

REPORT NUMBER: SINCAP-CAL-19-005

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

**Ford Motor Co
2019 Ford F-250
Four Door Truck**

NHTSA No: M20190207

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



June 6, 2019


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: June 6, 2019

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Date: June 6, 2019

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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		6. Performing Organization Code CAL																												
Vincent Paolini, Senior Test Engineer Vanessa Hansen, Operations Manager		8. Performing Organization Report No. CAL-DOT-2019-005																												
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		14. Sponsoring Agency Code NRM-110																												
15. Supplementary Notes																														
16. Abstract <p>A 55/28, (61.90kph / 38.5 mph), 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2019 Ford F-250 four door Truck 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 March 21, 2019.</p> <p>The impact velocity of the Moving Deformable Barrier (MDB) was 61.82 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 220mm located at level 1. The test vehicle's occupant performance data is as follows:</p>																														
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<p>* Proposed IARV</p> <p>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.</p>																														
17. Key Words New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs		18. Distribution Statement <u>Copies of this report are available from:</u> 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																												
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TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	Test Purpose and Procedure	1-1
2	Summary of Test Results	2-1
3	Occupant and Vehicle Information	3-1
 <u>Data Sheet</u>		 <u>Page</u>
1	General Test and Vehicle Parameter Data	3-2
2	Seat, Seat Belt, Steering Wheel Adjustment and Fuel System Data	3-6
3	Dummy Longitudinal Clearance Dimensions	3-10
4	Dummy Lateral Clearance Dimensions	3-11
5	Camera and Instrumentation Data	3-12
6	Test Vehicle Accelerometer Locations	3-13
7	MDB Accelerometer Locations	3-14
8	Post-Test Observations	3-15
9	MDB Summary of Results	3-17
10	Test Vehicle Profile Measurements	3-18
11	Test Vehicle Exterior Crush Measurements	3-19
12	MDB Exterior Static Crush Measurements	3-22
13	Vehicle and MDB Damage Profile Distances	3-23
14	FMVSS No. 301 Static Rollover Results	3-24
15	Dummy/Vehicle Temperature and Humidity Stabilization Data	3-25
 <u>Appendix</u>		 <u>Page</u>
A	Photographs	A-1
B	Vehicle and Dummy Response Data Plots	B-1
C	Dummy Configuration and Performance Verification Data	C-1
D	Test Equipment and Instrumentation Calibration Data	D-1

SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2019 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 2019 Ford F-250 four door Truck. 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 2019 Ford F-250 four door Truck 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 61.82 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 March 21, 2019. 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	11.594
Maximum Thorax Rib Deflection	mm	44	17.527
Combined Abdominal Force	N	2500	524.138
Pubic Symphysis Force	N	6000	502.221

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	23.228
Lower Spine (T12) Resultant Acceleration	G	82	14.631
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	354.285
Maximum Thoracic Rib Deflection	mm	38*	4.839
Maximum Abdominal Rib Deflection	mm	45*	0.879

*Proposed IARV

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Air bag	Yes	No		
Knee Air bag	No	N/A		
Side Air bag 1 - Curtain	Yes	Yes	Yes	Yes
Side Air bag 2 – Torso/Pelvis Air bag	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 – 300

Data Anomalies:

The following channel was questionable for

- Left A-Pillar Lower Y Acceleration, Exceeded calibration range at 16.6 ms
- Left Front Sill Y Acceleration, Questionable data throughout
- Left B-Pillar Lower Y Acceleration, Exceeded calibration range and saturated at 19.3 ms
- Left B-Pillar Middle Y Acceleration, Exceeded calibration range at 12.4 ms
- Left Rear Sill Y Acceleration, Questionable data throughout

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: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20190207
Model Year	2019
Make	Ford
Model	F-250
Body Style	Crew Cab Truck
VIN	1FT7W2A67KED34446
Body Color	Charcoal Gray
Odometer Reading (km/mi)	53 miles
Engine Displacement (L)	6.2
Type/No. Cylinders	V8
Engine Placement	Inline
Transmission Type	Automatic
Transmission Speeds	6-Speed
Overdrive	Yes
Final Drive	Rear Wheel Drive
Roof Rack	No
Sunroof/T-Top	No
Running Boards	Yes
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	No
Other Optional Feature	-
Driver Front Air bag	Yes
Driver Curtain Air bag	Yes
Driver Head/Torso Air bag	No
Driver Torso Air bag	No
Driver Torso/Pelvis Air bag	Yes
Driver Pelvis Air bag	No
Driver Knee Air bag	No
Rear Pass. Curtain Air bag	Yes
Rear Pass. Head/Torso Air bag	No
Rear Pass. Torso Air bag	No
Rear Pass. Torso/Pelvis Air bag	No
Rear Pass. Pelvis Air bag	No
Driver Seat Belt Pretensioners	Yes
Rear Pass. Seat Belt Pretensioners	No
Driver Load Limiter	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
Date of Manufacture	11/18
Vehicle Type	Truck

GVWR (kg)	4536
GAWR Front (kg)	1792
GAWR Rear (kg)	2876

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	3	3	-	6	
Capacity Weight (VCW) (kg)				1731	(A)
DSC X 68.04 kg				408.24	(B)
Cargo Weight (RCLW) (kg)				136	(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							

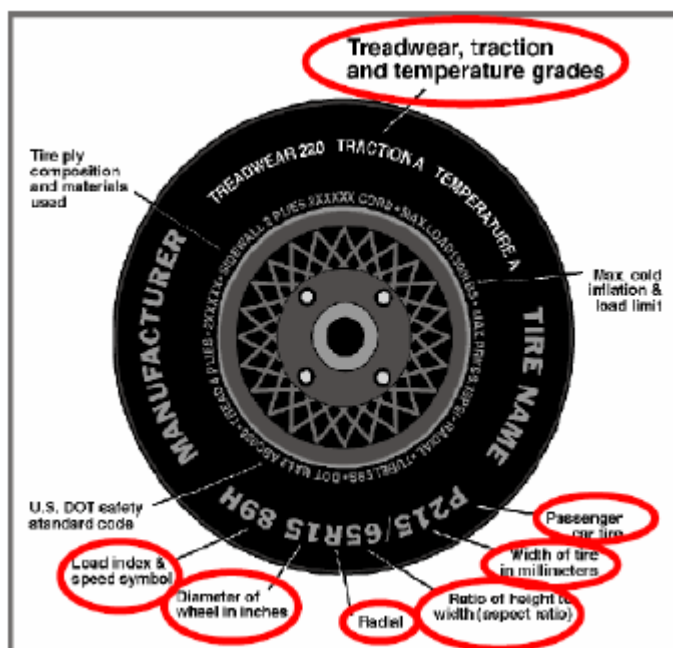
DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

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)	550	550
Cold Pressure (kPa)	450	550
Recommended Tire Size	LT245/75R17	LT245/75R17
Tire Size on Vehicle	LT245/75R17	LT245/75R17
Tire Manufacturer	Michelin	Michelin
Tire Model	LTX	LTX
Treadwear	N/A	N/A
Traction	N/A	N/A
Temperature Grade	N/A	N/A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 1 Polyamide, 2 Steel	2 Polyester, 1 Polyamide, 2 Steel
Load Index/Speed Symbol	121 / 118R	121 / 118R
Tire Material	Rubber	Rubber
DOT Safety Code Left	M343007X4218	M343007X4218
DOT Safety Code Right	M343007X4218	M343007X4218

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

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	430	425	530	530
Tire Placard	kPa	450	450	550	550
Owner's Manual	kPa	450	450	550	550
As Tested	kPa	450	450	550	550

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	782	590		832	671		856	687	
Right	kg	786	589		836.5	662.5		810	660	
Ratio	%	57	43		55	45		55	45	
Totals	kg	1568	1179	2747	1668.5	1333.5	3002	1666	1347	3013

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2747	(A)
Sum of Actual Weight of 1 ES2re and 1 P572 ATD (SID-IIs)	kg	127	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	136	(C)
Calculated Target Vehicle Test Weight (TVTWW)	kg	3010	(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	936	938	Yes
RF	mm	938	933	Yes
RR	mm	1031	1028	Yes
LR	mm	1032	1038	Yes
Vehicle CG (Aft of Front Axle)	mm	1815	1803	
Vehicle CG (Left+)/Right(-) from Longitudinal Centerline)	mm	21	1	

*** 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: 2019 Ford F-250 four door Truck NHTSA No.: M20190207
Test Program: NCAP Side MDB Impact Test Test Date: 3/21/2019

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Spare Tire	50.5
Ballast / Equipment Added	124

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

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

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	Not Adjustable		
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 SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore/Aft	Forward-Most
Driver Seat	Not Adjustable		Max	-	-	-
			Mid	-	-	-
			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: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

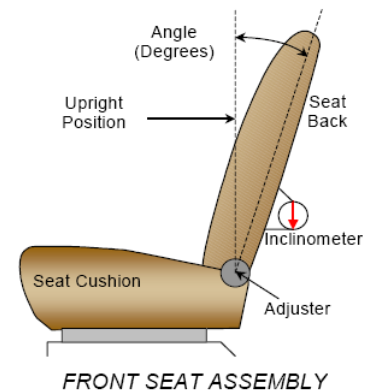
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	255	38 (0-37)	132	19
Front Passenger Seat	255	38 (0-37)	132	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	50.3	-	2.7	-
Front Passenger Seat	50.5	-	2.7	-
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: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

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	4	0
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

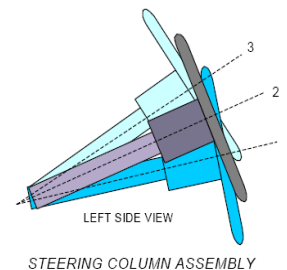
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	3	Uppermost
Rear Seat	1	Lowermost

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.

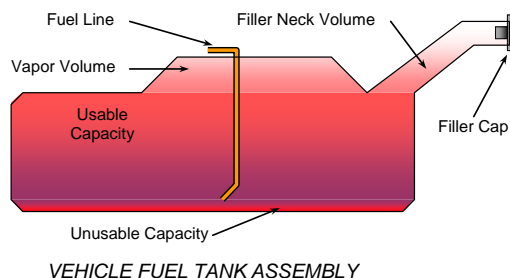
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	19.5	
Geometric Center – Position 2	21.6	
Uppermost – Position 3	23.2	
Telescoping Steering Wheel Travel		42
Test Position	21.6	21



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: 2019 Ford F-250 four door Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
Test Date: 3/21/2019

FUEL TANK CAPACITY

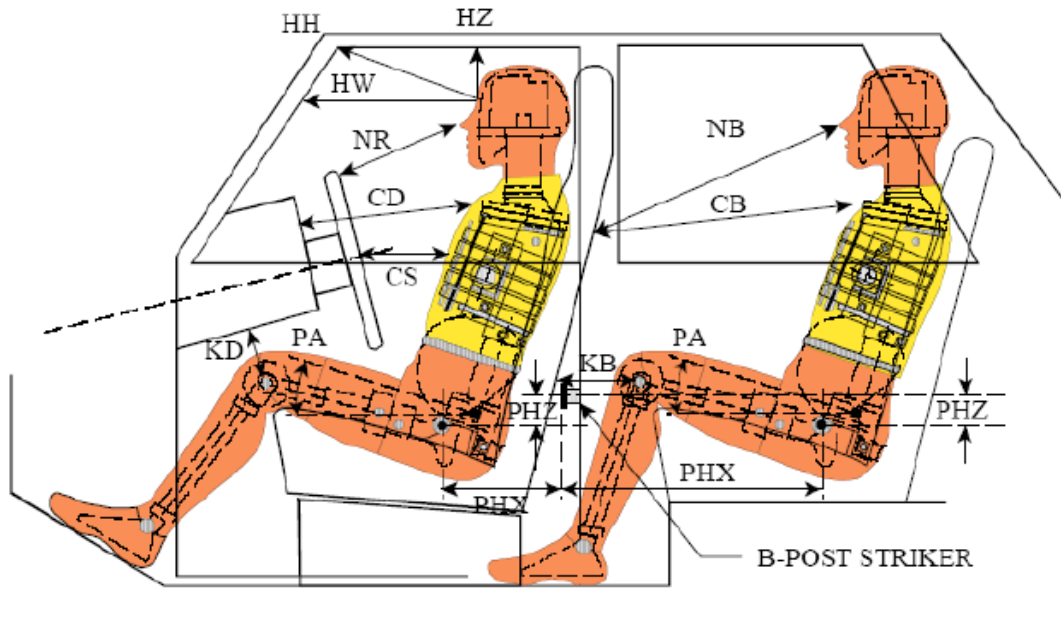
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	128.7
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	128.7
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	119.7
Actual Amount of Solvent Used in Test	119.7
1/3 of Usable Capacity	42.9

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

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

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019



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

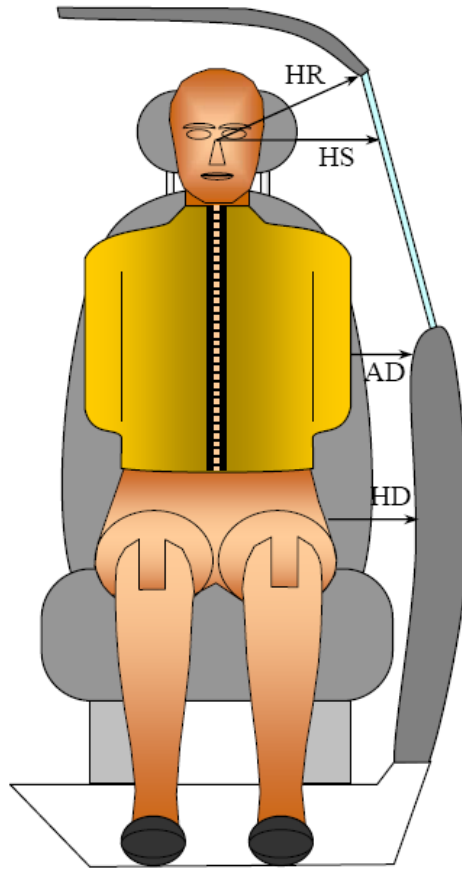
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver (Serial No. F034)		Passenger (Serial No.300)	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	498			
HW		Header to Windshield	692			
HZ	HZ	Head to Roof Liner	203		326	
NR	NB	Nose to Rim/Seat Back	463		708	
CD	CB	Chest to Dash/Seat Back	604		731	
CS		Chest to Steering Wheel	357			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	178	24.8	448	8.2
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	164	10.8	446	8.2
PAX°	PAX°	Pelvic Tilt Angle X		20.6		18.5
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (X-Axis)	306		205	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	67		58	

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

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019



FRONT VIEW OF DUMMY

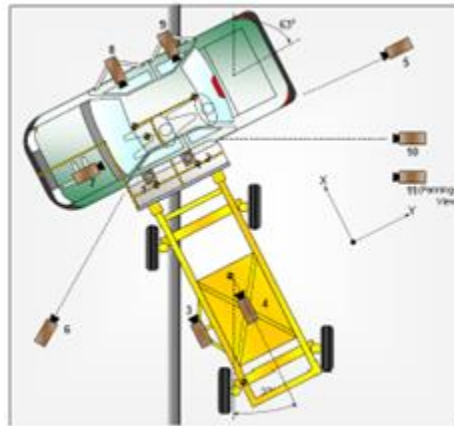
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F034)	Passenger (Serial No. 300)
HR	Head to Side Header	mm	183	273
HS	Head to Side Window	mm	325	365
AD	Arm to Door	mm	124	156
HD	Hip Point to Door	mm	168	215

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

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	-292	366	9370	12.5	1000
2	Overhead Close-up	-200	656	9370	28	1000
3	Left Impact Point (MDB)	-1470	0	-847	25	1000
4	Side Overall (MDB)	-1140	878	-1587	8	1000
5	Rear	0	11738	-1435	24	1000
6	Left Front	-3519	-4344	-1427	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

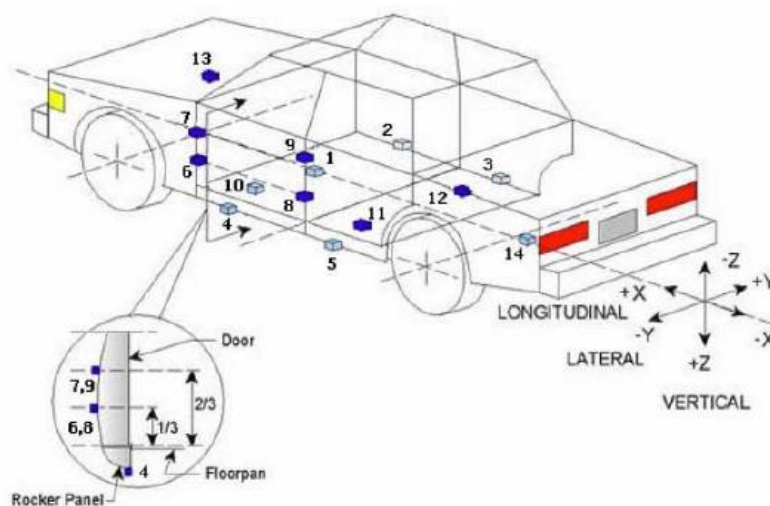
INSTRUMENTATION

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: 2019 Ford F-250 four door Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
Test Date: 3/21/2019



TEST VEHICLE ACCELEROMETER LOCATIONS

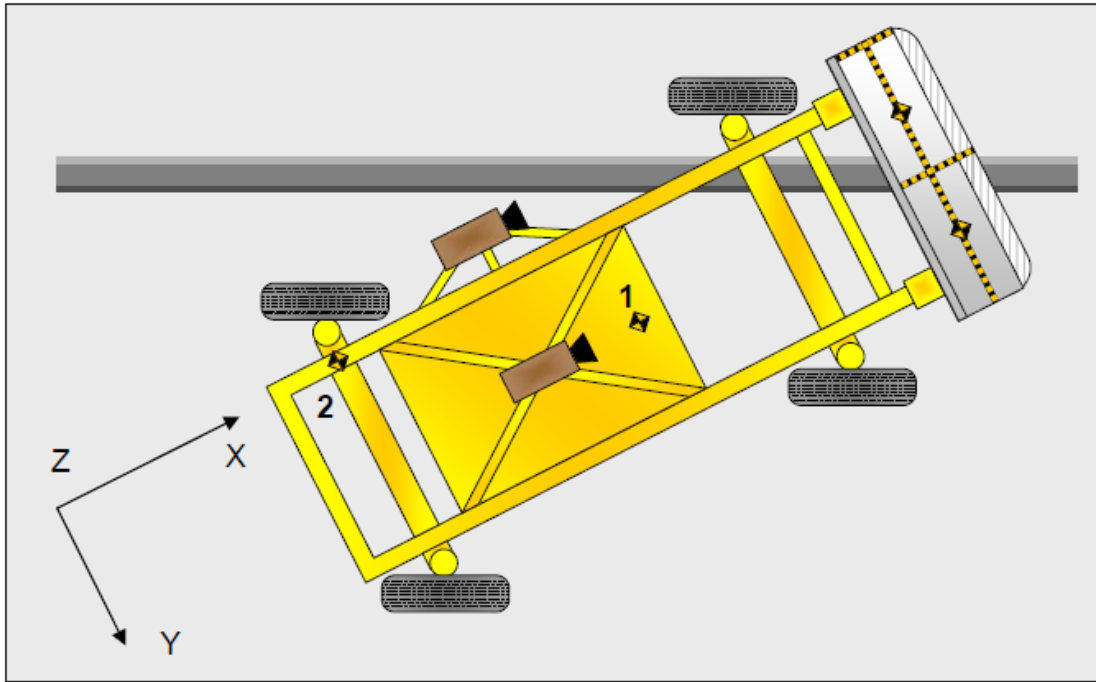
No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	4016	0	-212
2	Right Sill at Front Seat	4021	788	-63
3	Right Sill at Rear Seat	2963	775	-87
4	Left Sill at Front Door	4019	-814	-62
5	Left Sill at Rear Door	2965	-803	-91
6	A-Post Lower	4659	-773	-109
7	A-Post Middle	4617	-736	-850
8	B-Post Lower	3486	-764	-307
9	B-Post Middle	3481	-757	-728
10	Front Seat Track	3753	-643	-156
11	Rear Seat Structure	2785	-649	-227
12	Rt. Rear Occ. Compartment	3322	447	-117
13	Engine Block	5515	-68	-365
14	Rear Above Axle	1340	0	-270

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: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019



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: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	None	None
Top of Head	Side Headliner	Curtain Airbag
Left Side of Head	Side Headliner & Curtain Airbag	Curtain Airbag
Back of Head	Side Headliner & Headrest	Curtain Airbag & C-Pillar
Left Shoulder	Curtain Airbag	Curtain Airbag
Upper Torso	Seatback & Torso/Pelvis Airbag	Passenger Door
Lower Torso	Seatback & Torso/Pelvis Airbag	Passenger Door
Left Hip	Torso/Pelvis Airbag	None
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	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Width of Opening at Striker (mm)	0	0	0	0	0

POST-TEST SEAT PERFORMANCE

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

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	None
Other Notable Effects	None

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

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Frontal Air bag	Yes	No		
Knee Air bag	No	N/A		
Side Air bag 1 - Curtain	Yes	Yes	Yes	Yes
Side Air bag 2 - Torso/Pelvis Air bag	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		4060
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		508
Actual Impact Point (Aft of Frontal Axle)	mm		503
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+5
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	+3

**DATA SHEET NO. 9
MDB SUMMARY OF RESULTS**

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

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	61.82
Trap No. 2 Velocity (Redundant)	km/h	61.10 to 62.70	61.83
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

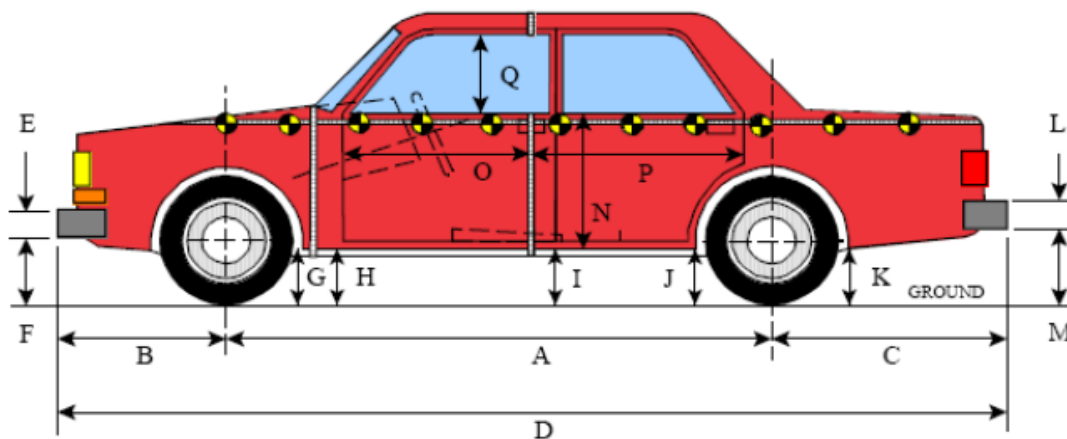
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	91
B	Top of Bumper	533	800	Right	119
C	Mid-Level	686	800	Right	184
D	Top of Stack	813	800	Right	240

**DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019



LEFT SIDE VIEW

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

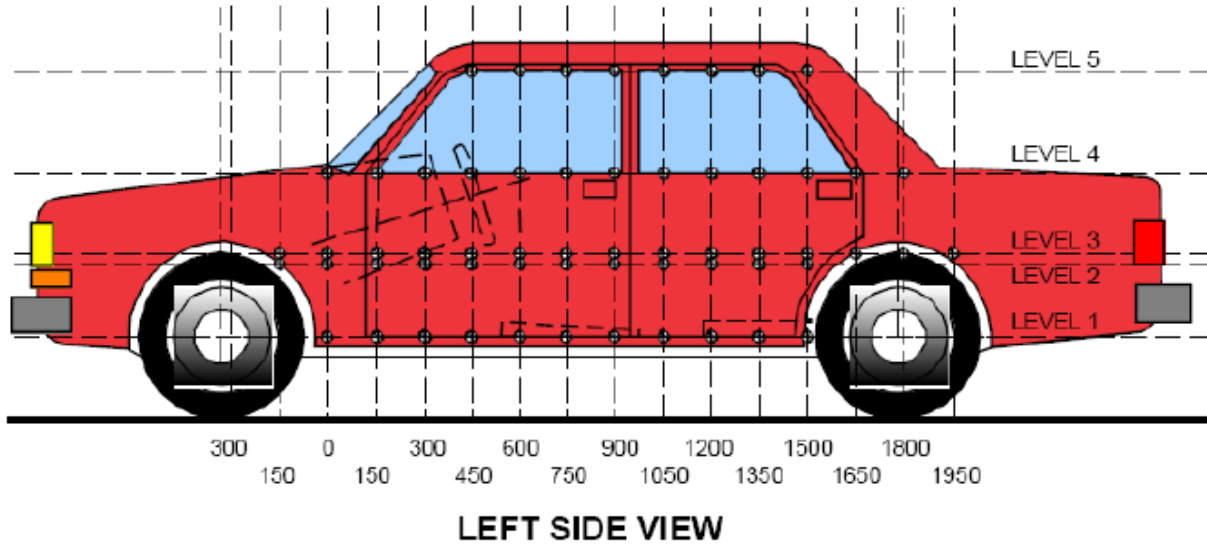
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	4060	4063	3
B	Front Axle to FSOV	975	978	3
C	Rear Axle to RSOV	1312	1308	-4
D	Total Length at Centerline	6346	6349	3
E	Front Bumper Thickness	245	245	0
F	Front Bumper Bottom to Ground	385	387	2
G	Sill Height at Front Wheel Well	420	418	-2
H	Sill Height at Front Door Leading Edge	455	455	0
I	Sill Height at B Pillar	492	486	-6
J1	Sill Height at Rear Wheel Well	495	516	21
J2	Pinch Weld Height at Rear Wheel Well	484	492	8
K	Sill Height Aft of Rear Wheel Well	520	515	-5
L	Rear Bumper Thickness	215	215	0
M	Rear Bumper Bottom to Ground	537	524	-13
N	Sill Height to Window Bottom of Front Window Sill	867	865	-2
O	Front Door Leading Edge to Impact CL	719	718	-1
P	Rear Door Trailing Edge to Impact CL	1510	1477	-33
Q	Front Window Opening	520	524	4
R	Right Side Length	6292	6295	3
S	Left Side Length	6285	6290	5
T	Maximum Vehicle Width	2019	1931	-88

**DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	572	220	1800
2	Driver Hip Point	mm	994	151	1650
3	Mid-Door	mm	909	173	1650
4	Window Sill	mm	1237	69	1500
5	Window Top	mm	1923	8	2250

*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: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

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				691					724						-33	
-750				712					741						-29	
-600				729					754						-25	
-450				741					761						-20	
-300				751					764						-13	
-150		803	811	759			790	788	766			13	23	-7		
0	793	792	792	766		704	773	771	768		89	19	21	-2		
150	774	794	792	770		657	767	749	786		117	27	43	-16		
300	771	797	795	773		639	751	720	771		132	46	75	2		
450	773	800	797	778		635	738	719	780		138	62	78	-2		
600	776	802	800	784		626	724	712	785		150	78	88	-1		
750	778	804	801	788		621	714	693	784		157	90	108	4		
900	781	806	803	791		615	723	697	774		166	83	106	17		
1050	783	808	804	794	500	610	715	694	762	500	173	93	110	32	0	
1200	785	809	806	796	513	601	698	674	751	516	184	111	132	45	-3	
1350	788	810	807	799	521	594	704	681	745	523	194	106	126	54	-2	
1500	789	808	804	799	526	572	683	668	730	526	217	125	136	69	0	
1650	791	808	804	799	530	581	657	631	751	528	210	151	173	48	2	
1800	791	808	803	800	532	571	684	652	767	529	220	124	151	33	3	
1950	791	807	803	799	533	595	702	674	783	528	196	105	129	16	5	
2100	792	809	805	797	534	622	726	707	792	527	170	83	98	5	7	
2250	790	808	804	798	536	682	762	754	809	528	108	46	50	-11	8	
2400	789	806	803	801		729	785	776	786		60	21	27	15		
2550	781	799	795	795		784	802	798	798		-3	-3	-3	-3		
2700		798	795	796			801	798	799			-3	-3	-3		
2850		800	797	796			803	799	798			-3	-2	-2		
3000		806	812	795			808	815	797			-2	-3	-2		

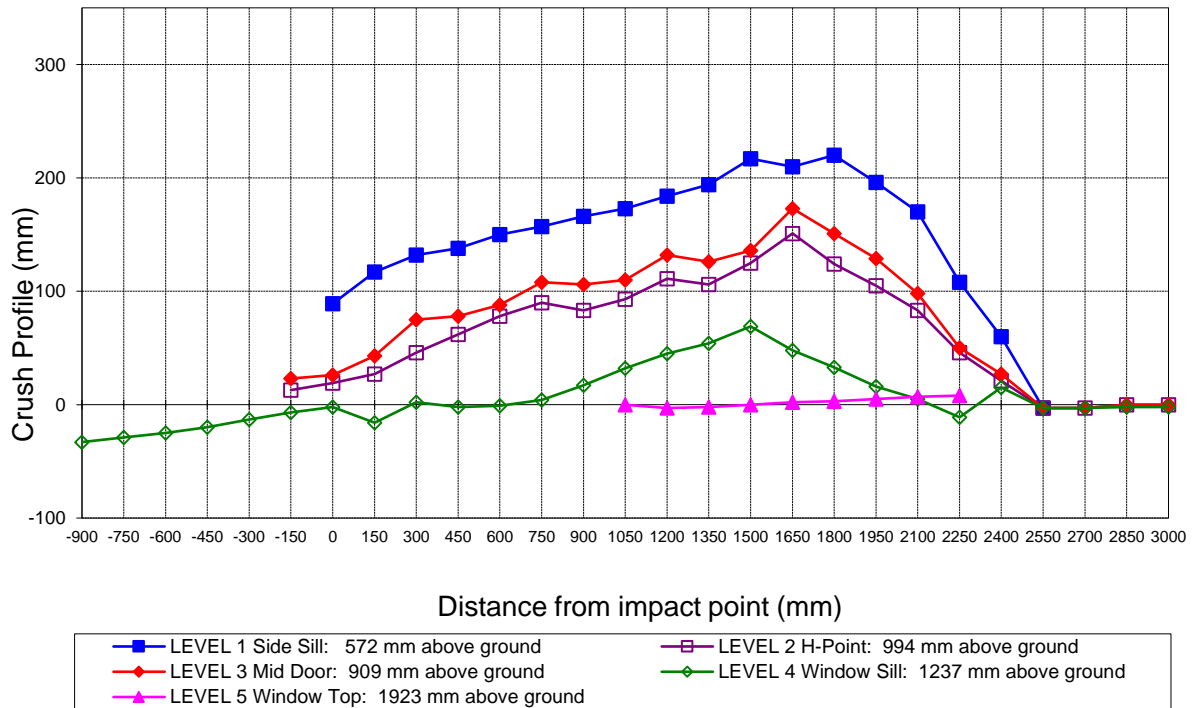
NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition.
 Vehicle measurements forward of the vertical impact reference line are negative.
 The crush profile grid is established prior to test based on an estimated impact point.

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

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

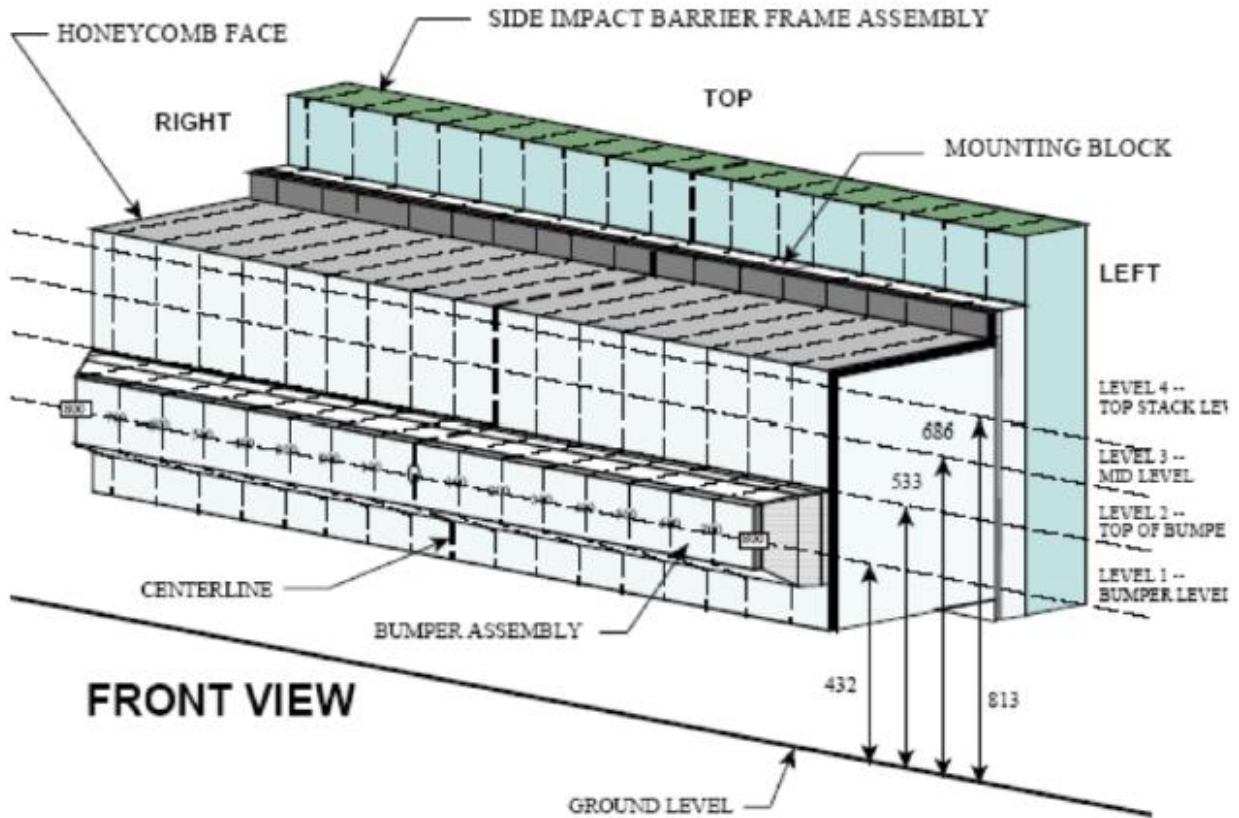
Vehicle Exterior Crush Measurements - Visual Representation



**DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS**

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

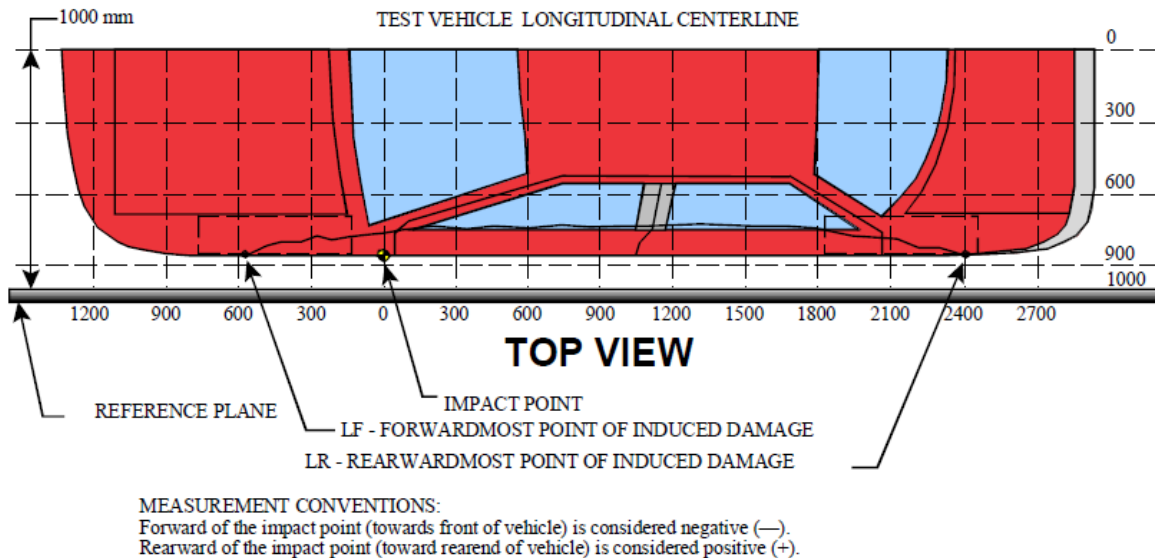
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	87	91	86	82	78	76	74	73	72	76	74	69	65	65	64	69	75
2	119	116	112	108	103	101	98	97	97	95	93	92	91	90	90	90	91
3	184	162	154	138	131	140	141	135	139	135	136	137	138	141	144	149	152
4	240	217	200	183	183	177	207	184	191	190	178	168	161	158	162	163	181

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2019 Ford F-250 four door Truck
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
 Test Date: 3/21/2019

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	212	189	23
2	480	3	282	202	80
3	1110	3	314	195	119
4	1740	3	356	197	159
5	2370	3	228	197	31
6	3000	3	185	188	-3

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)*
1	800 mm left of center	1	75
2	480 mm left of center	1	65
3	160 mm left of center	1	75
4	160 mm right of center	1	74
5	480 mm right of center	1	81
6	800 mm right of center	1	87

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

Test Vehicle:	<u>2019 Ford F-250 four door Truck</u>	NHTSA No.:	<u>M20190207</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>3/21/2019</u>
Test Time:	<u>11:36 AM</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°	67	300	367
90° to 180°	63	300	363
180° to 270°	68	300	368
270° to 360°	68	300	368

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

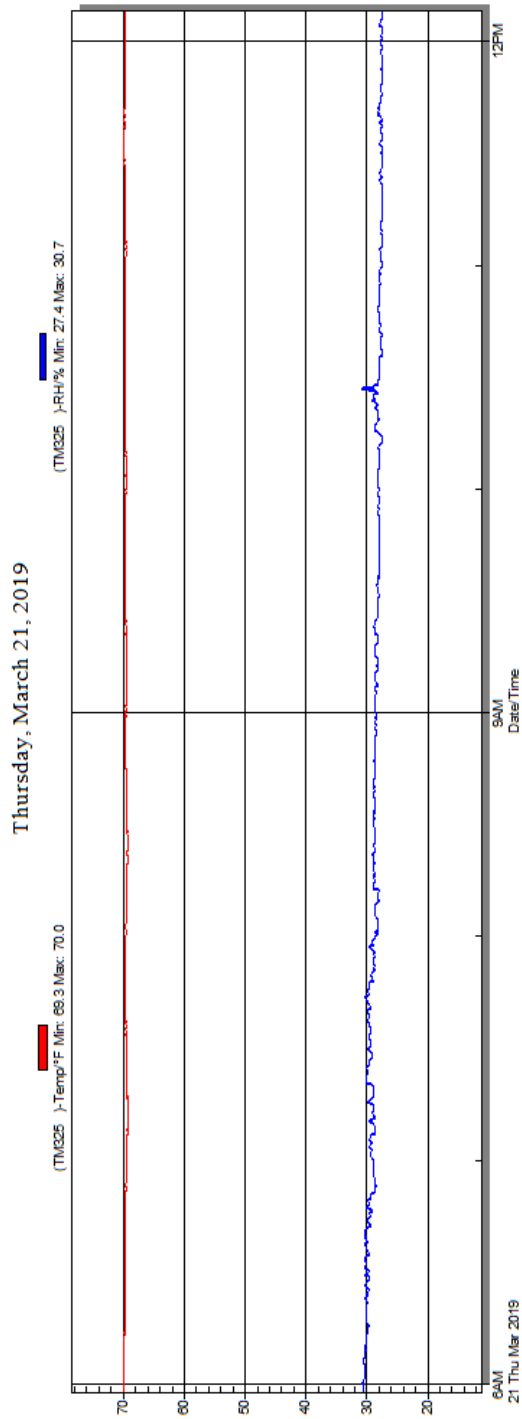
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2019 Ford F-250 four door Truck
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20190207
Test Date: 3/21/2019



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

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Fig.	Description	Page
1	As-Delivered Right Front 3/4 View of Test Vehicle	A-5
2	As-Delivered Left Rear 3/4 View of Test Vehicle	A-5
3	Pre-Test Frontal View of Test Vehicle	A-6
4	Post-Test Frontal View of Test Vehicle	A-6
5	Pre-Test Left Front 3/4 View of Test Vehicle	A-7
6	Post-Test Left Front 3/4 View of Test Vehicle	A-7
7	Pre-Test Left Side View of Test Vehicle	A-8
8	Post-Test Left Side View of Test Vehicle	A-8
9	Pre-Test Left Rear 3/4 View of Test Vehicle	A-9
10	Post-Test Left Rear 3/4 View of Test Vehicle	A-9
11	Pre-Test Rear View of Test Vehicle	A-10
12	Post-Test Rear Side View of Test Vehicle	A-10
13	Pre-Test Right Side View of Test Vehicle	A-11
14	Post-Test Right Side View of Test Vehicle	A-11
15	Pre-Test Overhead View of Test Area	A-12
16	Post-Test Overhead View of Test Area	A-12
17	Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle	A-13
18	Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle	A-13
19	Pre-Test Close-Up View of Impact Point Target	A-14
20	Post-Test Close-up View of Impact Point Target	A-14
21	Pre-Test Left Front Door Latch Close-Up	A-15
22	Post-Test Left Front Door Latch Close-Up	A-15
23	Pre-Test Left Rear Door Latch Close-Up	A-16
24	Post-Test Left Rear Door Latch Close-Up	A-16
25	Pre-Test Front Close-up View of Driver Dummy	A-17
26	Post-Test Front Close-up View of Driver Dummy	A-17
27	Pre-Test Left Side View of Driver Dummy Showing Belt and Chalking	A-18
28	Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-18
29	Post-Test Left Side View of Driver Dummy Shoulder and Door Top View	A-19
30	Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning	A-19
31	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-20
32	Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning	A-20
33	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-21
34	Pre-Test Placement of Driver Dummy's Feet	A-21

Fig.	Description	Page
35	Pre-Test View of Belt Anchorage for Driver Dummy	A-22
36	Pre-Test Left Side View of Steering Wheel	A-22
37	View of Disengaged Parking Brake	A-23
38	Pre-Test View of Parking Brake	A-23
39	Pre-Test Close-Up Left Side View of Driver Seat Track	A-24
40	Pre-Test Close-Up Left Side View of Driver Seat Back	A-24
41	Pre-Test Close-Up View of Driver Seat Back or Head Restraint	A-25
42	Pre-Test Driver Dummy and Door Clearance View	A-25
43	Post-Test Driver Dummy and Door Clearance View	A-26
44	Pre-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-26
45	Post-Test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-27
46	Pre-Test Driver Inner Door Panel View	A-27
47	Post-Test Driver Inner Door Panel View	A-28
48	Post-Test Driver Dummy Close-Up Head Contact with Vehicle View	A-28
49	Post-Test Driver Dummy Close-Up Head Contact with Side Air bag View	A-29
50	Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View	A-29
51	Post-Test Driver Dummy Close-Up Torso Contact with Side Air bag View	A-30
52	Post-Test Driver Dummy Close-Up Pelvis Contact View	A-30
53	Post-Test Driver Dummy Close-Up Pelvis Contact with Side Air bag View	A-31
54	Post-Test Driver Dummy Close-Up Knee Contact View	A-31
55	Pre-Test Left Side View of Rear Passenger Dummy Showing Belt and Chalking	A-32
56	Pre-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-32
57	Post-Test Left Side View of Rear Passenger Dummy Shoulder and Door Top View	A-33
58	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-33
59	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-34
60	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-34
61	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-35
62	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-35
63	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-36
64	Pre-Test Placement of Rear Passenger Dummy's Feet	A-36
65	Pre-Test View of Belt Anchorage for Rear Passenger Dummy	A-37
66	Pre-Test Close-Up Left Side View of Rear Passenger Seat Track	A-37
67	Pre-test Close-Up Left Side View of Rear Passenger Seat Back	A-38
68	Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint	A-38

Fig.	Description	Page
69	Pre-Test Rear Passenger Dummy and Door Clearance View	A-39
70	Post-Test Rear Passenger Dummy and Door Clearance View	A-39
71	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-40
72	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-40
73	Pre-Test Rear Passenger Inner Door Panel View	A-41
74	Post-Test Rear Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations	A-41
75	Post-Test Rear Passenger Dummy Close-Up Head Contact with Vehicle View	A-42
76	Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Air bag View	A-42
77	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View	A-43
78	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Air bag View	A-43
79	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View	A-44
80	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Air bag View	A-44
81	Post-Test Rear Passenger Dummy Close-Up Knee Contact View	A-45
82	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-45
83	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-46
84	Pre-Test Front View of MDB Impactor Face	A-46
85	Post-Test Front View of MDB Impactor Face	A-47
86	Pre-Test Top View of MDB Impactor Face	A-47
87	Post-Test Top View of MDB Impactor Face	A-48
88	Pre-Test Left Side View of MDB Impactor Face	A-48
89	Post-Test Left Side View of MDB Impactor Face	A-49
90	Pre-Test Right Side View of MDB Impactor Face	A-49
91	Post-Test Right Side View of MDB Impactor Face	A-50
92	Close-Up View of Vehicle's Certification Label	A-50
93	Close-Up View of Vehicle's Tire Information Placard or Label	A-51
94	Pre-Test Ballast View	A-51
95	Post-Test Primary and Redundant Speed Trap Read-Out	A-52
96	FMVSS No. 301 Static Rollover 0 Degrees	A-52
97	FMVSS No. 301 Static Rollover 90 Degrees	A-53
98	FMVSS No. 301 Static Rollover 180 Degrees	A-53
99	FMVSS No. 301 Static Rollover 270 Degrees	A-54
100	FMVSS No. 301 Static Rollover 360 Degrees	A-54
101	Impact Event	A-55
102	Monroney Label	A-55
103	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-56
104	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-56



M20190207

Figure A-1: As-Delivered Right Front 3/4 View of Test Vehicle



M20190207

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 ¾ View of Test Vehicle



Figure A-6: Post-Test Left Front ¾ 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

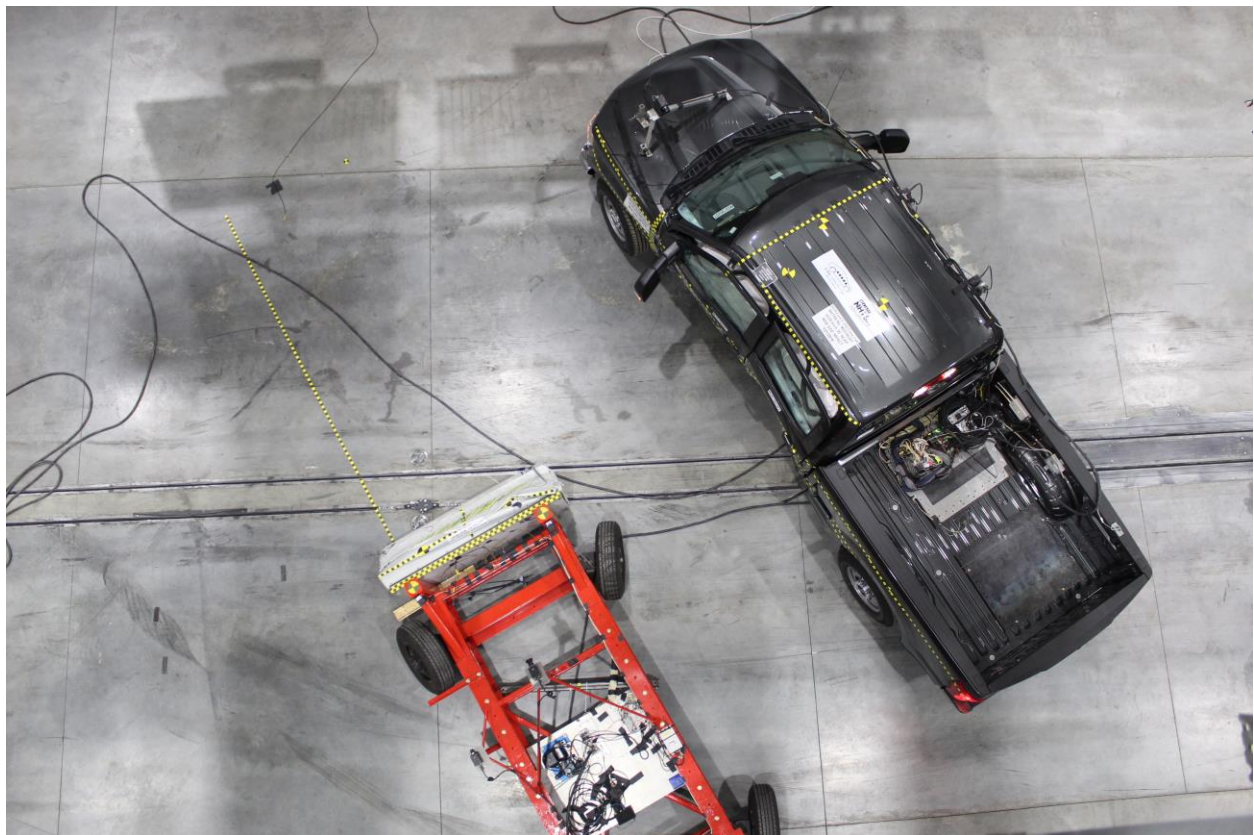


Figure A-16: Post-Test Overhead View of Test Area



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

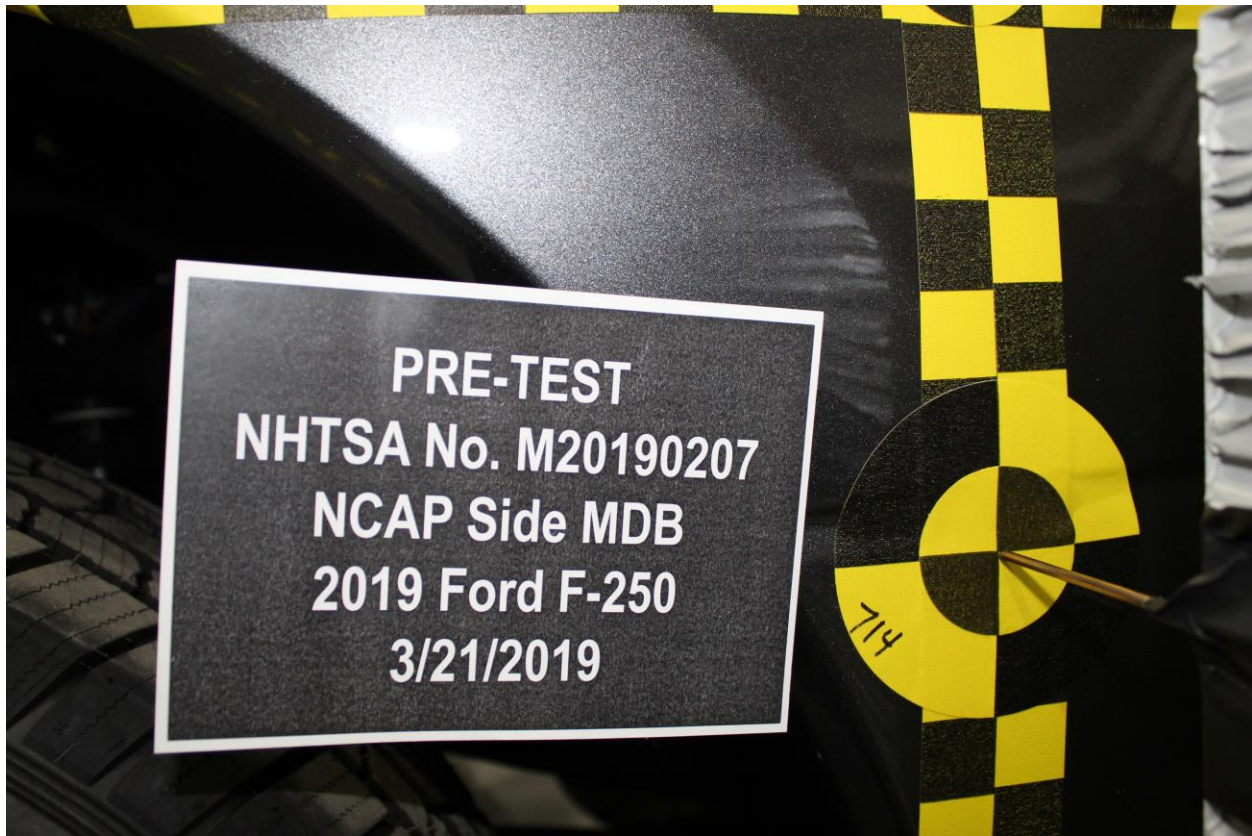


Figure A-19: Pre-Test Close-up View of Impact Point Target



Figure A-20: Post-Test Close-up View of Impact Point Target

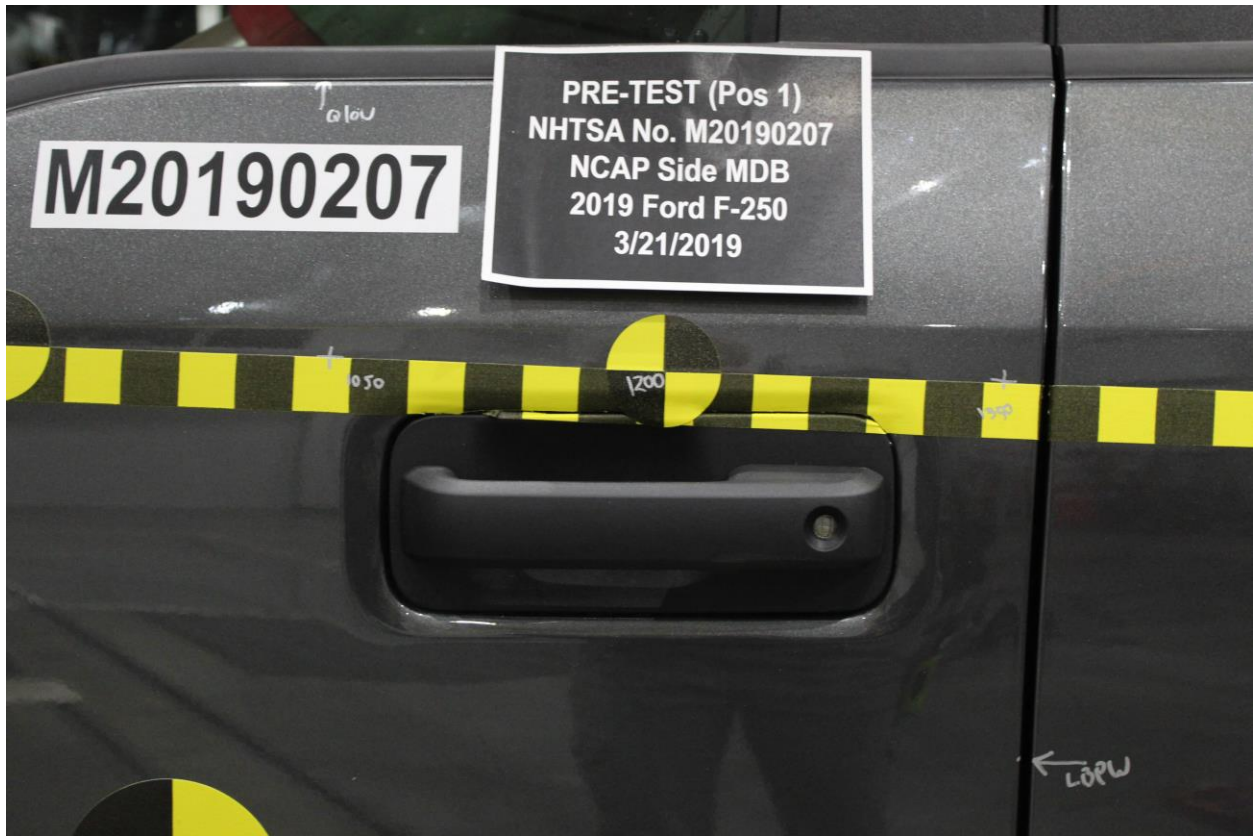


Figure A-21: Pre-Test Left Front Door Latch Close-Up



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

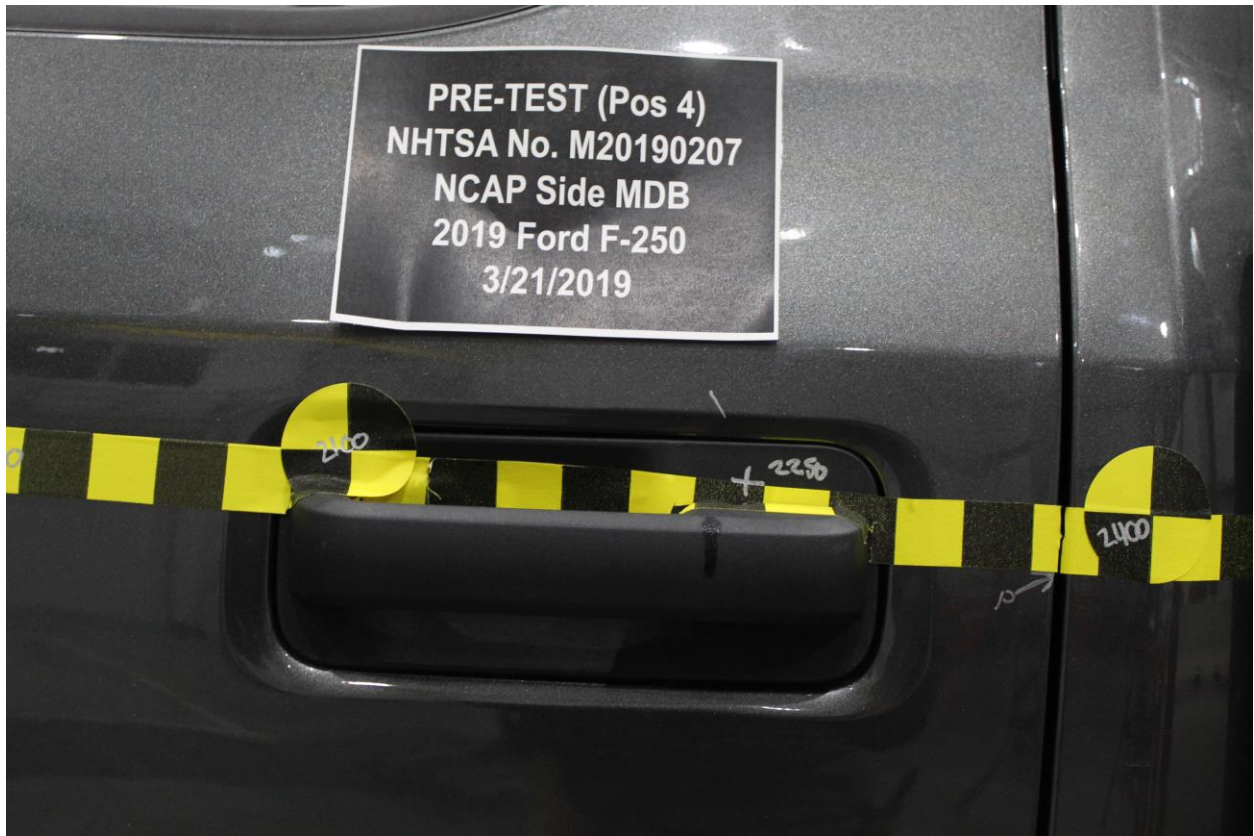


Figure A-23: Pre-Test Left Rear Door Latch Close-Up



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

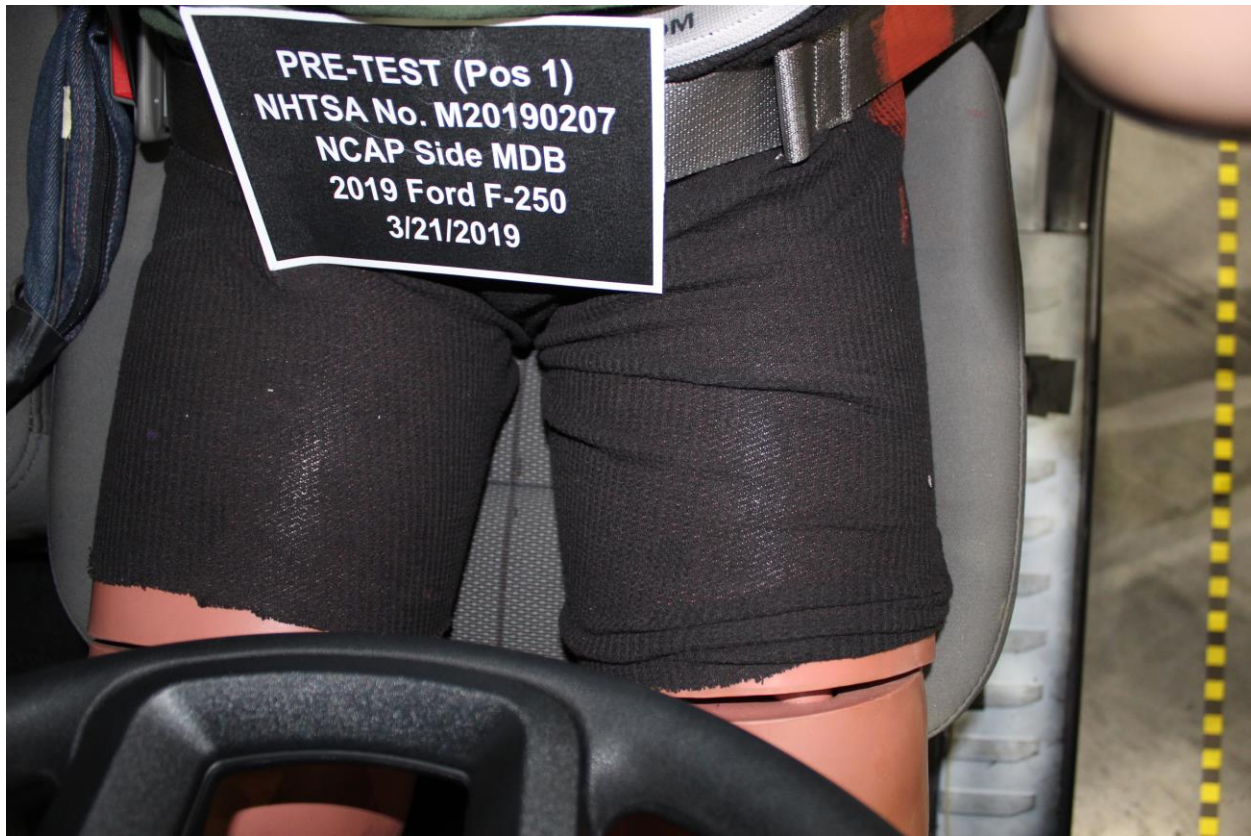


Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



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

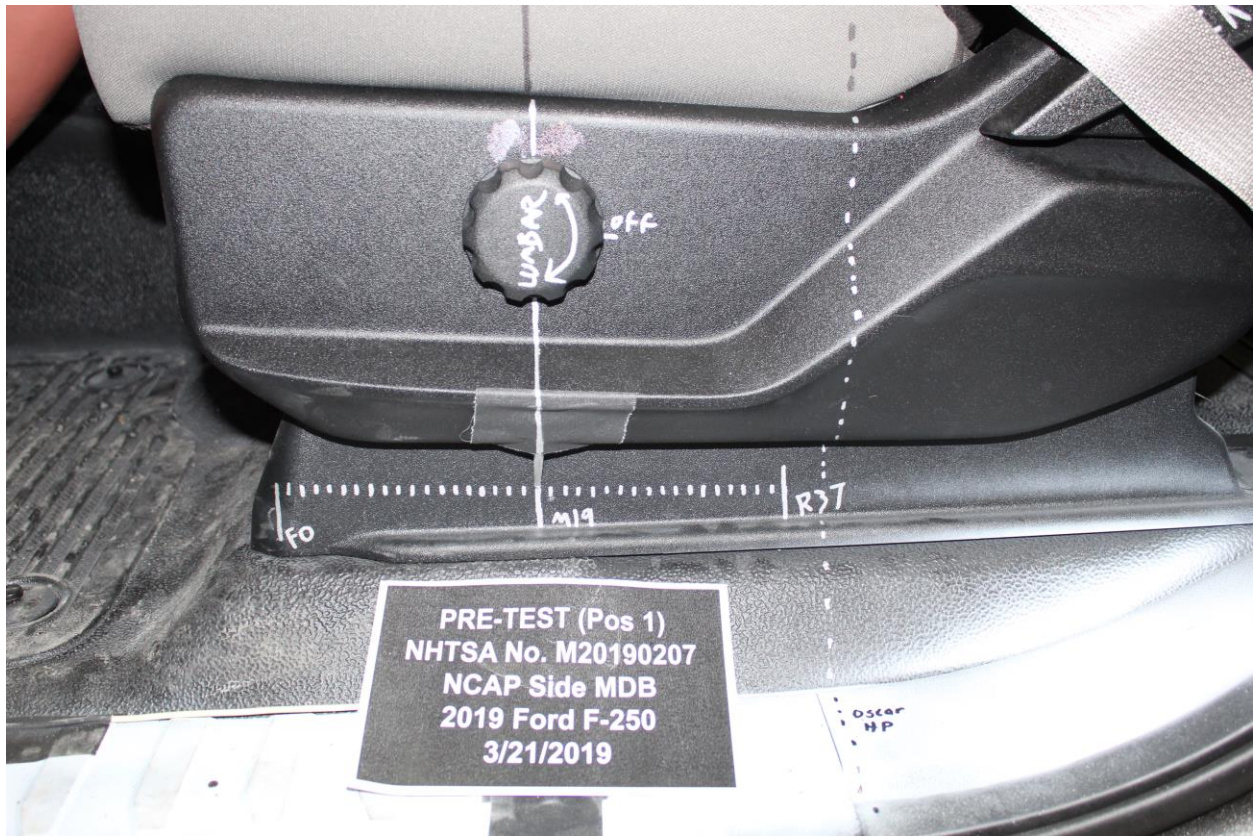


Figure A-39: Pre-test Close-Up Left Side View of Driver Seat Track



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 Showing Driver Dummy Contact Locations



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 Air bag 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 Air bag View



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

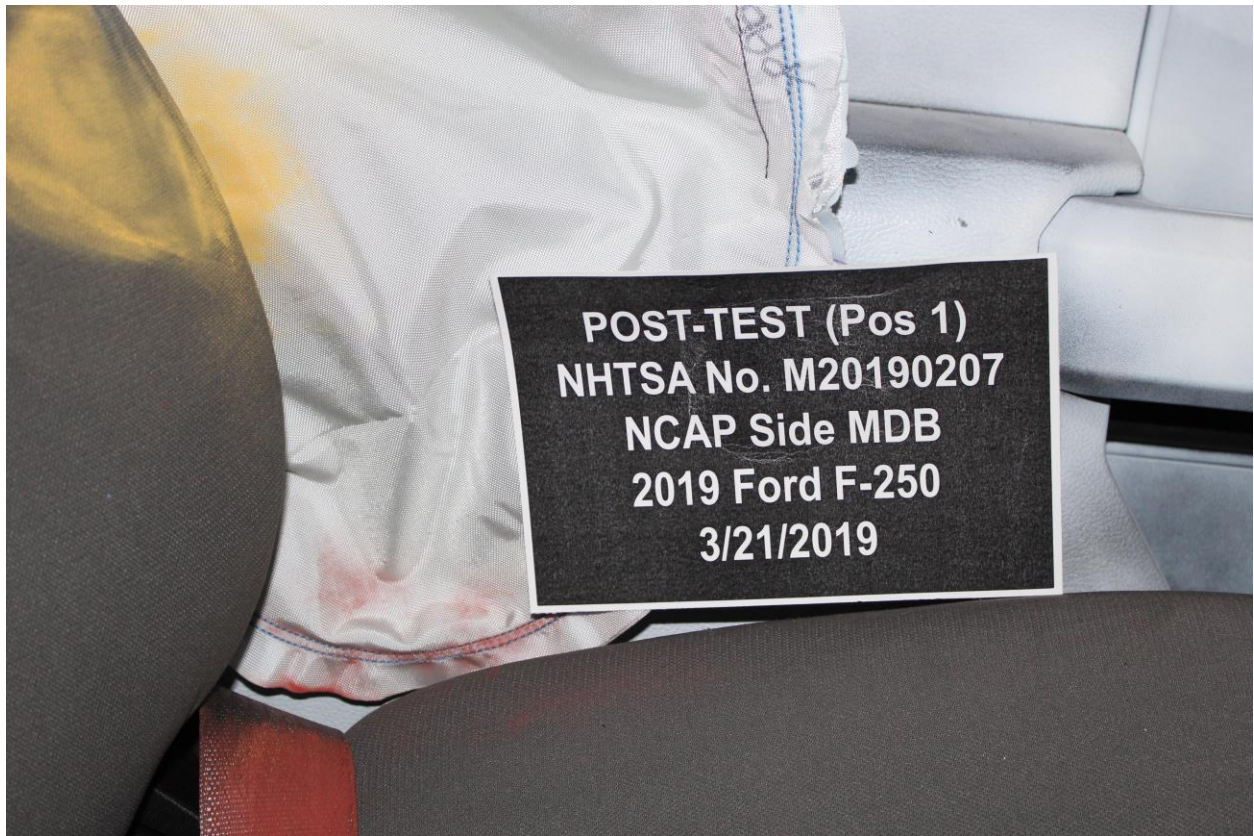


Figure A-53: Post-Test Driver Dummy Close-Up Pelvis Contact with Side Air bag View



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



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



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



Figure A-57: Post-Test Left Side View of Rear 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

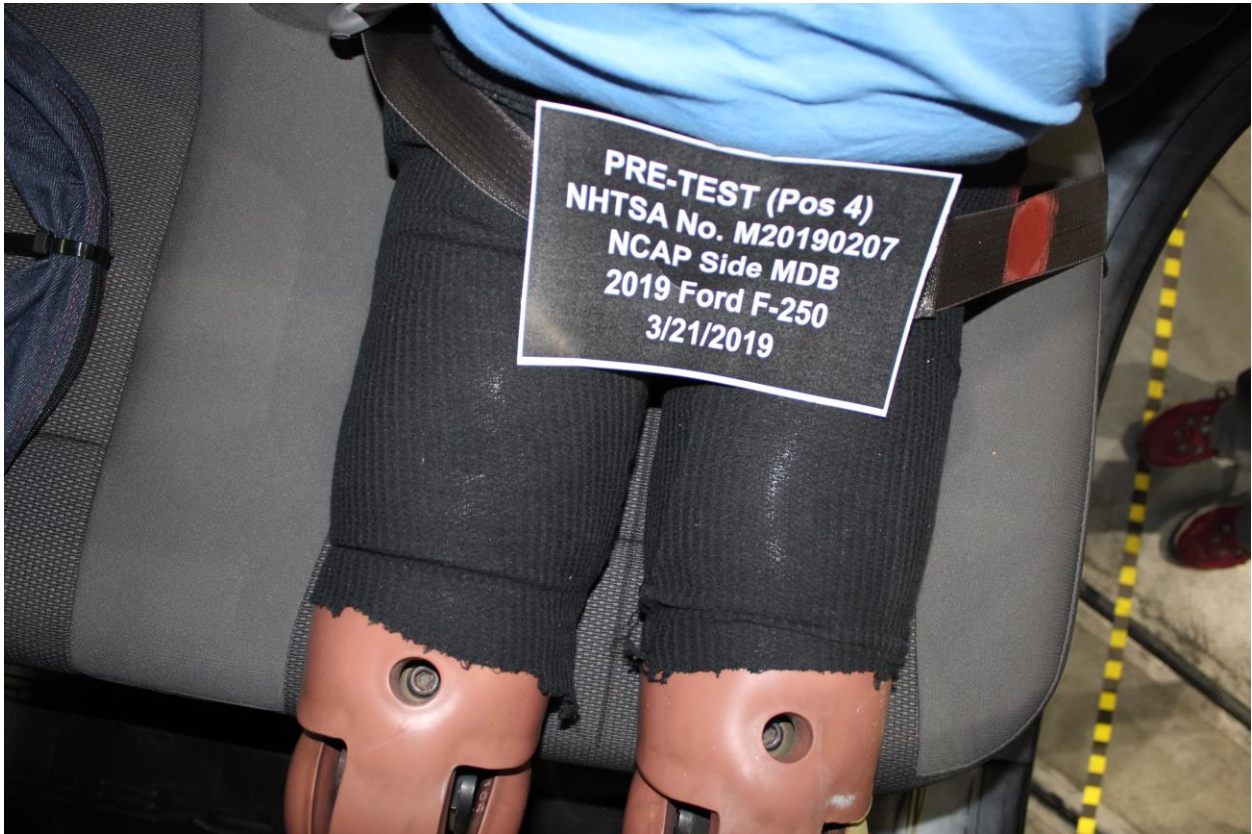


Figure A-61: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

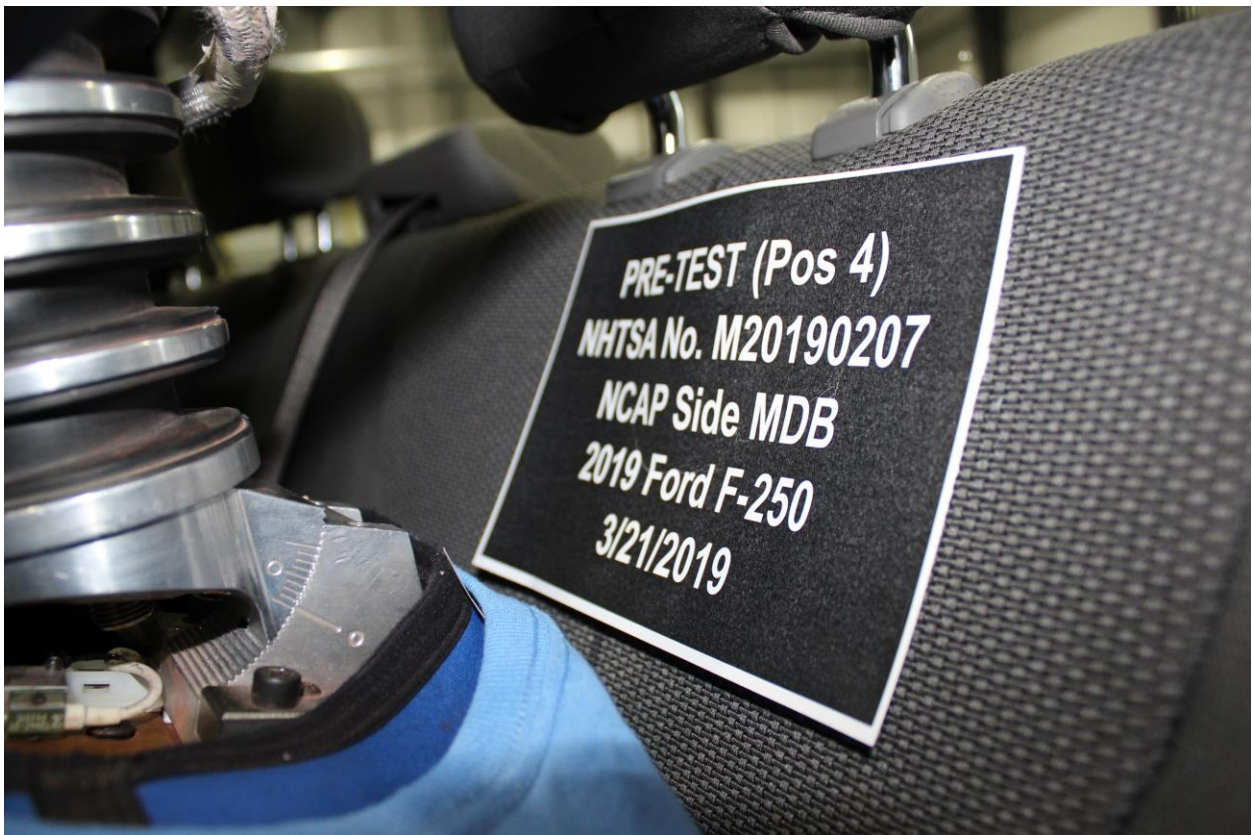


Figure A-62: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



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



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



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 Rear Passenger Dummy and Door Clearance View



Figure A-70: Post-Test Rear 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 Rear Passenger Inner Door Panel View



Figure A-74: Post-Test Rear Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations



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 Air bag 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 Air bag View

Photo Not Applicable

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 Air bag 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

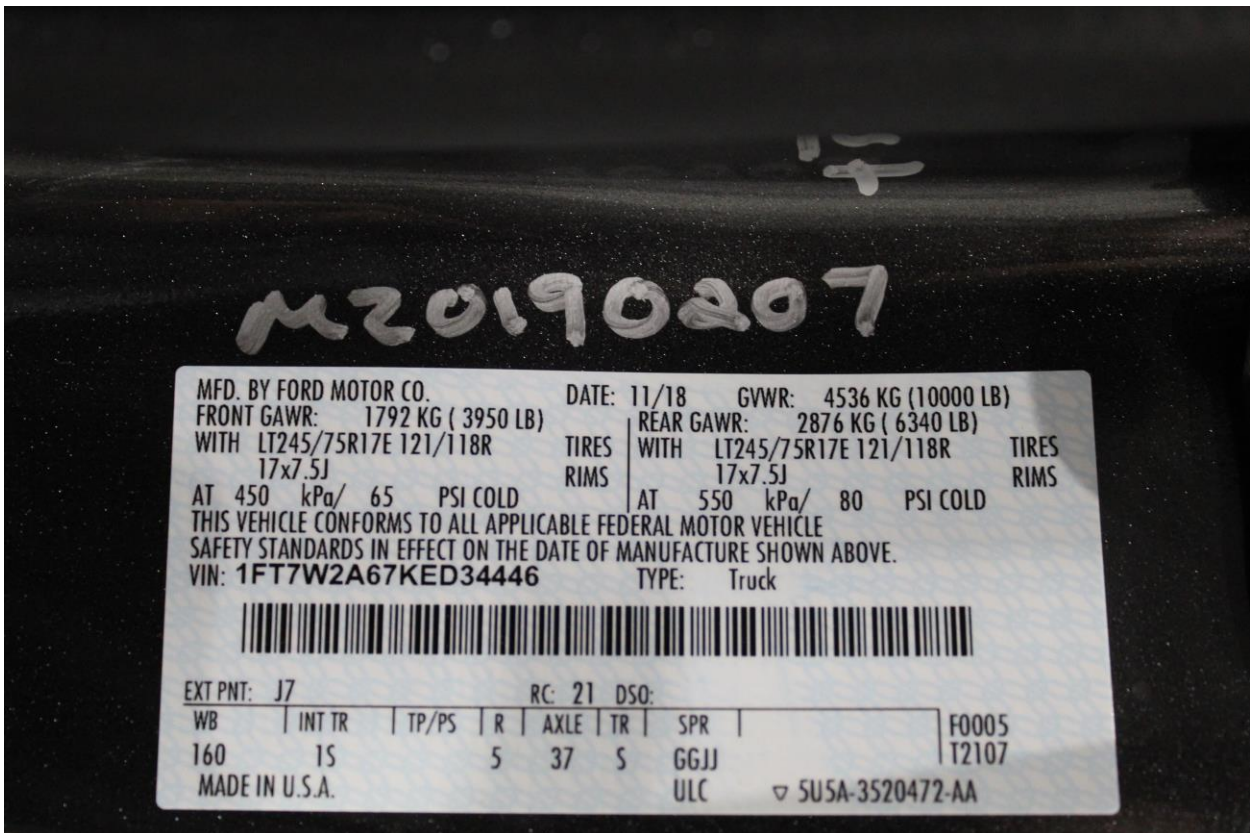


Figure A-92: Close-Up View of Vehicle's Certification Label

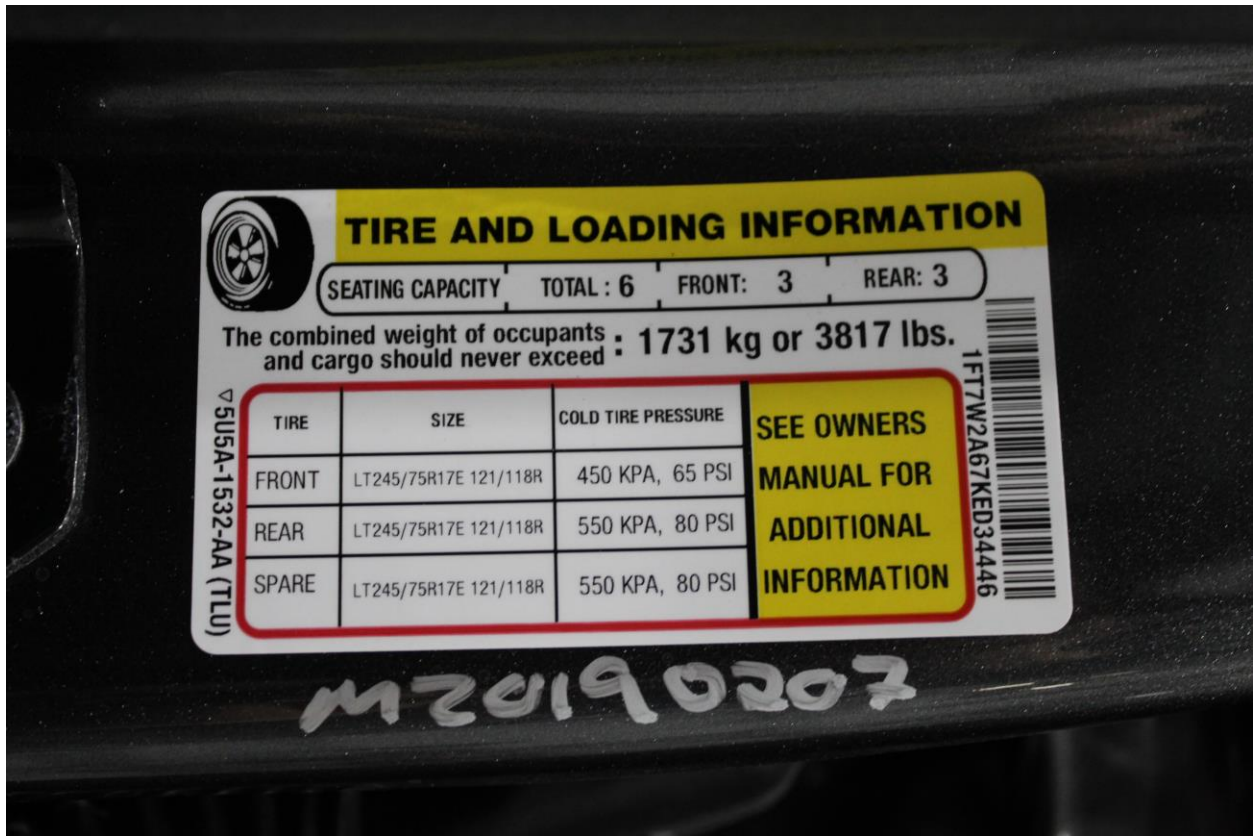


Figure A-93: Close-Up View of Vehicle's Tire Information Placard or Label

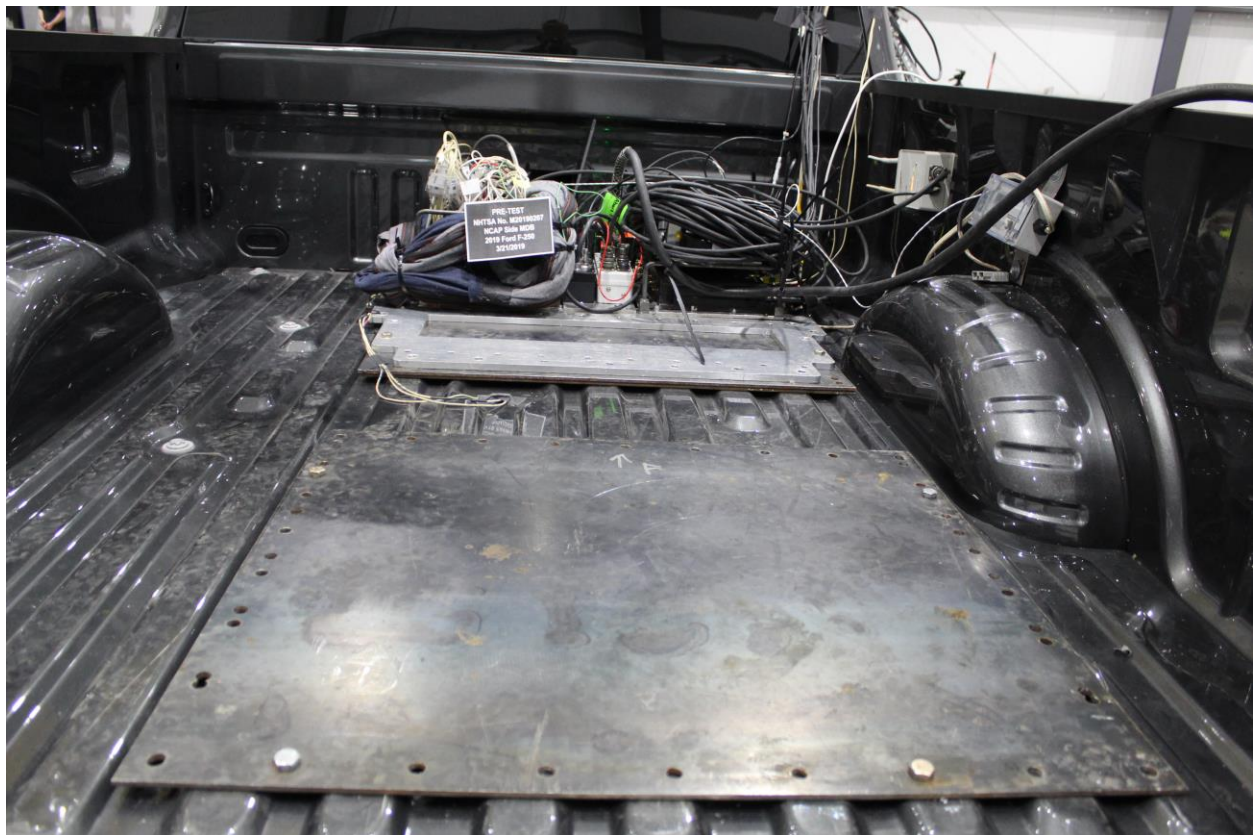


Figure A-94: Pre-Test Ballast View



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



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

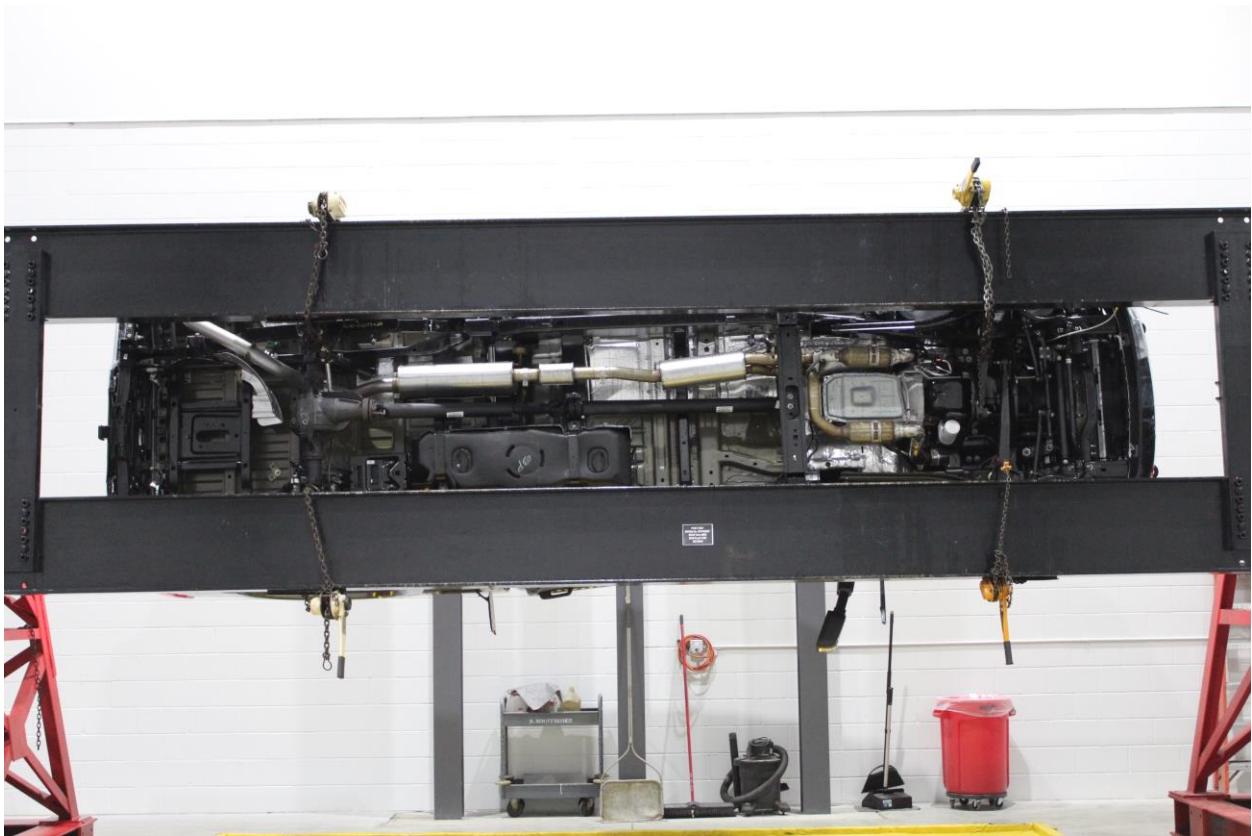


Figure A-97: FMVSS No. 301 Static Rollover 90 Degrees



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 Go Further ford.com		VEHICLE DESCRIPTION SUPER DUTY 2019 F250 SRW 4X2 CREW CAB XL 160" WB STYLE SIDE 6.2L EFI V-8 ENGINE 6-SPEED AUTOMATIC TRANS G		KE D34446		EPA DOT Fuel Economy and Environment													
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE		EXTERIOR MAGNETIC INTERIOR MEDIUM EARTH GRAY CLOTH		FUEL ECONOMY RATINGS NOT REQUIRED ON THIS VEHICLE fuelconomy.gov <small>Calculate personalized estimates and compare vehicles</small>		GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score Not Rated <small>Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</small> <table border="1"> <tr> <td>Frontal Crash</td> <td>Driver</td> <td>Not Rated</td> </tr> <tr> <td>Crash</td> <td>Passenger</td> <td>Not Rated</td> </tr> </table> <small>Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.</small> <table border="1"> <tr> <td>Side Crash</td> <td>Front seat</td> <td>Not Rated</td> </tr> <tr> <td>Crash</td> <td>Rear seat</td> <td>Not Rated</td> </tr> </table> <small>Based on the risk of injury in a side impact.</small> Rollover ★ ★ ★ ★ <small>Based on the risk of rollover in a single-vehicle crash.</small>		Frontal Crash	Driver	Not Rated	Crash	Passenger	Not Rated	Side Crash	Front seat	Not Rated	Crash	Rear seat	Not Rated
Frontal Crash	Driver	Not Rated																	
Crash	Passenger	Not Rated																	
Side Crash	Front seat	Not Rated																	
Crash	Rear seat	Not Rated																	
EXTERIOR • BOX RAIL/TAILOGATE MOLDINGS • DOOR HANDLES - BLACK • HEADLAMPS, WIRES ACTIVATED • LOCKING REMOVABLE TAILGATE • PICKUP BOX, TIE-DOWN HOOKS • NA W/BOX DLT • SPARE TIRE AND WHEEL LOCK • NA W/BOX DLT • TOW HOOKS • TRAILER SWAY CONTROL	INTERIOR • 60/40 REAR BENCH W/F LIP-UP • FLIP-DOWN W/ HEAD RESTRAINT • AIR COND, MANUAL FRONT • DRIVER SEAT-MANUAL LUMBAR • OUTSIDE TEMP DISPLAY • PARTICULATE AIR FILTER • TILT/TELESCOPE STR COLUMN • VINYL SUN VISORS	FUNCTIONAL • 4-WHEEL ANTI-LOCK DISC BRAKING SYSTEM • HILL START ASSIST • JEWEL EFFECT HEADLAMPS • MYKEY® • REAR VIEW CAMERA • NA W/BOX DLT • TWIN I-BEAM INDEPENDENT FR T SUSPENSION W/STAB BAR	SAFETY/SECURITY • ADVANCED TRAC WITH RSC • AIRBAGS - SAFETY CANOPY • BELT-MINDER CHIME • DRIVER/PASSENGER AIR BAGS • SECURILOCK® ANTI-THEFT SYS • SOS POST CRASH ALERT SYS WARRANTY • 3YR/36,000 BUMPER / BUMPER • 5YR/60,000 POWERTRAIN • 5YR/60,000 ROADSIDE ASSIST • 5YR/100,000 DIESEL ENGINE	INCLUDED ON THIS VEHICLE (MSRP) OPTIONAL EQUIPMENT/OTHER PREFERRED EQUIPMENT PKG 600A 6-SPEED AUTOMATIC TRANS G 3.73 RATIO REGULAR AXLE POWER EQUIPMENT GROUP XL DECOR PACKAGE PLATFORM RUNNING BOARDS 10000H GVWR PACKAGE 60 STATE EMISSIONS SPARE TIRE AND WHEEL TELESCOPING T1 MIRR-POWER/HTD JACK CLOTH 40/20/40 SEAT XL VALUE PACKAGE CRUISE CONTROL JAMPM STEREO MP3/CD SYNC VOICE ACTIVATED SYSTEMS		PRICE INFORMATION (MSRP) BASE PRICE \$36,745.00 TOTAL OPTIONS/OTHER 2,885.00 TOTAL VEHICLE & OPTIONS/OTHER DESTINATION & DELIVERY 39,630.00 1,495.00		FUEL ECONOMY RATINGS NOT REQUIRED ON THIS VEHICLE 41 YEARS FORD F-SERIES AMERICA'S BEST SELLING TRUCKS											
SOLD TO: Palmetto Ford P.O. BOX 21820 Charleston SC 29417		21B 290 RAMP ONE RA4F	FINAL ASSEMBLY PLANT KENTUCKY METHOD OF TRANSF. RAIL	TOTAL MSRP \$41,125.00		1F17W2A67KED34446 													
RAMP TWO ITEM # 2-1011 QUT 1		FORD CREDIT Whether you decide to lease or finance your vehicle, you'll find the choices that are right for you. See your dealer for details or visit www.ford.com/finance .		SPECIAL ORDER JL051 N RB 2X 930 003129 11 05 18		WARNING: Operating, servicing and maintaining a passenger vehicle, pickup truck, van, or off-road vehicle can expose you to chemicals including engine exhaust, carbon monoxide, phthalates, and lead, which are known to the State of California to cause cancer and birth defects or other reproductive harm. To minimize exposure, avoid breathing exhaust, do not idle the engine except as necessary, service your vehicle in a well-ventilated area and wear gloves or wash your hands frequently when servicing your vehicle. For more information go to www.PSVWarnings.ca.gov/passenger-vehicle .													

Figure A-102: Monroney Label

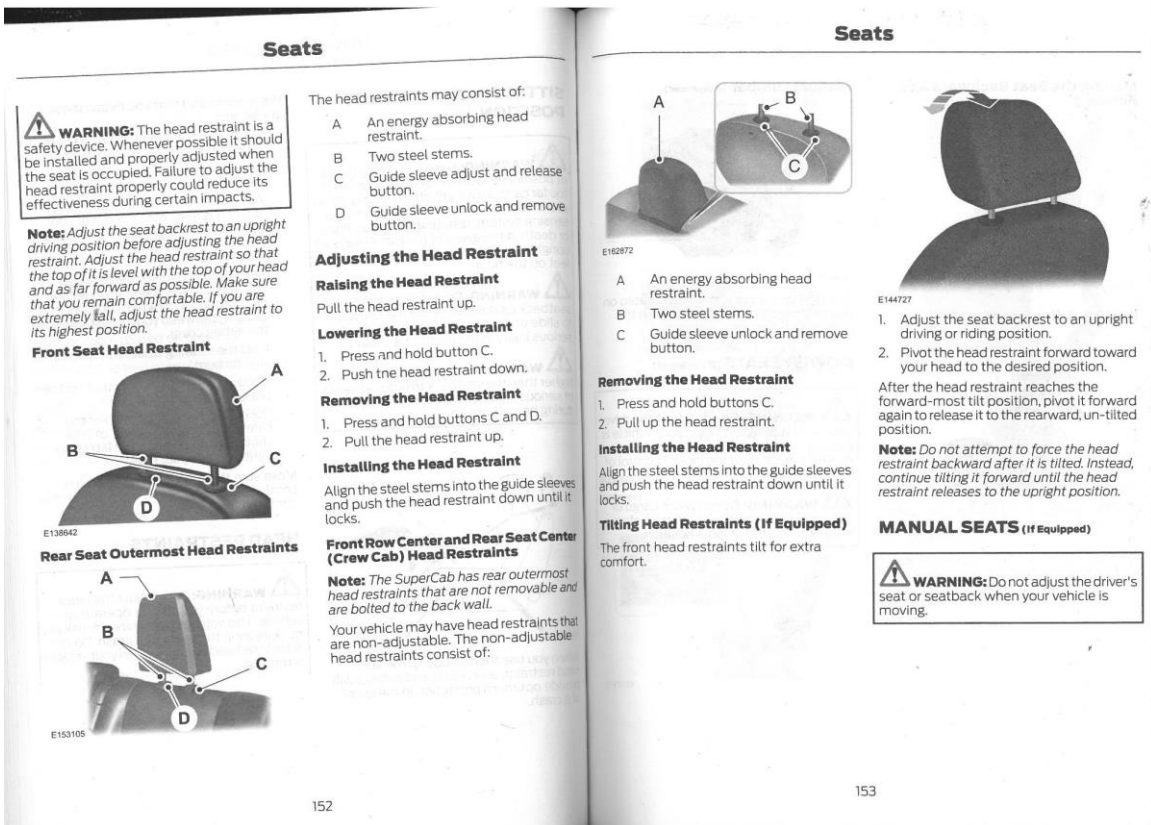


Figure A-103: Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

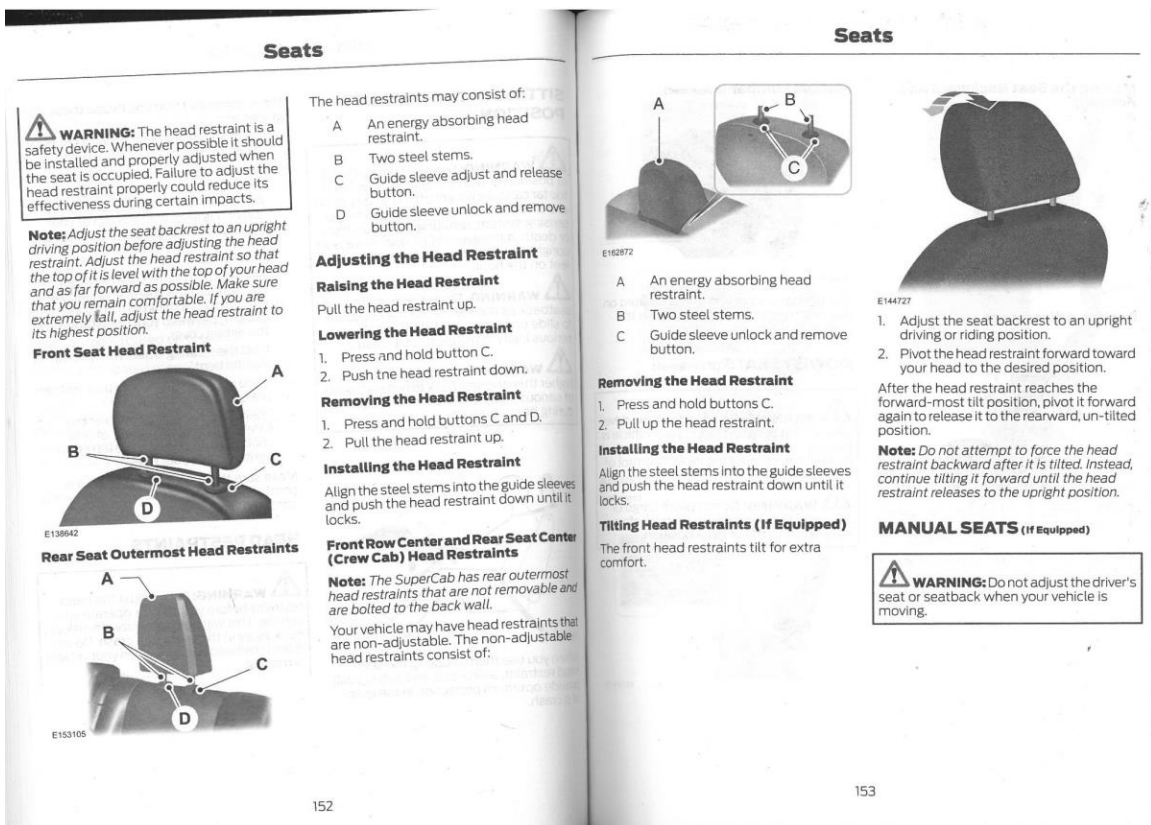


Figure A-104: Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual-Rear Restraints Not Adjustable

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

Fig.	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-5
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration (Z) Primary vs. Time	B-5
4	Driver Head Resultant Acceleration Primary vs. Time	B-5
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
9	Driver Anterior Abdominal Force (Y) vs. Time	B-7
10	Driver Middle Abdominal Force (Y) vs. Time	B-7
11	Driver Posterior Abdominal Force (Y) vs. Time	B-7
12	Driver Total Abdominal Force (Y) vs. Time	B-7
13	Driver Pubic Symphysis Force (Y) vs. Time	B-8
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
17	Passenger Head Resultant Acceleration Primary vs. Time	B-9
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.gov.

Additional Driver & Passenger Dummy Instrumentation Data

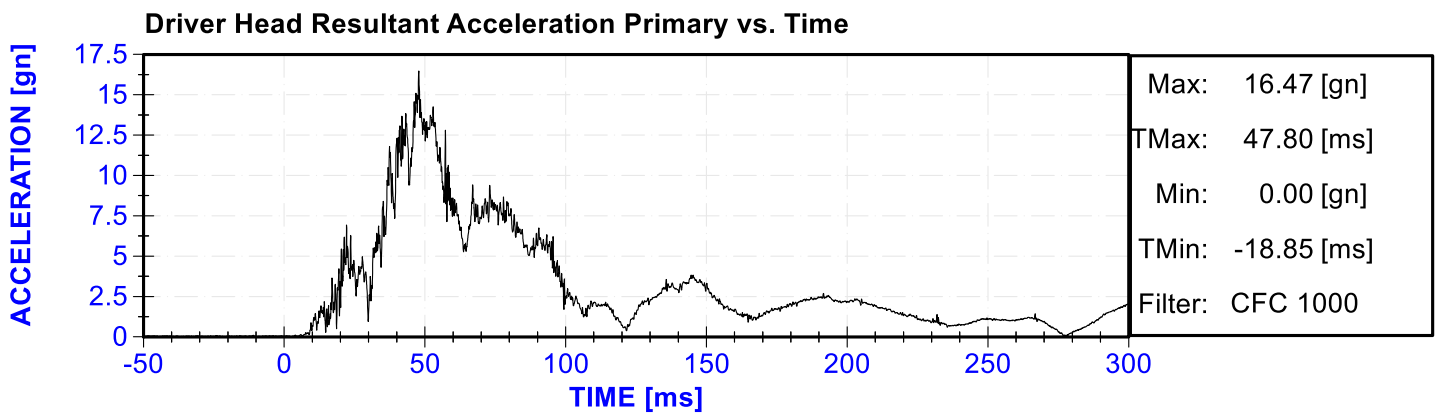
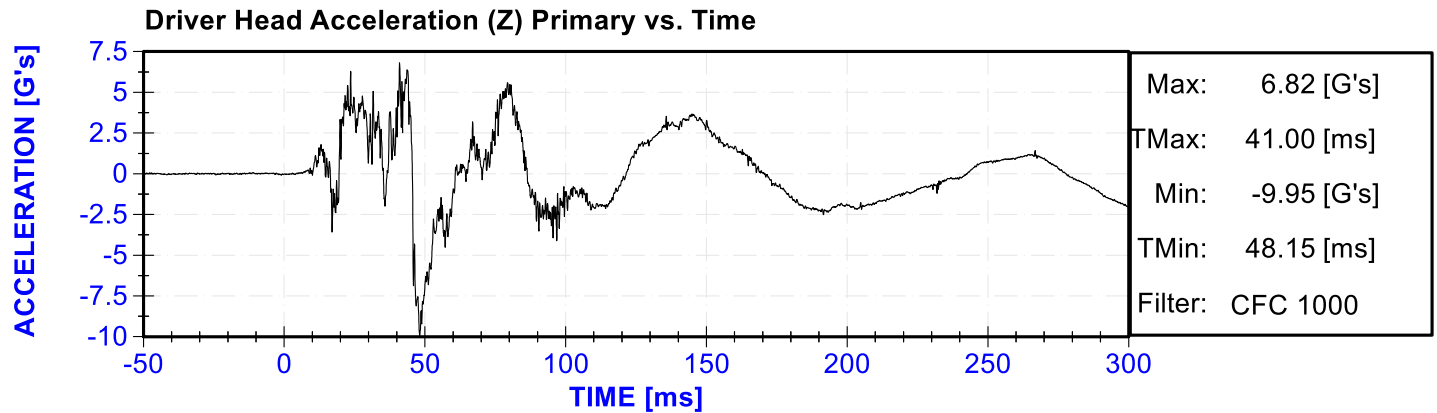
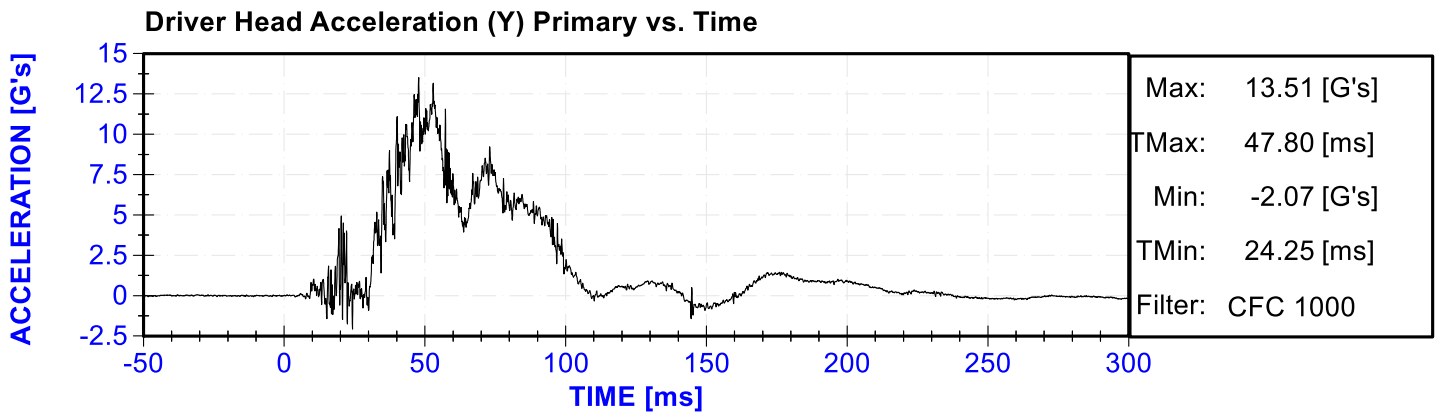
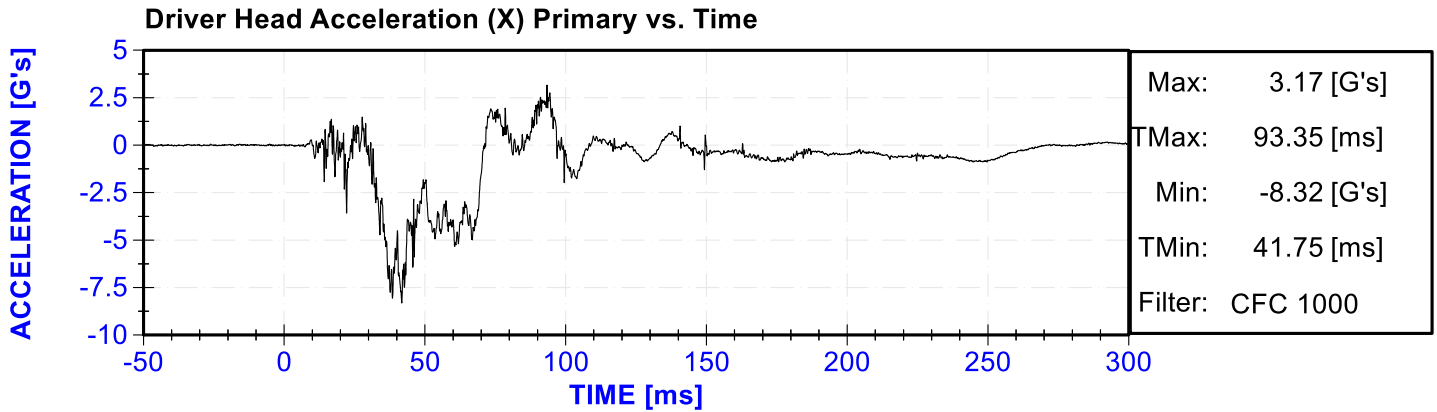
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Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
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Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
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Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)

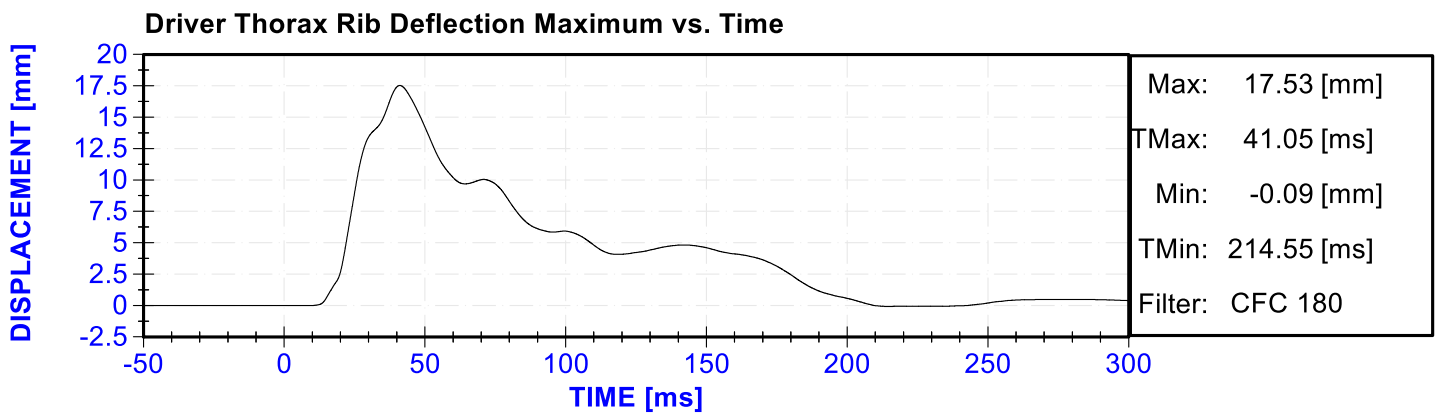
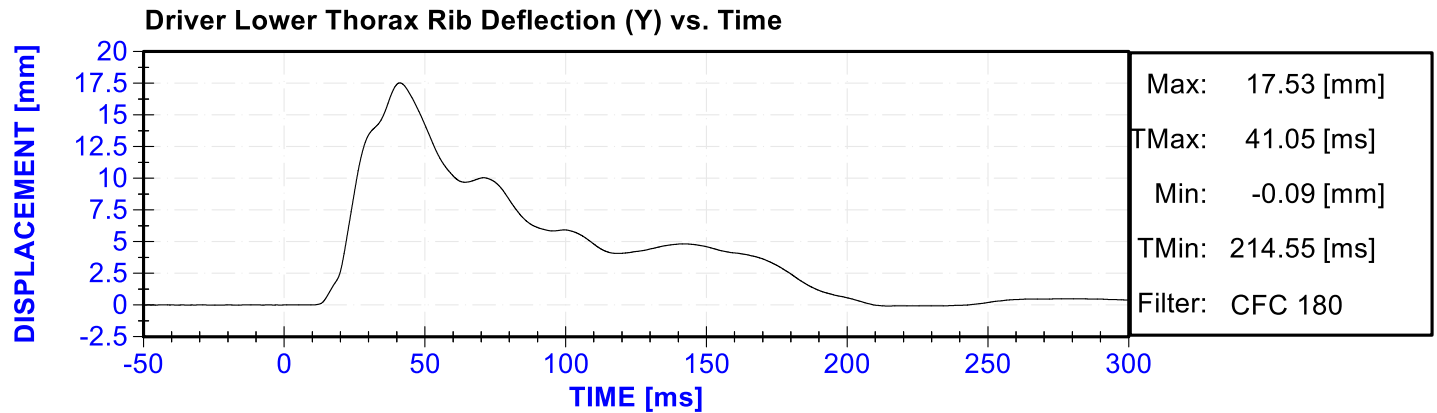
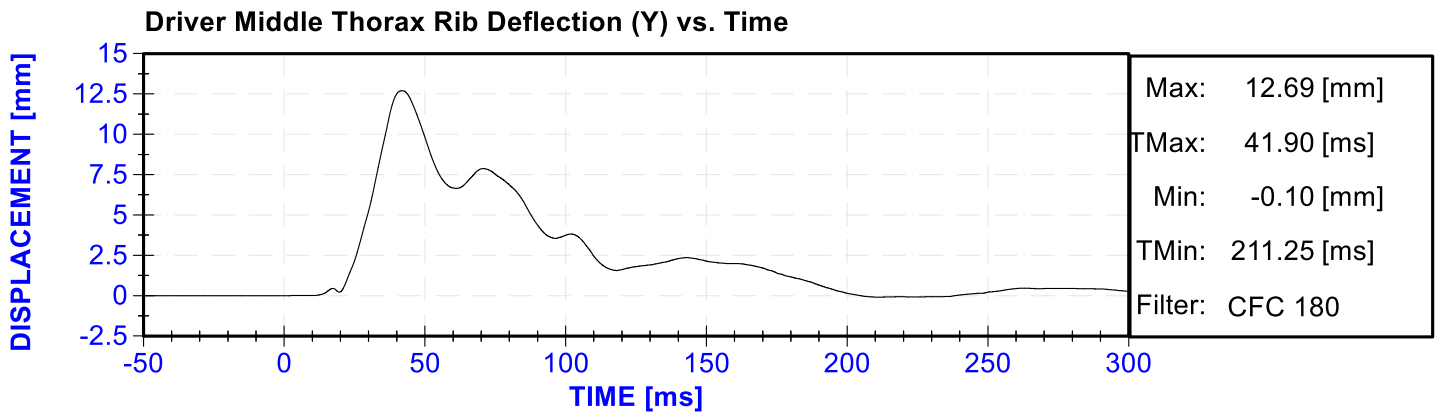
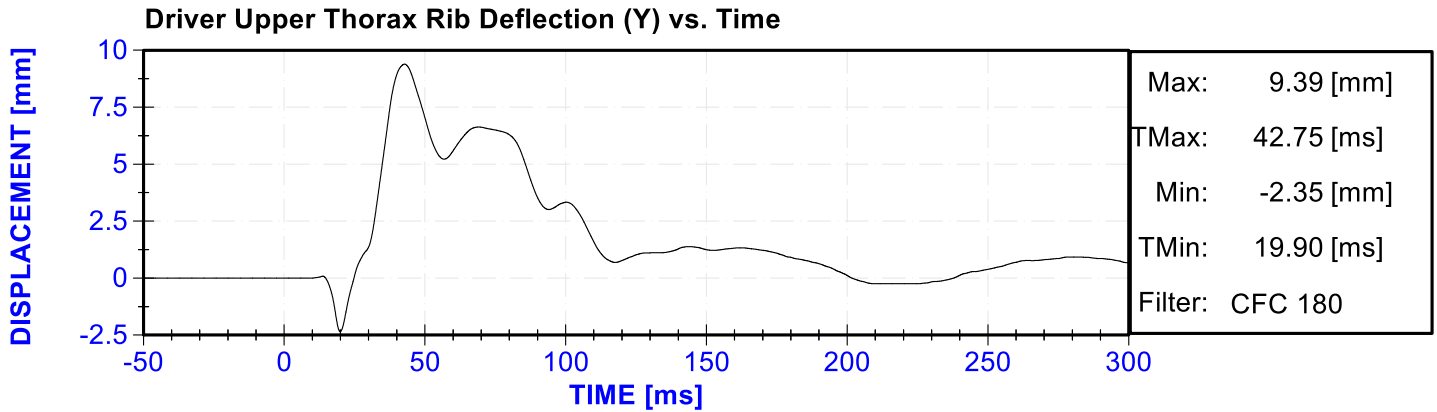
Vehicle Instrumentation Data

Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
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)

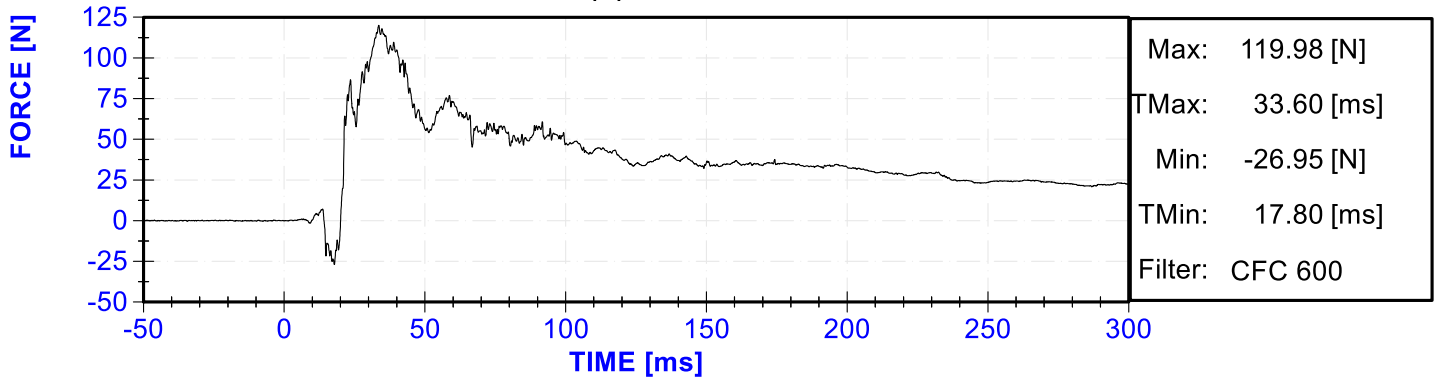
MDB Instrumentation Data

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

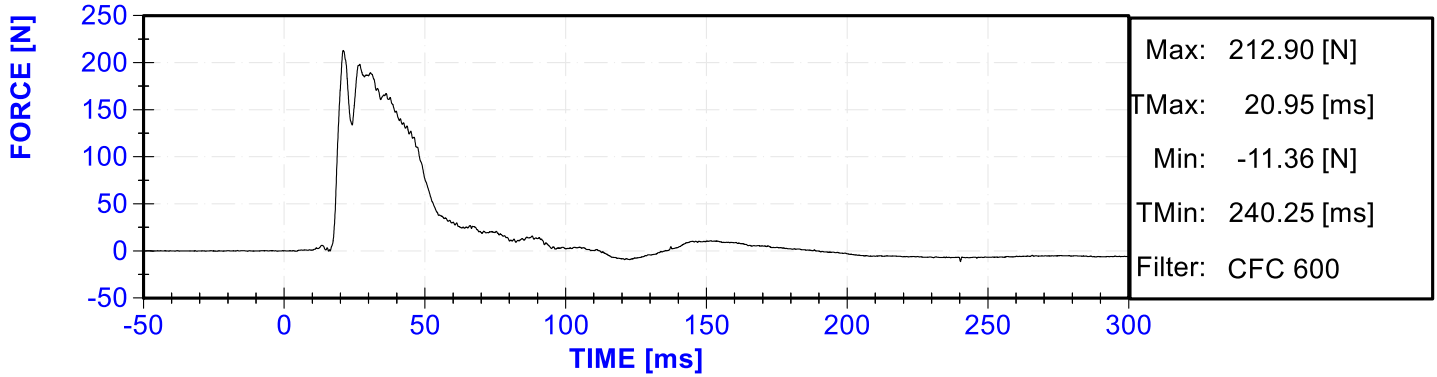




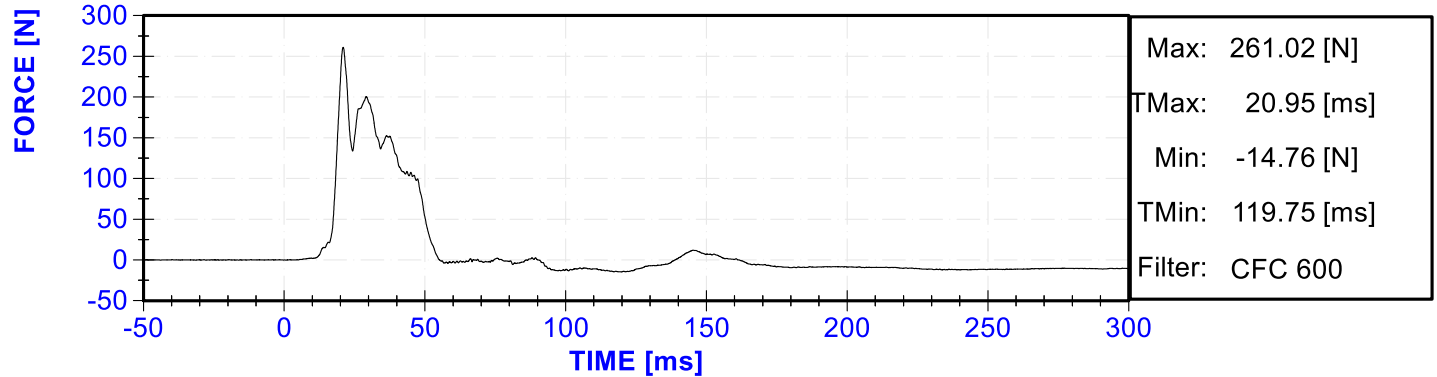
Driver Anterior Abdominal Force (Y) vs. Time



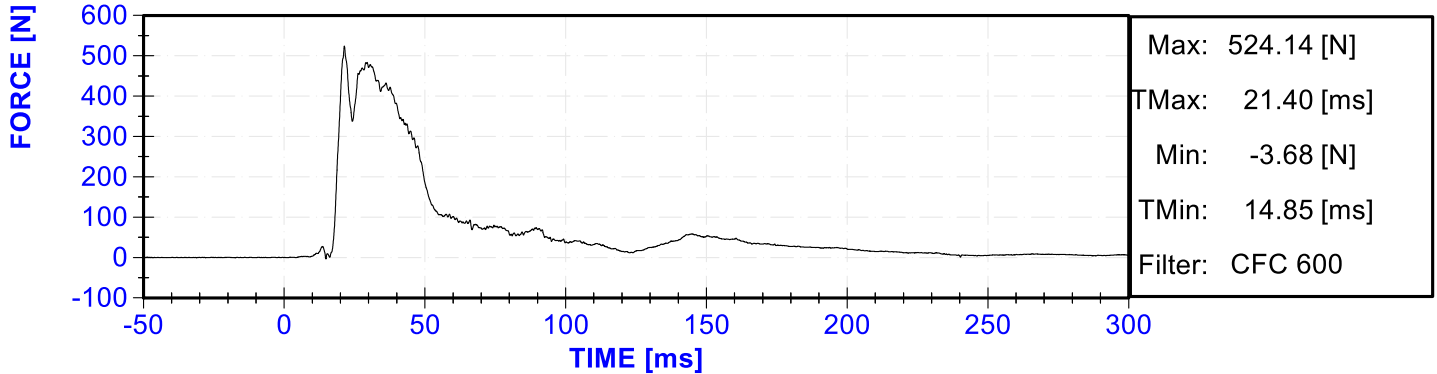
Driver Middle Abdominal Force (Y) vs. Time

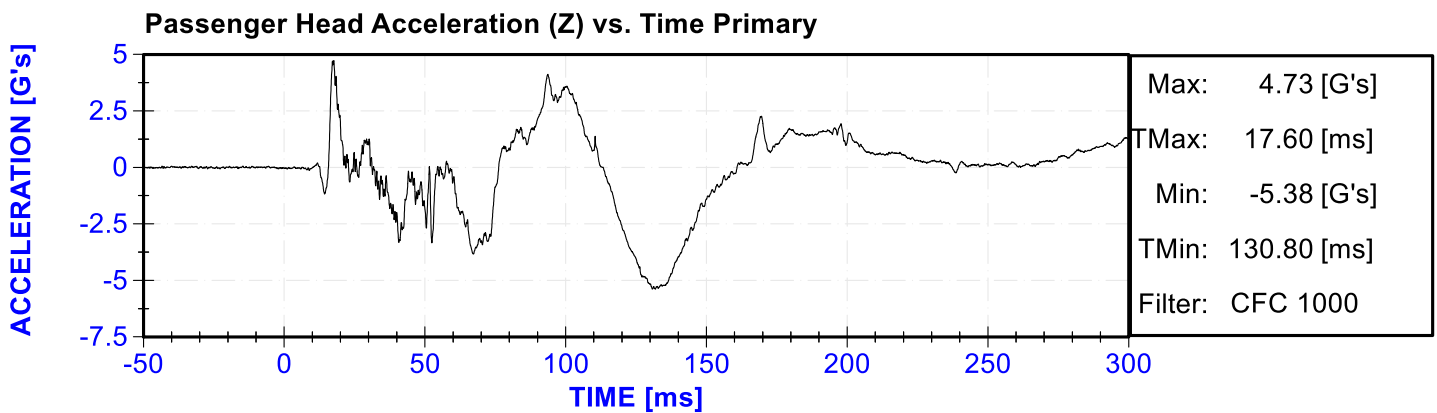
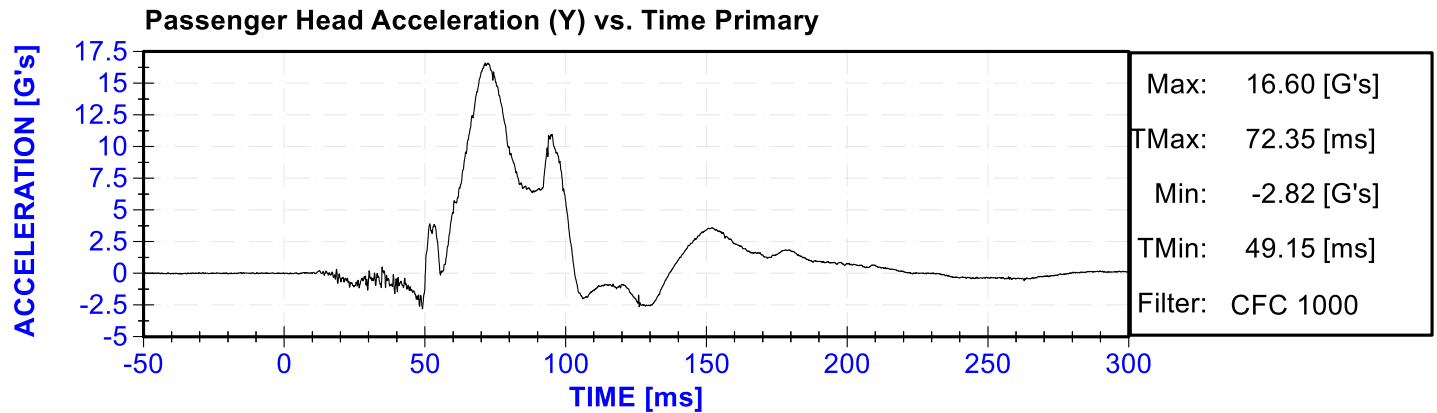
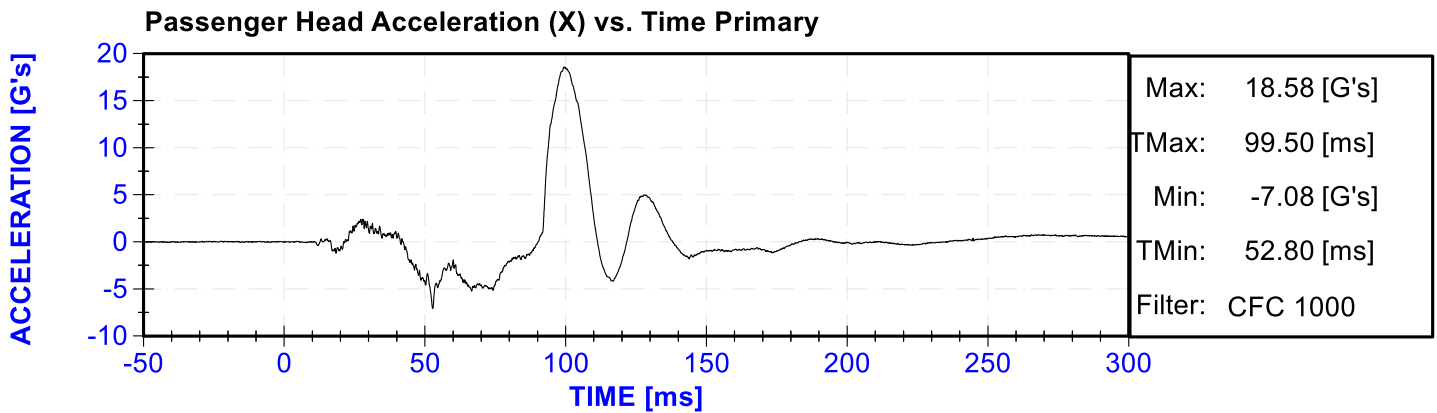
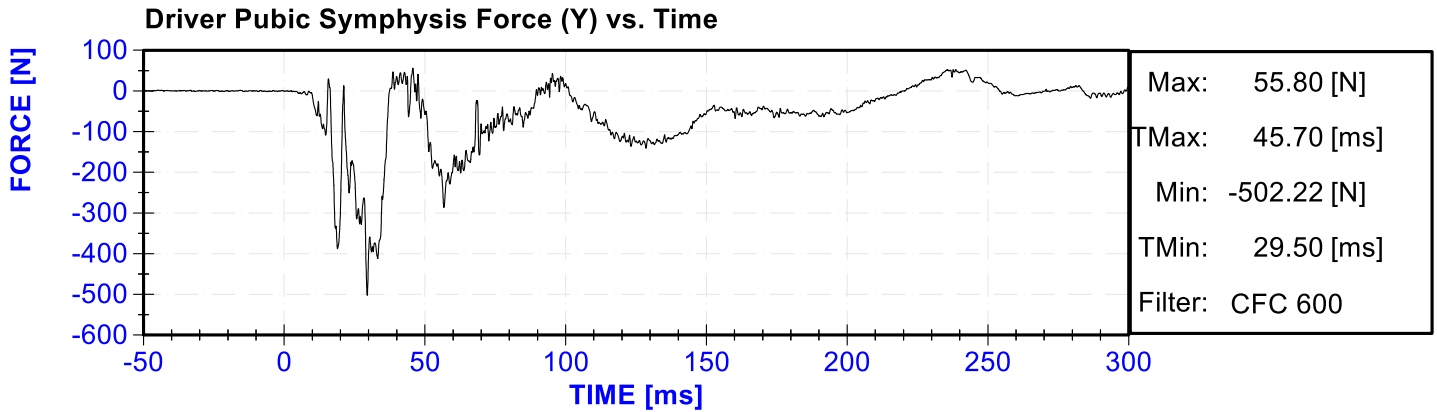


Driver Posterior Abdominal Force (Y) vs. Time

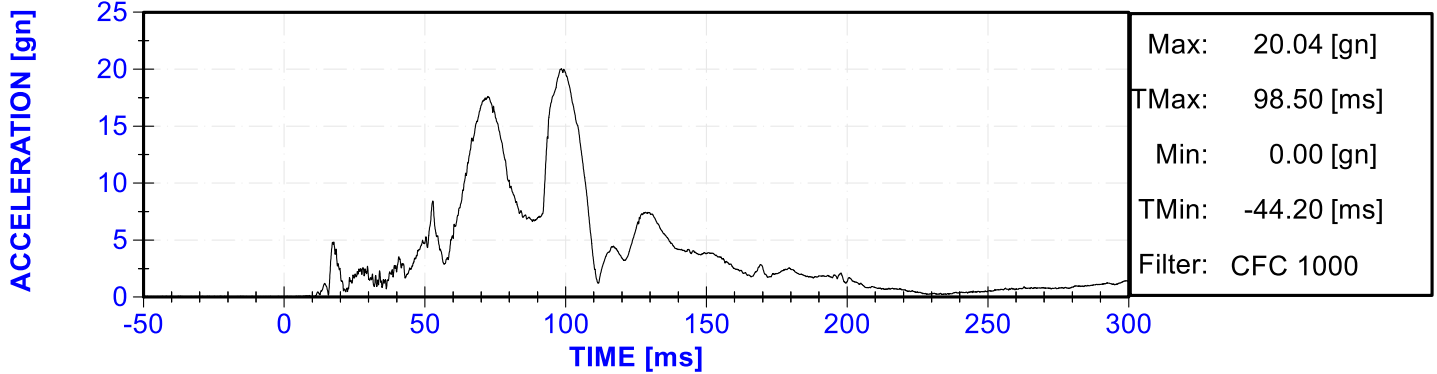


Driver Total Abdominal Force (Y) vs. Time

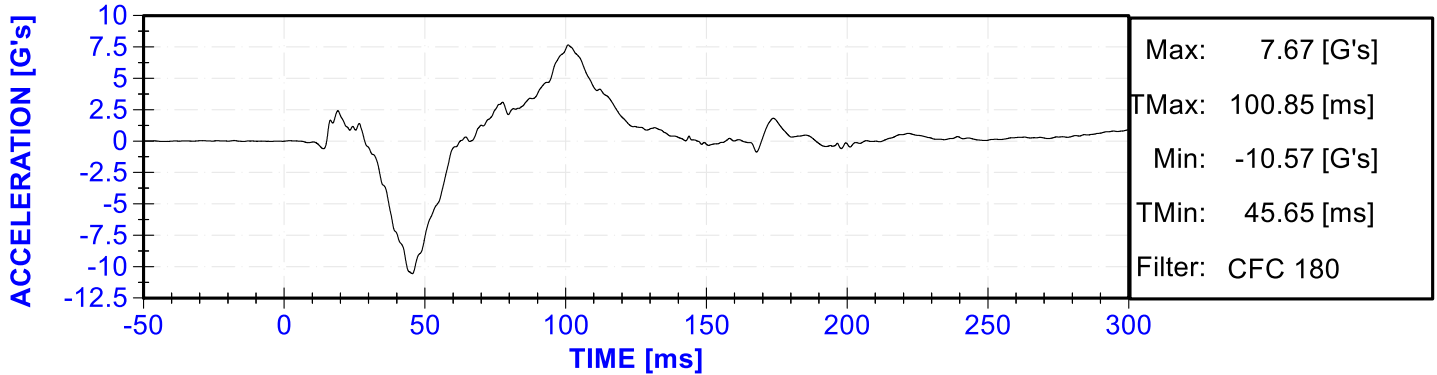




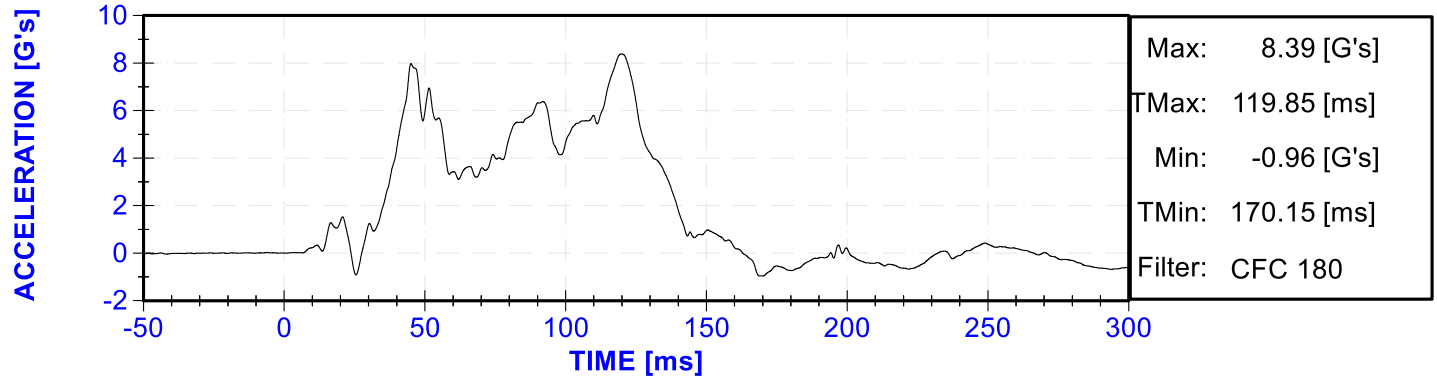
Passenger Head Resultant Acceleration Primary vs. Time



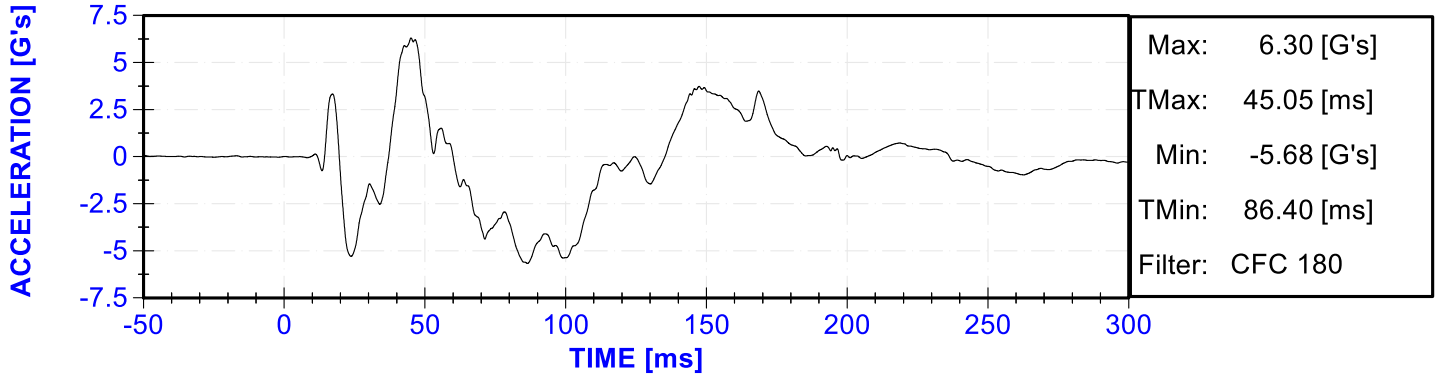
Passenger Lower Spine T12 Acceleration (X) vs. Time

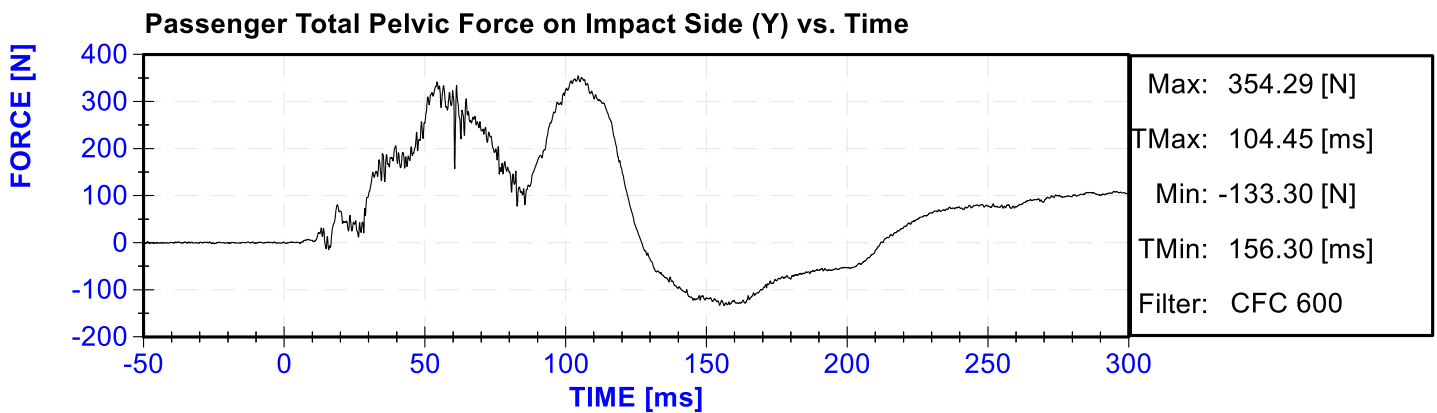
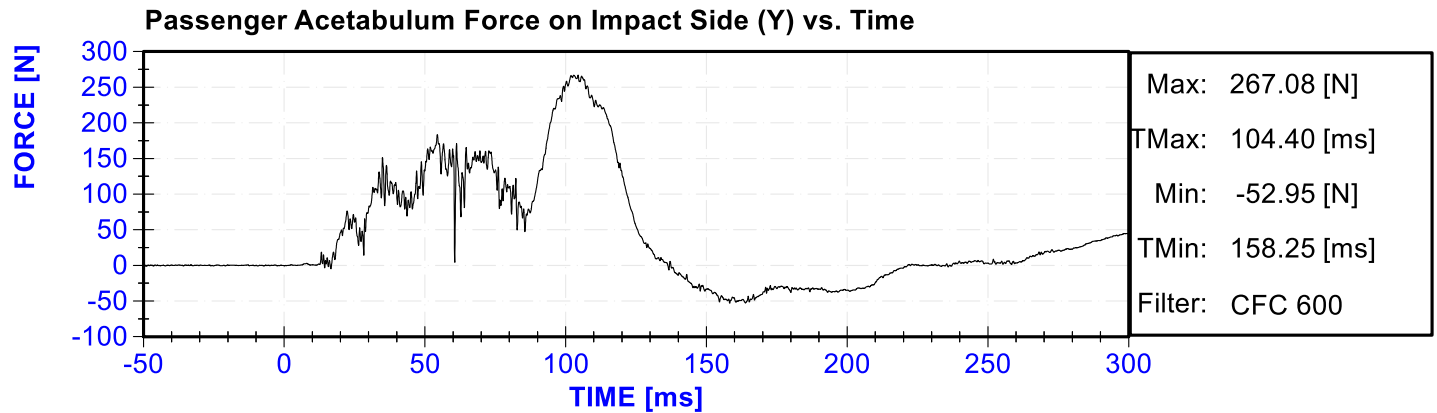
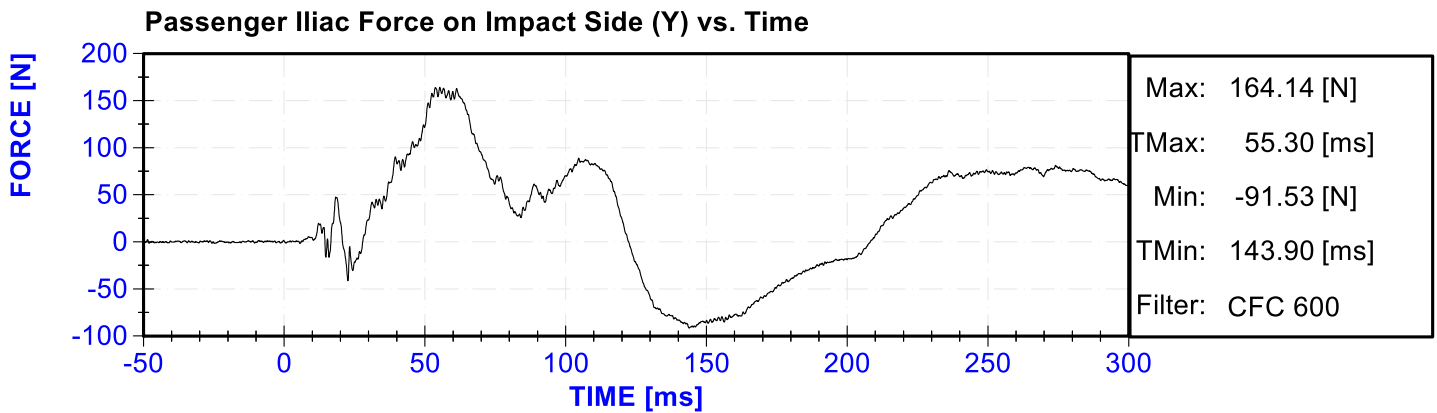
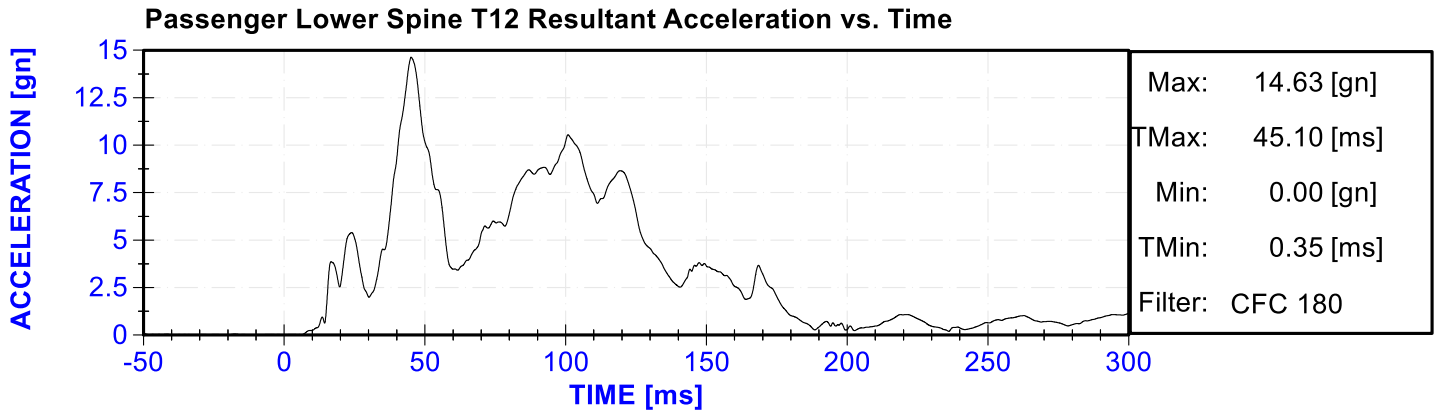


Passenger Lower Spine T12 Acceleration (Y) vs. Time



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)

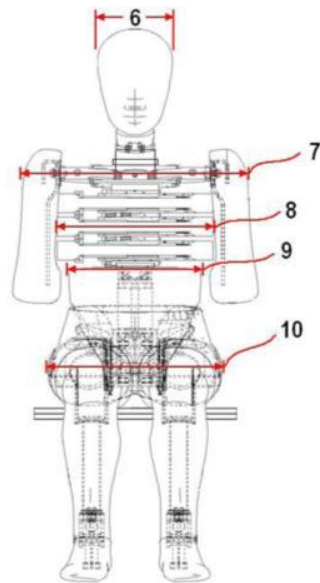


External Measurements - EuroSID-2re

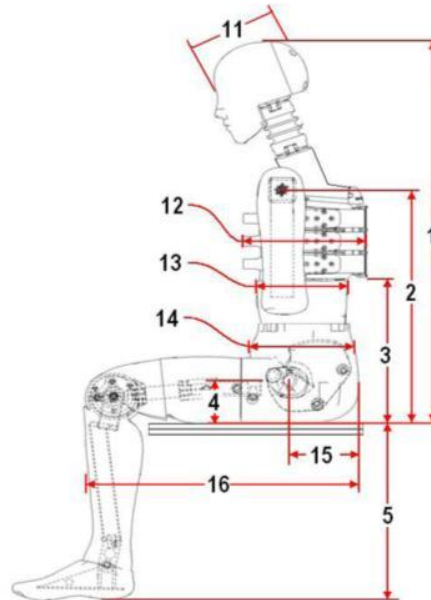
Technician: K. Dutton

Date: 3/07/2019

Dummy Serial Number: F034



FRONT VIEW



SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	911	Pass
2	Seat to Shoulder Joint	558	572	566	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	352	Pass
4	Seat to Hip Joint (center of bolt)	97	103	102	Pass
5	Sole to Seat, Sitting	333	451	419	Pass
6	Head Width	152	158	154	Pass
7	Shoulder/Arm Width	461	479	472	Pass
8	Thorax Width	322	332	328	Pass
9	Abdomen Width	273	287	280	Pass
10	Pelvis Lap Width	359	373	365	Pass
11	Head Depth	196	206	200	Pass
12	Thorax Depth	262	272	268	Pass
13	Abdomen Depth	194	204	201	Pass
14	Pelvis Depth	235	245	242	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	155	Pass
16	Back of Buttocks to Front Knee	597	615	609	Pass

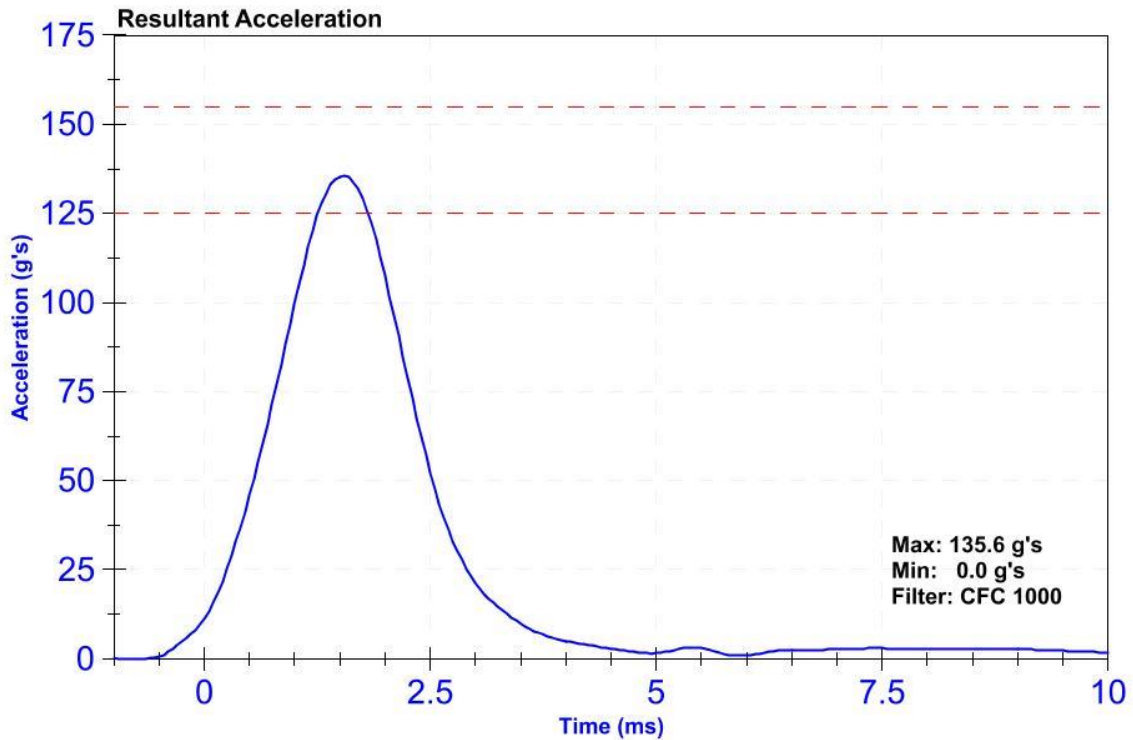
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

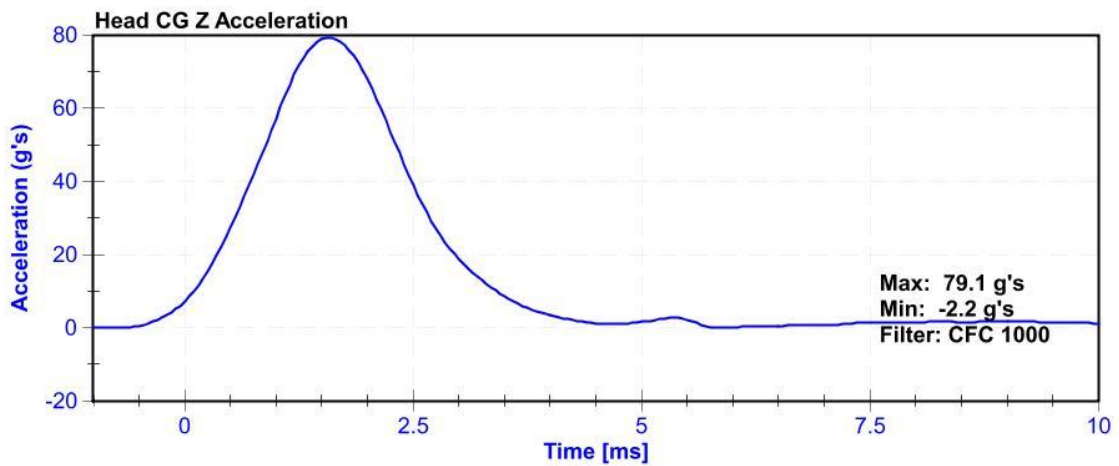
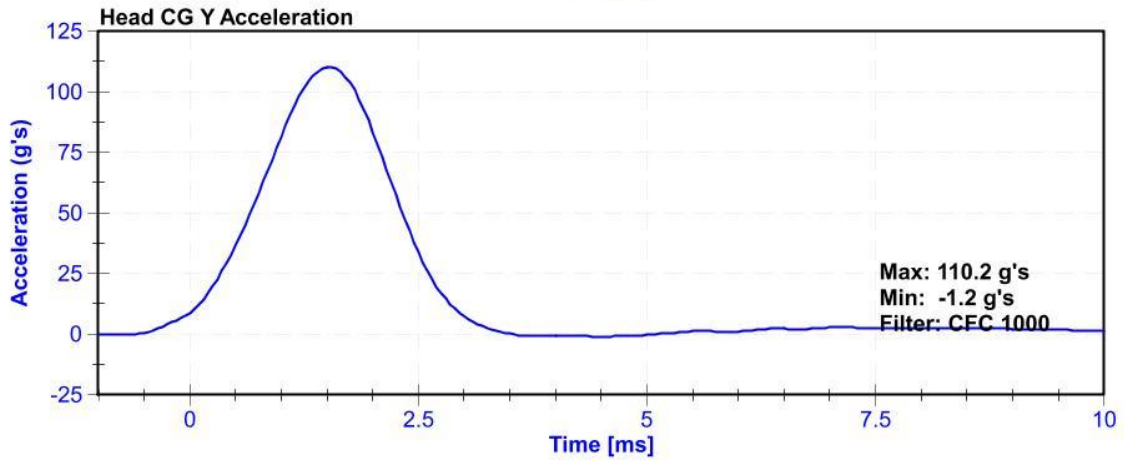
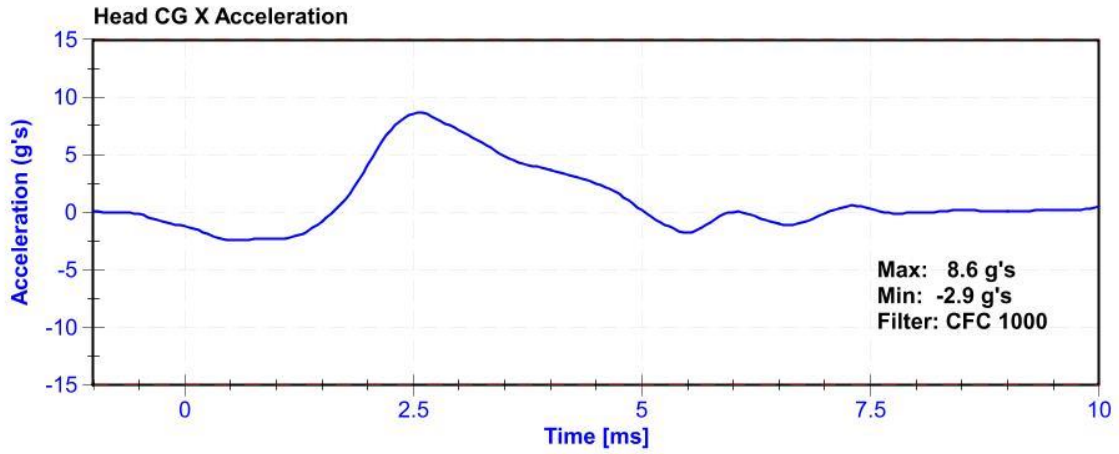
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	17.5	Pass
Resultant Acceleration	125	155	g's	135.6	Pass
Oscillation	0	15	%	2.63	Pass
Fore-Aft Acceleration	-15	15	g's	8.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58904	10/5/2018	4/5/2019
Y Accelerometer	ENDEVCO 7264CT	AC-P58911	10/5/2018	4/5/2019
Z Accelerometer	ENDEVCO 7264CT	AC-P58776	10/5/2018	4/5/2019





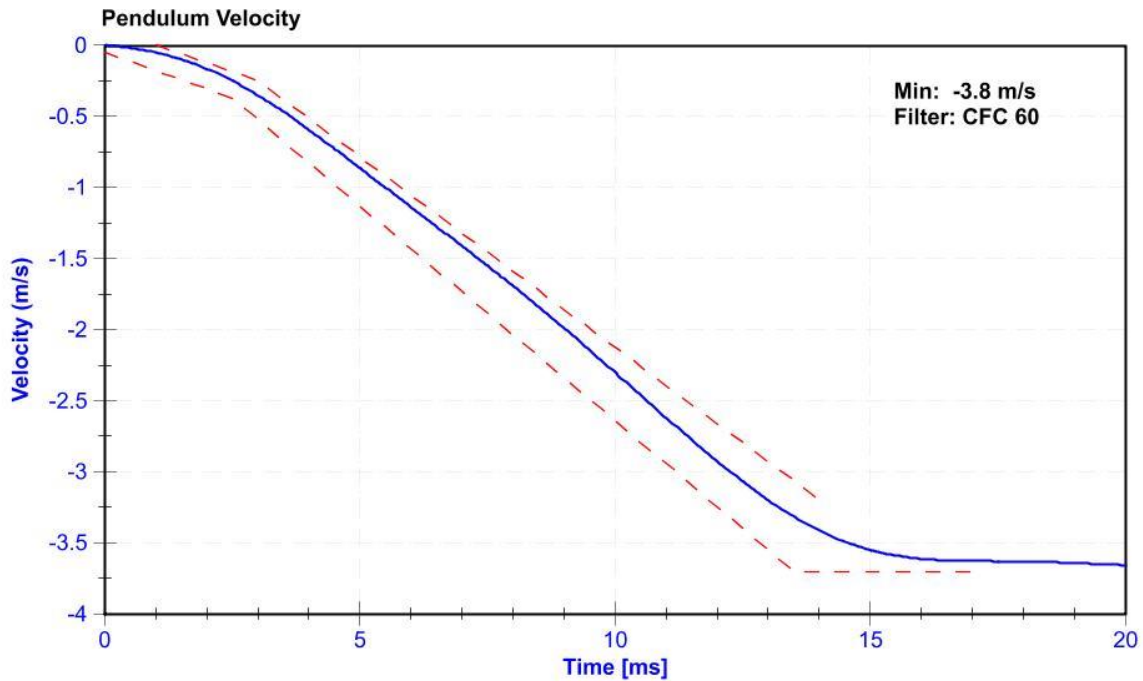
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

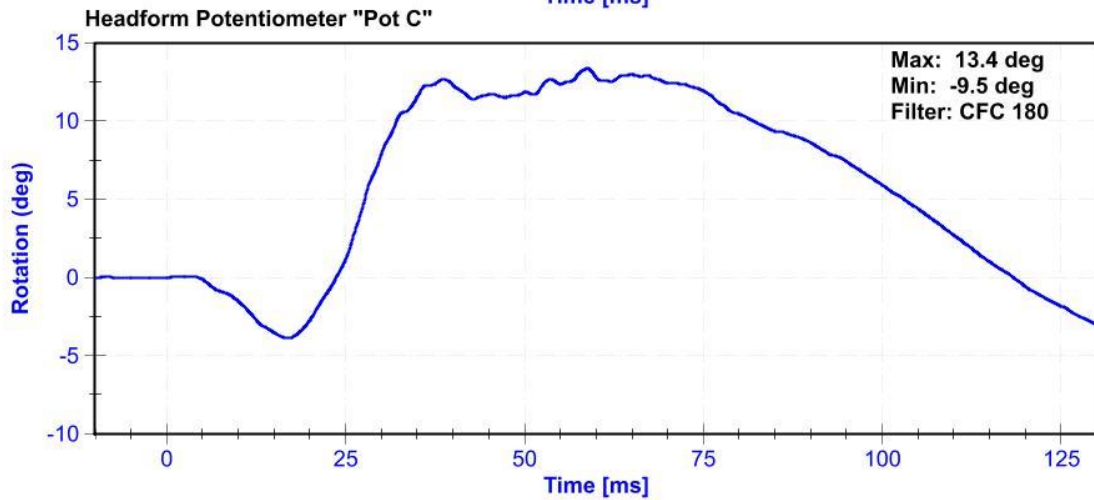
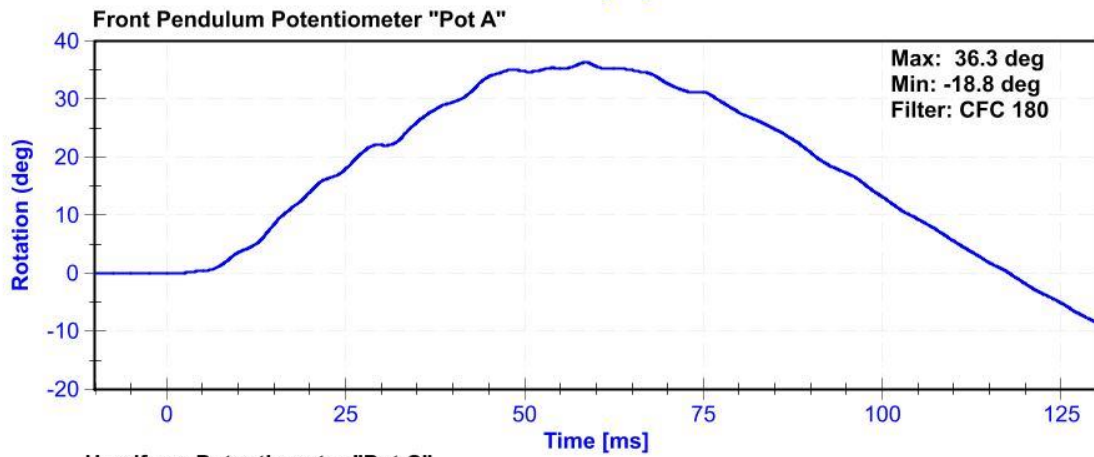
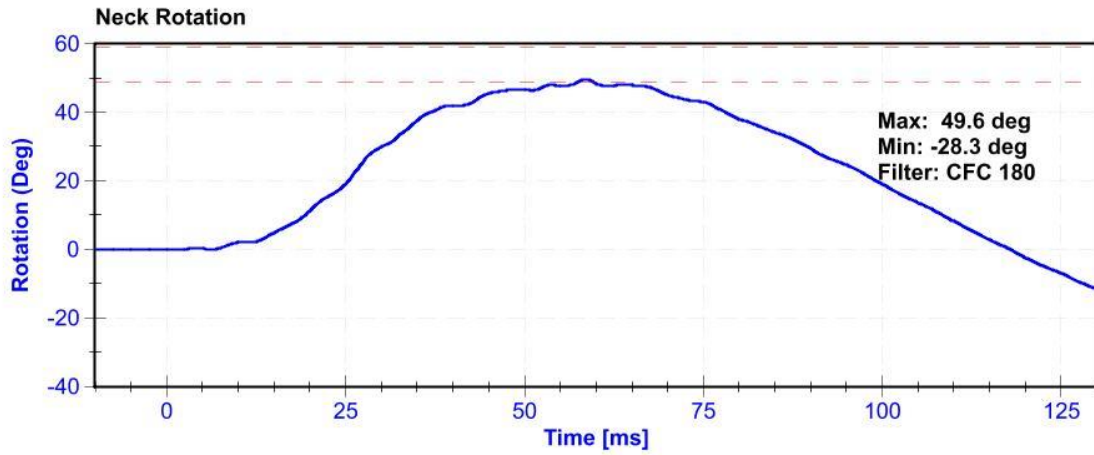
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	16.8	Pass
Velocity	3.3	3.5	m/s	3.35	Pass
Lateral Neck Rotation	49	59	deg	49.6	Pass
Time at Maximum Rotation	54	66	ms	58.7	Pass
Time of Rotation Decay from Maximum	53	88	ms	59.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9	1/29/2019	1/29/2020
Front Pendulum Potentiometer	SP22G	DS-094	10/31/2018	10/31/2019
Headform Potentiometer	SP22G	DS-095	10/31/2018	10/31/2019





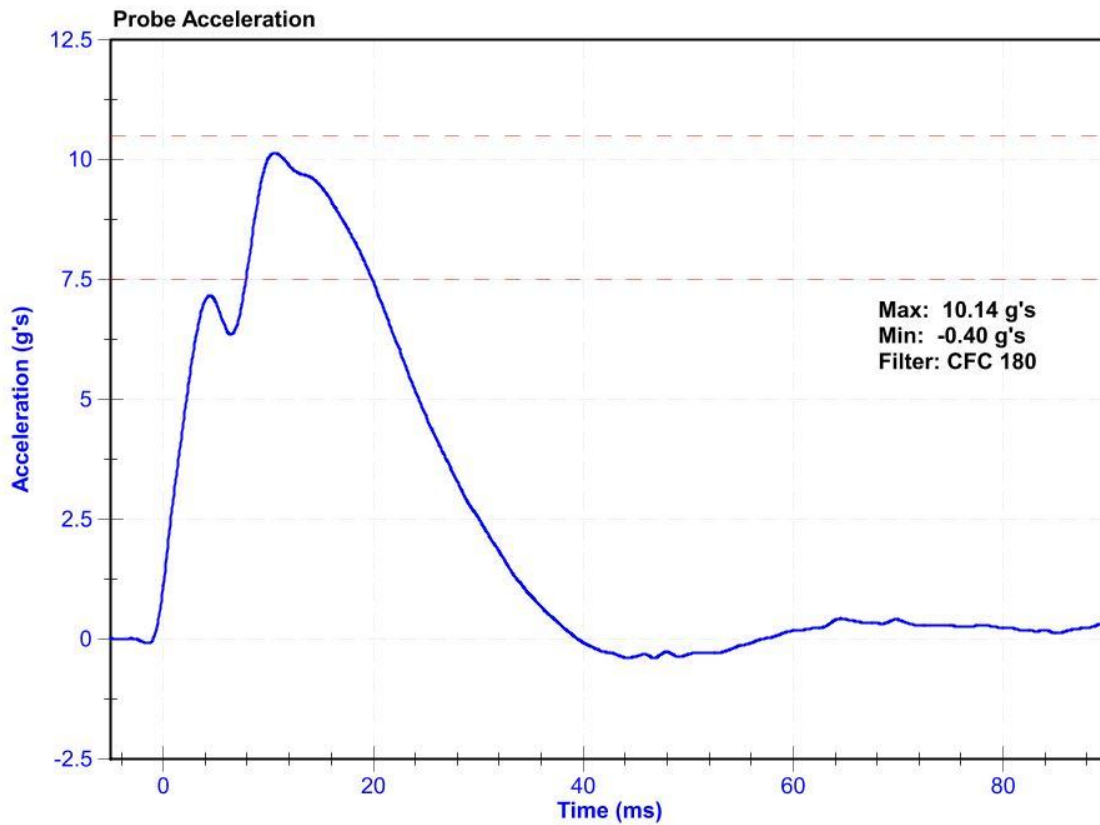
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	18.4	Pass
Velocity	4.2	4.4	m/s	4.20	Pass
Probe Acceleration	7.5	10.5	g's	10.14	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019



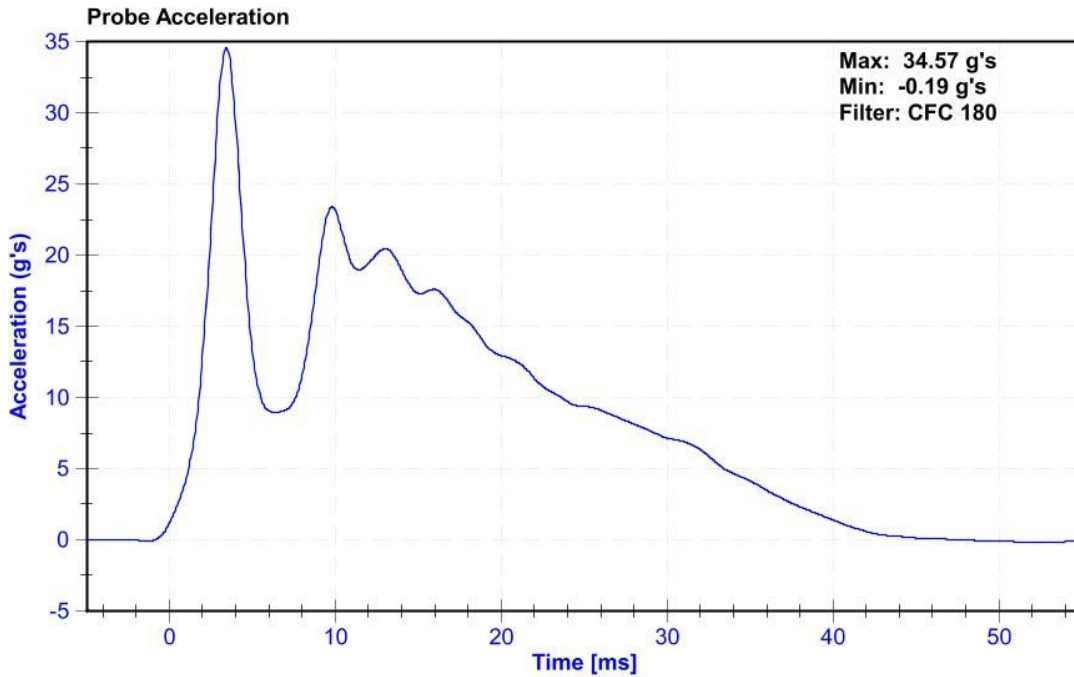
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

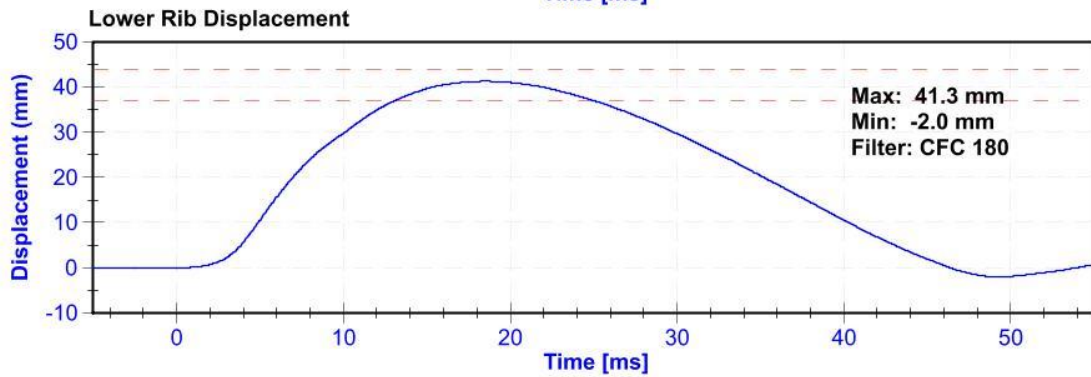
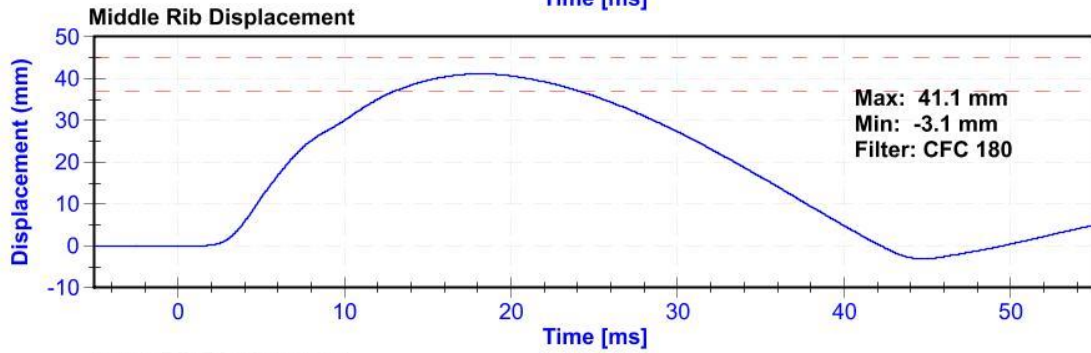
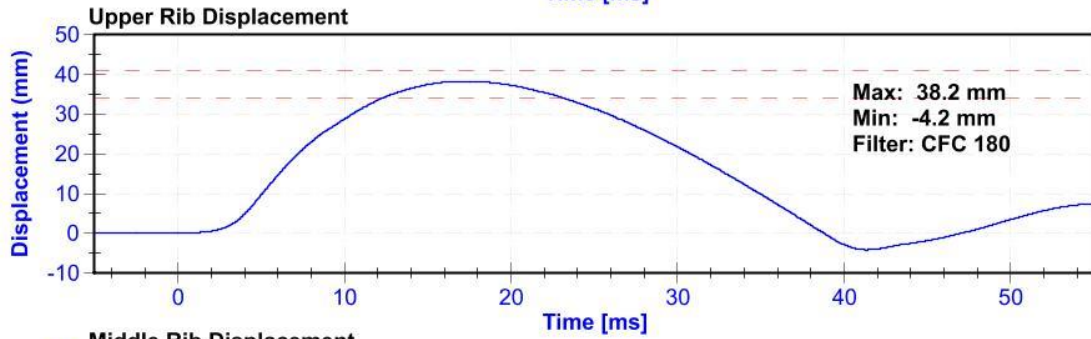
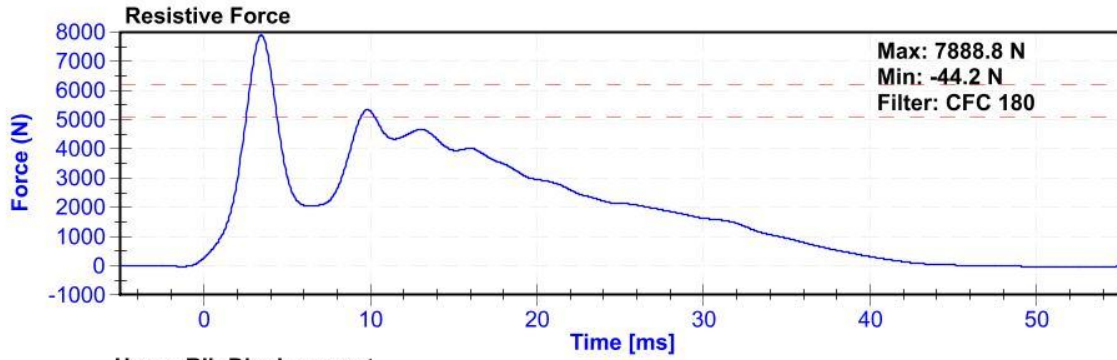
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	15.5	Pass
Velocity	5.4	5.6	m/s	5.49	Pass
Resistive Force after 6ms	5100	6200	N	5337.4	Pass
Upper Thorax Rib Deflection	34	41	mm	38.2	Pass
Mid Thorax Rib Deflection	37	45	mm	41.1	Pass
Lower Thorax Rib Deflection	37	44	mm	41.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019
Upper Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/10/2018	10/10/2019
Middle Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/11/2018	10/11/2019
Lower Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/10/2018	10/10/2019





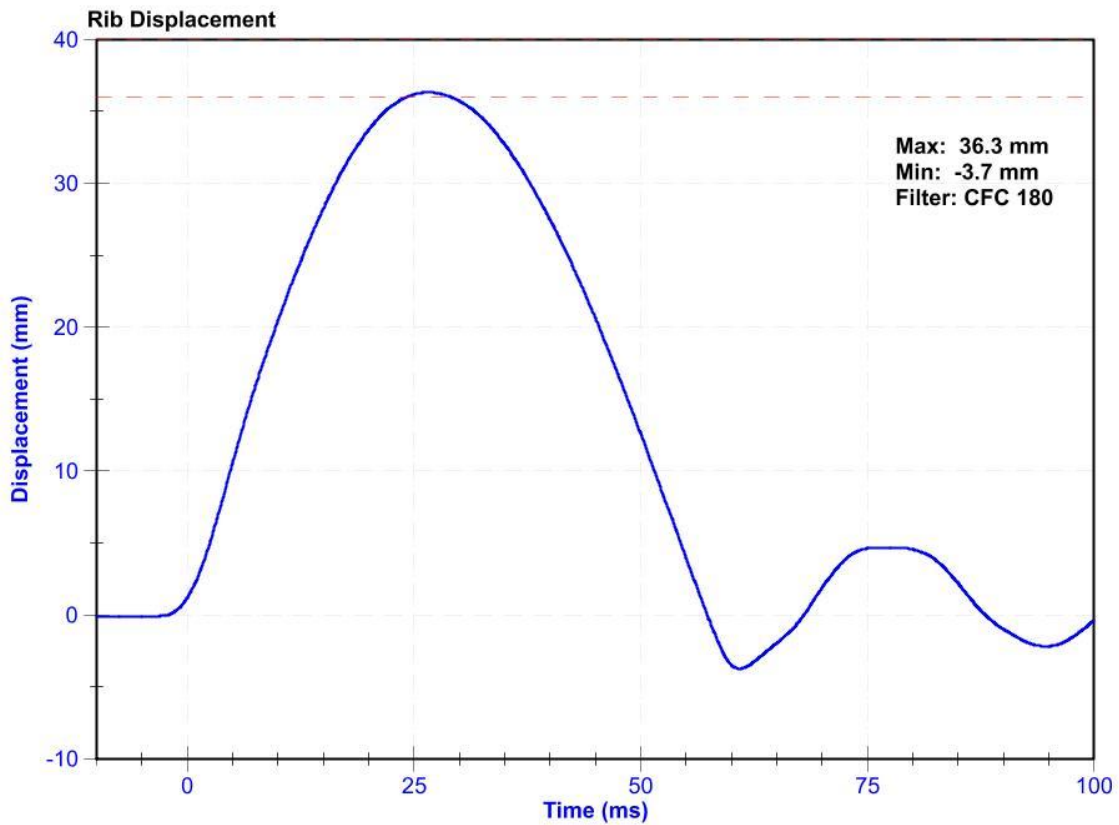
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	17.5	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	10/10/2018	10/10/2019



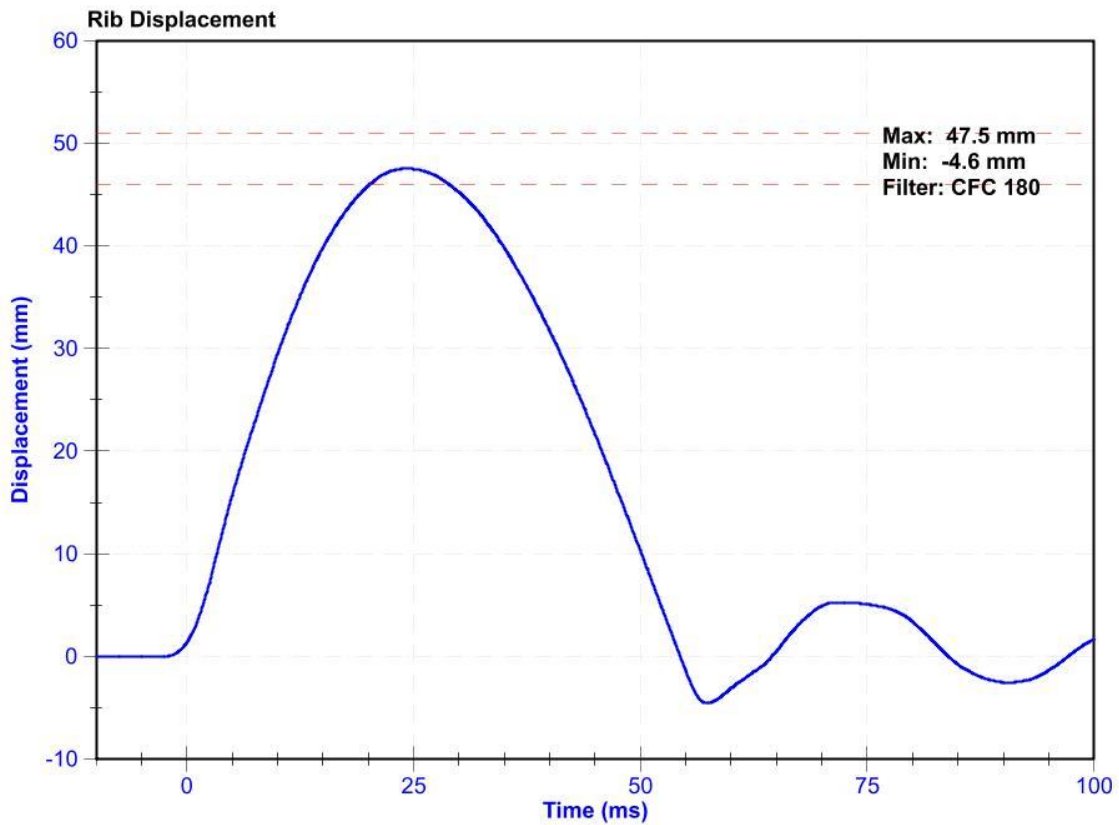
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	17.5	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-183GFE	10/10/2018	10/10/2019



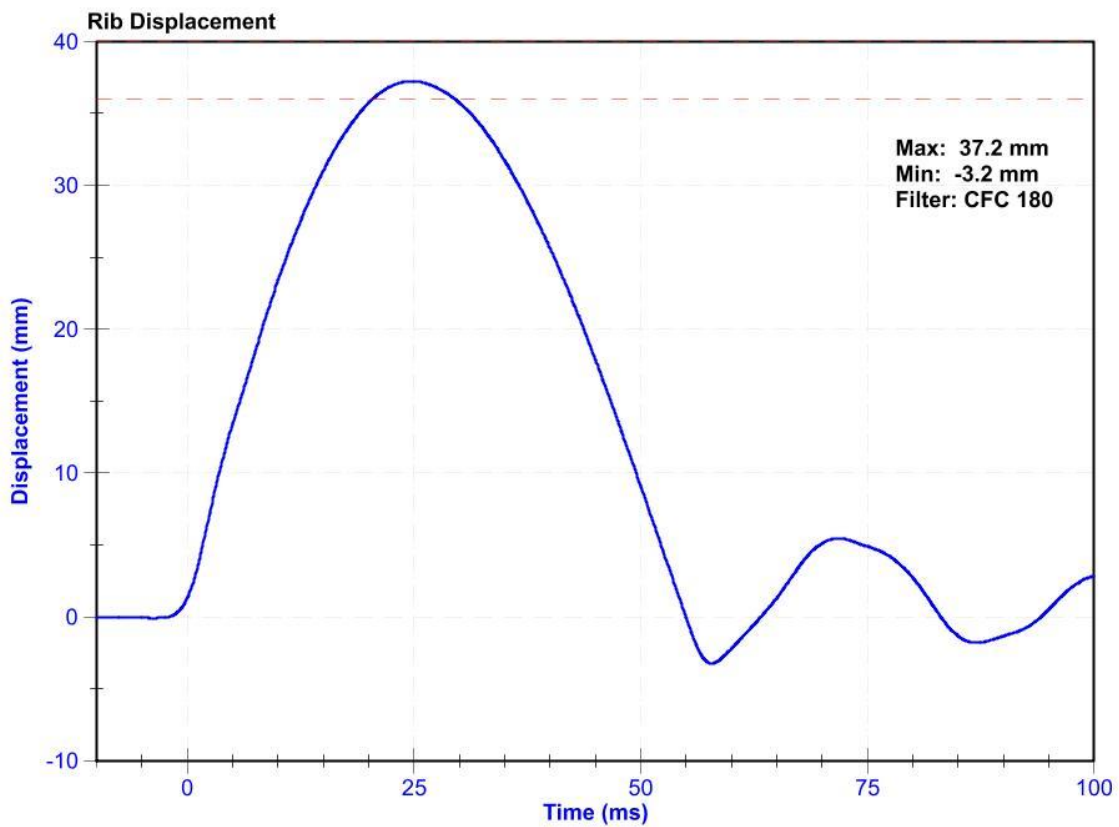
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	17.8	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-184GFE	10/11/2018	10/11/2019



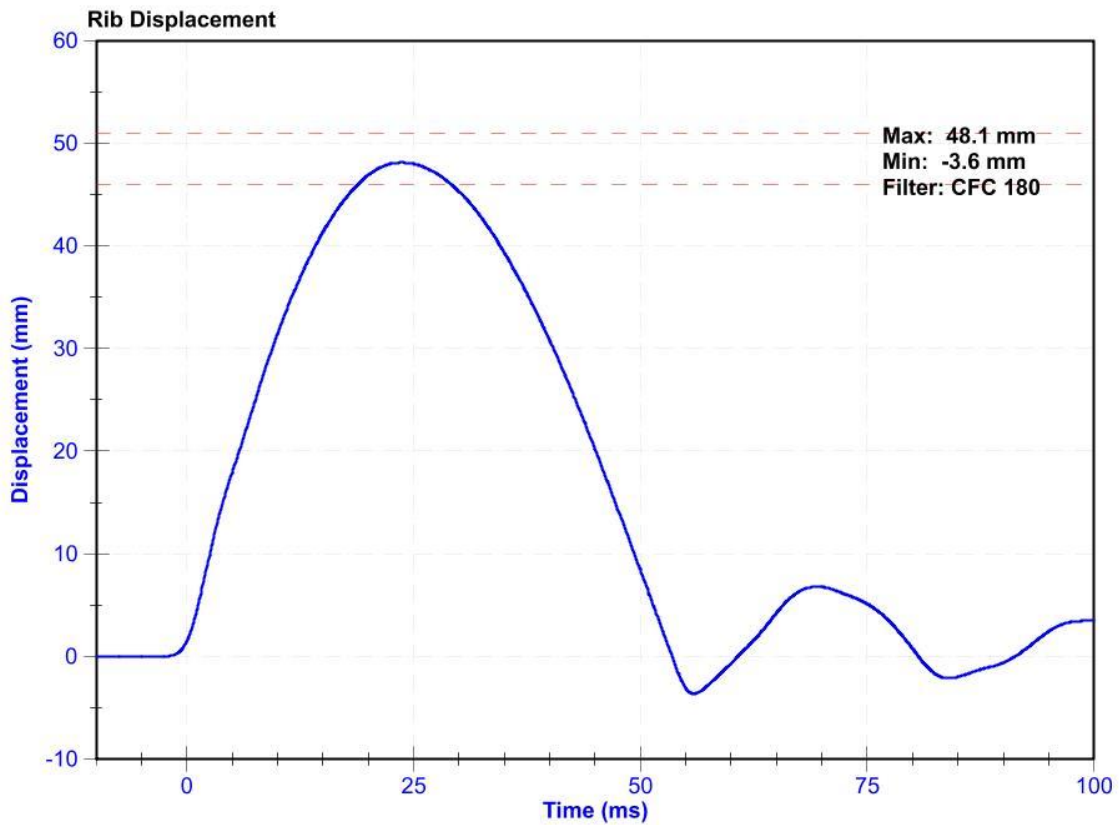
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	17.8	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-184GFE	10/11/2018	10/11/2019



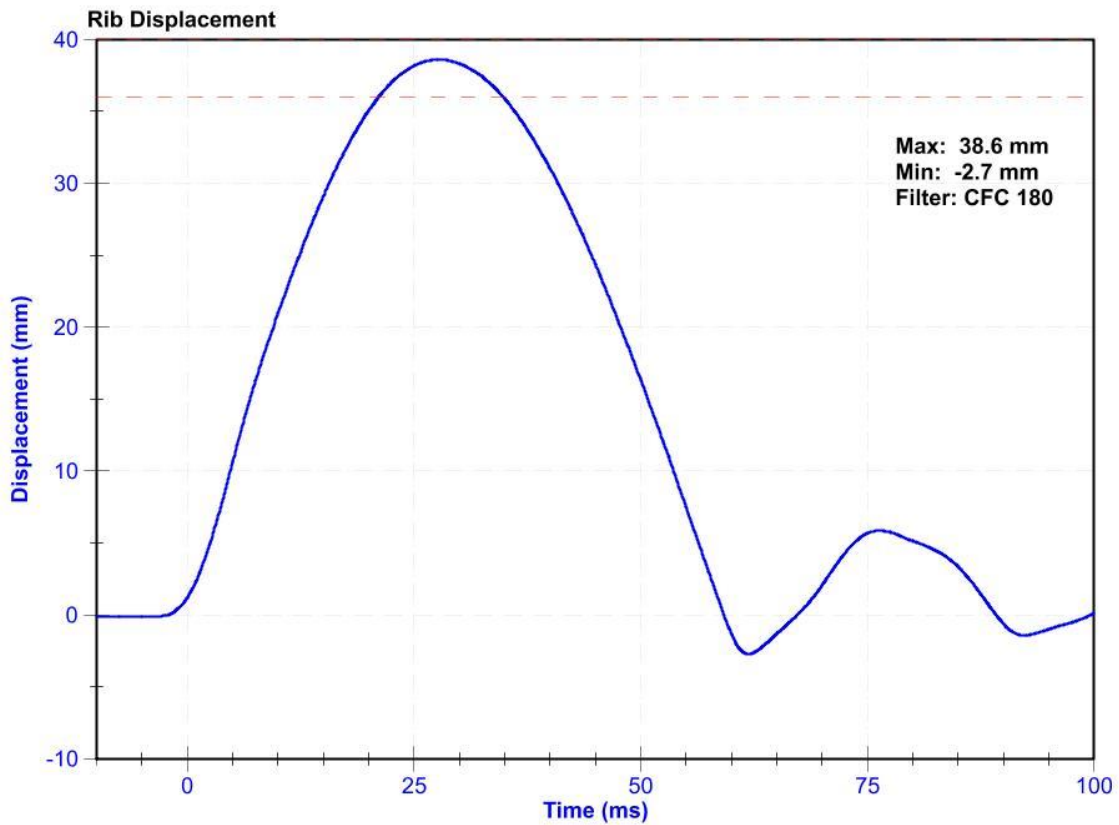
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	18.0	Pass
Rib Displacement	36	40	mm	38.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/10/2018	10/10/2019



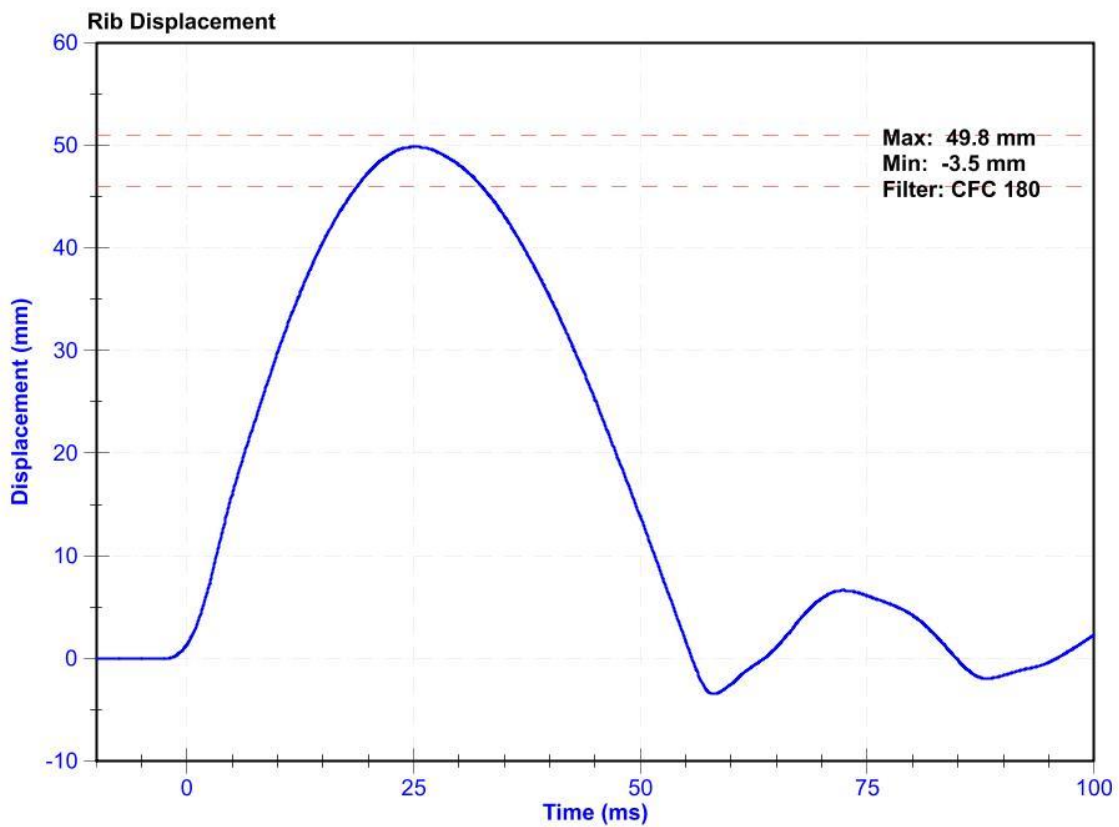
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	18.0	Pass
Rib Displacement	46	51	mm	49.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/10/2018	10/10/2019



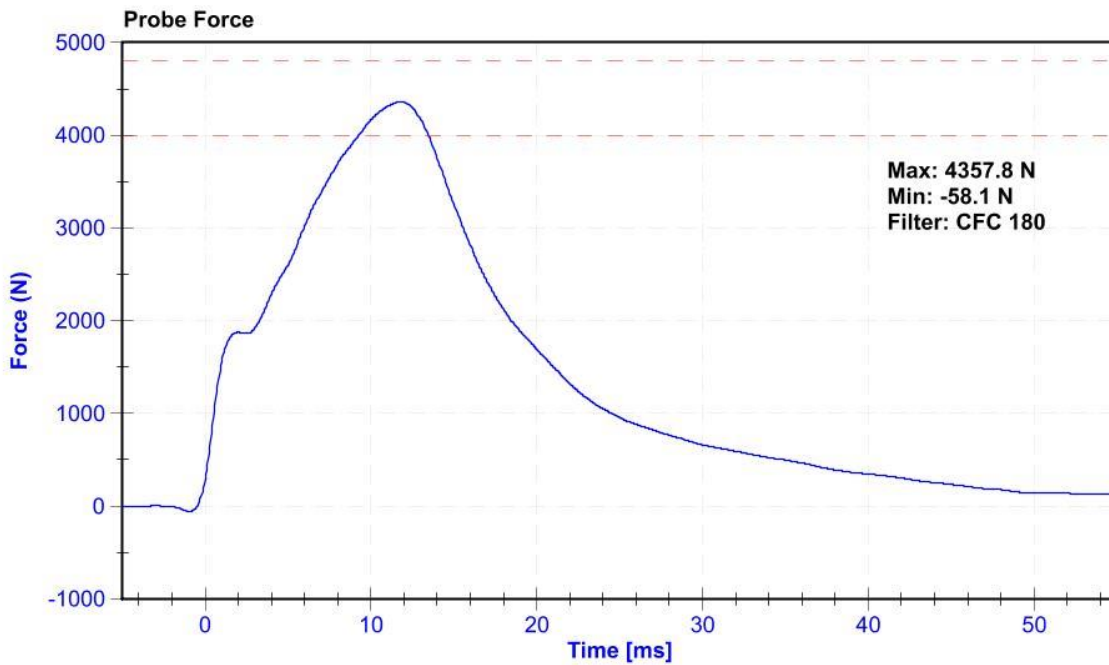
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	FO34	Laboratory Supervisor	K.Brogan

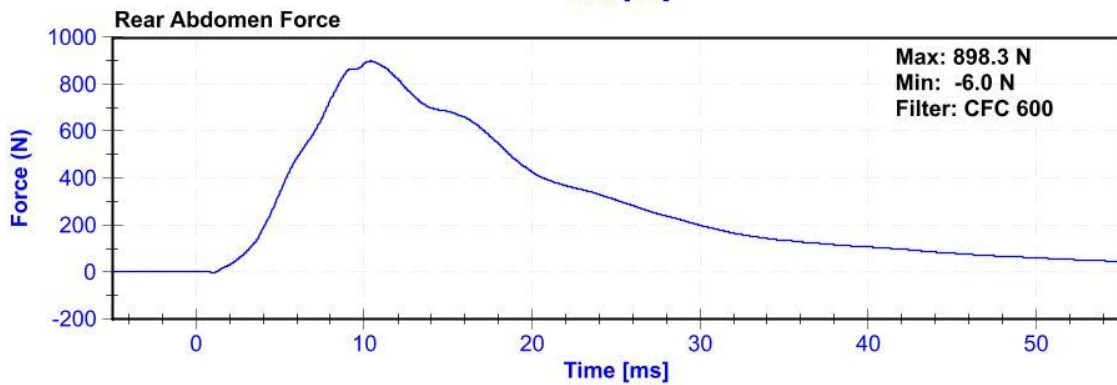
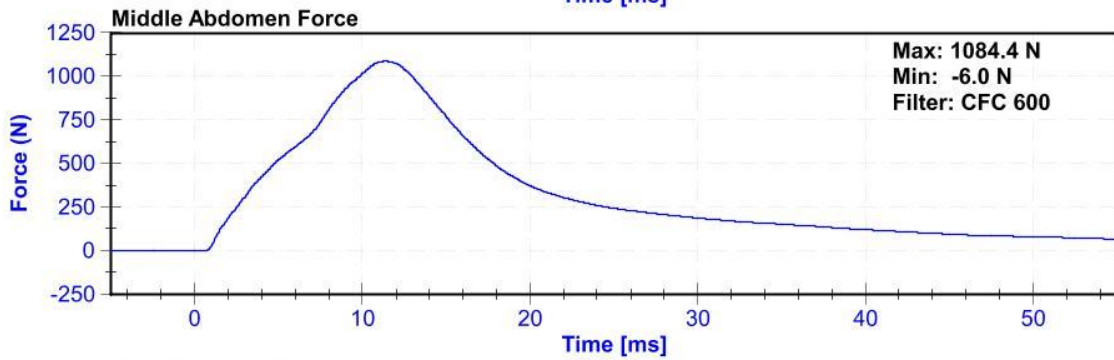
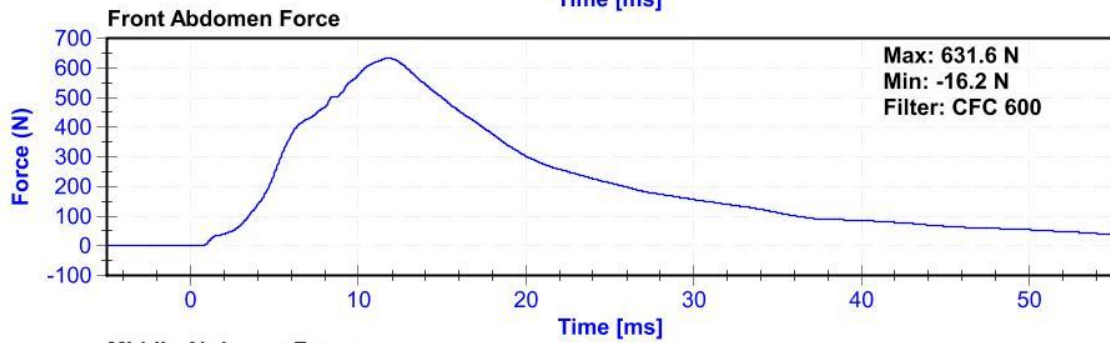
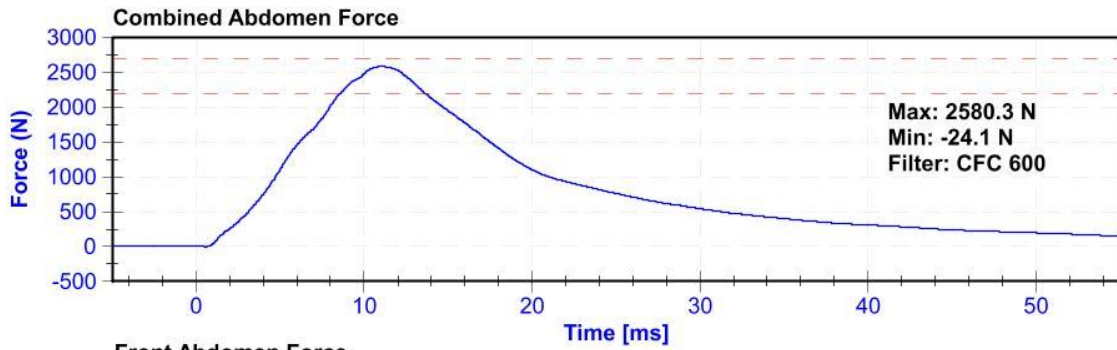
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	15.6	Pass
Velocity	3.9	4.1	m/s	4.10	Pass
Combined Abdomen Force	2200	2700	N	2580.3	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.05	Pass
Resistive Probe Force	4000	4800	N	4357.8	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.80	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019
Front Abdomen Load Cell	DENTON 2631	LC-1440	6/4/2018	6/4/2019
Middle Abdomen Load Cell	DENTON 2631	LC-1525	6/4/2018	6/4/2019
Rear Abdomen Load Cell	DENTON 2631	LC-1528	6/4/2018	6/4/2019





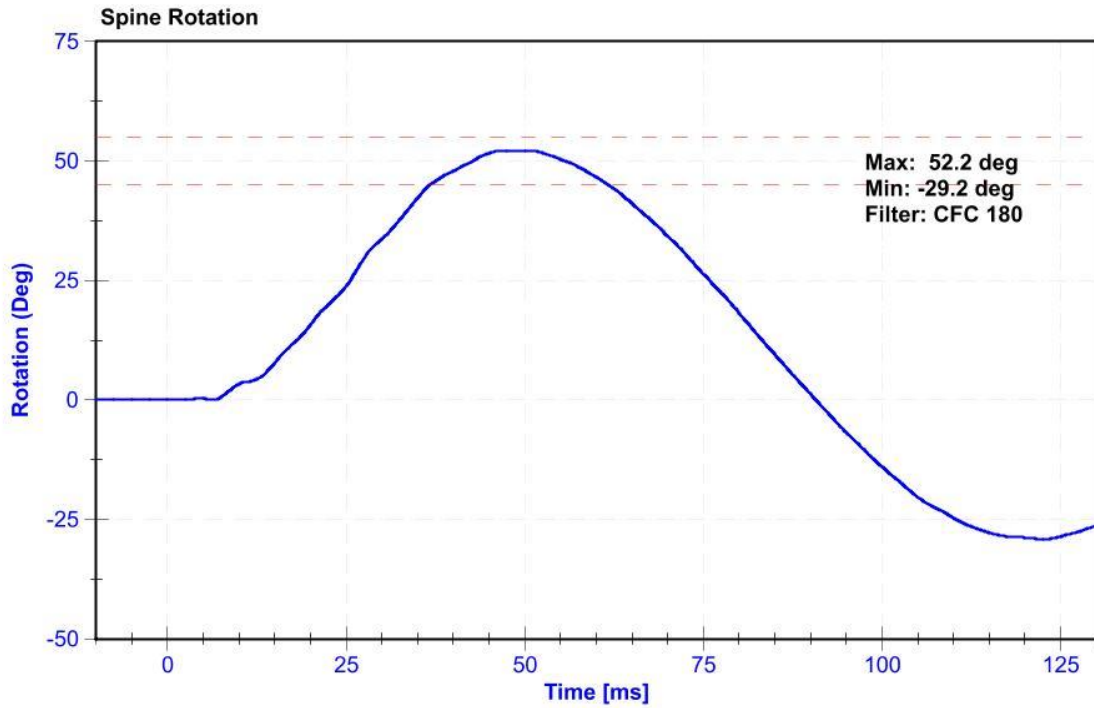
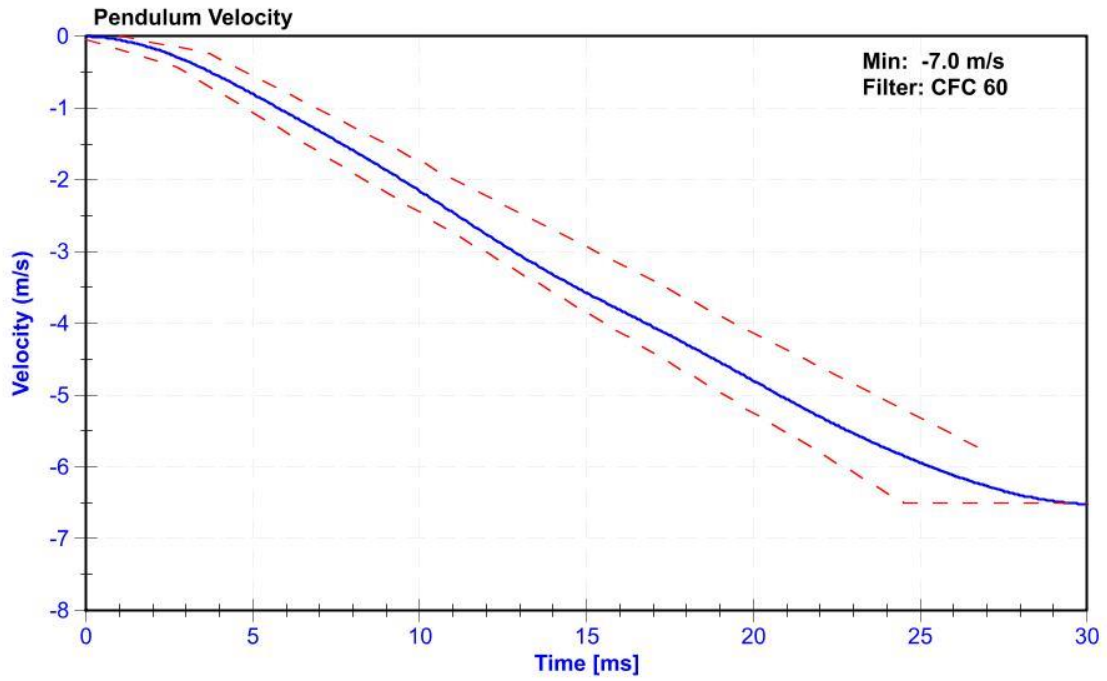
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

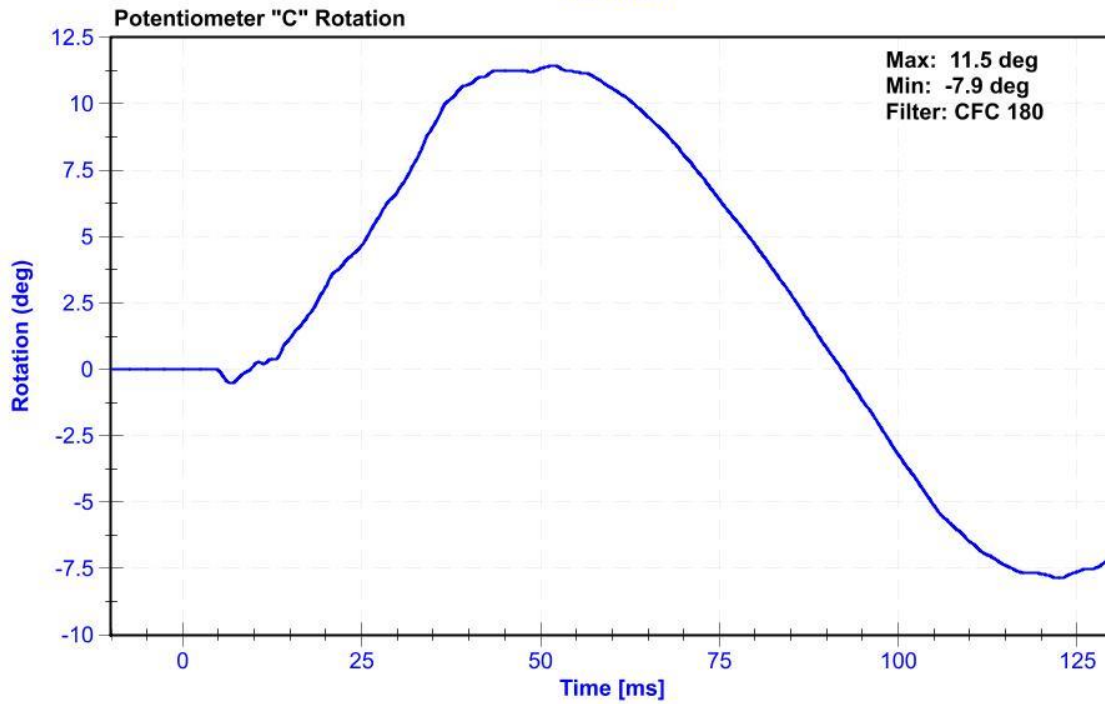
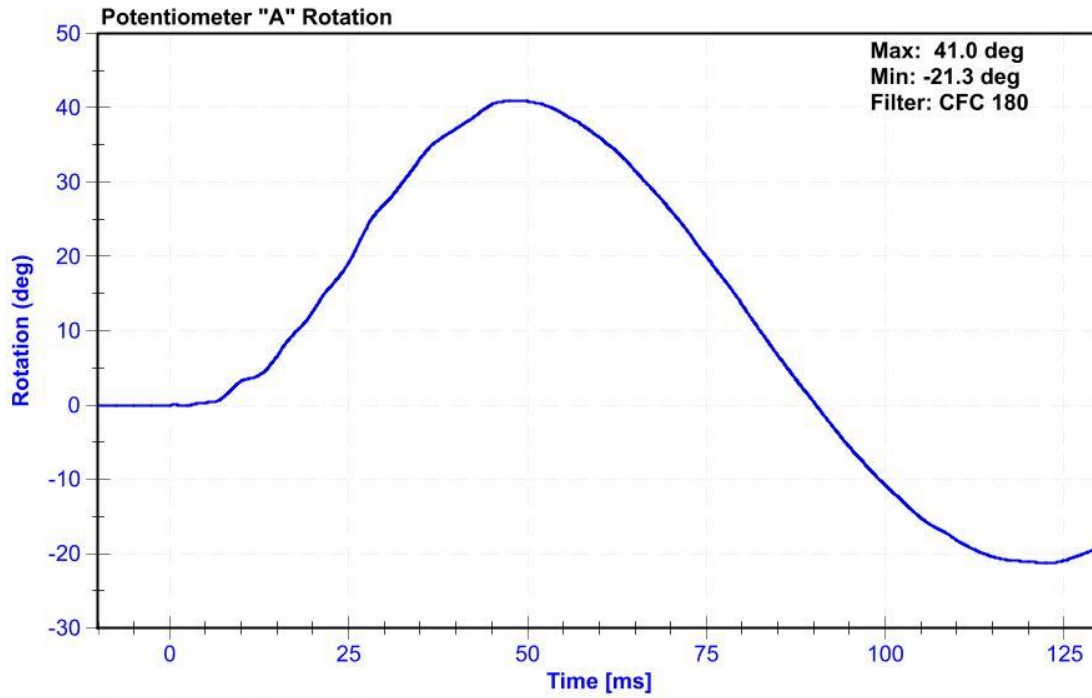
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	23.9	Pass
Velocity	5.95	6.15	m/s	6.005	Pass
Lateral Spine Rotation	45	55	deg	52.2	Pass
Time at Maximum Rotation	39	53	ms	47.7	Pass
Time of Decay to Zero Degrees	37	57	ms	43.0	Pass
Pulse within Corridor?	-	-	-		

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/29/2019	1/29/2020
Pendulum "A" Potentiometer	SP22G	DS-094	10/31/2018	10/31/2019
Condyle "B" Potentiometer	SP22G	DS-095	10/31/2018	10/31/2019





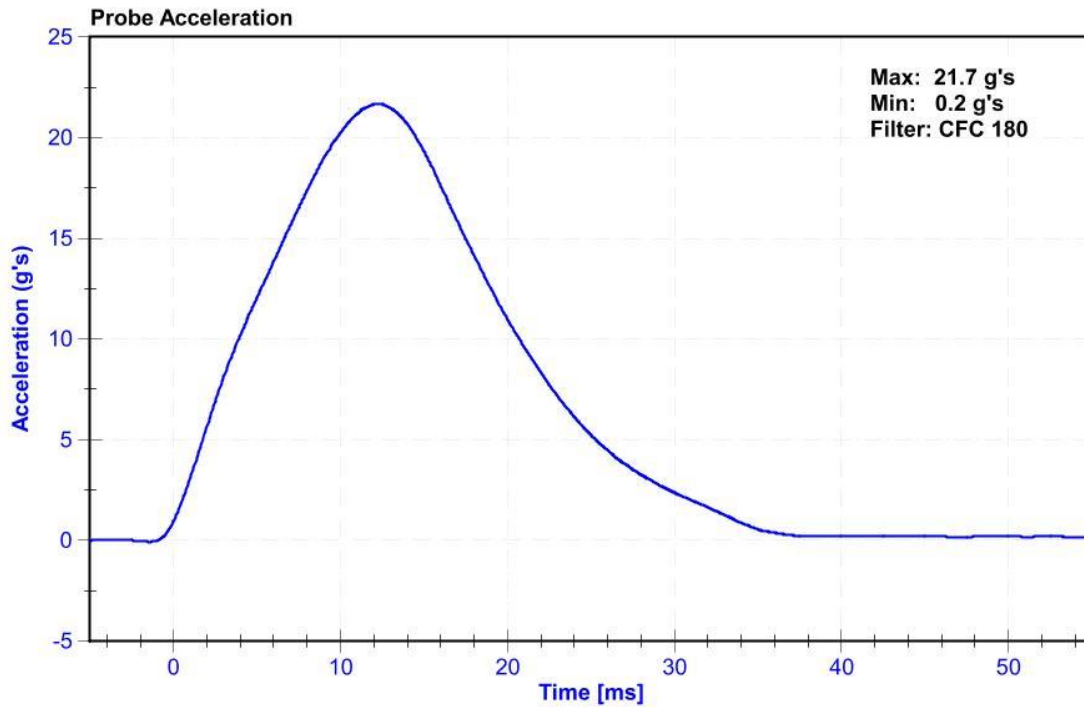
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

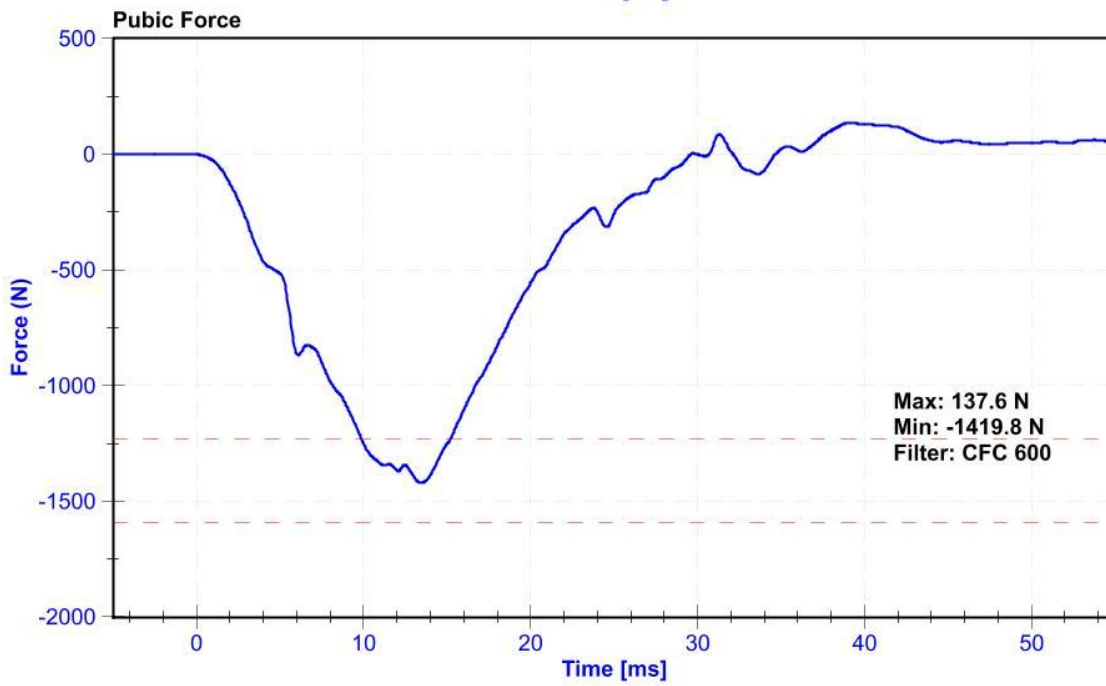
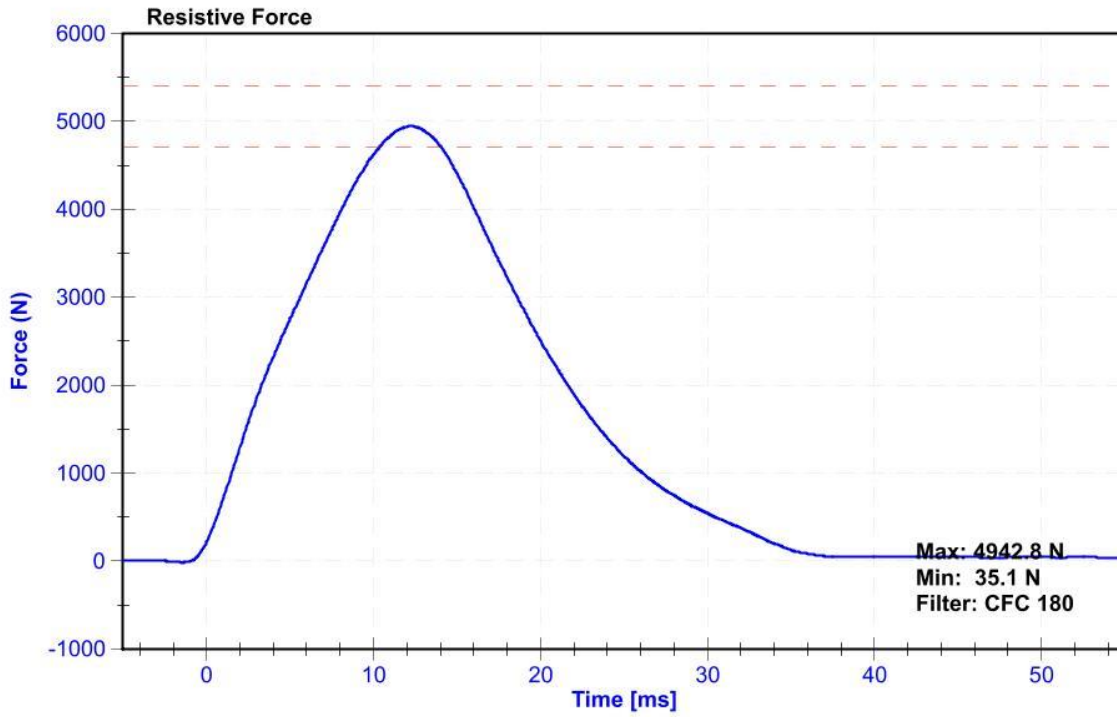
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	15.3	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Resistive Force	4700	5400	N	4942.8	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.20	Pass
Pubic Force	-1590	-1230	N	-1419.8	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.45	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019
Pubic Load Cell	Denton 3096JFL	LC-464fy	6/4/2018	6/4/2019





CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: 300

(CONFIGURED FOR LEFT SIDE IMPACT)

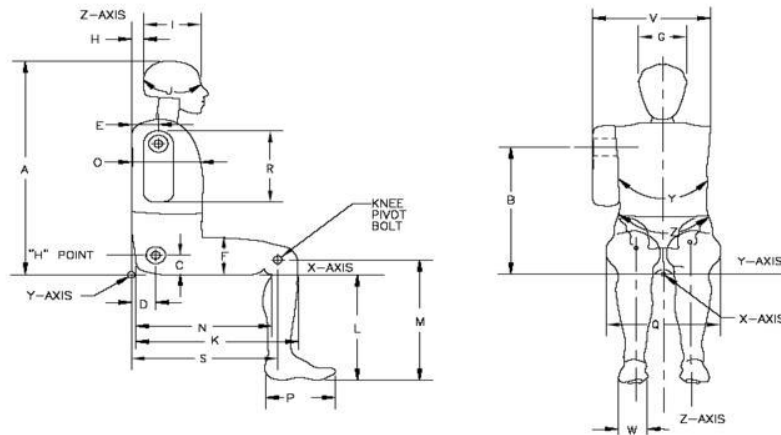


External Measurements - SID-IIs

Technician: K. Dutton

Date: 3/07/2019

Dummy Serial Number: 300



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	449	Pass
C	H-point Height	79	89	85	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	104	Pass
F	Thigh Clearance	119	135	124	Pass
G	Head Breadth	140	148	145	Pass
H	Head Back from Backline	40	46	42	Pass
I	Head Depth	178	188	186	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	531	Pass
L	Popliteal Height	343	369	358	Pass
M	Knee Pivot to floor height	392	409	402	Pass
N	Buttock Popliteal Length	416	442	432	Pass
O	Chest Depth w/o jacket	195	211	204	Pass
P	Foot Length	216	232	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	485	Pass
V	Shoulder Width	341	357	351	Pass
W	Foot Width	78	94	83	Pass
Y	Chest Circumference w/jacket	851	881	872	Pass
Z	Waist Circumference	761	791	770	Pass

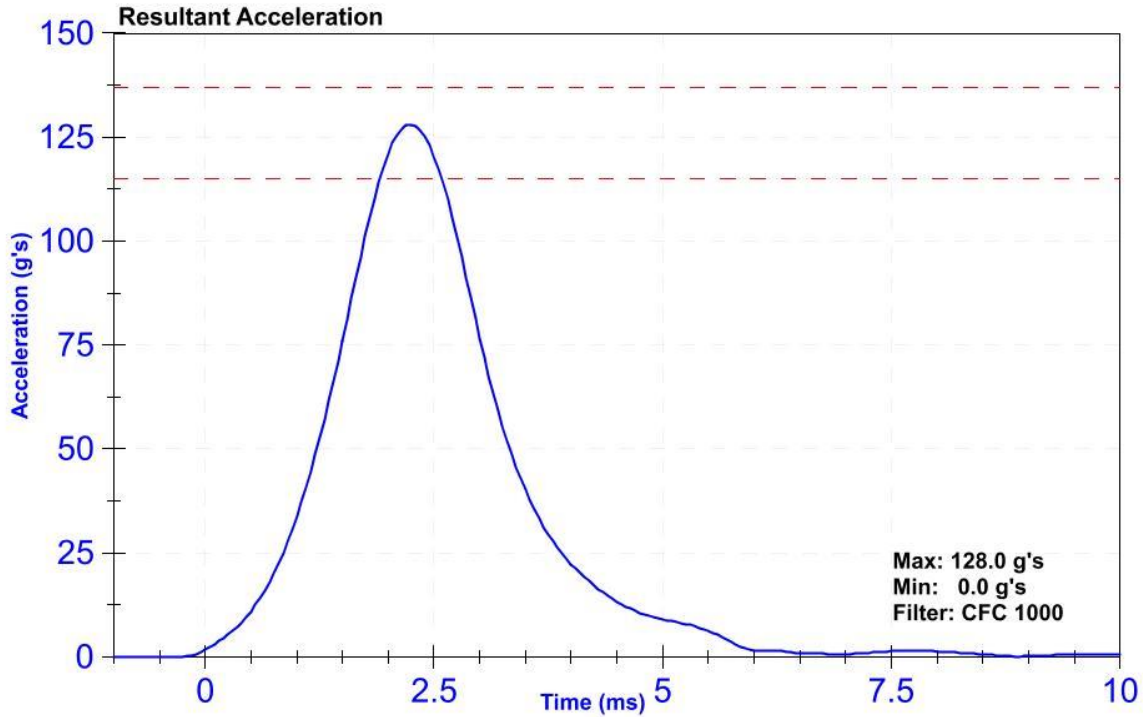
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

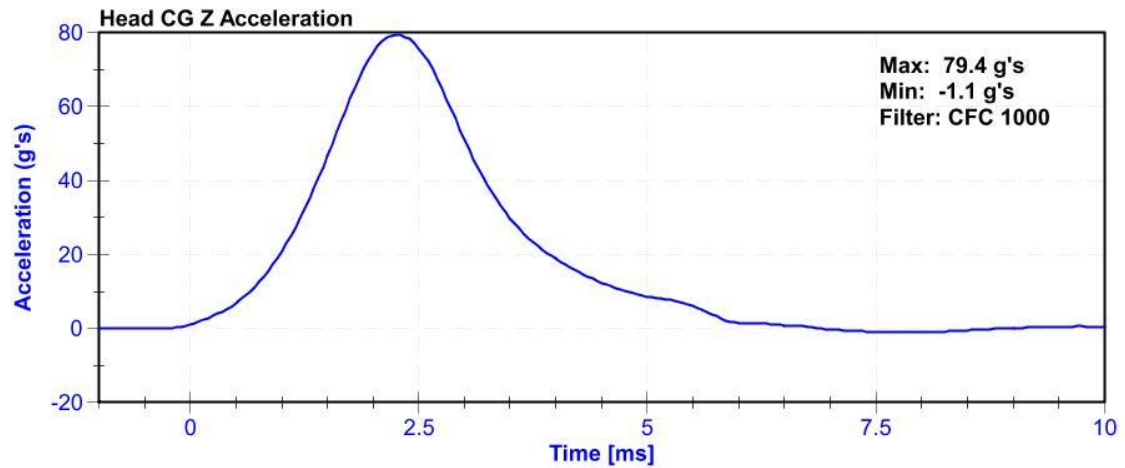
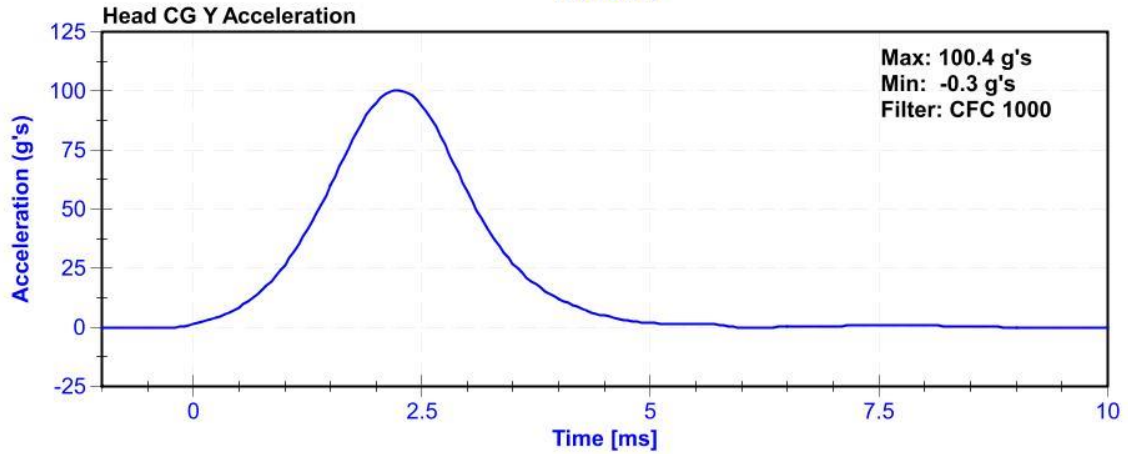
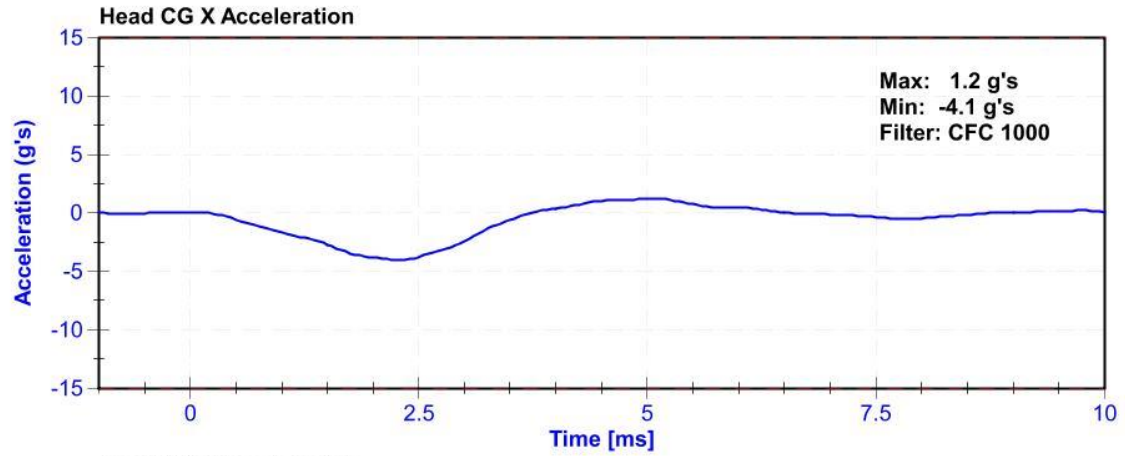
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22	Pass
Humidity	10	70	%	17.5	Pass
Resultant Acceleration	115	137	g's	128.0	Pass
Oscillation	0	15	%	1.1	Pass
Fore-Aft Acceleration	-15	15	g's	-4.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58777	10/5/2018	4/5/2019
Y Accelerometer	ENDEVCO 7264CT	AC-P59018	10/5/2018	4/5/2019
Z Accelerometer	ENDEVCO 7264	AC-P79189	10/5/2018	4/5/2019





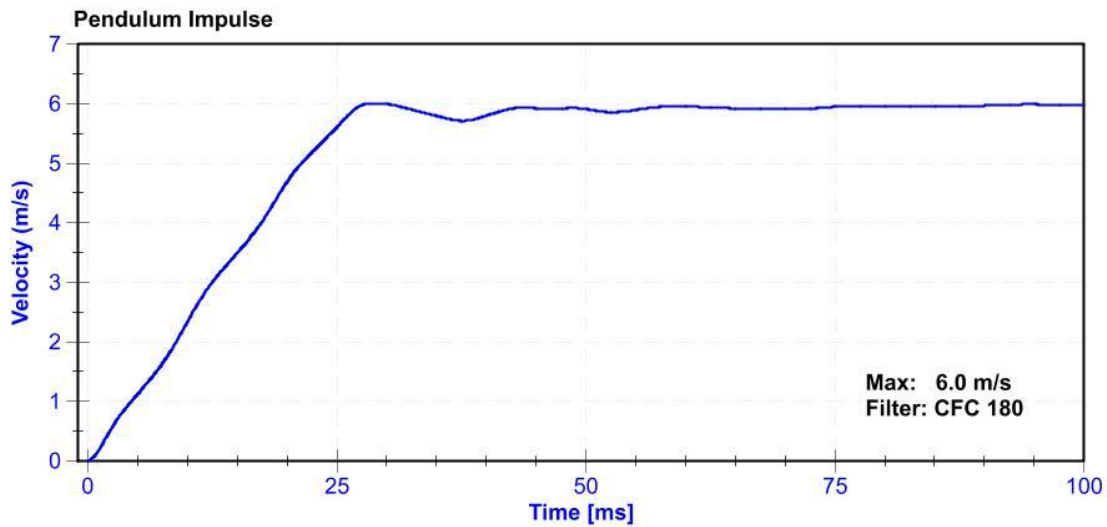
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

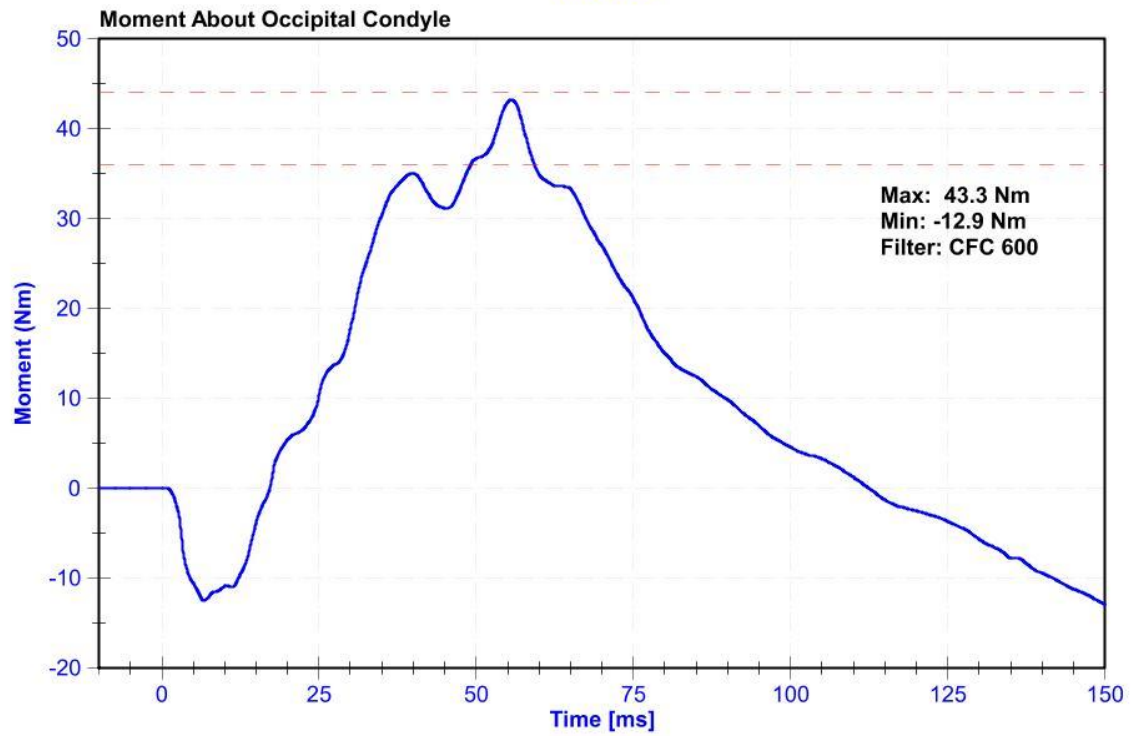
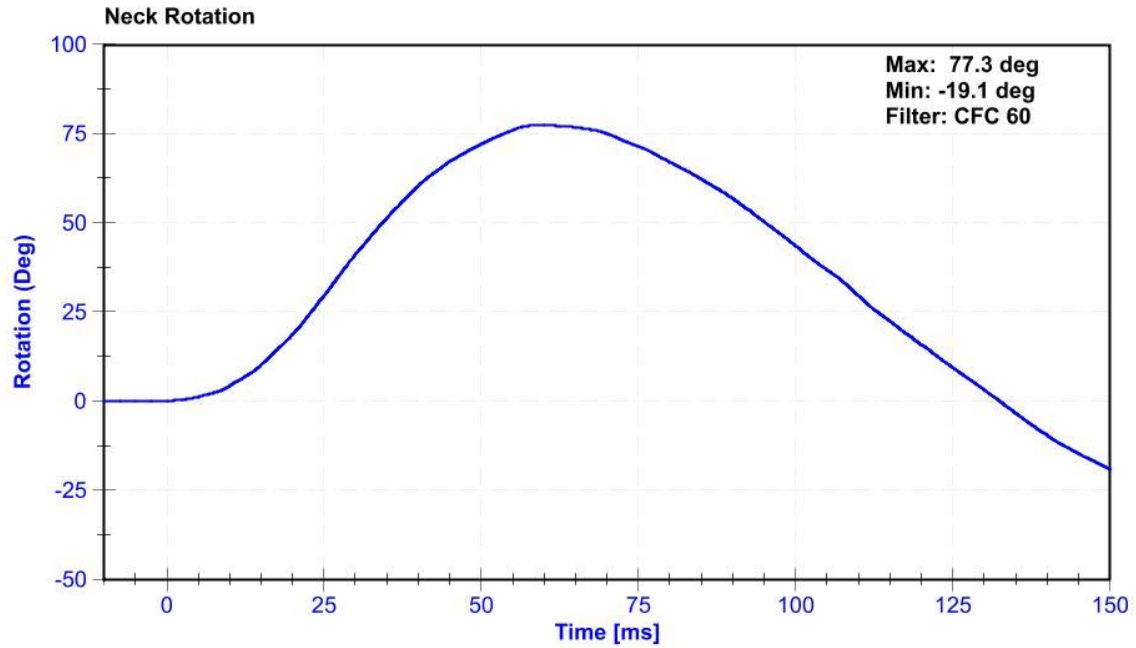
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	16.5	Pass
Velocity	5.51	5.63	m/s	5.514	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.34	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.49	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.69	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.61	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.01	Pass
Neck Rotation	71	81	deg	77.3	Pass
Time at Maximum Rotation	50	70	ms	59.0	Pass
Moment about the OC	36	44	Nm	43.3	Pass
Moment Decay to 0 Nm	102	126	ms	112.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/29/2019	1/29/2020
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/1/2018	11/1/2019
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/1/2018	11/1/2019
Upper Neck Load Cell	Denton 1716	LC-2018 FY	9/28/2018	9/28/2019





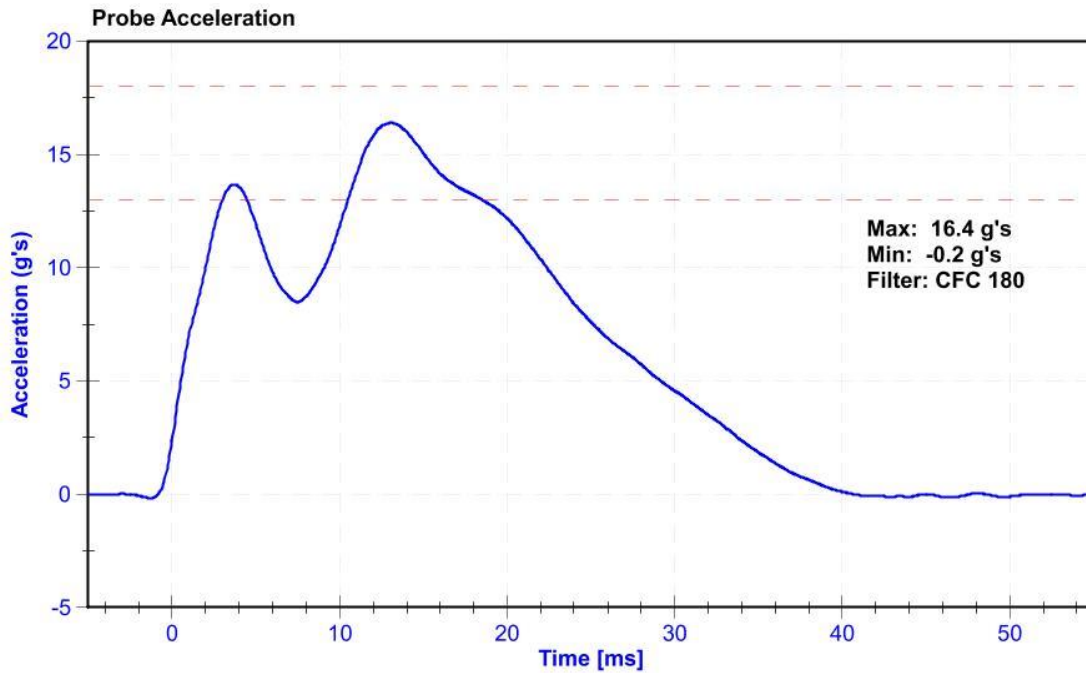
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

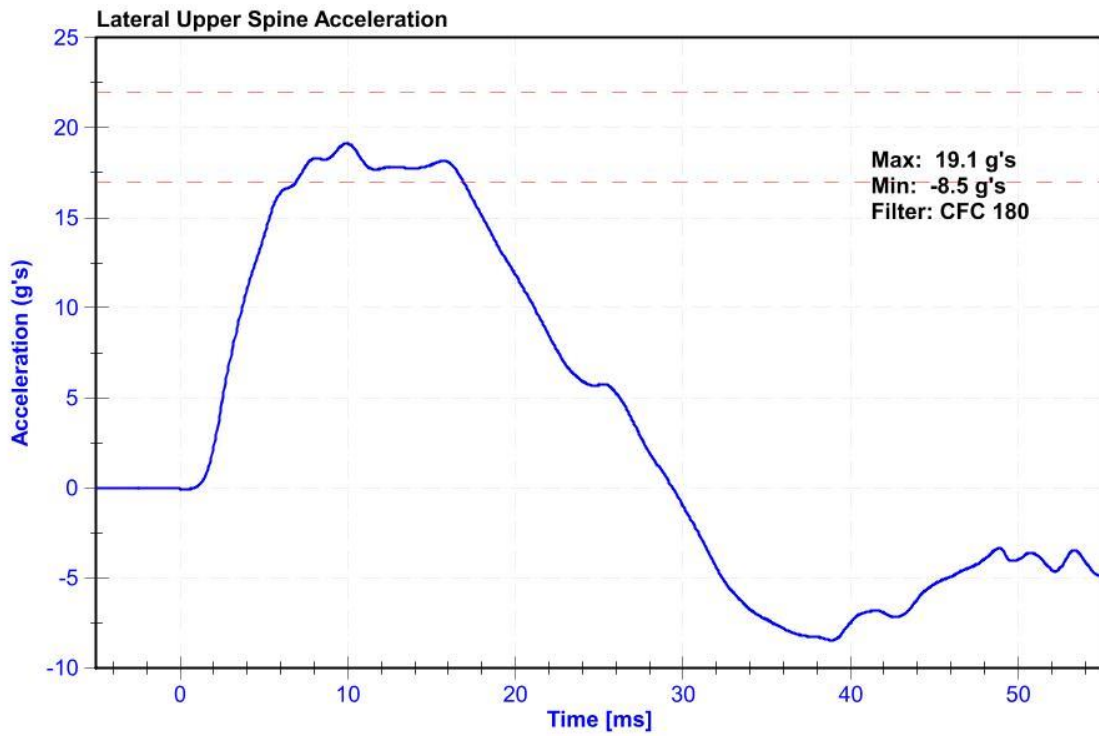
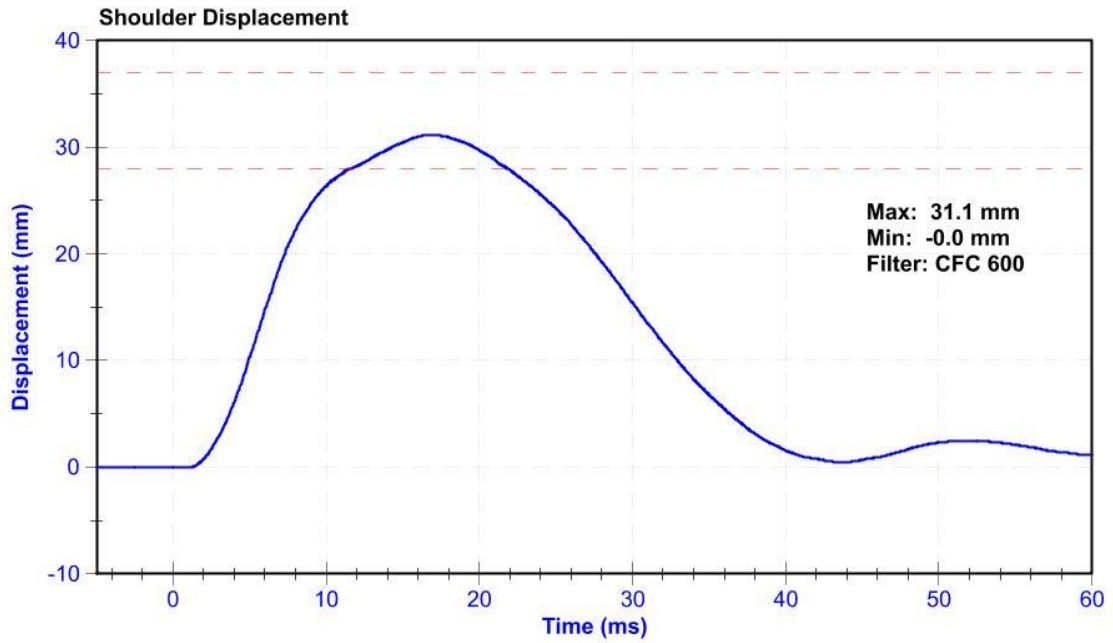
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	17.6	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Probe Acceleration	13	18	g's	16.4	Pass
Shoulder Deflection	28	37	mm	31.1	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/30/2018	10/30/2019
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/24/2018	4/24/2019





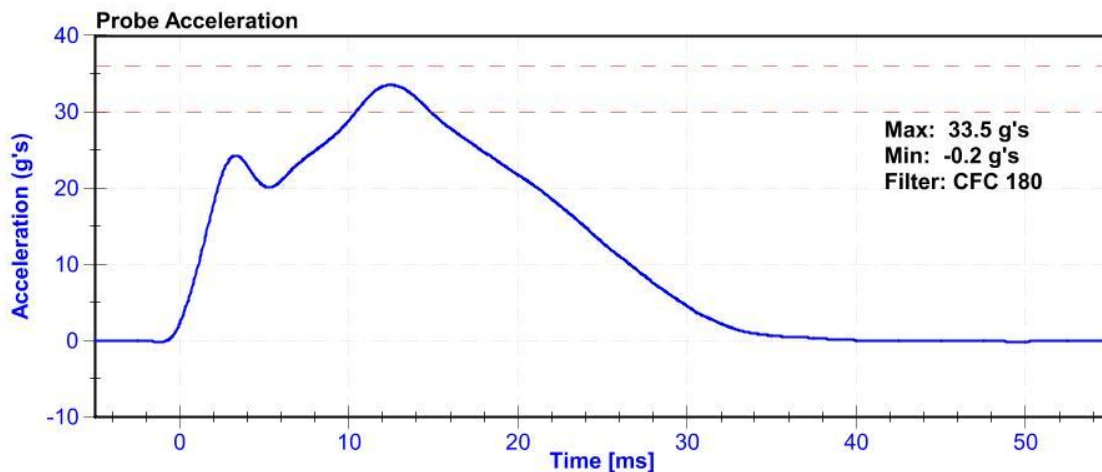
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

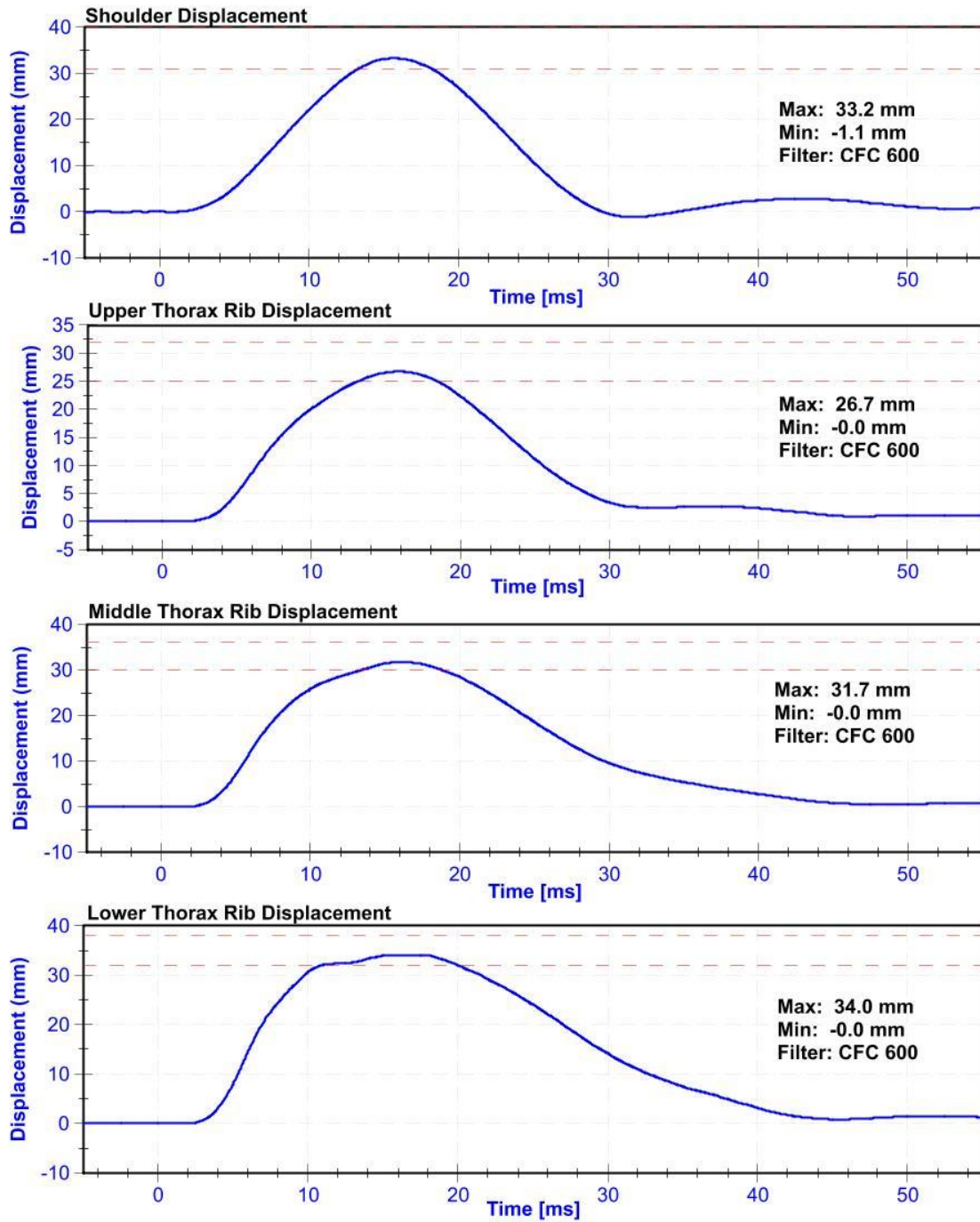
Results

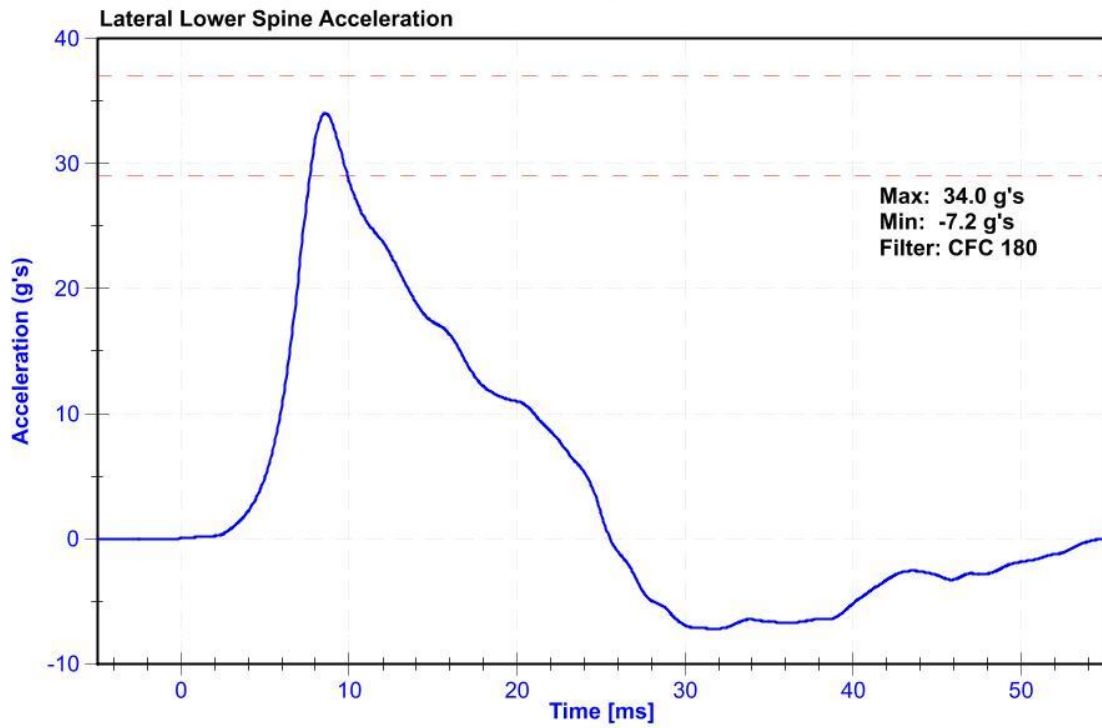
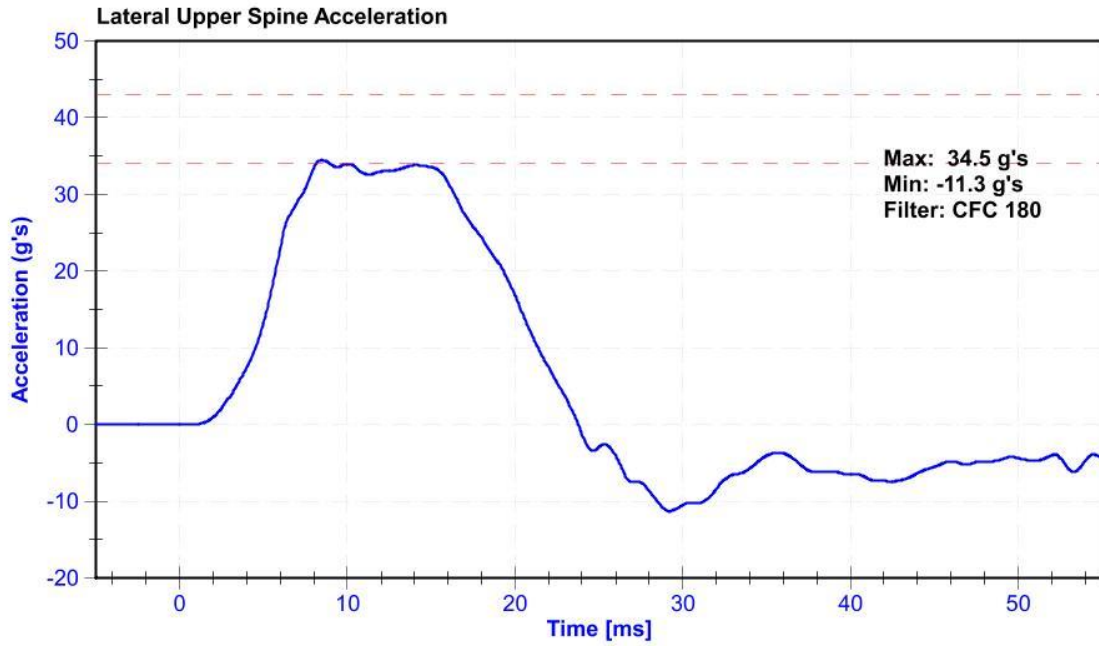
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	27.7	Pass
Velocity	6.6	6.8	m/s	6.63	Pass
Probe Acceleration after 5 ms	30	36	g's	33.5	Pass
Lateral Upper Spine Acceleration	34	43	g's	34.5	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.0	Pass
Shoulder Deflection	31	40	mm	33.2	Pass
Upper Thorax Rib Deflection	25	32	mm	26.7	Pass
Mid Thorax Rib Deflection	30	36	mm	31.7	Pass
Lower Thorax Rib Deflection	32	38	mm	34.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/24/2018	4/24/2019
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P64147	1/10/2019	7/11/2019
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/30/2018	10/30/2019
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/10/2018	10/10/2019
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/11/2018	10/11/2019
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/10/2018	10/10/2019







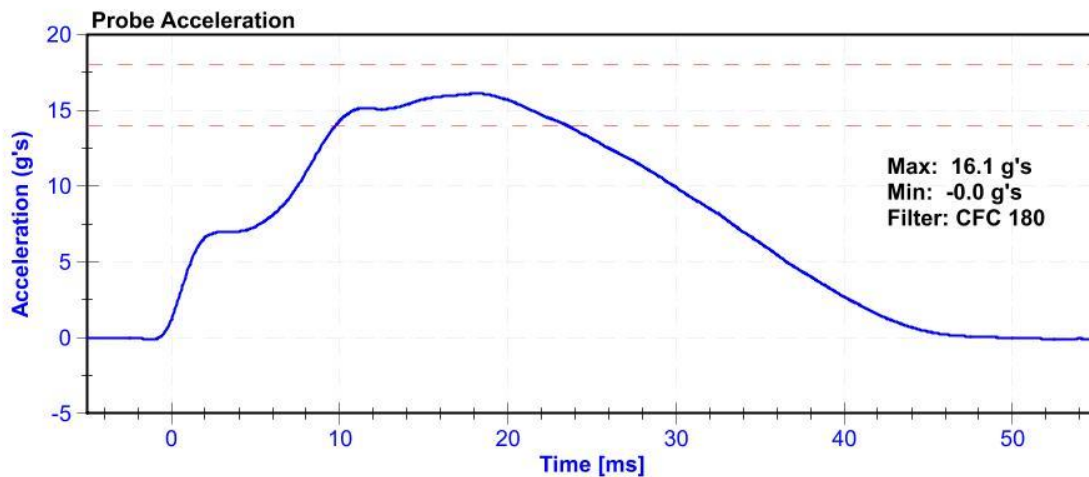
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

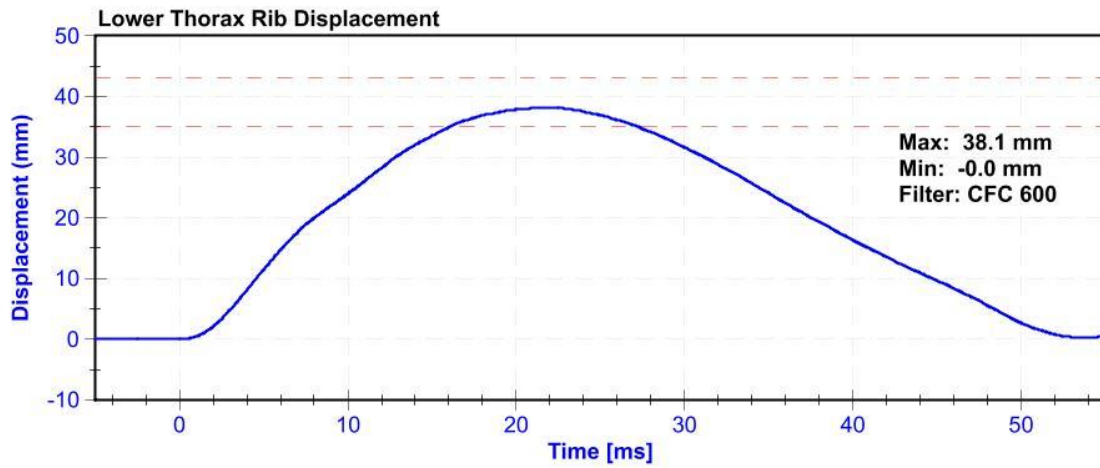
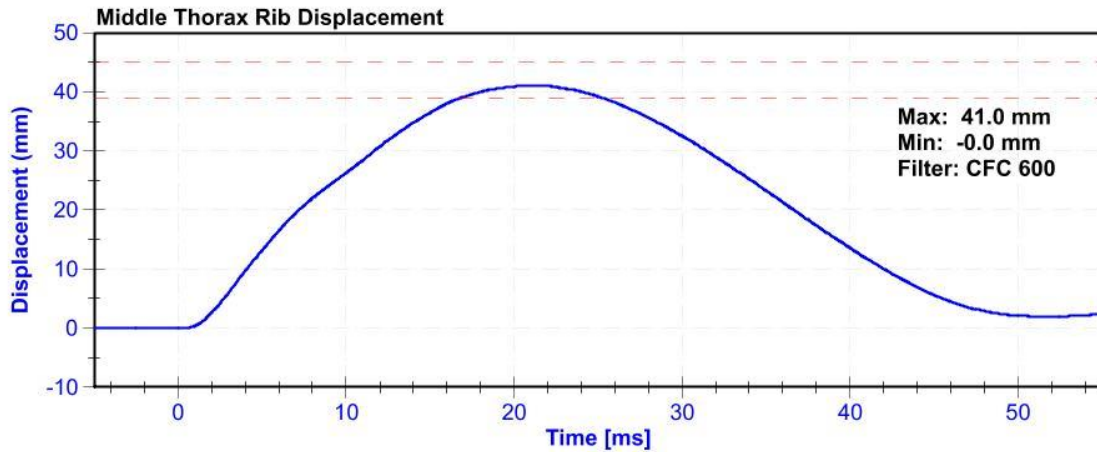
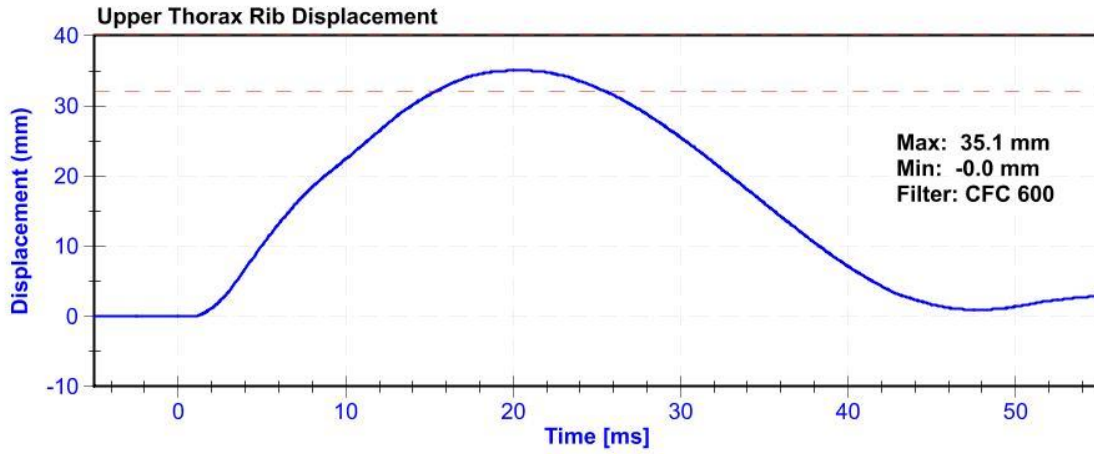
Results

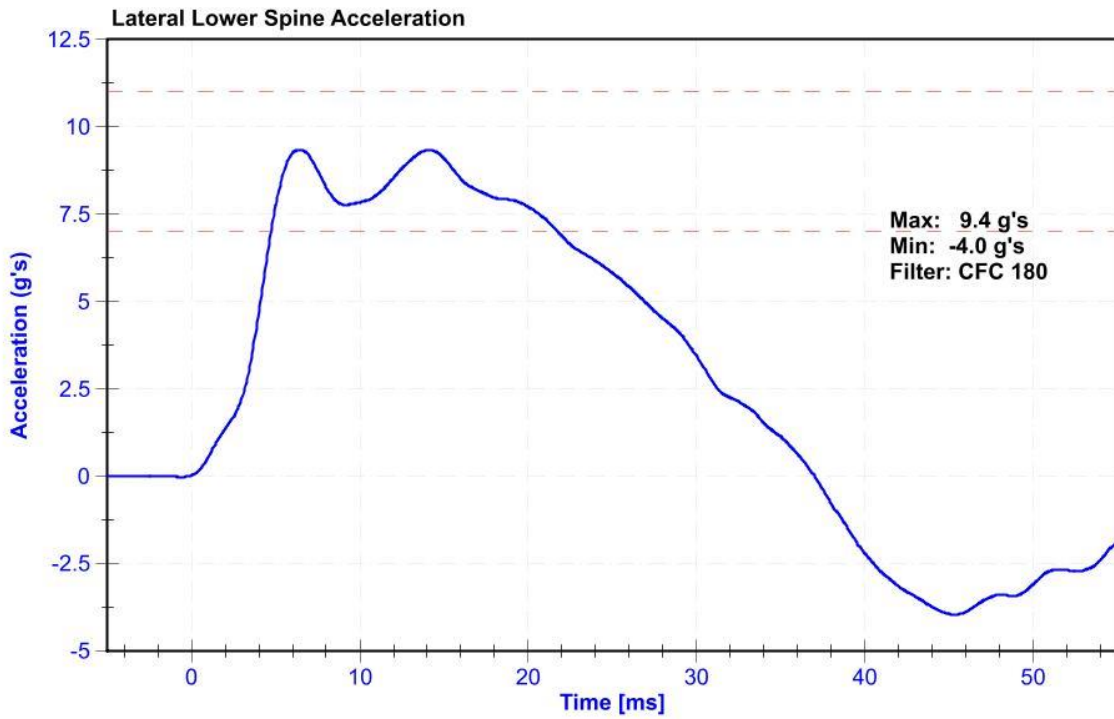
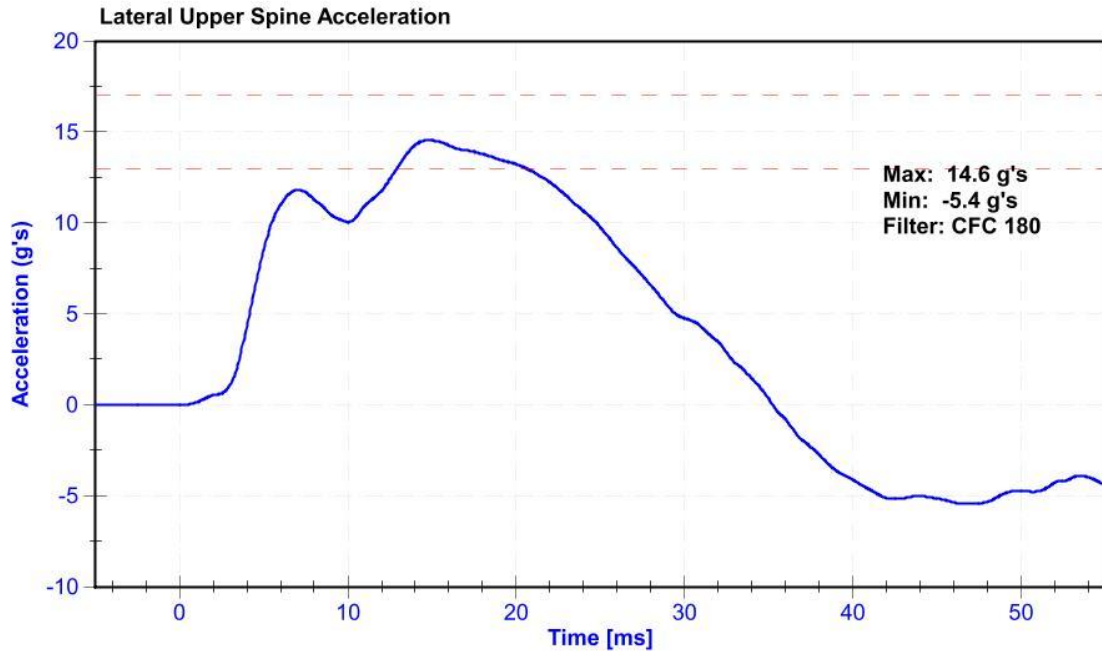
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	35.7	Pass
Velocity	4.2	4.4	m/s	4.33	Pass
Probe Acceleration	14	18	g's	16.1	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.6	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.4	Pass
Upper Thorax Rib Deflection	32	40	mm	35.1	Pass
Middle Thorax Rib Deflection	39	45	mm	41.0	Pass
Lower Thorax Rib Deflection	35	43	mm	38.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/24/2018	4/24/2019
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	1/10/2019	7/11/2019
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/10/2018	10/10/2019
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/11/2018	10/11/2019
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/10/2018	10/10/2019







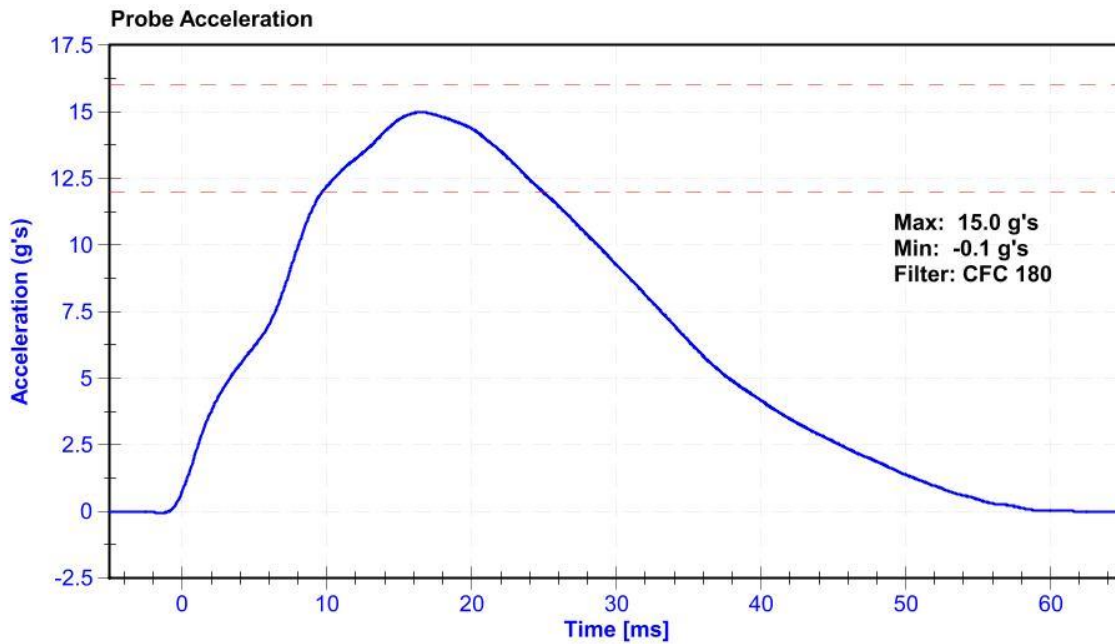
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

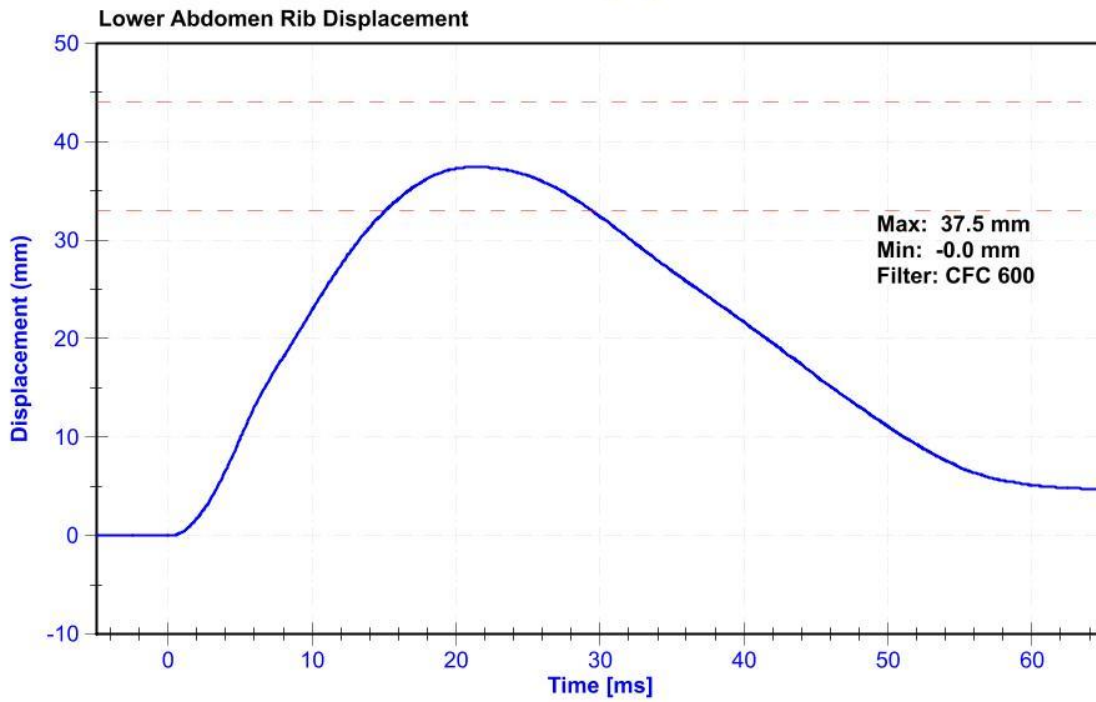
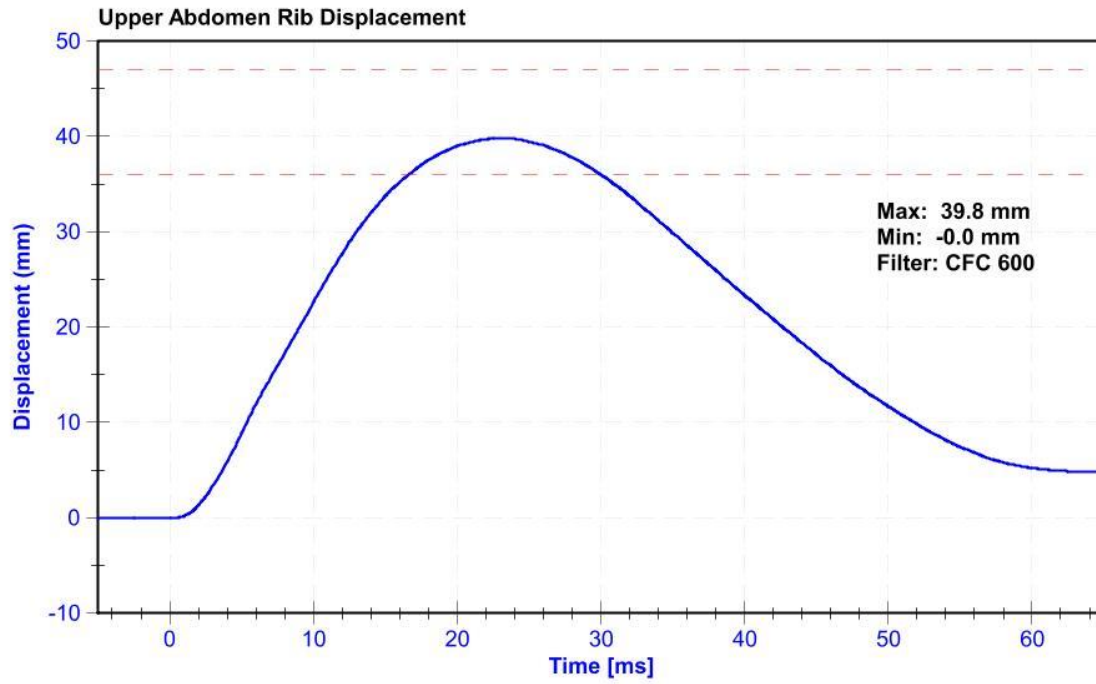
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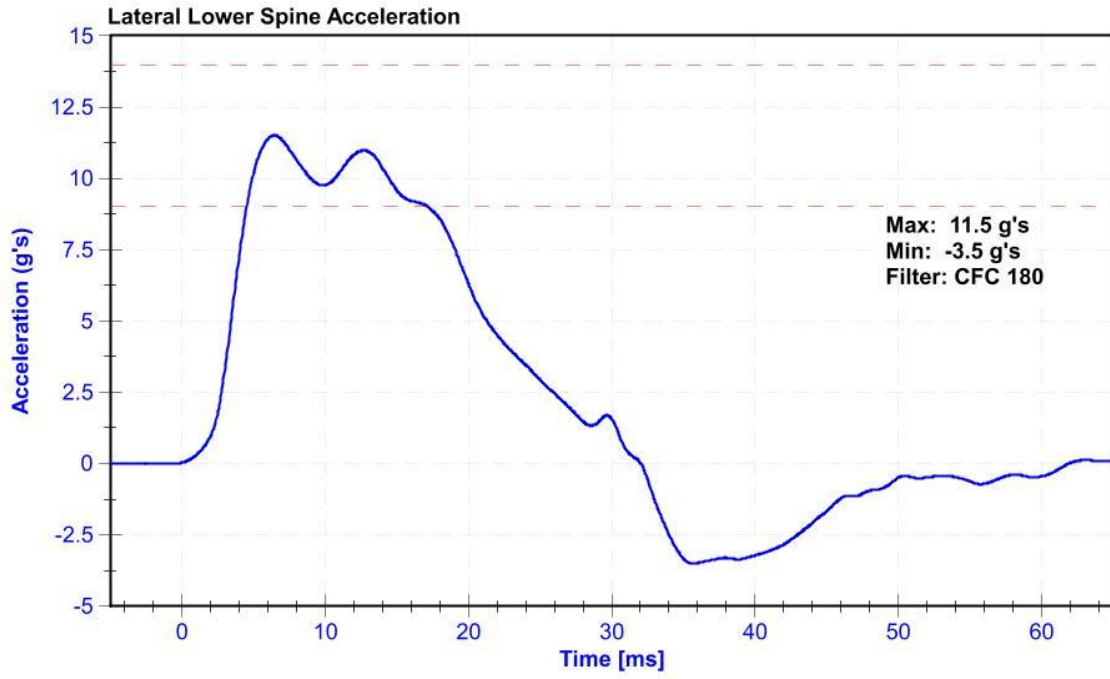
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	18.0	Pass
Velocity	4.2	4.4	m/s	4.31	Pass
Probe Acceleration	12	16	g's	15.0	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.5	Pass
Upper Abdomen Rib Deflection	36	47	mm	39.8	Pass
Lower Abdomen Rib Deflection	33	44	mm	37.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	1/10/2019	7/11/2019
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-308GFE	10/10/2018	10/10/2019
Lower Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-307GFE	10/11/2018	10/11/2019







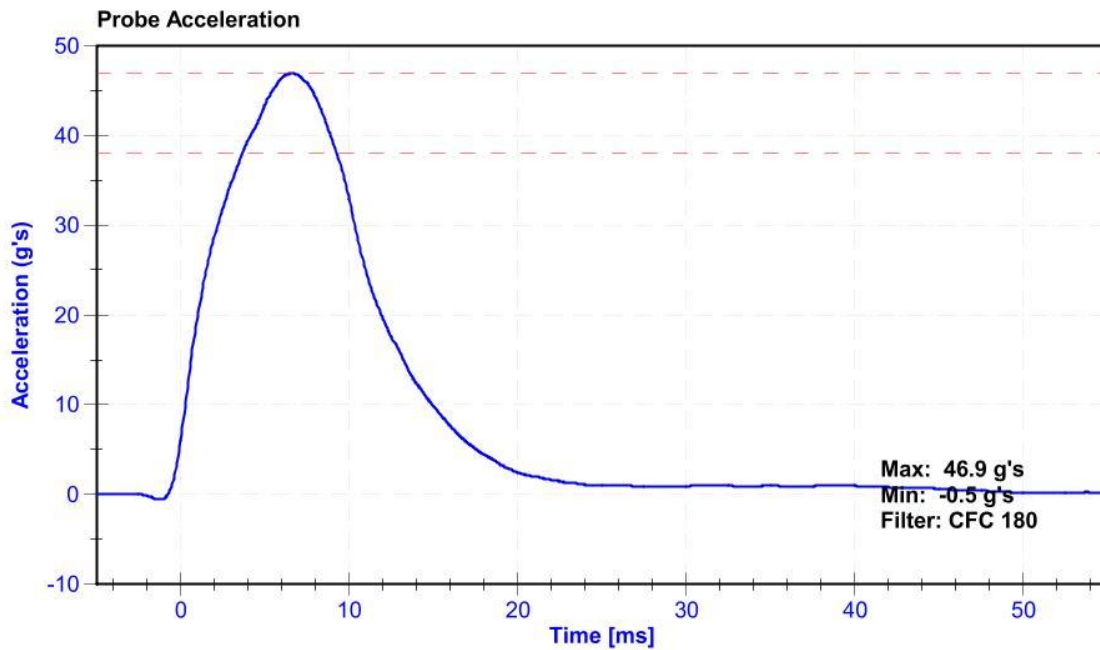
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

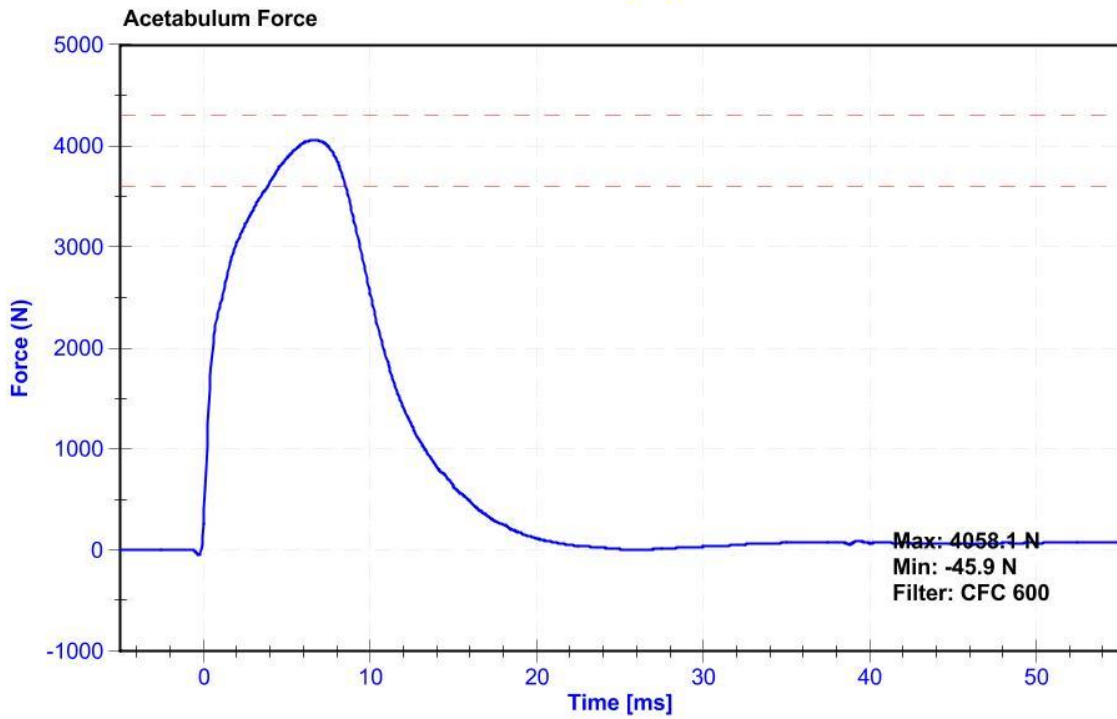
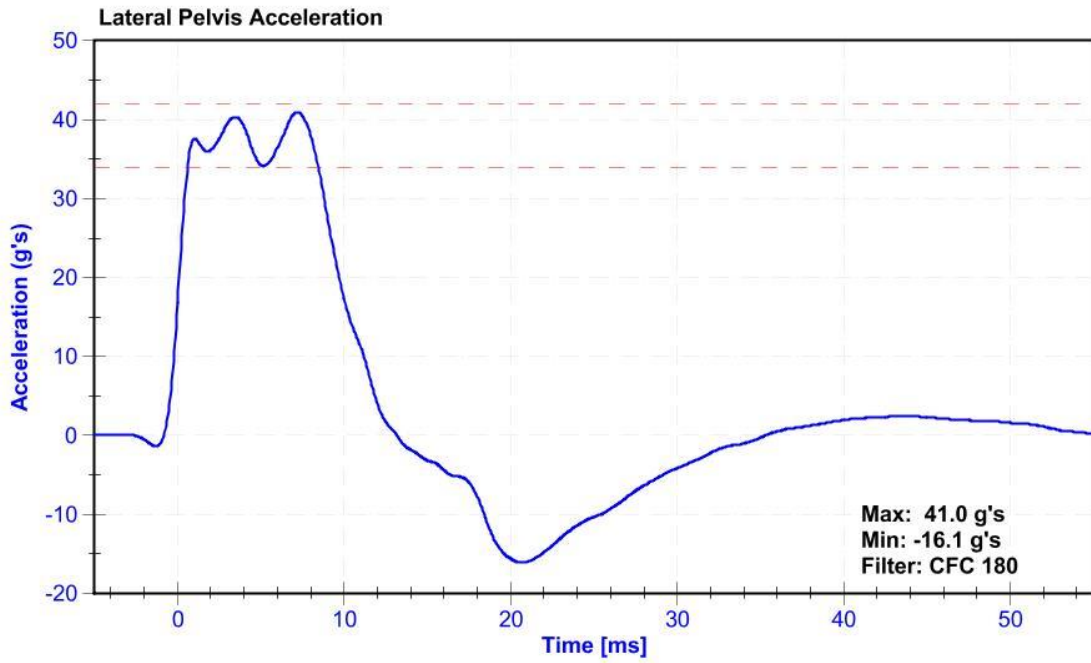
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	14.5	Pass
Velocity	6.6	6.8	m/s	6.61	Pass
Probe Acceleration	38	47	g's	46.9	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.0	Pass
Acetabulum Force	3600	4300	N	4058.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/24/2018	4/24/2019
Acetabulum Load Cell	DENTON 3249J	LC-275Fy	10/4/2018	10/4/2019
Certification Plug	Humanetics	11796	1/22/2018	N/A
Crash Test Plug	Humanetics	11410	8/29/2016	N/A







SID-11s Pelvis Plug Certification Test

Plug S/N 11410

Test Number 2879

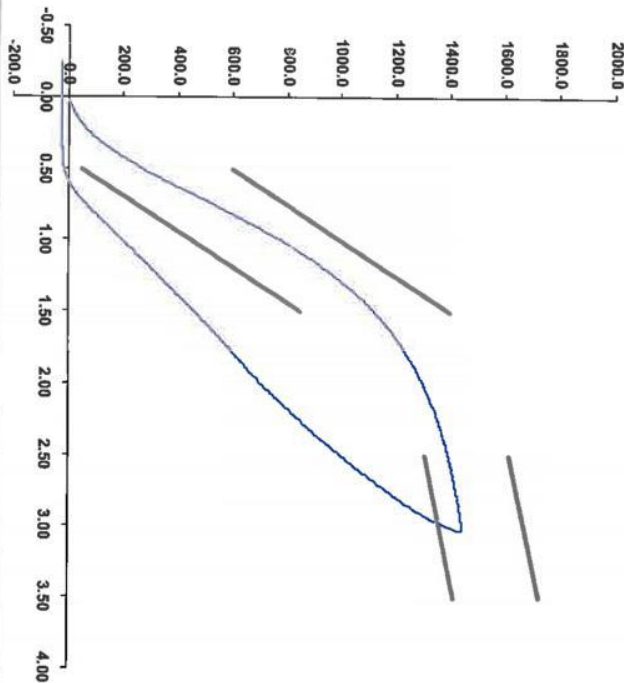
Report Number 2876

Test Date 8/29/2016 10:58:02 AM

Force (-N) vs Extension (-mm)

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

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



Operator DC

Part Number 180-4450

Template No 107
 SACO Research 29-Aug-16

By: *DC* Date: *8/29/16*
 SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



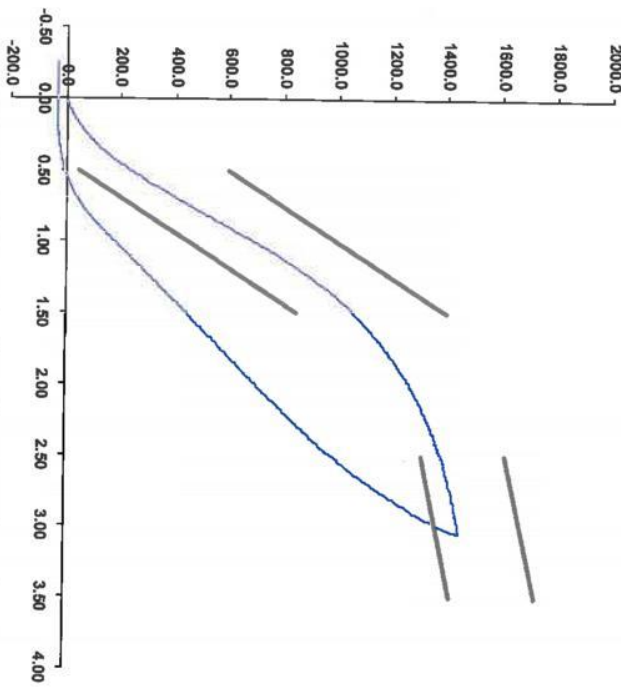
cert 2 SACO 3/8/19

SID-11s Pelvis Plug Certification Test

Plug S/N 11796
Test Number 5903
Report Number 5919
Test Date 1/22/2018 12:34:22 PM

Force (-N) vs Extension (-mm)

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50.00	600.00
Force @ 1.5 mm (N)	850.00	1,400.00
Force @ 2.5 mm (N)	1,381.85	1,618.00
Force @ 3.0 mm (N)	1,446.26	1,673.00



Notes:

Testing Machine STM-20 5965642
Load Cell S/N (F1360947), Units (LBS) 1000
Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured By XHD_100 (XHD100)

Operator DC

Part Number 180-4450

Template No 107 22-Jan-18
SACO Research

By: DC Date: 1/22/18
SACO Research 41735 Elm St, #401 Murreta, CA 92562 Tel 310-694-2082 FAX

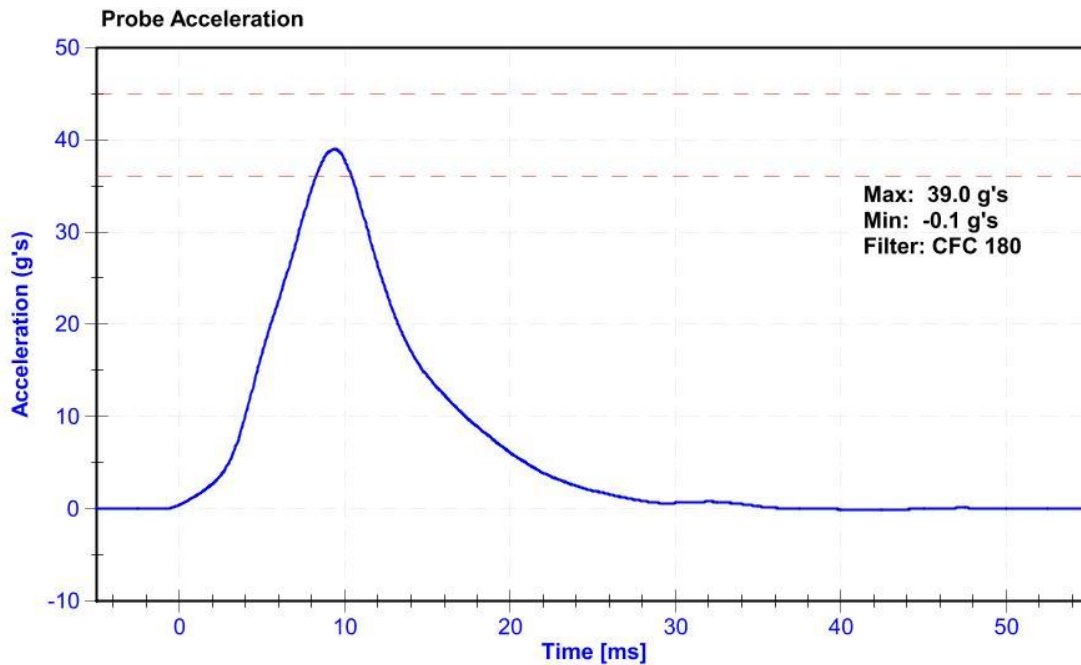
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	D.Reinhard

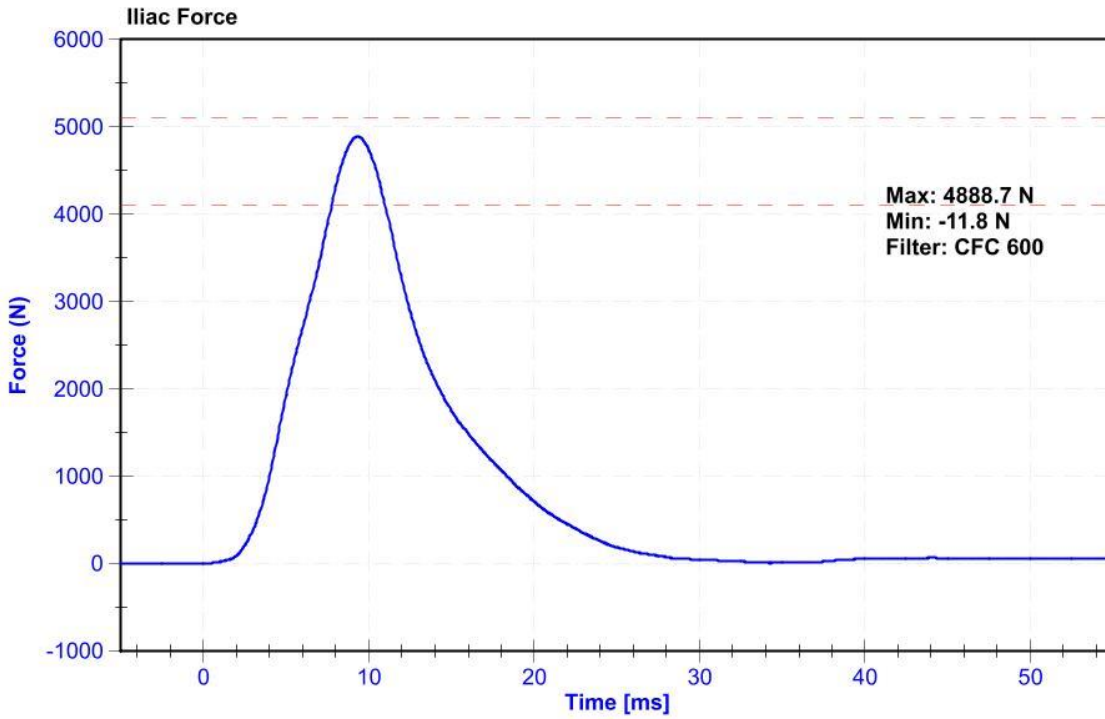
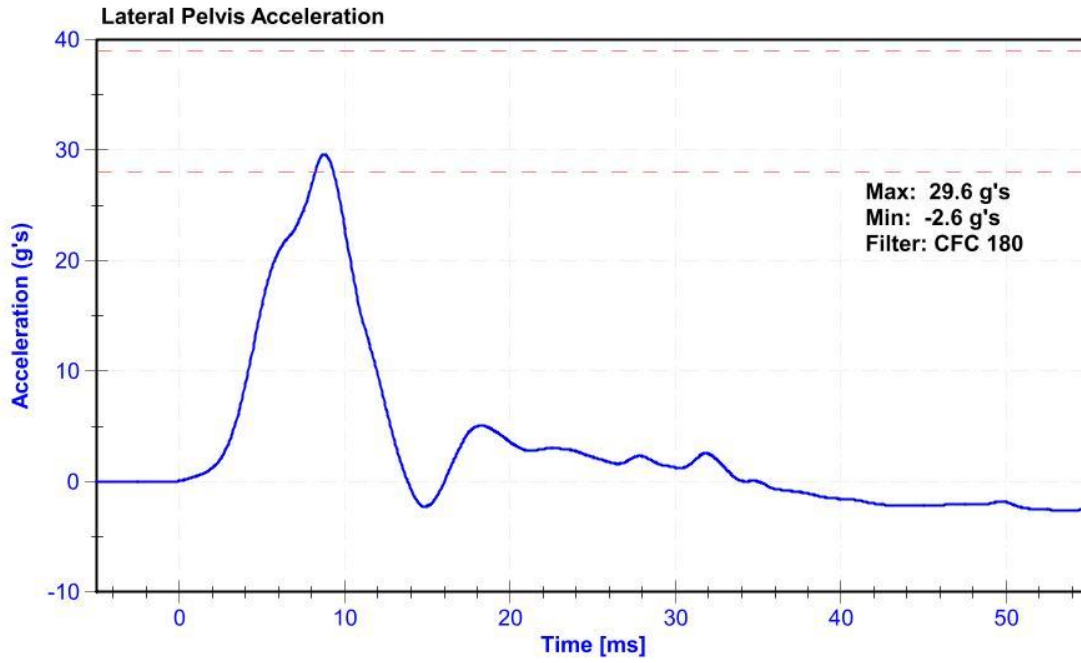
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	15.4	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Probe Acceleration	36	45	g's	39.0	Pass
Lateral Pelvis Acceleration	28	39	g's	29.6	Pass
Iliac Force	4100	5100	N	4888.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/24/2018	4/24/2019
Iliac Load Cell	Kistler 3228J	LC-DM5054 Fy	2/6/2019	2/6/2020





CALIBRATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

SERIAL NO: F034

(CONFIGURED FOR LEFT SIDE IMPACT)

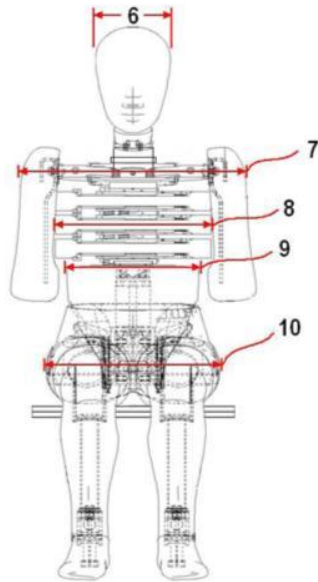


External Measurements - EuroSID-2re

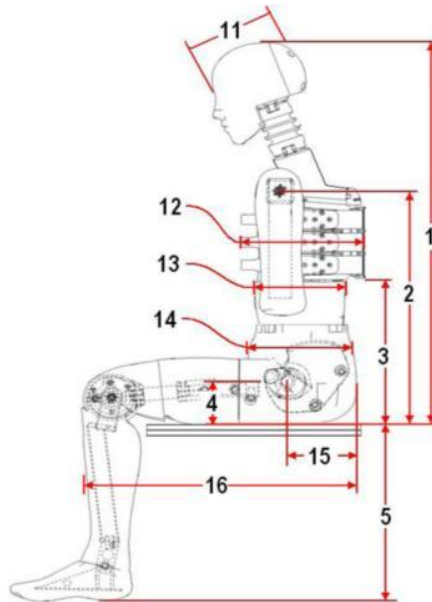
Technician: K. Dutton

Date: 3/21/2019

Dummy Serial Number: F034



FRONT VIEW



SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	910	Pass
2	Seat to Shoulder Joint	558	572	566	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	352	Pass
4	Seat to Hip Joint (center of bolt)	97	103	101	Pass
5	Sole to Seat, Sitting	333	451	419	Pass
6	Head Width	152	158	154	Pass
7	Shoulder/Arm Width	461	479	472	Pass
8	Thorax Width	322	332	328	Pass
9	Abdomen Width	273	287	280	Pass
10	Pelvis Lap Width	359	373	365	Pass
11	Head Depth	196	206	200	Pass
12	Thorax Depth	262	272	269	Pass
13	Abdomen Depth	194	204	201	Pass
14	Pelvis Depth	235	245	242	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	155	Pass
16	Back of Buttocks to Front Knee	597	615	609	Pass

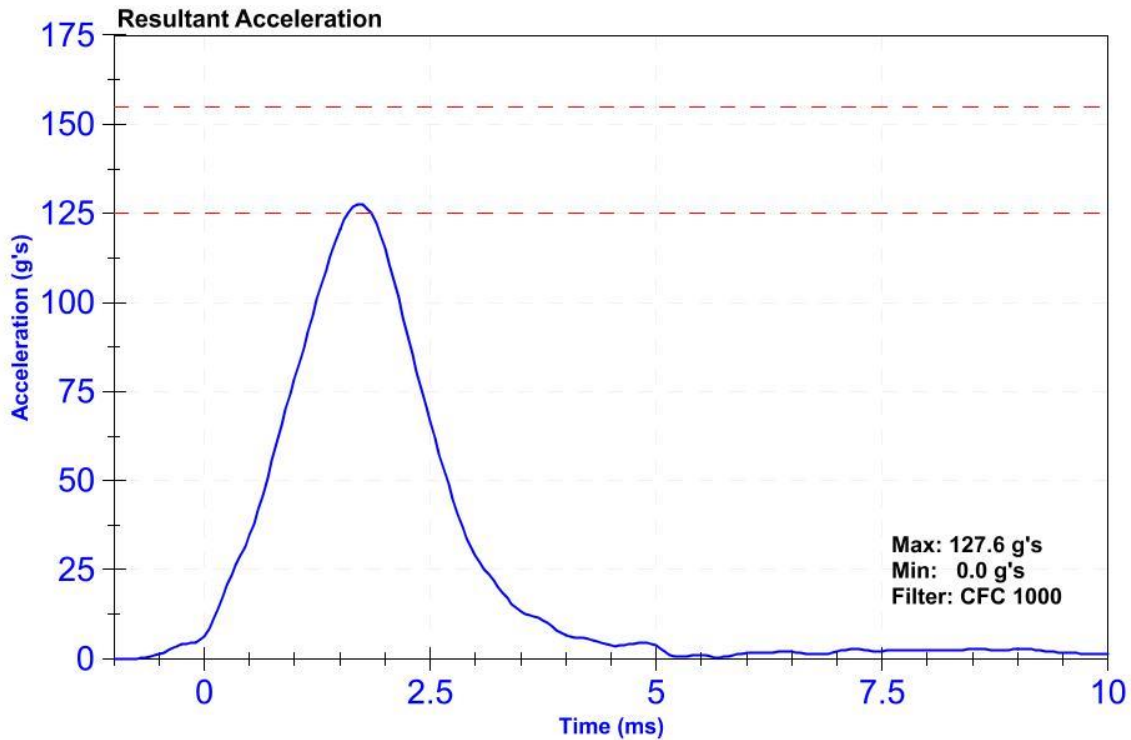
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

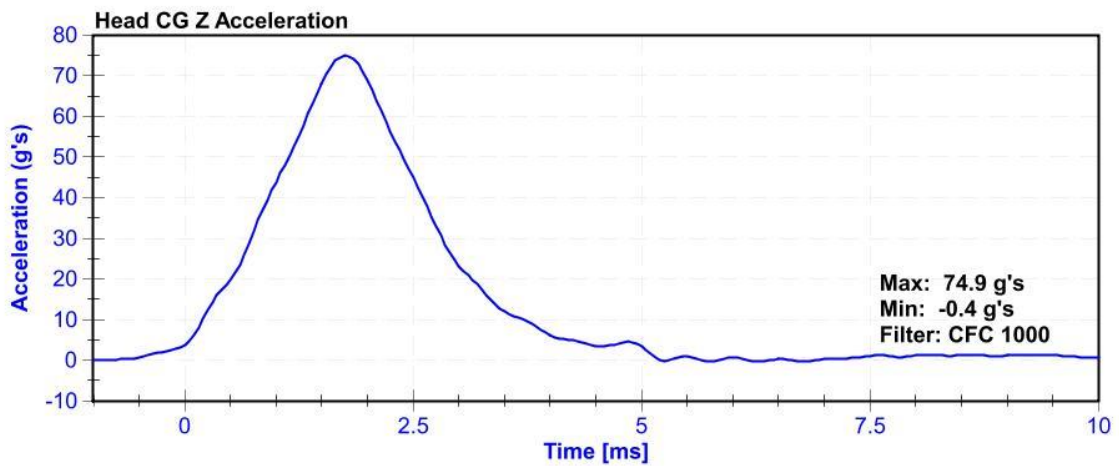
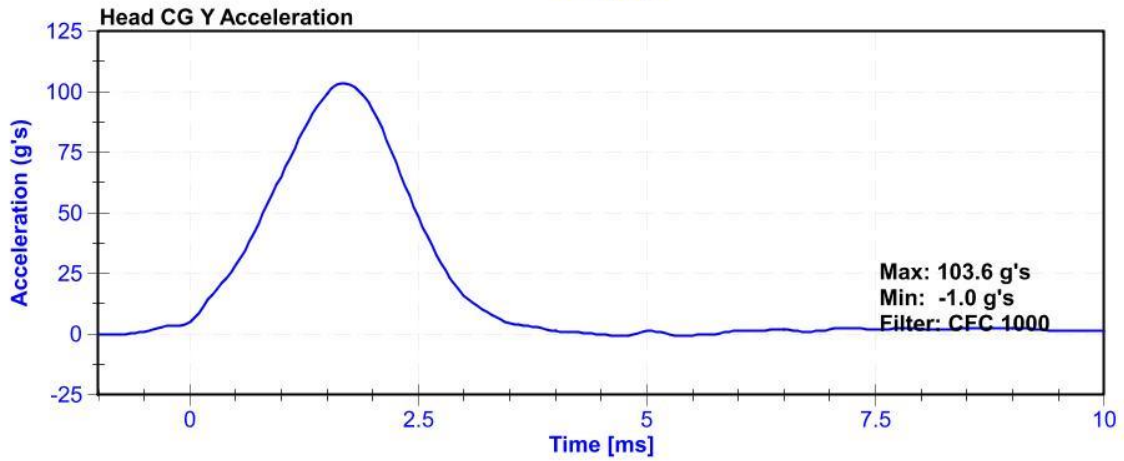
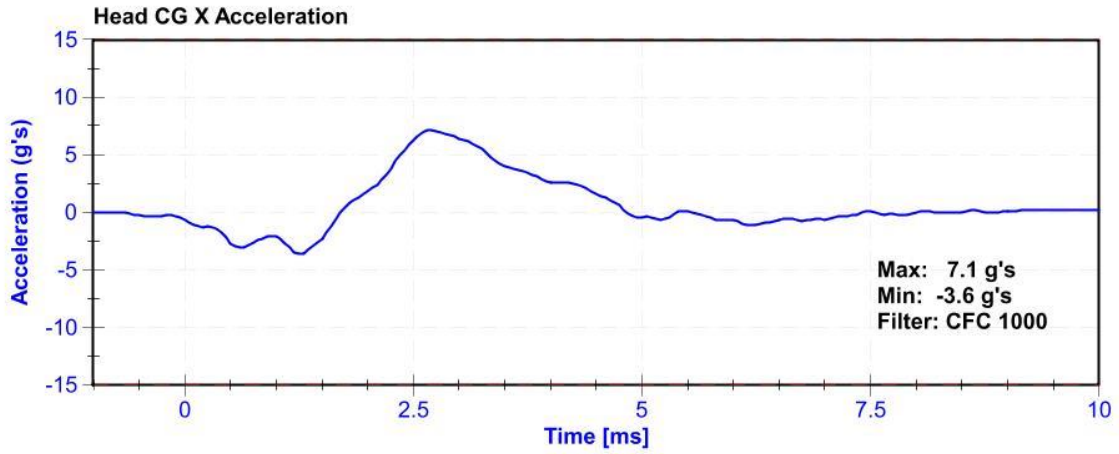
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	31.3	Pass
Resultant Acceleration	125	155	g's	127.6	Pass
Oscillation	0	15	%	3.54	Pass
Fore-Aft Acceleration	-15	15	g's	7.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58904	10/5/2018	4/5/2019
Y Accelerometer	ENDEVCO 7264CT	AC-P58911	10/5/2018	4/5/2019
Z Accelerometer	ENDEVCO 7264CT	AC-P58776	10/5/2018	4/5/2019





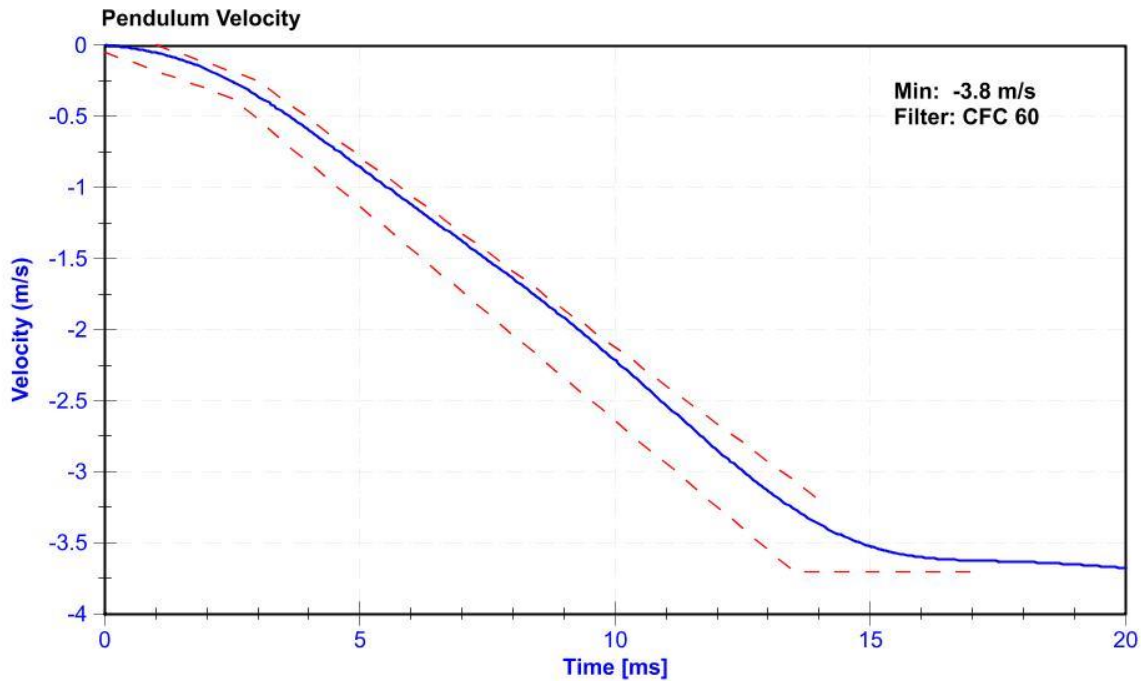
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

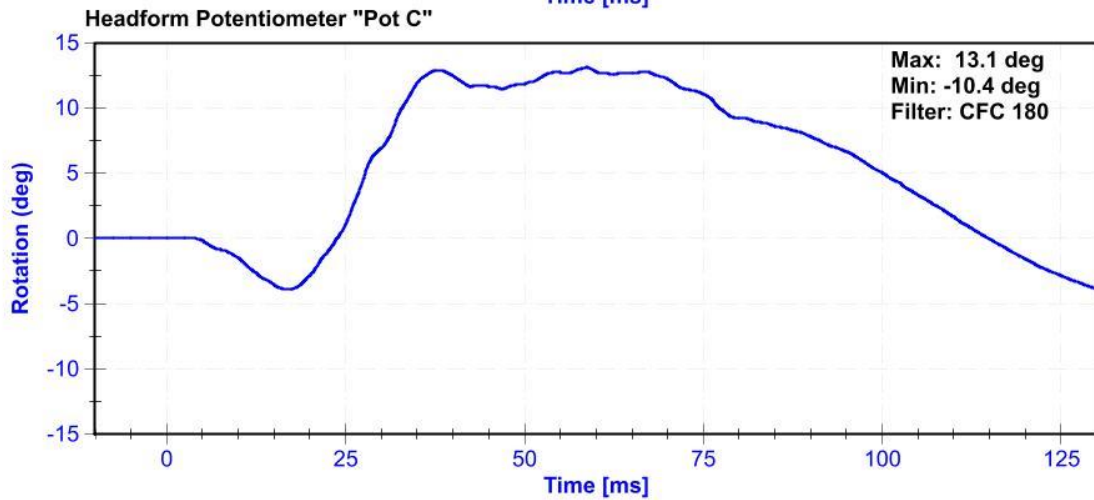
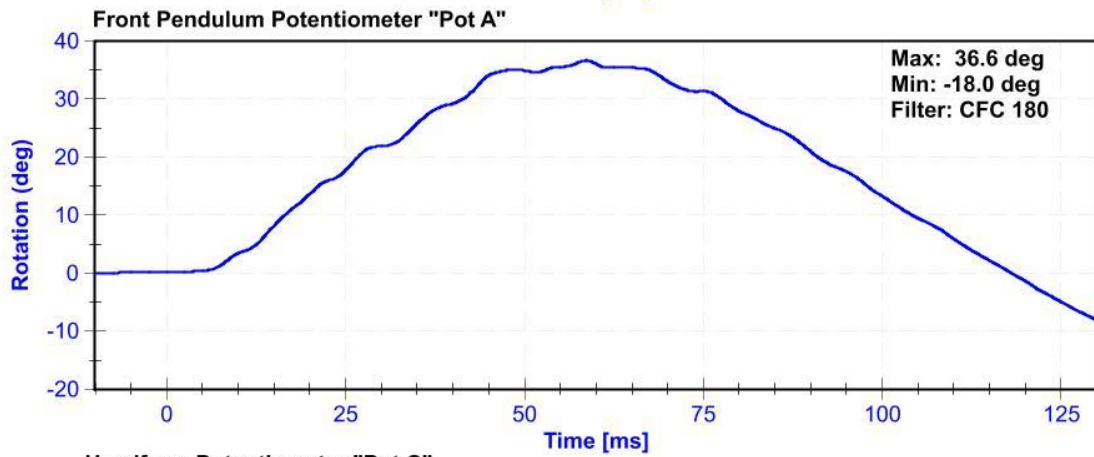
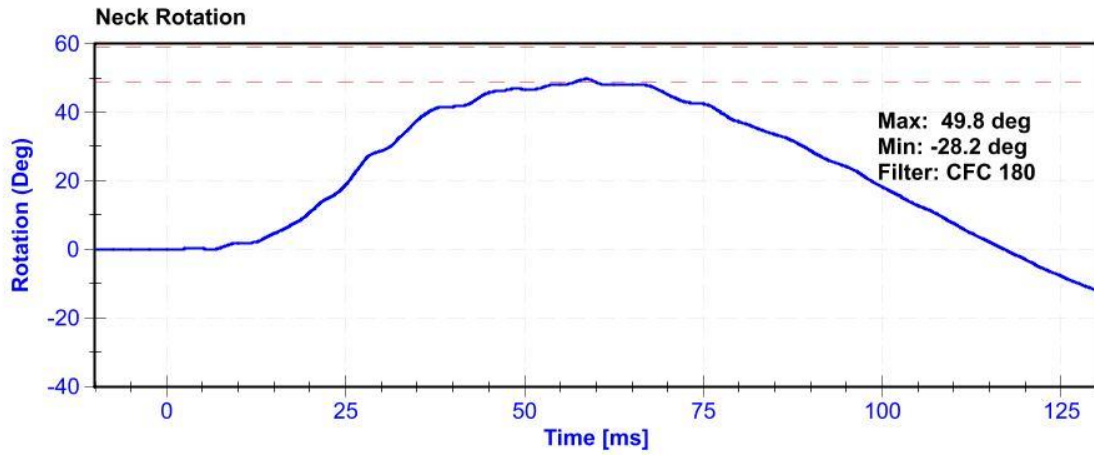
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	30.9	Pass
Velocity	3.3	3.5	m/s	3.35	Pass
Lateral Neck Rotation	49	59	deg	49.8	Pass
Time at Maximum Rotation	54	66	ms	58.7	Pass
Time of Rotation Decay from Maximum	53	88	ms	58.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CTAC-AH5M9 Pend		1/29/2019	1/29/2020
Front Pendulum Potentiometer	SP22G	DS-094	10/31/2018	10/31/2019
Headform Potentiometer	SP22G	DS-095	10/31/2018	10/31/2019





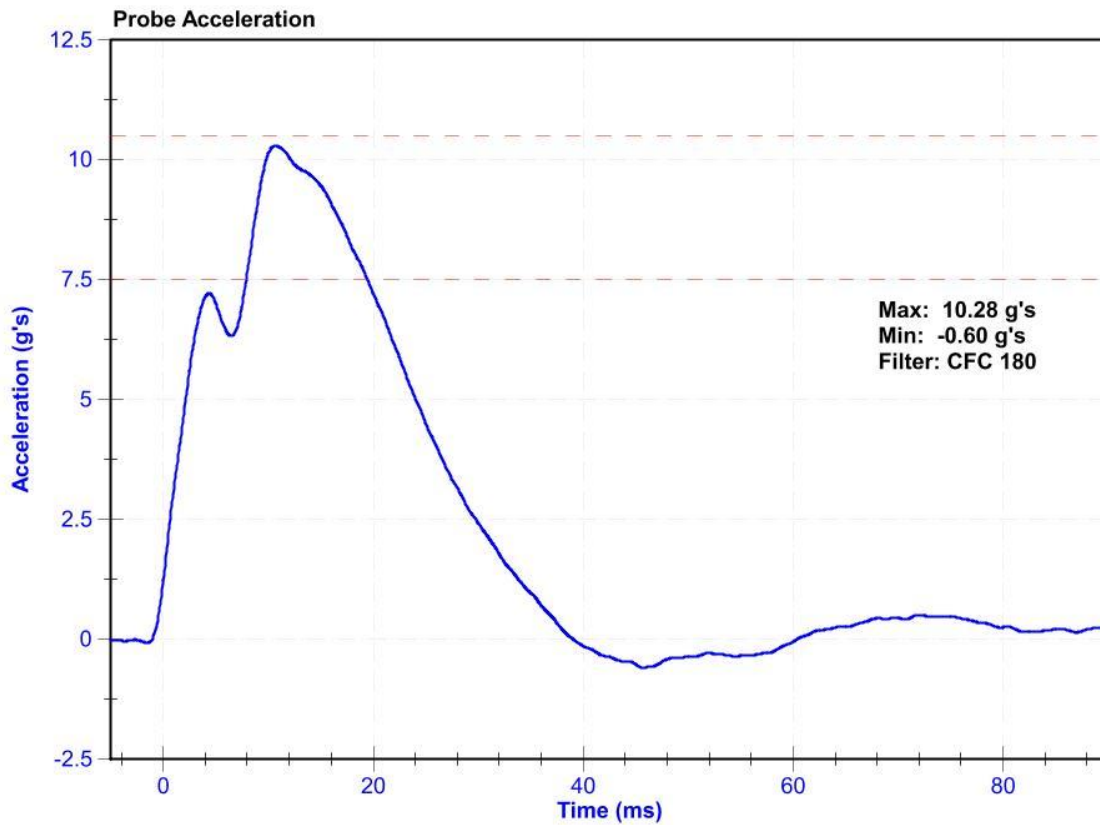
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	31.8	Pass
Velocity	4.2	4.4	m/s	4.20	Pass
Probe Acceleration	7.5	10.5	g's	10.28	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019



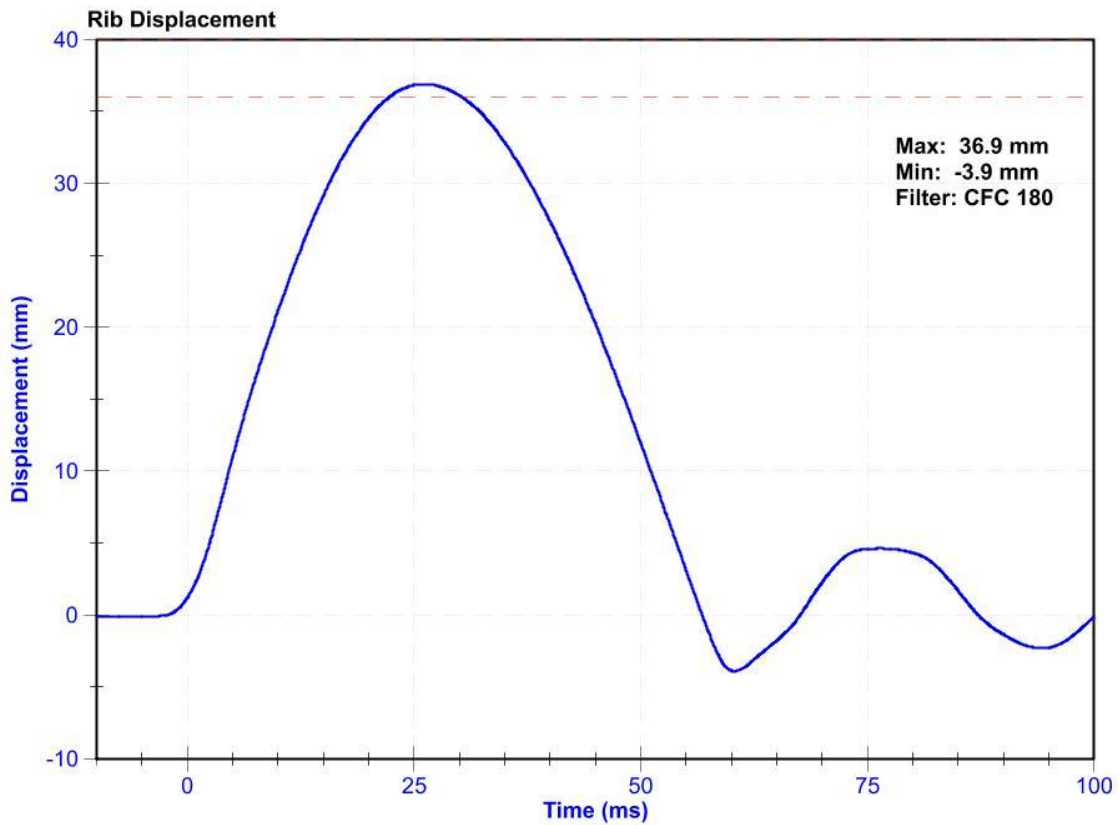
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	31.1	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-183GFE	10/10/2018	10/10/2019



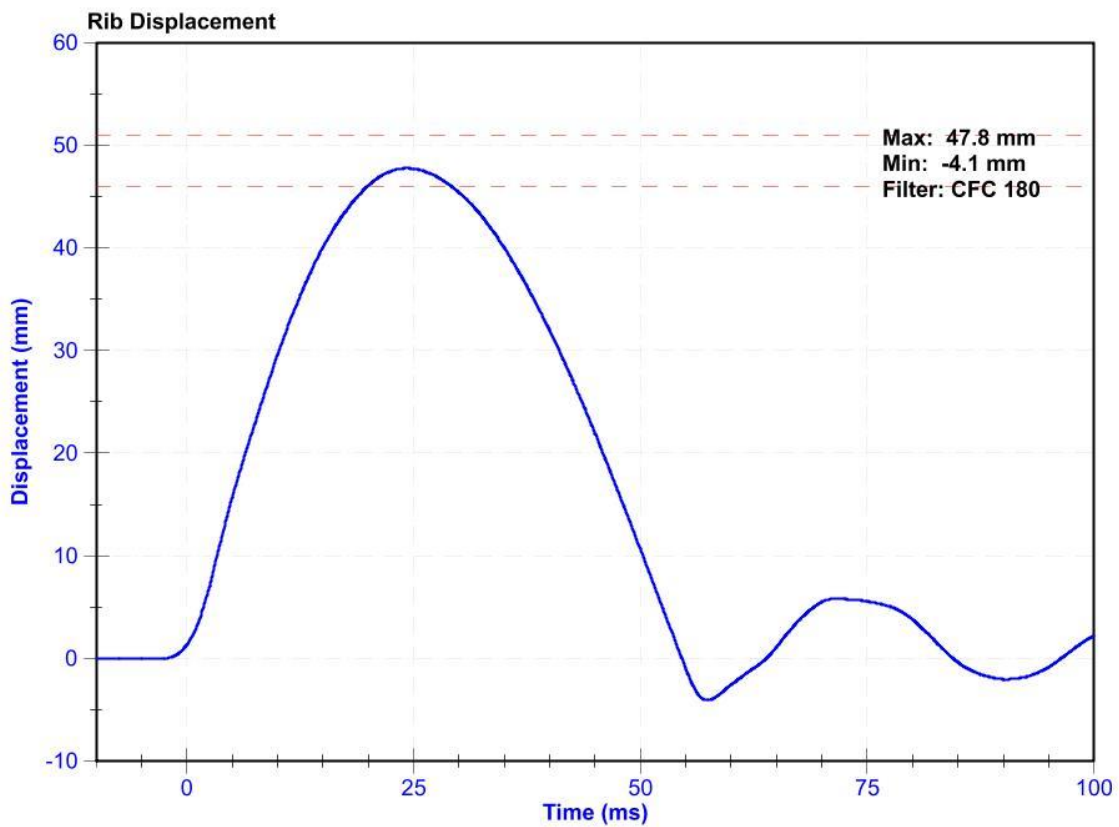
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	31.1	Pass
Rib Displacement	46	51	mm	47.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/10/2018	10/10/2019



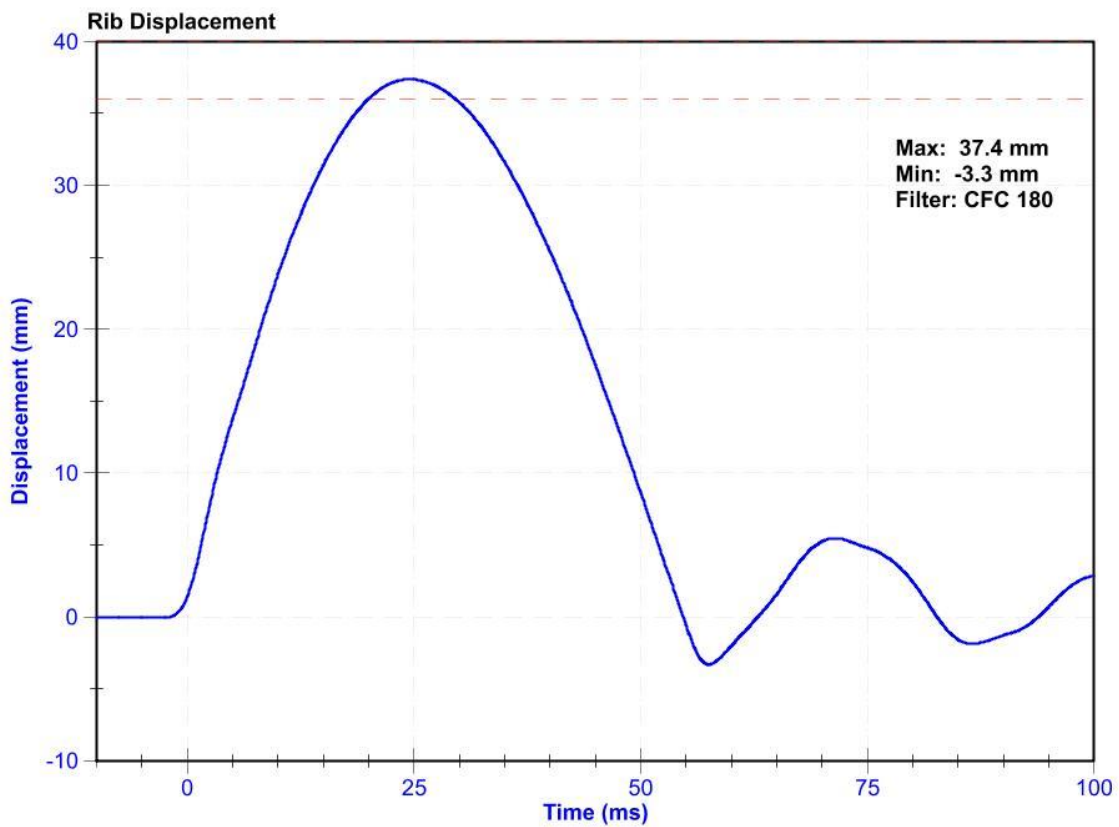
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	30.9	Pass
Rib Displacement	36	40	mm	37.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/11/2018	10/11/2019



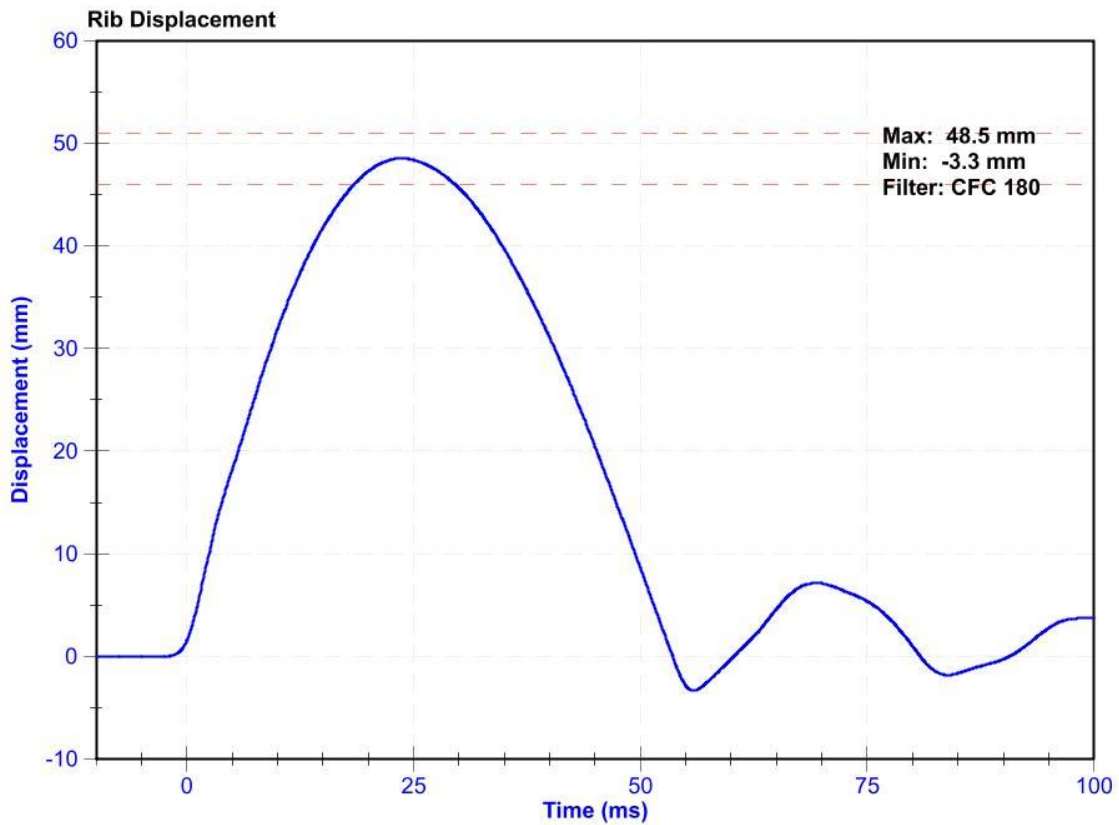
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	30.9	Pass
Rib Displacement	46	51	mm	48.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/11/2018	10/11/2019



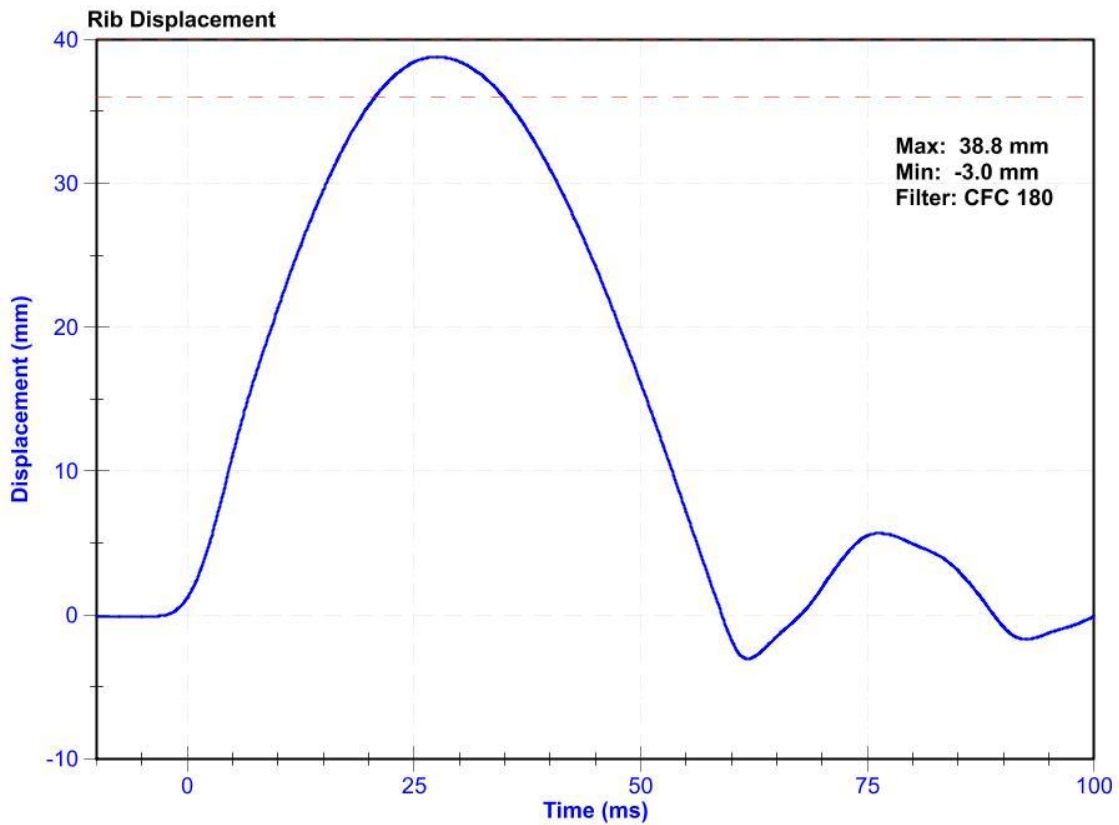
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	31.0	Pass
Rib Displacement	36	40	mm	38.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/10/2018	10/10/2019



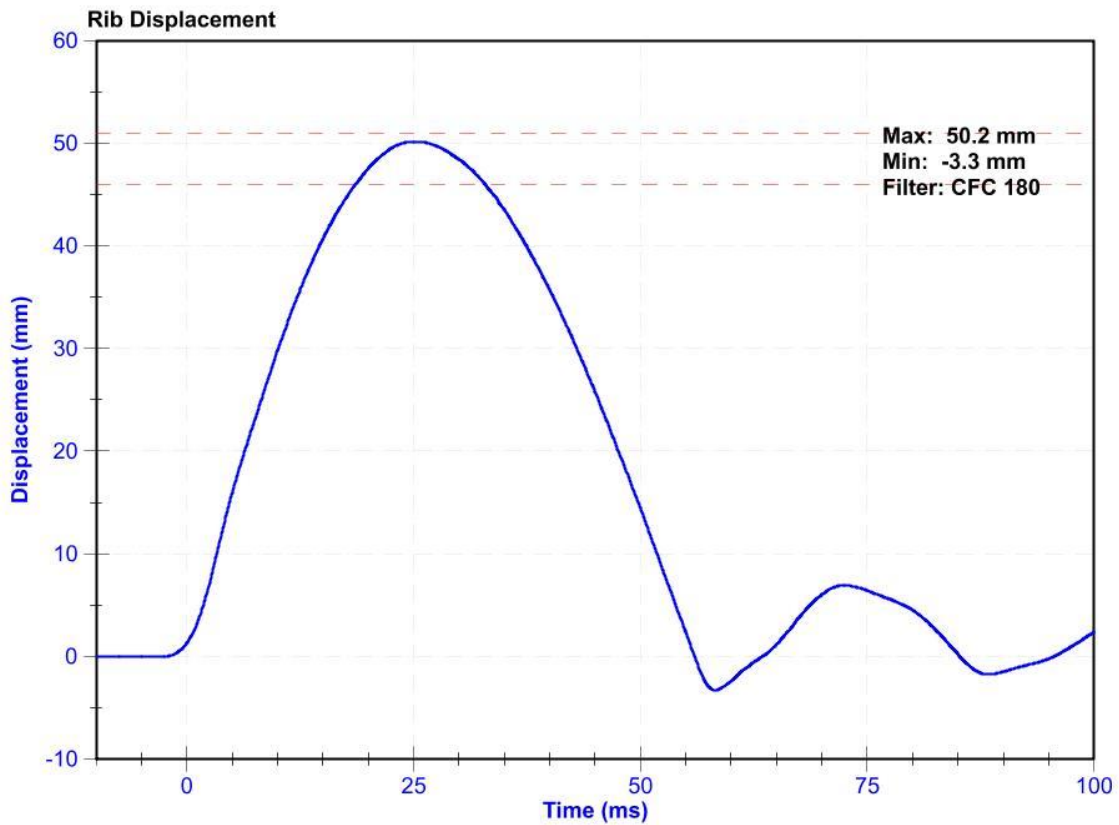
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	31.0	Pass
Rib Displacement	46	51	mm	50.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/10/2018	10/10/2019



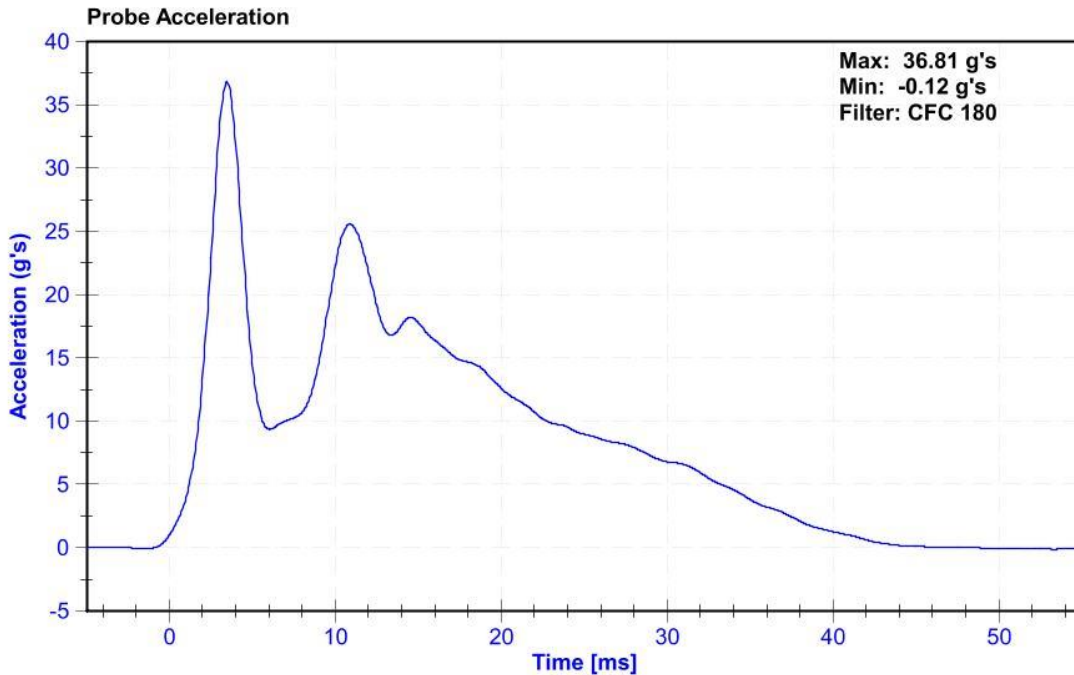
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

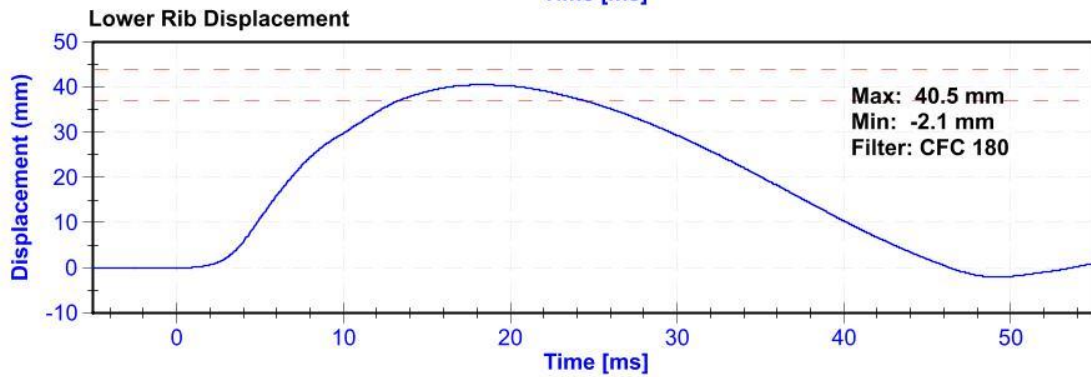
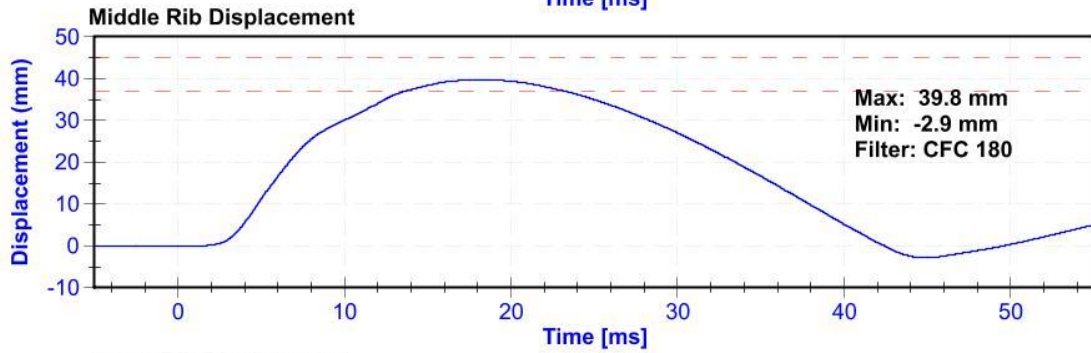
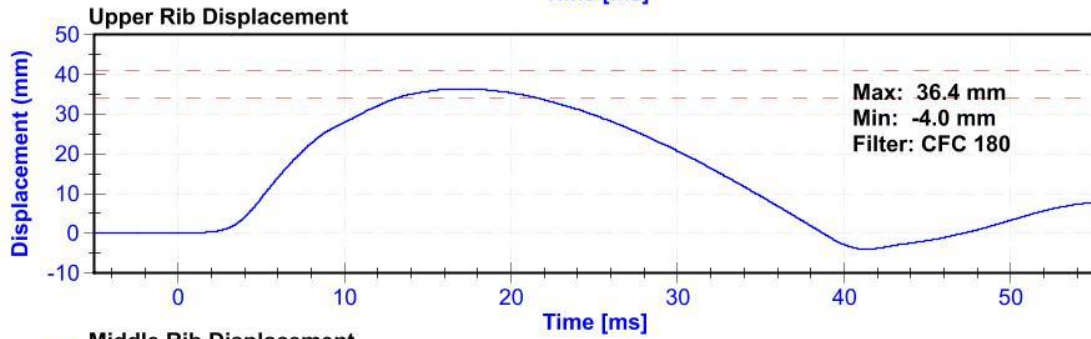
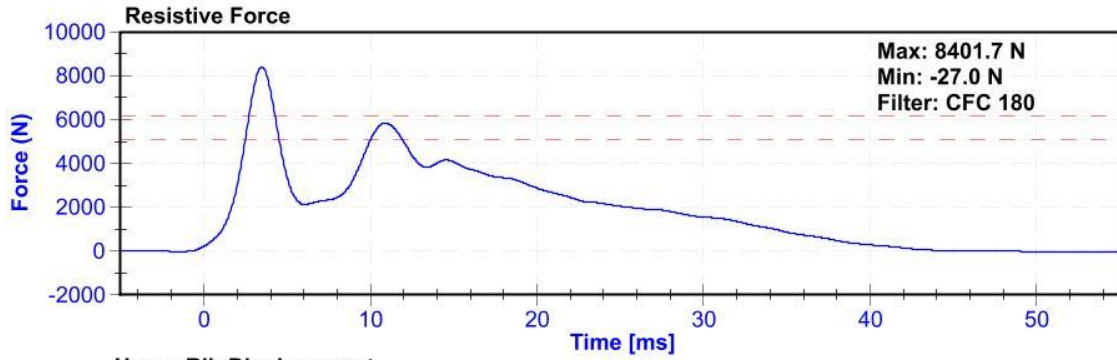
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	30.8	Pass
Velocity	5.4	5.6	m/s	5.48	Pass
Resistive Force after 6ms	5100	6200	N	5837.3	Pass
Upper Thorax Rib Deflection	34	41	mm	36.4	Pass
Mid Thorax Rib Deflection	37	45	mm	39.8	Pass
Lower Thorax Rib Deflection	37	44	mm	40.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019
Upper Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/10/2018	10/10/2019
Middle Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/11/2018	10/11/2019
Lower Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/10/2018	10/10/2019





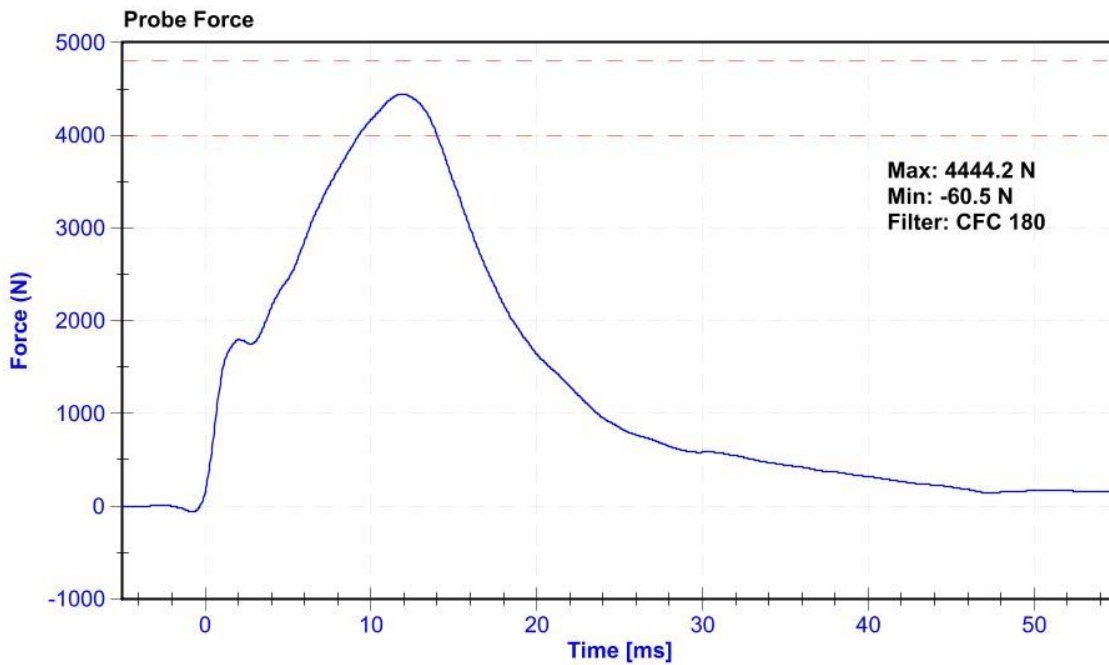
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

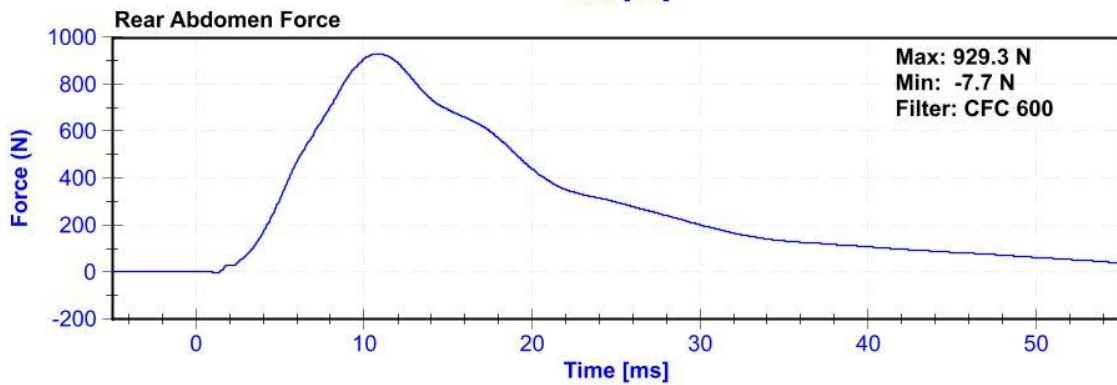
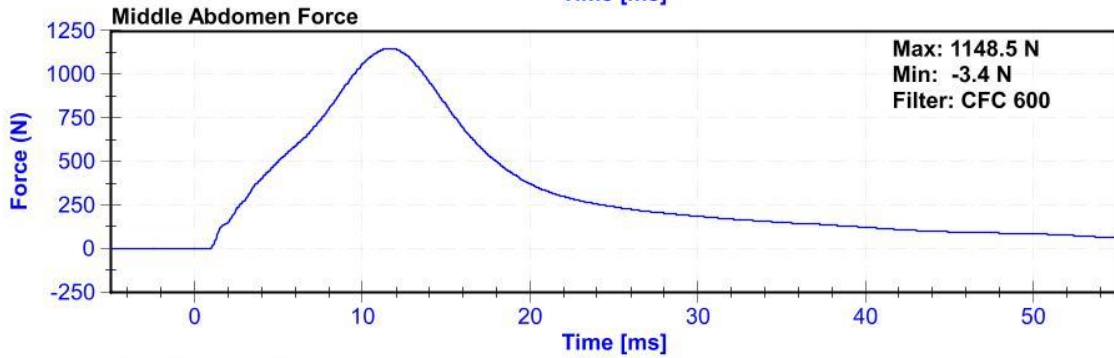
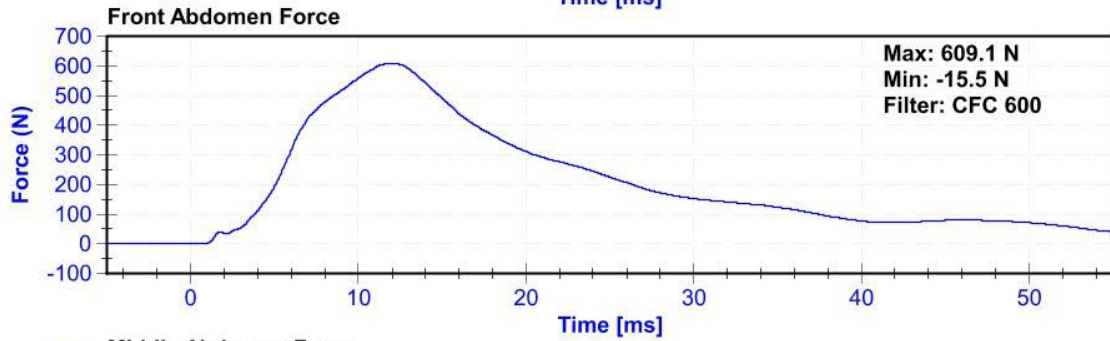
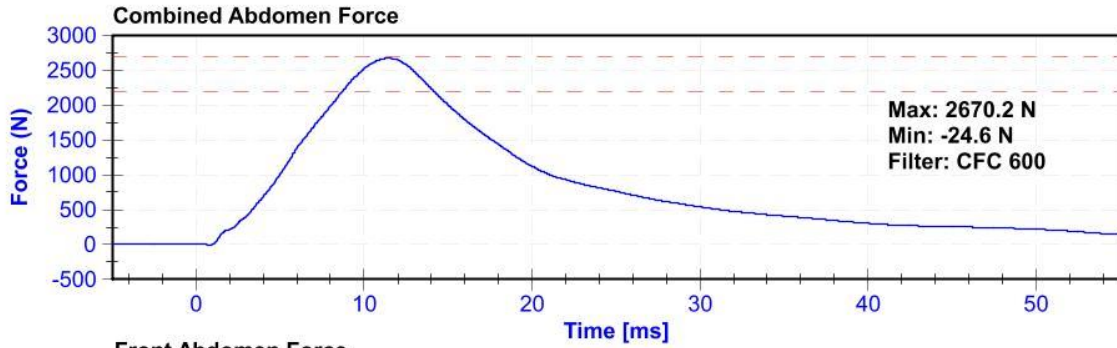
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	32.2	Pass
Velocity	3.9	4.1	m/s	4.10	Pass
Combined Abdomen Force	2200	2700	N	2670.2	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.40	Pass
Resistive Probe Force	4000	4800	N	4444.2	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.85	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019
Front Abdomen Load Cell	DENTON 2631	LC-1440	6/4/2018	6/4/2019
Middle Abdomen Load Cell	DENTON 2631	LC-1525	6/4/2018	6/4/2019
Rear Abdomen Load Cell	DENTON 2631	LC-1528	6/4/2018	6/4/2019





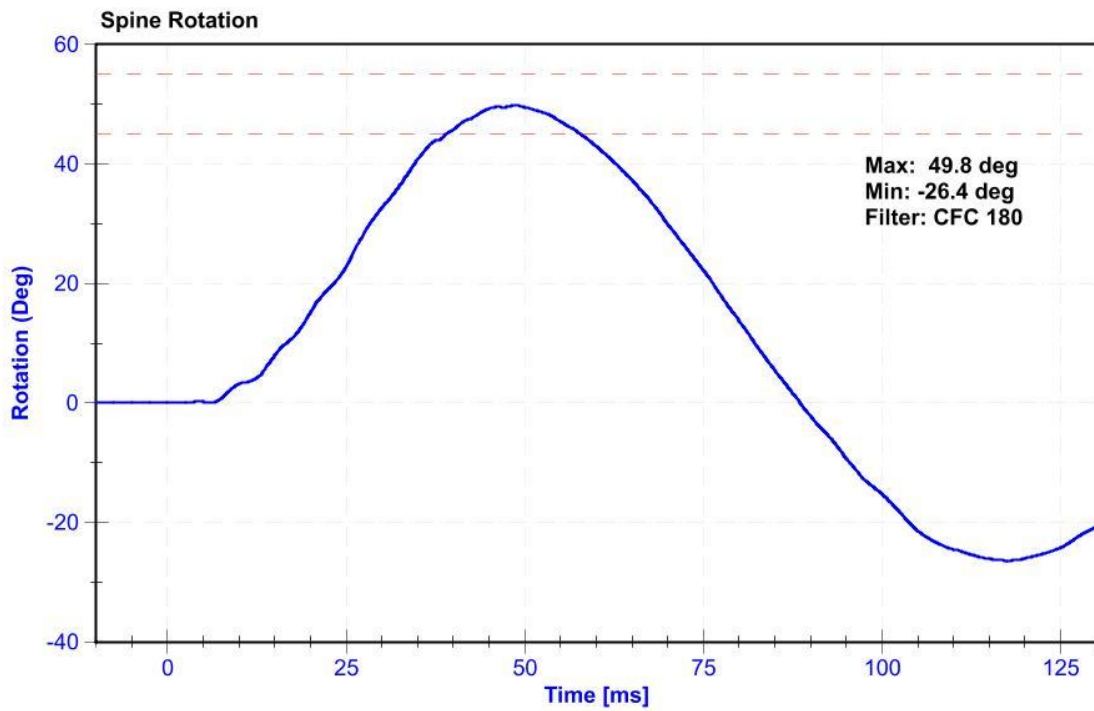
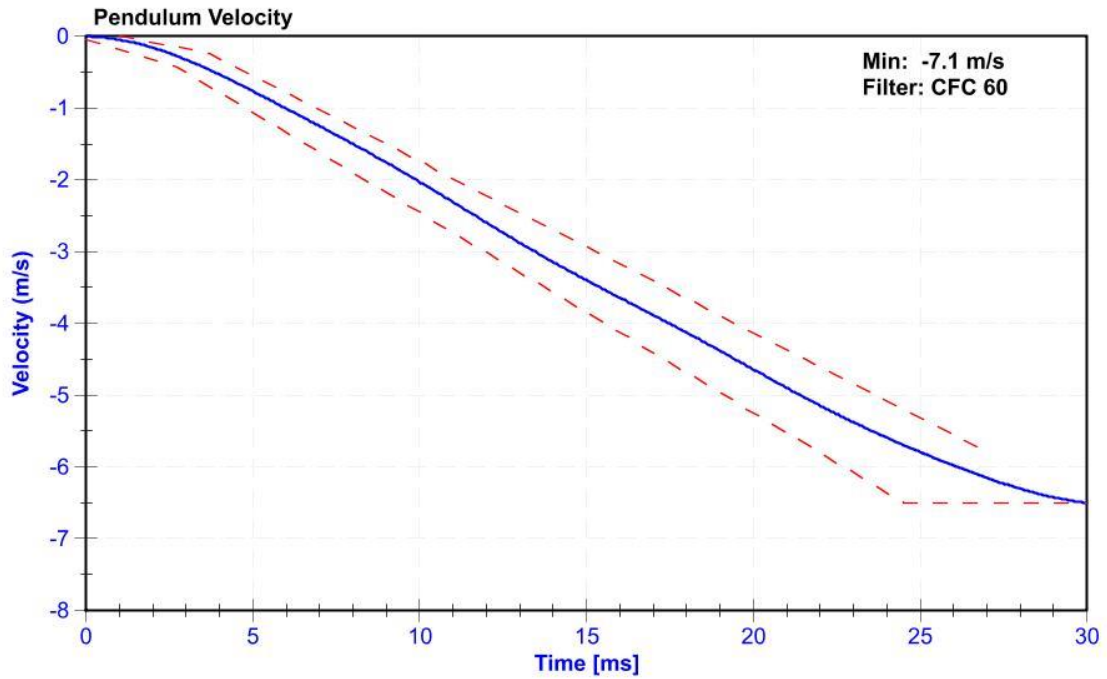
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

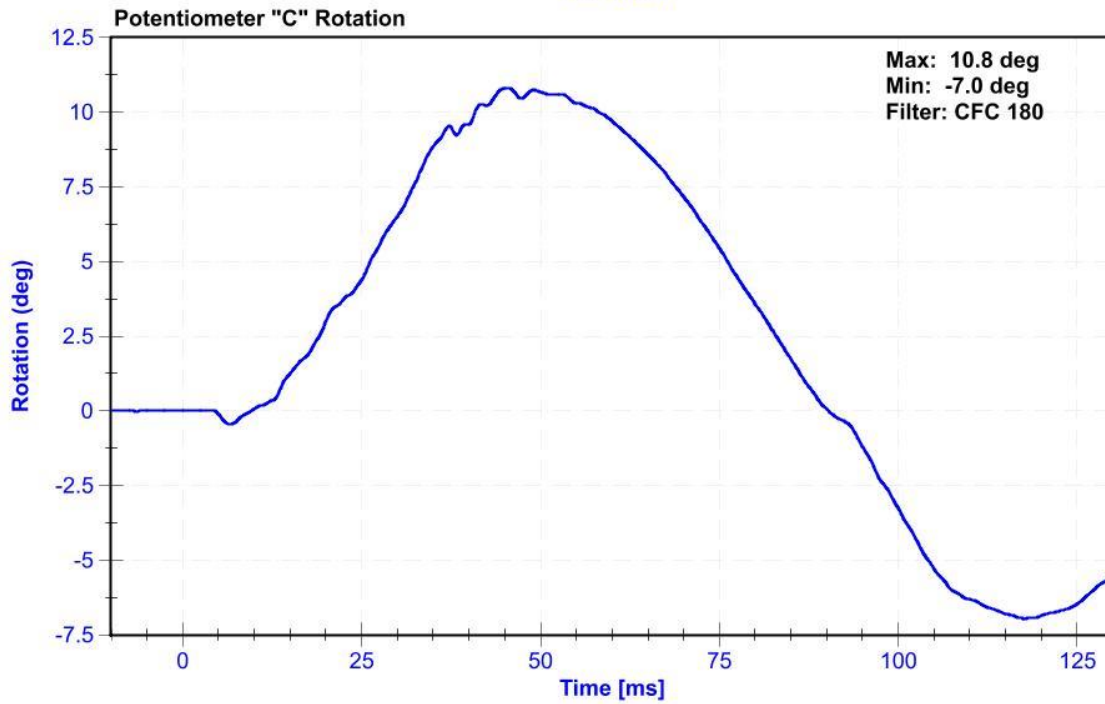
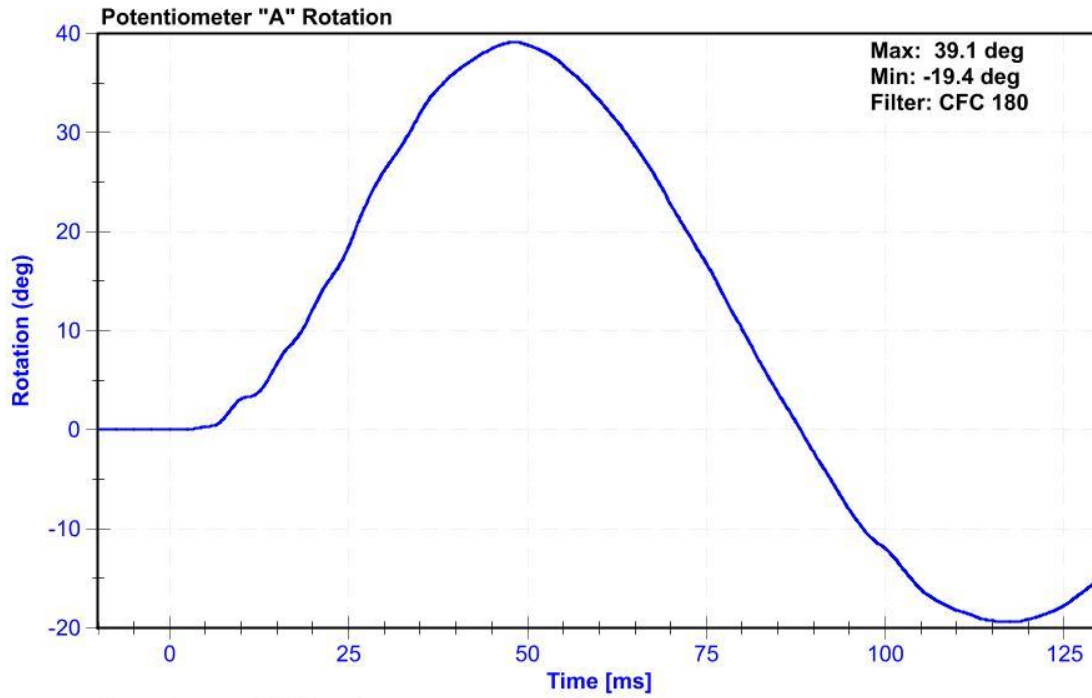
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	31.1	Pass
Velocity	5.95	6.15	m/s	6.005	Pass
Lateral Spine Rotation	45	55	deg	49.8	Pass
Time at Maximum Rotation	39	53	ms	48.7	Pass
Time of Decay to Zero Degrees	37	57	ms	39.8	Pass
Pulse within Corridor?	-	-	-		

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/29/2019	1/29/2020
Pendulum "A" Potentiometer	SP22G	DS-094	10/31/2018	10/31/2019
Condyle "B" Potentiometer	SP22G	DS-095	10/31/2018	10/31/2019





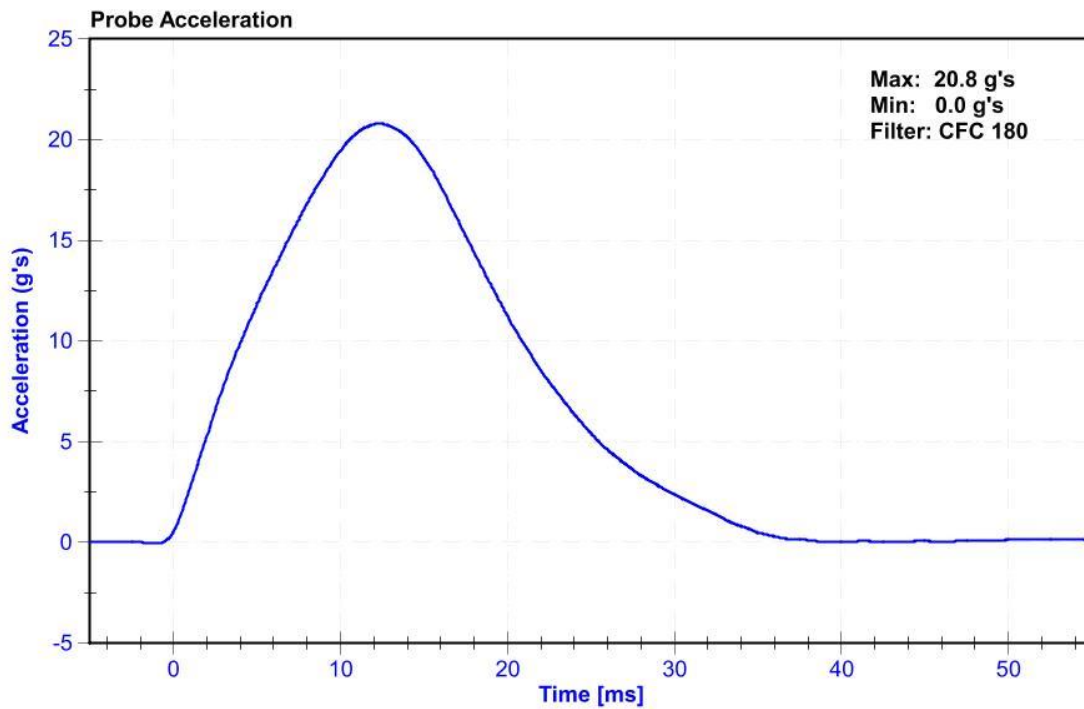
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

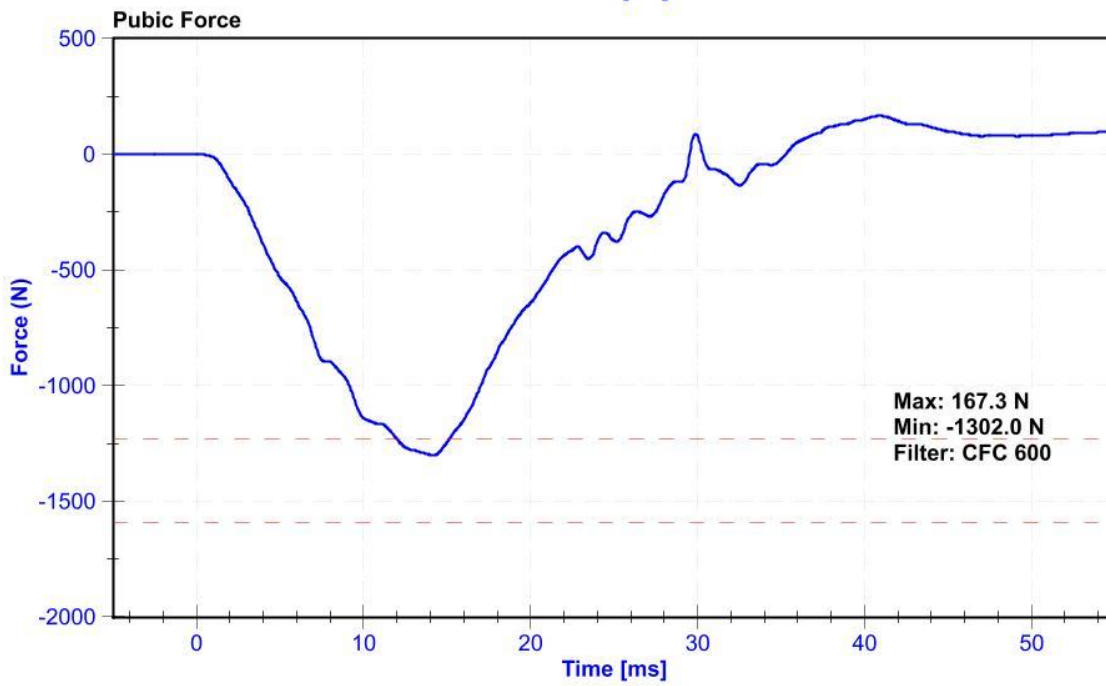
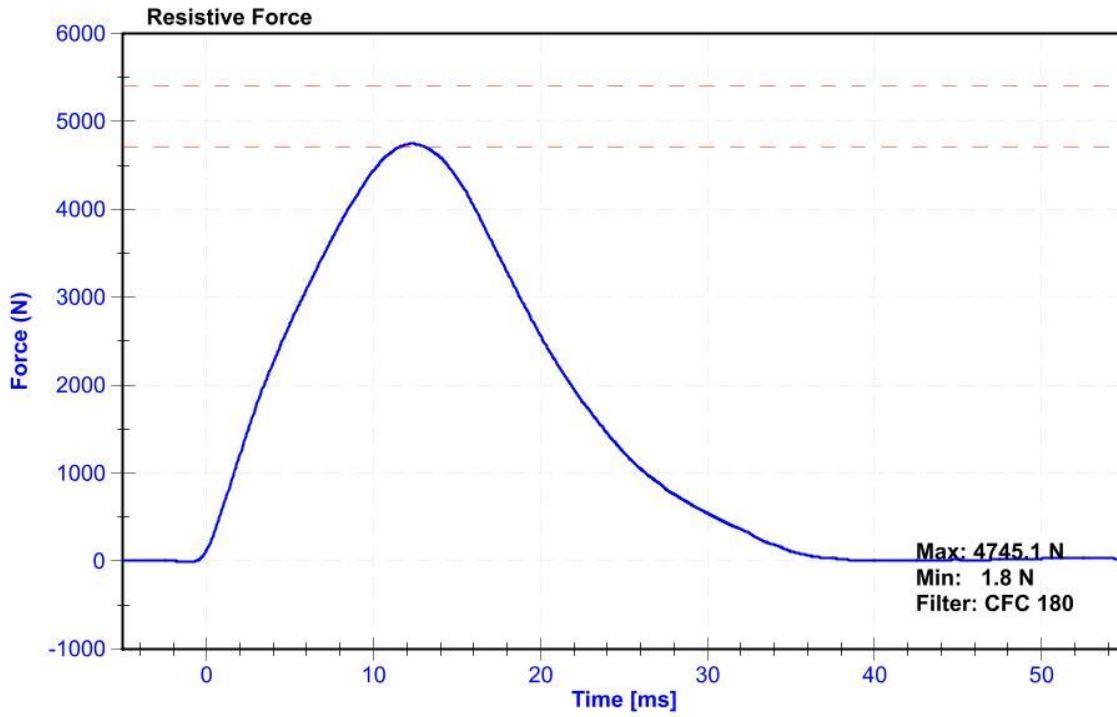
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	30.6	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Resistive Force	4700	5400	N	4745.1	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.30	Pass
Pubic Force	-1590	-1230	N	-1302.0	Pass
Time at Peak Pubic Force	12.2	17.0	ms	14.20	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7264CT	AC-P23904	11/1/2018	5/2/2019
Pubic Load Cell	Denton 3096JFL	LC-464fy	6/4/2018	6/4/2019





CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: 300

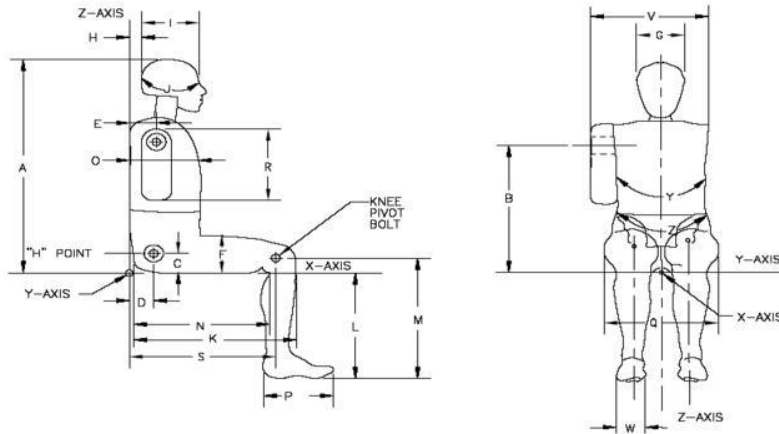


External Measurements - SID-IIs

Technician: K. Dutton

Date: 3/23/2019

Dummy Serial Number: 300



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	781	Pass
B	Shoulder Pivot Height	437	453	450	Pass
C	H-point Height	79	89	85	Pass
D	H-point from seatback	141	151	144	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	125	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	185	Pass
J	Head Circumference	541	551	546	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	401	Pass
N	Buttock Popliteal Length	416	442	431	Pass
O	Chest Depth w/o jacket	195	211	203	Pass
P	Foot Length	216	232	222	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	485	Pass
V	Shoulder Width	341	357	350	Pass
W	Foot Width	78	94	84	Pass
Y	Chest Circumference w/jacket	851	881	870	Pass
Z	Waist Circumference	761	791	769	Pass

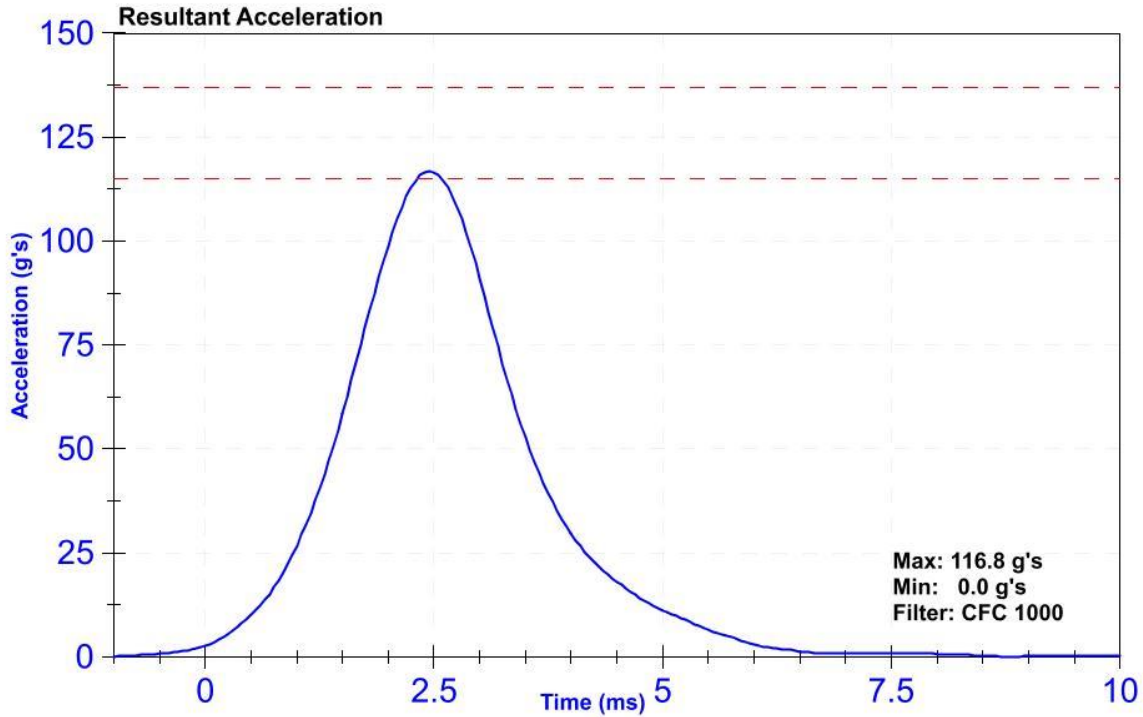
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

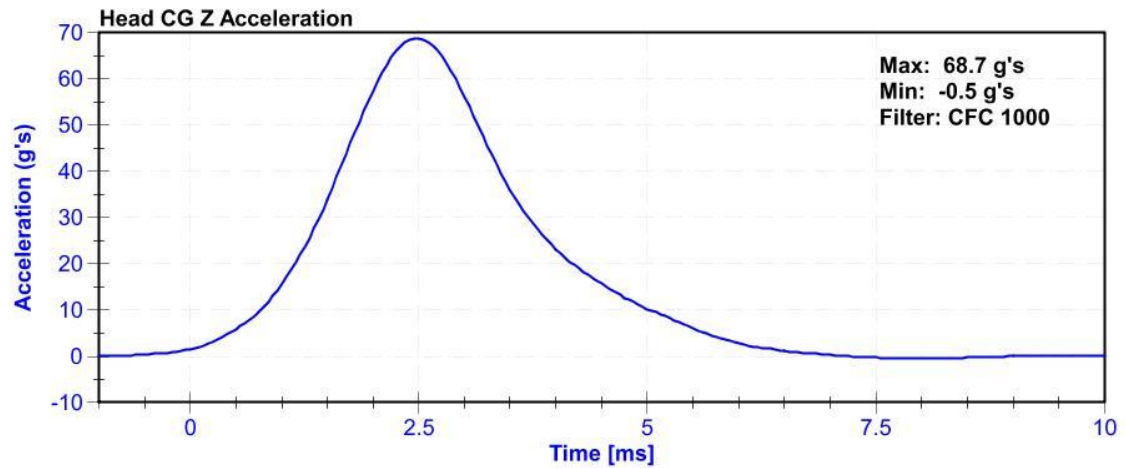
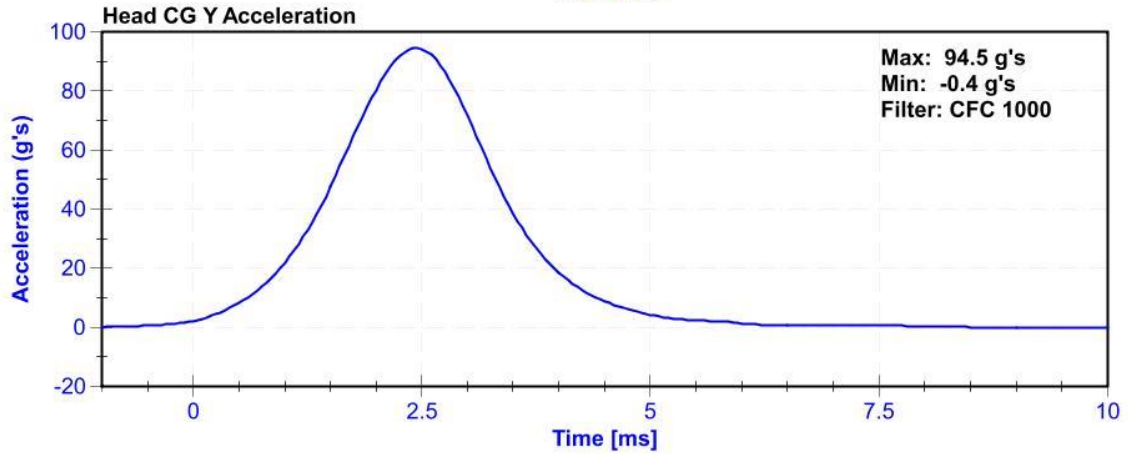
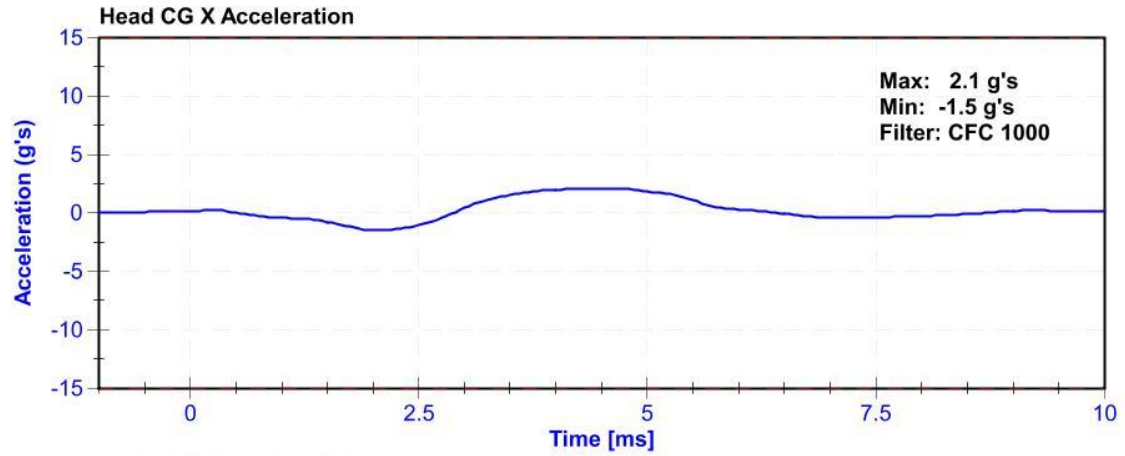
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	30.7	Pass
Resultant Acceleration	115	137	g's	116.8	Pass
Oscillation	0	15	%	0.8	Pass
Fore-Aft Acceleration	-15	15	g's	2.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58777	10/5/2018	4/5/2019
Y Accelerometer	ENDEVCO 7264CT	AC-P59018	10/5/2018	4/5/2019
Z Accelerometer	ENDEVCO 7264	AC-P79189	10/5/2018	4/5/2019





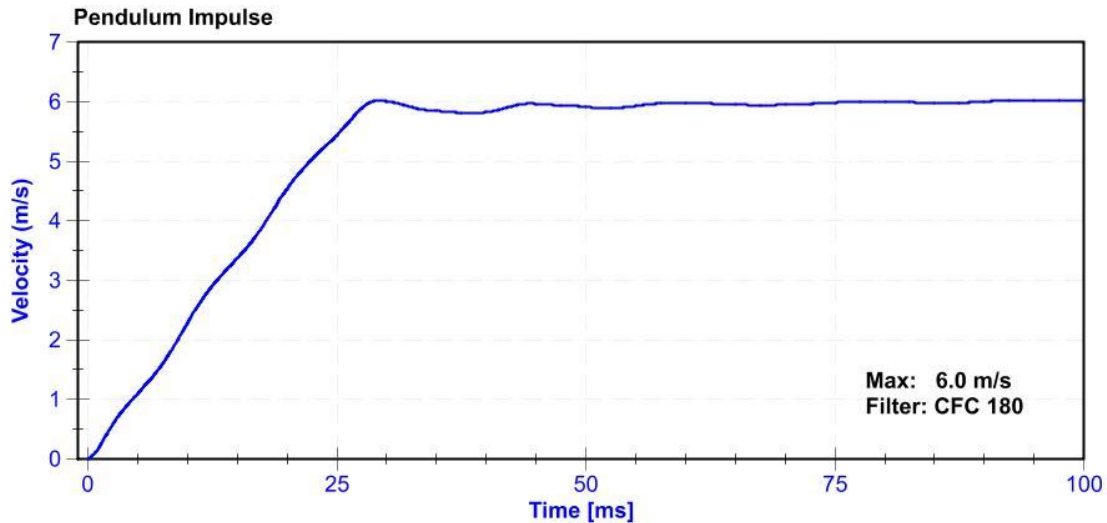
ATD Manufacturer	FTSS	Test Technician	K. Dutton
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

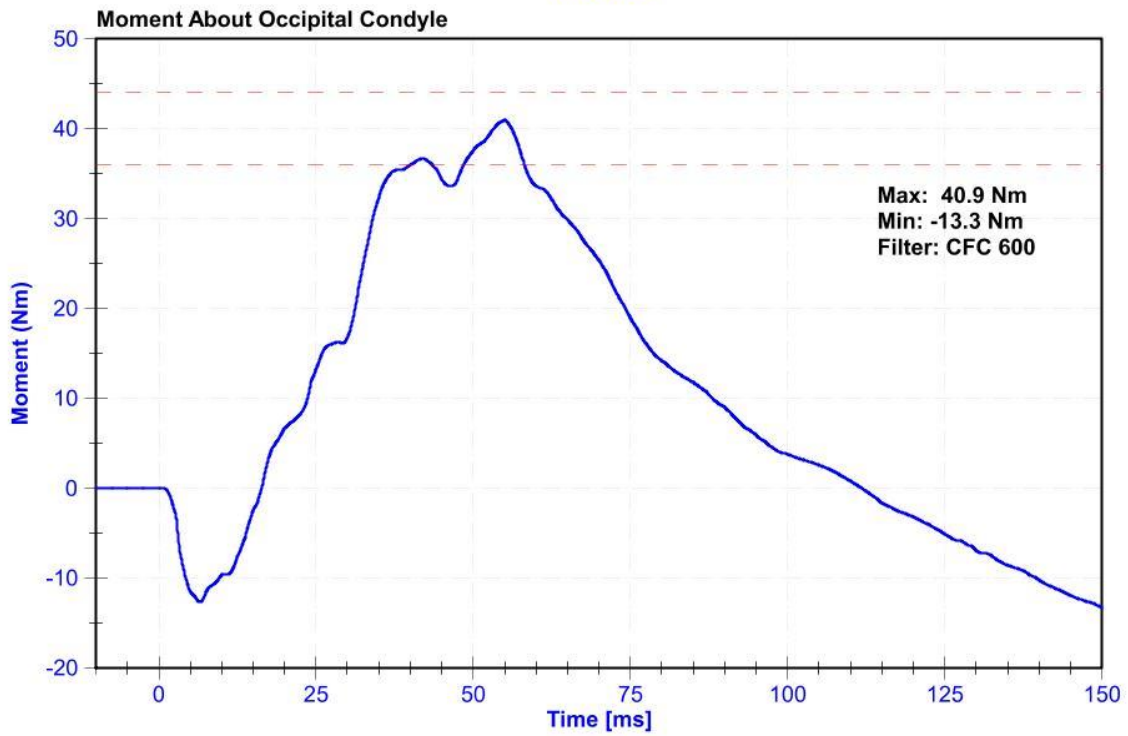
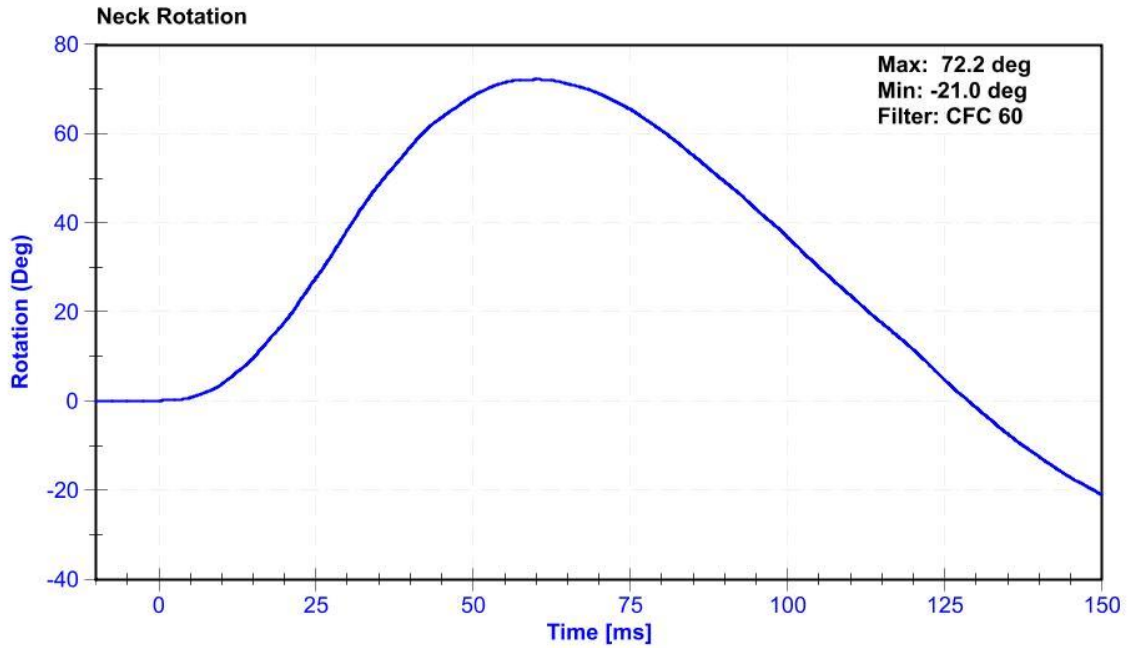
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	31	Pass
Velocity	5.51	5.63	m/s	5.514	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.28	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.37	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.54	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.44	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.02	Pass
Neck Rotation	71	81	deg	72.2	Pass
Time at Maximum Rotation	50	70	ms	60.3	Pass
Moment about the OC	36	44	Nm	40.9	Pass
Moment Decay to 0 Nm	102	126	ms	111.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/29/2019	1/29/2020
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/1/2018	11/1/2019
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/1/2018	11/1/2019
Upper Neck Load Cell	Denton 1716	LC-2018 FY	9/28/2018	9/28/2019





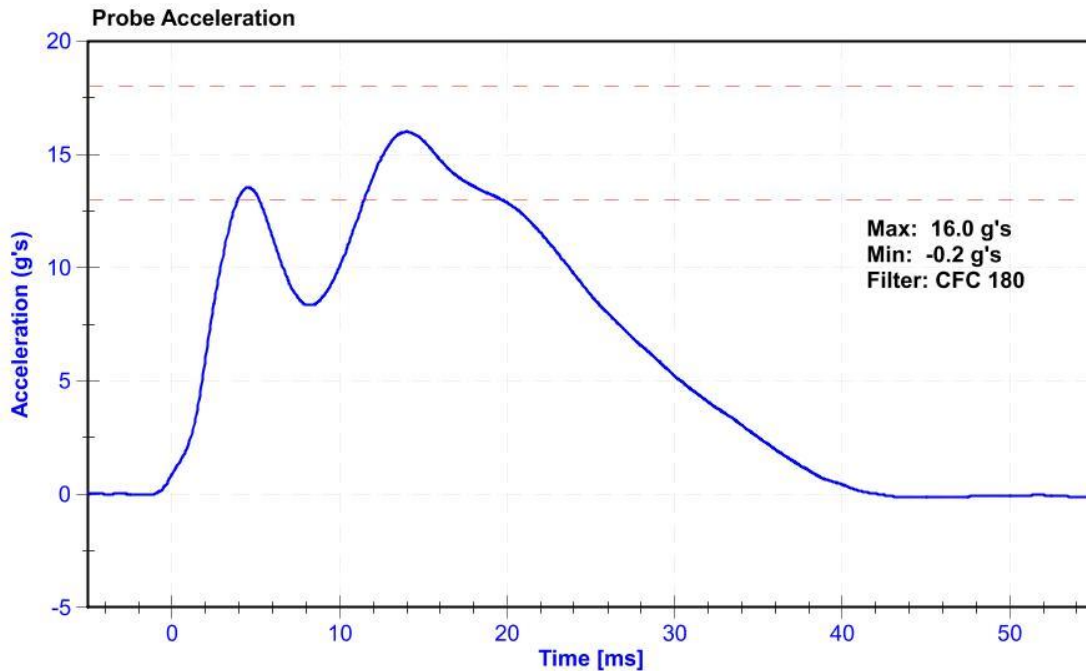
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

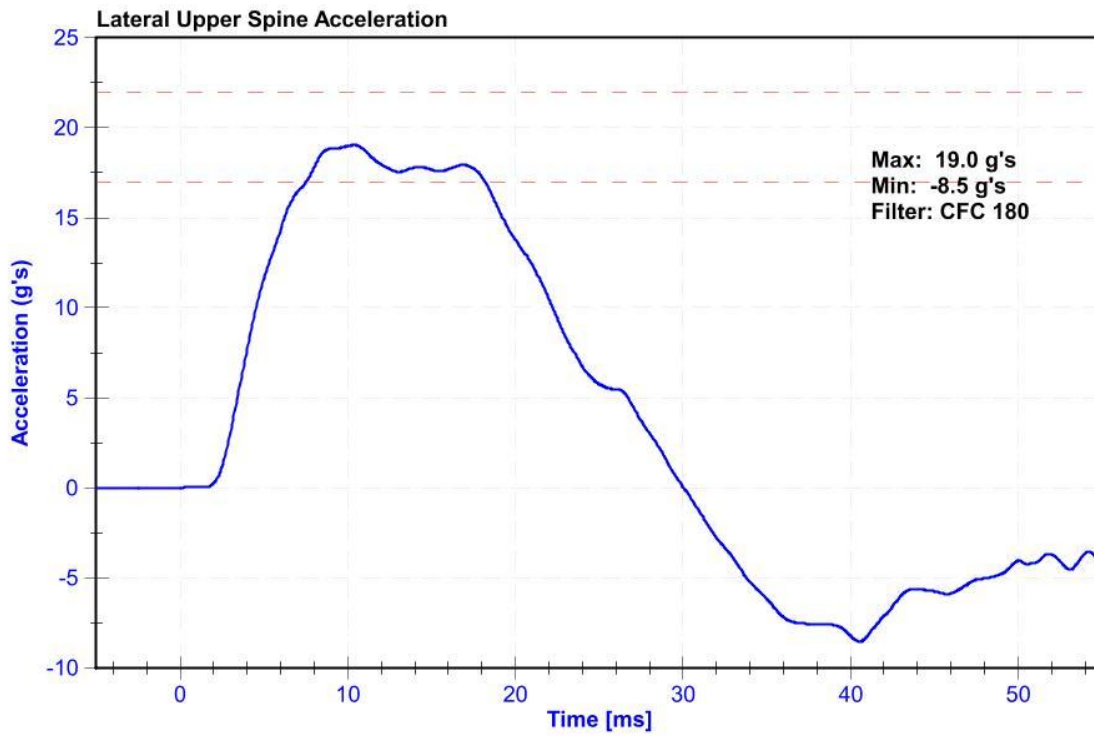
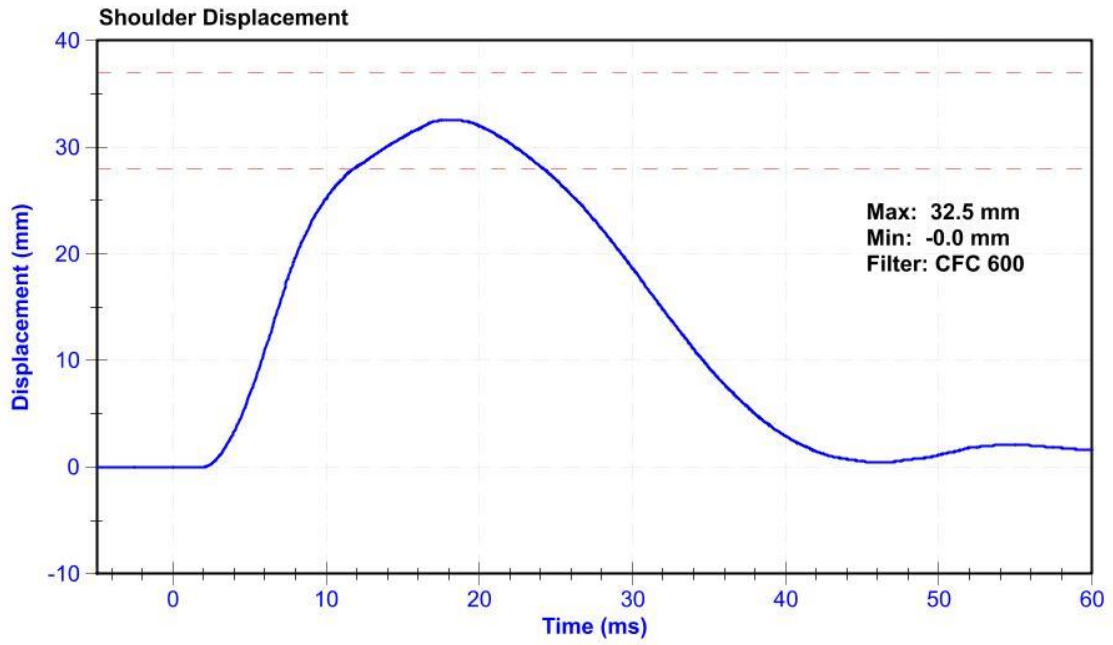
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	32	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Probe Acceleration	13	18	g's	16.0	Pass
Shoulder Deflection	28	37	mm	32.5	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/30/2018	10/30/2019
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/24/2018	4/24/2019





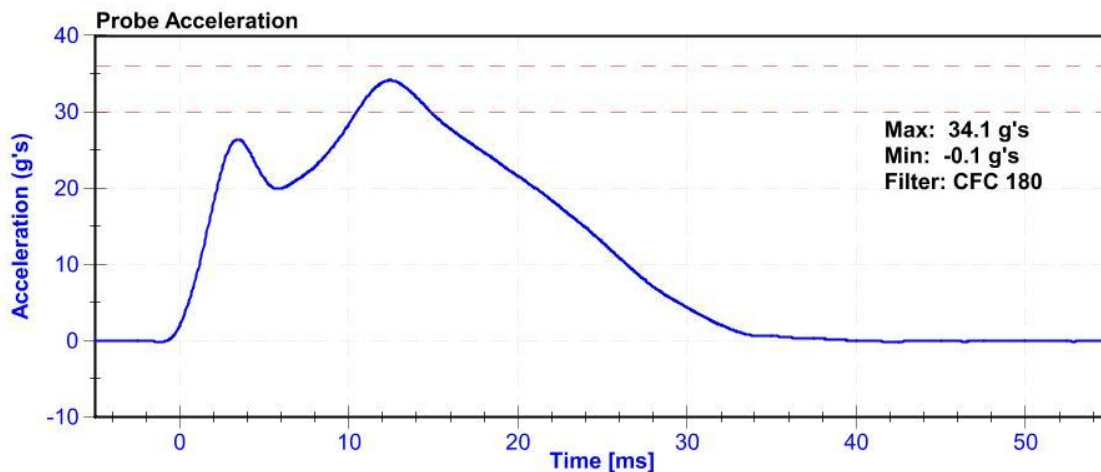
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

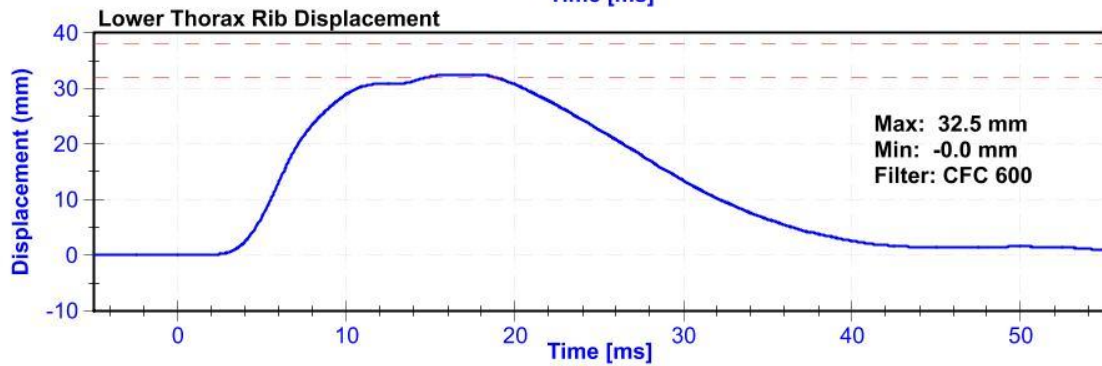
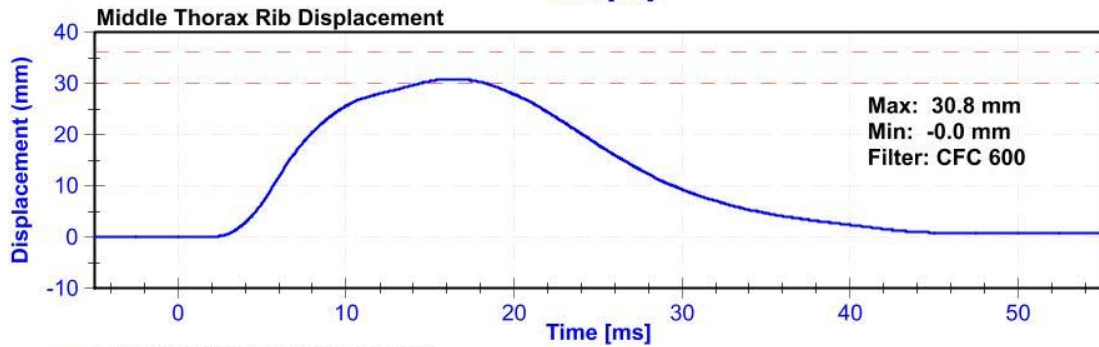
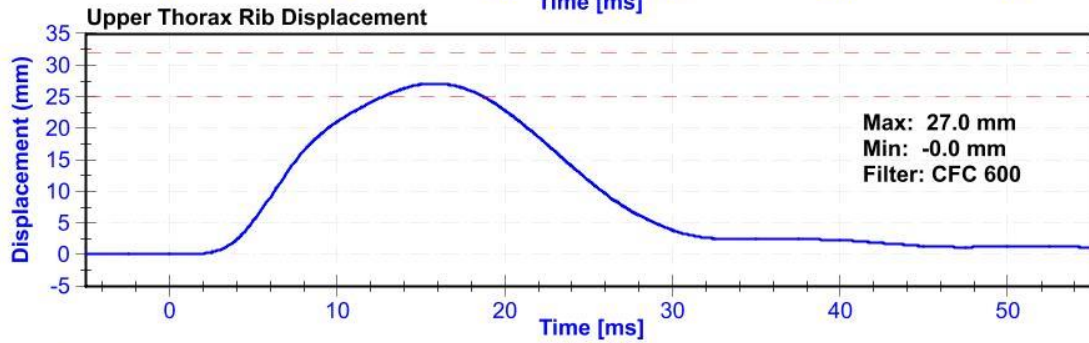
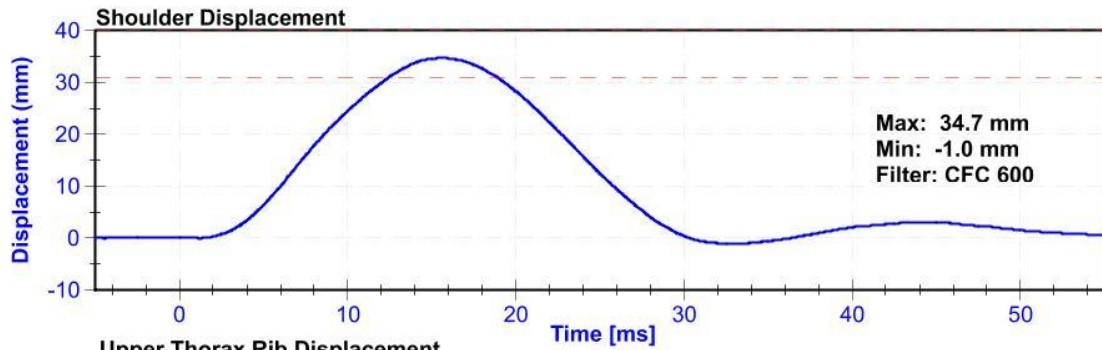
Results

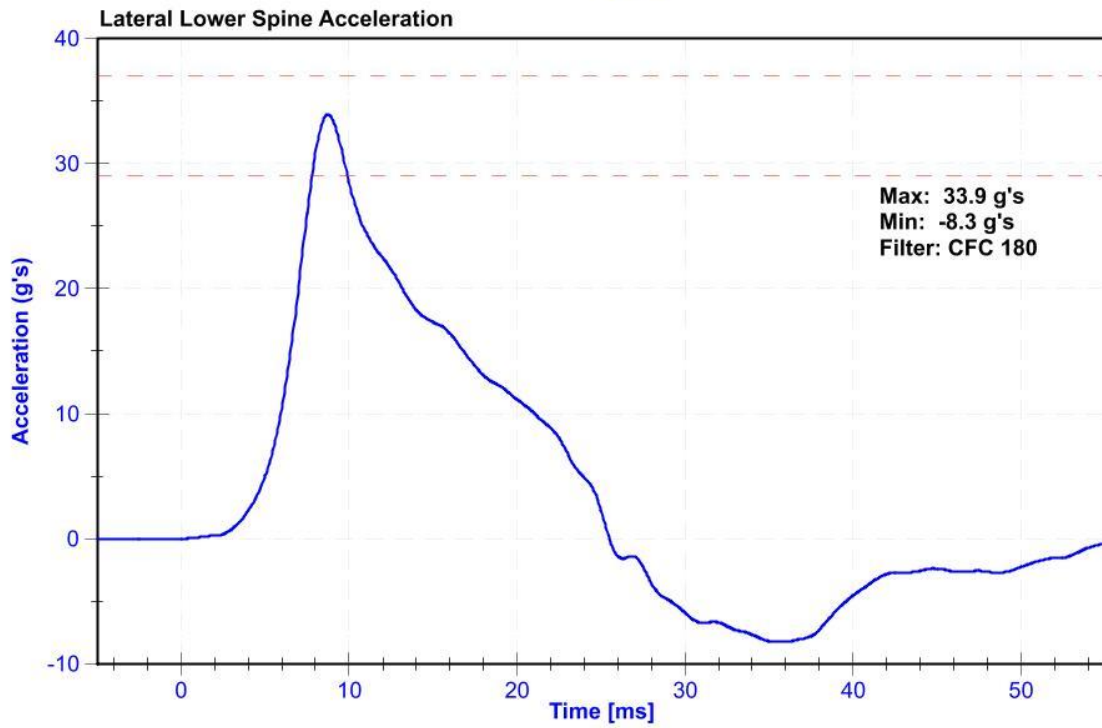
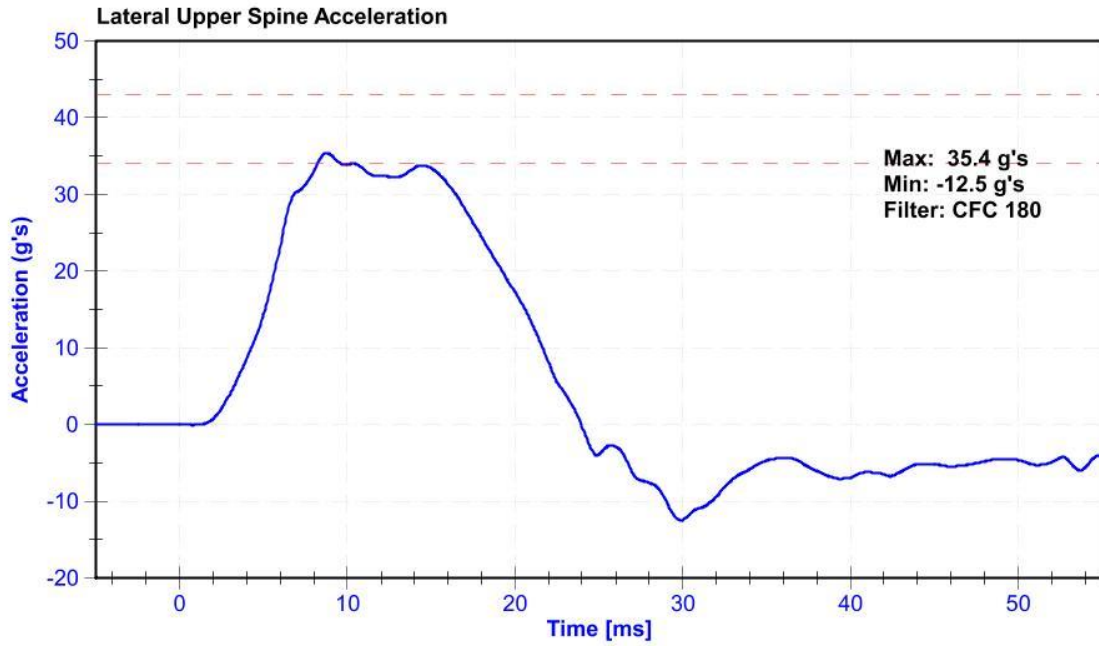
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	30.2	Pass
Velocity	6.6	6.8	m/s	6.63	Pass
Probe Acceleration after 5 ms	30	36	g's	34.1	Pass
Lateral Upper Spine Acceleration	34	43	g's	35.4	Pass
Lateral Lower Spine Acceleration	29	37	g's	33.9	Pass
Shoulder Deflection	31	40	mm	34.7	Pass
Upper Thorax Rib Deflection	25	32	mm	27.0	Pass
Mid Thorax Rib Deflection	30	36	mm	30.8	Pass
Lower Thorax Rib Deflection	32	38	mm	32.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/24/2018	4/24/2019
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P64147	1/10/2019	7/11/2019
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/30/2018	10/30/2019
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/10/2018	10/10/2019
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/11/2018	10/11/2019
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/10/2018	10/10/2019







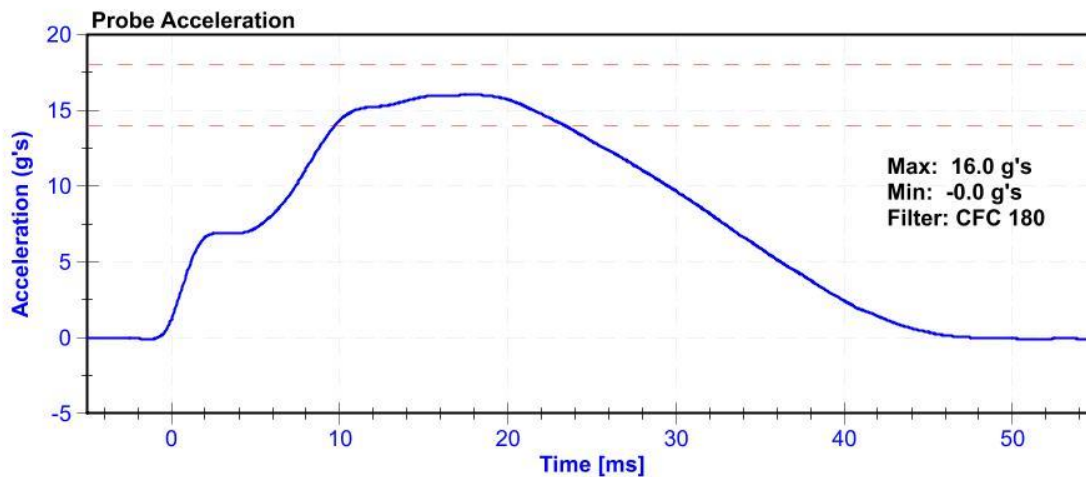
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

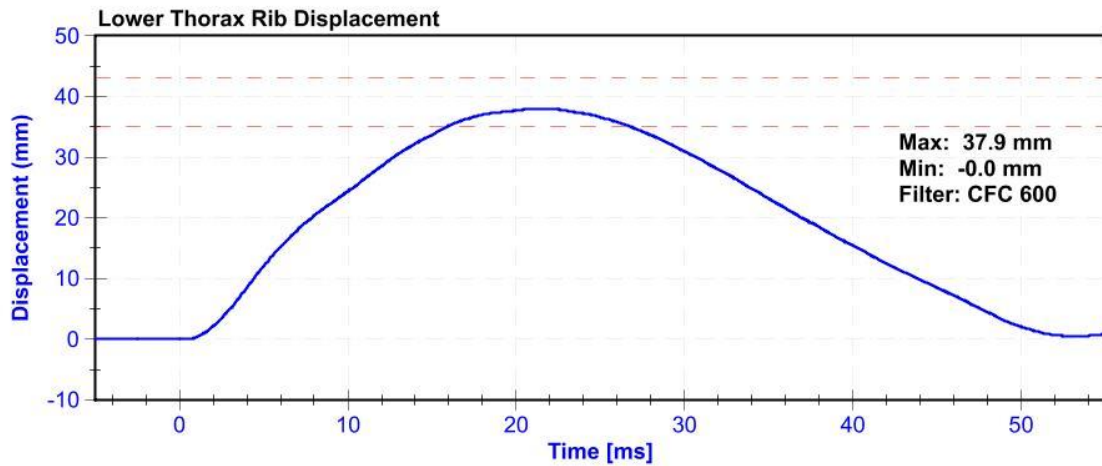
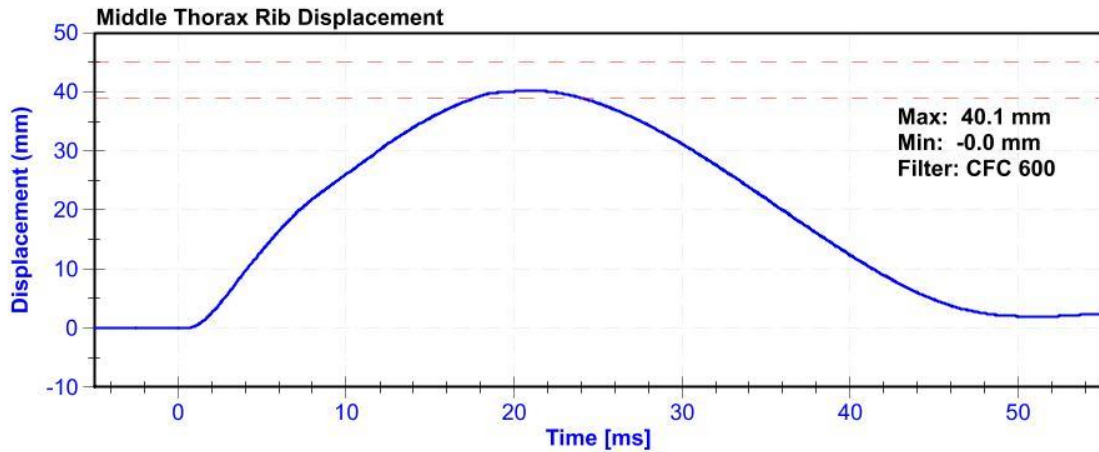
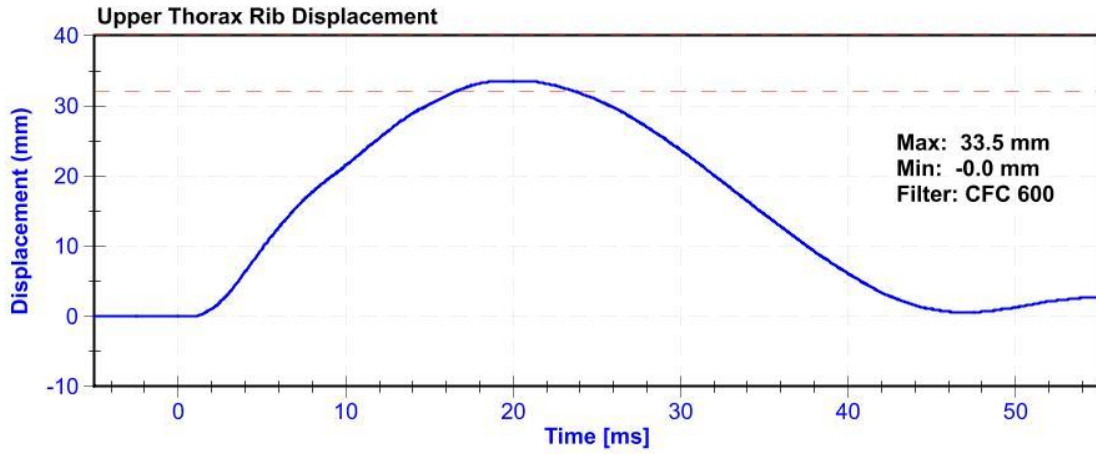
Results

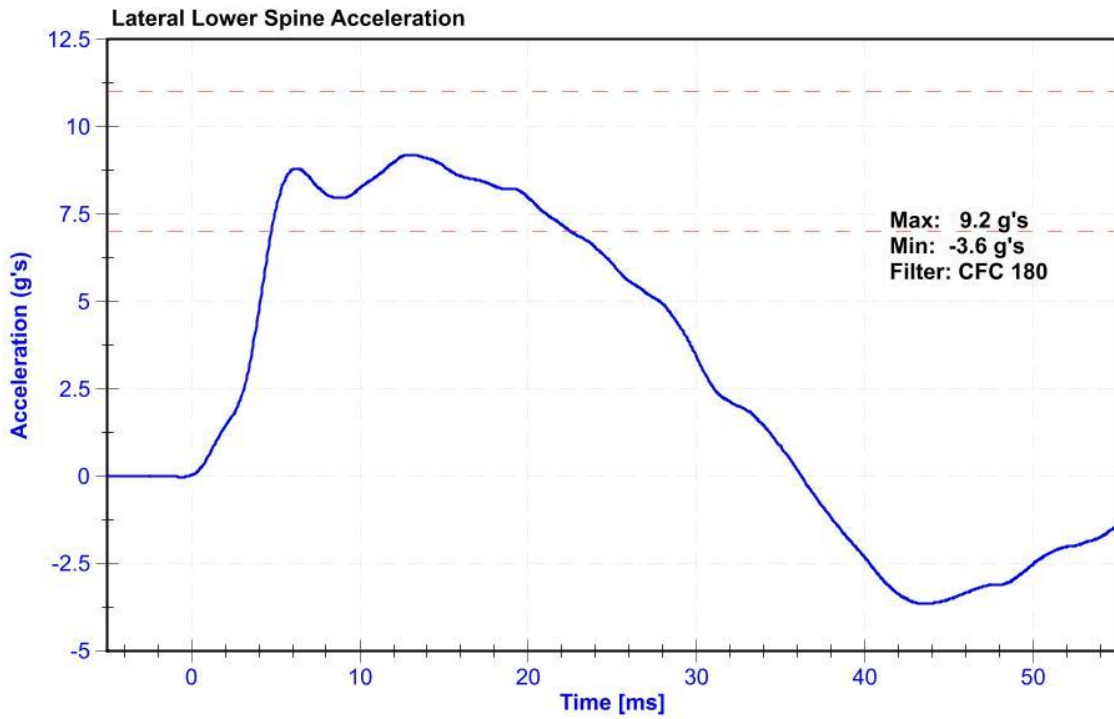
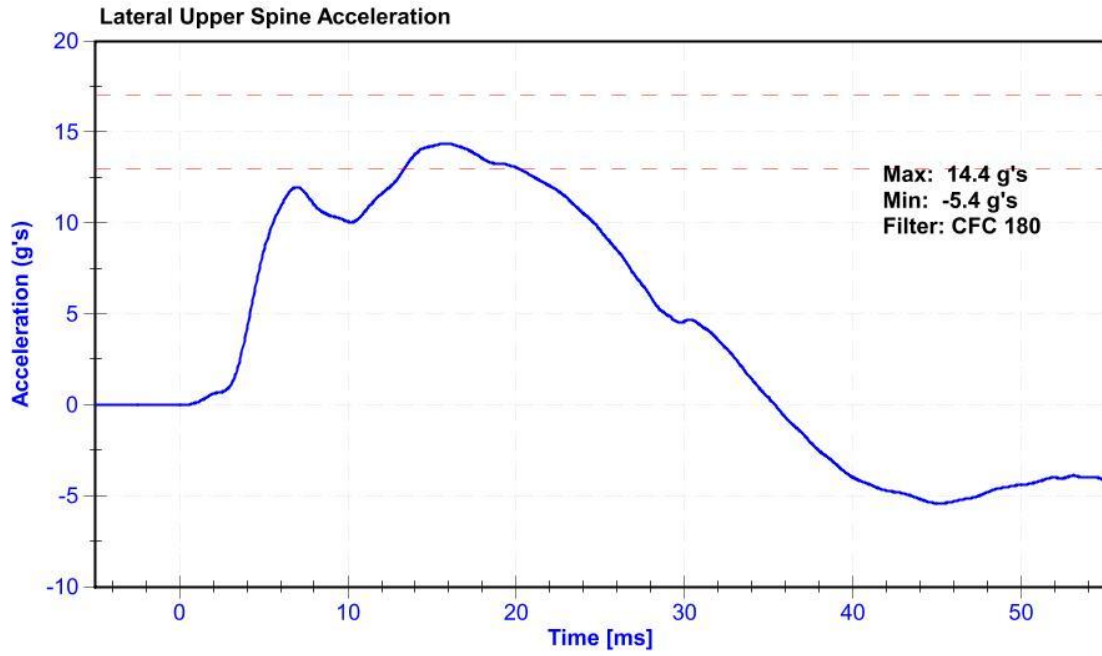
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	32	Pass
Velocity	4.2	4.4	m/s	4.31	Pass
Probe Acceleration	14	18	g's	16.0	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.4	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.2	Pass
Upper Thorax Rib Deflection	32	40	mm	33.5	Pass
Middle Thorax Rib Deflection	39	45	mm	40.1	Pass
Lower Thorax Rib Deflection	35	43	mm	37.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P63315	10/24/2018	4/24/2019
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	1/10/2019	7/11/2019
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/10/2018	10/10/2019
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/11/2018	10/11/2019
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/10/2018	10/10/2019







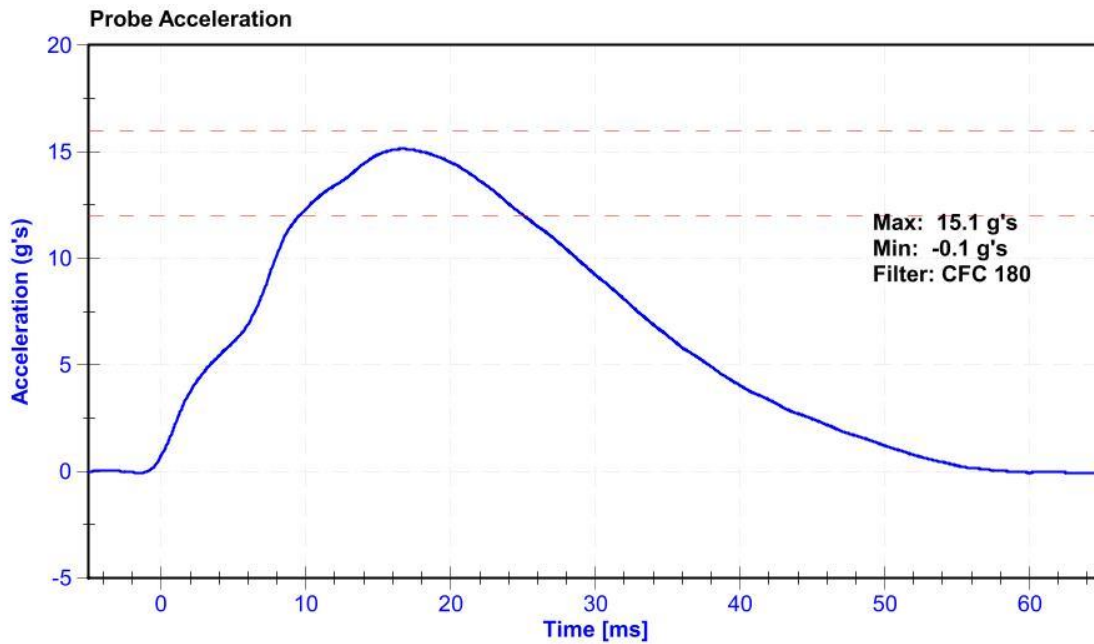
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

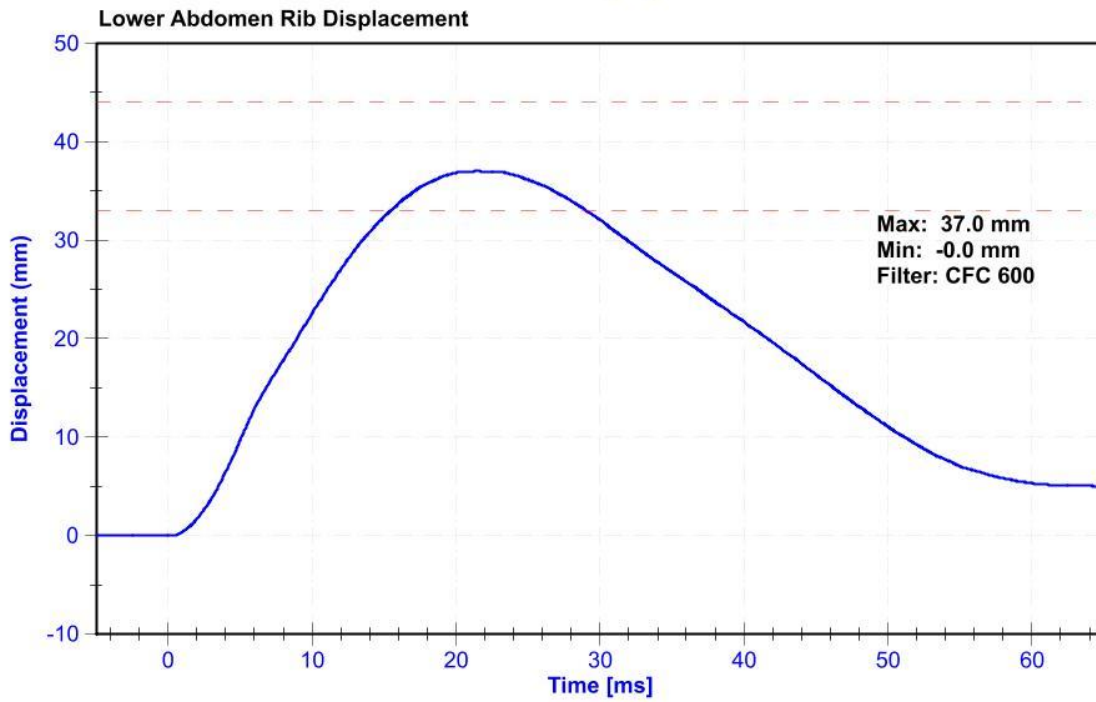
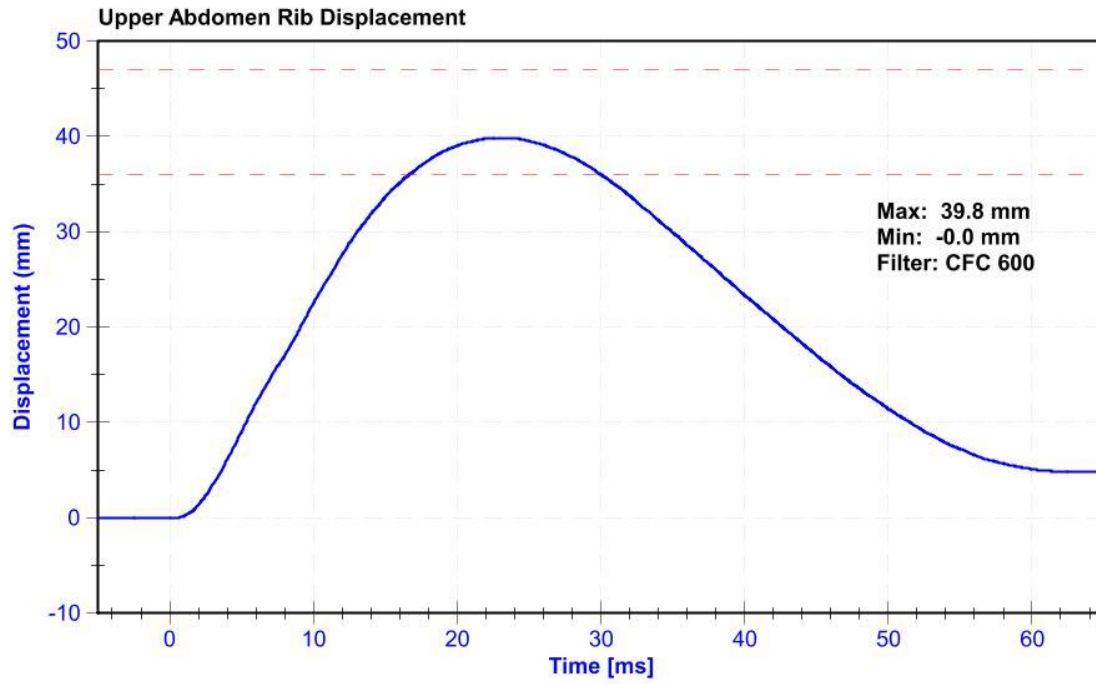
Results

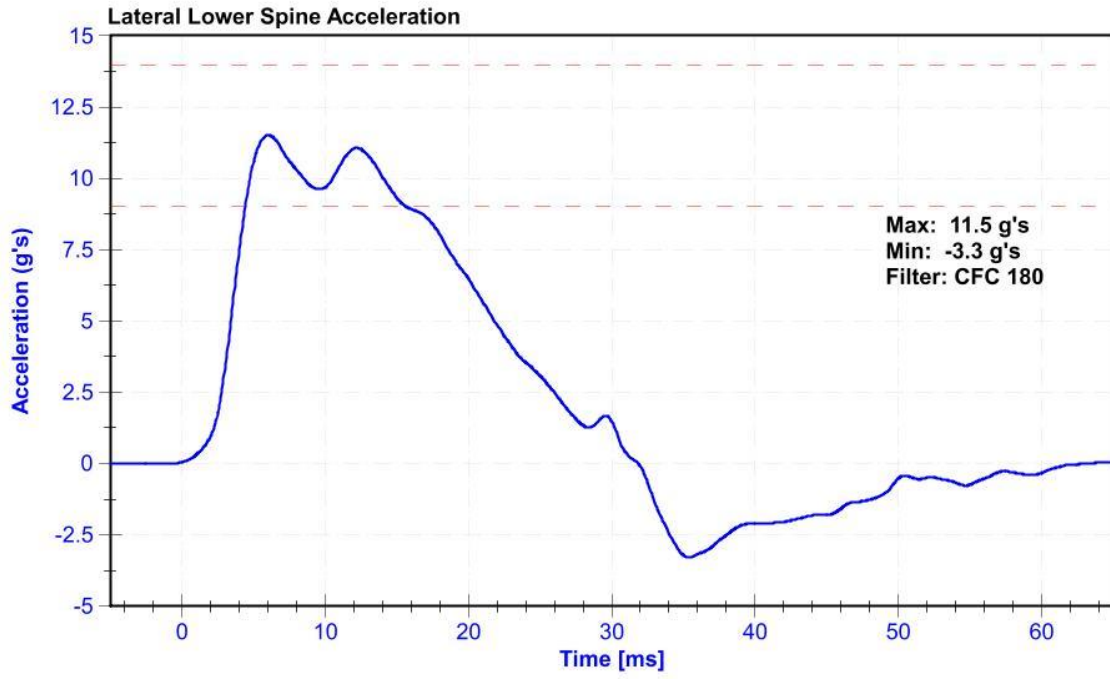
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	32.0	Pass
Velocity	4.2	4.4	m/s	4.31	Pass
Probe Acceleration	12	16	g's	15.1	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.5	Pass
Upper Abdomen Rib Deflection	36	47	mm	39.8	Pass
Lower Abdomen Rib Deflection	33	44	mm	37.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	1/10/2019	7/11/2019
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-308GFE	10/10/2018	10/10/2019
Lower Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-307GFE	10/11/2018	10/11/2019







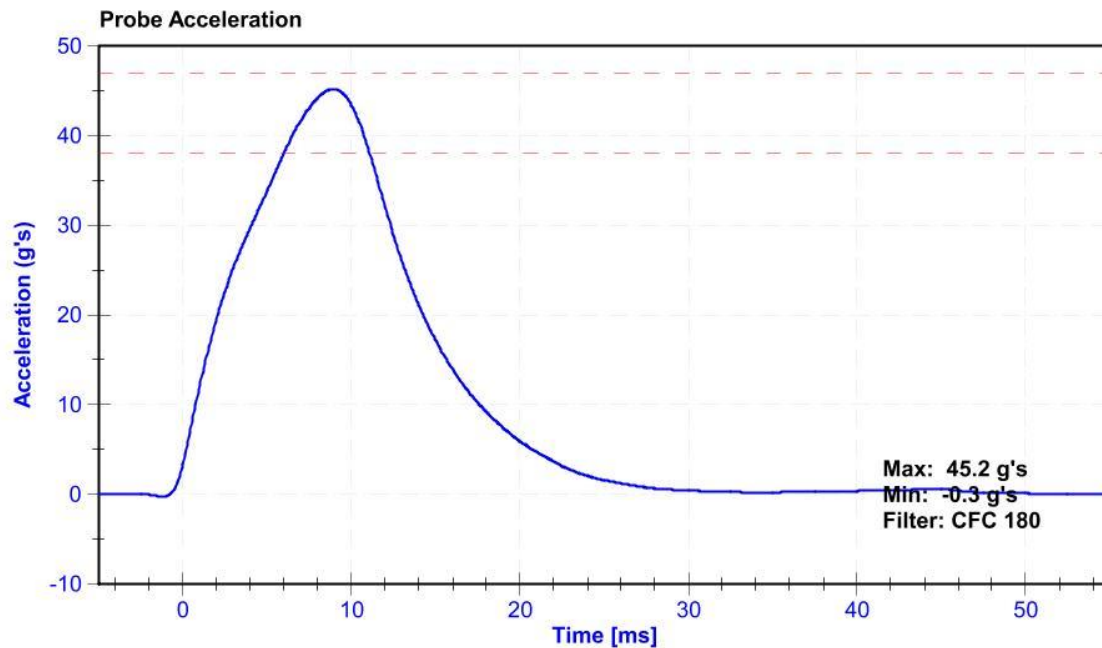
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

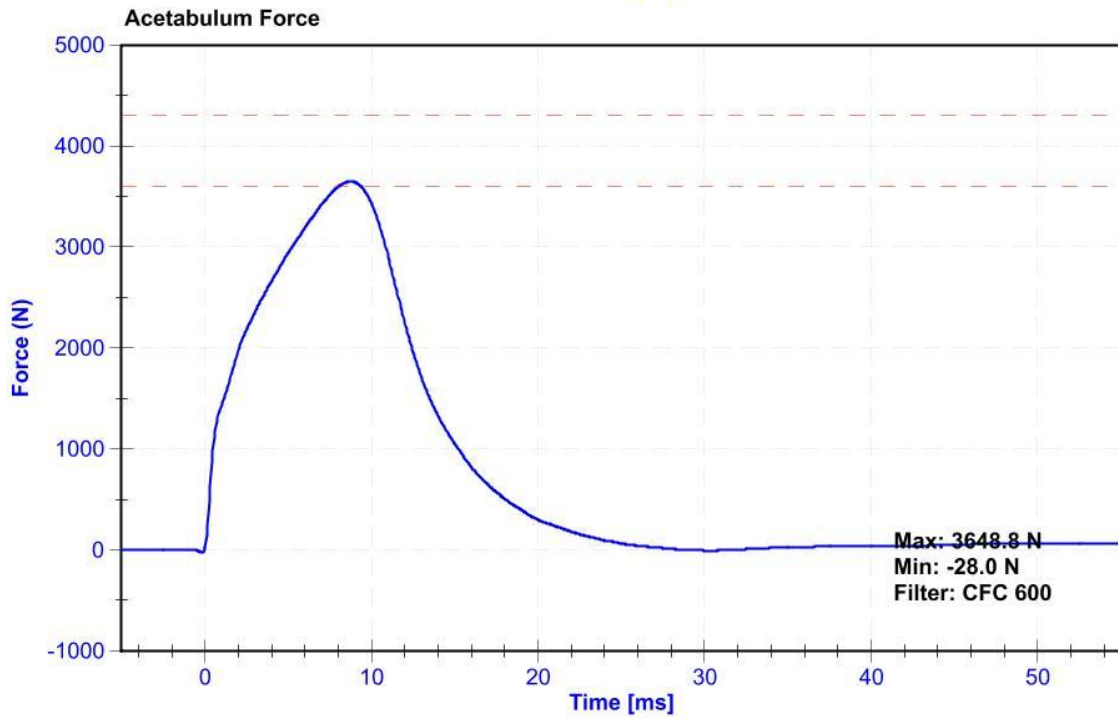
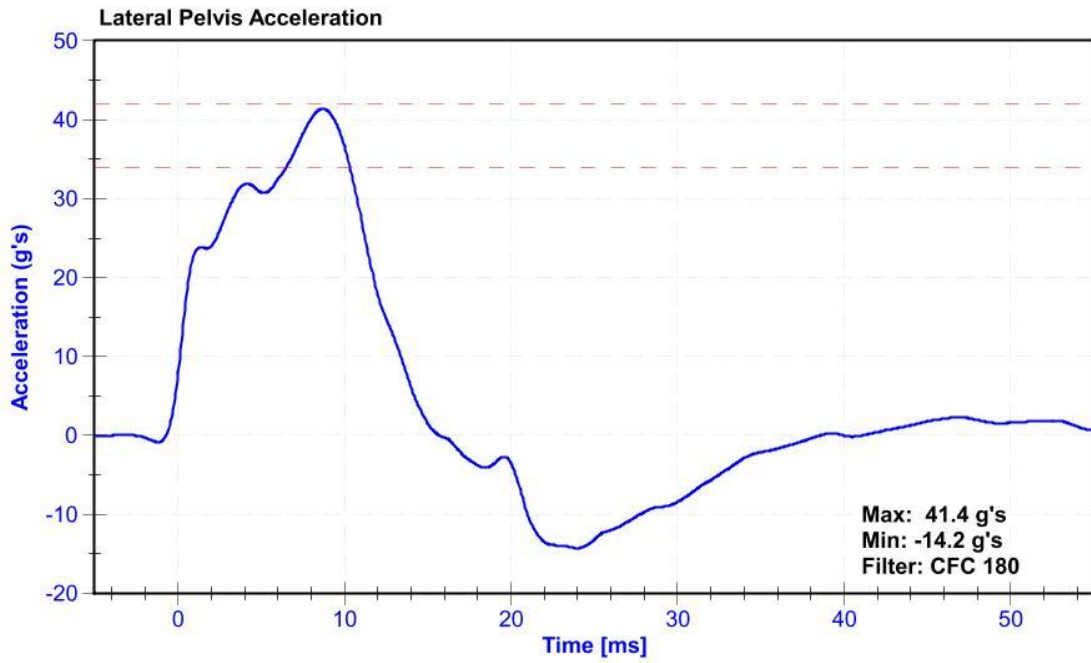
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	31.2	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	45.2	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.4	Pass
Acetabulum Force	3600	4300	N	3648.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/24/2018	4/24/2019
Acetabulum Load Cell	DENTON 3249J	LC-275Fy	10/4/2018	10/4/2019
Certification Plug	Humanetics	11641	3/28/2018	N/A
Crash Test Plug	Humanetics	12523	10/2/2018	N/A







300 / 3/22/19 cert 2

SID-11s Pelvis Plug Certification Test

Plug S/N 11641

Test Number 3484

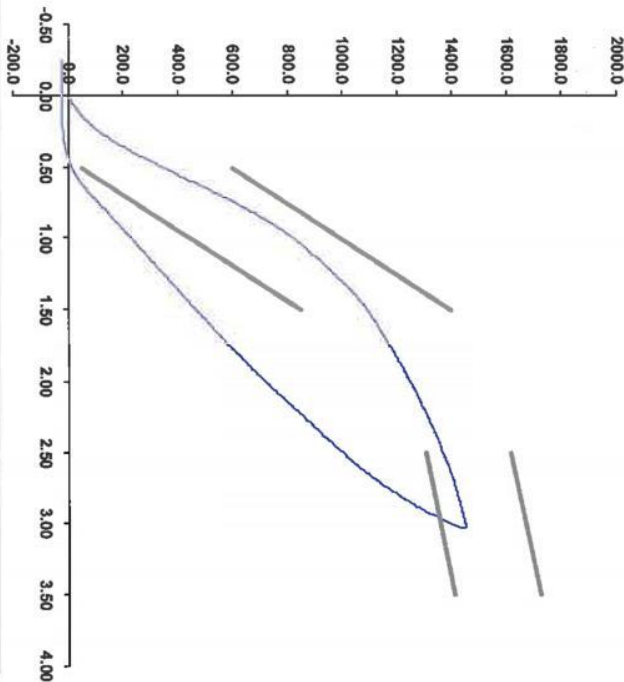
Report Number 3477

Test Date 3/28/2017 11:15:30 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50.00	600.00
Force @ 1.5 mm (N)	850.00	1,400.00
Force @ 2.5 mm (N)	1,308.00	1,618.00
Force @ 3.0 mm (N)	1,391.00	1,673.00

Testing Machine STM-20 5965542
 Load Cell S/N (T1240813), Units (LBS) 1000
 Crosshead Speed (mm / min) or Rate 127
 Extension or Position Measured by XHD_100 (XHD100)

Notes:



Operator DC

Part Number 180-4450

Template No 107 28-Mar-17
 SACO Research

By: DC Date: 3/28/17

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



300 3/22/19 crash

SID-11s Pelvis Plug Certification Test

Plug S/N 12523

Test Number 7450

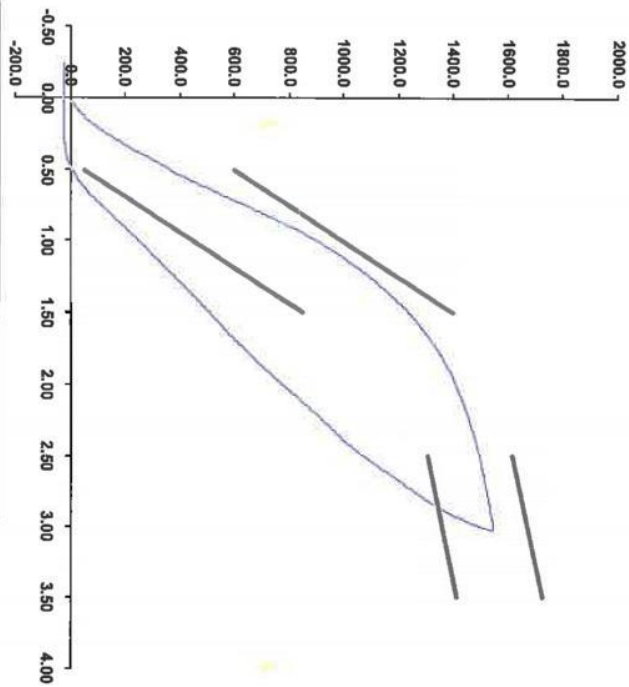
Report Number 7464

Test Date 10/2/2018 8:28:24 AM

Force (-N) vs Extension (-mm)

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50.00	600.00
Force @ 1.5 mm (N)	850.00	1,400.00
Force @ 2.5 mm (N)	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,391.00	1,673.30

Testing Machine STM-20 5965542
 Load Cell S/N (F1360947), Units (LBS) 1000
 Crosshead Speed (mm / min) or Rate 127
 Extension or Position Measured by XHD_100 (XHD100)



Notes:

Operator DC

Part Number 180-4450

Template No 107 02-Oct-18
 SACO Research

By: DC Date: 10/2/18
 SACO Research 41735 Elm St, #401 Murfeta, CA 92562 Tel 310-694-2082 FAX

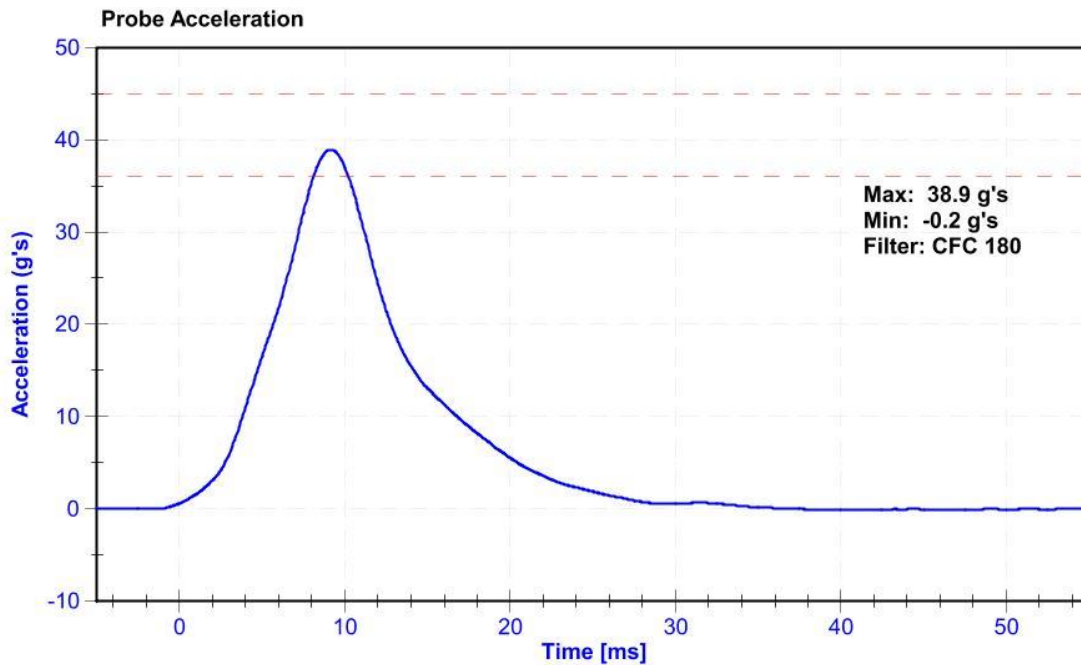
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	D.Reinhard

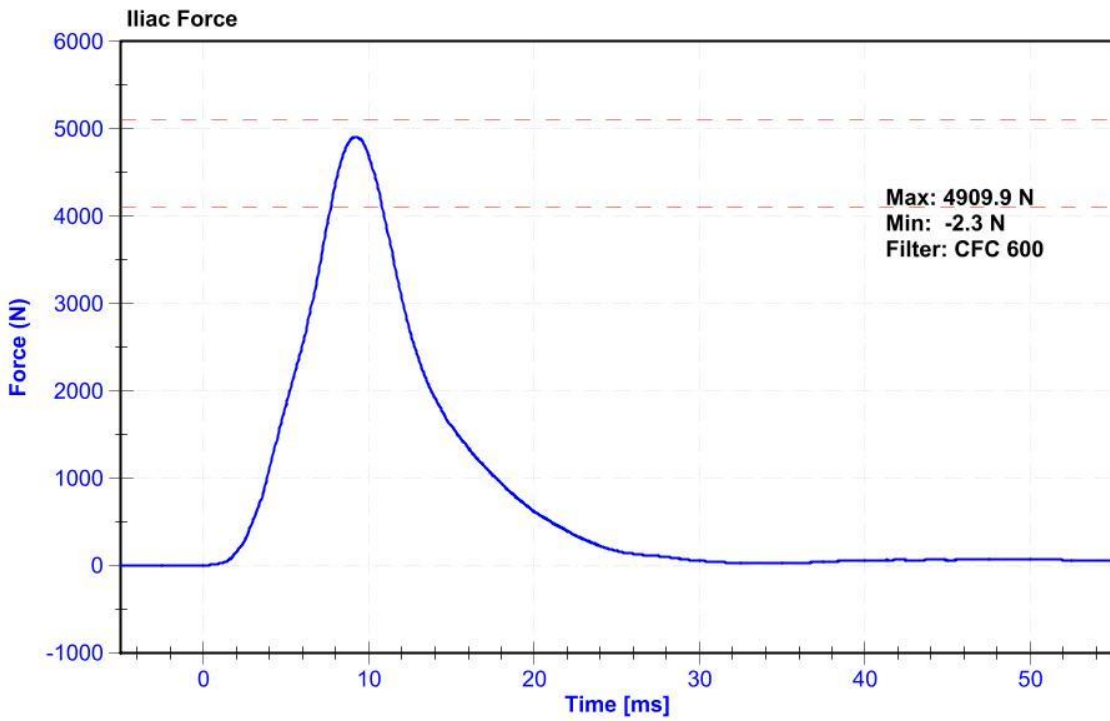
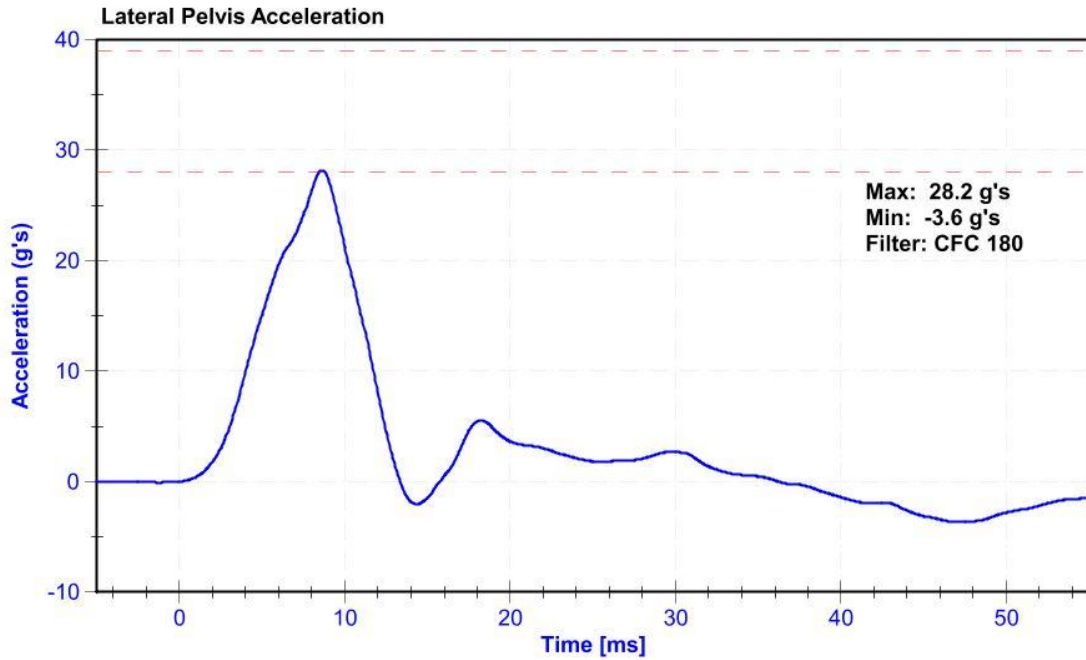
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	30.4	Pass
Velocity	4.2	4.4	m/s	4.30	Pass
Probe Acceleration	36	45	g's	38.9	Pass
Lateral Pelvis Acceleration	28	39	g's	28.2	Pass
Iliac Force	4100	5100	N	4909.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco 7264C	AC-P94667	11/1/2018	11/1/2019
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/24/2018	4/24/2019
Iliac Load Cell	Kistler 3228J	LC-DM5054 Fy	2/6/2019	2/6/2020





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	10/5/2018
		Y	AC-P58911	ENDEVCO	10/5/2018
		Z	AC-P58776	ENDEVCO	10/5/2018
	Redundant	X	AC-P58887	ENDEVCO	10/5/2018
		Y	AC-P58888	ENDEVCO	10/5/2018
		Z	AC-P51734	ENDEVCO	10/5/2018
Thorax Rib Displacement Potentiometers	Upper	Y	DS-183GFE	Honeywell	10/10/2018
	Middle	Y	DS-184GFE	Honeywell	10/11/2018
	Lower	Y	DS-182GFE	Honeywell	10/10/2018
Abdomen Load Cells	Forward	Y	LC-1440	DENTON	6/4/2018
	Middle	Y	LC-1525	DENTON	6/4/2018
	Rear	Y	LC-1528	DENTON	6/4/2018
Lower Spine Accelerometers (T12)		X	AC-P52079	ENDEVCO	10/4/2018
		Y	AC-P51927	ENDEVCO	10/25/2018
		Z	AC-P51269	ENDEVCO	10/4/2018
Pubic Symphysis Load Cell		Y	LC-464fy	DENTON	6/4/2018

Table 2 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N: 300			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers	Primary	X	AC-P58777	ENDEVCO	10/5/2018	
		Y	AC-P59018	ENDEVCO	10/5/2018	
		Z	AC-P79189	ENDEVCO	10/5/2018	
	Redundant	X	AC-P52095	ENDEVCO	10/5/2018	
		Y	AC-P58986	ENDEVCO	10/5/2018	
		Z	AC-P68057	ENDEVCO	10/5/2018	
Displacement Potentiometers	Thoracic Rib	Upper	Y	DS-451GFE	Servo	10/10/2018
		Middle	Y	DS-040GFE	Servo	10/11/2018
		Lower	Y	DS-1156GFE	Servo	10/10/2018
	Abdominal Rib	Upper	Y	DS-308GFE	Servo	10/10/2018
		Lower	Y	DS-307GFE	Servo	10/11/2018
Lower Spine Accelerometers (T12)		X	AC-P58883	ENDEVCO	1/10/2019	
		Y	AC-P64147	ENDEVCO	1/10/2019	
		Z	AC-P58786	ENDEVCO	1/10/2019	
Acetabulum Load Cell		Y	LC-275Fy	DENTON	10/4/2018	
Iliac Wing Load Cell		Y	LC-DM5054 Fy	Kistler	2/6/2019	
Pelvis Plug (struck side)			11410	SACO	8/29/2016	
Pelvis Plug (non-struck side)			-	-	-	

Table 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	AC-A254664	MSI 1201-1000	3/11/2019
	Vehicle Center of Gravity	Y	AC-A255883	MSI 1201-1000	1/28/2019
	Vehicle Center of Gravity	Z	AC-A255977	MSI 1201-1000	3/11/2019
2	Right Sill at Front Seat	X	AC-A255984	MSI 1201-1000	3/11/2019
	Right Sill at Front Seat	Y	AC-A255987	MSI 1201-1000	3/11/2019
	Right Sill at Front Seat	Z	AC-A255998	MSI 1201-1000	3/11/2019
3	Right Sill at Rear Seat	X	AC-A280330	MSI 1201-1000	3/11/2019
	Right Sill at Rear Seat	Y	AC-A280341	MSI 1201-1000	3/11/2019
	Right Sill at Rear Seat	Z	AC-A280940	MSI 1201-1000	3/11/2019
4	Left Sill at Front Door	Y	AC-A280322	MSI 1201-1000	11/14/2018
5	Left Sill at Rear Door	Y	AC-A280023	MSI 1201-1000	11/11/2018
6	Left A-Post Lower	Y	AC-A280360	MSI 1201-1000	11/15/2018
7	Left A-Post Middle	Y	AC-A280886	MSI 1201-1000	11/20/2018
8	Left B-Post Lower	Y	AC-A280913	MSI 1201-1000	11/21/2018
9	Left B-Post Middle	Y	AC-A280882	MSI 1201-1000	11/22/2018
10	Front Seat Track	Y	AC-A280974	MSI 1201-1000	11/23/2018
11	Rear Seat Track or Structure	Y	AC-A280869	MSI 1201-1000	11/22/2018
12	Right Rear Occ. Compartment	Y	AC-A280955	MSI 1201-1000	11/23/2018
13	Engine Block	X	AC-A250382	MSI 1201-1005	10/4/2018
	Engine Block	Y	AC-A262926	MSI 1201-1000	10/12/2018
14	Rear Floorpan Above Axle	X	AC-A184912	MSI 1201-1000	11/3/2019
	Rear Floorpan Above Axle	Y	AC-A196982	MSI 1201-1000	3/11/2019
	Rear Floorpan Above Axle	Z	AC-A262923	MSI 1201-1000	3/11/2019

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	AC-A251545	MSI 58-2000-360	11/1/2018
MDB Center of Gravity	Y	AC-A255130	MSI 58-2000-360	11/1/2018
MDB Center of Gravity	Z	AC-A255143	MSI 58-2000-360	11/1/2018
Left Frame at Rear Axle Centerline	X	AC-A280950	MSI 1201-1000	11/24/2018
Left Frame at Rear Axle Centerline	Y	AC-A280989	MSI 1201-1000	11/23/2018