

REPORT NUMBER: SINCAP-CAL-20-005

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

**Volkswagen Group of America
2020 Volkswagen Passat
Four Door Sedan**

NHTSA No: M20205805

**PREPARED BY:
CALSPAN CORPORATION
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December 11, 2020

FINAL REPORT

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

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Matthew Pronko, Test Engineer

Date: December 11, 2020

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Vanessa Hansen, Operations Manager

Date: December 11, 2020

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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Matthew Pronko, Test Engineer Vanessa Hansen, Operations Manager		8. Performing Organization Report No. CAL-DOT-2020-005																												
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		14. Sponsoring Agency Code NRM-110																												
15. Supplementary Notes																														
16. Abstract A 55/28, (61.90kph / 38.5 mph), 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2020 Volkswagen Passat four door sedan 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 3, 2030. 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 227mm located at level 3. The test vehicle's occupant performance data is as follows:																														
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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, 1200 New Jersey Ave. SE Washington, D.C. 20590																												
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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2020 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 2020 Volkswagen Passat four door sedan. 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 2020 Volkswagen Passat four door sedan 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 3, 2020. 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	87.167
Maximum Thorax Rib Deflection	mm	44	26.012
Combined Abdominal Force	N	2500	694.861
Pubic Symphysis Force	N	6000	1405.424

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	249.227
Lower Spine (T12) Resultant Acceleration	G	82	62.236
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3169.949
Maximum Thoracic Rib Deflection	mm	38*	33.258
Maximum Abdominal Rib Deflection	mm	45*	30.993

*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 B-Pillar Lower Y Acceleration, Exceeded calibration range and saturated at 7.2 ms
- Left B-Pillar Middle Y Acceleration, Exceeded calibration range and saturated at 8.1 ms

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

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

Data Sheet No. 2 – Seat, Seat Belt, Steering Wheel Adjustment and Fuel 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: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20205805
Model Year	2020
Make	Volkswagen
Model	Passat
Body Style	Four Door Sedan
VIN	1VWAA7A34LC008850
Body Color	Silver
Odometer Reading (km/mi)	5 miles
Engine Displacement (L)	2.0
Type/No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	6-Speed
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	No
Other Optional Feature	-
Driver Front 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	Volkswagen Group of America
Date of Manufacture	01/2020
Vehicle Type	Passenger Car

GVWR (kg)	2010
GAWR Front (kg)	1060
GAWR Rear (kg)	1000

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	-	5	
Capacity Weight (VCW) (kg)				420	(A)
DSC X 68.04 kg				340.2	(B)
Cargo Weight (RCLW) (kg)				79.8	(A-B)

VEHICLE SEAT TYPE

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

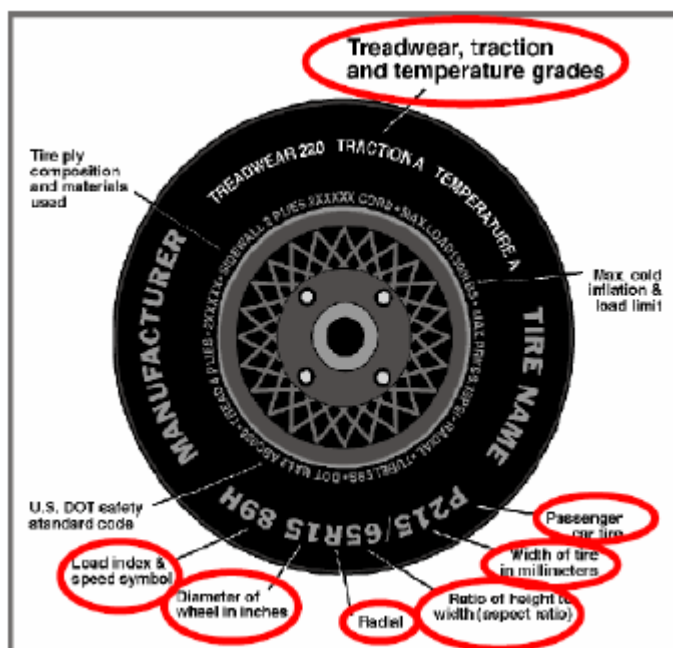
DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

VEHICLE TIRE INFORMATION

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



TIRE SIDEWALL INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	215/55R17	215/55R17
Tire Size on Vehicle	215/55R17	215/55R17
Tire Manufacturer	Continental	Continental
Tire Model	ProContact	ProContact
Treadwear	500	500
Traction	A	A
Temperature Grade	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index/Speed Symbol	94H	94H
Tire Material	Rubber	Rubber
DOT Safety Code Left	VY3RWCRK4319	VY3RWCRK4319
DOT Safety Code Right	VY3RWCRK4319	VY3RWCRK4319

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	328	328	329	329
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

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	439	315		478	401		478	412	
Right	kg	457	299		462	369		460	374	
Ratio	%	59.3	40.7		55	45		54.4	45.6	
Totals	kg	896	614	1510	940	770	1710	938	786	1724

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1510	(A)
Sum of Actual Weight of 1 ES2re and 1 P572 ATD (SID-IIs)	kg	127	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	79.8	(C)
Calculated Target Vehicle Test Weight (TVTWW)	kg	1716.8	(A+B+C)

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

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	Fully Loaded	As Tested	Meets Requirement**
LF	mm	712	714	Yes
RF	mm	719	719	Yes
RR	mm	697	693	Yes
LR	mm	687	688	Yes
Vehicle CG (Aft of Front Axle)	mm	1277	1261	
Vehicle CG (Left+)/Right(-) from Longitudinal Centerline)	mm	24	21	

*** 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: 2020 Volkswagen Passat four door sedan NHTSA No.: M20205805
Test Program: NCAP Side MDB Impact Test Test Date: 3/3/2020

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	7.5
Spare Tire	14
Jack	2.5
Tail Light	2
Right Rear Window	1.5
Ballast / Equipment Added	68

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

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	15.6	10.8	13.2
Front Passenger Seat	16.4	11.8	14.1
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	13.2	12	Max	-	-	-
			Mid	9	12	18
			Min	-	-	-
Front Passenger Seat	14.1	12	Max	-	-	-
			Mid	6	12	18
			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: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

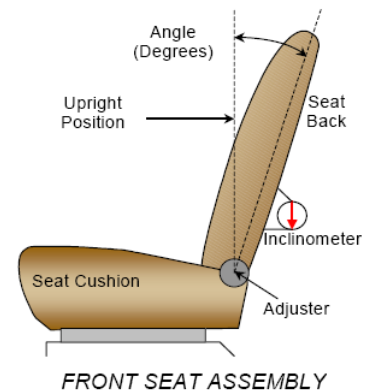
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	255	38 (0-37)	127	18
Front Passenger Seat	173	26 (0-25)	87	13
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	71.4	-	1.8	7
Front Passenger Seat	69	-	1.8	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: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

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 (0-3)	3 - Lowest
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

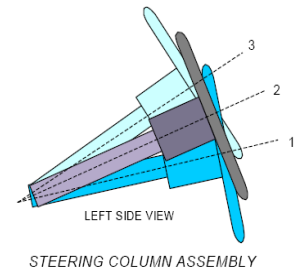
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	4 (0-3)	Uppermost
Rear Seat	2 (0-1)	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.

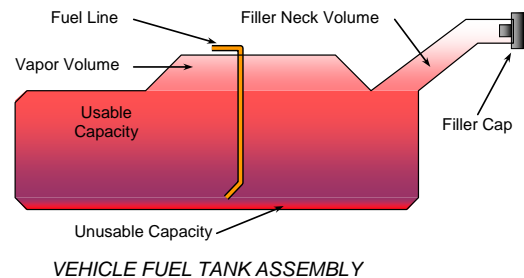
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	22	
Geometric Center – Position 2	24.8	
Uppermost – Position 3	27	
Telescoping Steering Wheel Travel		55
Test Position	24.8	22.5



FUEL PUMP

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

The vehicle is equipped with an electric fuel pump. The fuel filler neck is on the right 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: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

FUEL TANK CAPACITY

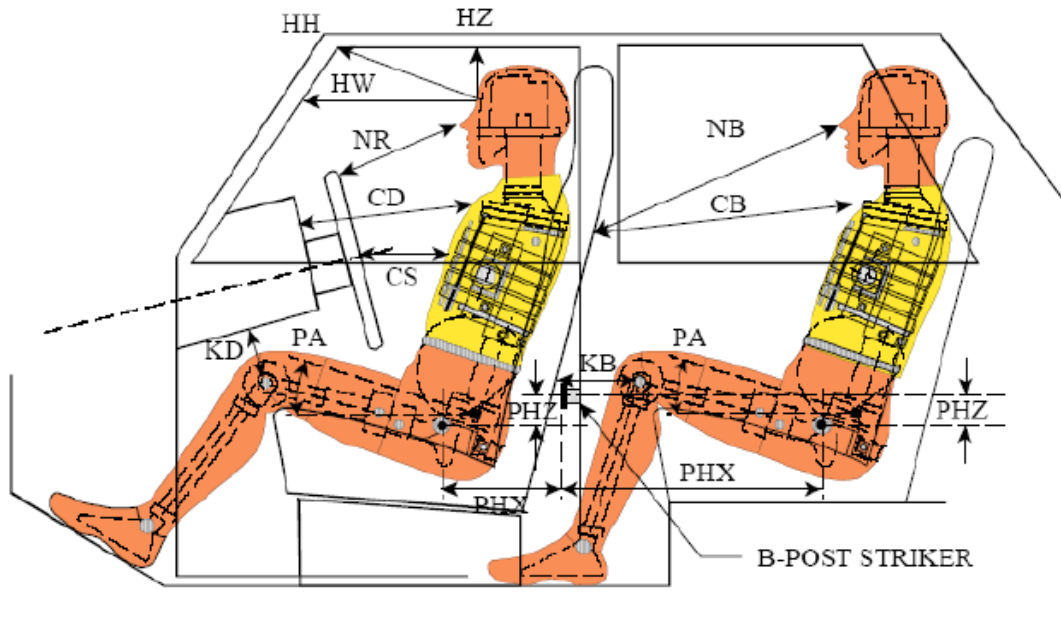
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	70
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	70
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	65.1
Actual Amount of Solvent Used in Test	65.1
1/3 of Usable Capacity	23.3

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

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020



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

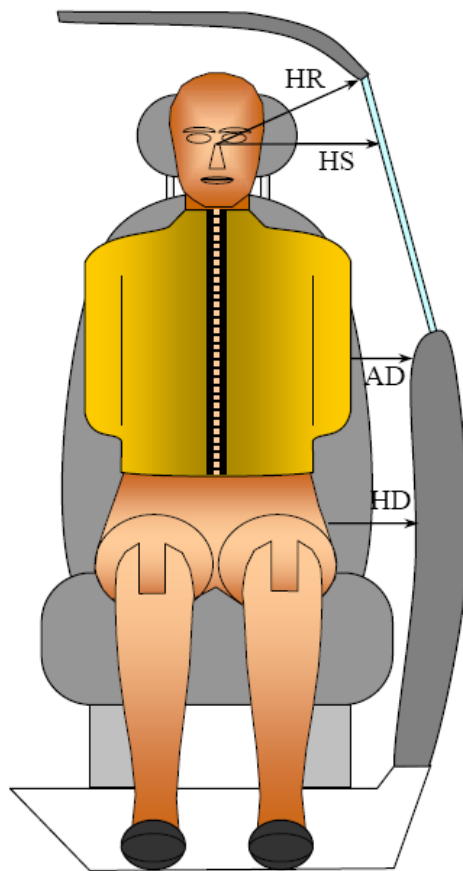
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver (Serial No. F034)		Passenger (Serial No.300)	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	373			
HW		Header to Windshield	558			
HZ	HZ	Head to Roof Liner	145		274	
NR	NB	Nose to Rim/Seat Back	449		696	
CD	CB	Chest to Dash/Seat Back	590		687	
CS		Chest to Steering Wheel	403			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	210	34.8	399	0.2
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	210	31.4	396	0.8
PAX°	PAX°	Pelvic Tilt Angle X		23.2		23.3
	PAY°	Pelvic Tilt Angle Y				0.3
PHX	PHX	Hip Point to Striker (X-Axis)	199		218	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	200		238	

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020



FRONT VIEW OF DUMMY

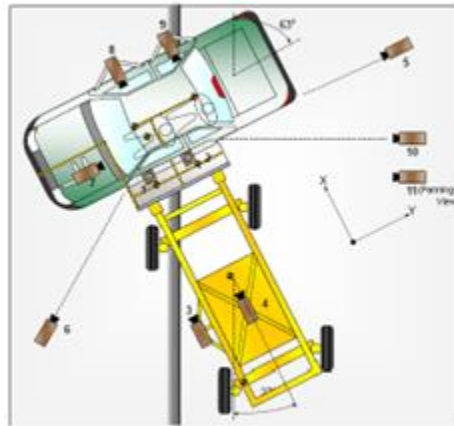
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F034)	Passenger (Serial No. 300)
HR	Head to Side Header	mm	185	253
HS	Head to Side Window	mm	325	378
AD	Arm to Door	mm	124	190
HD	Hip Point to Door	mm	159	185

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	460	-8856	12.5	1000
2	Overhead Close-up	-292	816	-8856	24	1000
3	Left Impact Point (MDB)	-1470	0	-847	25	1000
4	Side Overall (MDB)	-1140	878	-1587	8	1000
5	Rear	0	9045	-1155	24	1000
6	Left Front	-5054	-2283	-1421	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

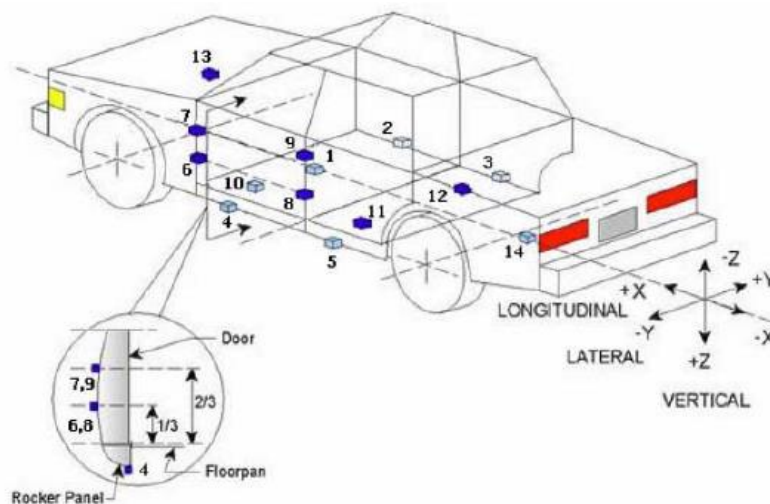
INSTRUMENTATION

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: 2020 Volkswagen Passat four door sedan
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
Test Date: 3/3/2020



TEST VEHICLE ACCELEROMETER LOCATIONS

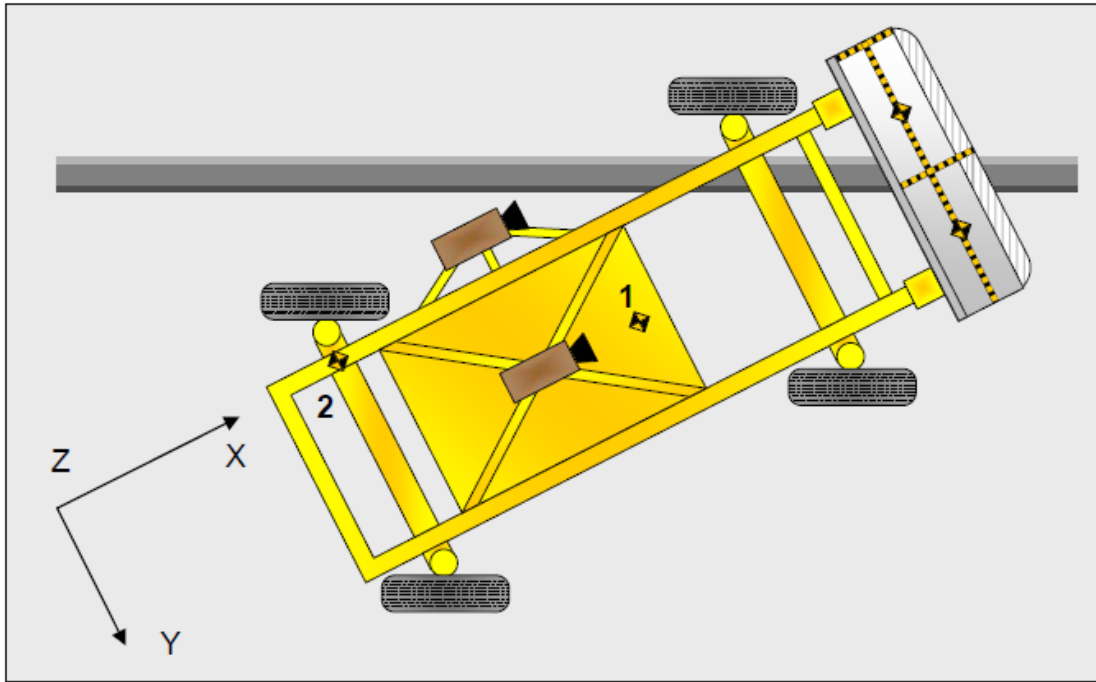
No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2736	25	20
2	Right Sill at Front Seat	3101	677	108
3	Right Sill at Rear Seat	2119	672	102
4	Left Sill at Front Door	3128	-675	105
5	Left Sill at Rear Door	2136	-667	121
6	A-Post Lower	3536	-649	-100
7	A-Post Middle	3338	-651	-525
8	B-Post Lower	2408	-696	-138
9	B-Post Middle	2346	-680	-418
10	Front Seat Track	2587	-608	148
11	Rear Seat Structure	1793	-671	41
12	Rt. Rear Occ. Compartment	2276	376	240
13	Engine Block	4071	84	-320
14	Rear Above Axle	950	21	-15

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: 2020 Volkswagen Passat four door sedan
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
Test Date: 3/3/2020



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: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

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 Header	Curtain Airbag & Center Headrest
Left Side of Head	Curtain Airbag	Curtain Airbag
Back of Head	Headrest, Side Header, Curtain Airbag	Curtain Airbag & Center Headrest
Left Shoulder	Curtain Airbag, Driver Door, Torso/Pelvis Airbag	Passenger Door
Upper Torso	Torso/Pelvis Airbag & Seat Back	Seat Back, Rear Passenger Door
Lower Torso	Torso/Pelvis Airbag & Seat Back	Seat Back, Rear Passenger Door
Left Hip	Torso/Pelvis Airbag, Seat Pan, Driver Door	Seat Pan, Rear Passenger Door
Left Knee	Driver Door	Rear 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 & C-Pillar Buckled
Sill Separation	None
Windshield Damage	None
Side Window Damage	Driver & Rear Passenger Windows Shattered
Other Notable Effects	None

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

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		2801
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		460
Actual Impact Point (Aft of Frontal Axle)	mm		453
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+7
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	+3

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

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	61.89
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

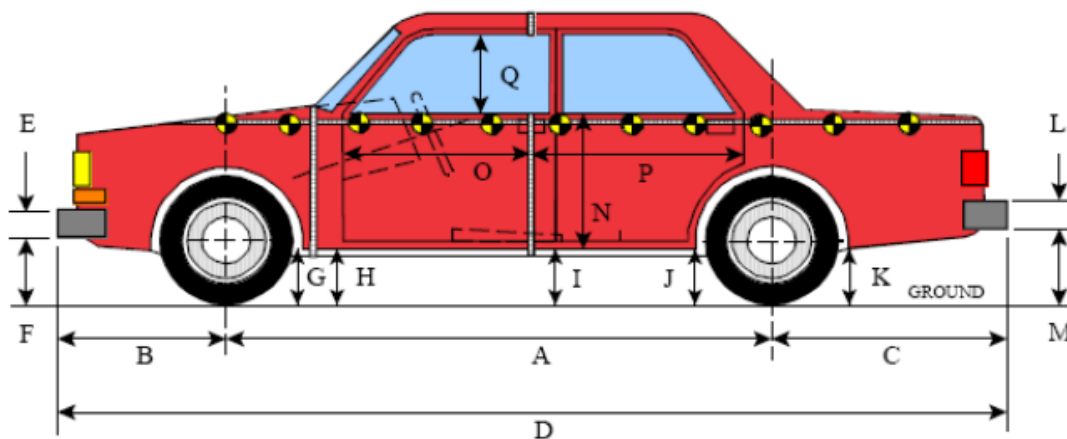
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	200	Right	204
B	Top of Bumper	533	100	Right	112
C	Mid-Level	686	800	Left	133
D	Top of Stack	813	800	Left	153

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020



LEFT SIDE VIEW

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

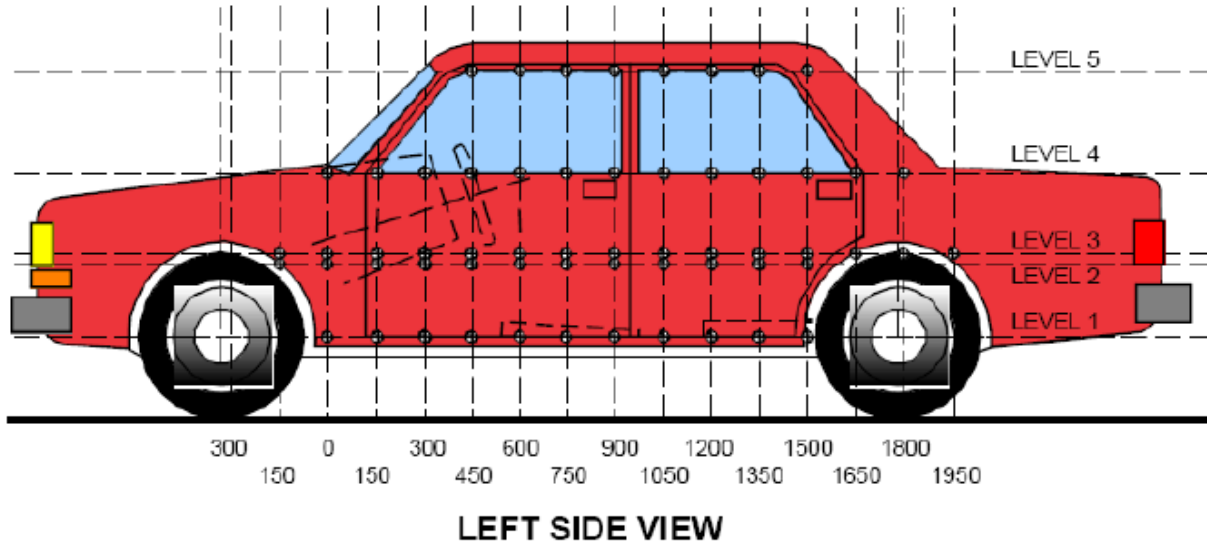
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2801	2794	-7
B	Front Axle to FSOV	968	963	-5
C	Rear Axle to RSOV	1152	1154	2
D	Total Length at Centerline	4921	4910	-11
E	Front Bumper Thickness	255	255	0
F	Front Bumper Bottom to Ground	260	262	2
G	Sill Height at Front Wheel Well	186	222	36
H	Sill Height at Front Door Leading Edge	187	225	38
I	Sill Height at B Pillar	198	215	17
J1	Sill Height at Rear Wheel Well	200	191	-9
J2	Pinch Weld Height at Rear Wheel Well	189	165	-24
K	Sill Height Aft of Rear Wheel Well	217	213	-4
L	Rear Bumper Thickness	225	225	0
M	Rear Bumper Bottom to Ground	364	377	13
N	Sill Height to Window Bottom of Front Window Sill	697	659	-38
O	Front Door Leading Edge to Impact CL	803	793	-10
P	Rear Door Trailing Edge to Impact CL	1354	1279	-75
Q	Front Window Opening	428	458	30
R	Right Side Length	4828	4824	-4
S	Left Side Length	4829	4811	-18
T	Maximum Vehicle Width	1794	1653	-141

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	315	114	1050
2	Driver Hip Point	mm	537	227	1650
3	Mid-Door	mm	638	227	1800
4	Window Sill	mm	936	199	1650
5	Window Top	mm	1403	11	1050

*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: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

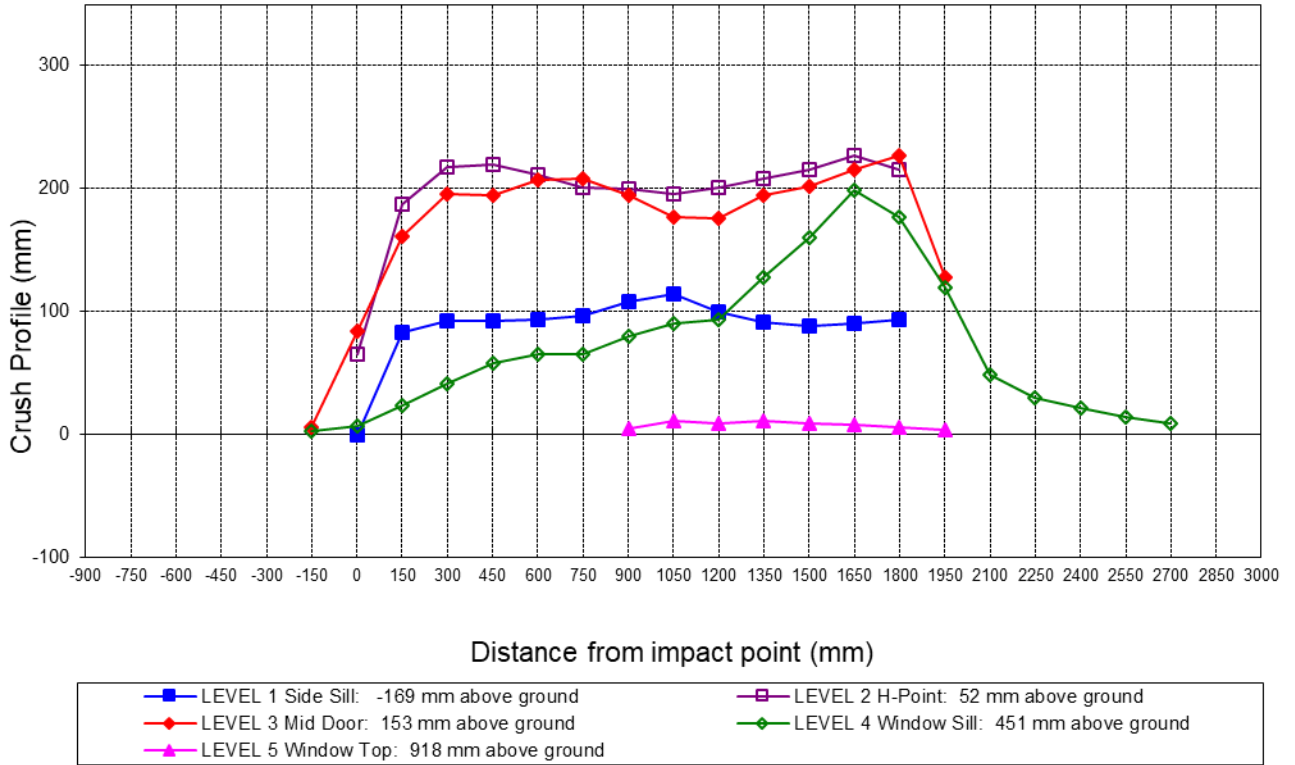
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			908	800				902	797				6	3	
0	881	900	900	811		882	835	818	804		-1	65	82	7	
150	876	893	898	819		793	706	737	796		83	187	161	23	
300	874	890	897	835		782	673	701	794		92	217	196	41	
450	875	890	897	848		783	670	703	790		92	220	194	58	
600	875	890	898	856		782	679	691	791		93	211	207	65	
750	875	890	897	856		779	689	689	791		96	201	208	65	
900	874	890	897	857	607	766	690	703	777	602	108	200	194	80	5
1050	873	889	896	857	615	759	693	719	767	604	114	196	177	90	11
1200	869	885	893	858	616	769	684	717	765	607	100	201	176	93	9
1350	865	882	890	856	613	774	674	696	728	602	91	208	194	128	11
1500	861	879	886	856	610	773	664	684	696	601	88	215	202	160	9
1650	858	878	884	853	606	768	651	669	654	598	90	227	215	199	8
1800	859	882	886	851	599	766	667	659	674	593	93	215	227	177	6
1950			894	852	580			766	733	576			128	119	4
2100				856					808					48	
2250				857					827					30	
2400				855					834					21	
2550				847					833					14	
2700				835					826					9	
2850															
3000															

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

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

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

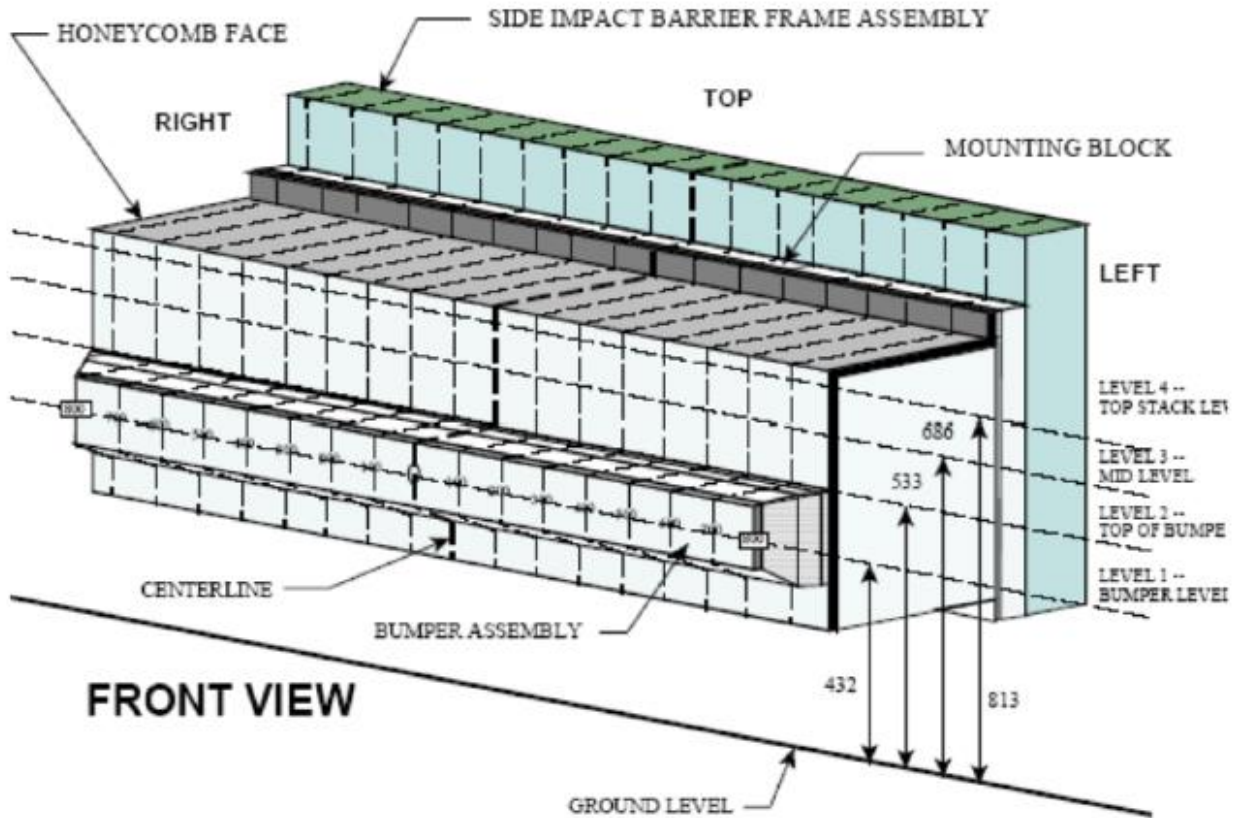


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

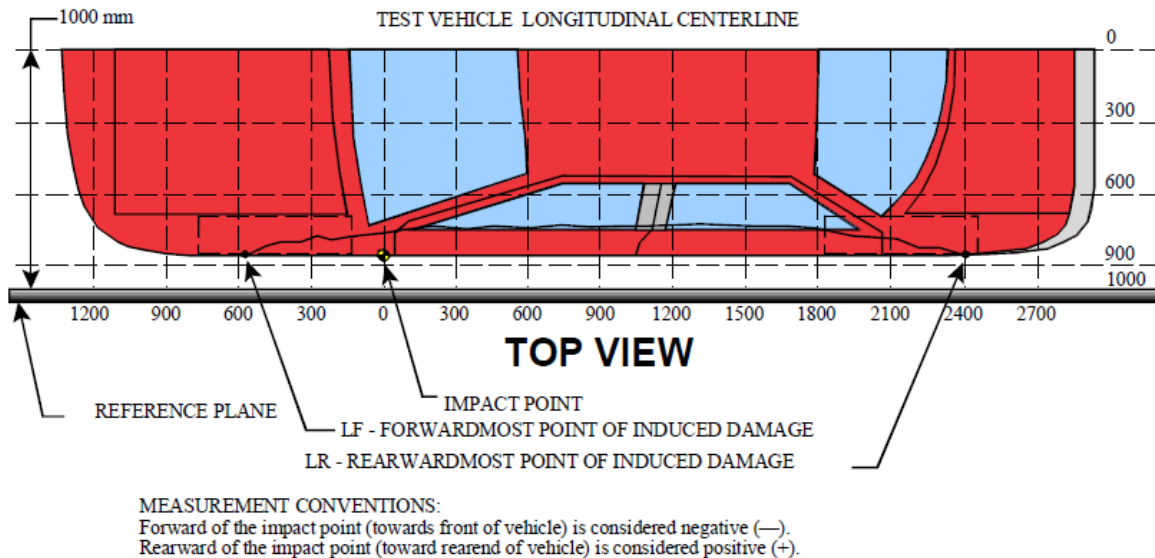
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	182	180	178	181	184	198	204	195	193	182	176	175	174	173	172	175	186
2	93	97	98	100	103	105	102	112	105	100	96	95	95	94	92	94	100
3	37	21	21	26	36	51	79	100	79	53	41	36	37	46	65	98	133
4	33	3	7	23	45	82	123	133	128	97	70	82	91	94	115	132	153

DATA SHEET NO. 13
VEHICLE AND MDB DAMAGE PROFILE DISTANCES

Test Vehicle: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020

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	98	92	6
2	270	3	292	103	189
3	690	3	310	103	207
4	1110	3	282	105	177
5	1530	3	319	114	205
6	1950	3	234	106	128

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)*
1	800 mm left of center	1	186
2	480 mm left of center	1	173
3	160 mm left of center	1	178
4	160 mm right of center	1	200
5	480 mm right of center	1	182
6	800 mm right of center	1	182

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

Test Vehicle:	<u>2020 Volkswagen Passat four door sedan</u>	NHTSA No.:	<u>M20205805</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>3/3/2020</u>
Test Time:	<u>11:35 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°	69	300	369
90° to 180°	68	300	368
180° to 270°	68	300	368
270° to 360°	69	300	369

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	

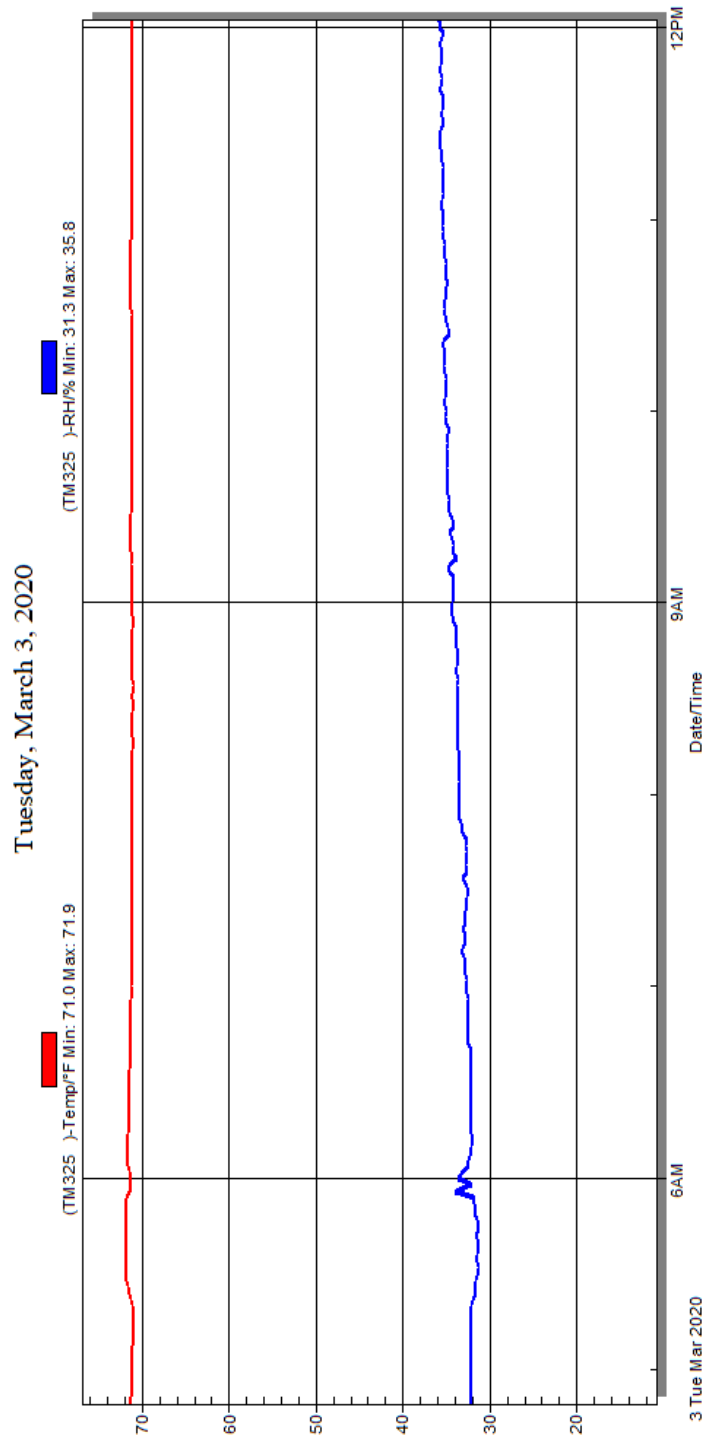
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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: 2020 Volkswagen Passat four door sedan
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20205805
 Test Date: 3/3/2020



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

APPENDIX A
PHOTOGRAPHS

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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

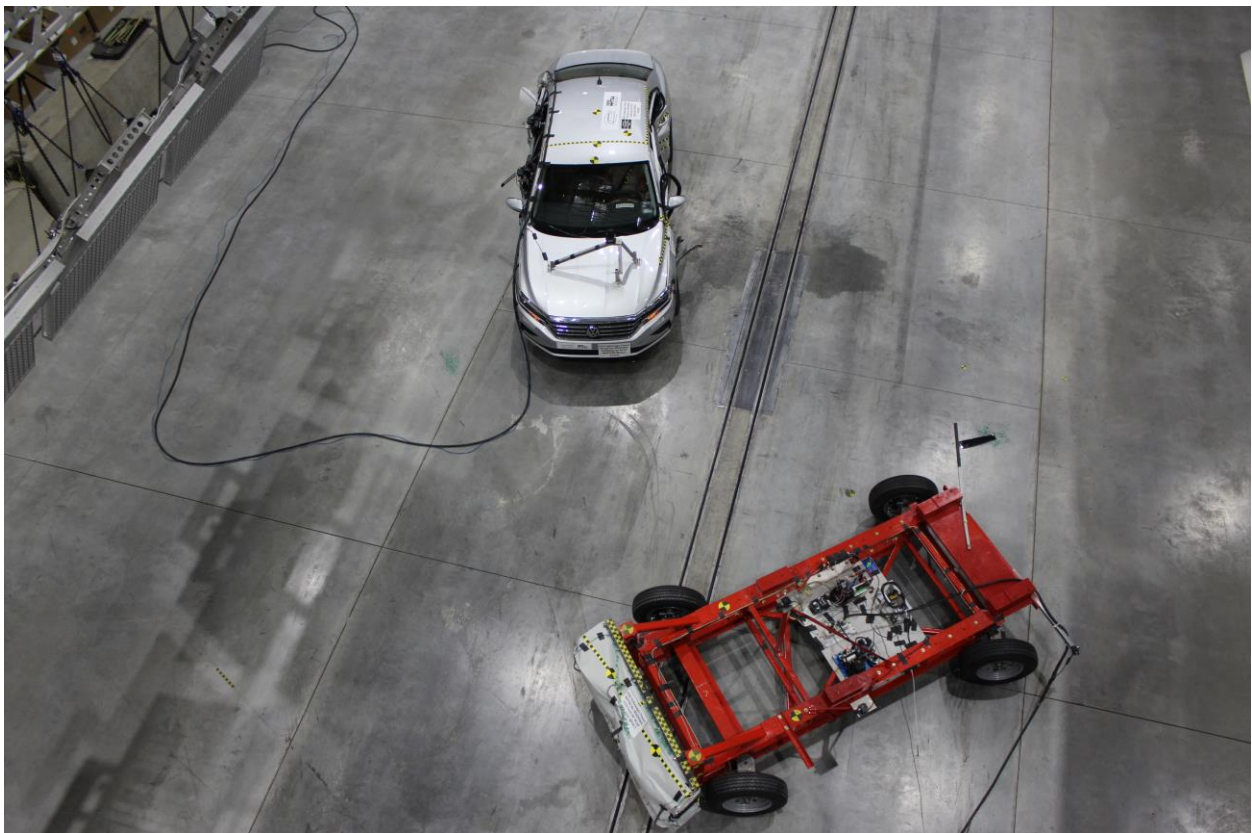


Figure A-16: Post-Test Overhead View of Test Area



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



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



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



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

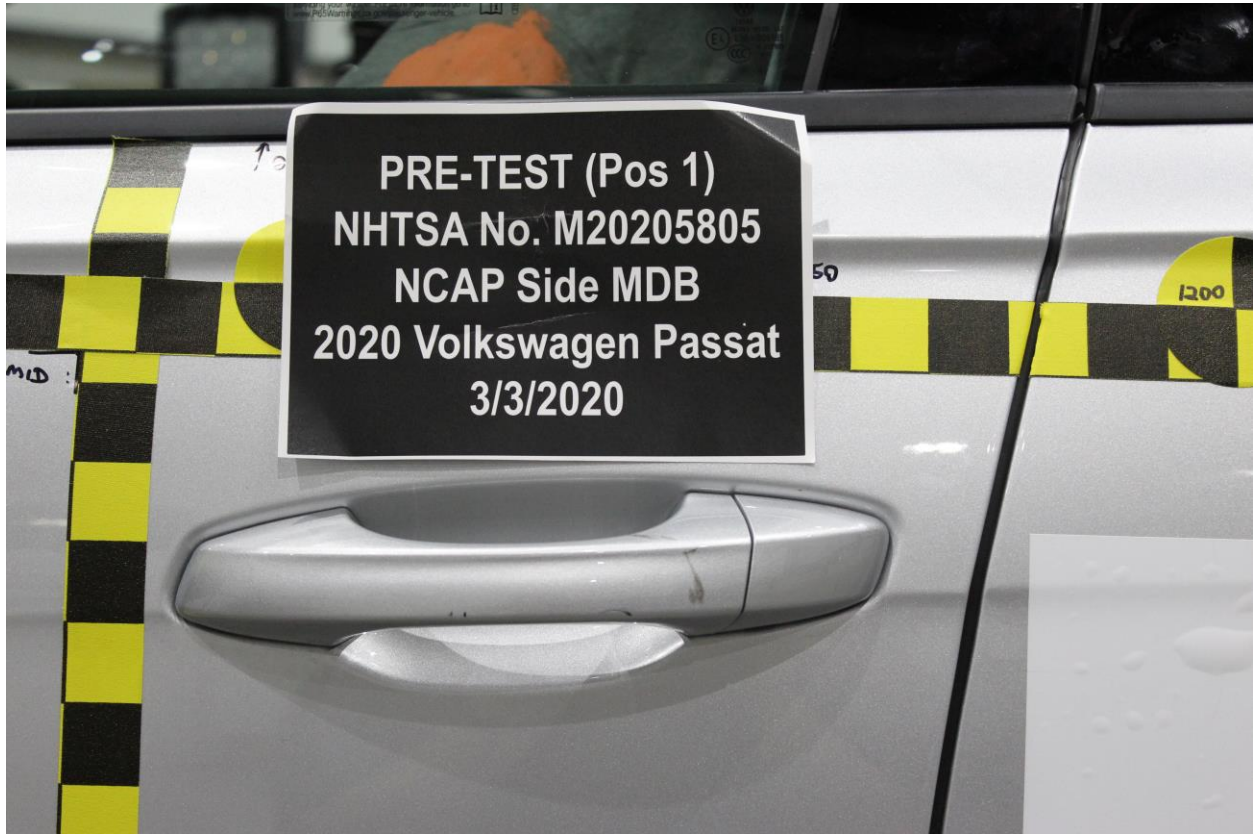


Figure A-21: Pre-Test Left Front Door Latch Close-Up

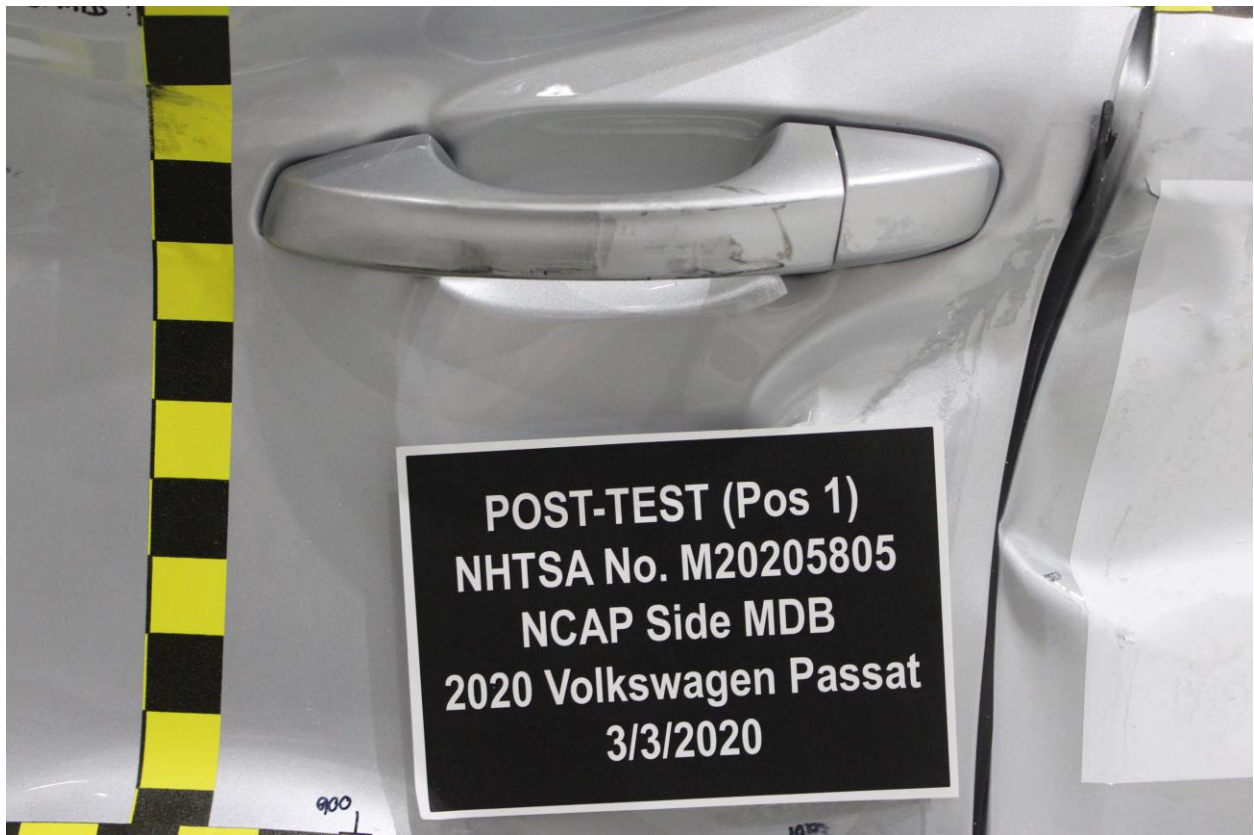


Figure A-22: Post-Test Left Front Door Latch Close-Up



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



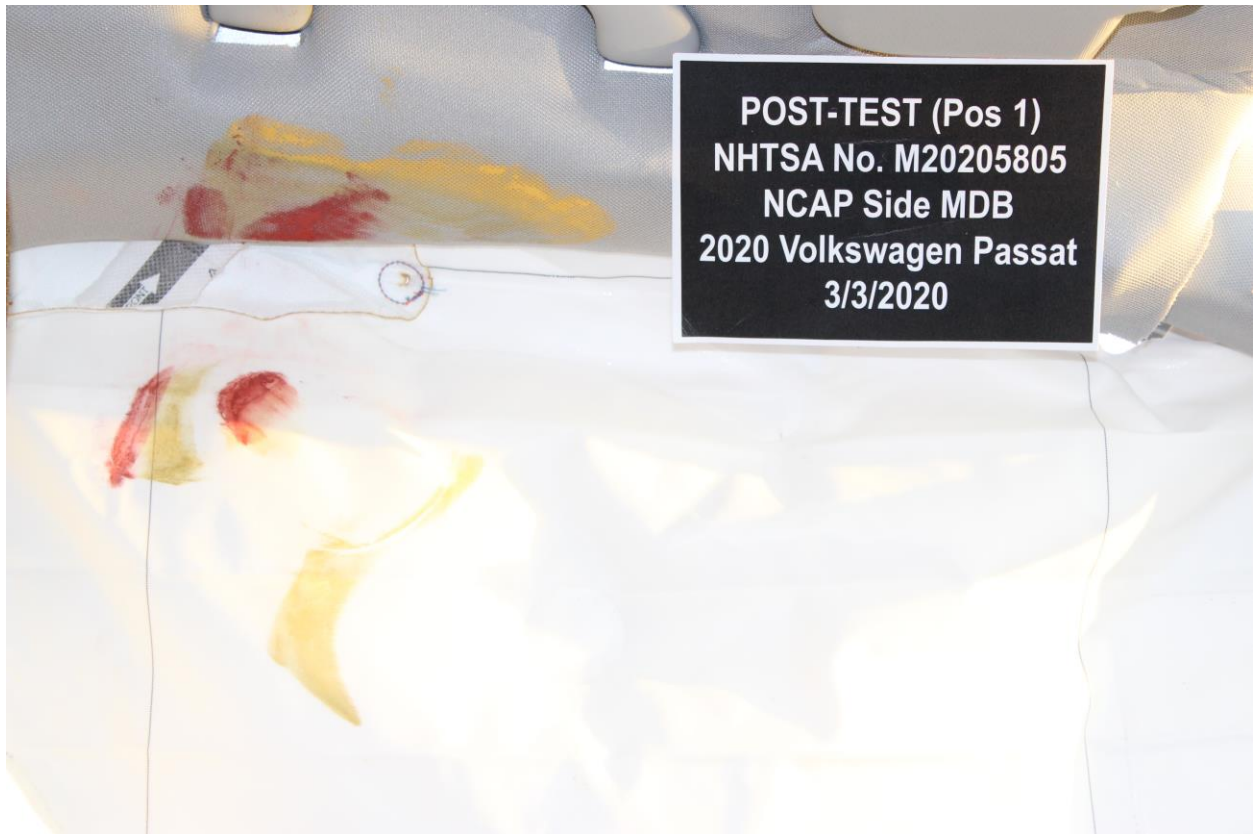
Figure A-46: Pre-Test Driver Inner Door Panel View



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



POST-TEST (Pos 1)
NHTSA No. M20205805
NCAP Side MDB
2020 Volkswagen Passat
3/3/2020

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



POST-TEST (Pos 1)
NHTSA No. M20205805
NCAP Side MDB
2020 Volkswagen Passat
3/3/2020

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

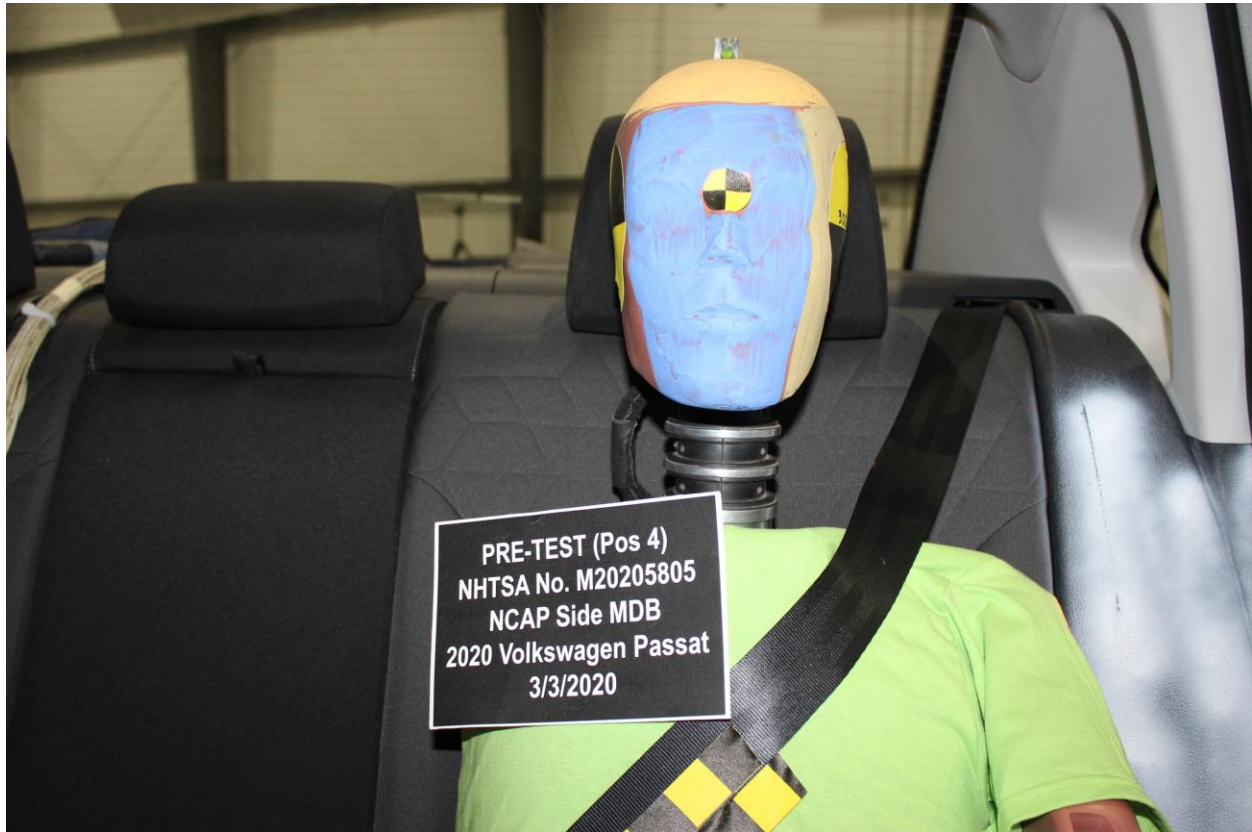


Figure A-59: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



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

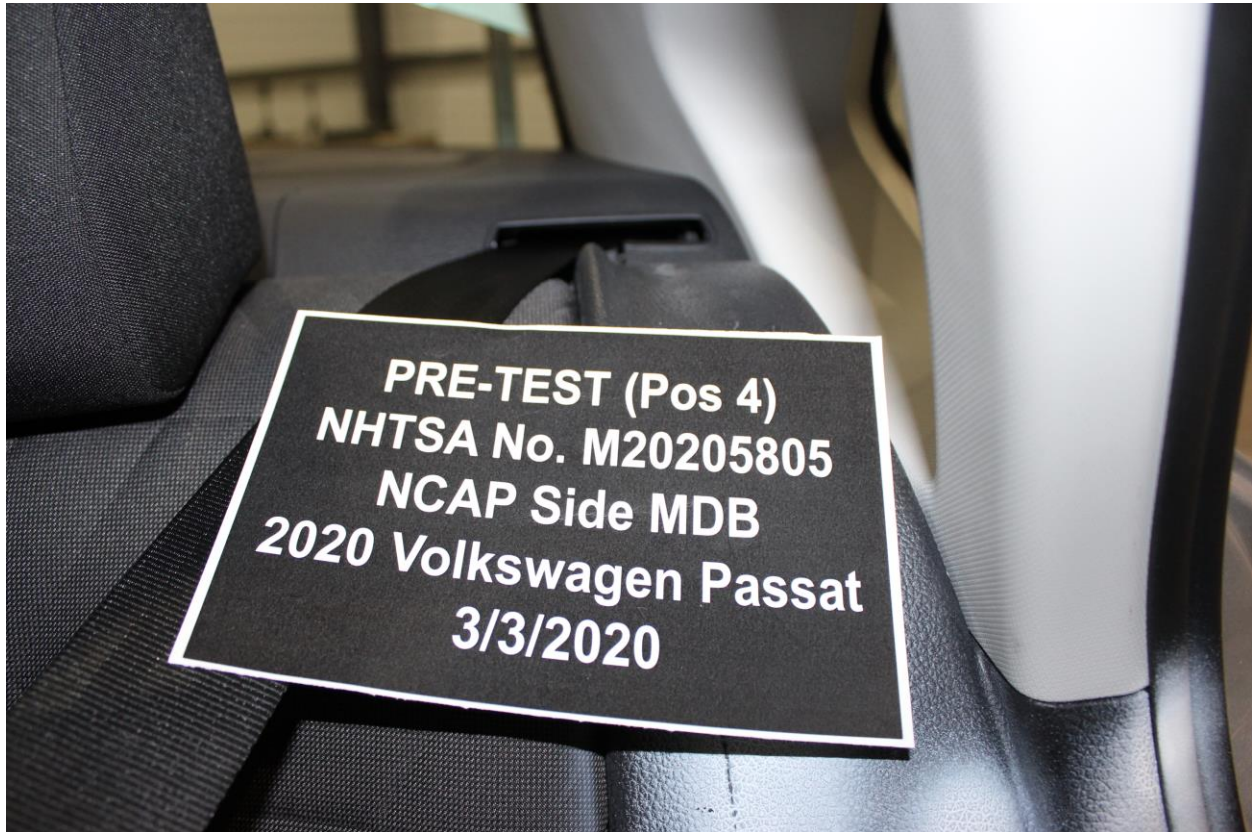


Figure A-65: Pre-Test View of Belt Anchorage for Rear Passenger Dummy



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

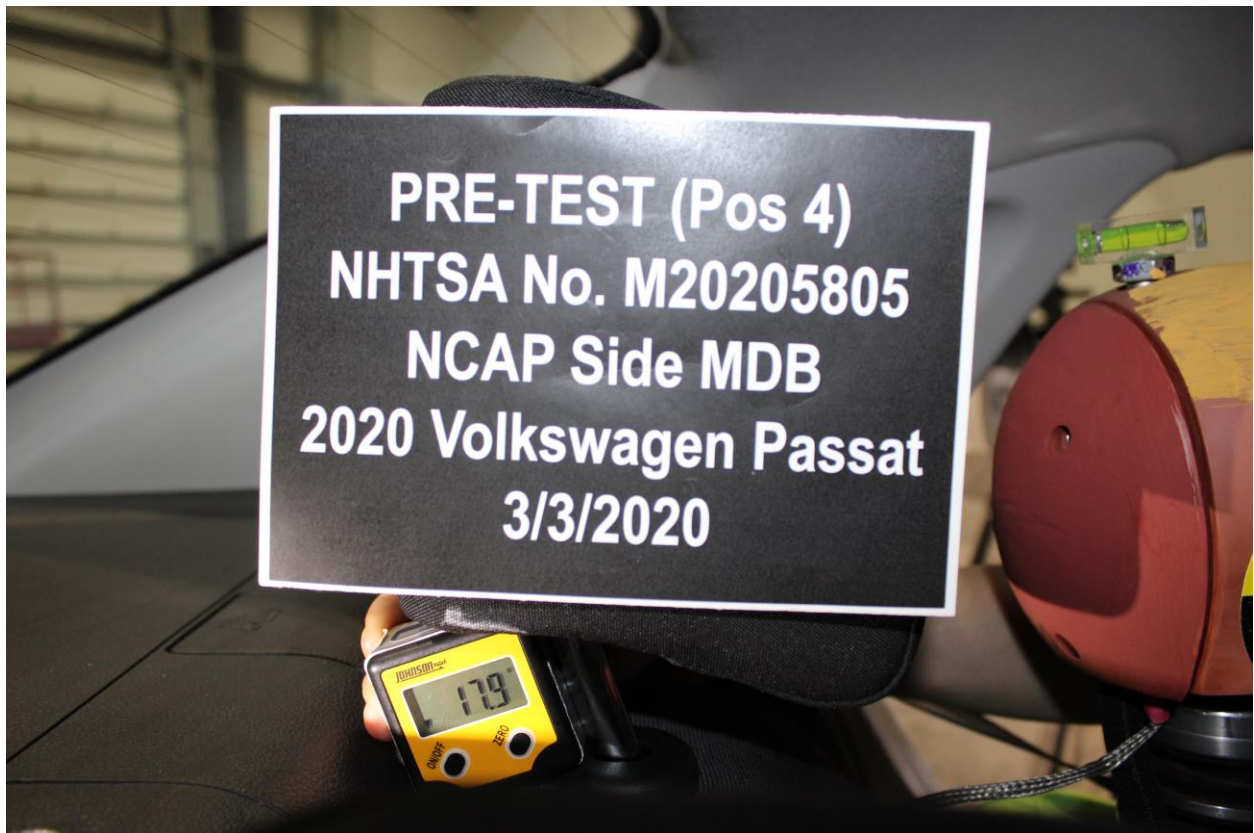


Figure A-68: Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint



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

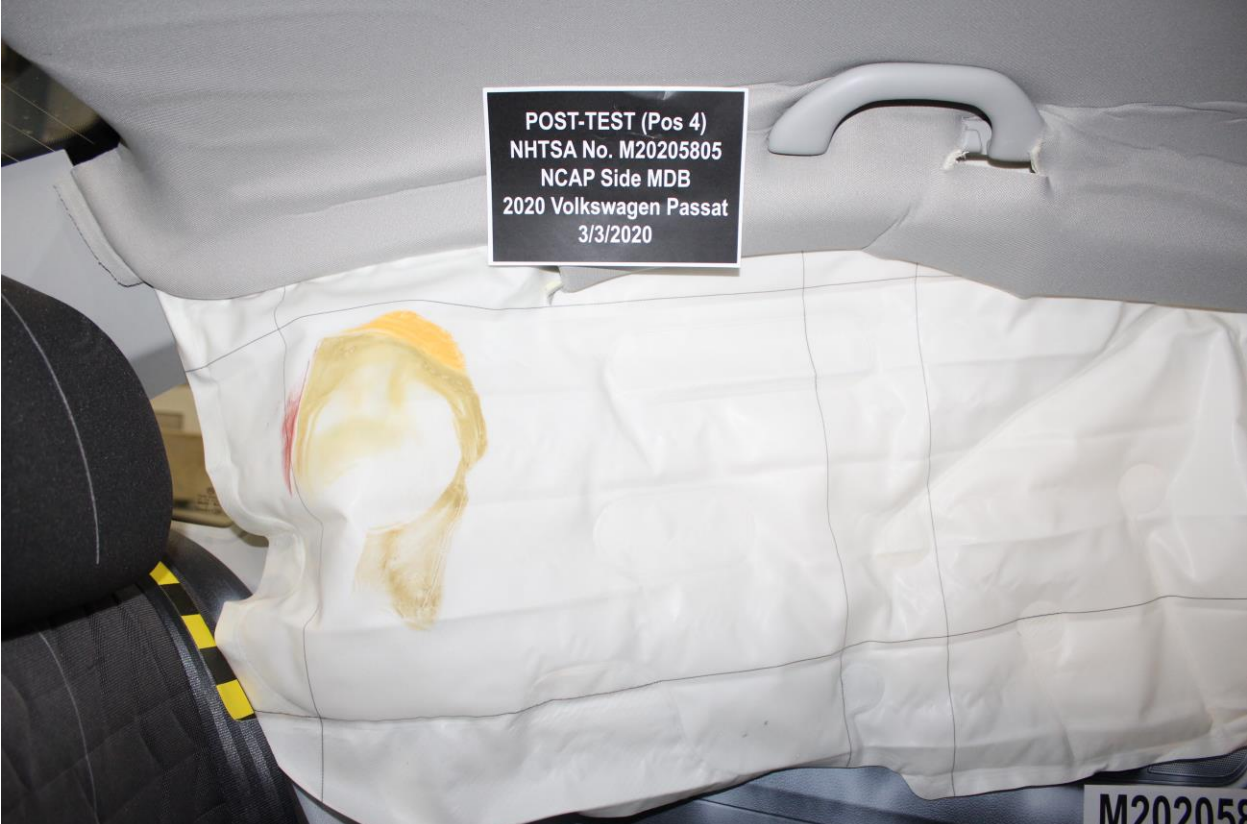


Figure A-76: Post-Test Rear Passenger Dummy Close-Up Head Contact with Side Air bag View



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



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

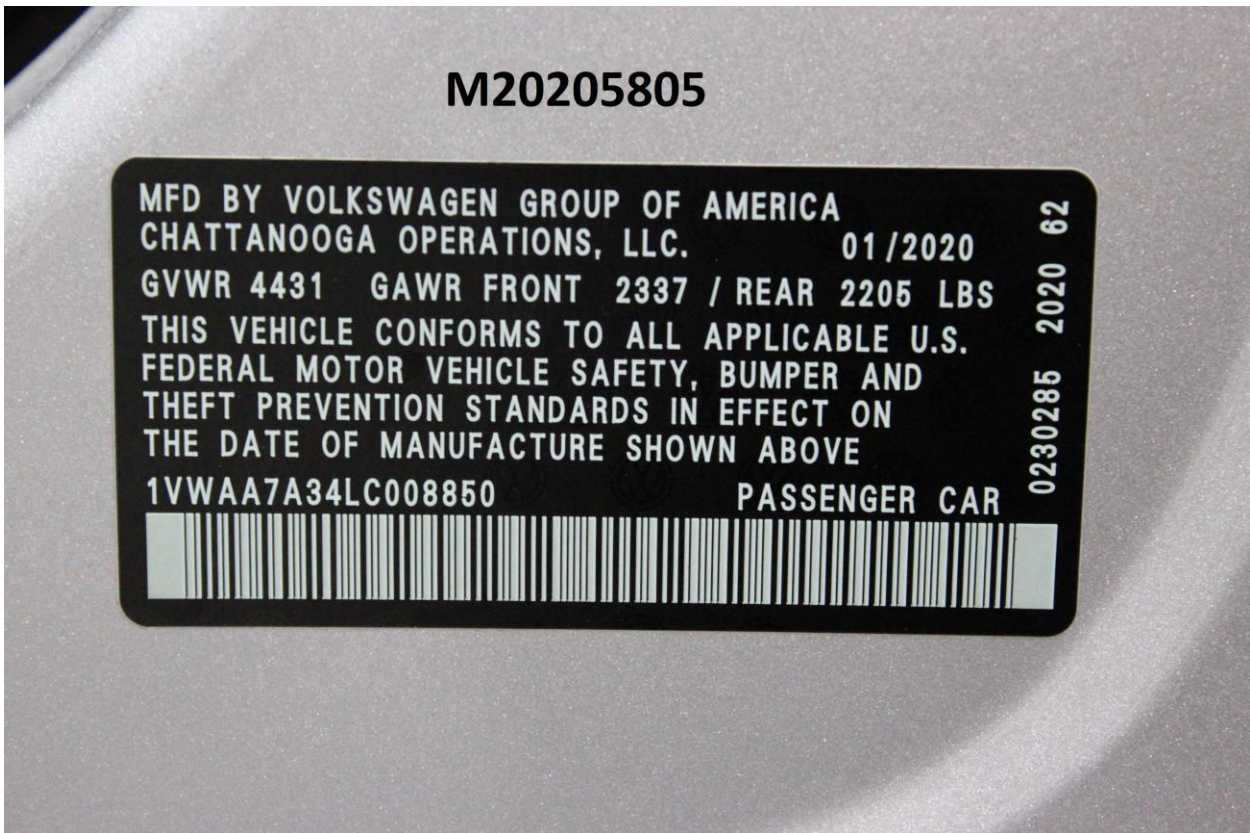


Figure A-92: Close-Up View of Vehicle's Certification Label



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

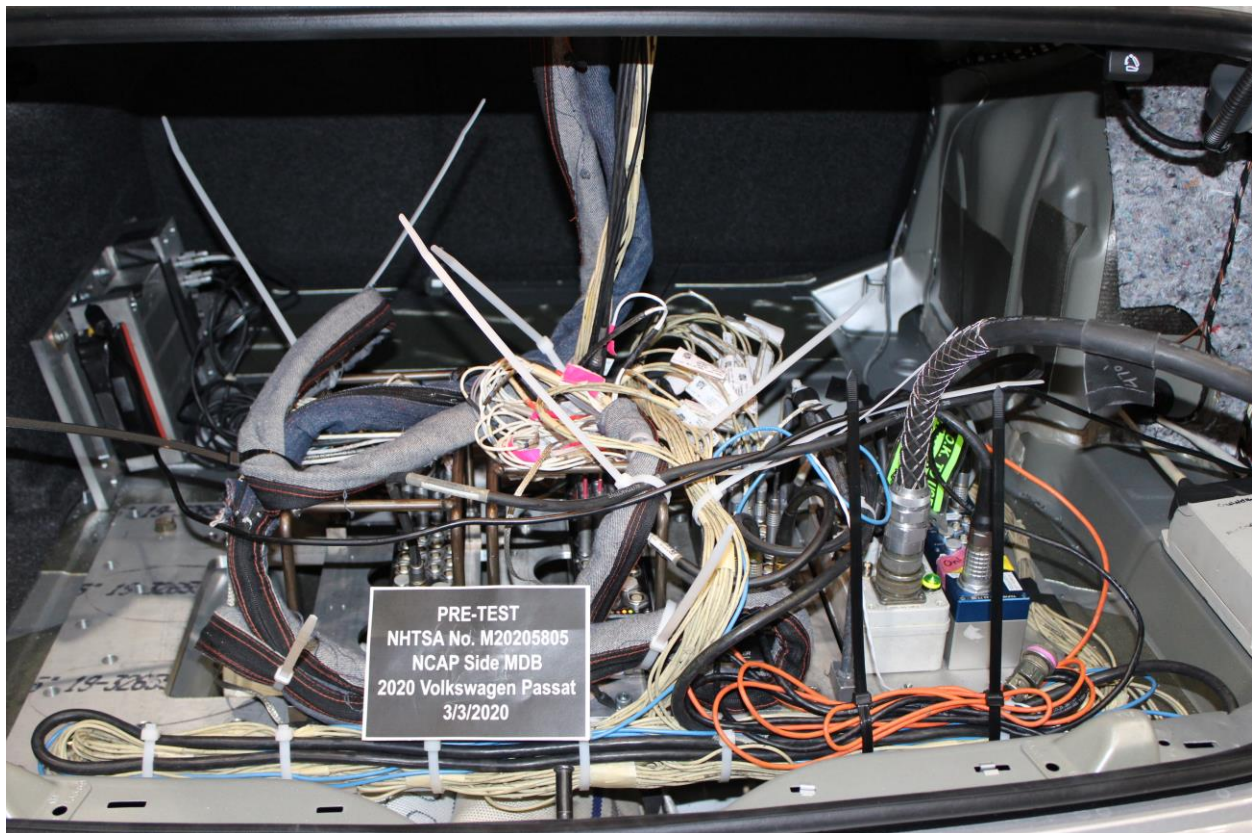


Figure A-94: Pre-Test Ballast View



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

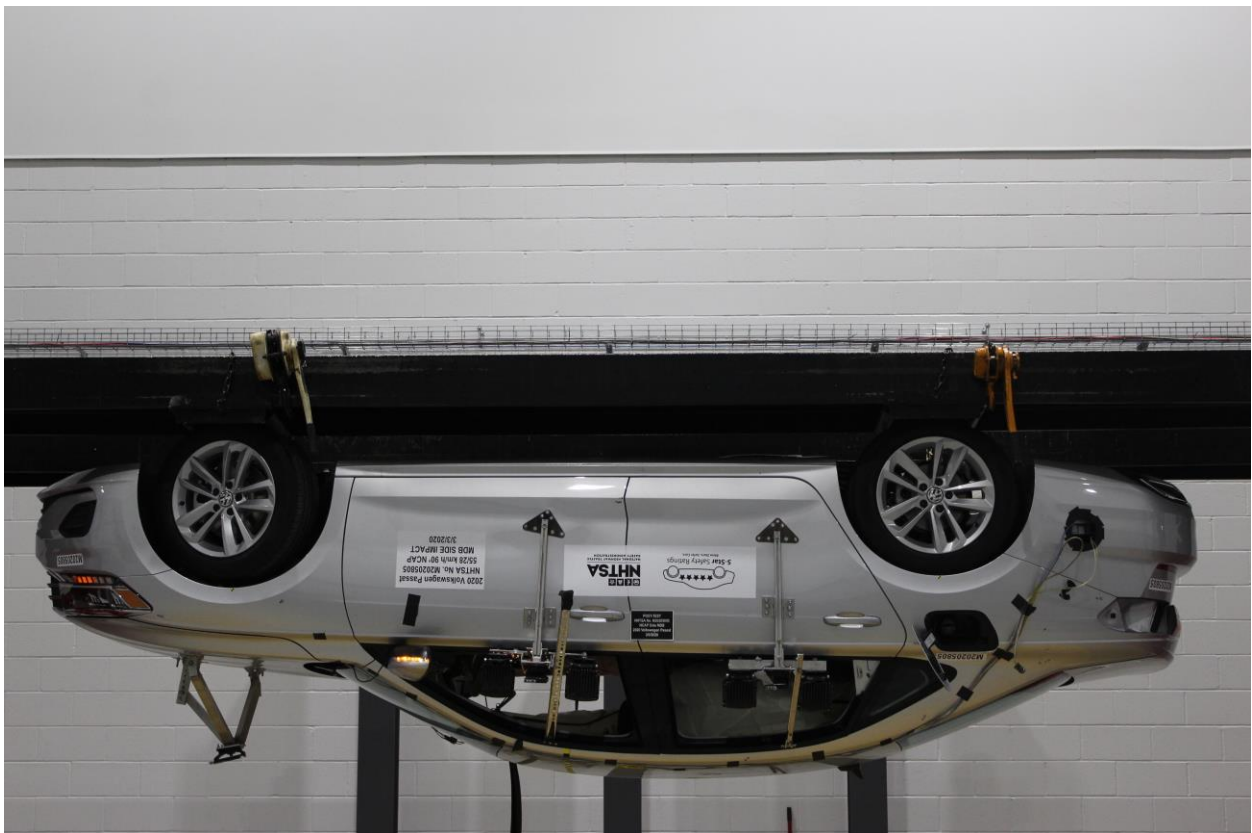


Figure A-98: FMVSS No. 301 Static Rollover 180 Degrees

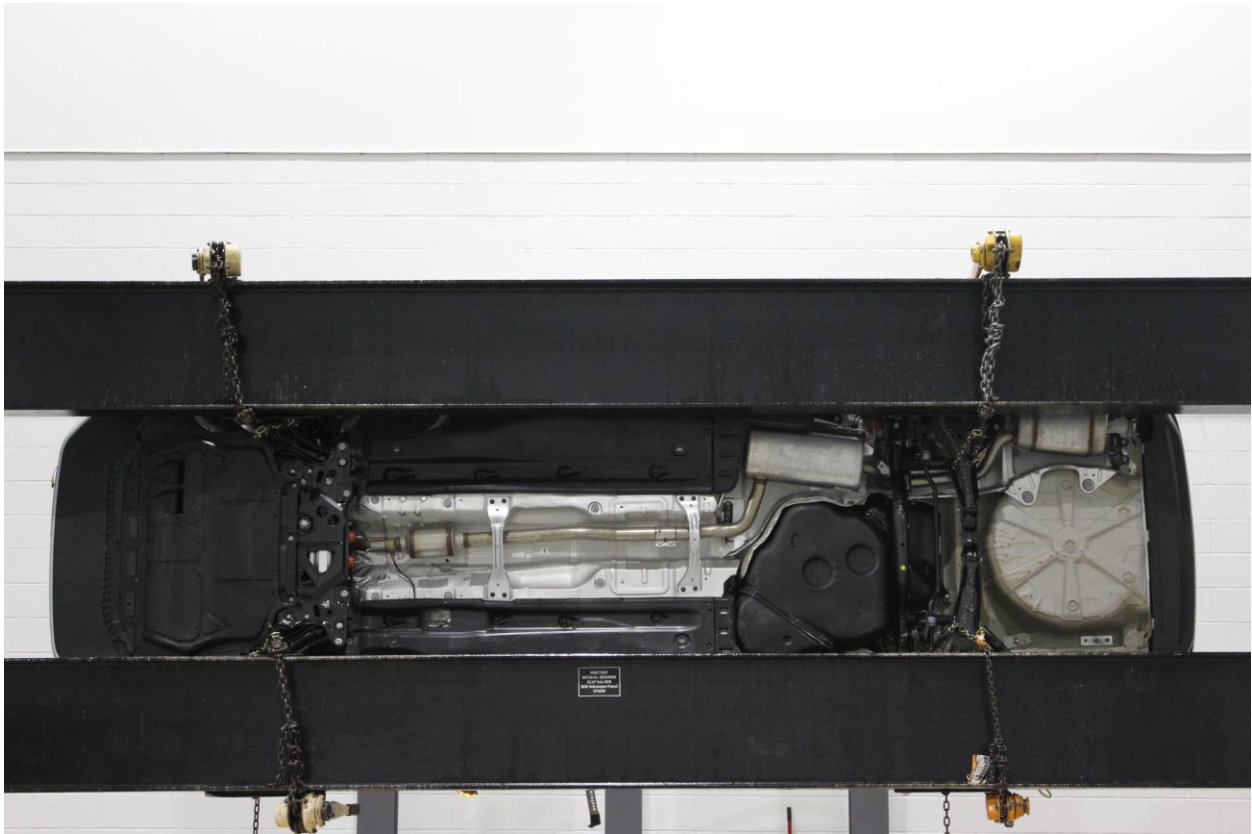


Figure A-99: FMVSS No. 301 Static Rollover 270 Degrees

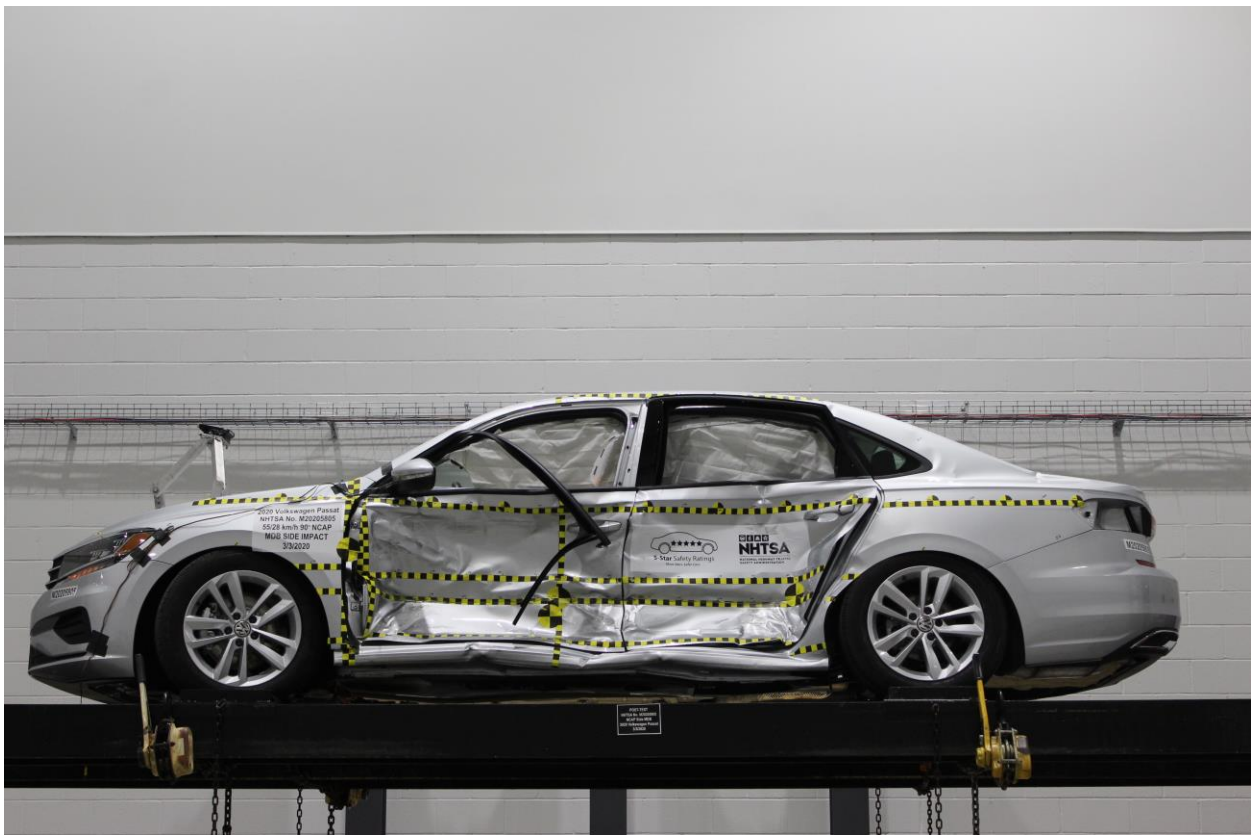


Figure A-100: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-101: Impact Event

EPA DOT Fuel Economy and Environment Gasoline Vehicle		2020 Passat 2.0T S Reflex Silver Metallic Exterior 6-speed Automatic w/ Tiptronic® Titan Black Cloth Interior			
Fuel Economy 27 MPG 23 city 34 highway 3.7 gallons per 100 miles		You save \$0 in fuel costs over 5 years compared to the average new vehicle.		STANDARD FEATURES (unless replaced by packages or options) PERFORMANCE - 2.0L TSI® 16-valve DOHC turbocharged 4-cylinder engine w/ direct fuel injection - Front-wheel drive - Four-wheel independent suspension - 4-mode-mechanical power steering w/ variable assistance	WARRANTY INFORMATION - Volkswagen New Vehicle Limited Warranty: 4 years/50,000 miles (whichever occurs first). Includes coverage for powertrain components* - Limited Warranty against Corrosion Perforation: 7 years/100,000 miles (whichever occurs first)* *See owner's literature or dealer for important details and limitations.
Annual fuel cost \$1,500		Fuel Economy & Greenhouse Gas Rating (tailpipe only)		CAREFREE SCHEDULED MAINTENANCE - 2 years/20,000 miles (whichever occurs first)* *See owner's literature or dealer for important details and limitations.	
fuueleconomy.gov Calculate personalized estimates and compare vehicles.		Smog Rating (tailpipe only)		24-HOUR ROADSIDE ASSISTANCE - 3 years/36,000 miles (whichever occurs first), for towing, jump starts, tire changes, out-of-fuel & lock-out.* Services provided by third party supplier. *See owner's literature or dealer for important details and limitations.	
GOVERNMENT 5-STAR SAFETY RATINGS Overall Vehicle Score Not Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.		PARTS CONTENT INFORMATION For vehicles in this carline: U.S./CANADIAN PARTS CONTENT: 44% Major sources of foreign parts content: MEXICO 24% JAPAN 16% Note: parts content does not include final assembly, distribution or other non-parts costs. For this vehicle: Final assembly point: CHATTANOOGA TN, U.S.A. Country of origin: MEXICO TRANSMISSION: JAPAN		EXTERIOR - 17" alloy wheels w/ all-season tires - Automatic, LED headlights & LED Daytime Running Lights (DRL); LED taillights - Heated, foldable, power adjustable side mirrors w/ integrated turn signals - Variable intermittent front wipers	
Frontal Crash Driver Not Rated Passenger Not Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.		TECHNOLOGY & CONVENIENCE - Forward Collision Warning & Autonomous Emergency Braking (Front Assist) - Blind Spot Monitor & Rear Traffic Alert - Power door locks & trunk release w/ remote featuring panic button - Anti-theft engine immobilizer - Composition Media: touchscreen AMF/MHD Radio™ w/ USB input, voice control & SiriusXM® Satellite Radio (w/ limited time trial subscription) - 8-speaker sound system - Bluetooth® connectivity (for compatible devices) - VW App-Connect® (Smartphone Integration & Interface) - Cruise control - Color multi-function display (MFD) w/ trip computer		Interior - Manual climate control - 3-spoke steering wheel, multi-function - Tilting & telescoping adjustable steering column - Front seats: 6-way manual (includes height adjustment) - Rear seat: 3-passenger, 60/40 split-folding w/ center armrest. - Cloth seating surfaces - Center console w/ cup holders, armrest & storage - Lockable glove compartment - Dual front reading lights	
Side Crash Front Seat Not Rated Rear Seat Not Rated Based on the risk of injury in a side impact.		Rollover ★★★★★ Based on the risk of rollover in a single-vehicle crash.		Manufacturer's Suggested Retail Price: \$22,995.00	
Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236		VIN: 1WVA7A3L4C88850 		Total Suggested Vehicle Price: \$24,235.00 Fuel, license, title fees, taxes and dealer-installed accessories are not included.	
SOLD TO: 408158 MAGUIRE VOLKSWAGEN 370 ELMIRA RD ITHACA, NY 14850		SHIP TO: 408158 MAGUIRE VOLKSWAGEN 370 ELMIRA RD ITHACA, NY 14850		Destination Charge \$920.00 Ready to make this your new ride? Apply now with Volkswagen Credit! Volkswagen Credit	

Figure A-102: Monroney Label

- Position the head restraint correctly above the head restraint guides with both guide pins and insert into the guides of the corresponding backrest.
 - Push the head restraint as far down as possible while pressing the button → fig. 72 ② fully.
 - Adjust the head restraint to the correct seat position and allow to lock into place.
- Removing the rear head restraint**
- Release the backrest of the rear bench seat and fold forwards.
 - Slide the head restraint all the way upward → fig. 73 ① in the direction of the arrow, and hold in this position.
 - At the same time, press button → fig. 73 ② while a second person pulls the head restraint all the way out.
 - Fold the rear bench seat backrest toward the rear and lock it securely into place.
- Installing the rear head restraint**
- Release the backrest of the rear bench seat and fold forwards.
 - Position the head restraint correctly above the head restraint guides and insert into the guides on the seat backrest.
 - Push the head restraint downward while pressing the → fig. 73 ② button.
 - Fold the rear bench seat backrest toward the rear and lock it securely into place.
 - Adjust the head restraint to the correct position.
- Seat functions**
- Memory function**

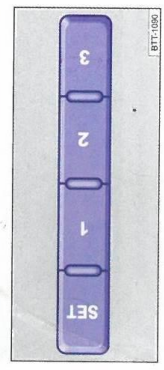


Fig. 74 On the outer side of the driver's seat: memory buttons.

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

Adjusting the head restraints

□ Please read the introductory information and heed the Warnings and Notice ▲ and ① on page 75.

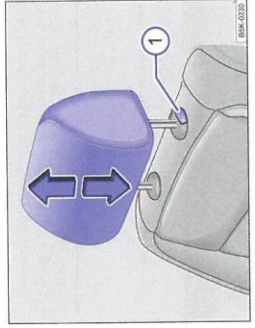


Fig. 70 Front head restraint: adjusting.

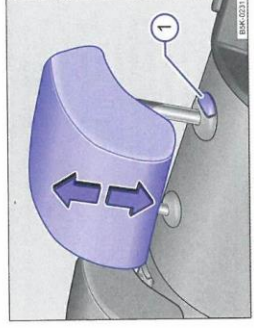


Fig. 71 Rear head restraint: adjusting.

Removing and installing the head restraints

□ Please read the introductory information and heed the Warnings and Notice ▲ and ① on page 75.

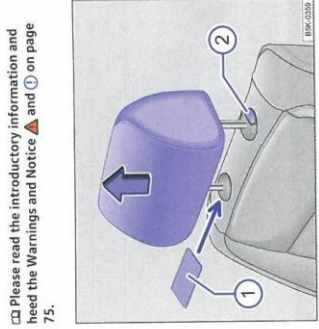


Fig. 72 Front head restraints: removing.

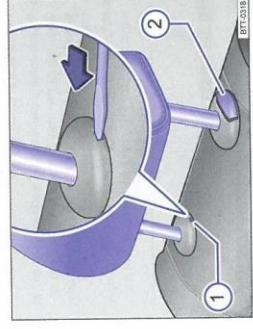


Fig. 73 Rear head restraint: removing.

Removing the front head restraints

- If necessary, adjust the seat backrest so that the head restraint can be removed.
- Slide the head restraint all the way upward → ▲ in Introduction on page 75.
- To unlock, insert a flat object, e.g. a plastic card → fig. 72 ① between the backrest cover and the head restraint guide pin cap.
- Pull the head restraint all the way out while pressing the button → fig. 72 ② fully.

Installing the front head restraints

- If necessary, adjust the seat backrest so that the head restraint can be installed.

Adjusting the height of the head restraints

- Slide the head restraint upward or downward in the direction of the arrow and when pressing the → fig. 70 ① or → fig. 71 ① button → ▲ in Introduction on page 75.

The head restraint must lock securely into place.

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

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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4	Driver Head Resultant Acceleration Primary vs. Time	B-5
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18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-9
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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

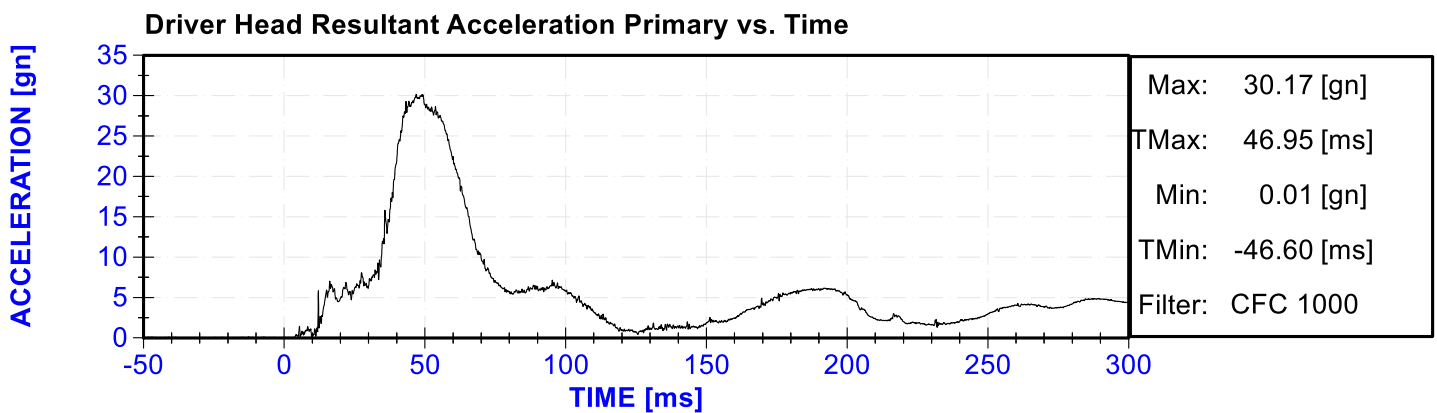
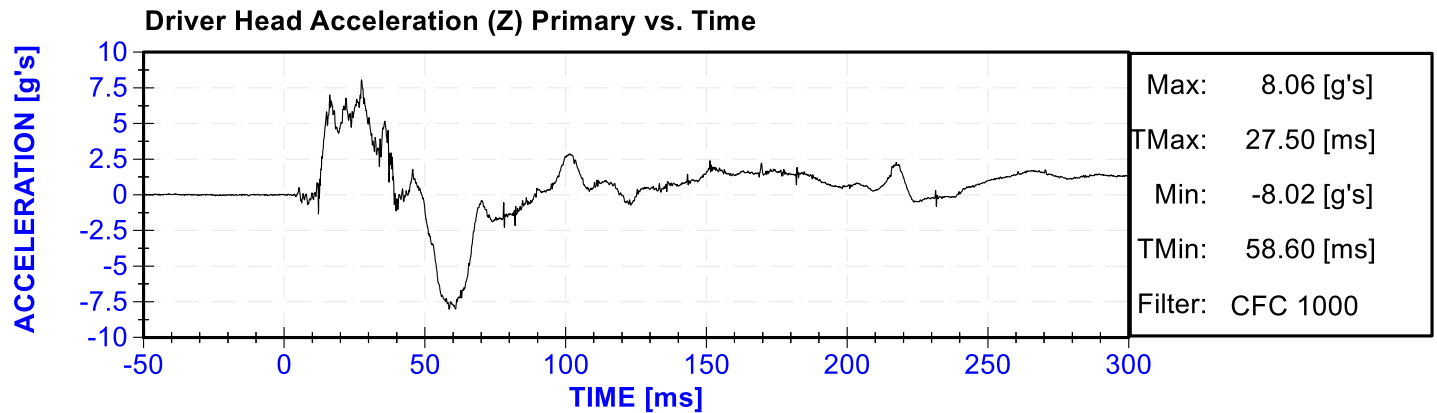
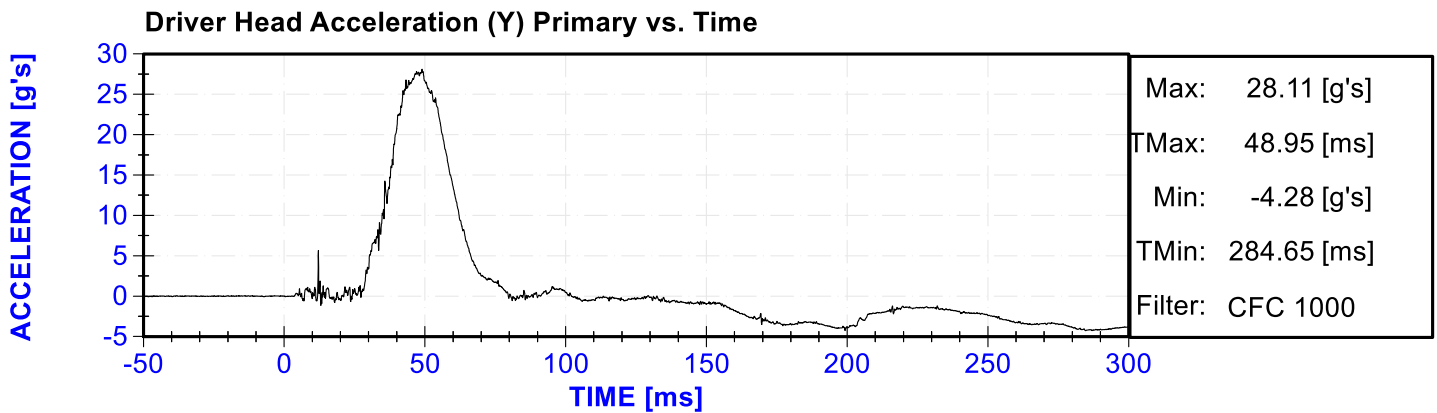
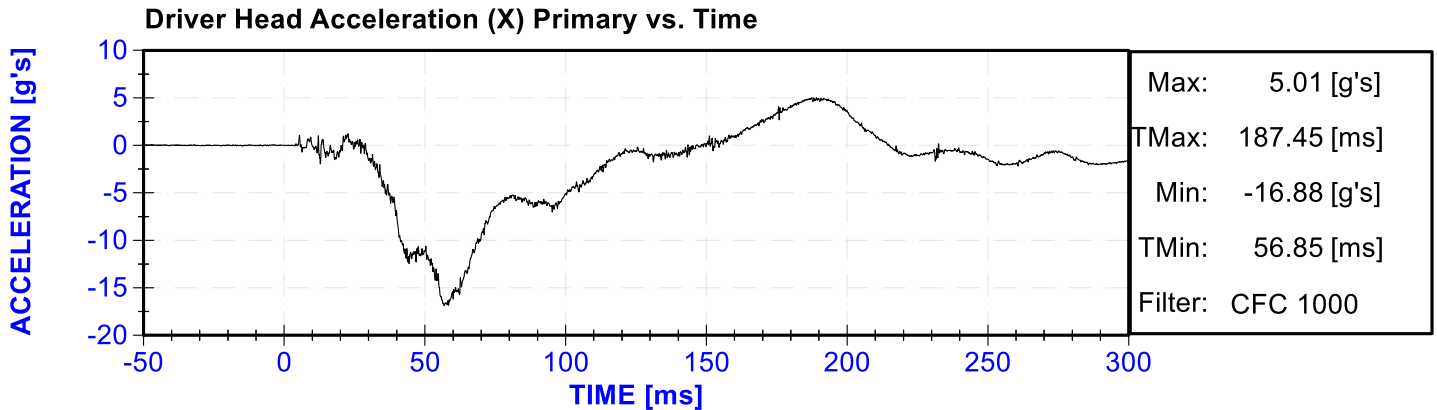
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Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)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

Vehicle Instrumentation Data

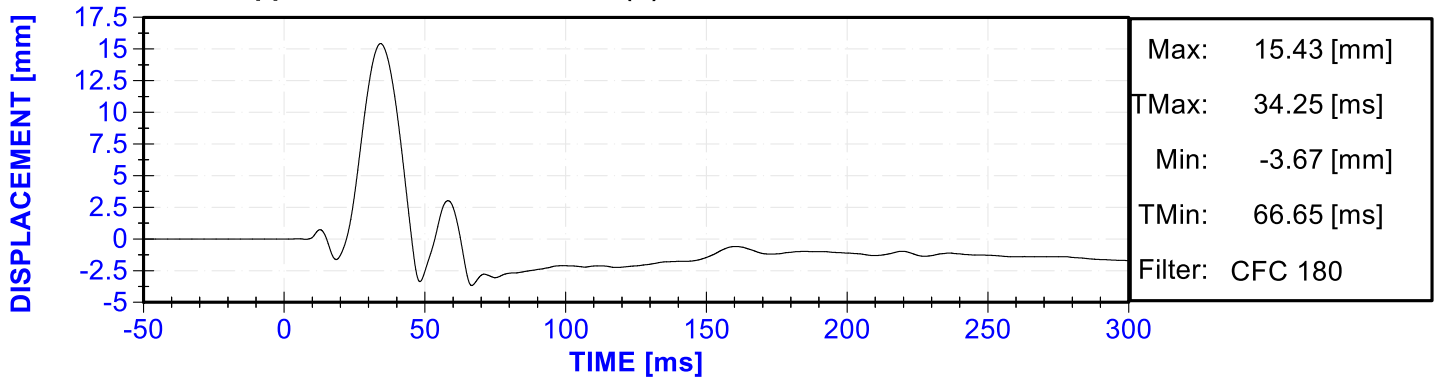
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration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

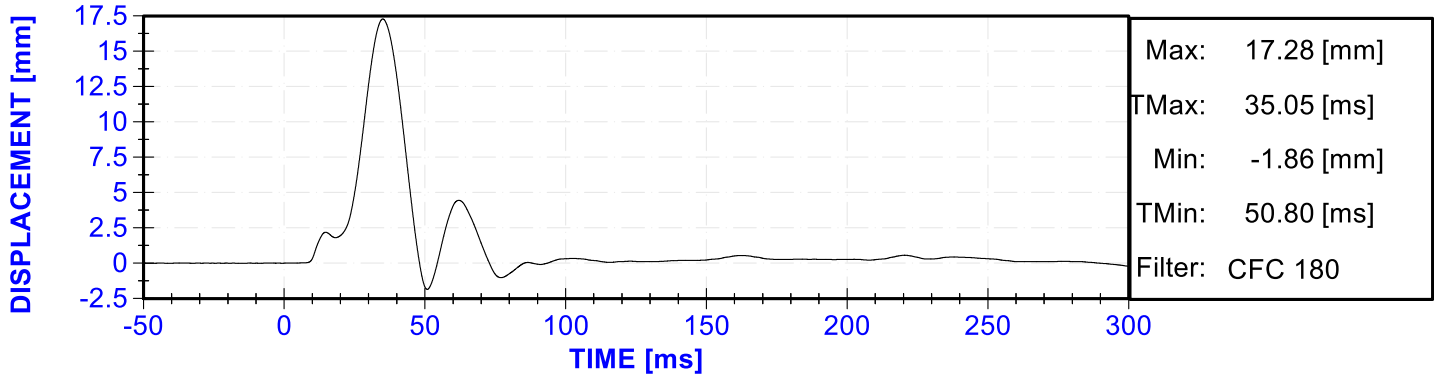
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch



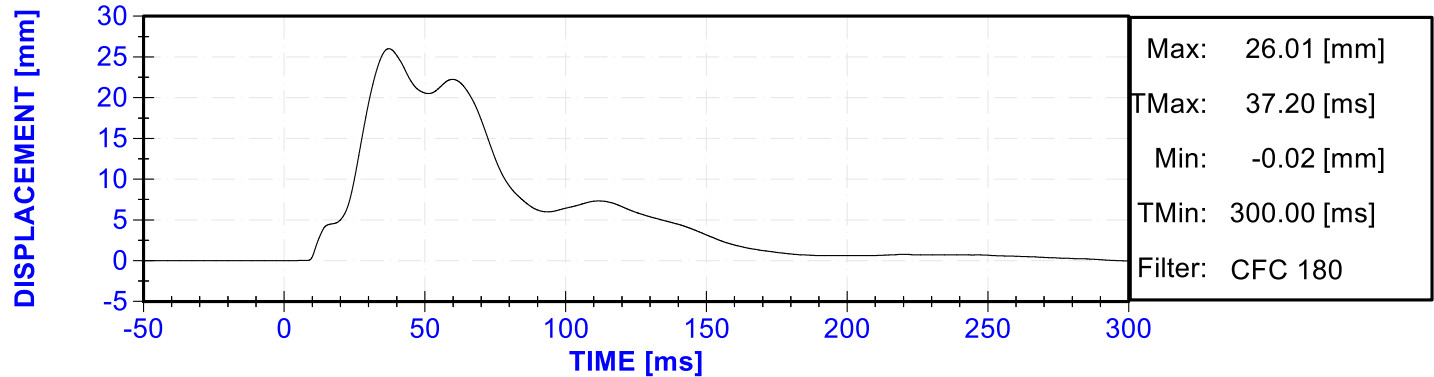
Driver Upper Thorax Rib Deflection (Y) vs. Time



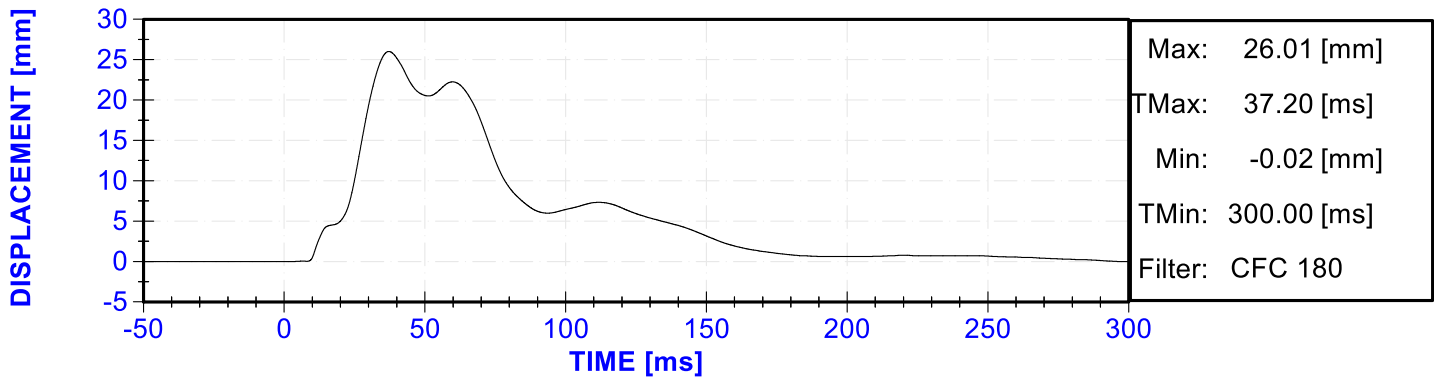
Driver Middle Thorax Rib Deflection (Y) vs. Time

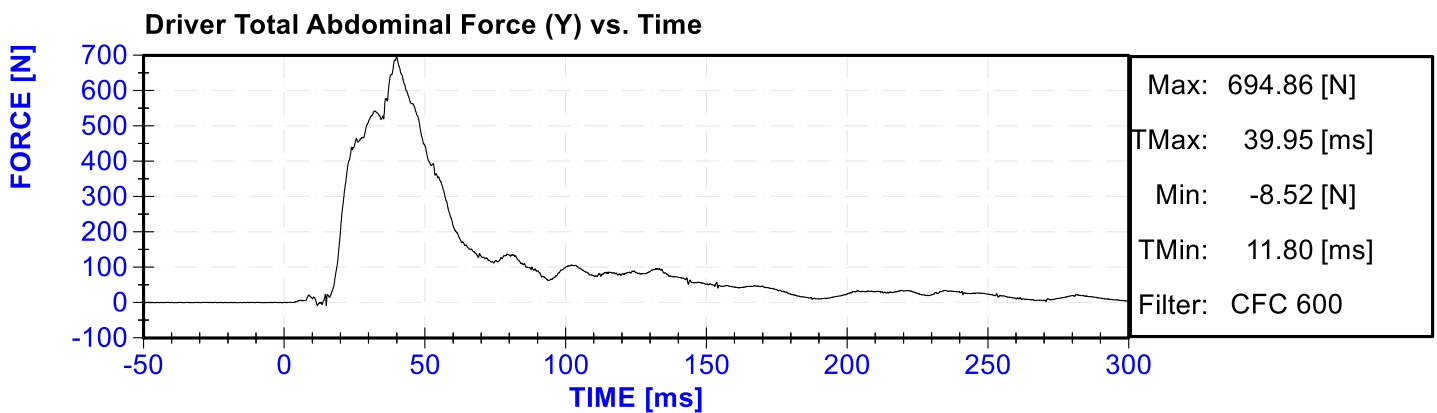
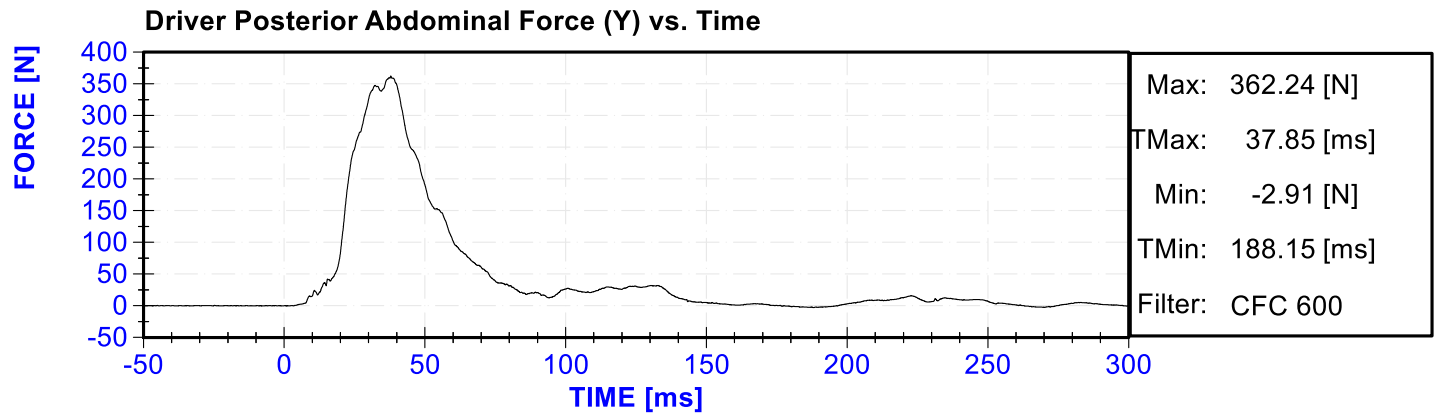
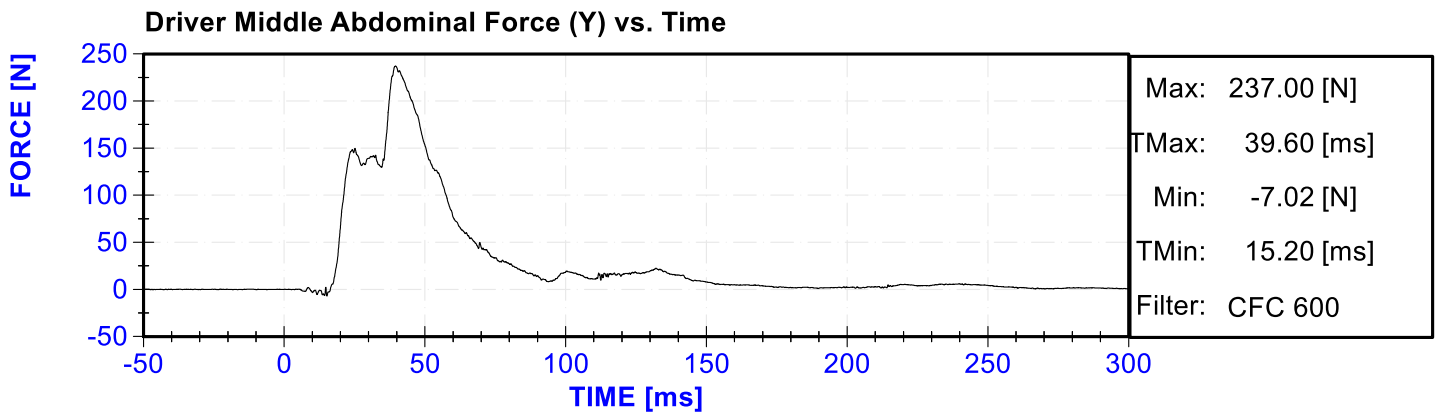
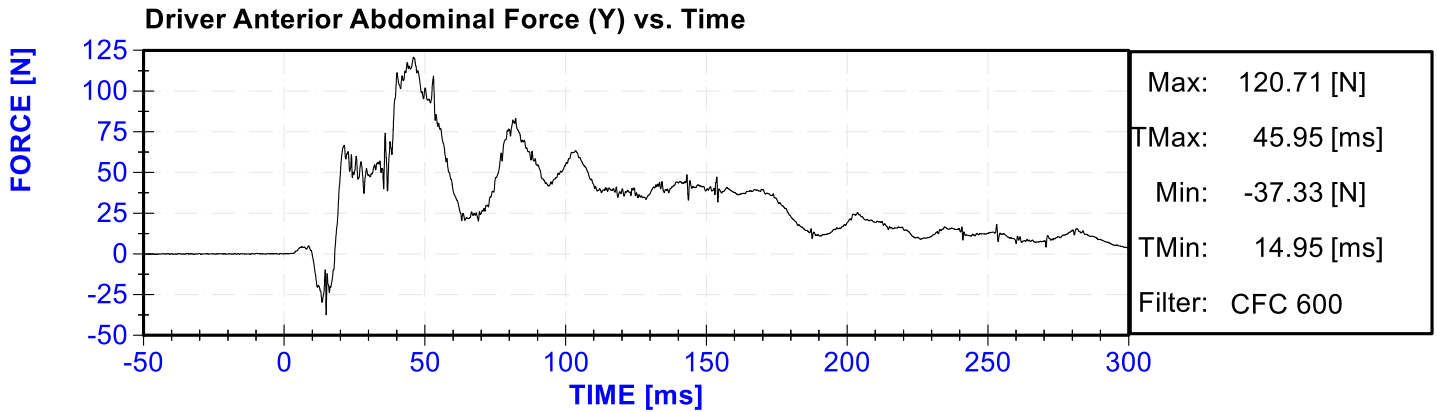


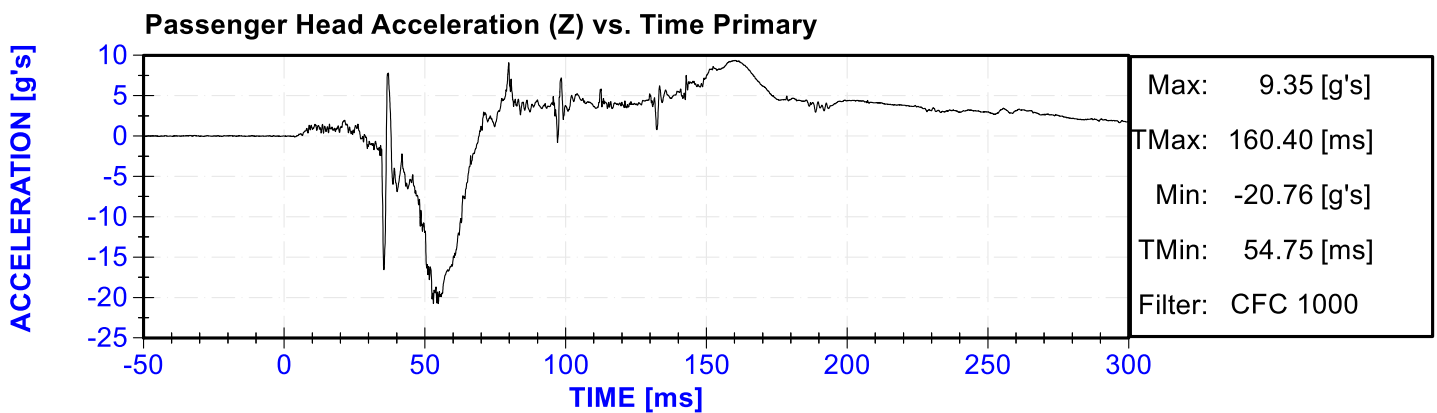
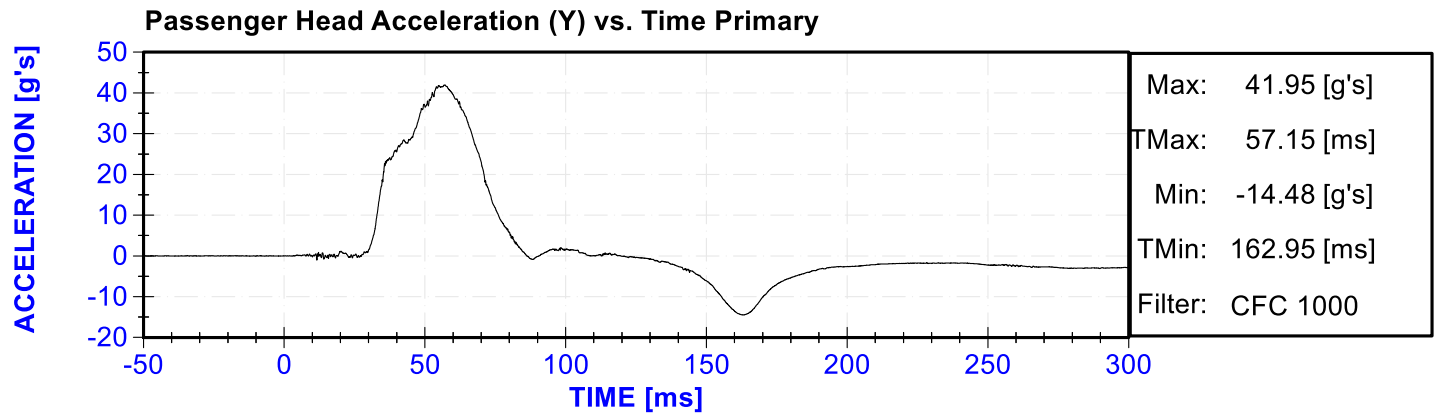
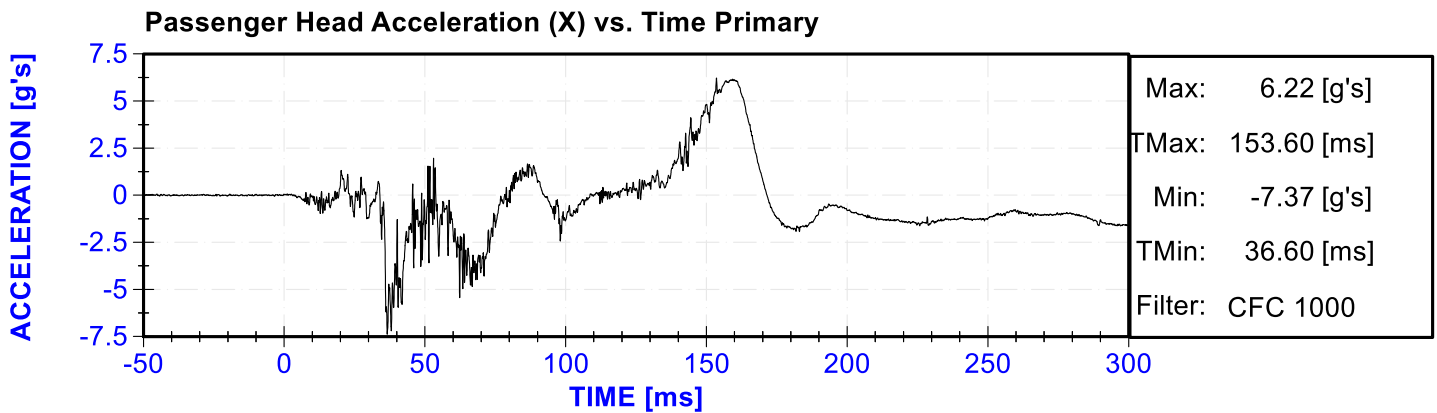
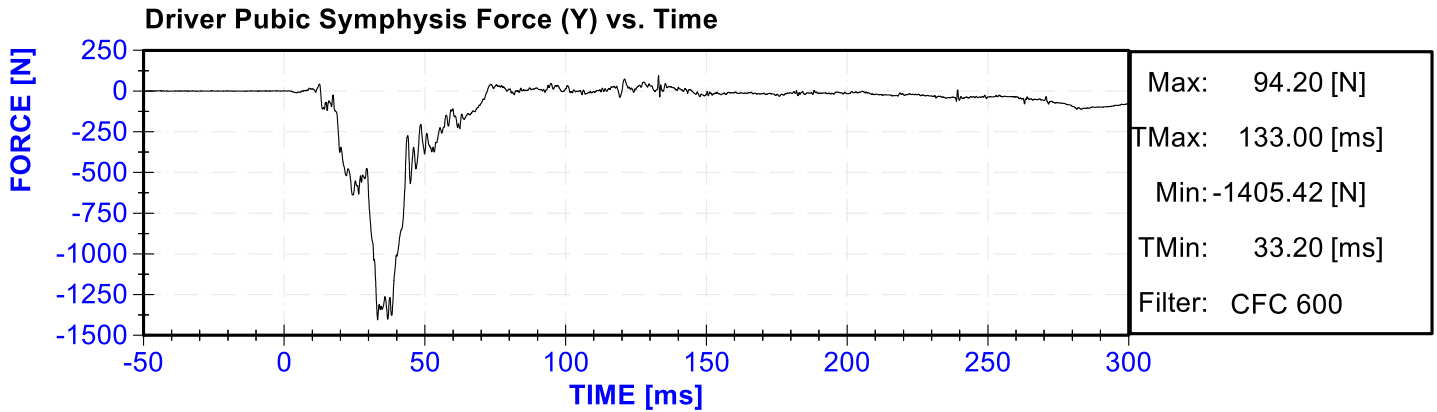
Driver Lower Thorax Rib Deflection (Y) vs. Time



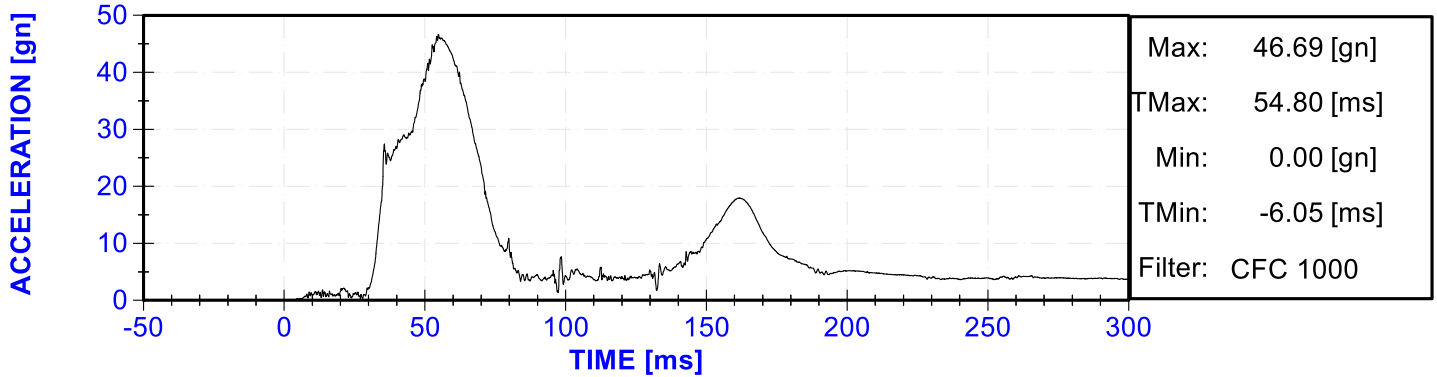
Driver Thorax Rib Deflection Maximum vs. Time



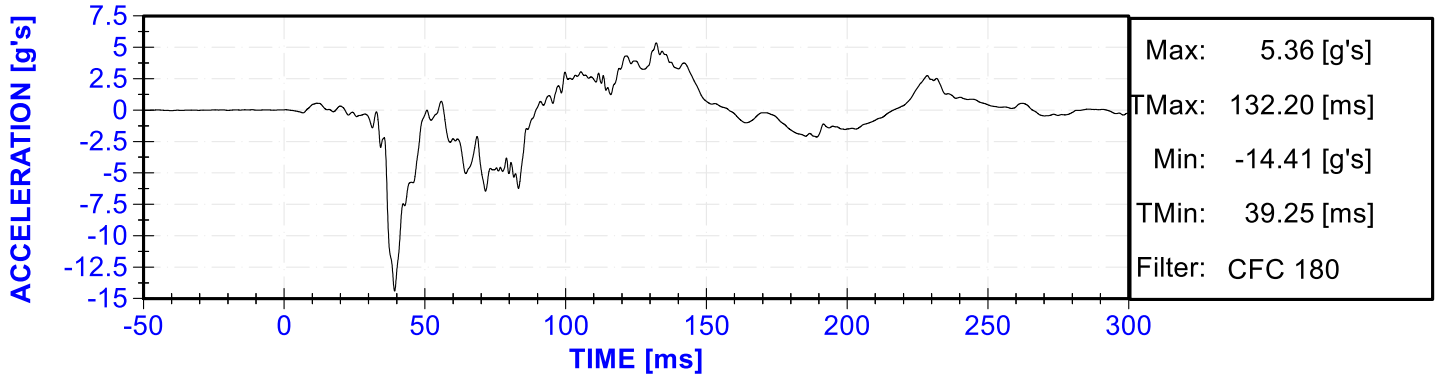




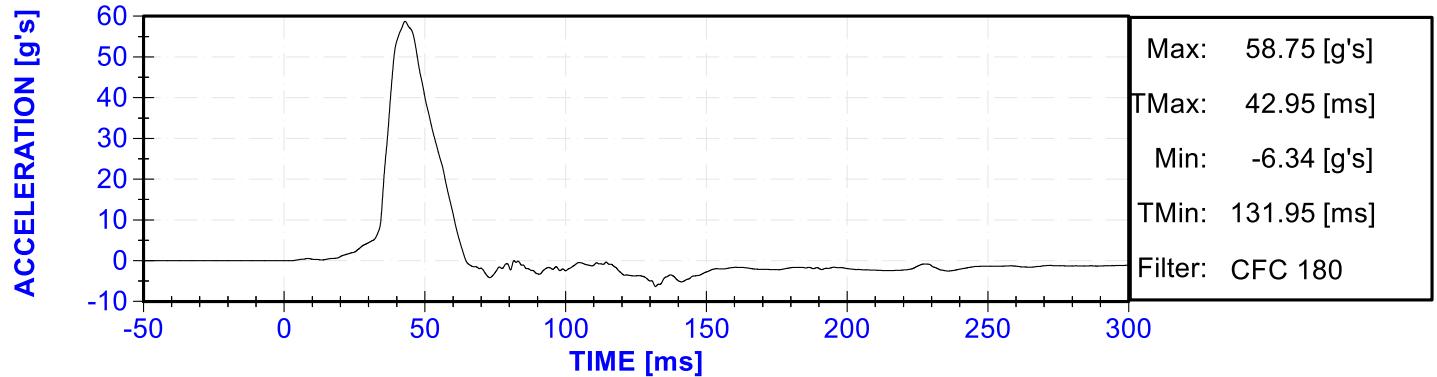
Passenger Head Resultant Acceleration Primary vs. Time



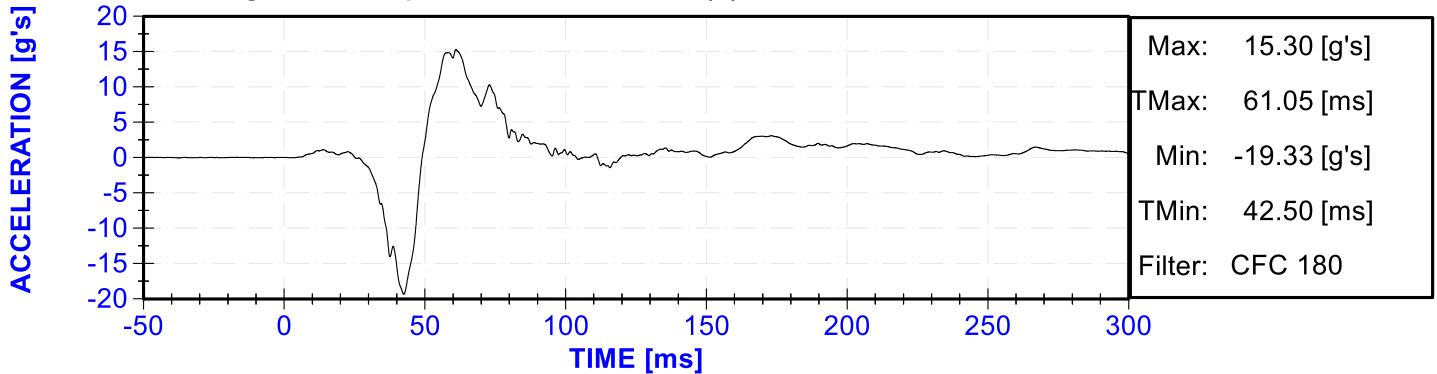
Passenger Lower Spine T12 Acceleration (X) vs. Time

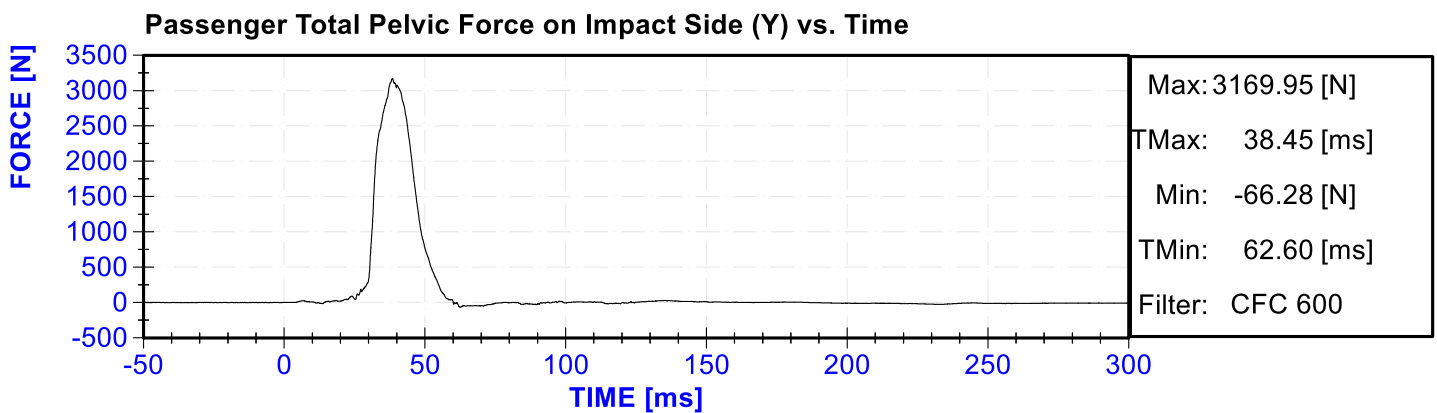
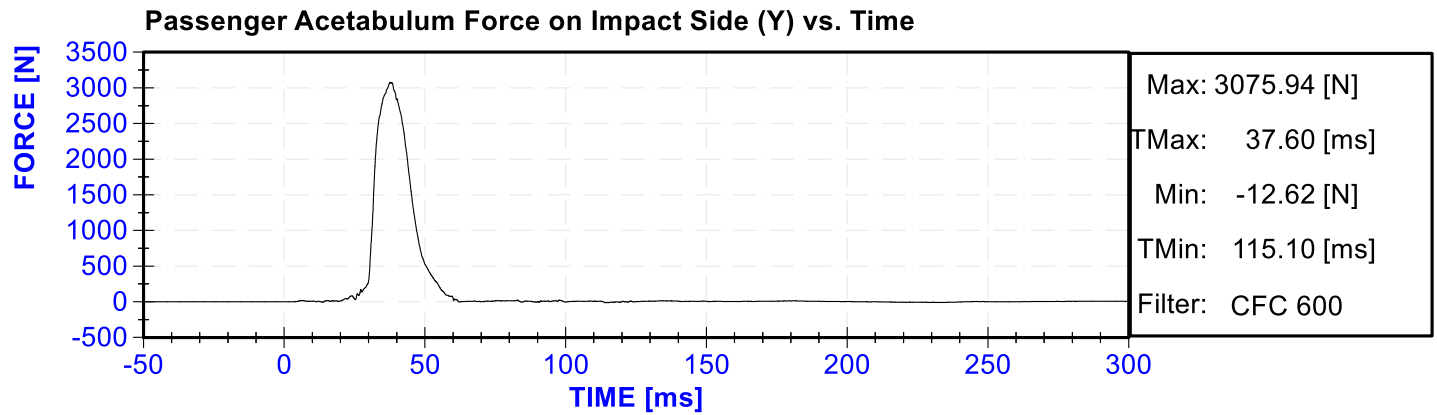
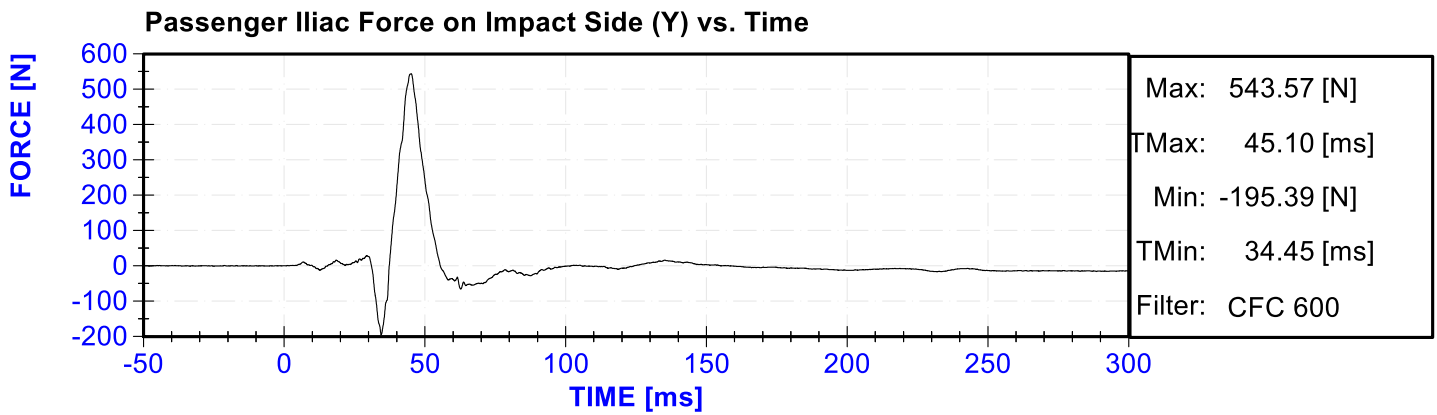
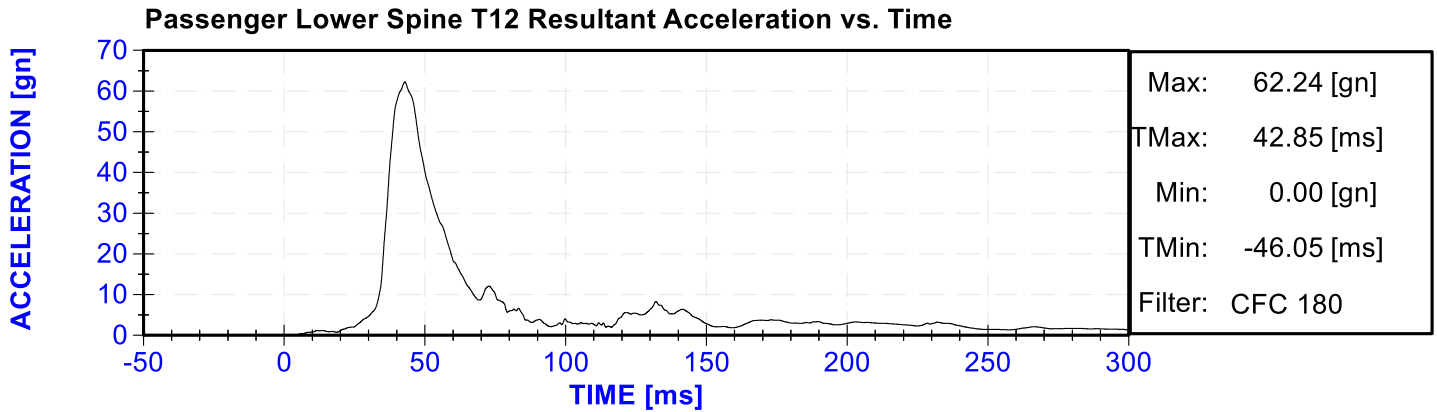


Passenger Lower Spine T12 Acceleration (Y) vs. Time



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)

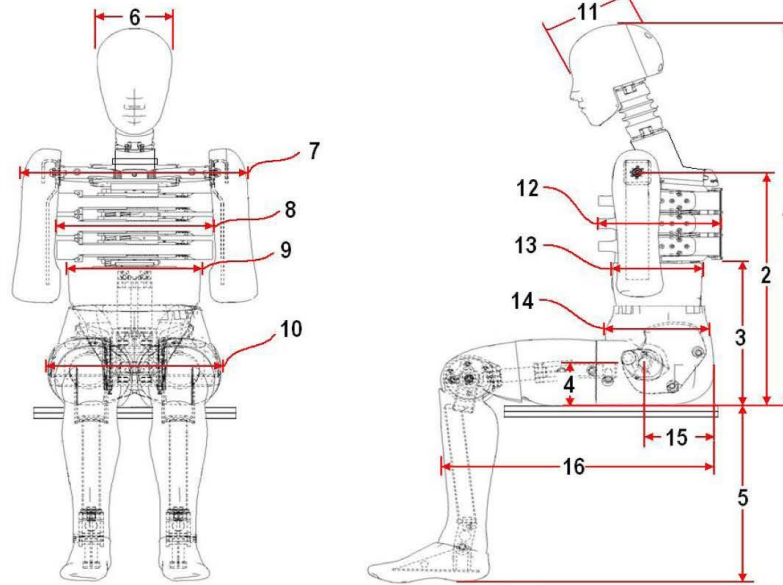


External Measurements - EuroSID-2re

Technician: K. Dutton

Date: 02/11/2020

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	569	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	327	Pass
9	Abdomen Width	273	287	284	Pass
10	Pelvis Lap Width	359	373	365	Pass
11	Head Depth	196	206	203	Pass
12	Thorax Depth	262	272	269	Pass
13	Abdomen Depth	194	204	202	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

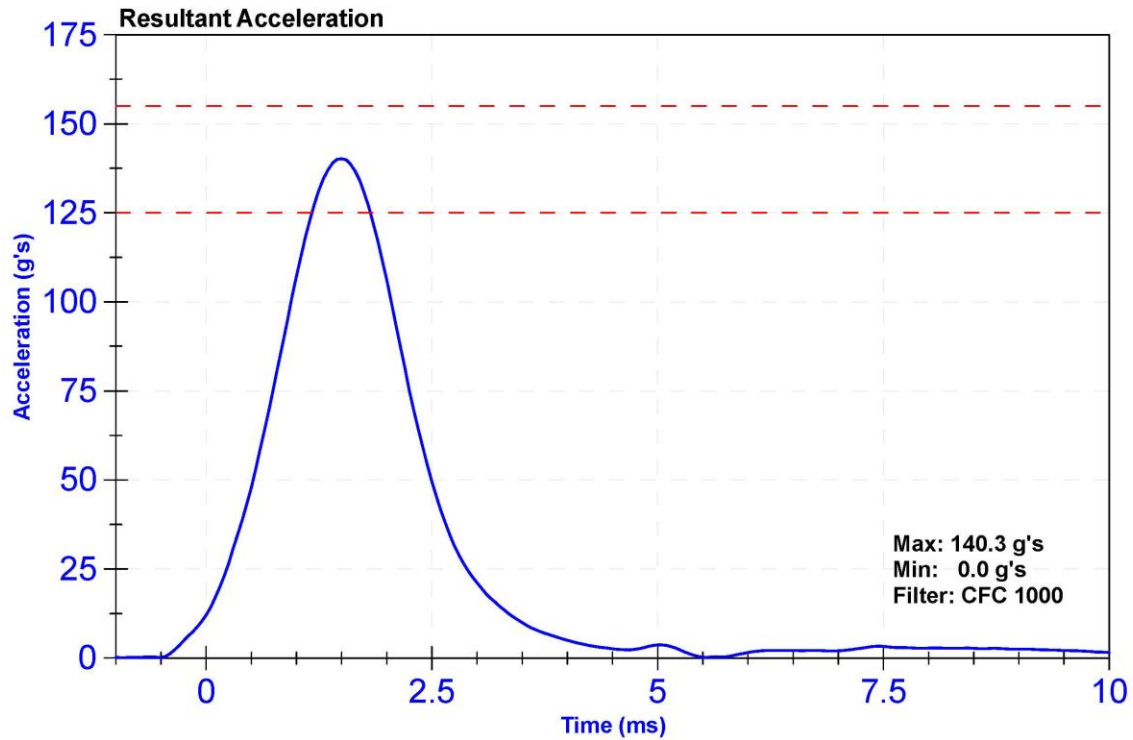
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

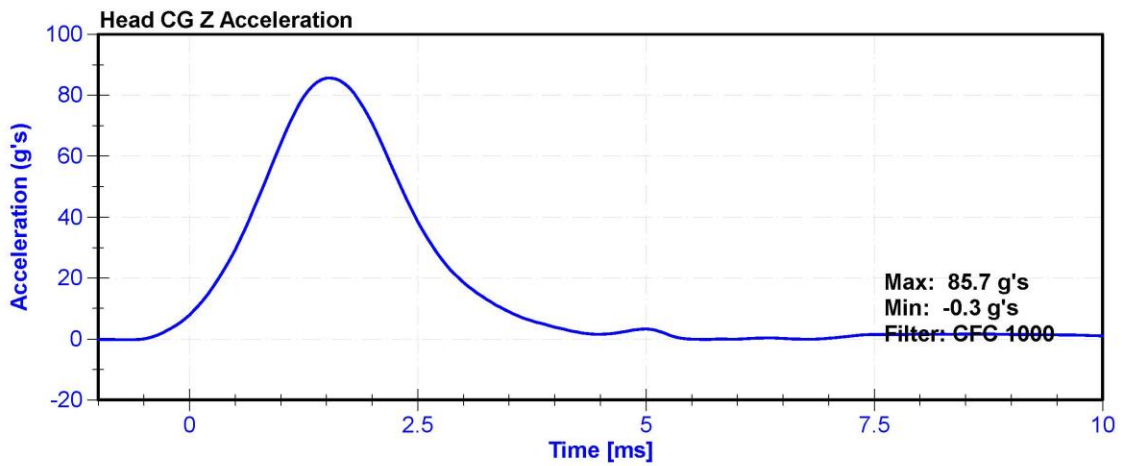
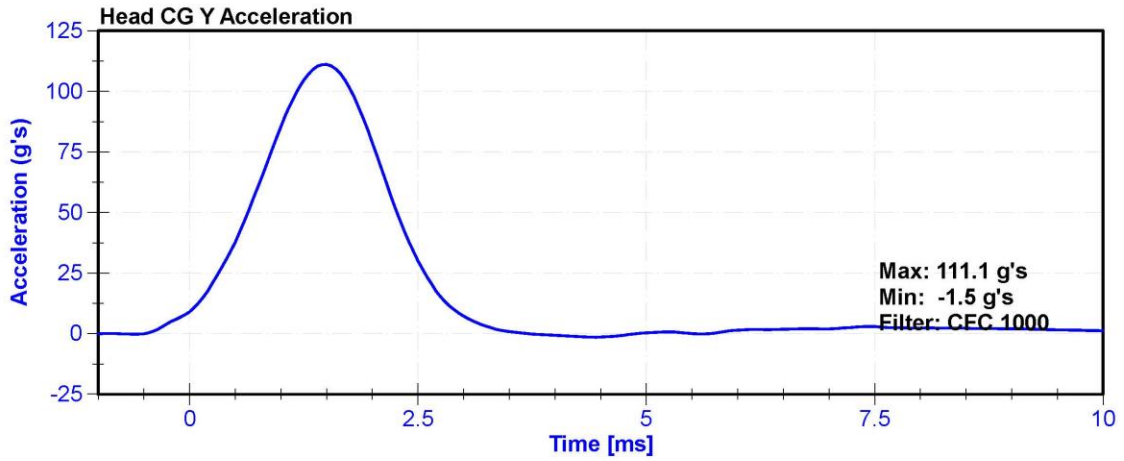
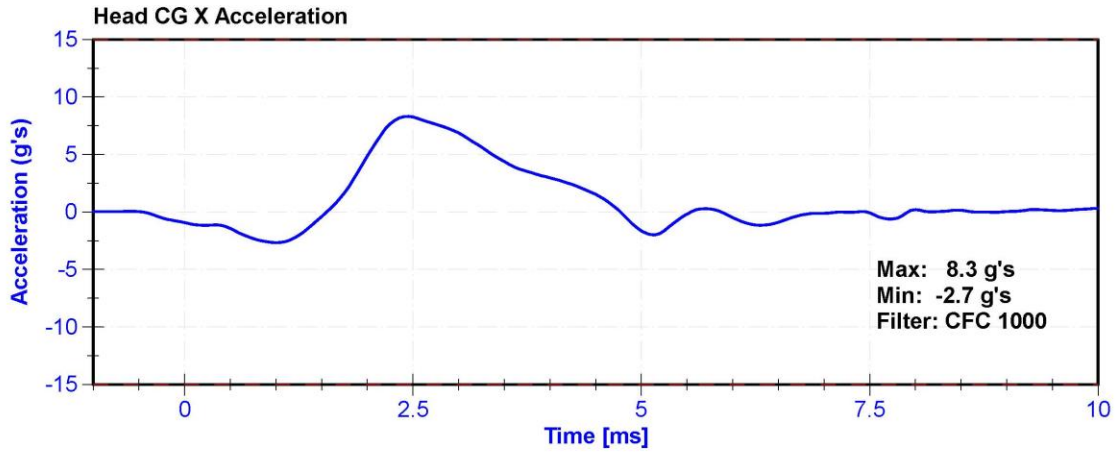
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	22.2	Pass
Resultant Acceleration	125	155	g's	140.3	Pass
Oscillation	0	15	%	2.63	Pass
Fore-Aft Acceleration	-15	15	g's	8.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P49204	10/29/2019	4/28/2020
Y Accelerometer	ENDEVCO 7264	AC-P63981	10/29/2019	4/28/2020
Z Accelerometer	ENDEVCO 7264	AC-P64007	10/29/2019	4/28/2020





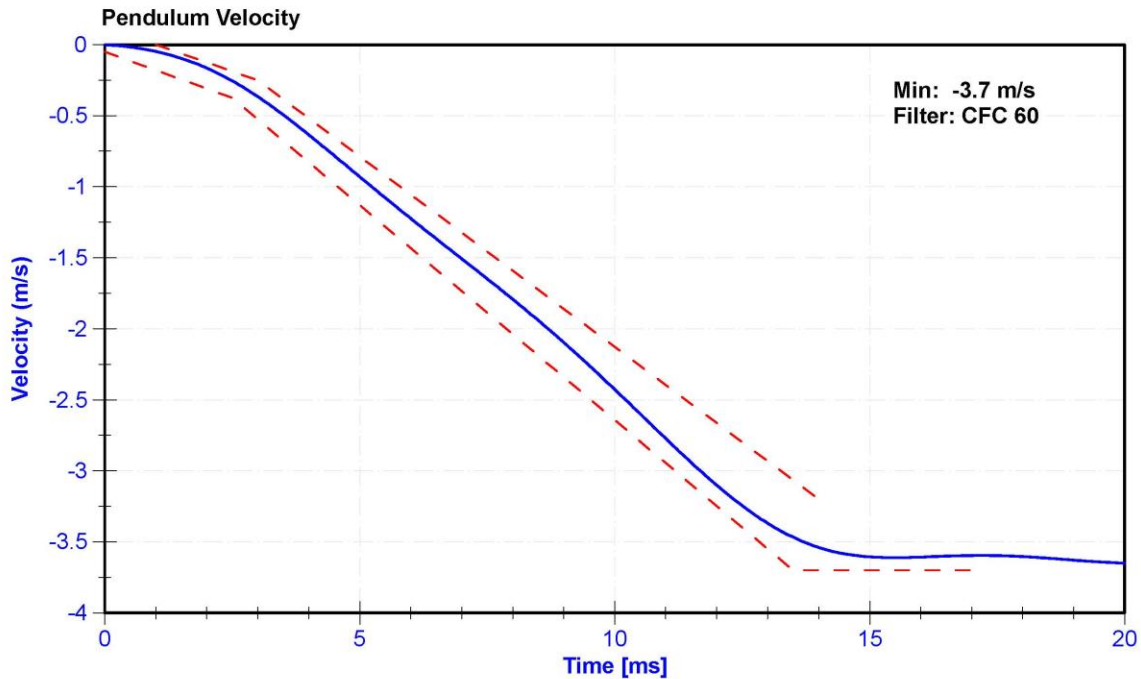
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

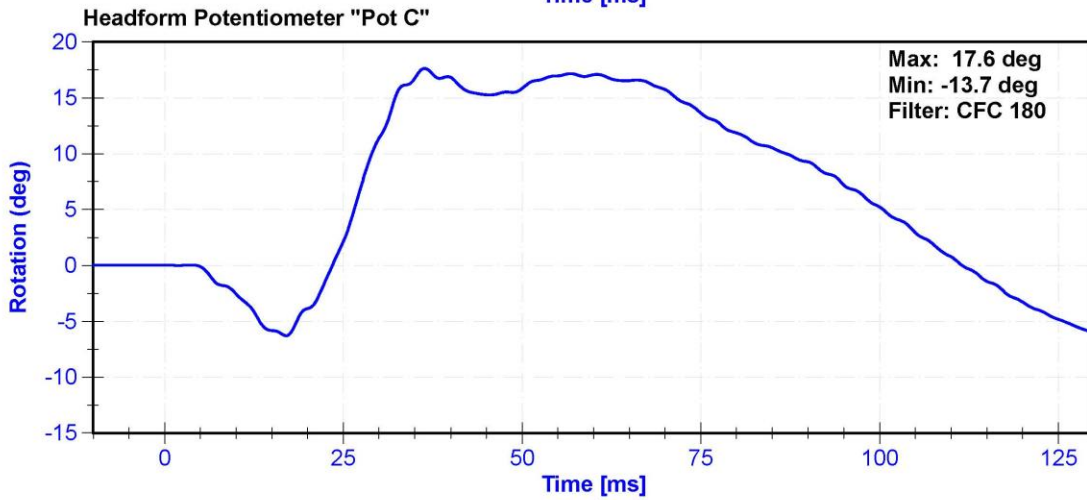
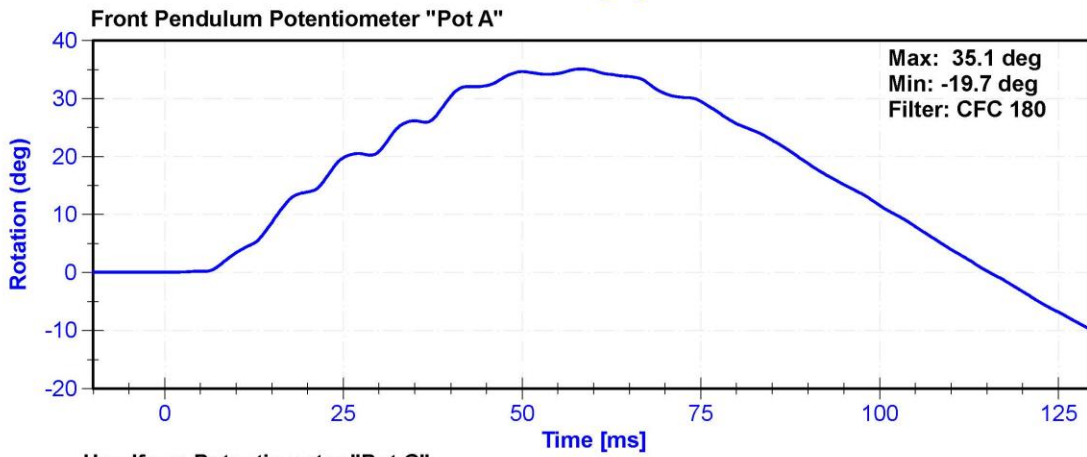
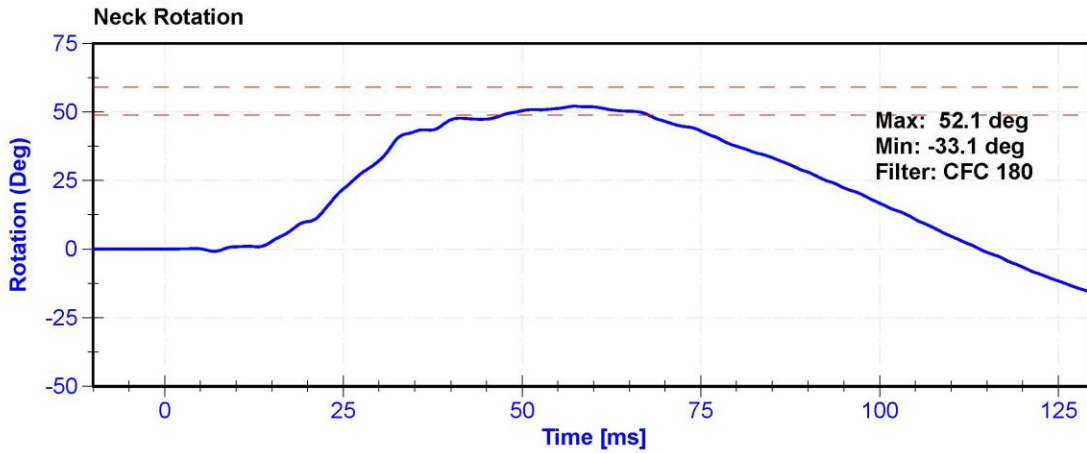
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	34.6	Pass
Velocity	3.3	3.5	m/s	3.37	Pass
Lateral Neck Rotation	49	59	deg	52.1	Pass
Time at Maximum Rotation	54	66	ms	57.3	Pass
Time of Rotation Decay from Maximum	53	88	ms	56.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CTAC	C16503 Striker	2/6/2020	2/5/2021
Front Pendulum Potentiometer	SP22G	DS-094	10/31/2019	10/30/2020
Headform Potentiometer	SP22G	DS-095	10/31/2019	10/30/2020





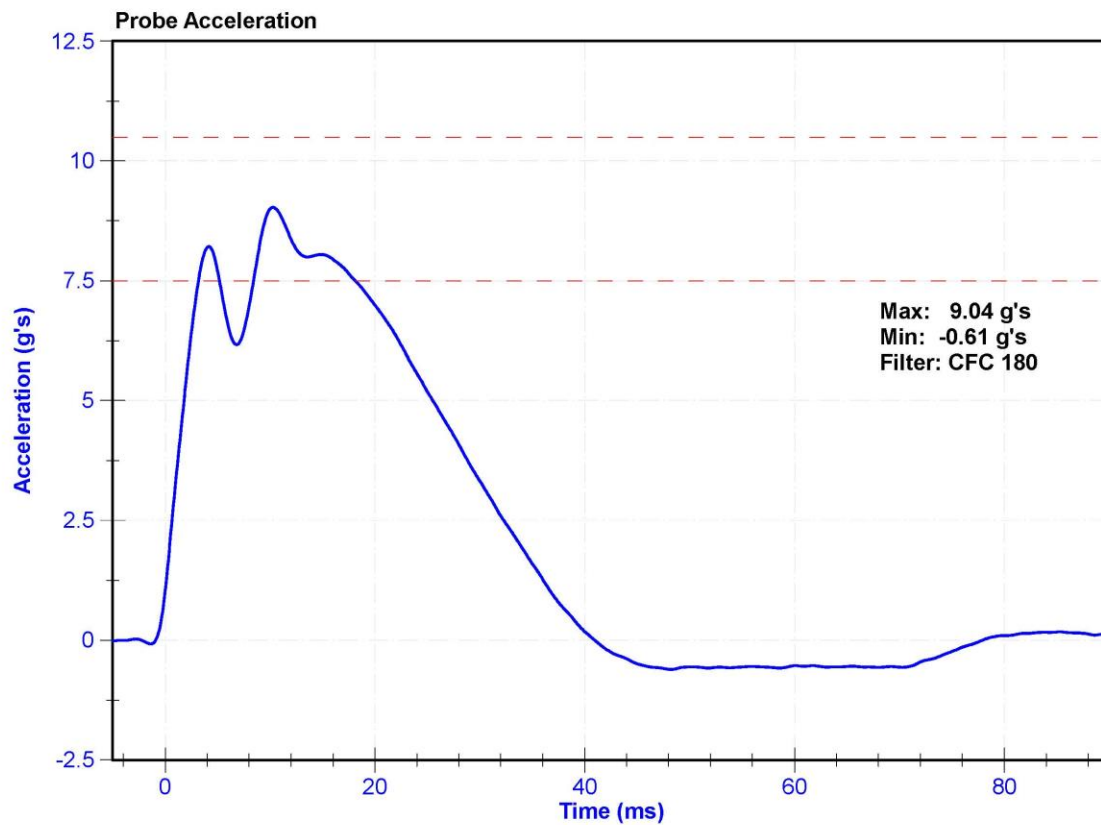
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	7.5	10.5	g's	9.04	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020



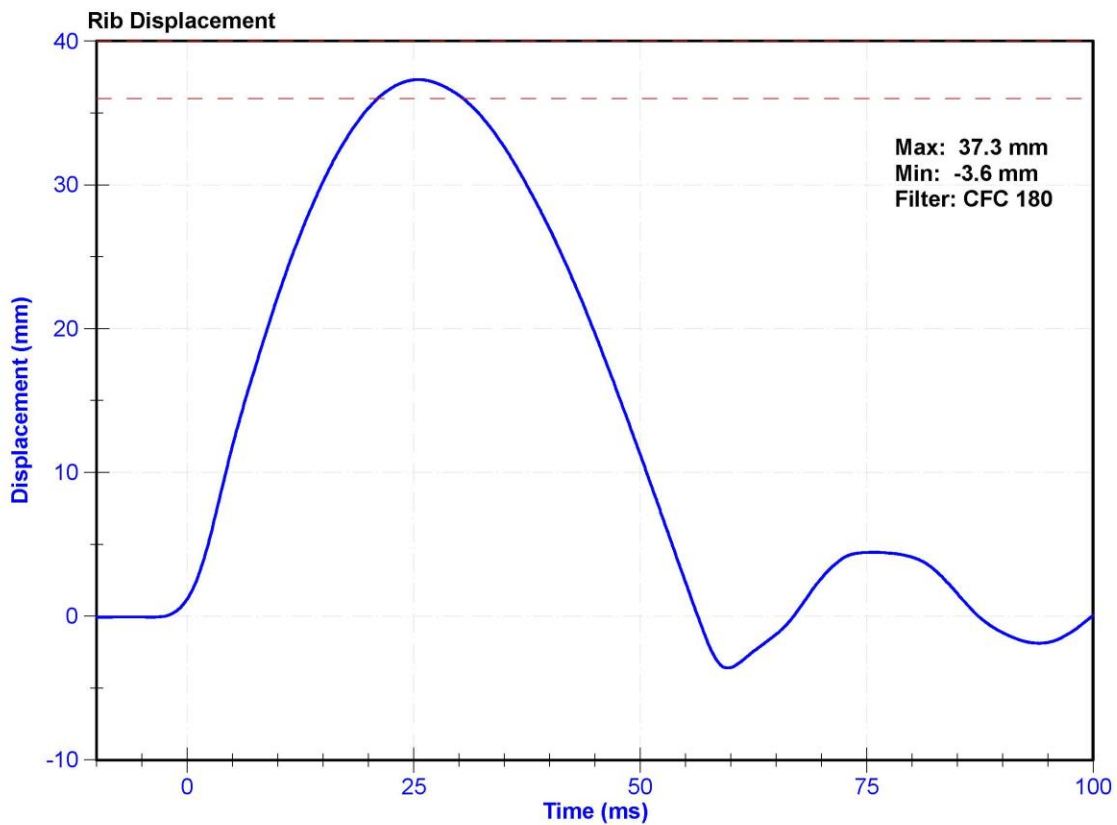
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	22.7	Pass
Rib Displacement	36	40	mm	37.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/31/2019	4/30/2020



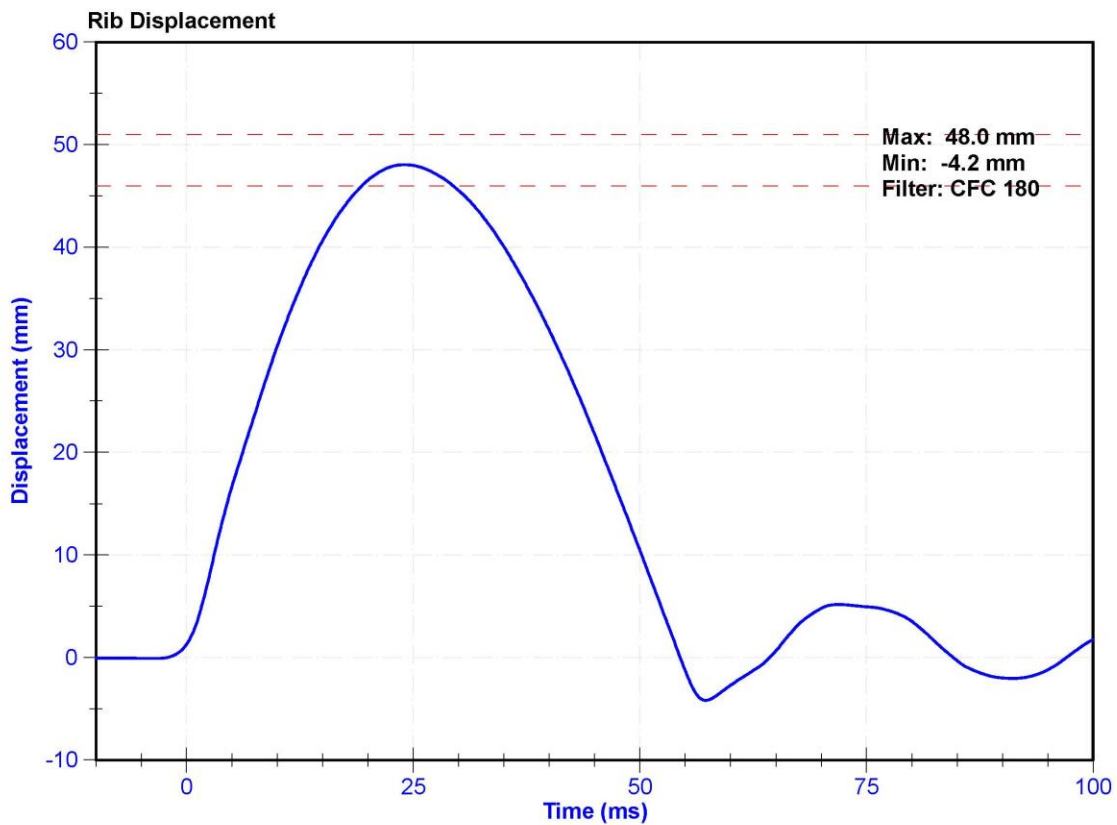
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	22.7	Pass
Rib Displacement	46	51	mm	48.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/31/2019	4/30/2020



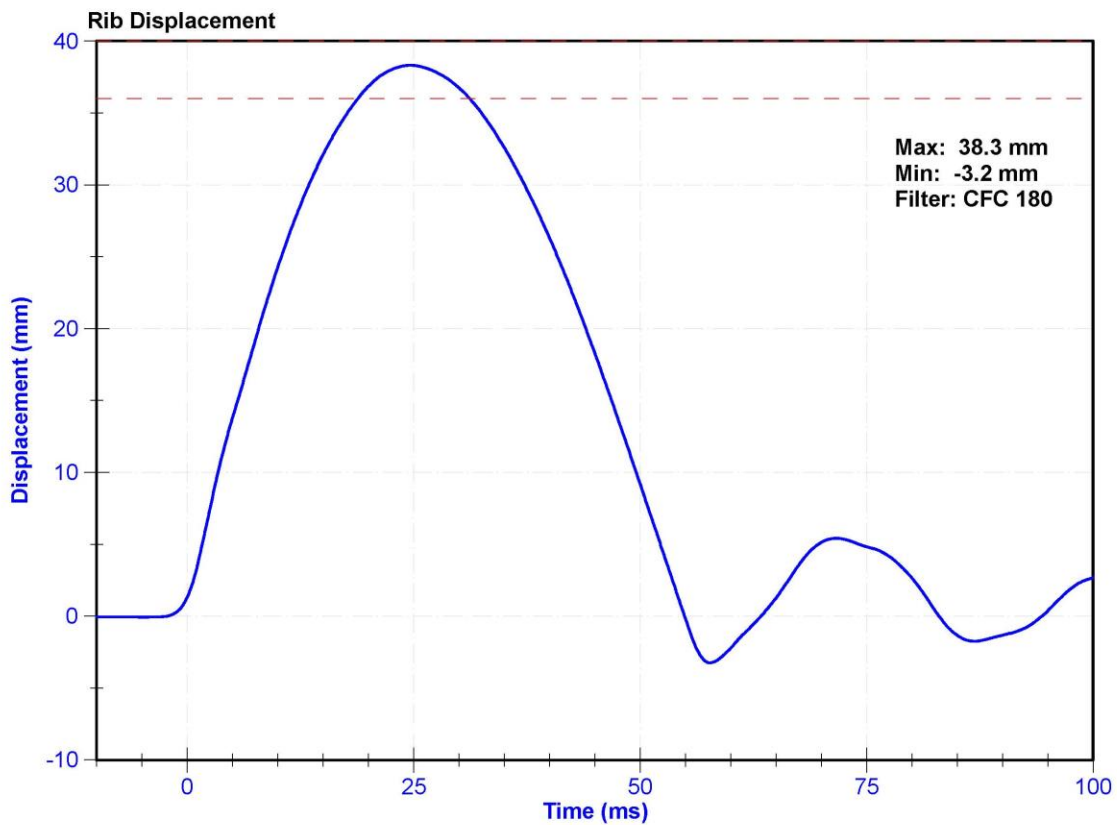
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	23.2	Pass
Rib Displacement	36	40	mm	38.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/31/2019	4/30/2020



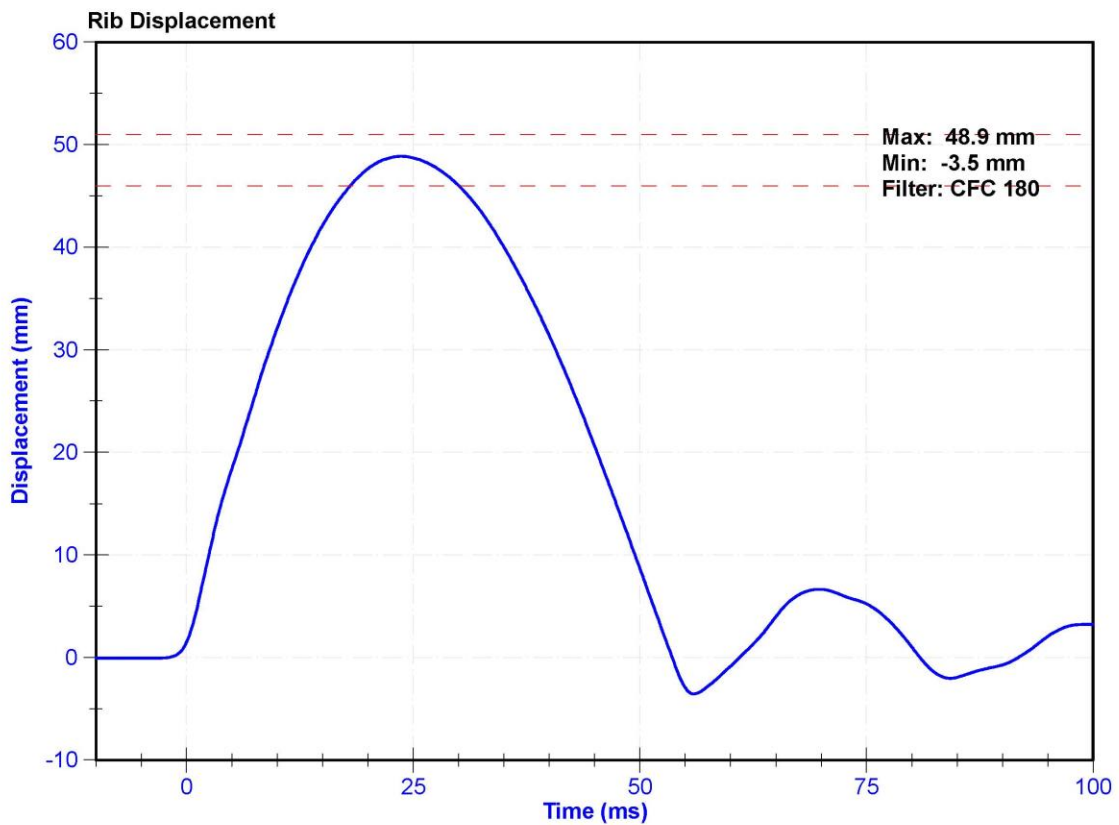
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	23.2	Pass
Rib Displacement	46	51	mm	48.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/31/2019	4/30/2020



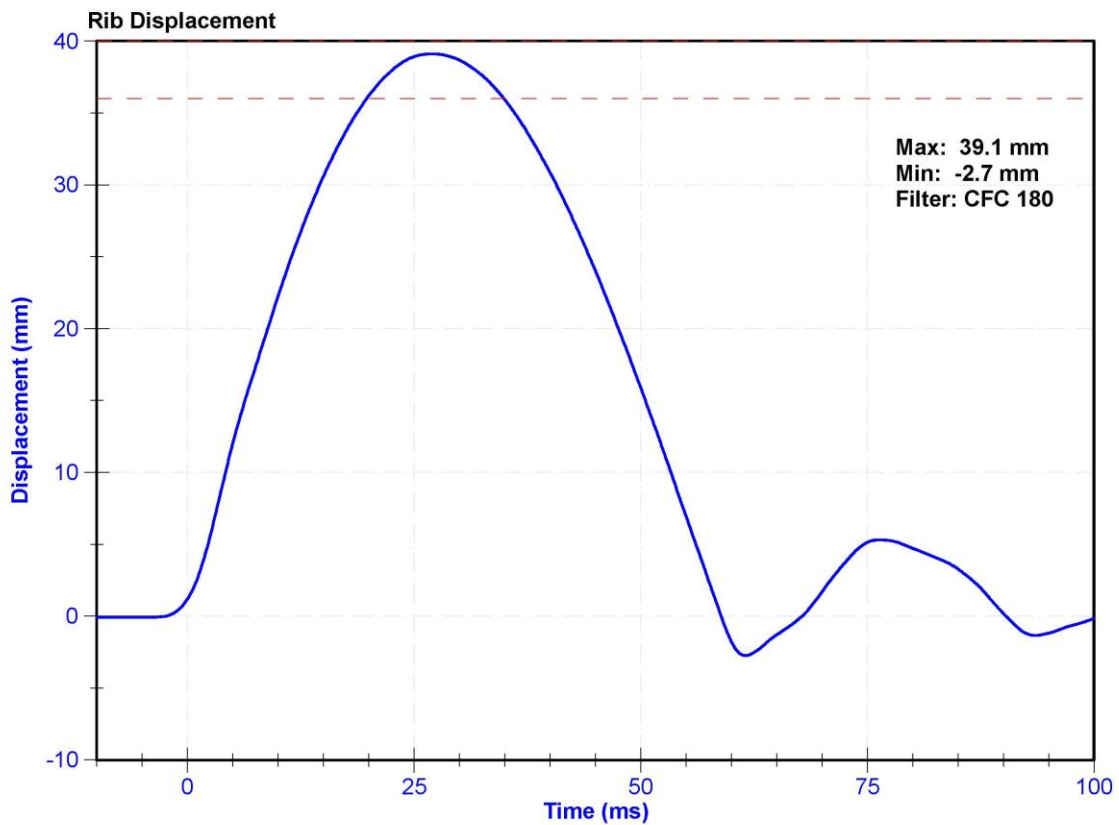
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	23.5	Pass
Rib Displacement	36	40	mm	39.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/31/2019	4/30/2020



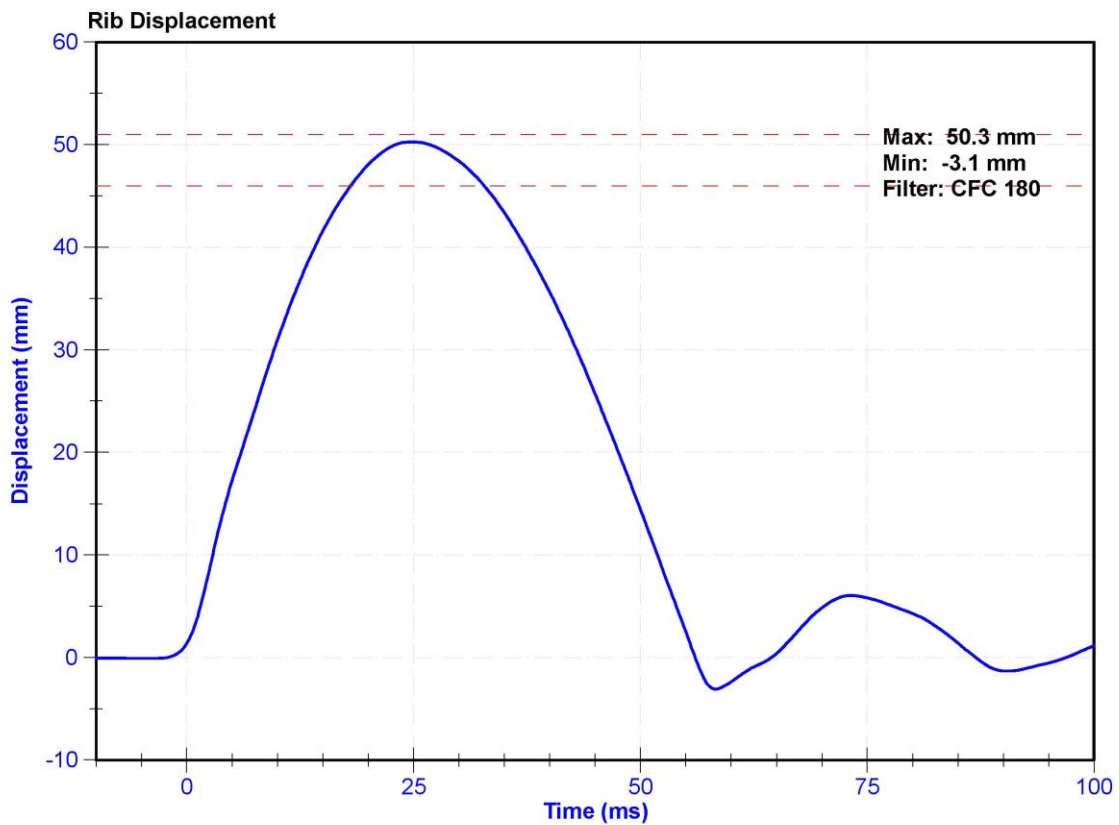
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	23.5	Pass
Rib Displacement	46	51	mm	50.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/31/2019	4/30/2020



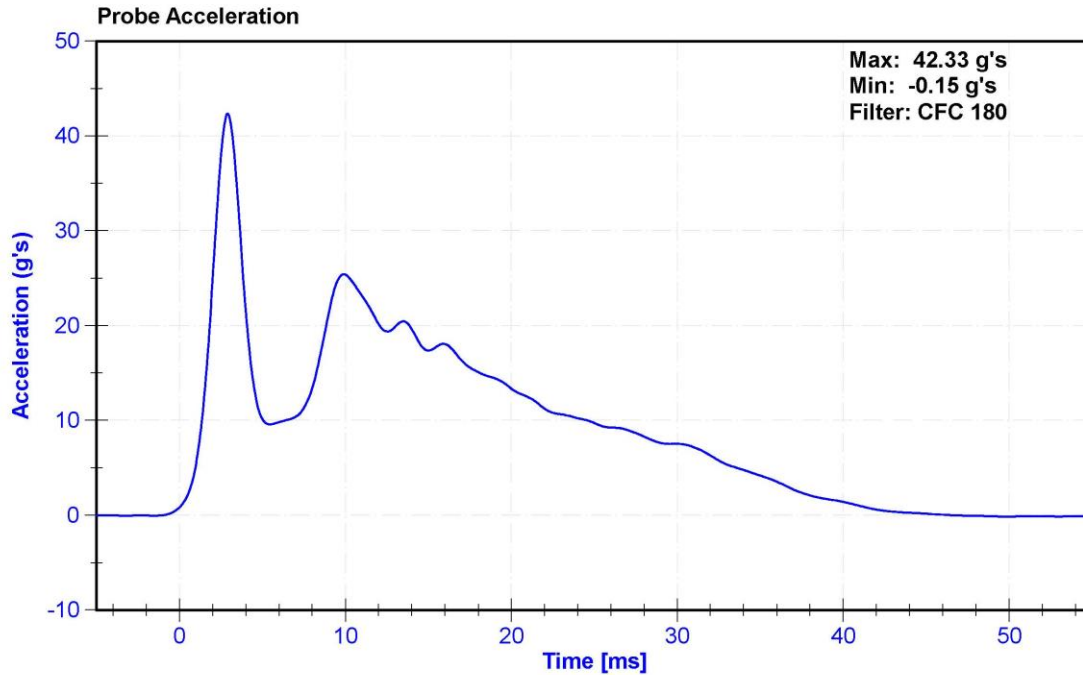
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

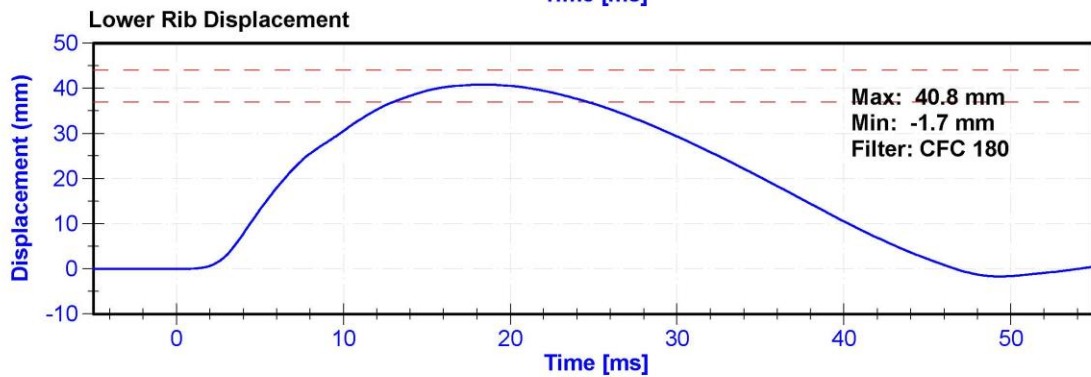
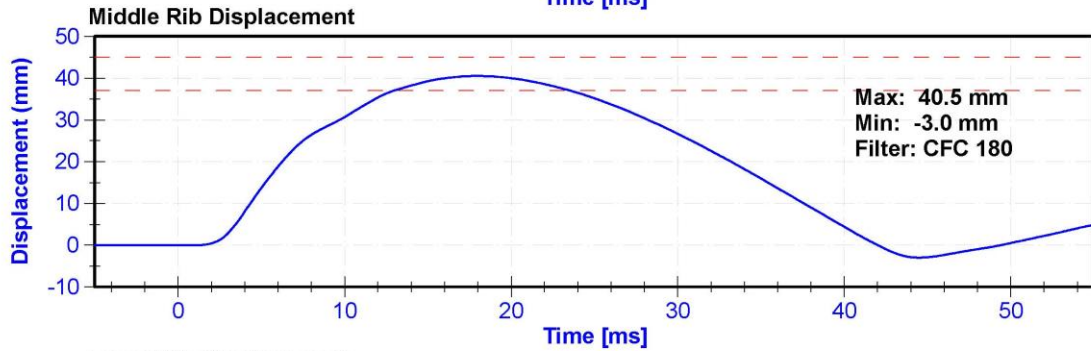
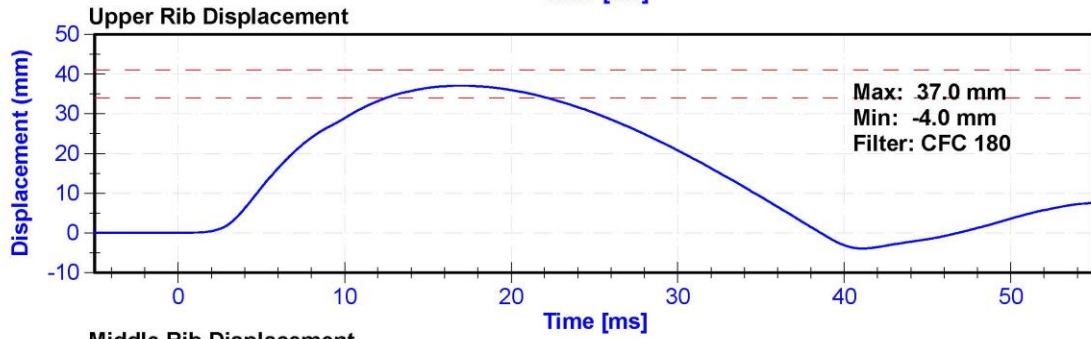
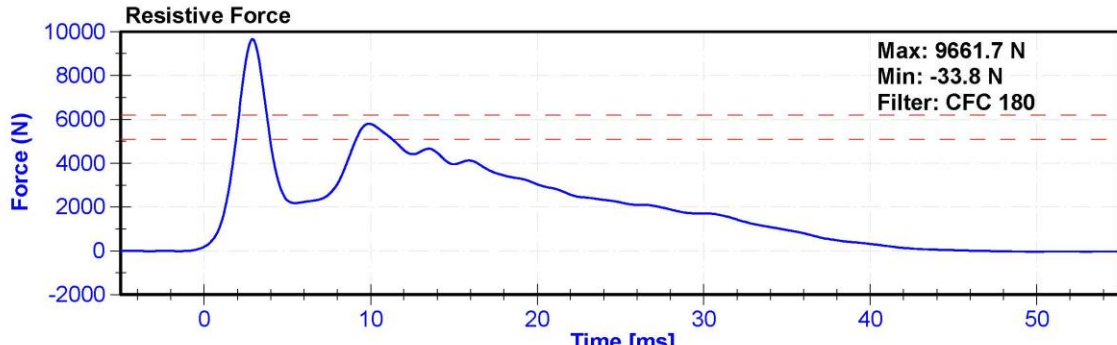
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	29.0	Pass
Velocity	5.4	5.6	m/s	5.43	Pass
Resistive Force after 6ms	5100	6200	N	5800.5	Pass
Upper Thorax Rib Deflection	34	41	mm	37.0	Pass
Mid Thorax Rib Deflection	37	45	mm	40.5	Pass
Lower Thorax Rib Deflection	37	44	mm	40.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Upper Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/31/2019	4/30/2020
Middle Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/31/2019	4/30/2020
Lower Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/31/2019	4/30/2020





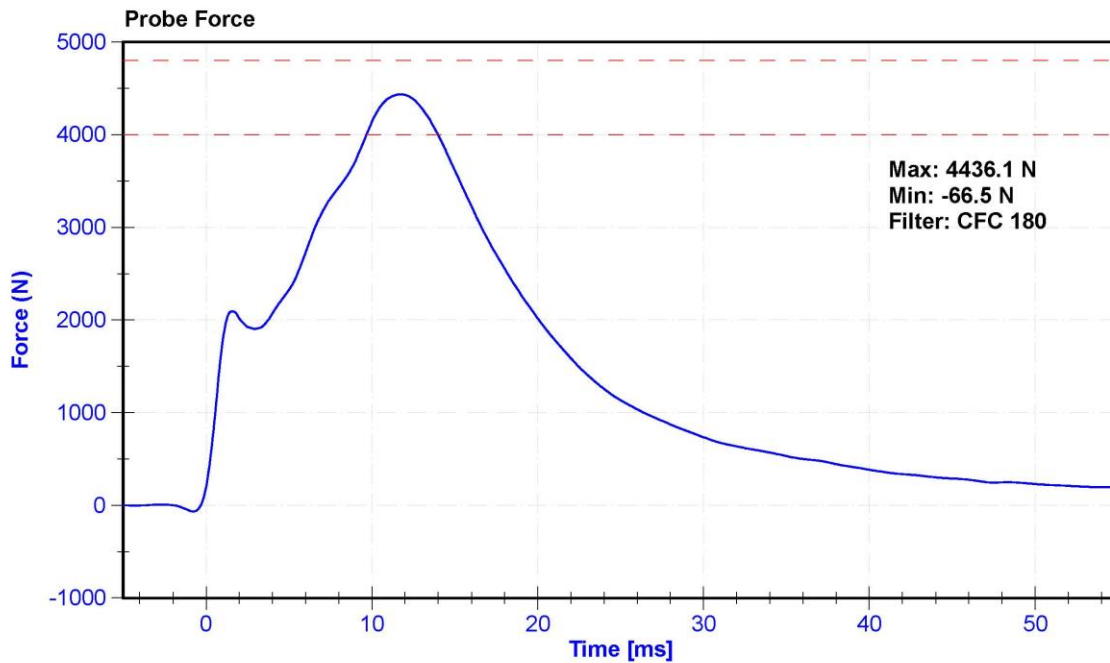
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

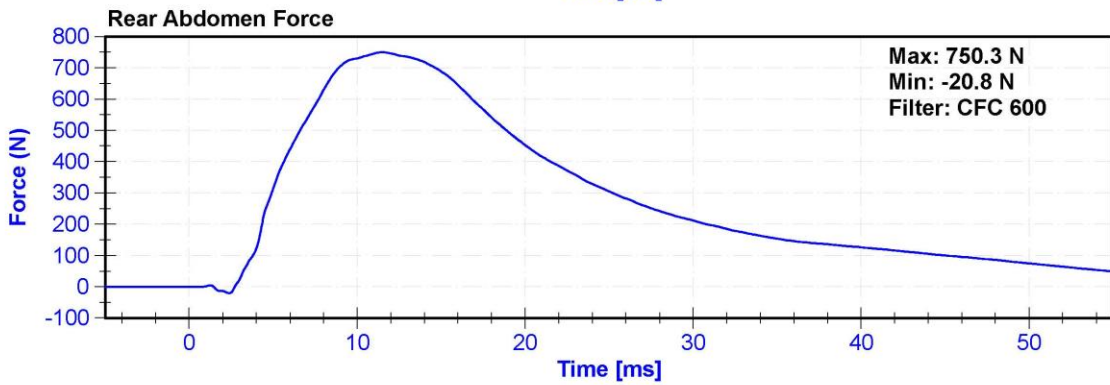
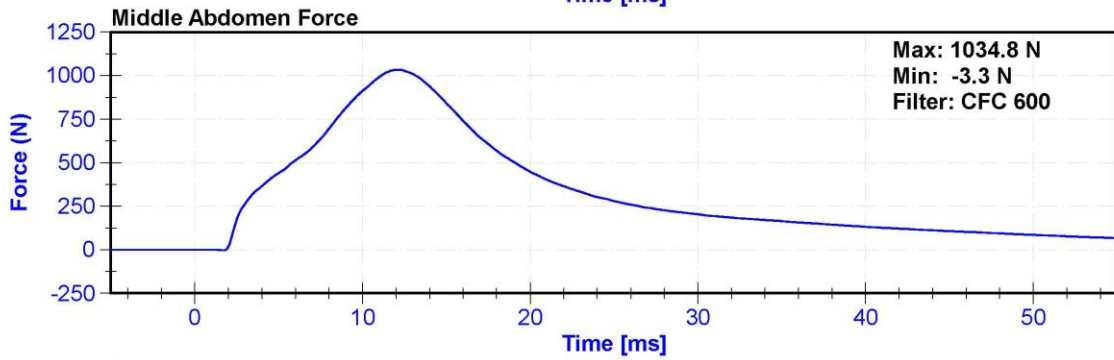
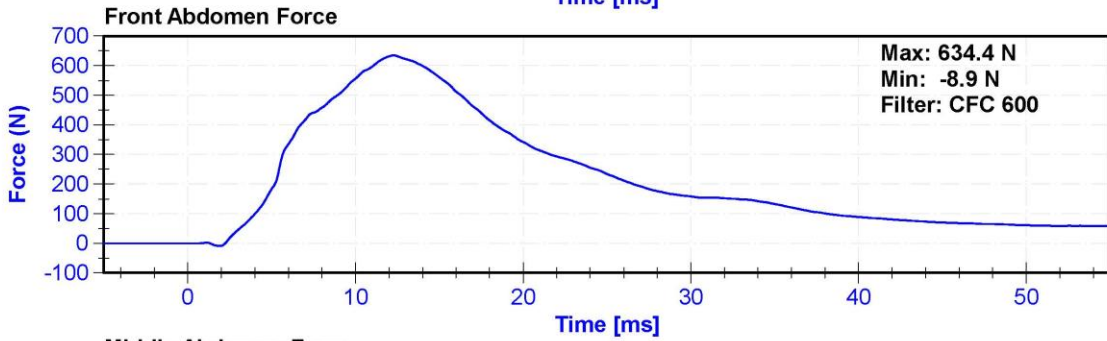
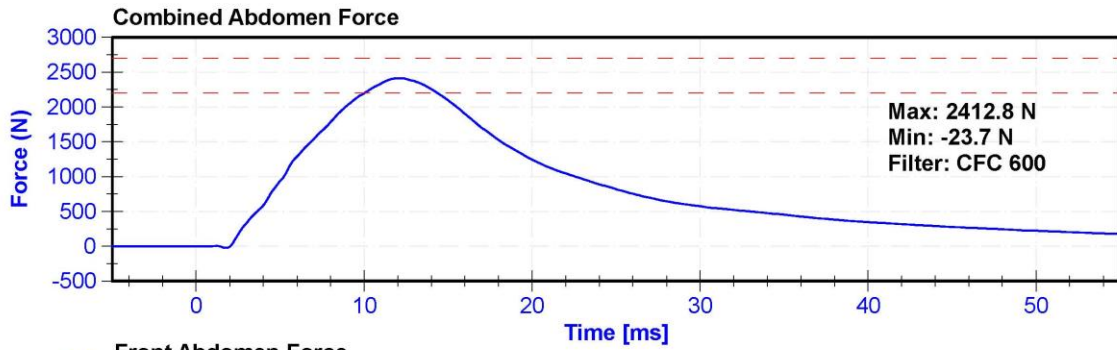
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	29	Pass
Velocity	3.9	4.1	m/s	4.07	Pass
Combined Abdomen Force	2200	2700	N	2412.8	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	12.15	Pass
Resistive Probe Force	4000	4800	N	4436.1	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.75	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Front Abdomen Load Cell	DENTON 2631	LC-1440	6/14/2019	6/13/2020
Middle Abdomen Load Cell	DENTON 2631	LC-1525	6/5/2019	6/4/2020
Rear Abdomen Load Cell	DENTON 2631	LC-1528	6/14/2019	6/13/2020





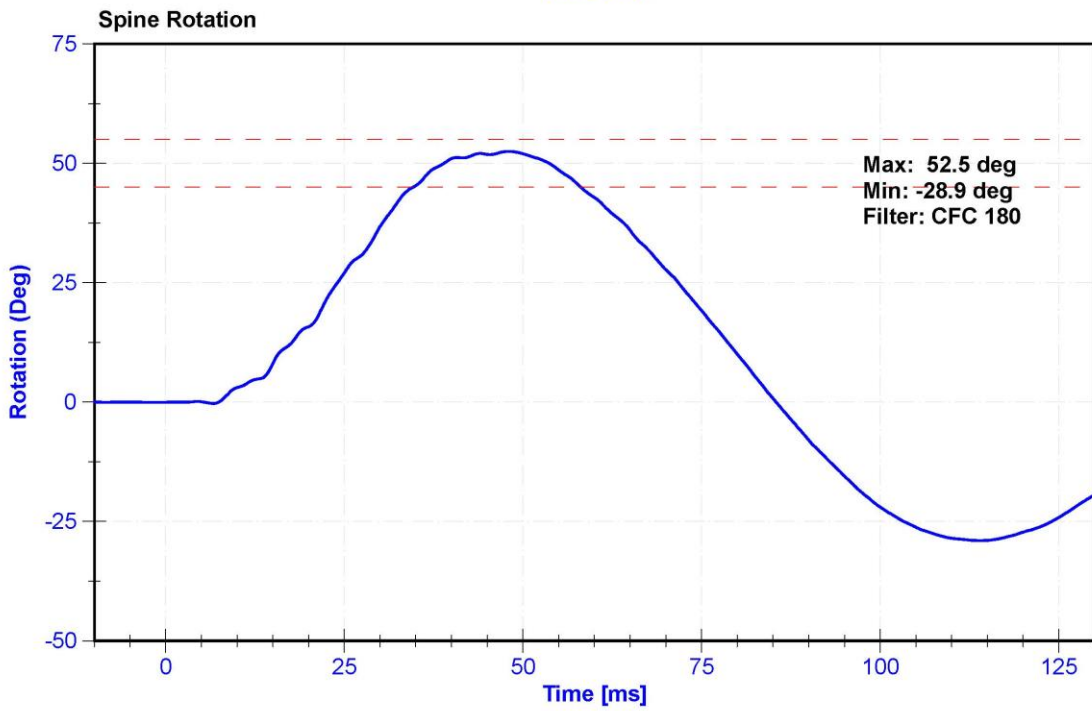
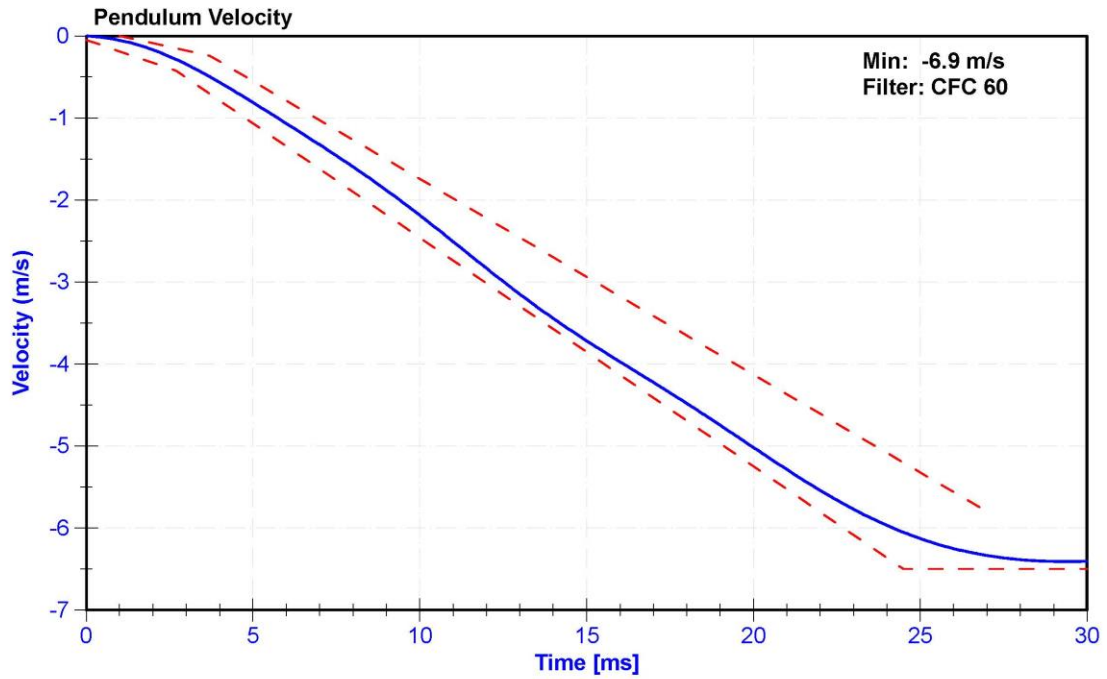
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

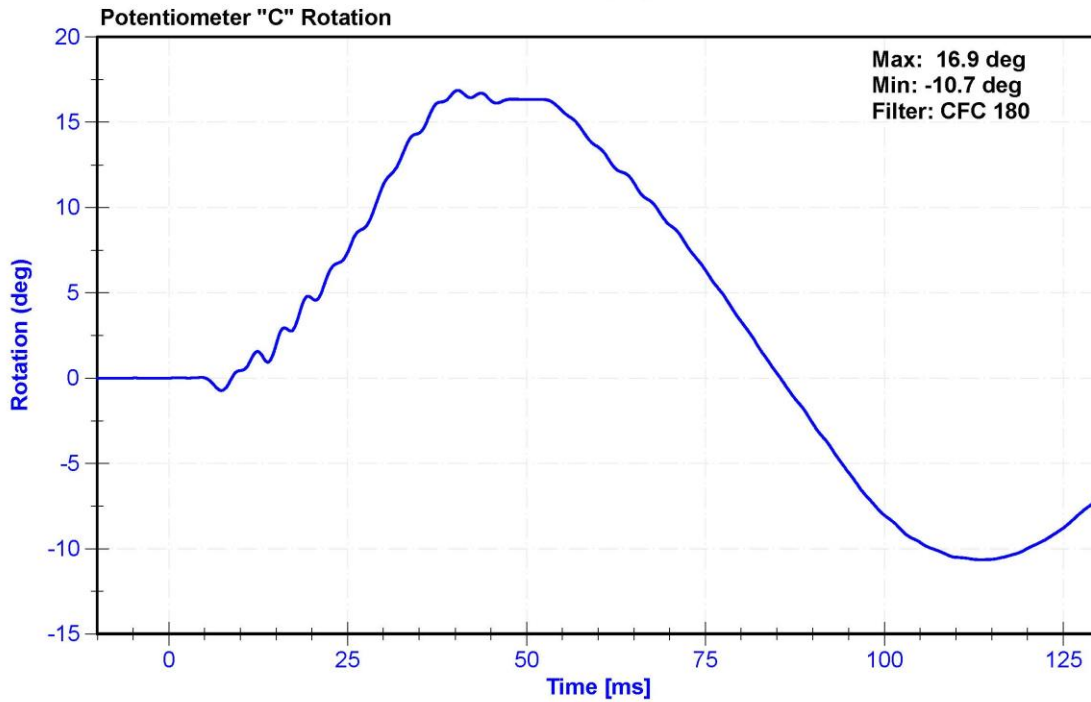
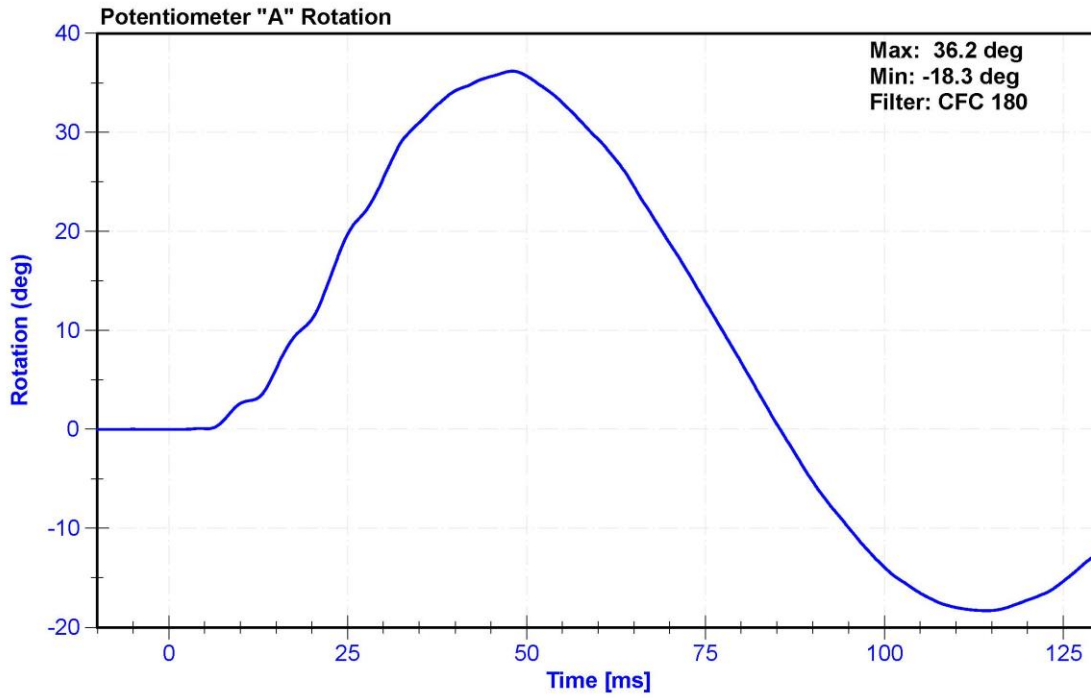
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	32.4	Pass
Velocity	5.95	6.15	m/s	6.046	Pass
Lateral Spine Rotation	45	55	deg	52.5	Pass
Time at Maximum Rotation	39	53	ms	48.0	Pass
Time of Decay to Zero Degrees	37	57	ms	37.4	Pass
Pulse within Corridor?	-	-	-		

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C16503 Striker	2/6/2020	2/5/2021
Pendulum "A" Potentiometer	SP22G	DS-094	10/31/2019	10/30/2020
Condyle "B" Potentiometer	SP22G	DS-095	10/31/2019	10/30/2020





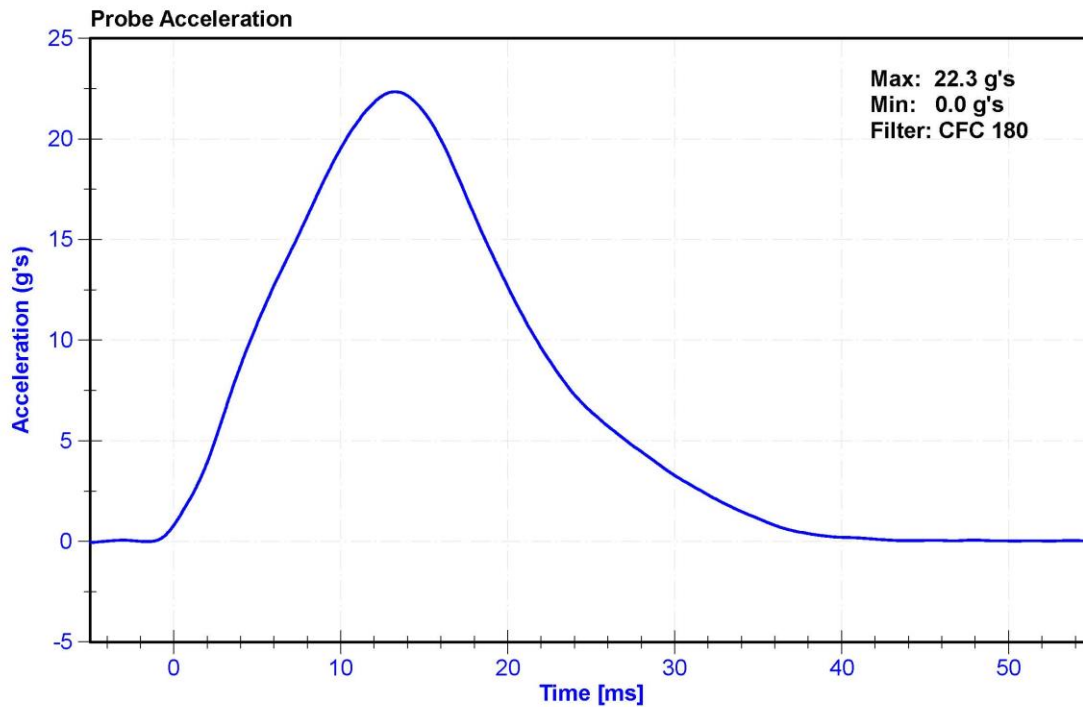
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

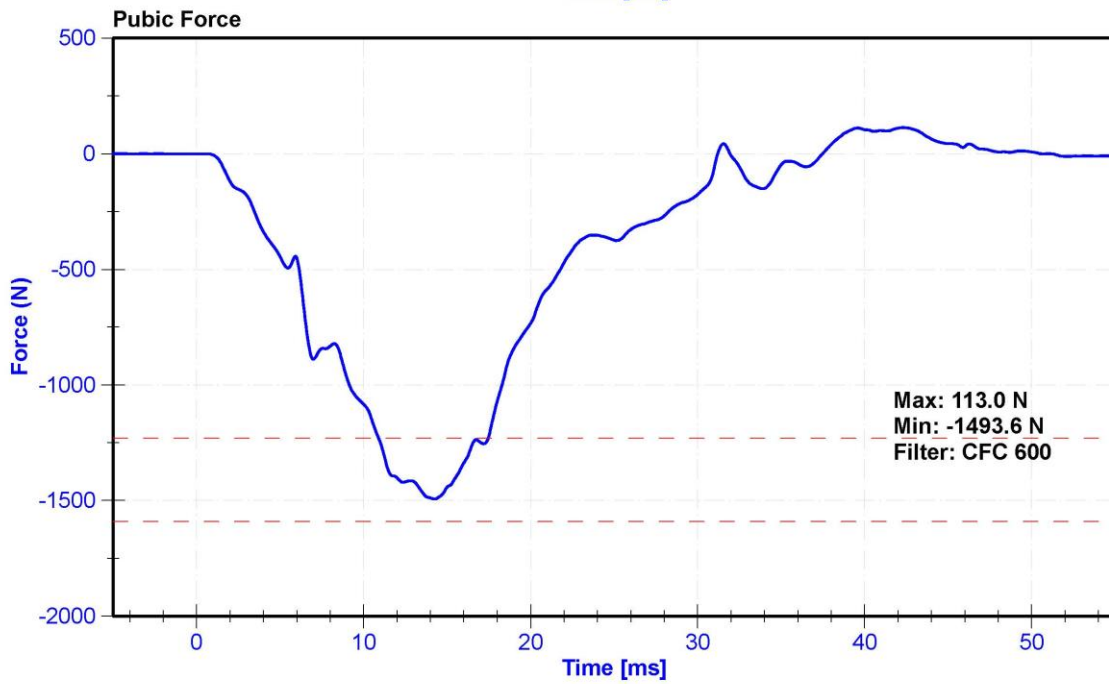
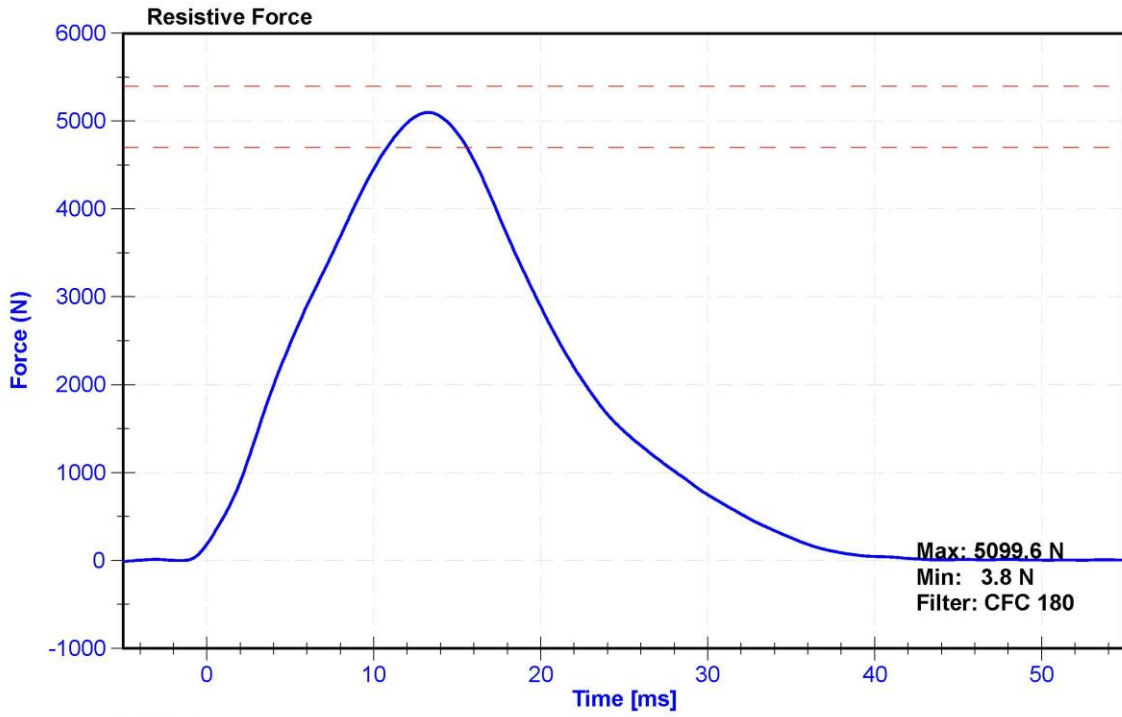
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	41.0	Pass
Velocity	4.2	4.4	m/s	4.38	Pass
Resistive Force	4700	5400	N	5099.6	Pass
Time at Peak Resistive Force	11.8	16.1	ms	13.25	Pass
Pubic Force	-1590	-1230	N	-1493.6	Pass
Time at Peak Pubic Force	12.2	17.0	ms	14.25	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Pubic Load Cell	Denton 3096JFL	LC-464fy	6/14/2019	6/13/2020





CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: 300

(CONFIGURED FOR LEFT SIDE IMPACT)

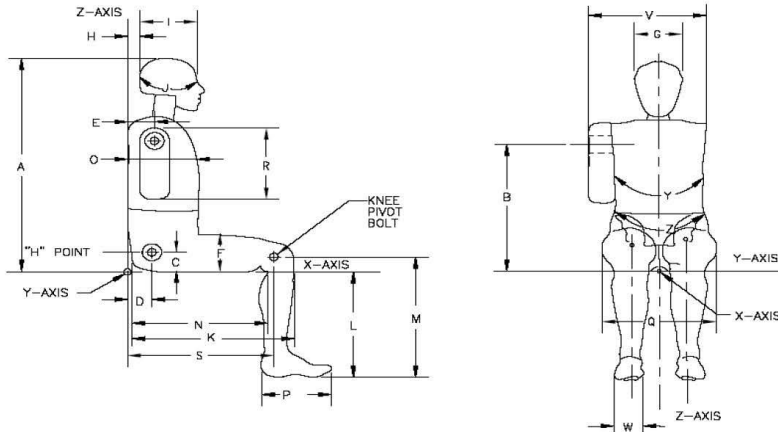


External Measurements - SID-IIs

Technician: K. Dutton

Date: 02/12/2020

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	450	Pass
C	H-point Height	79	89	86	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	101	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	145	Pass
H	Head Back from Backline	40	46	45	Pass
I	Head Depth	178	188	185	Pass
J	Head Circumference	541	551	545	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	402	Pass
N	Buttock Popliteal Length	416	442	432	Pass
O	Chest Depth w/o jacket	195	211	203	Pass
P	Foot Length	216	232	221	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	352	Pass
W	Foot Width	78	94	84	Pass
Y	Chest Circumference w/jacket	851	881	870	Pass
Z	Waist Circumference	761	791	772	Pass

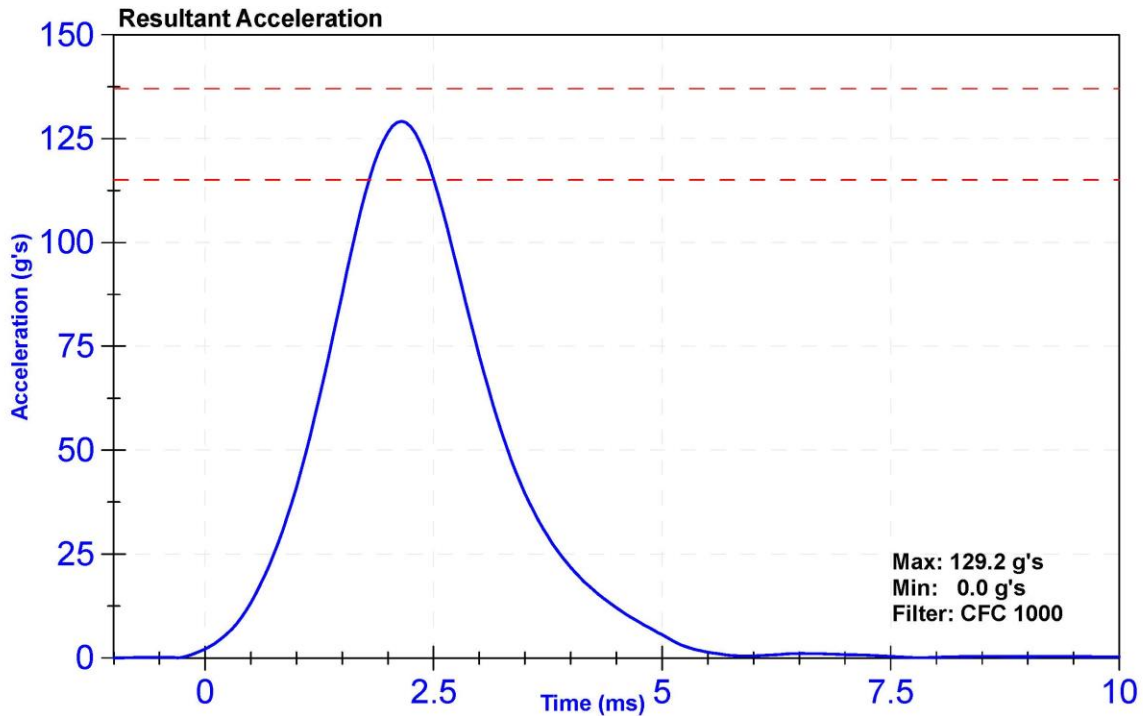
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

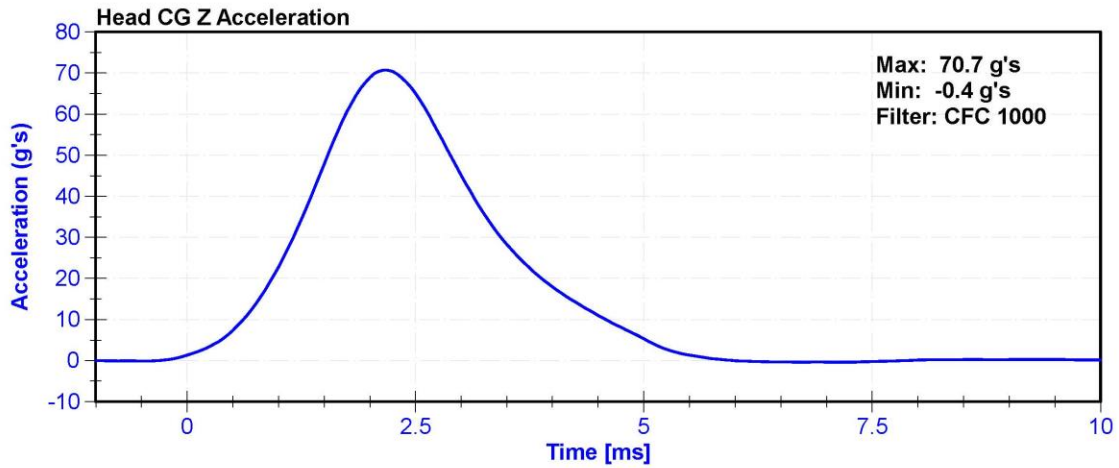
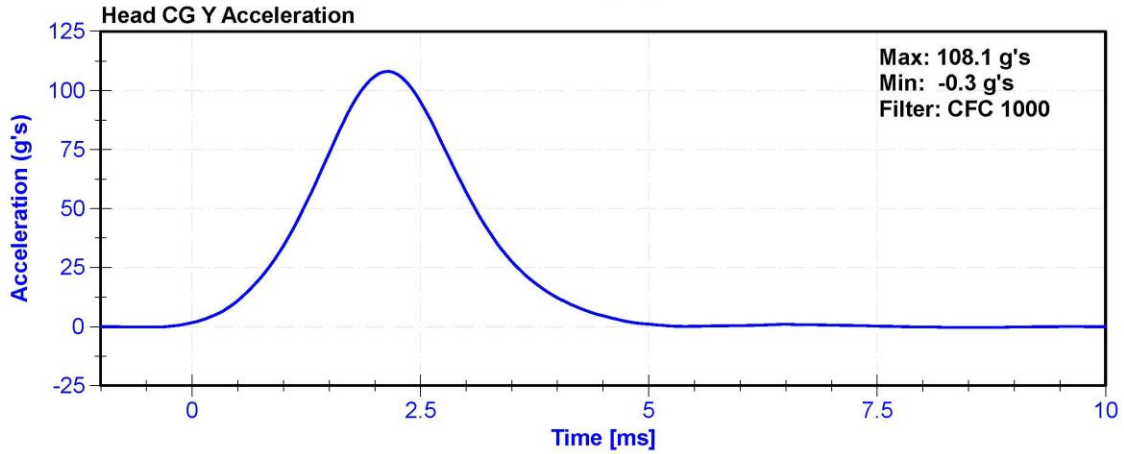
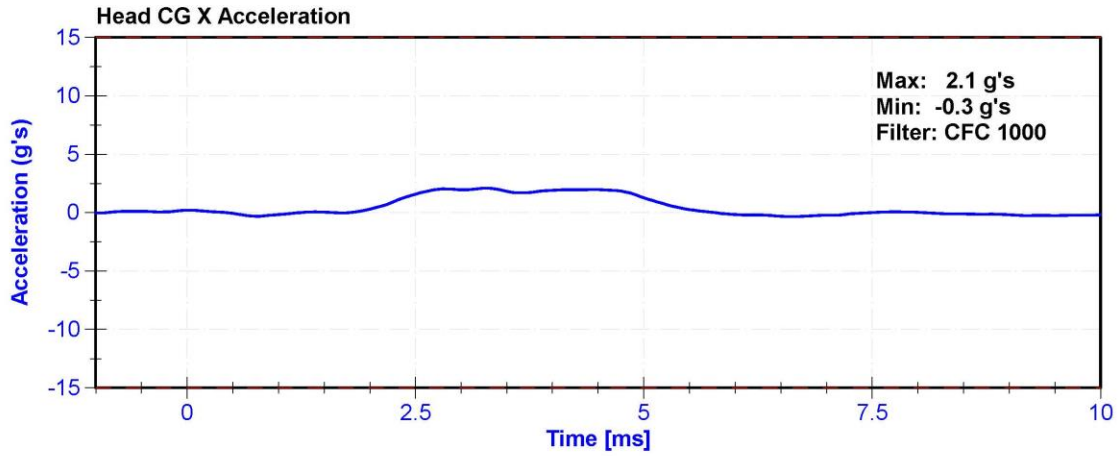
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	23.3	Pass
Resultant Acceleration	115	137	g's	129.2	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 7264	AC-P68057	10/29/2019	4/28/2020
Y Accelerometer	ENDEVCO 7264	AC-P79189	10/29/2019	4/28/2020
Z Accelerometer	ENDEVCO 7264CT	AC-P52095	10/29/2019	4/28/2020





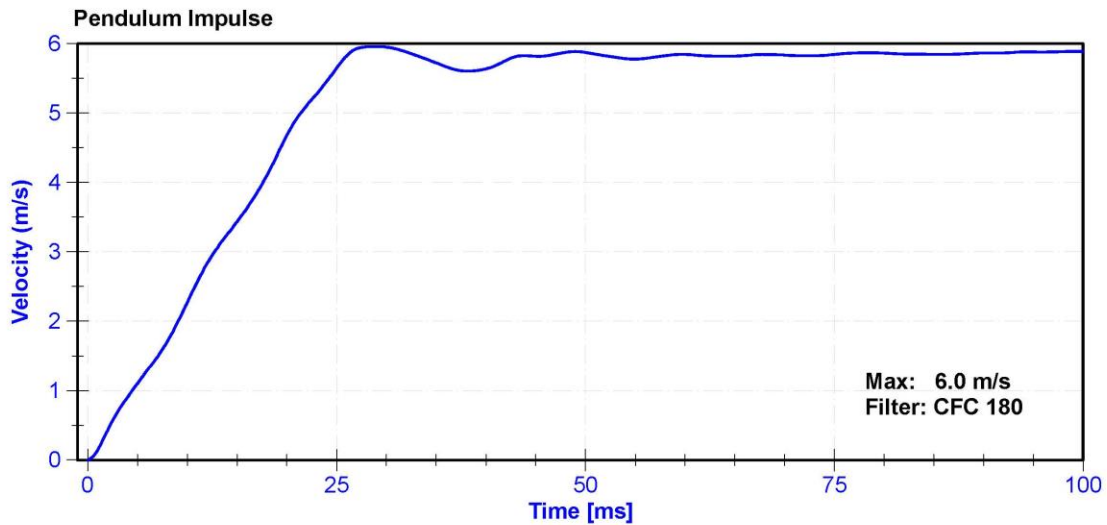
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

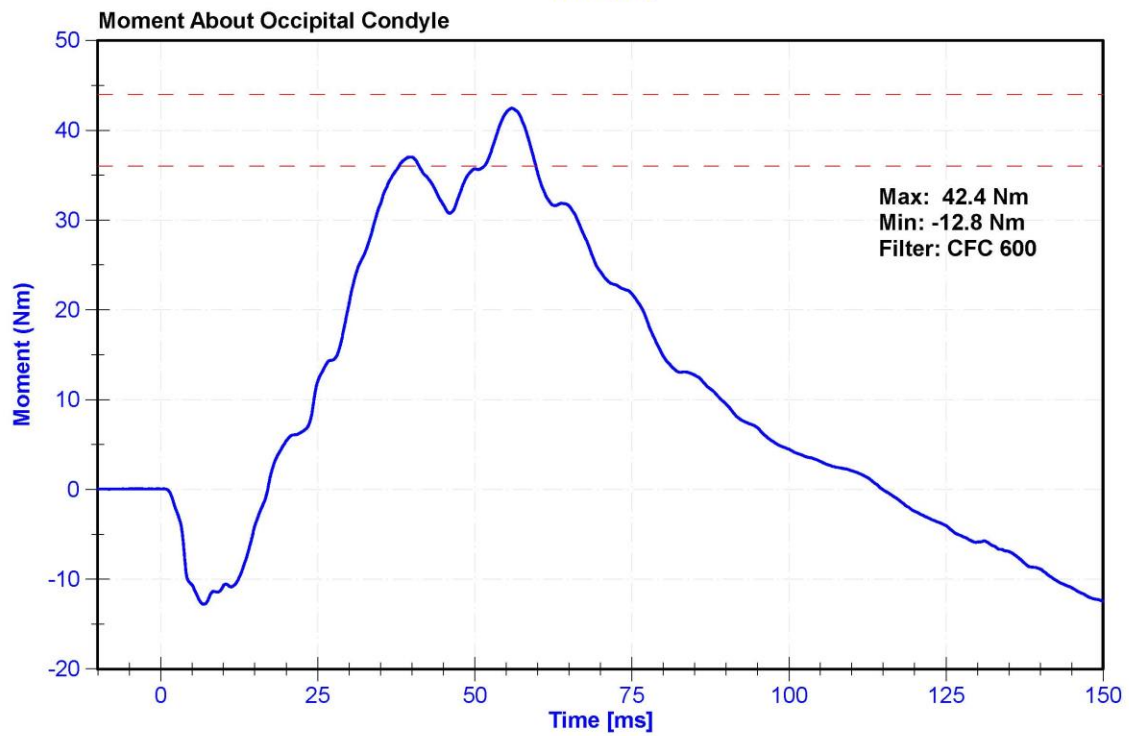
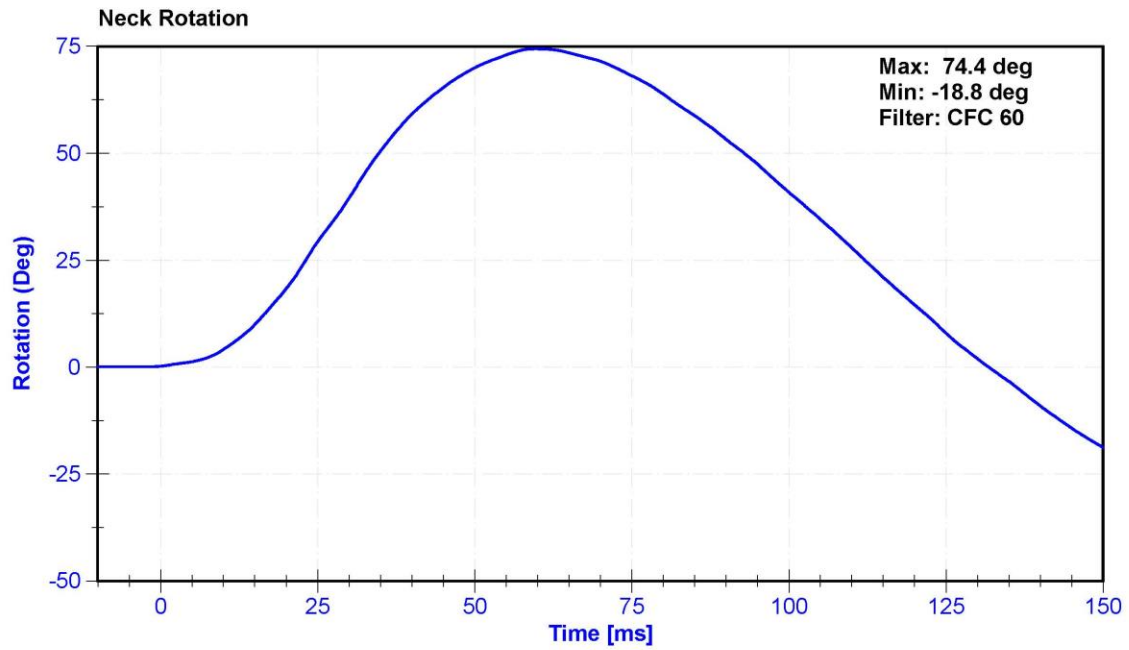
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	22.5	Pass
Velocity	5.51	5.63	m/s	5.514	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.27	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.43	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.68	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.64	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.95	Pass
Neck Rotation	71	81	deg	74.4	Pass
Time at Maximum Rotation	50	70	ms	59.7	Pass
Moment about the OC	36	44	Nm	42.4	Pass
Moment Decay to 0 Nm	102	126	ms	114.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/30/2020	1/29/2021
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/4/2019	11/3/2020
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/4/2019	11/3/2020
Upper Neck Load Cell	Denton 1716A	LC-2192Fy	6/20/2019	6/19/2020





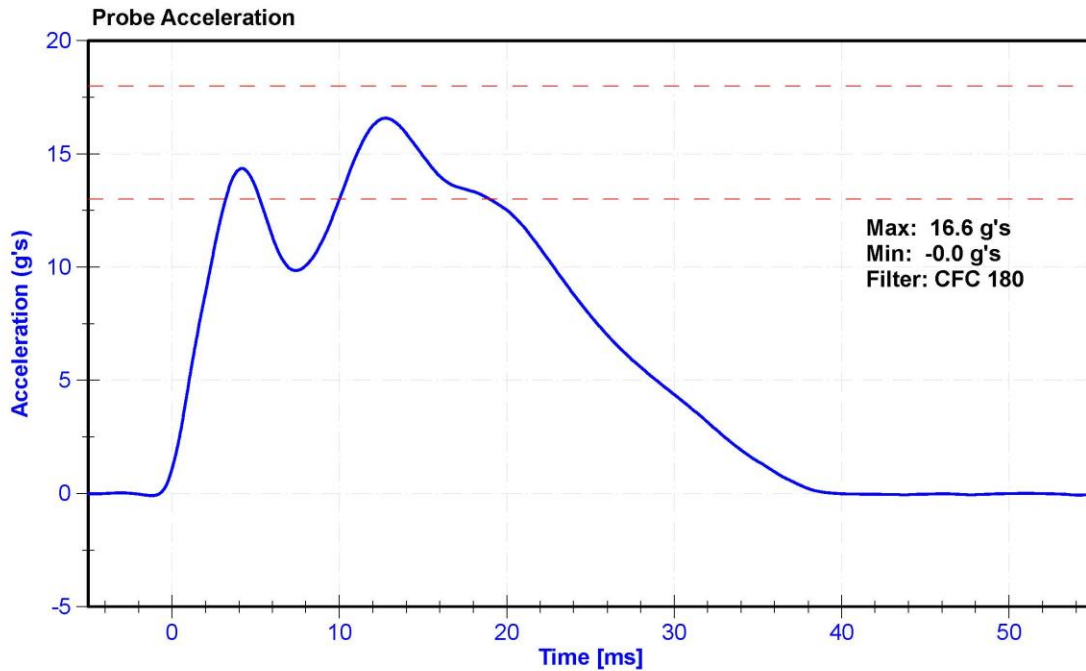
ATD Manufacturer	FTSS	Test Technician	D. Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

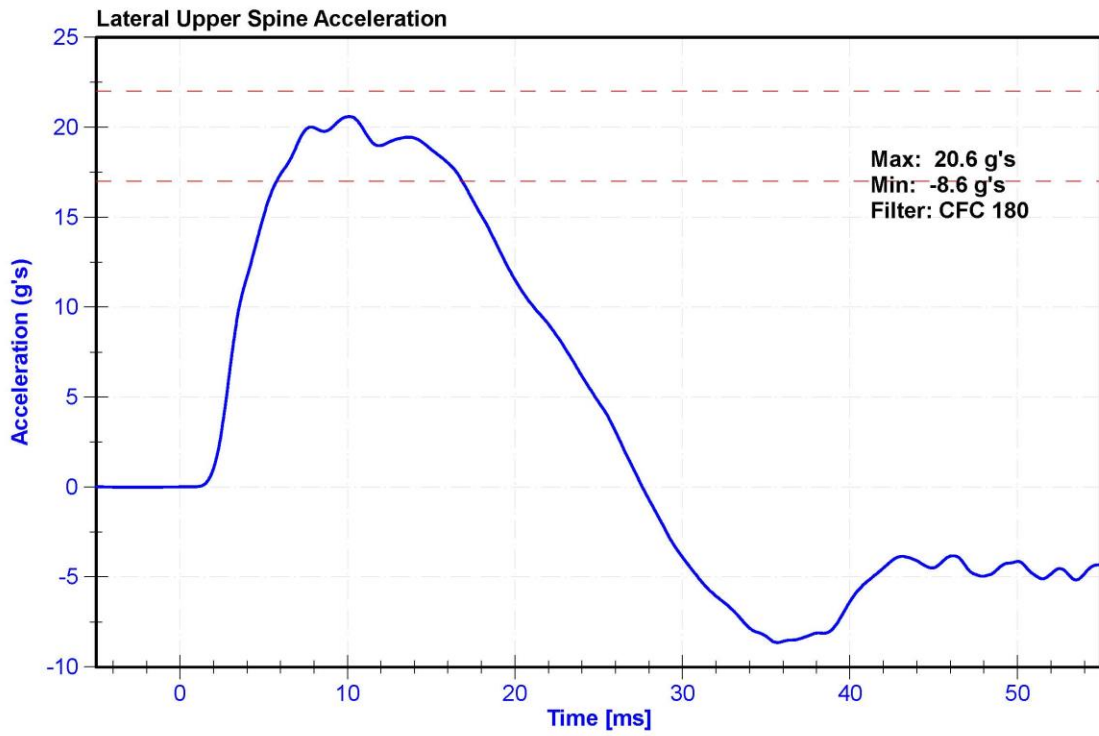
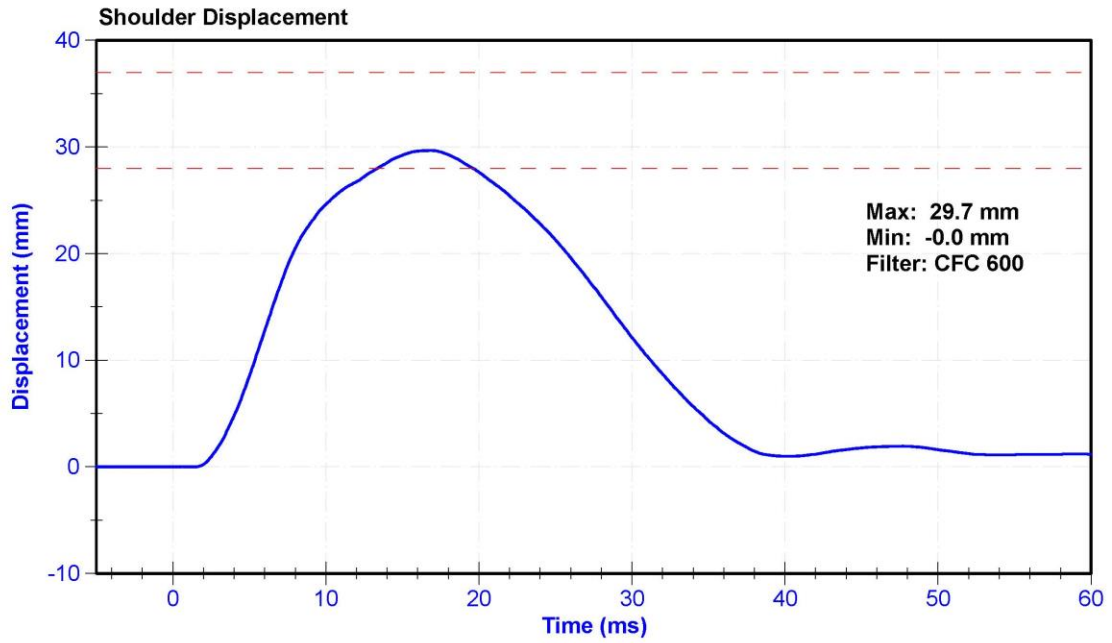
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Probe Acceleration	13	18	g's	16.6	Pass
Shoulder Deflection	28	37	mm	29.7	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/29/2021
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/29/2019	4/28/2020
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/29/2019	4/28/2020





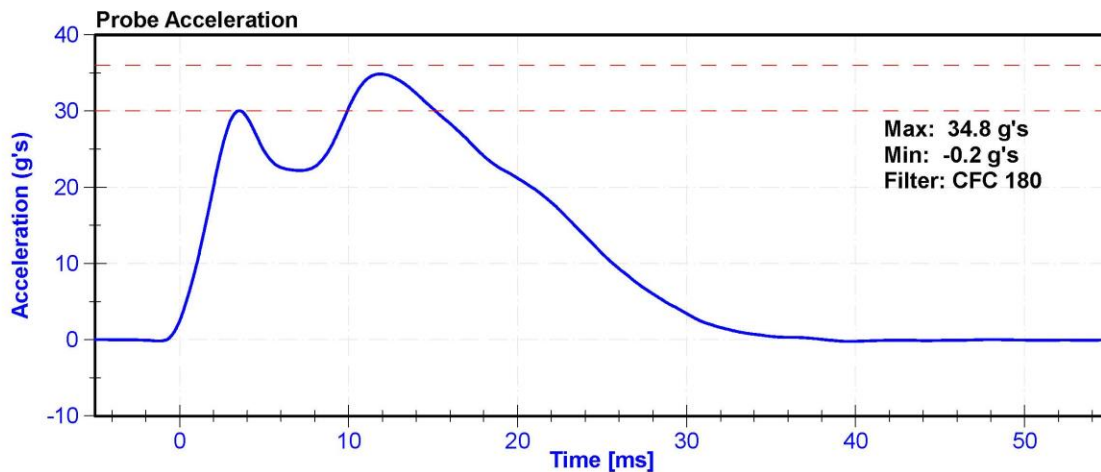
ATD Manufacturer	FTSS	Test Technician	D. Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

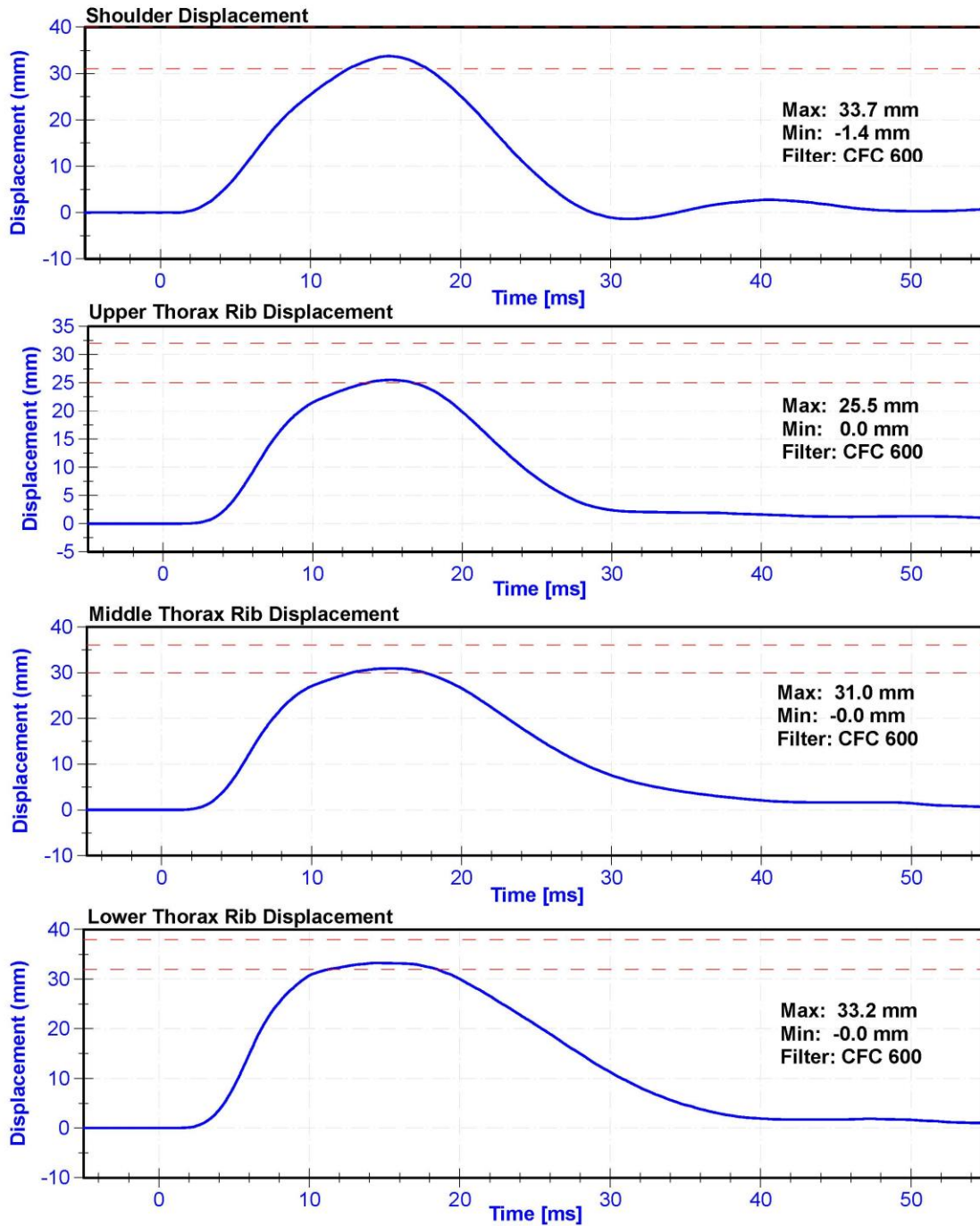
Results

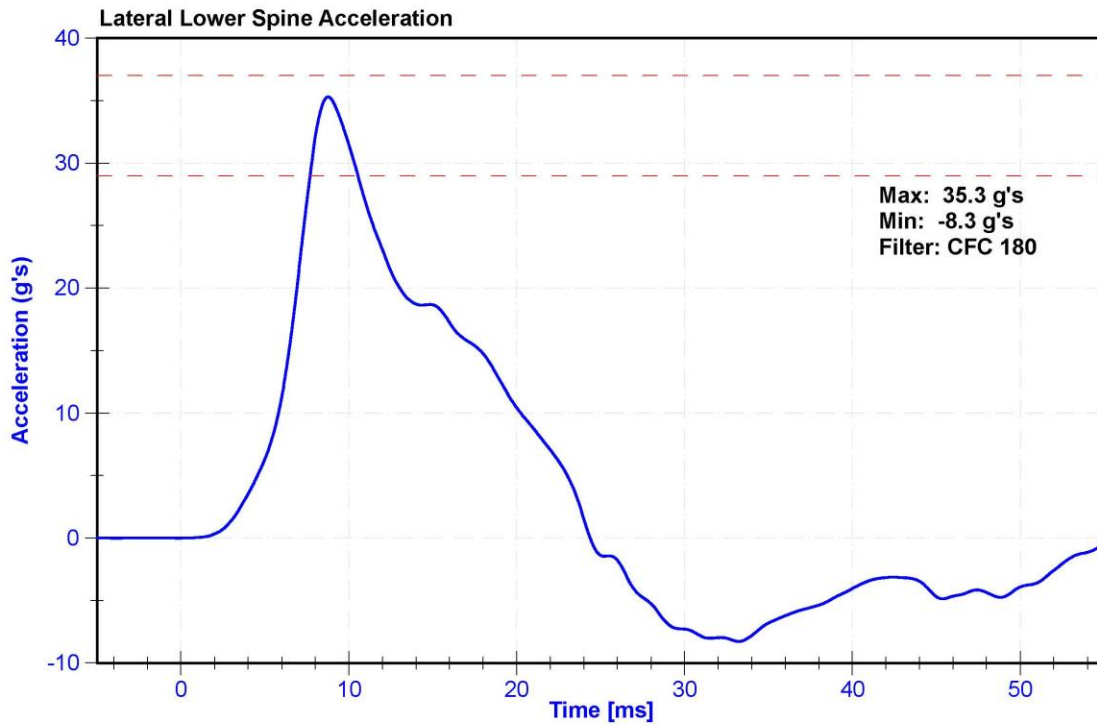
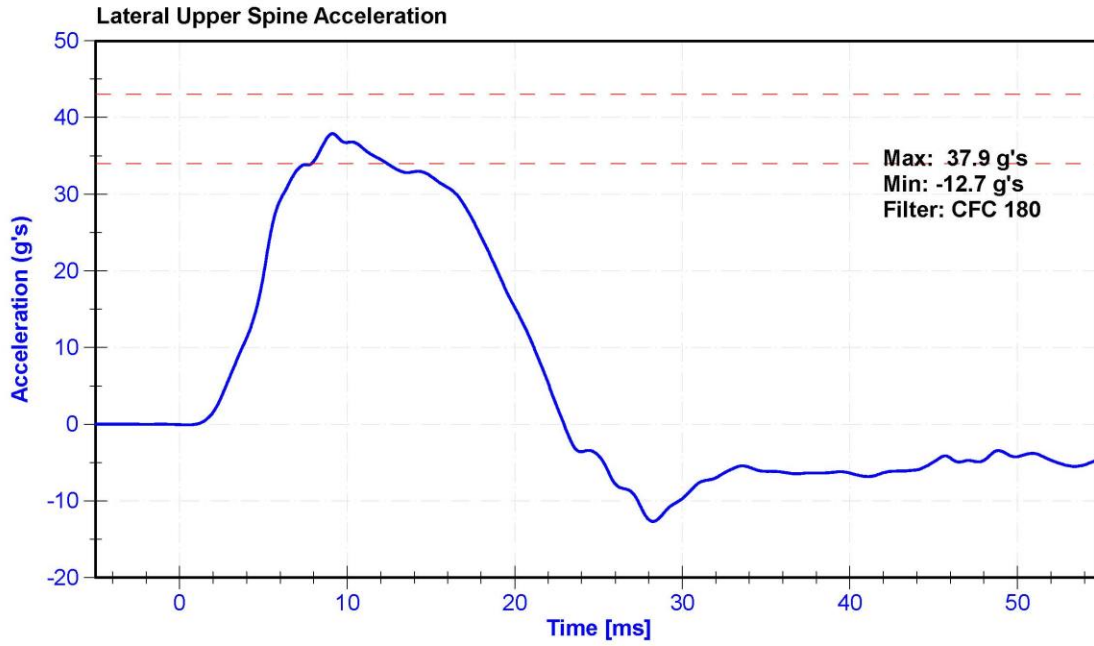
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	29.0	Pass
Velocity	6.6	6.8	m/s	6.74	Pass
Probe Acceleration after 5 ms	30	36	g's	34.8	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.9	Pass
Lateral Lower Spine Acceleration	29	37	g's	35.3	Pass
Shoulder Deflection	31	40	mm	33.7	Pass
Upper Thorax Rib Deflection	25	32	mm	25.5	Pass
Mid Thorax Rib Deflection	30	36	mm	31.0	Pass
Lower Thorax Rib Deflection	32	38	mm	33.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/29/2021
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/29/2019	4/28/2020
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P64147	10/29/2019	4/28/2020
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/29/2019	4/28/2020
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/29/2019	4/28/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/29/2019	4/28/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/29/2019	4/28/2020







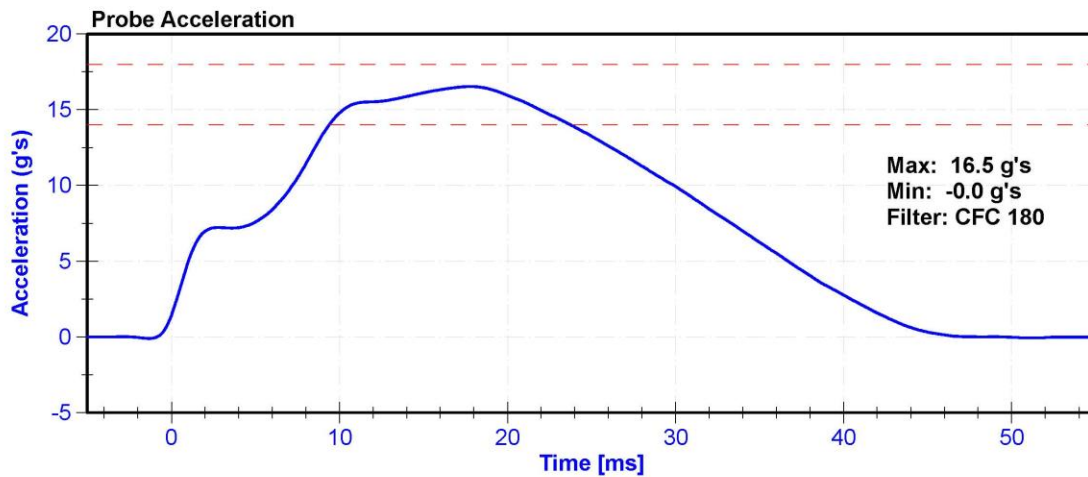
ATD Manufacturer	FTSS	Test Technician	D. Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

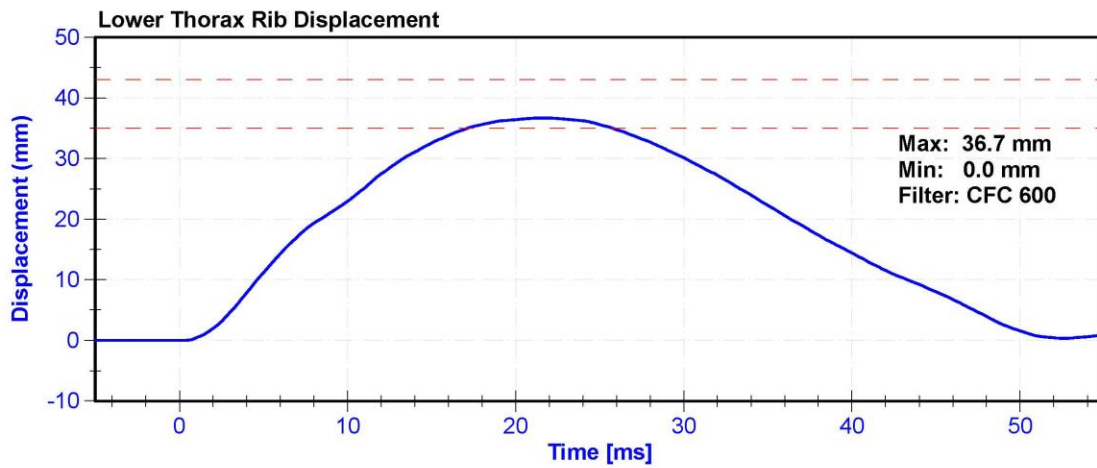
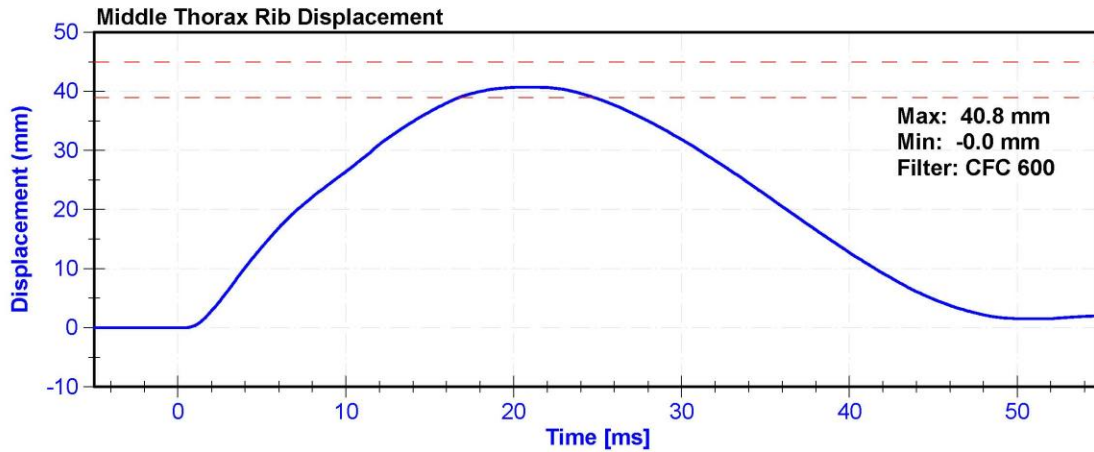
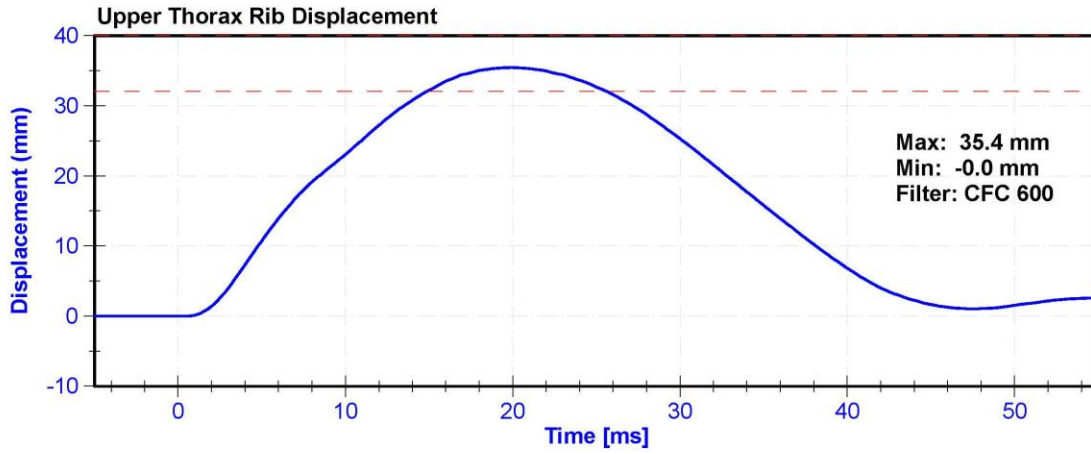
Results

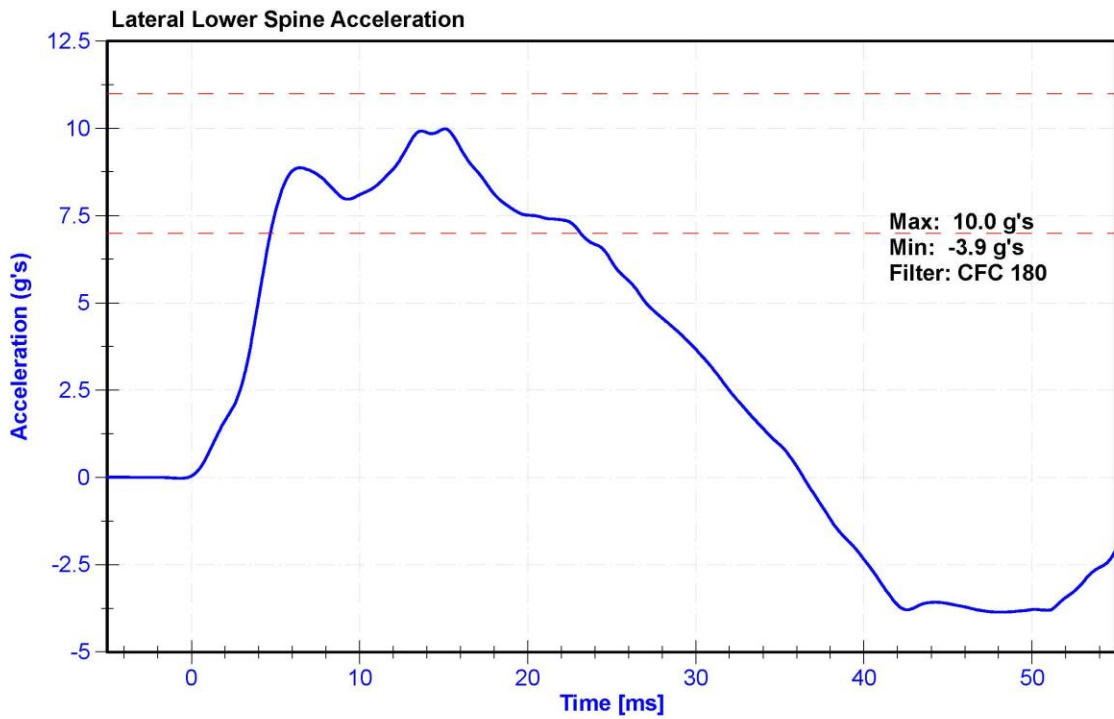
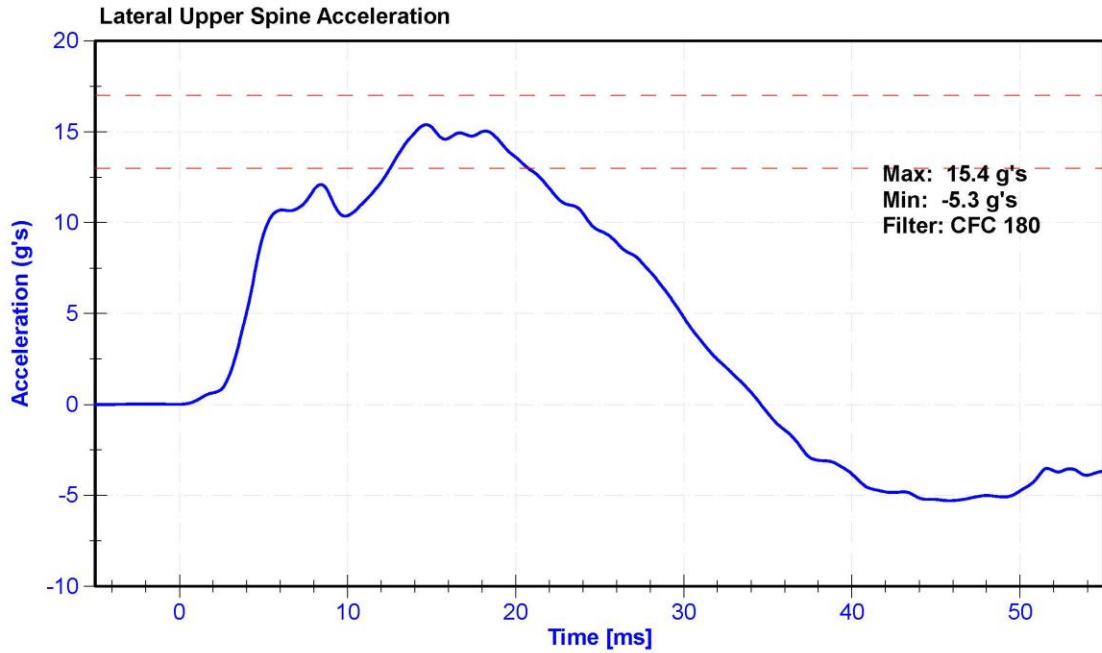
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	14	18	g's	16.5	Pass
Lateral Upper Spine Acceleration	13	17	g's	15.4	Pass
Lateral Lower Spine Acceleration	7	11	g's	10.0	Pass
Upper Thorax Rib Deflection	32	40	mm	35.4	Pass
Middle Thorax Rib Deflection	39	45	mm	40.8	Pass
Lower Thorax Rib Deflection	35	43	mm	36.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/29/2021
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/29/2019	4/28/2020
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	10/29/2019	4/28/2020
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/29/2019	4/28/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/29/2019	4/28/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/29/2019	4/28/2020







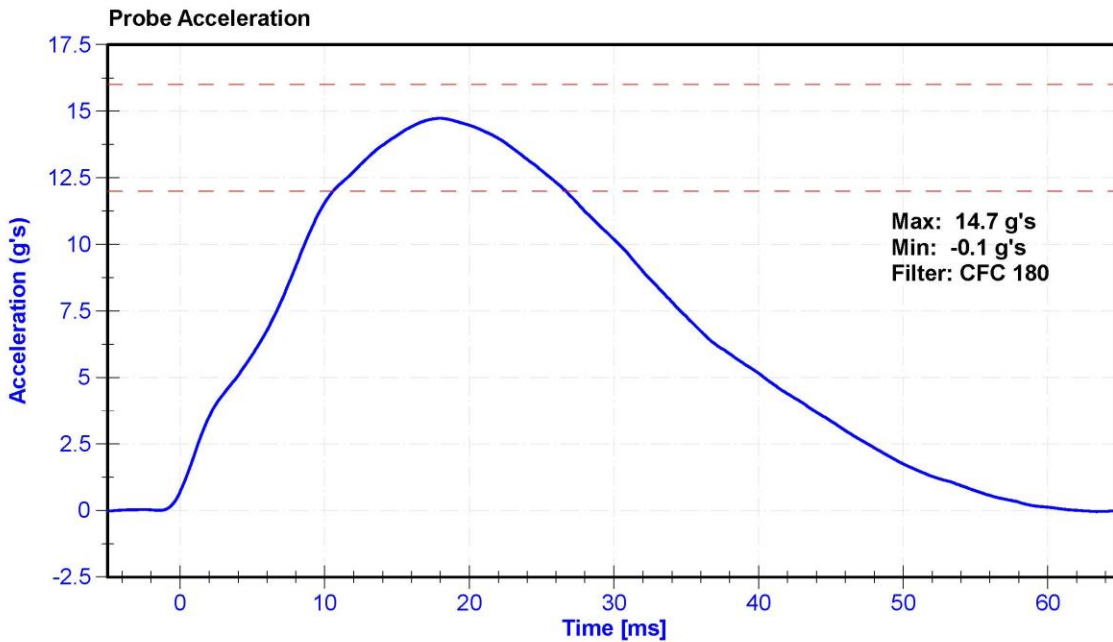
ATD Manufacturer	FTSS	Test Technician	D. Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

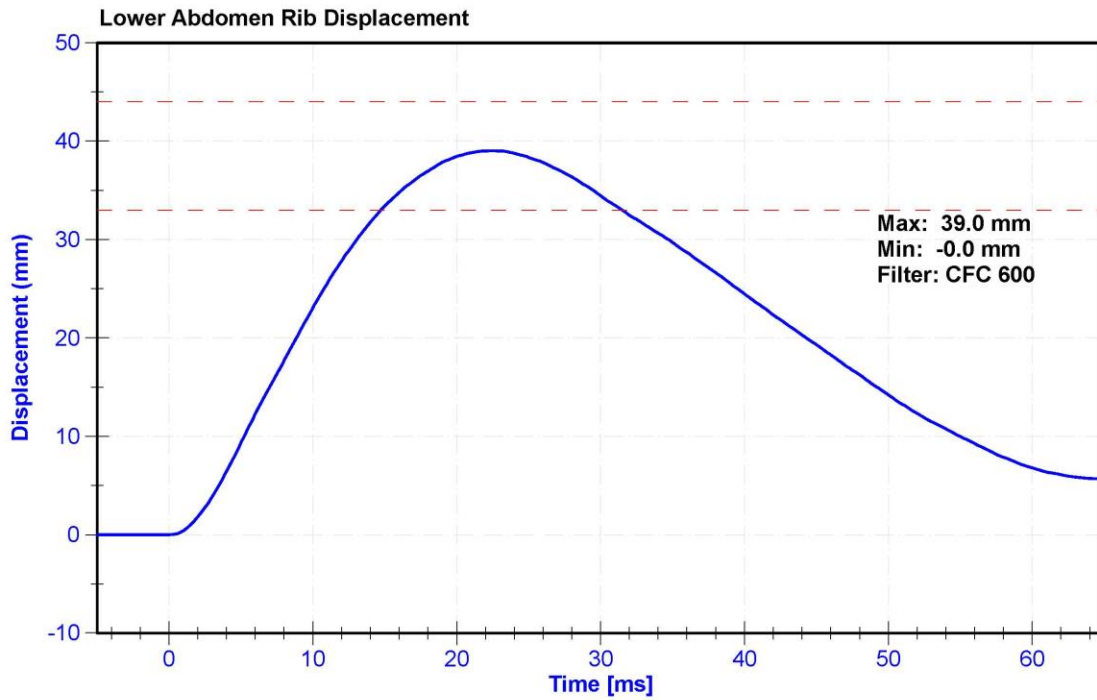
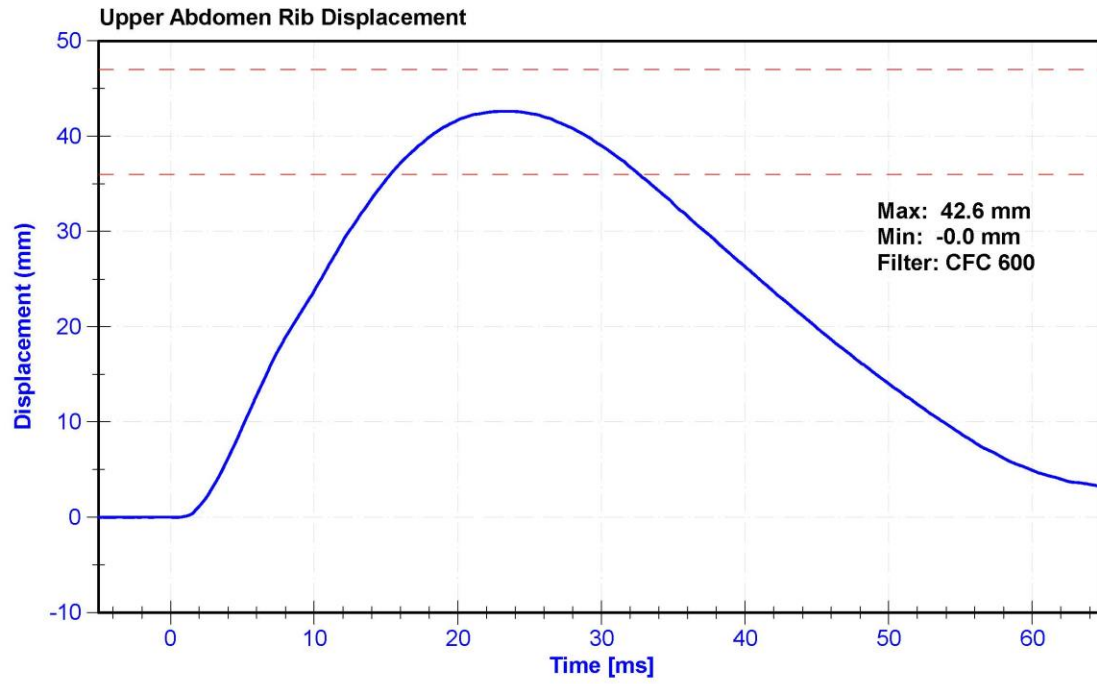
Results

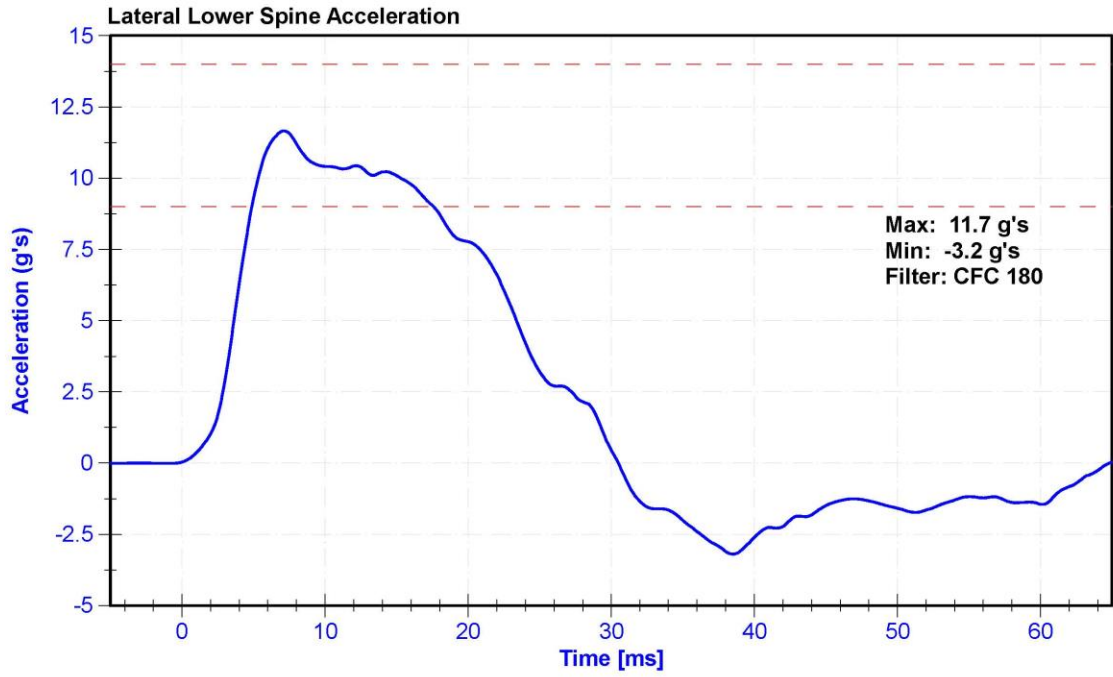
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	29.0	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	12	16	g's	14.7	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.7	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.6	Pass
Lower Abdomen Rib Deflection	33	44	mm	39.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/29/2021
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	10/29/2019	4/28/2020
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-308GFE	10/29/2019	4/28/2020
Lower Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-307GFE	10/29/2019	4/28/2020







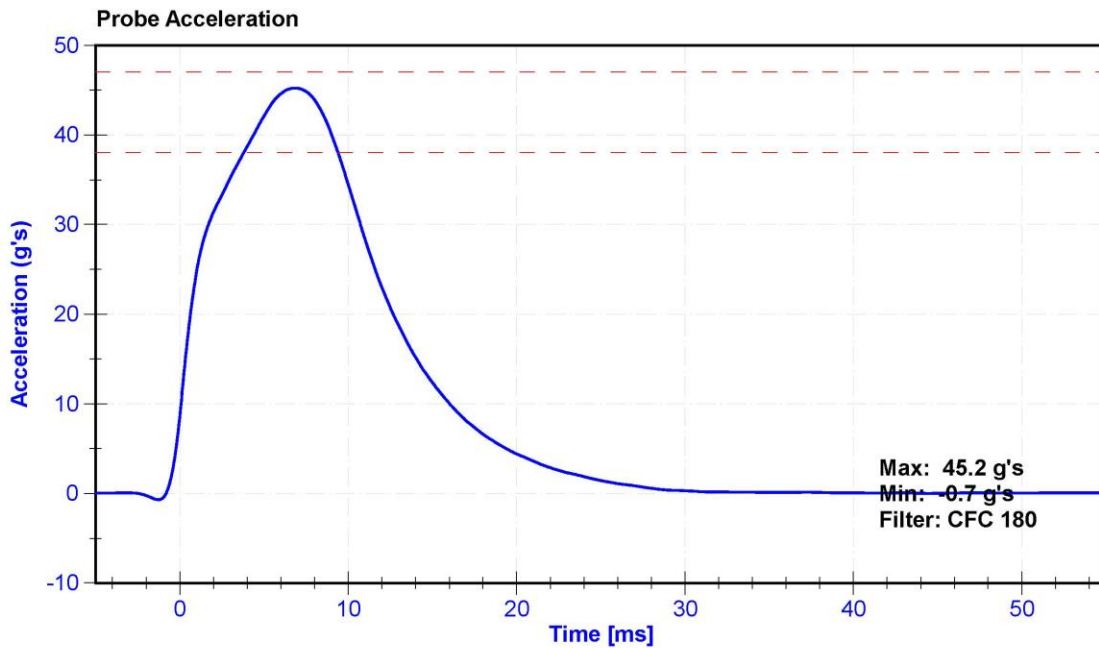
ATD Manufacturer	FTSS	Test Technician	D. Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

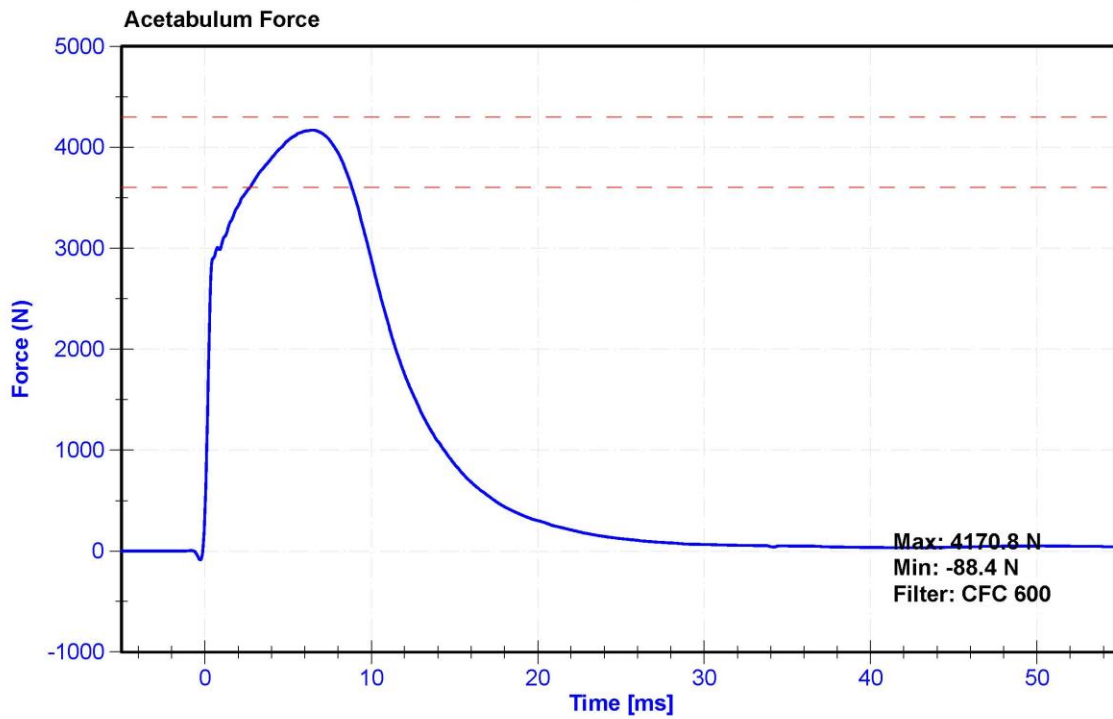
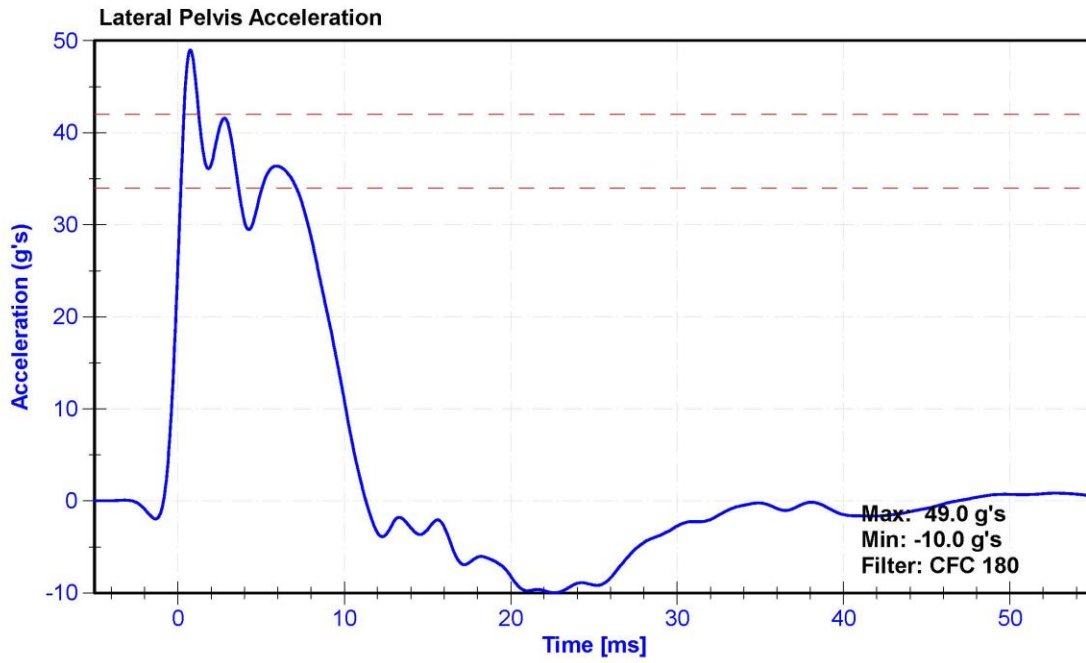
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	29	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	36.4	Pass
Acetabulum Force	3600	4300	N	4170.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/29/2021
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51731	10/29/2019	4/28/2020
Acetabulum Load Cell	Denton 3249J	LC-276Fy	9/24/2019	9/23/2020
Certification Plug	Humanetics	12688	11-21-2018	N/A
Crash Test Plug	Humanetics	12858	1-18-2019	N/A







300 Cash 2-12-2020

SID-IIs Pelvis Plug Certification Test

Plug S/N 12582

Test Number 7512

Report Number 7527

Test Date 10/3/2018 9:02:43 AM

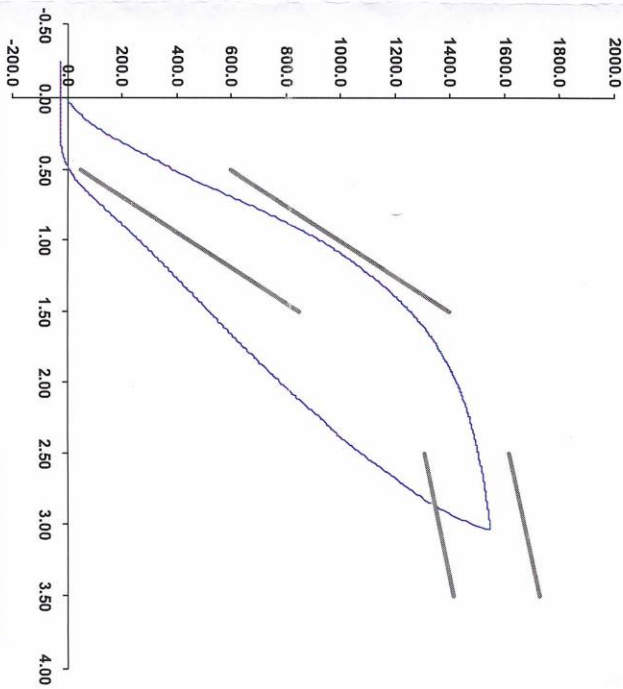
Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50.00	600.00
Force @ 1.5 mm (N)	850.00	1,400.00
Force @ 2.5 mm (N)	1,306.00	1,618.00
Force @ 3.0 mm (N)	1,361.00	1,673.00

Testing Machine STM-20 5965542

Load Cell S/N (F1360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:



Operator

Part Number 180-4450

Template No 107 03-Oct-18
SACO Research

By: MC Date: 10/3/18

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



300 Cert y 2-12-2020

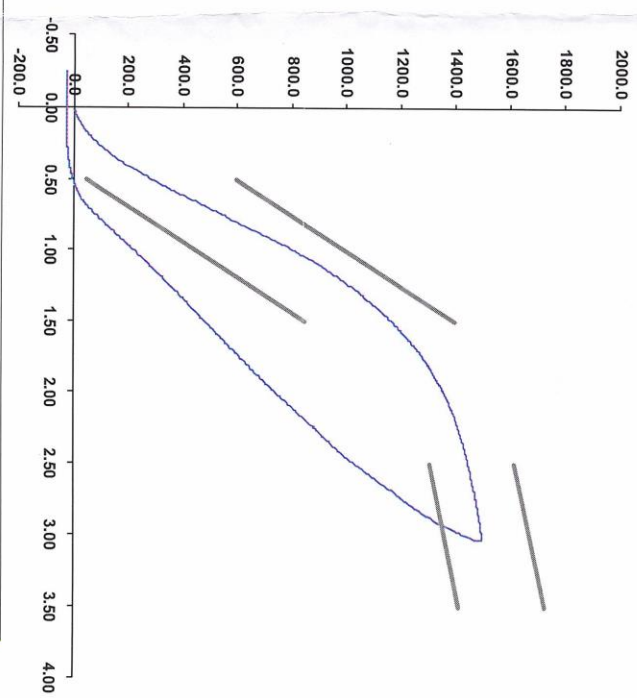
SID-IIs Pelvis Plug Certification Test

Plug S/N 12689
Test Number 7692
Report Number 7721
Test Date 11/21/2018 12:22:43 PM

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

Testing Machine STM-20 5965542
 Load Cell S/N (F1360947), Units (LBS) 1000
 Preload Value (-N) 22.24
 Crosshead Speed (mm / min) or Rate 12.7
 Extension or Position Measured by XHD_100 (XHD100)

Notes:



Operator
Part Number 180-4450

Template No 107 21-Nov-18
 SACO Research
 By: De Date: 11/21/2018
 SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

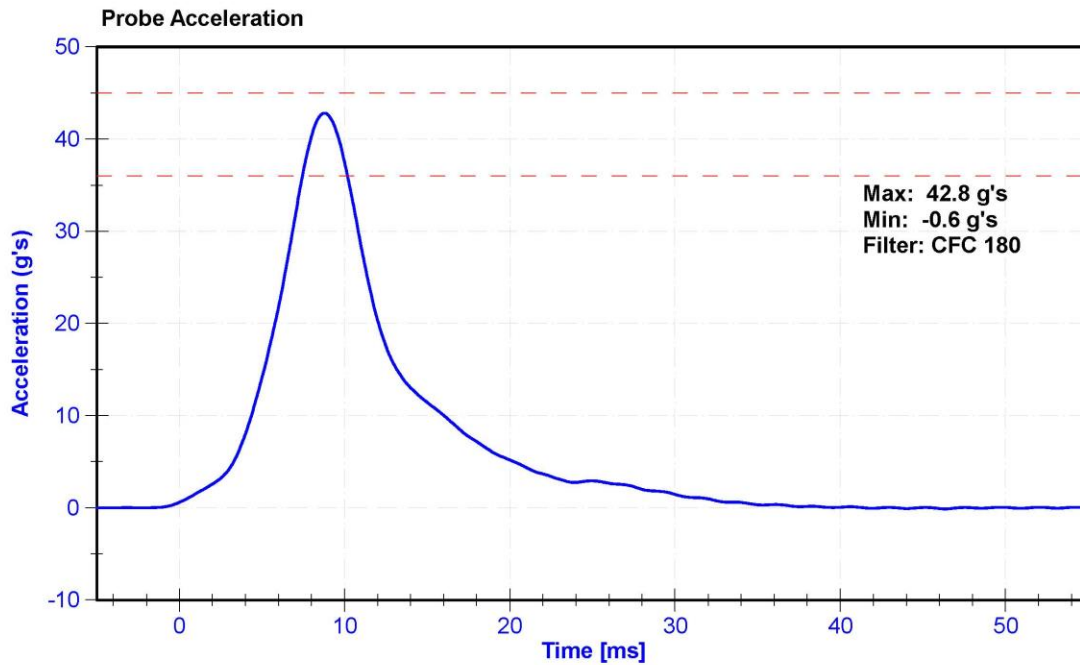
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	D. Reinhard

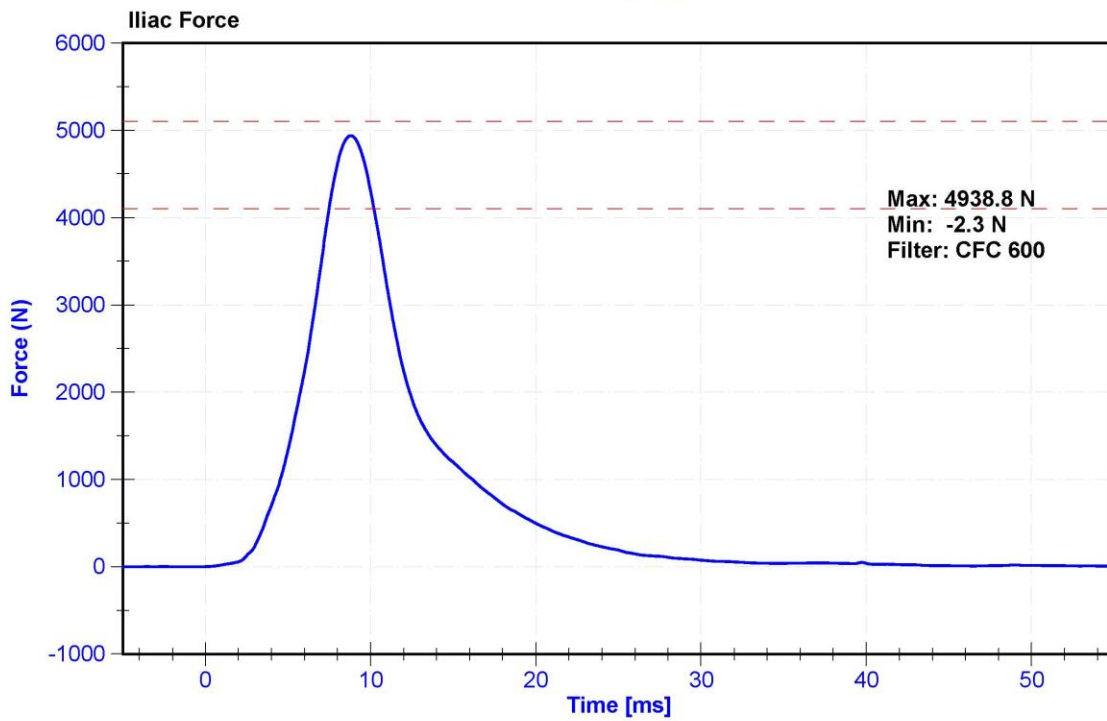
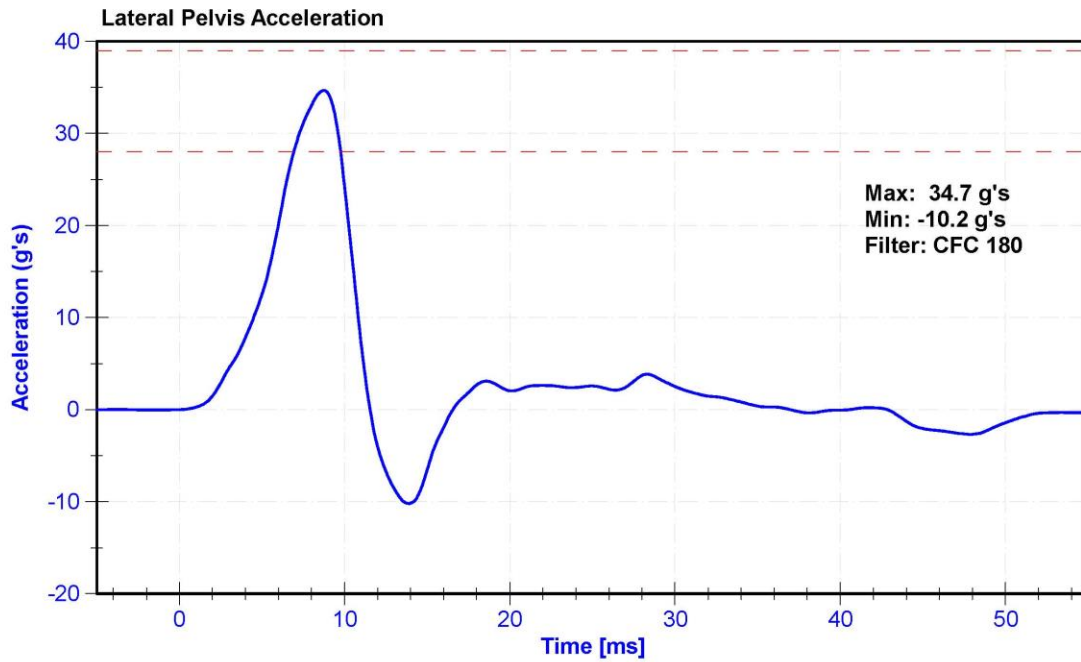
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	29.0	Pass
Velocity	4.2	4.4	m/s	4.22	Pass
Probe Acceleration	36	45	g's	42.8	Pass
Lateral Pelvis Acceleration	28	39	g's	34.7	Pass
Iliac Force	4100	5100	N	4938.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	1/29/2021
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51731	10/29/2019	4/28/2020
Iliac Load Cell	DENTON 3228J	LC-280Fy	6/20/2019	6/19/2020





CALIBRATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

SERIAL NO: F034

(CONFIGURED FOR LEFT SIDE IMPACT)

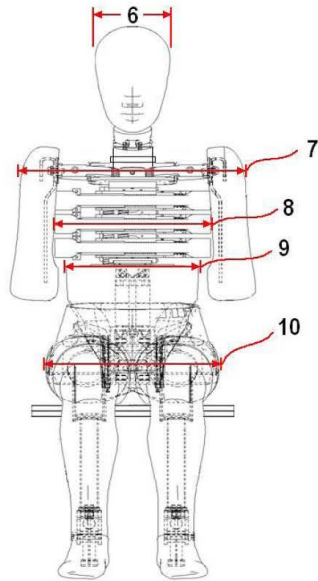


External Measurements - EuroSID-2re

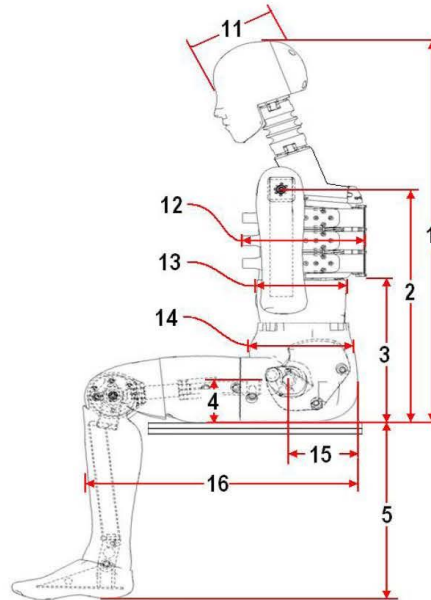
Technician: K. Dutton

Date: 03/05/2020

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	569	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	329	Pass
9	Abdomen Width	273	287	284	Pass
10	Pelvis Lap Width	359	373	365	Pass
11	Head Depth	196	206	203	Pass
12	Thorax Depth	262	272	269	Pass
13	Abdomen Depth	194	204	202	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

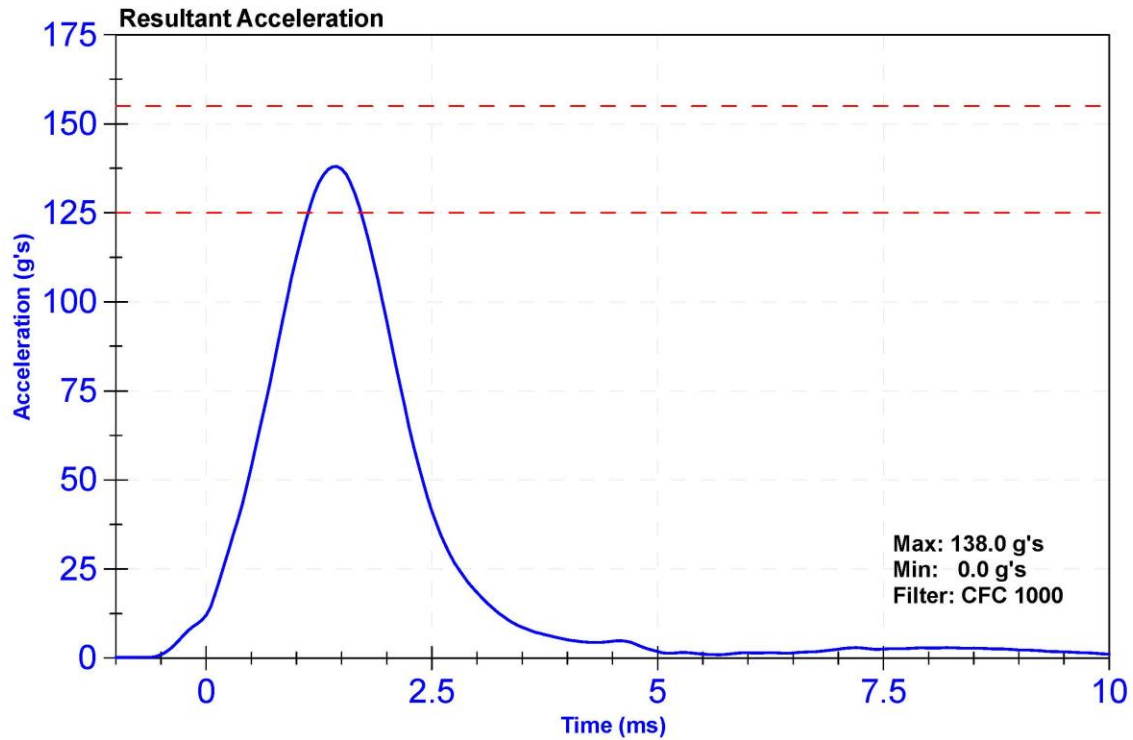
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

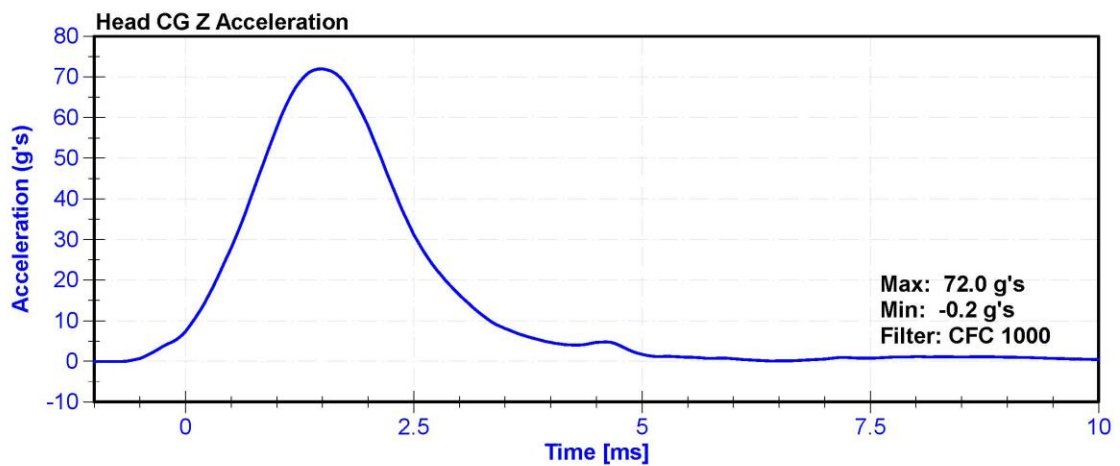
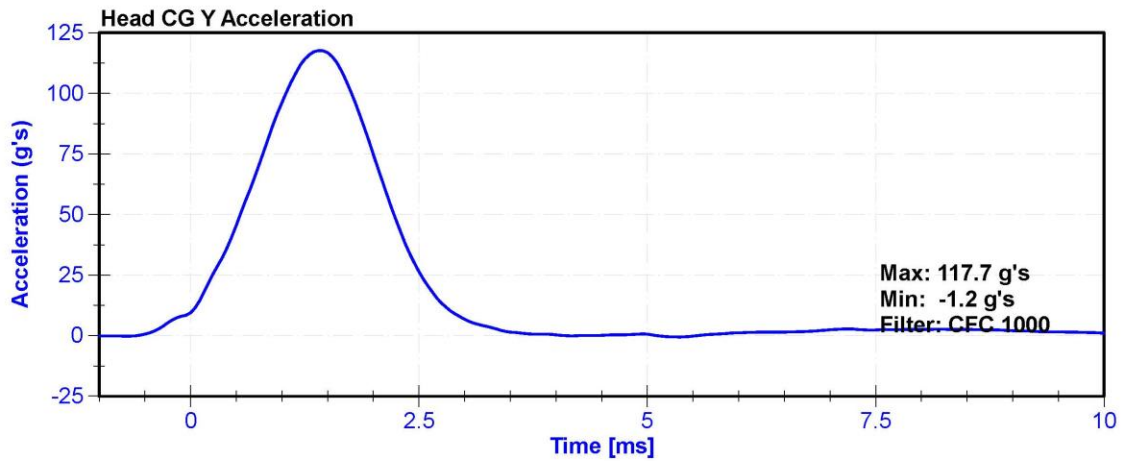
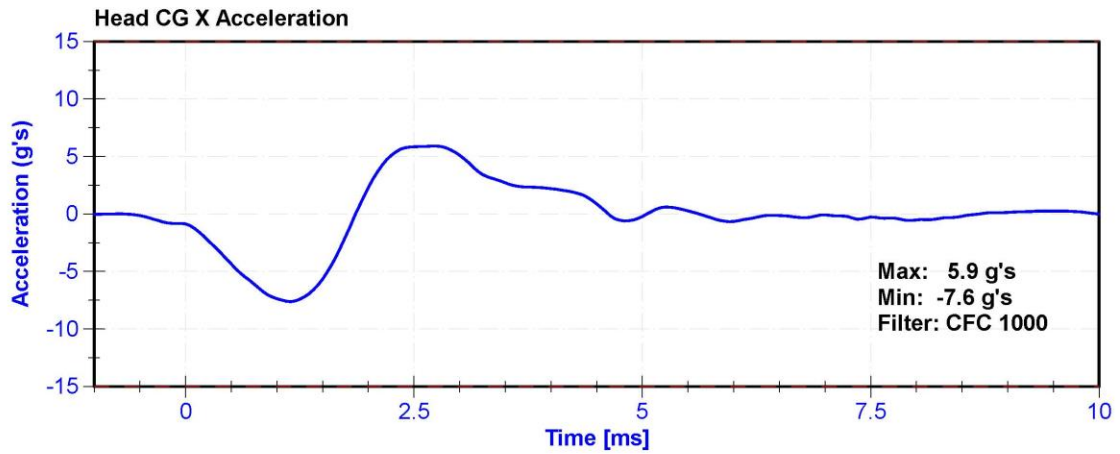
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	30.3	Pass
Resultant Acceleration	125	155	g's	138.0	Pass
Oscillation	0	15	%	3.50	Pass
Fore-Aft Acceleration	-15	15	g's	-7.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P49204	10/29/2019	4/28/2020
Y Accelerometer	ENDEVCO 7264	AC-P63981	10/29/2019	4/28/2020
Z Accelerometer	ENDEVCO 7264	AC-P64007	10/29/2019	4/28/2020





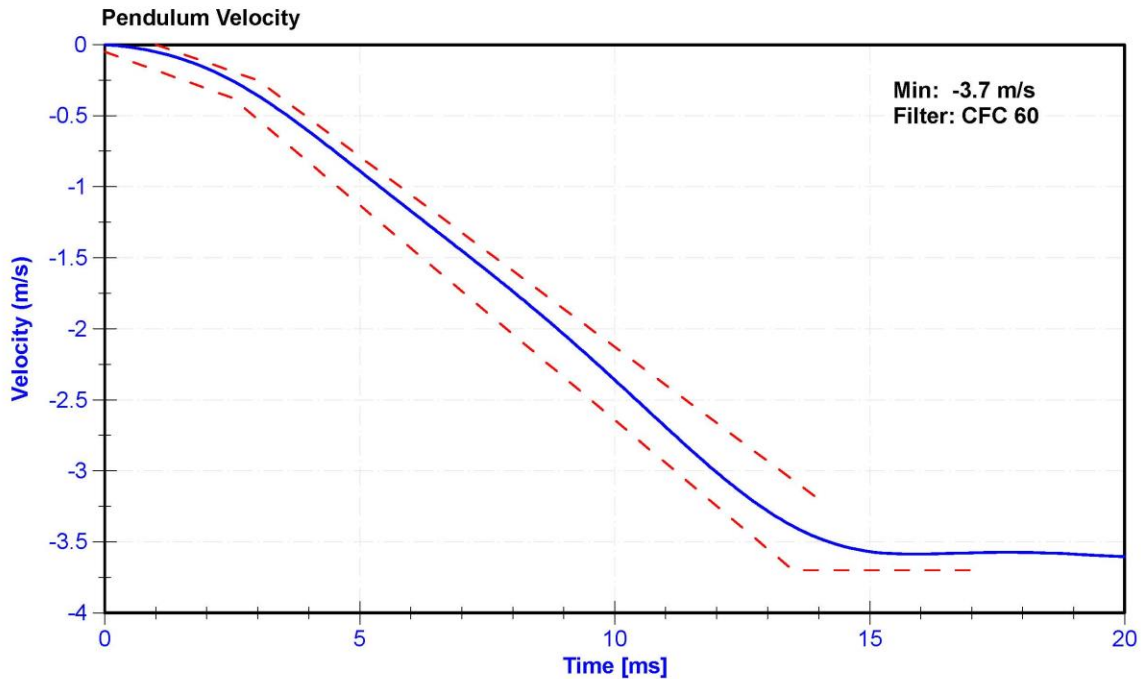
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

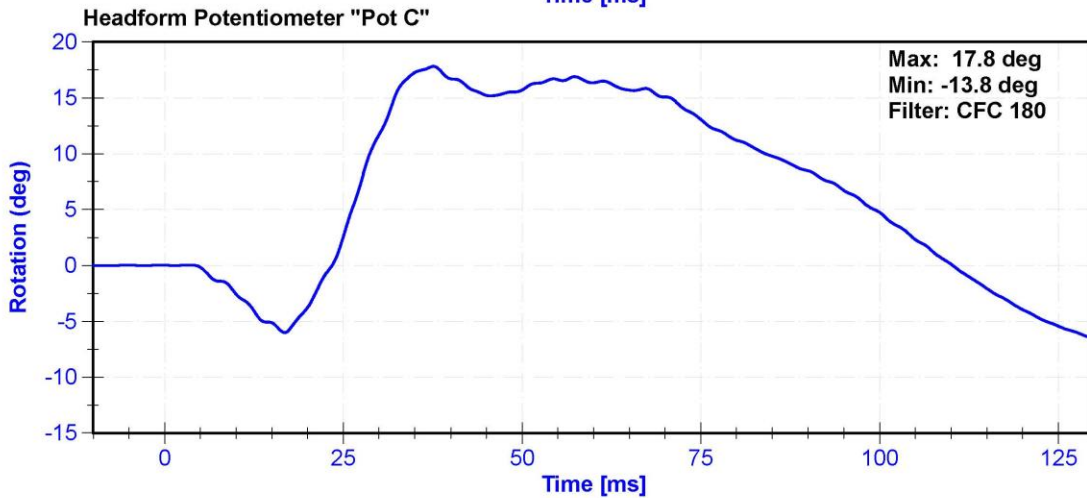
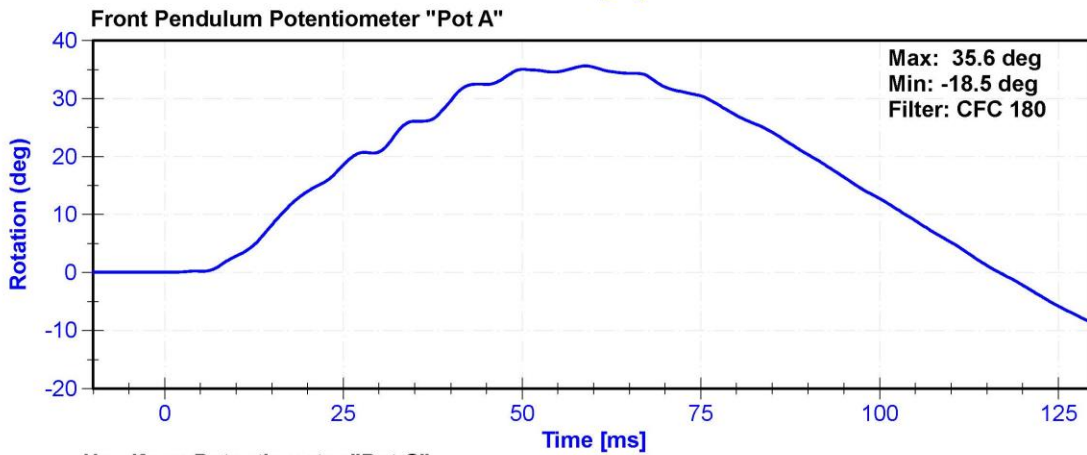
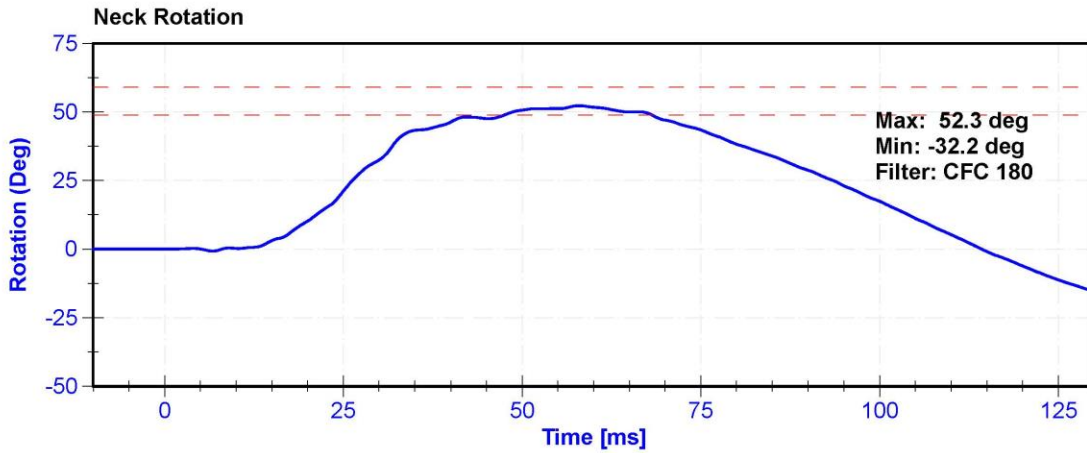
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	30	Pass
Velocity	3.3	3.5	m/s	3.35	Pass
Lateral Neck Rotation	49	59	deg	52.3	Pass
Time at Maximum Rotation	54	66	ms	57.9	Pass
Time of Rotation Decay from Maximum	53	88	ms	56.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CTAC-AH5M9 Pend		1/30/2020	1/29/2021
Front Pendulum Potentiometer	SP22G	DS-094	10/31/2019	10/30/2020
Headform Potentiometer	SP22G	DS-095	10/31/2019	10/30/2020





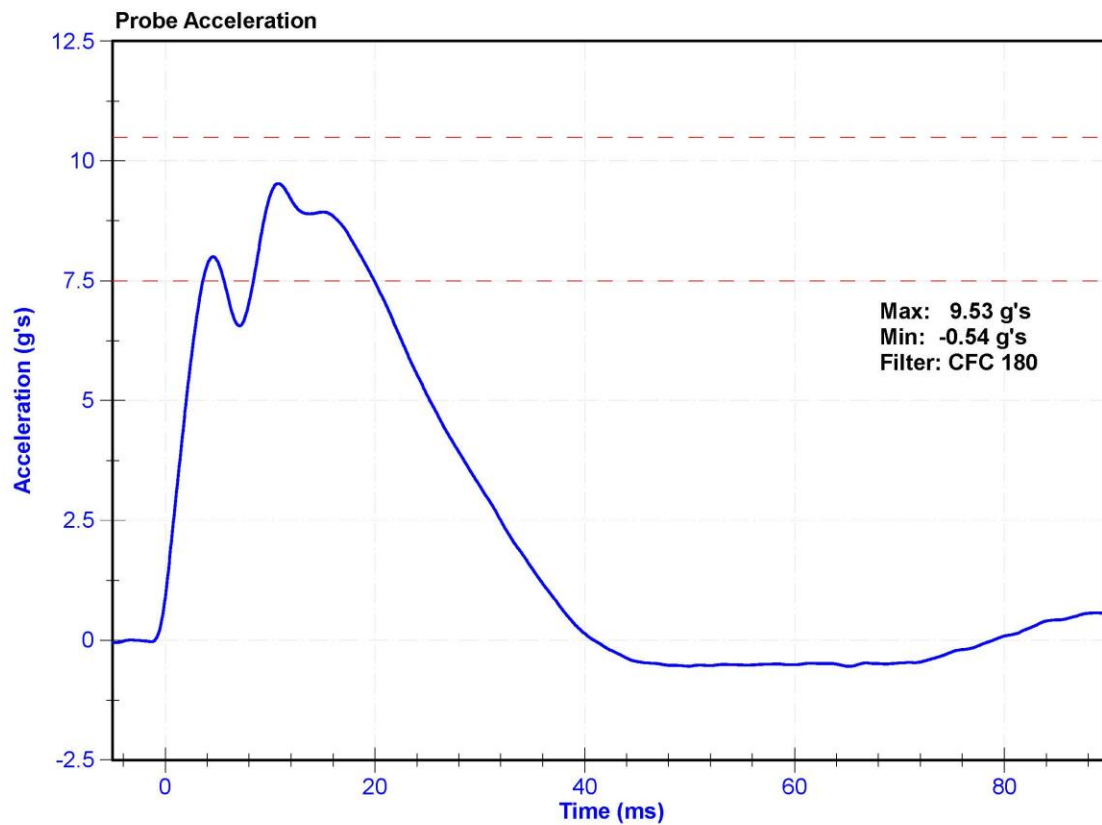
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	25.0	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	7.5	10.5	g's	9.53	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020



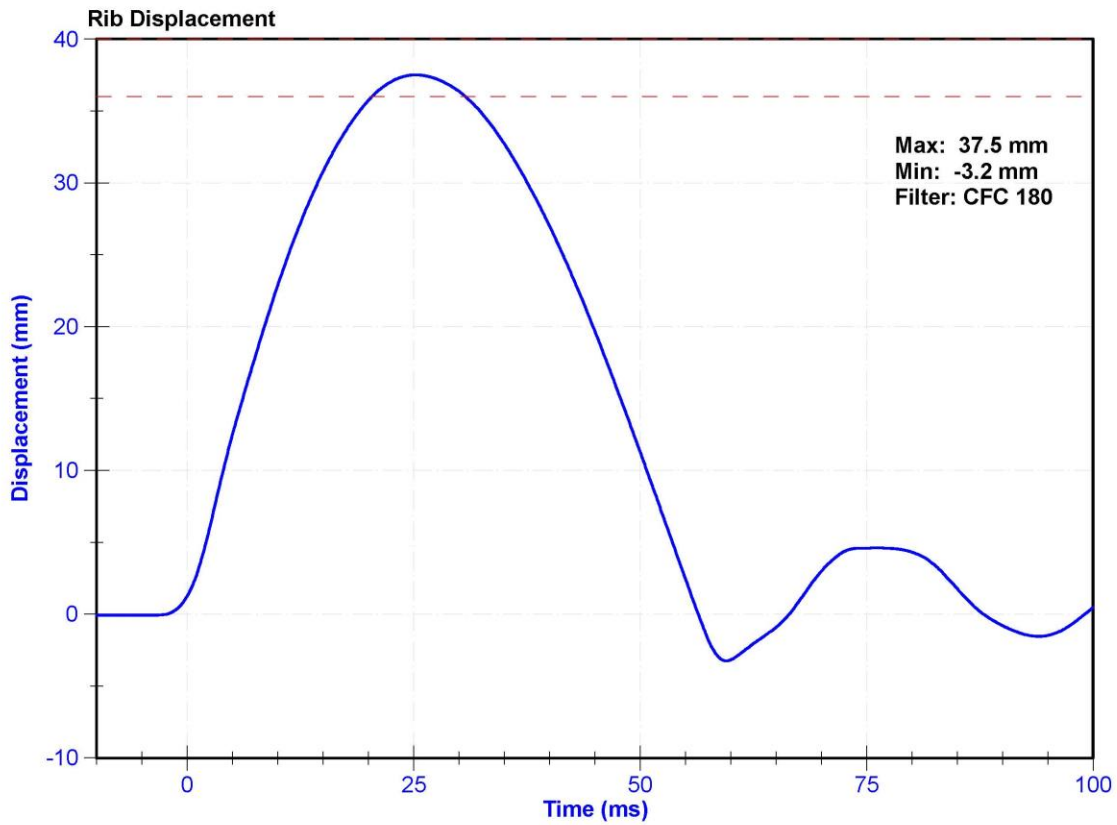
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	20.5	Pass
Rib Displacement	36	40	mm	37.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/31/2019	4/30/2020



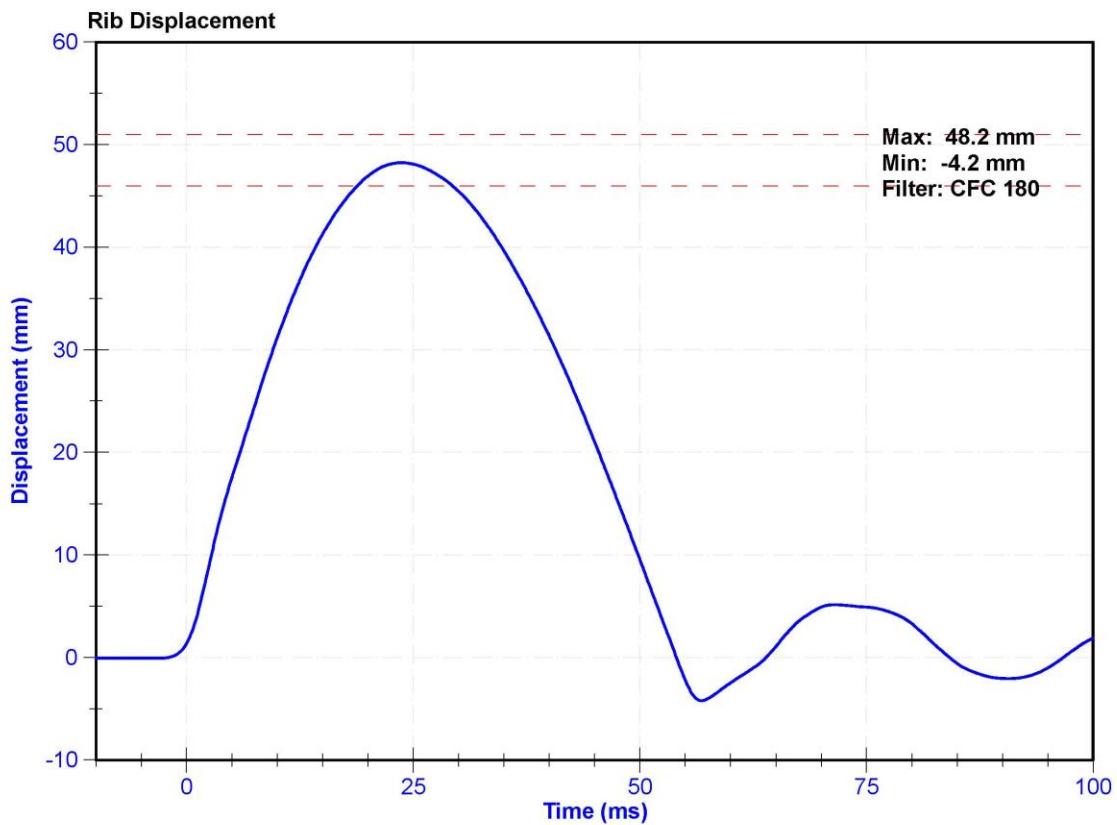
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	20.5	Pass
Rib Displacement	46	51	mm	48.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/31/2019	4/30/2020



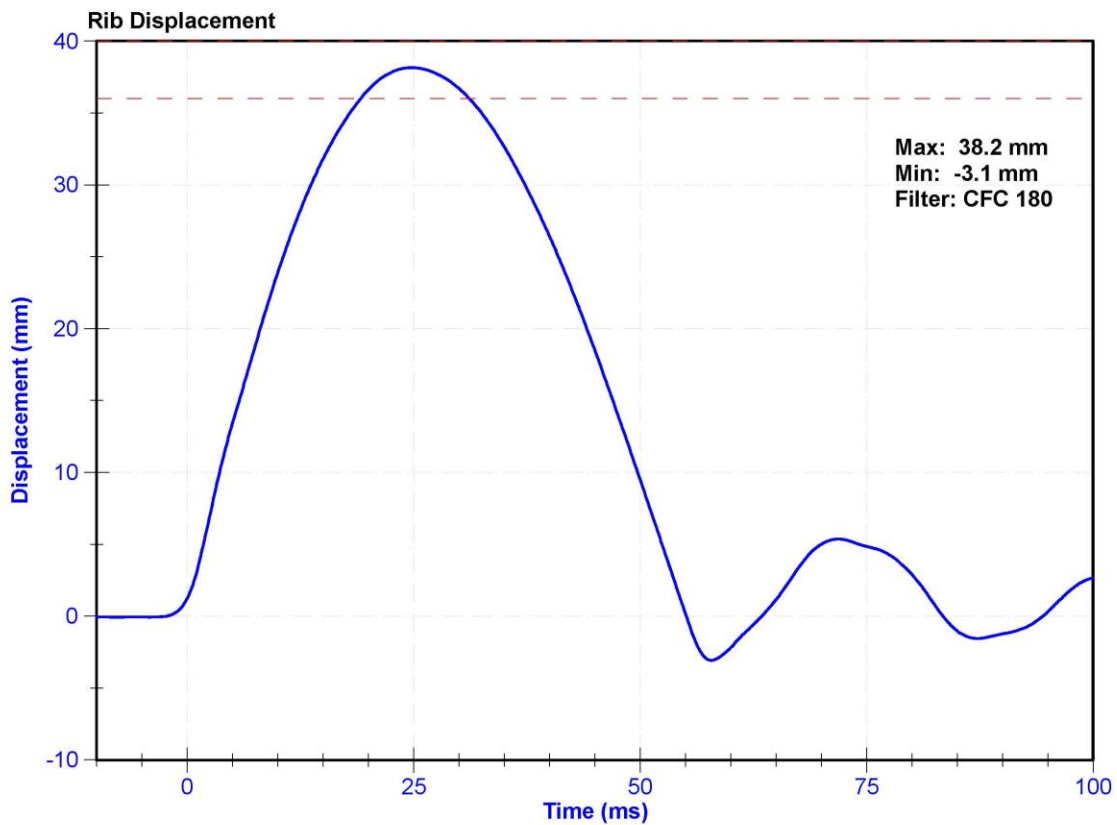
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	20.5	Pass
Rib Displacement	36	40	mm	38.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/31/2019	4/30/2020



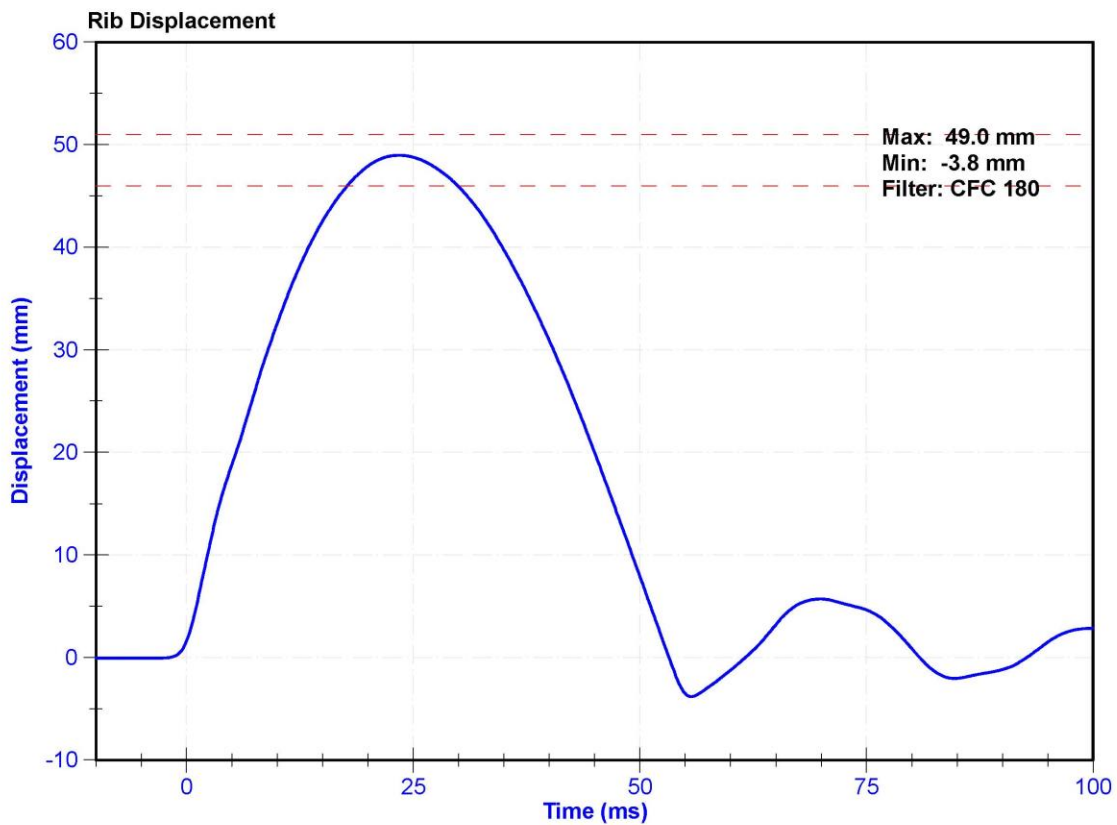
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	20.5	Pass
Rib Displacement	46	51	mm	49.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/31/2019	4/30/2020



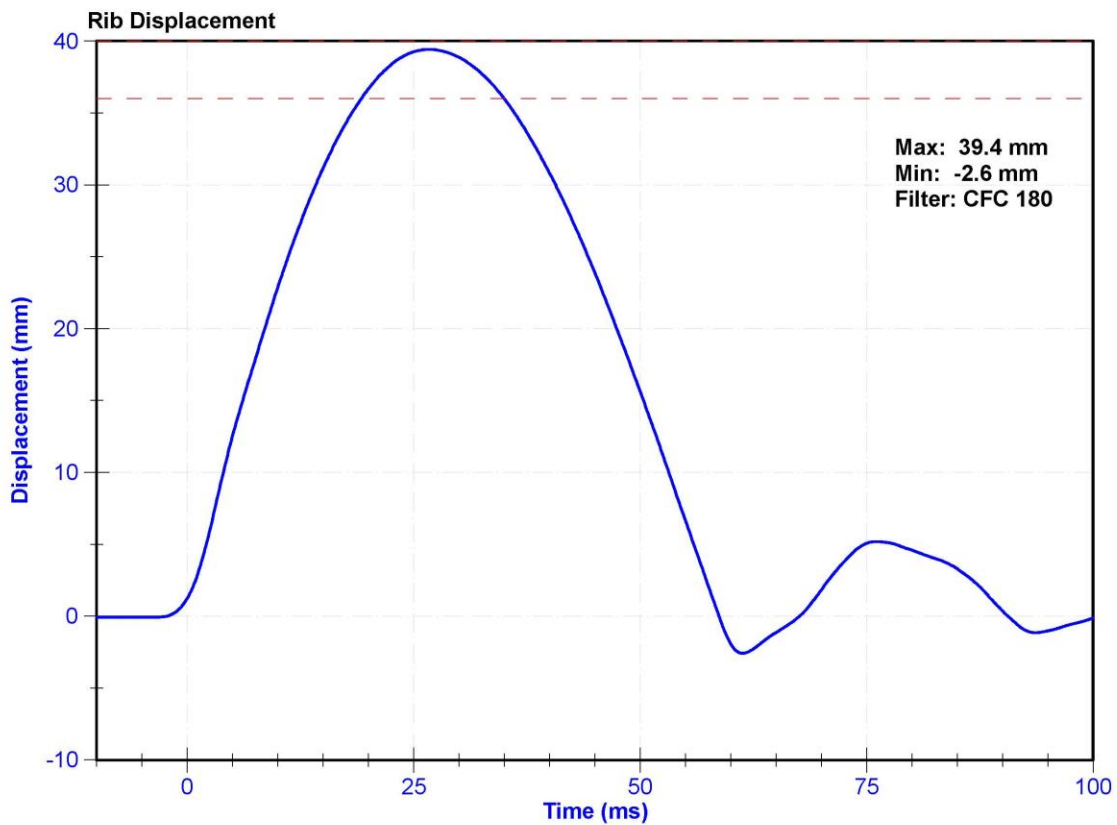
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	20.5	Pass
Rib Displacement	36	40	mm	39.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/31/2019	4/30/2020



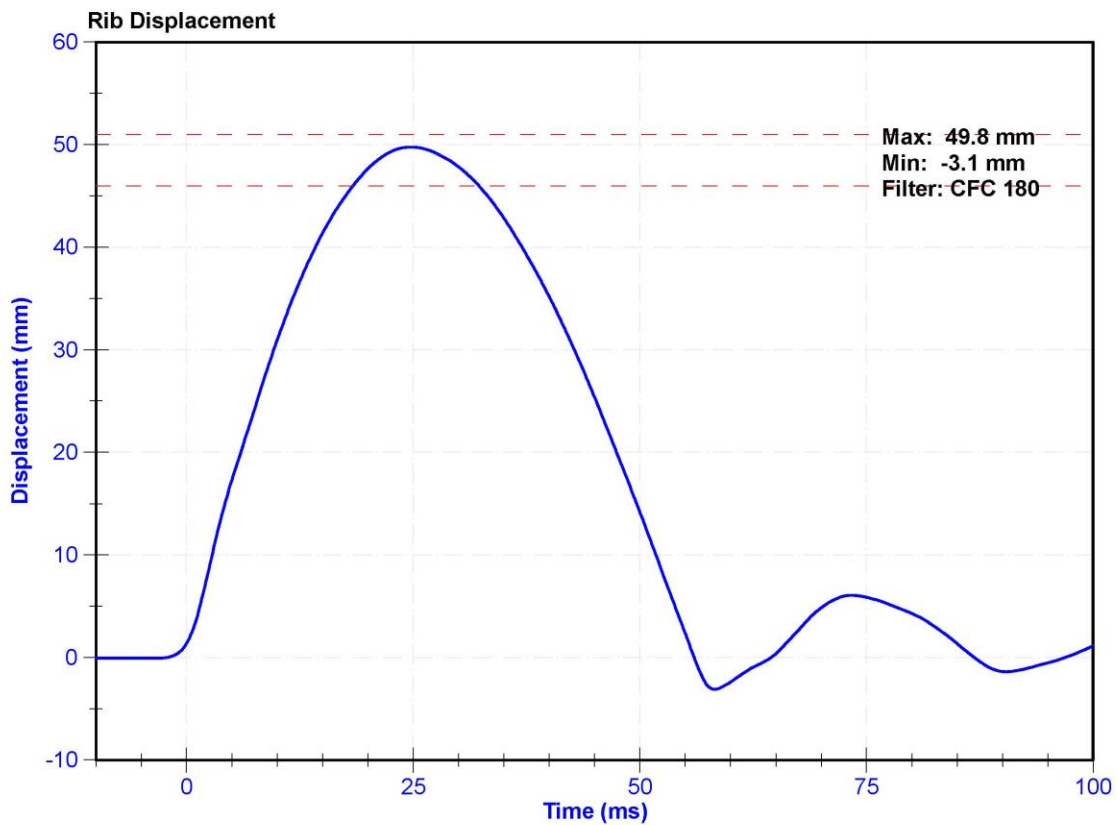
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	20.5	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	10/31/2019	4/30/2020



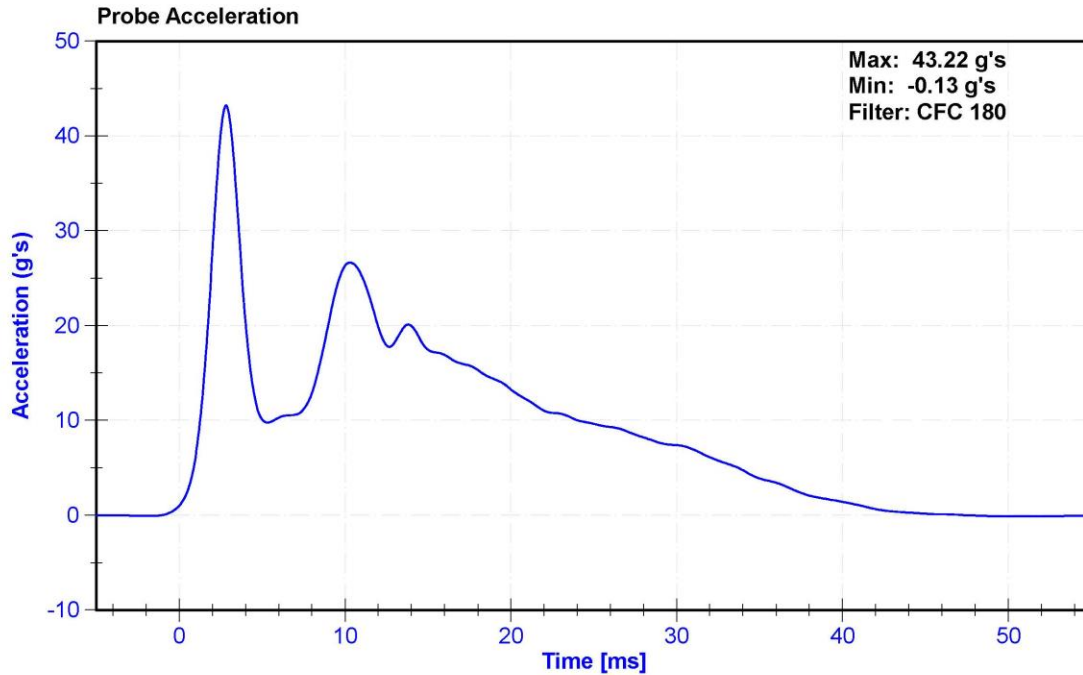
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

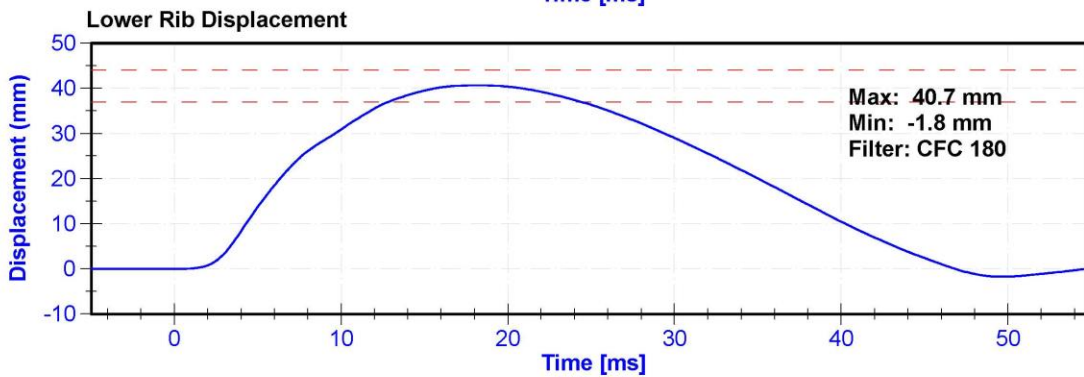
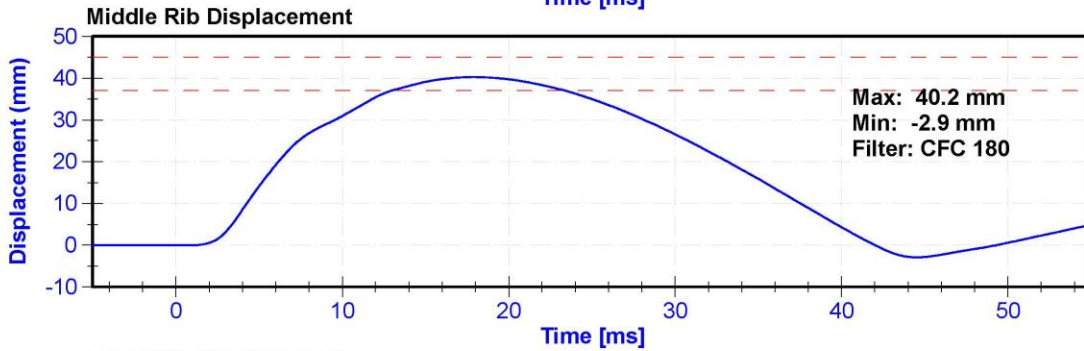
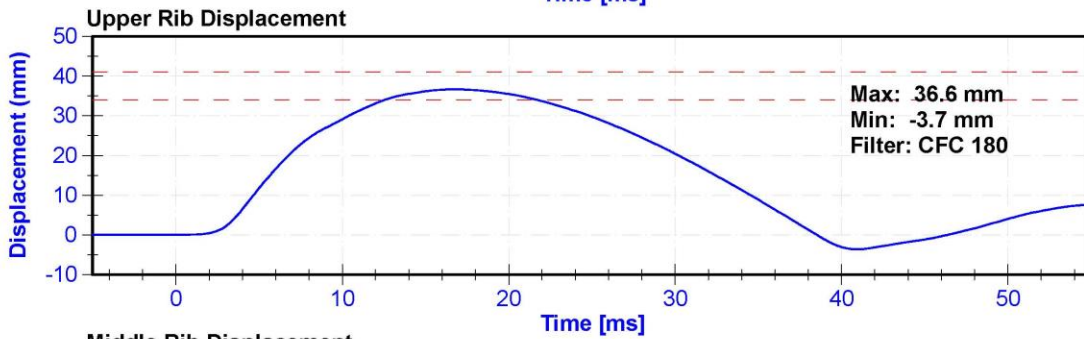
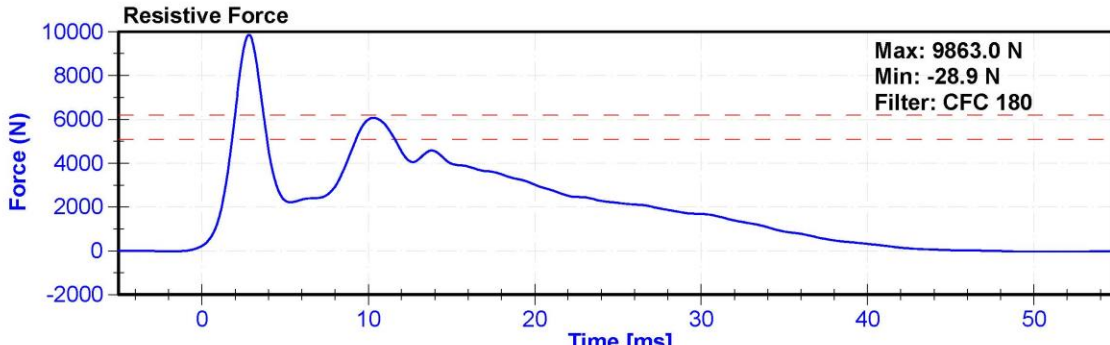
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	26.0	Pass
Velocity	5.4	5.6	m/s	5.46	Pass
Resistive Force after 6ms	5100	6200	N	6079.0	Pass
Upper Thorax Rib Deflection	34	41	mm	36.6	Pass
Mid Thorax Rib Deflection	37	45	mm	40.2	Pass
Lower Thorax Rib Deflection	37	44	mm	40.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Upper Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-183GFE	10/31/2019	4/30/2020
Middle Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-184GFE	10/31/2019	4/30/2020
Lower Thorax Rib Potentiometer	Honeywell MLT-38000203	DS-182GFE	10/31/2019	4/30/2020





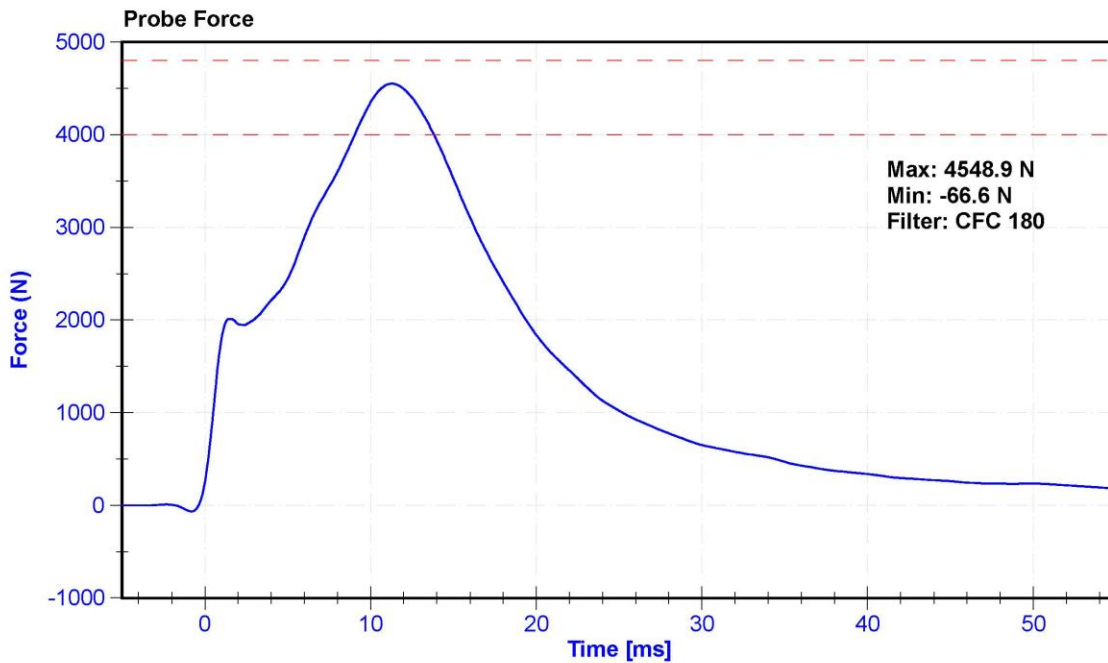
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

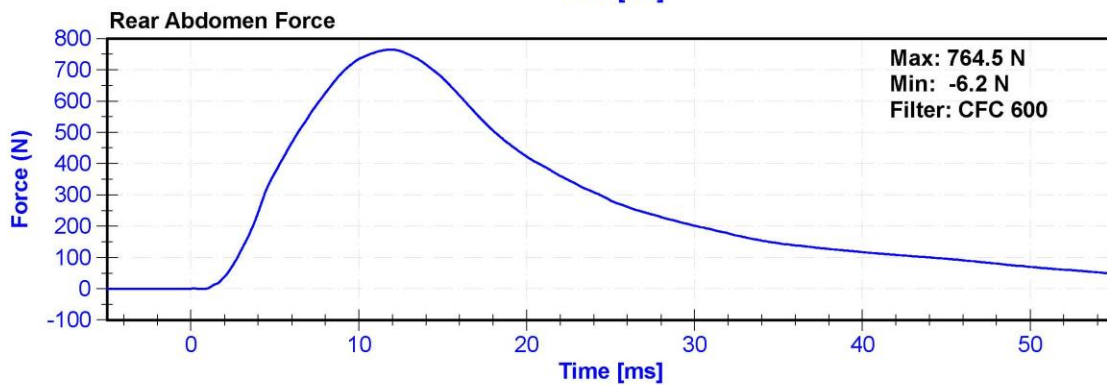
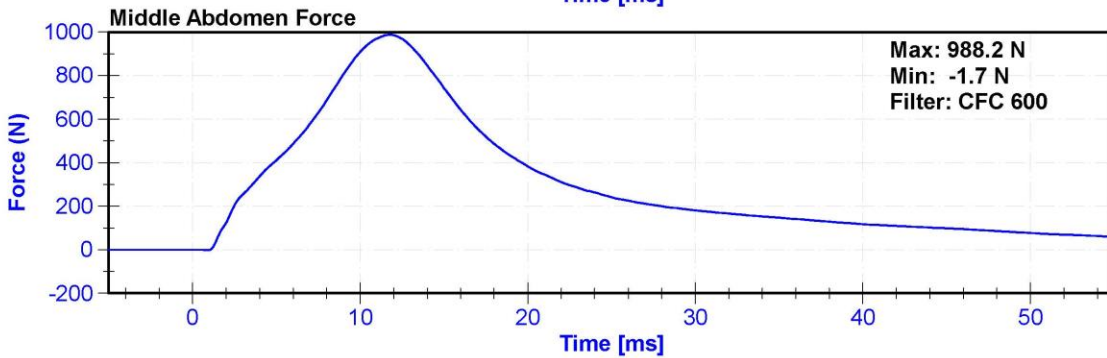
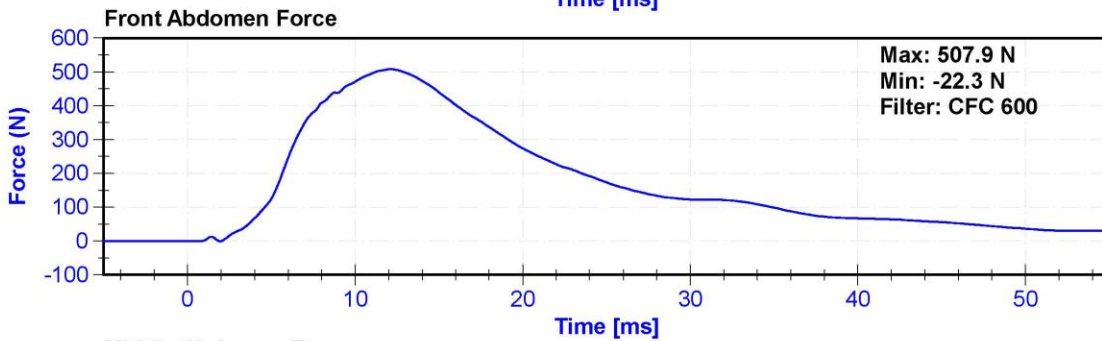
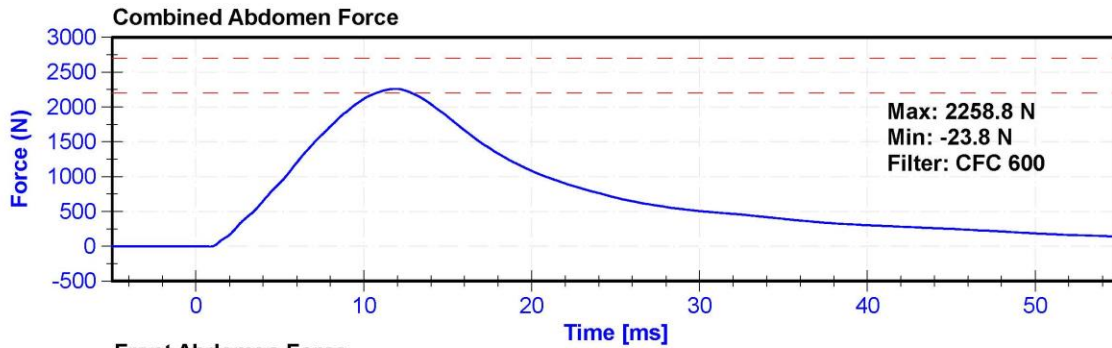
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	30	Pass
Velocity	3.9	4.1	m/s	4.02	Pass
Combined Abdomen Force	2200	2700	N	2258.8	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.90	Pass
Resistive Probe Force	4000	4800	N	4548.9	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.30	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Front Abdomen Load Cell	DENTON 2631	LC-1440	6/14/2019	6/13/2020
Middle Abdomen Load Cell	DENTON 2631	LC-1525	6/5/2019	6/4/2020
Rear Abdomen Load Cell	DENTON 2631	LC-1528	6/14/2019	6/13/2020





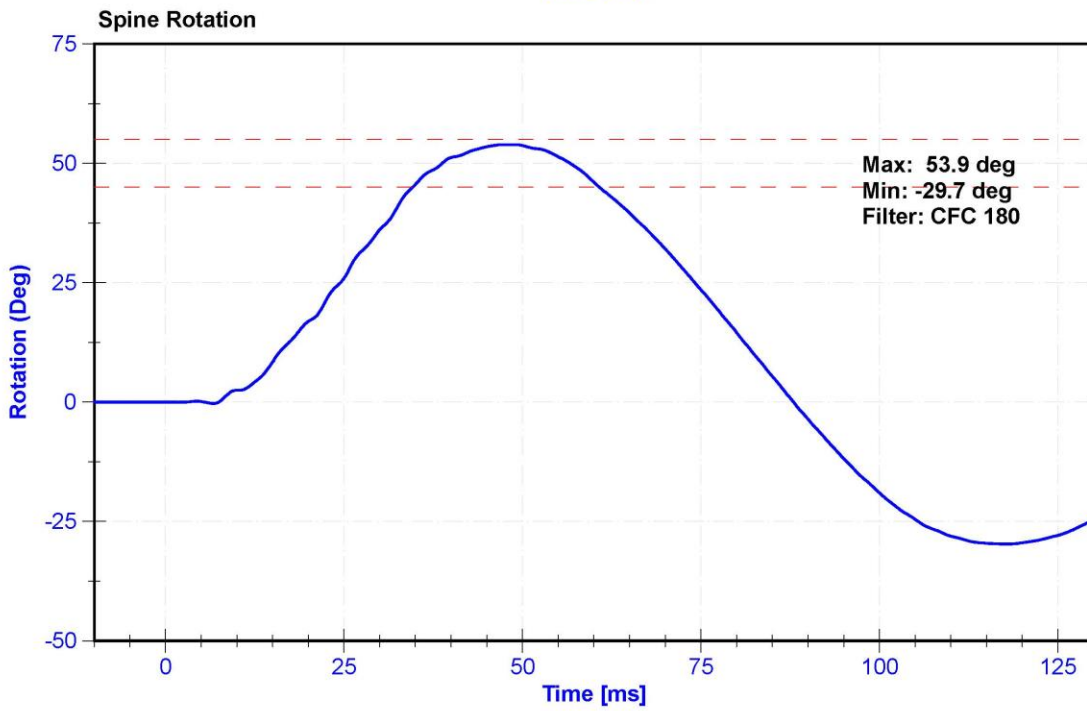
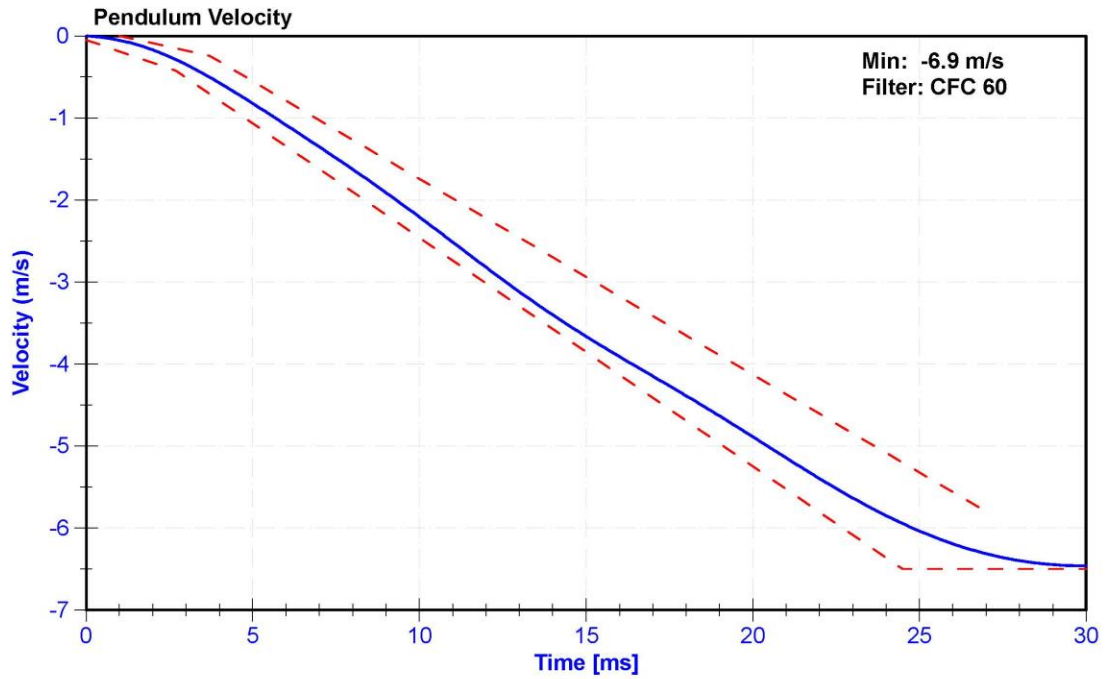
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

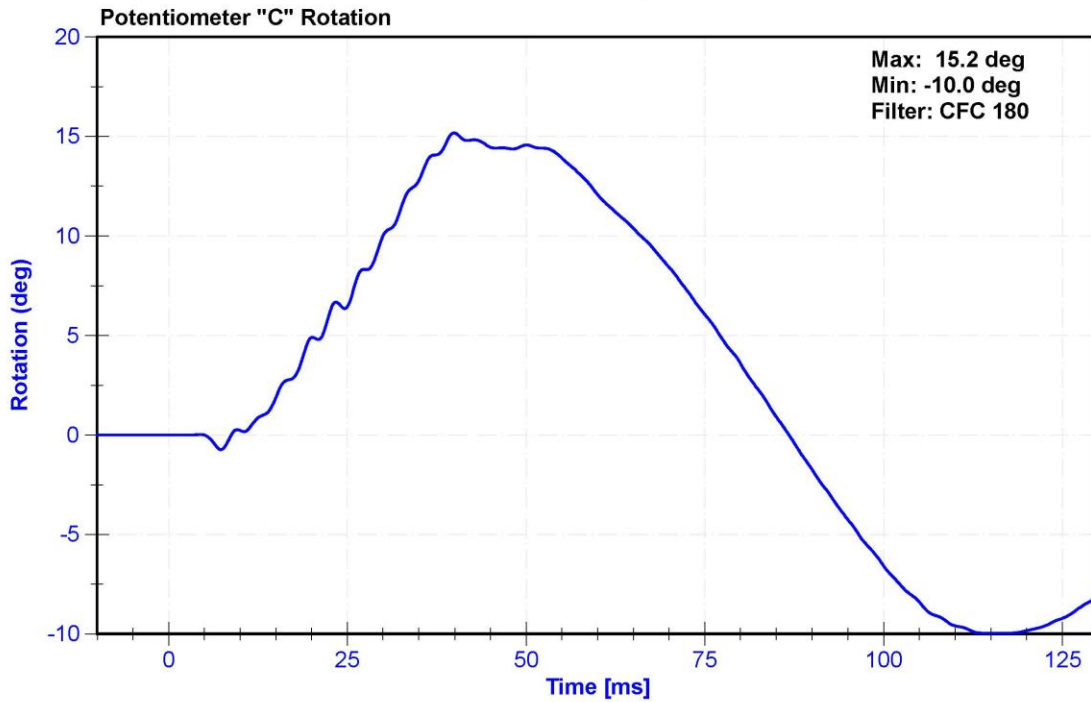
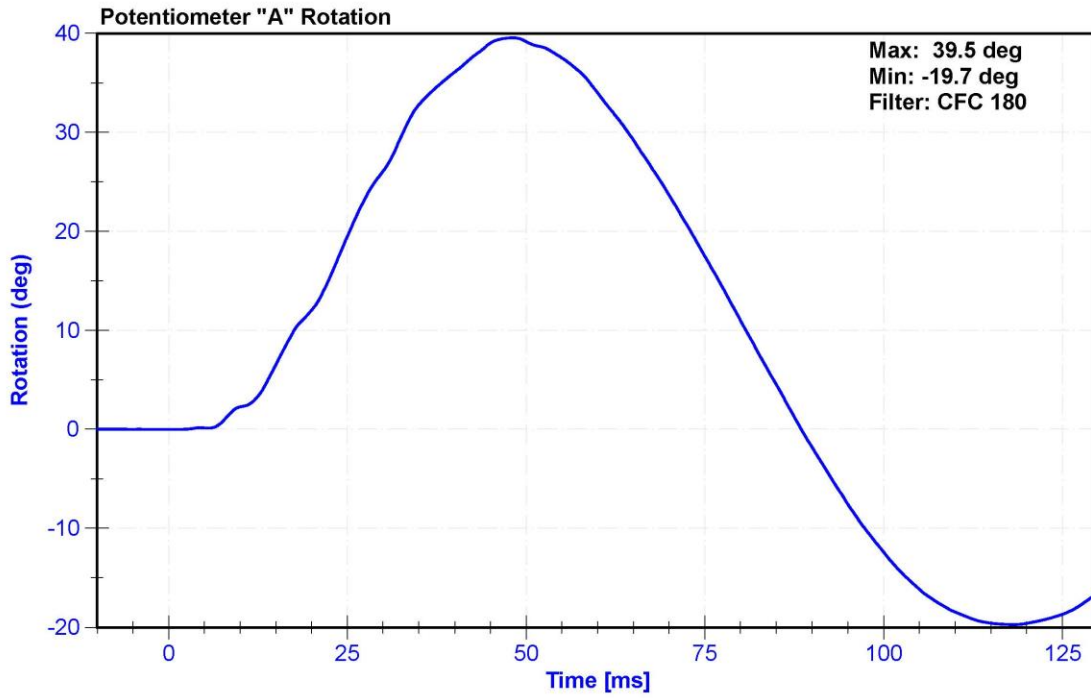
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	30.1	Pass
Velocity	5.95	6.15	m/s	6.005	Pass
Lateral Spine Rotation	45	55	deg	53.9	Pass
Time at Maximum Rotation	39	53	ms	48.9	Pass
Time of Decay to Zero Degrees	37	57	ms	39.0	Pass
Pulse within Corridor?	-	-	-		

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/30/2020	1/29/2021
Pendulum "A" Potentiometer	SP22G	DS-094	10/31/2019	10/30/2020
Condyle "B" Potentiometer	SP22G	DS-095	10/31/2019	10/30/2020





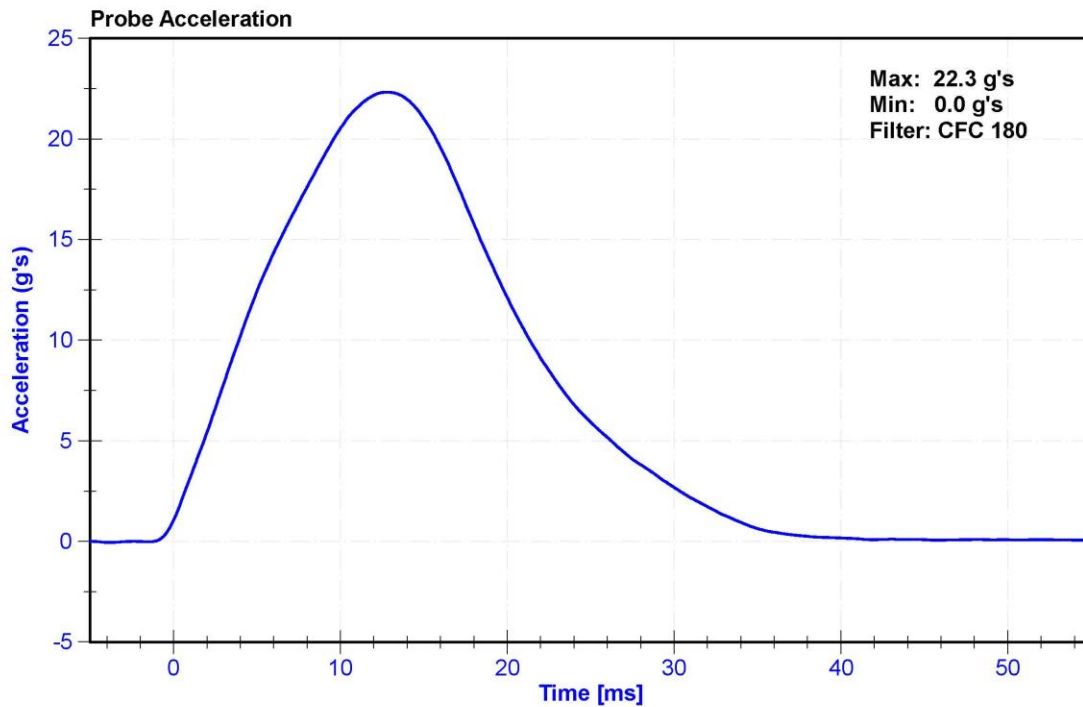
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

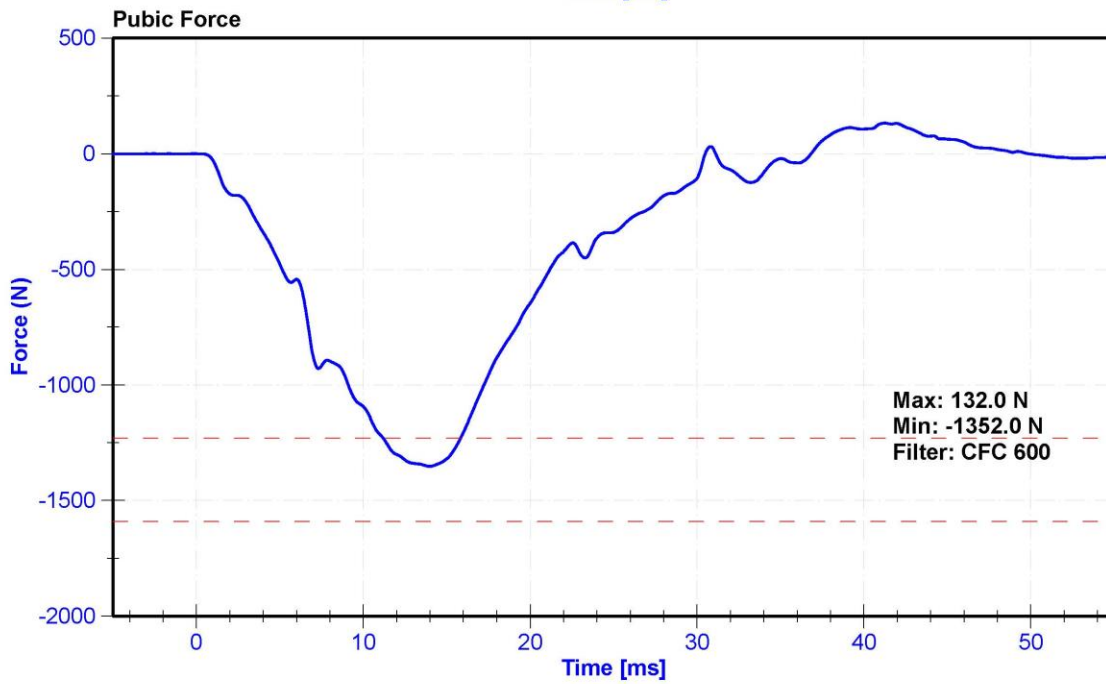
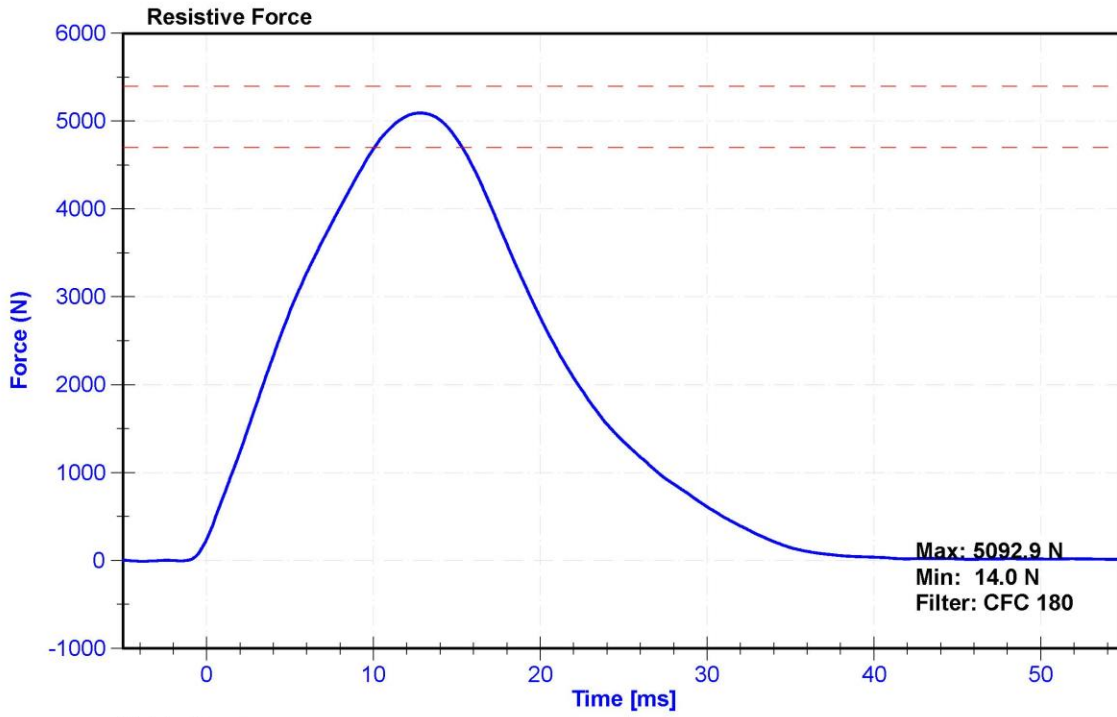
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	34.0	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Resistive Force	4700	5400	N	5092.9	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.80	Pass
Pubic Force	-1590	-1230	N	-1352.0	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.95	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Pubic Load Cell	Denton 3096JFL	LC-464fy	6/14/2019	6/13/2020





CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL No: 300

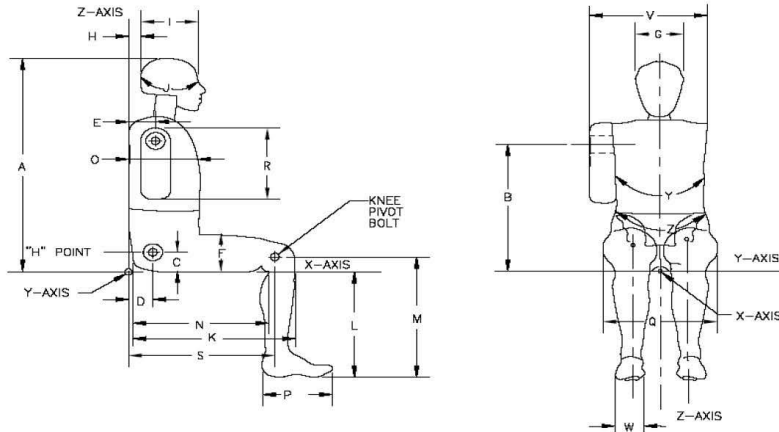


External Measurements - SID-IIs

Technician: K. Dutton

Date: 03/04/2020

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	450	Pass
C	H-point Height	79	89	86	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	101	Pass
F	Thigh Clearance	119	135	125	Pass
G	Head Breadth	140	148	145	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	185	Pass
J	Head Circumference	541	551	545	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	402	Pass
N	Buttock Popliteal Length	416	442	432	Pass
O	Chest Depth w/o jacket	195	211	203	Pass
P	Foot Length	216	232	221	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	352	Pass
W	Foot Width	78	94	84	Pass
Y	Chest Circumference w/jacket	851	881	870	Pass
Z	Waist Circumference	761	791	772	Pass

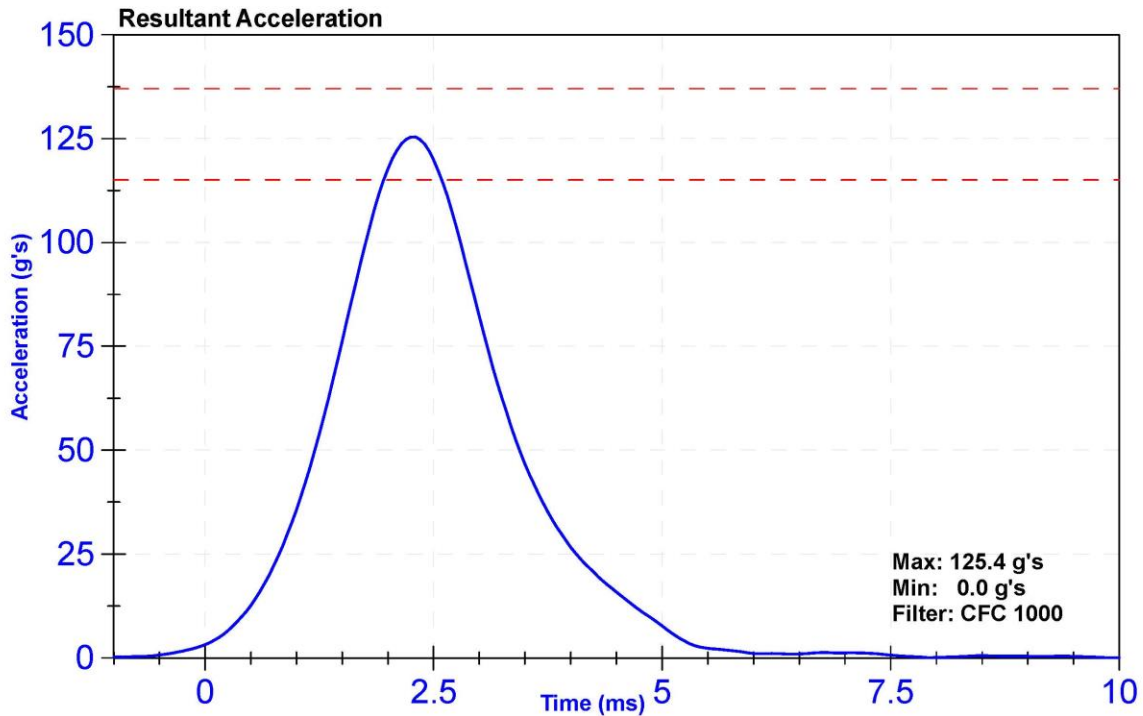
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

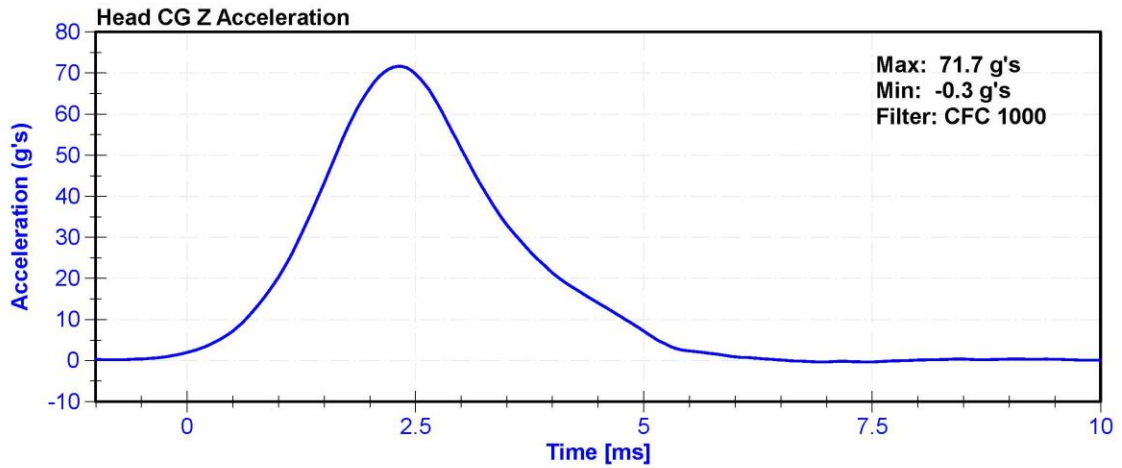
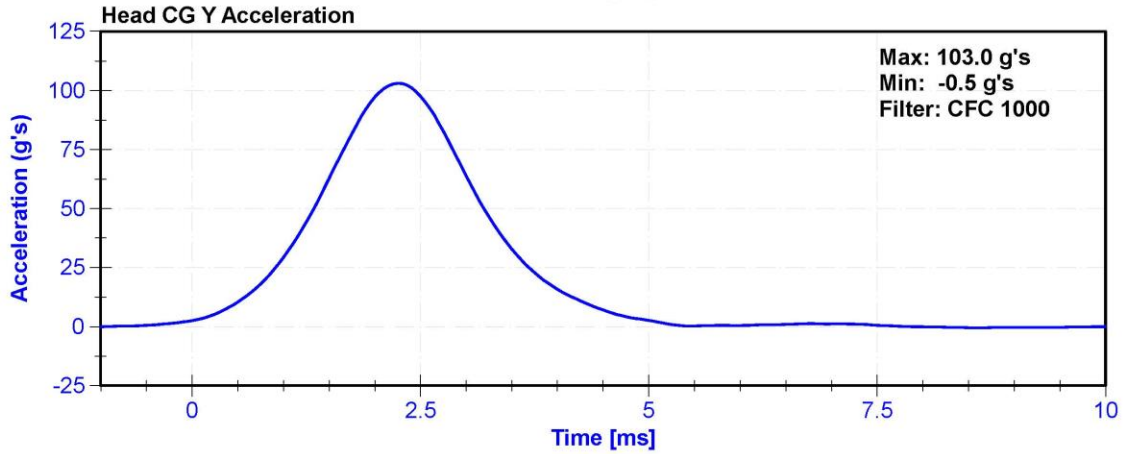
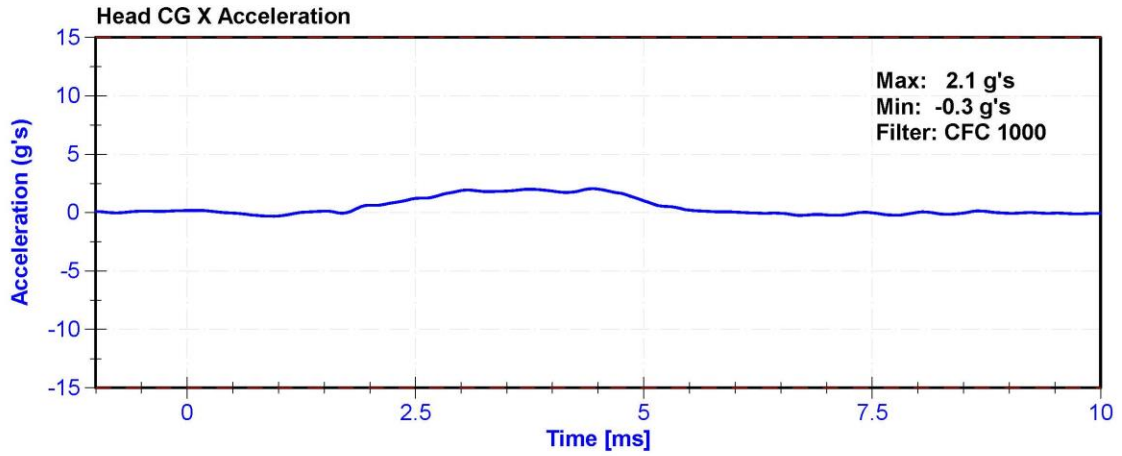
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	20.4	Pass
Resultant Acceleration	115	137	g's	125.4	Pass
Oscillation	0	15	%	1.0	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 7264	P68057	4/20/2019	4/19/2020
Y Accelerometer	ENDEVCO 7264	P79189	4/20/2019	4/19/2020
Z Accelerometer	ENDEVCO 7264CT	P52095	4/20/2019	4/19/2020





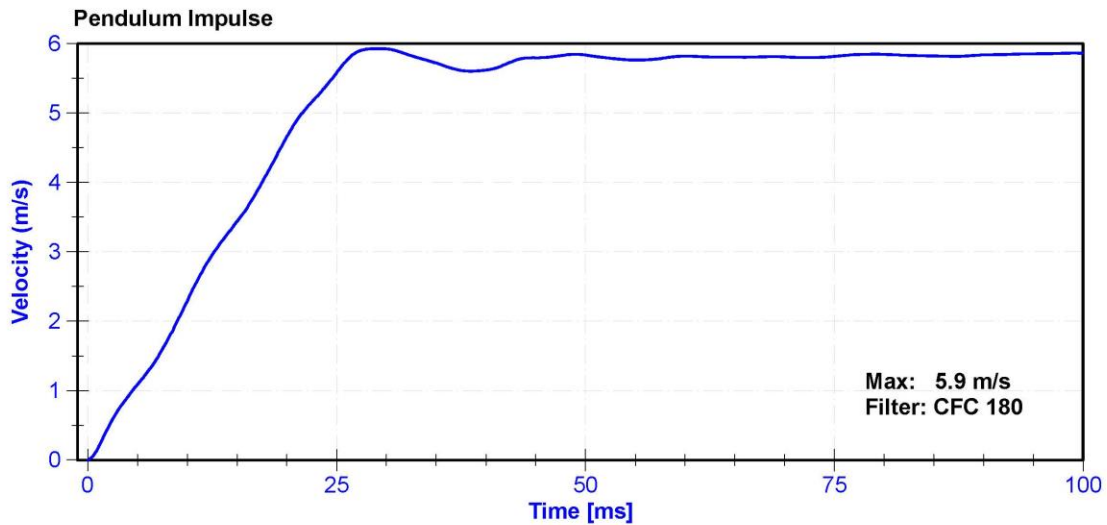
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

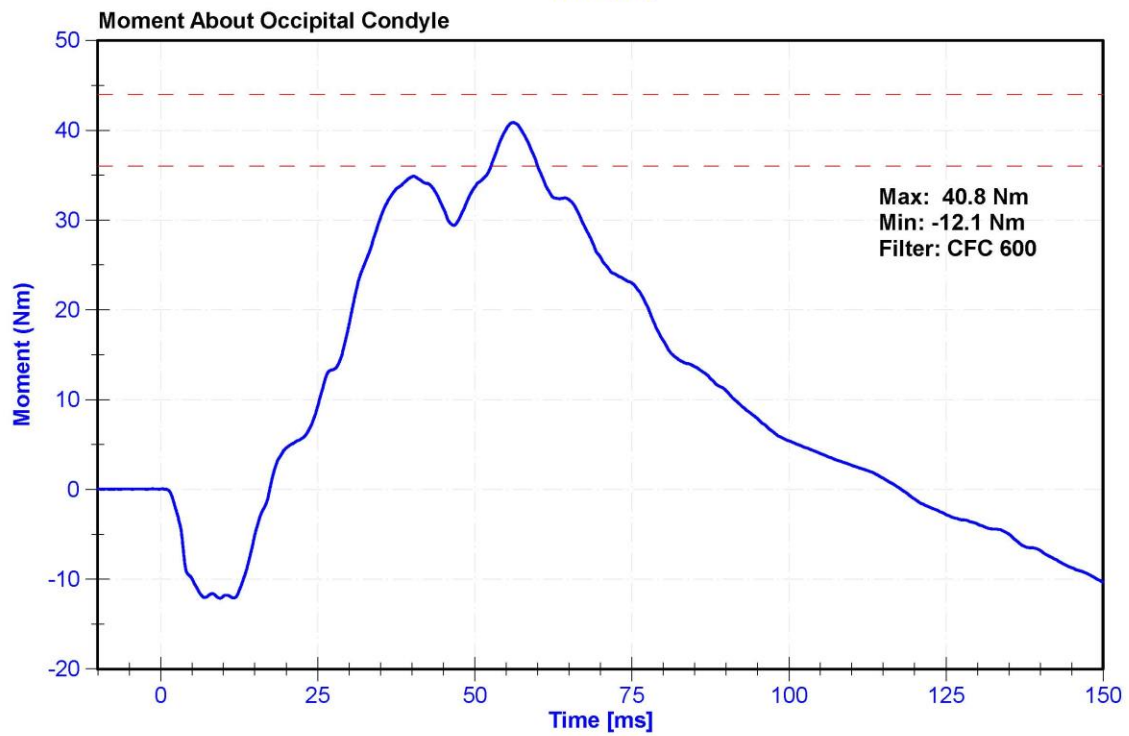
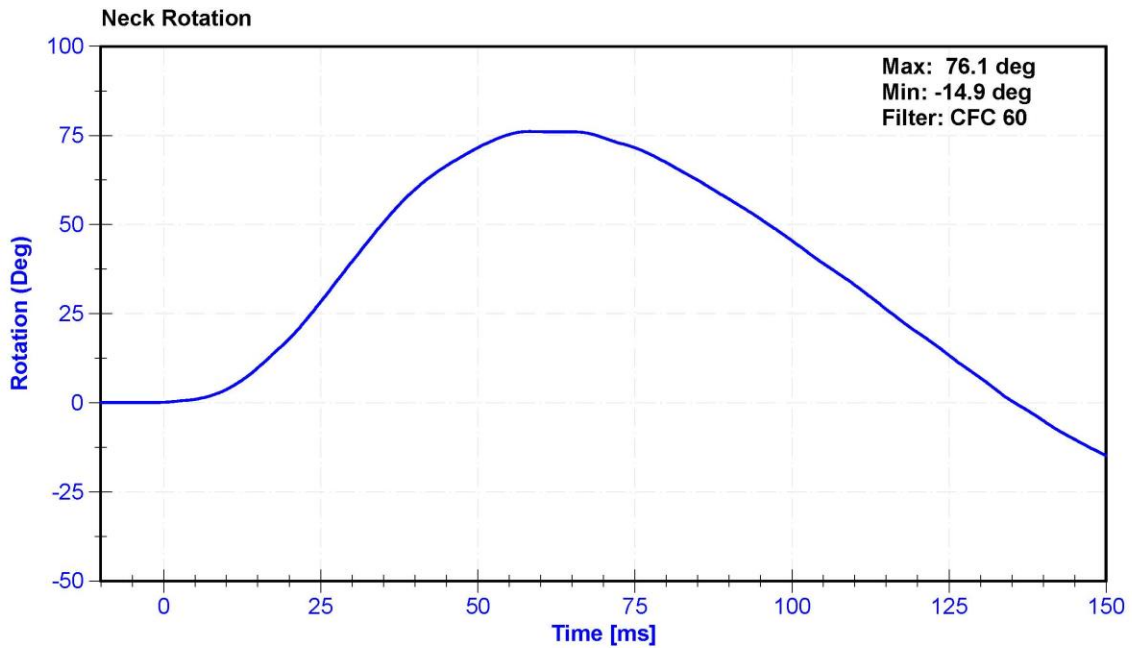
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	30.1	Pass
Velocity	5.51	5.63	m/s	5.514	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.29	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.44	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.65	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.58	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.92	Pass
Neck Rotation	71	81	deg	76.1	Pass
Time at Maximum Rotation	50	70	ms	58.2	Pass
Moment about the OC	36	44	Nm	40.8	Pass
Moment Decay to 0 Nm	102	126	ms	117.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9 Pend	1/30/2020	1/29/2021
Pendulum Potentiometer	Denton 78051-342	DS-184Pend	11/4/2019	11/3/2020
Condyle Potentiometer	Denton 78051-342	DS-185Pend	11/4/2019	11/3/2020
Upper Neck Load Cell	Denton 1716A	LC-2192Fy	6/20/2019	6/19/2020





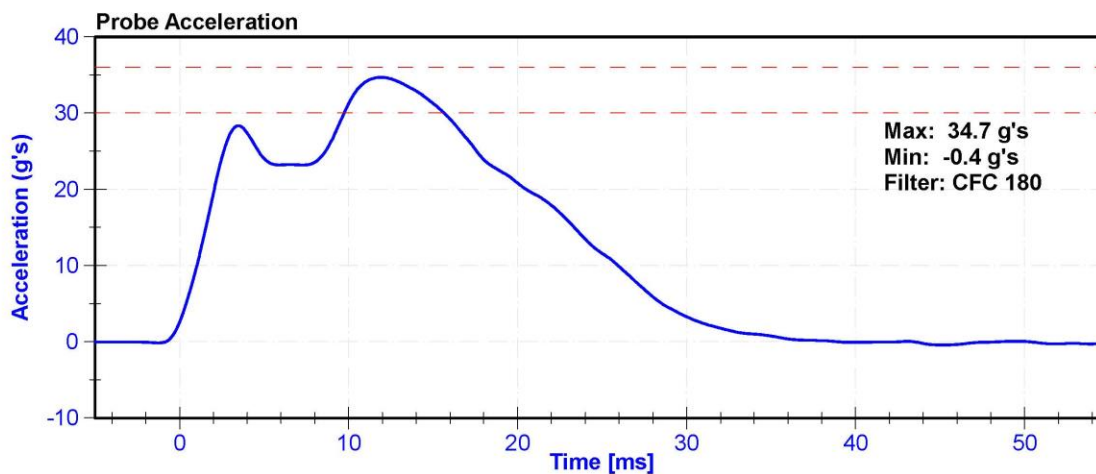
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

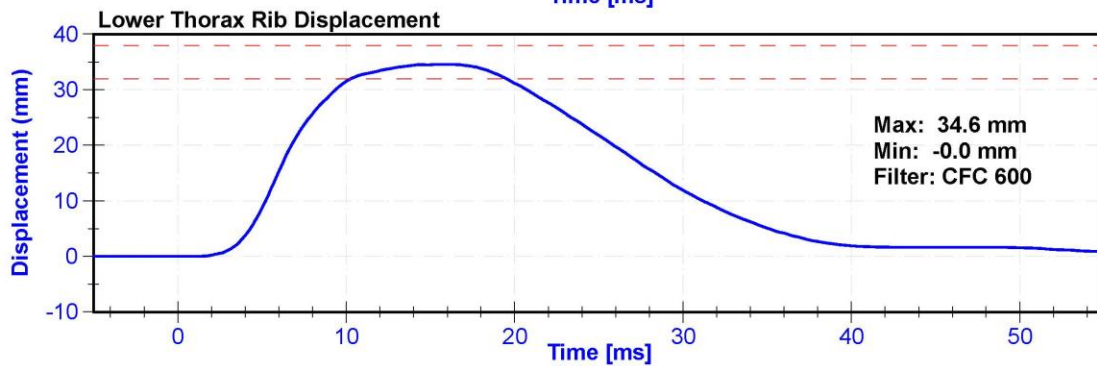
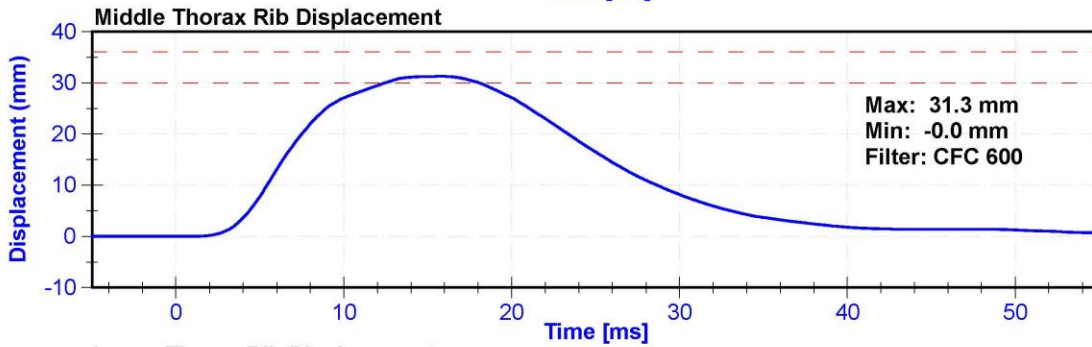
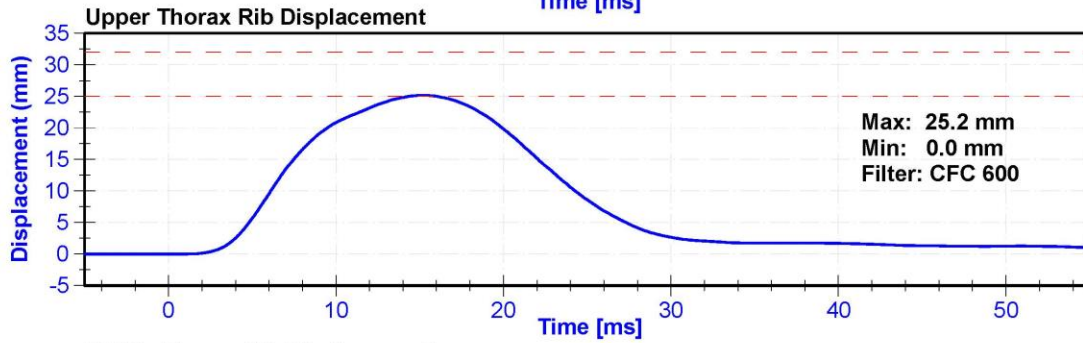
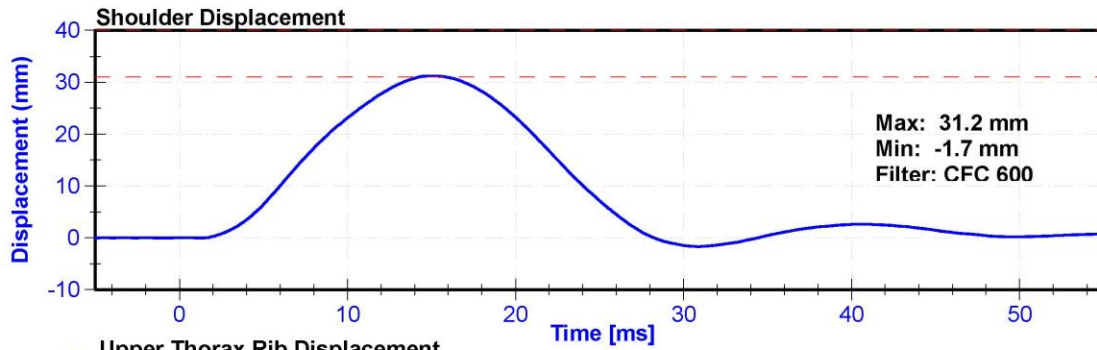
Results

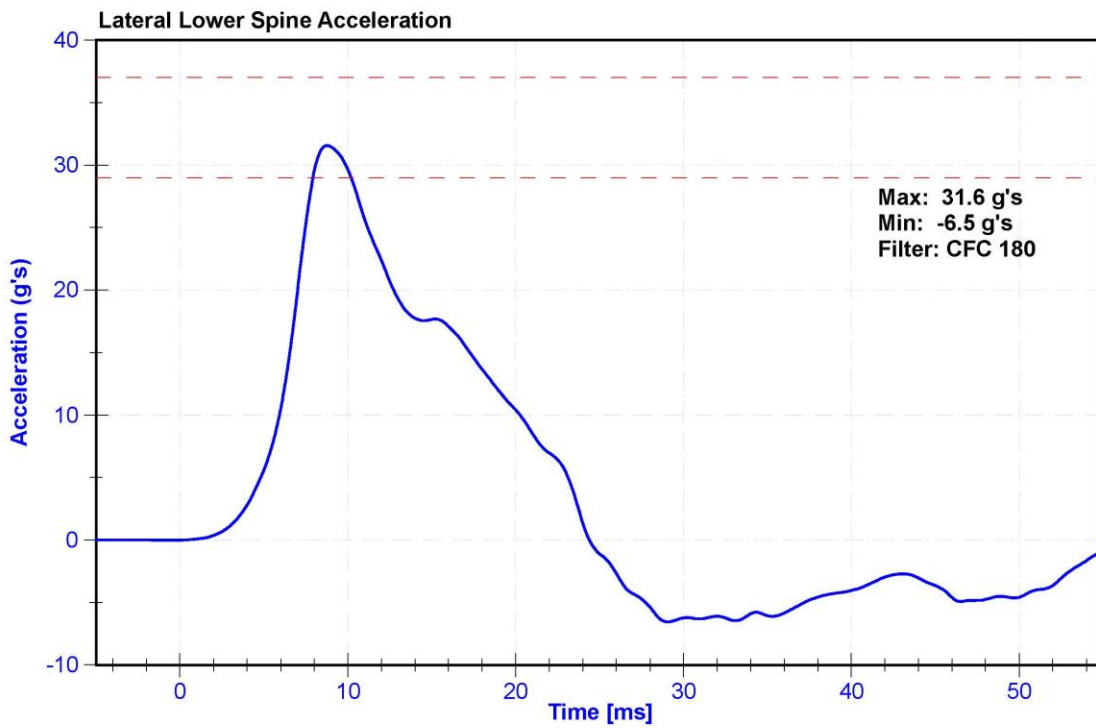
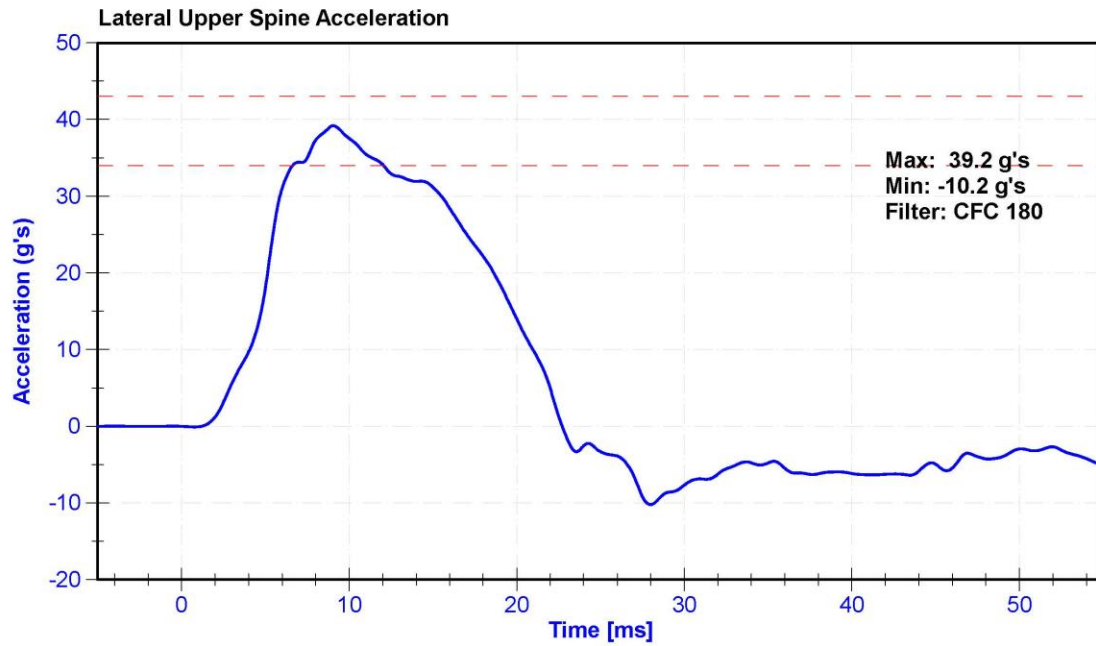
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	23.0	Pass
Velocity	6.6	6.8	m/s	6.74	Pass
Probe Acceleration after 5 ms	30	36	g's	34.7	Pass
Lateral Upper Spine Acceleration	34	43	g's	39.2	Pass
Lateral Lower Spine Acceleration	29	37	g's	31.6	Pass
Shoulder Deflection	31	40	mm	31.2	Pass
Upper Thorax Rib Deflection	25	32	mm	25.2	Pass
Mid Thorax Rib Deflection	30	36	mm	31.3	Pass
Lower Thorax Rib Deflection	32	38	mm	34.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/29/2019	4/28/2020
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P64147	10/29/2019	4/28/2020
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/29/2019	4/28/2020
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/29/2019	4/28/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/29/2019	4/28/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/29/2019	4/28/2020







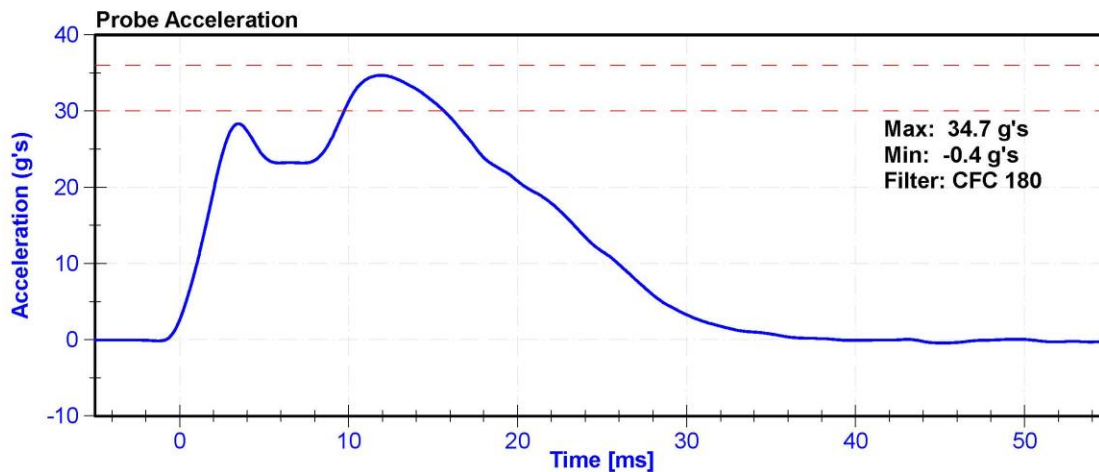
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

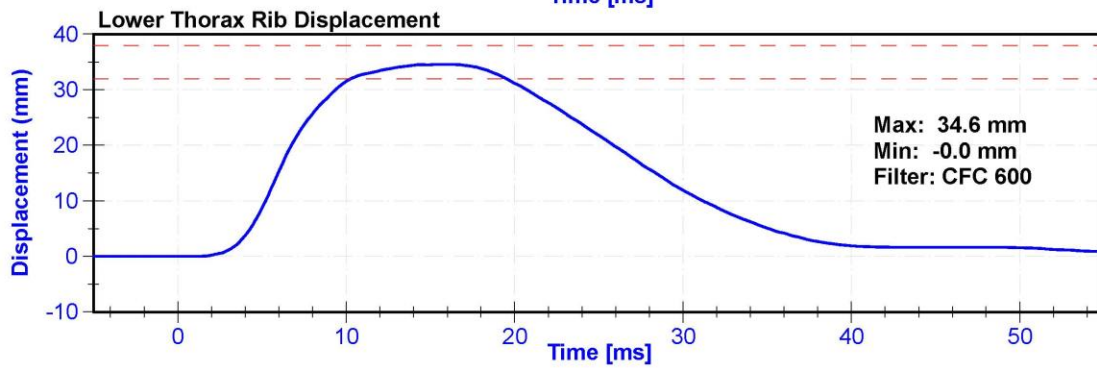
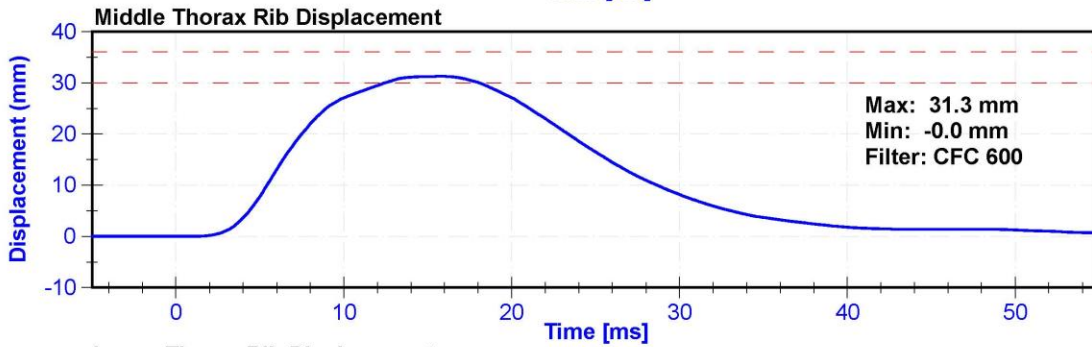
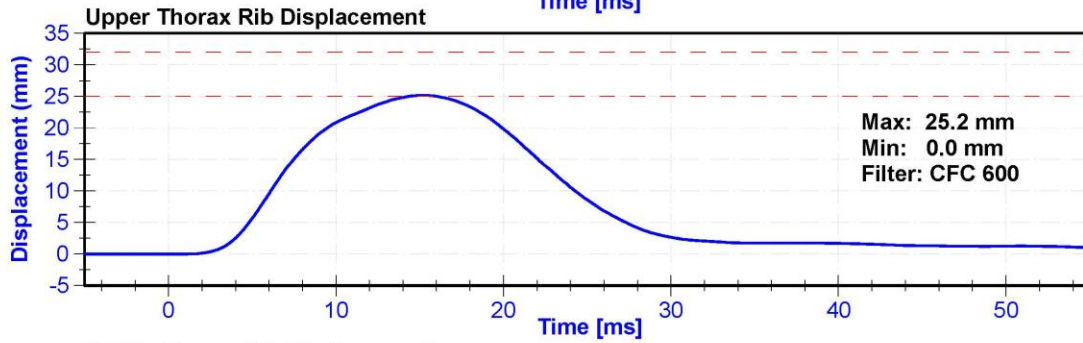
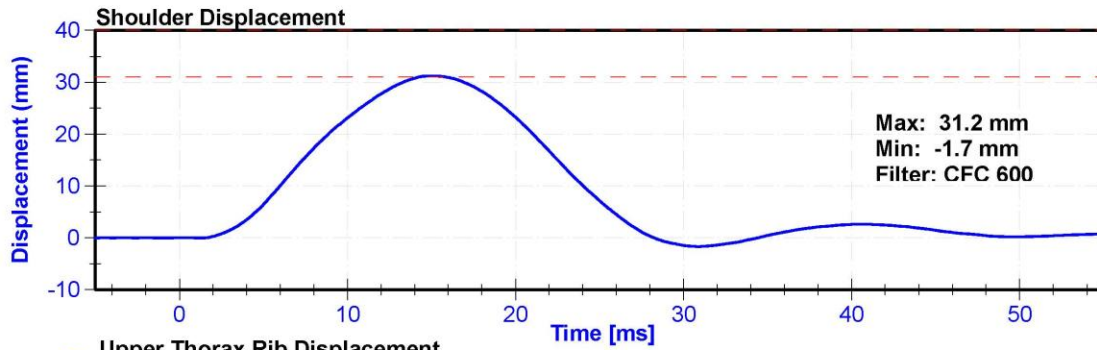
Results

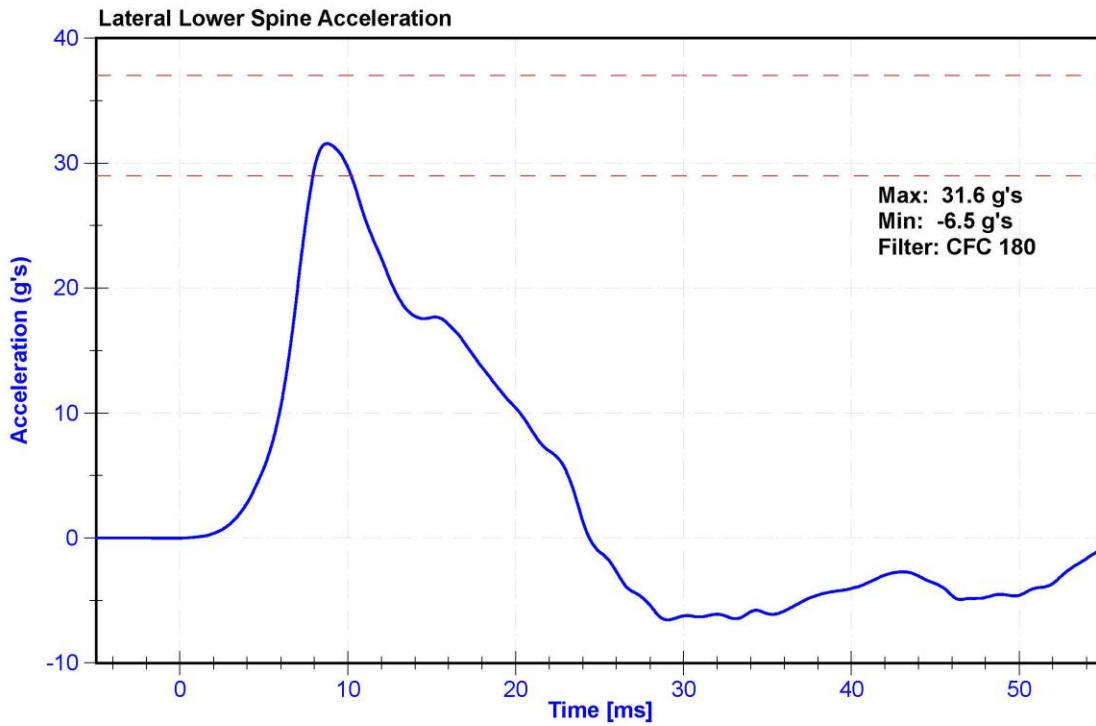
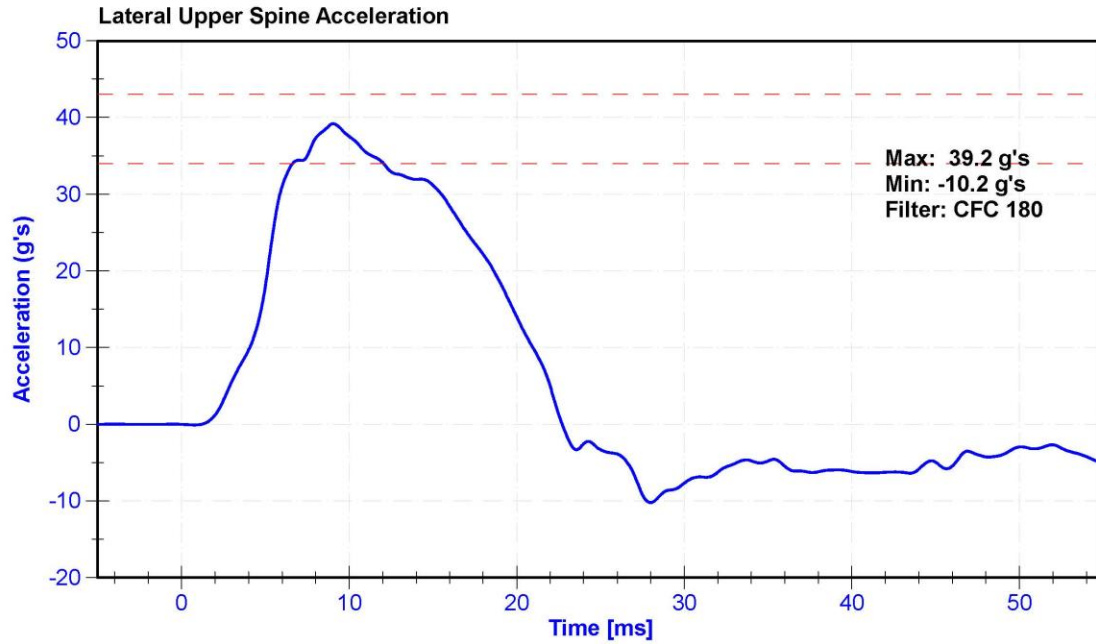
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	23.0	Pass
Velocity	6.6	6.8	m/s	6.74	Pass
Probe Acceleration after 5 ms	30	36	g's	34.7	Pass
Lateral Upper Spine Acceleration	34	43	g's	39.2	Pass
Lateral Lower Spine Acceleration	29	37	g's	31.6	Pass
Shoulder Deflection	31	40	mm	31.2	Pass
Upper Thorax Rib Deflection	25	32	mm	25.2	Pass
Mid Thorax Rib Deflection	30	36	mm	31.3	Pass
Lower Thorax Rib Deflection	32	38	mm	34.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Upper Spine T1 Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/29/2019	4/28/2020
Upper Spine T12 Y Accelerometer	ENDEVCO 7264	AC-P64147	10/29/2019	4/28/2020
Shoulder Potentiometer	Servo 08CT1-3725	DS-053 GFE	10/29/2019	4/28/2020
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/29/2019	4/28/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/29/2019	4/28/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/29/2019	4/28/2020







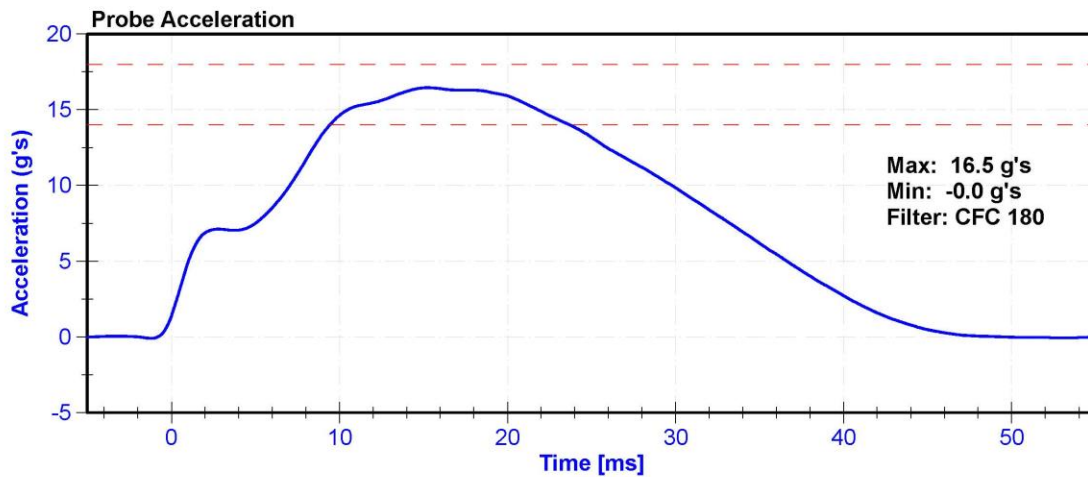
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

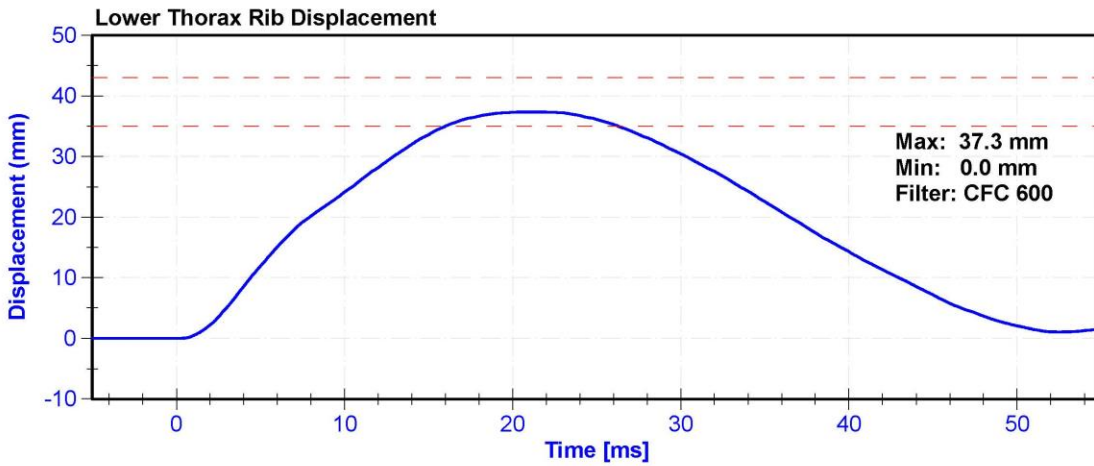
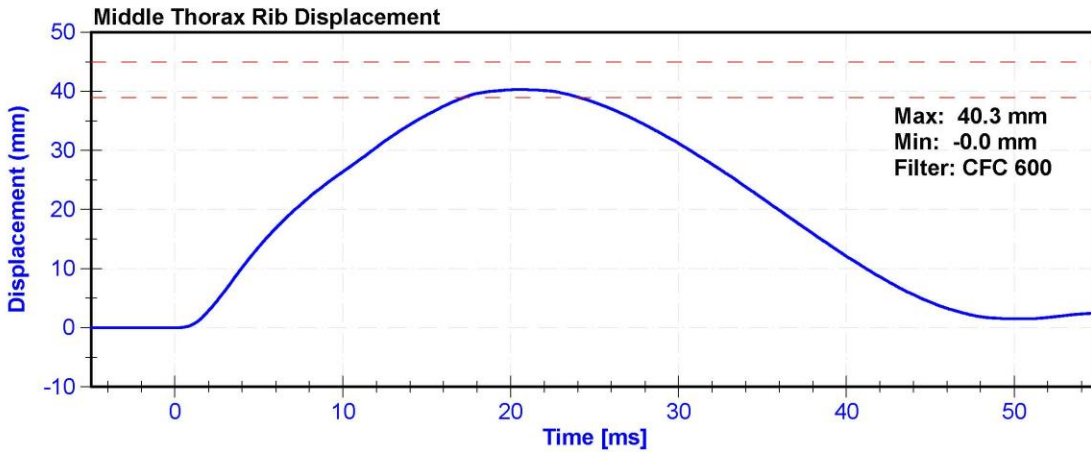
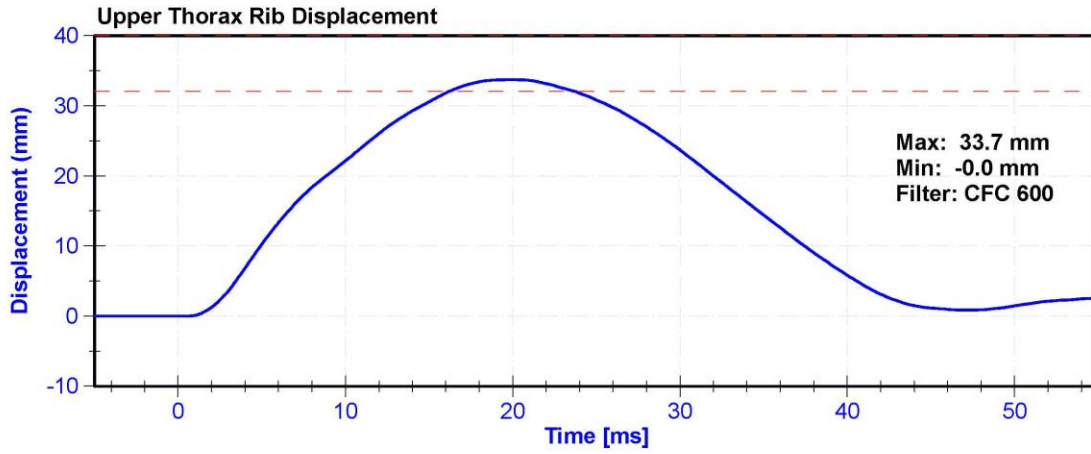
Results

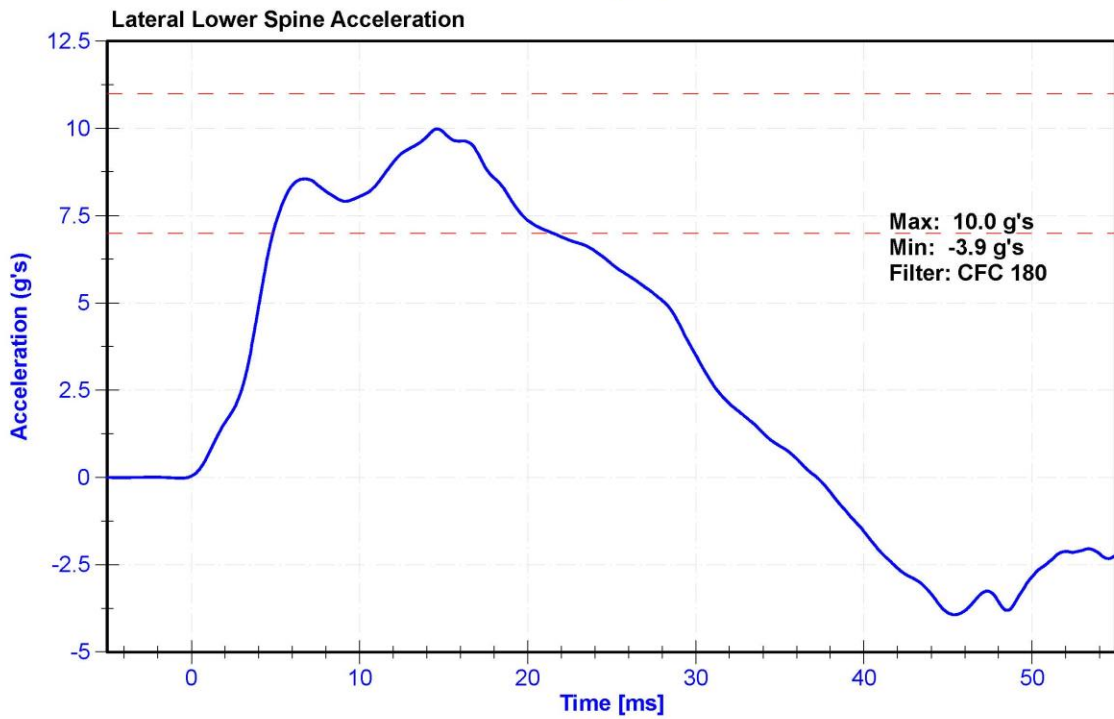
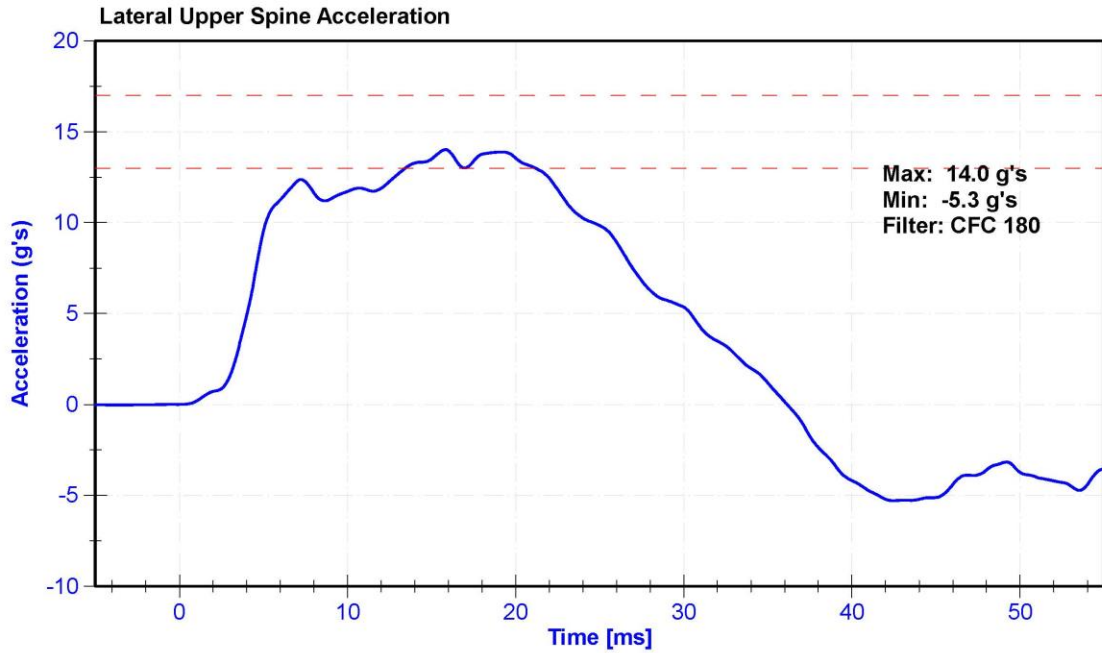
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	14	18	g's	16.5	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.0	Pass
Lateral Lower Spine Acceleration	7	11	g's	10.0	Pass
Upper Thorax Rib Deflection	32	40	mm	33.7	Pass
Middle Thorax Rib Deflection	39	45	mm	40.3	Pass
Lower Thorax Rib Deflection	35	43	mm	37.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Upper Spine Y Accelerometer	ENDEVCO 7264CT	AC-P51668	10/29/2019	4/28/2020
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	10/29/2019	4/28/2020
Upper Thorax Rib Potentiometer	Servo 08CT1-3725	DS-451GFE	10/29/2019	4/28/2020
Middle Thorax Rib Potentiometer	Servo 08TC1-3745	DS-040GFE	10/29/2019	4/28/2020
Lower Thorax Rib Potentiometer	Servo 08TC1-3725	DS-1156GFE	10/29/2019	4/28/2020







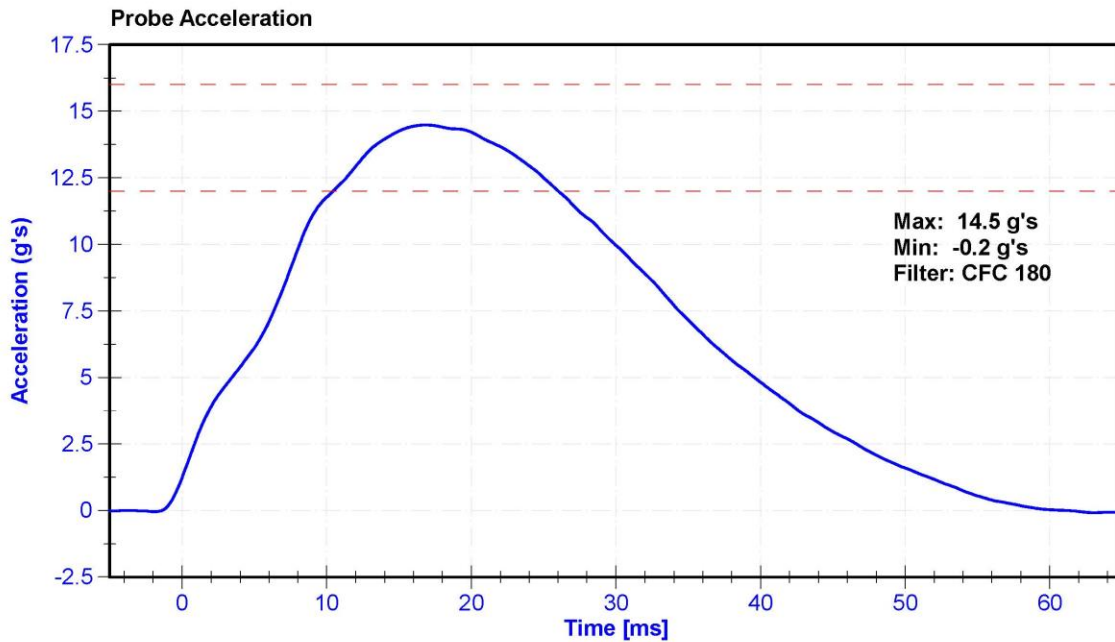
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

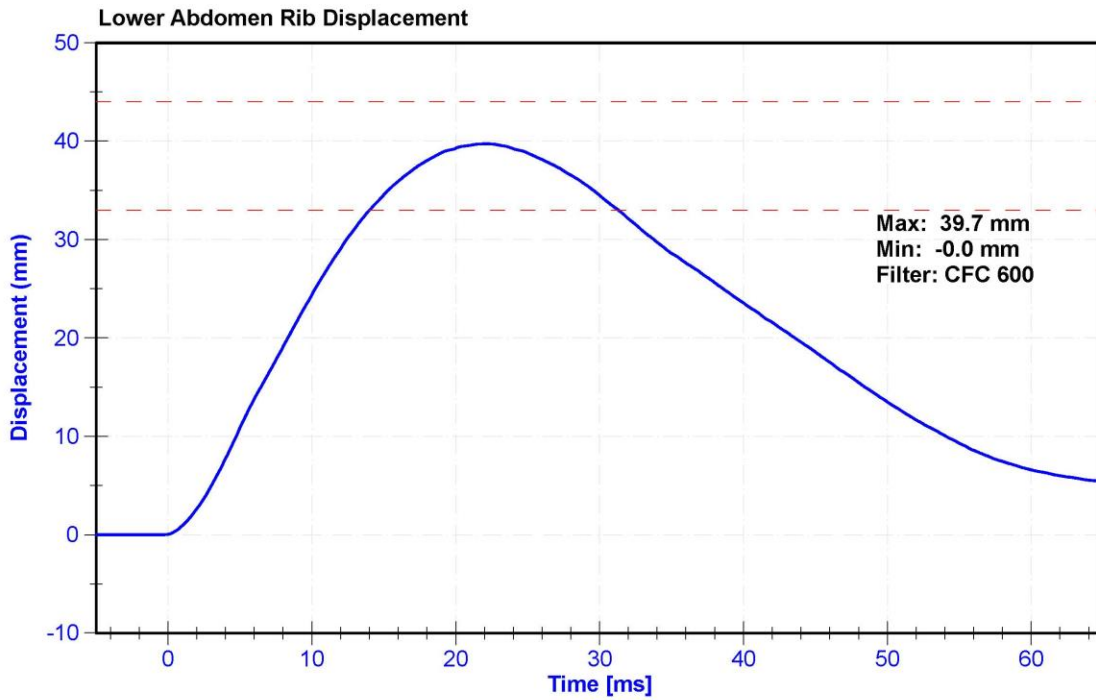
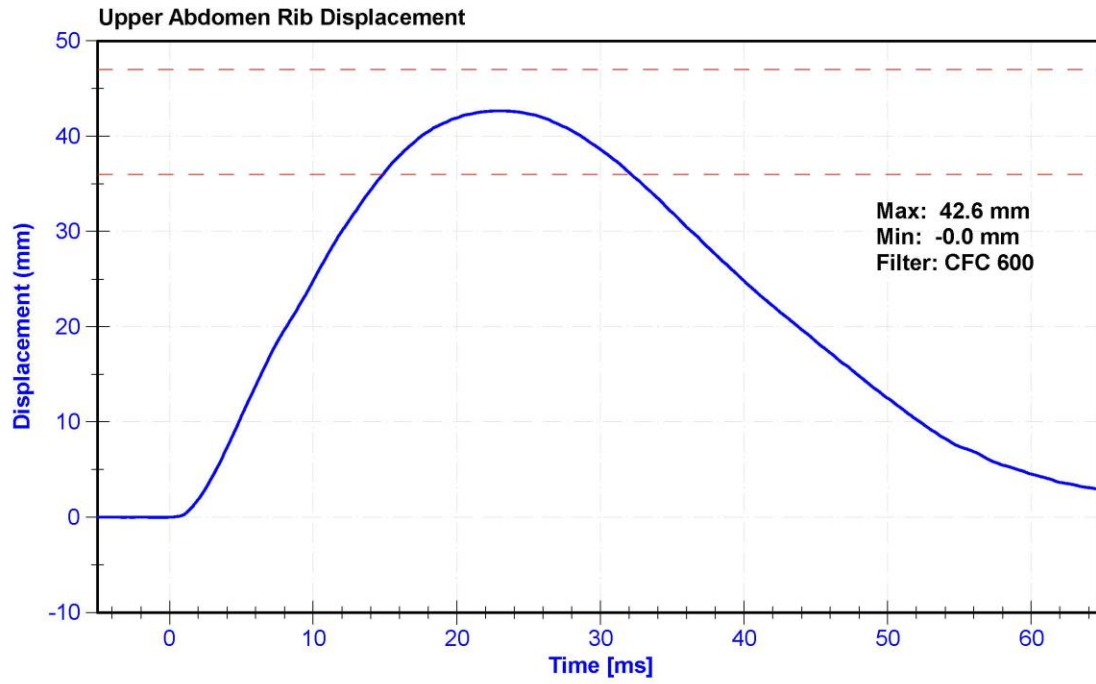
Results

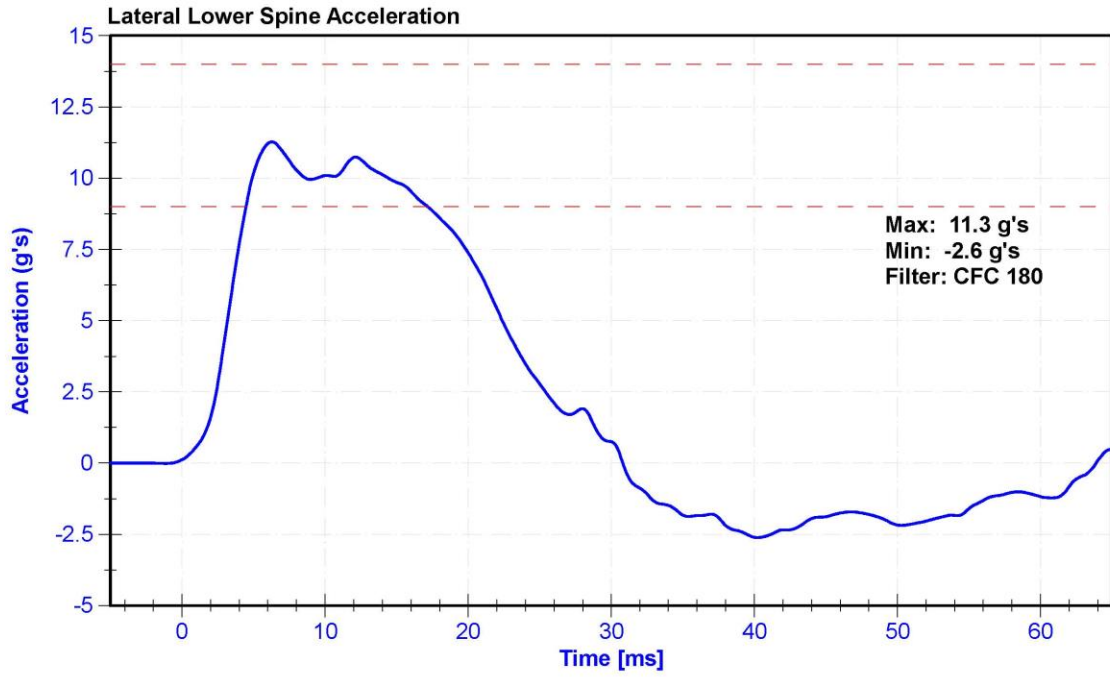
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	26.0	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	12	16	g's	14.5	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.3	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.6	Pass
Lower Abdomen Rib Deflection	33	44	mm	39.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Lower Spine Y Accelerometer	ENDEVCO 7264	AC-P64147	10/29/2019	4/28/2020
Upper Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-308GFE	10/29/2019	4/28/2020
Lower Abdomen Rib Potentiometer	Servo 08CT1-3725	DS-307GFE	10/29/2019	4/28/2020







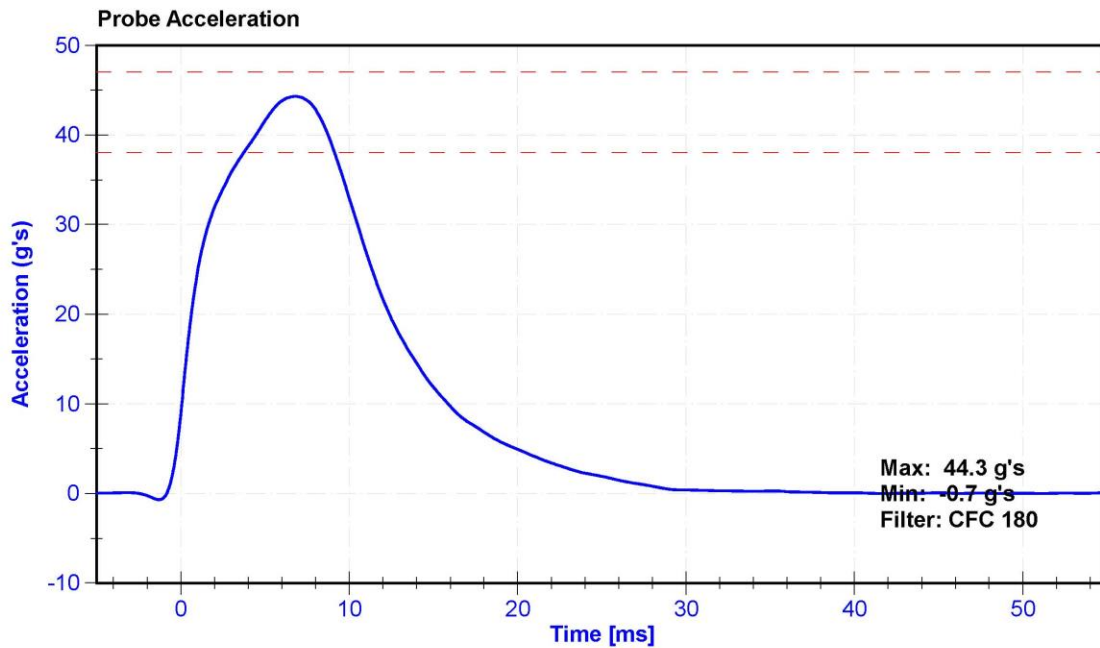
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

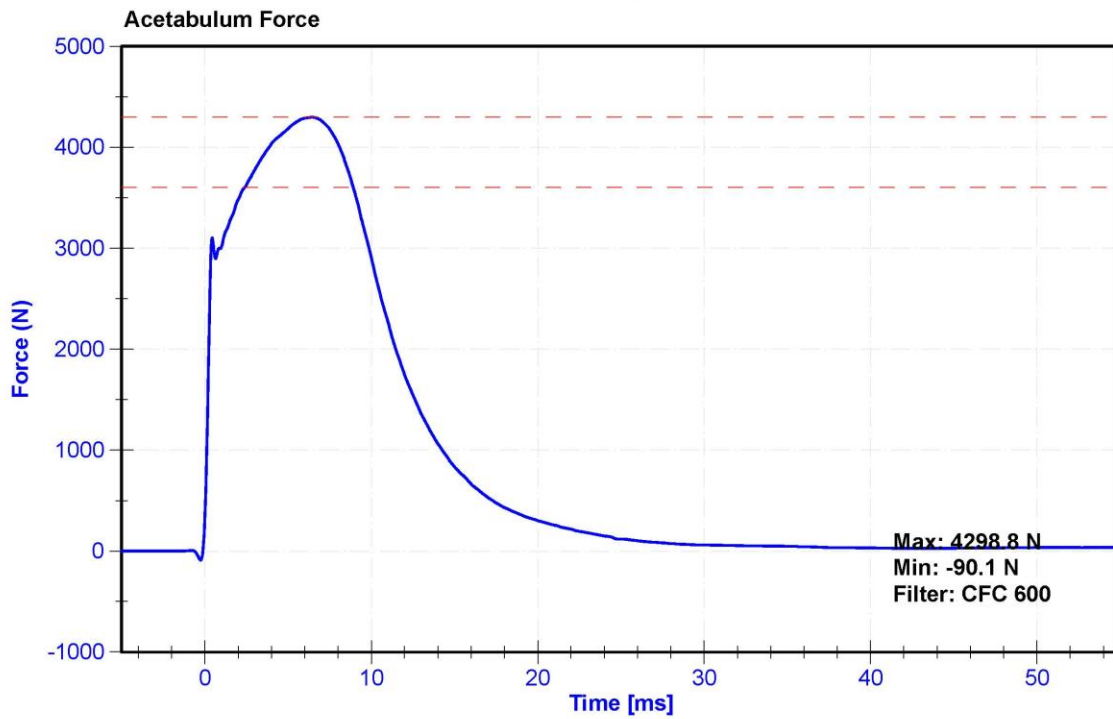
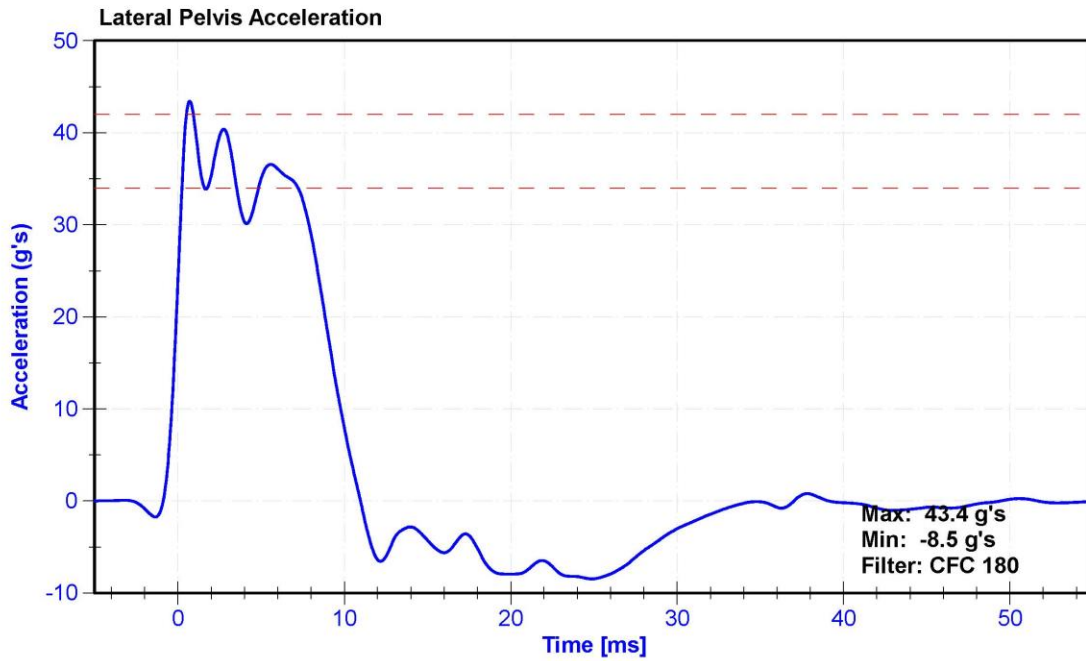
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	26	Pass
Velocity	6.6	6.8	m/s	6.64	Pass
Probe Acceleration	38	47	g's	44.3	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	36.1	Pass
Acetabulum Force	3600	4300	N	4298.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51731	10/29/2019	4/28/2020
Acetabulum Load Cell	Denton 3249J	LC-276Fy	9/24/2019	9/23/2020
Certification Plug	SACO	12809	01-18-2019	N/A
Crash Test Plug	SACO	12644	11-21-2018	N/A







300 cert 3/5/20

SID-11s Pelvis Plug Certification Test

Plug S/N 12809

Test Number 8141

Report Number 8171

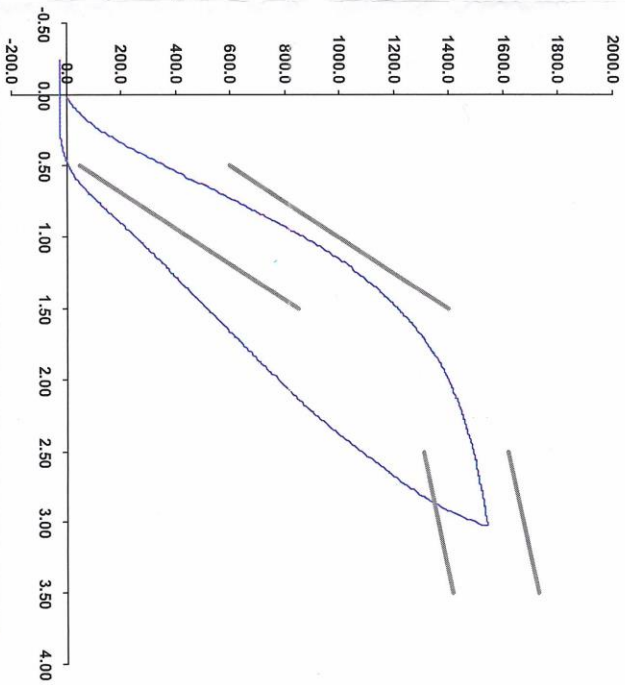
Test Date 1/18/2019 7:53:49 AM

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

Testing Machine STM-20 5965542
 Load Cell S/N (F1360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7
 Extension or Position Measured by XHD_100 (XHD100)

Notes:



Operator

Part Number 180-4450

Template No 107 18-Jan-19
 SACO Research

By: DC Date: 1/18/2019
 SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-11s Pelvis Plug Certification Test

Plug S/N 12644
 Test Number 7645
 Report Number 7674
 Test Date 11/21/2018 9:33:26 AM

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

Testing Machine STM-20 5965542
 Load Cell S/N (F1360947), Units (LBS) 1000
 Preload Value (-N) 22.24
 Crosshead Speed (mm / min) or Rate 12.7
 Extension or Position Measured by XHD_100 (XHD100)

Notes:

Operator

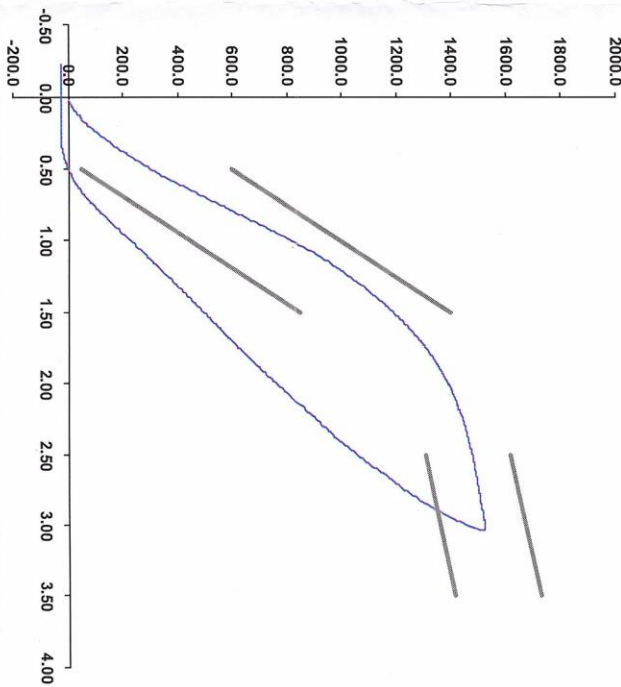
Part Number 180-4450

Template No 107 21-Nov-18
 SACO Research

By: *DC* Date: *11/21/2018*

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

Force (-N) vs Extension (-mm)



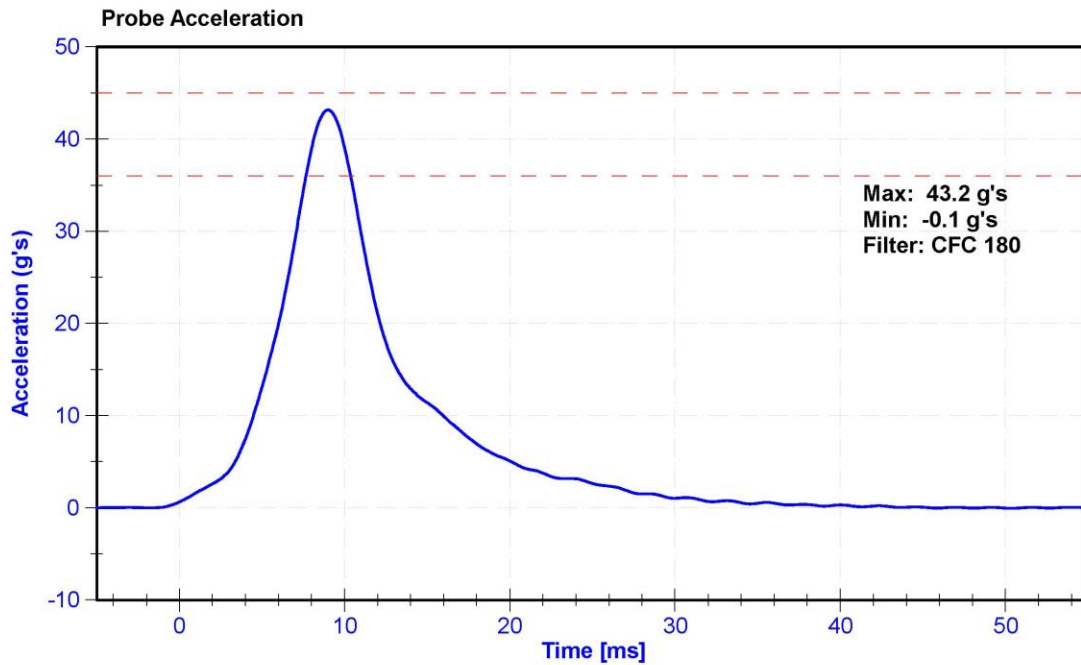
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	D.Reinhard

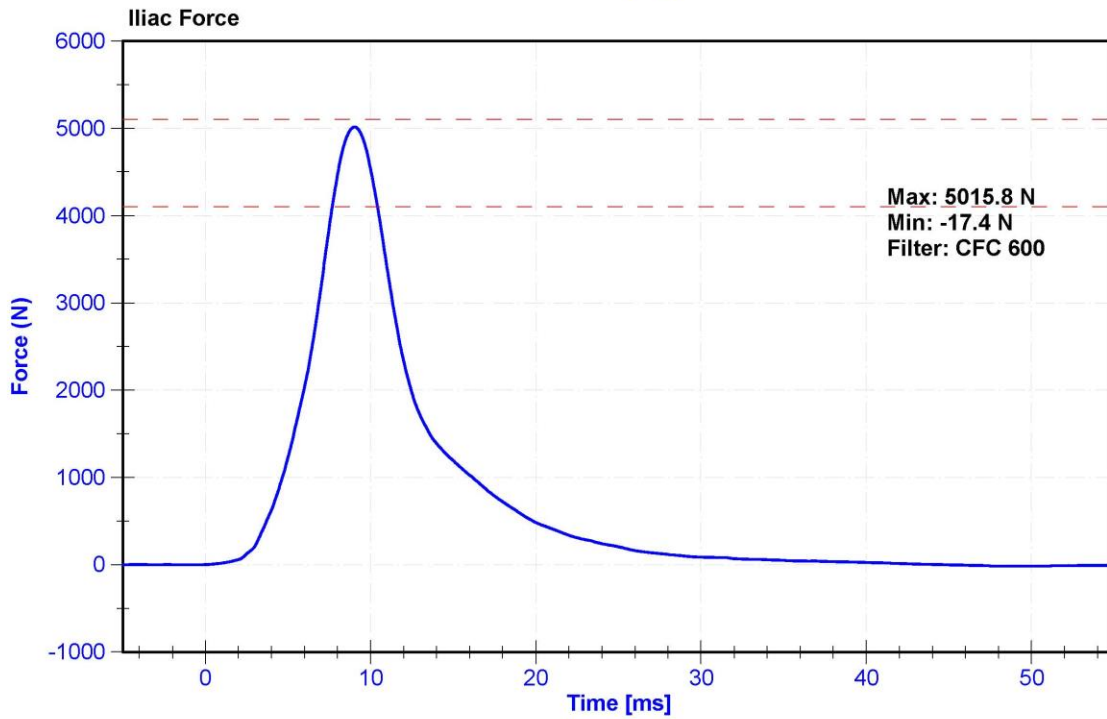
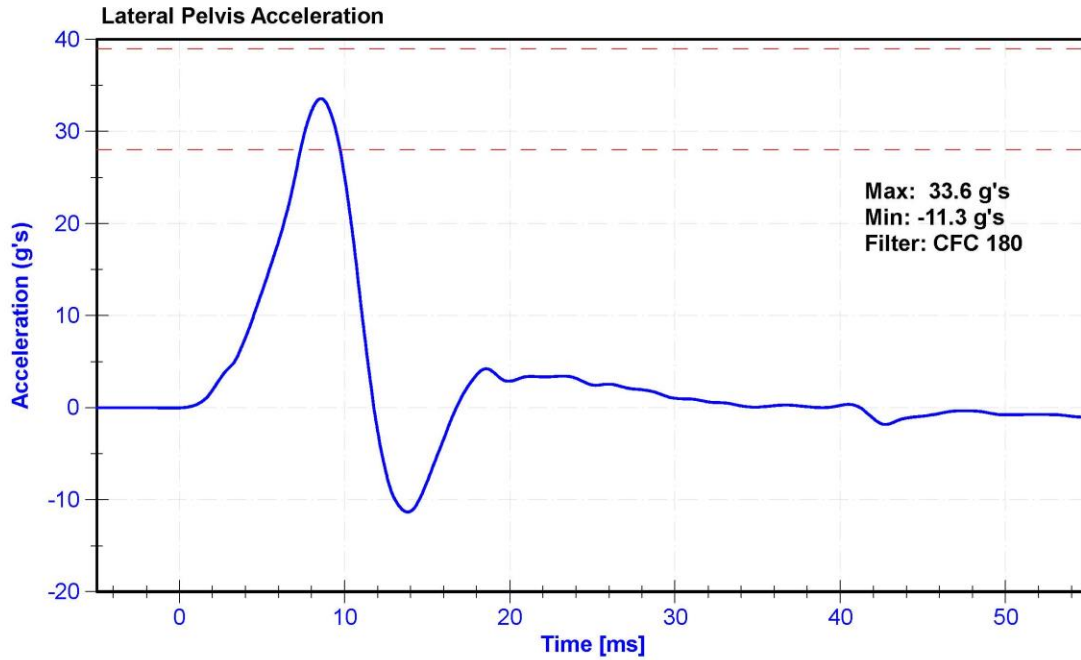
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	27.0	Pass
Velocity	4.2	4.4	m/s	4.21	Pass
Probe Acceleration	36	45	g's	43.2	Pass
Lateral Pelvis Acceleration	28	39	g's	33.6	Pass
Iliac Force	4100	5100	N	5015.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	MSI 64C-2000	A286228	1/29/2020	7/29/2020
Pelvis Y Accelerometer	ENDEVCO 7264CT	AC-P51731	10/29/2019	4/28/2020
Iliac Load Cell	DENTON 3228J	LC-280Fy	6/20/2019	6/19/2020





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-P49204	ENDEVCO	10/29/2019
		Y	AC-P63981	ENDEVCO	10/29/2019
		Z	AC-P64007	ENDEVCO	10/29/2019
	Redundant	X	AC-P52003	ENDEVCO	10/29/2019
		Y	AC-P64122	ENDEVCO	10/29/2019
		Z	AC-P51962	ENDEVCO	10/29/2019
Thorax Rib Displacement Potentiometers	Upper	Y	DS-183GFE	Honeywell	10/31/2019
	Middle	Y	DS-184GFE	Honeywell	10/31/2019
	Lower	Y	DS-182GFE	Honeywell	10/31/2019
Abdomen Load Cells	Forward	Y	LC-1440	Denton	6/14/2019
	Middle	Y	LC-1525	Denton	6/5/2019
	Rear	Y	LC-1528	Denton	6/14/2019
Lower Spine Accelerometers (T12)		X	AC-P17299	ENDEVCO	10/29/2019
		Y	AC-P39731	ENDEVCO	10/29/2019
		Z	AC-P22639	ENDEVCO	10/29/2019
Pubic Symphysis Load Cell		Y	LC-464fy	Denton	6/14/2019

Table 2 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N: 300			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers	Primary	X	AC-P68057	ENDEVCO	10/29/2019	
		Y	AC-P79189	ENDEVCO	10/29/2019	
		Z	AC-P52095	ENDEVCO	10/29/2019	
	Redundant	X	AC-P59018	ENDEVCO	10/29/2019	
		Y	AC-P58986	ENDEVCO	10/29/2019	
		Z	AC-P58777	ENDEVCO	10/29/2019	
Displacement Potentiometers	Thoracic Rib	Upper	Y	DS-451GFE	Servo	10/29/2019
		Middle	Y	DS-040GFE	Servo	10/29/2019
		Lower	Y	DS-1156GFE	Servo	10/29/2019
	Abdominal Rib	Upper	Y	DS-308GFE	Servo	10/29/2019
		Lower	Y	DS-307GFE	Servo	10/29/2019
Lower Spine Accelerometers (T12)		X	AC-P58883	ENDEVCO	10/29/2019	
		Y	AC-P64147	ENDEVCO	10/29/2019	
		Z	AC-P58786	ENDEVCO	10/29/2019	
Acetabulum Load Cell		Y	LC-276Fy	Denton	9/24/2019	
Iliac Wing Load Cell		Y	LC-280Fy	Denton	6/20/2019	
Pelvis Plug (struck side)			12582	SACO	10/3/2018	
Pelvis Plug (non-struck side)			-	-	-	

Table 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	AC-A197030	MSI	1/13/2020
	Vehicle Center of Gravity	Y	AC-A280980	MSI	1/13/2020
	Vehicle Center of Gravity	Z	AC-A280993	MSI	1/13/2020
2	Right Sill at Front Seat	X	AC-A280358	MSI	12/17/2019
	Right Sill at Front Seat	Y	AC-A280996	MSI	12/18/2019
	Right Sill at Front Seat	Z	A284376	MSI	12/13/2019
3	Right Sill at Rear Seat	X	AC-A250366	MSI	1/13/2020
	Right Sill at Rear Seat	Y	AC-A255977	MSI	11/21/2019
	Right Sill at Rear Seat	Z	AC-A262049	MSI	1/27/2020
4	Left Sill at Front Door	Y	AC-A280985	MSI	11/14/2019
5	Left Sill at Rear Door	Y	AC-A196605	MSI	12/17/2019
6	Left A-Post Lower	Y	AC-A255973	MSI	12/2/2019
7	Left A-Post Middle	Y	AC-A280375	MSI	12/2/2019
8	Left B-Post Lower	Y	AC-A280010	MSI	2/19/2020
9	Left B-Post Middle	Y	AC-A279970	MSI	2/19/2020
10	Front Seat Track	Y	AC-A280934	MSI	1/10/2020
11	Rear Seat Track or Structure	Y	AC-A280174	MSI	12/17/2019
12	Right Rear Occ. Compartment	Y	AC-A280203	MSI	11/8/2019
13	Engine Block	X	AC-A280386	MSI	9/17/2019
	Engine Block	Y	A282722	MSI	10/30/2019
14	Rear Floorpan Above Axle	X	AC-A255987	MSI	2/21/2020
	Rear Floorpan Above Axle	Y	AC-A280390	MSI	1/24/2020
	Rear Floorpan Above Axle	Z	AC-A280329	MSI	9/9/2019

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A255112	MSI	11/21/2019
MDB Center of Gravity	Y	A255126	MSI	11/21/2019
MDB Center of Gravity	Z	A255143	MSI	11/21/2019
Left Frame at Rear Axle Centerline	X	A280025	MSI	11/22/2019
Left Frame at Rear Axle Centerline	Y	A280334	MSI	11/22/2019