REPORT NUMBER: SINCAP-CAL-25-006

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

Volkswagen De Mexico S.A. DE C.V. Mexico
2025 Volkswagen Tiguan
5 Door SUV

NHTSA No: M20255805

PREPARED BY:
CALSPAN CORPORATION
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April 14, 2026

FINAL REPORT

PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
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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 Volkswagen Tiguan 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 July 23, 2025.

The impact velocity of the Moving Deformable Barrier (MDB) was 62.06 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 163 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	117.927
Maximum Thorax Rib Deflection	mm	44	13.338
Total Abdominal Force	N	2500	487.008
Pubic Symphysis Force	N	6000	1356.311
Lower Spine (T12) Resultant Acceleration	G	82*	22.434
Measurement Description	**Passenger ATD (SID-IIs)**		
	Units	**IARV**	**Result**
Head Injury Criteria (HIC36)		1000	202.772
Maximum Thorax Rib Deflection	mm	38*	24.389
Lower Spine (T12) Resultant Acceleration	G	82	38.777
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2014.380
Maximum Abdominal Rib Deflection	mm	45*	18.814

**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 New Car Assessment Program (NCAP) Side Impact MDB ES-2re SID-IIs	***18. Distribution Statement*** 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 Volkswagen Tiguan 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 Volkswagen Tiguan 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 62.06 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 July 23, 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	117.927
Maximum Thorax Rib Deflection	mm	44	13.338
Total Abdominal Force	N	2500	487.008
Pubic Symphysis Force	N	6000	1356.311
Lower Spine (T12) Resultant Acceleration	G	82*	22.434

Measurement Description	Passenger ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC36)		1000	202.772
Maximum Thorax Rib Deflection	mm	38*	24.389
Lower Spine (T12) Resultant Acceleration	G	82	38.777
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2014.380
Maximum Abdominal Rib Deflection	mm	45*	18.814

**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	Yes	Yes
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 - DG8012

Data Anomalies:

The following channel was questionable for:

- Left B-Pillar Lower Y Acceleration, Exceeded calibration range at 11 ms 16.3 ms
- Left B-Pillar Middle Y Acceleration, Exceeded calibration range at 14.7 ms
- Left Rear Seat Track/Structure Y Acceleration, Exceeded calibration range at 15.2 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 Systems 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 Volkswagen Tiguan 5 Door SUV
NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test
Test Date: 07/23/2025

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20255805
Model Year	2025
Make	Volkswagen
Model	Tiguan
Body Style	SUV
VIN	3VVCR7RM8SM007541
Body Color	Pyrite Silver Metallic
Odometer Reading (km/mi)	615 mi.
Engine Displacement (L)	2.0
Type / No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	8-Speed
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	Yes
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	No
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	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	Yes
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	Volkswagen De Mexico S.A. DE C.V. Mexico
Date of Manufacture	04/25
Vehicle Type	MPV

GVWR (KG)	2160
GAWR Front (KG)	1140
GAWR Rear (KG)	1070

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)				435	(A)
DSC x 68.0 kg				340	(B)
Cargo Weight (RCLW) (kg)				95	(A-B)

VEHICLE SEAT TYPE

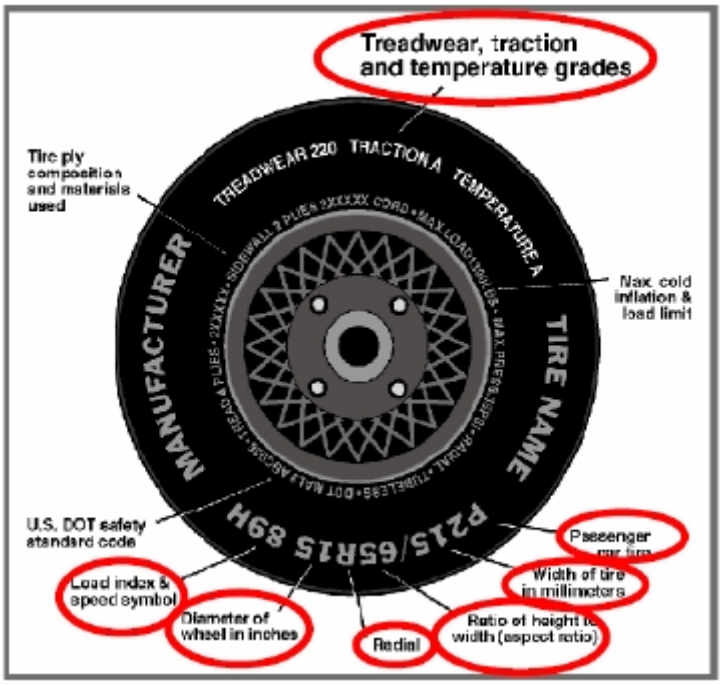
Seating Location	Type Of Seat Pan				Type Of Seat Back		
	Bucket	Bench	Split Bench	Contour	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front	X					X	
Rear or Second Row Seat			X		X		
Third Row Seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025

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)	260	260
Recommended Tire Size	215/65R17	215/65R17
Tire Size on Vehicle	215/65R17	215/65R17
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Ecopia H/L 422 Plus	Ecopia H/L 422 Plus
Treadwear	700	700
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 polyester	2 polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	99H	99H
Tire Material	Rubber	Rubber
DOT Safety Code Left	IV6 E3ECII 0425	IV6 E3ECII 0425
DOT Safety Code Right	IV6 E3ECII 4924	IV6 E3ECII 4924

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

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV | NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test | Test Date: 07/23/2025

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	255	248	242	253
Tire Placard	kPa	260	260	260	260
Owner's Manual	kPa	260	260	260	260
As Tested	kPa	260	260	260	260

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	490	325		507	436		532	425	
Right	kg	477	334		518	380		483	409	
Ratio	%	59.5	40.5		55.7	44.3		54.9	45.1	
Totals	kg	967	659	1626	1025	816	1841	1015	834	1849

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1626	(A)
Actual Weight of 2 P572V (ES-2re and SID-IIs) ATDs Used	kg	127	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	95	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1848	(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	824	828	Yes
RF	mm	830	833	Yes
RR	mm	845	844	Yes
LR	mm	838	837	Yes
Vehicle CG (Aft of Front Axle)	mm	1235	1257	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	+19	+28	

****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 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Truck carpeting	11
Spare Tire	16
Jack	2
Ballast / Equipment Added	56

TEST SURFACE MARKINGS

	Distance from 63° Impact Location Line (mm)
Fore 25 mm target	910
Aft 25 mm target	912
Pre-Impact Angle Line	233

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 SYSTEMS DATA

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025

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	16.6	12.5	14.6
Front Passenger Seat	16.8	12.4	14.6
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	14.6	14	Max	-	-	-
			Mid	-	-	-
			Min	13	14	15
Front Passenger Seat	14.6	16	Max	-	-	-
			Mid	-	-	-
			Min	15	16	17
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 SYSTEMS DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test
Test Date: 07/23/2025

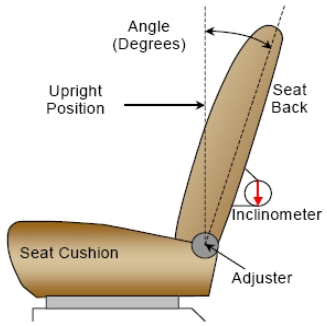
SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	254	40 (0-39)	130	20
Front Passenger Seat	213	34 (0-33)	103	17
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	63.7	32	15.1	8
Front Passenger Seat	64.7	32	15.1	8
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 SYSTEMS DATA

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025

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	Fixed	Fixed

HEAD RESTRAINT ADJUSTMENT

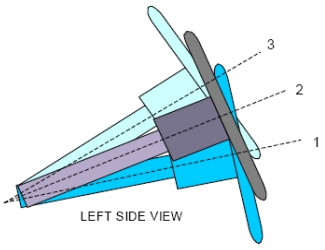
The driver's head restraint is adjusted to the highest and most full forward in-use position. The struck-side rear passenger's head restraint is adjusted to the lowest and most full forward in-use position.

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

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	23.9	
Geometric center - Position No. 2	26.6	
Uppermost - Position No. 3	29.2	
Telescoping Steering Wheel Travel		70
Test Position	26.7	35

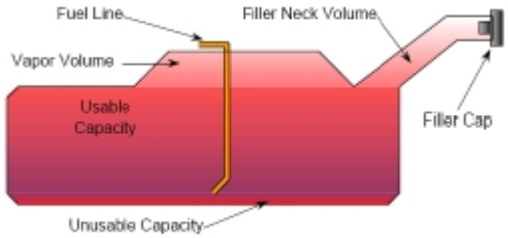


STEERING COLUMN ASSEMBLY

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 SYSTEMS DATA

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025

FUEL TANK CAPACITY

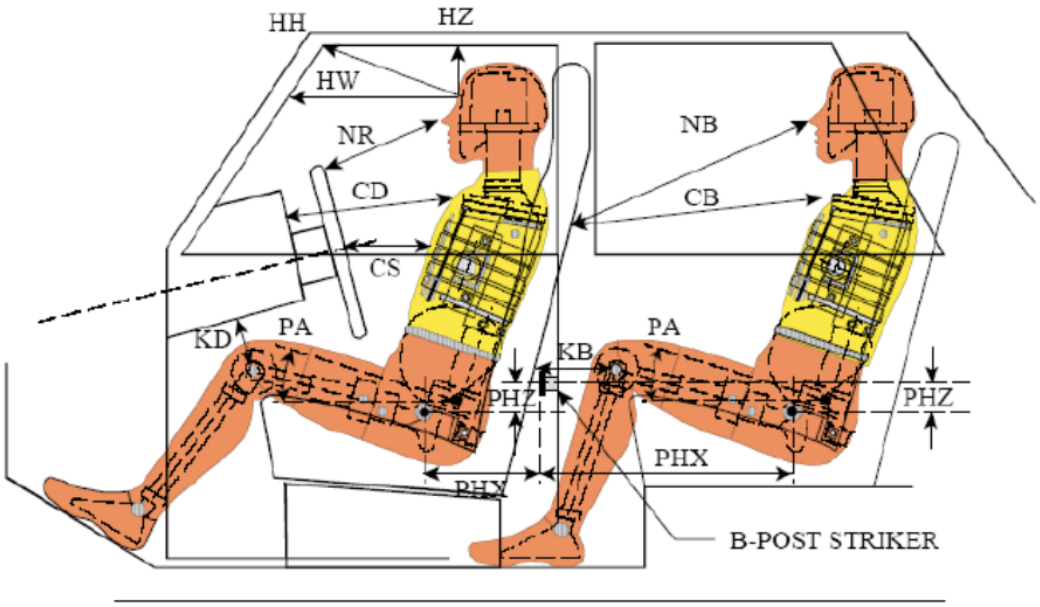
Description	Liters
Usable Capacity of “Standard Tank” (see Form No. 1)	55
Usable Capacity of “Optional Tank” (see Form No. 1)	N/A
Usable Capacity of “Standard Tank” (see Owner’s Manual)	55
Usable Capacity of “Optional Tank” (see Owner’s Manual)	N/A
93% of Usable Capacity	51.15
Actual Amount of Solvent Used in Test	51.15
1/3 of Usable Capacity	18.3

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 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION



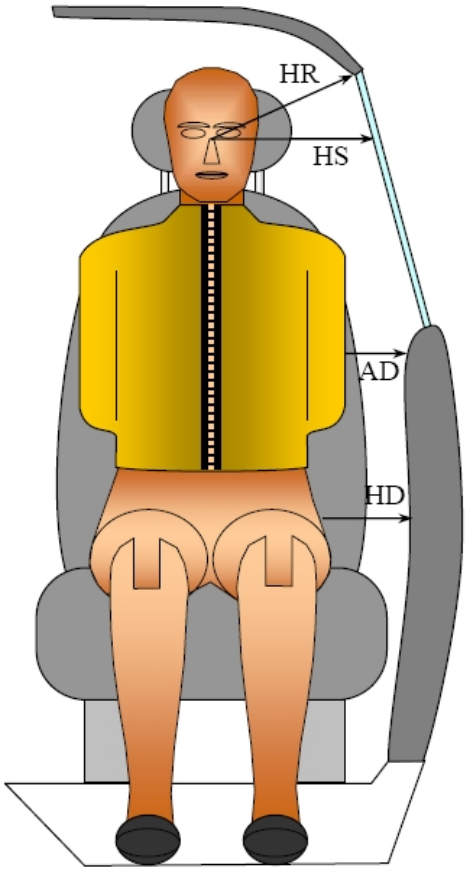
LEFT SIDE VIEW

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. DG8012)	
			Length (mm)	Angle (°)	Length (mm)	Angle (°)
HH		Header to Header	392			
HW		Header to Windshield	610			
HZ	HZ	Head to Roof Liner	182		340	
NR	NB	Nose to Rim/Seat Back	431		697	
CD	CB	Chest to Dash/Seat Back	627		710	
CS		Chest to Steering Wheel	387			
KD(L)/KDA(L)°	KB(L)/KBA(L)°	Left Knee to Dash/Seat Back	206	27.2	365	8.4
KD(R)/KDA(R)°	KB(R)/KBA(R)°	Right Knee to Dash/Seat Back	201	21.5	366	8.5
PAX°	PAX°	Pelvic Tilt Angle X		17.5		25.95
	PAY°	Pelvic Tilt Angle Y				0.2
PHX	PHX	Hip Point to Striker (X-Axis)	181		252	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	203		249	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



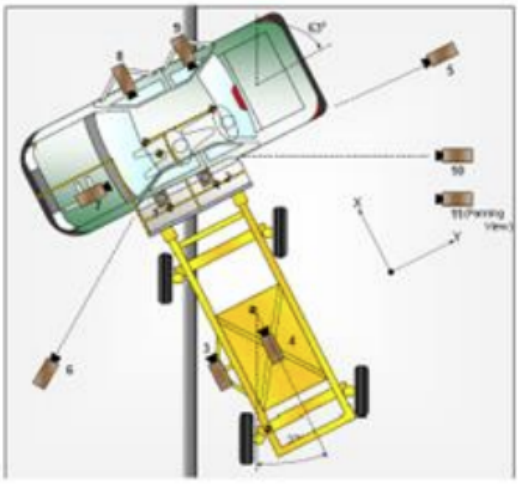
FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver (Serial No. F033)	Left Rear Passenger (Serial No. DG8012)
HR	Head to Side Header	mm	221	285
HS	Head to Side Window	mm	345	360
AD	Arm to Door	mm	111	173
HD	Hip Point to Door	mm	158	174

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test
Test Date: 07/23/2025



CAMERA LOCATIONS AND DATA

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Overhead Overall	-393	0	-9220	12.5	1000
2	Overhead Close-up	0	0	-9220	28	1000
3	Left Impact Point (MDB)	-1470	0	-847	25	1000
4	Side Overall (MDB)	-1140	878	-1587	8	1000
5	Rear	412	8042	-1451	28	1000
6	Left Front	-2679	-5015	-1332	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.*

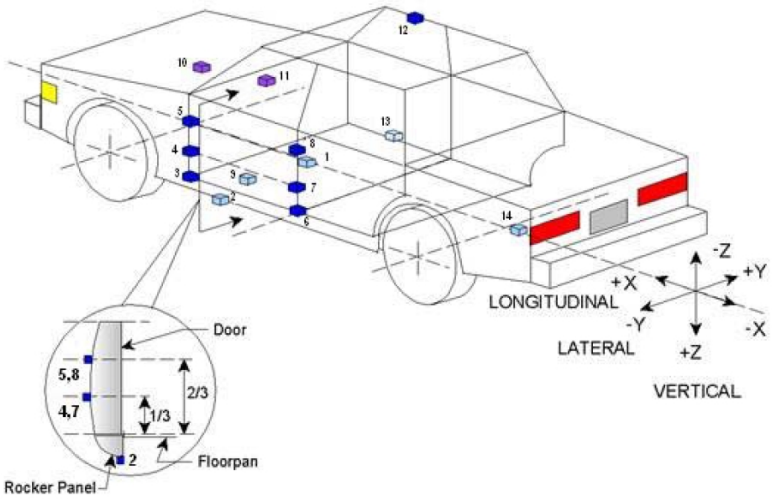
If applicable, explain why camera(s) did not operate as intended: All cameras operated as intended.

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 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



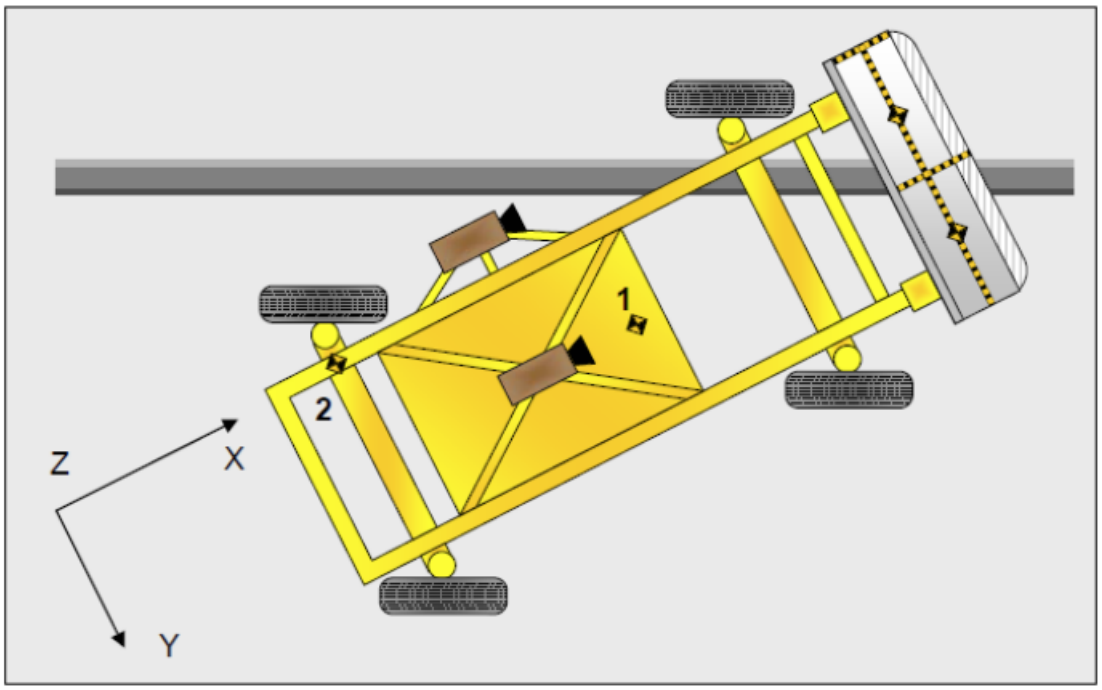
TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2425	11	-38
2	Right Sill at Front Seat	2821	659	145
3	Right Sill at Rear Seat	1834	660	129
4	Left Sill at Front Door	2809	-658	141
5	Left Sill at Rear Door	1829	-659	133
6	A-Post Lower	3220	-646	-100
7	A-Post Middle	3157	-655	-618
8	B-Post Lower	2149	-684	-247
9	B-Post Middle	2122	-667	-507
10	Front Seat Track	2483	-592	108
11	Rear Seat Structure	1674	-637	12
12	Rt. Rear Occ. Compartment	2081	378	247
13	Engine Block	3900	326	-291
14	Rear Above Axle	893	4	43

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 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



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): 1486

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV | NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test | Test Date: 07/23/2025

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	Side Header	Curtain Airbag
Left Side of Head	Curtain Airbag & Side Header	Curtain Airbag
Back of Head	Side Header & Head Restraint	Head Restraint & Seatback
Left Shoulder	Seatbelt & Door Trim	Torso/Pelvis Airbag, Seat back & Door Trim
Upper Torso	Torso/Pelvis Airbag & Seatback	Torso/Pelvis Airbag & Seatback
Lower Torso	Torso/Pelvis Airbag & Seatback	Torso/Pelvis Airbag & Seatback
Left Hip	Torso/Pelvis Airbag & Seat Pan	Torso/Pelvis Airbag, Seat Pan & Door Trim
Left Knee	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	B-Pillar & C-Pillar Buckled
Sill Separation	None
Windshield Damage	None
Side Window Damage	Driver & Rear Passenger windows shattered
Other Notable Effects	None

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

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test Test Date: 07/23/2025

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	Yes	Yes
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		2787
Vertical Impact Reference Line (Aft of Front Axle - Intended Impact Point)	mm		454
Actual Impact Point (Aft of Frontal Axle)	mm		432
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+22
Vertical Offset (+ down / - up)	mm	+/- 20 of Intended Impact Point	-2

DATA SHEET NO. 9
MDB SUMMARY OF RESULTS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test
Test Date: 07/23/2025

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

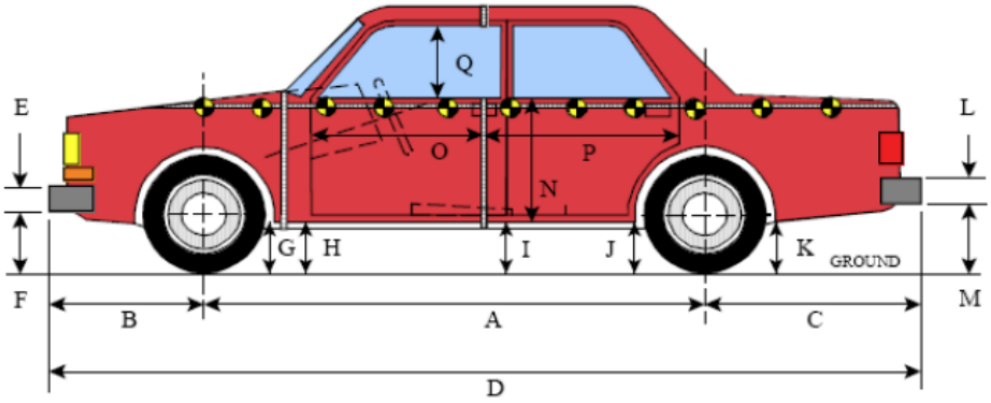
Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.10 to 62.70	62.06
Trap No. 2 Velocity (Redundant)	km/h	61.10 to 62.70	62.09
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0
MDB Forward Line of Motion to Target Vehicle CL	degrees	62.5 to 63.5	63.0
MDB Crabbed angle 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	Left	244
B	Top of Bumper	533	200	Right	177
C	Mid-Level	686	100	Right	155
D	Top of Stack	813	800	Left	169

DATA SHEET NO. 10
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



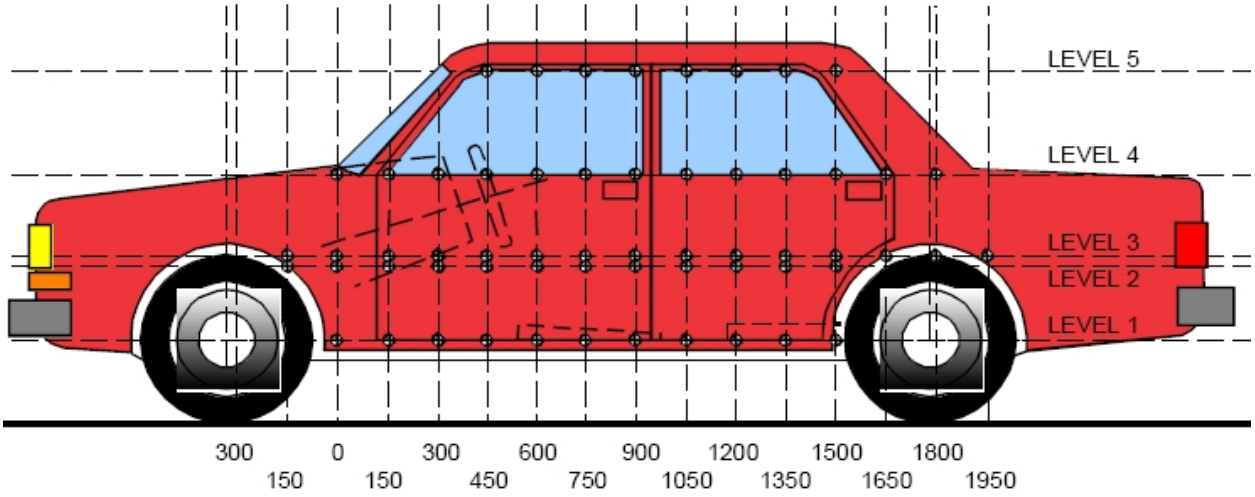
LEFT SIDE VIEW
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code.	Measurement Description	Pre-Test	Post-Test	Change
A	Wheelbase	2787	2803	16
B	Front Axle to FSOV	956	940	-16
C	Rear Axle to RSOV	945	941	-4
D	Total Length at Centerline	4684	4684	0
E	Front Bumper Thickness	115	115	0
F	Front Bumper Bottom to Ground	458	465	7
G	Sill Height at Front Wheel Well	241	249	8
H	Sill Height at Front Door Leading Edge	244	278	34
I	Sill Height at B Pillar	257	260	3
J1	Sill Height at Rear Wheel Well	262	271	9
J2	Pinch Weld Height at Rear Wheel Well	236	233	-3
K	Sill Height Aft of Rear Wheel Well	261	268	7
L	Rear Bumper Thickness	120	120	0
M	Rear Bumper Bottom to Ground	402	410	8
N	Sill Height to Bottom of Front Window Sill	872	850	-22
O	Front Door Leading Edge to Impact CL	776	758	-18
P	Rear Door Trailing Edge to Impact CL	1406	1383	-23
Q	Front Window Opening	408	408	0
R	Right Side Length	4606	4607	1
S	Left Side Length	4603	4603	0
T	Maximum Vehicle Width	1843	1769	-74
U	Front Wheel Track Width	1578	1577	-1
V	Rear Wheel Track Width	1570	1566	-4

DATA SHEET NO.11
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



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	392	84	1200
2	Driver H-Point	mm	671	154	600
3	Mid-Door	mm	710	163	600
4	Window Sill	mm	1099	58	1800
5	Window Top	mm	1591	4	1500

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 Volkswagen Tiguan 5 Door SUV NHTSA No.: M20255805
Test Program: NCAP Side MDB Impact Test Test Date: 07/23/2025

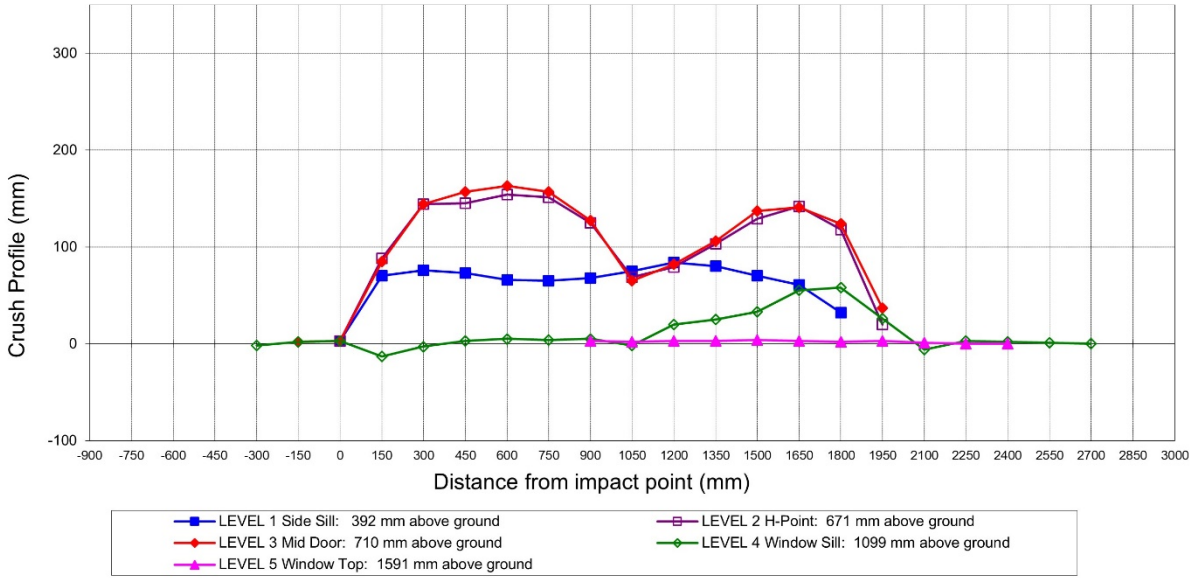
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	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				801					803					-2	
-150			924	812				922	810				2	2	
0	904	918	918	821		901	915	917	818		3	3	1	3	
150	907	910	912	824		837	822	827	837		70	88	85	-13	
300	910	907	910	833		834	763	766	836		76	144	144	-3	
450	913	906	909	836		840	761	752	833		73	145	157	3	
600	914	905	907	836		848	751	744	831		66	154	163	5	
750	916	903	905	837		851	752	748	833		65	151	157	4	
900	917	901	903	839	607	849	776	776	834	604	68	125	127	5	3
1050	915	898	899	841	622	840	829	834	843	620	75	69	65	-2	2
1200	914	895	895	843	624	830	816	813	823	621	84	79	82	20	3
1350	912	893	891	843	622	832	790	785	818	619	80	103	106	25	3
1500	908	889	887	842	619	838	760	750	809	615	70	129	137	33	4
1650	901	890	888	841	614	840	748	747	786	611	61	142	141	55	3
1800	896	902	902	854	606	864	784	778	796	604	32	118	124	58	2
1950		908	911	865	597		888	874	839	594		20	37	26	3
2100				863	582				869	581				-6	1
2250				860	562				857	562				3	0
2400				855	527				853	527				2	0
2550				846					845					1	
2700				832					832					0	
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

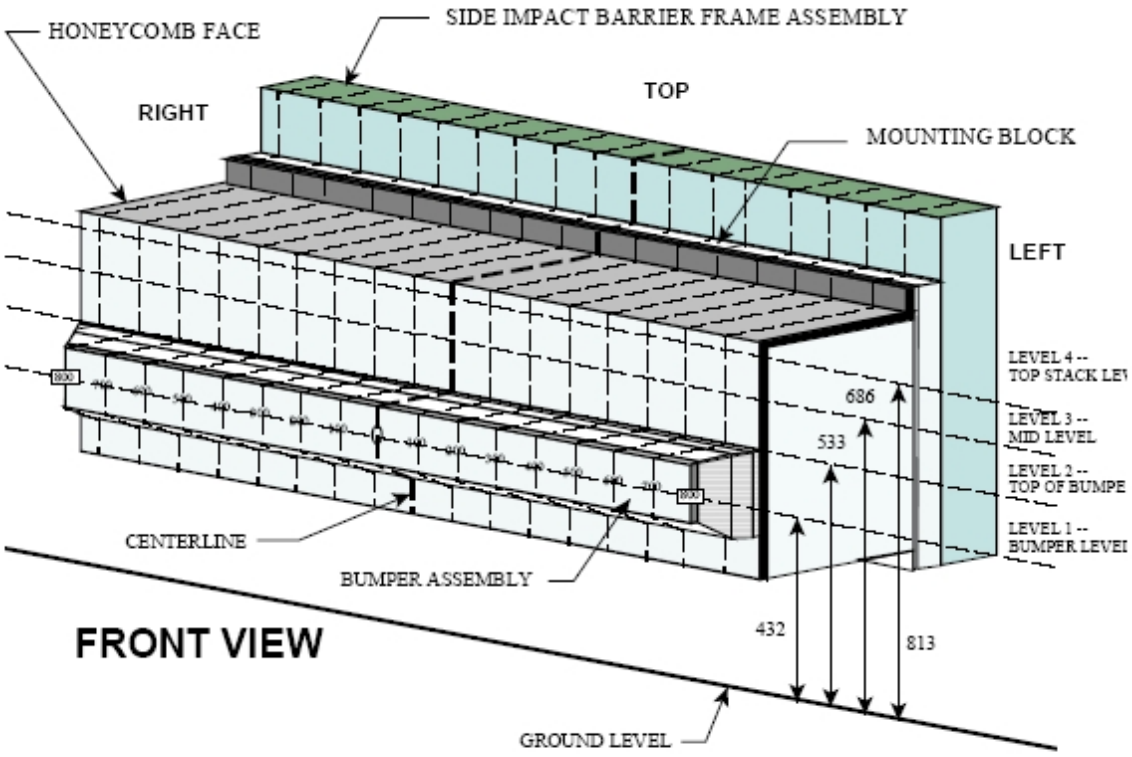
Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO.12
MDB EXTERIOR STATIC CRUSH MEASUREMENTS

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



NOTE: Dimensions are shown in millimeters, mm

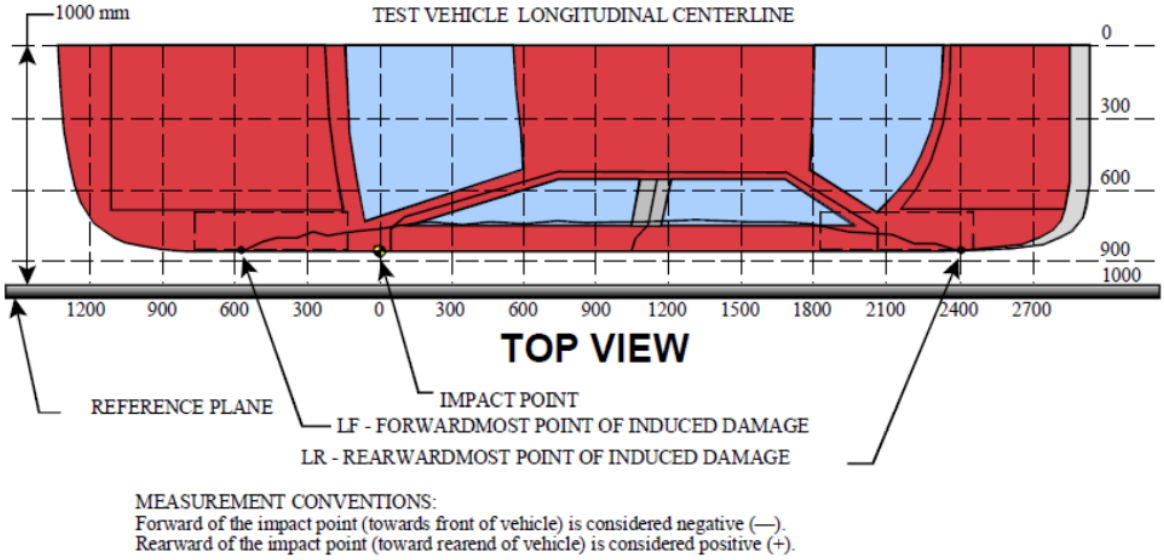
DEFORMABLE BARRIER STATIC CRUSH

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	236	233	229	230	229	230	232	236	231	230	230	229	228	228	228	227	244
2	152	153	153	154	152	154	177	166	144	122	122	117	113	105	93	118	144
3	87	70	66	78	103	121	146	155	111	75	57	52	53	59	70	92	154
4	85	55	52	62	78	109	138	157	126	98	82	66	71	82	92	115	169

DATA SHEET NO.13
VEHICLE AND MDB DAMAGE PROFILE DISTANCE

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025

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	78	76	2
2	270	3	222	90	132
3	690	3	254	94	160
4	1110	3	174	103	71
5	1530	3	251	113	138
6	1950	3	126	89	37

MDB DAMAGE PROFILE DISTANCES

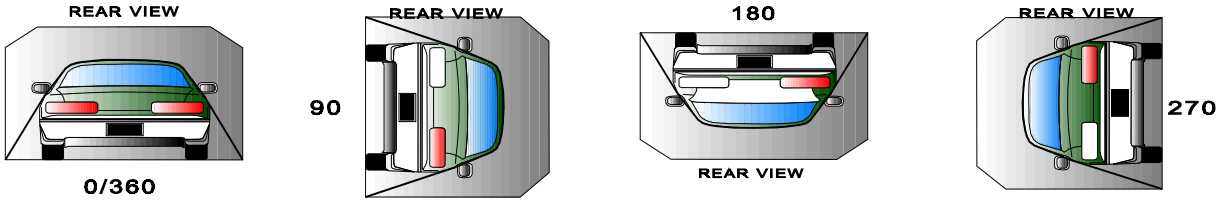
DPD	Distance From Center of MDB	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	800 mm left of center	1	261	505	-244
2	480 mm left of center	1	286	514	-228
3	160 mm left of center	1	284	514	-230
4	160 mm right of center	1	280	513	-234
5	480 mm right of center	1	283	513	-230
6	800 mm right of center	1	265	501	-236

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

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025
Test Time:	11:48 AM	Temperature:	21.0 °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°	65	300	365
180° to 270°	62	300	362
270° to 360°	67	300	367

FMVSS 301 SPILLAGE TABLE

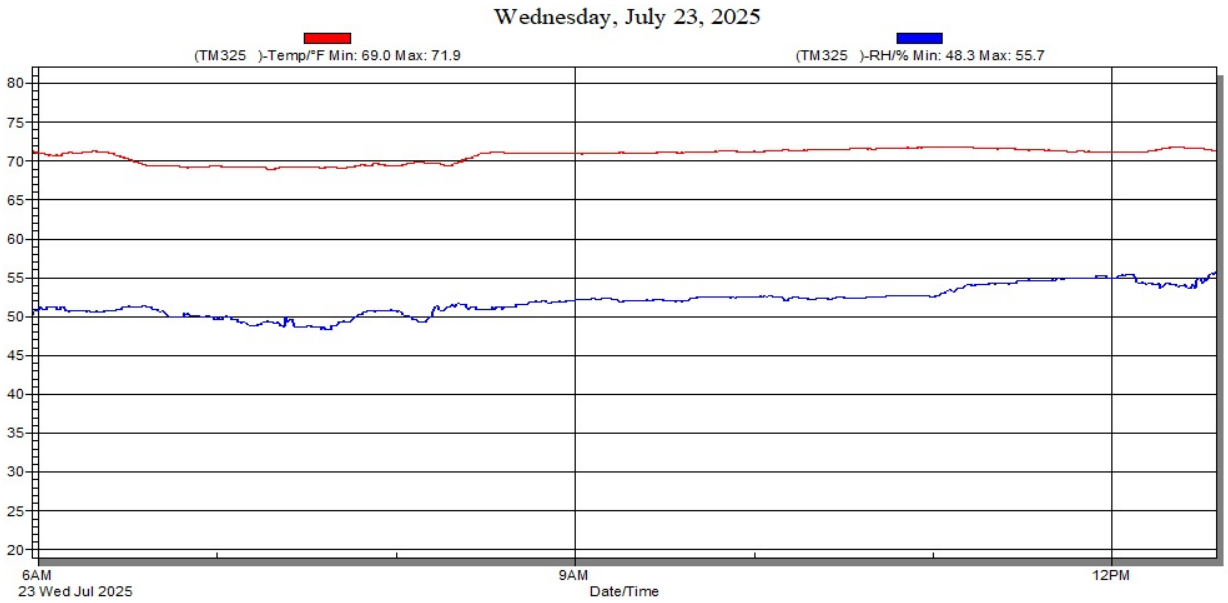
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

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 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255805
Test Program:	NCAP Side MDB Impact Test	Test Date:	07/23/2025



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

APPENDIX A

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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

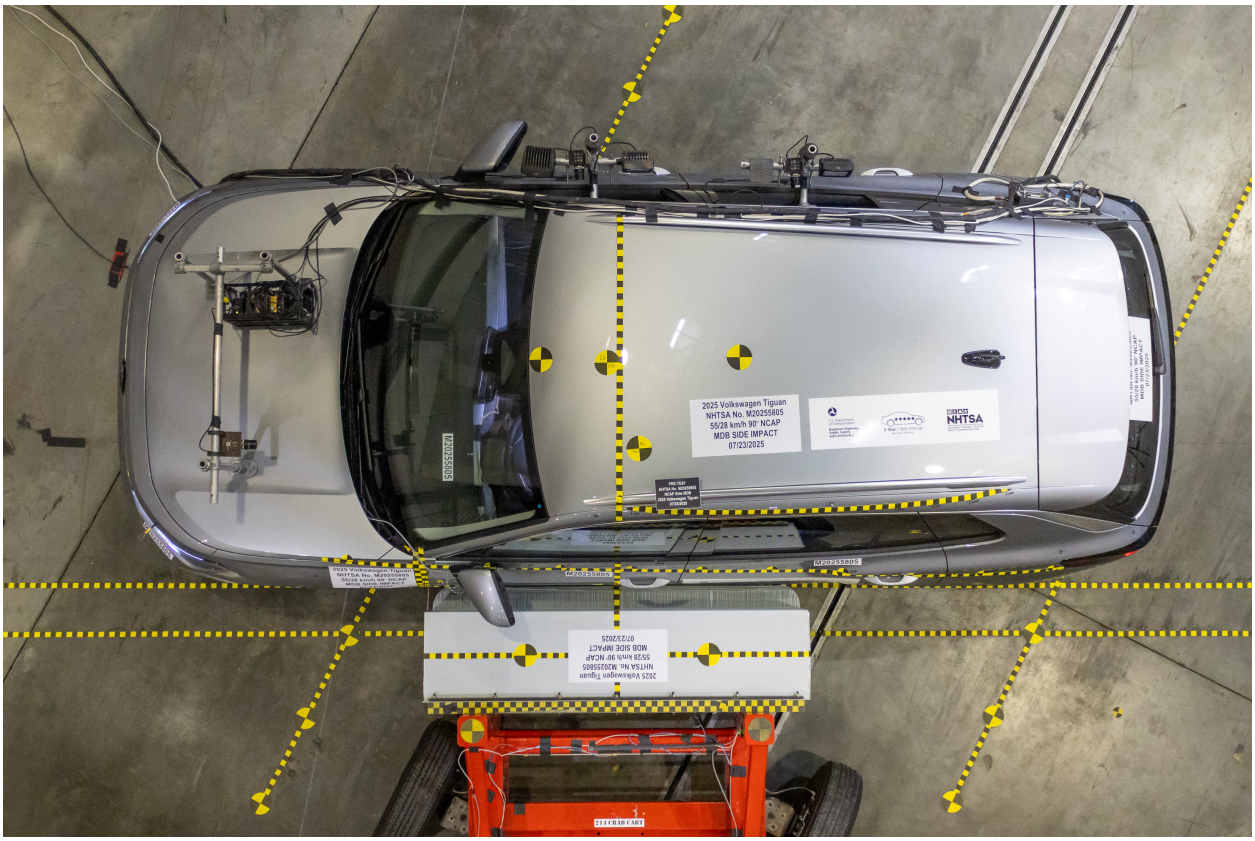

Figure A-15: Pre-Test Overhead View of Test Area

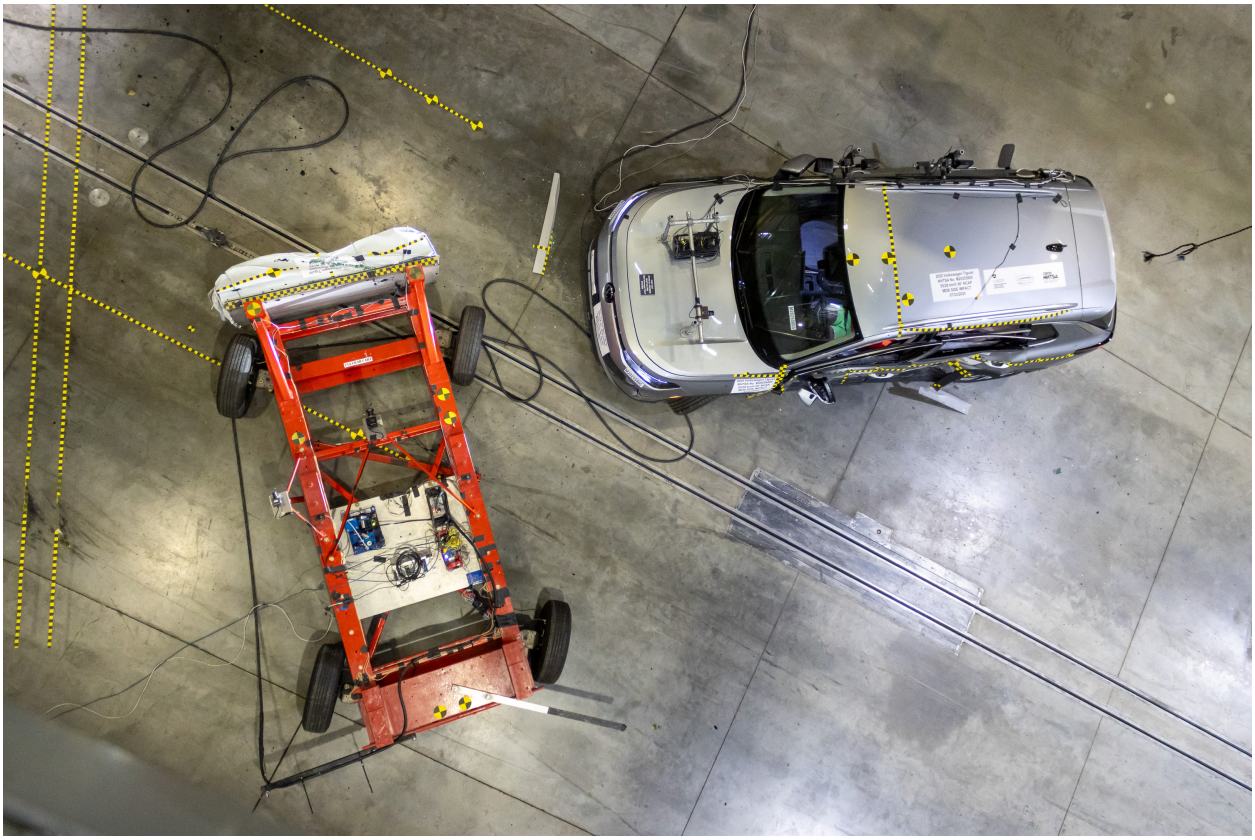

Figure A-16: Post-Test Overhead View of Test Area



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

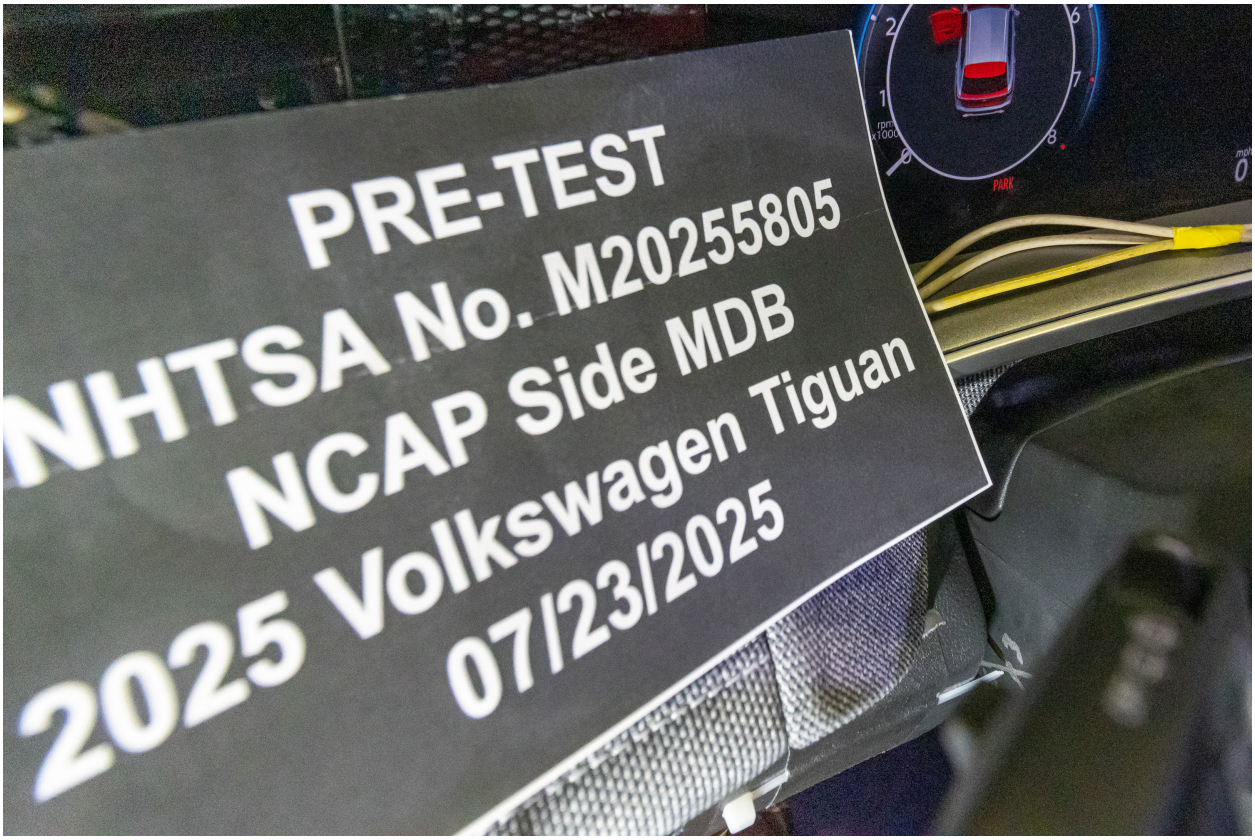

Figure A-38: Pre-Test View of Parking Brake



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 Air bag View



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



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



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



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



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



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



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

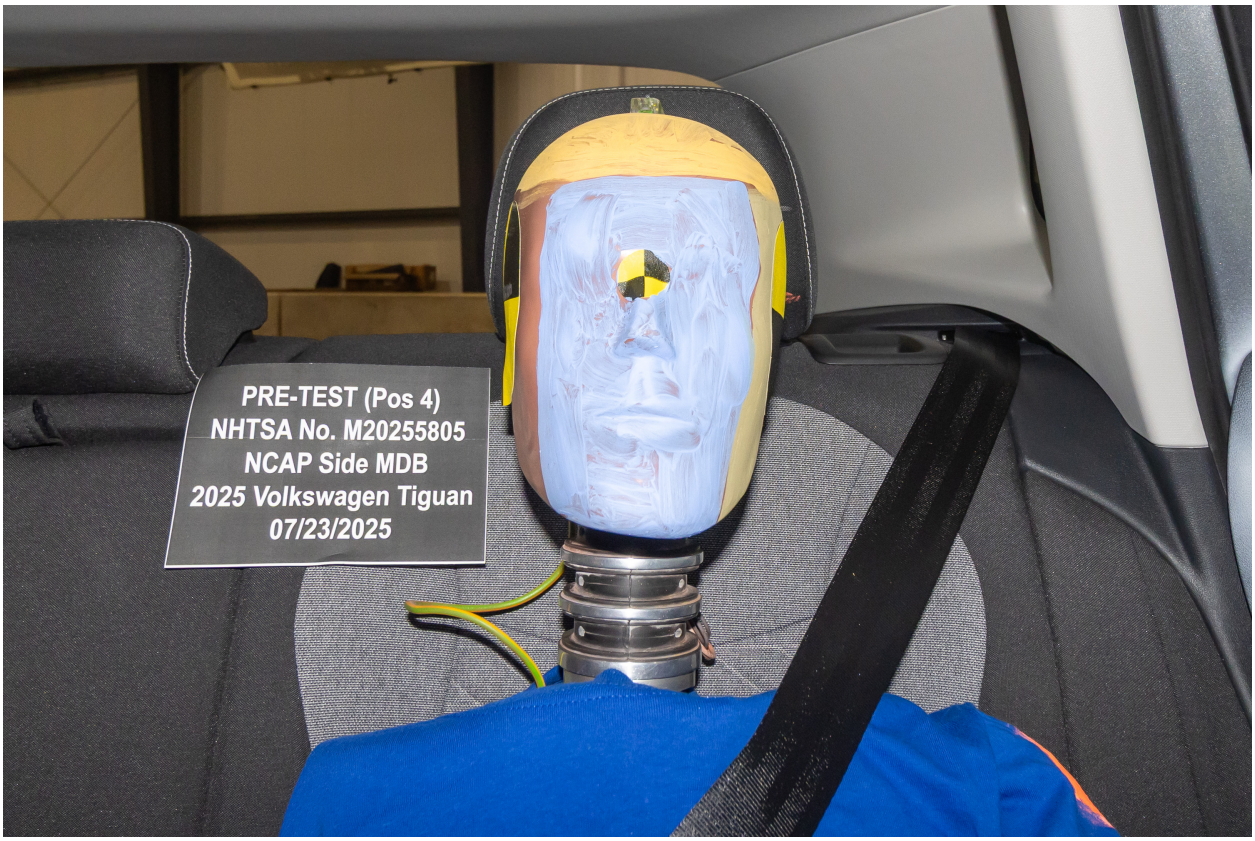

Figure A-59: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

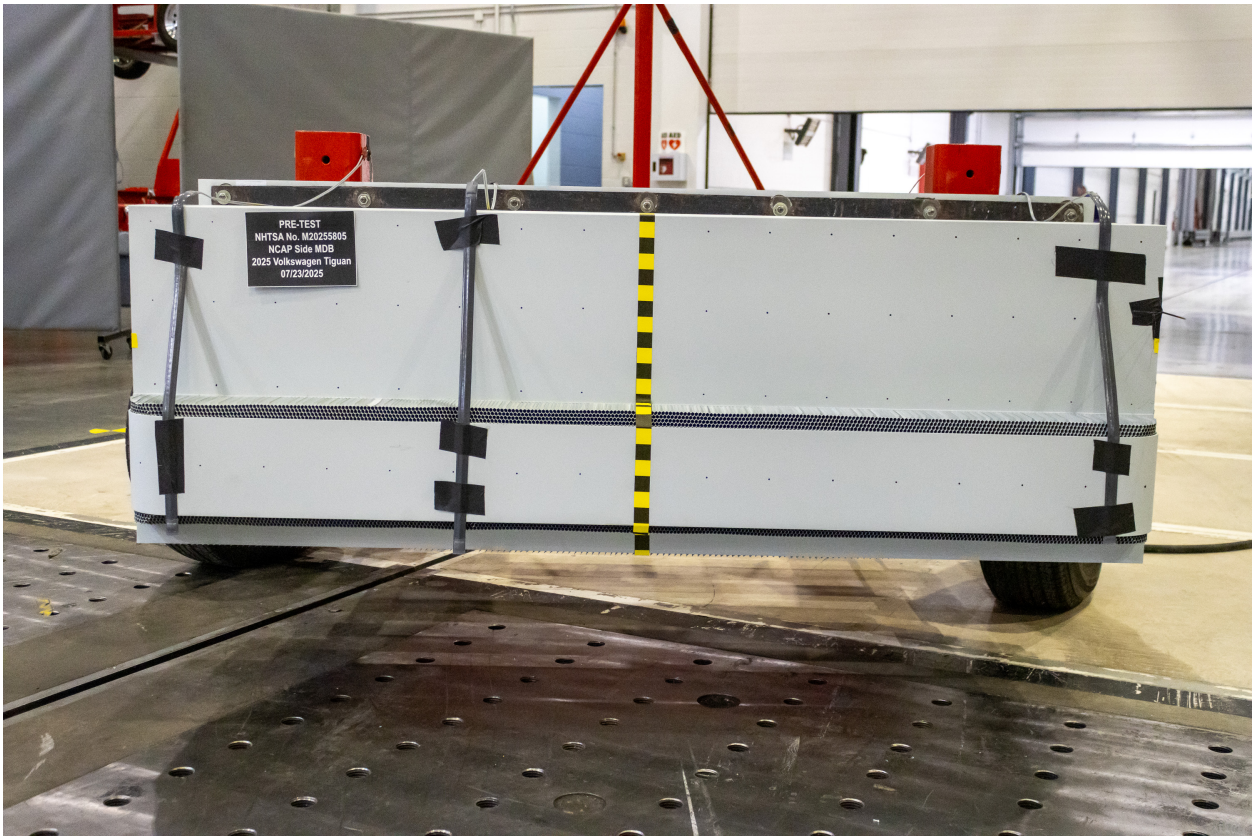

Figure A-84: Pre-Test Front View of MDB Impactor Face



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

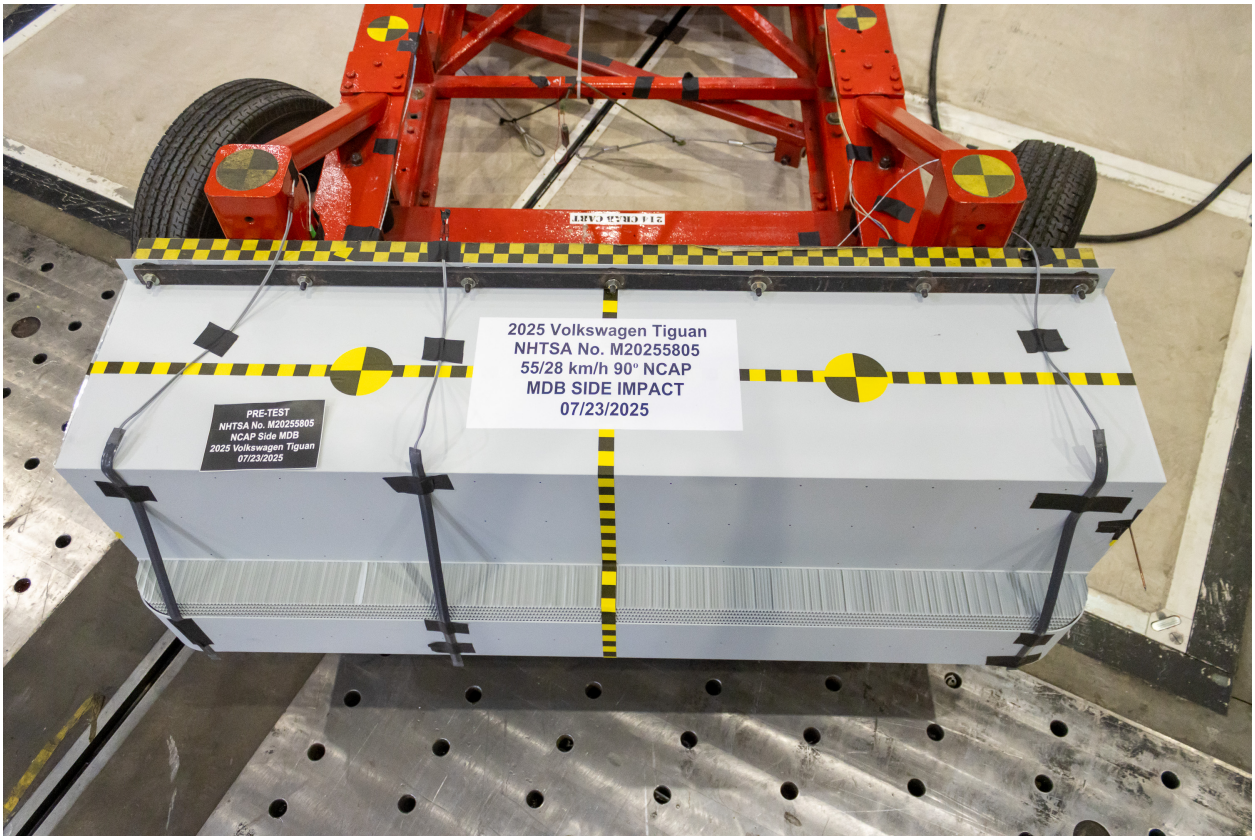

Figure A-86: Pre-Test Top View of MDB Impactor Face

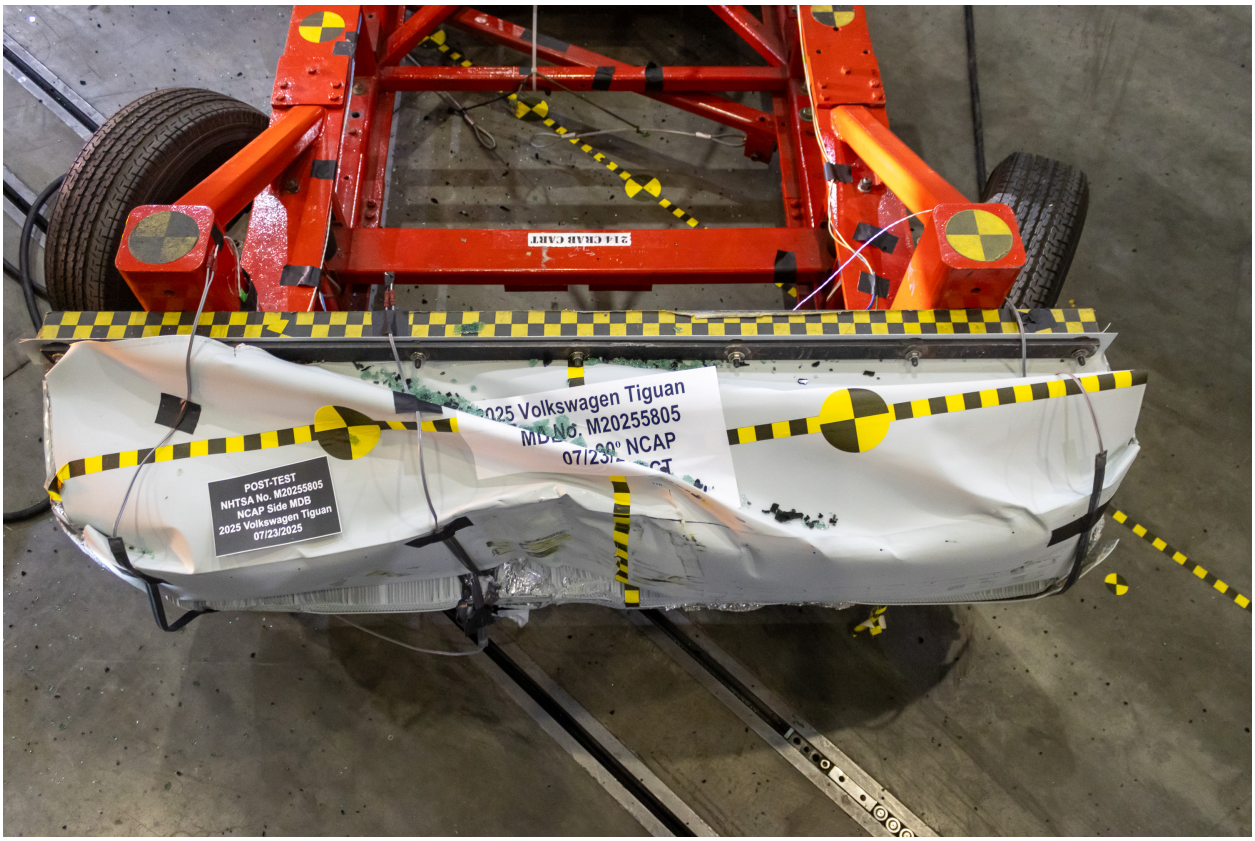

Figure A-87: Post-Test Top View of MDB Impactor Face



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



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

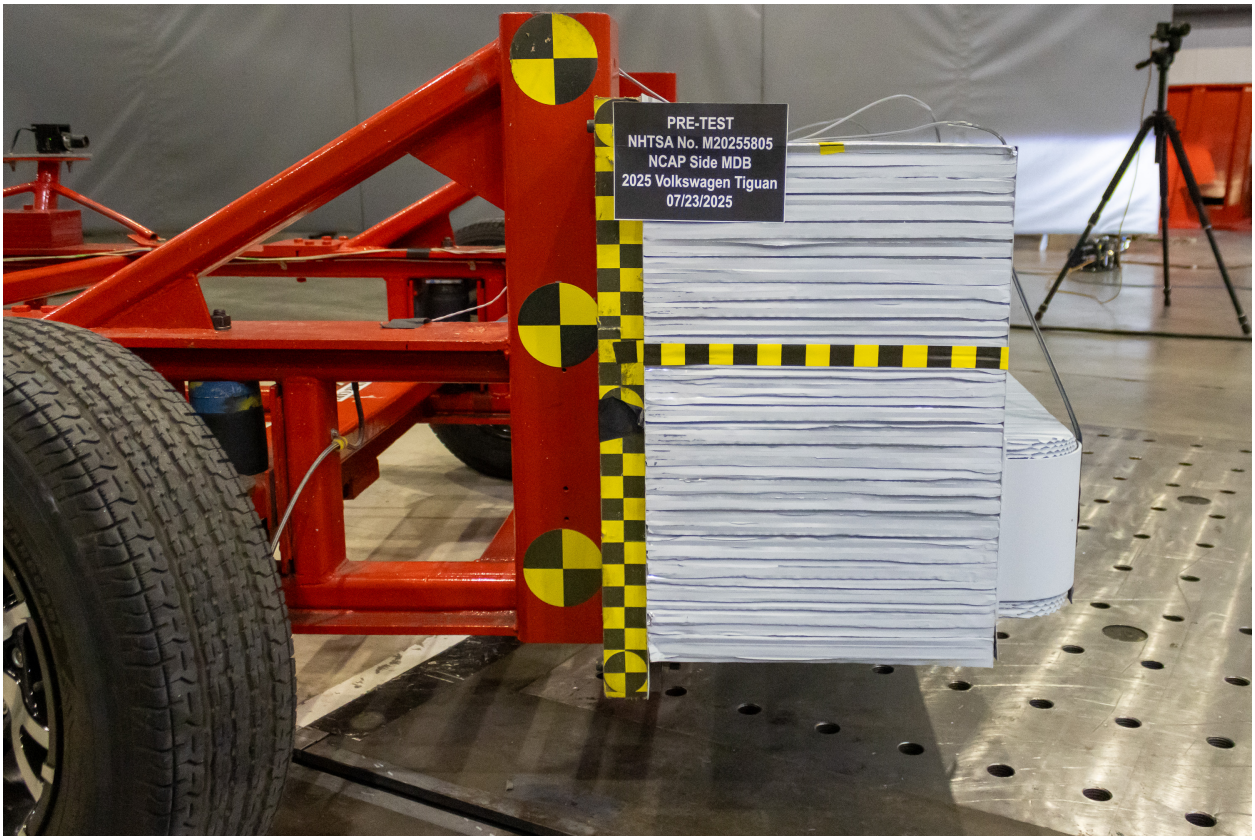

Figure A-90: Pre-Test Right Side View of MDB Impactor Face



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

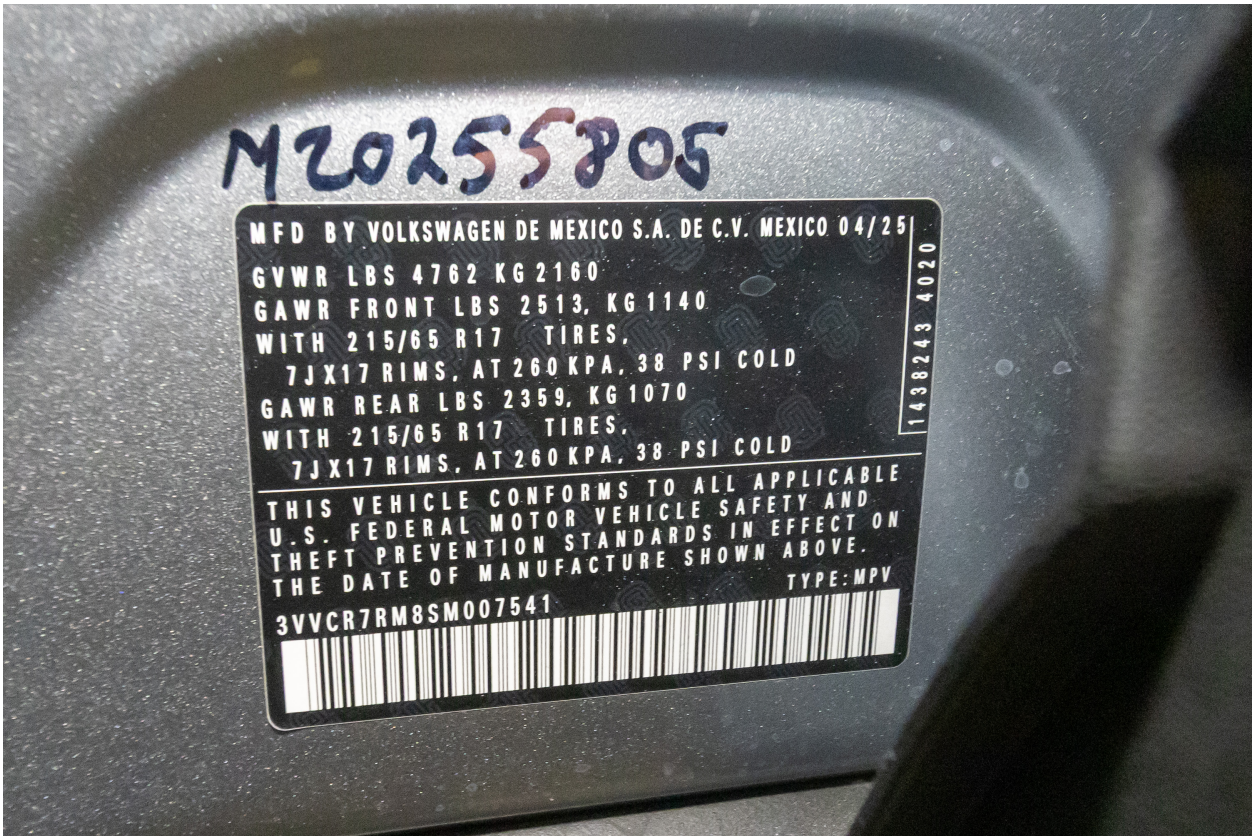

Figure A-92: Close-Up View of Vehicle's Certification Label



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

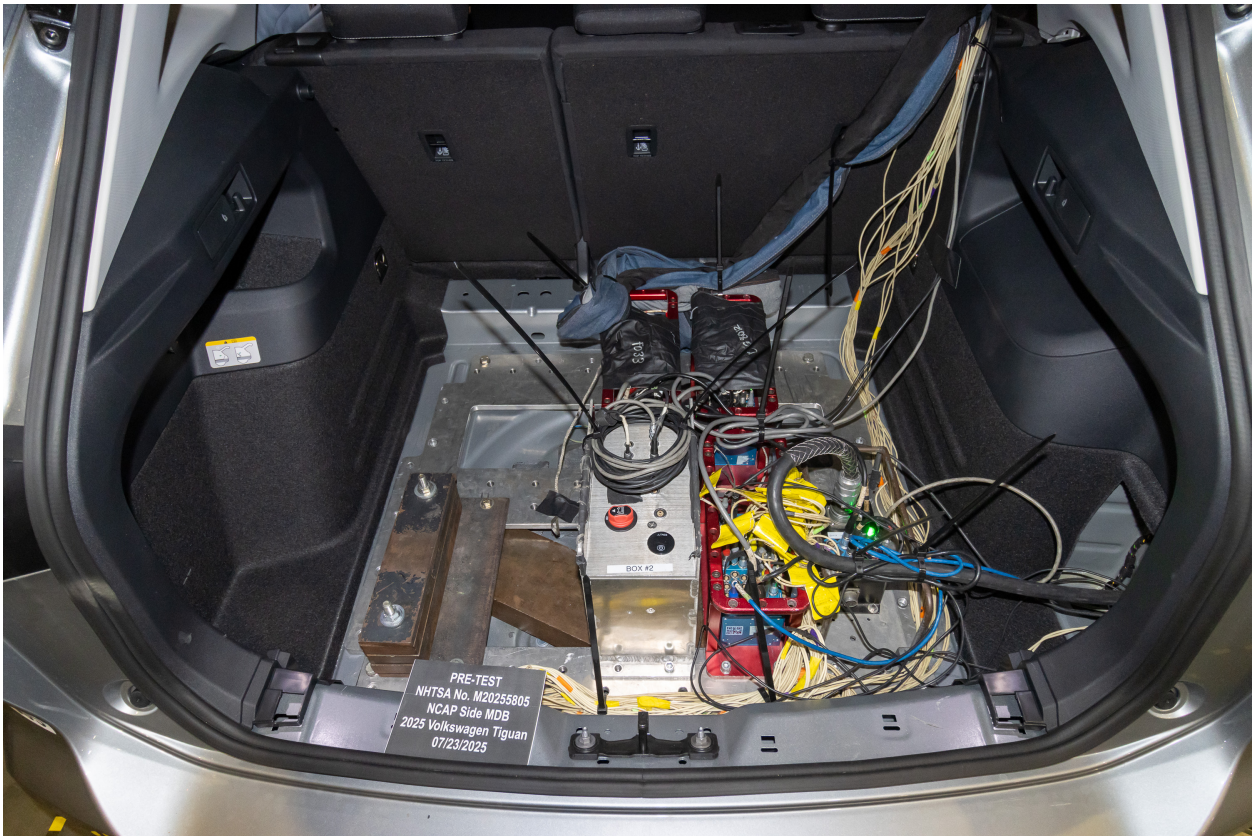

Figure A-94: Pre-Test Ballast View



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



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

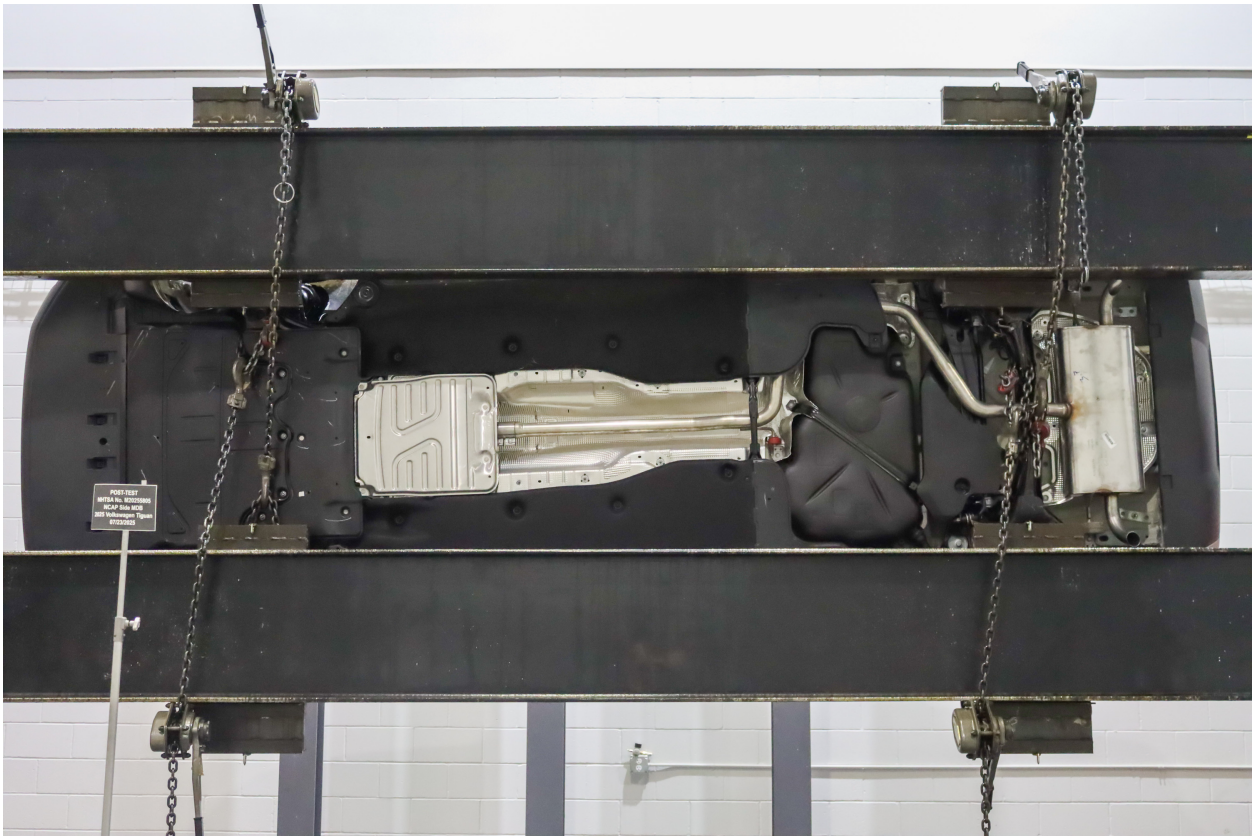

Figure A-97: FMVSS No. 301 Static Rollover 90 Degrees

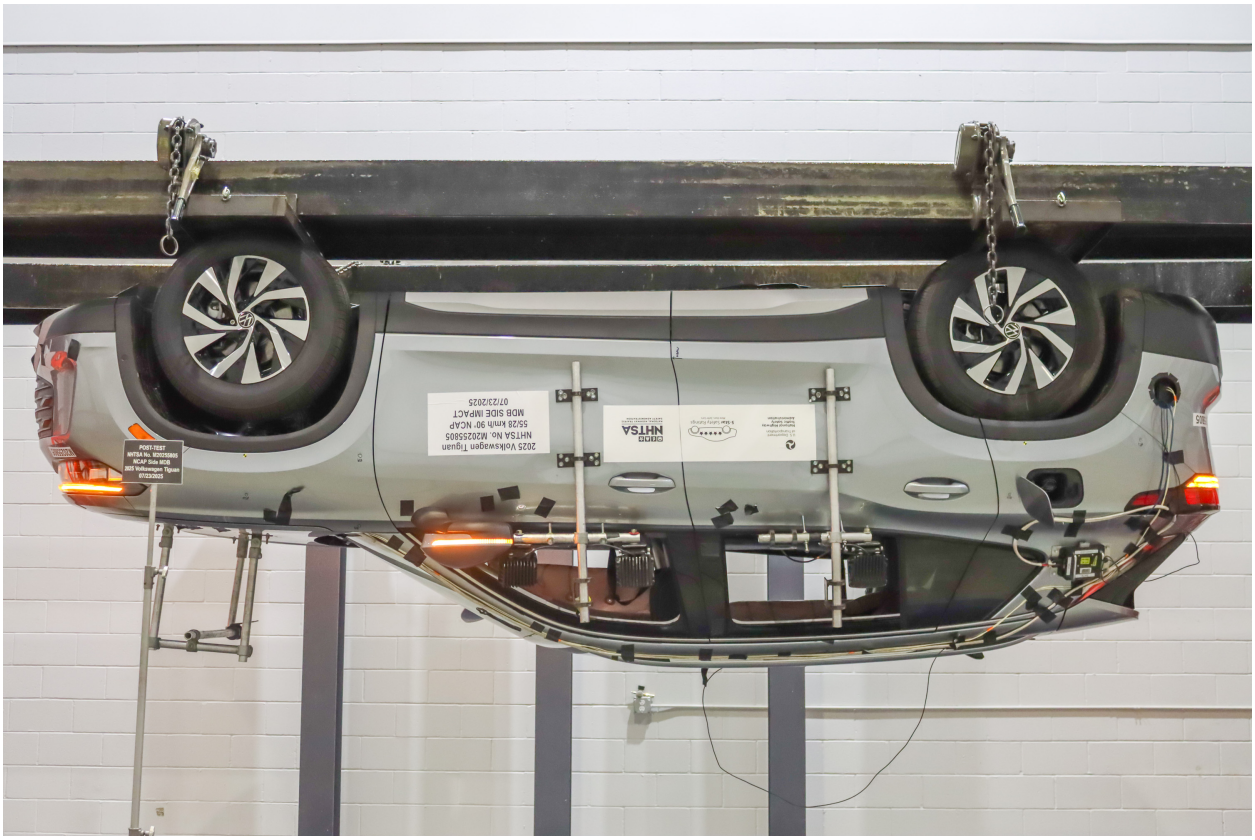

Figure A-98: FMVSS No. 301 Static Rollover 180 Degrees

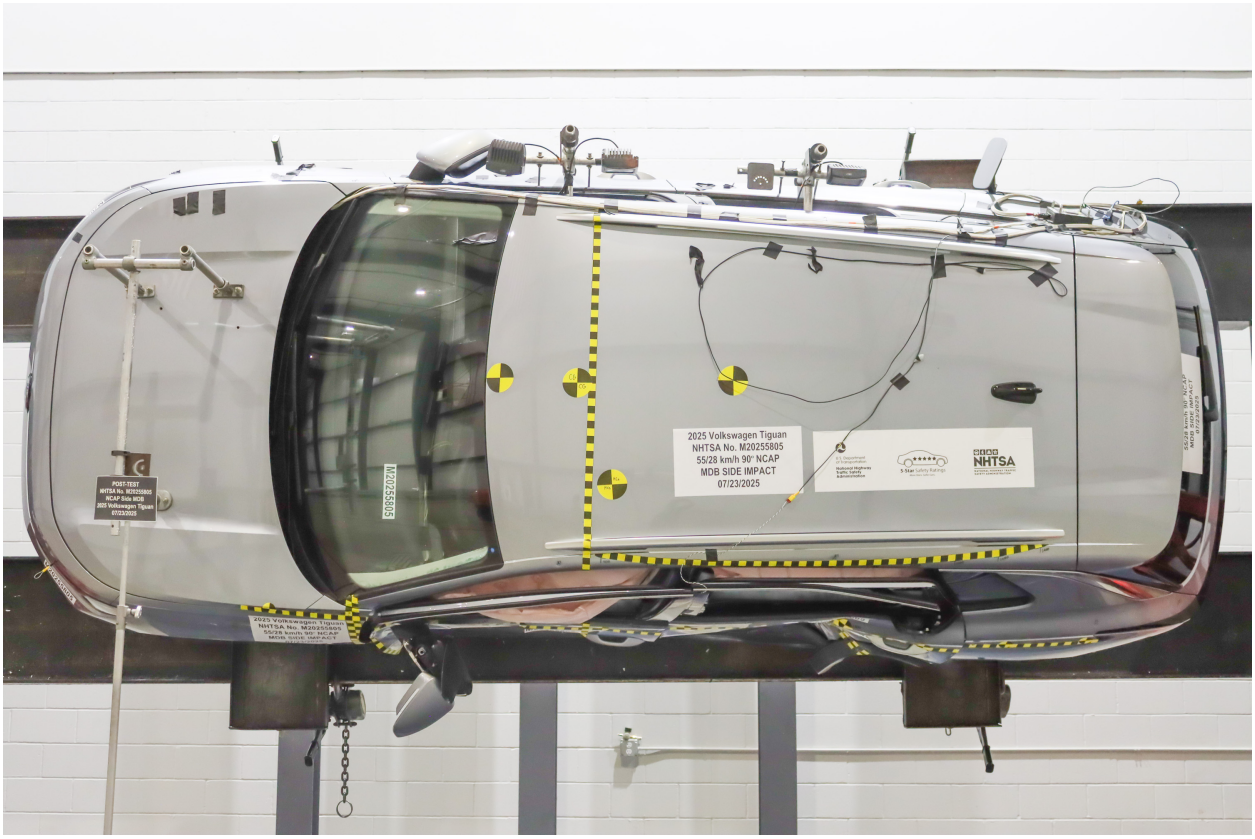

Figure A-99: FMVSS No. 301 Static Rollover 270 Degrees



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

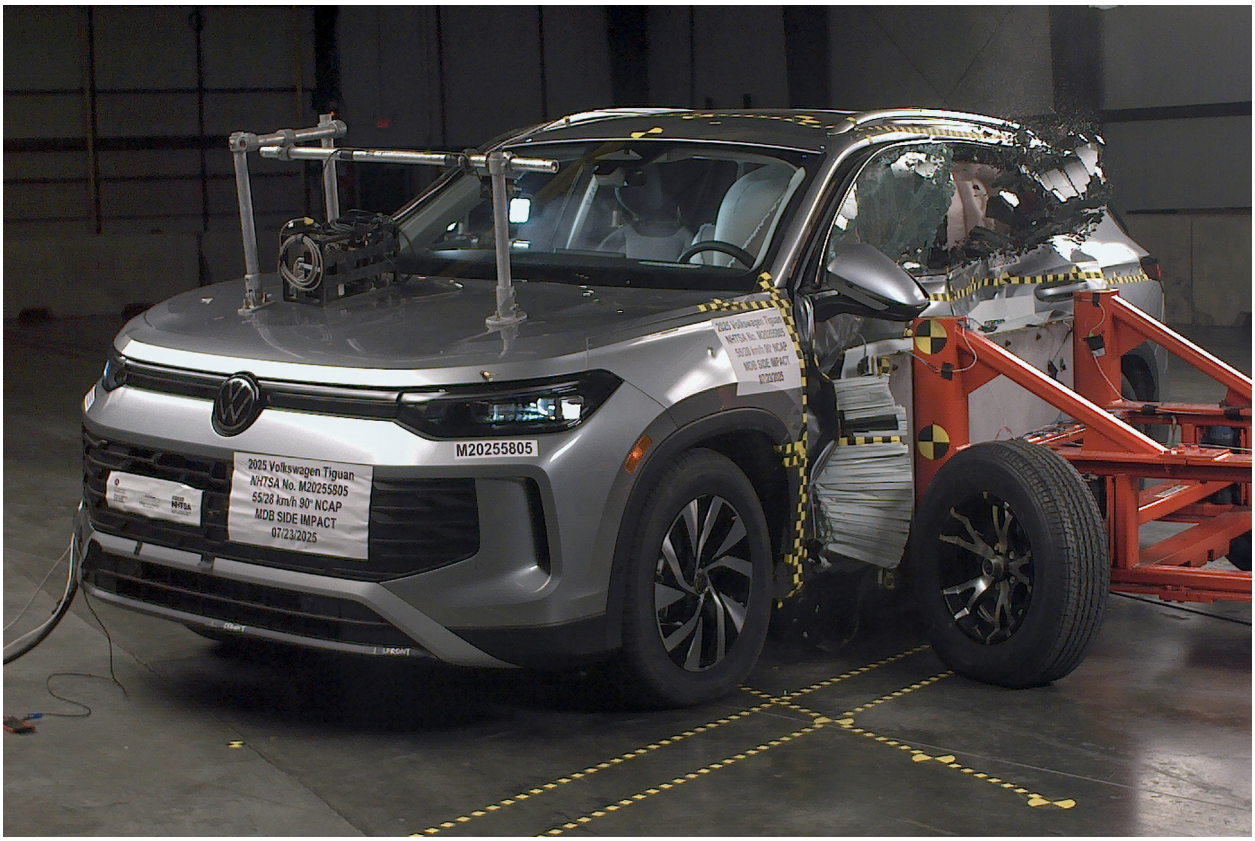

Figure A-101: Impact Event

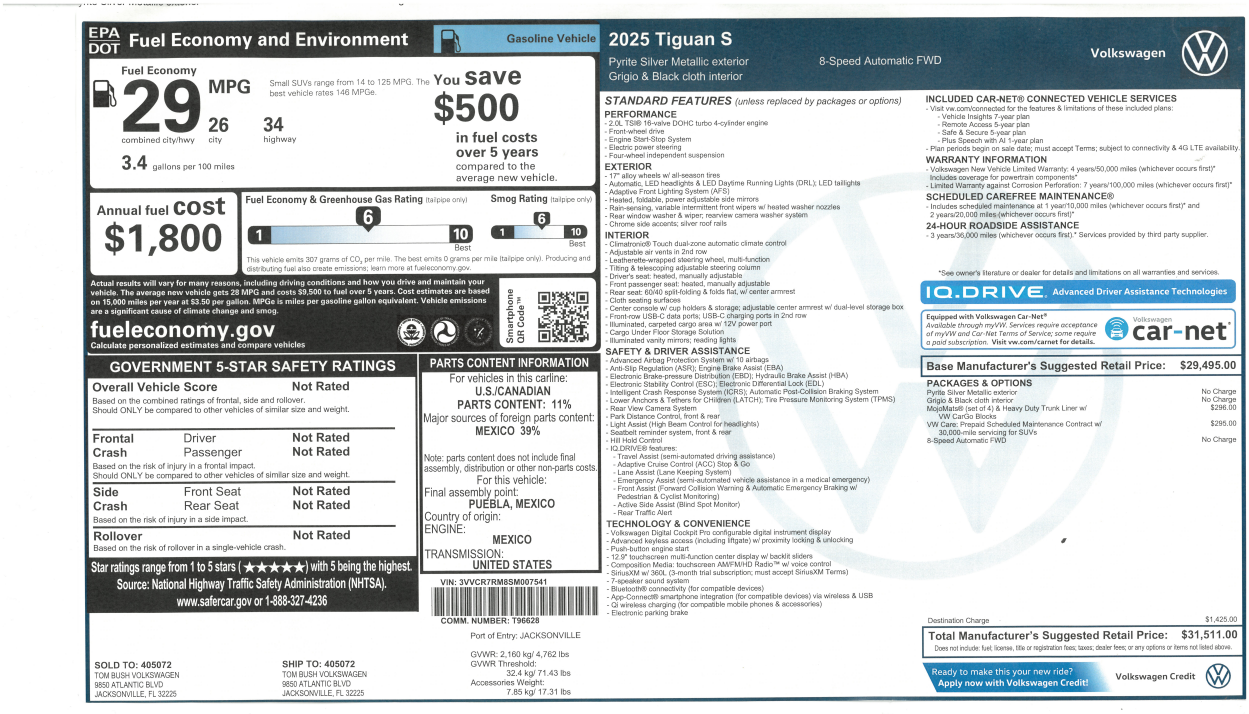

Figure A-102: Monroney Label

Before folding the rear seat backrest forward, always adjust the front seats so that the head restraint or padding on the rear seat backrest does not press against the front seats.

Before folding the rear seat backrest forward, ensure that there are no safety belt buckle tongues in belt buckles.

Before folding the rear seat backrest forward, always take care that there are no objects in its path.

Head restraint adjustment for taller persons

Move the head restraint up all the way.

WARNING

Driving with head restraint that have been removed or adjusted incorrectly increases the risk of serious or fatal injuries in the event of an accident or sudden driving and braking maneuvers.

- If a person is sitting in a seat, always drive with the head restraint correctly installed and adjusted on that seat.
- If a person is sitting in a seat, adjust the head restraint according to their height.
- Never adjust the head restraint while driving.

NOTICE

Removing and fitting the head restraints incorrectly may cause damage.

- When removing and installing the head restraint, make sure the head restraint does not hit the headliner, the front seat backrest, or other vehicle components.

ead restraints

Introduction

e information that follows describes how the head straints can be adjusted and removed. Always ake sure the seats are adjusted to the correct posi- n → page 32.

seats are equipped with head restraints. The head straints are specially approved for the relevant at and should not be installed in another seat in e vehicle.

a seat is occupied, select the correct head restraint tting for the respective head restraint. If a seat is t occupied, the respective head restraint can be shed down as far as it will go.

e center rear head restraint (depending on the ve- cle equipment) is only intended for the center seat the rear bench seat. Therefore do not install this ad restraint in any other position.

ere are notches in the head restraint supports so at they can be locked in different positions. Only ad restraints which are correctly mounted can k into the notches within the adjustable range. To event the head restraints from being removed un- entionally after mounting, there are stops at the p and bottom of the adjustable range.

rrect head restraint adjustment

just the head restraint so that the upper edge of e head restraint is in line with the upper portion of e head as much as possible, but not lower than e level. Position the back of the head as close as ssible to the head restraint.

ad restraint adjustment for shorter persons

de the head restraint all the way down, even if the ad is then below the upper edge of the head re- aint. When the head restraint is in the lowest po- ion, there may be a small gap between the head straint and the backrest.

Adjusting the head restraints

Please read the introductory information and heed the Warnings and Notice ⚠ and ① on page 84.

Adjusting the height of the front head restraint

Fig. 61 Adjusting the front head restraint (general example).

1. If necessary, slide the head restraint upward or downward in the direction of the arrow and when pressing the → fig. 61 ① button.

The head restraint must lock securely into place.

Adjusting the height of the rear head restraint

Fig. 62 Adjusting the rear head restraint (general example).

1. If necessary, slide the head restraint upward or downward in the direction of the arrow and when pressing the → fig. 62 ① button.

The head restraint must lock securely into place.

Removing and installing the head restraints

Please read the introductory information and heed the Warnings and Notice ⚠ and ① on page 84.

Removing the front head restraints

Fig. 63 Removing the front head restraint (general example).

1. Lower the head restraint if necessary.
2. To unlock, press down the ring around the guide rod of the head restraint → fig. 63 ①.
3. Pull out the head restraint in the direction of the arrow → fig. 63 ②.

Installing the front head restraints

1. Position the head restraint correctly above the head restraint guides and insert into the guides on the seat backrest.
2. Slide the head restraint downward until it engages into the guide rods.
3. Adjust the head restraint to the correct position.

Removing the rear head restraint

Fig. 64 Removing the rear head restraint (general example).

1. Release the backrest of the rear bench seat and fold slightly forwards.
2. Slide the head restraint all the way upward → page 84.
3. Press the button → fig. 64 ① on the head restraint guide.
4. At the same time, press button → fig. 64 ② while a second person pulls the head restraint all the way out.
5. Fold the rear bench seat backrest toward the rear and lock it securely into place.

Installing the rear head restraint

1. Release the backrest of the rear bench seat and fold slightly forwards.
2. Position the head restraint correctly above the head restraint guides and insert into the guides on the seat backrest.
3. Push the head restraint downward while pressing the → fig. 64 ② button.
4. Fold the rear bench seat backrest toward the rear and lock it securely into place.
5. Adjust the head restraint to the correct position.

Head restraints | 85

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

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

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA TRACES

Table of Data Plots
Driver Dummy Instrumentation Plots

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Plot 2	Driver Head Acceleration (Y) Primary vs. Time	B-5
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Plot 17	Passenger Head Resultant Acceleration Primary vs. Time	B-9
Plot 18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-9
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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)

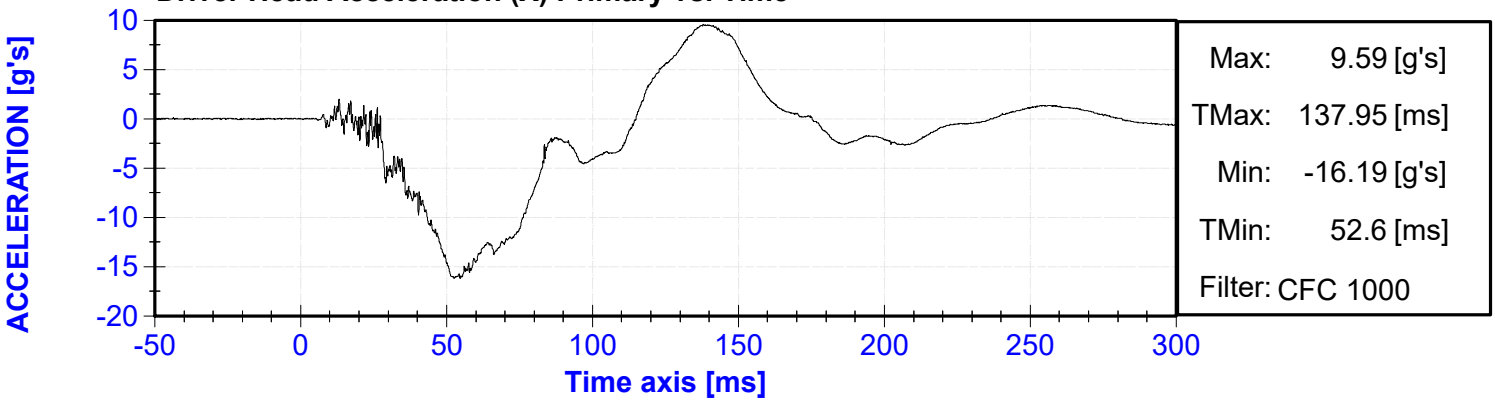
Vehicle Instrumentation Data

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)

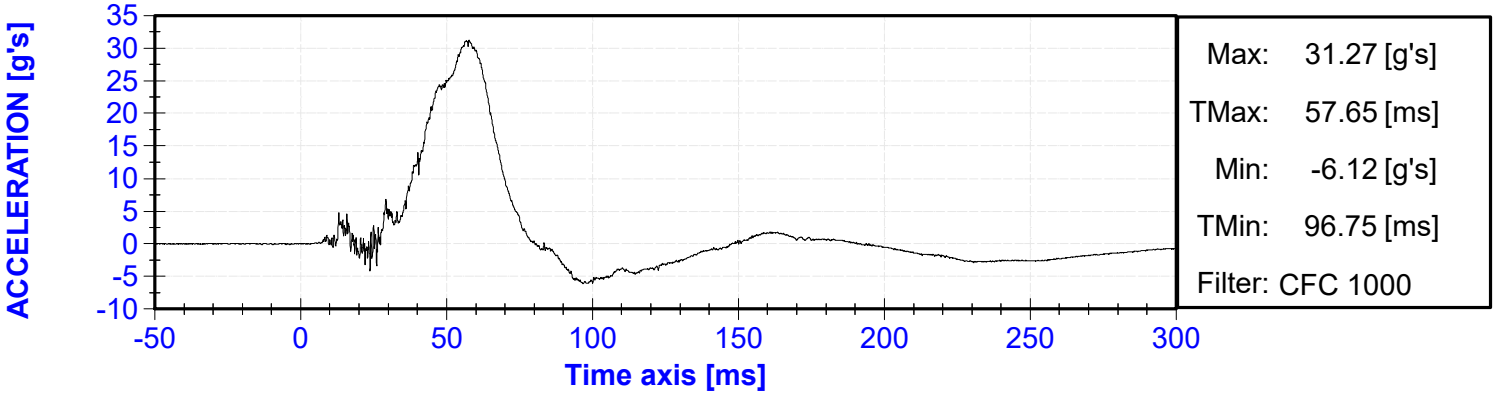
MDB Instrumentation Data

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

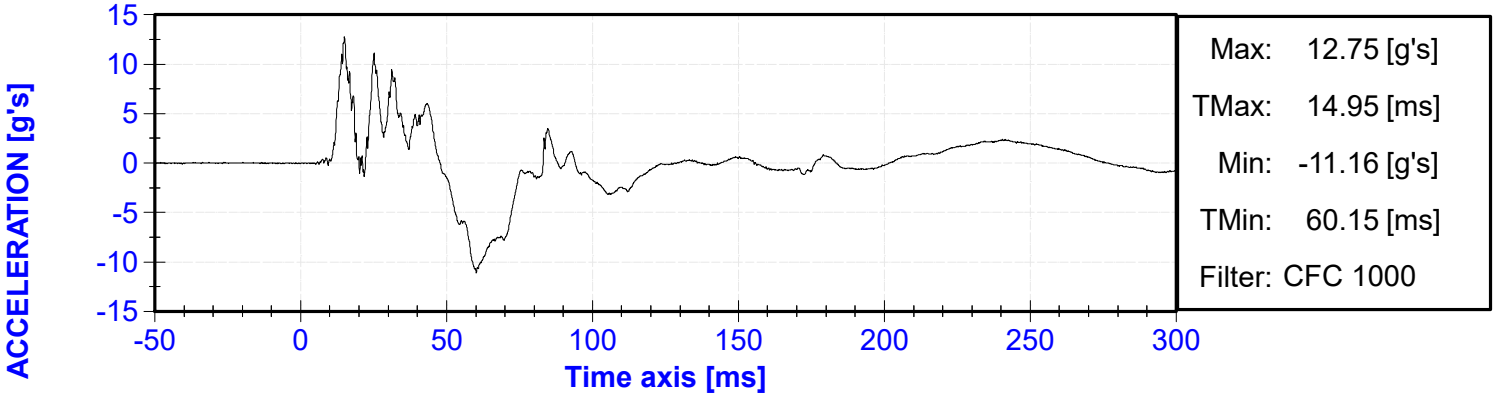
Driver Head Acceleration (X) Primary vs. Time



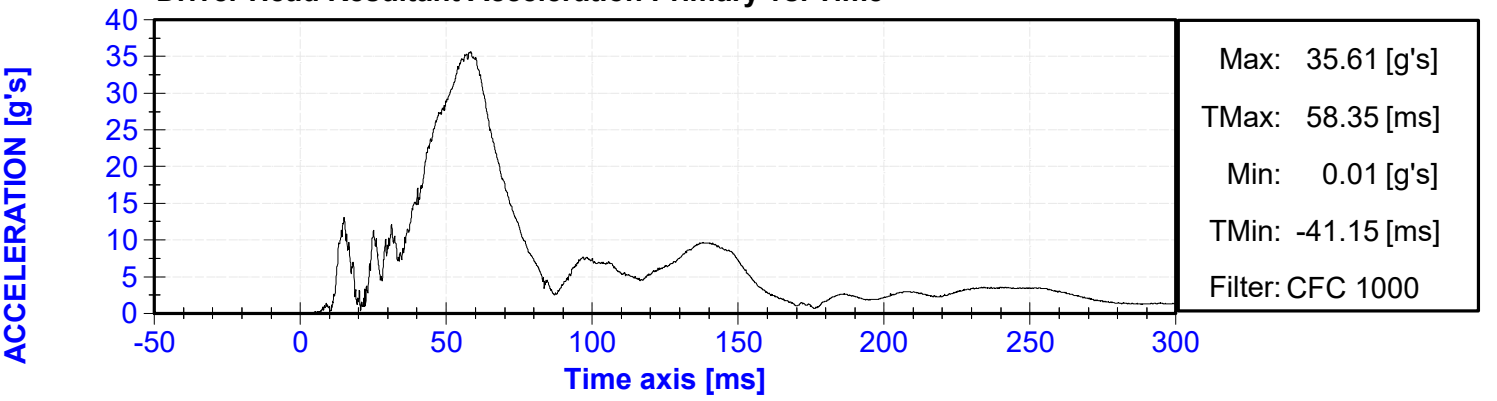
Driver Head Acceleration (Y) Primary vs. Time



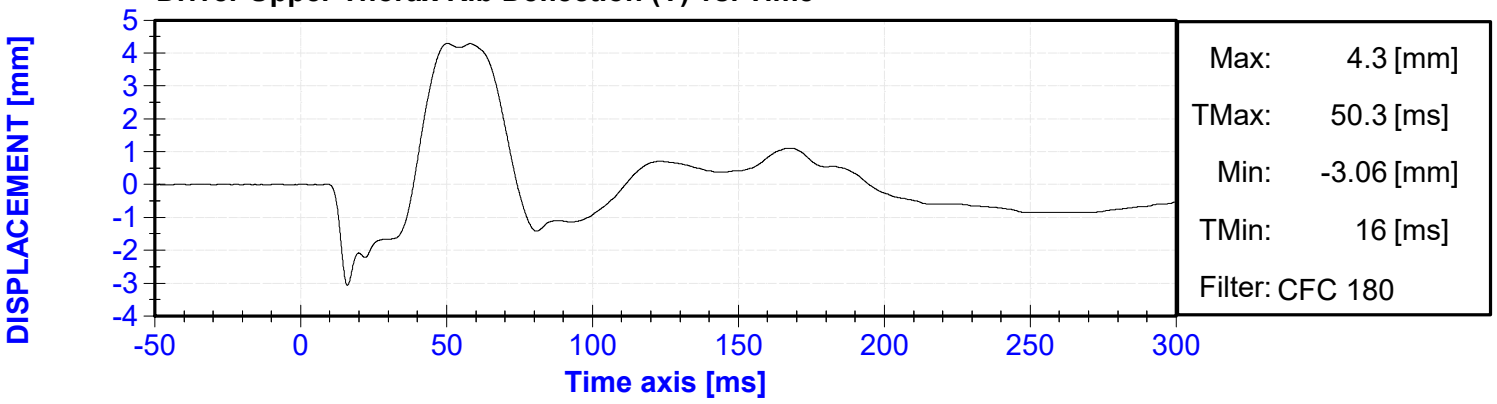
Driver Head Acceleration (Z) Primary vs. Time



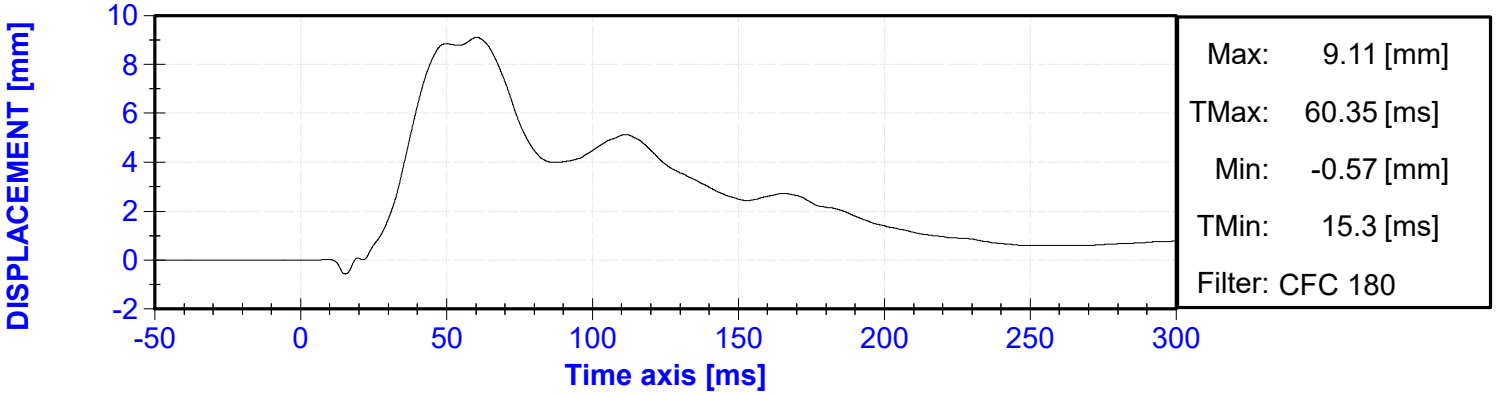
Driver Head Resultant Acceleration Primary vs. Time



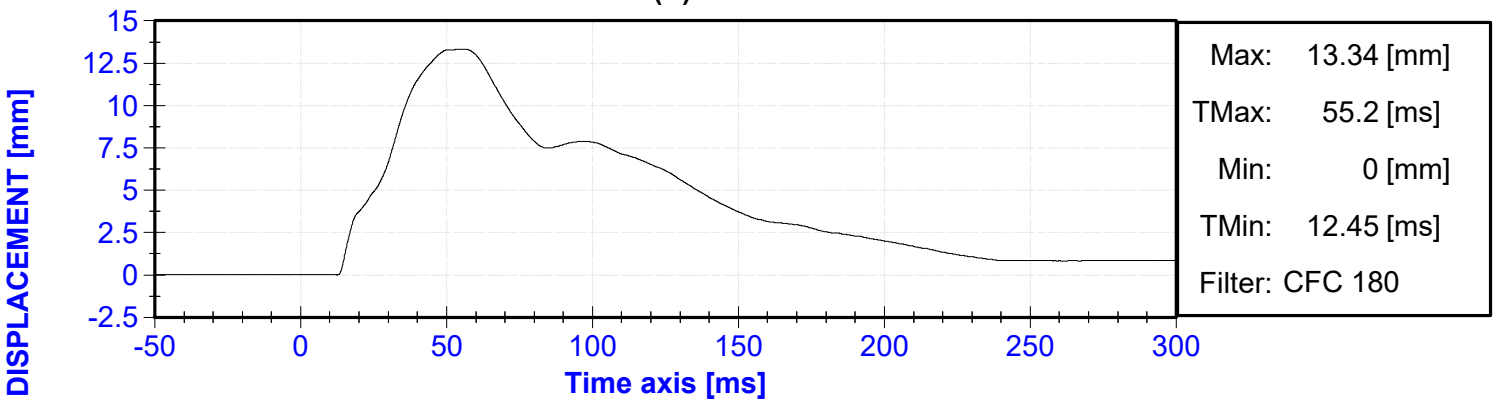
Driver Upper Thorax Rib Deflection (Y) vs. Time



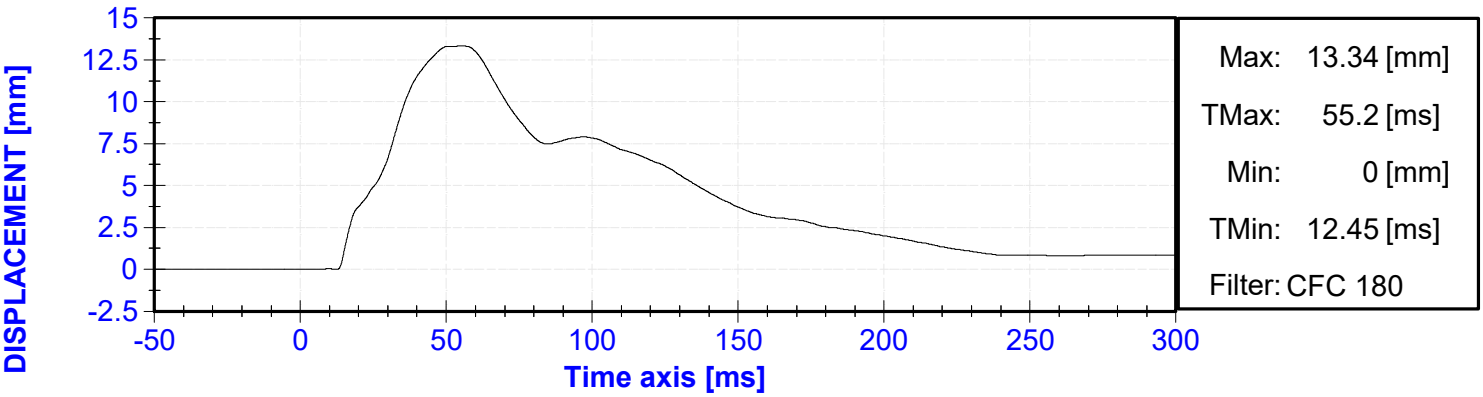
Driver Middle Thorax Rib Deflection (Y) vs. Time



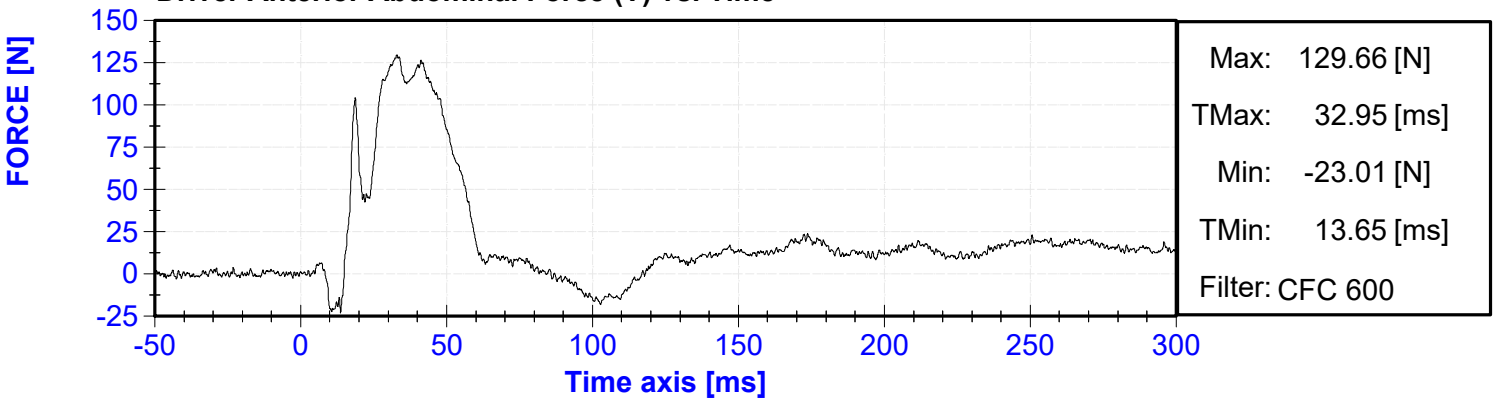
Driver Lower Thorax Rib Deflection (Y) vs. Time



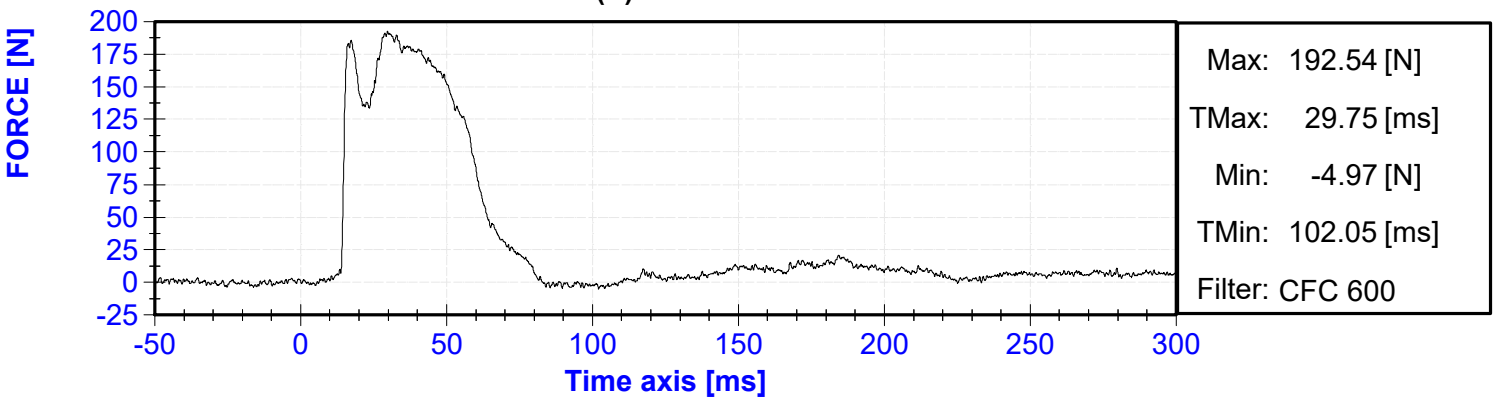
Driver Thorax Rib Deflection Maximum vs. Time



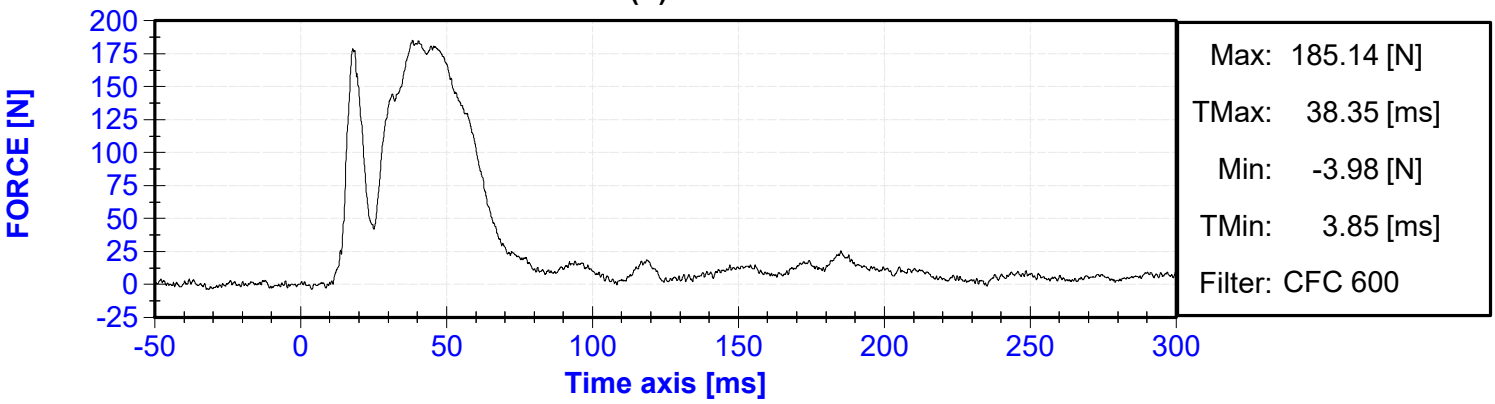
Driver Anterior Abdominal Force (Y) vs. Time



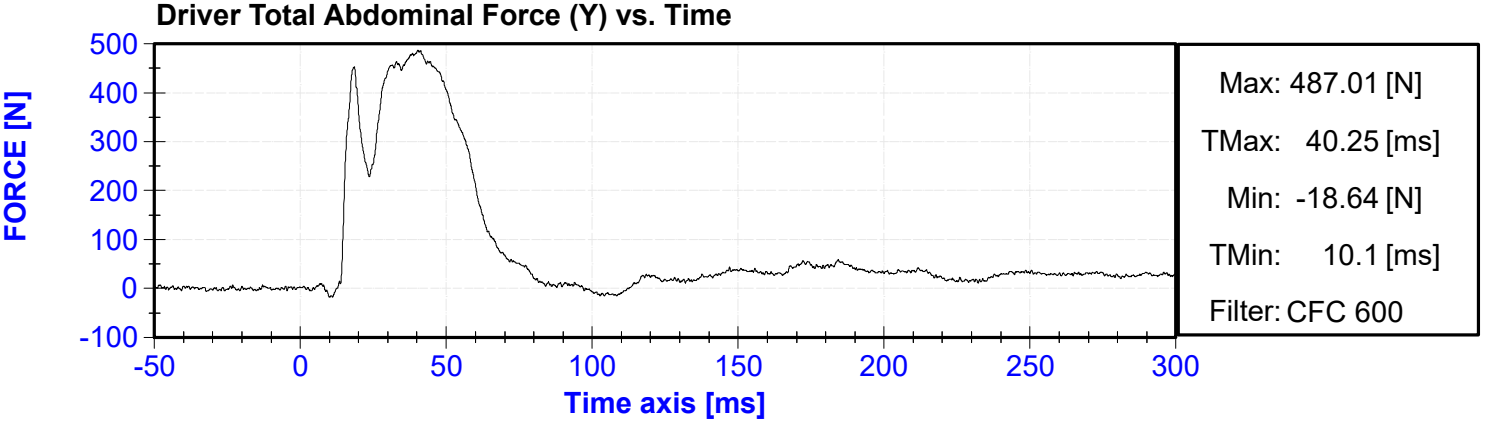
Driver Middle Abdominal Force (Y) vs. Time



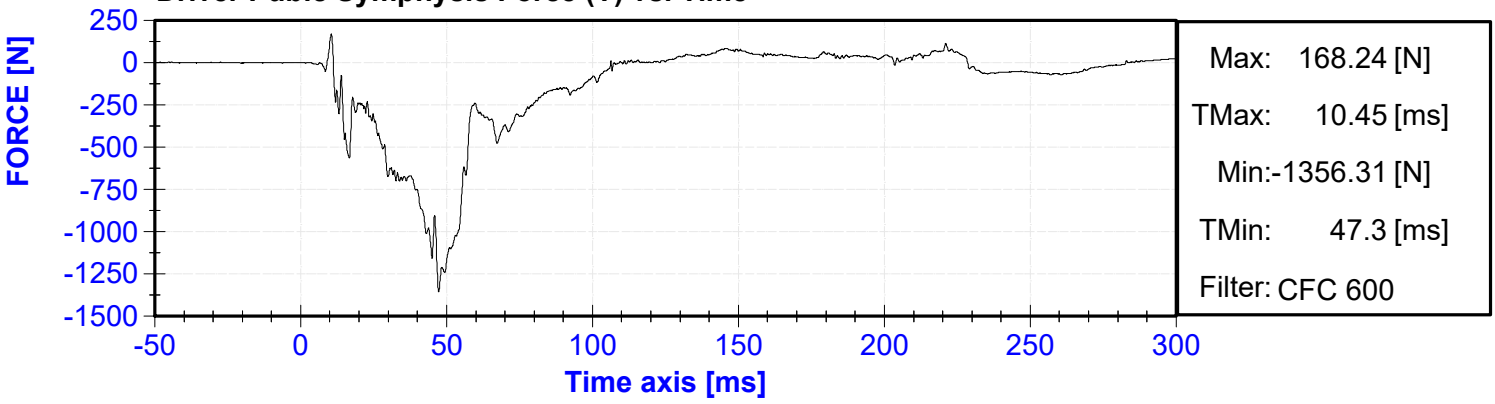
Driver Posterior Abdominal Force (Y) vs. Time



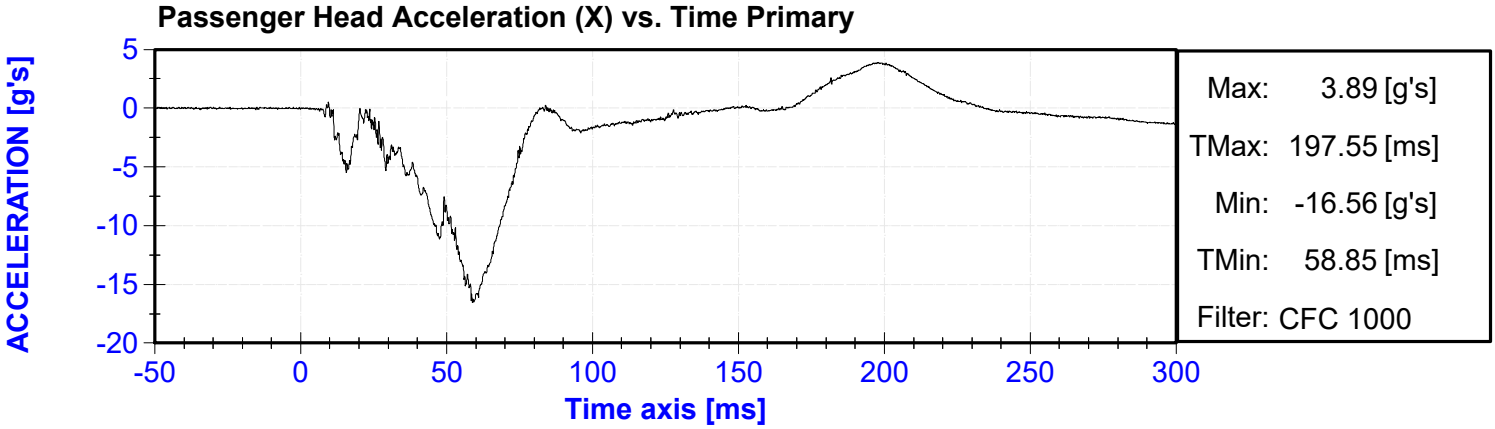
Driver Total Abdominal Force (Y) vs. Time



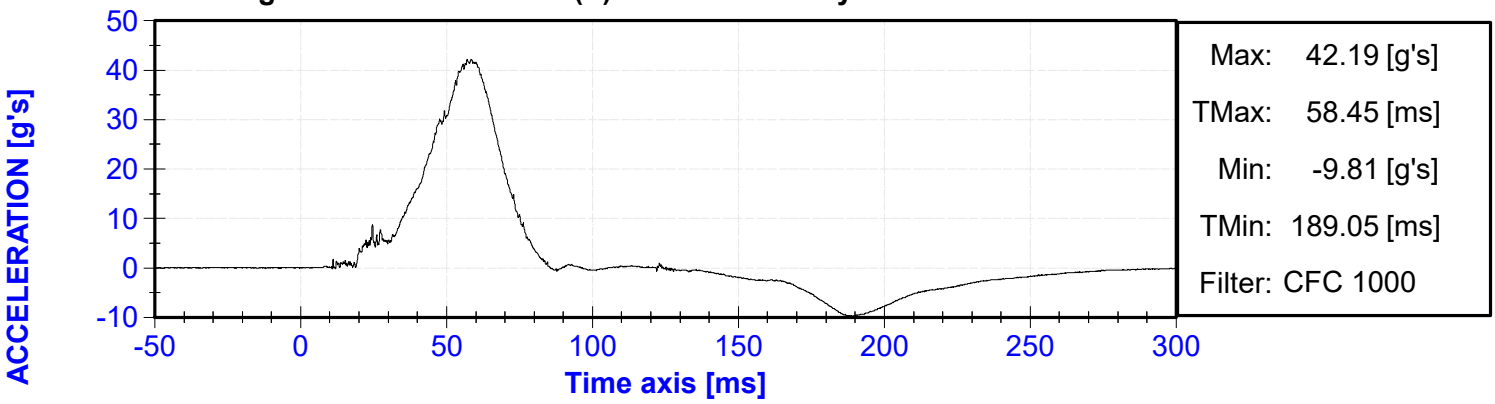
Driver Pubic Symphysis Force (Y) vs. Time



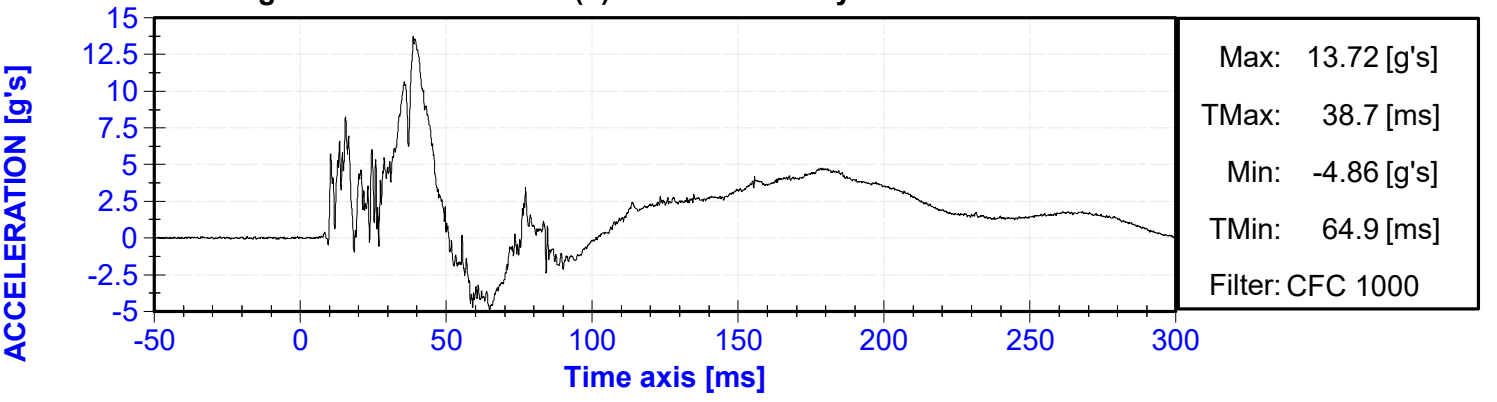
Passenger Head Acceleration (X) vs. Time Primary



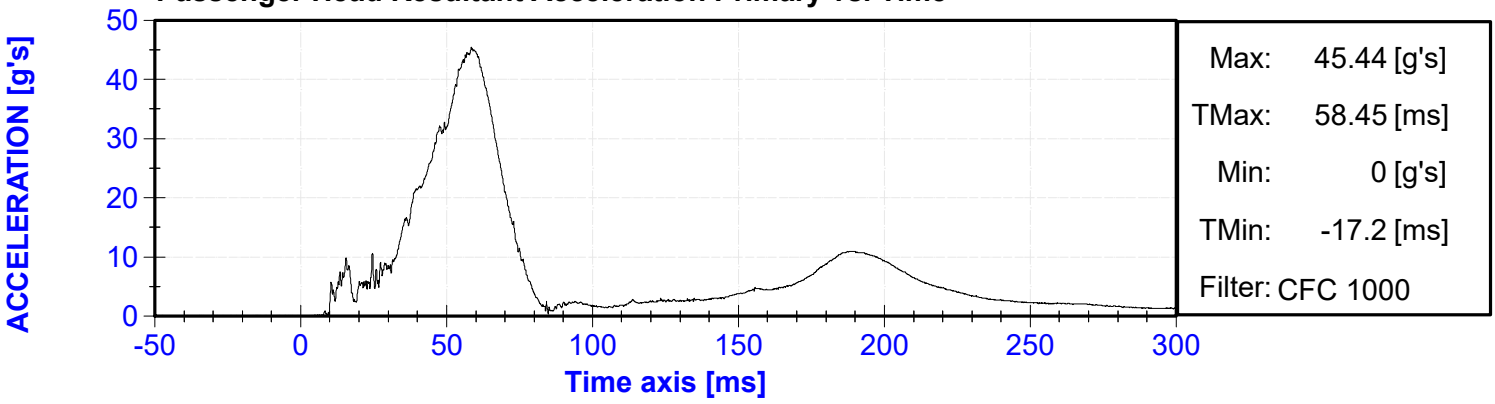
Passenger Head Acceleration (Y) vs. Time Primary



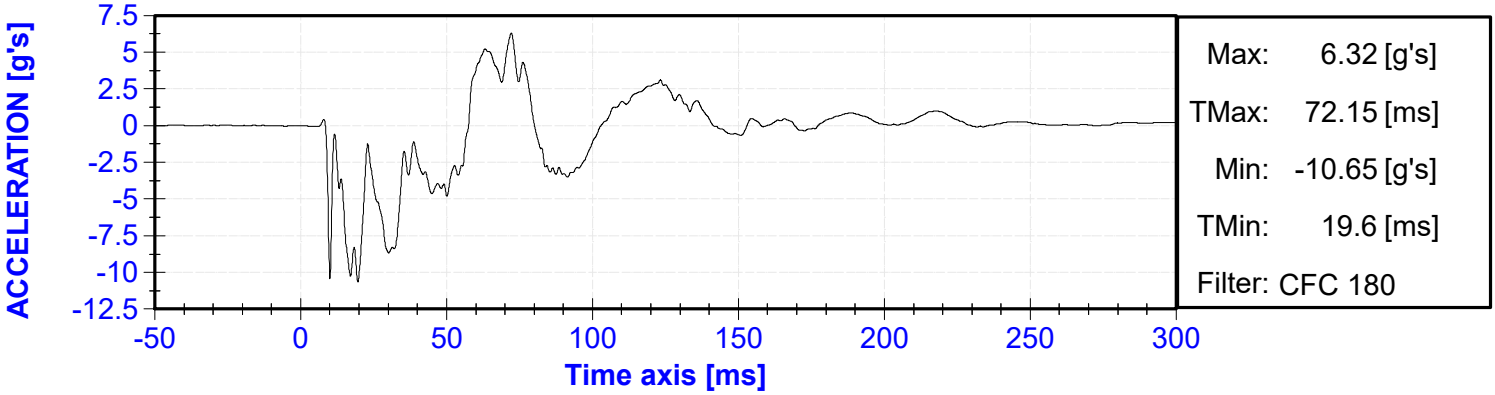
Passenger Head Acceleration (Z) vs. Time Primary



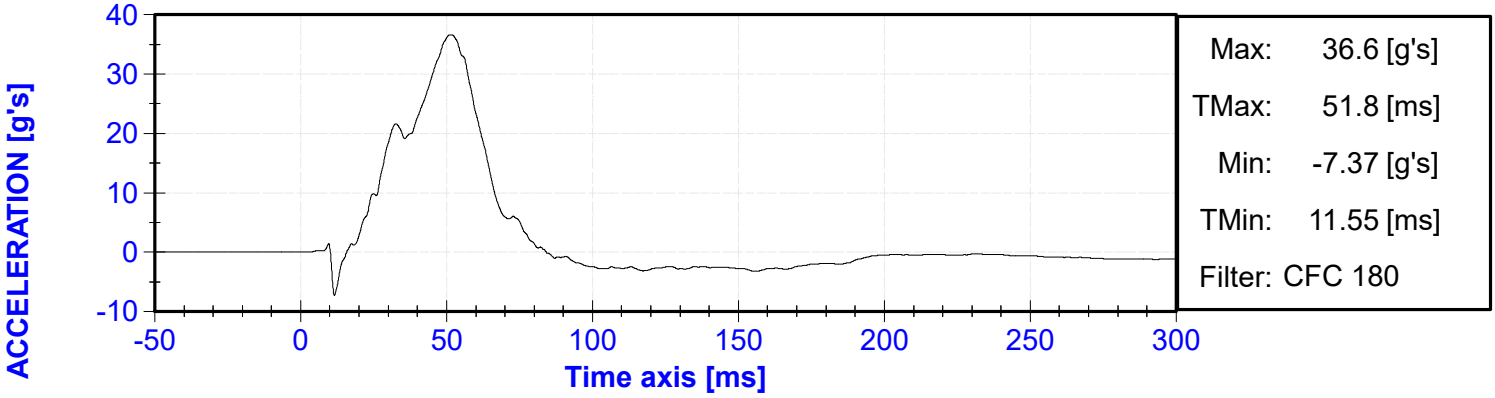
Passenger Head Resultant Acceleration Primary vs. Time



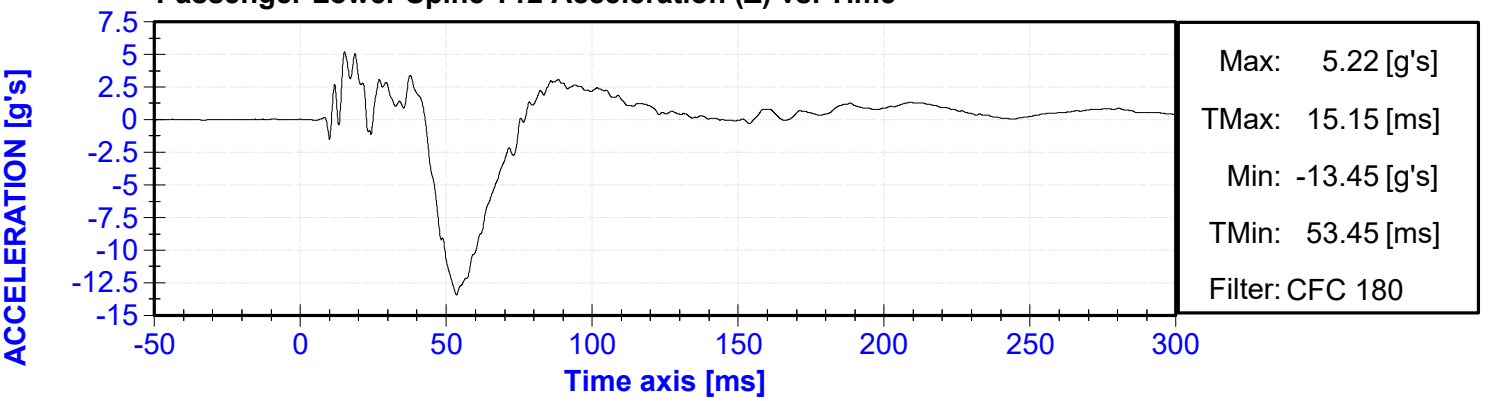
Passenger Lower Spine T12 Acceleration (X) vs. Time



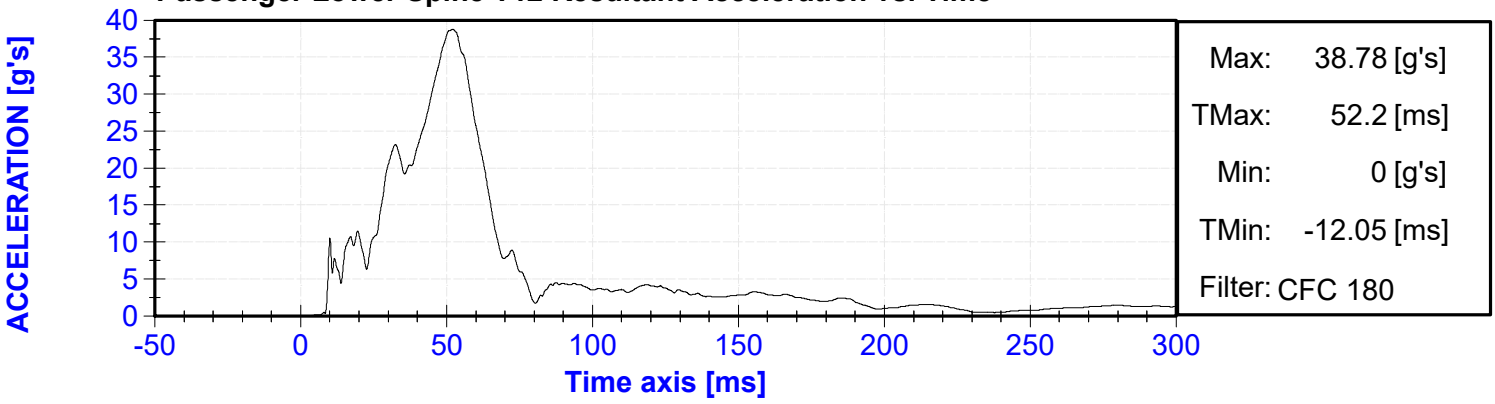
Passenger Lower Spine T12 Acceleration (Y) vs. Time



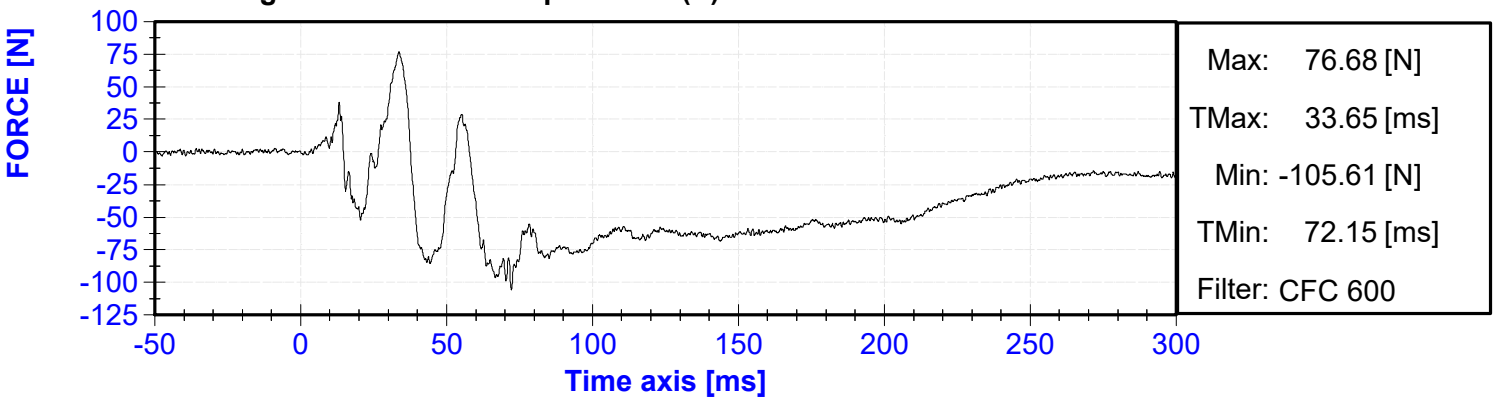
Passenger Lower Spine T12 Acceleration (Z) vs. Time



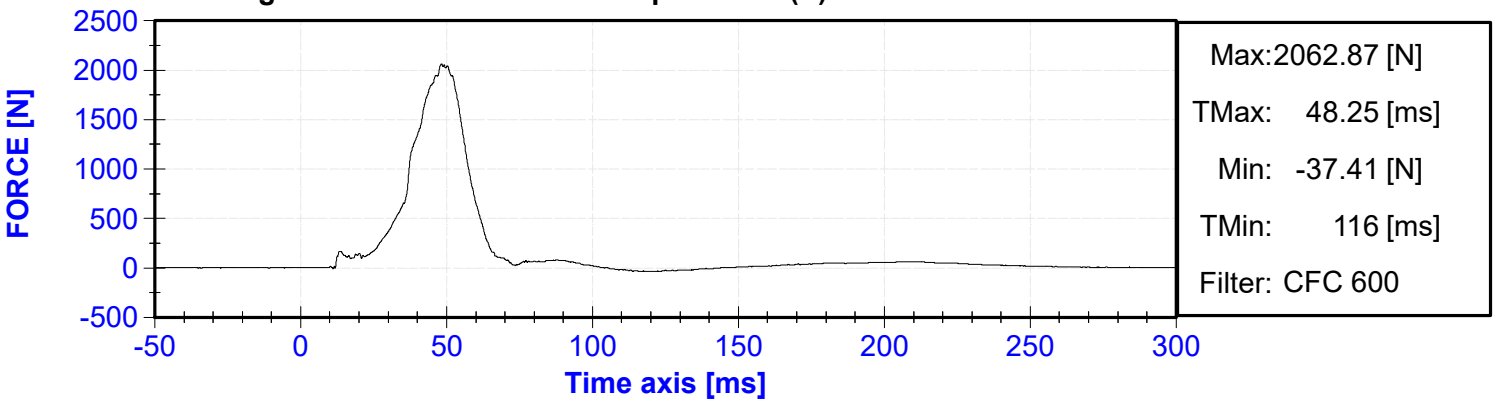
Passenger Lower Spine T12 Resultant Acceleration vs. Time



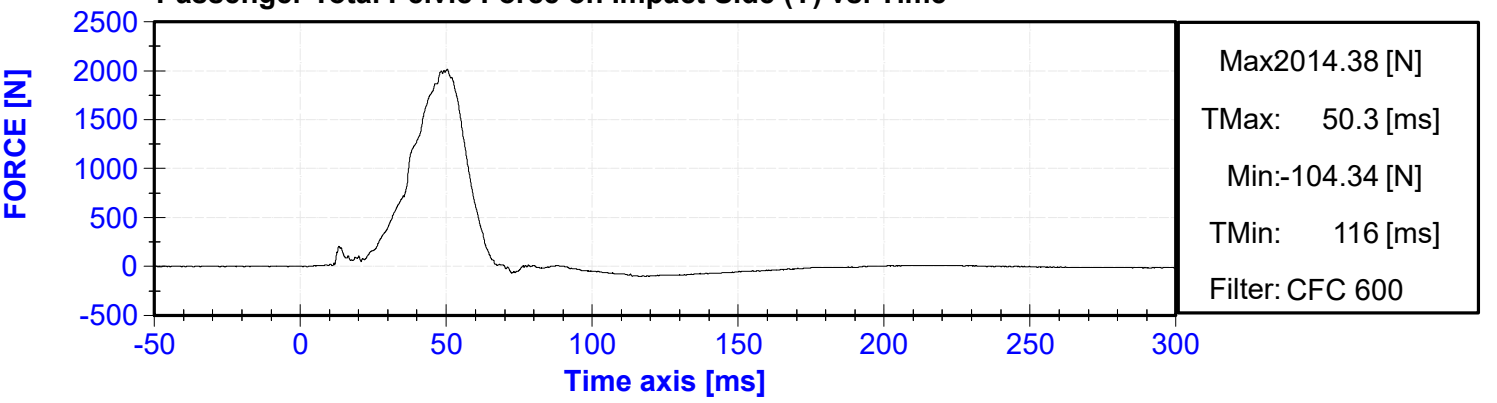
Passenger Iliac Force on Impact Side (Y) vs. Time



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

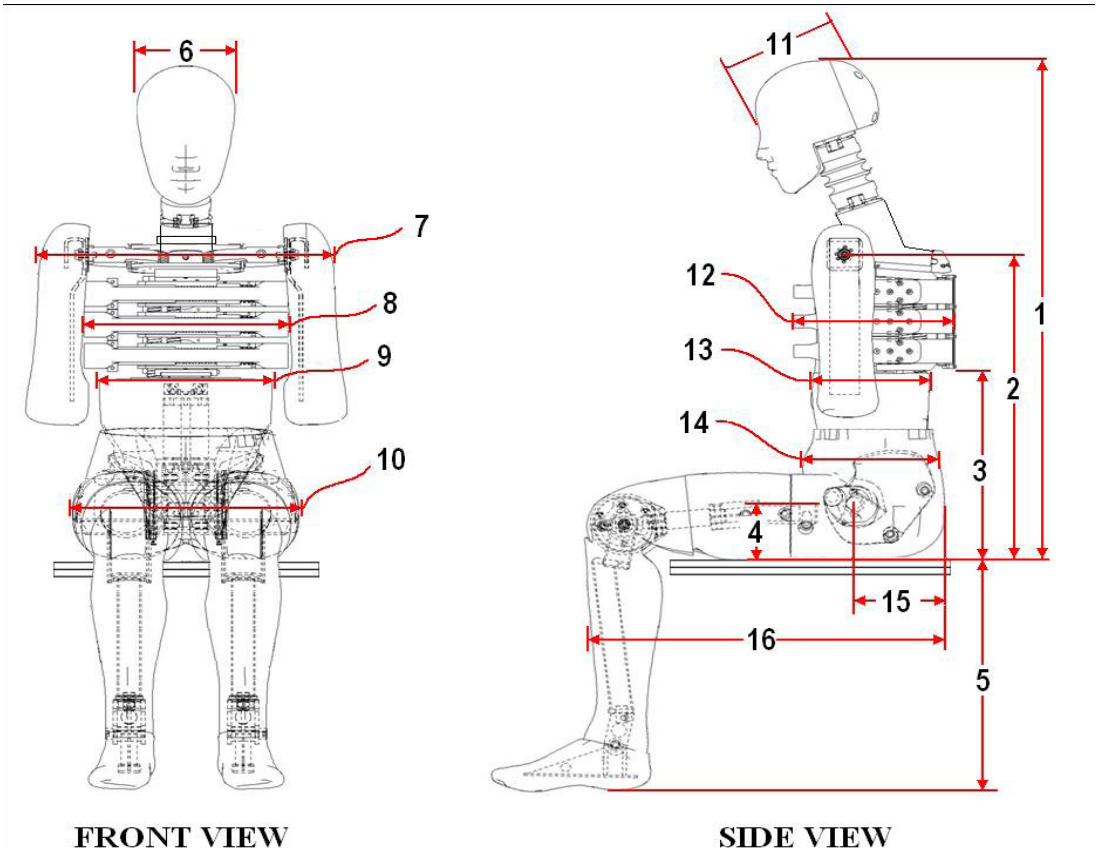
SERIAL NO:F033

(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - EuroSID-2re

Technician: J. Rios Date: 07/16/2025

Dummy Serial Number: F033



FRONT VIEW SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	903	Pass
2	Seat to Shoulder Joint	558	572	563	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	354	Pass
4	Seat to Hip Joint (center of bolt)	97	103	102	Pass
5	Sole to Seat, Sitting	333	451	394	Pass
6	Head Width	152	158	155	Pass
7	Shoulder/Arm Width	461	479	469	Pass
8	Thorax Width	322	332	327	Pass
9	Abdomen Width	273	287	281	Pass
10	Pelvis Lap Width	359	373	364	Pass
11	Head Depth	196	206	202	Pass
12	Thorax Depth	262	272	267	Pass
13	Abdomen Depth	194	204	198	Pass
14	Pelvis Depth	235	245	240	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	154	Pass
16	Back of Buttocks to Front Knee	597	615	602	Pass

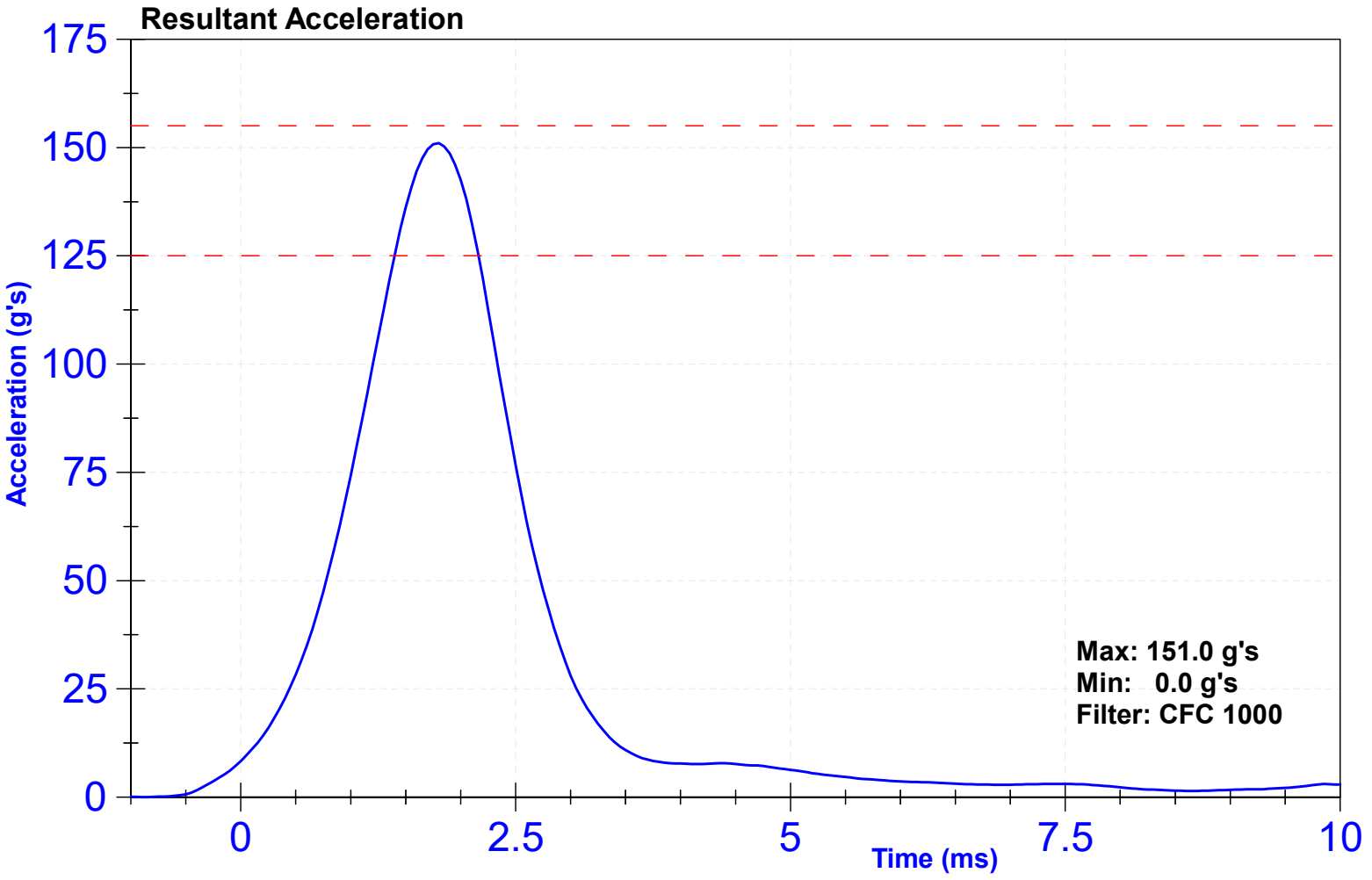
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

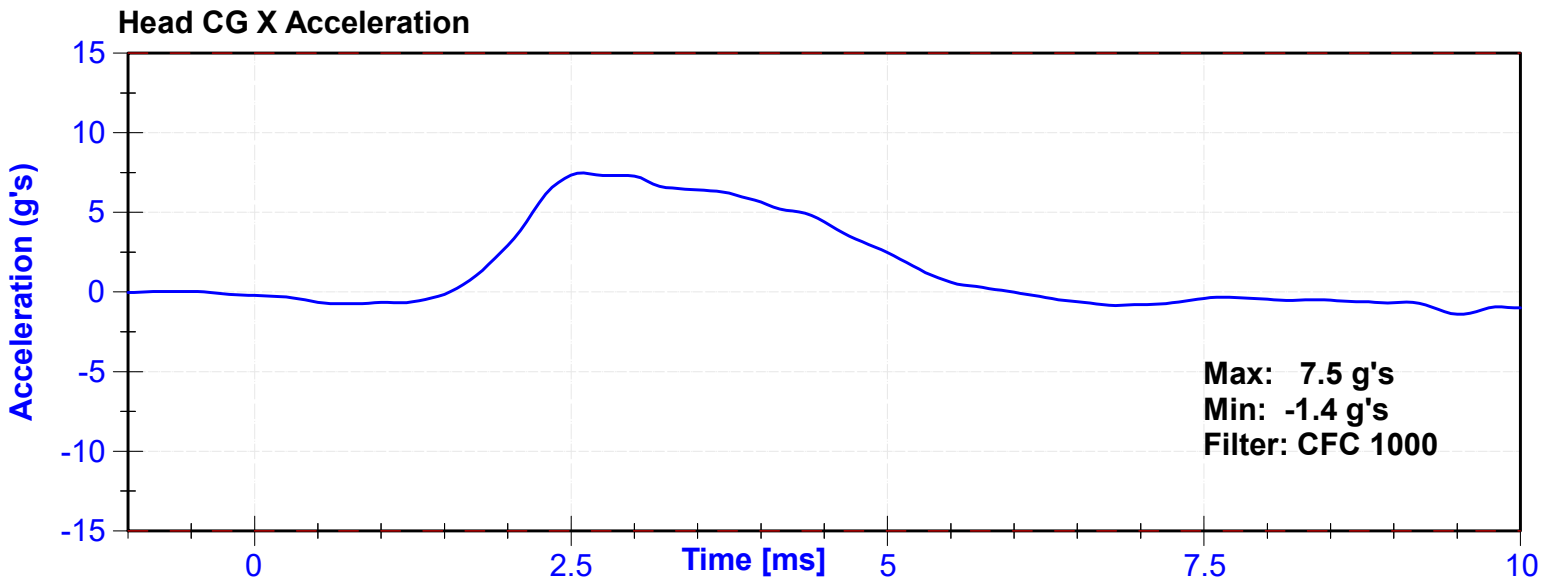
Results

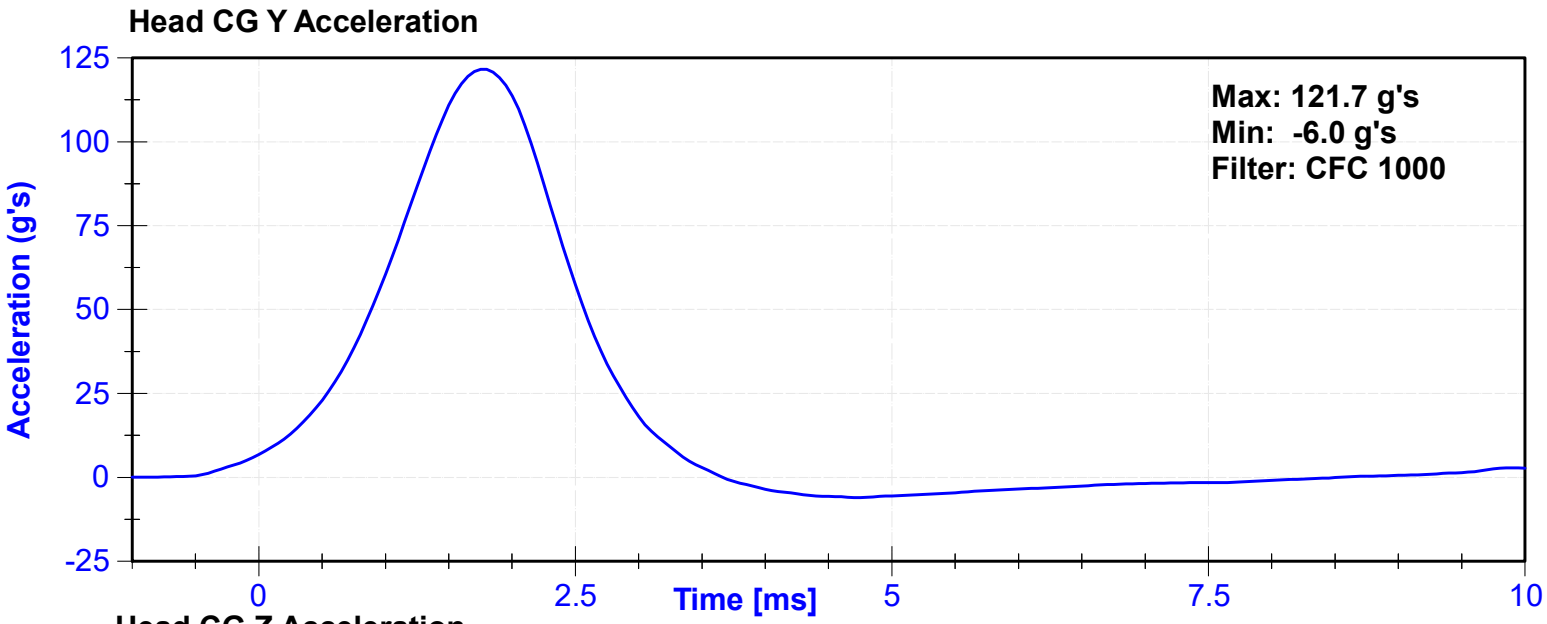
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Resultant Acceleration	125	155	g's	151.0	Pass
Oscillation	0	15	%	5.20	Pass
Fore-Aft Acceleration	-15	15	g's	7.5	Pass

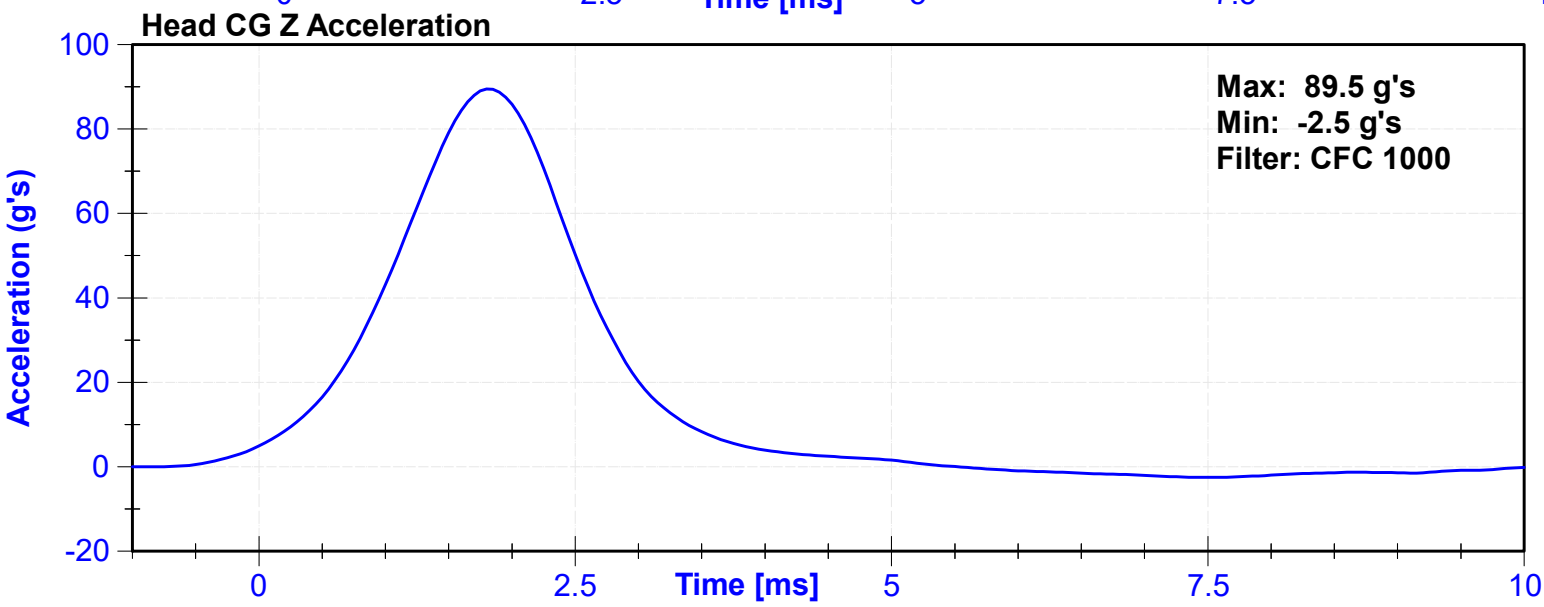
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P63861	7/1/2025	12/28/2025
Y Accelerometer	Endevco	P49216	7/1/2025	12/28/2025
Z Accelerometer	Endevco	P51303	7/1/2025	12/28/2025




Head CG X Acceleration
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
Time [ms]
5
7.5
10
Max: 7.5 g's
Min: -1.4 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: 121.7 g's
Min: -6.0 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: 89.5 g's
Min: -2.5 g's
Filter: CFC 1000

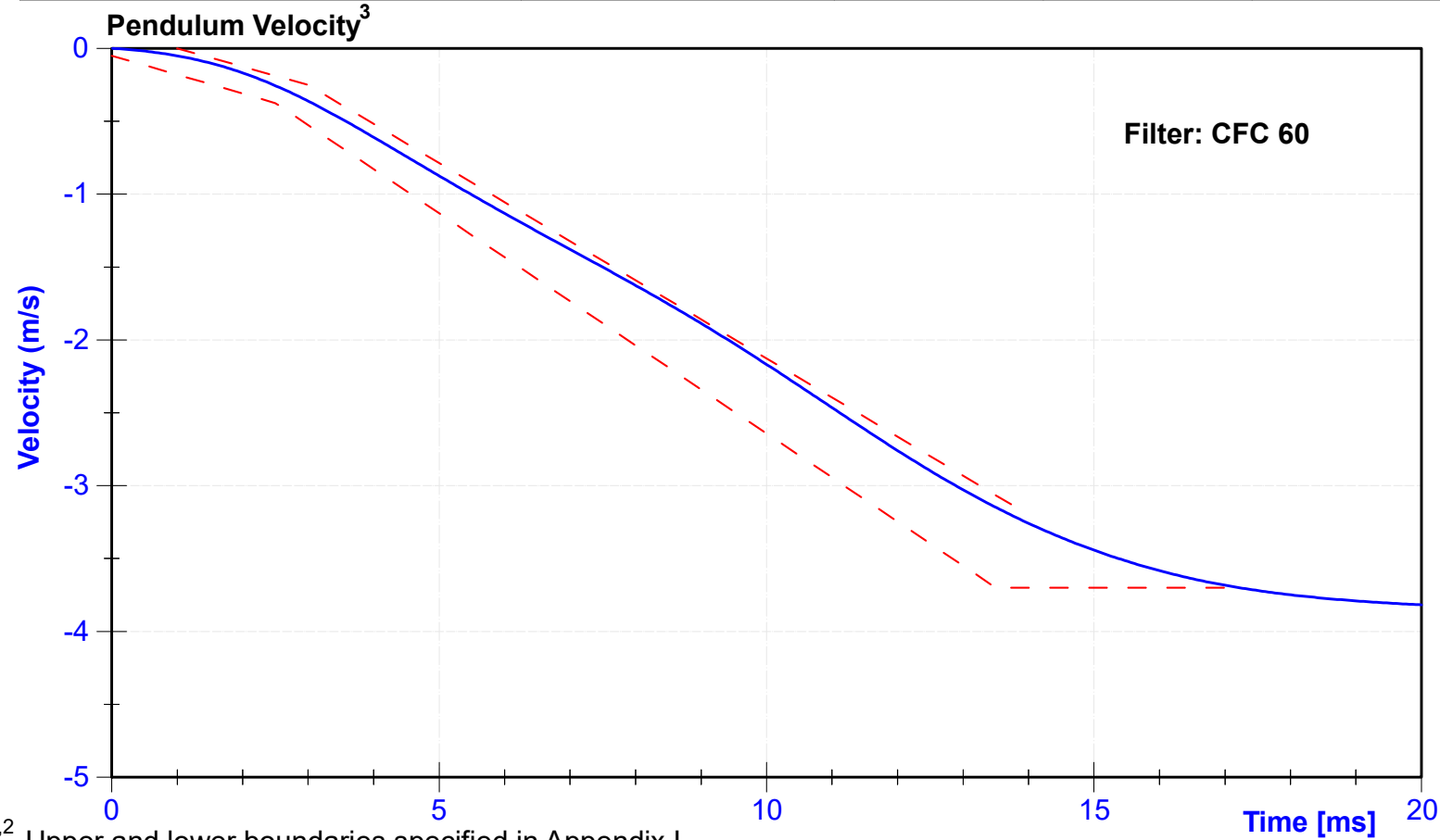
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	3.3	3.5	m/s	3.49	Pass
Lateral Neck Rotation	49	59	deg	52.8	Pass
Time at Maximum Rotation	54	66	ms	56.2	Pass
Time of Rotation Decay from Maximum	53	88	ms	59.6	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

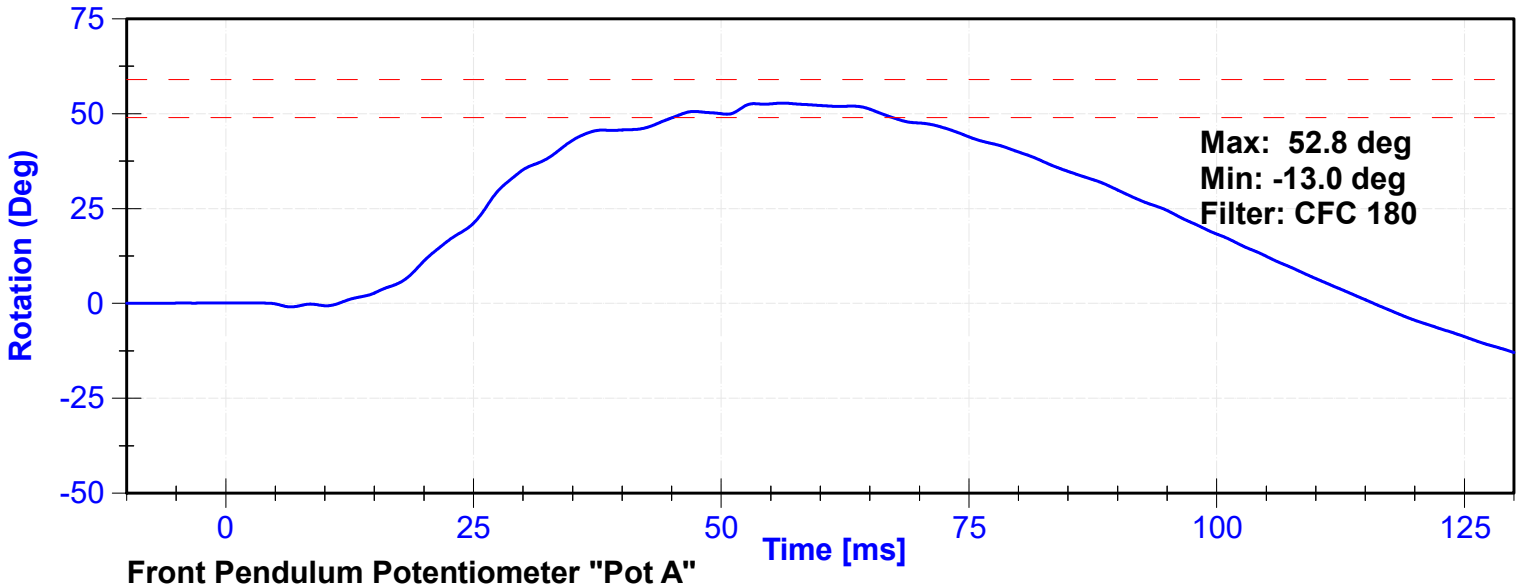
Transducer Calibrations

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

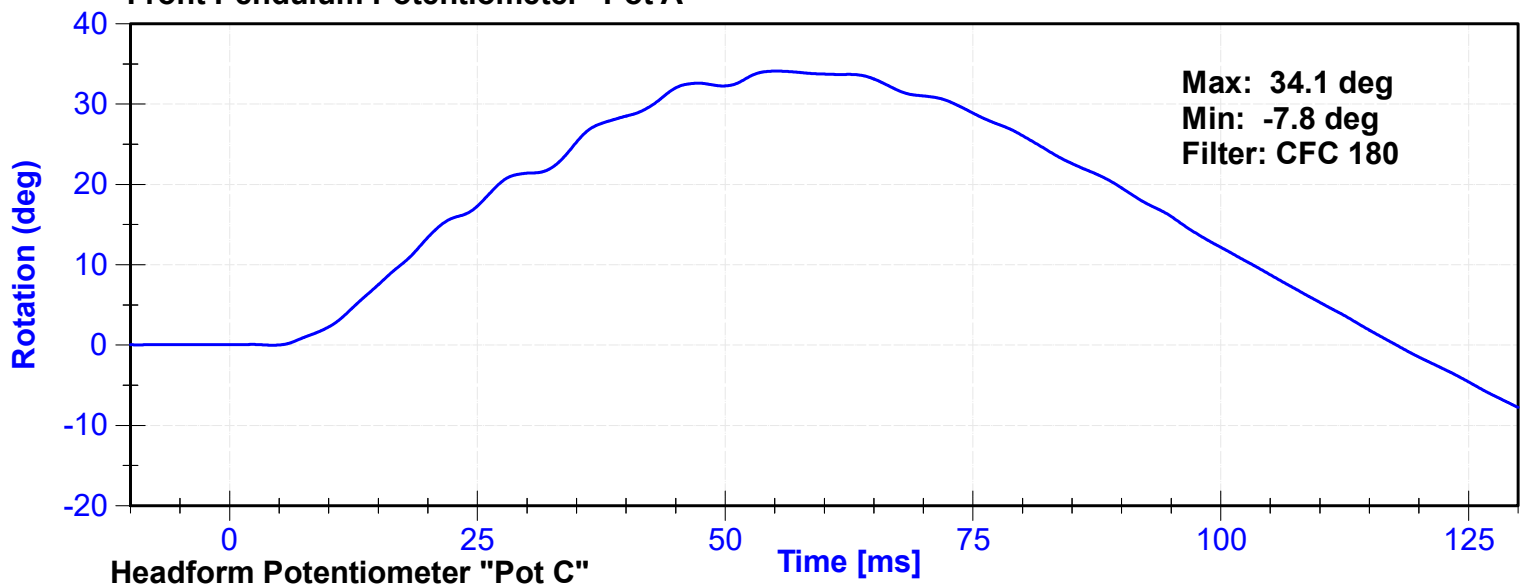


[1,2] Upper and lower boundaries specified in Appendix I

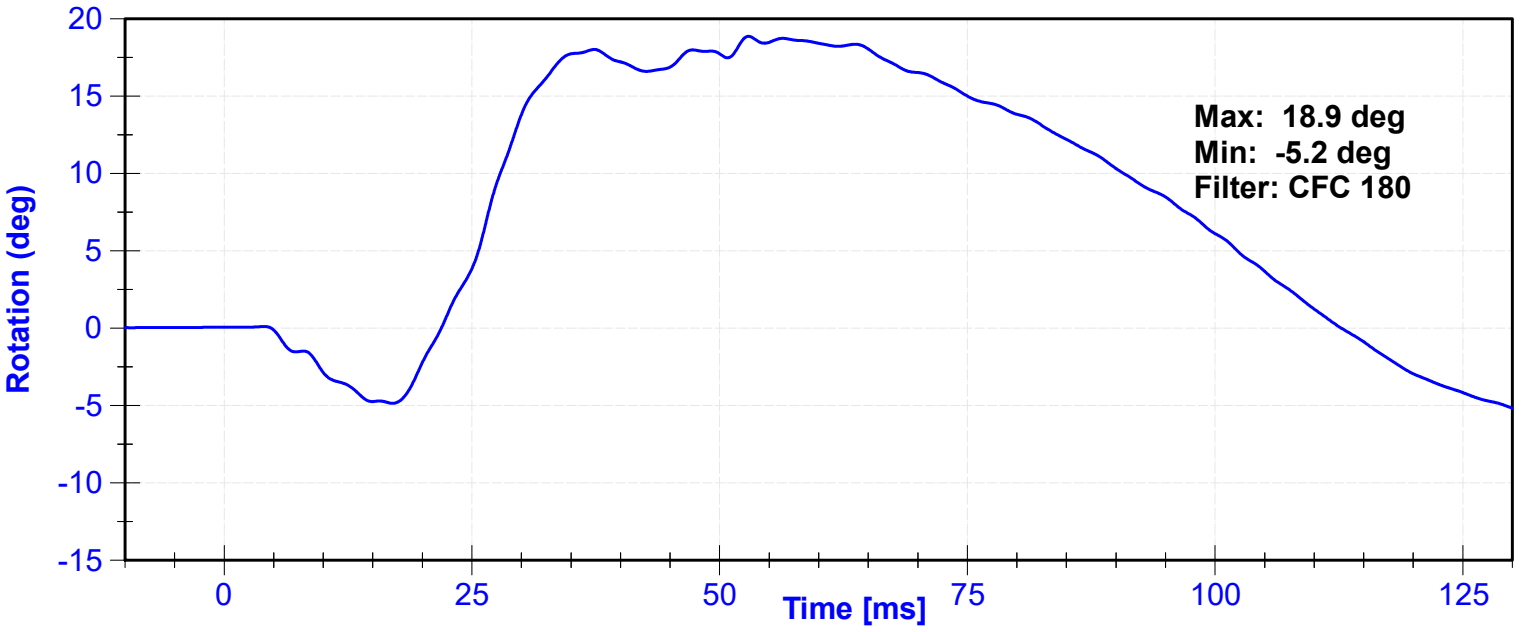
Neck Rotation



Front Pendulum Potentiometer "Pot A"



Headform Potentiometer "Pot C"



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

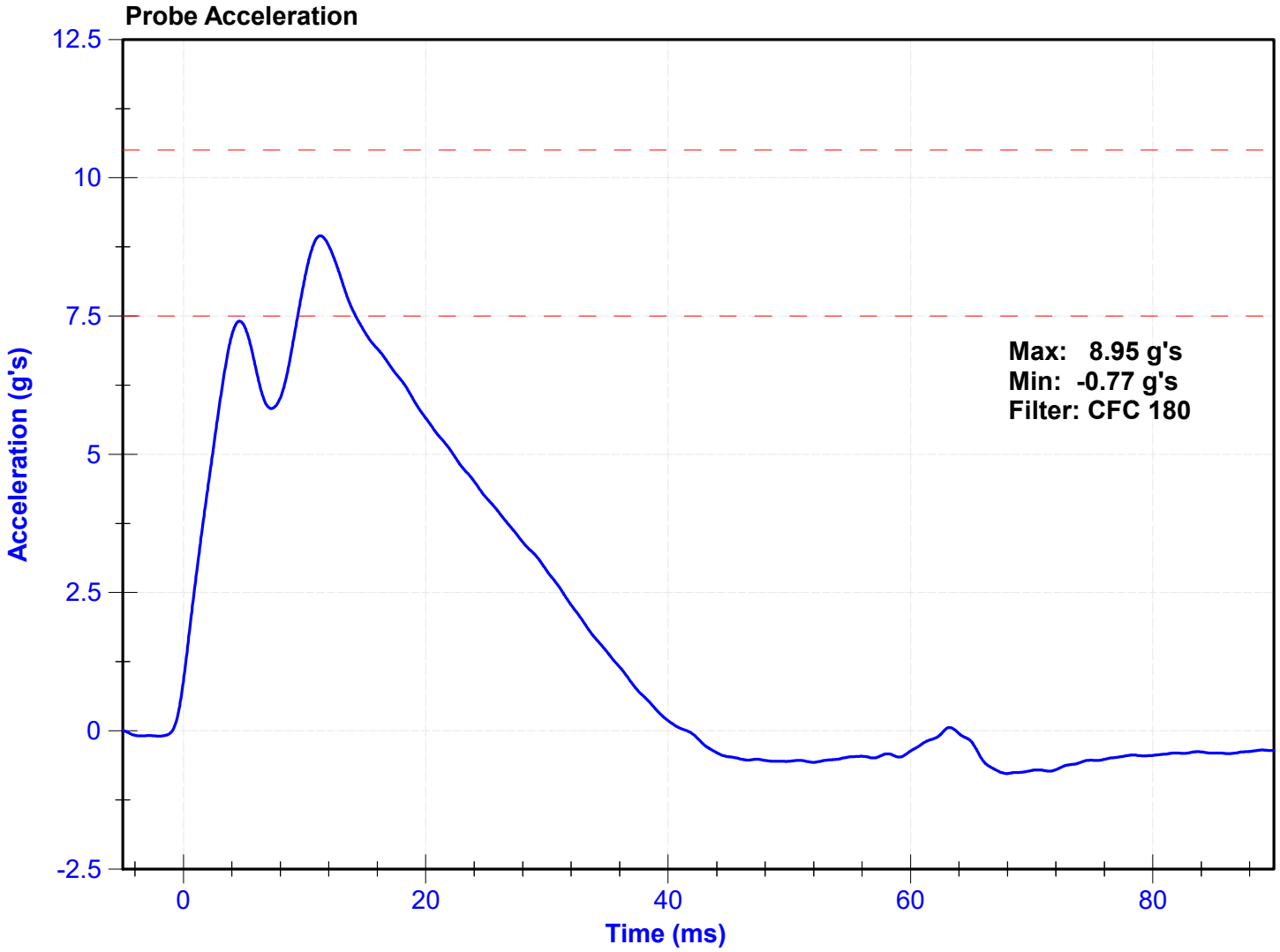
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	7.5	10.5	g's	8.95	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025



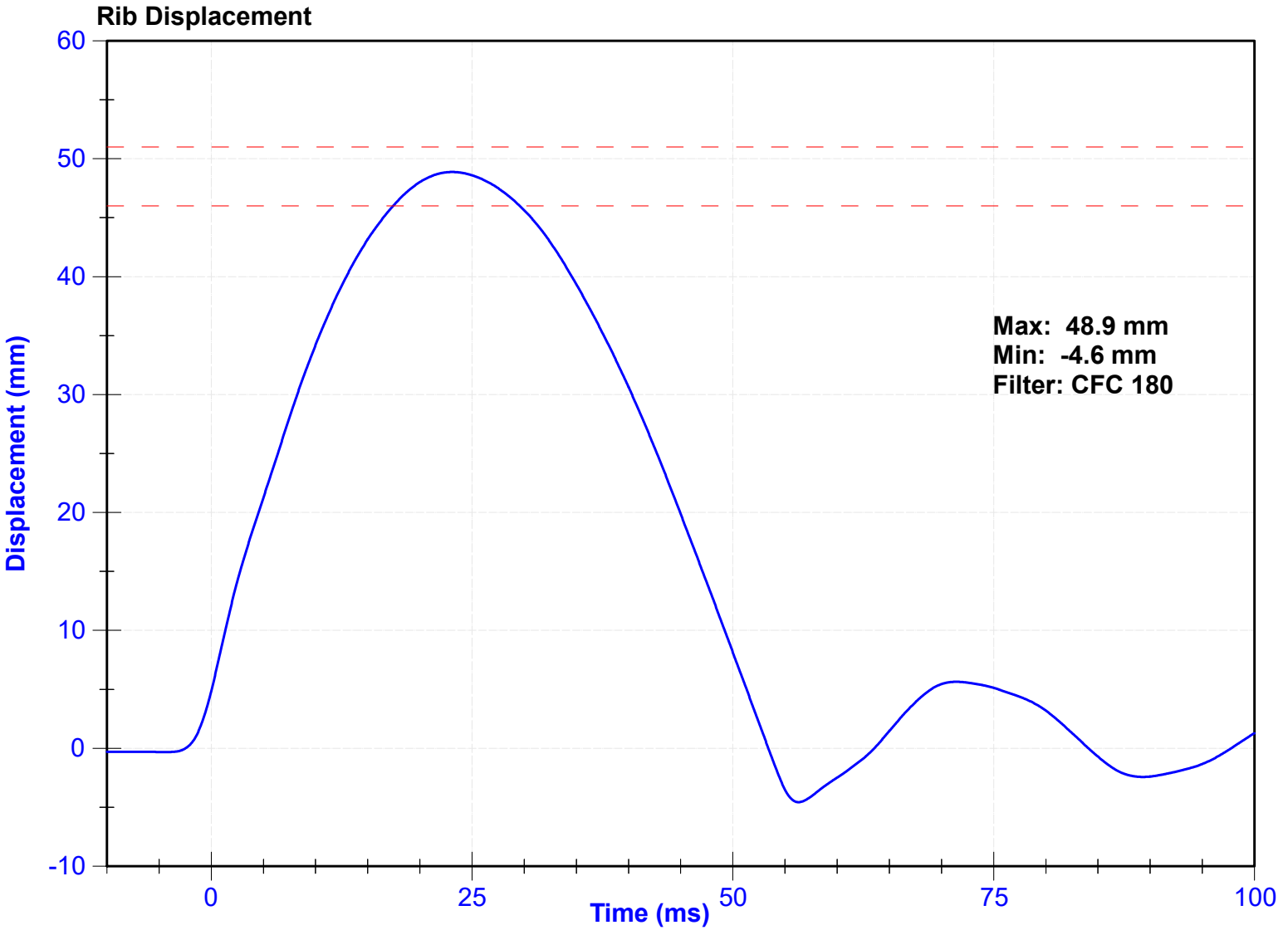
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Rib Displacement	46	51	mm	48.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	179GFE	7/1/2025	12/30/2025



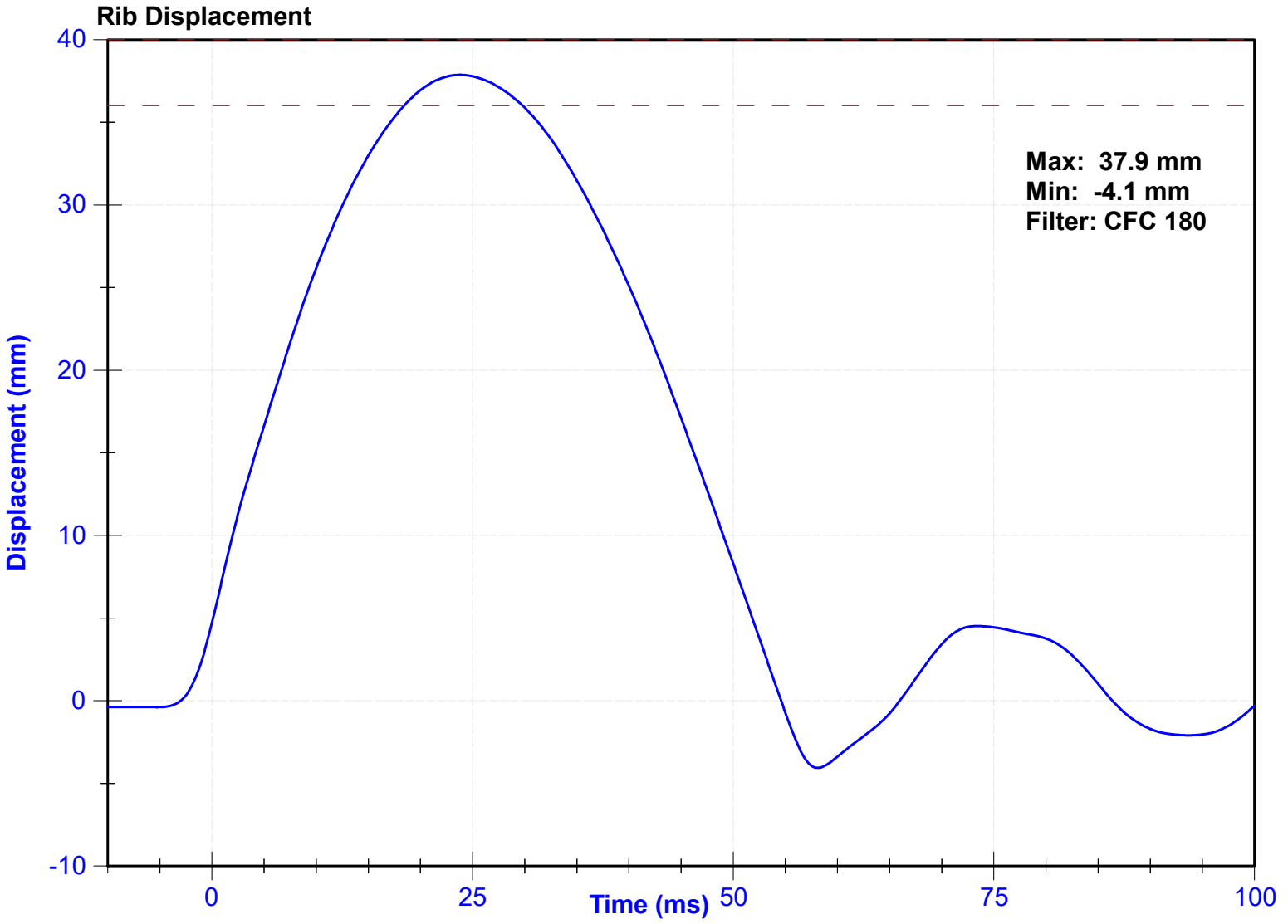
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Rib Displacement	36	40	mm	37.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	179GFE	7/1/2025	12/30/2025



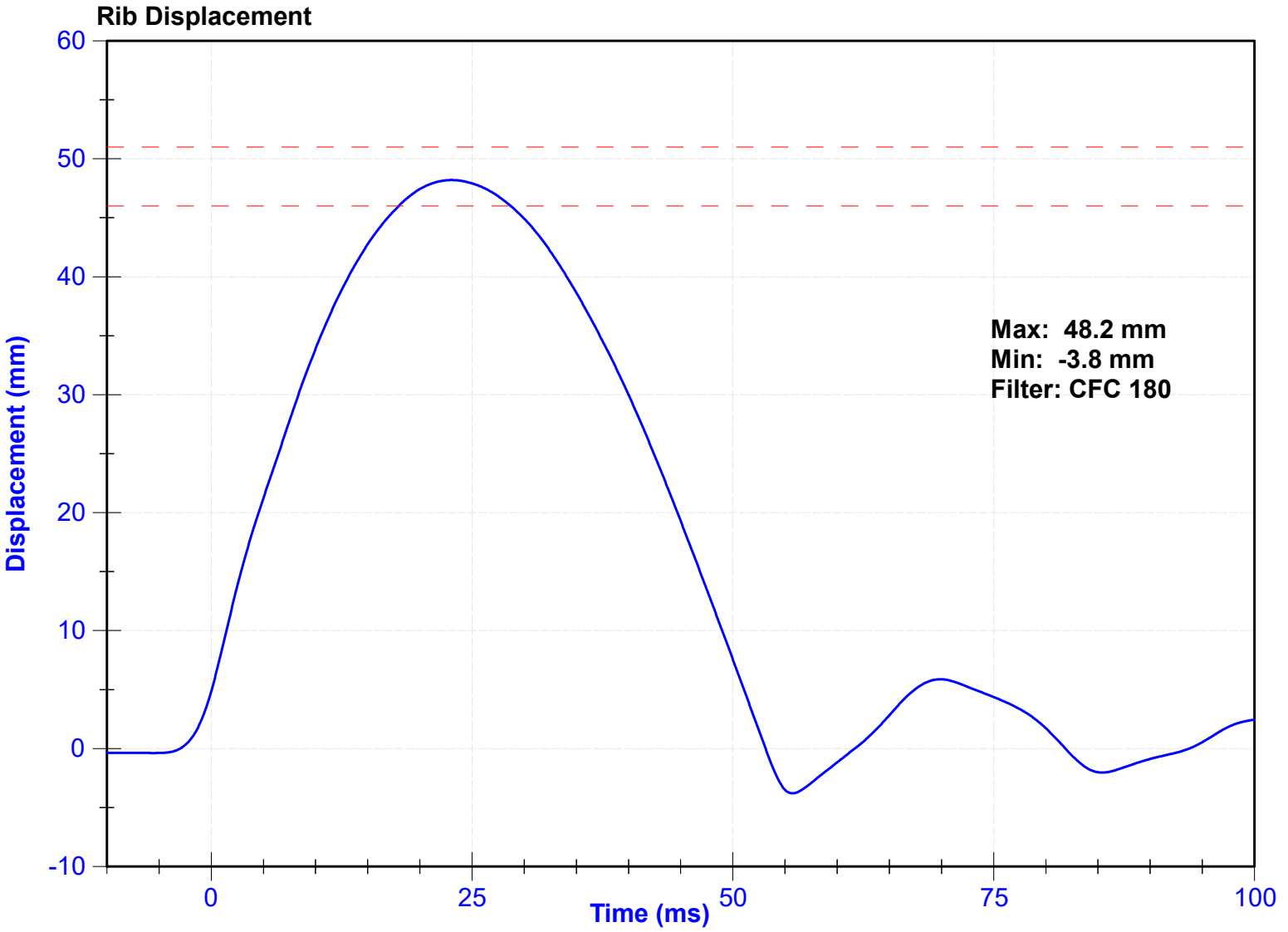
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Rib Displacement	46	51	mm	48.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	7/1/2025	12/30/2025



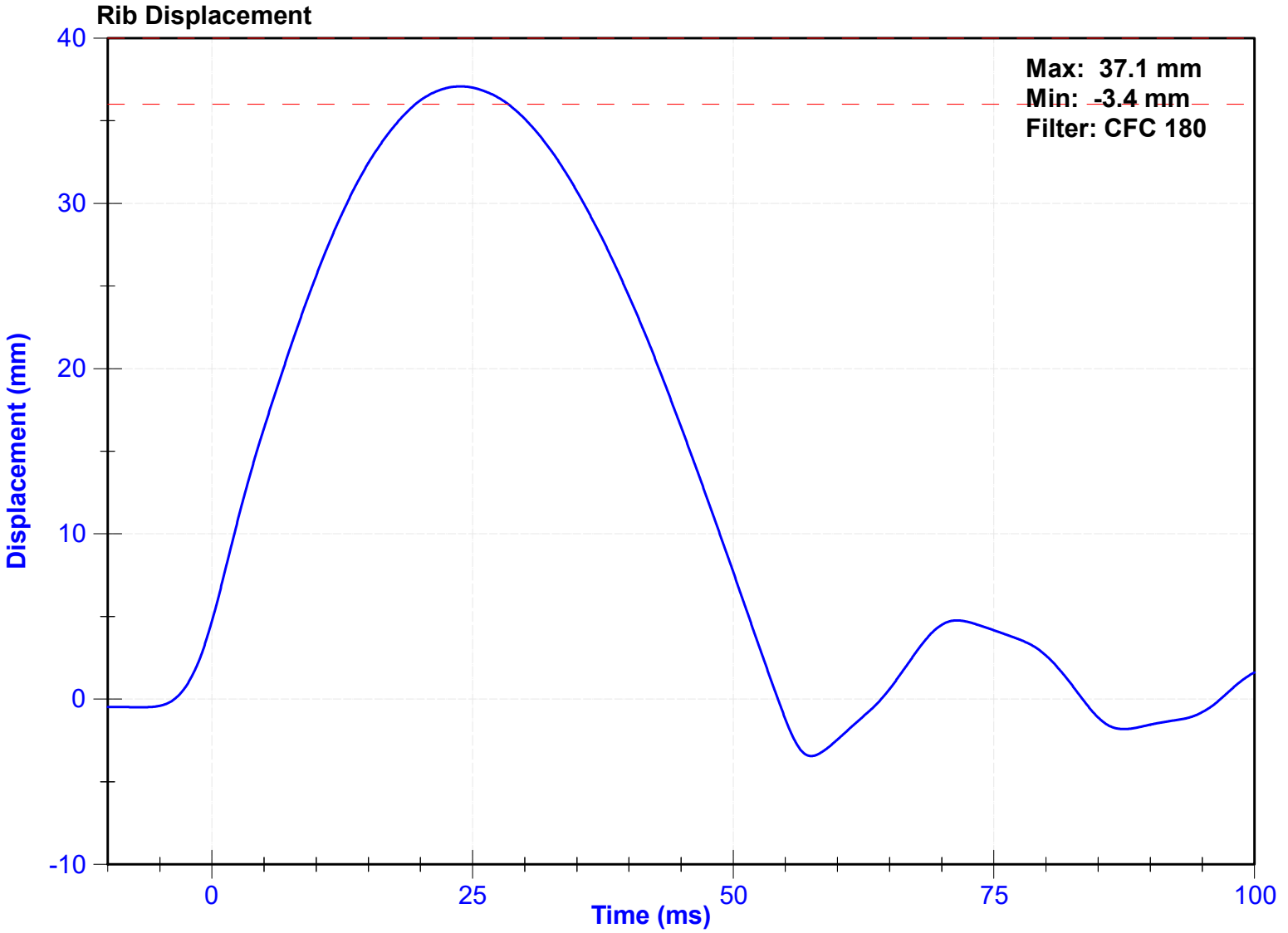
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Rib Displacement	36	40	mm	37.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	7/1/2025	12/30/2025



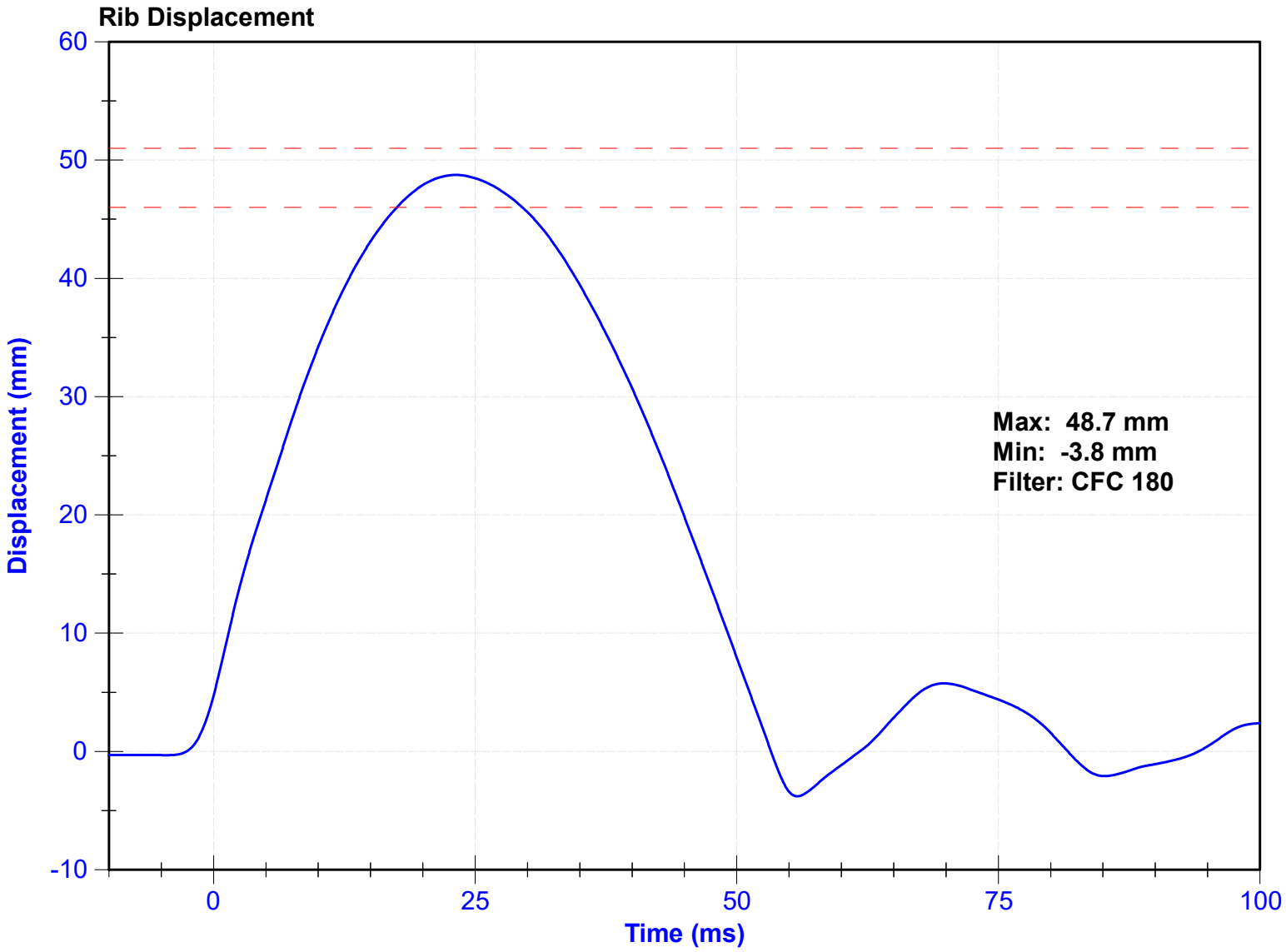
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Rib Displacement	46	51	mm	48.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	7/1/2025	12/30/2025



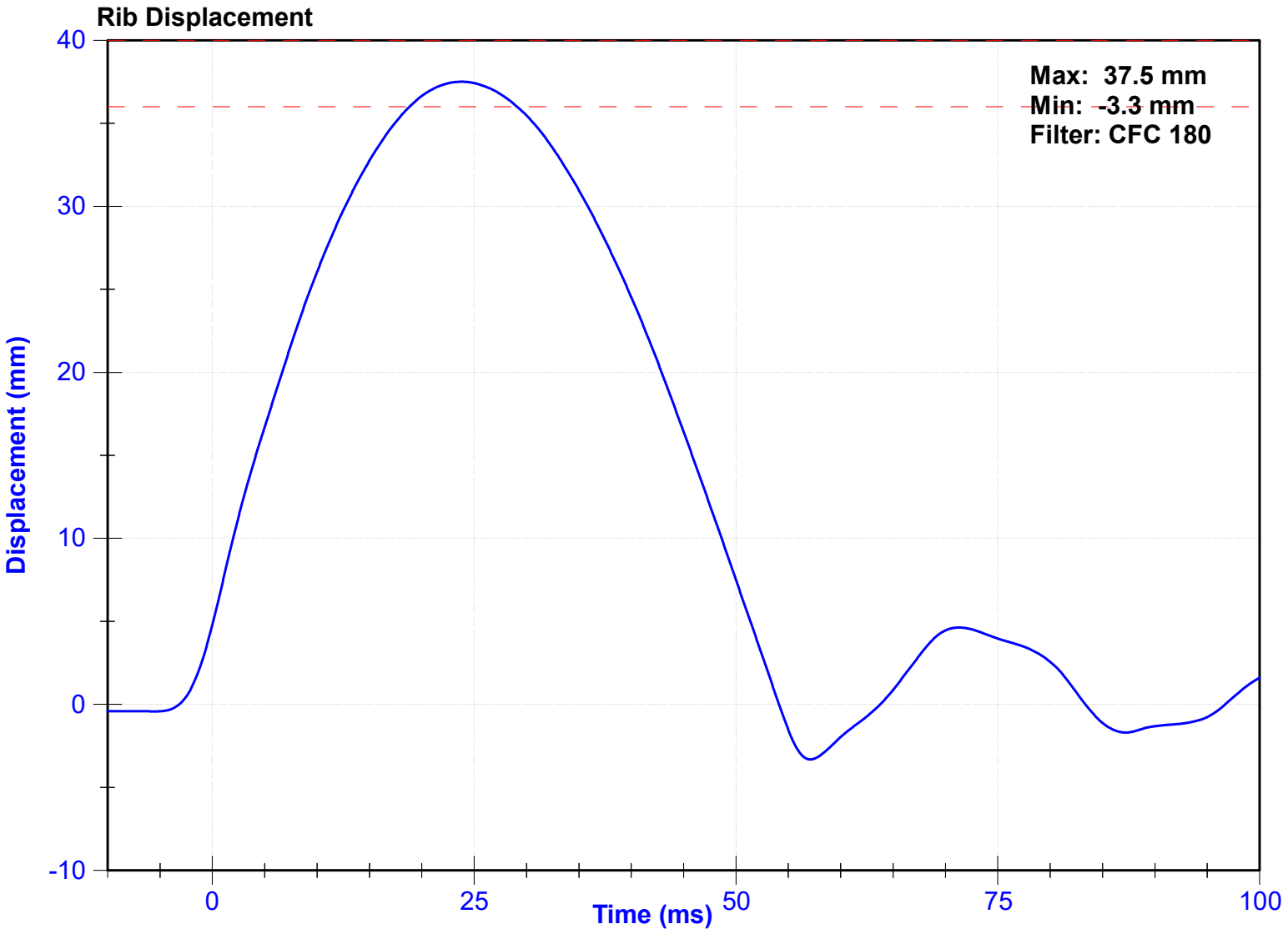
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Rib Displacement	36	40	mm	37.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	7/1/2025	12/30/2025



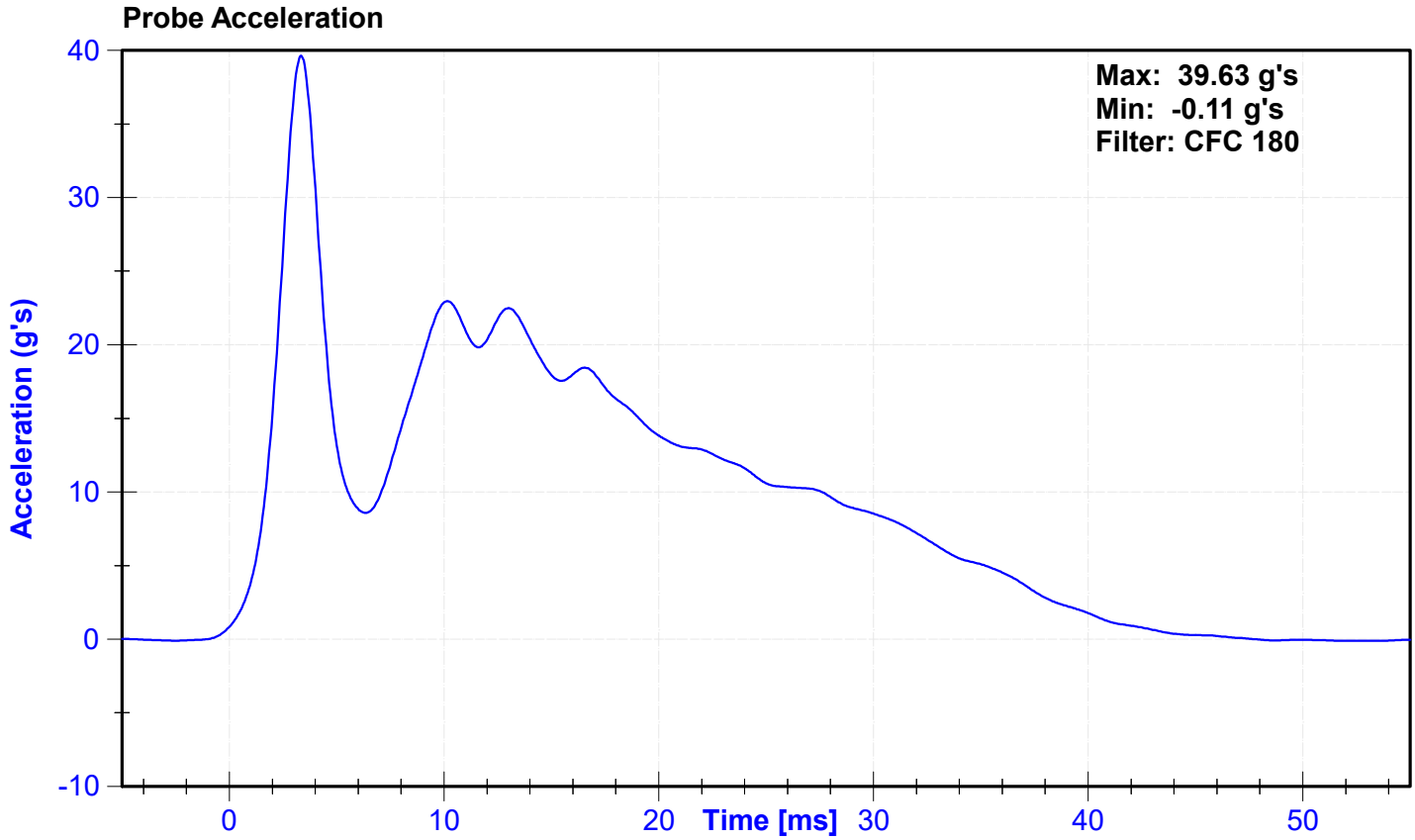
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

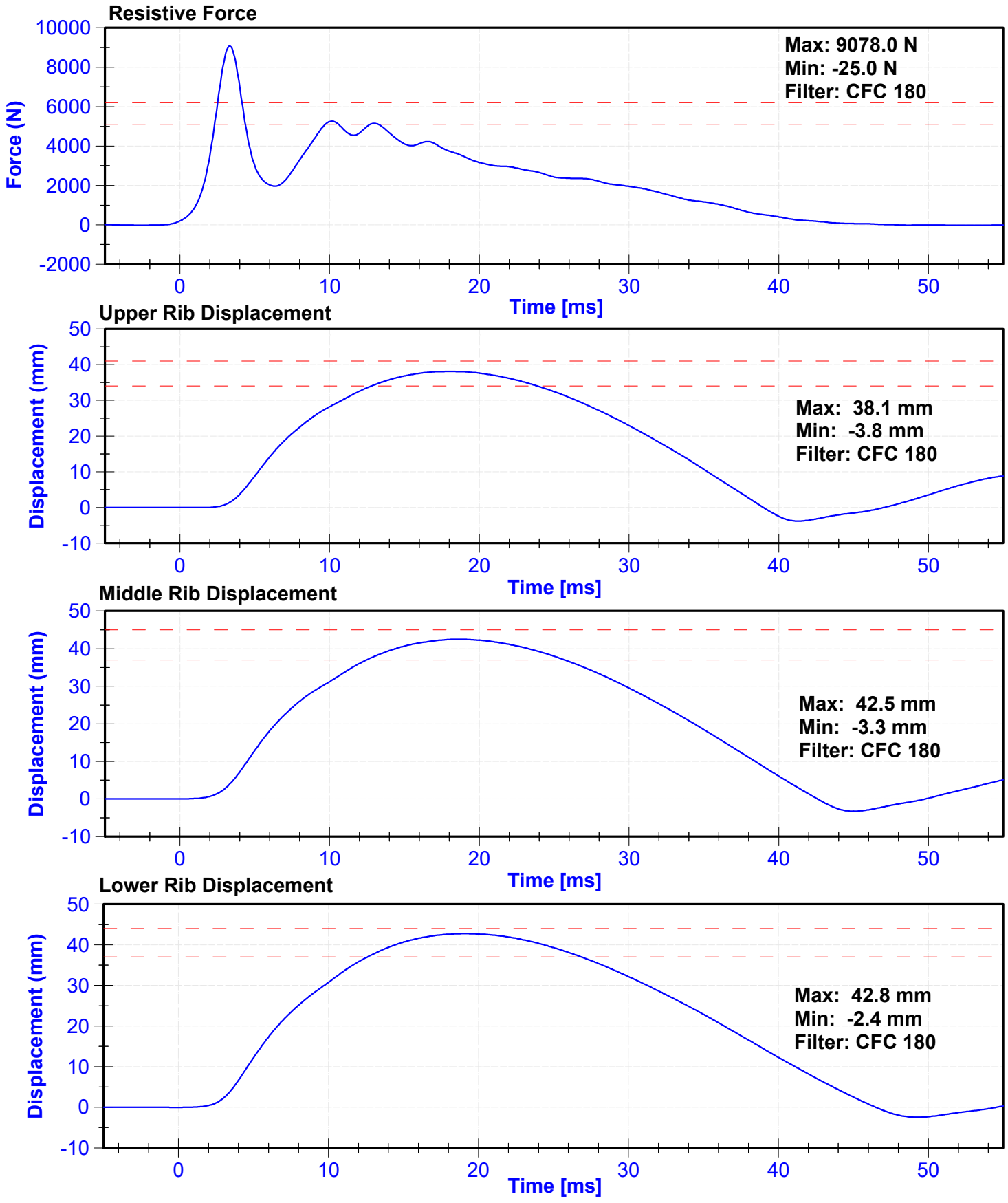
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	5.4	5.6	m/s	5.50	Pass
Resistive Force after 6ms	5100	6200	N	5260.6	Pass
Upper Thorax Rib Deflection	34	41	mm	38.1	Pass
Mid Thorax Rib Deflection	37	45	mm	42.5	Pass
Lower Thorax Rib Deflection	37	44	mm	42.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Thorax Rib Potentiometer	Honeywell	179GFE	7/1/2025	12/30/2025
Middle Thorax Rib Potentiometer	Honeywell	185GFE	7/1/2025	12/30/2025
Lower Thorax Rib Potentiometer	Honeywell	184GFE	7/1/2025	12/30/2025




Resistive Force
Force (N)
Max: 9078.0 N
Min: -25.0 N
Filter: CFC 180
Time [ms]
Upper Rib Displacement
Displacement (mm)
Max: 38.1 mm
Min: -3.8 mm
Filter: CFC 180
Time [ms]
Middle Rib Displacement
Displacement (mm)
Max: 42.5 mm
Min: -3.3 mm
Filter: CFC 180
Time [ms]
Lower Rib Displacement
Displacement (mm)
Max: 42.8 mm
Min: -2.4 mm
Filter: CFC 180
Time [ms]

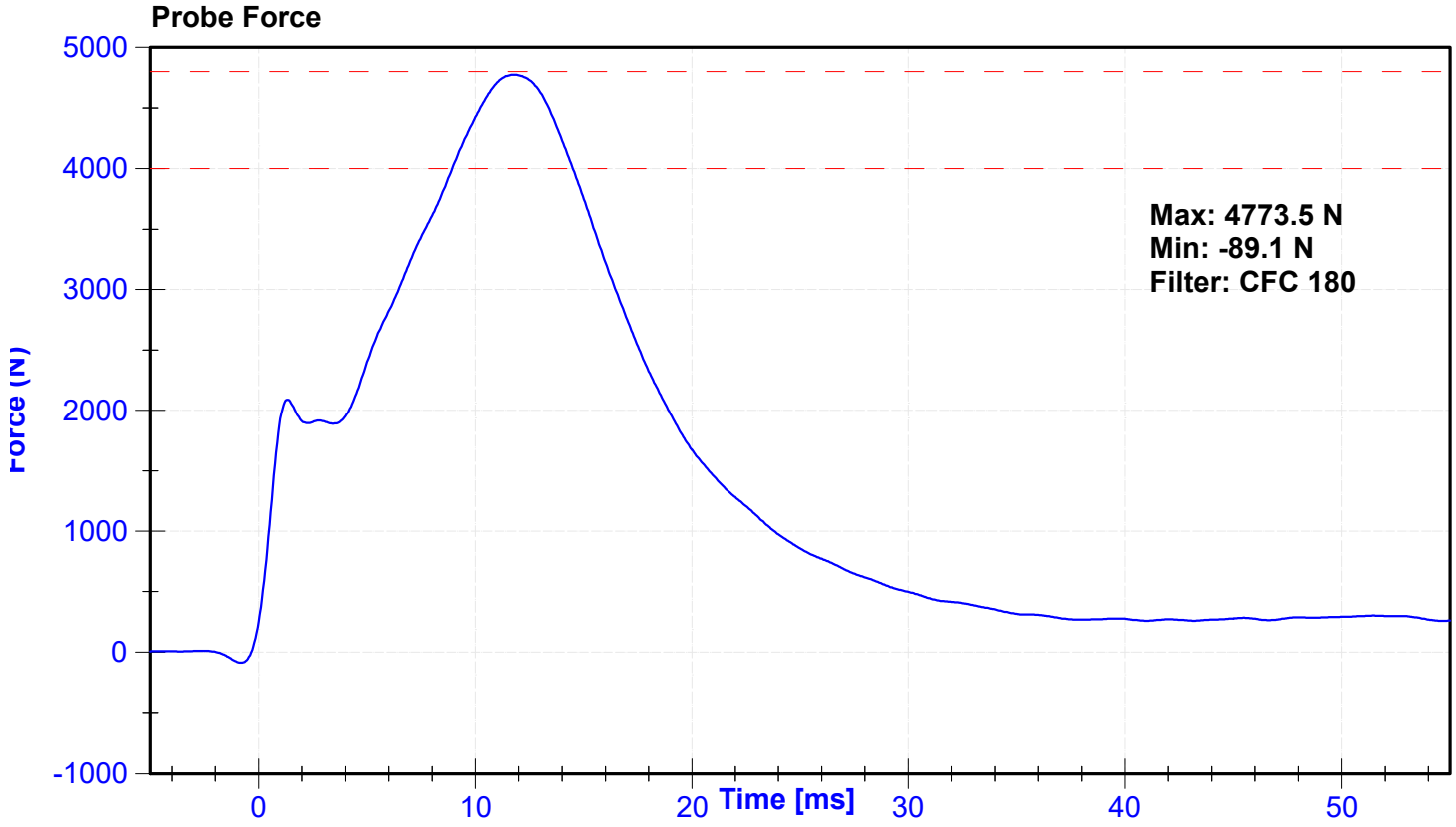
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

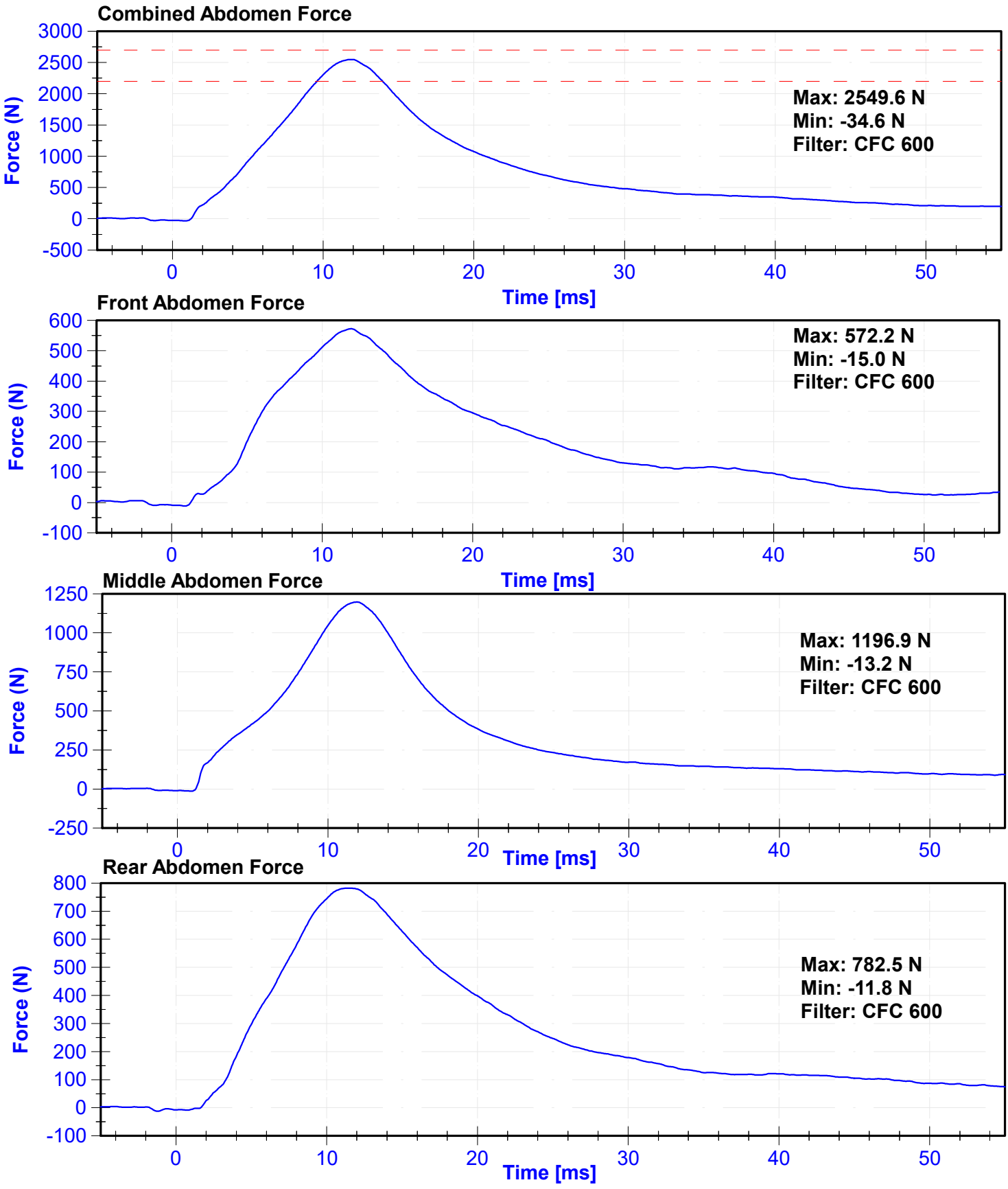
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	3.9	4.1	m/s	4.02	Pass
Combined Abdomen Force	2200	2700	N	2549.6	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.90	Pass
Resistive Probe Force	4000	4800	N	4773.5	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.75	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
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: 2549.6 N
Min: -34.6 N
Filter: CFC 600
Front Abdomen Force
Max: 572.2 N
Min: -15.0 N
Filter: CFC 600
Middle Abdomen Force
Max: 1196.9 N
Min: -13.2 N
Filter: CFC 600
Rear Abdomen Force
Max: 782.5 N
Min: -11.8 N
Filter: CFC 600

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

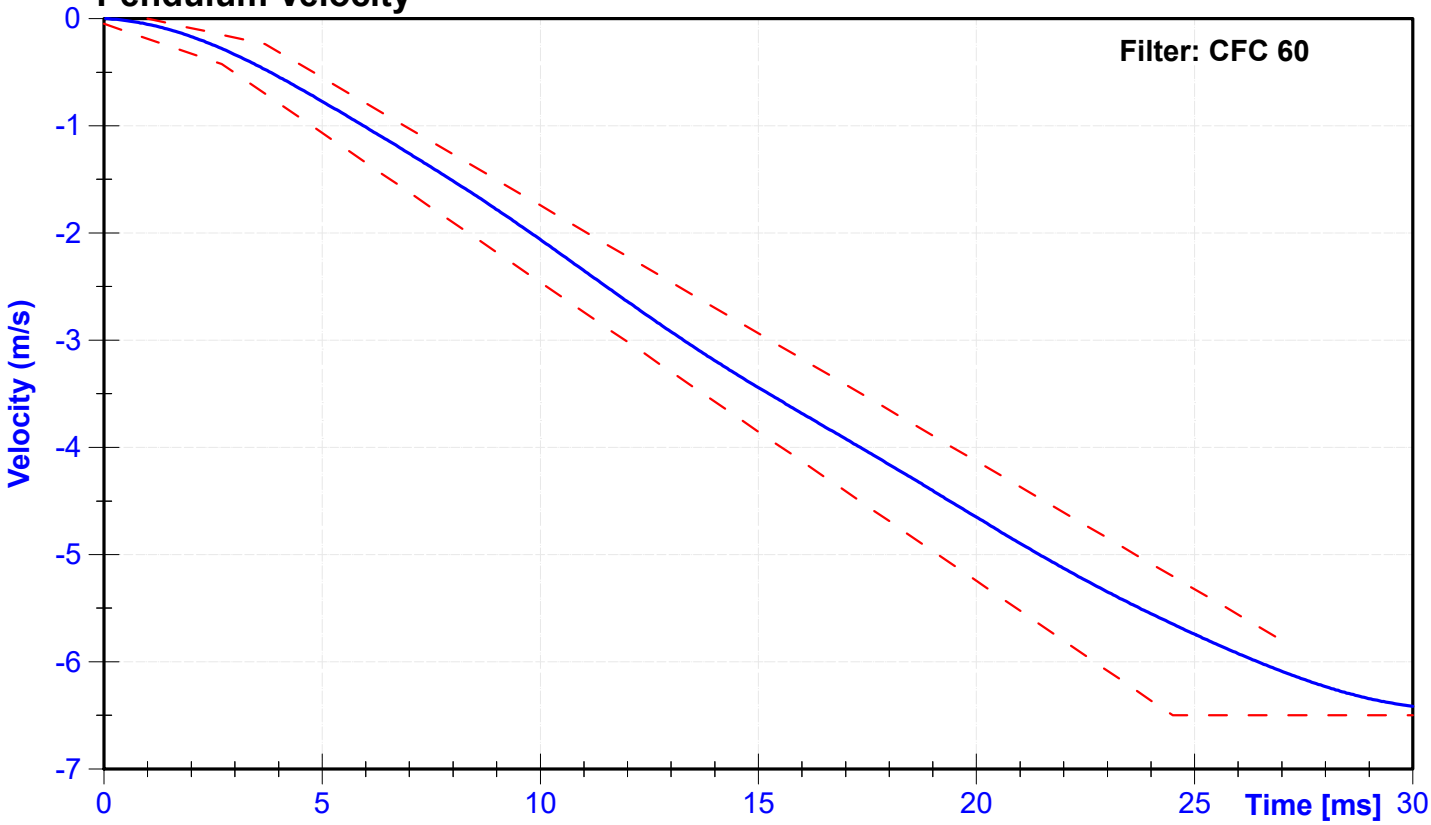
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	5.95	6.15	m/s	6.137	Pass
Lateral Spine Rotation	45	55	deg	49.1	Pass
Time at Maximum Rotation	39	53	ms	43.6	Pass
Time of Decay to Zero Degrees	37	57	ms	39.2	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

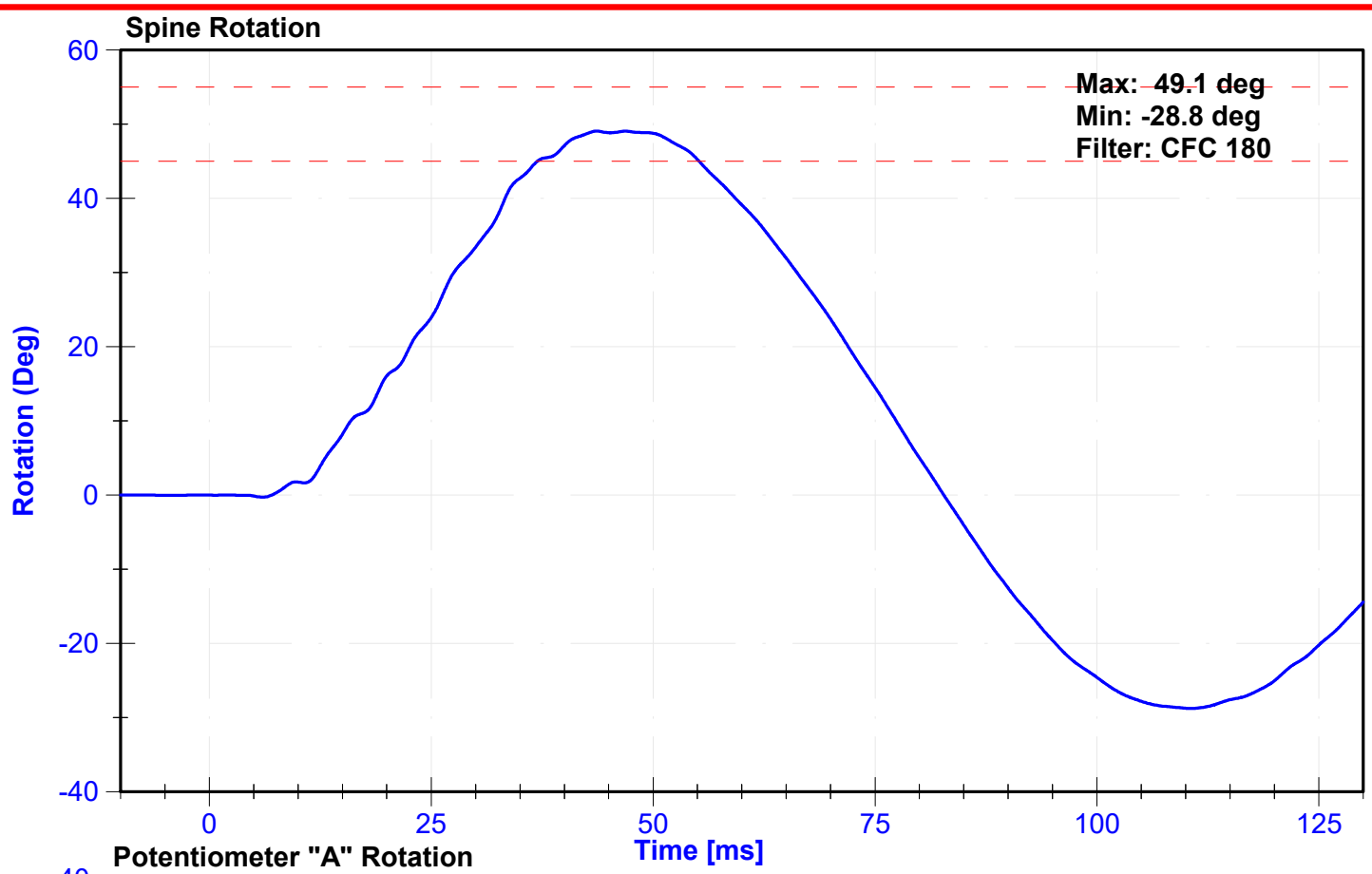
Transducer Calibrations

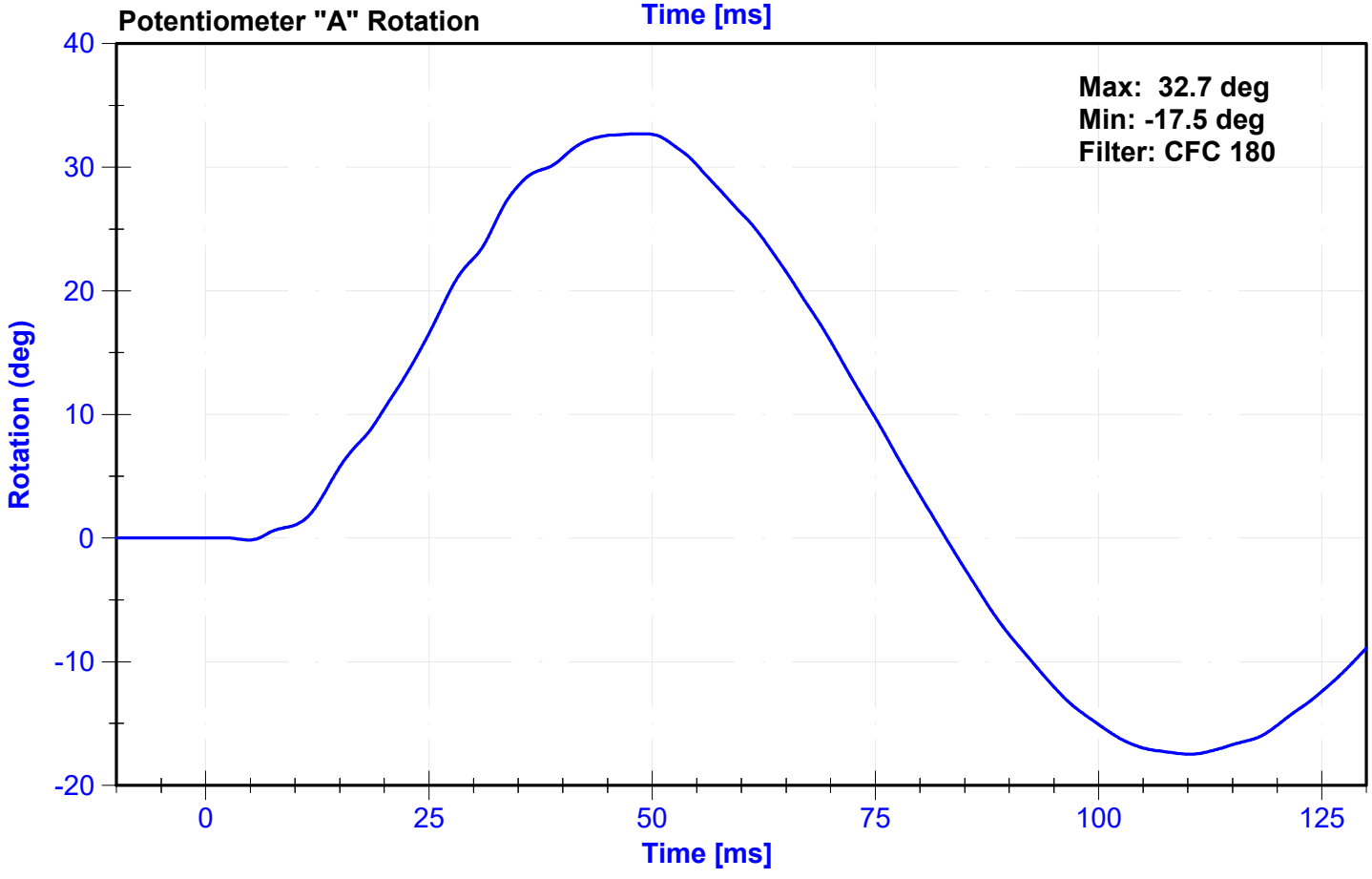
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum "A" Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Condyle "B" Potentiometer	Sfernice	095	9/13/2024	9/13/2025

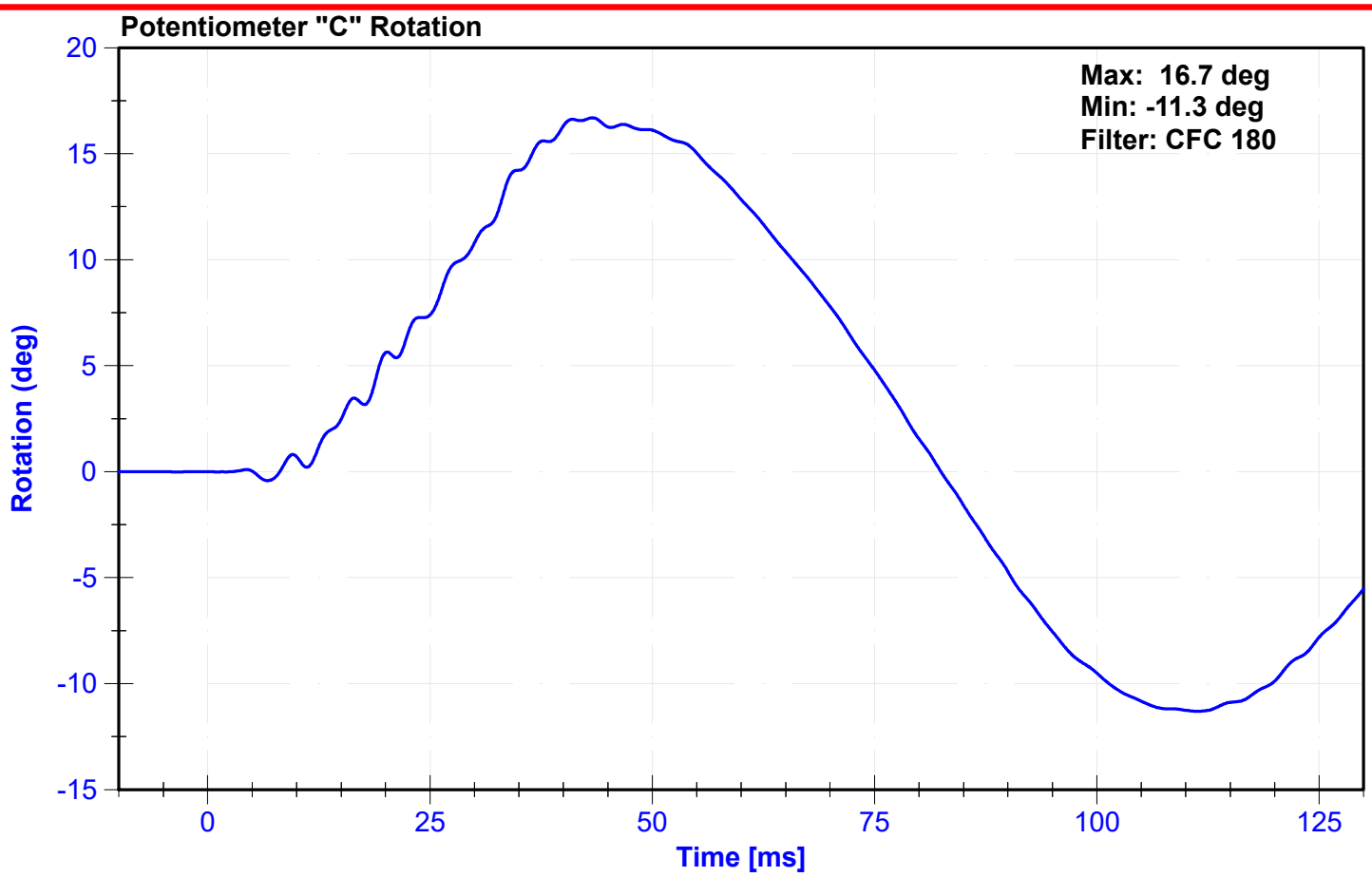
Pendulum Velocity[3]



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


Spine Rotation
Max: 49.1 deg
Min: -28.8 deg
Filter: CFC 180
Rotation (Deg)
60
40
20
0
-20
-40
0
25
50
75
100
125
Time [ms]


Potentiometer "A" Rotation
Max: 32.7 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

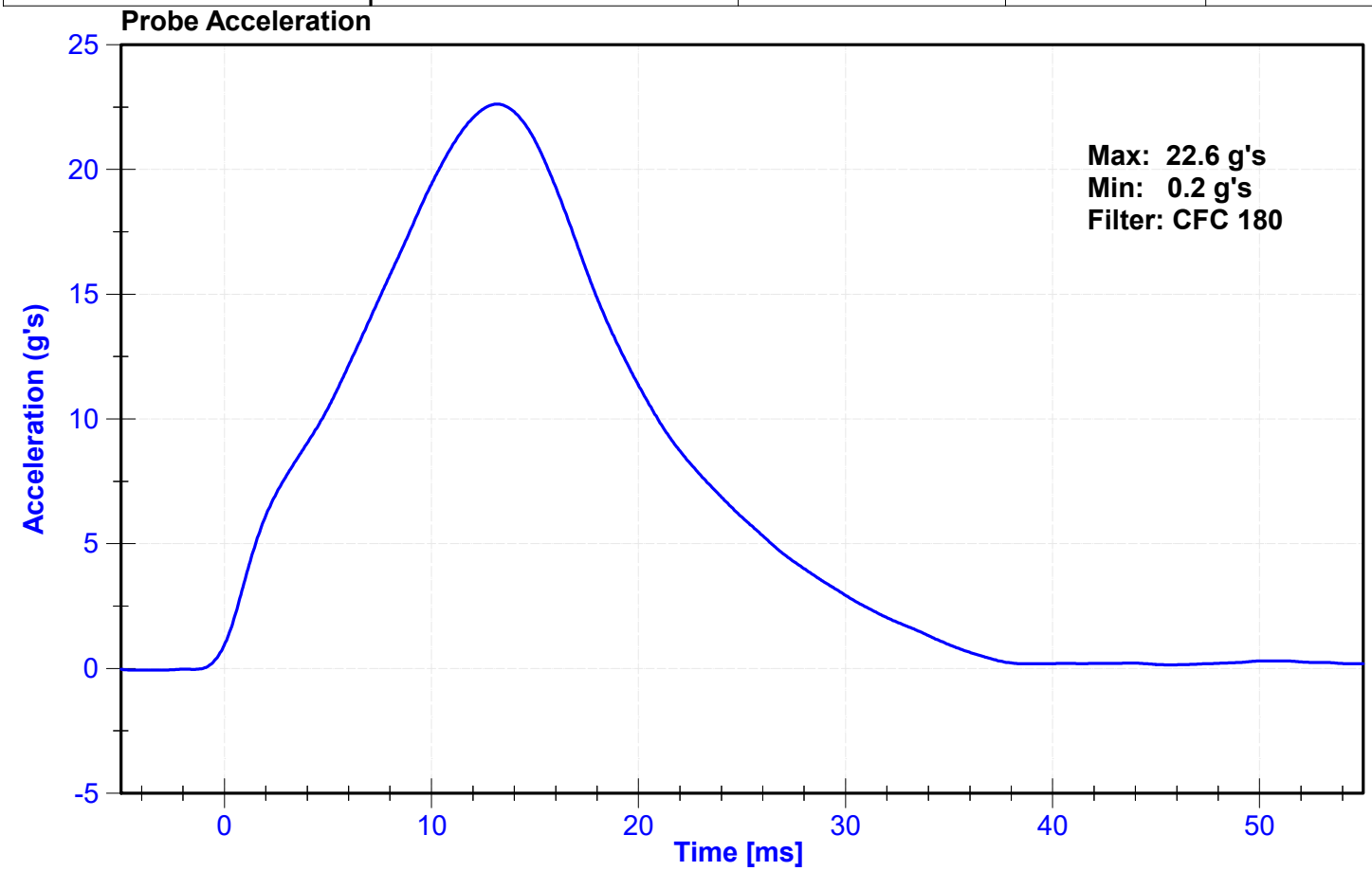
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

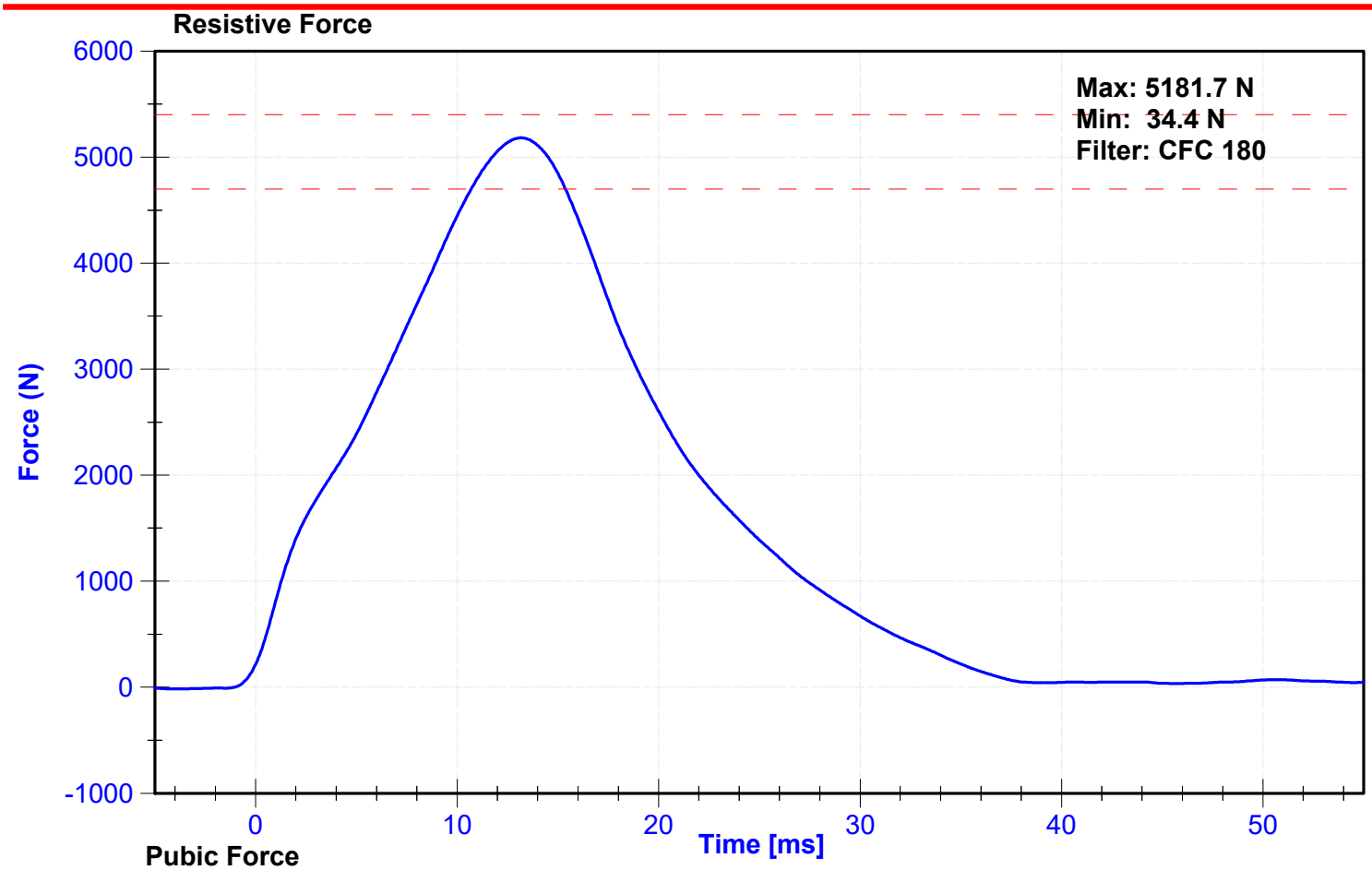
Results

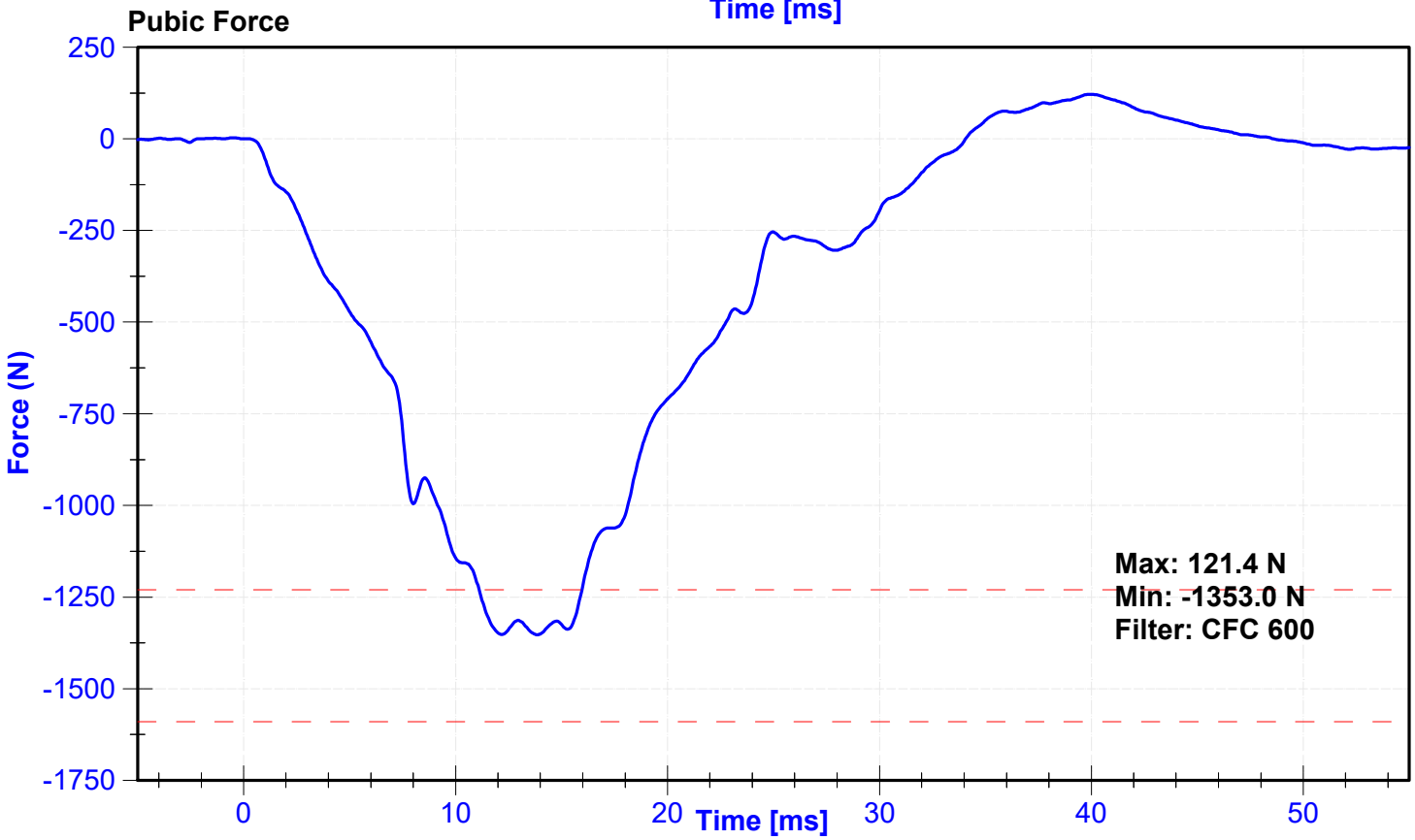
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Resistive Force	4700	5400	N	5181.7	Pass
Time at Peak Resistive Force	11.8	16.1	ms	13.15	Pass
Pubic Force	-1590	-1230	N	-1353.0	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.85	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pubic Load Cell	Denton	458-FY	10/28/2024	10/28/2025




Resistive Force
Max: 5181.7 N
Min: 34.4 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: 121.4 N
Min: -1353.0 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

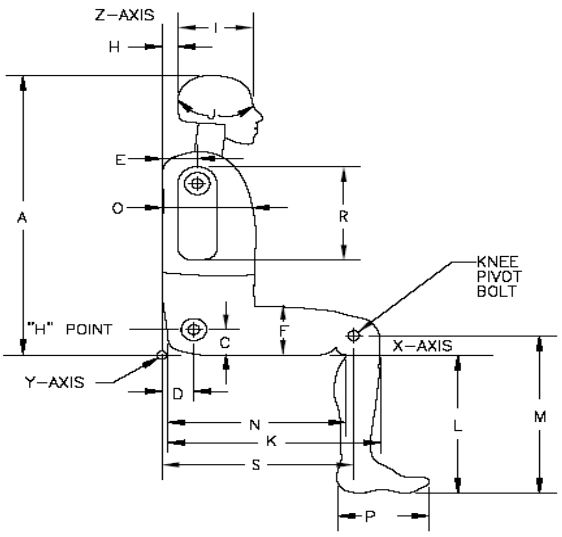
SERIAL NO:DG8012

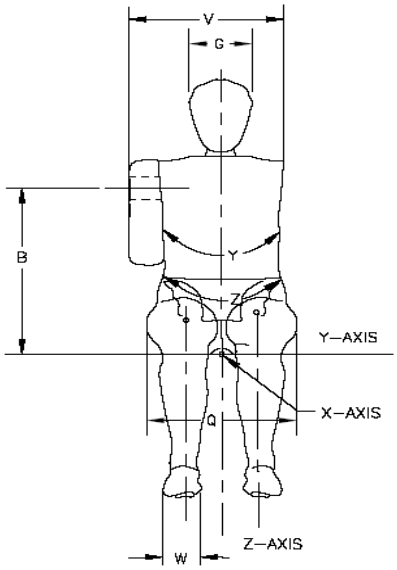
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: J. Rios Date: 07/22/2025

Dummy Serial Number: DG8012





Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	778	Pass
B	Shoulder Pivot Height	437	453	442	Pass
C	H-point Height	79	89	85	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	100	Pass
F	Thigh Clearance	119	135	124	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	547	Pass
K	Buttock to Knee Length	514	540	522	Pass
L	Popliteal Height	343	369	355	Pass
M	Knee Pivot to floor height	392	409	402	Pass
N	Buttock Popliteal Length	416	442	428	Pass
O	Chest Depth w/o jacket	195	211	204	Pass
P	Foot Length	216	232	219	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	258	Pass
S	Knee Joint to seatback	477	493	483	Pass
V	Shoulder Width	341	357	353	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	872	Pass
Z	Waist Circumference	761	791	779	Pass

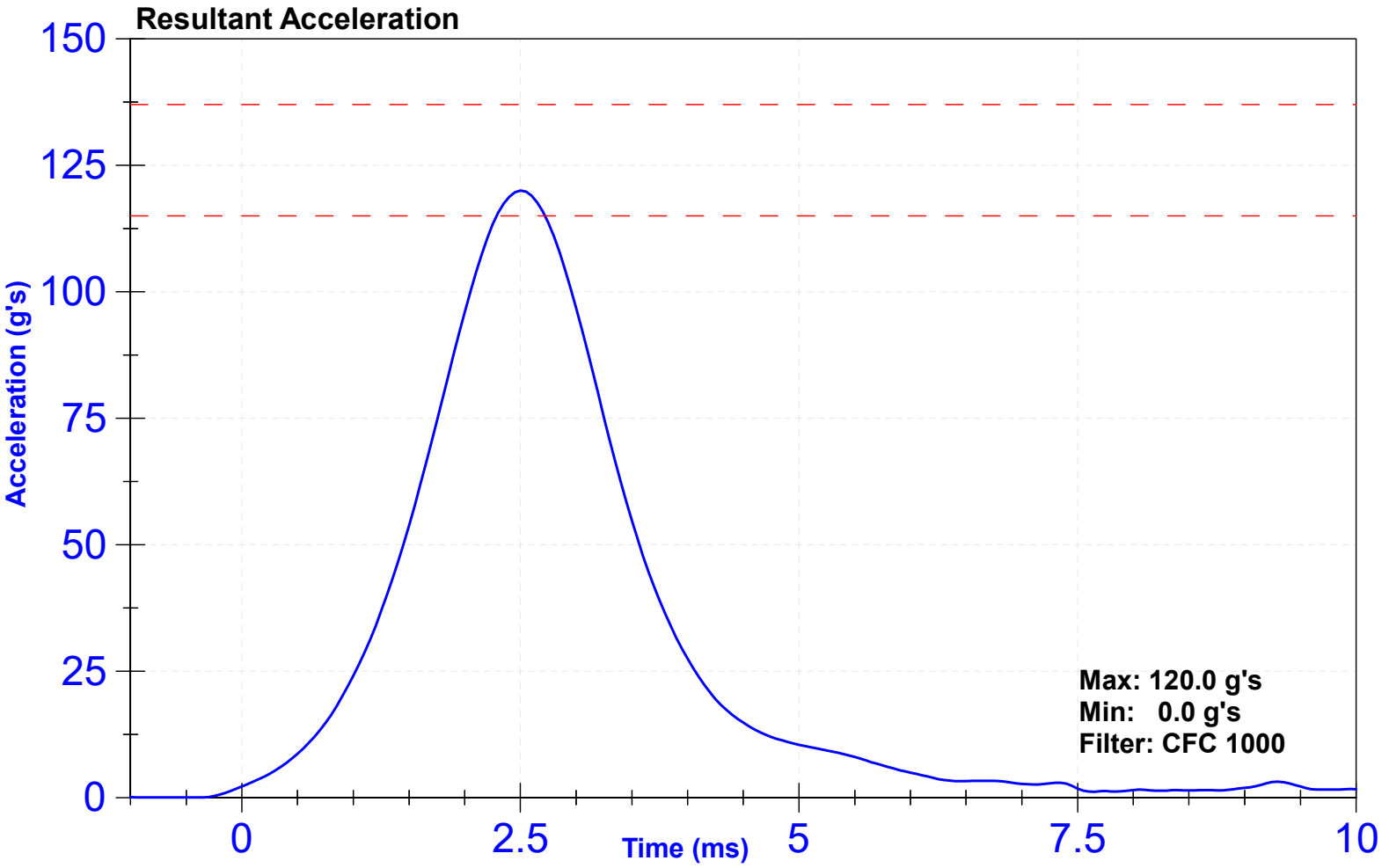
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

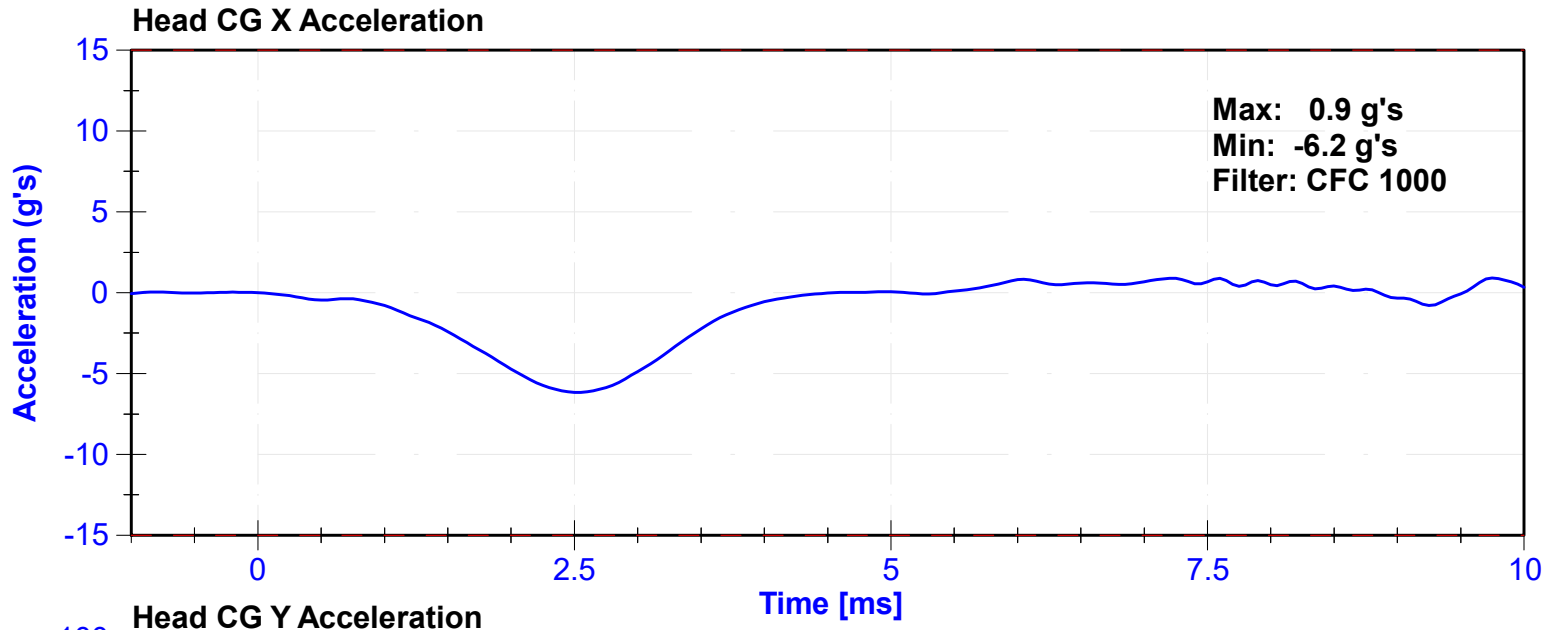
Results

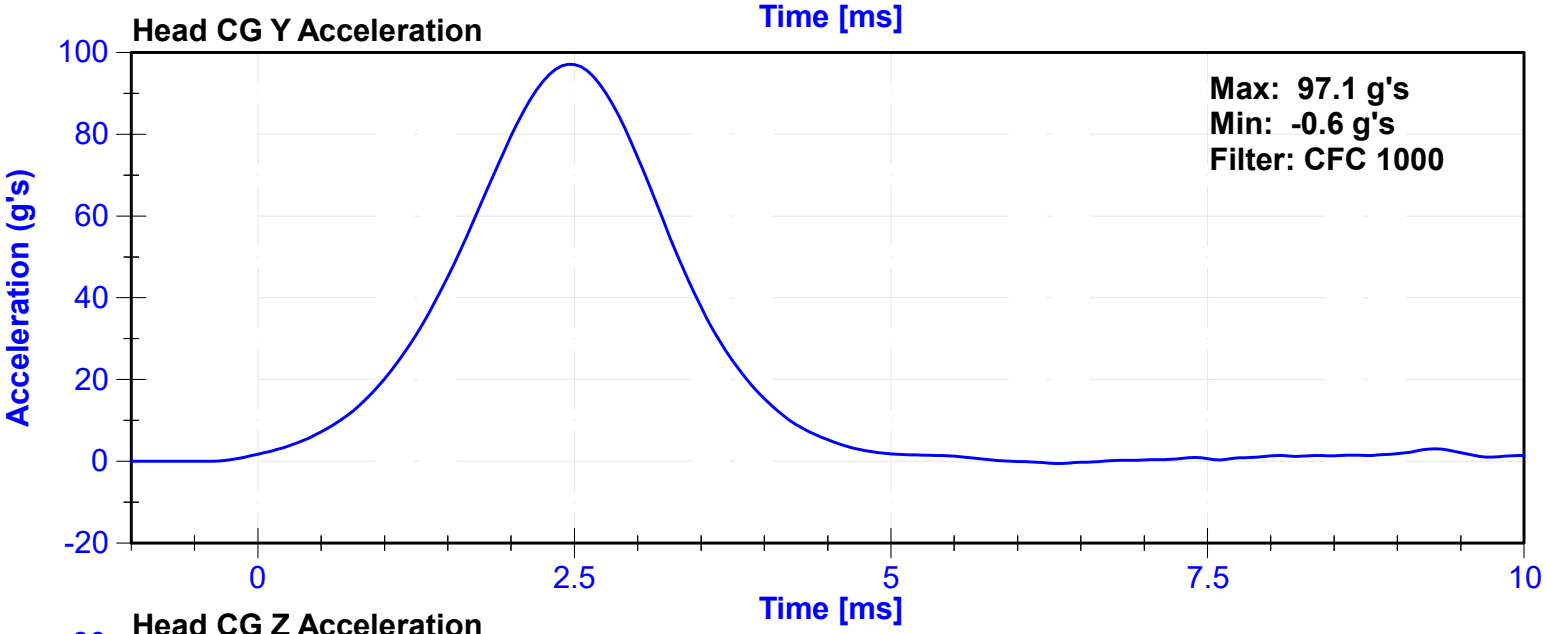
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	46	Pass
Resultant Acceleration	115	137	g's	120.0	Pass
Oscillation	0	15	%	2.7	Pass
Fore-Aft Acceleration	-15	15	g's	-6.2	Pass

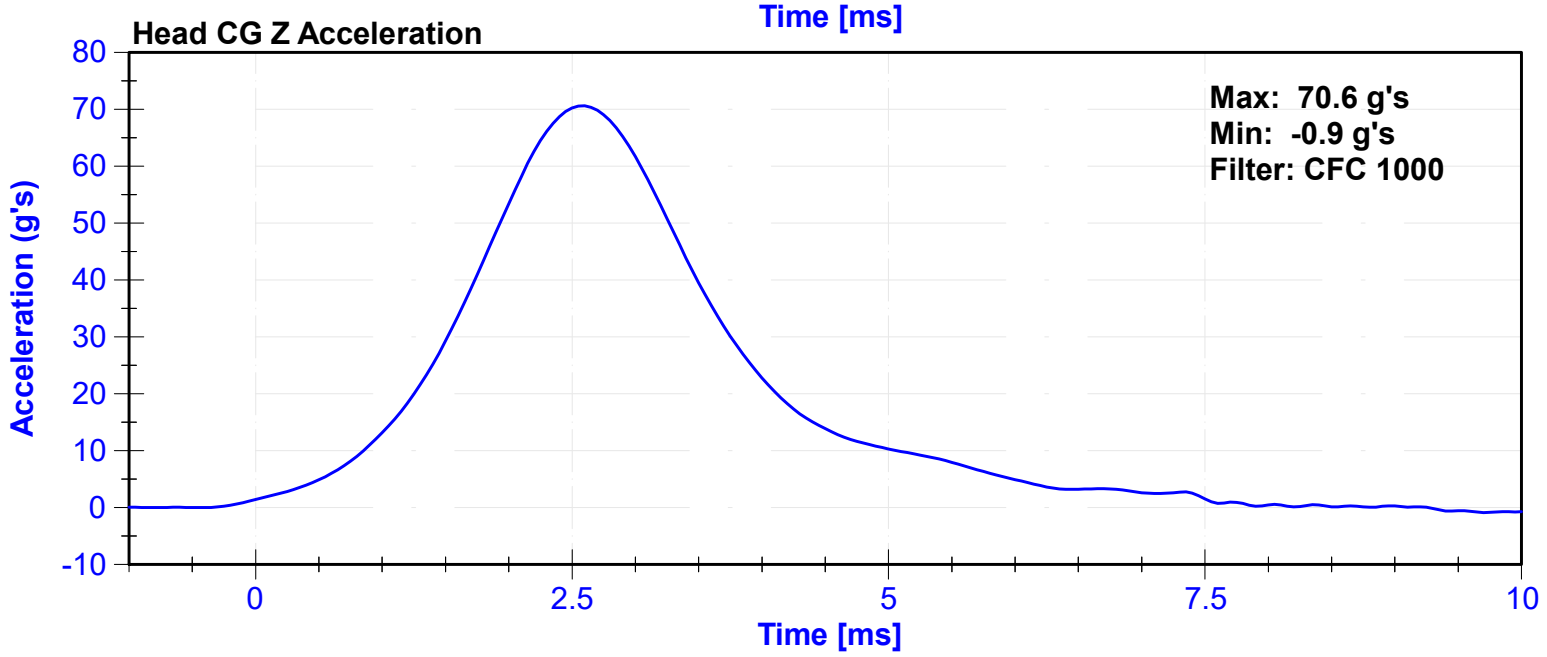
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	T21184	7/2/2025	12/29/2025
Y Accelerometer	Endevco	T31030	7/2/2025	12/29/2025
Z Accelerometer	Endevco	P83319	7/2/2025	12/29/2025




Head CG X Acceleration
Max: 0.9 g's
Min: -6.2 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Y Acceleration
Max: 97.1 g's
Min: -0.6 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Z Acceleration
Max: 70.6 g's
Min: -0.9 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]

ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

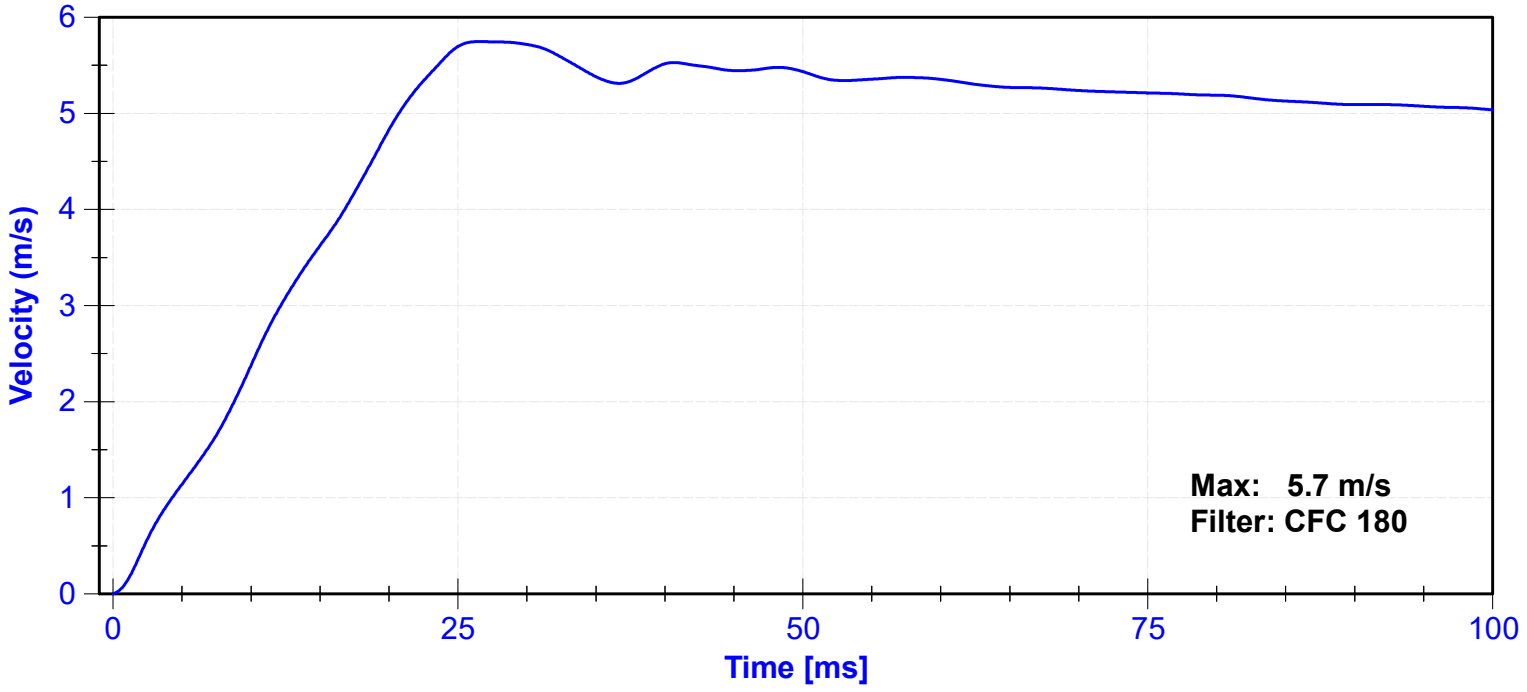
Results

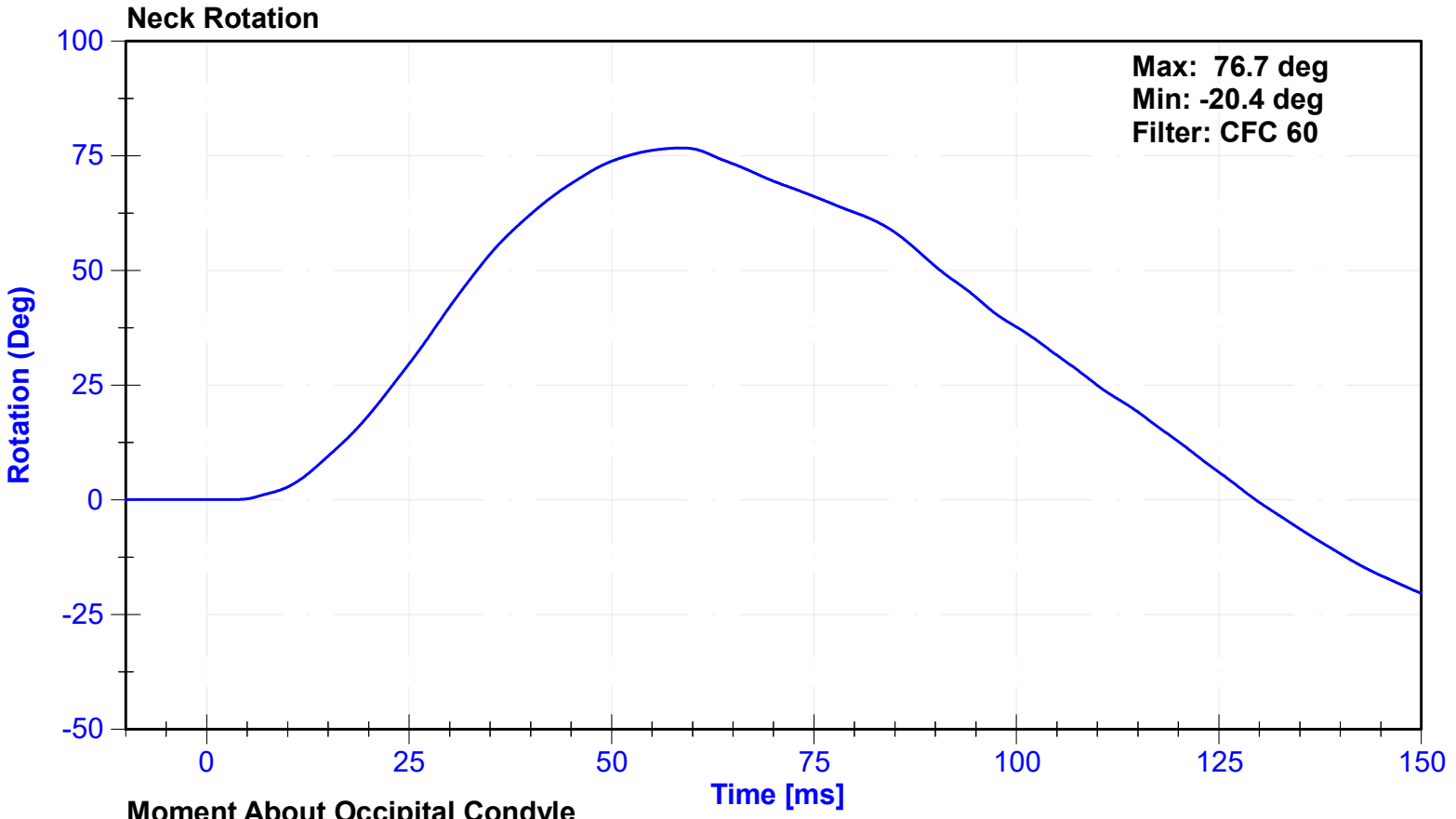
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.0	Pass
Humidity	10	70	%	46	Pass
Velocity	5.51	5.63	m/s	5.517	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.38	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.62	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.83	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.70	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.75	Pass
Neck Rotation	71	81	deg	76.7	Pass
Time at Maximum Rotation	50	70	ms	58.6	Pass
Moment about the OC	36	44	Nm	43.0	Pass
Moment Decay to 0 Nm	102	126	ms	112.3	Pass

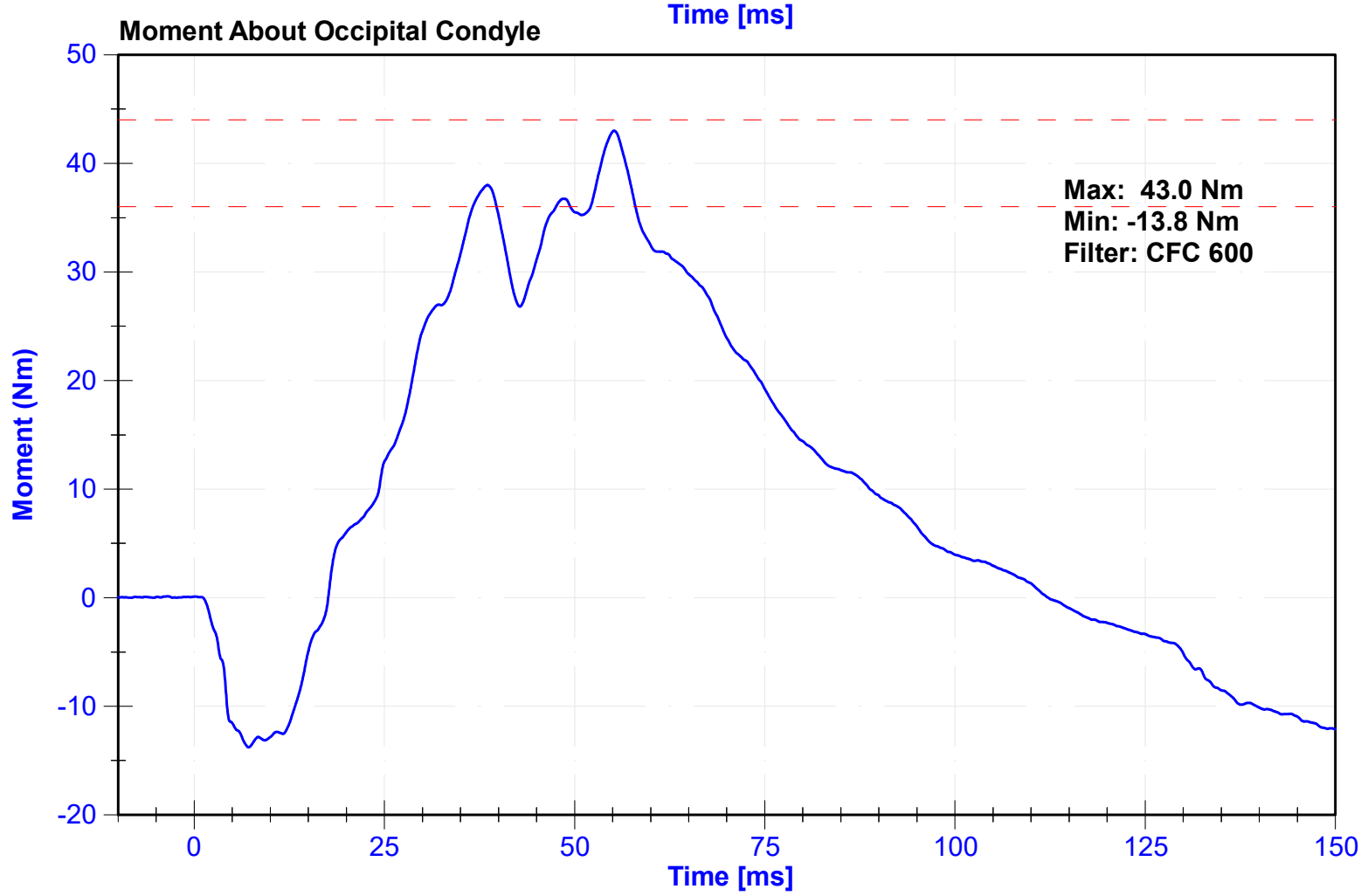
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/17/2024	10/17/2025
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_1935H01698-FY	4/17/2025	4/17/2026

Pendulum Impulse




Neck Rotation
Max: 76.7 deg
Min: -20.4 deg
Filter: CFC 60
Rotation (Deg)
100
75
50
25
0
-25
-50
0
25
50
75
100
125
150
Time [ms]


Moment About Occipital Condyle
Max: 43.0 Nm
Min: -13.8 Nm
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

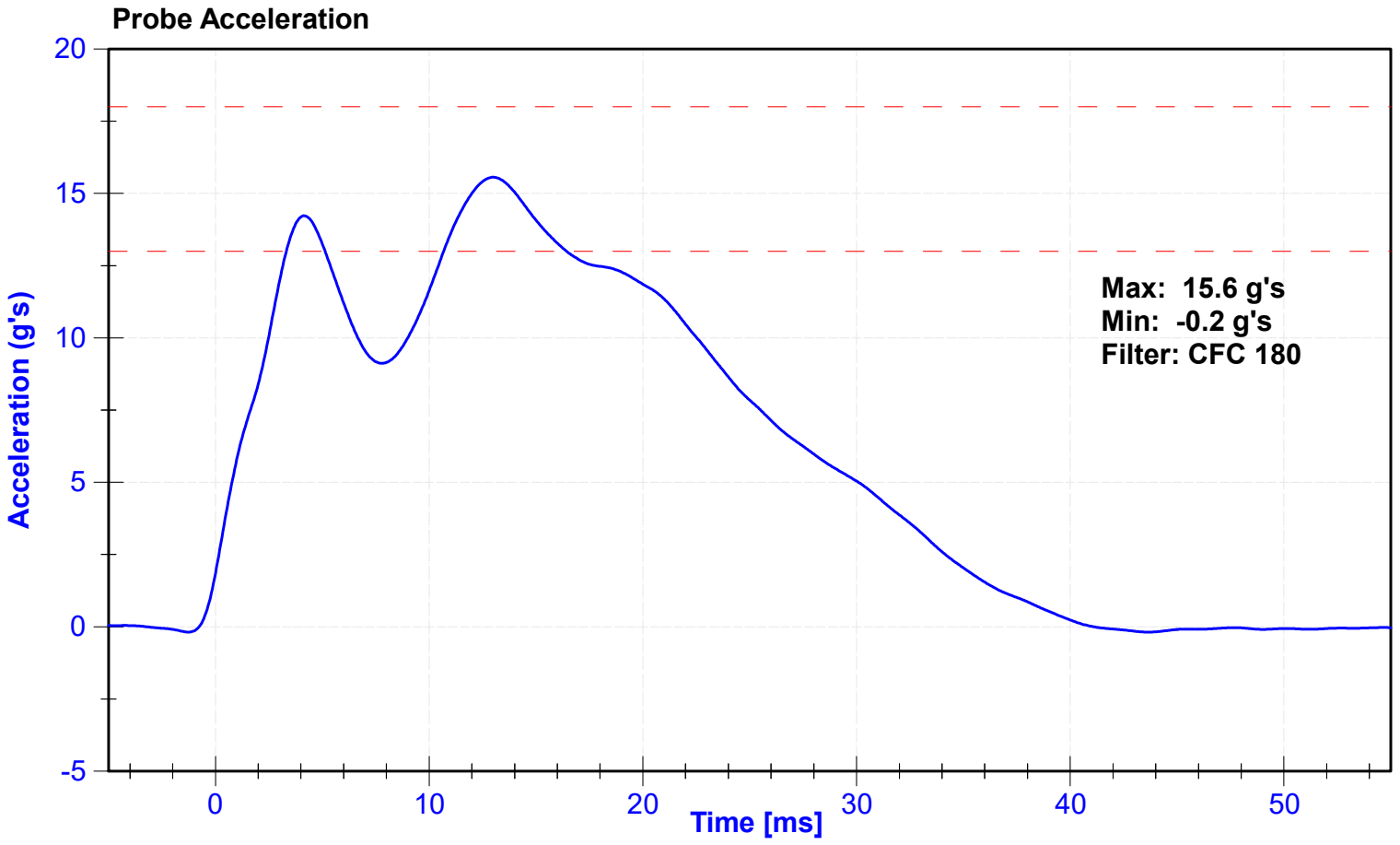
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

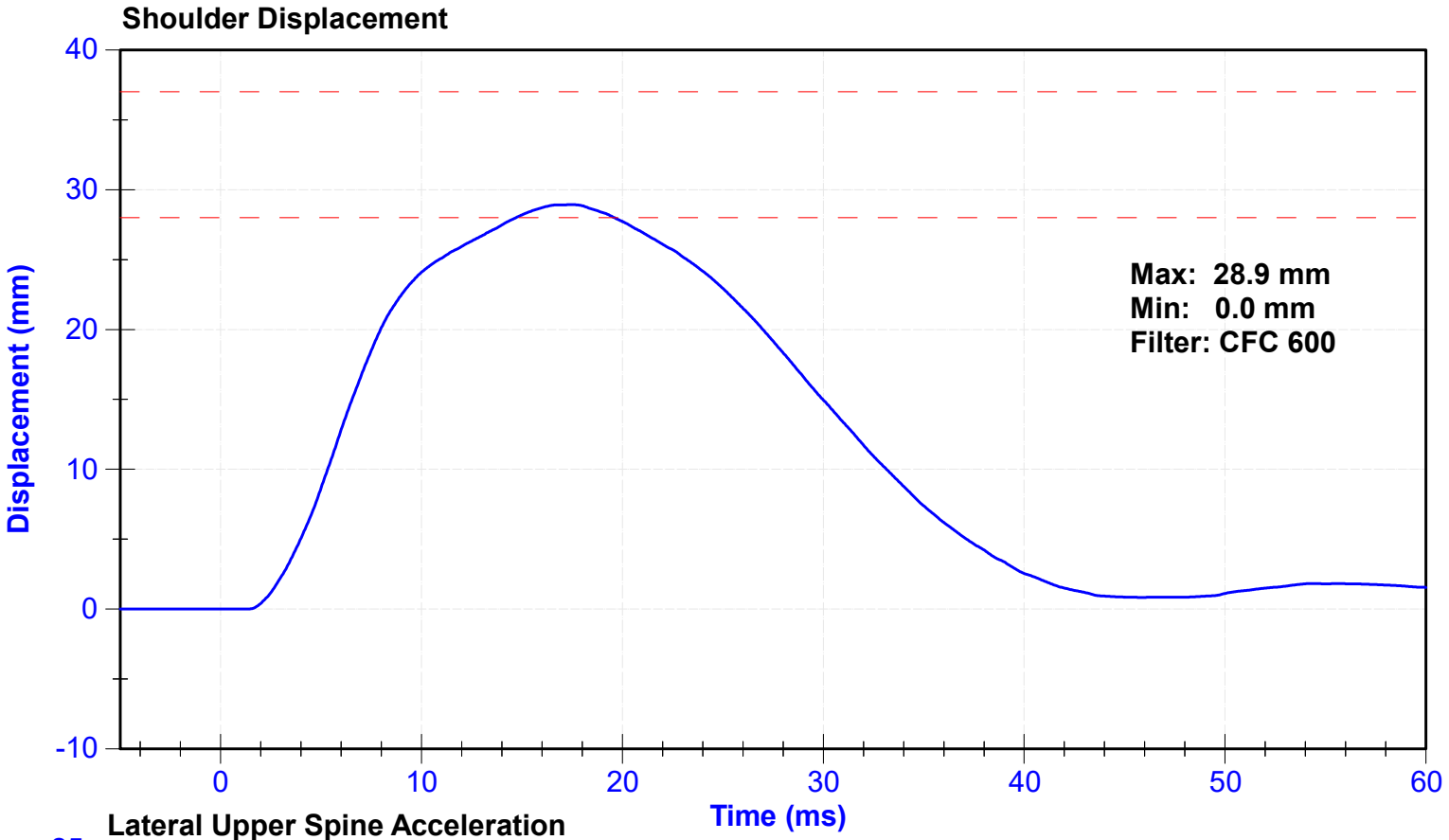
Results

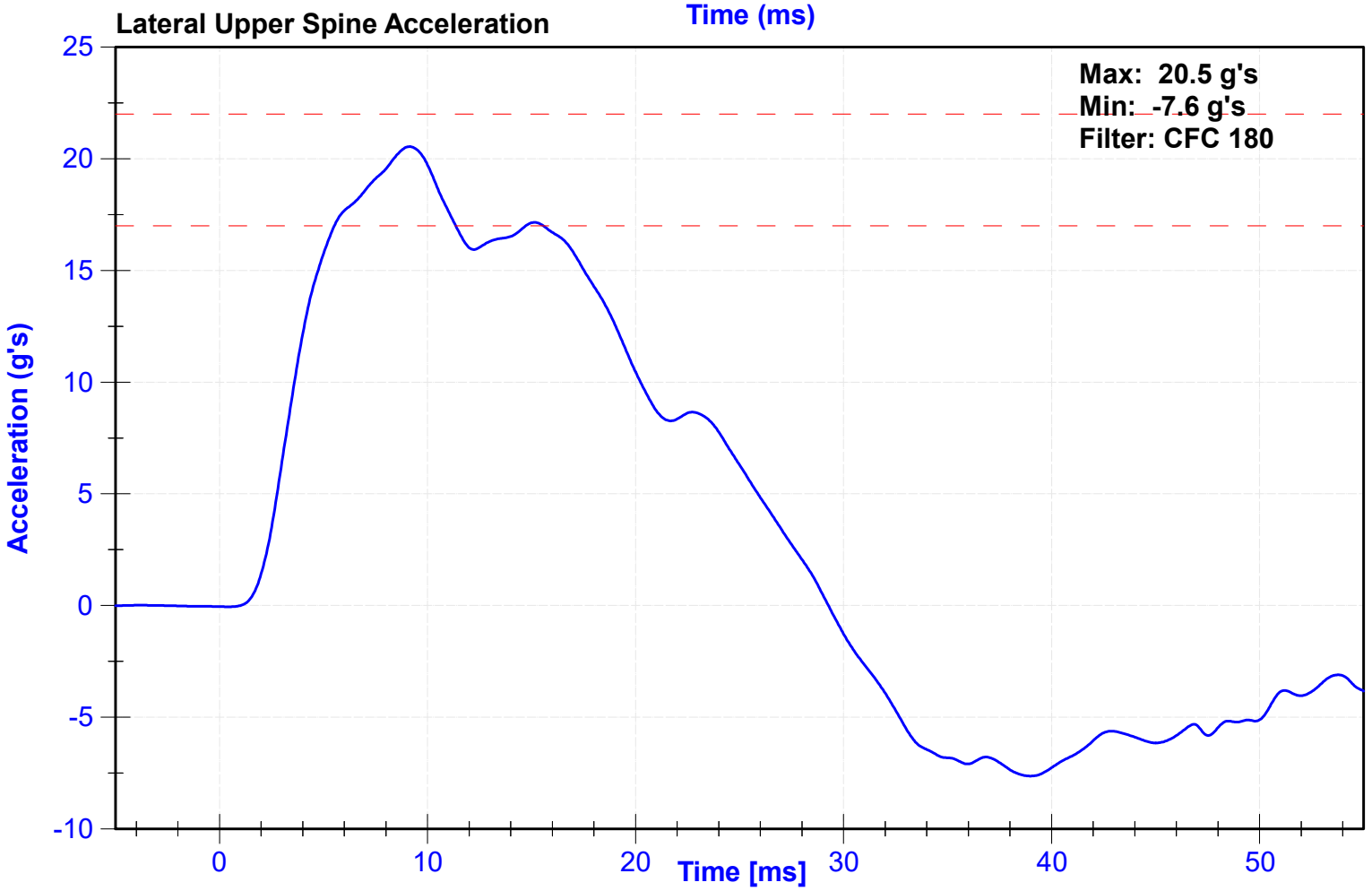
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.0	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	13	18	g's	15.6	Pass
Shoulder Deflection	28	37	mm	28.9	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Shoulder Potentiometer	Servo	1274GFE	7/8/2025	1/6/2026
Upper Spine Y Accelerometer	Endevco	P64148	7/2/2025	12/29/2025




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 28.9 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 20.5 g's
Min: -7.6 g's
Filter: CFC 180

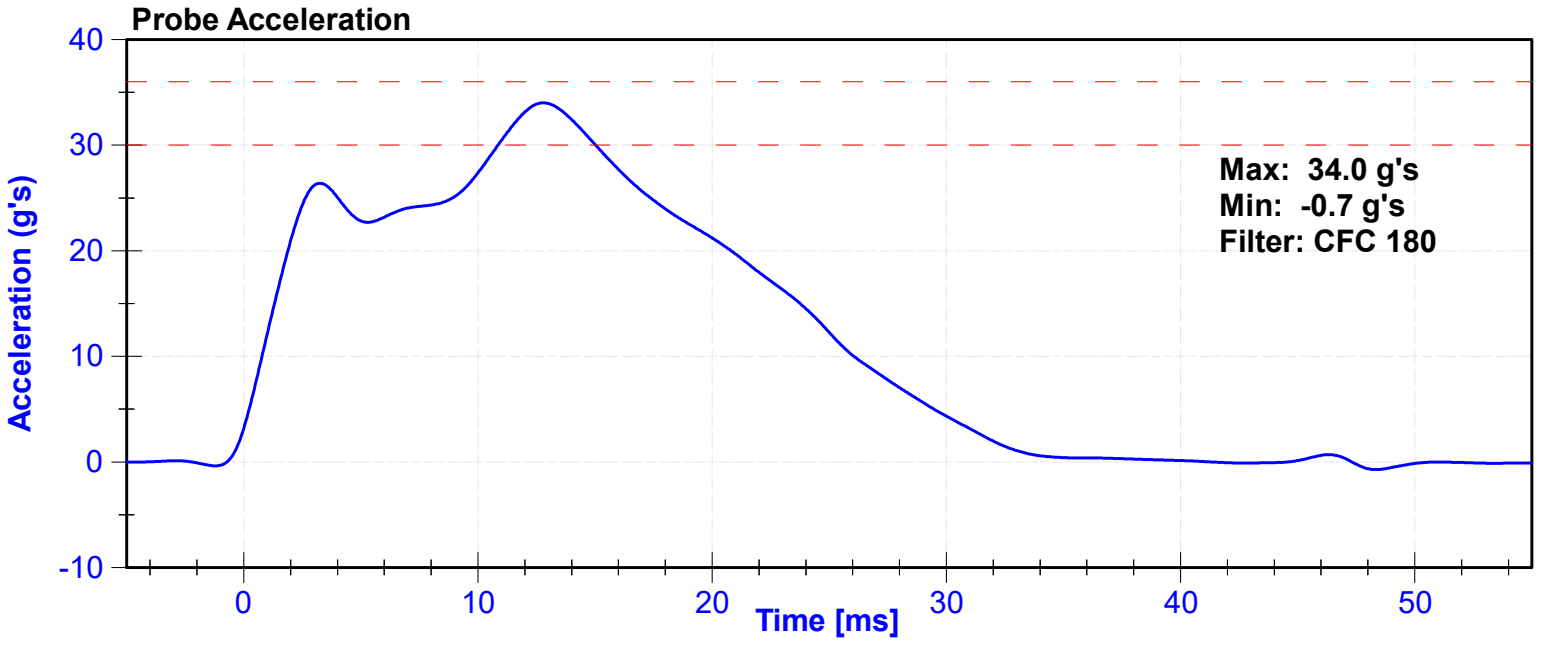
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

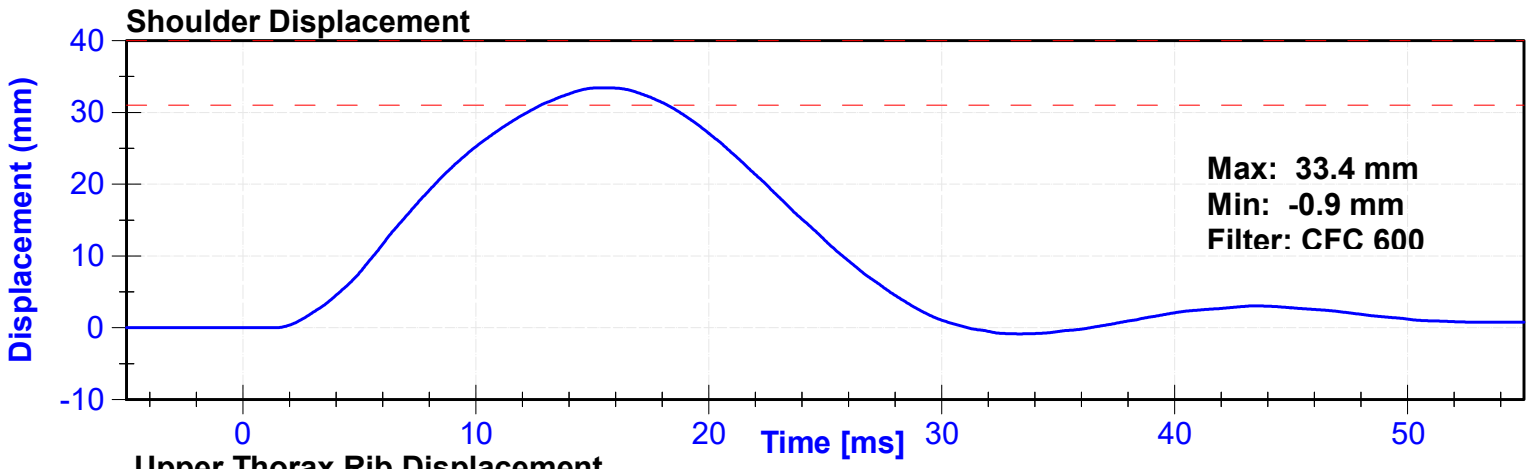
Results

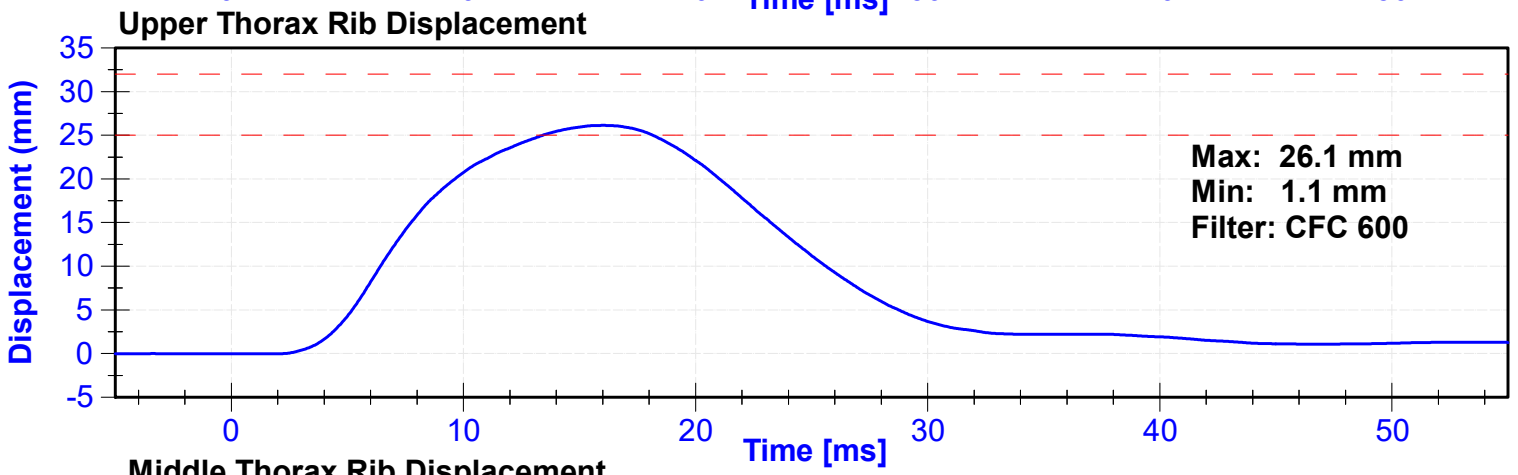
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.0	Pass
Humidity	10	70	%	44	Pass
Velocity	6.6	6.8	m/s	6.68	Pass
Probe Acceleration after 5 ms	30	36	g's	34.0	Pass
Lateral Upper Spine Acceleration	34	43	g's	38.8	Pass
Lateral Lower Spine Acceleration	29	37	g's	32.8	Pass
Shoulder Deflection	31	40	mm	33.4	Pass
Upper Thorax Rib Deflection	25	32	mm	26.1	Pass
Mid Thorax Rib Deflection	30	36	mm	31.5	Pass
Lower Thorax Rib Deflection	32	38	mm	34.9	Pass

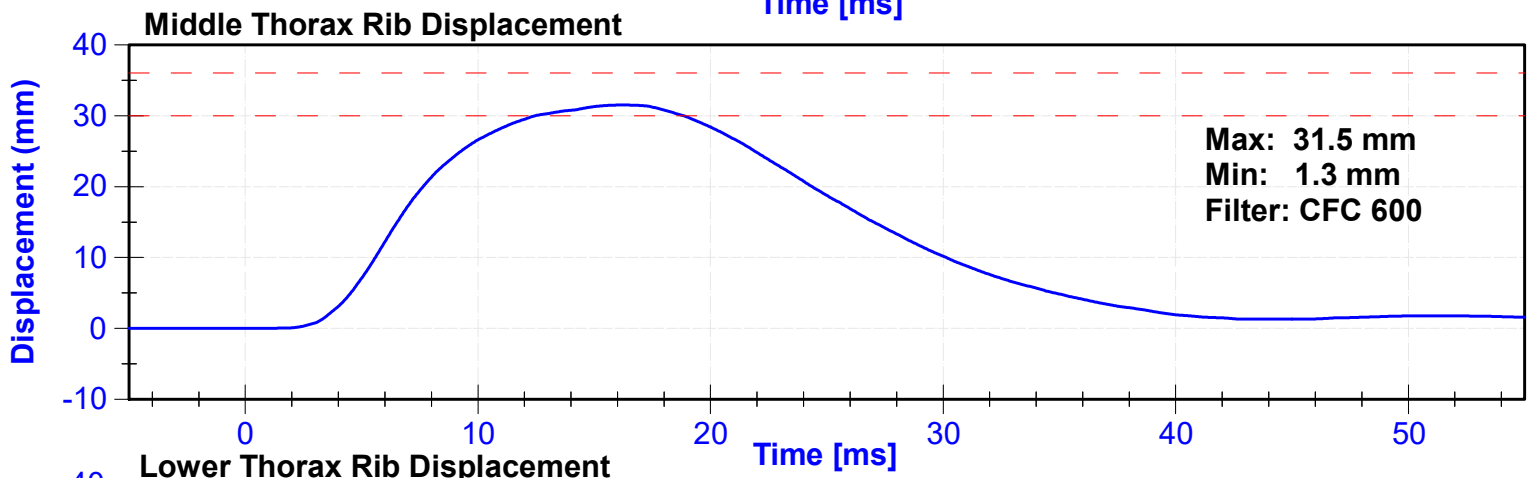
Transducer Calibrations

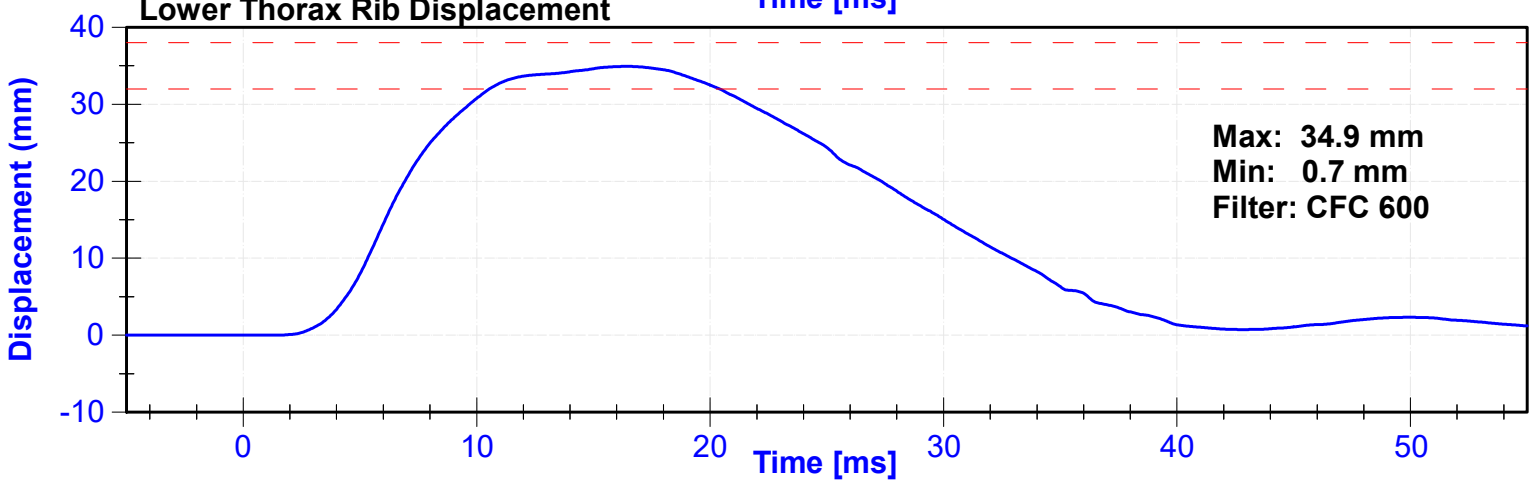
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Spine T1 Y Accelerometer	Endevco	P64148	7/2/2025	12/29/2025
Upper Spine T12 Y Accelerometer	Endevco	P58883	7/2/2025	12/29/2025
Shoulder Potentiometer	Servo	1274GFE	7/8/2025	1/6/2026
Upper Thorax Rib Potentiometer	Servo	1199GFE	7/8/2025	1/6/2026
Middle Thorax Rib Potentiometer	Servo	1246GFE	7/8/2025	1/6/2026
Lower Thorax Rib Potentiometer	Servo	011GFE	7/8/2025	1/6/2026

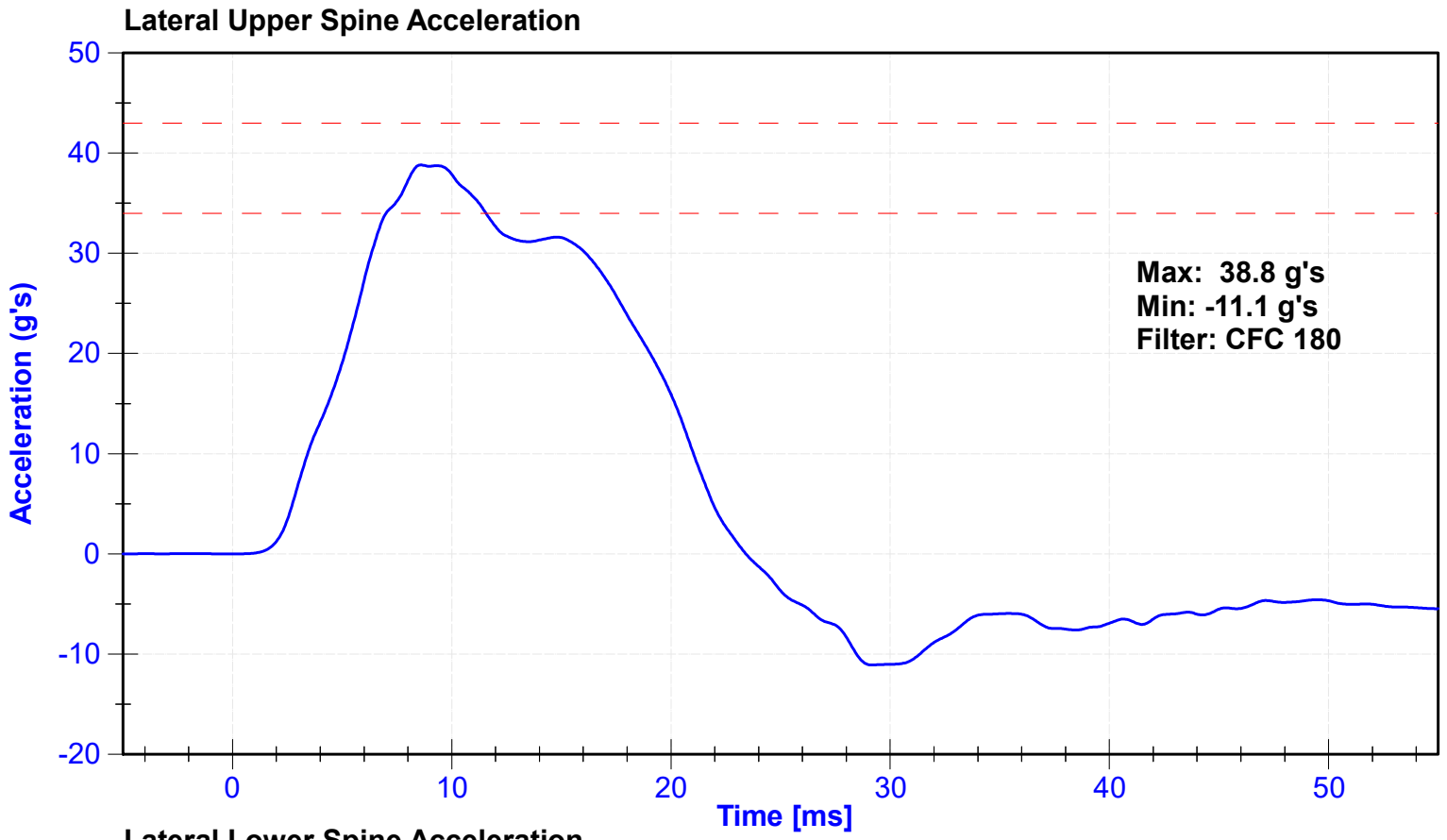


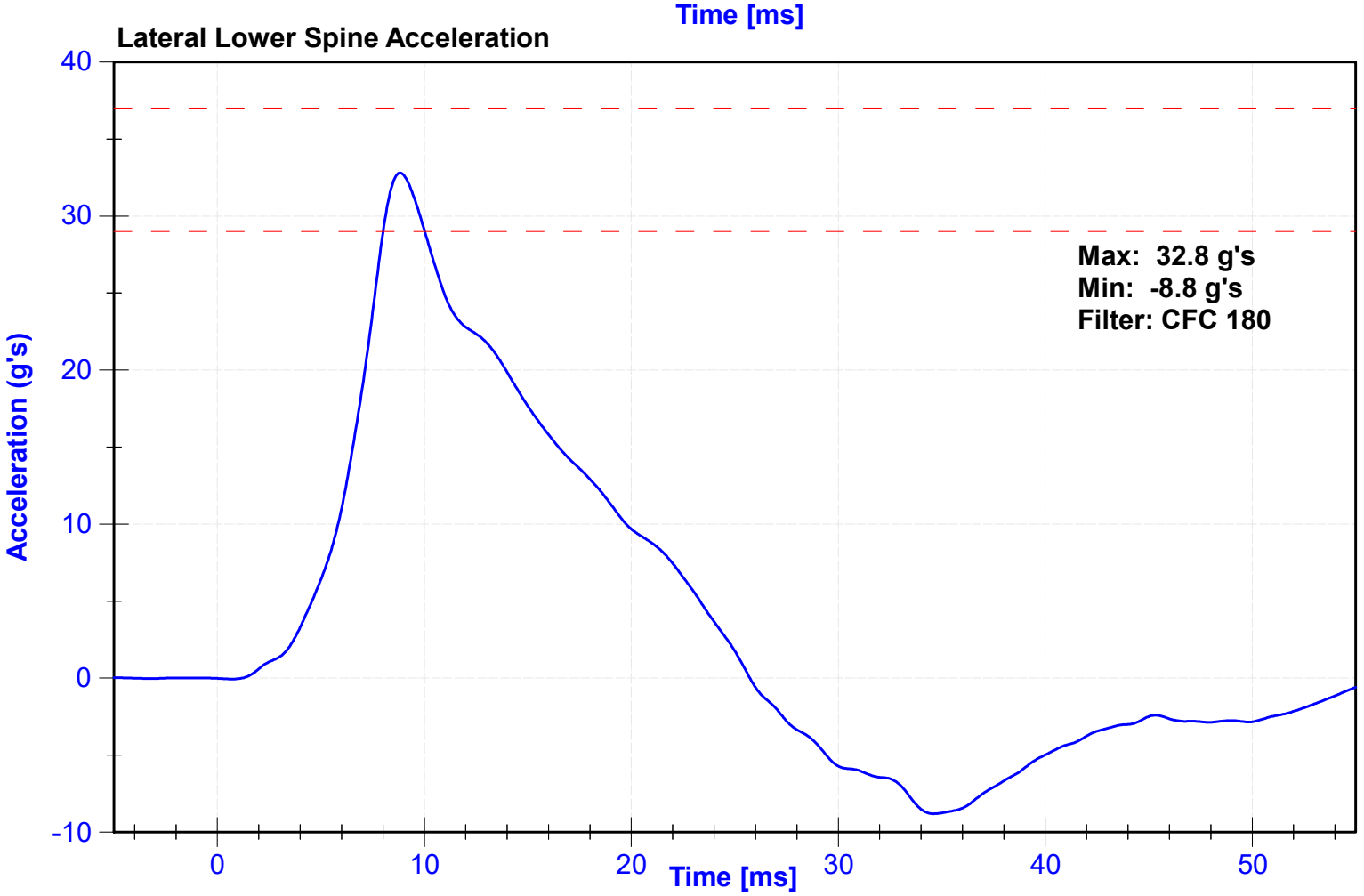

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 33.4 mm
Min: -0.9 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 26.1 mm
Min: 1.1 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 31.5 mm
Min: 1.3 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 34.9 mm
Min: 0.7 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 38.8 g's
Min: -11.1 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 32.8 g's
Min: -8.8 g's
Filter: CFC 180

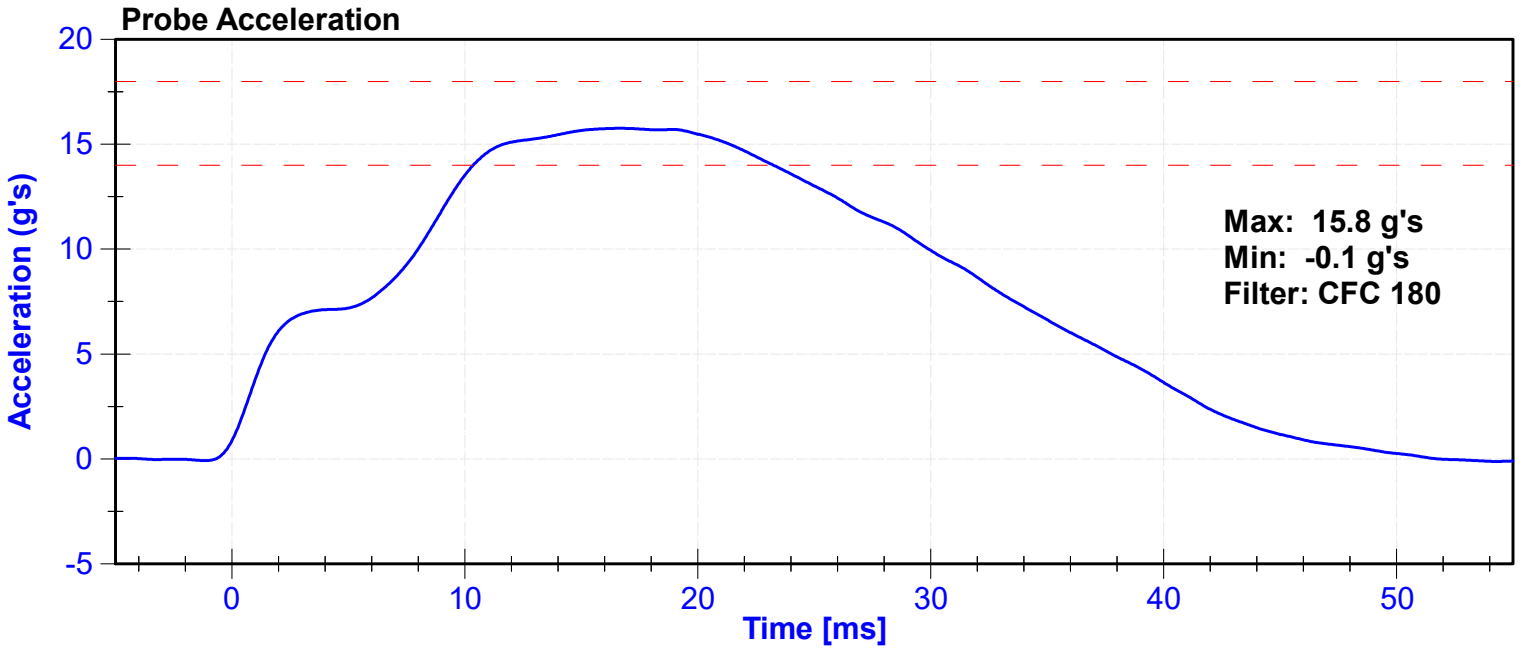
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

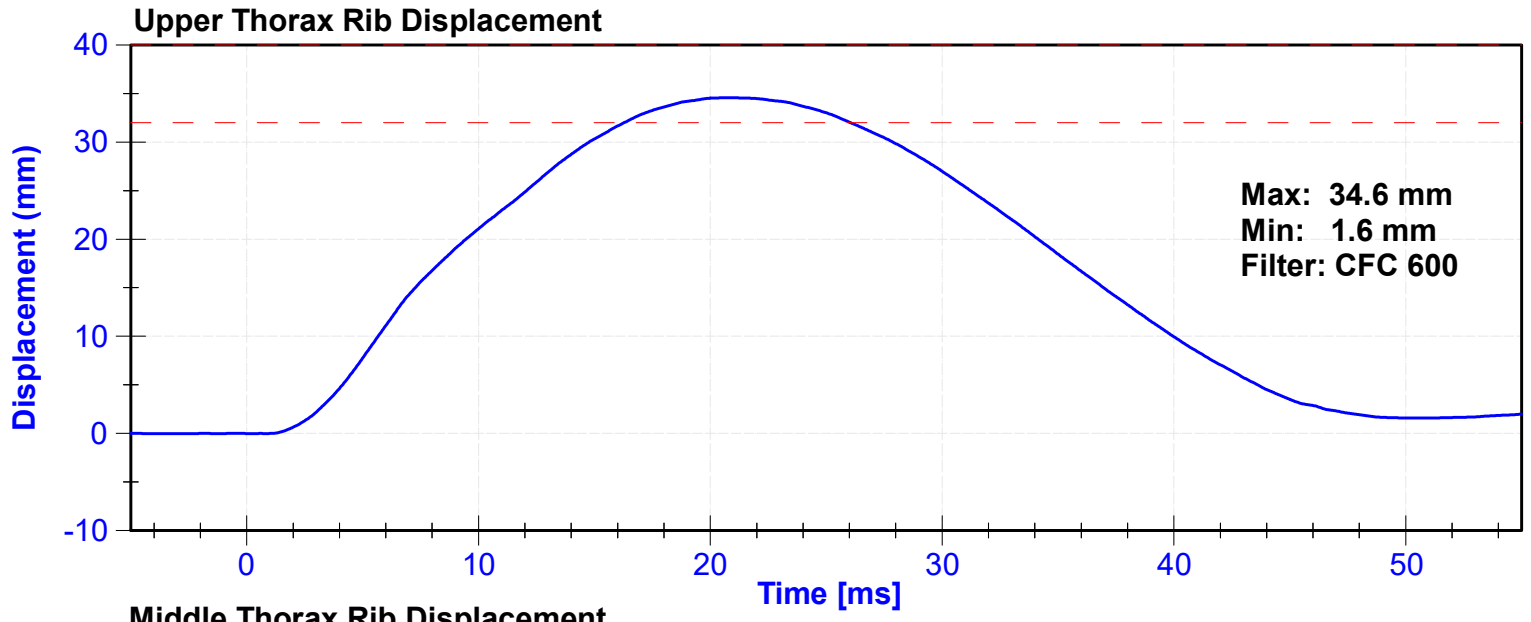
Results

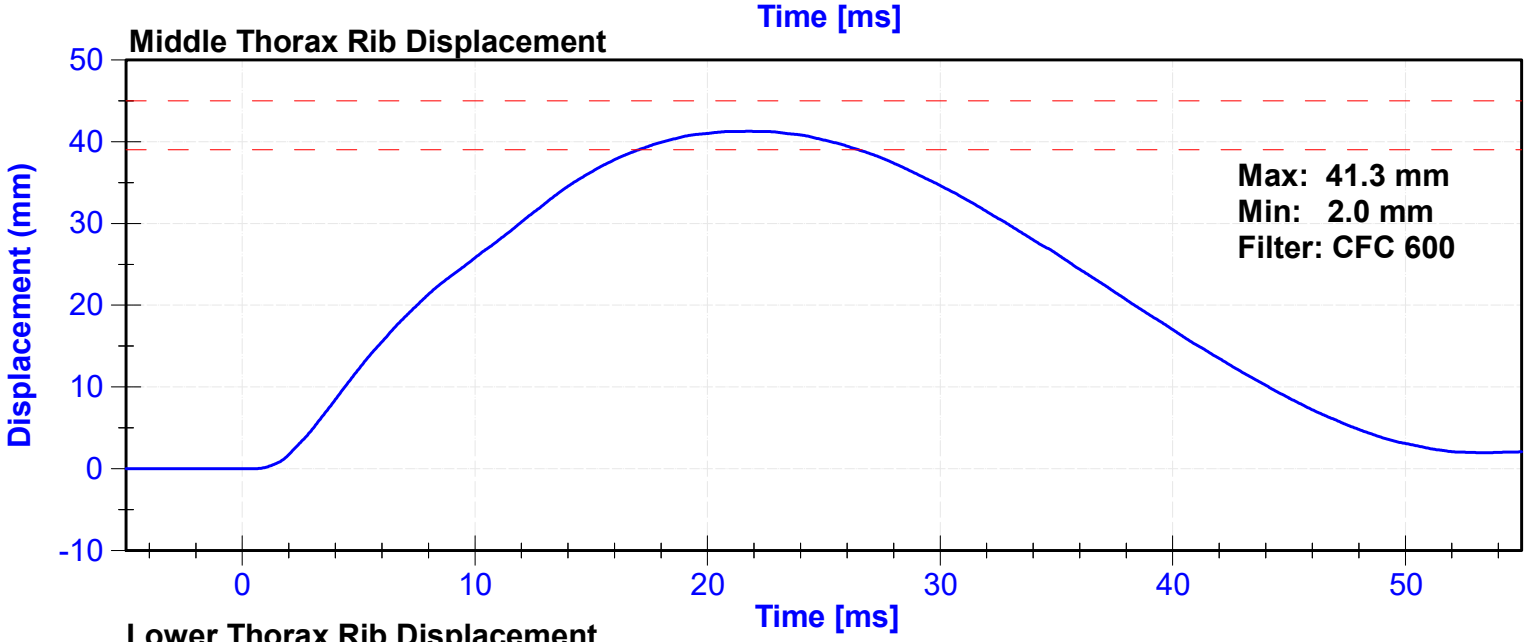
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.0	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	14	18	g's	15.8	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.0	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.0	Pass
Upper Thorax Rib Deflection	32	40	mm	34.6	Pass
Middle Thorax Rib Deflection	39	45	mm	41.3	Pass
Lower Thorax Rib Deflection	35	43	mm	40.4	Pass

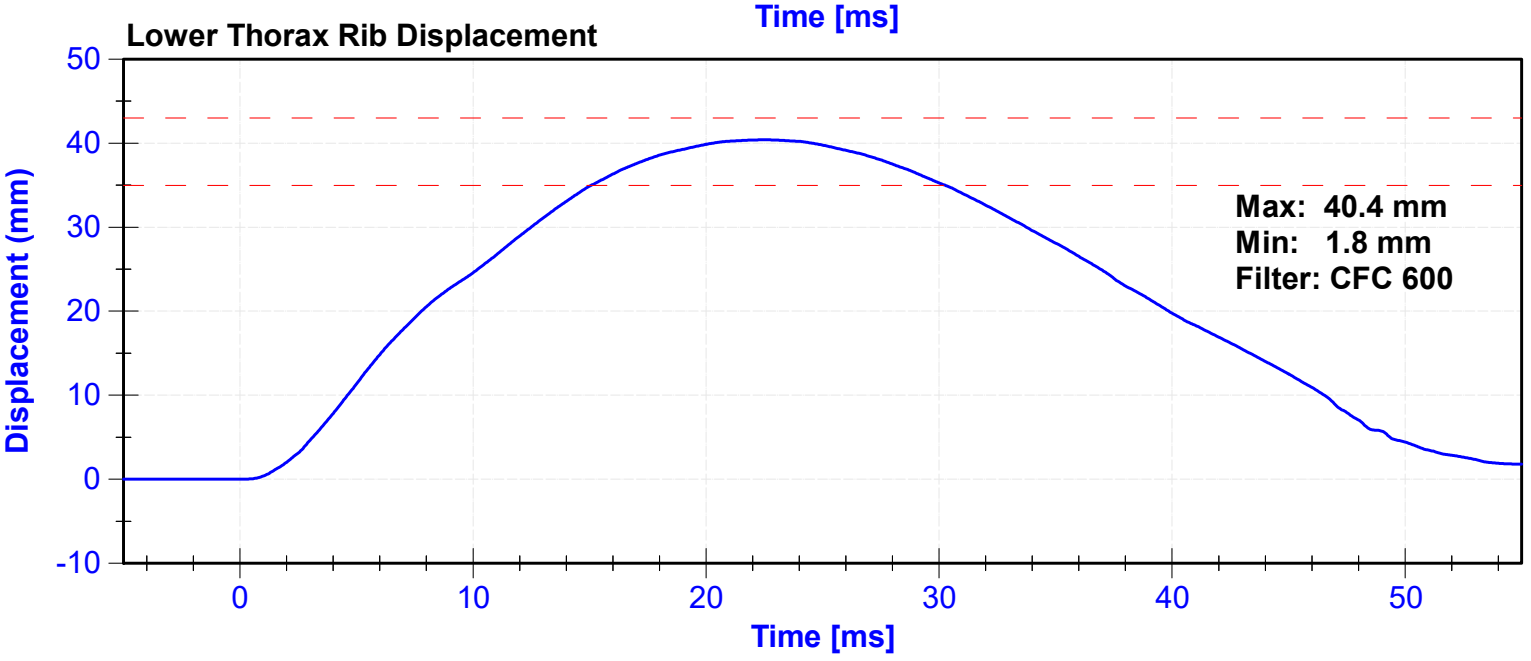
Transducer Calibrations

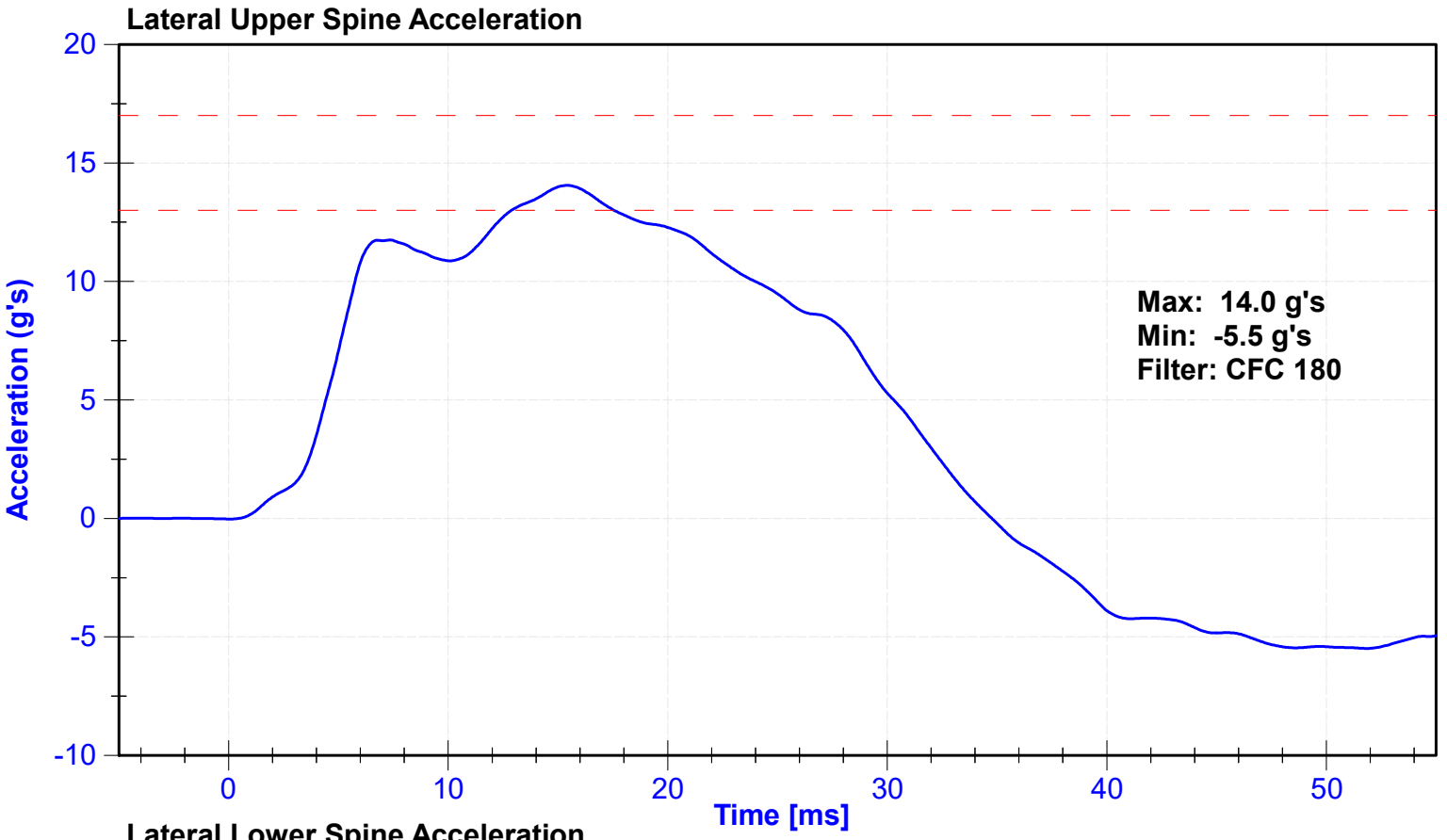
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Spine Y Accelerometer	Endevco	P64148	7/2/2025	12/29/2025
Lower Spine Y Accelerometer	Endevco	P58883	7/2/2025	12/29/2025
Upper Thorax Rib Potentiometer	Servo	1199GFE	7/8/2025	1/6/2026
Middle Thorax Rib Potentiometer	Servo	1246GFE	7/8/2025	1/6/2026
Lower Thorax Rib Potentiometer	Servo	011GFE	7/8/2025	1/6/2026

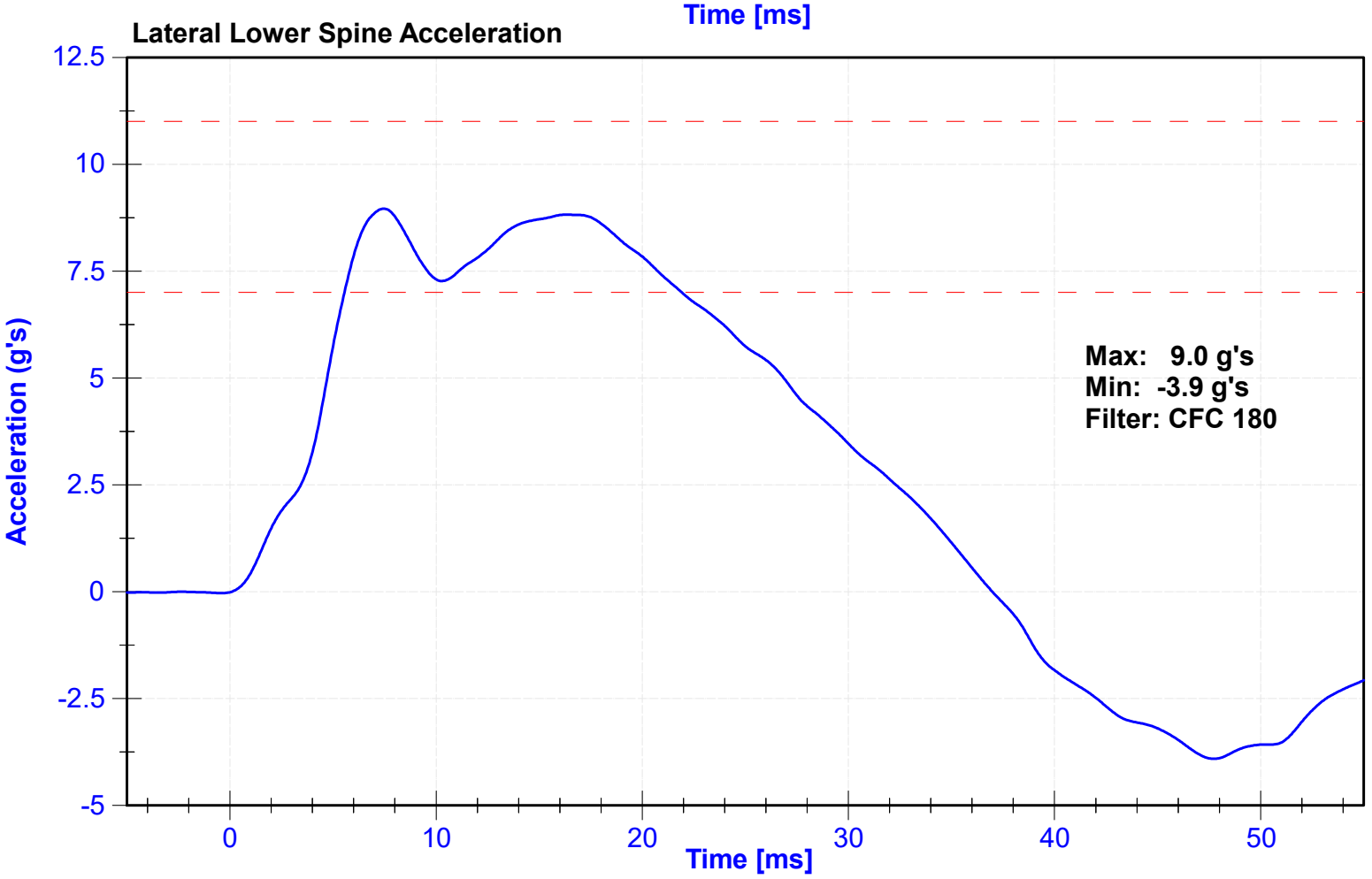



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 34.6 mm
Min: 1.6 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 41.3 mm
Min: 2.0 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 40.4 mm
Min: 1.8 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time [ms]
Max: 14.0 g's
Min: -5.5 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
12.5
10
7.5
5
2.5
0
-2.5
-5
0
10
20
30
40
50
Time [ms]
Max: 9.0 g's
Min: -3.9 g's
Filter: CFC 180

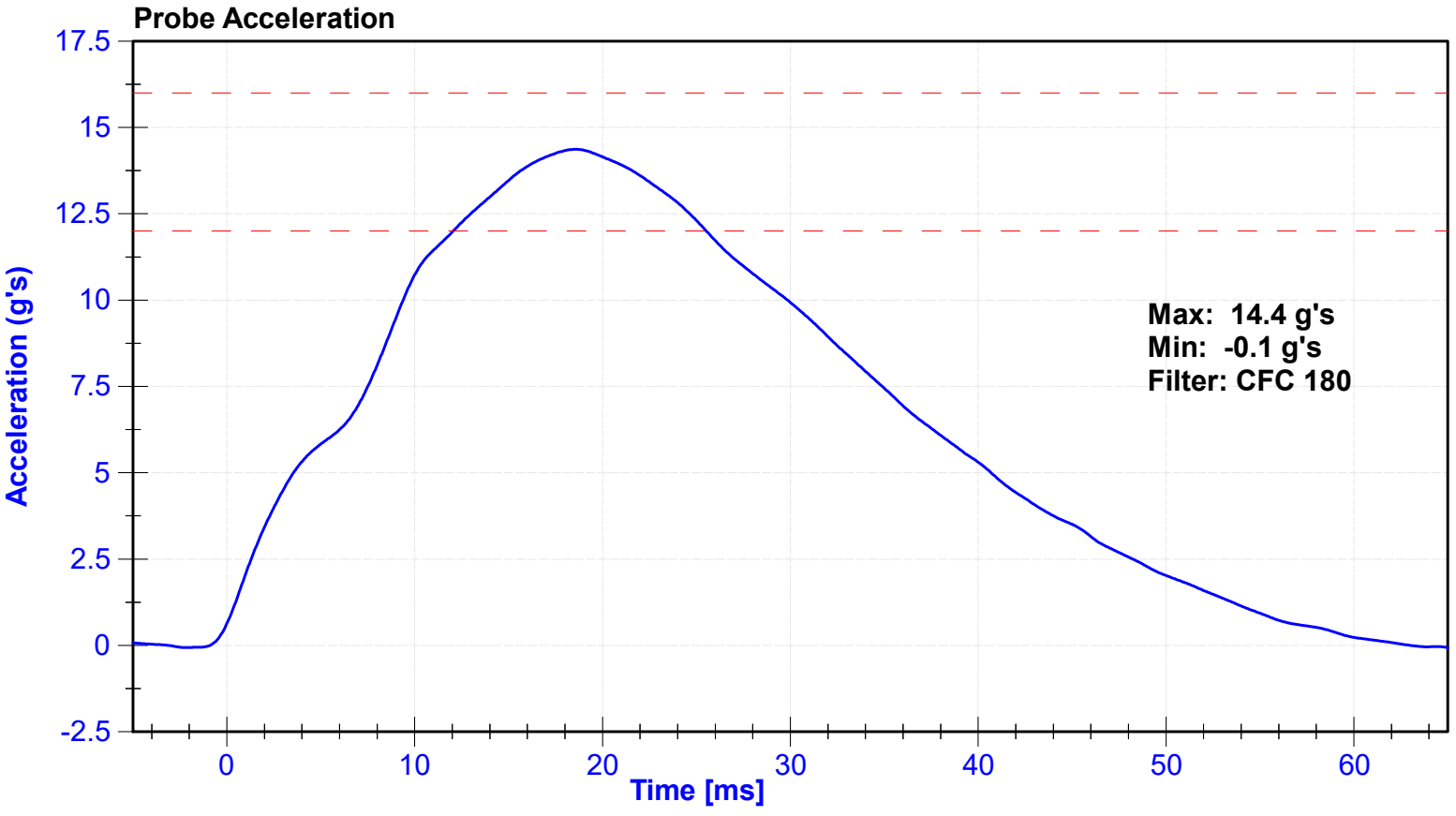
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

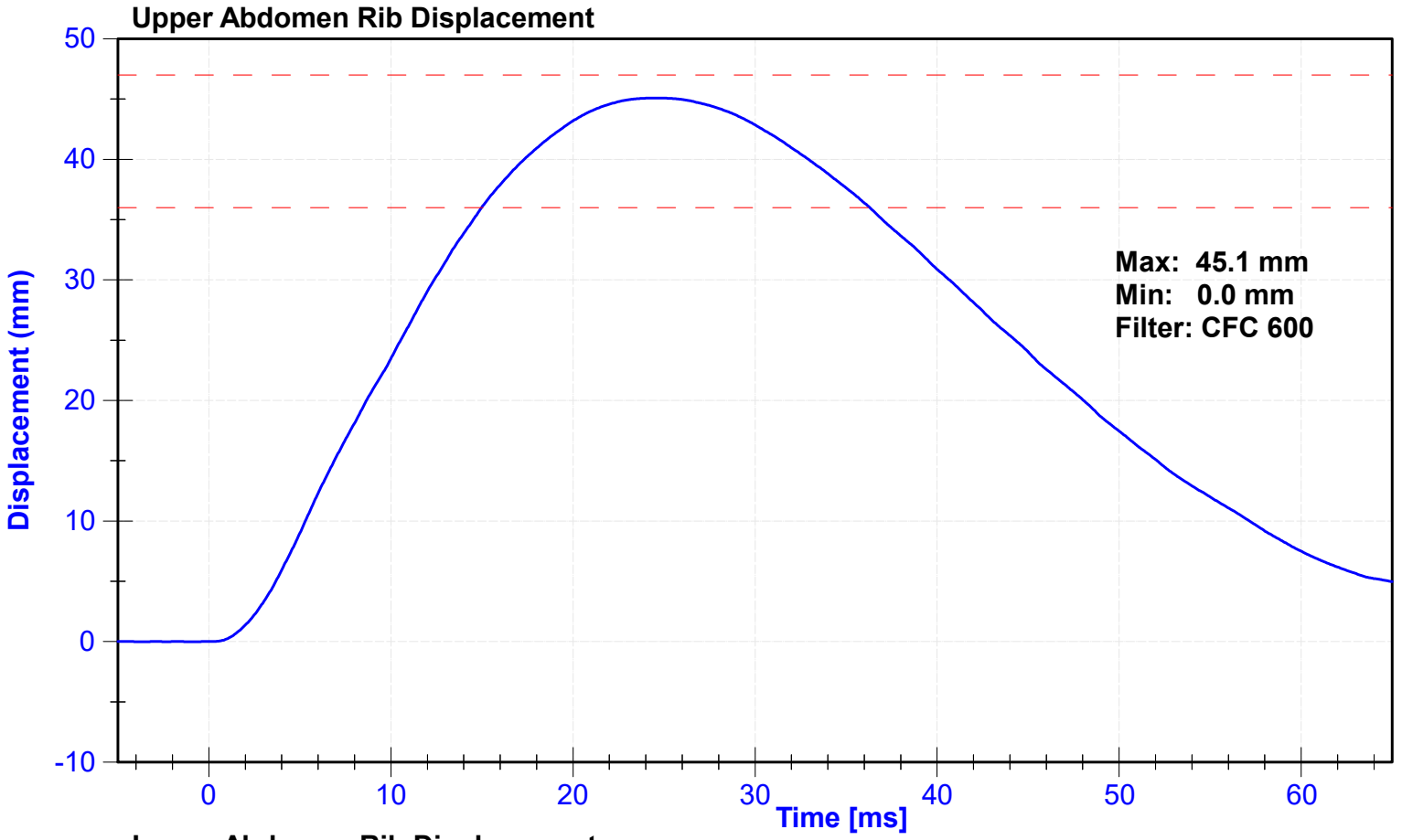
Results

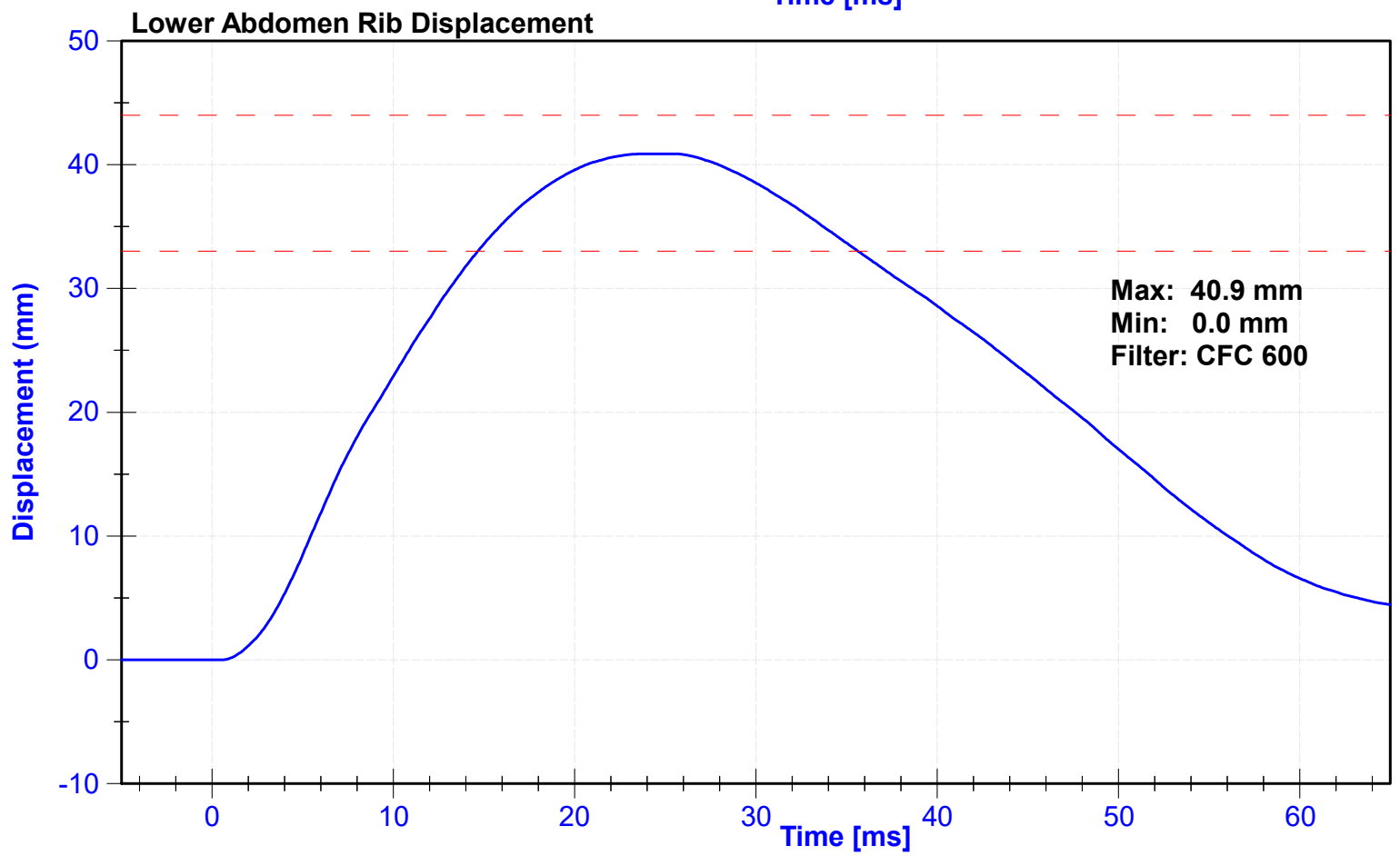
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.0	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	12	16	g's	14.4	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.7	Pass
Upper Abdomen Rib Deflection	36	47	mm	45.1	Pass
Lower Abdomen Rib Deflection	33	44	mm	40.9	Pass

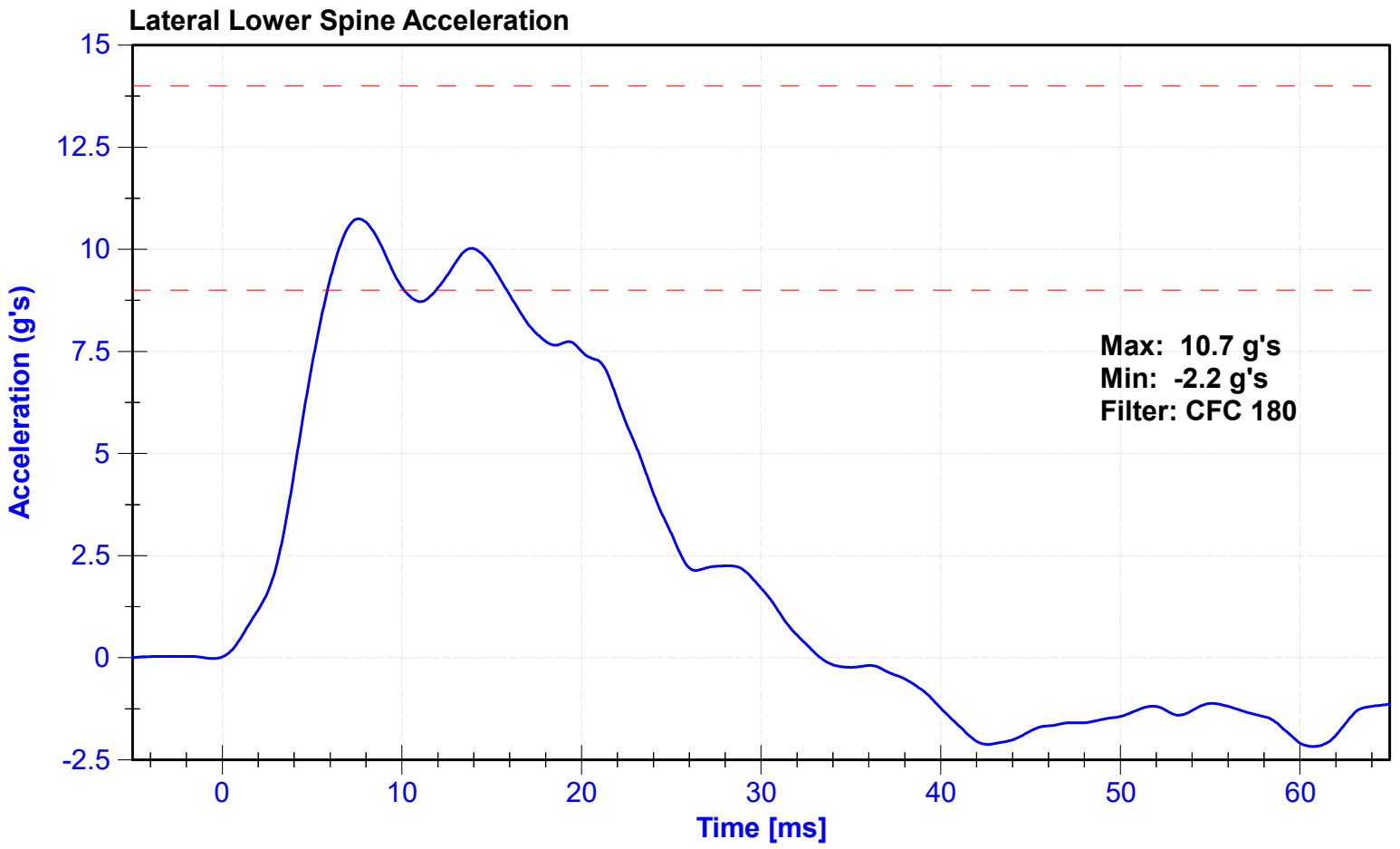
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Lower Spine Y Accelerometer	Endevco	P58883	7/2/2025	12/29/2025
Upper Abdomen Rib Potentiometer	Servo	008GFE	7/8/2025	1/6/2026
Lower Abdomen Rib Potentiometer	Servo	046GFE	7/8/2025	1/6/2026




Upper Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 45.1 mm
Min: 0.0 mm
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 40.9 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
0
10
20
30
40
50
60
Time [ms]
Max: 10.7 g's
Min: -2.2 g's
Filter: CFC 180

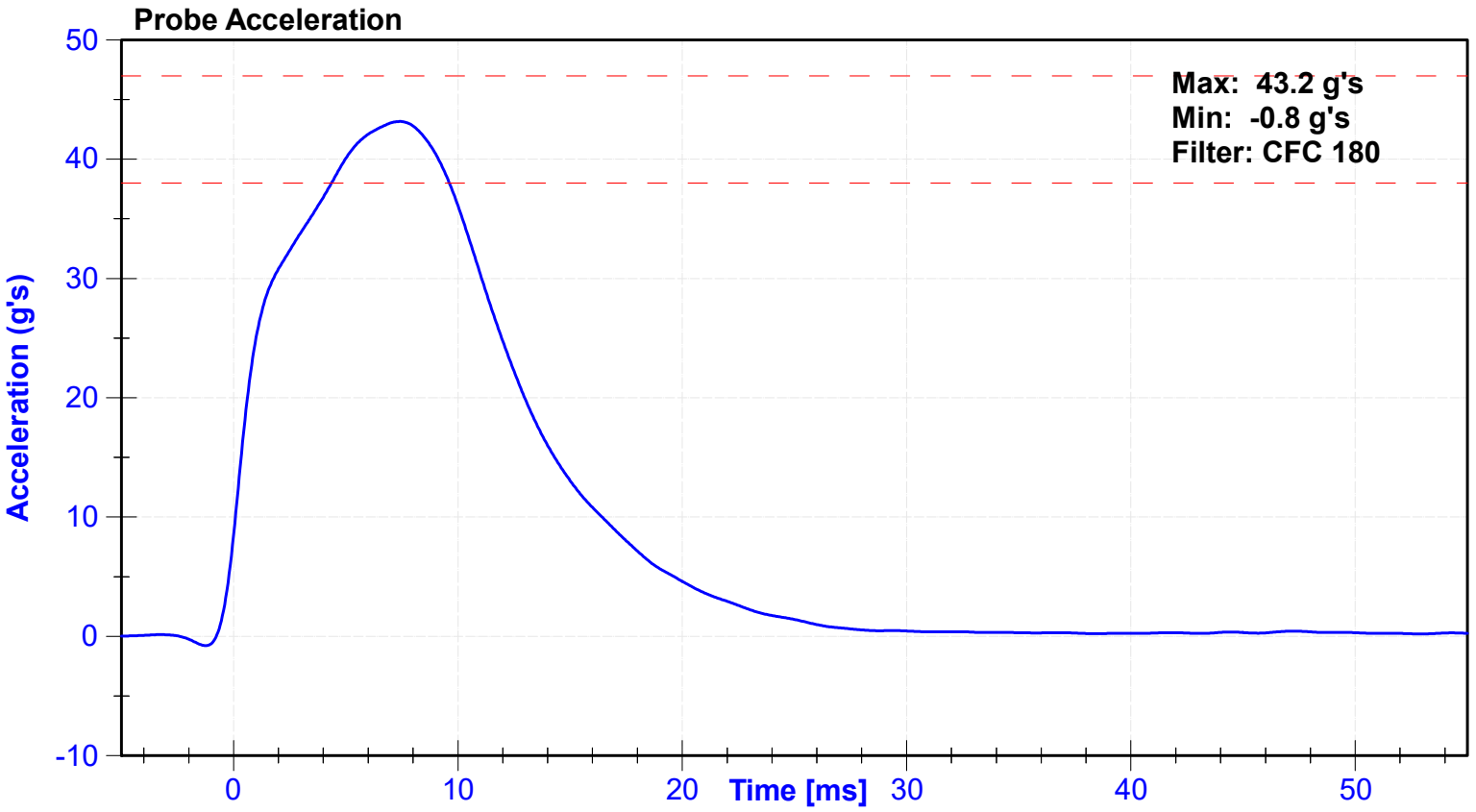
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

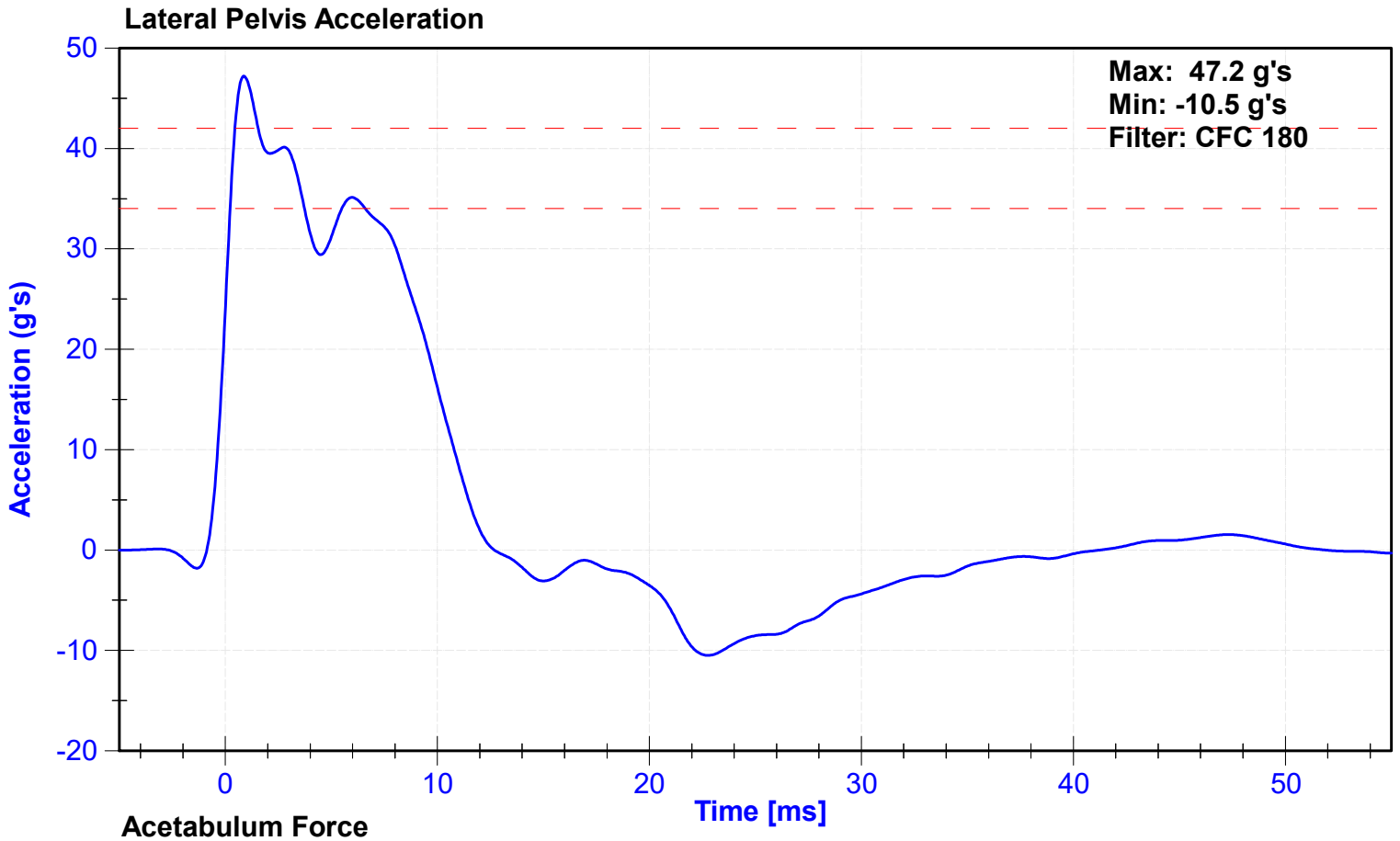
Results

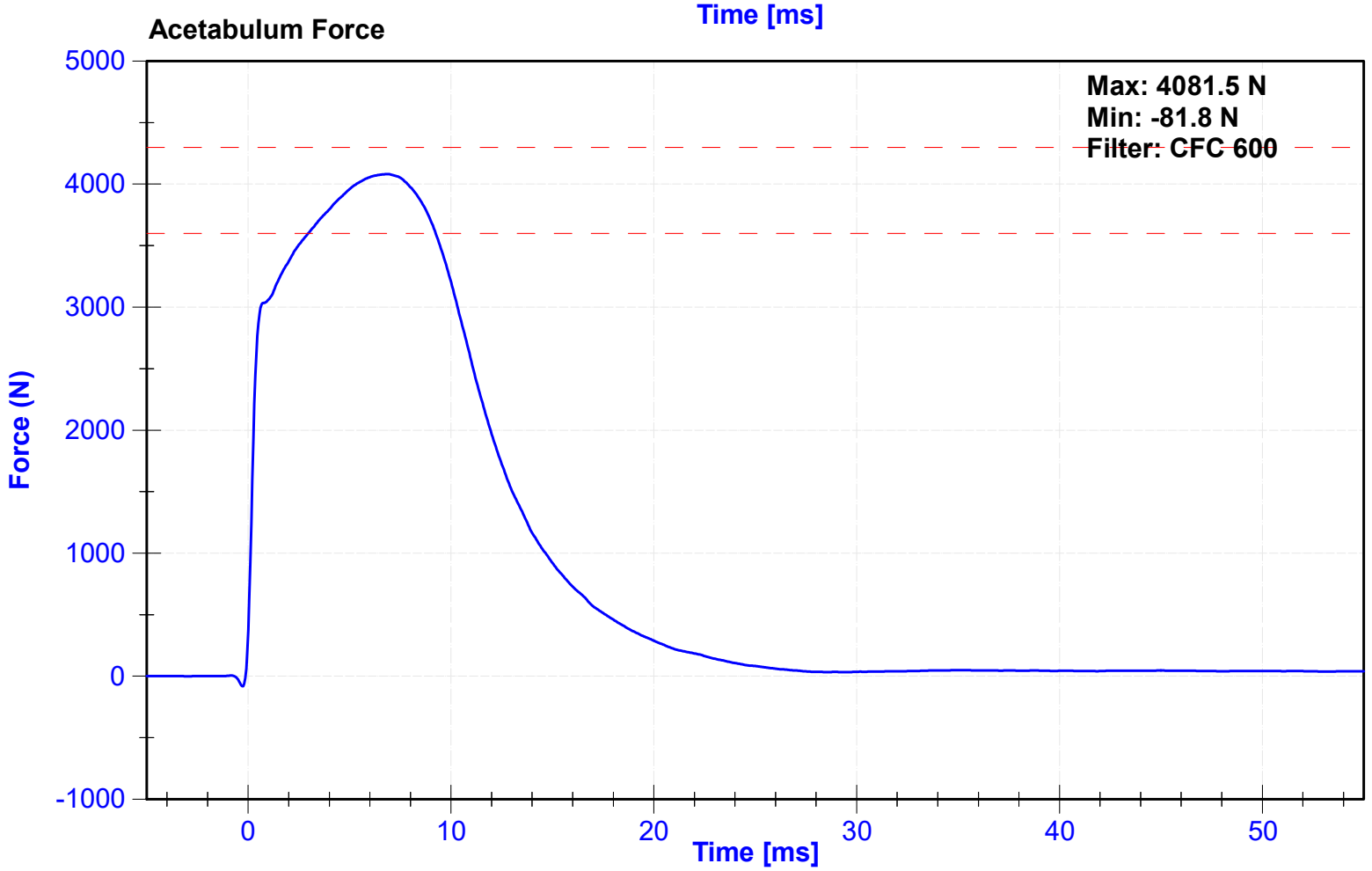
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.0	Pass
Humidity	10	70	%	44	Pass
Velocity	6.6	6.8	m/s	6.67	Pass
Probe Acceleration	38	47	g's	43.2	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	35.1	Pass
Acetabulum Force	3600	4300	N	4081.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pelvis Y Accelerometer	Endevco	T20860	7/2/2025	12/29/2025
Acetabulum Load Cell	Denton	270-FY	9/16/2024	9/16/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A




Lateral Pelvis Acceleration
Max: 47.2 g's
Min: -10.5 g's
Filter: CFC 180
Acceleration (g's)
50
40
30
20
10
0
-10
-20
0
10
20
30
40
50
Time [ms]


Acetabulum Force
Max: 4081.5 N
Min: -81.8 N
Filter: CFC 600
Force (N)
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]

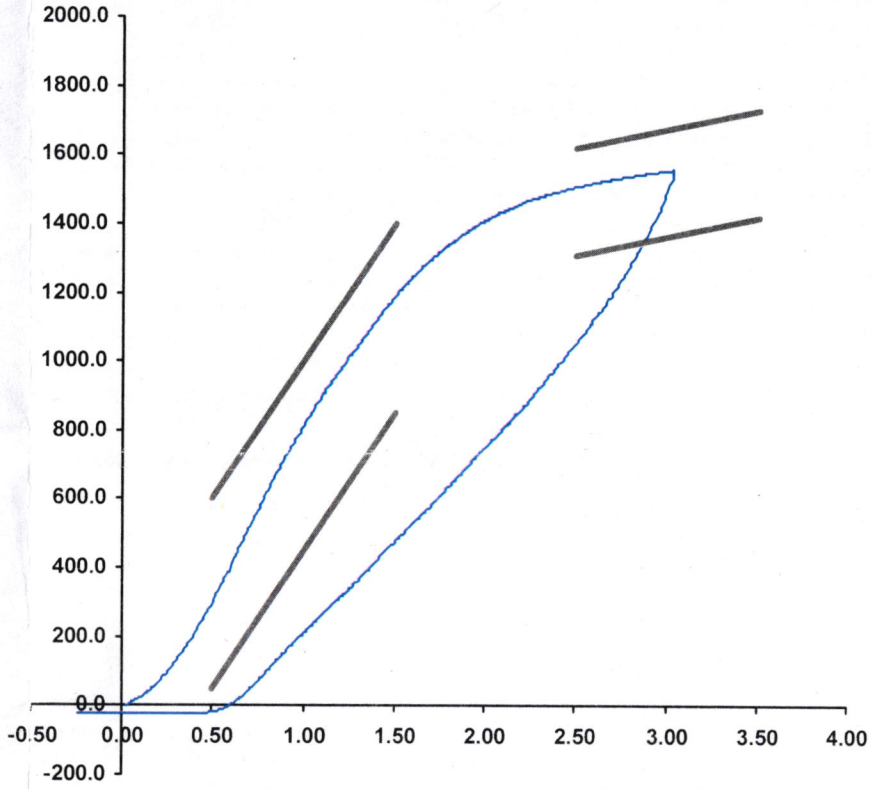
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16903
Test Number 23750
Report Number 23807
Test Date 8/2/2022 2:37:07 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	302	50	600
Force @ 1.5 mm (N)	1,197	850	1,400
Force @ 2.5 mm (N)	1,509	1,306	1,618
Force @ 3.0 mm (N)	1,556	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 DG 8012 7.22.25

Operator

Part Number 180-4450

Template No 107 02-Aug-22
SACO Research

By : DC Date : 8/2/22

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

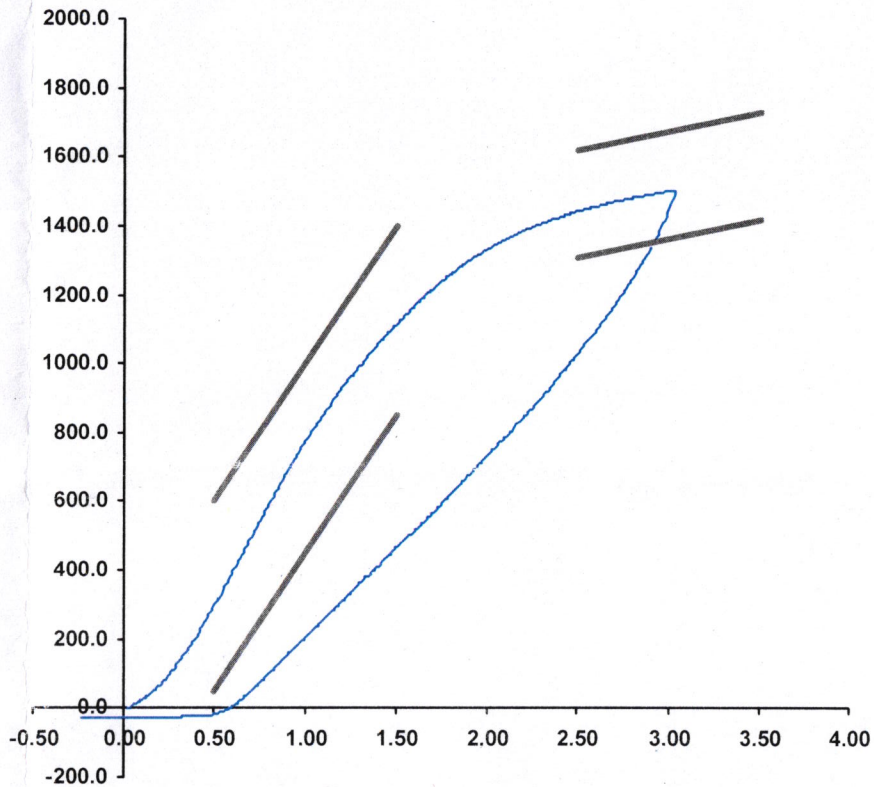
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16883
Test Number 23729
Report Number 23786
Test Date 8/2/2022 1:46:01 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	307	50	600
Force @ 1.5 mm (N)	1,121	850	1,400
Force @ 2.5 mm (N)	1,445	1,306	1,618
Force @ 3.0 mm (N)	1,503	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 DG8012 7.21.25

Operator

Part Number 180-4450

Template No 107 02-Aug-22
SACO Research

By : DC Date : 8/2/22

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

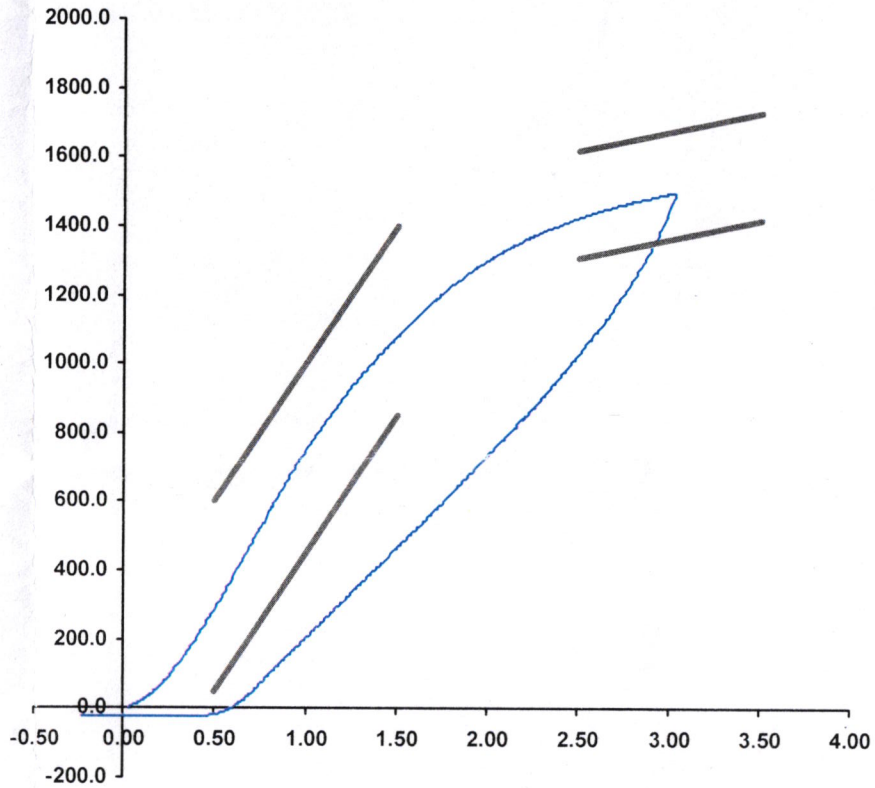
C-45

SID-IIs Pelvis Plug Certification Test

Plug S/N 16885
Test Number 23731
Report Number 23788
Test Date 8/2/2022 1:50:05 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	294	50	600
Force @ 1.5 mm (N)	1,084	850	1,400
Force @ 2.5 mm (N)	1,428	1,306	1,618
Force @ 3.0 mm (N)	1,497	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 DG8012 @ 7.21.25

Operator

Part Number 180-4450

Template No 107 02-Aug-22
SACO Research

By : DC Date : 8/2/22

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

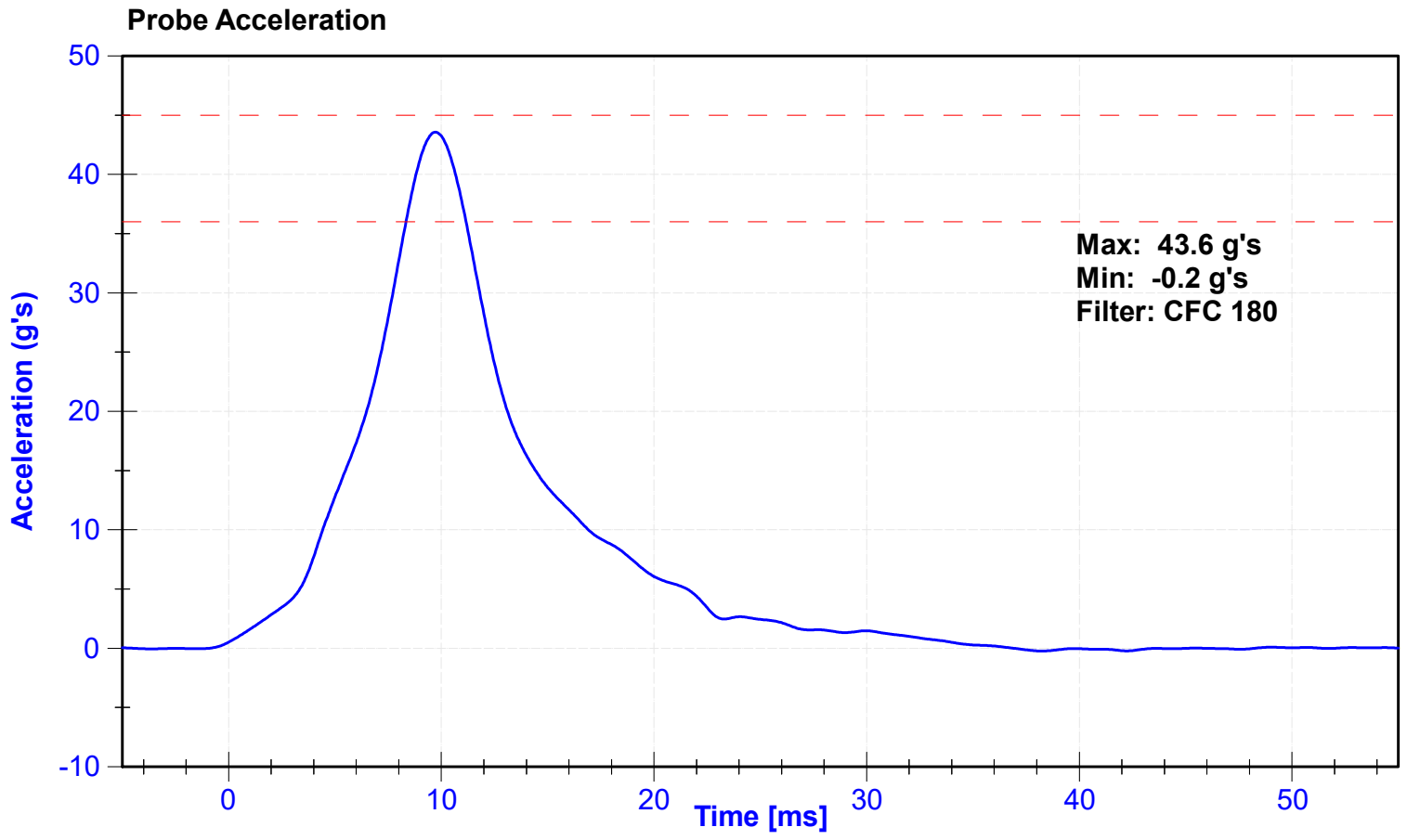
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

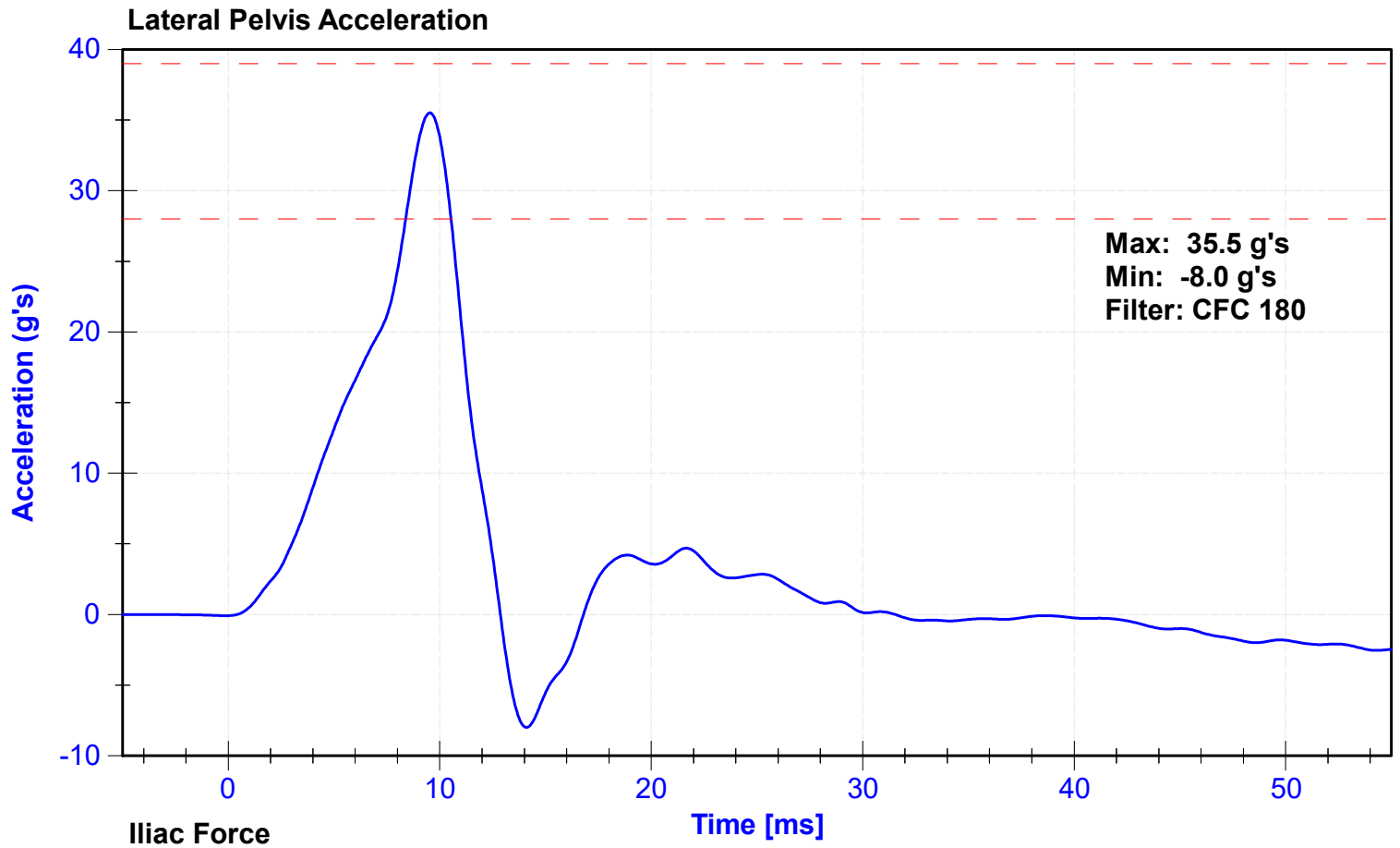
Results

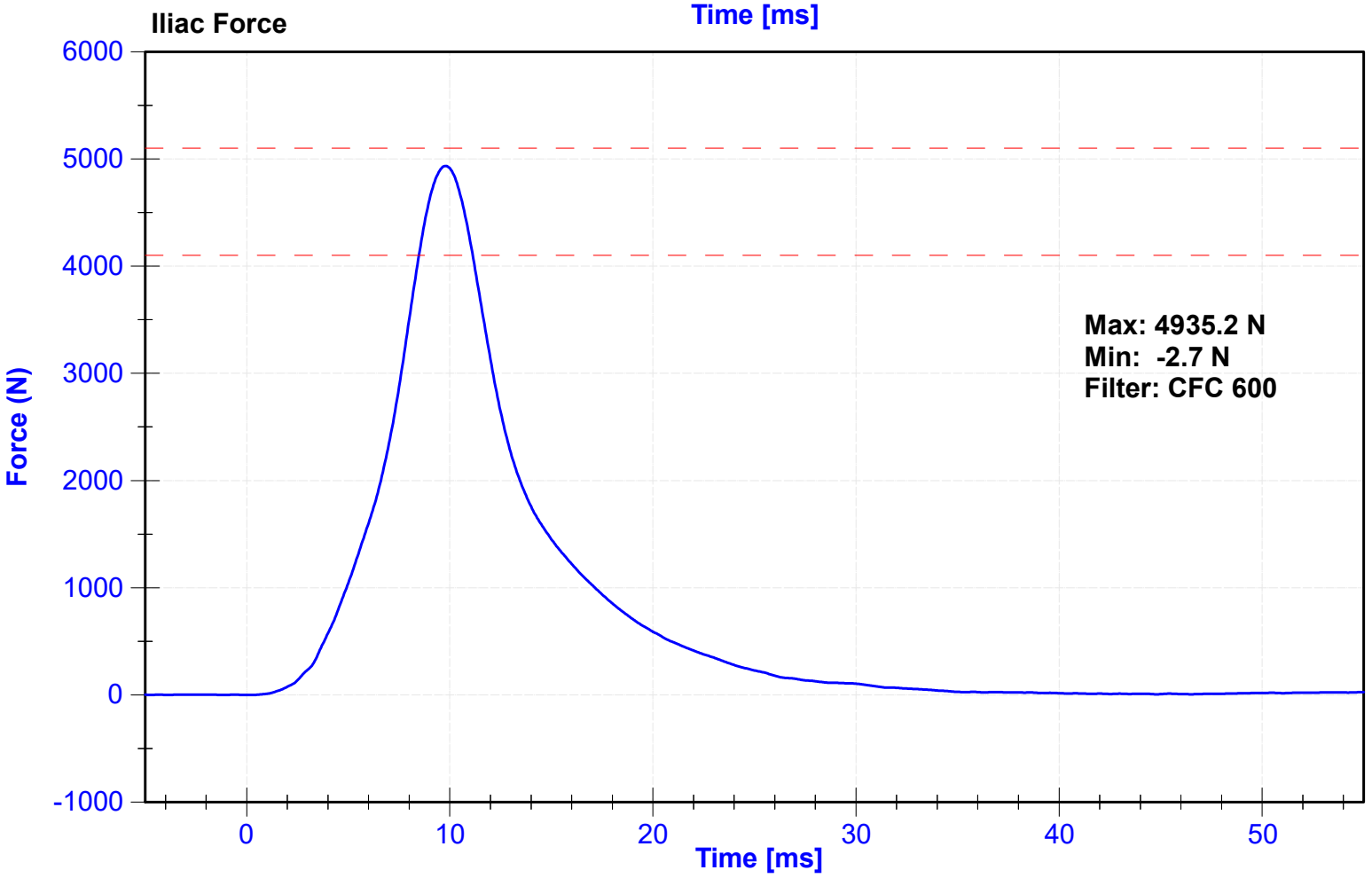
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.0	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	36	45	g's	43.6	Pass
Lateral Pelvis Acceleration	28	39	g's	35.5	Pass
Iliac Force	4100	5100	N	4935.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pelvis Y Accelerometer	Endevco	T20860	7/2/2025	12/29/2025
Iliac Load Cell	Denton	321	9/16/2024	9/16/2025




Lateral Pelvis Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 35.5 g's
Min: -8.0 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: 4935.2 N
Min: -2.7 N
Filter: CFC 600

CALIBRATION TEST RESULTS

POST-TEST

EUROSID 2 (ES-2RE) MALE – DRIVER ATD

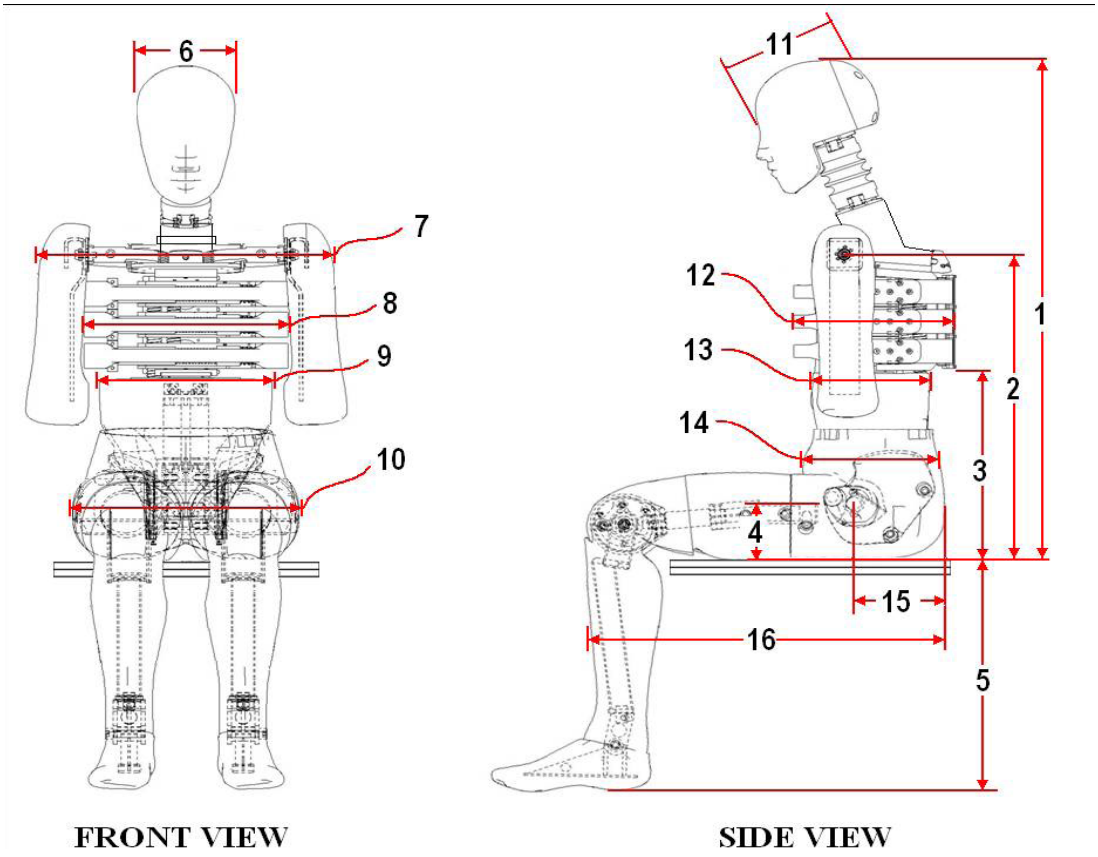
SERIAL NO:F033

(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - EuroSID-2re

Technician: J. Rios Date: 07/29/2025

Dummy Serial Number: F033



FRONT VIEW SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	913	Pass
2	Seat to Shoulder Joint	558	572	563	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	352	Pass
4	Seat to Hip Joint (center of bolt)	97	103	102	Pass
5	Sole to Seat, Sitting	333	451	414	Pass
6	Head Width	152	158	155	Pass
7	Shoulder/Arm Width	461	479	471	Pass
8	Thorax Width	322	332	327	Pass
9	Abdomen Width	273	287	282	Pass
10	Pelvis Lap Width	359	373	364	Pass
11	Head Depth	196	206	200	Pass
12	Thorax Depth	262	272	267	Pass
13	Abdomen Depth	194	204	198	Pass
14	Pelvis Depth	235	245	240	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	153	Pass
16	Back of Buttocks to Front Knee	597	615	604	Pass

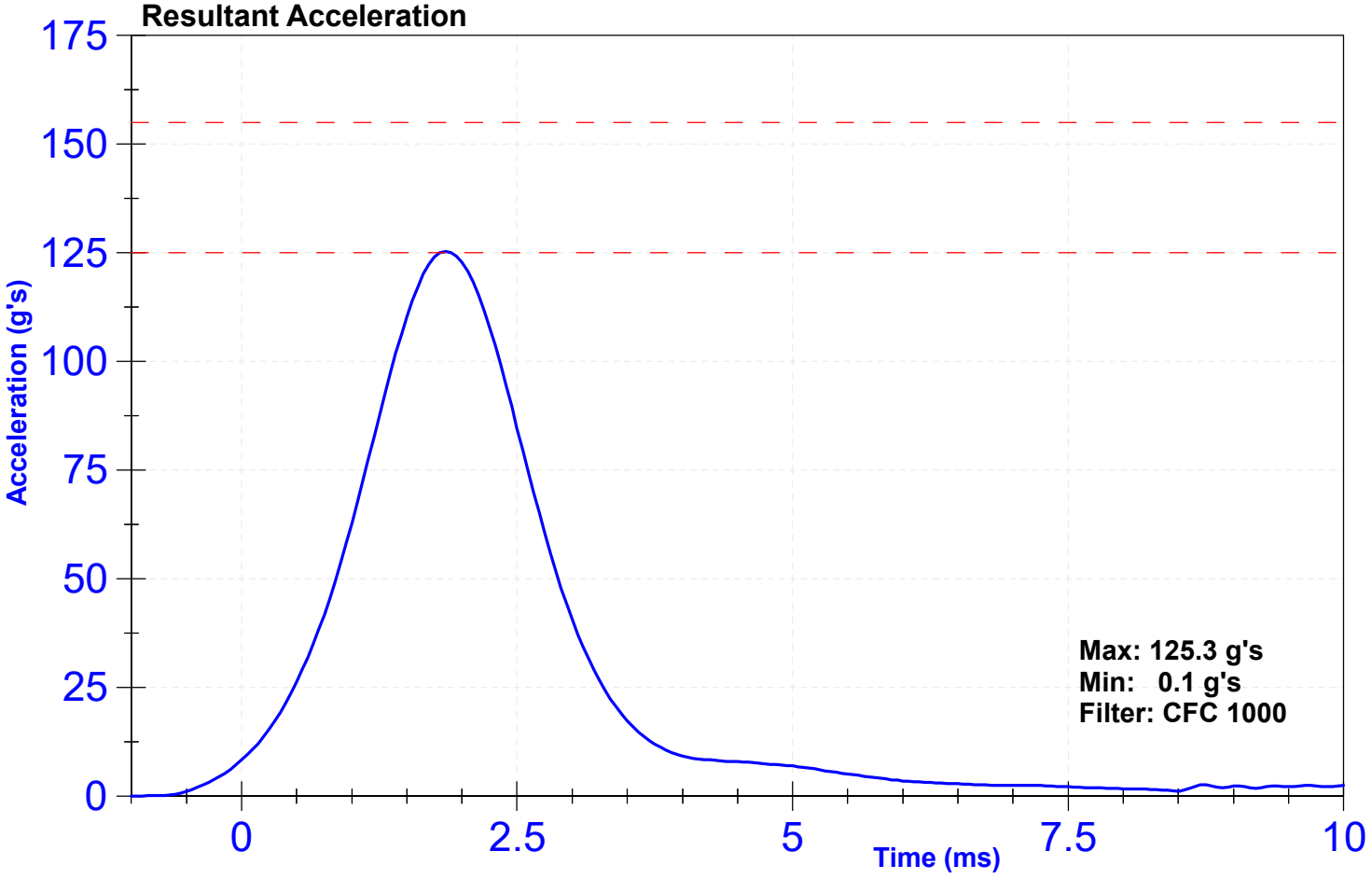
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

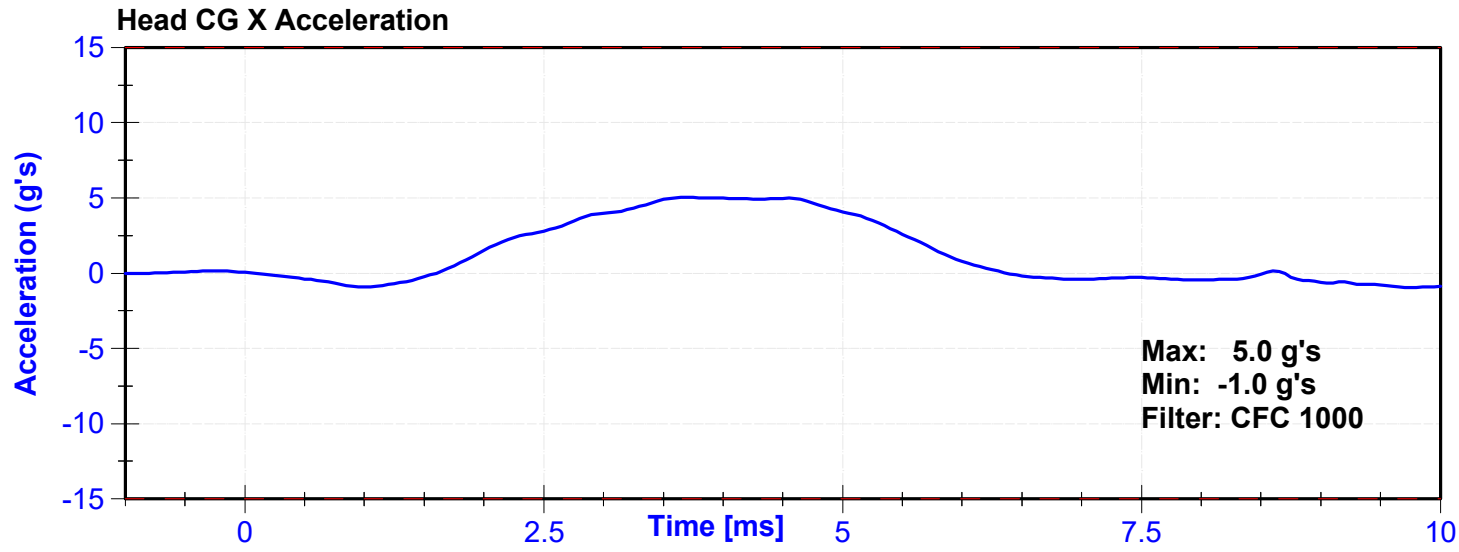
Results

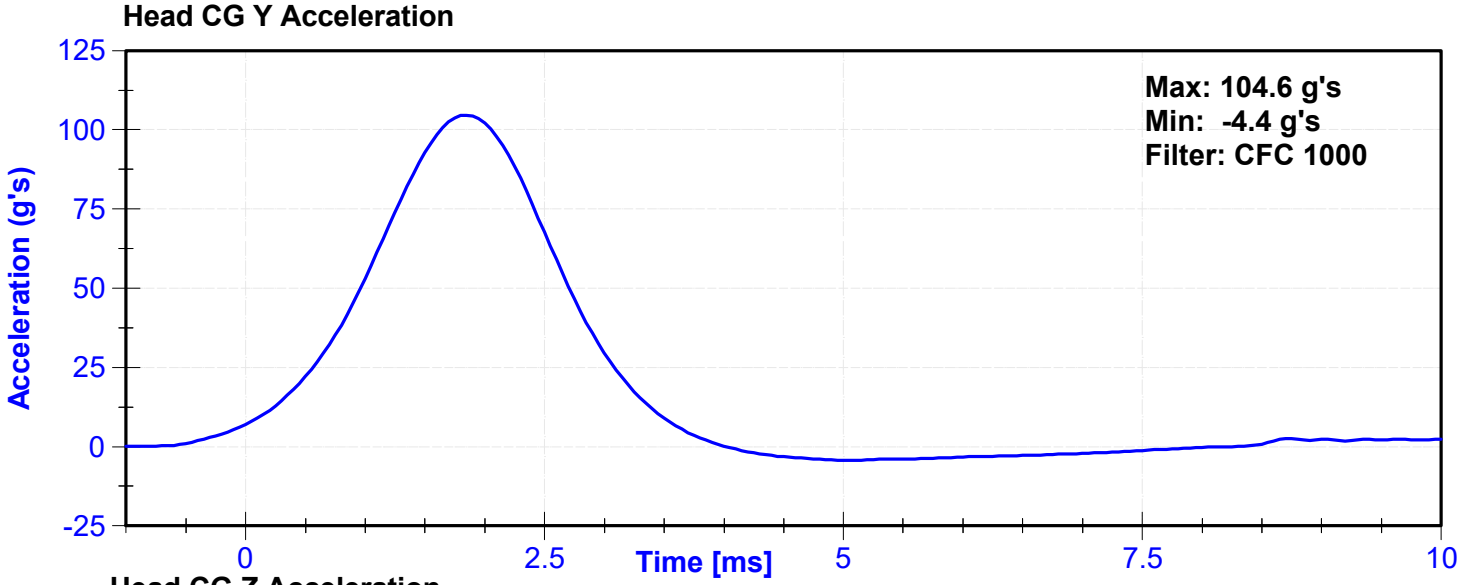
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	54	Pass
Resultant Acceleration	125	155	g's	125.3	Pass
Oscillation	0	15	%	2.71	Pass
Fore-Aft Acceleration	-15	15	g's	5.0	Pass

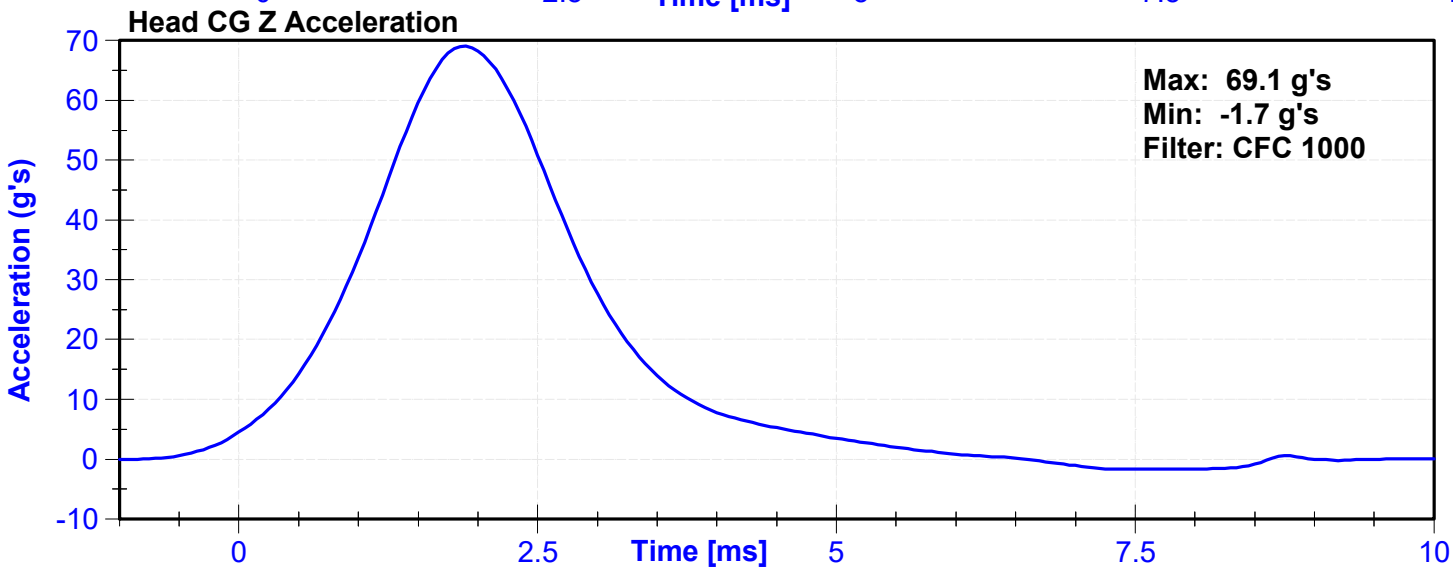
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P63861	7/1/2025	12/28/2025
Y Accelerometer	Endevco	P49216	7/1/2025	12/28/2025
Z Accelerometer	Endevco	P51303	7/1/2025	12/28/2025




Head CG X Acceleration
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
Time [ms]
5
7.5
10
Max: 5.0 g's
Min: -1.0 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: 104.6 g's
Min: -4.4 g's
Filter: CFC 1000


Head CG Z Acceleration
Acceleration (g's)
70
60
50
40
30
20
10
0
-10
0
2.5
Time [ms]
5
7.5
10
Max: 69.1 g's
Min: -1.7 g's
Filter: CFC 1000

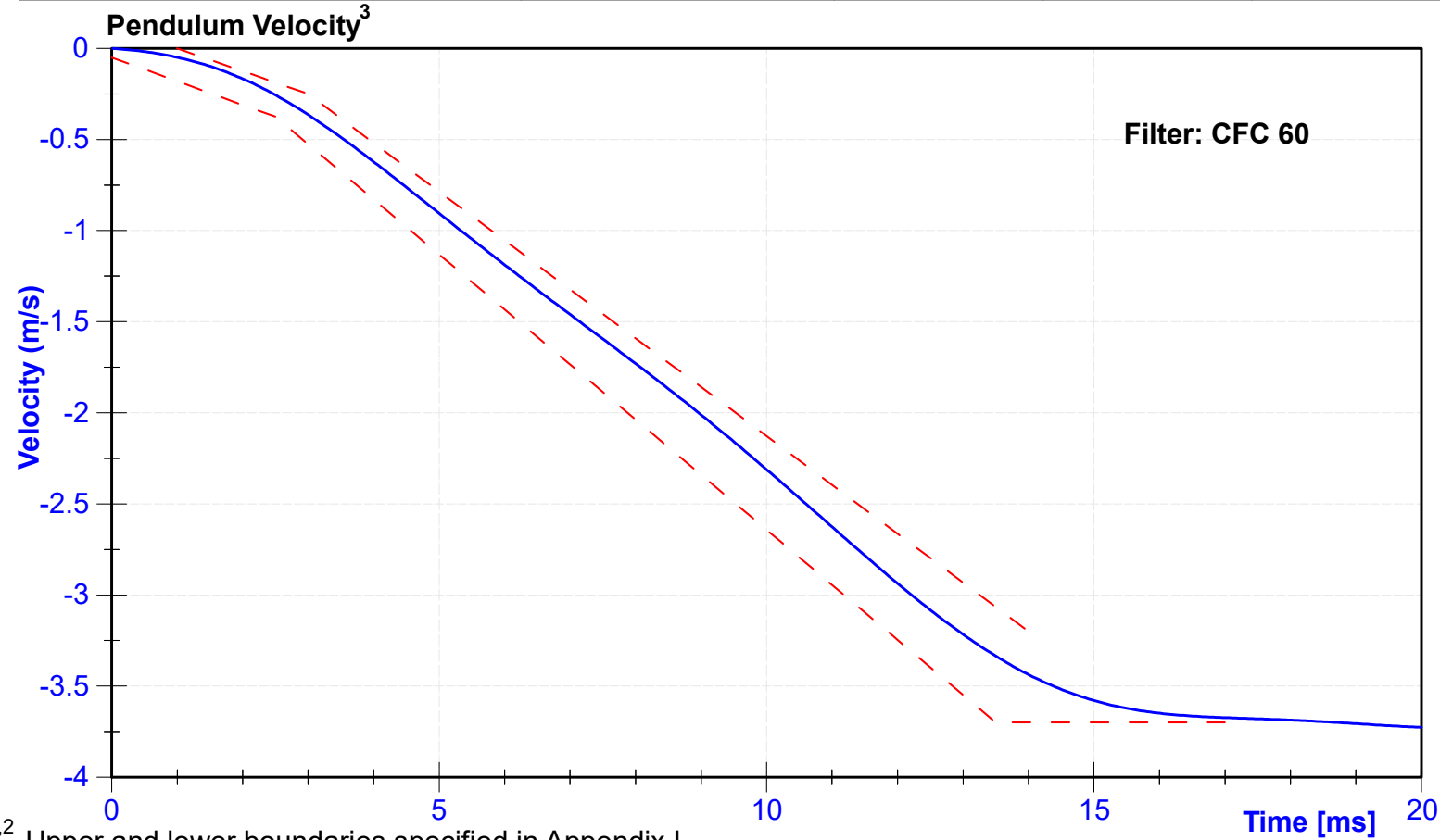
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

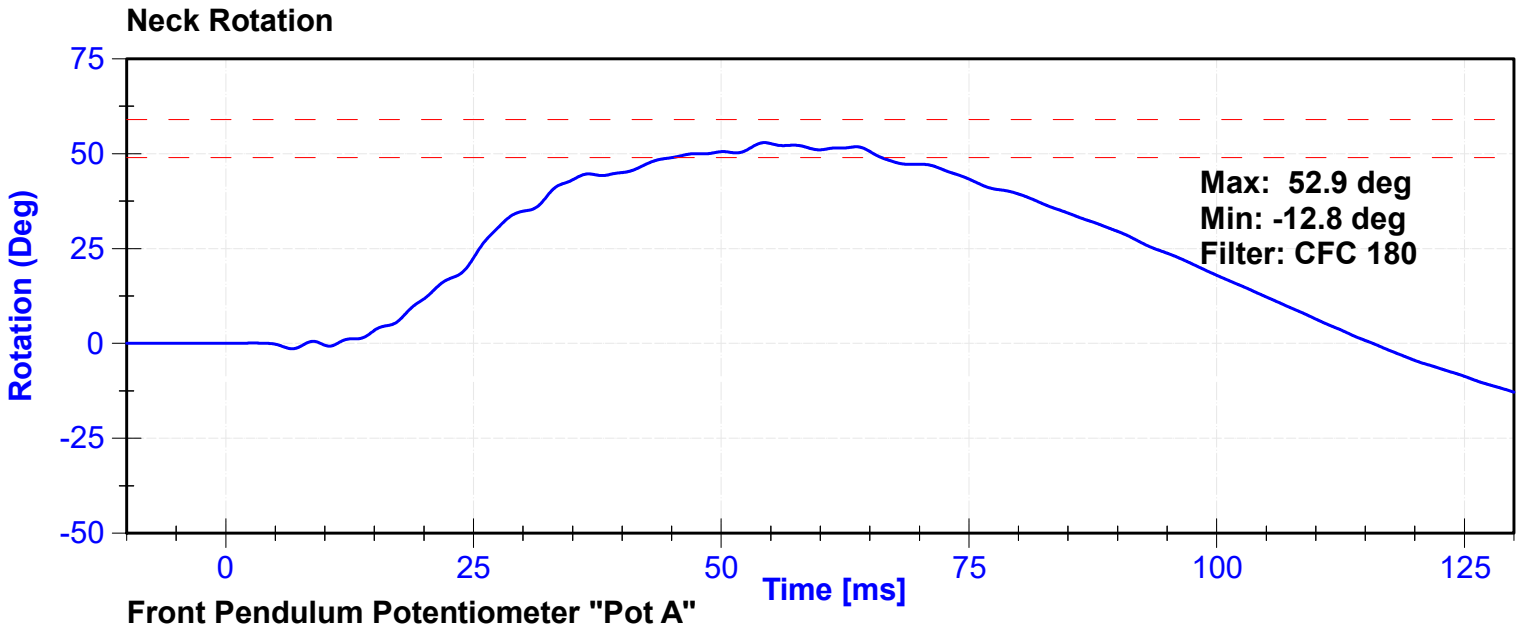
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.6	Pass
Humidity	10	70	%	55	Pass
Velocity	3.3	3.5	m/s	3.47	Pass
Lateral Neck Rotation	49	59	deg	52.9	Pass
Time at Maximum Rotation	54	66	ms	54.4	Pass
Time of Rotation Decay from Maximum	53	88	ms	61.4	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

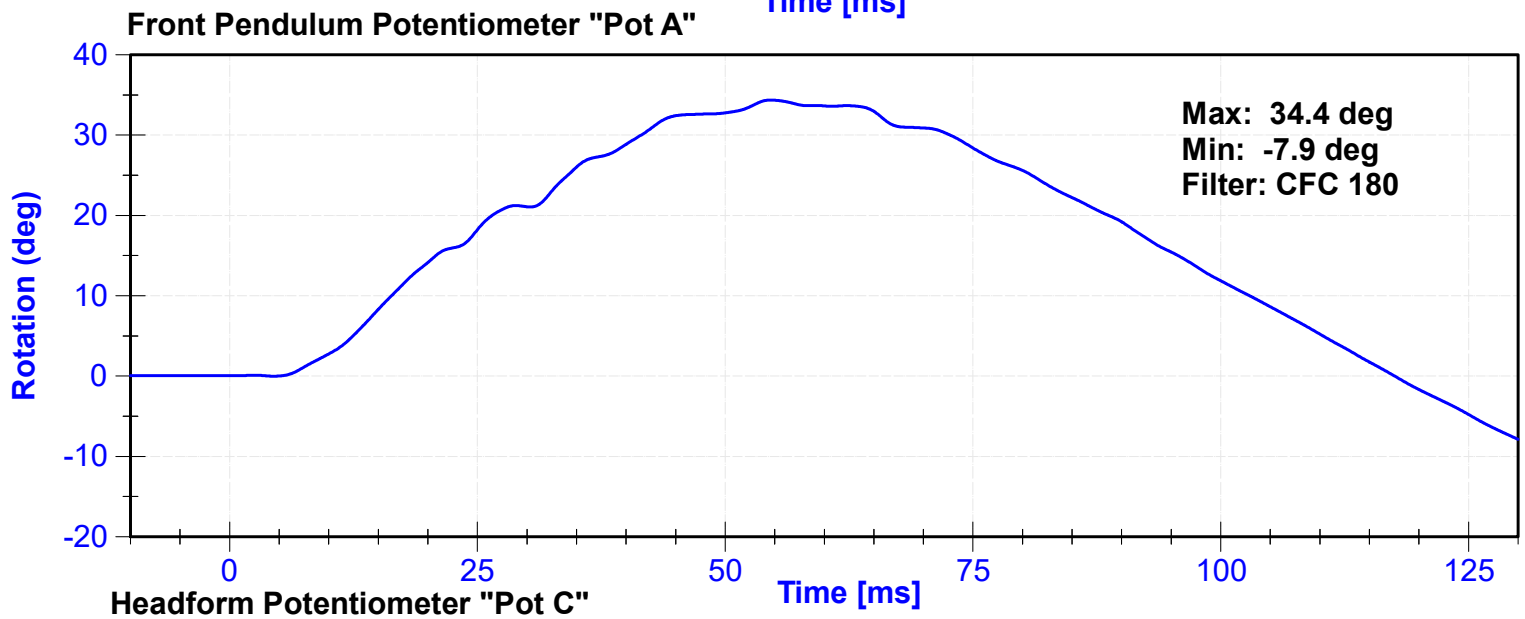
Transducer Calibrations

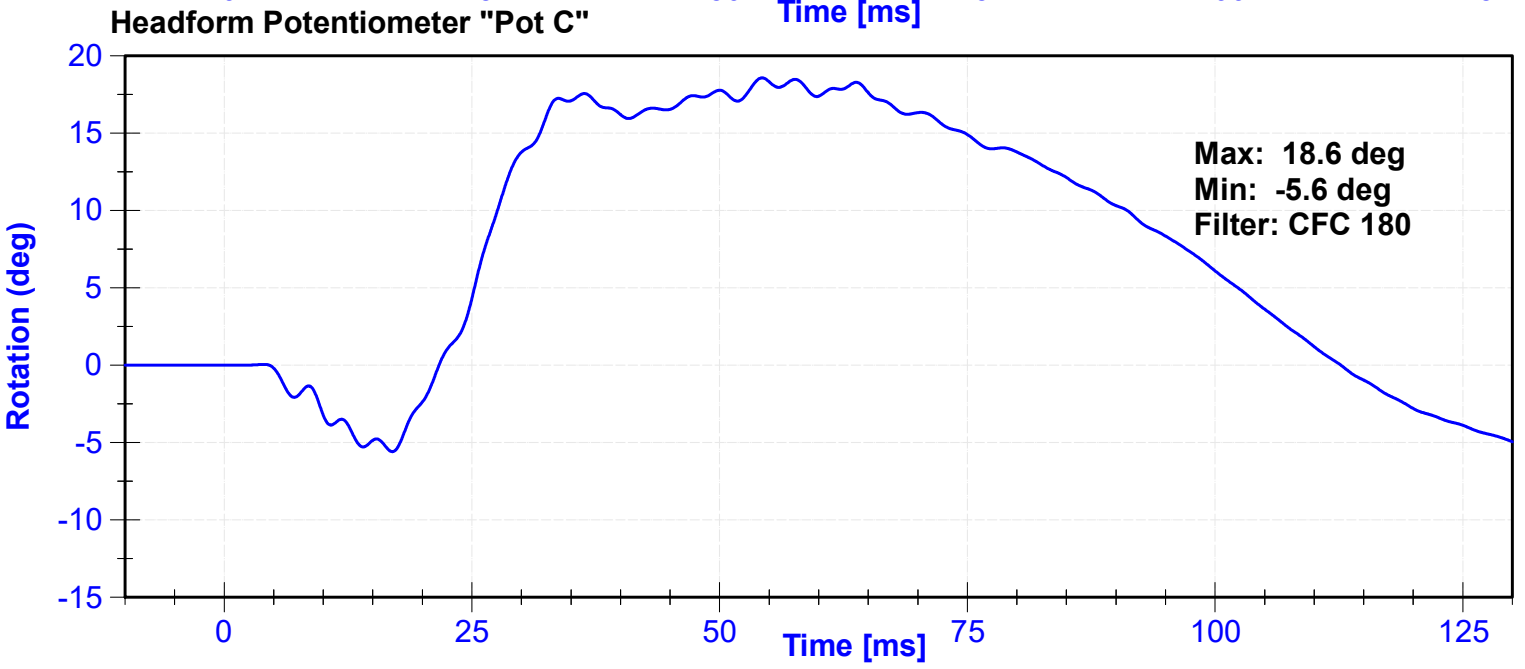
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Front Pendulum Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Headform Potentiometer	Sfernice	095	9/13/2024	9/13/2025



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


Neck Rotation
Rotation (Deg)
Time [ms]
Max: 52.9 deg
Min: -12.8 deg
Filter: CFC 180


Front Pendulum Potentiometer "Pot A"
Rotation (deg)
Time [ms]
Max: 34.4 deg
Min: -7.9 deg
Filter: CFC 180


Headform Potentiometer "Pot C"
Rotation (deg)
Time [ms]
Max: 18.6 deg
Min: -5.6 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

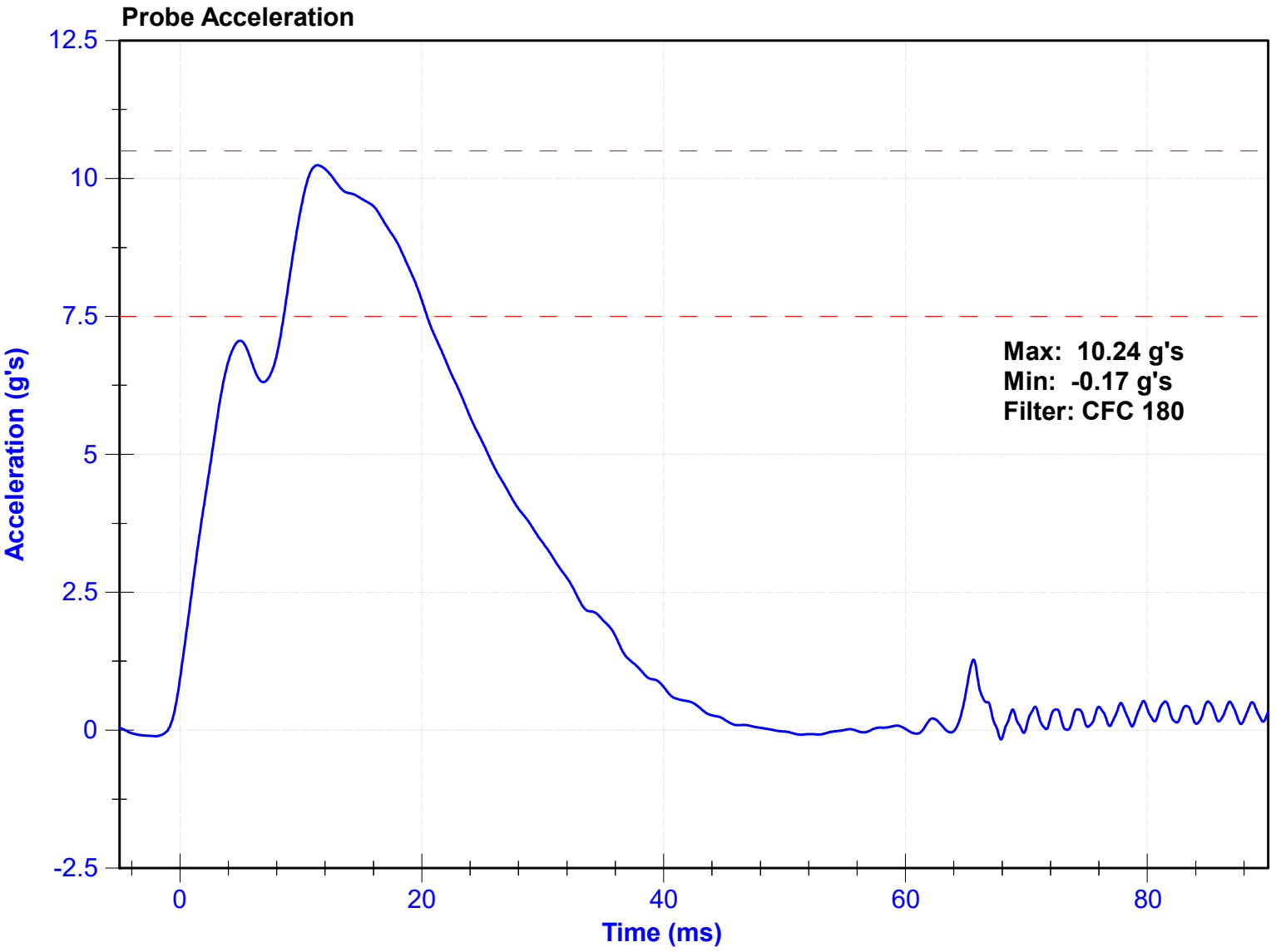
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.1	Pass
Humidity	10	70	%	55	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	7.5	10.5	g's	10.24	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025



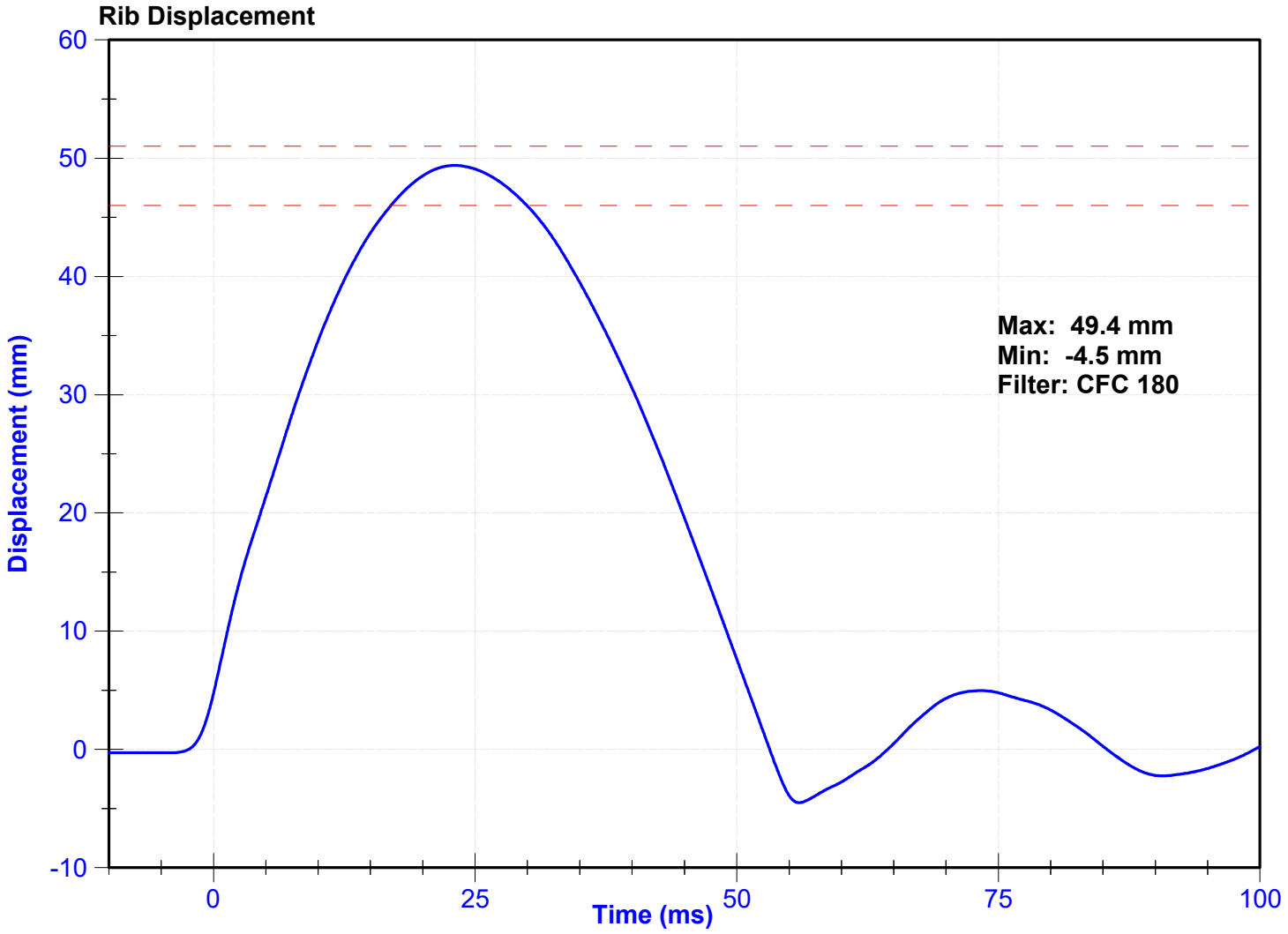
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.6	Pass
Humidity	10	70	%	65	Pass
Rib Displacement	46	51	mm	49.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer		179GFE		



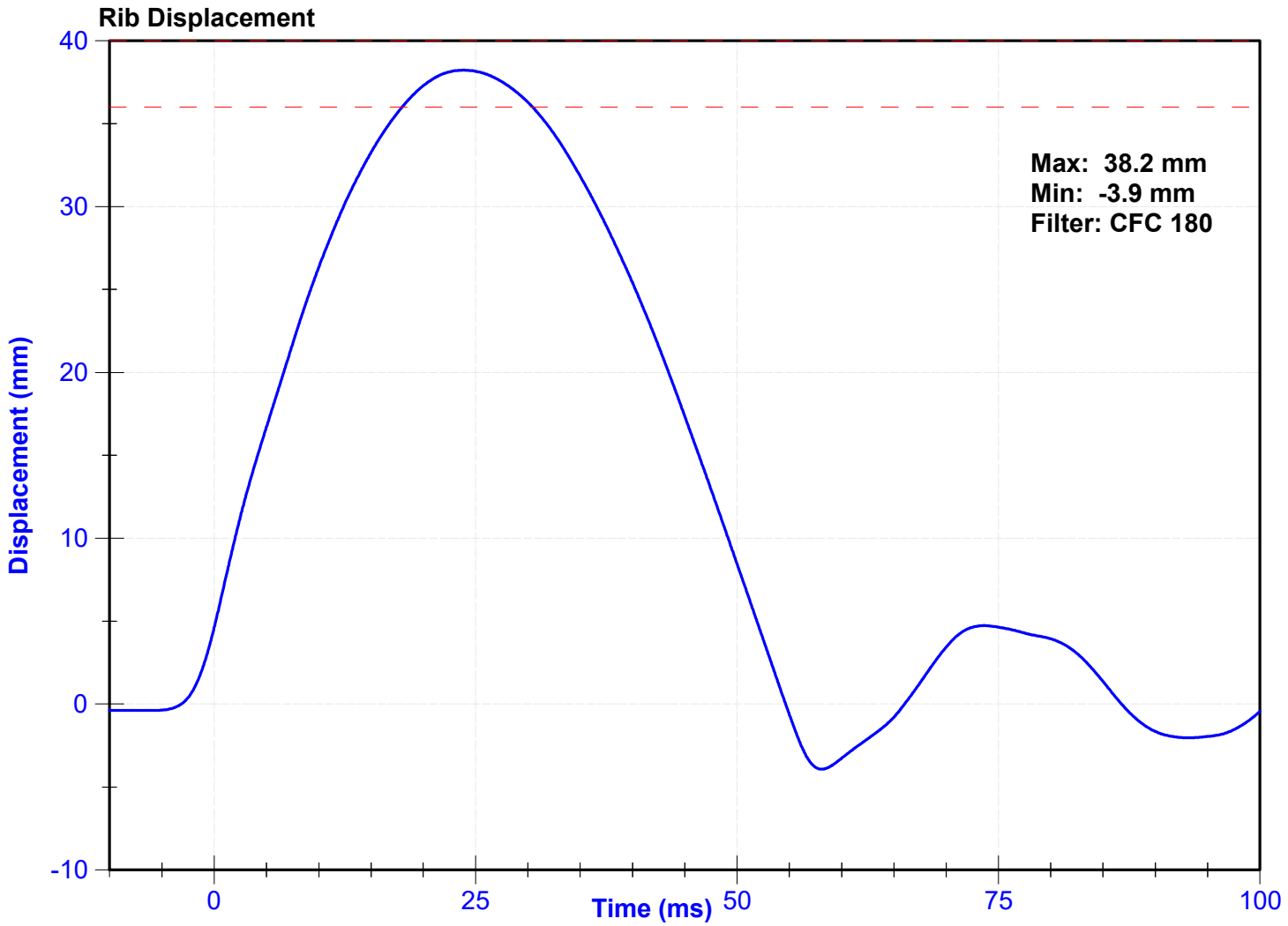
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.6	Pass
Humidity	10	70	%	65	Pass
Rib Displacement	36	40	mm	38.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	179GFE	7/1/2025	12/30/2025



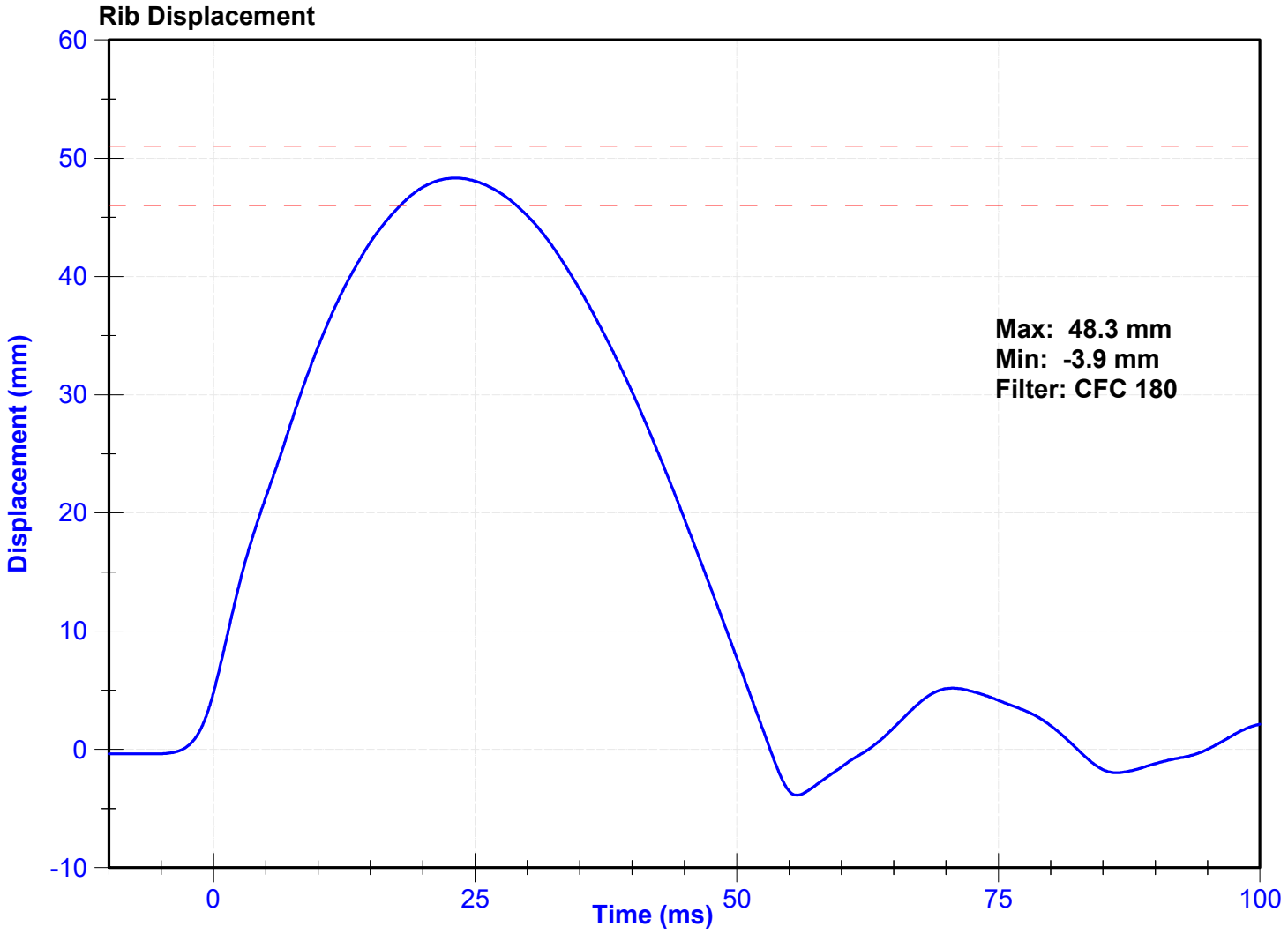
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.6	Pass
Humidity	10	70	%	65	Pass
Rib Displacement	46	51	mm	48.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	7/1/2025	12/30/2025



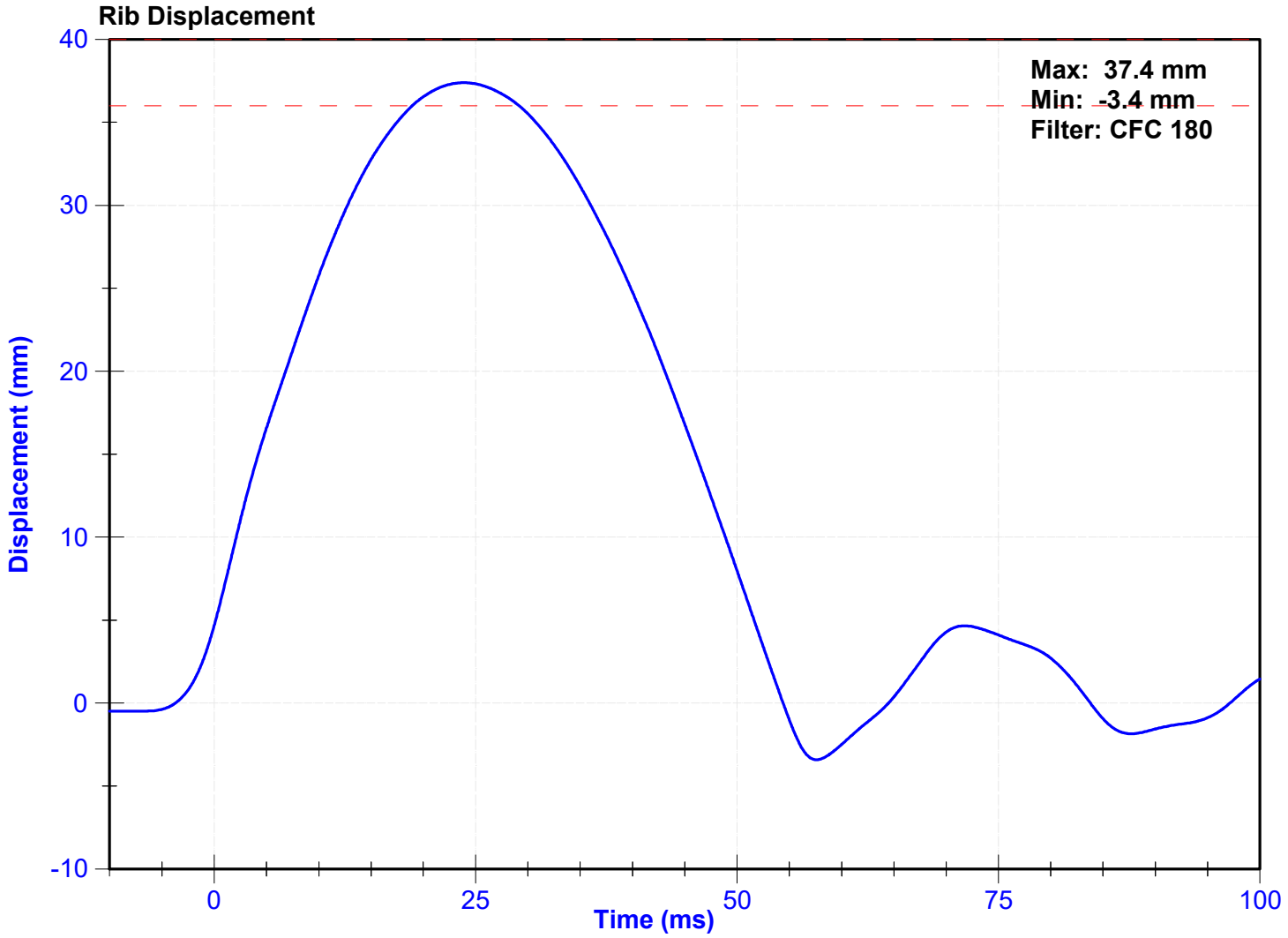
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.6	Pass
Humidity	10	70	%	65	Pass
Rib Displacement	36	40	mm	37.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	185GFE	7/1/2025	12/30/2025



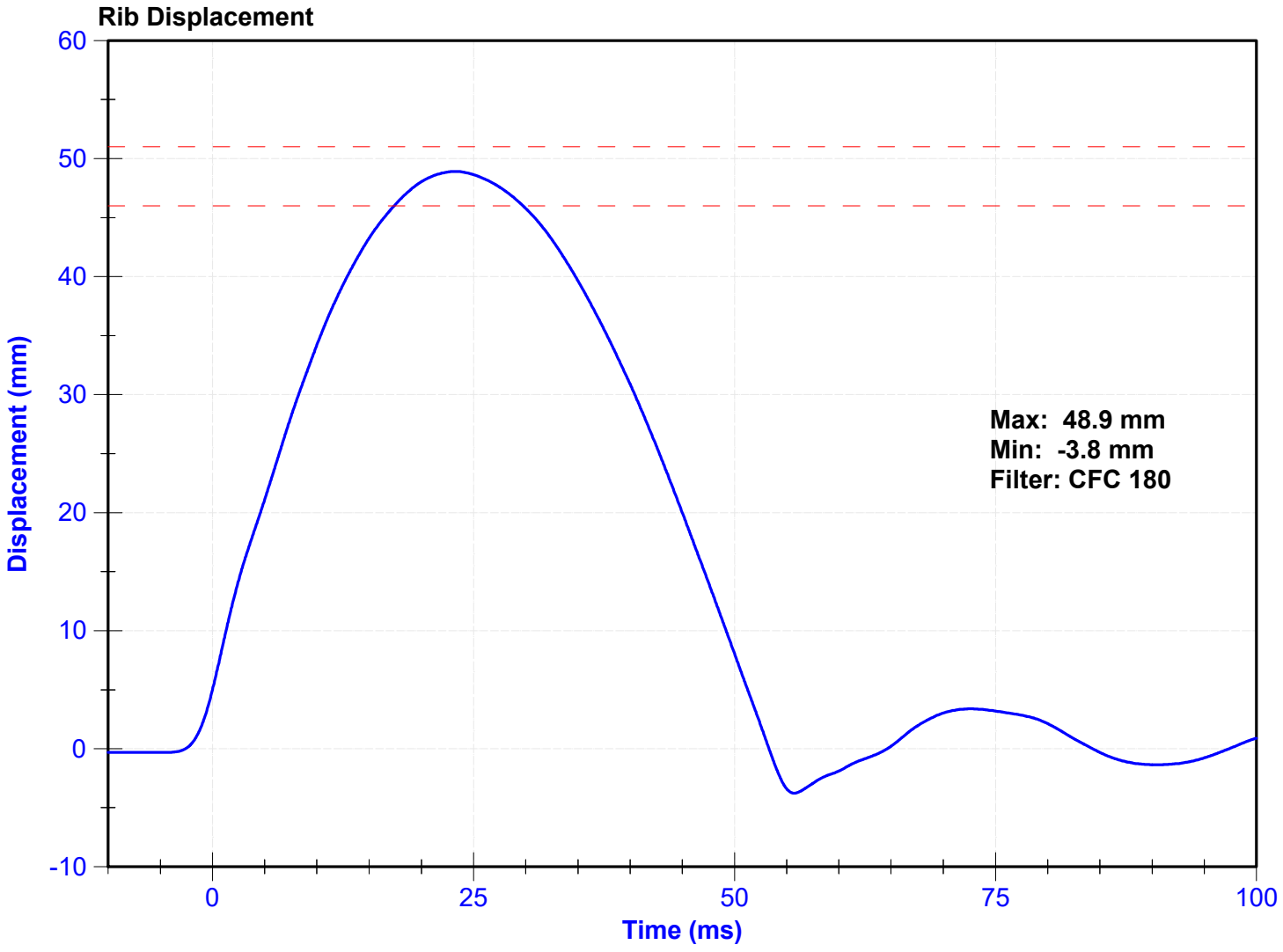
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.4	Pass
Humidity	10	70	%	65	Pass
Rib Displacement	46	51	mm	48.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	7/1/2025	12/30/2025



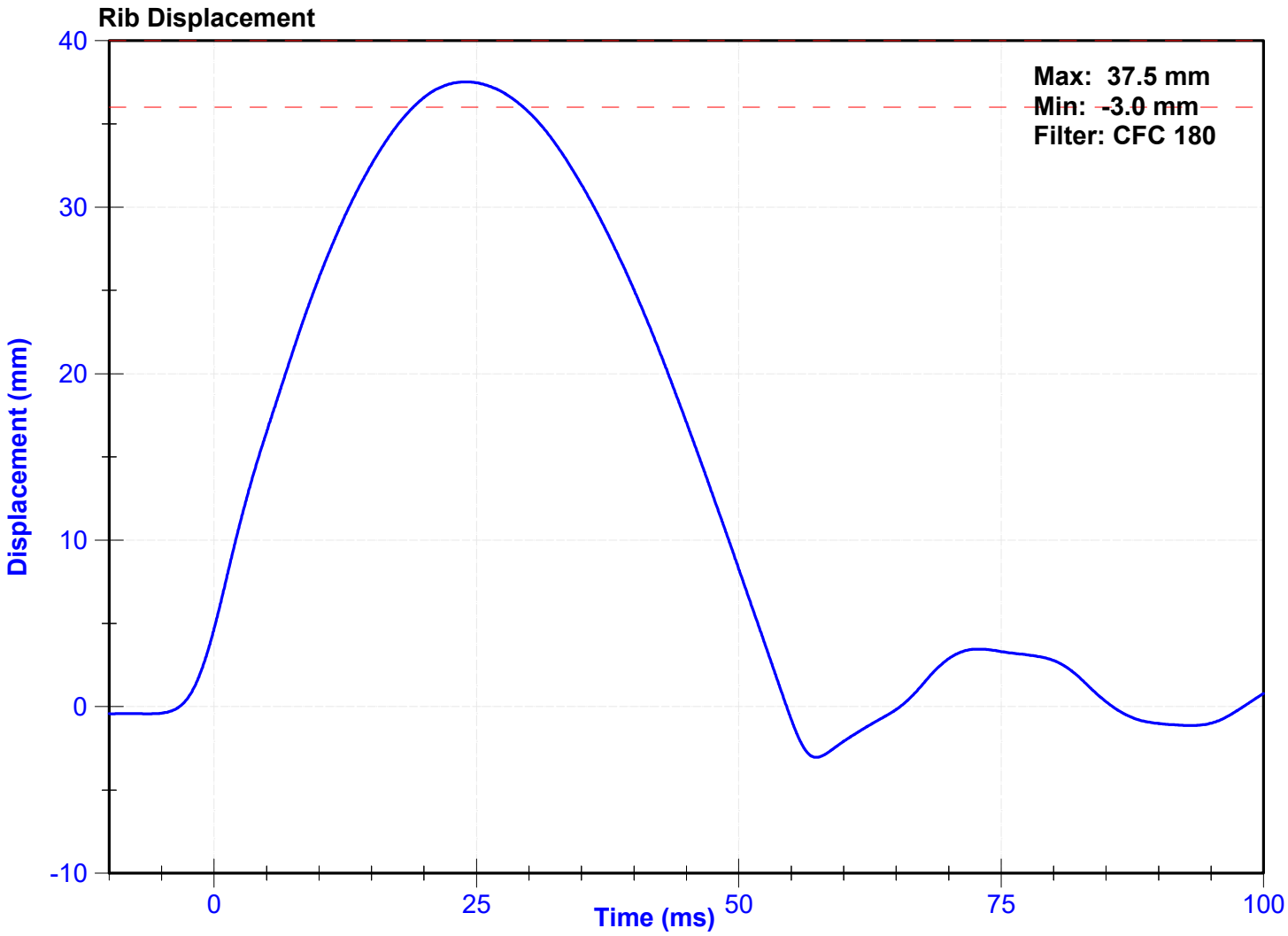
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.4	Pass
Humidity	10	70	%	65	Pass
Rib Displacement	36	40	mm	37.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	184GFE	7/1/2025	12/30/2025



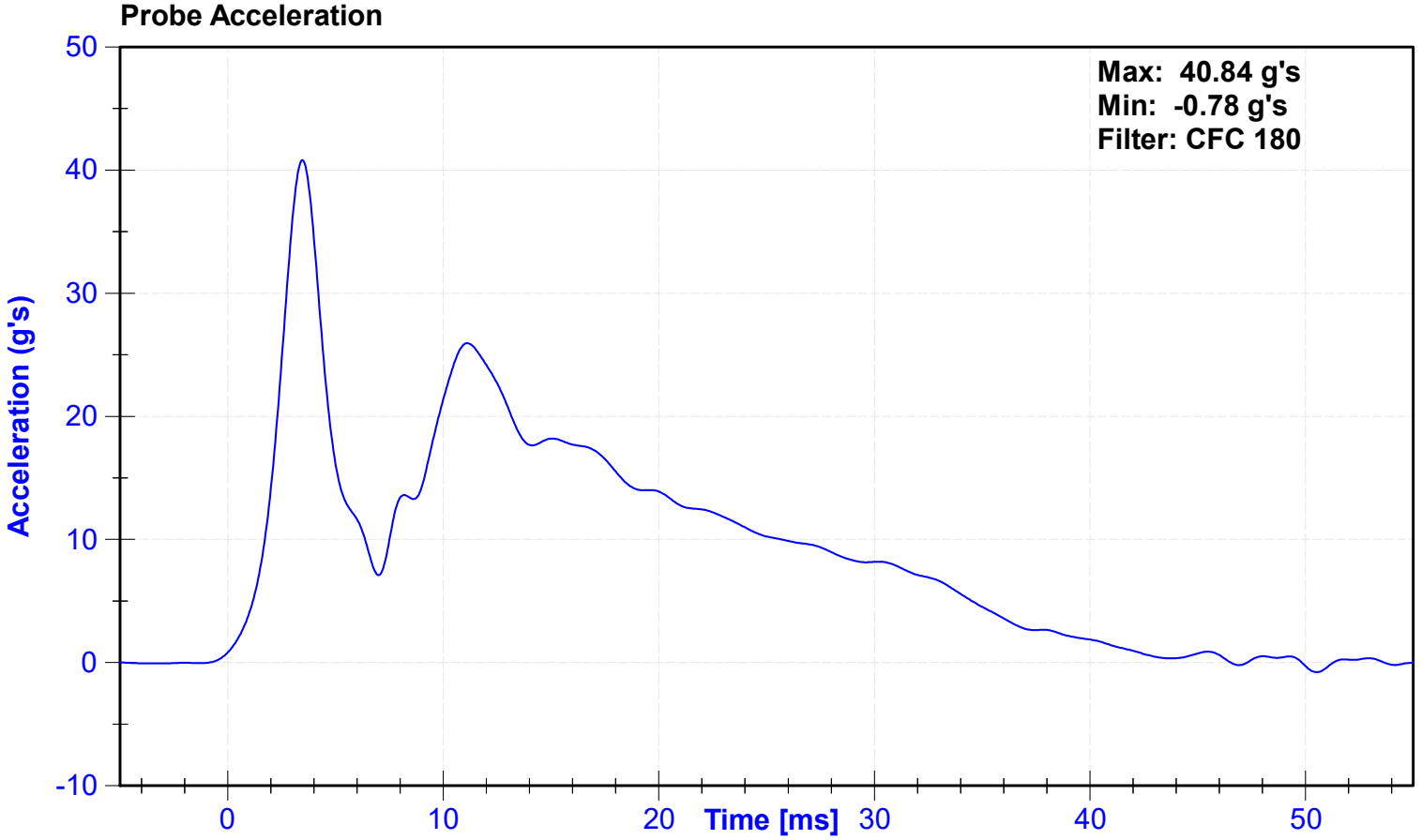
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

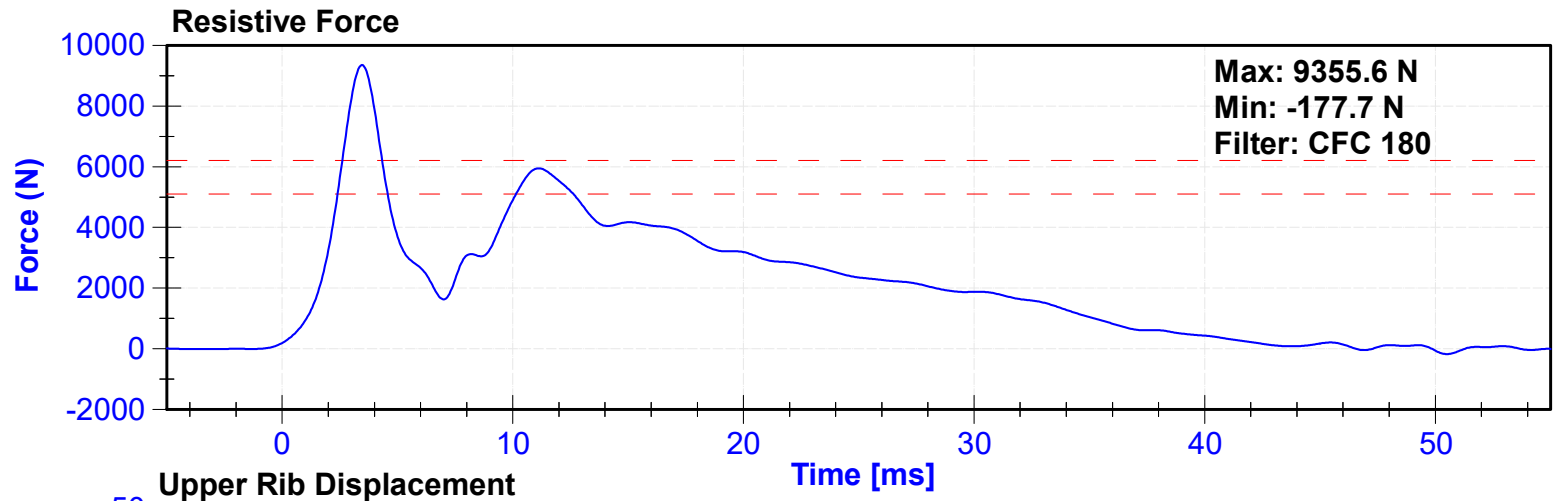
Results

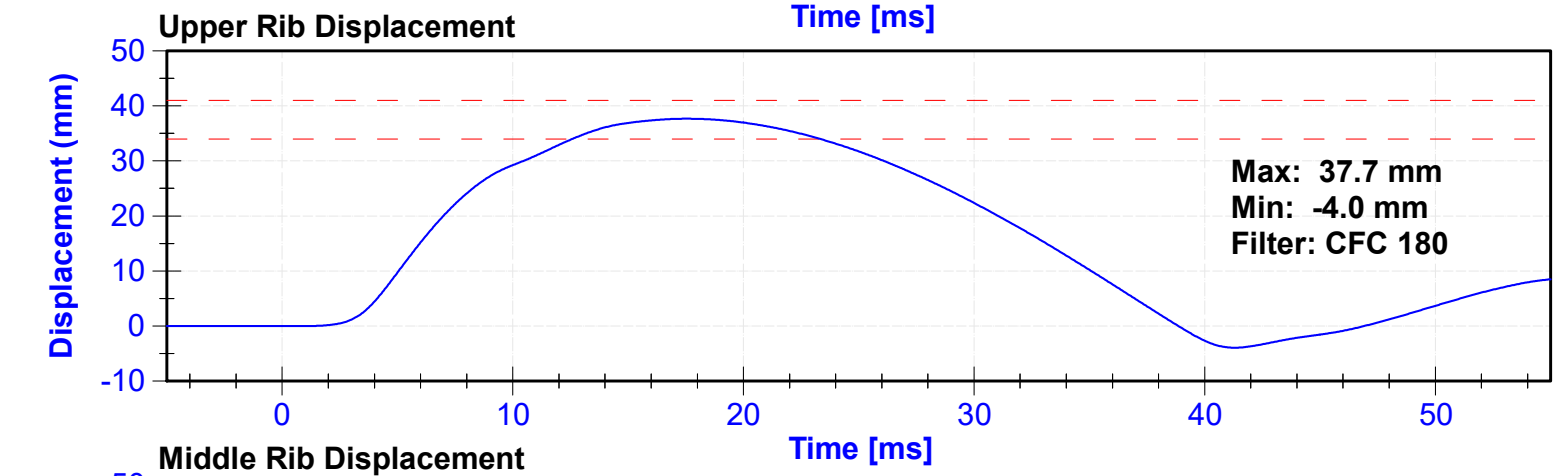
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	5.4	5.6	m/s	5.51	Pass
Resistive Force after 6ms	5100	6200	N	5945.6	Pass
Upper Thorax Rib Deflection	34	41	mm	37.7	Pass
Mid Thorax Rib Deflection	37	45	mm	41.0	Pass
Lower Thorax Rib Deflection	37	44	mm	40.8	Pass

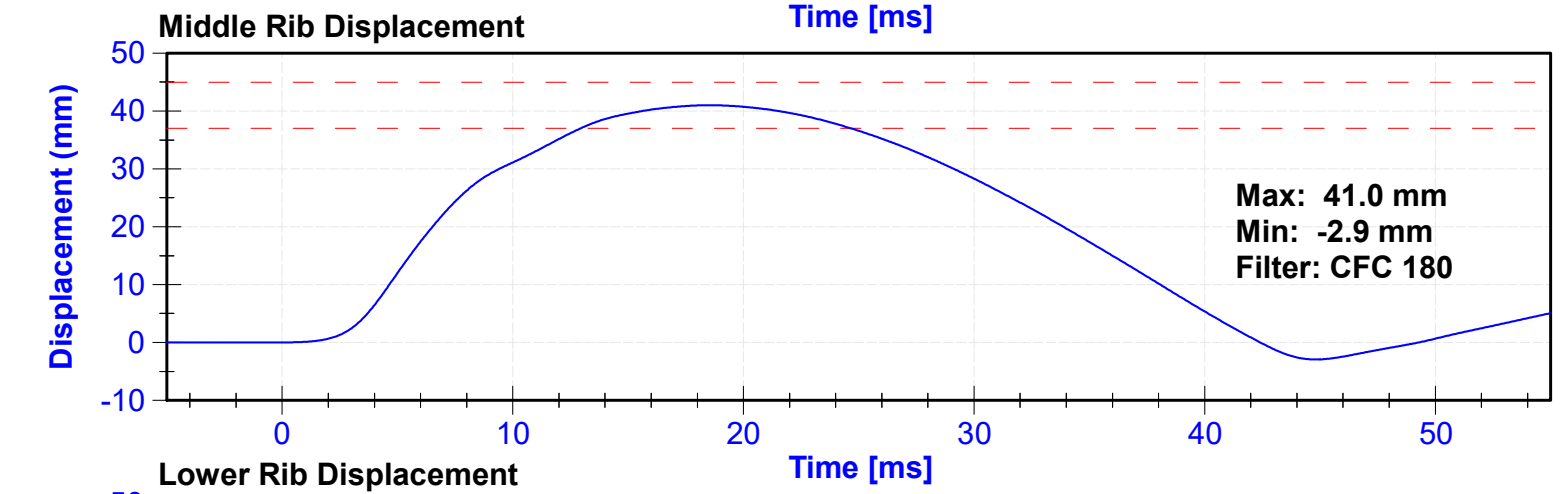
Transducer Calibrations

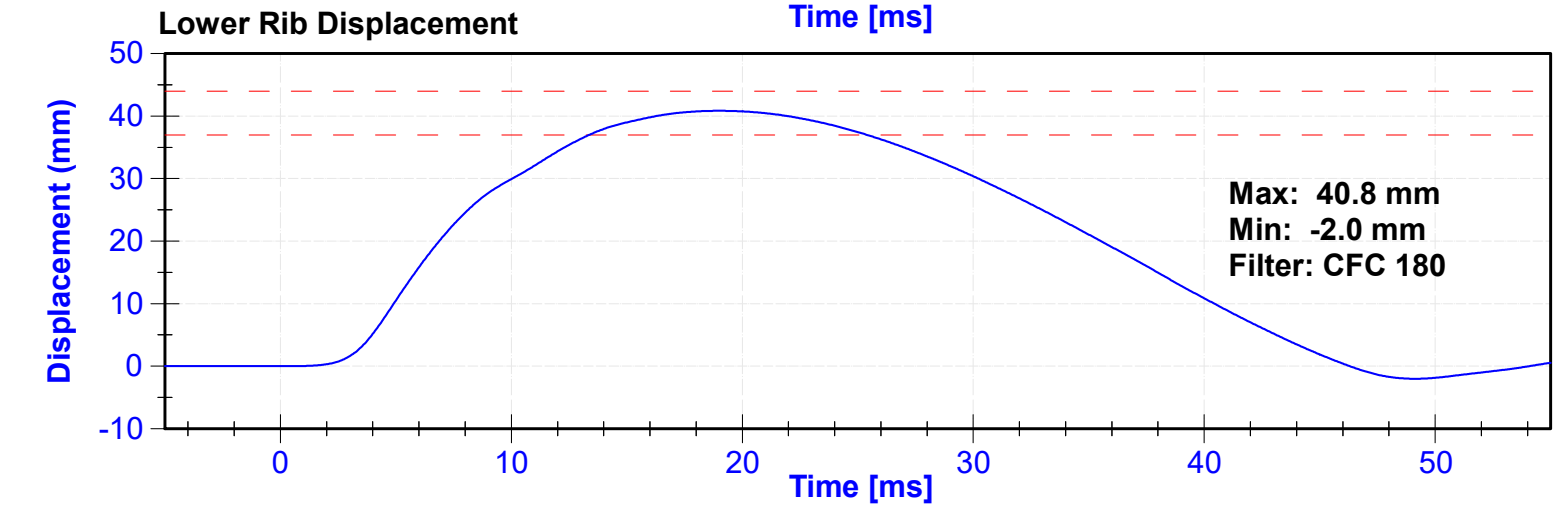
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Thorax Rib Potentiometer	Honeywell	179GFE	7/1/2025	12/30/2025
Middle Thorax Rib Potentiometer	Honeywell	185GFE	7/1/2025	12/30/2025
Lower Thorax Rib Potentiometer	Honeywell	184GFE	7/1/2025	12/30/2025




Resistive Force
Max: 9355.6 N
Min: -177.7 N
Filter: CFC 180
Force (N)
Time [ms]


Upper Rib Displacement
Max: 37.7 mm
Min: -4.0 mm
Filter: CFC 180
Displacement (mm)
Time [ms]


Middle Rib Displacement
Max: 41.0 mm
Min: -2.9 mm
Filter: CFC 180
Displacement (mm)
Time [ms]


Lower Rib Displacement
Max: 40.8 mm
Min: -2.0 mm
Filter: CFC 180
Displacement (mm)
Time [ms]

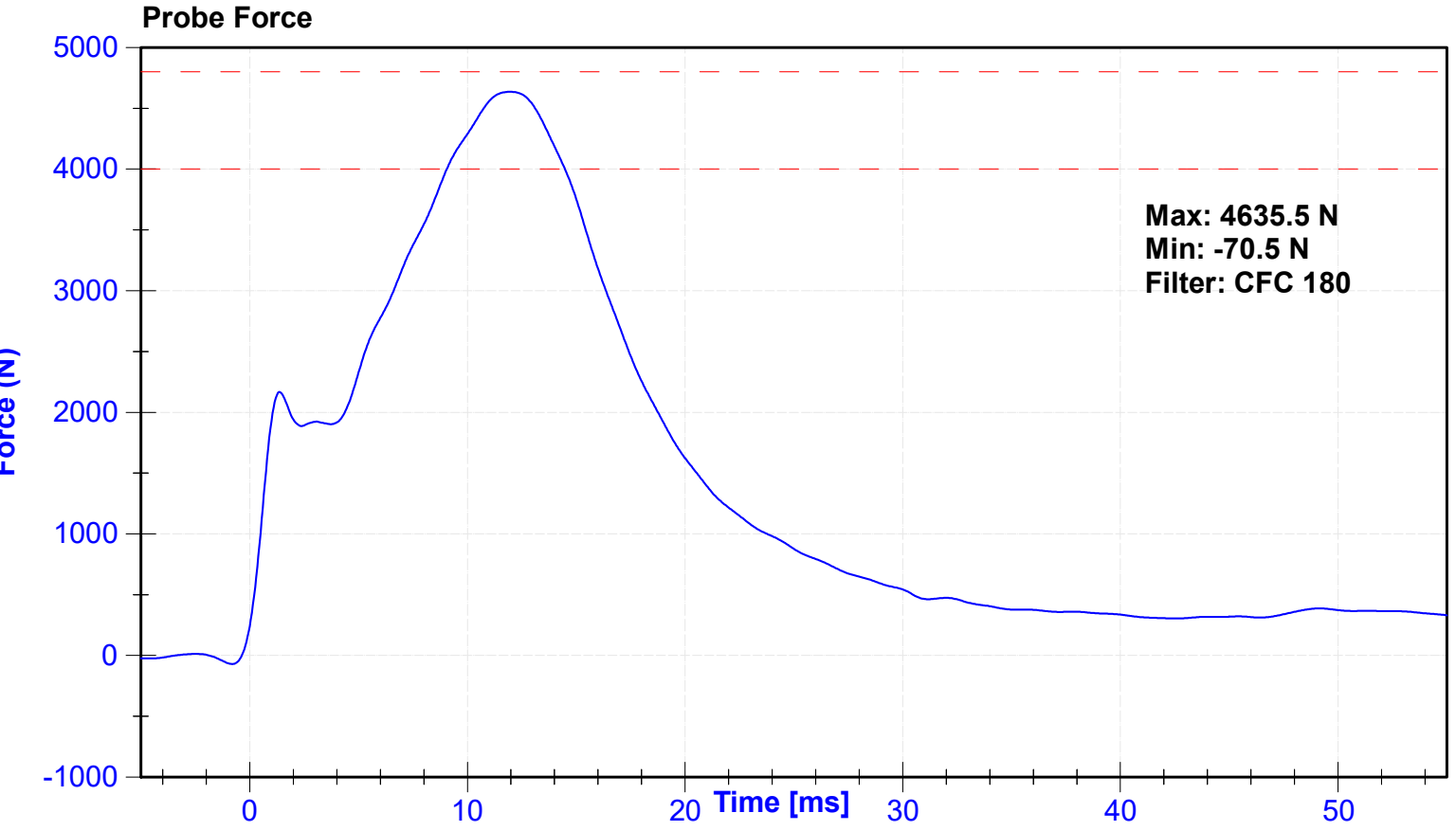
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

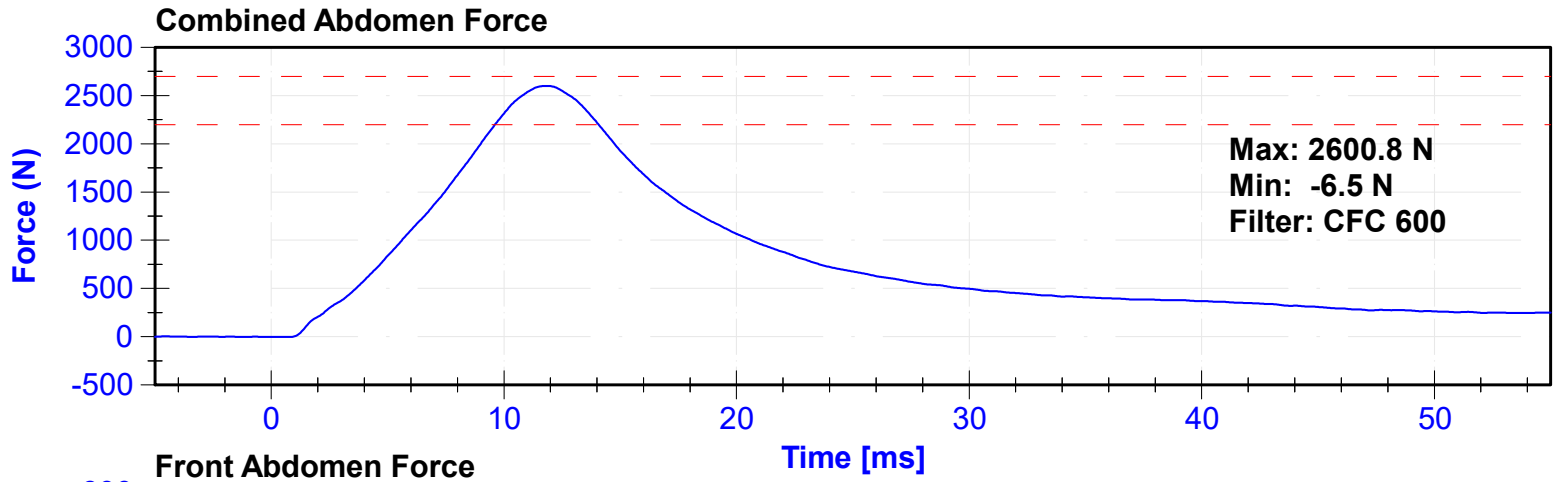
Results

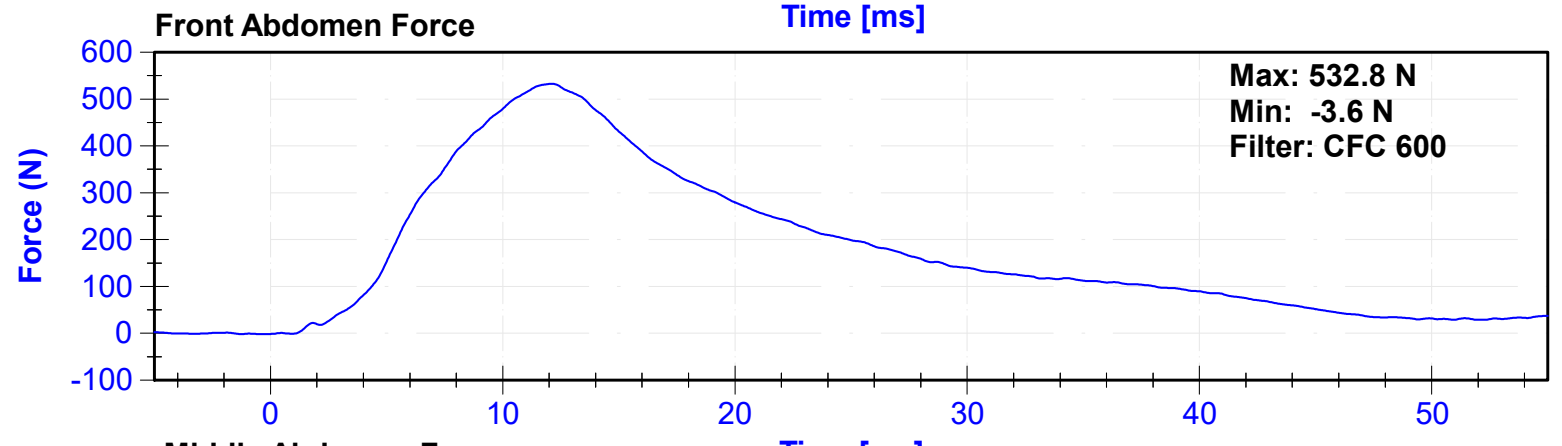
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	3.9	4.1	m/s	4.01	Pass
Combined Abdomen Force	2200	2700	N	2600.8	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.80	Pass
Resistive Probe Force	4000	4800	N	4635.5	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.95	Pass

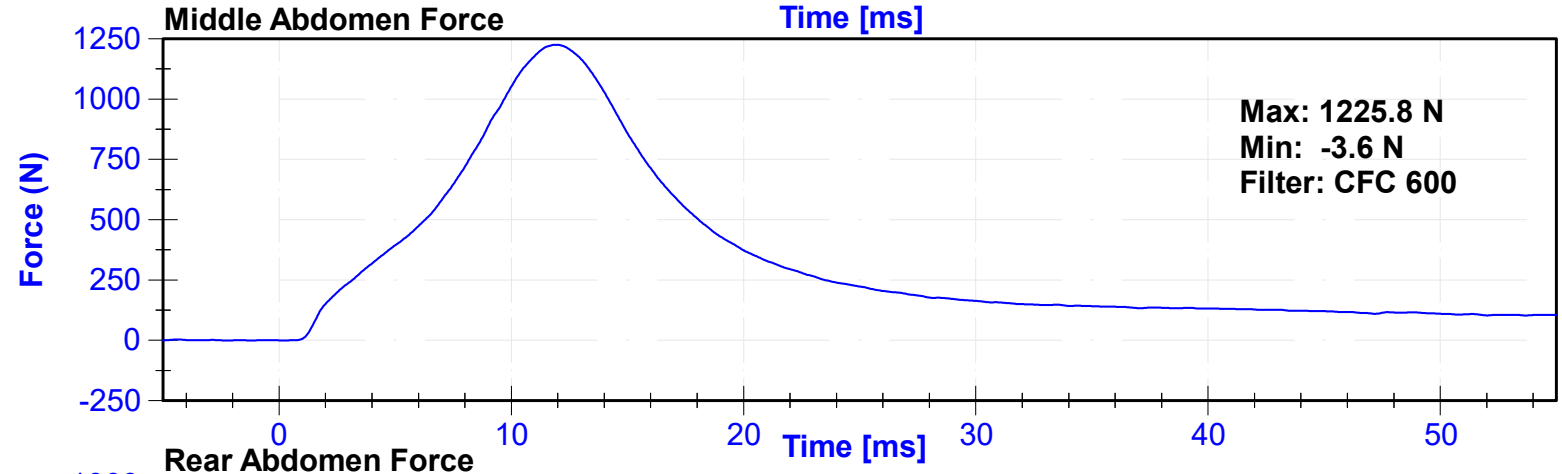
Transducer Calibrations

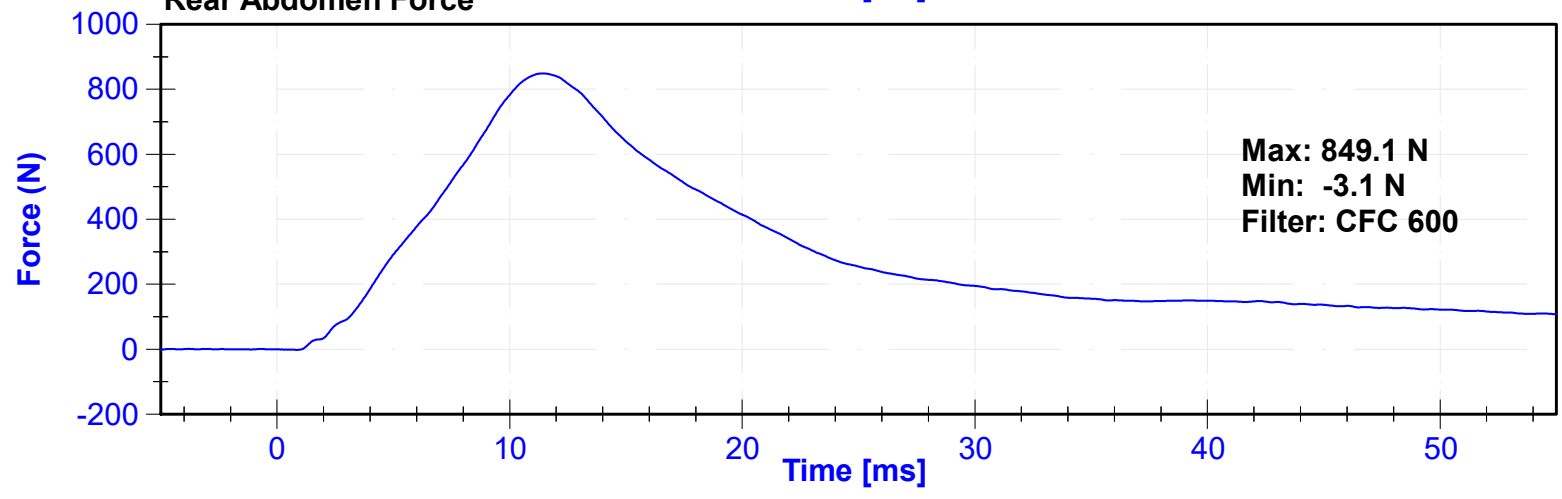
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Front Abdomen Load Cell	Denton	1523	10/28/2024	10/28/2025
Middle Abdomen Load Cell	Denton	1524	10/28/2024	10/28/2025
Rear Abdomen Load Cell	Denton	1530	10/28/2024	10/28/2025




Combined Abdomen Force
Force (N)
Time [ms]
Max: 2600.8 N
Min: -6.5 N
Filter: CFC 600


Front Abdomen Force
Force (N)
Time [ms]
Max: 532.8 N
Min: -3.6 N
Filter: CFC 600


Middle Abdomen Force
Force (N)
Time [ms]
Max: 1225.8 N
Min: -3.6 N
Filter: CFC 600


Rear Abdomen Force
Force (N)
Time [ms]
Max: 849.1 N
Min: -3.1 N
Filter: CFC 600

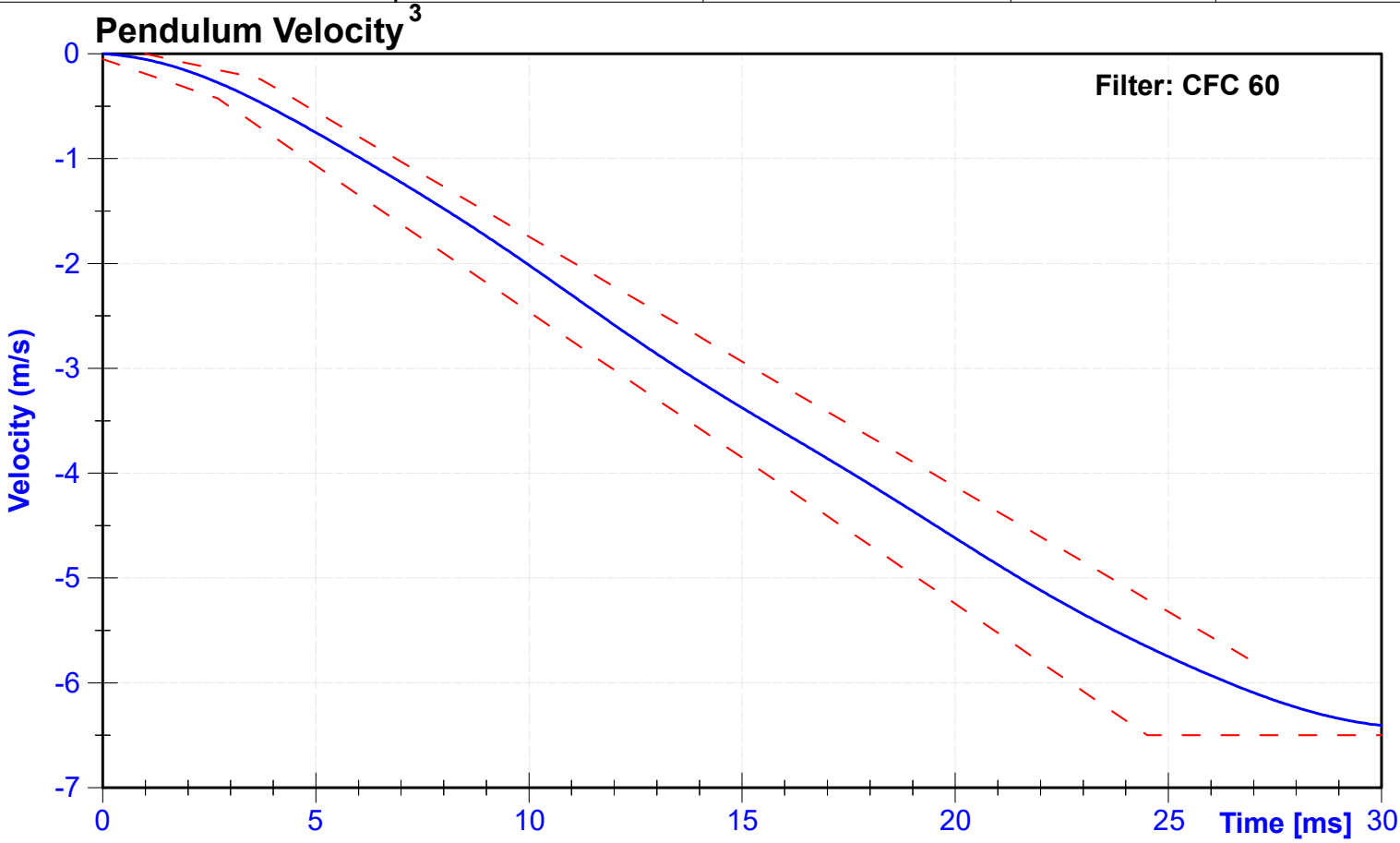
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

Results

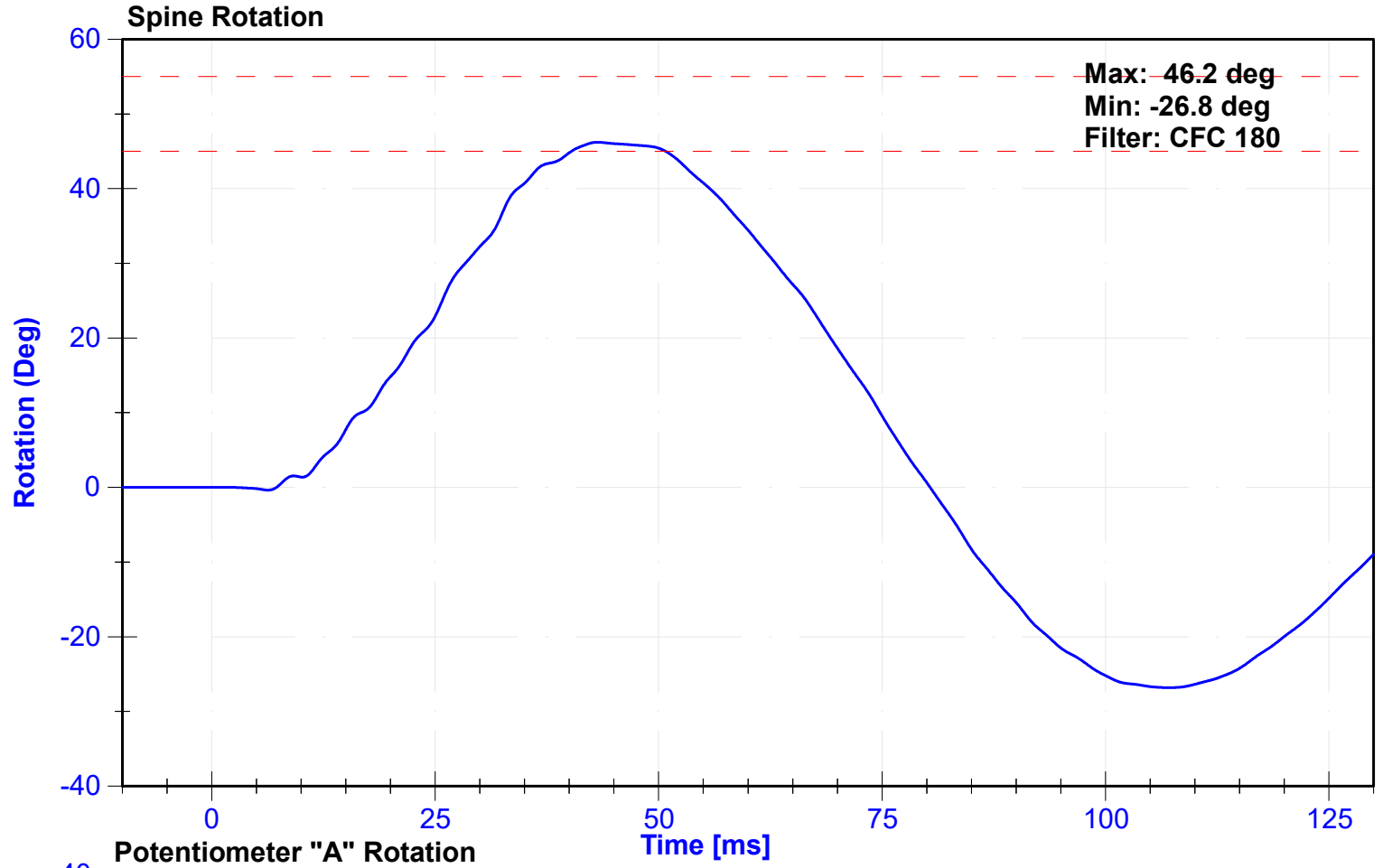
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.6	Pass
Humidity	10	70	%	55	Pass
Velocity	5.95	6.15	m/s	6.117	Pass
Lateral Spine Rotation	45	55	deg	46.2	Pass
Time at Maximum Rotation	39	53	ms	43.1	Pass
Time of Decay to Zero Degrees	37	57	ms	37.2	Pass
Pendulum Velocity Overall Corridor	Lower Boundary[1]	Upper Boundary[2]	m/s	See Plot[3]	Pass

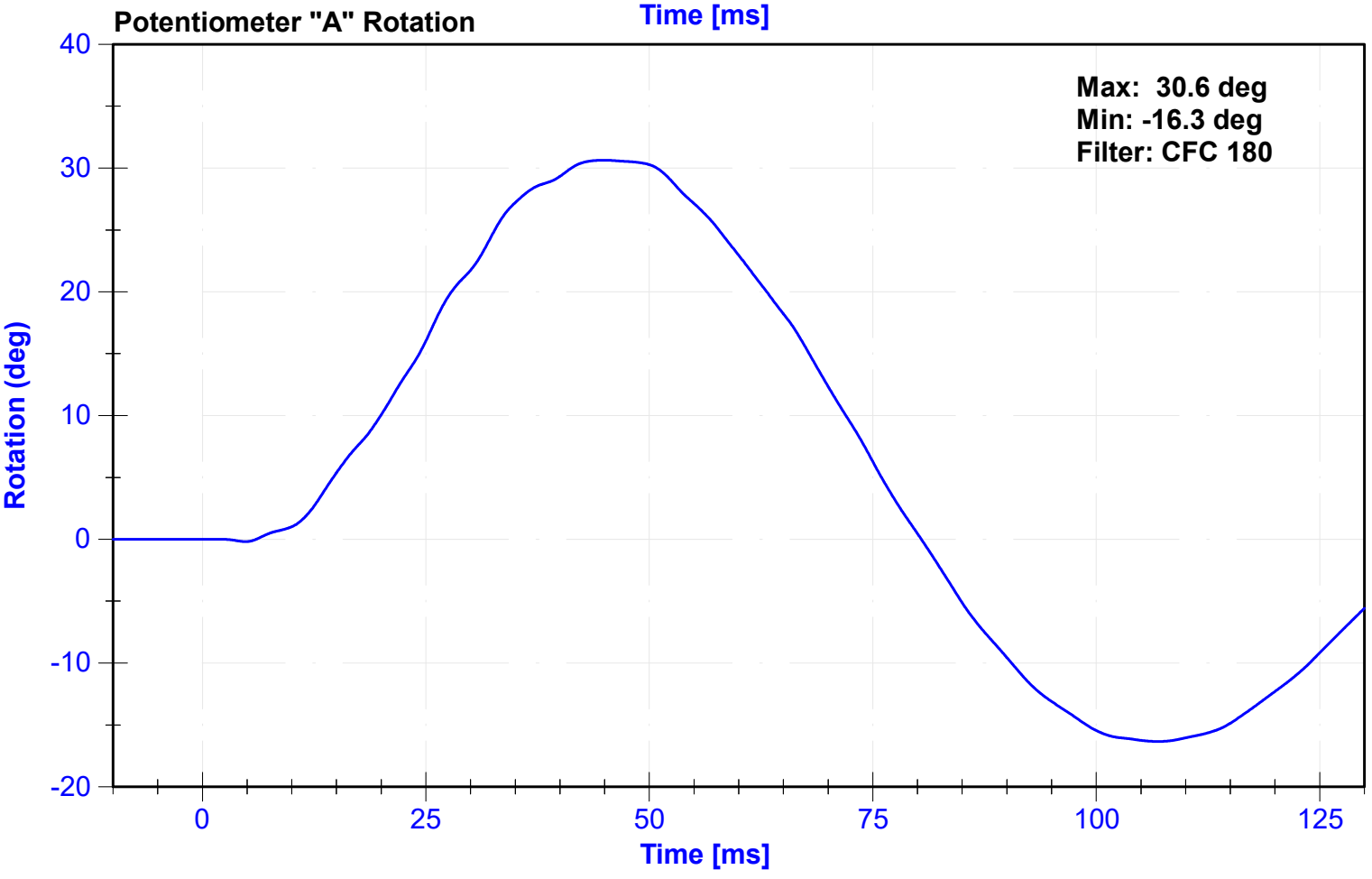
Transducer Calibrations

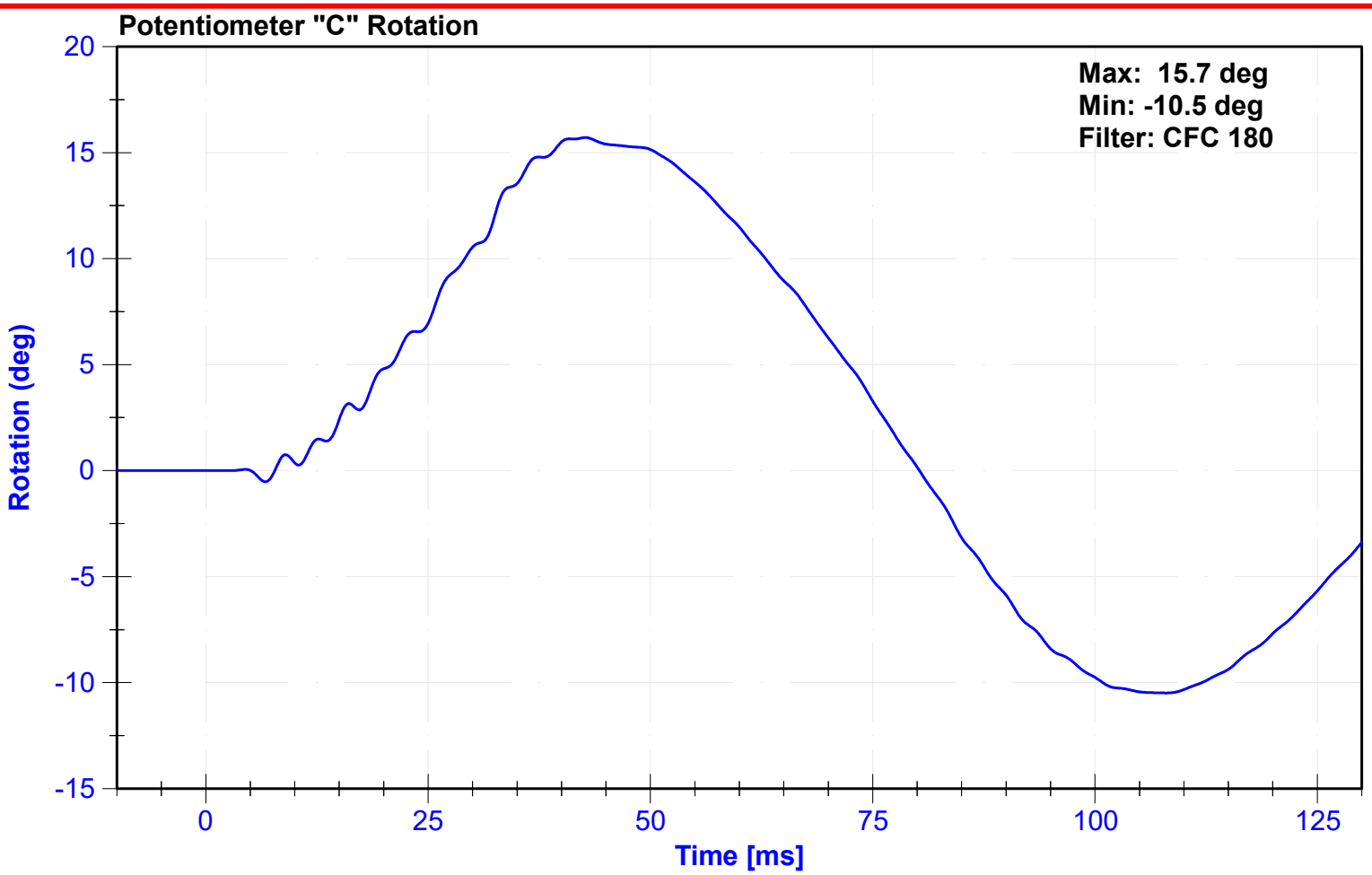
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum "A" Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Condyle "B" Potentiometer	Sfernice	095	9/13/2024	9/13/2025



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


Spine Rotation
Max: 46.2 deg
Min: -26.8 deg
Filter: CFC 180
Rotation (Deg)
60
40
20
0
-20
-40
0
25
50
75
100
125
Time [ms]


Potentiometer "A" Rotation
Max: 30.6 deg
Min: -16.3 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

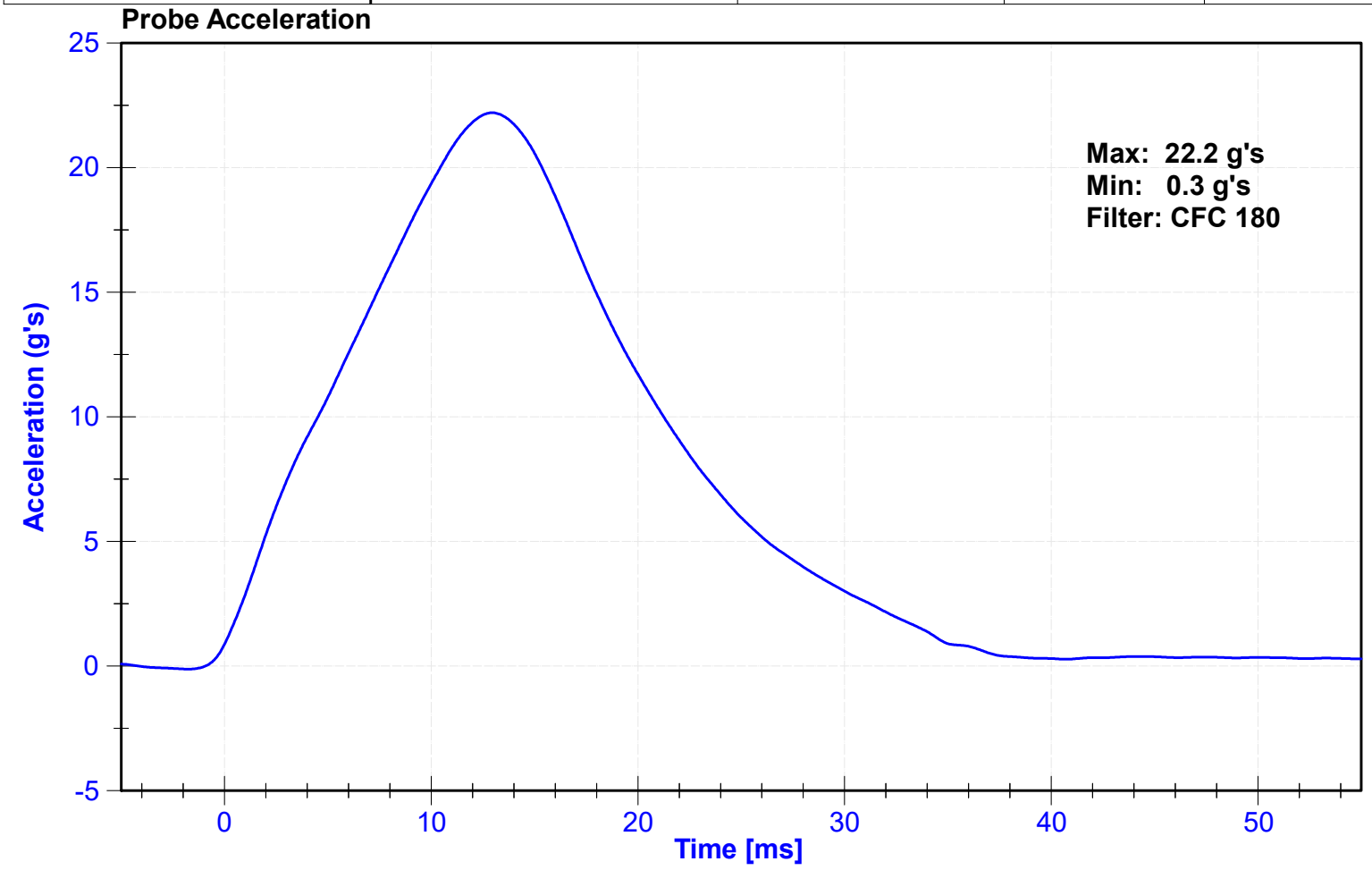
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	F033	Laboratory Supervisor	J. Kinderman

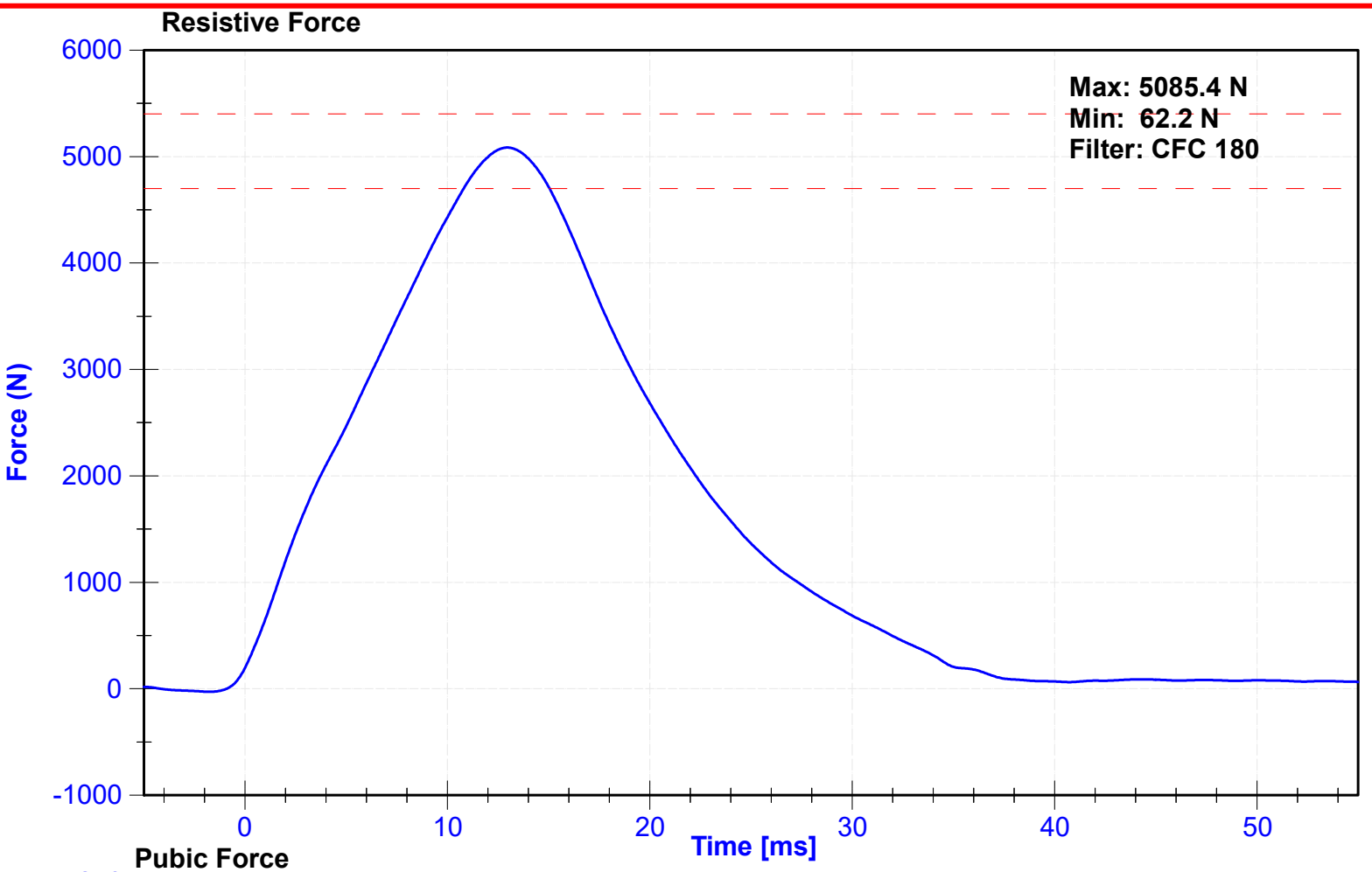
Results

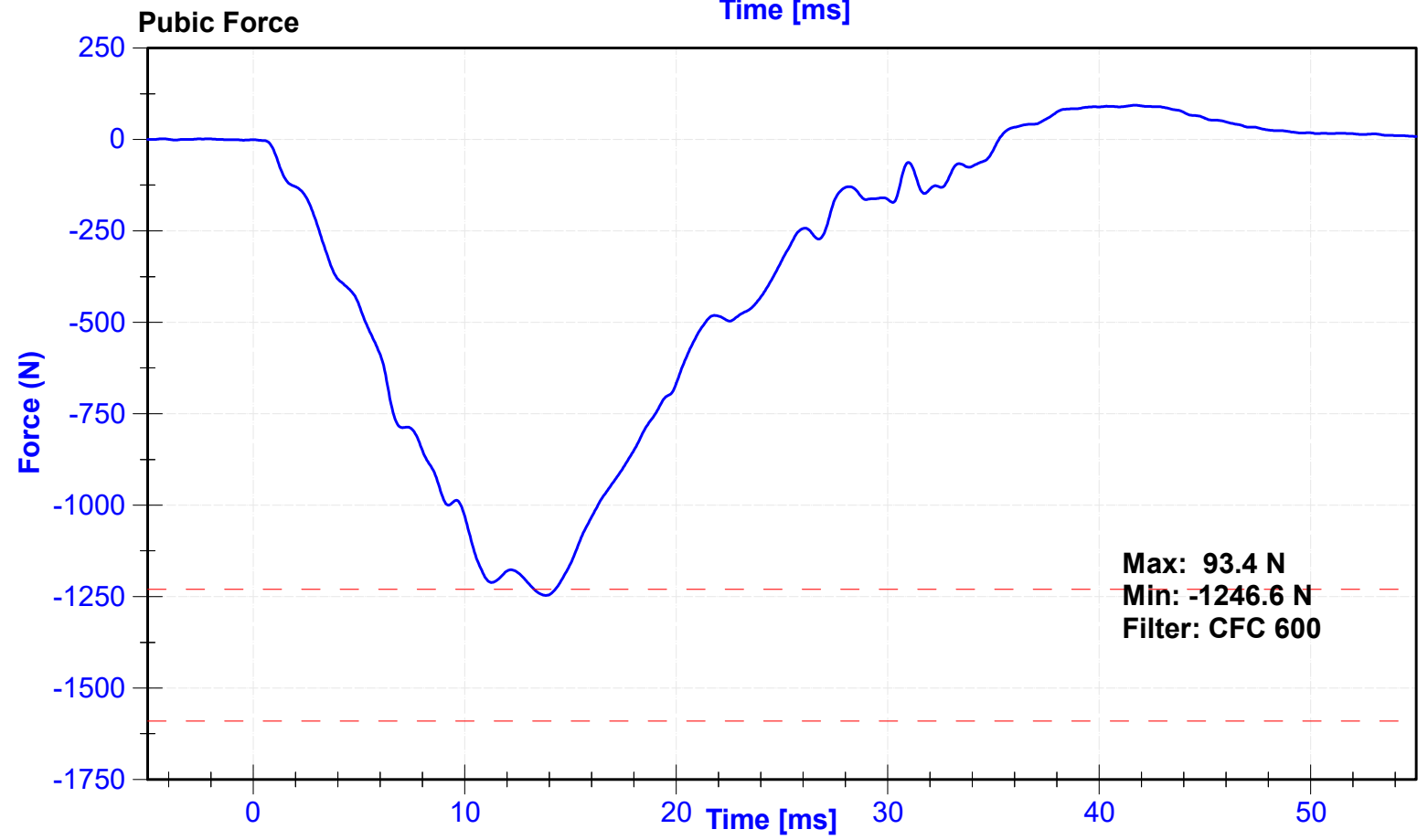
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	4.2	4.4	m/s	4.30	Pass
Resistive Force	4700	5400	N	5085.4	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.95	Pass
Pubic Force	-1590	-1230	N	-1246.6	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.85	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pubic Load Cell	Denton	458-FY	10/28/2024	10/28/2025




Resistive Force
Max: 5085.4 N
Min: 62.2 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: 93.4 N
Min: -1246.6 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

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE – PASSENGER ATD

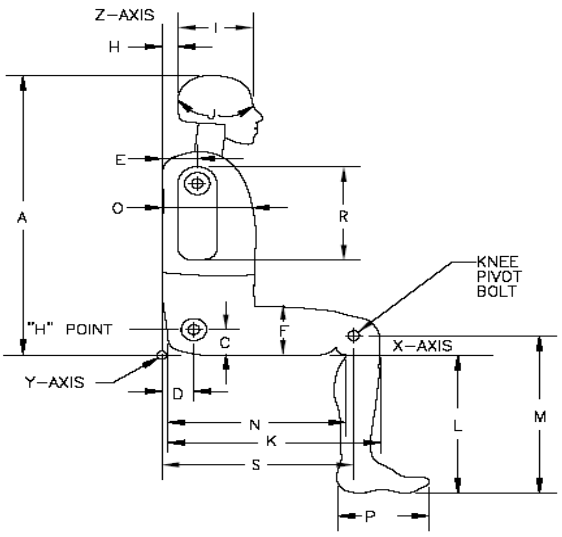
SERIAL NO:DG8012

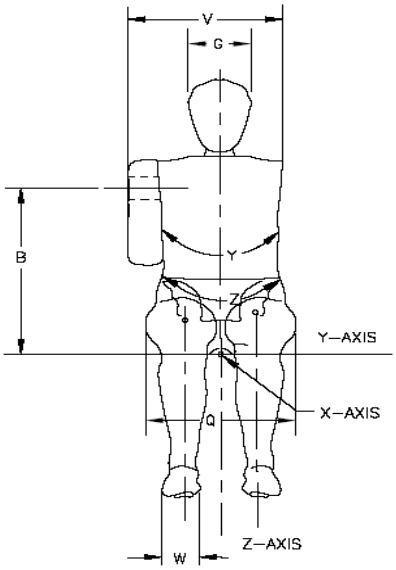
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: J. Rios Date: 07/28/2025

Dummy Serial Number: DG8012





Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	448	Pass
C	H-point Height	79	89	88	Pass
D	H-point from seatback	141	151	146	Pass
E	Shoulder Pivot from Backline	97	107	102	Pass
F	Thigh Clearance	119	135	123	Pass
G	Head Breadth	140	148	143	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	187	Pass
J	Head Circumference	541	551	549	Pass
K	Buttock to Knee Length	514	540	523	Pass
L	Popliteal Height	343	369	353	Pass
M	Knee Pivot to floor height	392	409	400	Pass
N	Buttock Popliteal Length	416	442	428	Pass
O	Chest Depth w/o jacket	195	211	202	Pass
P	Foot Length	216	232	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	255	Pass
S	Knee Joint to seatback	477	493	485	Pass
V	Shoulder Width	341	357	349	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	869	Pass
Z	Waist Circumference	761	791	781	Pass

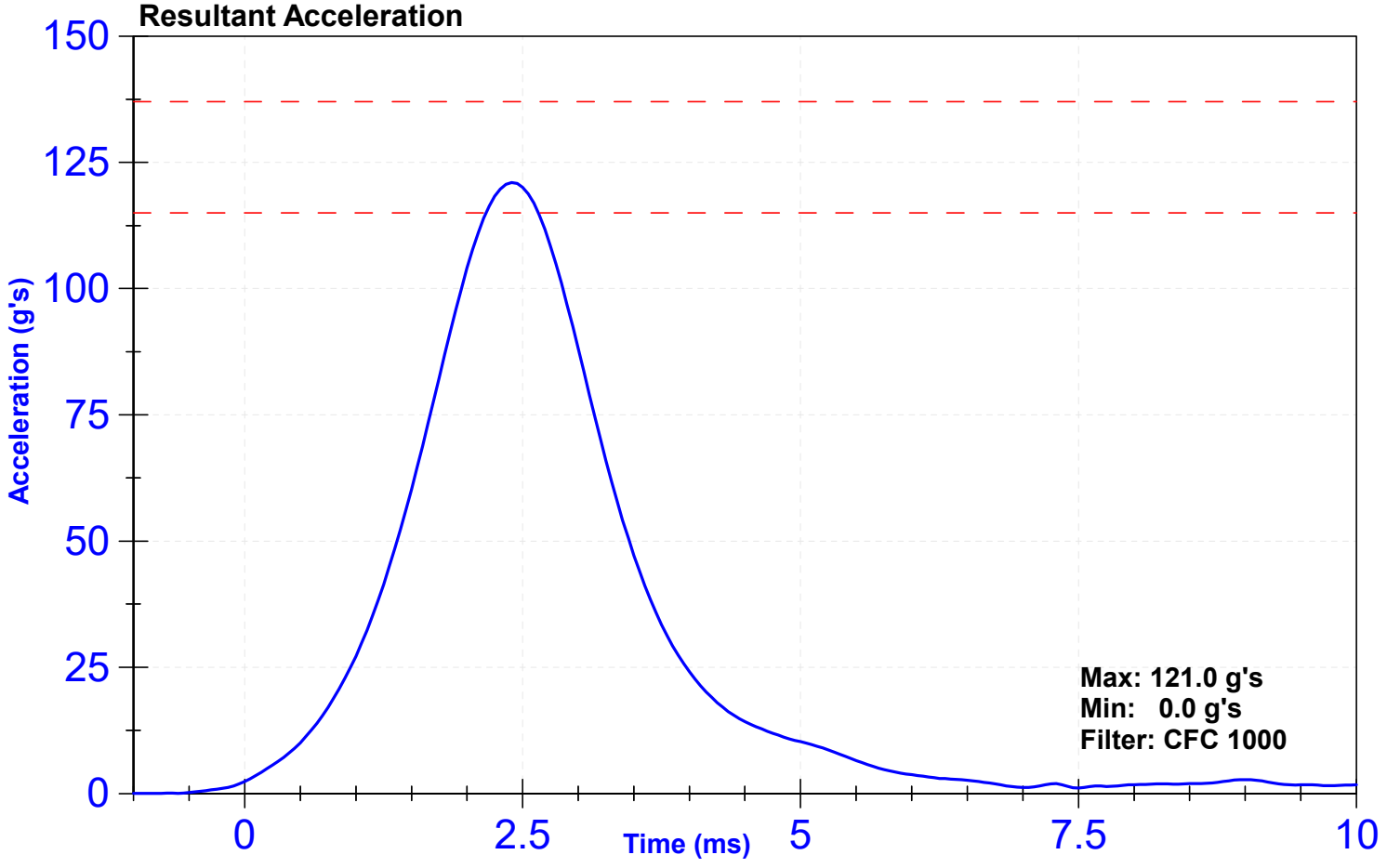
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

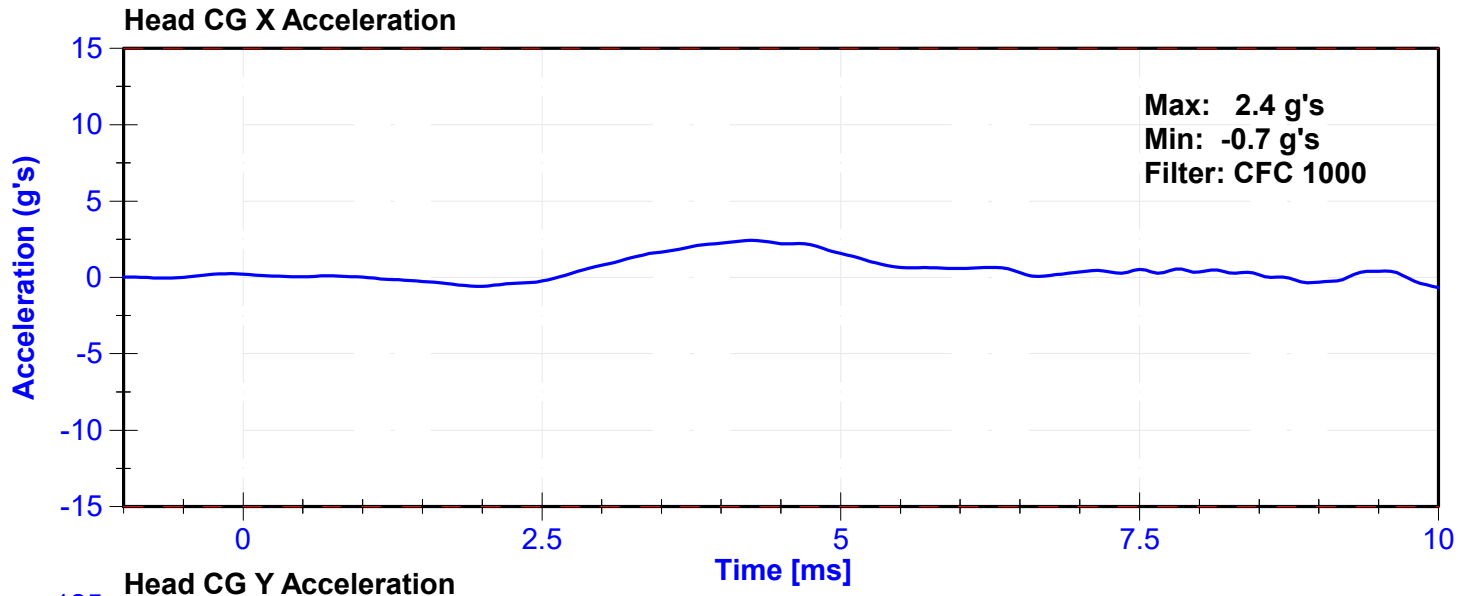
Results

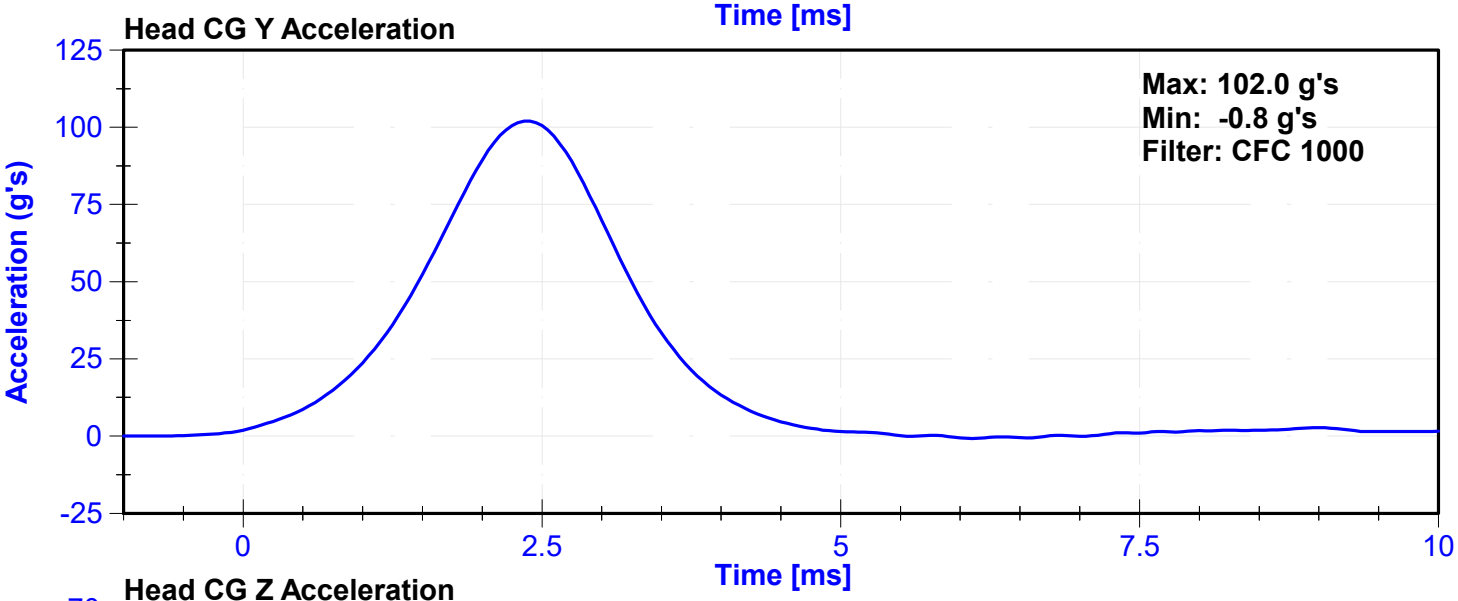
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.5	Pass
Humidity	10	70	%	64	Pass
Resultant Acceleration	115	137	g's	121.0	Pass
Oscillation	0	15	%	2.2	Pass
Fore-Aft Acceleration	-15	15	g's	2.4	Pass

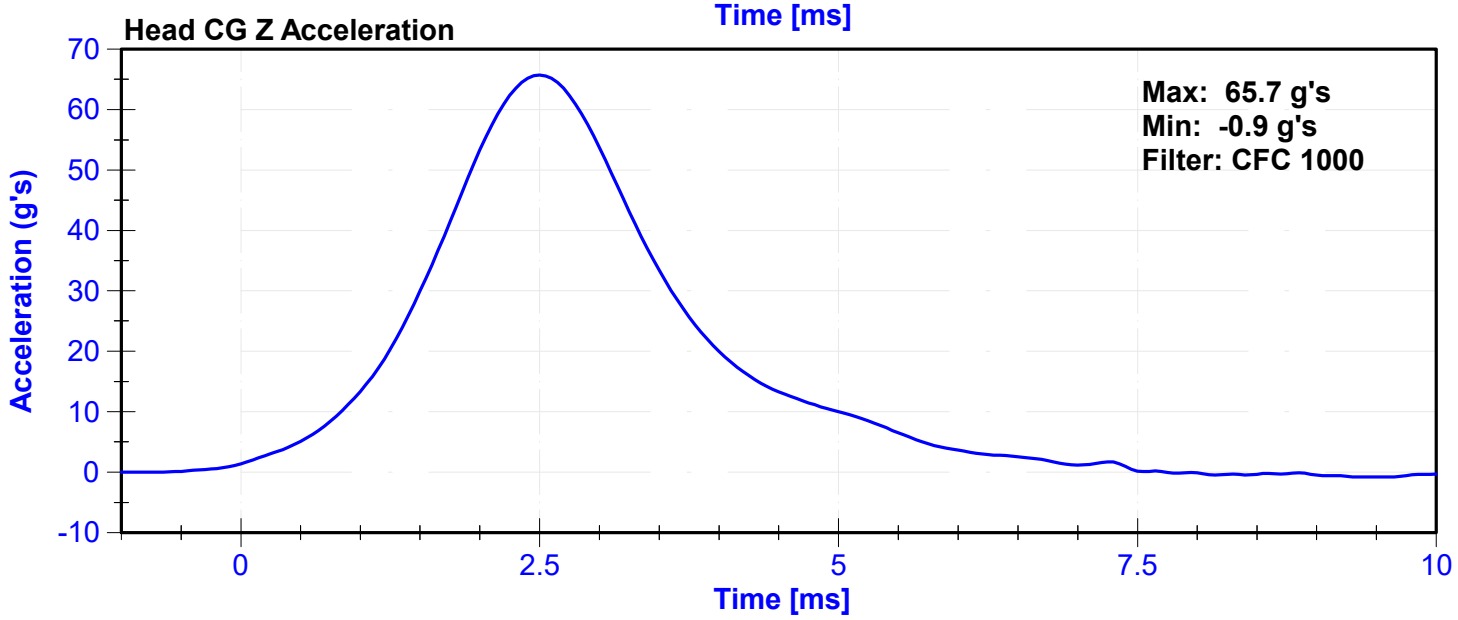
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	T21184	7/2/2025	12/29/2025
Y Accelerometer	Endevco	T31030	7/2/2025	12/29/2025
Z Accelerometer	Endevco	P83319	7/2/2025	12/29/2025




Head CG X Acceleration
Max: 2.4 g's
Min: -0.7 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Y Acceleration
Max: 102.0 g's
Min: -0.8 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Z Acceleration
Max: 65.7 g's
Min: -0.9 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]

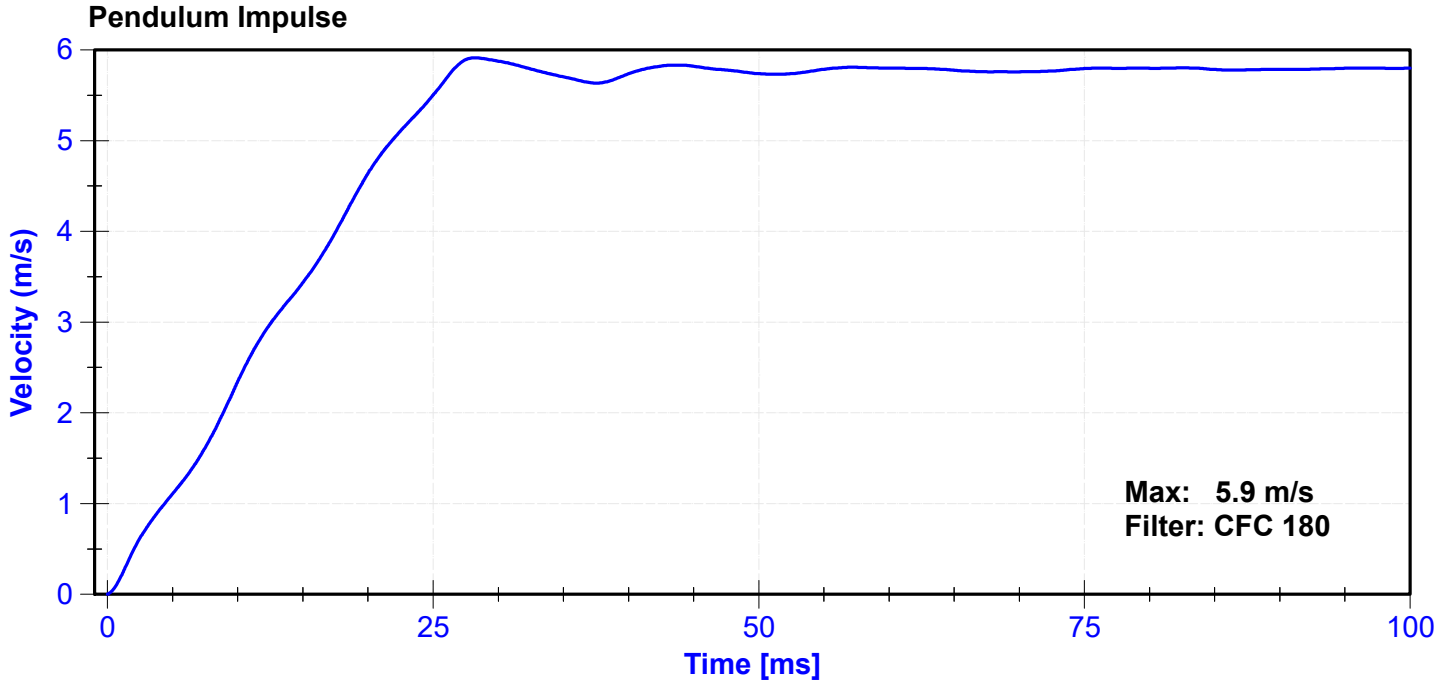
ATD Manufacturer	FTSS	Test Technician	K. Konieczny
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

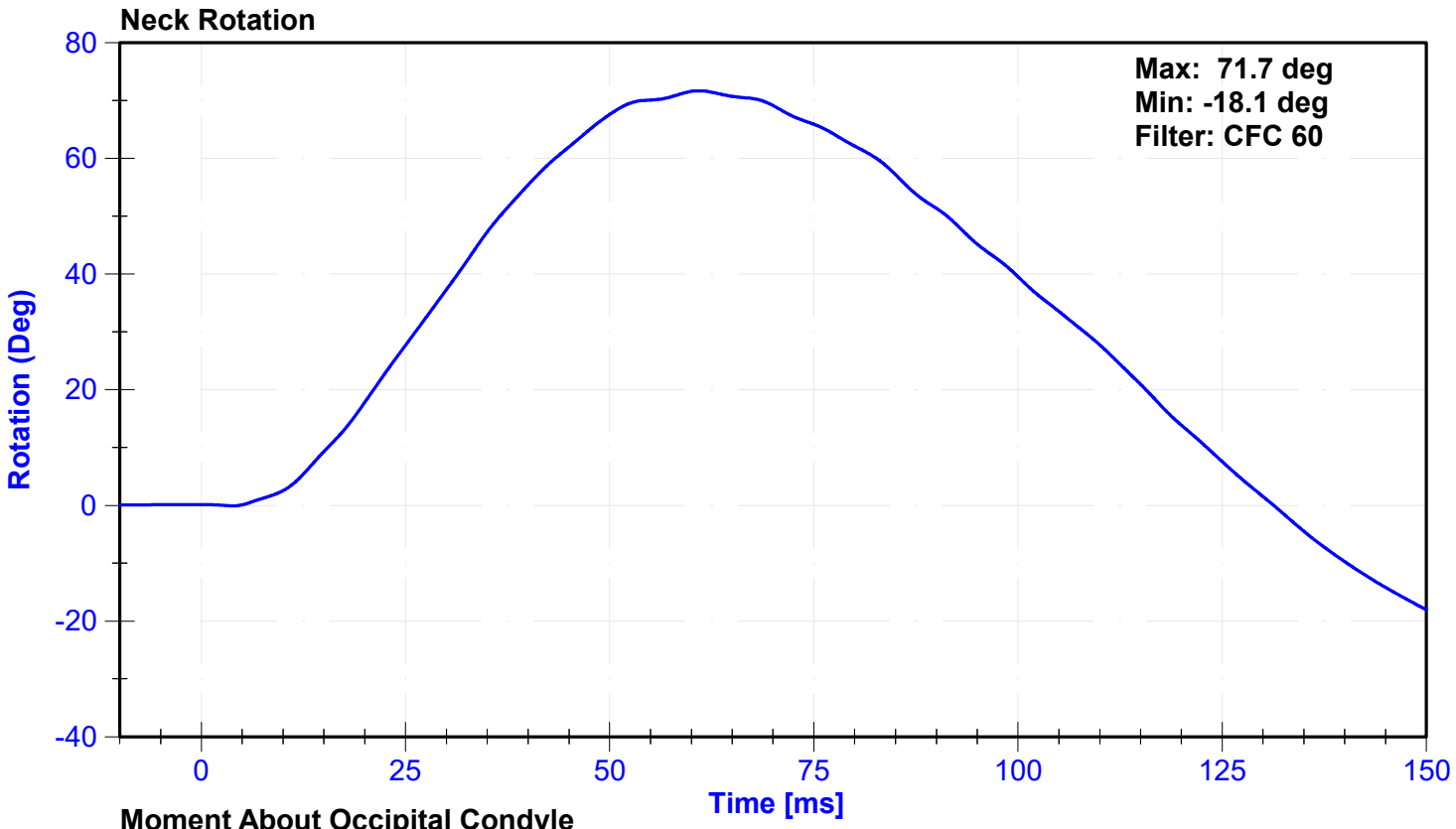
Results

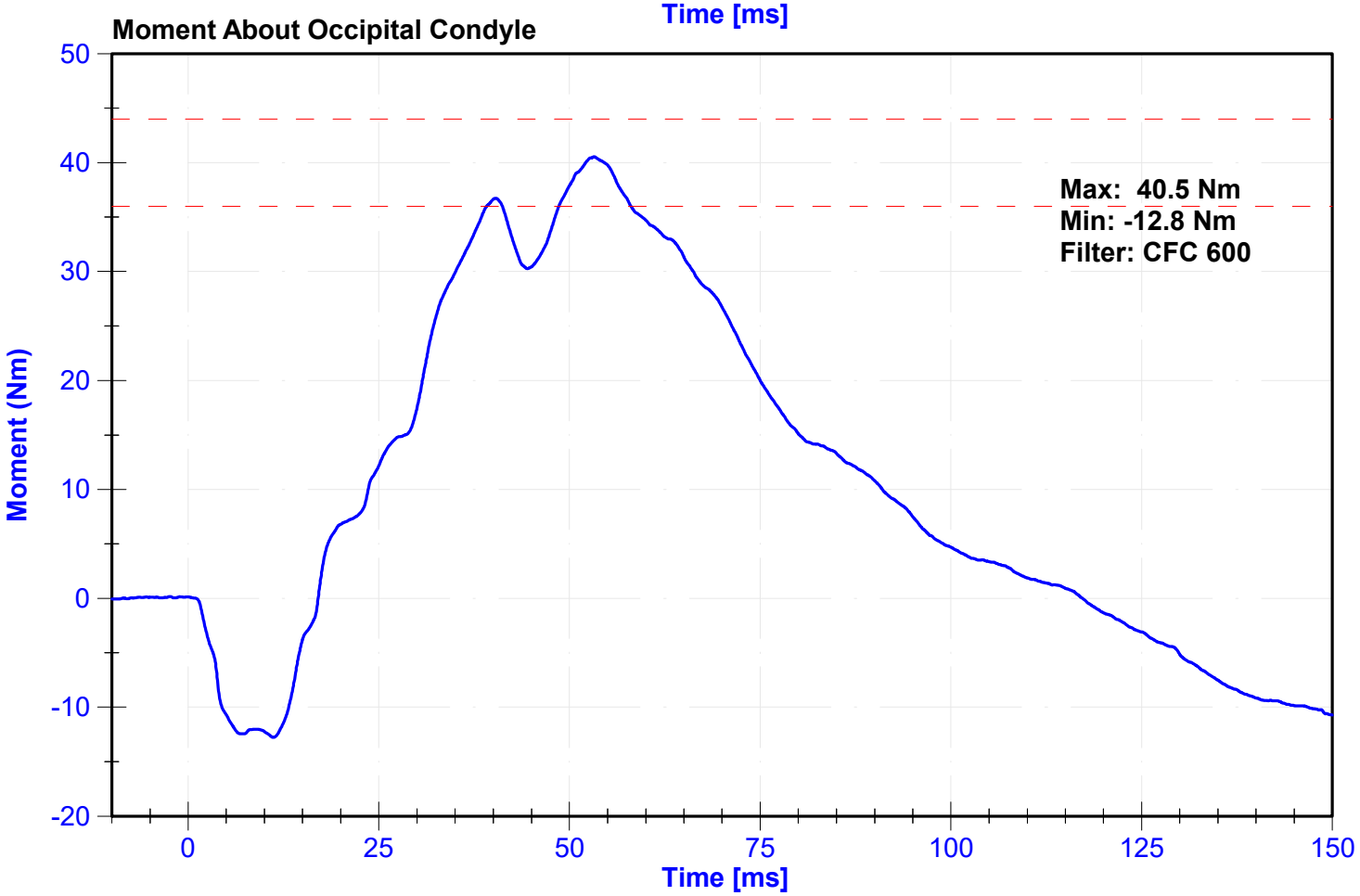
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.5	Pass
Humidity	10	70	%	65	Pass
Velocity	5.51	5.63	m/s	5.580	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.35	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.44	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.64	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	5.91	Pass
Neck Rotation	71	81	deg	71.7	Pass
Time at Maximum Rotation	50	70	ms	60.9	Pass
Moment about the OC	36	44	Nm	40.5	Pass
Moment Decay to 0 Nm	102	126	ms	117.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	11/1/2024	11/1/2025
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_1935H01698-F4Y	4/17/2025	4/17/2026




Neck Rotation
Max: 71.7 deg
Min: -18.1 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: 40.5 Nm
Min: -12.8 Nm
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

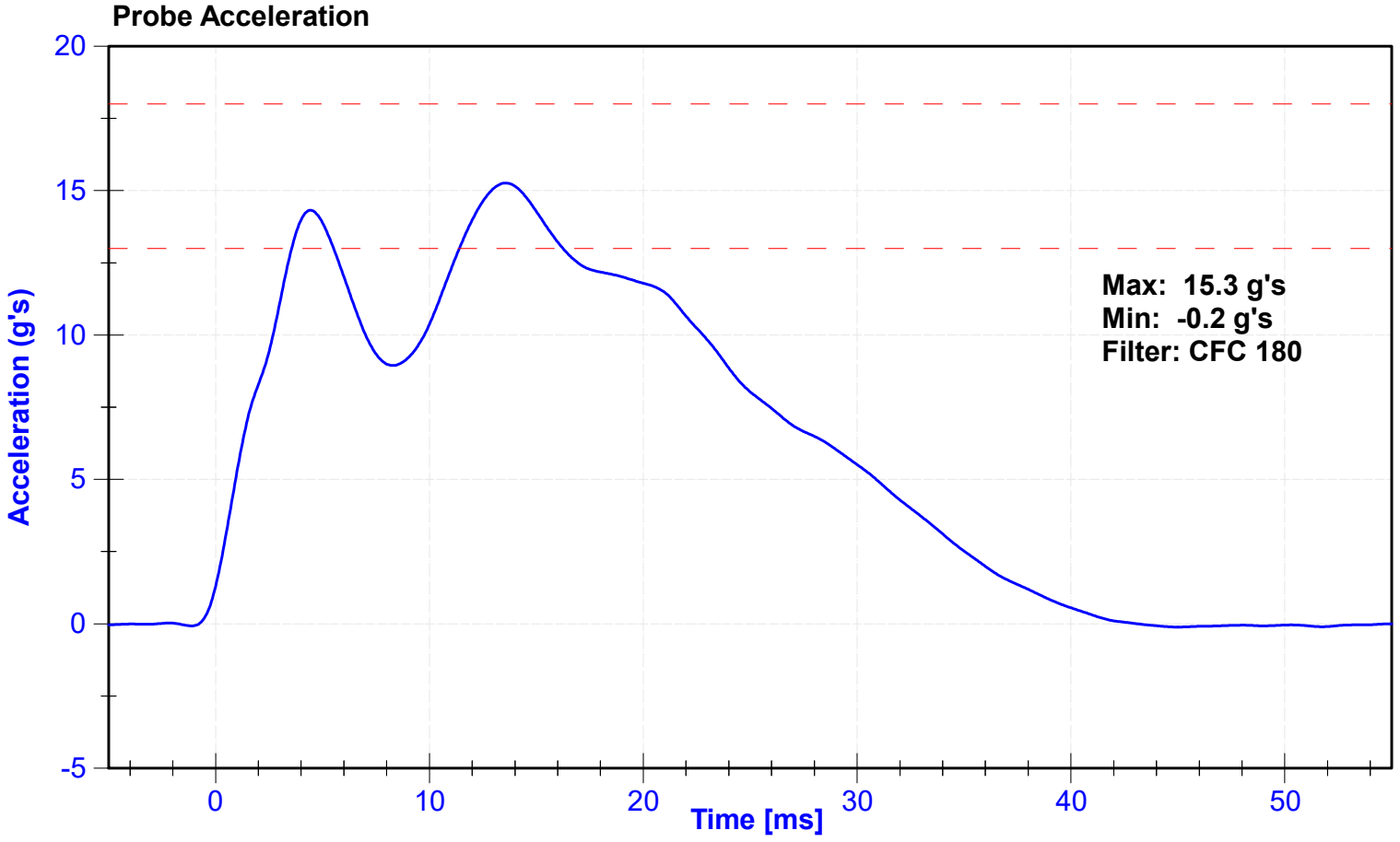
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

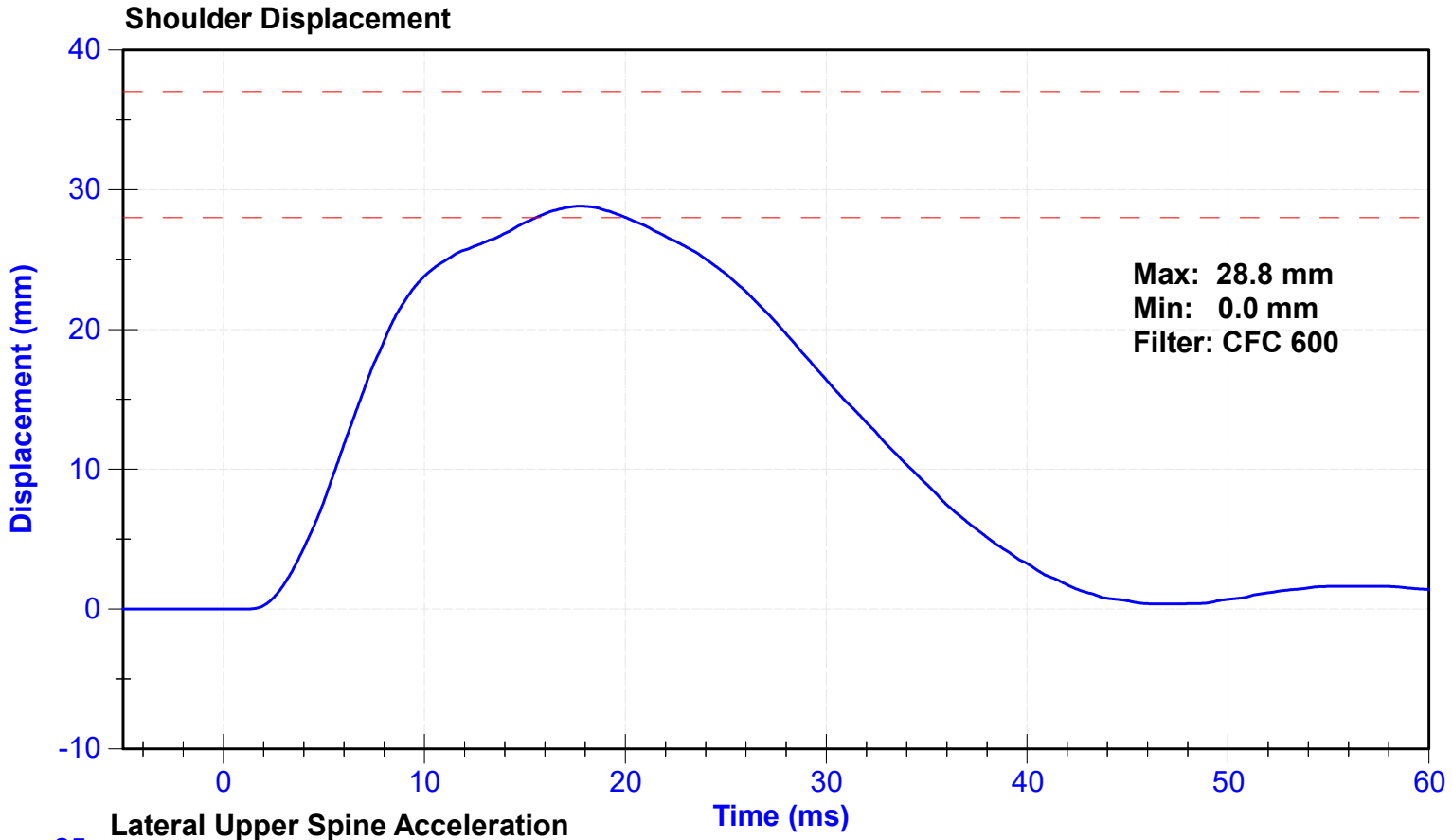
Results

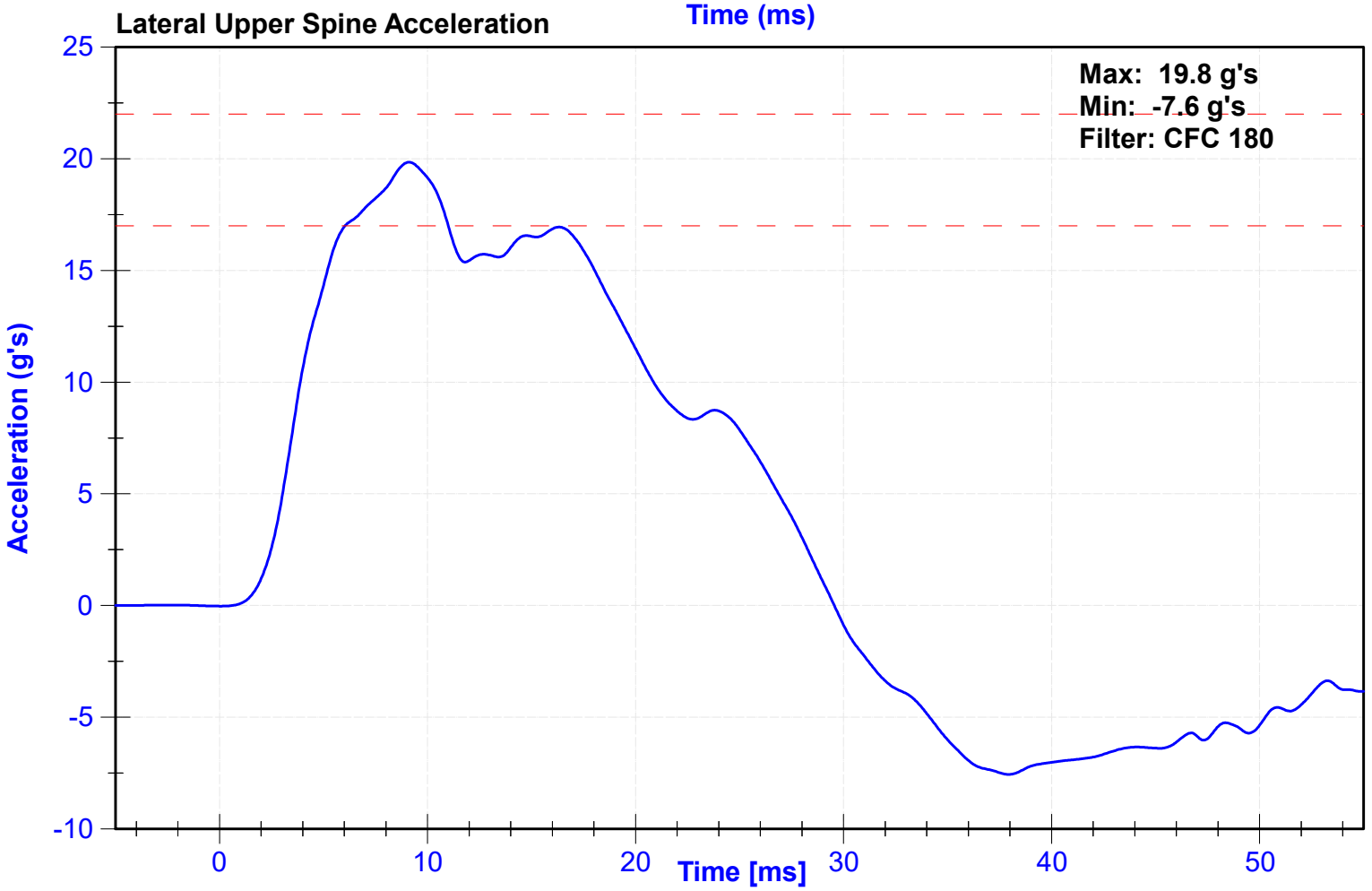
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	56	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	13	18	g's	15.3	Pass
Shoulder Deflection	28	37	mm	28.8	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Shoulder Potentiometer	Servo	1274GFE	7/8/2025	1/6/2026
Upper Spine Y Accelerometer	Endevco	P64148	7/2/2025	12/29/2025




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 28.8 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 19.8 g's
Min: -7.6 g's
Filter: CFC 180

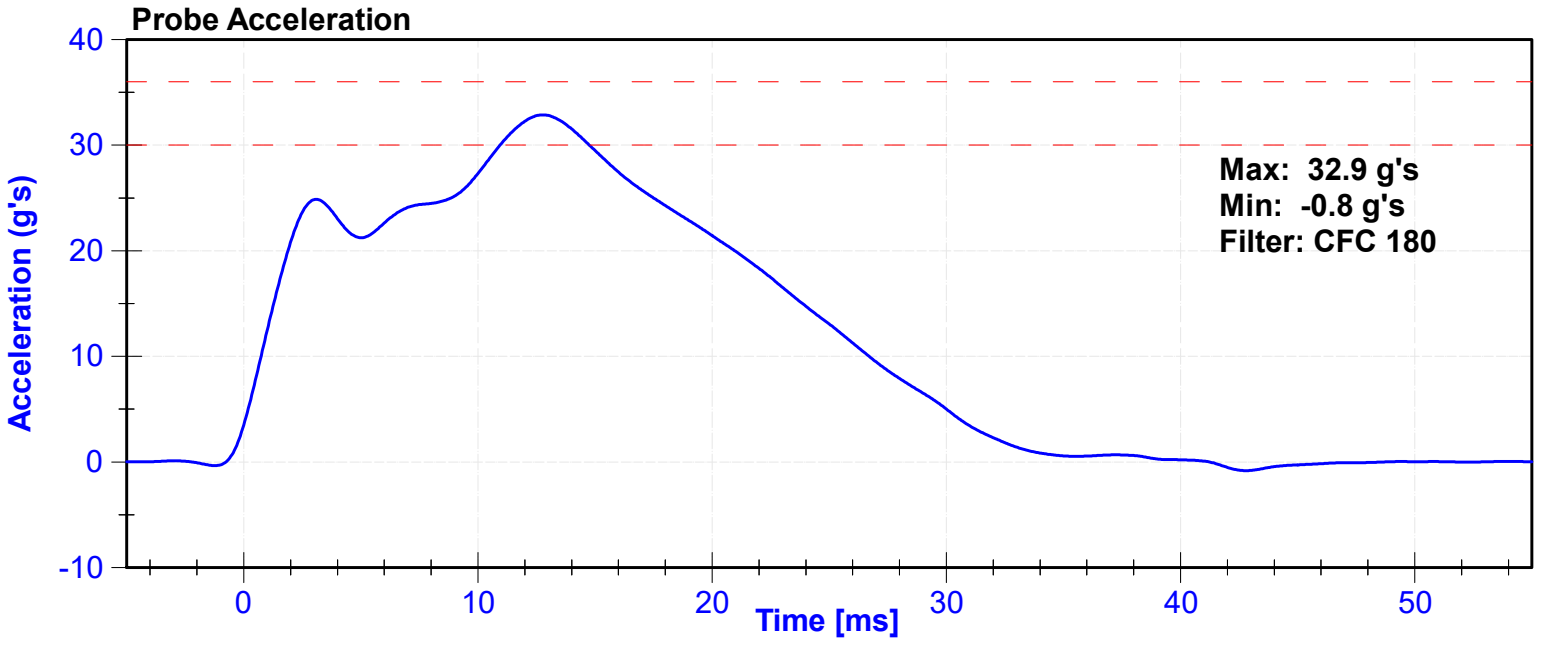
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

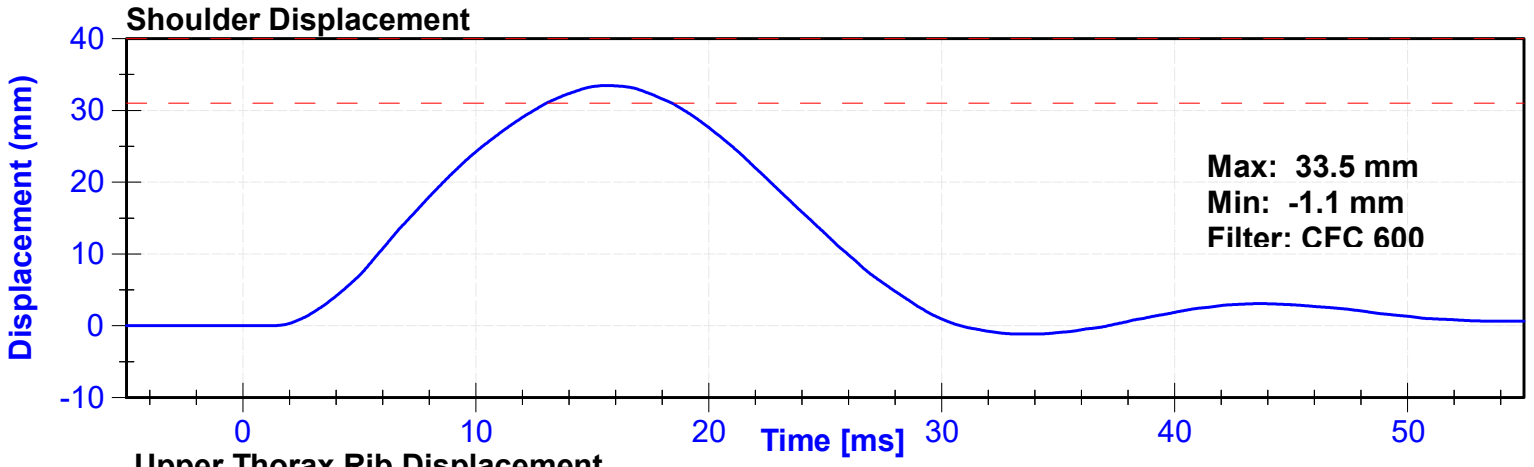
Results

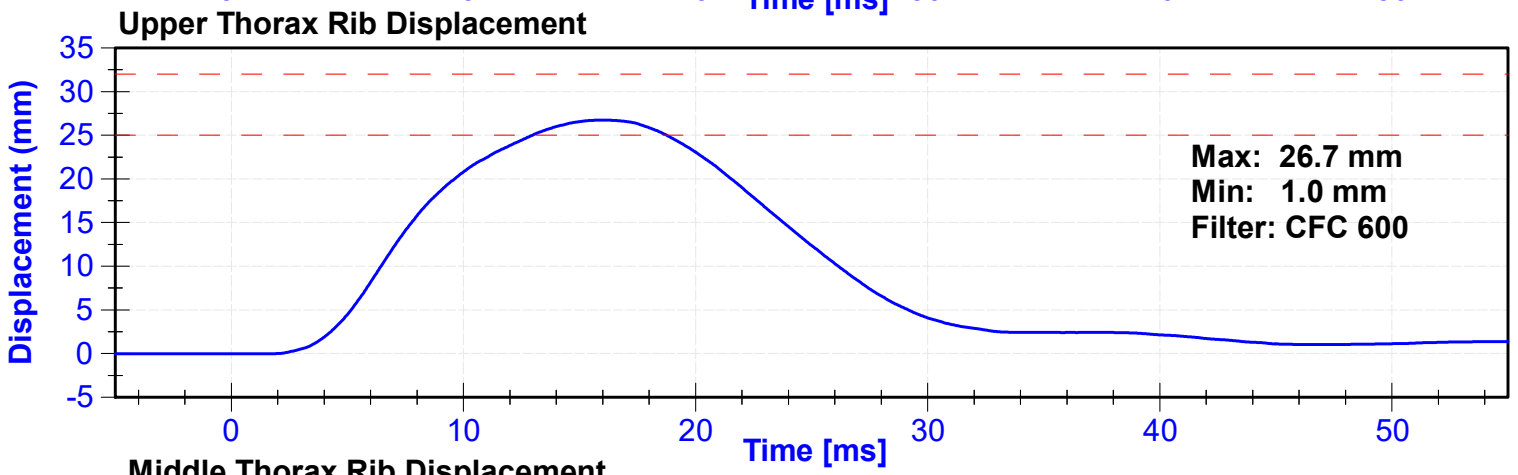
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	56	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration after 5 ms	30	36	g's	32.9	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.9	Pass
Lateral Lower Spine Acceleration	29	37	g's	31.4	Pass
Shoulder Deflection	31	40	mm	33.5	Pass
Upper Thorax Rib Deflection	25	32	mm	26.7	Pass
Mid Thorax Rib Deflection	30	36	mm	32.2	Pass
Lower Thorax Rib Deflection	32	38	mm	35.9	Pass

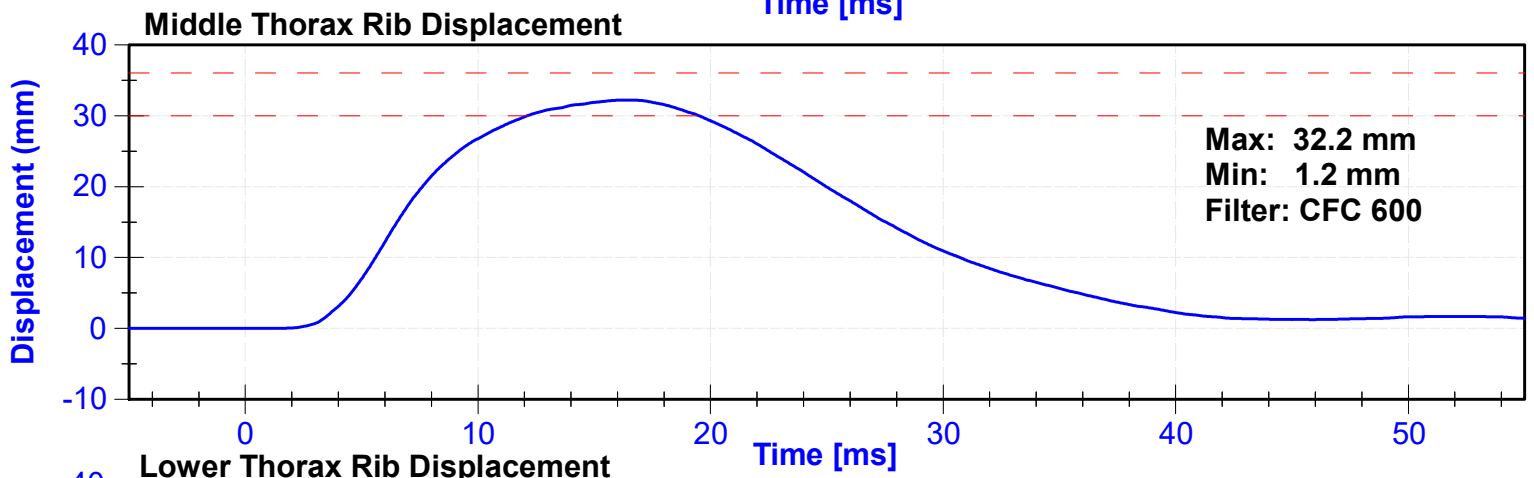
Transducer Calibrations

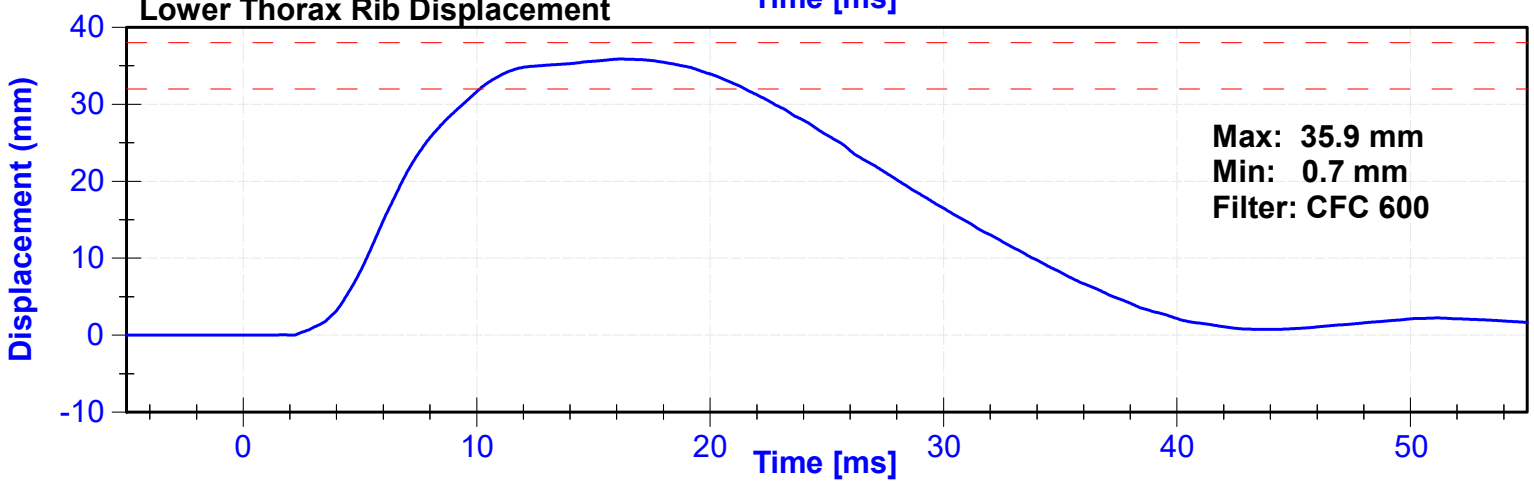
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Spine T1 Y Accelerometer	Endevco	P64148	7/2/2025	12/29/2025
Upper Spine T12 Y Accelerometer	Endevco	P58883	7/2/2025	12/29/2025
Shoulder Potentiometer	Servo	1274GFE	7/8/2025	1/6/2026
Upper Thorax Rib Potentiometer	Servo	1199GFE	7/8/2025	1/6/2026
Middle Thorax Rib Potentiometer	Servo	1246GFE	7/8/2025	1/6/2026
Lower Thorax Rib Potentiometer	Servo	011GFE	7/8/2025	1/6/2026

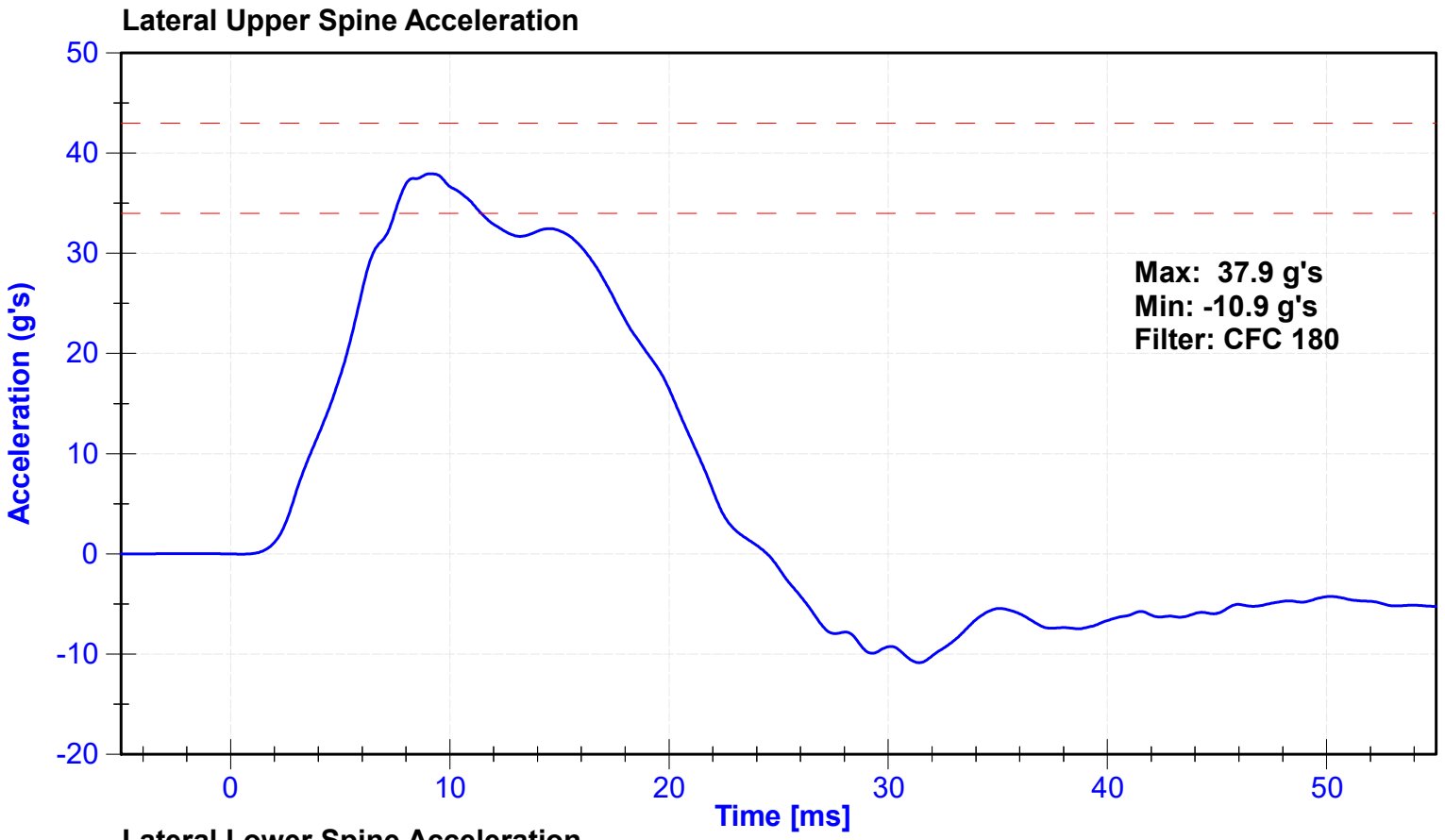


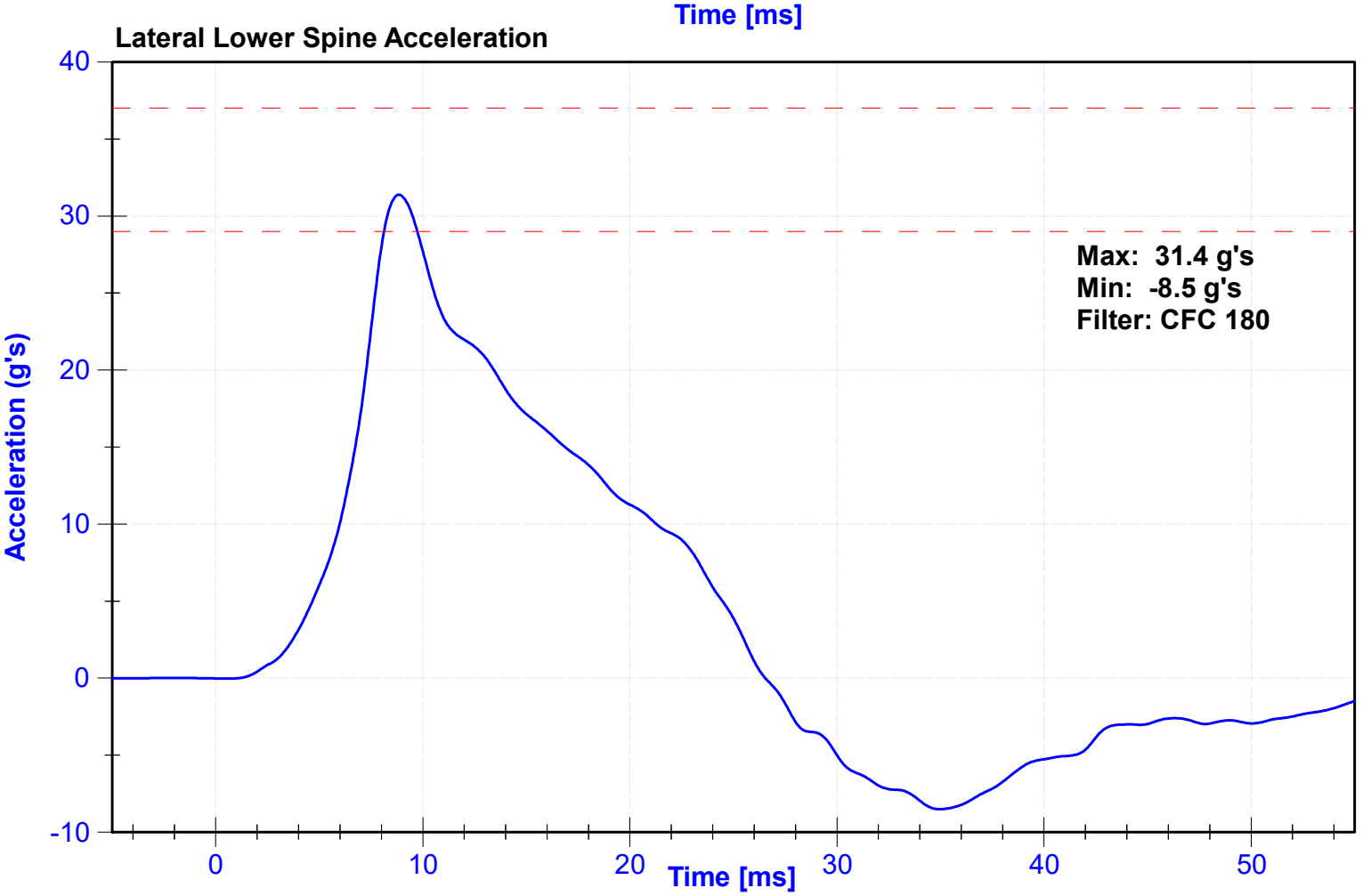

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 33.5 mm
Min: -1.1 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 26.7 mm
Min: 1.0 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 32.2 mm
Min: 1.2 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 35.9 mm
Min: 0.7 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 37.9 g's
Min: -10.9 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 31.4 g's
Min: -8.5 g's
Filter: CFC 180

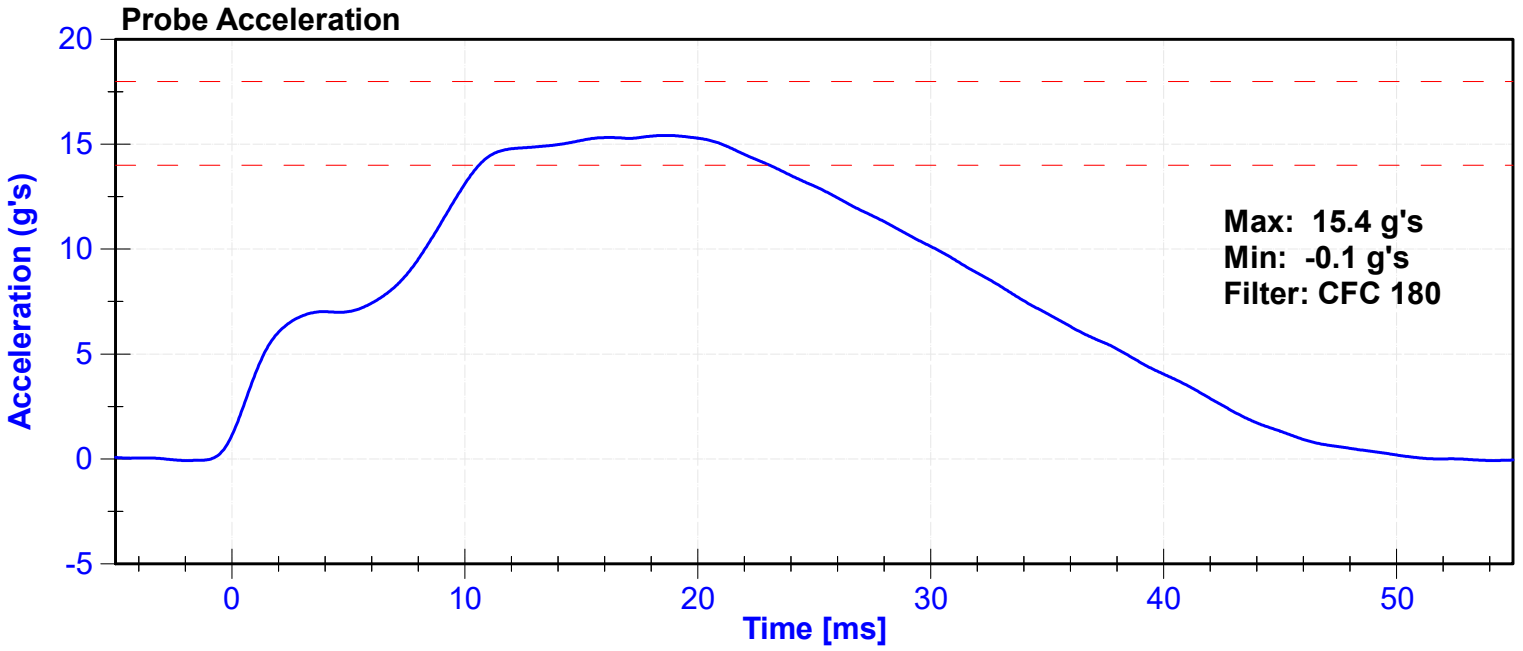
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

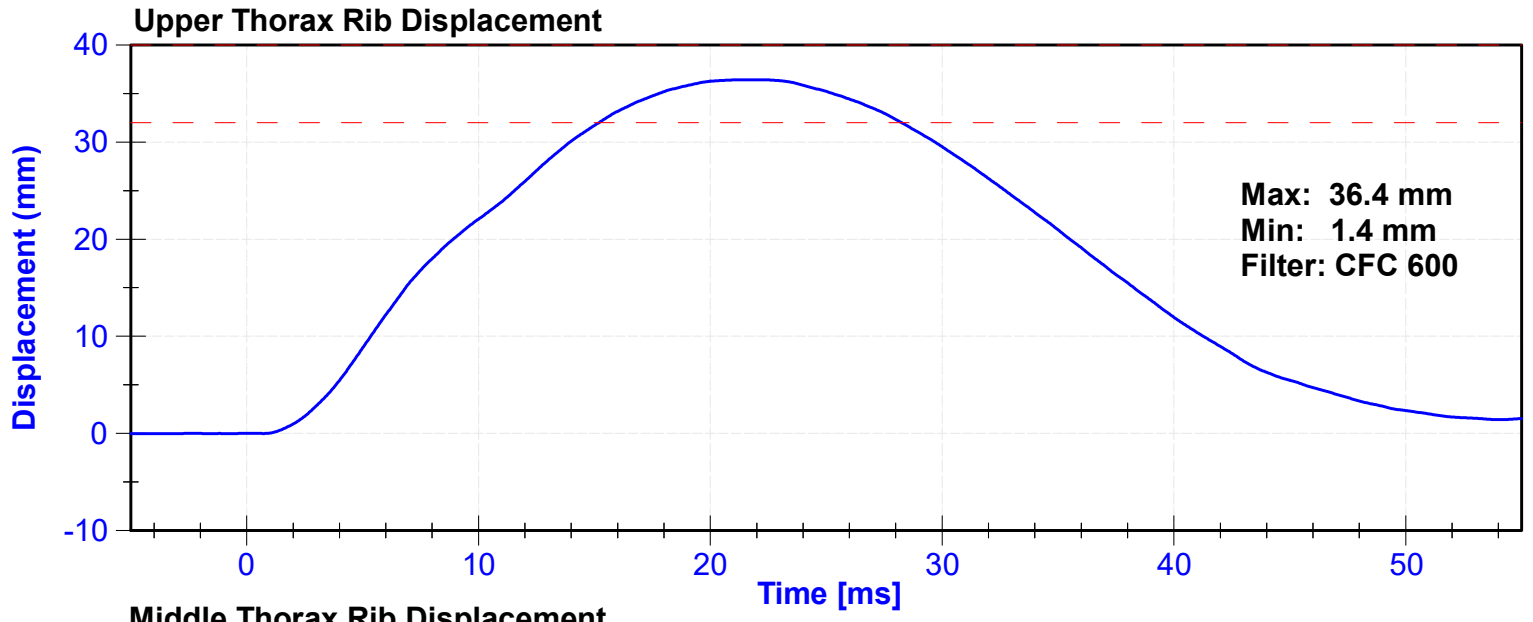
Results

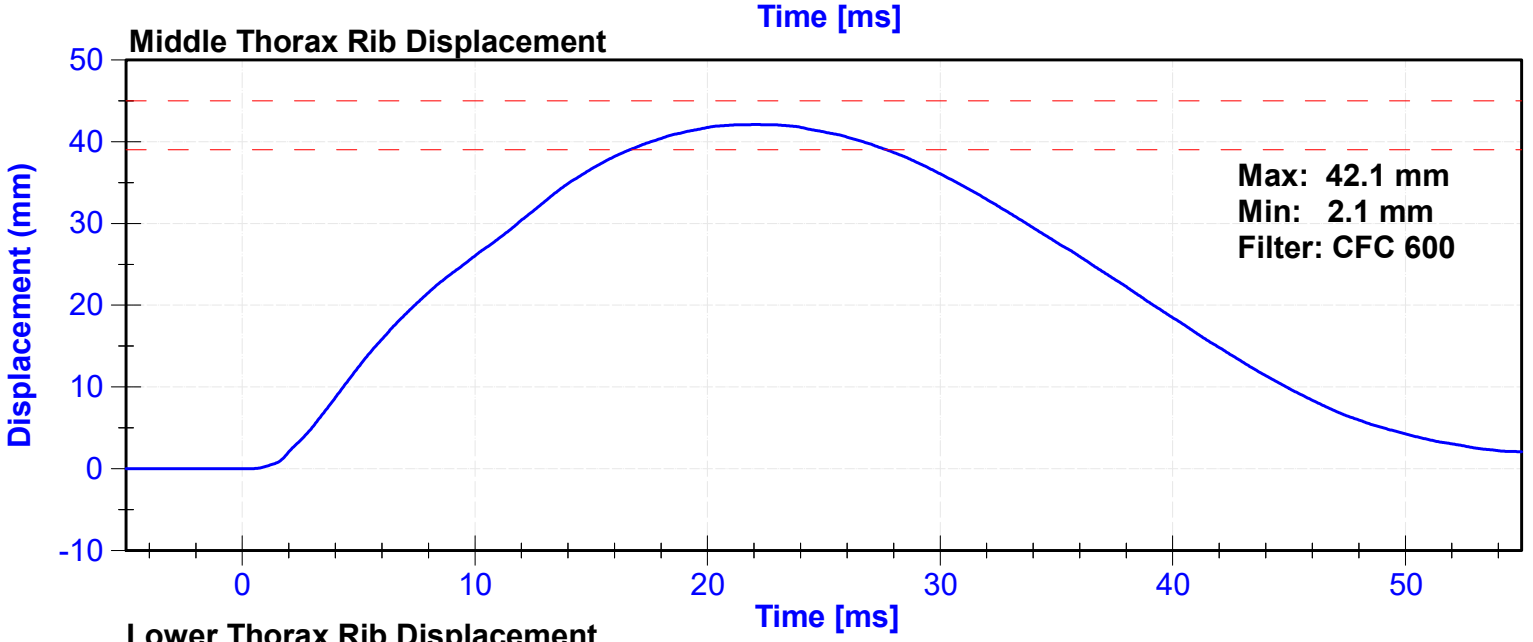
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	56	Pass
Velocity	4.2	4.4	m/s	4.20	Pass
Probe Acceleration	14	18	g's	15.4	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.0	Pass
Lateral Lower Spine Acceleration	7	11	g's	8.9	Pass
Upper Thorax Rib Deflection	32	40	mm	36.4	Pass
Middle Thorax Rib Deflection	39	45	mm	42.1	Pass
Lower Thorax Rib Deflection	35	43	mm	40.5	Pass

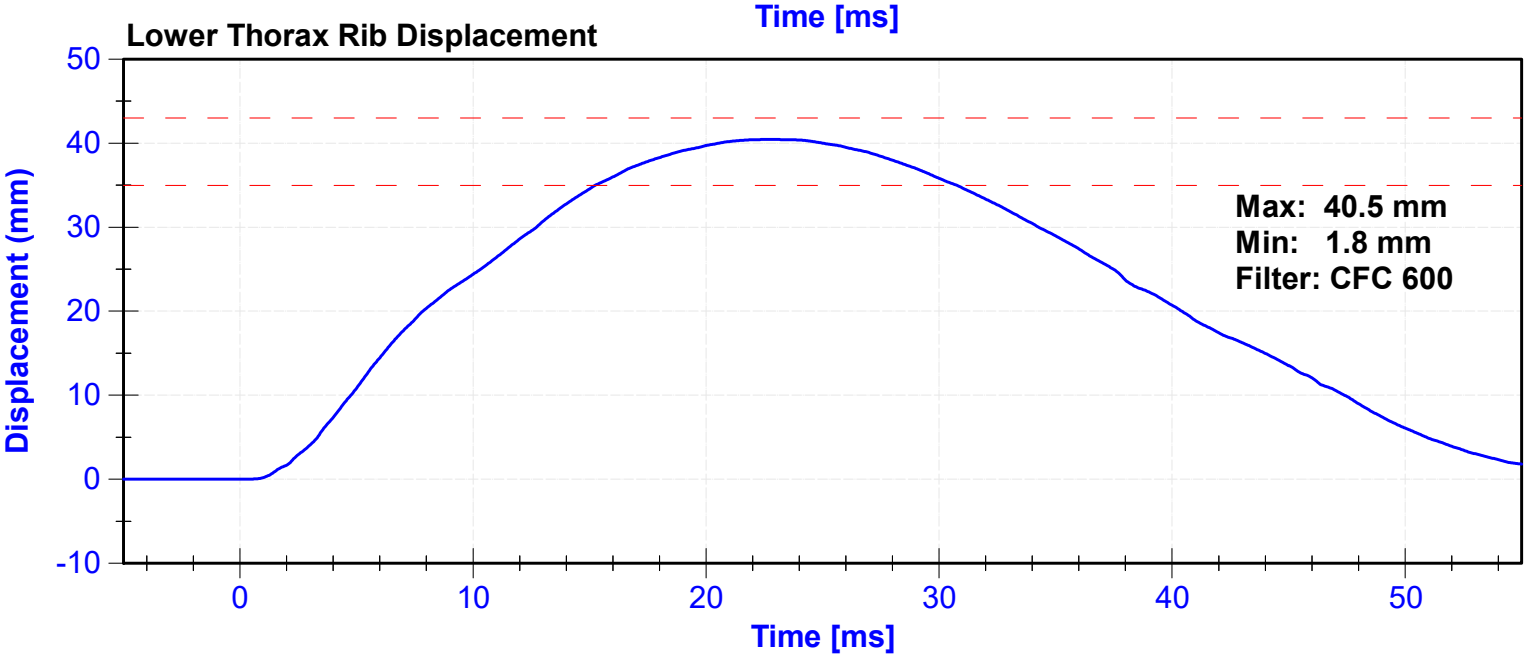
Transducer Calibrations

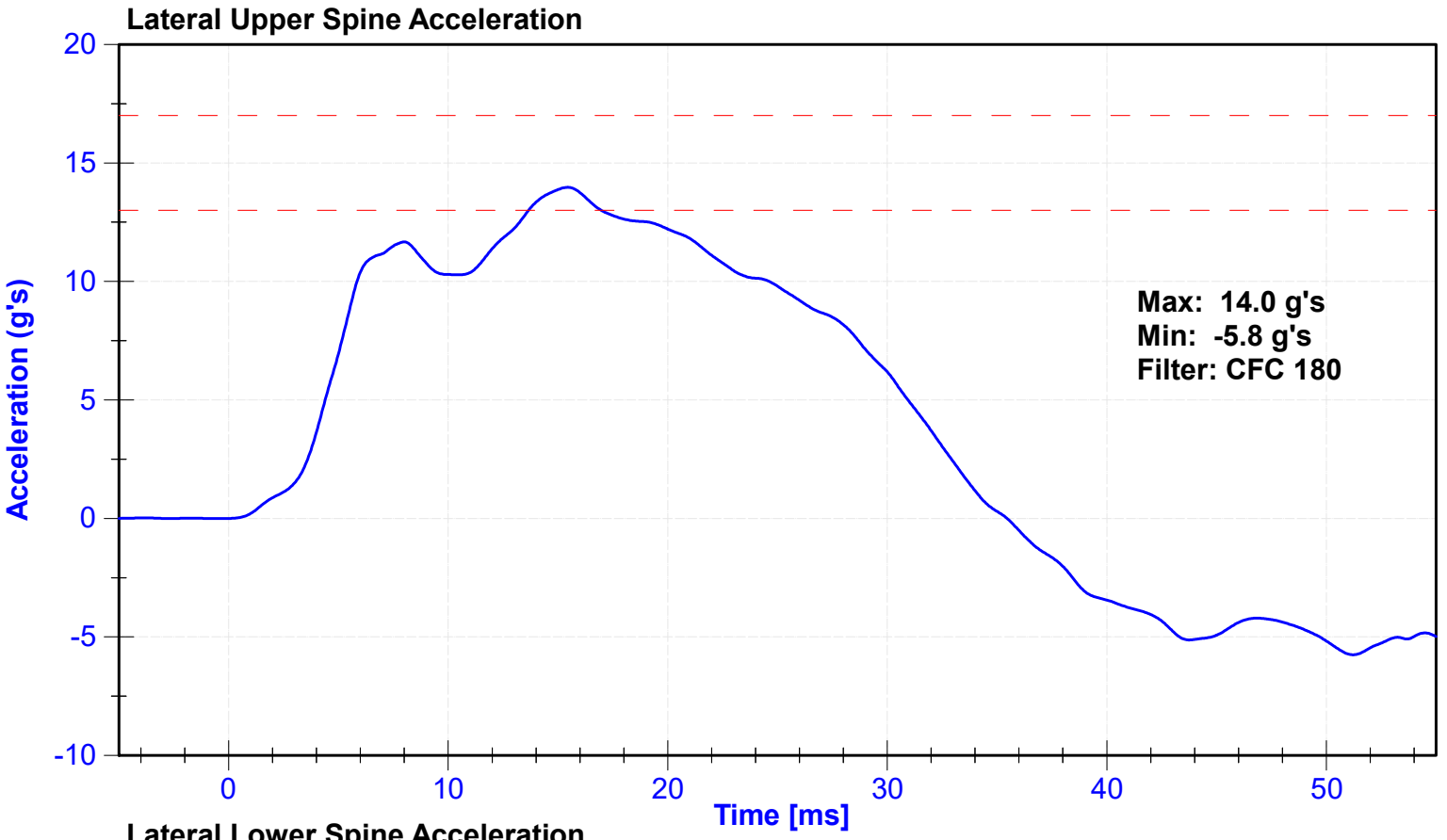
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Spine Y Accelerometer	Endevco	P64148	7/2/2025	12/29/2025
Lower Spine Y Accelerometer	Endevco	P58883	7/2/2025	12/29/2025
Upper Thorax Rib Potentiometer	Servo	1199GFE	7/8/2025	1/6/2026
Middle Thorax Rib Potentiometer	Servo	1246GFE	7/8/2025	1/6/2026
Lower Thorax Rib Potentiometer	Servo	011GFE	7/8/2025	1/6/2026

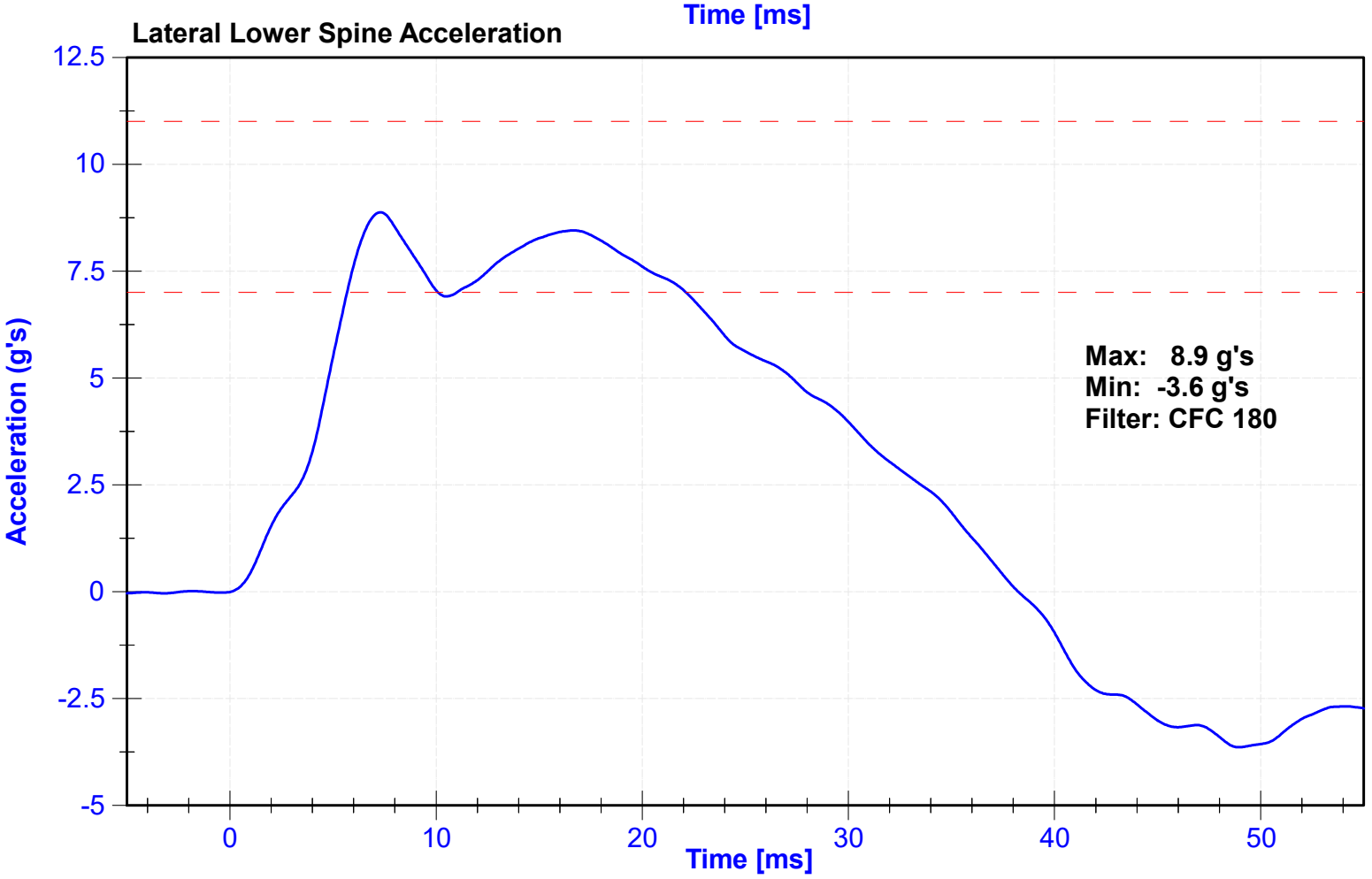



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 36.4 mm
Min: 1.4 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 42.1 mm
Min: 2.1 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 40.5 mm
Min: 1.8 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time [ms]
Max: 14.0 g's
Min: -5.8 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
12.5
10
7.5
5
2.5
0
-2.5
-5
0
10
20
30
40
50
Time [ms]
Max: 8.9 g's
Min: -3.6 g's
Filter: CFC 180

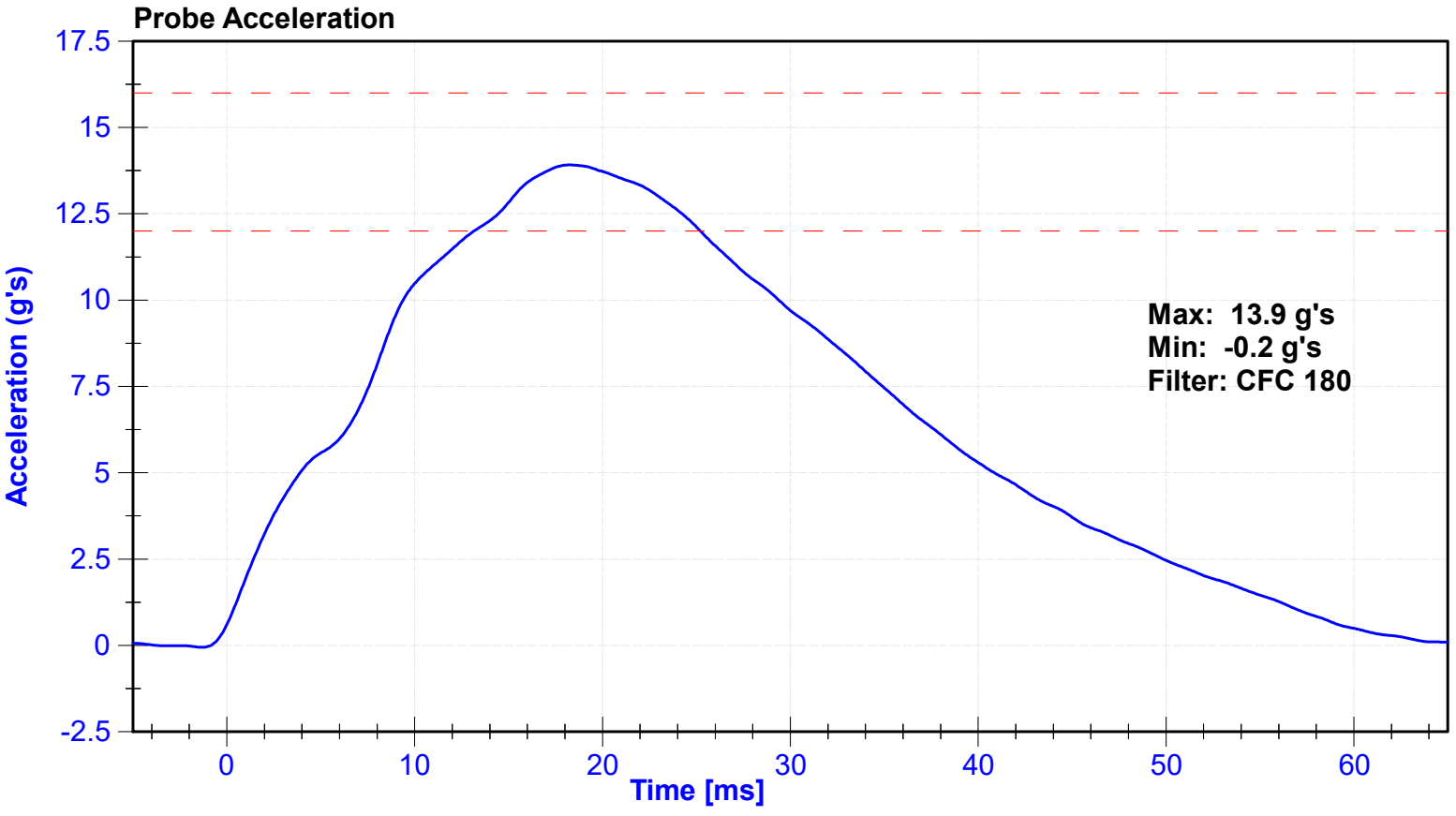
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

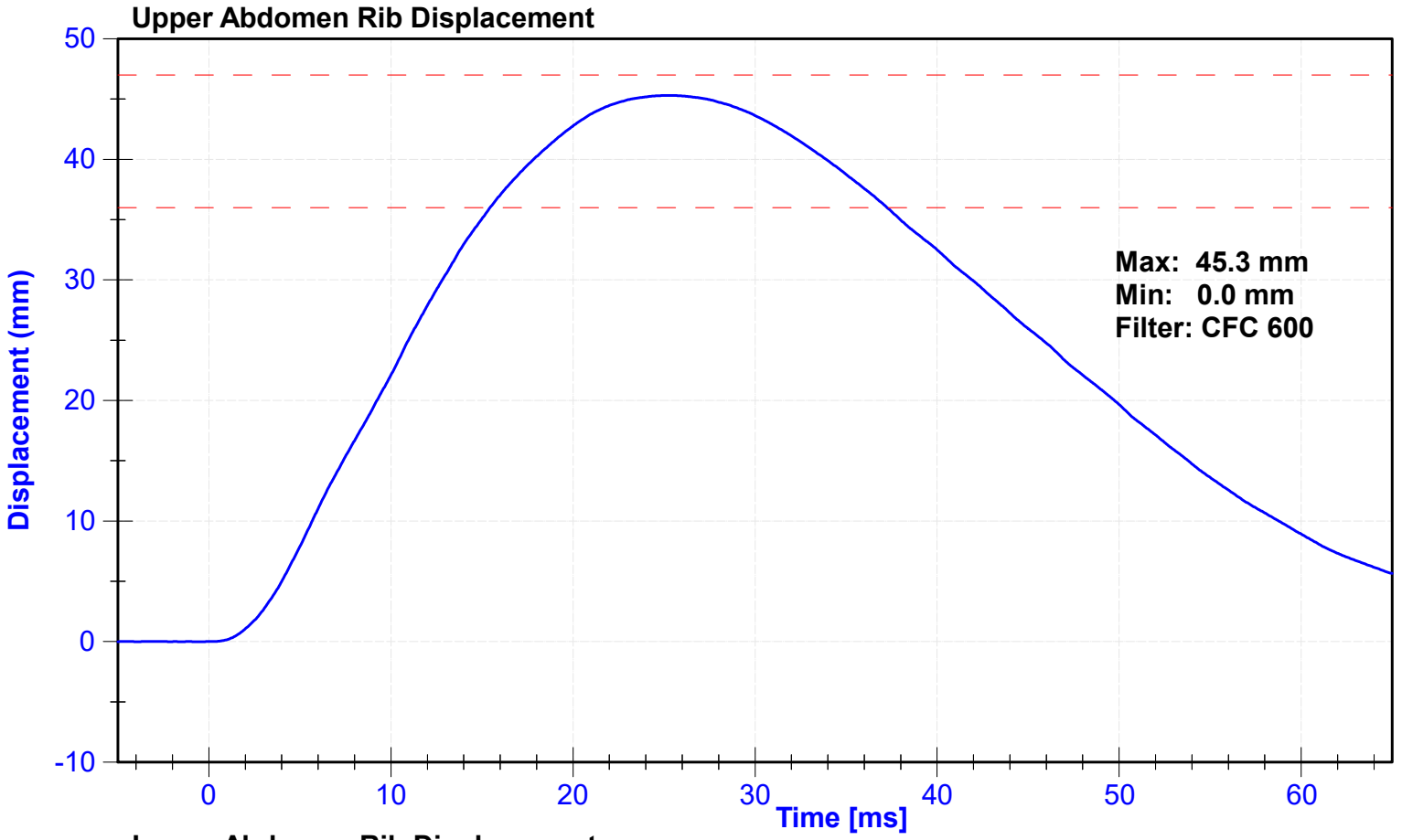
Results

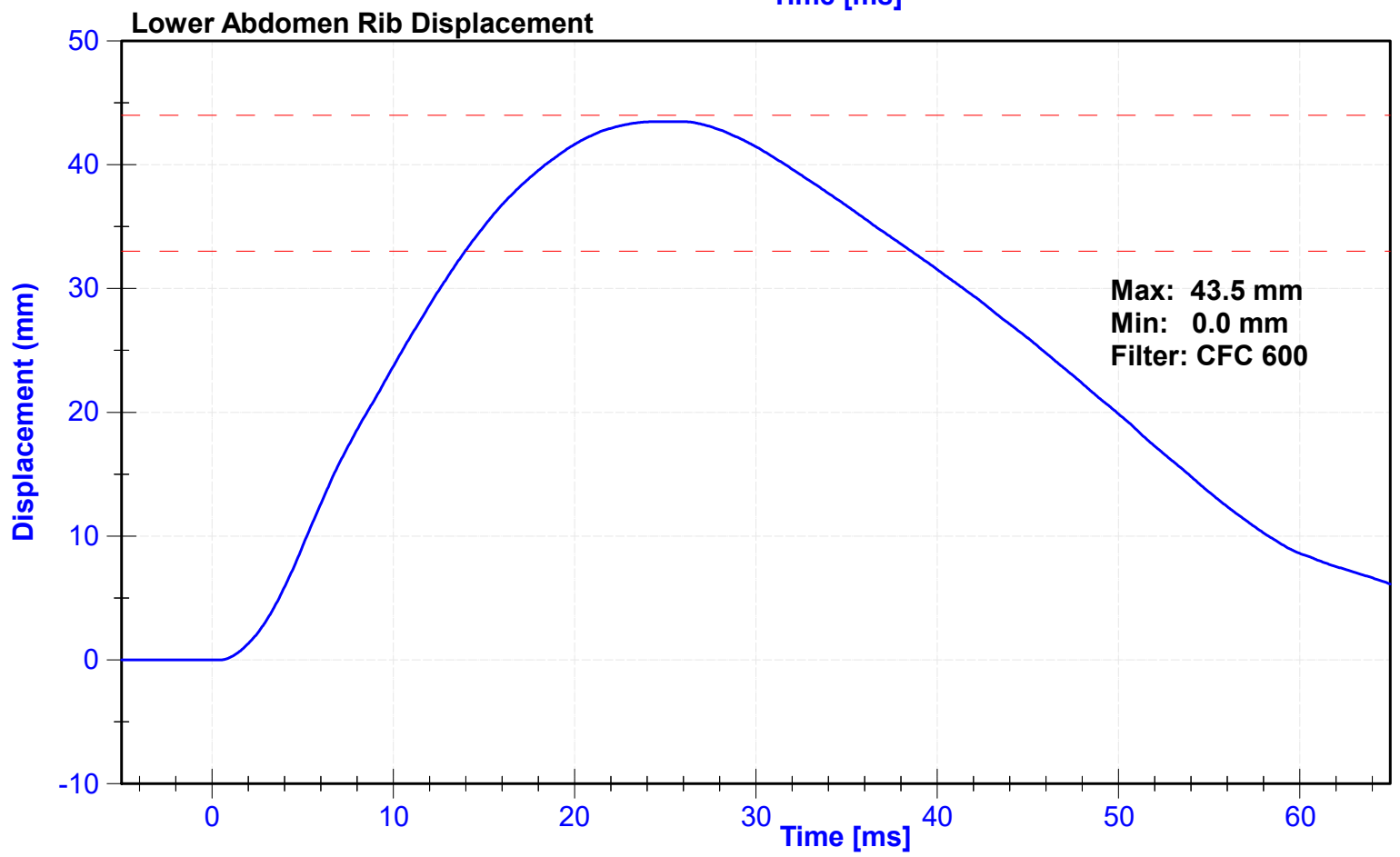
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	56	Pass
Velocity	4.2	4.4	m/s	4.22	Pass
Probe Acceleration	12	16	g's	13.9	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.7	Pass
Upper Abdomen Rib Deflection	36	47	mm	45.3	Pass
Lower Abdomen Rib Deflection	33	44	mm	43.5	Pass

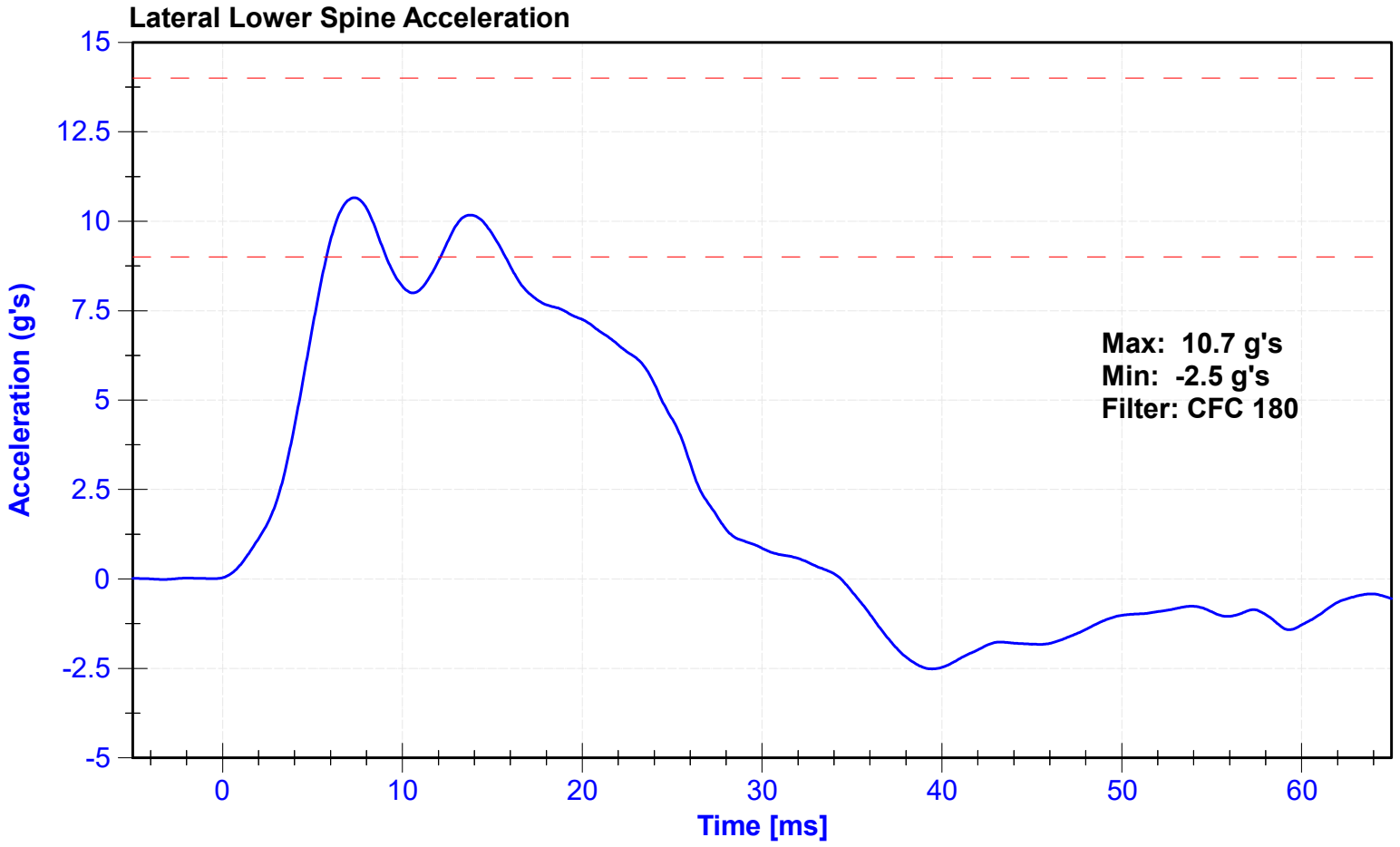
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Lower Spine Y Accelerometer	Endevco	P58883	7/2/2025	12/29/2025
Upper Abdomen Rib Potentiometer	Servo	008GFE	7/8/2025	1/6/2026
Lower Abdomen Rib Potentiometer	Servo	046GFE	7/8/2025	1/6/2026




Upper Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 45.3 mm
Min: 0.0 mm
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 43.5 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: 10.7 g's
Min: -2.5 g's
Filter: CFC 180

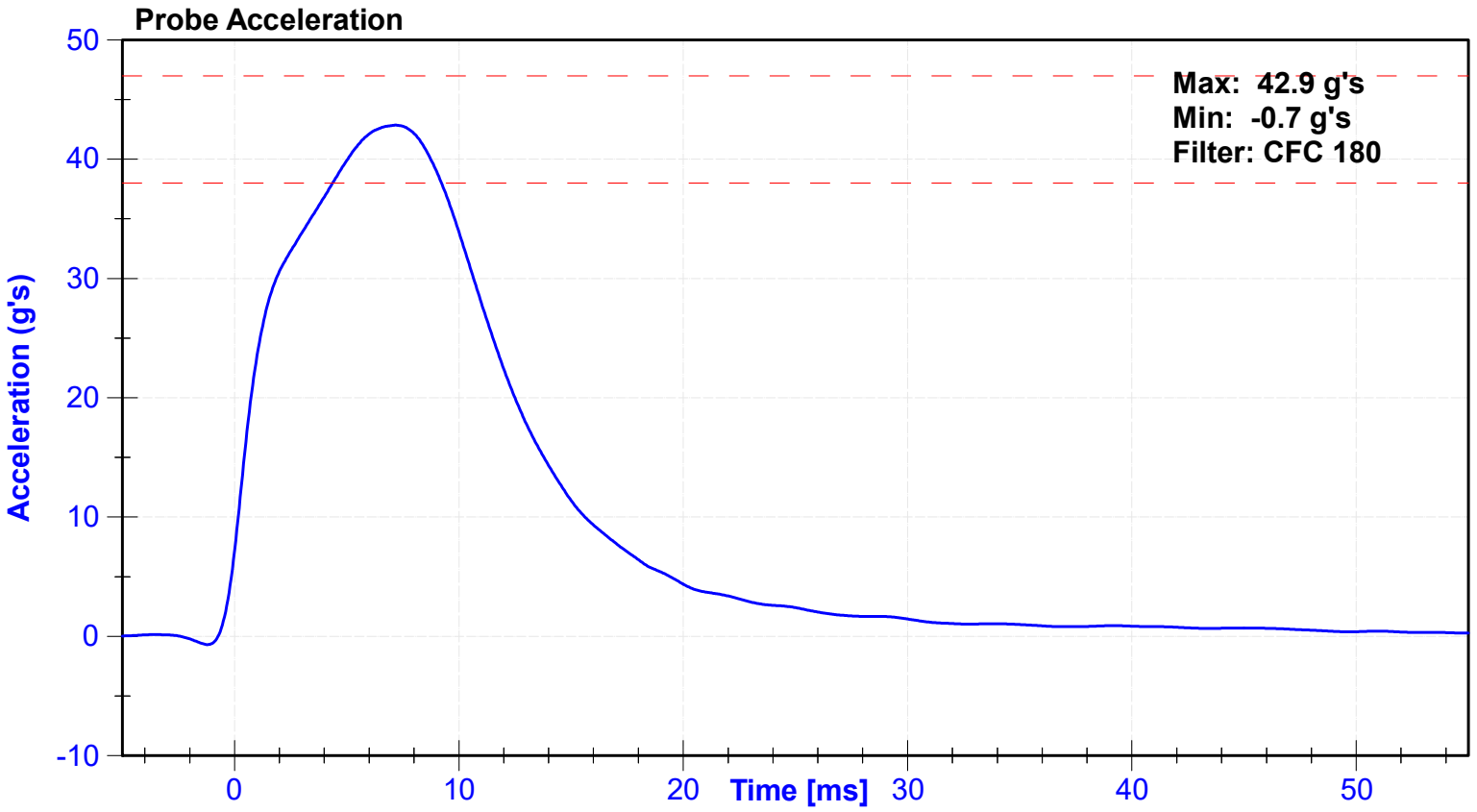
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

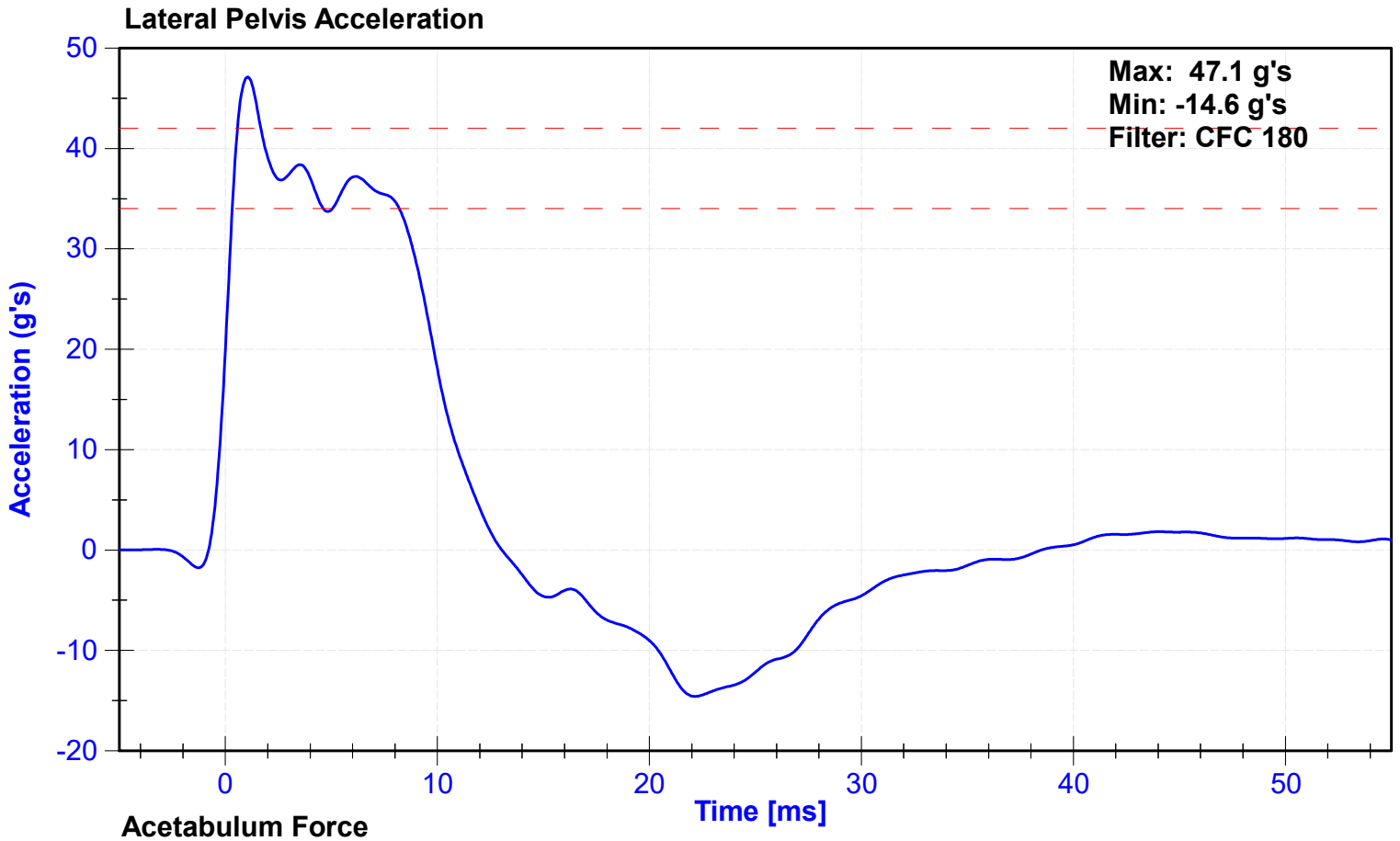
Results

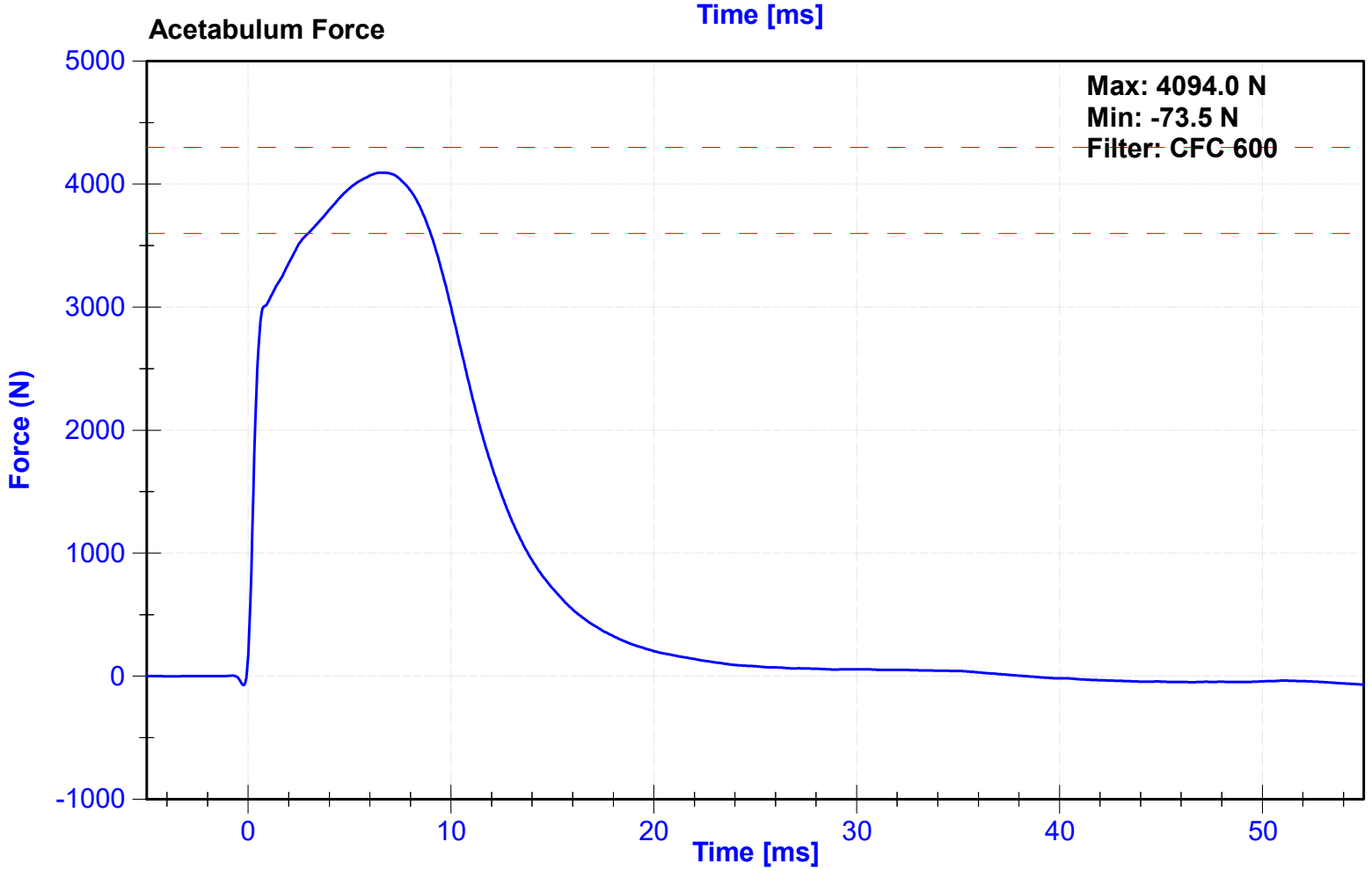
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	56	Pass
Velocity	6.6	6.8	m/s	6.70	Pass
Probe Acceleration	38	47	g's	42.9	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	37.2	Pass
Acetabulum Force	3600	4300	N	4094.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pelvis Y Accelerometer	Endevco	T20860	7/2/2025	12/29/2025
Acetabulum Load Cell	Denton	270-FY	9/16/2024	9/16/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A




Lateral Pelvis Acceleration
Max: 47.1 g's
Min: -14.6 g's
Filter: CFC 180
Acceleration (g's)
50
40
30
20
10
0
-10
-20
0
10
20
30
40
50
Time [ms]


Acetabulum Force
Max: 4094.0 N
Min: -73.5 N
Filter: CFC 600
Force (N)
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]

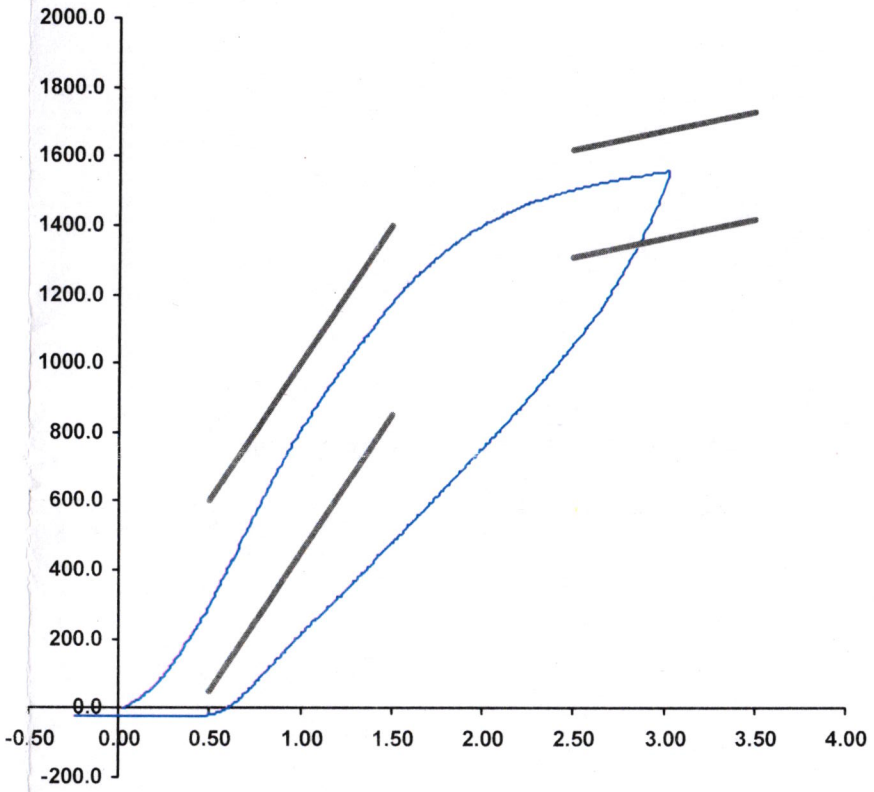
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16918
Test Number 23765
Report Number 23822
Test Date 8/2/2022 3:08:11 PM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	311	50	600
Force @ 1.5 mm (N)	1,180	850	1,400
Force @ 2.5 mm (N)	1,507	1,306	1,618
Force @ 3.0 mm (N)	1,558	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 DG8012 7.28.25

Operator

Part Number 180-4450

Template No 107 02-Aug-22
SACO Research

By : DC Date : 8/2/22

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

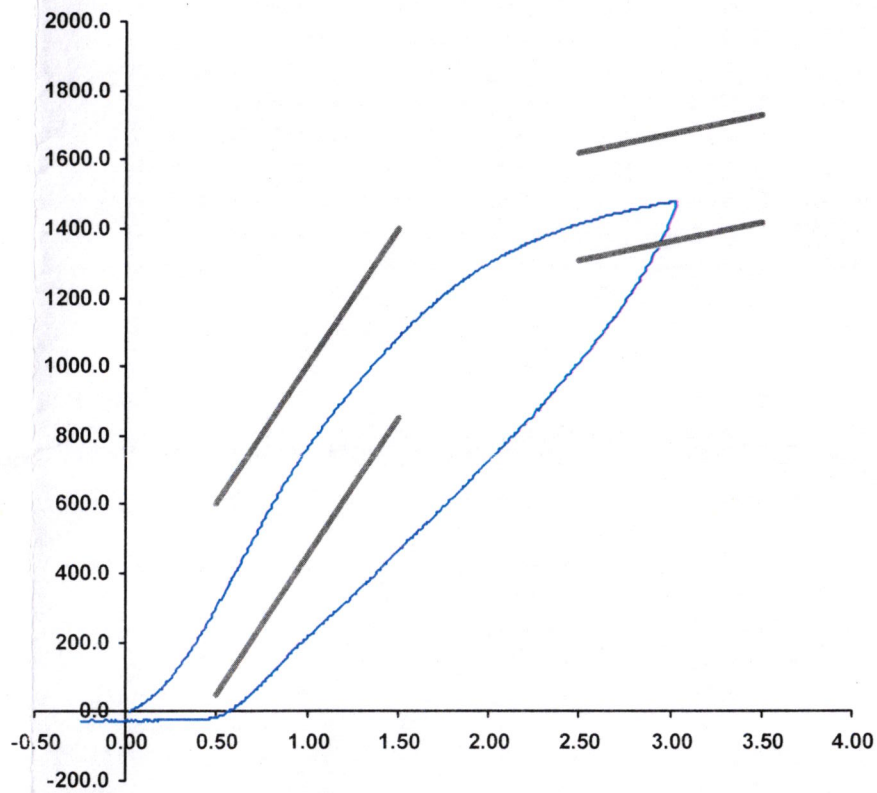
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16942
Test Number 23789
Report Number 23846
Test Date 8/3/2022 10:52:09 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	304	50	600
Force @ 1.5 mm (N)	1,087	850	1,400
Force @ 2.5 mm (N)	1,417	1,306	1,618
Force @ 3.0 mm (N)	1,479	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 DG8012 7.28.25

Operator

Part Number 180-4450

Template No 107 03-Aug-22
SACO Research

By : DC Date : 8/3/22

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

20
C-91

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16944
Test Number 23791
Report Number 23848
Test Date 8/3/2022 10:55:10 AM

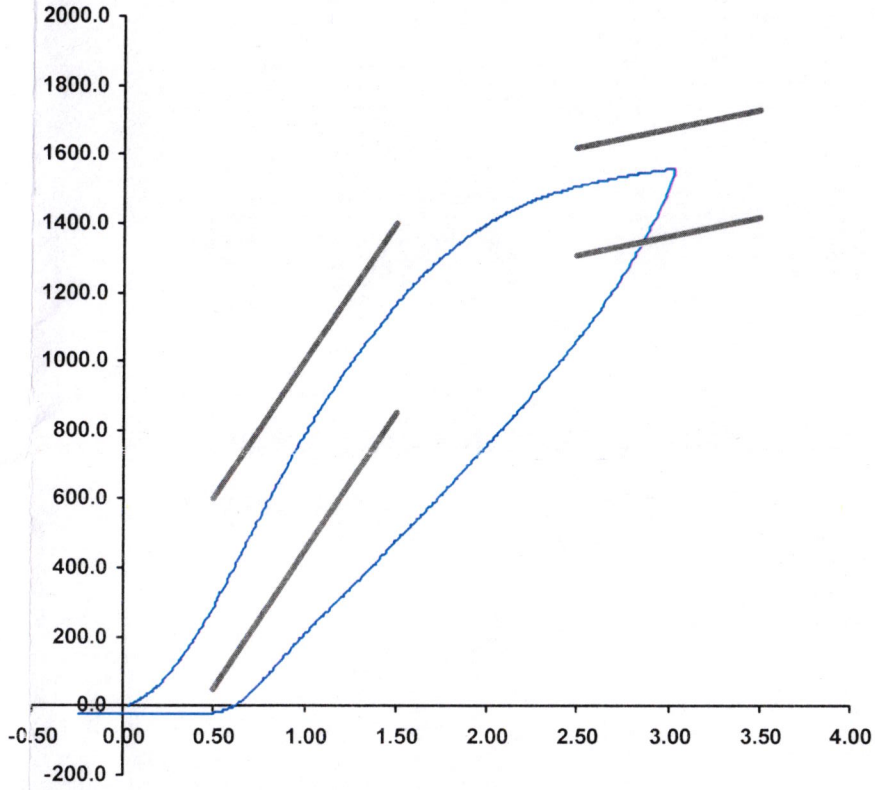
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	291	50	600
Force @ 1.5 mm (N)	1,173	850	1,400
Force @ 2.5 mm (N)	1,511	1,306	1,618
Force @ 3.0 mm (N)	1,560	1,361	1,673

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:
Non-Impact D68012 7.28.25

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 03-Aug-22
SACO Research

By : DC Date : 8/3/22

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

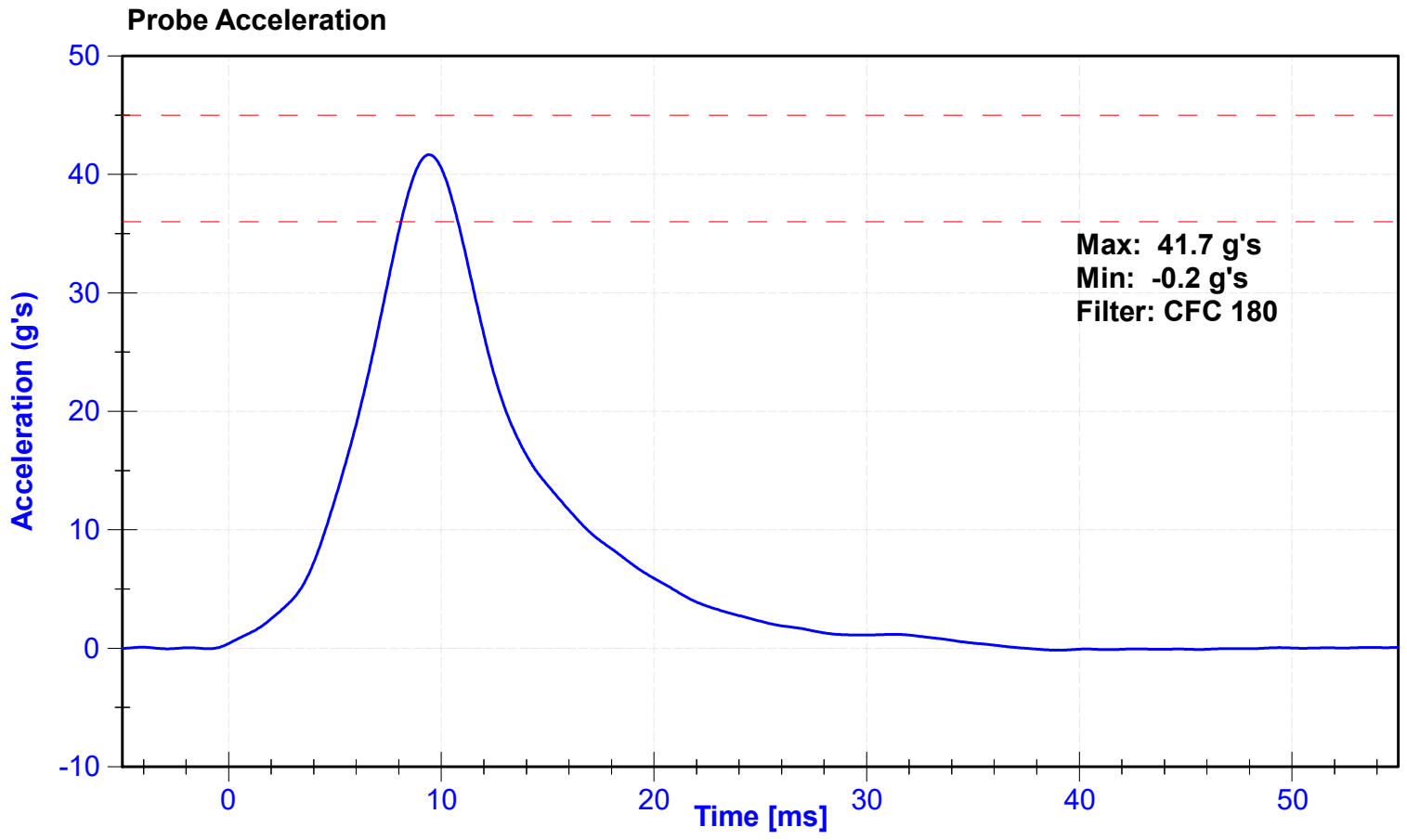
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	DG8012	Laboratory Supervisor	J. Kinderman

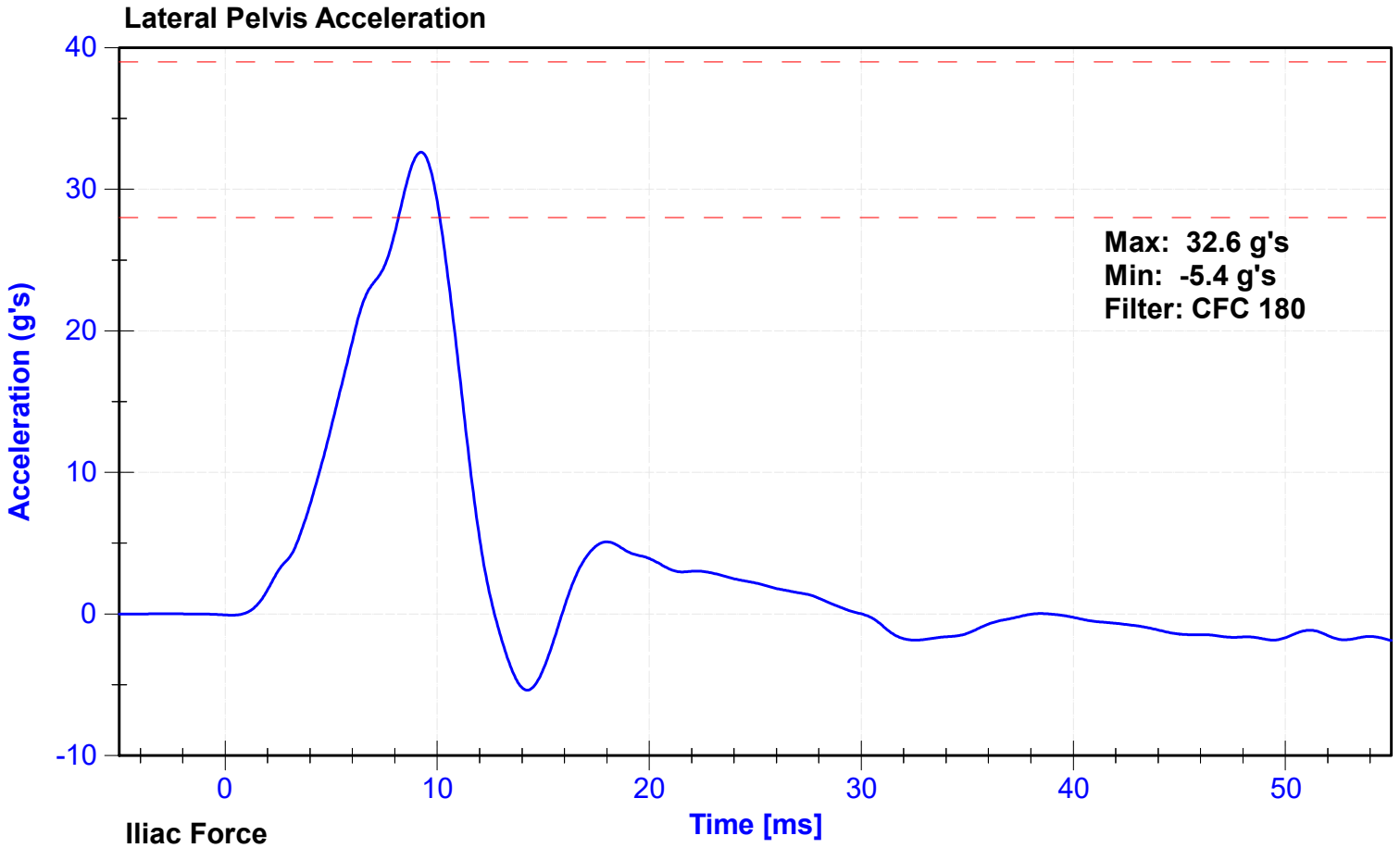
Results

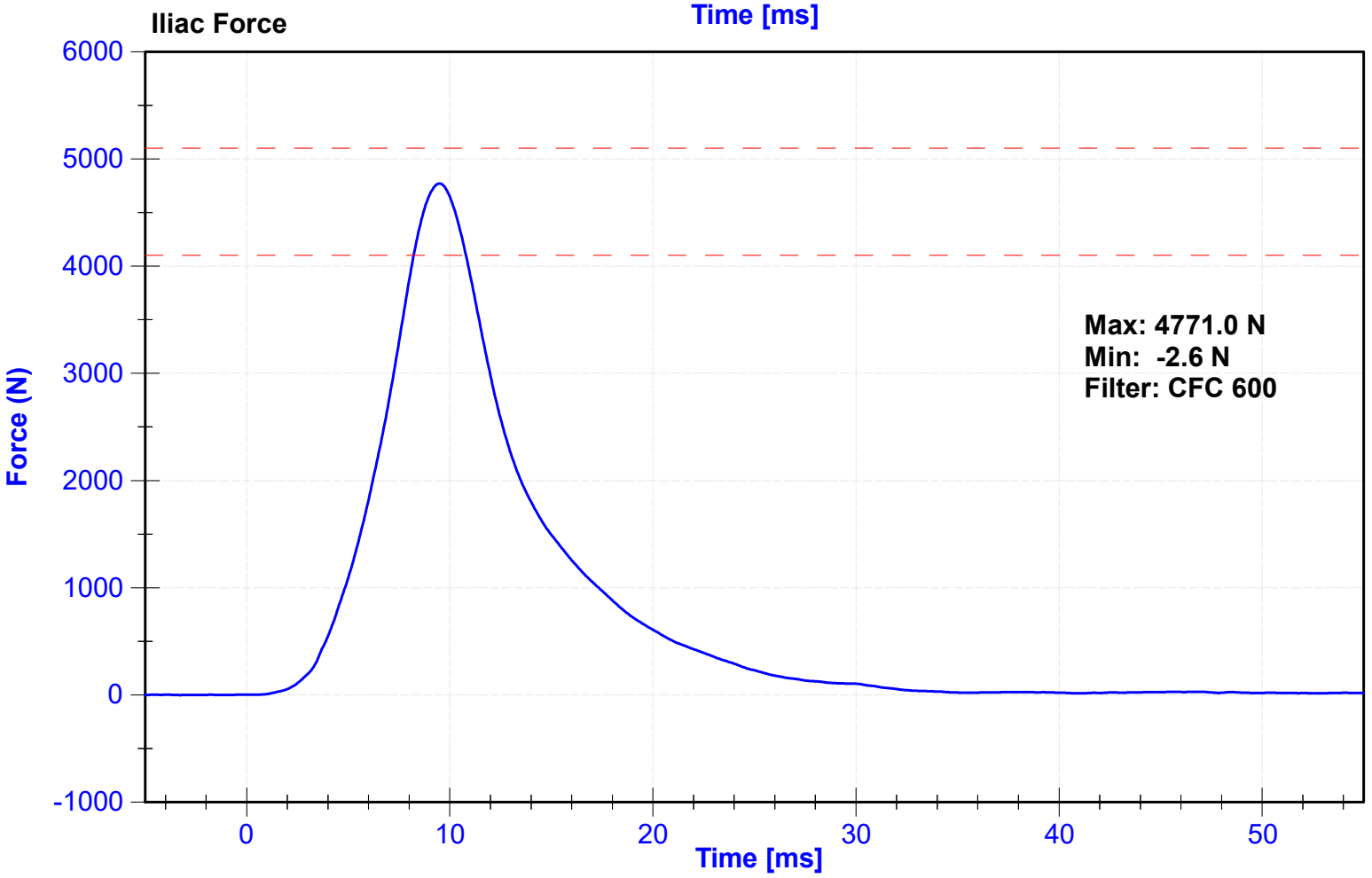
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	22.2	Pass
Humidity	10	70	%	56	Pass
Velocity	4.2	4.4	m/s	4.21	Pass
Probe Acceleration	36	45	g's	41.7	Pass
Lateral Pelvis Acceleration	28	39	g's	32.6	Pass
Iliac Force	4100	5100	N	4771.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pelvis Y Accelerometer	Endevco	T20860	7/2/2025	12/29/2025
Iliac Load Cell	Denton	321	9/16/2024	9/16/2025




Lateral Pelvis Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 32.6 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: 4771.0 N
Min: -2.6 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	07/01/2025
		Y	P49216	Endevco	07/01/2025
		Z	P51303	Endevco	07/01/2025
	Redundant	X	P58868	Endevco	07/01/2025
		Y	P59020	Endevco	07/01/2025
		Z	P52132	Endevco	07/01/2025
Thorax Rib Displacement Potentiometers	Upper	Y	179GFE	Honeywell	07/01/2025
	Middle	Y	185GFE	Honeywell	07/01/2025
	Lower	Y	184GFE	Honeywell	07/01/2025
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	T21166	Endevco	07/16/2025
		Y	T31029	Endevco	07/01/2025
		Z	P52033	Endevco	07/01/2025
Pubic Symphysis Load Cell		Y	458-FY	Denton	10/28/2024

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N DG8012		
				Serial Number	**Manufacturer**	**Calibration Date**
Head Accelerometers		Primary	X	T21184	Endevco	07/02/2025
			Y	T31030	Endevco	07/02/2025
			Z	P83319	Endevco	07/02/2025
		Redundant	X	T21354	Endevco	07/02/2025
			Y	P12566	Endevco	07/02/2025
			Z	P83322	Endevco	07/02/2025
Displacement Potentiometers	Thoracic Rib	Upper	Y	1199GFE	Servo	07/08/2025
		Middle	Y	1246GFE	Servo	07/08/2025
		Lower	Y	011GFE	Servo	07/08/2025
	Abdominal Rib	Upper	Y	008GFE	Servo	07/08/2025
		Lower	Y	046GFE	Servo	07/08/2025
Lower Spine Accelerometers (T12)			X	P71272	Endevco	07/02/2025
			Y	P58883	Endevco	07/02/2025
			Z	T30065	Endevco	07/02/2025
Acetabulum Load Cell			Y	270-FY	Denton	09/16/2024
Iliac Wing Load Cell			Y	321	Denton	09/16/2024
Pelvis Plug (struck side)				16883	SACO	07/21/2025
Pelvis Plug (non-struck side)				16885	SACO	07/21/2025

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A281010	Measurement Specialties	04/21/2025
	Vehicle Center of Gravity	Y	A290939	Measurement Specialties	04/21/2025
	Vehicle Center of Gravity	Z	A399939	Measurement Specialties	04/21/2025
2	Right Sill at Front Seat	X	A290898	Measurement Specialties	04/05/2025
	Right Sill at Front Seat	Y	A405552	Measurement Specialties	04/05/2025
	Right Sill at Front Seat	Z	A405635	Measurement Specialties	04/04/2025
3	Right Sill at Rear Seat	X	A274225	Measurement Specialties	04/04/2025
	Right Sill at Rear Seat	Y	A274236	Measurement Specialties	04/04/2025
	Right Sill at Rear Seat	Z	A373170	Measurement Specialties	04/04/2025
4	Left Sill at Front Door	Y	A373245	Measurement Specialties	06/24/2025
5	Left Sill at Rear Door	Y	A399960	Measurement Specialties	07/08/2025
6	Left A-Post Lower	Y	A374222	Measurement Specialties	06/23/2025
7	Left A-Post Middle	Y	G23417	Endevco	07/08/2025
8	Left B-Post Lower	Y	G22639	Endevco	07/08/2025
9	Left B-Post Middle	Y	A352327	Measurement Specialties	06/16/2025
10	Front Seat Track	Y	G22602	Endevco	07/08/2025
11	Rear Seat Track or Structure	Y	A396636	Measurement Specialties	07/09/2025
12	Right Rear Occ. Compartment	Y	G23625	Endevco	07/08/2025
13	Engine Block	X	G26789	Endevco	04/28/2025
	Engine Block	Y	G26791	Endevco	04/28/2025
14	Rear Floorpan Above Axle	X	A315905	Measurement Specialties	05/14/2025
	Rear Floorpan Above Axle	Y	A315970	Measurement Specialties	05/14/2025
	Rear Floorpan Above Axle	Z	A335459	Measurement Specialties	04/29/2025

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
MDB Center of Gravity	X	A413590	Measurement Specialties	06/23/2025
MDB Center of Gravity	Y	G24322	Endevco	06/23/2025
MDB Center of Gravity	Z	G25374	Endevco	12/14/2024
Left Frame at Rear Axle Centerline	X	A374247	Measurement Specialties	06/20/2025
Left Frame at Rear Axle Centerline	Y	G25272	Endevco	06/23/2025