REPORT NUMBER: SINCAP-CAL-25-002

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

General Motors LLC
2025 Cadillac XT4
5 Door SUV

NHTSA No: M20250103

PREPARED BY:
CALSPAN CORPORATION
P.O. BOX 400
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March 12, 2025

FINAL REPORT

PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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15. Supplementary Notes		

16. Abstract

A 55/28, (61.90kph / 38.5 mph), 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2025 Cadillac XT4 5 Door SUV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP MDB 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 February 6, 2025.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.05 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle was 21°C. The target vehicle's maximum post-test static crush was 243 mm located at level 3. The test vehicle's occupant performance data is as follows:

Measurement Description	Driver ATD (ES-2re)		
	Units	IARV	Result
Head Injury Criteria (HIC36)		1000	144.636
Maximum Thorax Rib Deflection	mm	44	17.478
Total Abdominal Force	N	2500	839.466
Pubic Symphysis Force	N	6000	1433.497
Lower Spine (T12) Resultant Acceleration	G	82*	29.575
Measurement Description	**Passenger ATD (SID-IIs)**		
	Units	**IARV**	**Result**
Head Injury Criteria (HIC36)		1000	92.115
Maximum Thorax Rib Deflection	mm	38*	27.205
Lower Spine (T12) Resultant Acceleration	G	82	56.052
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2209.255
Maximum Abdominal Rib Deflection	mm	45*	40.459

**Proposed IARV*

The two doors on the struck side of vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.

17. Key Words	*18. Distribution Statement*
New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave. SE Washington, D.C. 20590

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SECTION 1

TEST PURPOSE AND PROCEDURE

This moving deformable barrier side impact test is part of the MY 2025 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number 693JJ920D000016. The purpose of this test is to generate comparative side impact performance in a 2025 Cadillac XT4 5 Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated March 2020.

SECTION 2

SUMMARY OF TEST RESULTS

A 2025 Cadillac XT4 5 Door 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 62.05 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 February 6, 2025. 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 March 2020. 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
Pubic 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	IARV	Result
Head Injury Criteria (HIC36)		1000	144.636
Maximum Thorax Rib Deflection	mm	44	17.478
Total Abdominal Force	N	2500	839.466
Pubic Symphysis Force	N	6000	1433.497
Lower Spine (T12) Resultant Acceleration	G	82*	29.575

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC36)		1000	92.115
Maximum Thorax Rib Deflection	mm	38*	27.205
Lower Spine (T12) Resultant Acceleration	G	82	56.052
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2209.255
Maximum Abdominal Rib Deflection	mm	45*	40.459

**Proposed IARV*

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 - Torso/Pelvis Airbag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

GENERAL COMMENTS:

1. P1 serial number - F033
2. P4 serial number - 300

Data Anomalies:

The following channel was questionable for:

- Right Rear Sill Y, Questionable data after 48.9 ms
- Left Front Sill Y, Exceeded calibration range at 7.4 ms
- Left B-Pillar Lower Y, Exceeded calibration range at 11.5 ms 16.1 ms
- Left B-Pillar Middle Y, Exceeded calibration range and saturated at 14 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: 2025 Cadillac XT4 5 Door SUV
NHTSA No.: M20250103
Test Program: NCAP Side MDB Impact Test
Test Date: 02/06/2025

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20250103
Model Year	2025
Make	Cadillac
Model	XT4
Body Style	SUV
VIN	1GYFZCR42SF128564
Body Color	Deep Sea Metallic
Odometer Reading (km/mi)	145 mi
Engine Displacement (L)	2.0
Type / No. Cylinders	I4 Turbo
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	9-Speed
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	Yes
Other Optional Feature	N/A
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso / Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	Yes
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head / Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso / Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Rear Pass. Load Limiter	Yes
Other Safety Restraint	N/A

Does owner's manual provide instructions to turn off automatic door locks? No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC
Date of Manufacture	09/24
Vehicle Type	MPV

GVWR (KG)	2350
GAWR Front (KG)	1220
GAWR Rear (KG)	1220

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	N/A	5	
Vehicle Capacity Weight (VCW) (kg)				669	(A)
DSC x 68.0 kg				340	(B)
Cargo Weight (RCLW) (kg)				136	(A-B)

VEHICLE SEAT TYPE

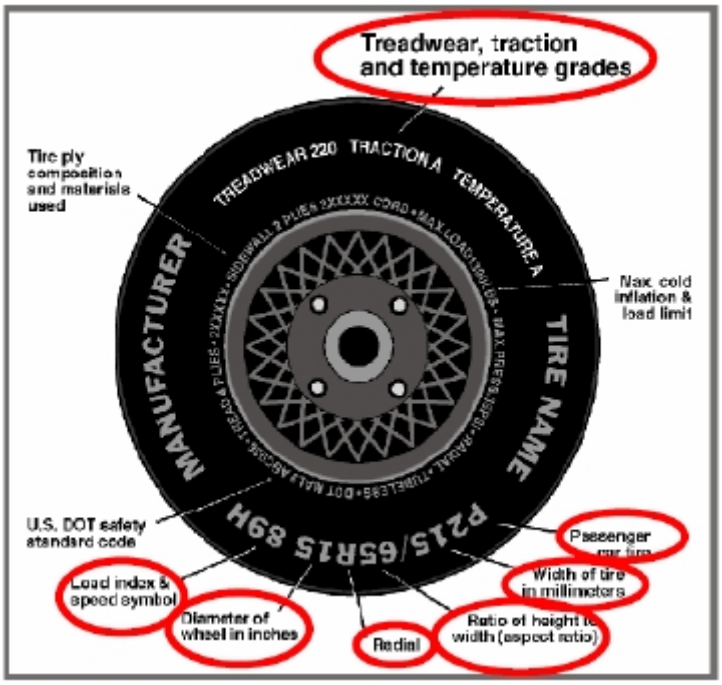
Seating Location	Type Of Seat Pan				Type Of Seat Back		
	Bucket	Bench	Split Bench	Contour	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front	X						X
Rear or Second Row Seat			X		X		
Third Row Seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

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	235/60R18	235/60R18
Tire Size on Vehicle	235/60R18	235/60R18
Tire Manufacturer	Continental	Continental
Tire Model	ProContact	ProContact
Treadwear	500	500
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index / Speed Symbol	103H	103H
Tire Material	Rubber	Rubber
DOT Safety Code Left	1A30FBBYB3324	1A30FBBYB3324
DOT Safety Code Right	1A30FBBYB3324	1A30FBBYB3324

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

Test Vehicle: 2025 Cadillac XT4 5 Door SUV | NHTSA No.: M20250103
Test Program: NCAP Side MDB Impact Test | Test Date: 02/06/2025

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	260	260	260	260
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	Requirements	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	528	325		543	465		564	455	
Right	kg	486	334		519	400		500	422	
Ratio	%	60.6	39.4		55.1	44.9		54.8	45.2	
Totals	kg	1014	659	1673	1062	865	1927	1064	877	1941

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1673	(A)
Actual Weight of 2 P572V (ES-2re and SID-IIs) ATDs Used	kg	127	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1936	(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)? [X] **Yes** [ ] **No**

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	As Tested	Fully Loaded	Meets Rqmt***
LF	mm	855	859	Yes
RF	mm	859	868	Yes
RR	mm	872	882	Yes
LR	mm	866	874	Yes
Vehicle CG (Aft of Front Axle)	mm	1245	1253	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	37	40	

****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:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	13
Spare Tire	2
Ballast / Equipment Added	68

TEST SURFACE MARKINGS

	Distance from 63° Impact Location Line (mm)
Fore 25 mm target	913
Aft 25 mm target	914
Pre-Impact Angle Line	232

Parallel Track Target	X Location (mm)	Y Location (mm)
A	0	0
B	2955	1555
C	2955	3355
D	0	3000

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

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

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 passenger's seats should be set to the rear-most, lowest, mid-angle position

SCRL ANGLE RANGE

Seat	SCRL(°)		
	Max	Min	Mid
Driver Seat	17.9	9.9	13.9
Front Passenger Seat	15.7	11.6	13.7
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore / Aft	Forward-Most
Driver Seat	13.9	1	Max	60	59	58
			Mid	31	30	29
			Min	2	1	0
Front Passenger Seat	13.7	12	Max	-	-	-
			Mid	-	-	-
			Min	13	12	11
Front Center Seat*			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:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

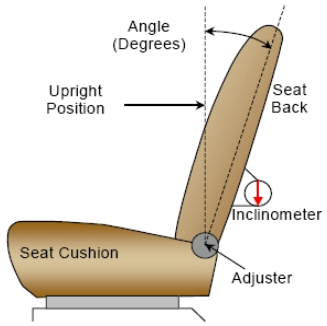
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	240	Power	120	Power
Front Passenger Seat	240	Power	120	Power
Front Center Seat				
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.



FRONT SEAT ASSEMBLY

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat	64.4	Power	8.9	Power
Front Passenger Seat	66.2	Power	8.9	Power
Front Center Seat				
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*

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

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

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.

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

HEAD RESTRAINT ADJUSTMENT

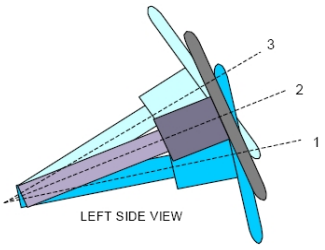
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

Seat	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 No. 1	23.3	
Geometric center - Position No. 2	25.7	
Uppermost - Position No. 3	28.0	
Telescoping Steering Wheel Travel		64
Test Position	25.7	32

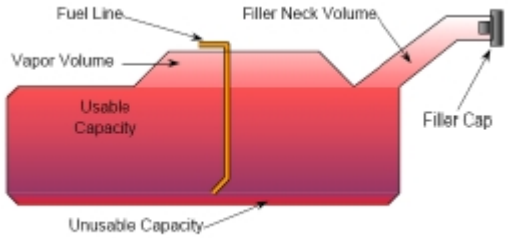


STEERING COLUMN ASSEMBLY

FUEL PUMP

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

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



VEHICLE FUEL TANK ASSEMBLY

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

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

FUEL TANK CAPACITY

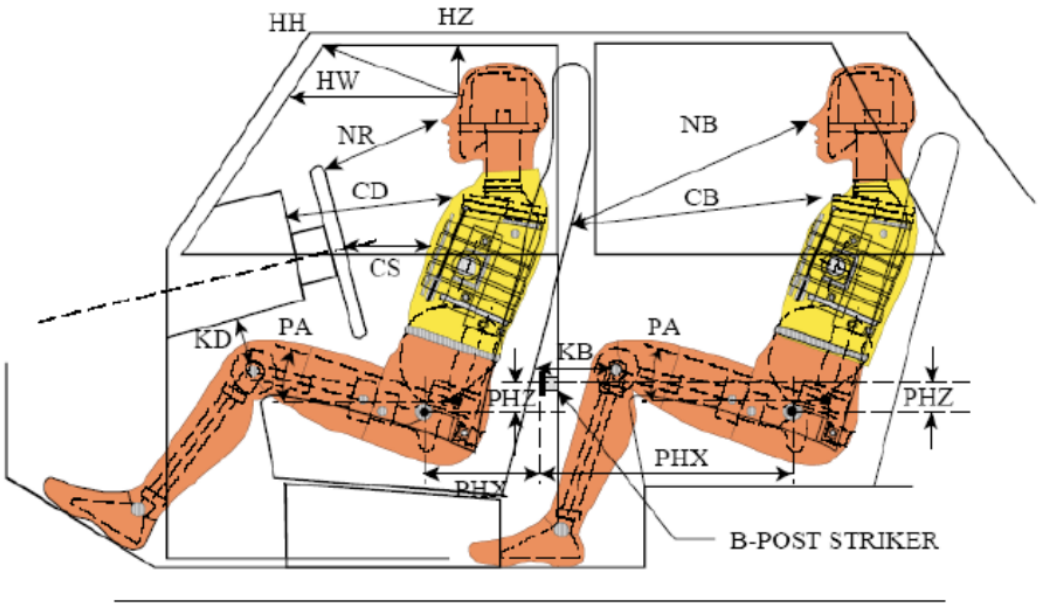
Description	Liters
Usable Capacity of “Standard Tank” (see Form No. 1)	60.2
Usable Capacity of “Optional Tank” (see Form No. 1)	N/A
Usable Capacity of “Standard Tank” (see Owner’s Manual)	60.2
Usable Capacity of “Optional Tank” (see Owner’s Manual)	N/A
93% of Usable Capacity	56.0
Actual Amount of Solvent Used in Test	56.0
1/3 of Usable Capacity	20.07

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

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION



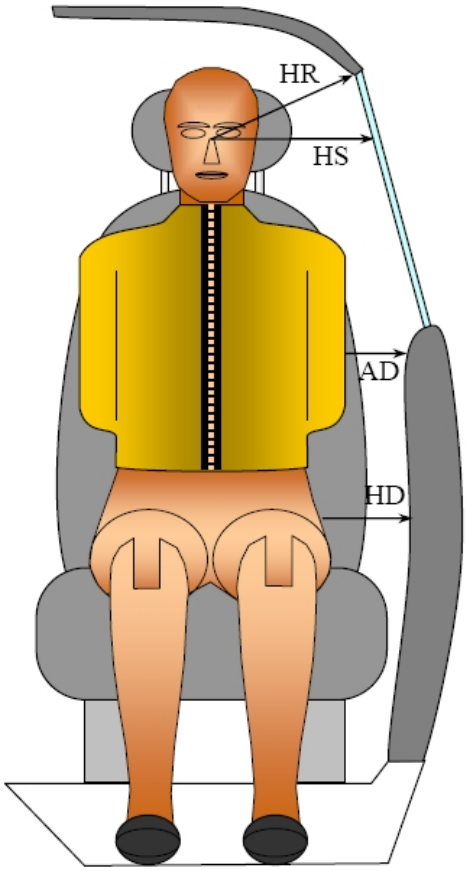
LEFT SIDE VIEW

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

Driver Code	Pass. Code	Description	Driver (Serial No. F033)		Left Rear Passenger (Serial No. 300)	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Header to Header	545			
HW		Header to Windshield	778			
HZ	HZ	Head to Roof Liner	237		285	
NR	NB	Nose to Rim/Seat Back	556		424	
CD	CB	Chest to Dash/Seat Back	715		438	
CS		Chest to Steering Wheel	480			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	251	21.3	185	24.5
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	225	33.8	185	26.1
PAX°	PAX°	Pelvic Tilt Angle X		25.6		19.95
	PAY°	Pelvic Tilt Angle Y		-1.7		0.4
PHX	PHX	Hip Point to Striker (X-Axis)	92		230	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	143		218	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



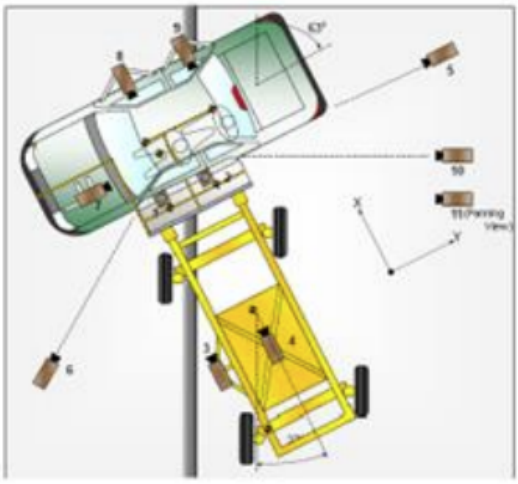
FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F033)	Left Rear Passenger (Serial No. 300)
HR	Head to Side Header	mm	231	266
HS	Head to Side Window	mm	343	380
AD	Arm to Door	mm	96	138
HD	Hip Point to Door	mm	158	169

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2025 Cadillac XT4 5 Door SUV
NHTSA No.: M20250103
Test Program: NCAP Side MDB Impact Test
Test Date: 02/06/2025



CAMERA LOCATIONS AND DATA

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Overhead Overall	0	-312	-9220	12.5	1000
2	Overhead Close-up	0	0	-9220	24	1000
3	Left Impact Point (MDB)	-1470	0	-847	25	1000
4	Side Overall (MDB)	-1140	878	-1587	8	1000
5	Rear	301	7579	-1555	28	1000
6	Left Front	-3390	-5574	-1531	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.*

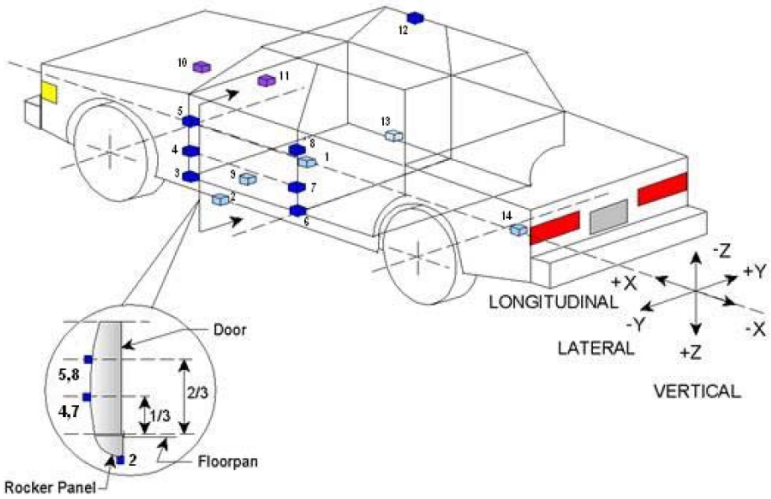
If applicable, explain why camera(s) did not operate as intended: All cameras operated as intended.

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:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



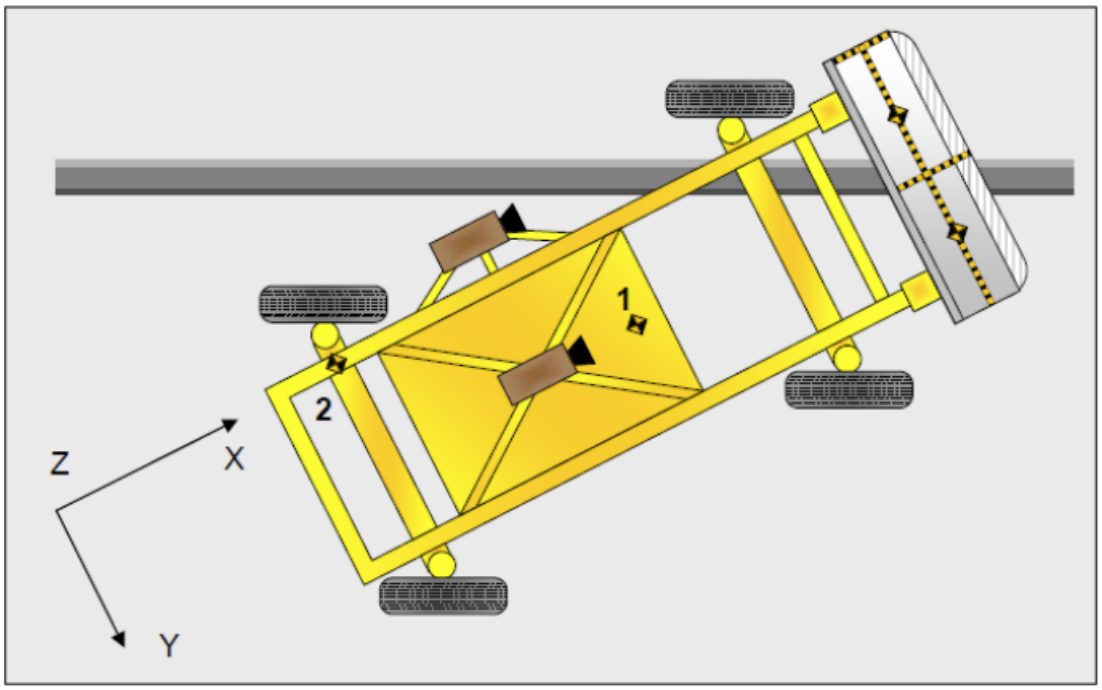
TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2422	-4	-198
2	Right Sill at Front Seat	2689	697	158
3	Right Sill at Rear Seat	1709	686	154
4	Left Sill at Front Door	2679	-692	165
5	Left Sill at Rear Door	1747	-686	152
6	A-Post Lower	3068	-675	-41
7	A-Post Middle	3127	-660	-542
8	B-Post Lower	2007	-705	-87
9	B-Post Middle	1978	-666	-510
10	Front Seat Track	2266	-559	148
11	Rear Seat Structure	1691	-386	204
12	Rt. Rear Occ. Compartment	1989	383	285
13	Engine Block	3800	251	-273
14	Rear Above Axle	726	-1	0

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:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



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)

Width between left and right contact switches (mm): 1500

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2025 Cadillac XT4 5 Door SUV | NHTSA No.: M20250103
Test Program: NCAP Side MDB Impact Test | Test Date: 02/06/2025

TEST DUMMY INFORMATION AND CONTACT POINTS

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

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	A-Pillar, B-Pillar and C-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: 2025 Cadillac XT4 5 Door SUV
NHTSA No.: M20250103
Test Program: NCAP Side MDB Impact Test
Test Date: 02/06/2025

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Struck Side Driver		Struck Side Rear Passenger	
	Mounted	Deployed	Mounted	Deployed
Front Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 - Torso/Pelvis Airbag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vehicle Wheel Base	mm		2773
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		446
Actual Impact Point (Aft of Frontal Axle)	mm		438
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+8
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	-5

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1250
Overall Length Including Honeycomb Frame	4120
Wheelbase of Framework Carriage	2591
CG Location of Front Axle	1122

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	396	291.5	687.5
Right	kg	377.5	301	678.5
Ratio	%	56.6	43.4	100
Totals	kg	773.5	592.5	1366

SPEED AND ANGLE AT IMPACT DATA

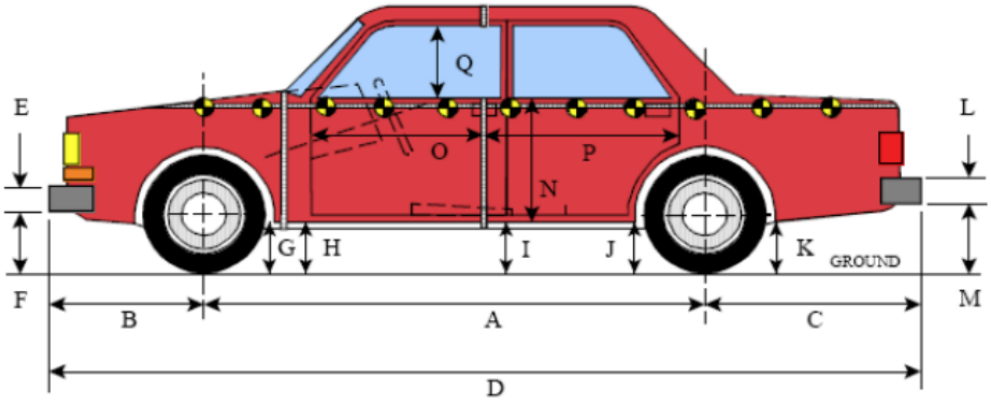
Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.10 to 62.70	62.05
Trap No. 2 Velocity (Redundant)	km/h	61.10 to 62.70	62.16
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed angle 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	226
B	Top of Bumper	533	200	Right	126
C	Mid-Level	686	800	Left	114
D	Top of Stack	813	800	Left	159

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



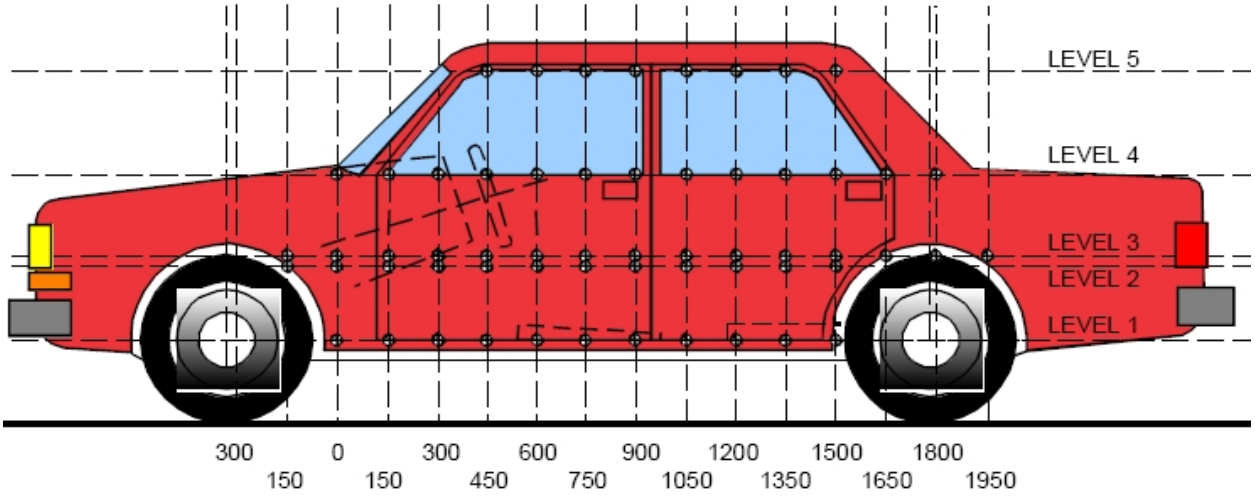
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code.	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2773	2787	14
B	Front Axle to FSOV	955	940	-15
C	Rear Axle to RSOV	870	867	-3
D	Total Length at Centerline	4596	4594	-2
E	Front Bumper Thickness	105	105	0
F	Front Bumper Bottom to Ground	483	492	9
G	Sill Height at Front Wheel Well	237	239	2
H	Sill Height at Front Door Leading Edge	238	241	3
I	Sill Height at B Pillar	238	247	9
J1	Sill Height at Rear Wheel Well	248	243	-5
J2	Pinch Weld Height at Rear Wheel Well	242	238	-4
K	Sill Height Aft of Rear Wheel Well	272	268	-4
L	Rear Bumper Thickness	85	85	0
M	Rear Bumper Bottom to Ground	418	420	2
N	Sill Height to Bottom of Front Window Sill	882	810	-72
O	Front Door Leading Edge to Impact CL	784	779	-5
P	Rear Door Trailing Edge to Impact CL	1399	1345	-54
Q	Front Window Opening	393	385	-8
R	Right Side Length	4439	4440	1
S	Left Side Length	4439	4437	-2
T	Maximum Vehicle Width	1870	1709	-161
U	Front Wheel Track Width	1617	1595	-22
V	Rear Wheel Track Width	1618	1618	0

DATA SHEET NO.11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



LEFT SIDE VIEW

MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	393	90	1050
2	Driver H-Point	mm	647	237	1650
3	Mid-Door	mm	729	243	1650
4	Window Sill	mm	1067	117	1350
5	Window Top	mm	1577	3	900

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: 2025 Cadillac XT4 5 Door SUV NHTSA No.: M20250103
Test Program: NCAP Side MDB Impact Test Test Date: 02/06/2025

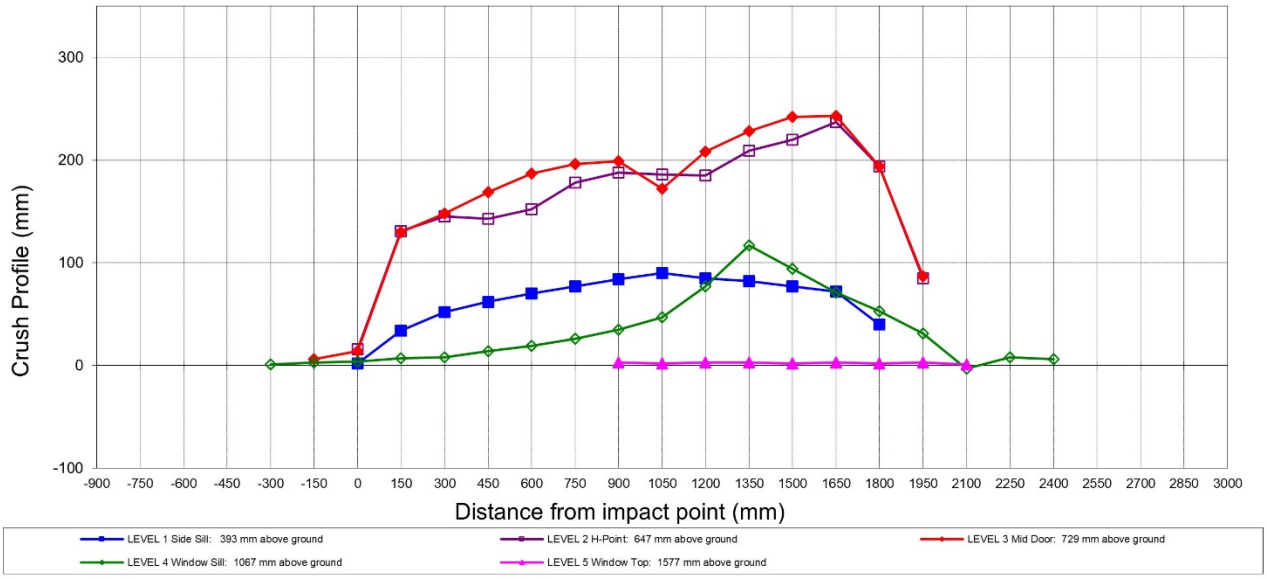
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	Pre-Test					Post-Test					Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300				808					807					1	
-150			943	818				937	815				6	3	
0	920	935	935	826		918	919	914	822		2	16	21	4	
150	911	915	918	835		877	784	788	828		34	131	130	7	
300	905	913	917	846		853	768	769	838		52	145	148	8	
450	903	915	916	855		841	772	747	841		62	143	169	14	
600	903	917	917	864		833	765	730	845		70	152	187	19	
750	903	919	916	871		826	741	720	845		77	178	196	26	
900	902	921	915	877	614	818	733	716	842	611	84	188	199	35	3
1050	900	924	914	882	618	810	738	742	835	616	90	186	172	47	2
1200	899	926	913	880	618	814	741	705	803	615	85	185	208	77	3
1350	897	928	913	878	616	815	719	685	761	613	82	209	228	117	3
1500	896	929	914	877	614	819	709	672	783	612	77	220	242	94	2
1650	900	930	917	874	610	828	693	674	803	607	72	237	243	71	3
1800	908	933	927	872	603	868	739	733	819	601	40	194	194	53	2
1950		938	940	853	595		853	853	822	592		85	87	31	3
2100				865	584				868	583				-3	1
2250				860					852					8	
2400				853					847					6	
2550															
2700															
2850															
3000															

NOTE: *Pre-Test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to the test based on an estimated impact point. The final distance from impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.*

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

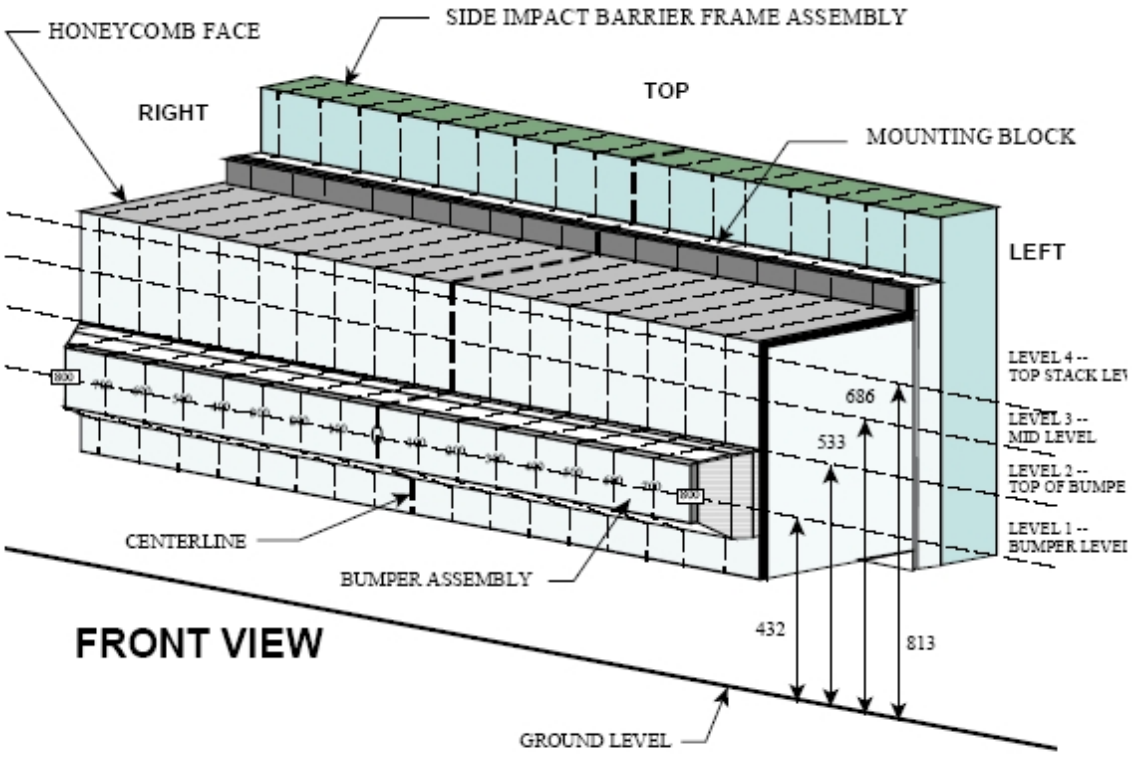
Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO.12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



NOTE: Dimensions are shown in millimeters, mm

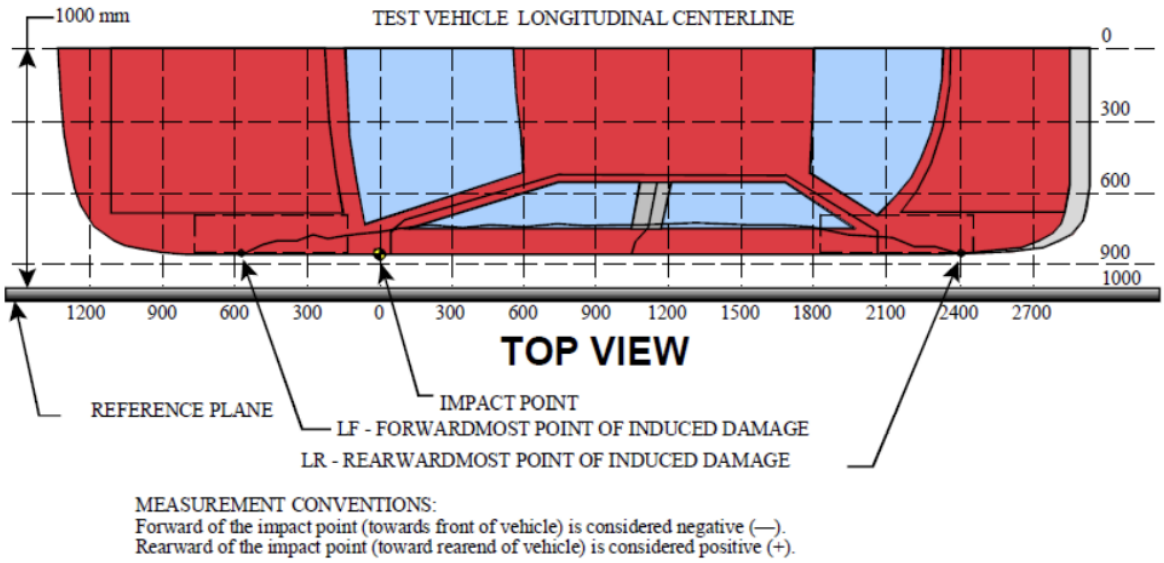
DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100	0	100	200	300	400	500	600	700	800
1	226	225	225	223	223	221	222	221	217	216	217	215	214	214	212	214	217
2	120	121	119	118	116	126	126	123	113	104	101	101	100	99	100	99	108
3	46	34	29	36	36	36	48	55	38	32	31	31	35	45	63	90	114
4	50	35	24	31	44	70	93	95	62	56	59	60	68	75	84	123	159

DATA SHEET NO.13
VEHICLE AND MDB DAMAGE PROFILE DISTANCE

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025

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



MEASUREMENT CONVENTIONS:
Forward of the impact point (towards front of vehicle) is considered negative (—).
Rearward of the impact point (toward rearend of vehicle) is considered positive (+).

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-150	3	63	57	6
2	270	3	227	83	144
3	690	3	276	84	192
4	1110	3	273	86	187
5	1530	3	328	85	243
6	1950	3	147	60	87

MDB DAMAGE PROFILE DISTANCES

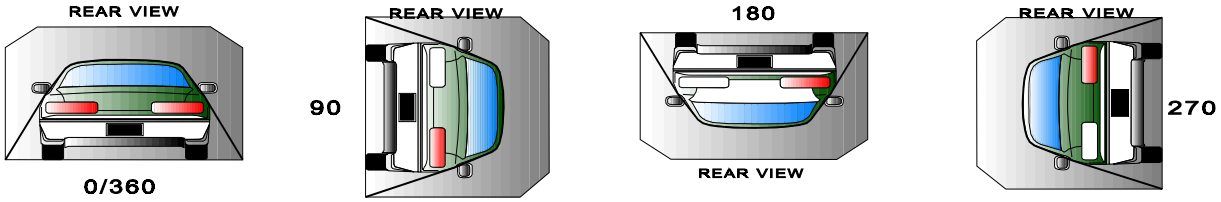
DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm left of center	1	288	505	-217
2	480 mm left of center	1	300	514	-214
3	160 mm left of center	1	297	514	-217
4	160 mm right of center	1	292	513	-221
5	480 mm right of center	1	290	513	-223
6	800 mm right of center	1	275	501	-226

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

Test Vehicle:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025
Test Time:	10:21AM	Temperature:	21 °C

A. From impact until vehicle motion ceases: 0 oz
(Maximum allowable is 1 oz.)
B. For the 5-minute period after motion ceases: 0 oz
(Maximum allowable is 5 oz.)
C. For the following 25 minutes: 0 oz
(Maximum allowable is 1 oz.)

D. Spillage Detail: No Spillage



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	67	300	367
90° to 180°	66	300	366
180° to 270°	63	300	363
270° to 360°	67	300	367

FMVSS 301 SPILLAGE TABLE

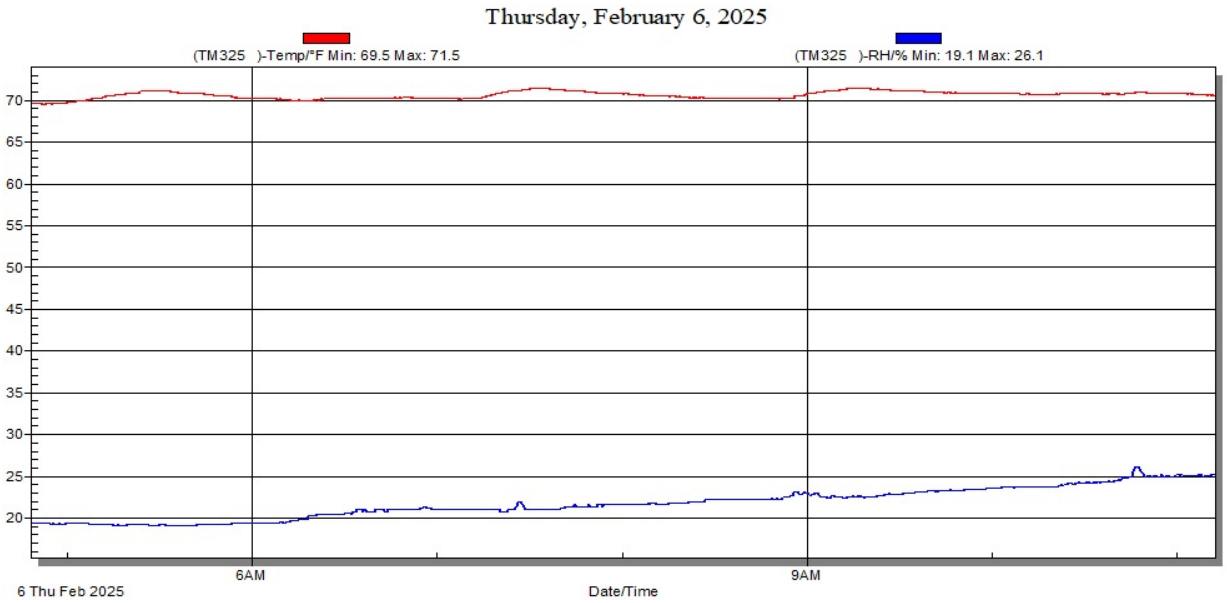
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

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:	2025 Cadillac XT4 5 Door SUV	NHTSA No.:	M20250103
Test Program:	NCAP Side MDB Impact Test	Test Date:	02/06/2025



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

APPENDIX A

PHOTOGRAPHS

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Figure A-1: As Delivered Right Front ¾ View of Test Vehicle

Figure A-2: As Delivered Left Rear ¾ View of Test Vehicle

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

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

Figure A-5: Pre-Test Left Front ¾ View of Test Vehicle

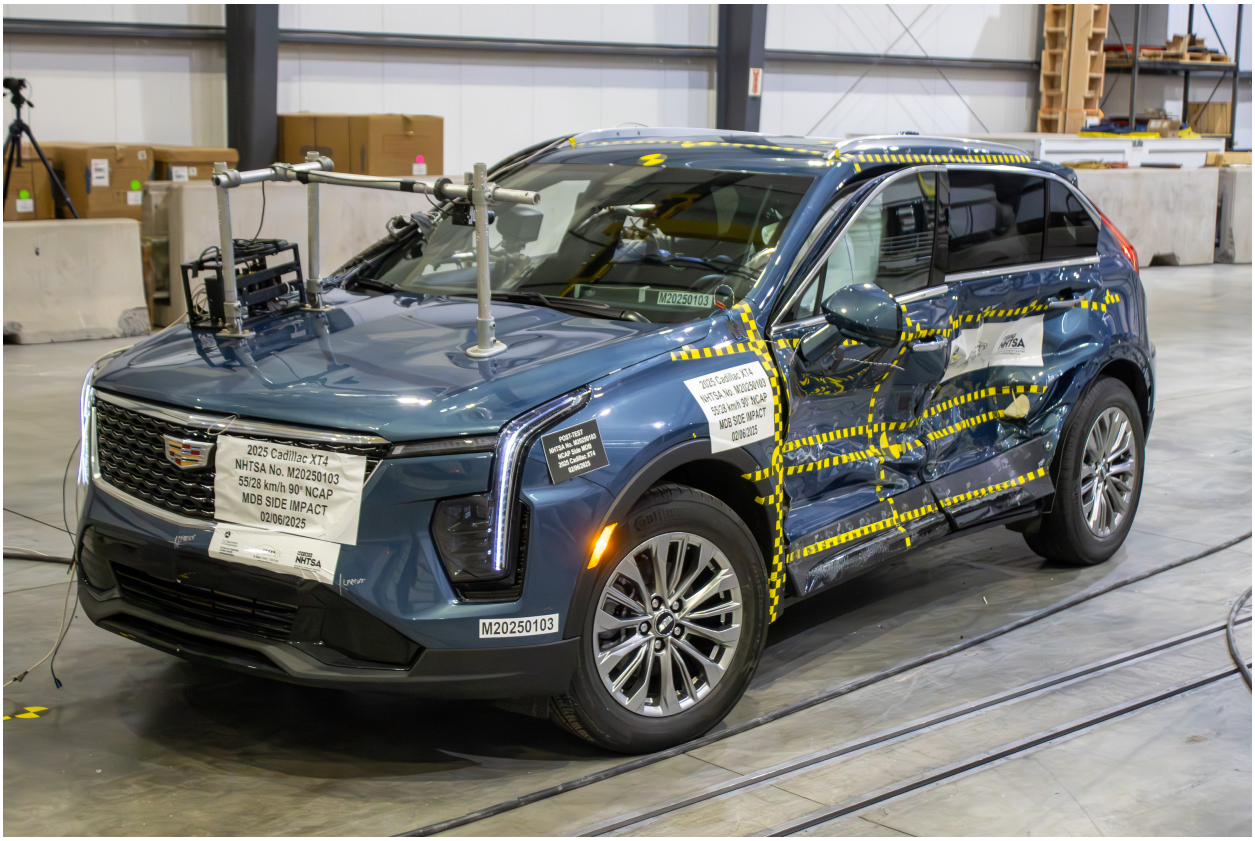

Figure A-6: Post-Test Left Front ¾ View of Test Vehicle

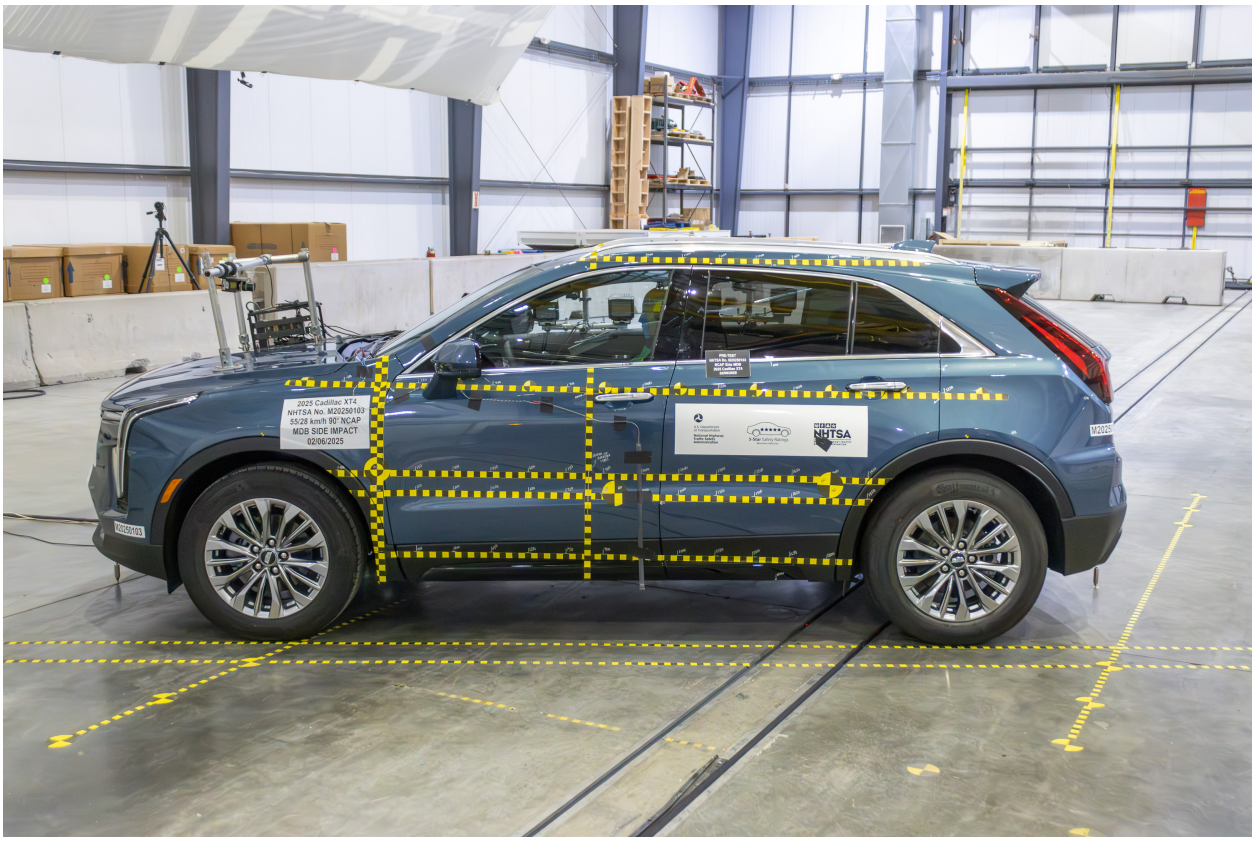

Figure A-7: Pre-Test Left Side View of Test Vehicle

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

Figure A-9: Pre-Test Left Rear ¾ View of Test Vehicle

Figure A-10: Post-Test Left Rear ¾ View of Test Vehicle

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

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

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

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

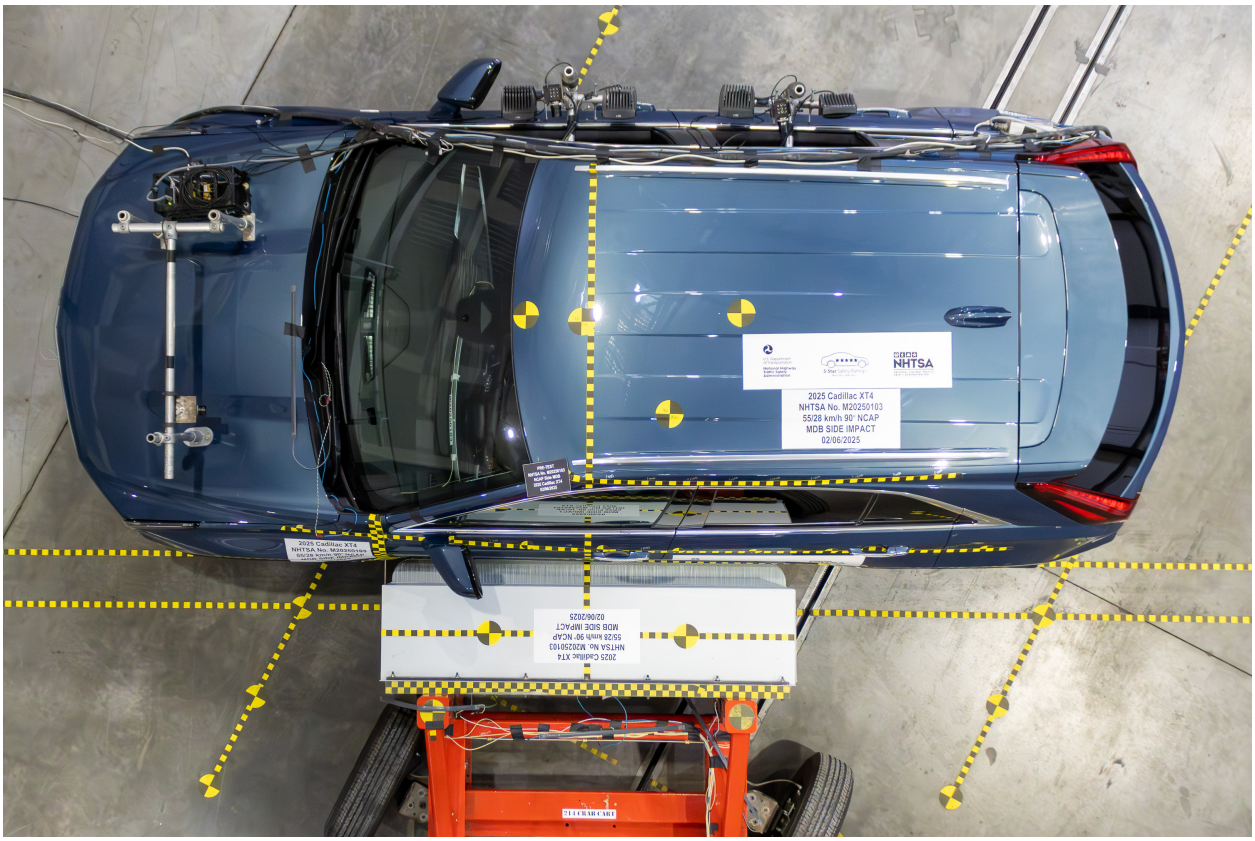

Figure A-15: Pre-Test Overhead View of Test Area

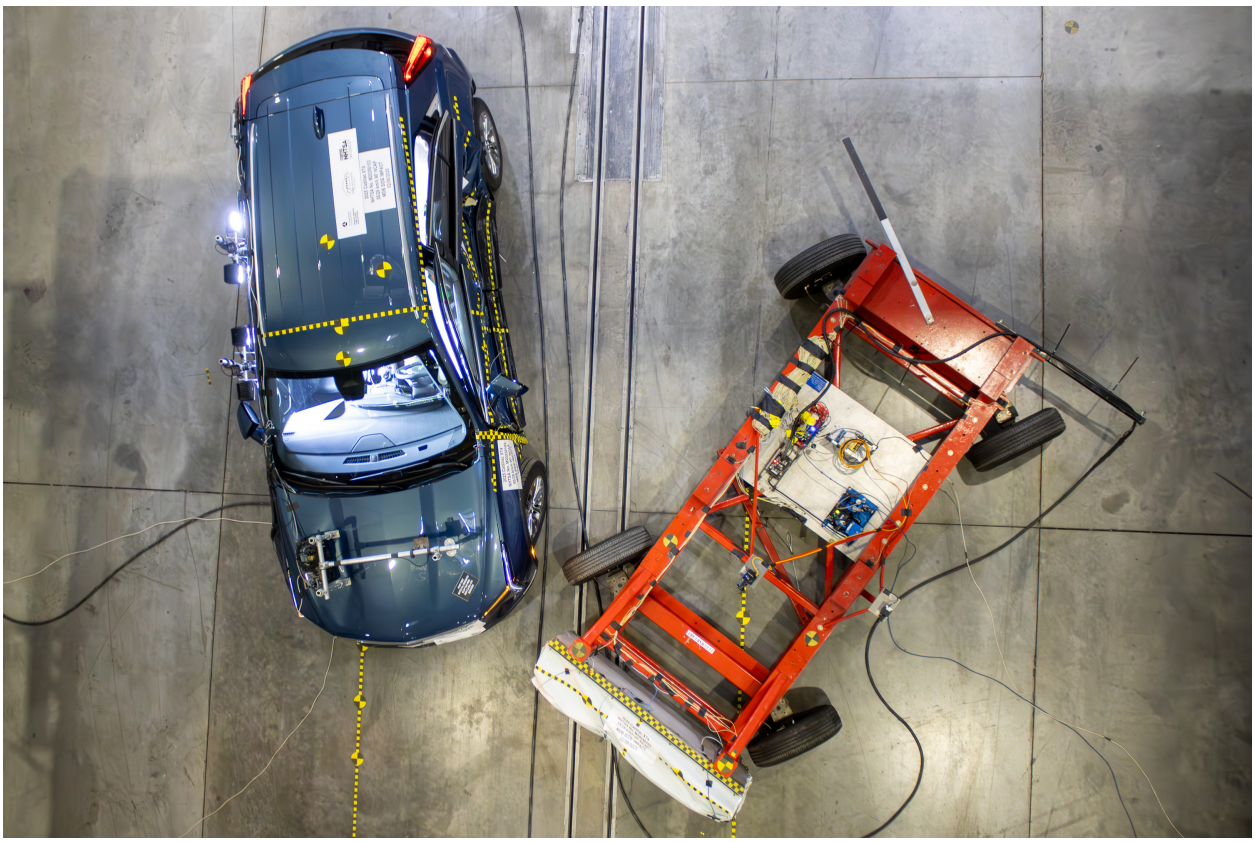

Figure A-16: Post-Test Overhead View of Test Area

Figure A-17: Pre-Test Left Side View of 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

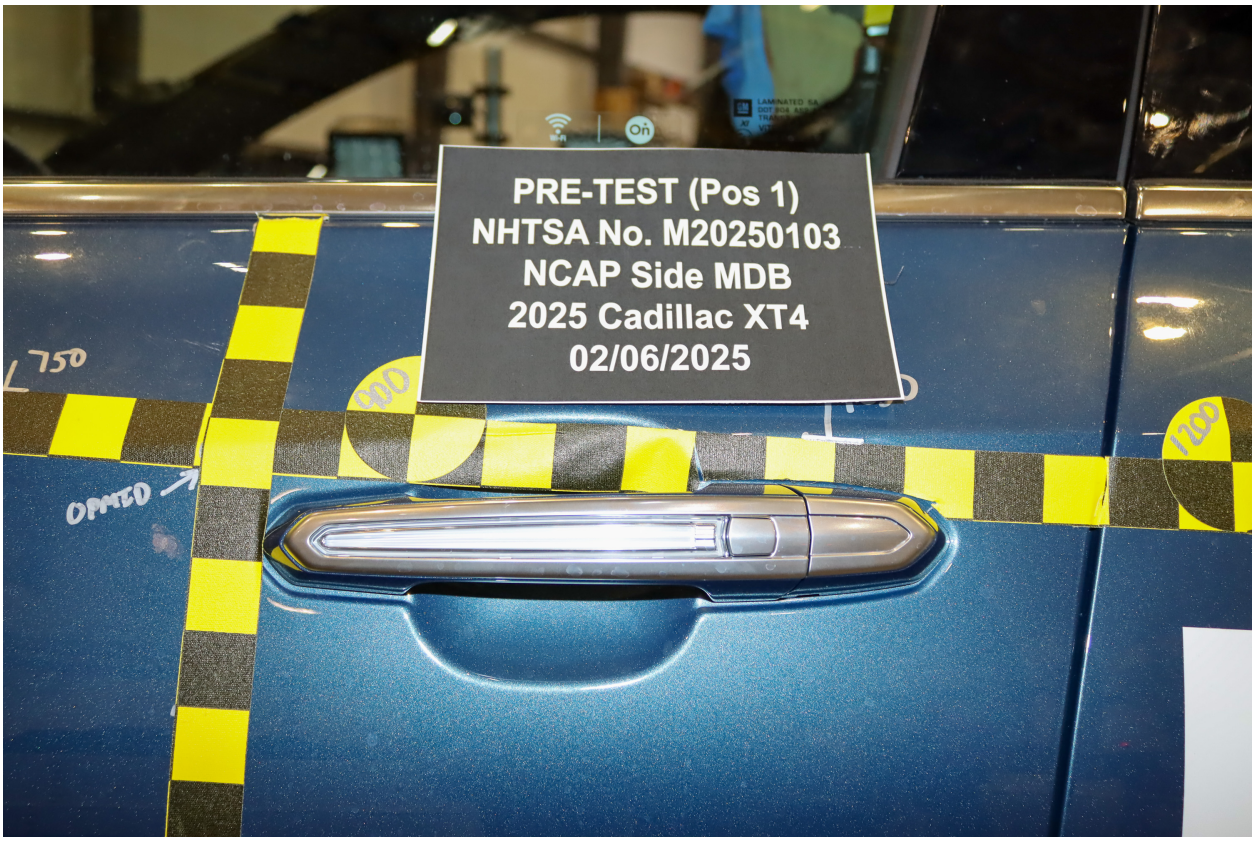

Figure A-21: Pre-Test Left Front Door Latch Close-Up

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

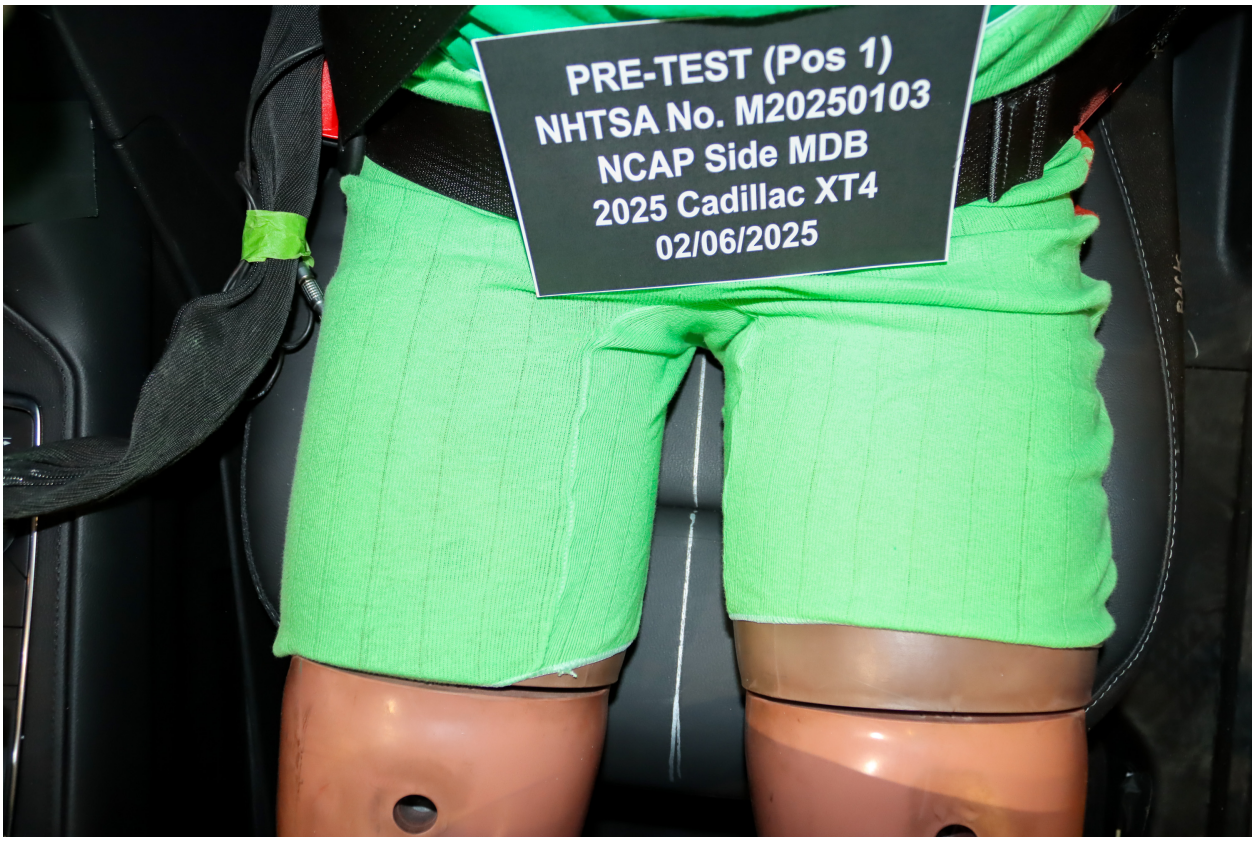

Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan

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

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

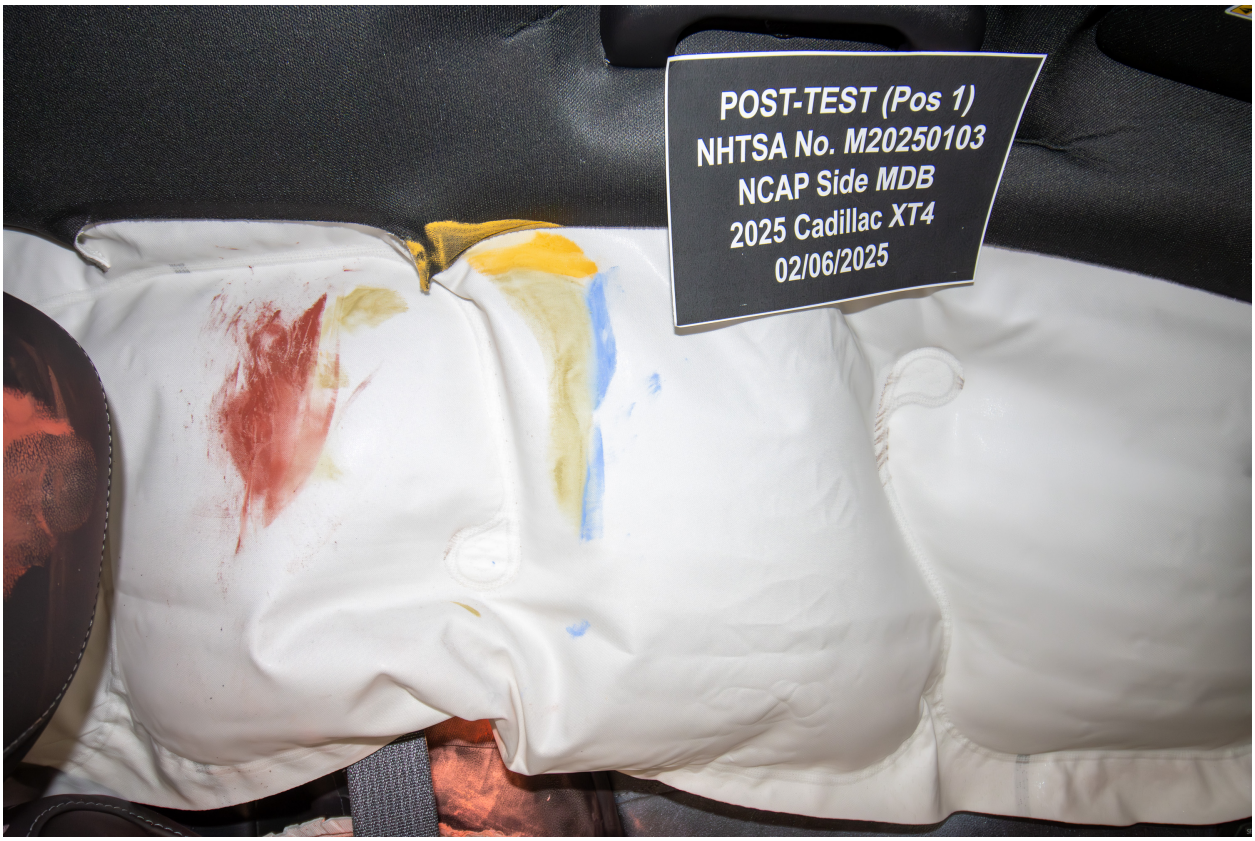

Figure A-49: Post-Test Driver Dummy Close-Up Head Contact with Side Air bag View

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 Airbag 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 Airbag 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

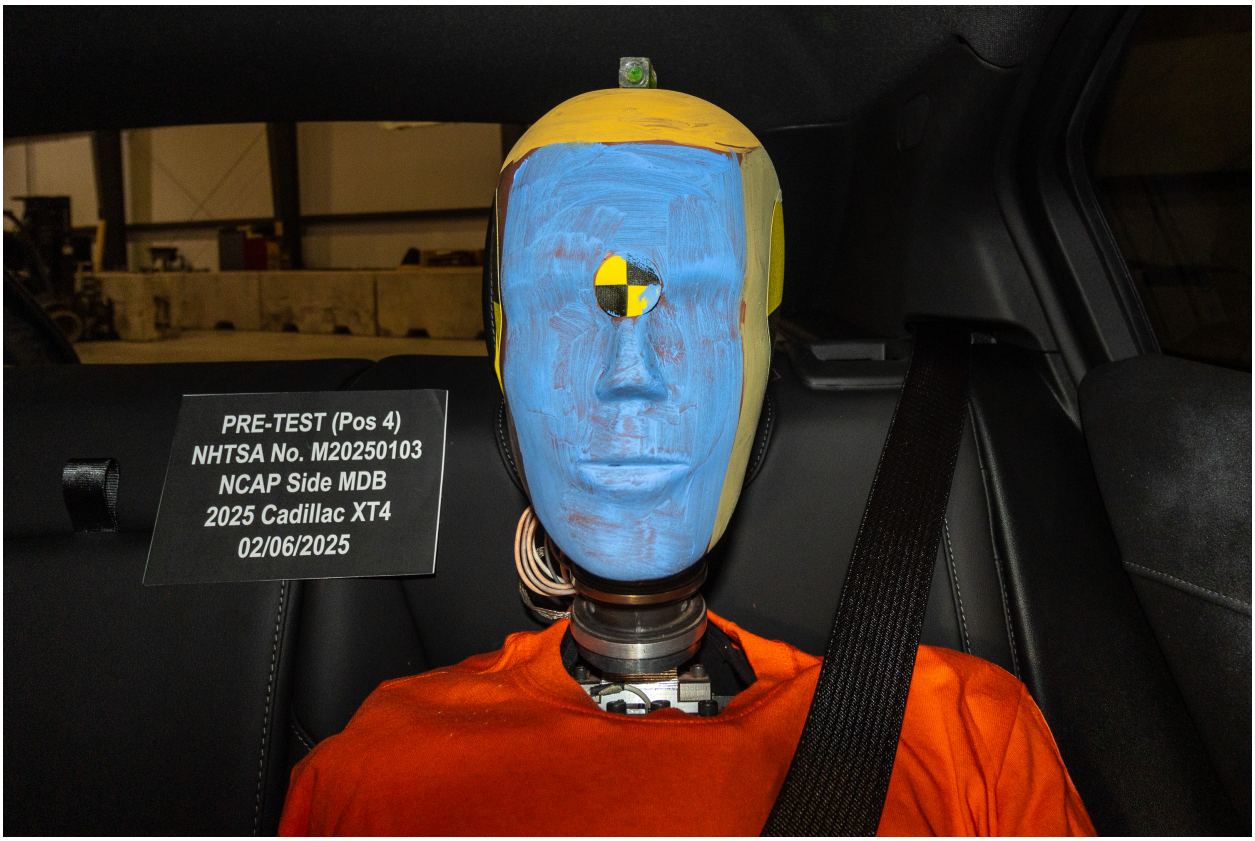

Figure A-59: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint

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

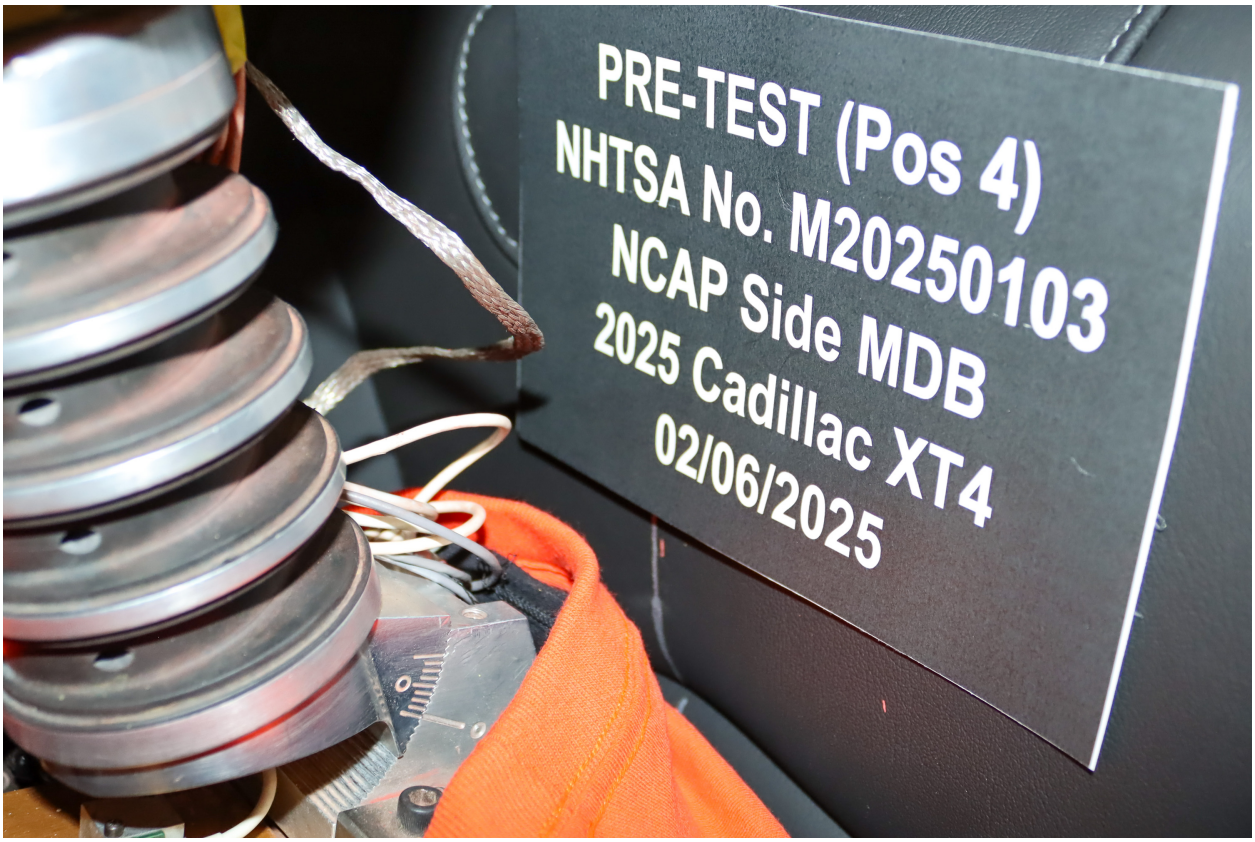

Figure A-62: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket

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 Airbag View

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

Photo Not Applicable

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

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

Photo Not Applicable

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

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

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

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

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

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

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

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

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

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

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

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

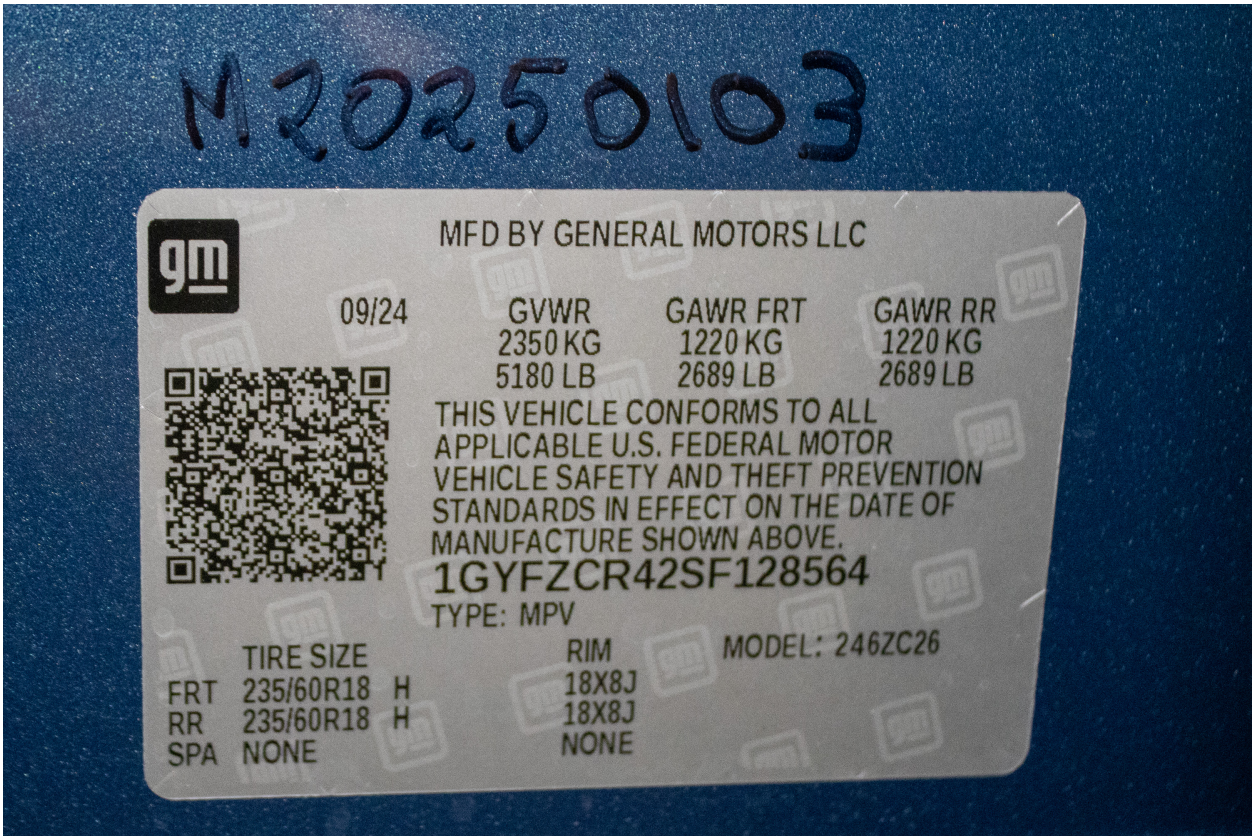

Figure A-92: Close-Up View of Vehicle's Certification Label

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

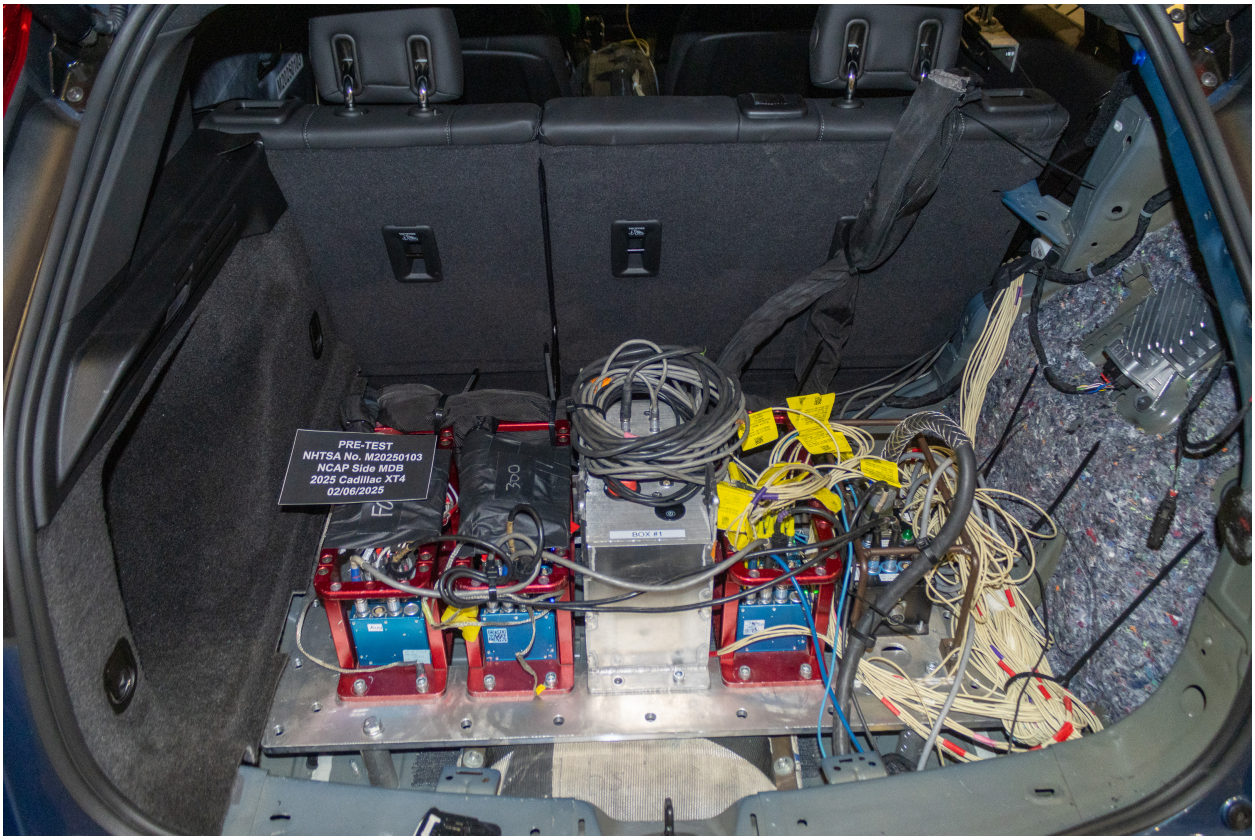

Figure A-94: Pre-Test Ballast View

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

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

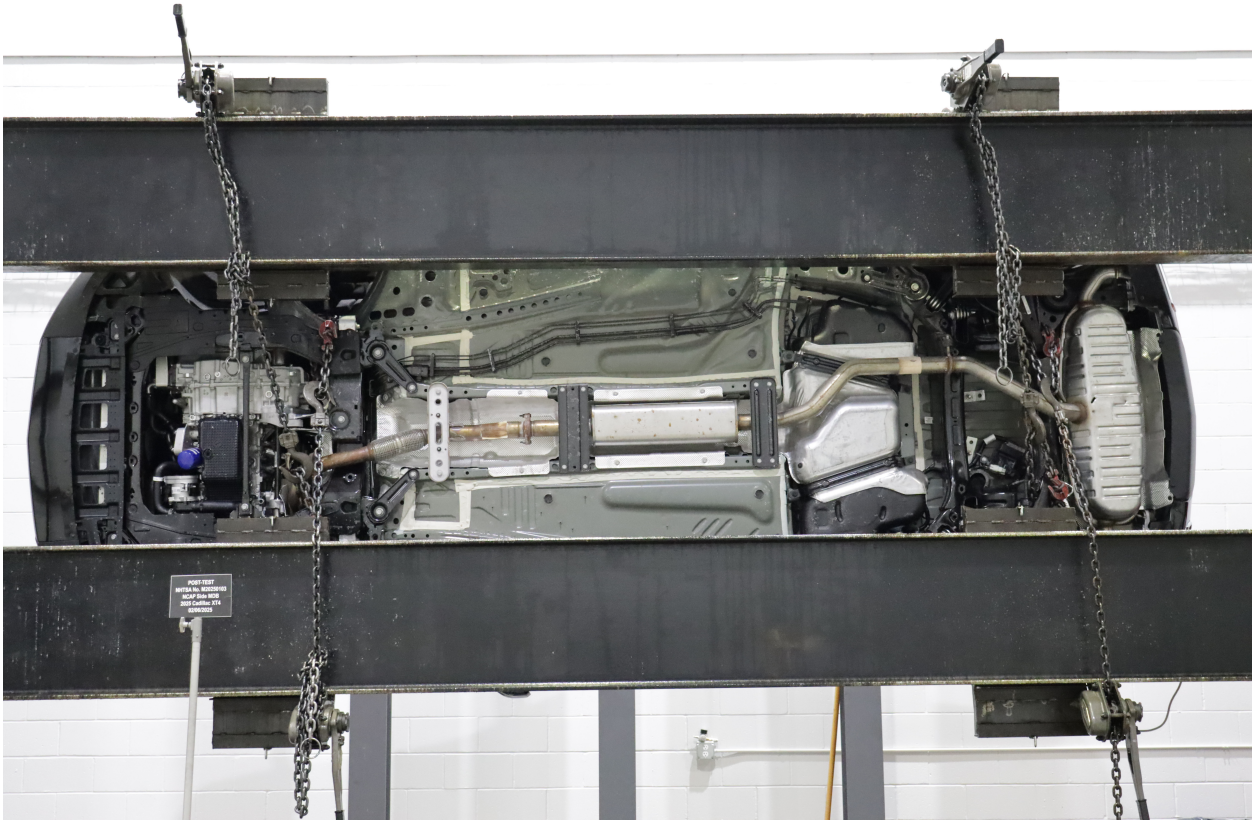

Figure A-97: FMVSS No. 301 Static Rollover 90 Degrees

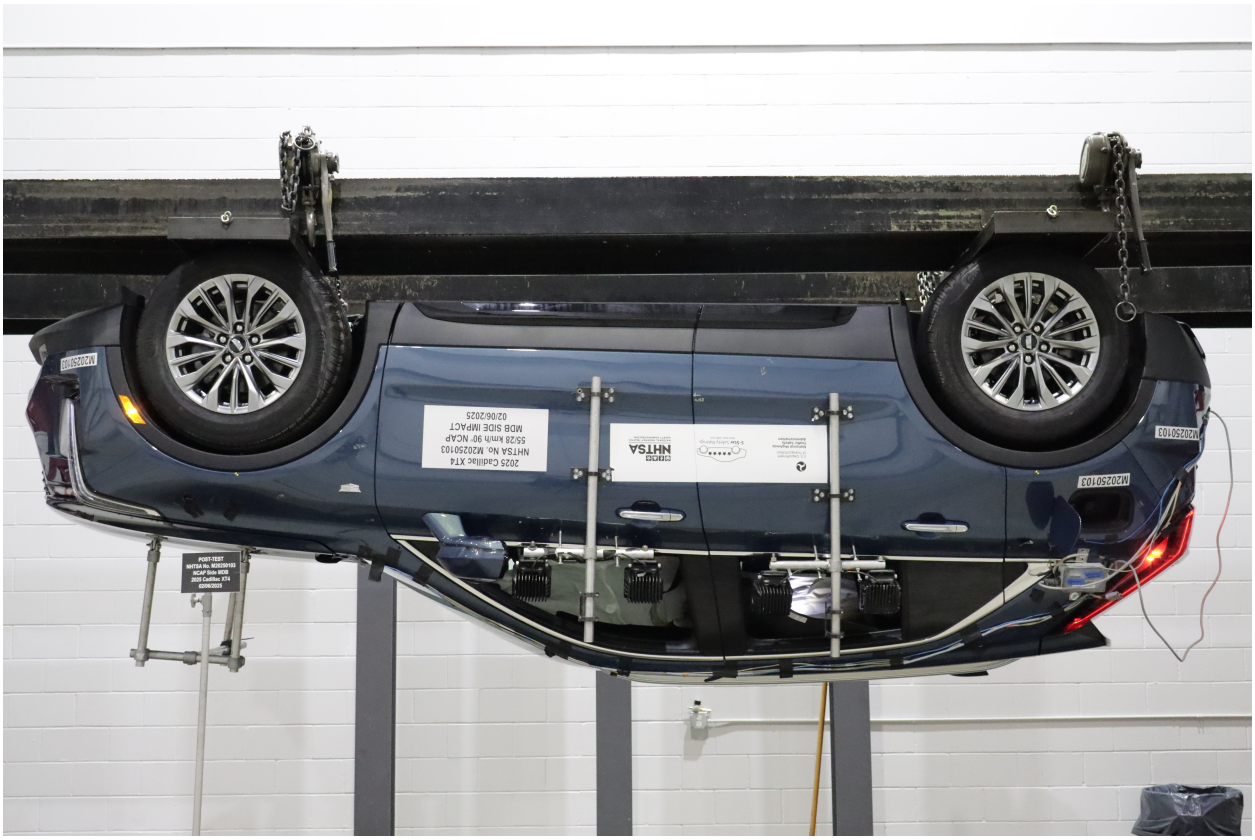

Figure A-98: FMVSS No. 301 Static Rollover 180 Degrees

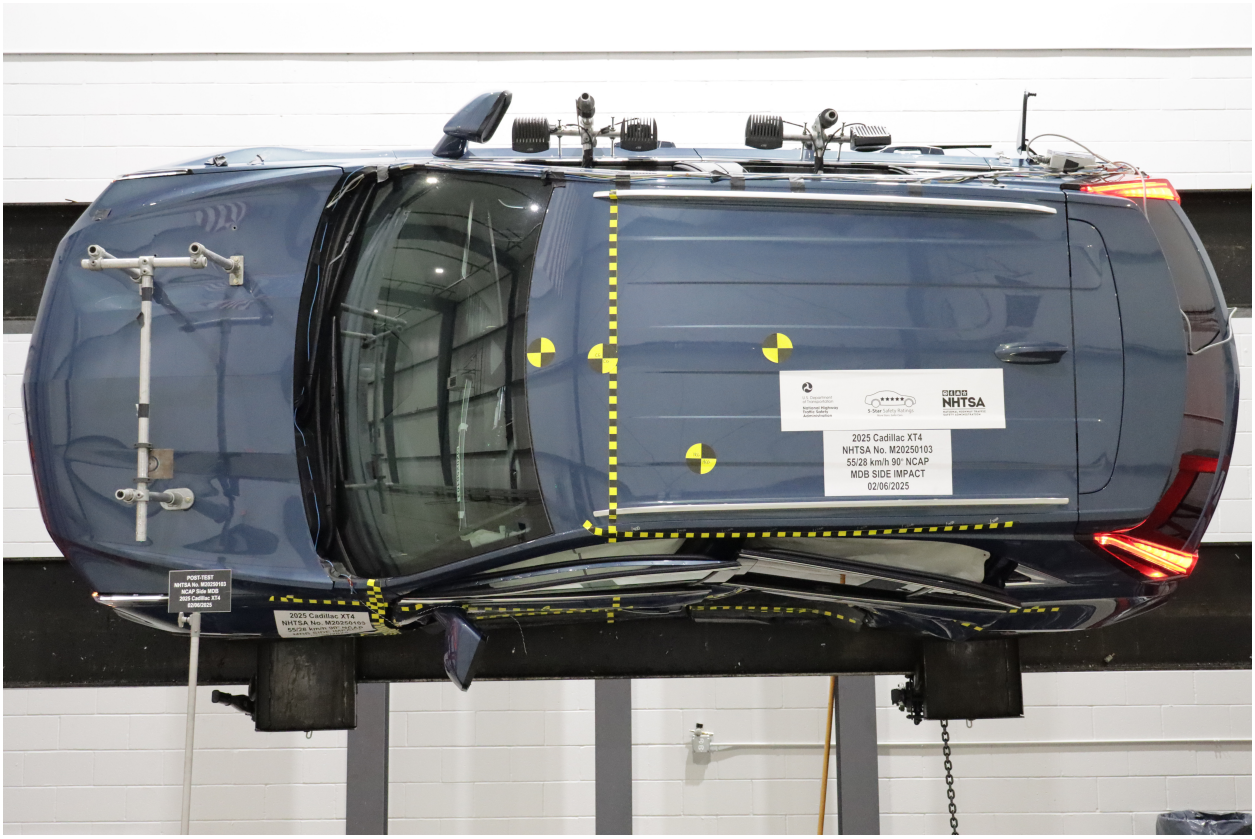

Figure A-99: FMVSS No. 301 Static Rollover 270 Degrees

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

Figure A-101: Impact Event

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STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN

OWNER BENEFITS
- 4 YEAR / 50,000 MILE* BUMPER-TO-BUMPER LIMITED WARRANTY, 6 YEAR / 70,000 MILE* POWERTRAIN LIMITED WARRANTY, ROADSIDE ASSISTANCE & COURTESY TRANSPORTATION FIRST MAINTENANCE VISIT *WHICHEVER COMES FIRST SEE CADILLAC.COM OR DEALER FOR TERMS, DETAILS & LIMITS
- 8 YEARS ONSTAR ONE ESSENTIALS. SEE ONSTAR.COM FOR TERMS
- 3 YEARS SAFETY SERVICES, WI-FI, IN-VEHICLE APPS CONNECTED BY ONSTAR; INFO AT ONSTAR.COM/PLANS

PERFORMANCE
- FRONT-WHEEL DRIVE W/ DRIVER MODE SELECTOR
- FOUR WHEEL INDEP SUSPENSION
- STABILITRAK-STABILITY CONTROL INCLUDES TRACTION CONTROL
- 18" ALLOY WHEELS
- TIRE SEALANT & INFLATOR KIT IN PLACE OF SPARE TIRE

LUXURY & CONVENIENCE
- LEATHER SEATING SURFACES
- GOOGLE BUILT-IN INFOTAINMENT
- 33" DIAGONAL ADVANCED LED DISPLAY
- WIRELESS PHONE PROJECTION
- SIRIUSXM AUDIO WITH SXM TRIAL SUBSCRIPTION
- ADAPTIVE REMOTE START
- LED HEADLAMPS & TAILLAMPS
- PASSIVE ENTRY & KEYLESS START
- MIRRORS, OUTSIDE HEATED, DRIVER & INSIDE AUTO DIM
- POWER SEAT ADJUSTER, DRIVER 8-WAY & PASSENGER 6-WAY
- POWER LUMBAR, 4-WAY, DRIVER & FRONT PASSENGER
- REAR SEAT, 60/40 SPLIT FOLDING SEATBACK
- ROTARY INFOTAINMENT CONTROLLER
- UNIVERSAL HOME REMOTE
- WINDSHIELD WIPERS, RAIN SENSING
- LIFTGATE, POWER, HANDS FREE

SAFETY & SECURITY
- SAFETY ALERT SEAT
- TEEN DRIVER
- BLIND ZONE STEERING ASSIST
- FORWARD COLLISION ALERT
- FRONT PEDESTRIAN AND BICYCLIST BRAKING
- INTERSECTION AUTOMATIC EMERGENCY BRAKING
- REAR PEDESTRIAN ALERT
- ADAPTIVE CRUISE CONTROL
- ENHANCED AUTOMATIC EMERGENCY BRAKING
- ENHANCED LANE KEEP ASSIST W/ LANE DEPARTURE WARNING
- SIDE BICYCLIST ALERT
- TRAFFIC SIGN RECOGNITION
- REVERSE AUTOMATIC BRAKING
- HD SURROUND VISION
- SEAT BELT INDICATOR, 2ND ROW

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE	**$40,795.00**

OPTIONS & PRICING

OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

DEEP SEA METALLIC	625.00
TOTAL OPTIONS	$625.00
TOTAL VEHICLE & OPTIONS	$41,420.00
DESTINATION CHARGE	1,195.00
TOTAL VEHICLE PRICE*	**$42,615.00**

EPA DOT Fuel Economy and Environment — Gasoline Vehicle

XT4 FWD

Fuel Economy: **26 MPG** combined city/hwy — 24 city, 29 highway

Small SUVs range from 14 to 118 MPG. The best vehicle rates 140 MPGe.

3.8 gallons per 100 miles

You spend **$2,750** more in fuel costs over 5 years compared to the average new vehicle. GHG

Annual fuel cost $2,450

Fuel Economy & Greenhouse Gas Rating (tailpipe only): 5 (1 — 10 Best)

Smog Rating (tailpipe only): 6 (1 — 10 Best)

This vehicle emits 343 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions, learn more at fueleconomy.gov.

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs $9,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $4.25 per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

Smartphone QR Code*

GOVERNMENT 5-STAR SAFETY RATINGS

This vehicle has not been rated by the government for overall vehicle score, frontal crash, side crash or rollover risk.

Source: National Highway Traffic Safety Administration (NHTSA)
www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 37%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 25%
CHINA 15%
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
KANSAS CITY, KS U.S.A.
COUNTRY OF ORIGIN:
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law – Do not remove prior to delivery to the ultimate purchaser. *Includes Manufacturer's Recommended Pre-Delivery Service. Does not include dealer installed options and accessories not listed above, local taxes or license fees.

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9177 W BROAD ST
RICHMOND, VA 23294-5808

WS
1AG4200627

Figure A-102: Monroney Label

Seats and Restraints

Head Restraints
Head Restraints 33
Front Seats
Power Seat Adjustment 35
Reclining Seatbacks 36
Lumbar Adjustment 36
Massage 37
Memory Seats 37
Heated and Ventilated Front Seats 40
Rear Seats
Rear Seats 41
Heated Rear Seats 42
Seat Belts
Seat Belts 43
Buckle To Drive 44
How to Wear Seat Belts Properly 44
Lap-Shoulder Belt 46
Seat Belt Use During Pregnancy 49
Seat Belt Extender 49
Safety System Check 49
Seat Belt Care 50
Replacing Seat Belt System Parts After a Crash 50
Airbag System
Airbag System 50
Where Are the Airbags? 52
When Should an Airbag Inflate? 53
What Makes an Airbag Inflate? 54
How Does an Airbag Restrain? 54
What Will You See After an Airbag Inflates? 55
Passenger Sensing System 56
Servicing the Airbag-Equipped Vehicle 59
Adding Equipment to the Airbag-Equipped Vehicle 59
Airbag System Check 60
Replacing Airbag System Parts After a Crash 60
Child Restraints
Older Children 61
Infants and Young Children 62
Child Restraint Systems 64
Where to Put the Restraint 66
Lower Anchors and Tethers for Children (LATCH System) 67
Replacing LATCH System Parts After a Crash 75
Securing Child Restraints (With the Seat Belt in the Rear Seat) 75
Securing Child Restraints (With the Seat Belt in the Front Seat) 77

Head Restraints

Front Seats

Warning

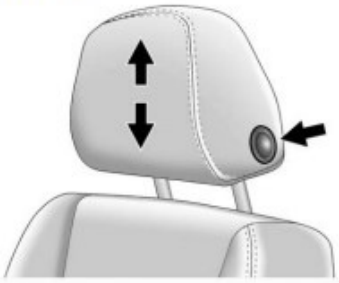
With head restraints that are not installed and adjusted properly, there is a greater chance that occupants will suffer a neck/spinal injury in a crash. Do not drive until the head restraints for all occupants are installed and adjusted properly.

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

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

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 chance of a neck injury in a crash.

The height of the head restraint can be adjusted.



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.

Rear Seats

Adjusting the Rear Head Restraint

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 that it is locked in place.

To lower the head restraint, press the button, located 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 that 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.

Figure A-104: Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA TRACES

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Driver Dummy Instrumentation Plots

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The following additional dummy and vehicle response data 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)

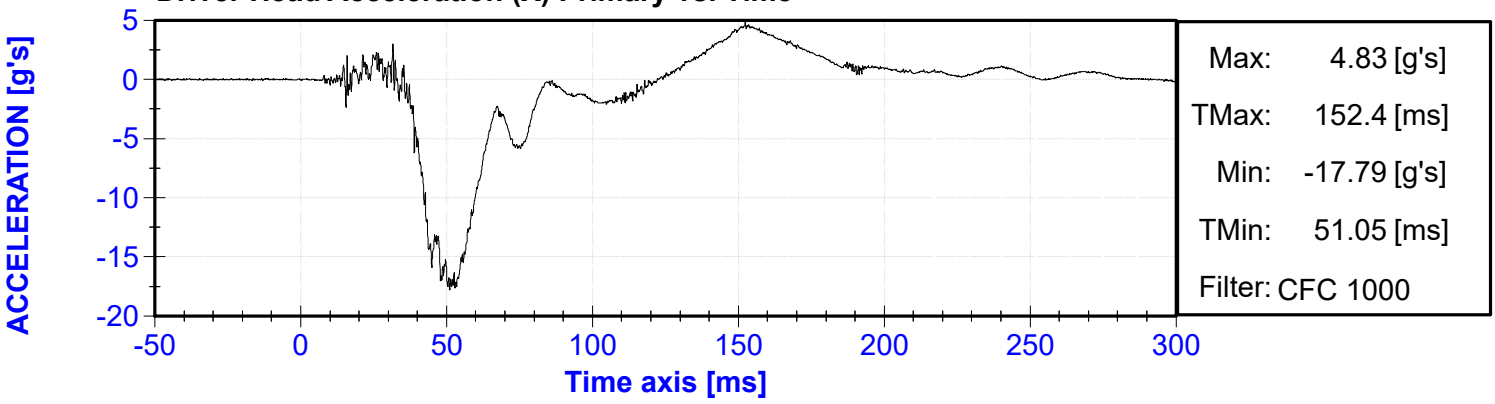
Vehicle Instrumentation Data

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)

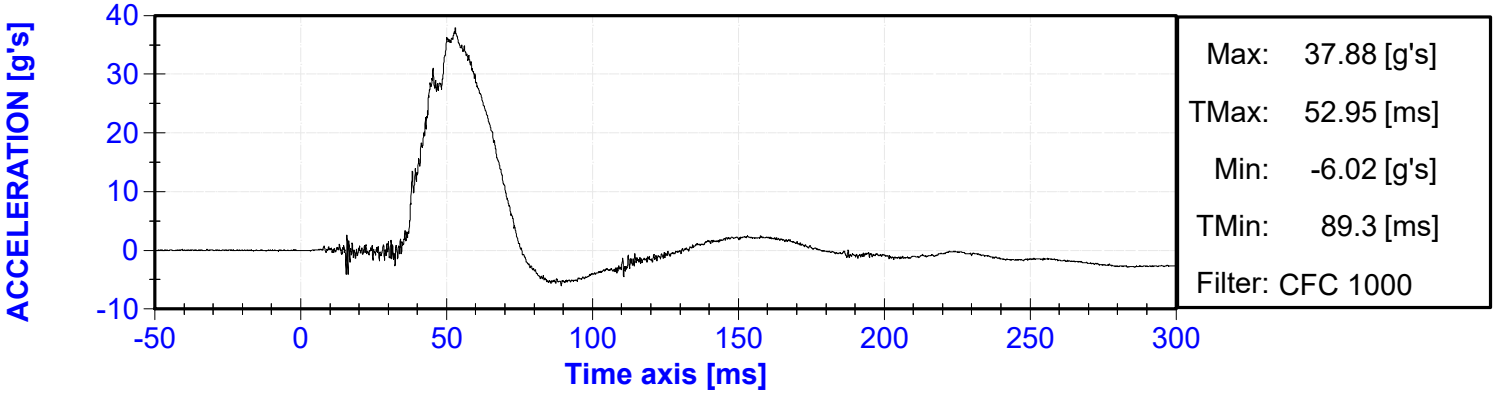
MDB Instrumentation Data

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

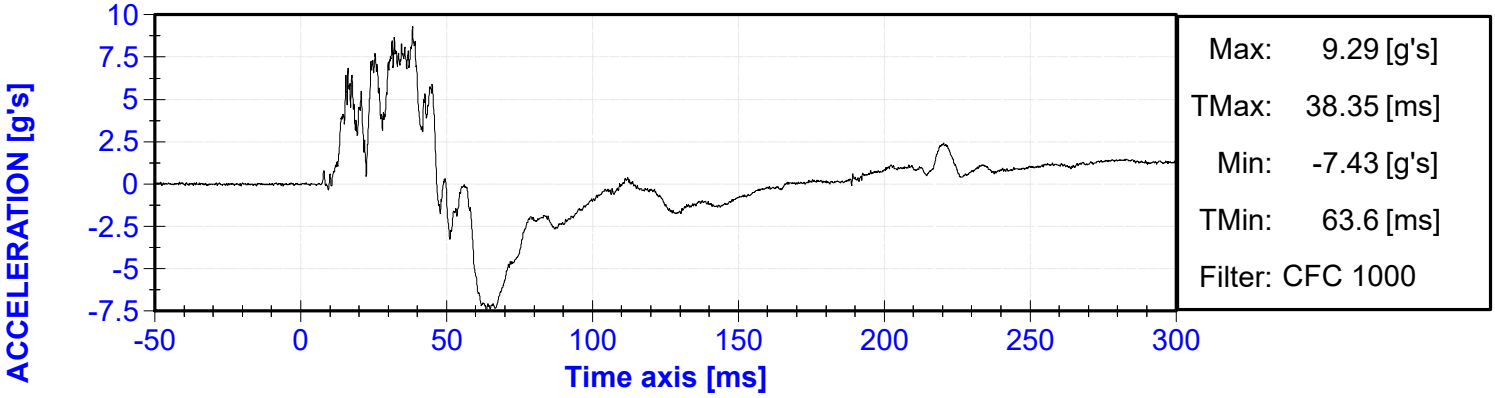
Driver Head Acceleration (X) Primary vs. Time



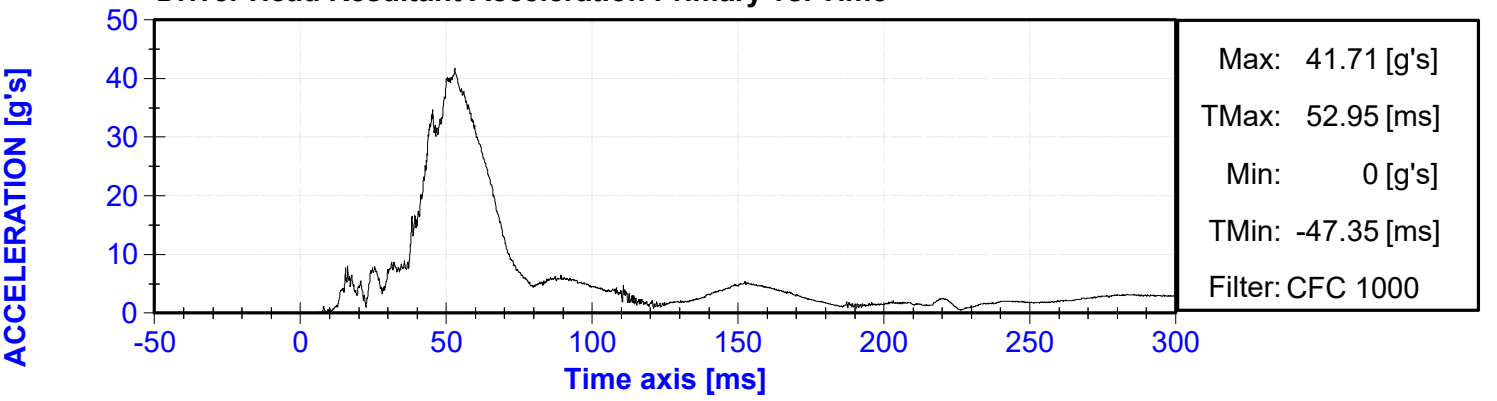
Driver Head Acceleration (Y) Primary vs. Time



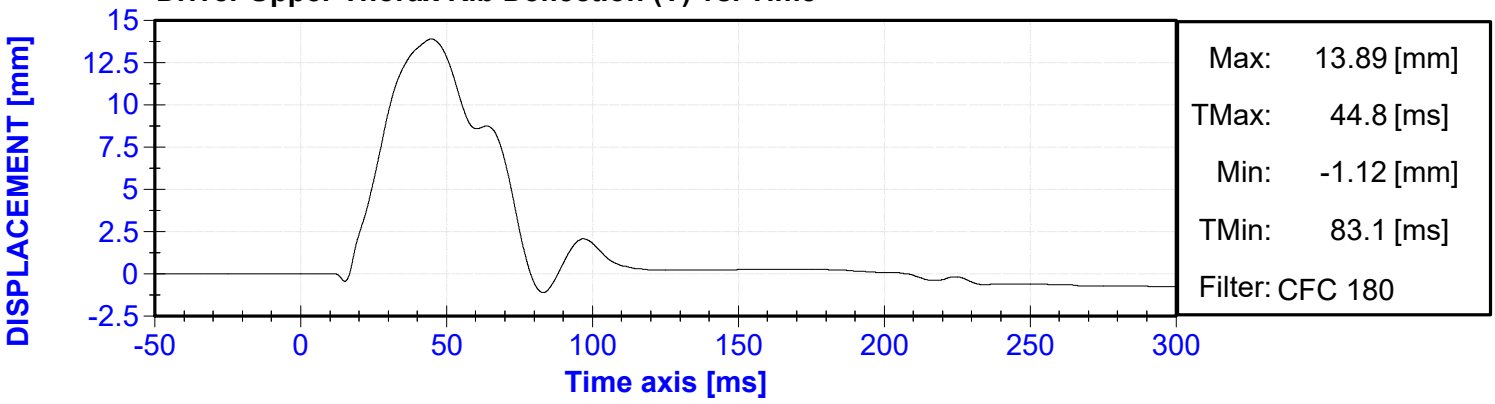
Driver Head Acceleration (Z) Primary vs. Time



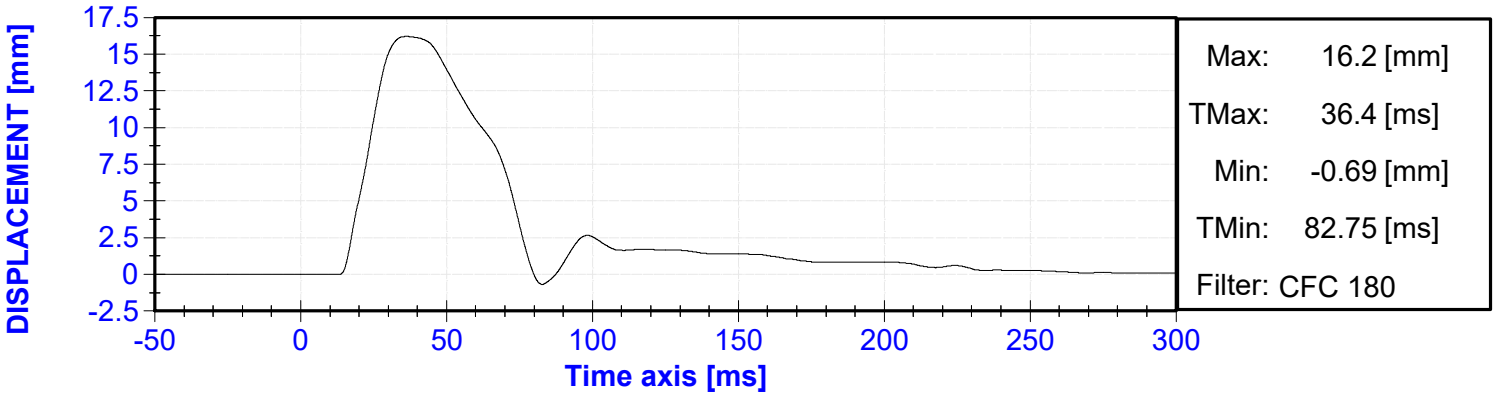
Driver Head Resultant Acceleration Primary vs. Time



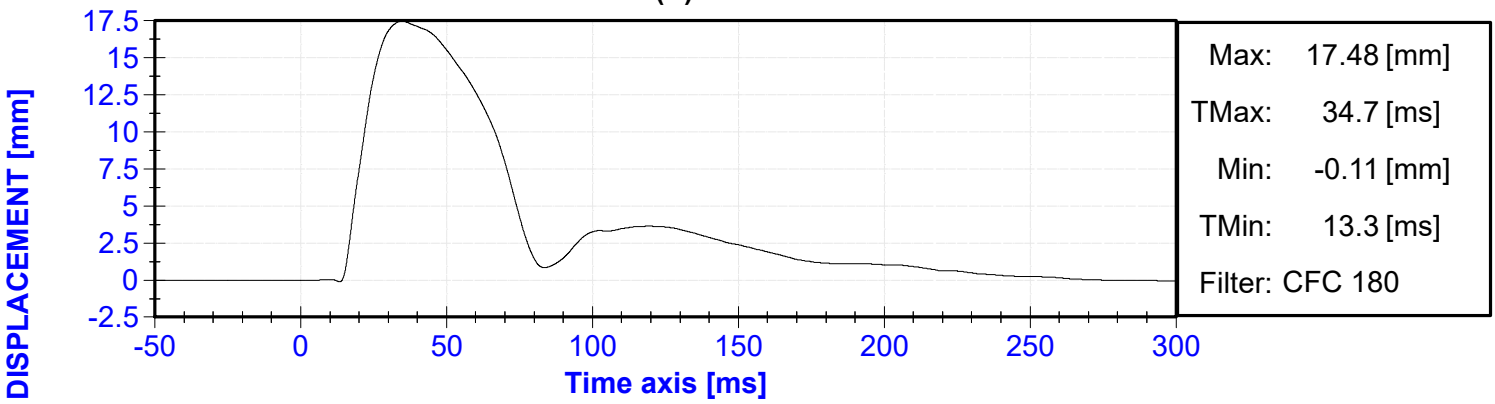
Driver Upper Thorax Rib Deflection (Y) vs. Time



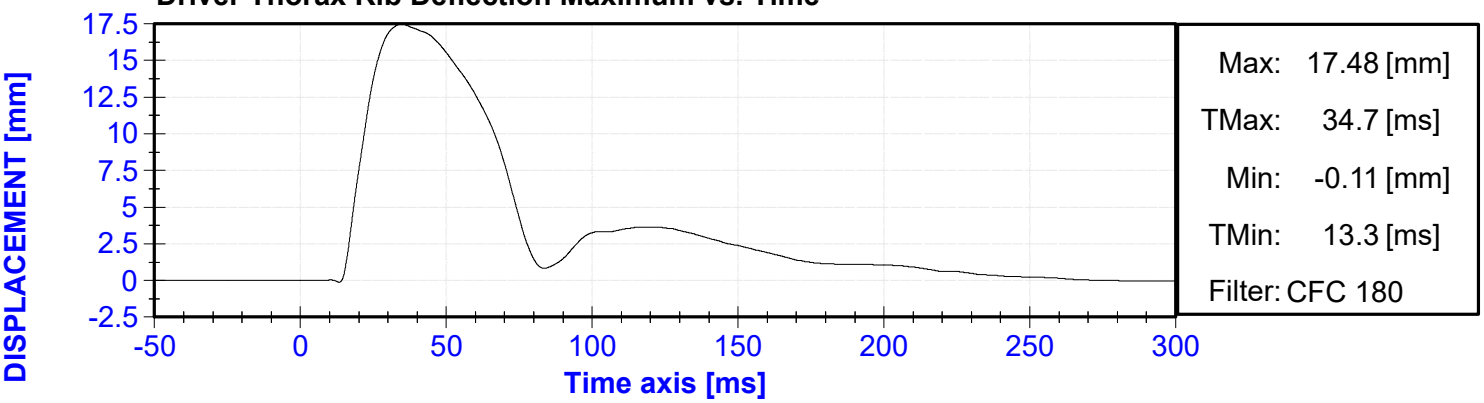
Driver Middle Thorax Rib Deflection (Y) vs. Time



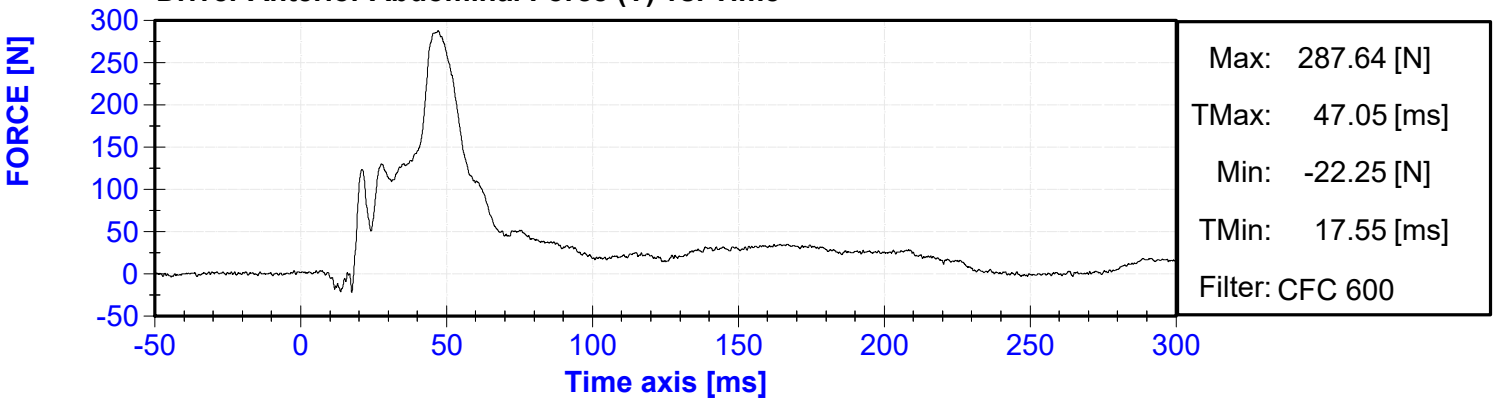
Driver Lower Thorax Rib Deflection (Y) vs. Time



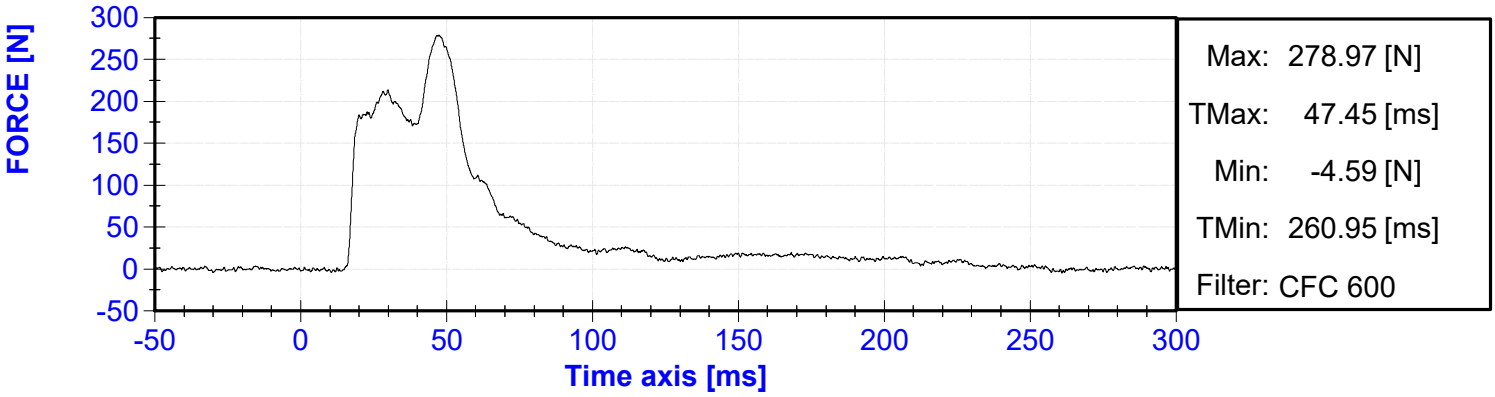
Driver Thorax Rib Deflection Maximum vs. Time



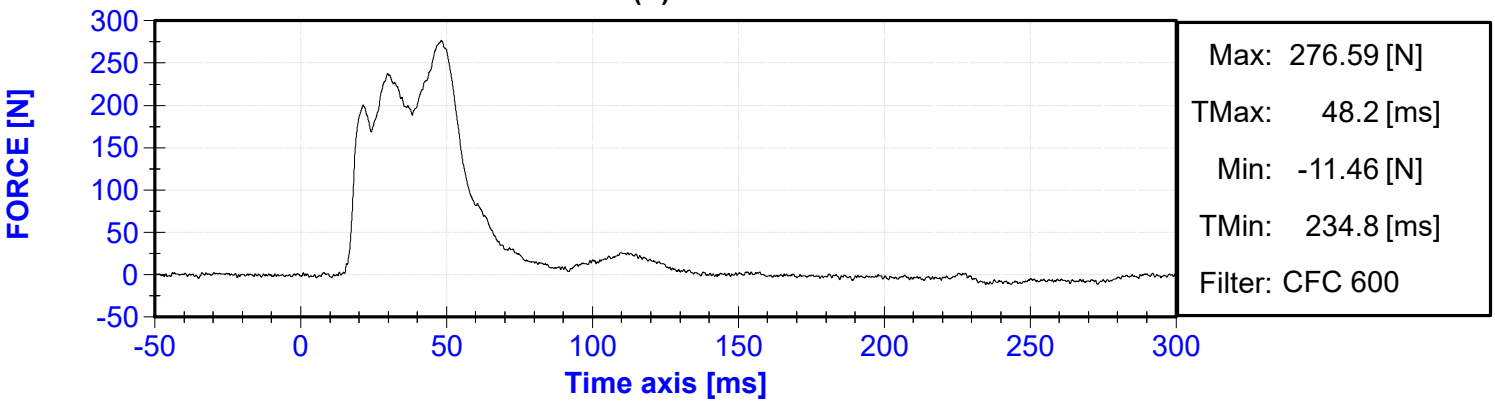
Driver Anterior Abdominal Force (Y) vs. Time



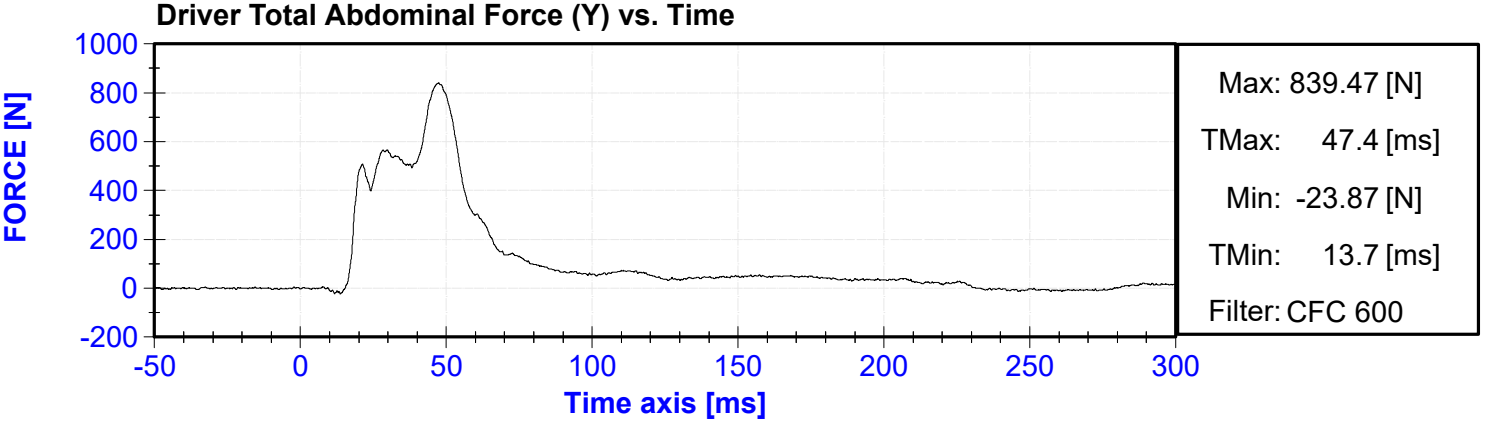
Driver Middle Abdominal Force (Y) vs. Time



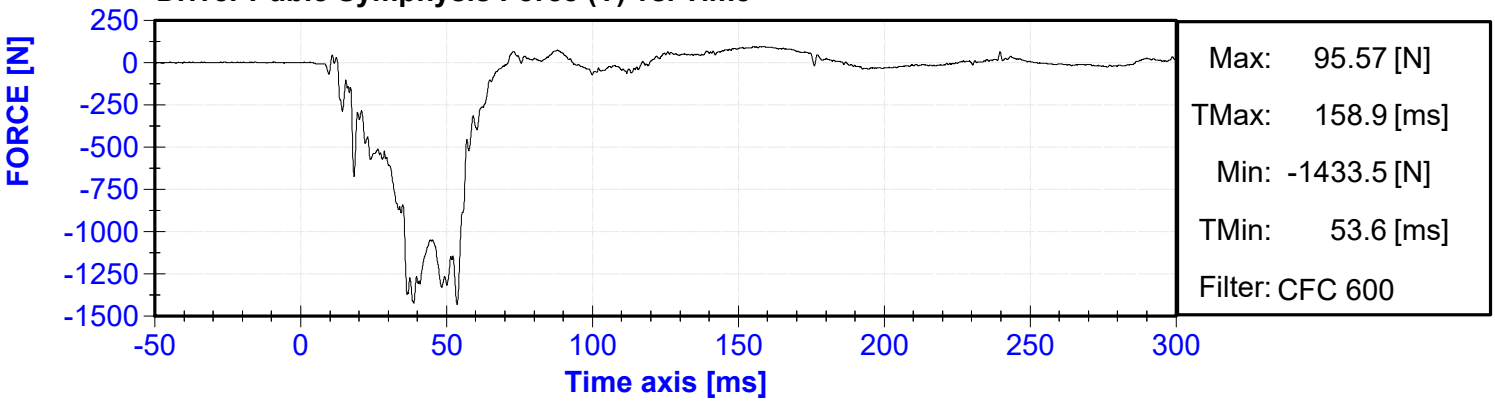
Driver Posterior Abdominal Force (Y) vs. Time



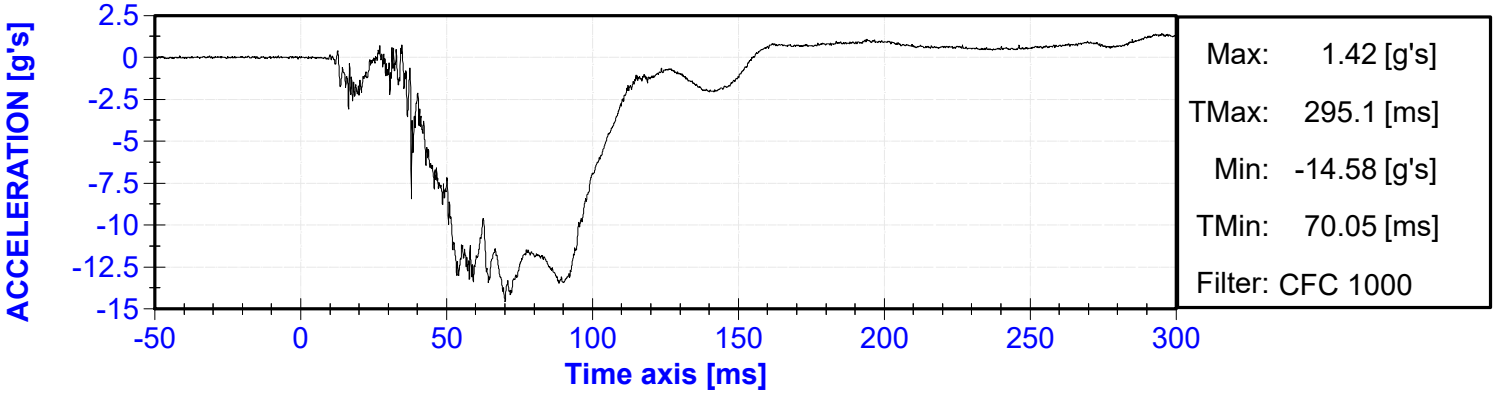
Driver Total Abdominal Force (Y) vs. Time



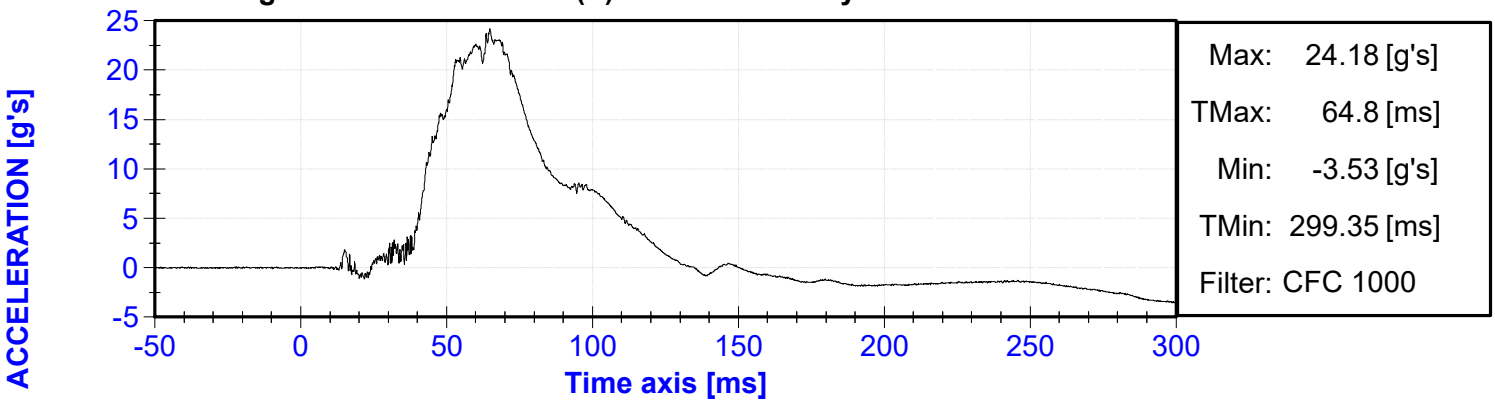
Driver Pubic Symphysis Force (Y) vs. Time



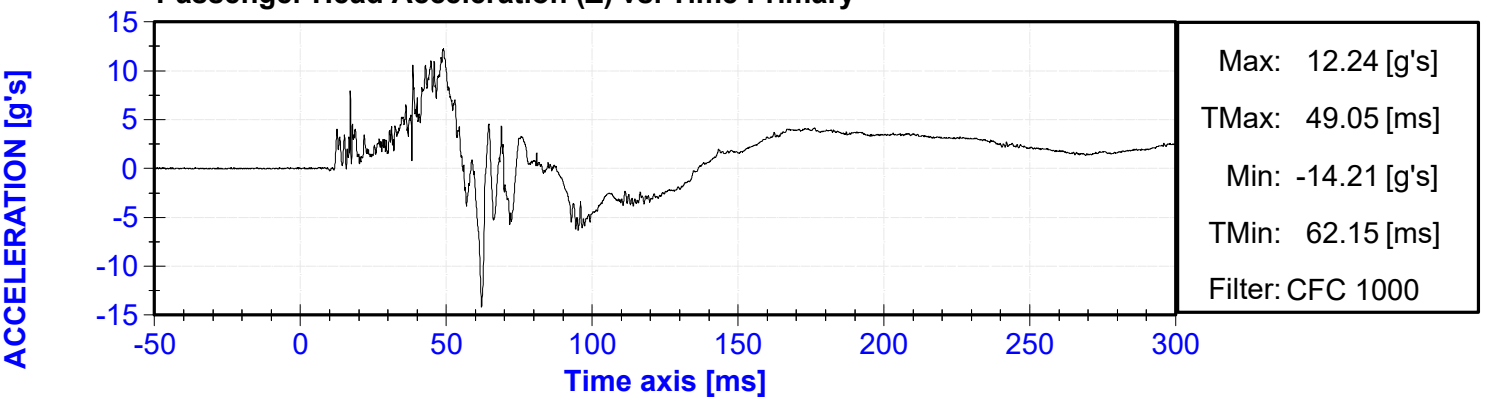
Passenger Head Acceleration (X) vs. Time Primary



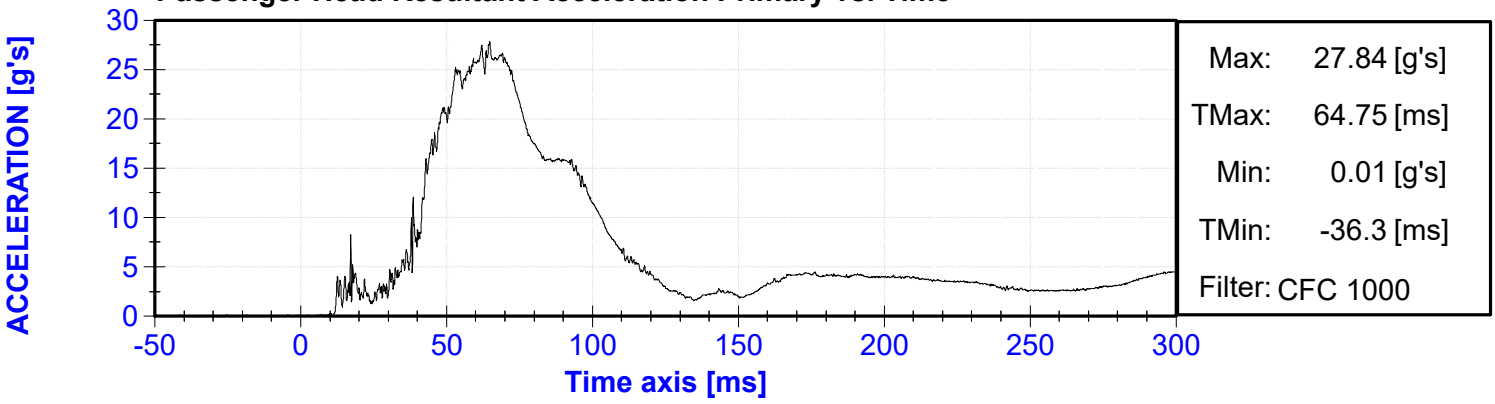
Passenger Head Acceleration (Y) vs. Time Primary



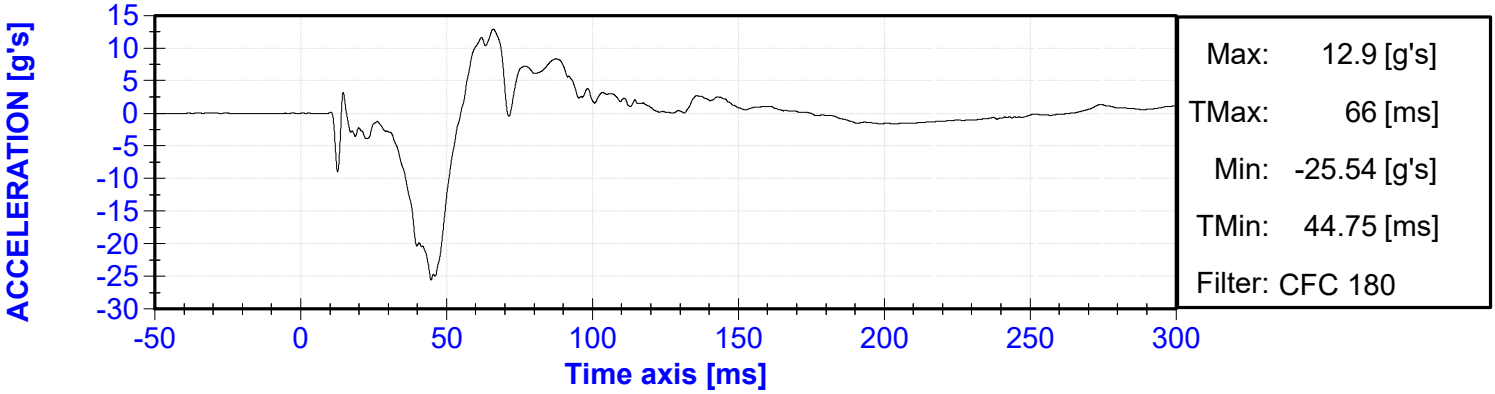
Passenger Head Acceleration (Z) vs. Time Primary



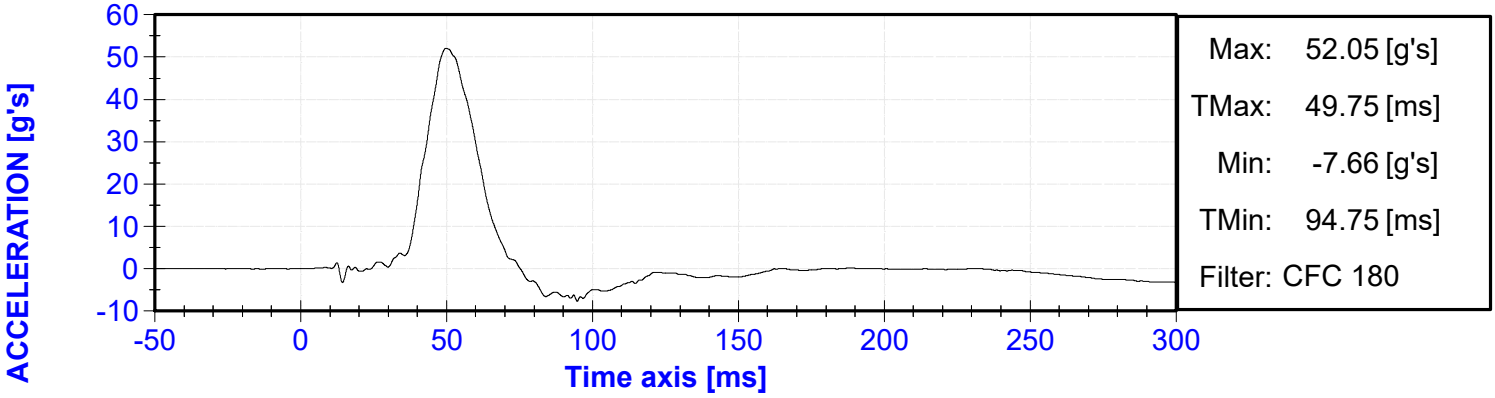
Passenger Head Resultant Acceleration Primary vs. Time



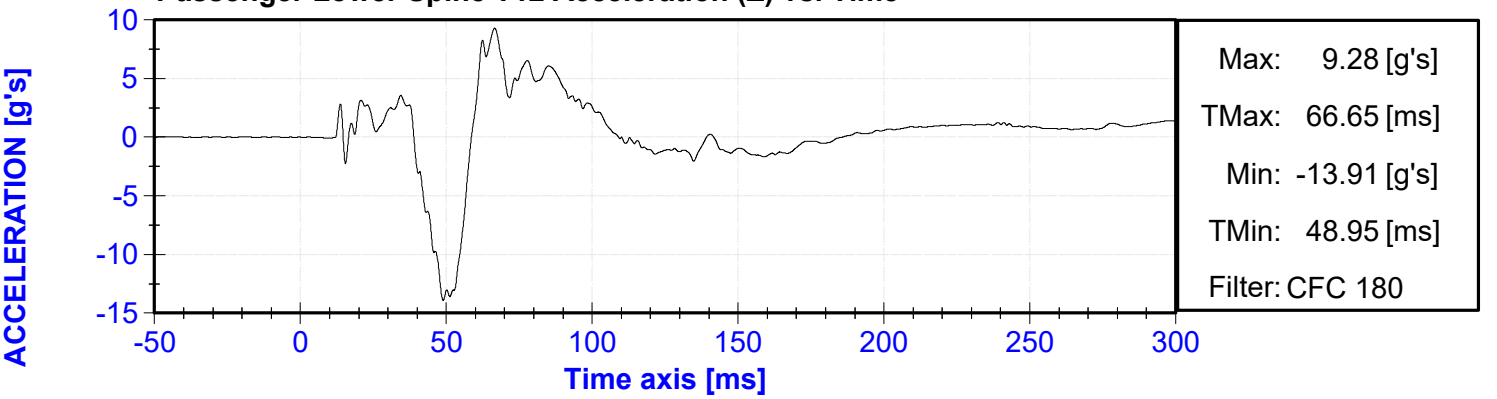
Passenger Lower Spine T12 Acceleration (X) vs. Time



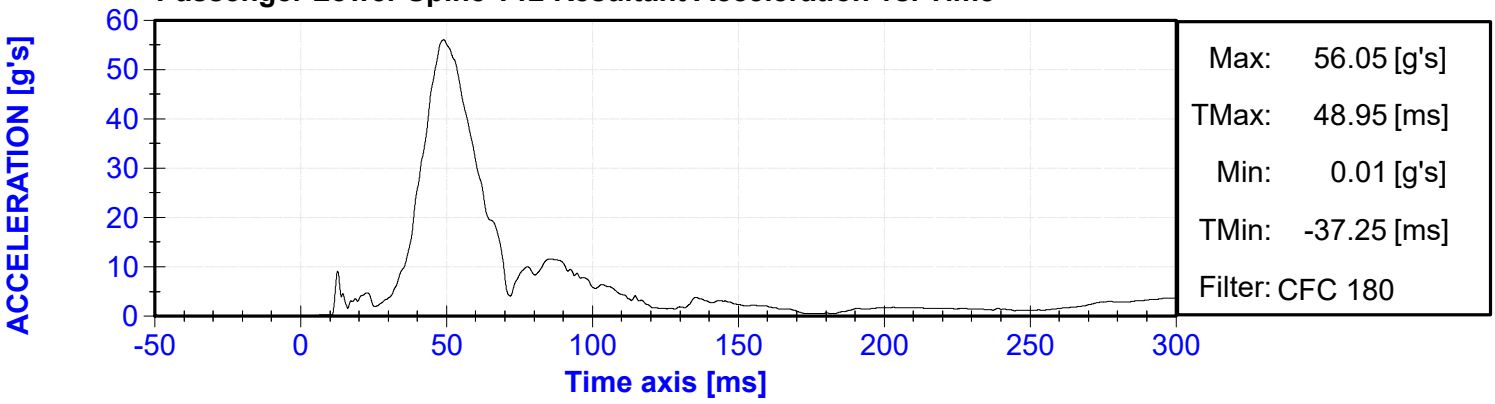
Passenger Lower Spine T12 Acceleration (Y) vs. Time



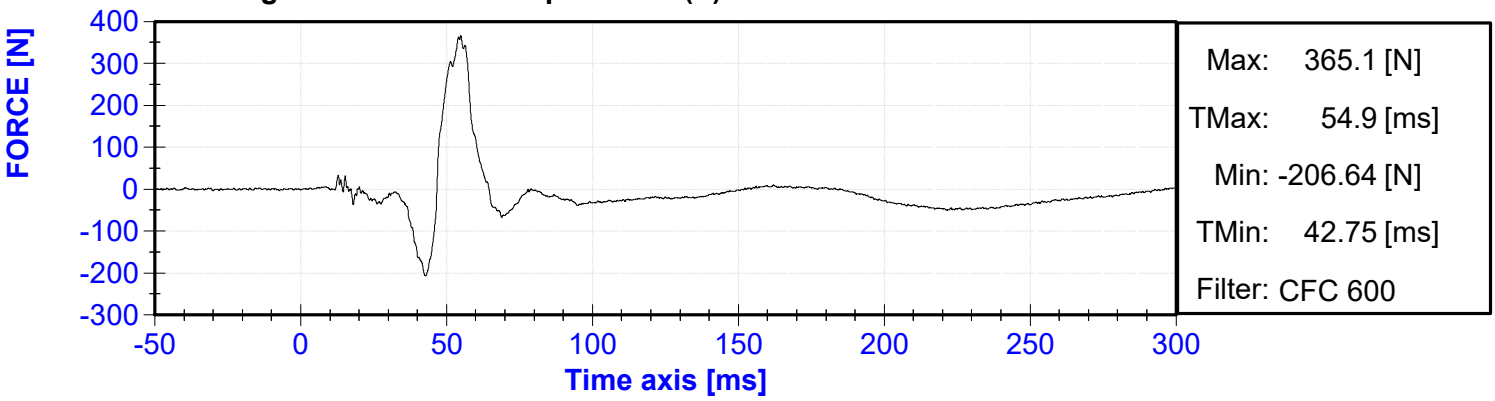
Passenger Lower Spine T12 Acceleration (Z) vs. Time



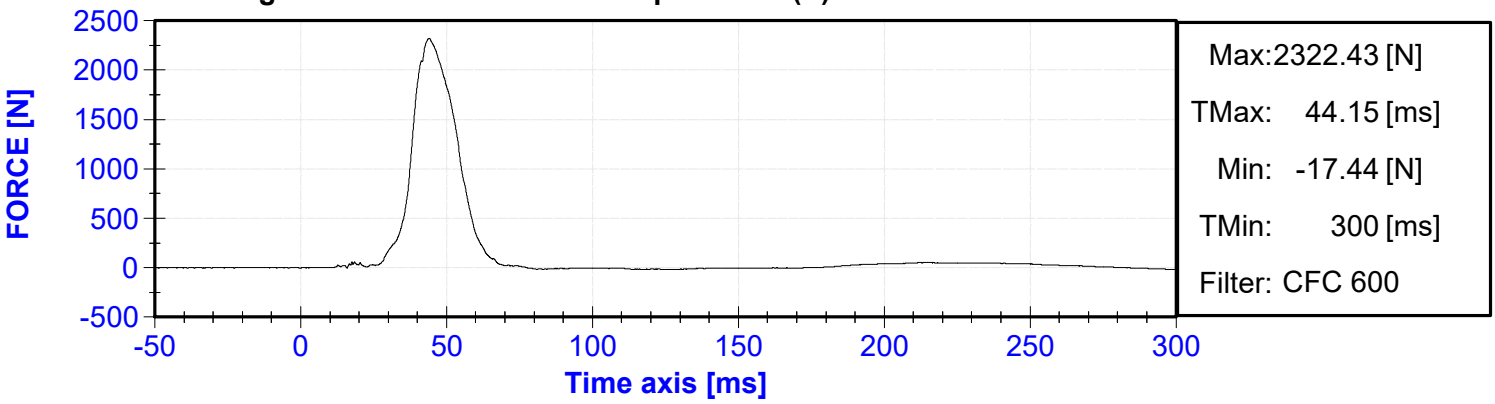
Passenger Lower Spine T12 Resultant Acceleration vs. Time



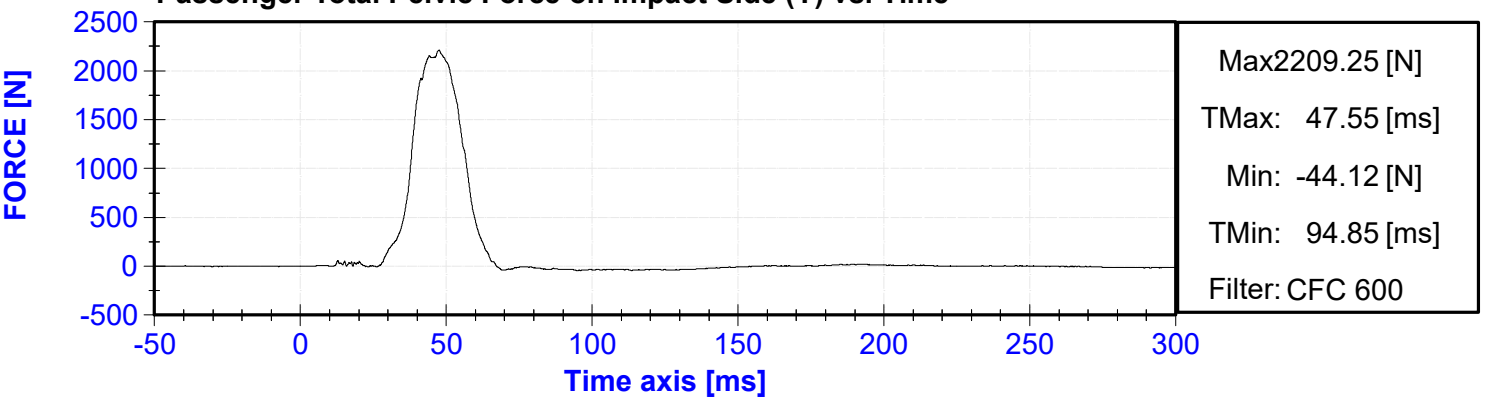
Passenger Iliac Force on Impact Side (Y) vs. Time



Passenger Acetabulum Force on Impact Side (Y) vs. Time



Passenger Total Pelvic Force on Impact Side (Y) vs. Time



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

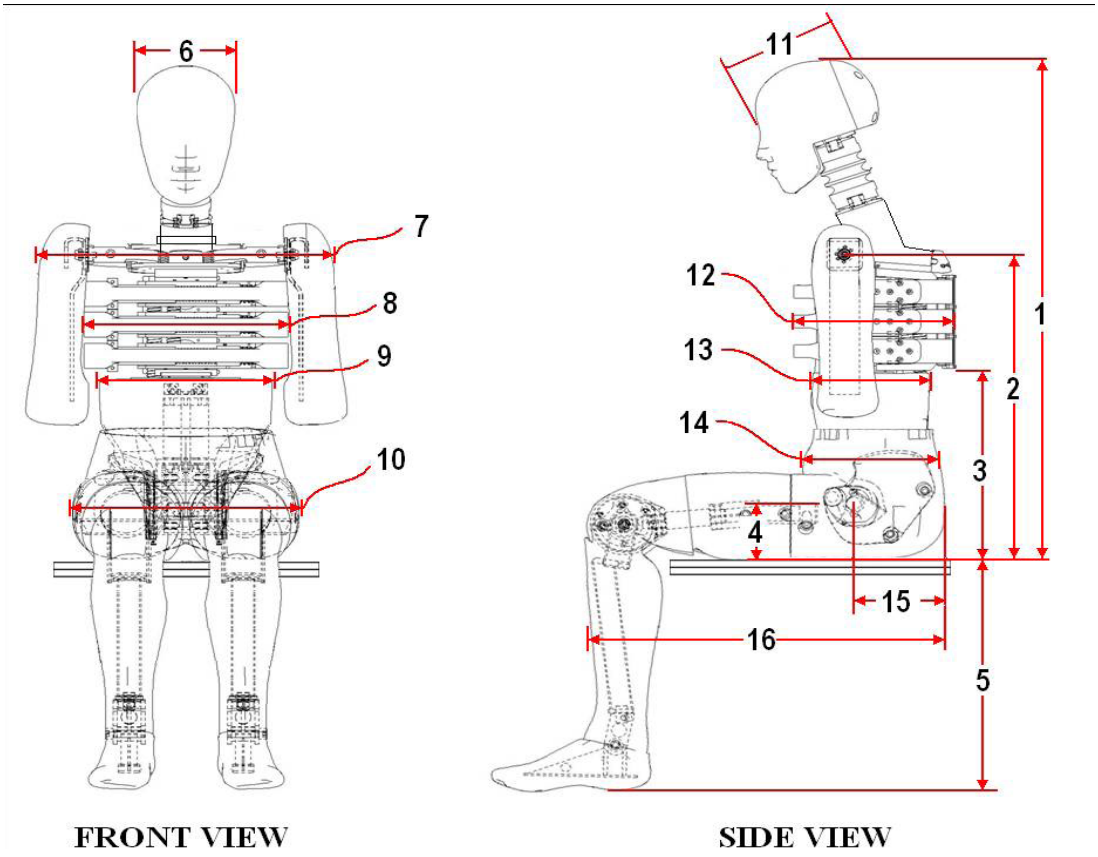
SERIAL NO:F033

(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - EuroSID-2re

Technician: J. Rios Date: 1/14/2025

Dummy Serial Number: F033



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	563	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	351	Pass
4	Seat to Hip Joint (center of bolt)	97	103	101	Pass
5	Sole to Seat, Sitting	333	451	411	Pass
6	Head Width	152	158	155	Pass
7	Shoulder/Arm Width	461	479	470	Pass
8	Thorax Width	322	332	328	Pass
9	Abdomen Width	273	287	283	Pass
10	Pelvis Lap Width	359	373	364	Pass
11	Head Depth	196	206	201	Pass
12	Thorax Depth	262	272	268	Pass
13	Abdomen Depth	194	204	197	Pass
14	Pelvis Depth	235	245	241	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	154	Pass
16	Back of Buttocks to Front Knee	597	615	603	Pass

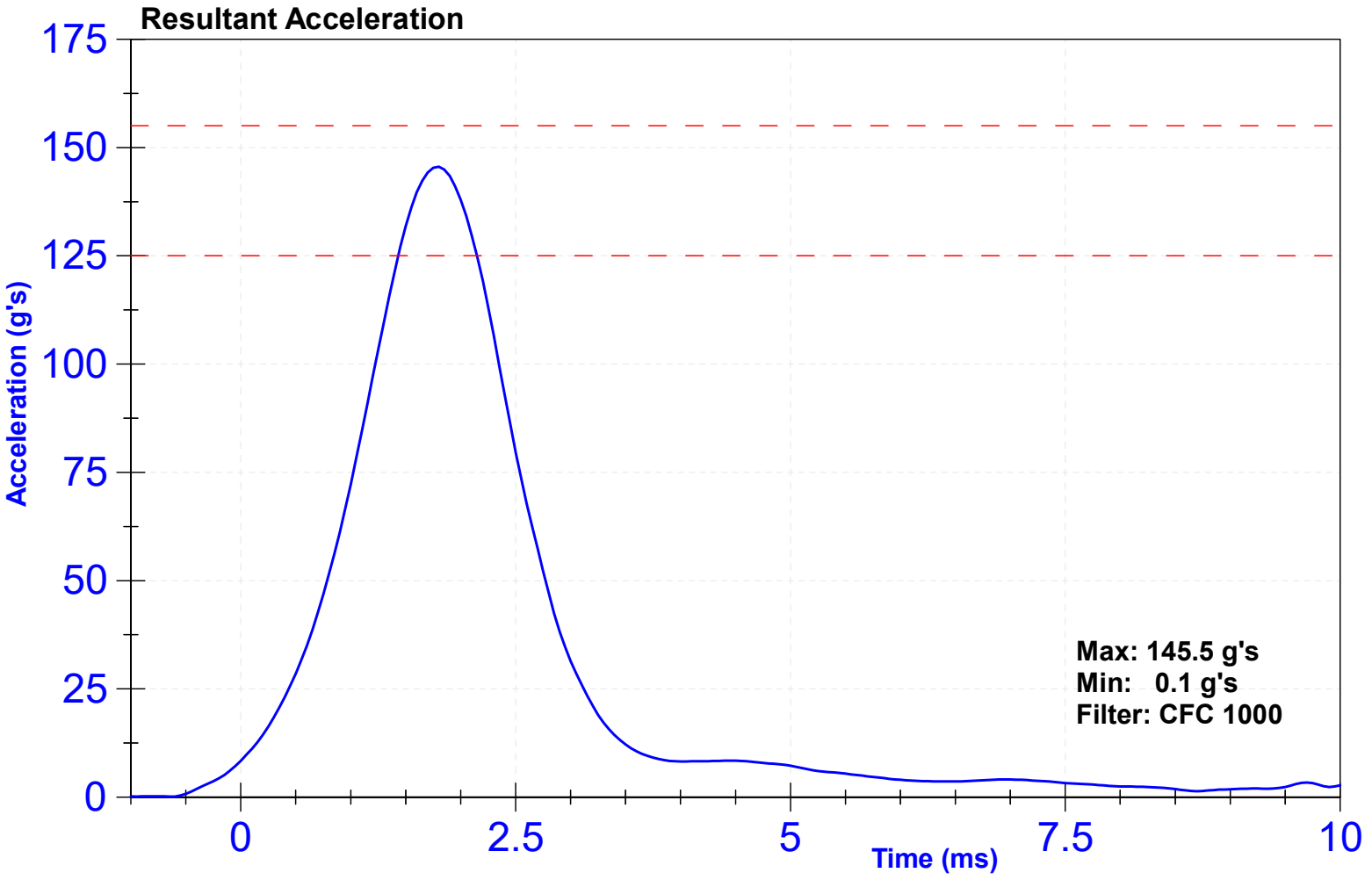
ATD Manufacturer	FTSS	Test Technician	K. Koineczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

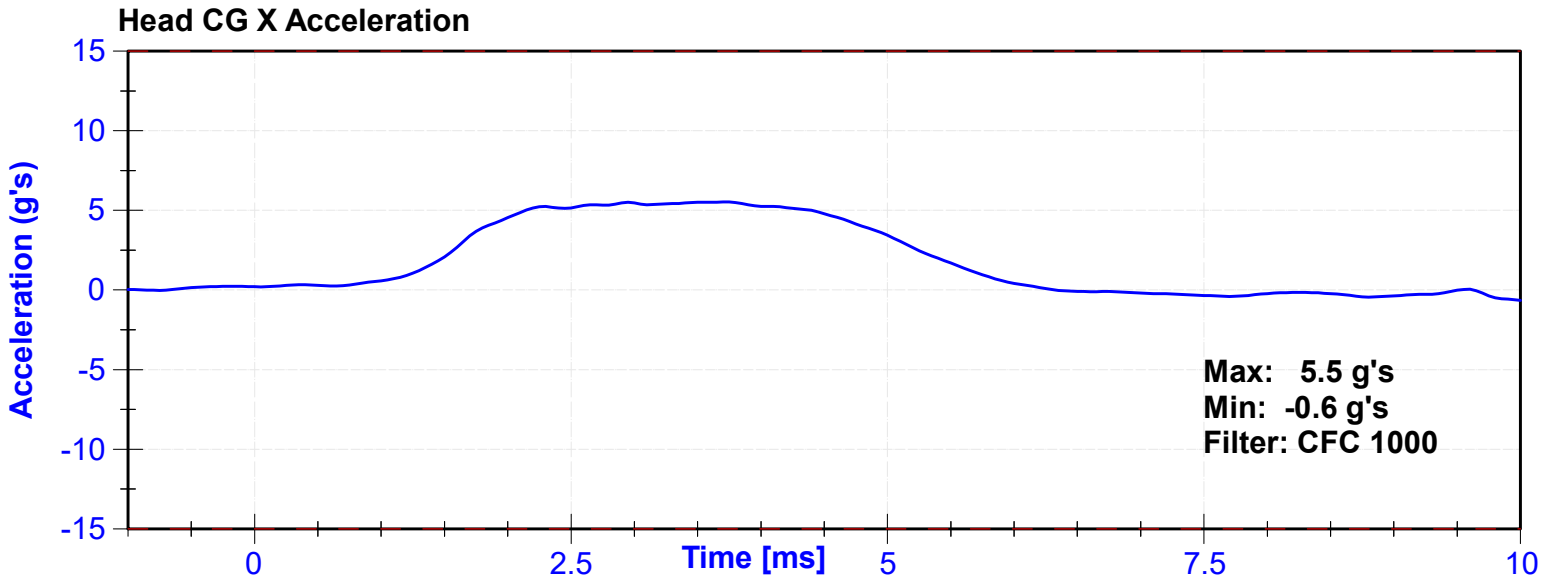
Results

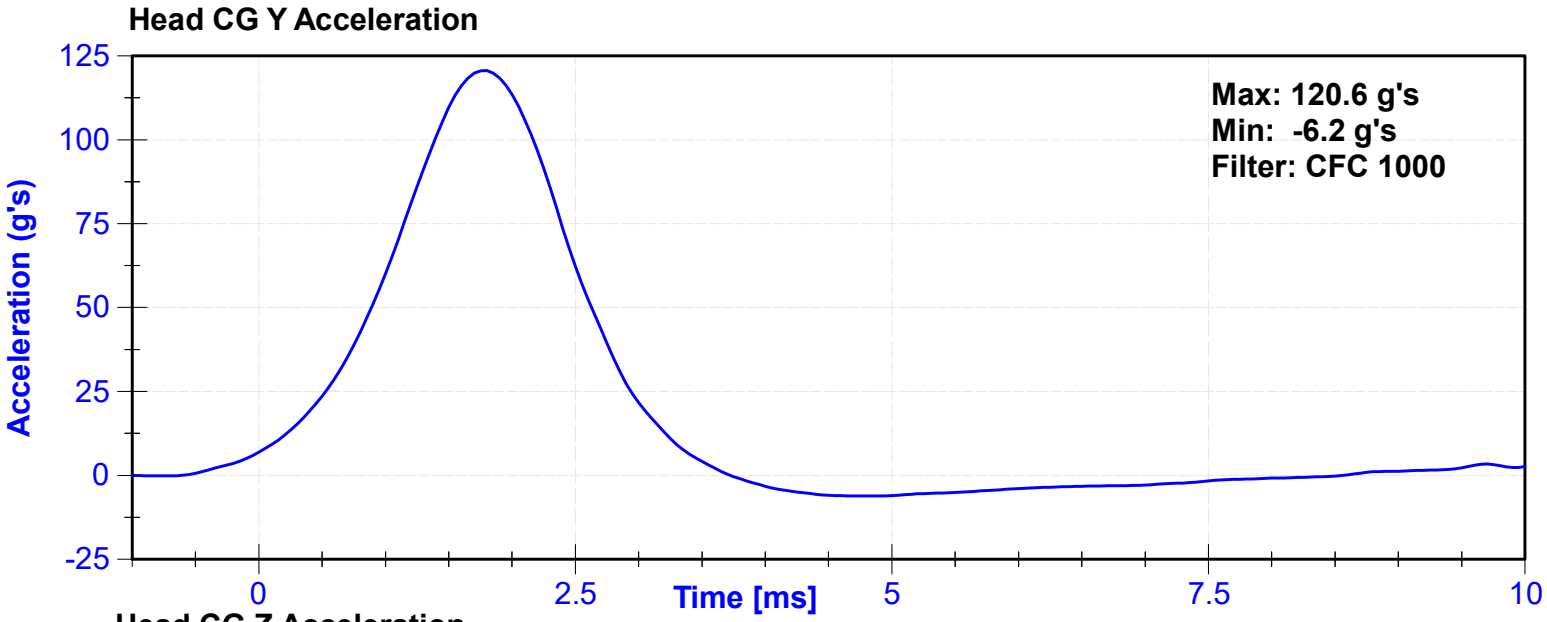
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.9	Pass
Humidity	10	70	%	17	Pass
Resultant Acceleration	125	155	g's	145.5	Pass
Oscillation	0	15	%	5.79	Pass
Fore-Aft Acceleration	-15	15	g's	5.5	Pass

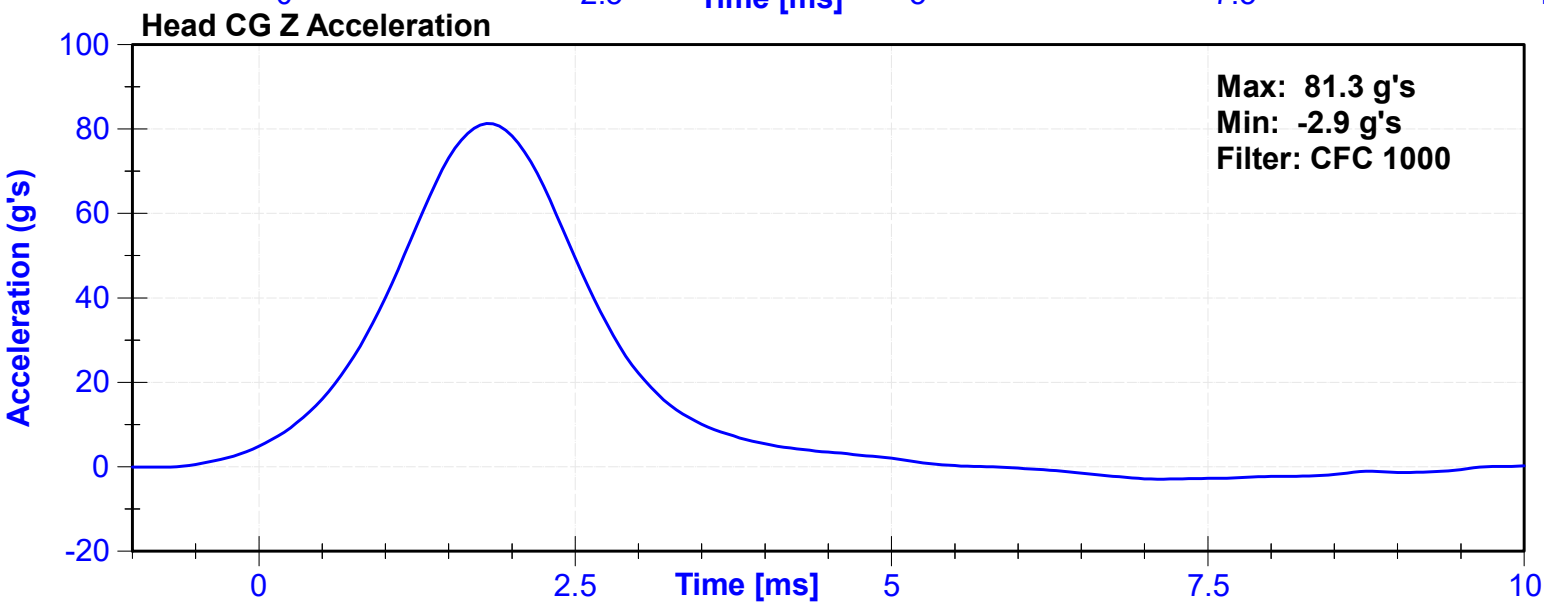
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P63861	10/17/2024	4/15/2025
Y Accelerometer	Endevco	P49216	10/17/2024	4/15/2025
Z Accelerometer	Endevco	P51303	10/17/2024	4/15/2025




Head CG X Acceleration
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
Time [ms]
5
7.5
10
Max: 5.5 g's
Min: -0.6 g's
Filter: CFC 1000


Head CG Y Acceleration
Acceleration (g's)
125
100
75
50
25
0
-25
0
2.5
Time [ms]
5
7.5
10
Max: 120.6 g's
Min: -6.2 g's
Filter: CFC 1000


Head CG Z Acceleration
Acceleration (g's)
100
80
60
40
20
0
-20
0
2.5
Time [ms]
5
7.5
10
Max: 81.3 g's
Min: -2.9 g's
Filter: CFC 1000

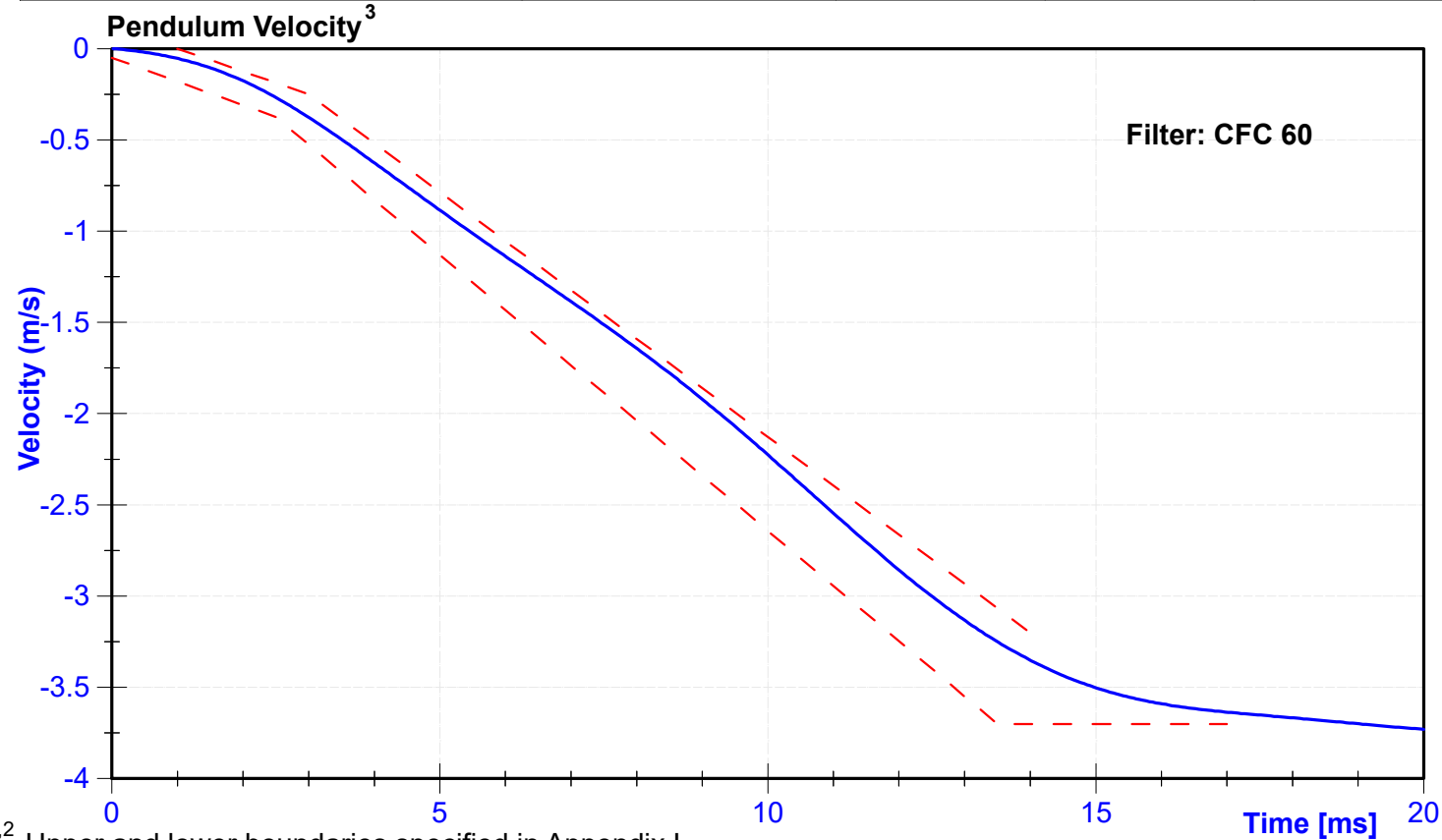
ATD Manufacturer	ftss	Test Technician	E. Andruczyk
ATD Serial Number	f033	Laboratory Supervisor	J. Kinderman

Results

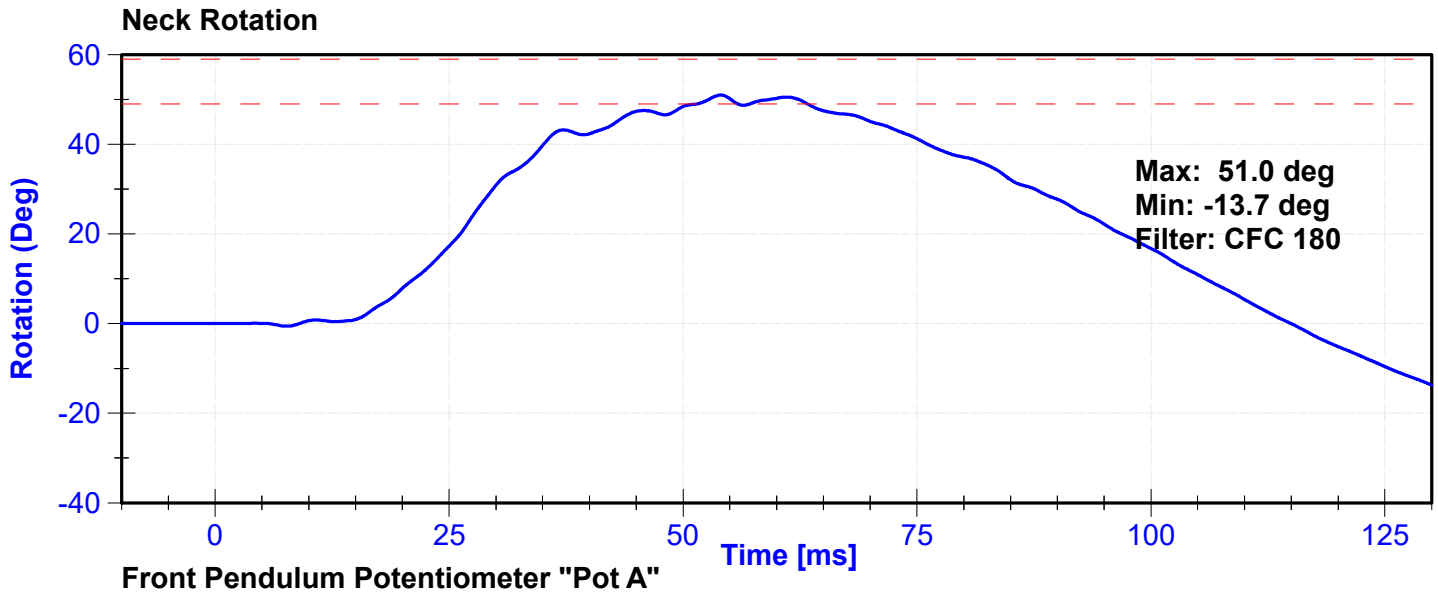
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Velocity	3.3	3.5	m/s	3.44	Pass
Lateral Neck Rotation	49	59	deg	51.0	Pass
Time at Maximum Rotation	54	66	ms	54.1	Pass
Time of Rotation Decay from Maximum	53	88	ms	61.0	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

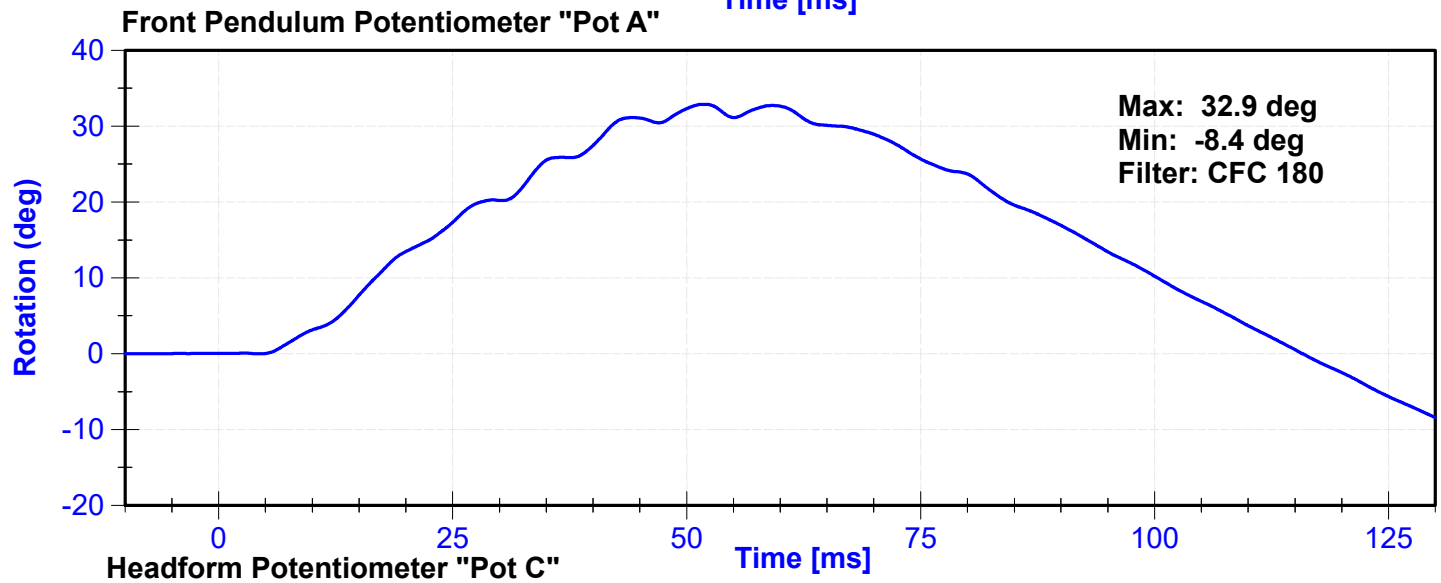
Transducer Calibrations

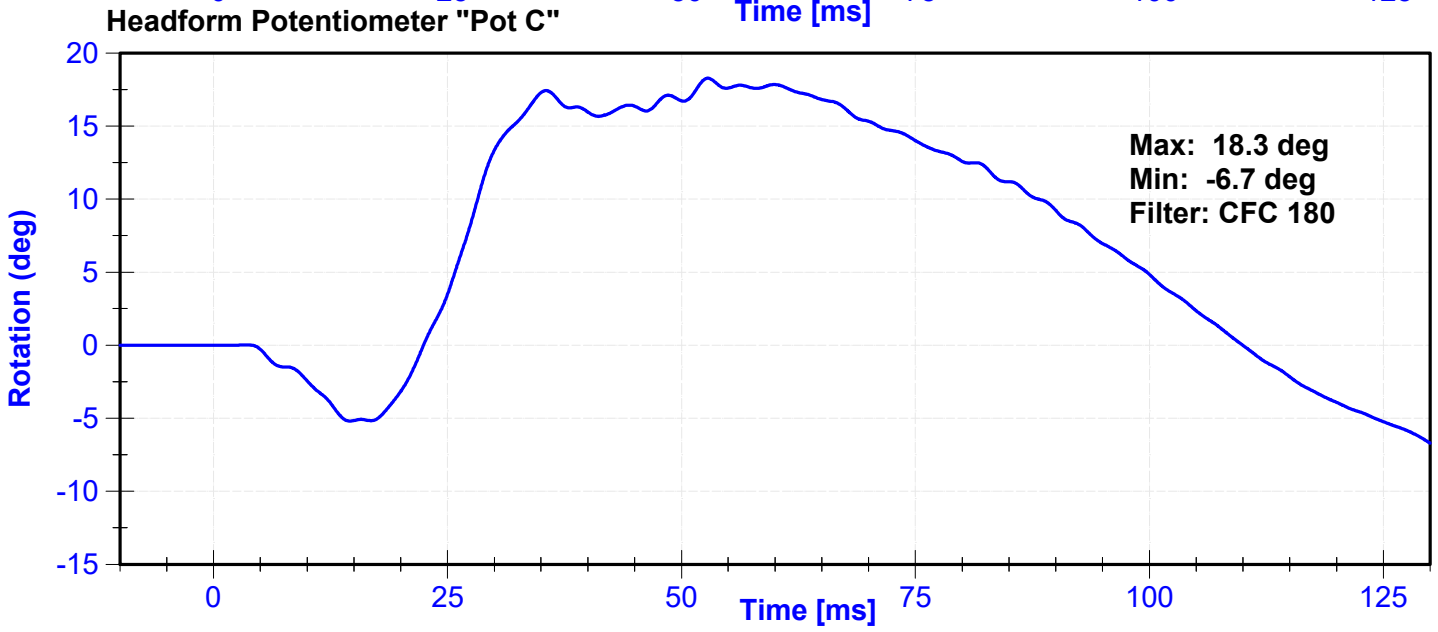
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16650	11/1/2024	11/1/2025
Front Pendulum Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Headform Potentiometer	Sfernice	095	9/13/2024	9/13/2025



[1,2] Upper and lower boundaries specified in Appendix I


Neck Rotation
Rotation (Deg)
60
40
20
0
-20
-40
0
25
50
75
100
125
Time [ms]
Max: 51.0 deg
Min: -13.7 deg
Filter: CFC 180


Front Pendulum Potentiometer "Pot A"
Rotation (deg)
40
30
20
10
0
-10
-20
0
25
50
75
100
125
Time [ms]
Max: 32.9 deg
Min: -8.4 deg
Filter: CFC 180


Headform Potentiometer "Pot C"
Rotation (deg)
20
15
10
5
0
-5
-10
-15
0
25
50
75
100
125
Time [ms]
Max: 18.3 deg
Min: -6.7 deg
Filter: CFC 180

Appendix I

[2] Upper Boundary Corridor		[1] Lower Boundary Corridor	
Time (ms)	Velocity (m/s)	Time (ms)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.25	2.5	-0.375
14.0	-3.20	13.5	-3.7
		17.0	-3.7

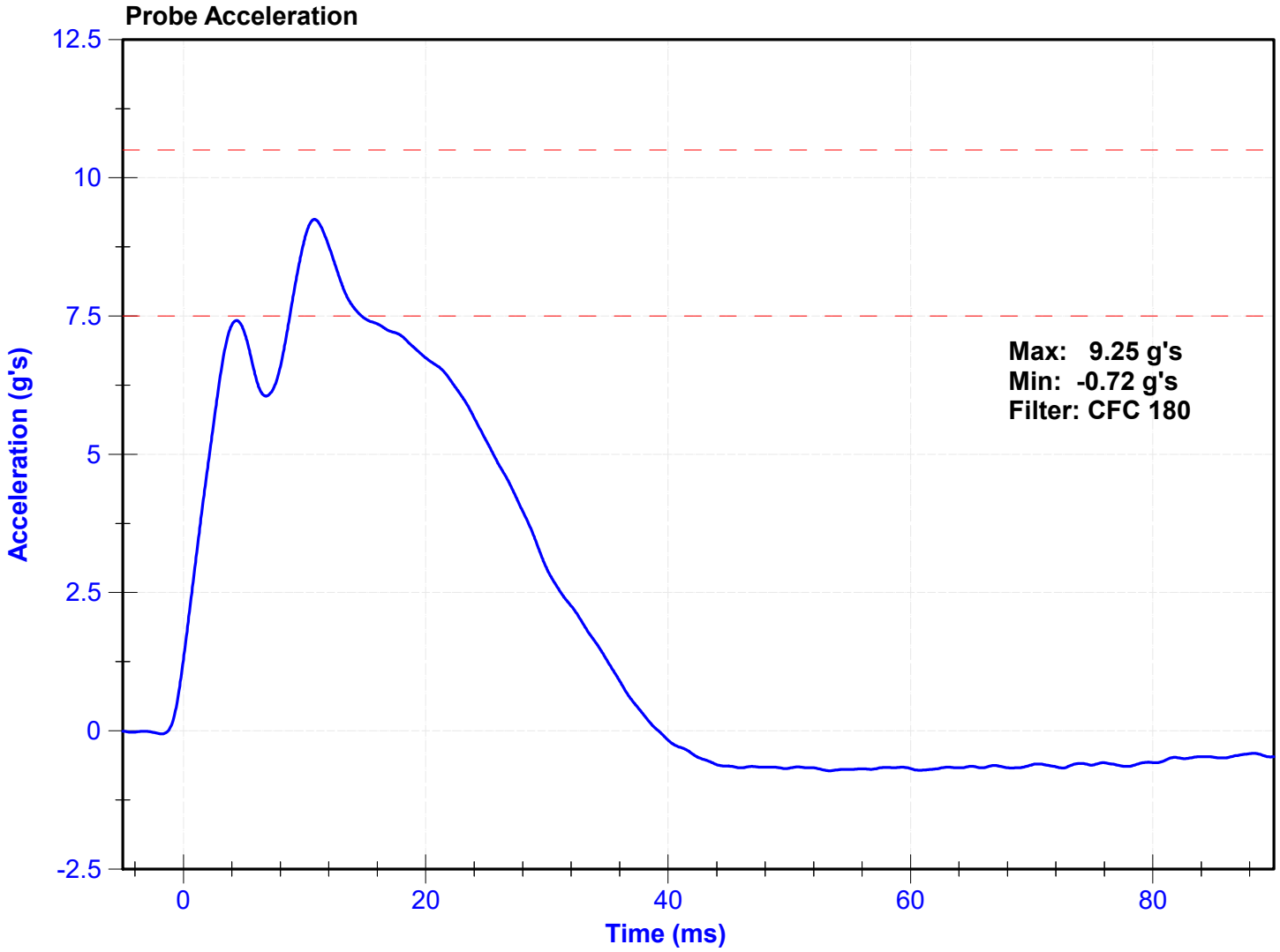
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	7.5	10.5	g's	9.25	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18599	9/13/2024	3/12/2025



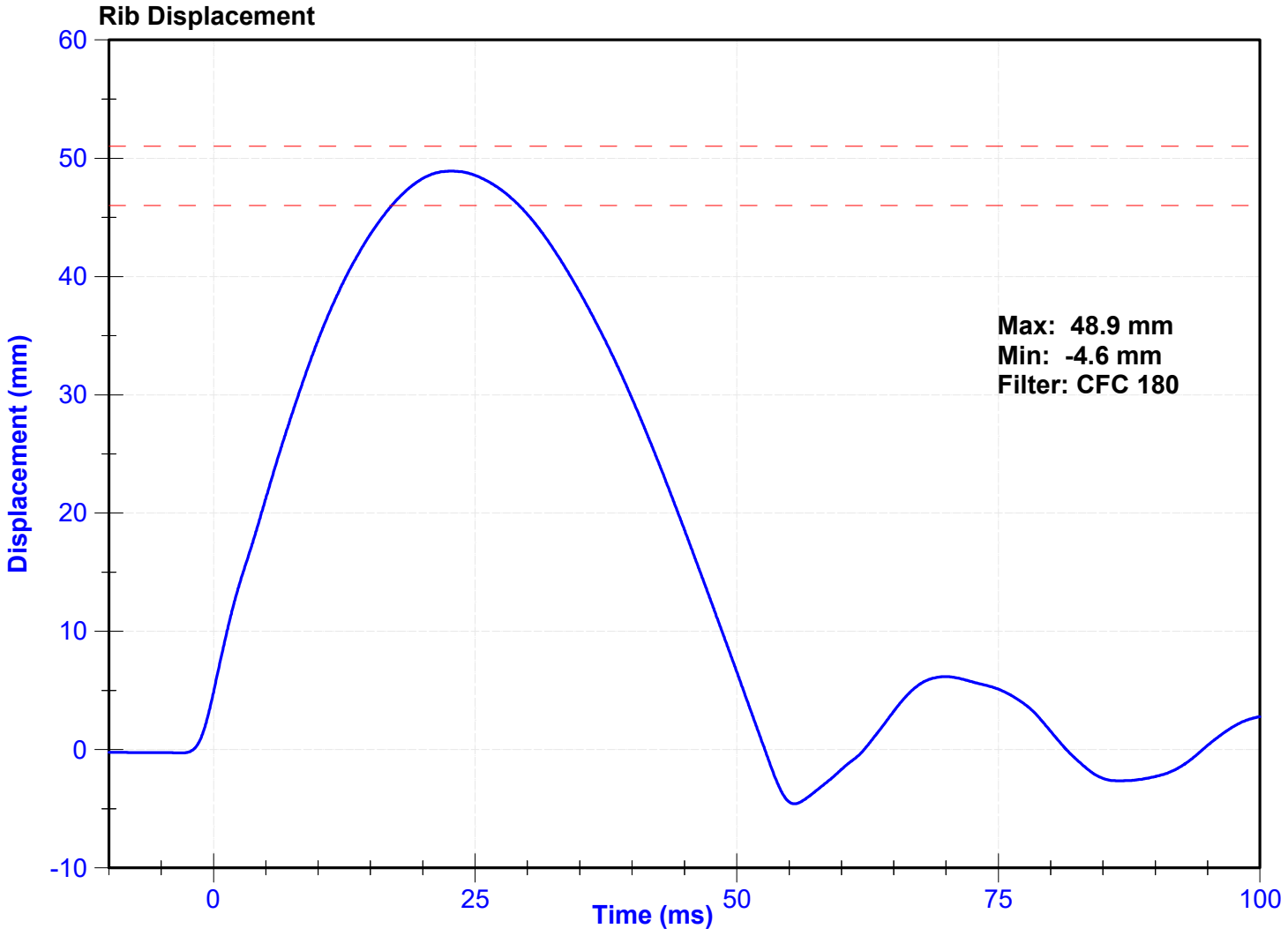
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J.Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Rib Displacement	46	51	mm	48.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	179GFE	10/16/2024	4/16/2025



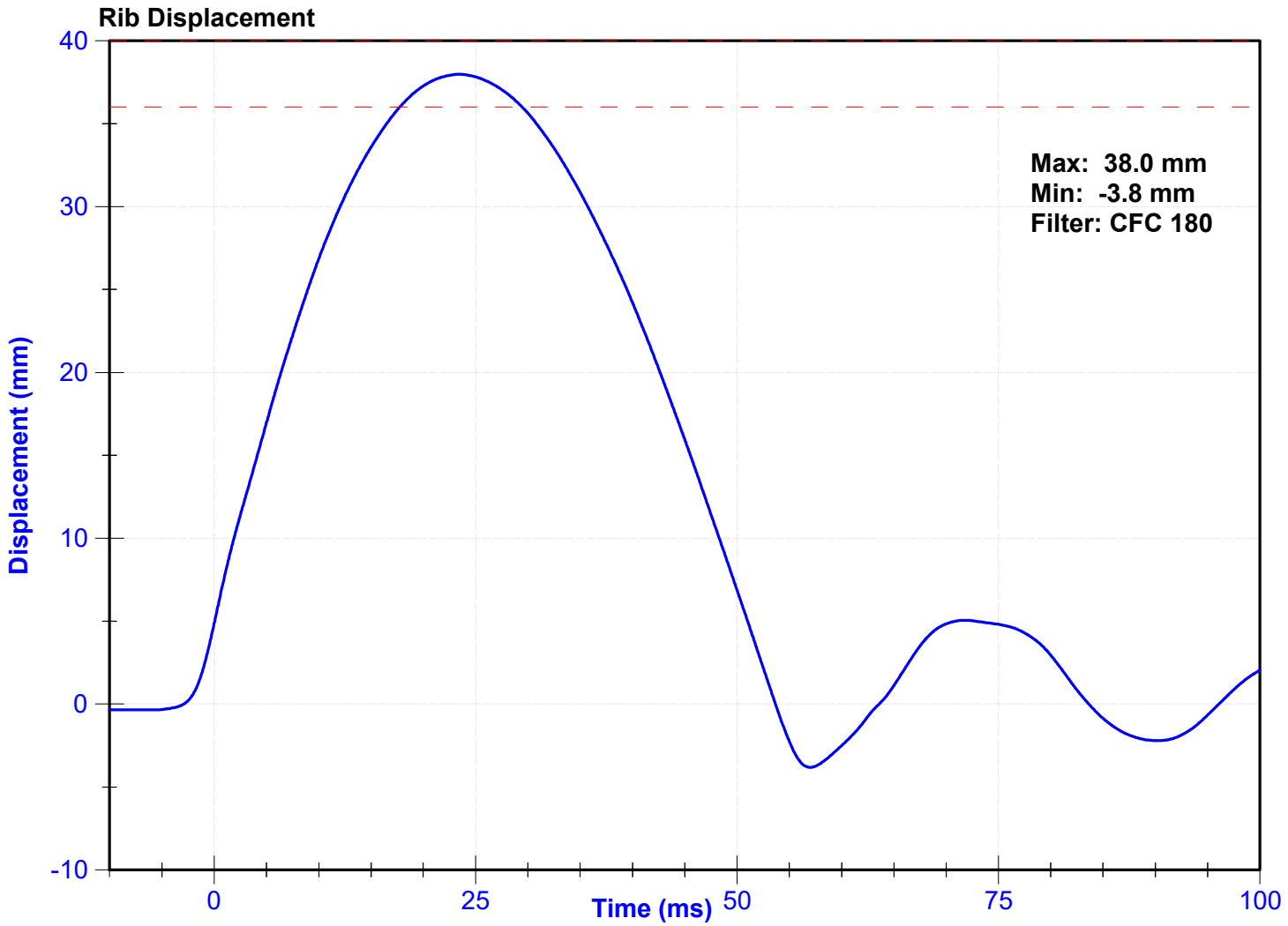
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J.Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Rib Displacement	36	40	mm	38.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	179GFE	10/16/2024	4/16/2025



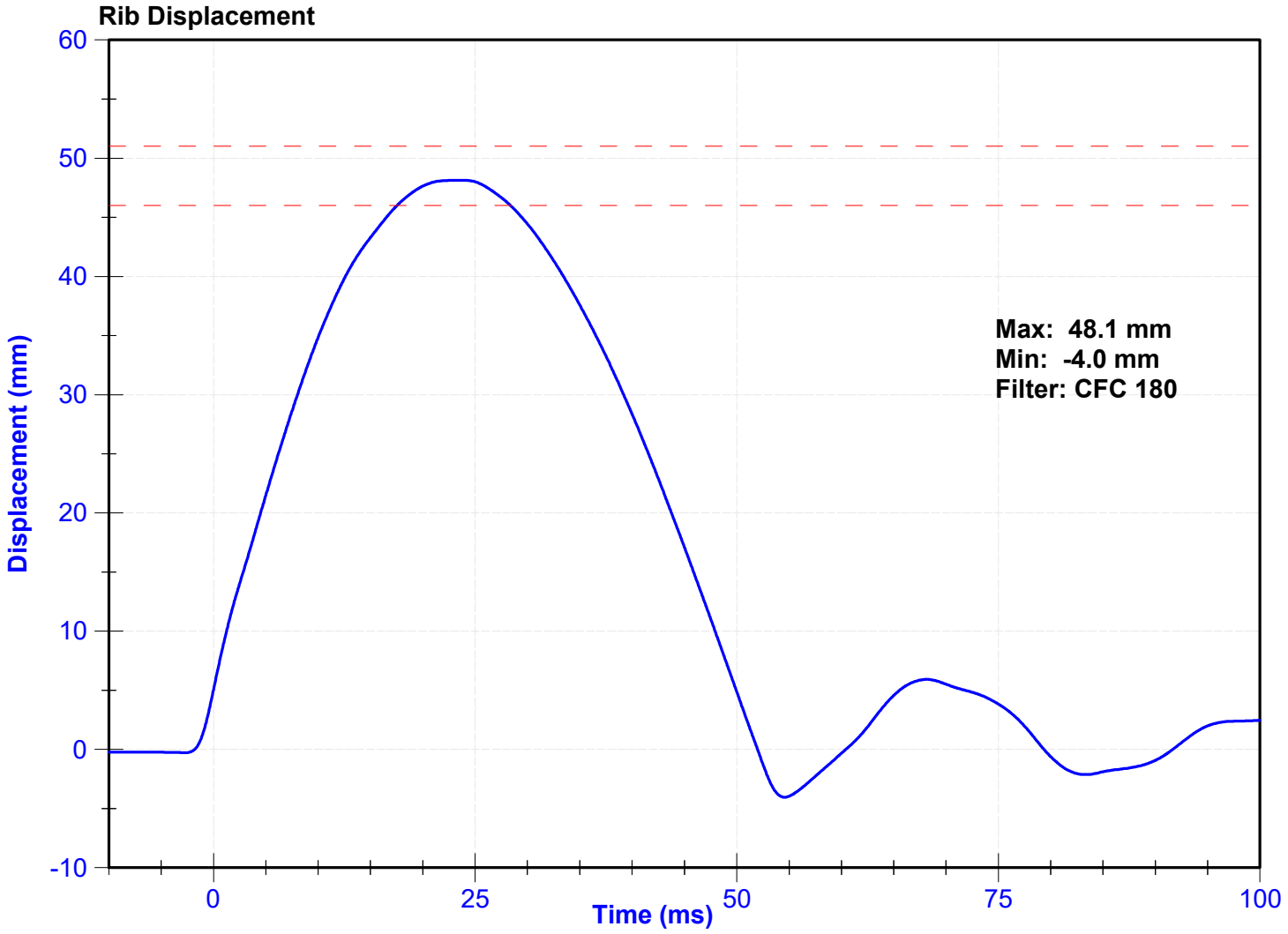
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J.Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Rib Displacement	46	51	mm	48.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	10/16/2024	4/16/2025



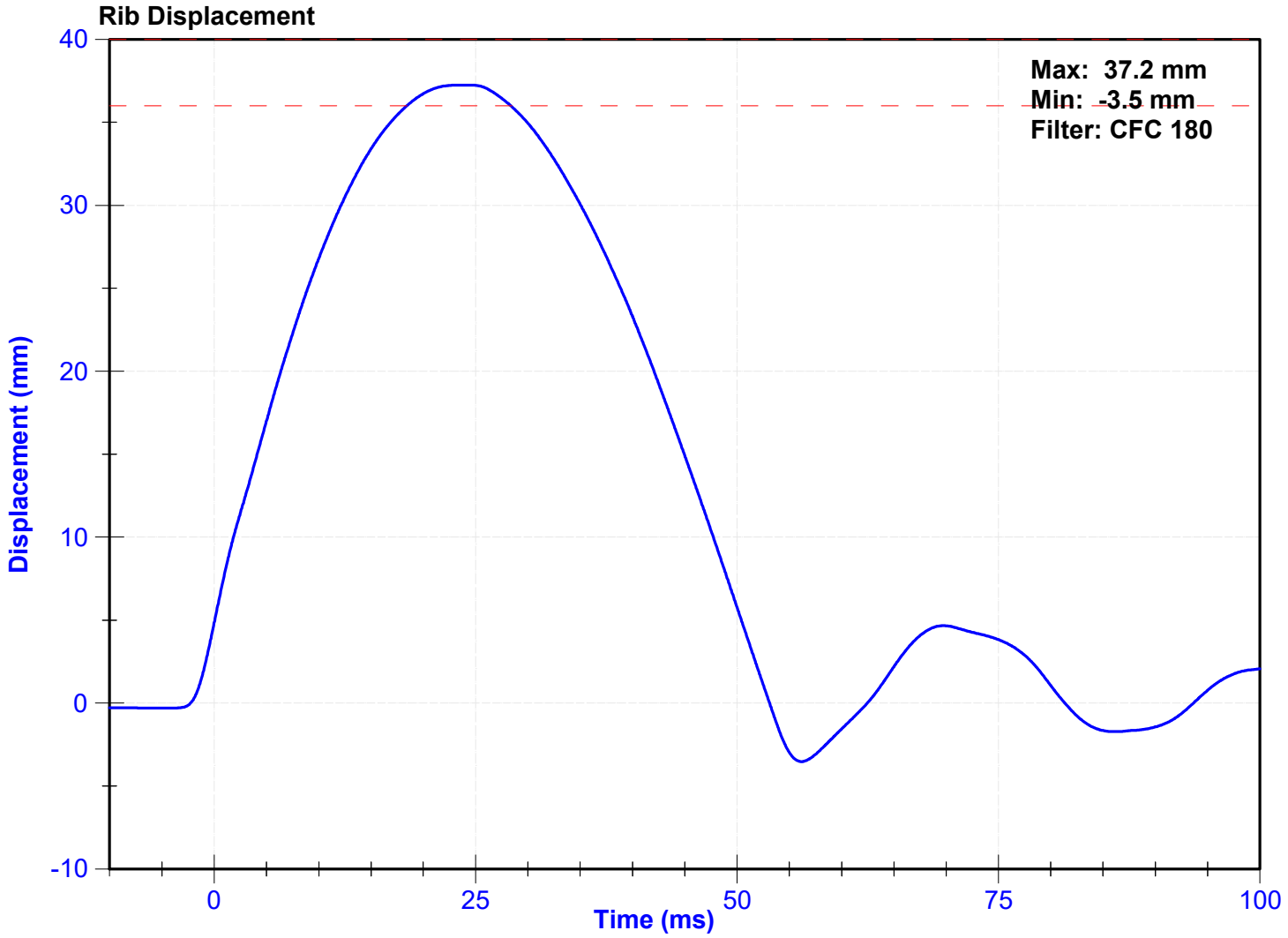
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Rib Displacement	36	40	mm	37.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	10/16/2024	4/16/2025



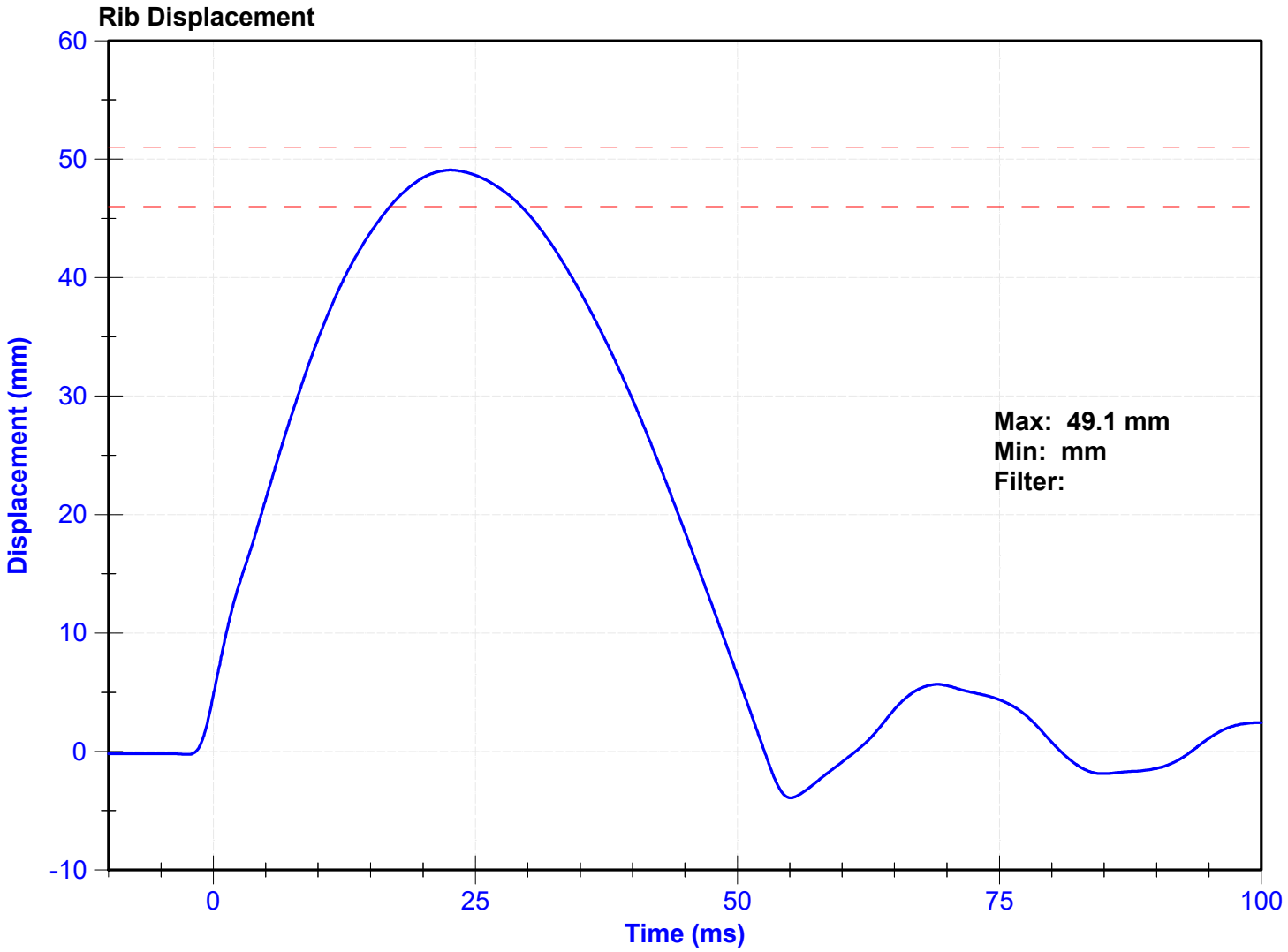
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J.Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Rib Displacement	46	51	mm	49.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	11/19/2024	5/20/2025



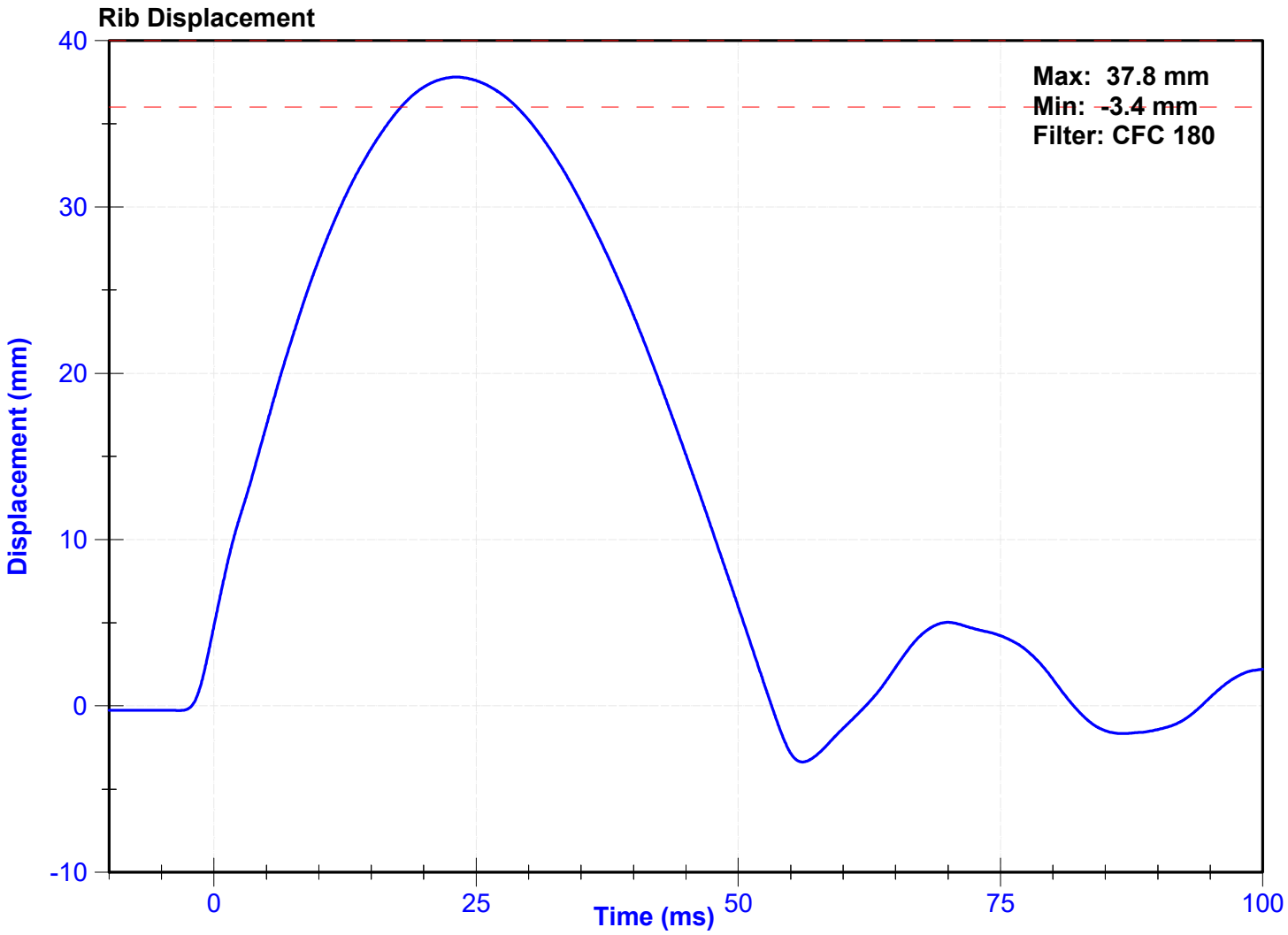
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J.Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Rib Displacement	36	40	mm	37.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	11/19/2024	5/20/2025



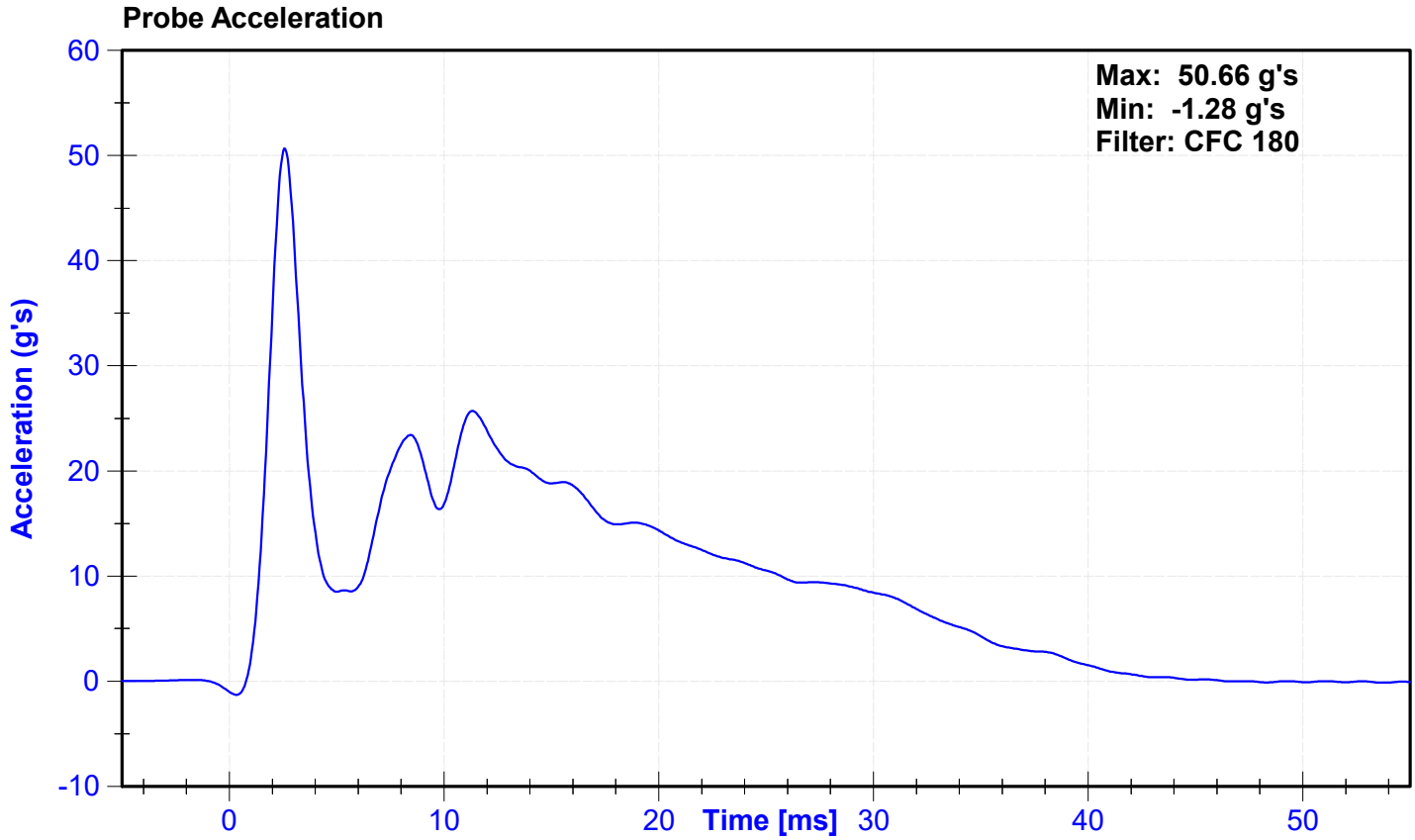
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

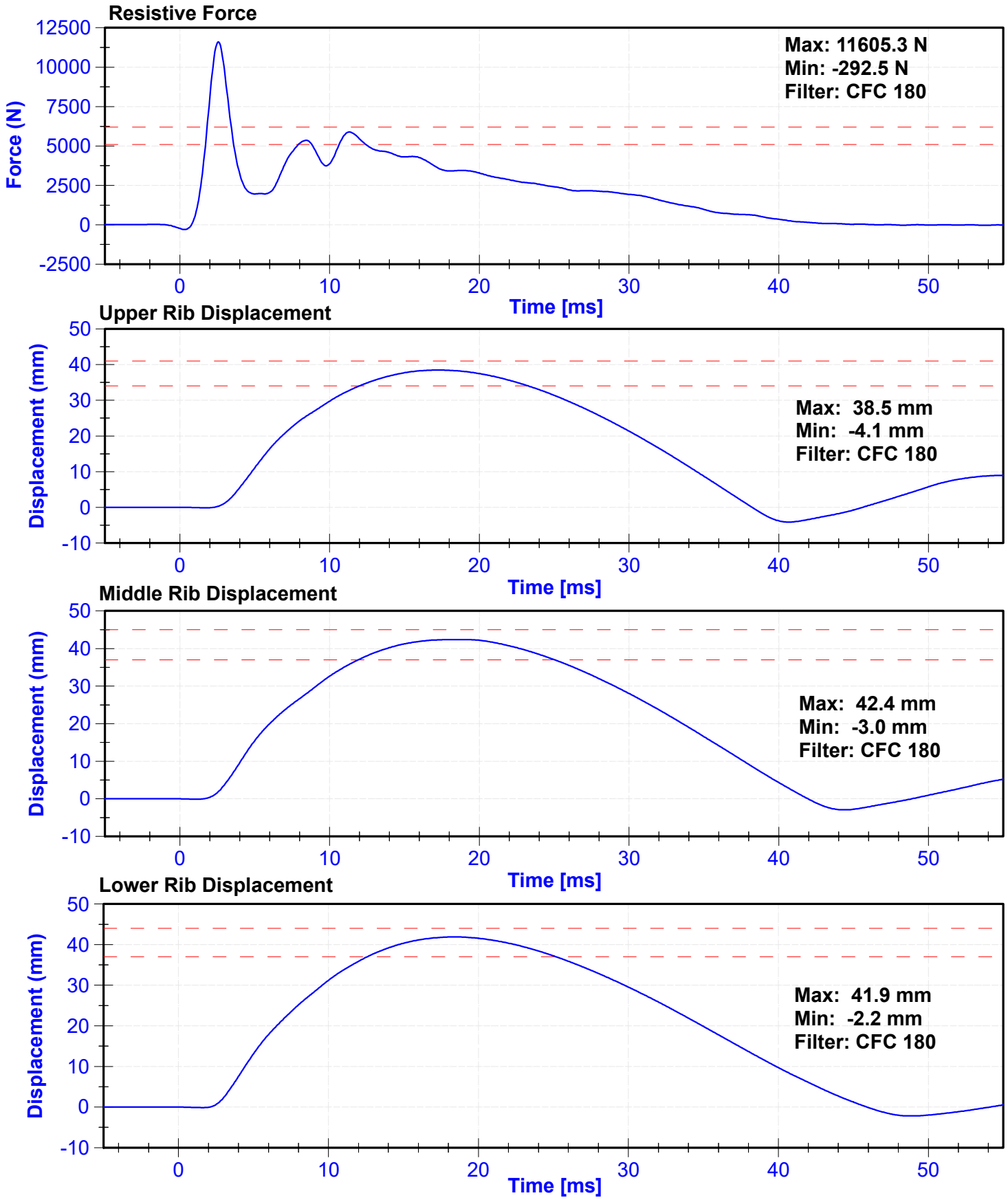
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Velocity	5.4	5.6	m/s	5.54	Pass
Resistive Force after 6ms	5100	6200	N	5891.0	Pass
Upper Thorax Rib Deflection	34	41	mm	38.5	Pass
Mid Thorax Rib Deflection	37	45	mm	42.4	Pass
Lower Thorax Rib Deflection	37	44	mm	41.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18599	9/13/2024	3/12/2025
Upper Thorax Rib Potentiometer	Honeywell	179GFE	10/16/2024	4/16/2025
Middle Thorax Rib Potentiometer	Honeywell	185GFE	10/16/2024	4/16/2025
Lower Thorax Rib Potentiometer	Honeywell	184GFE	11/19/2024	5/20/2025




Resistive Force
Force (N)
Max: 11605.3 N
Min: -292.5 N
Filter: CFC 180
Time [ms]
Upper Rib Displacement
Displacement (mm)
Max: 38.5 mm
Min: -4.1 mm
Filter: CFC 180
Time [ms]
Middle Rib Displacement
Displacement (mm)
Max: 42.4 mm
Min: -3.0 mm
Filter: CFC 180
Time [ms]
Lower Rib Displacement
Displacement (mm)
Max: 41.9 mm
Min: -2.2 mm
Filter: CFC 180
Time [ms]

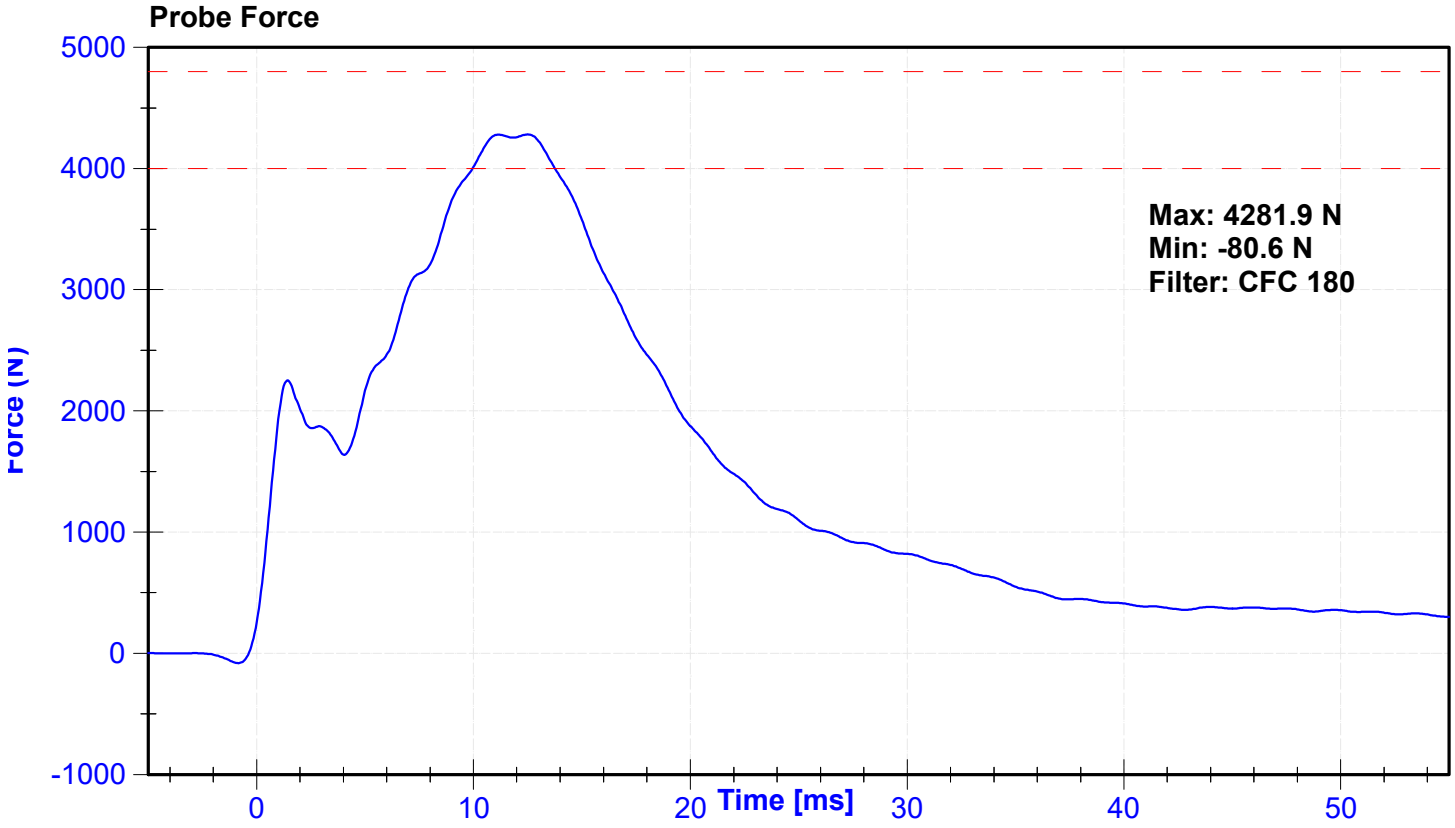
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

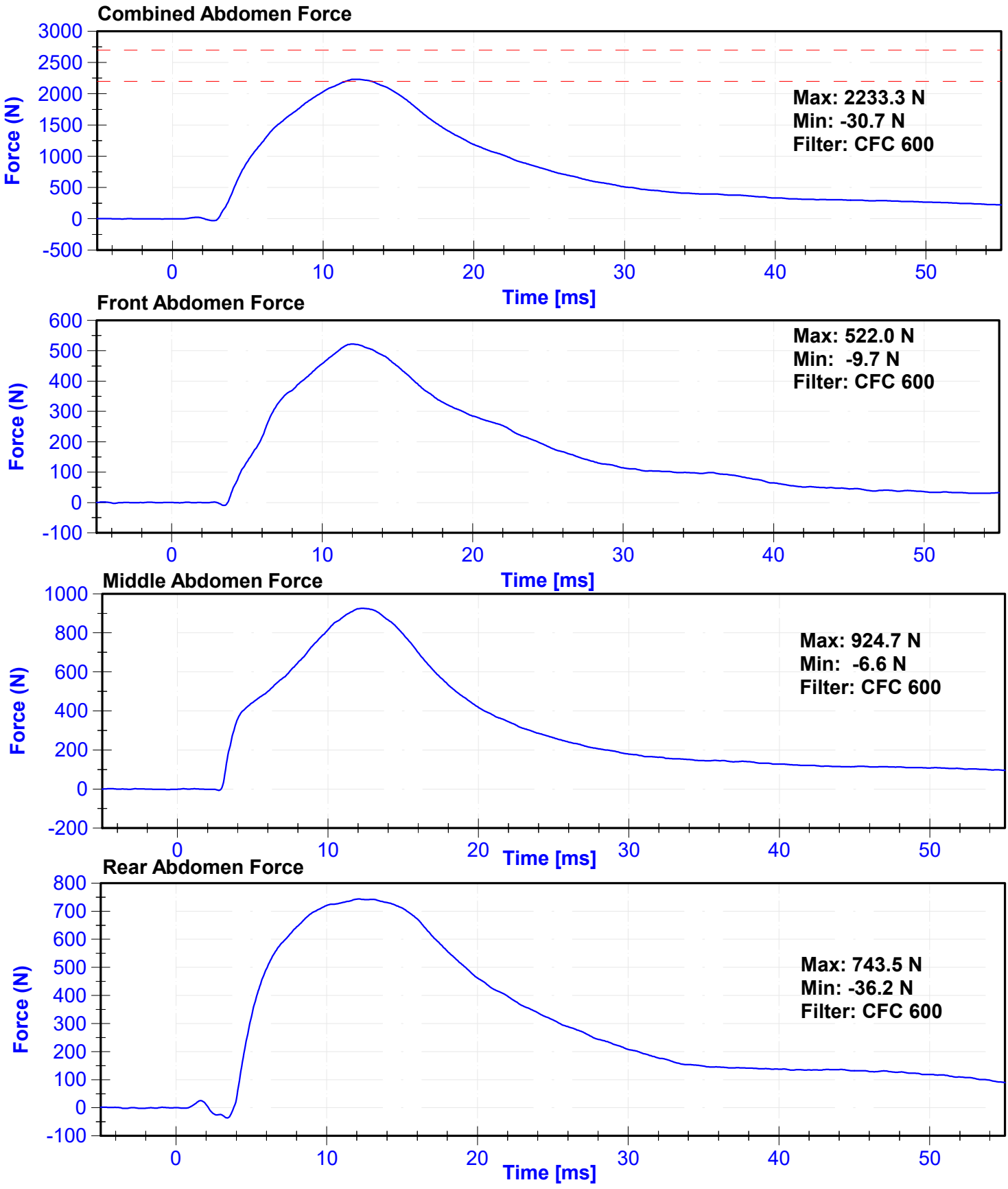
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Velocity	3.9	4.1	m/s	4.03	Pass
Combined Abdomen Force	2200	2700	N	2233.3	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	12.15	Pass
Resistive Probe Force	4000	4800	N	4281.9	Pass
Time at Peak Resistive Force	10.6	13.0	ms	12.50	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18599	9/13/2024	3/12/2025
Front Abdomen Load Cell	Denton	1523	10/28/2024	10/28/2025
Middle Abdomen Load Cell	Denton	1524	10/28/2024	10/28/2025
Rear Abdomen Load Cell	Denton	1530	10/28/2024	10/28/2025




Combined Abdomen Force
Force (N)
Time [ms]
Max: 2233.3 N
Min: -30.7 N
Filter: CFC 600
Front Abdomen Force
Max: 522.0 N
Min: -9.7 N
Filter: CFC 600
Middle Abdomen Force
Max: 924.7 N
Min: -6.6 N
Filter: CFC 600
Rear Abdomen Force
Max: 743.5 N
Min: -36.2 N
Filter: CFC 600

ATD Manufacturer	ftss	Test Technician	E. Andruczyk
ATD Serial Number	f033	Laboratory Supervisor	J. Kinderman

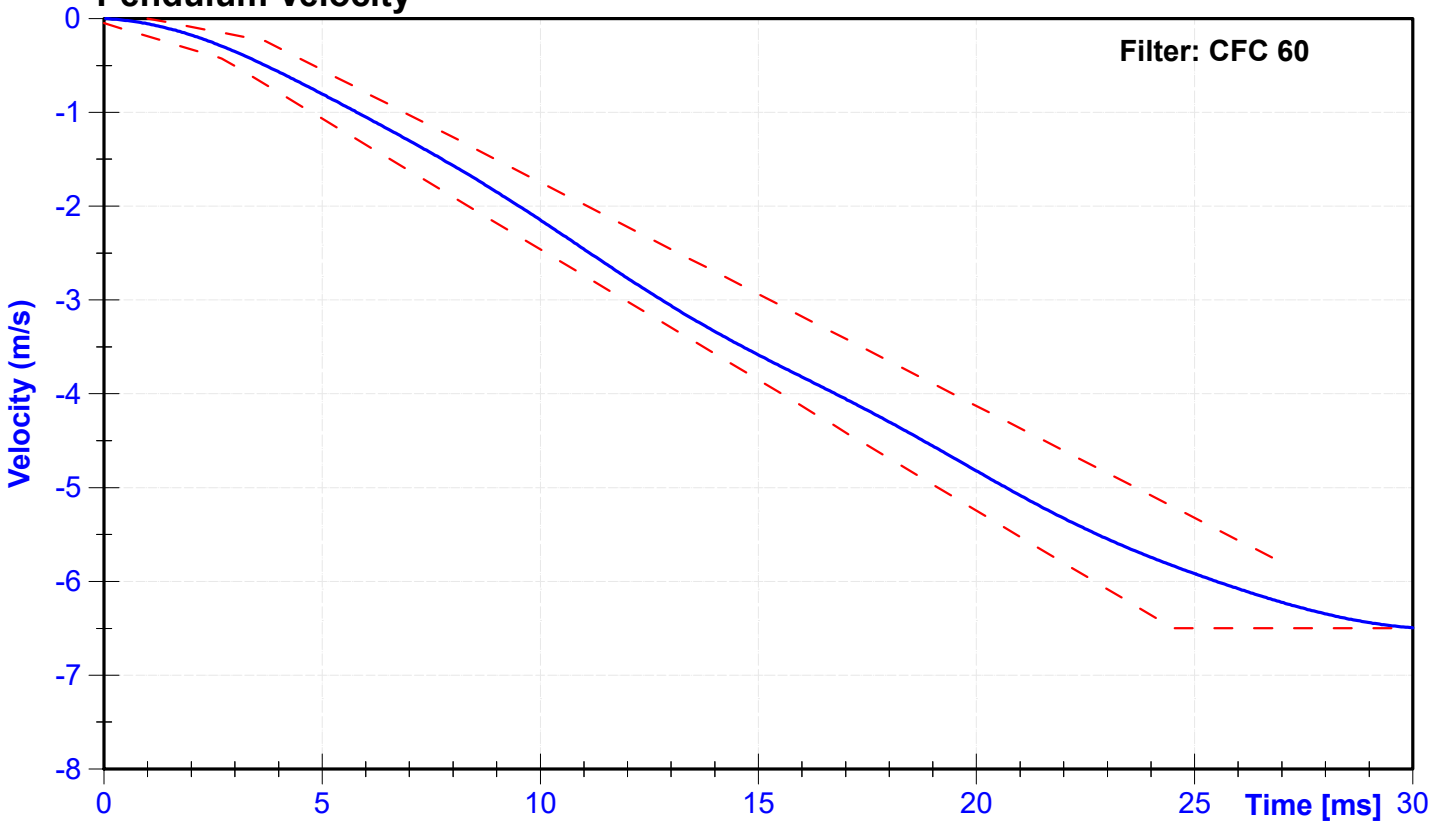
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Velocity	5.95	6.15	m/s	6.138	Pass
Lateral Spine Rotation	45	55	deg	49.9	Pass
Time at Maximum Rotation	39	53	ms	45.9	Pass
Time of Decay to Zero Degrees	37	57	ms	37.6	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

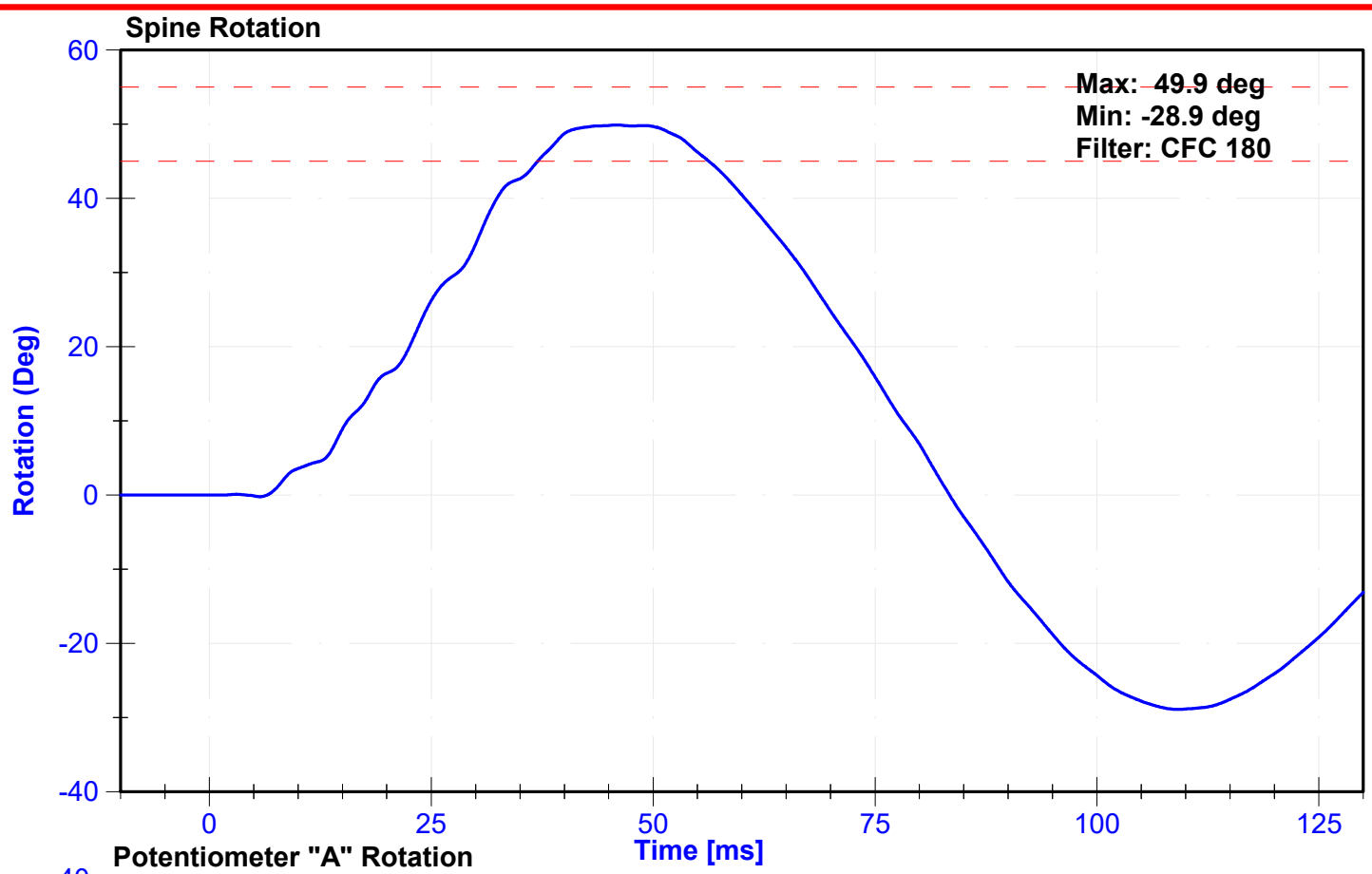
Transducer Calibrations

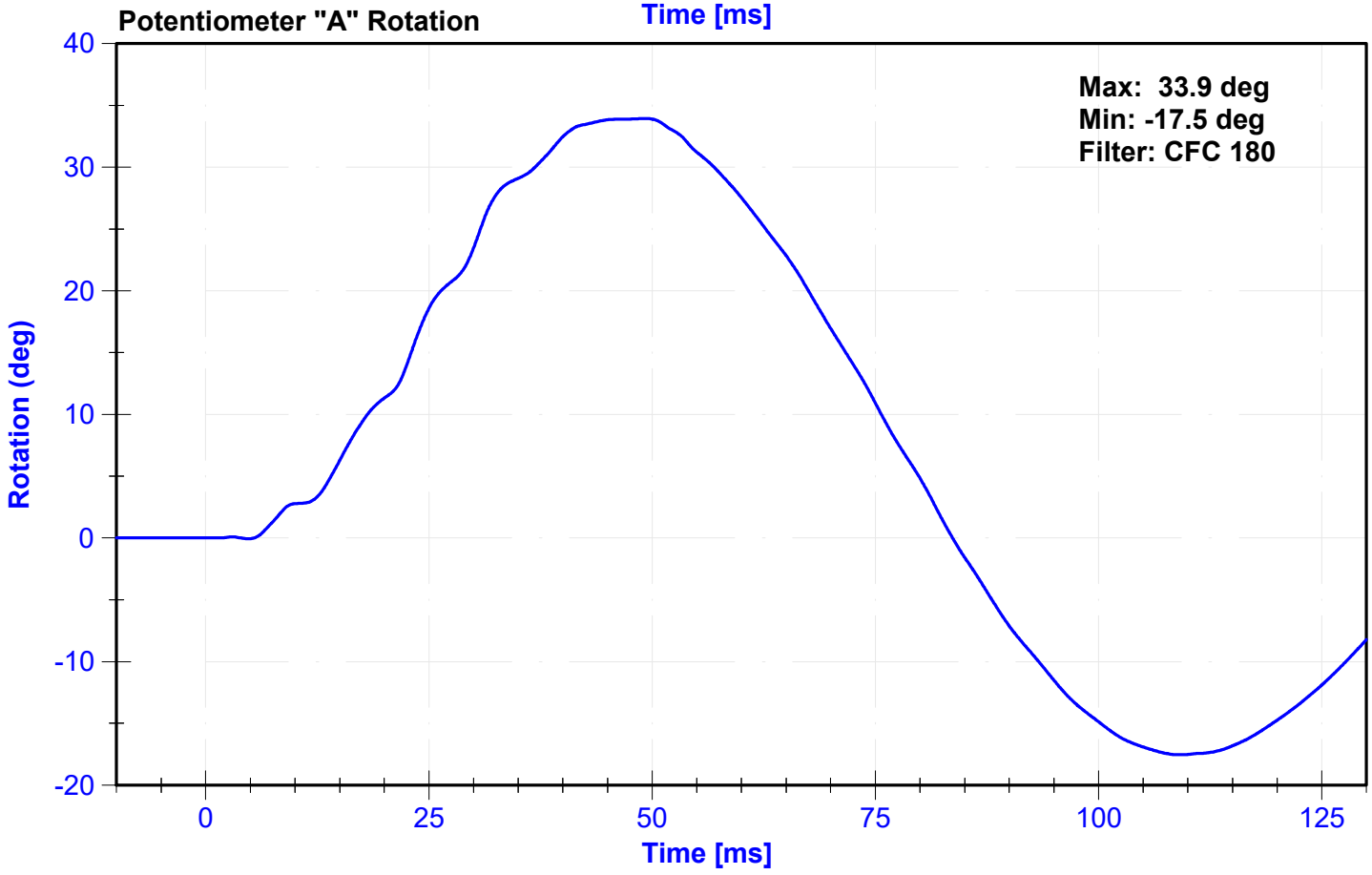
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16650	11/1/2024	11/1/2025
Pendulum "A" Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Condyle "B" Potentiometer	Sfernice	095	9/13/2024	9/13/2025

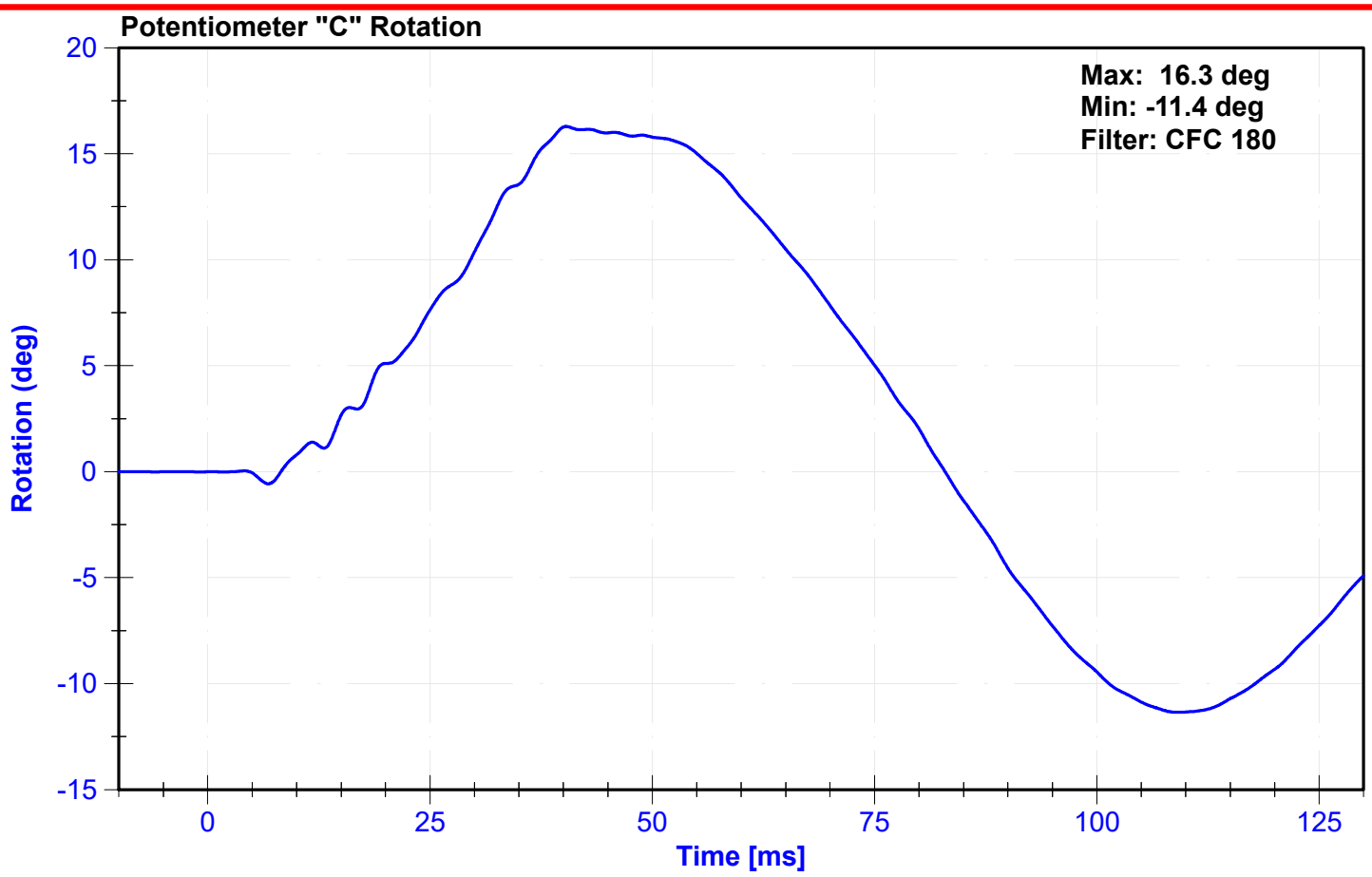
Pendulum Velocity[3]



[1,2] Upper and lower boundaries specified in Appendix I


Spine Rotation
Max: 49.9 deg
Min: -28.9 deg
Filter: CFC 180
Rotation (Deg)
60
40
20
0
-20
-40
0
25
50
75
100
125
Time [ms]


Potentiometer "A" Rotation
Max: 33.9 deg
Min: -17.5 deg
Filter: CFC 180
Rotation (deg)
40
30
20
10
0
-10
-20
0
25
50
75
100
125
Time [ms]



Appendix I

[2] Upper Boundary Corridor		[1] Lower Boundary Corridor	
Time (ms)	Velocity (m/s)	Time (ms)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.5
		30.0	-6.5

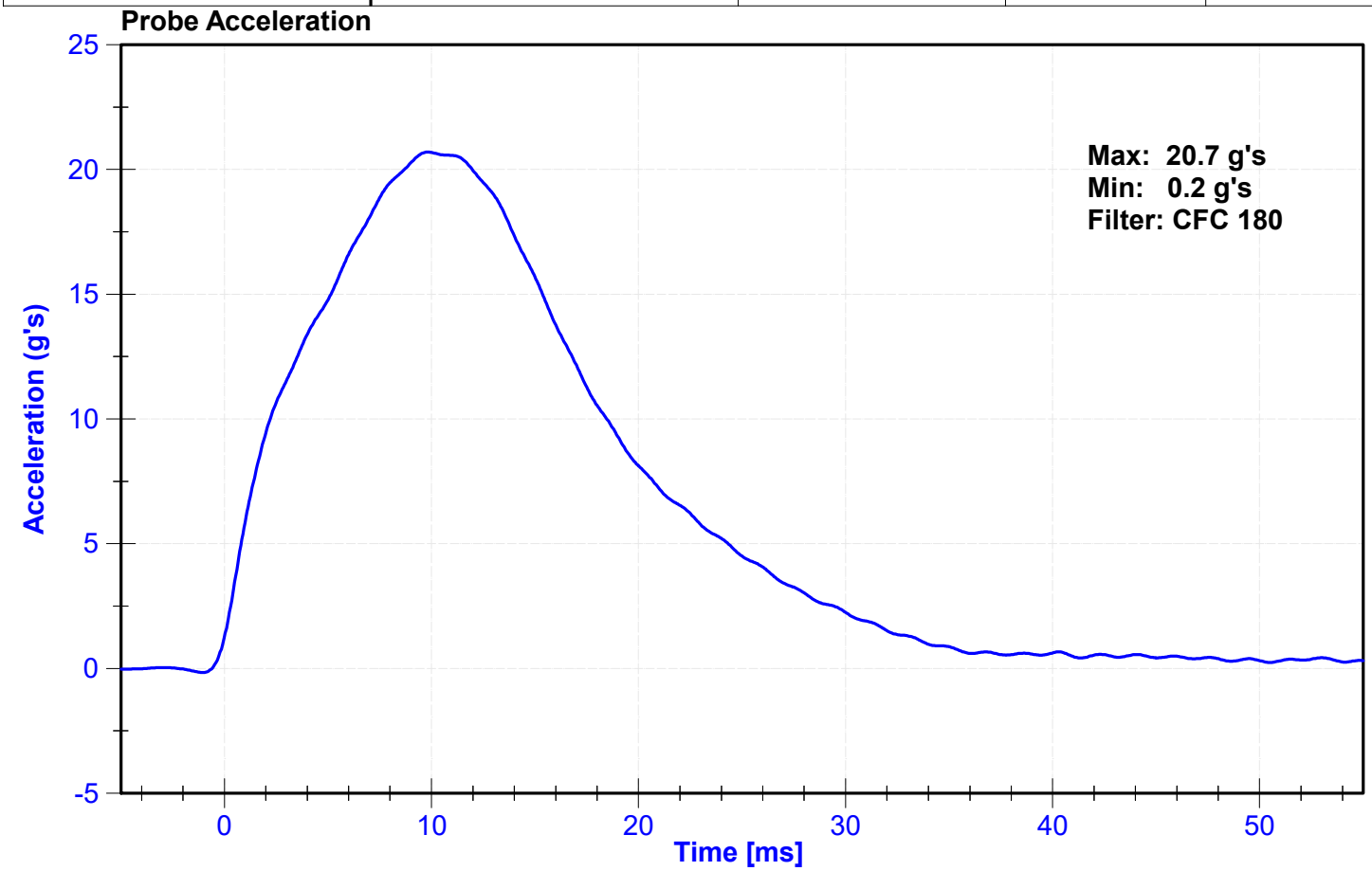
ATD Manufacturer	FTSS	Test Technician	E. Andruczyk
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

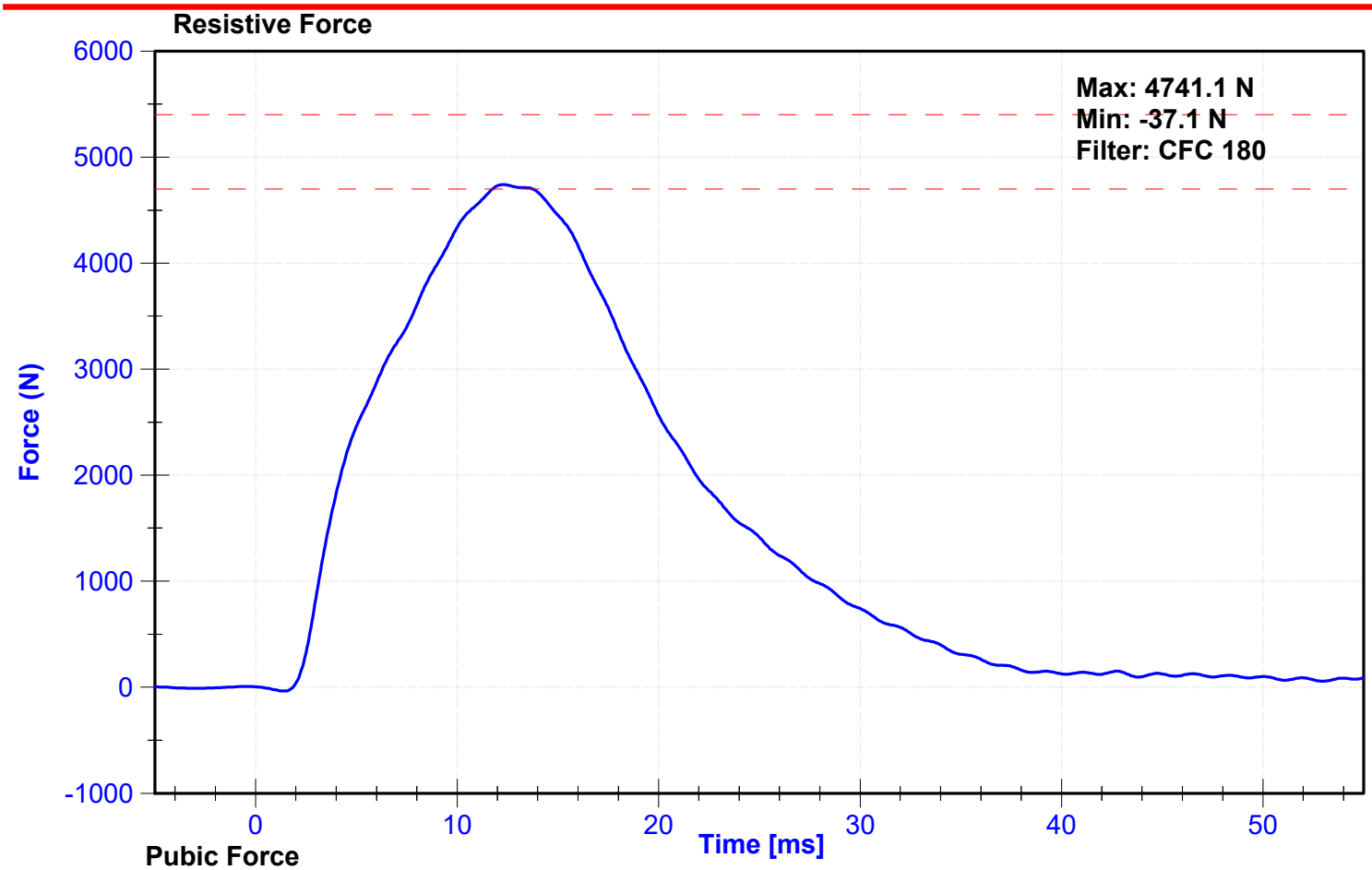
Results

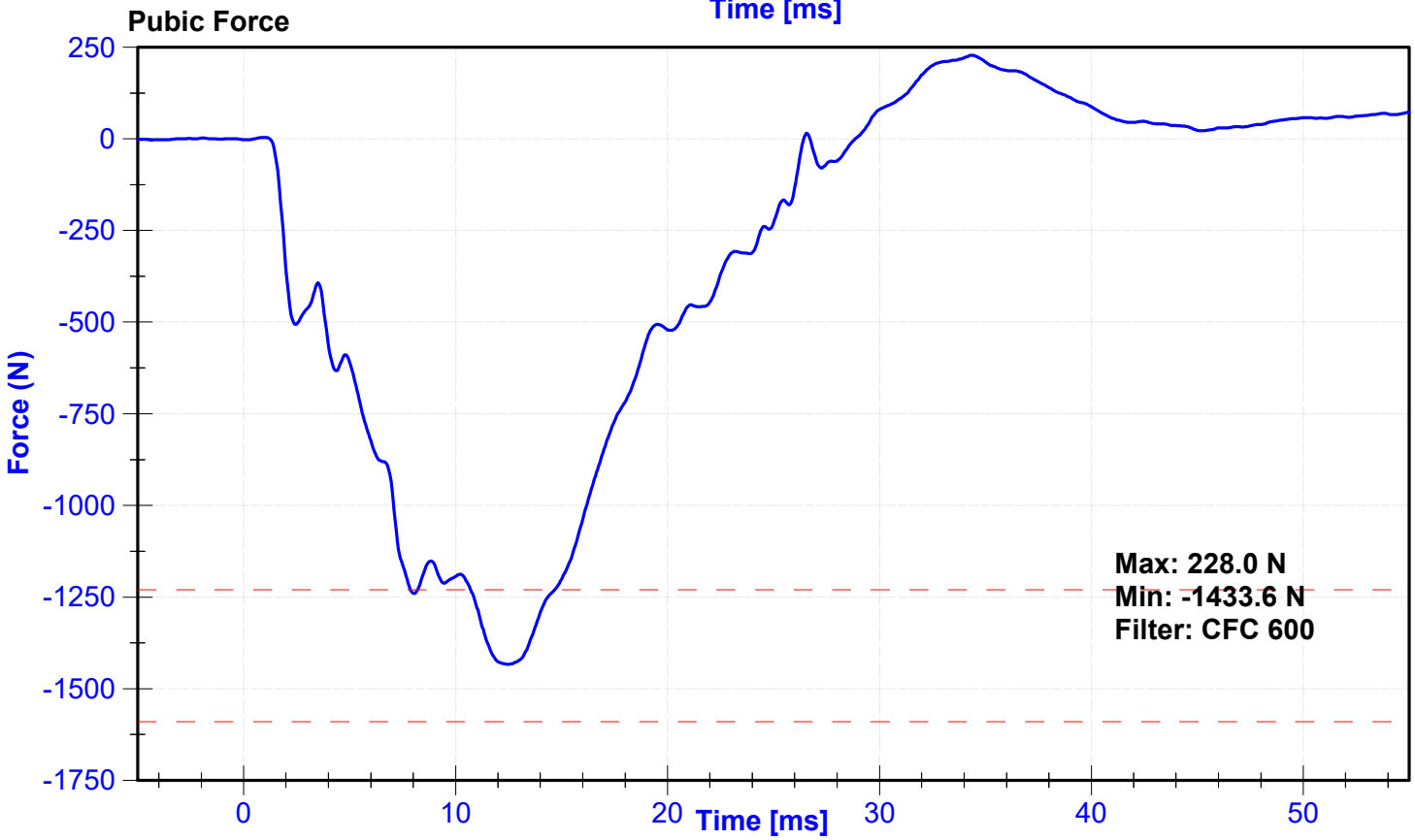
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	20	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Resistive Force	4700	5400	N	4741.1	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.25	Pass
Pubic Force	-1590	-1230	N	-1433.6	Pass
Time at Peak Pubic Force	12.2	17.0	ms	12.50	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18599	9/13/2024	3/12/2025
Pubic Load Cell	Denton	458-FY	10/28/2024	10/28/2025




Resistive Force
Max: 4741.1 N
Min: -37.1 N
Filter: CFC 180
Force (N)
6000
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]


Pubic Force
Max: 228.0 N
Min: -1433.6 N
Filter: CFC 600
Force (N)
250
0
-250
-500
-750
-1000
-1250
-1500
-1750
0
10
20
30
40
50
Time [ms]

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE – PASSENGER ATD

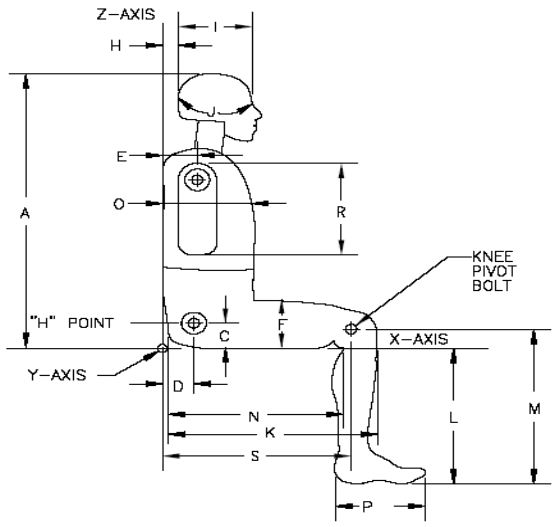
SERIAL NO:300

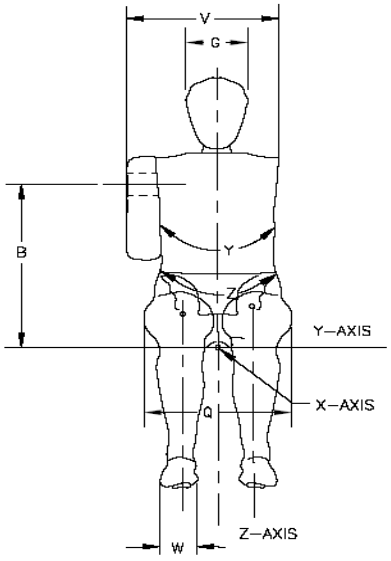
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: J. Rios Date: 1/14/2024

Dummy Serial Number: 300





Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	777	Pass
B	Shoulder Pivot Height	437	453	439	Pass
C	H-point Height	79	89	83	Pass
D	H-point from seatback	141	151	144	Pass
E	Shoulder Pivot from Backline	97	107	103	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	145	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	182	Pass
J	Head Circumference	541	551	548	Pass
K	Buttock to Knee Length	514	540	528	Pass
L	Popliteal Height	343	369	354	Pass
M	Knee Pivot to floor height	392	409	405	Pass
N	Buttock Popliteal Length	416	442	428	Pass
O	Chest Depth w/o jacket	195	211	206	Pass
P	Foot Length	216	232	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	484	Pass
V	Shoulder Width	341	357	350	Pass
W	Foot Width	78	94	80	Pass
Y	Chest Circumference w/jacket	851	881	867	Pass
Z	Waist Circumference	761	791	775	Pass

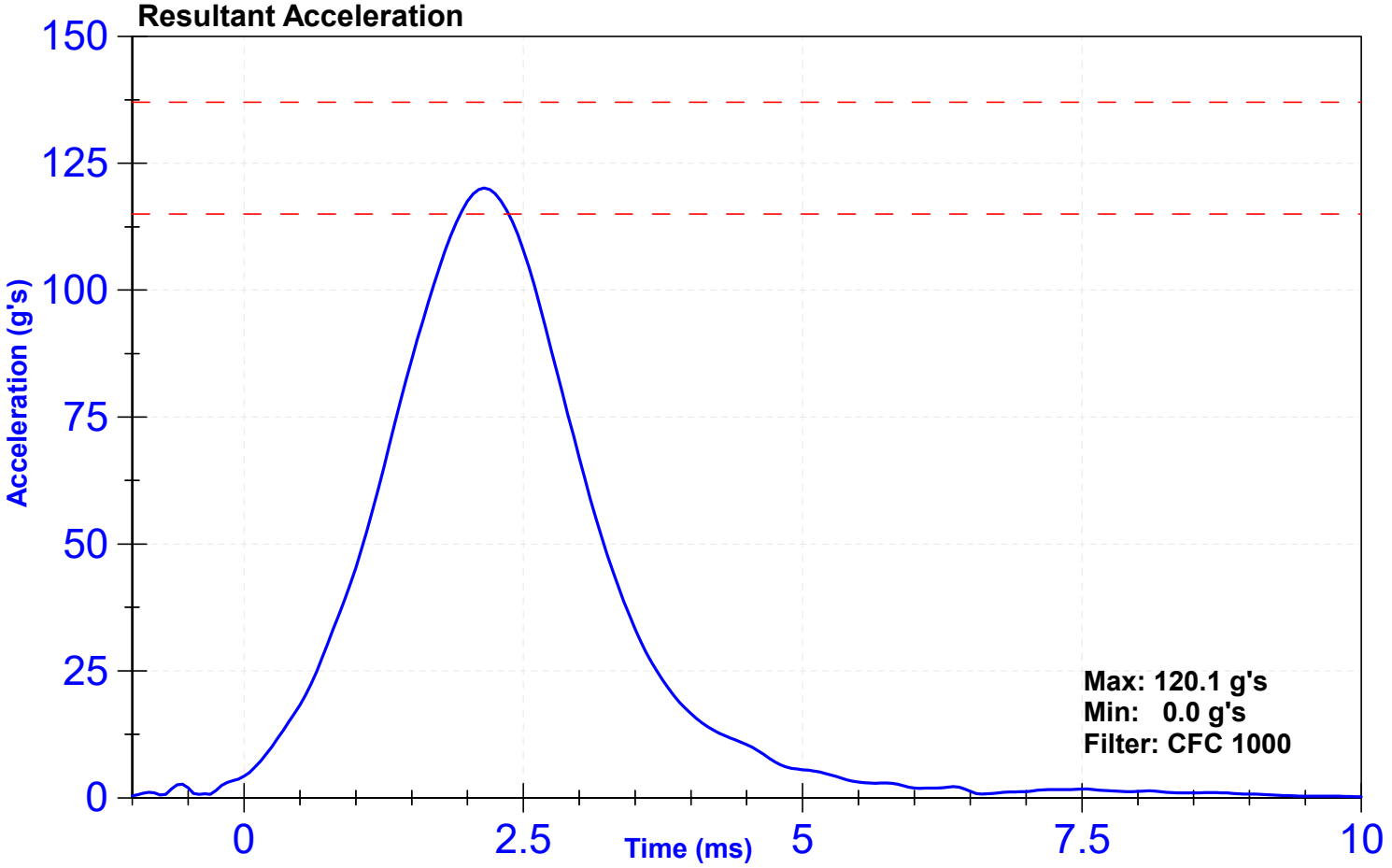
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

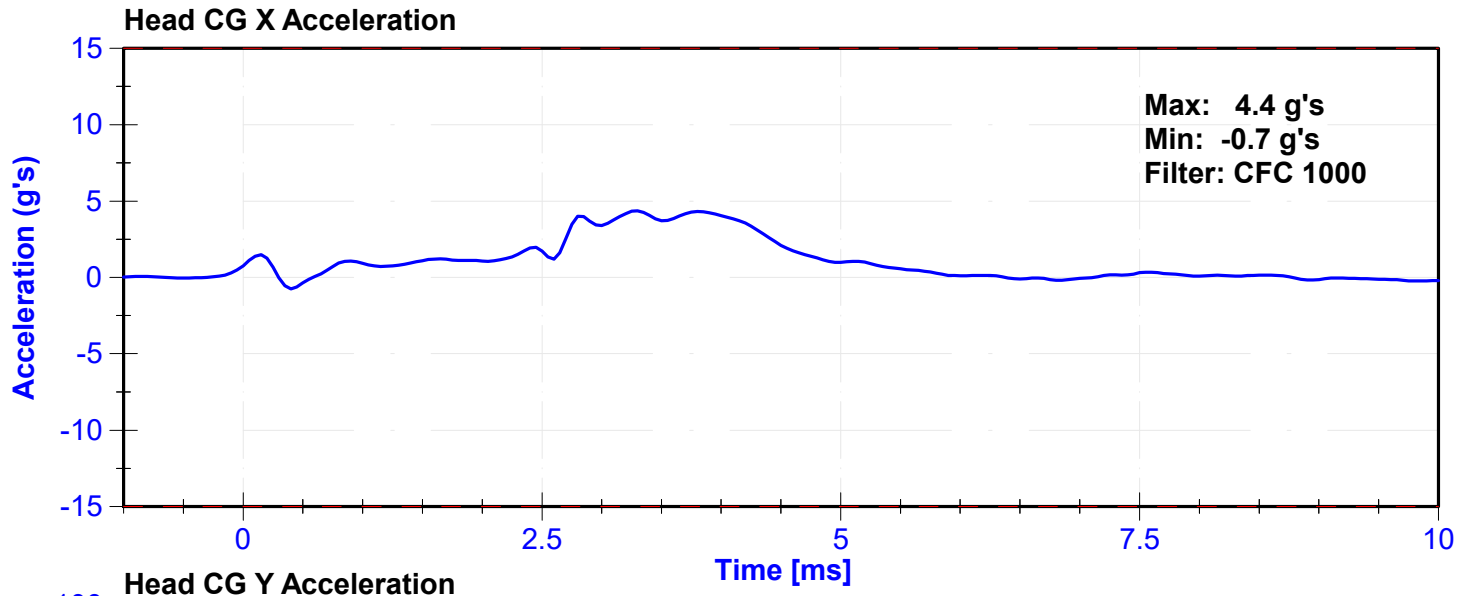
Results

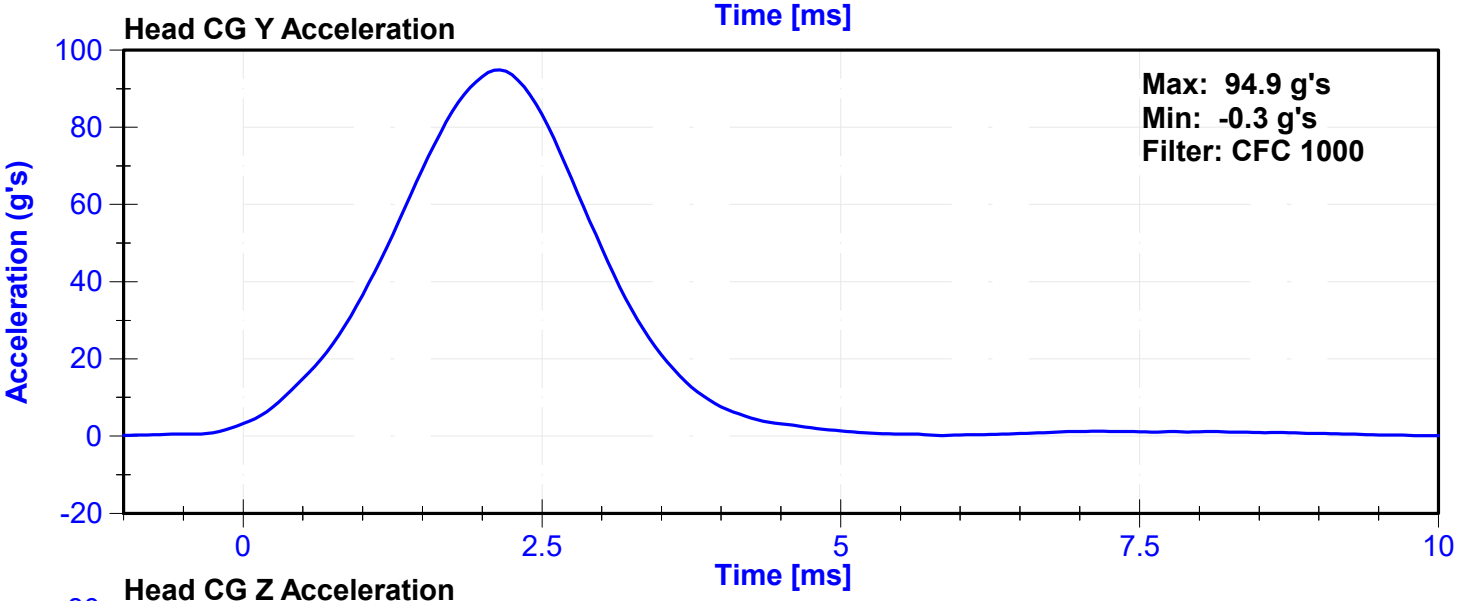
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	18	Pass
Resultant Acceleration	115	137	g's	120.1	Pass
Oscillation	0	15	%	2.4	Pass
Fore-Aft Acceleration	-15	15	g's	4.4	Pass

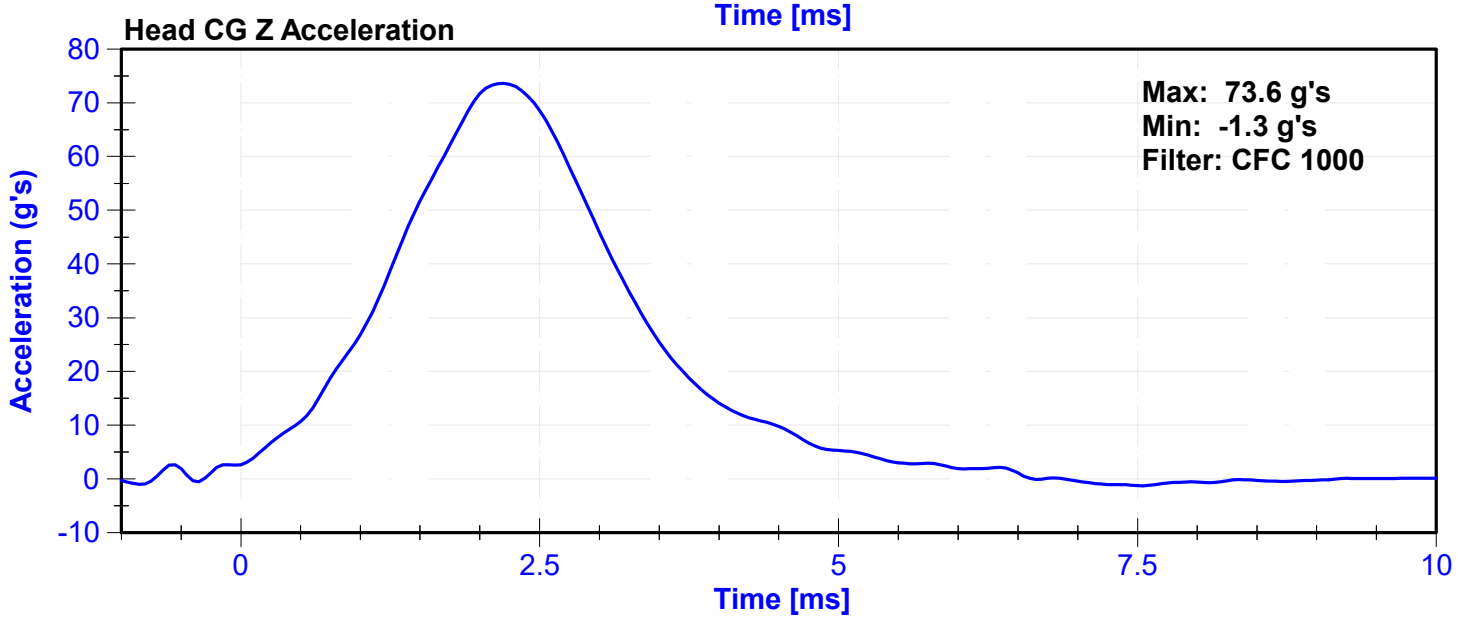
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P59018	10/17/2024	4/15/2025
Y Accelerometer	Endevco	P79189	10/17/2024	4/15/2025
Z Accelerometer	Endevco	P79587	10/17/2024	4/15/2025




Head CG X Acceleration
Max: 4.4 g's
Min: -0.7 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Y Acceleration
Max: 94.9 g's
Min: -0.3 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Z Acceleration
Max: 73.6 g's
Min: -1.3 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]

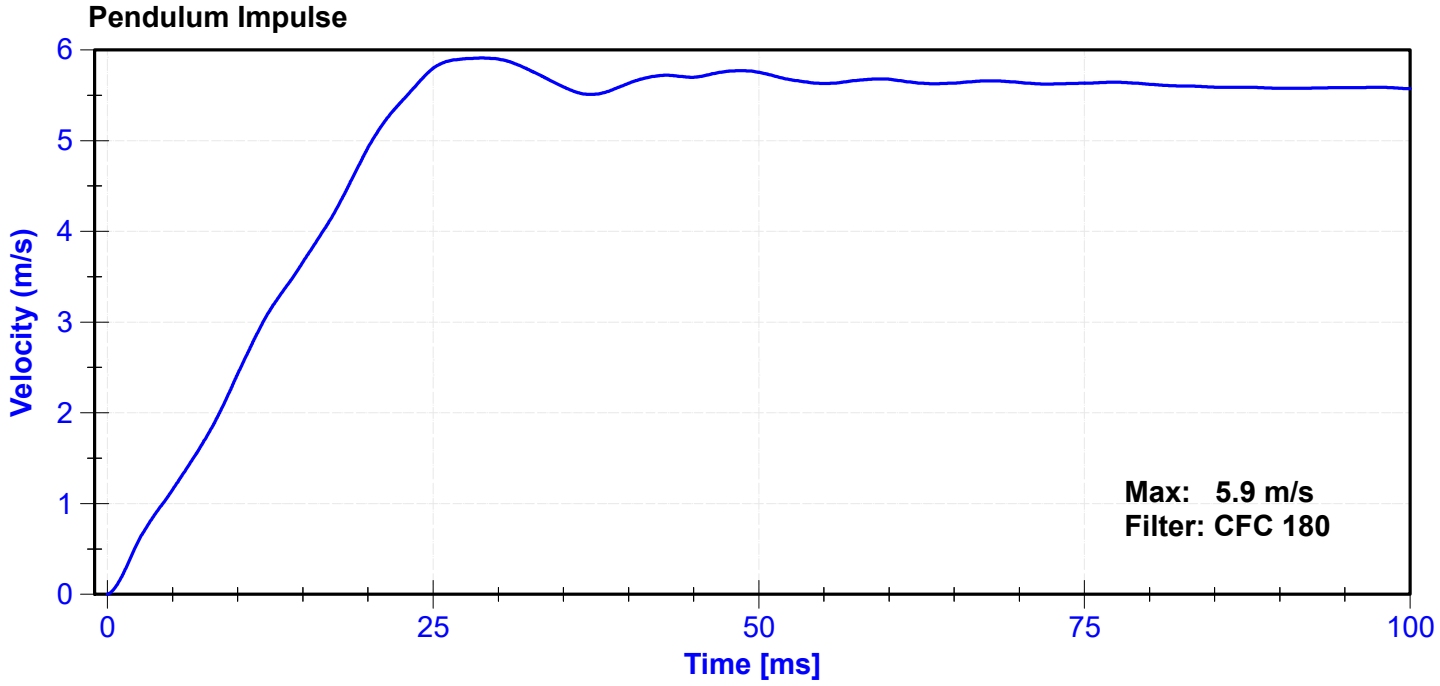
ATD Manufacturer	Humanetics	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

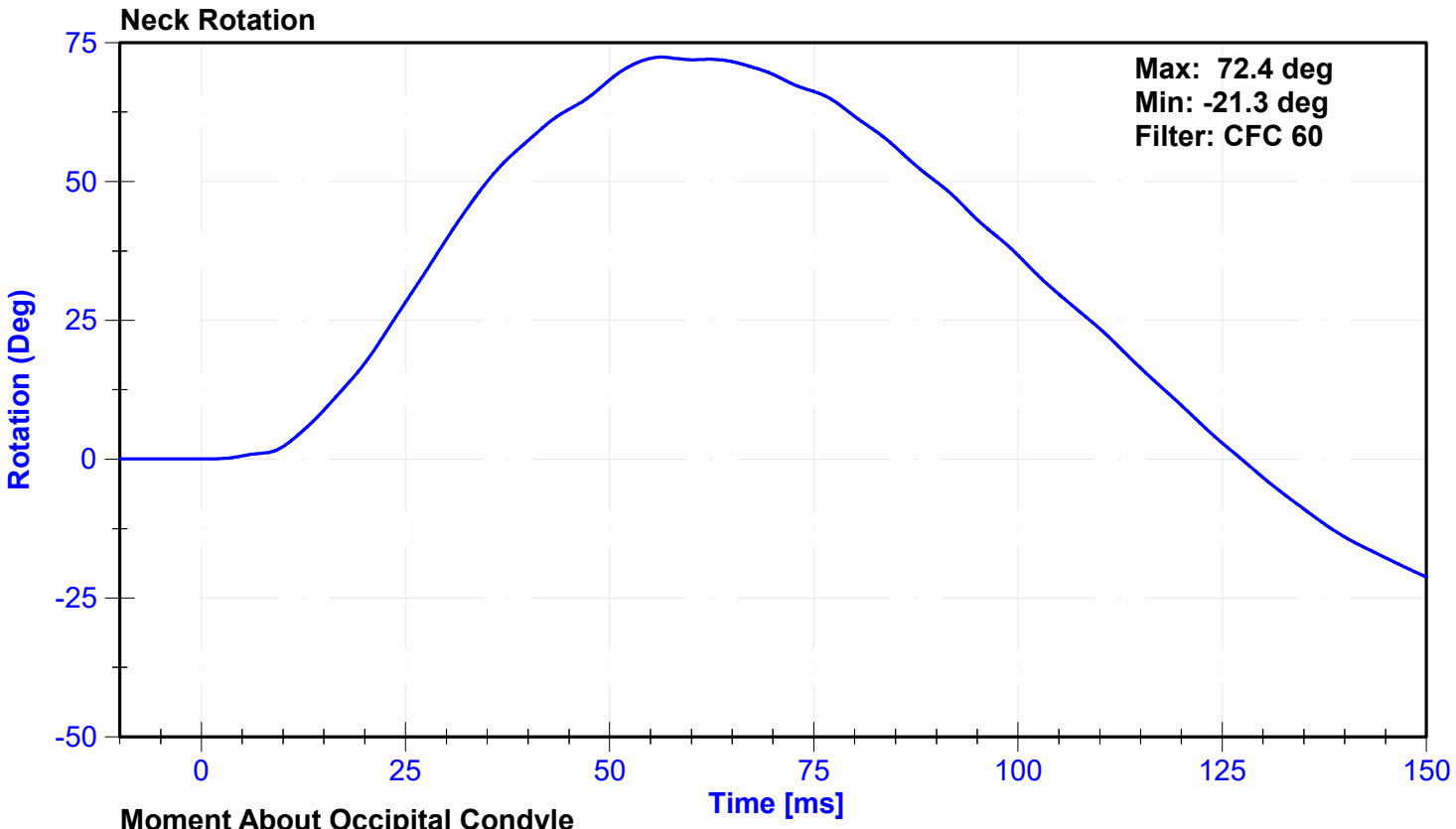
Results

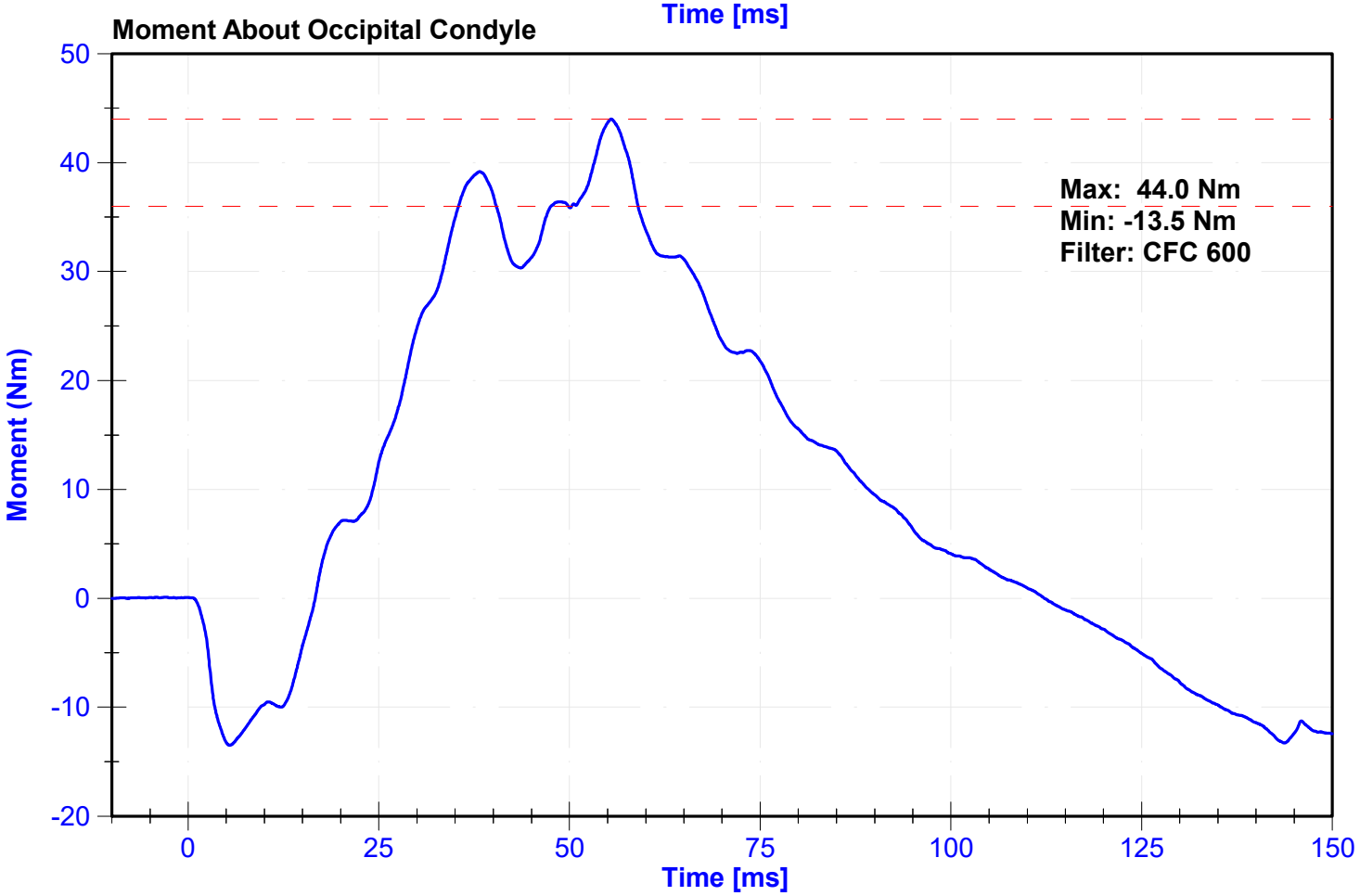
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.7	Pass
Humidity	10	70	%	29	Pass
Velocity	5.51	5.63	m/s	5.575	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.43	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.66	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.92	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.80	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.91	Pass
Neck Rotation	71	81	deg	72.4	Pass
Time at Maximum Rotation	50	70	ms	56.3	Pass
Moment about the OC	36	44	Nm	44.0	Pass
Moment Decay to 0 Nm	102	126	ms	112.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/30/2024	4/28/2025
Pendulum Potentiometer	Servo	4961	9/23/2024	9/23/2025
Condyle Potentiometer	Servo	DS185	9/23/2024	9/23/2025
Upper Neck Load Cell	Kistler	M555A6CFM_1935H01696-FY	1/2/2025	1/2/2026




Neck Rotation
Max: 72.4 deg
Min: -21.3 deg
Filter: CFC 60
Rotation (Deg)
75
50
25
0
-25
-50
0
25
50
75
100
125
150
Time [ms]


Moment About Occipital Condyle
Max: 44.0 Nm
Min: -13.5 Nm
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

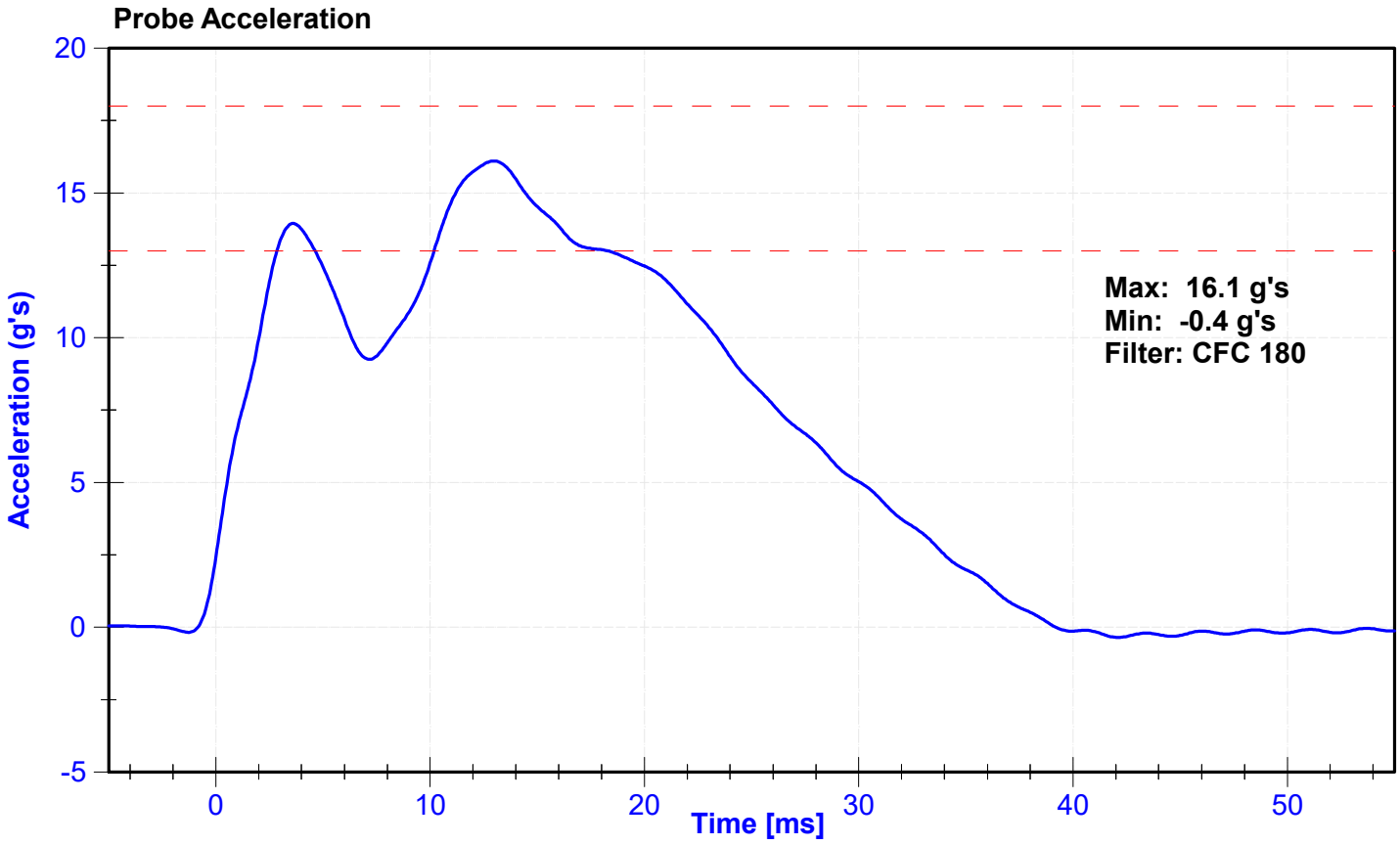
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

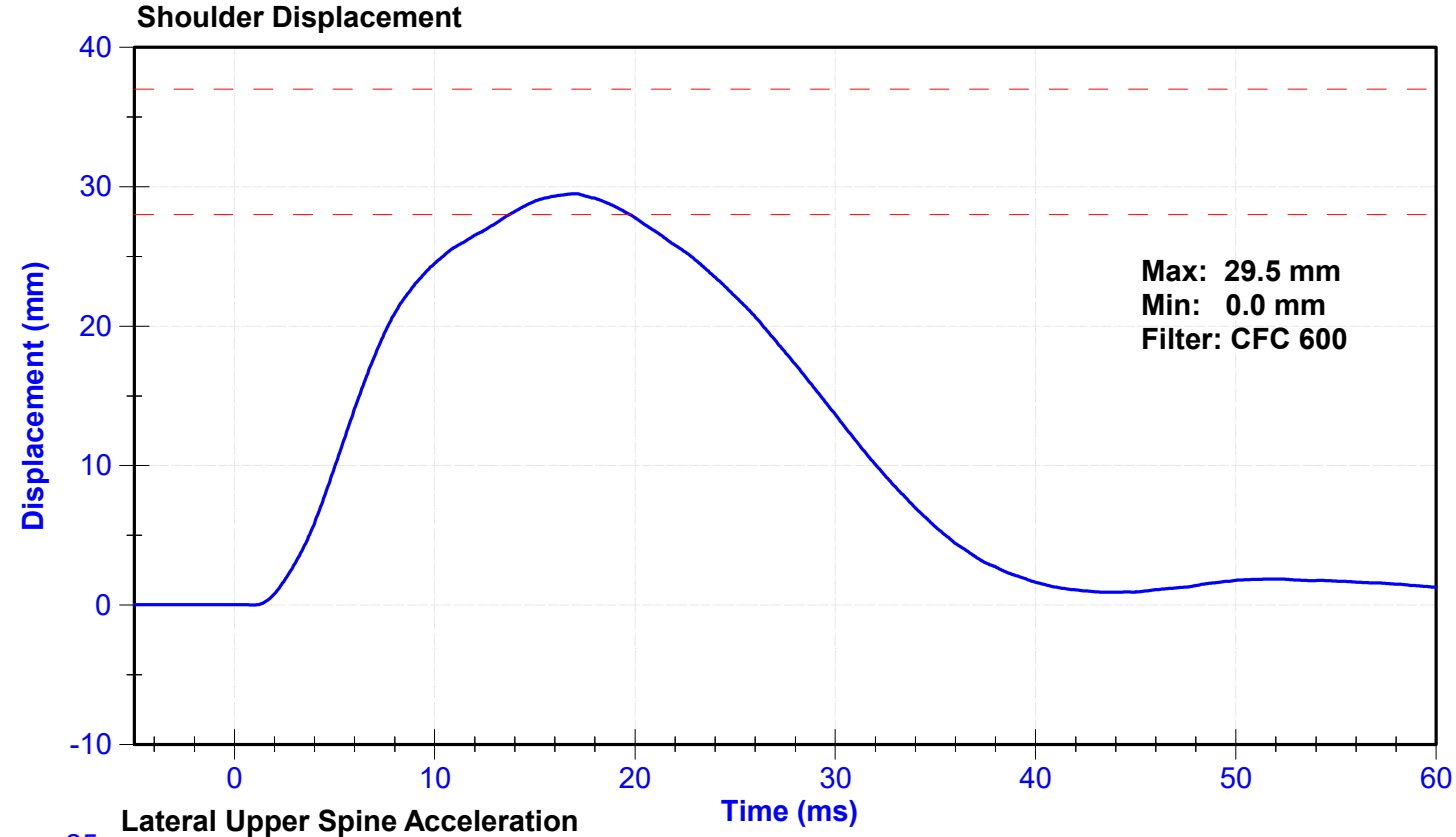
Results

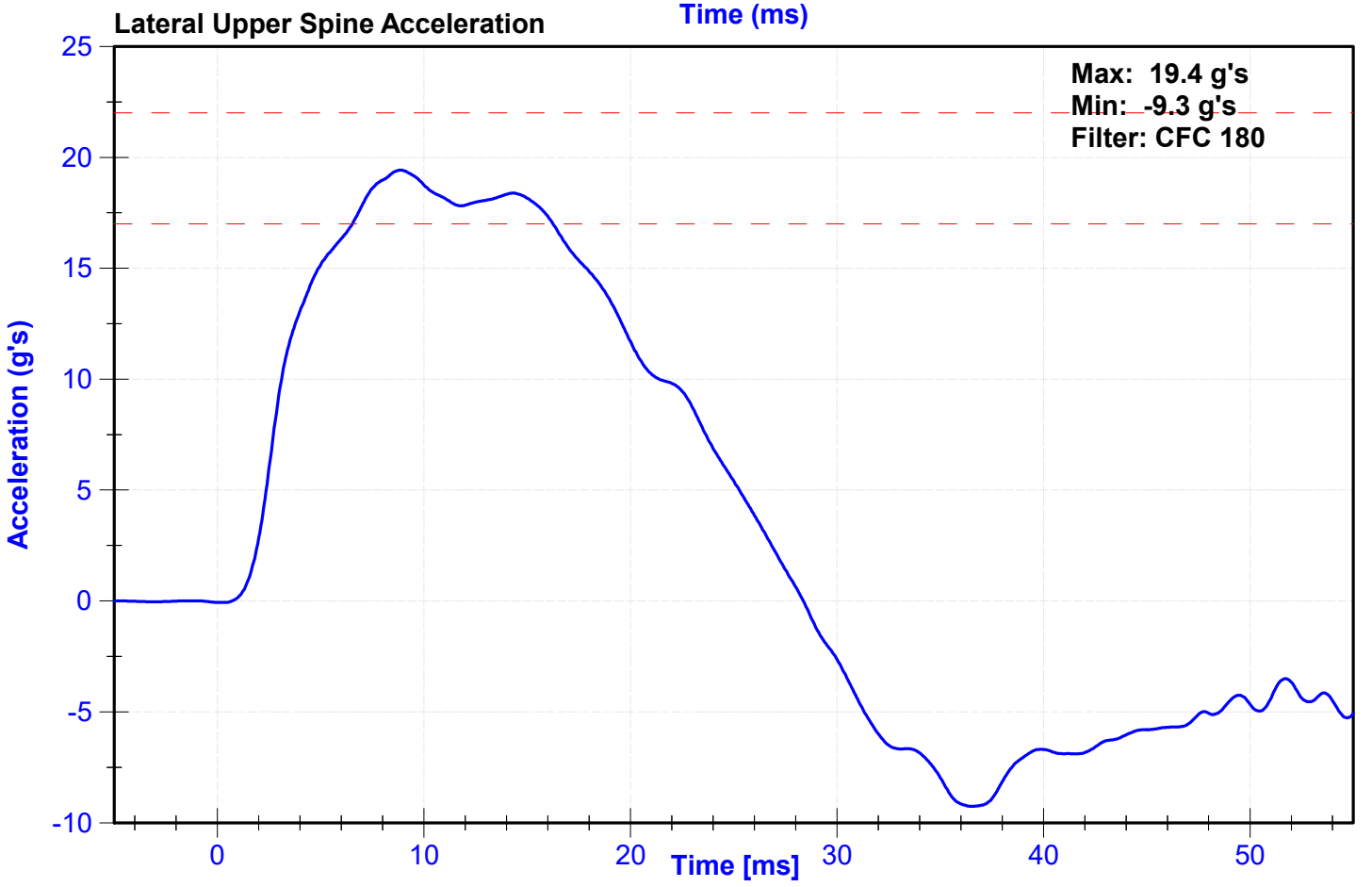
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	13	18	g's	16.1	Pass
Shoulder Deflection	28	37	mm	29.5	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Shoulder Potentiometer	Servo	053GFE	10/16/2024	4/16/2025
Upper Spine Y Accelerometer	Endevco	P52018	11/25/2024	5/24/2025




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 29.5 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 19.4 g's
Min: -9.3 g's
Filter: CFC 180

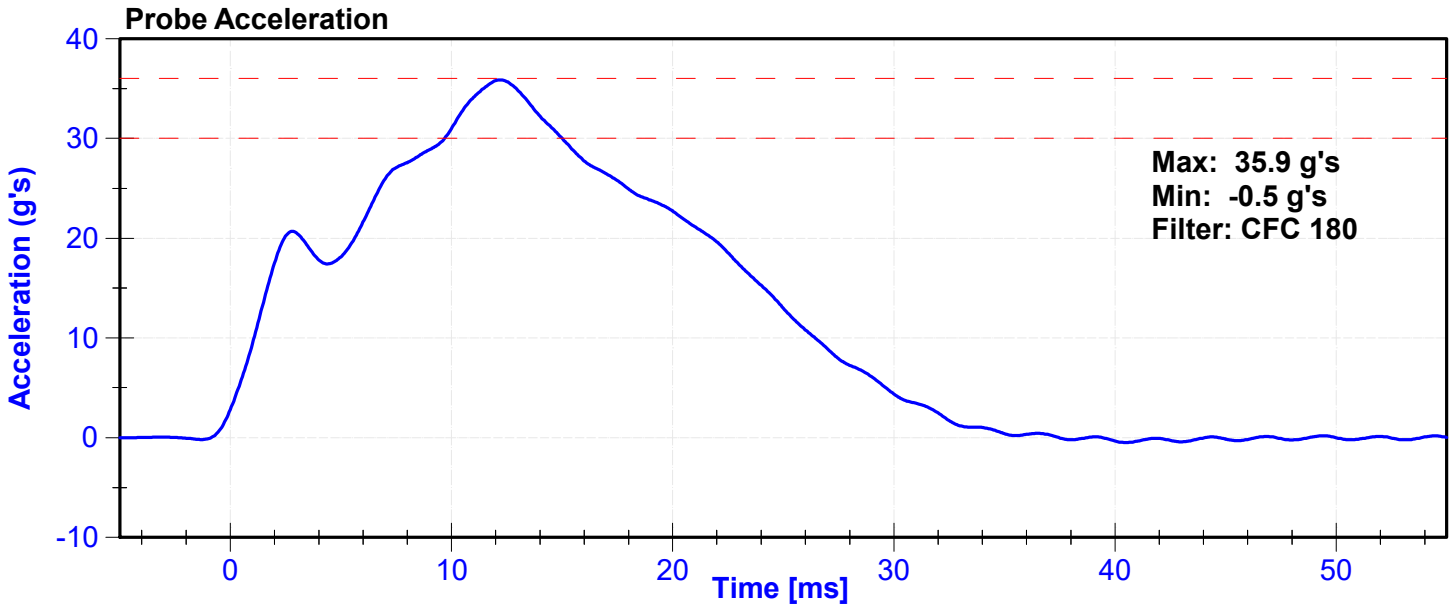
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

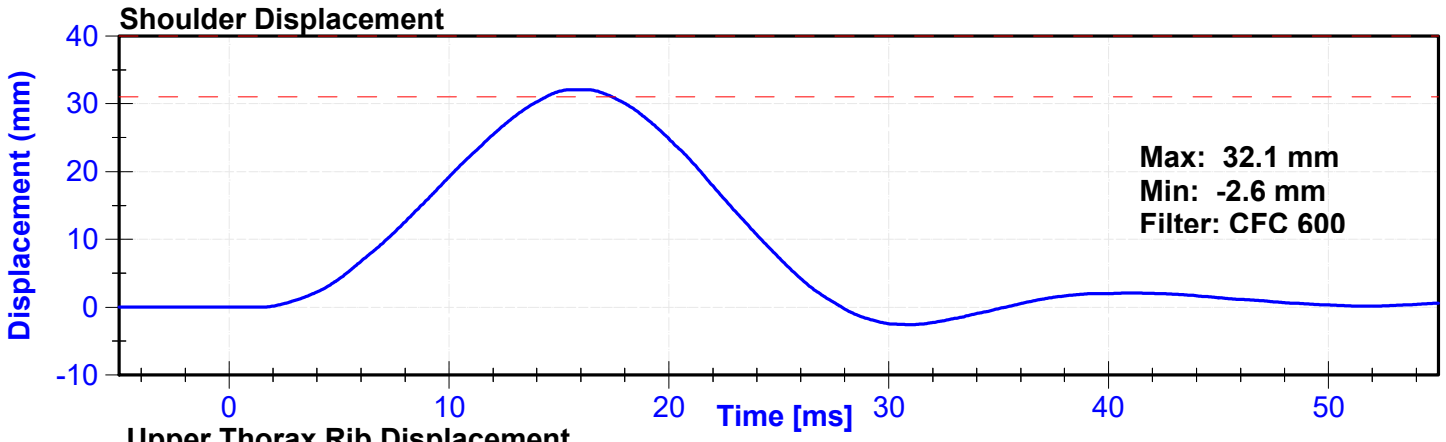
Results

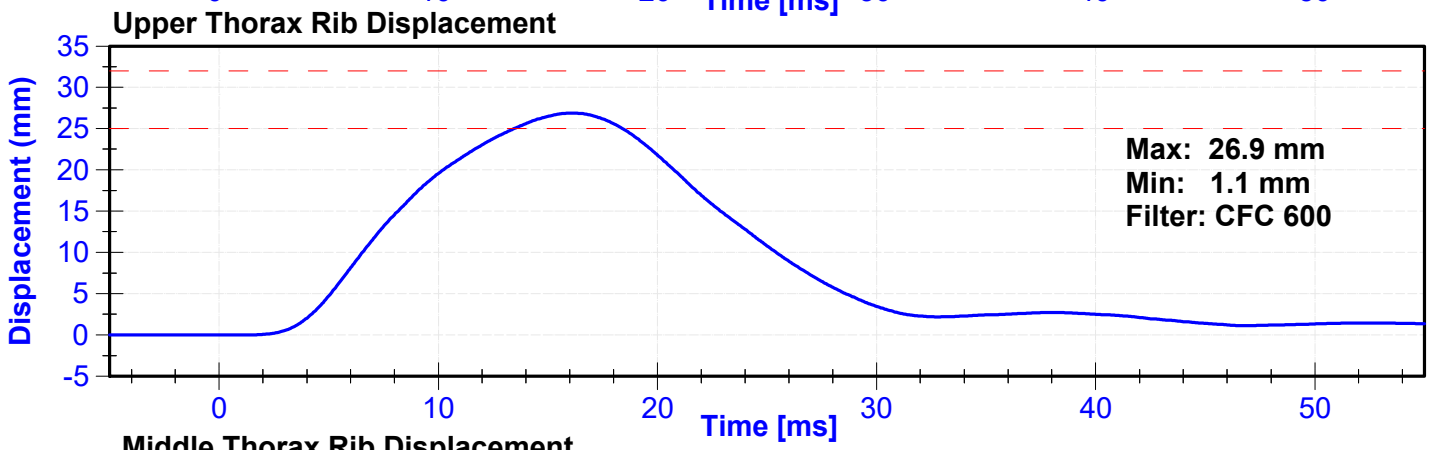
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	19	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration after 5 ms	30	36	g's	35.9	Pass
Lateral Upper Spine Acceleration	34	43	g's	34.6	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.5	Pass
Shoulder Deflection	31	40	mm	32.1	Pass
Upper Thorax Rib Deflection	25	32	mm	26.9	Pass
Mid Thorax Rib Deflection	30	36	mm	31.0	Pass
Lower Thorax Rib Deflection	32	38	mm	33.1	Pass

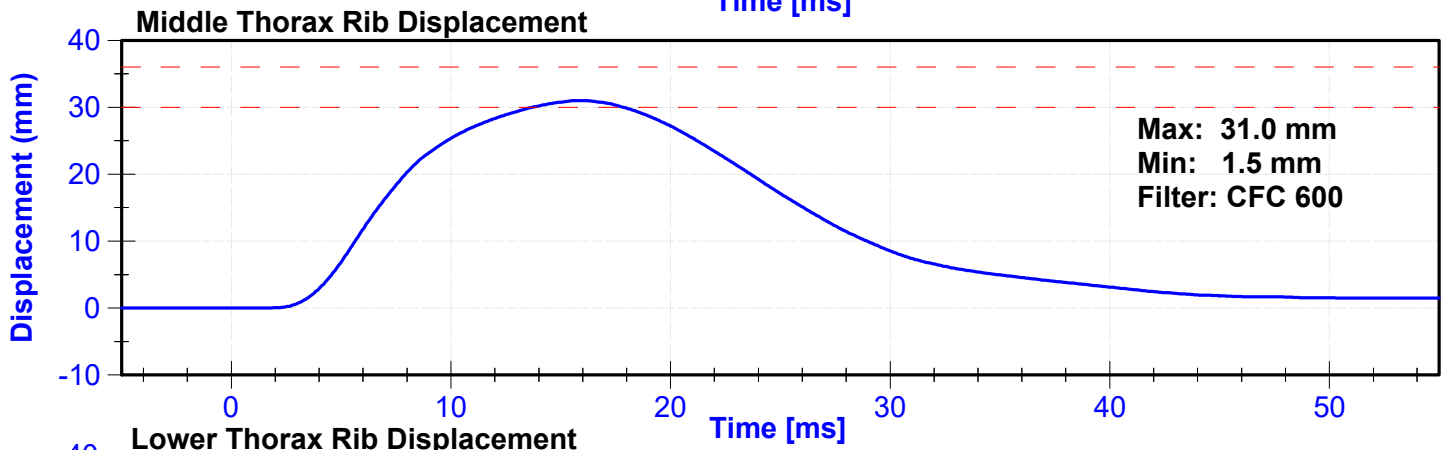
Transducer Calibrations

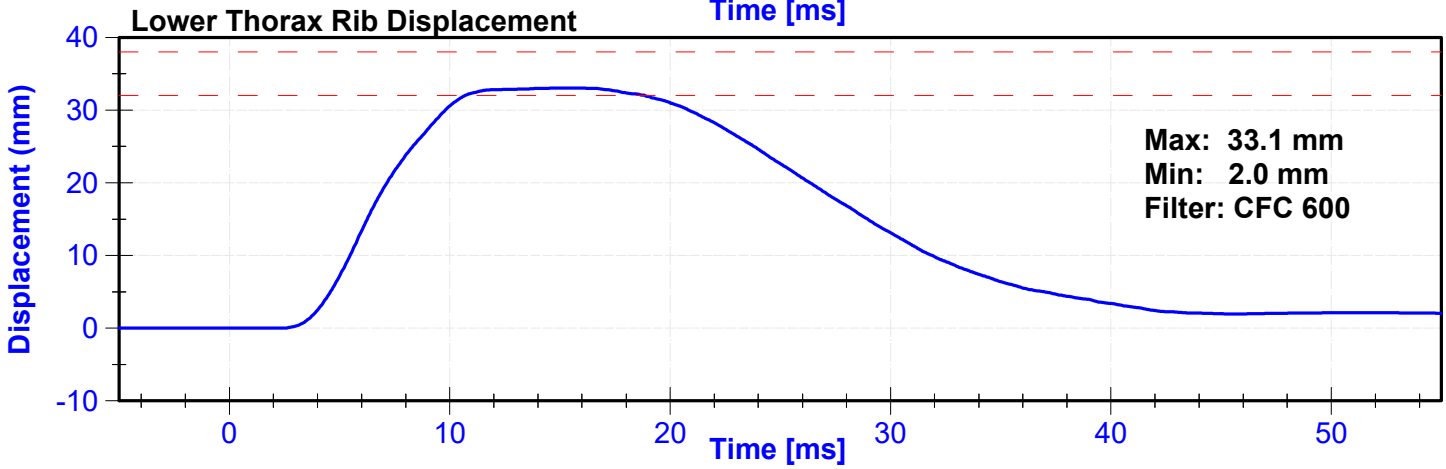
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Upper Spine T1 Y Accelerometer	Endevco	P52018	11/25/2024	5/24/2025
Upper Spine T12 Y Accelerometer	Endevco	P52071	10/17/2024	4/15/2025
Shoulder Potentiometer	Servo	053GFE	10/16/2024	4/16/2025
Upper Thorax Rib Potentiometer	Servo	2316GFE	10/16/2024	4/16/2025
Middle Thorax Rib Potentiometer	Servo	085GFE	10/16/2024	4/16/2025
Lower Thorax Rib Potentiometer	Servo	1156GFE	10/16/2024	4/16/2025

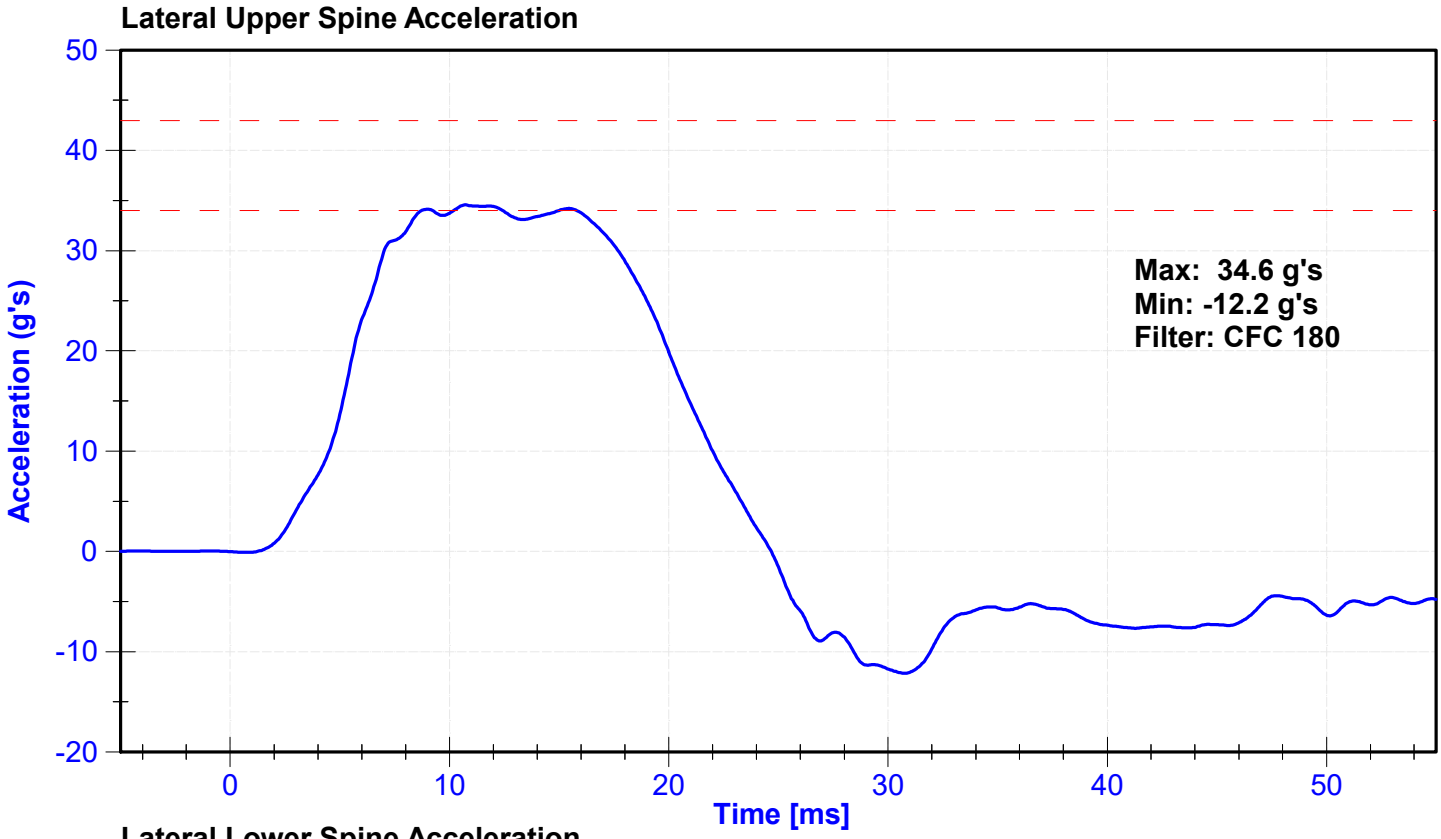


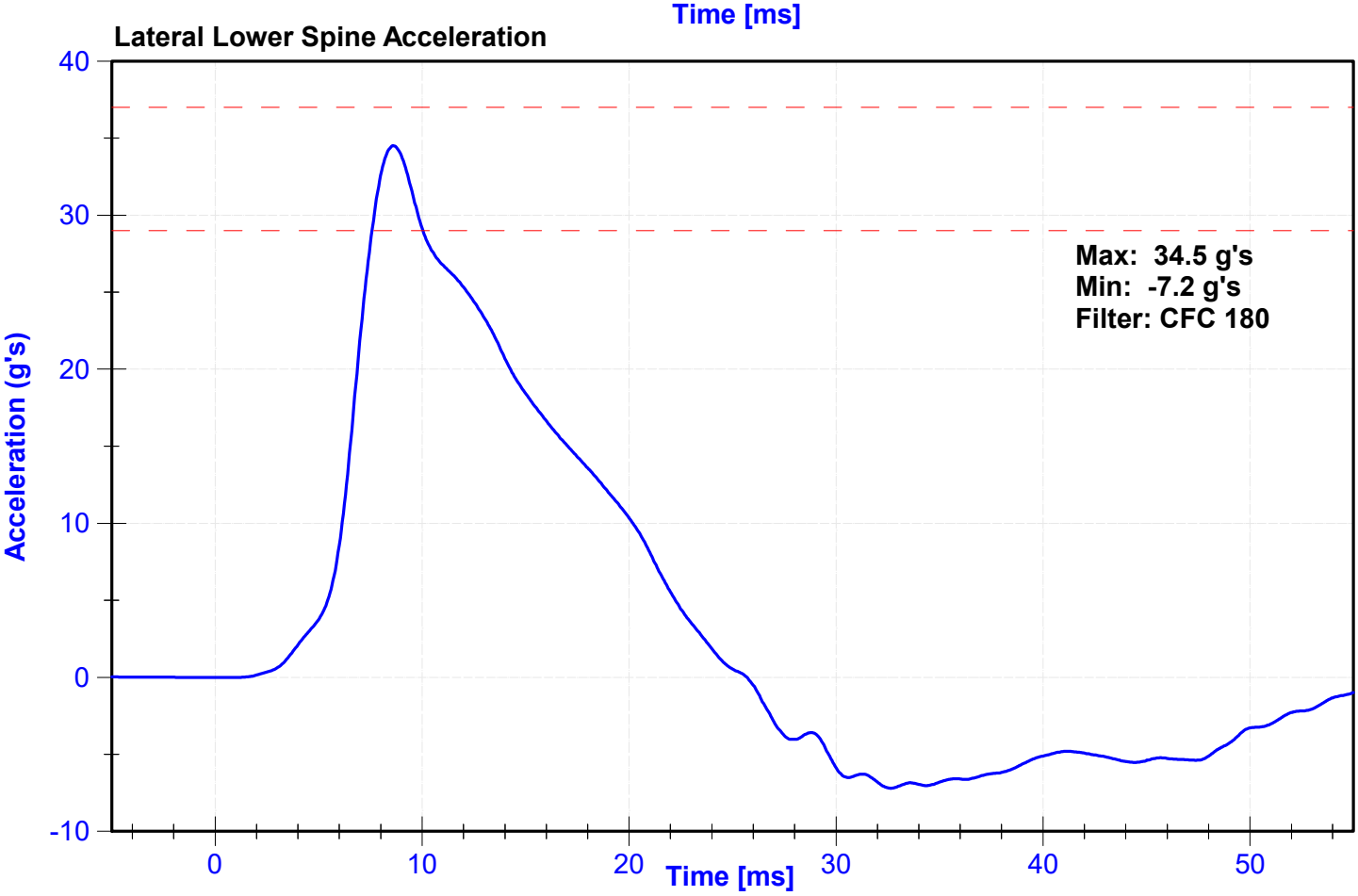

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 32.1 mm
Min: -2.6 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 26.9 mm
Min: 1.1 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 31.0 mm
Min: 1.5 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 33.1 mm
Min: 2.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 34.6 g's
Min: -12.2 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 34.5 g's
Min: -7.2 g's
Filter: CFC 180

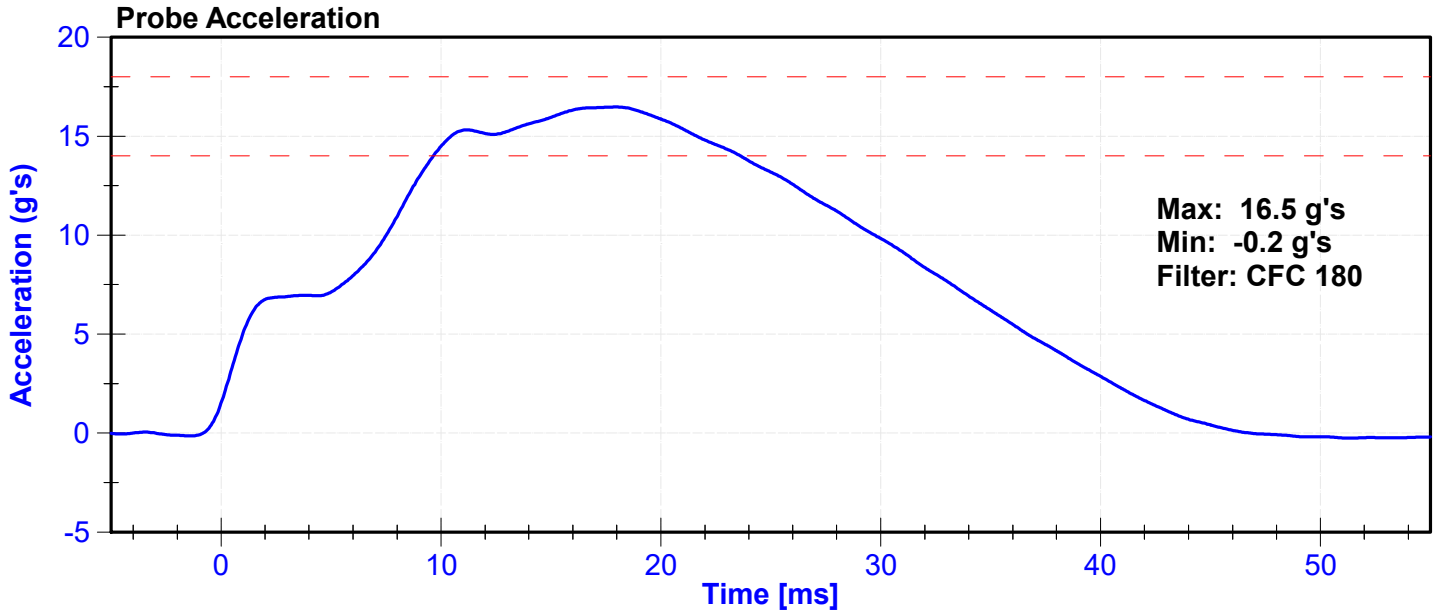
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

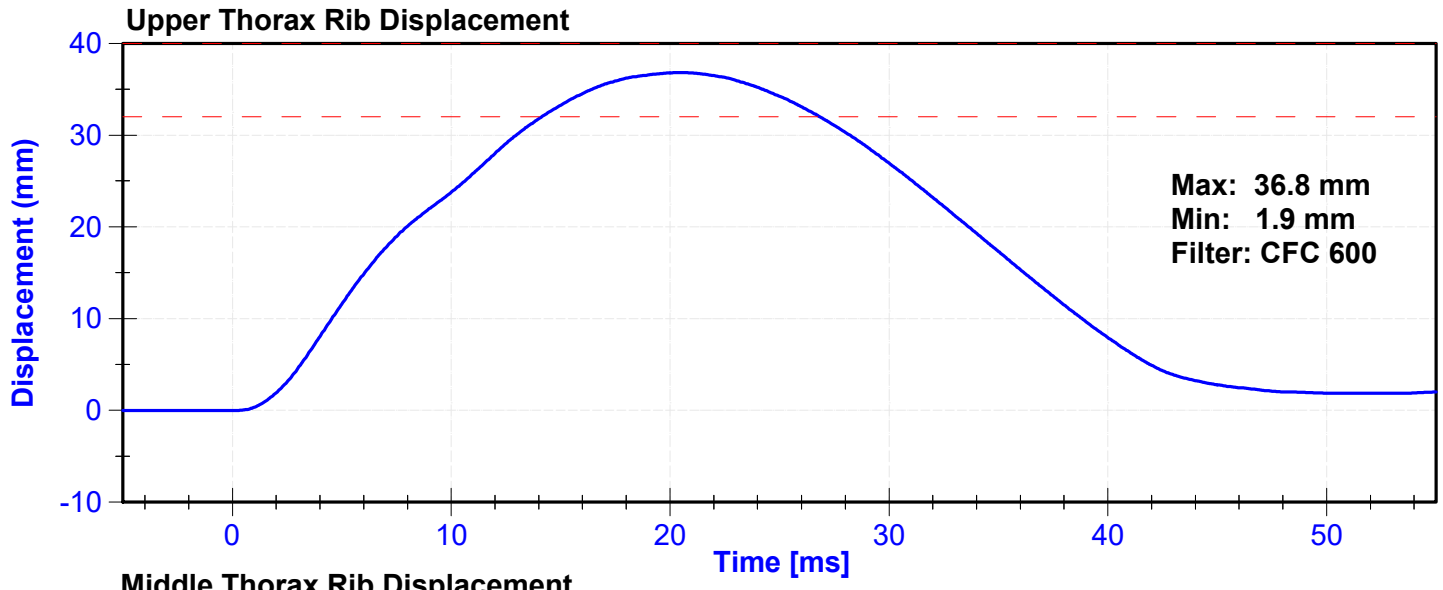
Results

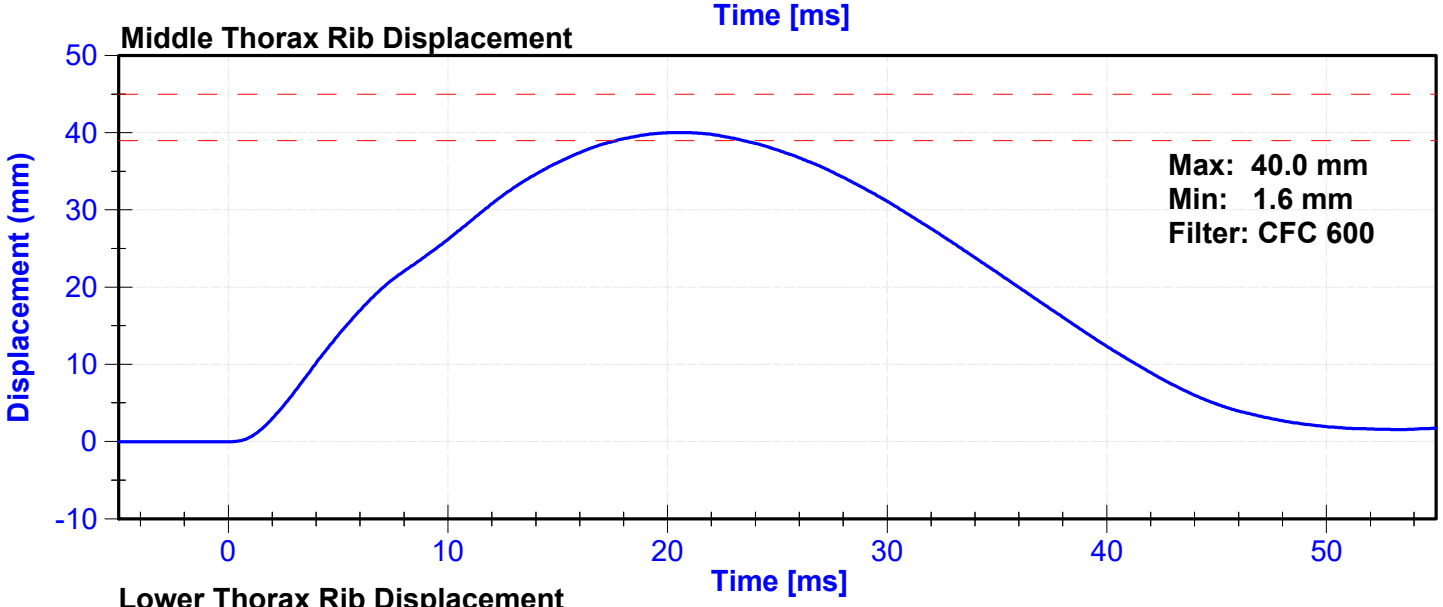
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	14	18	g's	16.5	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.7	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.6	Pass
Upper Thorax Rib Deflection	32	40	mm	36.8	Pass
Middle Thorax Rib Deflection	39	45	mm	40.0	Pass
Lower Thorax Rib Deflection	35	43	mm	36.0	Pass

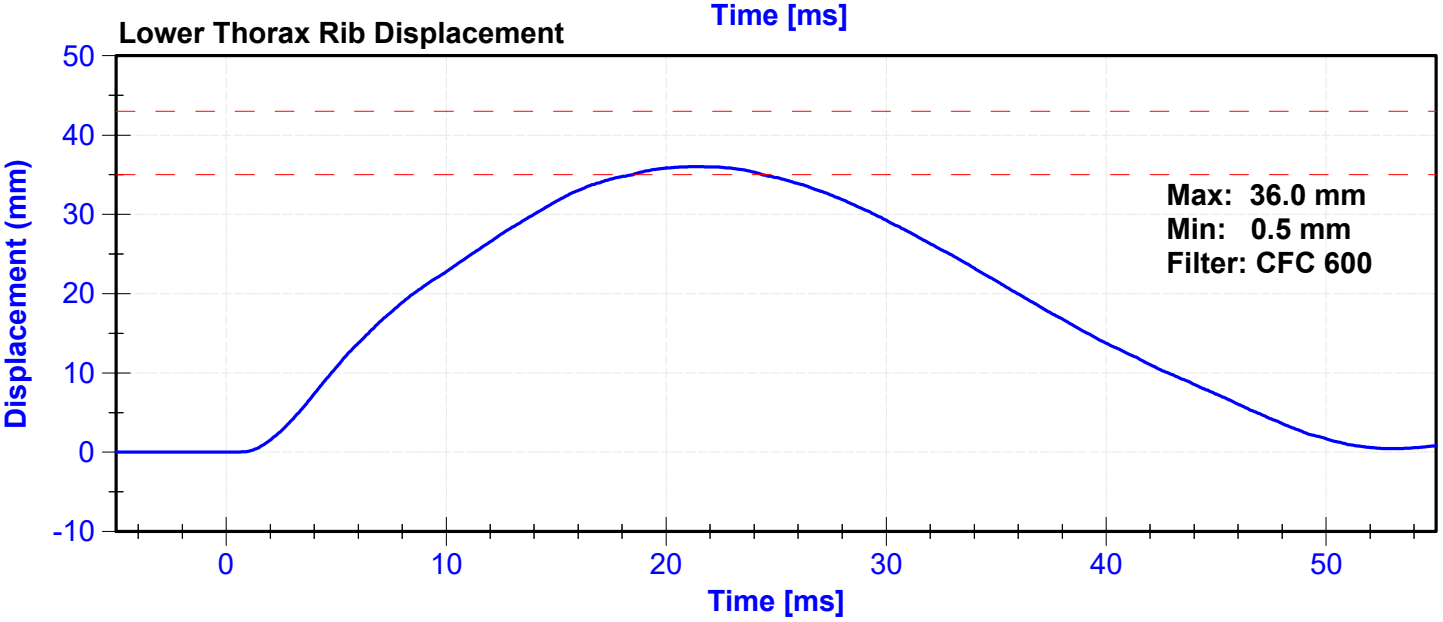
Transducer Calibrations

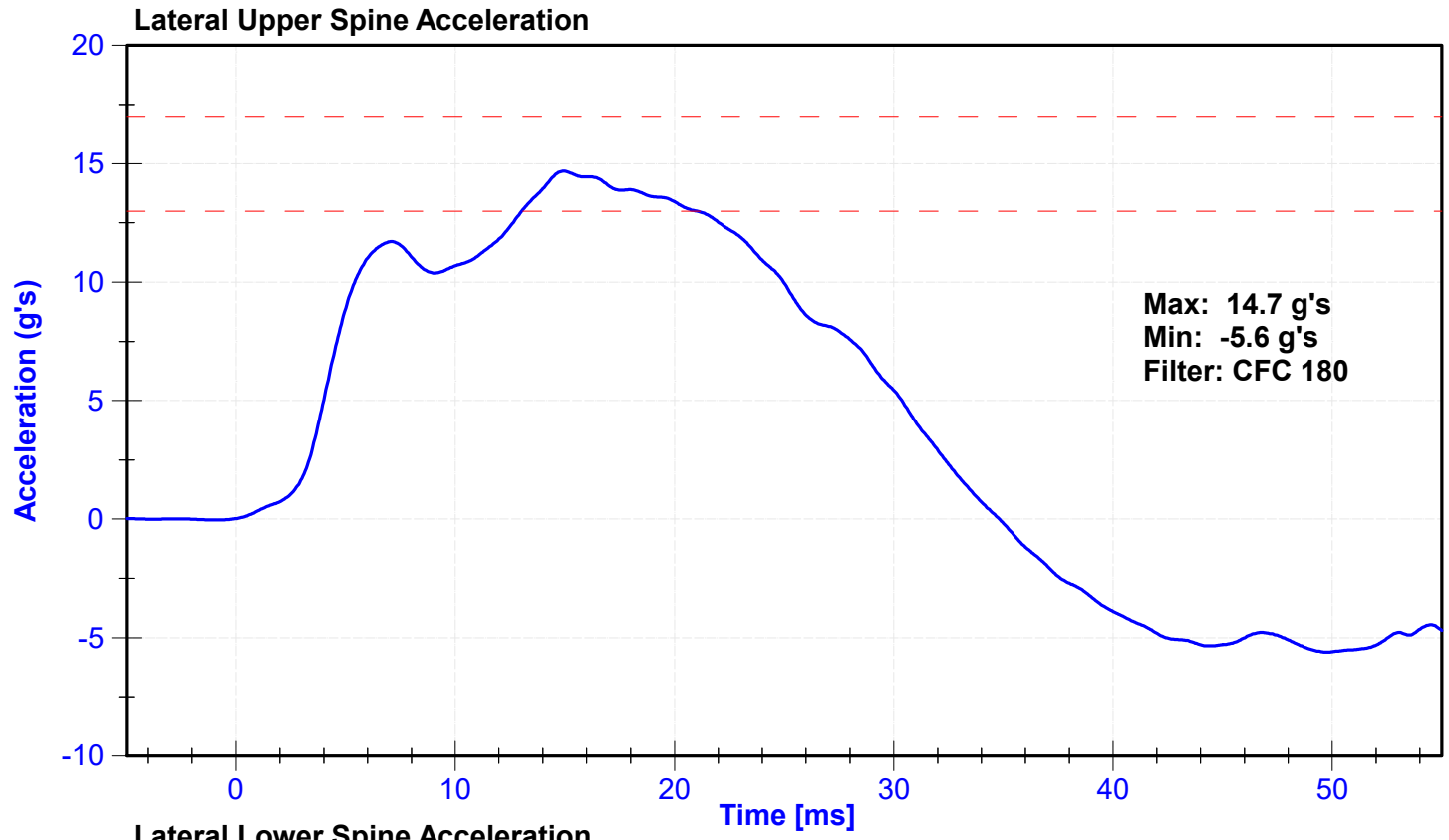
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Upper Spine Y Accelerometer	Endevco	P52018	11/25/2024	5/24/2025
Lower Spine Y Accelerometer	Endevco	P52071	10/17/2024	4/15/2025
Upper Thorax Rib Potentiometer	Servo	2316GFE	10/16/2024	4/16/2025
Middle Thorax Rib Potentiometer	Servo	085GFE	10/16/2024	4/16/2025
Lower Thorax Rib Potentiometer	Servo	1156GFE	10/16/2024	4/16/2025

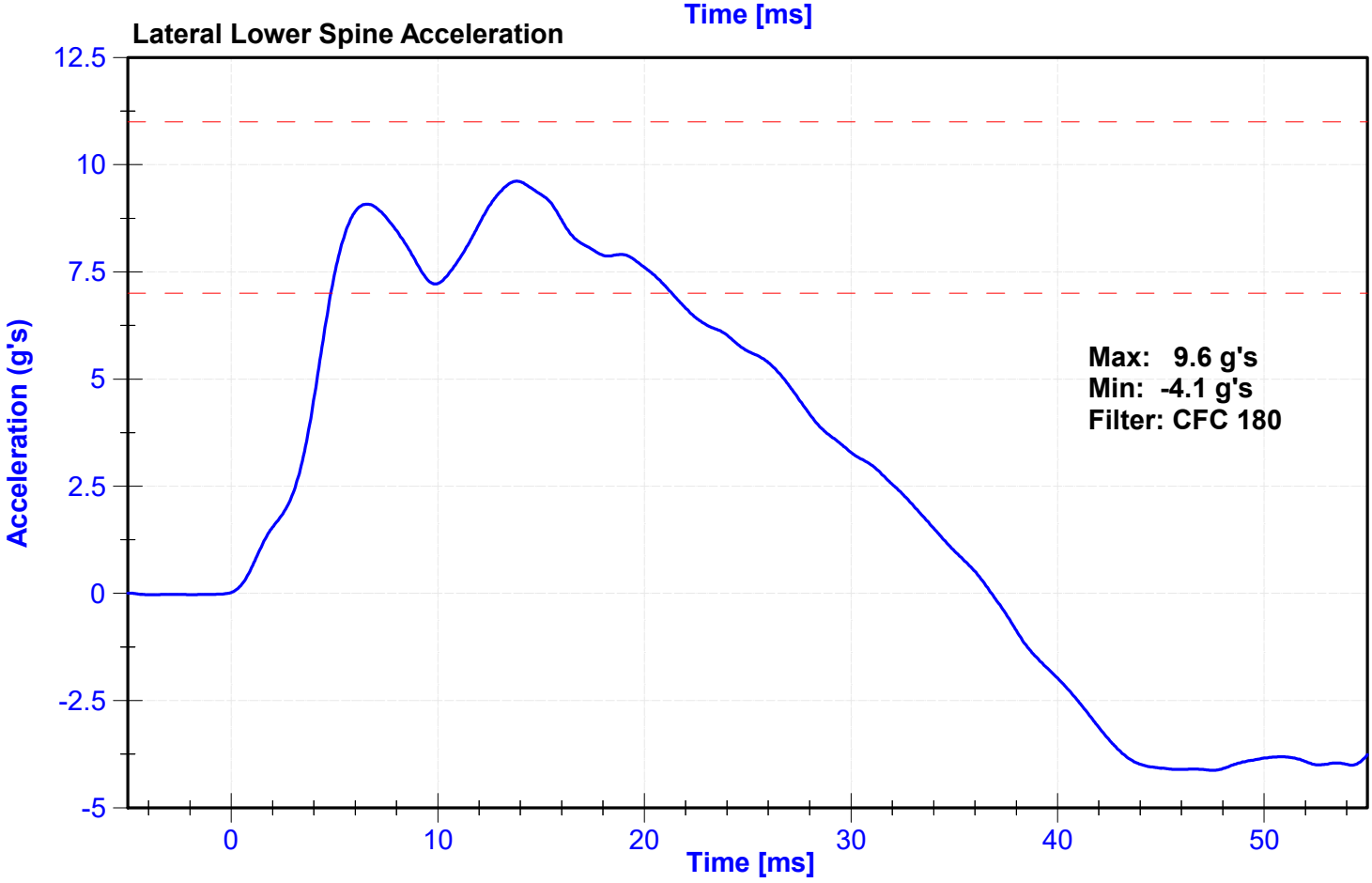



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 36.8 mm
Min: 1.9 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 40.0 mm
Min: 1.6 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 36.0 mm
Min: 0.5 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 14.7 g's
Min: -5.6 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 9.6 g's
Min: -4.1 g's
Filter: CFC 180

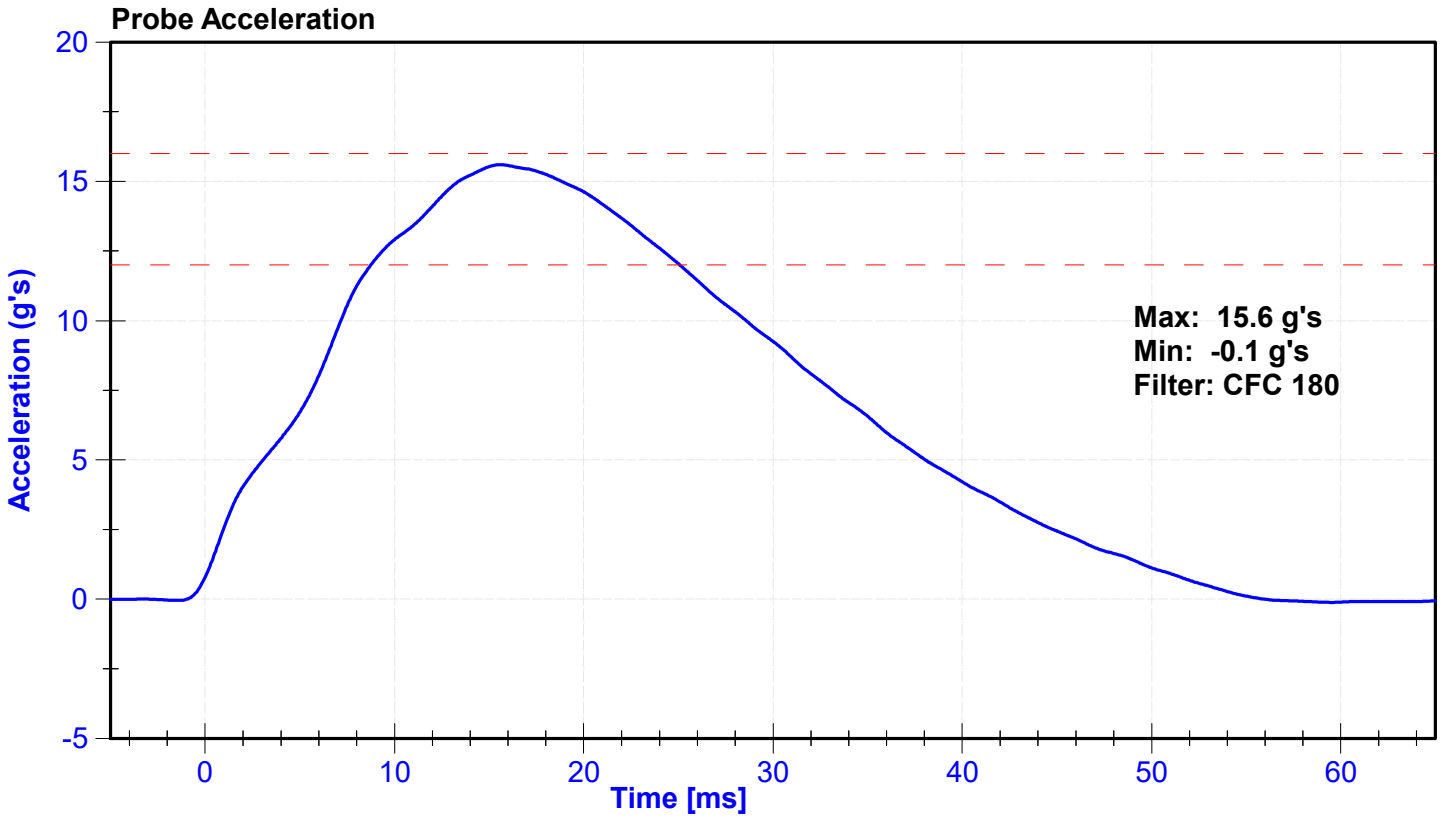
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

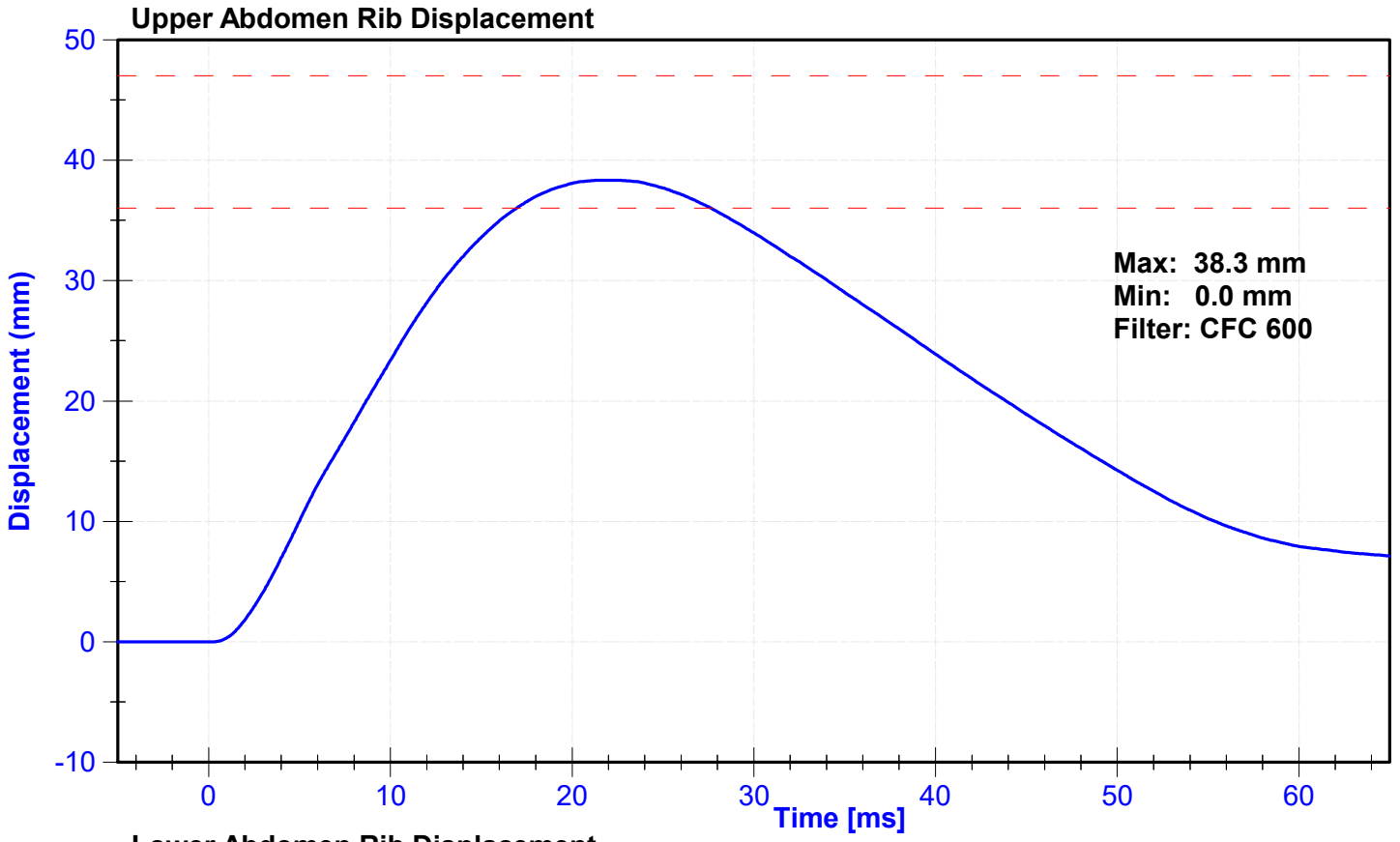
Results

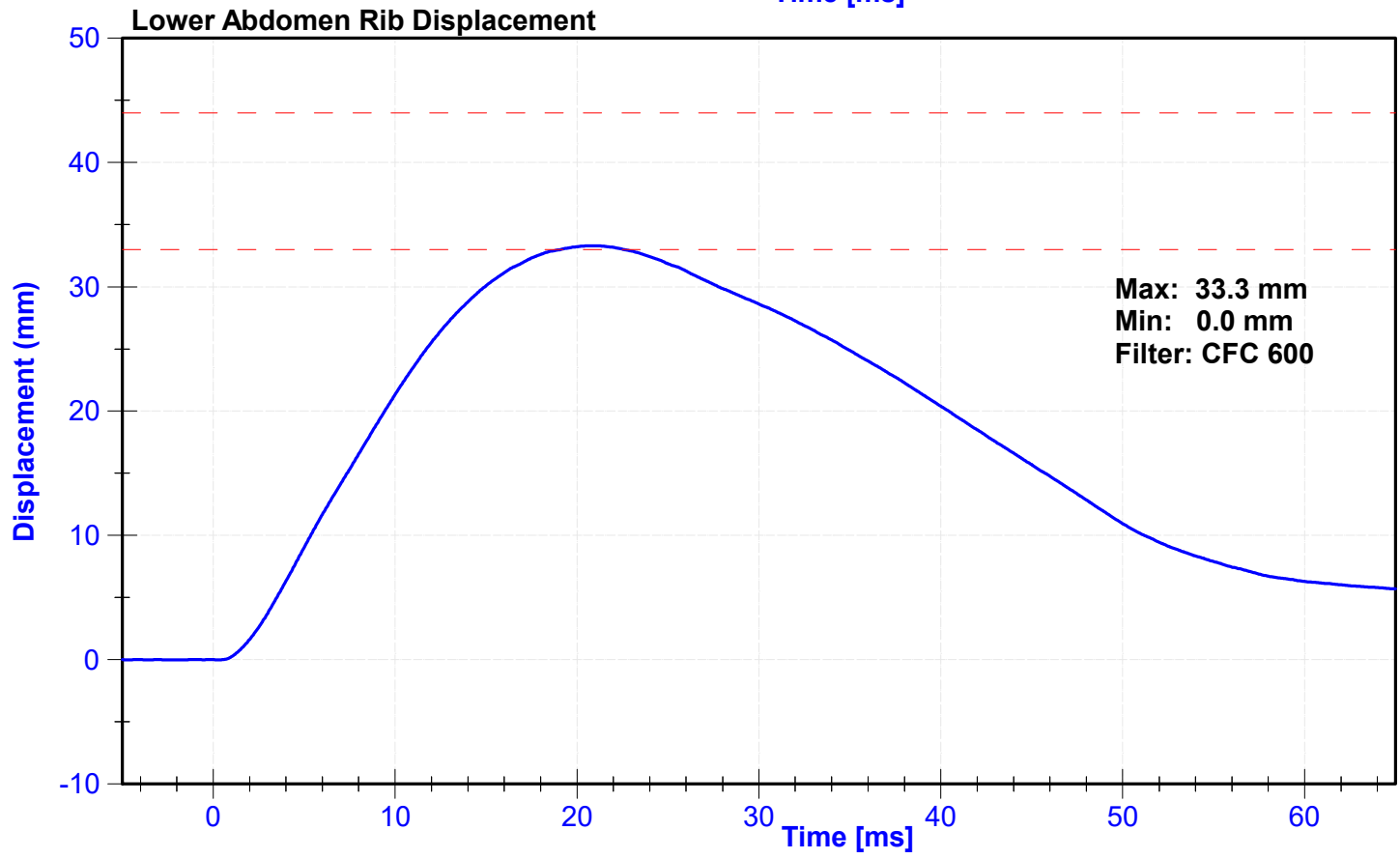
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	12	16	g's	15.6	Pass
Lateral Lower Spine Acceleration	9	14	g's	13.1	Pass
Upper Abdomen Rib Deflection	36	47	mm	38.3	Pass
Lower Abdomen Rib Deflection	33	44	mm	33.3	Pass

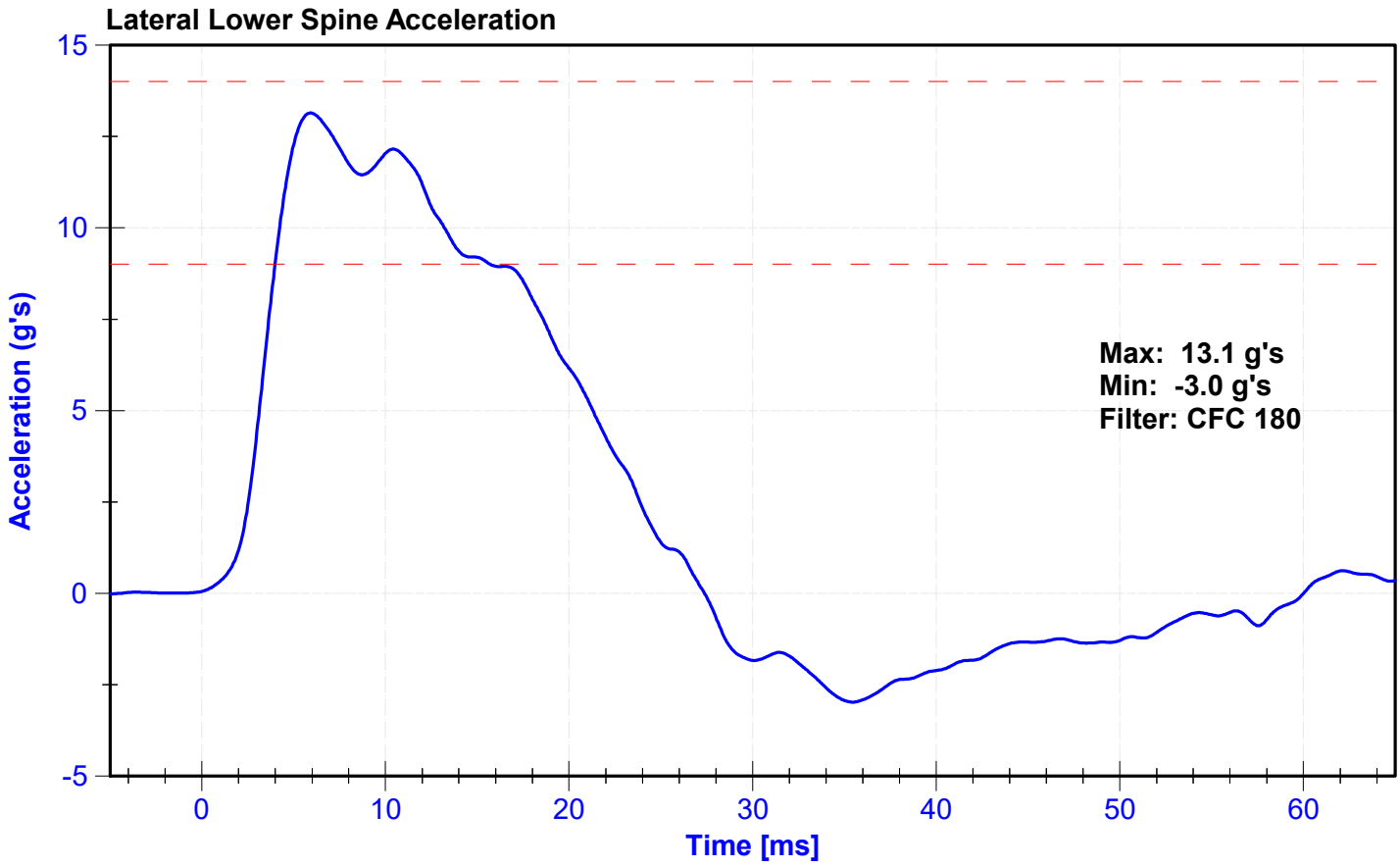
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Lower Spine Y Accelerometer	Endevco	P52071	10/17/2024	4/15/2025
Upper Abdomen Rib Potentiometer	Servo	074GFE	10/16/2024	4/16/2025
Lower Abdomen Rib Potentiometer	Servo	075GFE	10/16/2024	4/16/2025




Upper Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 38.3 mm
Min: 0.0 mm
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 33.3 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Lower Spine Acceleration
Acceleration (g's)
15
10
5
0
-5
0
10
20
30
40
50
60
Time [ms]
Max: 13.1 g's
Min: -3.0 g's
Filter: CFC 180

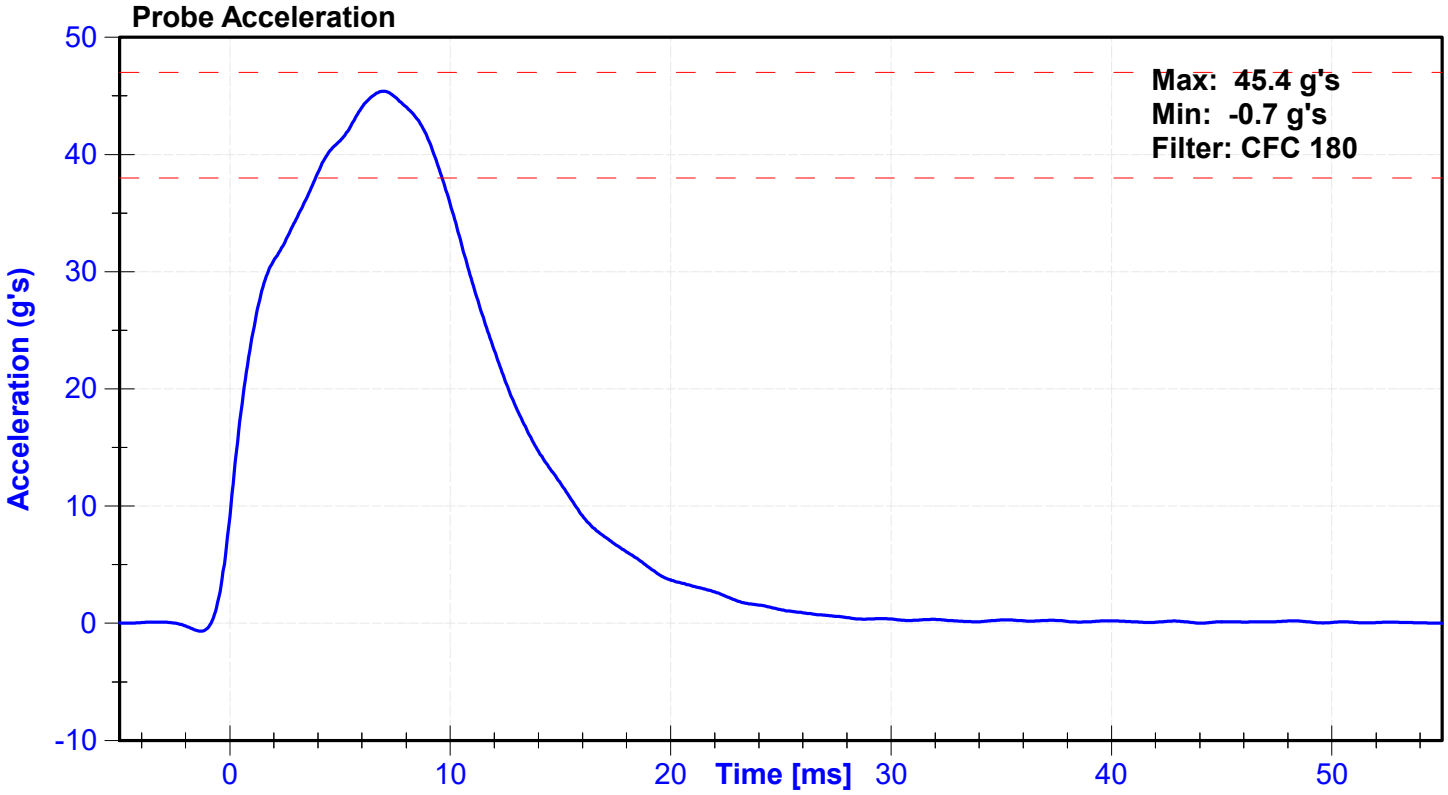
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

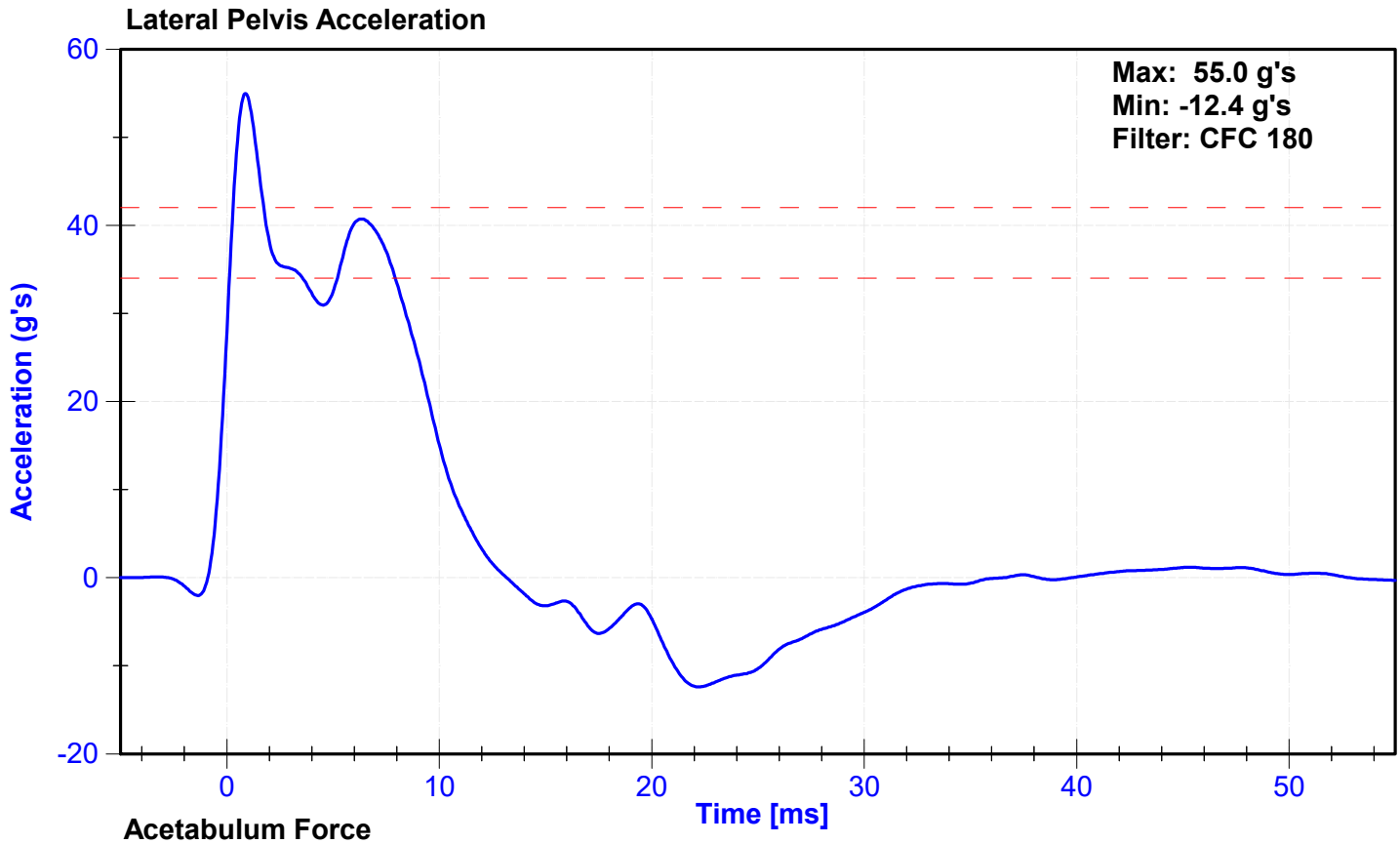
Results

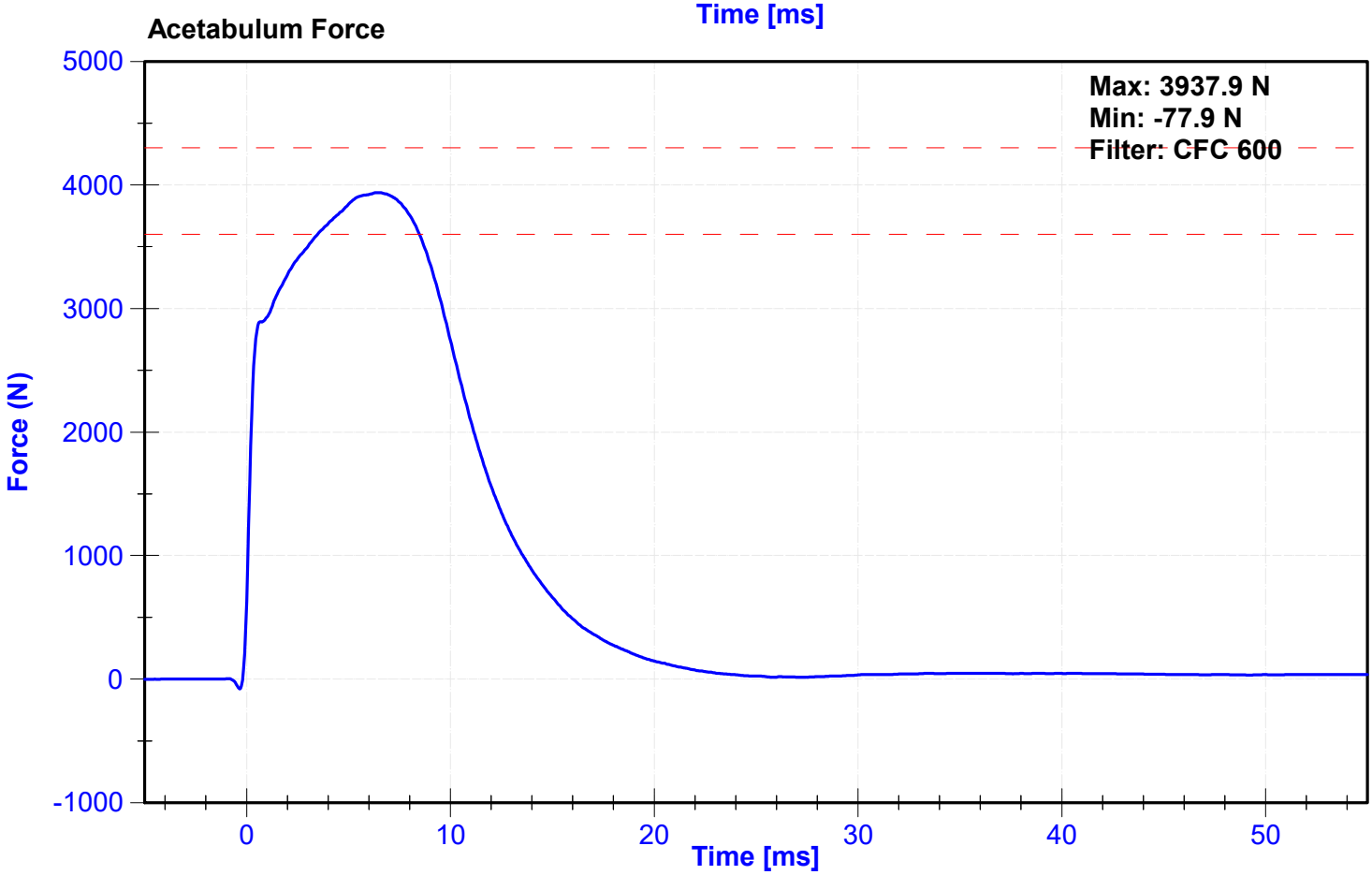
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	19	Pass
Velocity	6.6	6.8	m/s	6.65	Pass
Probe Acceleration	38	47	g's	45.4	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	40.7	Pass
Acetabulum Force	3600	4300	N	3937.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Pelvis Y Accelerometer	Endevco	P51731	10/17/2024	4/15/2025
Acetabulum Load Cell	Denton	275-FY	10/28/2024	10/28/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A




Lateral Pelvis Acceleration
Max: 55.0 g's
Min: -12.4 g's
Filter: CFC 180
Acceleration (g's)
60
40
20
0
-20
0
10
20
30
40
50
Time [ms]


Acetabulum Force
Max: 3937.9 N
Min: -77.9 N
Filter: CFC 600
Force (N)
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]

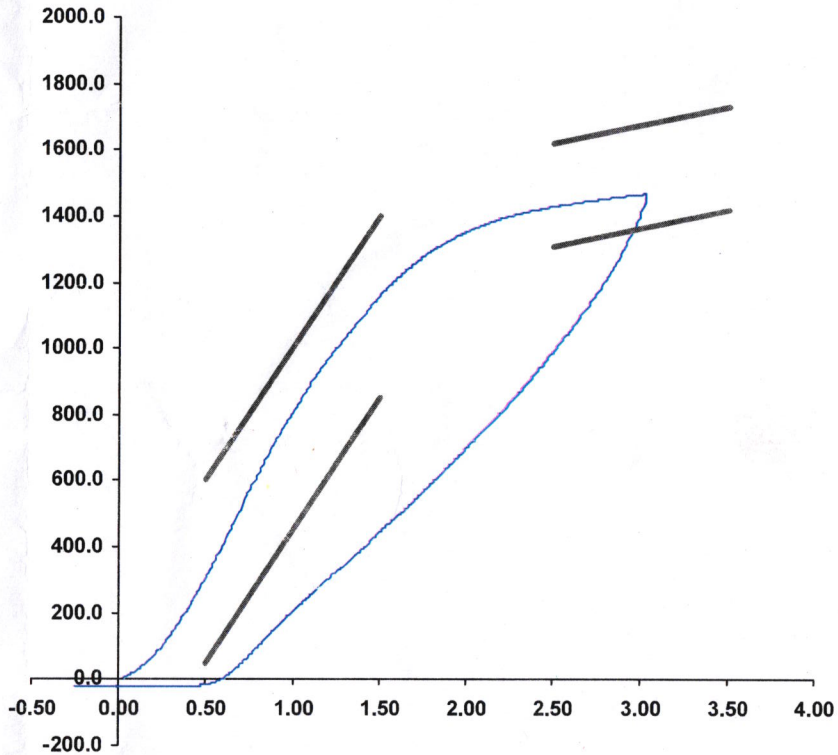
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16714
Test Number 23514
Report Number 23571
Test Date 7/22/2022 11:52:08 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	306	50	600
Force @ 1.5 mm (N)	1,161	850	1,400
Force @ 2.5 mm (N)	1,428	1,306	1,618
Force @ 3.0 mm (N)	1,466	1,361	1,673

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes:
Cert Plug 1-14-2025 300

Operator

Part Number 180-4450

Template No 107 22-Jul-22
SACO Research

By : DC Date : 7/22/22

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

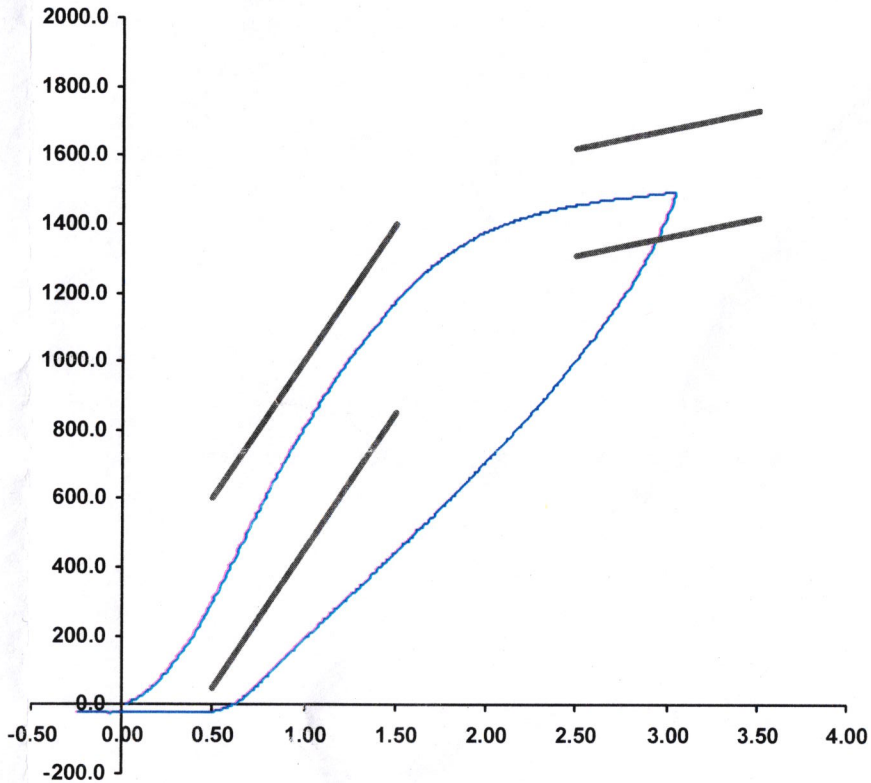
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16722
Test Number 23522
Report Number 23579
Test Date 7/22/2022 12:25:38 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	305	50	600
Force @ 1.5 mm (N)	1,174	850	1,400
Force @ 2.5 mm (N)	1,455	1,306	1,618
Force @ 3.0 mm (N)	1,490	1,361	1,673

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes:
Impact 1-14-2025 300

Operator

Part Number 180-4450

Template No 107 22-Jul-22
SACO Research

By : DC Date : 7/22/22

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

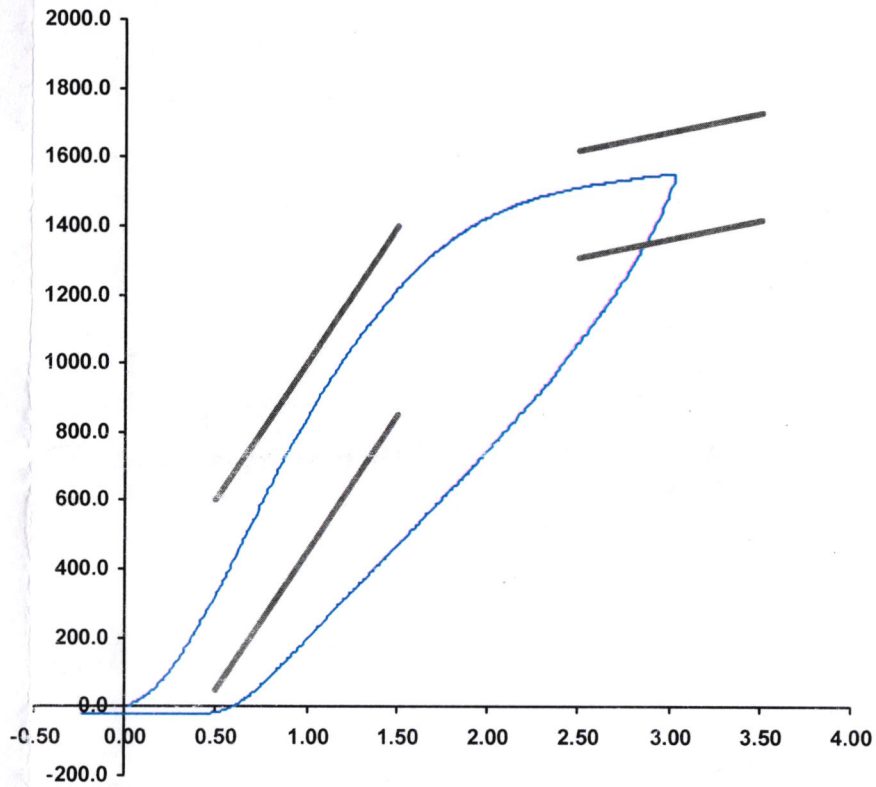
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16767
Test Number 23577
Report Number 23634
Test Date 7/25/2022 7:28:39 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	324	50	600
Force @ 1.5 mm (N)	1,218	850	1,400
Force @ 2.5 mm (N)	1,513	1,306	1,618
Force @ 3.0 mm (N)	1,551	1,361	1,673

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes:
Non Impact 1-14-2025 300

Operator

Part Number 180-4450

Template No 107 25-Jul-22
SACO Research

By : DC Date : 7/25/22

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

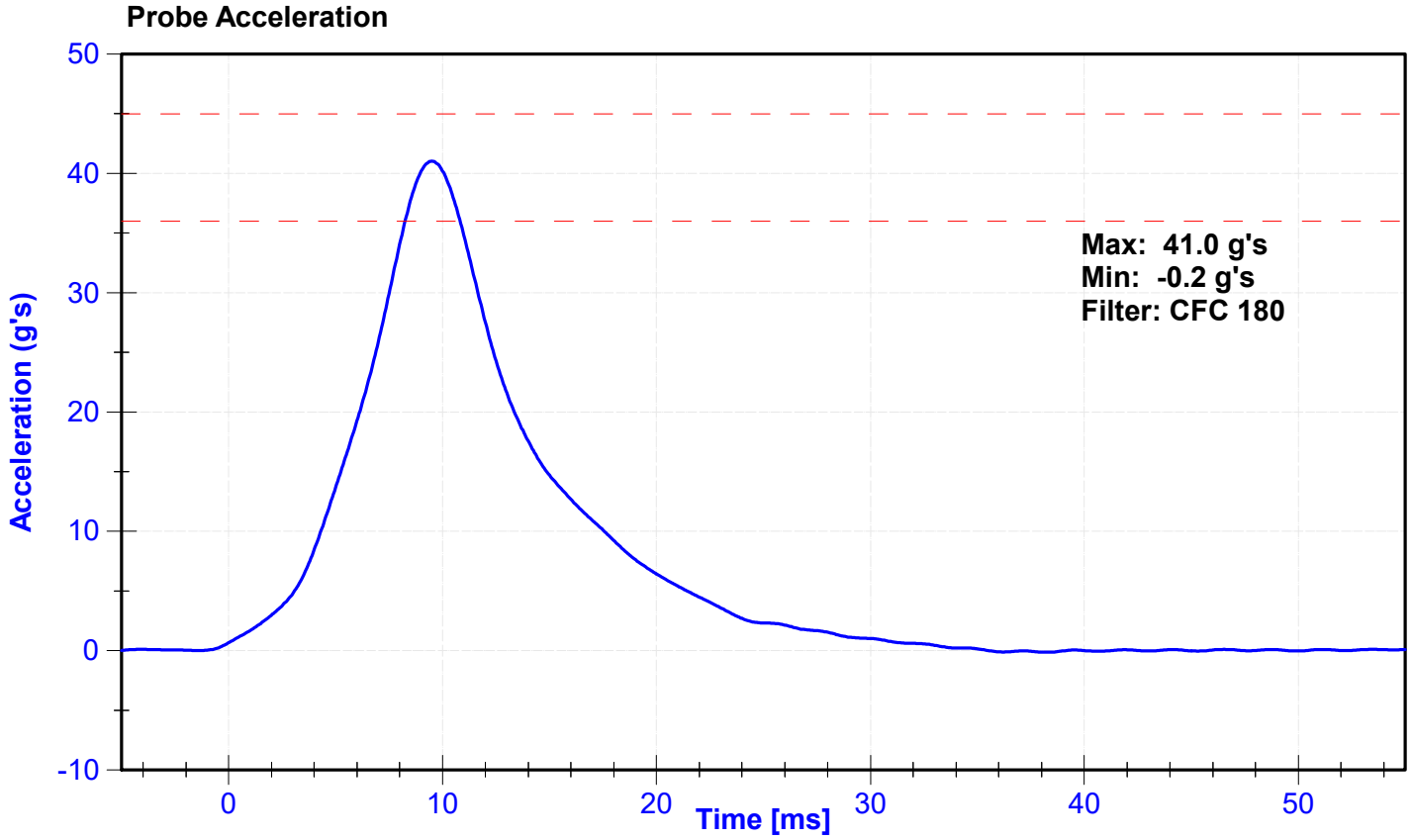
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

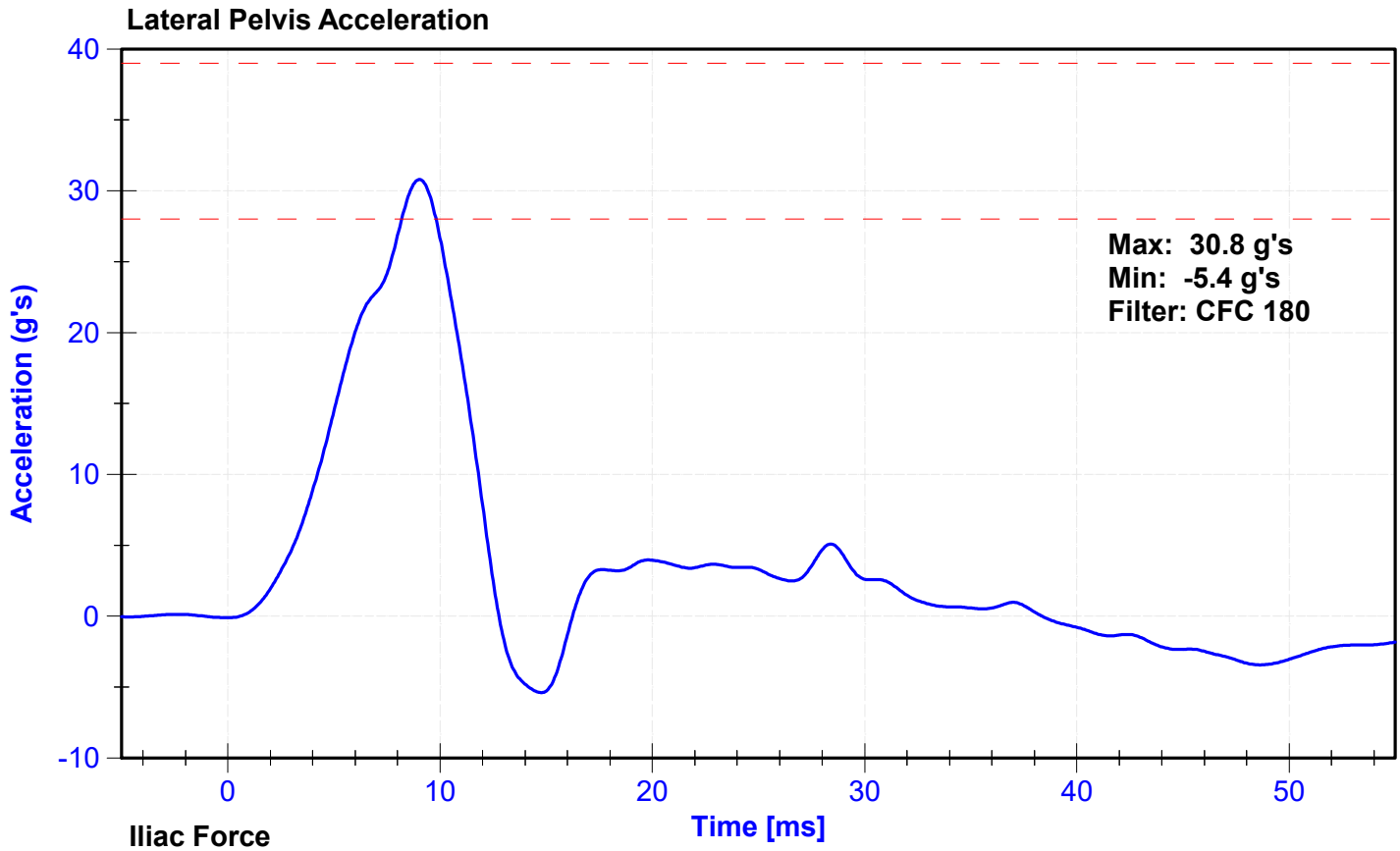
Results

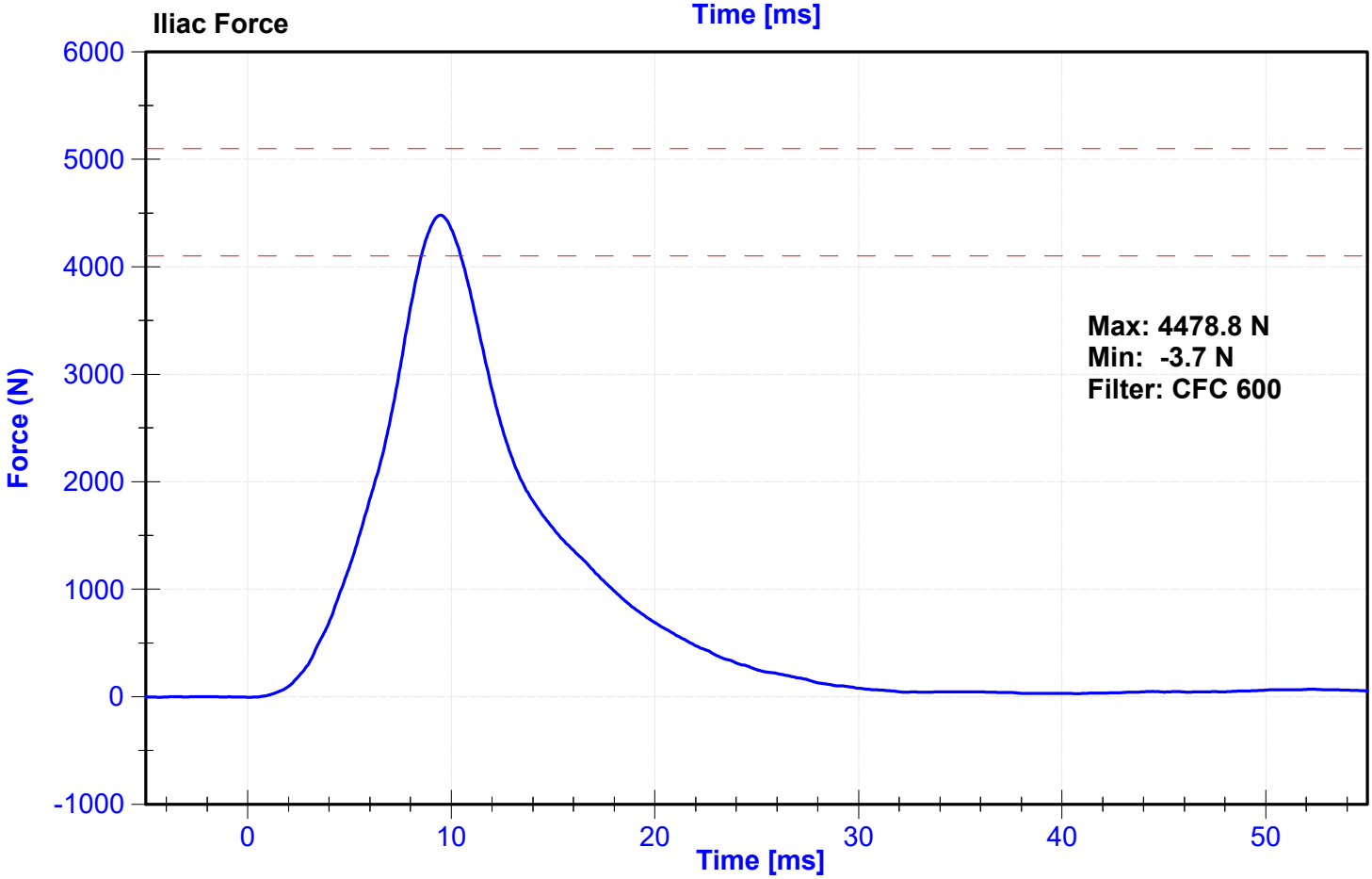
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	36	45	g's	41.0	Pass
Lateral Pelvis Acceleration	28	39	g's	30.8	Pass
Iliac Force	4100	5100	N	4478.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Pelvis Y Accelerometer	Endevco	P51731	10/17/2024	4/15/2025
Iliac Load Cell	Denton	279-FY	10/28/2024	10/28/2025




Lateral Pelvis Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 30.8 g's
Min: -5.4 g's
Filter: CFC 180


Iliac Force
Force (N)
6000
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]
Max: 4478.8 N
Min: -3.7 N
Filter: CFC 600

CALIBRATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

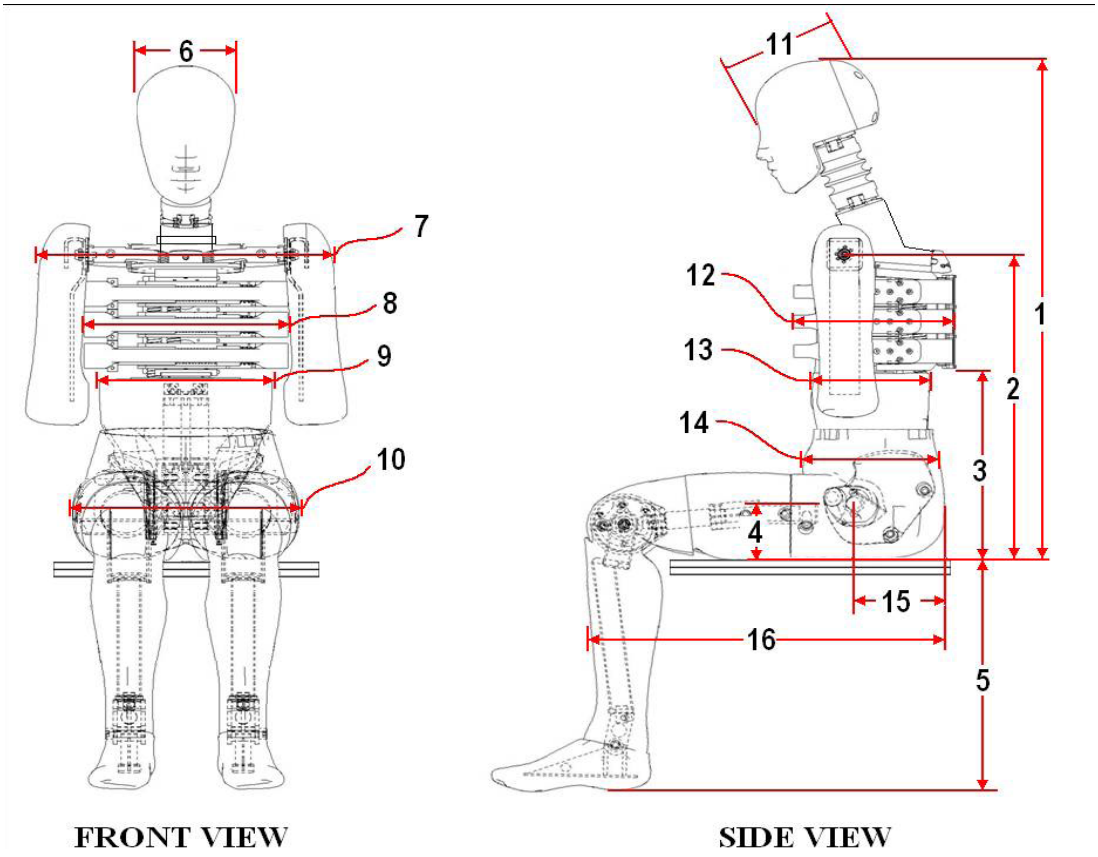
SERIAL NO:F033

(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - EuroSID-2re

Technician: J. Rios Date: 2/13/2024

Dummy Serial Number: F033



FRONT VIEW SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	912	Pass
2	Seat to Shoulder Joint	558	572	568	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	412	Pass
6	Head Width	152	158	155	Pass
7	Shoulder/Arm Width	461	479	470	Pass
8	Thorax Width	322	332	328	Pass
9	Abdomen Width	273	287	282	Pass
10	Pelvis Lap Width	359	373	363	Pass
11	Head Depth	196	206	202	Pass
12	Thorax Depth	262	272	271	Pass
13	Abdomen Depth	194	204	198	Pass
14	Pelvis Depth	235	245	241	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	154	Pass
16	Back of Buttocks to Front Knee	597	615	601	Pass

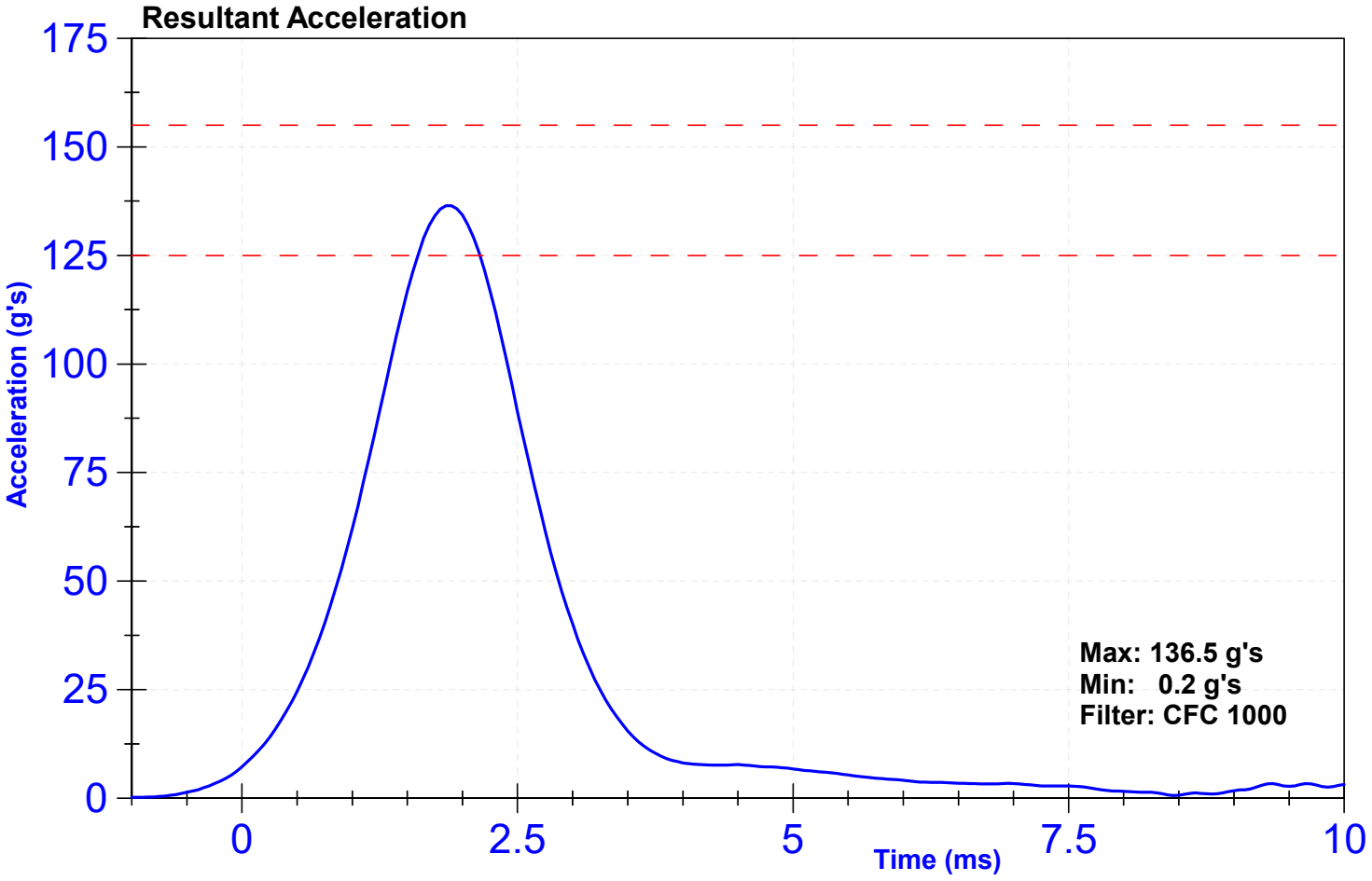
ATD Manufacturer	FTSS	Test Technician	K. Koineczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

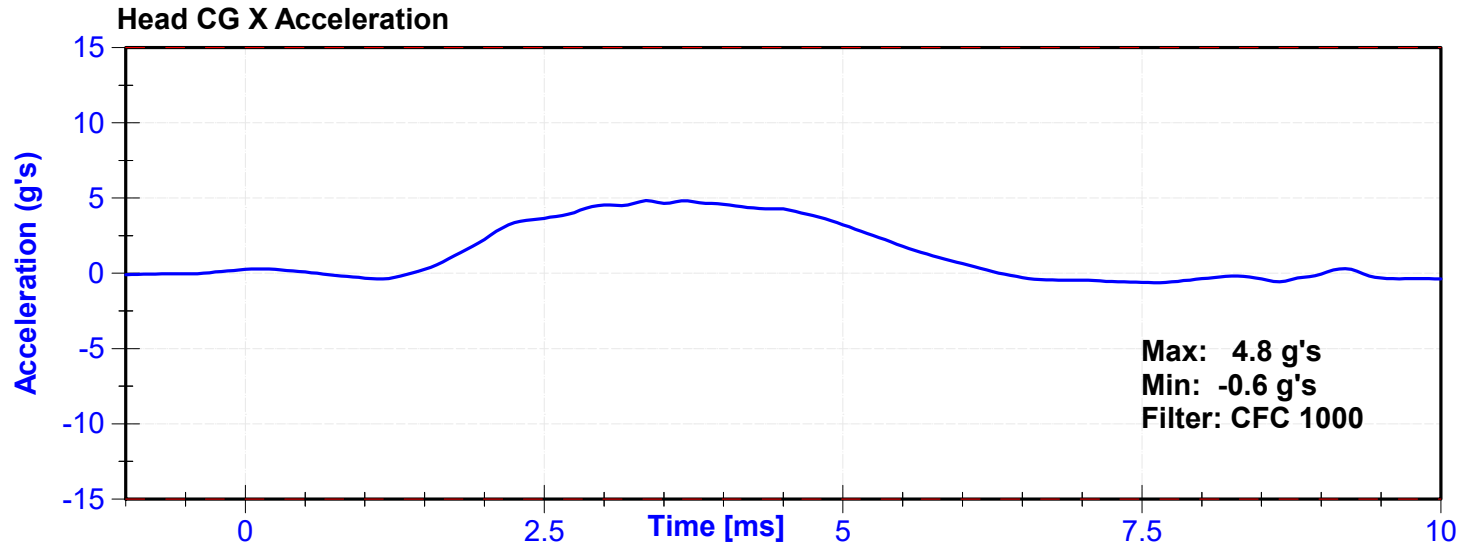
Results

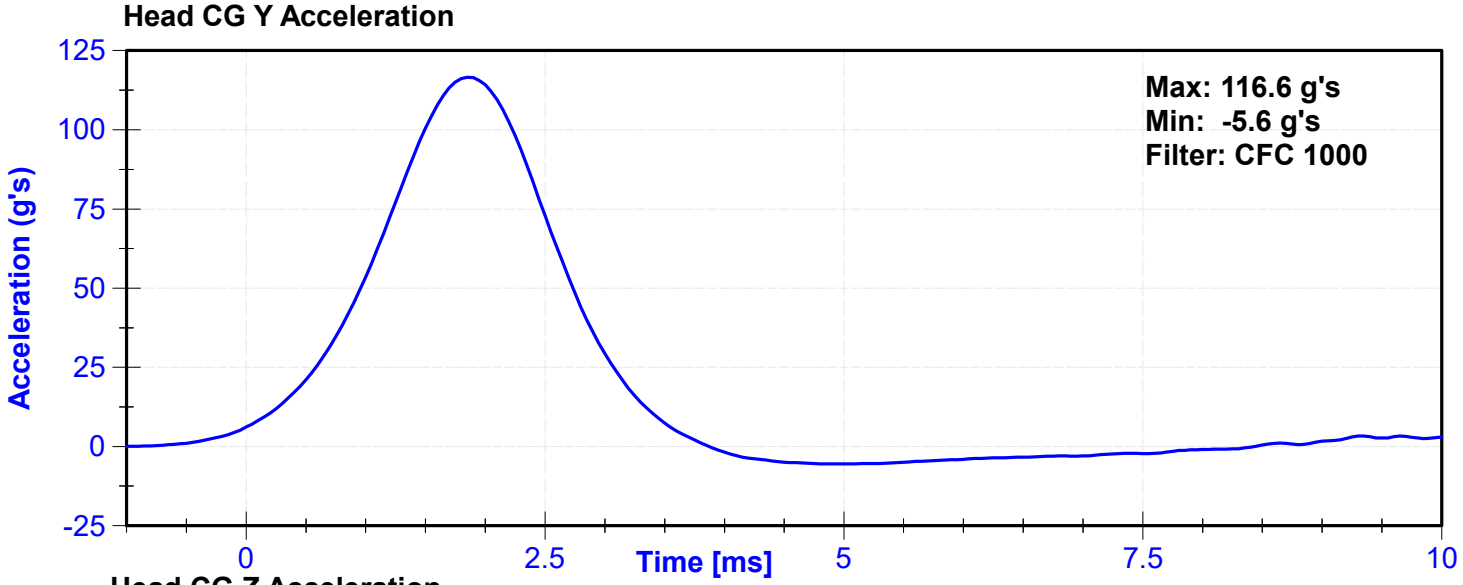
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	17	Pass
Resultant Acceleration	125	155	g's	136.5	Pass
Oscillation	0	15	%	5.65	Pass
Fore-Aft Acceleration	-15	15	g's	4.8	Pass

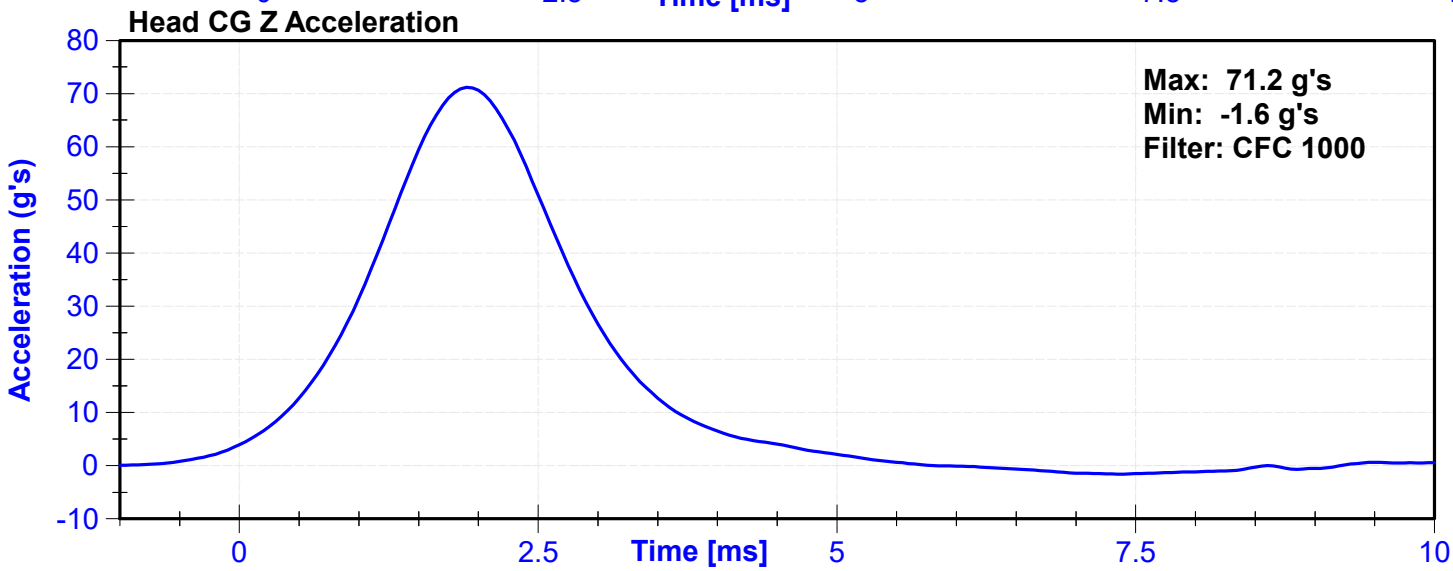
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P63861	10/17/2024	4/15/2025
Y Accelerometer	Endevco	P49216	10/17/2024	4/15/2025
Z Accelerometer	Endevco	P51303	10/17/2024	4/15/2025




Head CG X Acceleration
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
Time [ms]
5
7.5
10
Max: 4.8 g's
Min: -0.6 g's
Filter: CFC 1000


Head CG Y Acceleration
Acceleration (g's)
125
100
75
50
25
0
-25
0
2.5
Time [ms]
5
7.5
10
Max: 116.6 g's
Min: -5.6 g's
Filter: CFC 1000


Head CG Z Acceleration
Acceleration (g's)
80
70
60
50
40
30
20
10
0
-10
0
2.5
Time [ms]
5
7.5
10
Max: 71.2 g's
Min: -1.6 g's
Filter: CFC 1000

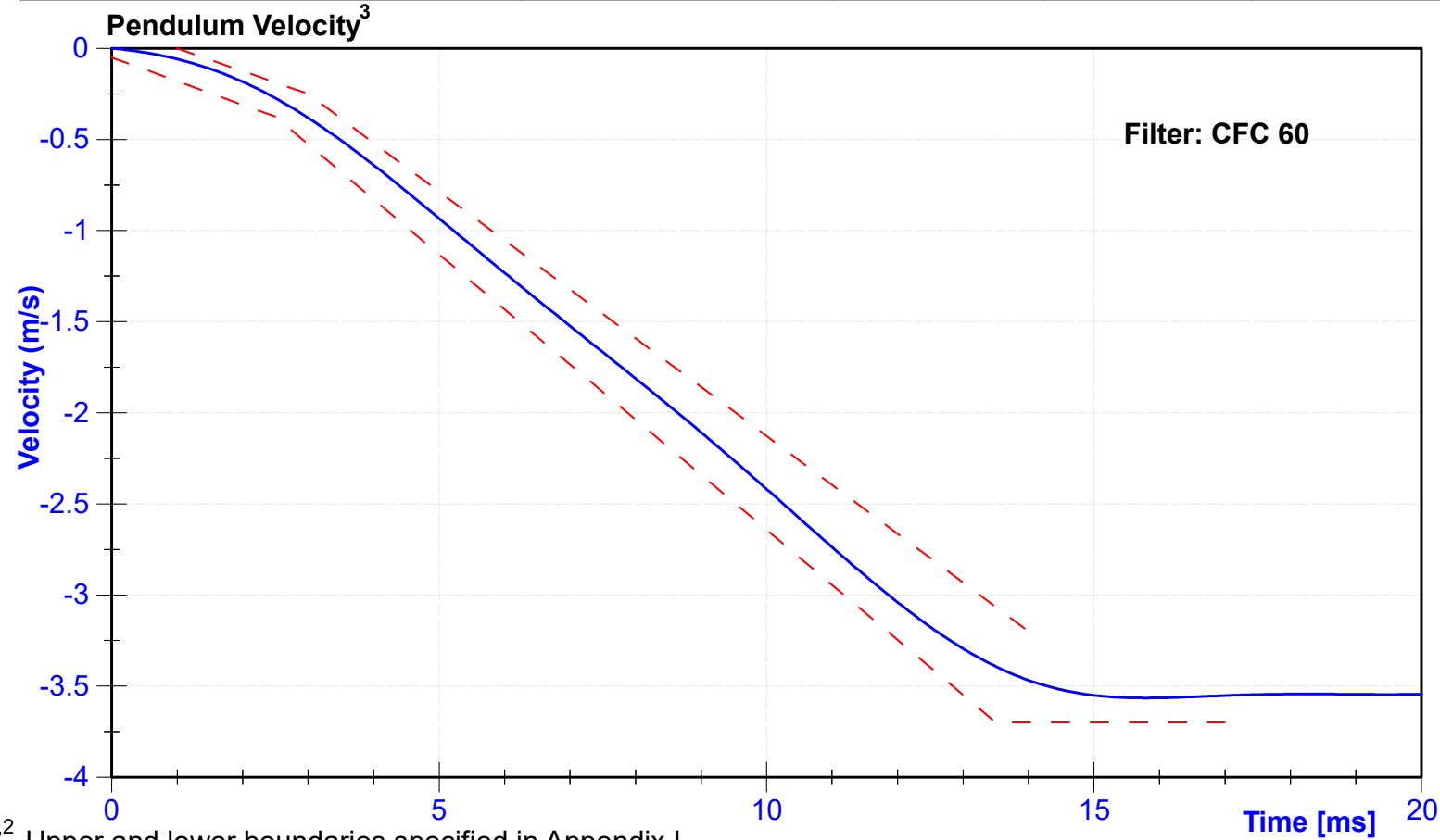
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

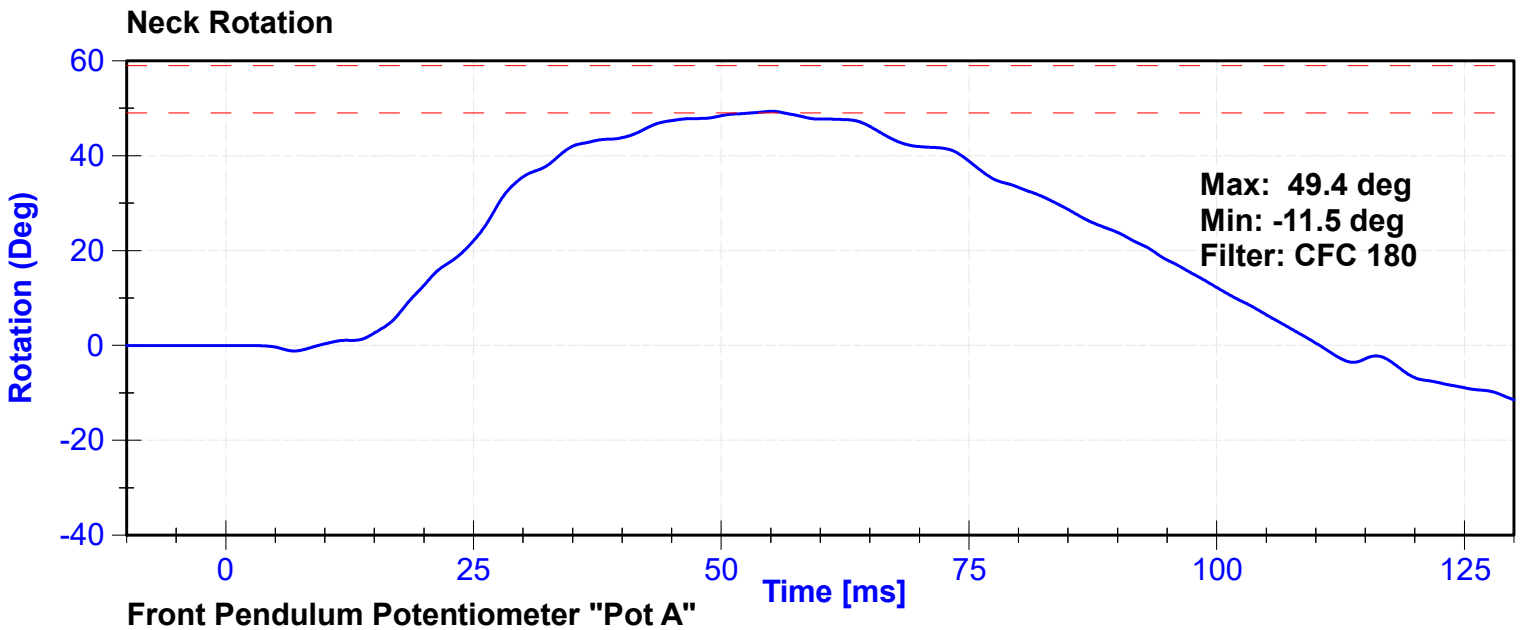
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.2	Pass
Humidity	10	70	%	17	Pass
Velocity	3.3	3.5	m/s	3.38	Pass
Lateral Neck Rotation	49	59	deg	49.4	Pass
Time at Maximum Rotation	54	66	ms	55.1	Pass
Time of Rotation Decay from Maximum	53	88	ms	55.3	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

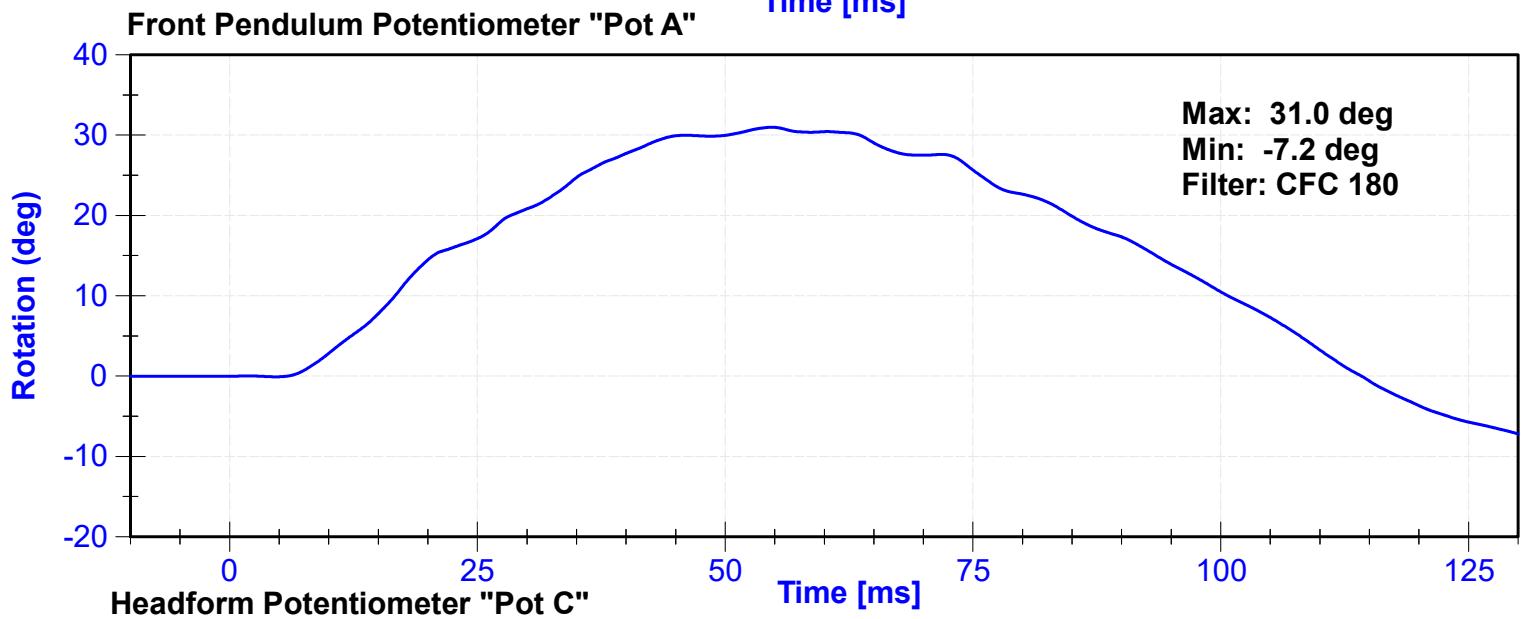
Transducer Calibrations

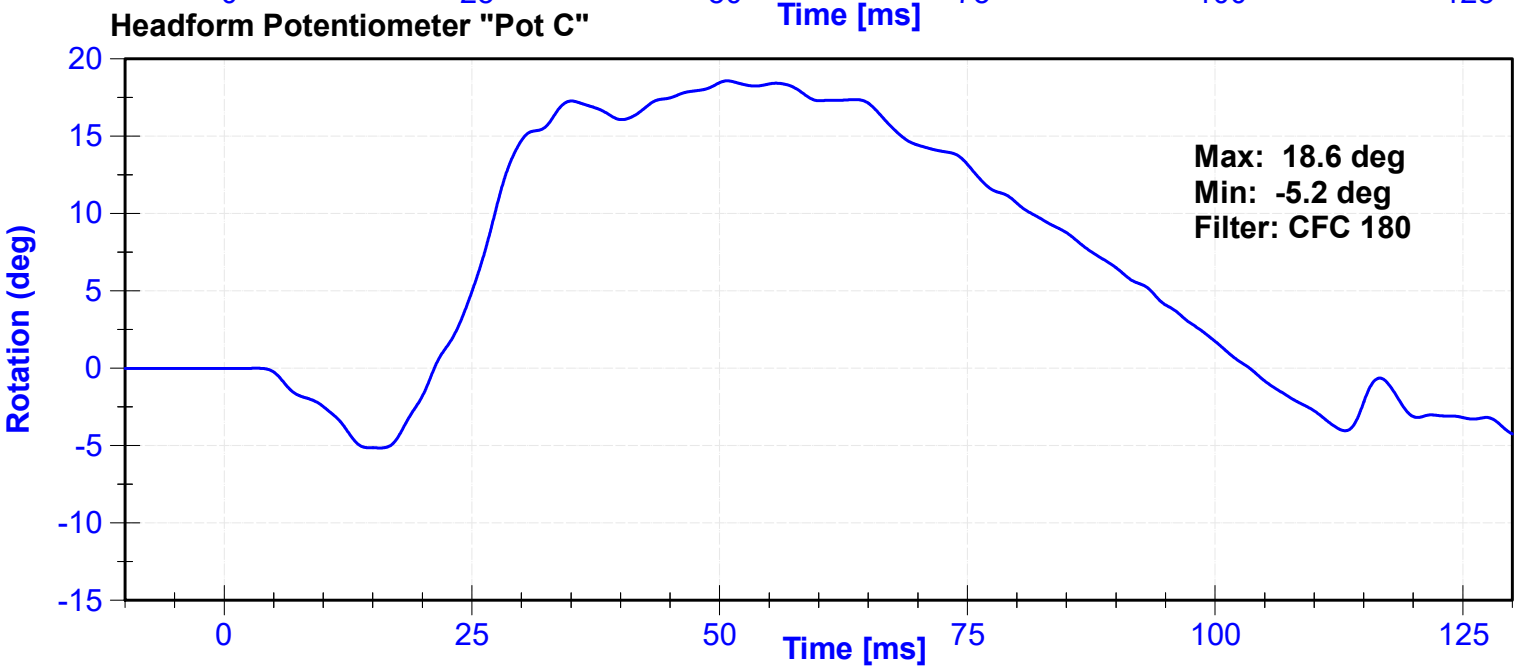
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	4/15/2025
Front Pendulum Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Headform Potentiometer	Sfernice	095	9/13/2024	9/13/2025



[1,2] Upper and lower boundaries specified in Appendix I


Neck Rotation
Rotation (Deg)
Time [ms]
Max: 49.4 deg
Min: -11.5 deg
Filter: CFC 180


Front Pendulum Potentiometer "Pot A"
Rotation (deg)
Time [ms]
Max: 31.0 deg
Min: -7.2 deg
Filter: CFC 180


Headform Potentiometer "Pot C"
Rotation (deg)
Time [ms]
Max: 18.6 deg
Min: -5.2 deg
Filter: CFC 180

Appendix I

[2] Upper Boundary Corridor		[1] Lower Boundary Corridor	
Time (ms)	Velocity (m/s)	Time (ms)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.0	-0.25	2.5	-0.375
14.0	-3.20	13.5	-3.7
		17.0	-3.7

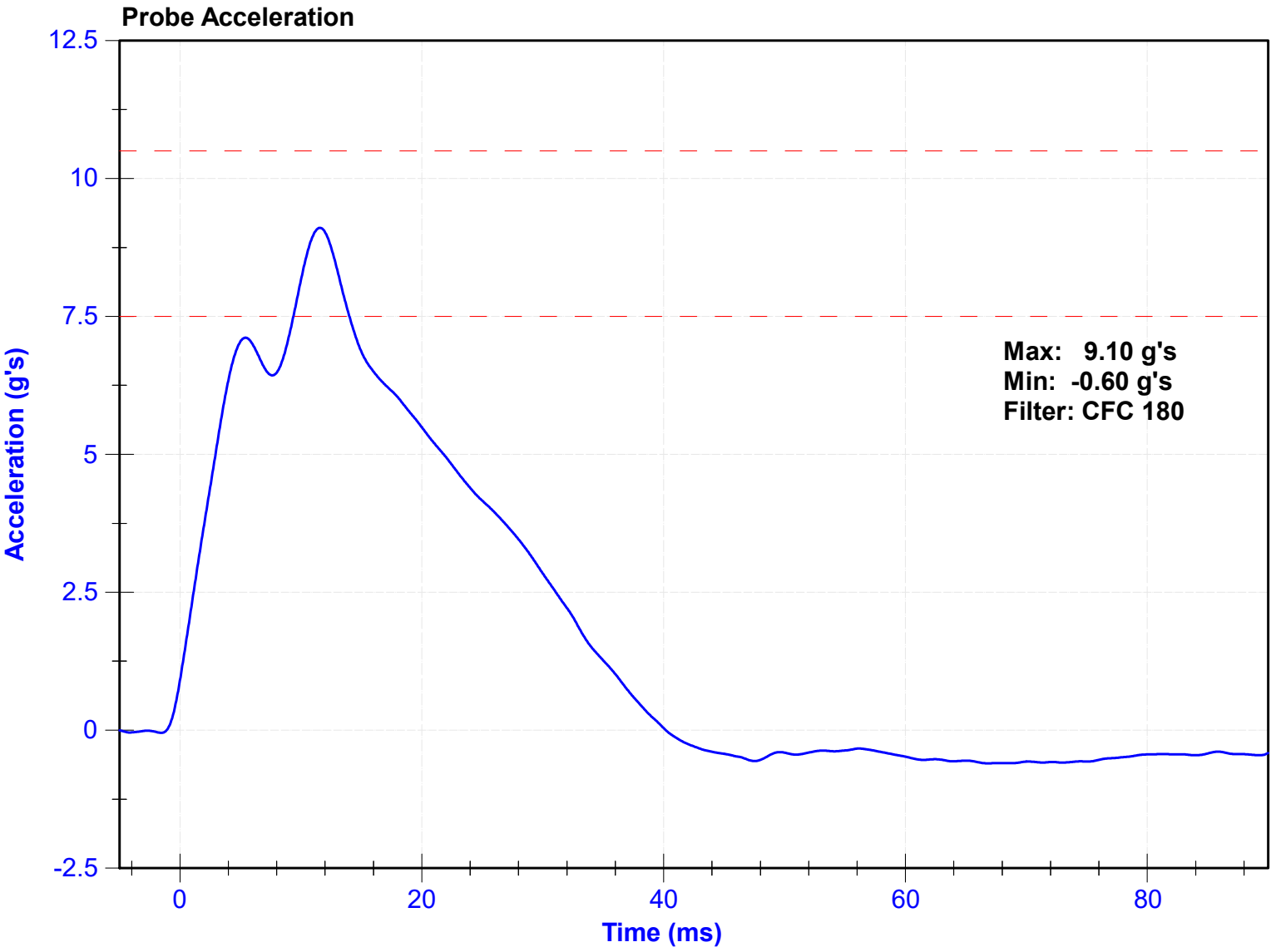
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	23	Pass
Velocity	4.2	4.4	m/s	4.31	Pass
Probe Acceleration	7.5	10.5	g's	9.10	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	11/26/2024	5/25/2025



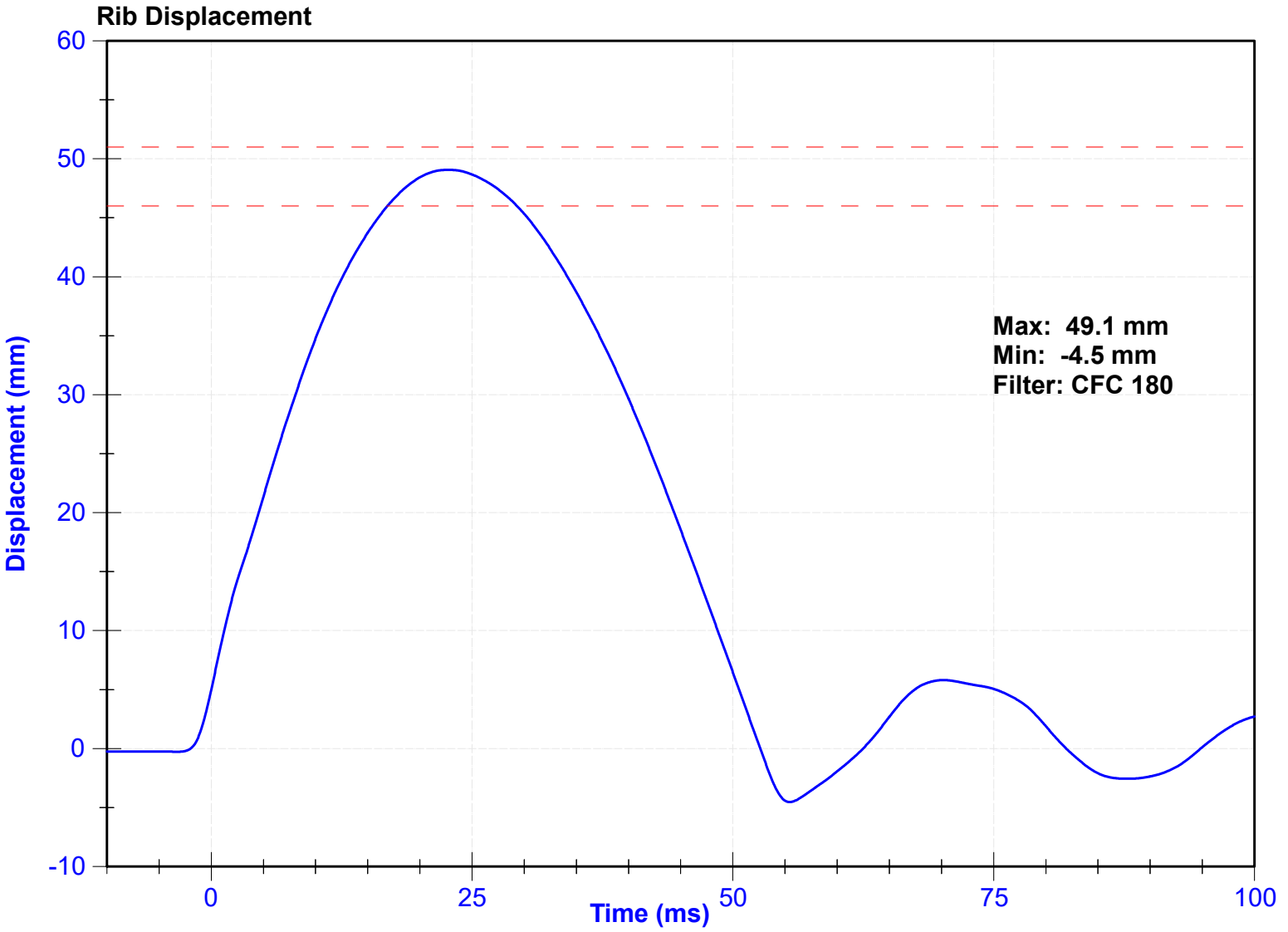
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	17	Pass
Rib Displacement	46	51	mm	49.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	179GFE	10/16/2024	4/16/2025



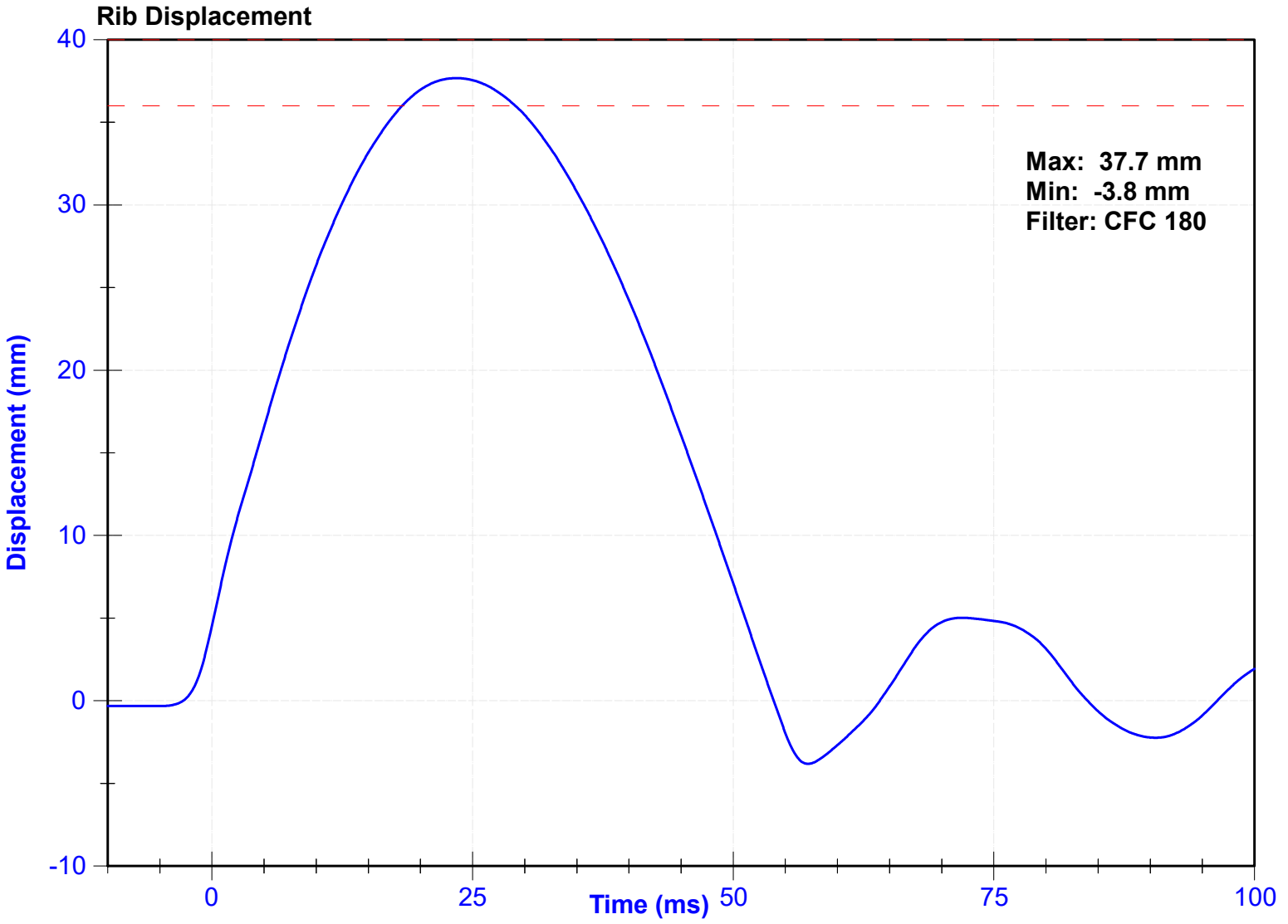
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	17	Pass
Rib Displacement	36	40	mm	37.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	179GFE	10/16/2024	4/16/2025



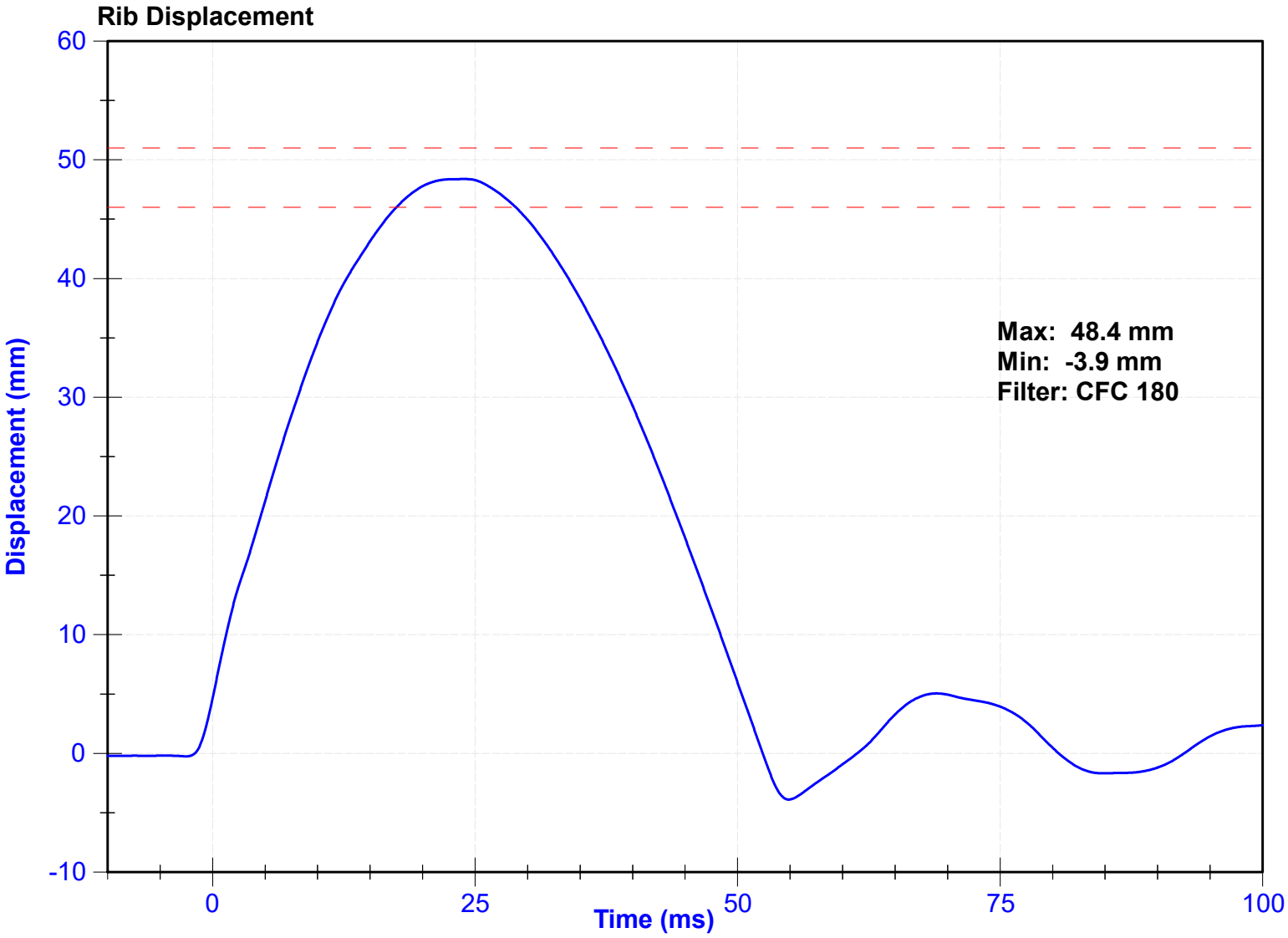
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	17	Pass
Rib Displacement	46	51	mm	48.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	10/16/2024	4/16/2025



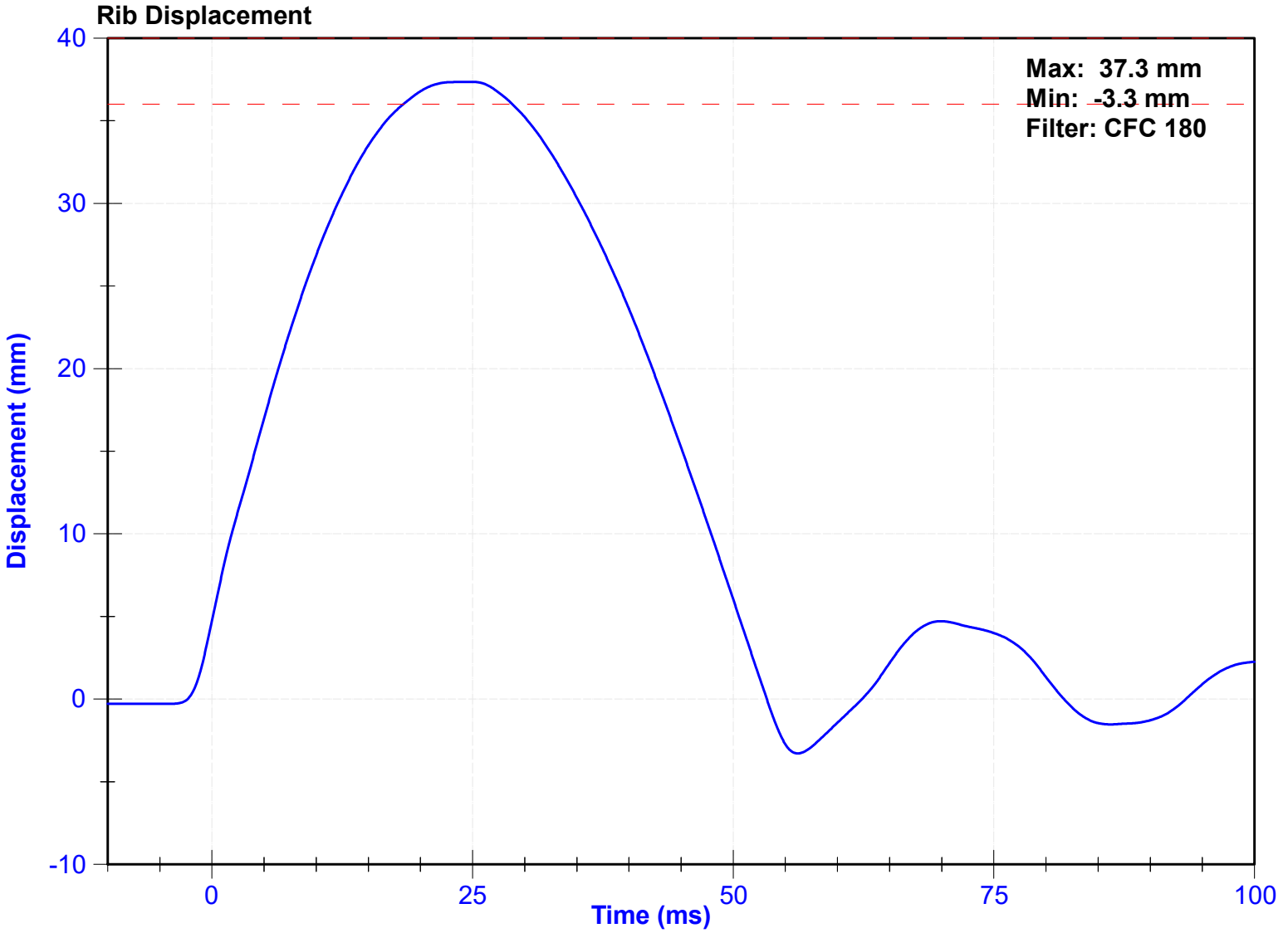
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	17	Pass
Rib Displacement	36	40	mm	37.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	10/16/2024	4/16/2025



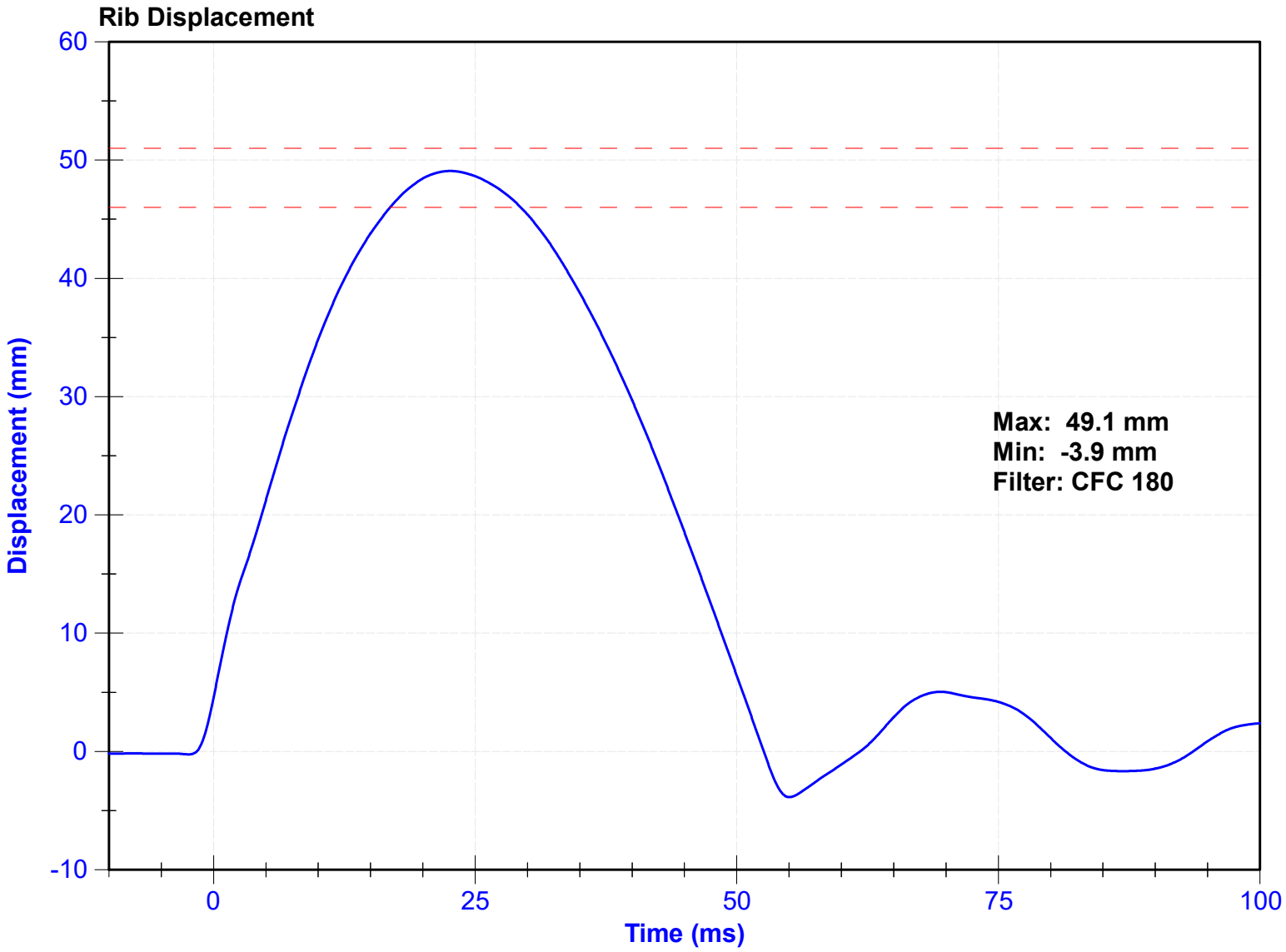
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	17	Pass
Rib Displacement	46	51	mm	49.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	11/19/2024	5/20/2025



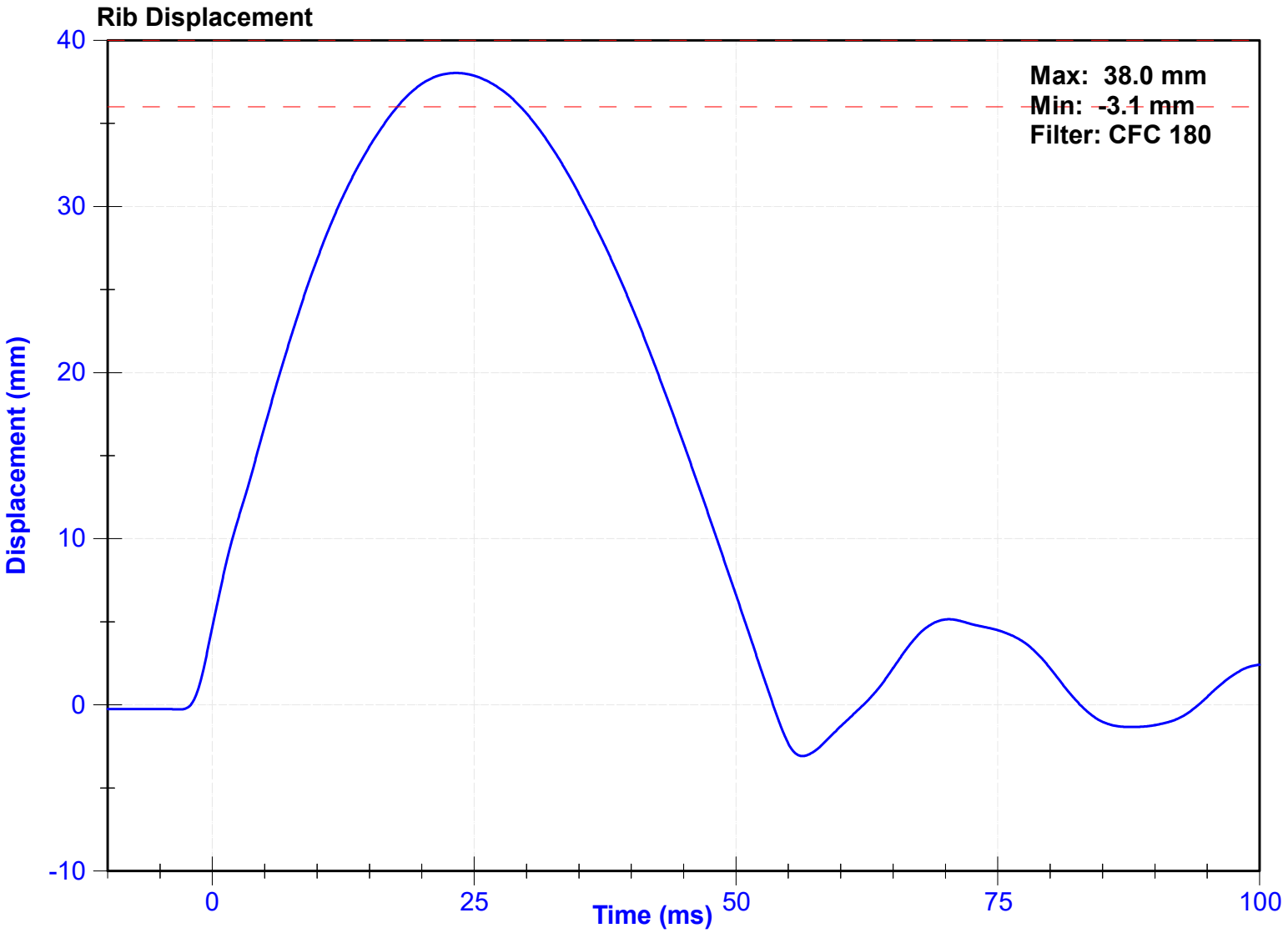
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21	Pass
Humidity	10	70	%	17	Pass
Rib Displacement	36	40	mm	38.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	11/19/2024	5/20/2025



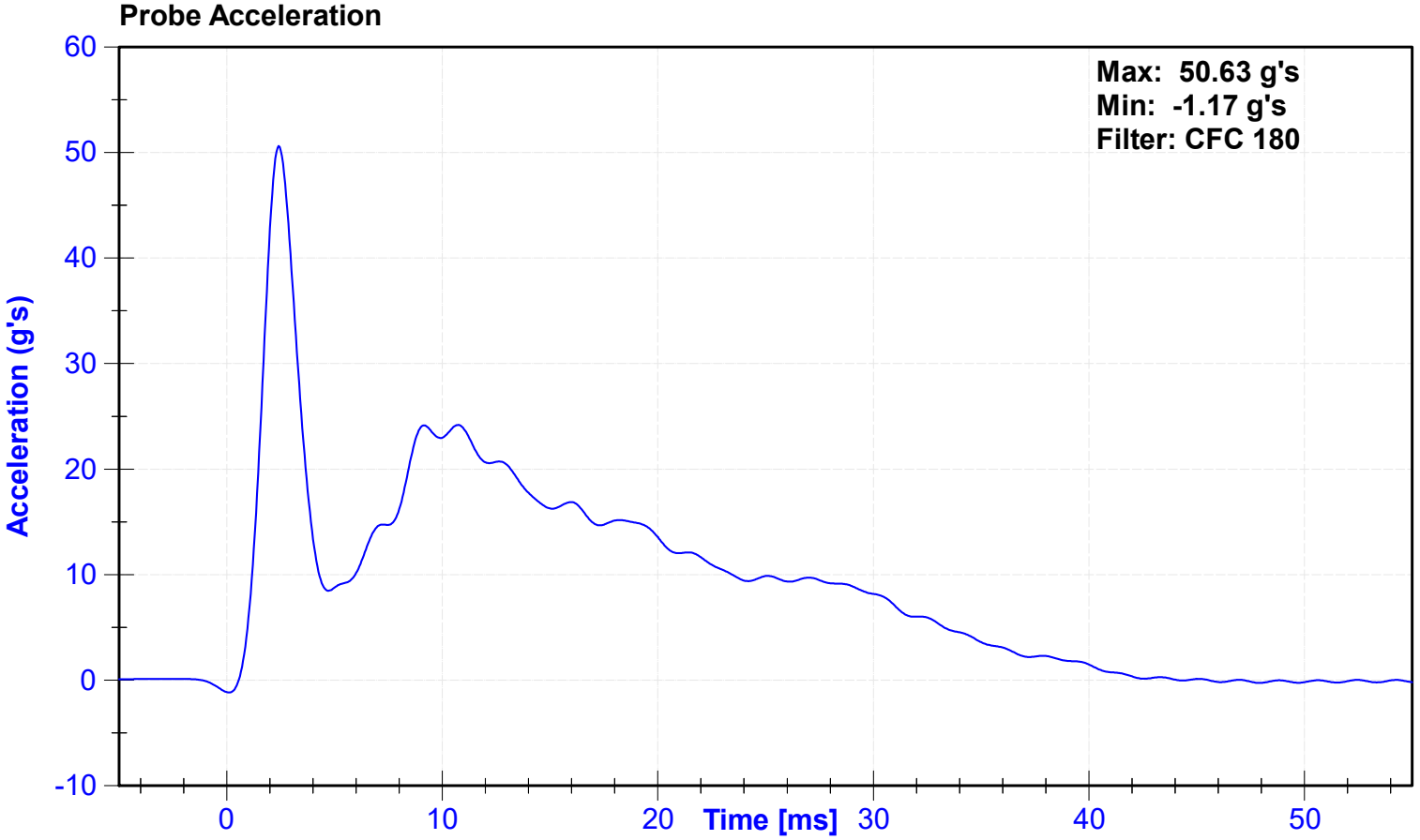
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

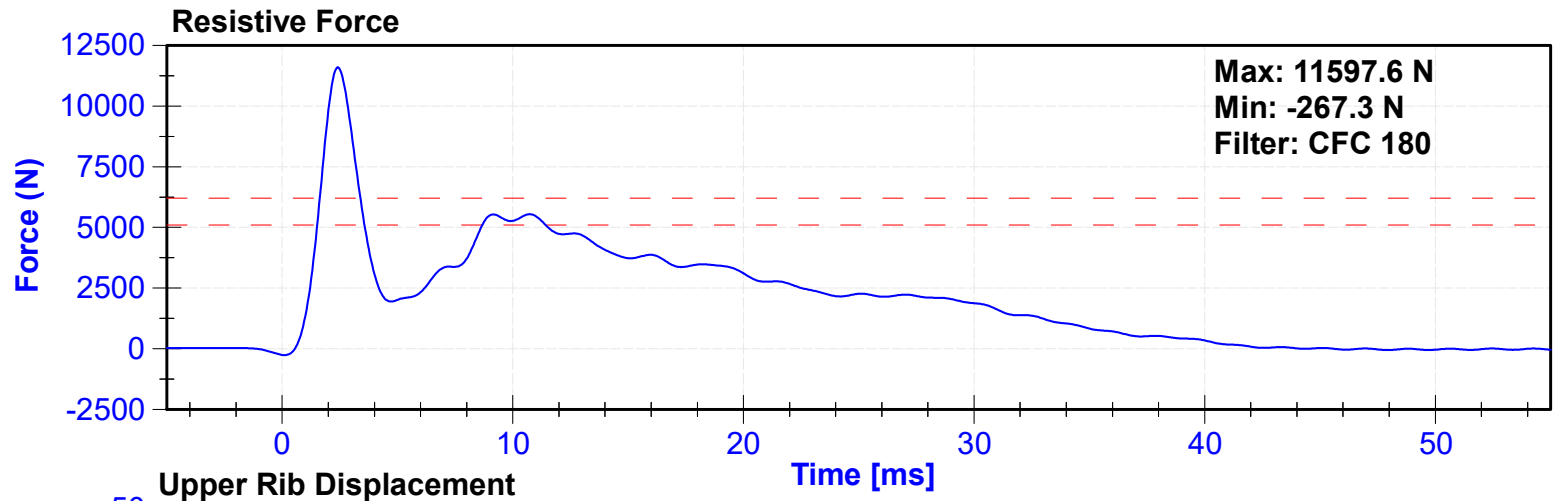
Results

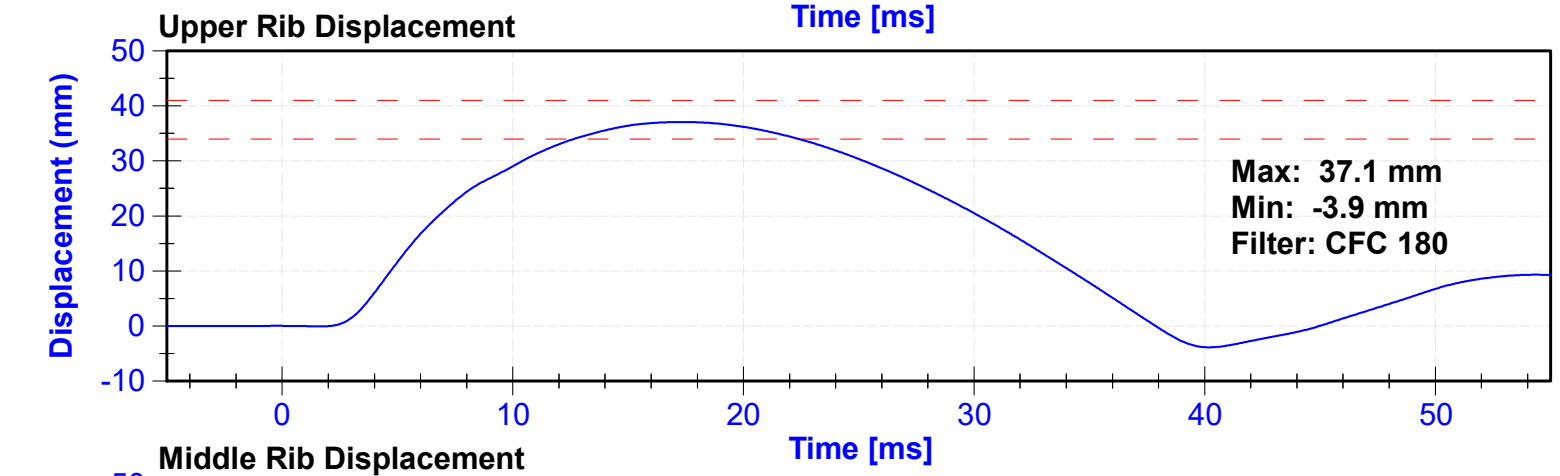
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	23	Pass
Velocity	5.4	5.6	m/s	5.55	Pass
Resistive Force after 6ms	5100	6200	N	5541.4	Pass
Upper Thorax Rib Deflection	34	41	mm	37.1	Pass
Mid Thorax Rib Deflection	37	45	mm	41.0	Pass
Lower Thorax Rib Deflection	37	44	mm	41.2	Pass

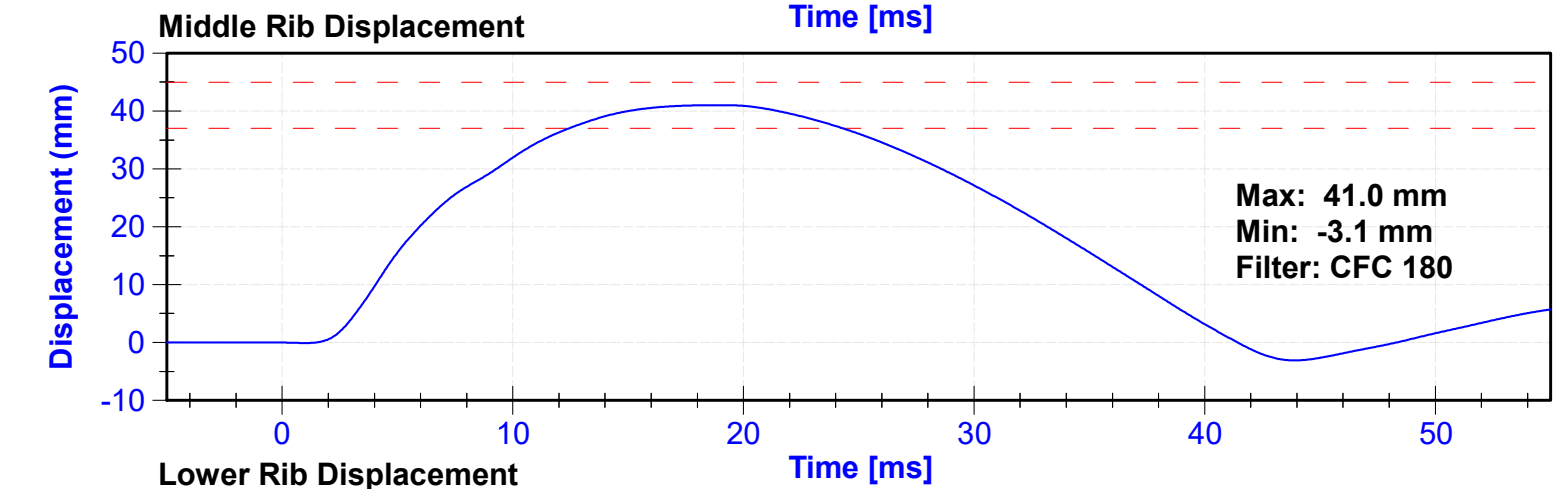
Transducer Calibrations

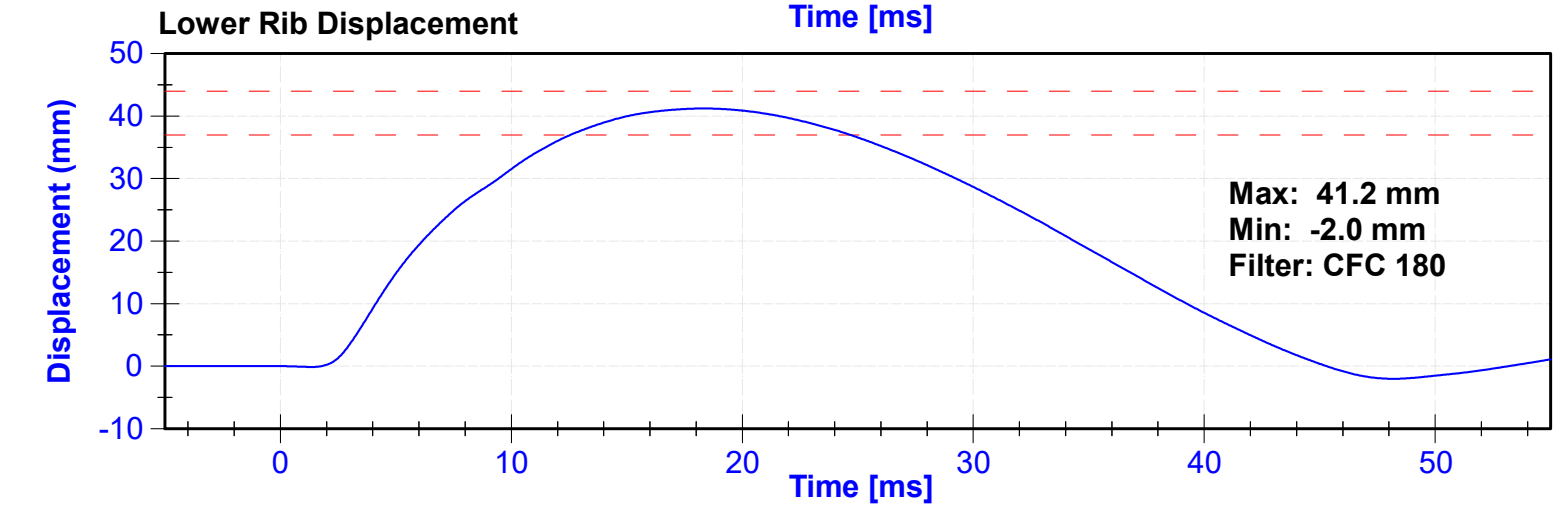
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Upper Thorax Rib Potentiometer	Honeywell	179GFE	10/16/2024	4/16/2025
Middle Thorax Rib Potentiometer	Honeywell	185GFE	10/16/2024	4/16/2025
Lower Thorax Rib Potentiometer	Honeywell	184GFE	11/19/2024	5/20/2025




Resistive Force
Force (N)
12500
10000
7500
5000
2500
0
-2500
0
10
20
30
40
50
Time [ms]
Max: 11597.6 N
Min: -267.3 N
Filter: CFC 180


Upper Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 37.1 mm
Min: -3.9 mm
Filter: CFC 180


Middle Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 41.0 mm
Min: -3.1 mm
Filter: CFC 180


Lower Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 41.2 mm
Min: -2.0 mm
Filter: CFC 180

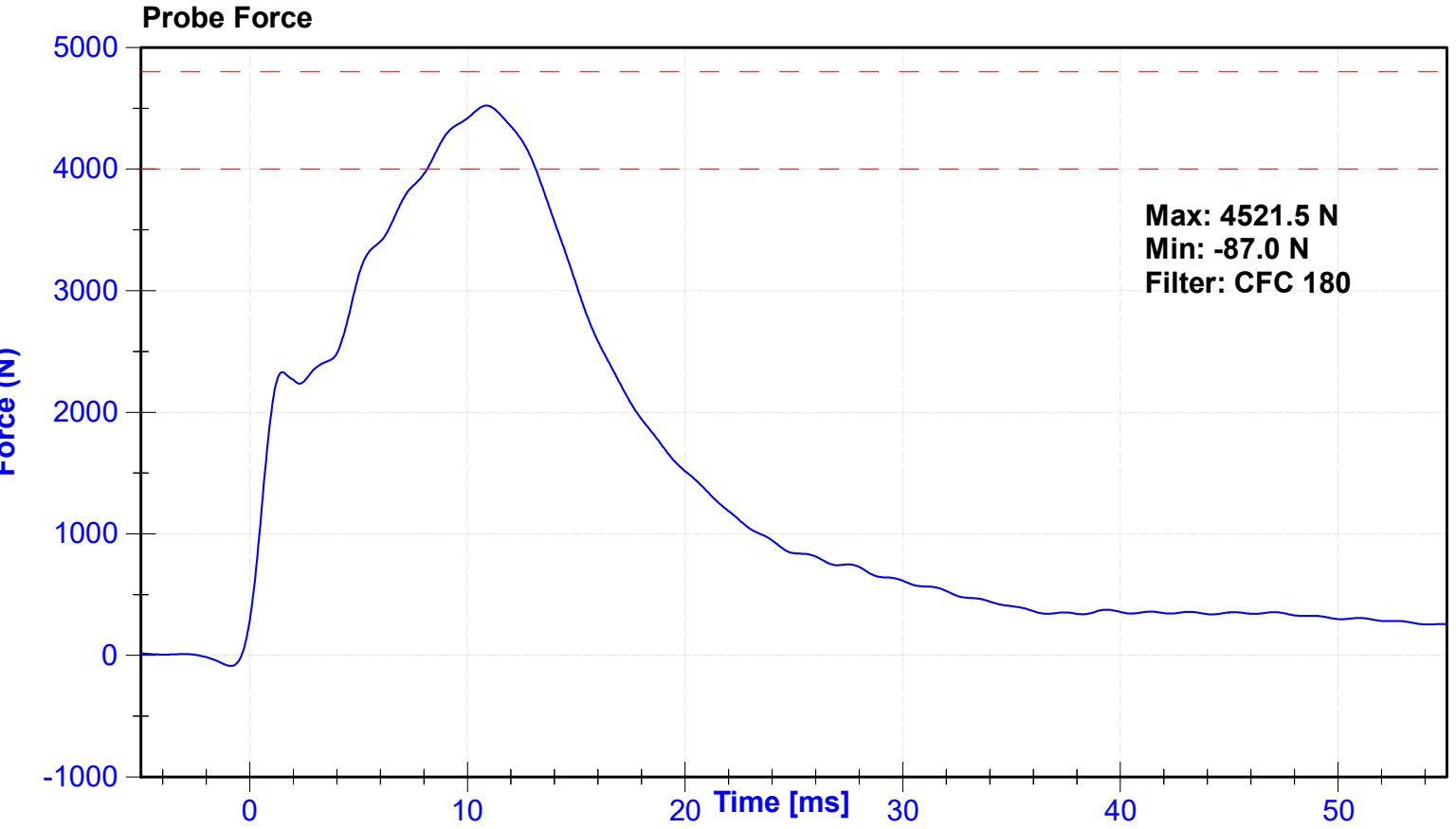
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

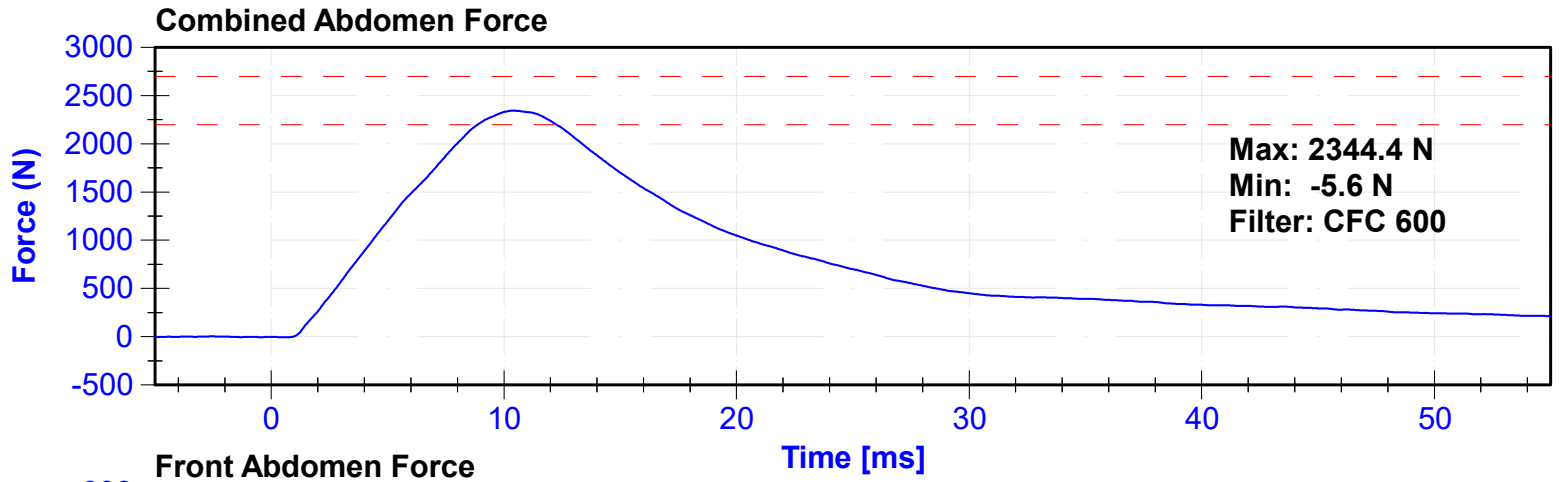
Results

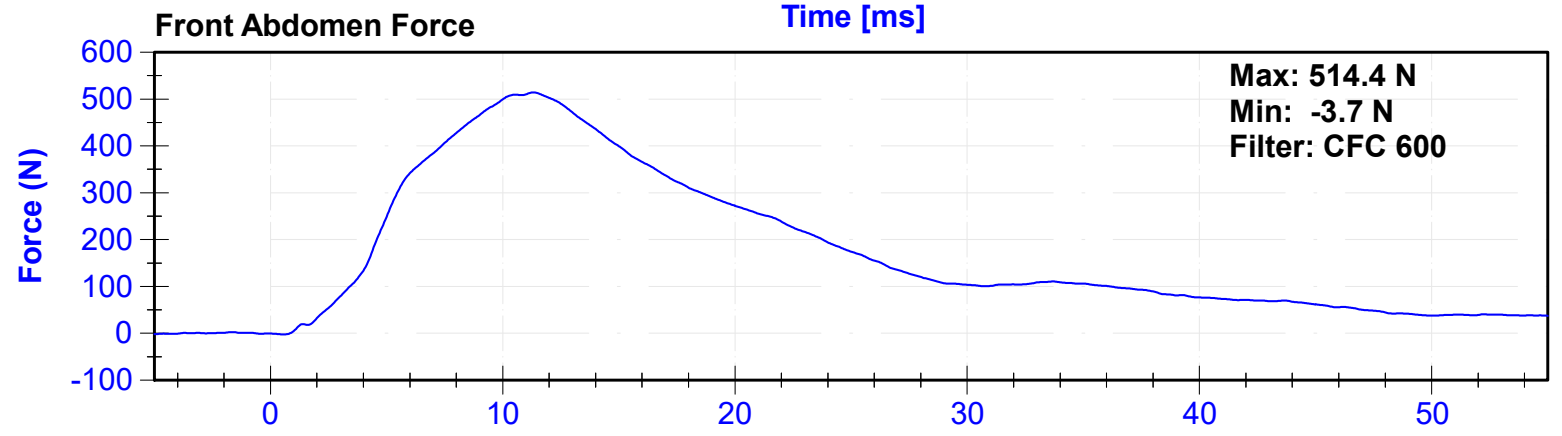
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	23	Pass
Velocity	3.9	4.1	m/s	4.02	Pass
Combined Abdomen Force	2200	2700	N	2344.4	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	10.40	Pass
Resistive Probe Force	4000	4800	N	4521.5	Pass
Time at Peak Resistive Force	10.6	13.0	ms	10.90	Pass

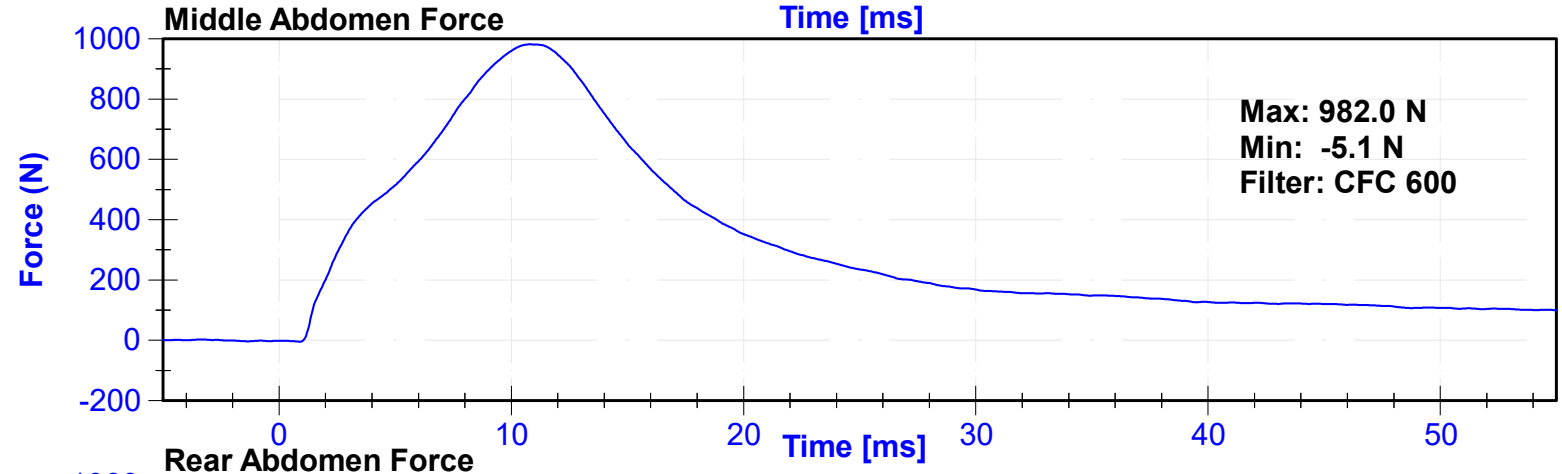
Transducer Calibrations

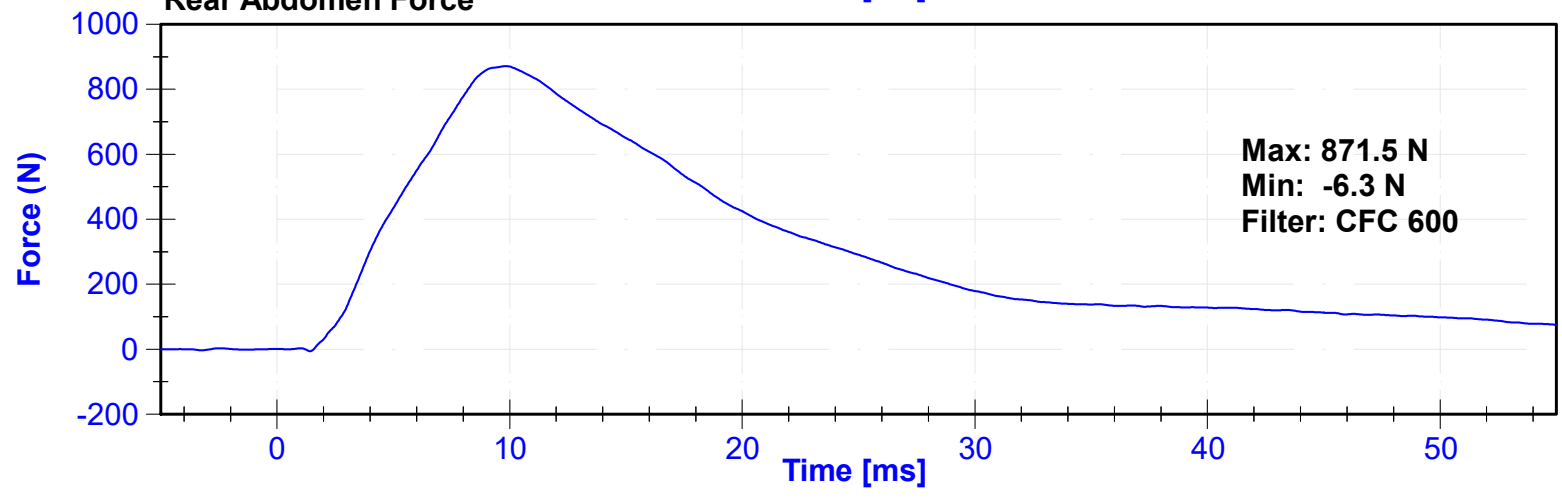
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Front Abdomen Load Cell	Denton	1523	10/28/2024	10/28/2025
Middle Abdomen Load Cell	Denton	1524	10/28/2024	10/28/2025
Rear Abdomen Load Cell	Denton	1530	10/28/2024	10/28/2025




Combined Abdomen Force
Force (N)
Time [ms]
Max: 2344.4 N
Min: -5.6 N
Filter: CFC 600


Front Abdomen Force
Force (N)
Time [ms]
Max: 514.4 N
Min: -3.7 N
Filter: CFC 600


Middle Abdomen Force
Force (N)
Time [ms]
Max: 982.0 N
Min: -5.1 N
Filter: CFC 600


Rear Abdomen Force
Force (N)
Time [ms]
Max: 871.5 N
Min: -6.3 N
Filter: CFC 600

ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

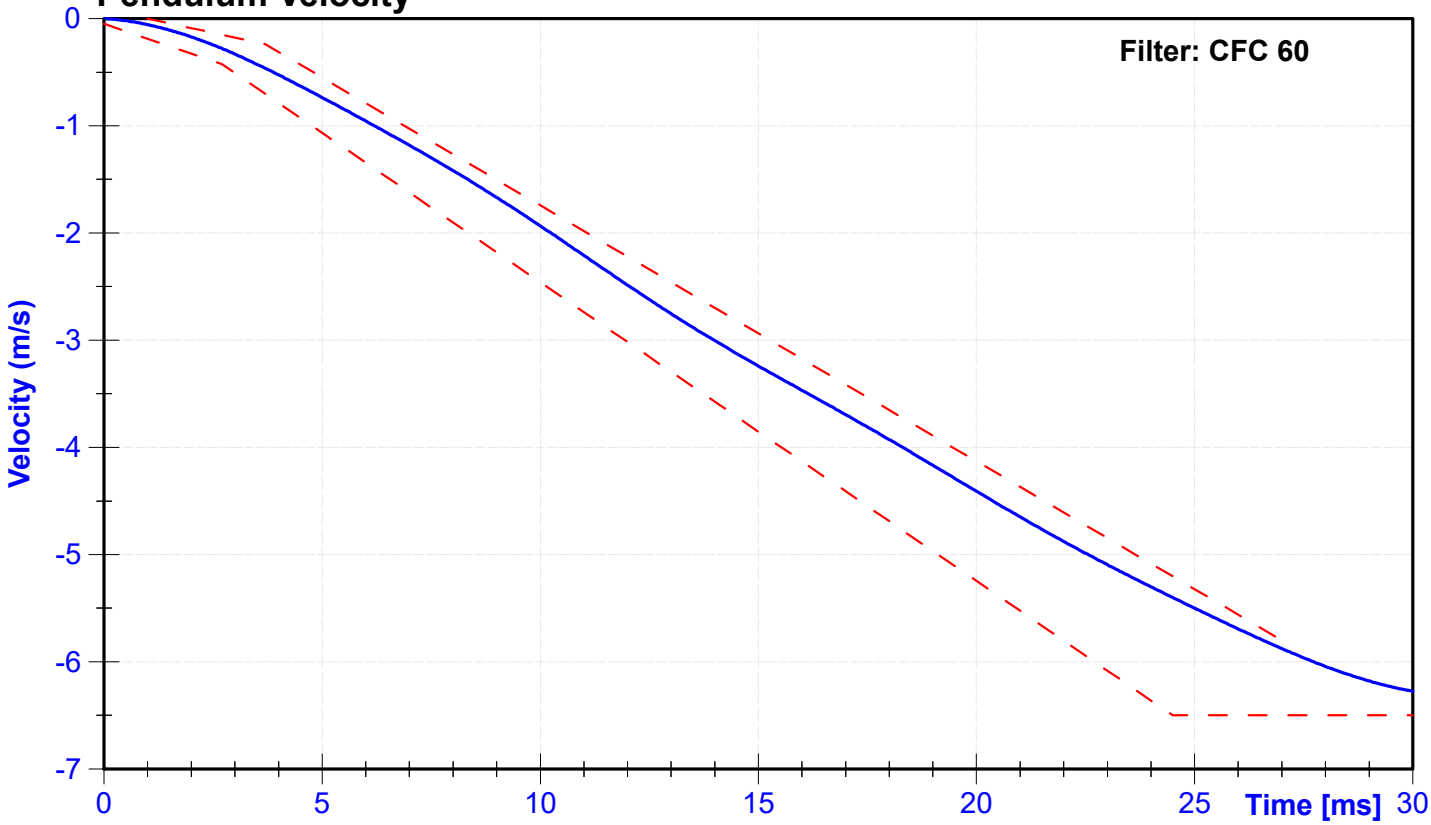
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.2	Pass
Humidity	10	70	%	17	Pass
Velocity	5.95	6.15	m/s	6.045	Pass
Lateral Spine Rotation	45	55	deg	48.6	Pass
Time at Maximum Rotation	39	53	ms	46.2	Pass
Time of Decay to Zero Degrees	37	57	ms	37.2	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

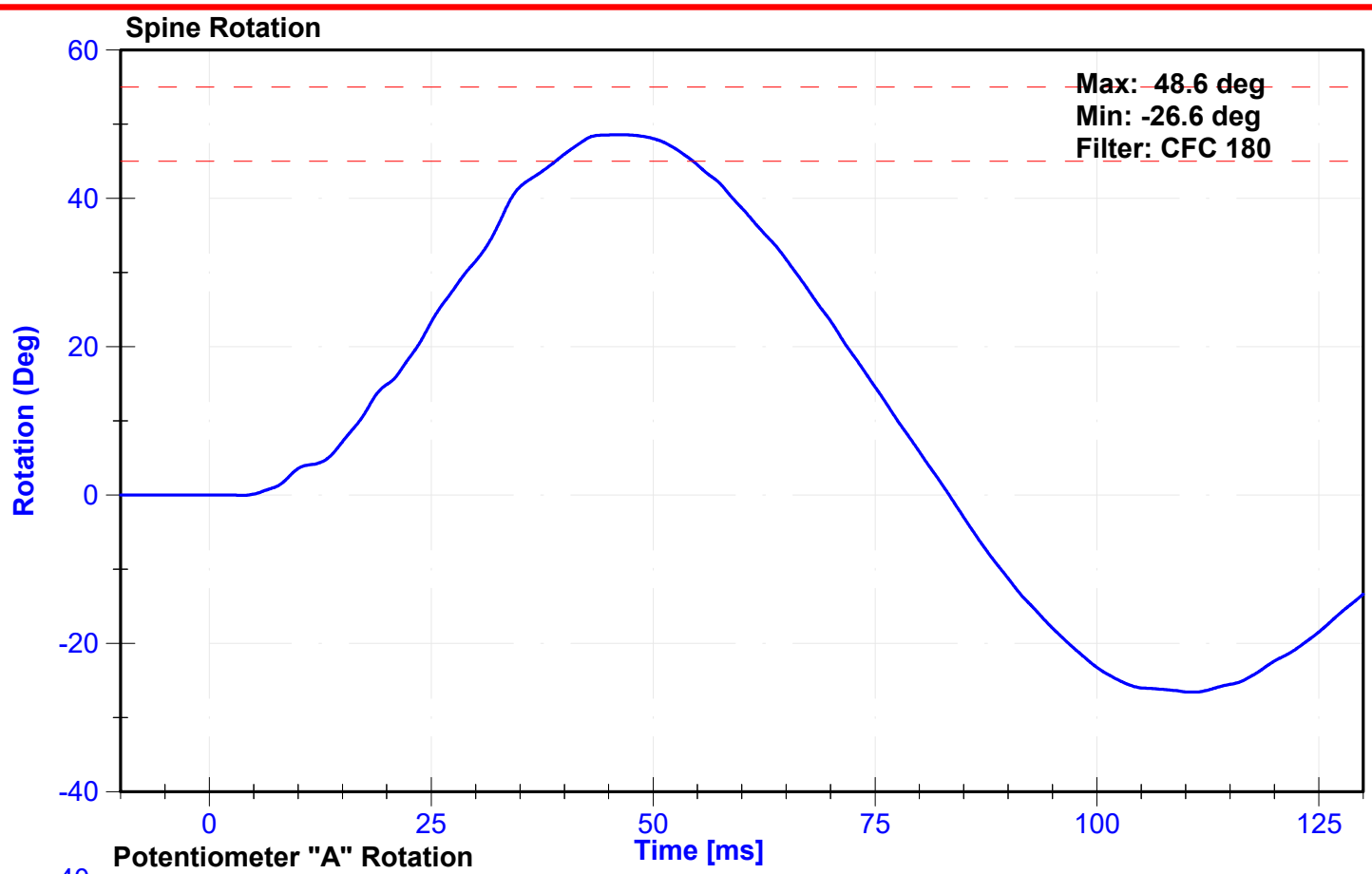
Transducer Calibrations

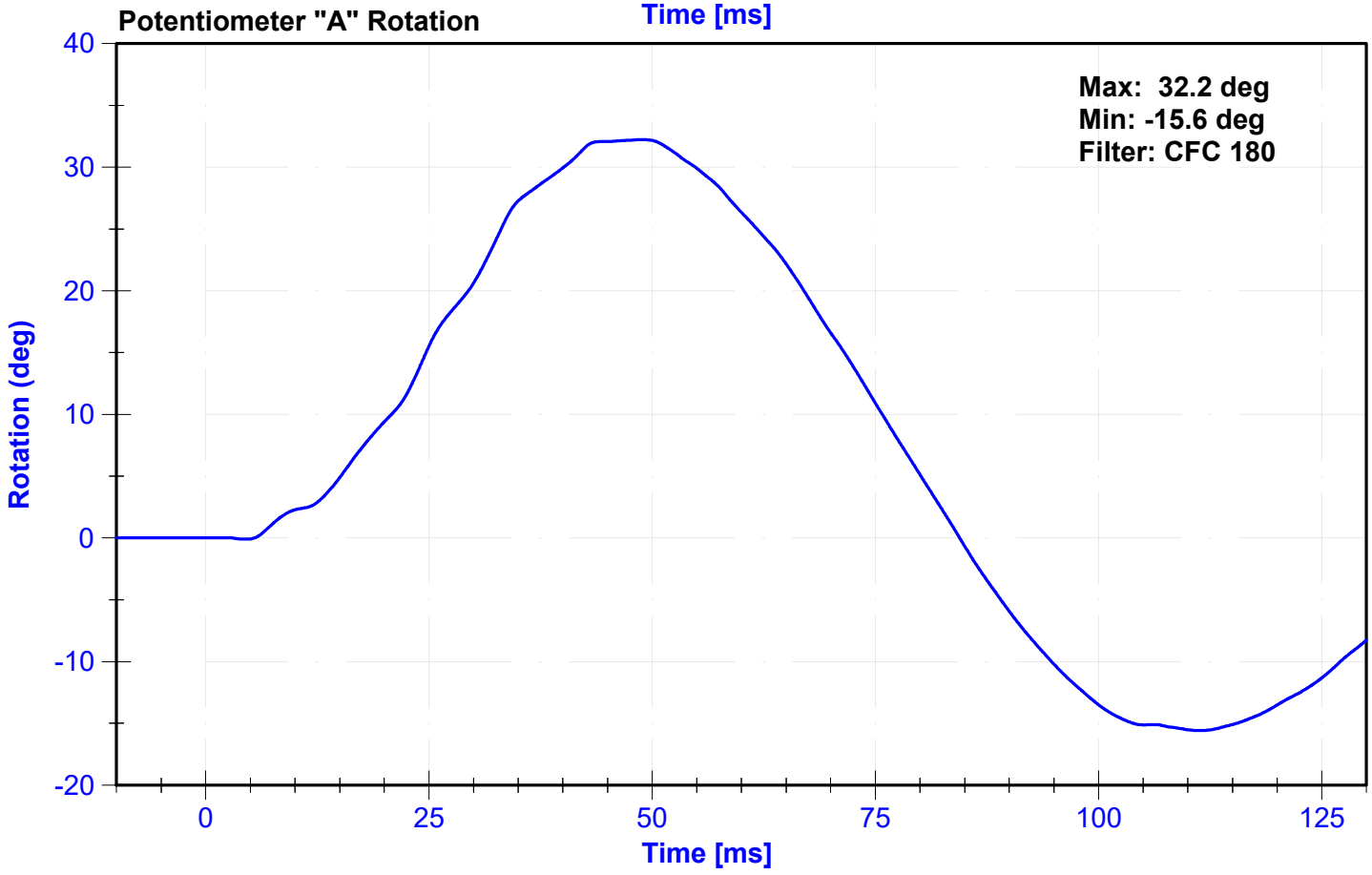
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	4/15/2025
Pendulum "A" Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Condyle "B" Potentiometer	Sfernice	095	9/13/2024	9/13/2025

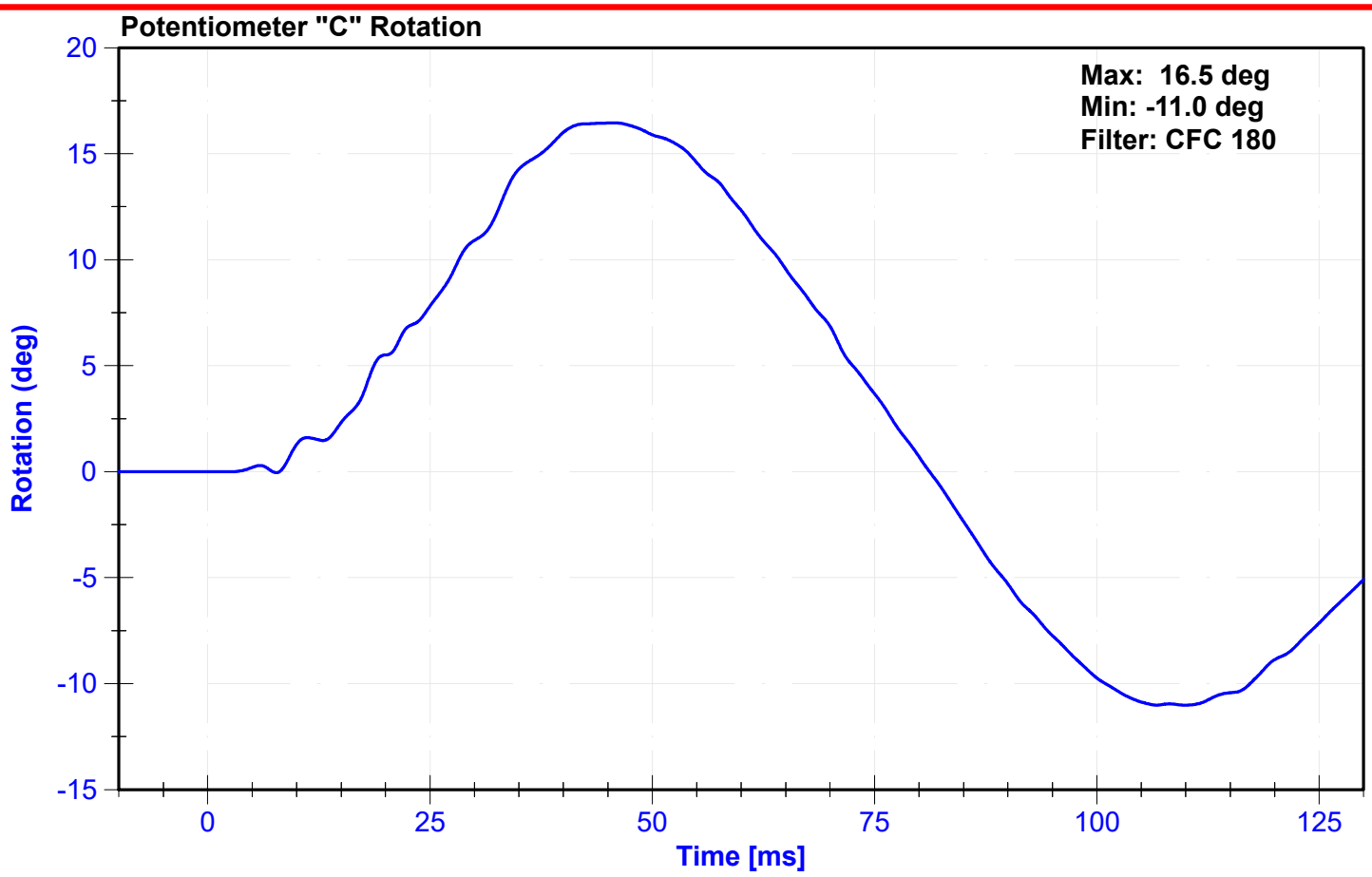
Pendulum Velocity[3]



[1,2] Upper and lower boundaries specified in Appendix I


Spine Rotation
Max: 48.6 deg
Min: -26.6 deg
Filter: CFC 180
Rotation (Deg)
60
40
20
0
-20
-40
0
25
50
75
100
125
Time [ms]


Potentiometer "A" Rotation
Max: 32.2 deg
Min: -15.6 deg
Filter: CFC 180
Rotation (deg)
40
30
20
10
0
-10
-20
0
25
50
75
100
125
Time [ms]



Appendix I

[2] Upper Boundary Corridor		[1] Lower Boundary Corridor	
Time (ms)	Velocity (m/s)	Time (ms)	Velocity (m/s)
1.0	0.00	0.0	-0.05
3.7	-0.24	2.7	-0.425
27.0	-5.80	24.5	-6.5
		30.0	-6.5

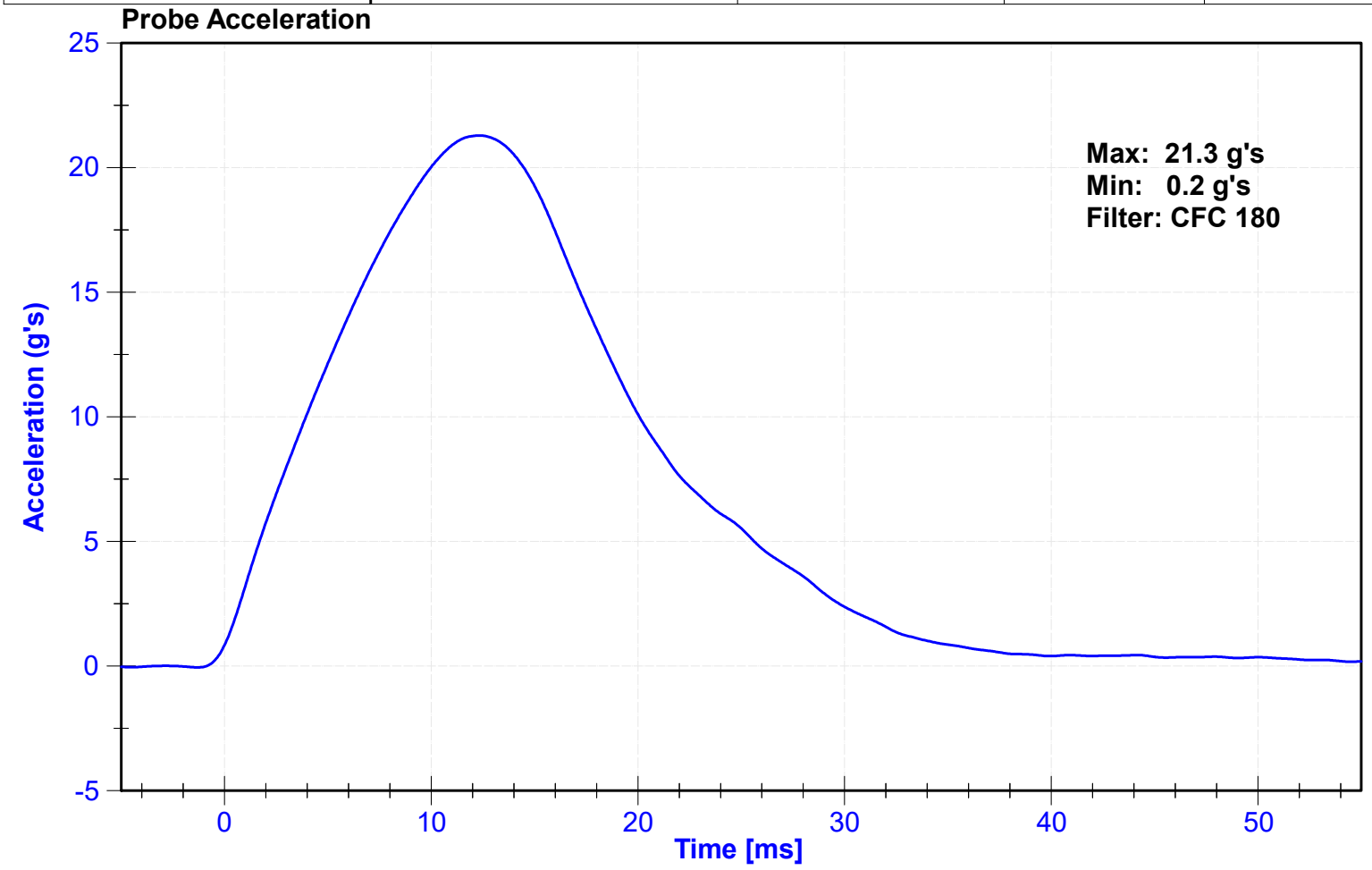
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

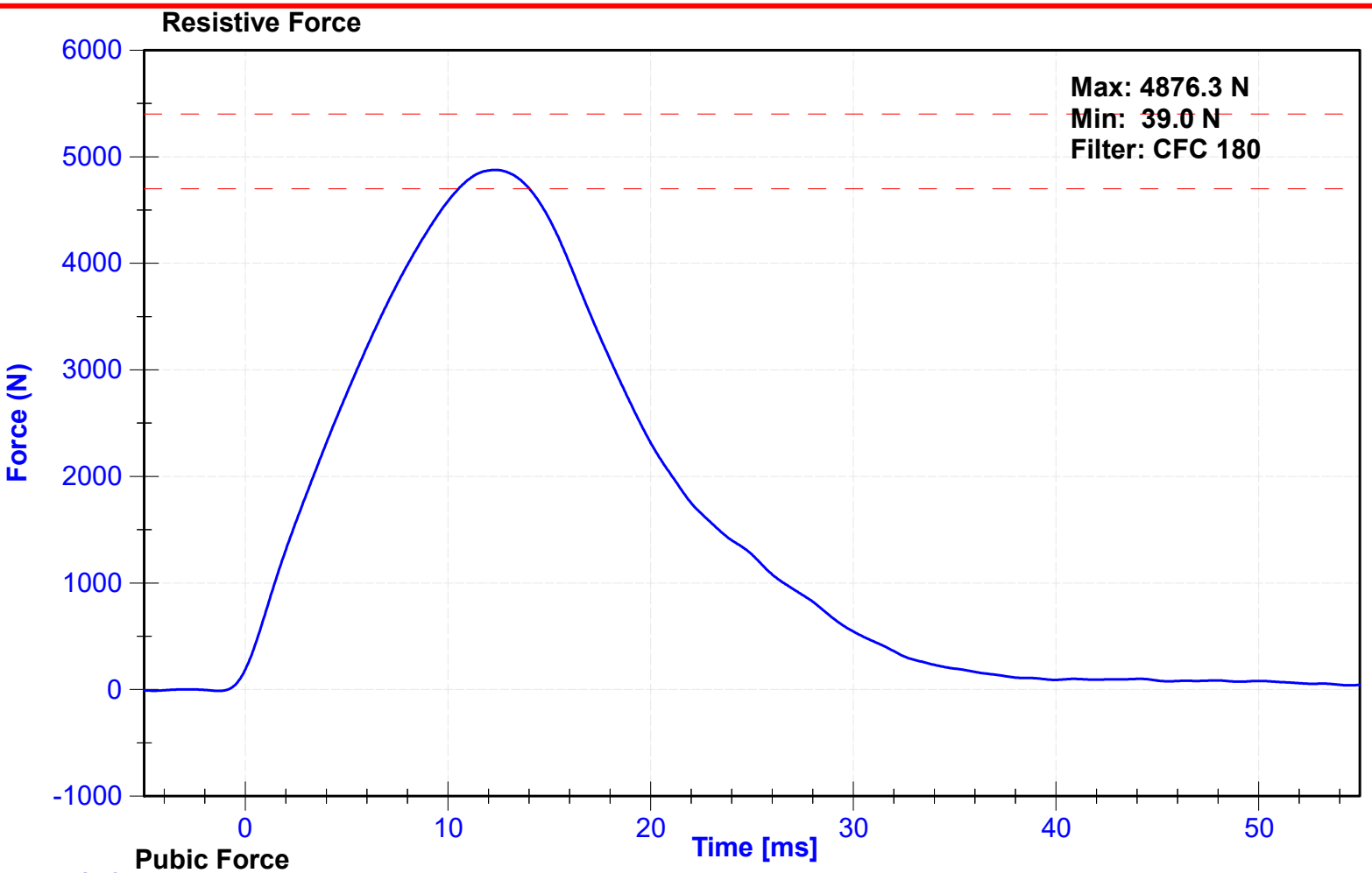
Results

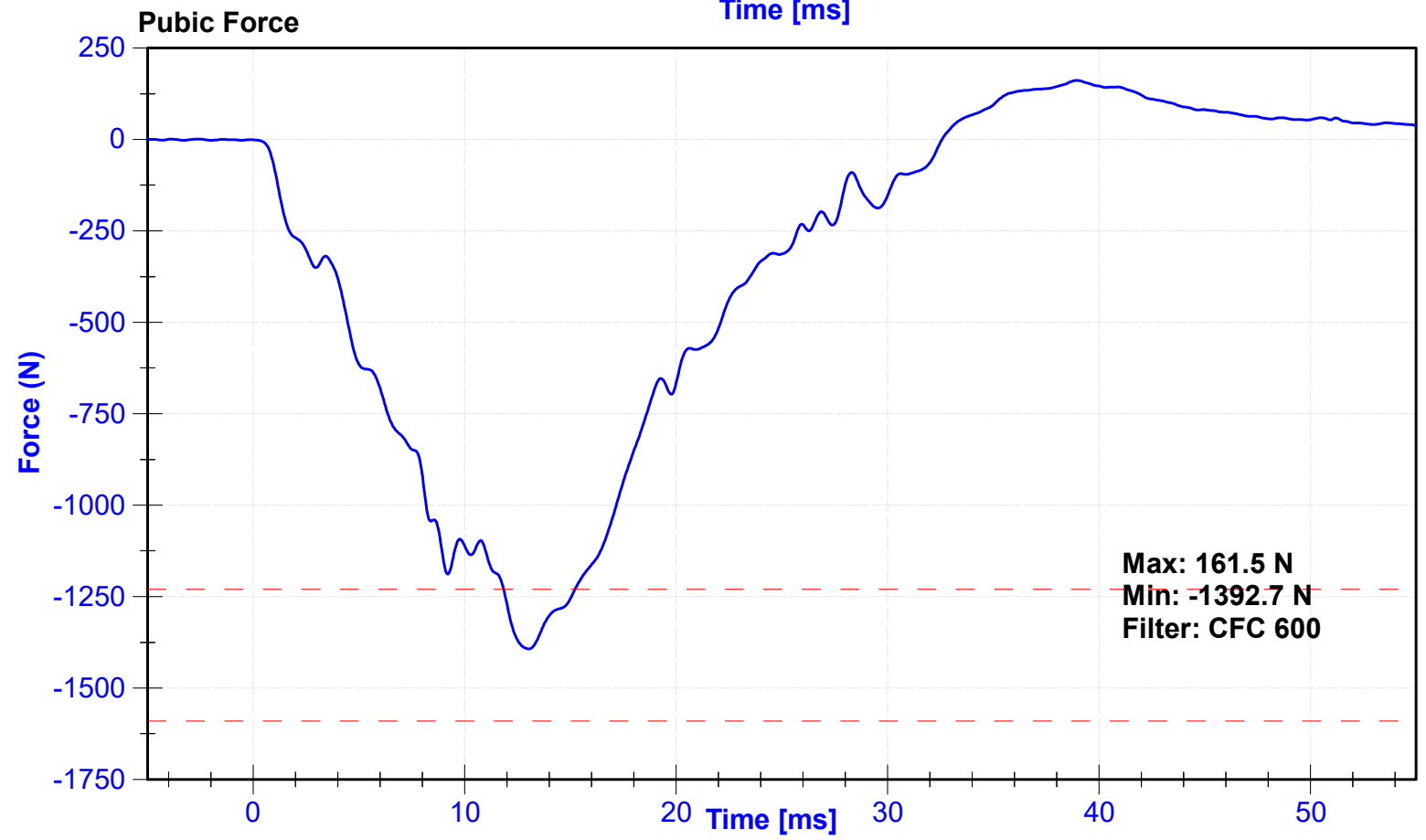
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.6	Pass
Humidity	10	70	%	23	Pass
Velocity	4.2	4.4	m/s	4.24	Pass
Resistive Force	4700	5400	N	4876.3	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.35	Pass
Pubic Force	-1590	-1230	N	-1392.7	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.00	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Pubic Load Cell	Denton	458-FY	10/28/2024	10/28/2025




Resistive Force
Max: 4876.3 N
Min: 39.0 N
Filter: CFC 180
Force (N)
6000
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]


Pubic Force
Max: 161.5 N
Min: -1392.7 N
Filter: CFC 600
Force (N)
250
0
-250
-500
-750
-1000
-1250
-1500
-1750
0
10
20
30
40
50
Time [ms]

CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE – PASSENGER ATD

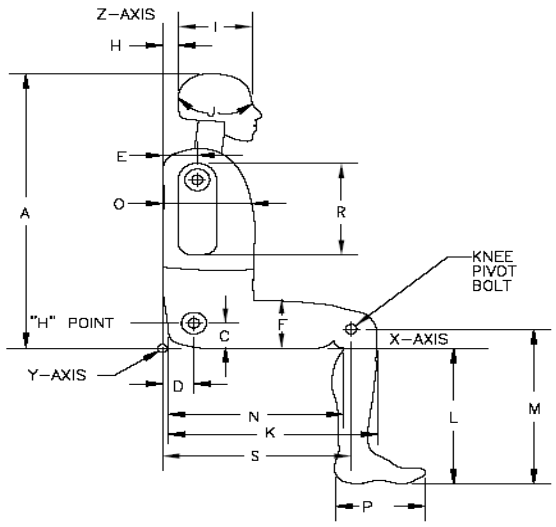
SERIAL NO:300

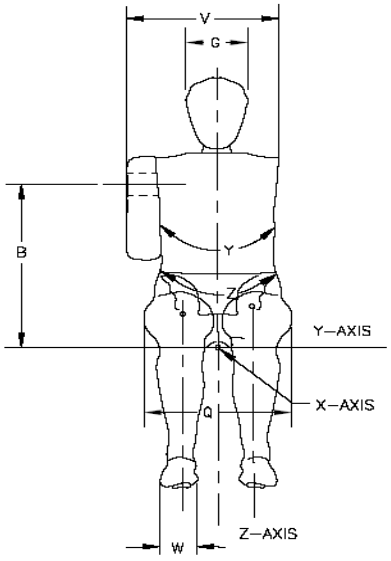
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: J. Rios Date: 2/11/2025

Dummy Serial Number: 300





Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	779	Pass
B	Shoulder Pivot Height	437	453	435	Pass
C	H-point Height	79	89	81	Pass
D	H-point from seatback	141	151	142	Pass
E	Shoulder Pivot from Backline	97	107	100	Pass
F	Thigh Clearance	119	135	122	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	185	Pass
J	Head Circumference	541	551	546	Pass
K	Buttock to Knee Length	514	540	531	Pass
L	Popliteal Height	343	369	354	Pass
M	Knee Pivot to floor height	392	409	401	Pass
N	Buttock Popliteal Length	416	442	430	Pass
O	Chest Depth w/o jacket	195	211	200	Pass
P	Foot Length	216	232	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	252	Pass
S	Knee Joint to seatback	477	493	484	Pass
V	Shoulder Width	341	357	349	Pass
W	Foot Width	78	94	80	Pass
Y	Chest Circumference w/jacket	851	881	869	Pass
Z	Waist Circumference	761	791	773	Pass

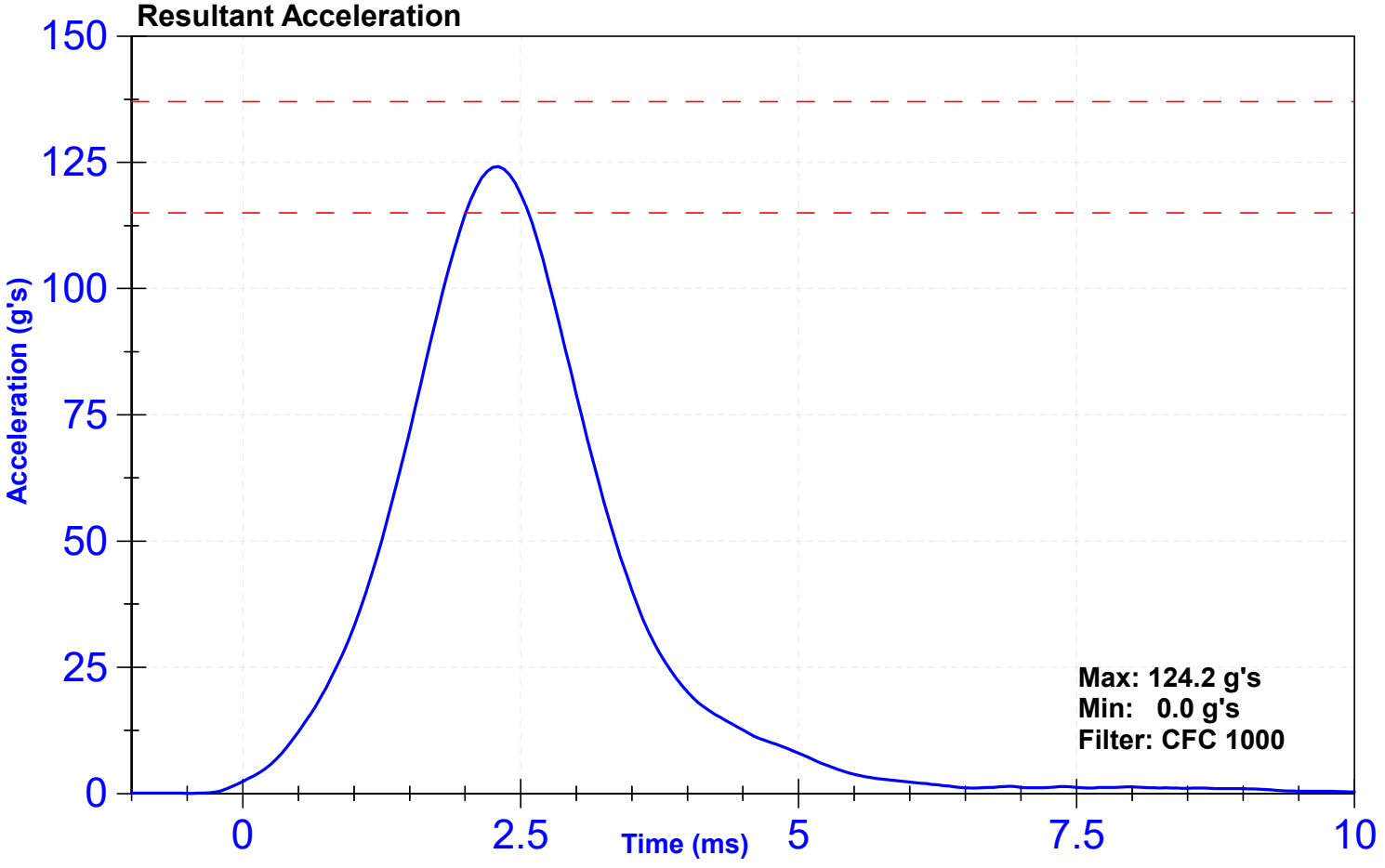
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

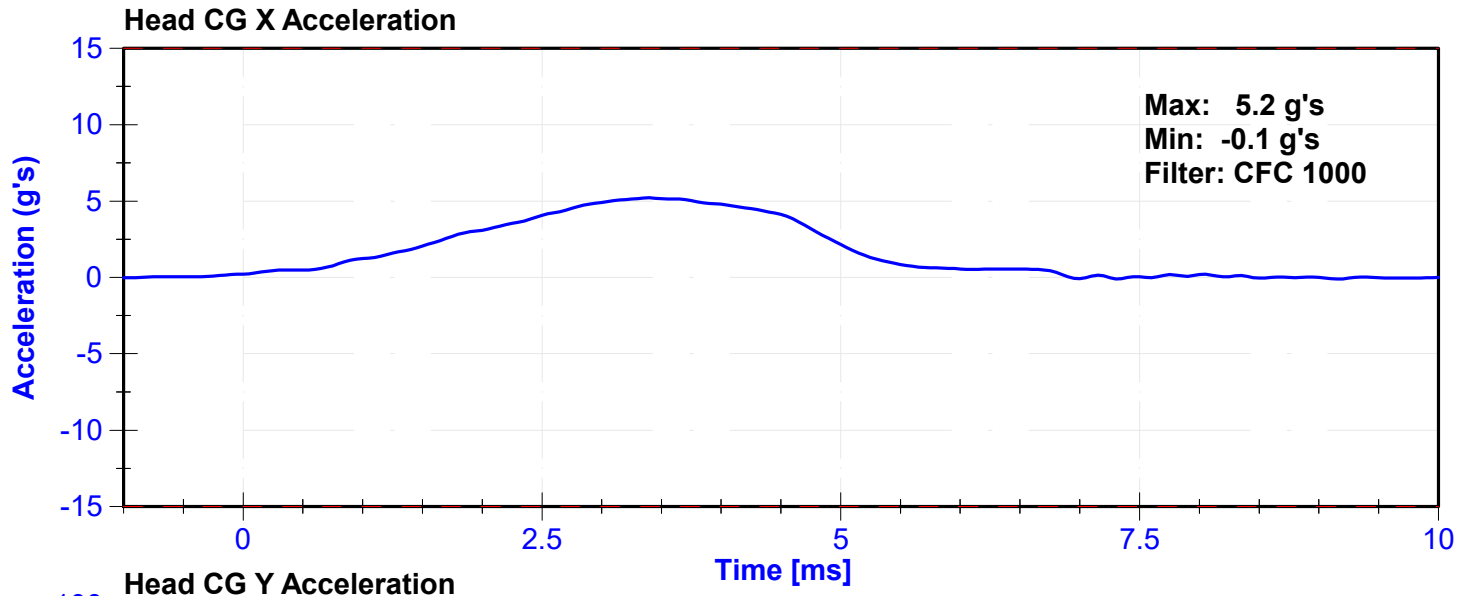
Results

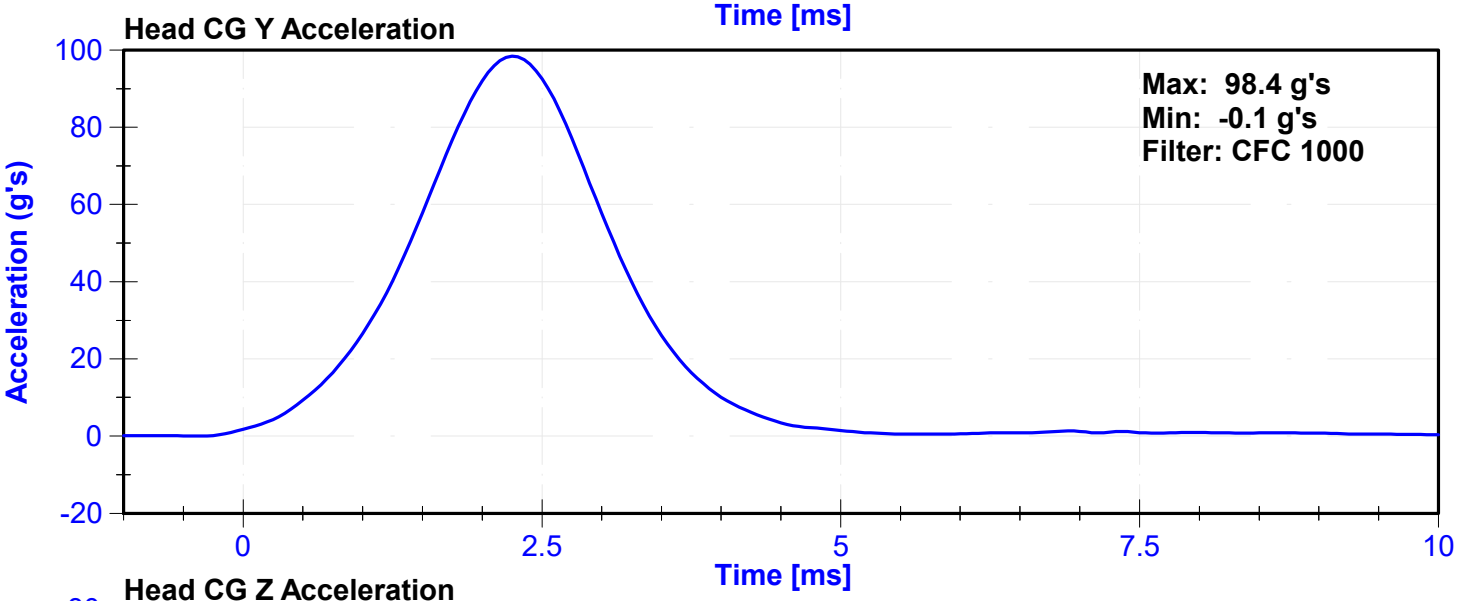
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	18	Pass
Resultant Acceleration	115	137	g's	124.2	Pass
Oscillation	0	15	%	1.1	Pass
Fore-Aft Acceleration	-15	15	g's	5.2	Pass

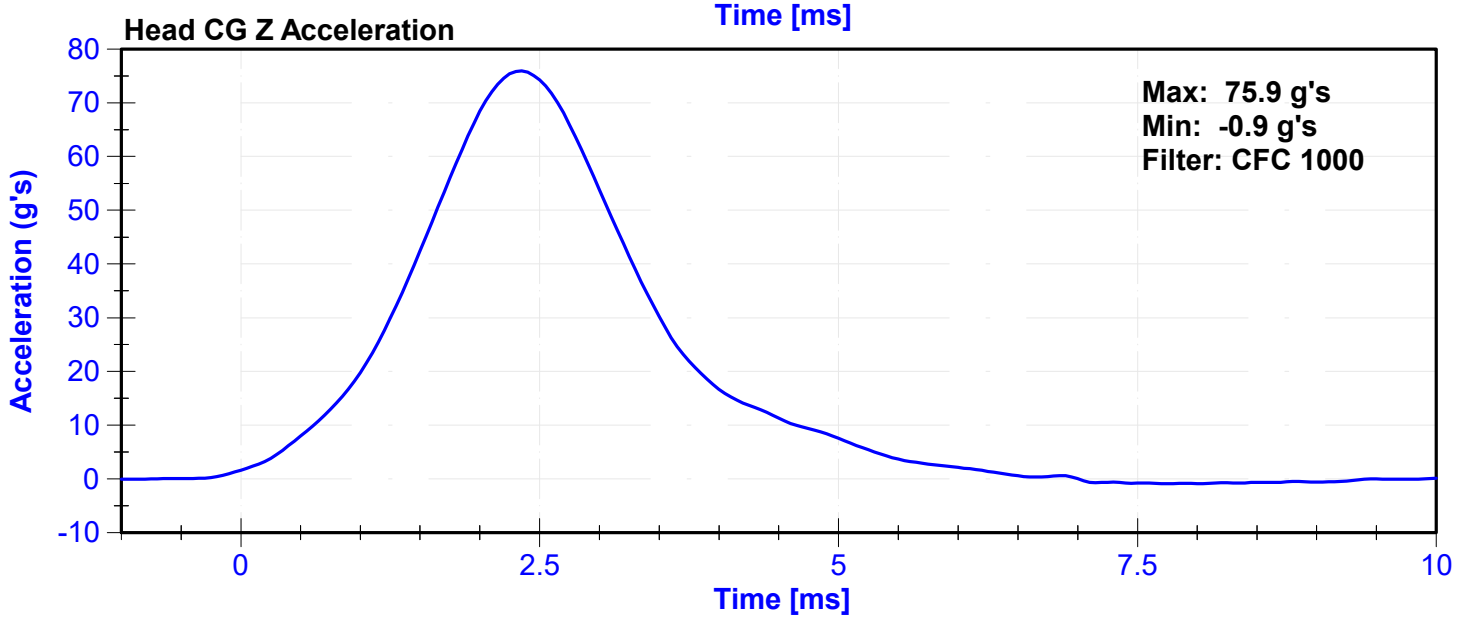
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P59018	10/17/2024	4/15/2025
Y Accelerometer	Endevco	P79189	10/17/2024	4/15/2025
Z Accelerometer	Endevco	P79587	10/17/2024	4/15/2025




Head CG X Acceleration
Max: 5.2 g's
Min: -0.1 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Y Acceleration
Max: 98.4 g's
Min: -0.1 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Z Acceleration
Max: 75.9 g's
Min: -0.9 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]

ATD Manufacturer	Humanetics	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

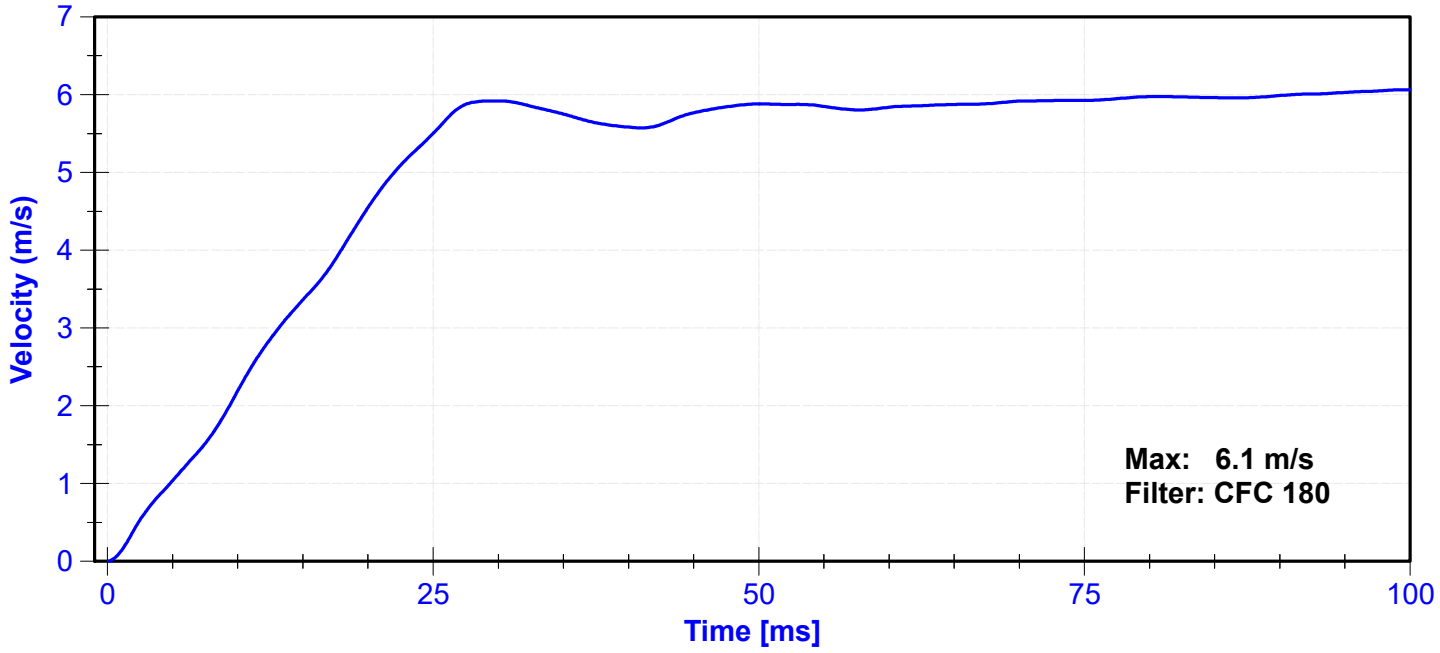
Results

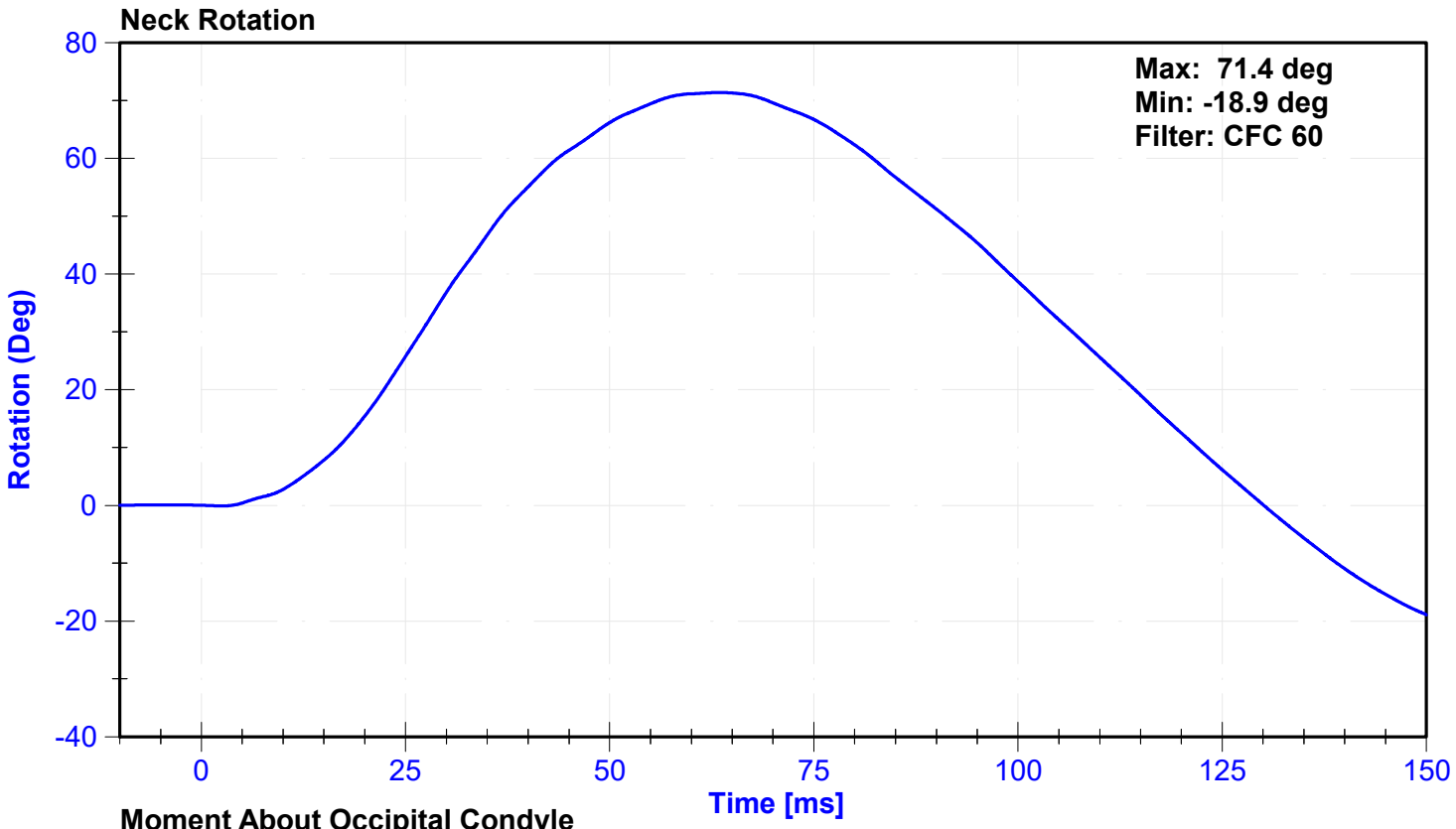
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	18	Pass
Velocity	5.51	5.63	m/s	5.579	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.20	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.36	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.55	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.50	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.06	Pass
Neck Rotation	71	81	deg	71.4	Pass
Time at Maximum Rotation	50	70	ms	63.4	Pass
Moment about the OC	36	44	Nm	40.6	Pass
Moment Decay to 0 Nm	102	126	ms	114.4	Pass

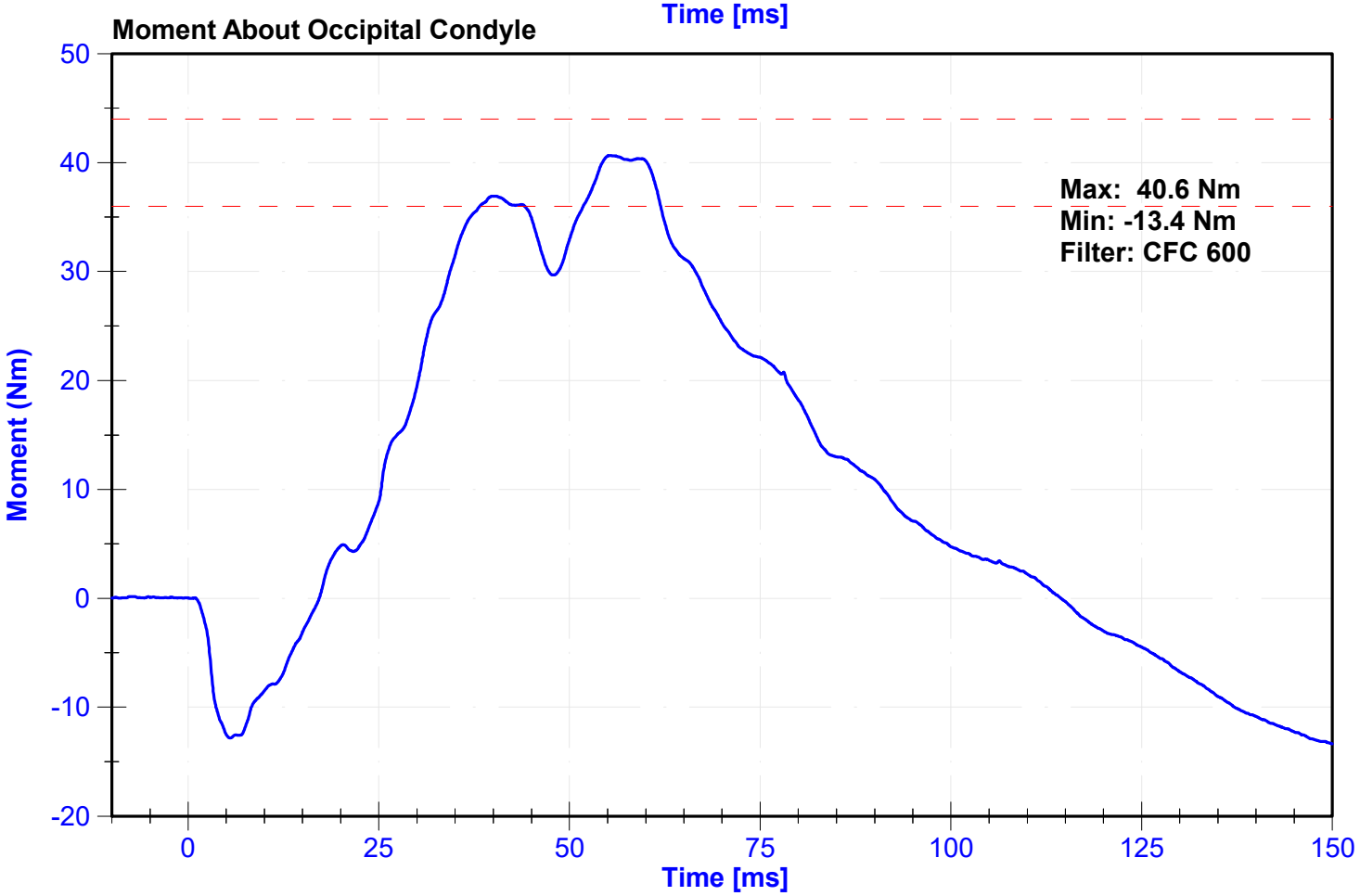
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/17/2024	4/15/2025
Pendulum Potentiometer	Servo	4961	9/23/2024	9/23/2025
Condyle Potentiometer	Servo	DS185	9/23/2024	9/23/2025
Upper Neck Load Cell	Kistler	M555A6CFM_1935H01700-F2Y	2/13/2024	2/12/2025

Pendulum Impulse




Neck Rotation
Max: 71.4 deg
Min: -18.9 deg
Filter: CFC 60
Rotation (Deg)
80
60
40
20
0
-20
-40
0
25
50
75
100
125
150
Time [ms]


Moment About Occipital Condyle
Max: 40.6 Nm
Min: -13.4 Nm
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

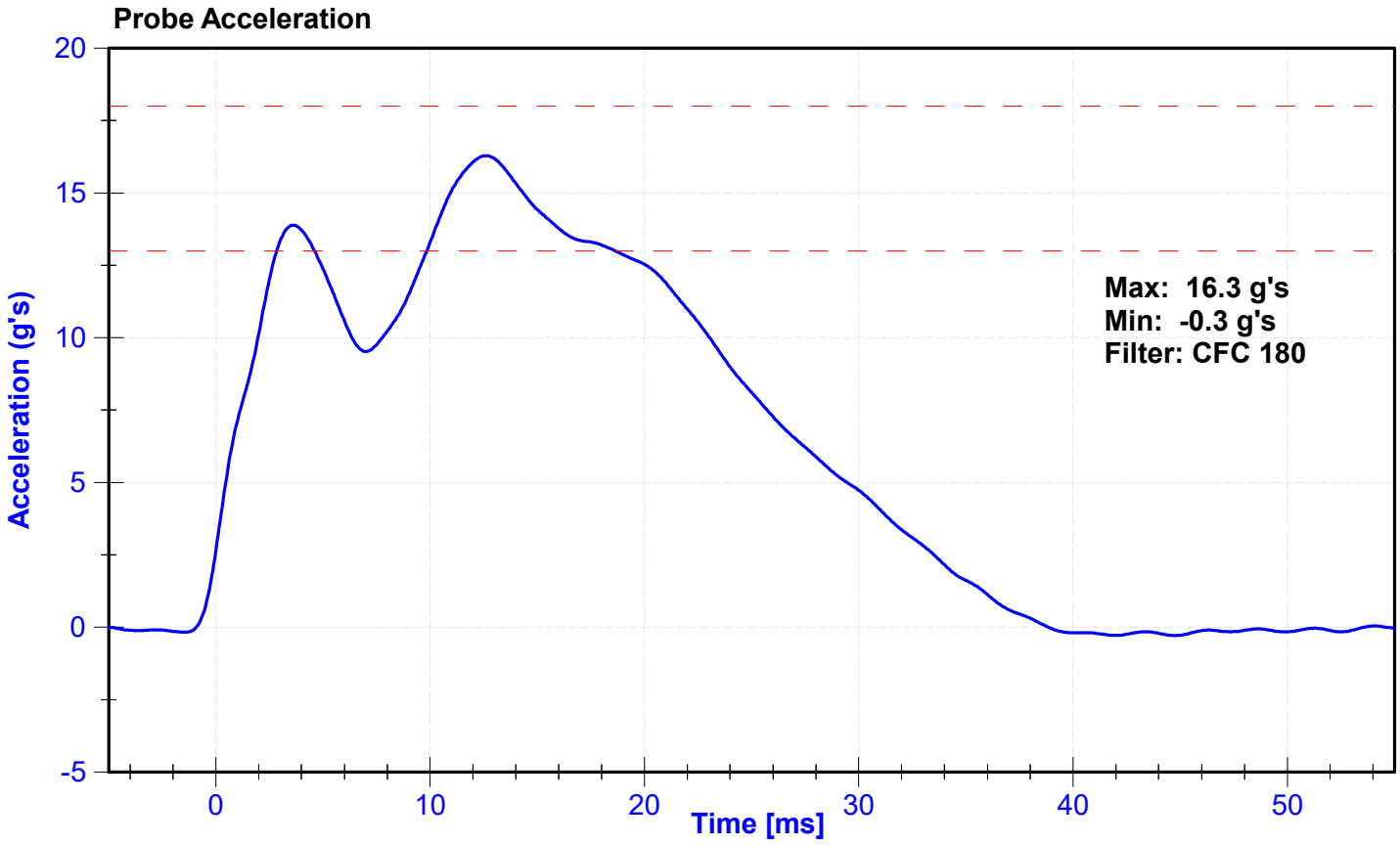
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

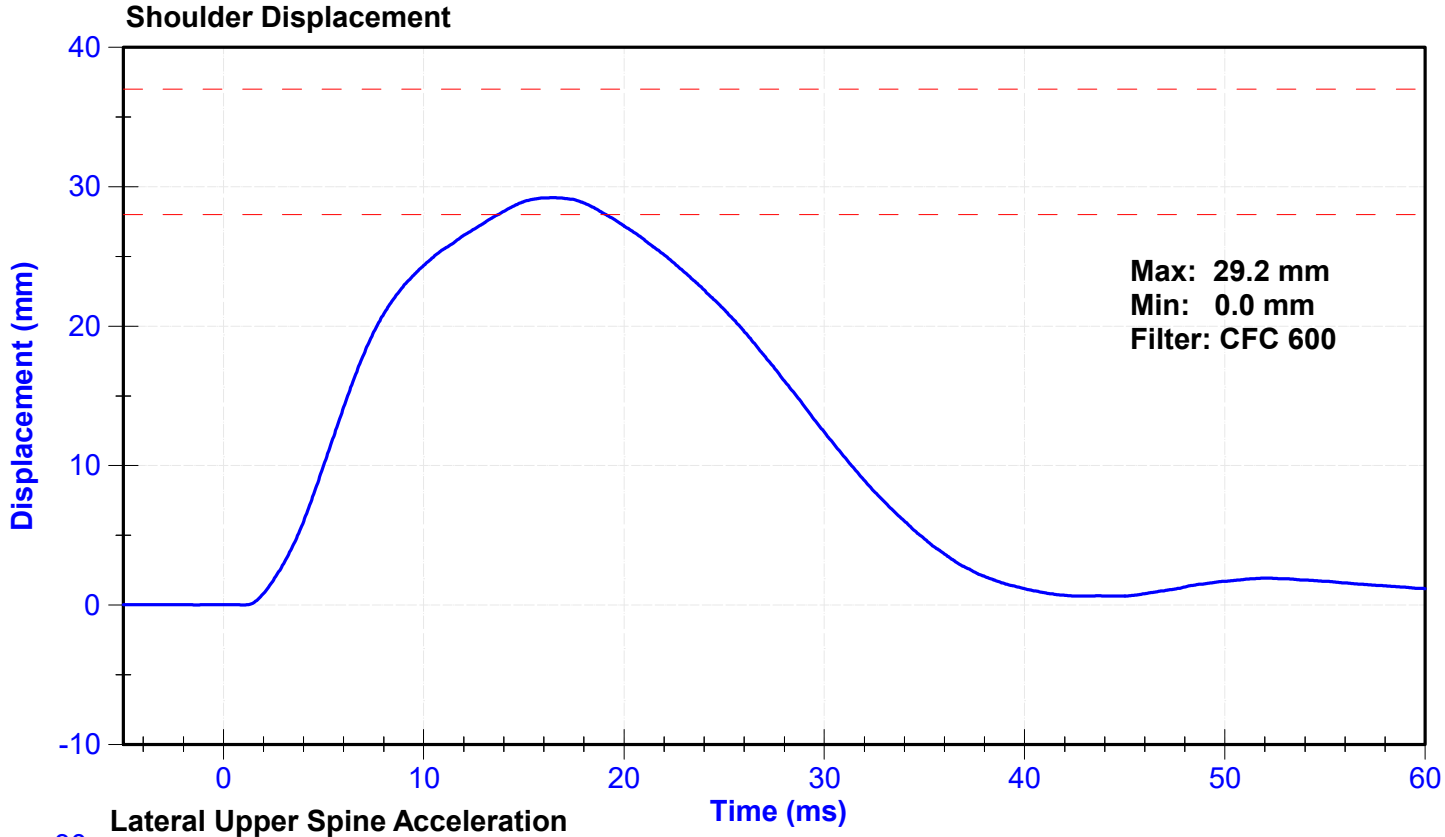
Results

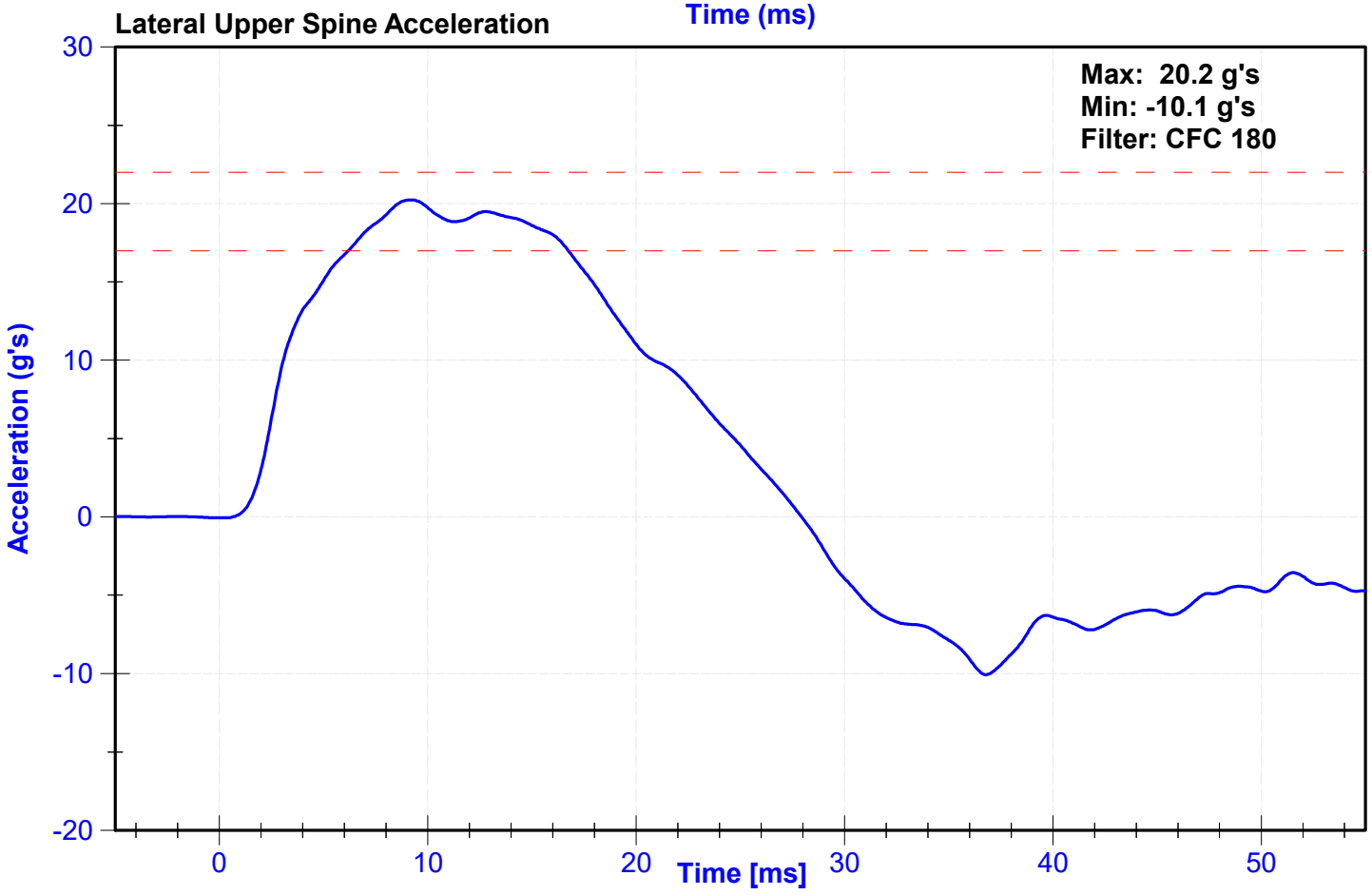
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.7	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	13	18	g's	16.3	Pass
Shoulder Deflection	28	37	mm	29.2	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Shoulder Potentiometer	Servo	053GFE	10/16/2024	4/16/2025
Upper Spine Y Accelerometer	Endevco	P52018	11/25/2024	5/24/2025




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 29.2 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 20.2 g's
Min: -10.1 g's
Filter: CFC 180

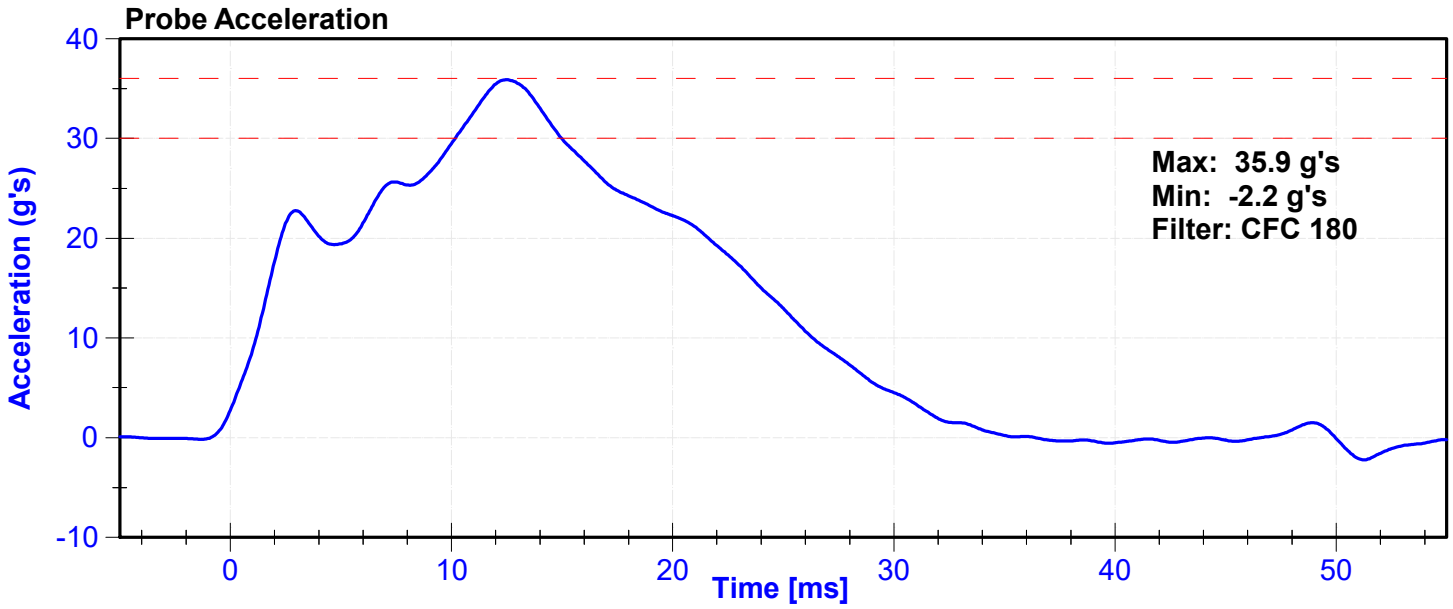
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

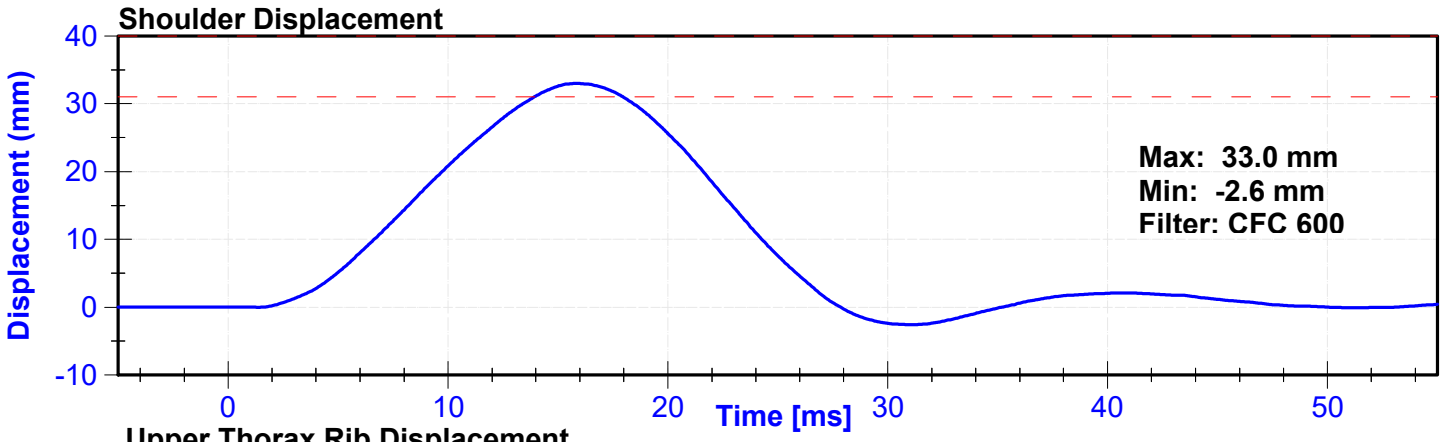
Results

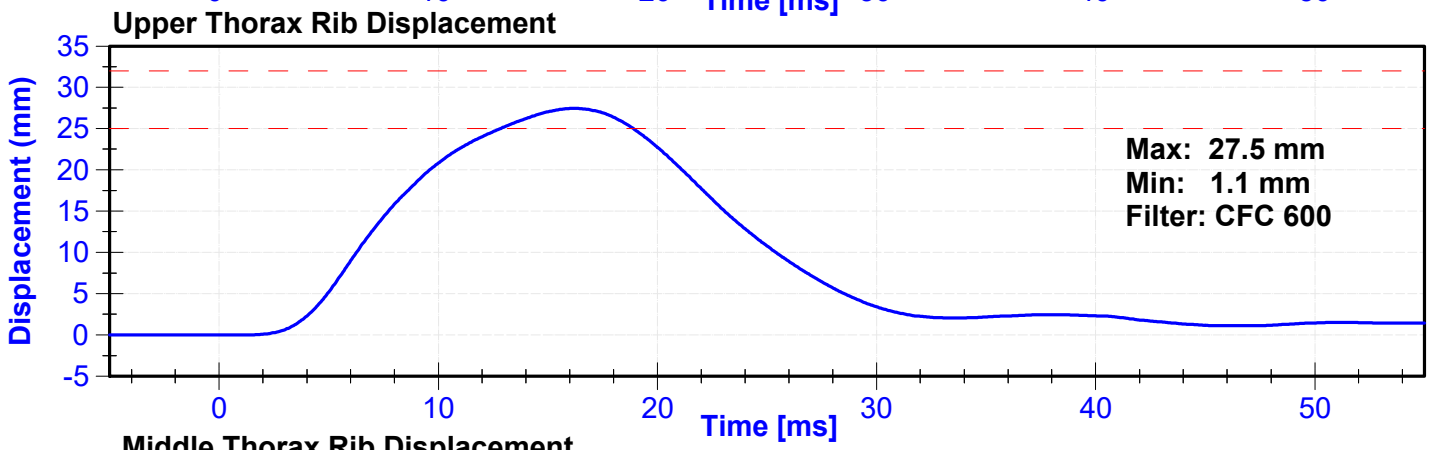
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.7	Pass
Humidity	10	70	%	19	Pass
Velocity	6.6	6.8	m/s	6.70	Pass
Probe Acceleration after 5 ms	30	36	g's	35.9	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.0	Pass
Lateral Lower Spine Acceleration	29	37	g's	35.9	Pass
Shoulder Deflection	31	40	mm	33.0	Pass
Upper Thorax Rib Deflection	25	32	mm	27.5	Pass
Mid Thorax Rib Deflection	30	36	mm	31.4	Pass
Lower Thorax Rib Deflection	32	38	mm	33.2	Pass

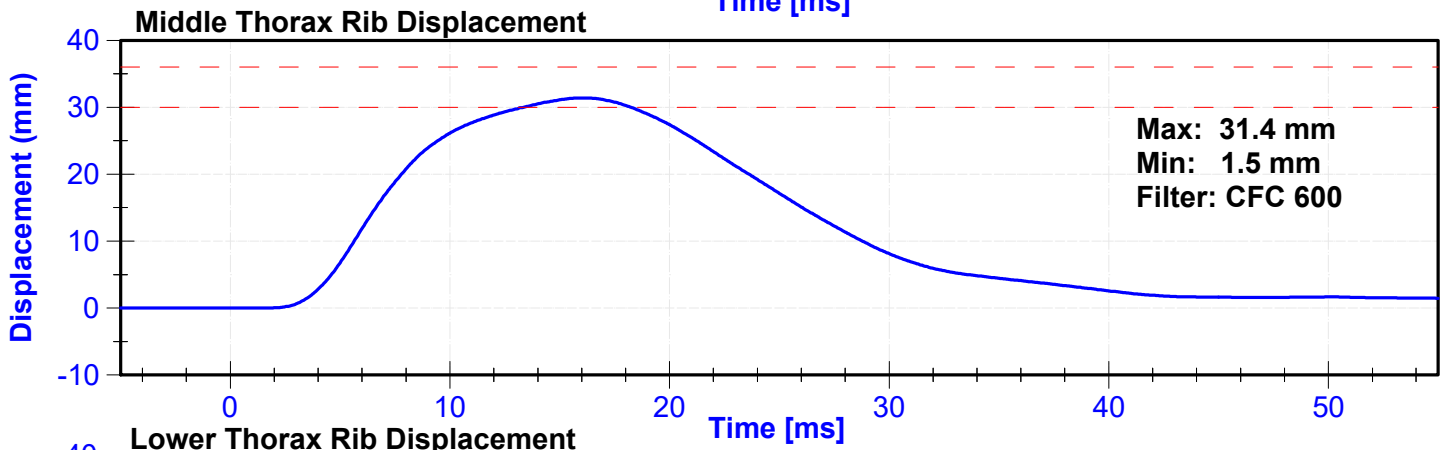
Transducer Calibrations

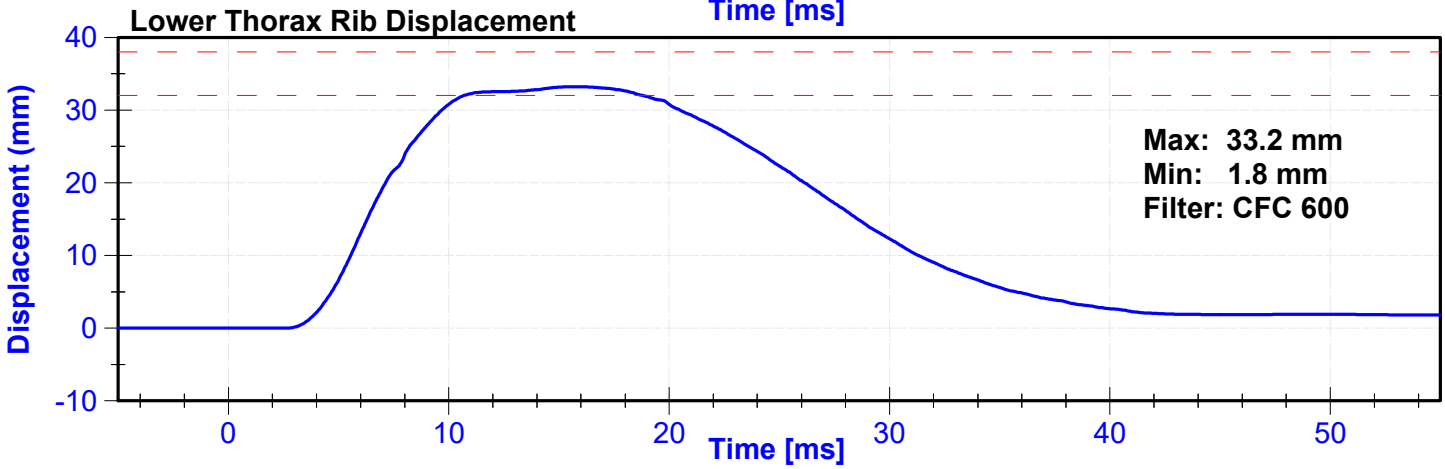
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Upper Spine T1 Y Accelerometer	Endevco	P52018	11/25/2024	5/24/2025
Upper Spine T12 Y Accelerometer	Endevco	P52071	10/17/2024	4/15/2025
Shoulder Potentiometer	Servo	053GFE	10/16/2024	4/16/2025
Upper Thorax Rib Potentiometer	Servo	2316GFE	10/16/2024	4/16/2025
Middle Thorax Rib Potentiometer	Servo	085GFE	10/16/2024	4/16/2025
Lower Thorax Rib Potentiometer	Servo	1156GFE	10/16/2024	4/16/2025

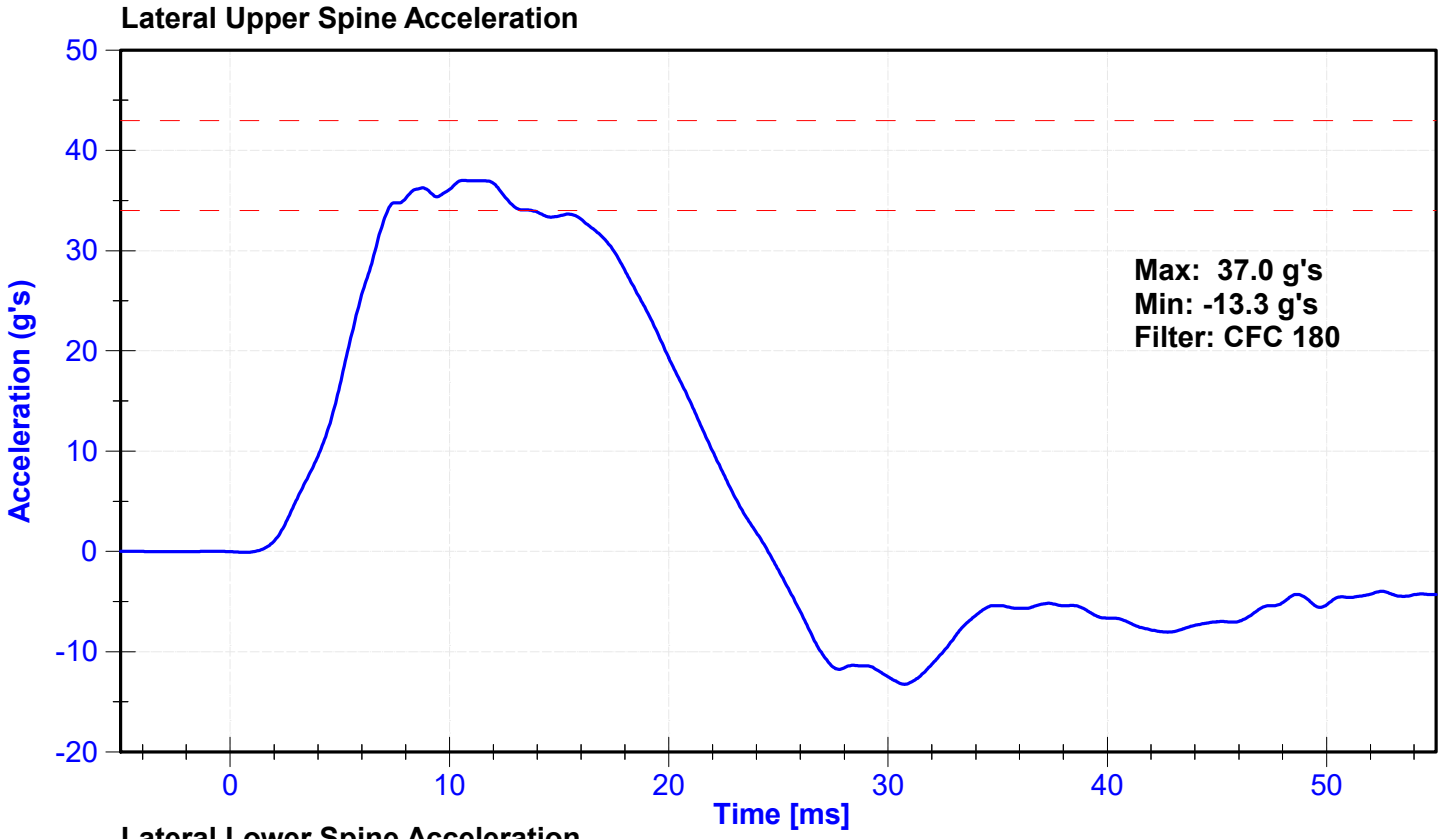


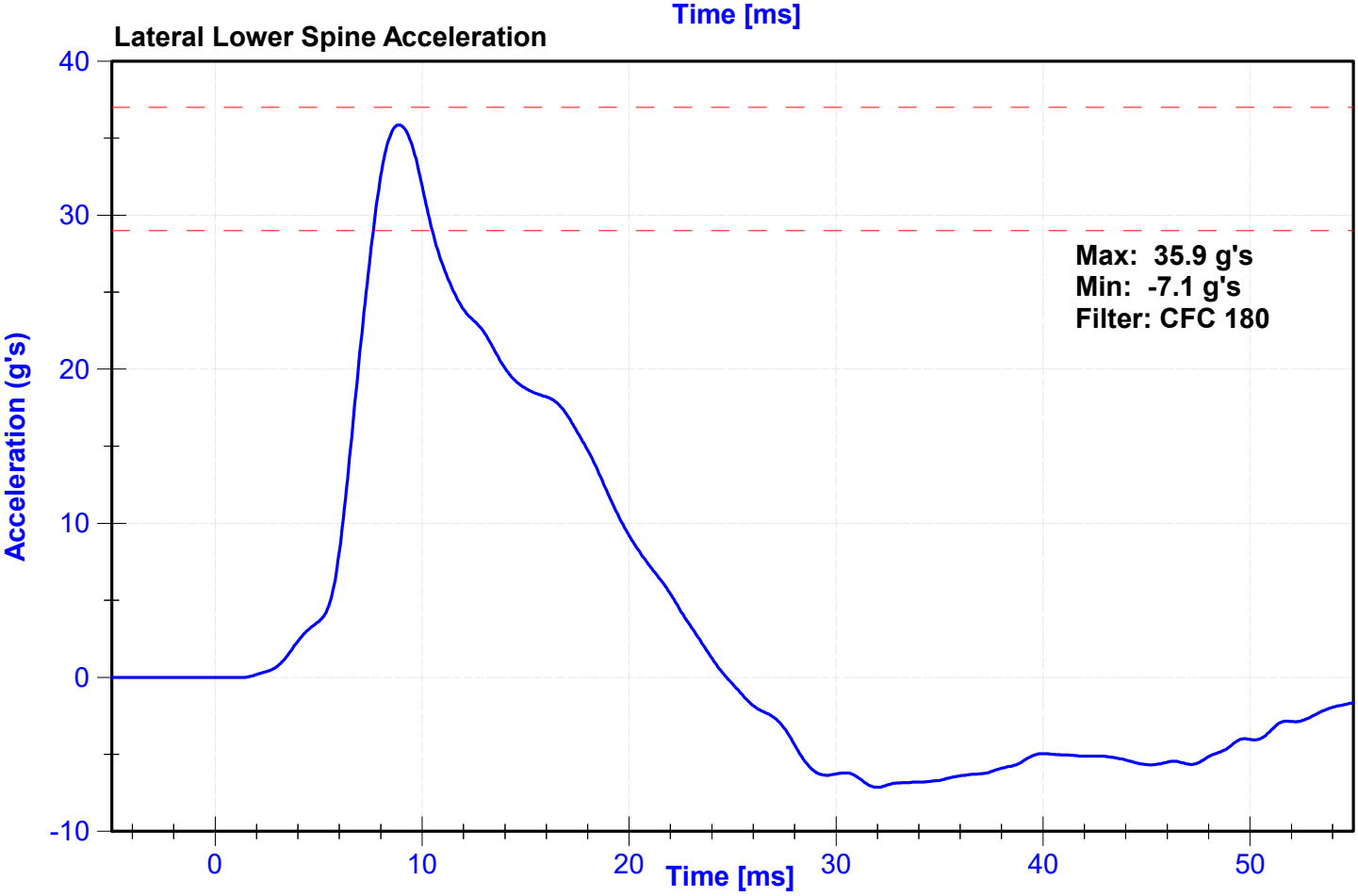

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 33.0 mm
Min: -2.6 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 27.5 mm
Min: 1.1 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 31.4 mm
Min: 1.5 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 33.2 mm
Min: 1.8 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 37.0 g's
Min: -13.3 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 35.9 g's
Min: -7.1 g's
Filter: CFC 180

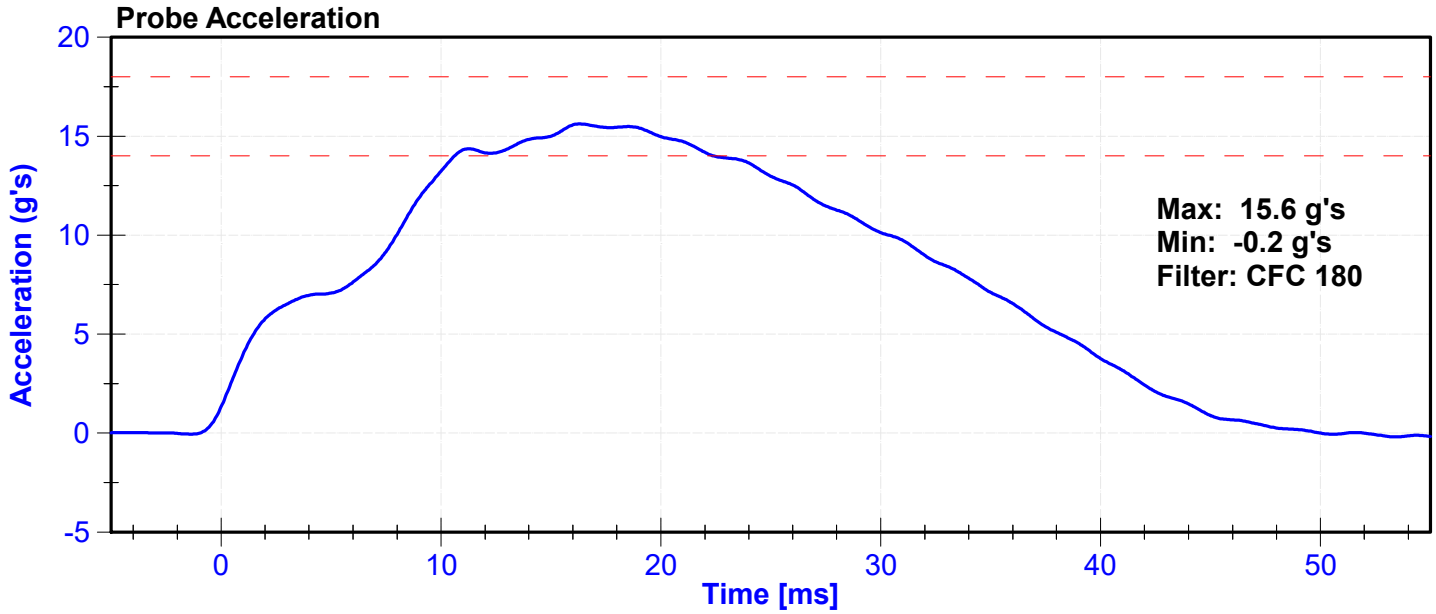
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

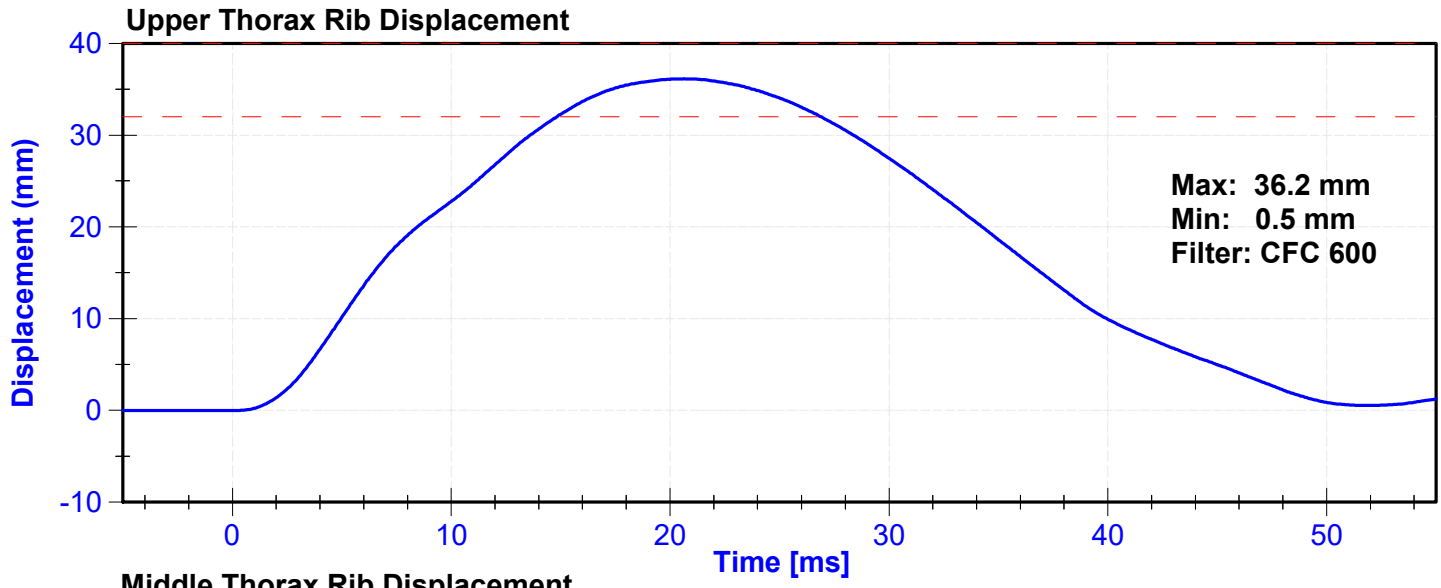
Results

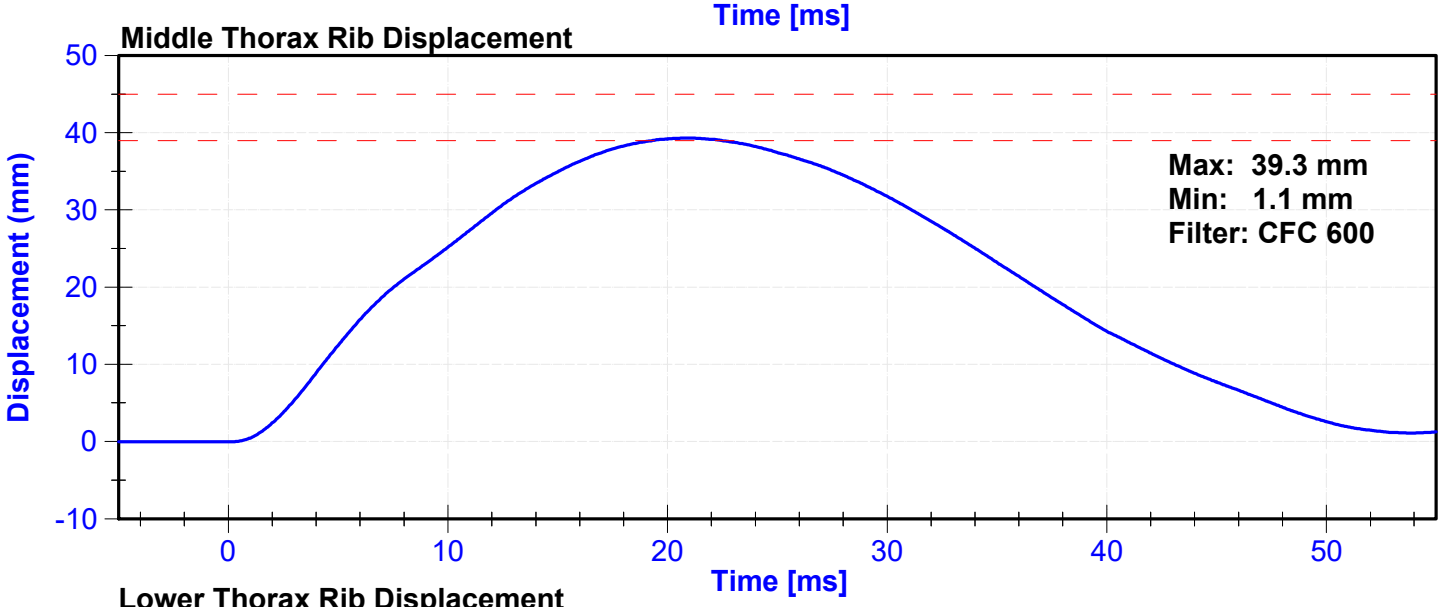
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.7	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	14	18	g's	15.6	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.6	Pass
Lateral Lower Spine Acceleration	7	11	g's	8.9	Pass
Upper Thorax Rib Deflection	32	40	mm	36.2	Pass
Middle Thorax Rib Deflection	39	45	mm	39.3	Pass
Lower Thorax Rib Deflection	35	43	mm	35.4	Pass

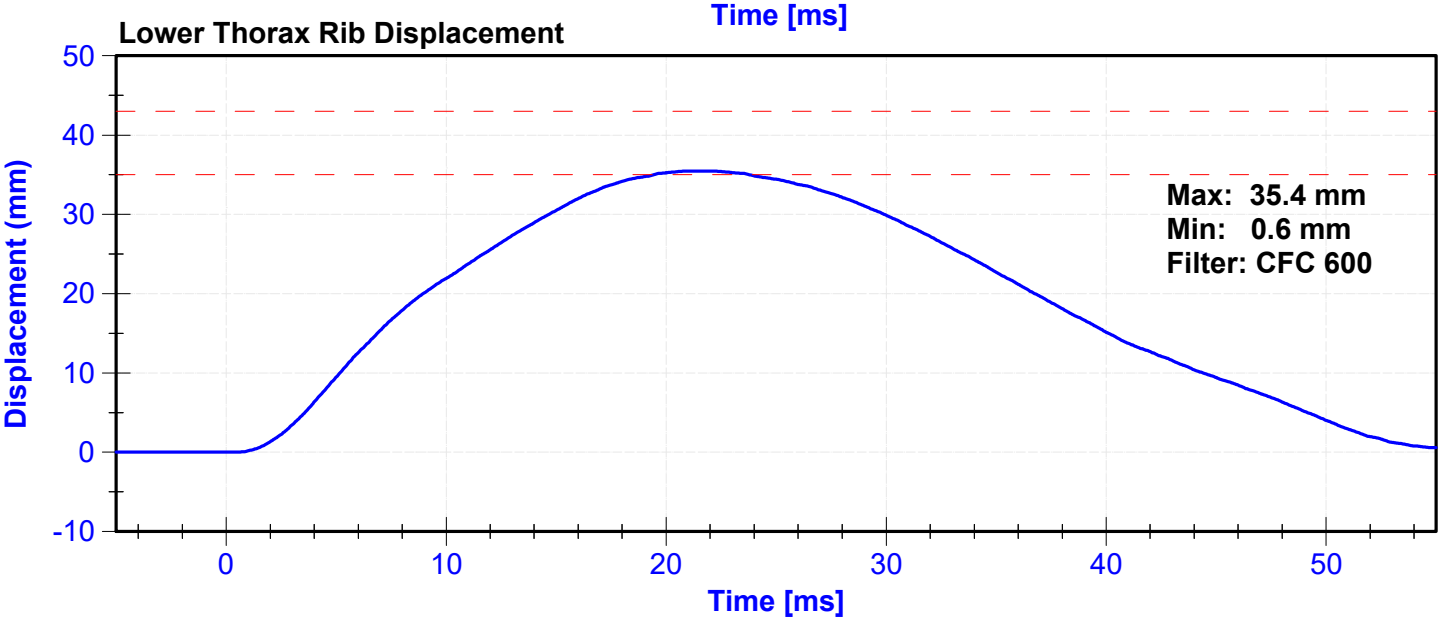
Transducer Calibrations

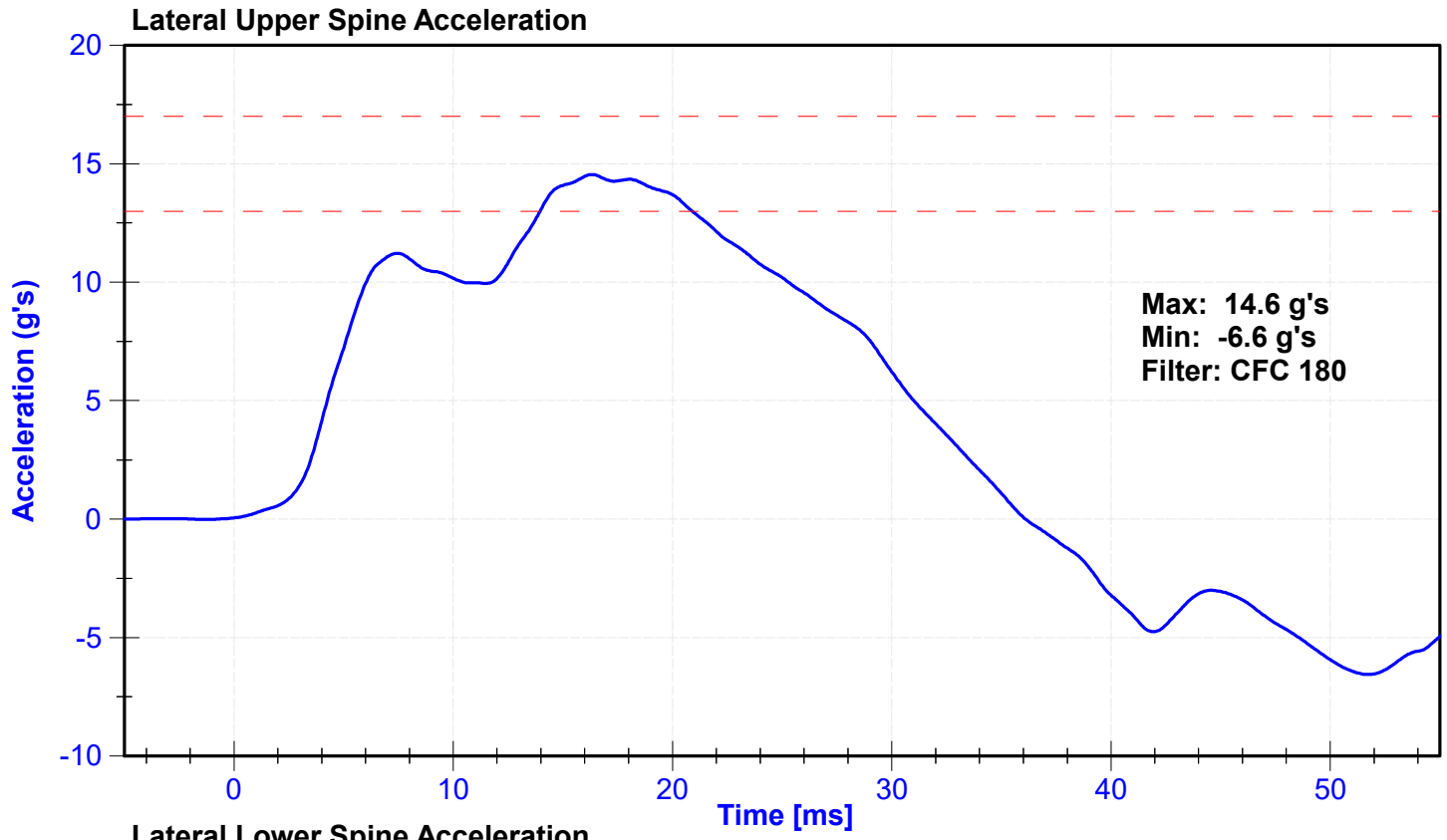
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Upper Spine Y Accelerometer	Endevco	P52018	11/25/2024	5/24/2025
Lower Spine Y Accelerometer	Endevco	P52071	10/17/2024	4/15/2025
Upper Thorax Rib Potentiometer	Servo	2316GFE	10/16/2024	4/16/2025
Middle Thorax Rib Potentiometer	Servo	085GFE	10/16/2024	4/16/2025
Lower Thorax Rib Potentiometer	Servo	1156GFE	10/16/2024	4/16/2025

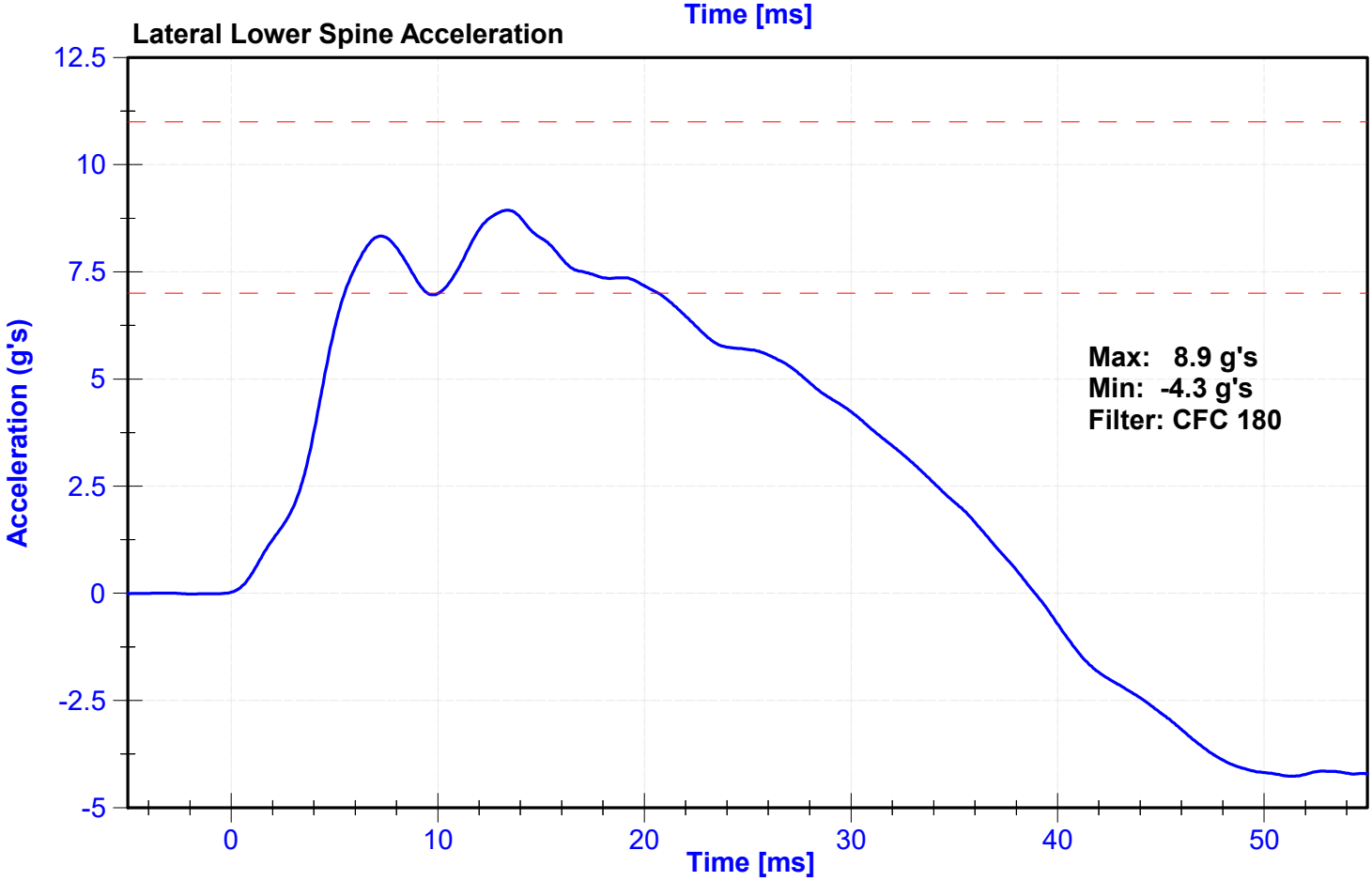



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 36.2 mm
Min: 0.5 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 39.3 mm
Min: 1.1 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 35.4 mm
Min: 0.6 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 14.6 g's
Min: -6.6 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 8.9 g's
Min: -4.3 g's
Filter: CFC 180

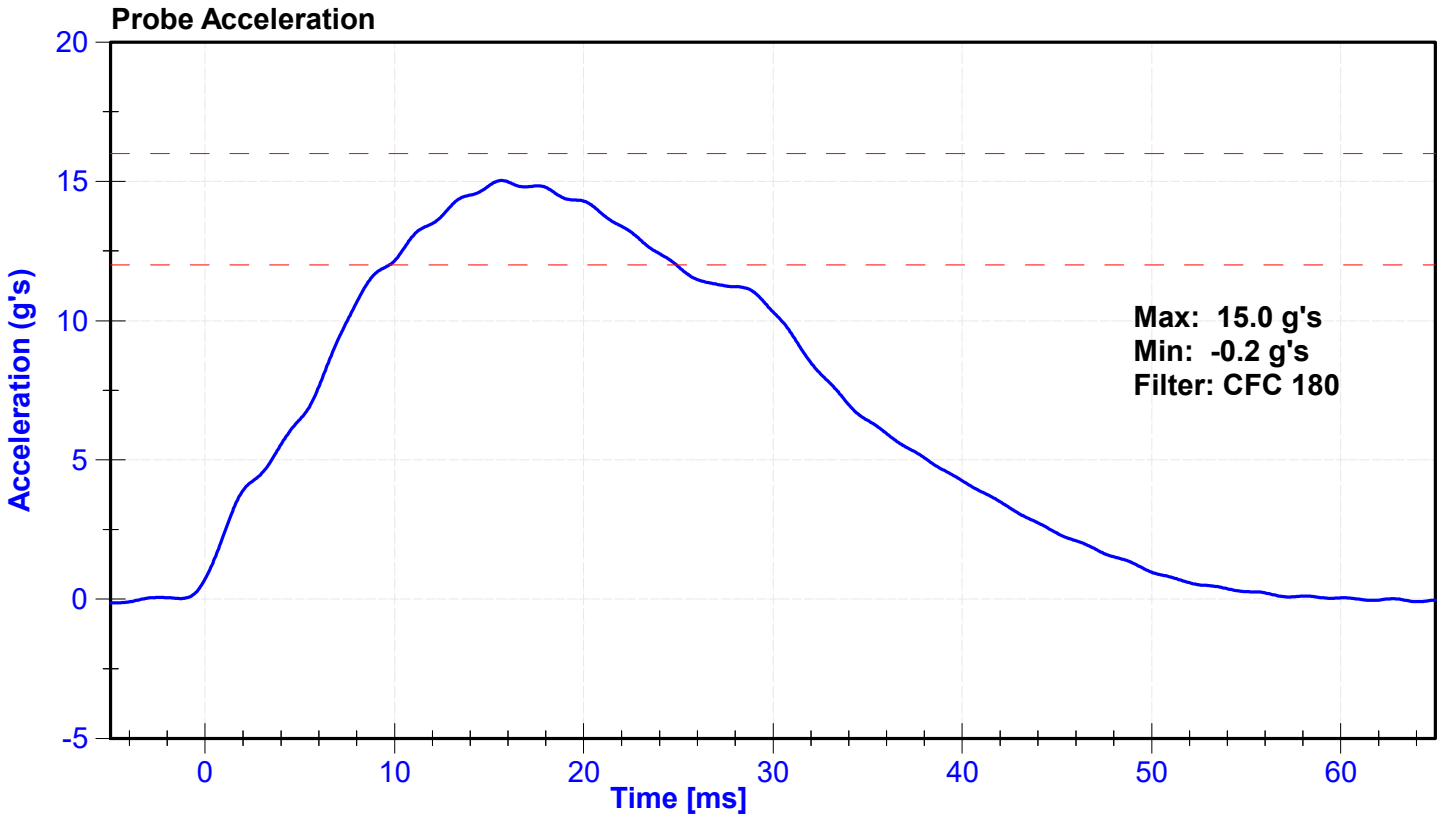
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

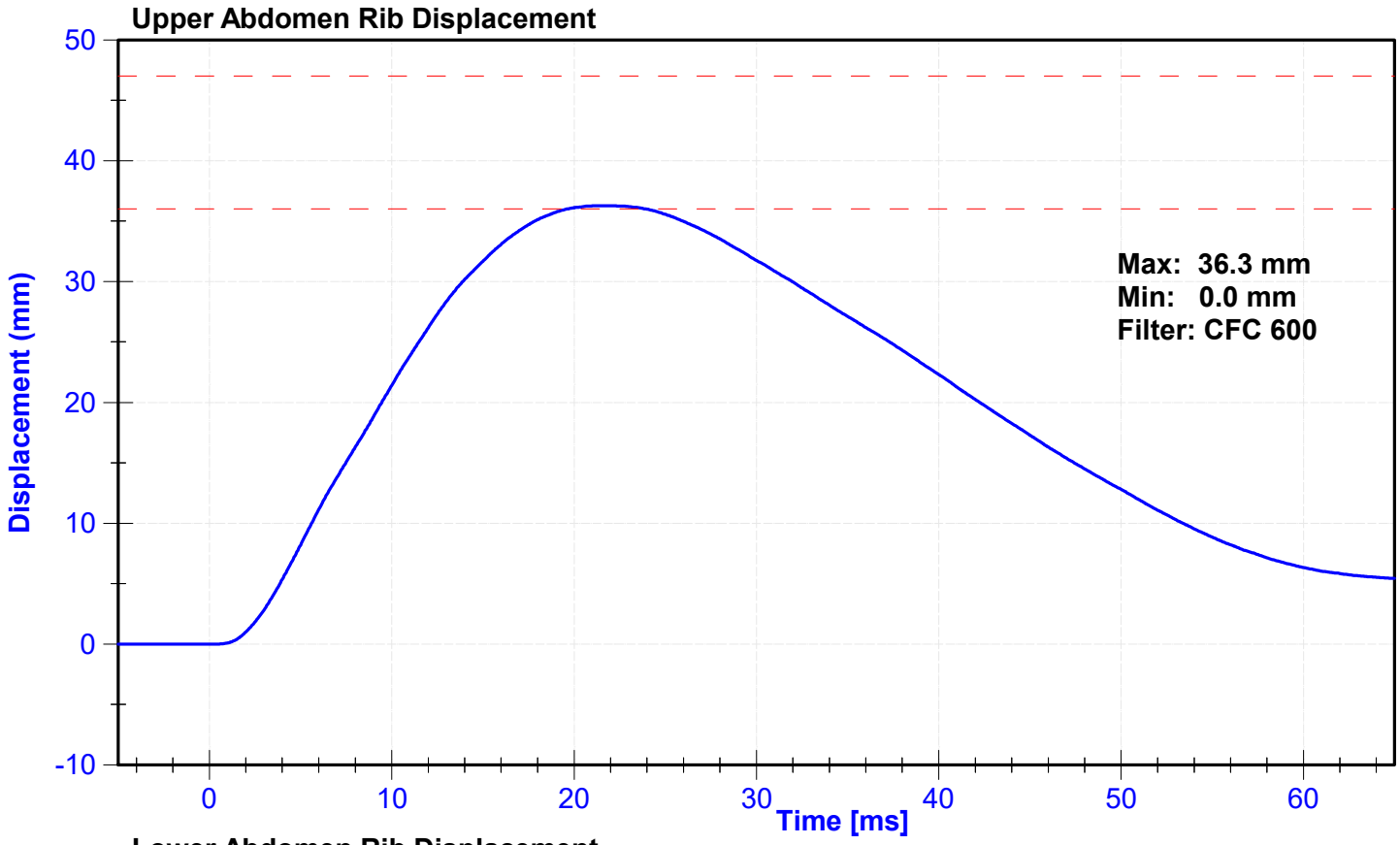
Results

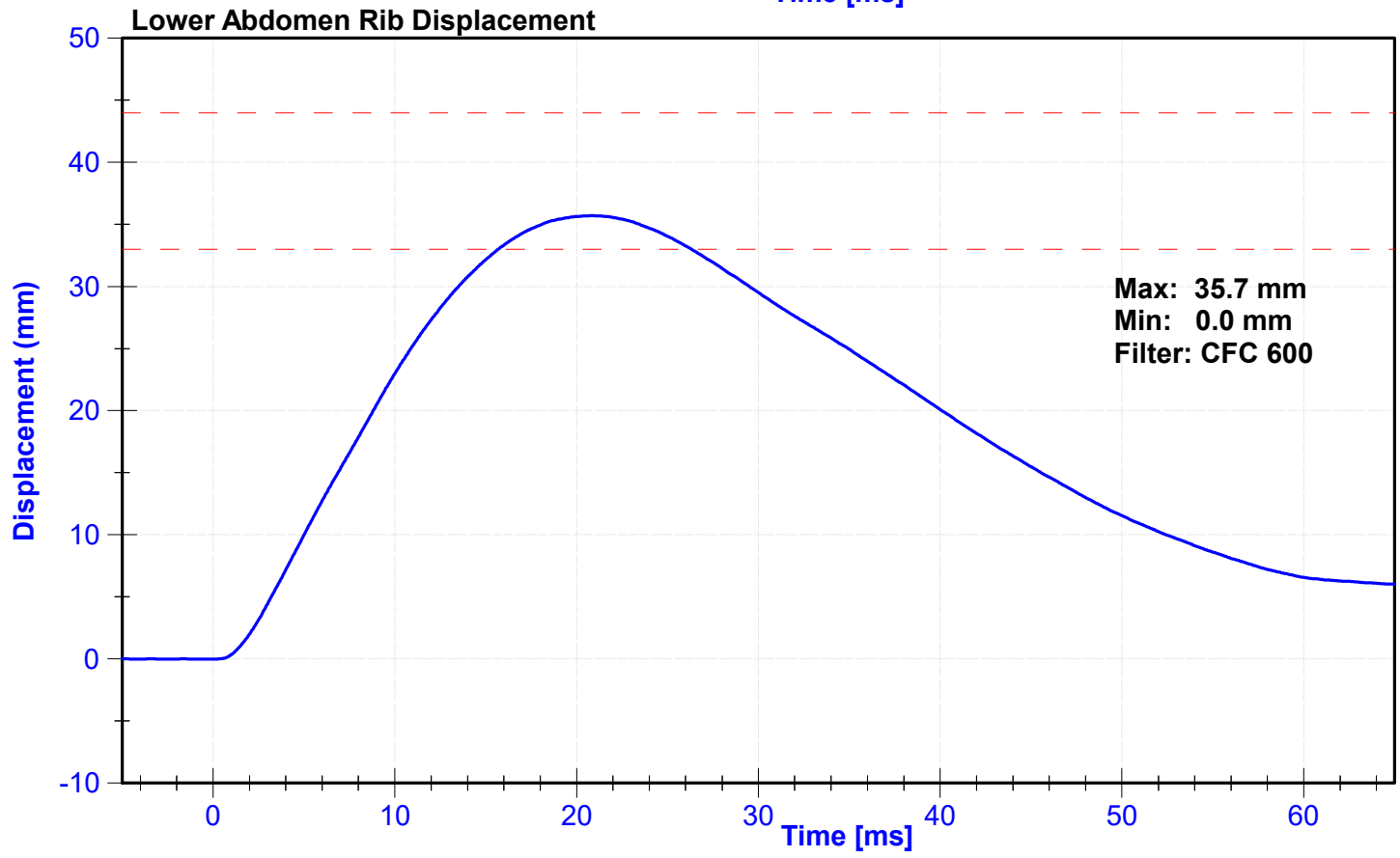
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.7	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.30	Pass
Probe Acceleration	12	16	g's	15.0	Pass
Lateral Lower Spine Acceleration	9	14	g's	12.5	Pass
Upper Abdomen Rib Deflection	36	47	mm	36.3	Pass
Lower Abdomen Rib Deflection	33	44	mm	35.7	Pass

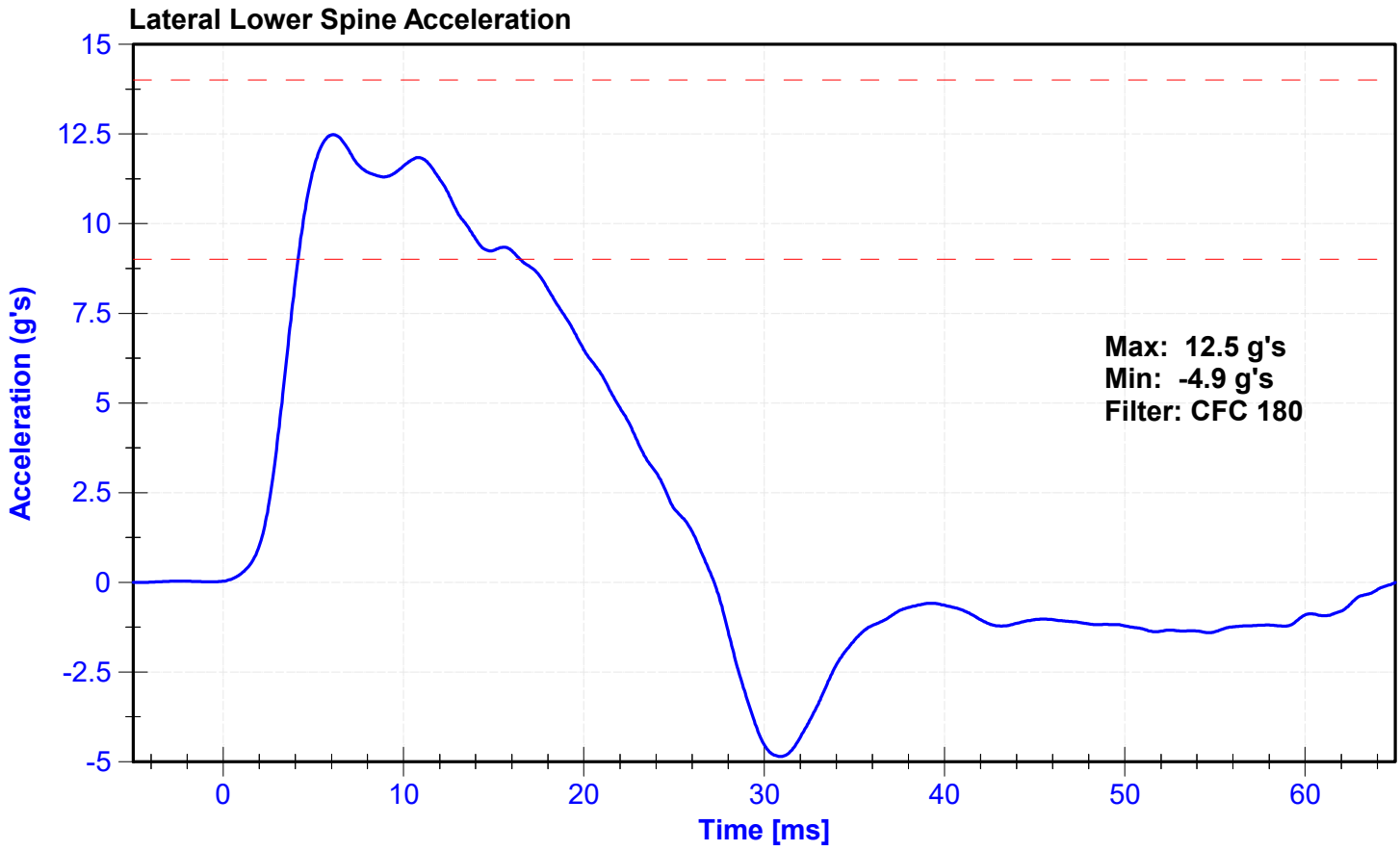
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Lower Spine Y Accelerometer	Endevco	P52071	10/17/2024	4/15/2025
Upper Abdomen Rib Potentiometer	Servo	074GFE	10/16/2024	4/16/2025
Lower Abdomen Rib Potentiometer	Servo	075GFE	10/16/2024	4/16/2025




Upper Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 36.3 mm
Min: 0.0 mm
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
Time [ms]
Max: 35.7 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Lower Spine Acceleration
Acceleration (g's)
15
12.5
10
7.5
5
2.5
0
-2.5
-5
0
10
20
30
40
50
60
Time [ms]
Max: 12.5 g's
Min: -4.9 g's
Filter: CFC 180

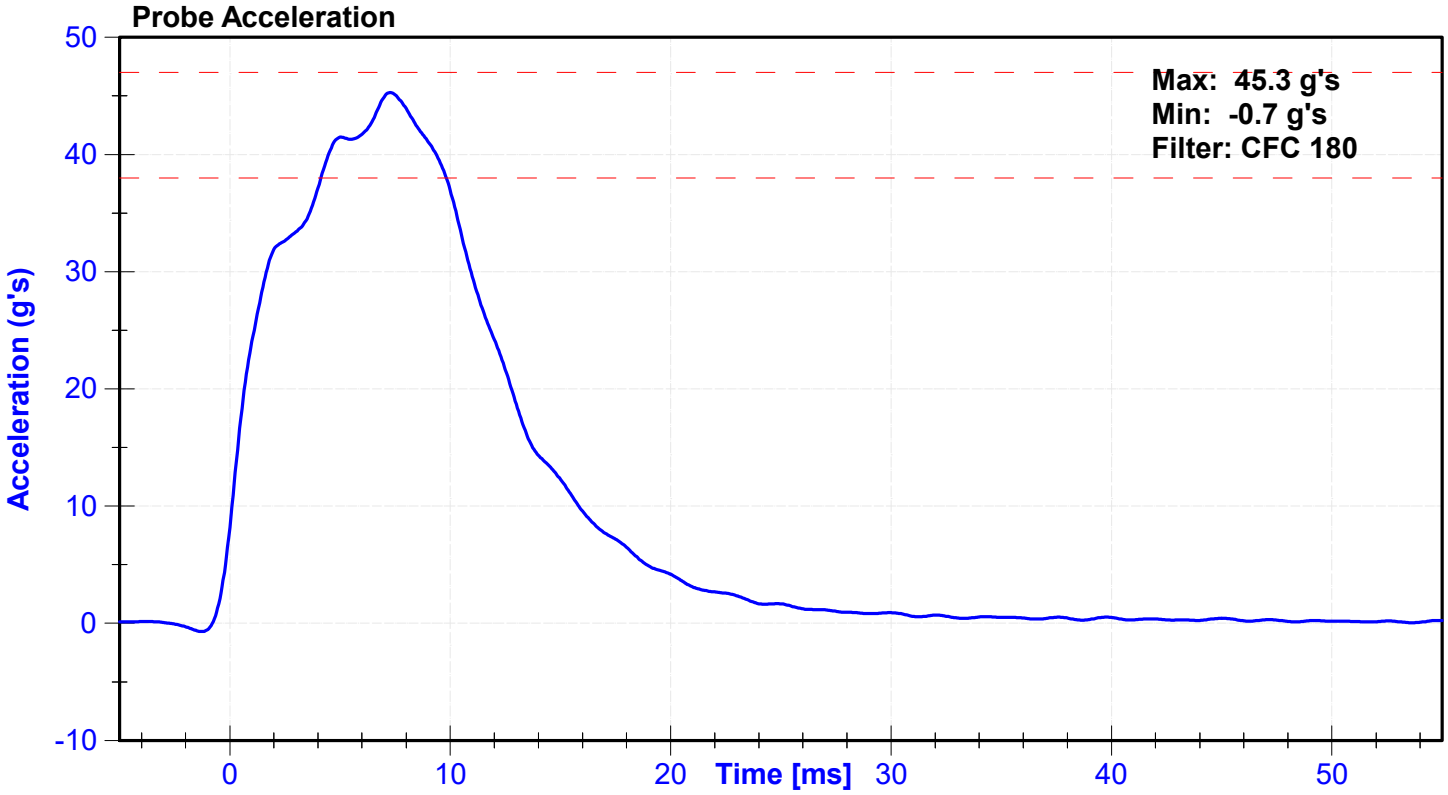
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

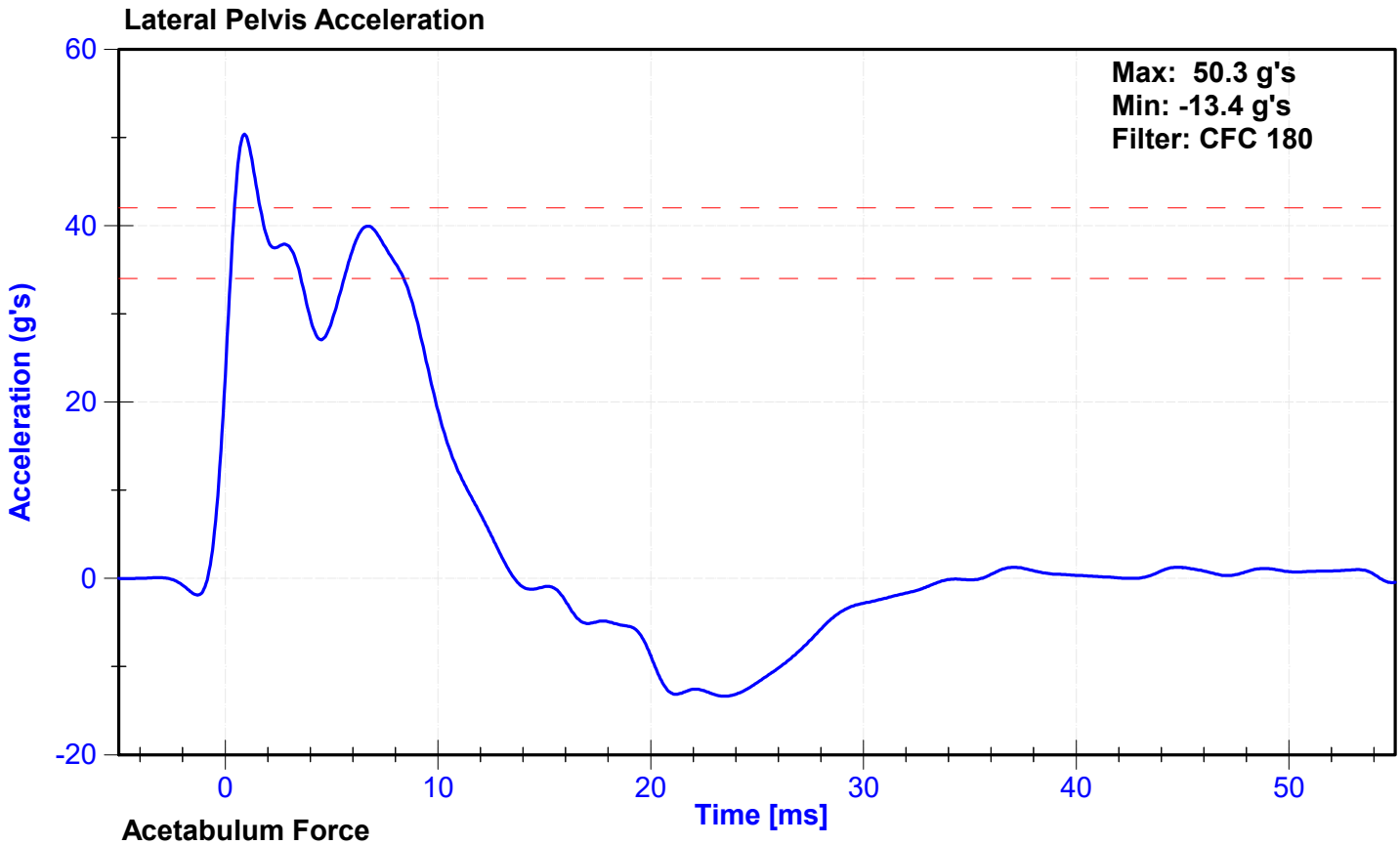
Results

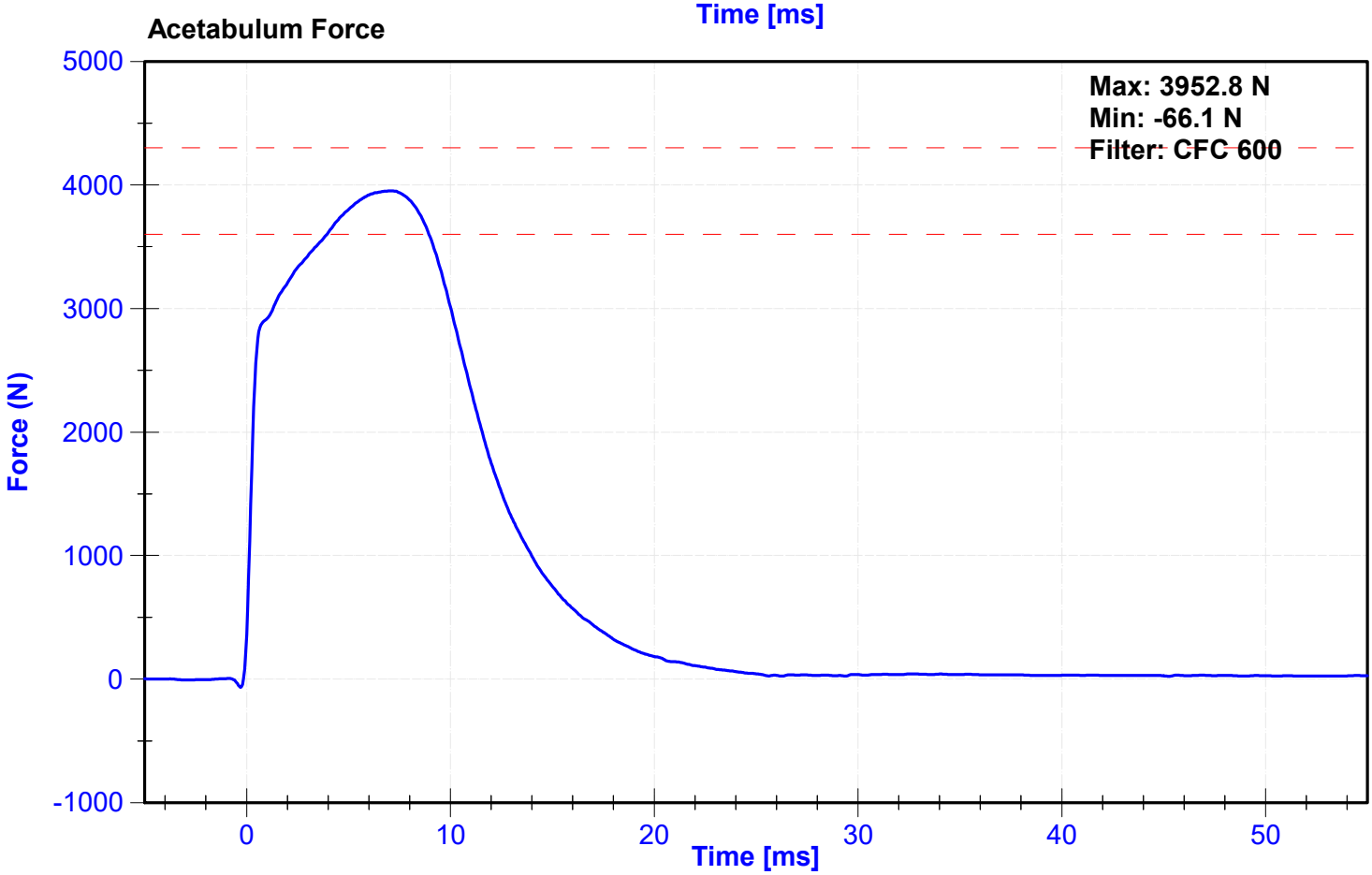
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.7	Pass
Humidity	10	70	%	19	Pass
Velocity	6.6	6.8	m/s	6.67	Pass
Probe Acceleration	38	47	g's	45.3	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	39.9	Pass
Acetabulum Force	3600	4300	N	3952.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Pelvis Y Accelerometer	Endevco	P51731	10/17/2024	4/15/2025
Acetabulum Load Cell	Denton	275-FY	10/28/2024	10/28/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A




Lateral Pelvis Acceleration
Max: 50.3 g's
Min: -13.4 g's
Filter: CFC 180
Acceleration (g's)
60
40
20
0
-20
0
10
20
30
40
50
Time [ms]


Acetabulum Force
Max: 3952.8 N
Min: -66.1 N
Filter: CFC 600
Force (N)
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16708
Test Number 23508
Report Number 23565
Test Date 7/22/2022 11:37:03 AM

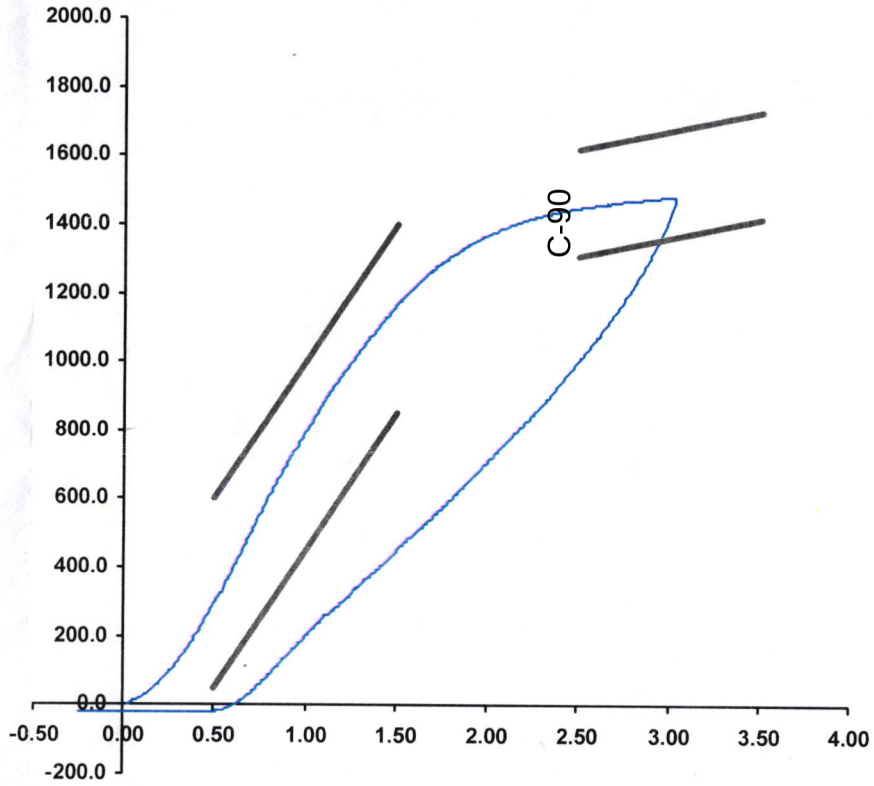
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	302	50	600
Force @ 1.5 mm (N)	1,167	850	1,400
Force @ 2.5 mm (N)	1,448	1,306	1,618
Force @ 3.0 mm (N)	1,480	1,361	1,673

Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes:
Cert Plug 300 2-12-25

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 22-Jul-22
SACO Research

By : DC Date : 7/22/22

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

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16709
Test Number 23509
Report Number 23566
Test Date 7/22/2022 11:40:09 AM

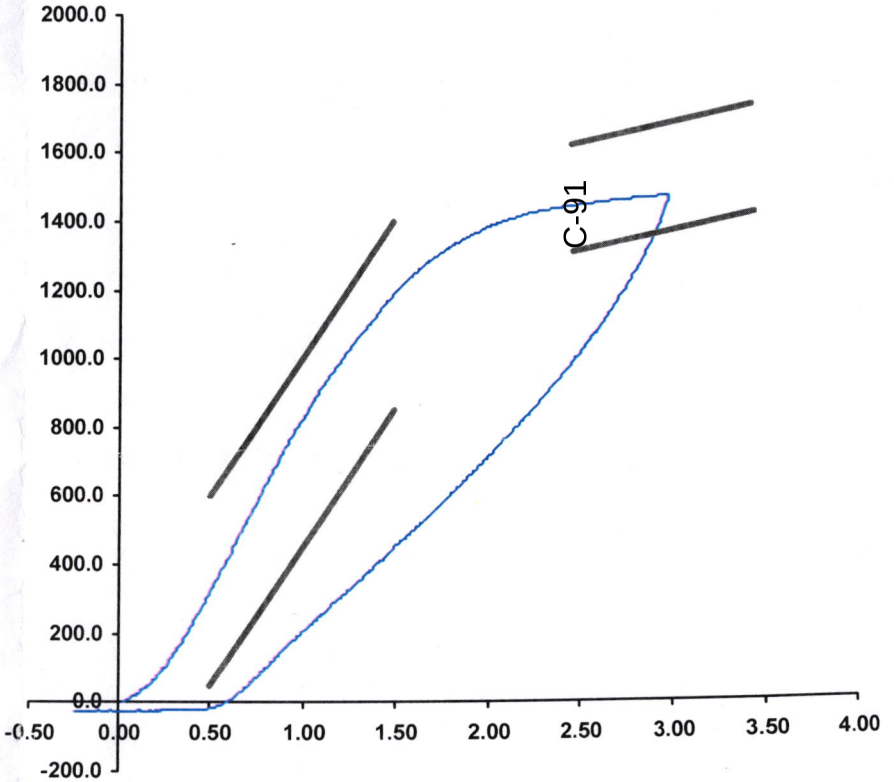
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	330	50	600
Force @ 1.5 mm (N)	1,185	850	1,400
Force @ 2.5 mm (N)	1,441	1,306	1,618
Force @ 3.0 mm (N)	1,467	1,361	1,673

Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes:
IMPACT 300 2-12-25

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 22-Jul-22
SACO Research

By : DC Date : 7/22/22

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

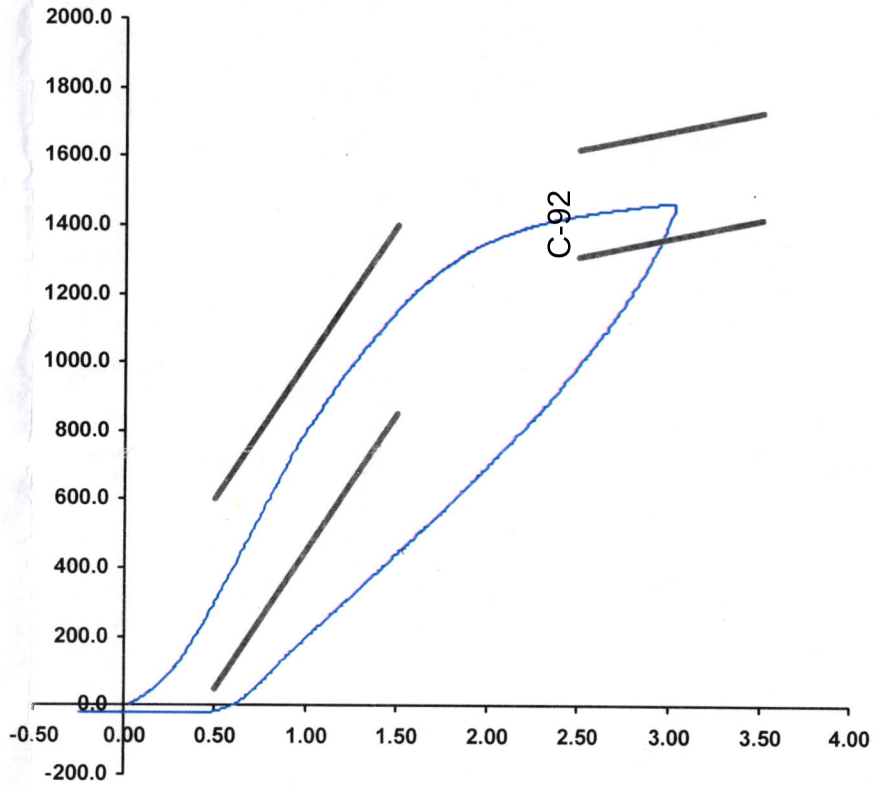
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16724
Test Number 23524
Report Number 23581
Test Date 7/22/2022 12:34:48 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	307	50	600
Force @ 1.5 mm (N)	1,149	850	1,400
Force @ 2.5 mm (N)	1,429	1,306	1,618
Force @ 3.0 mm (N)	1,465	1,361	1,673

Force (-N) vs Extension (-mm)



Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes:
NON IMPACT 300 2-12-25

Operator

Part Number 180-4450

Template No 107 22-Jul-22
SACO Research

By : DC Date : 7/22/22

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

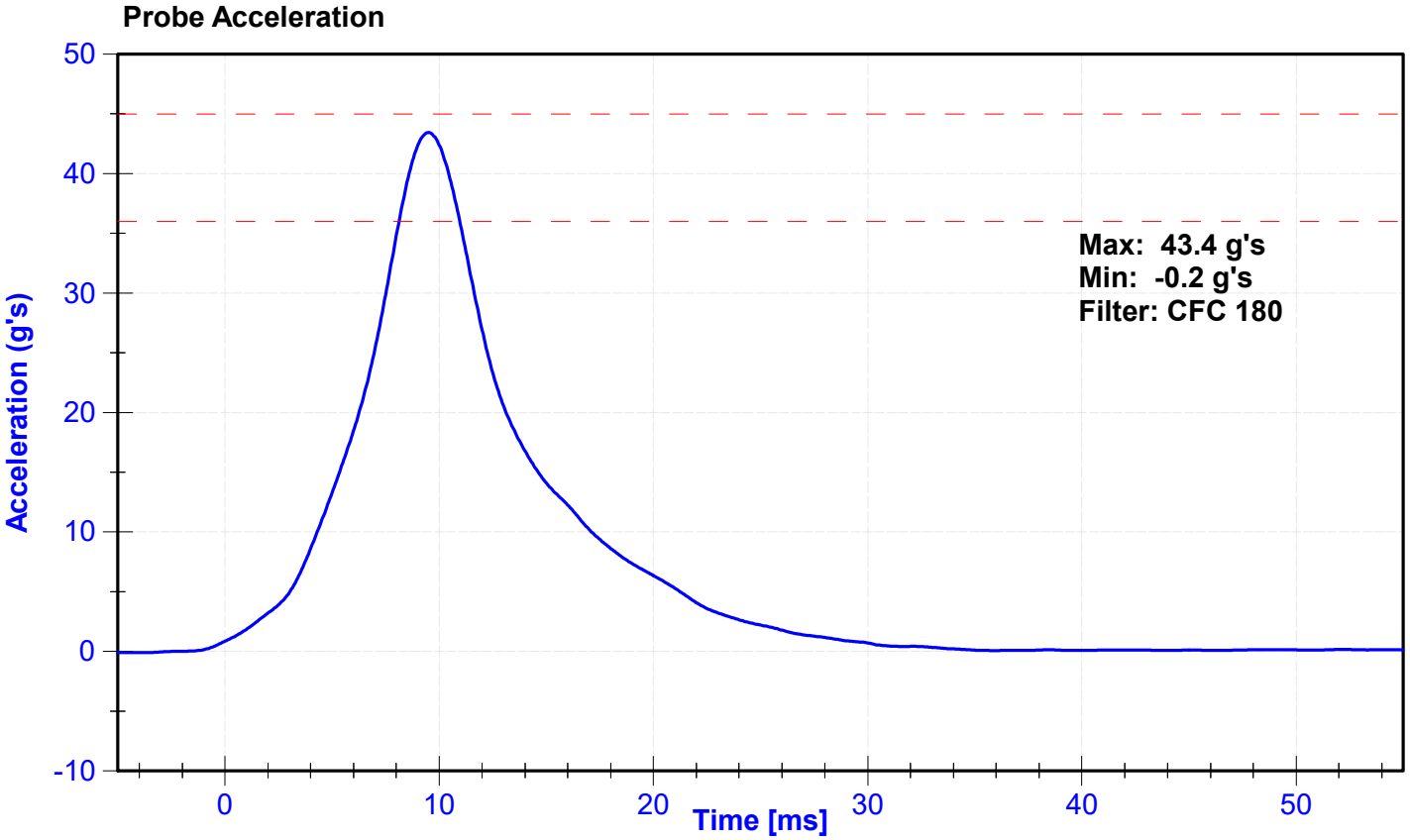
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	J. Kinderman

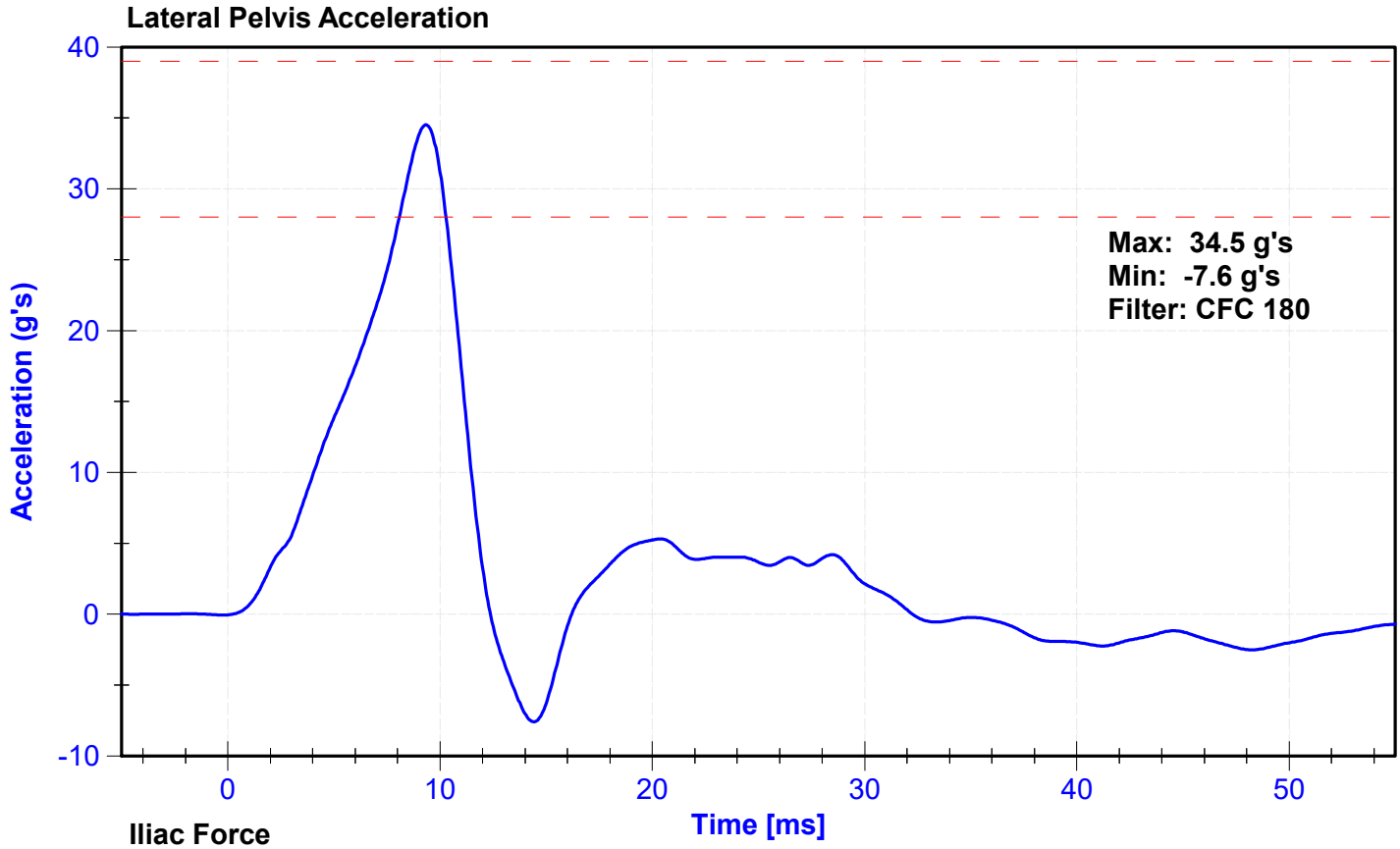
Results

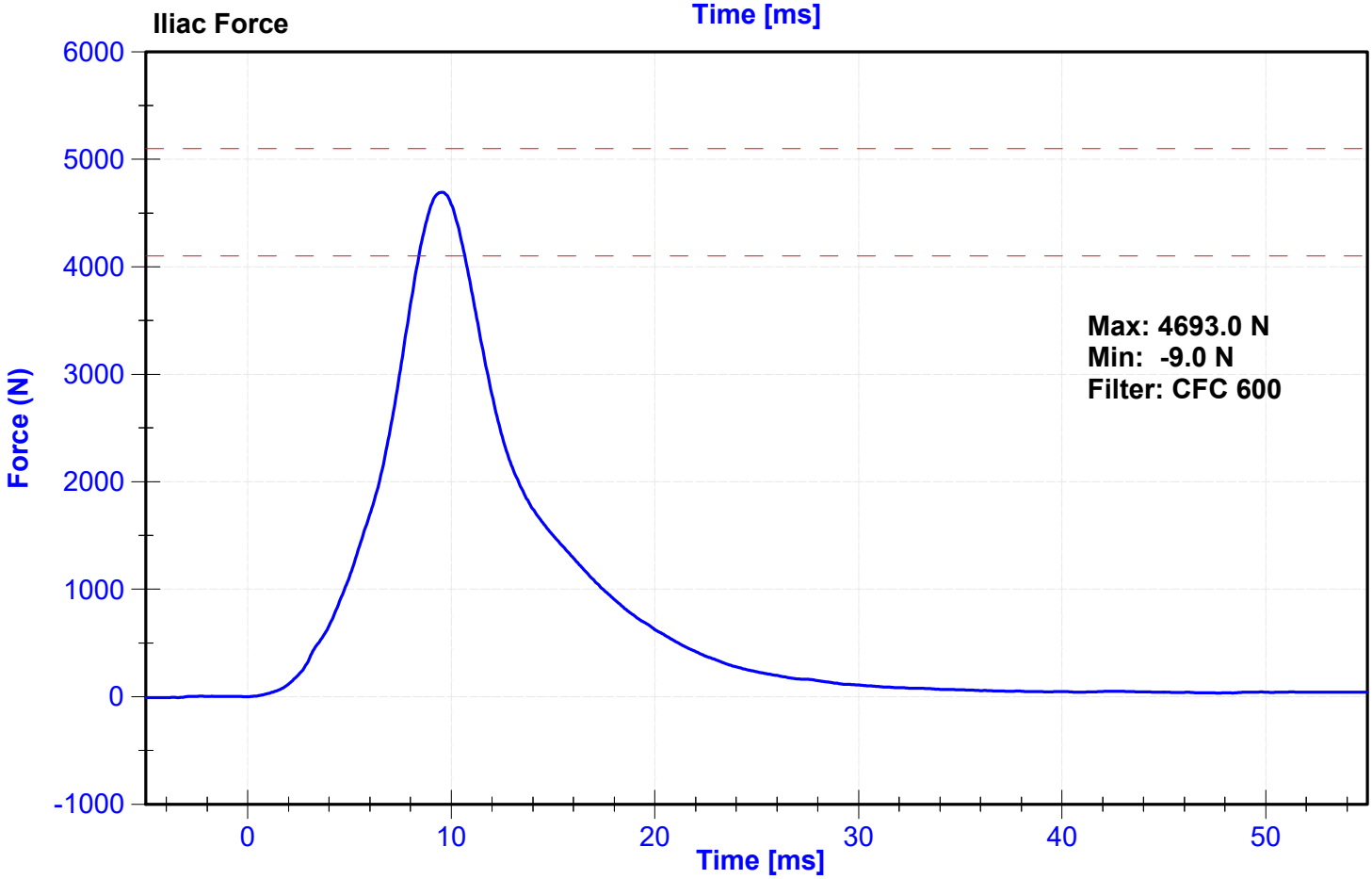
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.7	Pass
Humidity	10	70	%	19	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	36	45	g's	43.4	Pass
Lateral Pelvis Acceleration	28	39	g's	34.5	Pass
Iliac Force	4100	5100	N	4693.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	11/26/2024	5/25/2025
Pelvis Y Accelerometer	Endevco	P51731	10/17/2024	4/15/2025
Iliac Load Cell	Denton	279-FY	10/28/2024	10/28/2025




Lateral Pelvis Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 34.5 g's
Min: -7.6 g's
Filter: CFC 180


Iliac Force
Force (N)
6000
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]
Max: 4693.0 N
Min: -9.0 N
Filter: CFC 600

APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N _F033__		
			Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers	Primary	X	P63861	Endevco	10/17/2024
		Y	P49216	Endevco	10/17/2024
		Z	P51303	Endevco	10/17/2024
	Redundant	X	P58868	Endevco	10/17/2024
		Y	P59020	Endevco	10/17/2024
		Z	P52132	Endevco	10/17/2024
Thorax Rib Displacement Potentiometers	Upper	Y	179GFE	Honeywell	10/16/2024
	Middle	Y	185GFE	Honeywell	10/16/2024
	Lower	Y	184GFE	Honeywell	11/19/2024
Abdomen Load Cells	Forward	Y	1523	Denton	10/28/2024
	Middle	Y	1524	Denton	10/28/2024
	Rear	Y	1530	Denton	10/28/2024
Lower Spine Accelerometers (T12)		X	P35790	Endevco	10/17/2024
		Y	T31029	Endevco	10/17/2024
		Z	P52033	Endevco	10/17/2024
Pubic Symphysis Load Cell		Y	458-FY	Denton	10/28/2024

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N __300__		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers		Primary	X	P59018	Endevco	10/17/2024
			Y	P79189	Endevco	10/17/2024
			Z	P79587	Endevco	10/17/2024
		Redundant	X	P49182	Endevco	11/25/2024
			Y	P58986	Endevco	10/17/2024
			Z	P52025	Endevco	10/17/2024
Displacement Potentiometers	Thoracic Rib	Upper	Y	2316GFE	Servo	10/16/2024
		Middle	Y	085GFE	Servo	10/16/2024
		Lower	Y	1156GFE	Servo	10/16/2024
	Abdominal Rib	Upper	Y	074GFE	Servo	10/16/2024
		Lower	Y	075GFE	Servo	10/16/2024
Lower Spine Accelerometers (T12)			X	P64003	Endevco	10/17/2024
			Y	P52071	Endevco	10/17/2024
			Z	P17283	Endevco	10/17/2024
Acetabulum Load Cell			Y	275-FY	Denton	10/28/2024
Iliac Wing Load Cell			Y	279-FY	Denton	10/28/2024
Pelvis Plug (struck side)				16659	SACO	07/22/2022
Pelvis Plug (non-struck side)				16737	SACO	07/22/2022

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	G23641	Endevco	09/27/2024
	Vehicle Center of Gravity	Y	G23644	Endevco	09/27/2024
	Vehicle Center of Gravity	Z	G23645	Endevco	09/27/2024
2	Right Sill at Front Seat	X	A398324	Measurement Specialties	09/27/2024
	Right Sill at Front Seat	Y	A400004	Measurement Specialties	09/27/2024
	Right Sill at Front Seat	Z	A398332	Measurement Specialties	09/27/2024
3	Right Sill at Rear Seat	X	G22740	Endevco	08/21/2024
	Right Sill at Rear Seat	Y	G22743	Endevco	08/21/2024
	Right Sill at Rear Seat	Z	G22747	Endevco	08/21/2024
4	Left Sill at Front Door	Y	G25241	Endevco	12/03/2024
5	Left Sill at Rear Door	Y	A274234	Measurement Specialties	01/14/2025
6	Left A-Post Lower	Y	G21387	Endevco	09/09/2024
7	Left A-Post Middle	Y	G23450	Endevco	11/26/2024
8	Left B-Post Lower	Y	G25972	Endevco	12/17/2024
9	Left B-Post Middle	Y	G25997	Endevco	12/17/2024
10	Front Seat Track	Y	G24629	Endevco	11/26/2024
11	Rear Seat Track or Structure	Y	G24957	Endevco	11/04/2024
12	Right Rear Occ. Compartment	Y	G22712	Endevco	11/26/2024
13	Engine Block	X	A315772	Measurement Specialties	10/02/2024
	Engine Block	Y	G23414	Endevco	10/02/2024
14	Rear Floorpan Above Axle	X	A372862	Measurement Specialties	09/27/2024
	Rear Floorpan Above Axle	Y	G22926	Endevco	09/27/2024
	Rear Floorpan Above Axle	Z	G24035	Endevco	09/27/2024

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	G22621	Endevco	12/17/2024
MDB Center of Gravity	Y	A374224	Measurement Specialties	12/17/2024
MDB Center of Gravity	Z	A431195	Measurement Specialties	12/17/2024
Left Frame at Rear Axle Centerline	X	G23827	Endevco	12/16/2024
Left Frame at Rear Axle Centerline	Y	G23844	Endevco	12/16/2024