

REPORT NUMBER: SINCAP-CAL-20-008

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

**GM Korea Company
2020 Buick Encore GX
Four Door SUV**

NHTSA No: M20200102

**PREPARED BY:
CALSPAN CORPORATION
P.O. BOX 400
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June 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**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Administration, in response to Contract Number DTNH22-14-D-00352.

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Date: June 11, 2020

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Date: June 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

1. Report No. SINCAP-CAL-20-008		2. Government Accession No.		3. Recipient's Catalog No.																																																			
4. Title and Subtitle Final Report of New Car Assessment Program Side Impact MDB Testing of a 2020 Buick Encore GX SUV NHTSA No.: M20200102				5. Report Date June 11, 2020																																																			
				6. Performing Organization Code CAL																																																			
Matthew Pronko, Test Engineer Vanessa Hansen, Operations Manager				8. Performing Organization Report No. CAL-DOT-2020-008																																																			
9. Performing Organization Name and Address Calspan Corporation Transportation Test Operations P.O. Box 400 Buffalo, New York 14225				10. Work Unit No.																																																			
				11. Contract or Grant No. DTNH22-14-D-00352																																																			
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NRM-110) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590				13. Type of Report and Period Covered: Final Test Report April 7, 2020 - June 11, 2020																																																			
				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 Buick Encore GX SUV 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 April 7, 2020. The impact velocity of the Moving Deformable Barrier (MDB) was 61.72 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 231mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>80.517</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>44</td> <td>25.703</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>746.183</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1758.158</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td>N/A</td> <td>1000</td> <td>144.513</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td>G</td> <td>82</td> <td>42.669</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3515.685</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38*</td> <td>23.584</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45*</td> <td>24.999</td> </tr> </tbody> </table> * Proposed IARV The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.						Measurement Description	Driver ATD (ES-2re)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	80.517	Maximum Thoracic Rib Deflection	mm	44	25.703	Total Abdominal Force	N	2500	746.183	Pubic Symphysis Force	N	6000	1758.158	Measurement Description	Passenger ATD (SID-IIs)			Units	IARV	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	144.513	Lower Spine Resultant Acceleration	G	82	42.669	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3515.685	Maximum Thoracic Rib Deflection	mm	38*	23.584	Maximum Abdominal Rib Deflection	mm	45*	24.999
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19. Security Class. (of this report) UNCLASSIFIED		20. Security Class. (of this page) UNCLASSIFIED		21. No. of Pages 192	22. Price																																																		

TABLE OF CONTENTS

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

SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 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 Buick Encore GX SUV. 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 Buick Encore GX SUV 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 61.72 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 April 7, 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	80.517
Maximum Thorax Rib Deflection	mm	44	25.703
Combined Abdominal Force	N	2500	746.183
Pubic Symphysis Force	N	6000	1758.158

Measurement Description	Passenger ATD (SID-IIs)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	144.513
Lower Spine (T12) Resultant Acceleration	G	82	42.669
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3515.685
Maximum Thoracic Rib Deflection	mm	38*	23.584
Maximum Abdominal Rib Deflection	mm	45*	24.999

*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	Yes	No		
Side Air bag 1 - Curtain	Yes	Yes	Yes	Yes
Side Air bag 2 – Torso/Pelvis Air bag	Yes	Yes	Yes	Yes
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

- Driver Head CG Redundant Y Acceleration, Questionable spikes 4.55ms, 60.7ms to 159ms
- Left B-Pillar Lower Y Acceleration, Exceeded calibration range and saturated at 7.4 ms
- Left B-Pillar Middle Y Acceleration, Exceeded calibration range and saturated at 10.5 ms
- Left Rear Sill Y Acceleration, Exceeded calibration range at 19.3 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 Buick Encore GX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
Test Date: 4/7/2020

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20200102
Model Year	2020
Make	Buick
Model	Encore GX
Body Style	SUV
VIN	KL4MMBS2XLB073430
Body Color	Black
Odometer Reading (km/mi)	64 miles
Engine Displacement (L)	1.2
Type/No. Cylinders	I3
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	CVT
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof/T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	No
Other Optional Feature	-
Driver Front 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	Yes
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	Yes
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	GM Korea Company
Date of Manufacture	11/19
Vehicle Type	MPV

GVWR (kg)	1910
GAWR Front (kg)	1060
GAWR Rear (kg)	1060

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	-	5
Capacity Weight (VCW) (kg)				428
DSC X 68.04 kg				340.2
Cargo Weight (RCLW) (kg)				87.8

(A)

(B)

(A-B)

VEHICLE SEAT TYPE

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

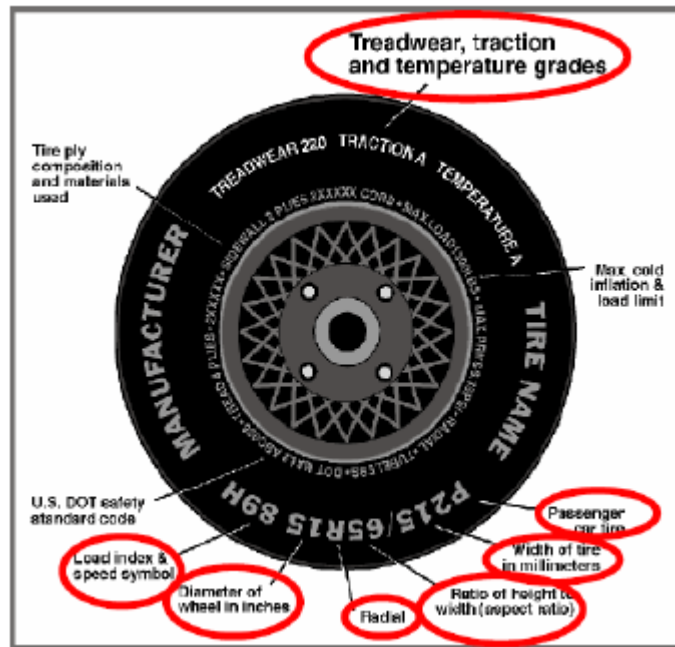
DATA SHEET NO. 1 ... (CONTINUED)
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

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	225/55R18	225/55R18
Tire Size on Vehicle	225/55R18	225/55R18
Tire Manufacturer	Hankook	Hankook
Tire Model	Kinergy	Kinergy
Treadwear	700	700
Traction	B	B
Temperature Grade	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index/Speed Symbol	98H	98H
Tire Material	Rubber	Rubber
DOT Safety Code Left	1T70018H04519	1T70018H04519
DOT Safety Code Right	1T70018H04519	1T70018H04519

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

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	250	249	251	254
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	433	267		480	345		476	365	
Right	kg	416	256		425	330		421	333	
Ratio	%	61.9	38.1		57.3	42.7		56.2	43.8	
Totals	kg	849	523	1372	905	675	1580	897	698	1595

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1372	(A)
Sum of Actual Weight of 1 ES2re and 1 P572 ATD (SID-IIs)	kg	127	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	87.8	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	1586.8	(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	857	847	Yes
RF	mm	865	857	Yes
RR	mm	853	855	Yes
LR	mm	843	844	Yes
Vehicle CG (Aft of Front Axle)	mm	1135	1108	
Vehicle CG (Left(+)/Right(-) from Longitudinal Centerline)	mm	43	35	

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

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

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

Test Vehicle:	<u>2020 Buick Encore GX SUV</u>	NHTSA No.:	<u>M20200102</u>
Test Program:	<u>NCAP Side MDB Impact Test</u>	Test Date:	<u>4/7/2020</u>

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	11
Spare Tire	12
Jack	3
Ballast / Equipment Added	59

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

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

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	19.4	9.8	14.6
Front Passenger Seat	Not Adjustable		
Front Center Seat*			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat*	Fixed	Fixed	Fixed

**if applicable*

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRП Height (mm)	SCRП Height Position	SCRП Height (mm)		
				Rearmost	Mid- Fore/Aft	Forward- Most
Driver Seat	14.6	-2.5	Max	65	60	60
			Mid	32.5	30	30
			Min	0	-2.5	-5
Front Passenger Seat	Not Adjustable		Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Front Center Seat*	N/A	N/A	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Non-Struck Side Rear Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Rear Center Seat*	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-

**if applicable*

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

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

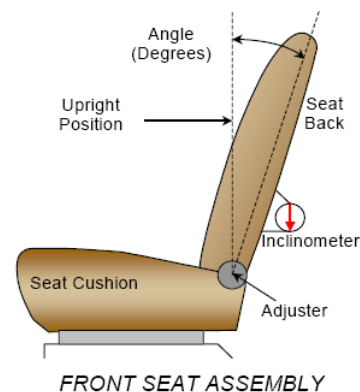
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forwardmost Position	
	mm	Detents*	mm	Detent*
Driver Seat	260	N/A	130	N/A
Front Passenger Seat	260	27 (0-26)	130	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	66.2	N/A	-7.4	N/A
Front Passenger Seat	41.1	N/A	-6.8	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 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

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)	0
Rear Seat	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

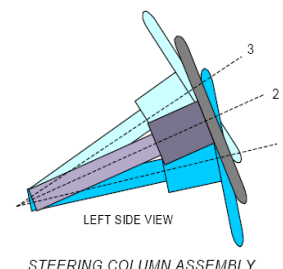
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

	Total # of Positions	Placed in Position #
Driver Seat	9 (0-8)	Uppermost
Rear Seat	5 (0-4)	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.

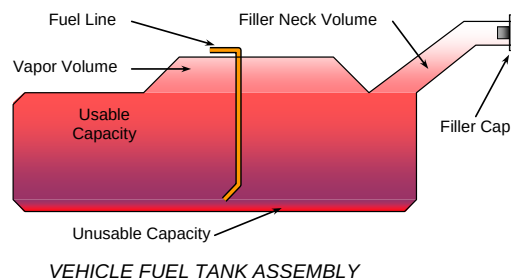
	Degrees	Fore/Aft Position (mm)
Lowermost – Position 1	22.2	
Geometric Center – Position 2	24.2	
Uppermost – Position 3	26.2	
Telescoping Steering Wheel Travel		50
Test Position	24.2	25



FUEL PUMP

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

The vehicle is equipped with an electric fuel pump. The fuel filler neck is on the left side of the vehicle. The pump creates positive pressure in the fuel lines, pushing the gasoline to the engine. See form 1 for more information.



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

Test Vehicle: 2020 Buick Encore GX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
Test Date: 4/7/2020

FUEL TANK CAPACITY

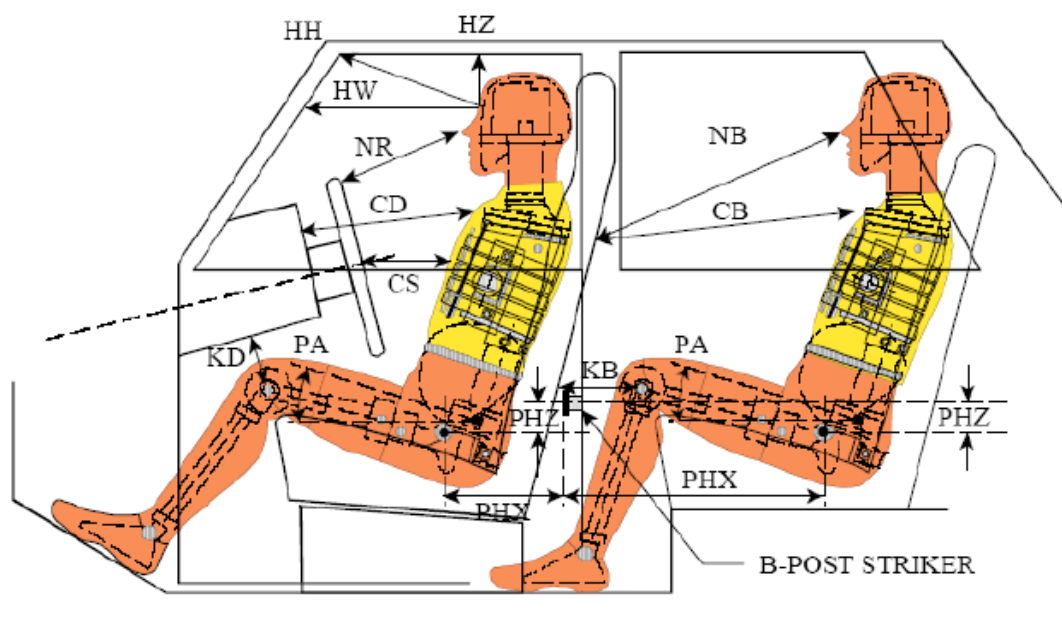
	Liters
Usable Capacity of "Standard Tank" (see Form No. 1)	50
Usable Capacity of "Optional Tank" (see Form No. 1)	N/A
Usable Capacity of Standard Tank (see Owner's Manual)	50
Usable Capacity of Optional Tank (see Owner's Manual)	N/A
93% of Usable Capacity	46.5
Actual Amount of Solvent Used in Test	46.5
1/3 of Usable Capacity	16.7

Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable Capacity stated in Form No. 1? ☒ Yes ☐ No

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



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

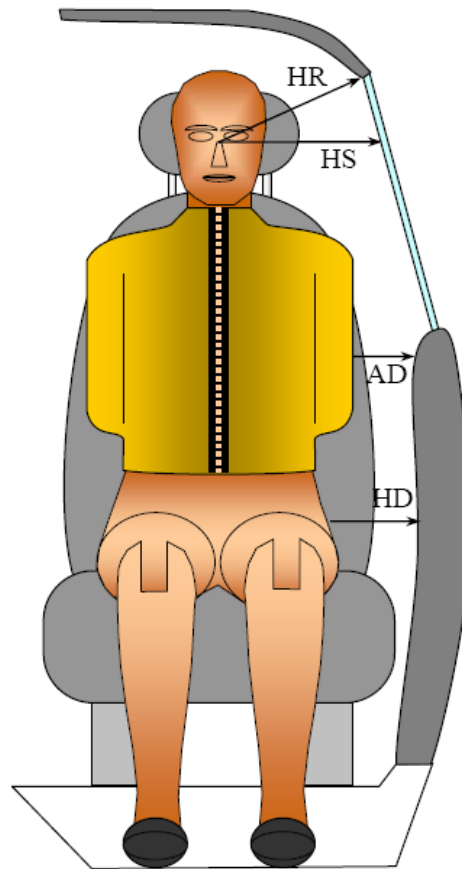
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Pass. Code	Description	Driver (Serial No. F034)		Passenger (Serial No.300)	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	437			
HW		Header to Windshield	747			
HZ	HZ	Head to Roof Liner	225		283	
NR	NB	Nose to Rim/Seat Back	468		495	
CD	CB	Chest to Dash/Seat Back	565		499	
CS		Chest to Steering Wheel	349			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	237	28.5	220	0.3
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	238	22.8	218	0.5
PAX°	PAX°	Pelvic Tilt Angle X		21.8		18.2
	PAY°	Pelvic Tilt Angle Y				0.3
PHX	PHX	Hip Point to Striker (X-Axis)	113		239	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	105		264	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



FRONT VIEW OF DUMMY

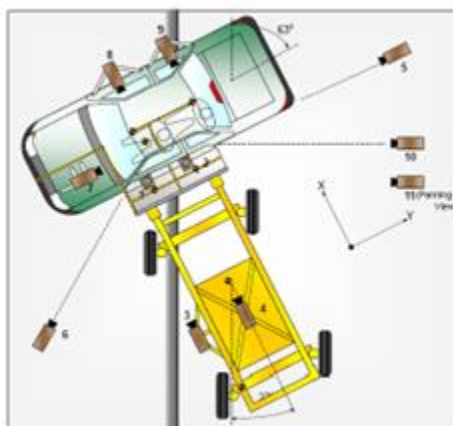
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F034)	Passenger (Serial No. 300)
HR	Head to Side Header	mm	208	248
HS	Head to Side Window	mm	340	361
AD	Arm to Door	mm	98	155
HD	Hip Point to Door	mm	146	165

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	0	-8883	12.5	1000
2	Overhead Close-up	0	0	-8883	24	1000
3	Left Impact Point (MDB)	-1470	0	-847	25	1000
4	Side Overall (MDB)	-1140	878	-1587	8	1000
5	Rear	0	6987	-1253	24	1000
6	Left Front	-3466	-5791	-1282	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

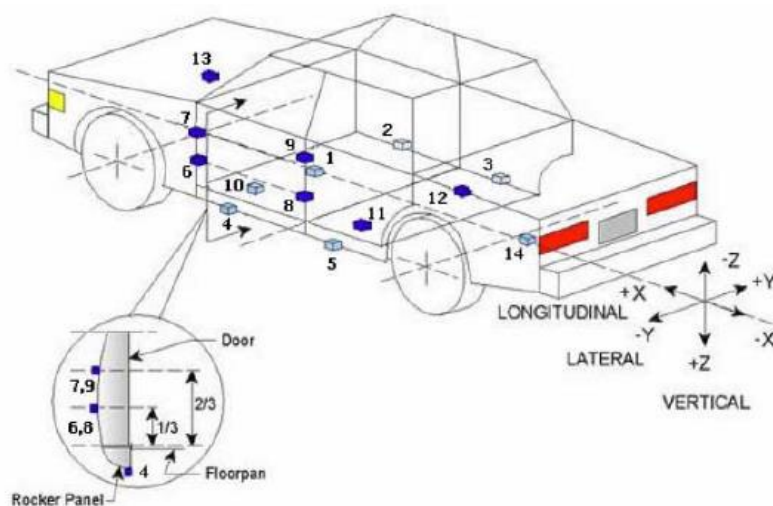
INSTRUMENTATION

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 Buick Encore GX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
Test Date: 4/7/2020



TEST VEHICLE ACCELEROMETER LOCATIONS

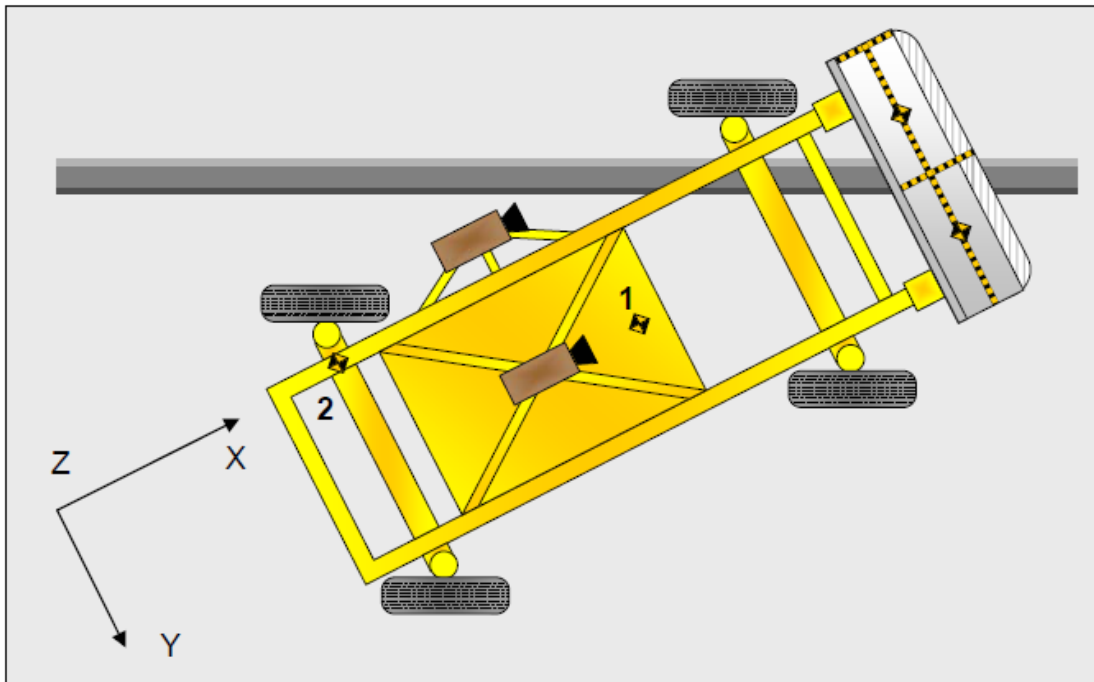
No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2358	7	-198
2	Right Sill at Front Seat	2581	623	133
3	Right Sill at Rear Seat	1673	630	113
4	Left Sill at Front Door	2572	-629	125
5	Left Sill at Rear Door	1672	-636	123
6	A-Post Lower	2980	-596	-104
7	A-Post Middle	2956	-618	-628
8	B-Post Lower	1943	-655	-187
9	B-Post Middle	1899	-641	-512
10	Front Seat Track	2129	-520	77
11	Rear Seat Structure	1534	-371	-66
12	Rt. Rear Occ. Compartment	1778	315	307
13	Engine Block	3656	285	-337
14	Rear Above Axle	834	8	48

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 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



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 Buick Encore GX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
Test Date: 4/7/2020

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Face	Curtain Airbag	None
Top of Head	Side Headliner	Curtain Airbag
Left Side of Head	Curtain Airbag & Side Headliner	Curtain Airbag
Back of Head	Curtain Airbag, Side Headliner & Headrest	Headrest
Left Shoulder	Curtain & Torso/Pelvis Airbag	Torso/Pelvis Airbag
Upper Torso	Seatback	Seatback & Torso/Pelvis Airbag
Lower Torso	Seatback & Torso/Pelvis Airbag	Seatback & Torso/Pelvis Airbag
Left Hip	Seat pan & Torso/Pelvis Airbag	Torso/Pelvis Airbag
Left Knee	Driver Door	Passenger Door

POST-TEST DOOR PERFORMANCE

Description	Struck Side		Non-Struck Side		Rear Hatch/ Other
	Front	Rear	Front	Rear	
Remained Closed and Operational	No	No	Yes	Yes	Yes
Total Separation from Vehicle at Hinges or Latches	No	No	No	No	No
Latch or Hinge Systems Pulled Out of Their Anchorages	No	No	No	No	No
Disengaged from Latched Position	No	No	No	No	No
Latch Separated from Striker	No	No	No	No	No
Jammed Shut	Yes	Yes	No	No	No
If Door Opened at Striker, Width of Opening at Striker (mm)	0	0	0	0	0

POST-TEST SEAT PERFORMANCE

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

POST-TEST STRUCTURAL OBSERVATIONS

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

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

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

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	Yes	No		
Side Air bag 1 - Curtain	Yes	Yes	Yes	Yes
Side Air bag 2 - Torso/Pelvis Air bag	Yes	Yes	Yes	Yes
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		2593
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		358
Actual Impact Point (Aft of Frontal Axle)	mm		354
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+4
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	+3

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2020 Buick Encore GX SUV
Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
Test Date: 4/7/2020

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	61.72
Trap No. 2 Velocity (Redundant)	km/h	61.10 to 62.70	61.81
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed angle to MDB Forward Line of Motion	degrees	26.0 to 28.0	27.0

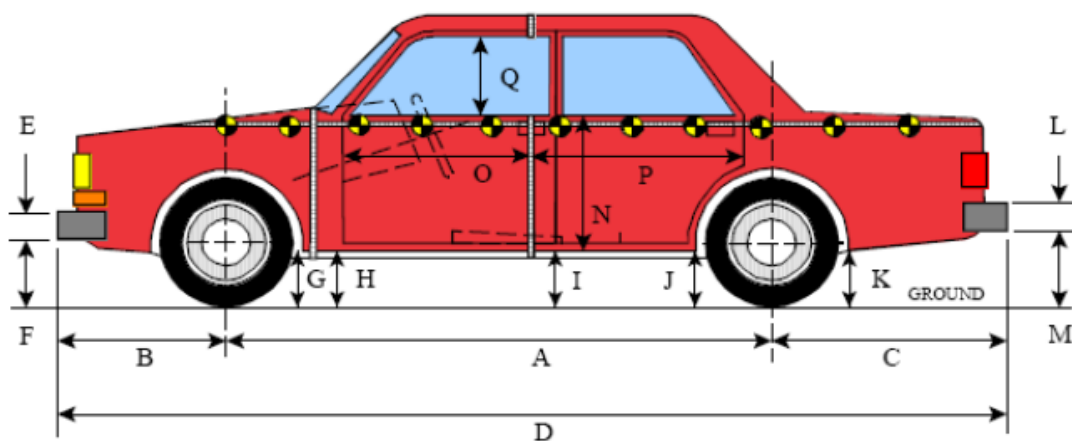
MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush (mm)
Row	Description	Height (mm)	Distance (mm)	Direction	
A	Center of Bumper	432	800	Right	201
B	Top of Bumper	533	800	Left	141
C	Mid-Level	686	800	Left	132
D	Top of Stack	813	800	Left	183

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



LEFT SIDE VIEW

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

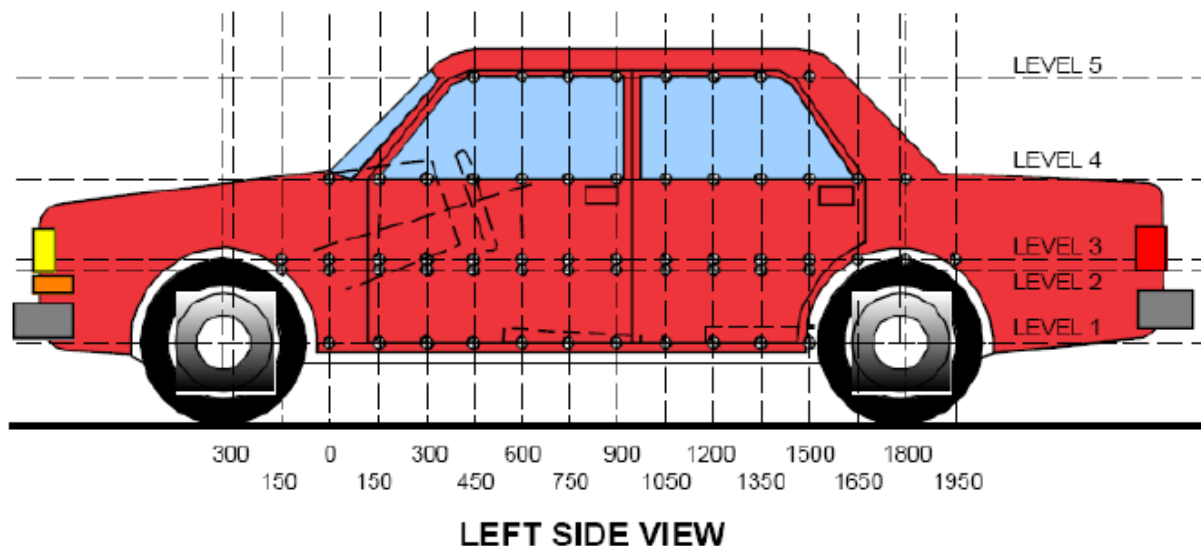
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2593	2597	4
B	Front Axle to FSOV	914	917	3
C	Rear Axle to RSOV	838	835	-3
D	Total Length at Centerline	4347	4348	1
E	Front Bumper Thickness	240	240	0
F	Front Bumper Bottom to Ground	290	287	-3
G	Sill Height at Front Wheel Well	222	225	3
H	Sill Height at Front Door Leading Edge	223	224	1
I	Sill Height at B Pillar	233	219	-14
J1	Sill Height at Rear Wheel Well	234	212	-22
J2	Pinch Weld Height at Rear Wheel Well	230	235	5
K	Sill Height Aft of Rear Wheel Well	265	265	0
L	Rear Bumper Thickness	125	125	0
M	Rear Bumper Bottom to Ground	368	371	3
N	Sill Height to Window Bottom of Front Window Sill	833	755	-78
O	Front Door Leading Edge to Impact CL	686	686	0
P	Rear Door Trailing Edge to Impact CL	1340	1295	-45
Q	Front Window Opening	445	476	31
R	Right Side Length	4186	4191	5
S	Left Side Length	4183	4195	12
T	Maximum Vehicle Width	1773	1615	-158

DATA SHEET NO. 11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	329	98	750
2	Driver Hip Point	mm	649	224	1650
3	Mid-Door	mm	729	231	1650
4	Window Sill	mm	1084	54	1200
5	Window Top	mm	1561	4	900

*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 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

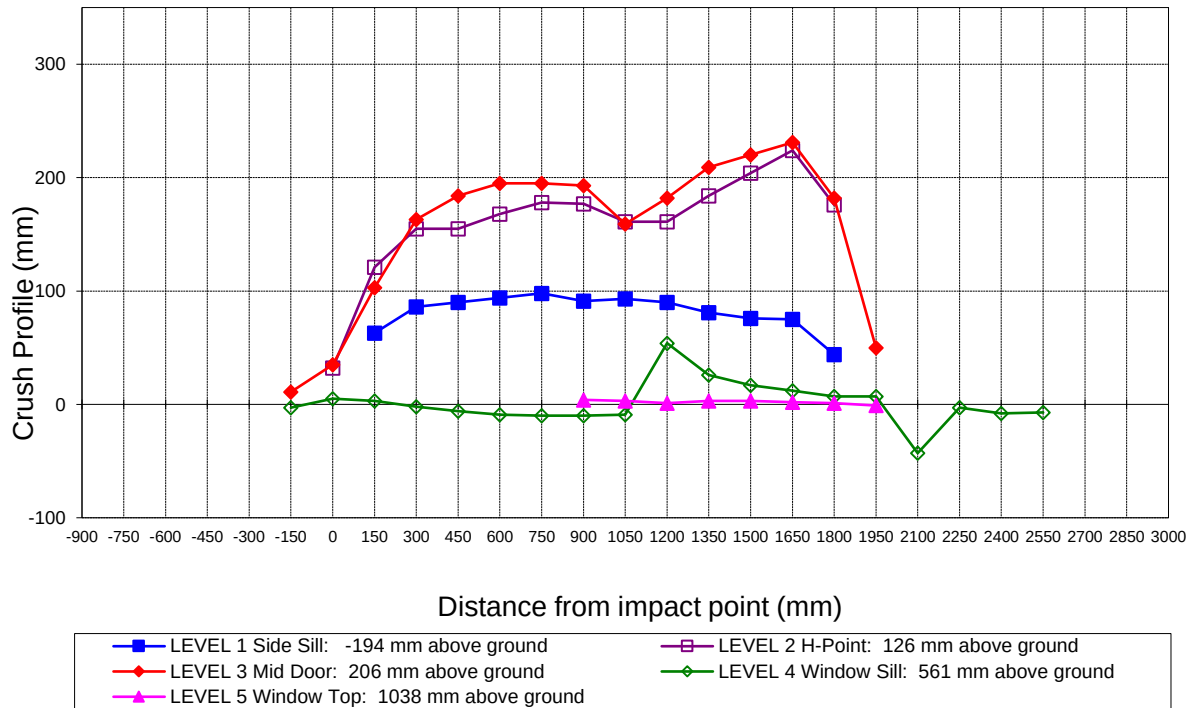
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			906	757				895	760				11	-3	
0		902	902	778			870	866	773			32	36	5	
150	853	890	889	787		790	769	786	784		63	121	103	3	
300	852	874	882	788		766	719	719	790		86	155	163	-2	
450	851	873	881	793		761	718	697	799		90	155	184	-6	
600	850	873	881	801		756	705	686	810		94	168	195	-9	
750	848	872	881	808		750	694	686	818		98	178	195	-10	
900	843	870	880	813	620	752	693	687	823	616	91	177	193	-10	4
1050	843	868	879	818	621	750	707	720	827	618	93	161	159	-9	3
1200	840	865	876	818	614	750	704	694	764	613	90	161	182	54	1
1350	836	864	875	817	615	755	680	666	791	612	81	184	209	26	3
1500	833	868	876	818	613	757	664	656	801	610	76	204	220	17	3
1650	832	879	884	830	608	757	655	653	818	606	75	224	231	12	2
1800	823	896	899	832	600	779	720	717	825	599	44	176	182	7	1
1950			904	831	587			854	824	588			50	7	-1
2100				831					874					-43	
2250				826					829					-3	
2400				819					827					-8	
2550				812					819					-7	
2700															
2850															
3000															

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

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

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

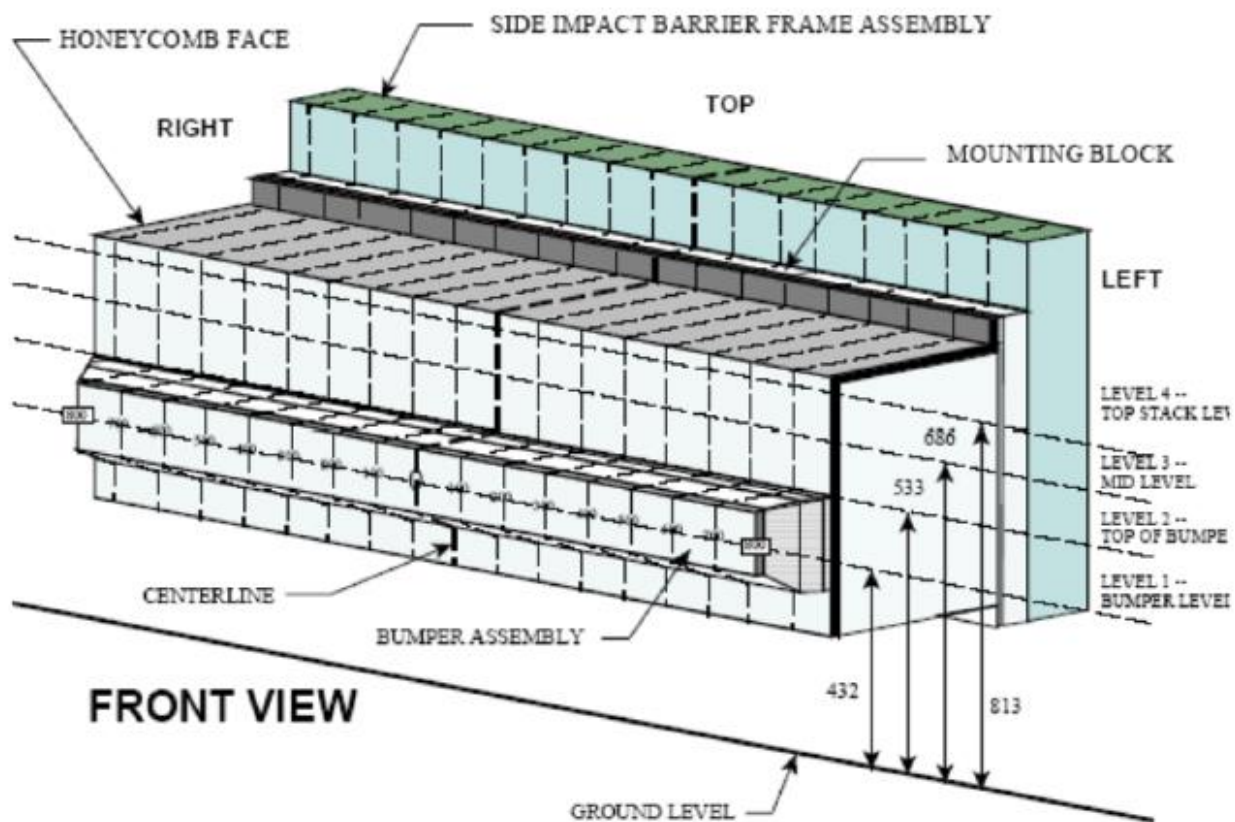


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

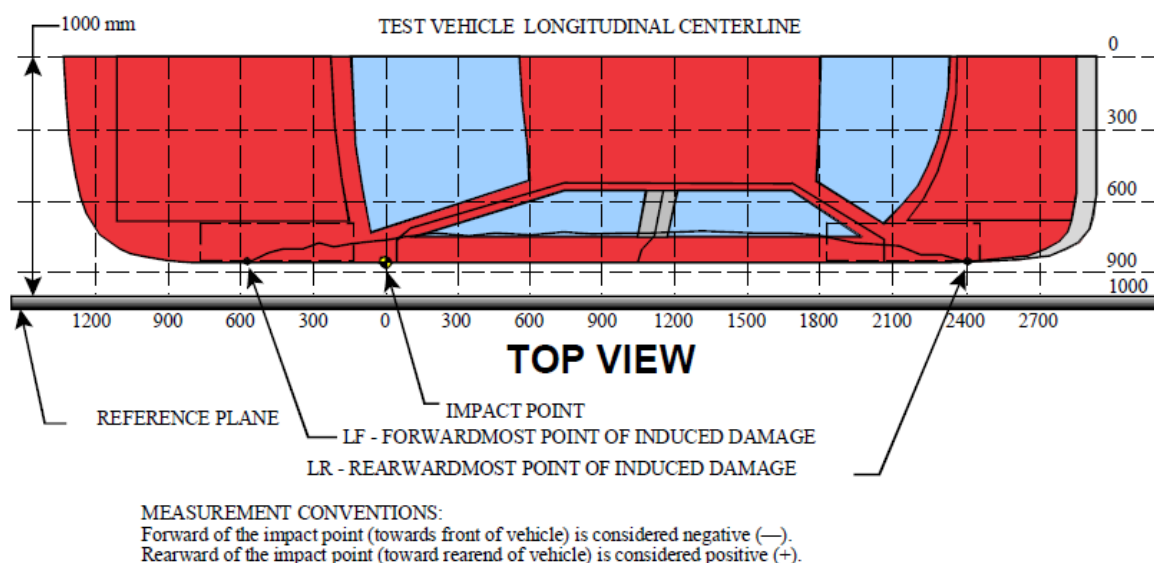
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	201	178	176	176	176	176	176	176	181	177	176	176	176	176	177	187	199
2	91	93	94	90	90	88	93	92	102	100	101	90	93	93	93	103	141
3	26	11	10	13	18	34	49	52	31	19	18	20	25	33	51	91	132
4	44	34	31	21	20	44	60	59	44	39	41	45	51	52	72	128	183

DATA SHEET NO. 13 **VEHICLE AND MDB DAMAGE PROFILE DISTANCES**

Test Vehicle: 2020 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020

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



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-150	3	105	94	11
2	270	3	268	117	151
3	690	3	314	119	195
4	1110	3	290	122	168
5	1530	3	345	122	223
6	1950	3	146	96	50

MDB DAMAGE PROFILE DISTANCES

DPD	Distance From Center of MDB	Level	Post-Test (mm)*
1	800 mm left of center	1	199
2	480 mm left of center	1	176
3	160 mm left of center	1	176
4	160 mm right of center	1	176
5	480 mm right of center	1	176
6	800 mm right of center	1	201

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

Test Vehicle: <u>2020 Buick Encore GX SUV</u>	NHTSA No.: <u>M20200102</u>
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>4/7/2020</u>
Test Time: <u>12:07 PM</u>	Temperature: <u>21°C</u>

- | | |
|---|-----------------------------|
| A. From impact until vehicle motion ceases:
(Maximum allowable is 1 oz.) | 0 oz. |
| B. For the 5-minute period after motion ceases:
(Maximum allowable is 5 oz.) | 0 oz. |
| C. For the following 25 minutes:
(Maximum allowable is 1 oz./minute) | 0 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°	69	300	369
270° to 360°	70	300	370

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	

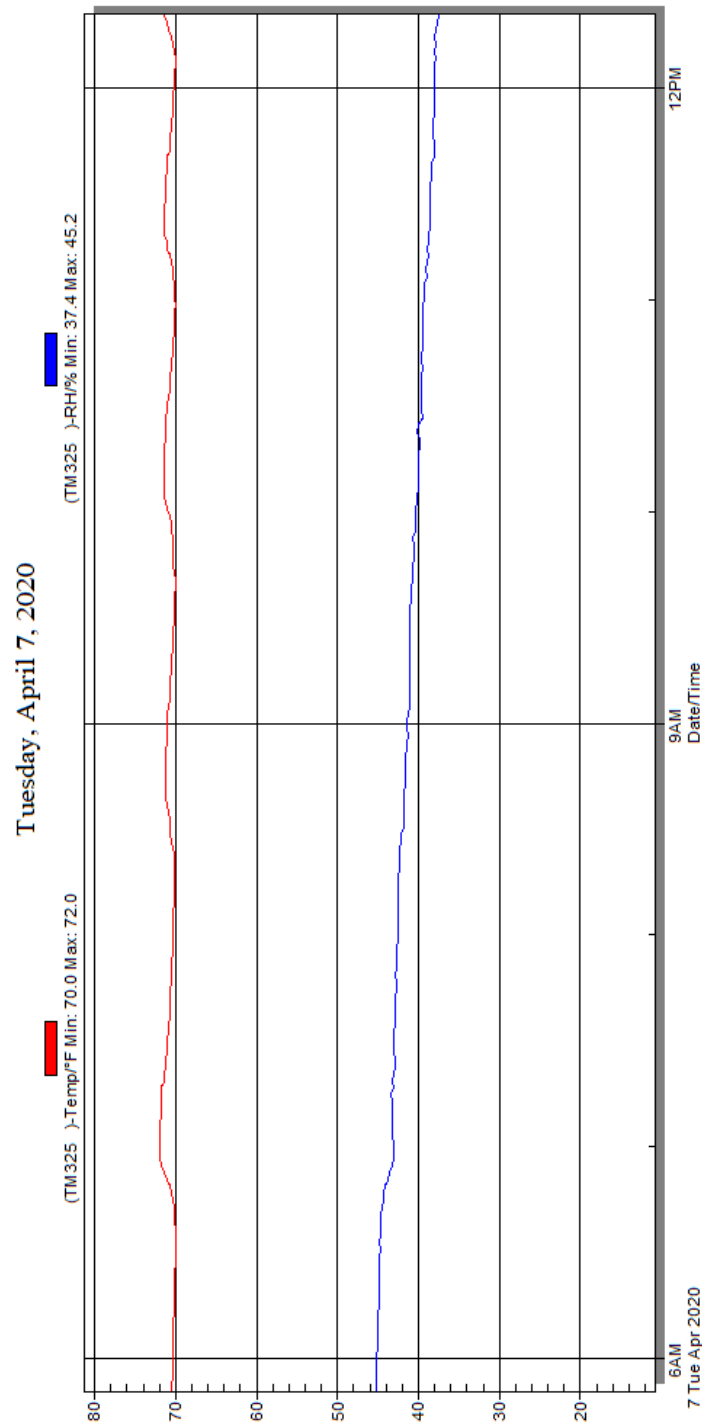
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

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 Buick Encore GX SUV
 Test Program: NCAP Side MDB Impact Test

NHTSA No.: M20200102
 Test Date: 4/7/2020



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

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

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

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

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



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

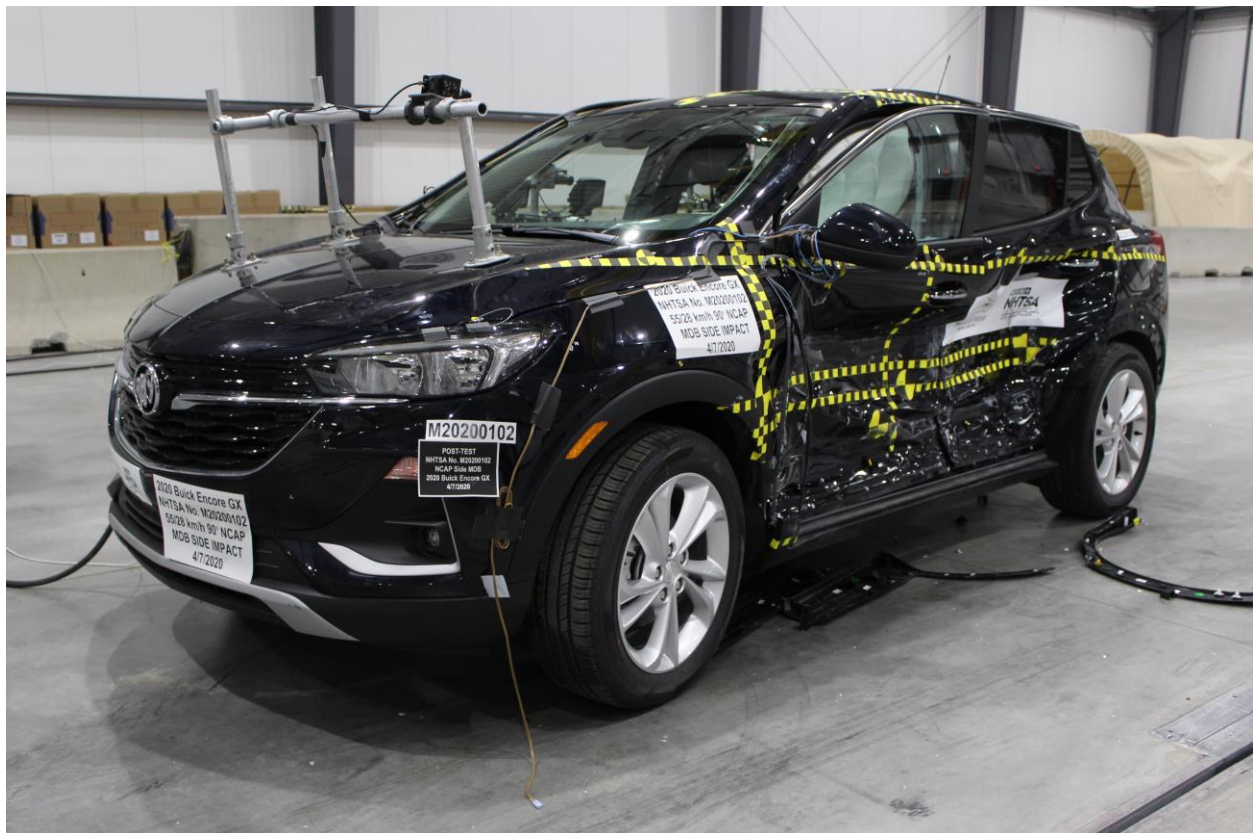


Figure A-6: Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle



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

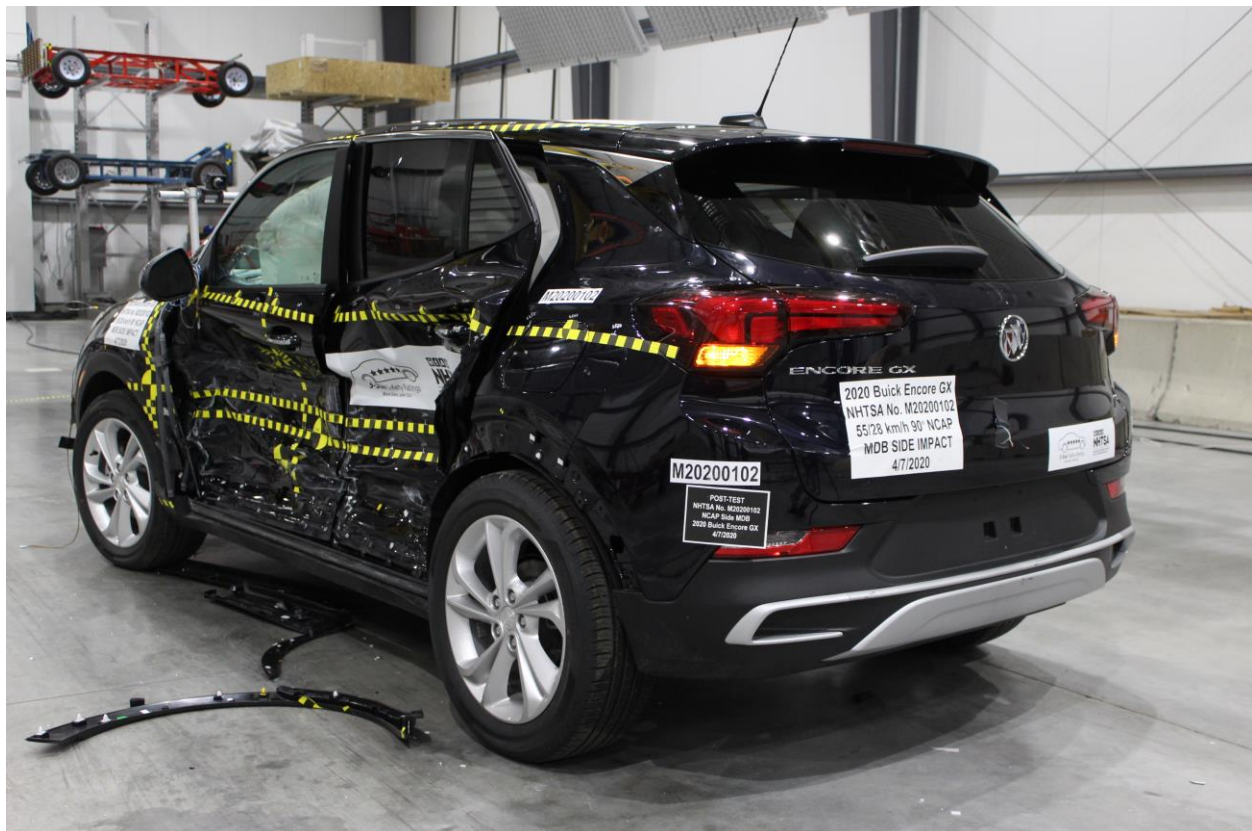


Figure A-10: Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



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

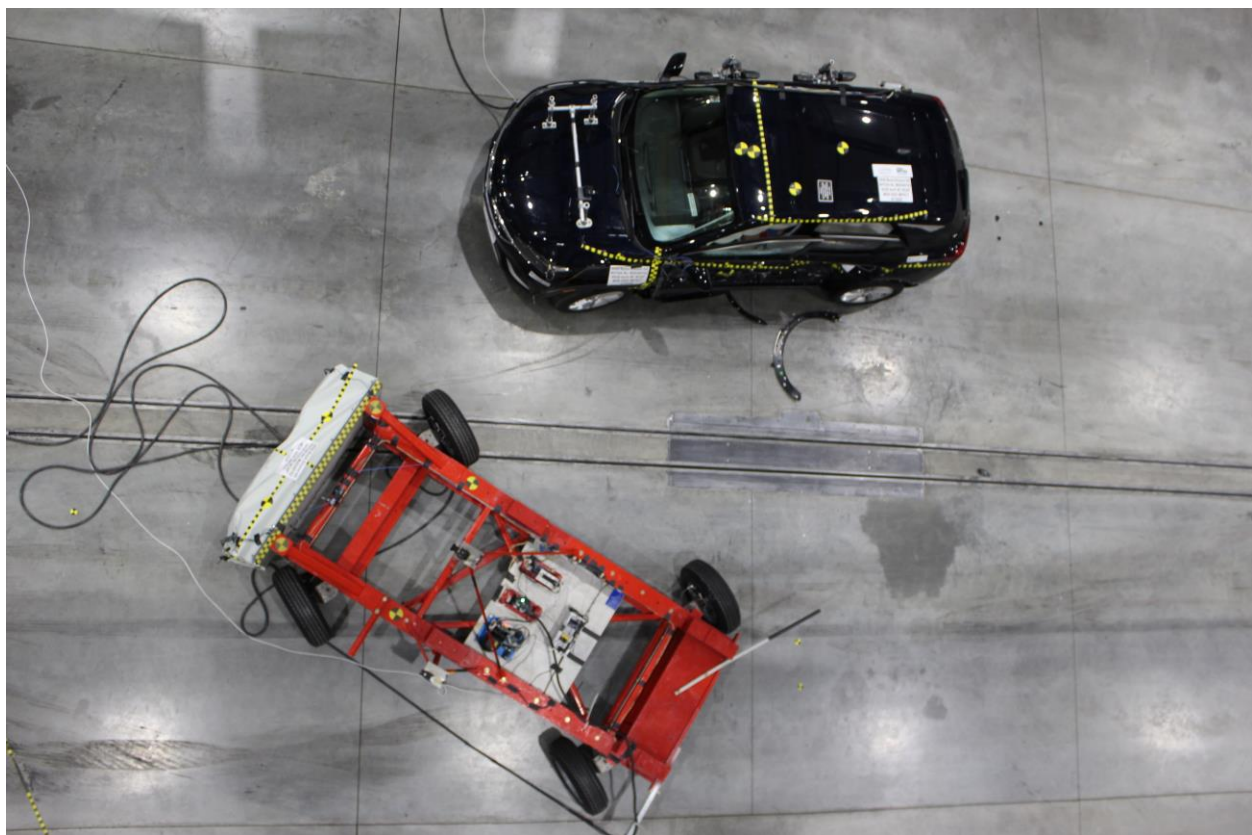


Figure A-16: Post-Test Overhead View of Test Area



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

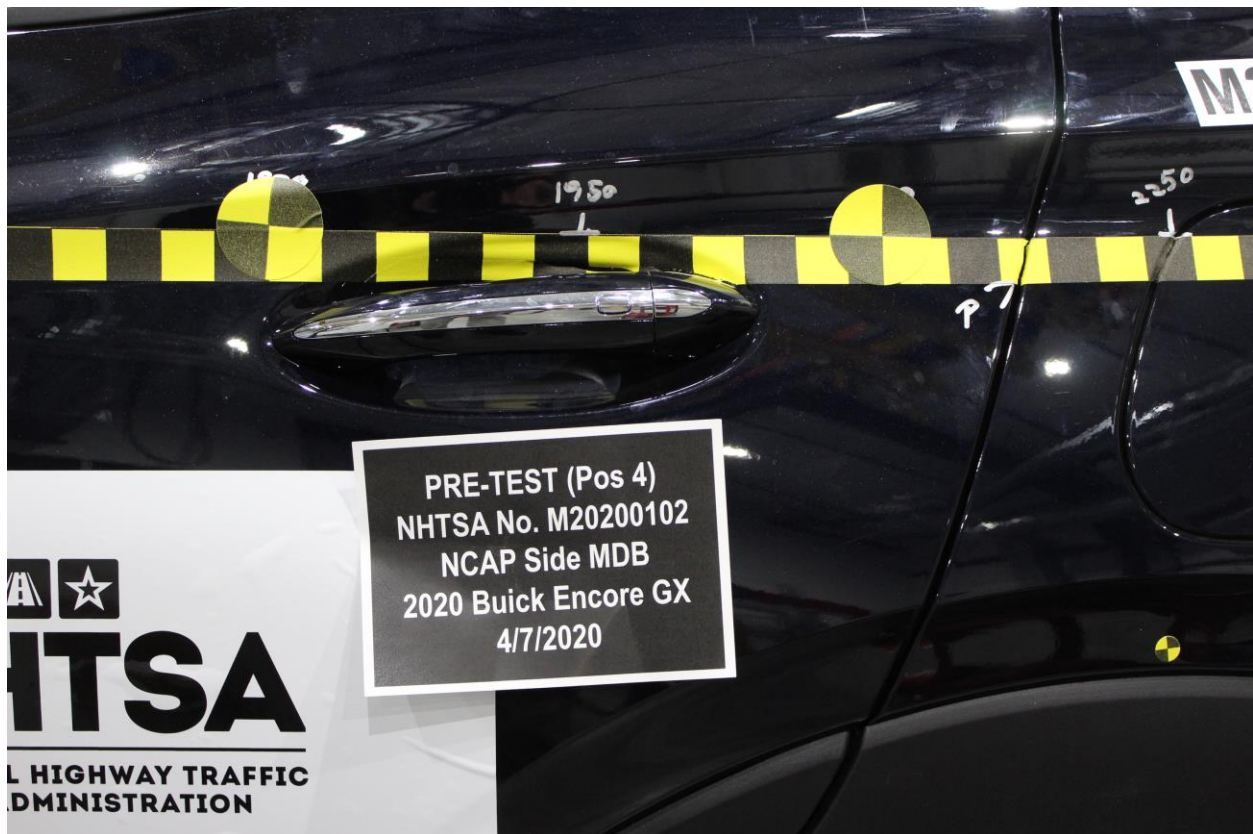


Figure A-23: Pre-Test Left Rear Door Latch Close-Up



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

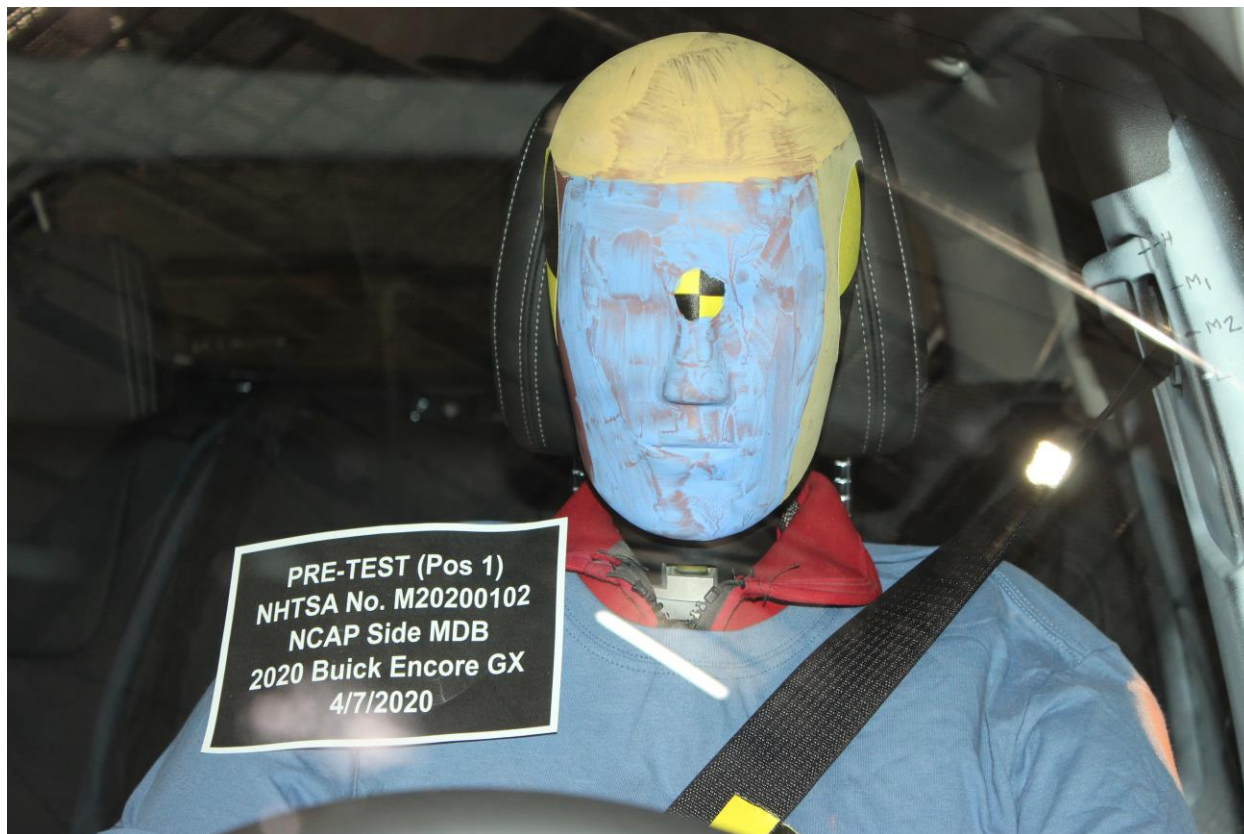


Figure A-25: Pre-Test Front Close-up View of Driver Dummy



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

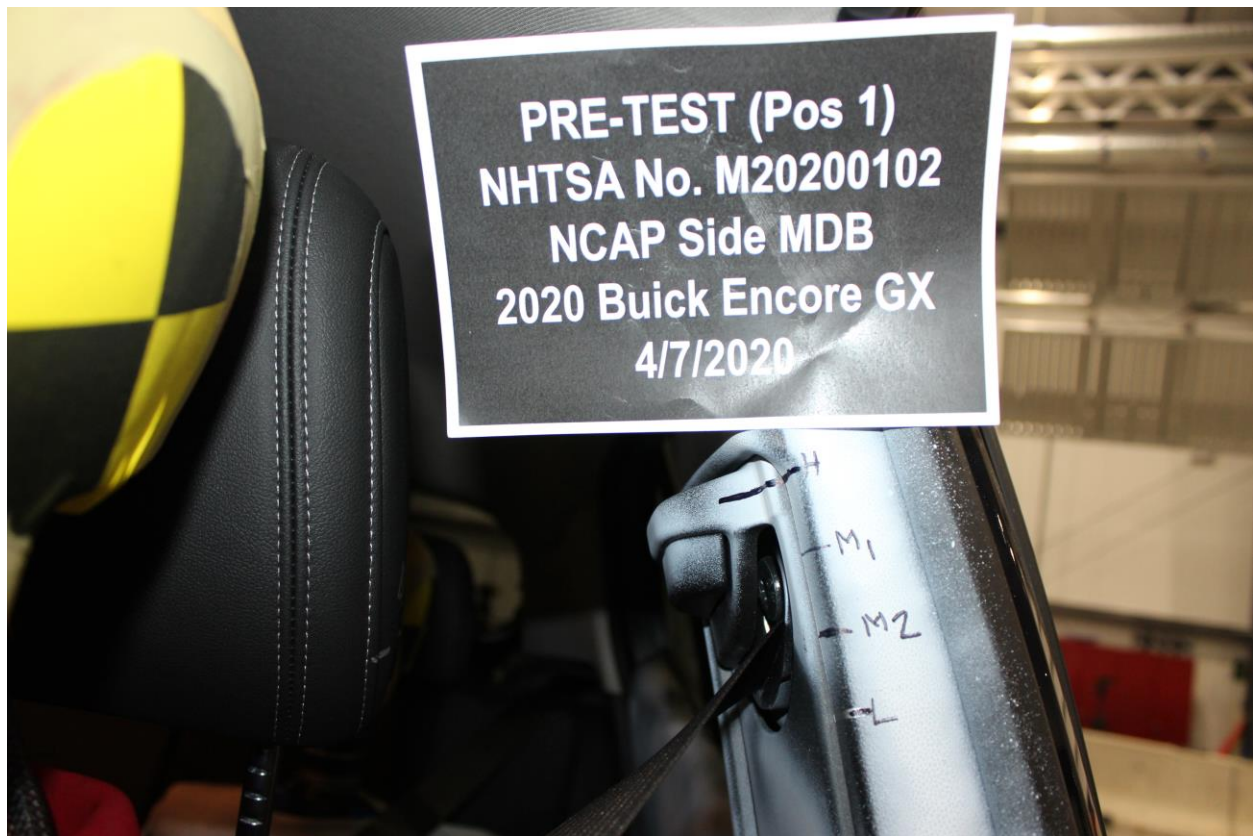


Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy

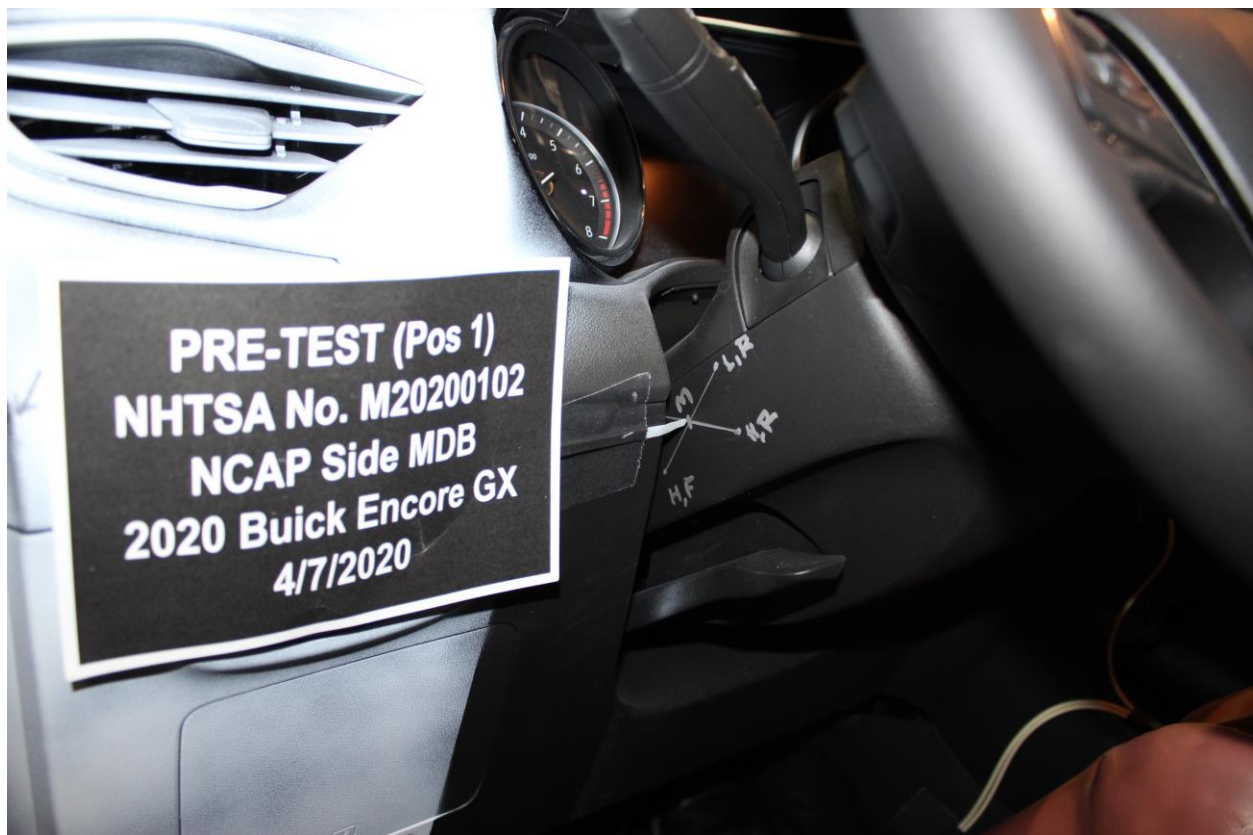


Figure A-36: Pre-Test Left Side View of Steering Wheel



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



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



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



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



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



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



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



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



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



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



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



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



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

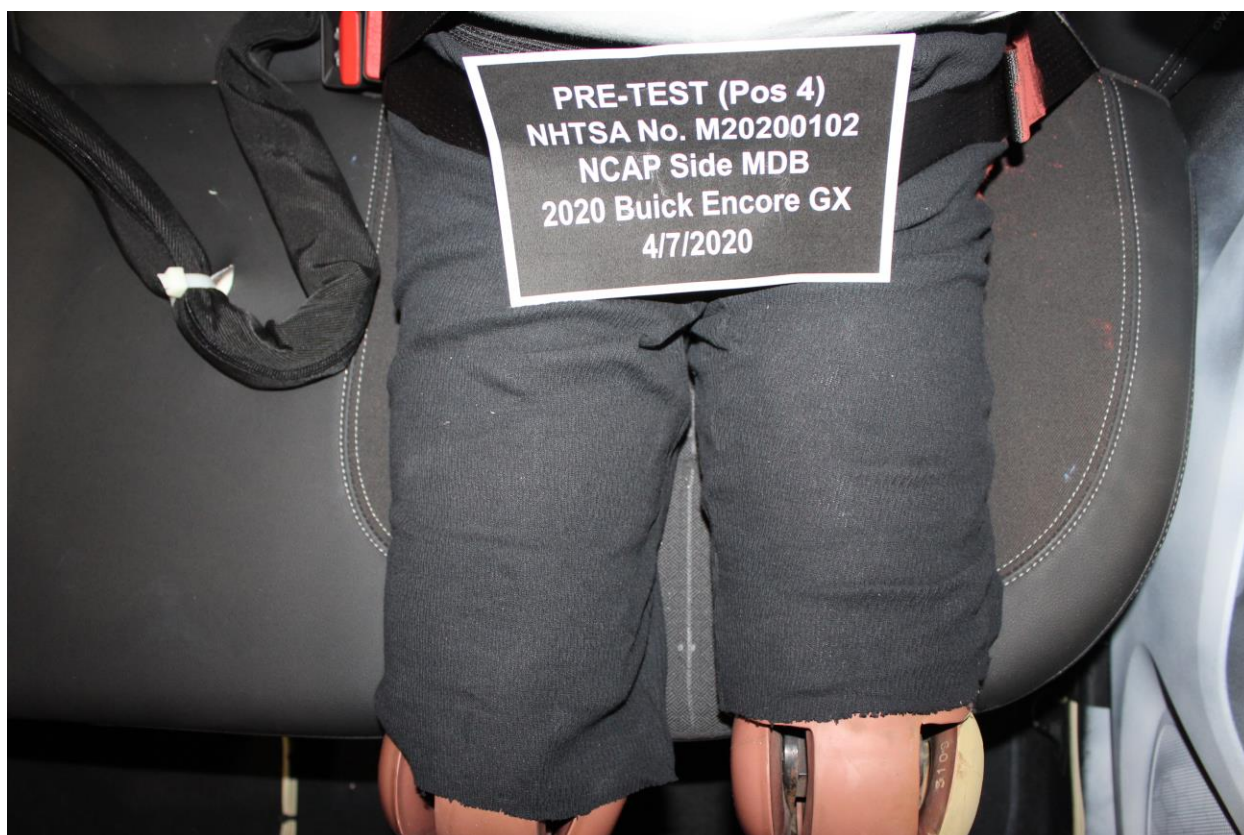


Figure A-61: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

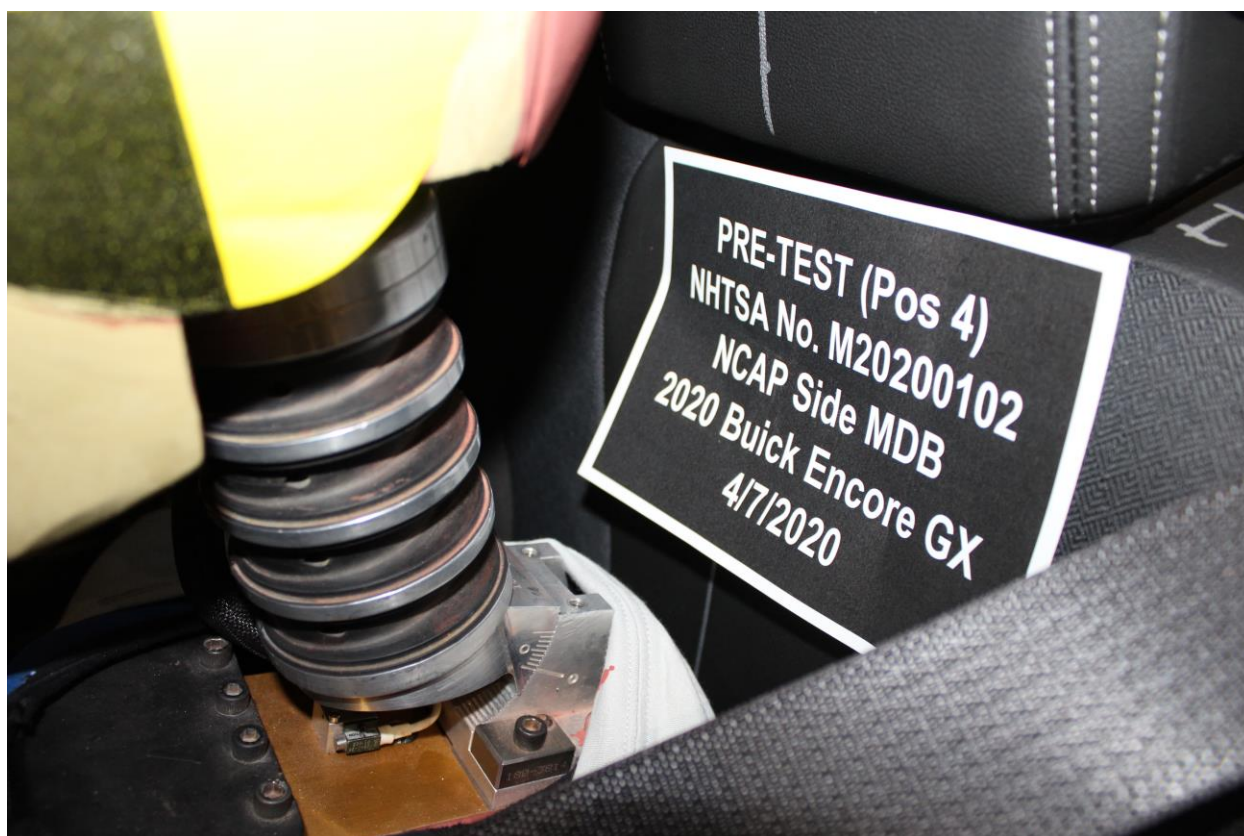


Figure A-62: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

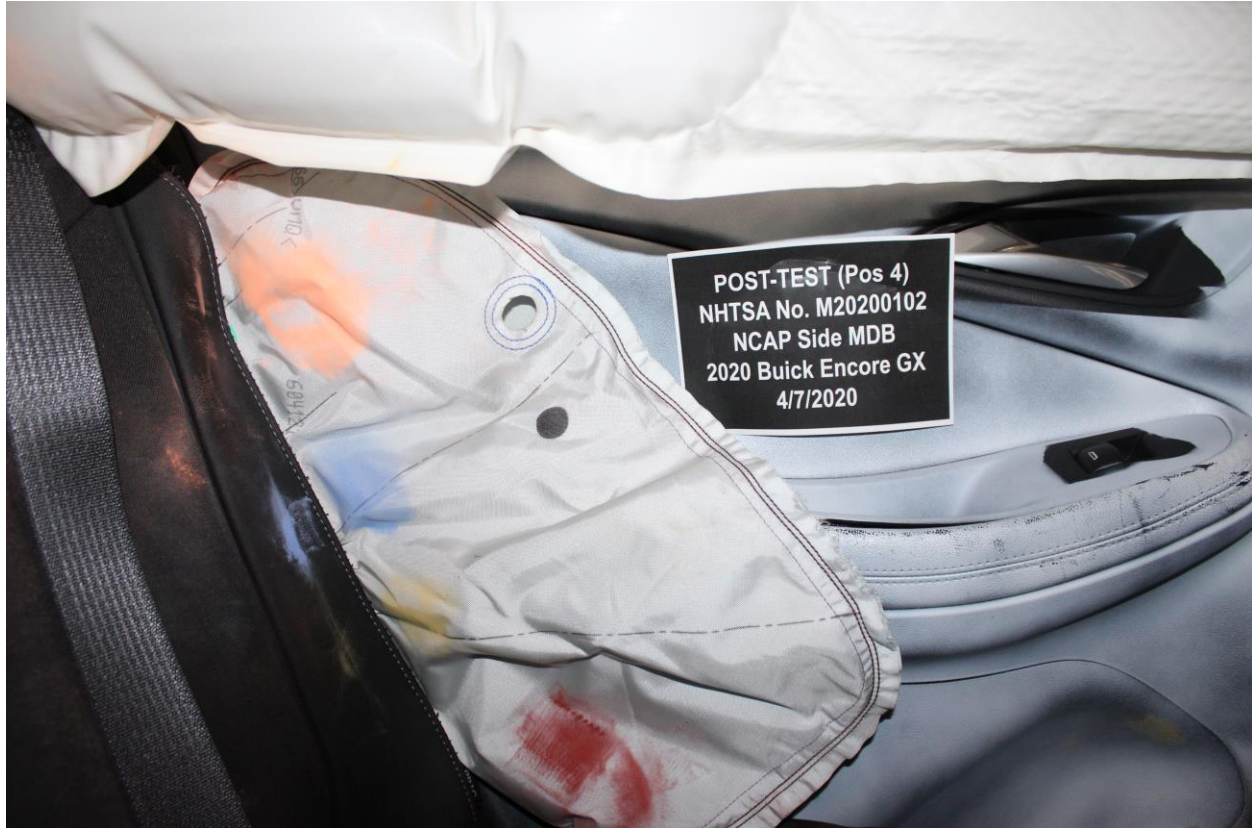


Figure A-78: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Air bag View



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



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

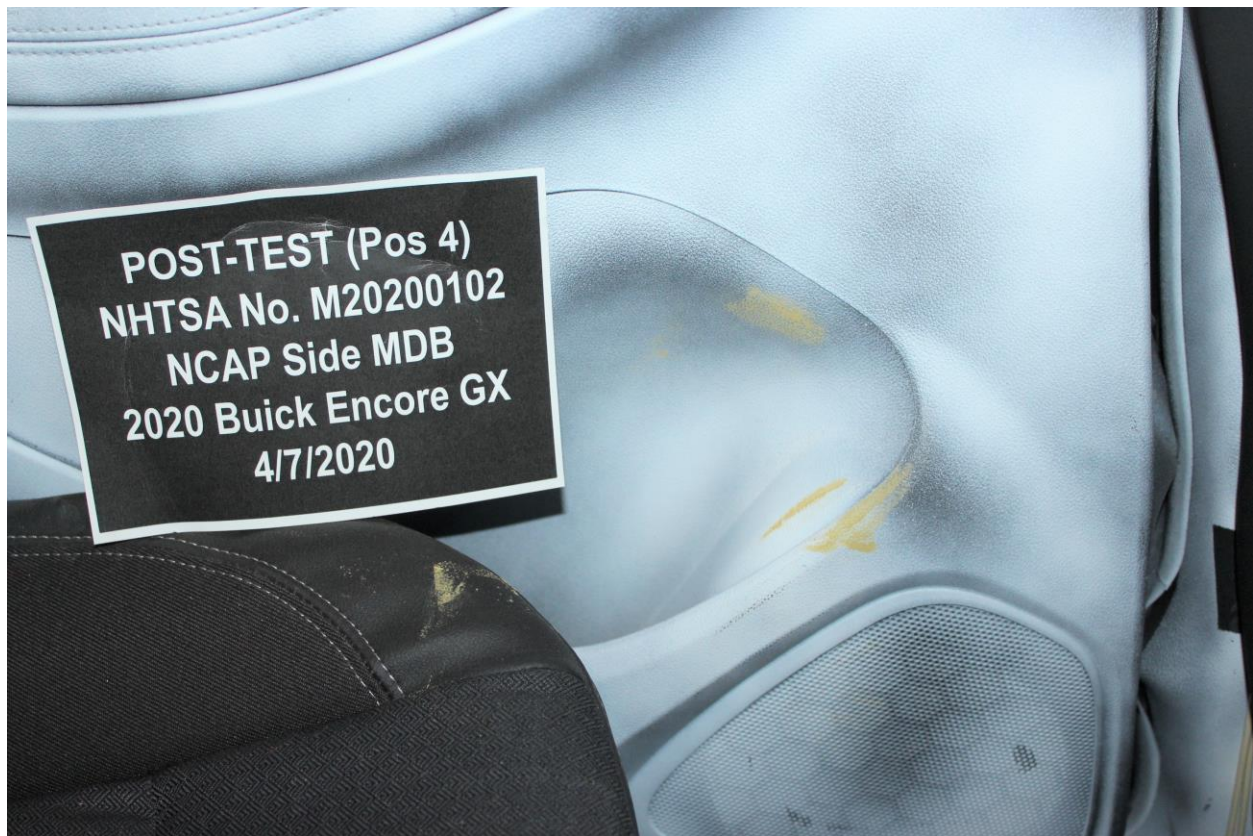


Figure A-81: Post-Test Rear Passenger Dummy Close-Up Knee Contact View



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

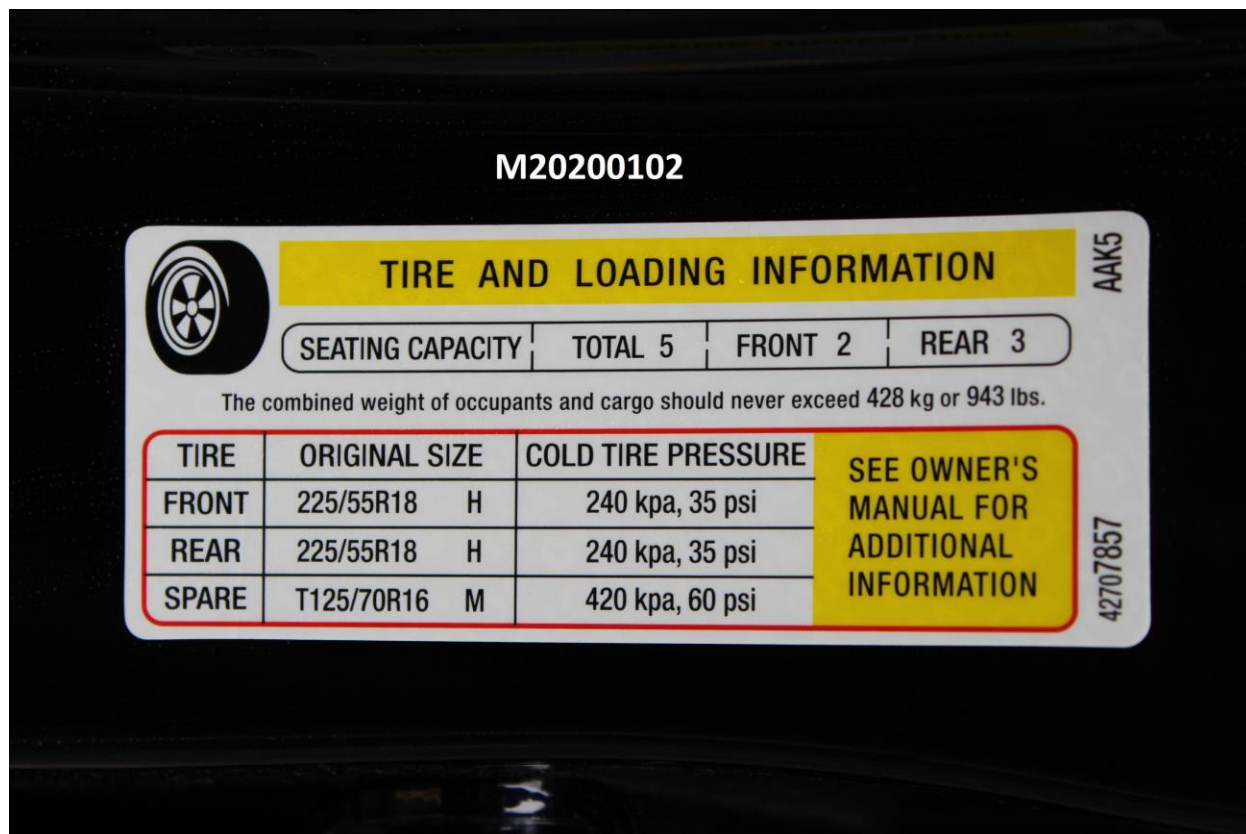


Figure A-93: Close-Up View of Vehicle's Tire Information Placard or Label

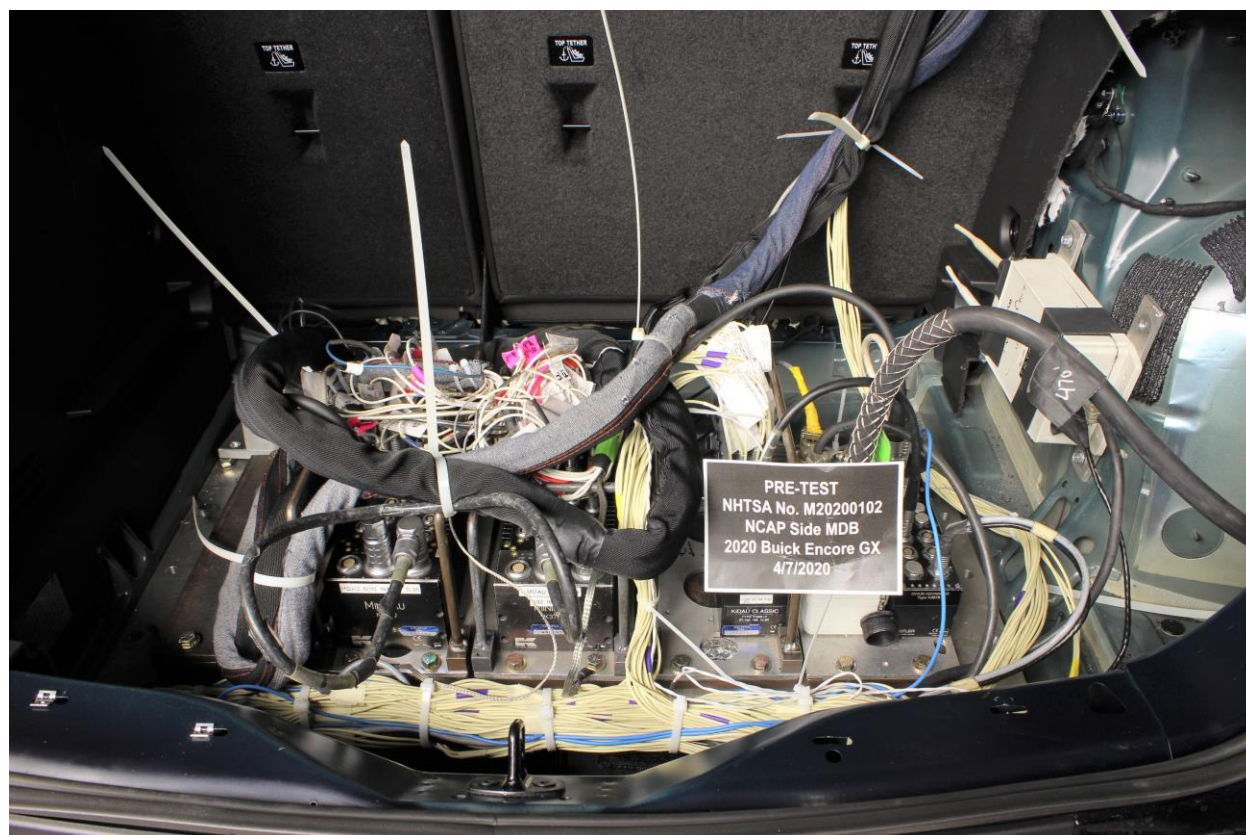


Figure A-94: Pre-Test Ballast View



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



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

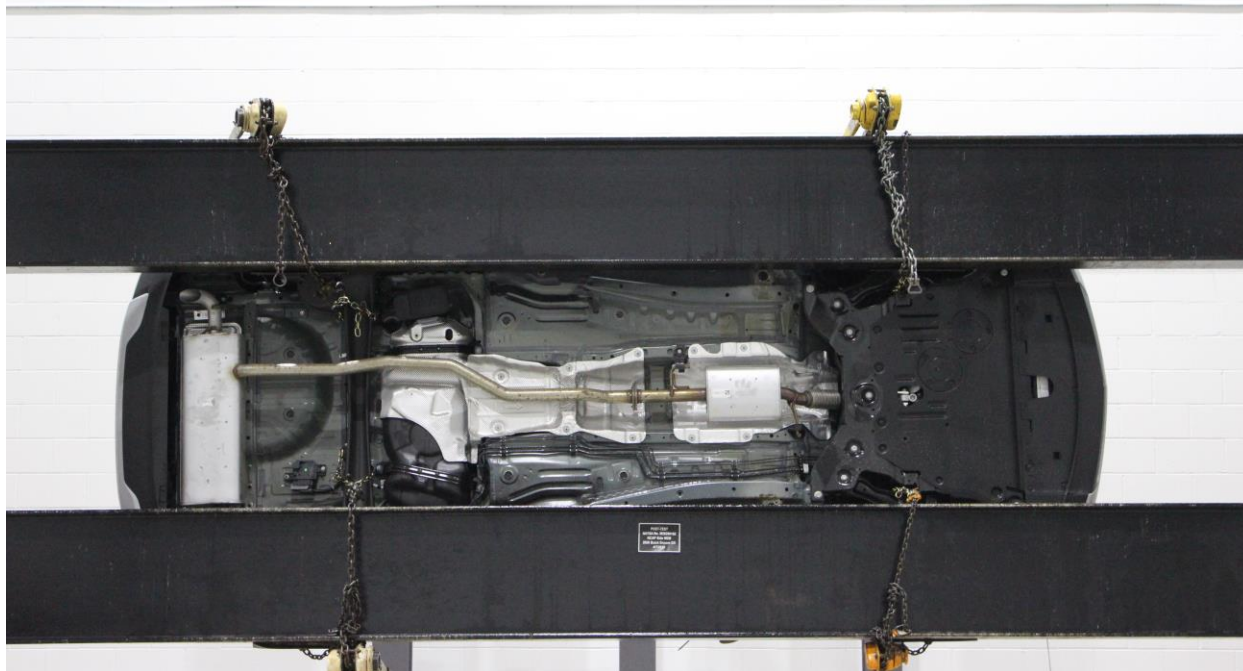


Figure A-97: FMVSS No. 301 Static Rollover 90 Degrees

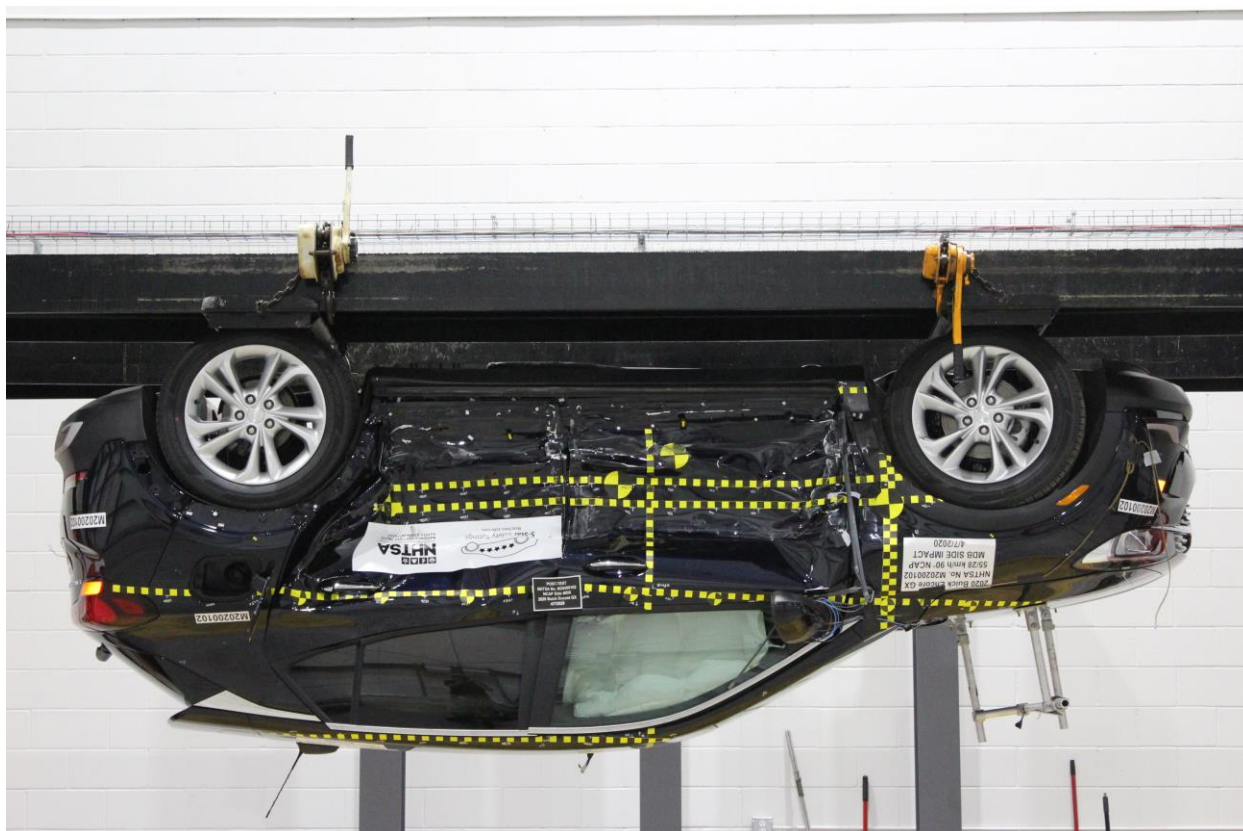


Figure A-98: FMVSS No. 301 Static Rollover 180 Degrees



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



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OPTIONS & PRICING	TOTAL VEHICLE PRICE*
OPTIONS INSTALLED BY THE MANUFACTURER MAY REPLACE STANDARD EQUIPMENT PRICING COLD WEATHER COMFORT PACKAGE: 950.00 • REMOTE VEHICLE STARTER SYSTEM • SEAT ADJUSTER, DRIVER 8-WAY POWER • DRIVER & FRONT PASSENGER HEATED SEATS • SIRIUSXM RADIO CAPABLE, ALL ACCESS TRIAL W/ SUBSCRIPTION SOLD SEPARATELY • DARK MOON BLUE METALLIC 495.00	TOTAL OPTIONS \$1,445.00 TOTAL VEHICLE & OPTIONS \$25,545.00 DESTINATION CHARGE 995.00
TOTAL VEHICLE PRICE* \$26,540.00	

EPA DOT Fuel Economy and Environment

Fuel Economy

28 MPG combined city/hwy

26 city 30 highway

3.6 gallons per 100 miles

You Save \$250 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,450

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

6 (1 to 10 scale, 10 is best)

Smog Rating (tailpipe only)

7 (1 to 10 scale, 10 is best)

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 27 MPG and costs \$7,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$2.78 per gallon. MPGe is miles per gallon gasoline equivalent. Vehicle emissions are a significant cause of climate change and smog.

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GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score

Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver Passenger	To Be Rated
Side Crash	Front seat Rear seat	To Be Rated
Rollover		To Be Rated

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

PARTS CONTENT INFORMATION

This label has been applied pursuant to Federal law. Do not remove prior to delivery to the ultimate purchaser. Includes Manufacturer's Recommended Maintenance Schedule and other information. Manufacturer's recommended maintenance schedule and accessories not listed above, but listed in the Owner's Manual.

FOR VEHICLES IN THIS CARLINE:

U.S./CANADIAN PARTS CONTENT: 3%

MAJOR SOURCES OF FOREIGN PARTS CONTENT: KOREA 45% MEXICO 26%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:

FINAL ASSEMBLY POINT: BUPYEONG GU, IN KOREA

COUNTRY OF ORIGIN: ENGINE: MEXICO TRANSMISSION: MEXICO

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DEALER TO WHOM DELIVERED

LYNCH CHEVROLET BUICK GMC

2300 BROWNS LAKE DRIVE

BURLINGTON, WI 53105-7105

Figure A-102: Monroney Label

Head Restraints

 Warning

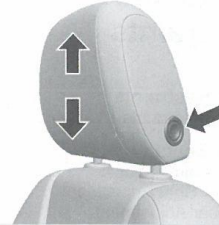
With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.

Front Seats

The vehicle's front seats have adjustable head restraints in the outboard seating positions.



Adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head. This position reduces the chances of a neck injury in a crash.



The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure that it is locked in place.

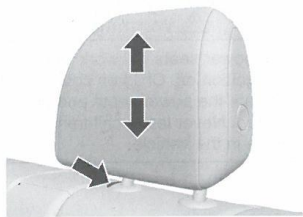
To raise or lower the head restraint, press the button located on the side of the head restraint, and pull up or push the head restraint down, and release the button. Pull and push on the head restraint after the button is released to make sure that it is locked in place.

The front seat outboard head restraints are not removable.

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

Rear Seats

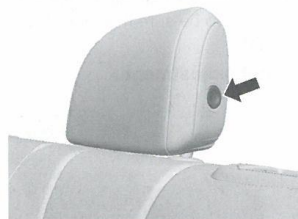
The vehicle's rear seats have adjustable head restraints in the outboard seating positions. The height of the head restraint can be adjusted. Pull the head restraint up to raise it. Try to move the head restraint to make sure it is locked in place.



To lower the head restraint, press the button on the top of the seatback and push the head restraint down. Try to move the head restraint after the button is released to make sure it is locked in place.

Folding the Rear Head Restraint

The head restraint can be folded rearward to allow for better visibility when the rear seat is unoccupied.



To fold the head restraint, press the button on the side of the head restraint.



The head restraint will fold rearward automatically.

When an occupant or child restraint is in the seat, always return the head restraint to the full upright position. Pull the head restraint up and forward until it locks into place. Push and pull on the head restraint to make sure that it is locked.

Always adjust the head restraint so that the top of the restraint is at the same height as the top of the occupant's head.

Rear outboard head restraints are not removable.

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

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

Driver & Passenger Dummy Instrumentation Plots

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

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at www.NHTSA.gov.

Additional Driver & Passenger Dummy Instrumentation Data

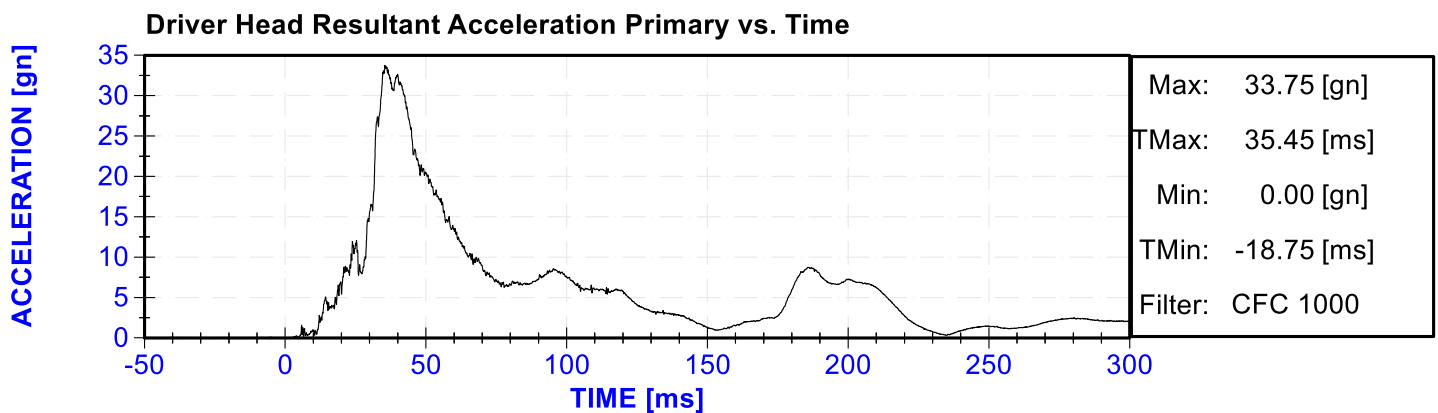
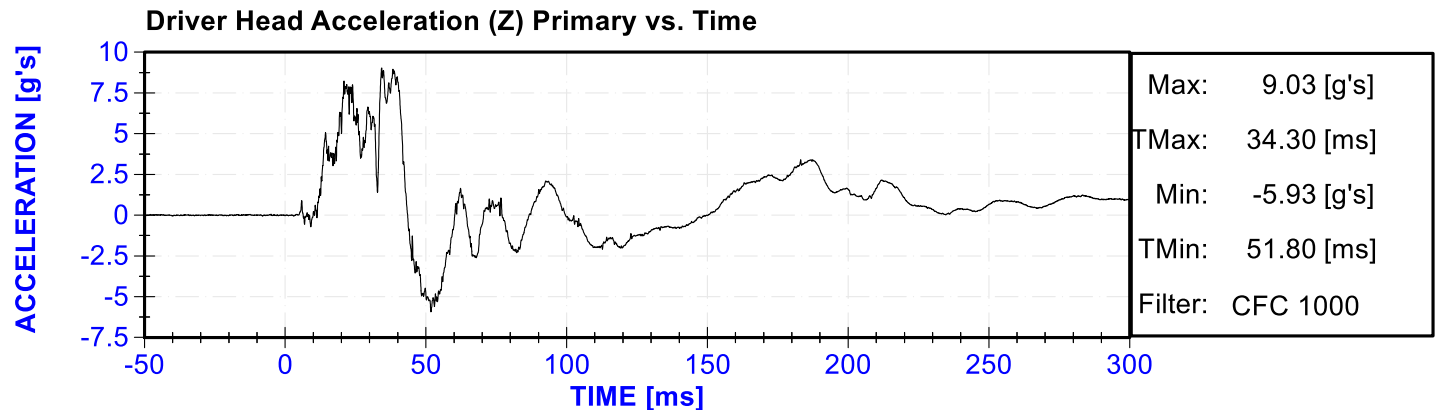
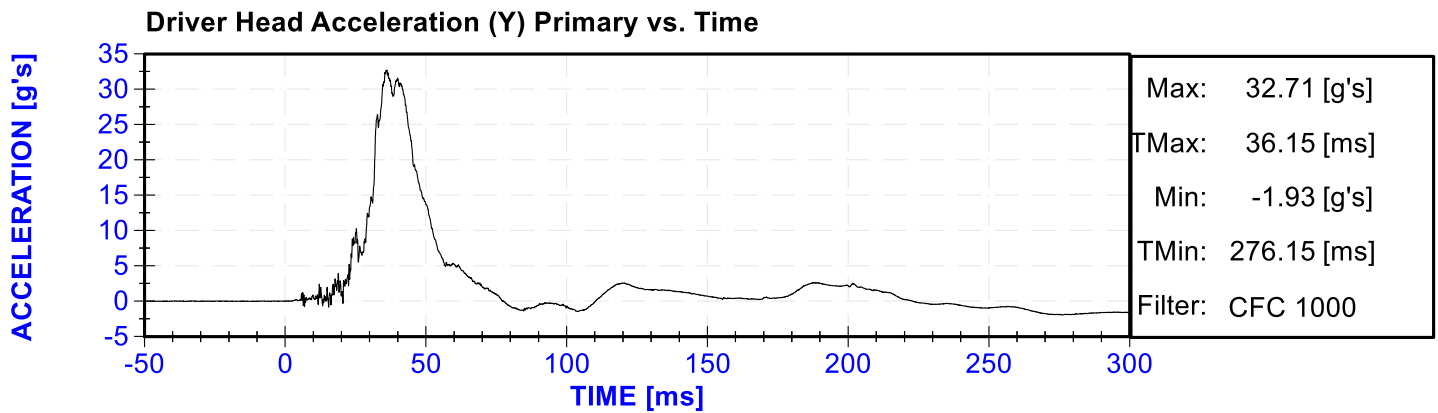
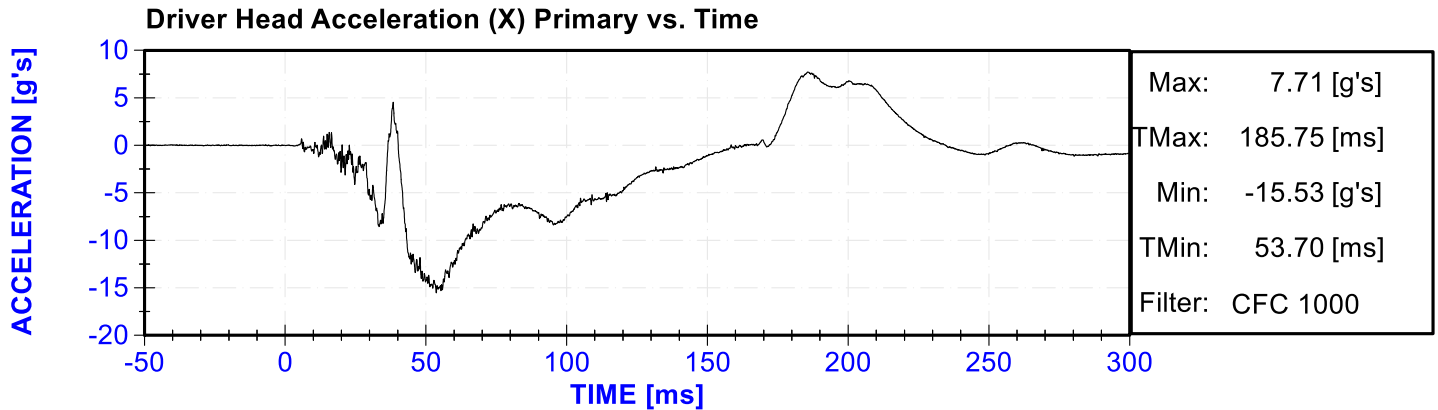
Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower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

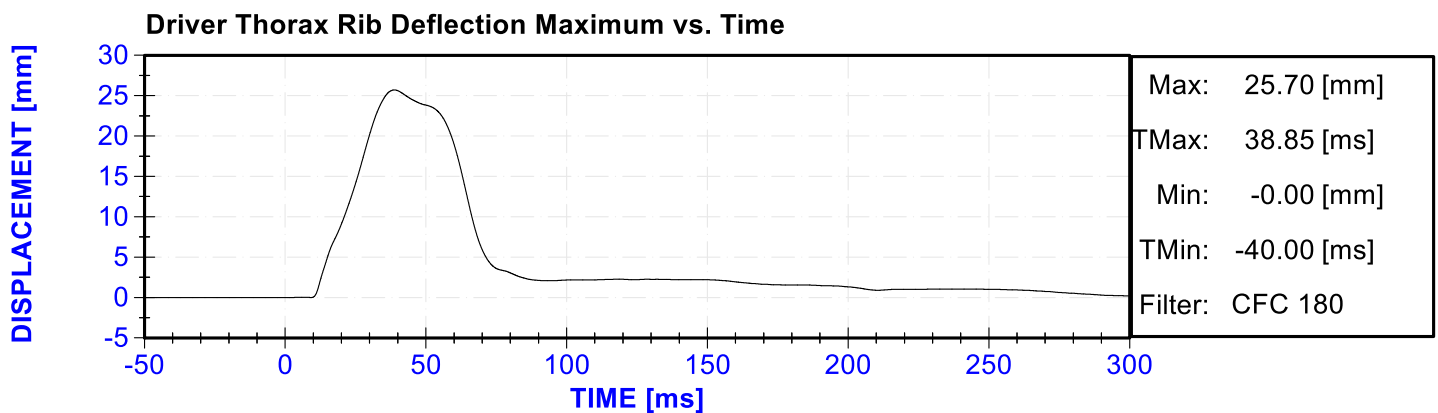
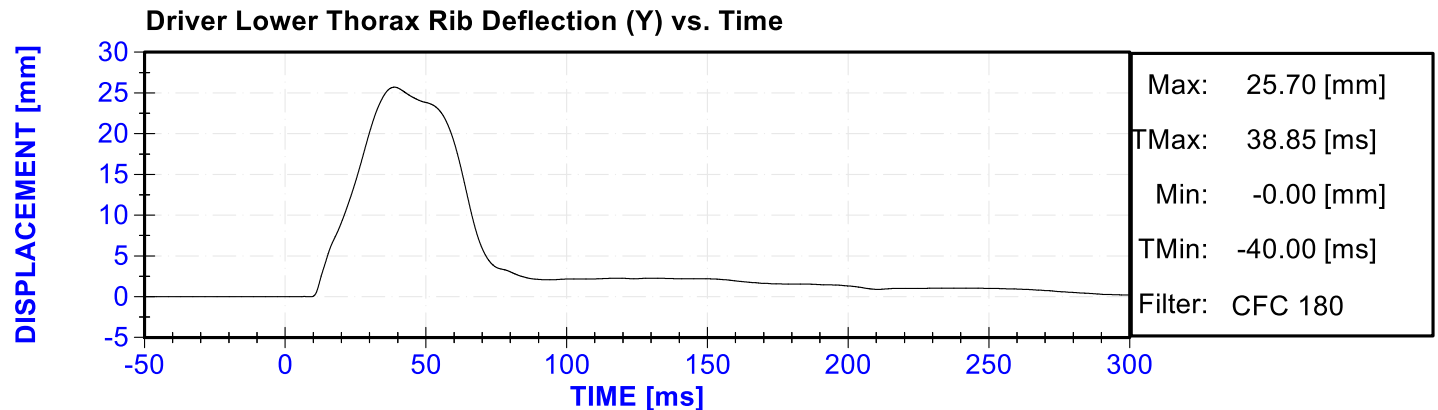
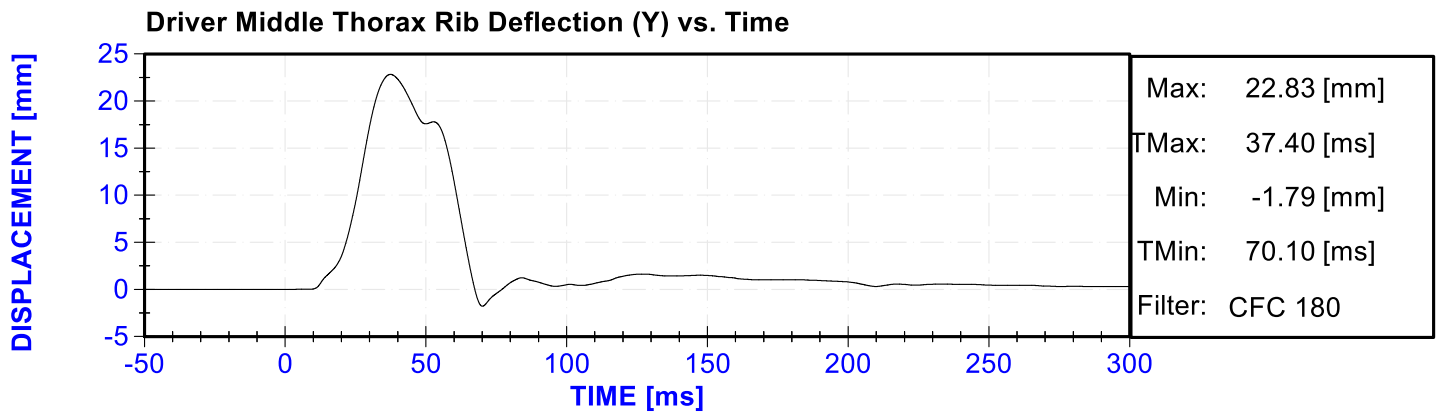
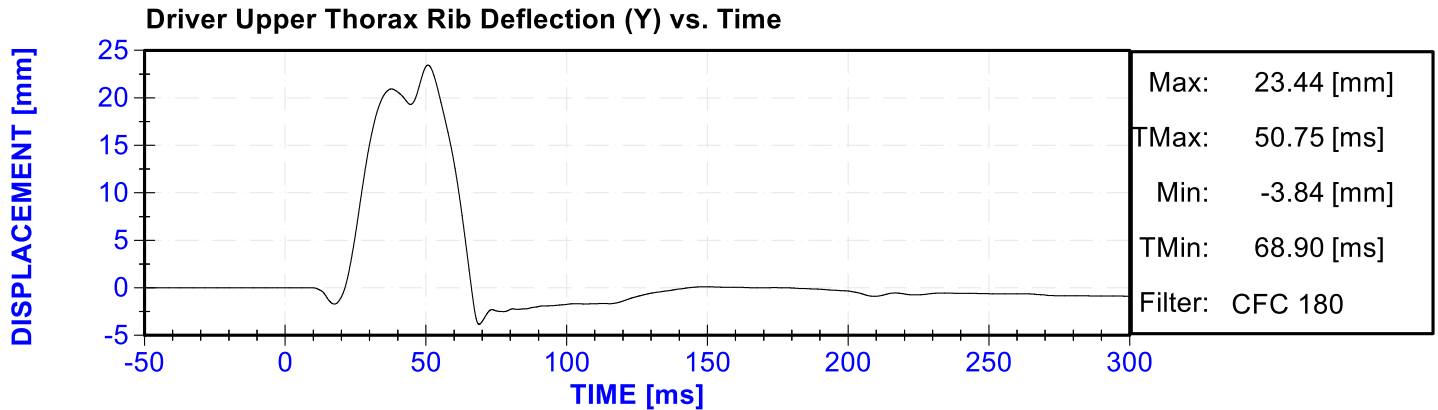
Vehicle Instrumentation Data

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)

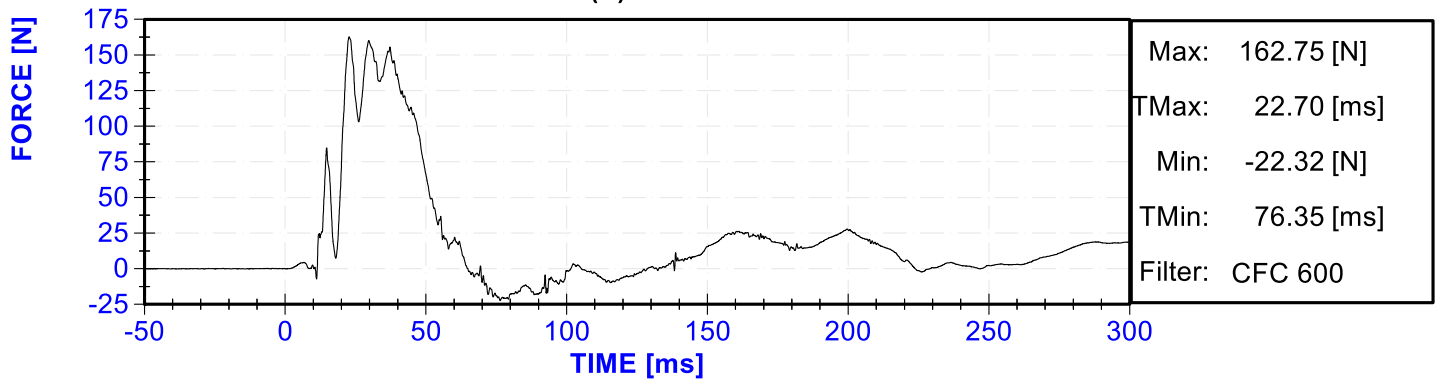
MDB Instrumentation Data

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

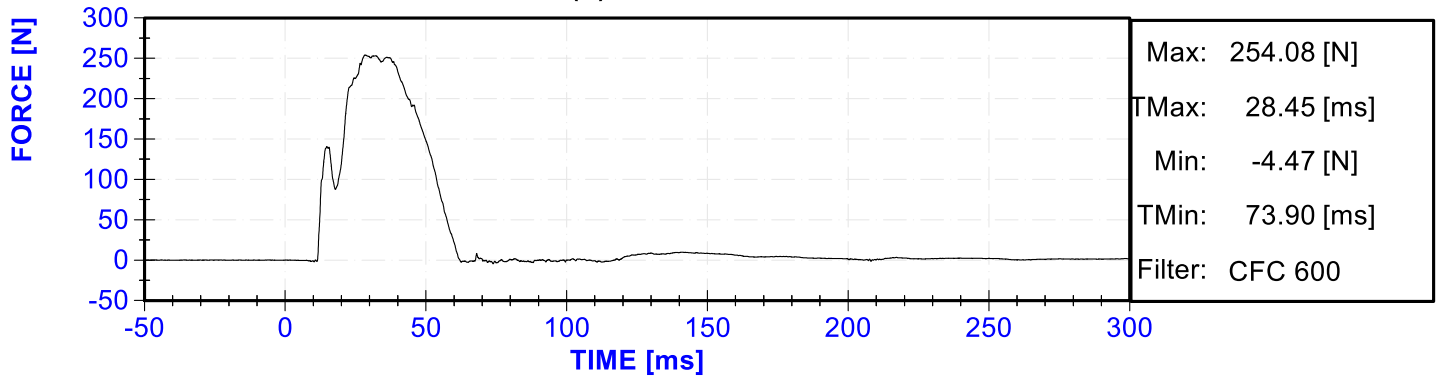




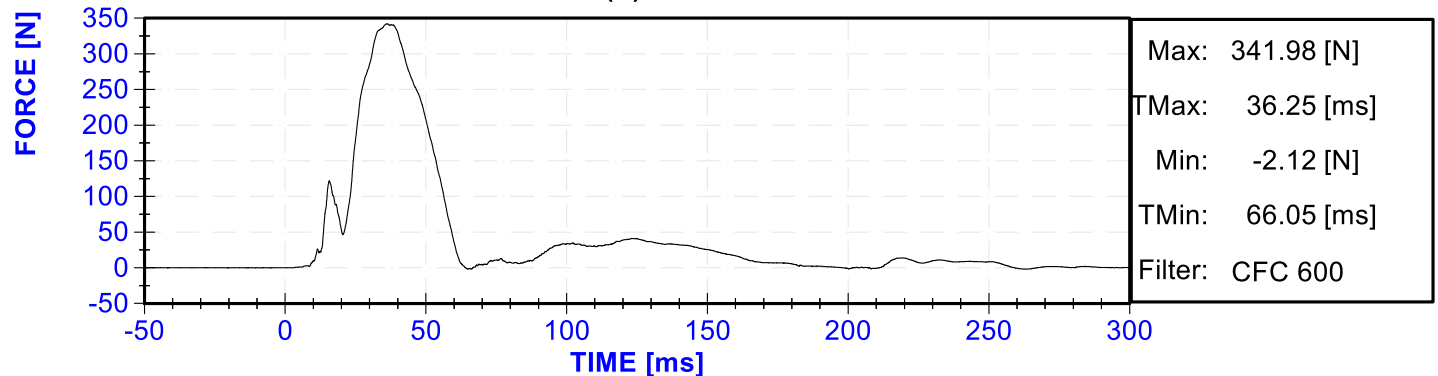
Driver Anterior Abdominal Force (Y) vs. Time



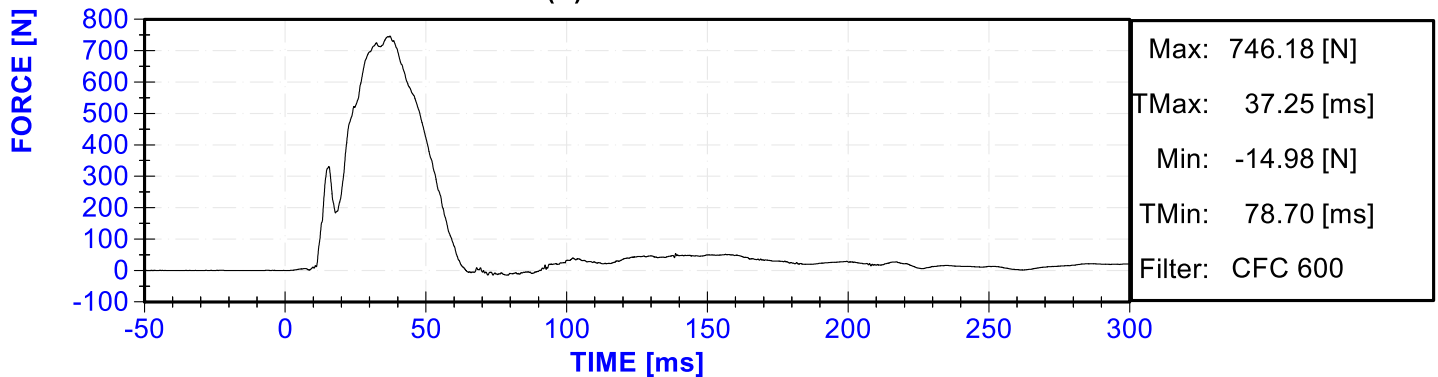
Driver Middle Abdominal Force (Y) vs. Time

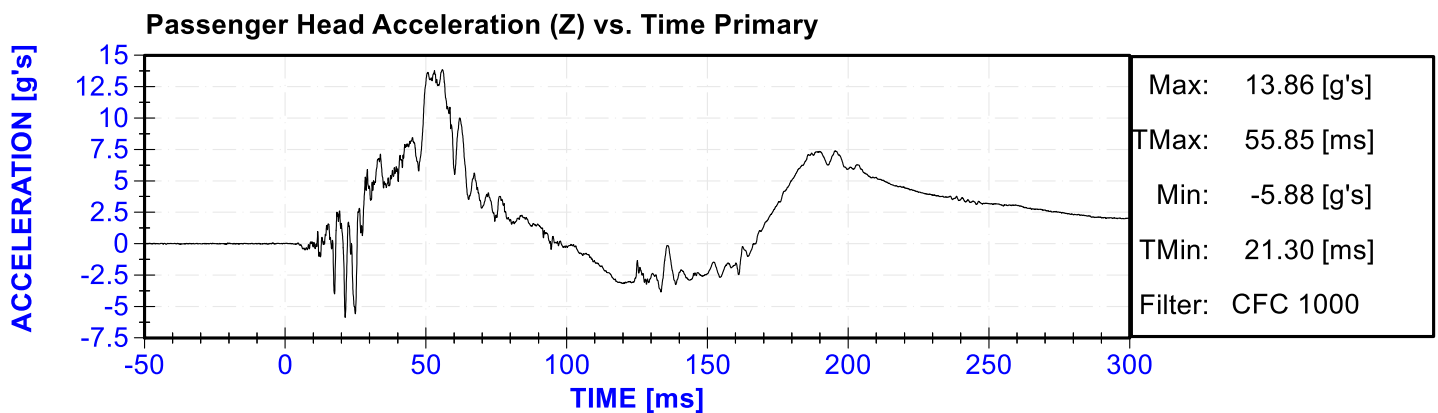
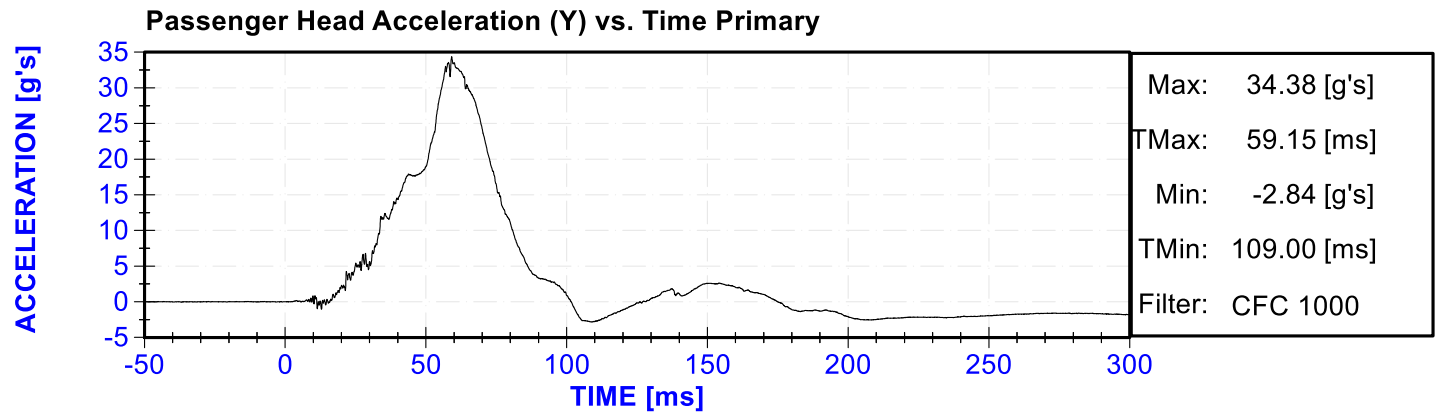
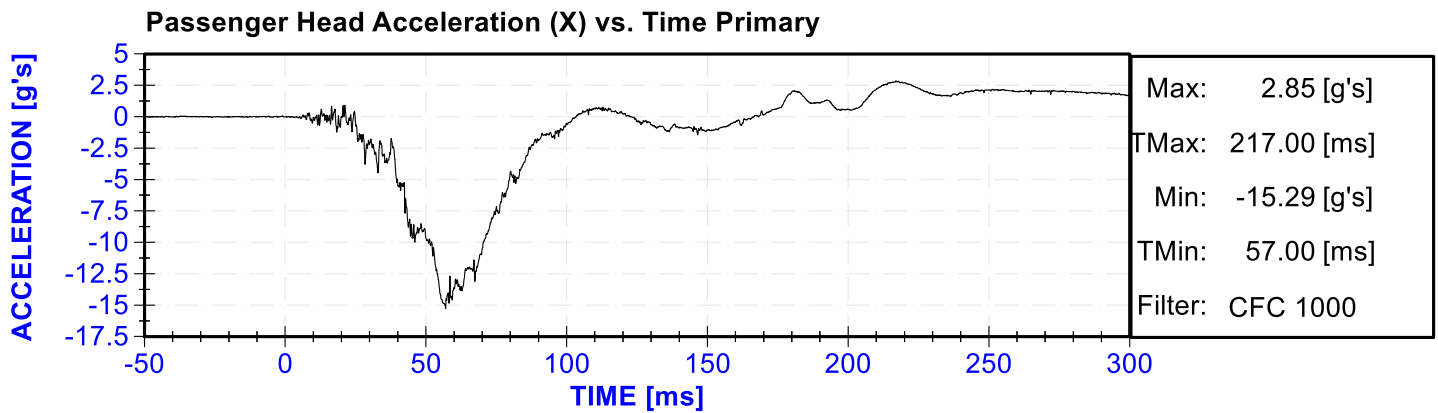
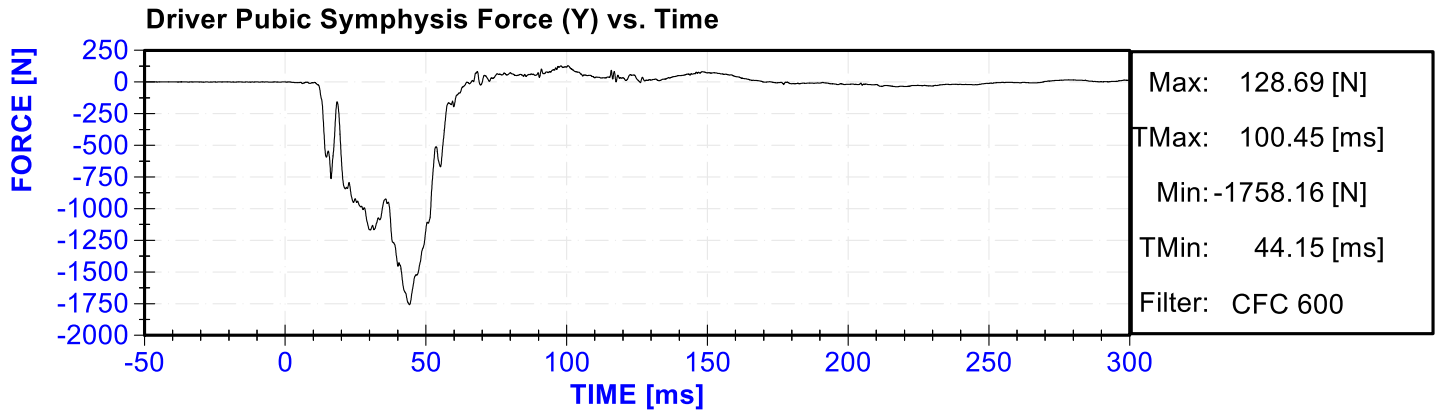


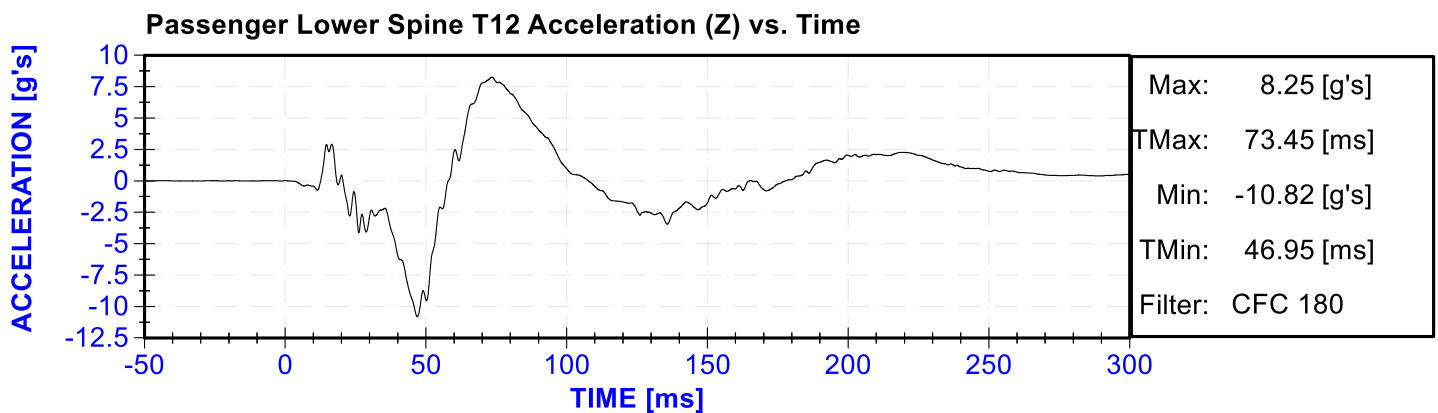
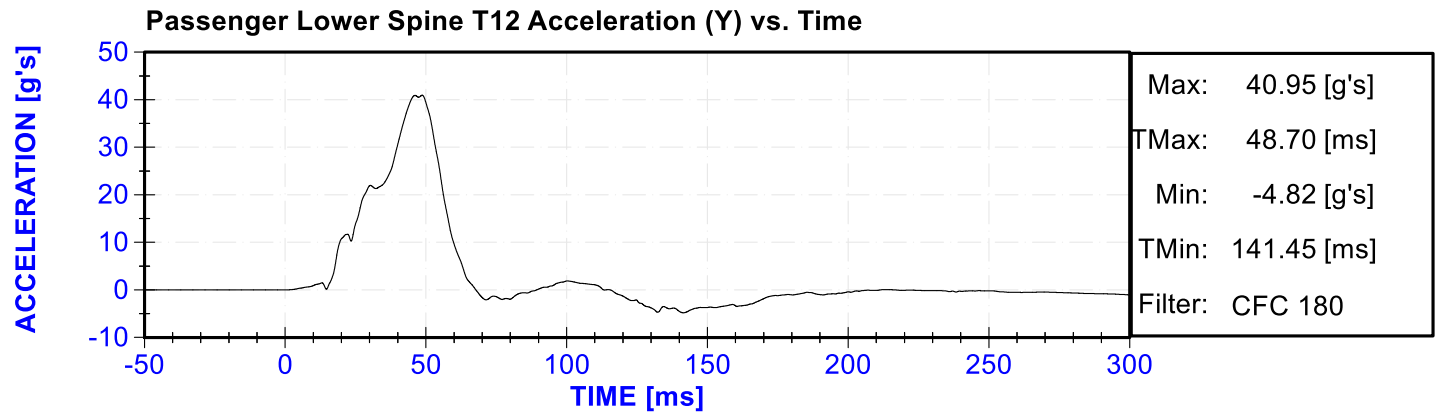
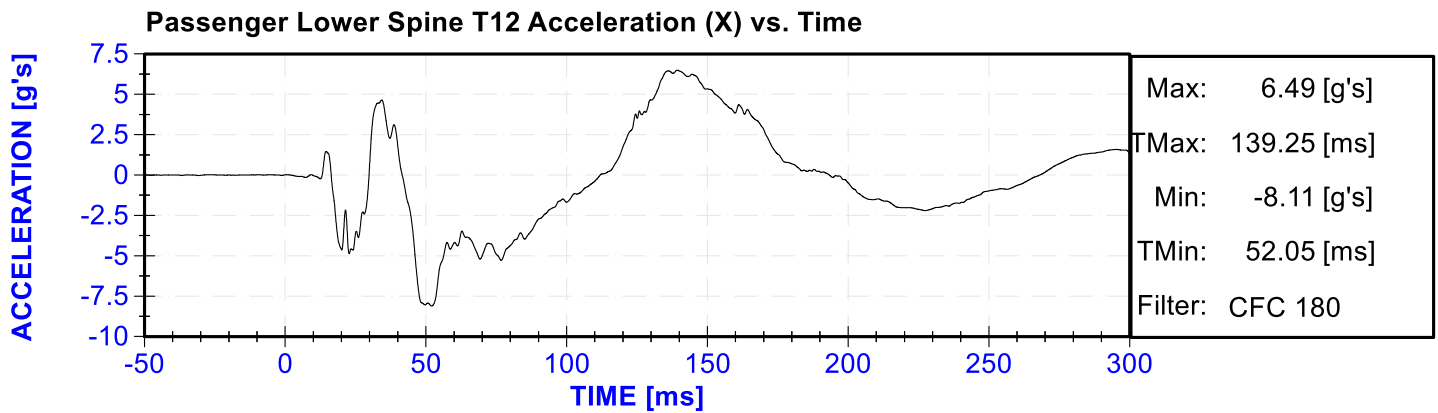
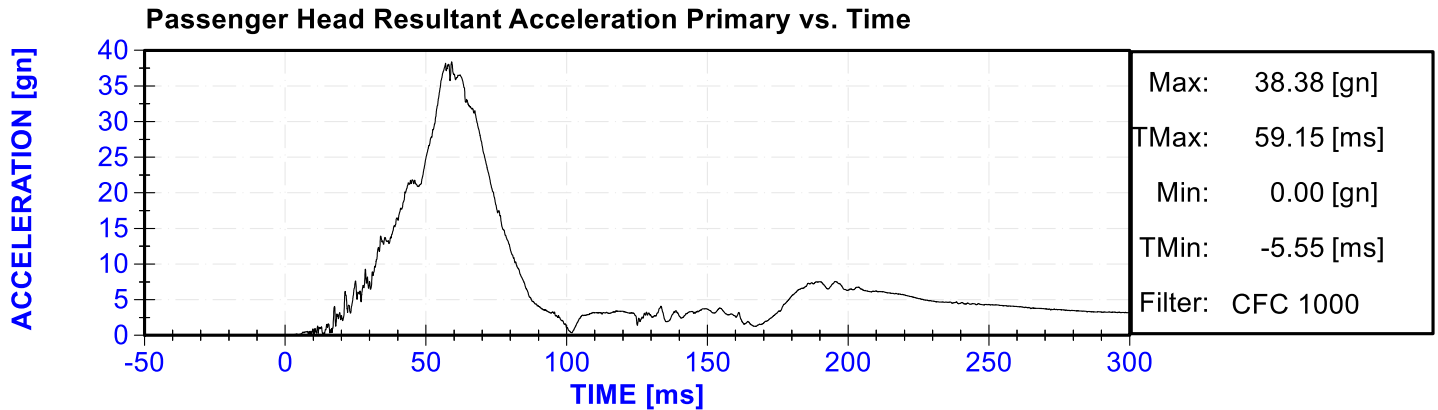
Driver Posterior Abdominal Force (Y) vs. Time

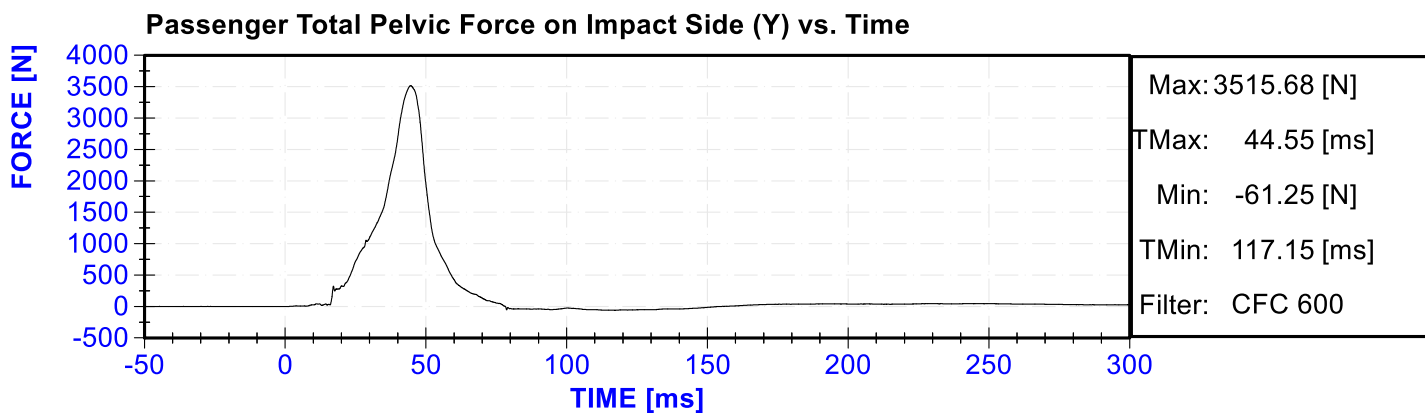
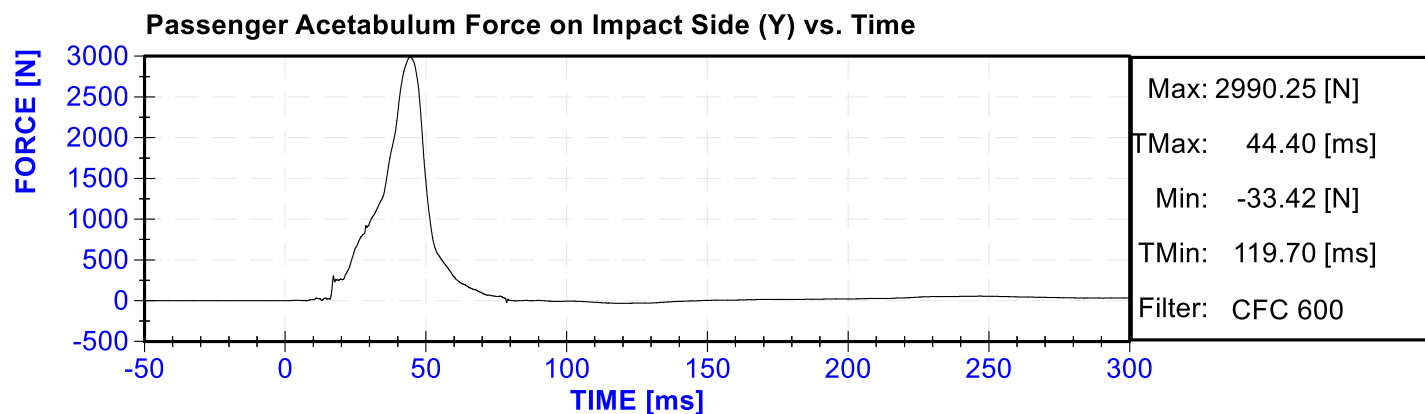
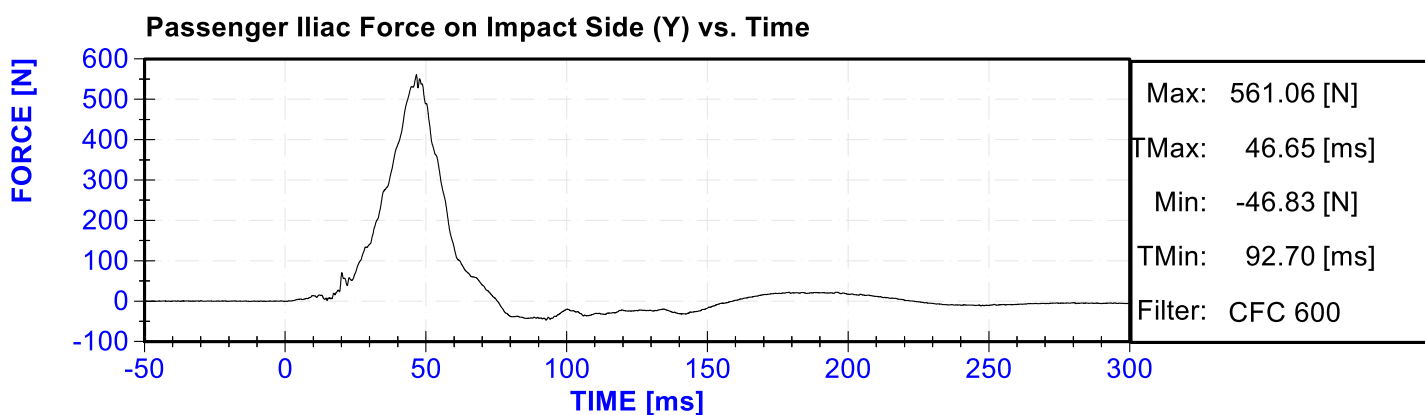
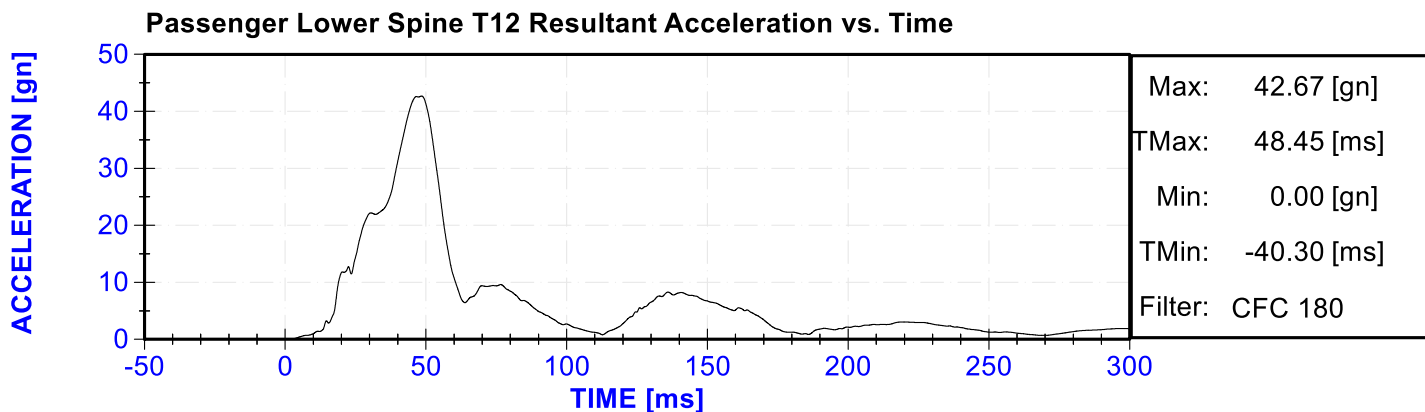


Driver Total Abdominal Force (Y) vs. Time









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)

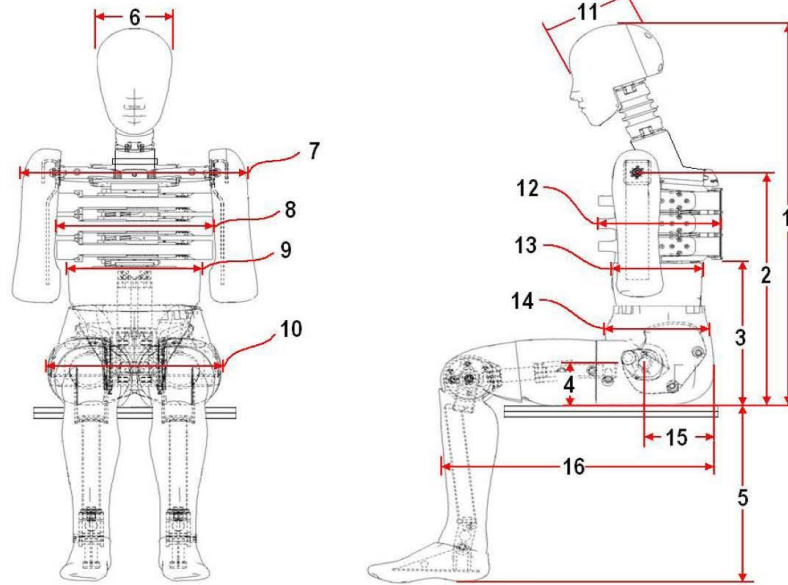


External Measurements - EuroSID-2re

Technician: K. Dutton

Date: 03/26/2020

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	421	Pass
6	Head Width	152	158	154	Pass
7	Shoulder/Arm Width	461	479	473	Pass
8	Thorax Width	322	332	330	Pass
9	Abdomen Width	273	287	284	Pass
10	Pelvis Lap Width	359	373	365	Pass
11	Head Depth	196	206	204	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

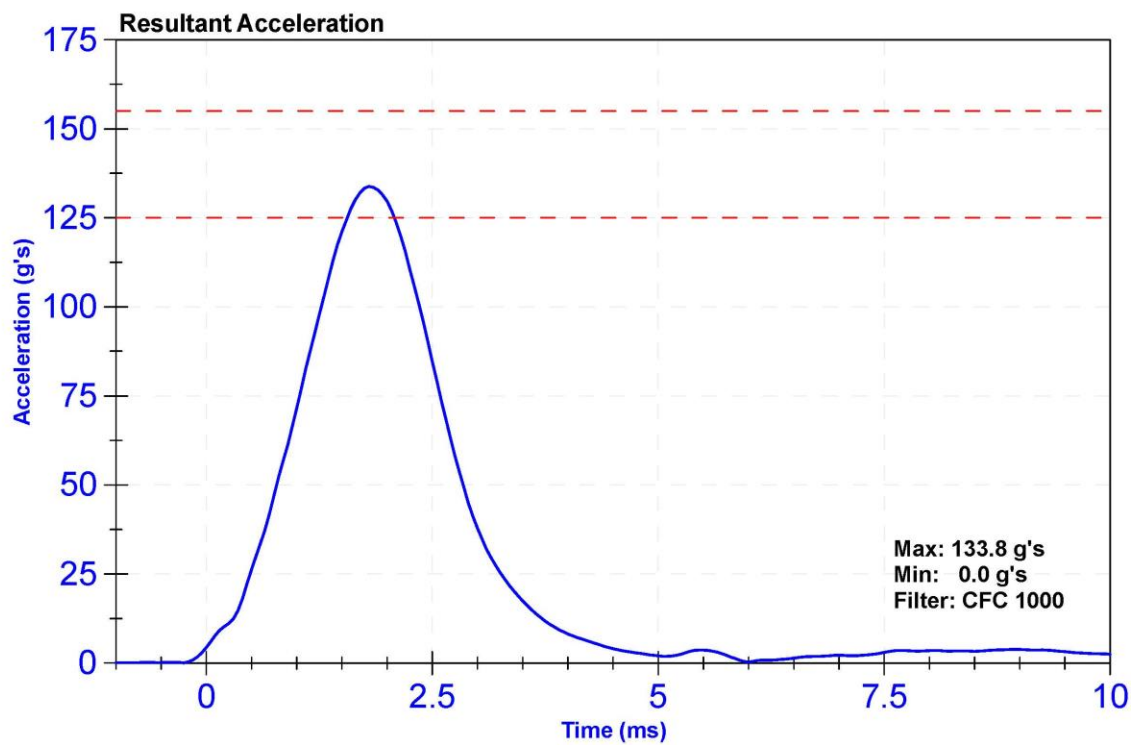
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

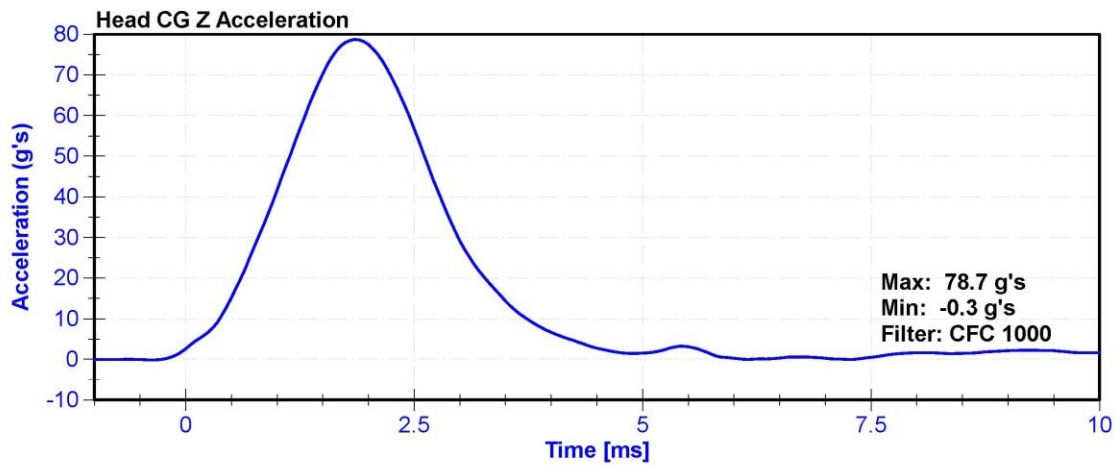
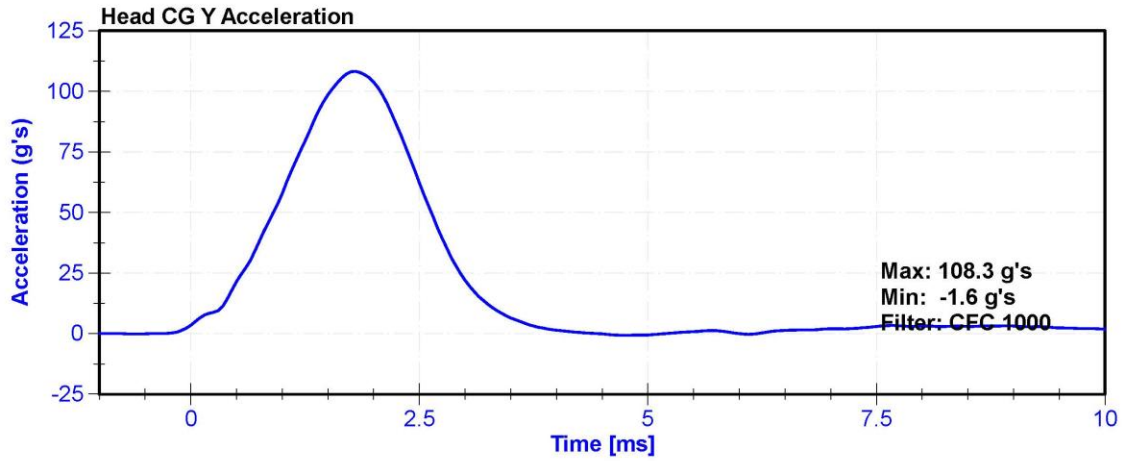
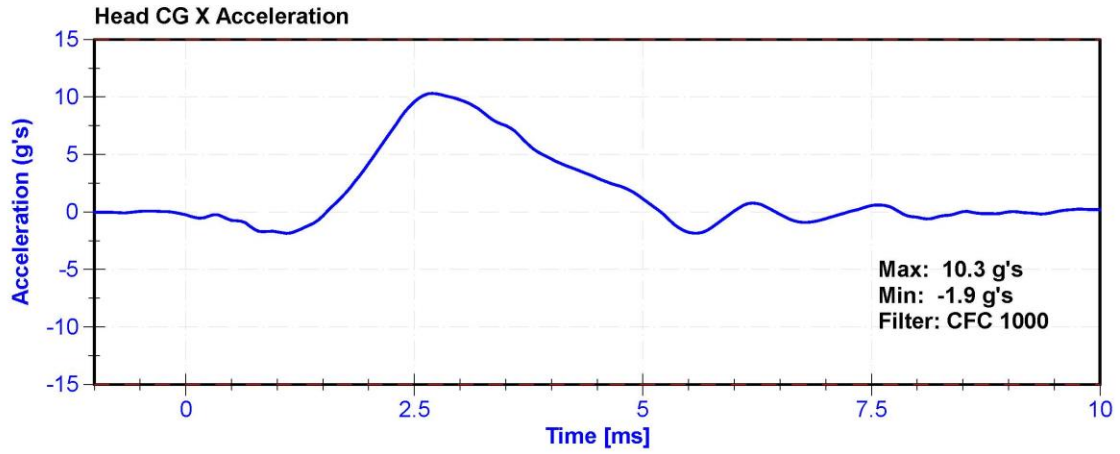
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	33.6	Pass
Resultant Acceleration	125	155	g's	133.8	Pass
Oscillation	0	15	%	4.09	Pass
Fore-Aft Acceleration	-15	15	g's	10.3	Pass

Transducer Calibrations

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





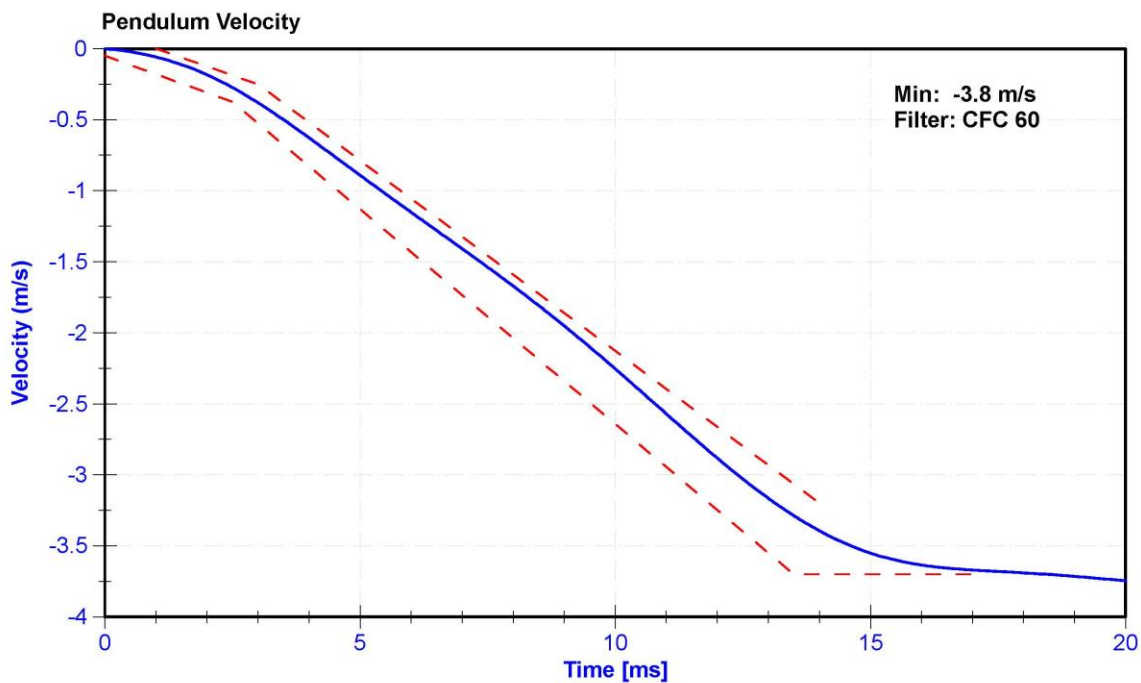
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

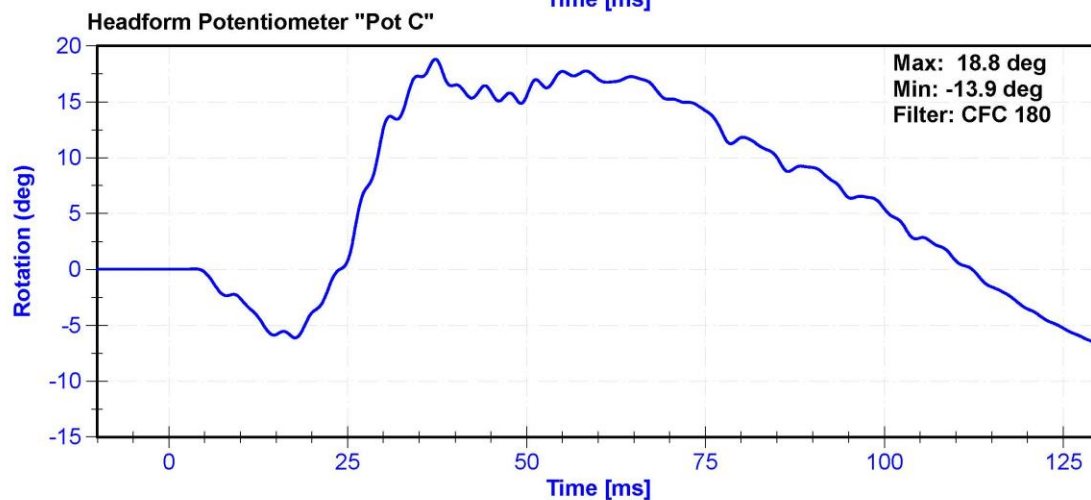
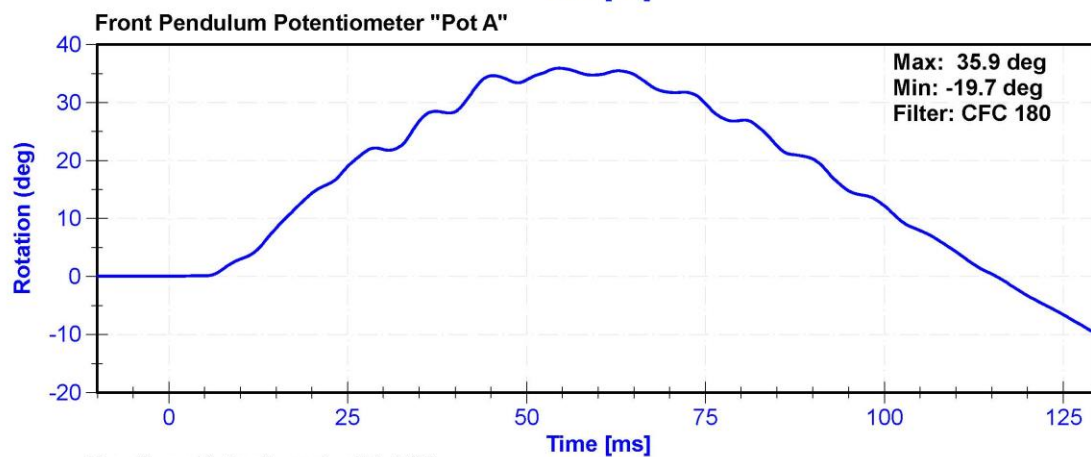
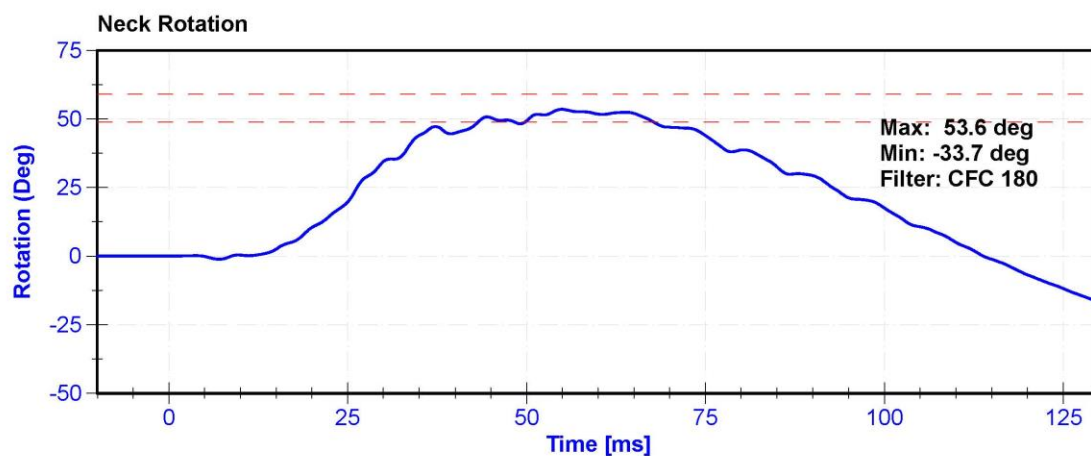
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	33.2	Pass
Velocity	3.3	3.5	m/s	3.42	Pass
Lateral Neck Rotation	49	59	deg	53.6	Pass
Time at Maximum Rotation	54	66	ms	54.9	Pass
Time of Rotation Decay from Maximum	53	88	ms	59.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231C	AC-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





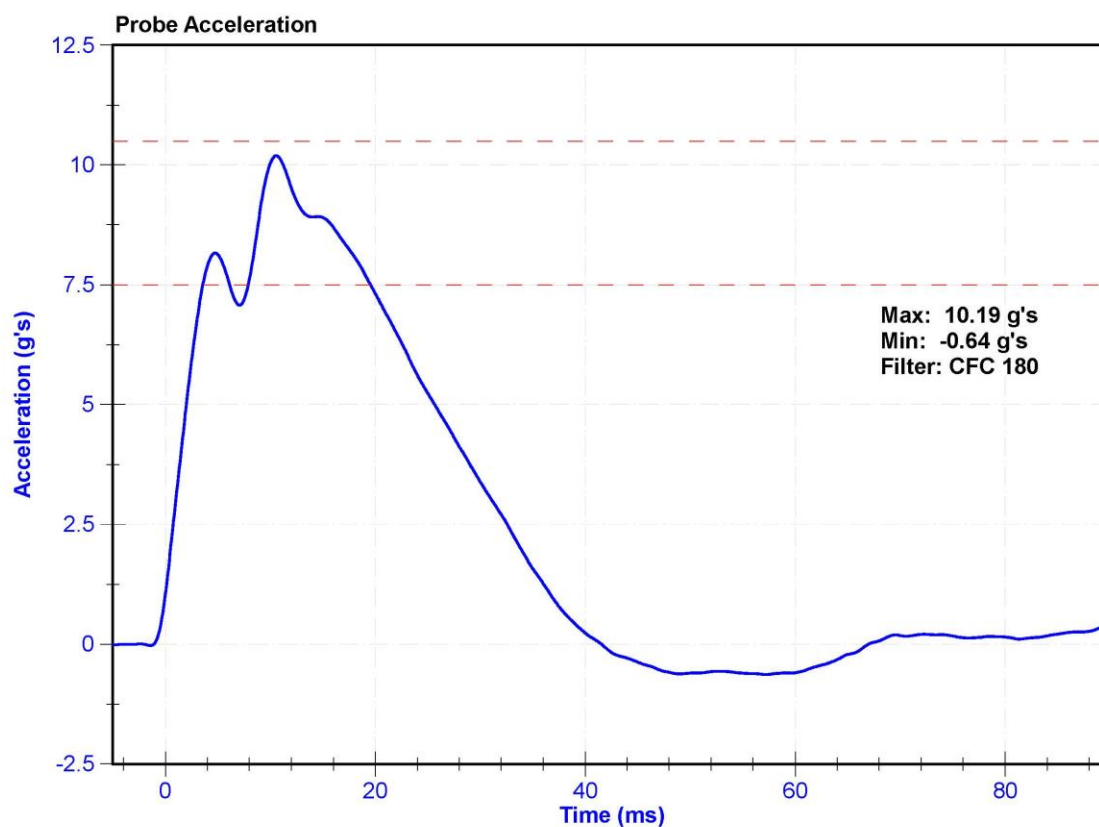
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	37.0	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	7.5	10.5	g's	10.19	Pass

Transducer Calibrations

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



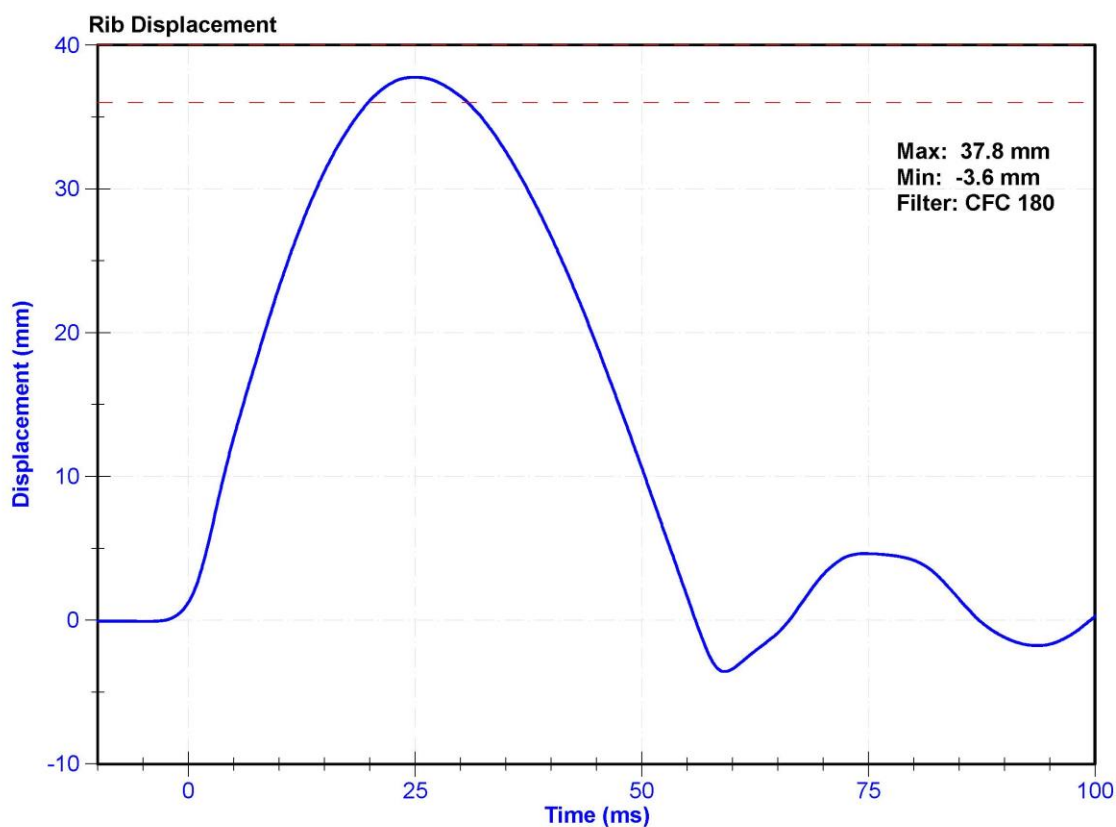
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	32.5	Pass
Rib Displacement	36	40	mm	37.8	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



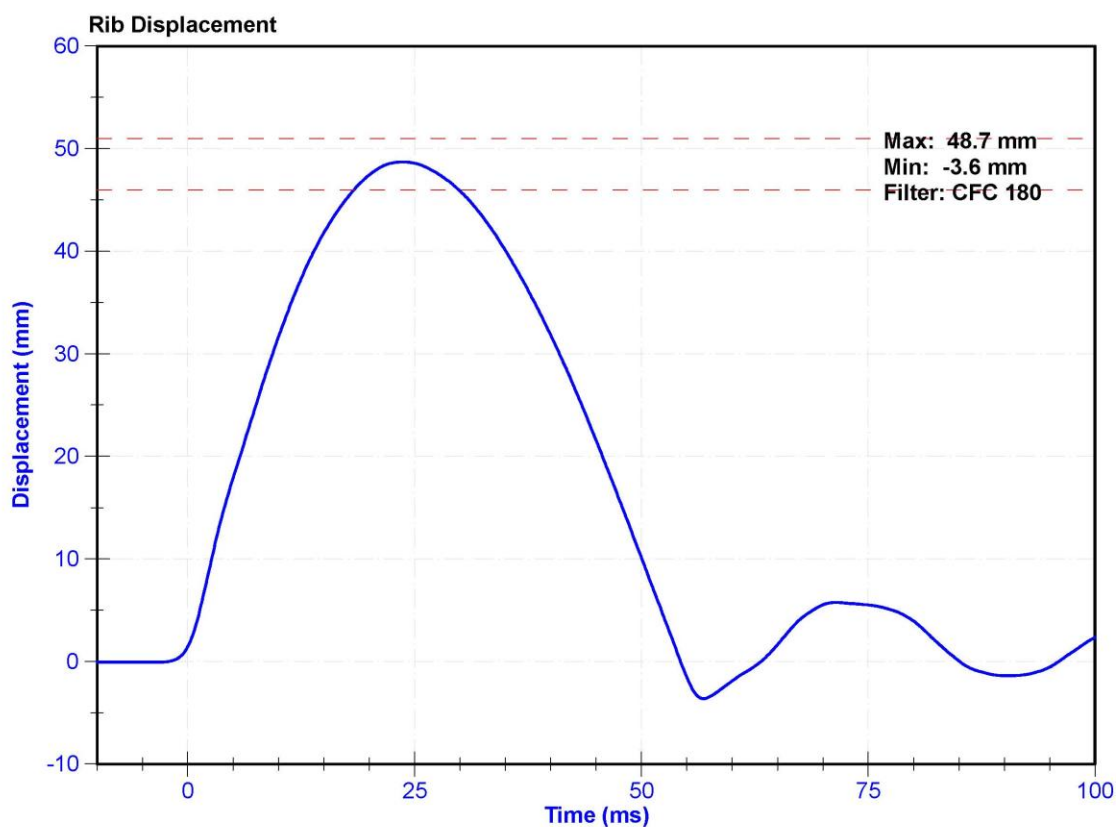
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	32.5	Pass
Rib Displacement	46	51	mm	48.7	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



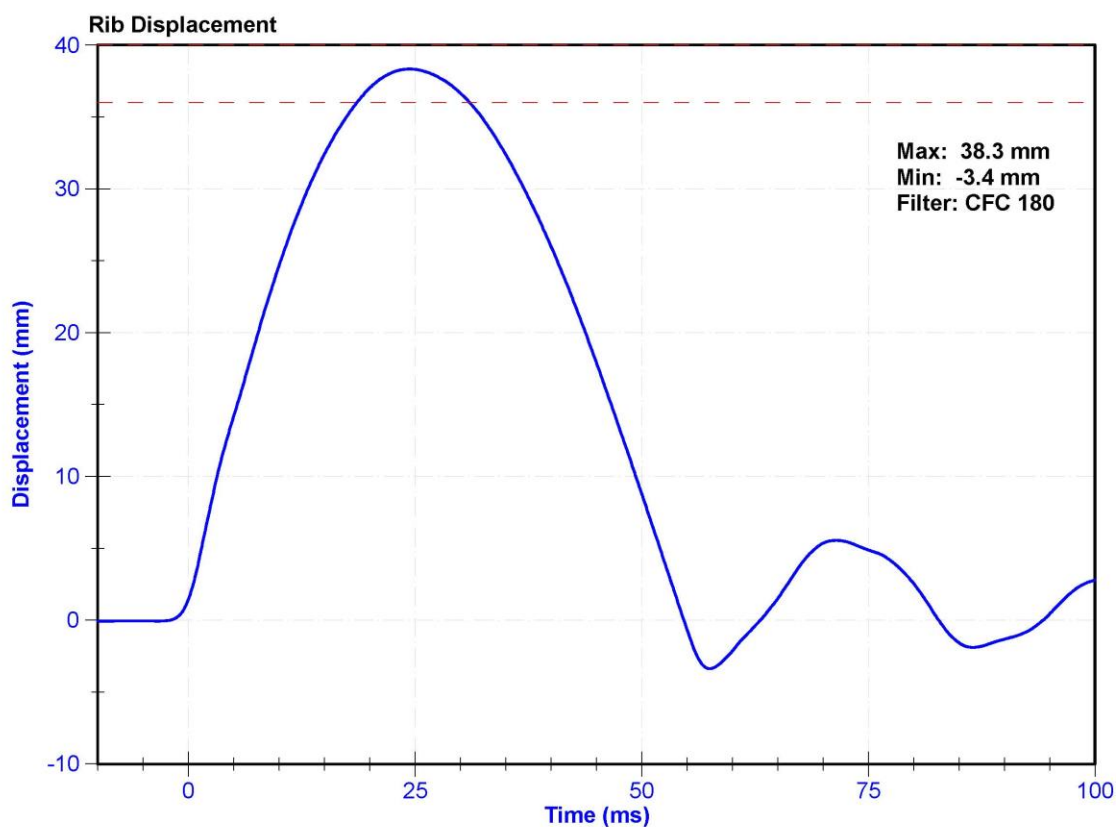
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	32.5	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



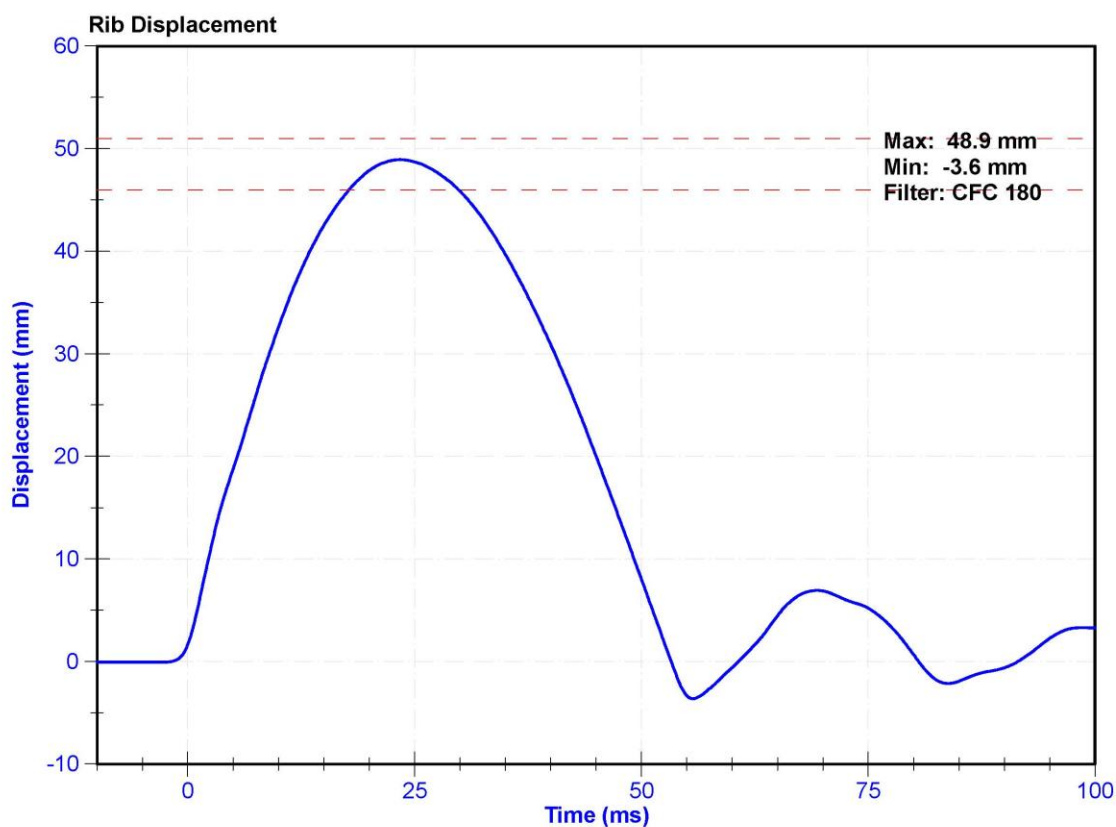
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	32.5	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





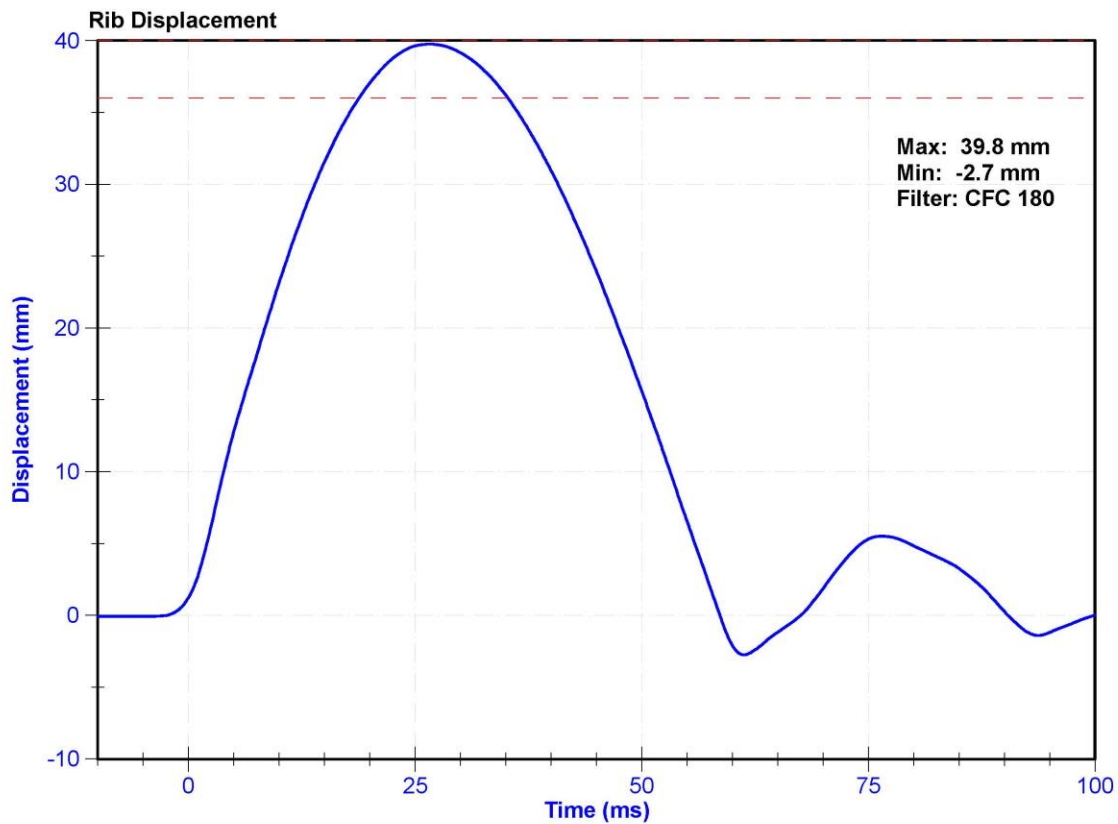
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	32.5	Pass
Rib Displacement	36	40	mm	39.8	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



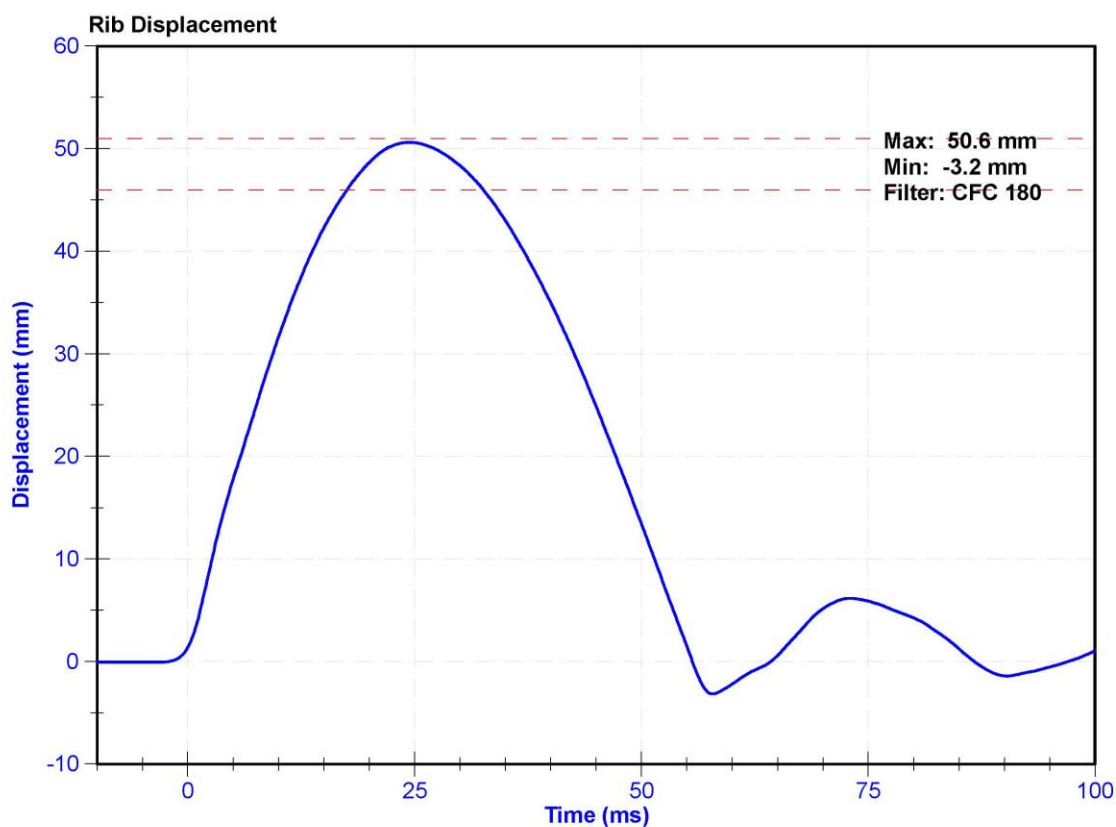
ATD Manufacturer	FTSS	Test Technician	M. Dudek
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	32.5	Pass
Rib Displacement	46	51	mm	50.6	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



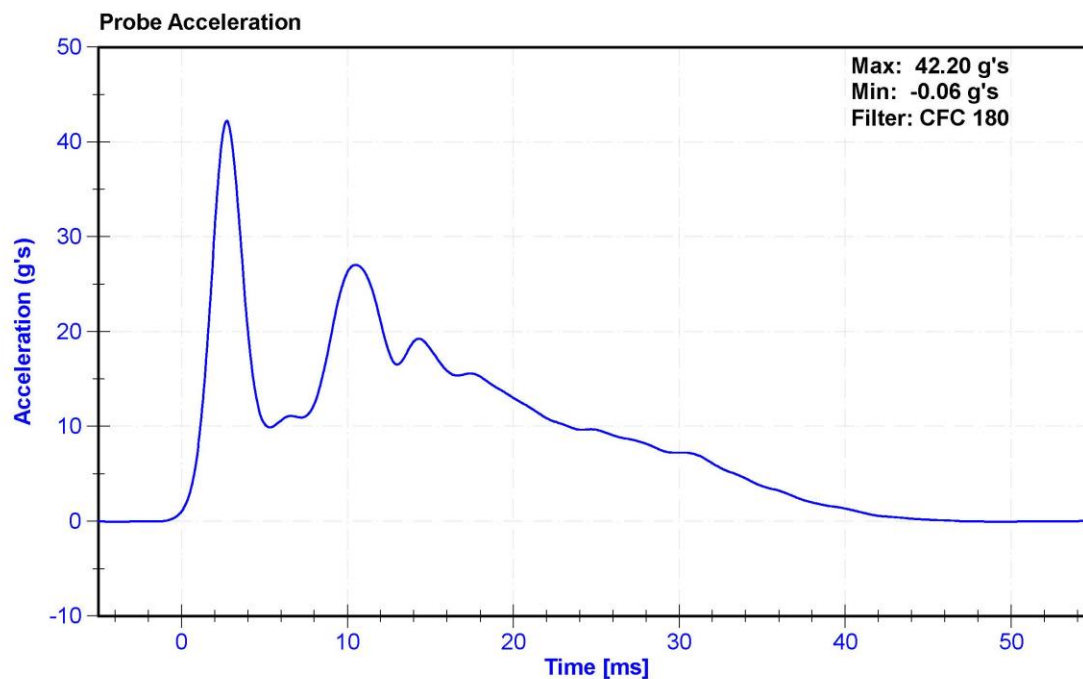
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

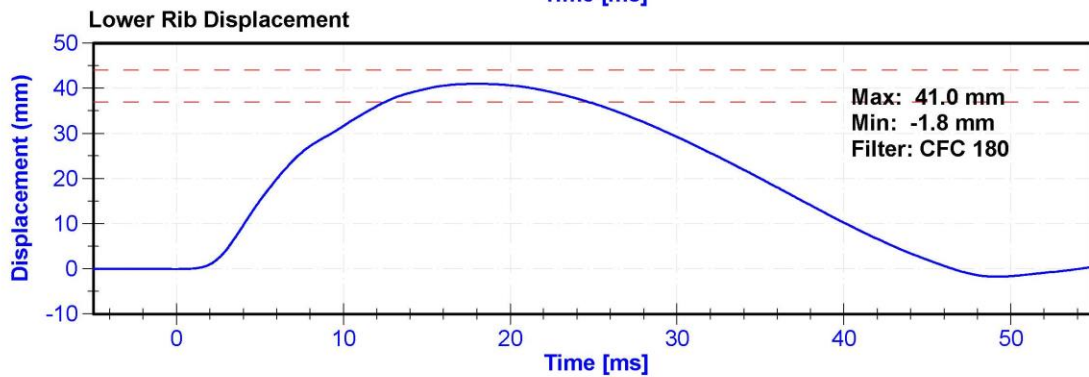
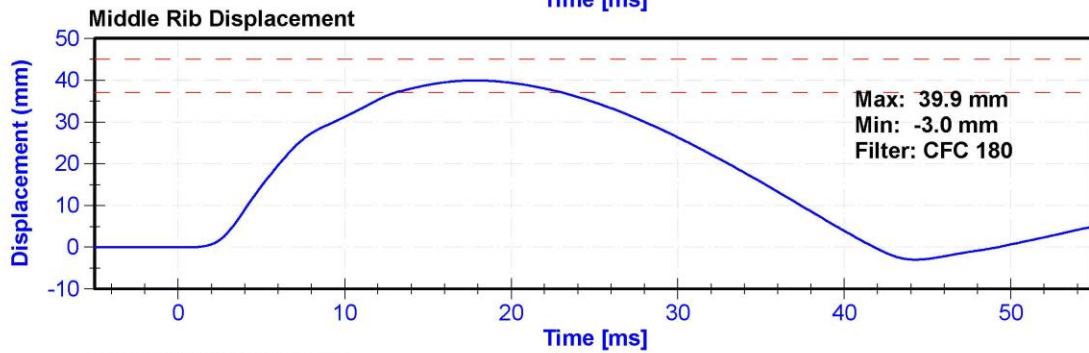
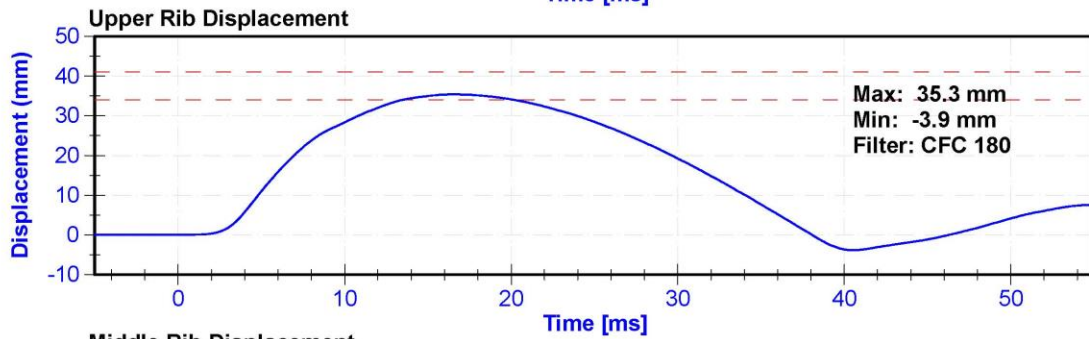
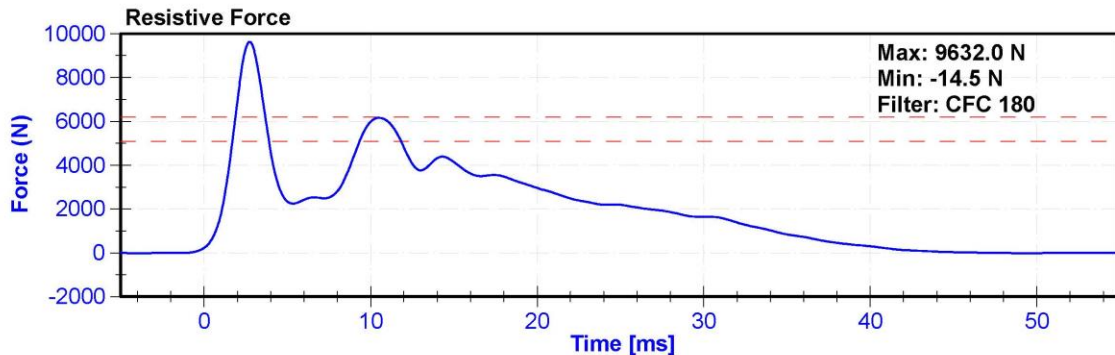
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	32.0	Pass
Velocity	5.4	5.6	m/s	5.44	Pass
Resistive Force after 6ms	5100	6200	N	6169.1	Pass
Upper Thorax Rib Deflection	34	41	mm	35.3	Pass
Mid Thorax Rib Deflection	37	45	mm	39.9	Pass
Lower Thorax Rib Deflection	37	44	mm	41.0	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





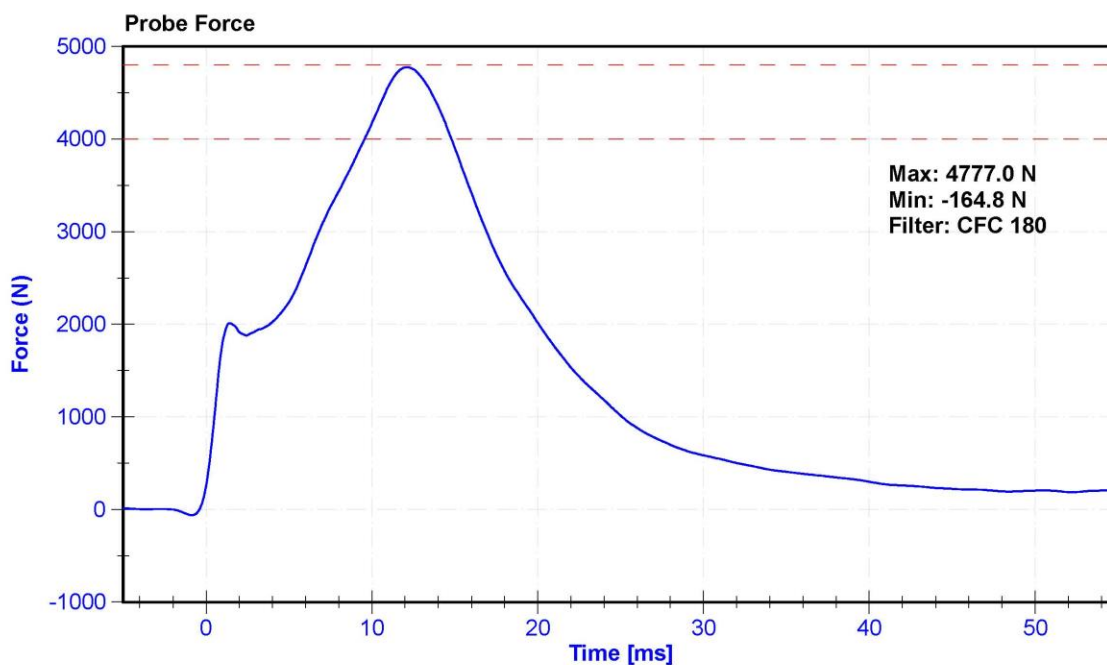
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

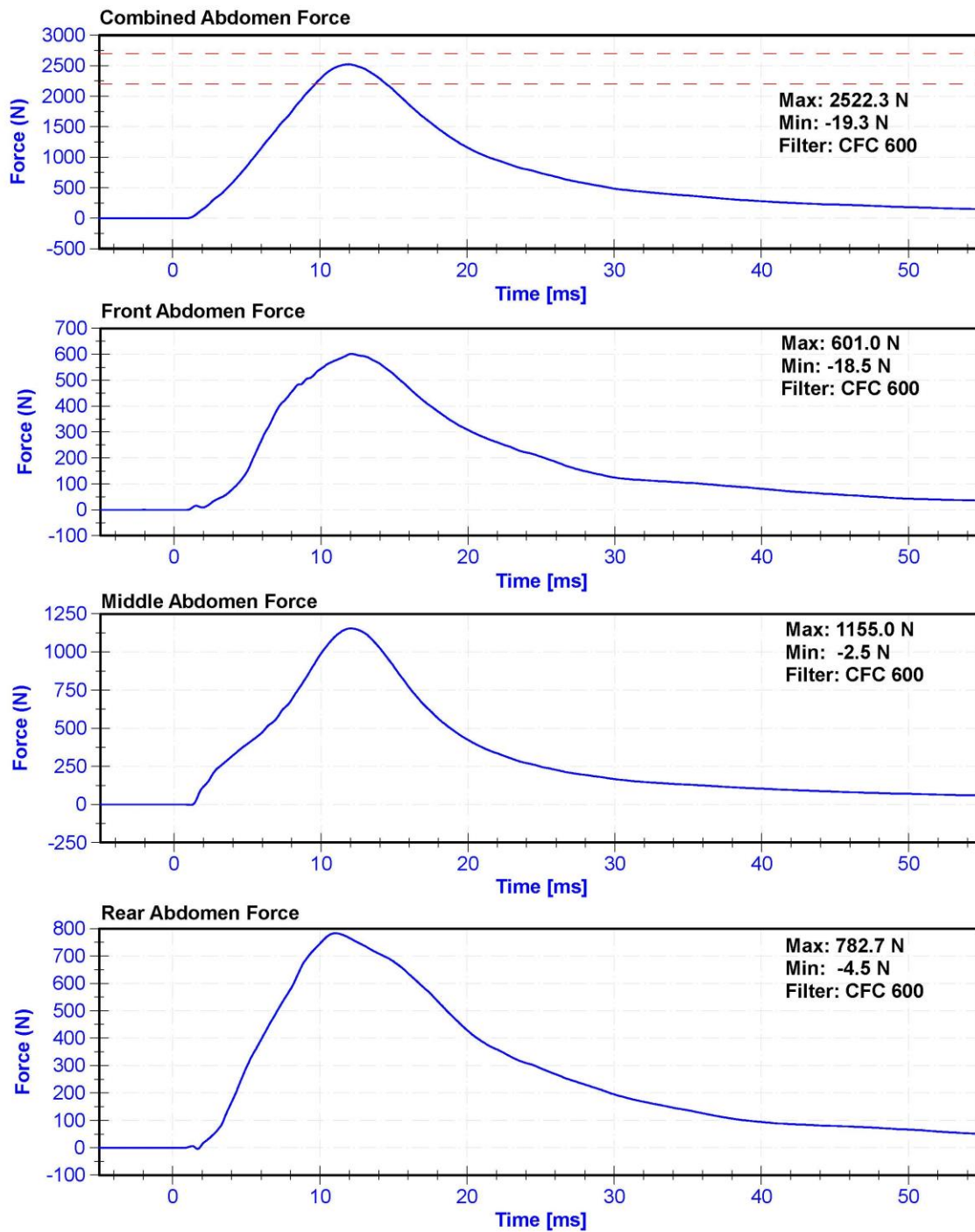
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	35	Pass
Velocity	3.9	4.1	m/s	4.09	Pass
Combined Abdomen Force	2200	2700	N	2522.3	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.95	Pass
Resistive Probe Force	4000	4800	N	4777.0	Pass
Time at Peak Resistive Force	10.6	13.0	ms	12.10	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







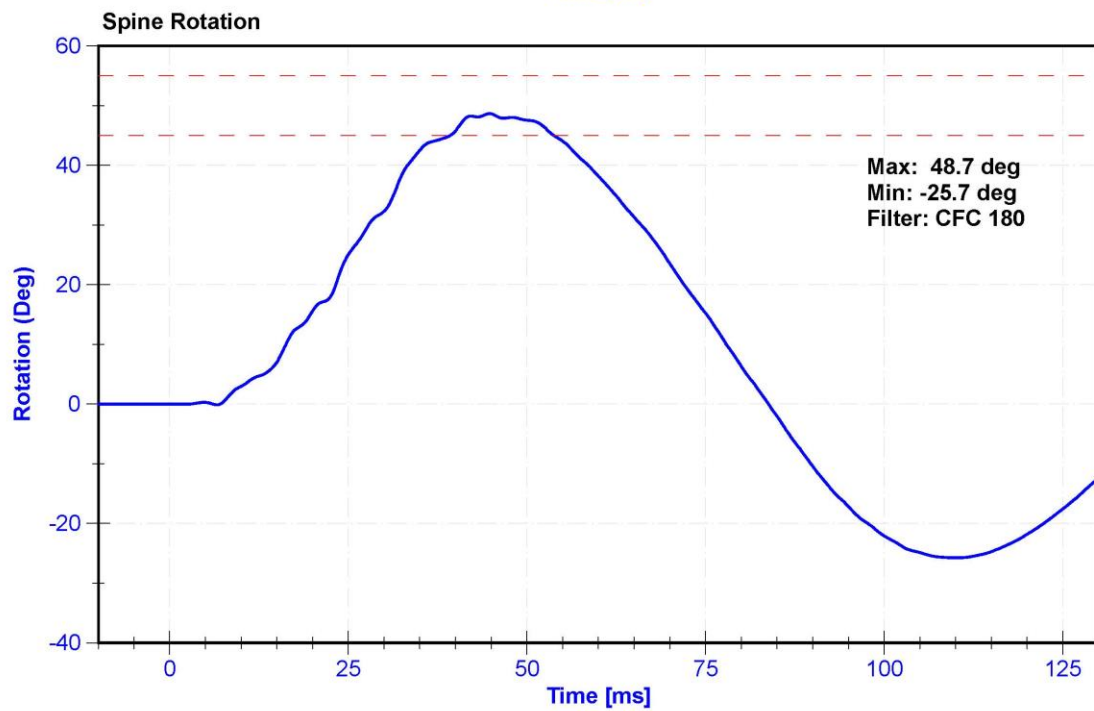
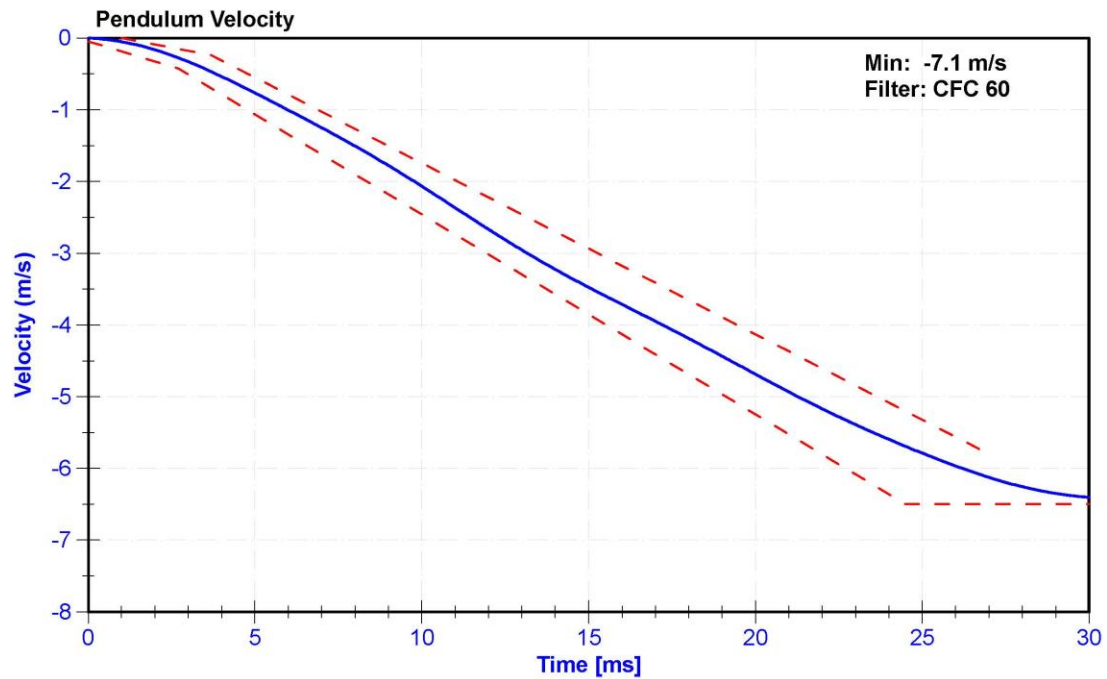
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

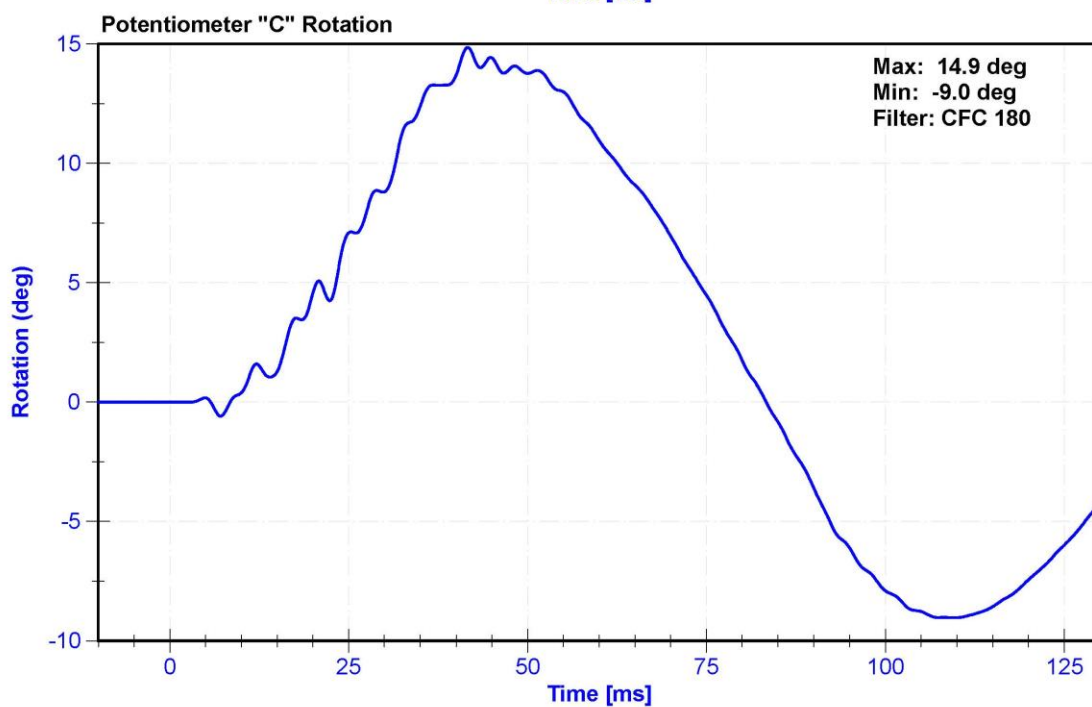
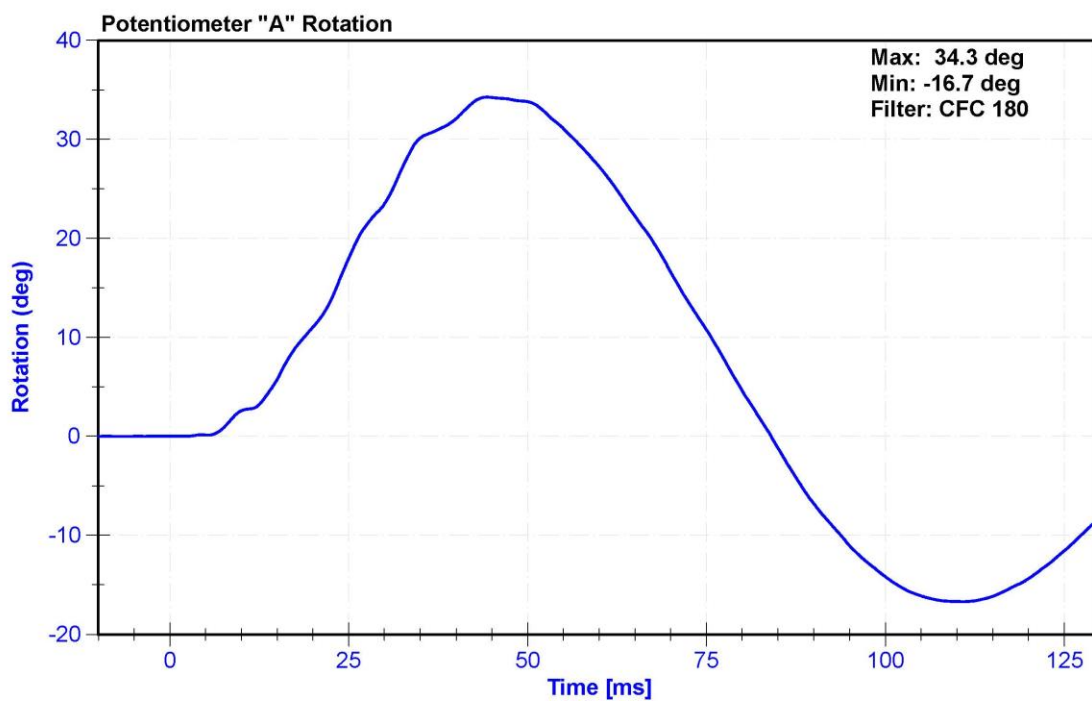
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	33.7	Pass
Velocity	5.95	6.15	m/s	6.088	Pass
Lateral Spine Rotation	45	55	deg	48.7	Pass
Time at Maximum Rotation	39	53	ms	44.8	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-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





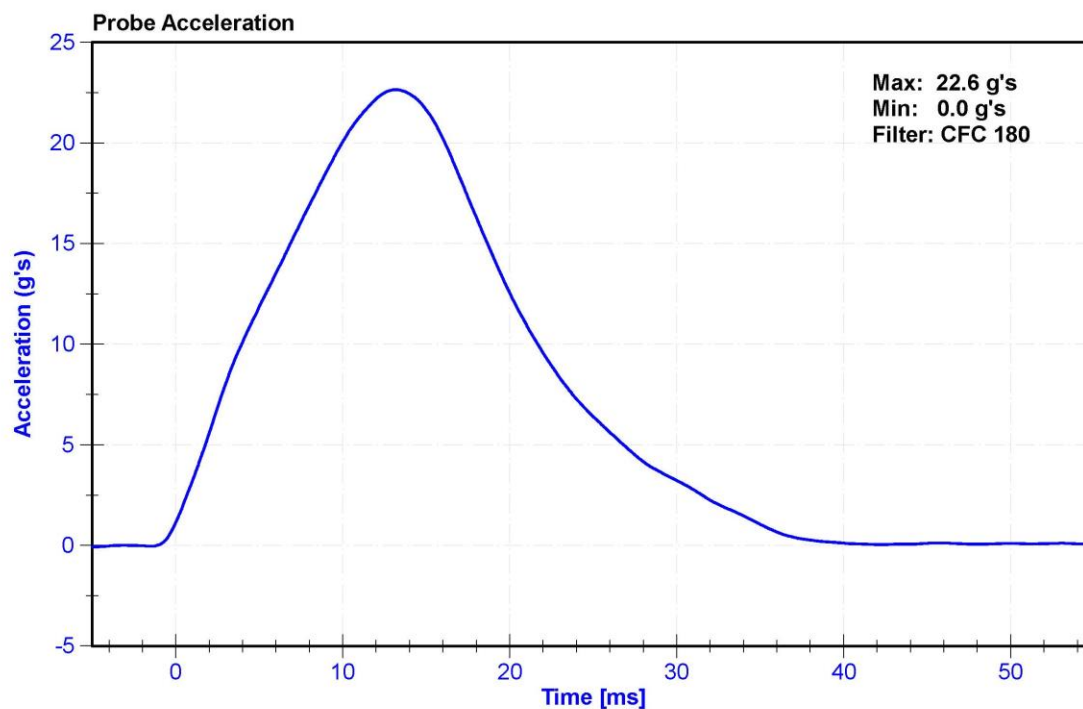
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

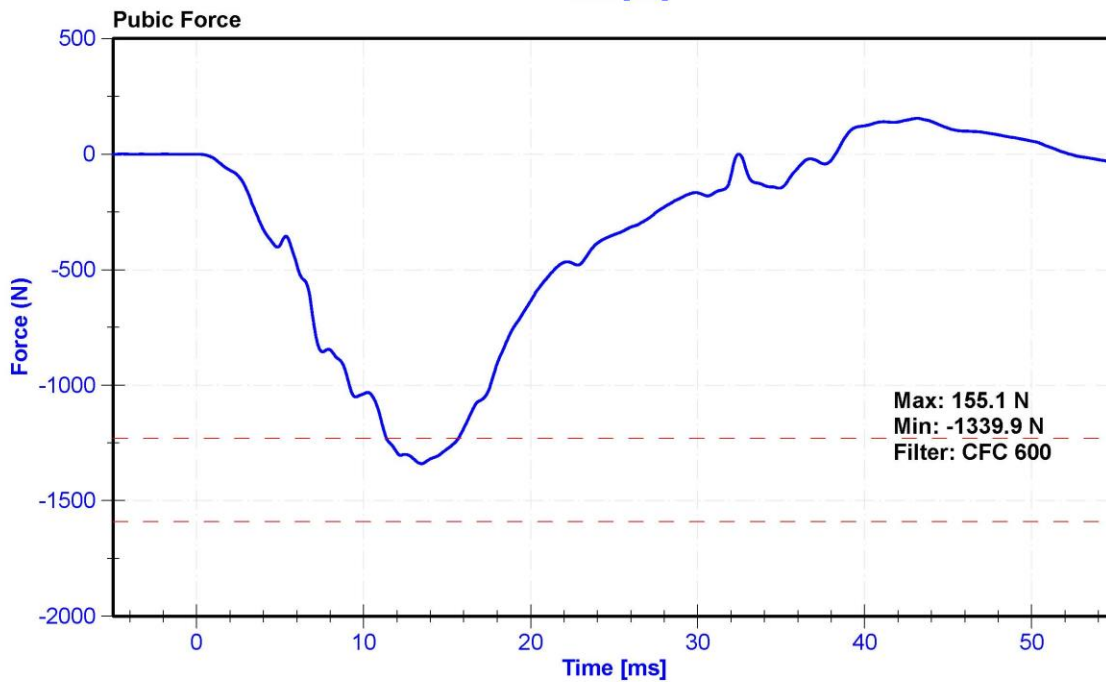
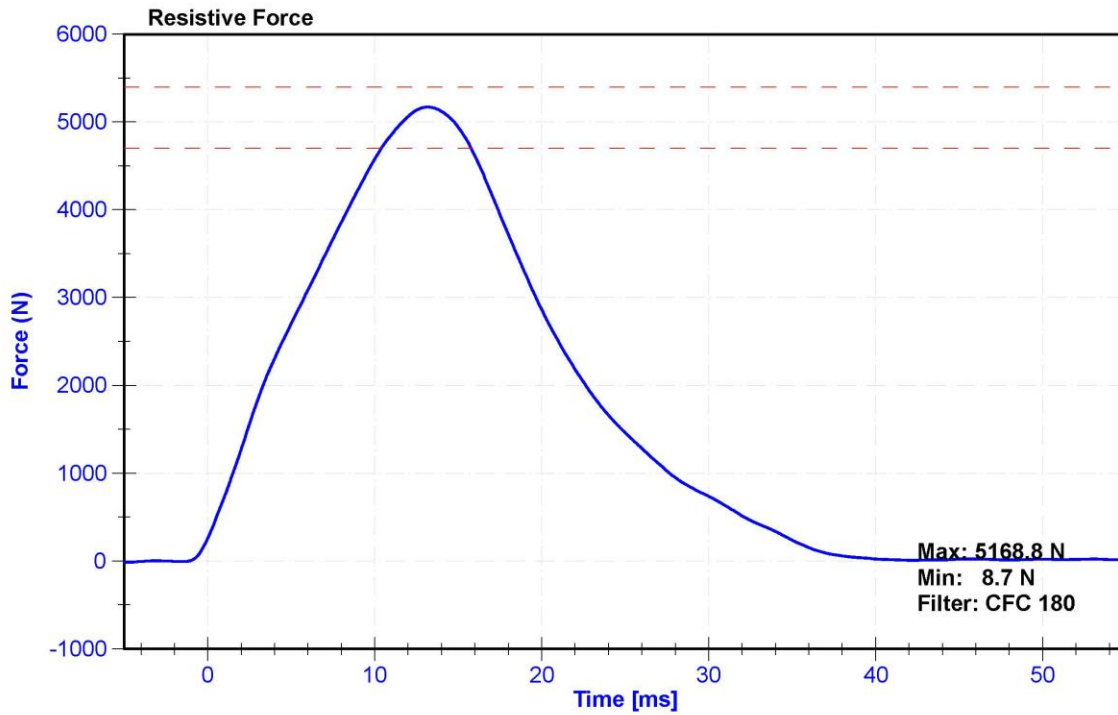
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	37.0	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Resistive Force	4700	5400	N	5168.8	Pass
Time at Peak Resistive Force	11.8	16.1	ms	13.15	Pass
Pubic Force	-1590	-1230	N	-1339.9	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.45	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	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)

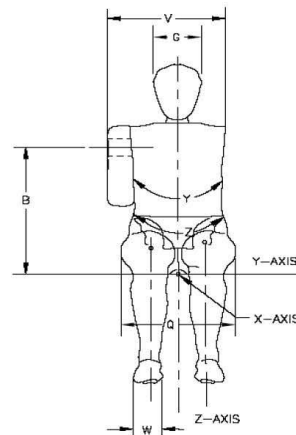
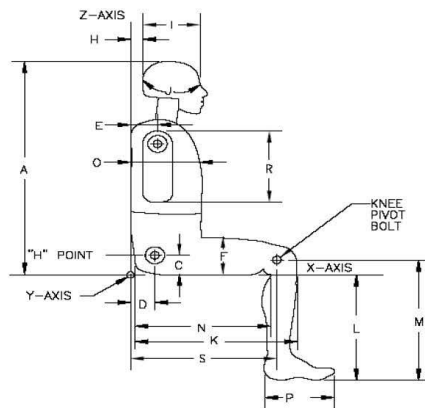


External Measurements - SID-IIs

Technician: **K. Dutton**

Date: **03/25/2020**

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	102	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	186	Pass
J	Head Circumference	541	551	545	Pass
K	Buttock to Knee Length	514	540	532	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	402	Pass
N	Buttock Popliteal Length	416	442	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

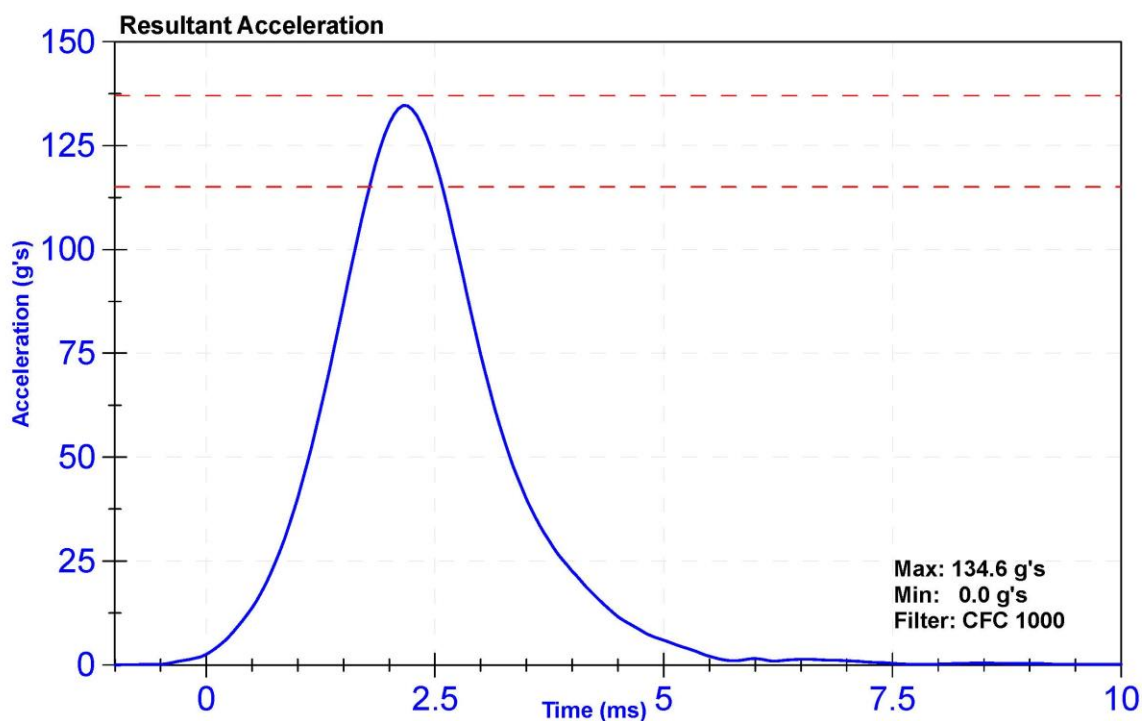
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

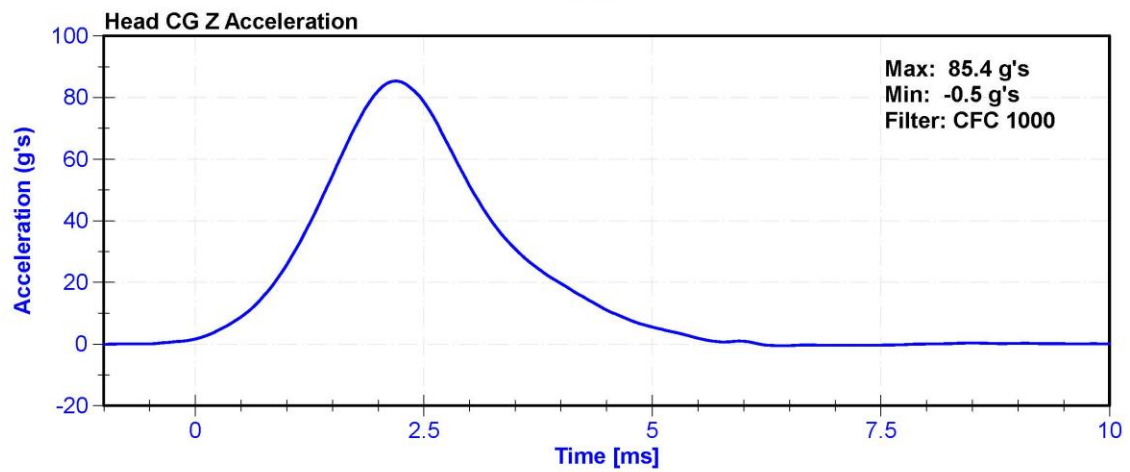
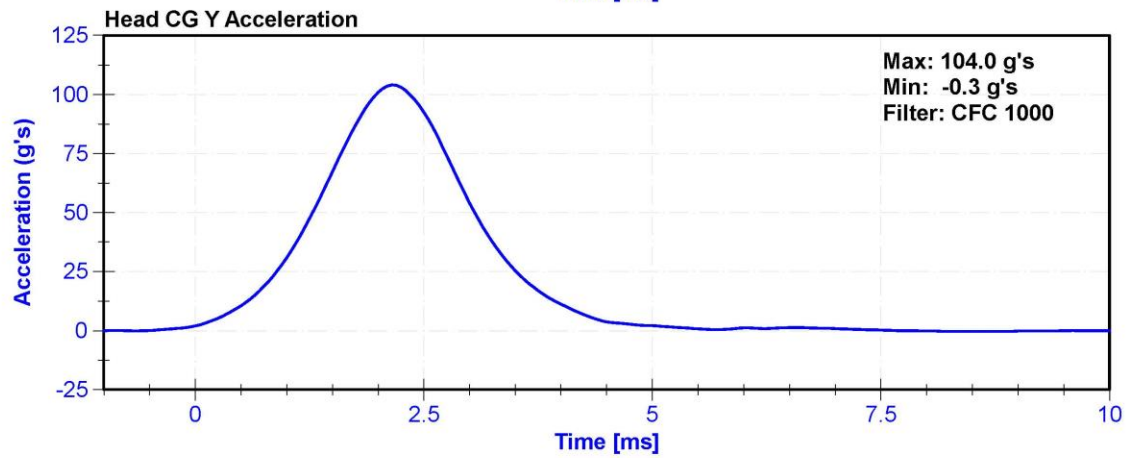
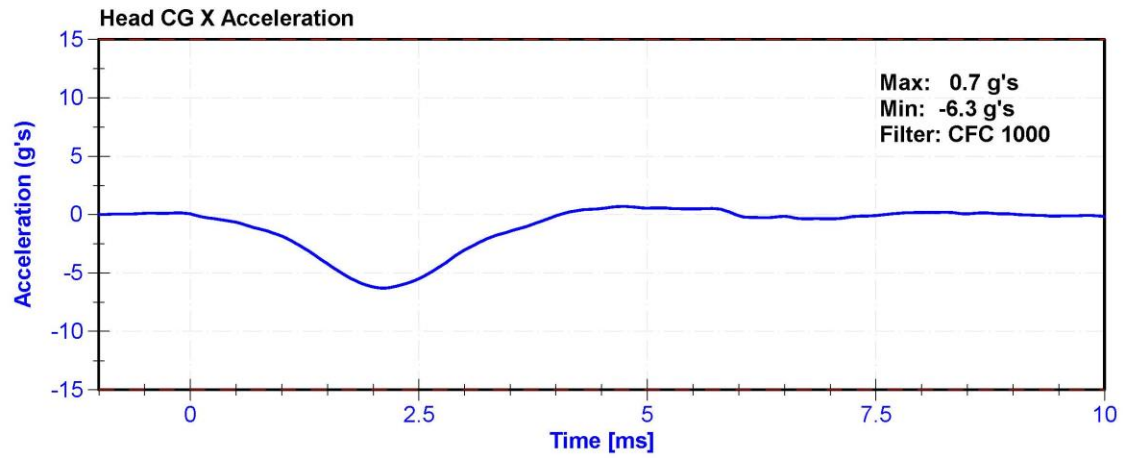
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	38.2	Pass
Resultant Acceleration	115	137	g's	134.6	Pass
Oscillation	0	15	%	1.1	Pass
Fore-Aft Acceleration	-15	15	g's	-6.3	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





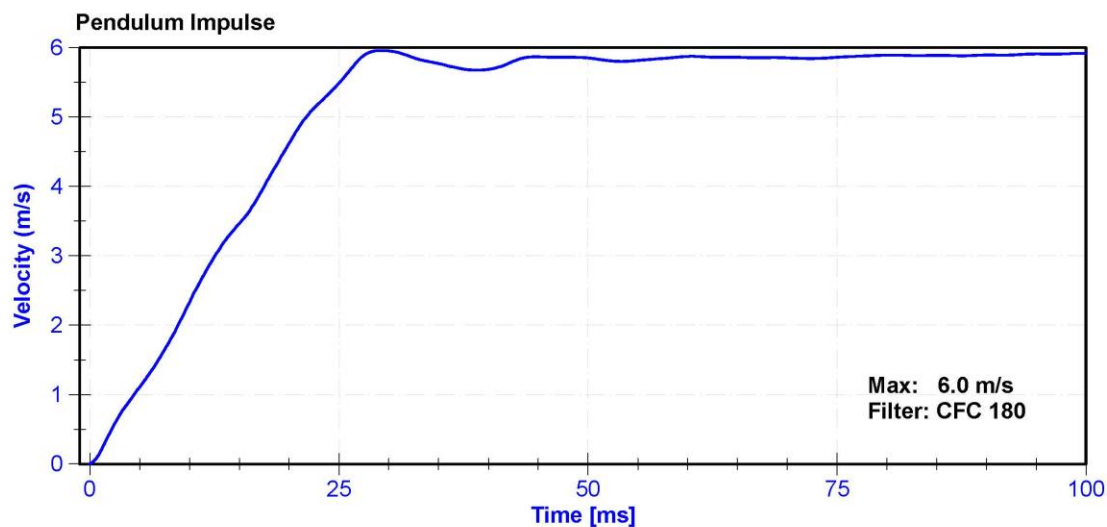
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

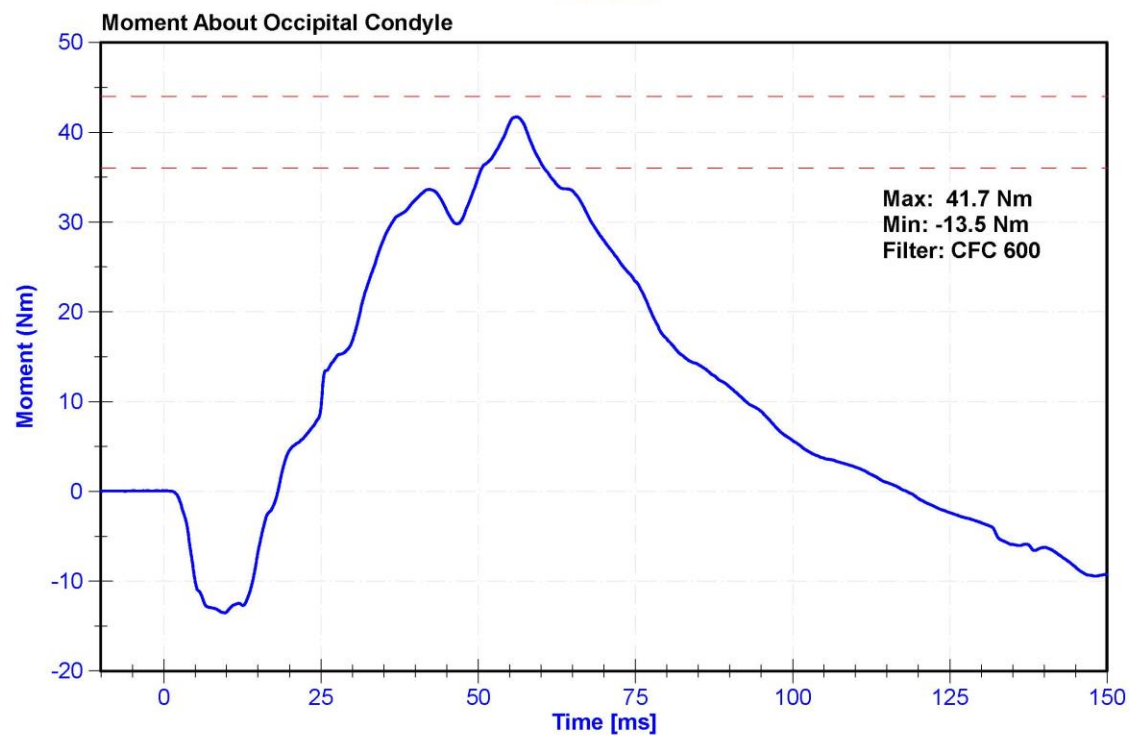
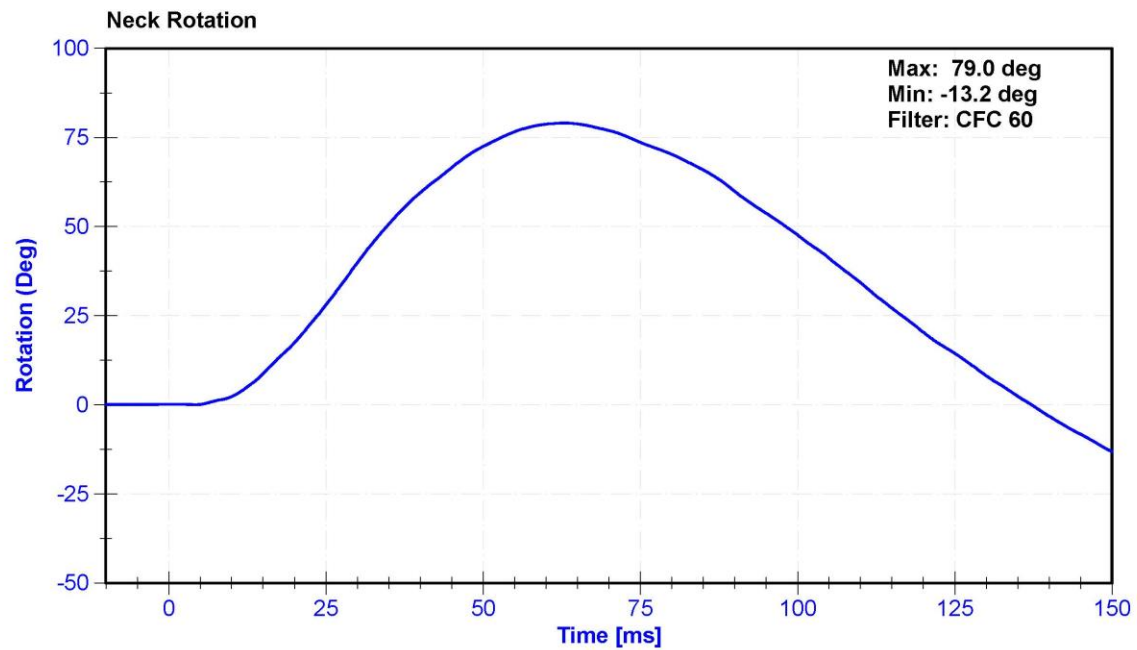
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	32	Pass
Velocity	5.51	5.63	m/s	5.549	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.33	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.46	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.62	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.48	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.95	Pass
Neck Rotation	71	81	deg	79.0	Pass
Time at Maximum Rotation	50	70	ms	63.0	Pass
Moment about the OC	36	44	Nm	41.7	Pass
Moment Decay to 0 Nm	102	126	ms	118.2	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





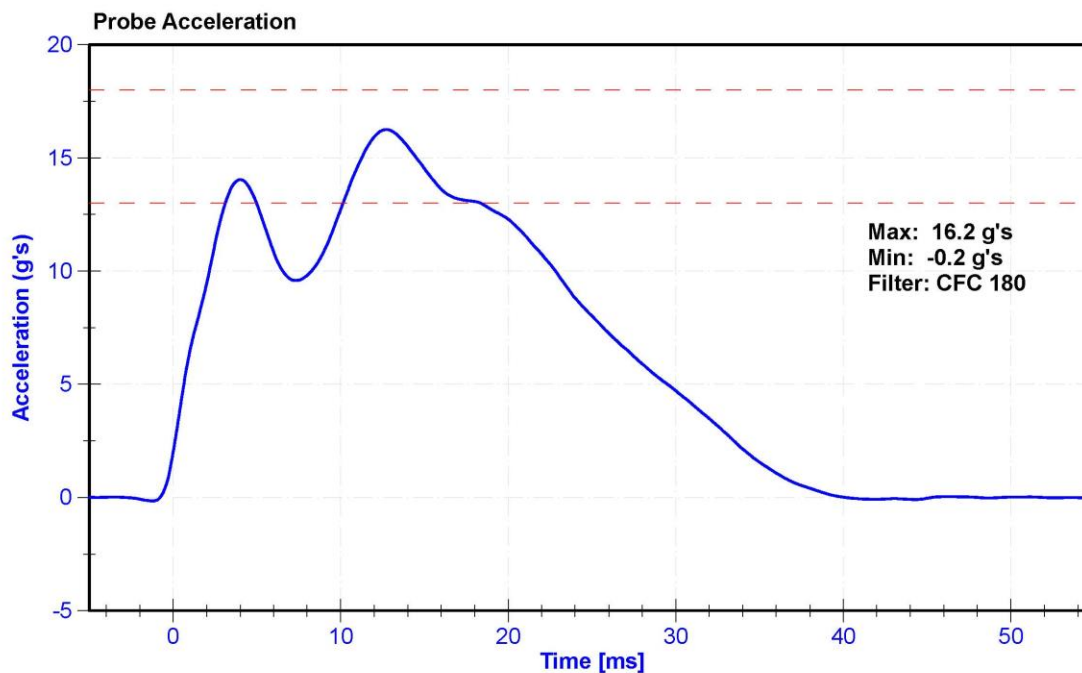
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

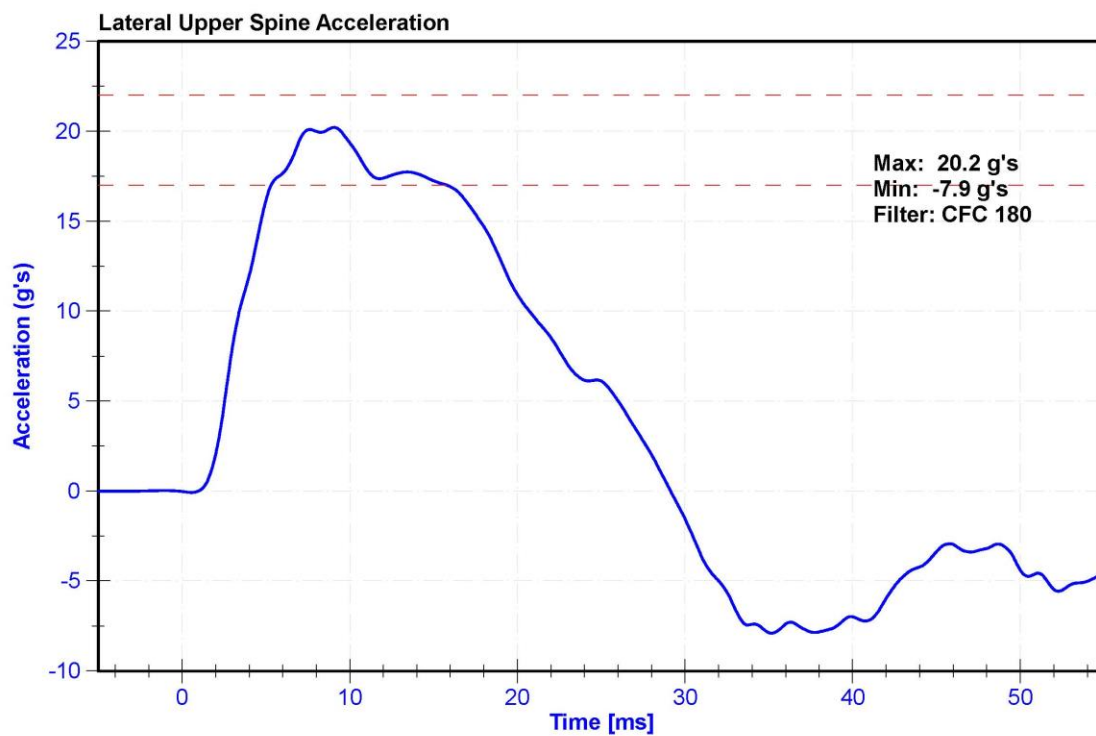
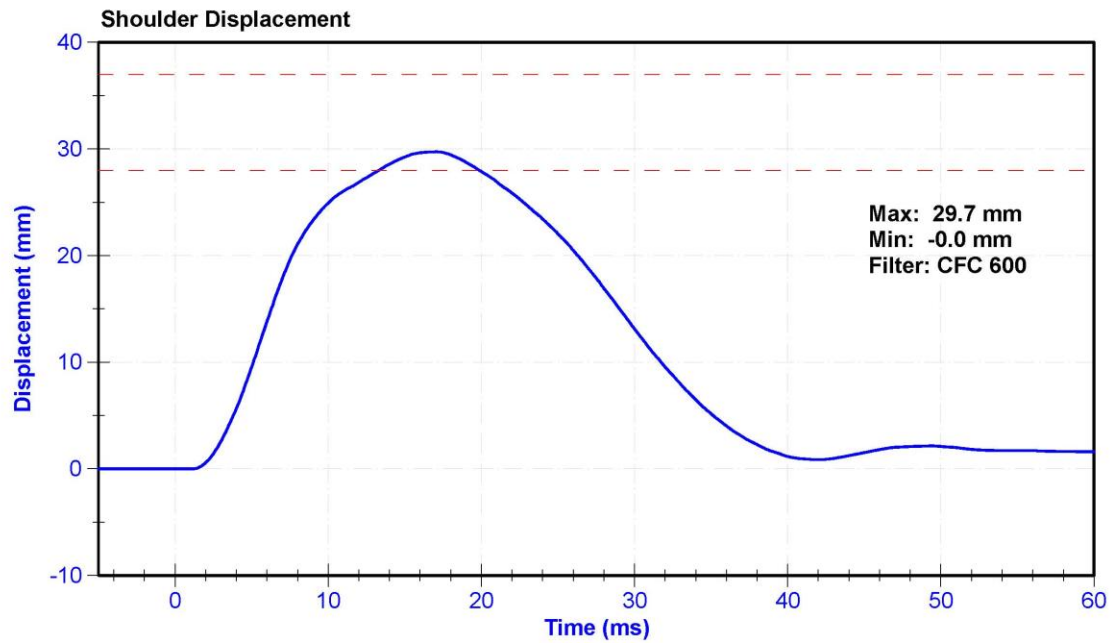
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	28	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	13	18	g's	16.2	Pass
Shoulder Deflection	28	37	mm	29.7	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.2	Pass

Transducer Calibrations

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





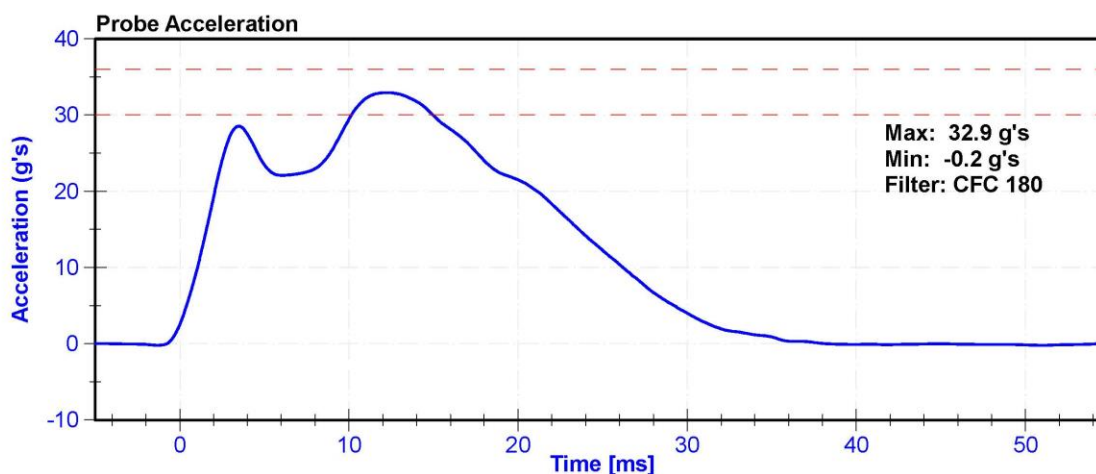
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

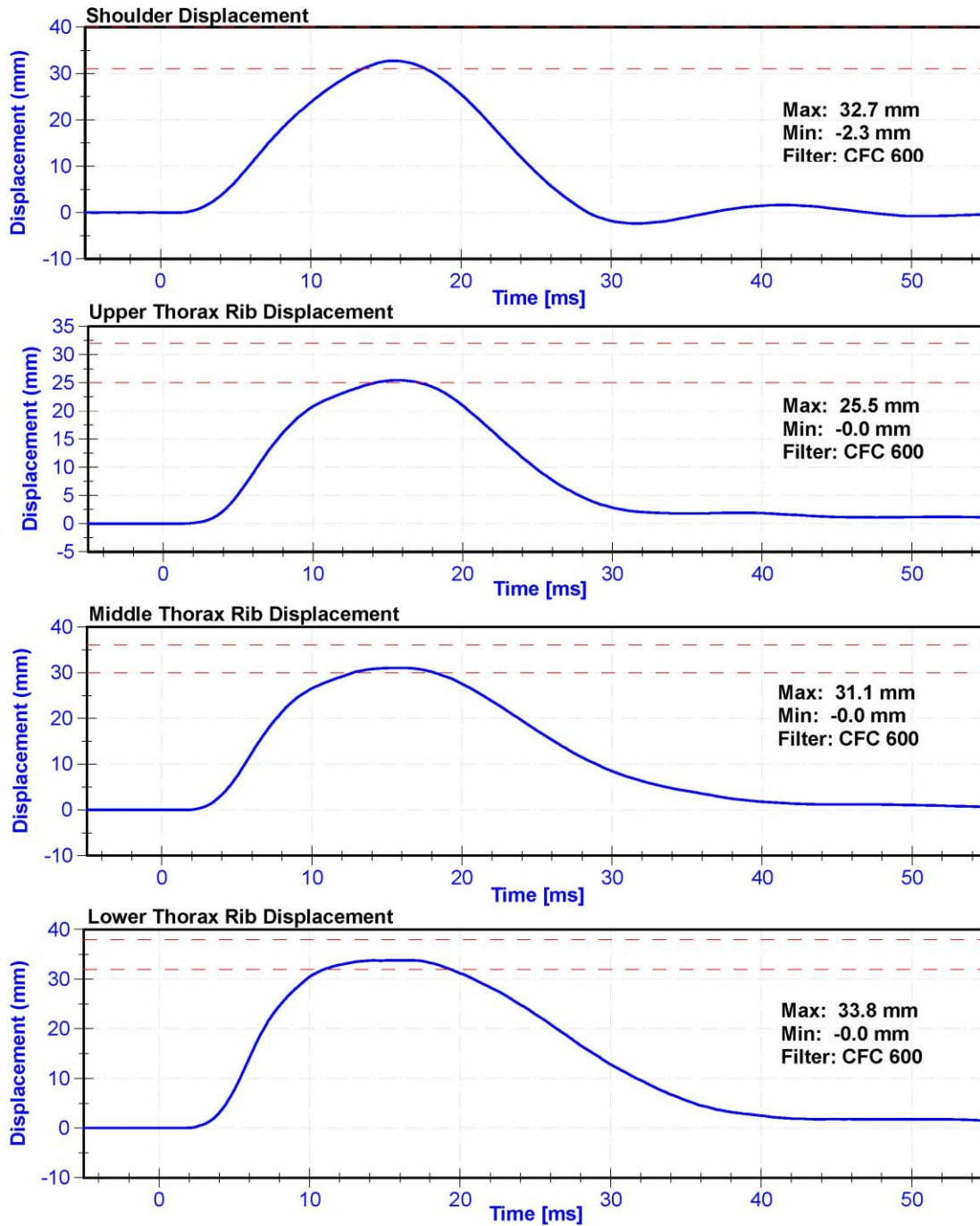
Results

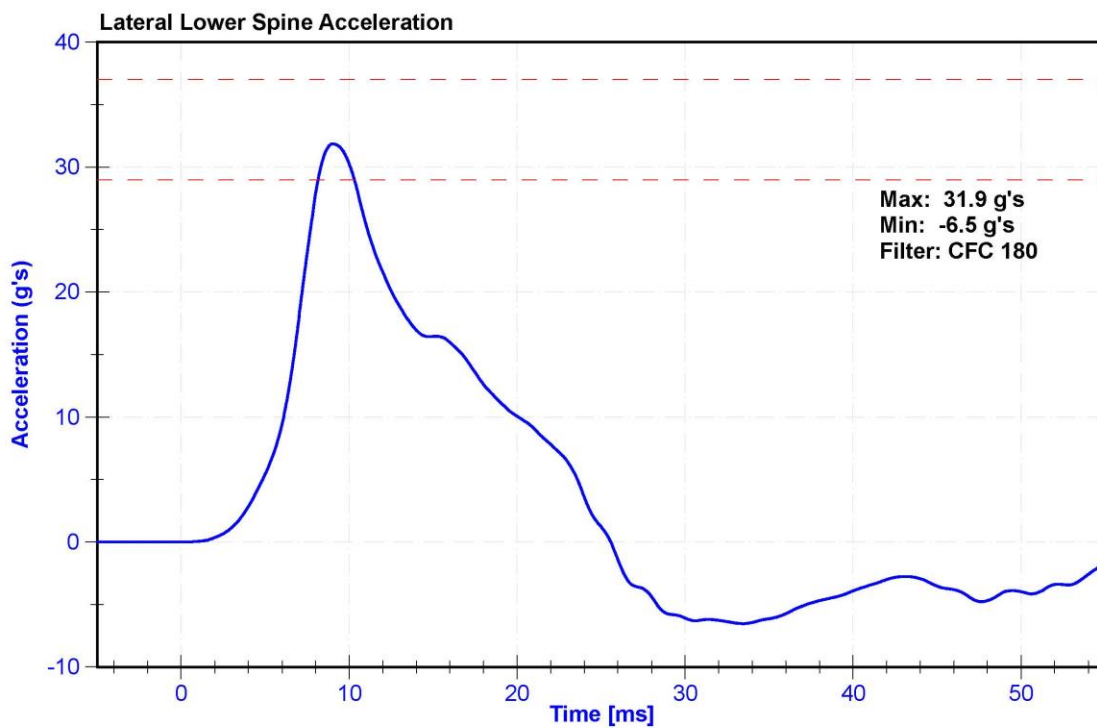
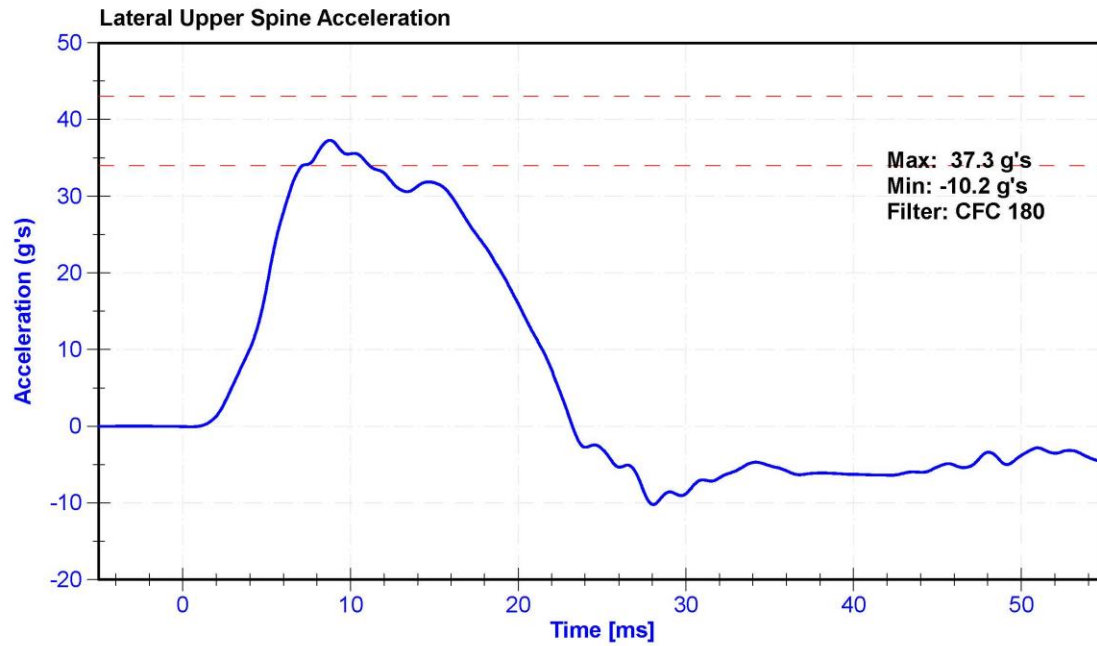
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	30.0	Pass
Velocity	6.6	6.8	m/s	6.68	Pass
Probe Acceleration after 5 ms	30	36	g's	32.9	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.3	Pass
Lateral Lower Spine Acceleration	29	37	g's	31.9	Pass
Shoulder Deflection	31	40	mm	32.7	Pass
Upper Thorax Rib Deflection	25	32	mm	25.5	Pass
Mid Thorax Rib Deflection	30	36	mm	31.1	Pass
Lower Thorax Rib Deflection	32	38	mm	33.8	Pass

Transducer Calibrations

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







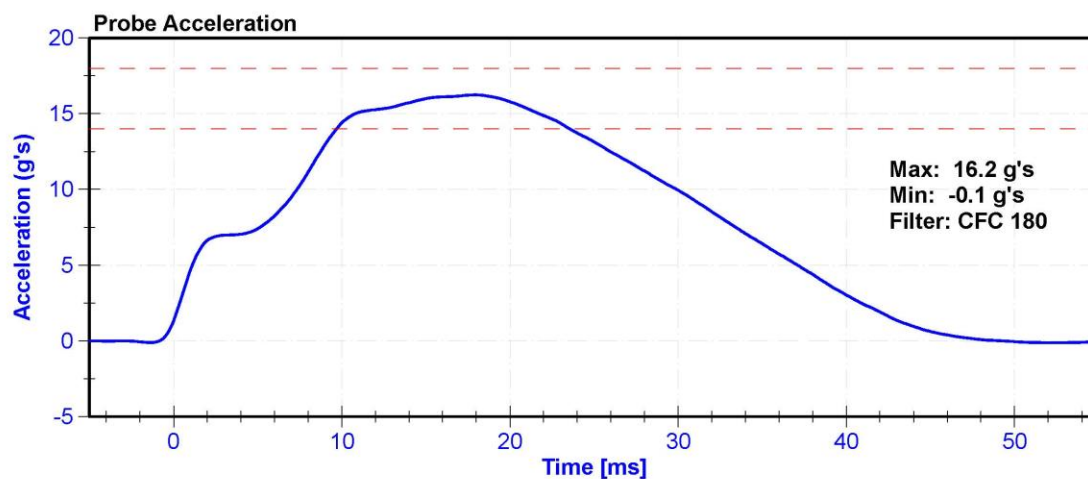
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

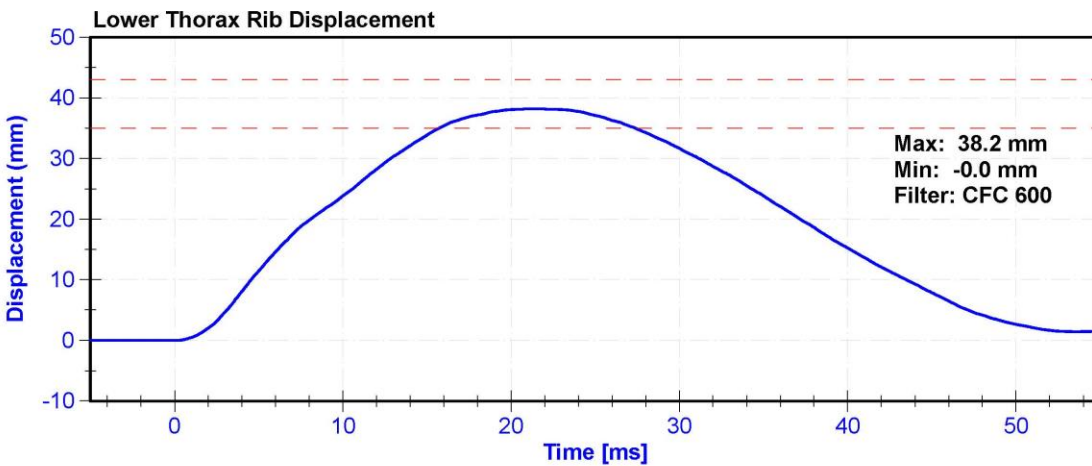
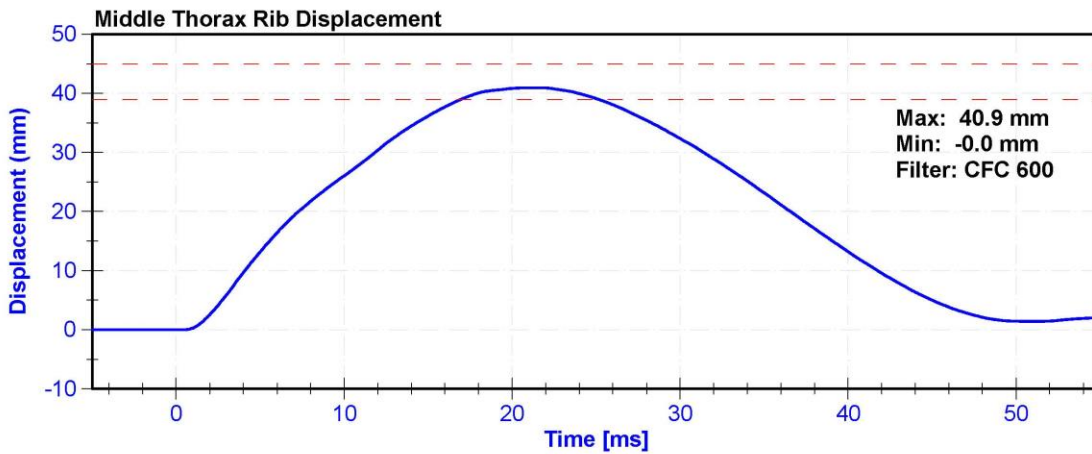
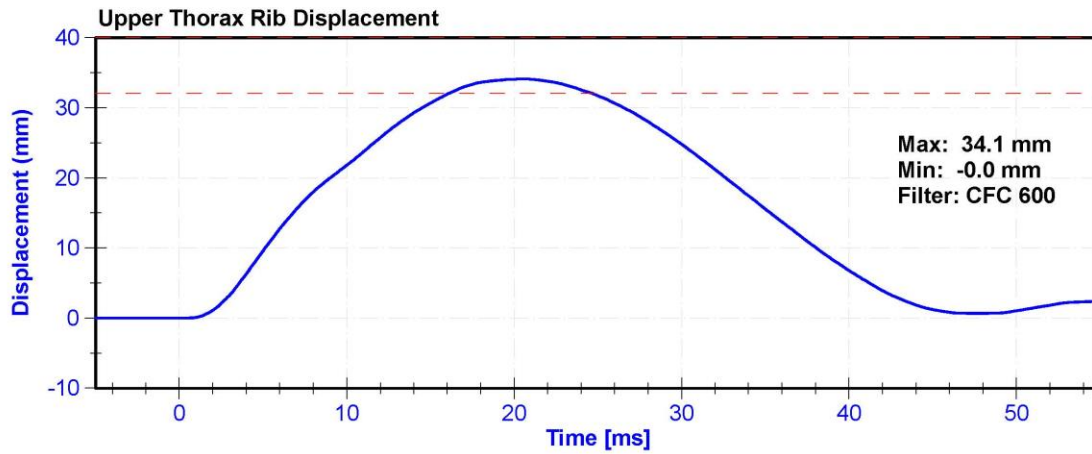
Results

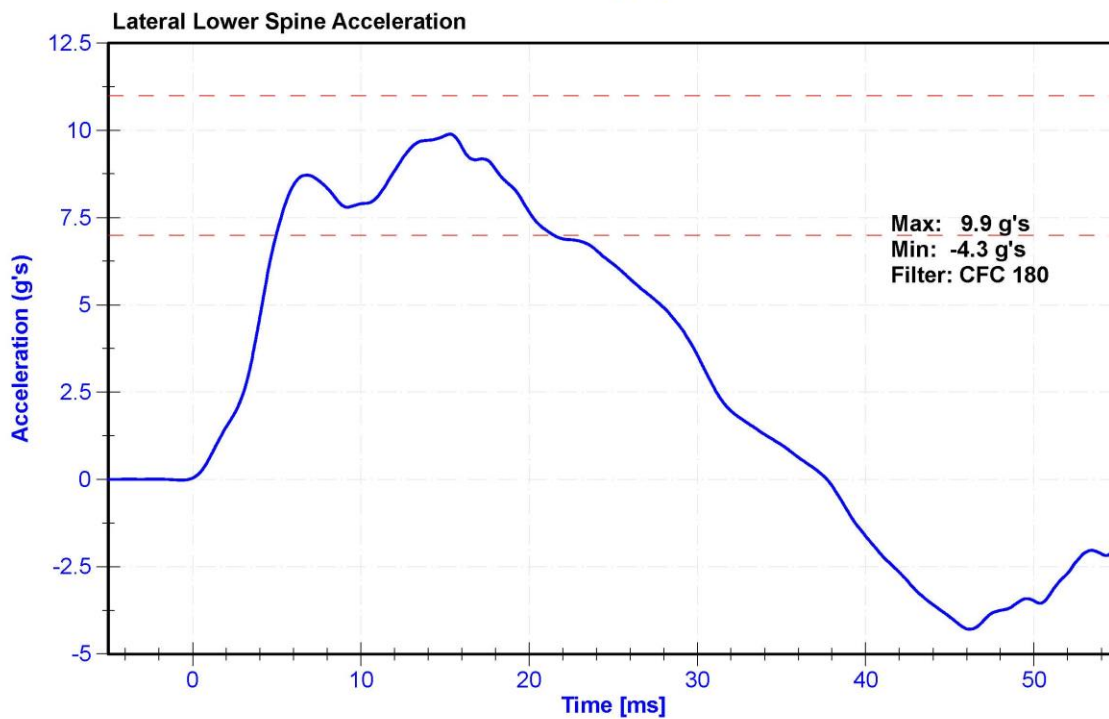
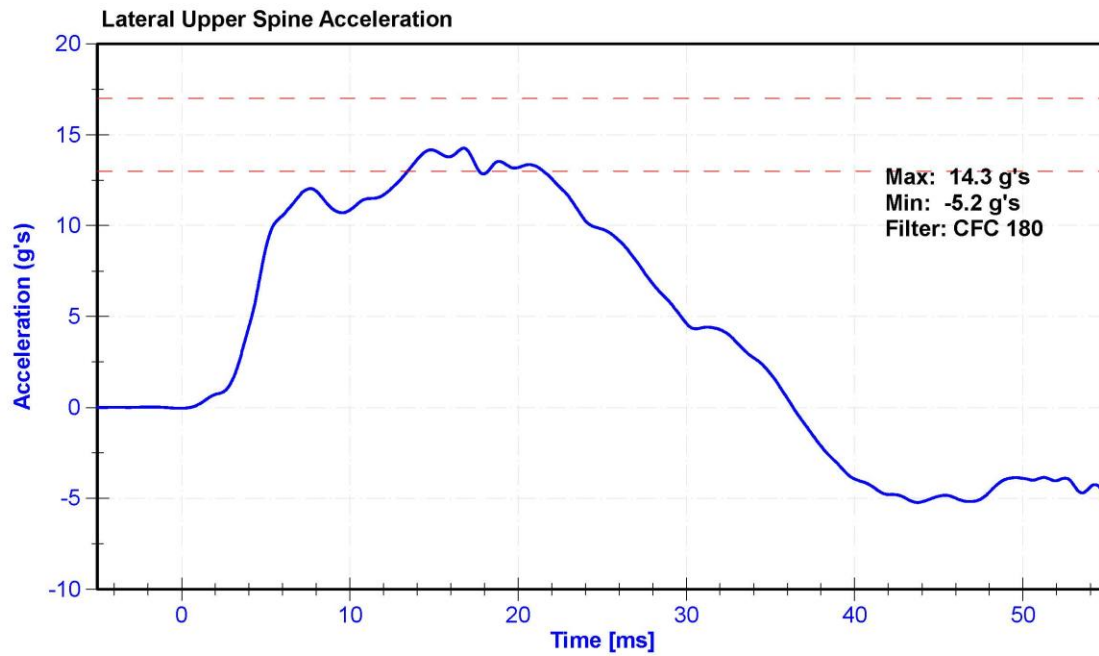
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22	Pass
Humidity	10	70	%	29	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	14	18	g's	16.2	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.3	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.9	Pass
Upper Thorax Rib Deflection	32	40	mm	34.1	Pass
Middle Thorax Rib Deflection	39	45	mm	40.9	Pass
Lower Thorax Rib Deflection	35	43	mm	38.2	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







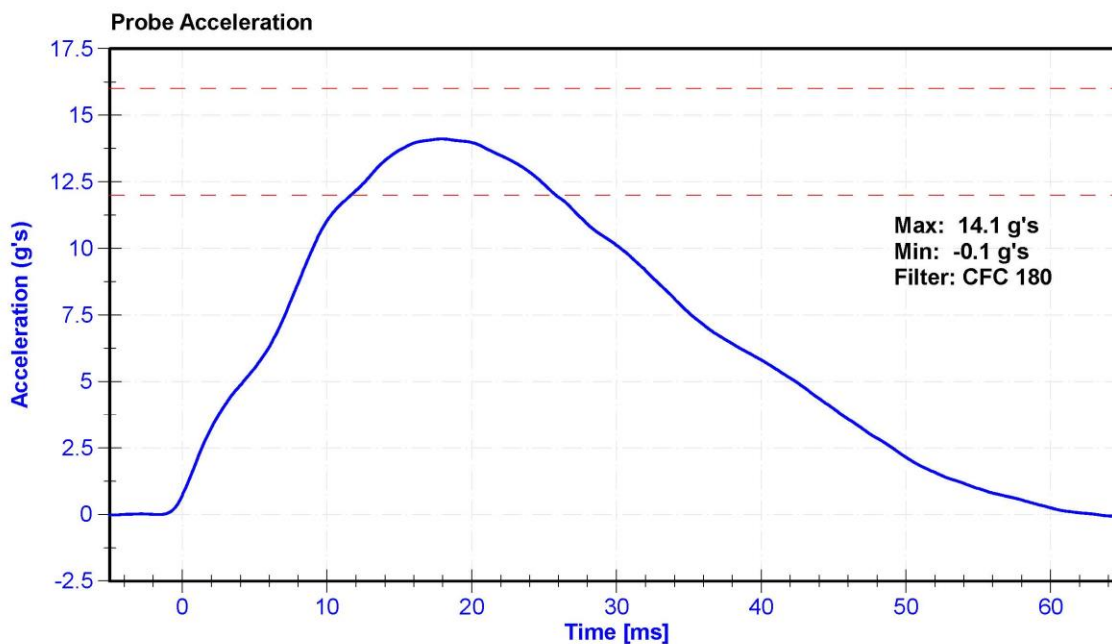
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

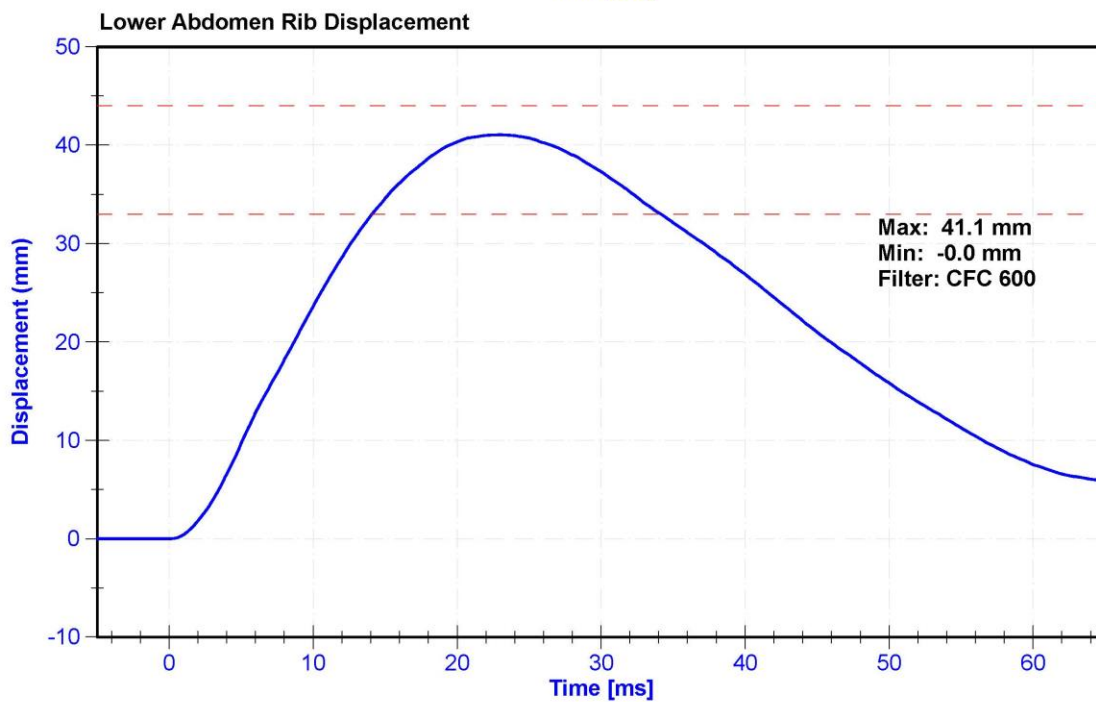
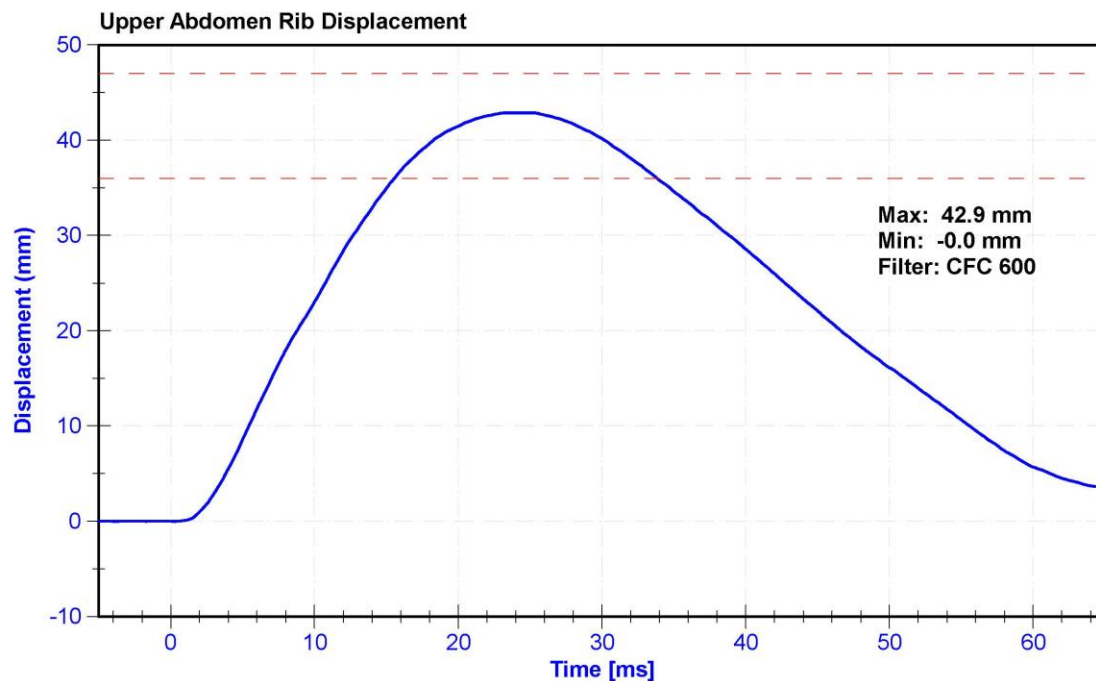
Results

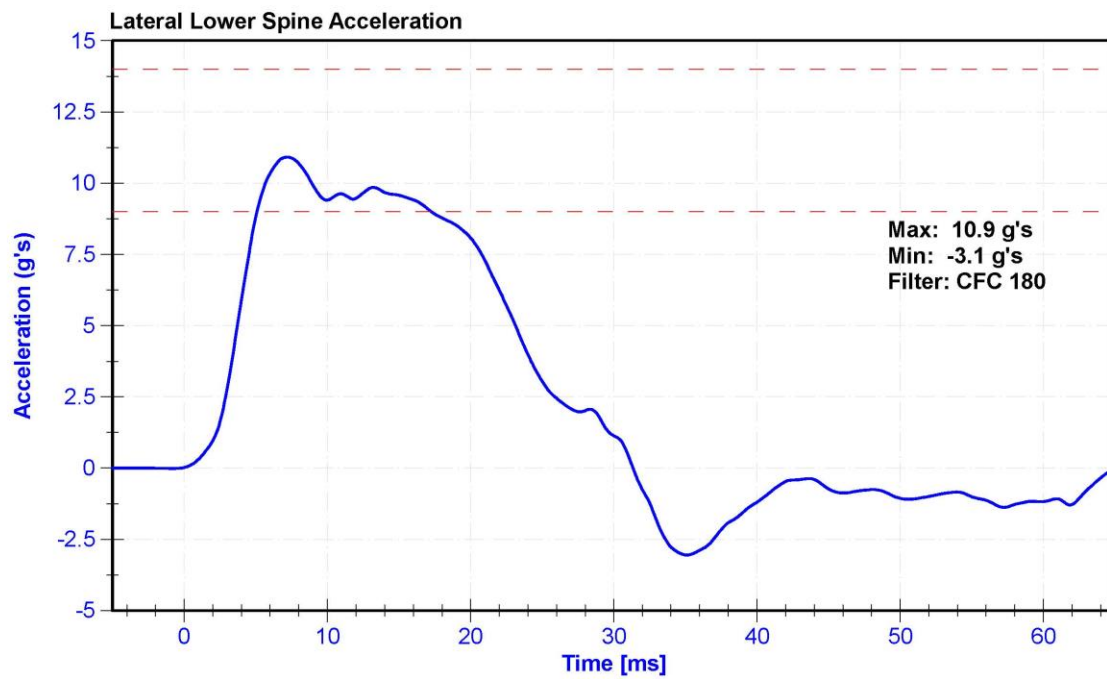
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	12	16	g's	14.1	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.9	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.9	Pass
Lower Abdomen Rib Deflection	33	44	mm	41.1	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







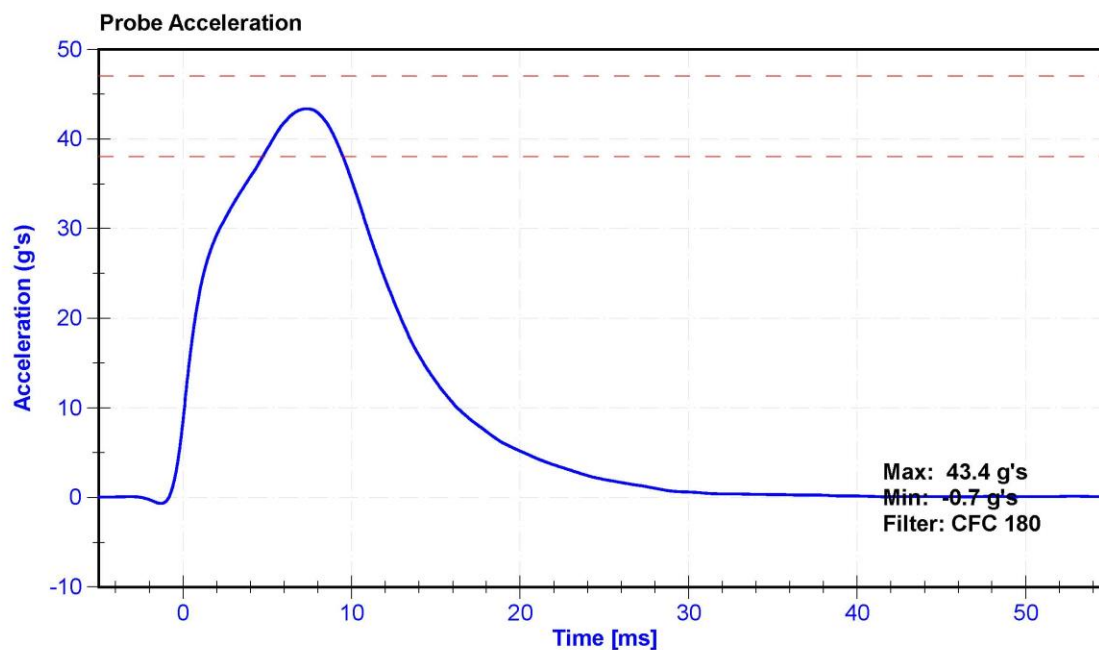
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

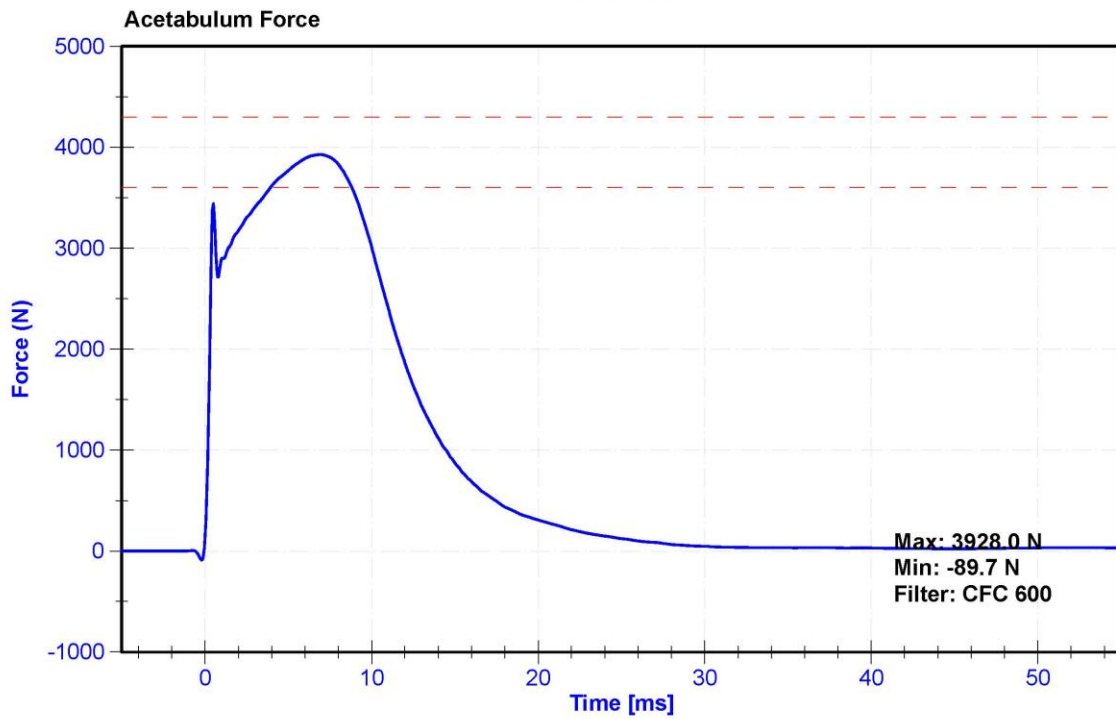
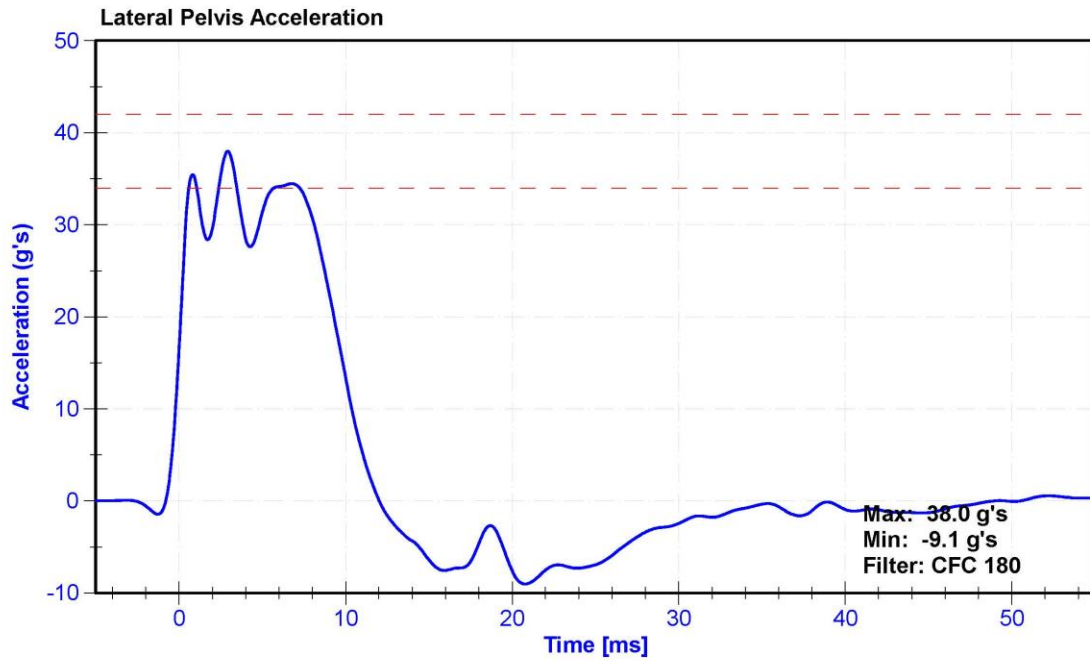
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	28	Pass
Velocity	6.6	6.8	m/s	6.63	Pass
Probe Acceleration	38	47	g's	43.4	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	34.5	Pass
Acetabulum Force	3600	4300	N	3928.0	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	13419	9/20/2019	N/A
Crash Test Plug	SACO	13438	9/20/2019	N/A







SID-11s Pelvis Plug Certification Test

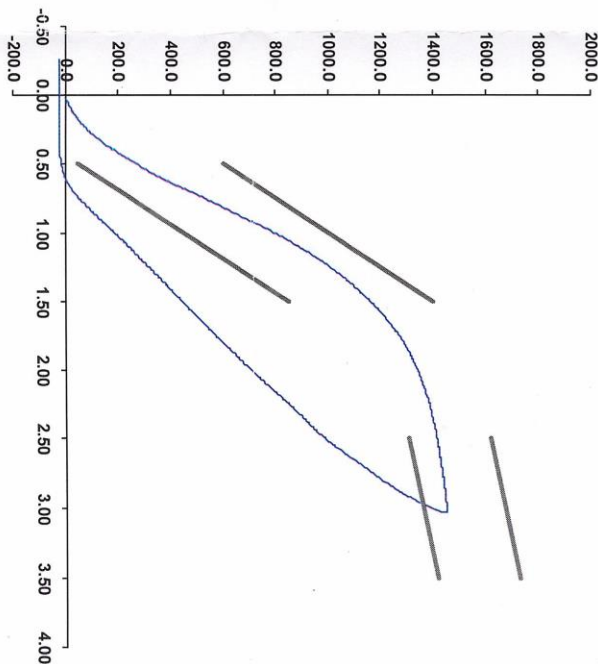
Plug S/N 13419
Test Number 11061
Report Number 11099
Test Date 9/20/2019 7:31:09 AM

Test Results		
	Spec Min	Spec Max
Force @ 0.5 mm (N)	277.23	50.00
Force @ 1.5 mm (N)	1,163.37	850.00
Force @ 2.5 mm (N)	1,414.77	1,306.00
Force @ 3.0 mm (N)	1,450.39	1,361.00

Testing Machine STM-20 596554;
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:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 20-Sep-19
SACO Research

By:
Date: 9/20/2019
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-IIs Pelvis Plug Certification Test

Plug S/N 13438
Test Number 11080
Report Number 11118
Test Date 9/20/2019 8:28:26 AM

Test Results		
	Spec Min	Spec Max
Force @ 0.5 mm (N)	284.76	600.00
Force @ 1.5 mm (N)	1,188.05	1,400.00
Force @ 2.5 mm (N)	1,470.62	1,618.00
Force @ 3.0 mm (N)	1,518.58	1,673.00

Testing Machine STM-20 596554;
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:

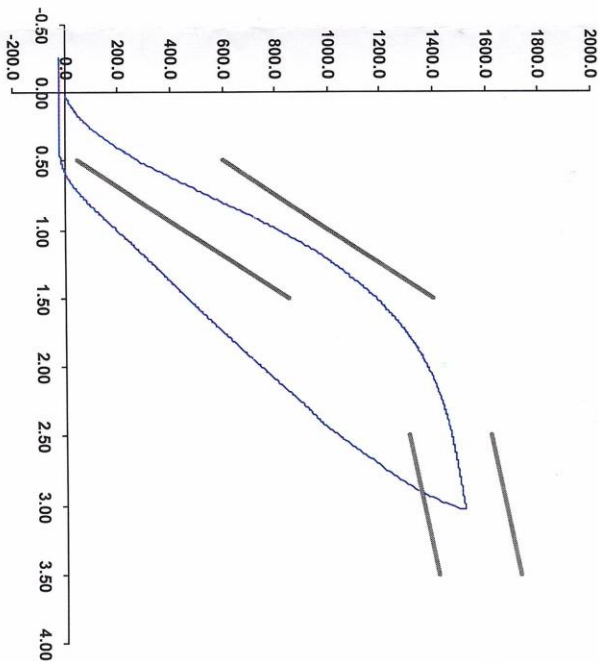
Operator
Part Number 180-4450

Template No 107 20-Sep-19
SACO Research

By: DC Date: 9/20/2019
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-594-2082 FAX

300 Crash
3lbs/20

Force (-N) vs Extension (-mm)



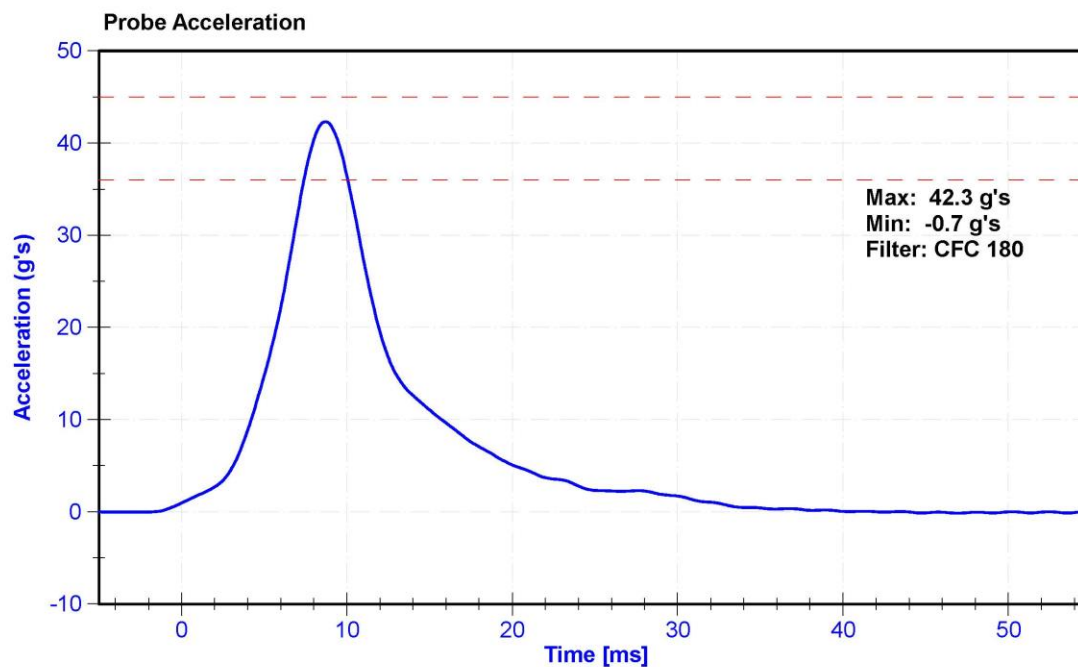
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	D.Reinhard

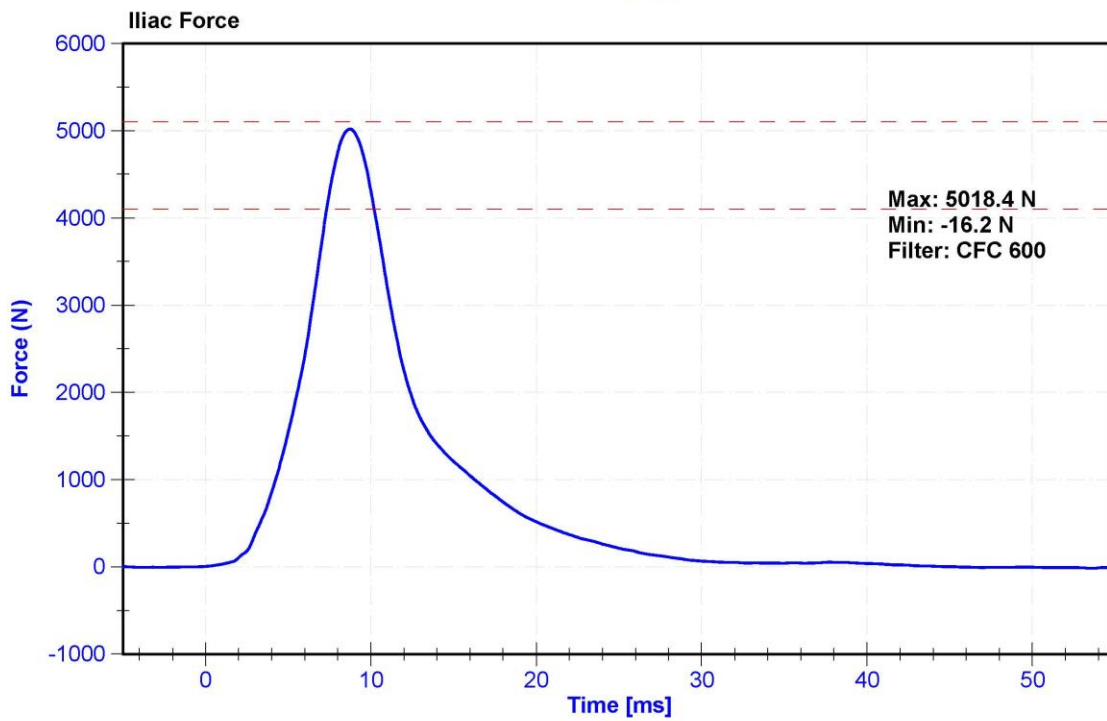
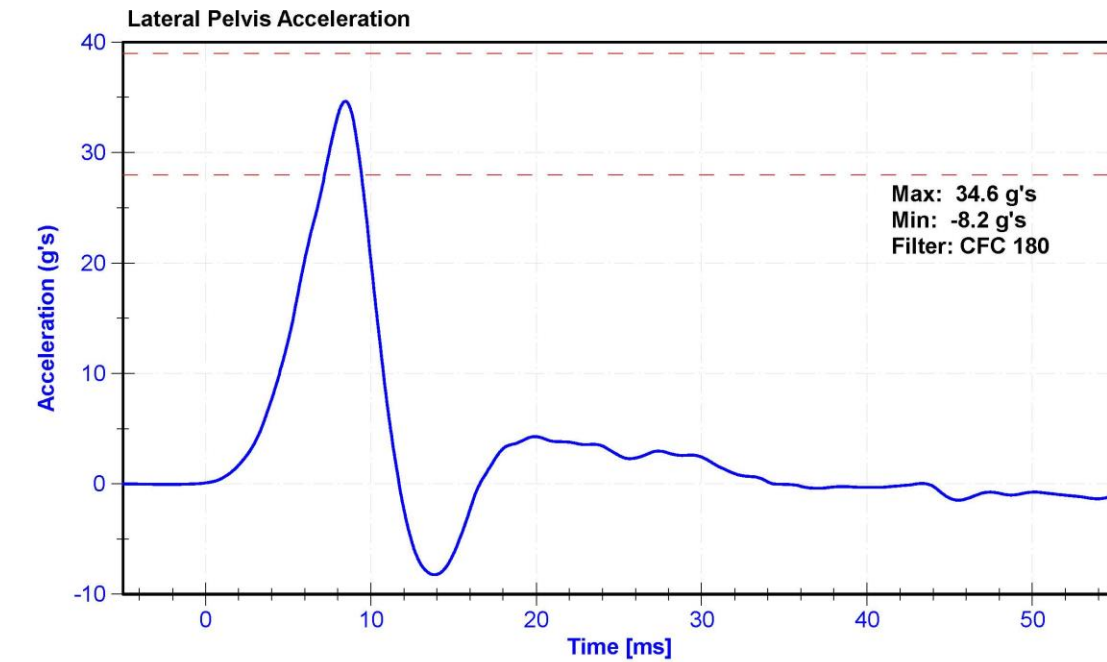
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	4.2	4.4	m/s	4.20	Pass
Probe Acceleration	36	45	g's	42.3	Pass
Lateral Pelvis Acceleration	28	39	g's	34.6	Pass
Iliac Force	4100	5100	N	5018.4	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





CALIBRATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

SERIAL NO: F034

(CONFIGURED FOR LEFT SIDE IMPACT)

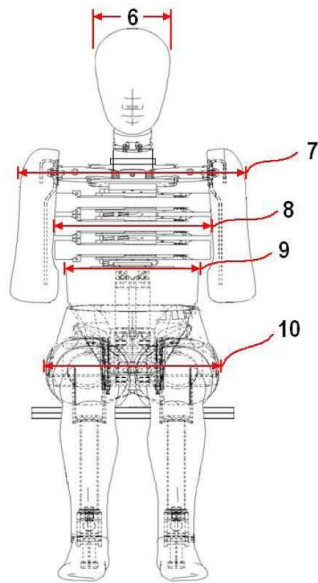


External Measurements - EuroSID-2re

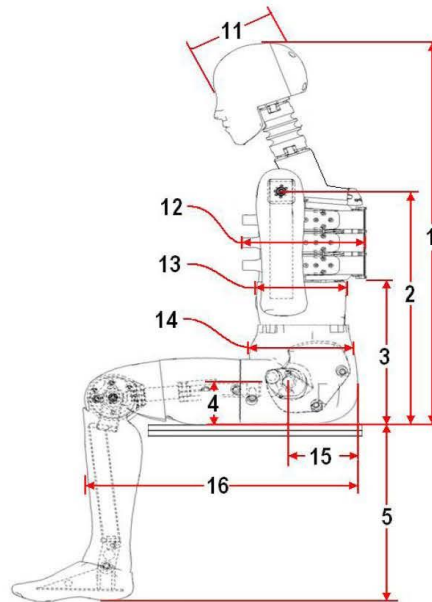
Technician: K. Dutton

Date: 04/07/2020

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	421	Pass
6	Head Width	152	158	154	Pass
7	Shoulder/Arm Width	461	479	473	Pass
8	Thorax Width	322	332	330	Pass
9	Abdomen Width	273	287	285	Pass
10	Pelvis Lap Width	359	373	365	Pass
11	Head Depth	196	206	204	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

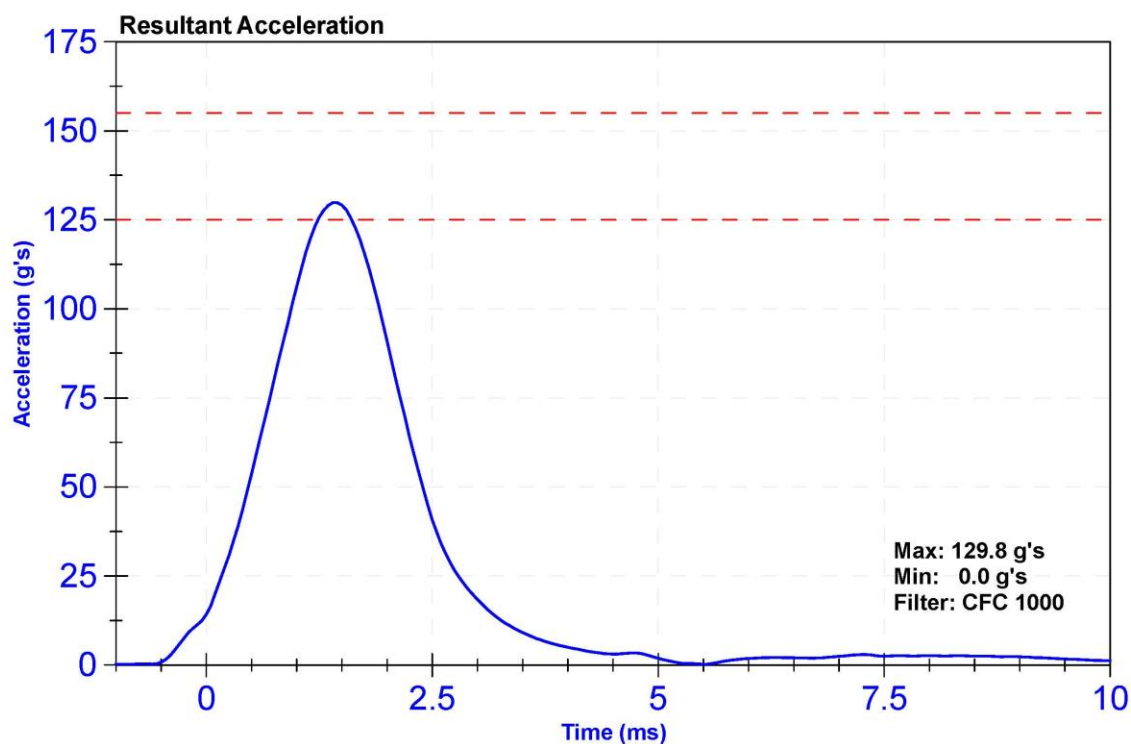
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

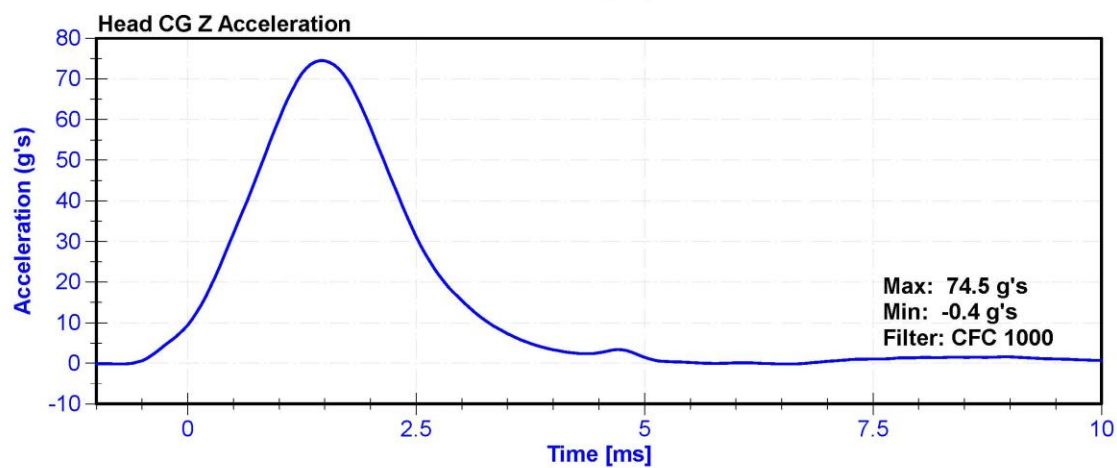
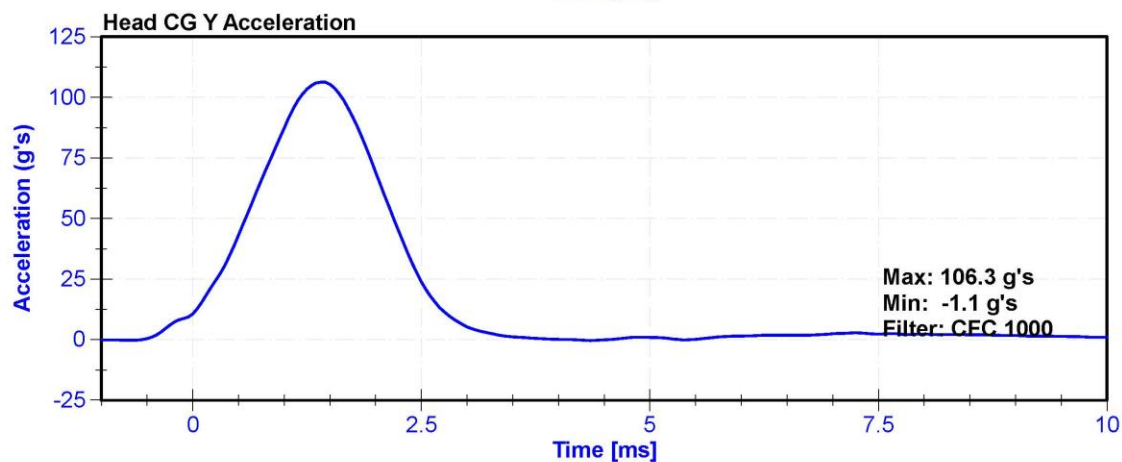
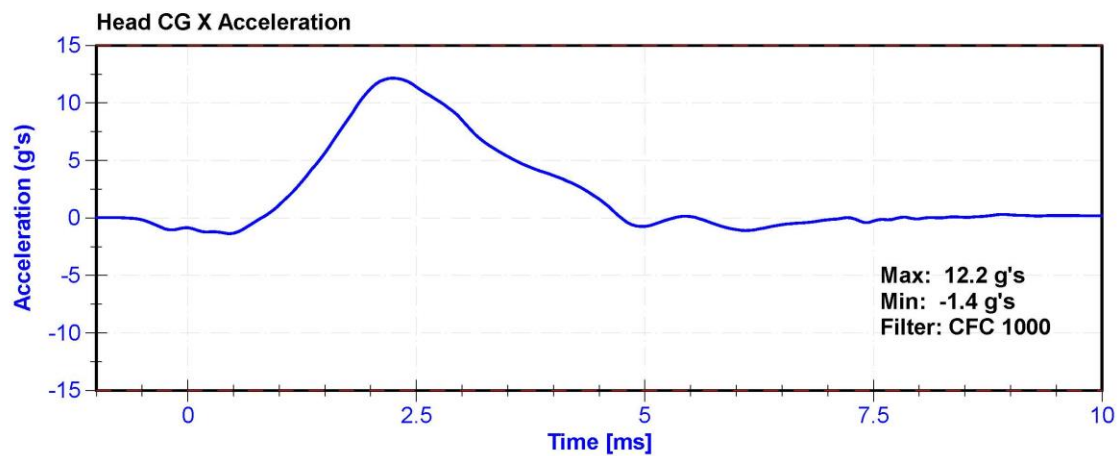
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	37.5	Pass
Resultant Acceleration	125	155	g's	129.8	Pass
Oscillation	0	15	%	2.62	Pass
Fore-Aft Acceleration	-15	15	g's	12.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P49204	10/29/2019	4/28/2020
Y Accelerometer	ENDEVCO 7264	AC-P83437	3/5/2020	9/3/2020
Z Accelerometer	ENDEVCO 7264	AC-P64007	10/29/2019	4/28/2020





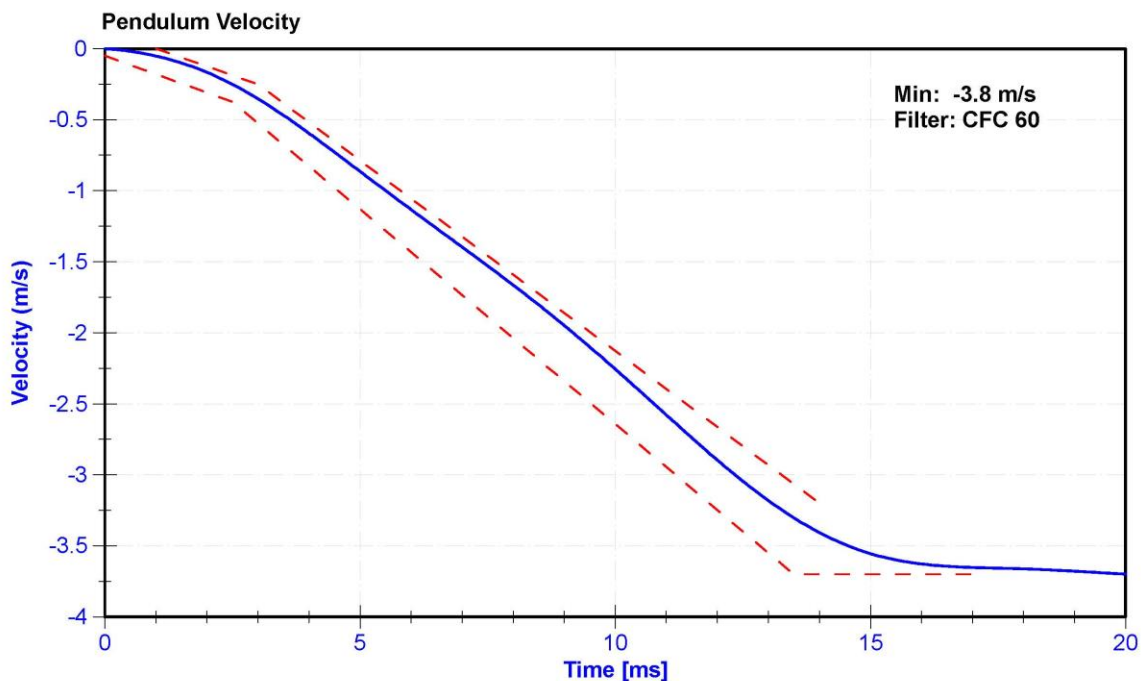
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

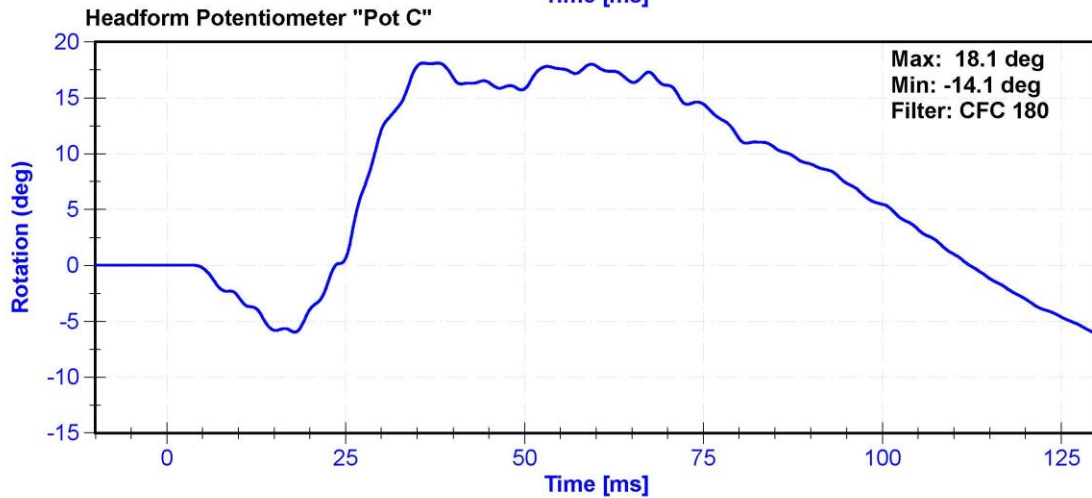
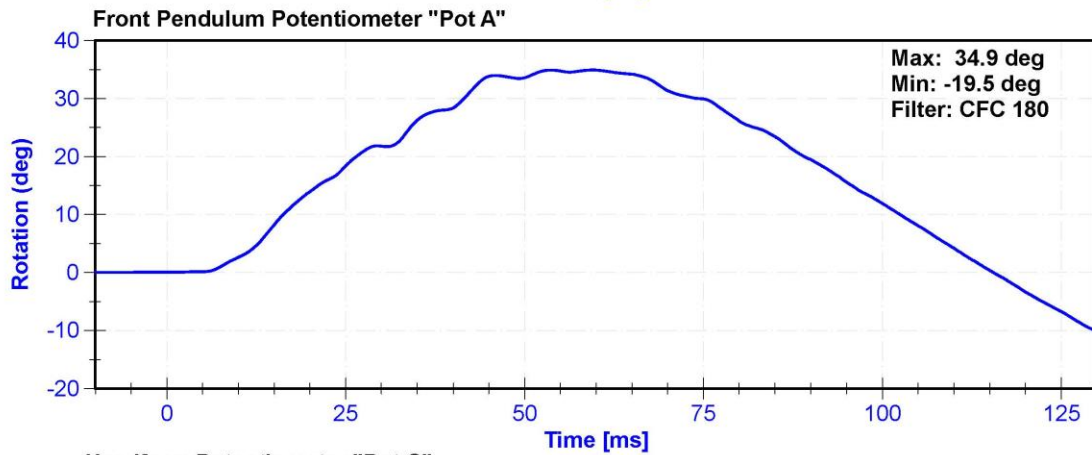
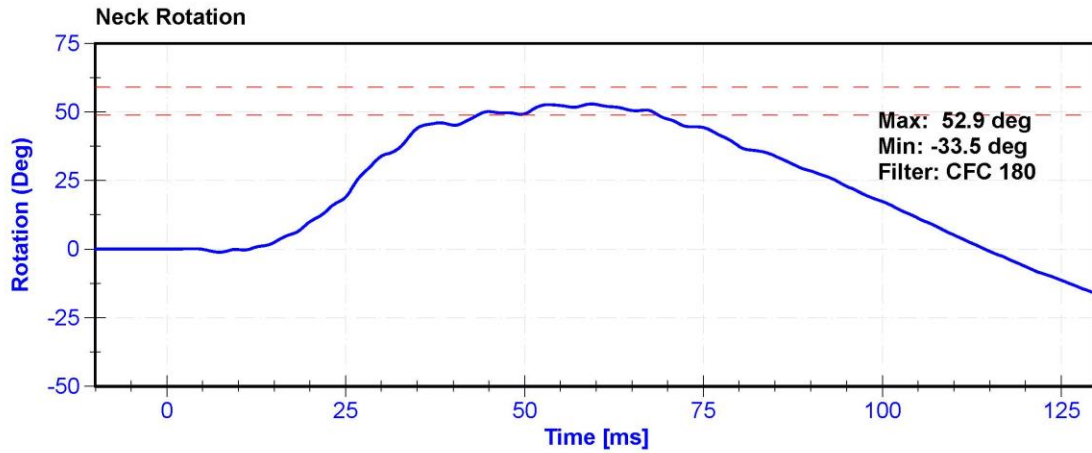
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	39.2	Pass
Velocity	3.3	3.5	m/s	3.41	Pass
Lateral Neck Rotation	49	59	deg	52.9	Pass
Time at Maximum Rotation	54	66	ms	59.4	Pass
Time of Rotation Decay from Maximum	53	88	ms	55.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5M9	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





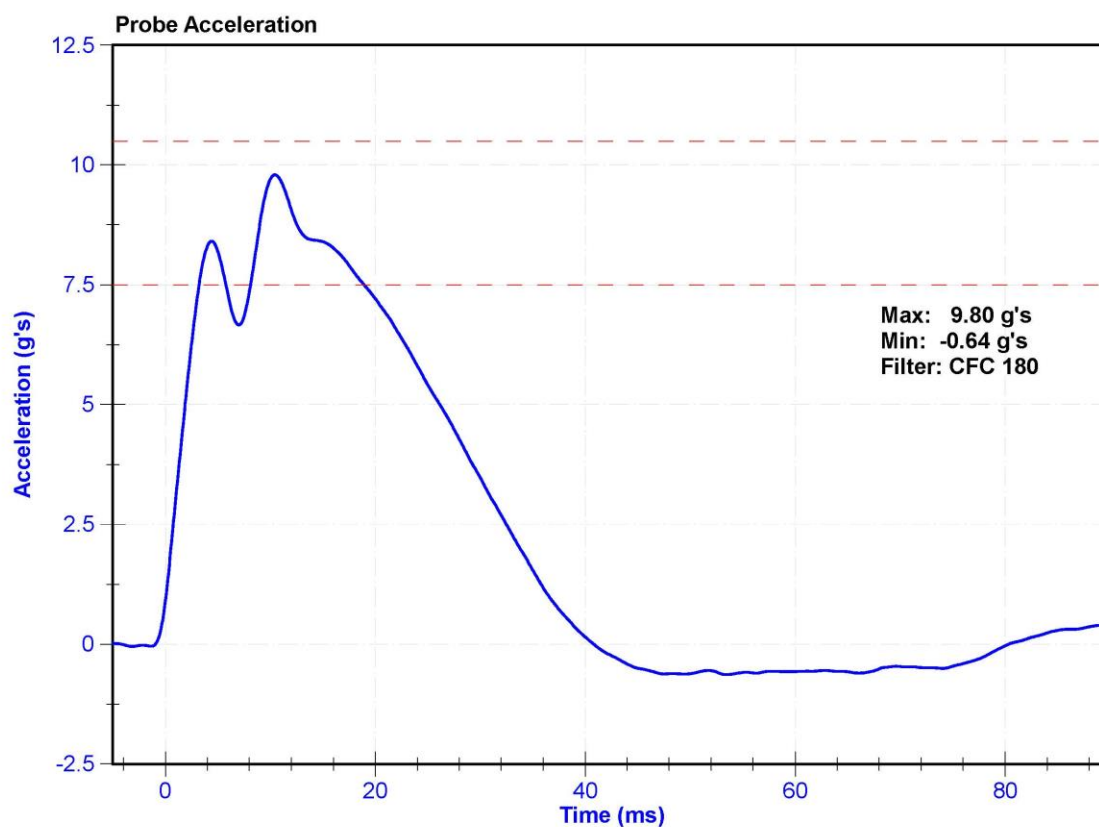
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	28.0	Pass
Velocity	4.2	4.4	m/s	4.40	Pass
Probe Acceleration	7.5	10.5	g's	9.80	Pass

Transducer Calibrations

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



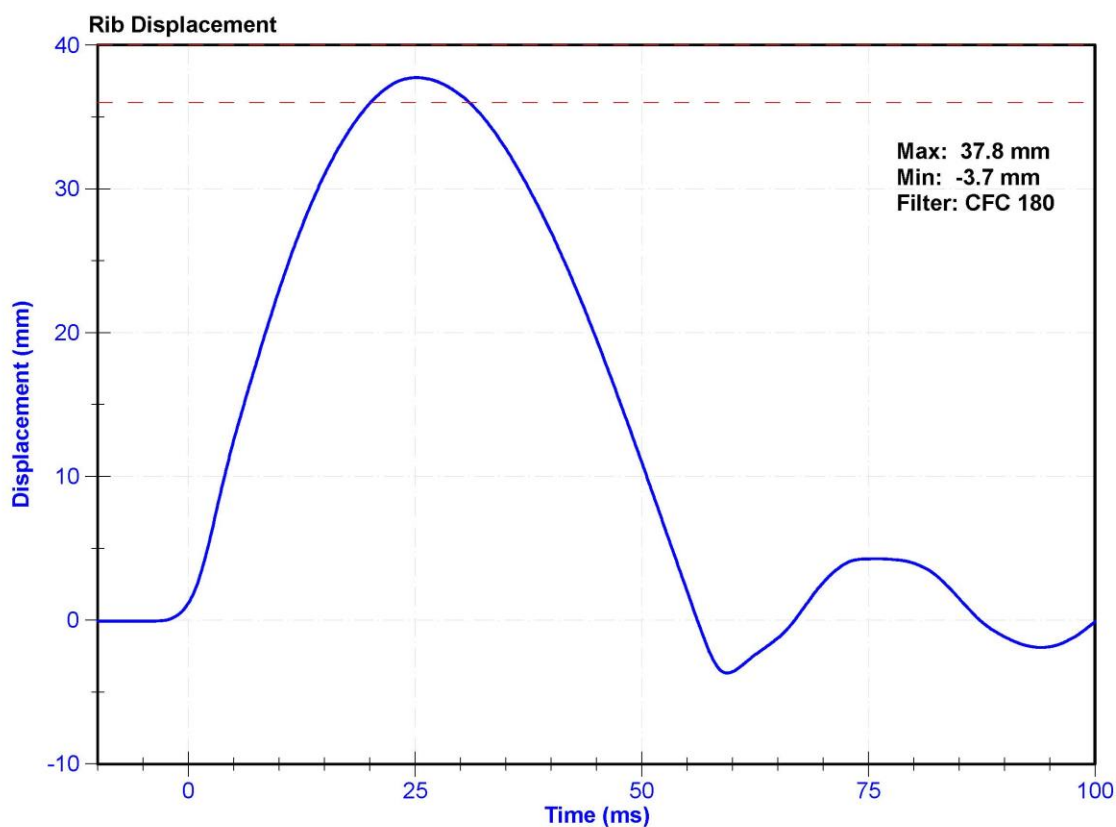
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	34.5	Pass
Rib Displacement	36	40	mm	37.8	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



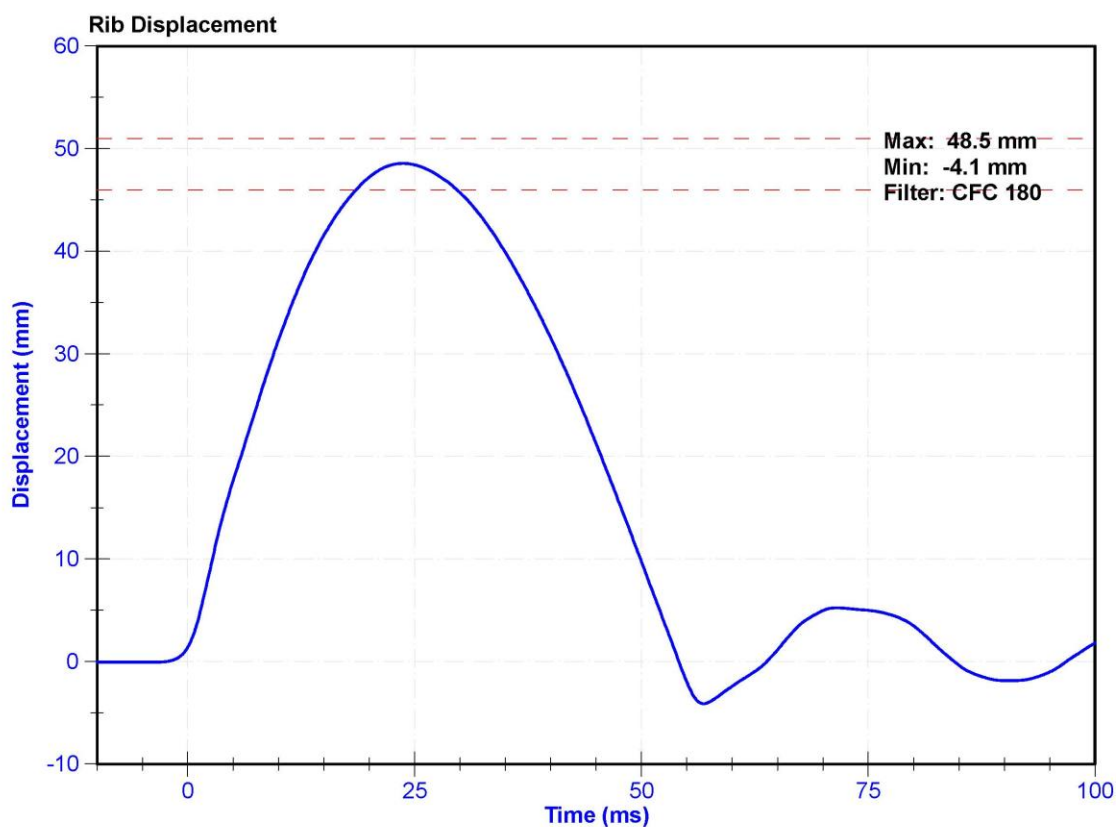
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	34.5	Pass
Rib Displacement	46	51	mm	48.5	Pass

Transducer Calibrations

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



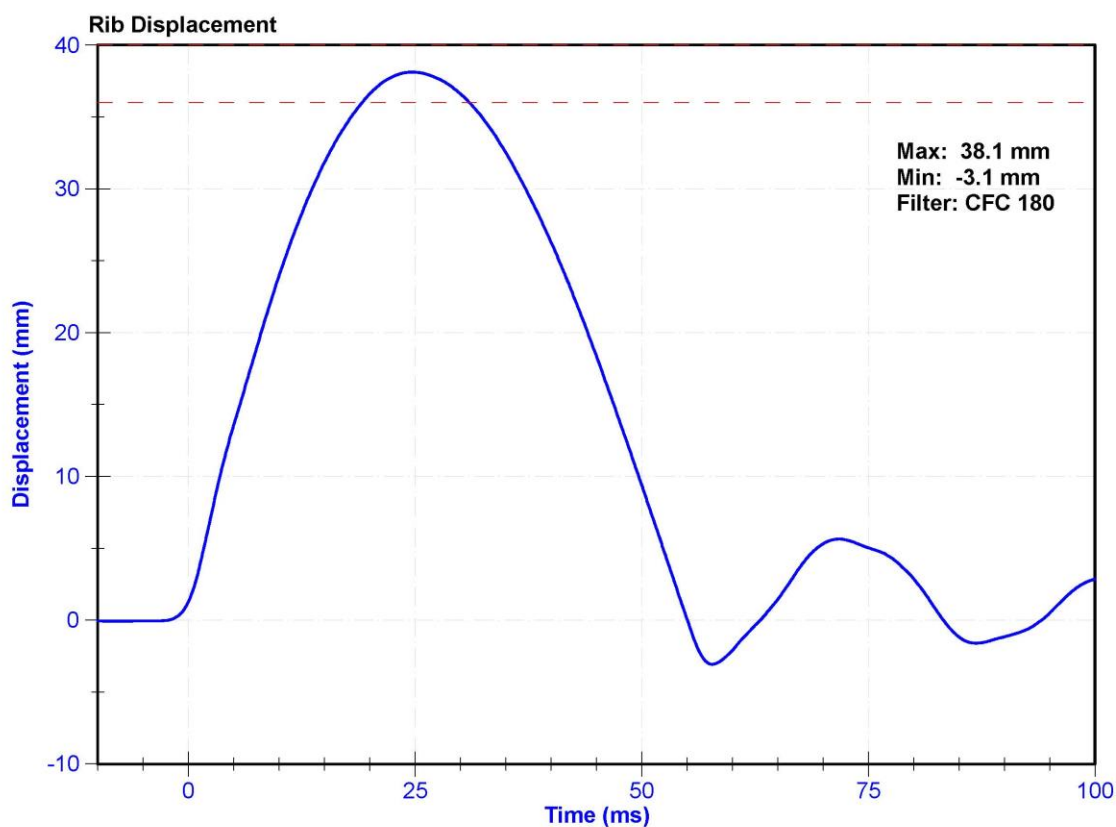
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	33.3	Pass
Rib Displacement	36	40	mm	38.1	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



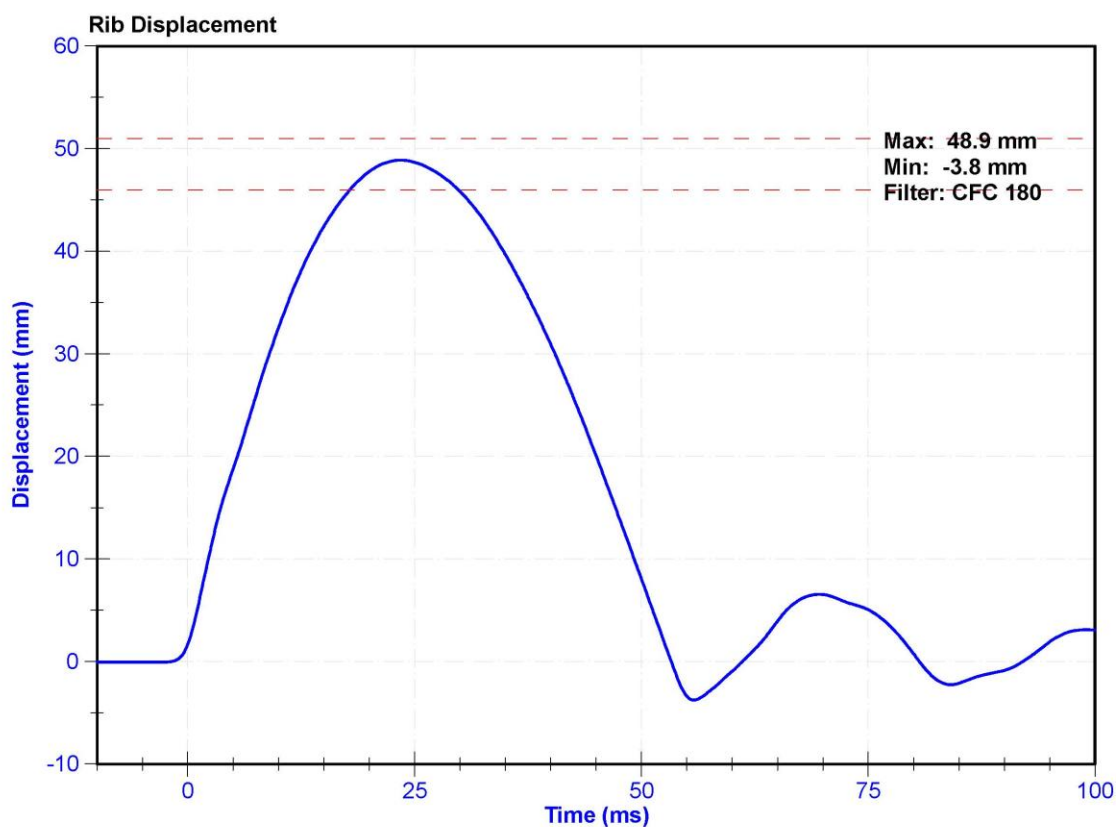
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	33.3	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



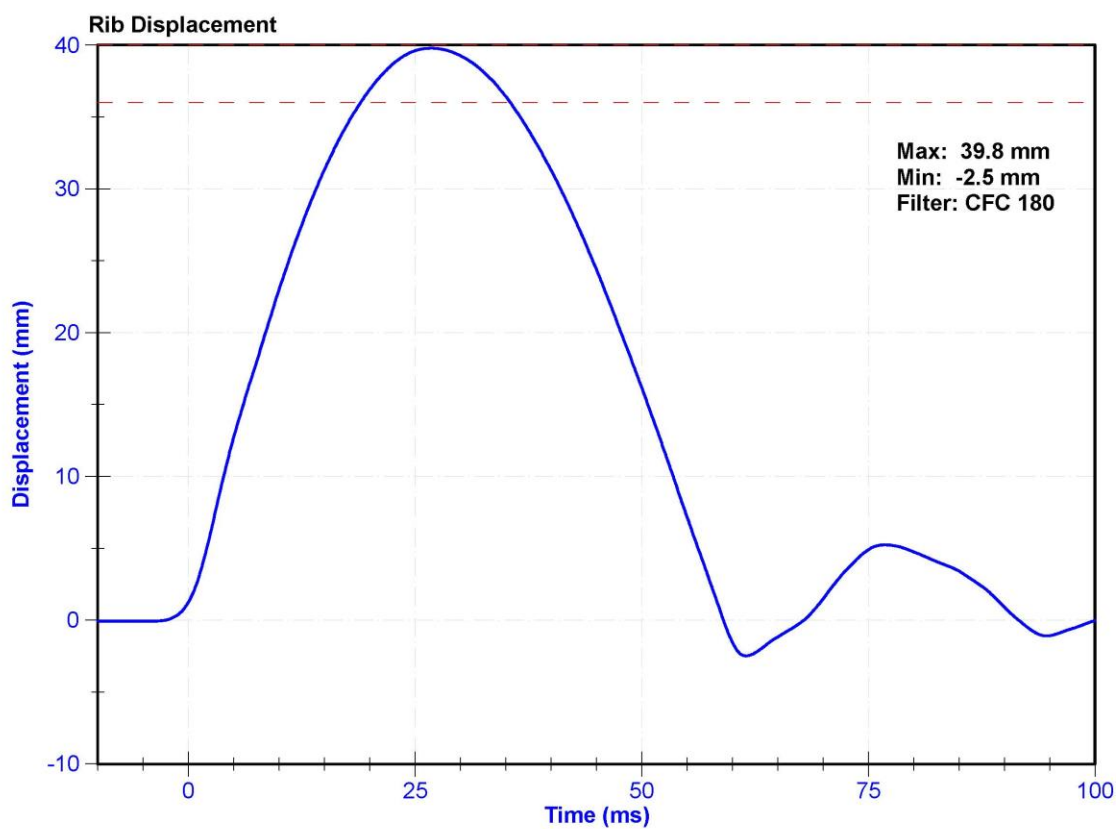
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	33.9	Pass
Rib Displacement	36	40	mm	39.8	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



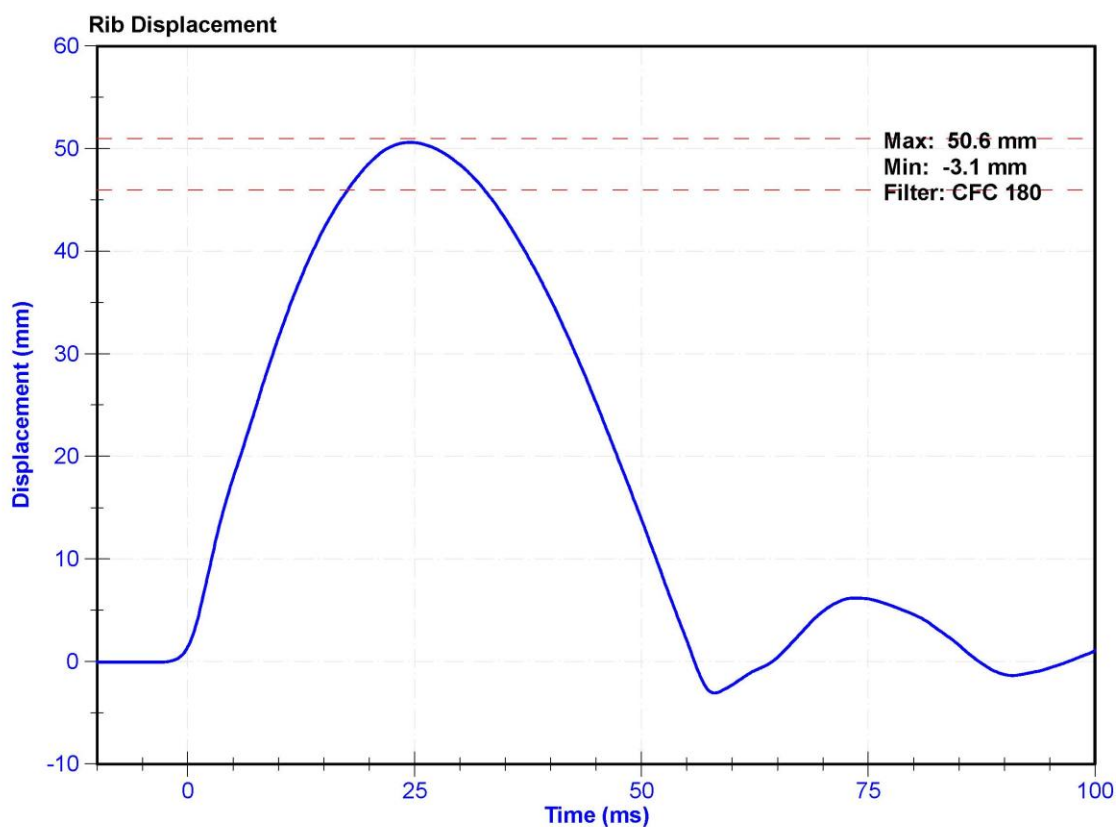
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	33.9	Pass
Rib Displacement	46	51	mm	50.6	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



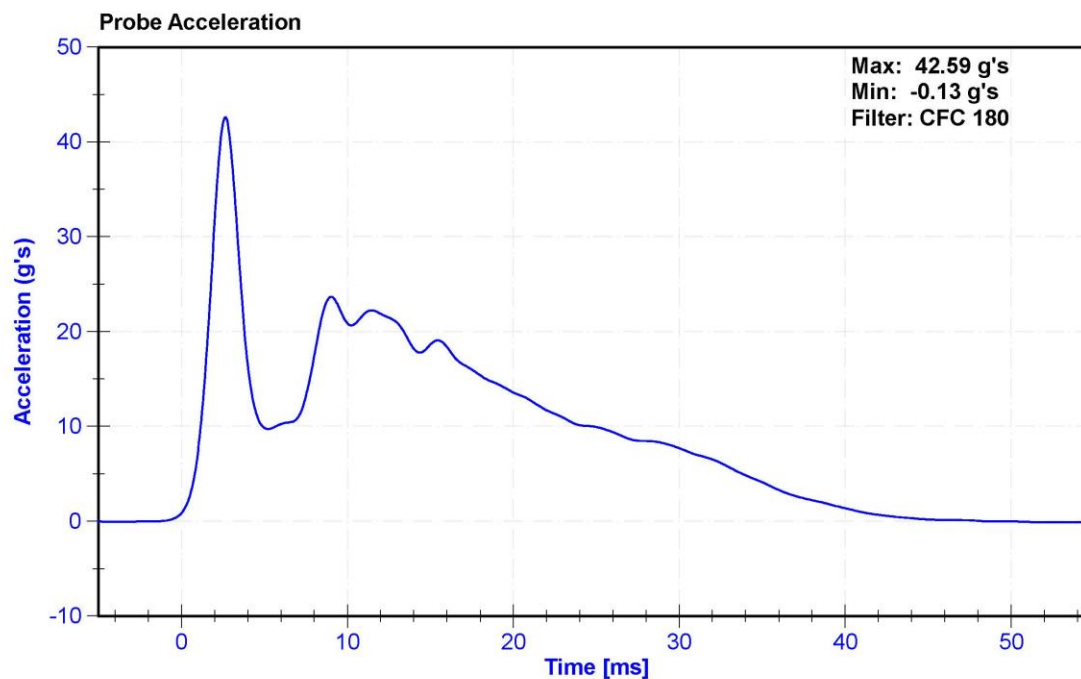
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

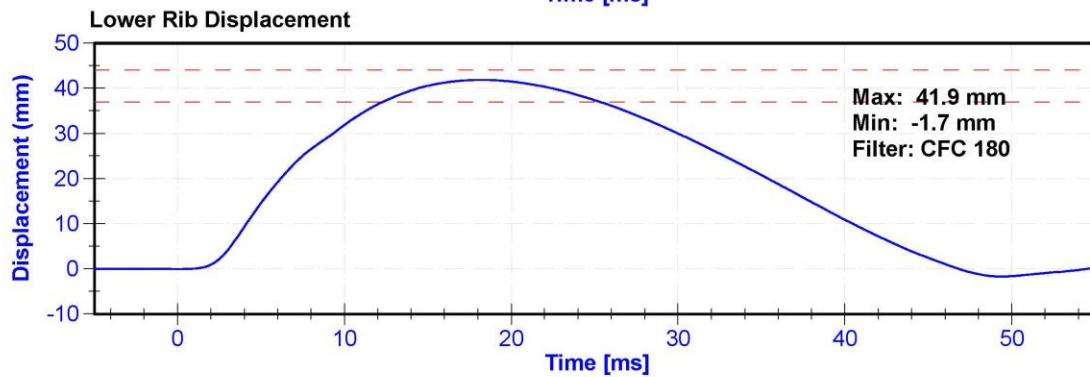
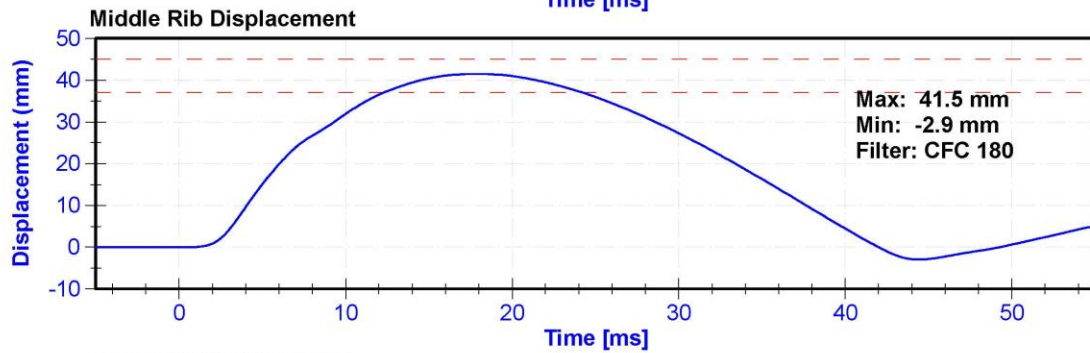
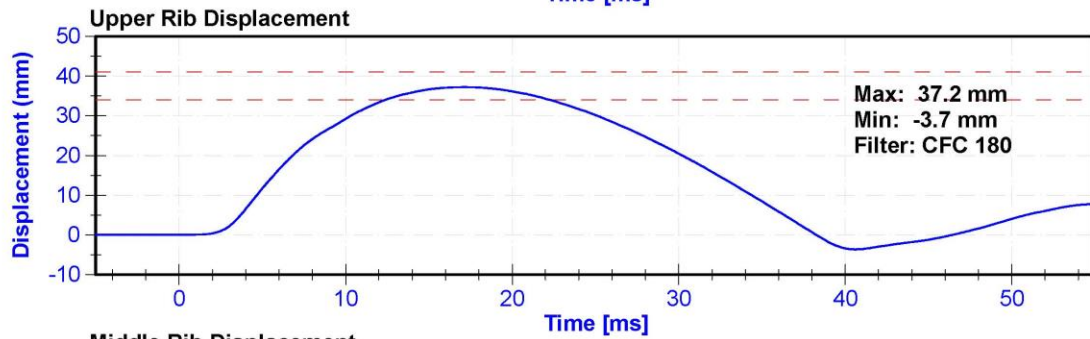
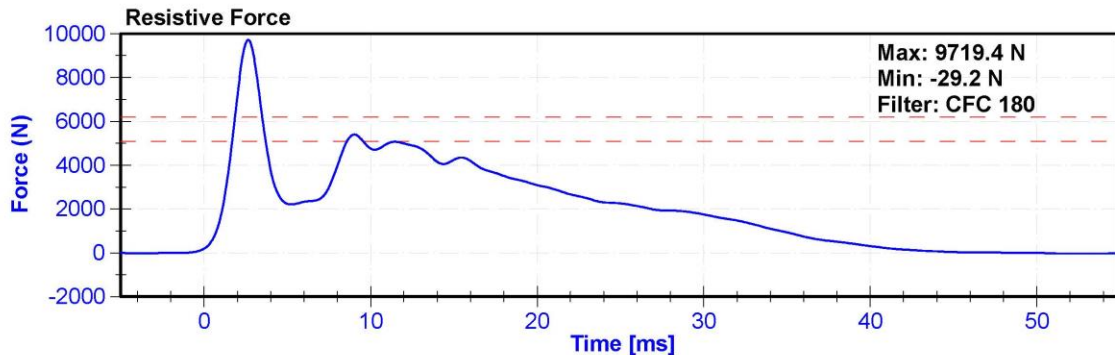
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	29.0	Pass
Velocity	5.4	5.6	m/s	5.45	Pass
Resistive Force after 6ms	5100	6200	N	5402.3	Pass
Upper Thorax Rib Deflection	34	41	mm	37.2	Pass
Mid Thorax Rib Deflection	37	45	mm	41.5	Pass
Lower Thorax Rib Deflection	37	44	mm	41.9	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





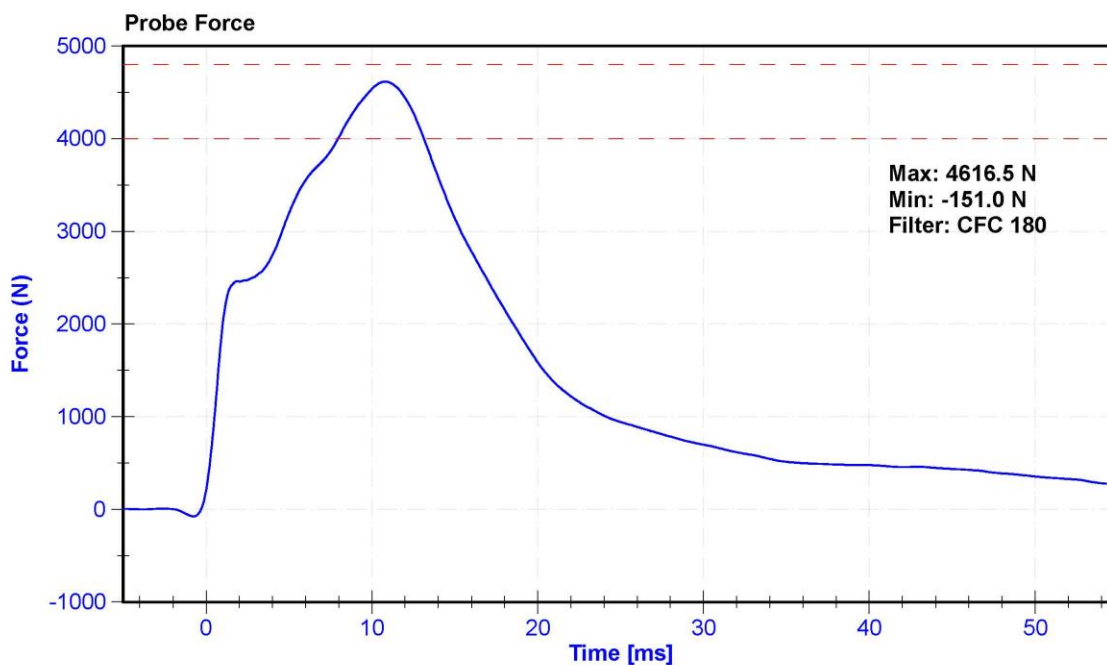
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K.Brogan

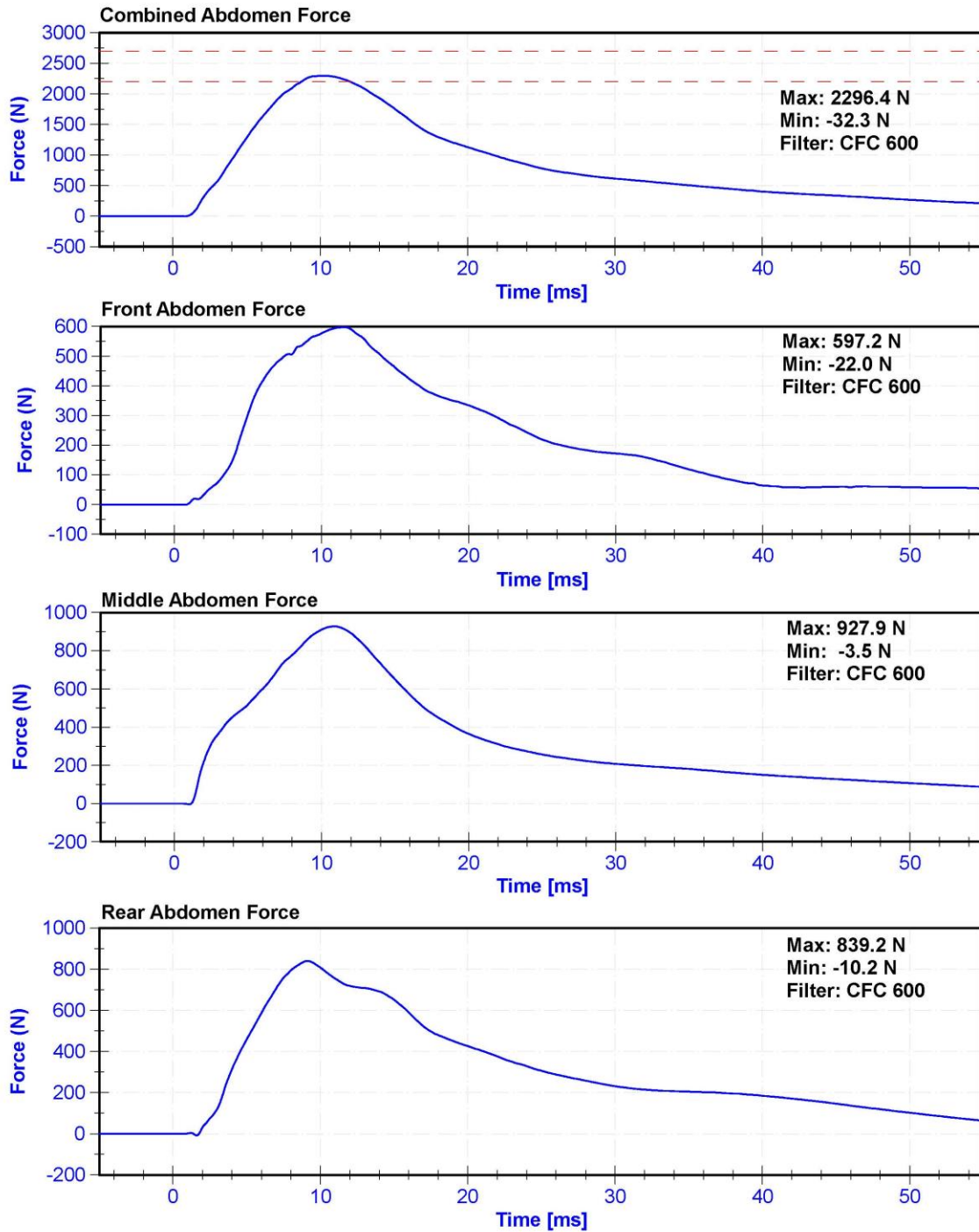
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	29	Pass
Velocity	3.9	4.1	m/s	4.09	Pass
Combined Abdomen Force	2200	2700	N	2296.4	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	10.15	Pass
Resistive Probe Force	4000	4800	N	4616.5	Pass
Time at Peak Resistive Force	10.6	13.0	ms	10.80	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







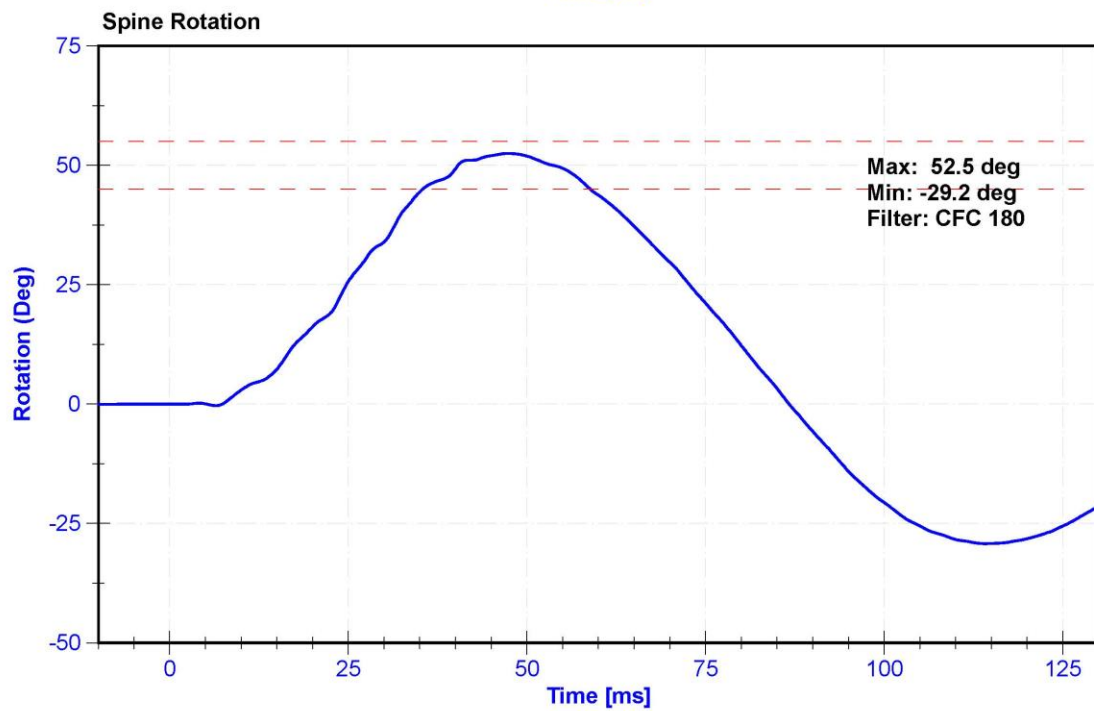
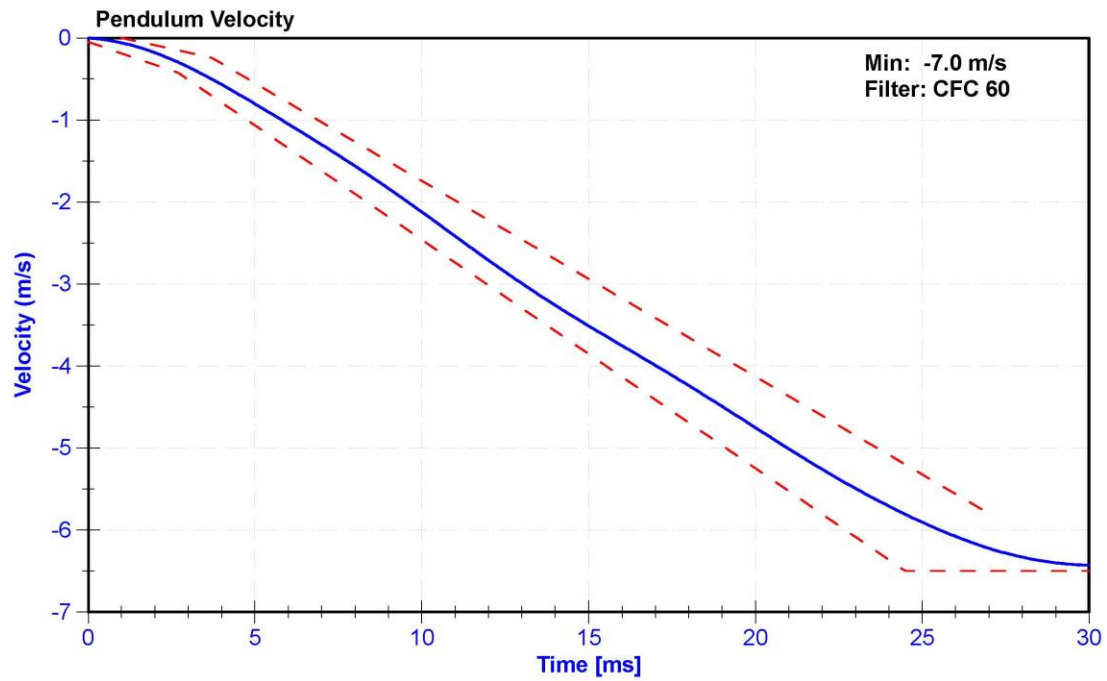
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

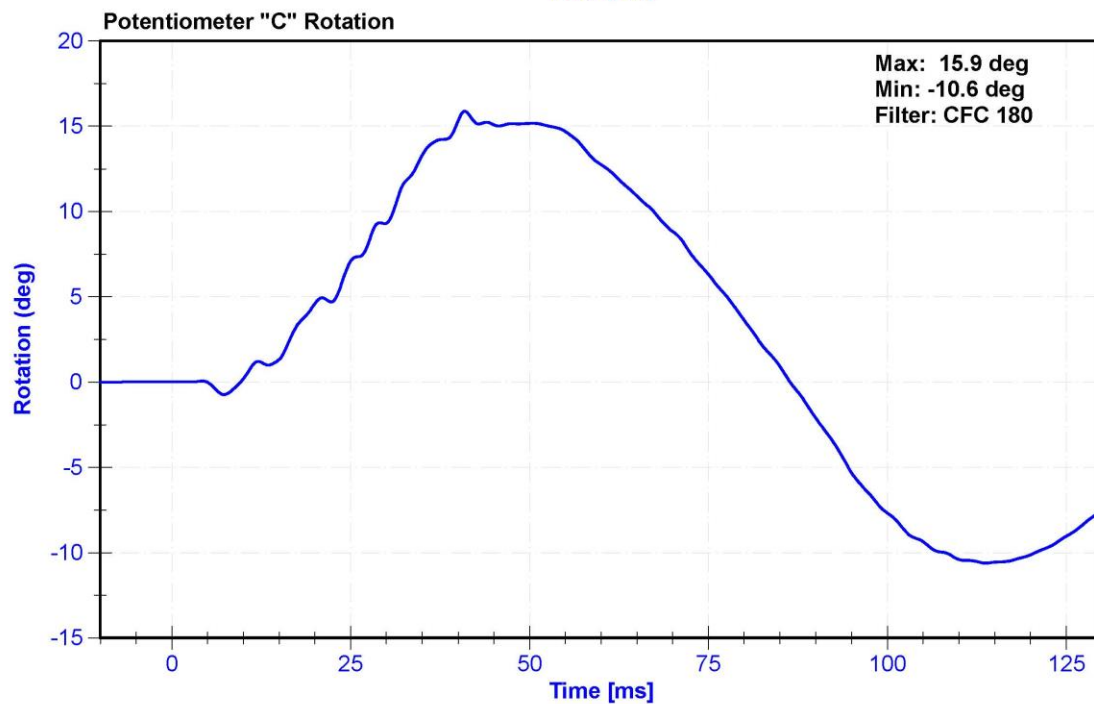
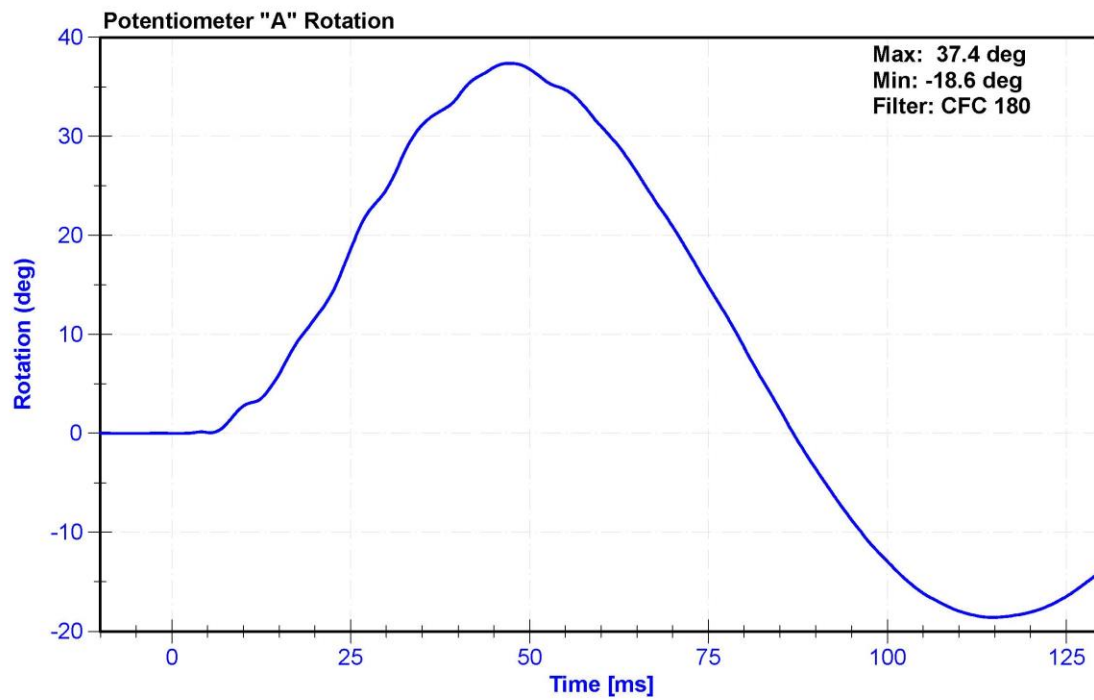
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	39.2	Pass
Velocity	5.95	6.15	m/s	6.005	Pass
Lateral Spine Rotation	45	55	deg	52.5	Pass
Time at Maximum Rotation	39	53	ms	47.4	Pass
Time of Decay to Zero Degrees	37	57	ms	39.4	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





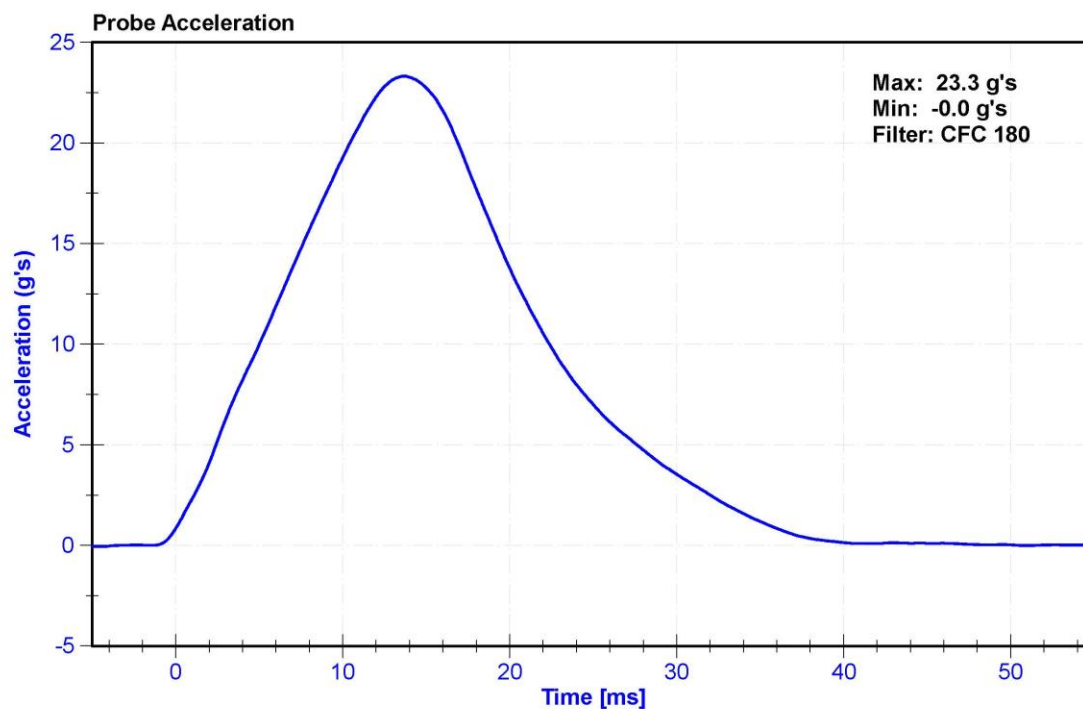
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	F034	Laboratory Supervisor	K. Brogan

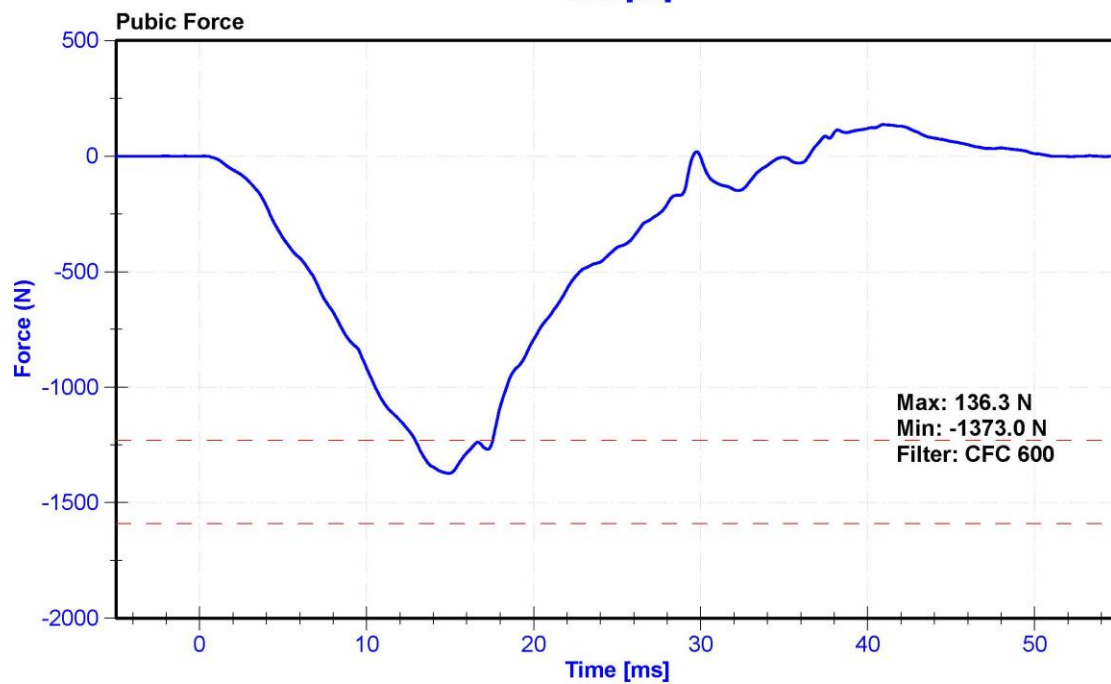
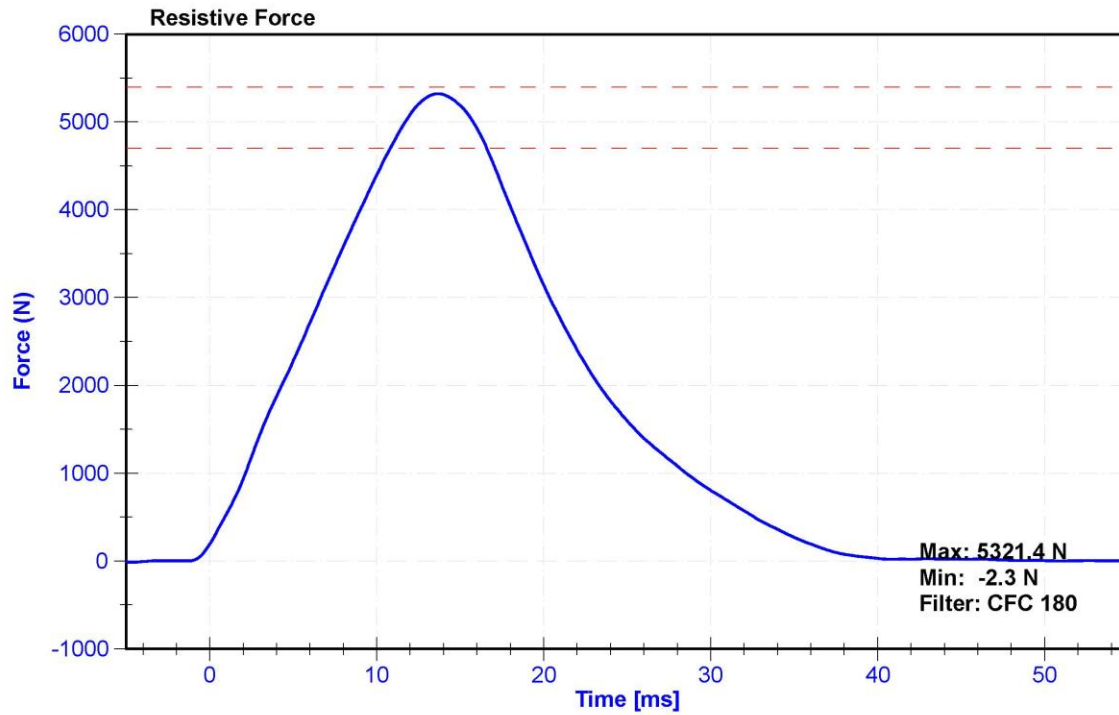
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	28.1	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Resistive Force	4700	5400	N	5321.4	Pass
Time at Peak Resistive Force	11.8	16.1	ms	13.65	Pass
Pubic Force	-1590	-1230	N	-1373.0	Pass
Time at Peak Pubic Force	12.2	17.0	ms	14.90	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

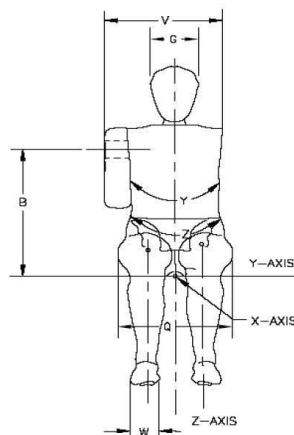
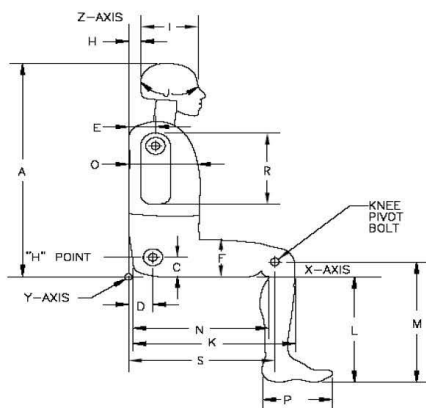


External Measurements - SID-IIs

Technician: **K. Dutton**

Date: **04/07/2020**

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	102	Pass
F	Thigh Clearance	119	135	125	Pass
G	Head Breadth	140	148	145	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	186	Pass
J	Head Circumference	541	551	545	Pass
K	Buttock to Knee Length	514	540	532	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	402	Pass
N	Buttock Popliteal Length	416	442	432	Pass
O	Chest Depth w/o jacket	195	211	205	Pass
P	Foot Length	216	232	221	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	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

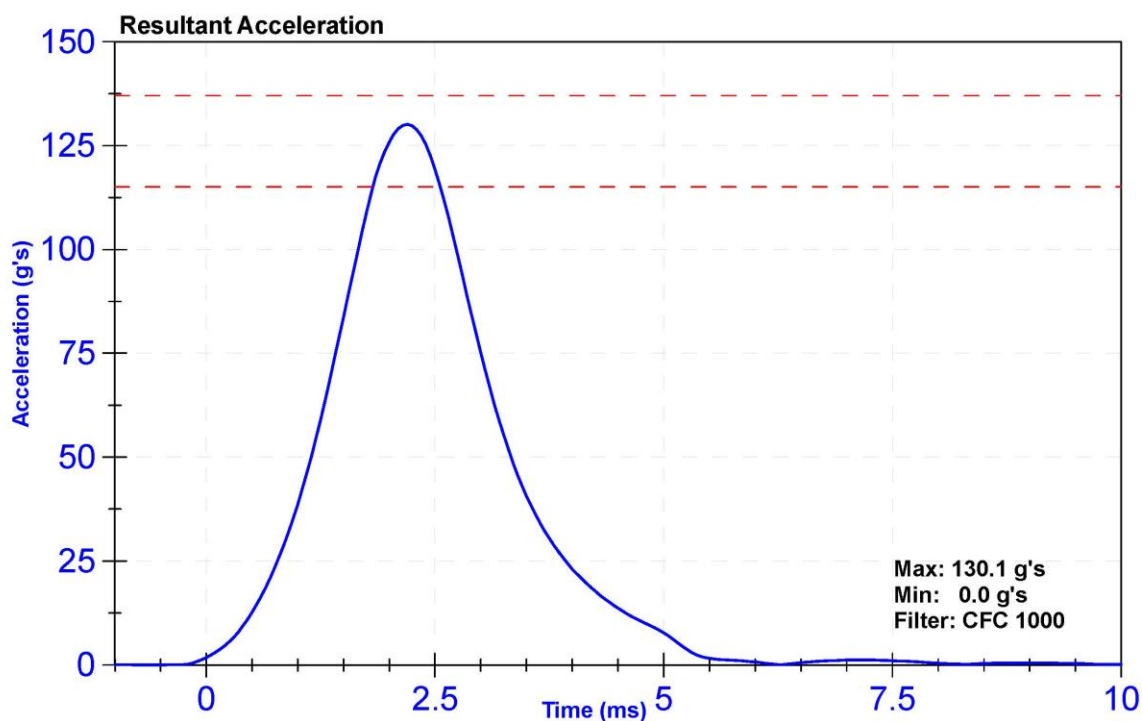
ATD Manufacturer	FTSS	Test Technician	E. Helenbrook
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

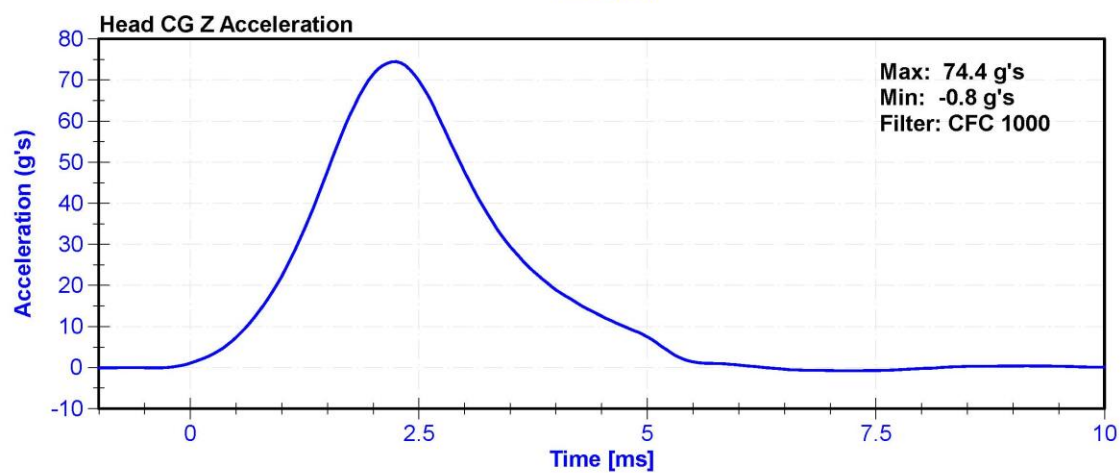
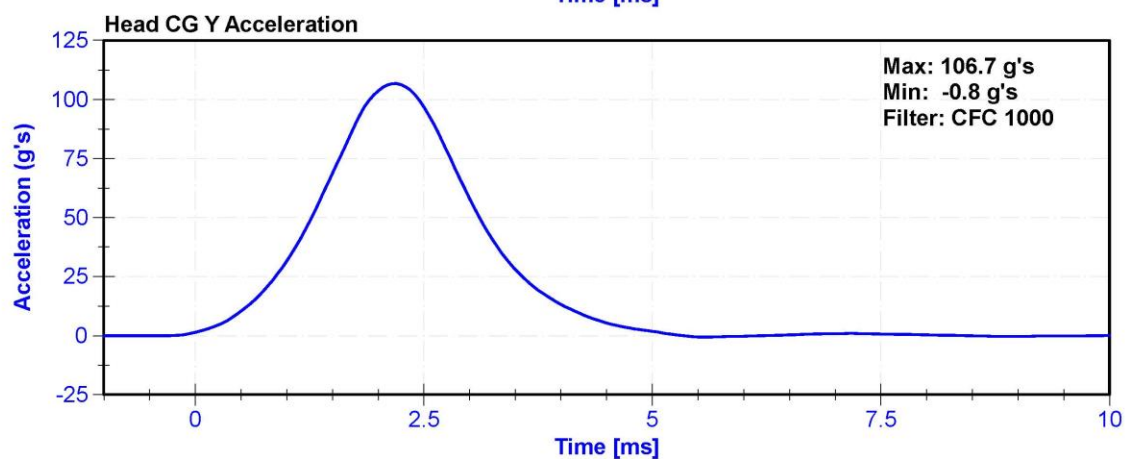
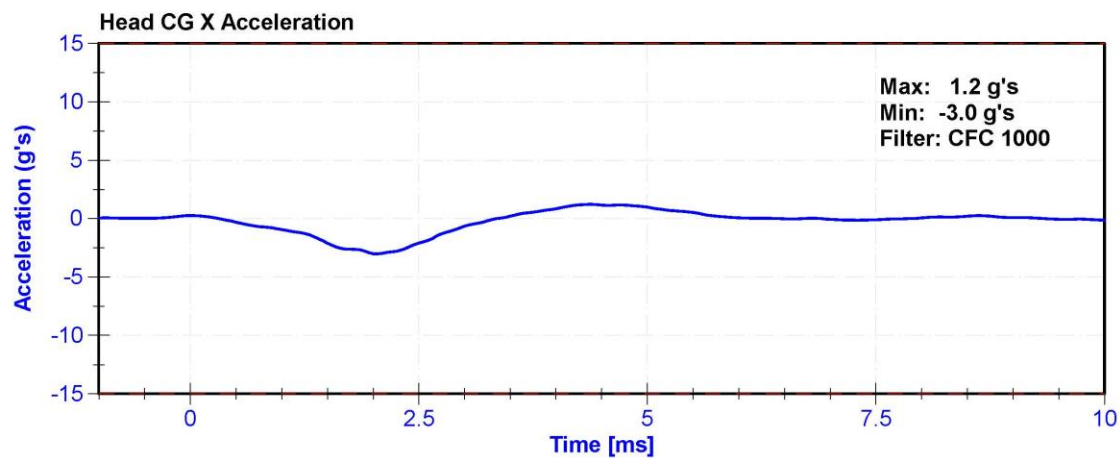
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	39.8	Pass
Resultant Acceleration	115	137	g's	130.1	Pass
Oscillation	0	15	%	0.9	Pass
Fore-Aft Acceleration	-15	15	g's	-3.0	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





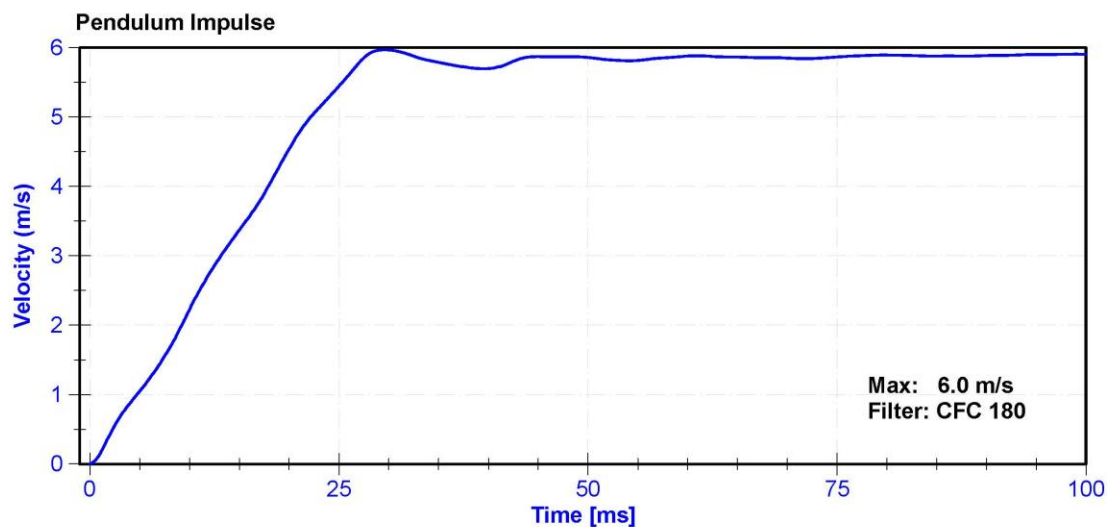
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

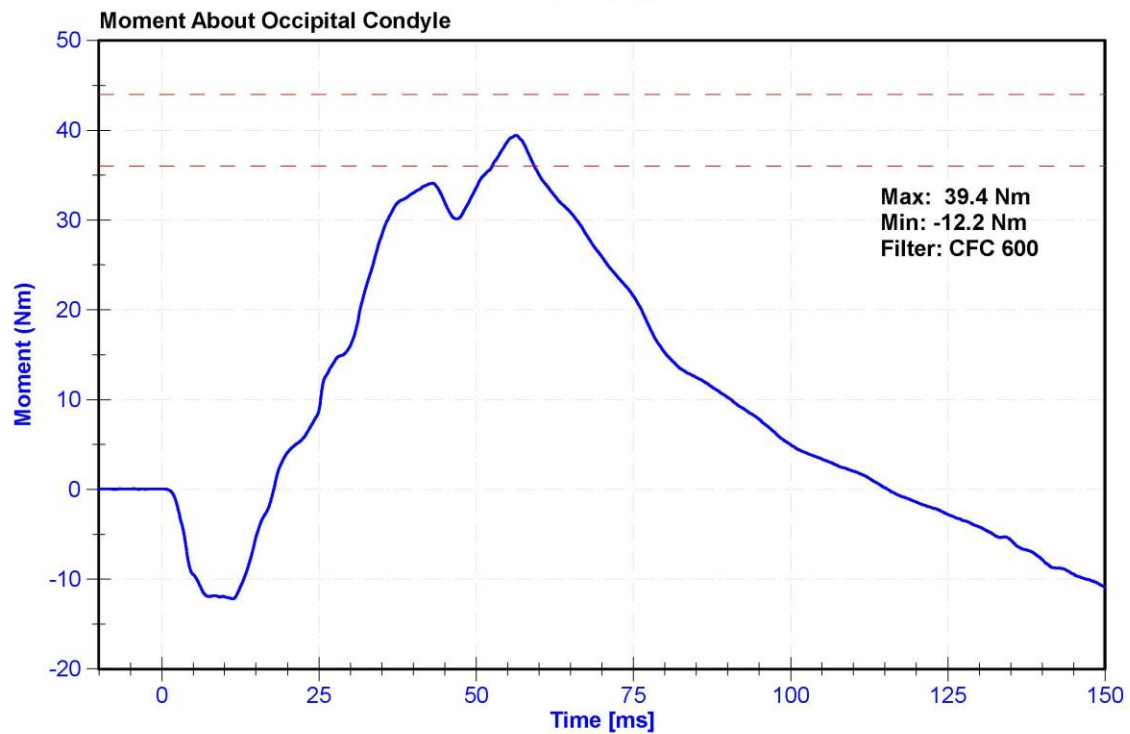
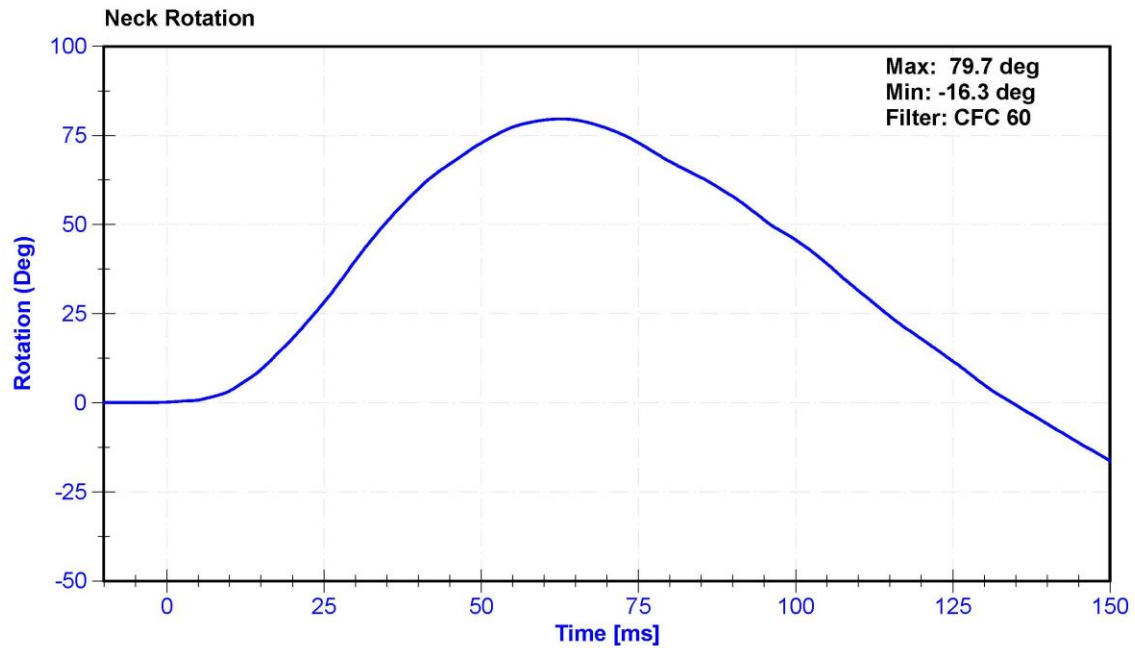
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	34.6	Pass
Velocity	5.51	5.63	m/s	5.549	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.23	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.37	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.54	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.44	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.96	Pass
Neck Rotation	71	81	deg	79.7	Pass
Time at Maximum Rotation	50	70	ms	62.7	Pass
Moment about the OC	36	44	Nm	39.4	Pass
Moment Decay to 0 Nm	102	126	ms	115.5	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





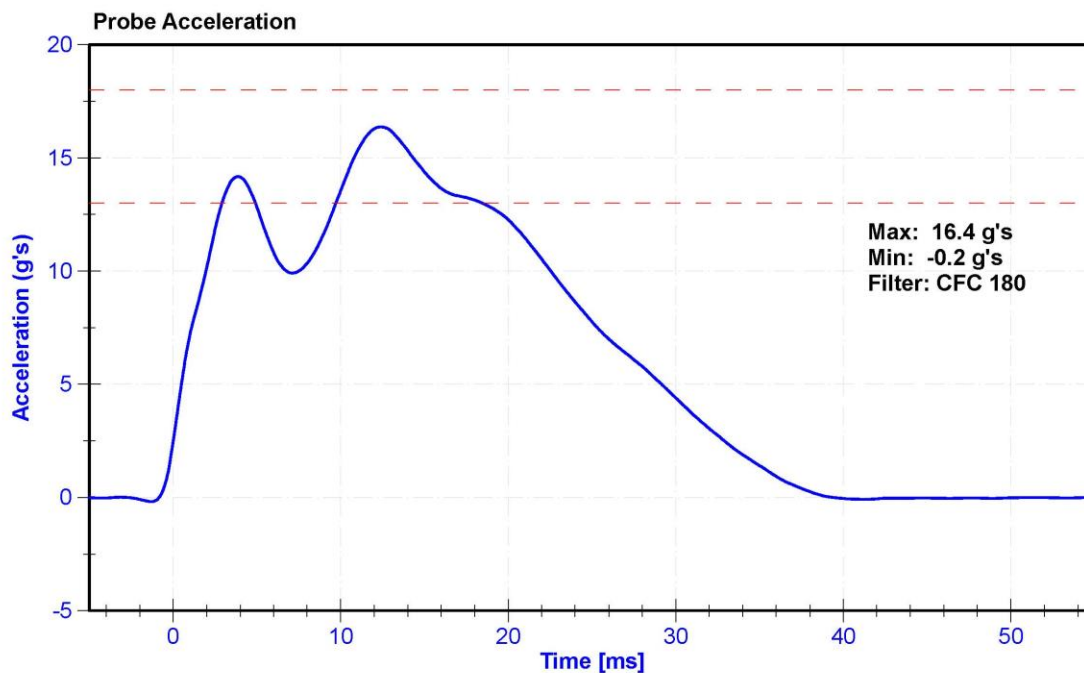
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

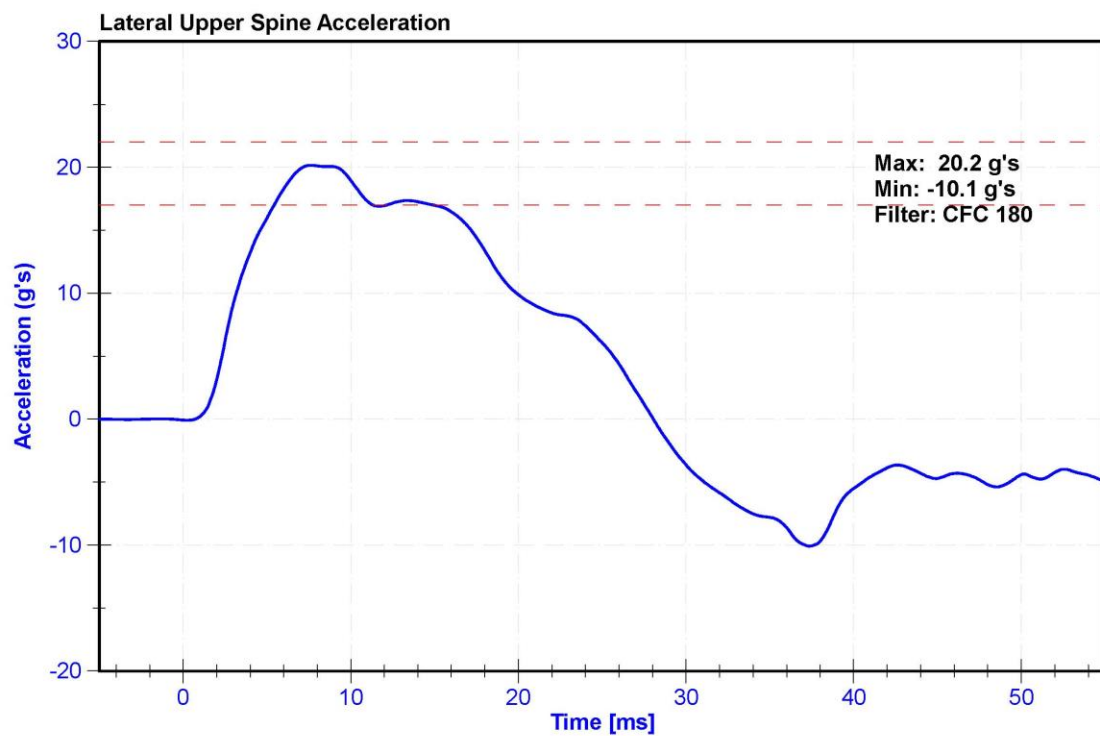
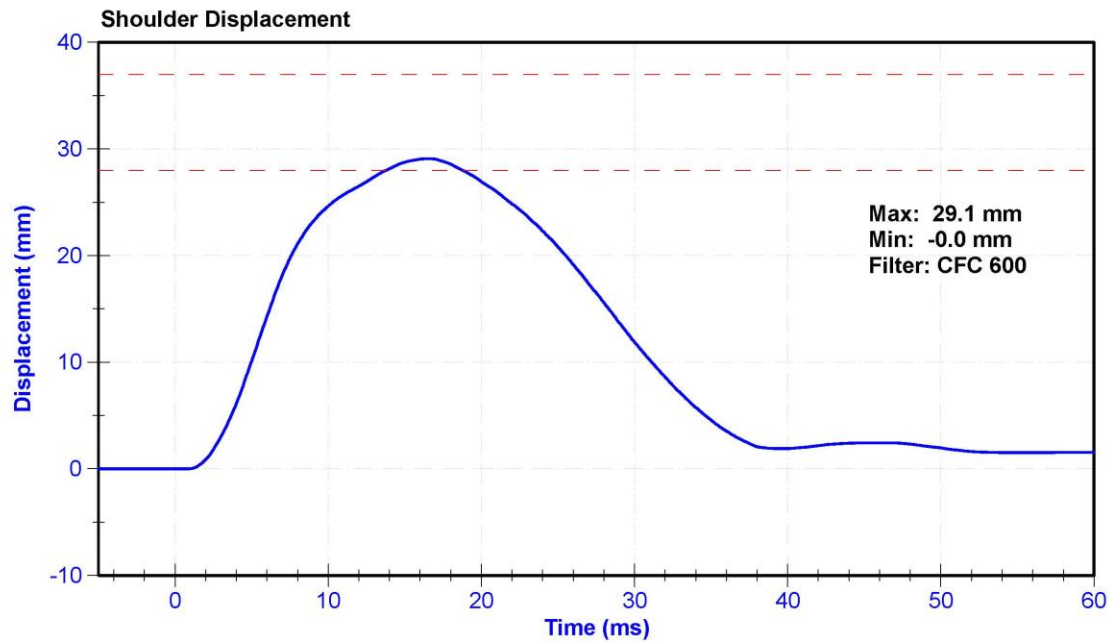
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	35.5	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	13	18	g's	16.4	Pass
Shoulder Deflection	28	37	mm	29.1	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.2	Pass

Transducer Calibrations

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





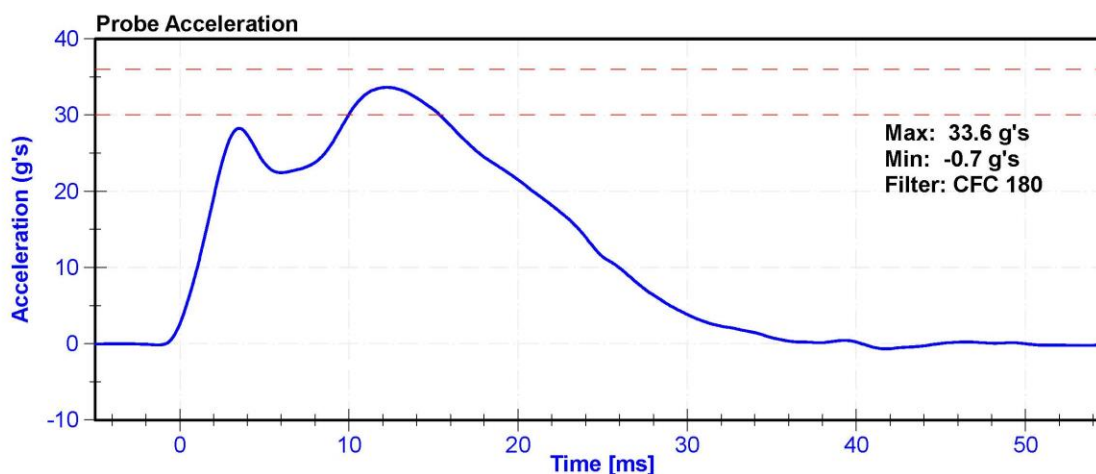
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

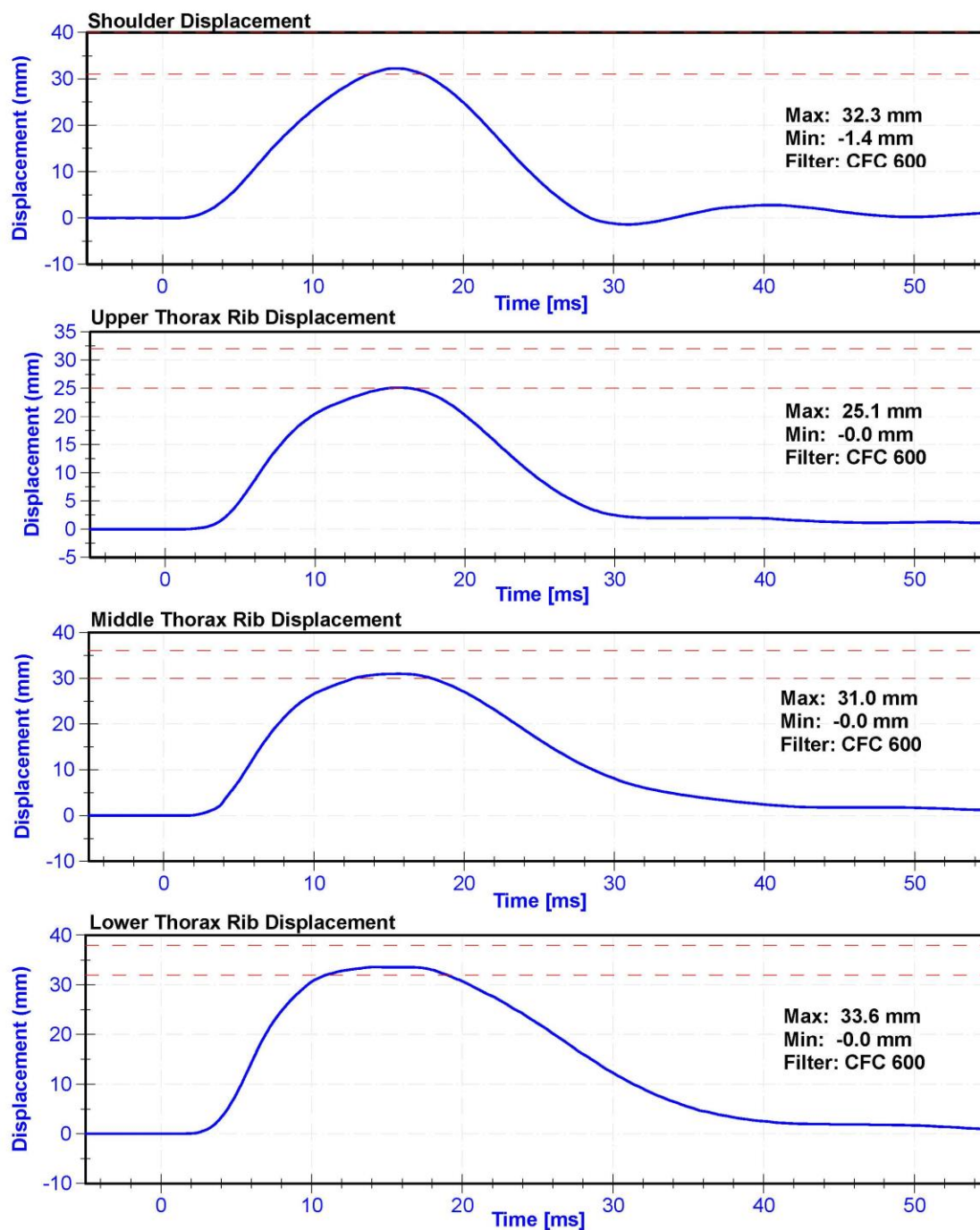
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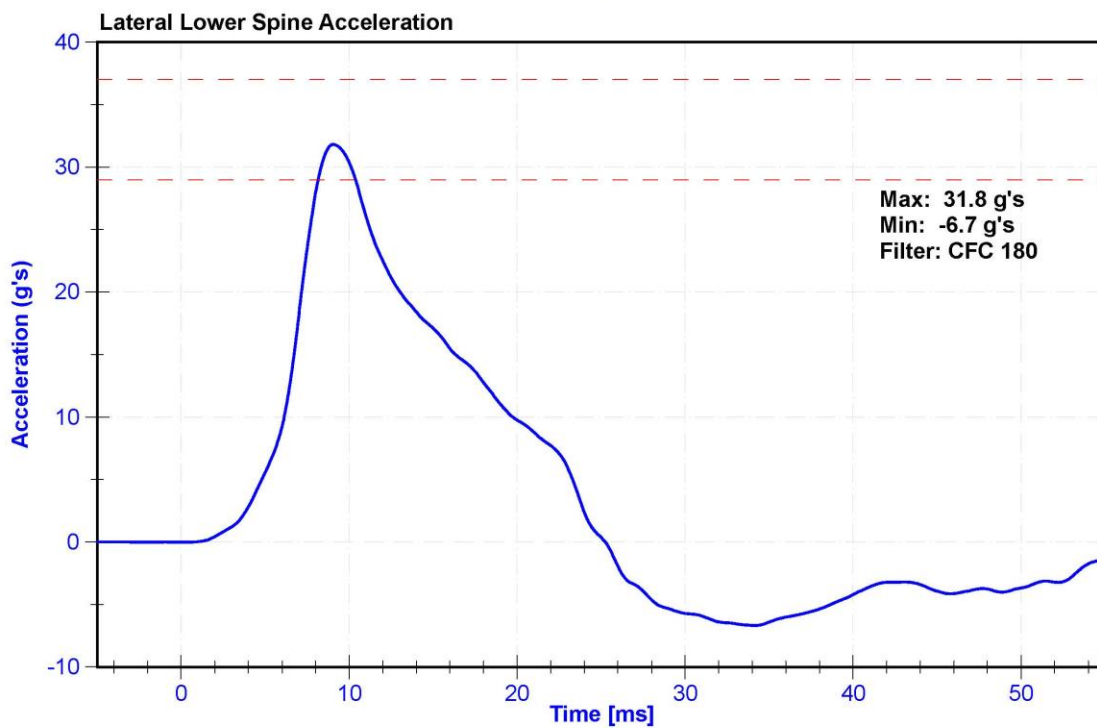
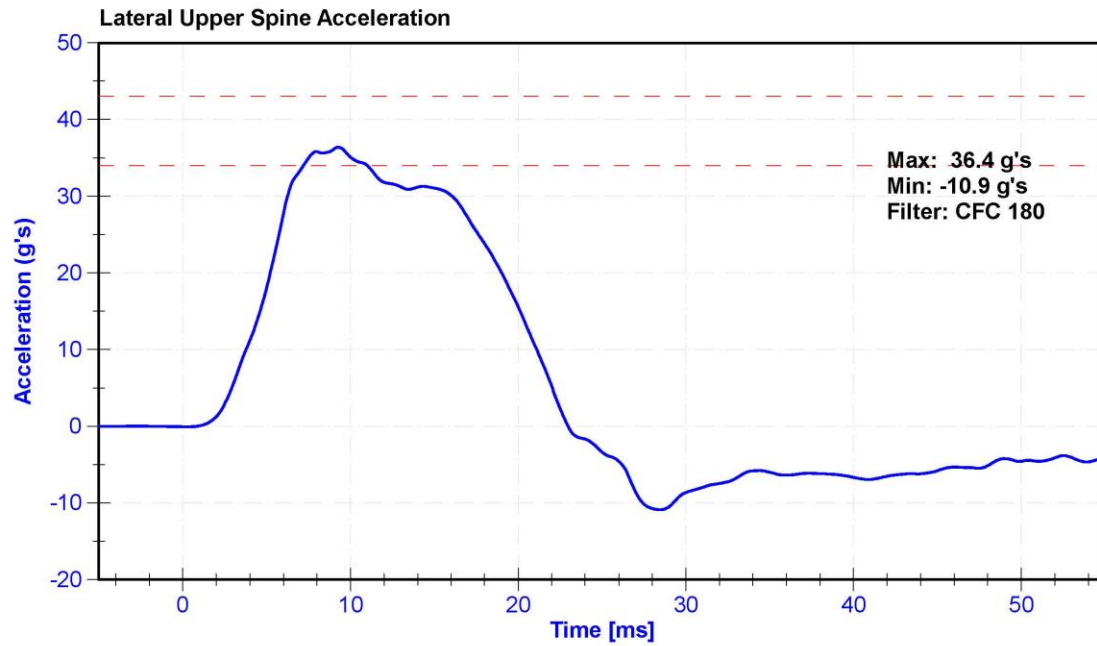
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	36.5	Pass
Velocity	6.6	6.8	m/s	6.70	Pass
Probe Acceleration after 5 ms	30	36	g's	33.6	Pass
Lateral Upper Spine Acceleration	34	43	g's	36.4	Pass
Lateral Lower Spine Acceleration	29	37	g's	31.8	Pass
Shoulder Deflection	31	40	mm	32.3	Pass
Upper Thorax Rib Deflection	25	32	mm	25.1	Pass
Mid Thorax Rib Deflection	30	36	mm	31.0	Pass
Lower Thorax Rib Deflection	32	38	mm	33.6	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







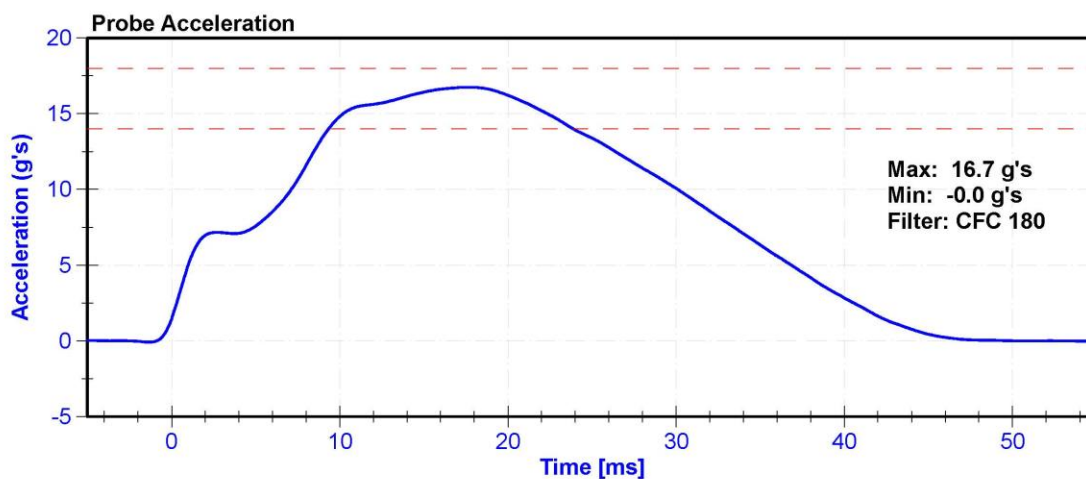
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

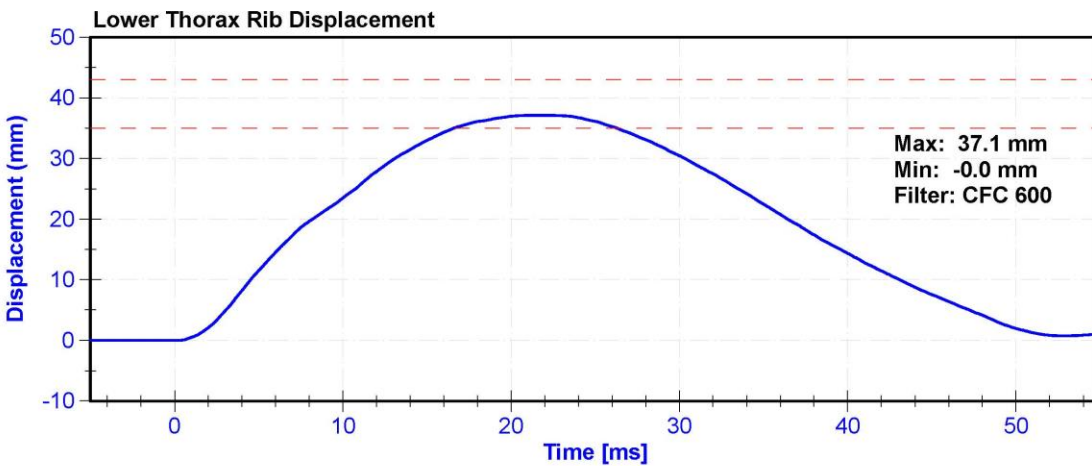
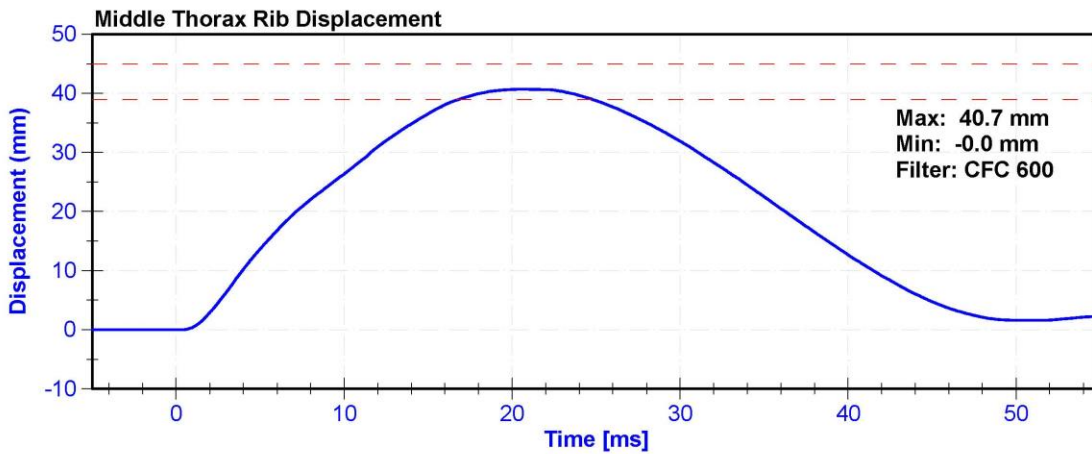
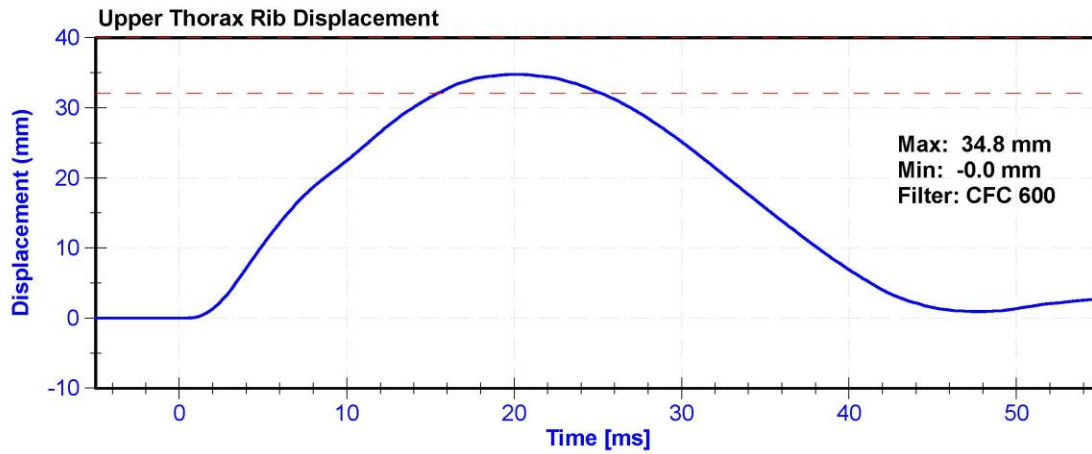
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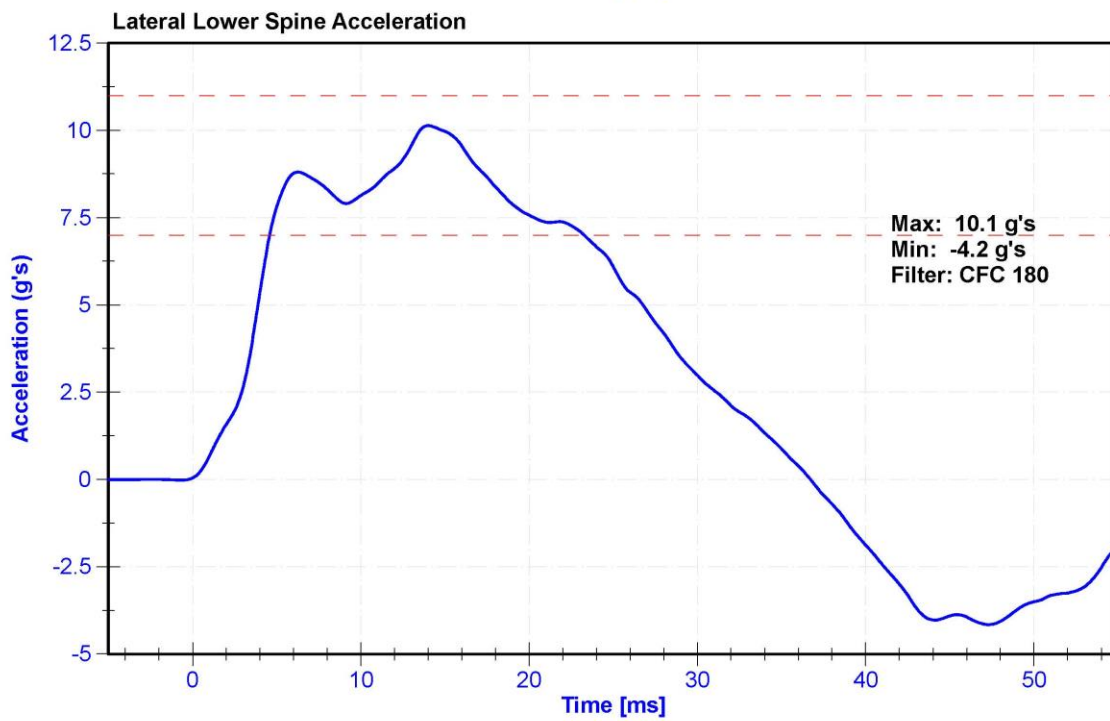
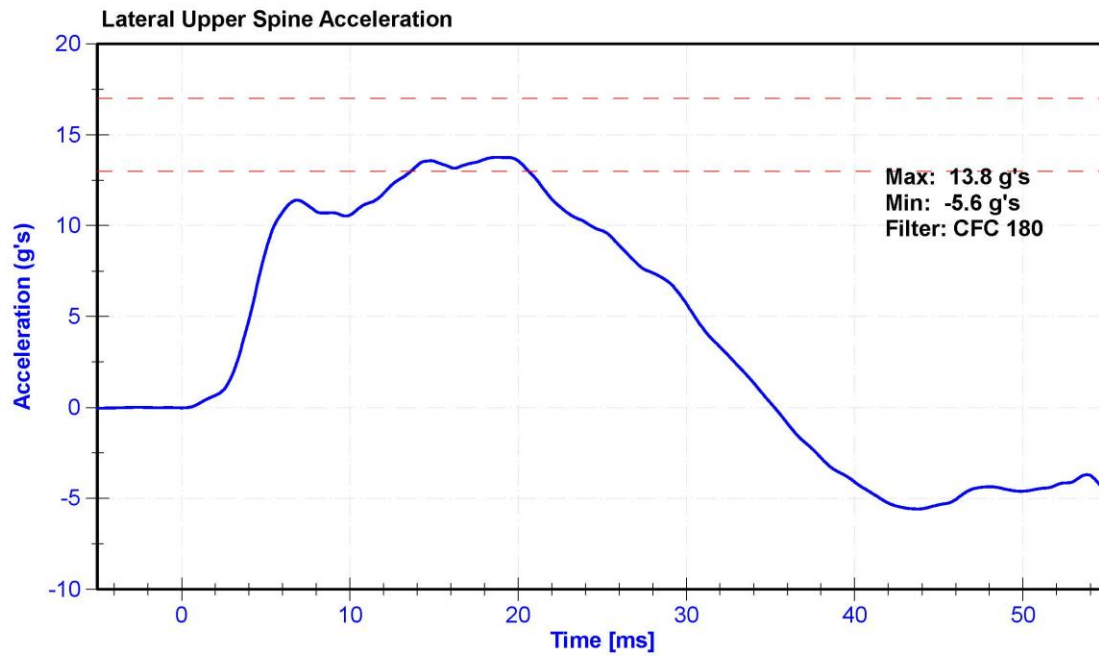
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	35.5	Pass
Velocity	4.2	4.4	m/s	4.39	Pass
Probe Acceleration	14	18	g's	16.7	Pass
Lateral Upper Spine Acceleration	13	17	g's	13.8	Pass
Lateral Lower Spine Acceleration	7	11	g's	10.1	Pass
Upper Thorax Rib Deflection	32	40	mm	34.8	Pass
Middle Thorax Rib Deflection	39	45	mm	40.7	Pass
Lower Thorax Rib Deflection	35	43	mm	37.1	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







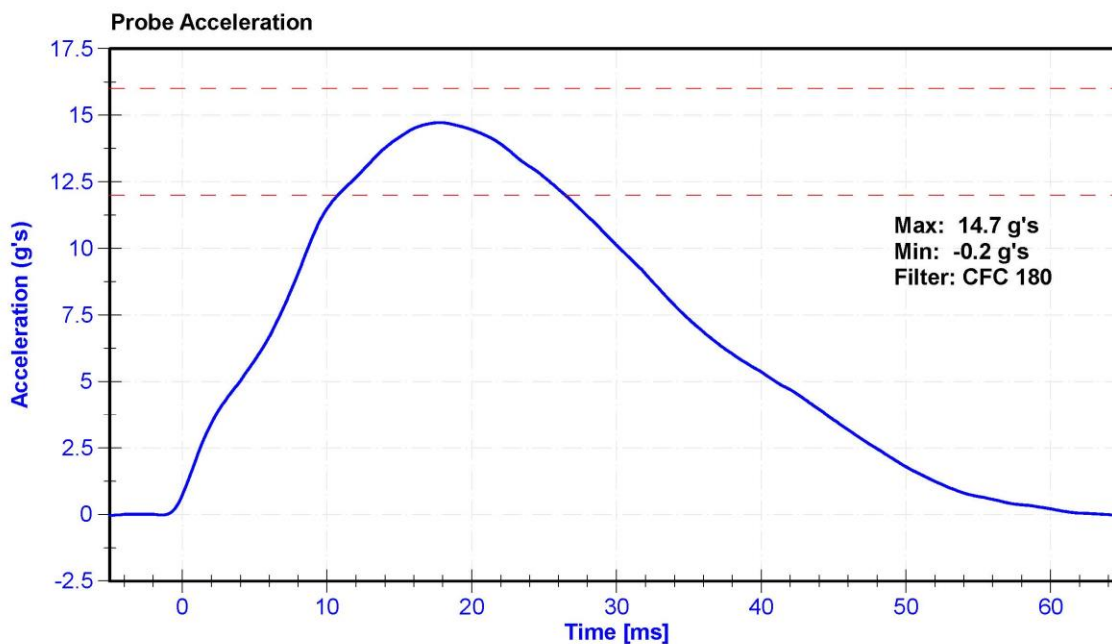
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

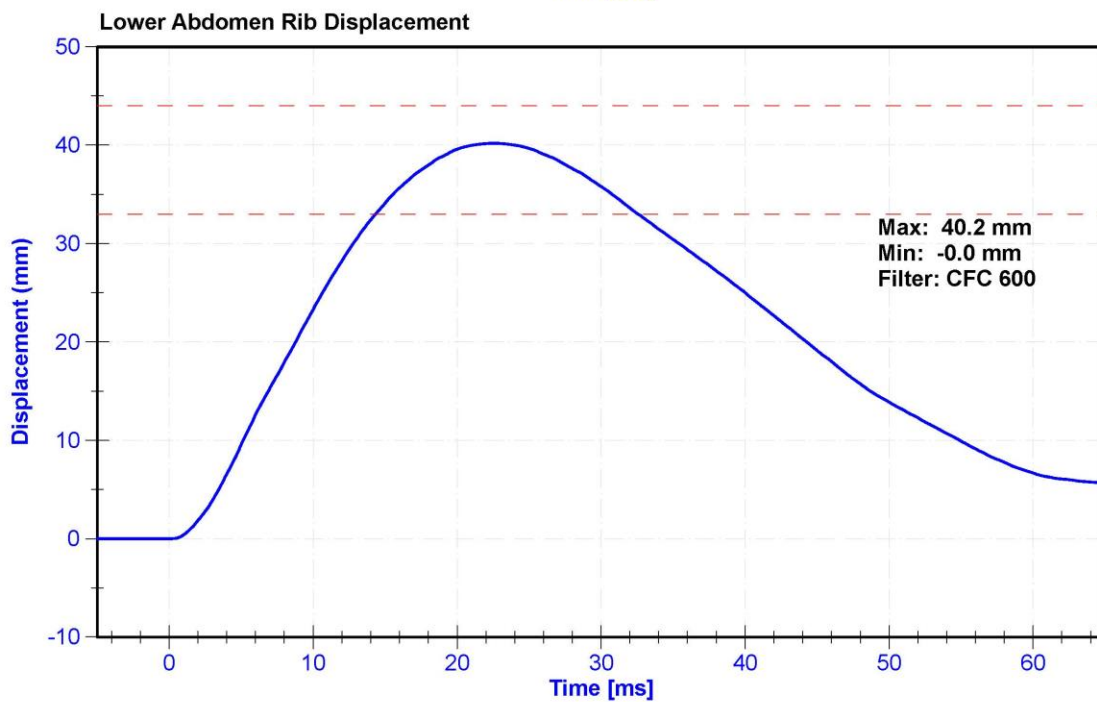
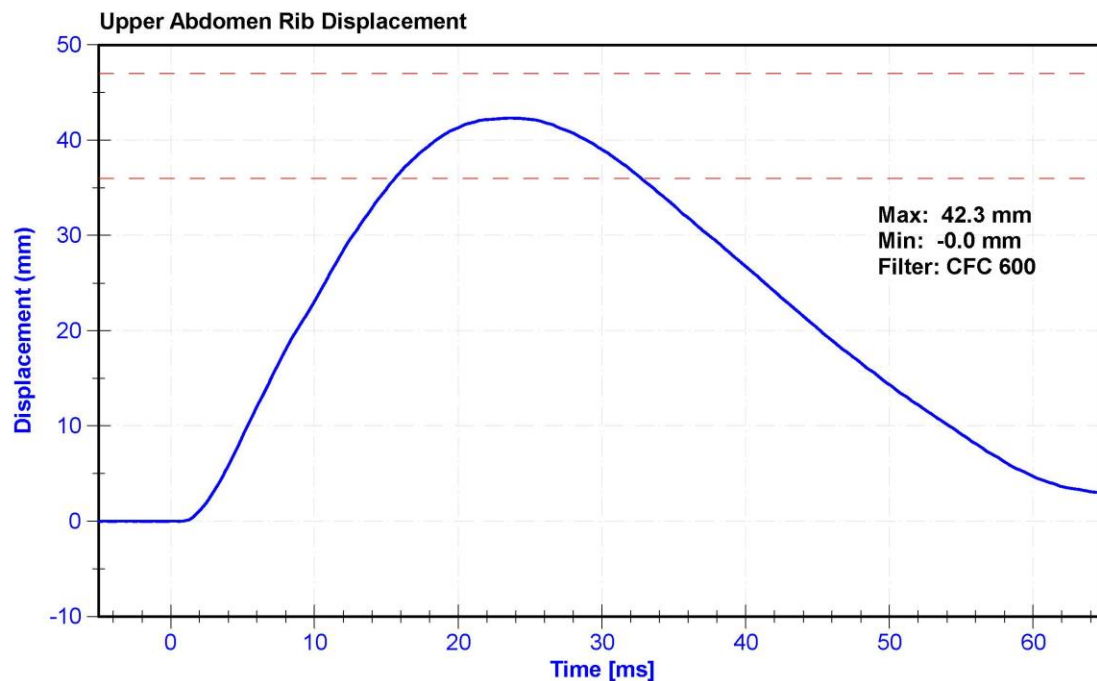
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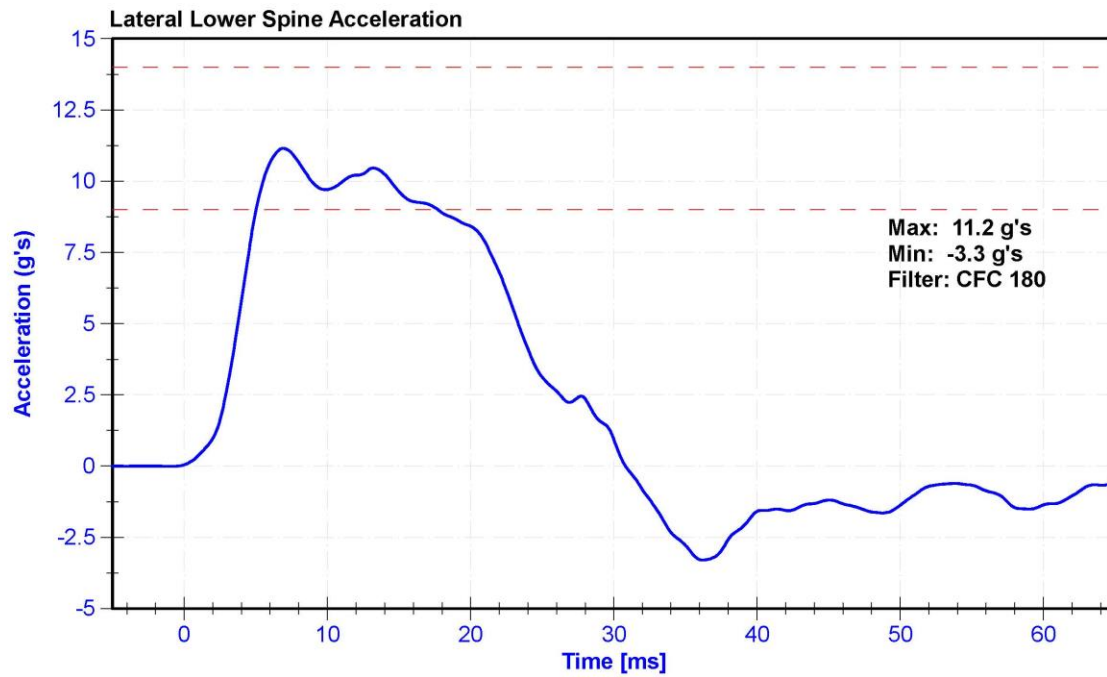
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	33.4	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	12	16	g's	14.7	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.2	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.3	Pass
Lower Abdomen Rib Deflection	33	44	mm	40.2	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







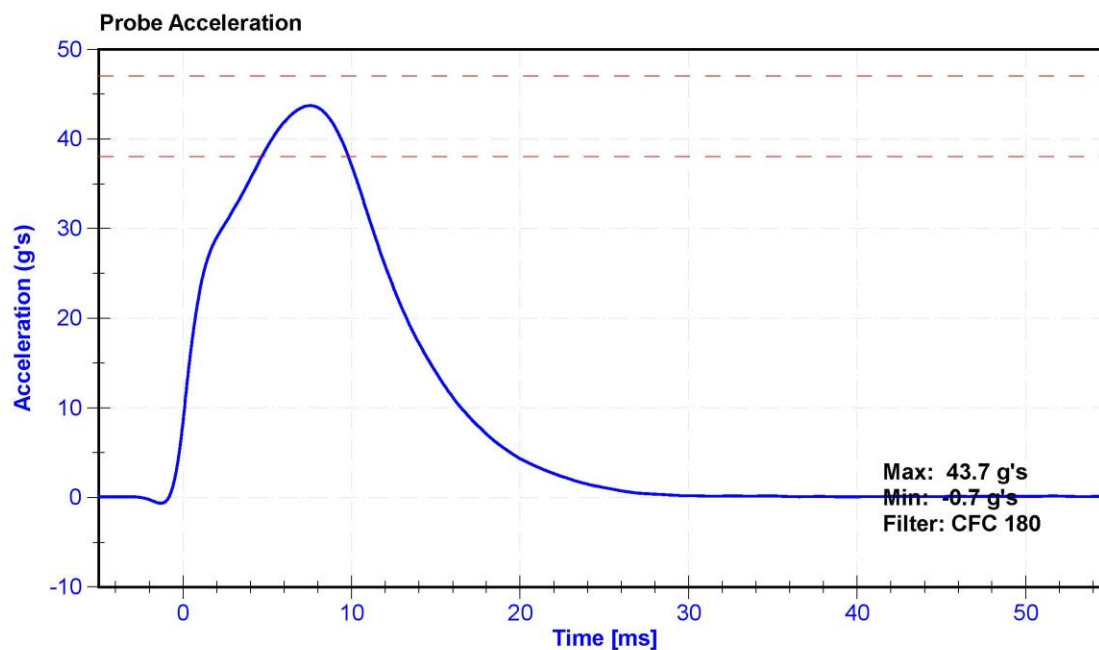
ATD Manufacturer	FTSS	Test Technician	D.Reinhard
ATD Serial Number	300	Laboratory Supervisor	K. Brogan

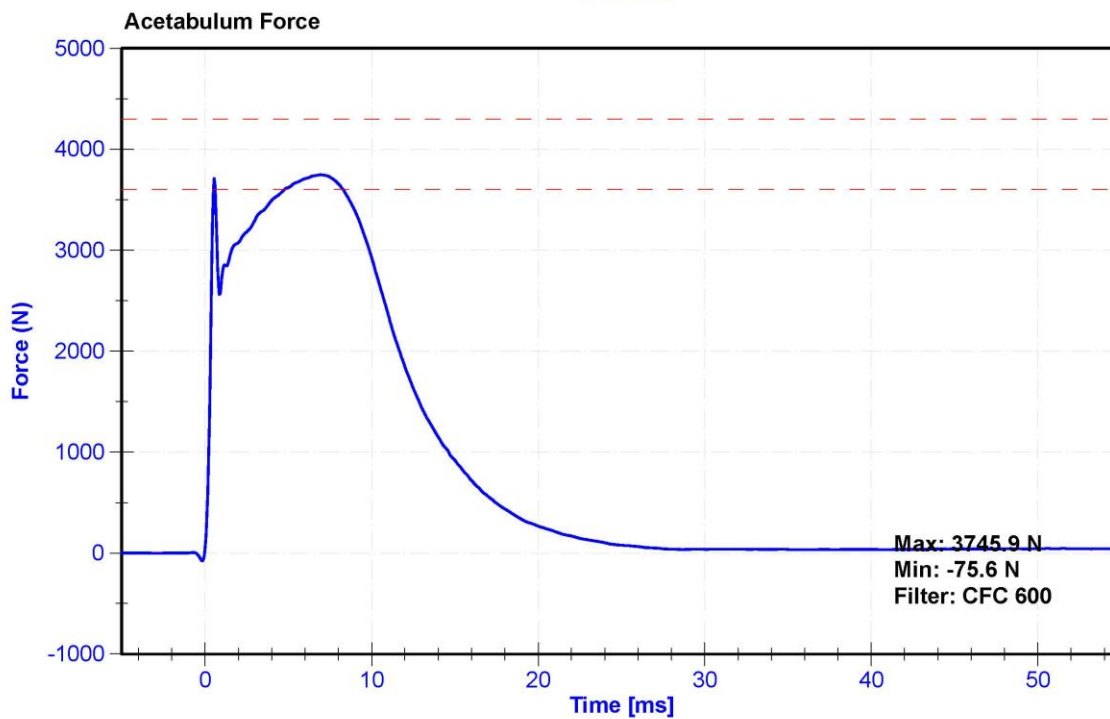
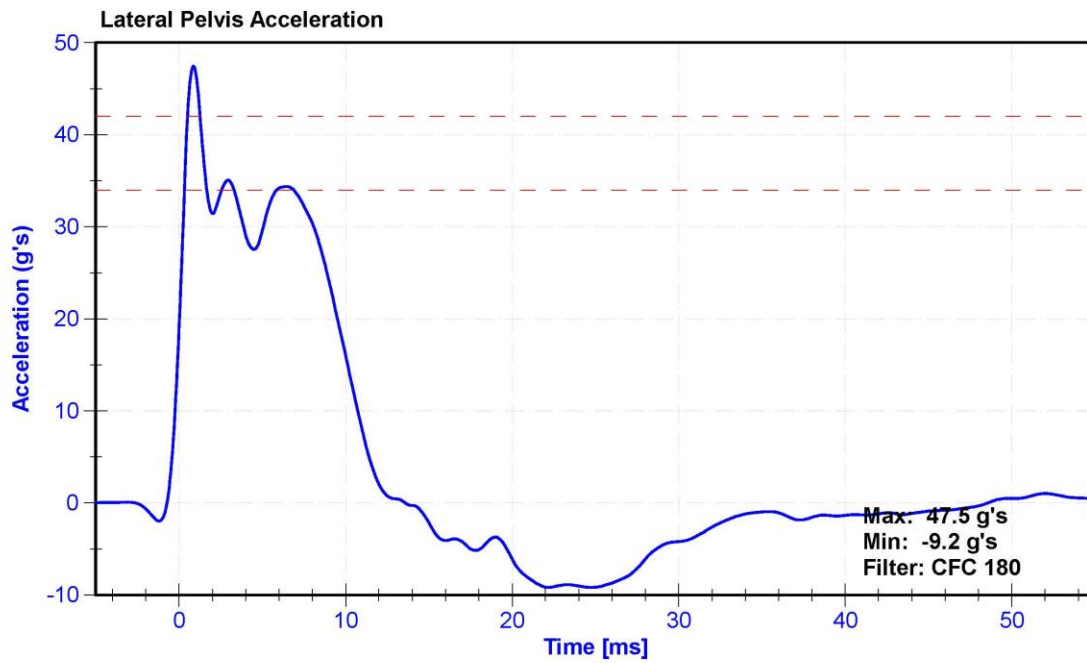
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	29	Pass
Velocity	6.6	6.8	m/s	6.63	Pass
Probe Acceleration	38	47	g's	43.7	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	34.4	Pass
Acetabulum Force	3600	4300	N	3745.9	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	13577	9/25/2019	N/A
Crash Test Plug	SACO	13471	9/20/2019	N/A







300
Cent Plug J
4/10/20

SID-11s Pelvis Plug Certification Test

Plug S/N 13577

Test Number 11221

Report Number 11259

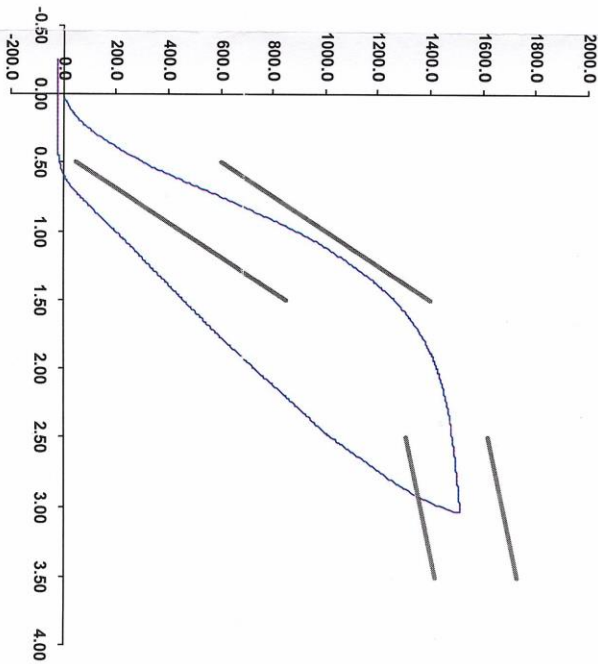
Test Date 9/25/2019 12:22:23 PM

Force (-N) vs Extension (-mm)

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	308.32	50.00
Force @ 1.5 mm (N)	1,266.86	850.00
Force @ 2.5 mm (N)	1,485.55	1,306.00
Force @ 3.0 mm (N)	1,513.47	1,361.00

Testing Machine STM-20 596554;
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
SACO Research

25-Sep-19

By: NC

Date: 9/25/2019

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



300
Crash Plug
4/10/20

SID-IIs Pelvis Plug Certification Test

Plug S/N 13471

Test Number 11114

Report Number 11152

Test Date 9/20/2019 10:41:38 AM

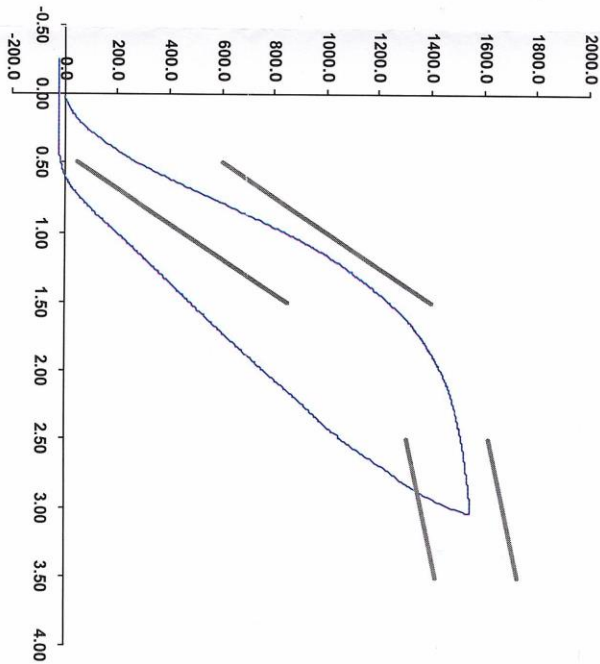
Force (-N) vs Extension (-mm)

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	282.01	50.00
Force @ 1.5 mm (N)	1,242.65	850.00
Force @ 2.5 mm (N)	1,517.25	1,306.00
Force @ 3.0 mm (N)	1,550.93	1,361.00

Testing Machine STM-20 596554;
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 20-Sep-19

SACO Research

By: DC

Date: 9/20/2019

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

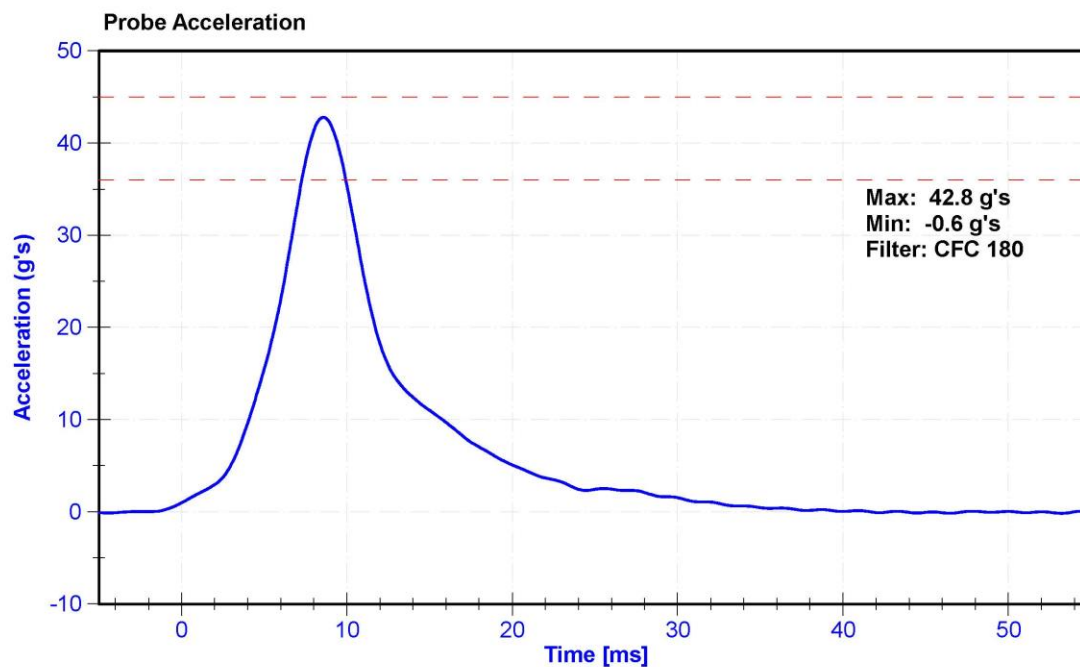
ATD Manufacturer	FTSS	Test Technician	K. Brogan
ATD Serial Number	300	Laboratory Supervisor	D.Reinhard

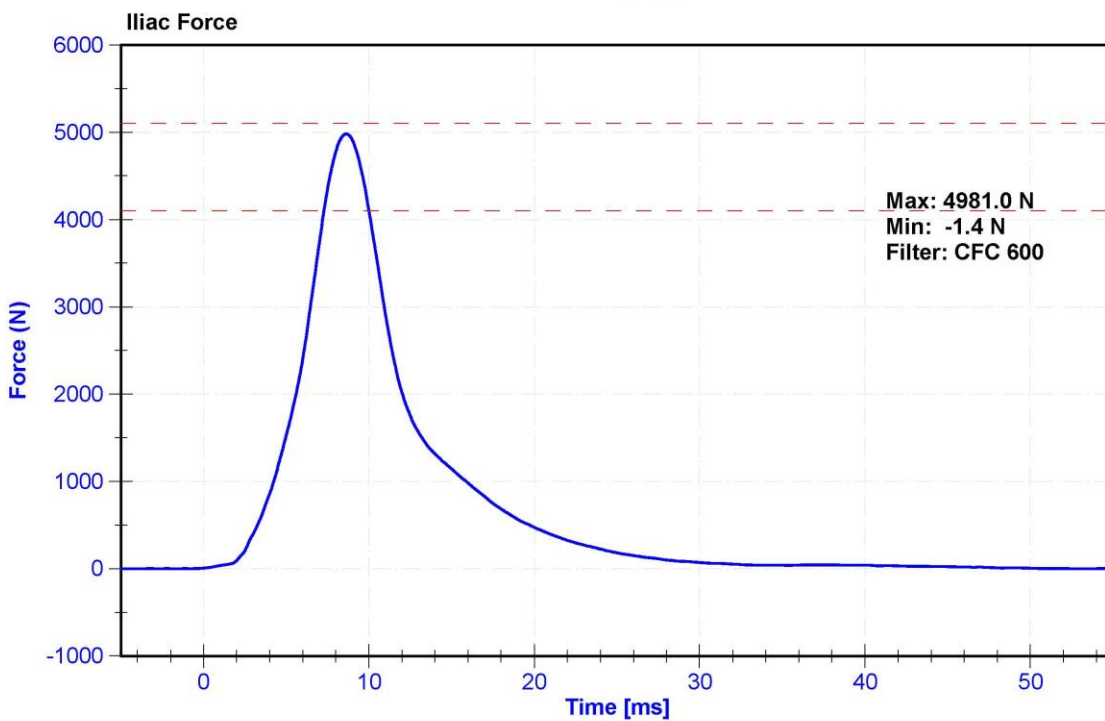
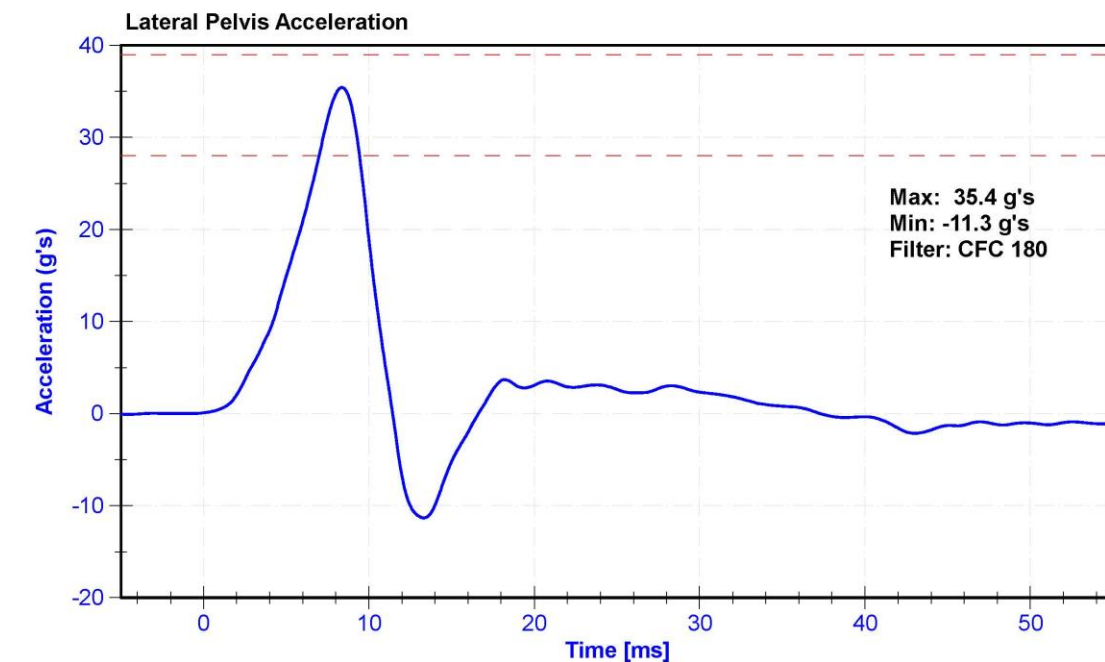
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	38.0	Pass
Velocity	4.2	4.4	m/s	4.20	Pass
Probe Acceleration	36	45	g's	42.8	Pass
Lateral Pelvis Acceleration	28	39	g's	35.4	Pass
Iliac Force	4100	5100	N	4981.0	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	3/13/2020
		Y	AC-P39731	ENDEVCO	3/13/2020
		Z	AC-P22639	ENDEVCO	3/13/2020
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)				13438	SACO	9/20/2019
Pelvis Plug (non-struck side)				-	-	-

Table 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A315704	MSI 1201-1000	1/29/2020
	Vehicle Center of Gravity	Y	A315782	MSI 1201-1000	1/28/2020
	Vehicle Center of Gravity	Z	A315844	MSI 1201-1000	3/9/2020
2	Right Sill at Front Seat	X	A315967	MSI 1201-1000	3/6/2020
	Right Sill at Front Seat	Y	A315973	MSI 1201-1000	3/6/2020
	Right Sill at Front Seat	Z	A315975	MSI 1201-1000	3/6/2020
3	Right Sill at Rear Seat	X	A315015	MSI 1201-1000	3/7/2020
	Right Sill at Rear Seat	Y	A315196	MSI 1201-1000	3/6/2020
	Right Sill at Rear Seat	Z	A315961	MSI 1201-1000	3/7/2020
4	Left Sill at Front Door	Y	A315746	MSI 1201-1000	3/30/2020
5	Left Sill at Rear Door	Y	A315930	MSI 1201-1000	3/31/2020
6	Left A-Post Lower	Y	A315738	MSI 1201-1000	3/30/2020
7	Left A-Post Middle	Y	A315082	MSI 1201-1000	3/26/2020
8	Left B-Post Lower	Y	A315727	MSI 1201-1000	3/30/2020
9	Left B-Post Middle	Y	A315737	MSI 1201-1000	3/30/2020
10	Front Seat Track	Y	AC-A280001	MSI 1201-1000	3/26/2020
11	Rear Seat Track or Structure	Y	A284985	MSI 1201-1000	3/26/2020
12	Right Rear Occ. Compartment	Y	A284329	MSI 1201-1000	3/26/2020
13	Engine Block	X	A315705	MSI 1201-1000	3/26/2020
	Engine Block	Y	A315977	MSI 1201-1000	3/24/2020
14	Rear Floorpan Above Axle	X	A315083	MSI 1201-1000	3/16/2020
	Rear Floorpan Above Axle	Y	A315092	MSI 1201-1000	3/16/2020
	Rear Floorpan Above Axle	Z	A315919	MSI 1201-1000	3/16/2020

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A255112	MSI 58-2000-360	11/21/2019
MDB Center of Gravity	Y	A255126	MSI 58-2000-360	11/21/2019
MDB Center of Gravity	Z	A255143	MSI 58-2000-360	11/21/2019
Left Frame at Rear Axle Centerline	X	A280025	MSI 1201-1000	11/22/2019
Left Frame at Rear Axle Centerline	Y	A280334	MSI 1201-1000	11/22/2019