

REPORT NUMBER: 214D-CAL-25-006

**SAFETY COMPLIANCE TESTING FOR FMVSS 214
SIDE IMPACT PROTECTION**

**Volkswagen AG Germany
2025 Volkswagen Golf GTI
5 Door Hatchback**

NHTSA No: C20255804

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



August 8, 2025

FINAL REPORT

**PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
ENFORCEMENT
OFFICE OF VEHICLE SAFETY COMPLIANCE
1200 NEW JERSEY AVE. S.E.
WEST Bldg. (NEF-240)
WASHINGTON, D.C. 20590**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Administration, in response to Contract Number 693JJ923D000043.

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Date: August 8, 2025

Approved by: Vanessa Hansen
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Date: August 8, 2025

FINAL REPORT ACCEPTANCE BY OVSC:

EDWARD E CHAN Digitally signed by EDWARD E CHAN
Date: 2025.08.12 07:16:49 -04'00'

Accepted by _____

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Enforcement Office of Vehicle Safety Compliance 1200 New Jersey Ave., SE, Room W43-304 Washington, D.C. 20590		13. Type of Report and Period Covered: Final Test Report July 28, 2025 - August 8, 2025																																																			
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16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Tests was conducted on the subject 2025 Volkswagen Golf GTI 5 Door Hatchback in accordance with the specifications of the Office of Vehicle Safety Compliance Test Procedure No. TP-214D-09 for the determination of FMVSS No. 214 Side Impact Protection compliance. This test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on July 28, 2025. The impact velocity of the Moving Deformable Barrier (MDB) was 53.23 kph, and the ambient temperature at the struck (driver side) of the target vehicle at the time of impact was 21°C. The target vehicle post-test maximum crush was 152 mm located at level 2. The test vehicle's occupant performance data is as follows:																																																					
<table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (ES-2re)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC36)</td> <td></td> <td>1000</td> <td>80.826</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>44</td> <td>20.898</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td>731.324</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td>1762.330</td> </tr> </tbody> </table> <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Passenger ATD (SID-IIs)</th> </tr> <tr> <th>Units</th> <th>IARV</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC36)</td> <td></td> <td>1000</td> <td>227.753</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td>G</td> <td>82</td> <td>62.897</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3123.895</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>16.167</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45</td> <td>20.275</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (ES-2re)			Units	IARV	Result	Head Injury Criteria (HIC36)		1000	80.826	Maximum Thoracic Rib Deflection	mm	44	20.898	Total Abdominal Force	N	2500	731.324	Pubic Symphysis Force	N	6000	1762.330	Measurement Description	Passenger ATD (SID-IIs)			Units	IARV	Result	Head Injury Criteria (HIC36)		1000	227.753	Lower Spine Resultant Acceleration	G	82	62.897	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3123.895	Maximum Thoracic Rib Deflection	mm	38	16.167	Maximum Abdominal Rib Deflection	mm	45	20.275
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17. Key Words Compliance Testing Side Impact Protection MDB ES-2re SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services (TIS) Room E12-100 East Bldg. 1200 New Jersey Ave. Washington, D.C. 20590 Telephone No. (202) 366-2588																																																			
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

This moving deformable barrier side impact test was conducted as part of the MY 2025 214 Side Impact Protection Compliance Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. 693JJ923D000043. The purpose of this test was to evaluate side impact protection in a 2025 Volkswagen Golf GTI 5 Door Hatchback. The side impact test was conducted in accordance with the Office of Vehicle Safety Compliance's Laboratory Test Procedure, TP-214D-09 dated September 2012.

SUMMARY

A 2025 Volkswagen Golf GTI 5 Door Hatchback was impacted on the left 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 53.23 kph. 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 28, 2025. Pre-test and post-test photographs of the test vehicle. The MDB and the dummies are included in this report.

Test dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OVSC Test Procedure, dated September, 2012. The side impact event was documented by 9 cameras. Camera location and other pertinent information are included in this report.

The ES2re male dummy was instrumented with triaxial accelerometer packs located in the head, three rib displacement transducers located in the chest, three load cells located in the abdomen and a load cell located in the pubic symphysis.

The SID-II's female dummy was instrumented with triaxial accelerometer packs located in the head and the spine and load cells located in the pubic symphysis and acetabulum. A summary of each dummy's configuration and performance verification test data has been included in the report along with the dummy response traces.

Injury readings for the dummies were recorded as follows:

INJURY READINGS

ES-2re Injury Criteria	Units	Max. Allowable IARV	Measured Value	Pass/Fail
Head Injury Criteria (HIC36)		1000	80.826	Pass
Upper Rib Deflection	mm	44	18.658	Pass
Mid Rib Deflection	mm	44	15.631	Pass
Lower Rib Deflection	mm	44	20.898	Pass
Abdominal Load (front)	N		55.386	
Abdominal Load (mid)	N		230.777	
Abdominal Load (rear)	N		471.434	
Total Abdominal Force	N	2500	731.324	Pass
Pubic Symphysis Force	N	6000	1762.330	Pass

INJURY READINGS

SIDIIIs Injury Criteria	Units	Max. Allowable IARV	Measured Value	Pass/Fail
Head Injury Criteria (HIC36)		1000	227.753	Pass
Lower Spine Resultant Acceleration	G	82	62.897	Pass
Acetabulum Force	N		2759.037	
Iliac Force	N		569.597	
Sum of Acetabular and Iliac	N	5525	3123.895	Pass

SECTION 2

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

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DATA SHEET NO. 1
TEST VEHICLE INFORMATION AND OPTIONS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025

TEST VEHICLE INFORMATION AND OPTIONS

Make	Volkswagen
Model	Golf GTI
Body Style	5 Door Hatchback
VIN	WVWLA7CD9SW217113
Body Color	Kings Red Metallic
Engine Displacement (L)	2.0
Type / No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	7-Speed
Overdrive	Yes
Final Drive	Front Wheel Drive
Odometer Reading	16 miles

Anti-Lock Brakes (ABS)	Yes
All-Wheel Drive (AWD)	No
Traction Control System (TCS)	Yes
Electric Stability Control (ECS)	Yes
Curtain Airbags	Yes
Torso Airbags – Front Seats	Yes
Torso Airbags – Rear Seats	No
Combination/Head Torso Bag	No
Pelvic Airbag – Front Seats	No
Pelvic Airbag – Rear Seats	No
Knee Airbag – Driver	No
Knee Airbag – Front Passenger	No
Seat Belt Pretensioners – Front Seats	Yes
Seat Belt Pretensioners – Rear Seats	Yes
Seat Belt Load Limiter – Front Seats	Yes
Seat Belt Load Limiter – Rear Seats	Yes
Tire Pressure Monitoring System (TPMS)	Yes
Tilt Steering Wheel	Yes
Automatic Door Locks (ADL)	Yes
Power Window Auto-reverse	Yes
Power Seats	Yes

DATA FROM CERTIFICATION LABEL

Manufactured By	Volkswagen AG Germany
Date of Manufacture	03/25
Vehicle Type	Passenger Car

GVWR (kg)	1960
GAWR Front (kg)	1060
GAWR Rear (kg)	950

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Type of Seats (Bench or Bucket)	Bucket	Split Bench	N/A	
Designated Seating Capacity (DSC)	2	3	N/A	5
Capacity Weight (VCW) (kg)				420

DATA SHEET NO. 1 ... (CONTINUED)

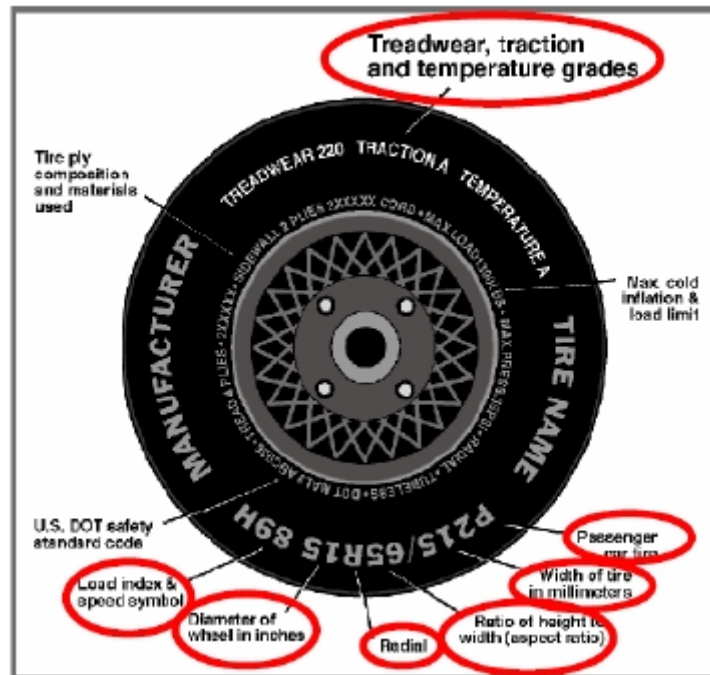
VEHICLE TIRE INFORMATION

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025

VEHICLE TIRE INFORMATION

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



TIRE SIDEWALL INFORMATION

Tire Placard	Front	Rear
Recommended Cold Pressure (kPa)	270	270
Recommended Tire Size	225/40R18	225/40R18
Tire Sidewall	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Tire Size on Vehicle	225/40R18	225/40R18
Tire Manufacturer Model	Pirelli	Pirelli
Tire Name	PZero	PZero
Tire Type	All Season	All Season
Tire Width	225	225
Aspect Ratio	40	40
Radial	Yes	Yes
Wheel Diameter	18"	18"
Load Index / Speed Symbol	92H	92H
Treadwear	500	500
Traction Grade	A	A
Temperature Grades	A	A

DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	272	270	271	269
Tire Placard	kPa	270	270	270	270

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			Fully Loaded			As Tested		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	438	293		481	389		478	376	
Right	kg	461	265		472	329		483	323	
Ratio	%	61.7	38.3		57.0	43.0		57.9	42.1	
Totals	kg	899	558	1457	953	718	1671	961	699	1660

TARGET TEST WEIGHT (TVTW) CALCULATION

Measured Parameter	Units	Value	
As Delivered Weight (UVW)	kg	1457	(A)
Weight of 2 P572 ATDs	kg	131	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	79.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1667.8	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Wheel Opening Location	Distance (grd to ref. point above wheel opening in mm)		Difference (mm)	Meets Requirement***
	Fully Loaded	As Tested		
Left Front	669	670	1	Yes
Right Front	683	678	5	Yes
Left Rear	660	667	7	Yes
Right Rear	670	675	5	Yes

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

MDB IMPACT POINT DATA

Measured Parameter	Distance (mm)	Met Requirement
Test Vehicle Wheelbase	2631	Yes
Target Vertical Impact Reference Line Aft of Front Axle	375	Yes
Actual Impact Point Location (fore-aft, above - below)	356	Yes

Note: Fore or above the target impact point is positive (+). Aft or below the target impact point is negative (-)

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	2
Spare Tire & Jack	17
Ballast (if any)	34

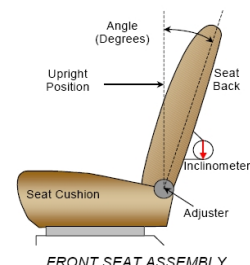
DATA SHEET NO. 3
SEAT AND SEAT BELT ANCHORAGE ADJUSTMENT DATA

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned to the manufacturer's designated design angle. The front center and front passenger's seat backs are positioned in a similar manner as the driver's seat back. The struck side rear seat back is positioned such that the dummy's head is level. The rear center and non-struck side rear outboard seat backs are positioned in a similar manner as the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat	61.3	Power	16.6	Power
Front Passenger Seat	61.0	Power	17.5	Power

*Measured on seat back per Form 1

SEAT POSITIONING

The driver's seat, front center seat (if applicable), and right front passenger's seat should be set to the mid-track, lowest, mid-angle position. The struck-side rear passenger's seat, rear center seat, and non-struck side rear passengers' seats should be set to the rear-most, lowest, mid-angle position

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCR P Height Position	SCR P Height (mm)		
				Rearmost	Mid-Fore / Aft	Forward-Most
Driver Seat	16.4	26	Max	-	-	-
			Mid	-	-	-
			Min	16	26	34
Front Passenger Seat	16.7	26	Max	-	-	-
			Mid	-	-	-
			Min	16	26	36

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	244	37 (0-36)	122	18
Front Passenger Seat	244	37 (0-36)	122	18

SEAT BELT ANCHORAGE ADJUSTMENT

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

HEAD RESTRAINT ADJUSTMENT

Seat	Total # of Positions	Placed in Position #
Driver Seat	Fixed	Fixed

DATA SHEET NO. 4
FUEL SYSTEMS AND STEERING WHEEL POSITION DATA

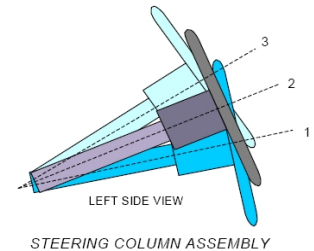
Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025

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.

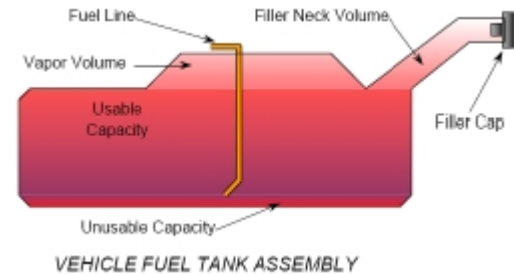
	Degrees	Fore / Aft Position (mm)
Lowermost - Position No. 1	19.6	
Geometric center - Position No. 2	22.3	
Uppermost - Position No. 3	24.9	
Telescoping Steering Wheel Travel		64
Test Position	22.3	32



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.



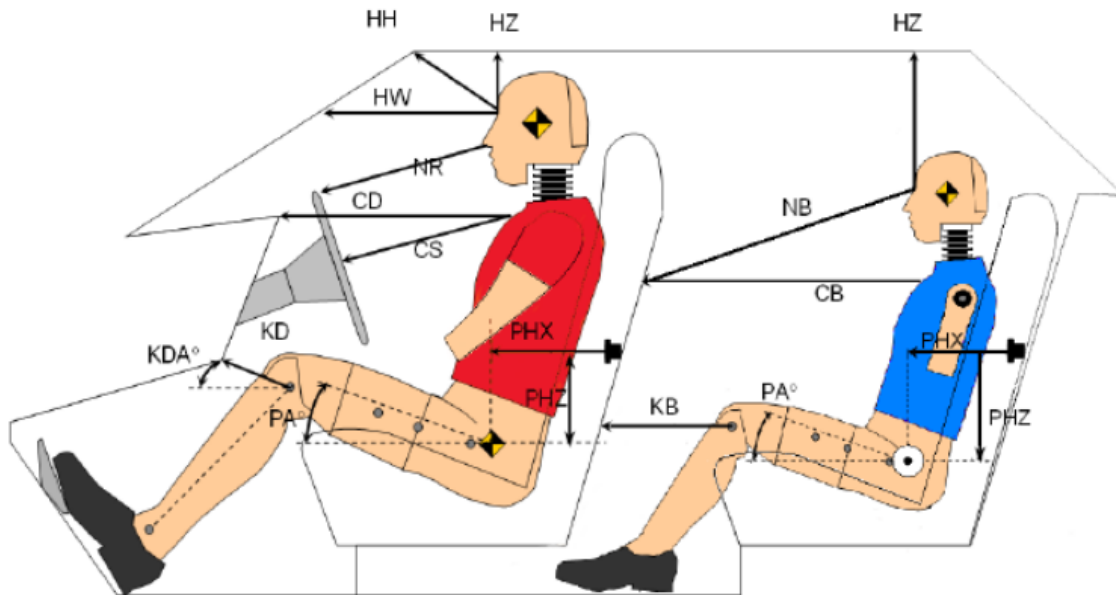
FUEL TANK CAPACITY

Description	Liters
Usable Capacity of - Form No.1	50
Usable Capacity of - Owner's Manual	50
92 - 94% of Usable Capacity	46 - 47
Actual Amount of Solvent Used in Test	46.5

DATA SHEET NO. 5
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025



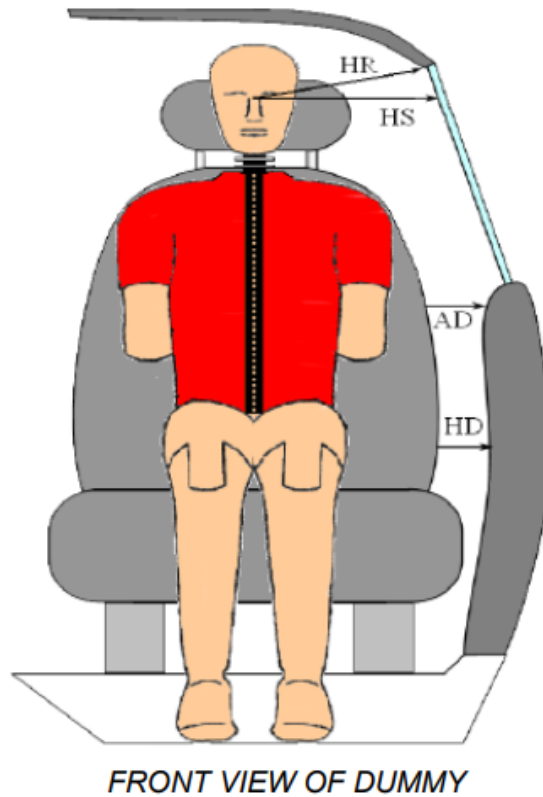
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Code	Pass. Code	Description	ES2-re		SID-IIs	
			Length (mm)	Angle	Length (mm)	Angle
HH		Head to Header	376			
HW		Head to Windshield	616			
HZ	HZ	Head to Roof Liner	175		297	
NR	NB	Nose to Rim	453		560	
CD	CB	Chest to Dash	546		550	
CS		Chest to Steering Wheel	380			
KD(L) / KDA(L)°	KB(L) / KBA(L)°	Left Knee to Dash	233	28.0	239	9.5
KD(R) / KDA(R)°	KB(R) / KBA(R)°	Right Knee to Dash	232	31.4	240	9.5
PAX°	PAX°	Pelvic Tilt Angle (X-Axis)		23.7		29.55
PAY°	PAY°	Pelvic Tilt Angle (Y-Axis)				0.2
X	PHX	Hip Point to Striker (X-Axis)	158		188	
PHX	PHZ	Hip Point to Striker (Z-Axis)	226		251	

DATA SHEET NO. 6
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025



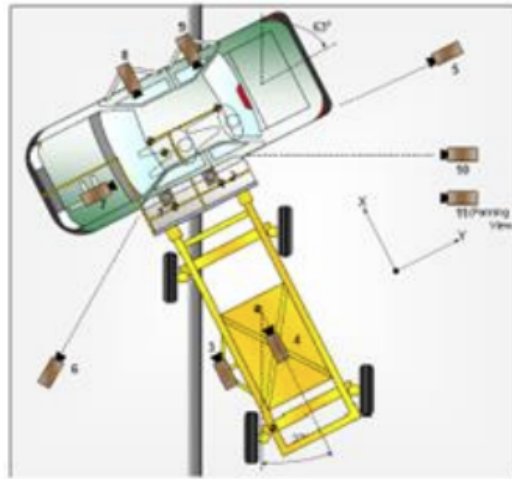
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Front Occupant	Rear Occupant
HR	Head to Side Header	mm	204	258
HS	Head to Side Window	mm	334	280
AD	Arm to Door	mm	102	129
HD	Hip Point to Door	mm	162	141

DATA SHEET NO. 7 **LOCATION OF CAMERAS**

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025



CAMERA LOCATIONS AND DATA

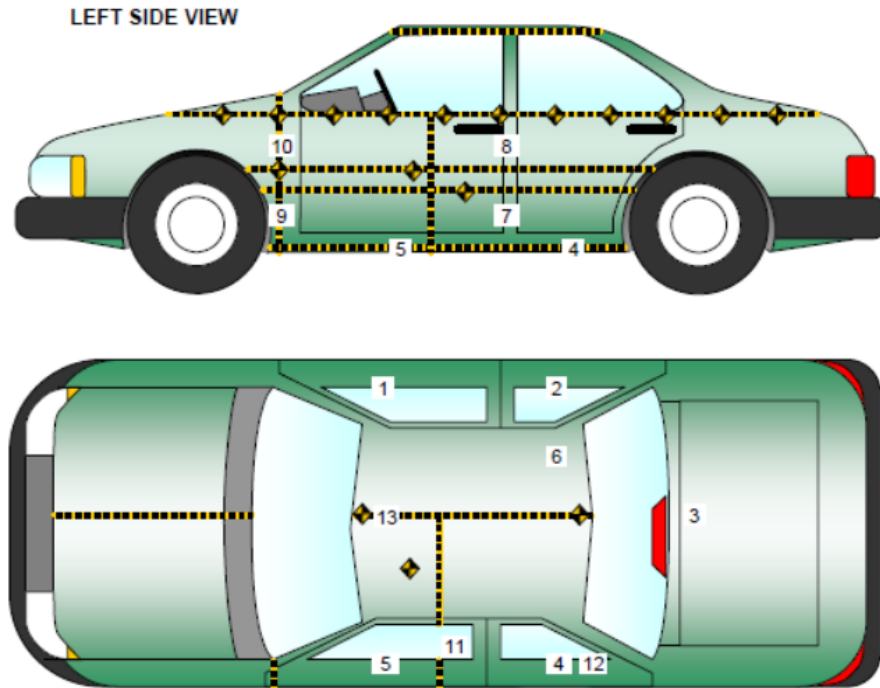
No.	Camera View	Location (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	-261	-9220	12.5	60
2	Overhead Close-up	0	0	-9220	28	1000
3	Impact Point Close-up				25	1000
4	Centerline of Impact (MDB)				8	1000
5	Right Side View	353	7034	-1409	28	1000
6	Left Side View	-2299	-5604	-1254	24	1000
7	Front Seat Occupant-Frontal View (OB)				25	1000
8	Front Seat Occupant-Side View (OB)				12.5	1000
9	Rear Passenger-Side View (OB)				12.5	1000
10	Real-time Coverage				Zoom	1000

Notes: *Reference: Impact Point projected to Ground*
 +X = To Front of MDB, +Y = To Right of MDB, +Z = Down

DATA SHEET NO. 8
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Left (or Rt.) Sill at Front Seat	2443	656	225
2	Left (or Rt.) Sill at Rear Seat	1655	658	217
3	Rear Floorpan Above Axle	950	6	80
4	Left (or Rt.) Sill at Front Door	1607	-654	208
5	Left (or Rt.) Sill at Rear Door	2459	-661	211
6	Left (or Rt.) Rear Occ. Compartment	1863	381	359
7	Left (or Rt.) B-Post Lower	1819	-673	-152
8	Left (or Rt.) B-Post Middle	1788	-657	-326
9	Left (or Rt.) A-Post Lower	2887	-633	-6
10	Left (or Rt.) A-Post Middle	2910	-654	-425
11	Front Seat Track	2031	-587	259
12	Rear Seat Track or Structure	1392	-624	127
13	Vehicle CG	1950	4	104

Reference: X – Rear surface of vehicle (+ forward)
 Y – Vehicle centerline (+ to right)
 Z – Ground plane (+ down)

DATA SHEET NO. 9
TEST VEHICLE ACCELEROMETER DATA SUMMARY

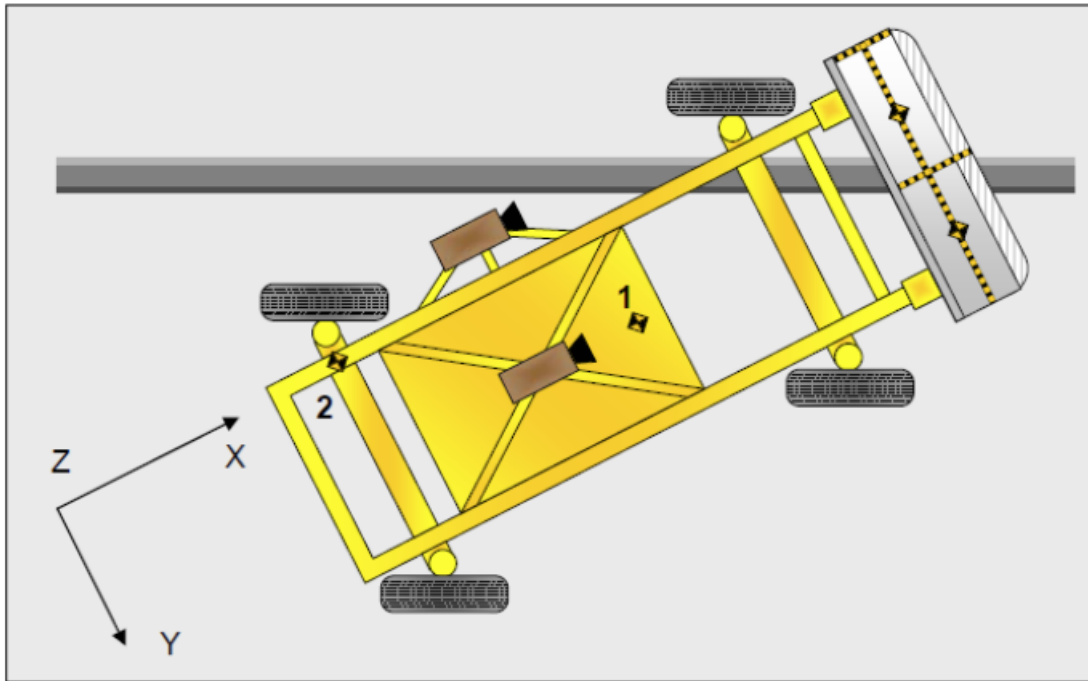
Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback NHTSA No.: C20255804
Test Facility: Calspan Test Date: 07/28/2025

Loc. No	Description	Axes	Units	Peak Values (g's)			
				Max	Time (ms)	Min	Time (ms)
1	Left (or Rt.) Sill at Front Seat	X	g	5.92	29.55	-9.89	14.25
	Left (or Rt.) Sill at Front Seat	Y	g	23.16	8.70	-2.40	115.90
	Left (or Rt.) Sill at Front Seat	Z	g	5.84	34.80	-11.13	6.70
	Left (or Rt.) Sill at Front Seat Resultant	N/A	g	24.50	6.65	0.01	-8.60
2	Left (or Rt.) Sill at Rear Seat	X	g	5.49	29.10	-8.01	14.70
	Left (or Rt.) Sill at Rear Seat	Y	g	32.27	6.90	-2.49	110.55
	Left (or Rt.) Sill at Rear Seat	Z	g	17.39	14.20	-21.51	10.85
	Left (or Rt.) Sill at Rear Seat Resultant	N/A	g	32.33	6.90	0.01	-9.40
3	Rear Floor Pan Above Axle	X	g	3.16	46.40	-10.32	10.15
	Rear Floor Pan Above Axle	Y	g	30.58	5.65	-1.59	111.30
	Rear Floor Pan Above Axle	Z	g	11.51	8.30	-9.21	4.55
	Rear Floor Pan Above Axle Resultant	N/A	g	31.70	5.50	0.01	-36.05
4	Left (or Rt.) Sill at Rear Door	Y	g	152.82	3.75	-114.00	11.80
5	Left (or Rt.) Sill at Front Door	Y	g	94.85	3.30	-31.29	9.55
6	Left (or Rt.) Rear Occ. Compartment	Y	g	30.16	6.45	-2.50	68.60
7	Left (or Rt.) B-Post Lower	Y	g	138.83	3.00	-137.40	13.75
8	Left (or Rt.) B-Post Middle	Y	g	113.04	3.75	-122.18	9.80
9	Left (or Rt.) A-Post Lower	Y	g	164.70	32.90	-193.26	36.80
10	Left (or Rt.) A-Post Middle	Y	g	68.05	17.70	-22.27	22.75
11	Front Seat Track	Y	g	52.62	4.15	-9.37	8.70
12	Rear Seat Track or Structure	Y	g	79.91	10.00	-36.00	13.95
13	Vehicle CG	X	g	2.73	76.20	-12.42	16.60
	Vehicle CG	Y	g	35.74	31.40	-2.82	49.25
	Vehicle CG	Z	g	19.89	11.55	-16.60	5.65
	Vehicle CG Resultant	N/A	g	37.04	31.40	0.01	-34.90

DATA SHEET NO. 10
MDB ACCELEROMETER LOCATIONS DATA SUMMARY

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025



MDB ACCELEROMETER LOCATIONS

Loc No.	Description	Axes	Units	Peak Values (g's)			
				Max	Time (ms)	Min	Time (ms)
1	MDB CG	X	g	1.16	300.00	-20.14	41.45
		Y	g	1.49	57.50	-8.38	21.50
		Z	g	11.25	35.95	-6.04	29.35
		Resultant		22.50	35.65	0.03	-24.35
2	MDB Rear	Y	g	2.12	97.10	-24.13	25.30
		Z	g	7.15	21.45	-2.20	57.10

DATA SHEET NO. 11
MDB SUMMARY OF RESULTS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025

MDB SPECIFICATIONS

Measurement Description	Requirement	Value
Overall Width of Framework Carriage	1241- 1261	1250
Overall Length Including Honeycomb Frame	4140 - 3990	4120
Wheelbase of Framework Carriage	2566 -2616	2600
CG Location of Front Axle		1120
MDB Front Axle Weight		764
MDB Rear Axle Weight		594
MDB Total Weight	1356.5 - 1365.5	1358

SPEED AND ANGLE AT IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	52.1 to 53.7	53.23
Trap No. 2 Velocity (Redundant)	km/h	52.1 to 53.7	53.18
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90.0

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	700	Left	139
B	Top of Bumper	533	800	Right	83
C	Mid-Level	686	800	Left	98
D	Top of Stack	813	800	Left	93

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+19
Vertical Offset (- down / + up)	mm	+/- 20 of Intended Impact Point	-8

DATA SHEET NO. 12
DUMMY INJURY RESPONSE DATA
(Subpart U, ES-2re)

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback NHTSA No.: C20255804
Test Facility: Calspan Test Date: 07/28/2025

Dummy Serial No. D037

Description	Axes	Positive Direction		Negative Direction	
		Max	Time (ms)	Max	Time (ms)
HEAD ACCELERATION (g)					
Longitudinal	X	5.61	183.55	-13.75	49.30
Lateral	Y	32.22	37.95	-4.20	243.25
Vertical	Z	17.01	11.95	-11.74	54.55
Resultant	N/A	33.96	37.95		
HIC36 (t1, t2)	N/A	80.83		t1 = 30.35	t2 = 57.50
THORAX DEFLECTION (mm)					
Upper Rib	Y	18.66	50.75	-6.04	76.15
Middle Rib	Y	15.63	44.50	-1.47	273.05
Lower Rib	Y	20.90	44.80	-0.84	277.20
ABDOMINAL FORCES (N)					
Front	Y	55.39	28.25	-25.33	17.60
Middle	Y	230.78	45.55	-6.92	12.45
Rear	Y	471.43	46.55	-2.86	8.50
SUM	N/A	731.32	45.65		
PELVIS FORCES (N)					
Pubic Symphysis	Y	153.81	88.45	-1762.33	48.10

Reference: Positive Direction - Longitudinal (X) = forward
 - Lateral (Y) = to right
 - Vertical (Z) = down

DATA SHEET NO. 13
DUMMY INJURY RESPONSE DATA
(Subpart V, SIDIIIs)

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback NHTSA No.: C20255804
Test Facility: Calspan Test Date: 07/28/2025

Dummy Serial No. 224

Description	Axes	Positive Direction		Negative Direction	
		Max	Time (ms)	Max	Time (ms)
HEAD ACCELERATION (g)					
Longitudinal	X	3.88	134.15	-12.51	58.10
Lateral	Y	46.81	54.35	-8.69	136.10
Vertical	Z	7.94	58.00	-3.66	44.60
Resultant	N/A	48.50	54.35		
HIC36 (t1, t2)	N/A	227.75		t1 = 45.35	t2 = 70.05
LOWER SPINE (g)					
Longitudinal	X	15.66	57.40	-10.93	31.90
Lateral	Y	59.37	44.55	-5.42	84.55
Vertical	Z	8.87	77.00	-20.69	44.05
Resultant	N/A	62.90	44.40	0.01	-30.50
PELVIS FORCES (N)					
Acetabular	Y	2759.04	38.85	-32.99	113.20
Iliac	Y	569.60	44.25	-175.71	31.20

Reference: Positive Direction - Longitudinal (X) = forward
 - Lateral (Y) = to right
 - Vertical (Z) = down

DATA SHEET NO. 14
POST-TEST OBSERVATIONS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Occupant	Rear Occupant
Head Contact	Curtain Airbag, Side Header & Headrest	Curtain Airbag & Headrest
Upper Torso Contact	Seatback & Torso/Pelvis Airbag	Seatback, Door Trim & C-Pillar Trim
Lower Torso Contact	Seatback & Torso/Pelvis Airbag	Seatback, Door Trim & C-Pillar Trim
Left Knee Contact	Door Trim	Door Trim
Right Knee Contact	Left Knee	Left Knee

POST-TEST DOOR PERFORMANCE

Description	Front	Rear
Left Side Doors	Jammed	Detached from Striker
Right Side Doors	Closed & Operational	Closed & Operational
Hatch and Other Doors		Closed & Operational
Seat Movement	None	None
Seatback Failure	Reclined after impact event	None

*Note: Description for door opening must be specific with the following three categories: Remained closed and operational, opened/unlatched during the crash, or jammed shut. Sometimes the door is jammed and unlatched. If the door cannot be opened, then note the door as jammed shut. If open, measurement must be taken for the width of the door opening (mm).

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar, B-Pillar & C-Pillar Buckled
Sill Separation	None
Windshield Damage	None
Side Window Damage	Rear Passenger window shattered during impact event
Other Notable Effects	None

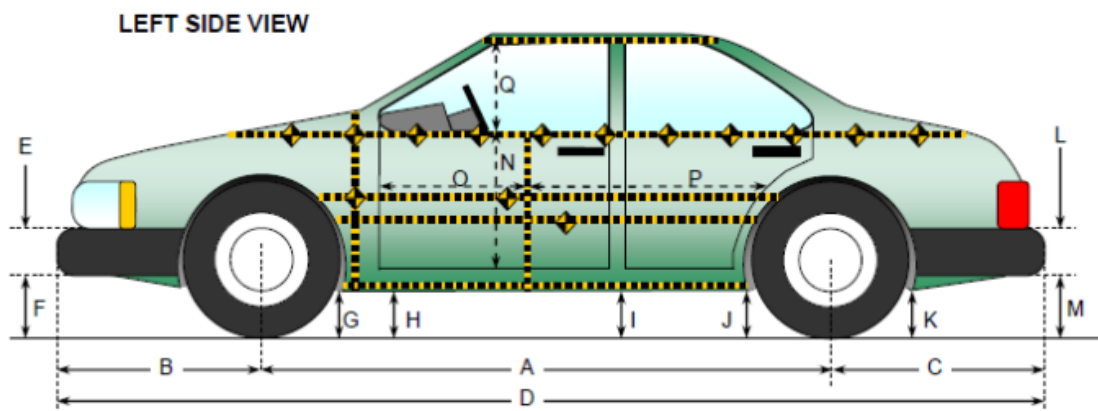
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Front Occupant		Rear Occupant	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes			
Side Torso Airbag	Yes	Yes	No	N/A
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Other				

DATA SHEET NO. 15
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025



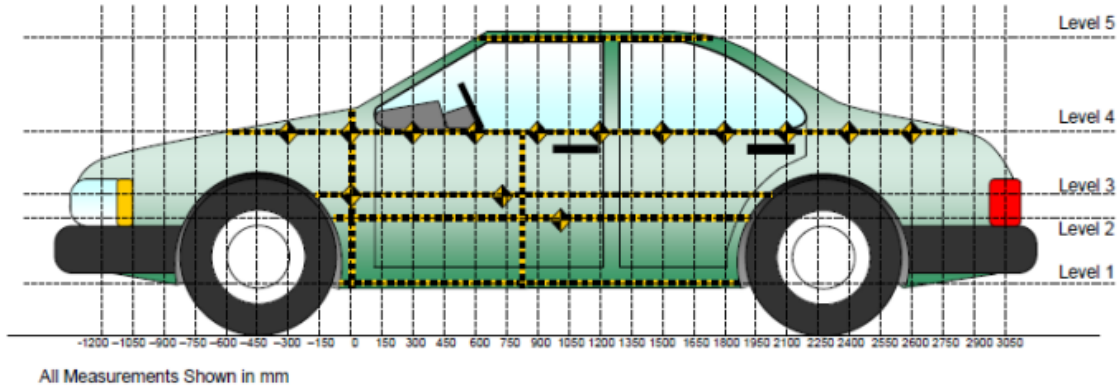
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code.	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2631	2631	1
B	Front Axle to FSOV	874	875	1
C	Rear Axle to RSOV	780	778	-1
D2	Total Vehicle Length at Centerline	4284	4285	1
E	Front Bumper Thickness	130	130	0
F	Front Bumper Bottom to Ground	403	400	-3
G	Sill Height at Front Wheel Well	192	210	18
H	Sill Height at Front Door Leading Edge	197	216	19
I	Sill Height at B Pillar	200	216	16
J1	Sill Height at Rear Wheel Well	202	208	6
J2	Pinch Weld Height at Rear Wheel Well	180	178	-2
K	Sill Height Aft of Rear Wheel Well	212	224	12
L	Rear Bumper Thickness	165	165	0
M	Rear Bumper Bottom to Ground	367	274	-93
N	Sill Height to Window Bottom of Front Window Sill	708	697	-11
O	Front Door Leading Edge to Impact CL	722	721	-1
P	Rear Door Trailing Edge to Impact CL	1279	1246	-33
Q	Front Window Opening	424	431	6
R	Right Side Length	4223	4221	-2
S	Left Side Length	4221	4215	-7
T	Vehicle Width at B-Pillars	1770	1671	-99

DATA SHEET NO.16
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	347	114	1200
2	Occupant H-Point	mm	528	145	900
3	Mid-Door	mm	633	152	750
4	Window Sill	mm	902	58	900
5	Window Top	mm	1400	3	1350

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.17
VEHICLE EXTERIOR CRUSH PROFILES

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback

NHTSA No.: C20255804

Test Facility: Calspan

Test Date: 07/28/2025

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

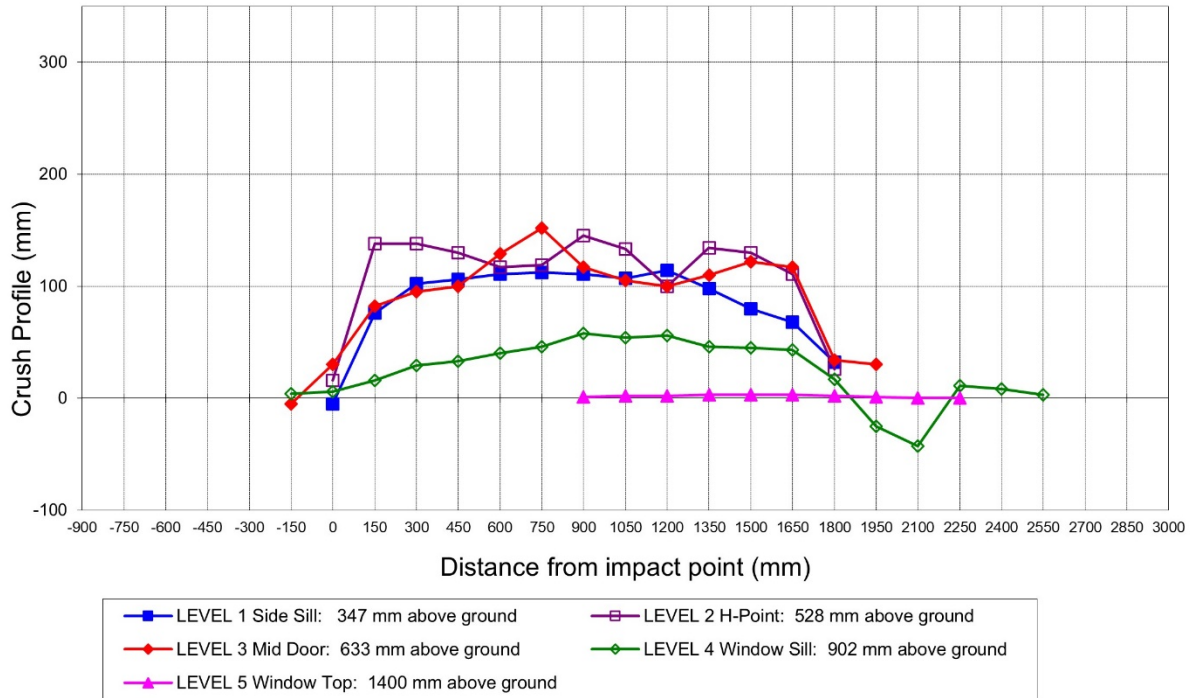
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			890	784				895	780				-5	4	
0	876	889	889	803		881	873	861	797		-5	16	28	6	
150	874	883	886	814		798	745	804	798		76	138	82	16	
300	877	882	886	820		775	744	791	791		102	138	95	29	
450	880	882	888	824		774	752	788	791		106	130	100	33	
600	882	883	889	829		771	766	760	789		111	117	129	40	
750	882	883	889	833		770	764	737	787		112	119	152	46	
900	880	881	889	839	574	769	736	772	781	573	111	145	117	58	1
1050	878	880	888	841	589	771	747	783	787	587	107	133	105	54	2
1200	874	877	885	845	591	760	777	785	789	589	114	100	100	56	2
1350	870	876	884	847	589	772	742	774	801	586	98	134	110	46	3
1500	865	873	881	849	585	785	743	759	804	582	80	130	122	45	3
1650	860	872	879	847	580	792	761	762	804	577	68	111	117	43	3
1800	859	872	877	844	573	827	846	843	827	571	32	26	34	17	2
1950			875	867	557			845	892	556			30	-25	1
2100				831	532				874	532				-43	0
2250				824	499				813	499				11	0
2400				812					804					8	
2550				792					789					3	
2700															
2850															
3000															

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

DATA SHEET NO.17 **TEST VEHICLE EXTERIOR CRUSH PROFILES (CONTINUED)**

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
 Test Facility: Calspan

NHTSA No.: C20255804
 Test Date: 07/28/2025

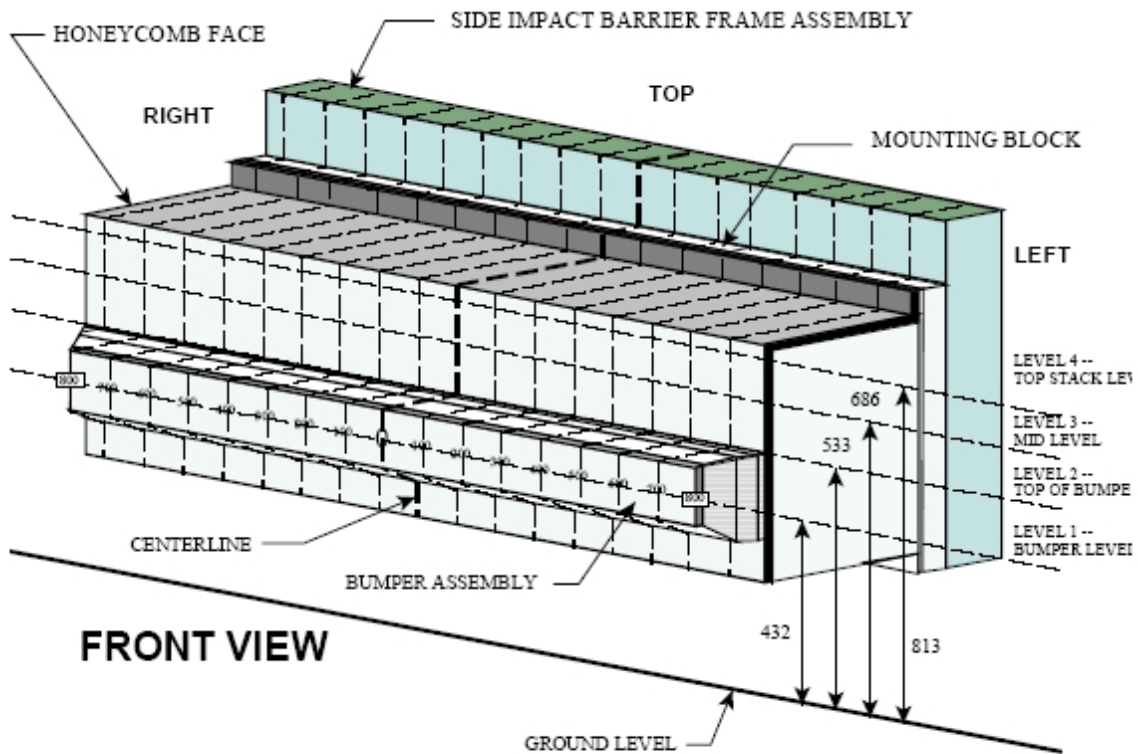


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO.18 EXTERIOR STATIC CRUSH FOR IMPACT FACE

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025



NOTE: Dimensions are shown in millimeters, mm

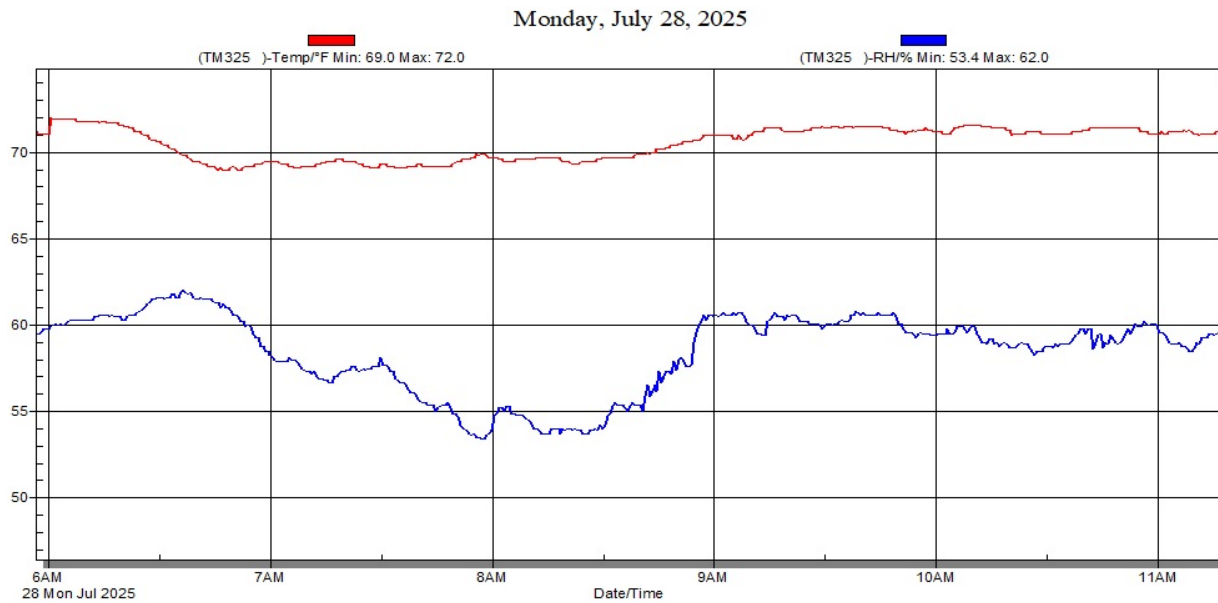
DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	135	129	125	122	120	118	115	107	105	107	115	118	120	122	125	129	135
2	83	80	78	76	73	70	63	58	55	58	63	70	73	76	78	80	83
3	12	4	9	15	28	49	37	17	13	17	37	49	28	15	9	4	12
4	3	4	10	21	44	68	55	41	28	41	55	68	44	21	10	4	3

DATA SHEET NO. 19
DUMMY / VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2025 Volkswagen Golf GTI 5 Door Hatchback
Test Facility: Calspan

NHTSA No.: C20255804
Test Date: 07/28/2025



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

APPENDIX I
PHOTOGRAPHS

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Figure A-1: Pre-Test Frontal View of Test Vehicle



Figure A-2: Post-Test Frontal View of Test Vehicle



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



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



Figure A-5: Pre-Test Impacted Side View of Test Vehicle



Figure A-6: Post-Test Impacted Side View of Test Vehicle



Figure A-7: Pre-Test Frontal View of Impactor Face



Figure A-8: Post-Test Frontal View of Impactor Face



Figure A-9: Pre-Test Left Side View of Impactor Face



Figure A-10: Post-Test Left Side View of Impactor Face



Figure A-11: Pre-Test Right Side View of Impactor Face



Figure A-12: Post-Test Right Side View of Impactor Face



Figure A-13: Pre-Test Top View of Impactor Face



Figure A-14: Post-Test Top View of Impactor Face

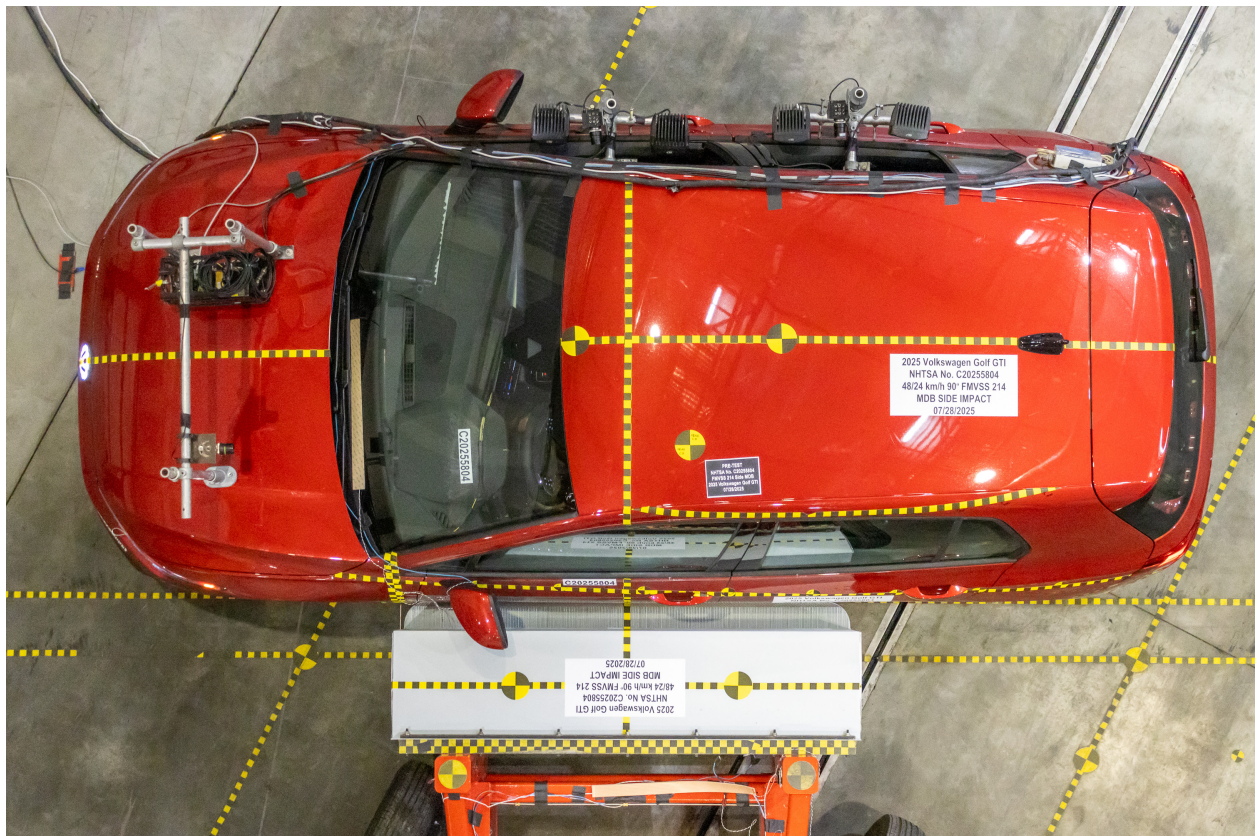


Figure A-15: Pre-Test Overhead View of MDB Positioned Against Impact Side of Test Vehicle at Impact Location



Figure A-16: Post-Test Overhead View of the MDB and Test Vehicle



Figure A-17: Pre-Test Front ES2-re in Final Seating Position (Door Open)



Figure A-18: Pre-Test Front ES2-re in Final Seating Position (Door Closed)



Figure A-19: Pre-Test Front ES2-re - Opposite Side View



Figure A-20: Post-Test Front ES2-re - Opposite Side View



Figure A-21: Pre-Test Rear SID in Final Seating Position (Door Open)



Figure A-22: Pre-Test Rear SID in Final Seating Position (Door Closed)



Figure A-23: Pre-Test Rear SID - Opposite Side View



Figure A-24: Post-Test Rear SID - Opposite Side View



Figure A-25: T (0) - Impact Event



Figure A-26: Post-Test Close-up View of Impact Point Target

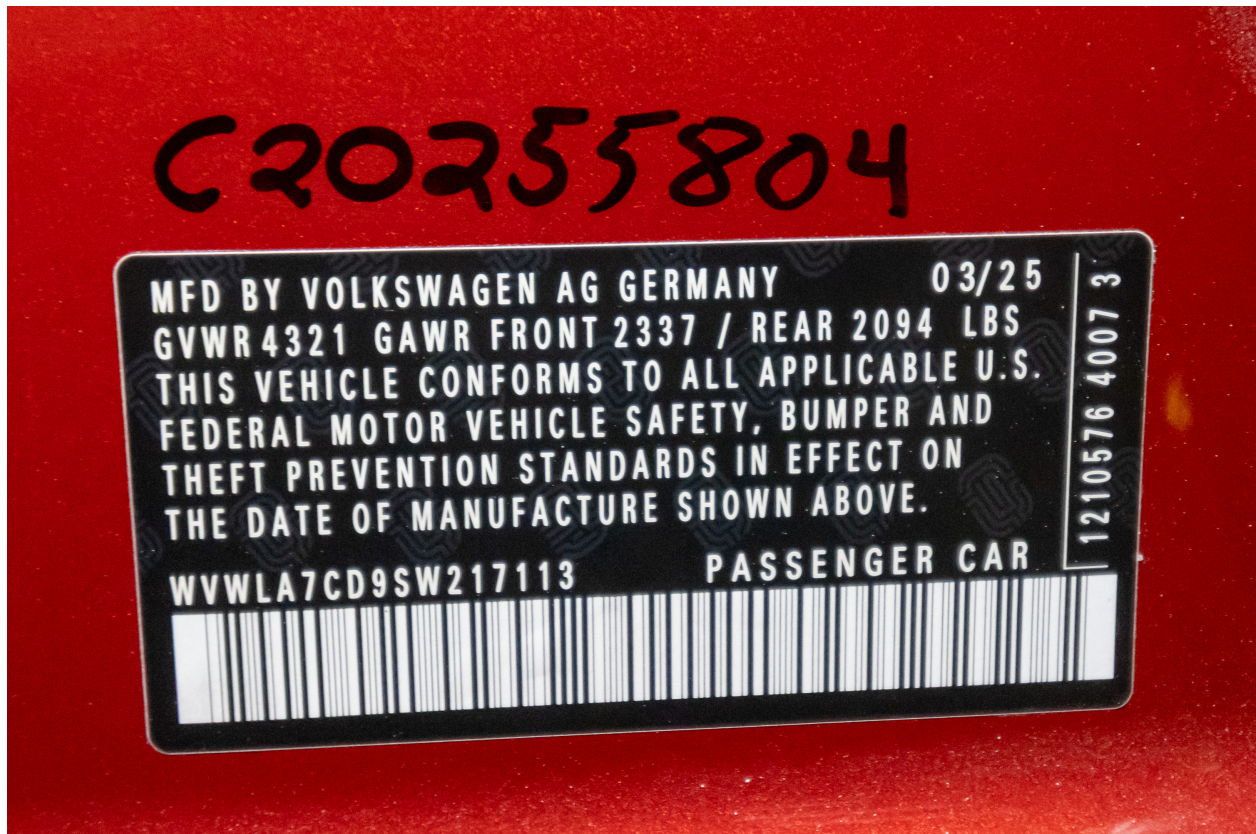


Figure A-27: Close-up View of Vehicle's Certification Label



Figure A-28: Post-Test Front Seat Occupant Area Showing Head & Torso Contact Regions



Figure A-29: Post-Test Rear Seat Occupant Area Showing Head & Torso Contact Regions



Figure A-30: Close-up View of Vehicle's Tire Placard

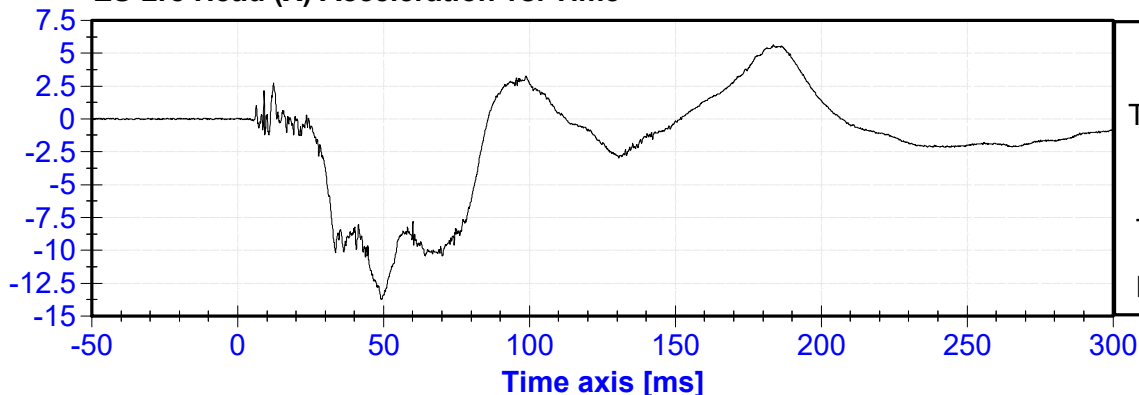
APPENDIX II
ES-2re DUMMY RESPONSE DATA TRACES

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18	ES-2re Pubic Symphysis Force (Y) vs. Time	II-7

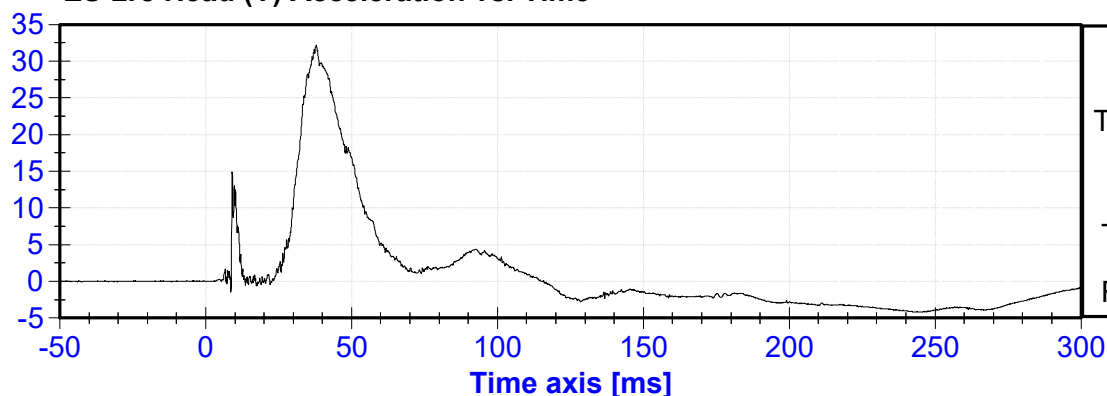
ACCELERATION [g's]

ES-2re Head (X) Acceleration vs. Time



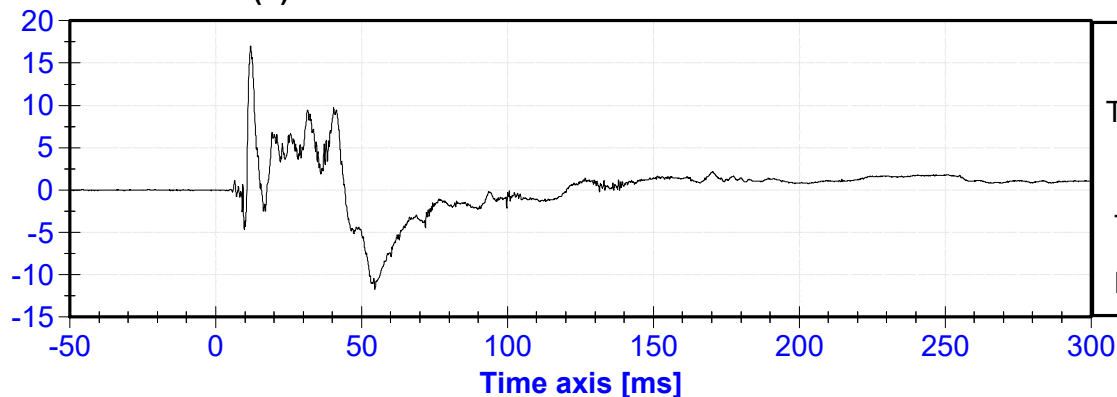
ACCELERATION [g's]

ES-2re Head (Y) Acceleration vs. Time



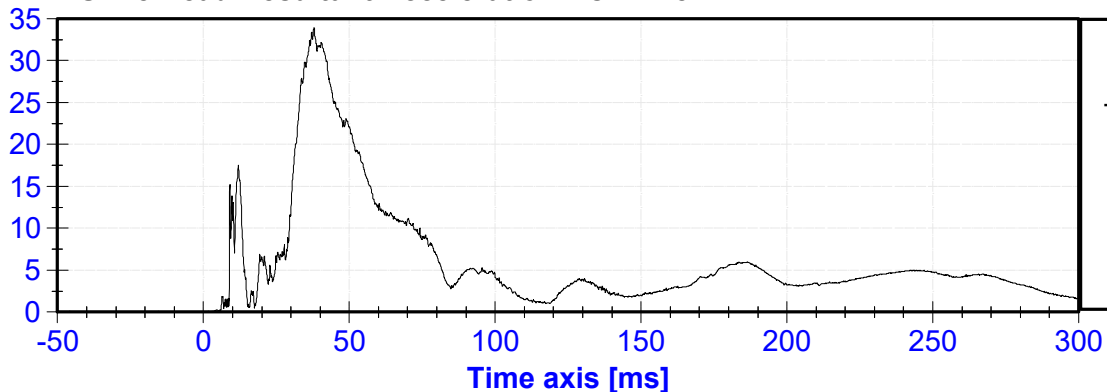
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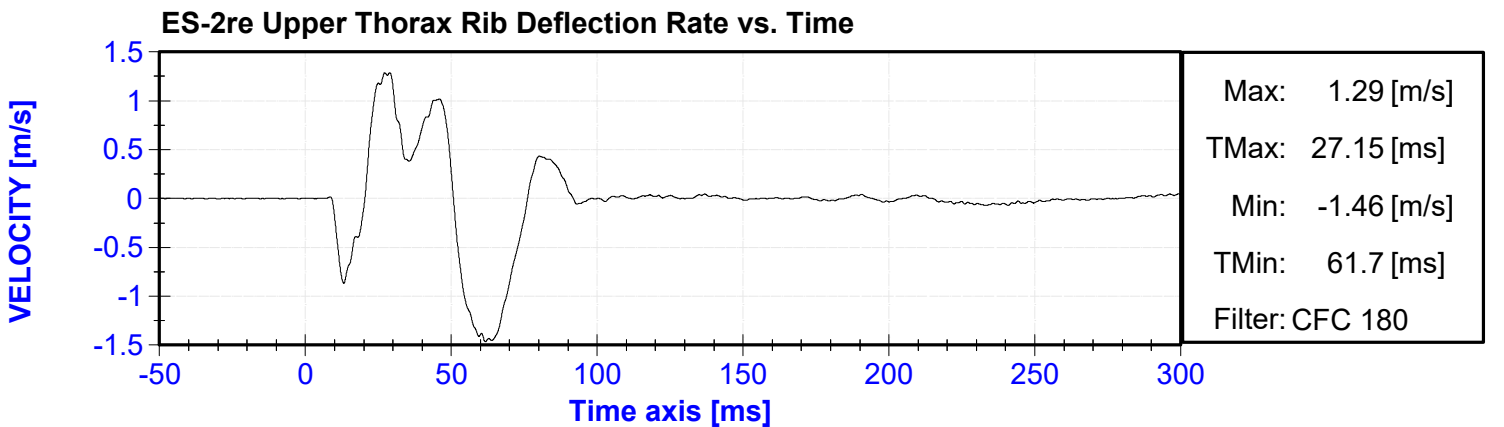
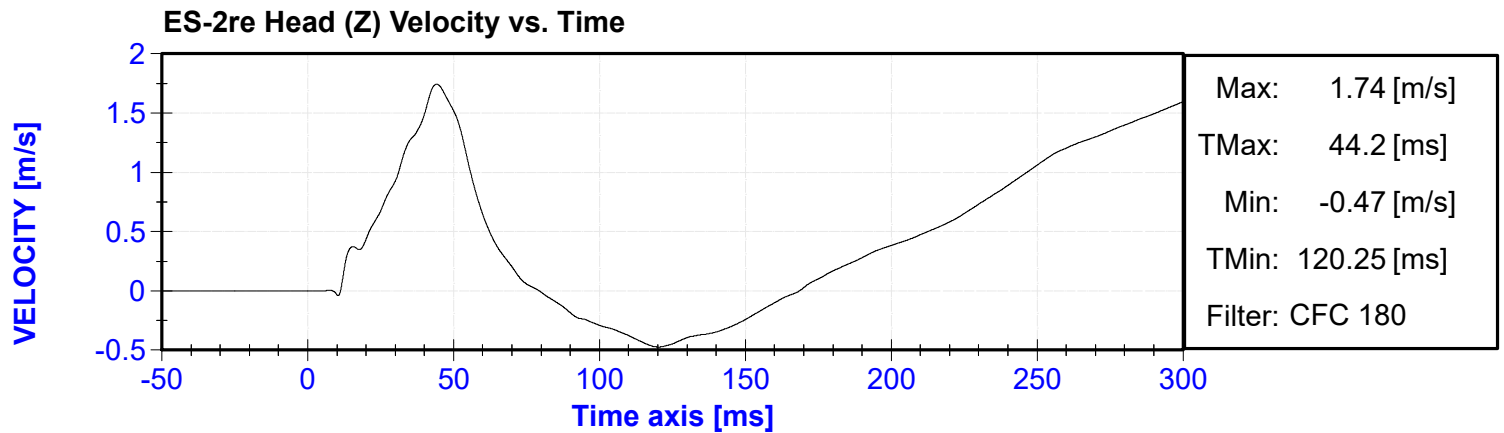
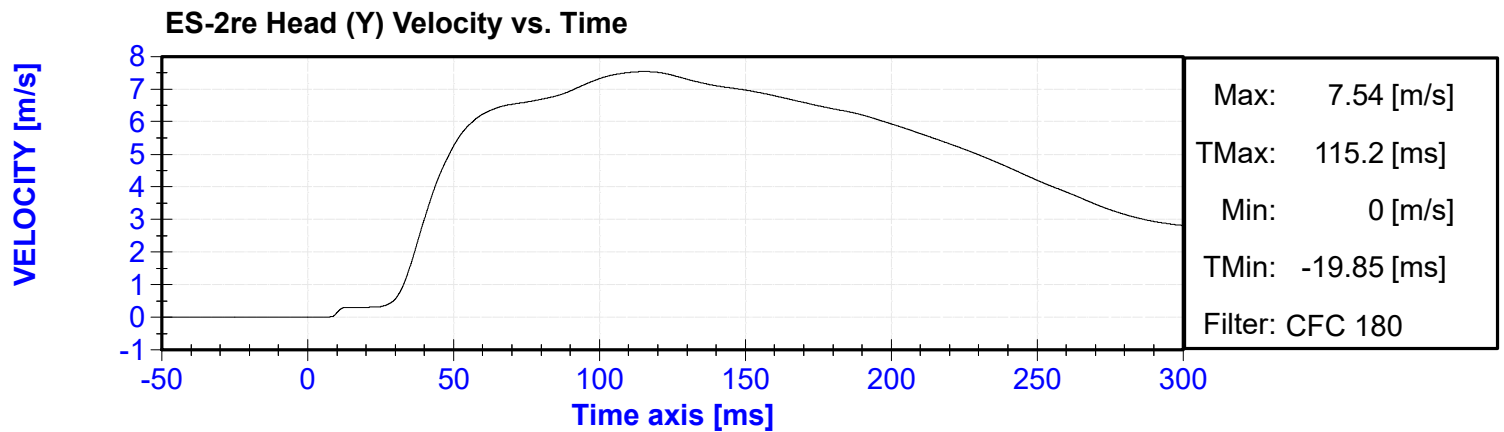
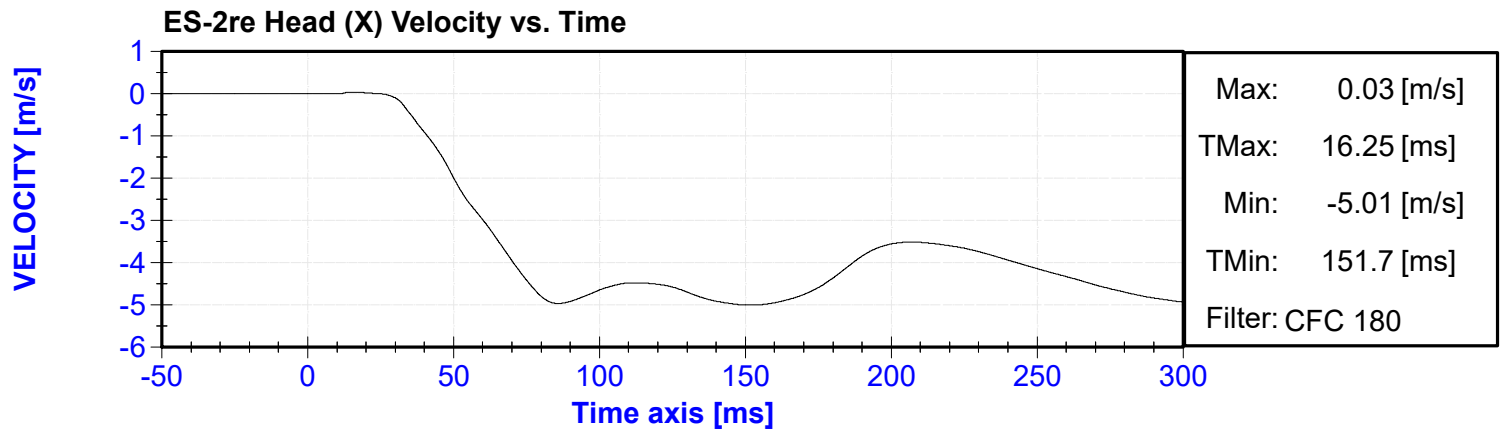
ES-2re Head (Z) Acceleration vs. Time

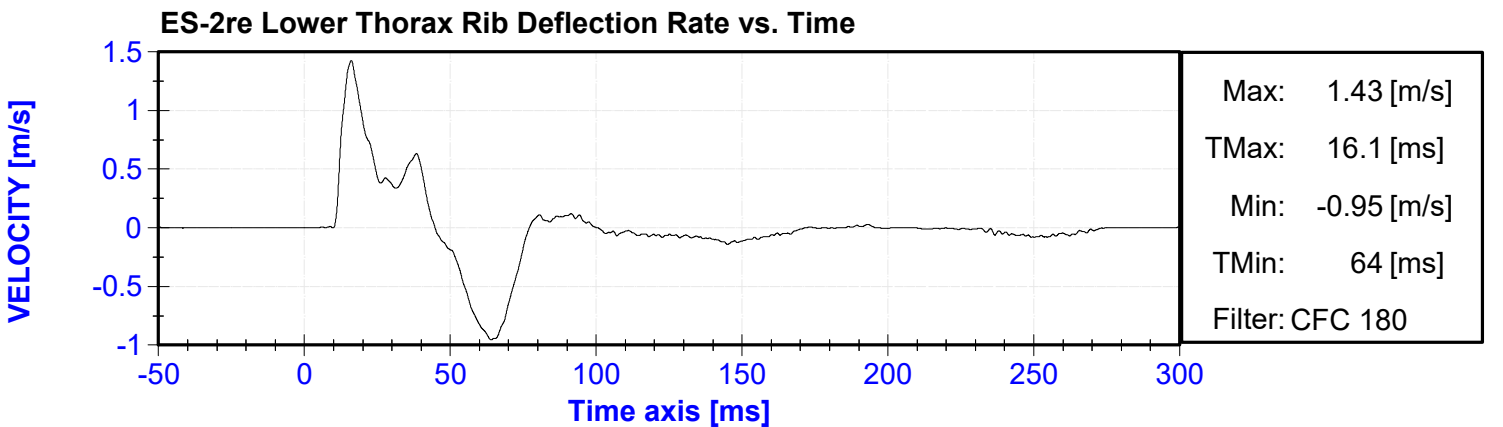
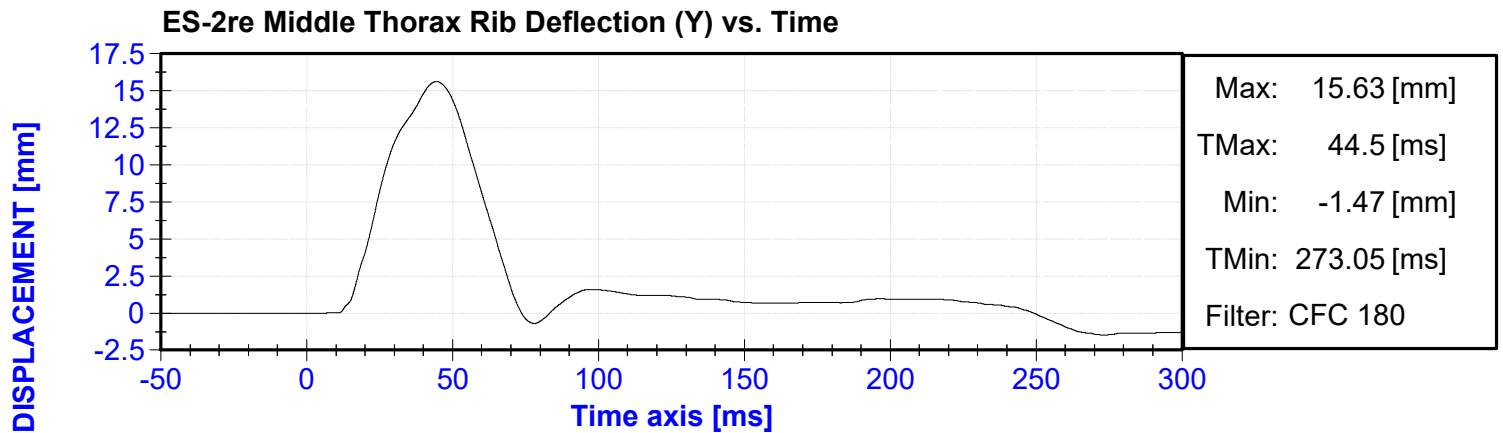
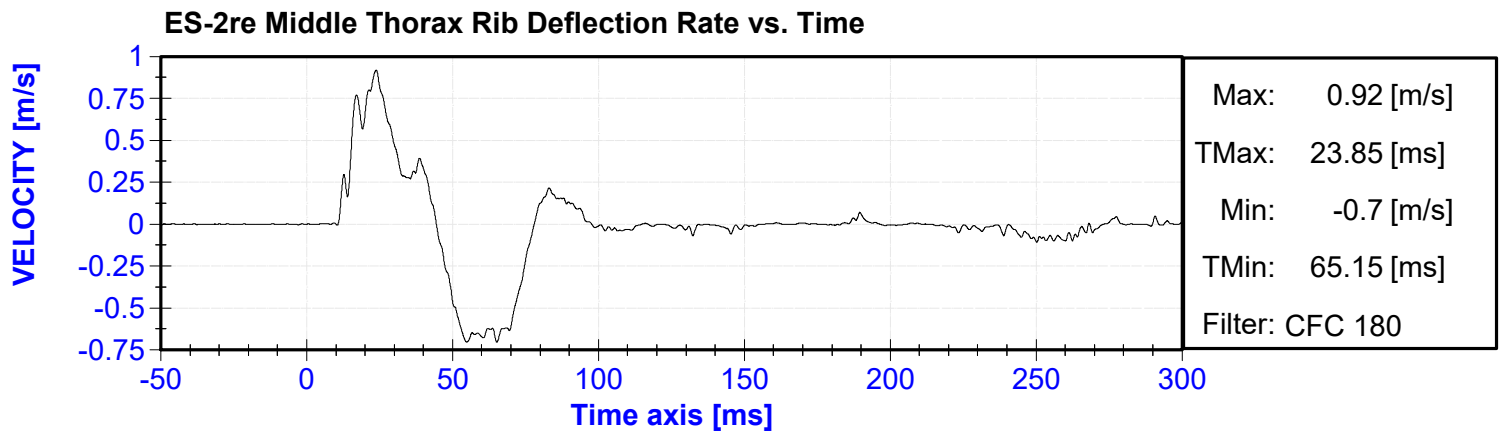
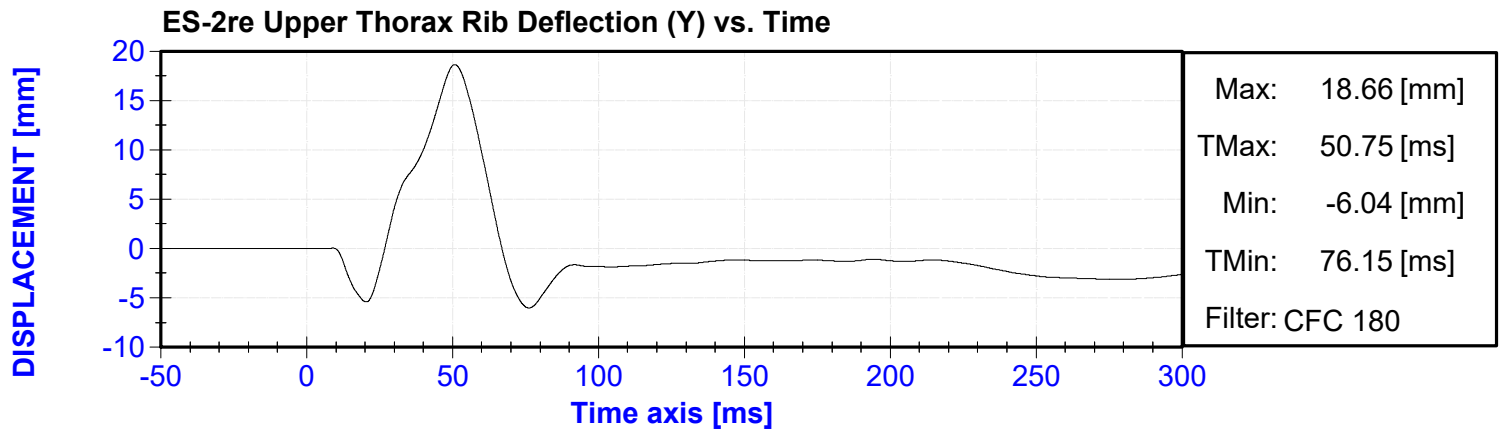


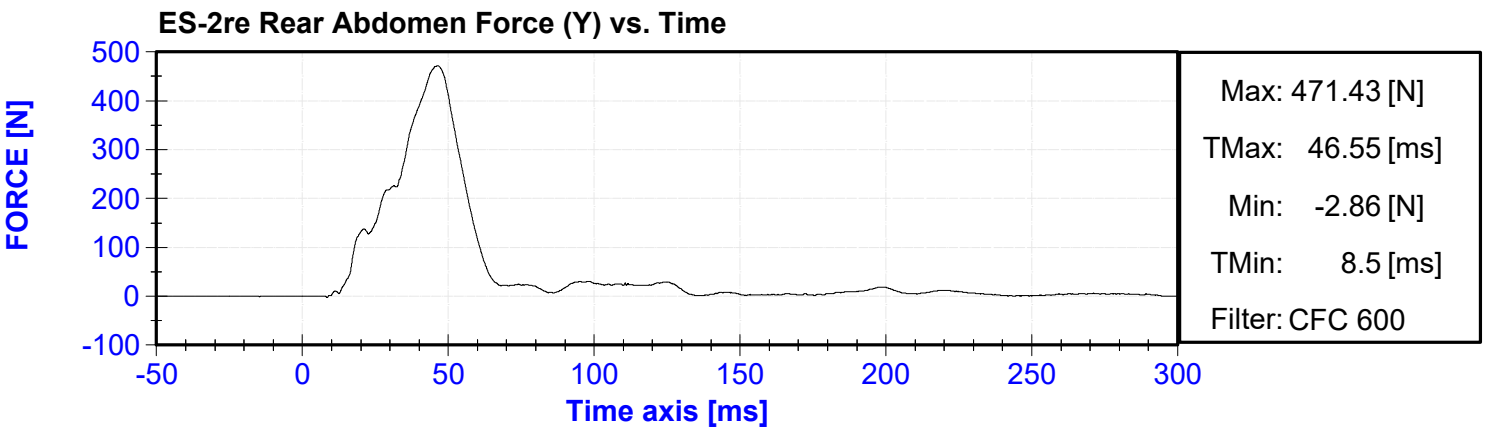
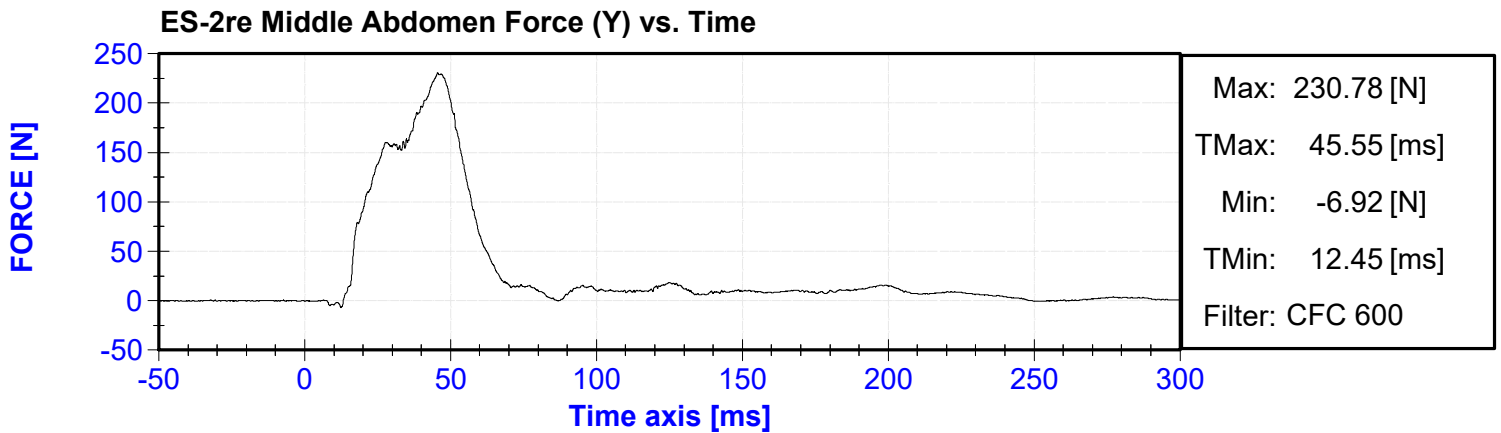
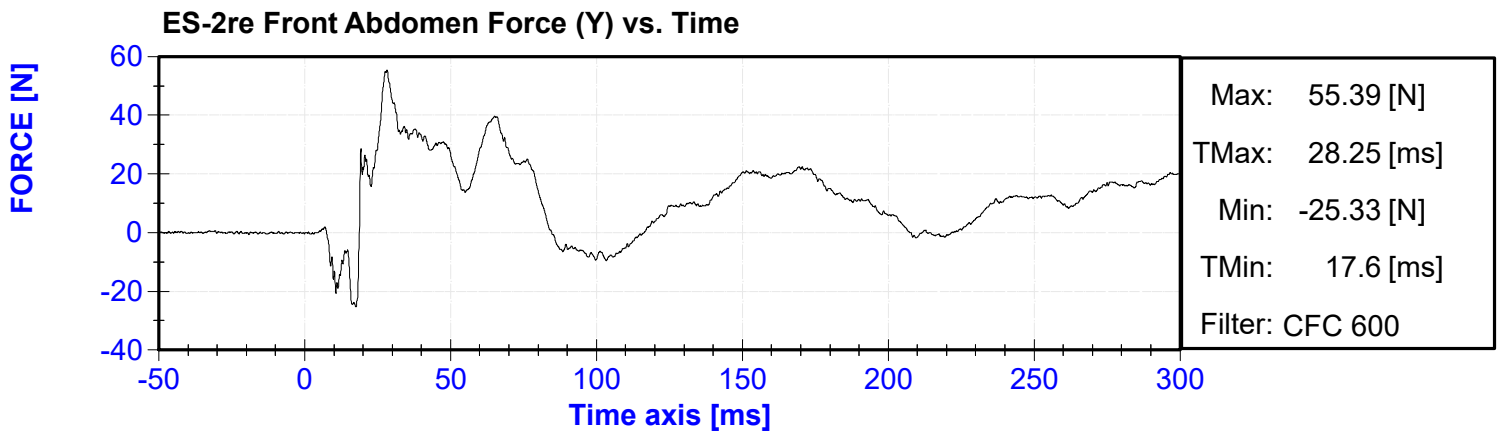
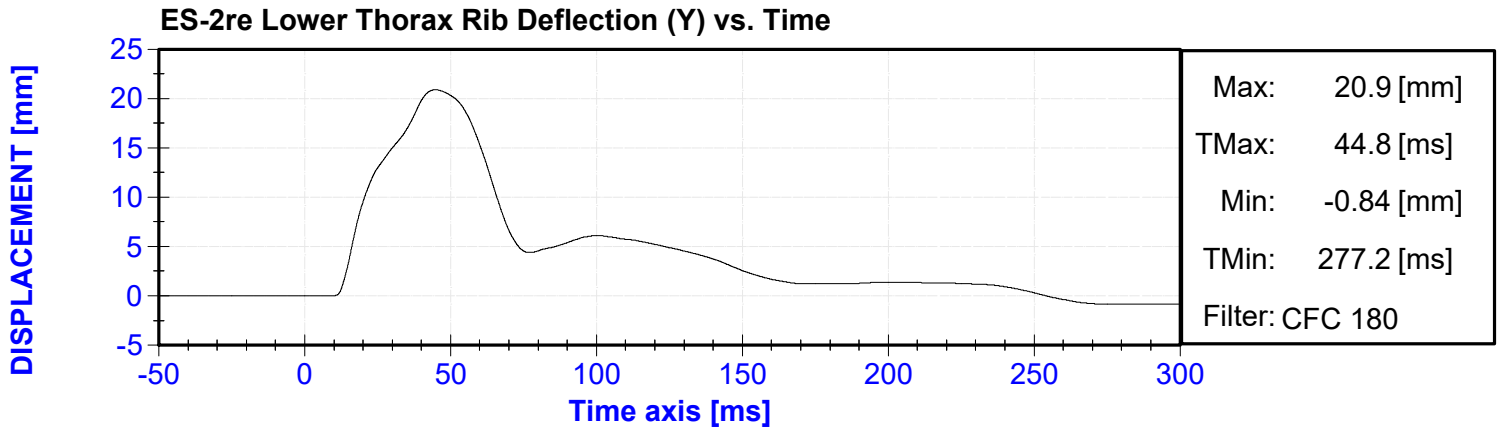
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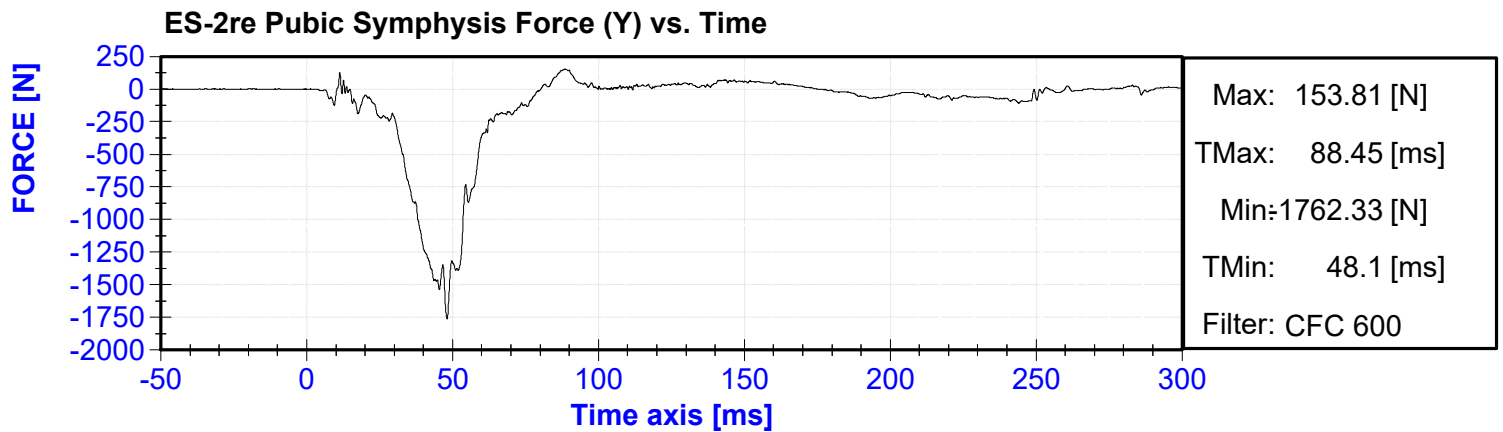
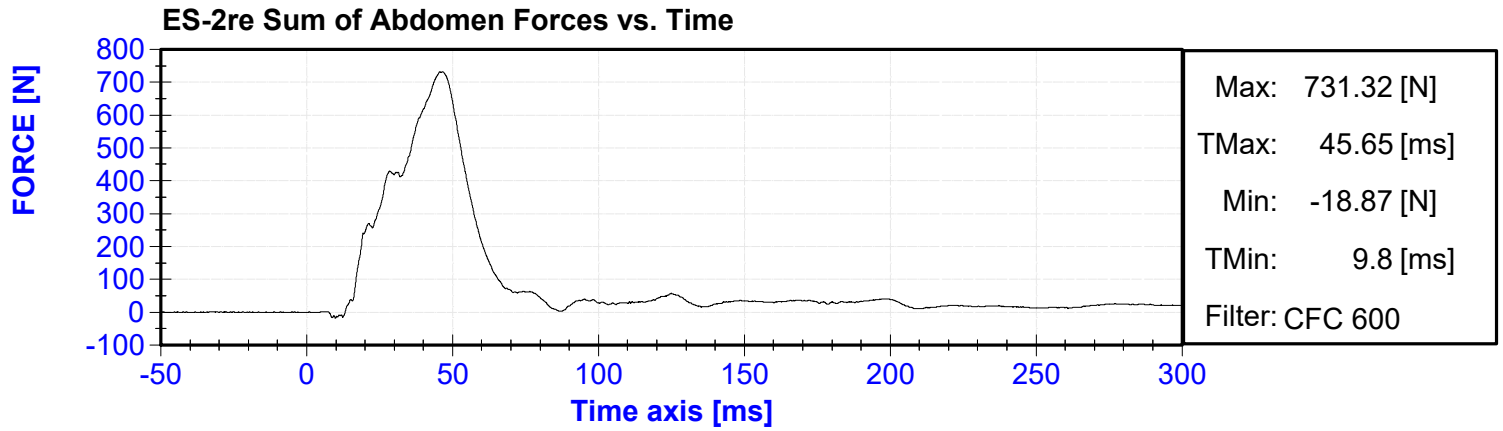
ES-2re Head Resultant Acceleration vs. Time











APPENDIX III

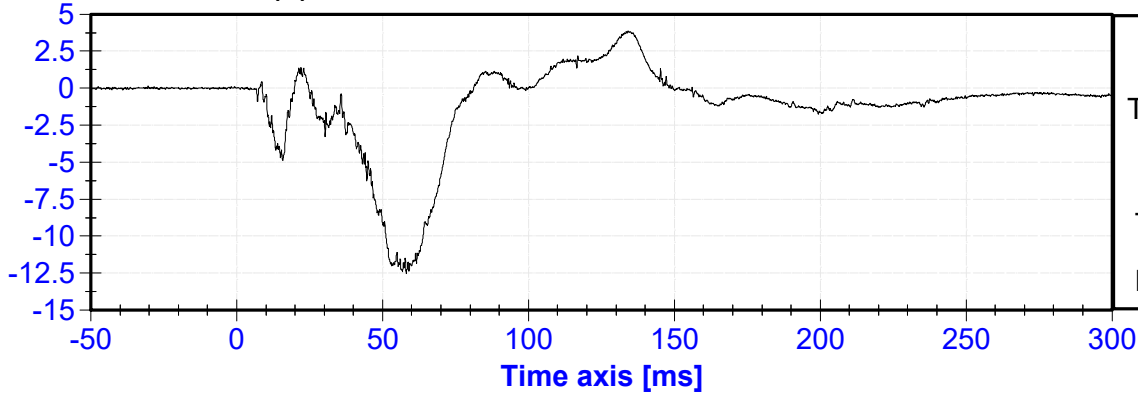
SID-IIs DUMMY RESPONSE DATA TRACES

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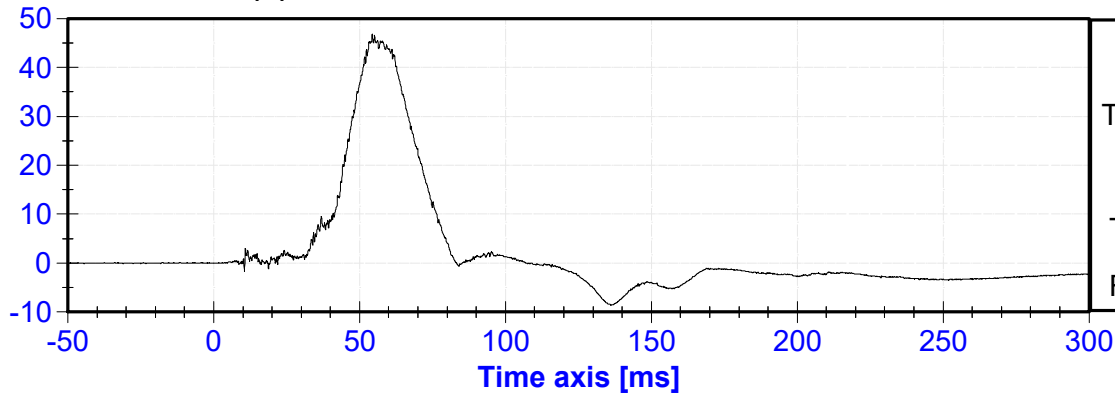
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SID-IIs Head (X) Acceleration vs. Time



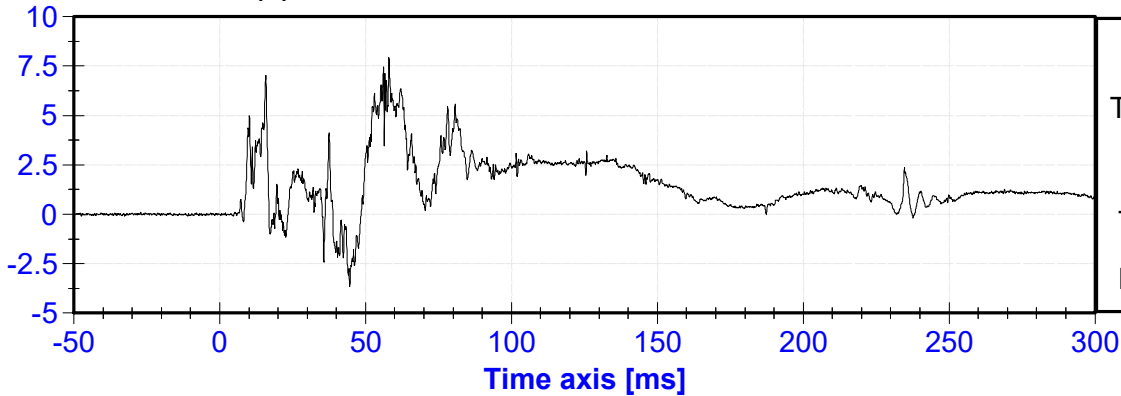
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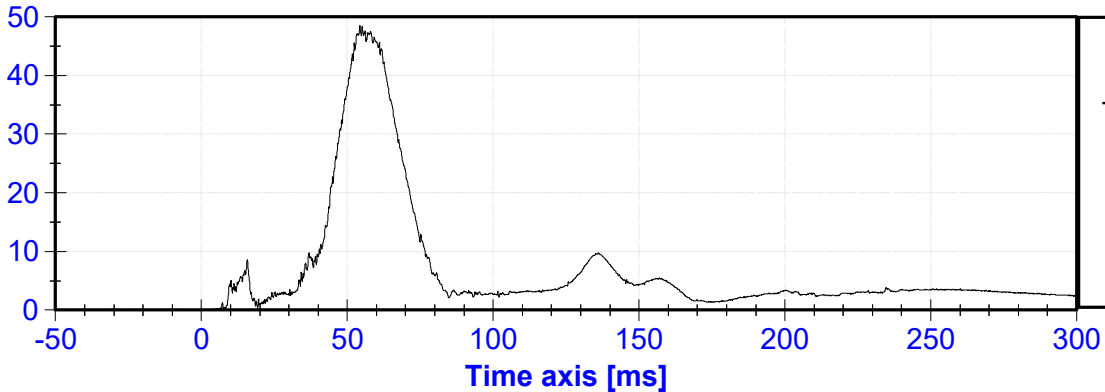
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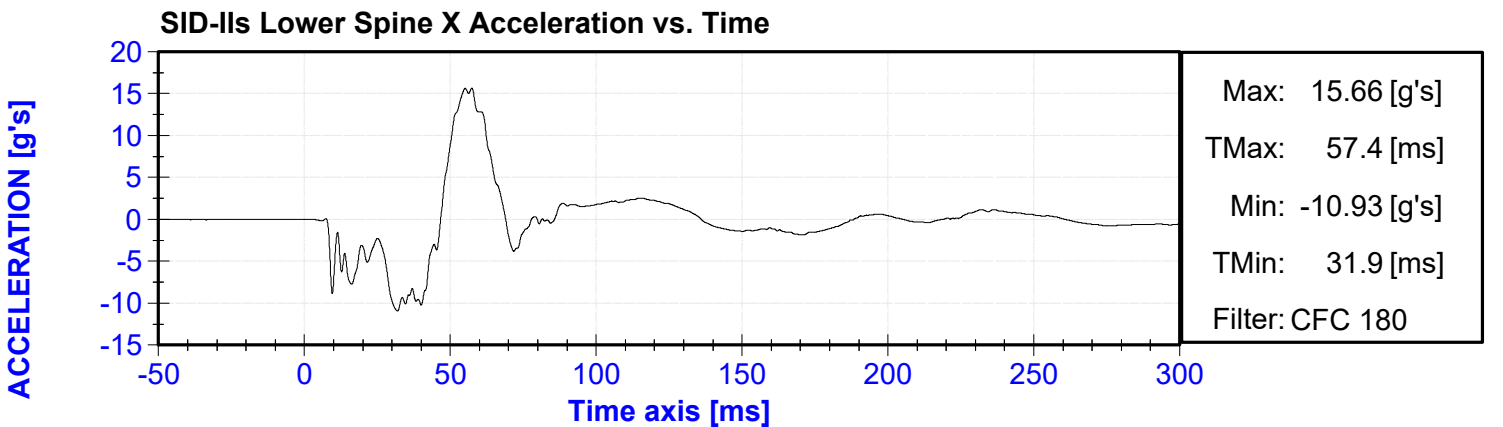
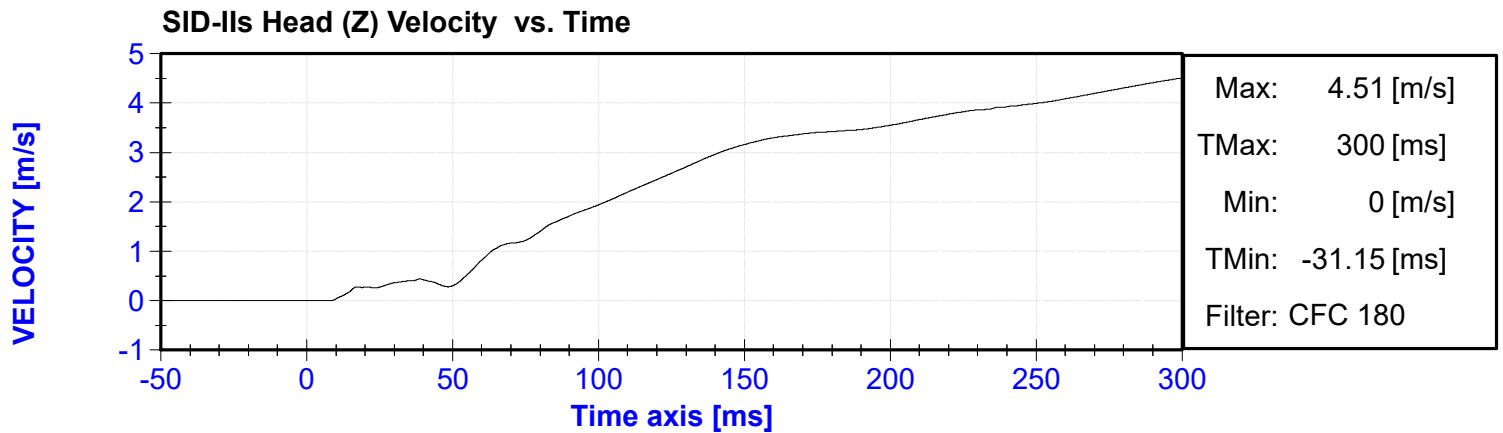
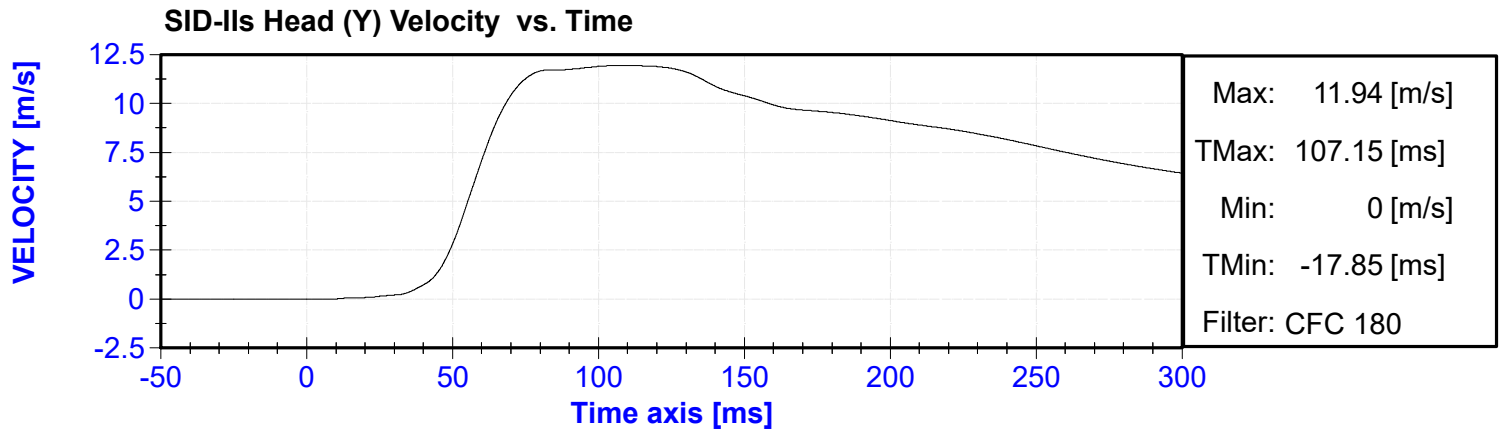
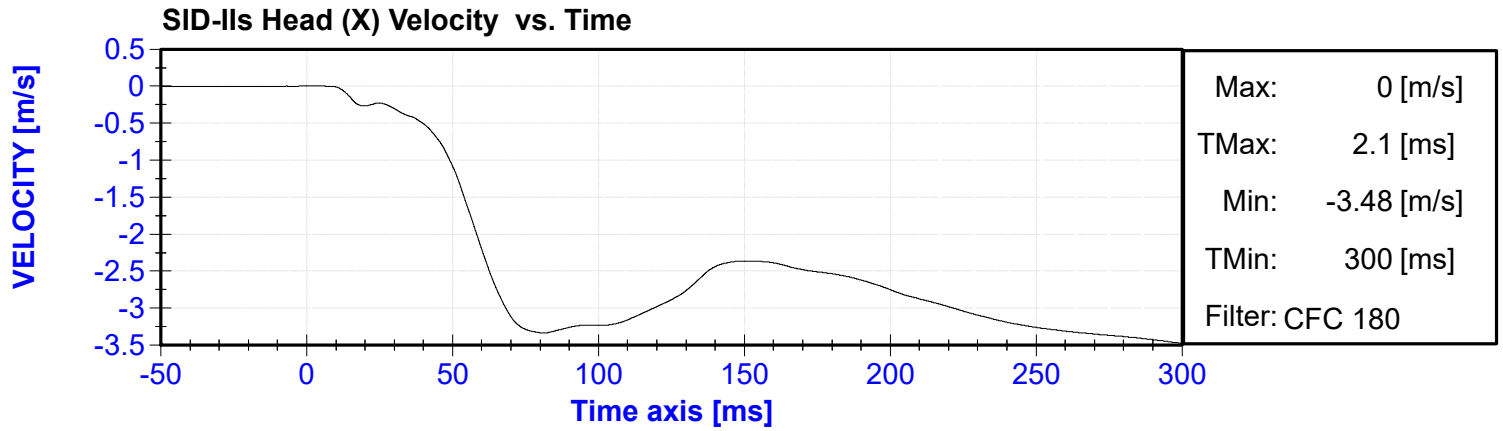
SID-IIs Head (Z) Acceleration vs. Time



ACCELERATION [g's]

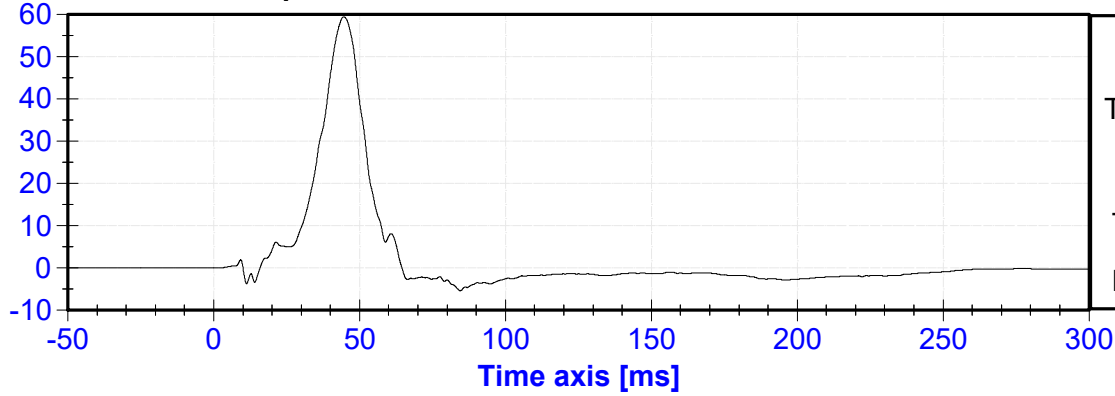
SID-IIs Head Resultant Acceleration vs. Time





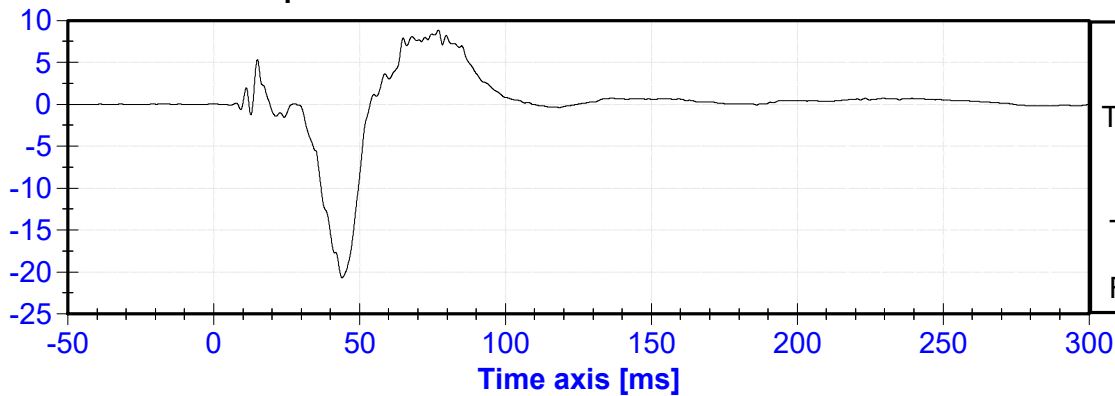
ACCELERATION [g's]

SID-IIs Lower Spine Y Acceleration vs. Time



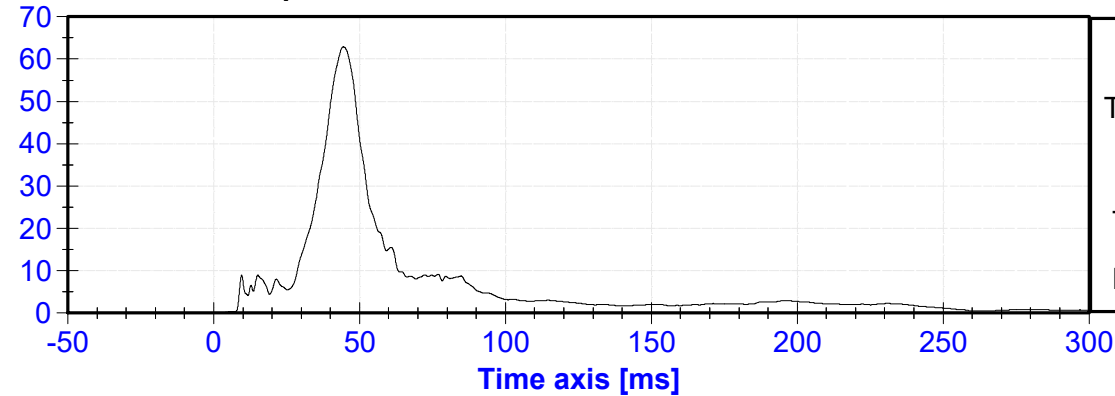
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SID-IIs Lower Spine Z Acceleration vs. Time



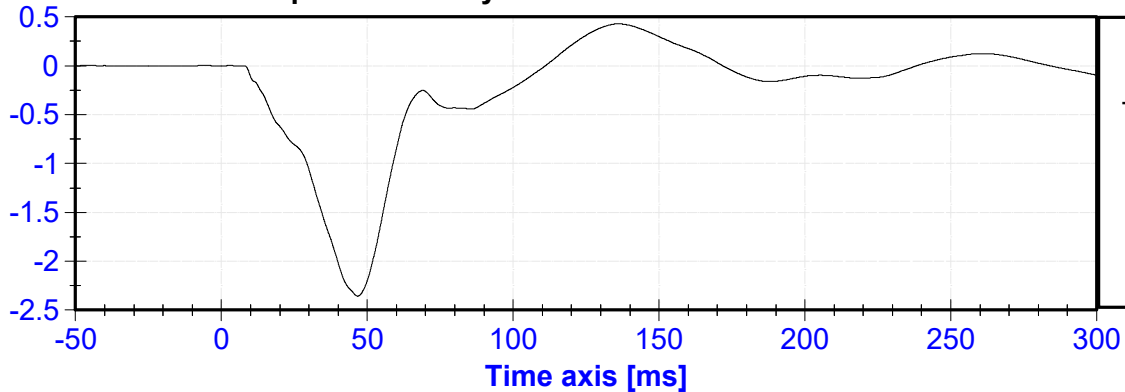
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SID-IIs Lower Spine Resultant Acceleration vs. Time

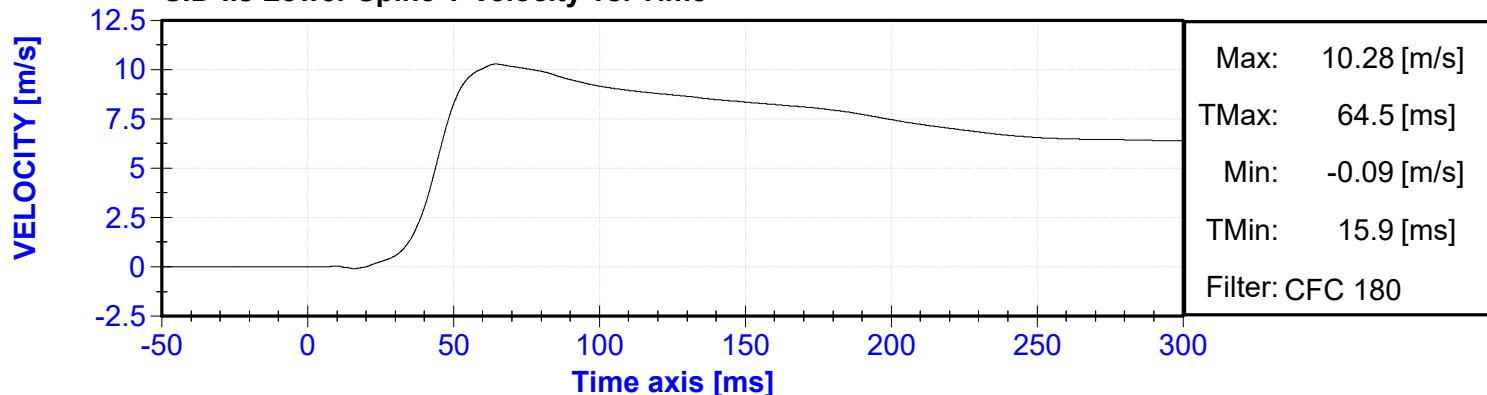


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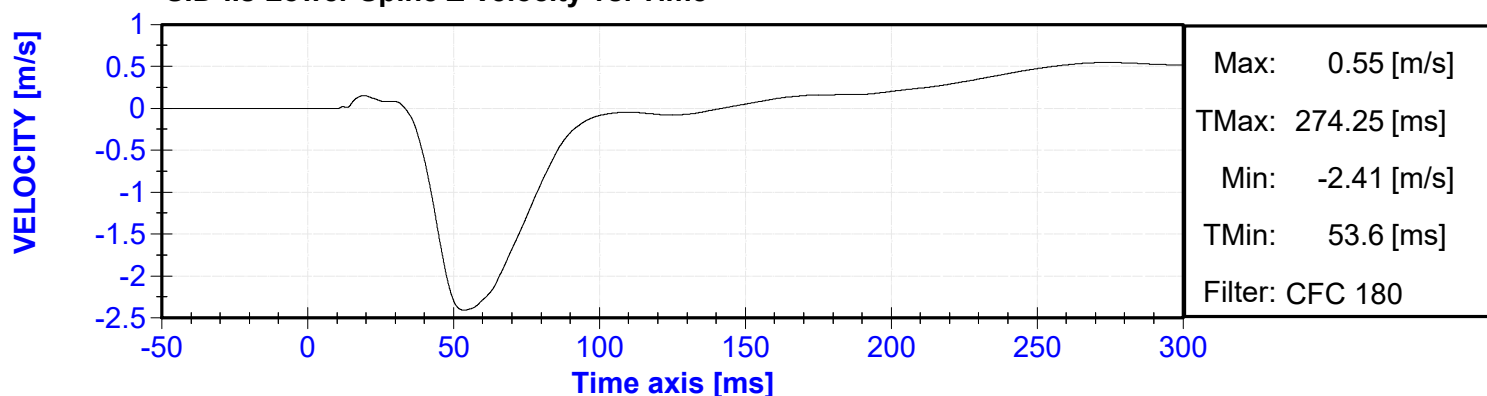
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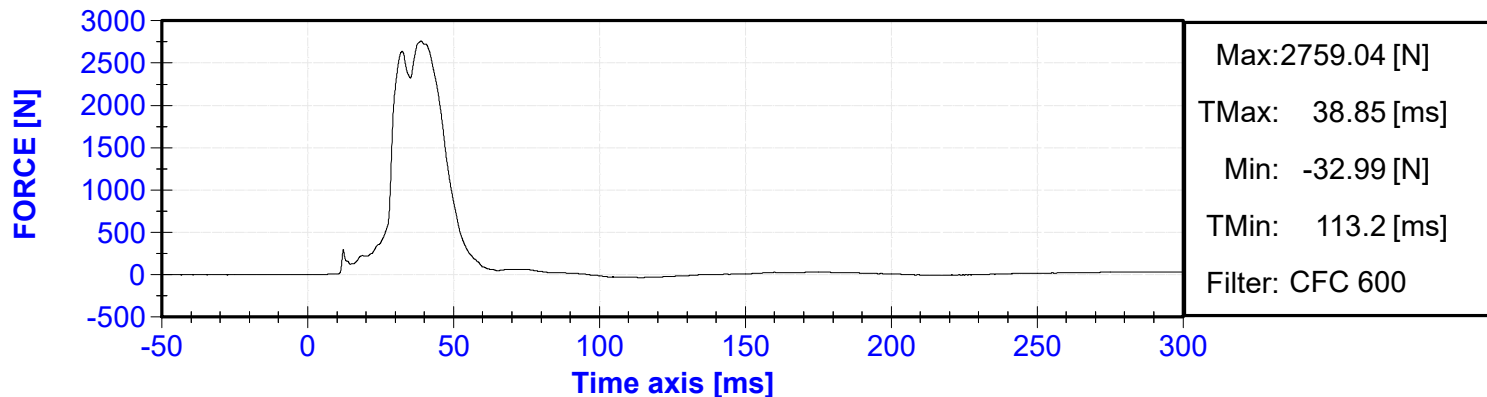
SID-IIs Lower Spine Y Velocity vs. Time



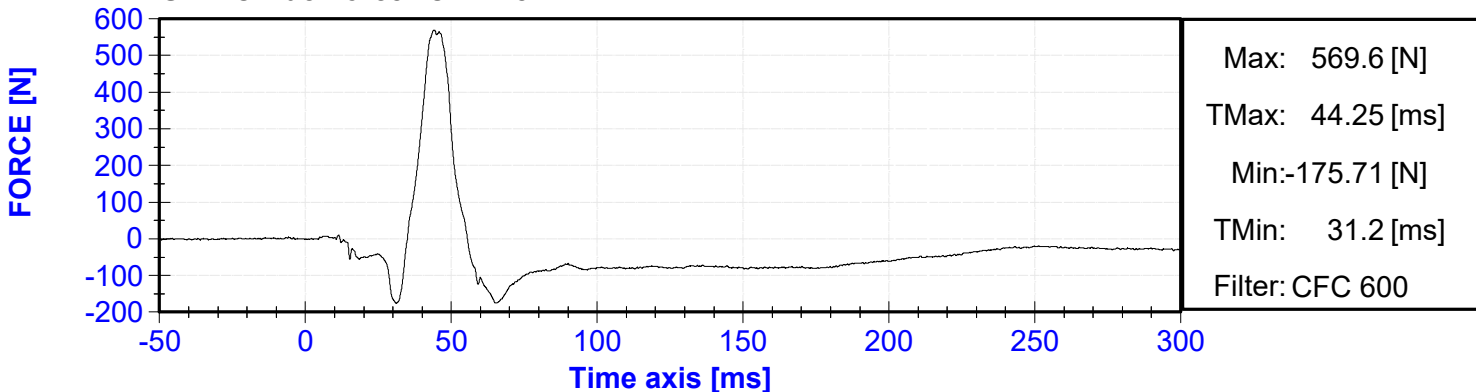
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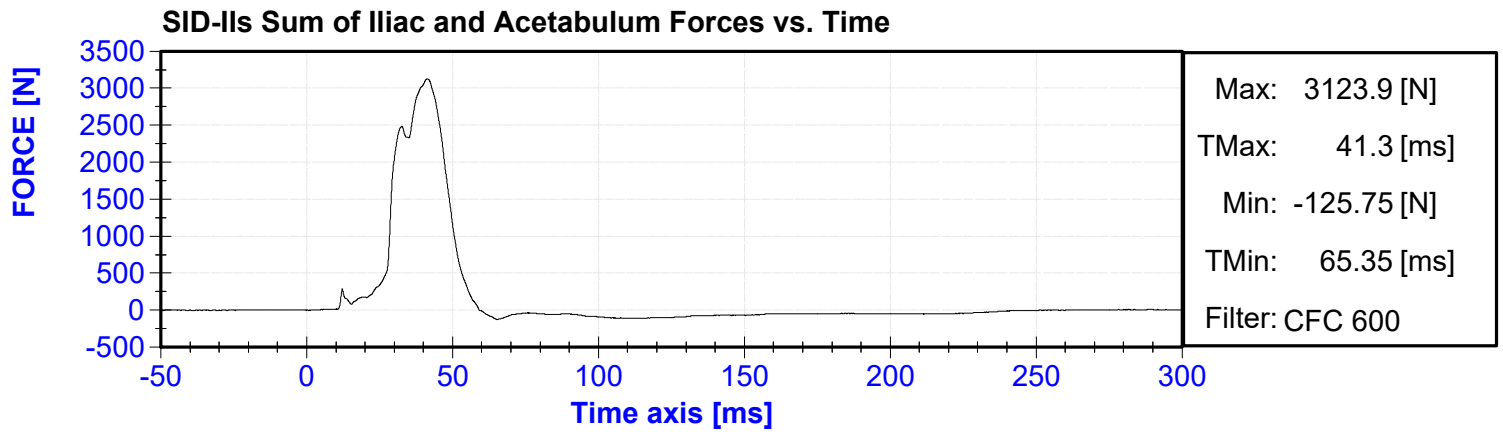


SID-IIs Acetabulum Force vs. Time



SID-IIs Iliac Force vs. Time



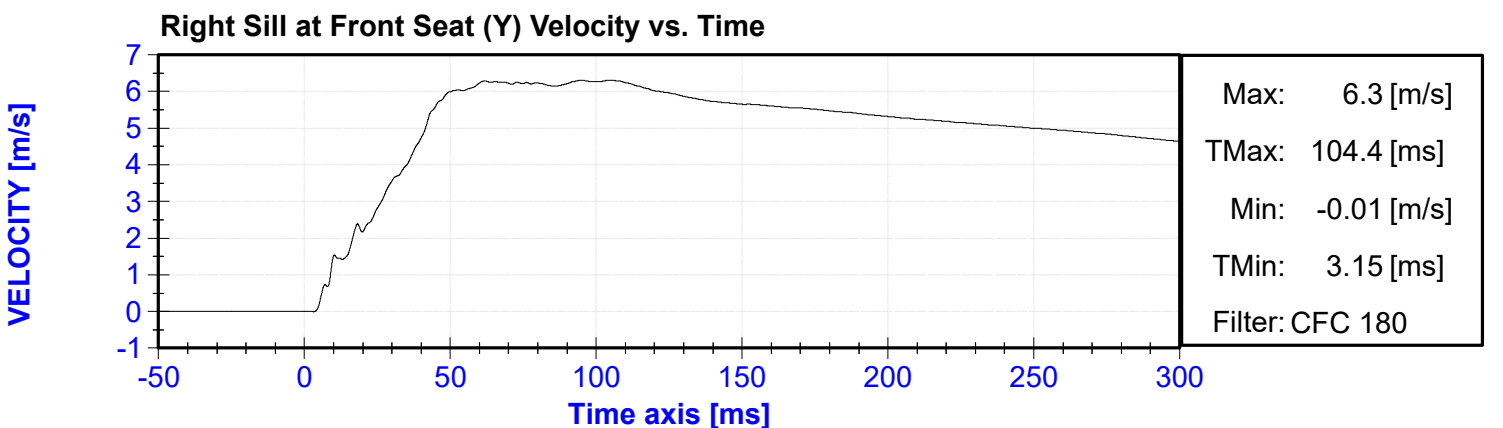
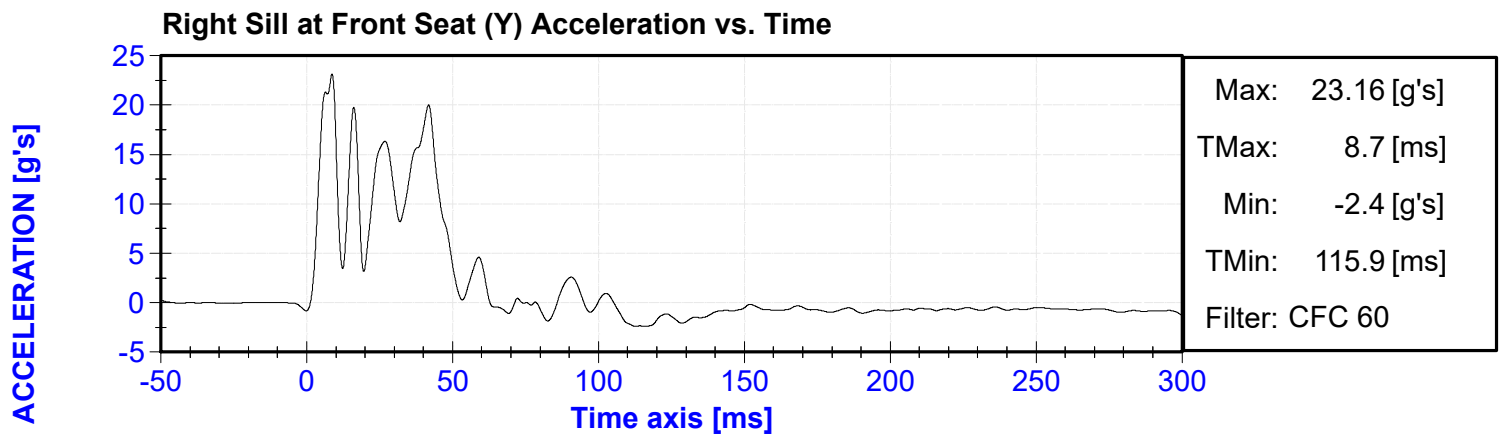
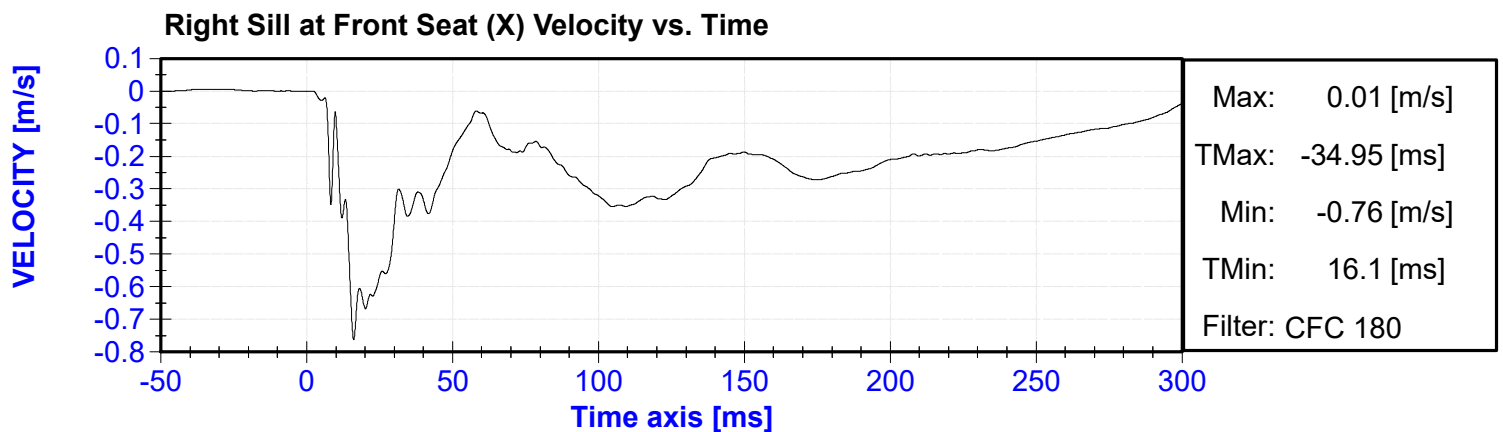
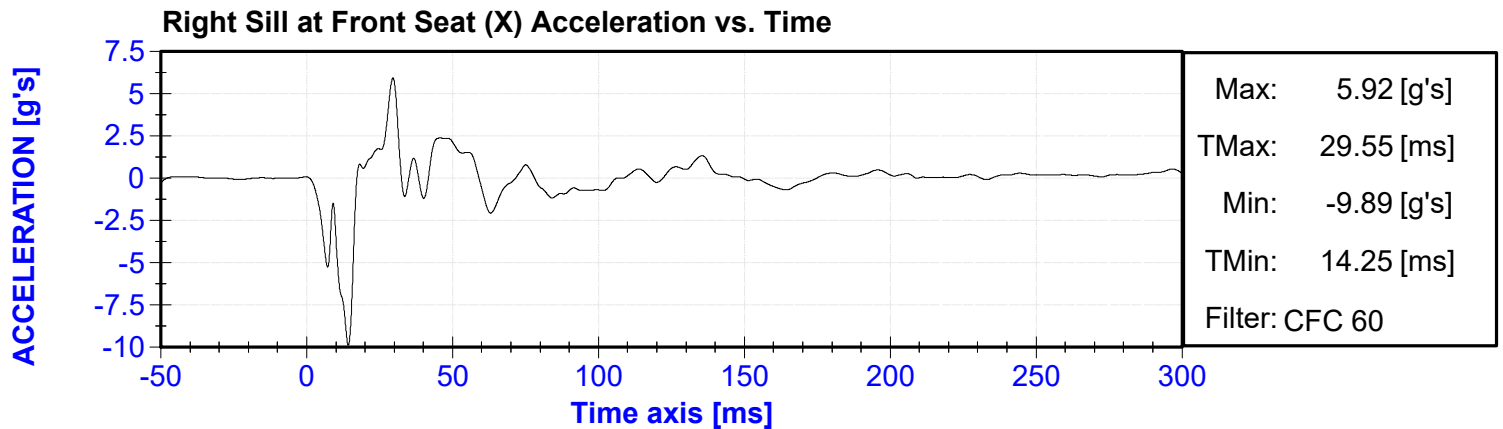


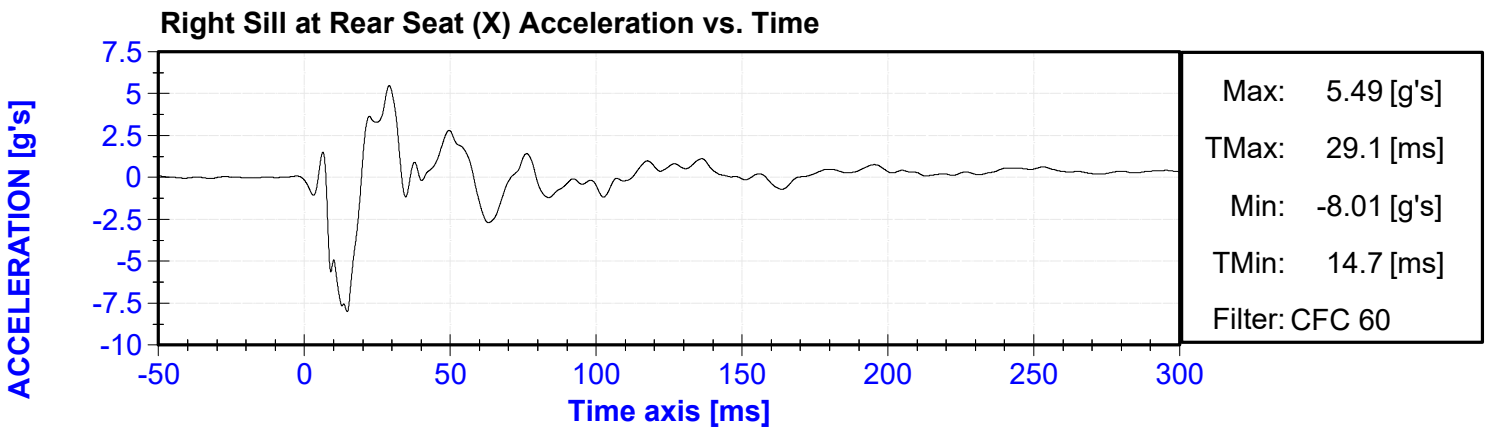
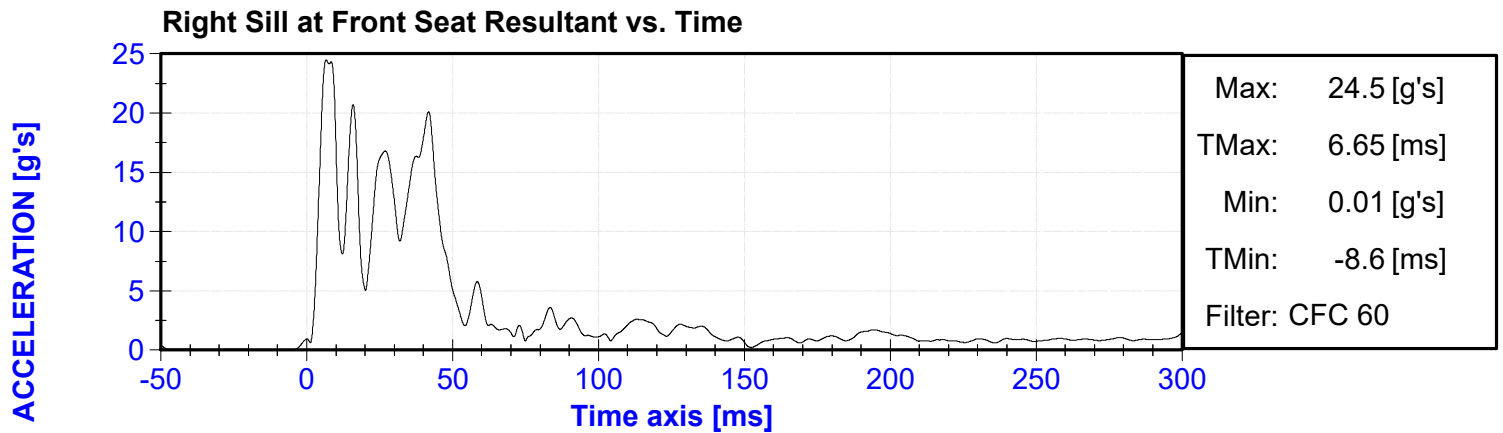
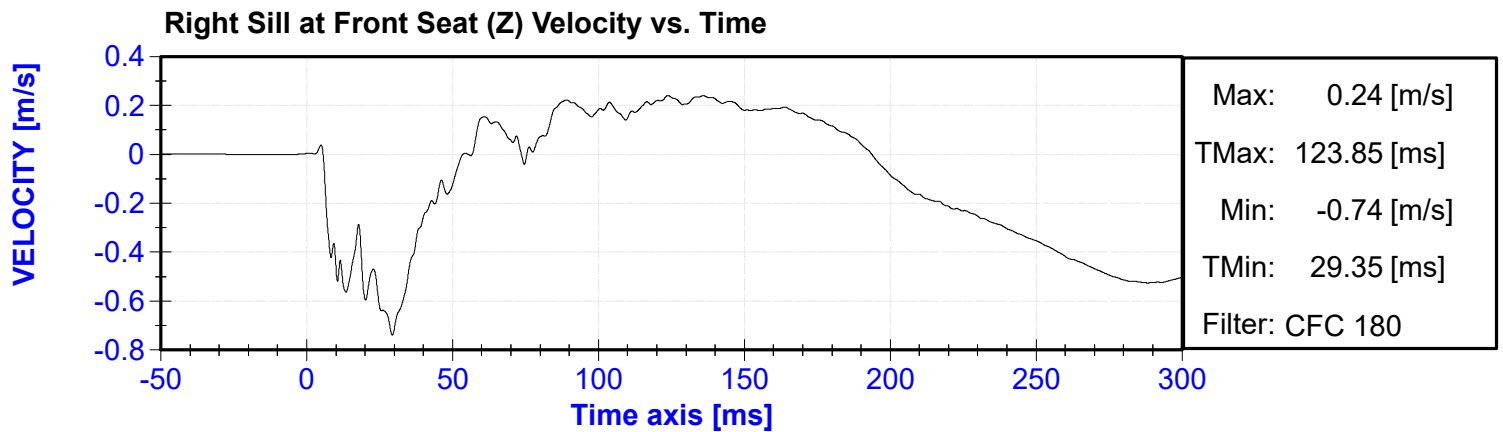
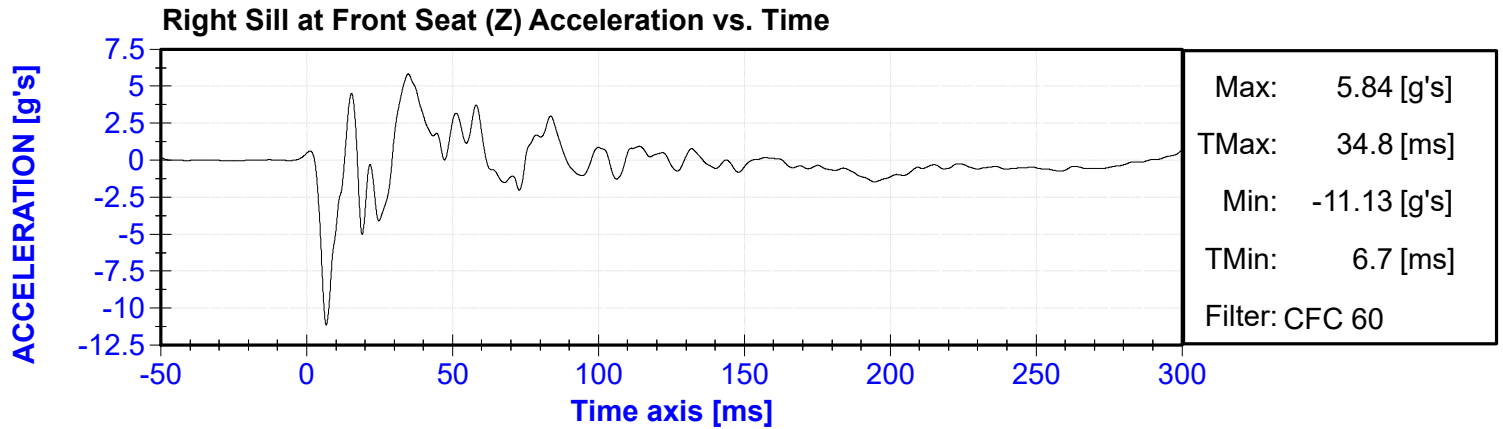
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DATA

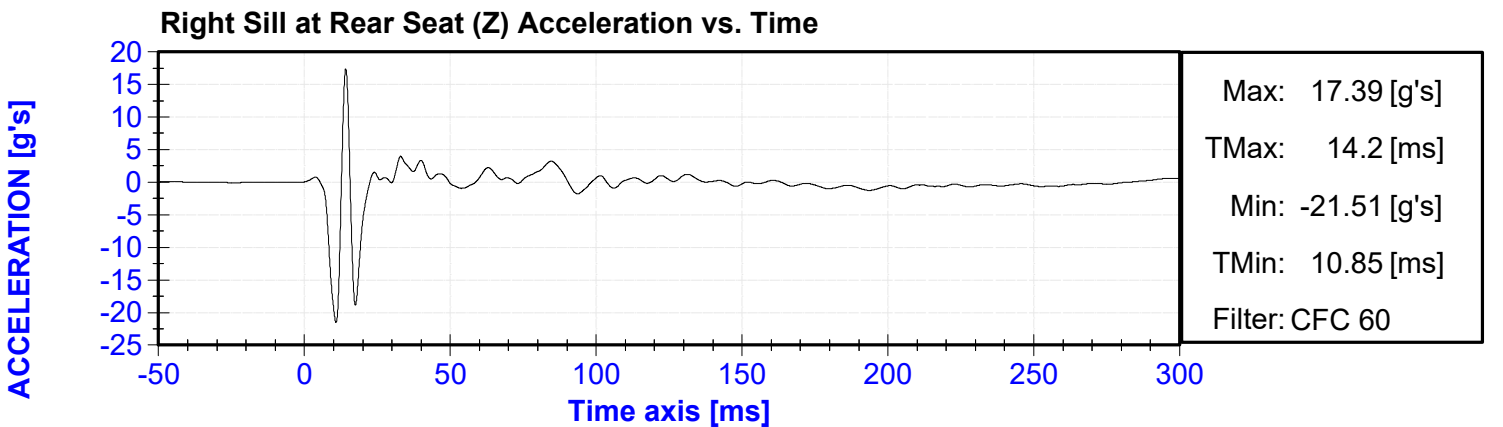
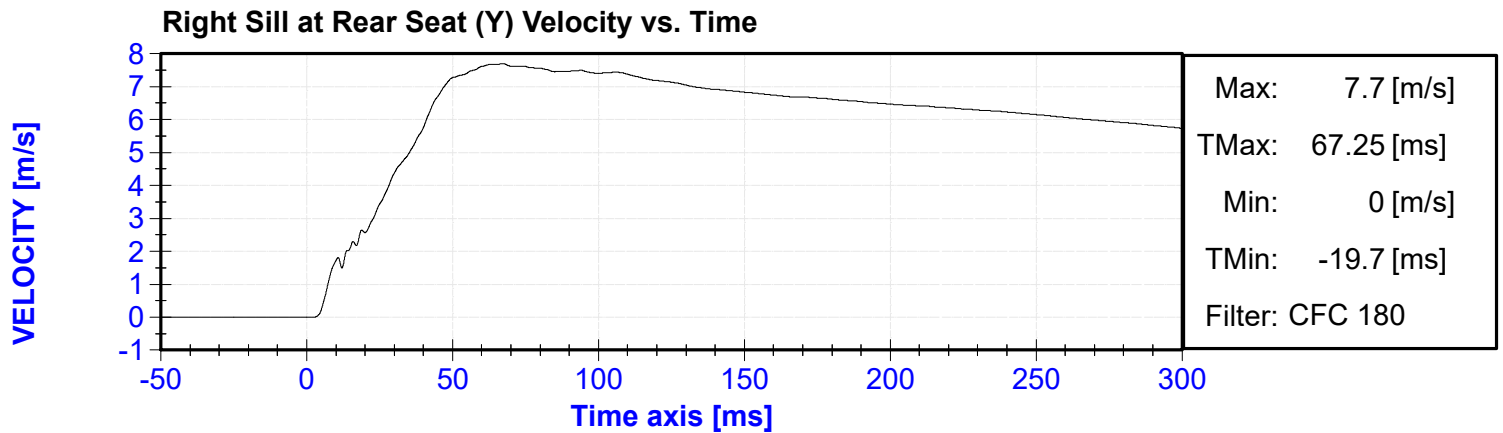
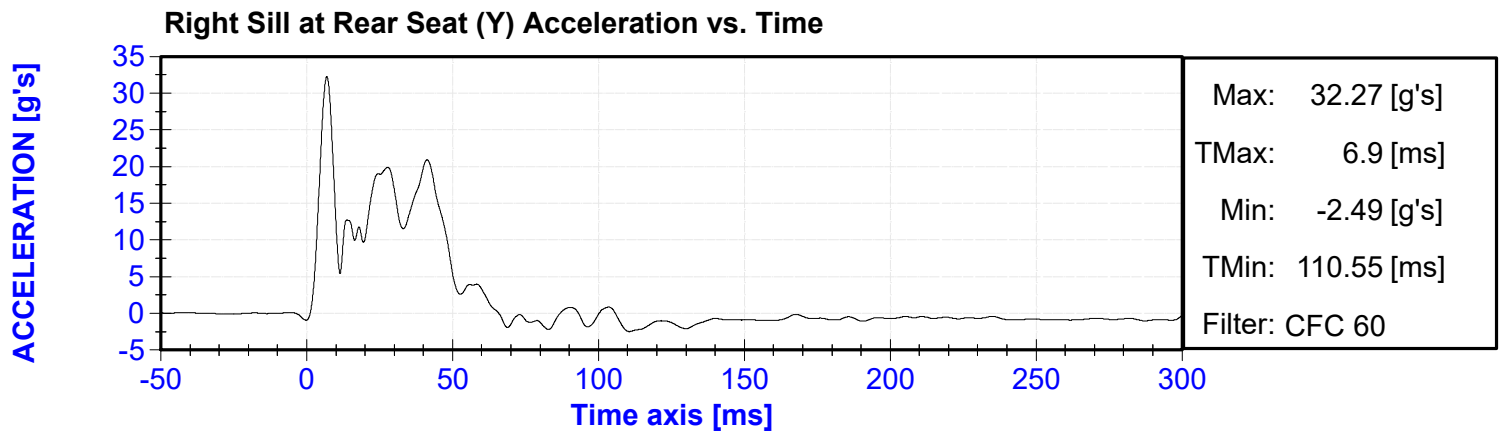
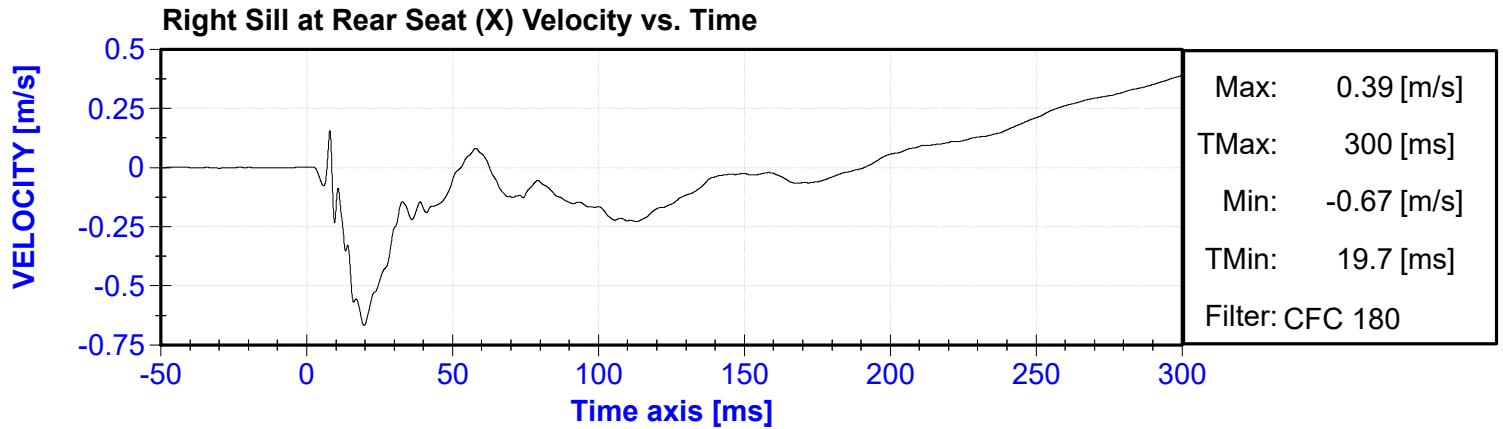
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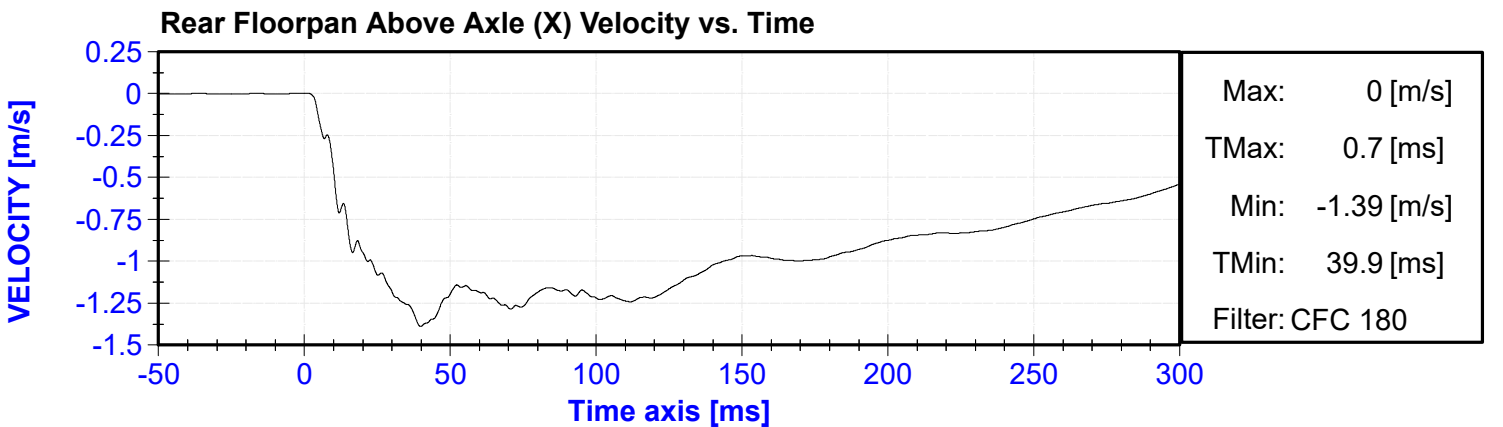
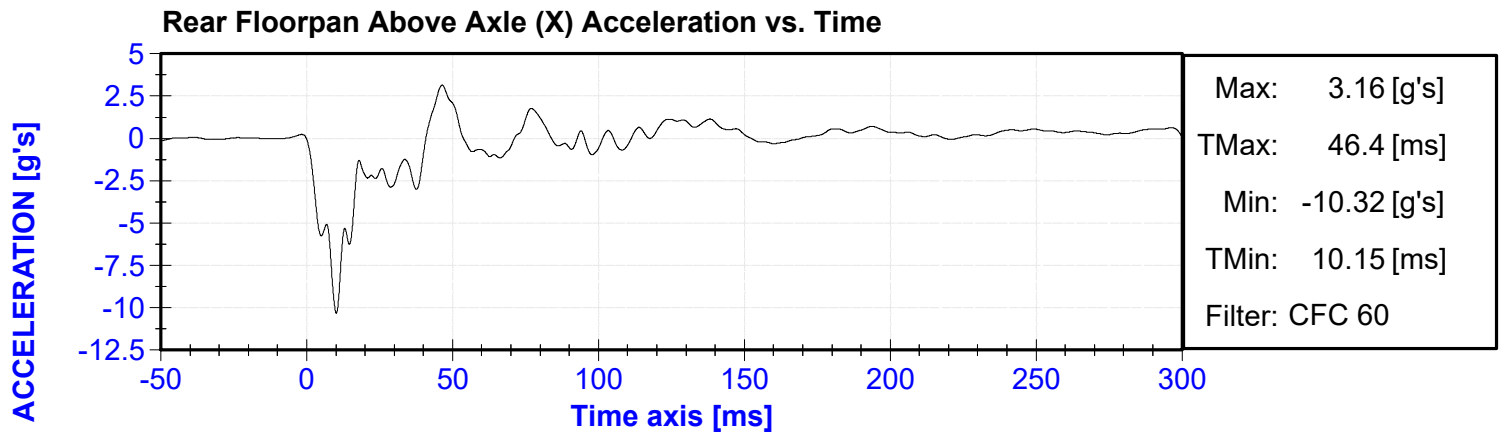
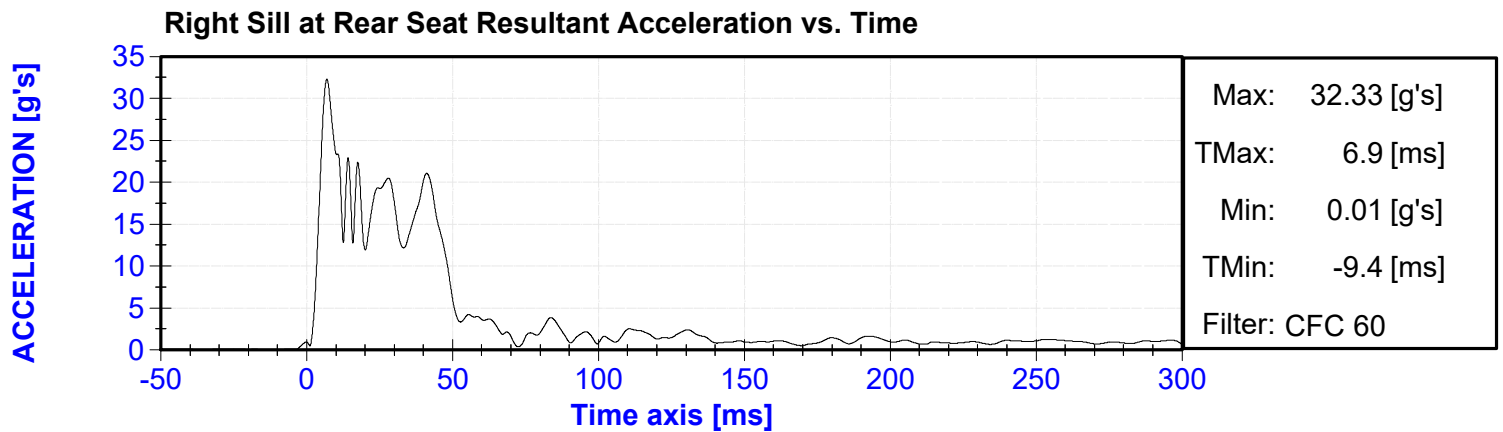
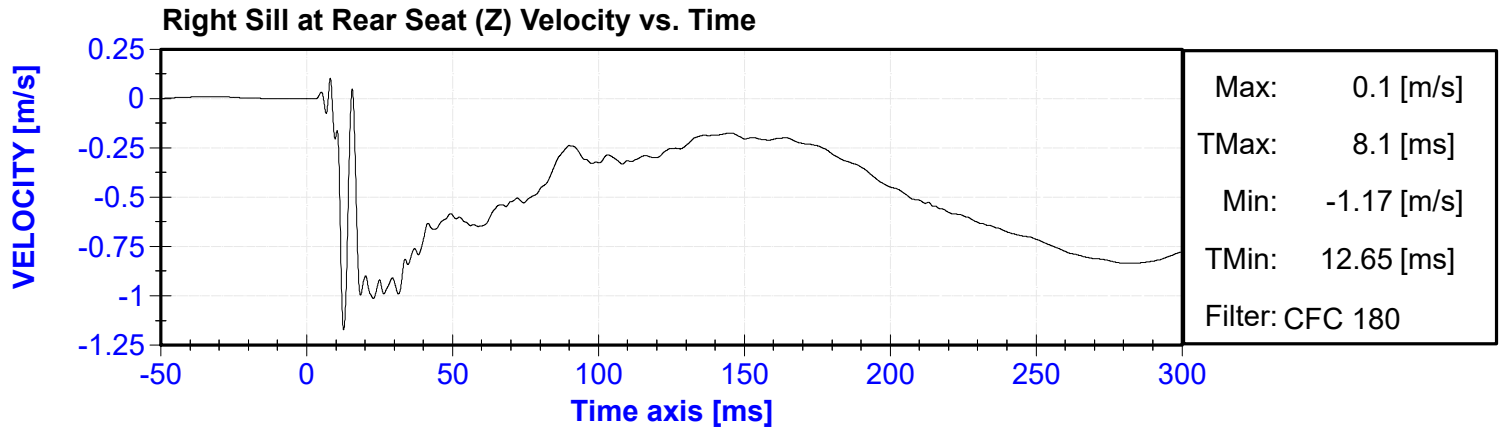
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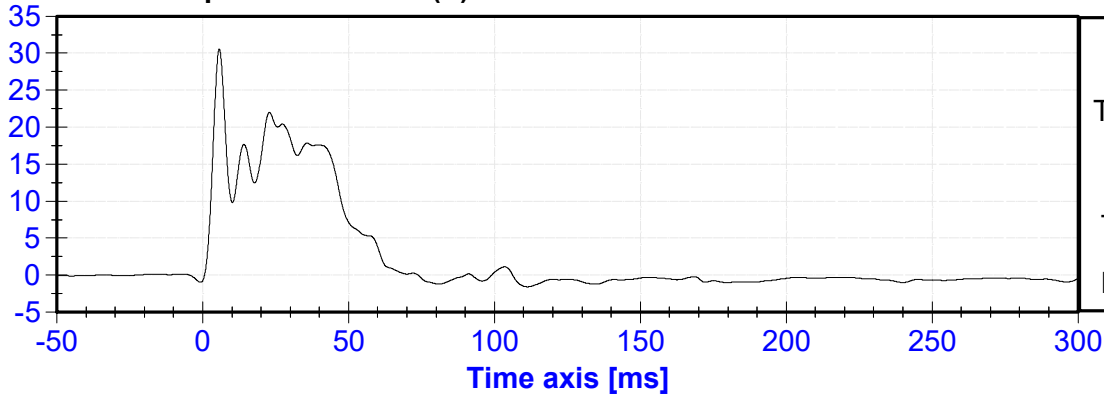






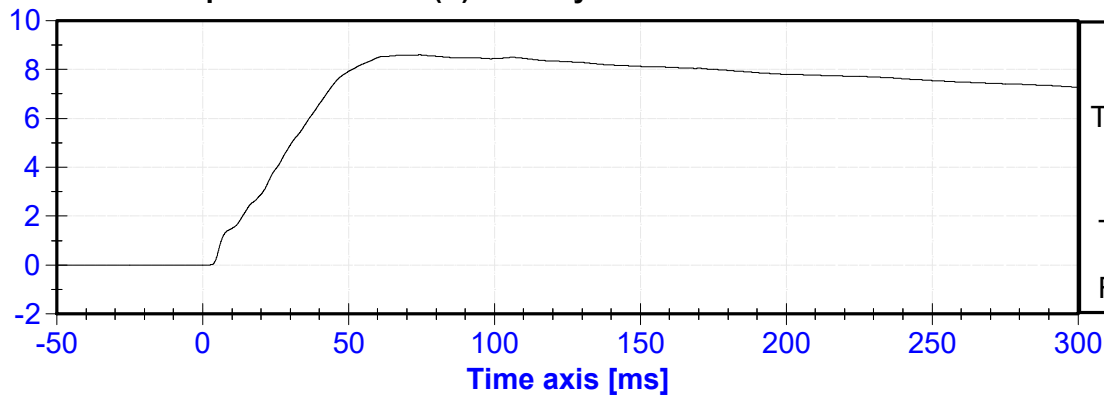
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Rear Floorpan Above Axle (Y) Acceleration vs. Time



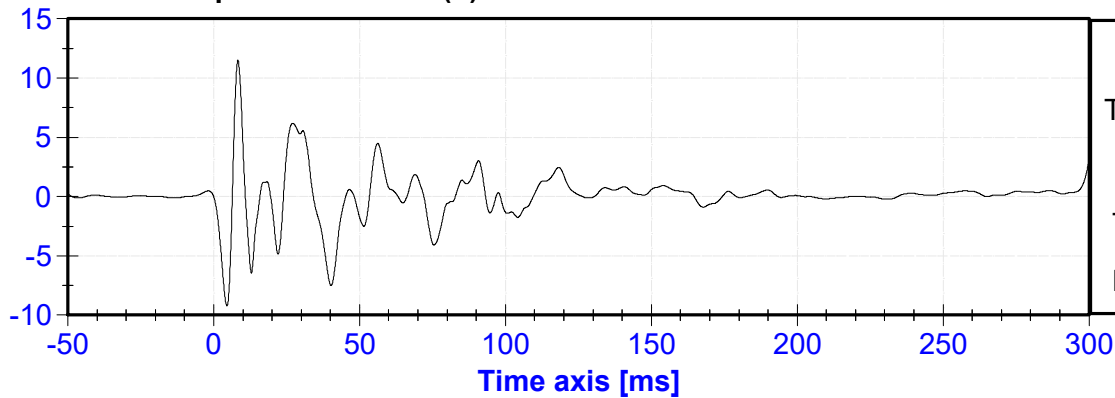
VELOCITY [m/s]

Rear Floorpan Above Axle (Y) Velocity vs. Time



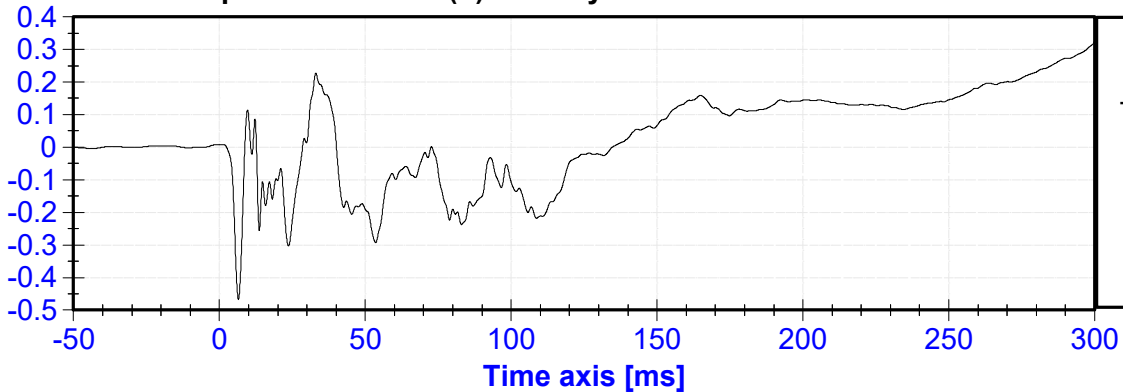
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Rear Floorpan Above Axle (Z) Acceleration vs. Time



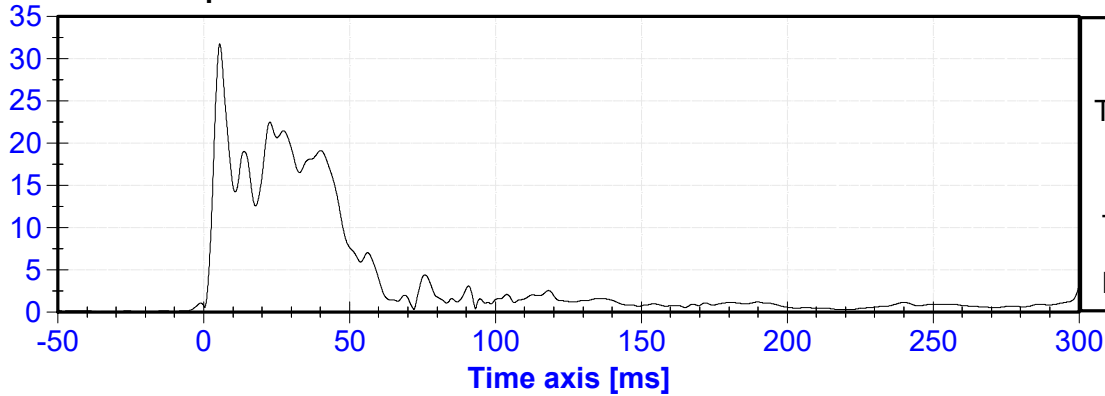
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Rear Floorpan Above Axle (Z) Velocity vs. Time



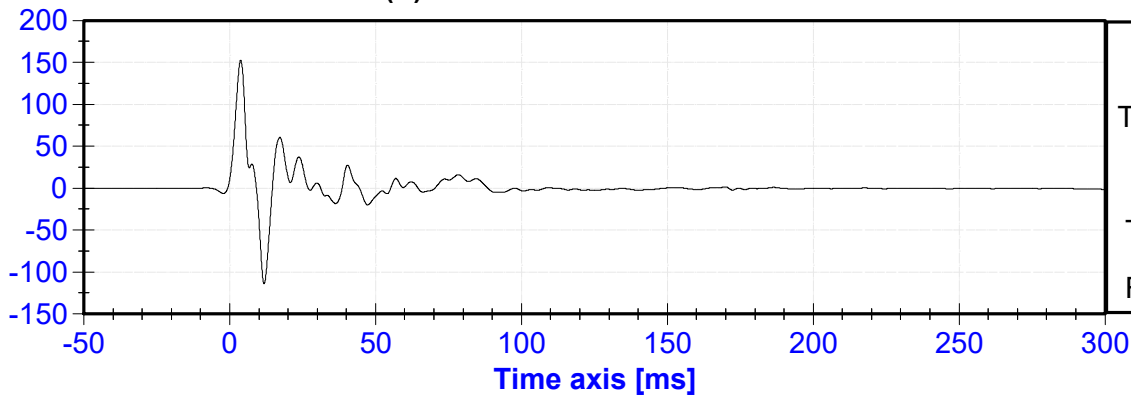
Rear Floorpan Above Axle Resultant Acceleration vs. Time

ACCELERATION [g's]



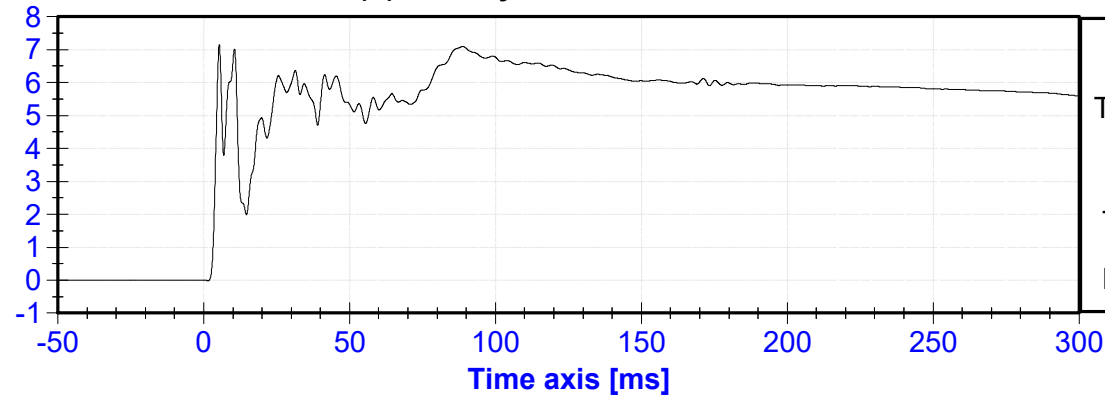
Left Sill at Rear Door (Y) Acceleration vs. Time

ACCELERATION [g's]



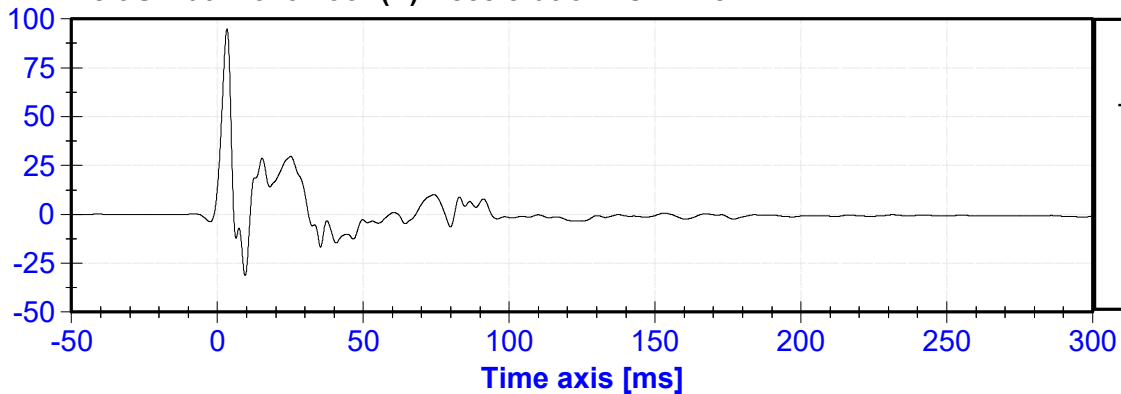
Left Sill at Rear Door (Y) Velocity vs. Time

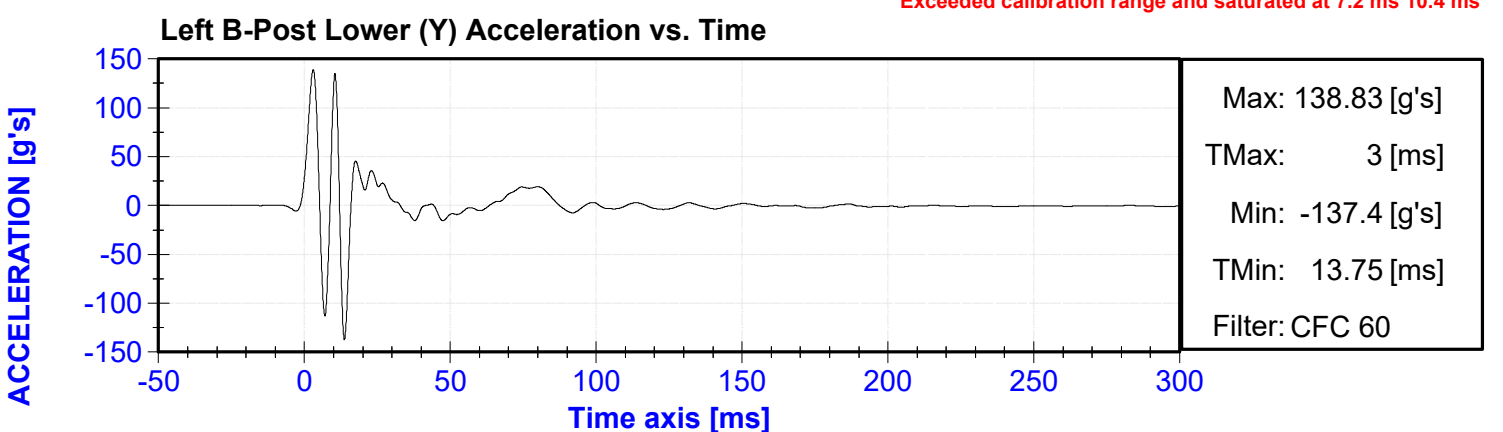
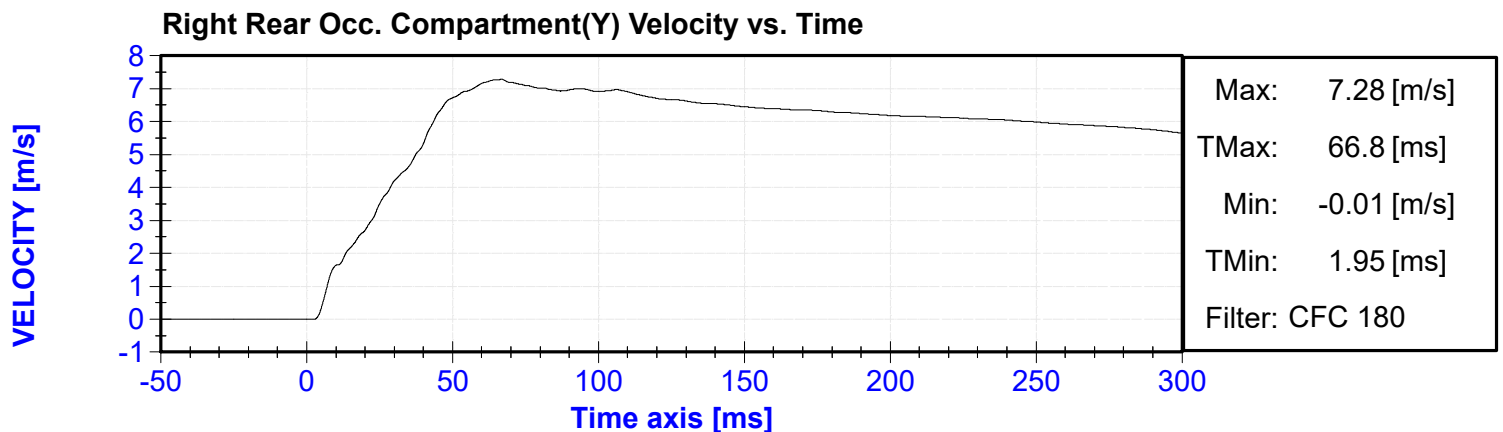
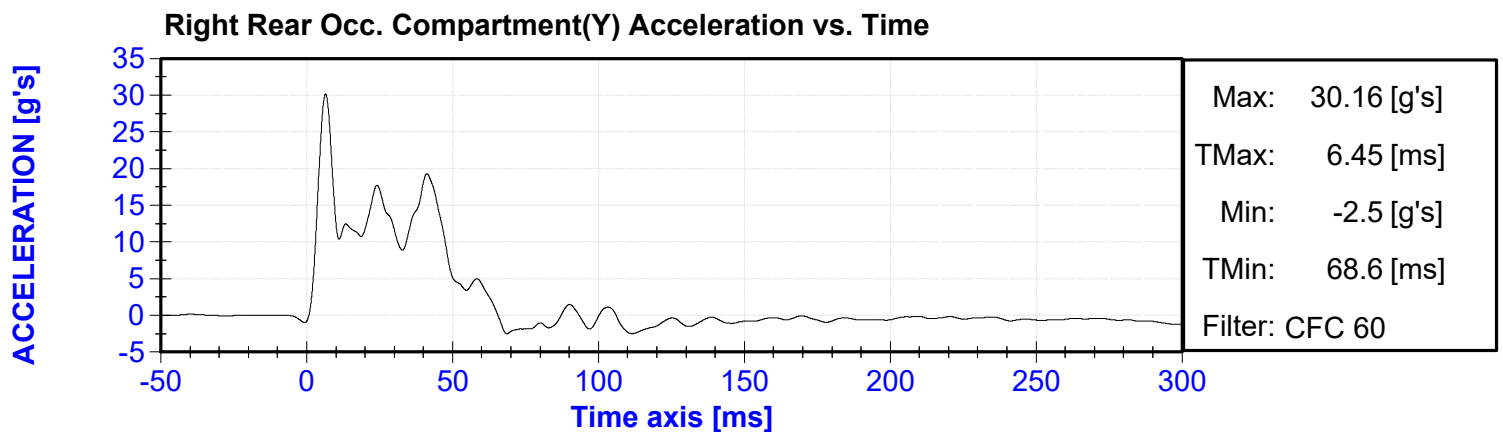
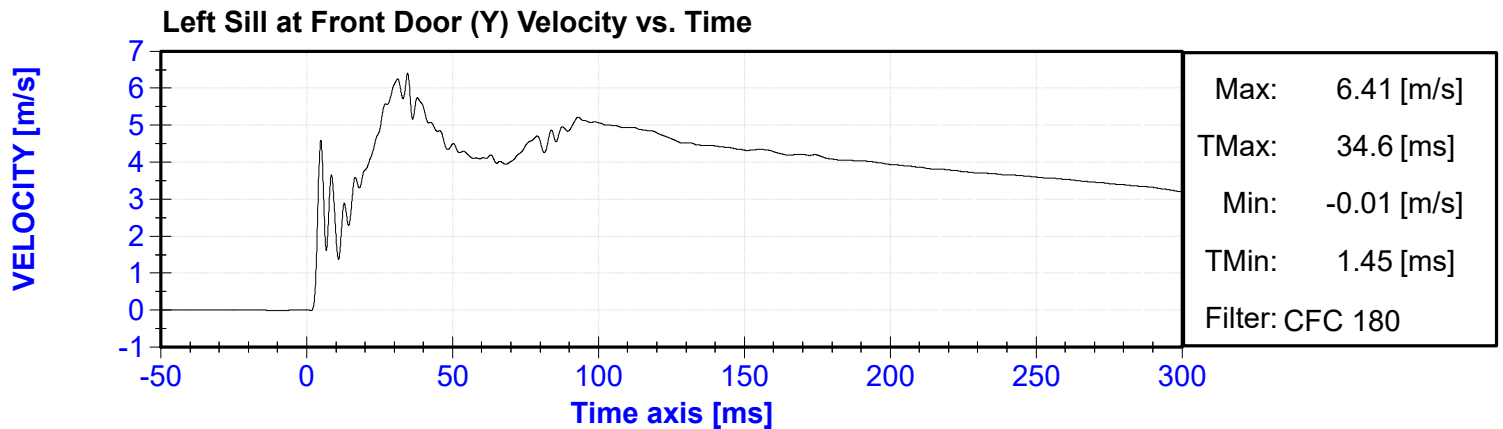
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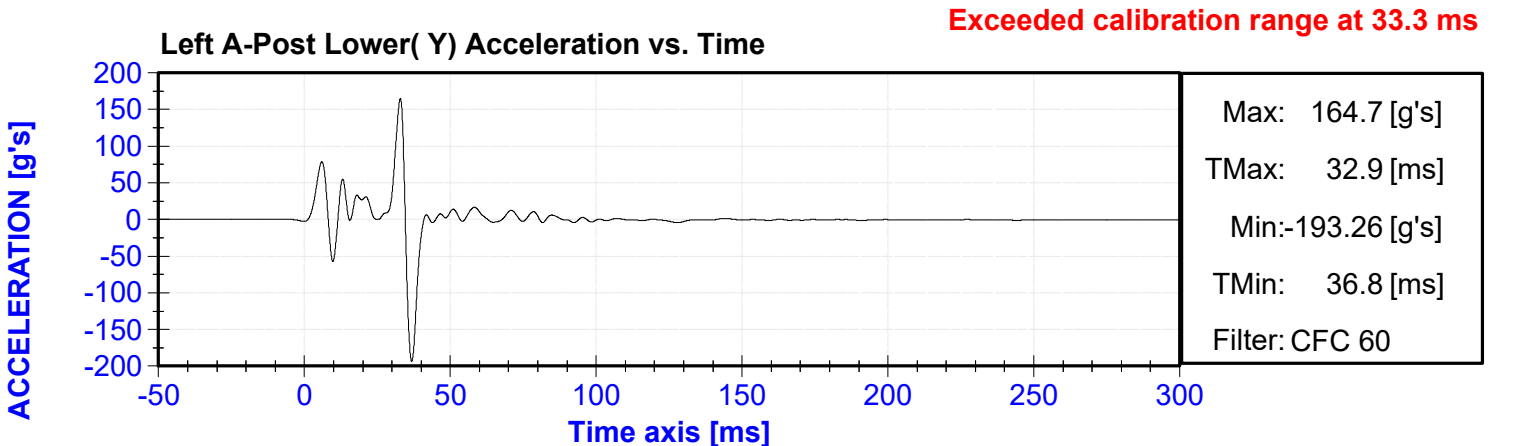
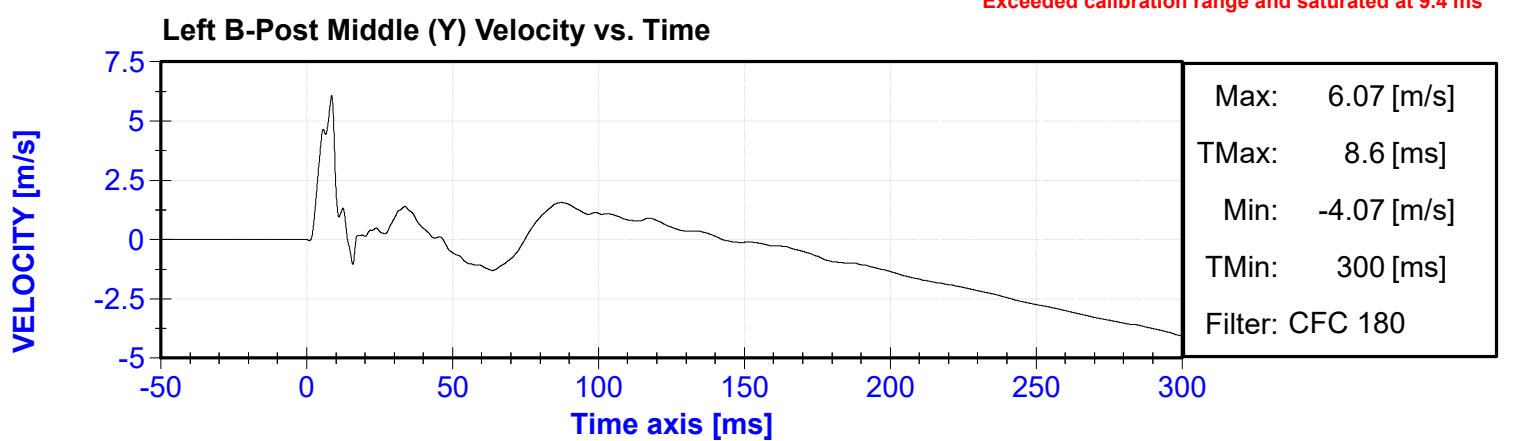
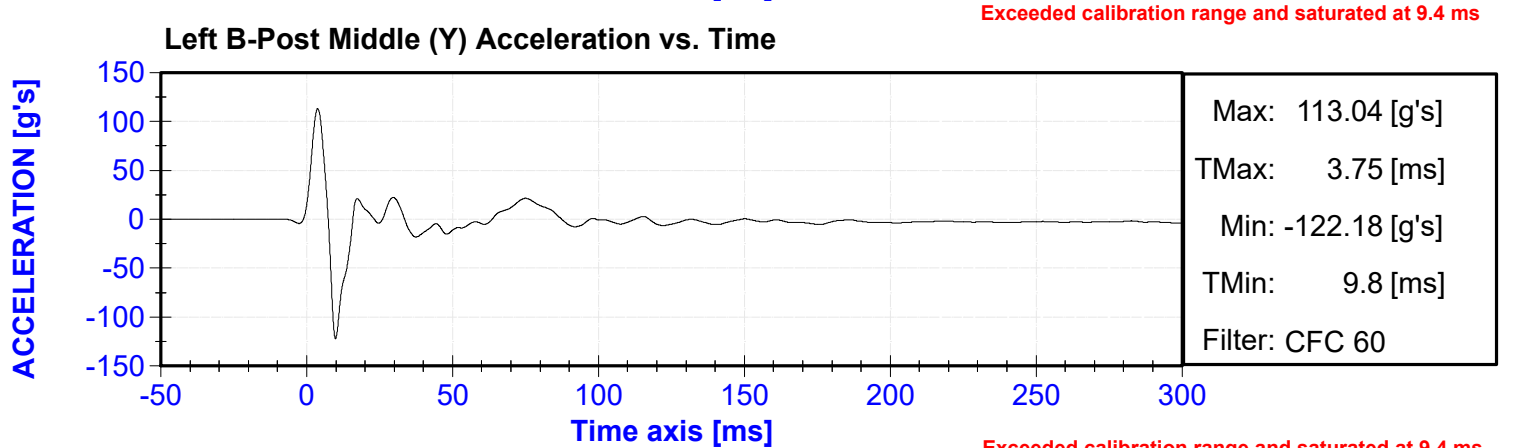
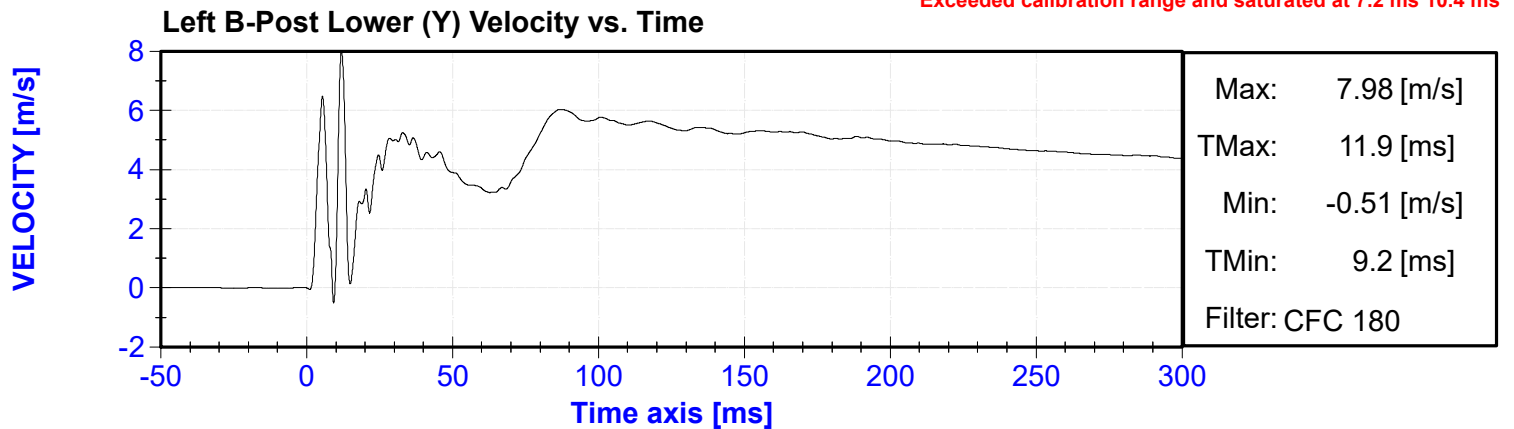


Left Sill at Front Door (Y) Acceleration vs. Time.

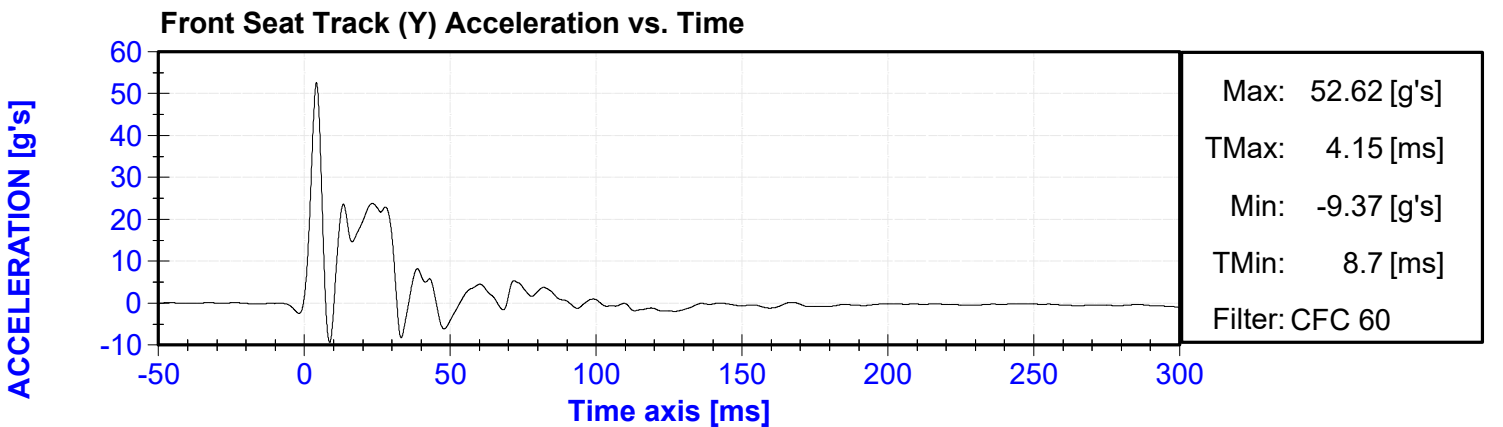
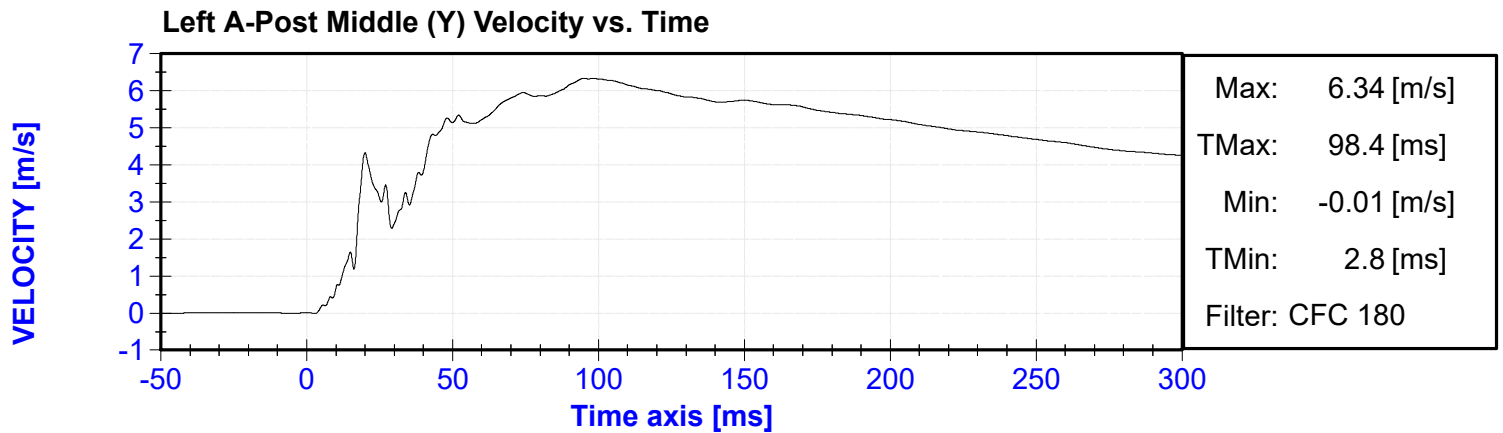
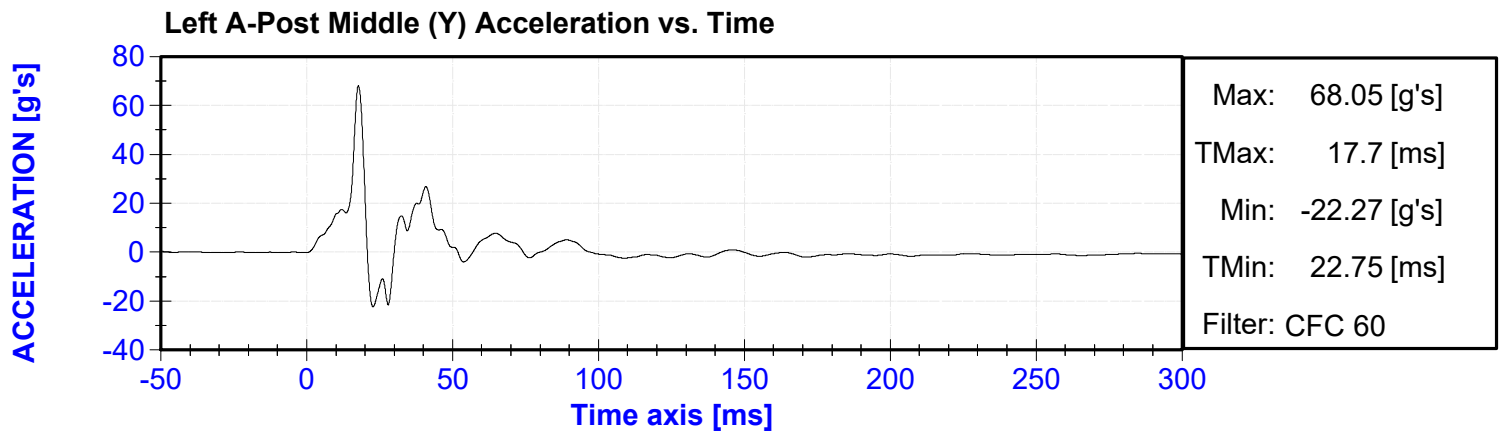
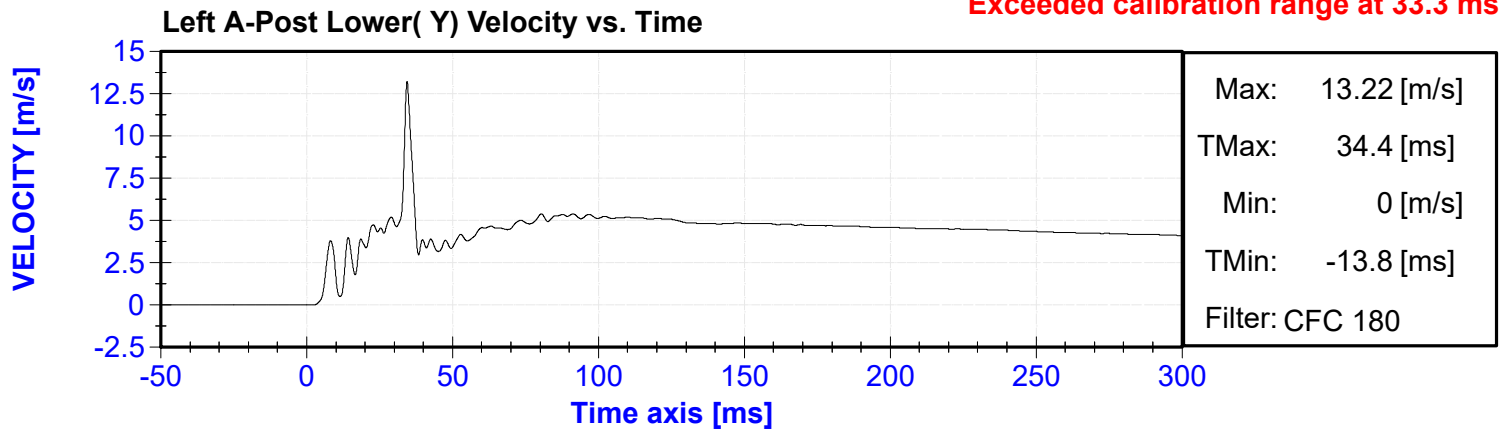
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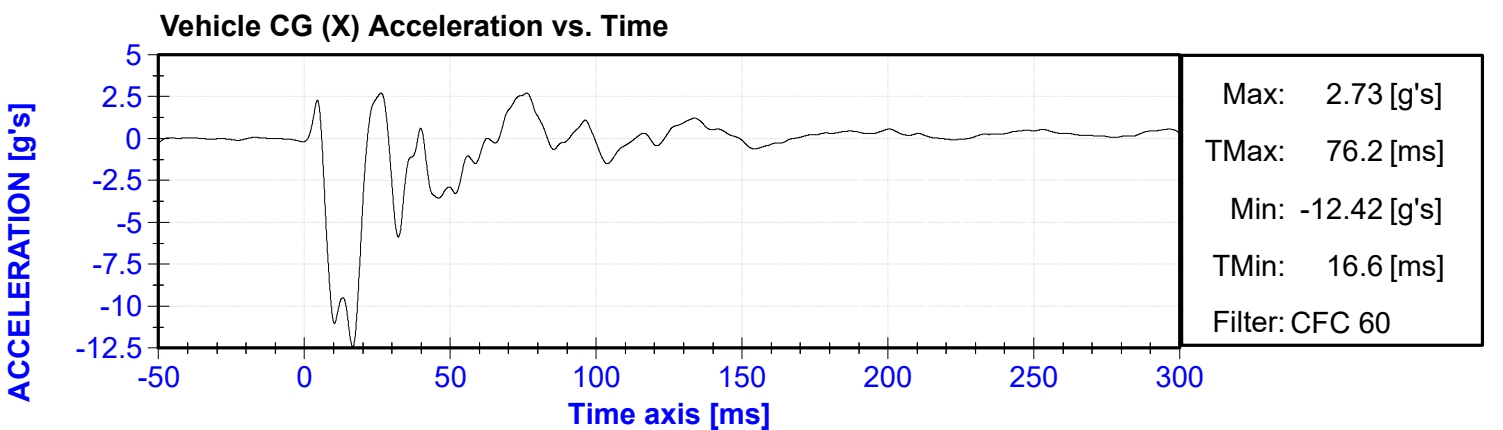
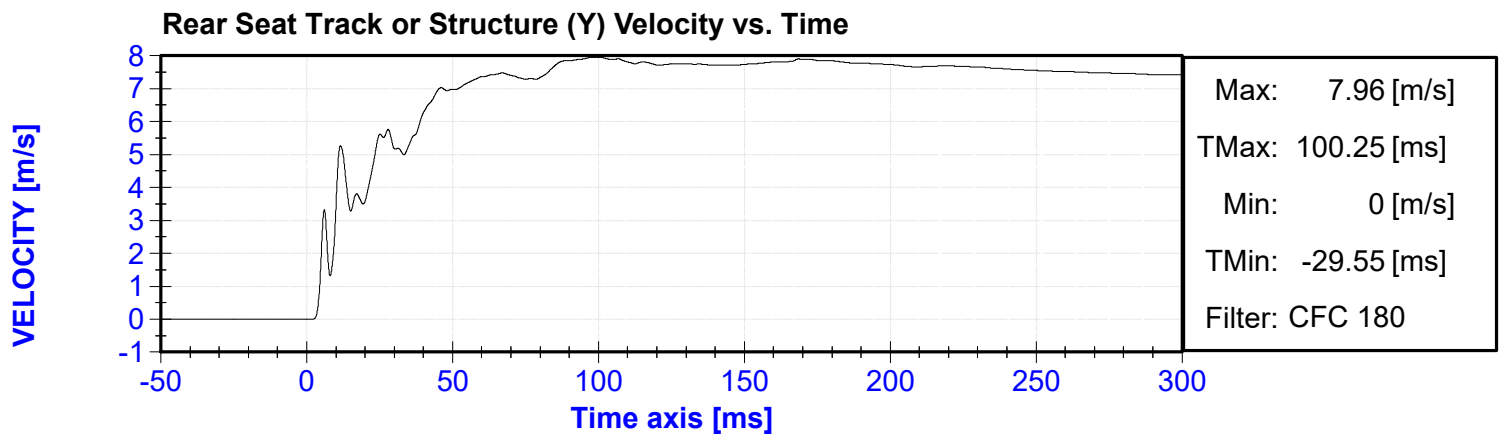
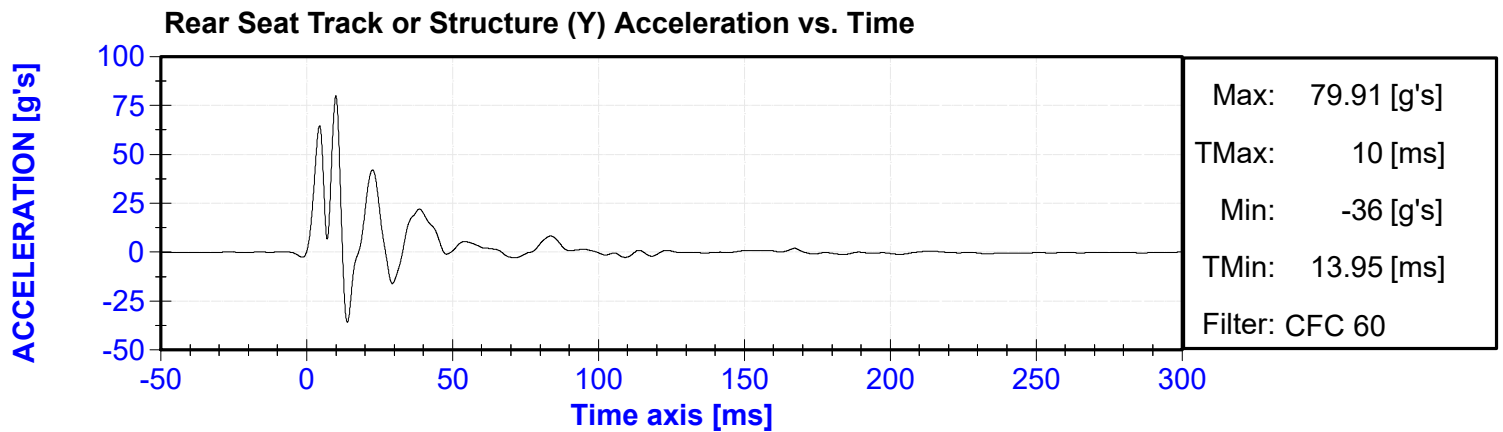
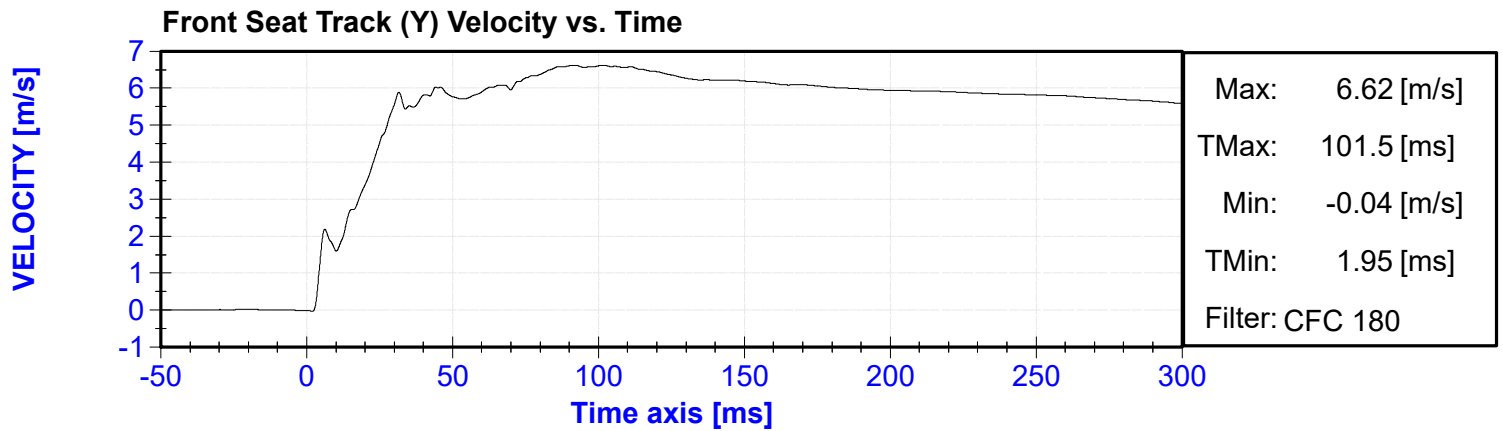


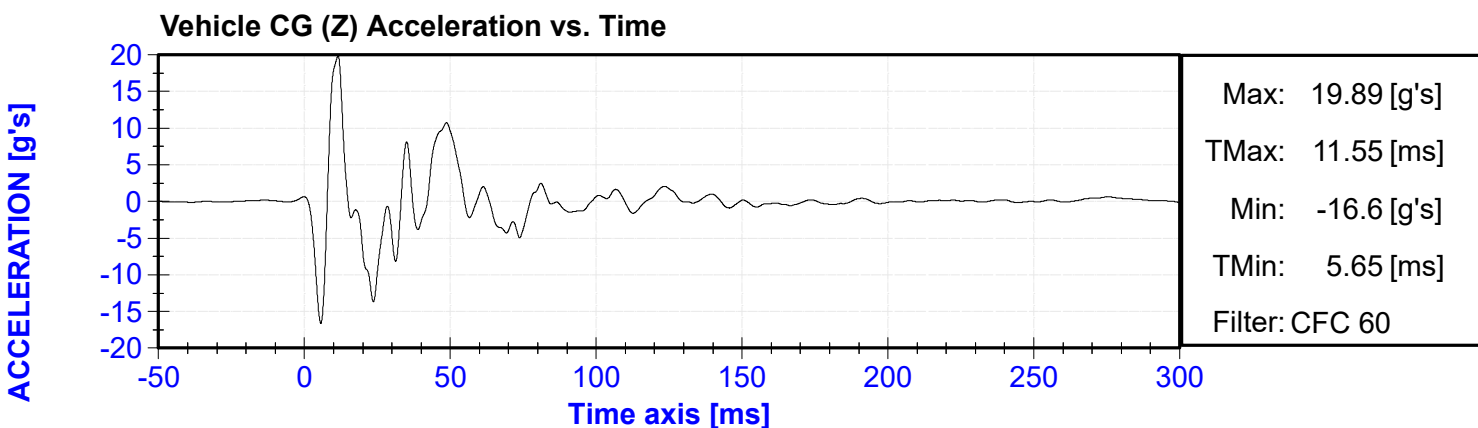
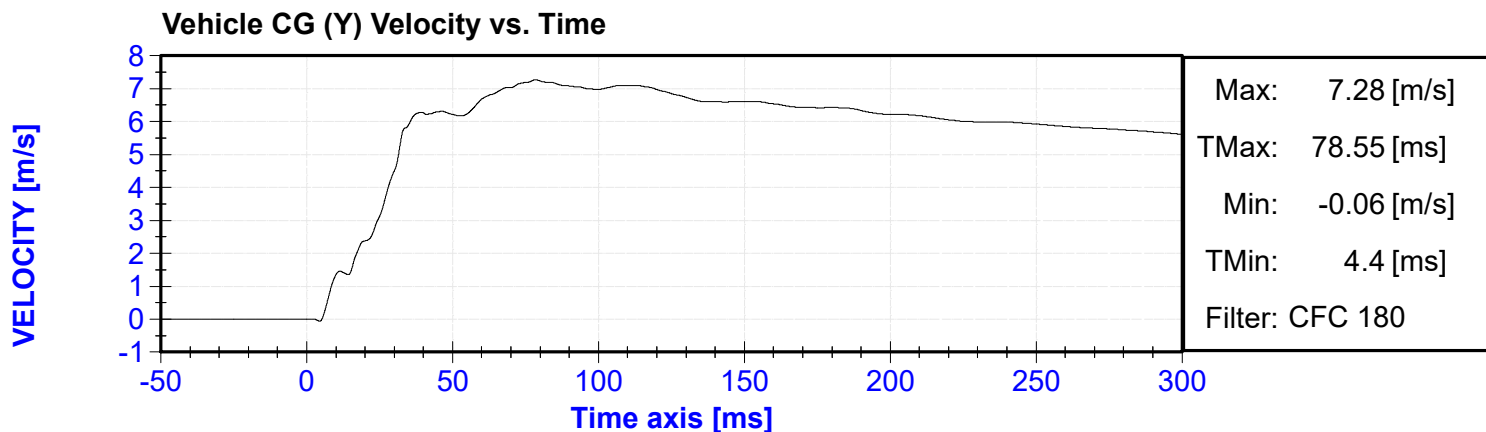
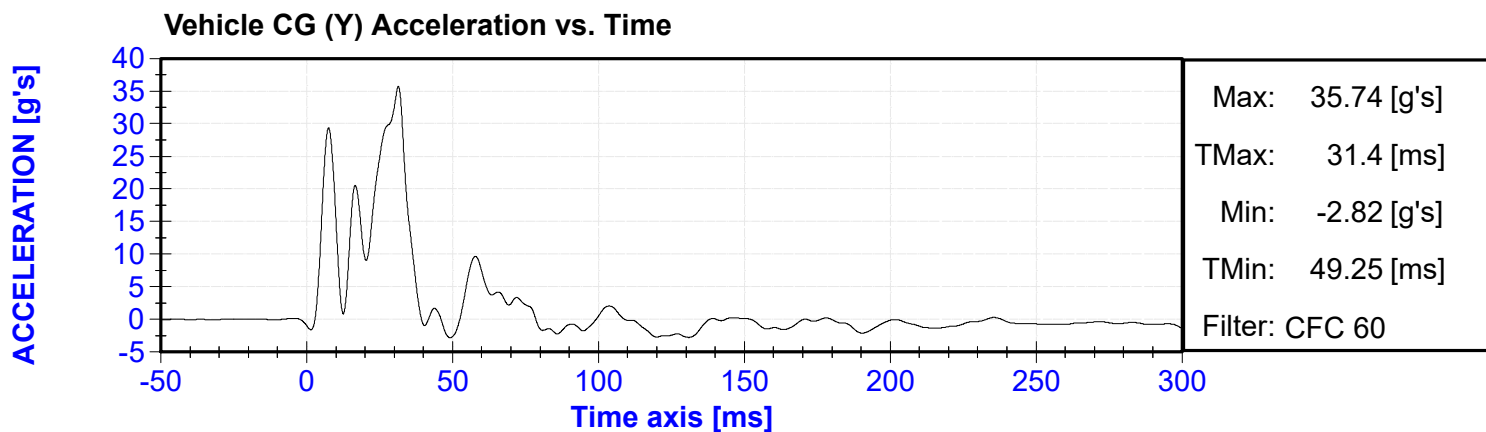
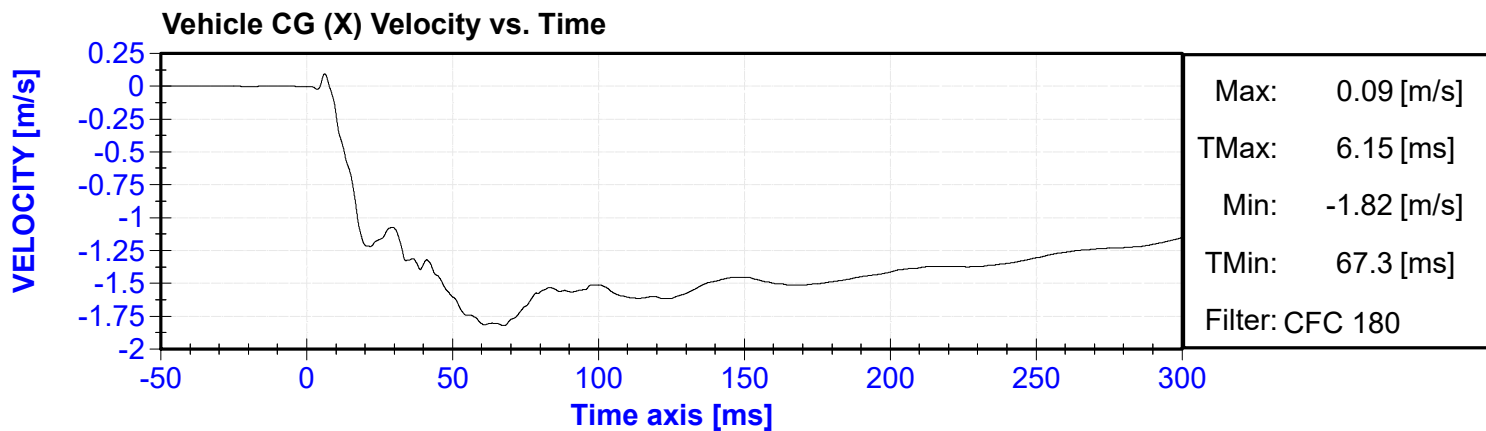


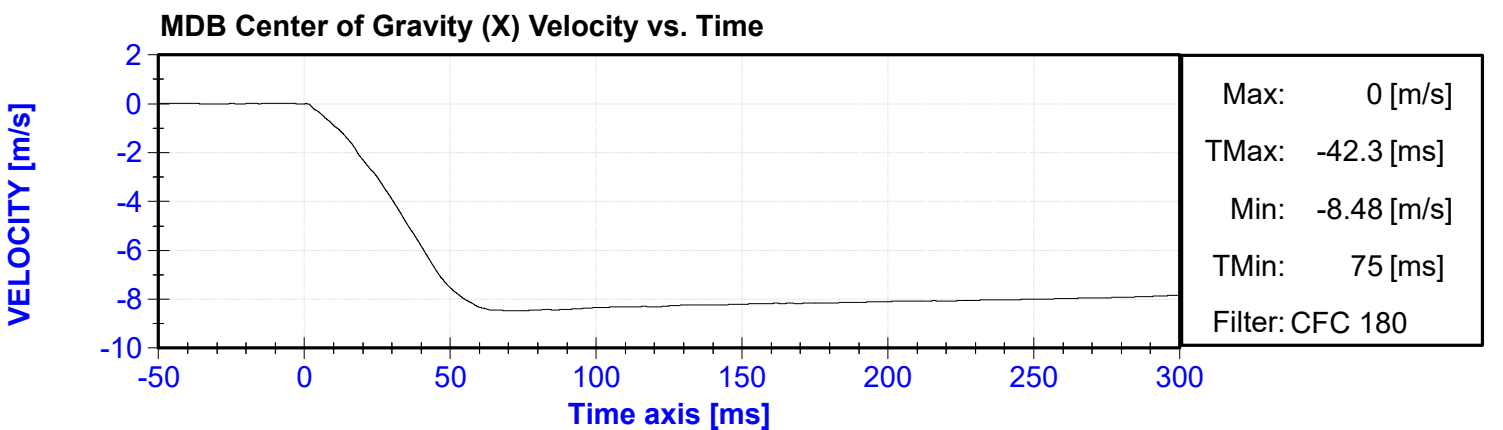
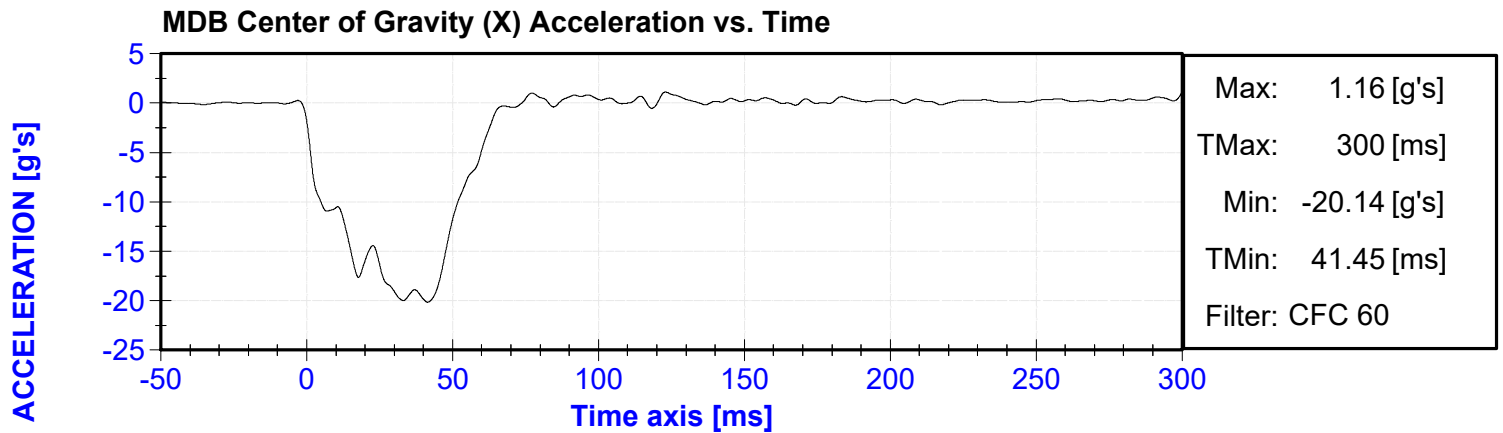
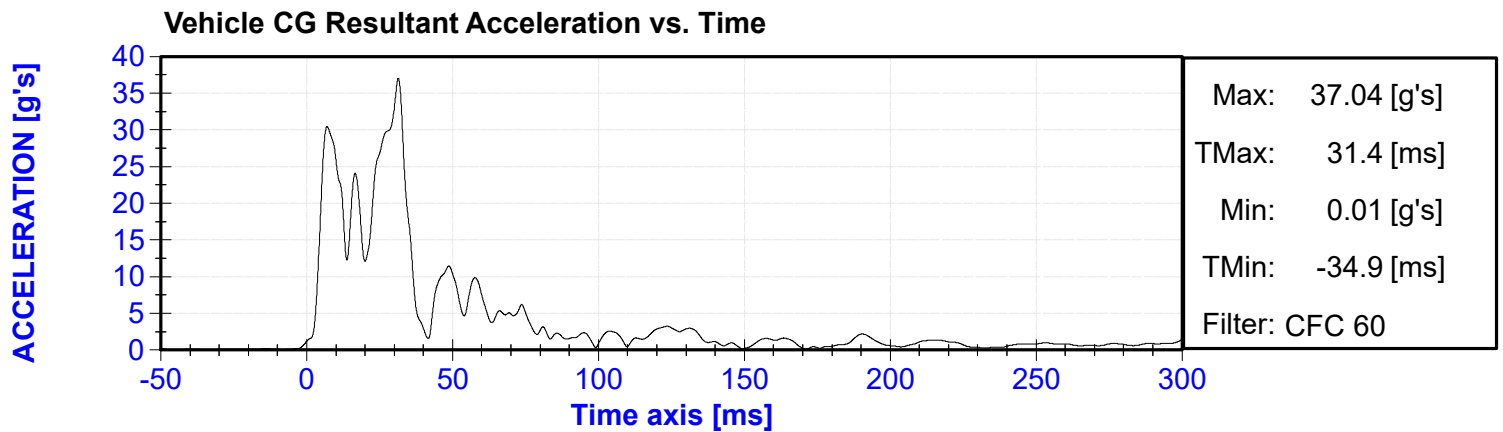
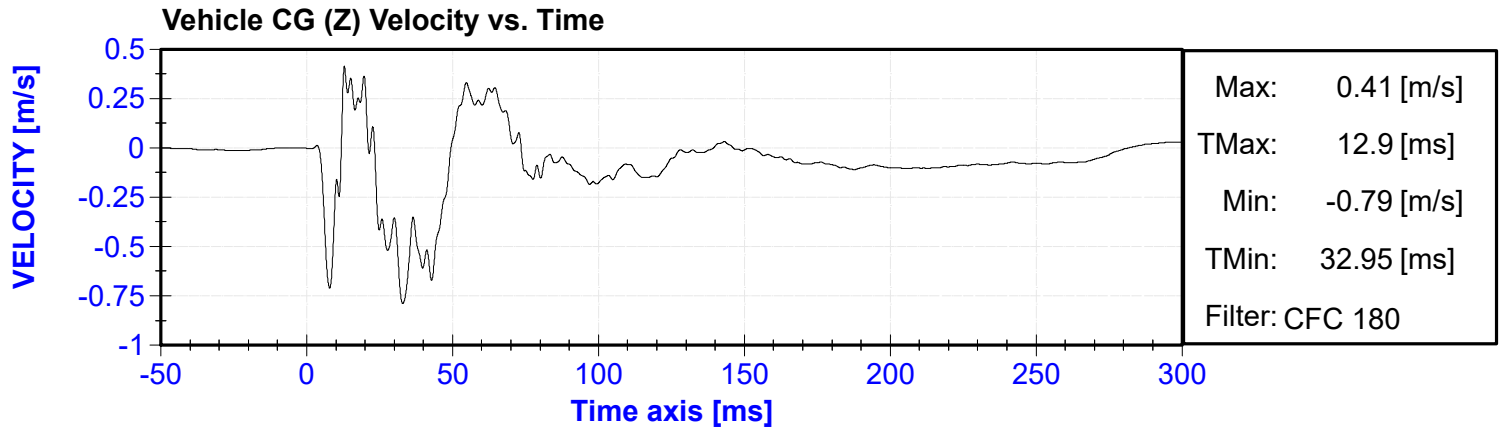


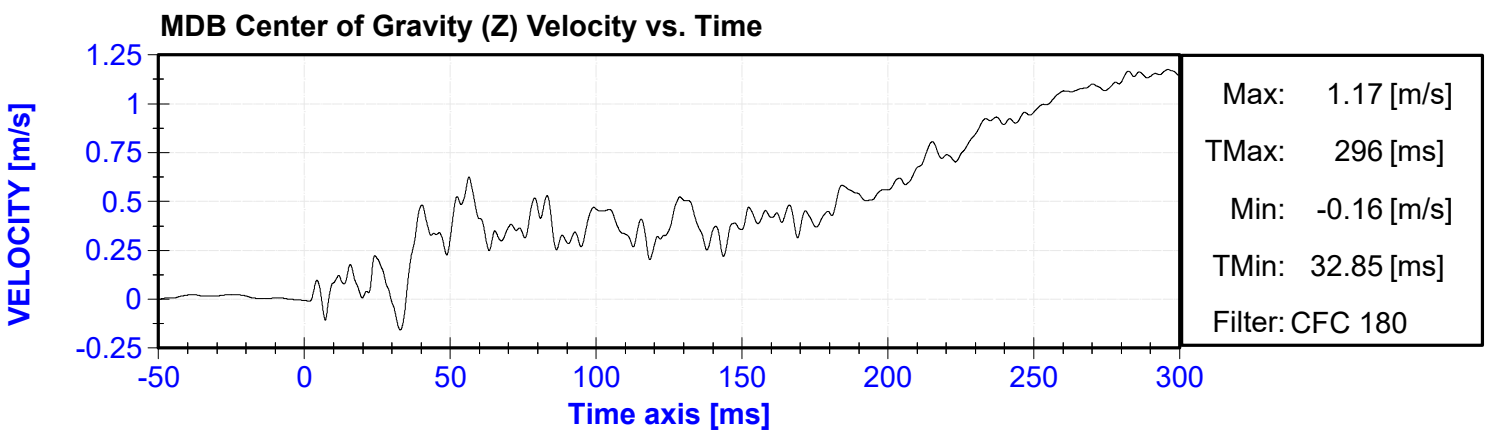
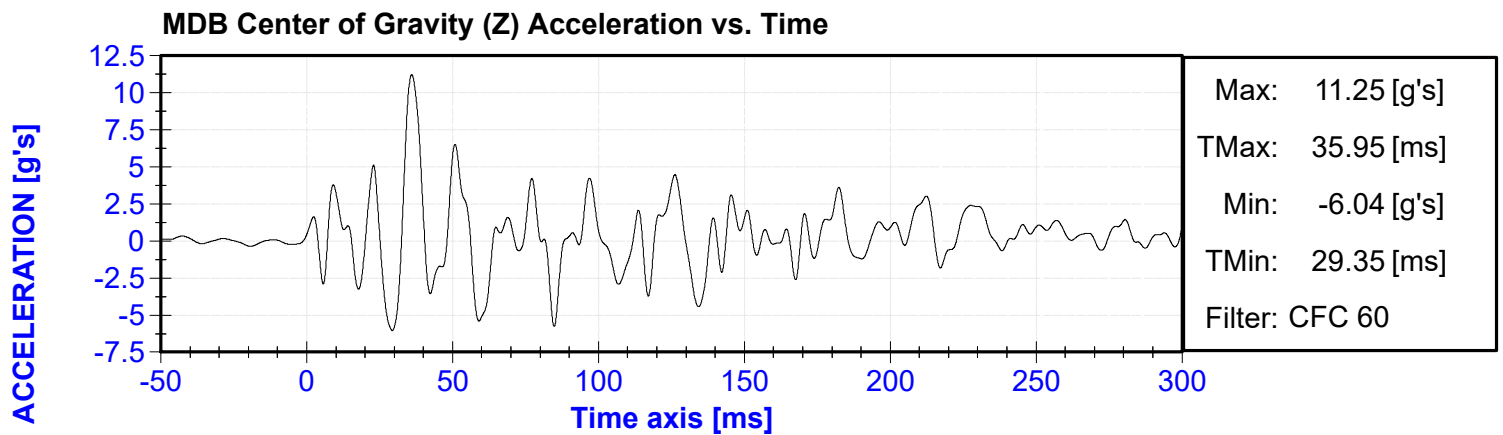
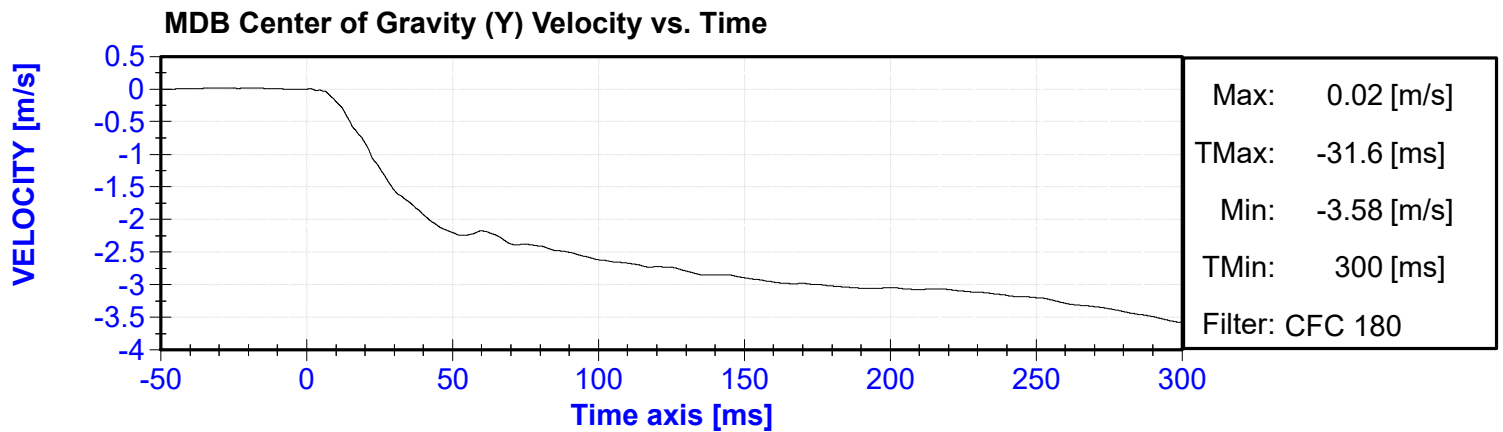
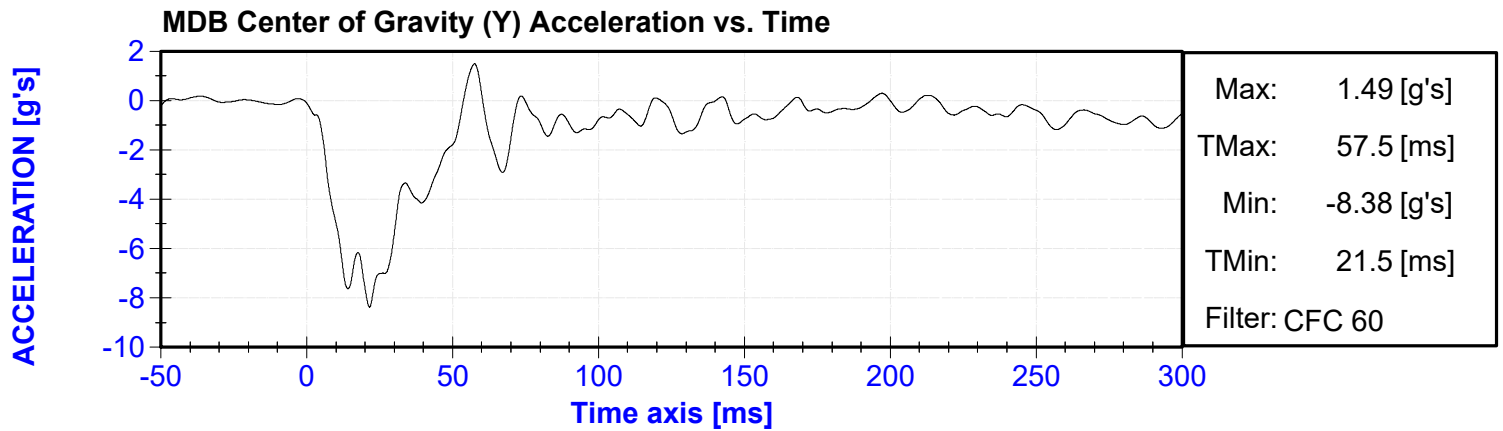
Exceeded calibration range at 33.3 ms





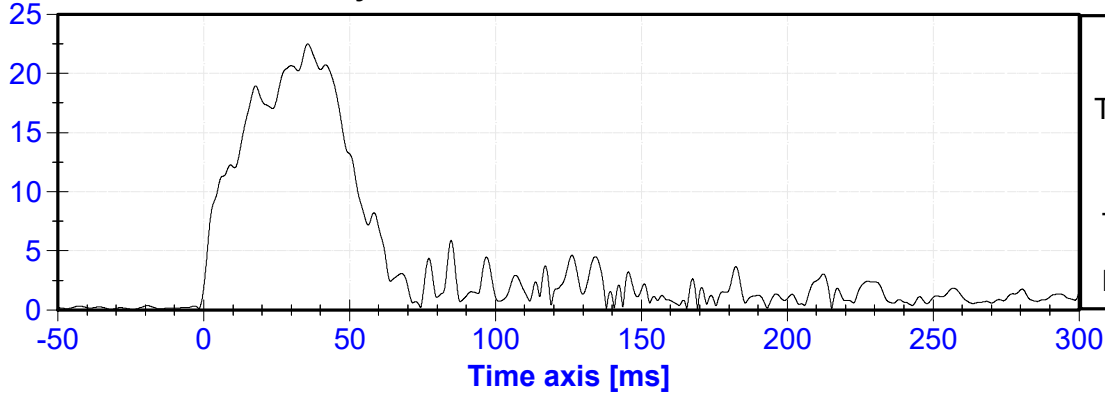






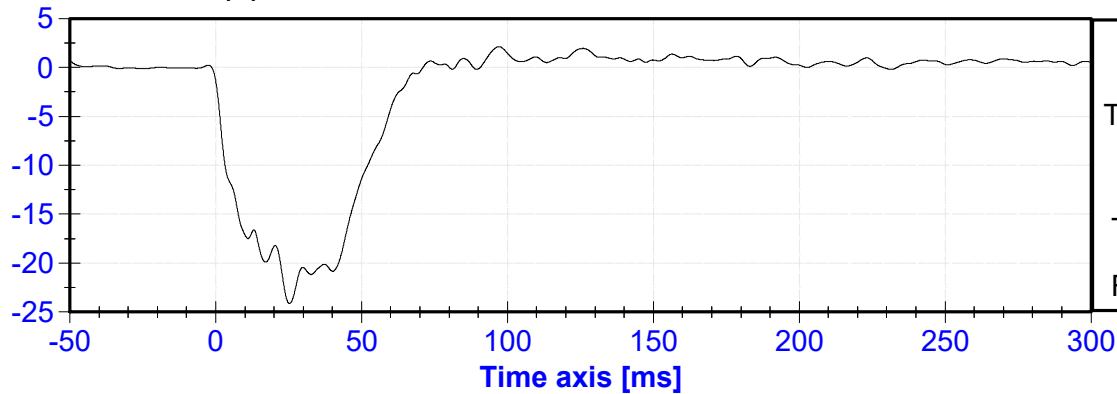
MDB Center of Gravity Resultant Acceleration vs. Time

ACCELERATION [g's]



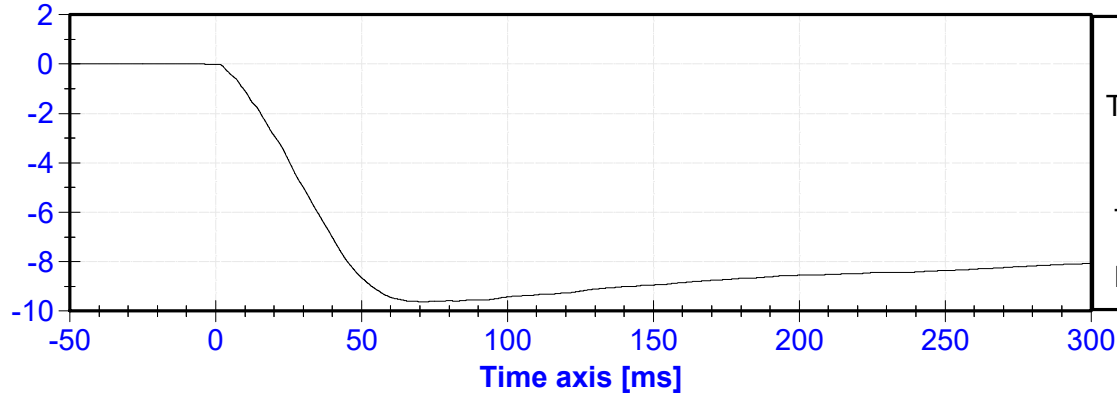
MDB Rear (X) Acceleration vs. Time

ACCELERATION [g's]



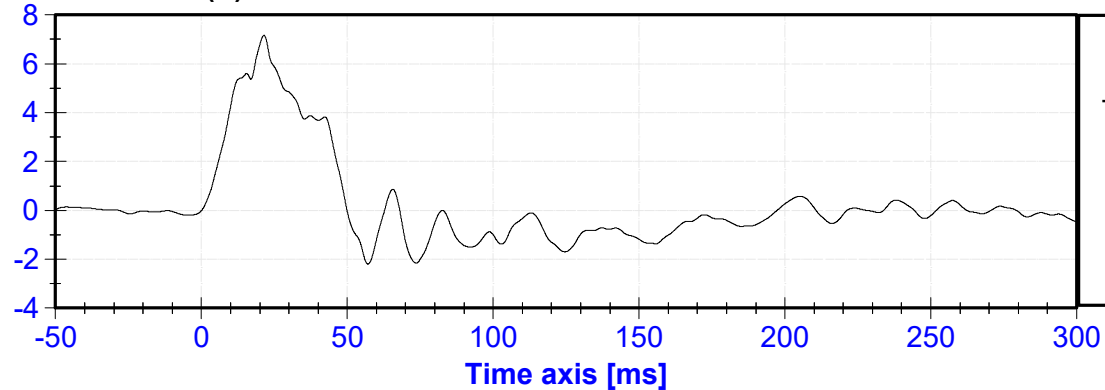
MDB Rear (X) Velocity vs. Time

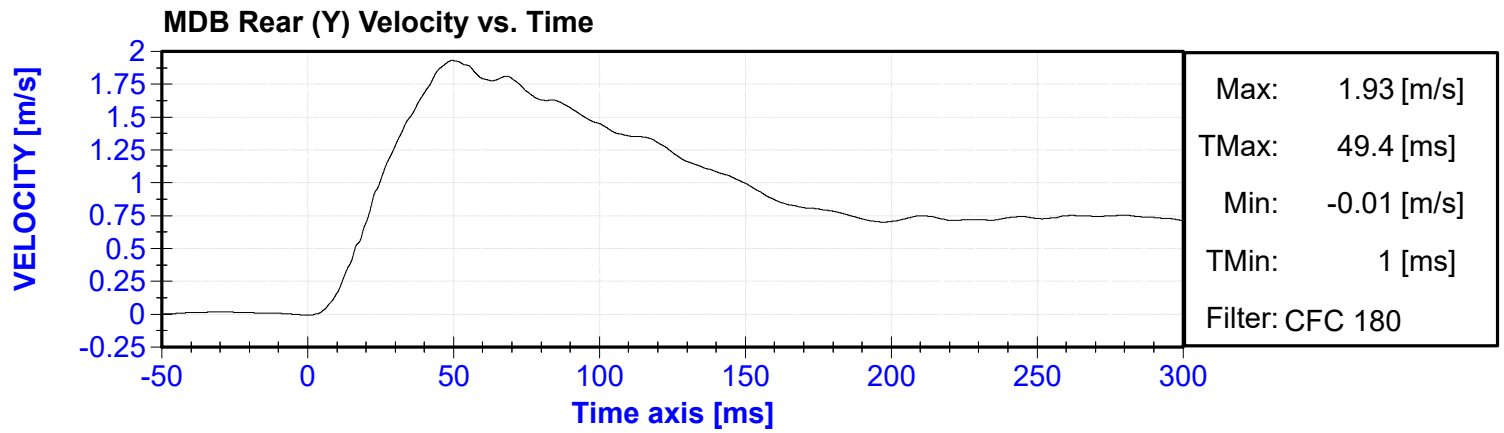
VELOCITY [m/s]



MDB Rear (Y) Acceleration vs. Time

ACCELERATION [g's]





APPENDIX V

PRE-TEST ES-2re PERFORMANCE CALIBRATION TEST DATA

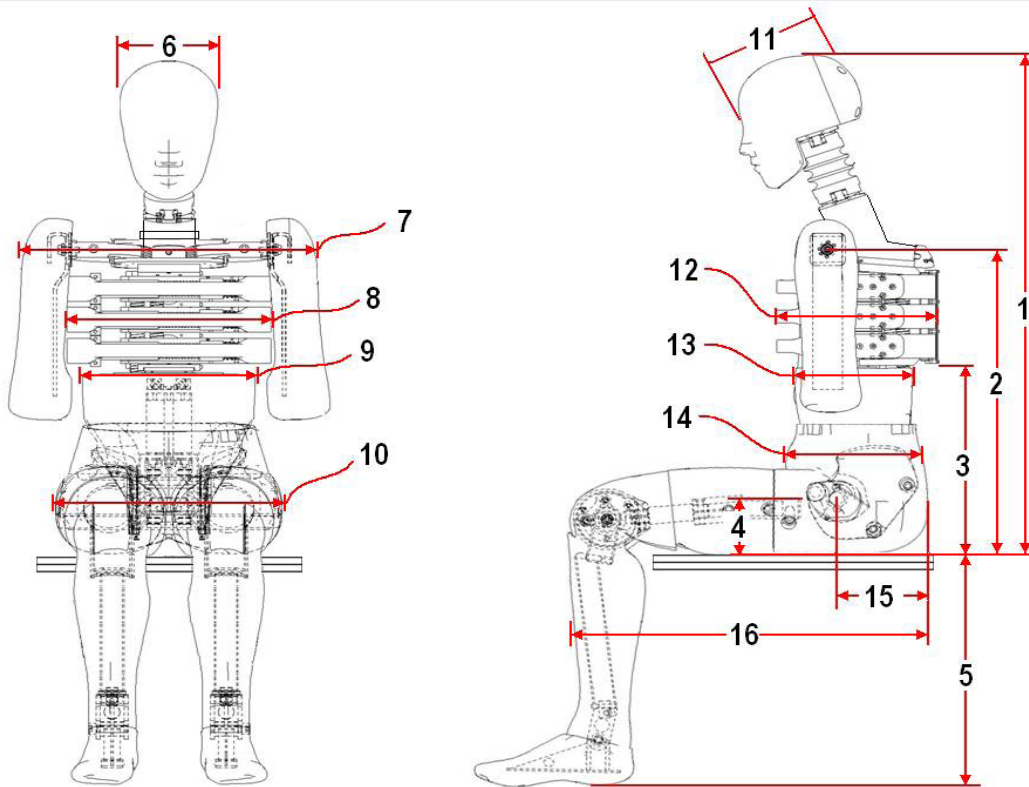


External Measurements - EuroSID-2re

Technician: J. Rios

Date: 7/23/2025

Dummy Serial Number: D037



FRONT VIEW

SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	911	Pass
2	Seat to Shoulder Joint	558	572	562	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	349	Pass
4	Seat to Hip Joint (center of bolt)	97	103	101	Pass
5	Sole to Seat, Sitting	333	451	425	Pass
6	Head Width	152	158	155	Pass
7	Shoulder/Arm Width	461	479	470	Pass
8	Thorax Width	322	332	328	Pass
9	Abdomen Width	273	287	280	Pass
10	Pelvis Lap Width	359	373	362	Pass
11	Head Depth	196	206	202	Pass
12	Thorax Depth	262	272	266	Pass
13	Abdomen Depth	194	204	196	Pass
14	Pelvis Depth	235	245	239	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	155	Pass
16	Back of Buttocks to Front Knee	597	615	604	Pass

ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

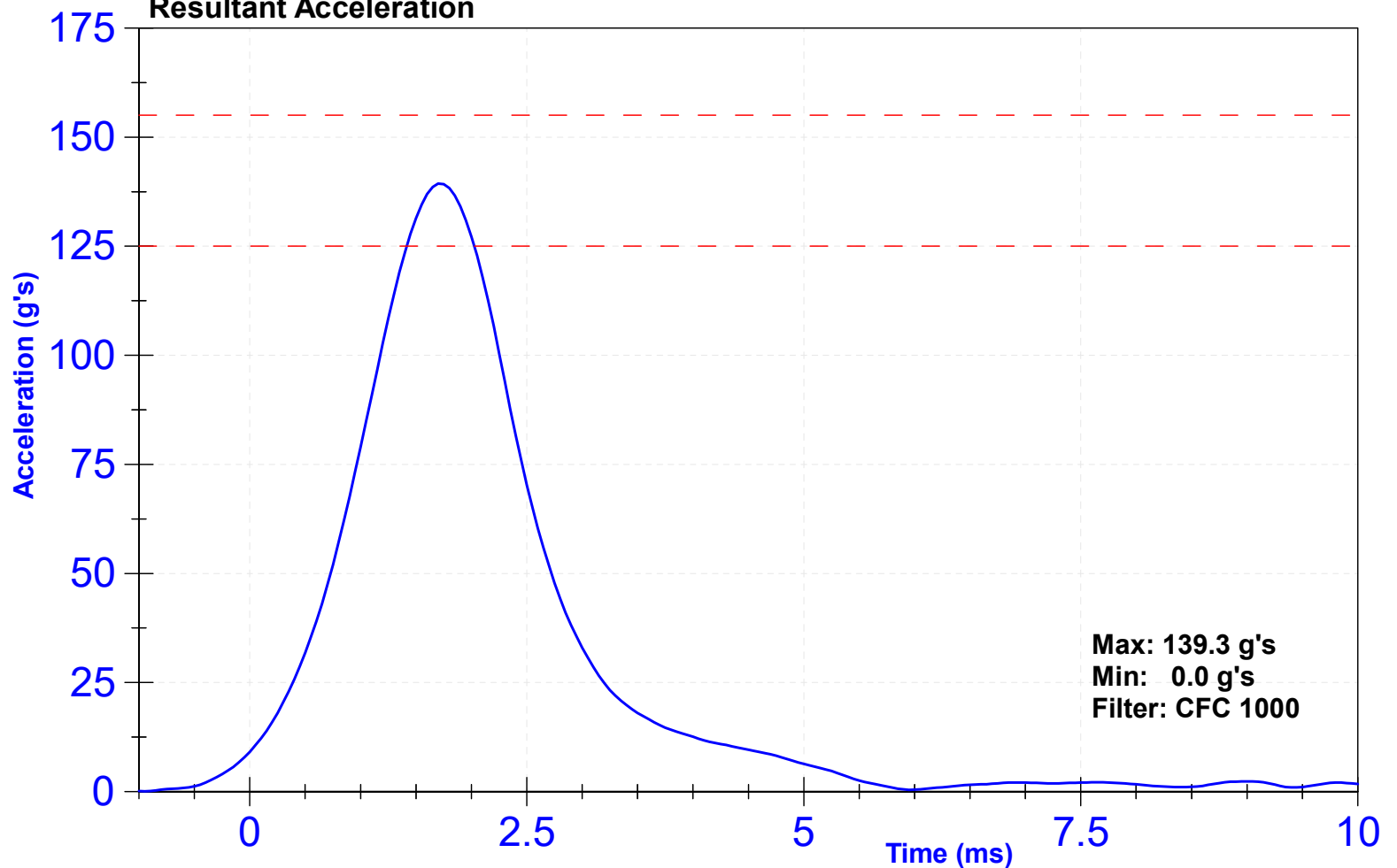
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Resultant Acceleration	125	155	g's	139.3	Pass
Oscillation	0	15	%	1.68	Pass
Fore-Aft Acceleration	-15	15	g's	7.5	Pass

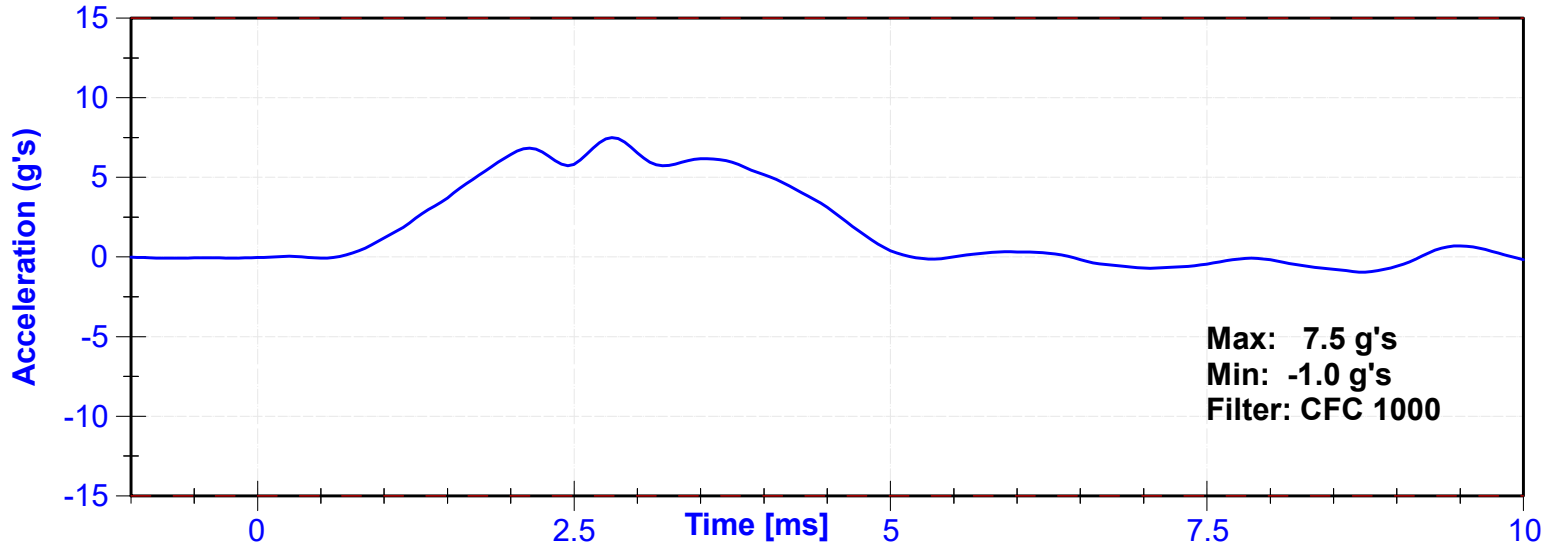
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	T21724	4/21/2025	10/18/2025
Y Accelerometer	Endevco	T22281	4/21/2025	10/18/2025
Z Accelerometer	Endevco	T26050	4/21/2025	10/18/2025

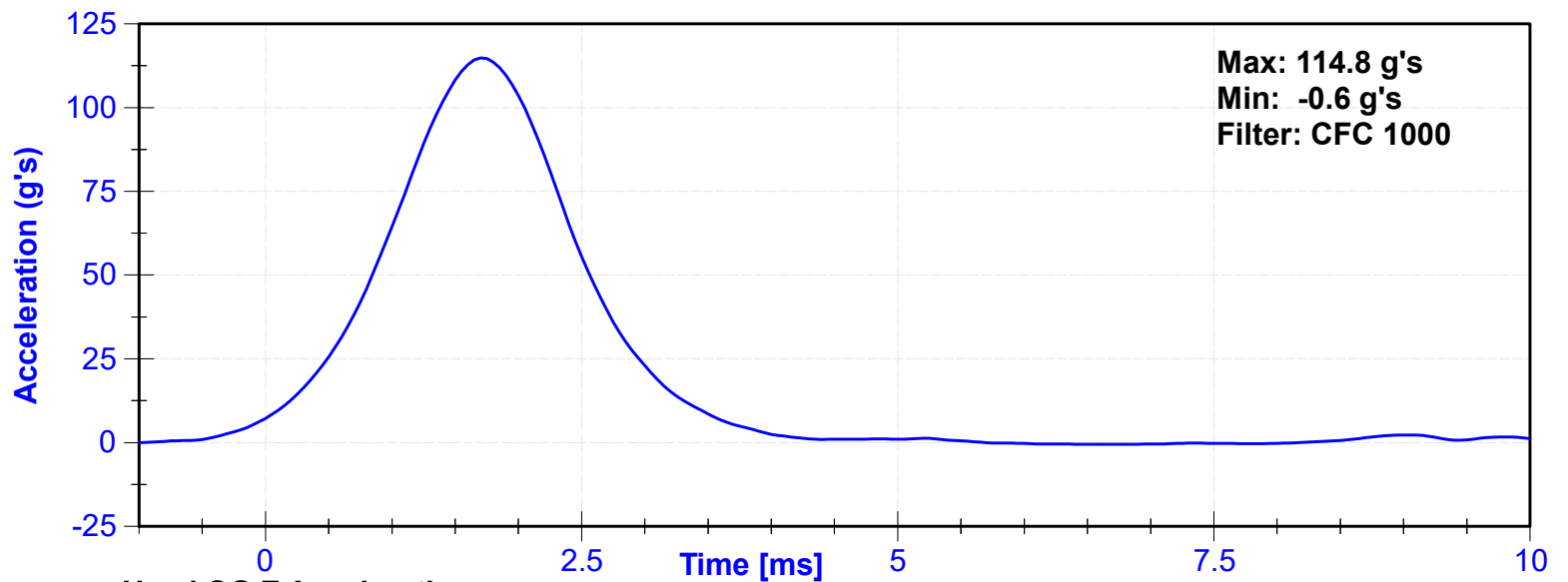
Resultant Acceleration



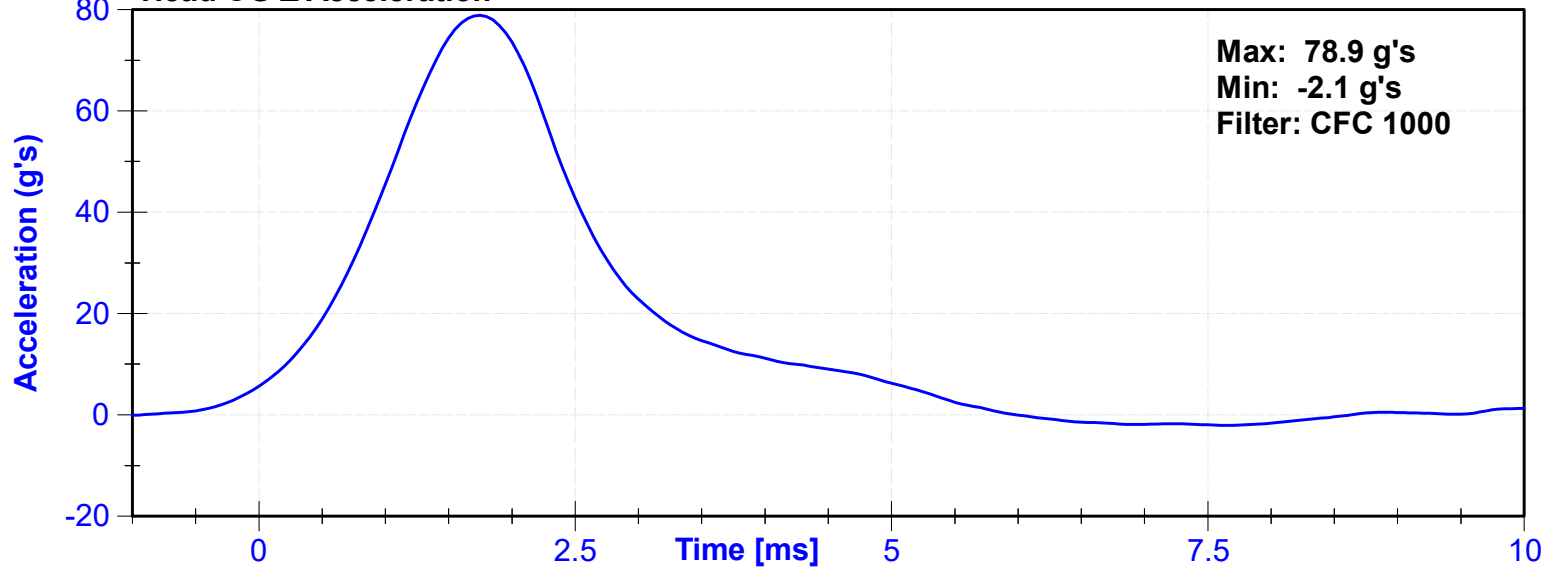
Head CG X Acceleration



Head CG Y Acceleration



Head CG Z Acceleration



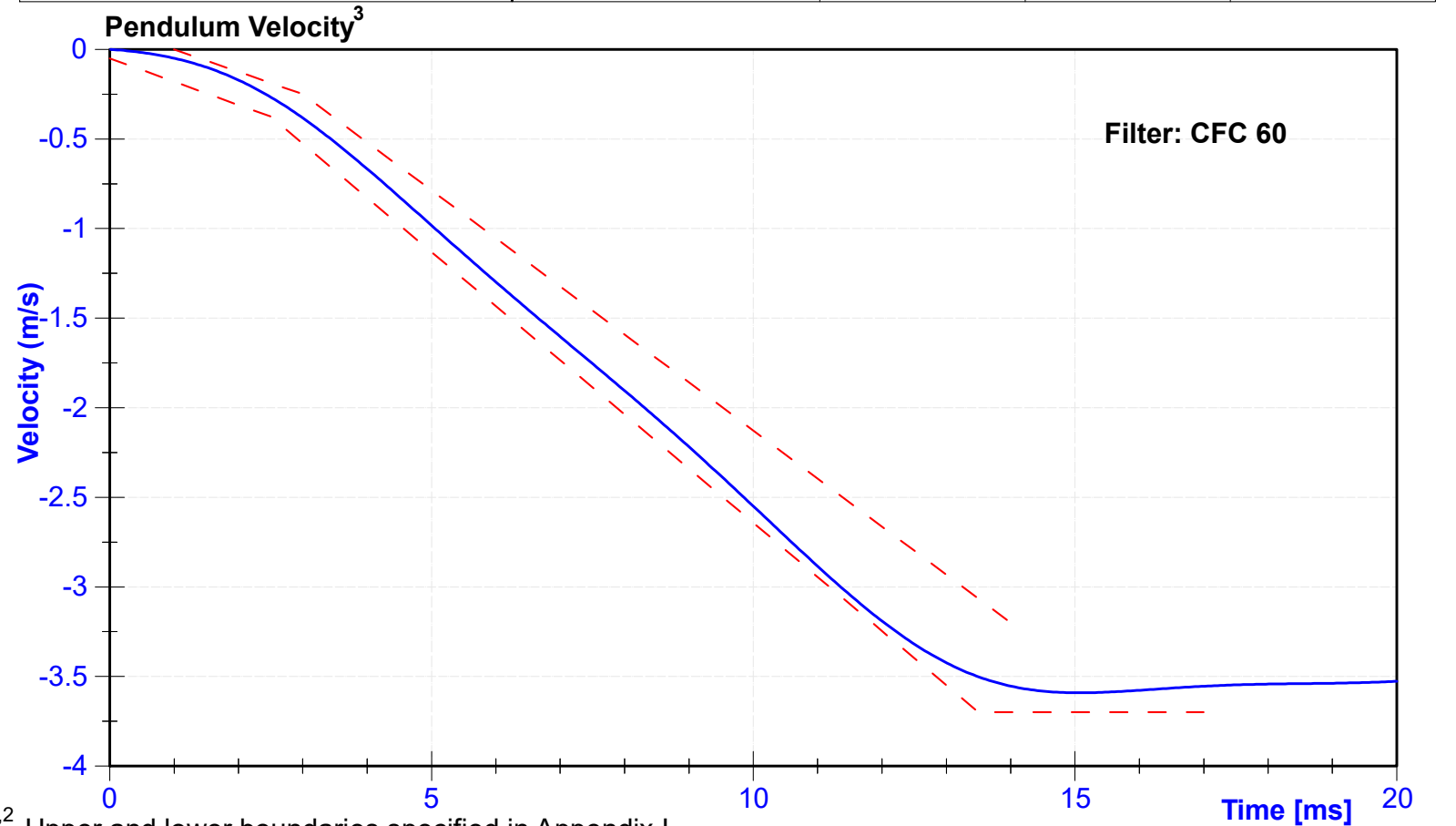
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

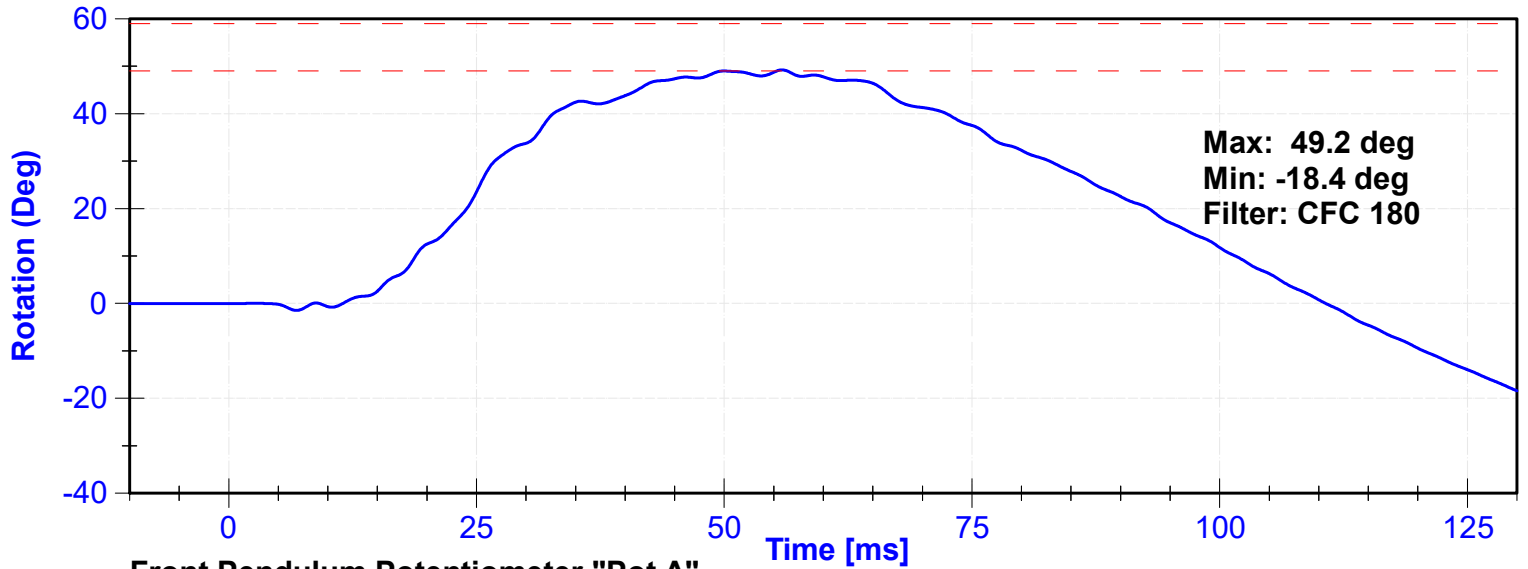
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	46	Pass
Velocity	3.3	3.5	m/s	3.42	Pass
Lateral Neck Rotation	49	59	deg	49.2	Pass
Time at Maximum Rotation	54	66	ms	55.8	Pass
Time of Rotation Decay from Maximum	53	88	ms	54.9	Pass
Pendulum Velocity Overall Corridor	Lower Boundary ¹	Upper Boundary ²	m/s	See Plot ³	Pass

Transducer Calibrations

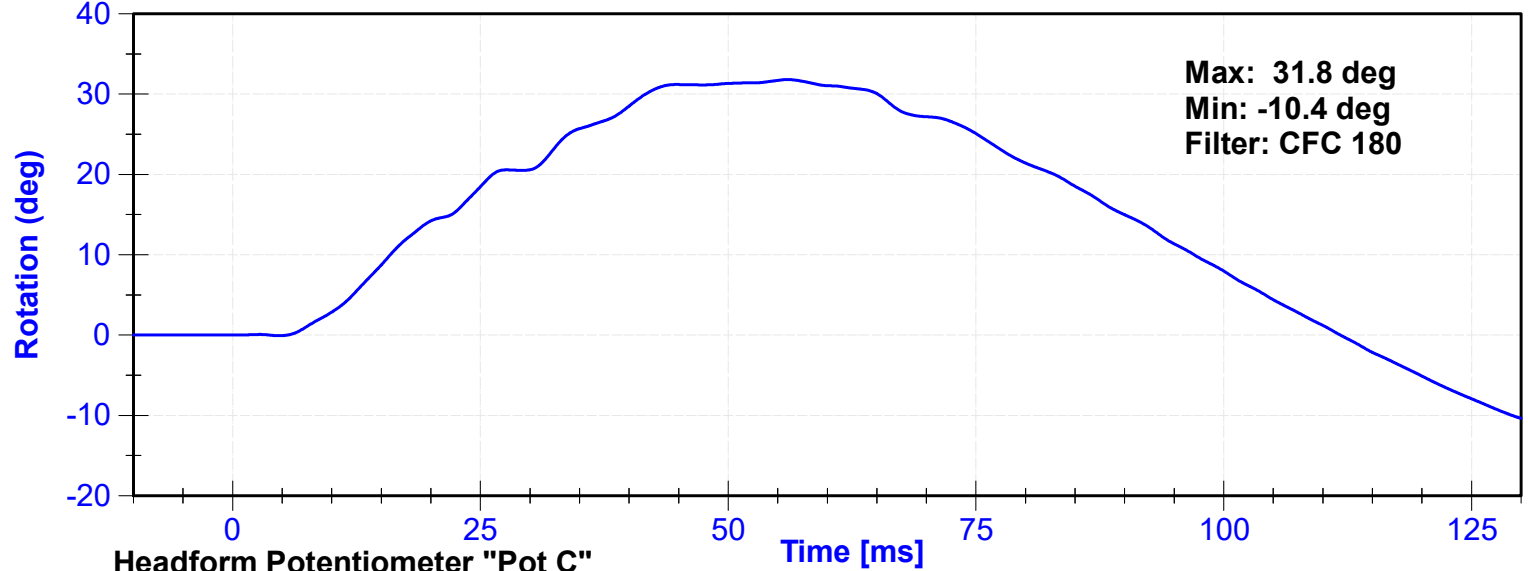
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Front Pendulum Potentiometer	Sfernice	2247	9/13/2024	9/13/2025
Headform Potentiometer	Sfernice	095	9/13/2024	9/13/2025



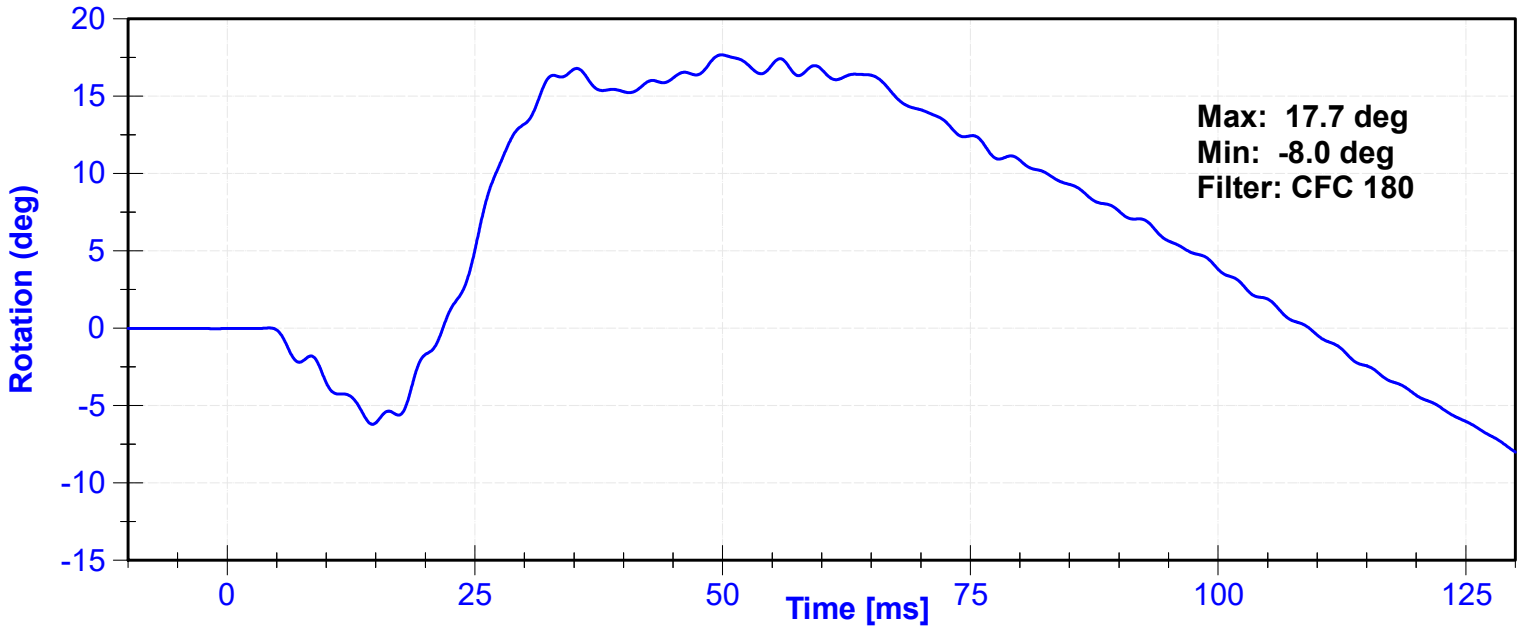
Neck Rotation



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

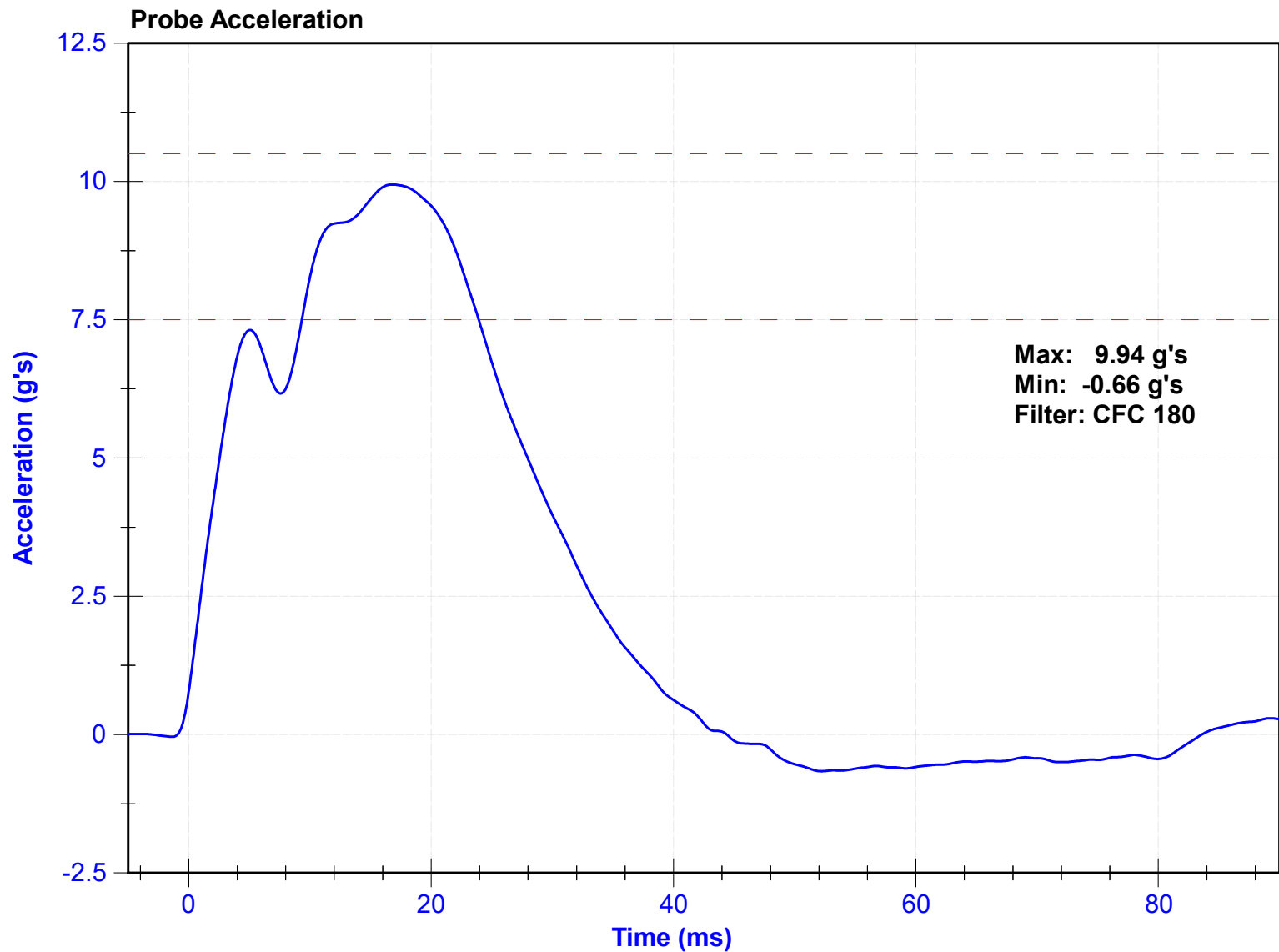
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	7.5	10.5	g's	9.94	Pass

Transducer Calibrations

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



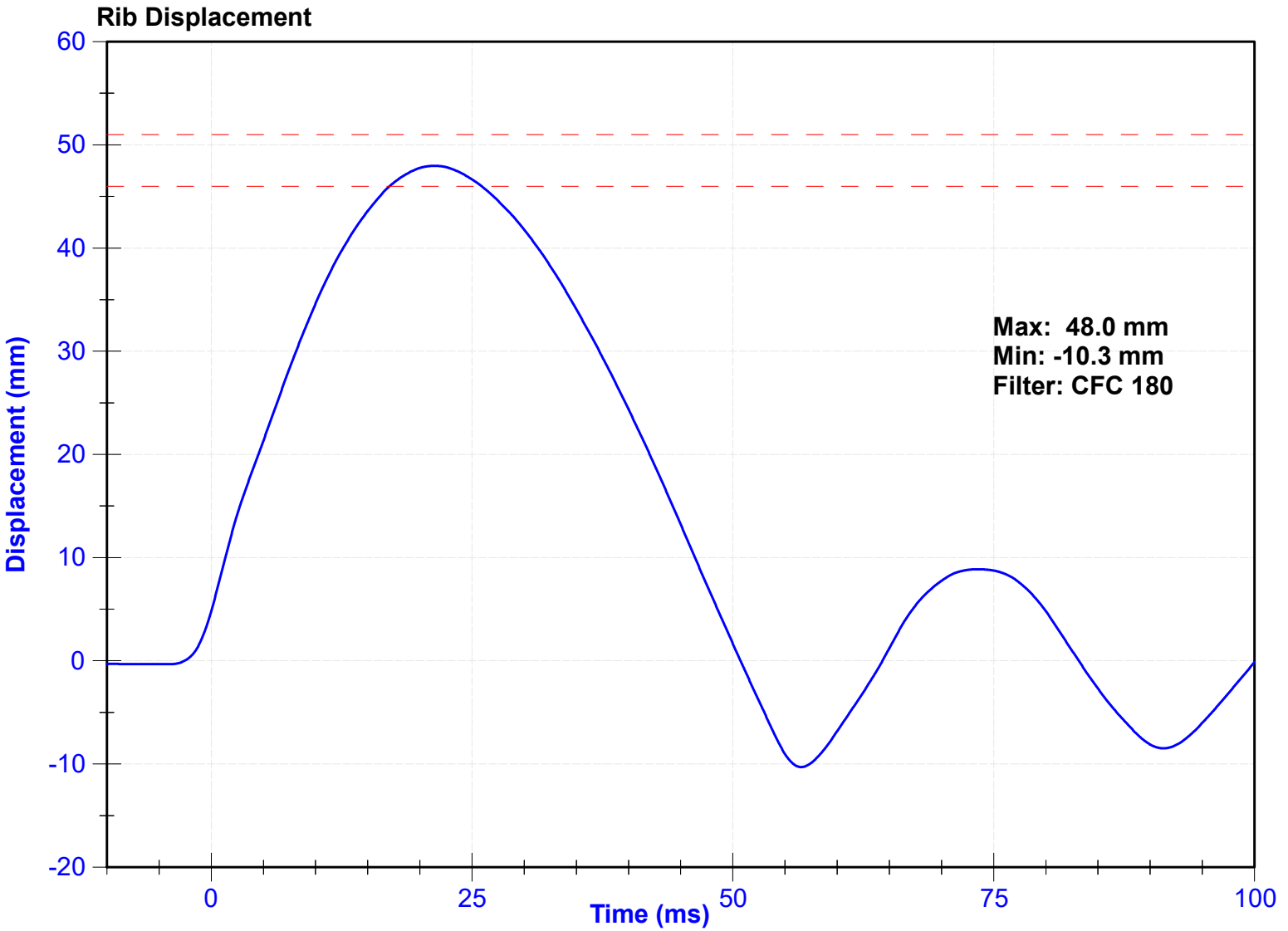
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	46	51	mm	48.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-01	4/21/2025	10/20/2025



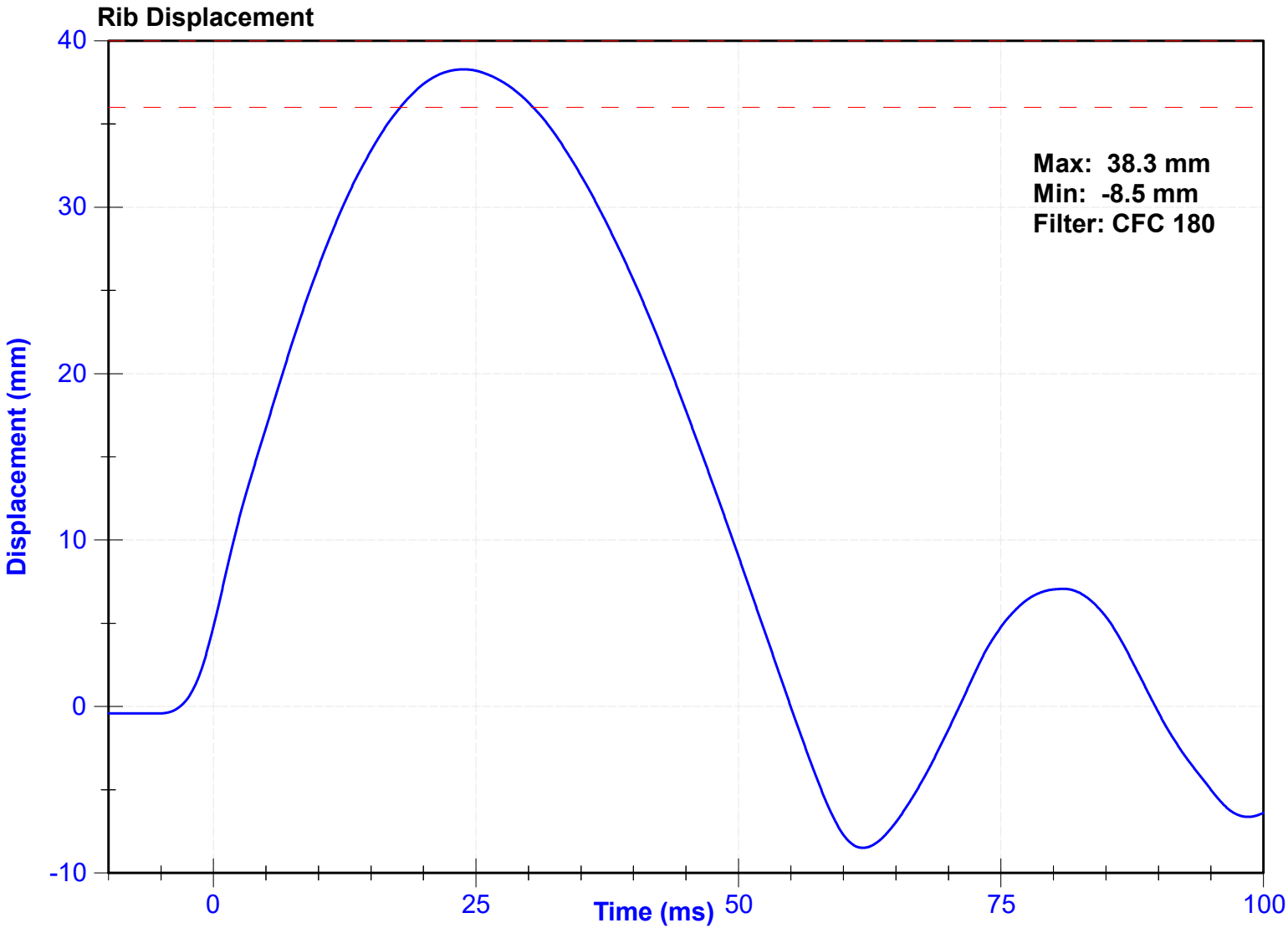
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	36	40	mm	38.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-01	4/21/2025	10/20/2025



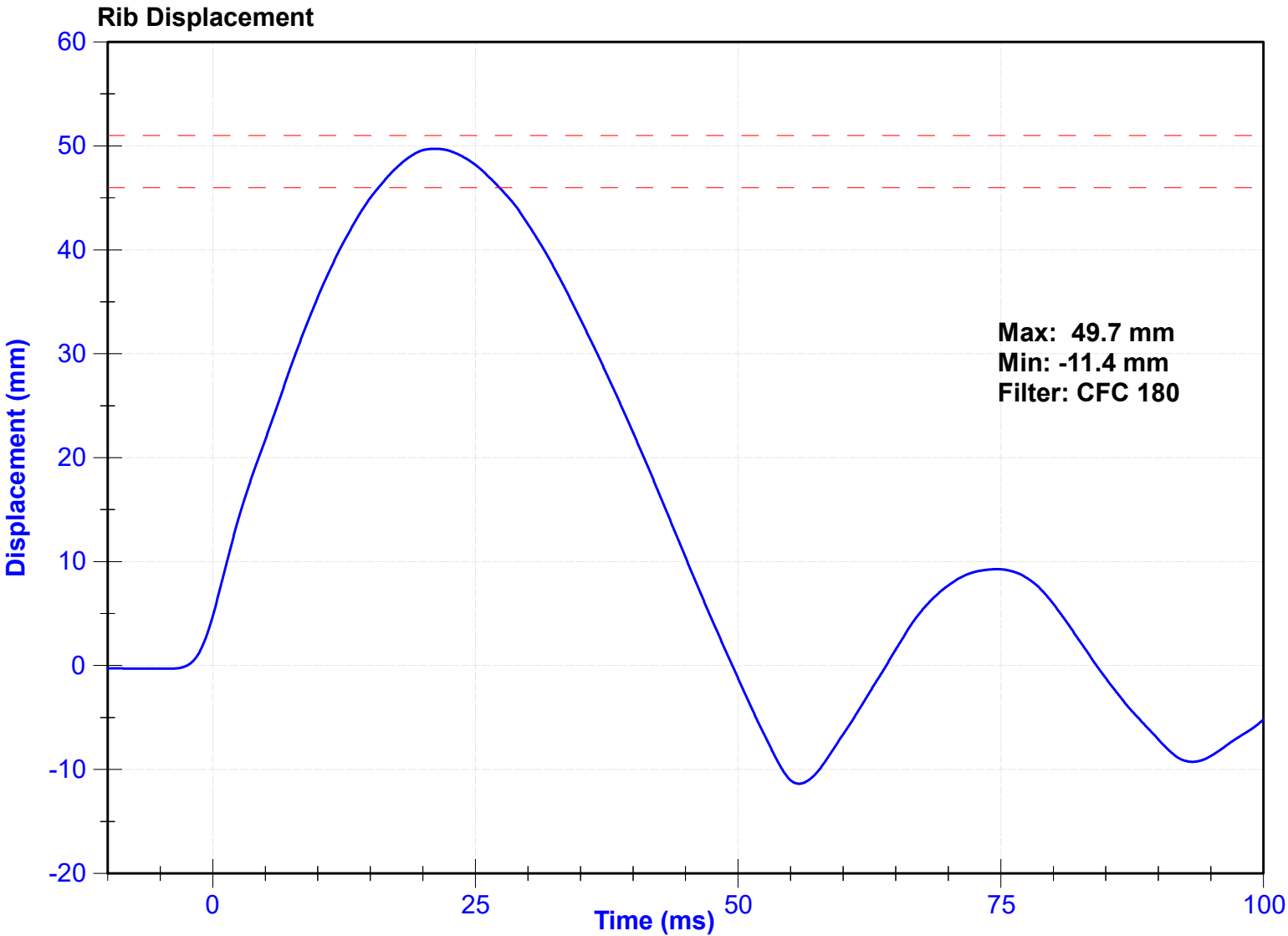
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	46	51	mm	49.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	807	4/21/2025	10/20/2025



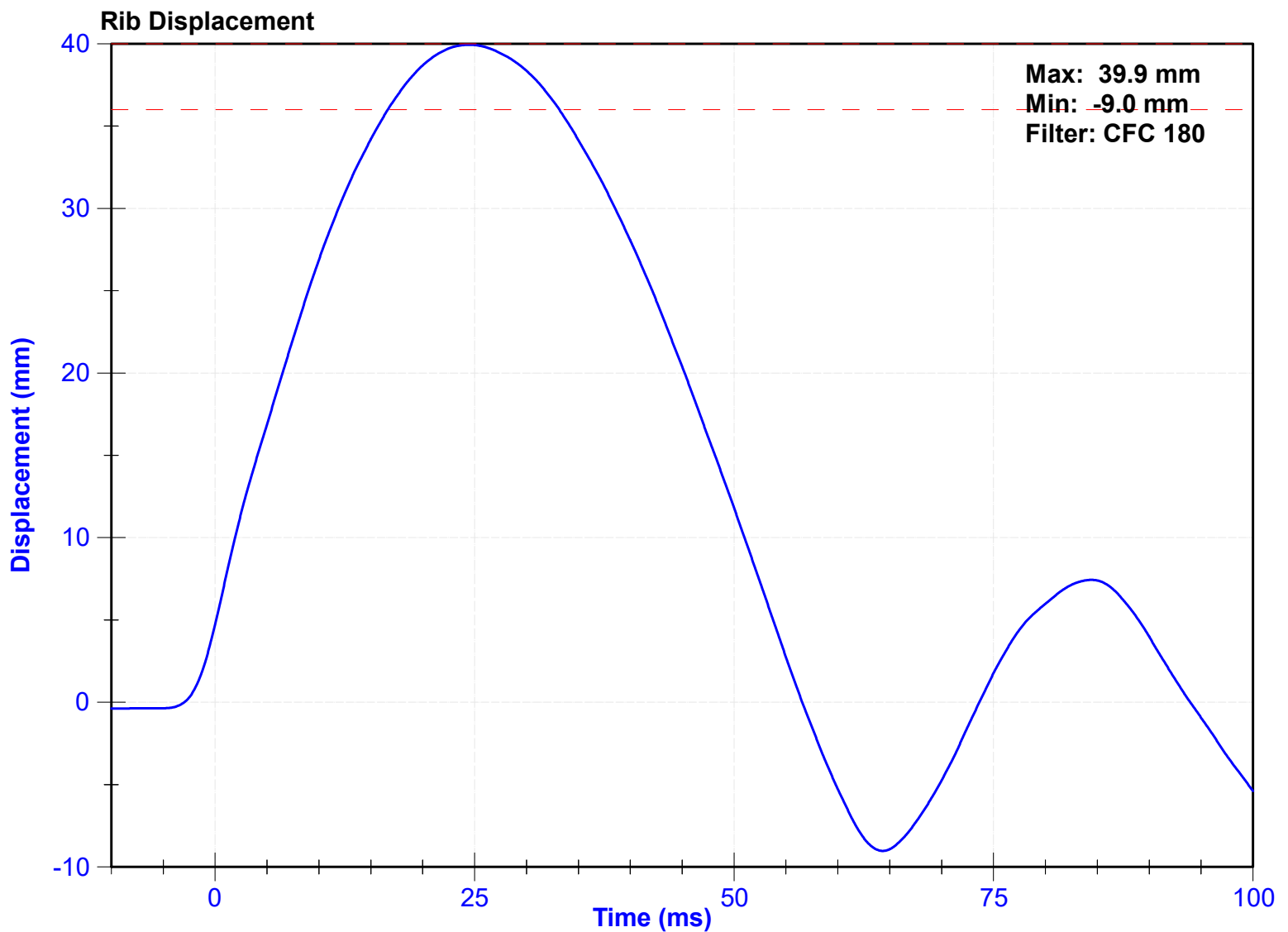
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	36	40	mm	39.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	807	4/21/2025	10/20/2025



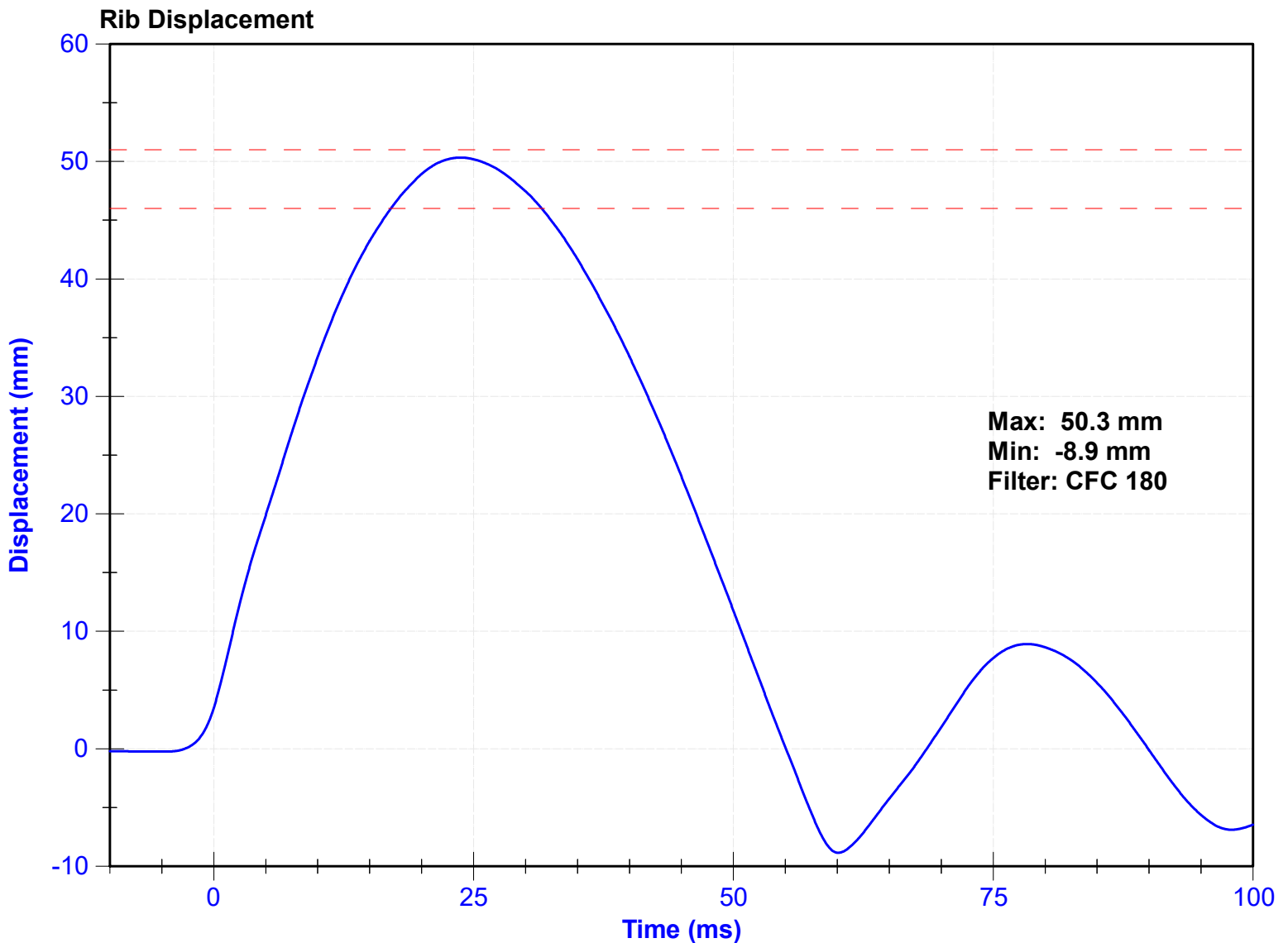
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	46	51	mm	50.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-03	4/21/2025	10/20/2025



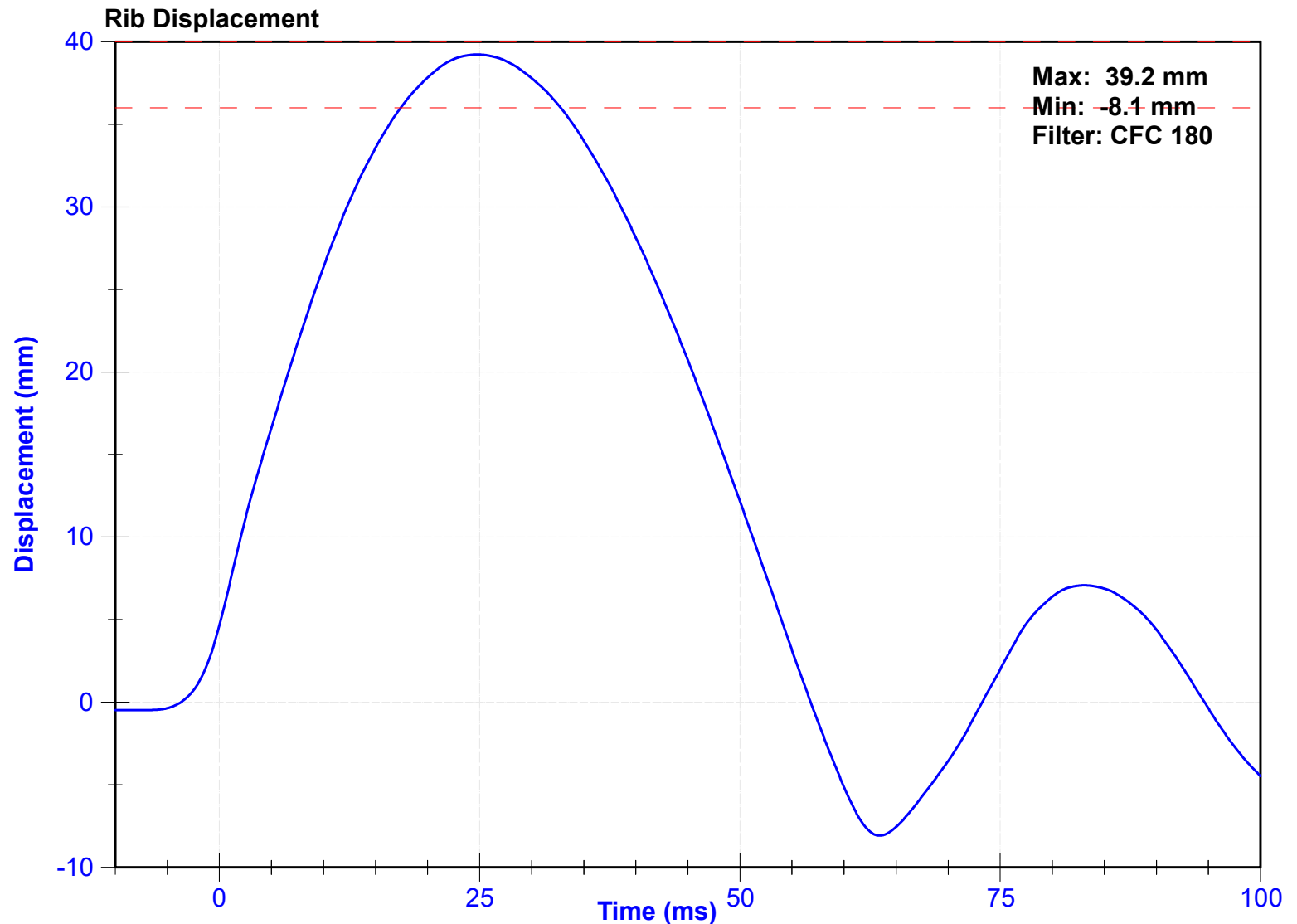
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	36	40	mm	39.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-03	4/21/2025	10/20/2025



ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

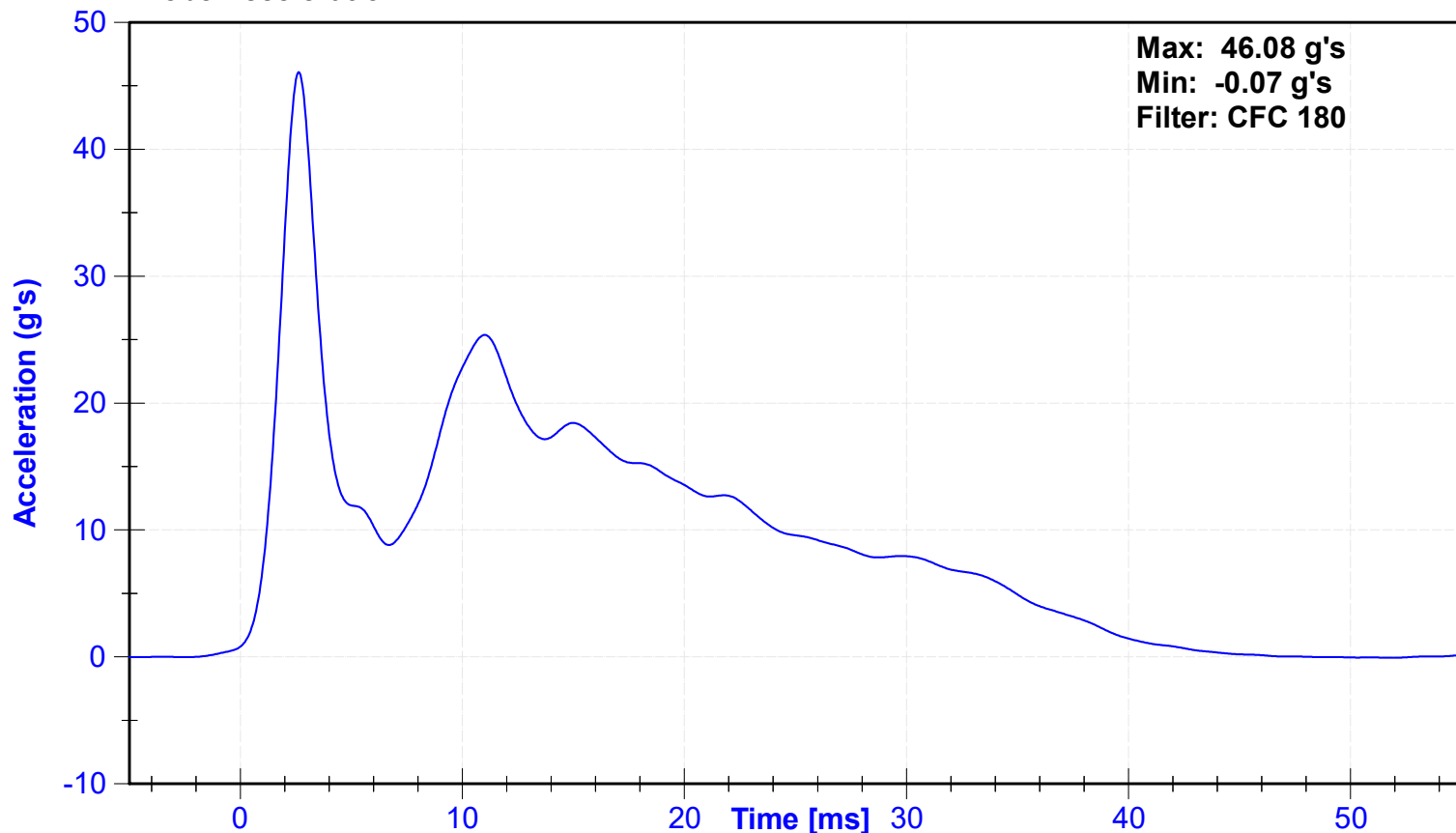
Results

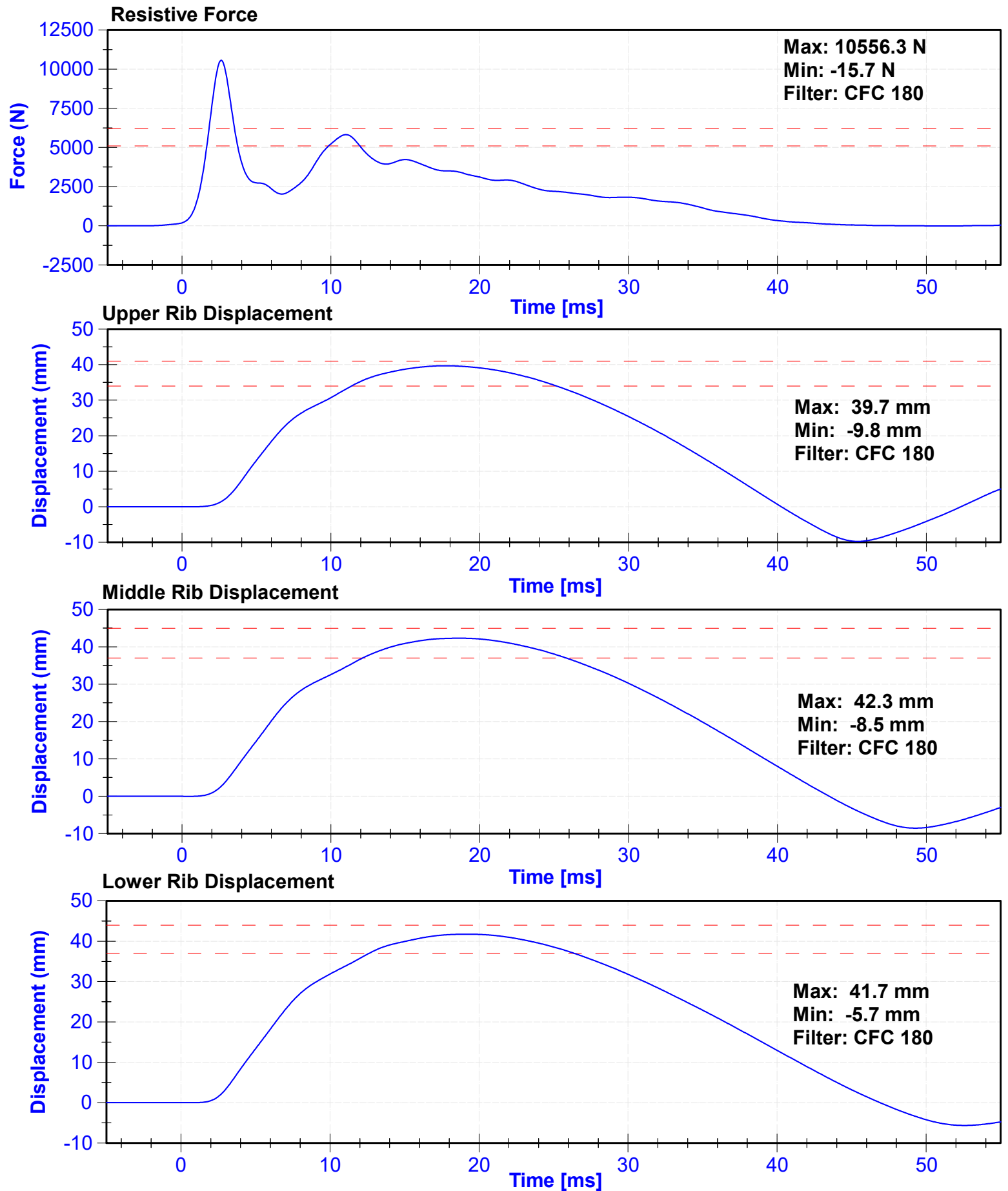
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	5.4	5.6	m/s	5.52	Pass
Resistive Force after 6ms	5100	6200	N	5814.0	Pass
Upper Thorax Rib Deflection	34	41	mm	39.7	Pass
Mid Thorax Rib Deflection	37	45	mm	42.3	Pass
Lower Thorax Rib Deflection	37	44	mm	41.7	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	0552-01	4/21/2025	10/20/2025
Middle Thorax Rib Potentiometer	Honeywell	807	4/21/2025	10/20/2025
Lower Thorax Rib Potentiometer	Honeywell	0552-03	4/21/2025	10/20/2025

Probe Acceleration





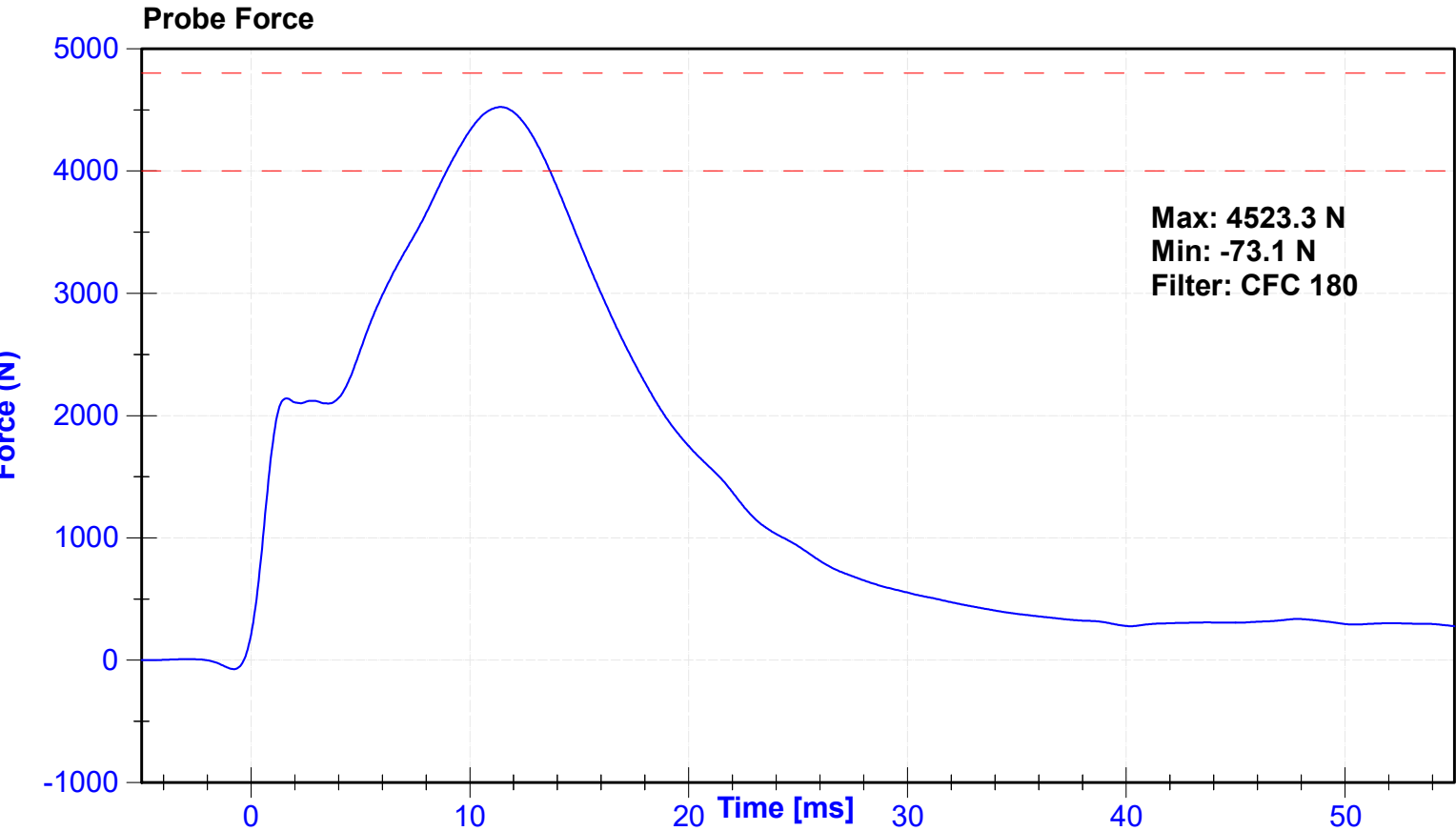
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

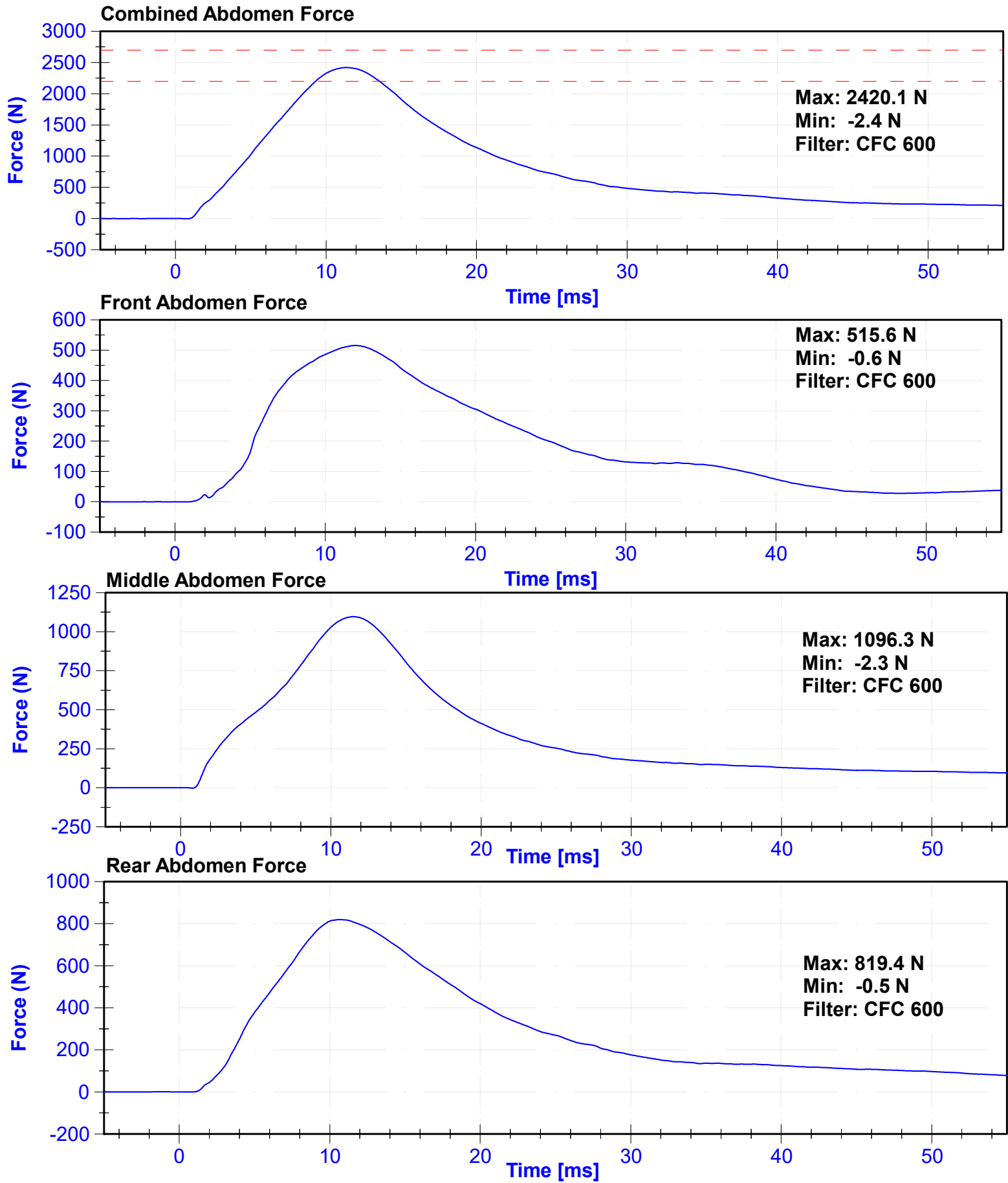
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	3.9	4.1	m/s	4.03	Pass
Combined Abdomen Force	2200	2700	N	2420.1	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.35	Pass
Resistive Probe Force	4000	4800	N	4523.3	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.40	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	1512	9/16/2024	9/16/2025
Middle Abdomen Load Cell	Denton	1526	9/16/2024	9/16/2025
Rear Abdomen Load Cell	Denton	1516	9/16/2024	9/16/2025





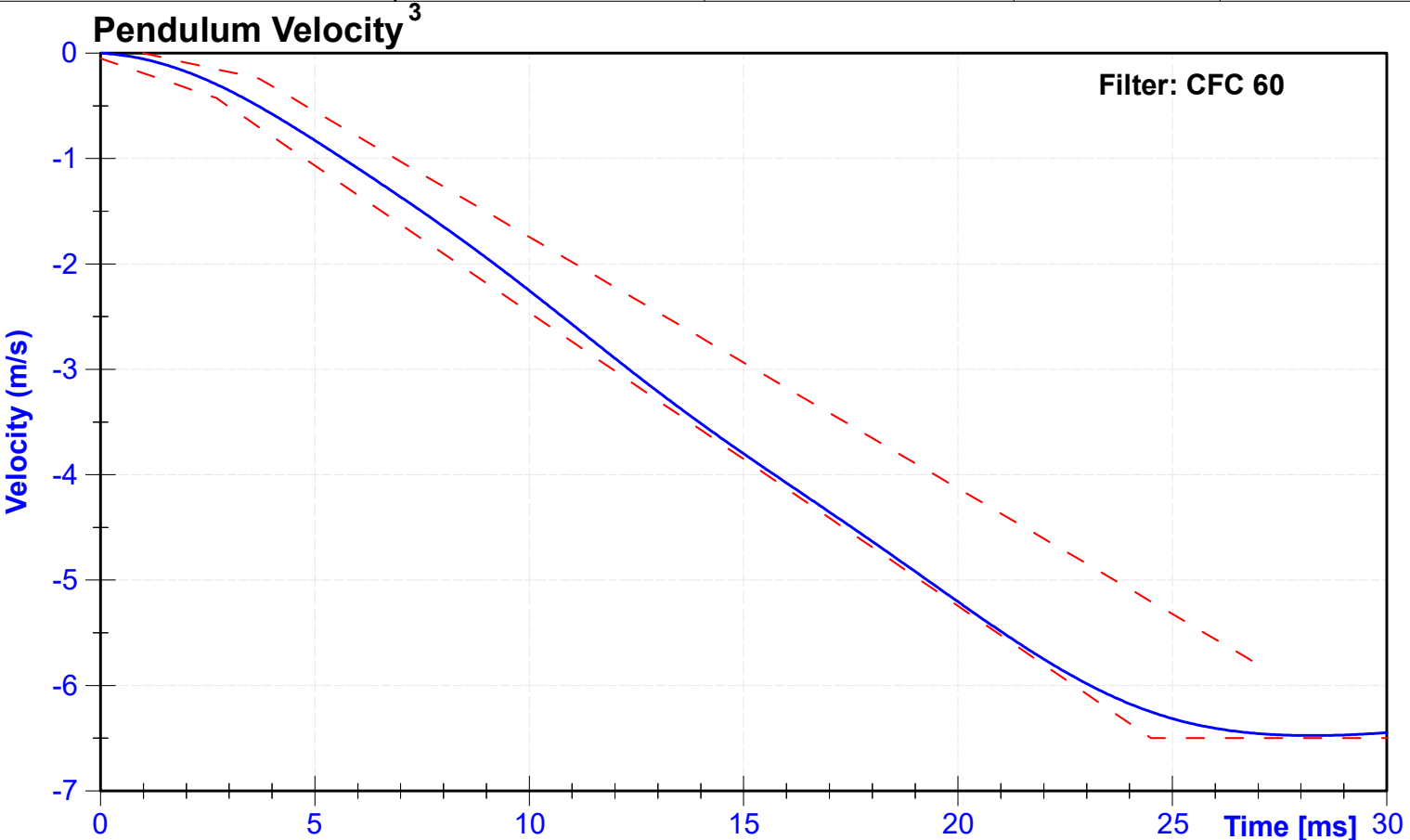
ATD Manufacturer	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

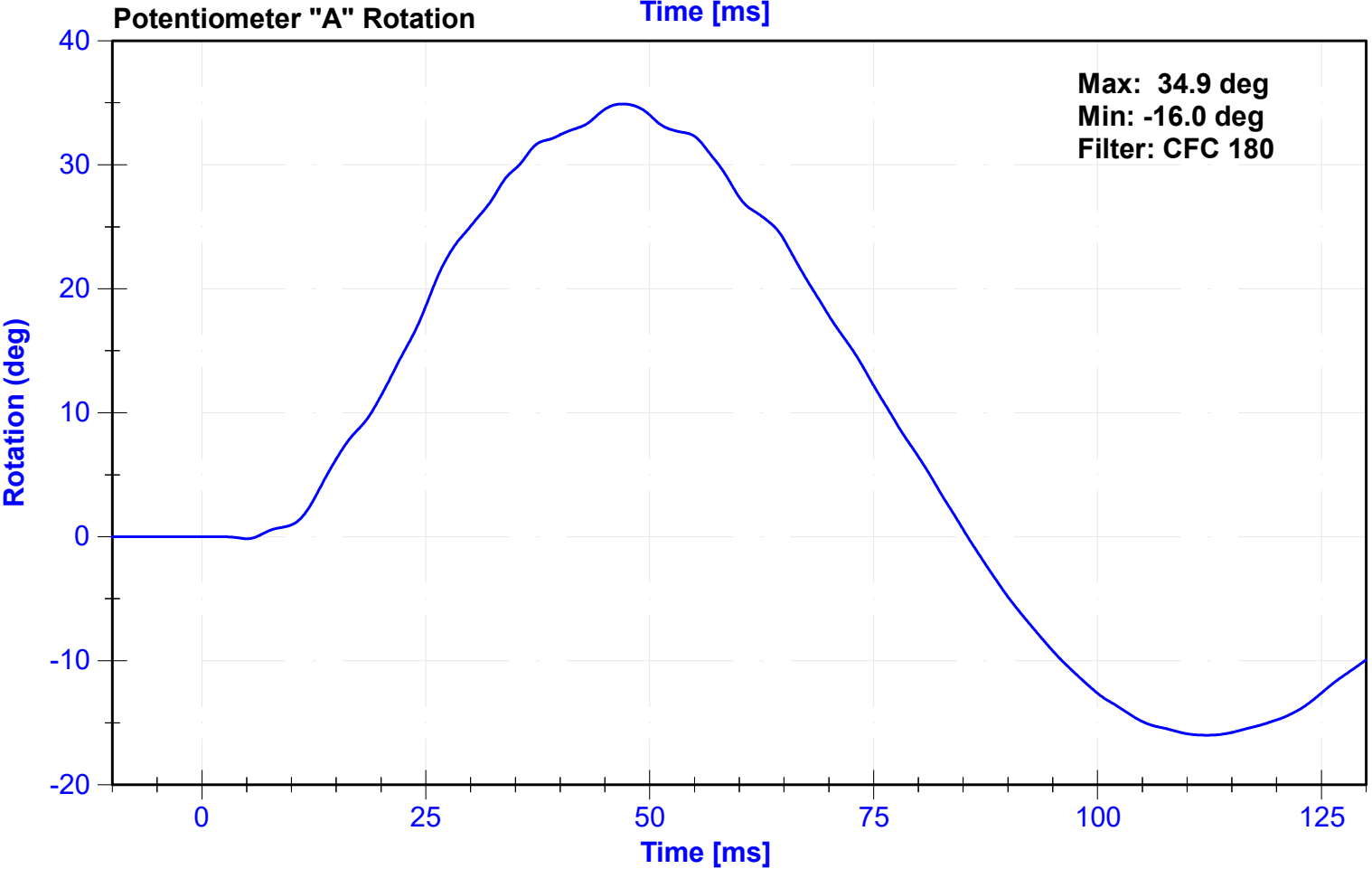
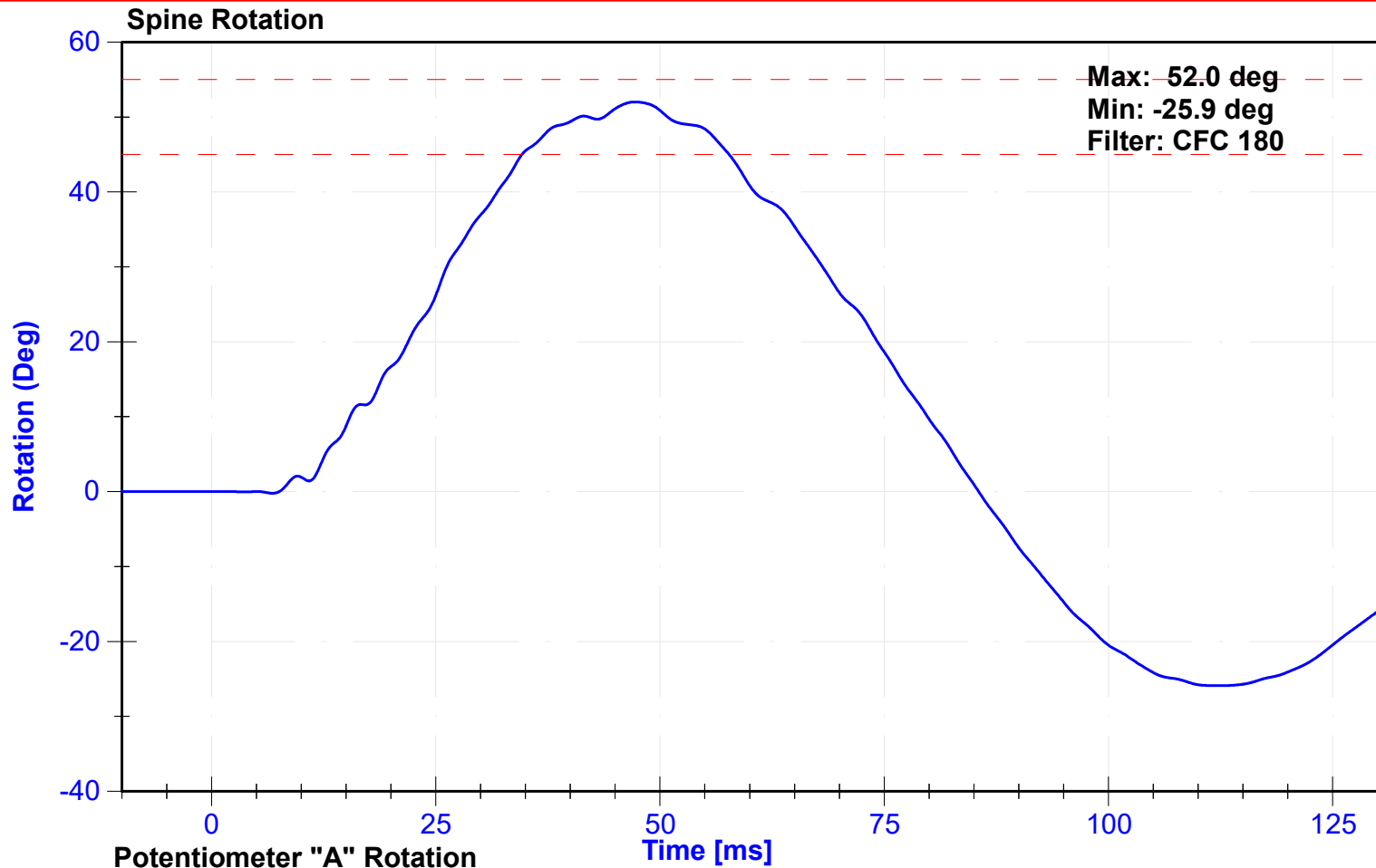
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	46	Pass
Velocity	5.95	6.15	m/s	6.061	Pass
Lateral Spine Rotation	45	55	deg	52.0	Pass
Time at Maximum Rotation	39	53	ms	47.2	Pass
Time of Decay to Zero Degrees	37	57	ms	38.4	Pass
Pendulum Velocity Overall Corridor	Lower Boundary ¹	Upper Boundary ²	m/s	See Plot ³	Pass

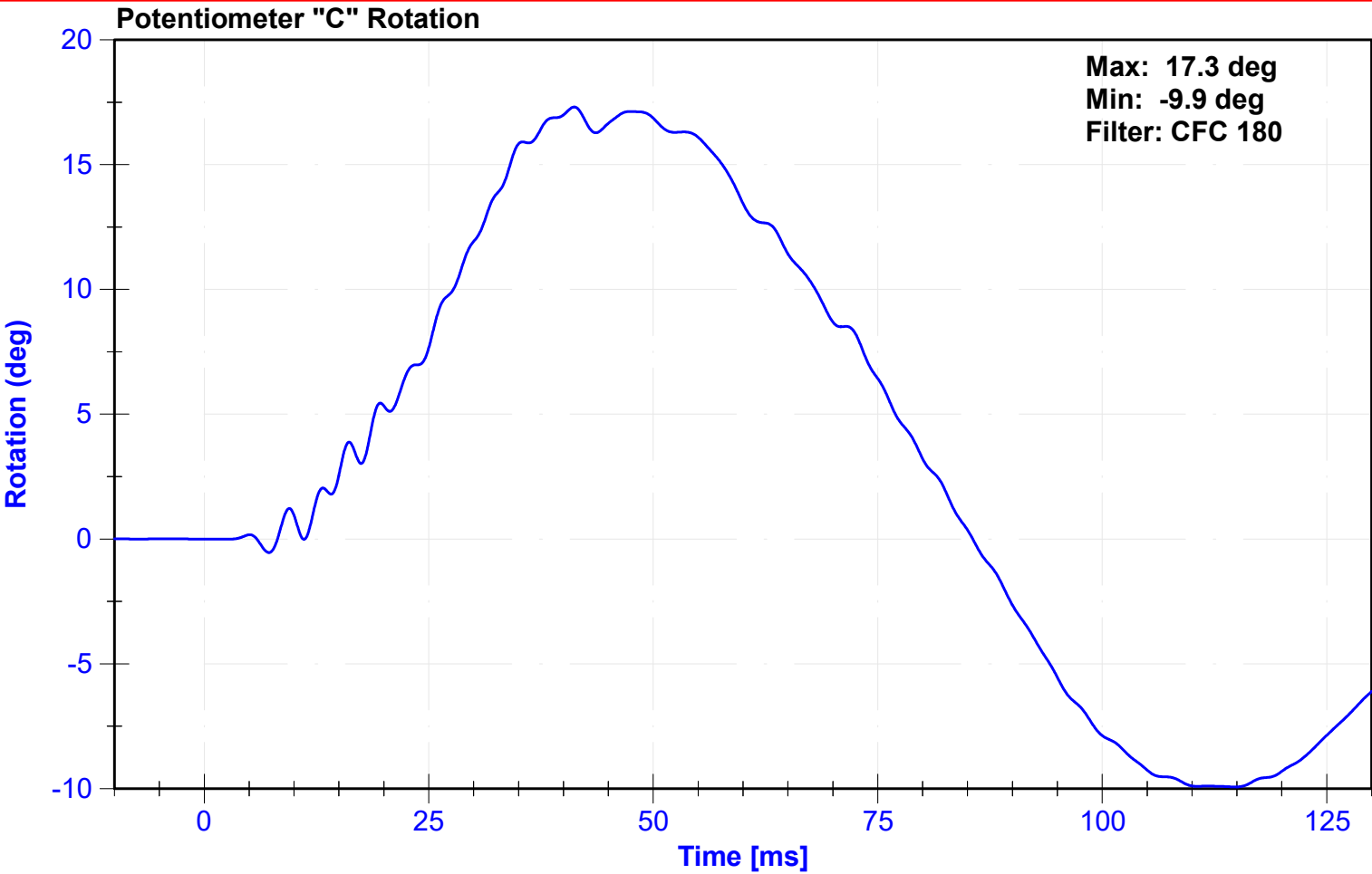
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
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 V-19





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	Denton	Test Technician	Z. Nyhart
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

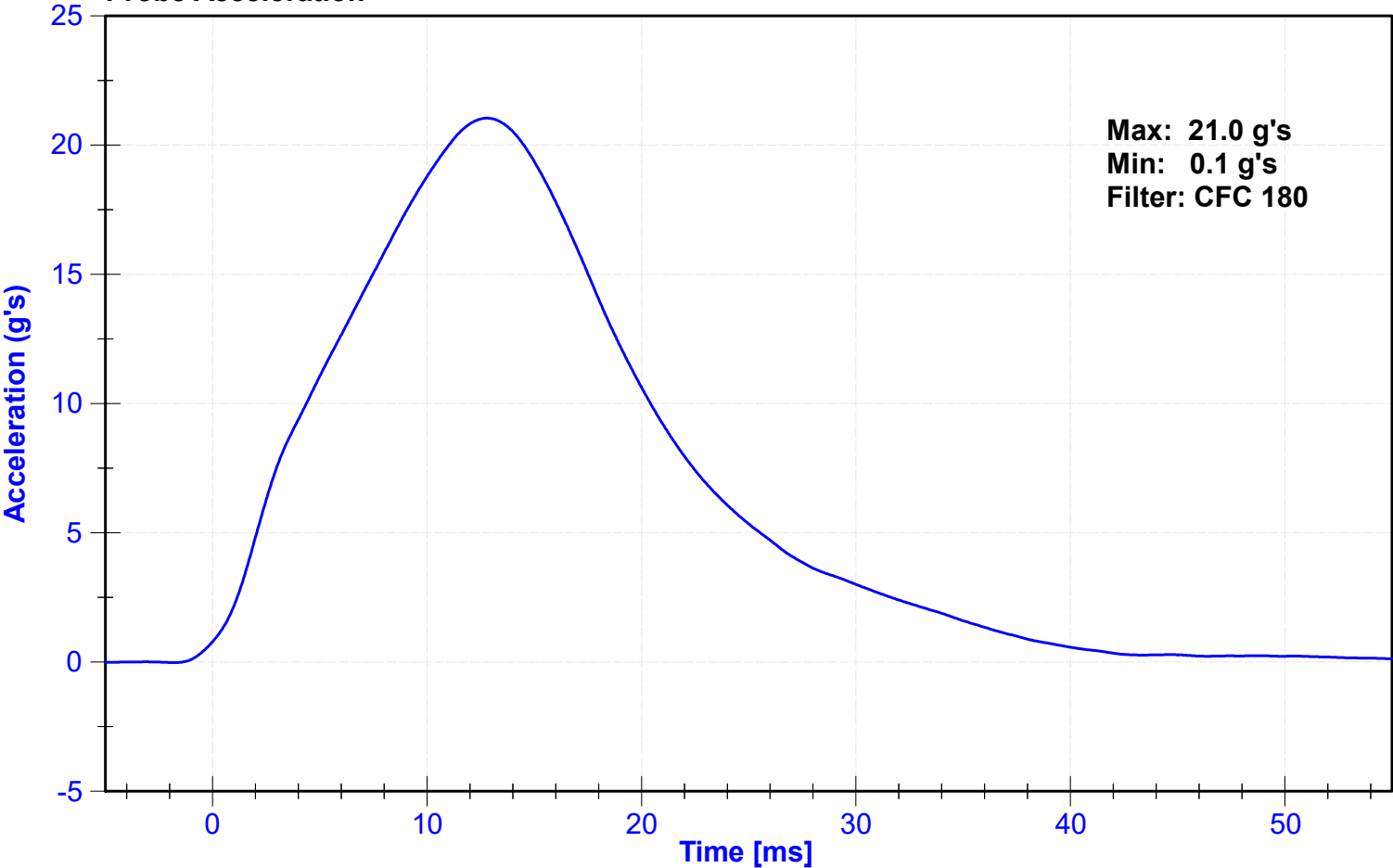
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Resistive Force	4700	5400	N	4819.9	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.80	Pass
Pubic Force	-1590	-1230	N	-1451.4	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.75	Pass

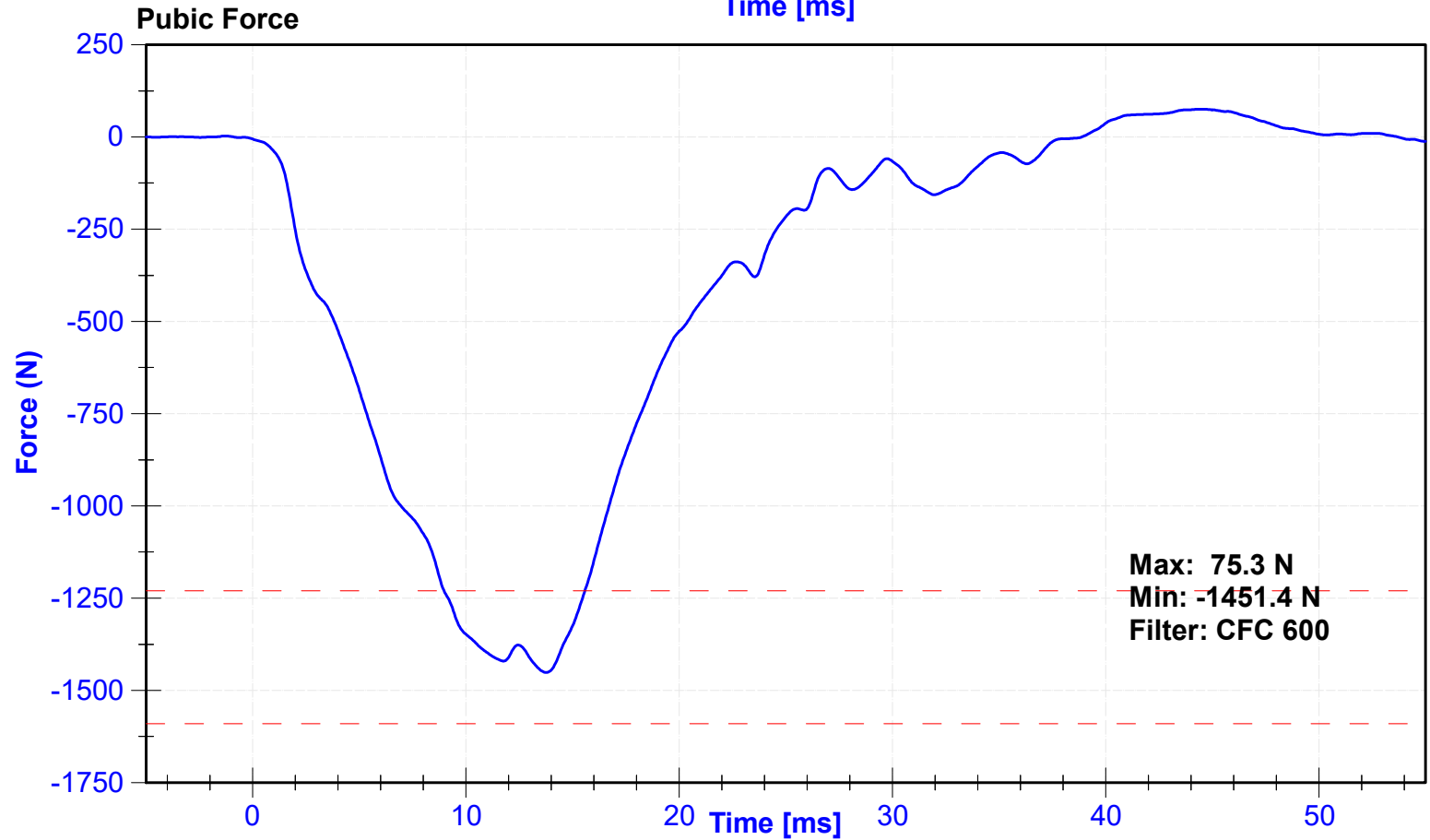
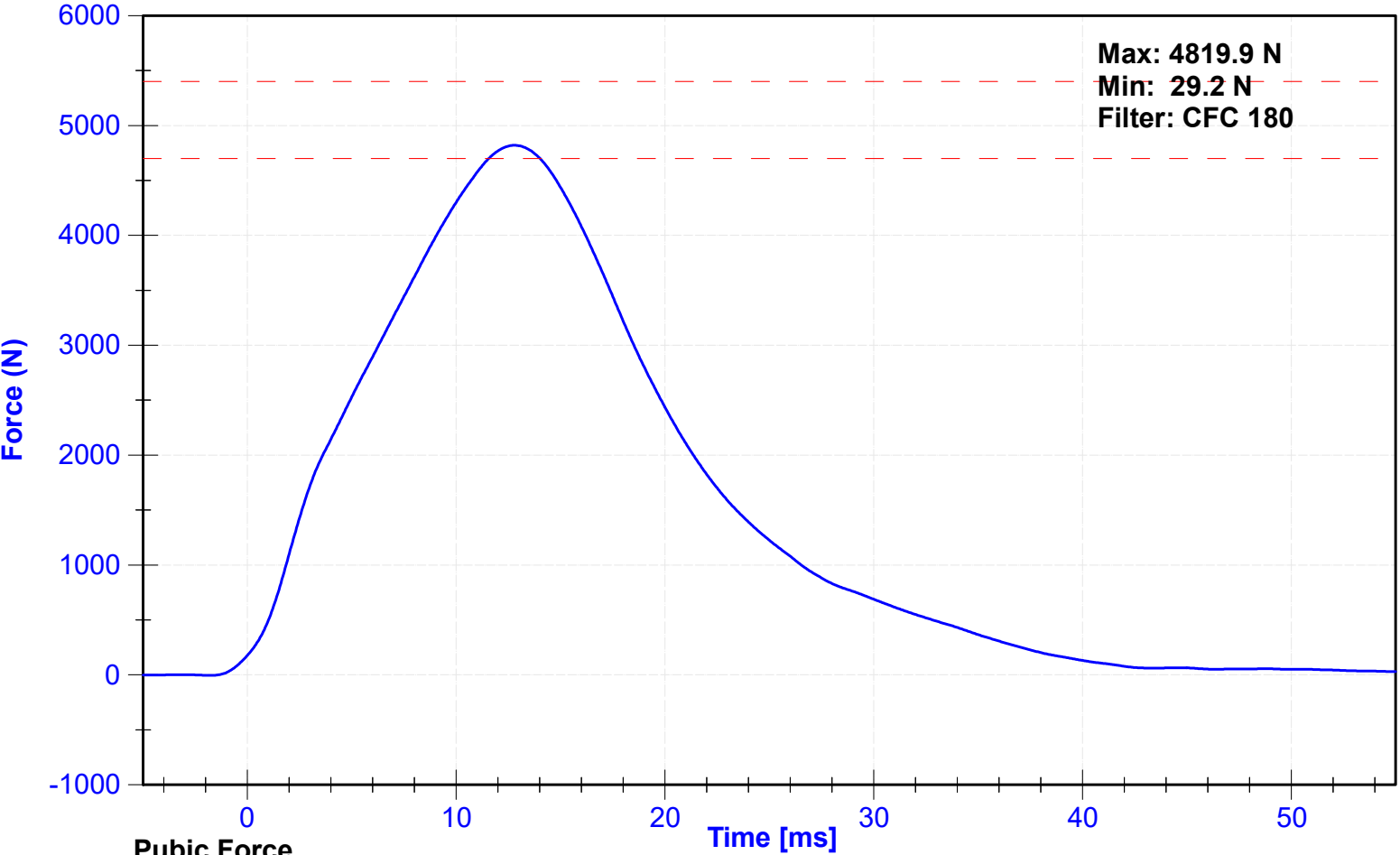
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pubic Load Cell	Denton	464-FY	9/16/2024	9/16/2025

Probe Acceleration



Resistive Force



POST-TEST
ES-2re PERFORMANCE CALIBRATION TEST DATA

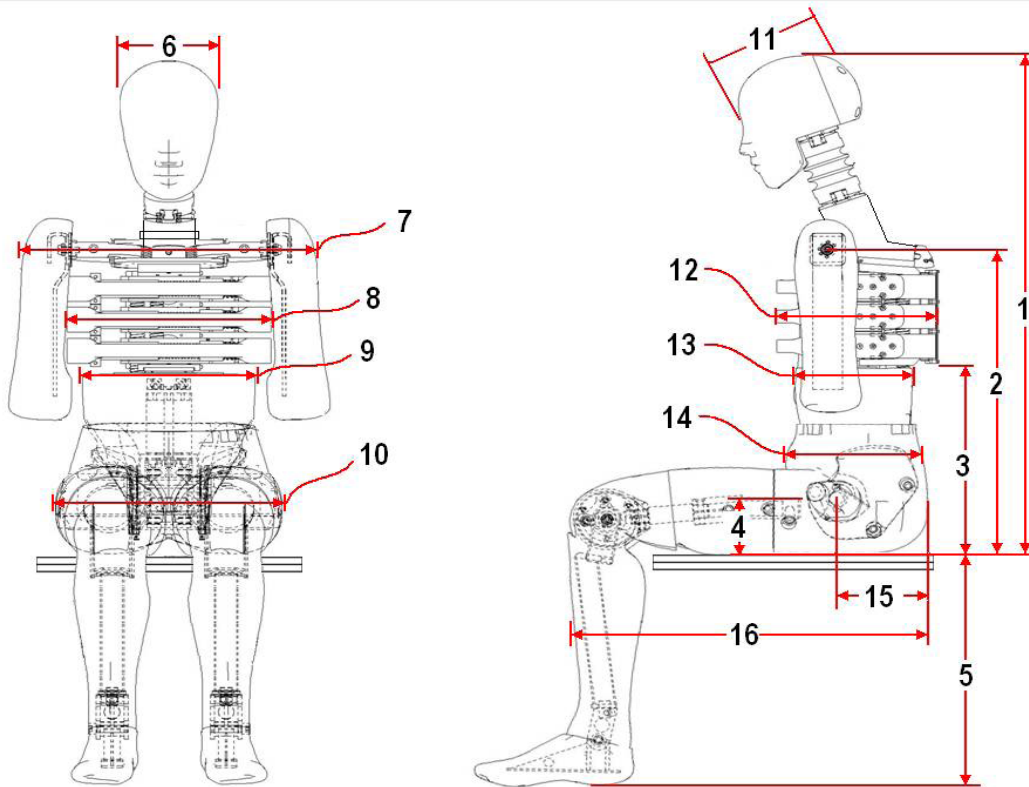


External Measurements - EuroSID-2re

Technician: J. Rios

Date: 8/1/2025

Dummy Serial Number: D037



FRONT VIEW

SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	912	Pass
2	Seat to Shoulder Joint	558	572	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	100	Pass
5	Sole to Seat, Sitting	333	451	409	Pass
6	Head Width	152	158	154	Pass
7	Shoulder/Arm Width	461	479	470	Pass
8	Thorax Width	322	332	328	Pass
9	Abdomen Width	273	287	281	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	197	Pass
14	Pelvis Depth	235	245	239	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	155	Pass
16	Back of Buttocks to Front Knee	597	615	605	Pass

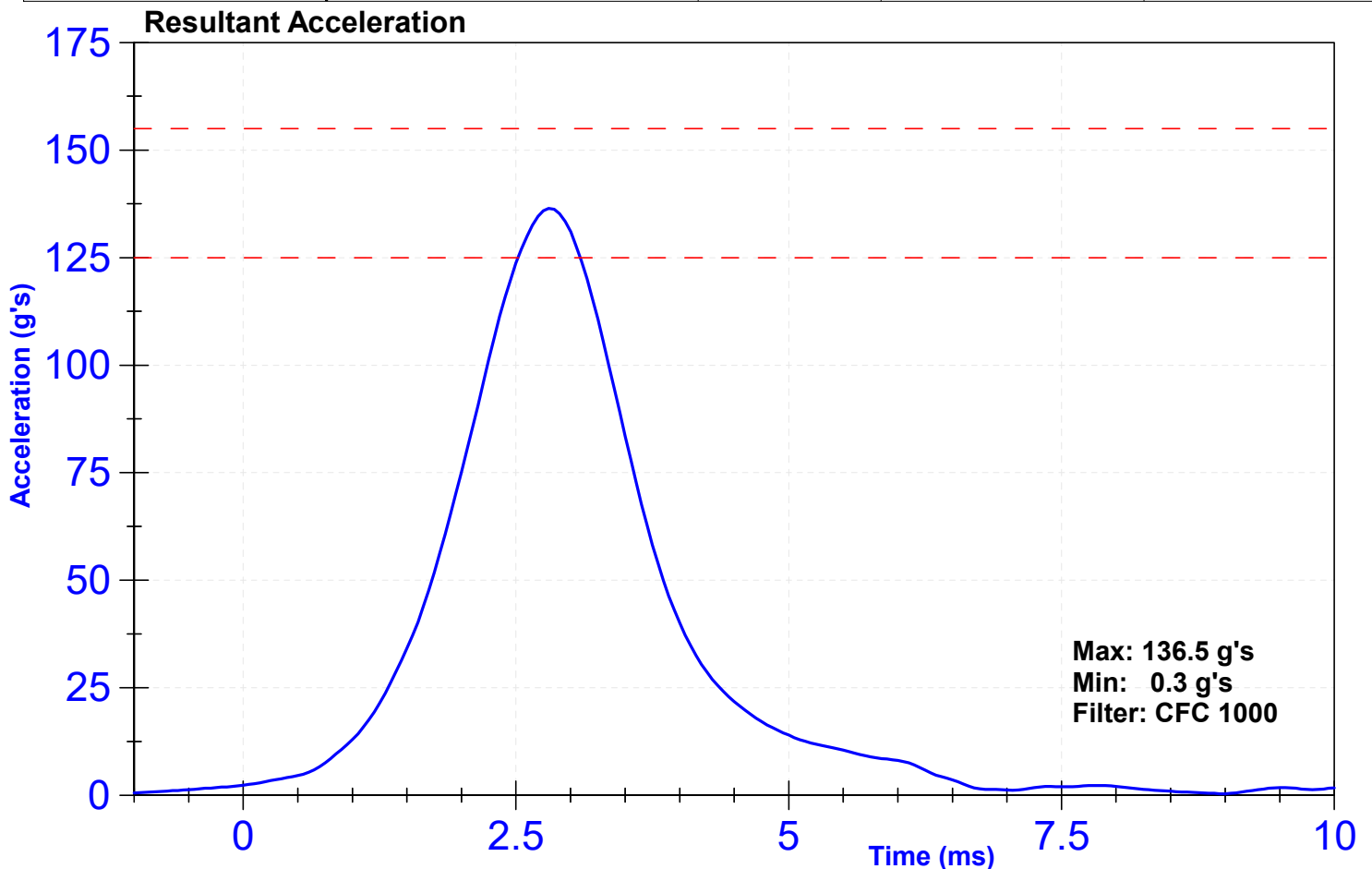
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

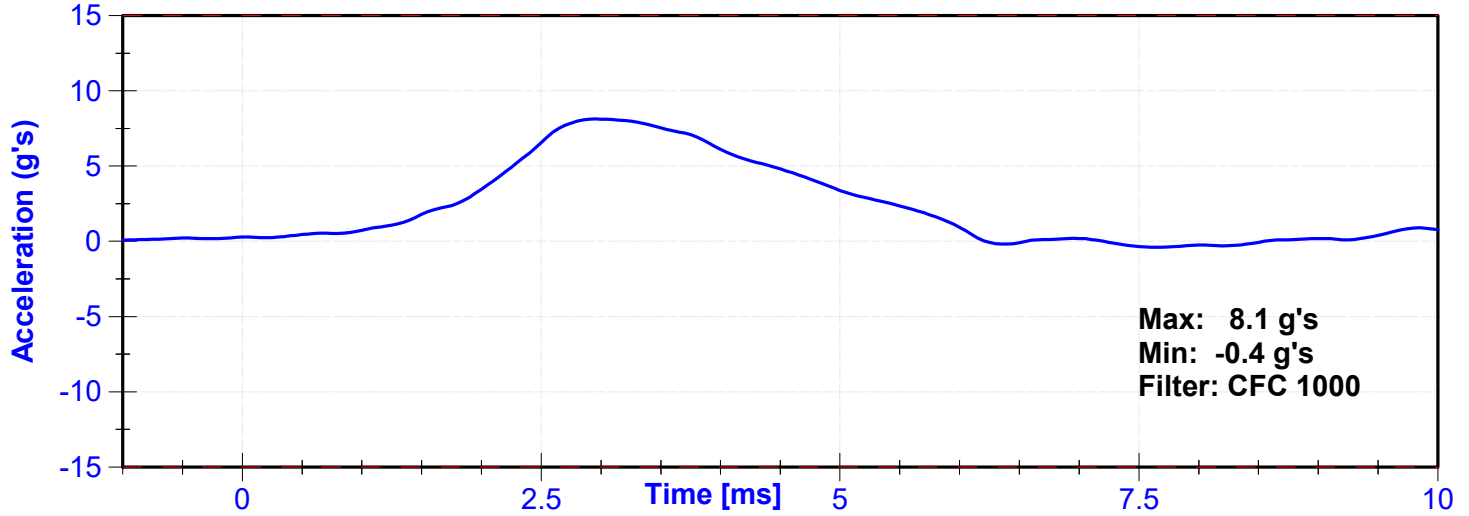
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Resultant Acceleration	125	155	g's	136.5	Pass
Oscillation	0	15	%	1.69	Pass
Fore-Aft Acceleration	-15	15	g's	8.1	Pass

Transducer Calibrations

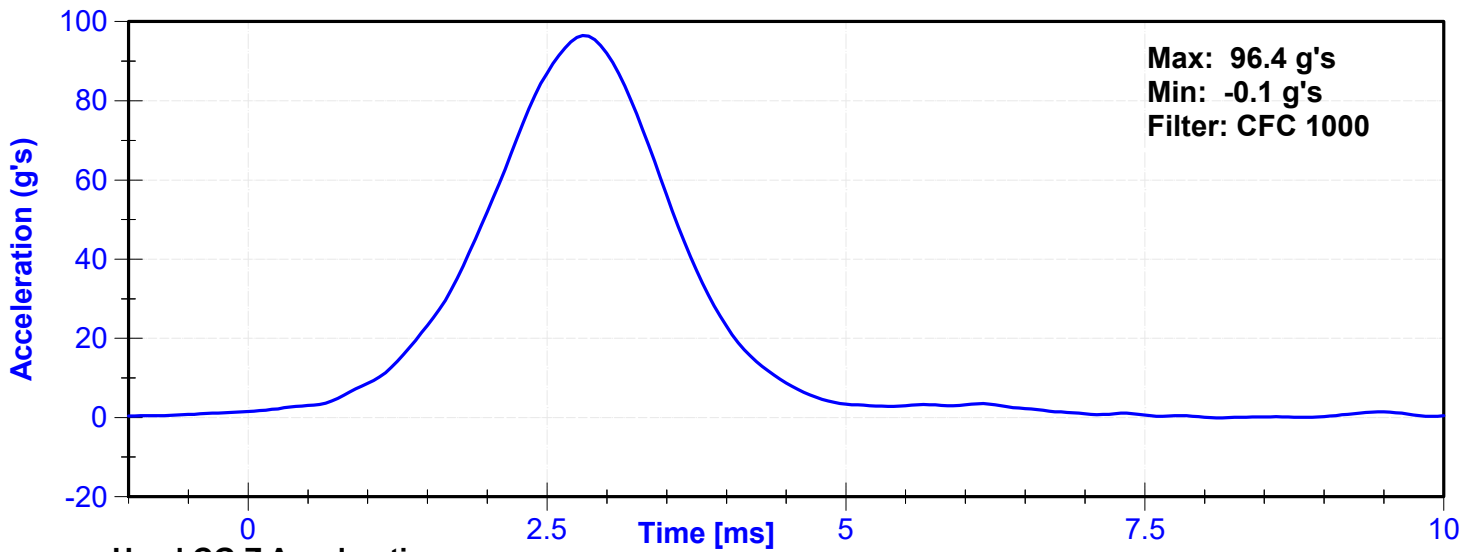
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	T21724	4/21/2025	10/18/2025
Y Accelerometer	Endevco	T22281	4/21/2025	10/18/2025
Z Accelerometer	Endevco	T26050	4/21/2025	10/18/2025



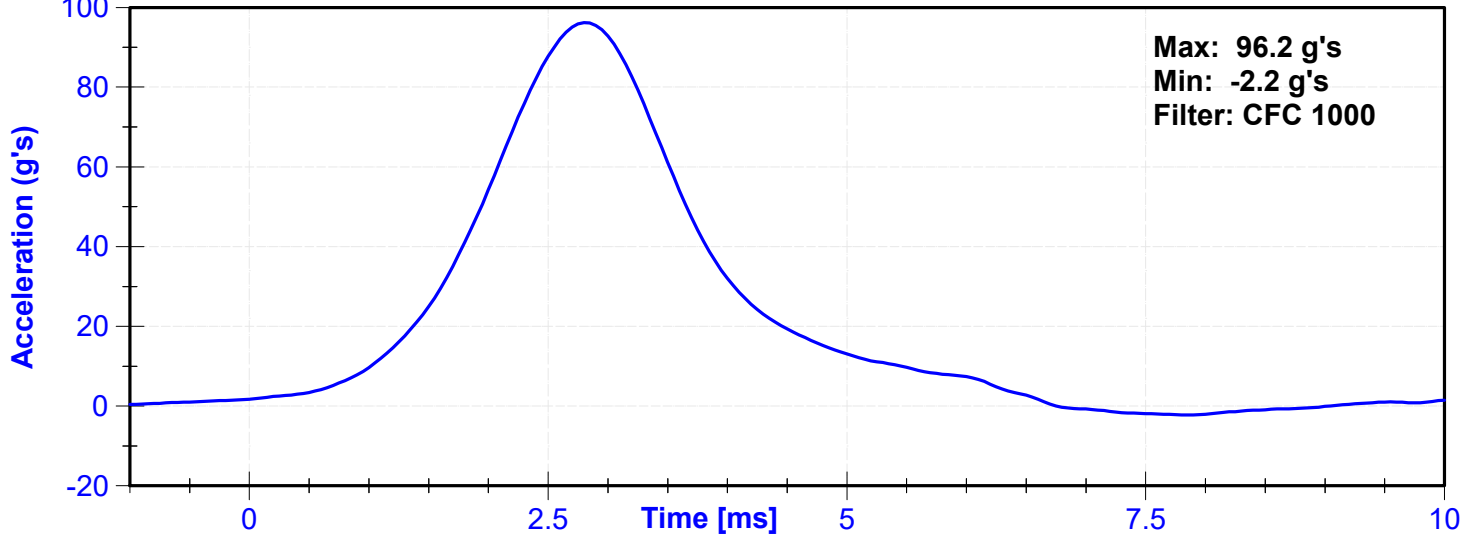
Head CG X Acceleration



Head CG Y Acceleration



Head CG Z Acceleration



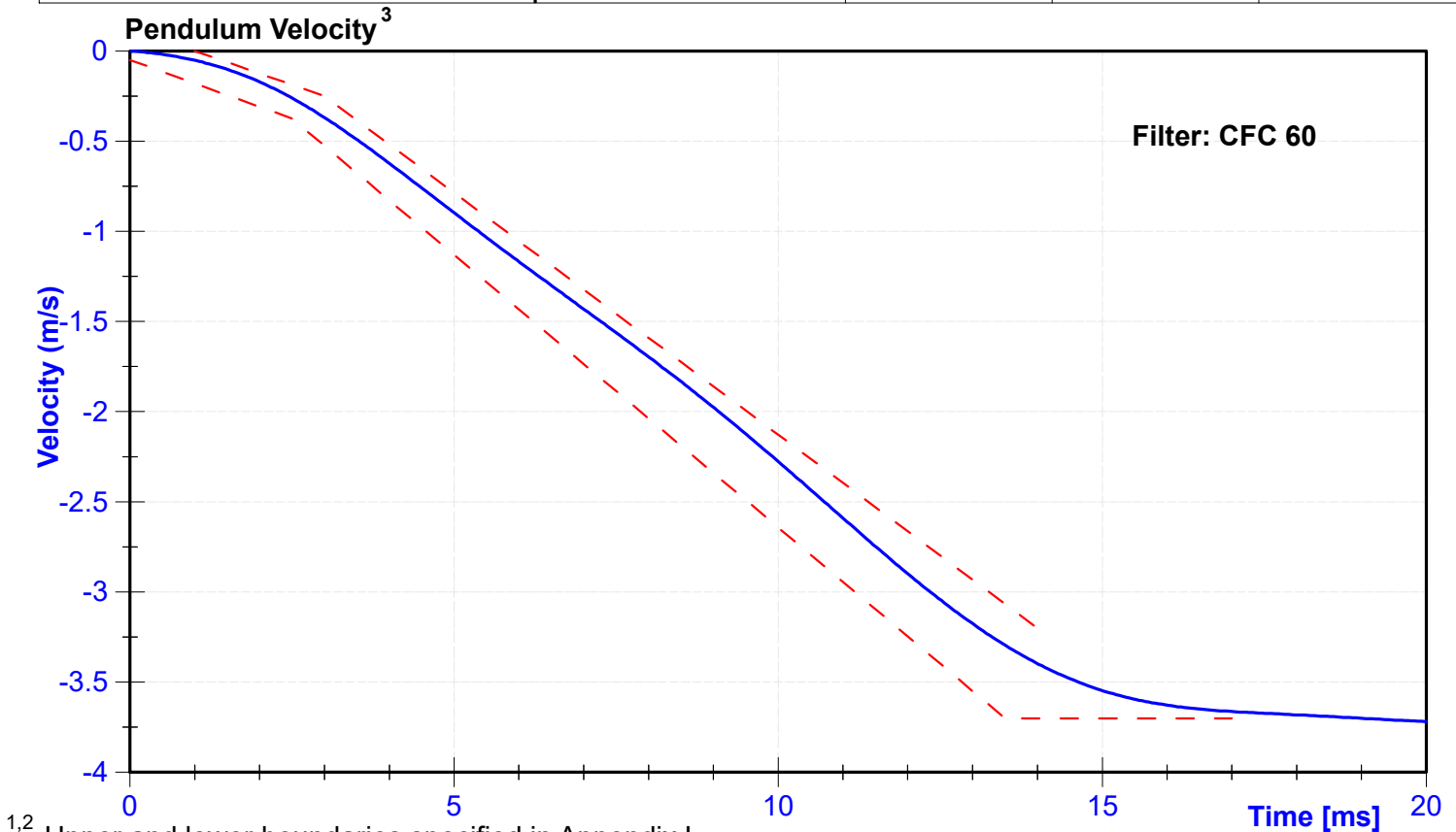
ATD Manufacturer	Denton	Test Technician	J. Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

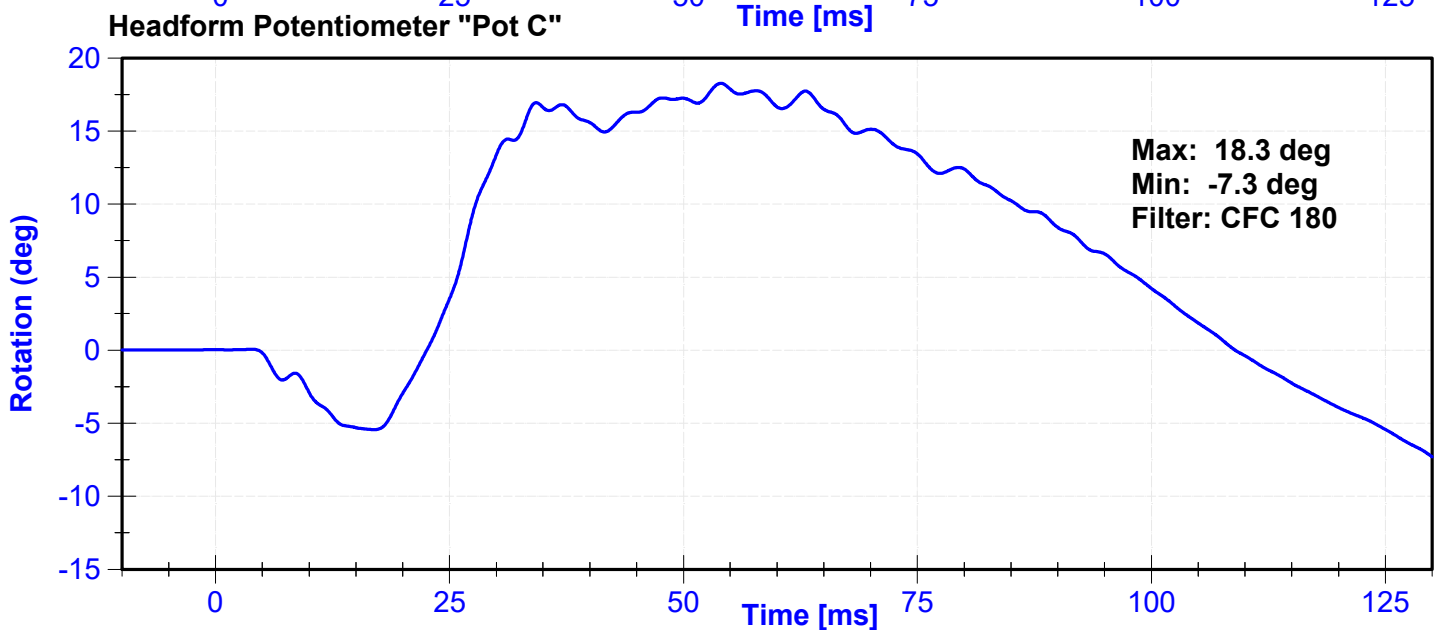
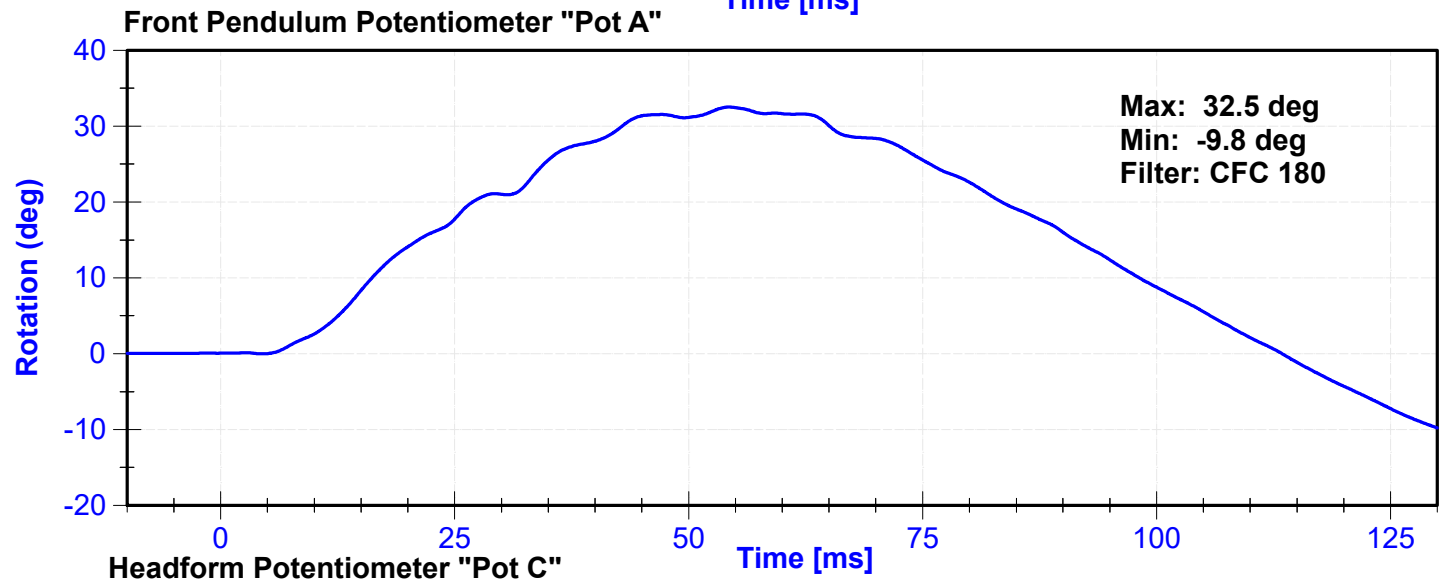
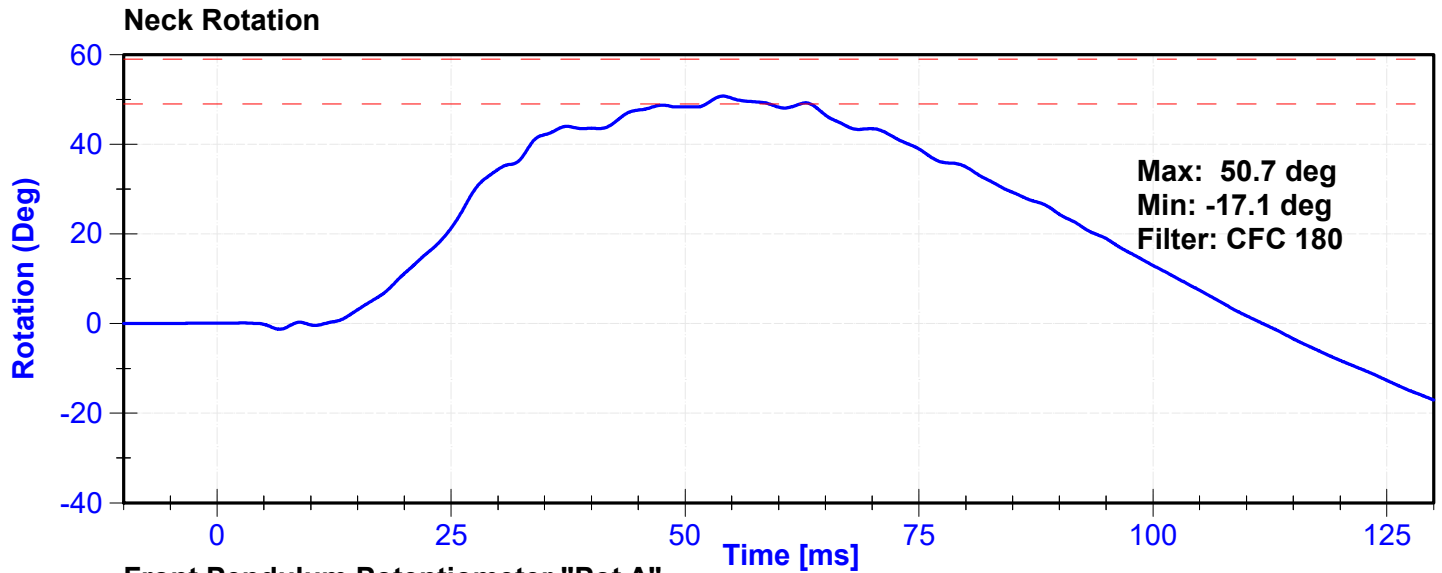
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	55	Pass
Velocity	3.3	3.5	m/s	3.45	Pass
Lateral Neck Rotation	49	59	deg	50.7	Pass
Time at Maximum Rotation	54	66	ms	54.1	Pass
Time of Rotation Decay from Maximum	53	88	ms	57.7	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





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

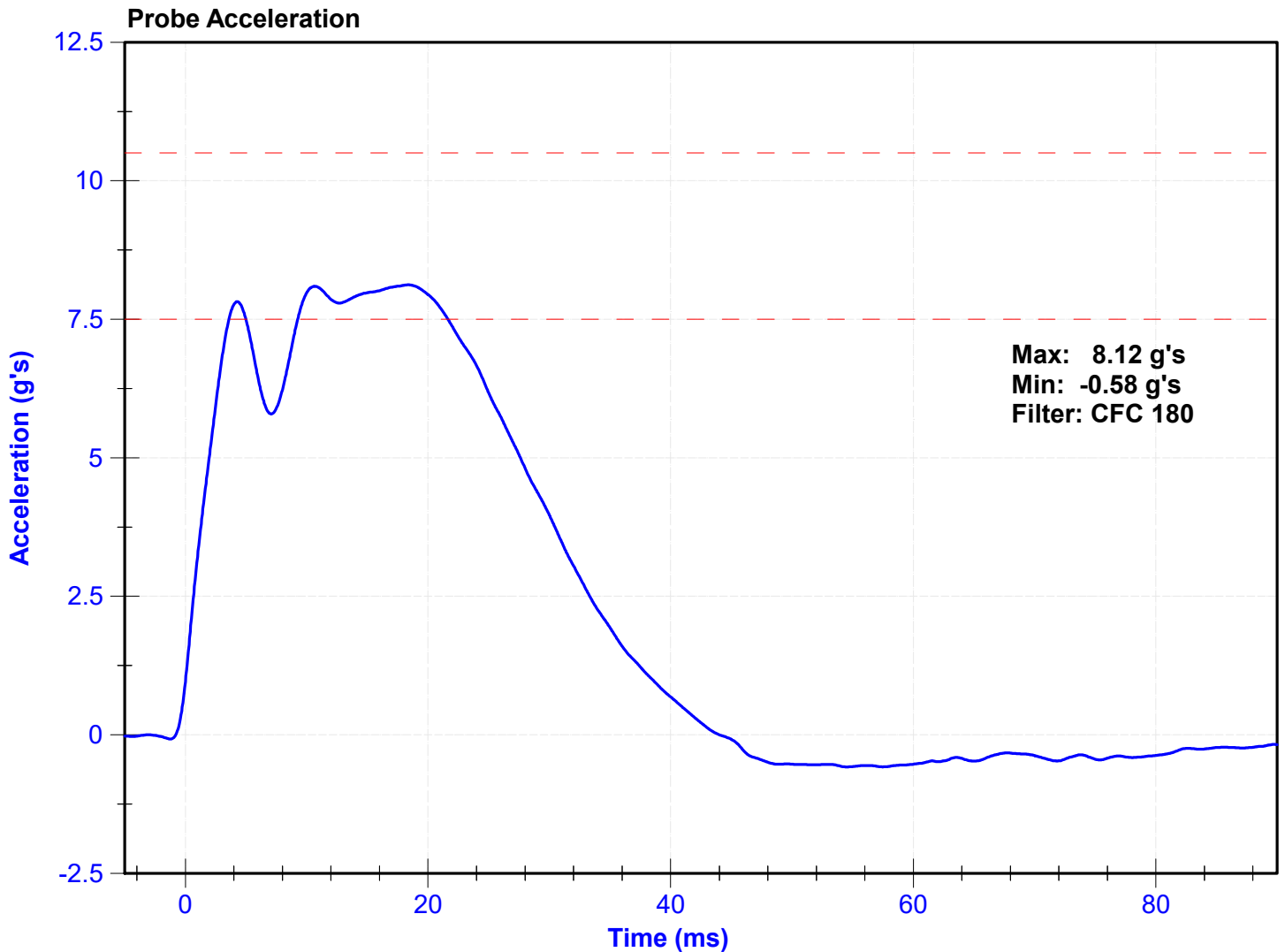
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	4.2	4.4	m/s	4.31	Pass
Probe Acceleration	7.5	10.5	g's	8.12	Pass

Transducer Calibrations

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



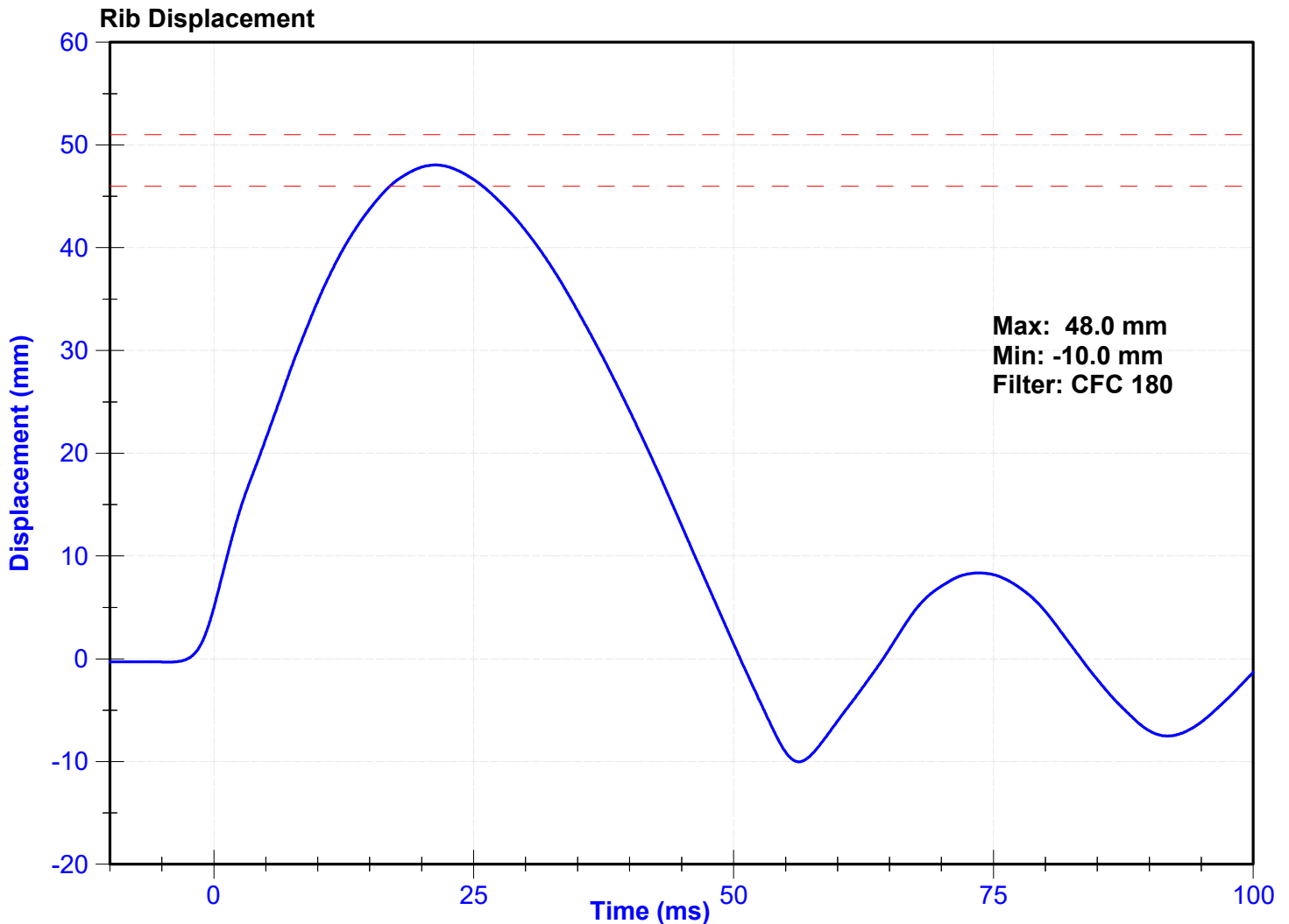
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	46	51	mm	48.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-01	4/21/2025	10/20/2025



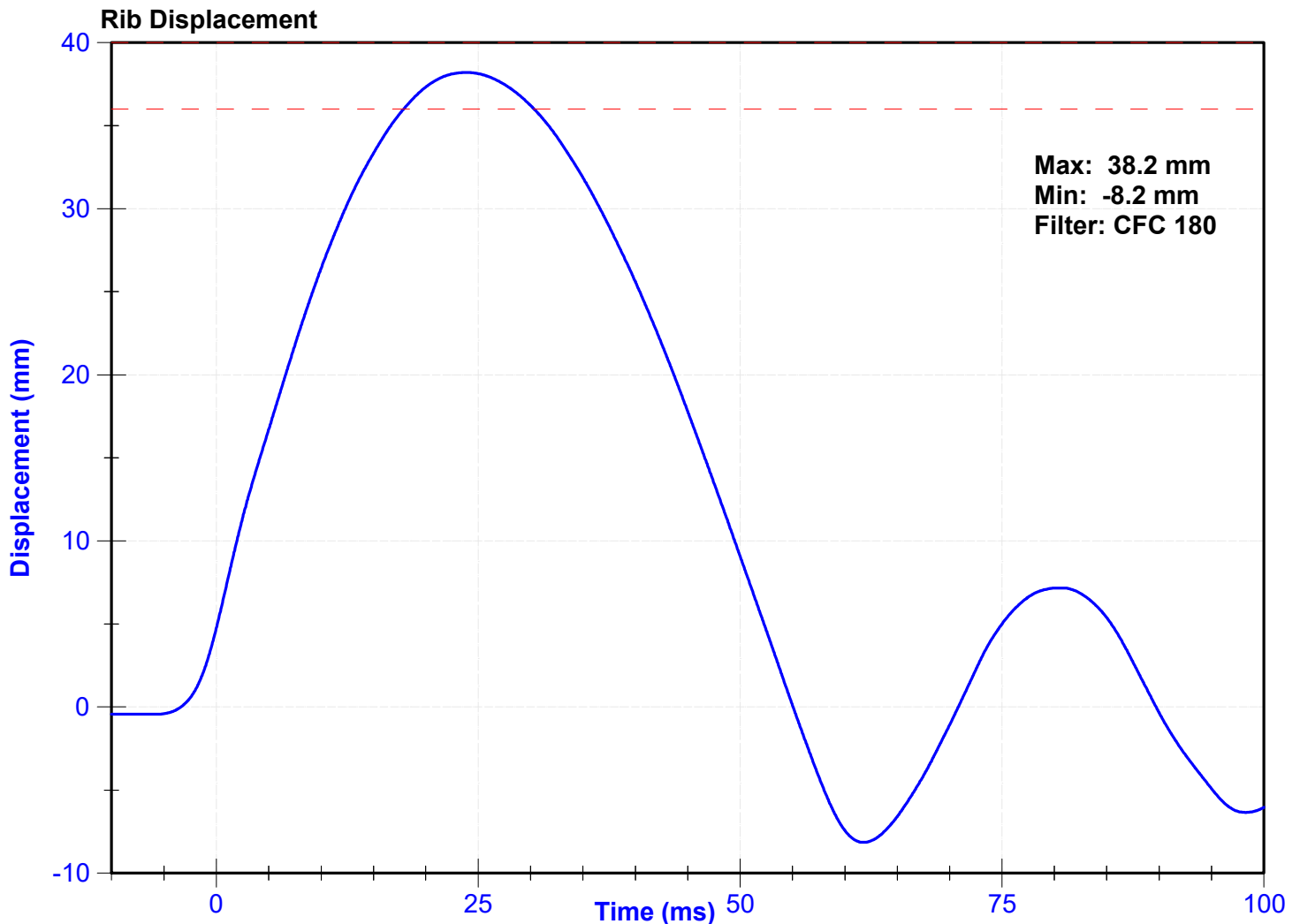
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	36	40	mm	38.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-01	4/21/2025	10/20/2025



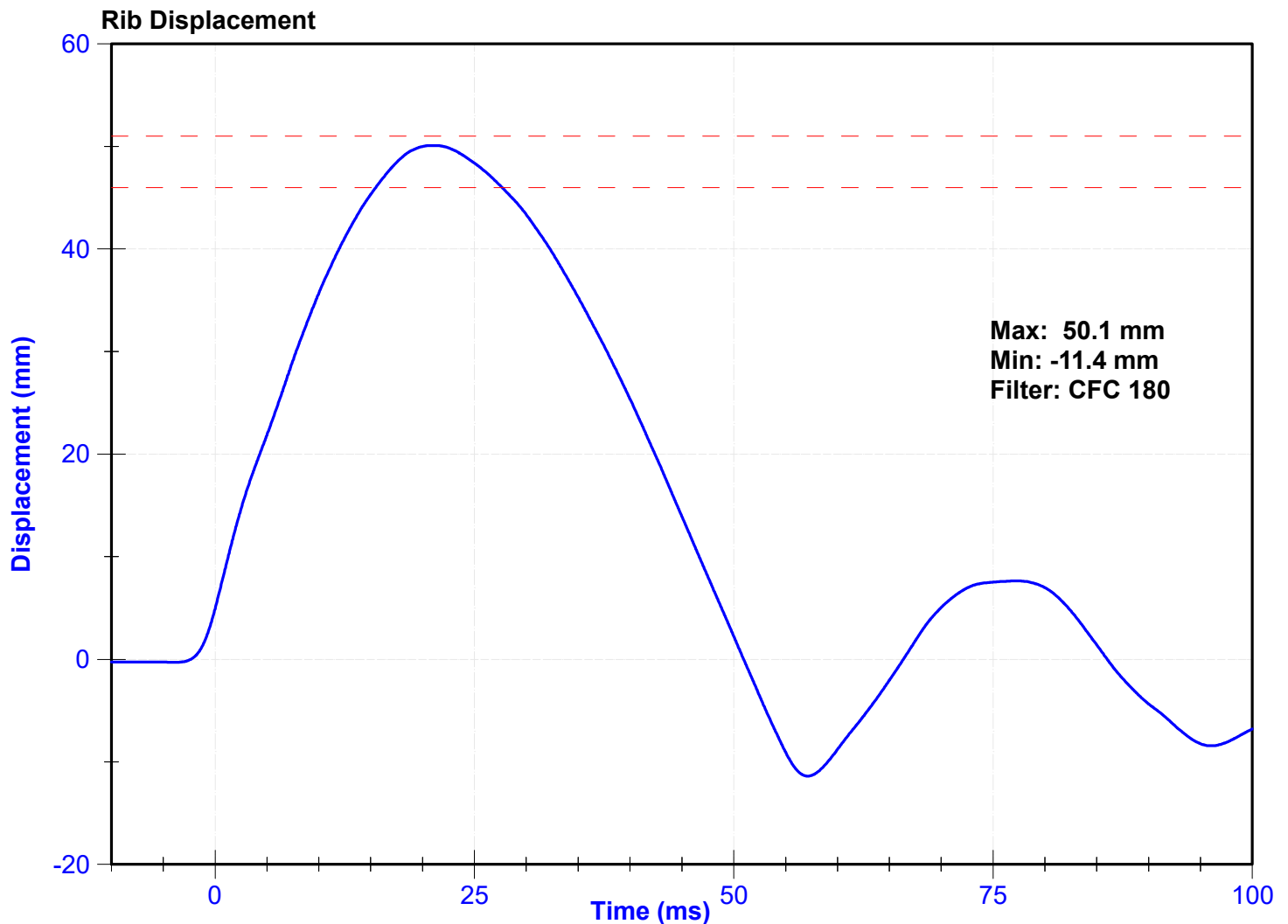
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	46	51	mm	50.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	807	4/21/2025	10/20/2025



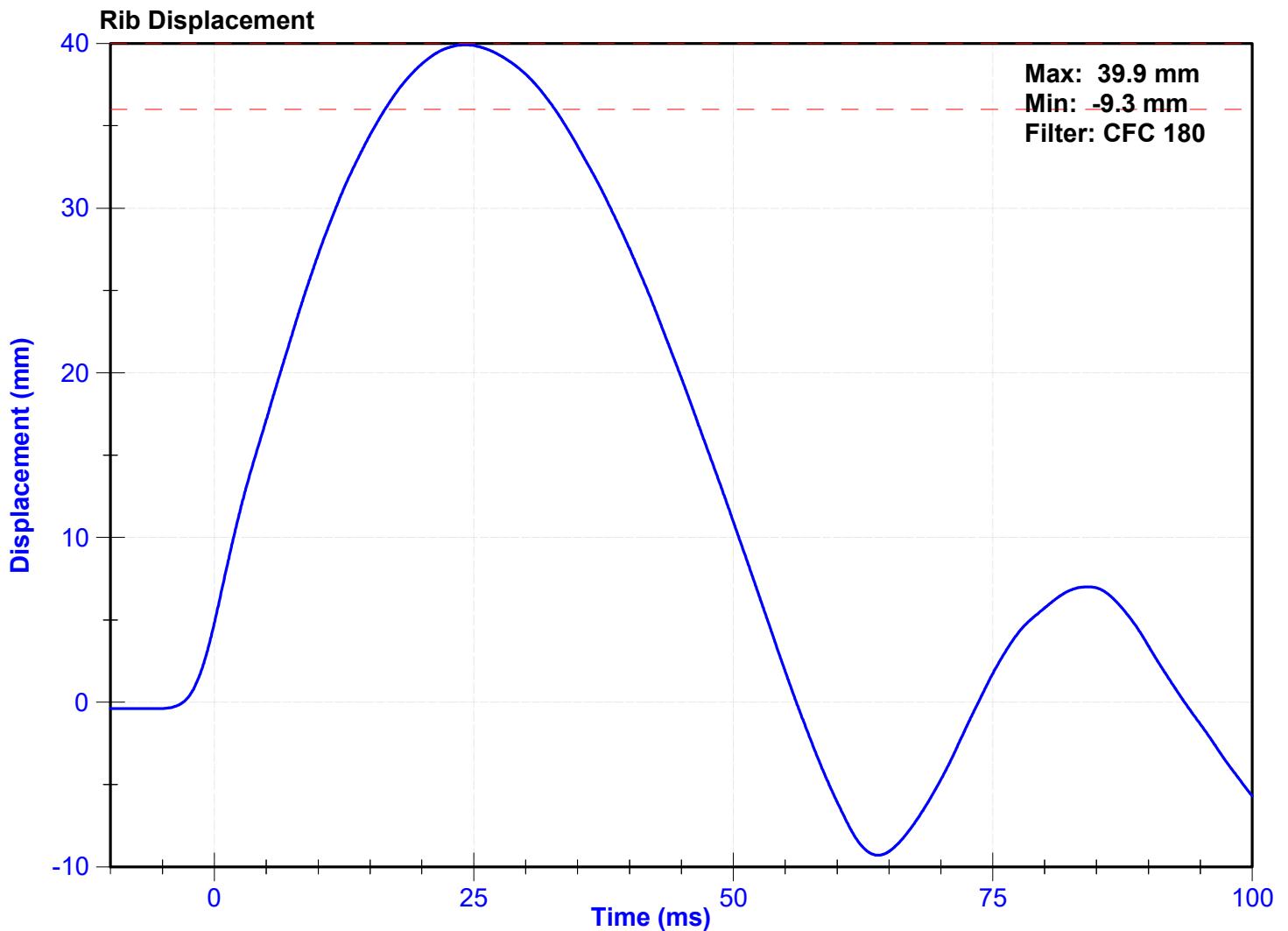
ATD Manufacturer	Denton	Test Technician	J. Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	36	40	mm	39.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	807	4/21/2025	10/20/2025



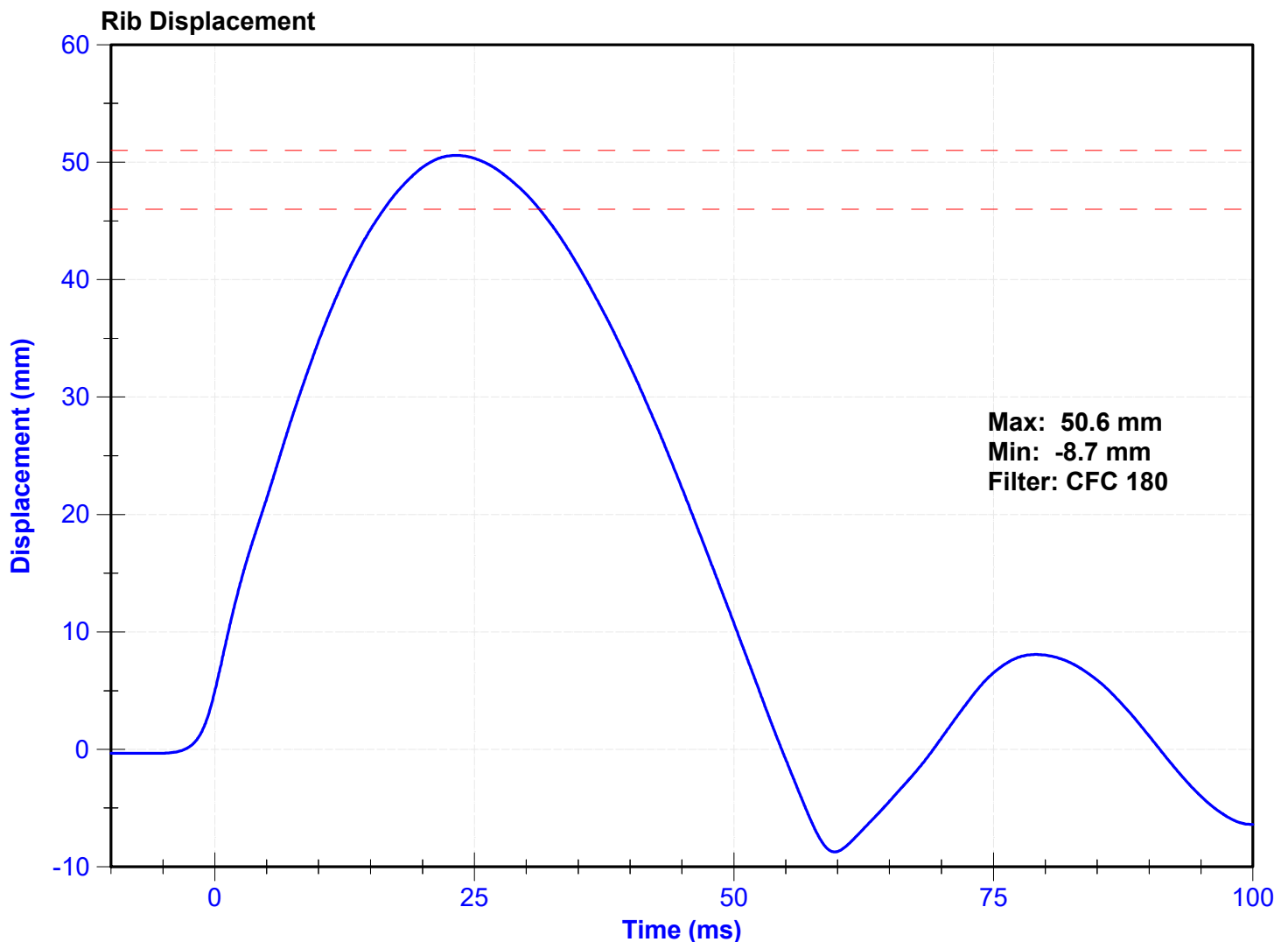
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	46	51	mm	50.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-03	4/21/2025	10/20/2025



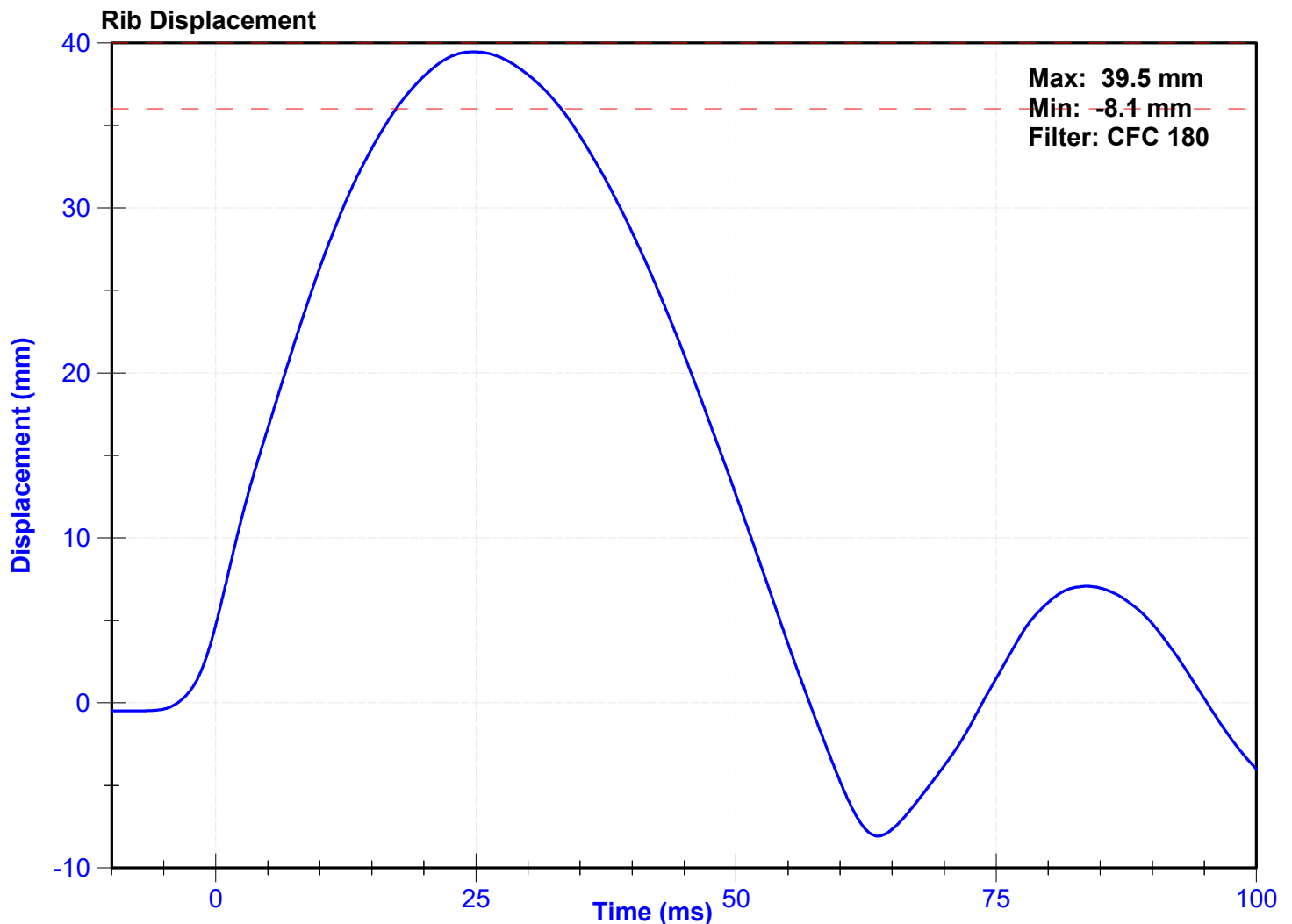
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	40	Pass
Rib Displacement	36	40	mm	39.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	0552-03	4/21/2025	10/20/2025



ATD Manufacturer	Denton	Test Technician	J. Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

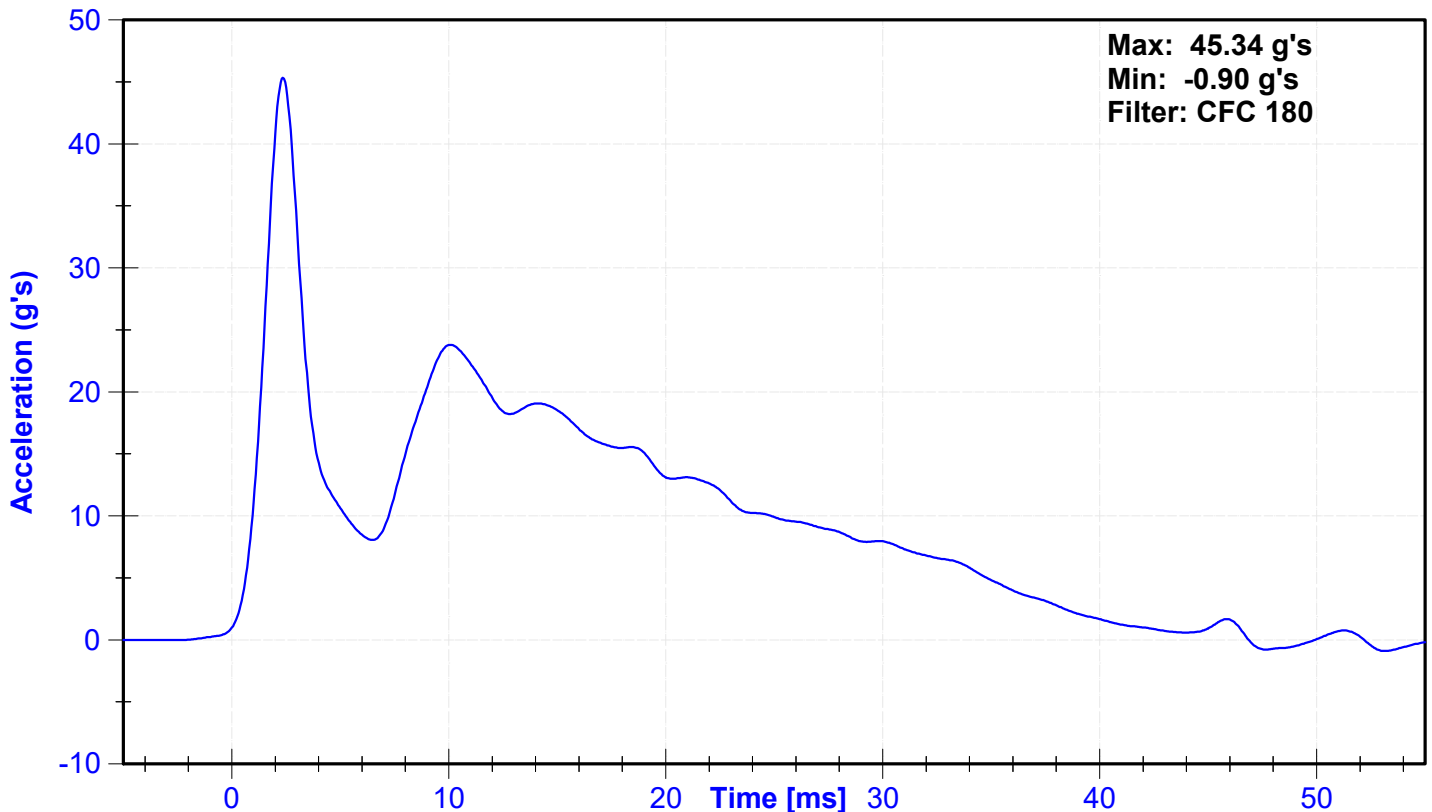
Results

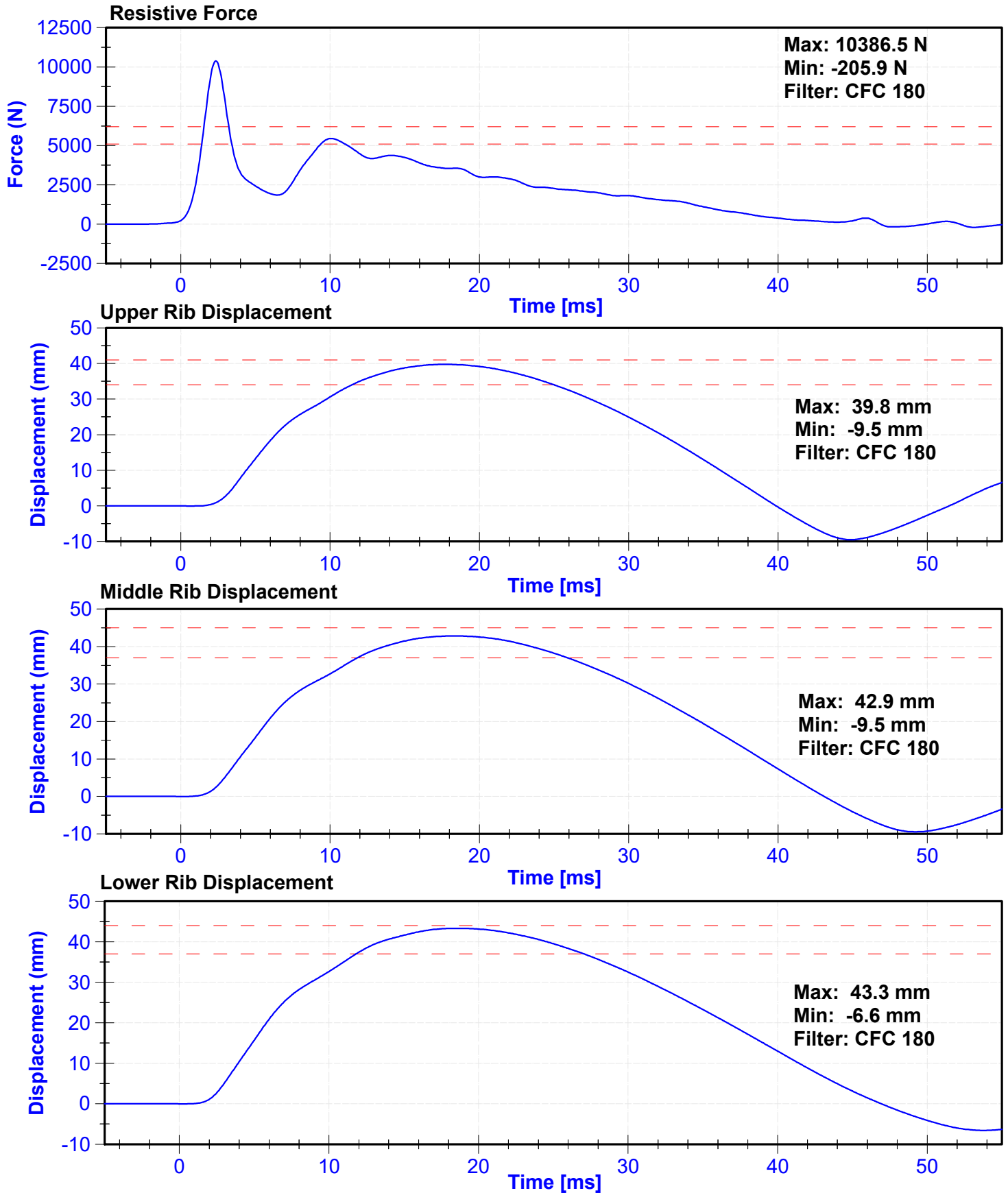
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	5.4	5.6	m/s	5.46	Pass
Resistive Force after 6ms	5100	6200	N	5450.8	Pass
Upper Thorax Rib Deflection	34	41	mm	39.8	Pass
Mid Thorax Rib Deflection	37	45	mm	42.9	Pass
Lower Thorax Rib Deflection	37	44	mm	43.3	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	0552-01	4/21/2025	10/20/2025
Middle Thorax Rib Potentiometer	Honeywell	807	4/21/2025	10/20/2025
Lower Thorax Rib Potentiometer	Honeywell	0552-03	4/21/2025	10/20/2025

Probe Acceleration





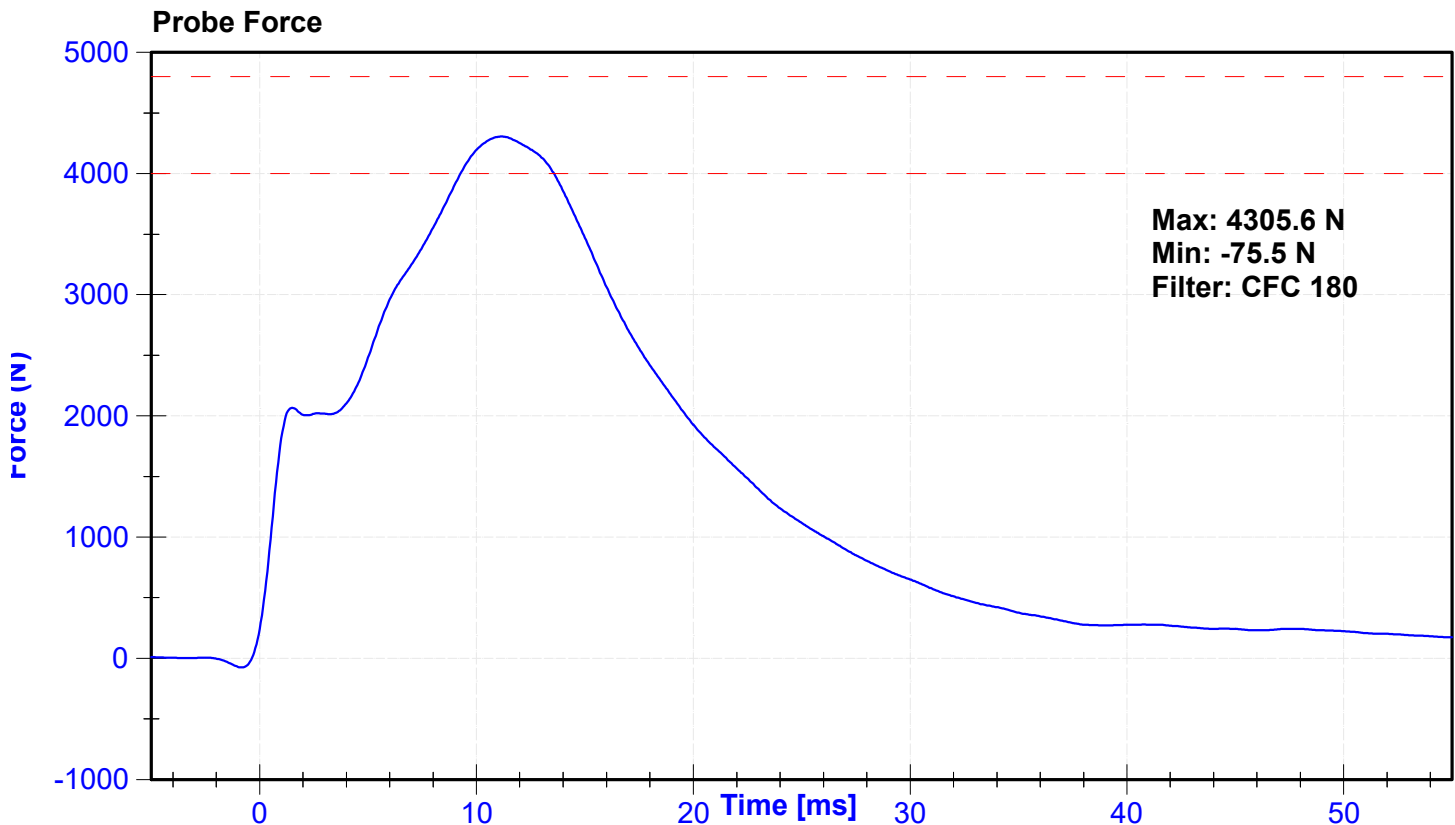
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

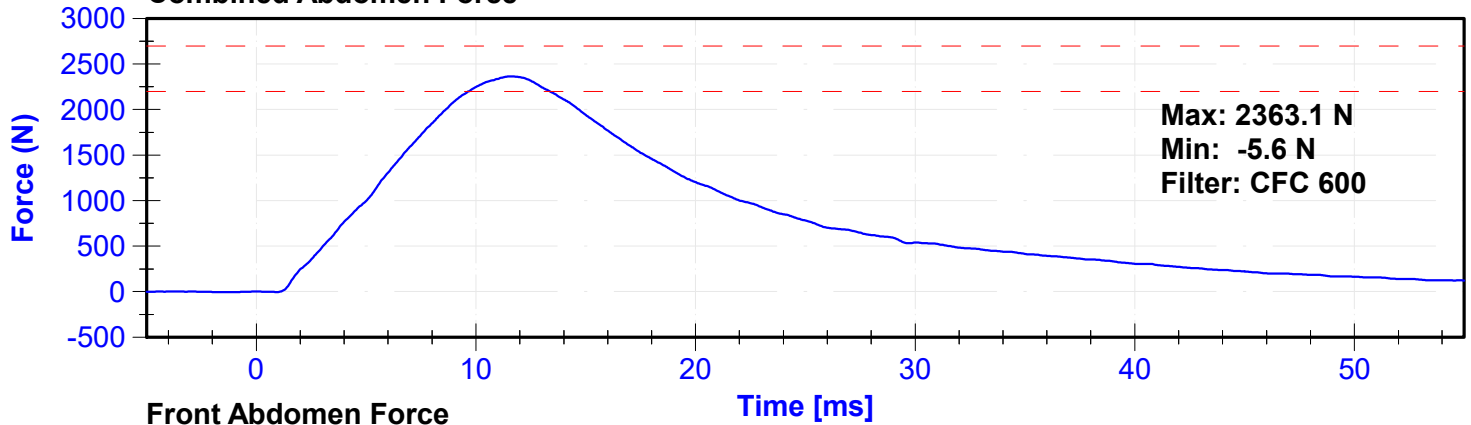
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	3.9	4.1	m/s	4.01	Pass
Combined Abdomen Force	2200	2700	N	2363.1	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.65	Pass
Resistive Probe Force	4000	4800	N	4305.6	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.15	Pass

Transducer Calibrations

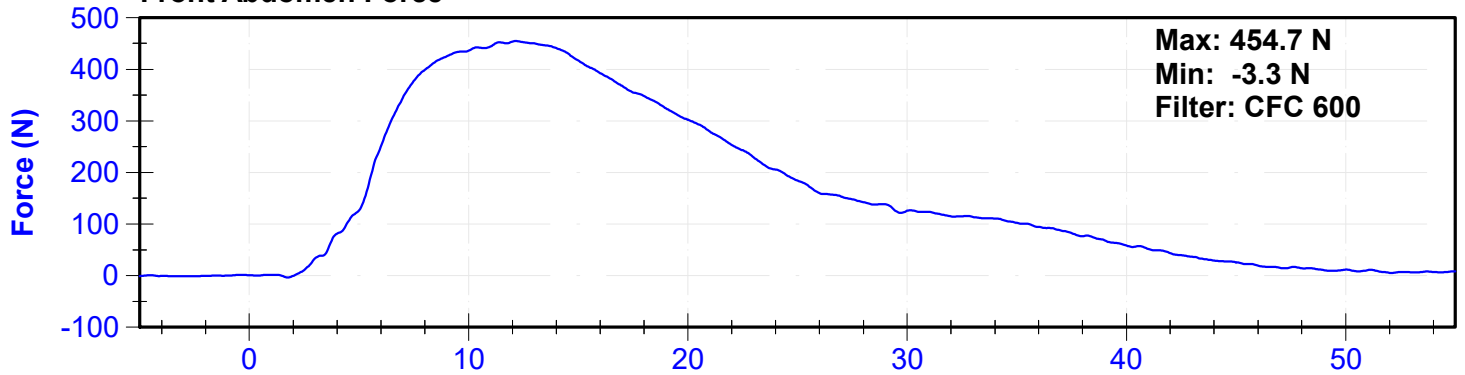
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Front Abdomen Load Cell	Denton	1512	9/16/2024	9/16/2025
Middle Abdomen Load Cell	Denton	1526	9/16/2024	9/16/2025
Rear Abdomen Load Cell	Denton	1516	9/16/2024	9/16/2025



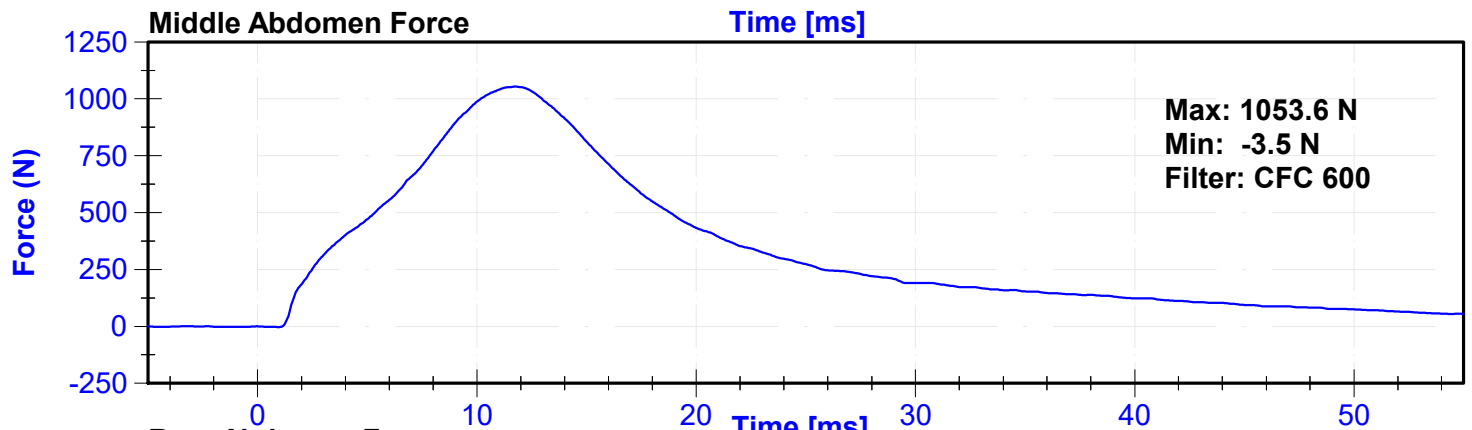
Combined Abdomen Force



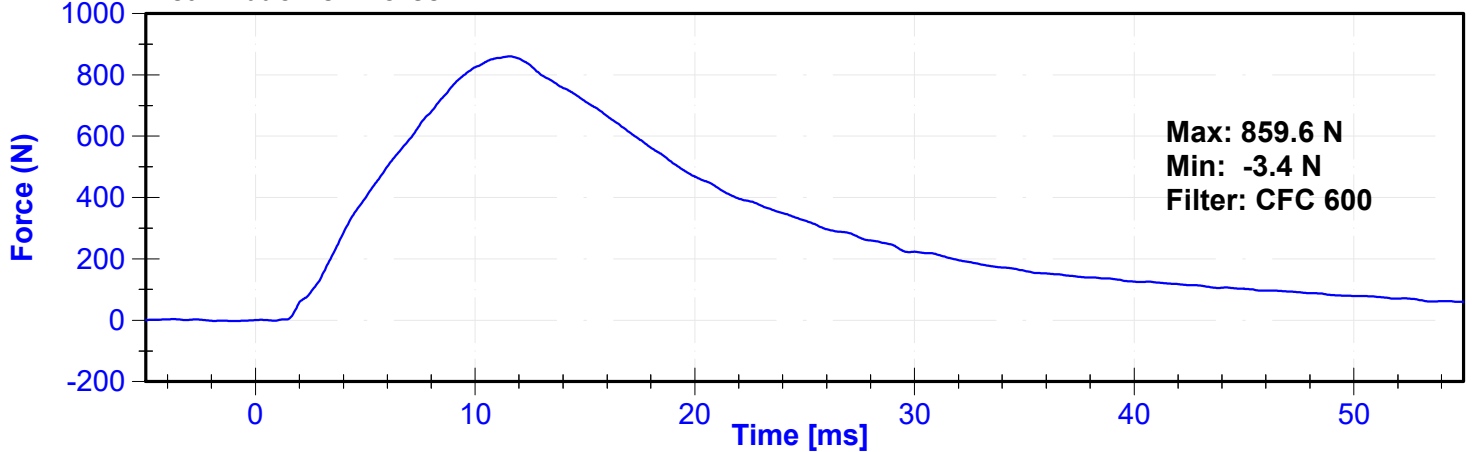
Front Abdomen Force



Middle Abdomen Force



Rear Abdomen Force



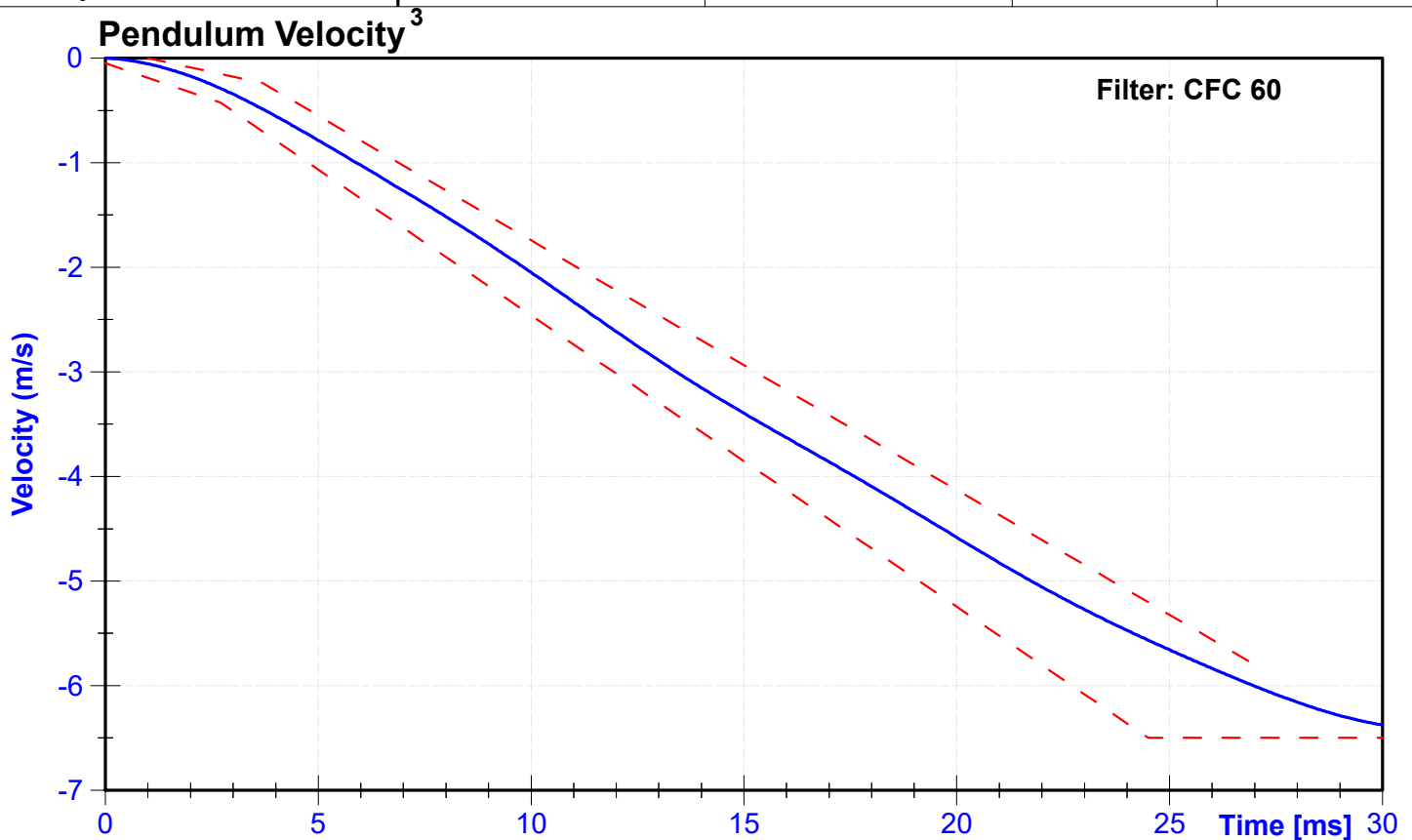
ATD Manufacturer	Denton	Test Technician	J. Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

Results

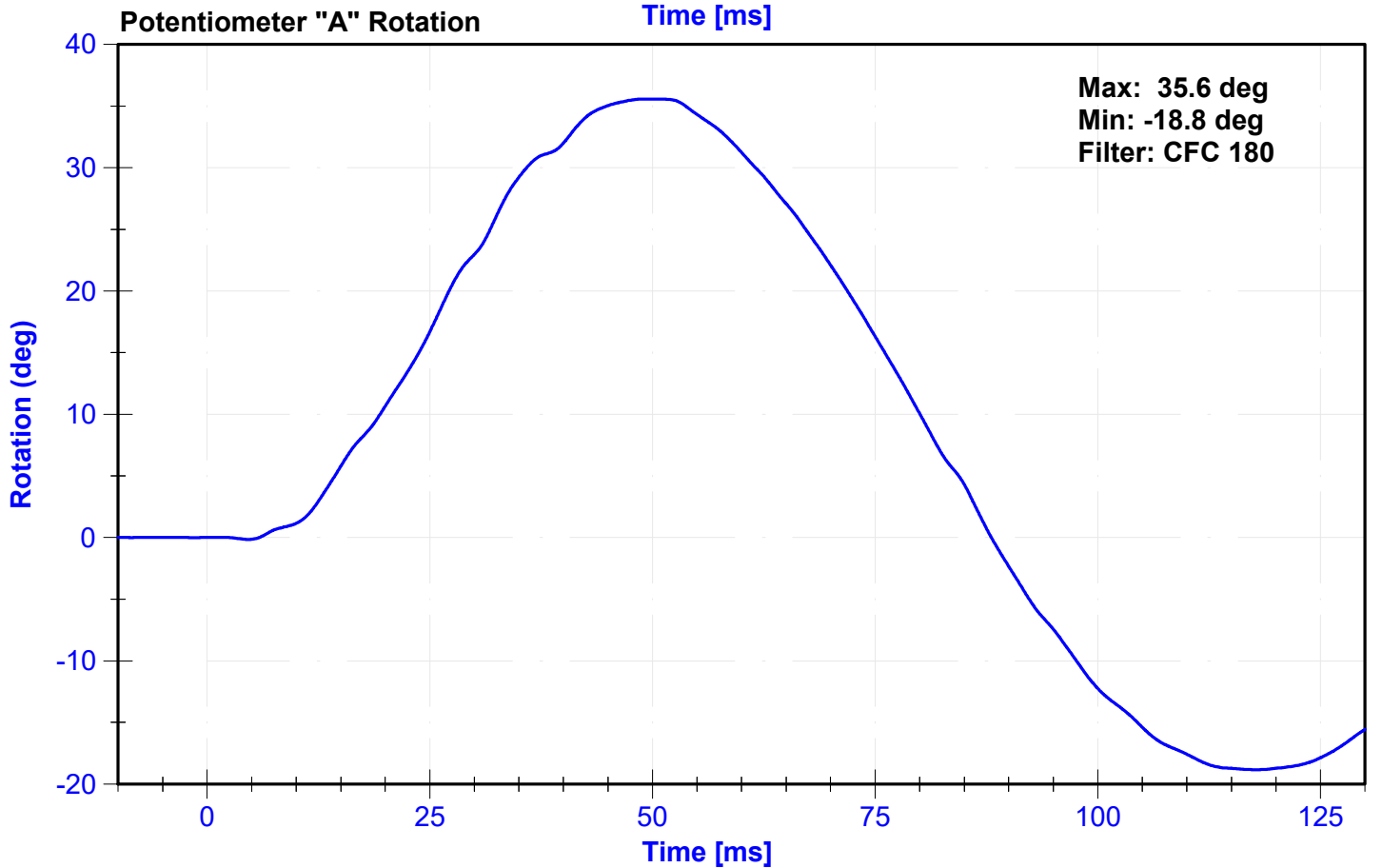
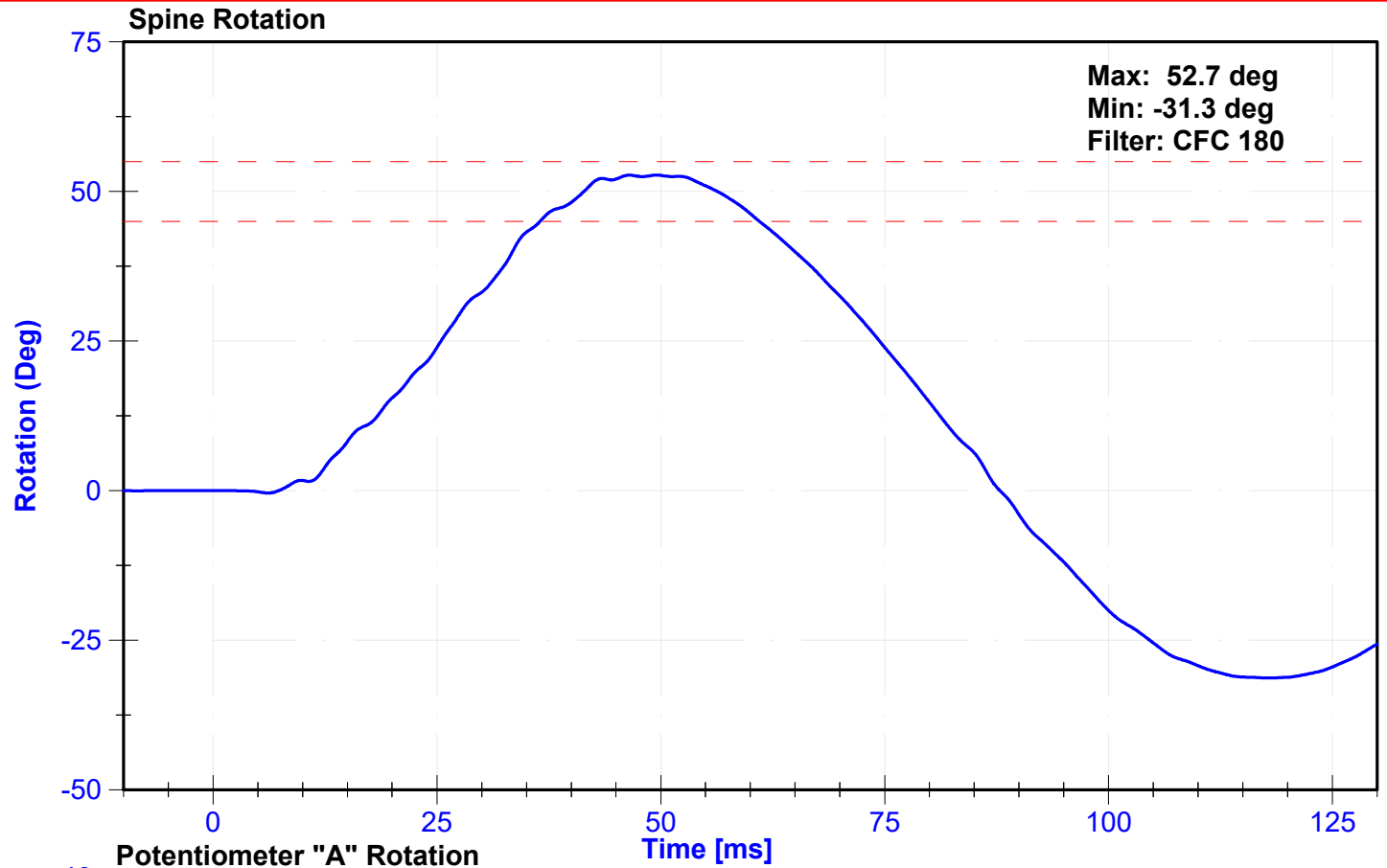
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	55	Pass
Velocity	5.95	6.15	m/s	6.116	Pass
Lateral Spine Rotation	45	55	deg	52.7	Pass
Time at Maximum Rotation	39	53	ms	49.5	Pass
Time of Decay to Zero Degrees	37	57	ms	38.3	Pass
Pendulum Velocity Overall Corridor	Lower Boundary ¹	Upper Boundary ²	m/s	See Plot ³	Pass

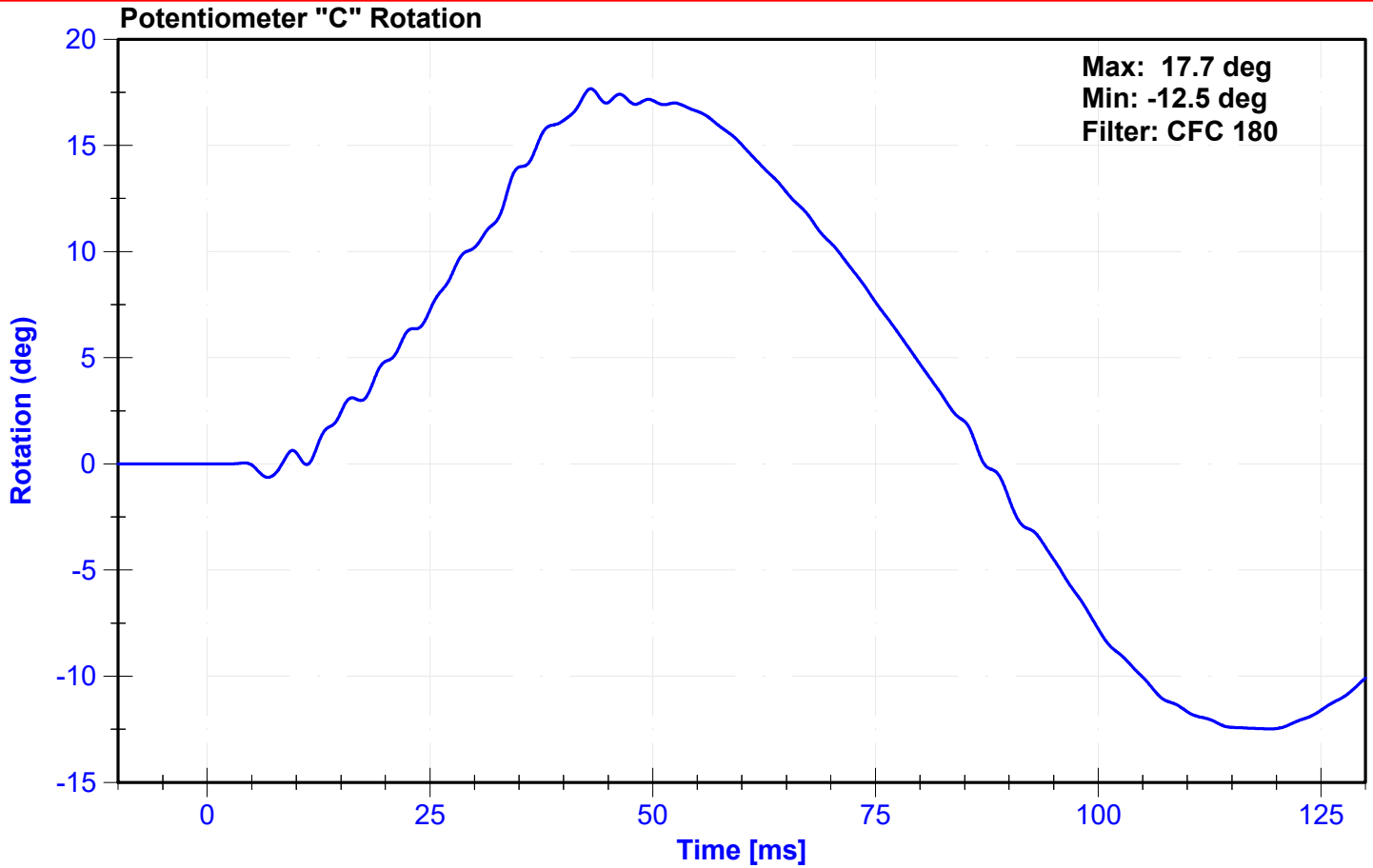
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	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





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

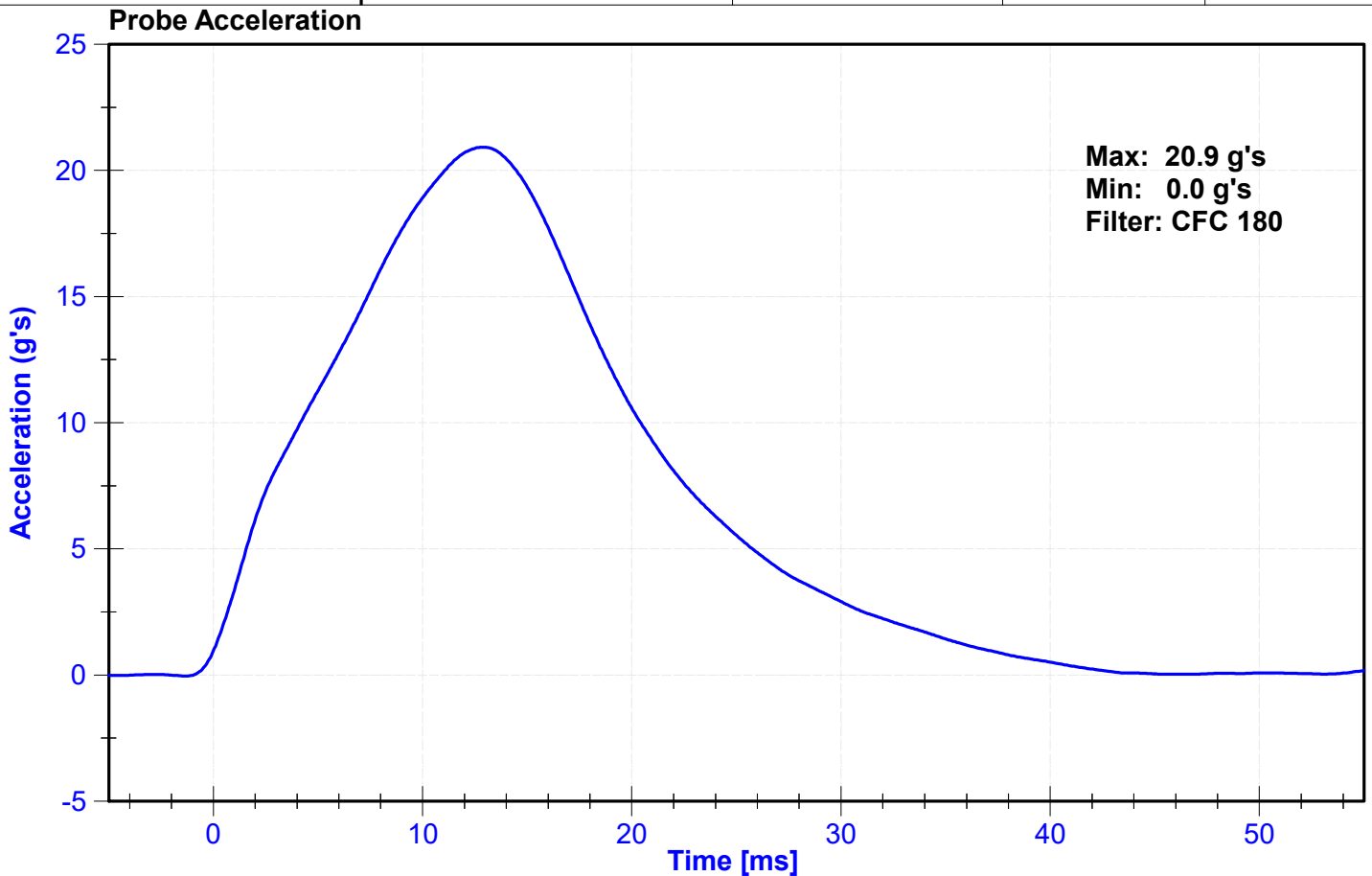
ATD Manufacturer	Denton	Test Technician	J.Kinderman
ATD Serial Number	D037	Laboratory Supervisor	J. Kinderman

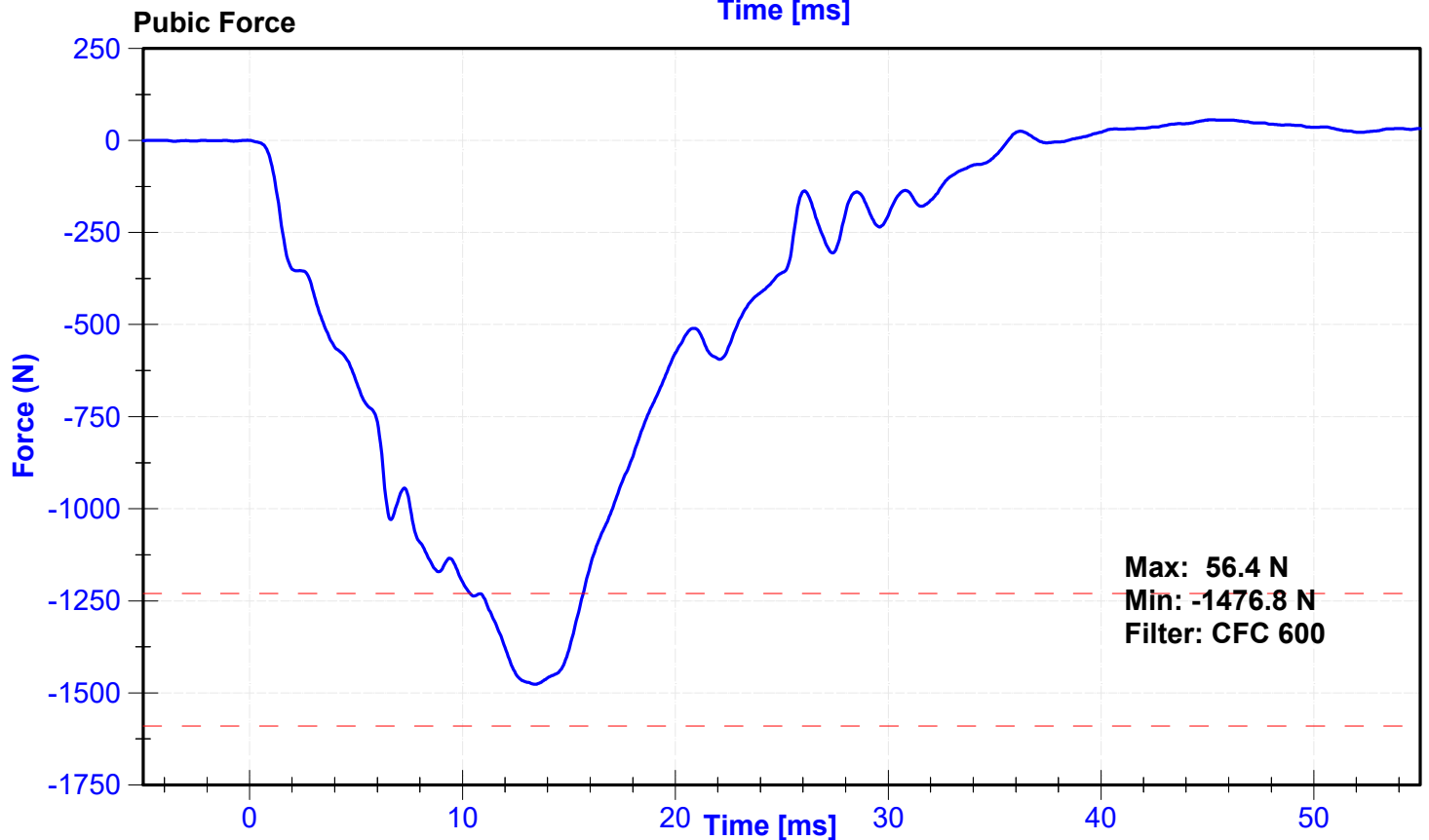
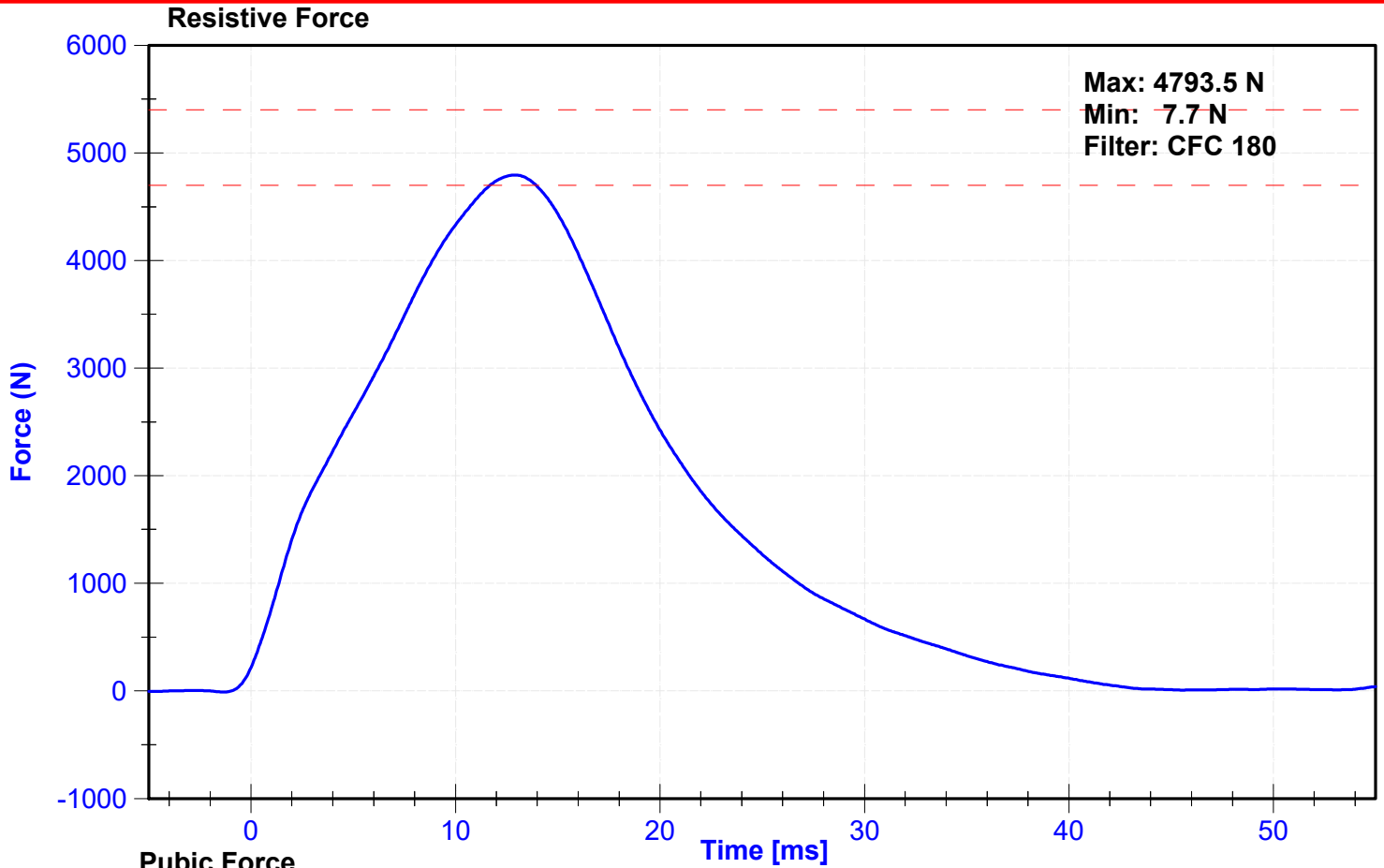
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	53	Pass
Velocity	4.2	4.4	m/s	4.30	Pass
Resistive Force	4700	5400	N	4793.5	Pass
Time at Peak Resistive Force	11.8	16.1	ms	12.90	Pass
Pubic Force	-1590	-1230	N	-1476.8	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.40	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	464-FY	9/16/2024	9/16/2025





APPENDIX VI
SID-IIs PERFORMANCE CALIBRATION TEST DATA

PRE-TEST
SID-IIs PERFORMANCE CALIBRATION TEST DATA

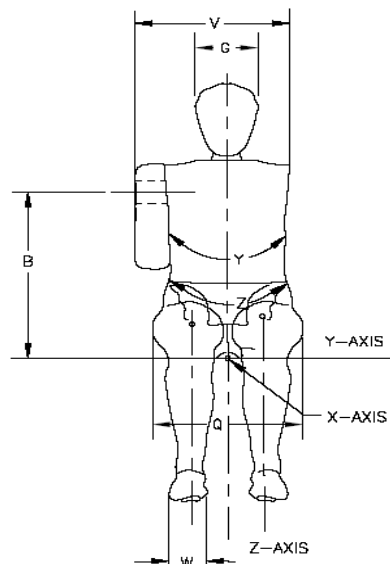
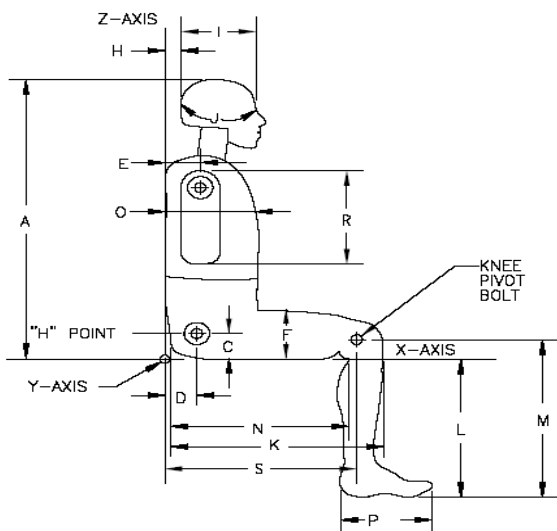


External Measurements - SID-IIs

Technician: **J. Rios**

Date: **07/25/2025**

Dummy Serial Number: **224**



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	781	Pass
B	Shoulder Pivot Height	437	453	448	Pass
C	H-point Height	79	89	84	Pass
D	H-point from seatback	141	151	142	Pass
E	Shoulder Pivot from Backline	97	107	101	Pass
F	Thigh Clearance	119	135	122	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	184	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	531	Pass
L	Popliteal Height	343	369	353	Pass
M	Knee Pivot to floor height	392	409	401	Pass
N	Buttock Popliteal Length	416	442	427	Pass
O	Chest Depth w/o jacket	195	211	207	Pass
P	Foot Length	216	232	219	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	485	Pass
V	Shoulder Width	341	357	348	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	868	Pass
Z	Waist Circumference	761	791	775	Pass

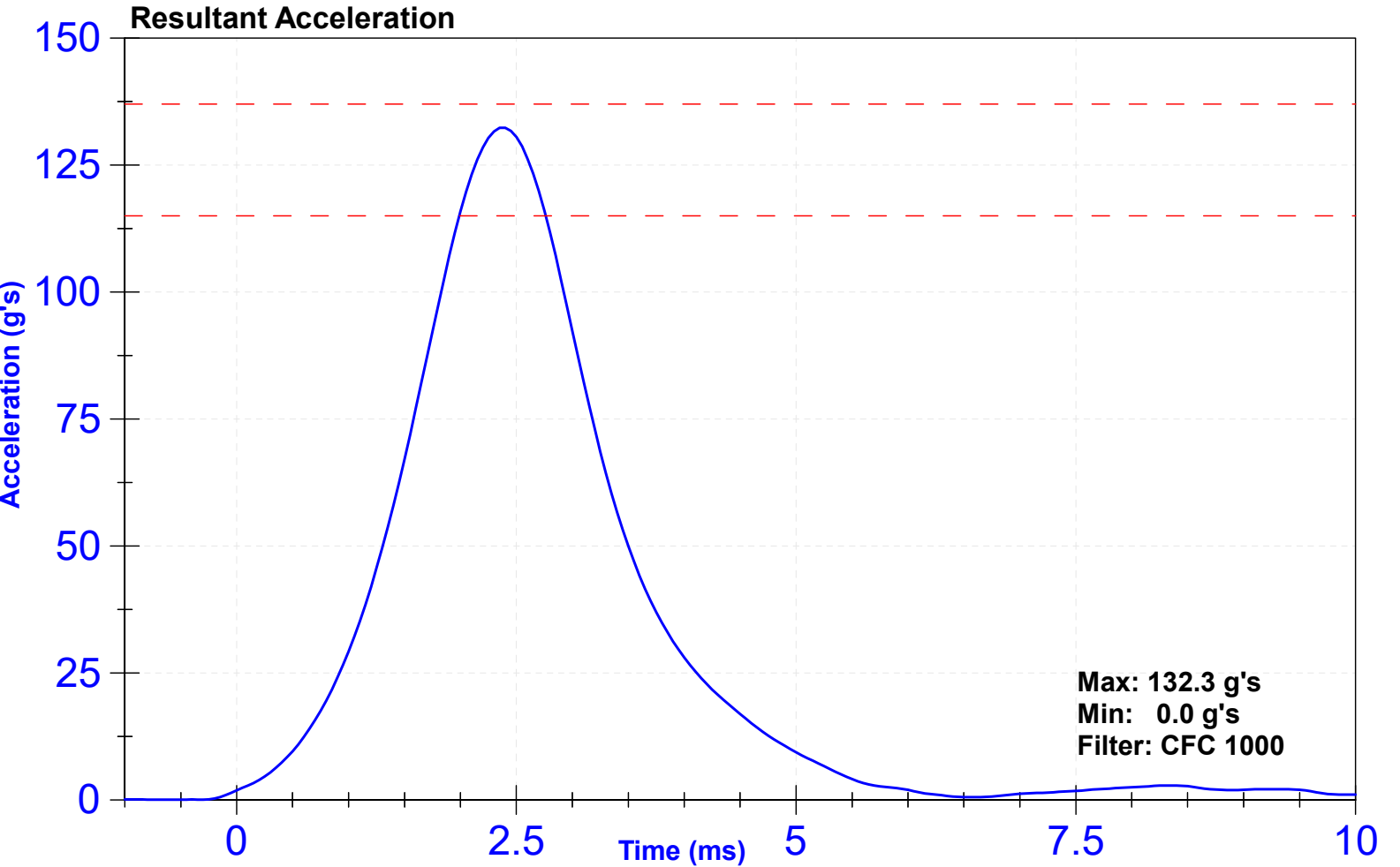
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

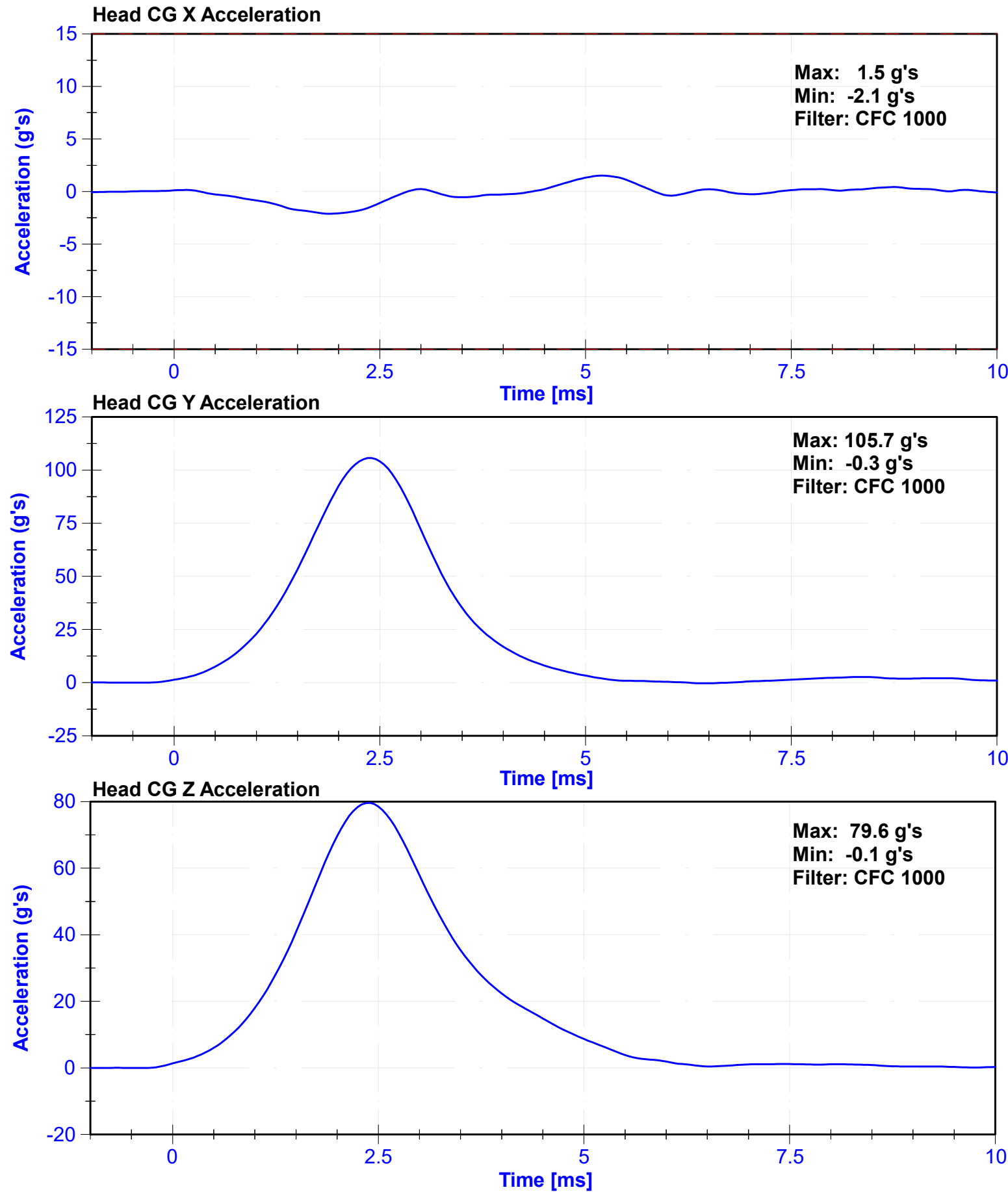
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	60	Pass
Resultant Acceleration	115	137	g's	132.3	Pass
Oscillation	0	15	%	2.1	Pass
Fore-Aft Acceleration	-15	15	g's	-2.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P51884	4/19/2025	10/16/2025
Y Accelerometer	Endevco	P73161	4/19/2025	10/16/2025
Z Accelerometer	Endevco	P79588	4/19/2025	10/16/2025





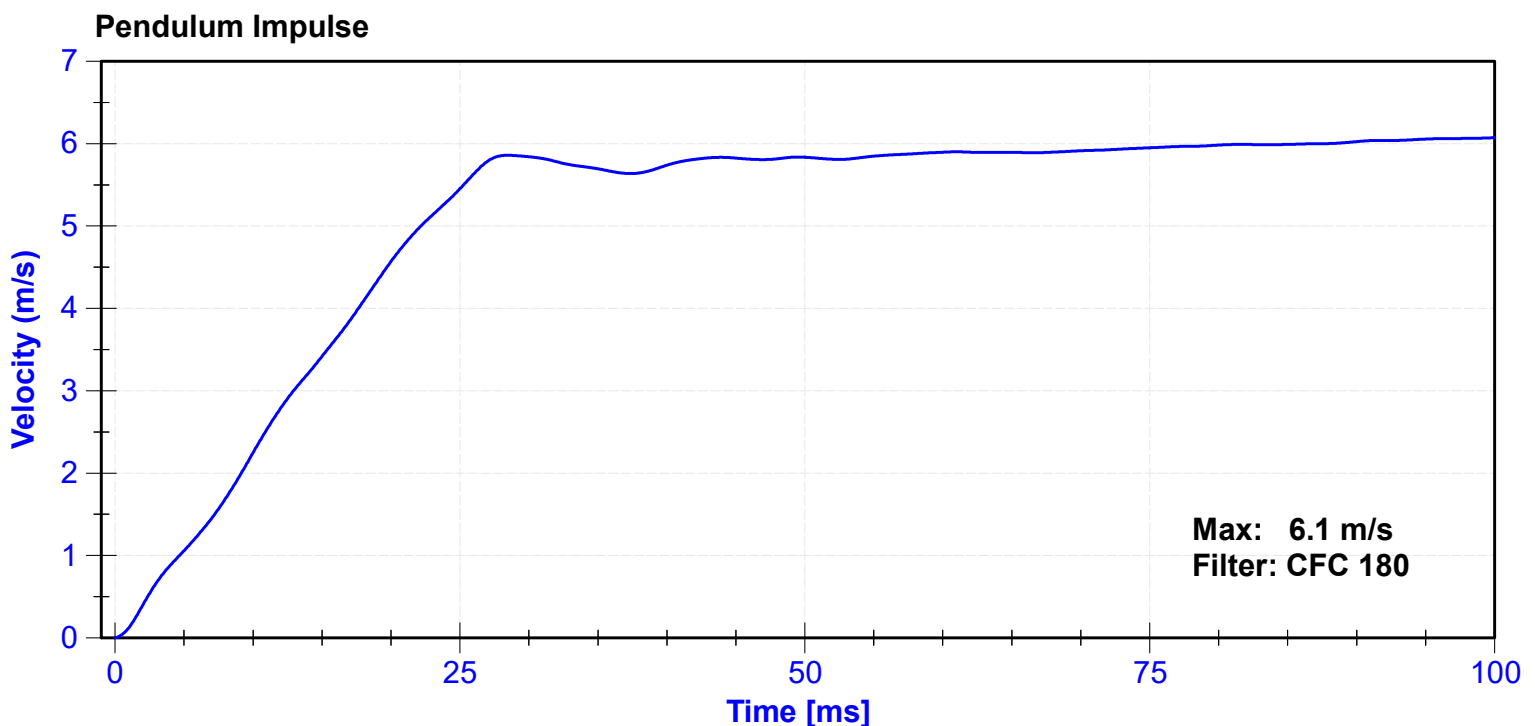
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

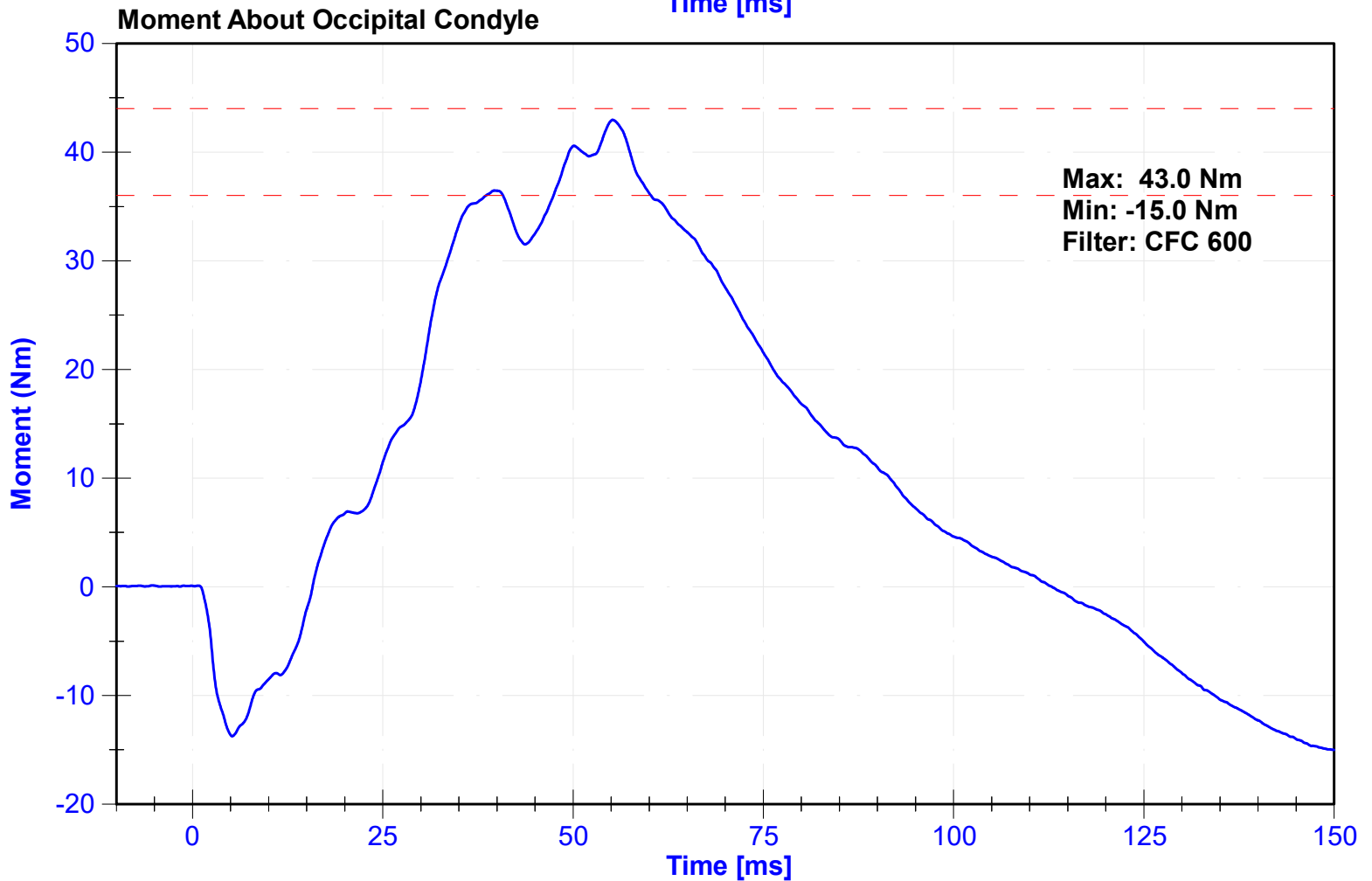
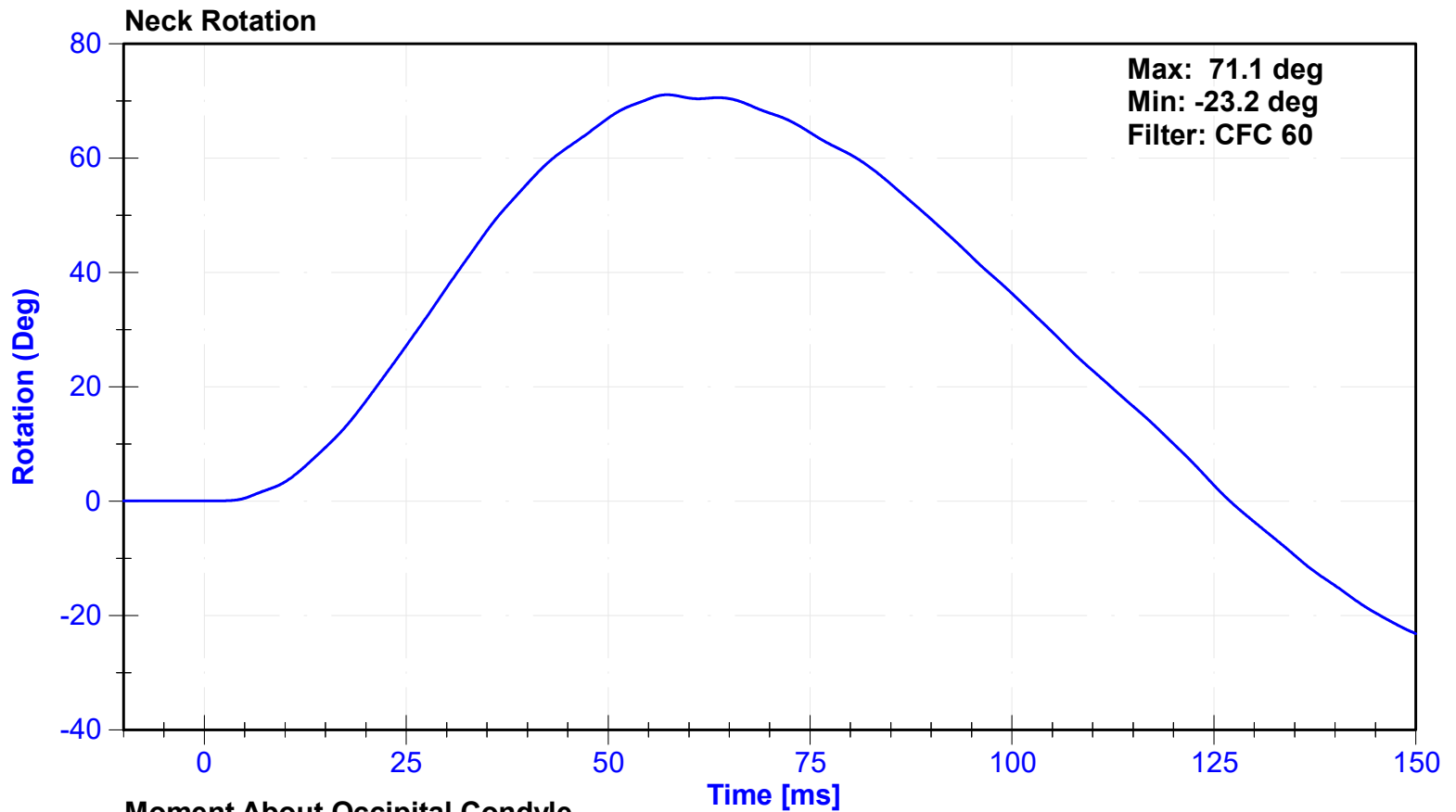
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	50	Pass
Velocity	5.51	5.63	m/s	5.545	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.25	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.42	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.57	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.45	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.07	Pass
Neck Rotation	71	81	deg	71.1	Pass
Time at Maximum Rotation	50	70	ms	57.3	Pass
Moment about the OC	36	44	Nm	43.0	Pass
Moment Decay to 0 Nm	102	126	ms	112.9	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-F4	4/17/2025	4/17/2026





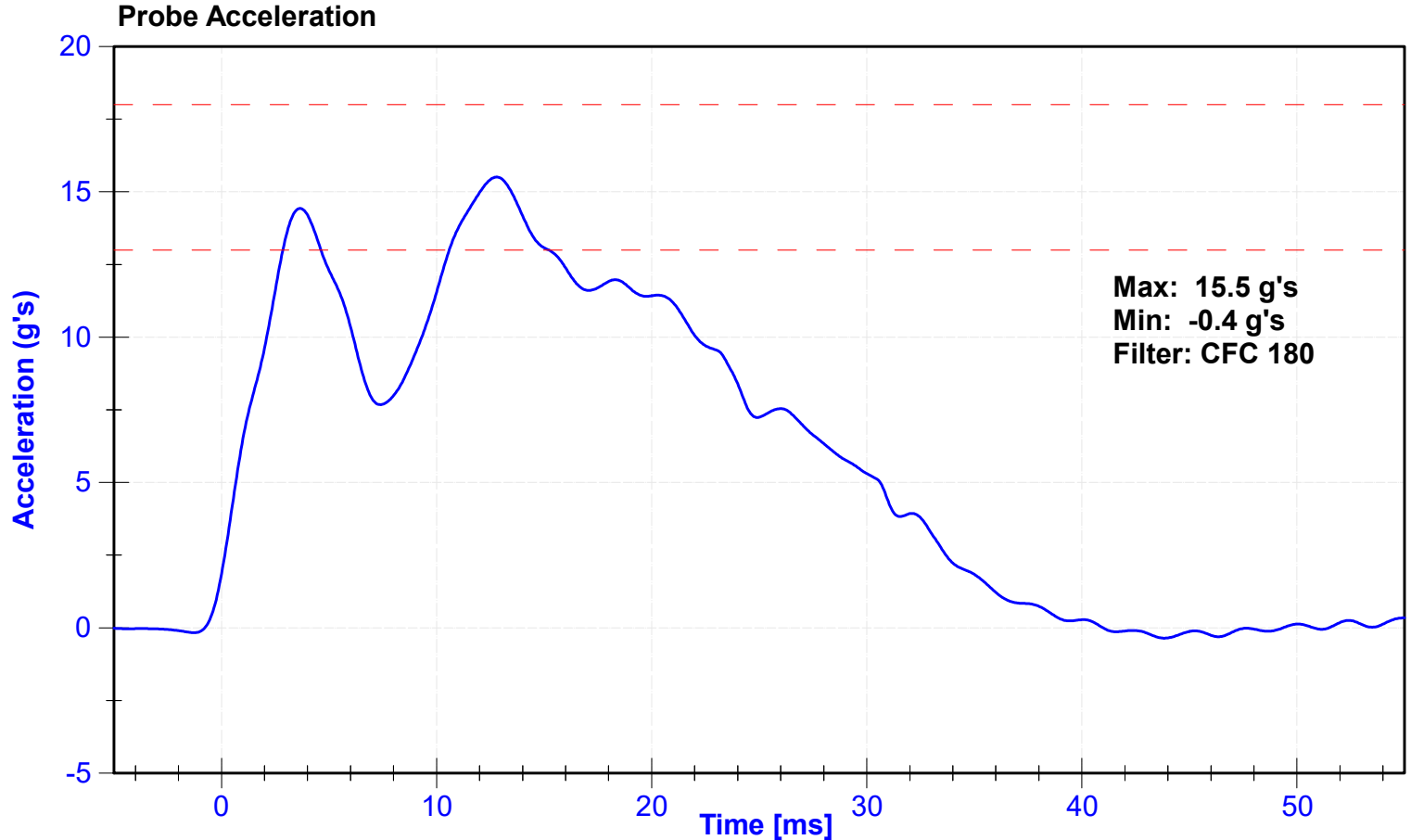
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

Results

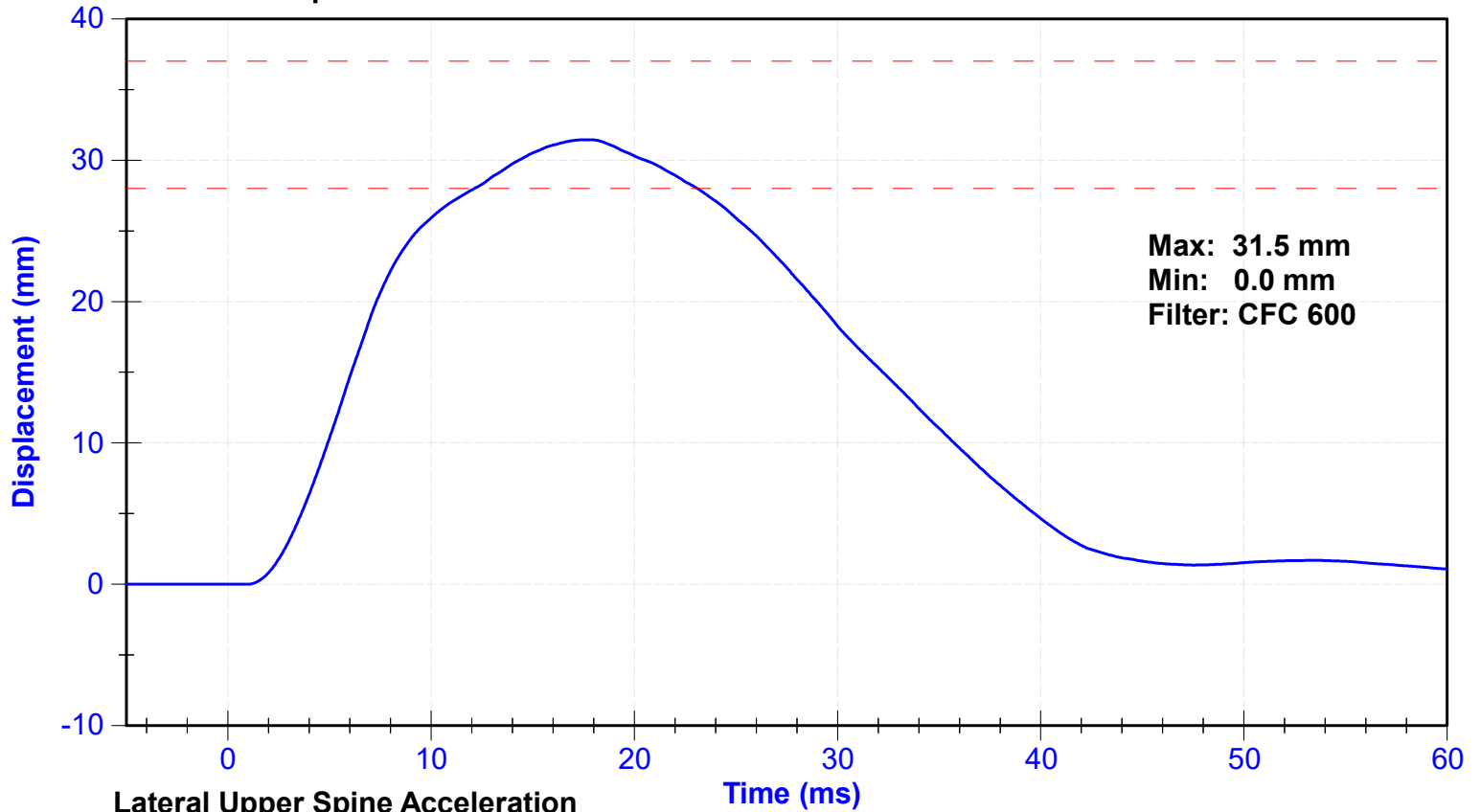
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	65	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	13	18	g's	15.5	Pass
Shoulder Deflection	28	37	mm	31.5	Pass
Lateral Upper Spine Acceleration	17	22	g's	18.2	Pass

Transducer Calibrations

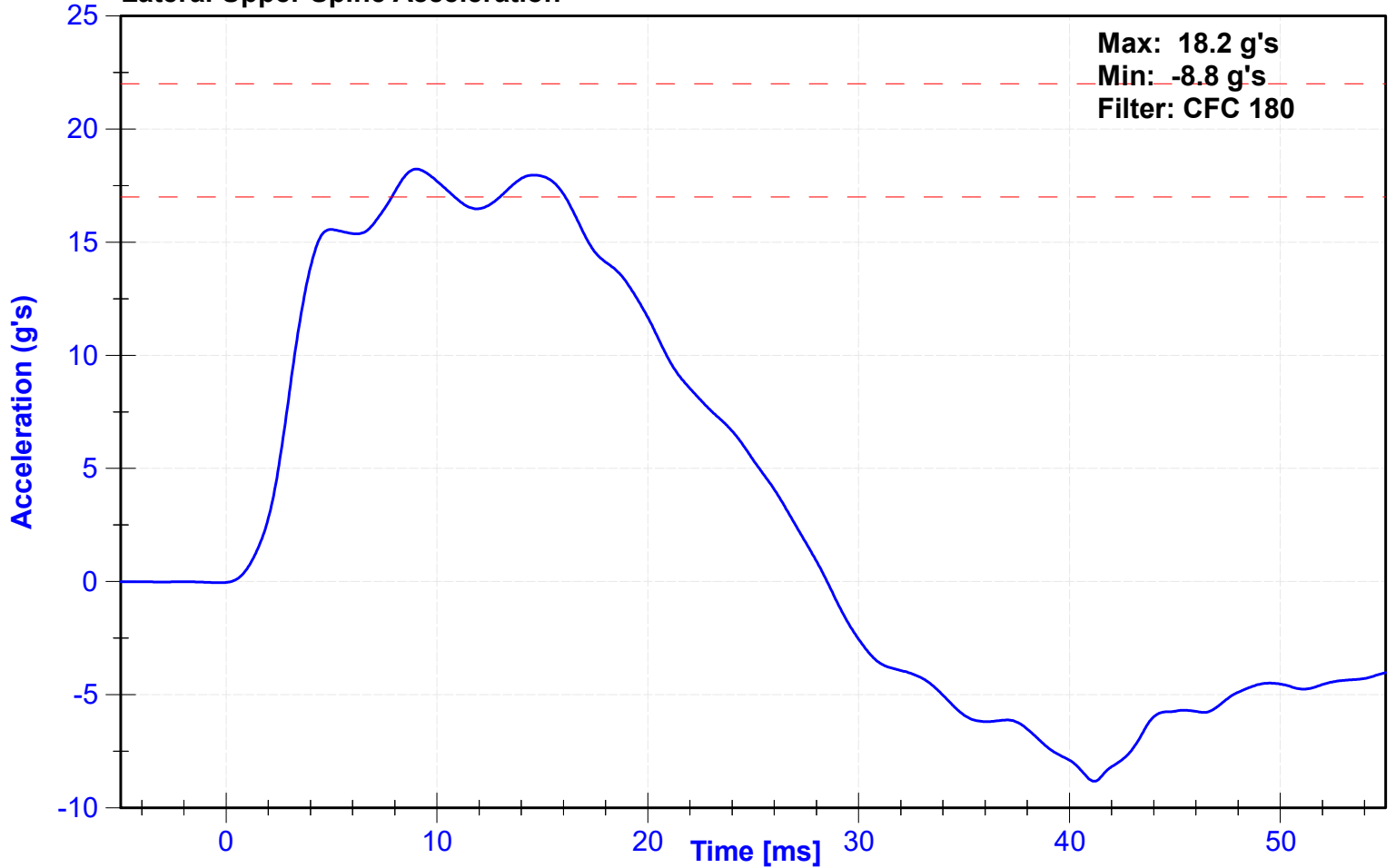
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Shoulder Potentiometer	Servo	829GFE	4/18/2025	10/17/2025
Upper Spine Y Accelerometer	Endevco	18698	4/19/2025	10/16/2025



Shoulder Displacement



Lateral Upper Spine Acceleration



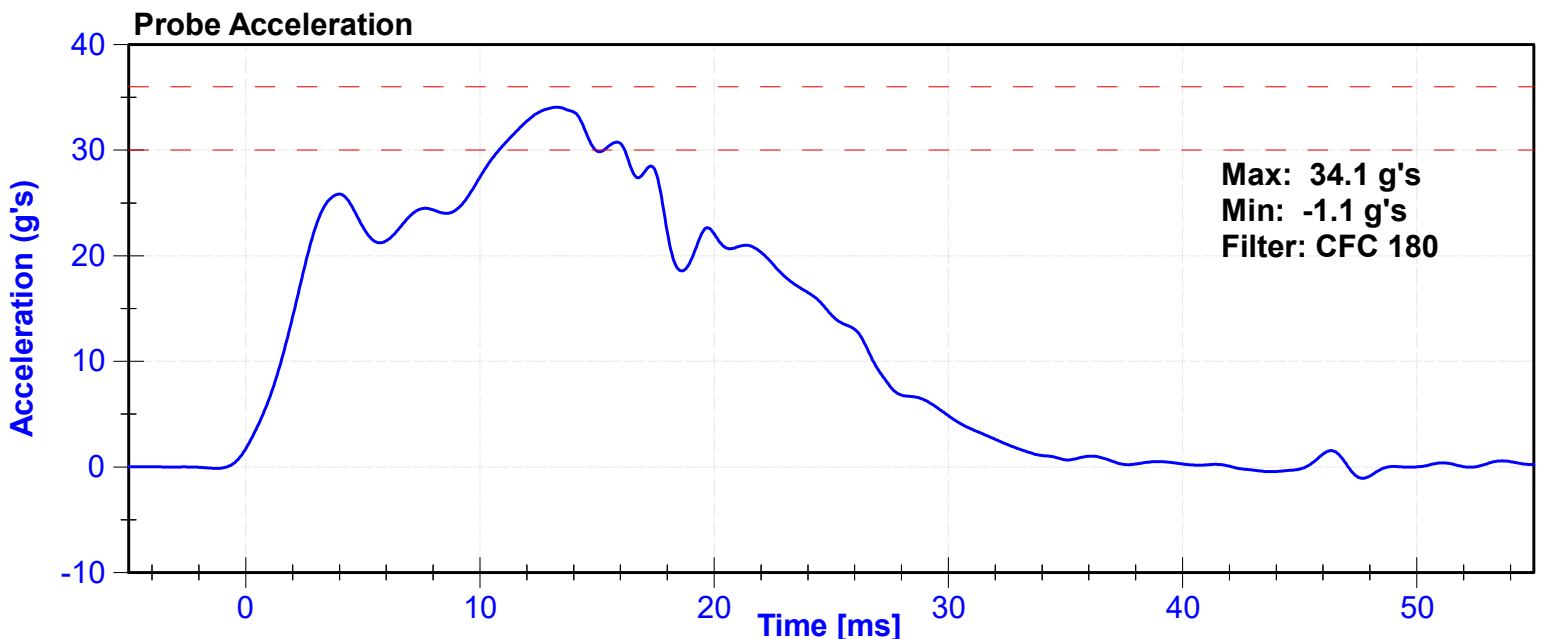
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

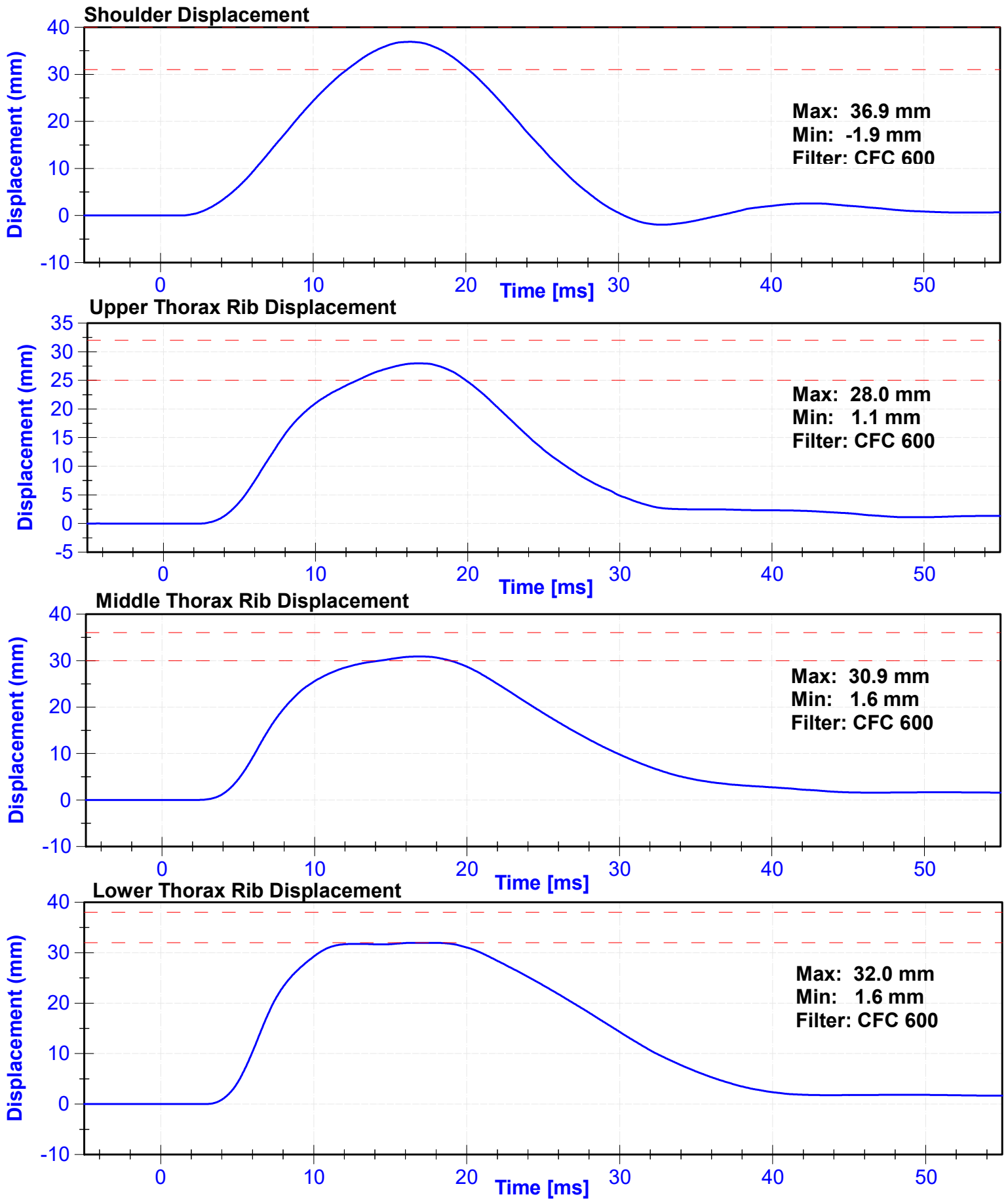
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	65	Pass
Velocity	6.6	6.8	m/s	6.70	Pass
Probe Acceleration after 5 ms	30	36	g's	34.1	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.5	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.0	Pass
Shoulder Deflection	31	40	mm	36.9	Pass
Upper Thorax Rib Deflection	25	32	mm	28.0	Pass
Mid Thorax Rib Deflection	30	36	mm	30.9	Pass
Lower Thorax Rib Deflection	32	38	mm	32.0	Pass

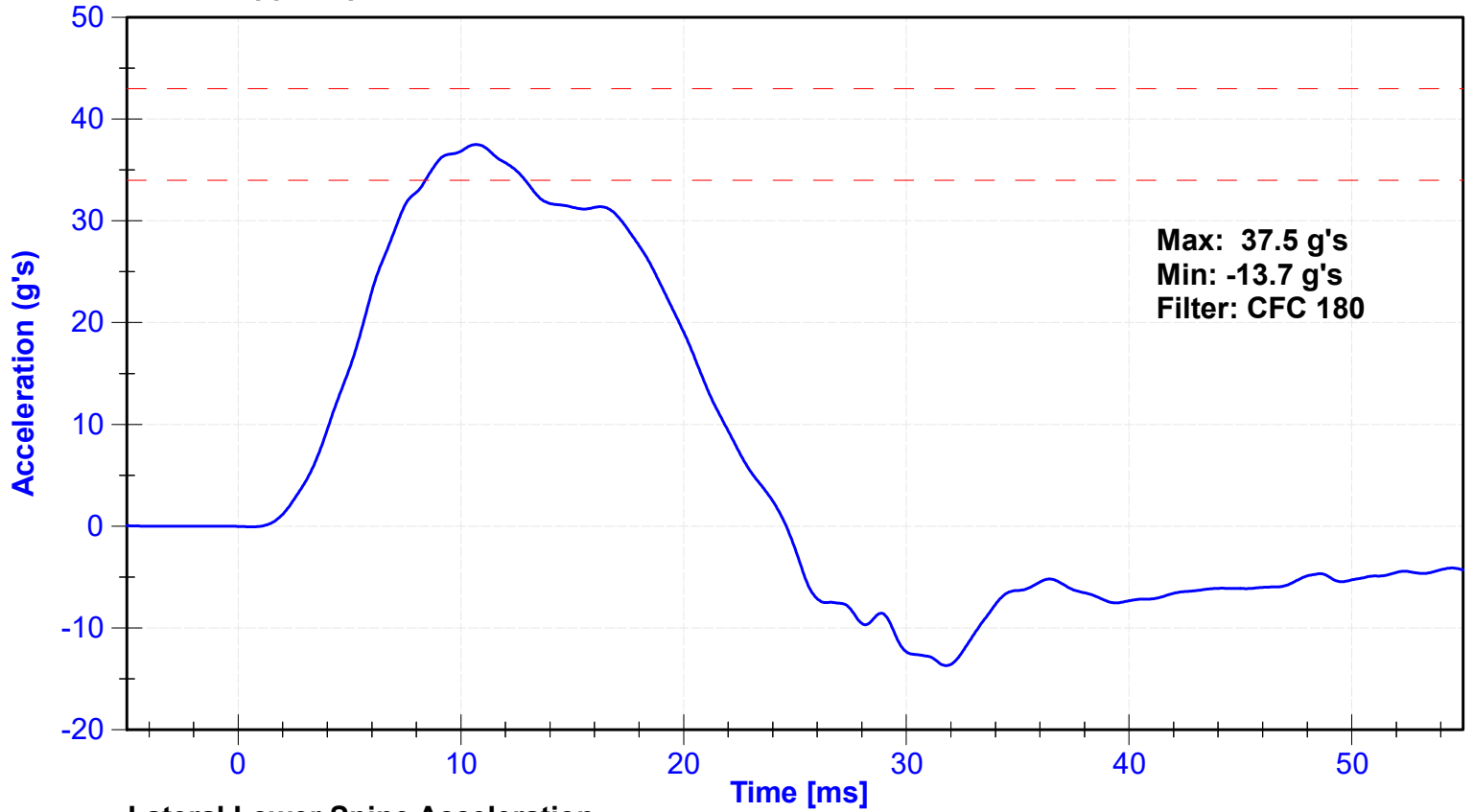
Transducer Calibrations

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	18698	4/19/2025	10/16/2025
Upper Spine T12 Y Accelerometer	Endevco	T20906	4/19/2025	10/16/2025
Shoulder Potentiometer	Servo	829GFE	4/18/2025	10/17/2025
Upper Thorax Rib Potentiometer	Servo	DS-2166GFE	4/18/2025	10/17/2025
Middle Thorax Rib Potentiometer	Servo	080GFE	4/18/2025	10/17/2025
Lower Thorax Rib Potentiometer	Servo	087GFE	4/18/2025	10/17/2025

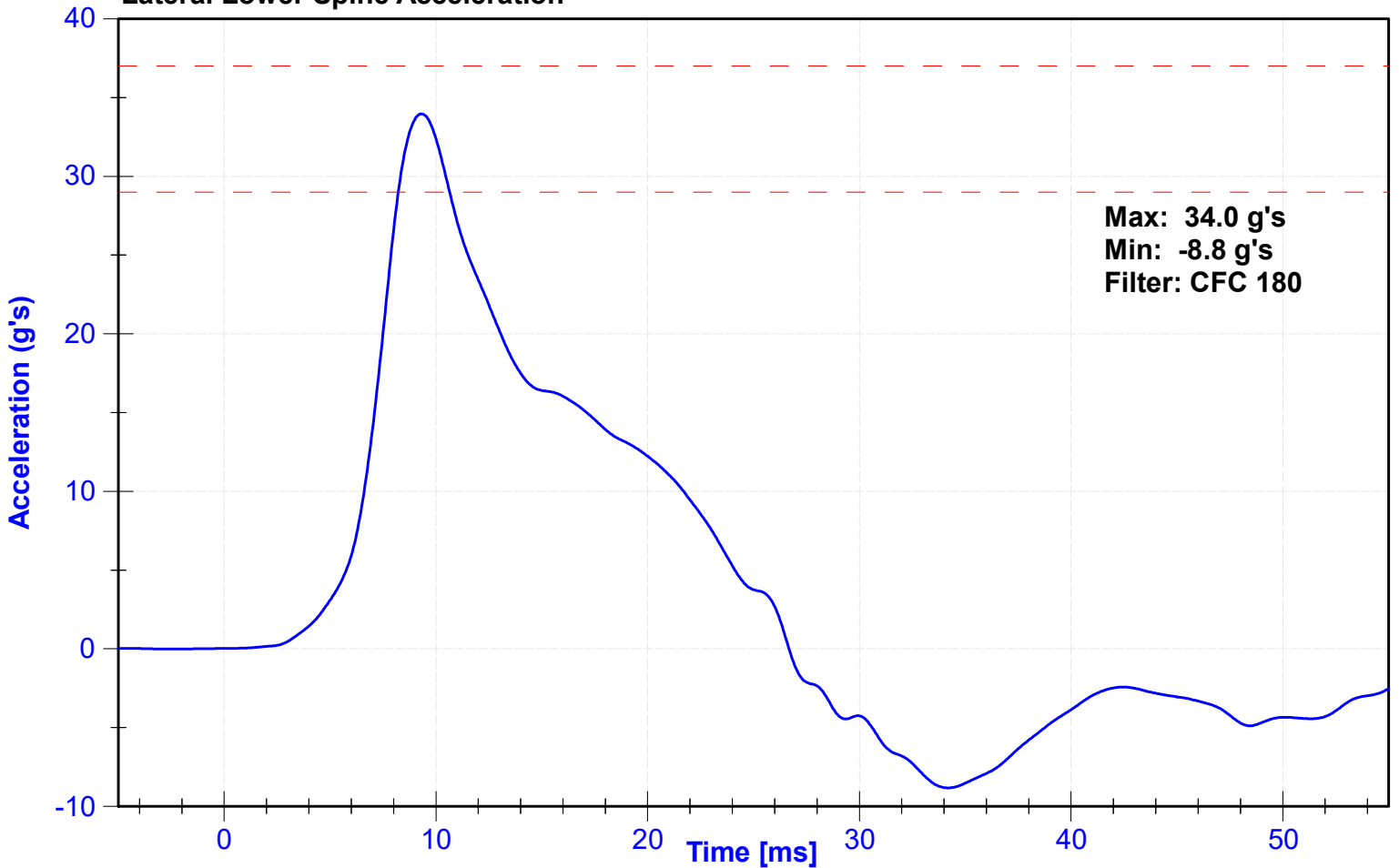




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



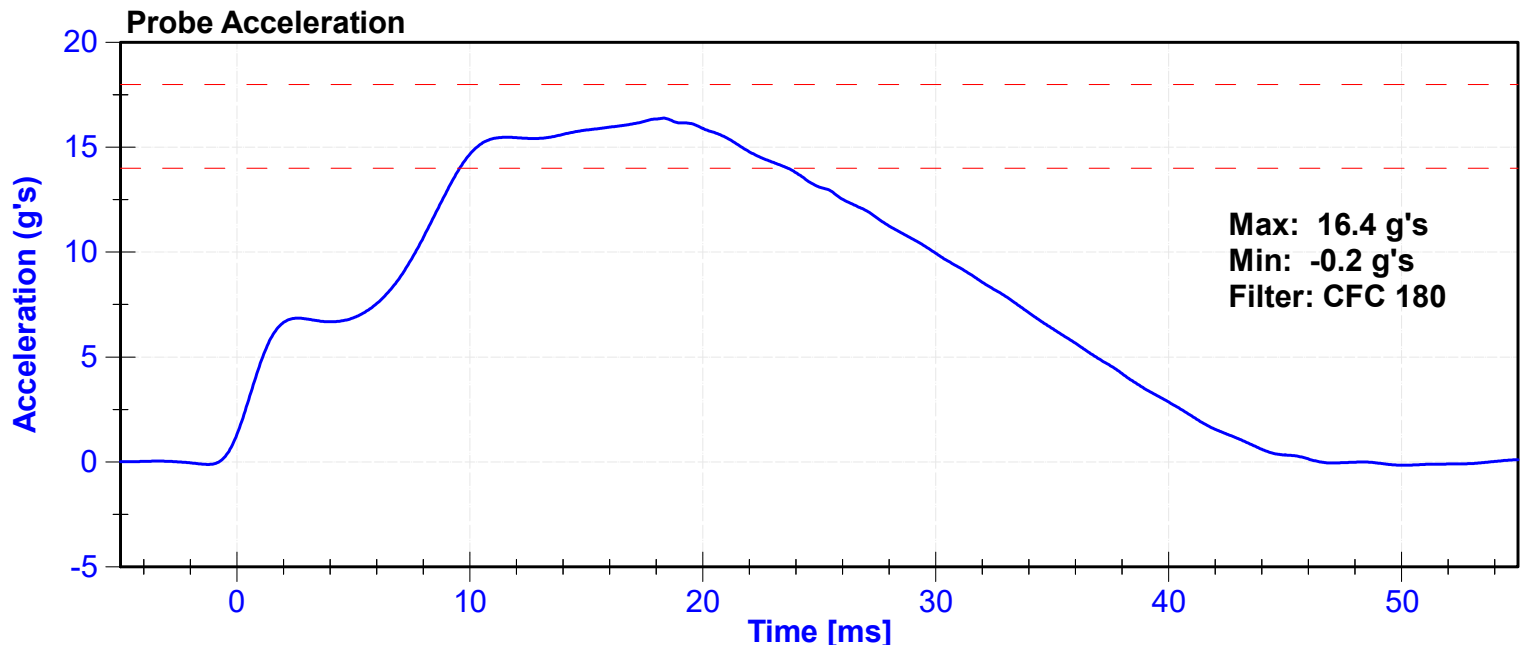
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

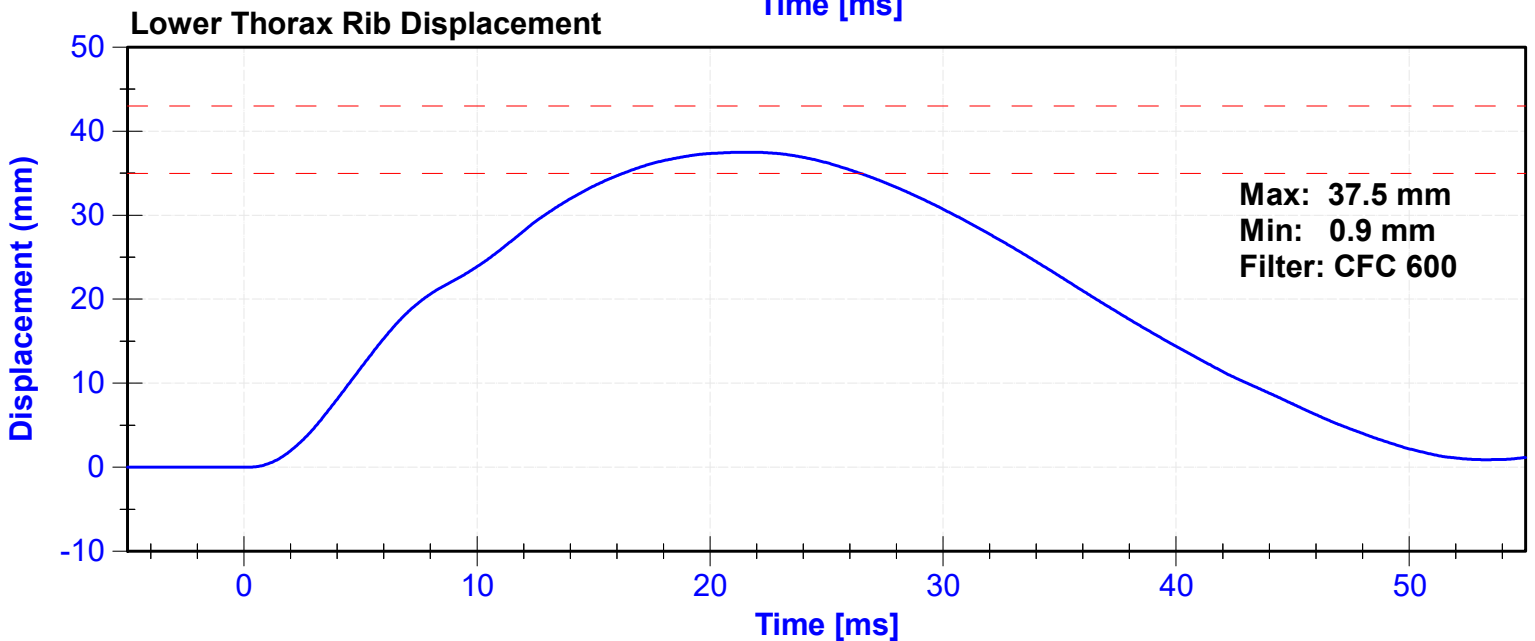
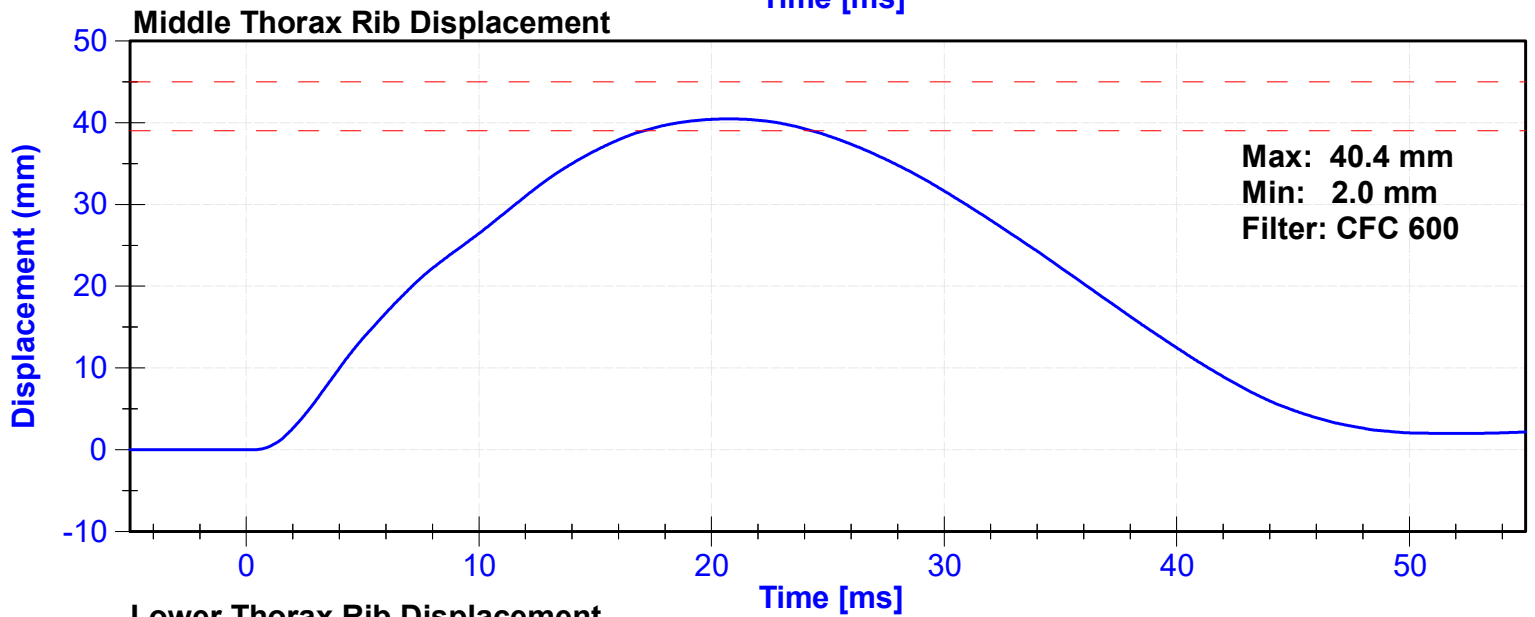
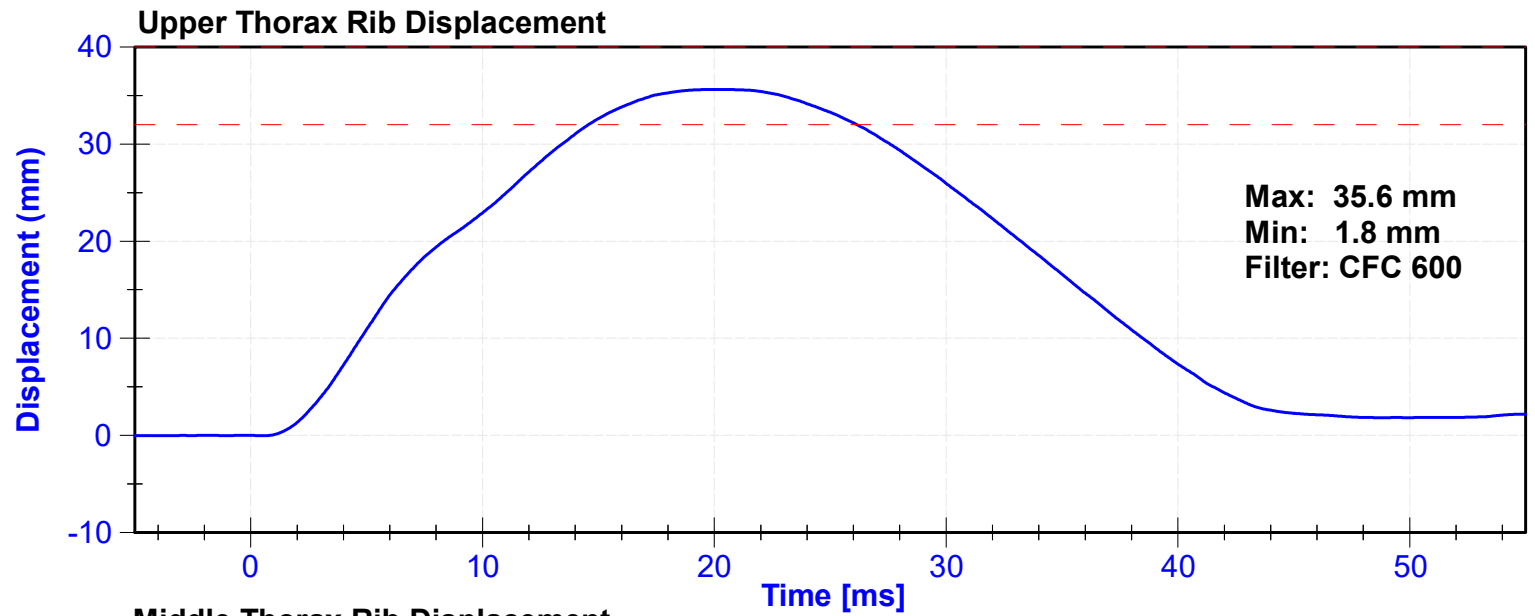
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	65	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	14	18	g's	16.4	Pass
Lateral Upper Spine Acceleration	13	17	g's	15.3	Pass
Lateral Lower Spine Acceleration	7	11	g's	10.4	Pass
Upper Thorax Rib Deflection	32	40	mm	35.6	Pass
Middle Thorax Rib Deflection	39	45	mm	40.4	Pass
Lower Thorax Rib Deflection	35	43	mm	37.5	Pass

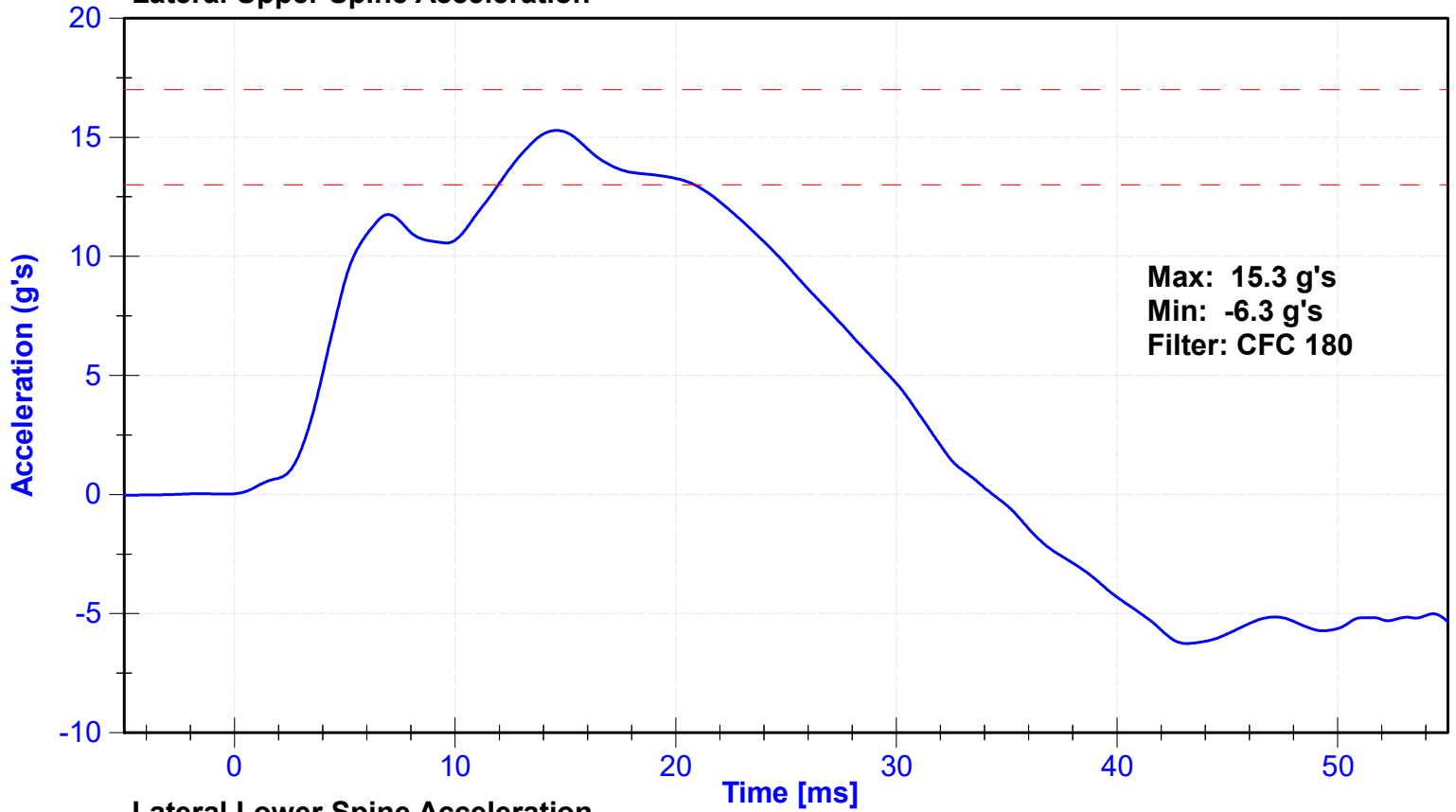
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Spine Y Accelerometer	Endevco	18698	4/19/2025	10/16/2025
Lower Spine Y Accelerometer	Endevco	T20906	4/19/2025	10/16/2025
Upper Thorax Rib Potentiometer	Servo	DS-2166GFE	4/18/2025	10/17/2025
Middle Thorax Rib Potentiometer	Servo	080GFE	4/18/2025	10/17/2025
Lower Thorax Rib Potentiometer	Servo	087GFE	4/18/2025	10/17/2025

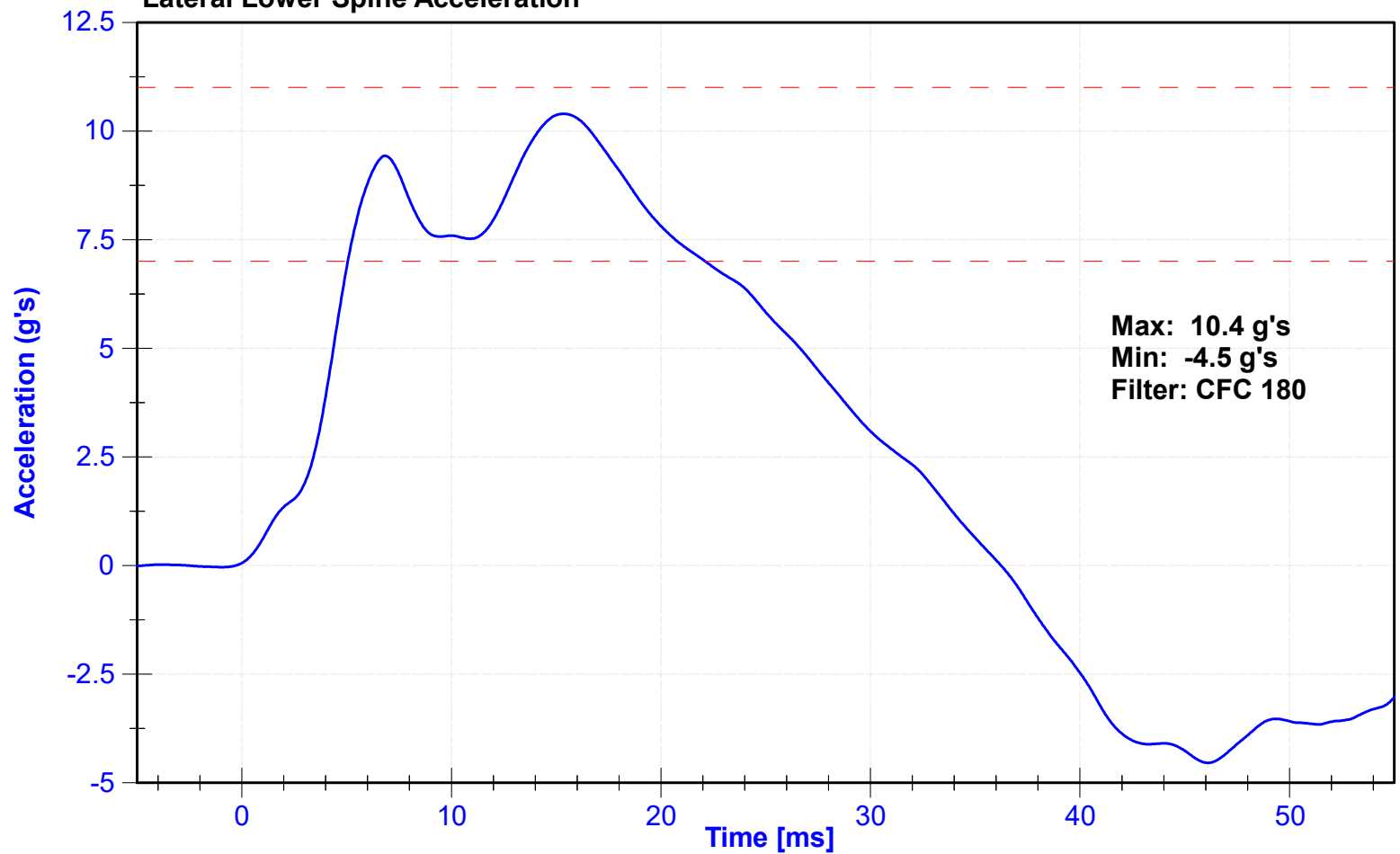




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

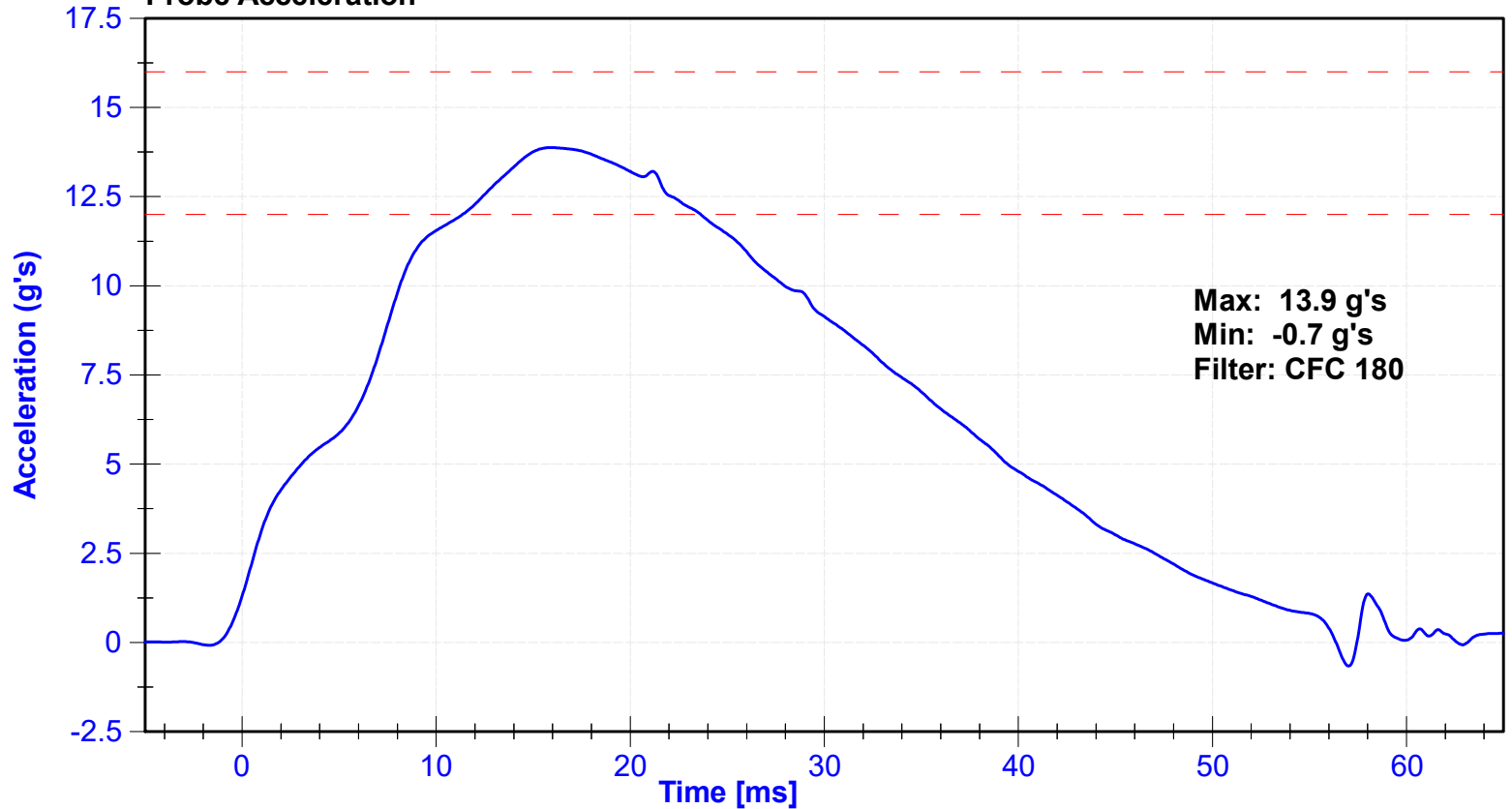
Results

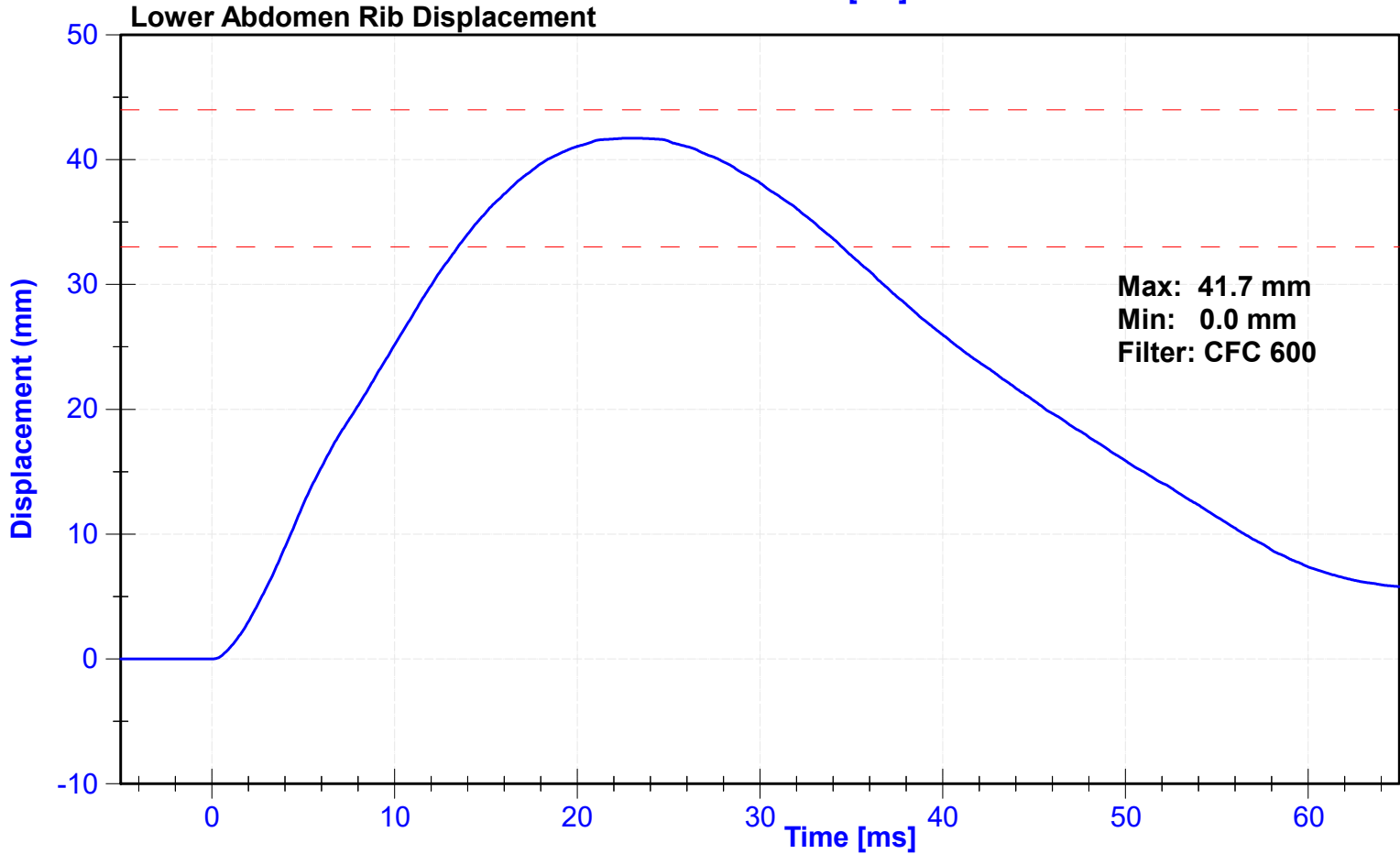
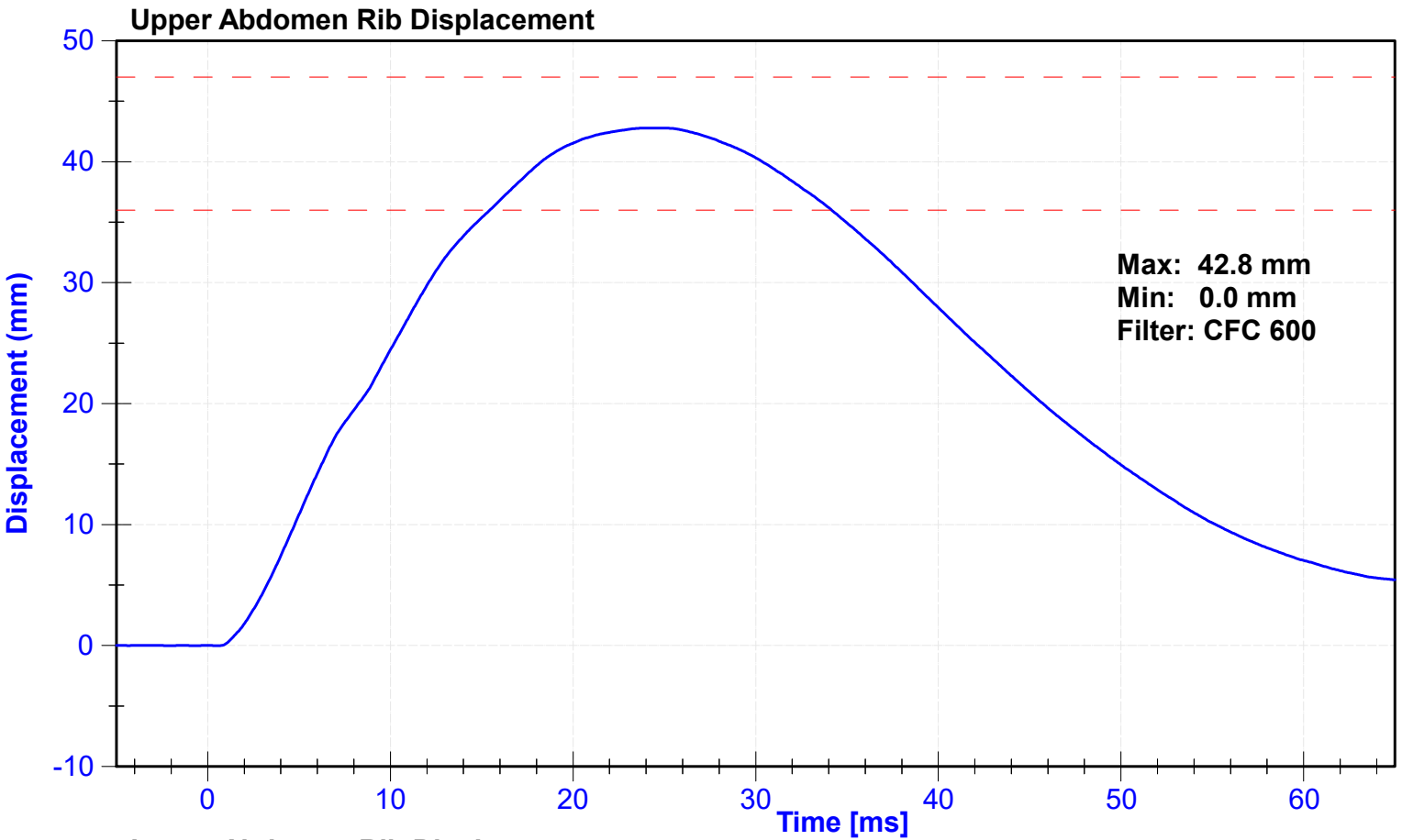
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	65	Pass
Velocity	4.2	4.4	m/s	4.24	Pass
Probe Acceleration	12	16	g's	13.9	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.7	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.8	Pass
Lower Abdomen Rib Deflection	33	44	mm	41.7	Pass

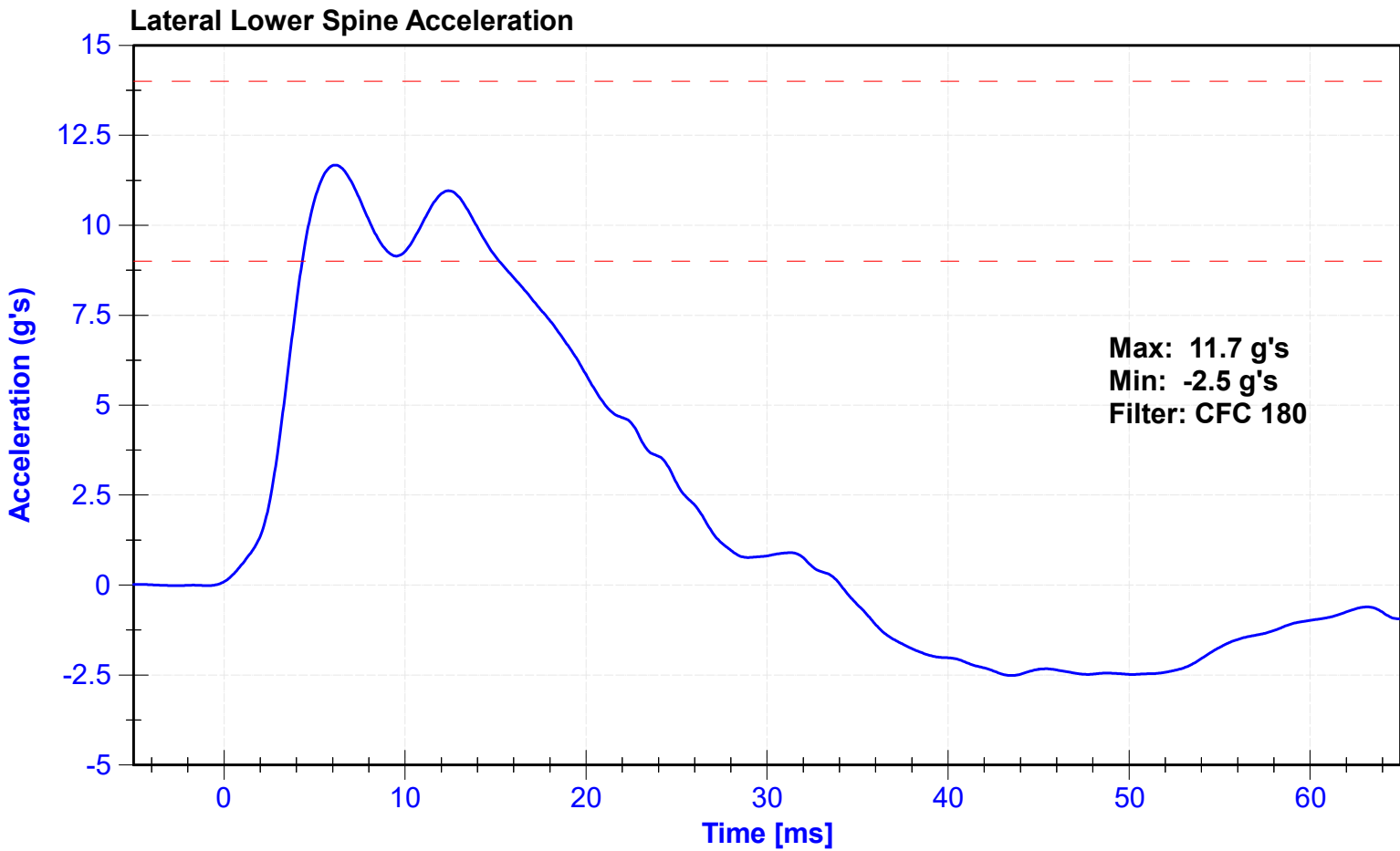
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Lower Spine Y Accelerometer	Endevco	T20906	4/19/2025	10/16/2025
Upper Abdomen Rib Potentiometer	Servo	047GFE	4/18/2025	4/18/2026
Lower Abdomen Rib Potentiometer	Servo	1256GFE	4/18/2025	10/17/2025

Probe Acceleration







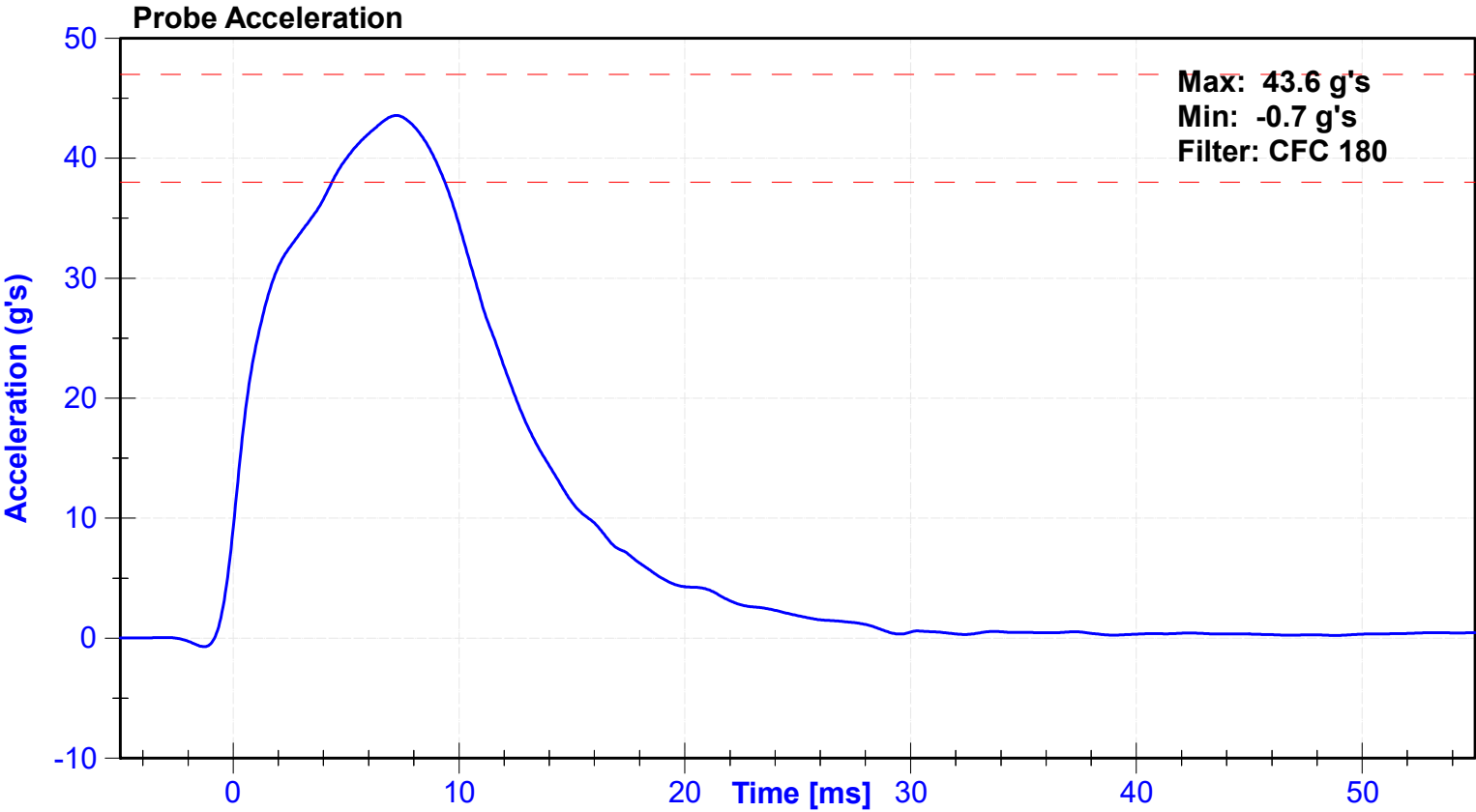
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

Results

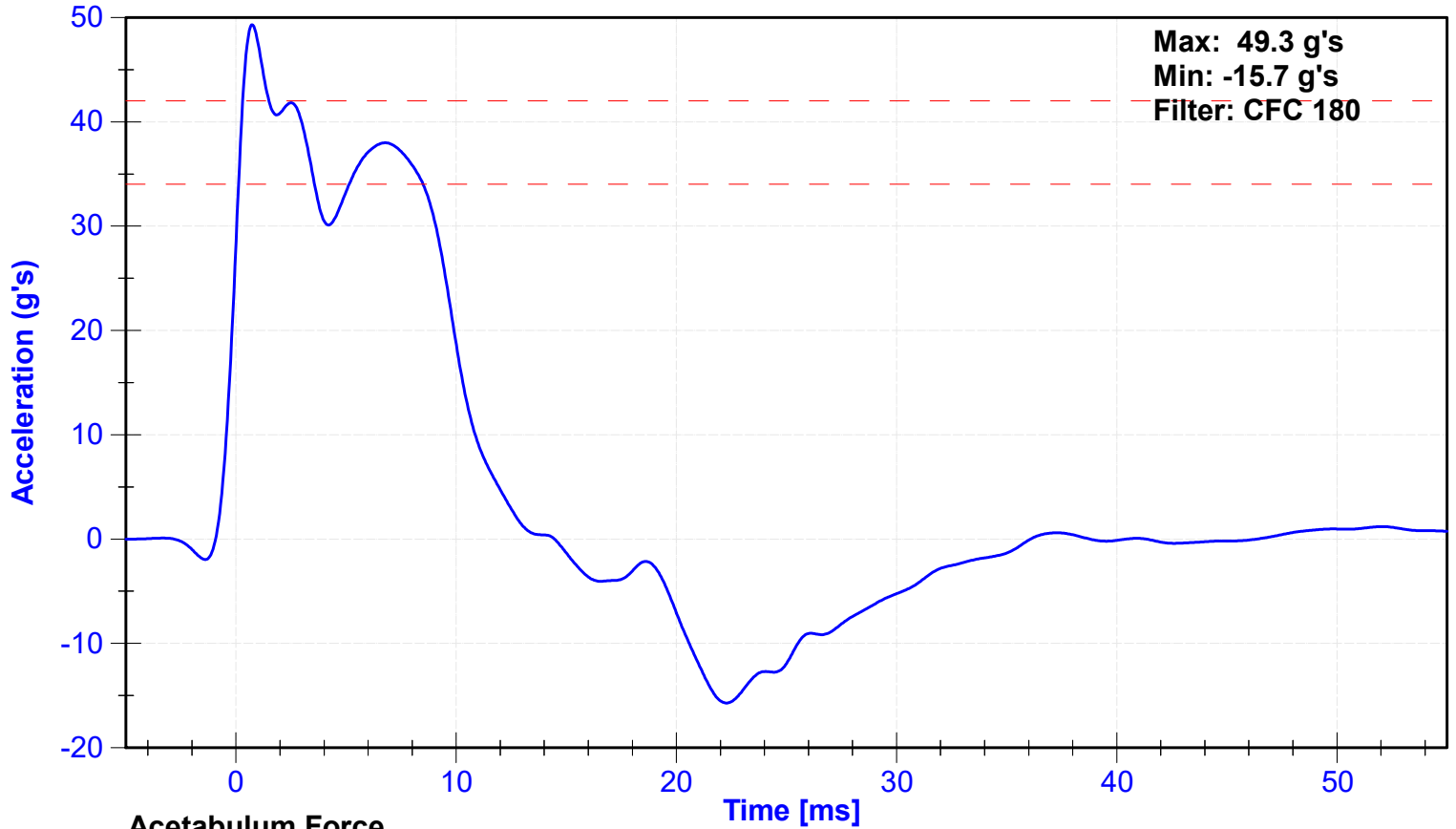
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	65	Pass
Velocity	6.6	6.8	m/s	6.69	Pass
Probe Acceleration	38	47	g's	43.6	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	38.0	Pass
Acetabulum Force	3600	4300	N	4066.4	Pass

Transducer Calibrations

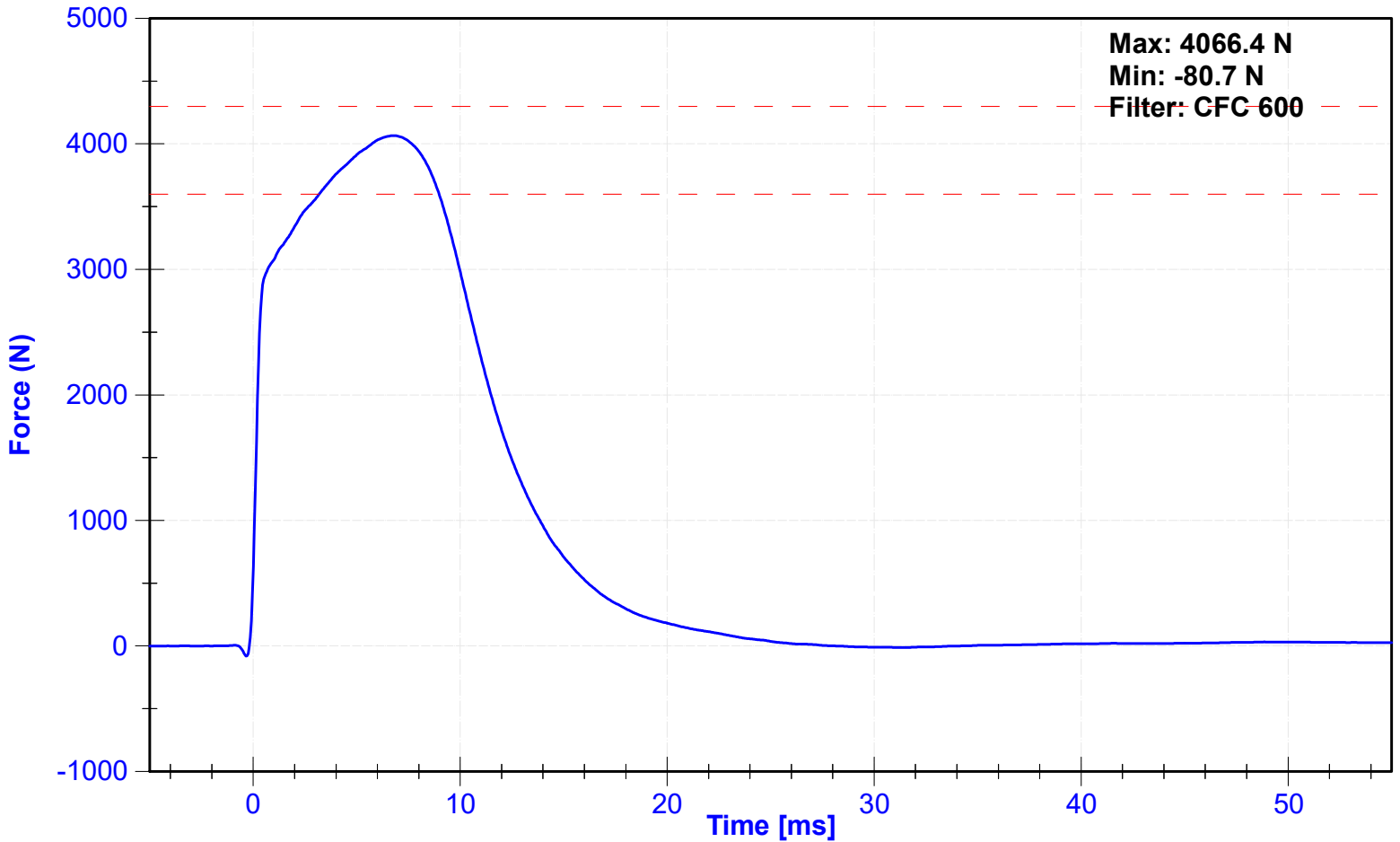
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pelvis Y Accelerometer	Endevco	P63987	4/19/2025	10/16/2025
Acetabulum Load Cell	Denton	267-FY	9/16/2024	9/16/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A



Lateral Pelvis Acceleration



Acetabulum Force





SID-IIs Pelvis Plug Certification Test

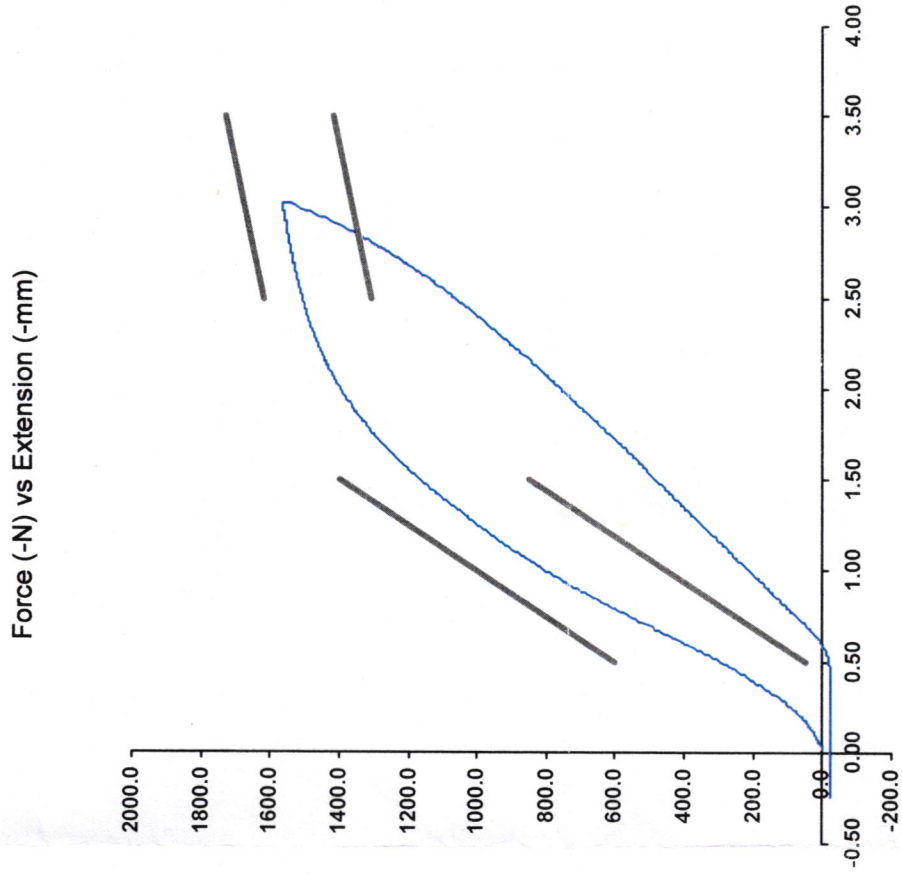
Plug S/N 16910
Test Number 23757
Report Number 23814

Test Date 8/2/2022 2:50:50 PM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	303	600
Force @ 1.5 mm (N)	1,172	1,400
Force @ 2.5 mm (N)	1,510	1,618
Force @ 3.0 mm (N)	1,565	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: Inspect 7.25.25 224



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



SID-Its Pelvis Plug Certification Test

Plug S/N 16914

Test Number 23761

Report Number 23818

Test Date 8/2/2022 2:57:10 PM

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

Testing Machine STM-20 5965542

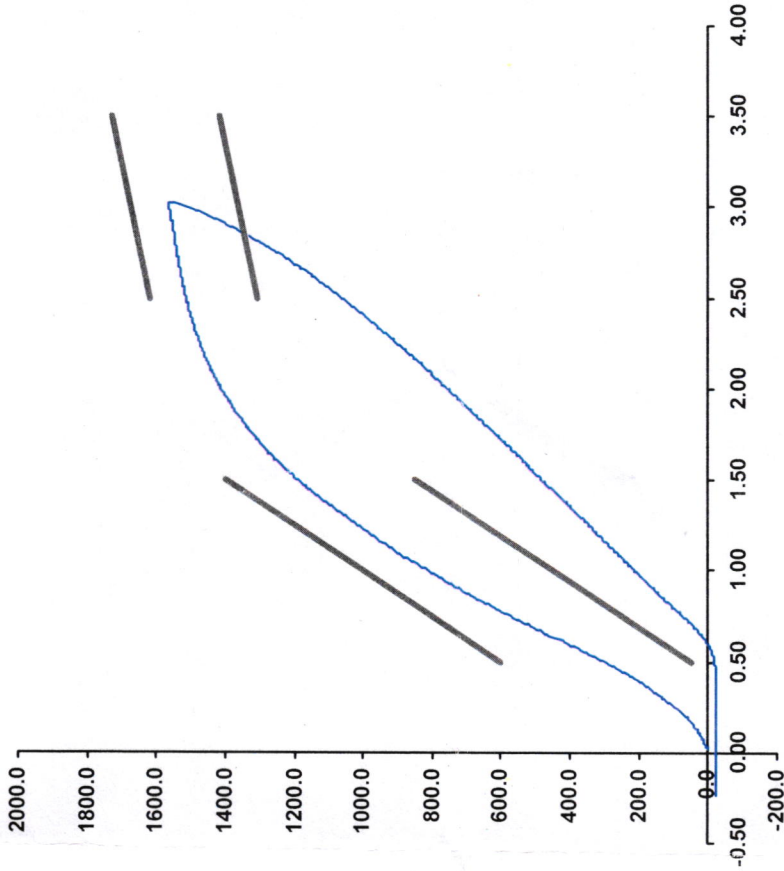
Load Cell S/N (FI360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes: Non-Impact 17.25.25 224

Force (-N) vs Extension (-mm)



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



SID-IIs Pelvis Plug Certification Test

Plug S/N 16898

Test Number 23745

Report Number 23802

Test Date 8/2/2022 2:22:04 PM

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

Testing Machine STM-20 5965542

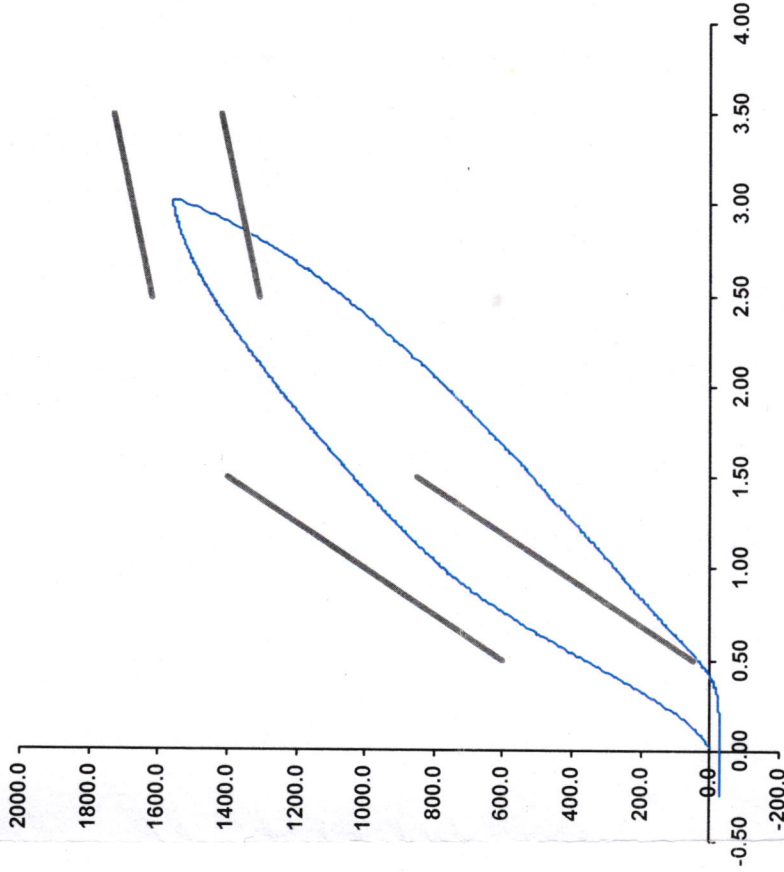
Load Cell S/N (FI360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes: Cert 1725.25 224

Force (-N) vs Extension (-mm)



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	224	Laboratory Supervisor	J. Kinderman

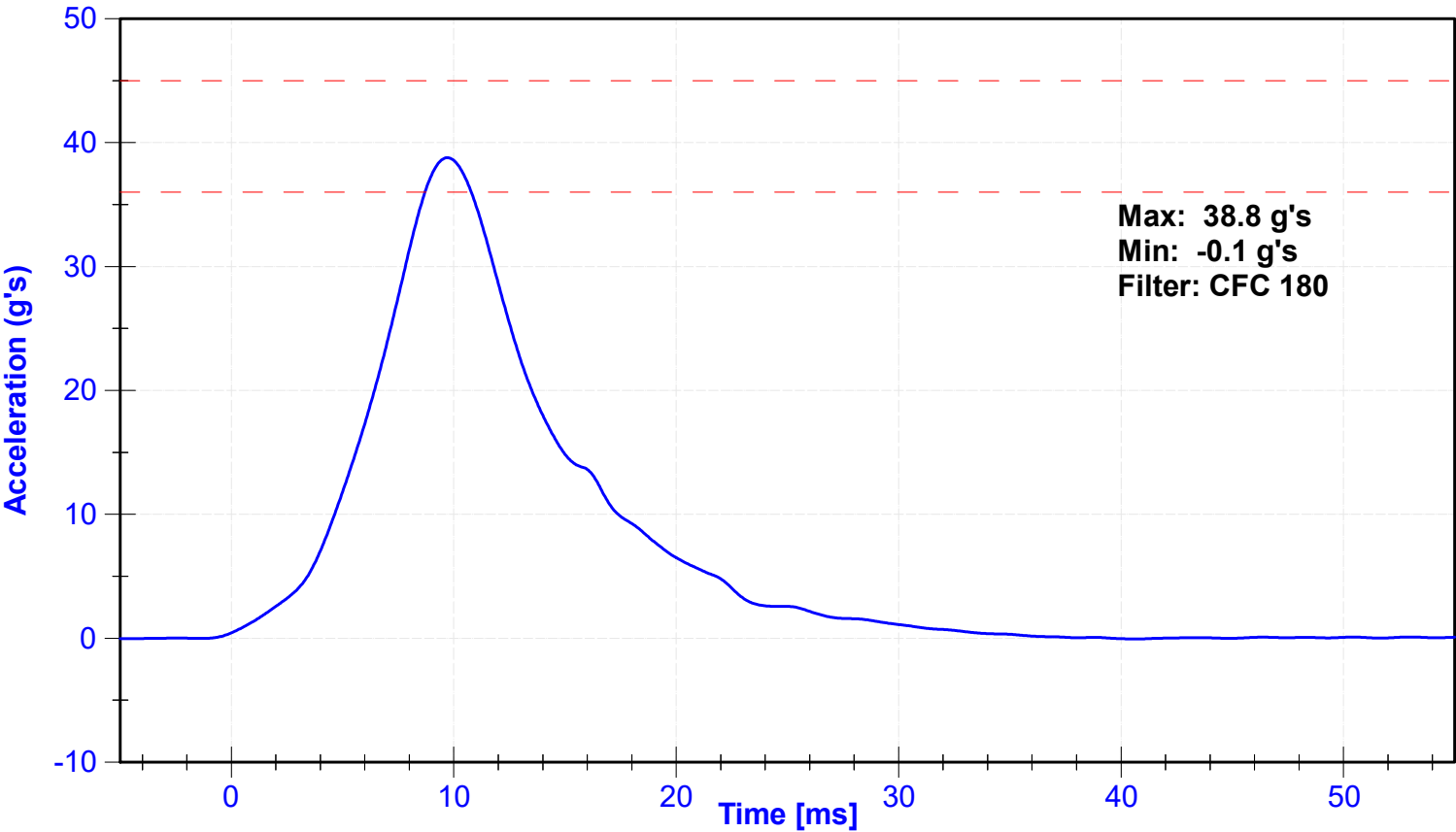
Results

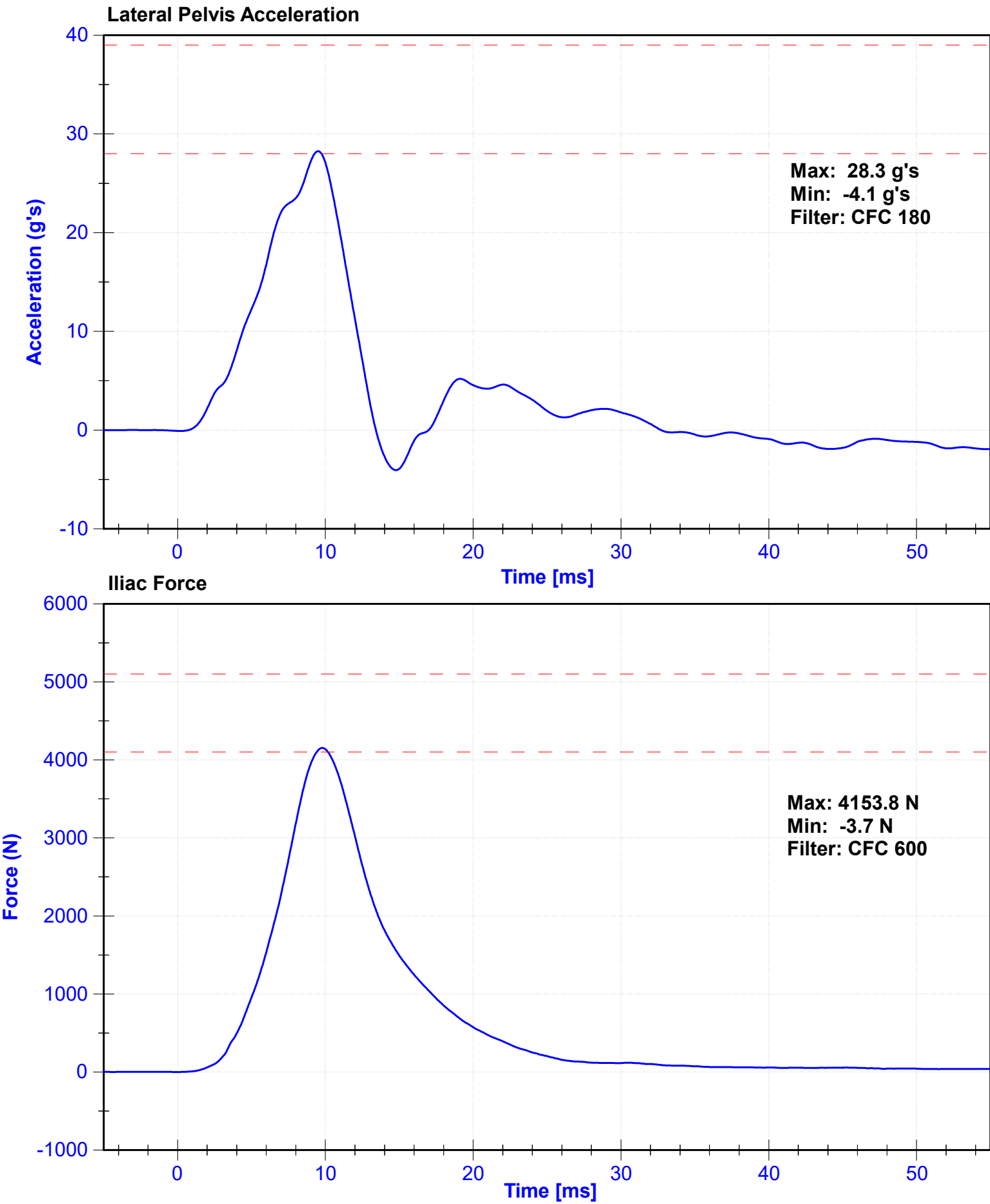
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	65	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	36	45	g's	38.8	Pass
Lateral Pelvis Acceleration	28	39	g's	28.3	Pass
Iliac Force	4100	5100	N	4153.8	Pass

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	P63987	4/19/2025	10/16/2025
Iliac Load Cell	Denton	280-FY	9/16/2024	9/16/2025

Probe Acceleration





**POST-TEST
SID-IIs PERFORMANCE CALIBRATION TEST DATA**

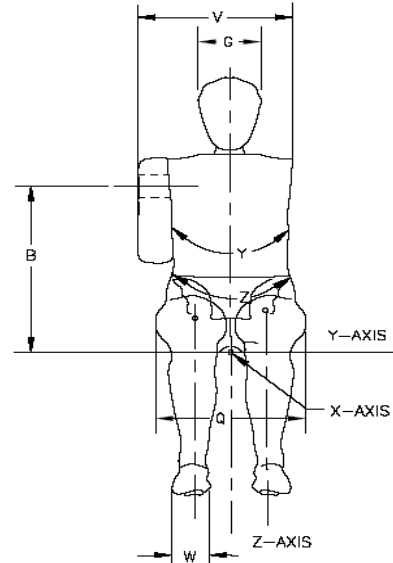
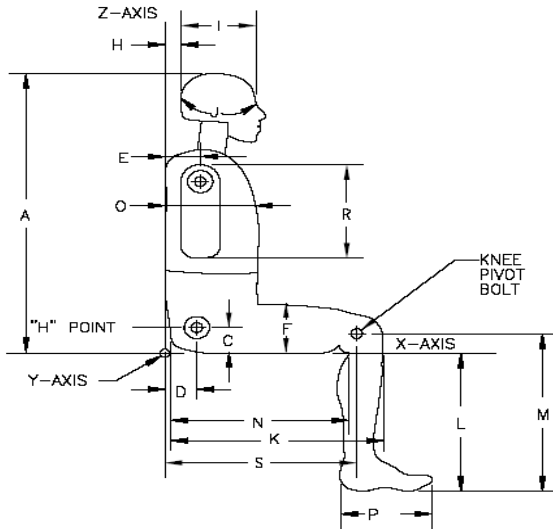


External Measurements - SID-IIs

Technician: **J. Rios**

Date: **8/7/2024**

Dummy Serial Number: **224**



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	779	Pass
B	Shoulder Pivot Height	437	453	451	Pass
C	H-point Height	79	89	85	Pass
D	H-point from seatback	141	151	148	Pass
E	Shoulder Pivot from Backline	97	107	104	Pass
F	Thigh Clearance	119	135	128	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	182	Pass
J	Head Circumference	541	551	550	Pass
K	Buttock to Knee Length	514	540	532	Pass
L	Popliteal Height	343	369	349	Pass
M	Knee Pivot to floor height	392	409	407	Pass
N	Buttock Popliteal Length	416	442	431	Pass
O	Chest Depth w/o jacket	195	211	204	Pass
P	Foot Length	216	232	225	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	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	82	Pass
Y	Chest Circumference w/jacket	851	881	871	Pass
Z	Waist Circumference	761	791	777	Pass

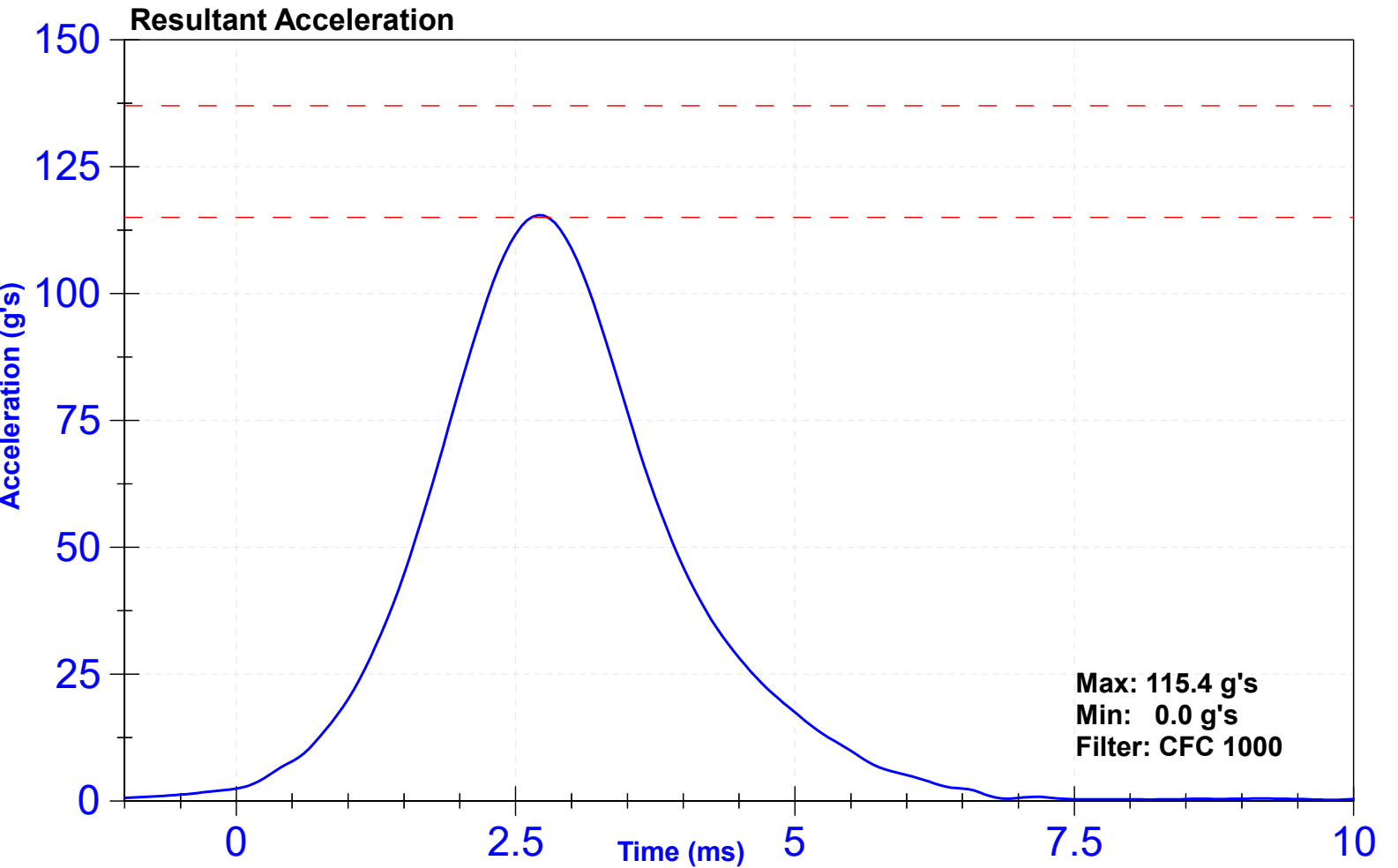
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

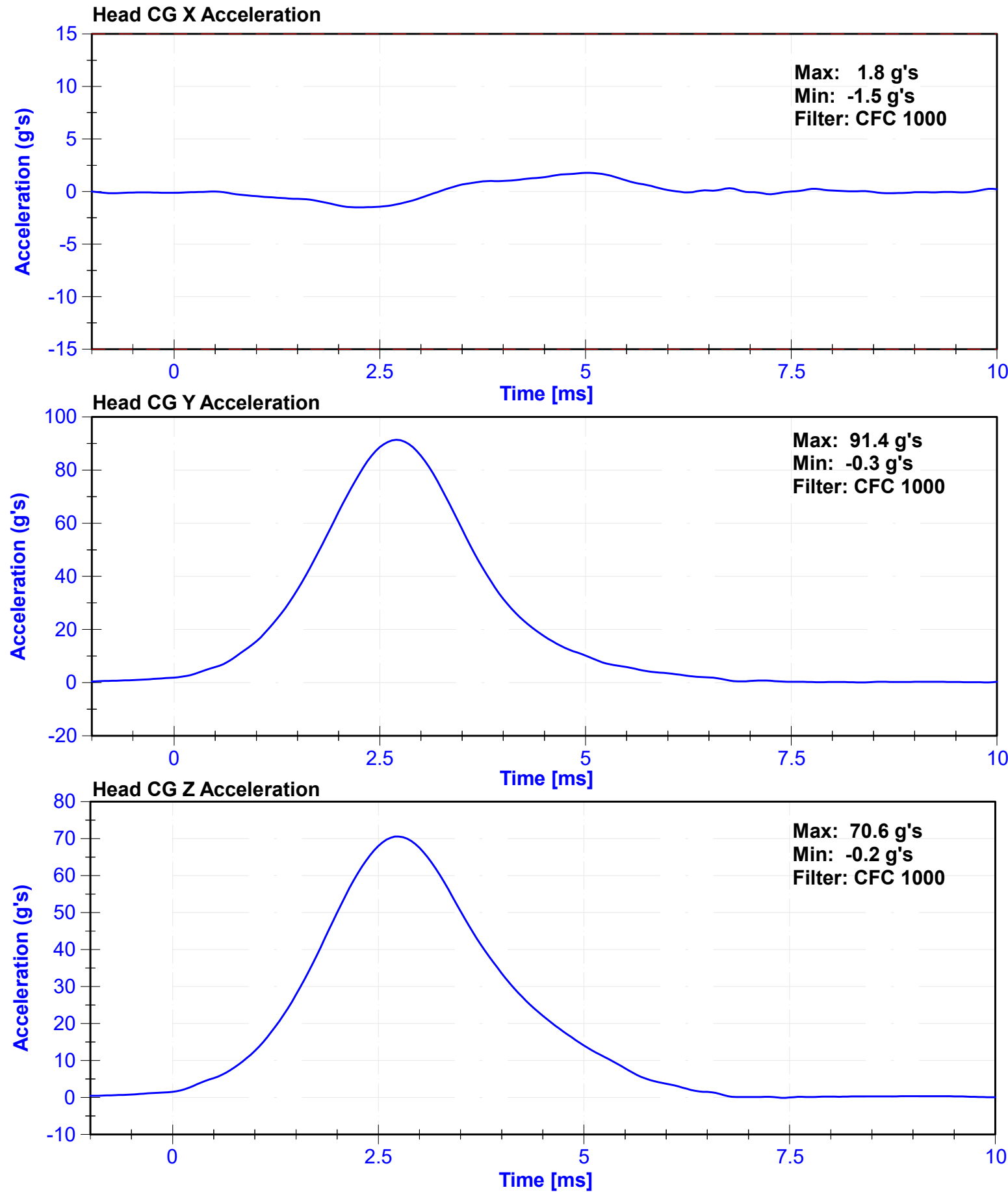
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	47	Pass
Resultant Acceleration	115	137	g's	115.4	Pass
Oscillation	0	15	%	1.3	Pass
Fore-Aft Acceleration	-15	15	g's	1.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P51884	4/19/2025	10/16/2025
Y Accelerometer	Endevco	P73161	4/19/2025	10/16/2025
Z Accelerometer	Endevco	P79588	4/19/2025	10/16/2025





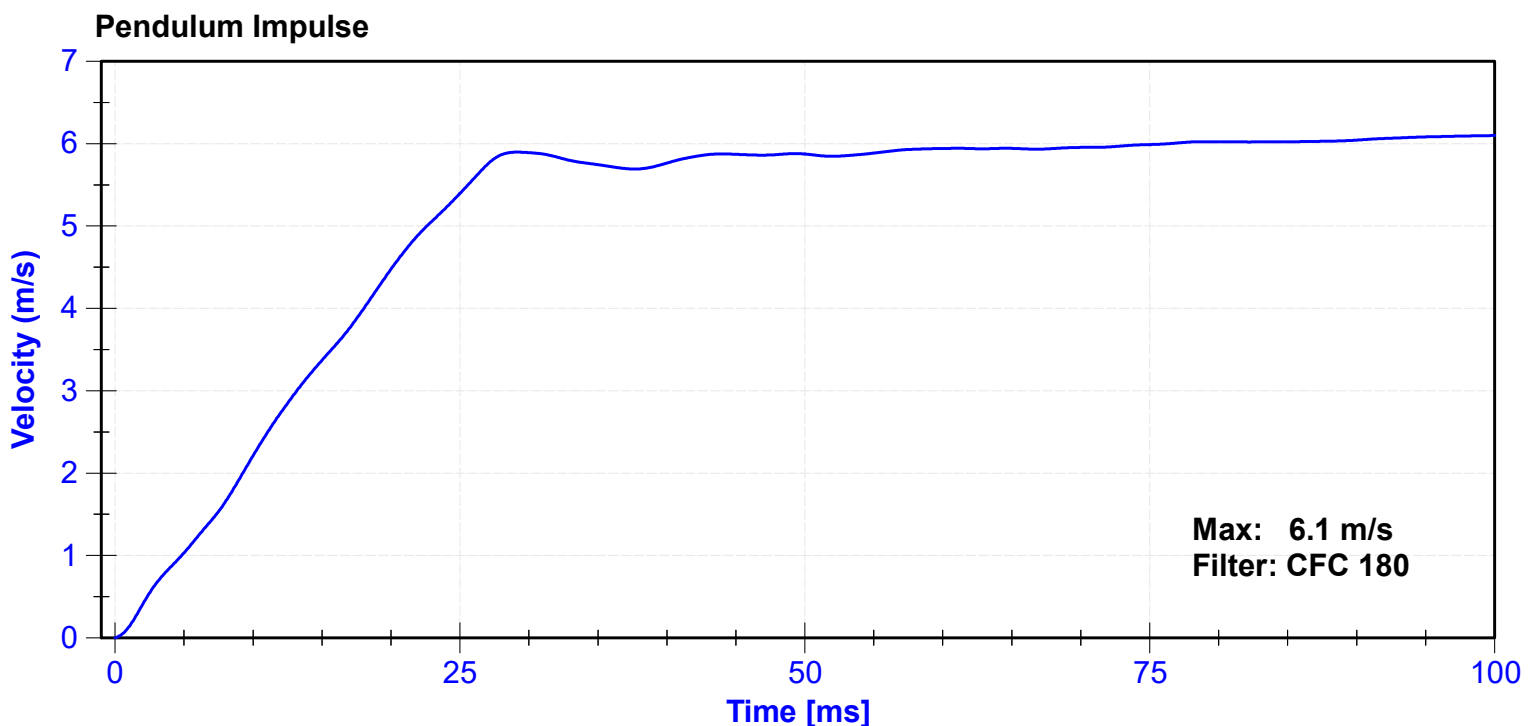
ATD Manufacturer	FTSS	Test Technician	Z. Nyhart
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

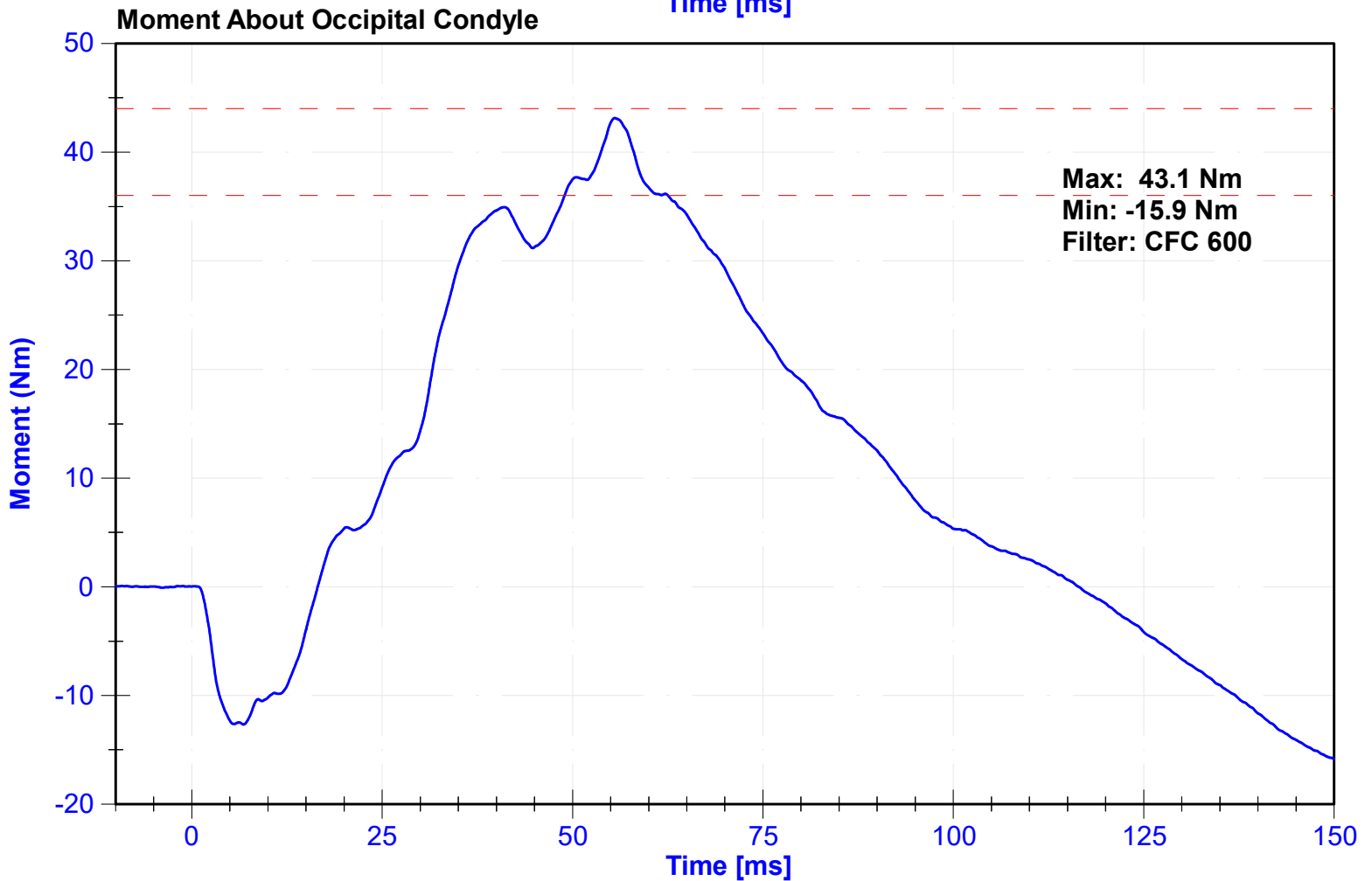
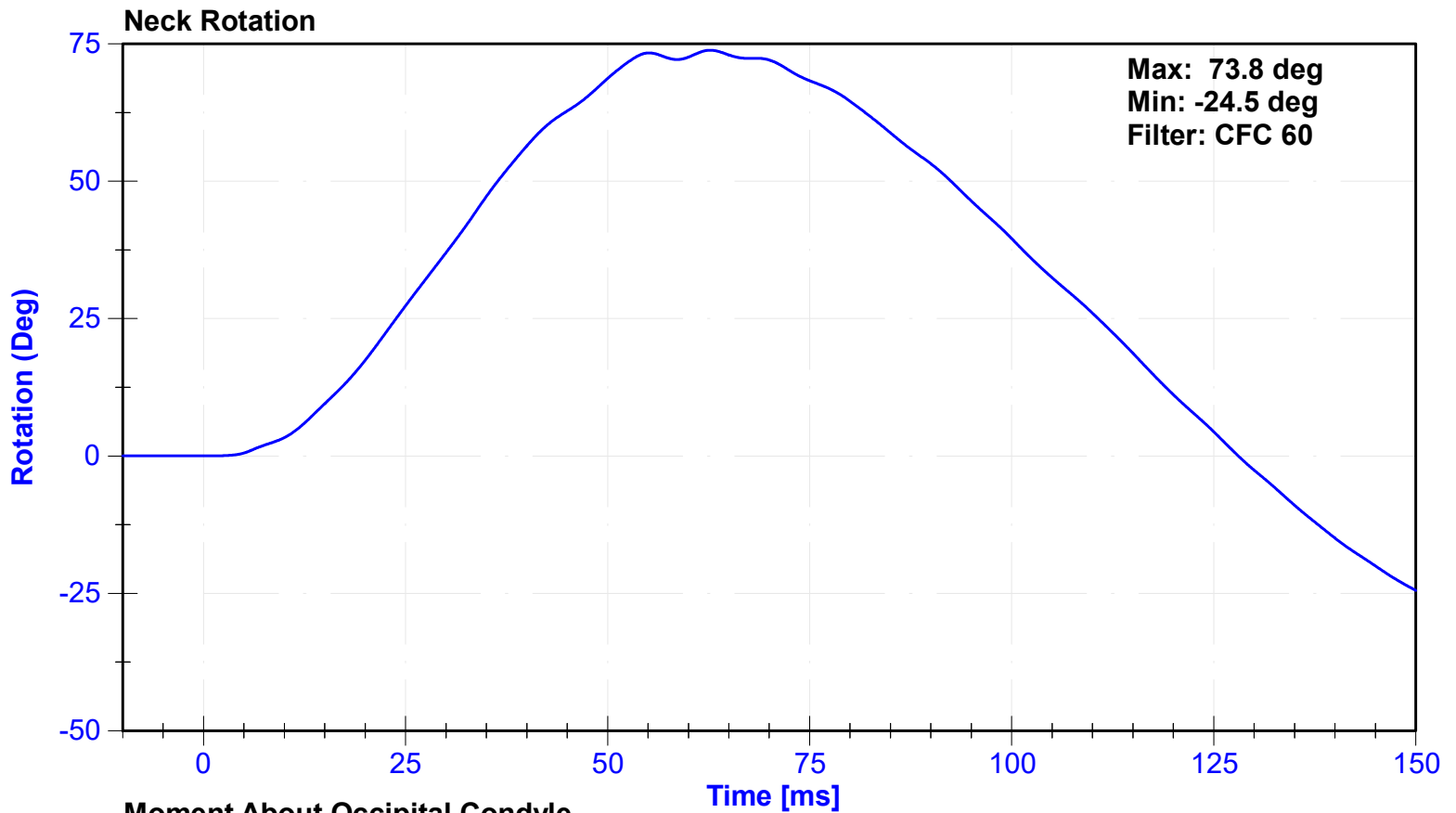
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	46	Pass
Velocity	5.51	5.63	m/s	5.566	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.21	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.37	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.48	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.40	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.10	Pass
Neck Rotation	71	81	deg	73.8	Pass
Time at Maximum Rotation	50	70	ms	62.7	Pass
Moment about the OC	36	44	Nm	43.1	Pass
Moment Decay to 0 Nm	102	126	ms	116.5	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-F4	4/17/2025	4/17/2026





ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

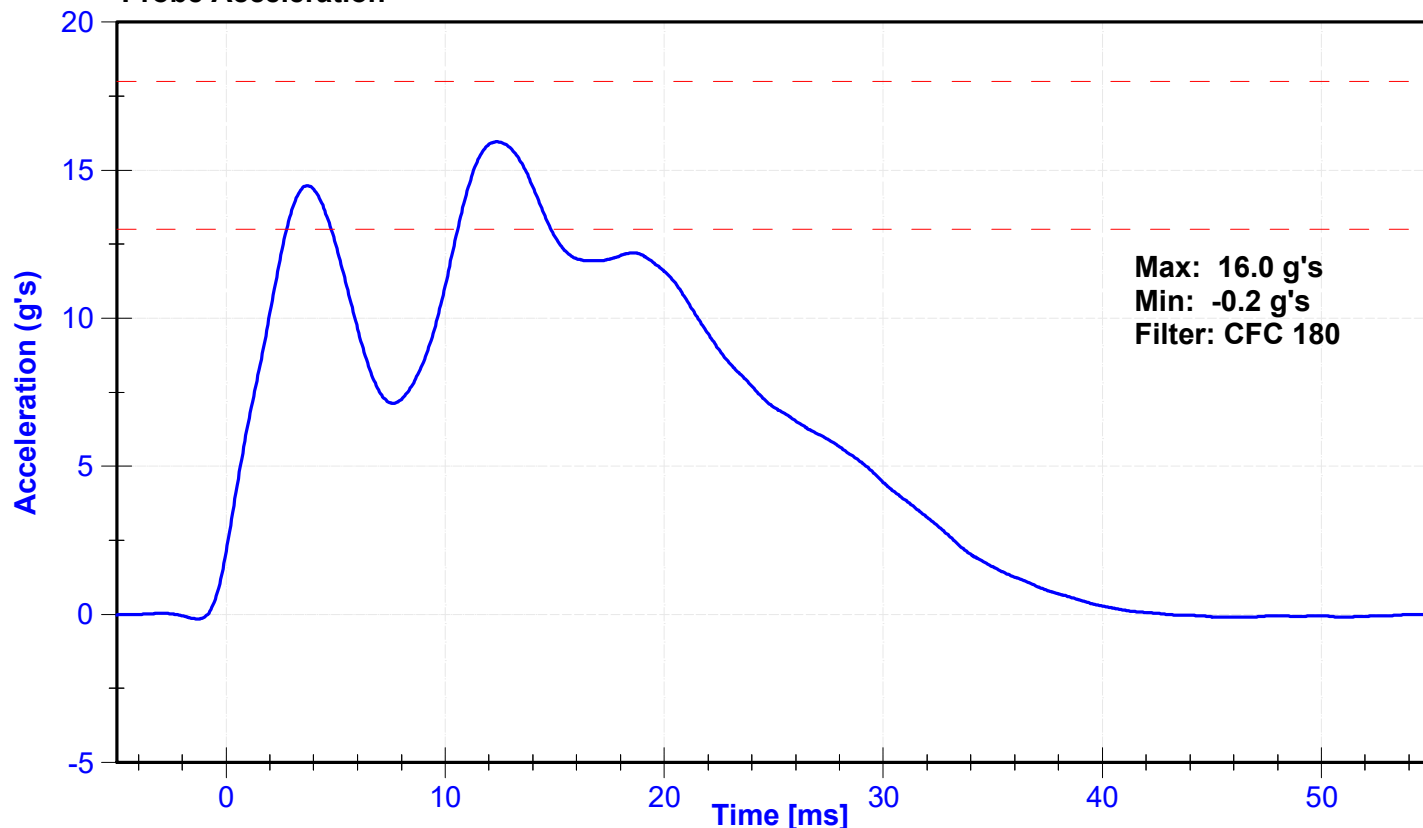
Results

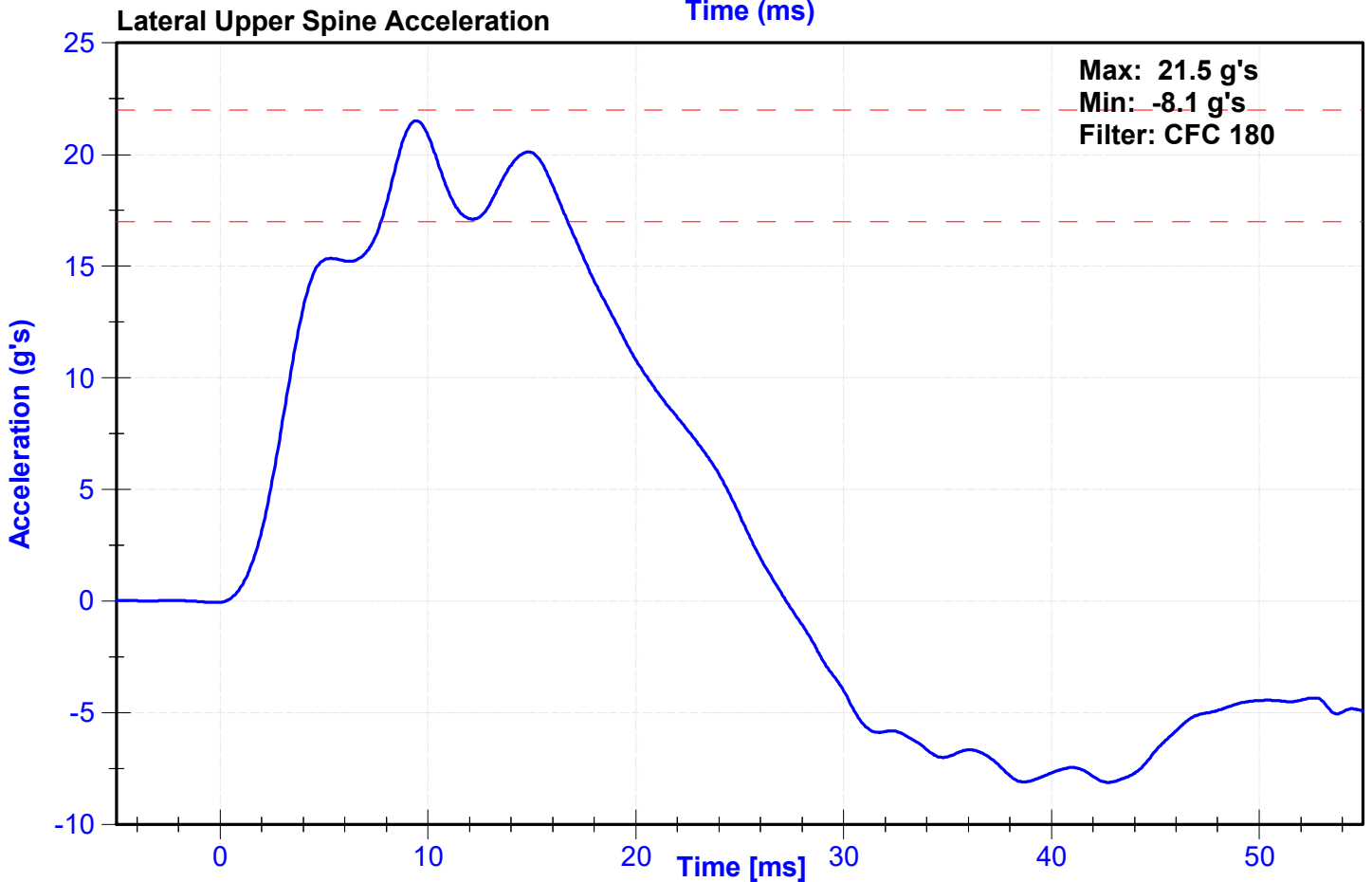
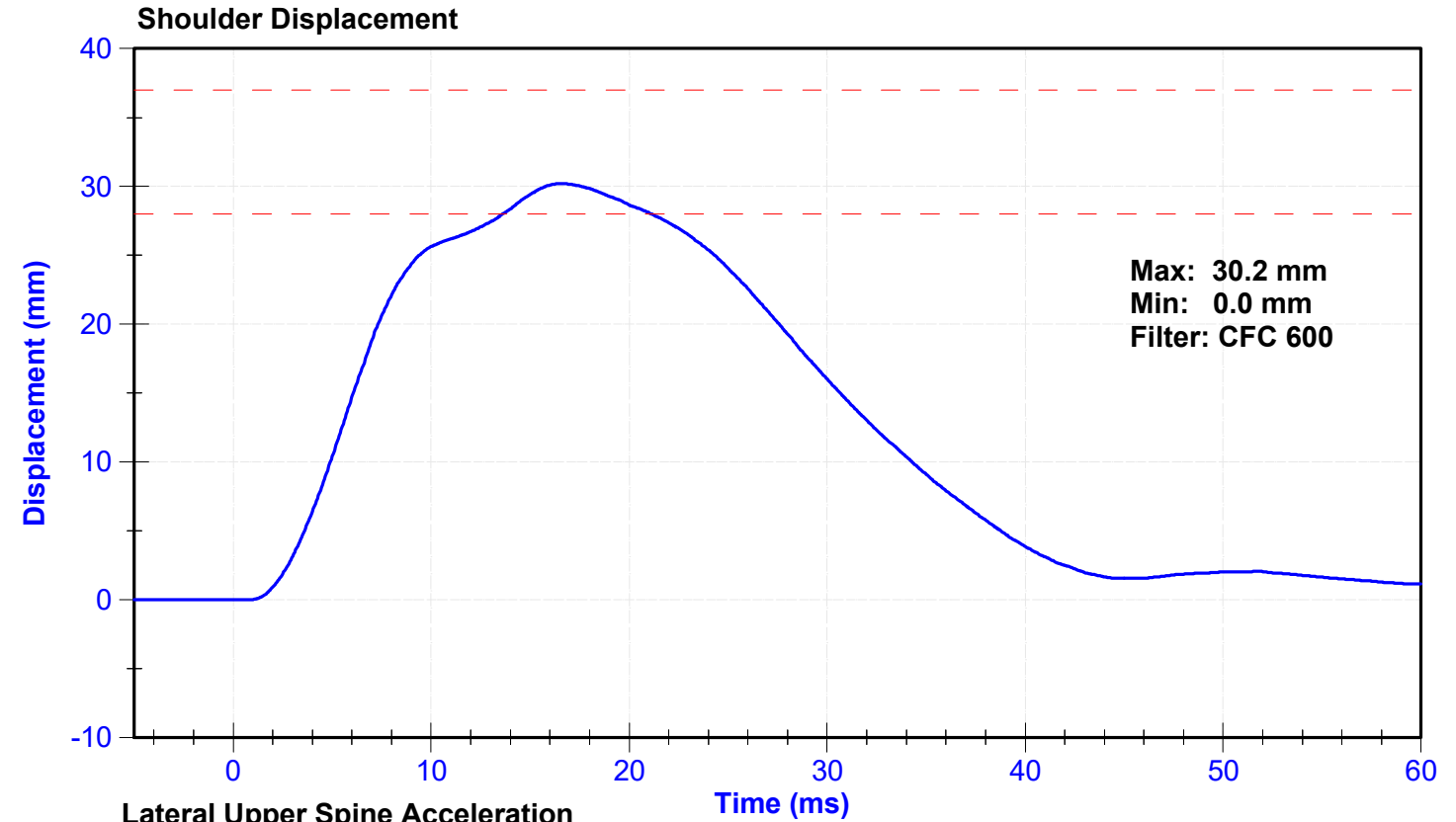
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	47	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	13	18	g's	16.0	Pass
Shoulder Deflection	28	37	mm	30.2	Pass
Lateral Upper Spine Acceleration	17	22	g's	21.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Shoulder Potentiometer	Servo	829GFE	4/18/2025	10/17/2025
Upper Spine Y Accelerometer	Endevco	18698	4/19/2025	10/16/2025

Probe Acceleration





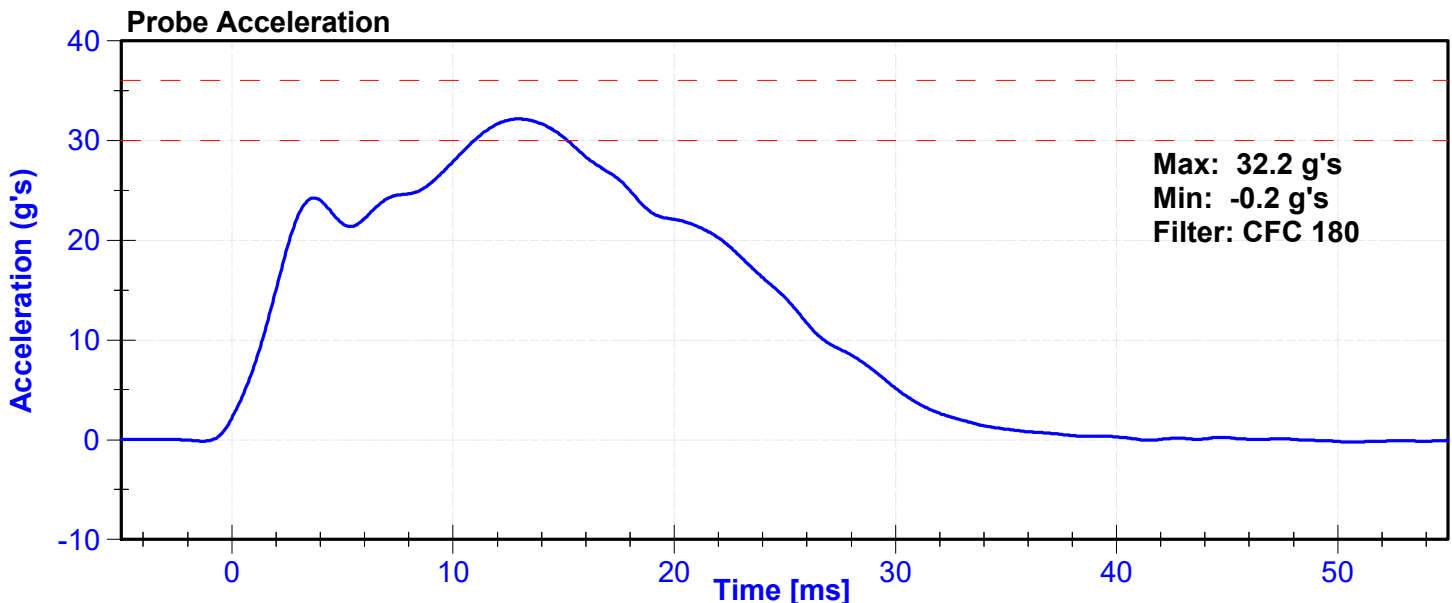
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

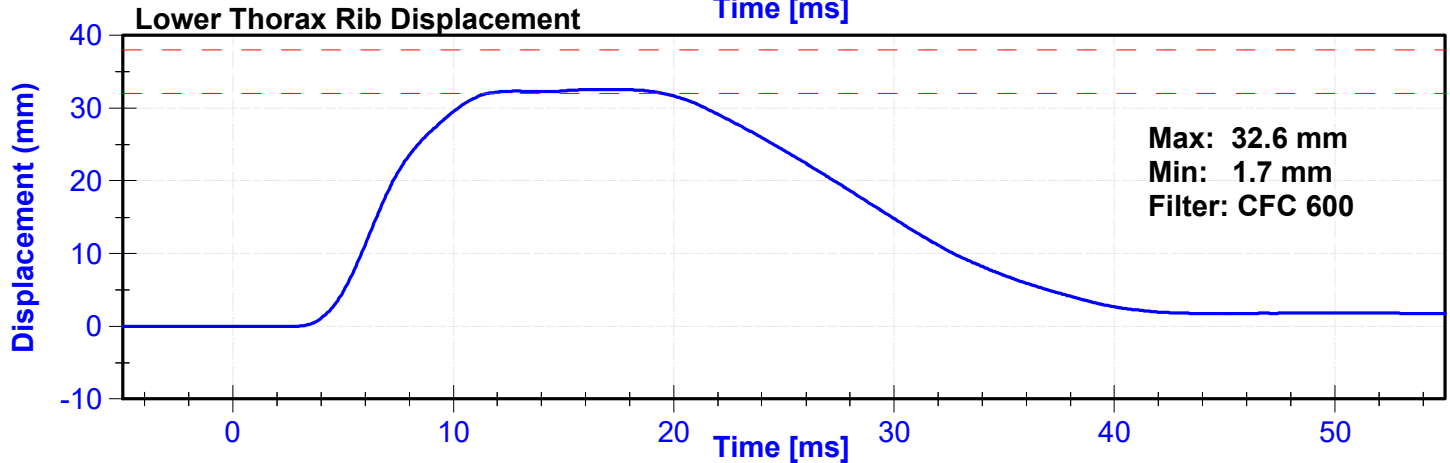
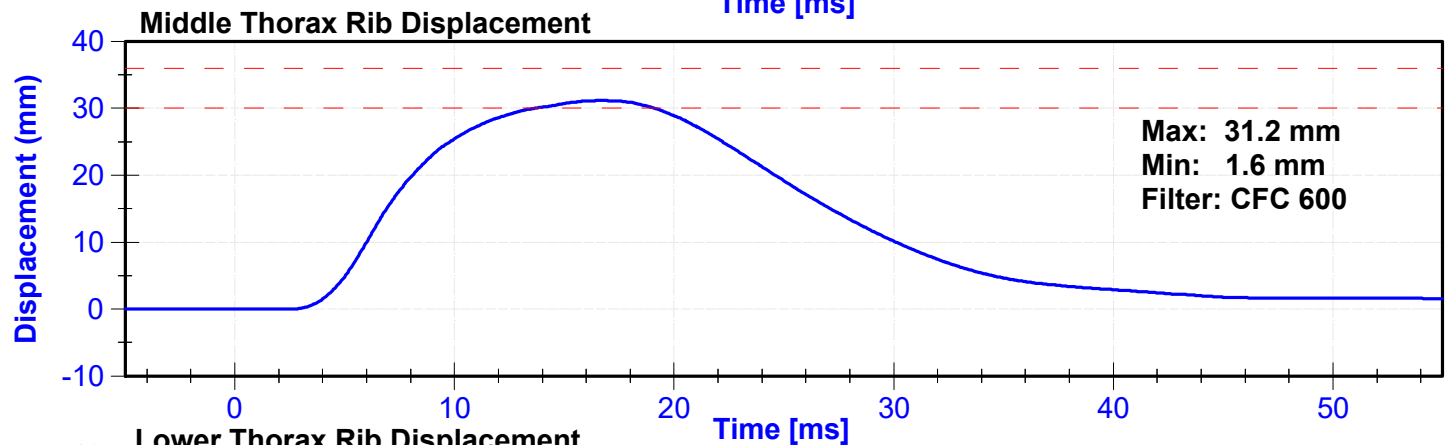
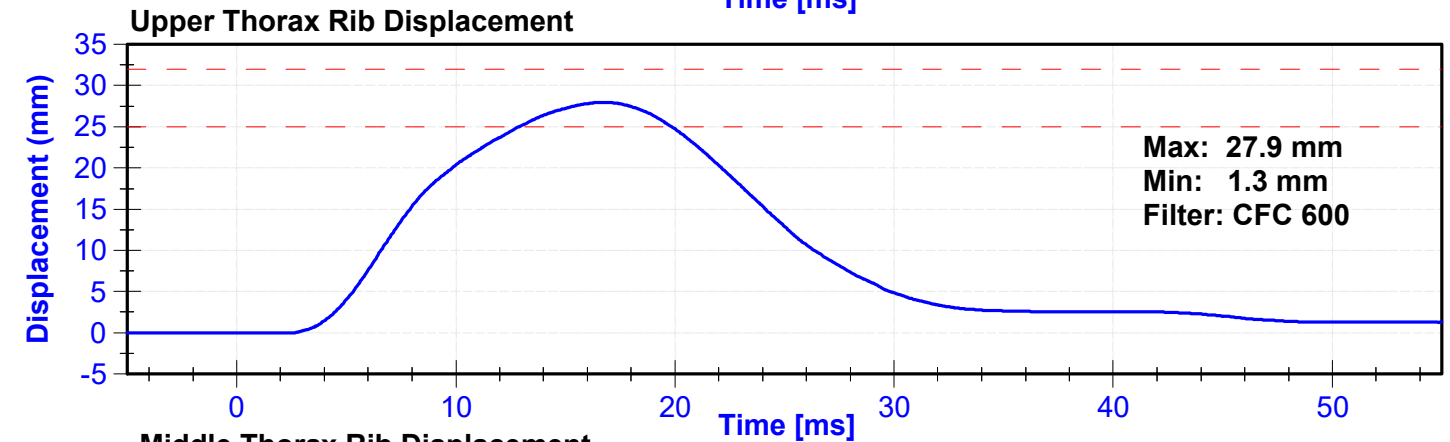
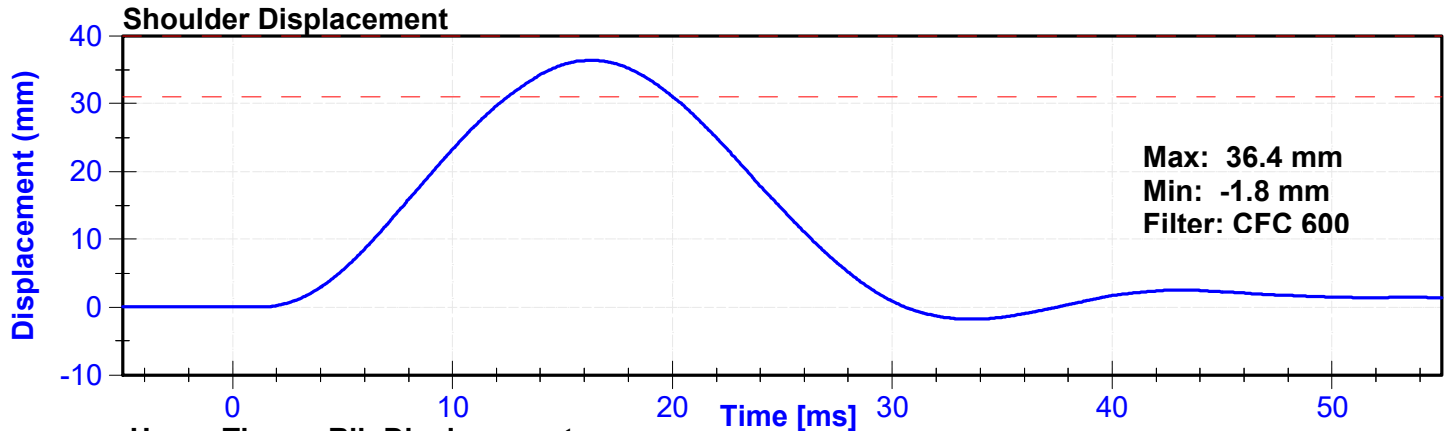
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	47	Pass
Velocity	6.6	6.8	m/s	6.69	Pass
Probe Acceleration after 5 ms	30	36	g's	32.2	Pass
Lateral Upper Spine Acceleration	34	43	g's	36.0	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.0	Pass
Shoulder Deflection	31	40	mm	36.4	Pass
Upper Thorax Rib Deflection	25	32	mm	27.9	Pass
Mid Thorax Rib Deflection	30	36	mm	31.2	Pass
Lower Thorax Rib Deflection	32	38	mm	32.6	Pass

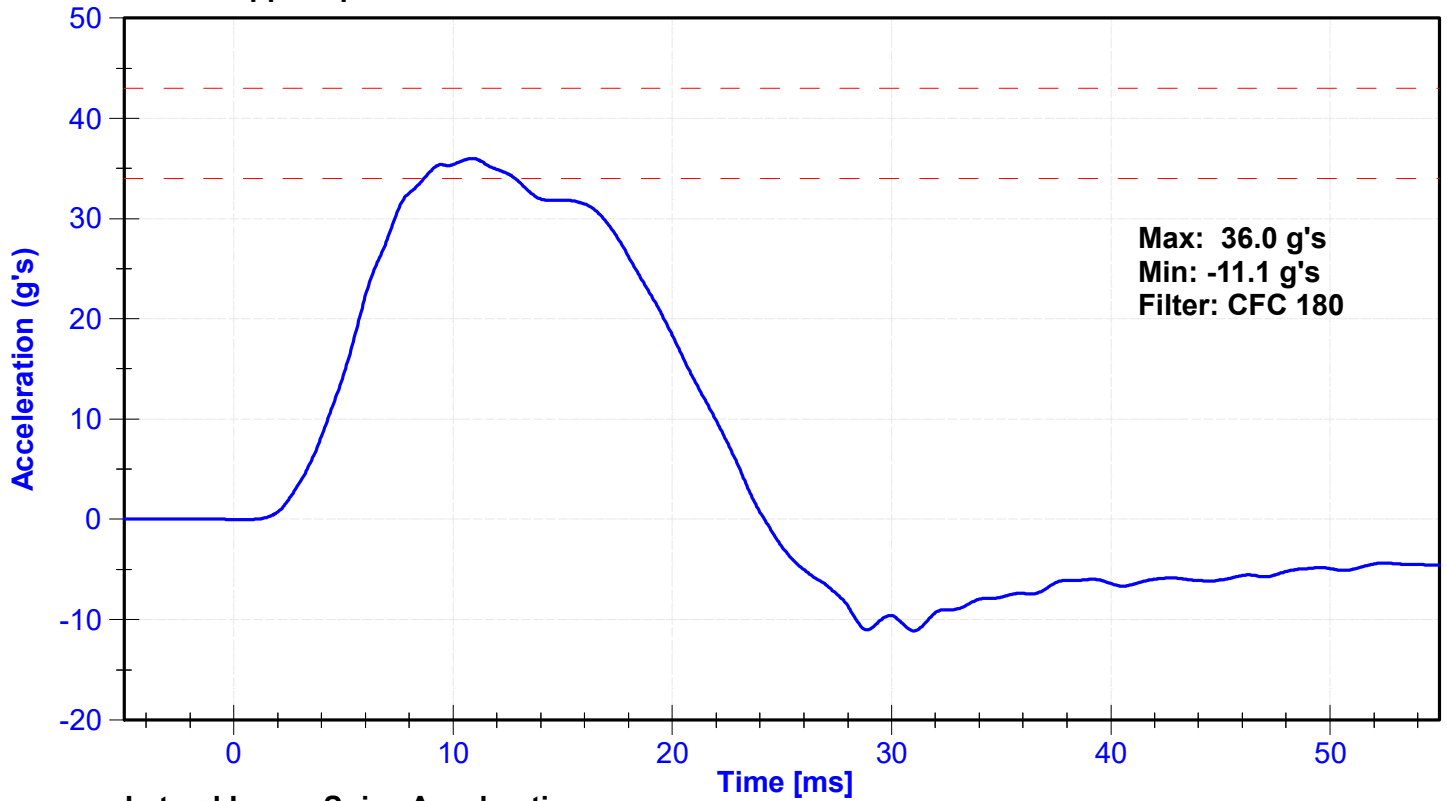
Transducer Calibrations

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	18698	4/19/2025	10/16/2025
Upper Spine T12 Y Accelerometer	Endevco	T20906	4/19/2025	10/16/2025
Shoulder Potentiometer	Servo	829GFE	4/18/2025	10/17/2025
Upper Thorax Rib Potentiometer	Servo	DS-2166GFE	4/18/2025	10/17/2025
Middle Thorax Rib Potentiometer	Servo	080GFE	4/18/2025	10/17/2025
Lower Thorax Rib Potentiometer	Servo	087GFE	4/18/2025	10/17/2025

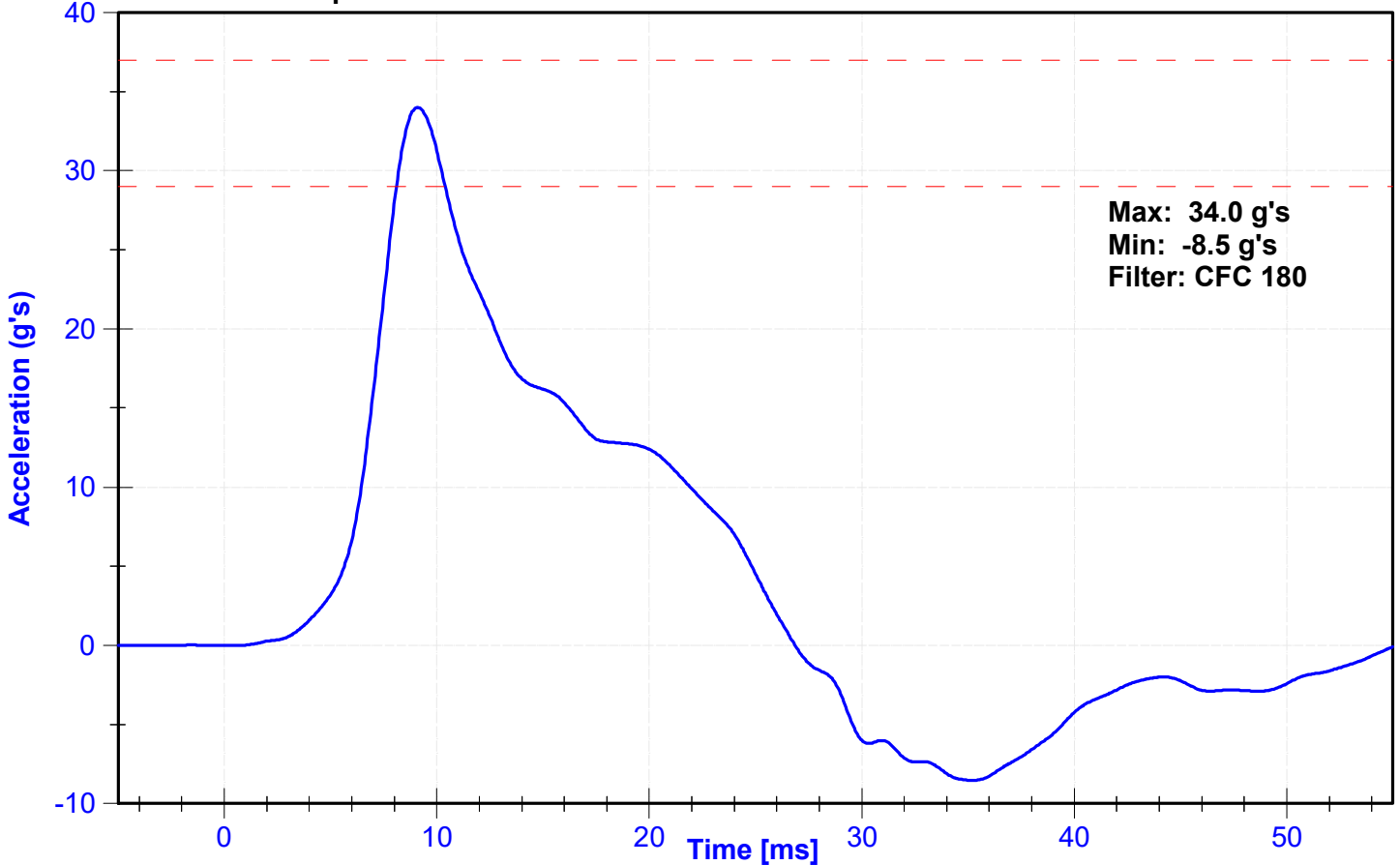




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



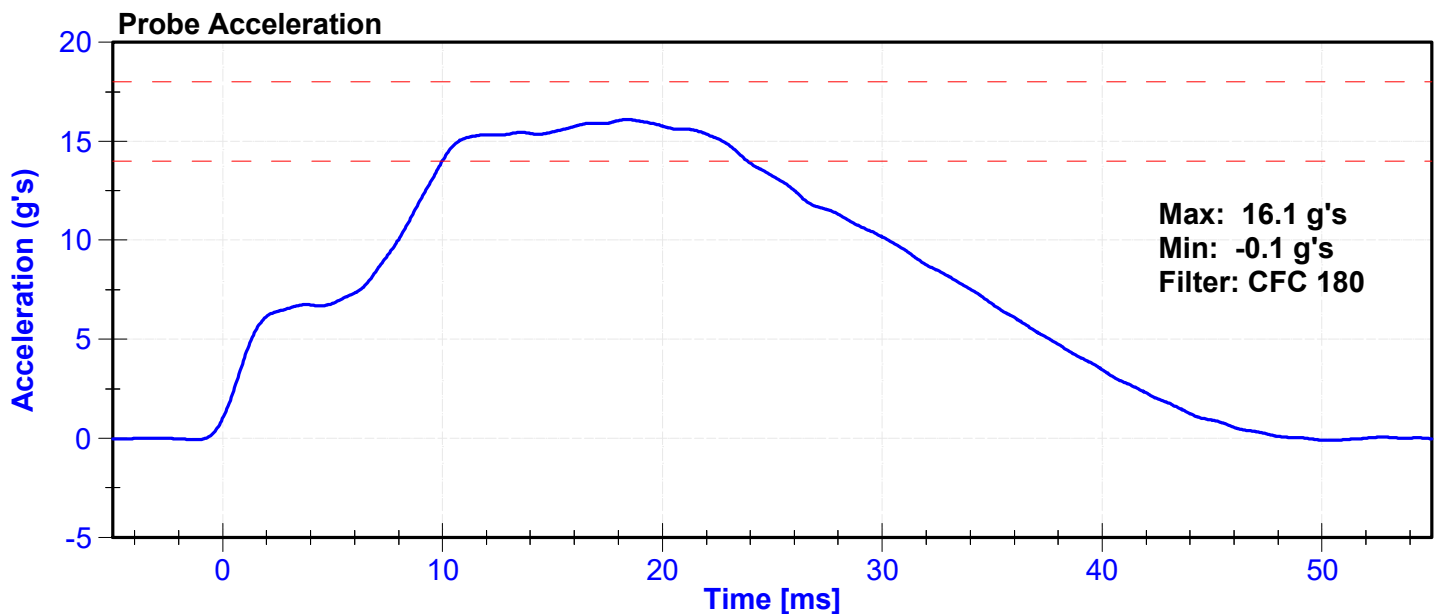
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

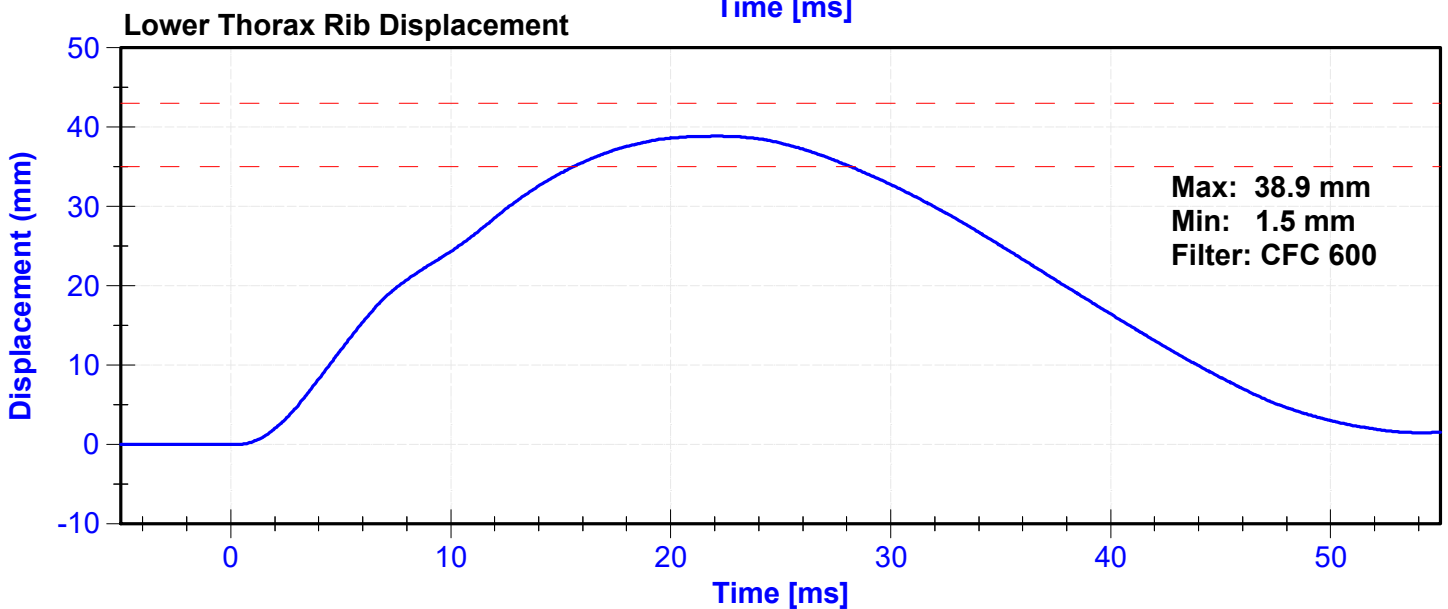
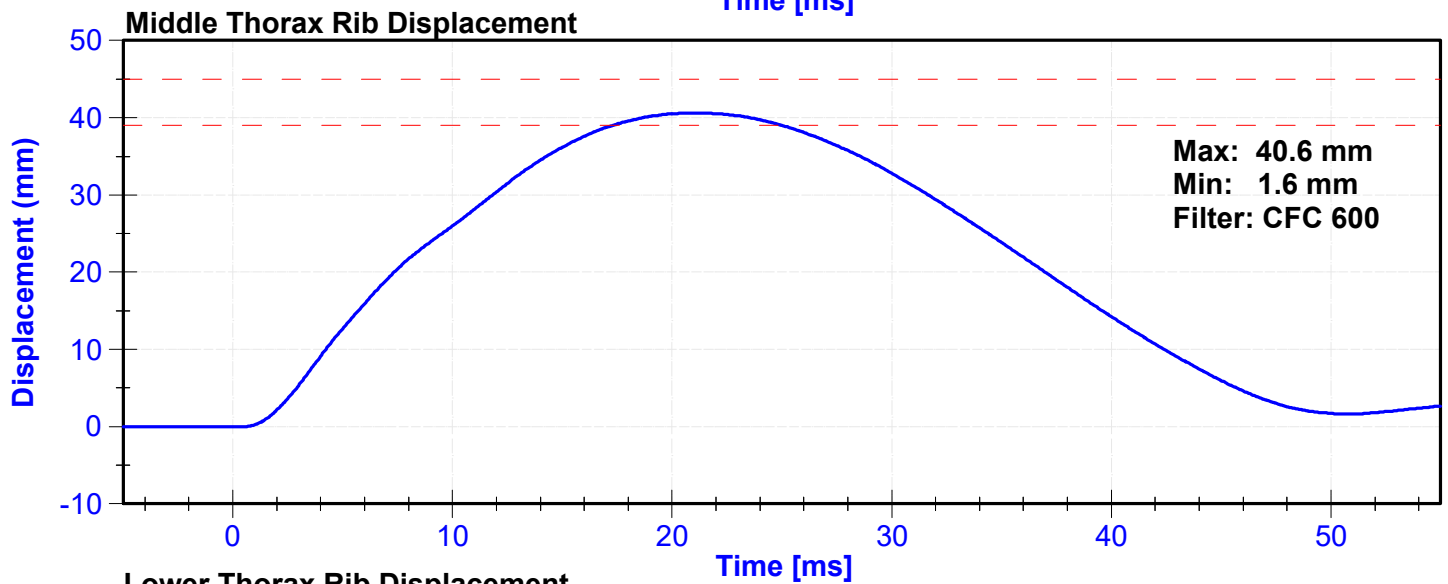
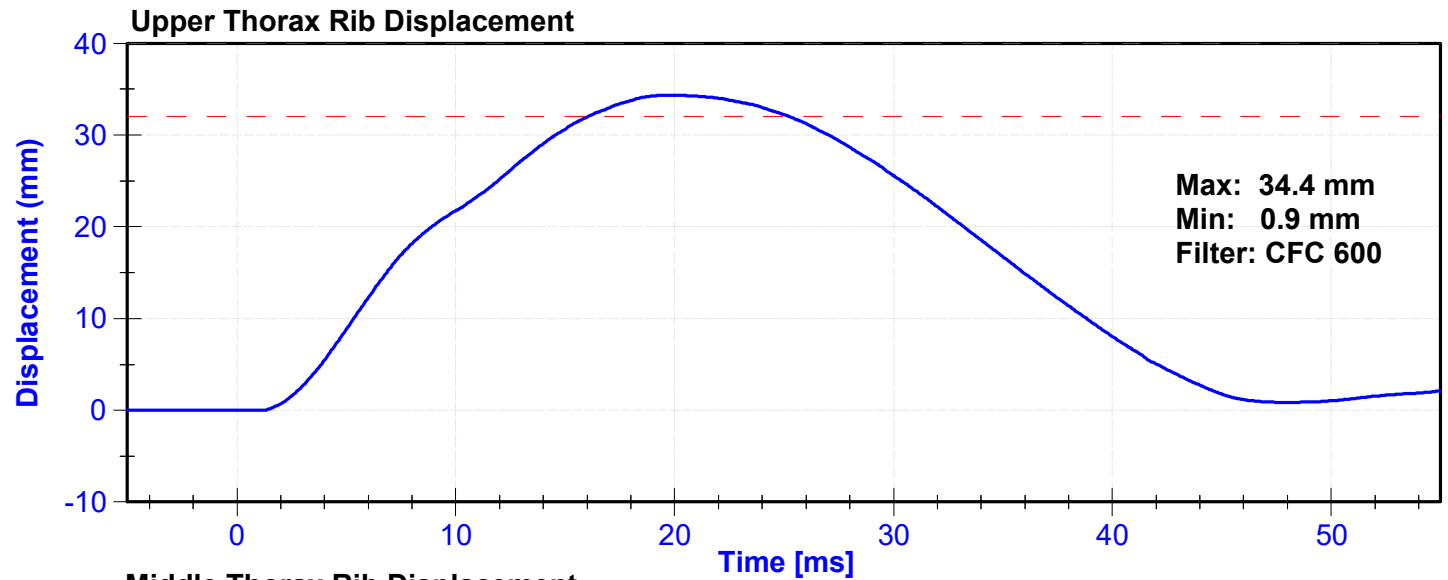
Results

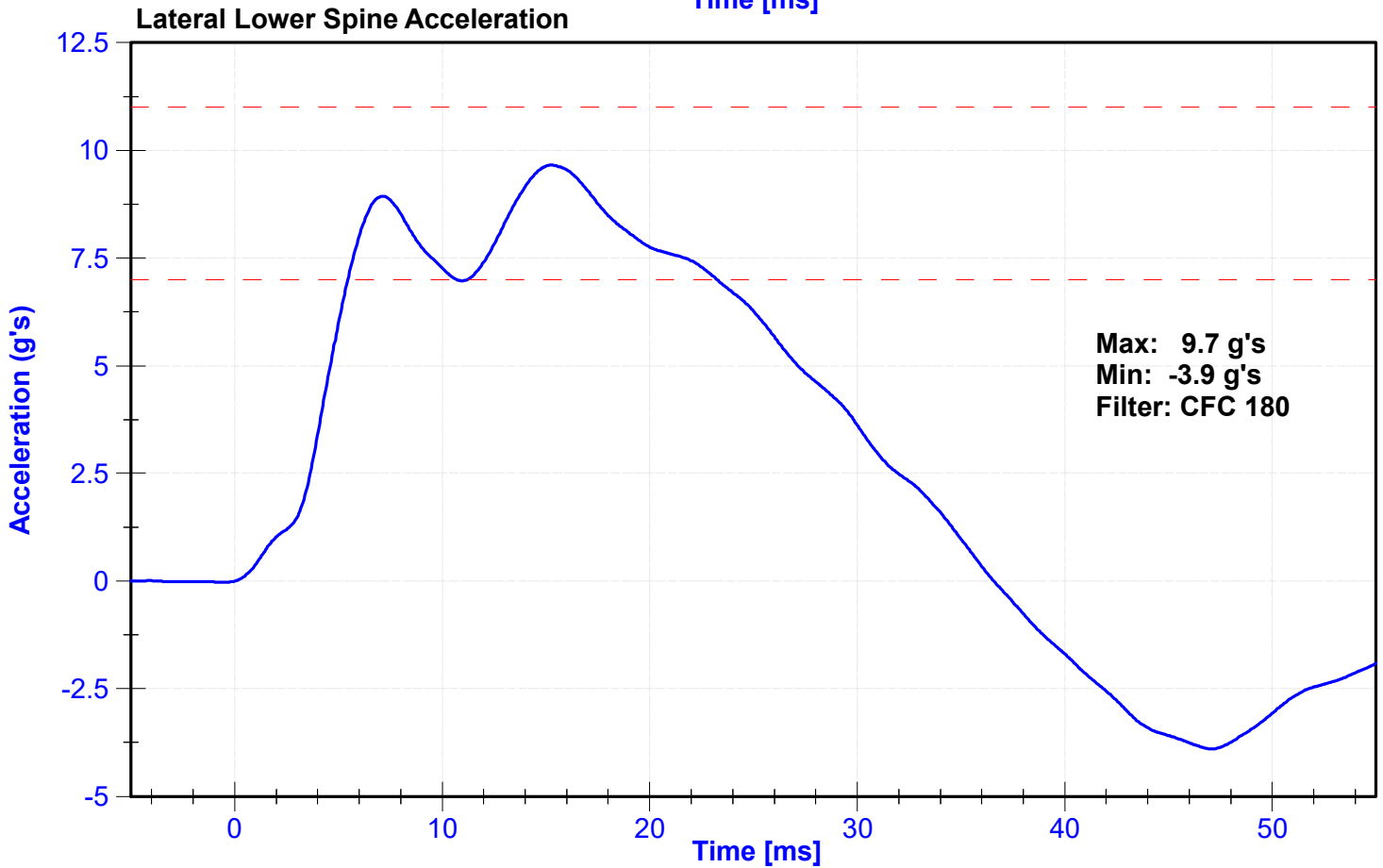
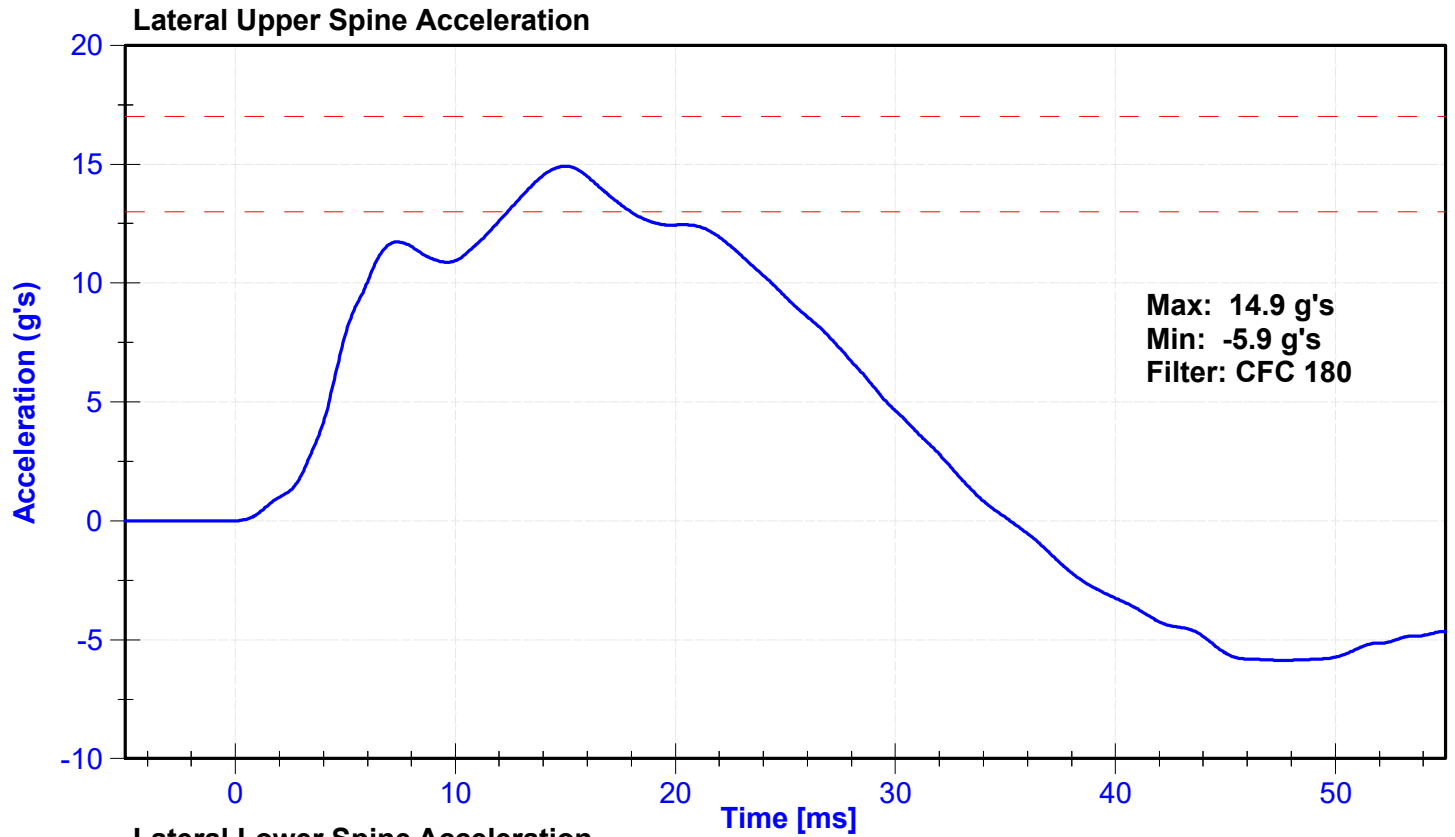
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	47	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	14	18	g's	16.1	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.9	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.7	Pass
Upper Thorax Rib Deflection	32	40	mm	34.4	Pass
Middle Thorax Rib Deflection	39	45	mm	40.6	Pass
Lower Thorax Rib Deflection	35	43	mm	38.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Upper Spine Y Accelerometer	Endevco	18698	4/19/2025	10/16/2025
Lower Spine Y Accelerometer	Endevco	T20906	4/19/2025	10/16/2025
Upper Thorax Rib Potentiometer	Servo	DS-2166GFE	4/18/2025	10/17/2025
Middle Thorax Rib Potentiometer	Servo	080GFE	4/18/2025	10/17/2025
Lower Thorax Rib Potentiometer	Servo	087GFE	4/18/2025	10/17/2025







ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

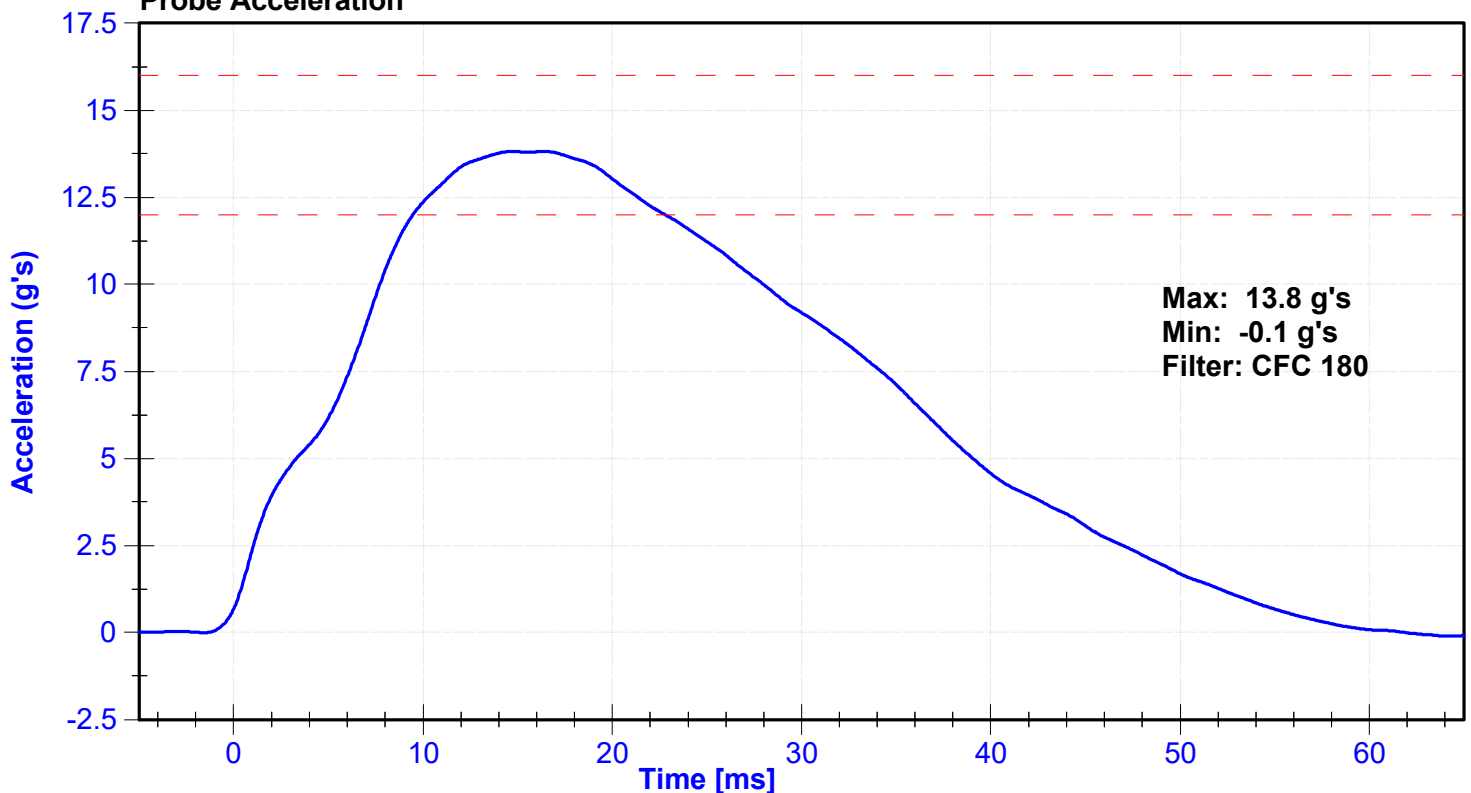
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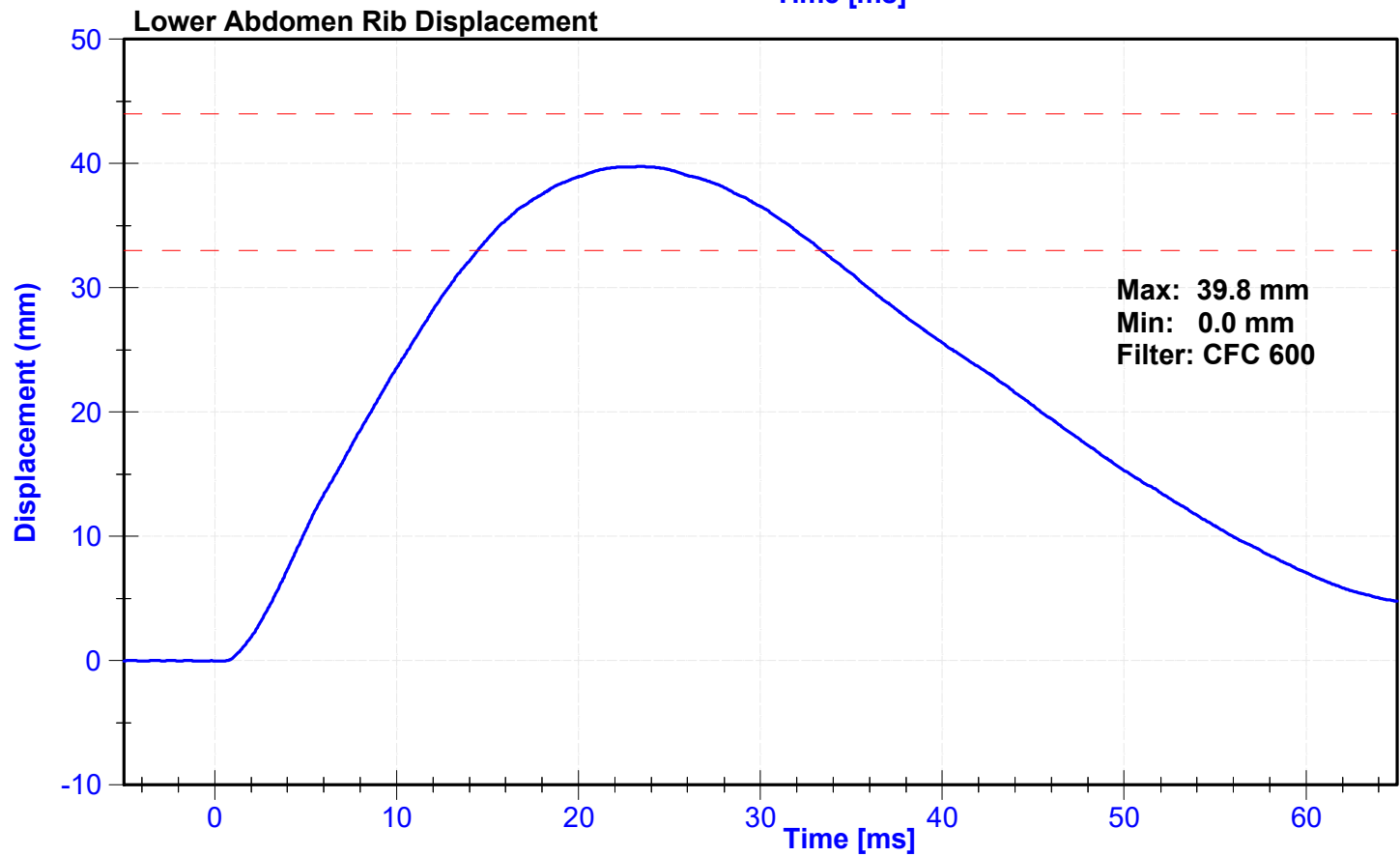
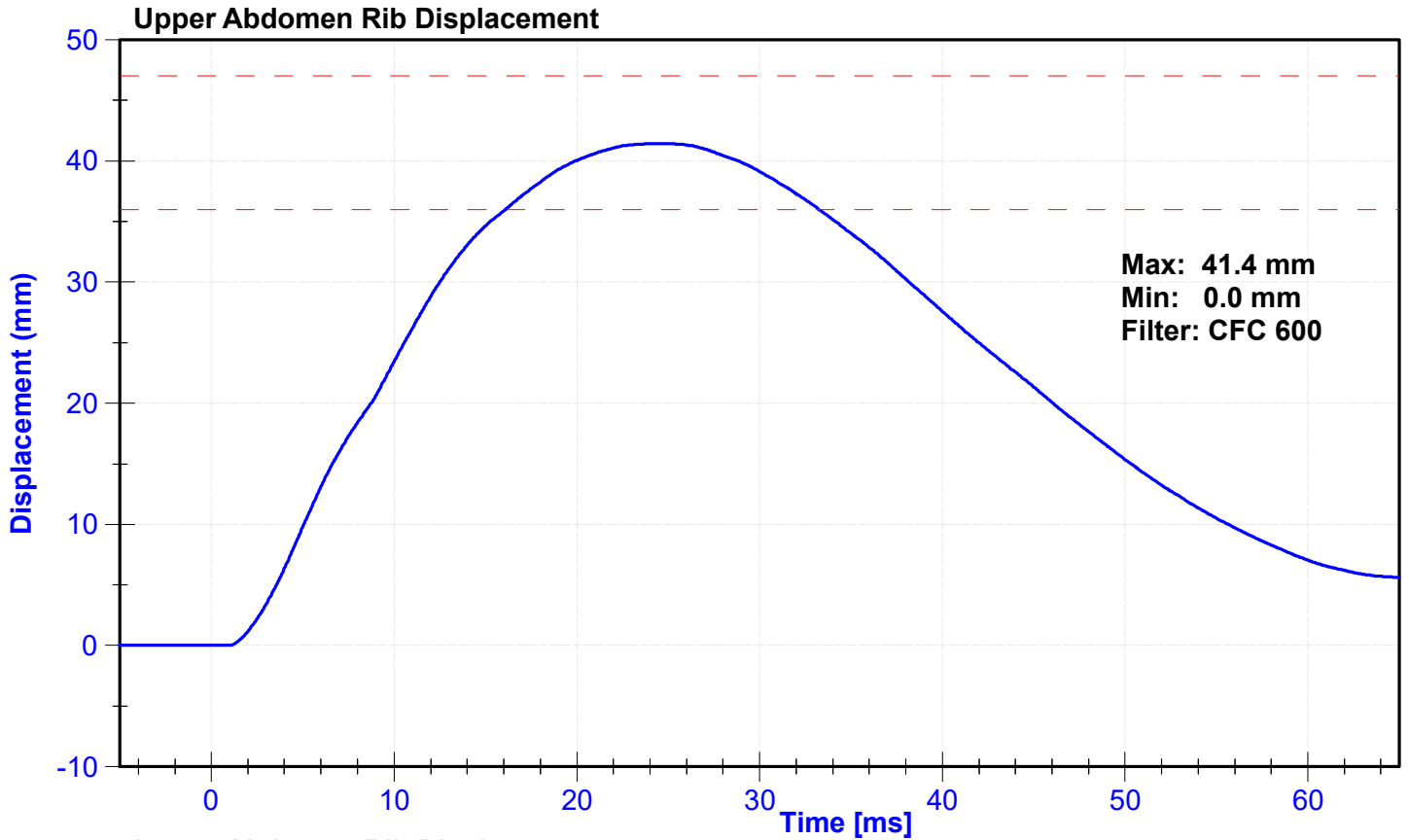
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	47	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	12	16	g's	13.8	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.4	Pass
Upper Abdomen Rib Deflection	36	47	mm	41.4	Pass
Lower Abdomen Rib Deflection	33	44	mm	39.8	Pass

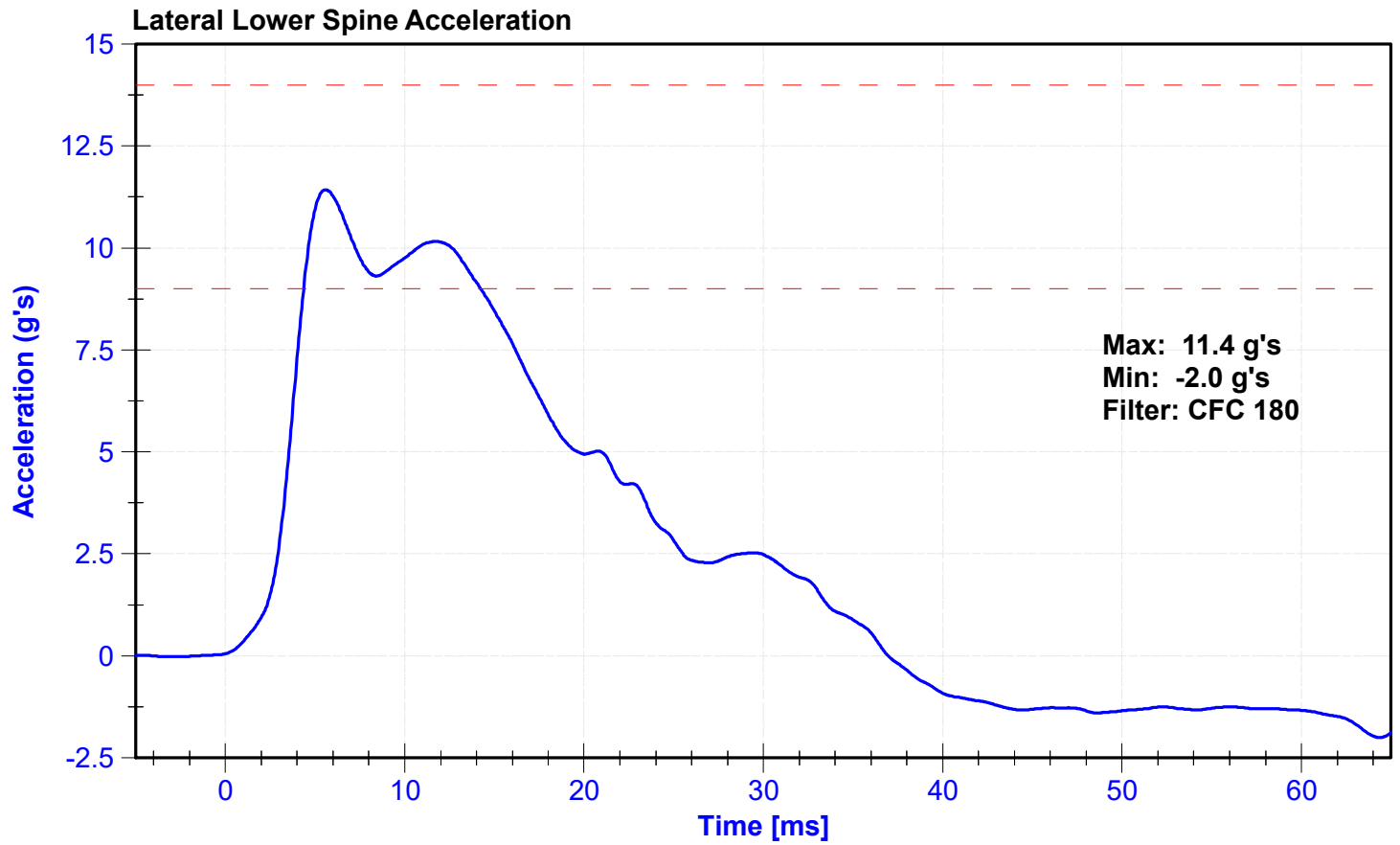
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Lower Spine Y Accelerometer	Endevco	T20906	4/19/2025	10/16/2025
Upper Abdomen Rib Potentiometer	Servo	047GFE	4/18/2025	4/18/2026
Lower Abdomen Rib Potentiometer	Servo	1256GFE	4/18/2025	10/17/2025

Probe Acceleration







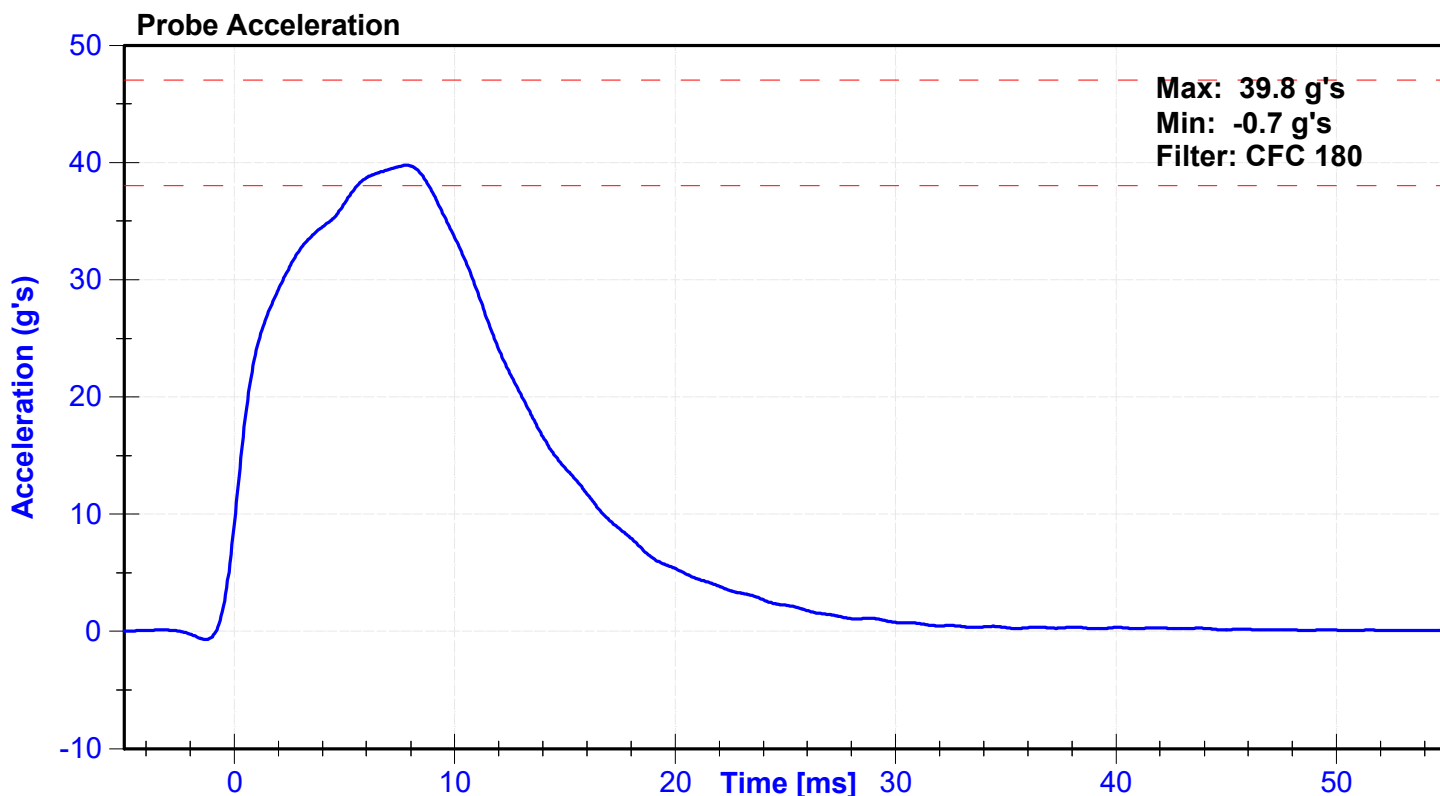
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

Results

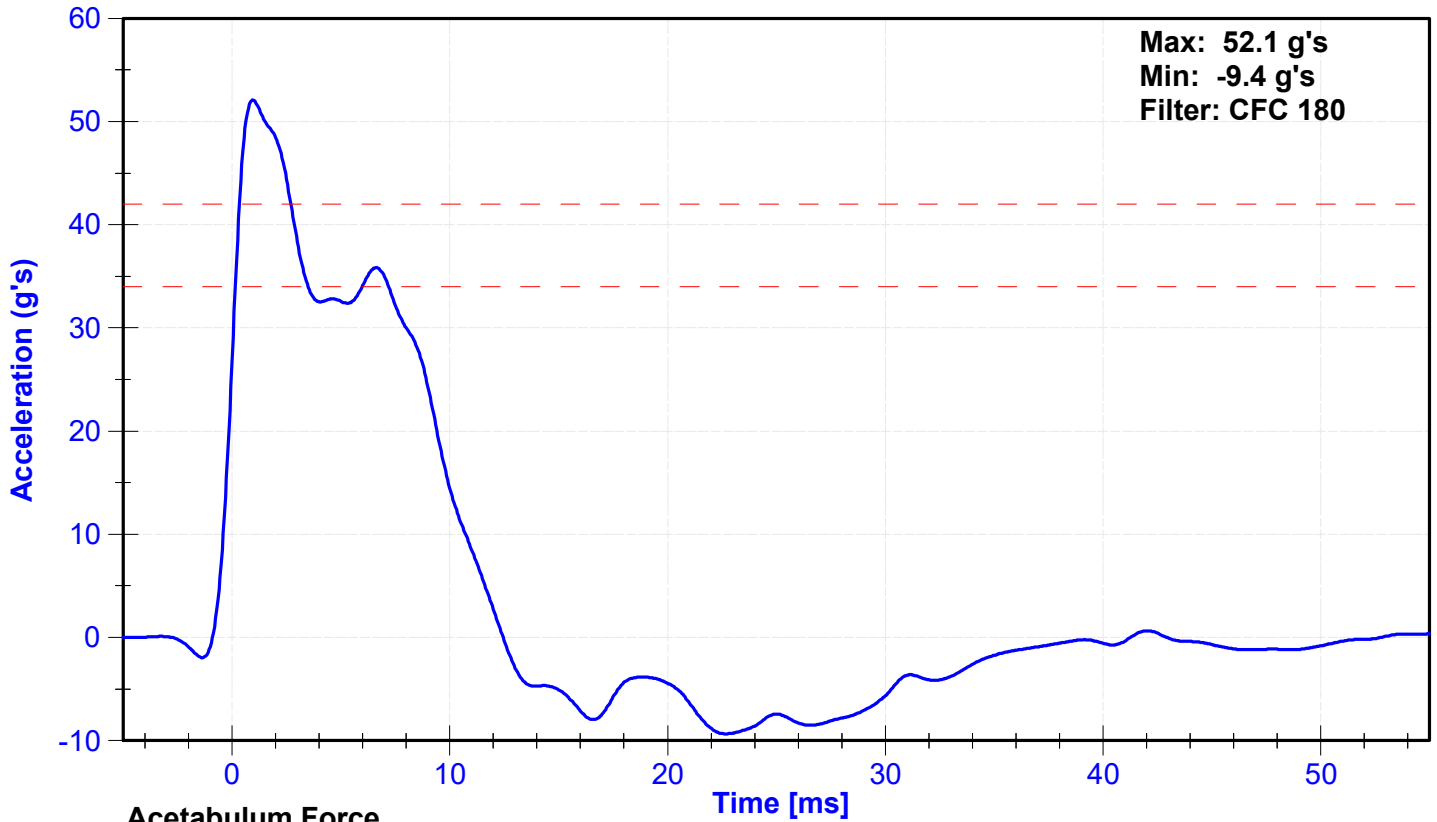
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	47	Pass
Velocity	6.6	6.8	m/s	6.62	Pass
Probe Acceleration	38	47	g's	39.8	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	35.8	Pass
Acetabulum Force	3600	4300	N	3946.0	Pass

Transducer Calibrations

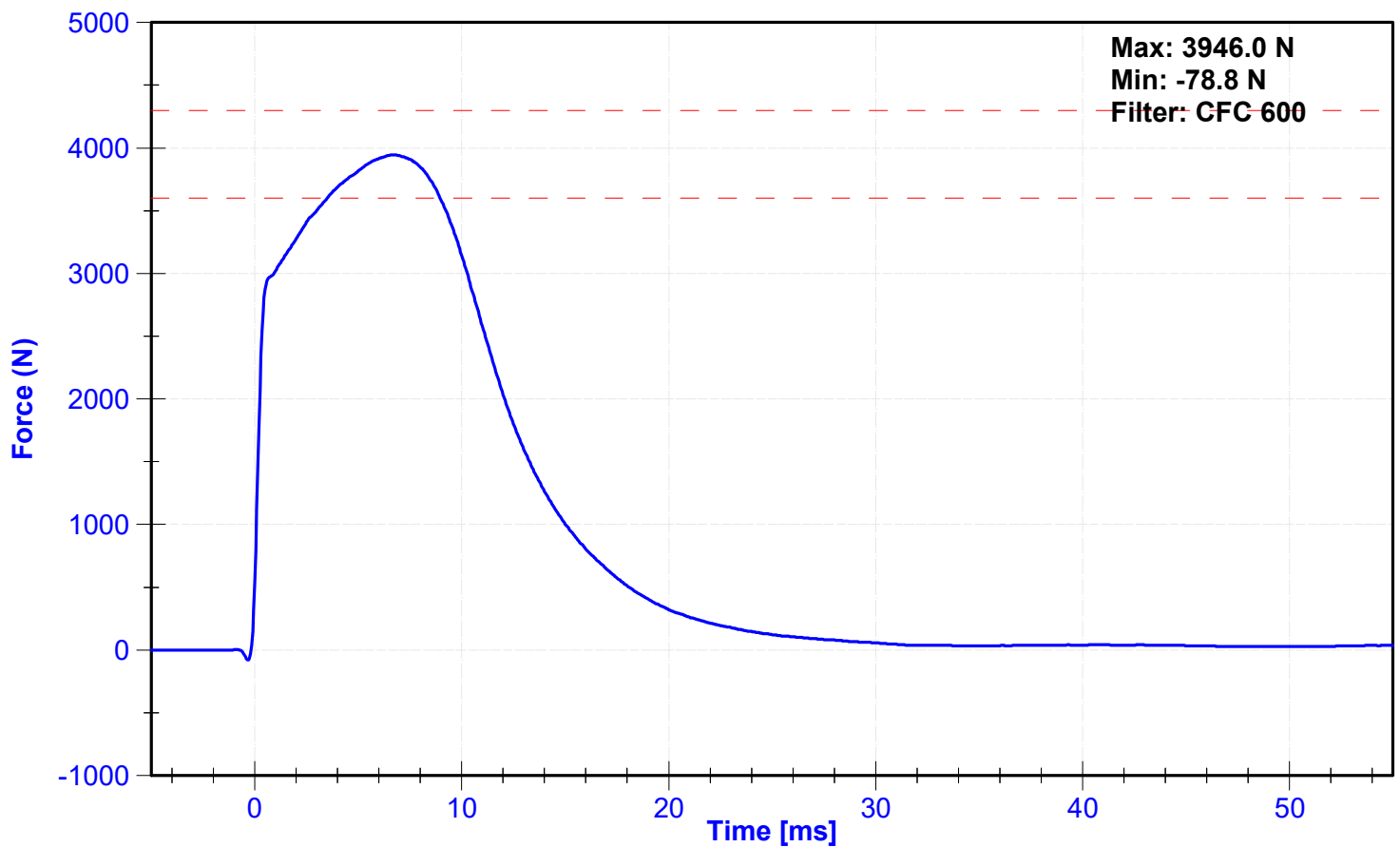
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pelvis Y Accelerometer	Endevco	P63987	4/19/2025	10/16/2025
Acetabulum Load Cell	Denton	267-FY	9/16/2024	9/16/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A



Lateral Pelvis Acceleration



Acetabulum Force





SID-11s Pelvis Plug Certification Test

Plug S/N 17025

Test Number 23923

Report Number 23980

Test Date 8/19/2022 12:33:36 PM

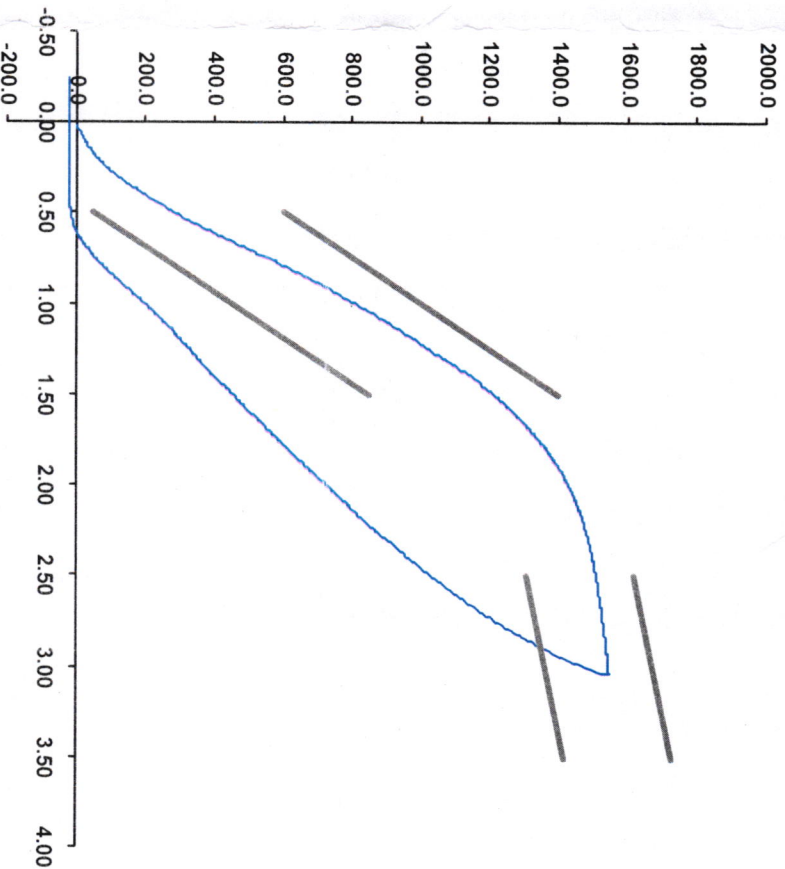
Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	289	50
Force @ 1.5 mm (N)	1,219	850
Force @ 2.5 mm (N)	1,510	1,306
Force @ 3.0 mm (N)	1,546	1,361

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:
324 Cert Plug Q-7-25

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107
SACO Research

19-Aug-22

By: DC Date: 8/19/2022

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



SID-11s Pelvis Plug Certification Test

Plug S/N 16986

Test Number 23883

Report Number 23940

Test Date 8/18/2022 11:52:08 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	272	50
Force @ 1.5 mm (N)	1,163	850
Force @ 2.5 mm (N)	1,459	1,306
Force @ 3.0 mm (N)	1,487	1,361

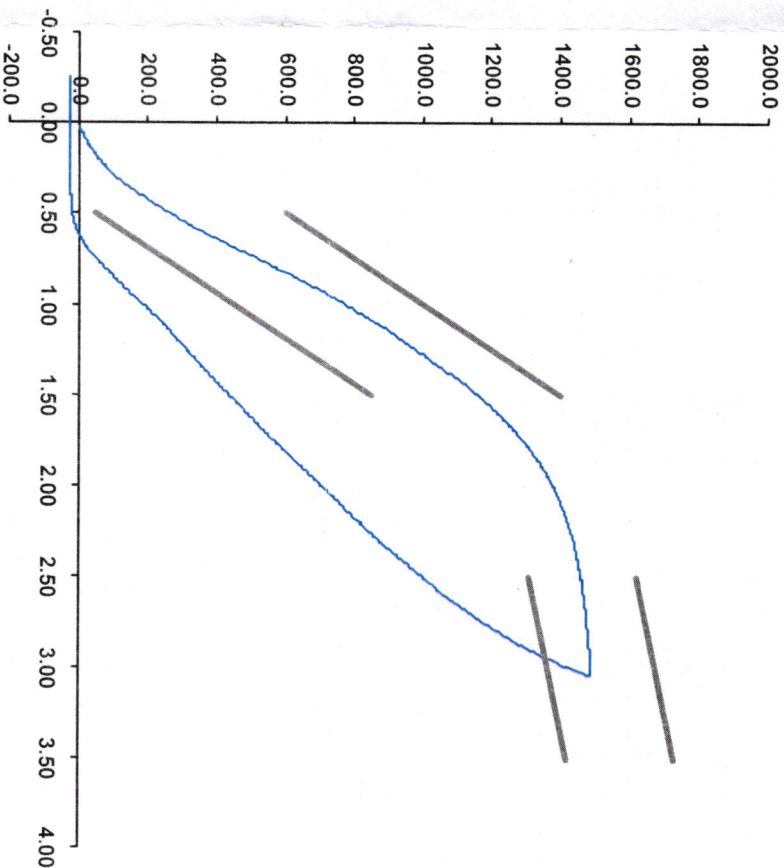
Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes:

Impact 8.1.25 224

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107

18-Aug-22

SACO Research

By:

Date:

8/18/22

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



SID-11s Pelvis Plug Certification Test

Plug S/N 16973
Test Number 23820
Report Number 23877
Test Date 8/3/2022 12:04:05 PM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	293	50
Force @ 1.5 mm (N)	1,147	850
Force @ 2.5 mm (N)	1,493	1,306
Force @ 3.0 mm (N)	1,552	1,361
		1,673

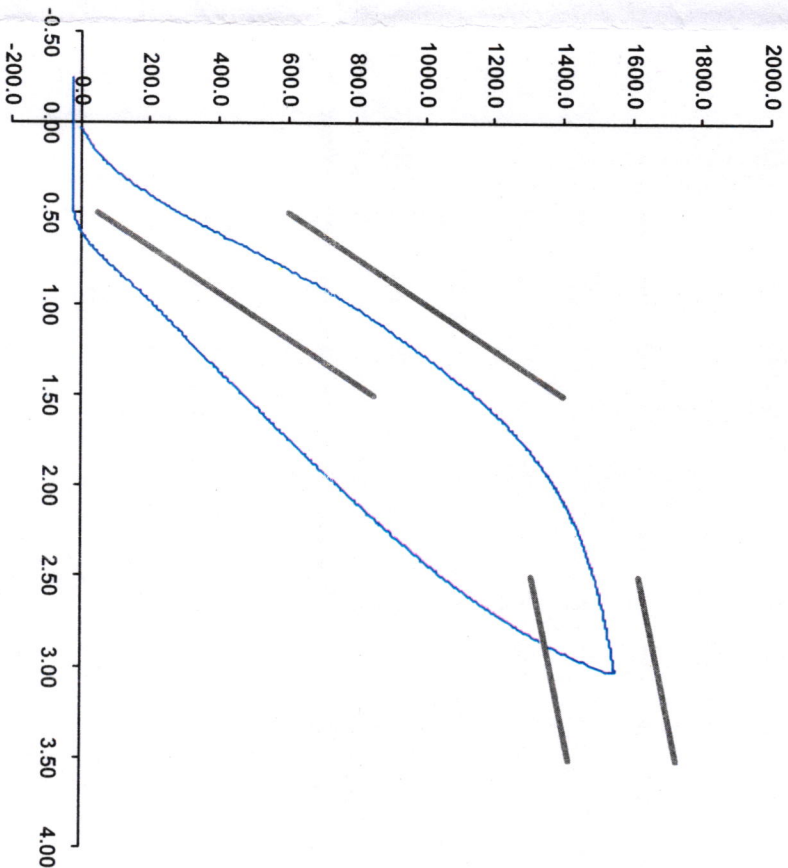
Testing Machine STM-20 5965542
Load Cell S/N (F1360947), Units (LBS) 1000

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

Notes:

Non-Impact 8.125 224

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 03-Aug-22
SACO Research

By:

Date: 8/3/22

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

ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	224	Laboratory Supervisor	J. Kinderman

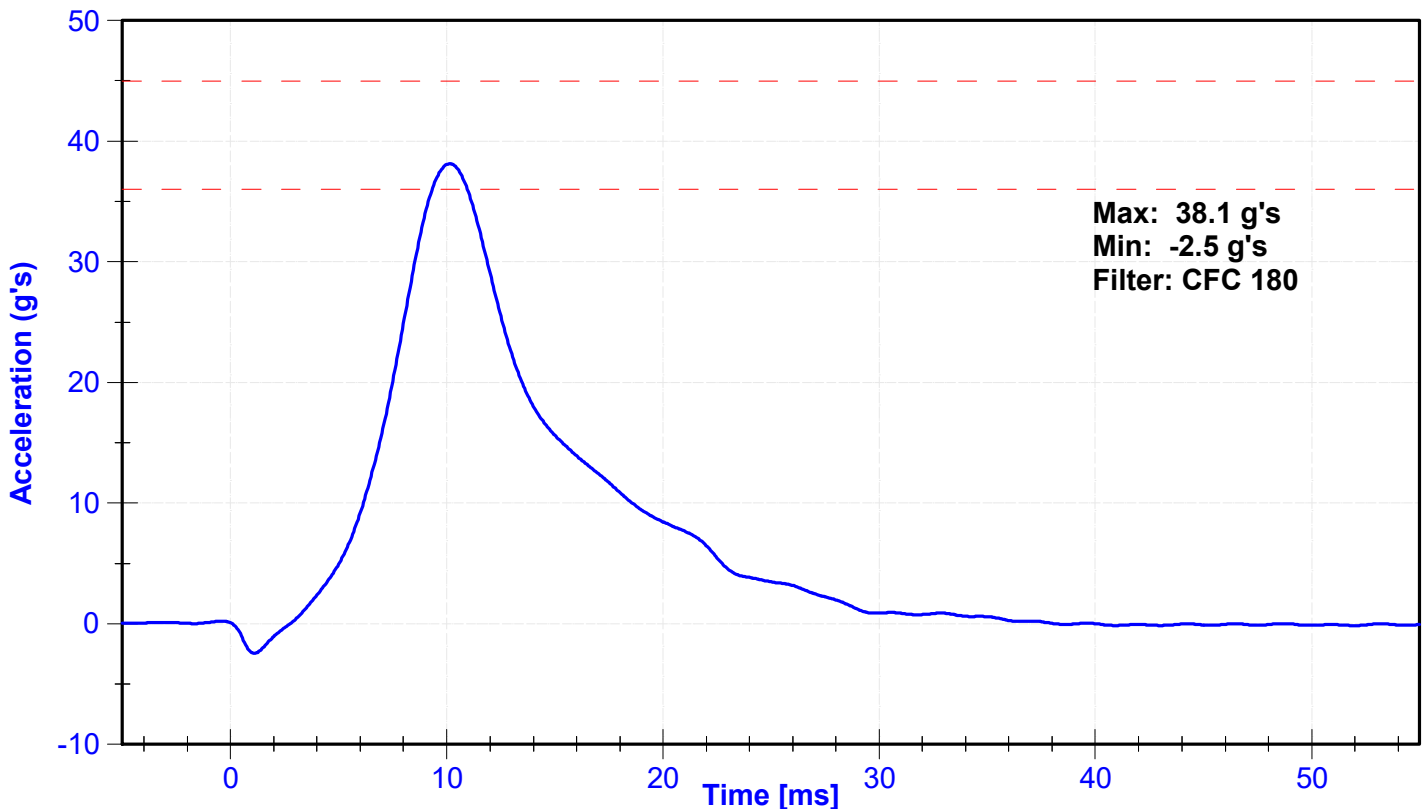
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	47	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	36	45	g's	38.1	Pass
Lateral Pelvis Acceleration	28	39	g's	31.3	Pass
Iliac Force	4100	5100	N	4511.8	Pass

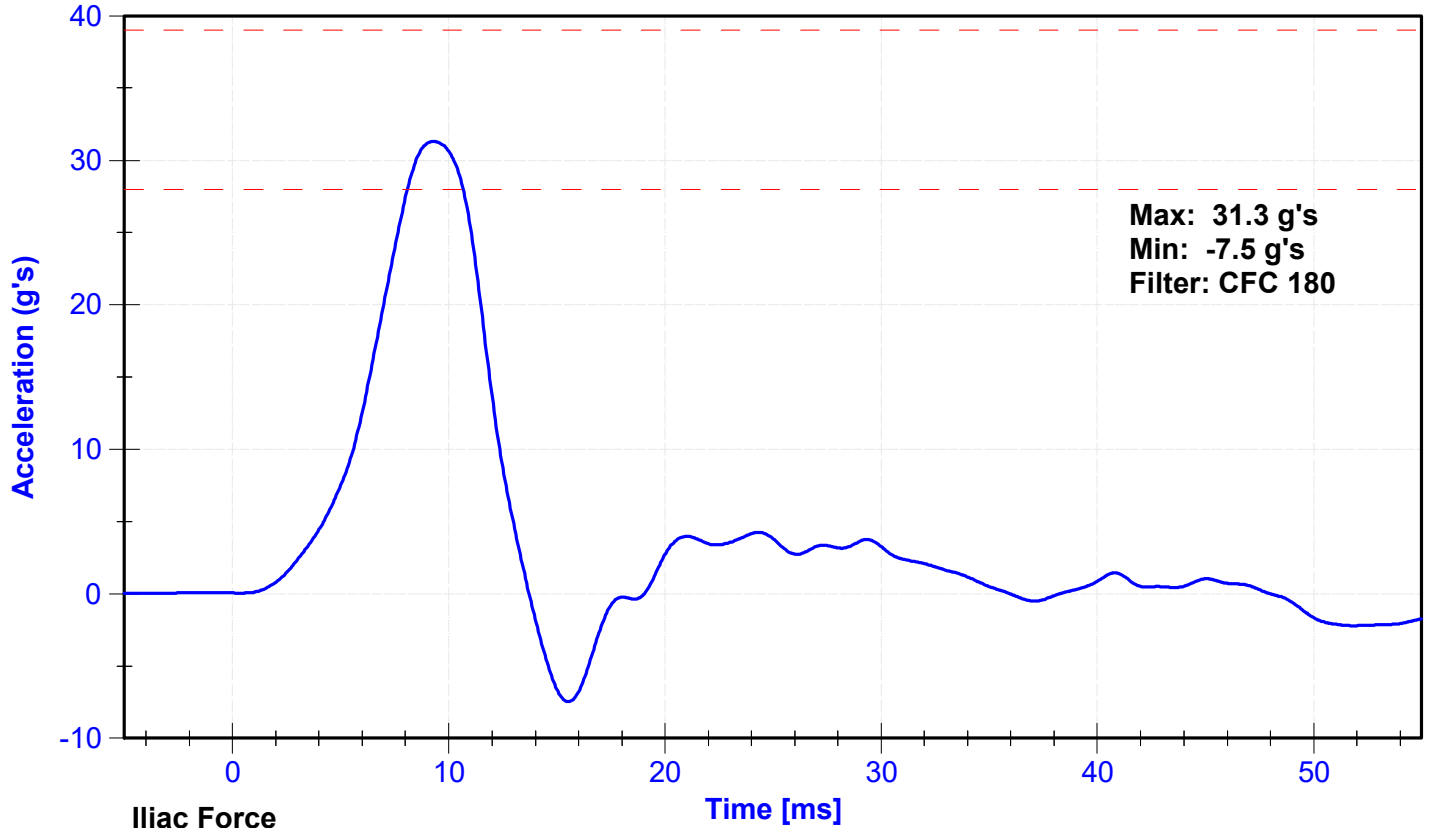
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Pelvis Y Accelerometer	Endevco	P63987	4/19/2025	10/16/2025
Iliac Load Cell	Denton	280-FY	9/16/2024	9/16/2025

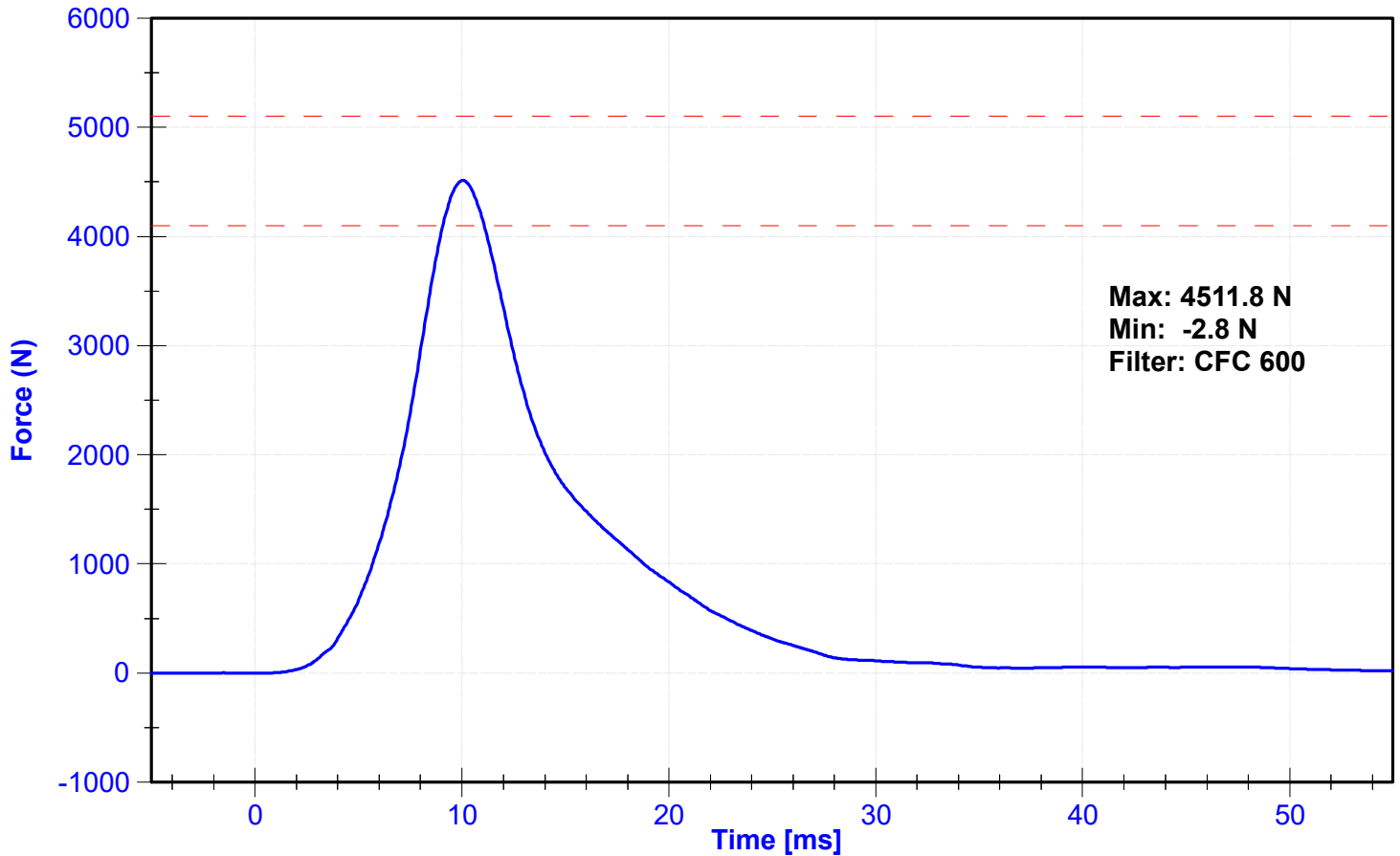
Probe Acceleration



Lateral Pelvis Acceleration



Iliac Force



APPENDIX VII

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N D037		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	T21724	Endevco	04/21/2025
		Y	T22281	Endevco	04/21/2025
		Z	T26050	Endevco	04/21/2025
	Redundant	X	T21682	Endevco	04/21/2025
		Y	T25989	Endevco	04/21/2025
		Z	T25864	Endevco	04/21/2025
Thorax Rib Displacement Potentiometers	Upper	Y	0552-01	Honeywell	04/21/2025
	Middle	Y	807	Honeywell	04/21/2025
	Lower	Y	0552-03	Honeywell	04/21/2025
Abdomen Load Cells	Forward	Y	1512	Denton	09/16/2024
	Middle	Y	1526	Denton	09/16/2024
	Rear	Y	1516	Denton	09/16/2024
Lower Spine Accelerometers (T12)		X	P71278	Endevco	04/21/2025
		Y	18595	Endevco	04/21/2025
		Z	T29729	Endevco	04/21/2025
Pubic Symphysis Load Cell		Y	464-FY	Denton	09/16/2024

TABLE 2 – Dummy Instrumentation (SID-IIs)

				SID-IIs S/N 224		
				Serial Number	Manufacturer	Calibration Date
Head Accelerometers		Primary	X	P51884	Endevco	04/19/2025
			Y	P73161	Endevco	04/19/2025
			Z	P79588	Endevco	04/19/2025
		Redundant	X	P74963	Endevco	04/19/2025
			Y	P58864	Endevco	04/19/2025
			Z	P52030	Endevco	04/19/2025
Displacement Potentiometers	Thoracic Rib	Upper	Y	DS-2166GFE	Servo	04/18/2025
		Middle	Y	080GFE	Servo	04/18/2025
		Lower	Y	087GFE	Servo	04/18/2025
	Abdominal Rib	Upper	Y	047GFE	Servo	04/18/2025
		Lower	Y	1256GFE	Servo	04/18/2025
Lower Spine Accelerometers (T12)			X	P82326	Endevco	04/19/2025
			Y	T20906	Endevco	04/19/2025
			Z	T21176	Endevco	04/19/2025
Acetabulum Load Cell			Y	267-FY	Denton	09/16/2024
Iliac Wing Load Cell			Y	280-FY	Denton	09/16/2024
Pelvis Plug (struck side)				16849	SACO	08/01/2022
Pelvis Plug (non-struck side)				16858	SACO	08/01/2022

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	G22654	Endevco	04/15/2025
	Vehicle Center of Gravity	Y	A405545	Measurement Specialties	04/15/2025
	Vehicle Center of Gravity	Z	A352411	Measurement Specialties	04/15/2025
2	Right Sill at Front Seat	X	G26670	Endevco	07/17/2025
	Right Sill at Front Seat	Y	G26694	Endevco	07/17/2025
	Right Sill at Front Seat	Z	G26697	Endevco	07/17/2025
3	Right Sill at Rear Seat	X	G25345	Endevco	07/17/2025
	Right Sill at Rear Seat	Y	G25390	Endevco	07/17/2025
	Right Sill at Rear Seat	Z	G25367	Endevco	07/17/2025
4	Left Sill at Front Door	Y	A284293	Measurement Specialties	06/30/2025
5	Left Sill at Rear Door	Y	A400038	Measurement Specialties	05/16/2025
6	Left A-Post Lower	Y	A280898	Measurement Specialties	06/20/2025
7	Left A-Post Middle	Y	A316002	Measurement Specialties	06/20/2025
8	Left B-Post Lower	Y	G24999	Endevco	06/30/2025
9	Left B-Post Middle	Y	G22906	Endevco	06/30/2025
10	Front Seat Track	Y	A282762	Measurement Specialties	06/20/2025
11	Rear Seat Track or Structure	Y	A280896	Measurement Specialties	10/11/2024
12	Right Rear Occ. Compartment	Y	A373221	Measurement Specialties	04/29/2025
13	Rear Floorpan Above Axle	X	G22632	Endevco	04/17/2025
	Rear Floorpan Above Axle	Y	A352405	Measurement Specialties	04/17/2025
	Rear Floorpan Above Axle	Z	A374331	Measurement Specialties	04/17/2025

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle CG Acceleration vs. Time	X	A413590	Measurement Specialties	06/23/2025
Vehicle CG Acceleration vs. Time	Y	G24322	Endevco	06/23/2025
Vehicle CG Velocity vs. Time	Y	G24322	Endevco	06/23/2025
Vehicle CG Acceleration vs. Time	Z	G25374	Endevco	12/14/2024
Vehicle CG Velocity vs. Time	Z	G25374	Endevco	12/14/2024
Vehicle CG Resultant Acceleration vs. Time	R	Computed		