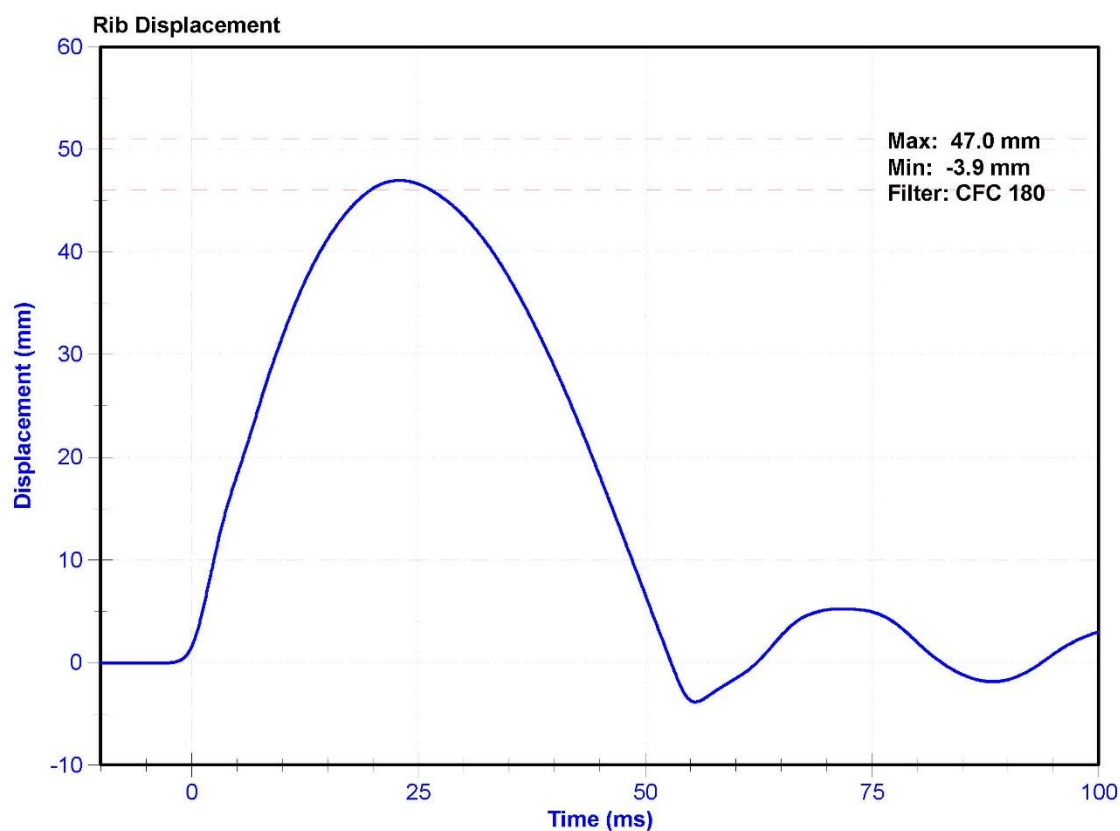
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	27.2	Pass
Rib Displacement	46	51	mm	47.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	9/27/2017	9/27/2018



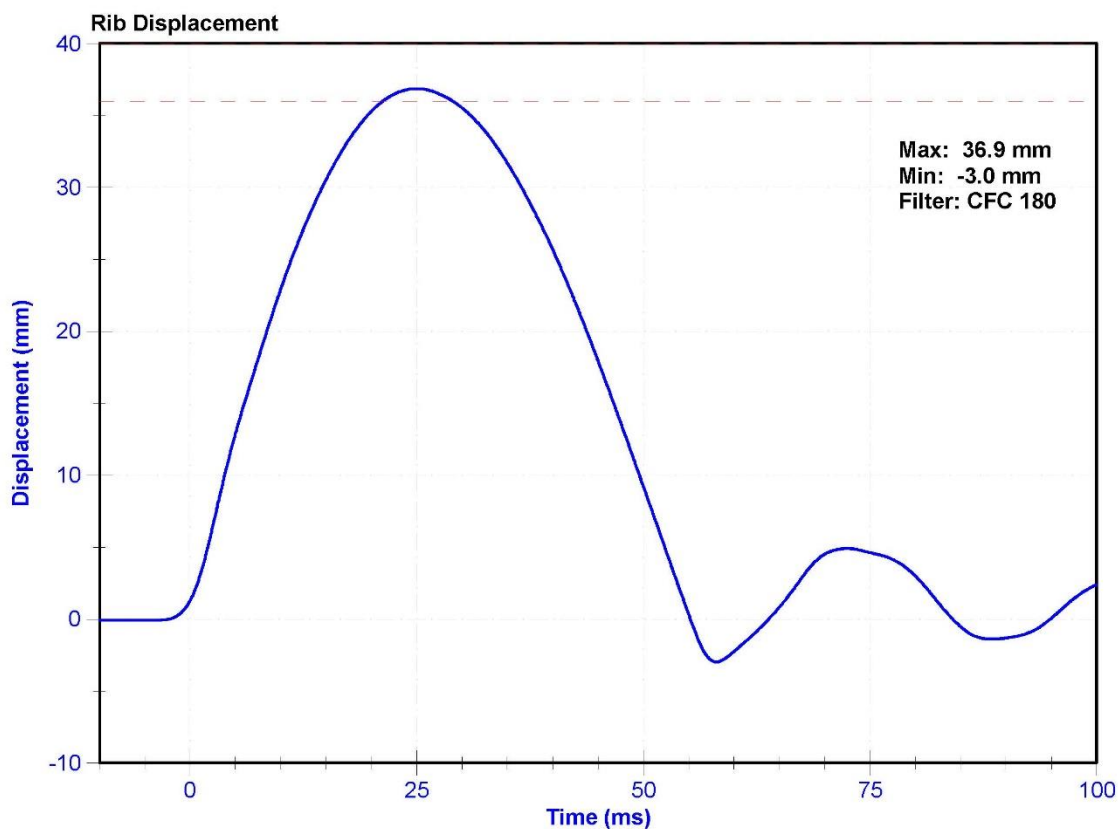
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	27.0	Pass
Rib Displacement	36	40	mm	36.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	9/27/2017	9/27/2018



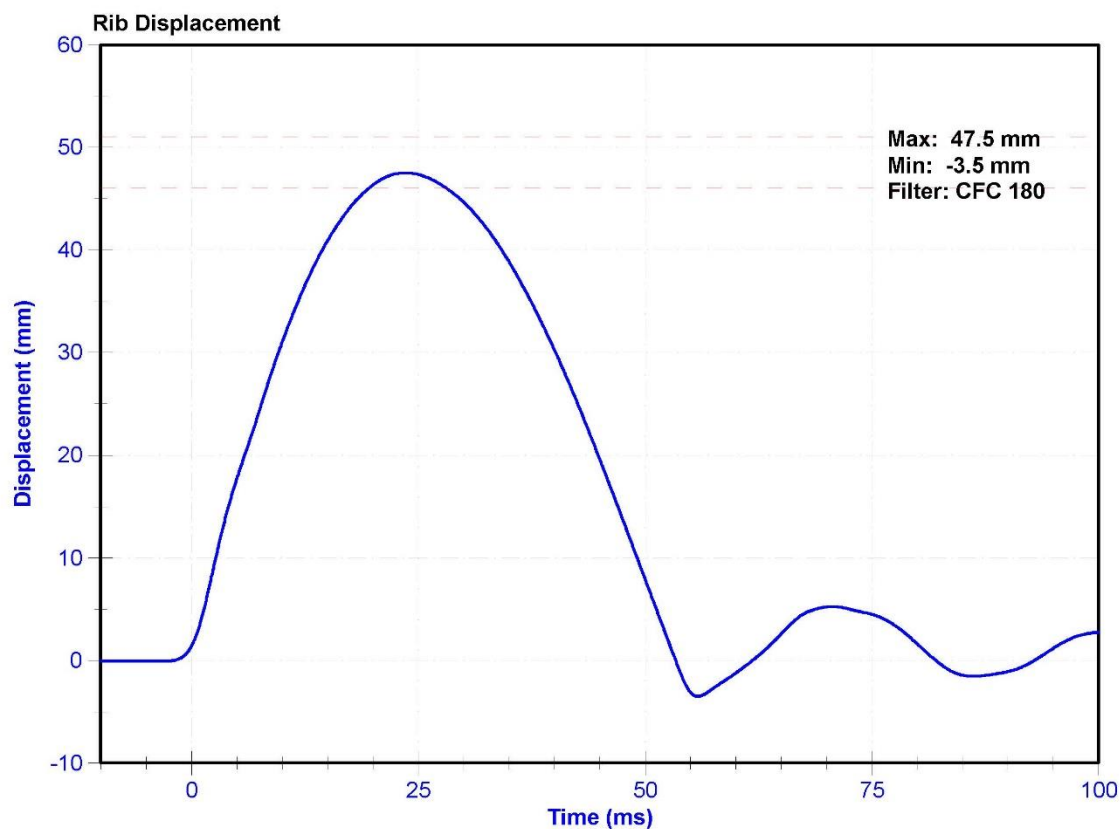
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	27.0	Pass
Rib Displacement	46	51	mm	47.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	9/27/2017	9/27/2018



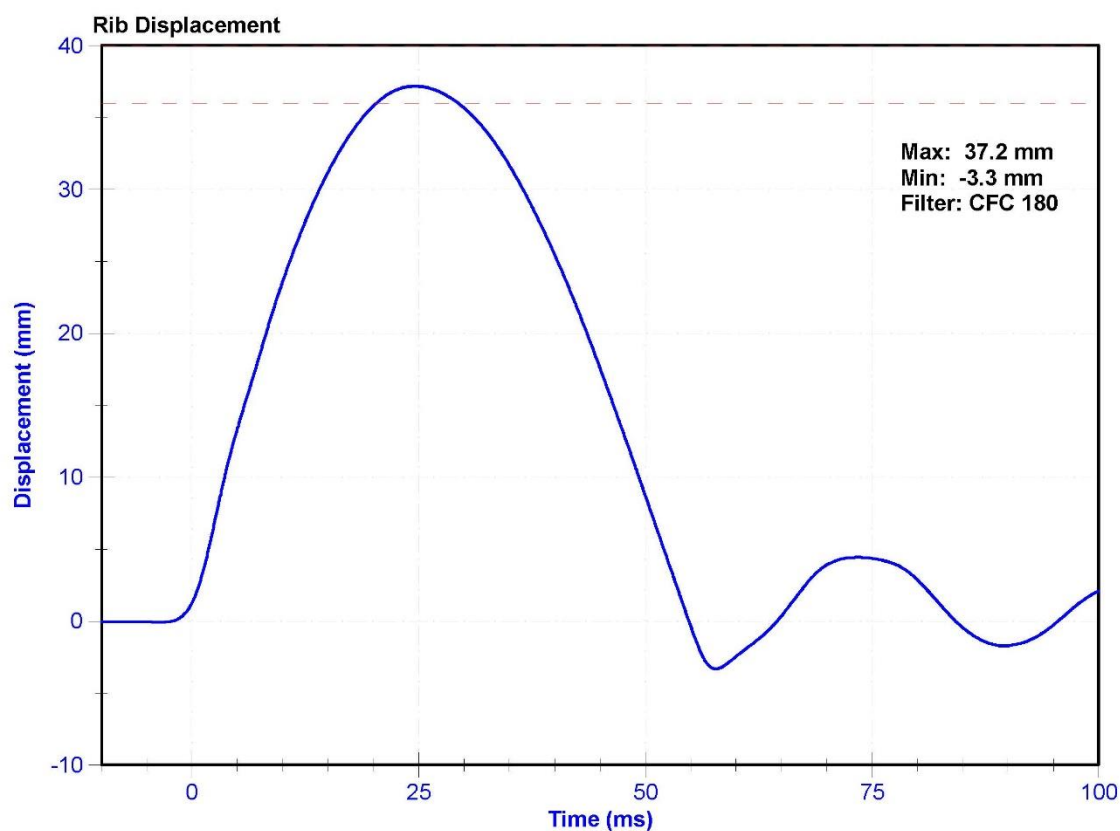
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	37.8	Pass
Rib Displacement	36	40	mm	37.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	9/27/2017	9/27/2018



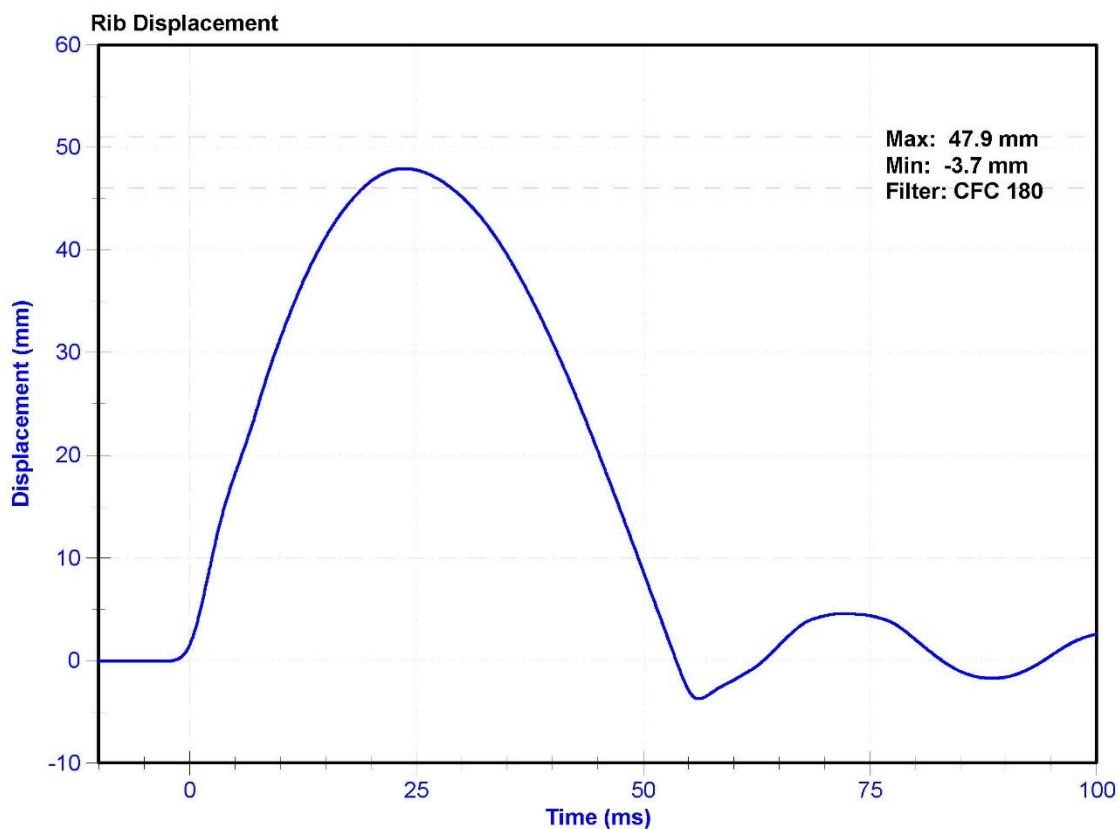
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	27.1	Pass
Rib Displacement	46	51	mm	47.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	9/27/2017	9/27/2018



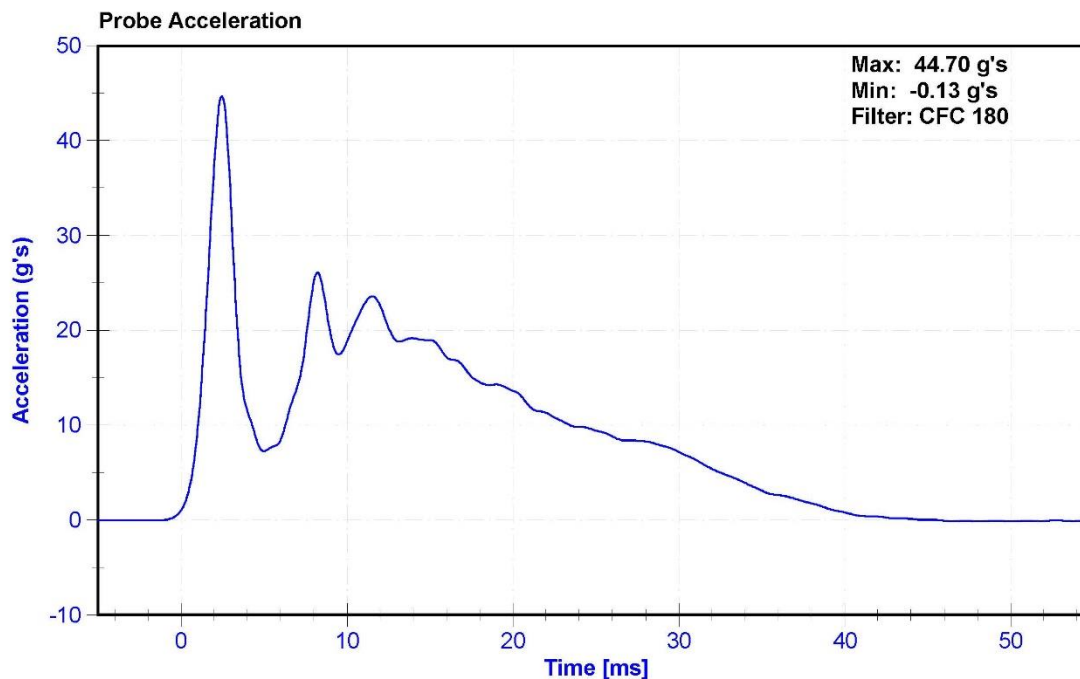
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

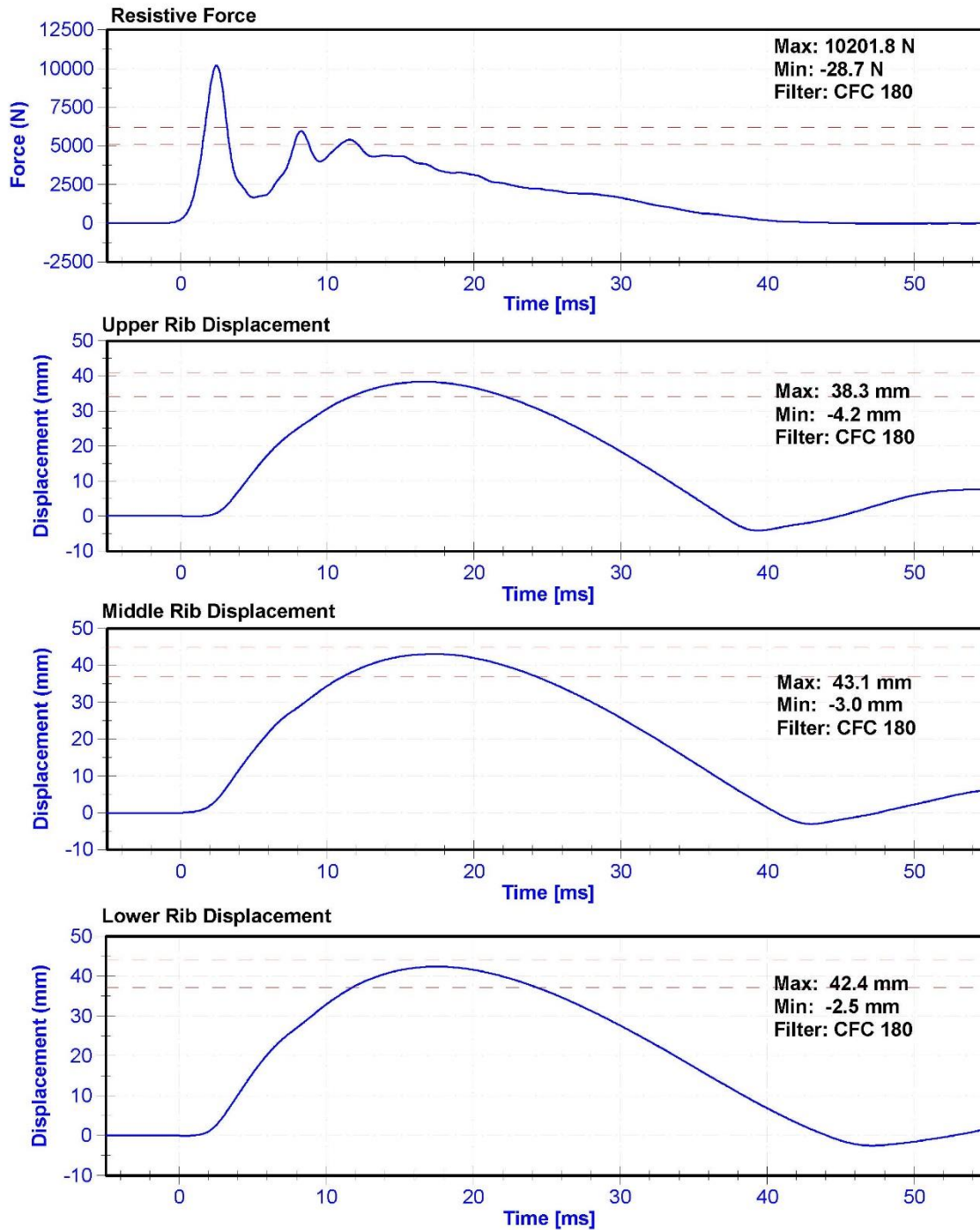
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	23.2	Pass
Velocity	5.4	5.6	m/s	5.56	Pass
Resistive Force after 6ms	5100	6200	N	5954.3	Pass
Upper Thorax Rib Deflection	34	41	mm	38.3	Pass
Mid Thorax Rib Deflection	37	45	mm	43.1	Pass
Lower Thorax Rib Deflection	37	44	mm	42.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Upper Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	9/27/2017	9/27/2018
Lower Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	9/27/2017	9/27/2018





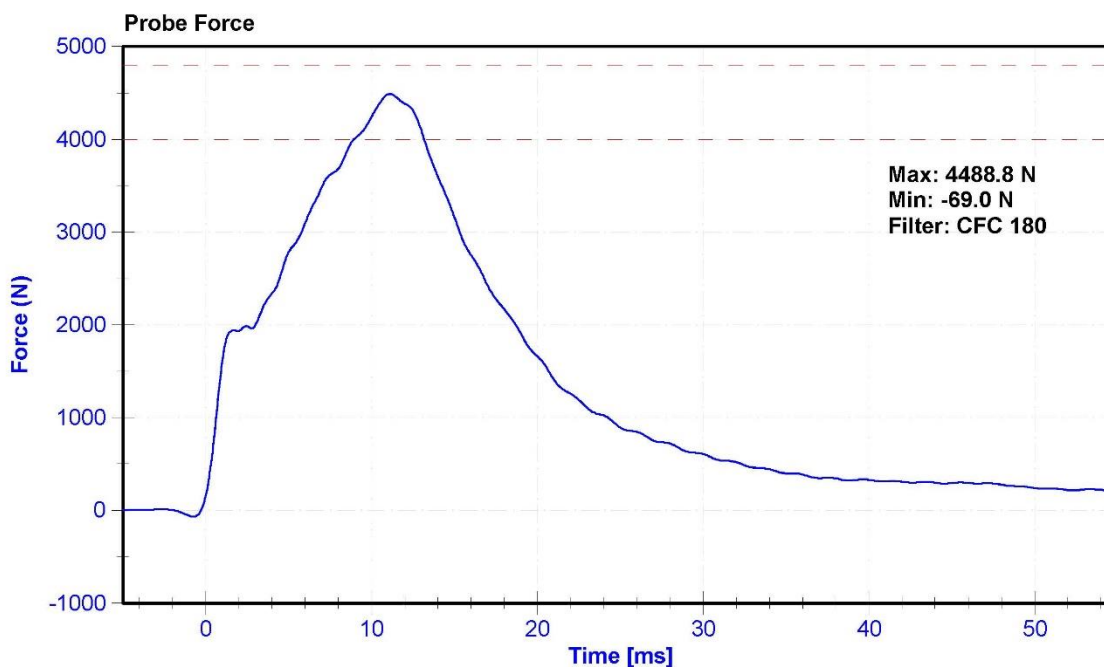
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

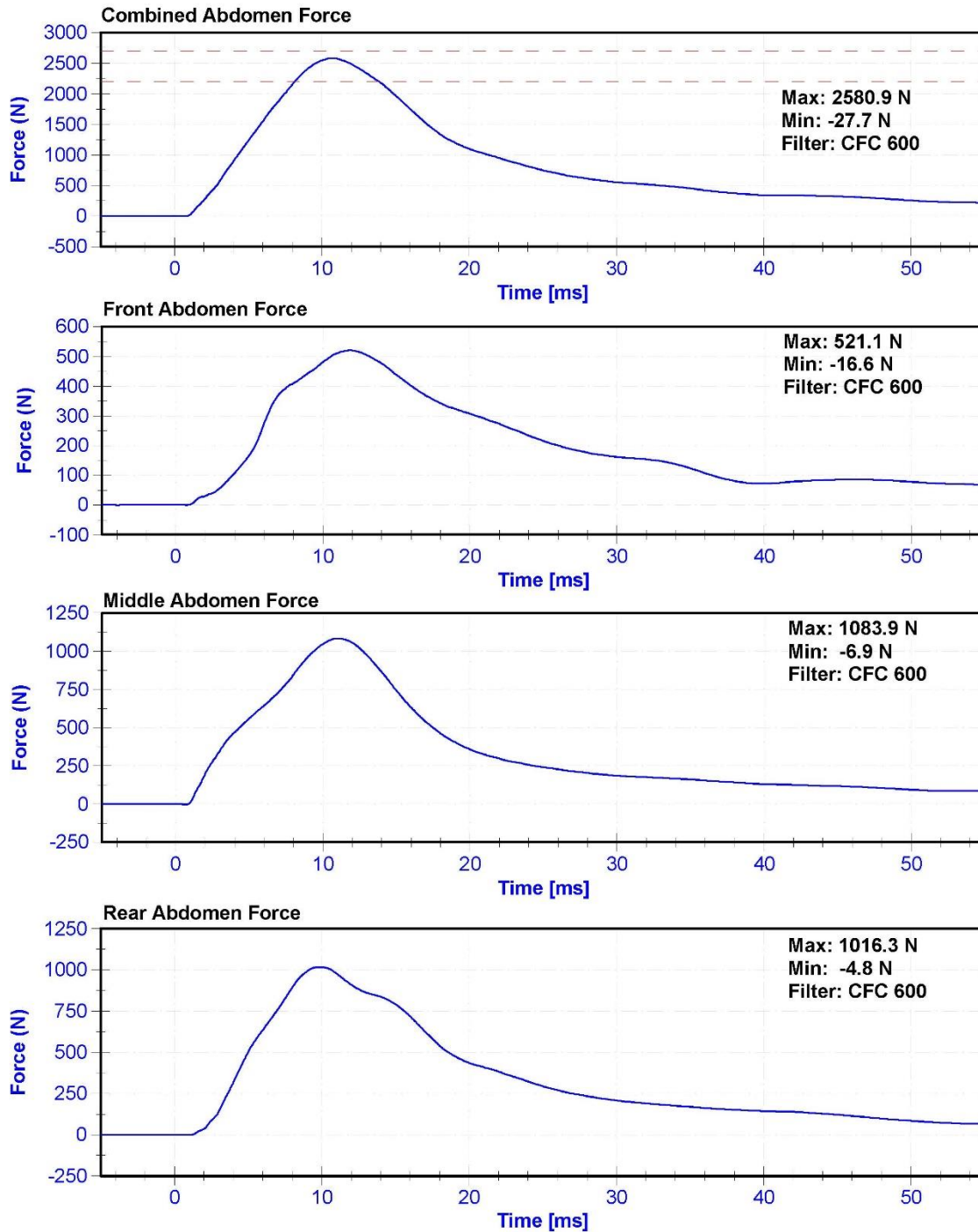
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	25.6	Pass
Velocity	3.9	4.1	m/s	4.07	Pass
Combined Abdomen Force	2200	2700	N	2580.9	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	10.70	Pass
Resistive Probe Force	4000	4800	N	4488.8	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.10	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Front Abdomen Load Cell	DENTON 2631	LC-1512	6/5/2017	6/5/2018
Middle Abdomen Load Cell	DENTON 2631	LC-1526	6/5/2017	6/5/2018
Rear Abdomen Load Cell	DENTON 2631	LC-1516	6/5/2017	6/5/2018







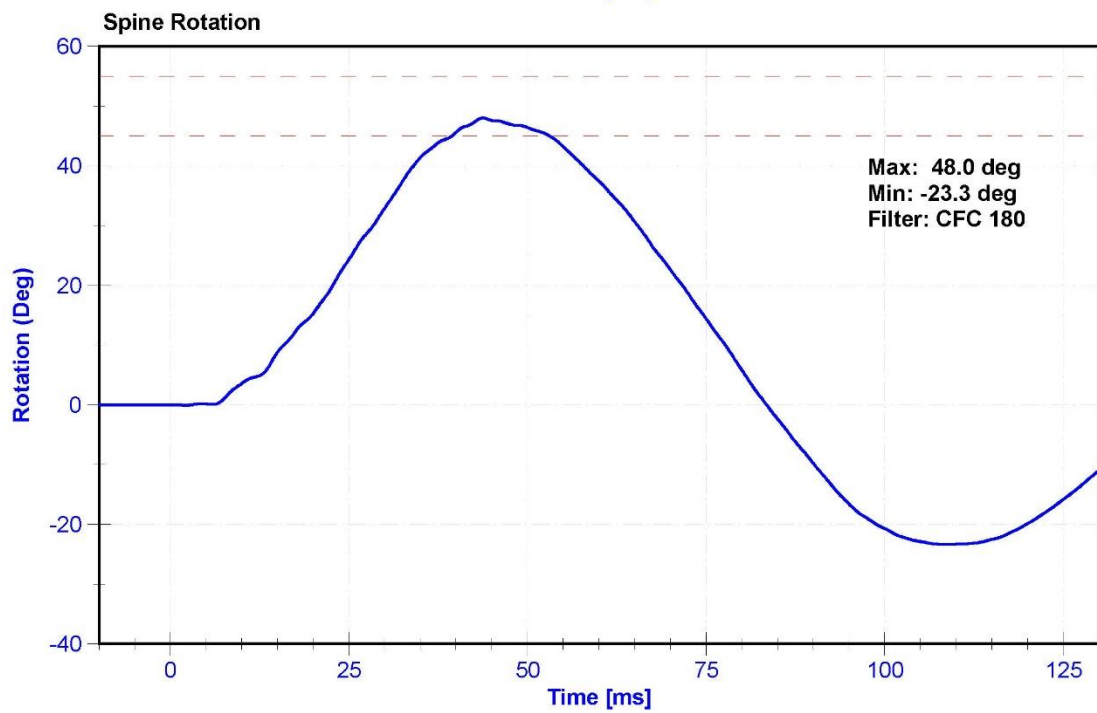
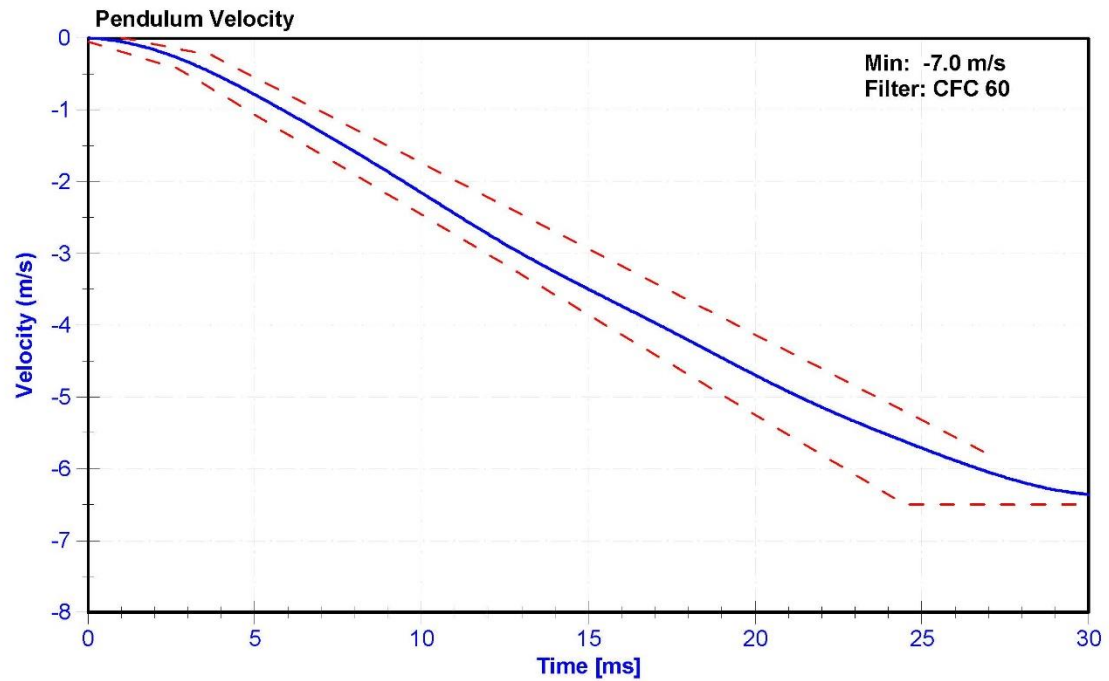
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

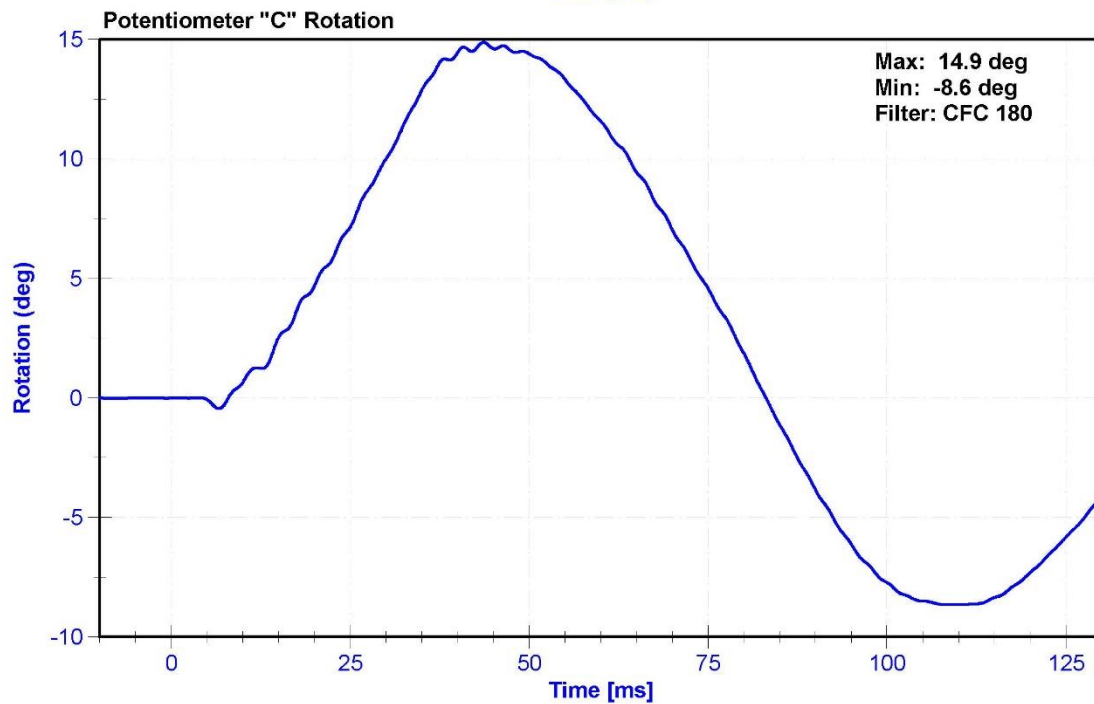
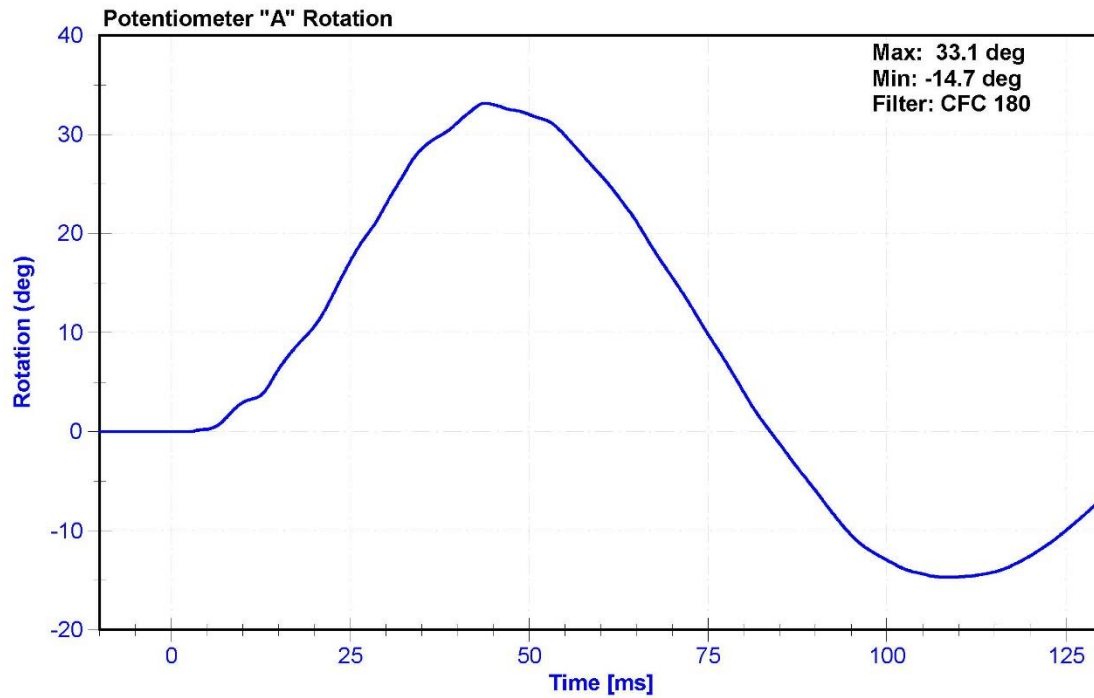
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.3	Pass
Velocity	5.95	6.15	m/s	6.068	Pass
Lateral Spine Rotation	45	55	deg	48.0	Pass
Time at Maximum Rotation	39	53	ms	43.7	Pass
Time of Decay to Zero Degrees	37	57	ms	39.7	Pass
Pulse within Corridor?	-	-	-		

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/11/2017	5/11/2018
Pendulum "A" Potentiometer	SP22G	DS-094	10/30/2017	10/30/2018
Condyle "B" Potentiometer	SP22G	DS-095	10/30/2017	10/30/2018





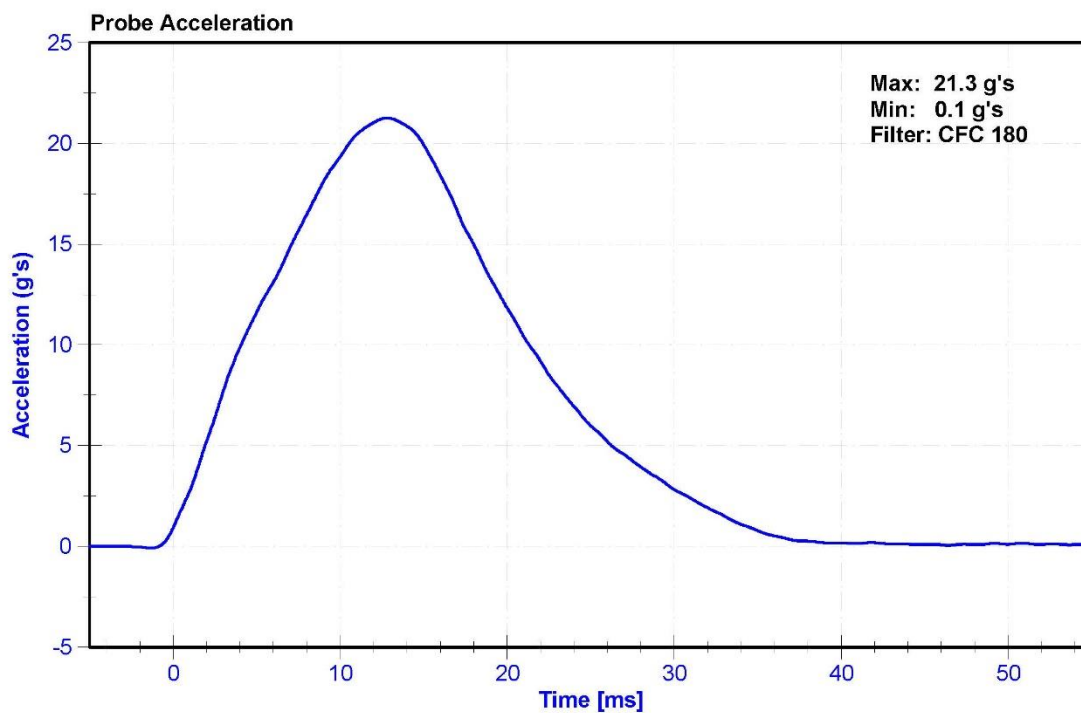
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

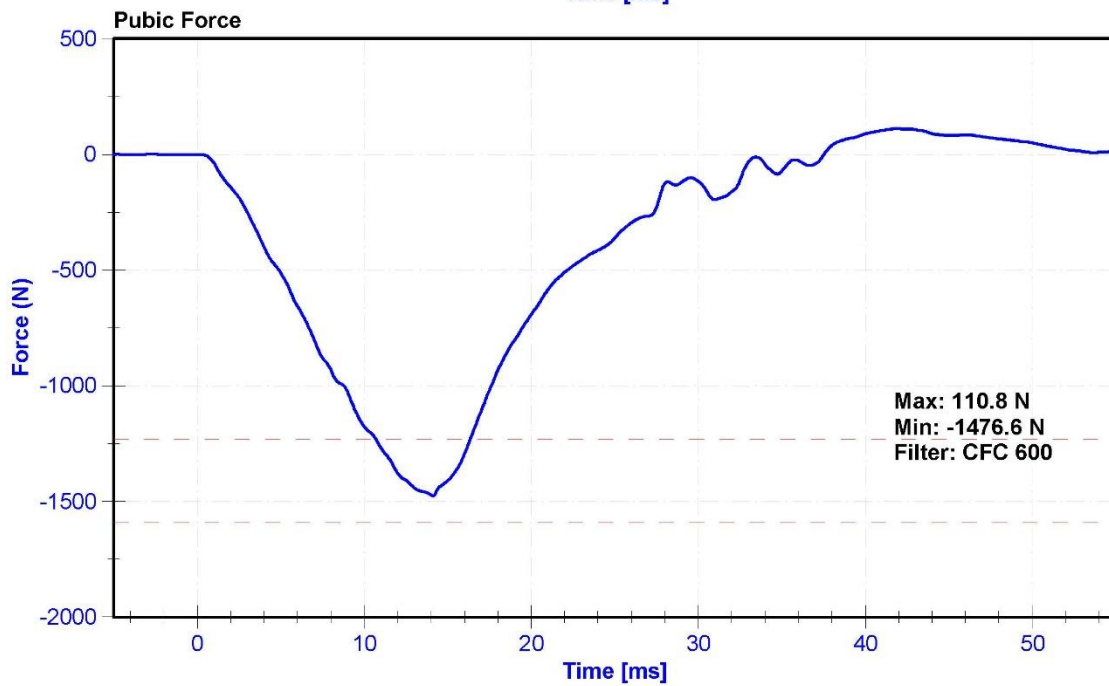
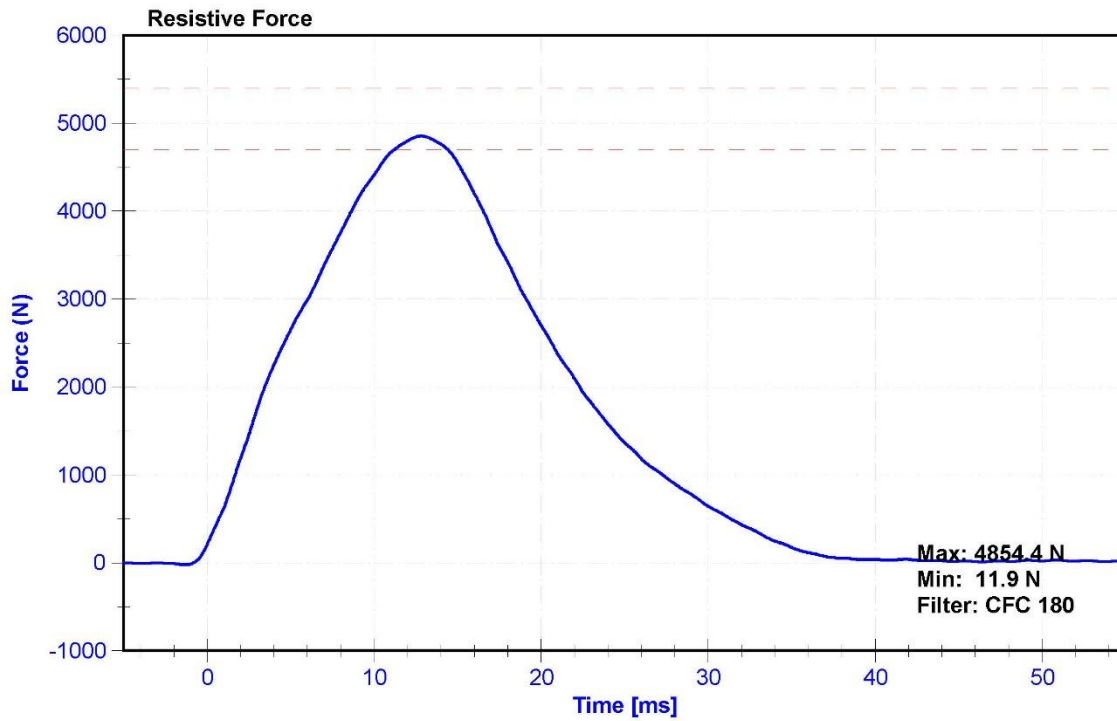
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	25.2	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Resistive Force	4700	5400	N	4854.4	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.80	Pass
Pubic Force	-1590	-1230	N	-1476.6	Pass
Time at Peak Pubic Force	12.2	17.0	ms	14.15	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pubic Load Cell	Denton 3096JFL	LC-465Fy	6/6/2017	6/6/2018





CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: DG8012

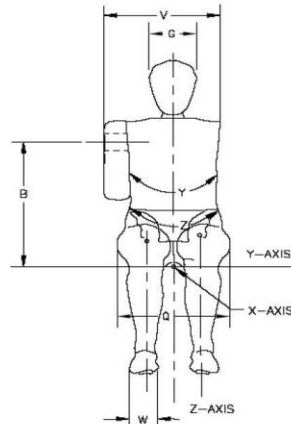
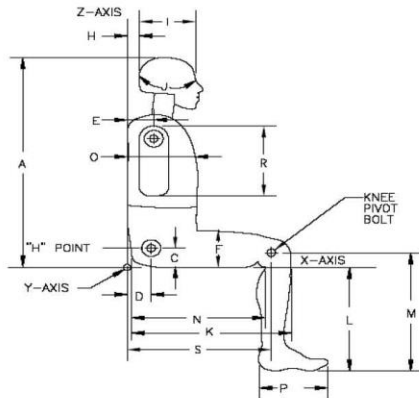


External Measurements - SID-IIs

Technician: S. McCloskey

Date: 12/15/2017

Dummy Serial Number: DG8012



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	444	Pass
C	H-point Height	79	89	87	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	99	Pass
F	Thigh Clearance	119	135	128	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	183	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	351	Pass
M	Knee Pivot to floor height	392	409	399	Pass
N	Buttock Popliteal Length	416	442	428	Pass
O	Chest Depth w/o jacket	195	211	205	Pass
P	Foot Length	216	232	222	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	320	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	488	Pass
V	Shoulder Width	341	357	347	Pass
W	Foot Width	78	94	86	Pass
Y	Chest Circumference w/jacket	851	881	861	Pass
Z	Waist Circumference	761	791	771	Pass

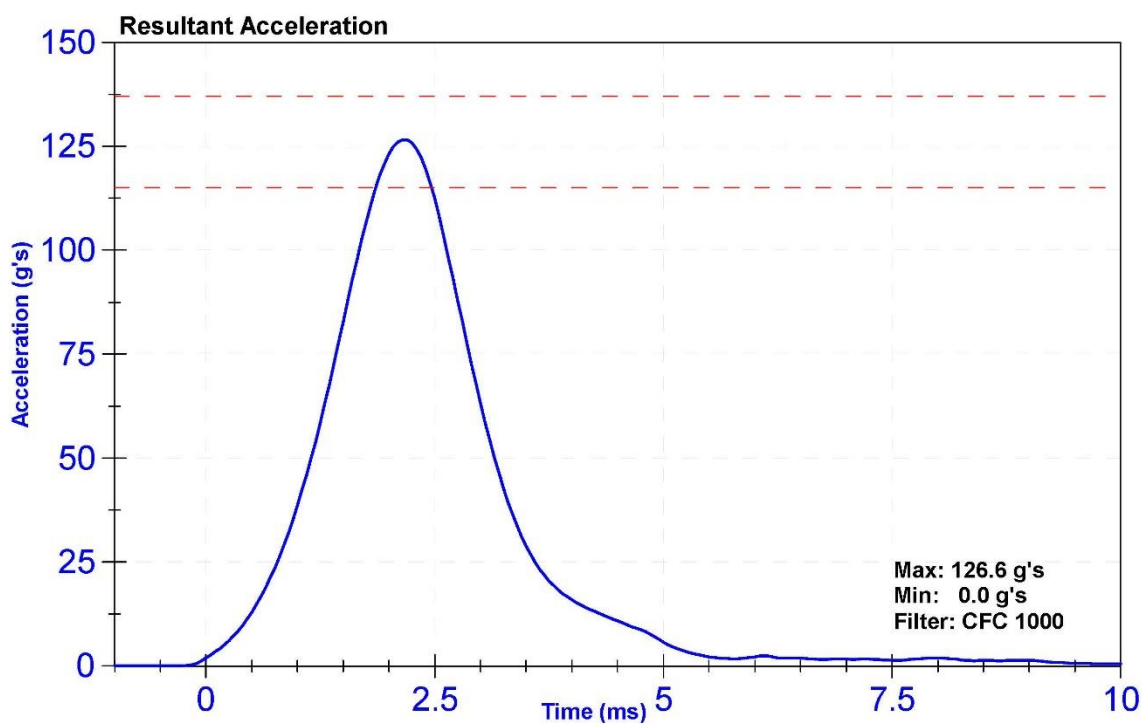
ATD Manufacturer	FTSS	Test Technician	S. Keller
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

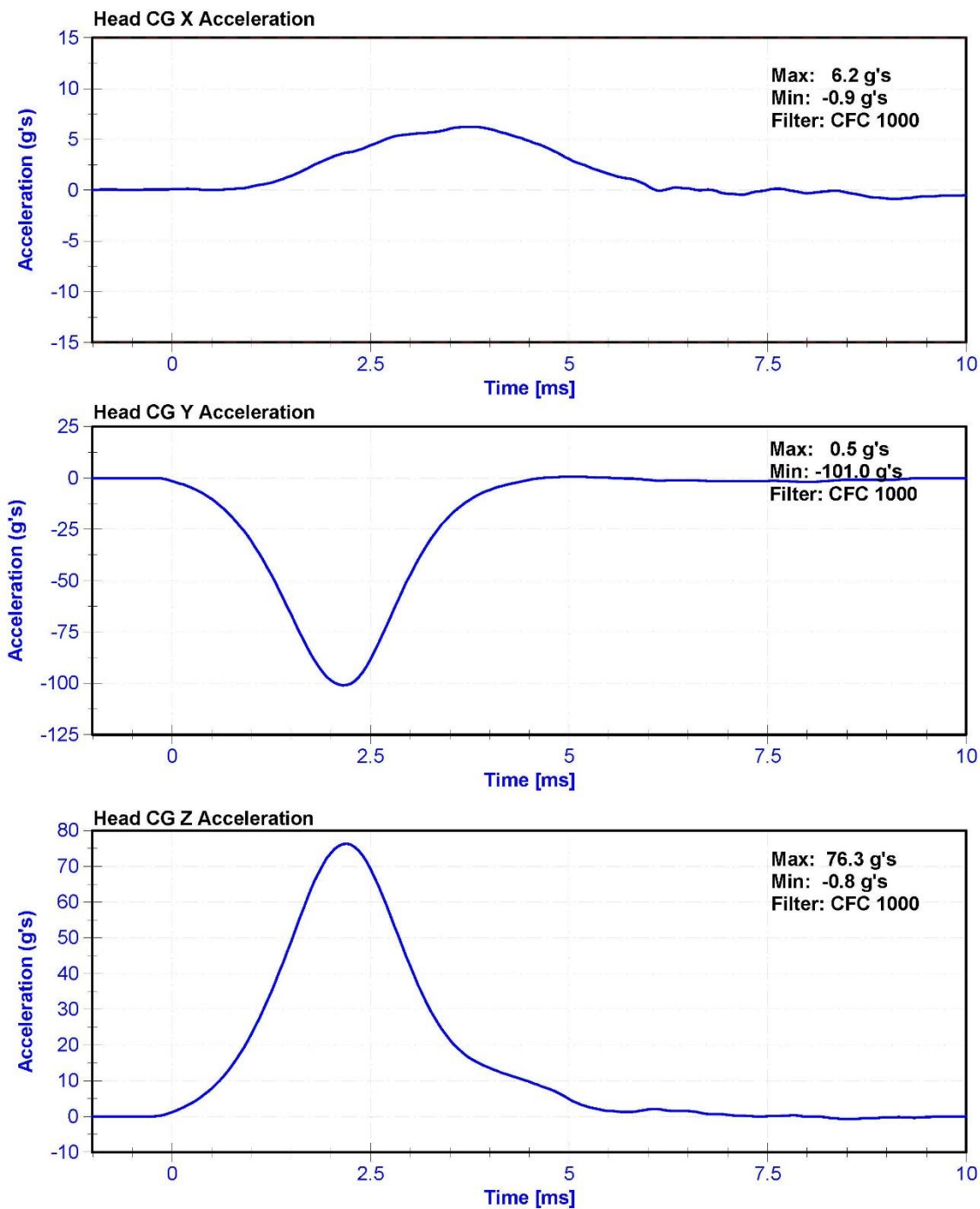
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	30.8	Pass
Resultant Acceleration	115	137	g's	126.6	Pass
Oscillation	0	15	%	1.9	Pass
Fore-Aft Acceleration	-15	15	g's	6.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P51685	10/31/2017	5/1/2018
Y Accelerometer	ENDEVCO 7264CT	AC-P51682	10/31/2017	5/1/2018
Z Accelerometer	ENDEVCO 7264CT	AC-P51699	10/31/2017	5/1/2018





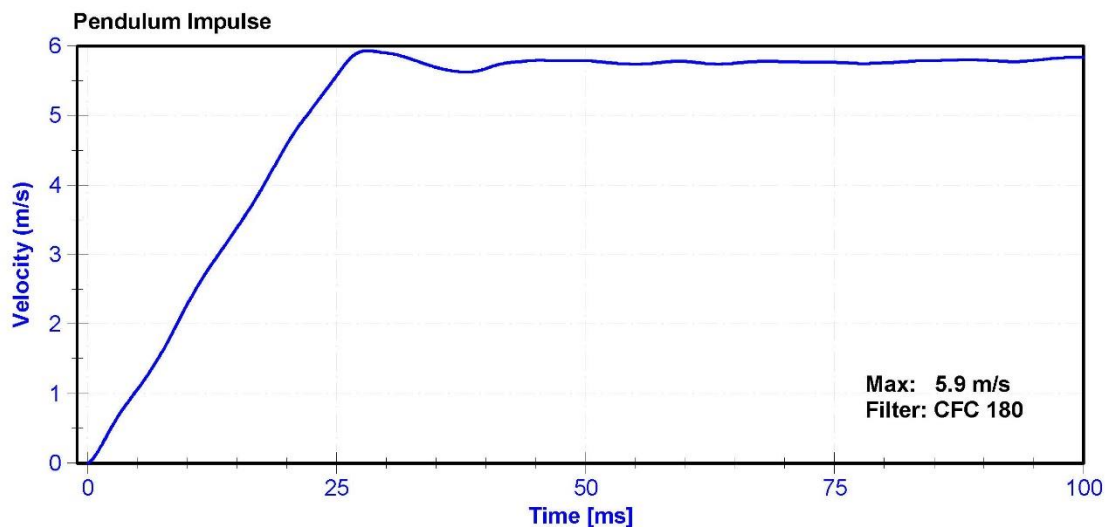
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

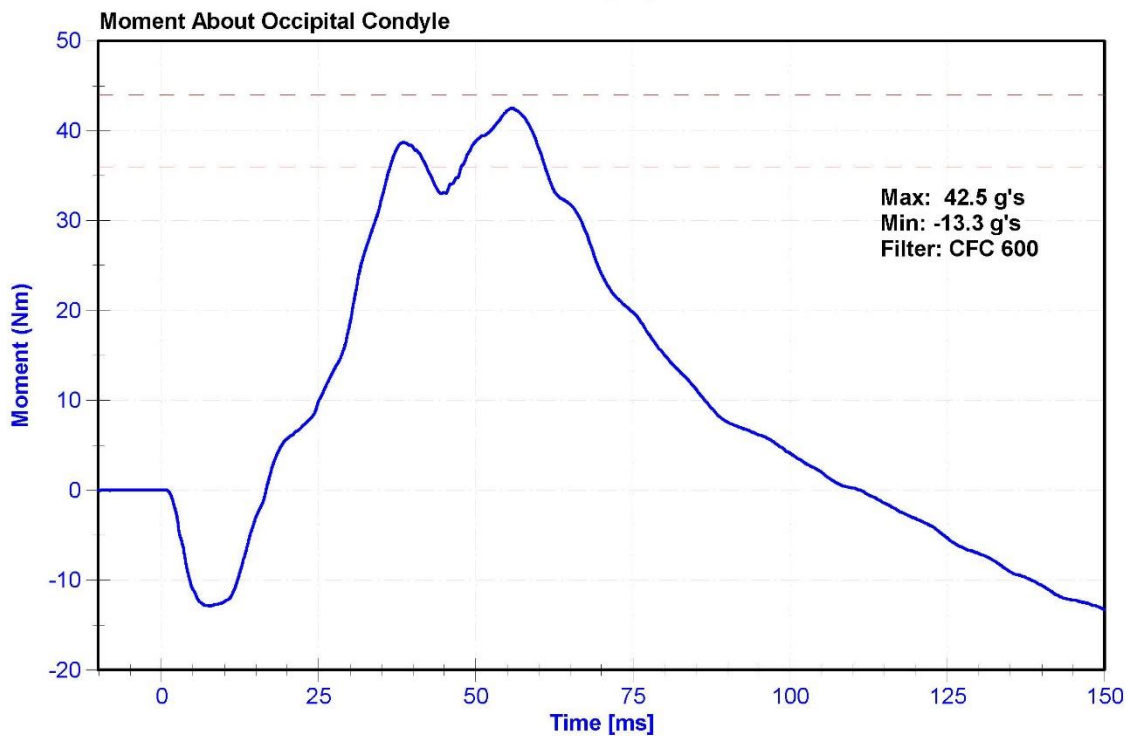
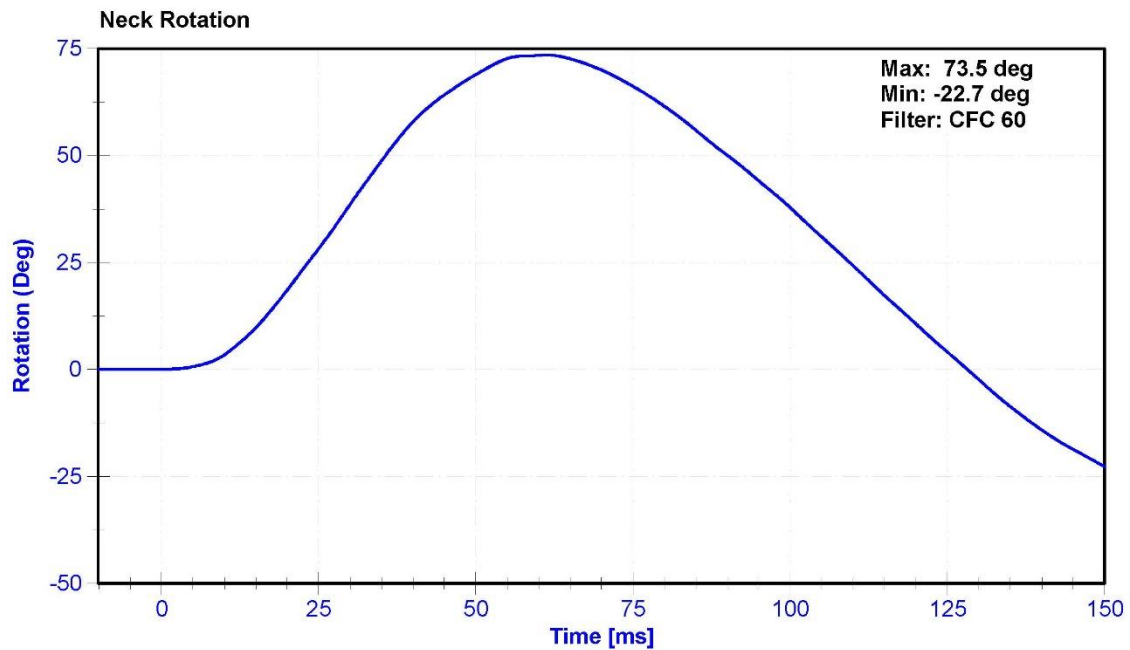
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22	Pass
Humidity	10	70	%	25	Pass
Velocity	5.51	5.63	m/s	5.620	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.28	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.39	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.58	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.58	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.93	Pass
Neck Rotation	71	81	deg	73.5	Pass
Time at Maximum Rotation	50	70	ms	61.3	Pass
Moment about the OC	36	44	Nm	42.5	Pass
Moment Decay to 0 Nm	102	126	ms	111.2	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





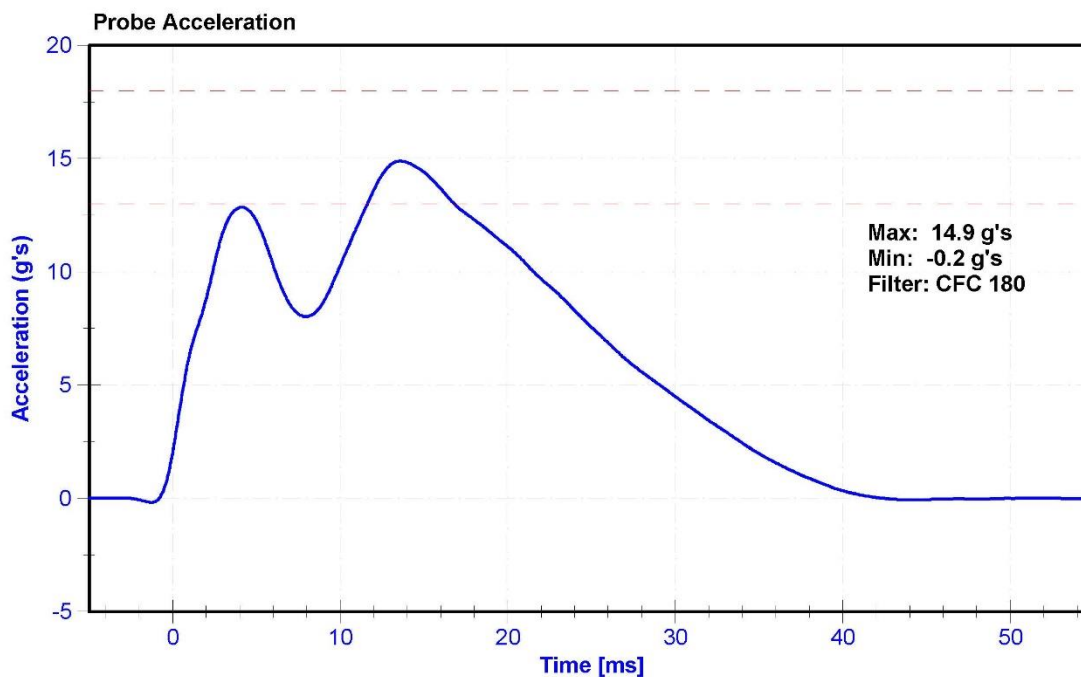
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

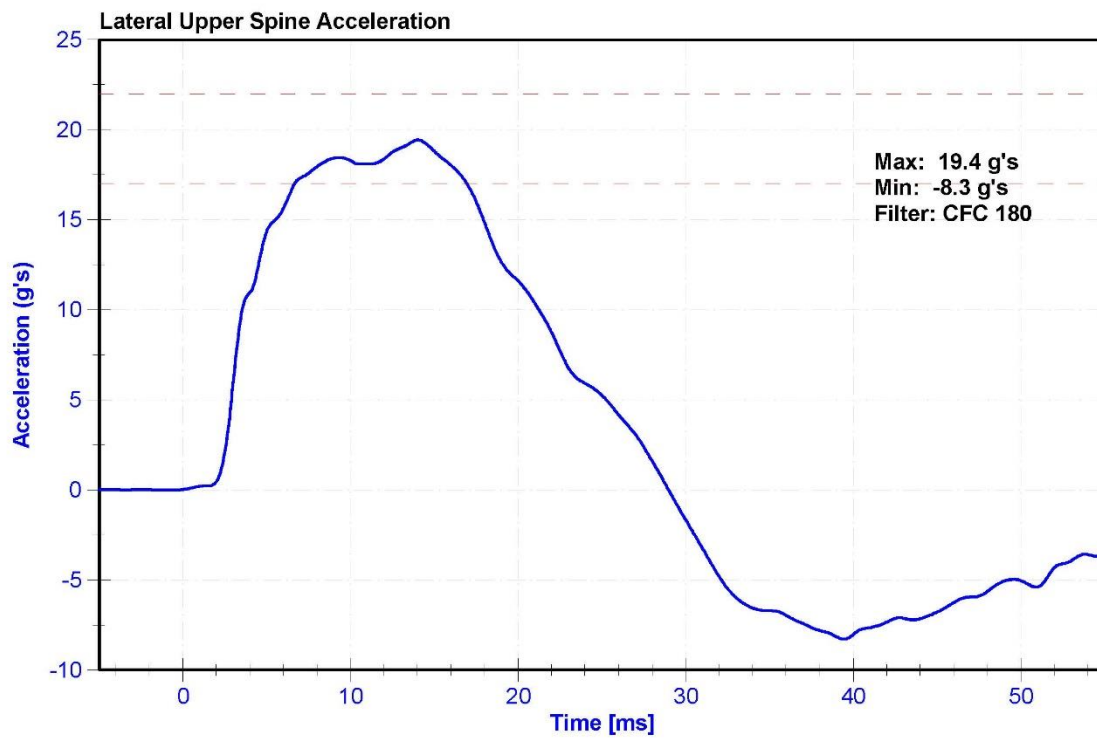
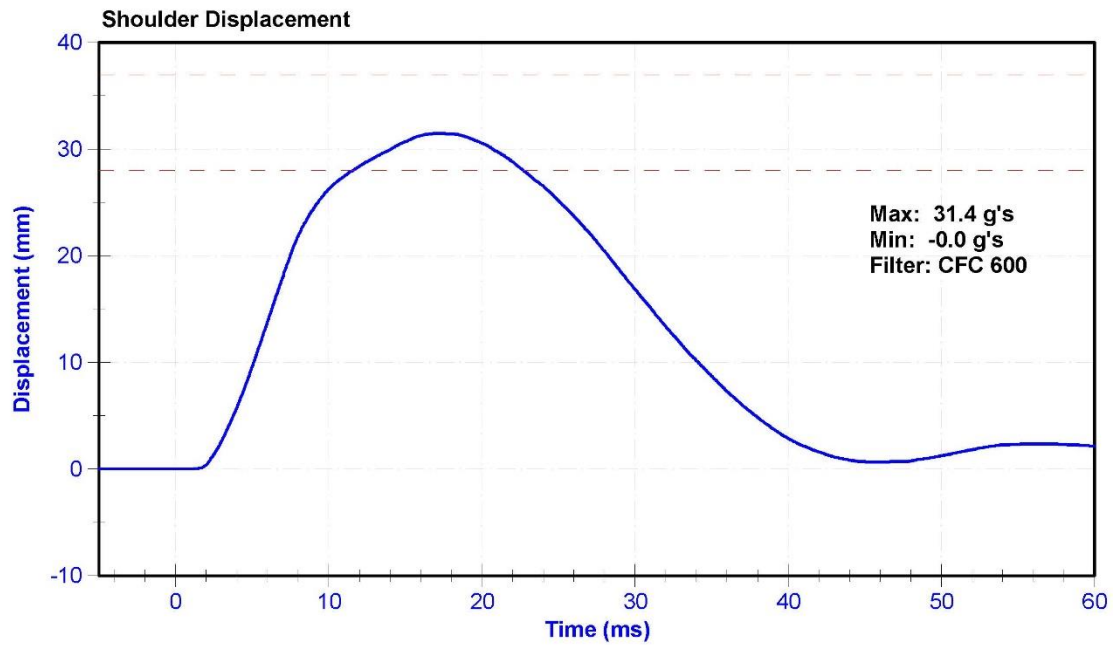
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	27.4	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	31.4	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.4	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 08TC1-3745	DS-1845GFE	9/27/2017	9/27/2018
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63561	10/31/2017	5/1/2018





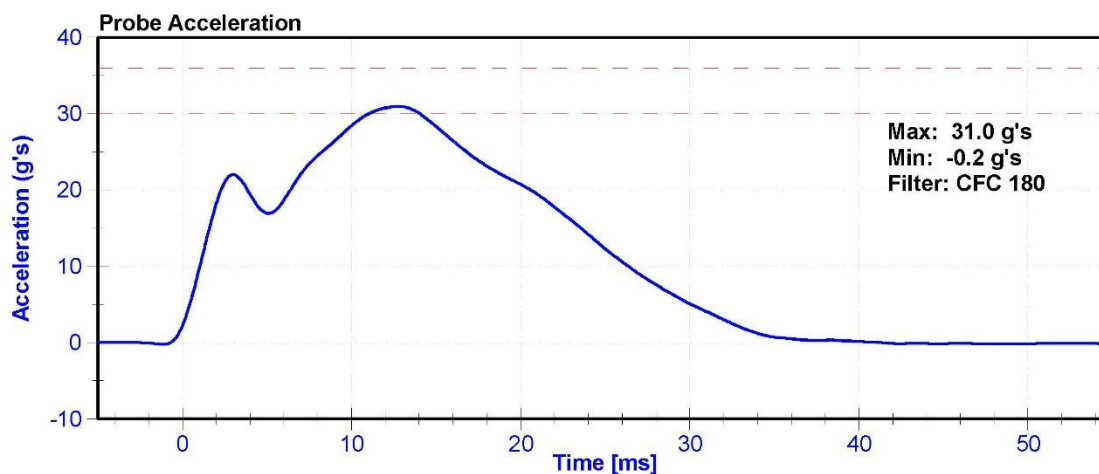
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

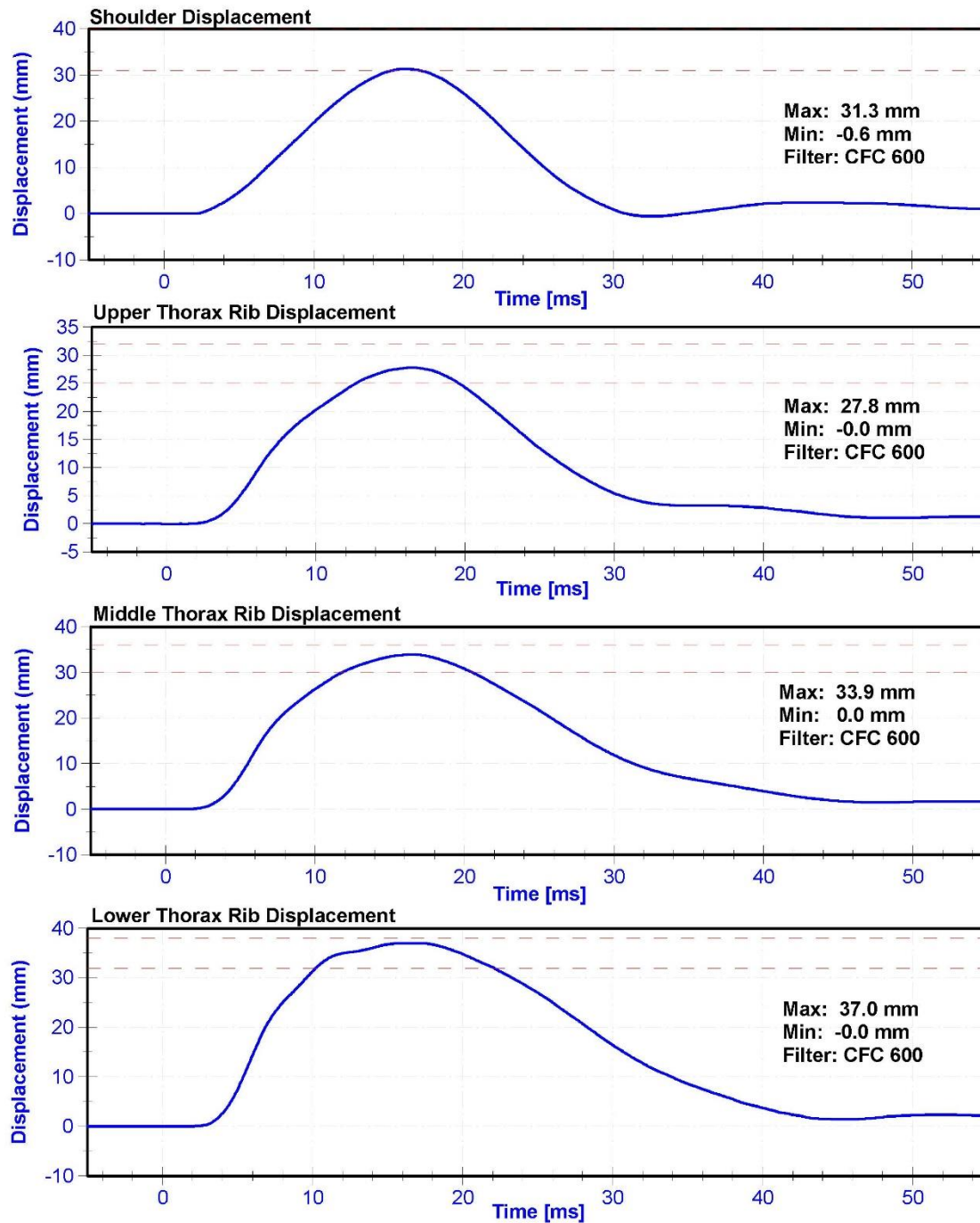
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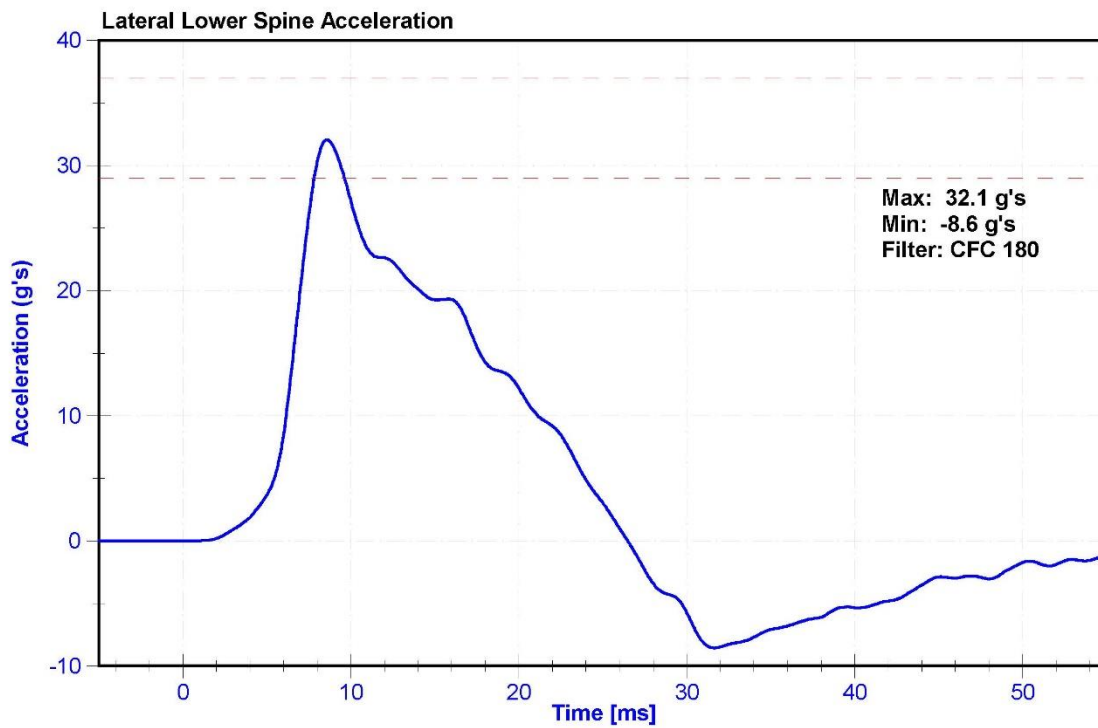
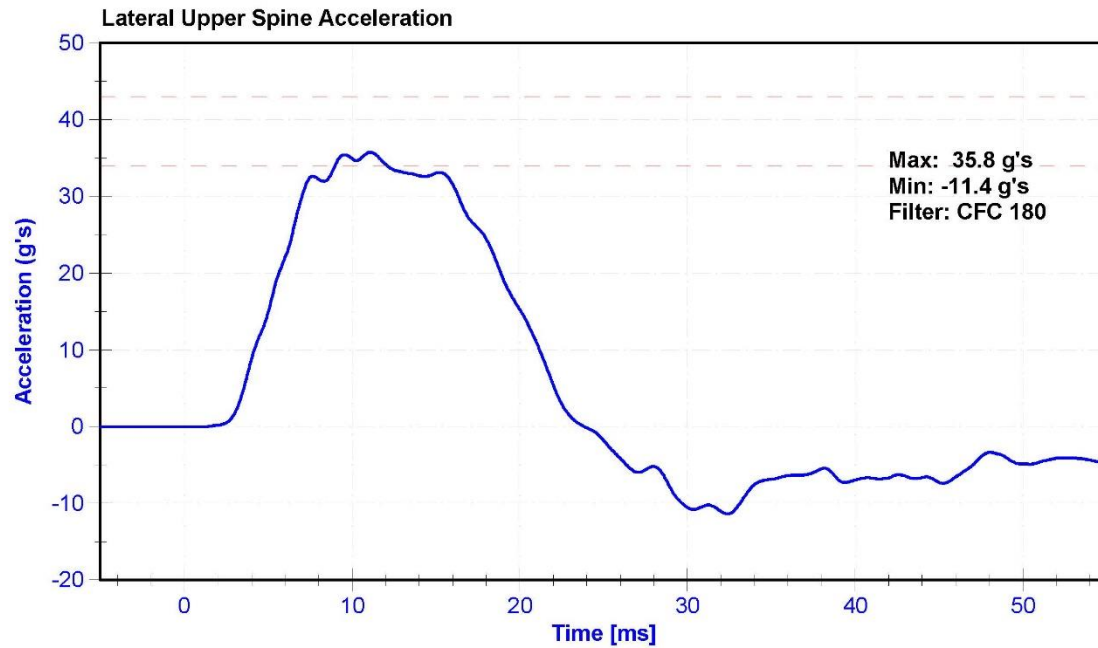
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	28.6	Pass
Velocity	6.6	6.8	m/s	6.73	Pass
Probe Acceleration after 5 ms	30	36	g's	31.0	Pass
Lateral Upper Spine Acceleration	34	43	g's	35.8	Pass
Lateral Lower Spine Acceleration	29	37	g's	32.1	Pass
Shoulder Deflection	31	40	mm	31.3	Pass
Upper Thorax Rib Deflection	25	32	mm	27.8	Pass
Mid Thorax Rib Deflection	30	36	mm	33.9	Pass
Lower Thorax Rib Deflection	32	38	mm	37.0	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 7264CT	AC-P63561	10/31/2017	5/1/2018
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P83319	10/31/2017	5/1/2018
Shoulder Potentiometer	Servo 08TC1-3745	DS-1845GFE	9/27/2017	9/27/2018
Upper Thorax Rib Potentiometer	Servo 08TC1-3621	DS-808GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	12/11/2017	12/11/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	9/27/2017	9/27/2018







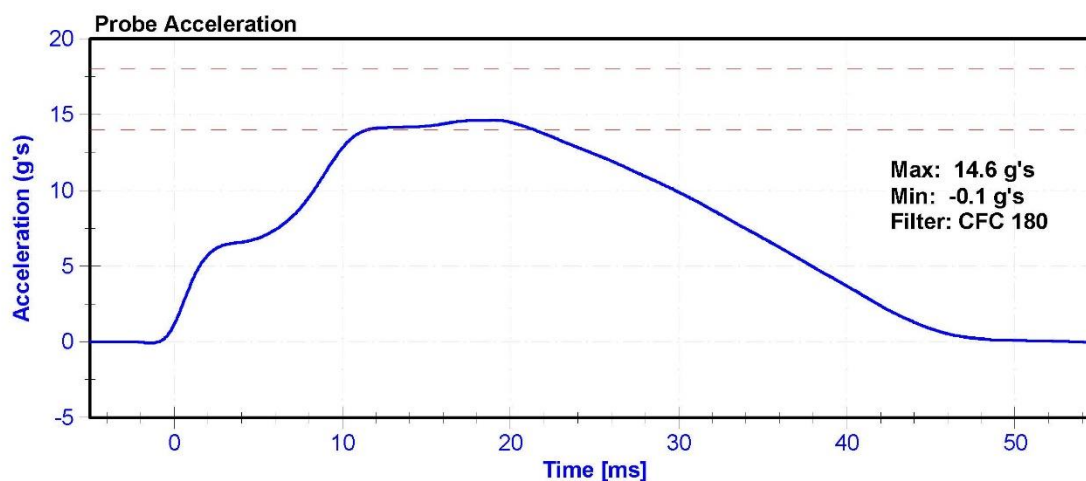
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

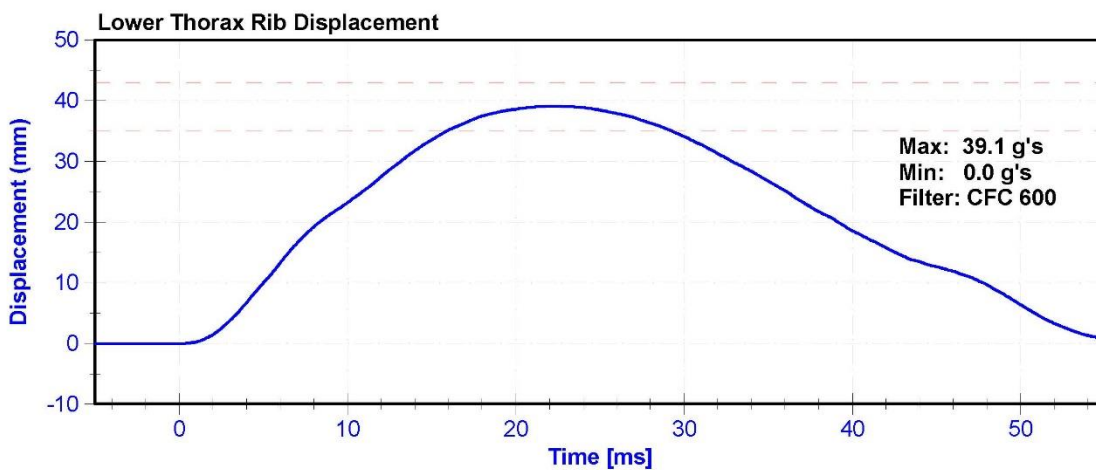
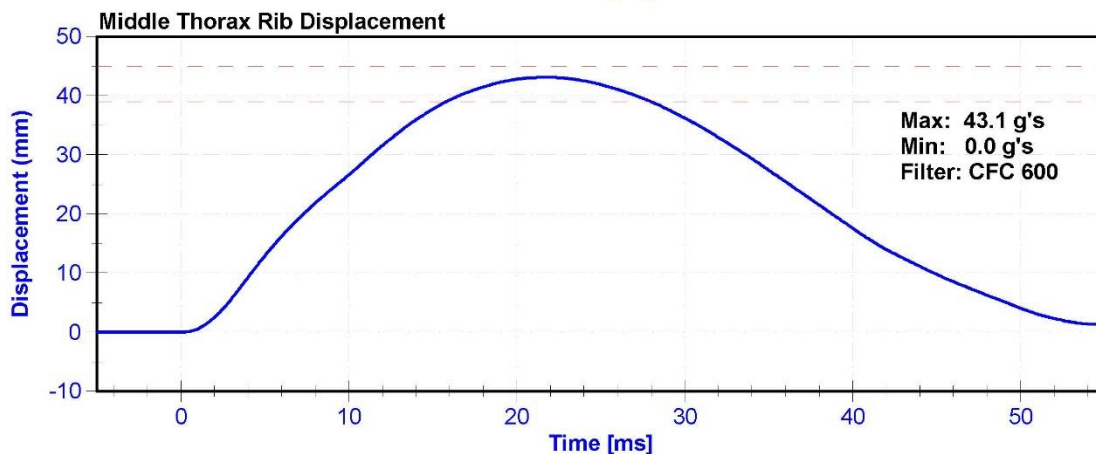
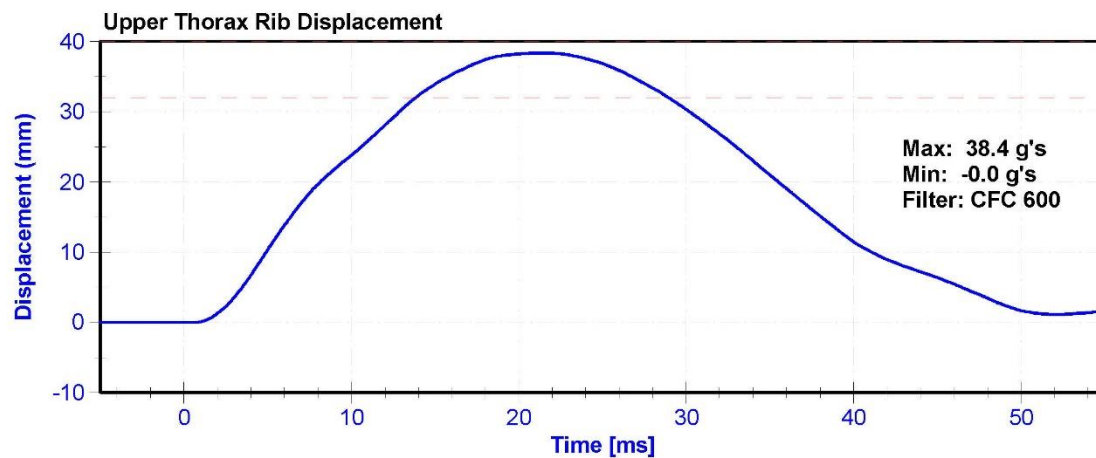
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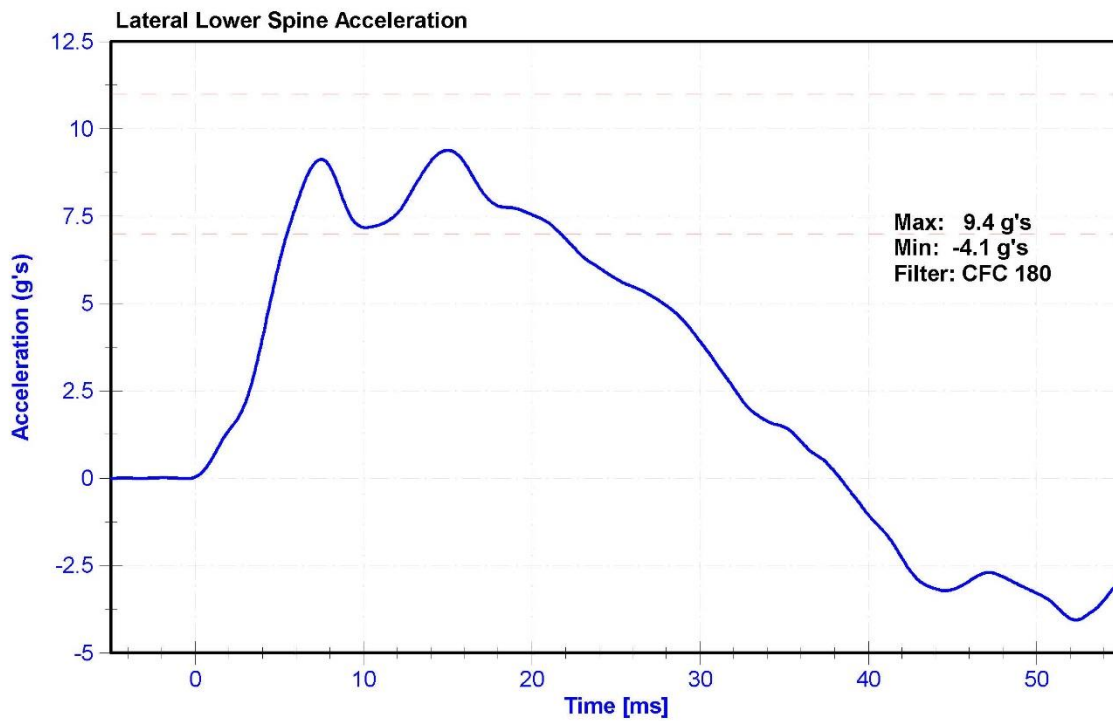
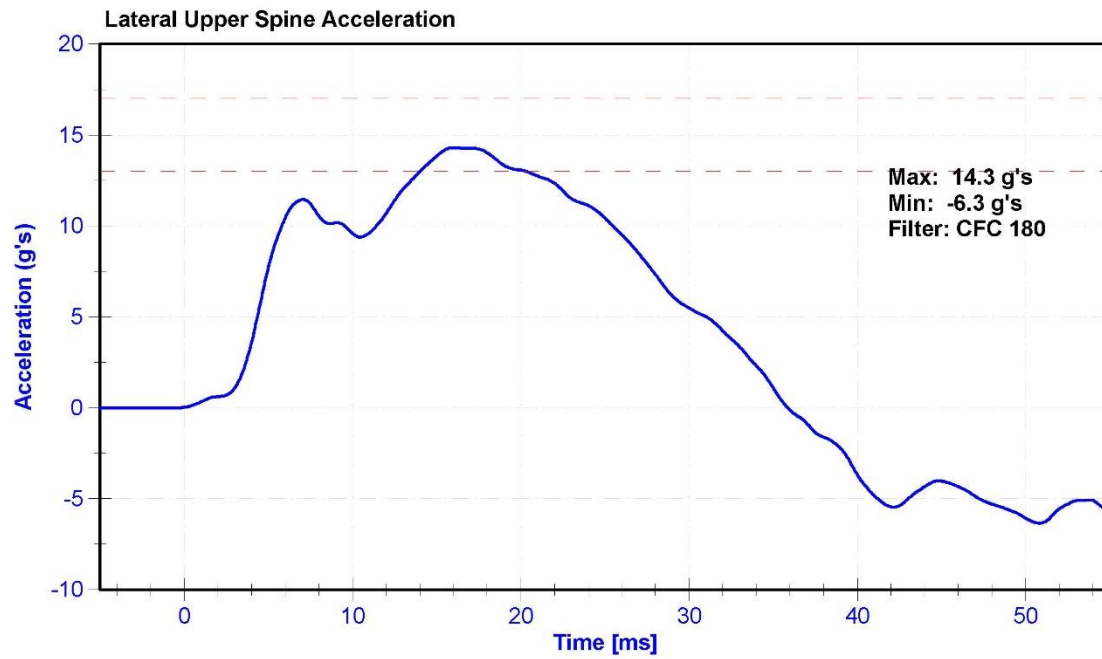
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	28.5	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	14	18	g's	14.6	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.3	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.4	Pass
Upper Thorax Rib Deflection	32	40	mm	38.4	Pass
Middle Thorax Rib Deflection	39	45	mm	43.1	Pass
Lower Thorax Rib Deflection	35	43	mm	39.1	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 7264CT	AC-P63561	10/31/2017	5/1/2018
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P83319	10/31/2017	5/1/2018
Upper Thorax Rib Potentiometer	Servo 08TC1-3621	DS-808GFE	9/27/2017	9/27/2018
Middle Thorax Rib Potentiometer	Servo 08TC1-3621	DS-45 GFE	12/11/2017	12/11/2018
Lower Thorax Rib Potentiometer	Servo 08TC1-3787	DS-011GFE	9/27/2017	9/27/2018







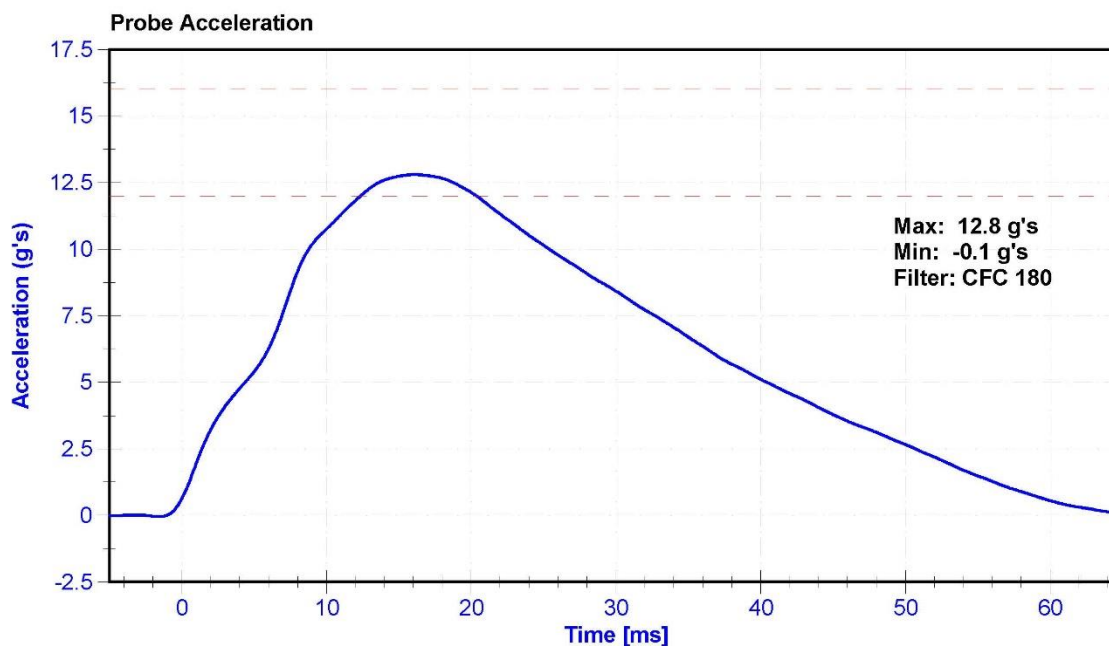
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

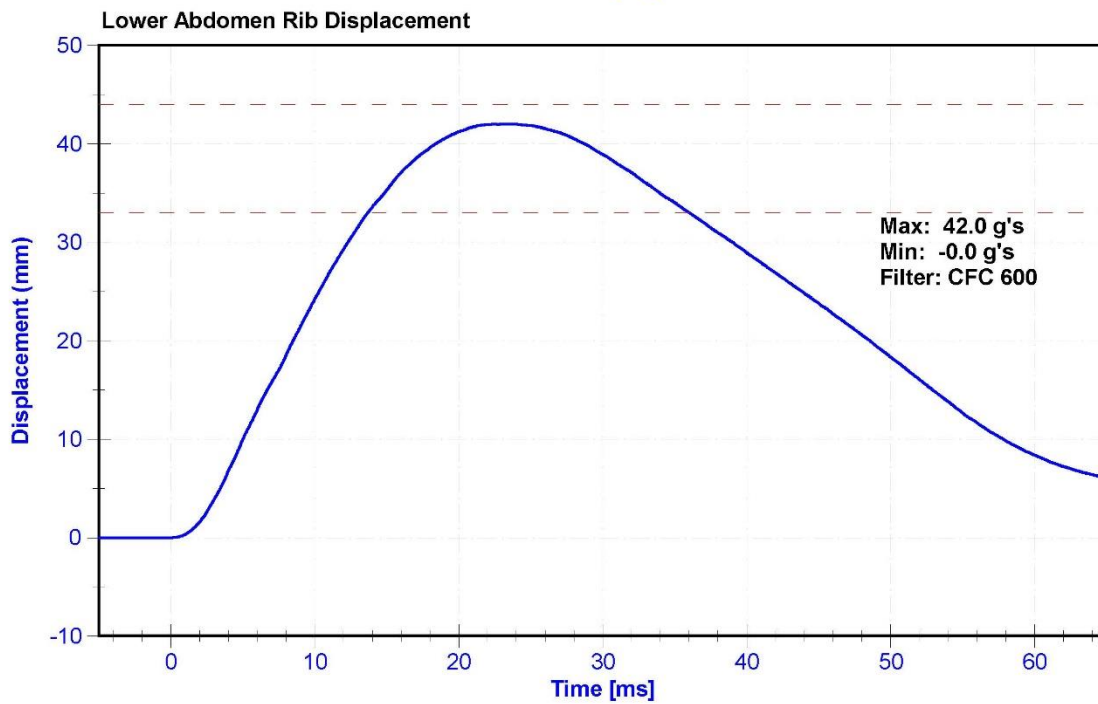
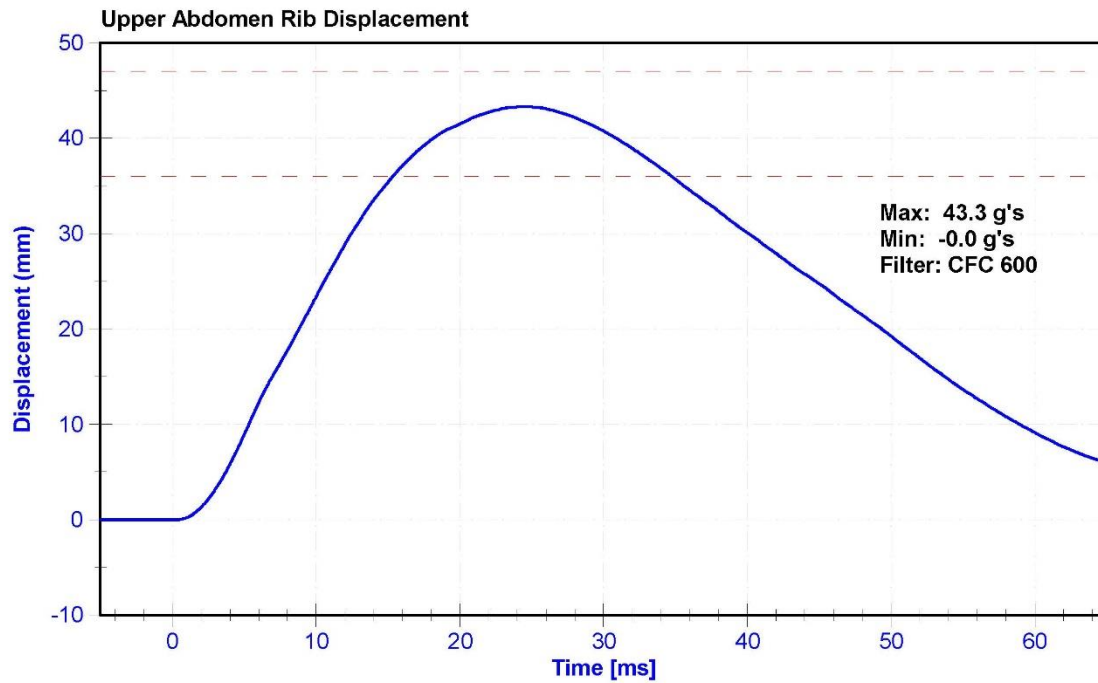
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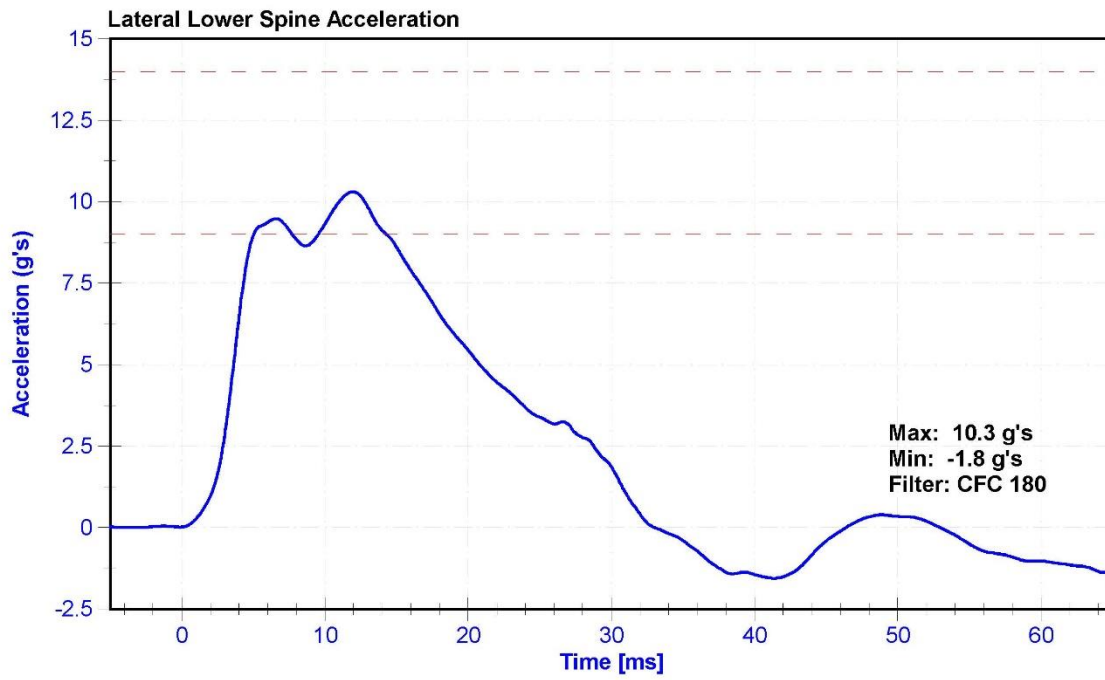
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	27.3	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	12	16	g's	12.8	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.3	Pass
Upper Abdomen Rib Deflection	36	47	mm	43.3	Pass
Lower Abdomen Rib Deflection	33	44	mm	42.0	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-P83319	10/31/2017	5/1/2018
Upper Abdomen Rib Potentiometer	Servo 08TC1-3725	DS-008GFE	9/27/2017	9/27/2018
Lower Abdomen Rib Potentiometer	Servo 08TC1-3745	DS-1774GFE	9/27/2017	9/27/2018







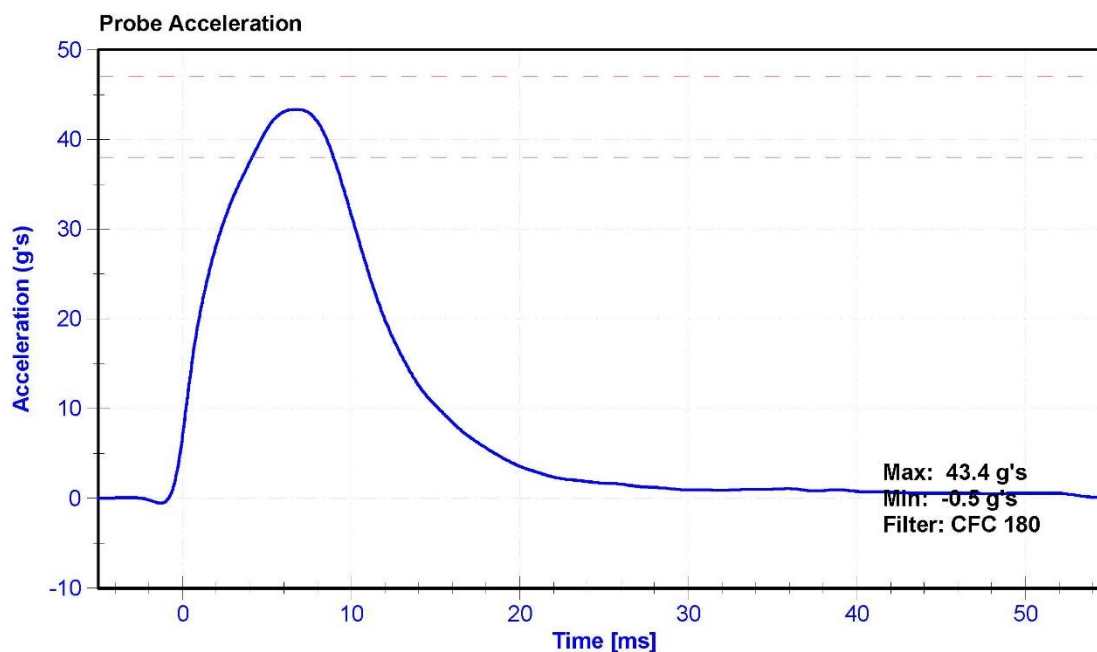
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

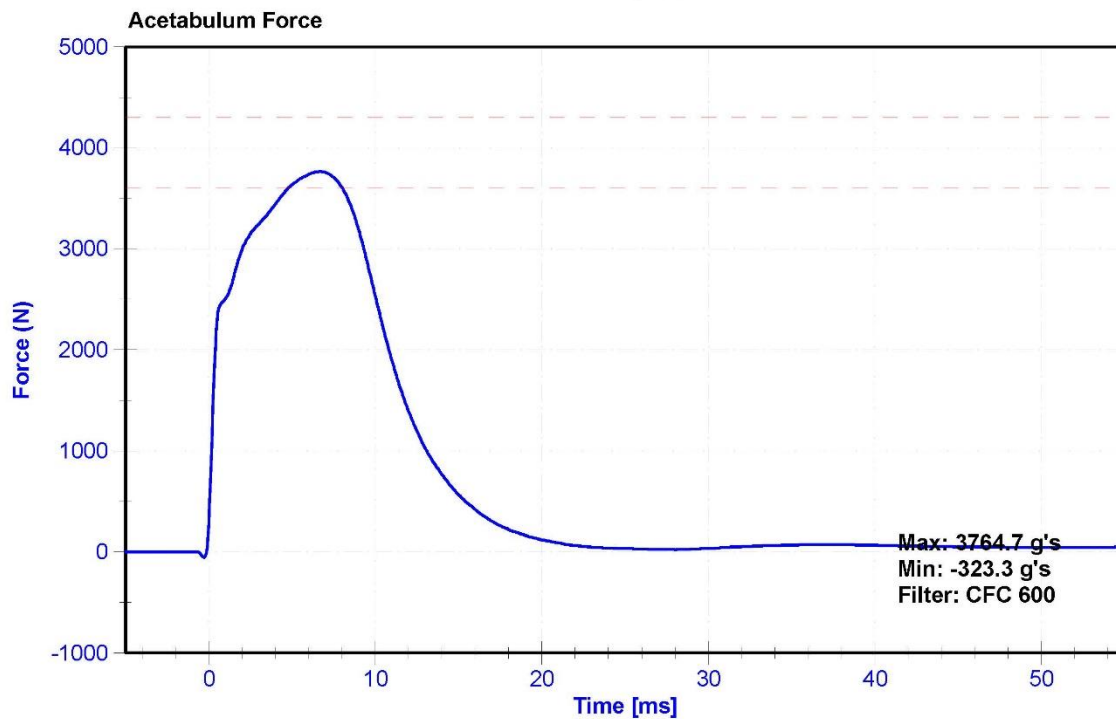
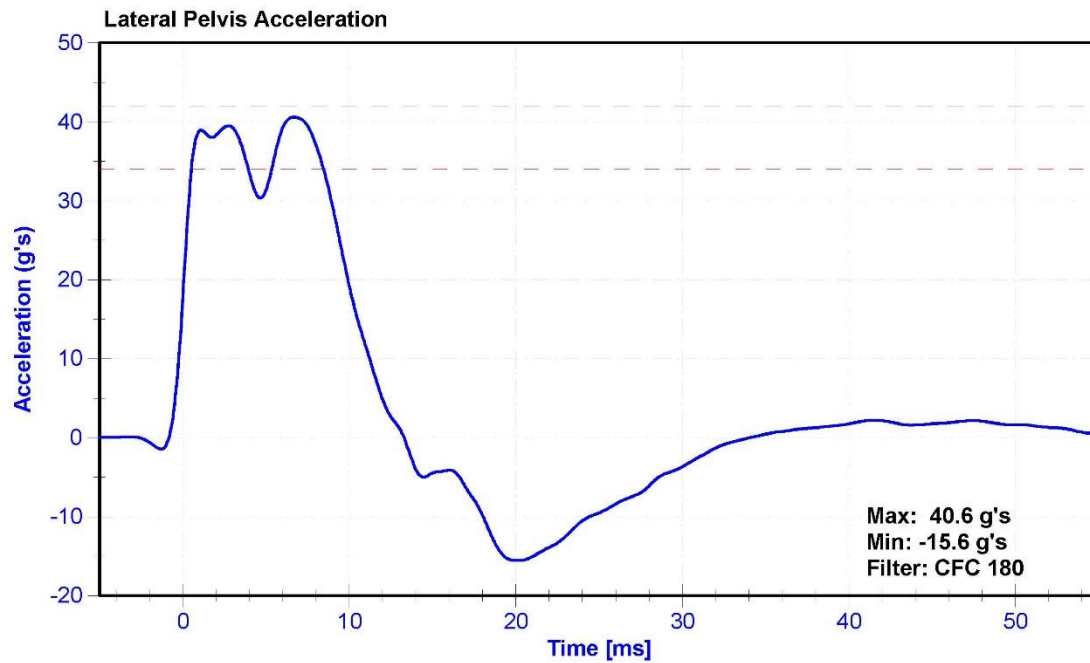
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	27.6	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	43.4	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	40.6	Pass
Acetabulum Force	3600	4300	N	3764.7	Pass

Transducer Calibrations

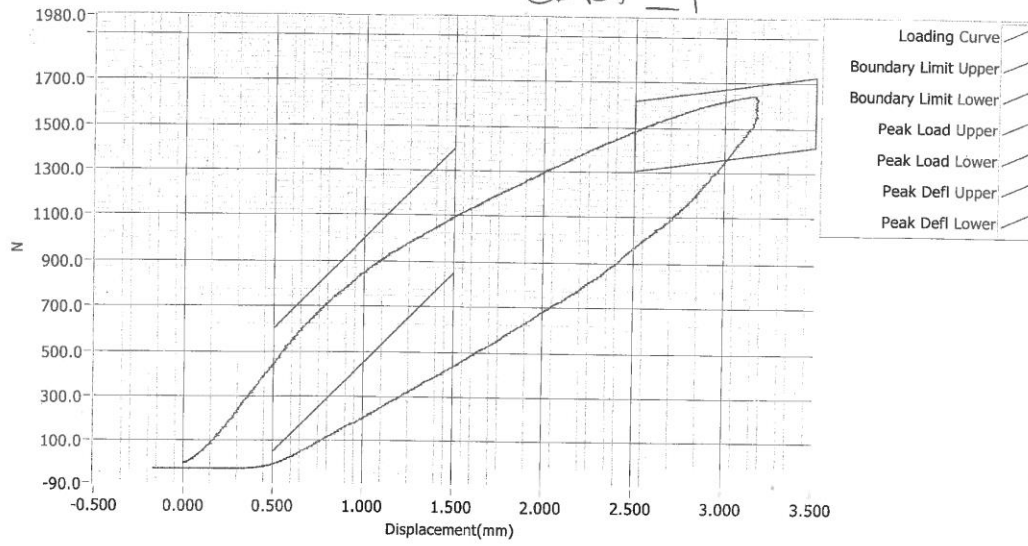
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P32453	10/17/2017	4/17/2018
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51875	10/31/2017	5/1/2018
Acetabulum Load Cell	Denton 3249J	LC-267Fy	6/6/2017	6/6/2018
Certification Plug	Humanetics	80936	11/25/2014	N/A
Crash Test Plug	Humanetics	80941	11/25/2014	N/A





Resultant Data - SIDIIs Plug Compression

CERT_1

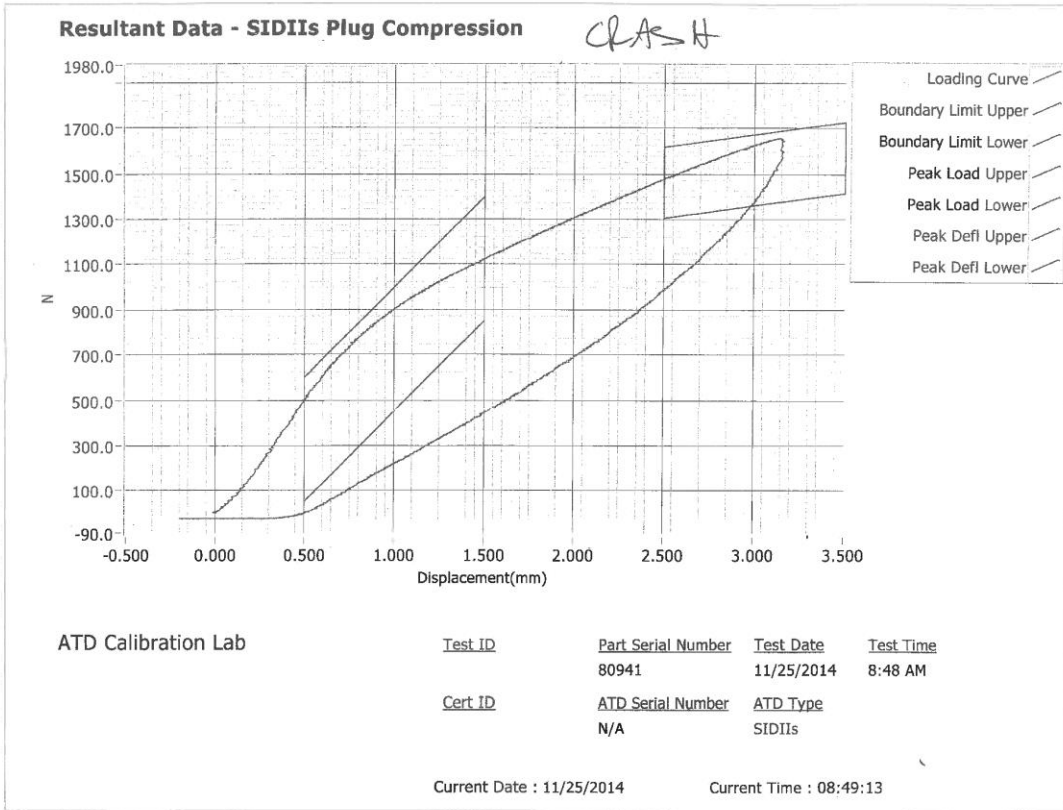


ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
	80936	11/25/2014	8:06 AM
Cert ID	ATD Serial Number	ATD Type	
	N/A	SIDIIs	

Current Date : 11/25/2014

Current Time : 08:07:41



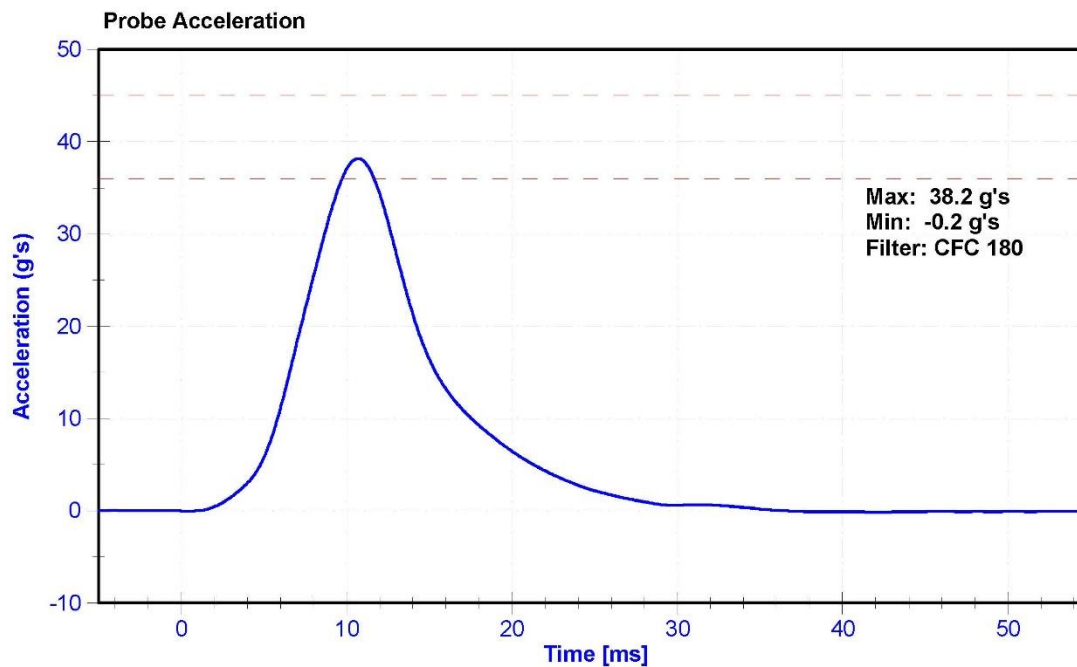
ATD Manufacturer	FTSS	Test Technician	S. McCloskey
ATD Serial Number	DG8012	Laboratory Supervisor	K. Brogan

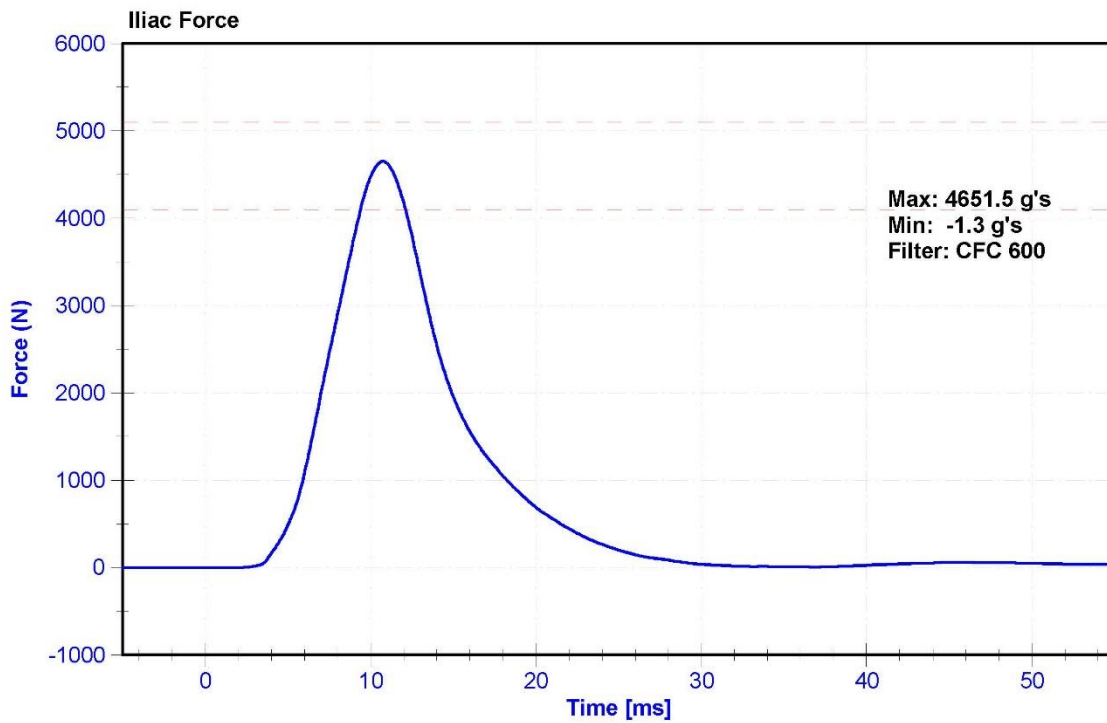
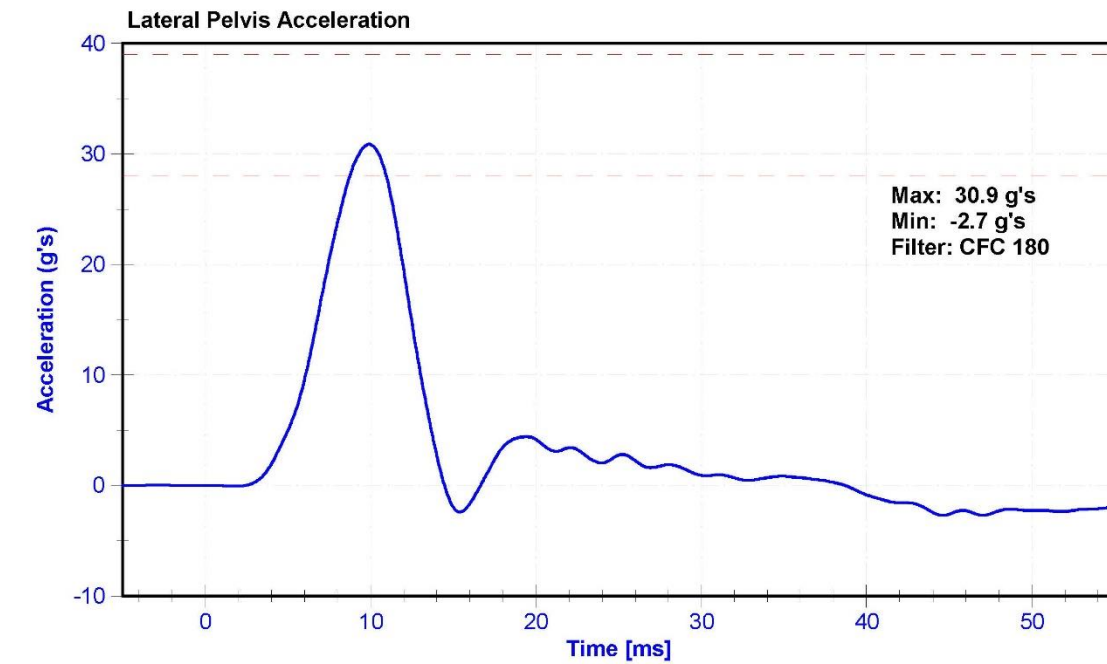
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	30.3	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	36	45	g's	38.2	Pass
Lateral Pelvis Acceleration	28	39	g's	30.9	Pass
Iliac Force	4100	5100	N	4651.5	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-P51875	10/31/2017	5/1/2018
Iliac Load Cell	DENTON 3228J	LC-281Fy	6/6/2017	6/6/2018





APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N: F034		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	AC-P58904	ENDEVCO	10/24/2017
		Y	AC-P58911	ENDEVCO	10/24/2017
		Z	AC-P58776	ENDEVCO	10/24/2017
	Redundant	X	AC-P58887	ENDEVCO	10/24/2017
		Y	AC-P58888	ENDEVCO	10/24/2017
		Z	AC-P51734	ENDEVCO	10/24/2017
Thorax Rib Displacement Potentiometers	Upper	Y	DS-183GFE	Honeywell	9/27/2017
	Middle	Y	DS-184GFE	Honeywell	9/27/2017
	Lower	Y	DS-182GFE	Honeywell	9/27/2017
Abdomen Load Cells	Forward	Y	LC-1512	DENTON	6/5/2017
	Middle	Y	LC-1526	DENTON	6/5/2017
	Rear	Y	LC-1516	DENTON	6/5/2017
Lower Spine Accelerometers (T12)		X	AC-P52079	ENDEVCO	10/24/2017
		Y	AC-P51948	ENDEVCO	10/24/2017
		Z	AC-P51269	ENDEVCO	10/24/2017
Pubic Symphysis Load Cell		Y	LC-465Fy	DENTON	6/6/2017

Table 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N: DG8012		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers		Primary	X	AC-P51685	ENDEVCO	10/31/2017
			Y	AC-P51682	ENDEVCO	10/31/2017
			Z	AC-P51699	ENDEVCO	10/31/2017
		Redundant	X	AC-P51701	ENDEVCO	10/31/2017
			Y	AC-P45019	ENDEVCO	10/31/2017
			Z	AC-P51690	ENDEVCO	10/31/2017
Displacement Potentiometers	Thoracic Rib	Upper	Y	DS-808GFE	Servo	9/27/2017
		Middle	Y	DS-45 GFE	Servo	12/11/2017
		Lower	Y	DS-011GFE	Servo	9/27/2017
	Abdominal Rib	Upper	Y	DS-008GFE	Servo	9/27/2017
		Lower	Y	DS-1774GFE	Servo	9/27/2017
Lower Spine Accelerometers (T12)			X	AC-P74788	ENDEVCO	10/31/2017
			Y	AC-P83319	ENDEVCO	10/31/2017
			Z	AC-P83432	ENDEVCO	10/31/2017
Acetabulum Load Cell			Y	LC-267Fy	DENTON	6/6/2017
Iliac Wing Load Cell			Y	LC-281Fy	DENTON	6/6/2017
Pelvis Plug (struck side)				80890	Humanetics	11/25/2014
Pelvis Plug (non-struck side)				-	-	-

Table 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	AC-A197052	MSI 1201-1000	9/25/2017
	Vehicle Center of Gravity	Y	AC-A211494	MSI 1201-1000	9/25/2017
	Vehicle Center of Gravity	Z	AC-A222650	MSI 1201-1000	8/24/2017
2	Right Sill at Front Seat	X	AC-A197016	MSI 1201-1000	10/23/2017
	Right Sill at Front Seat	Y	AC-A197036	MSI 1201-1000	11/20/2017
	Right Sill at Front Seat	Z	AC-A197046	MSI 1201-1000	11/20/2017
3	Right Sill at Rear Seat	X	AC-A192193	Measurement Specialties	9/26/2017
	Right Sill at Rear Seat	Y	AC-A217576	MSI 1201-1000	8/24/2017
	Right Sill at Rear Seat	Z	AC-A229238	MSI 1201-1000	10/12/2017
4	Left Sill at Front Door	Y	AC-A217563	MSI 1201-1000	11/20/2017
5	Left Sill at Rear Door	Y	AC-A217555	MSI 1201-1000	10/23/2017
6	Left A-Post Lower	Y	AC-A197005	MSI 1201-1000	8/25/2017
7	Left A-Post Middle	Y	AC-A185911	MSI 1201-1000	10/17/2017
8	Left B-Post Lower	Y	AC-A184944	MSI 1201-1000	10/23/2017
9	Left B-Post Middle	Y	AC-A192201	MSI 1201-1000	10/23/2017
10	Front Seat Track	Y	AC-A228322	MSI 1201-1000	11/29/2017
11	Rear Seat Track or Structure	Y	AC-A192219	Measurement Specialties	11/29/2017
12	Right Rear Occ. Compartment	Y	AC-A192196	Measurement Specialties	10/17/2017
13	Engine Block	X	AC-A192217	Measurement Specialties	10/12/2017
	Engine Block	Y	AC-A197060	MSI 1201-1000	10/17/2017
14	Rear Floorpan Above Axle	X	AC-A206883	MSI 1201-1000	10/23/2017
	Rear Floorpan Above Axle	Y	AC-A211599	MSI 1201-1000	10/23/2017
	Rear Floorpan Above Axle	Z	AC-A217550	MSI 1201-1000	10/23/2017

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	AC-A197006	MSI 1201-1000	10/17/2017
MDB Center of Gravity	Y	AC-A197023	MSI 1201-1000	10/17/2017
MDB Center of Gravity	Z	AC-A197032	MSI 1201-1000	10/17/2017
Left Frame at Rear Axle Centerline	X	AC-A217559	MSI 1201-1000	10/17/2017
Left Frame at Rear Axle Centerline	Y	AC-A222646	MSI 1201-1000	10/17/2017