

REPORT NUMBER: 214D-CAL-24-005

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

**General Motors DE Mexico, S. DE R.L. DE C.V.
2024 Chevrolet Equinox EV
5 Door SUV**

NHTSA No: C20240112

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



August 19, 2024

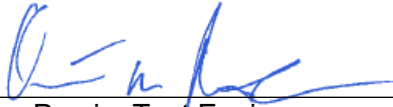
FINAL REPORT

**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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Prepared by:  Date: August 30, 2024
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Approved by:  Date: August 30, 2024
Vanessa Hansen, Operations Manager

FINAL REPORT ACCEPTANCE BY OVSC:


Accepted by

Date: 9-30-24

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. 214D-CAL-24-005	2. Government Accession No.	3. Recipient's Catalog No.																																											
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		6. Performing Organization Code CAL																																											
7. Author(s) Quinn Porzio, Test Engineer Vanessa Hansen, Operations Manager		8. Performing Organization Report No. CAL-DOT-2024-005																																											
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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 August 5, 2024 - August 30, 2024																																											
		14. Sponsoring Agency Code NEF-240																																											
15. Supplementary Notes																																													
16. Abstract A 48/24 kph 90° Impact (Moving Deformable Barrier) Compliance Tests was conducted on the subject 2024 Chevrolet Equinox EV 5 Door SUV 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 August 5, 2024. The impact velocity of the Moving Deformable Barrier (MDB) was 52.95 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 164 mm located at level 2. The test vehicle's occupant performance data is as follows:																																													
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 50%;">Measurement Description</th> <th colspan="3" style="background-color: #d3d3d3;">Driver ATD (ES-2re)</th> </tr> <tr> <th style="background-color: #d3d3d3;">Units</th> <th style="background-color: #d3d3d3;">IARV</th> <th style="background-color: #d3d3d3;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC36)</td> <td>N/A</td> <td>1000</td> <td style="background-color: yellow;">76.407</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>44</td> <td style="background-color: yellow;">24.027</td> </tr> <tr> <td>Total Abdominal Force</td> <td>N</td> <td>2500</td> <td style="background-color: yellow;">675.880</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td>N</td> <td>6000</td> <td style="background-color: yellow;">716.232</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="width: 50%;">Measurement Description</th> <th colspan="3" style="background-color: #d3d3d3;">Passenger ATD (SID-IIs)</th> </tr> <tr> <th style="background-color: #d3d3d3;">Units</th> <th style="background-color: #d3d3d3;">IARV</th> <th style="background-color: #d3d3d3;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC36)</td> <td></td> <td>1000</td> <td style="background-color: yellow;">56.919</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td>G</td> <td>82</td> <td style="background-color: yellow;">38.189</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td style="background-color: yellow;">1830.231</td> </tr> </tbody> </table>				Measurement Description	Driver ATD (ES-2re)			Units	IARV	Result	Head Injury Criteria (HIC36)	N/A	1000	76.407	Maximum Thoracic Rib Deflection	mm	44	24.027	Total Abdominal Force	N	2500	675.880	Pubic Symphysis Force	N	6000	716.232	Measurement Description	Passenger ATD (SID-IIs)			Units	IARV	Result	Head Injury Criteria (HIC36)		1000	56.919	Lower Spine Resultant Acceleration	G	82	38.189	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	1830.231
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The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.																																													
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 2024 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 2024 Chevrolet Equinox EV 5 Door SUV. 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 2024 Chevrolet Equinox EV 5 Door SUV 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 52.95 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 August 5, 2024. 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 locations and other pertinent camera 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-1Is 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 this 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)	N/A	1000	76.407	Pass
Upper Rib Deflection	mm	44	23.508	Pass
Mid Rib Deflection	mm	44	23.140	Pass
Lower Rib Deflection	mm	44	24.027	Pass
Abdominal Load (front)	N		179.855	
Abdominal Load (mid)	N		224.039	
Abdominal Load (rear)	N		277.059	
Total Abdominal Force	N	2500	675.880	Pass
Pubic Symphysis Force	N	6000	716.232	Pass

INJURY READINGS

SIDIIs Injury Criteria	Units	Max. Allowable IARV	Measured Value	Pass/Fail
Head Injury Criteria (HIC36)		1000	56.919	Pass
Lower Spine Resultant Acceleration	G	82	38.189	Pass
Acetabulum Force	N		1641.004	
Iliac Force	N		229.416	
Sum of Acetabular and Iliac	N	5525	1830.231	Pass

SECTION 2

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

<u>Data Sheet</u>		<u>Page</u>
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**DATA SHEET NO. 1
TEST VEHICLE INFORMATION AND OPTIONS**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

TEST VEHICLE INFORMATION AND OPTIONS

Make	Chevrolet
Model	Equinox EV
Body Style	SUV
VIN	3GN7DLRP2RS251880
Body Color	Riptide Blue Metallic
Engine Displacement (L)	N/A
Type / No. Cylinders	N/A
Engine Placement	N/A
Transmission Type	Automatic
Transmission Speeds	Direct Drive
Overdrive	No
Final Drive	Front Wheel Drive
Odometer Reading	12 mi

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
Pelvis Airbag – Rear Seats	No
Knee Airbag – Driver	Yes
Knee Airbag – Front Passenger	Yes
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	General Motors DE Mexico, S. DE R.L. DE C.V.
Date of Manufacture	04/24
Vehicle Type	MPV

GVWR (kg)	2749
GVWR Front (kg)	1450
GVWR Rear (kg)	1425

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)				523

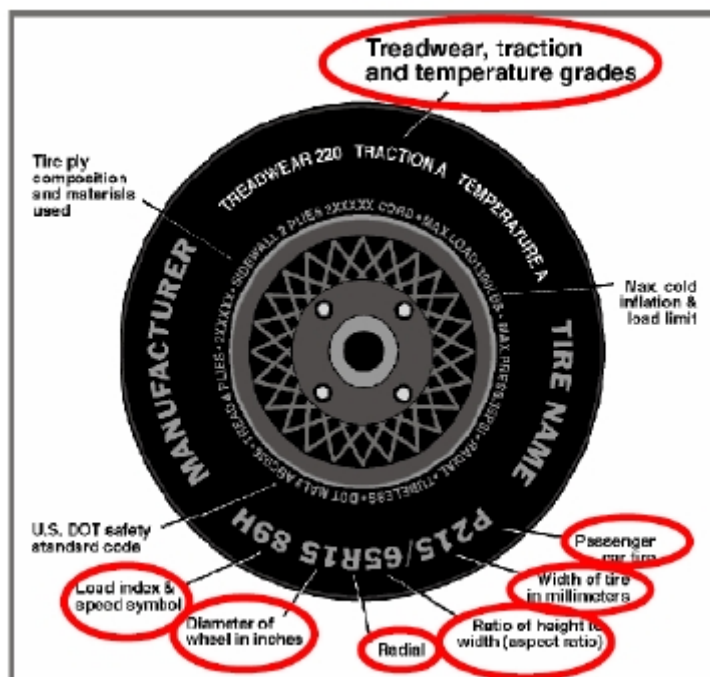
DATA SHEET NO. 1 ... (CONTINUED)
VEHICLE TIRE INFORMATION

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
Test Facility: Calspan

NHTSA No.: C20240112
Test Date: 08/05/2024

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)	290	290
Recommended Tire Size	245/55R19	245/55R19
Tire Sidewall	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Tire Size on Vehicle	245/55R19	245/55R19
Tire Manufacturer Model	Michelin	Michelin
Tire Name	Primacy	Primacy
Tire Type	All Season	All Season
Tire Width	245	245
Aspect Ratio	55	55
Radial	Yes	Yes
Wheel Diameter	19"	19"
Load Index / Speed Symbol	103H	103H
Treadwear	540	540
Traction Grade	B	B
Temperature Grades	B	B

**DATA SHEET NO. 2
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	240	241	245	246
Tire Placard	kPa	290	290	290	290

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			Fully Loaded			As Tested		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	576	527		620	647		635	618	
Right	kg	604	484		615	575		623	575	
Ratio	%	53.9	46.1		50.3	49.7		51.3	48.7	
Totals	kg	1180	1011	2191	1235	1222	2457	1258	1193	2451

TARGET TEST WEIGHT (TVTW) CALCULATION

Measured Parameter	Units	Value	
As Delivered Weight (UVW)	kg	2191	(A)
Weight of 2 P572 ATDs	kg	131	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2458	(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	880	875	5	Yes
Right Front	884	880	4	Yes
Left Rear	880	887	7	Yes
Right Rear	892	884	8	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	2953	Yes
Target Vertical Impact Reference Line Aft of Front Axle	508	Yes
Actual Impact Point Location (fore-aft, above - below)	8 Left, 12 Down	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	12
Trunk Plastic Trim	6
Charging Kit	4
Ballast (if any)	45.4

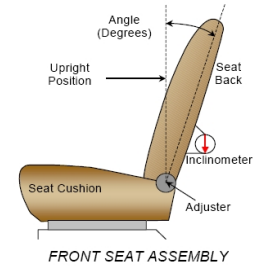
**DATA SHEET NO. 3
SEAT AND SEAT BELT ANCHORAGE ADJUSTMENT DATA**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

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	28.6	Power	-13.3	Power
Front Passenger Seat	36.4	32 (0-31)	-12.7	8

*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)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore / Aft	Forward-Most
Driver Seat	14.1	9	Max	68	65	73
			Mid	30	37	45
			Min	1	9	17
Front Passenger Seat	15.2	8	Max	-	-	-
			Mid	-	-	-
			Min	0	8	15

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	259	Power	129.5	Power
Front Passenger Seat	259	27 (0-26)	129.5	13

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	7 (0-6)	Uppermost

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

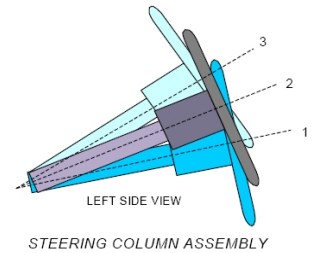
Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

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.

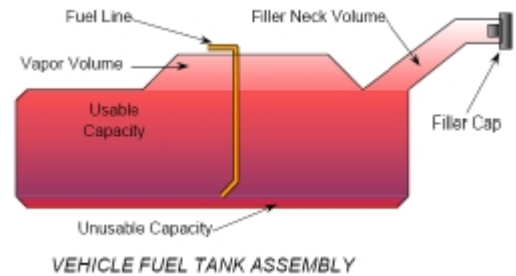
	Degrees	Fore / Aft Position (mm)
Lowermost - Position No. 1	19.9	
Geometric center - Position No. 2	22.0	
Uppermost - Position No. 3	24.0	
Telescoping Steering Wheel Travel		50
Test Position	22.0	25



FUEL PUMP

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

The vehicle is equipped with an electric charge port on the left front of the vehicle.



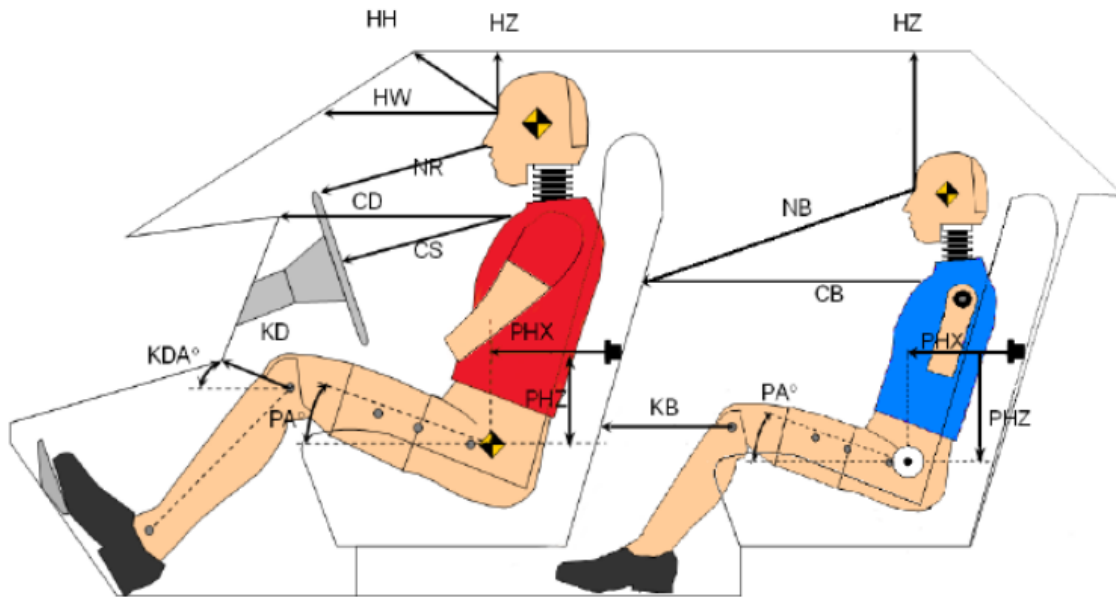
FUEL TANK CAPACITY

Description	Liters
Usable Capacity of - Form No.1	
Usable Capacity of - Owner's Manual	
92 - 94% of Usable Capacity	
Actual Amount of Solvent Used in Test	Electric Vehicle

DATA SHEET NO. 5
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
Test Facility: Calspan

NHTSA No.: C20240112
Test Date: 08/05/2024



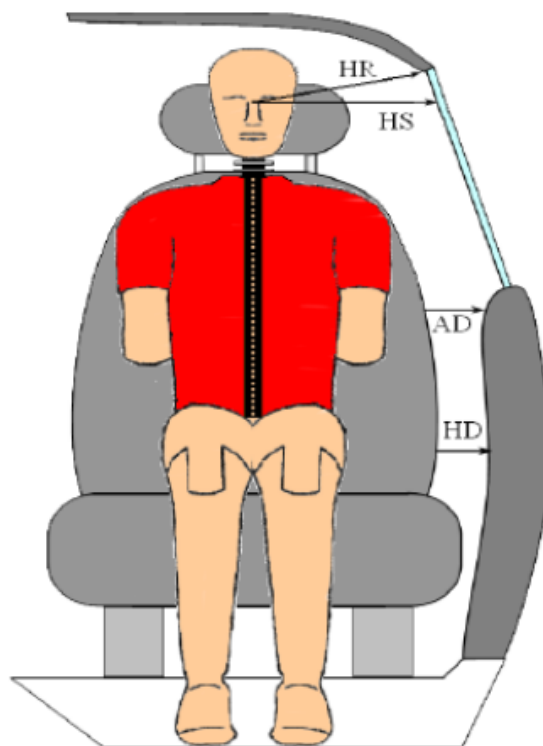
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Code	Pass. Code	Description	ES2-re		SID-IIs	
			Length (mm)	Angle	Length (mm)	Angle
HH		Head to Header	475			
HW		Head to Windshield	768			
HZ	HZ	Head to Roof Liner	212		299	
NR	NB	Nose to Rim	476		565	
CD	CB	Chest to Dash	705		571	
CS		Chest to Steering Wheel	386			
KD(L) / KDA(L)°	KB(L) / KBA(L)°	Left Knee to Dash	239	35.2	325	2.0
KD(R) / KDA(R)°	KB(R) / KBA(R)°	Right Knee to Dash	230	31.0	323	1.5
PAX°	PAX°	Pelvic Tilt Angle (X-Axis)		25.9		20.8
PAY°	PAY°	Pelvic Tilt Angle (Y-Axis)				0.2
PHX	PHX	Hip Point to Striker (X-Axis)	174		187	
PHZ	PHZ	Hip Point to Striker (Z-Axis)	170		222	

**DATA SHEET NO. 6
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024



FRONT VIEW OF DUMMY

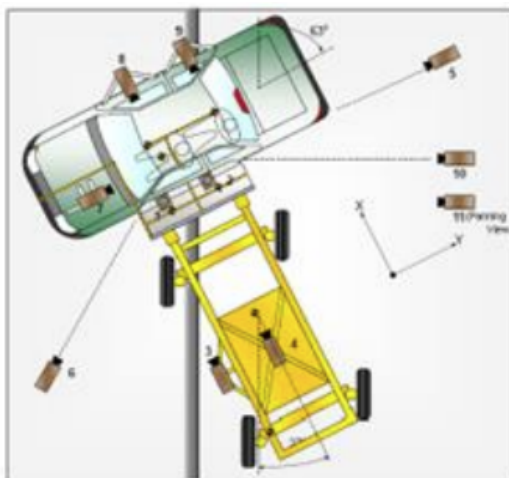
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Front Occupant	Rear Occupant
HR	Head to Side Header	mm	217	250
HS	Head to Side Window	mm	362	380
AD	Arm to Door	mm	109	134
HD	Hip Point to Door	mm	186	204

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

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024



CAMERA LOCATIONS AND DATA

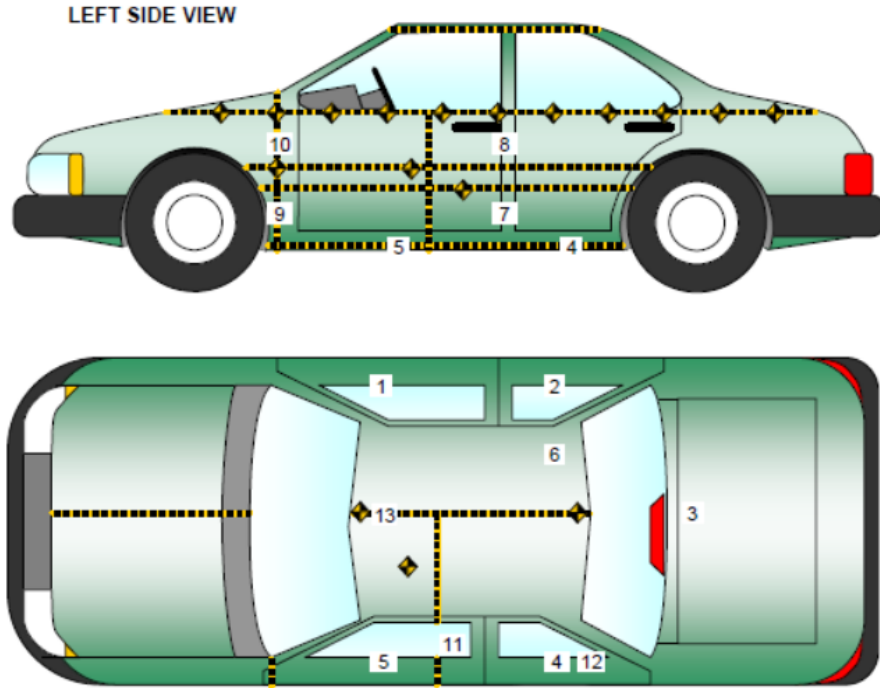
No.	Camera View	Location (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Overhead Overall	0	-201	-8360	12.5	60
2	Overhead Close-up	0	0	-8365	25	1000
3	Impact Point Close-up				25	1000
4	Centerline of Impact (MDB)				8	1000
5	Right Side View	0	8740	-1395	28	1000
6	Left Side View	-2407	-8235	-1435	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: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Left (or Rt.) Sill at Front Seat	2850	667	58
2	Left (or Rt.) Sill at Rear Seat	1975	681	49
3	Rear Floorpan Above Axle	716	7	-84
4	Left (or Rt.) Sill at Front Door	1996	-680	61
5	Left (or Rt.) Sill at Rear Door	2872	-665	77
6	Left (or Rt.) Rear Occ. Compartment	2130	387	123
7	Left (or Rt.) B-Post Lower	2182	-700	15
8	Left (or Rt.) B-Post Middle	2170	-692	-509
9	Left (or Rt.) A-Post Lower	3380	-636	-119
10	Left (or Rt.) A-Post Middle	3403	-658	-656
11	Front Seat Track	2416	-561	57
12	Rear Seat Track or Structure	1781	319	-5
13	Vehicle CG	2108	17	96

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

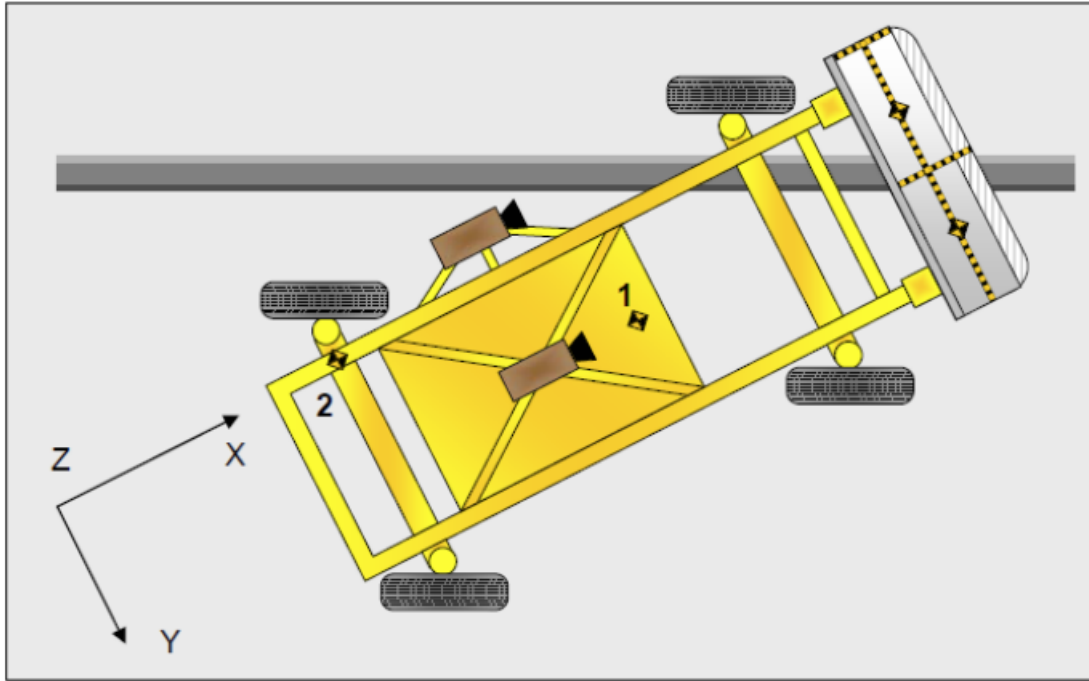
Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV NHTSA No.: C20240112
 Test Facility: Calspan Test Date: 08/05/2024

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	1.95	60.85	-2.57	11.65
	Left (or Rt.) Sill at Front Seat	Y	g	18.92	18.30	-2.23	137.60
	Left (or Rt.) Sill at Front Seat	Z	g	13.42	18.05	-11.07	21.75
	Left (or Rt.) Sill at Front Seat Resultant	N/A	g	23.11	18.20	0.02	-43.65
2	Left (or Rt.) Sill at Rear Seat	X	g	3.32	42.20	-2.10	11.15
	Left (or Rt.) Sill at Rear Seat	Y	g	14.96	33.35	-2.30	111.05
	Left (or Rt.) Sill at Rear Seat	Z	g	3.23	56.40	-7.47	21.40
	Left (or Rt.) Sill at Rear Seat Resultant	N/A	g	16.28	20.20	0.07	-31.15
3	Rear Floor Pan Above Axle	X	g	5.13	54.75	-4.29	25.75
	Rear Floor Pan Above Axle	Y	g	16.80	26.35	-2.34	79.85
	Rear Floor Pan Above Axle	Z	g	4.14	85.20	-9.49	37.65
	Rear Floor Pan Above Axle Resultant	N/A	g	17.42	26.15	0.02	-24.90
4	Left (or Rt.) Sill at Rear Door	Y	g	63.69	18.20	-54.78	8.80
5	Left (or Rt.) Sill at Front Door	Y	g	36.48	31.65	-20.54	35.25
6	Left (or Rt.) Rear Occ. Compartment	Y	g	13.13	7.00	-2.74	85.70
7	Left (or Rt.) B-Post Lower	Y	g	126.99	16.10	-91.42	10.00
8	Left (or Rt.) B-Post Middle	Y	g	213.78	15.80	-383.16	12.30
9	Left (or Rt.) A-Post Lower	Y	g	0.00	-50.00	0.00	-50.00
10	Left (or Rt.) A-Post Middle	Y	g	60.45	23.75	-27.14	32.05
11	Front Seat Track	Y	g	15.25	12.10	-2.67	111.80
12	Rear Seat Track or Structure	Y	g	14.06	7.05	-3.23	85.00
13	Vehicle CG	X	g	1.82	64.30	-4.16	14.40
	Vehicle CG	Y	g	14.10	33.40	-3.80	85.50
	Vehicle CG	Z	g	12.64	9.65	-6.15	4.80
	Vehicle CG Resultant	N/A	g	14.87	9.45	0.03	-18.30

DATA SHEET NO. 10
MDB ACCELEROMETER LOCATIONS DATA SUMMARY

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024



MDB ACCELEROMETER LOCATIONS

Loc No.	Description	Axes	Units	Peak Values (g's)			
				Max	Time (ms)	Min	Time (ms)
1	MDB CG	X	g	1.30	99.05	-21.20	31.00
		Y	g	3.49	65.60	-8.11	54.95
		Z	g	12.64	39.45	-12.63	26.30
		Resultant		24.55	26.40	0.02	-14.40
2	MDB Rear	Y	g	2.54	128.90	-24.53	34.20
		Z	g	1.74	30.55	-3.89	65.35

**DATA SHEET NO. 11
MDB SUMMARY OF RESULTS**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

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	52.95
Trap No. 2 Velocity (Redundant)	km/h	52.1 to 53.7	53.07
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	Right	245
B	Top of Bumper	533	800	Right	152
C	Mid-Level	686	800	Left	108
D	Top of Stack	813	800	Left	136

IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Horizontal Offset (+ forward / - rearward)	mm	+/- 50 of Intended Impact Point	+8
Vertical Offset (- down / + up)	mm	+/- 20 of Intended Impact Point	-12

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

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV NHTSA No.: C20240112
 Test Facility: Calspan Test Date: 08/05/2024

Dummy Serial No. DG5348

Description	Axes	Positive Direction		Negative Direction	
		MAX	TIME (ms)	MAX	TIME (ms)
HEAD ACCELERATION (g)					
Longitudinal	X	4.27	144.65	-12.37	64.30
Lateral	Y	29.13	54.55	-3.97	218.00
Vertical	Z	10.80	23.20	-6.32	65.45
Resultant	N/A	30.92	52.45		
HIC36 (t1, t2)	N/A	76.41		t1 = 42.60	t2 = 68.80
THORAX DEFLECTION (mm)					
Upper Rib	Y	23.51	50.10	-0.64	79.45
Middle Rib	Y	23.14	49.70	-0.97	81.25
Lower Rib	Y	24.03	48.70	-0.89	85.50
ABDOMINAL FORCES (N)					
Front	Y	179.85	41.75	-19.70	17.30
Middle	Y	224.04	43.05	-5.56	300.00
Rear	Y	277.06	44.75	-10.26	115.20
SUM	N/A	675.88	42.80		
PELVIS FORCES (N)					
Pubic Symphysis	Y	107.79	154.10	-716.23	65.60

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

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

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV NHTSA No.: C20240112
 Test Facility: Calspan Test Date: 08/05/2024

Dummy Serial No. 261

Description	Axes	Positive Direction		Negative Direction	
		MAX	TIME (ms)	MAX	TIME (ms)
HEAD ACCELERATION (g)					
Longitudinal	X	22.44	284.20	-7.61	71.75
Lateral	Y	20.36	70.40	-26.93	283.05
Vertical	Z	14.71	75.75	-2.02	106.30
Resultant	N/A	35.87	283.15		
HIC36 (t1, t2)	N/A	56.92		t1 = 57.65	t2 = 93.65
LOWER SPINE (g)					
Longitudinal	X	13.13	68.10	-14.23	54.90
Lateral	Y	36.98	65.80	-4.50	103.65
Vertical	Z	2.18	119.50	-9.91	67.20
Resultant	N/A	38.19	66.50	0.00	-17.65
PELVIS FORCES (N)					
Acetabular	Y	1641.00	61.05	-52.47	91.40
Iliac	Y	229.42	64.60	-83.54	84.55

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

**DATA SHEET NO. 14
POST-TEST OBSERVATIONS**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Front Occupant	Rear Occupant
Face Contact	Curtain Airbag	None
Top of Head Contact	Curtain Airbag, Header	Curtain Airbag
Left Side of Head Contact	Curtain Airbag	Curtain Airbag
Back of Head Contact	Curtain Airbag, Headrest	Curtain Airbag
Left Shoulder Contact	Curtain Airbag, Door Trim	Door Trim
Upper Torso Contact	Torso/Pelvis Airbag, Seatback	Door Trim
Lower Torso Contact	Torso/Pelvis Airbag, Seatback	Door Trim
Left Knee Contact	Door Trim	Door Trim
Left Hip Contact	Torso/Pelvis Airbag, Seat Back	Seat Pan

POST-TEST DOOR PERFORMANCE

Description	Front	Rear
Left Side Doors	Jammed Shut	Jammed Shut
Right Side Doors	Remained Closed & Operational	Remained Closed & Operational
Hatch and Other Doors	N/A	Remained Closed & Operational
Seat Movement	None	None
Seatback Failure	None	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	B-Pillar Buckled
Sill Separation	None
Windshield Damage	None
Side Window Damage	Rear passenger Window Shattered
Other Notable Effects	None

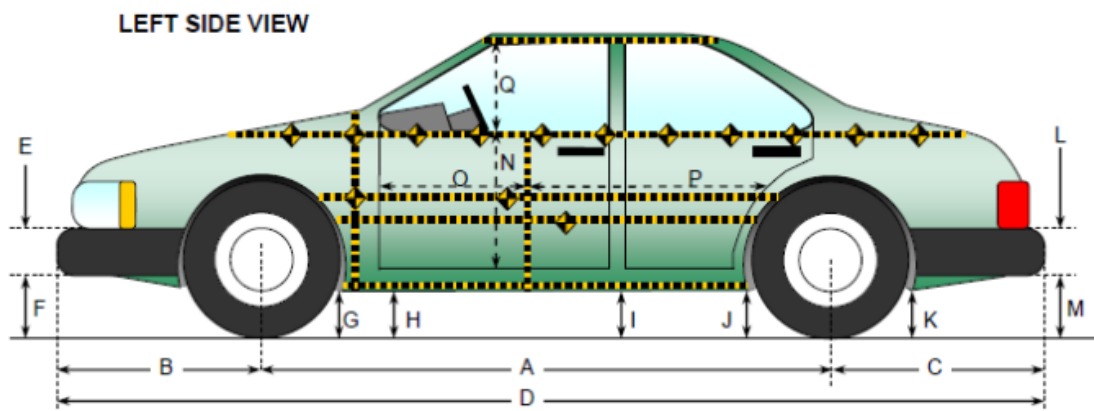
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Front Occupant		Rear Occupant	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	No		
Side Torso Airbag	Yes	Yes	No	No
Head Airbag	No	N/A	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: 2024 Chevrolet Equinox EV 5 Door SUV
Test Facility: Calspan

NHTSA No.: C20240112
Test Date: 08/05/2024



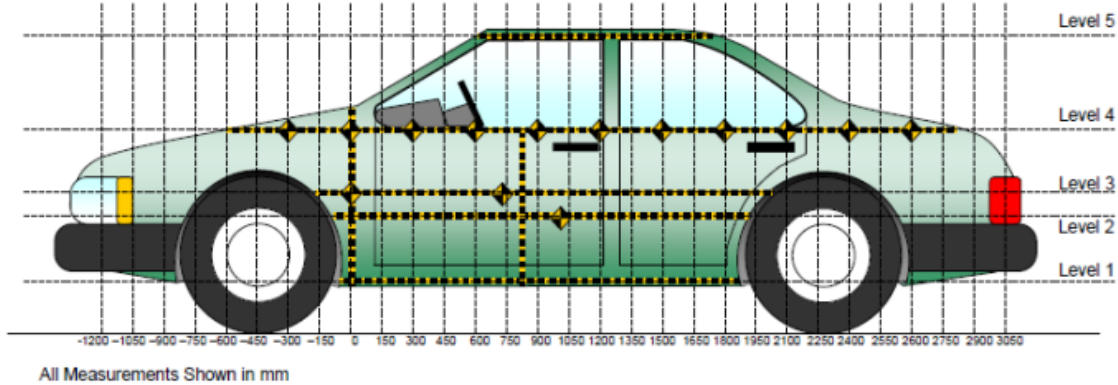
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code.	Measurement Description	Pre-Test	Post-Test	Difference
A	Wheelbase	2953	2950	-3
B	Front Axle to FSOV	905	911	6
C	Rear Axle to RSOV	977	977	-1
D2	Total Vehicle Length at Centerline	4836	4837	1
E	Front Bumper Thickness	170	170	0
F	Front Bumper Bottom to Ground	465	470	5
G	Sill Height at Front Wheel Well	223	221	-2
H	Sill Height at Front Door Leading Edge	224	220	-4
I	Sill Height at B Pillar	223	224	1
J1	Sill Height at Rear Wheel Well	223	219	-4
J2	Pinch Weld Height at Rear Wheel Well	201	204	3
K	Sill Height Aft of Rear Wheel Well	285	288	3
L	Rear Bumper Thickness	160	160	0
M	Rear Bumper Bottom to Ground	467	470	3
N	Sill Height to Window Bottom of Front Window Sill	848	845	-4
O	Front Door Leading Edge to Impact CL	752	749	-4
P	Rear Door Trailing Edge to Impact CL	1497	1468	-28
Q	Front Window Opening	392	391	-1
R	Right Side Length	4716	4717	2
S	Left Side Length	4714	4716	1
T	Vehicle Width at B-Pillars	1897	1803	-94

**DATA SHEET NO.16
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	454	60	1650
2	Occupant H-Point	mm	719	147	1500
3	Mid-Door	mm	786	164	1500
4	Window Sill	mm	1176	53	1500
5	Window Top	mm	1615	2	1500

NOTE: The above measurements should be taken along the vertical impact reference line.
 Vehicle measurements forward of the vertical impact reference line are negative.

**DATA SHEET NO.17
VEHICLE EXTERIOR CRUSH PROFILES**

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

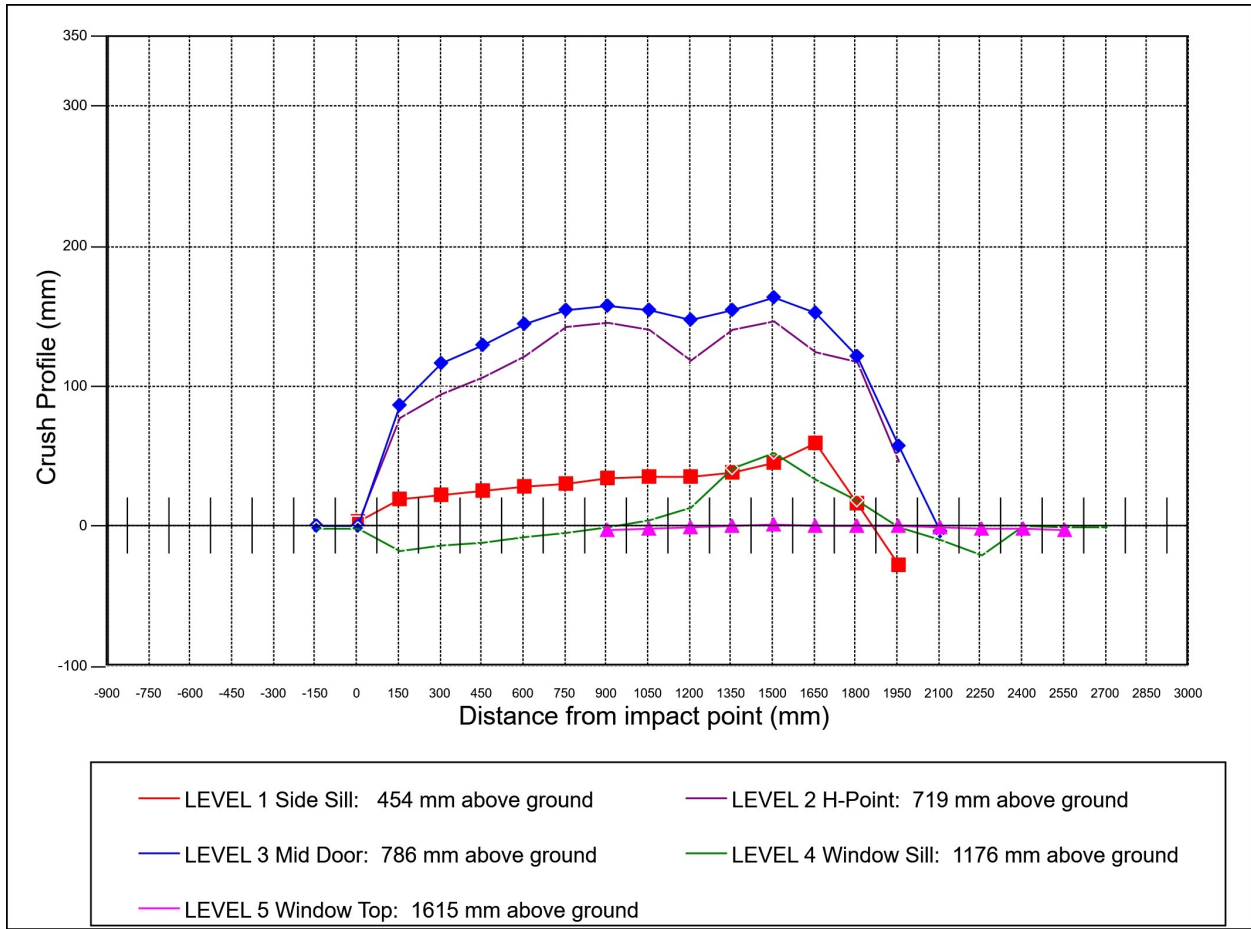
	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900															
-750															
-600															
-450															
-300															
-150			950	815				949	816				1	-1	
0	922	945	945	827		918	942	945	828		4	3	0	-1	
150	925	937	937	833		905	859	850	850		20	78	87	-17	
300	927	935	932	846		904	840	815	859		23	95	117	-13	
450	929	937	932	851		903	830	802	862		26	107	130	-11	
600	930	940	933	857		901	818	788	864		29	122	145	-7	
750	931	942	934	859		900	799	779	863		31	143	155	-4	
900	932	944	935	862	637	897	798	777	862	639	35	146	158	0	-2
1050	932	944	935	863	643	896	803	780	858	644	36	141	155	5	-1
1200	931	944	934	863	644	895	825	786	849	644	36	119	148	14	0
1350	930	941	931	861	644	891	800	776	819	643	39	141	155	42	1
1500	929	938	928	860	642	883	791	764	807	640	46	147	164	53	2
1650	927	935	927	856	640	867	810	774	822	639	60	125	153	34	1
1800	924	935	934	852	637	907	817	812	833	636	17	118	122	19	1
1950	921	945	945	855	631	948	898	887	855	630	-27	47	58	0	1
2100			952	871	622			955	880	622			-3	-9	0
2250				881	609				901	610				-20	-1
2400				884	589				883	590				1	-1
2550				879	546				879	548				0	-2
2700				868					868					0	
2850															
3000															

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

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

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
 Test Facility: Calspan

NHTSA No.: C20240112
 Test Date: 08/05/2024

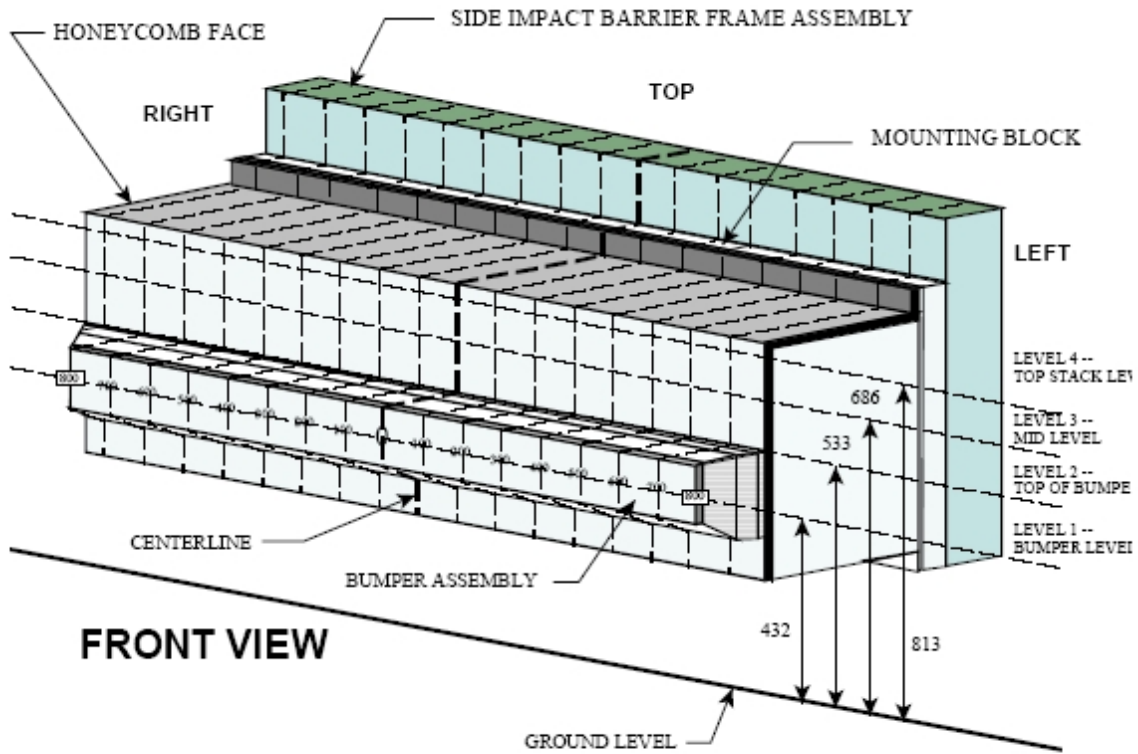


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO.18
EXTERIOR STATIC CRUSH FOR IMPACT FACE

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
Test Facility: Calspan

NHTSA No.: C20240112
Test Date: 08/05/2024



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

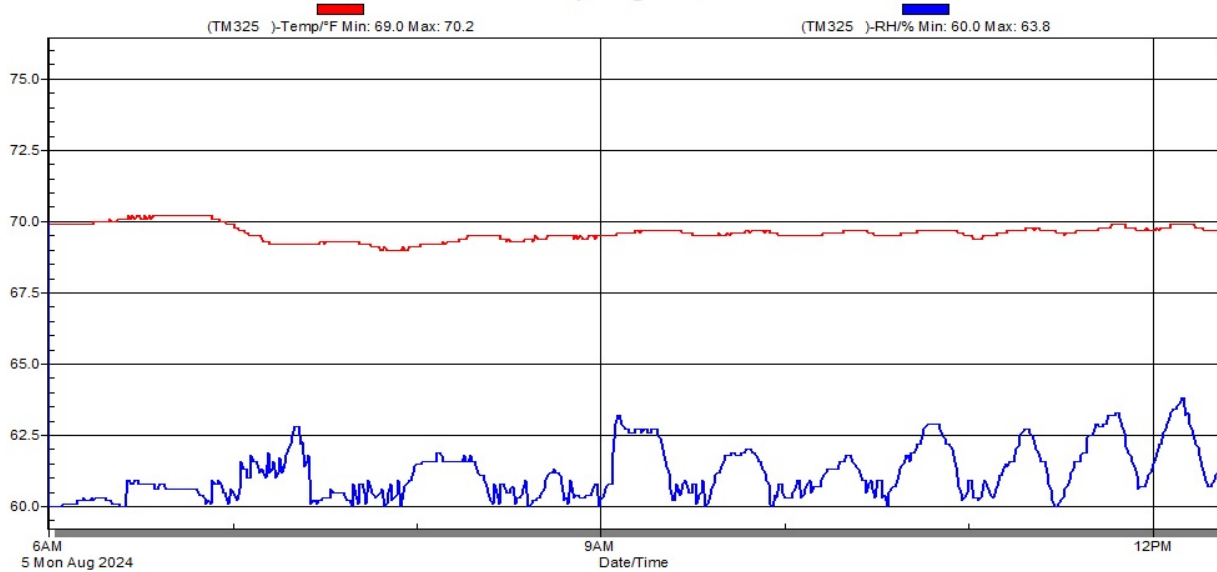
Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		0	100	200	300	400	500	600	700
1	245	245	243	242	242	241	235	231	227	231	235	241	242	242	243	245	245
2	152	143	142	142	138	141	134	130	126	130	134	141	138	142	142	143	152
3	79	59	52	45	59	58	49	33	30	33	49	58	59	45	52	59	79
4	56	28	19	33	58	76	67	42	28	42	67	76	58	33	19	28	56

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

Test Vehicle: 2024 Chevrolet Equinox EV 5 Door SUV
Test Facility: Calspan

NHTSA No.: C20240112
Test Date: 08/05/2024

Monday, August 5, 2024



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

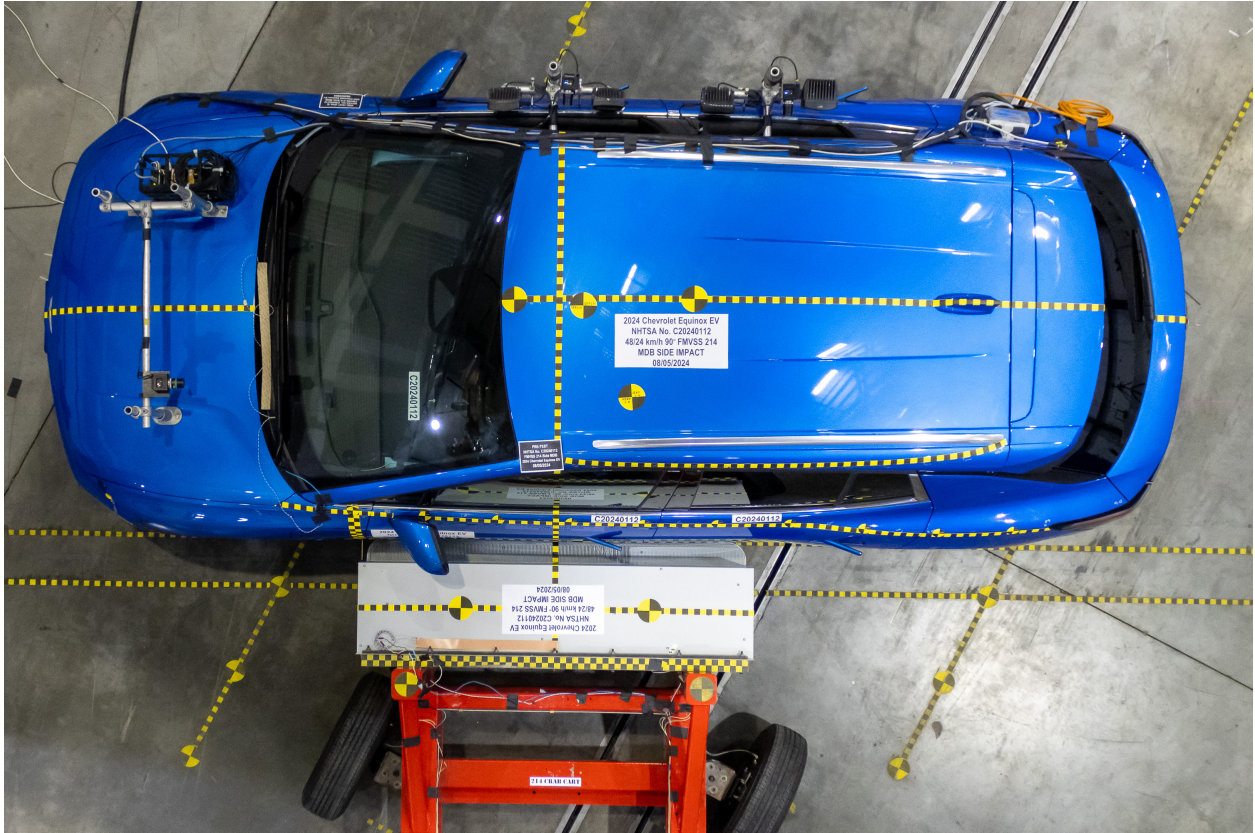


Figure A-15: Pre-Test Overhead View of MDB Positioned Against Impact Side of Test Vehicle at Impact Location



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

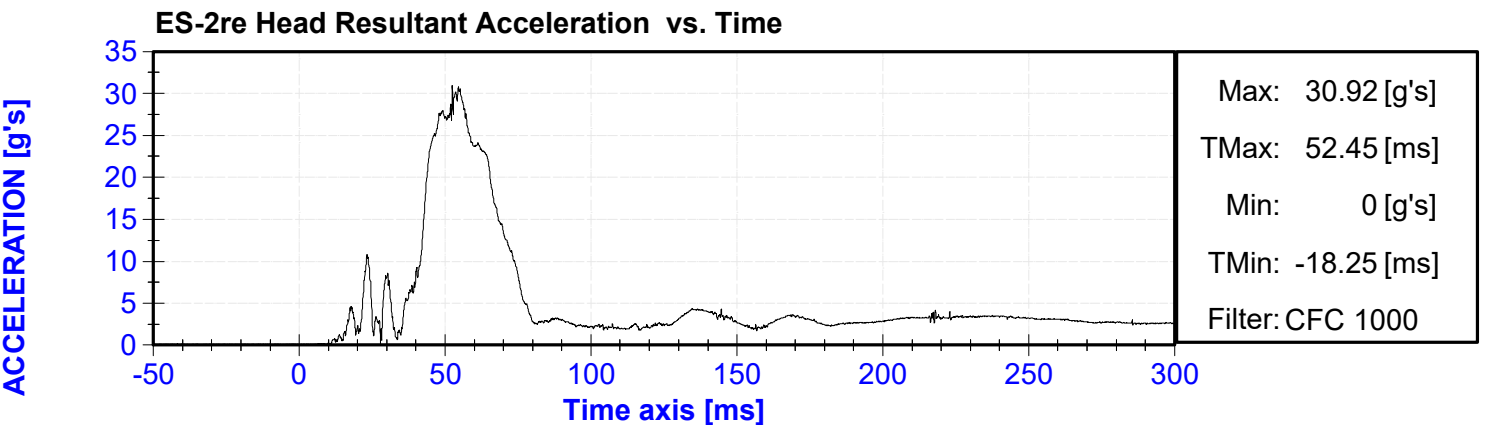
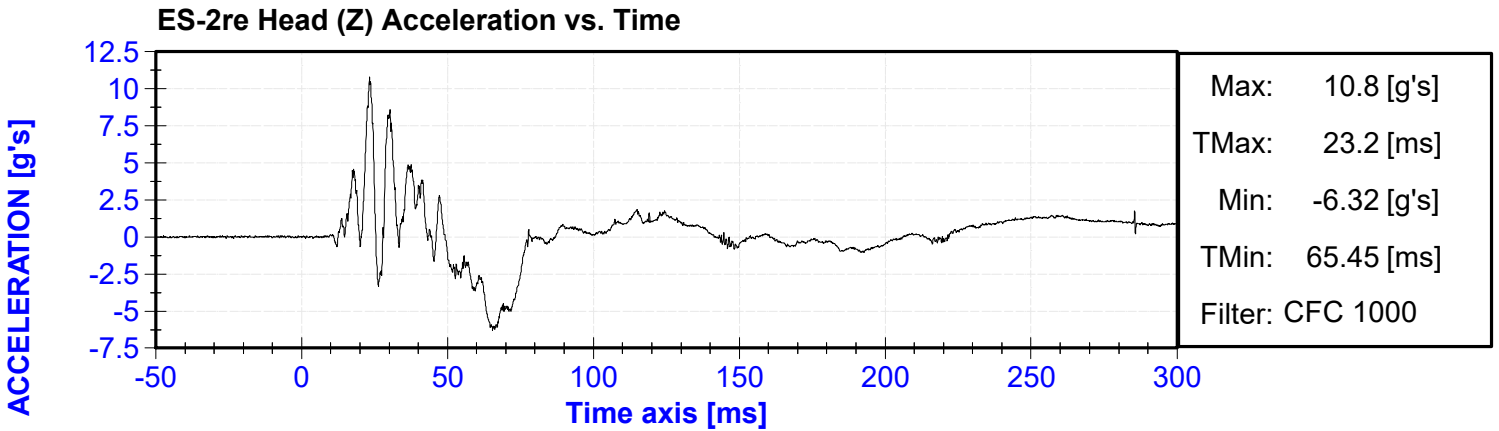
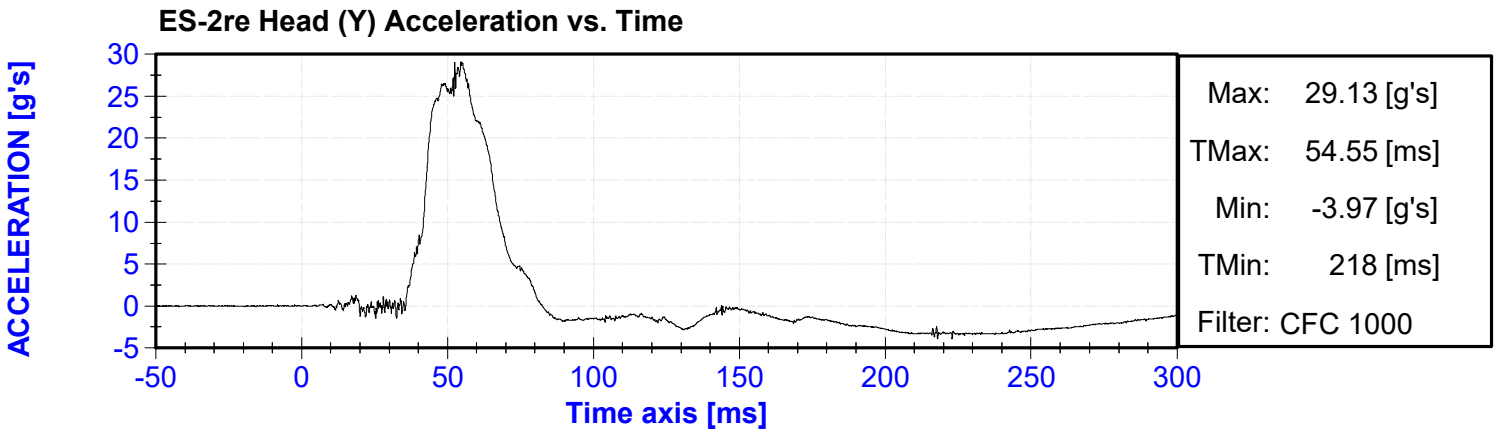
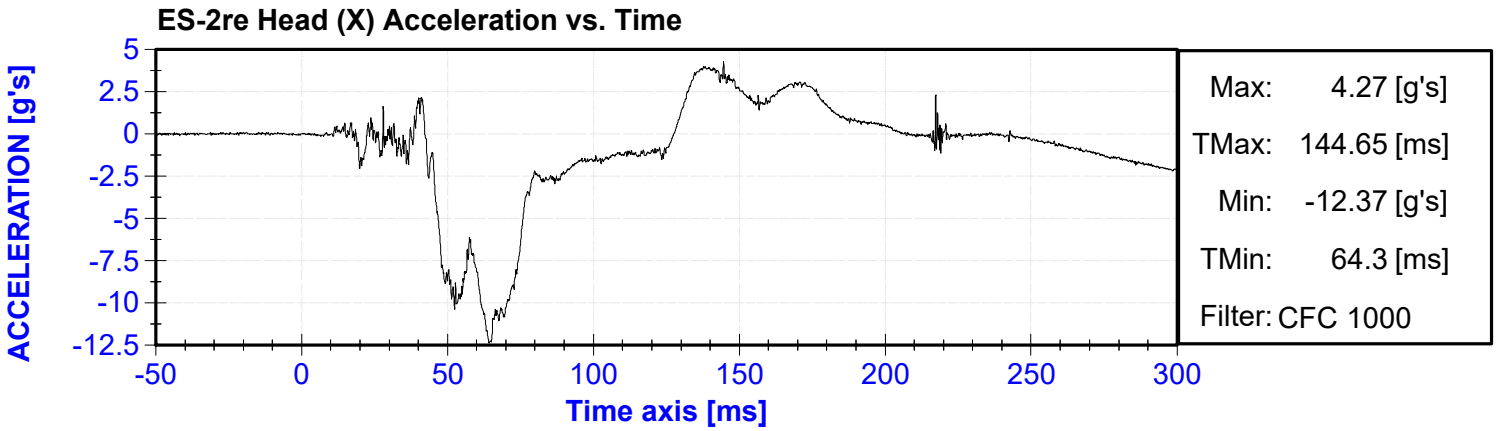


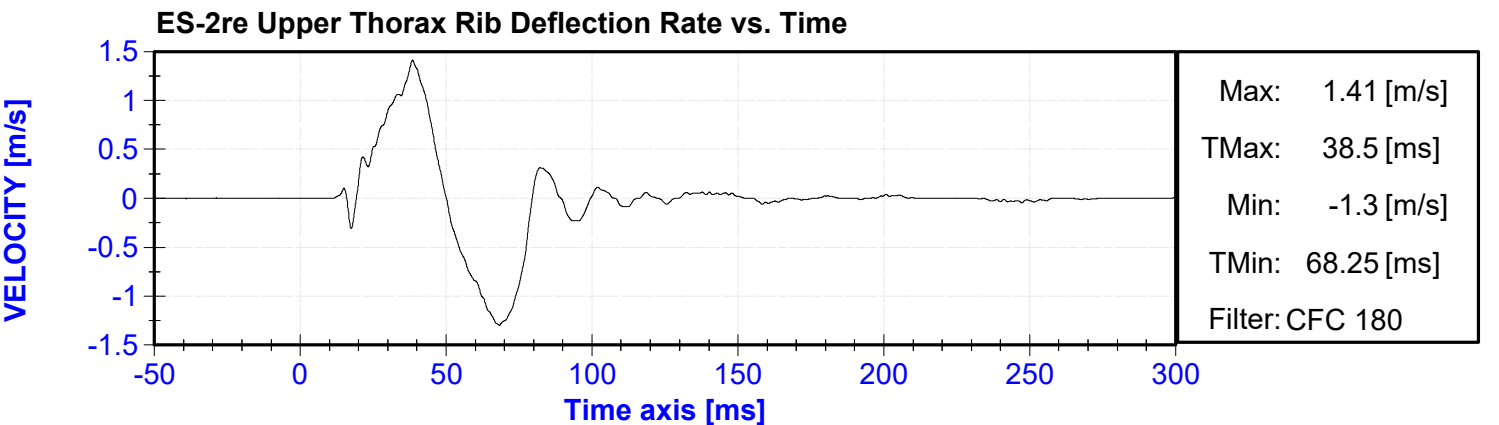
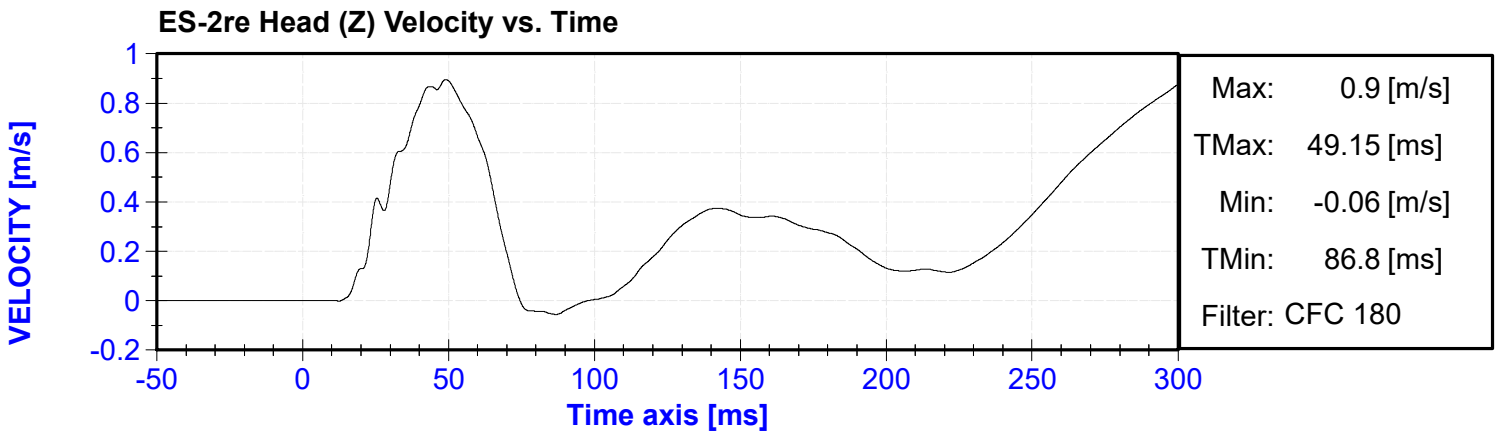
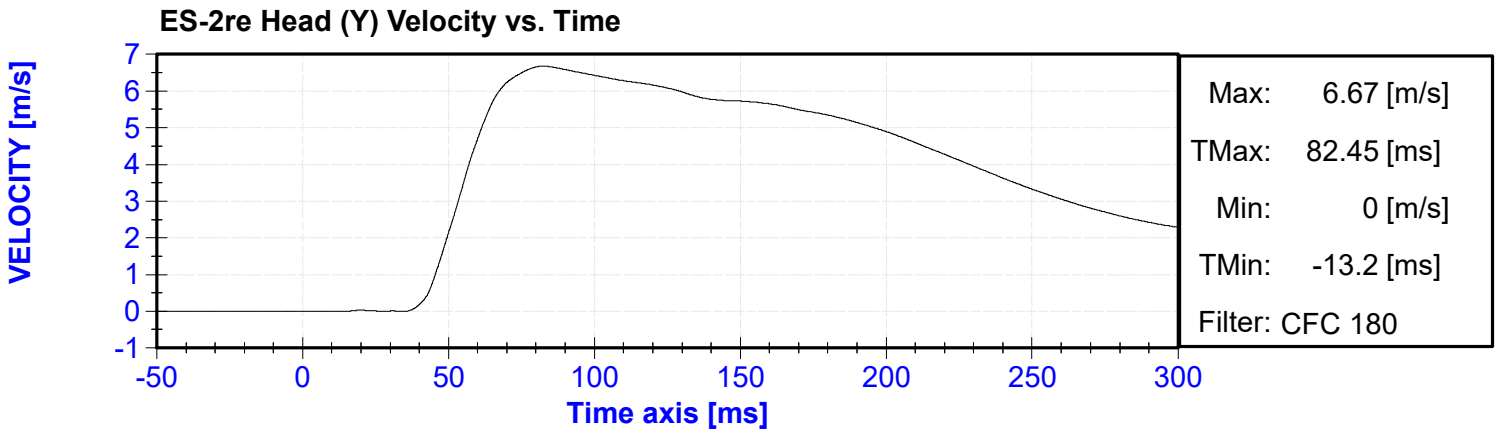
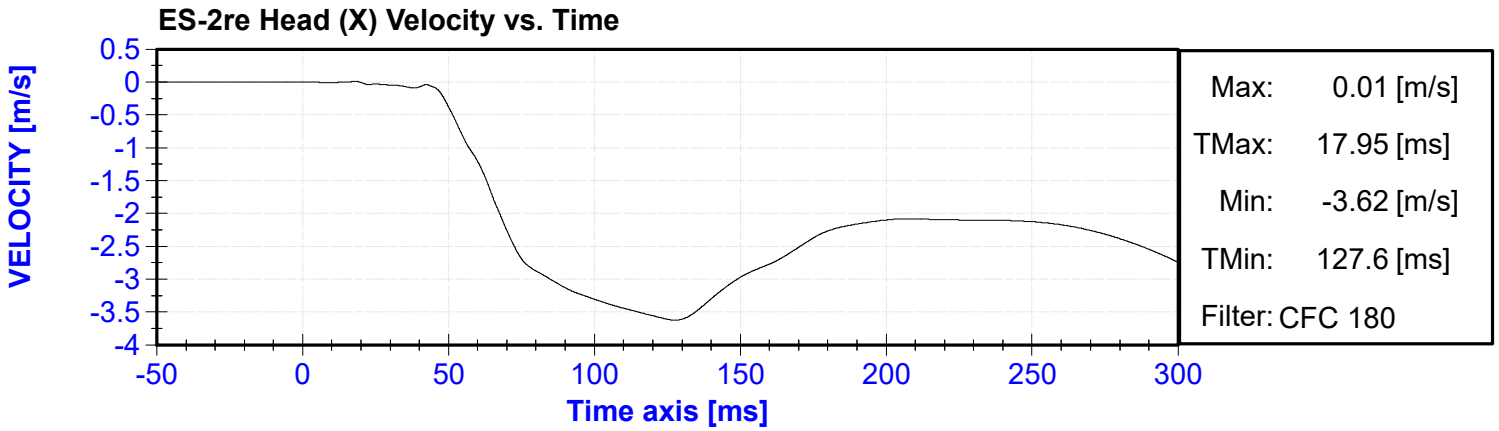
Figure A-30: Close-up View of Vehicle's Tire Placard

APPENDIX II
ES-2re DUMMY RESPONSE DATA TRACES

Table of Data Plots

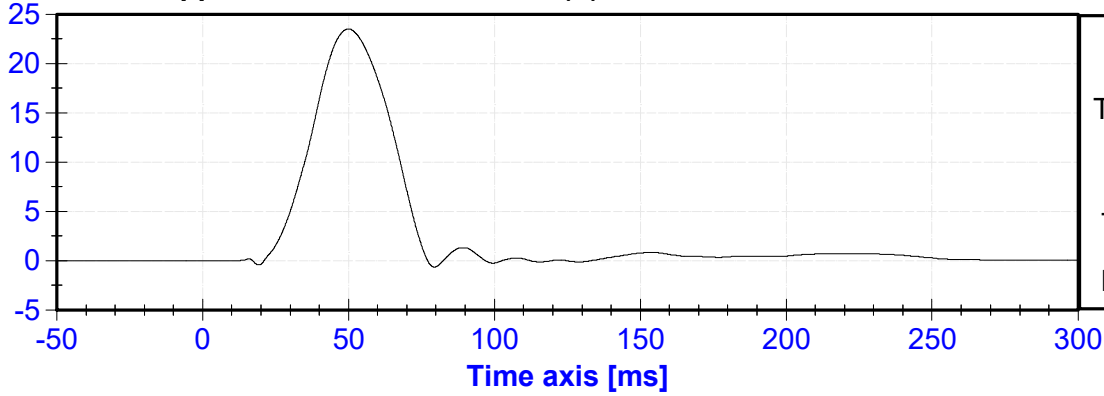
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11	ES-2re Middle Thorax Rib Deflection (Y) vs. Time	II-5
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13	ES-2re Lower Thorax Rib Deflection (Y) vs. Time	II-6
14	ES-2re Front Abdomen Force (Y) vs. Time	II-6
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16	ES-2re Rear Abdomen Force (Y) vs. Time	II-6
17	ES-2re Sum of Abdomen Forces vs. Time	II-7
18	ES-2re Pubic Symphysis Force (Y) vs. Time	II-7





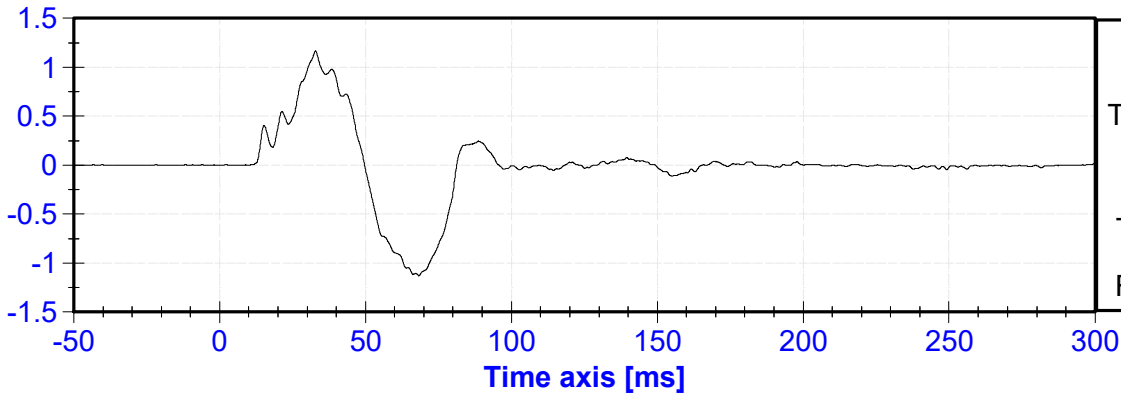
DISPLACEMENT [mm]

ES-2re Upper Thorax Rib Deflection (Y) vs. Time



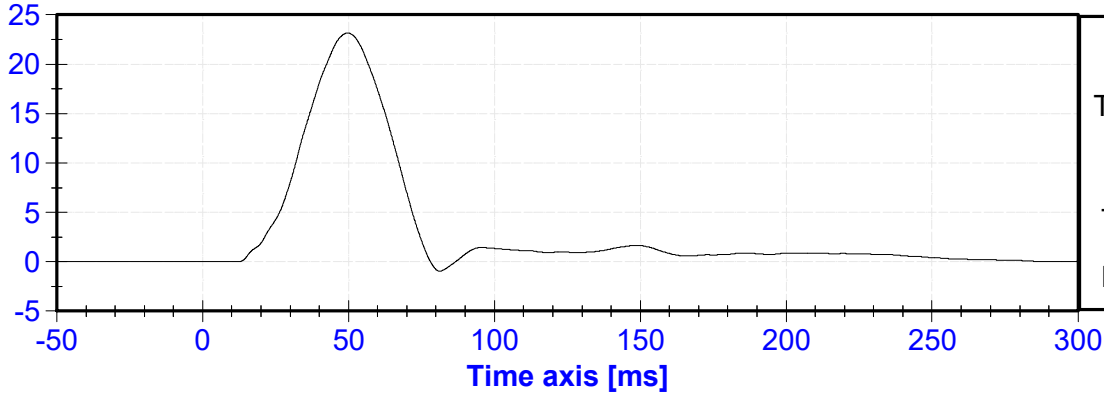
VELOCITY [m/s]

ES-2re Middle Thorax Rib Deflection Rate vs. Time



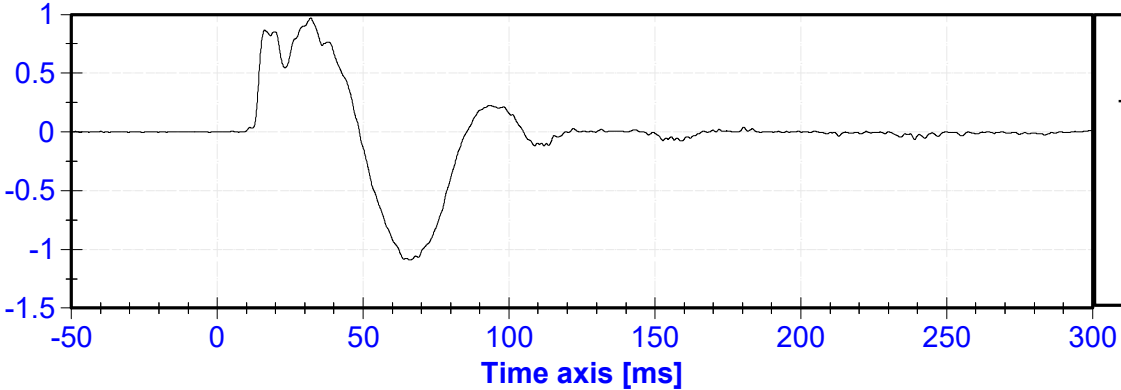
DISPLACEMENT [mm]

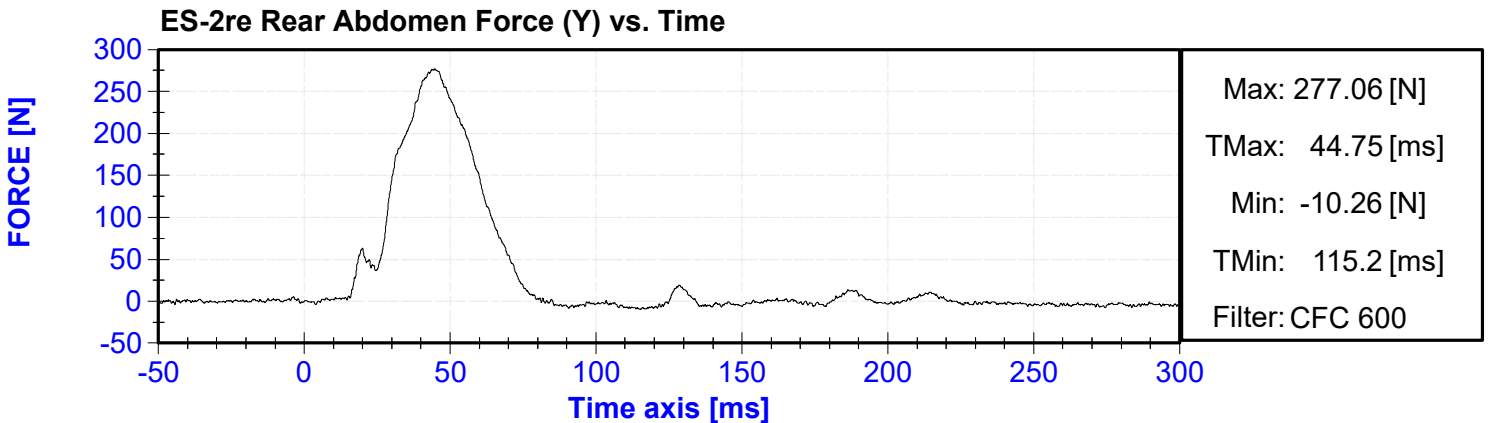
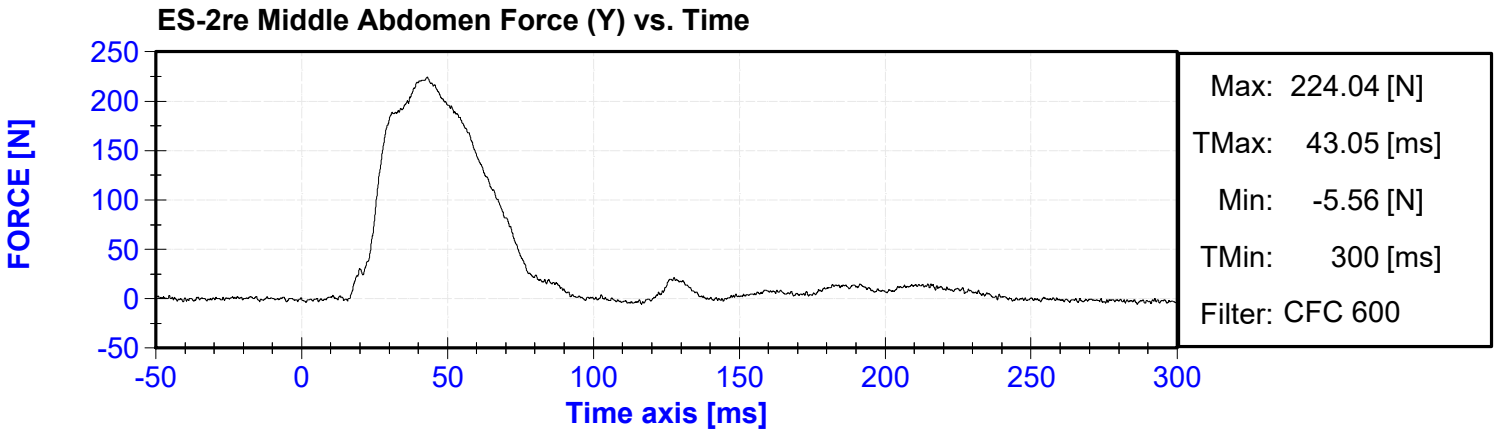
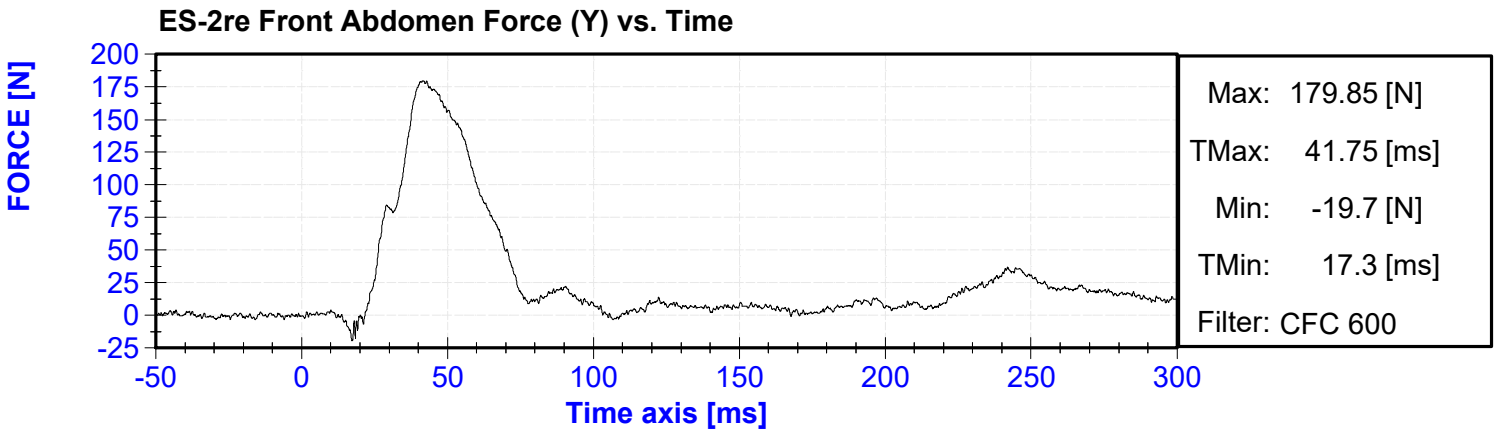
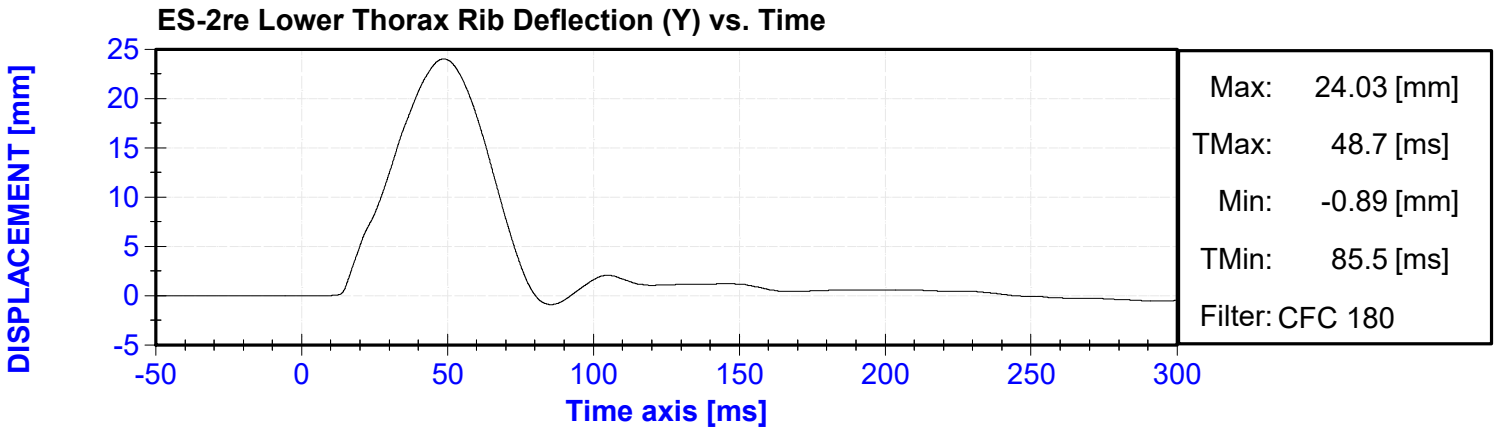
ES-2re Middle Thorax Rib Deflection (Y) vs. Time

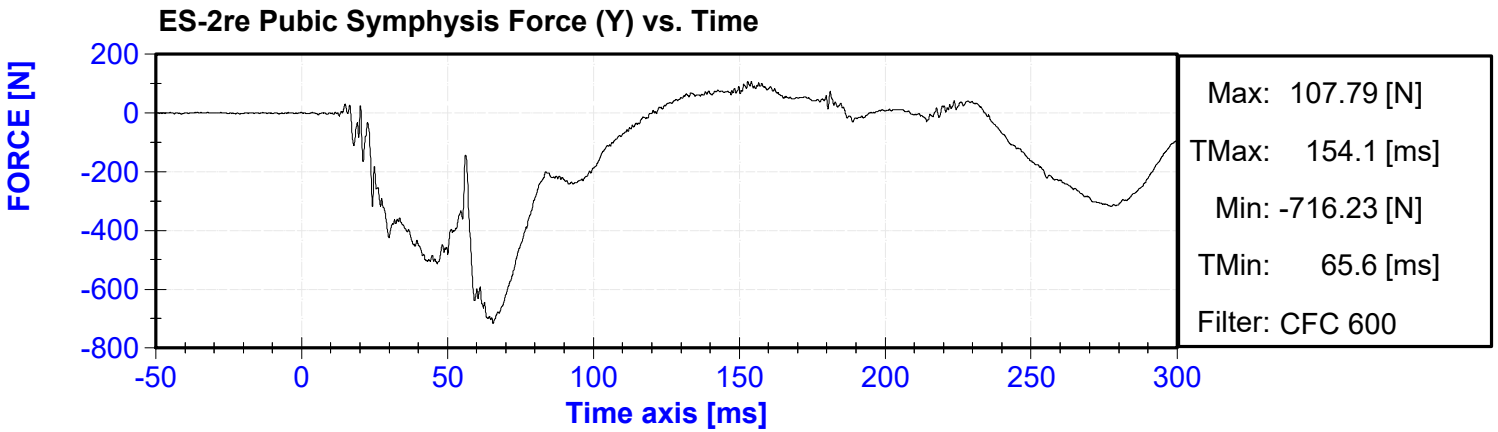
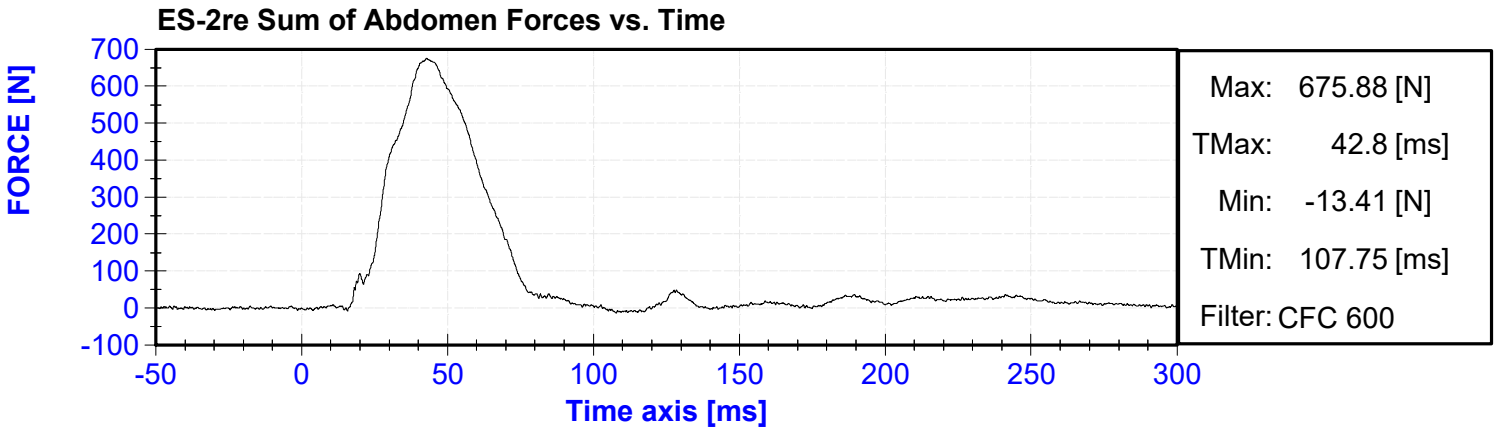


VELOCITY [m/s]

ES-2re Lower Thorax Rib Deflection Rate vs. Time







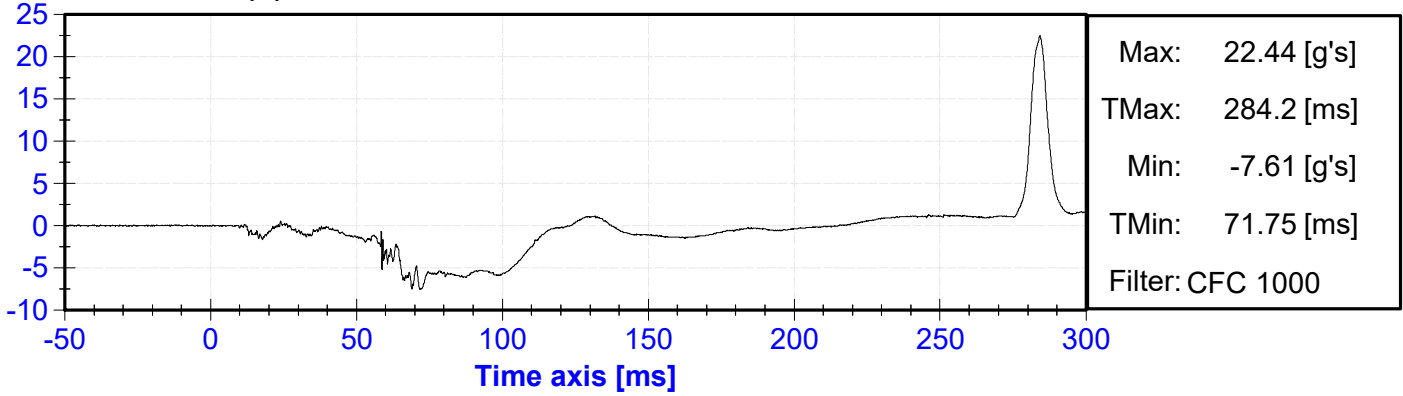
APPENDIX III
SID-II's DUMMY RESPONSE DATA TRACES

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17	SID-IIs Sum of Iliac and Acetabulum Forces vs. Time	III-7

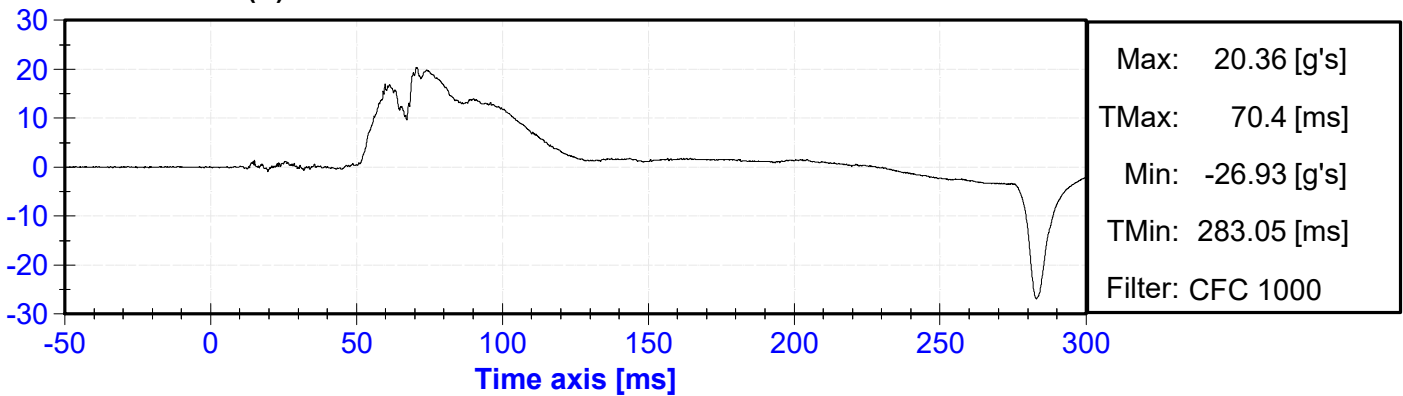
ACCELERATION [g's]

SID-IIs Head (X) Acceleration vs. Time



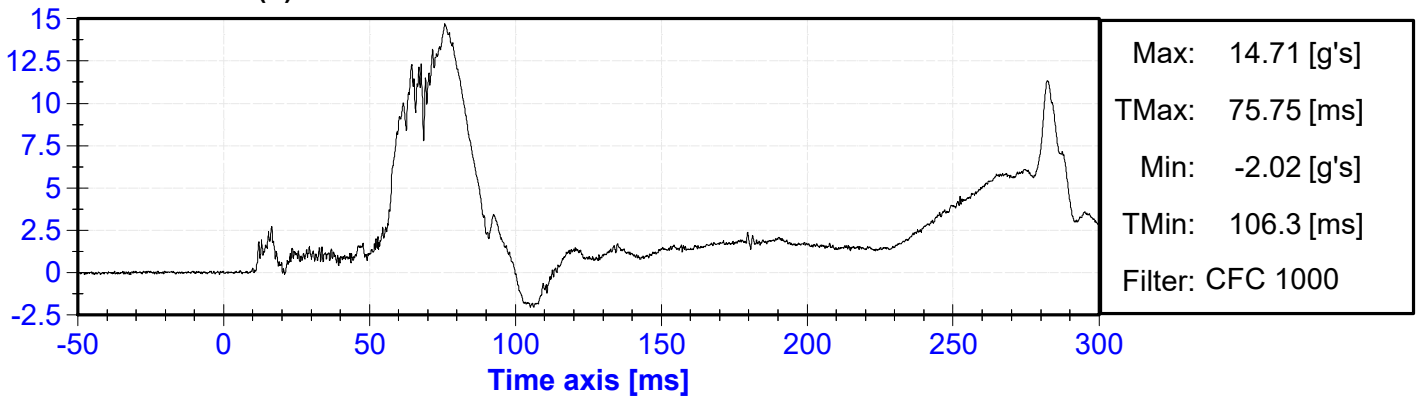
ACCELERATION [g's]

SID-IIs Head (Y) Acceleration vs. Time



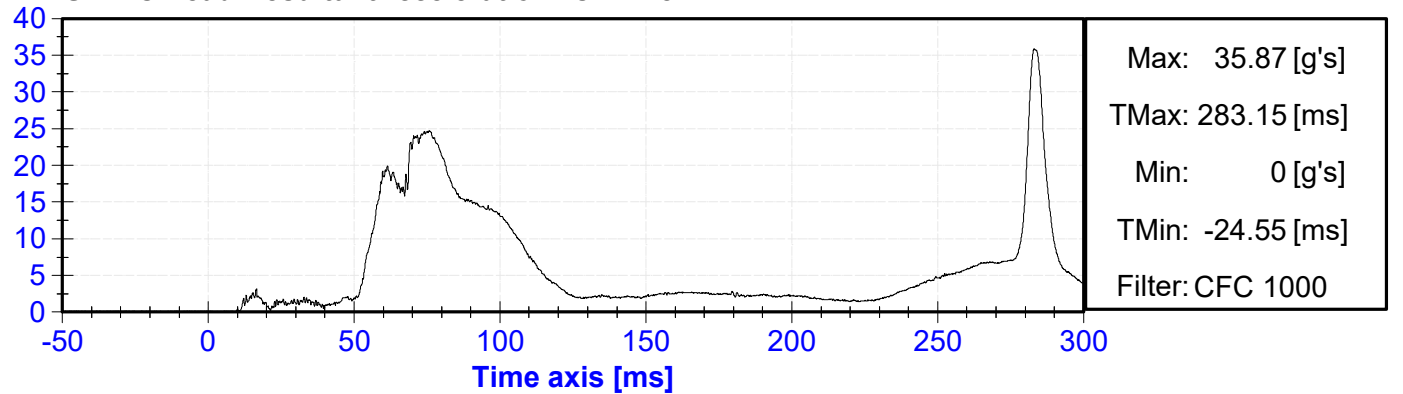
ACCELERATION [g's]

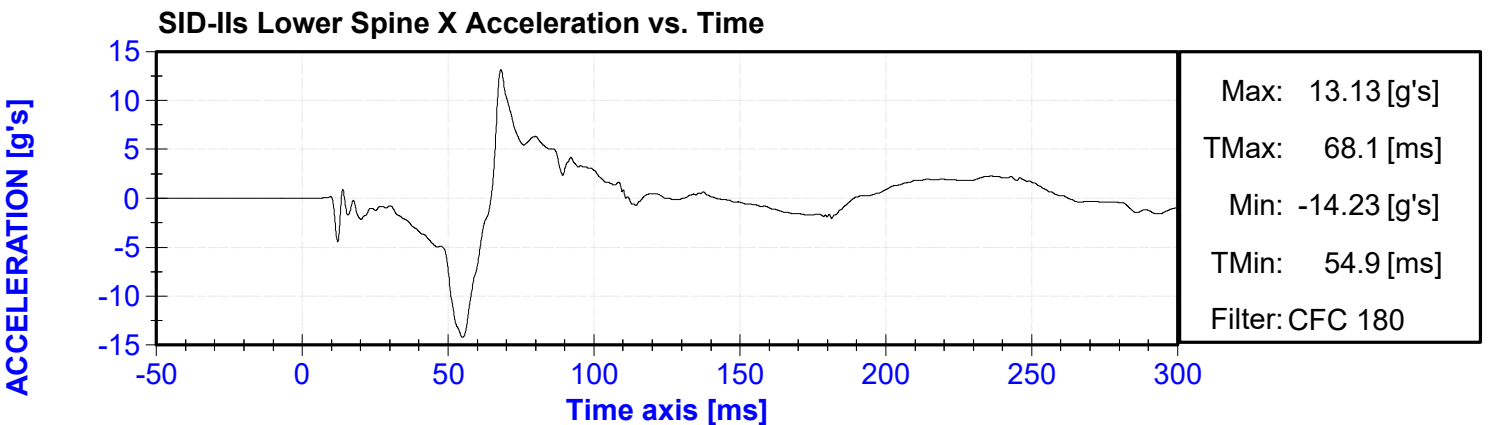
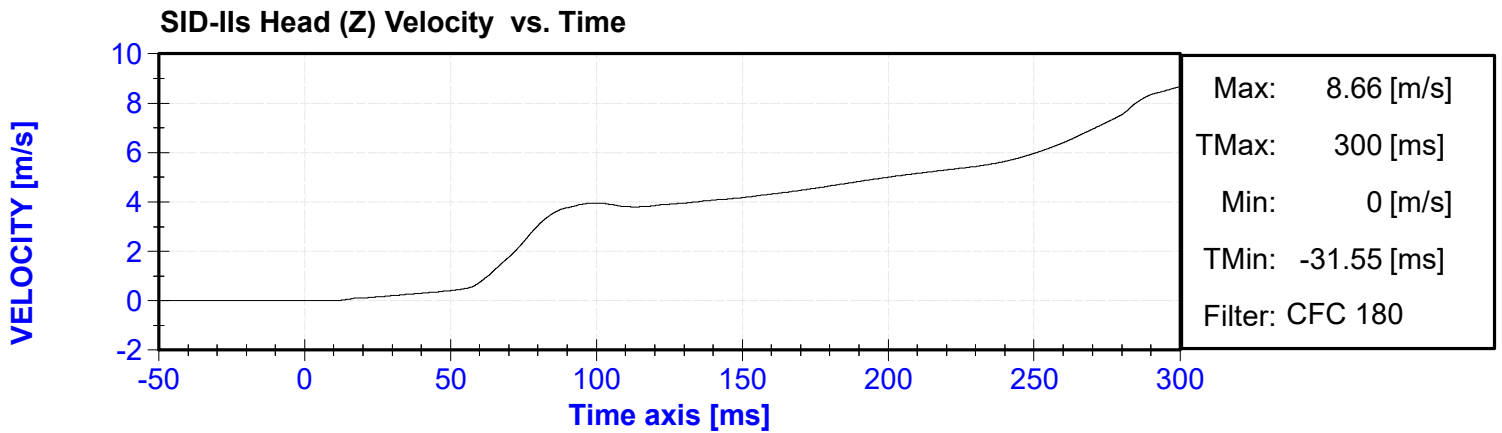
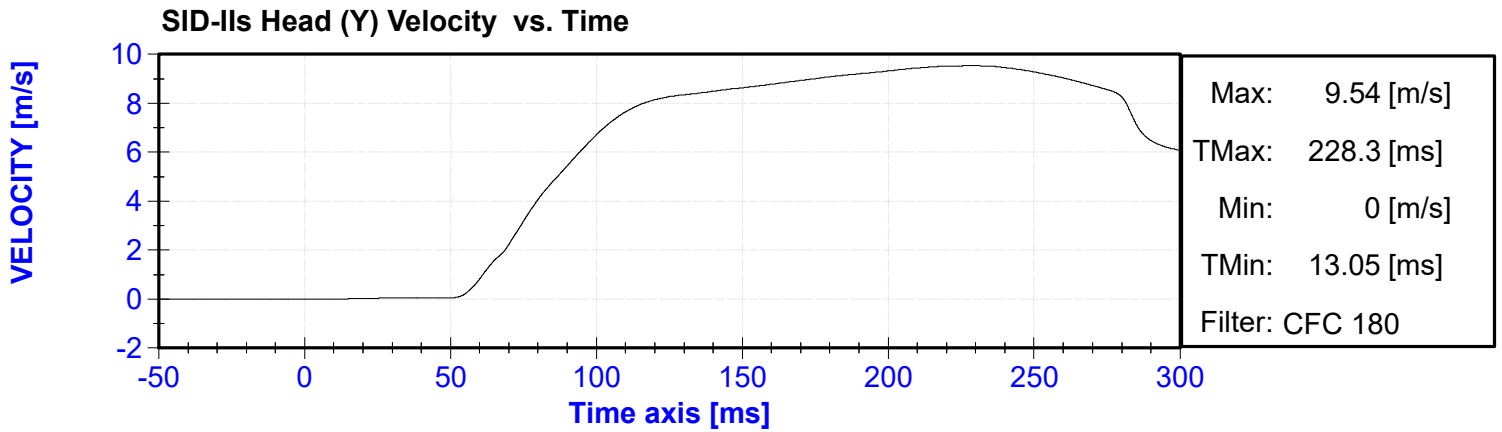
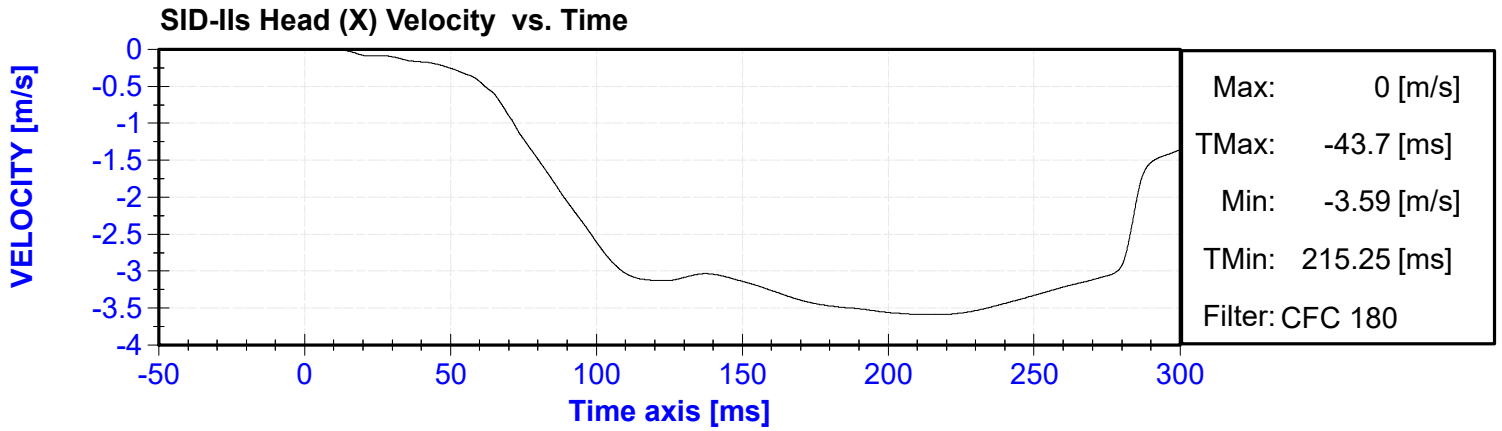
SID-IIs Head (Z) Acceleration vs. Time

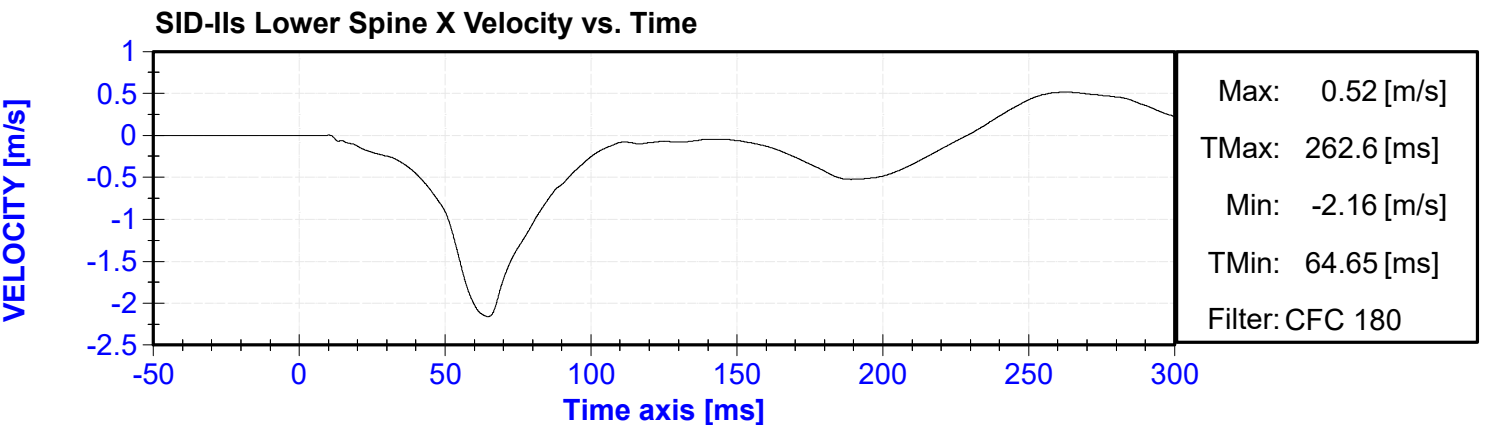
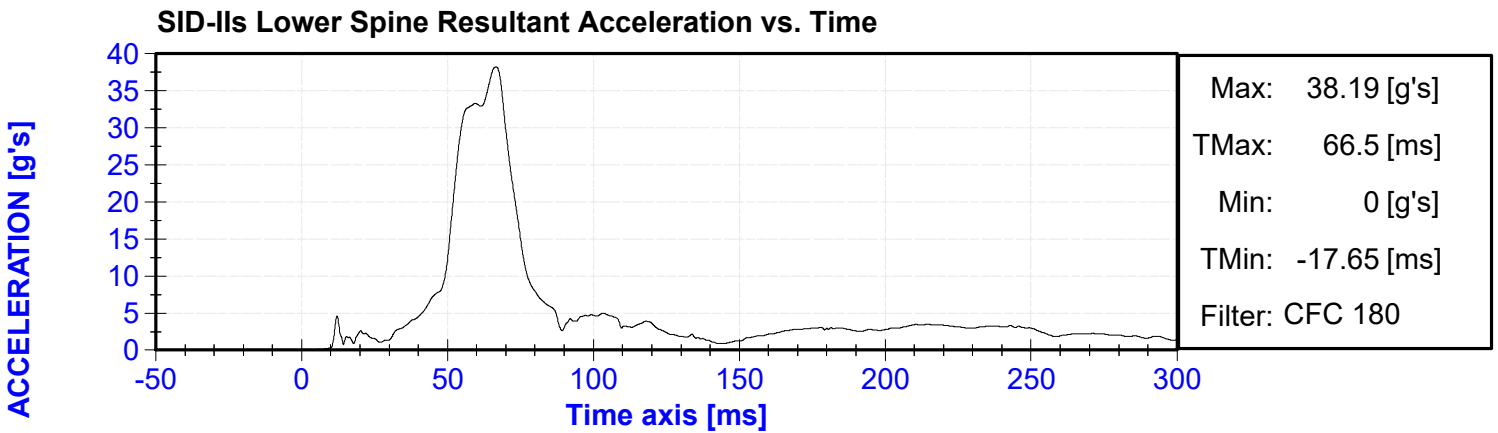
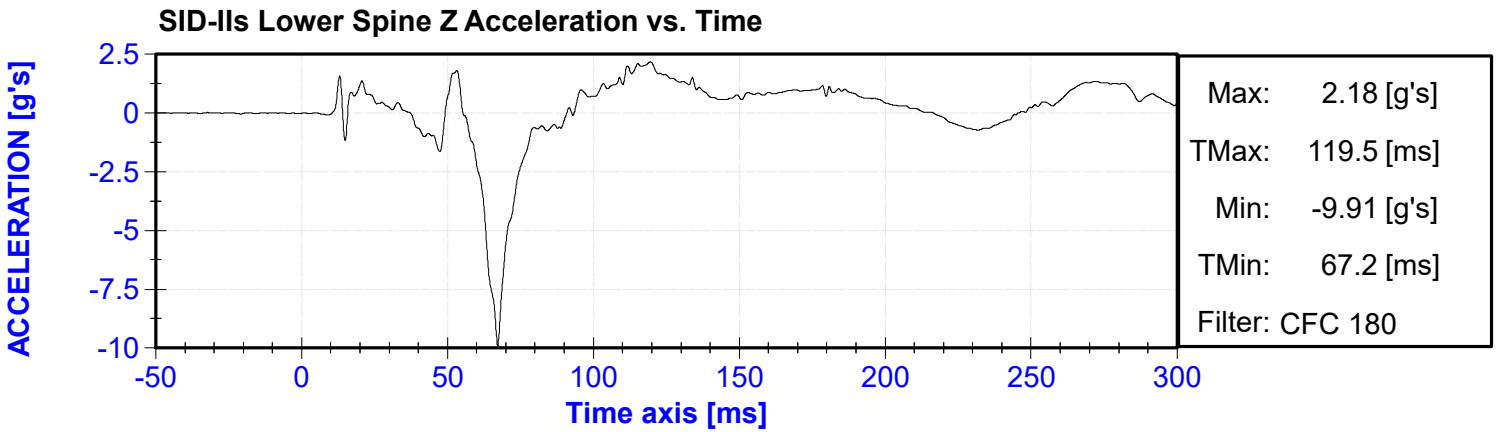
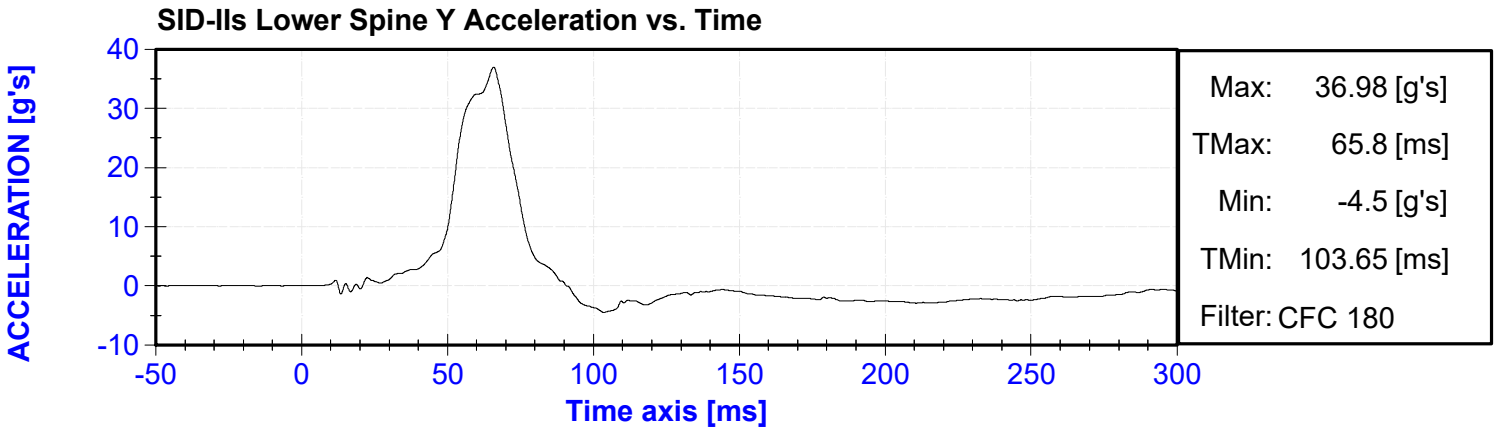


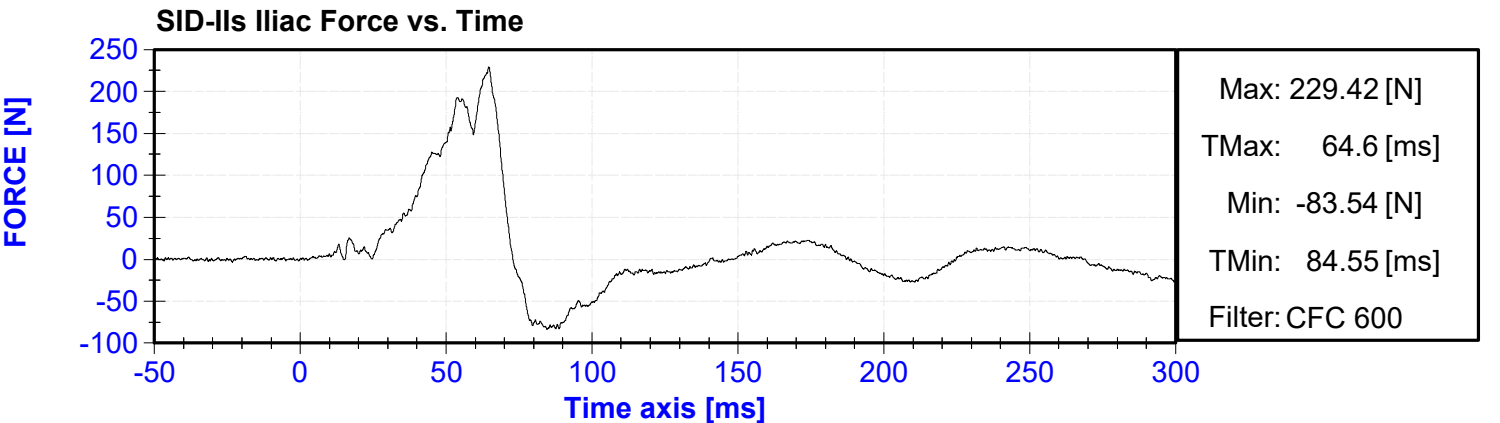
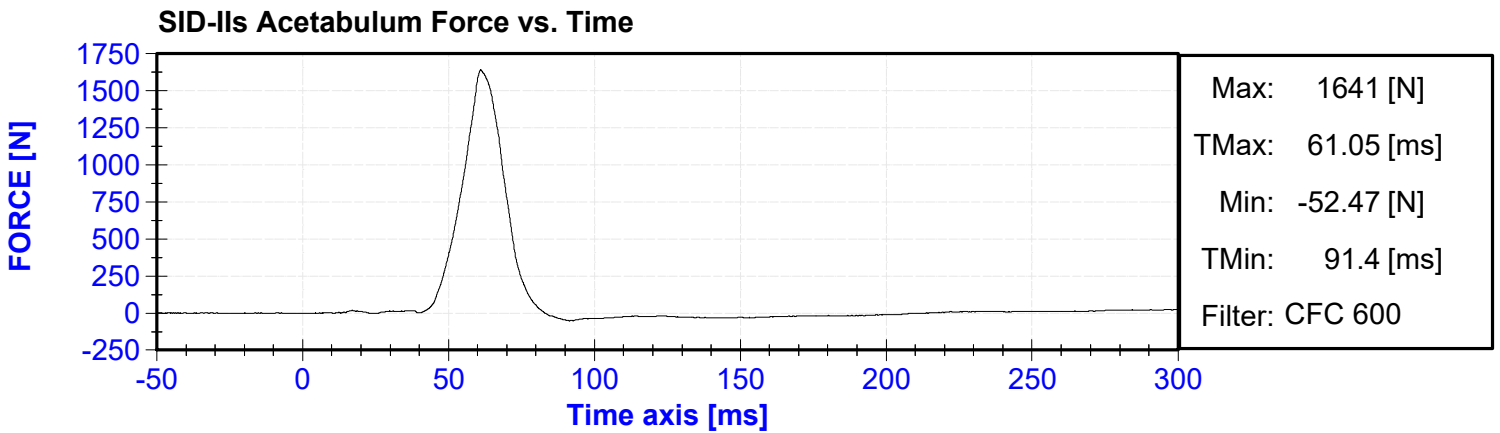
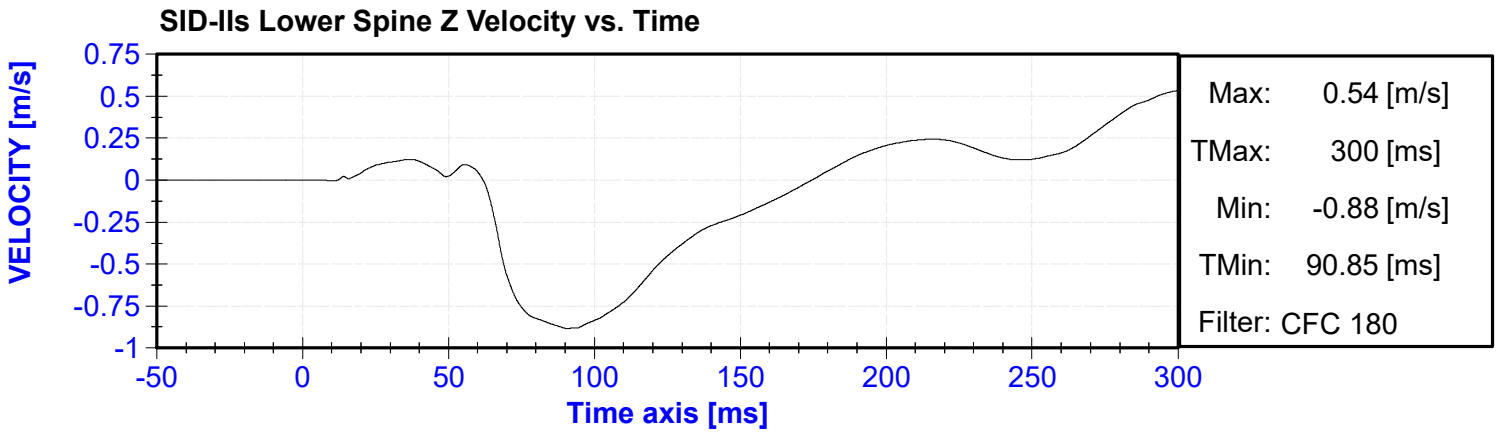
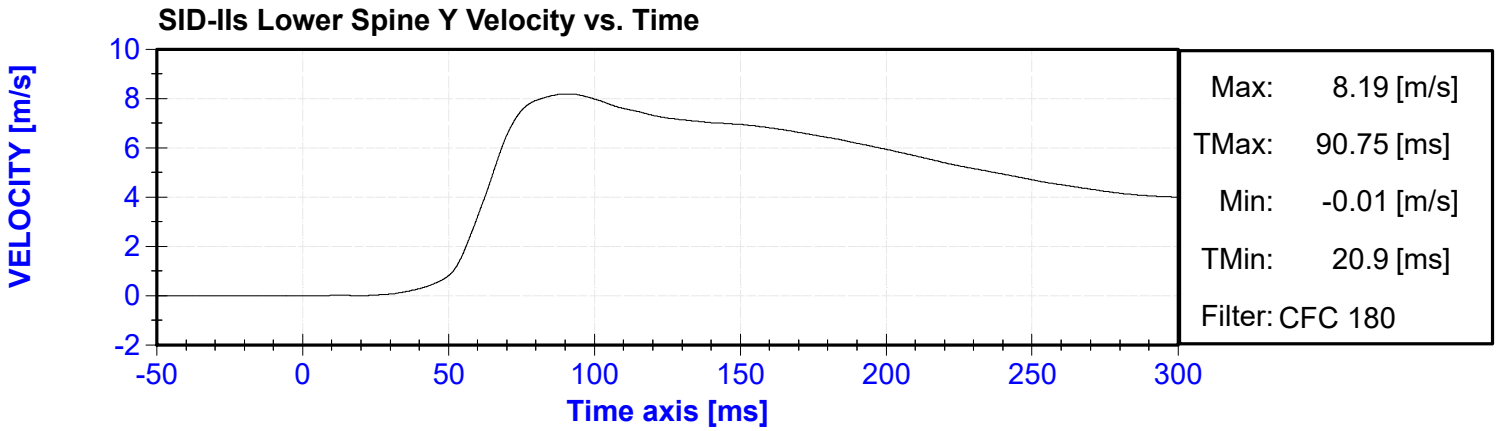
ACCELERATION [g's]

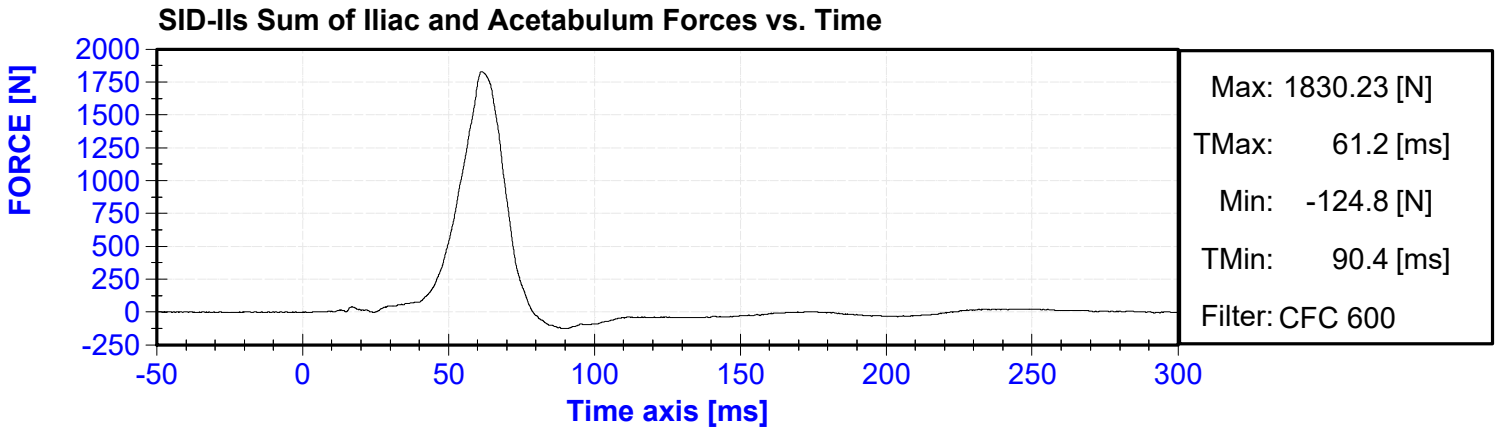
SID-IIs Head Resultant Acceleration vs. Time









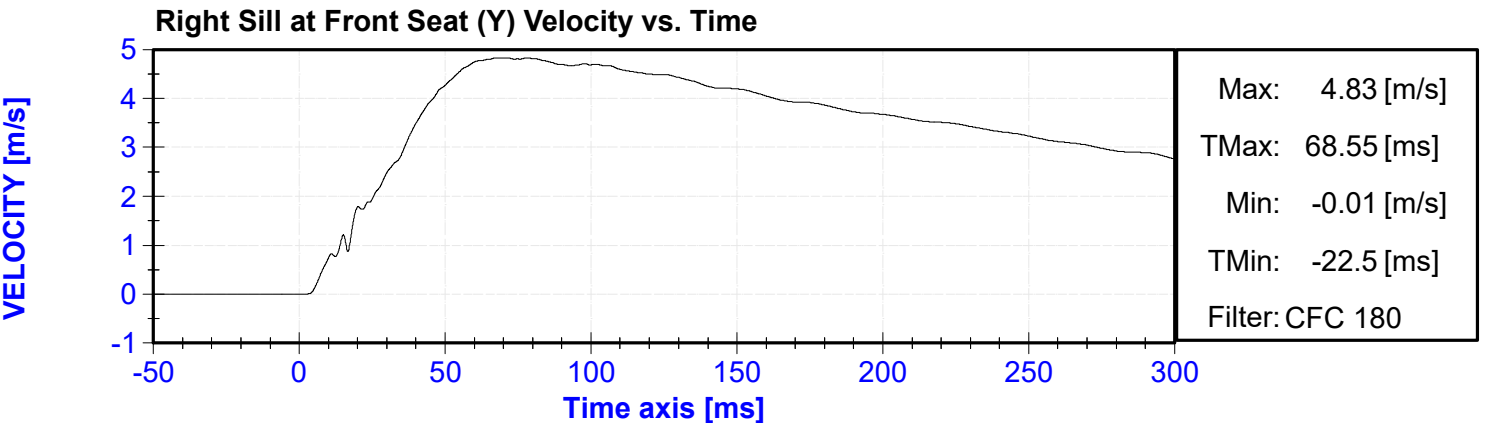
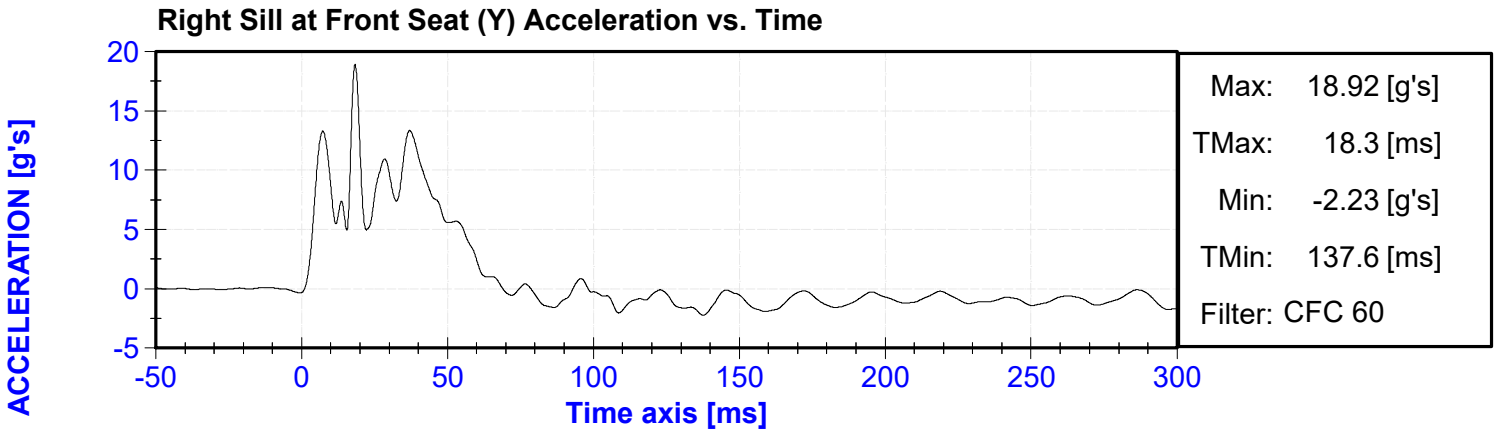
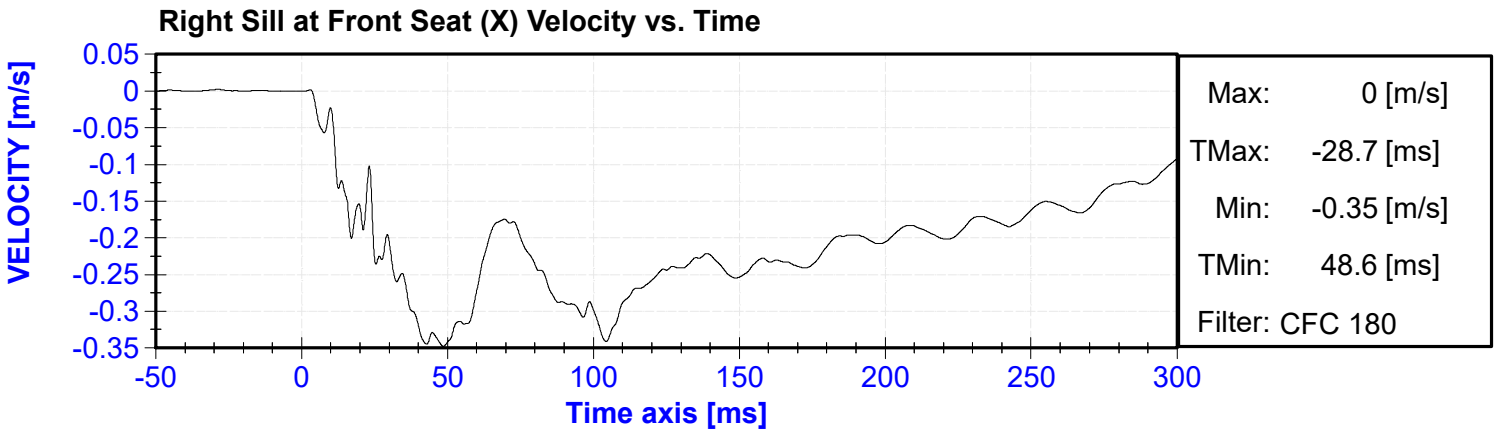
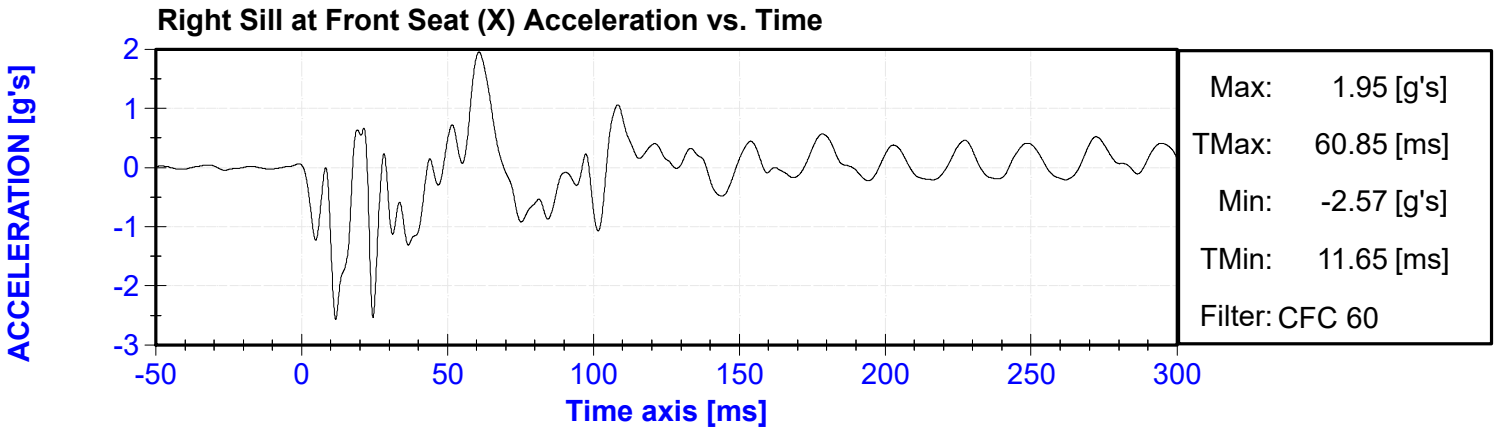


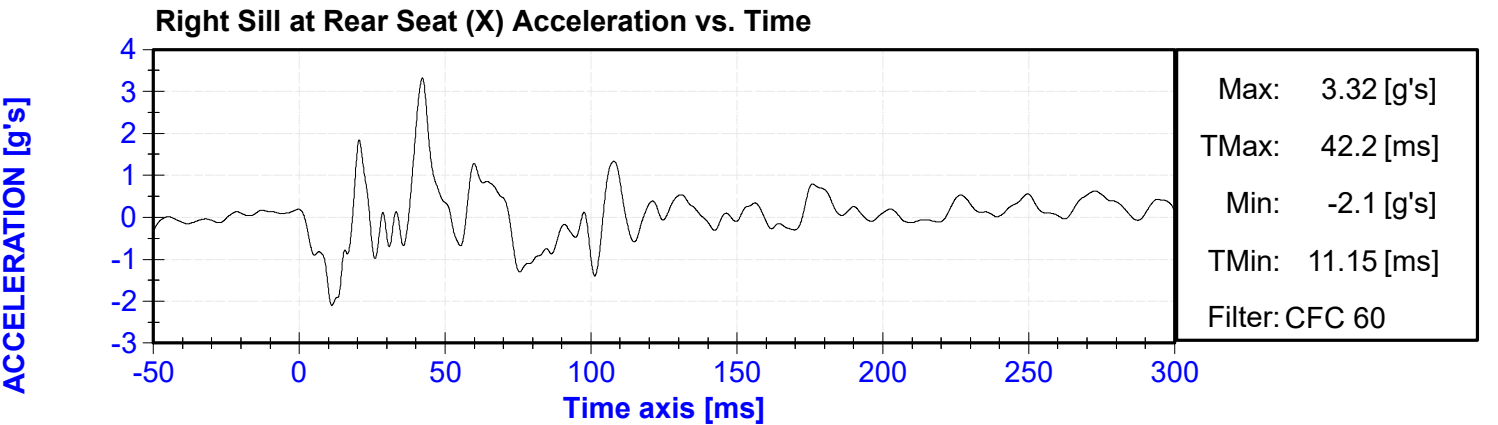
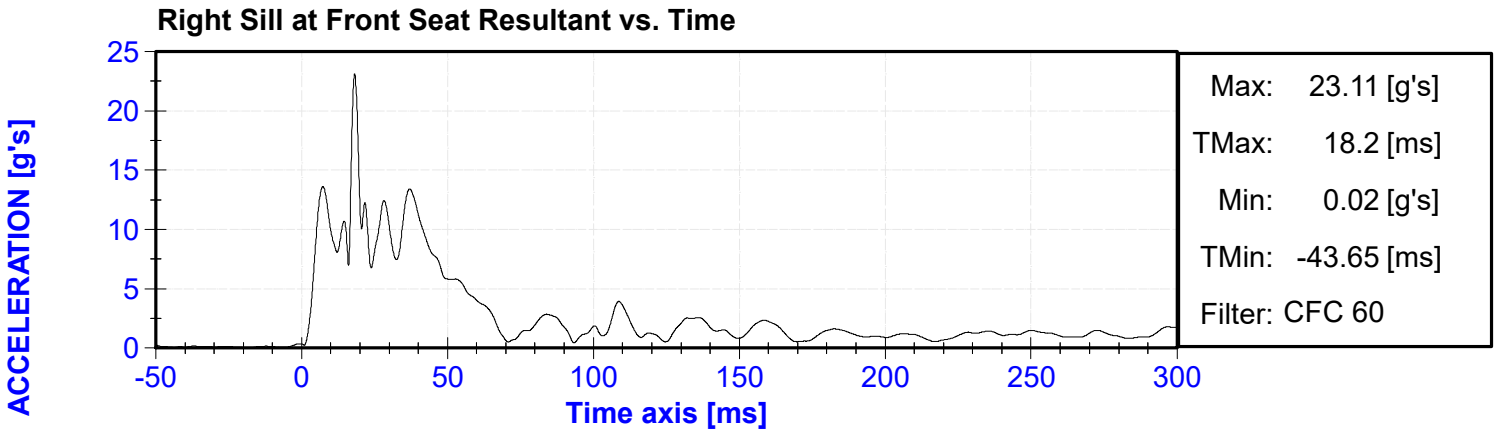
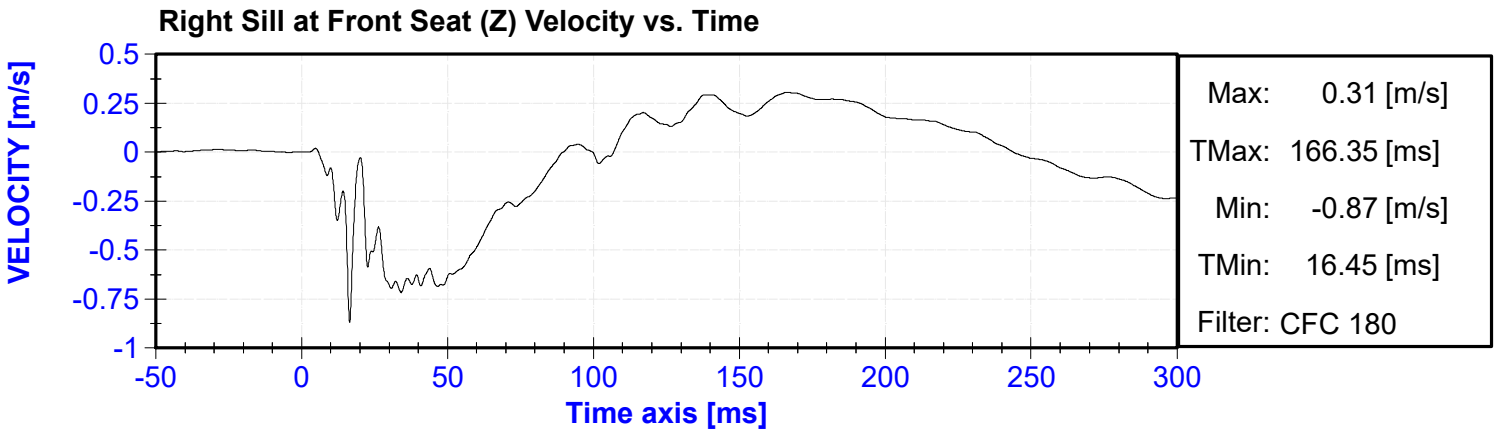
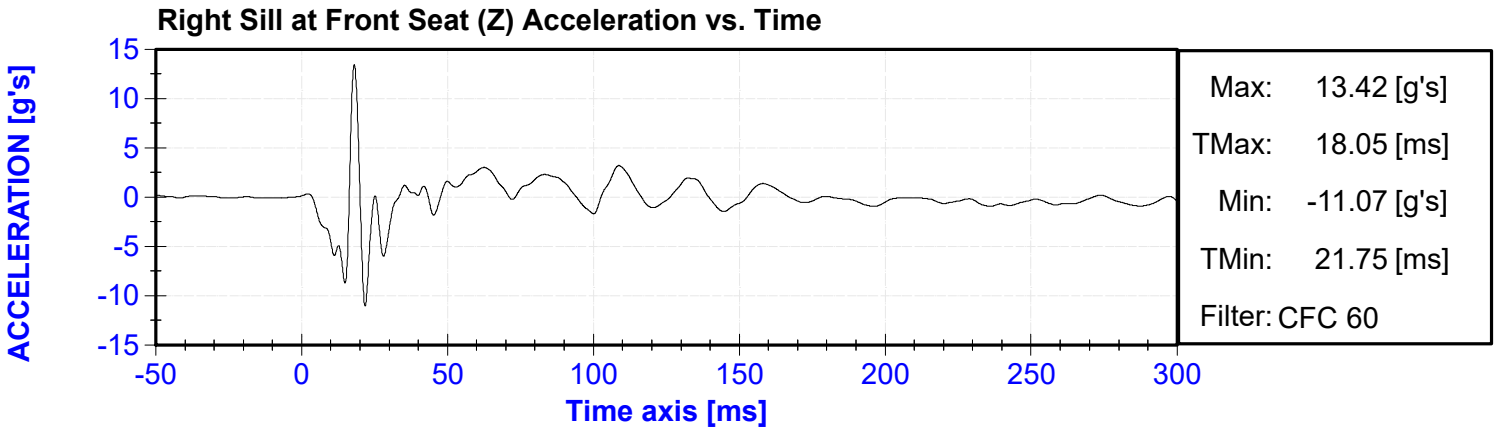
**APPENDIX IV
VEHICLE AND MDB ACCELEROMETER RESPONSE
DATA**

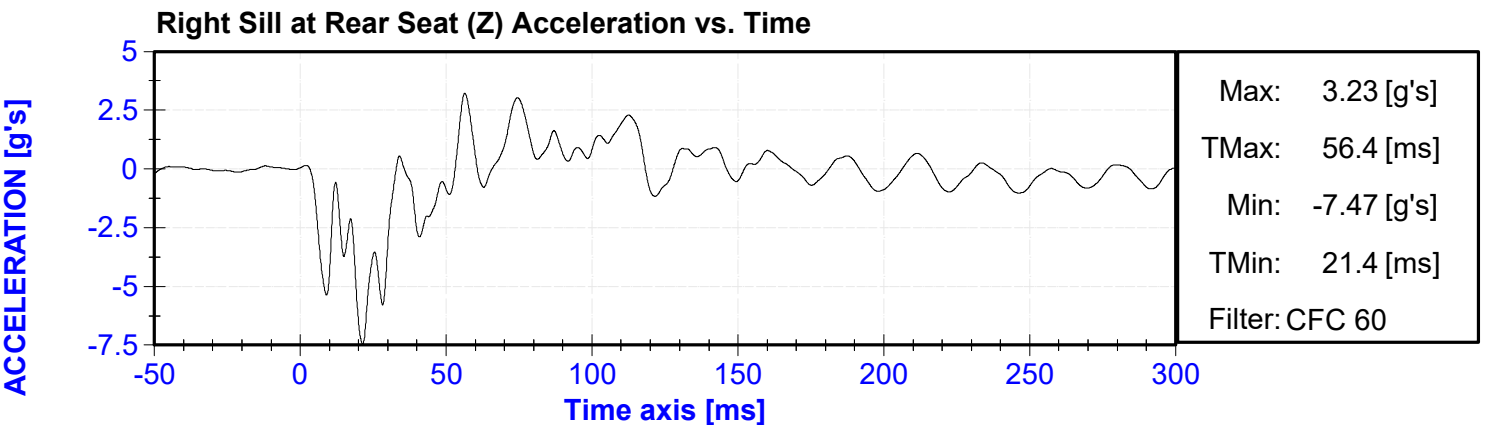
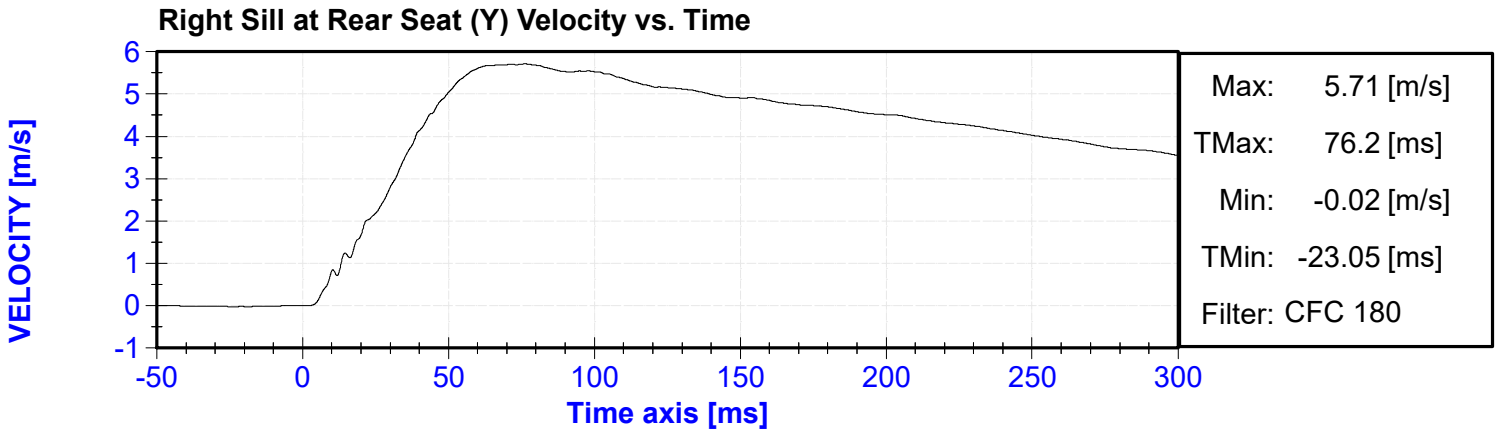
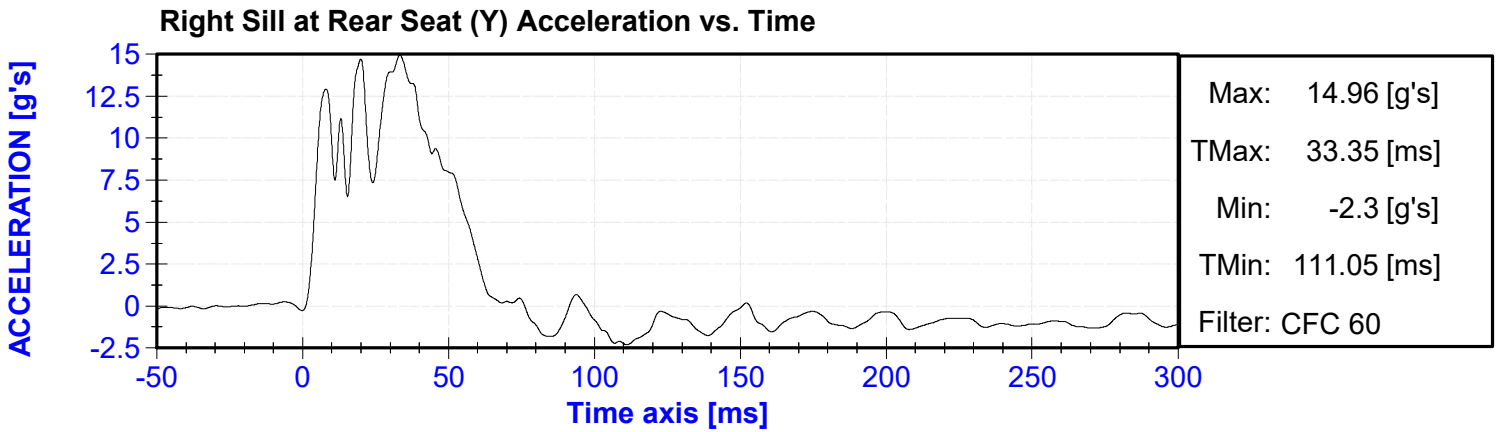
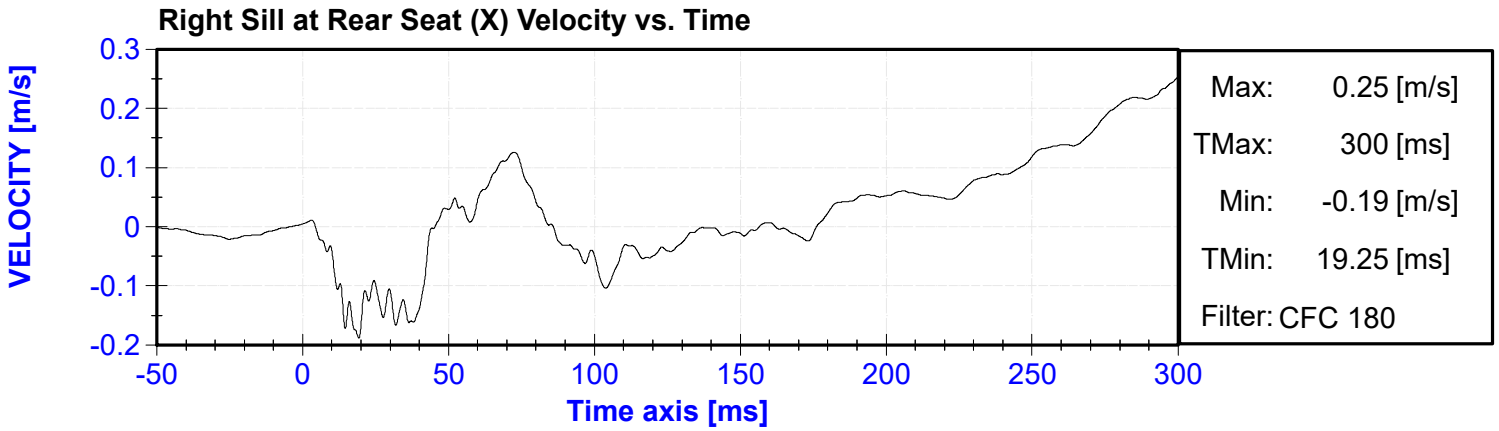
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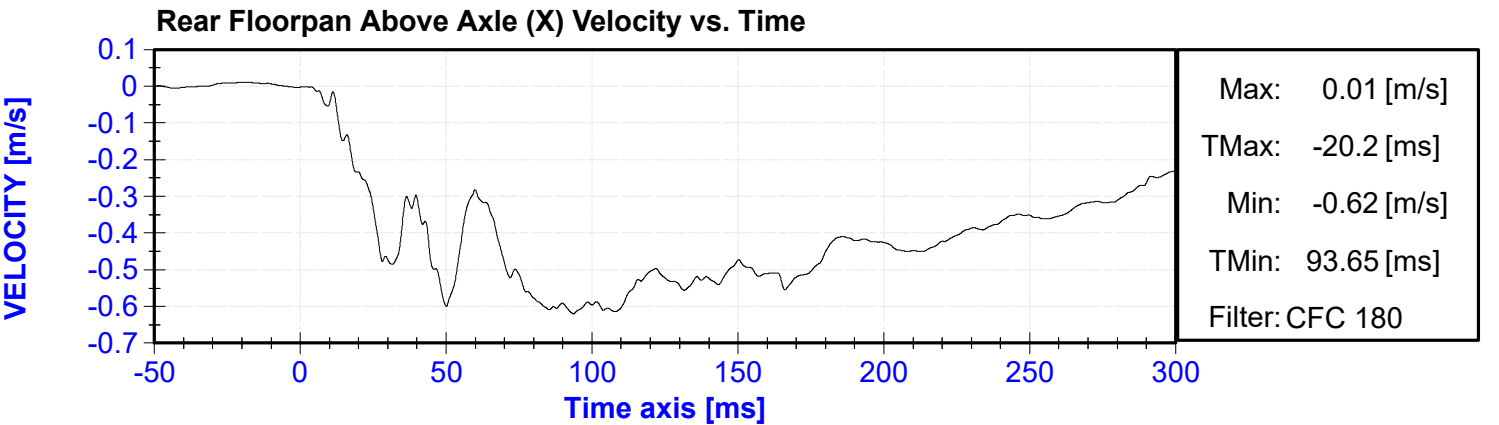
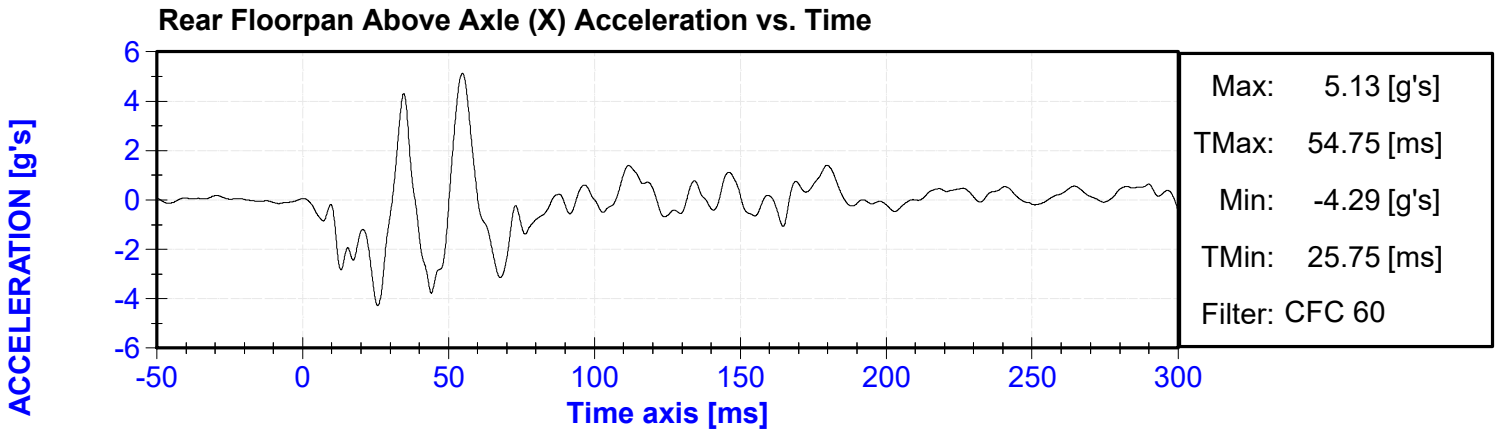
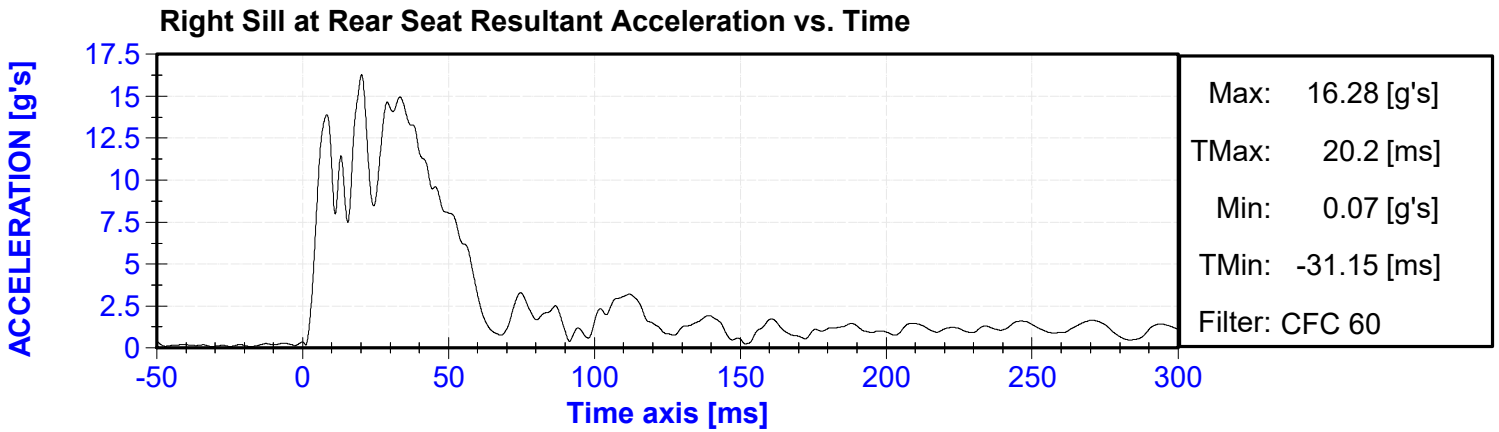
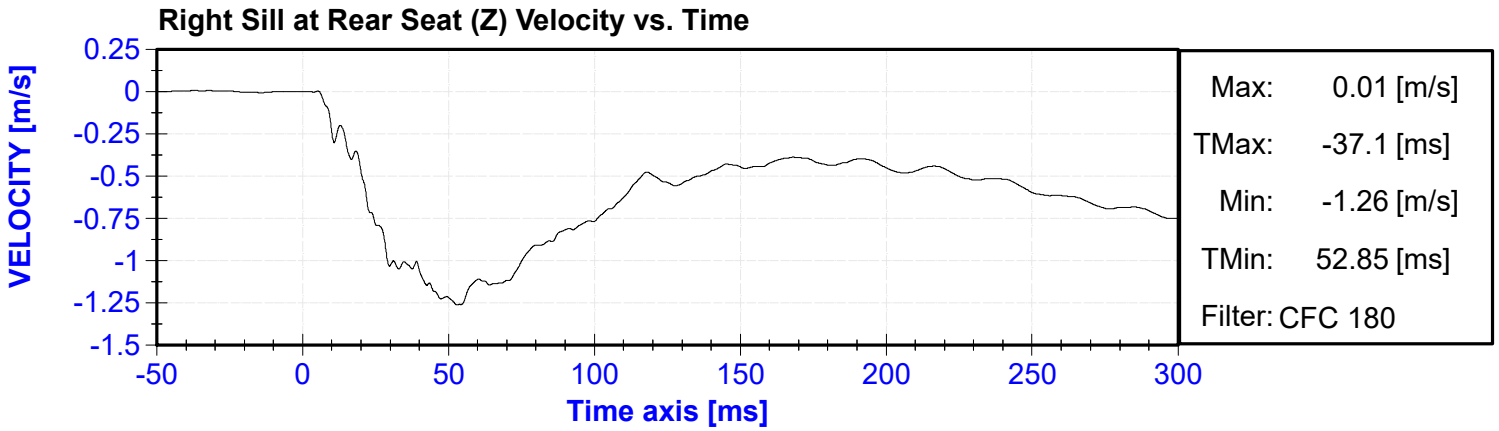
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1	Right Sill at Front Seat (X) Acceleration vs. Time	IV-4
2	Right Sill at Front Seat (X) Velocity vs. Time	IV-4
3	Right Sill at Front Seat (Y) Acceleration vs. Time	IV-4
4	Right Sill at Front Seat (Y) Velocity vs. Time	IV-4
5	Right Sill at Front Seat (Z) Acceleration vs. Time	IV-5
6	Right Sill at Front Seat (Z) Velocity vs. Time	IV-5
7	Right Sill at Front Seat Resultant vs. Time	IV-5
8	Right Sill at Rear Seat (X) Acceleration vs. Time	IV-5
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39	Rear Seat Track or Structure (Y) Velocity vs. Time	IV-13
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51	MDB Center of Gravity (Z) Acceleration vs. Time	IV-16
52	MDB Center of Gravity (Z) Velocity vs. Time	IV-16

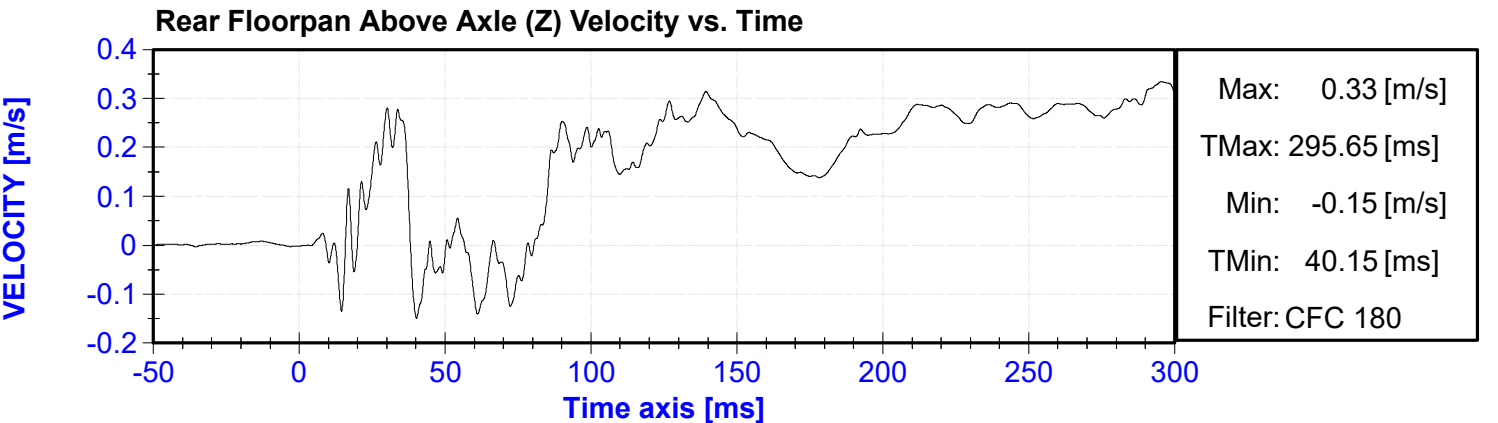
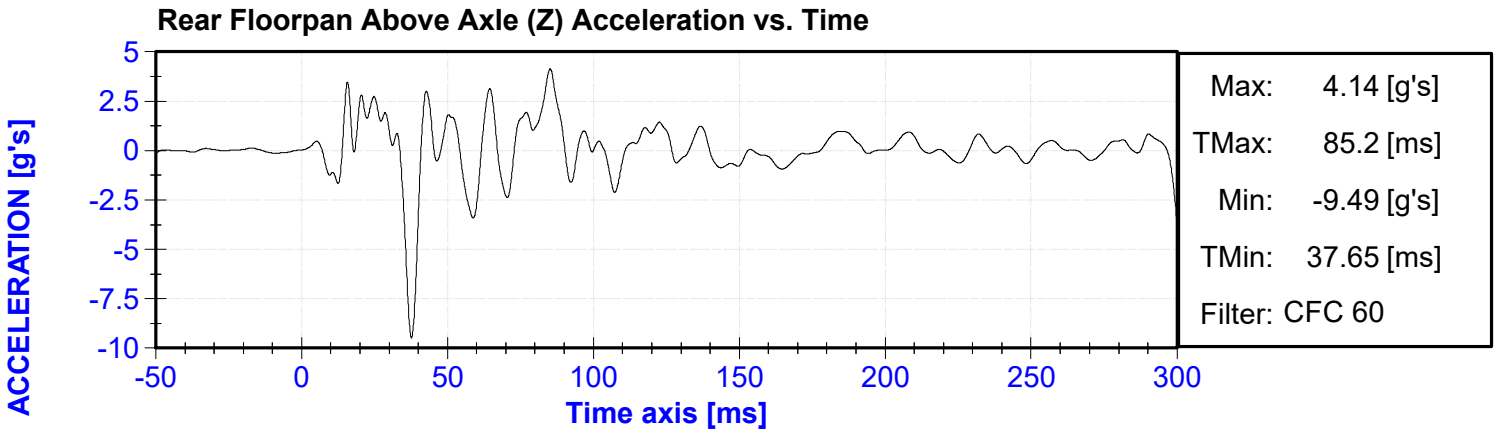
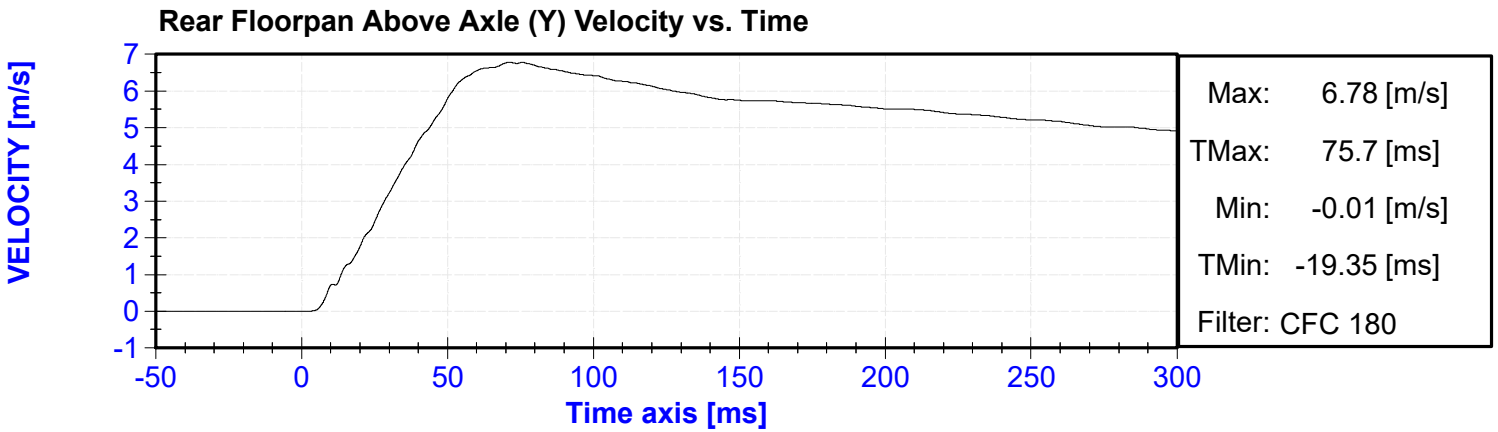
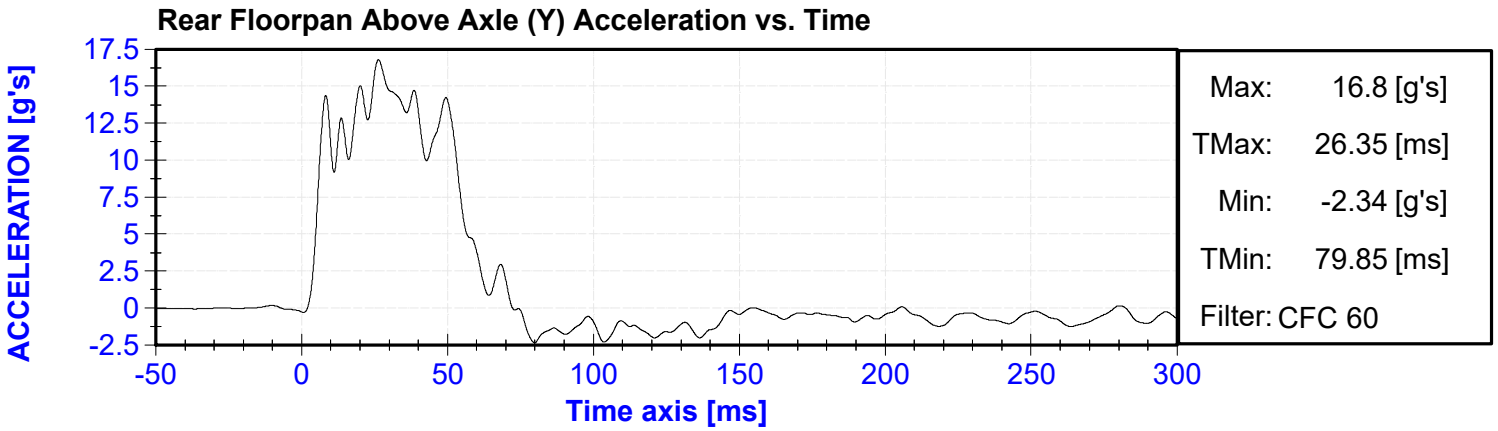
53	MDB Center of Gravity Resultant Acceleration vs. Time	IV-17
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55	MDB Rear (X) Velocity vs. Time	IV-17
56	MDB Rear (Y) Acceleration vs. Time	IV-17
57	MDB Rear (Y) Velocity vs. Time	IV-18

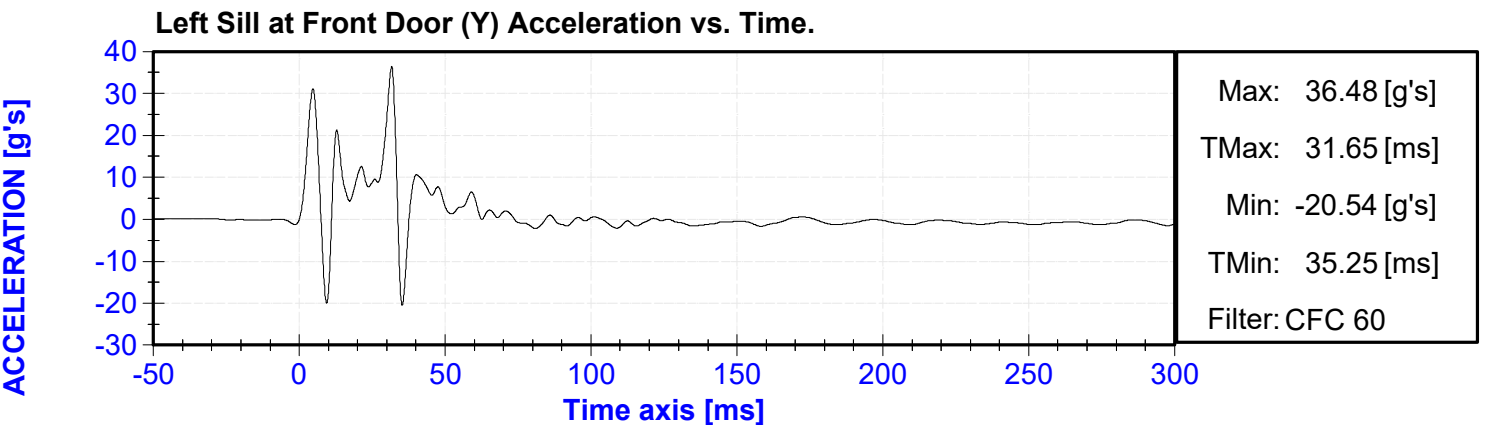
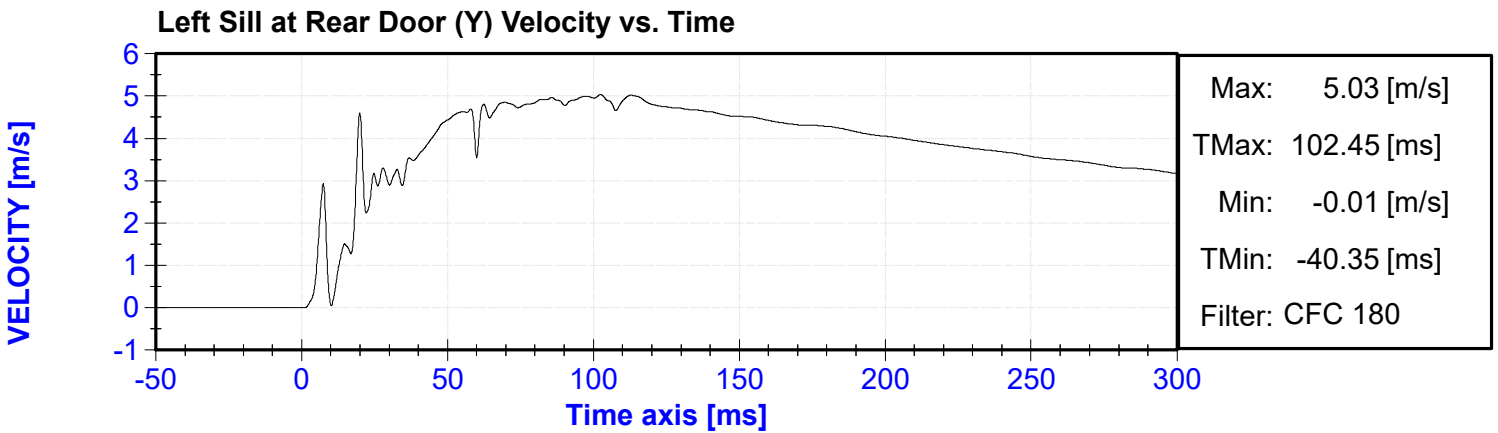
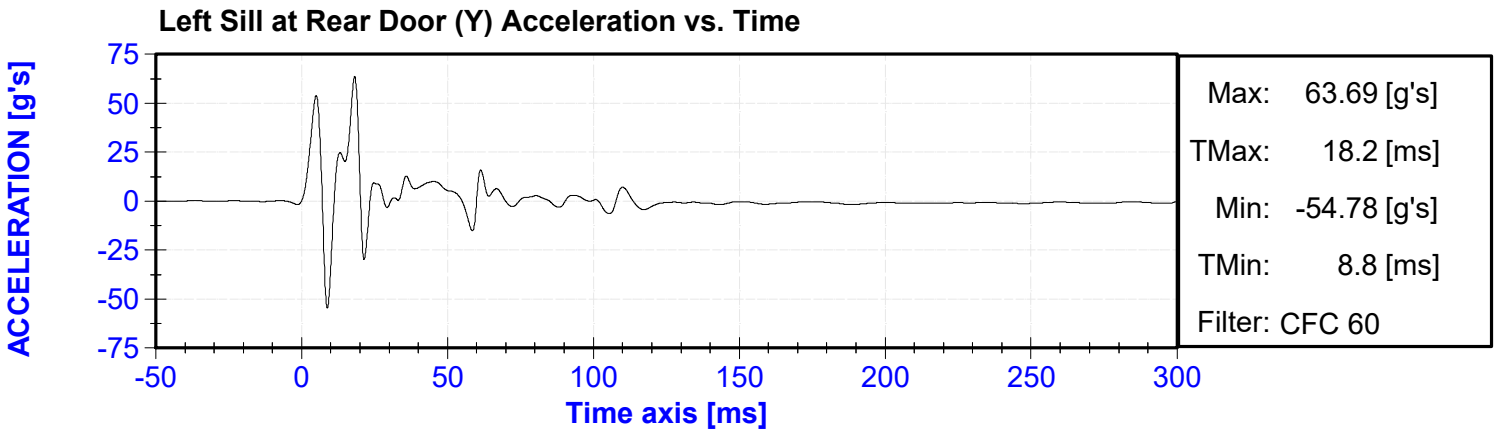
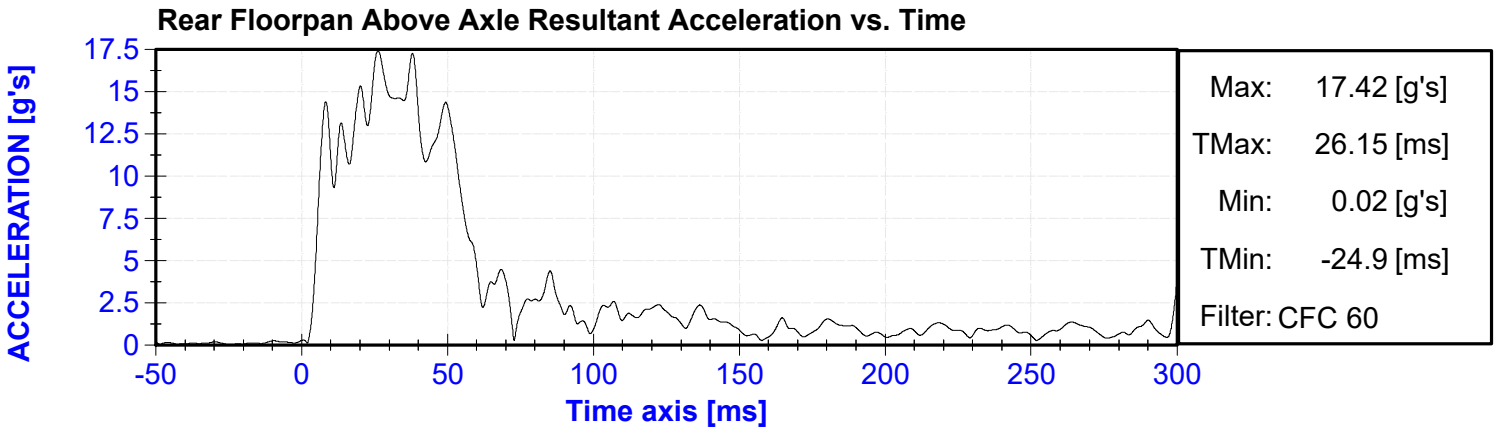


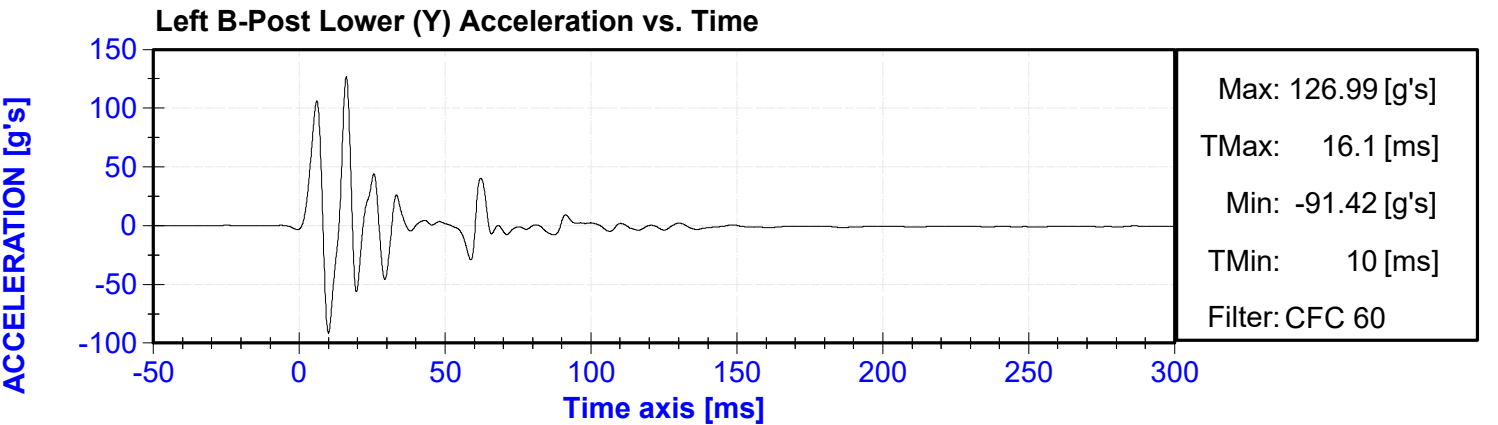
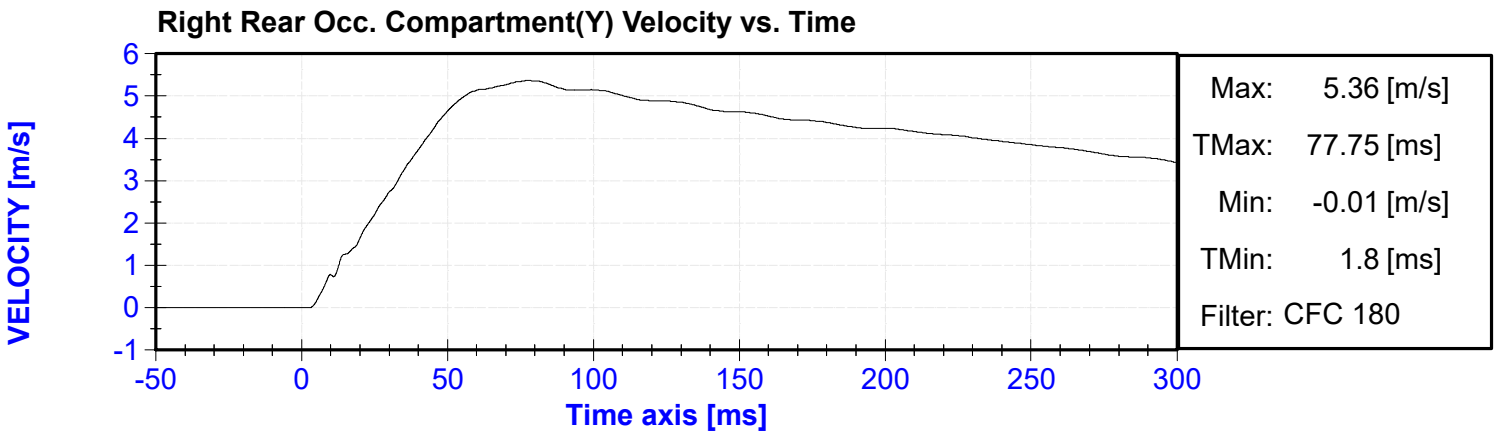
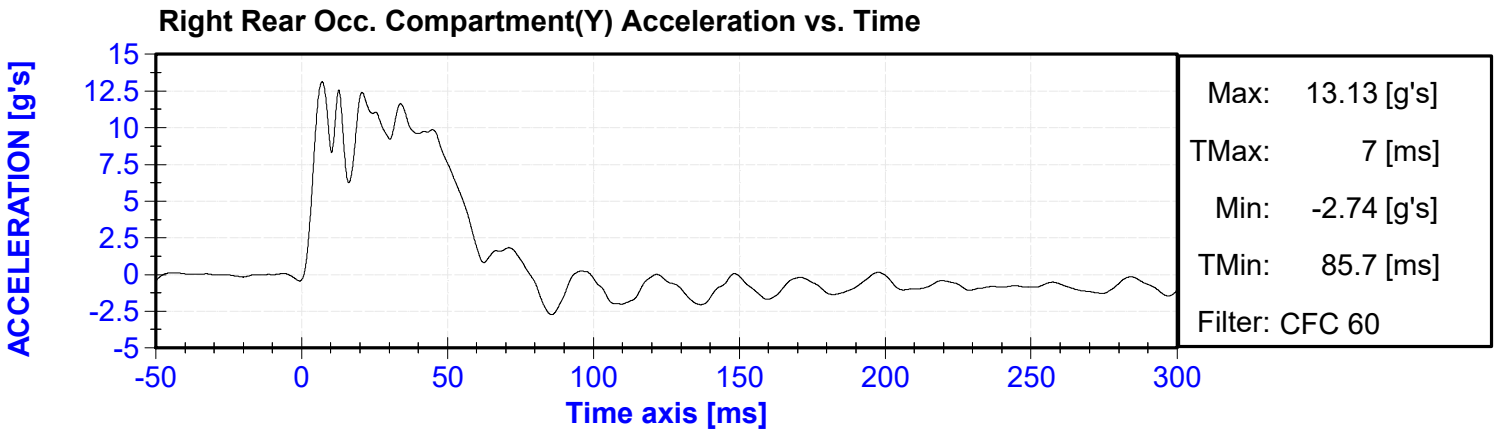
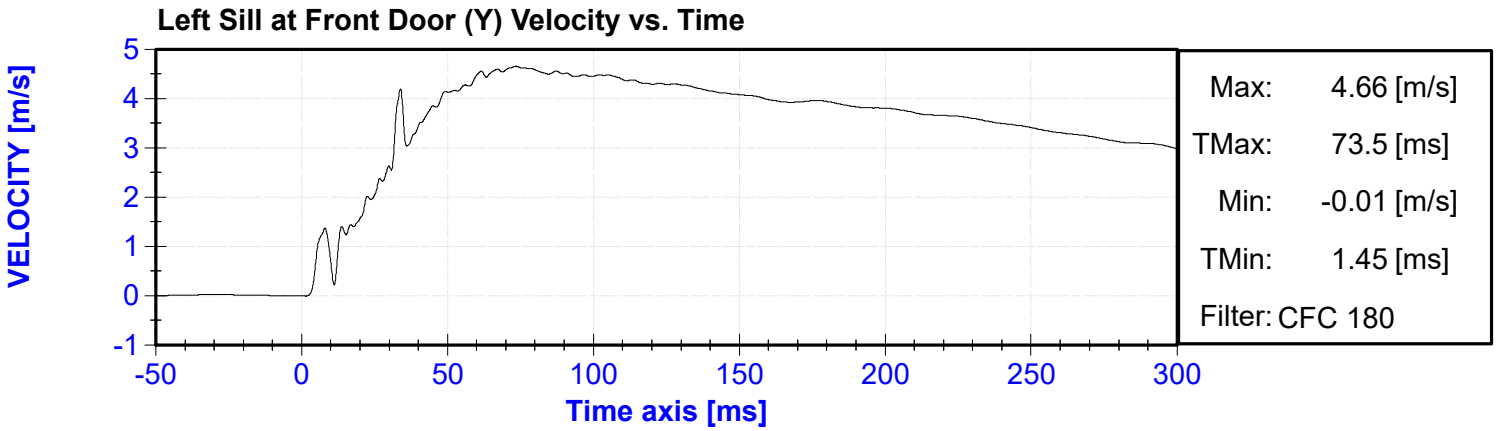


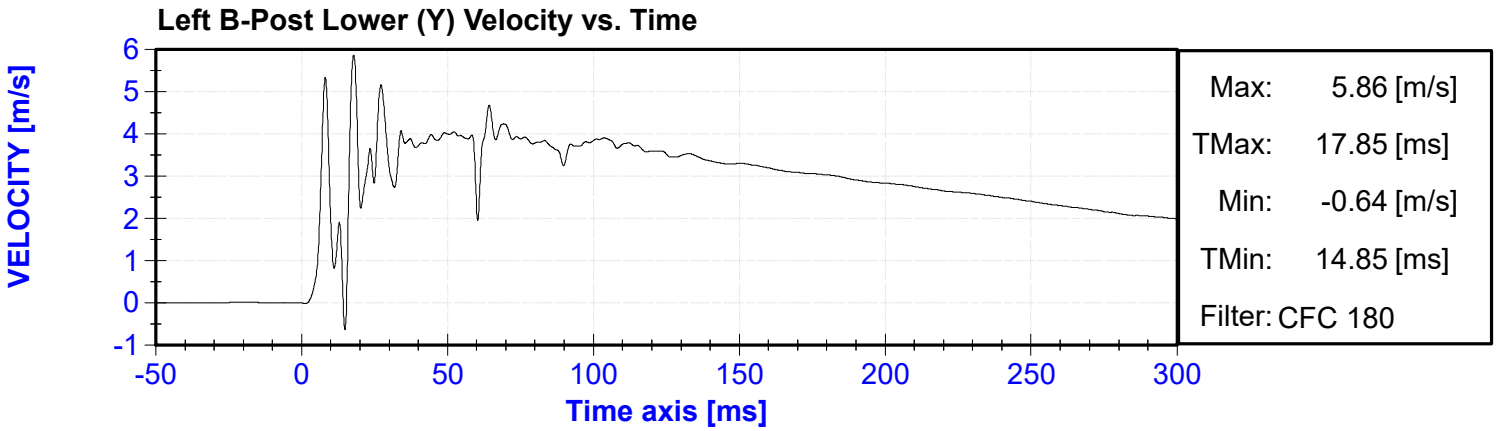




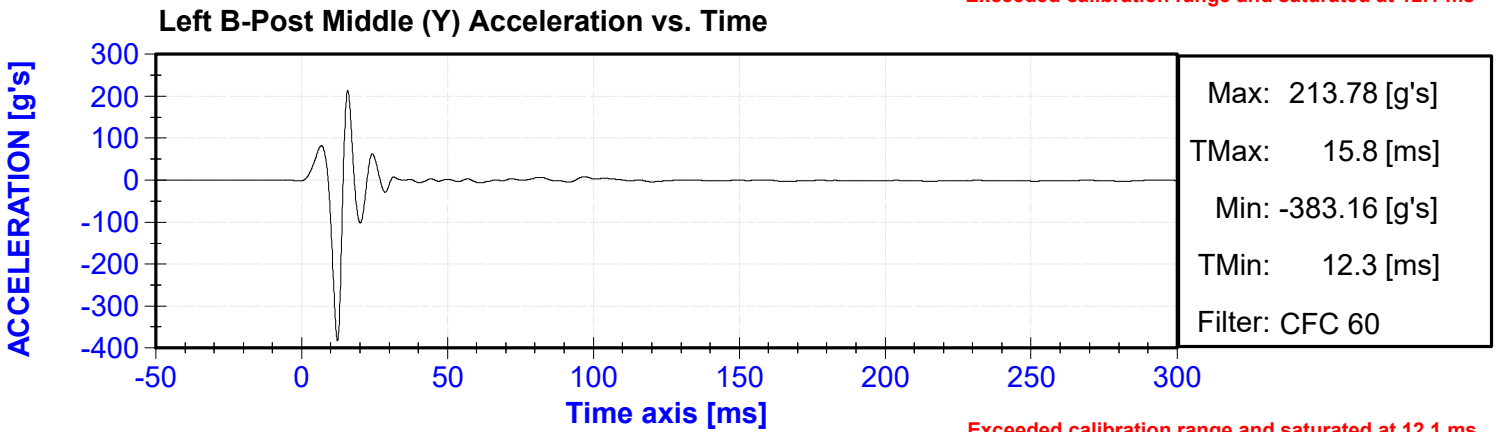




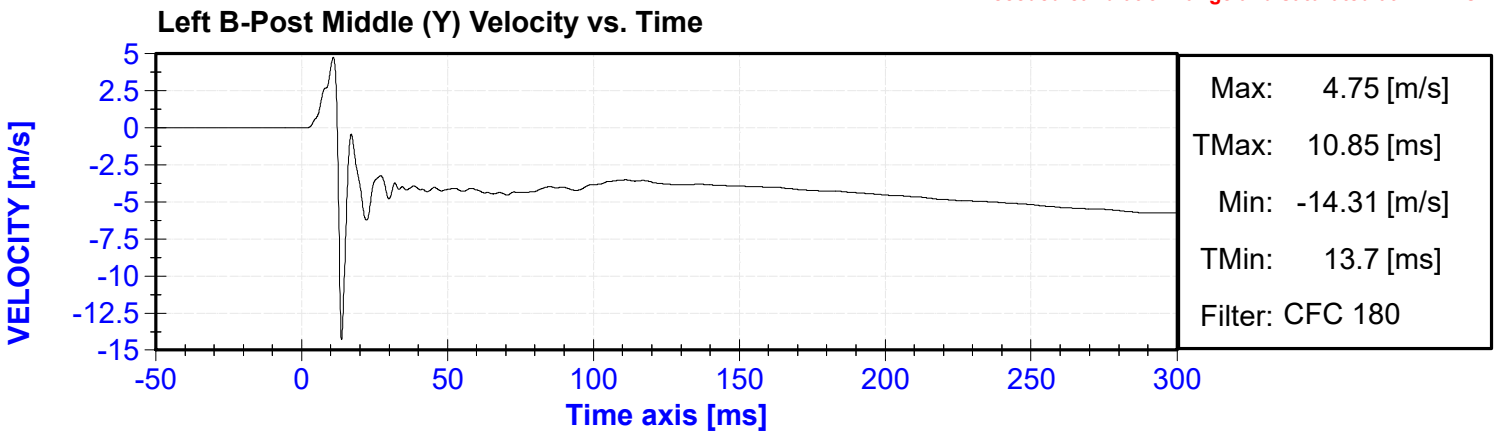




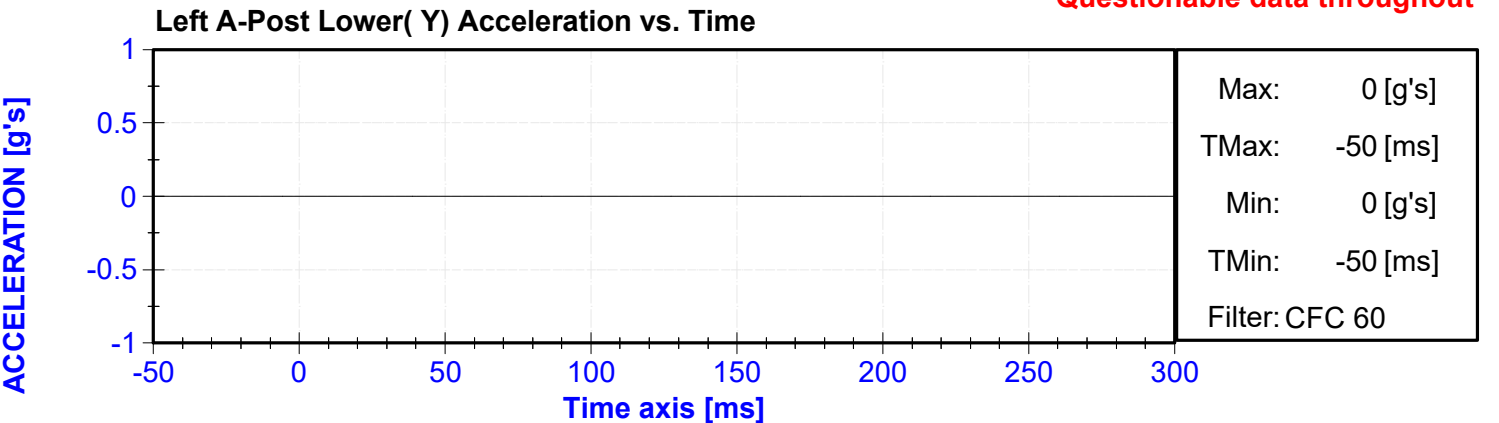
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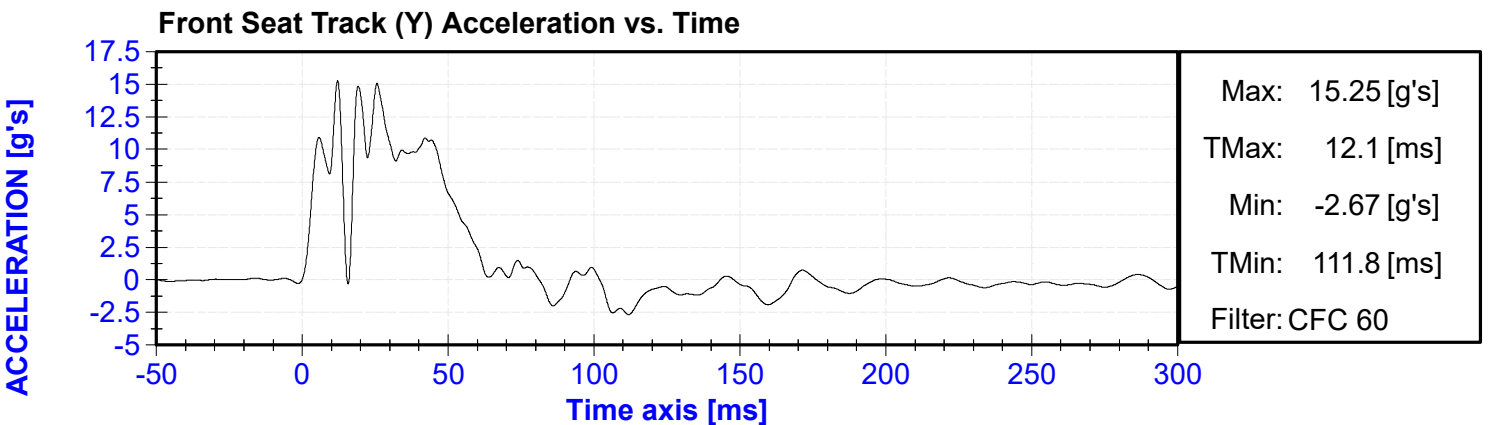
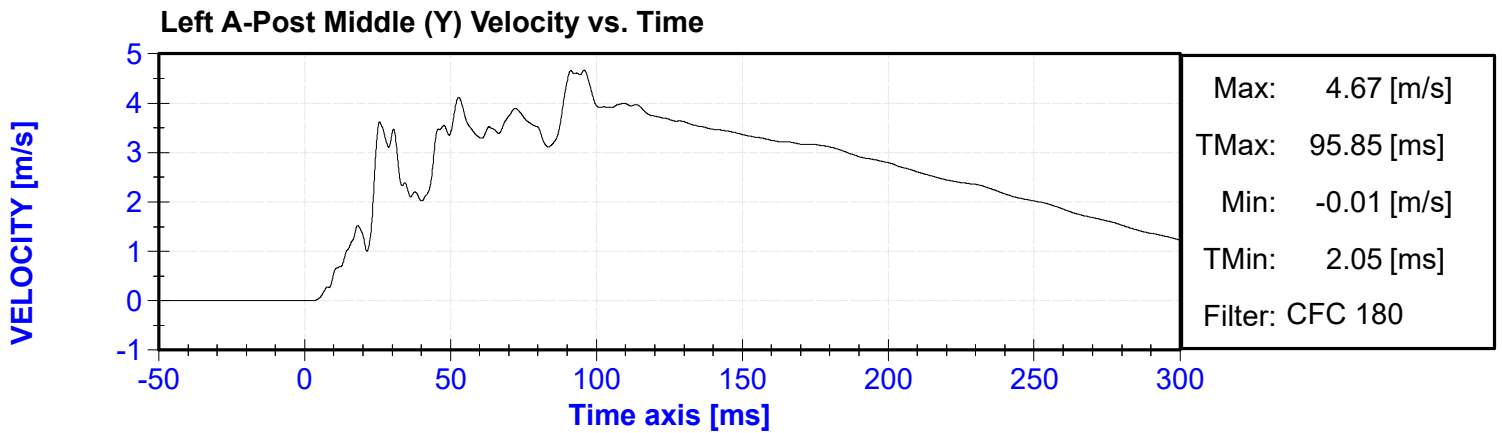
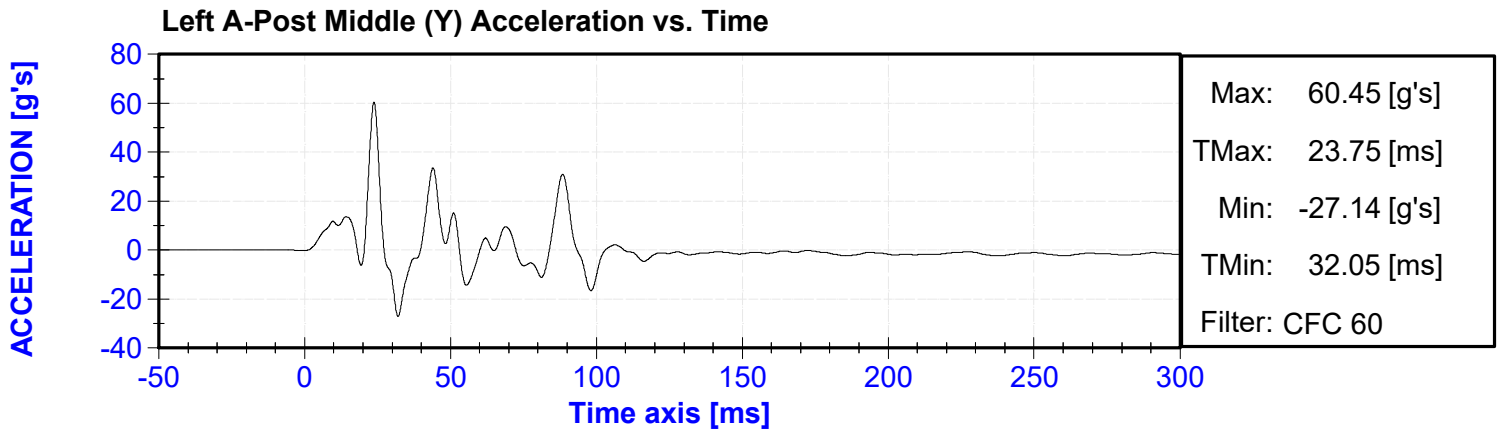
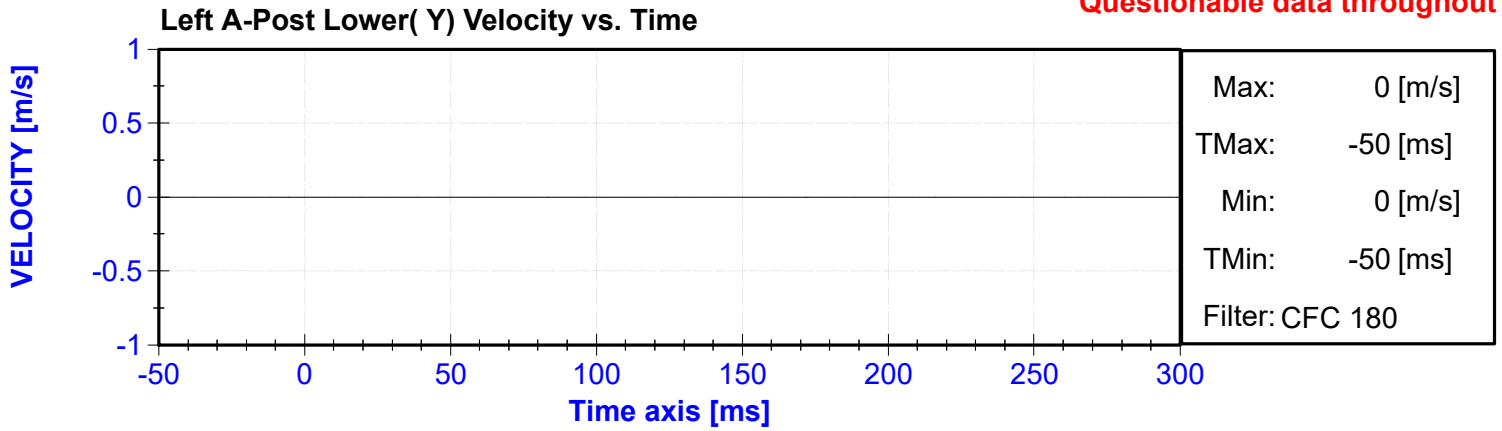
Exceeded calibration range and saturated at 12.1 ms

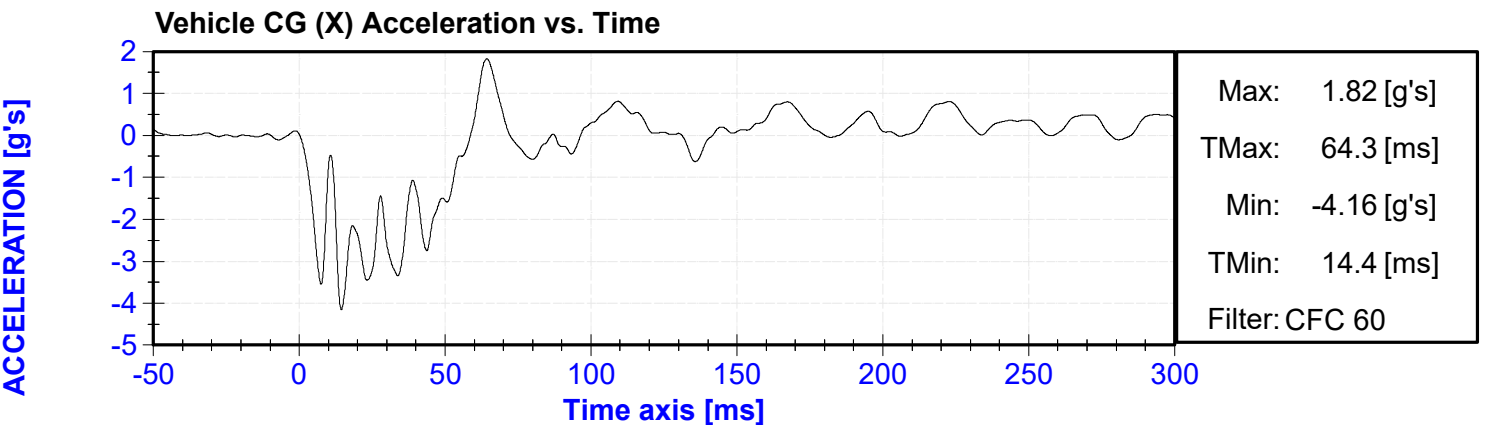
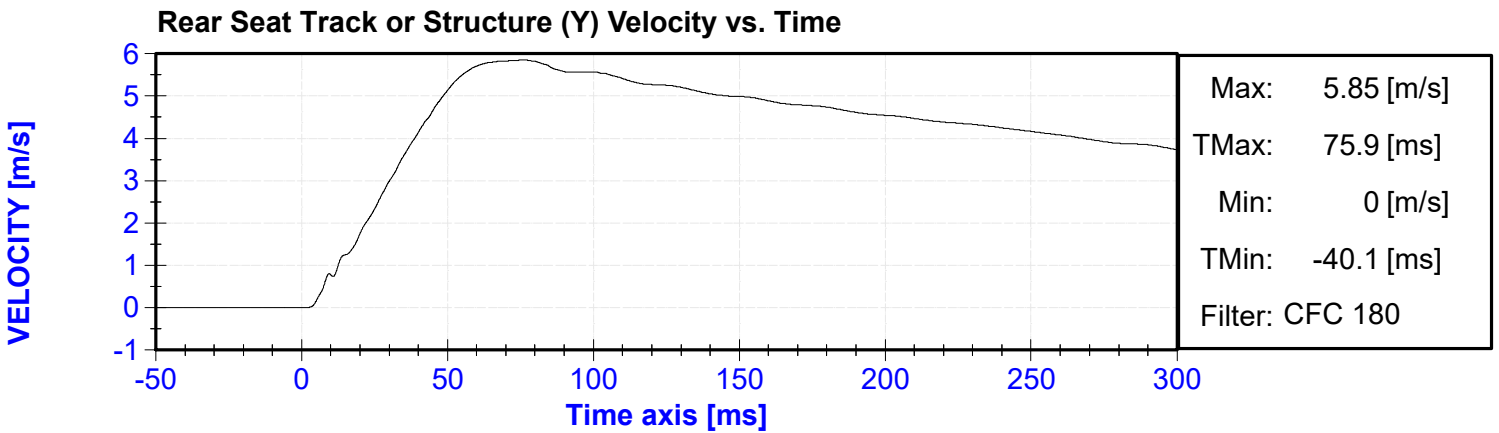
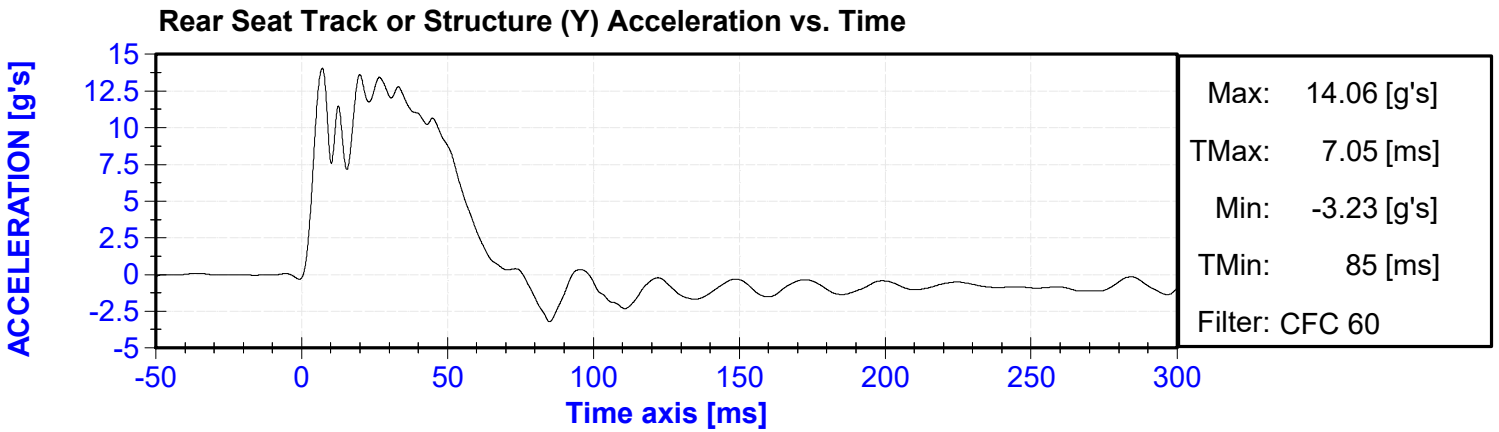
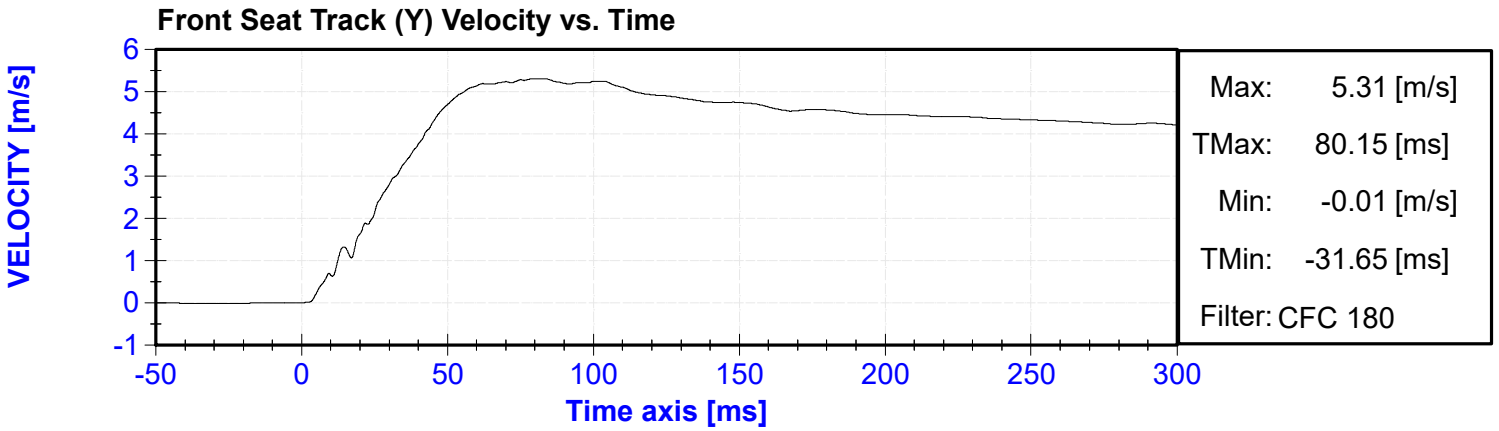


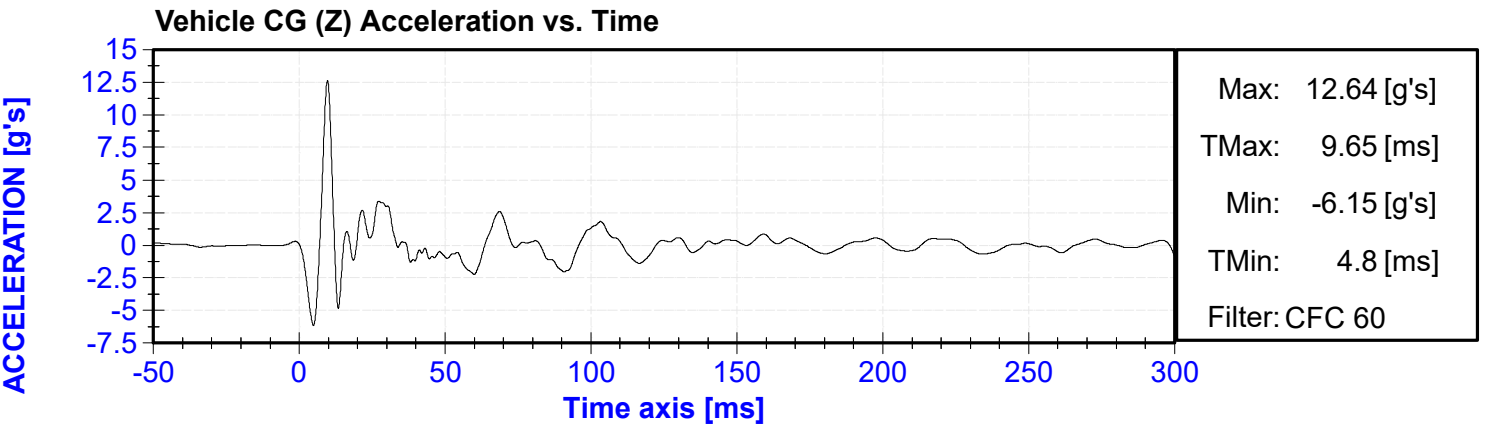
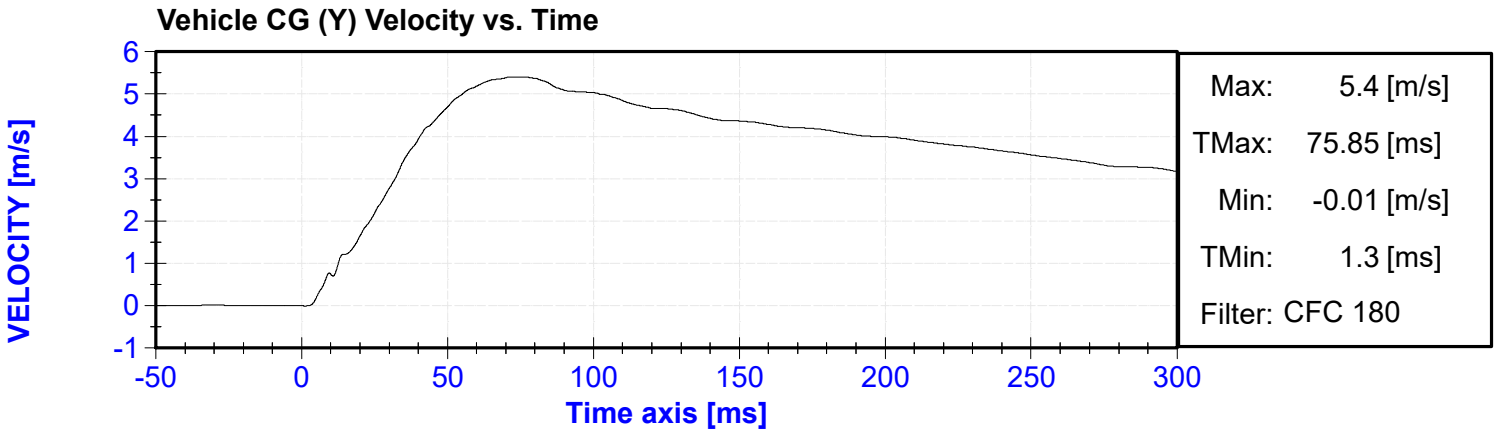
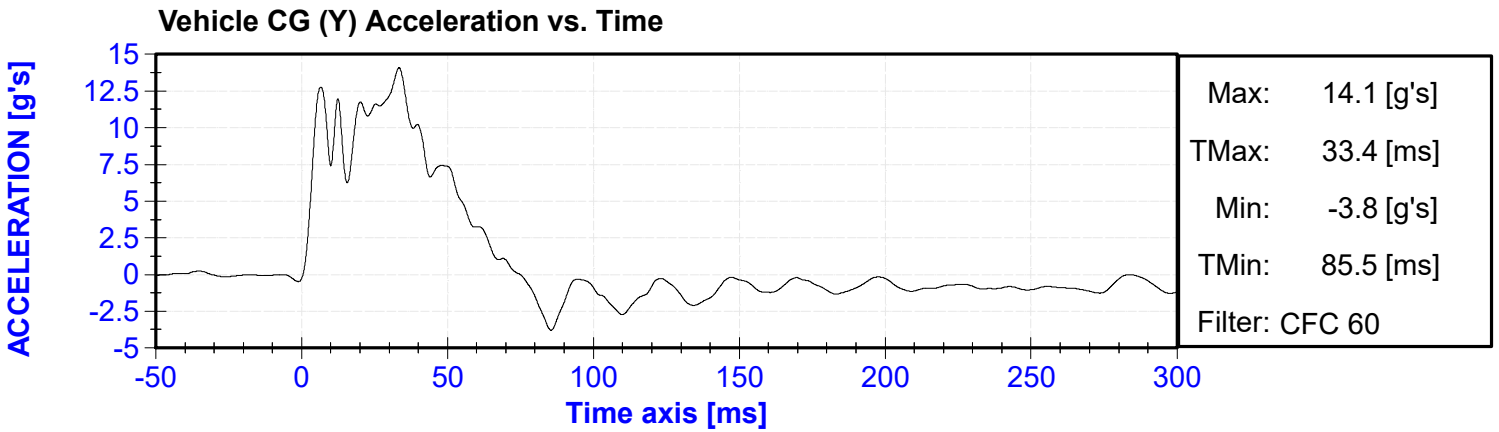
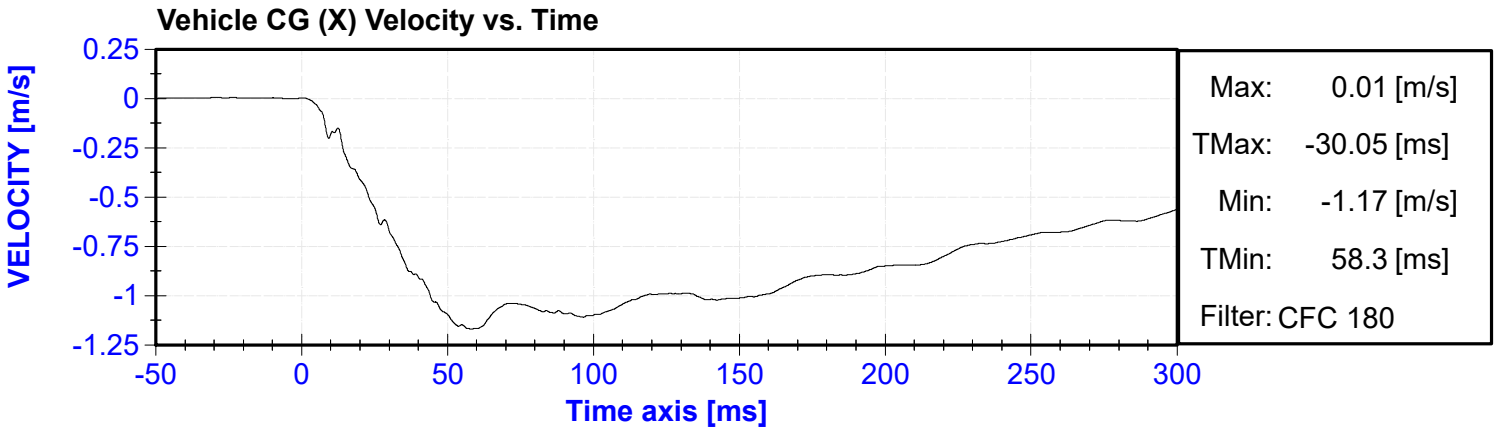
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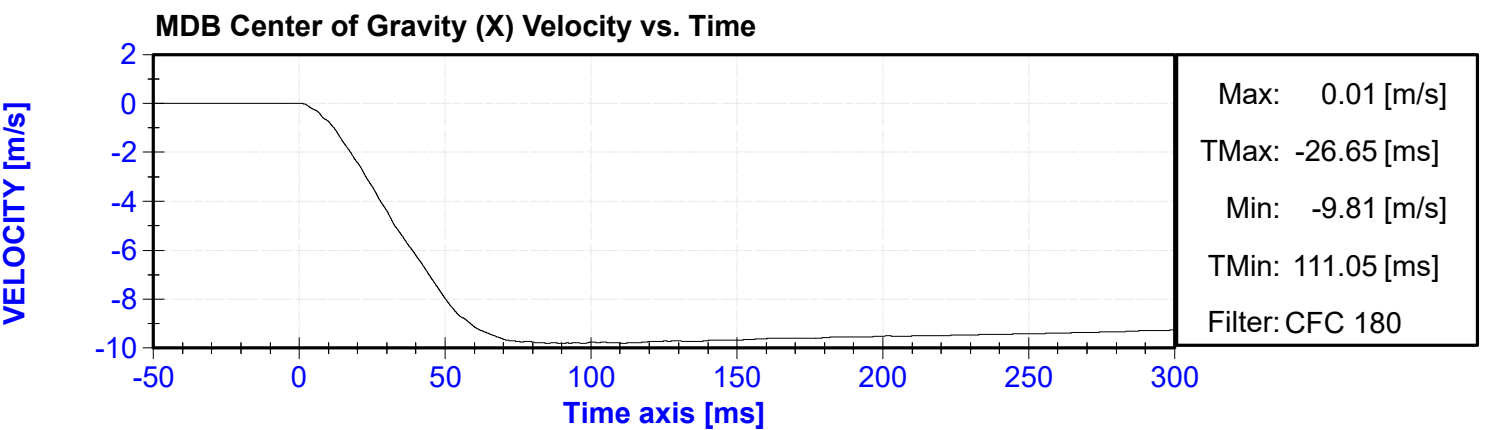
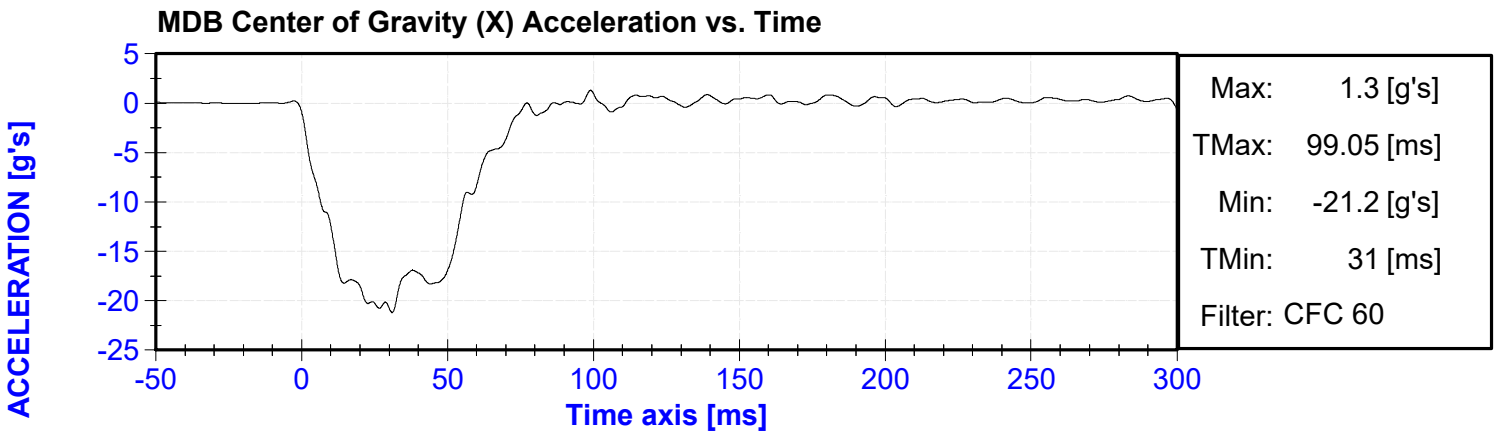
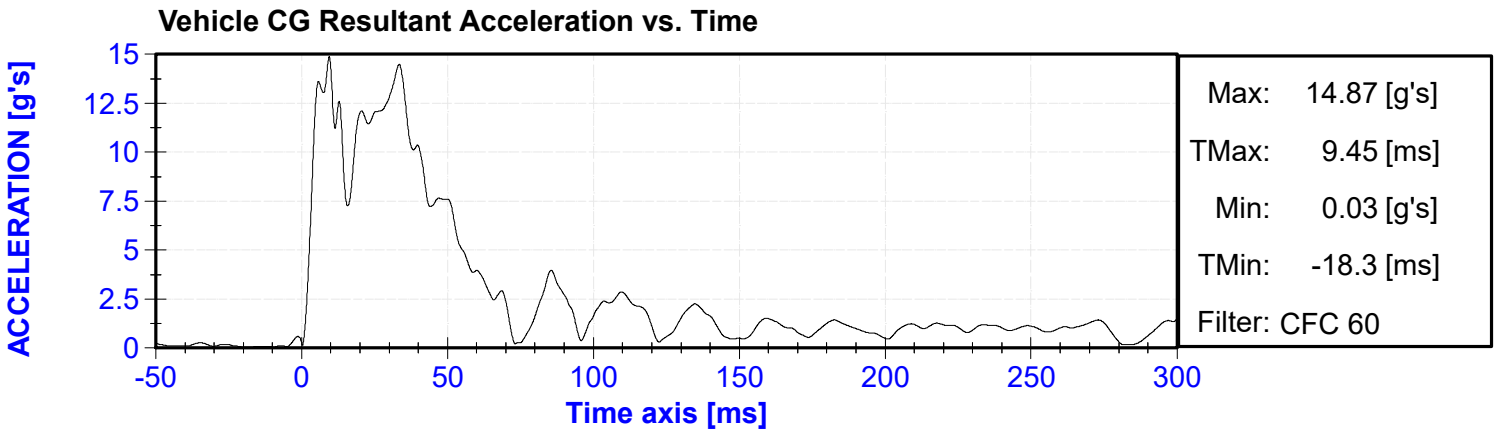
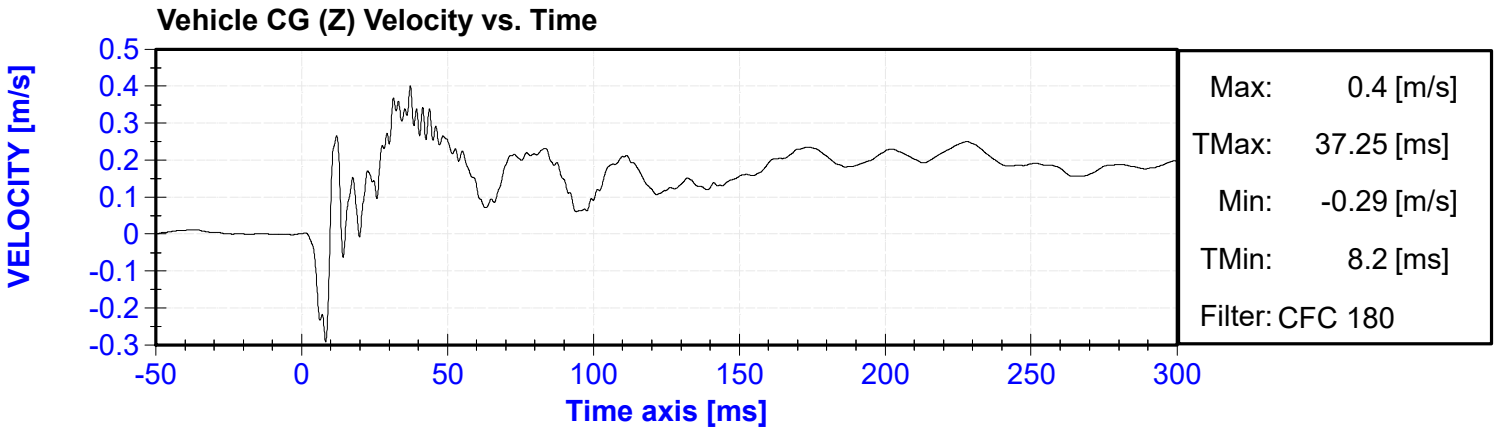


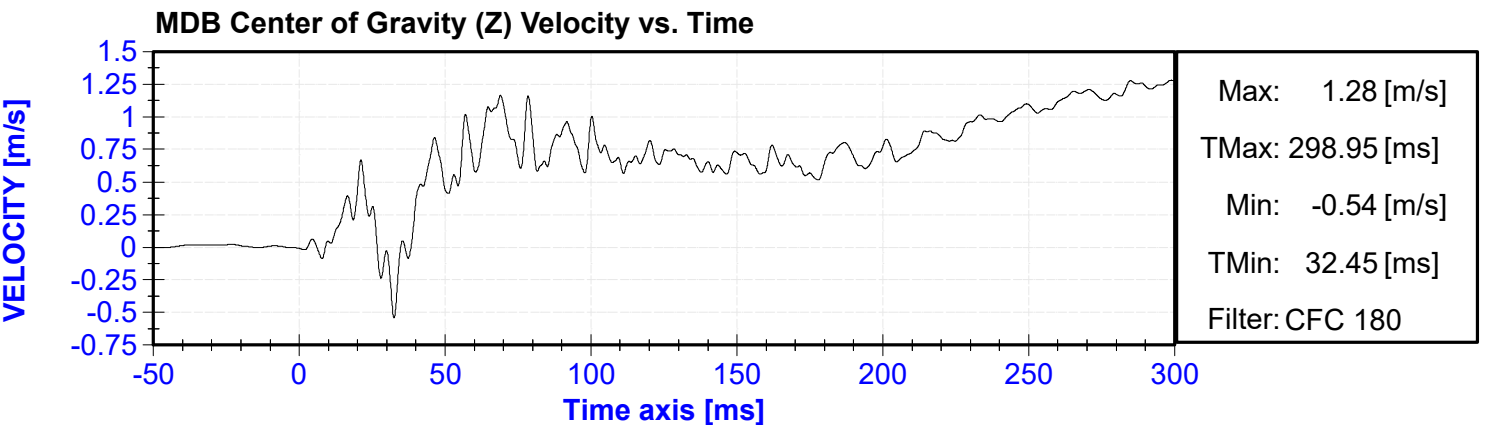
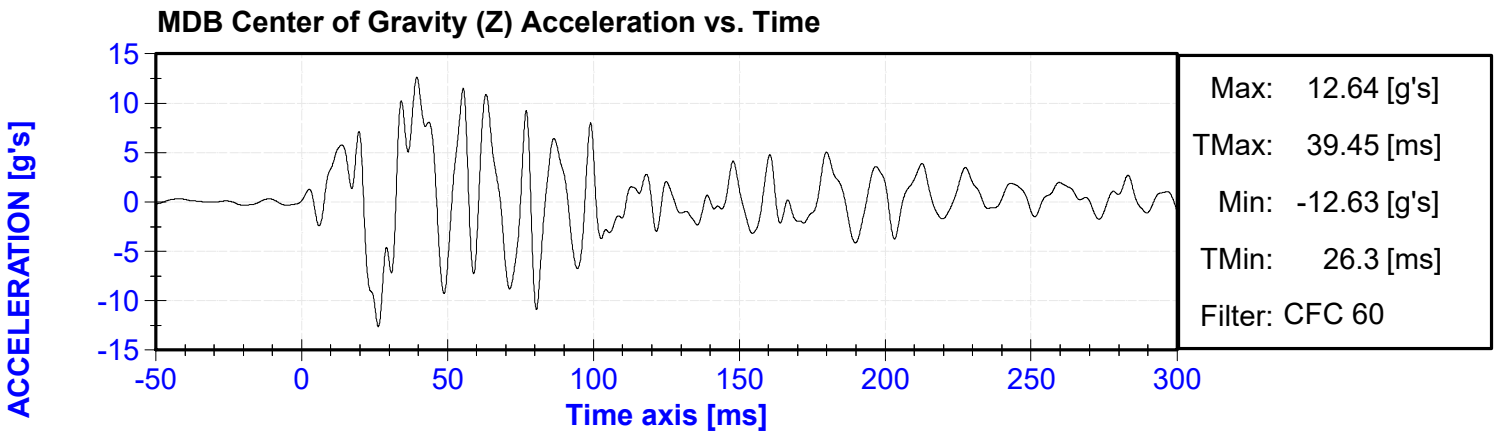
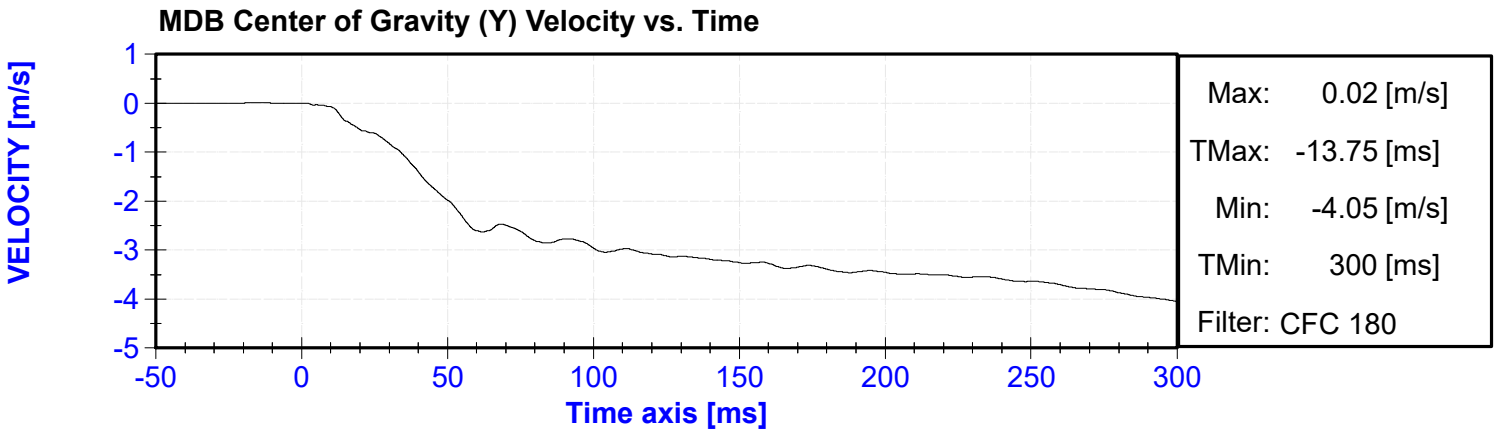
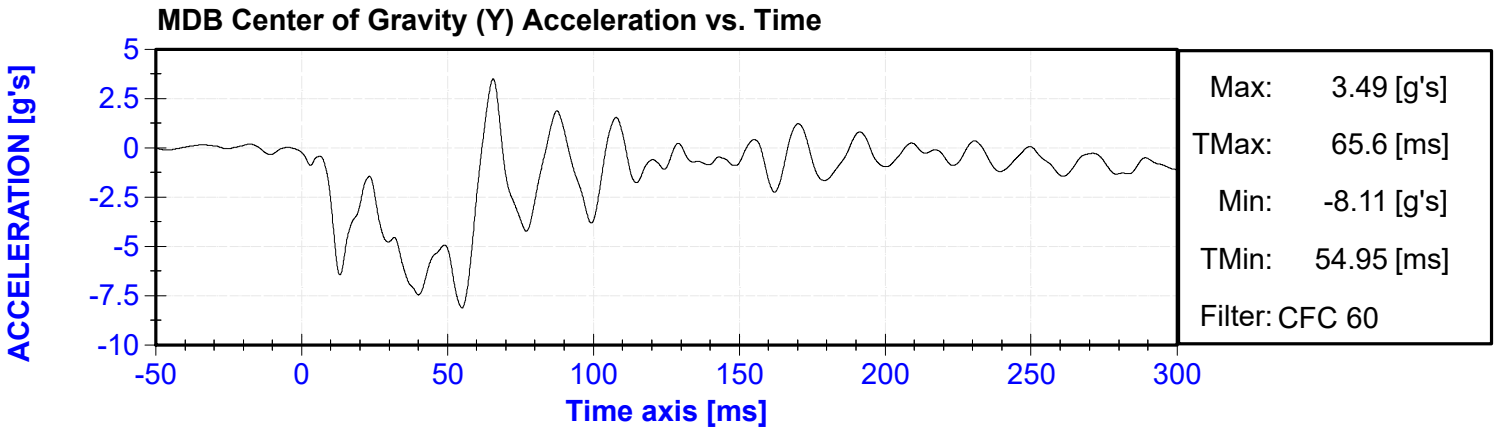
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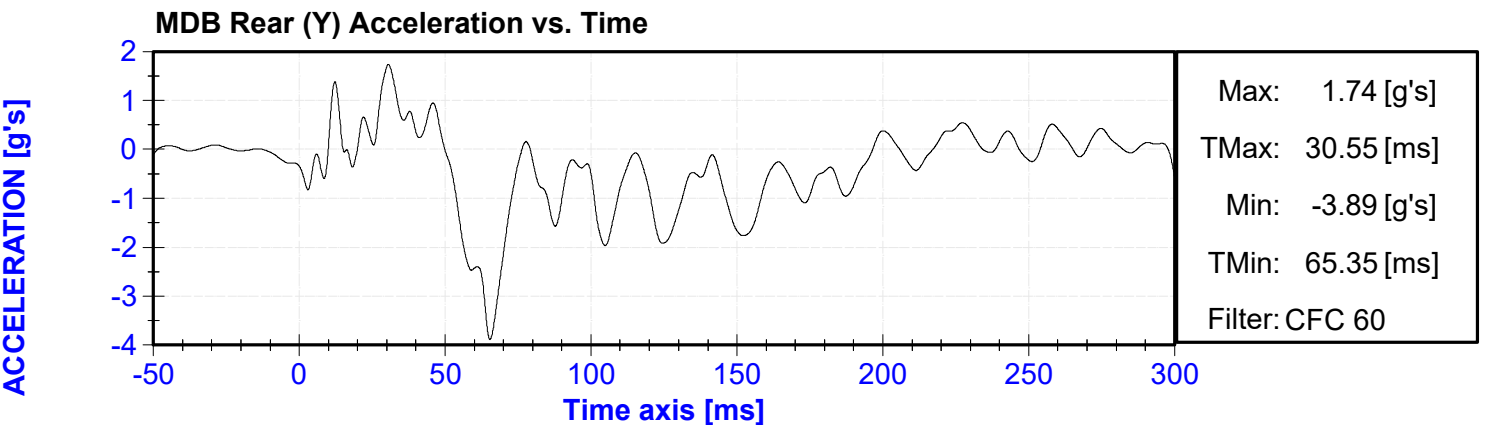
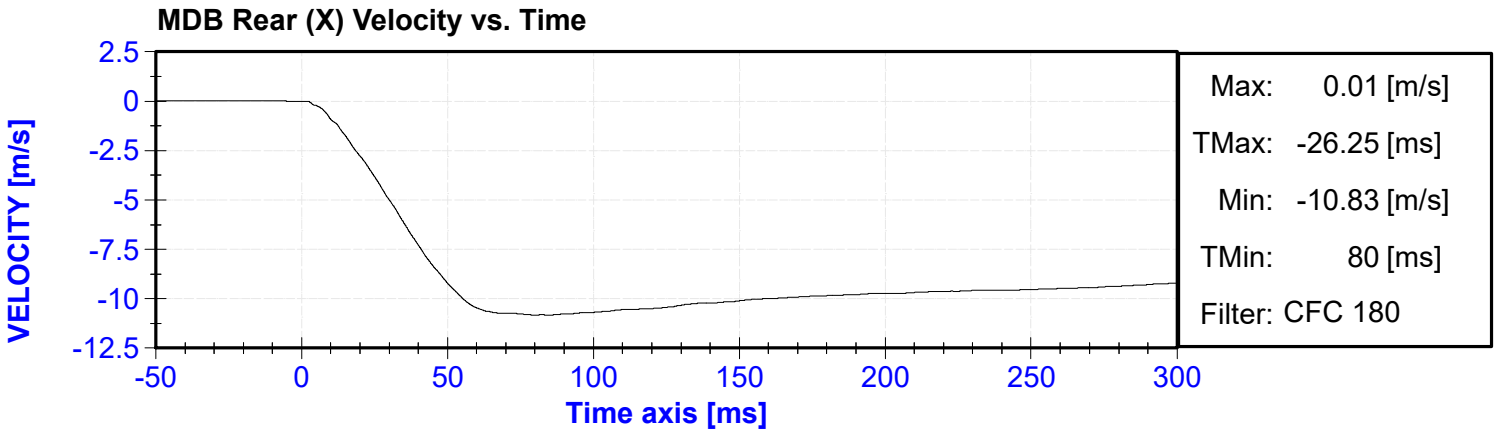
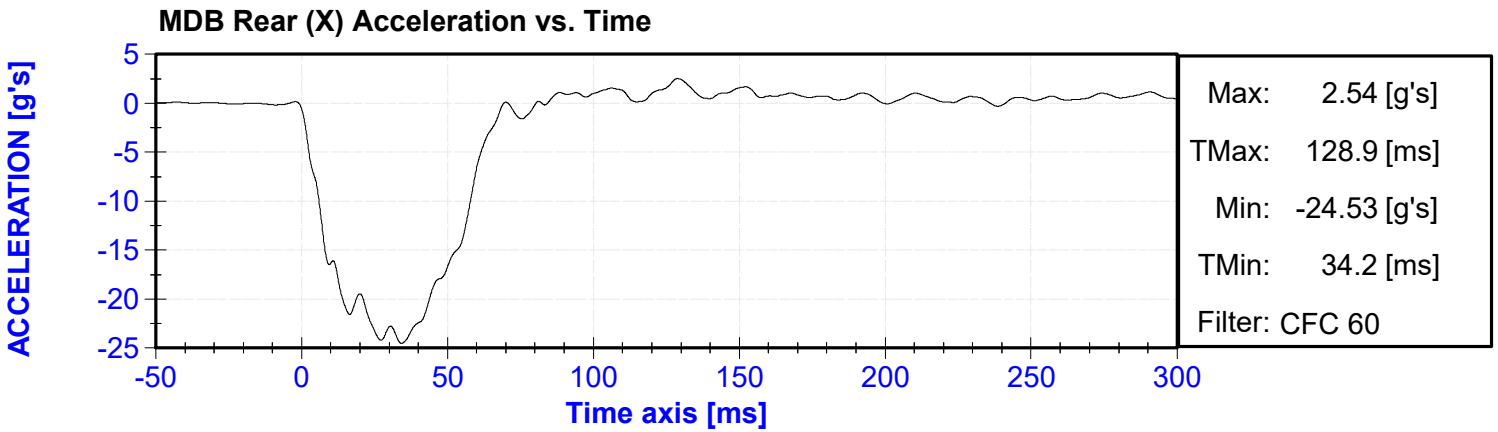
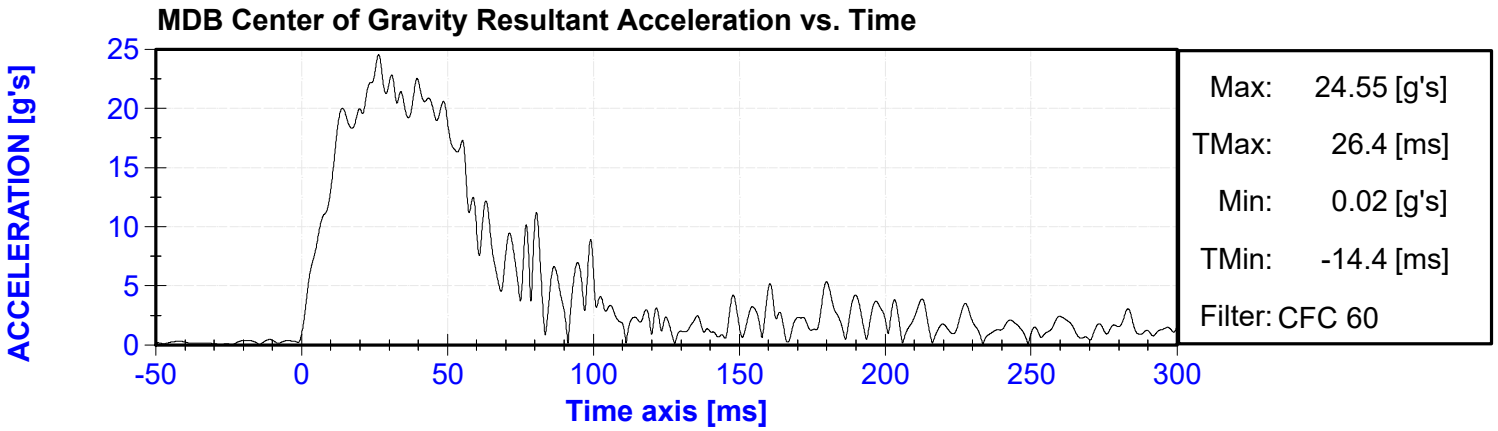


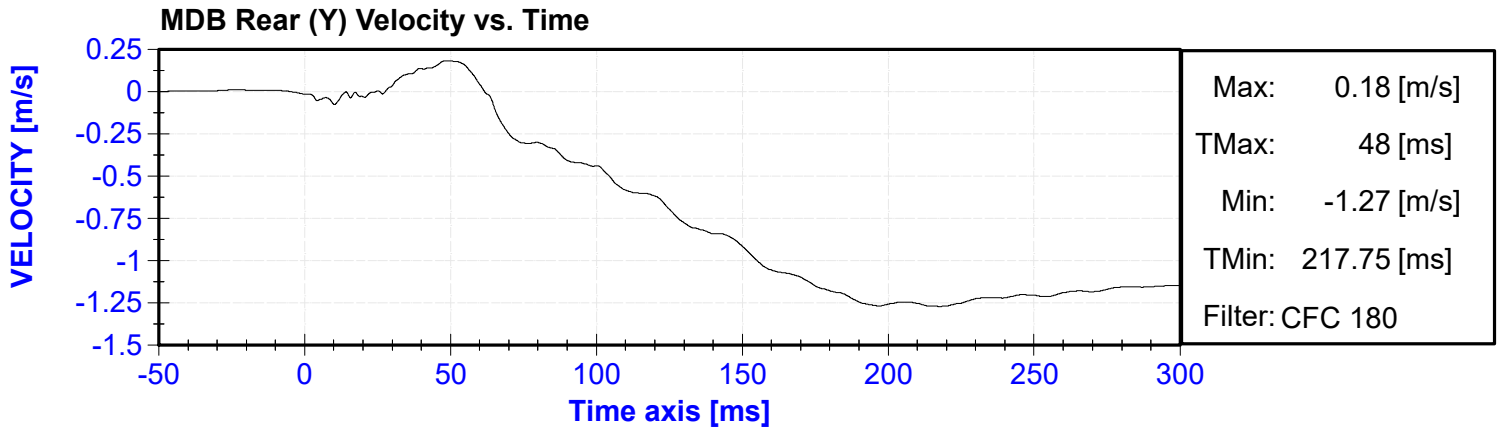












APPENDIX V

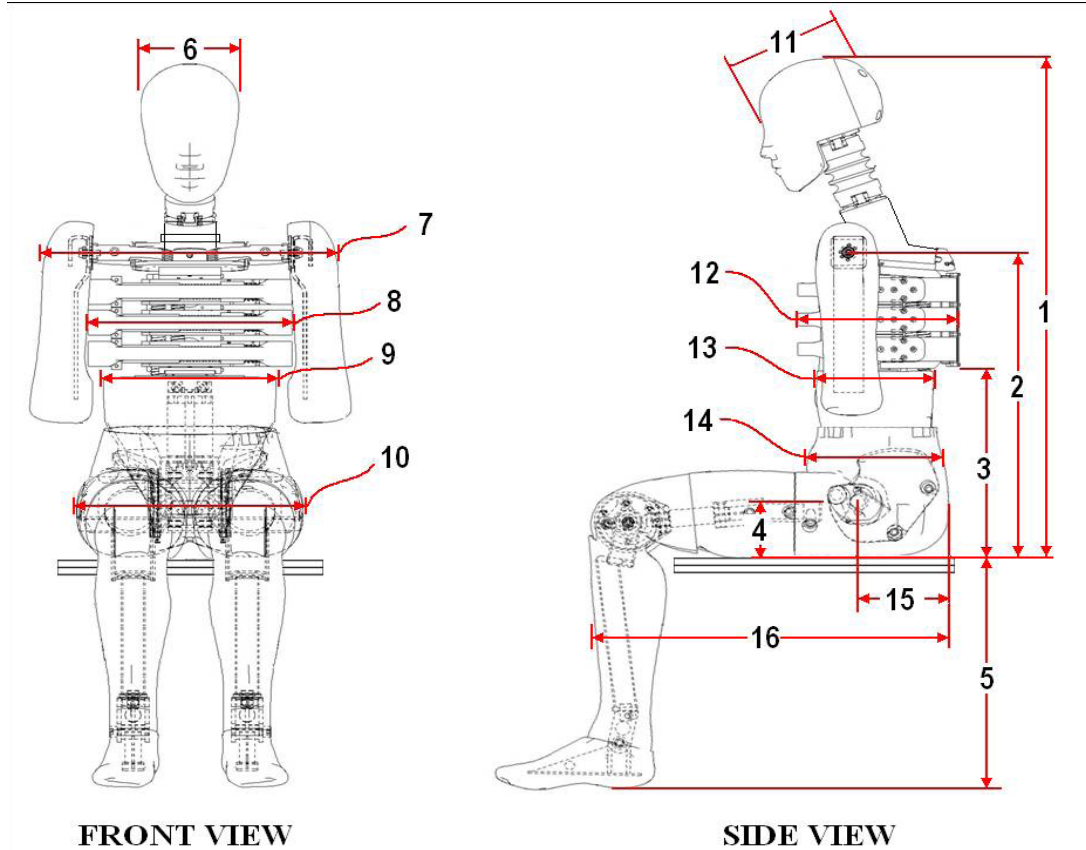
**PRE-TEST
ES-2re PERFORMANCE CALIBRATION TEST DATA**

External Measurements - EuroSID-2re

Technician: J. Rios

Date: 08/07/2024

Dummy Serial Number: DG5348



Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	912	Pass
2	Seat to Shoulder Joint	558	572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	351	Pass
4	Seat to Hip Joint (center of bolt)	97	103	102	Pass
5	Sole to Seat, Sitting	333	451	411	Pass
6	Head Width	152	158	155	Pass
7	Shoulder/Arm Width	461	479	472	Pass
8	Thorax Width	322	332	326	Pass
9	Abdomen Width	273	287	281	Pass
10	Pelvis Lap Width	359	373	367	Pass
11	Head Depth	196	206	201	Pass
12	Thorax Depth	262	272	268	Pass
13	Abdomen Depth	194	204	196	Pass
14	Pelvis Depth	235	245	241	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150	160	155	Pass
16	Back of Buttocks to Front Knee	597	615	606	Pass

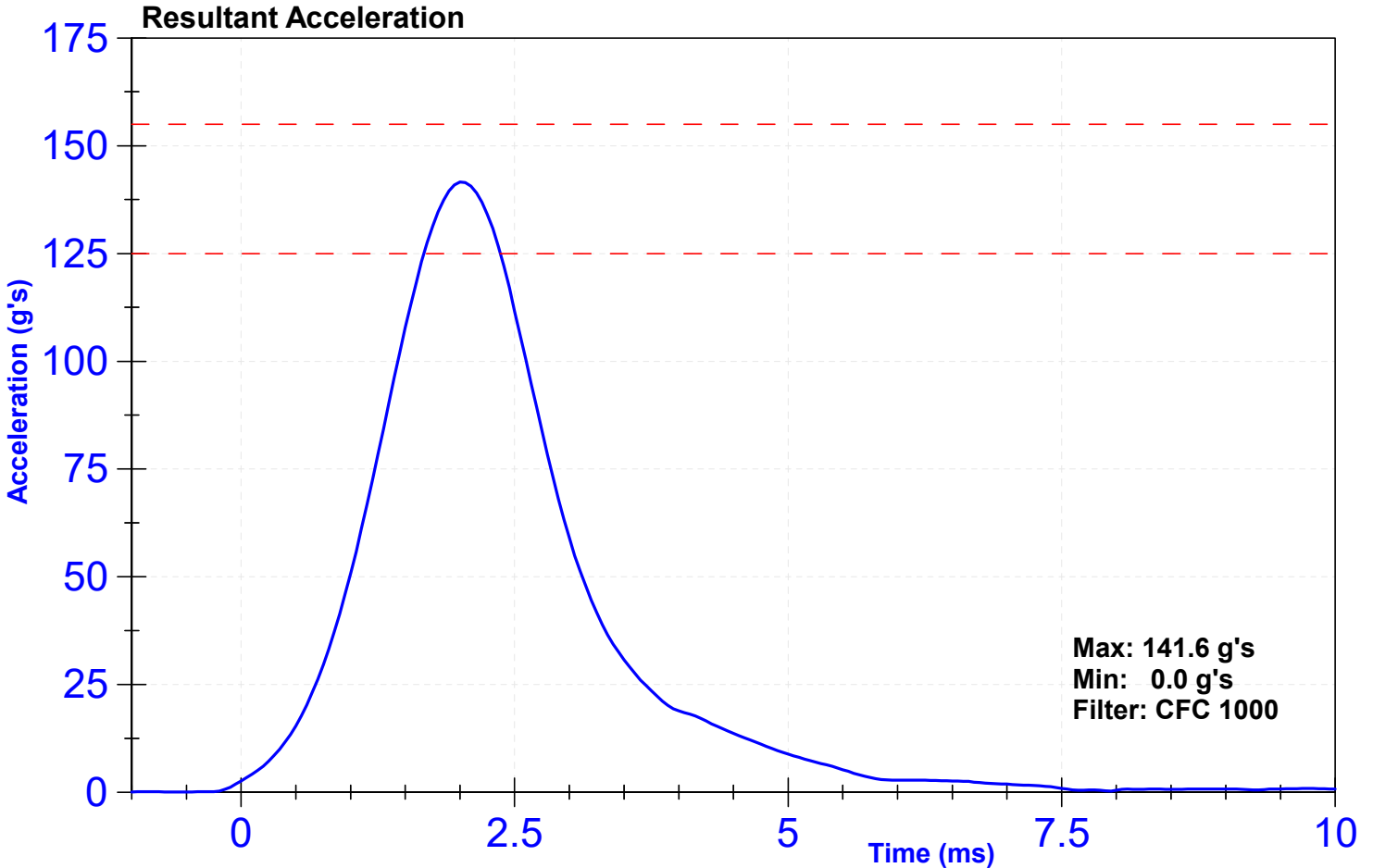
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

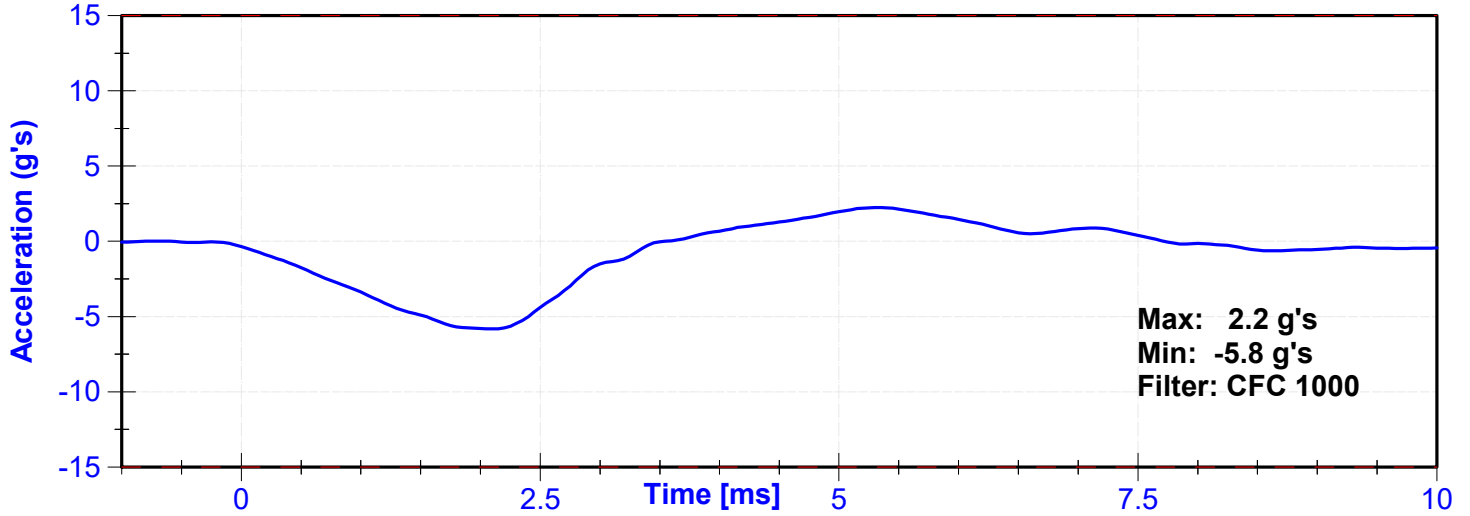
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	60	Pass
Resultant Acceleration	125	155	g's	141.6	Pass
Oscillation	0	15	%	0.62	Pass
Fore-Aft Acceleration	-15	15	g's	-5.8	Pass

Transducer Calibrations

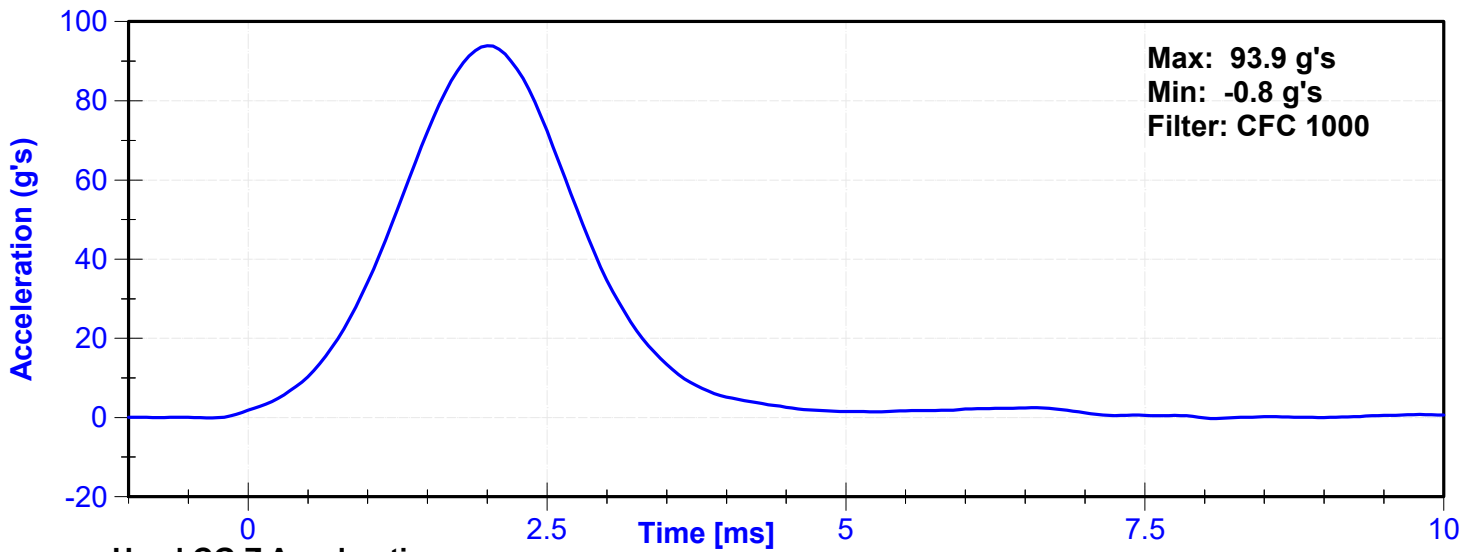
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	18613	7/30/2024	1/26/2025
Y Accelerometer	Endevco	18472	7/30/2024	1/26/2025
Z Accelerometer	Endevco	18663	7/30/2024	1/26/2025



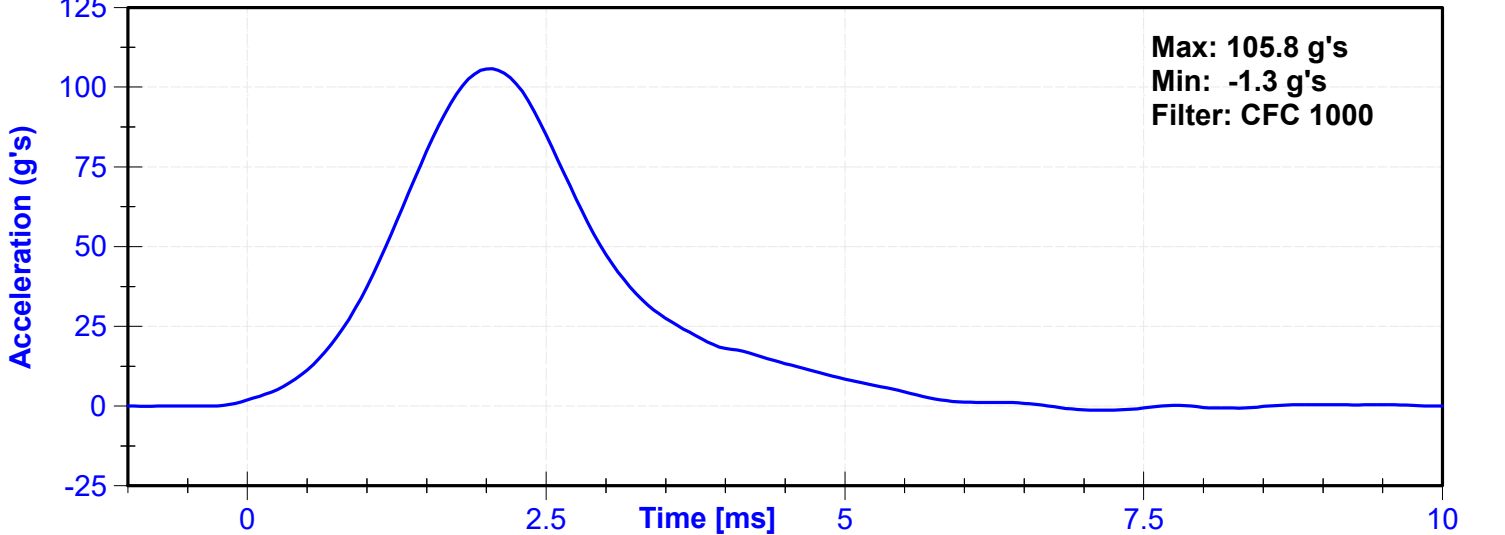
Head CG X Acceleration



Head CG Y Acceleration



Head CG Z Acceleration



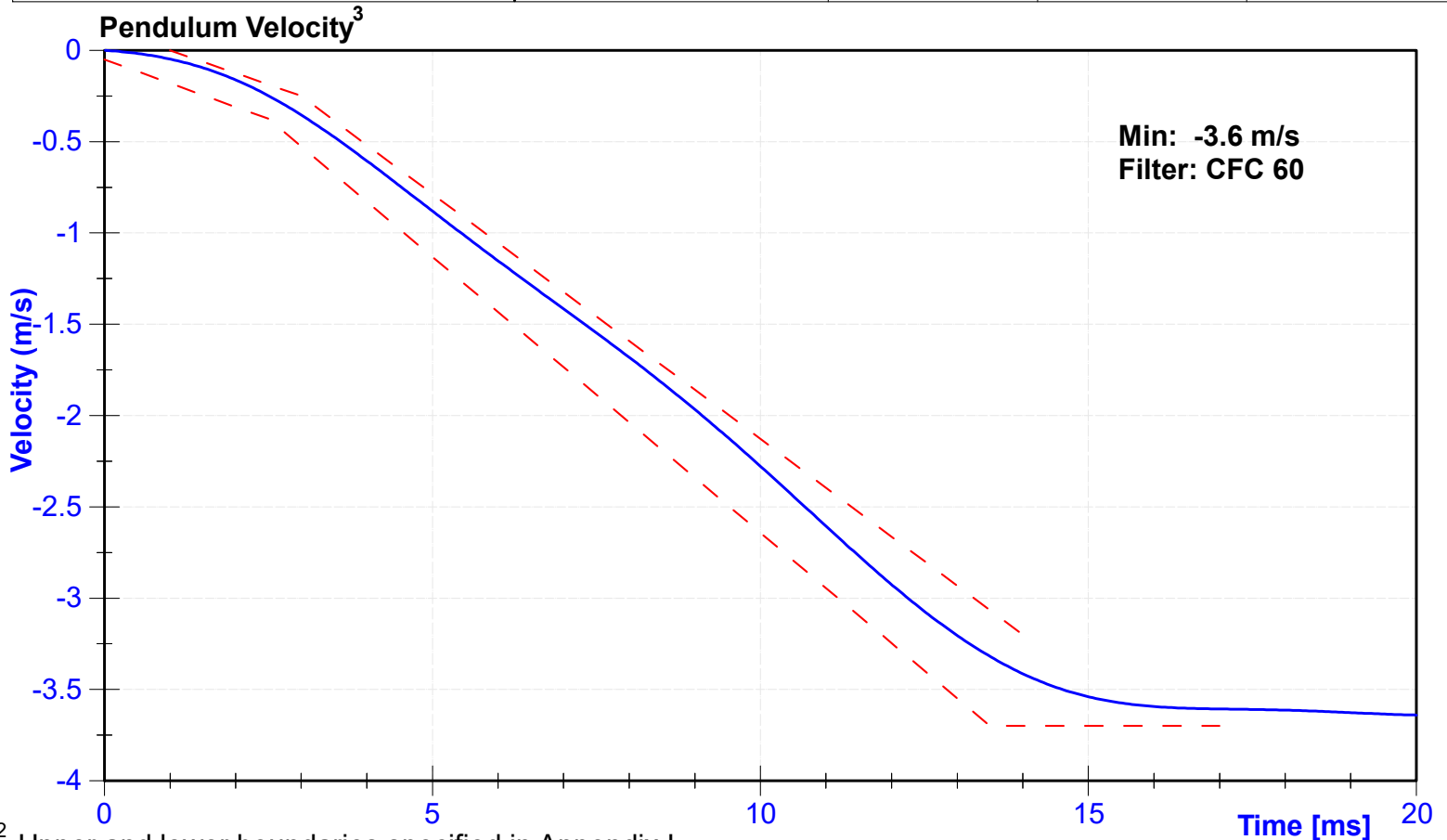
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

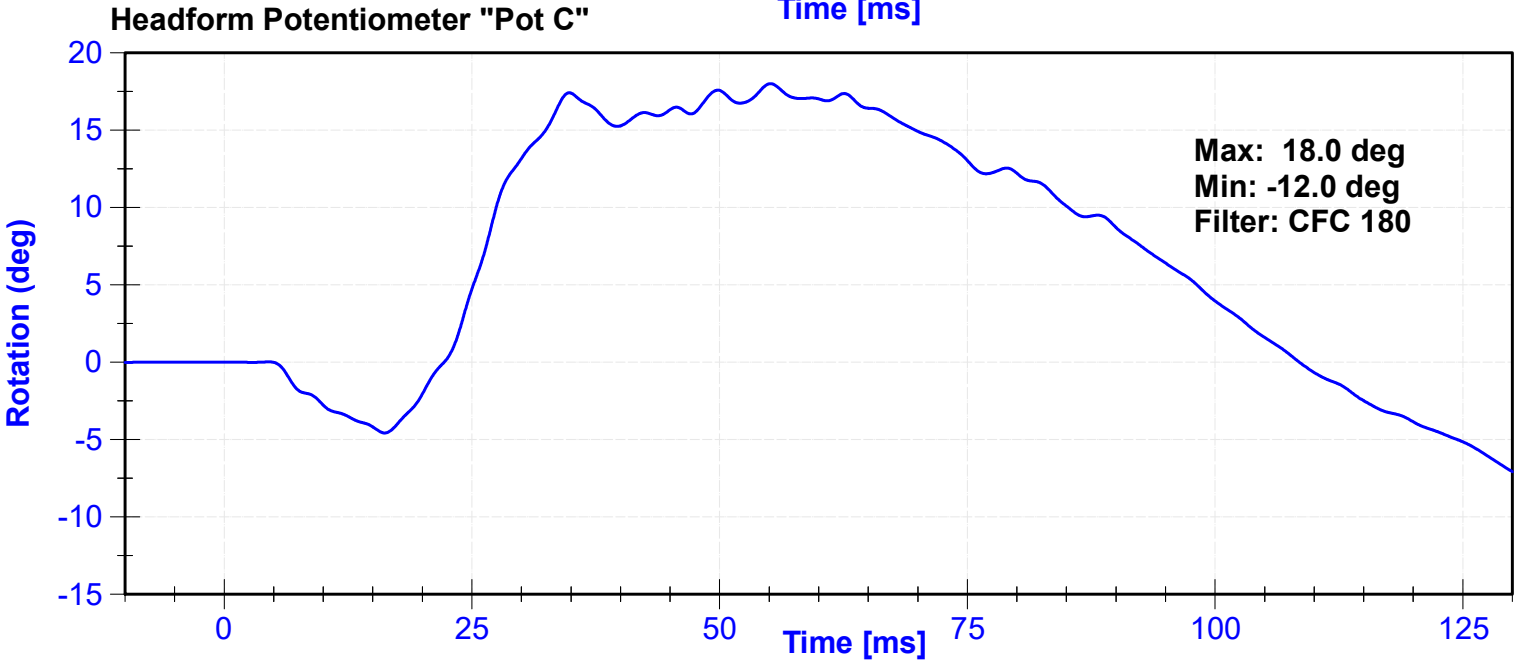
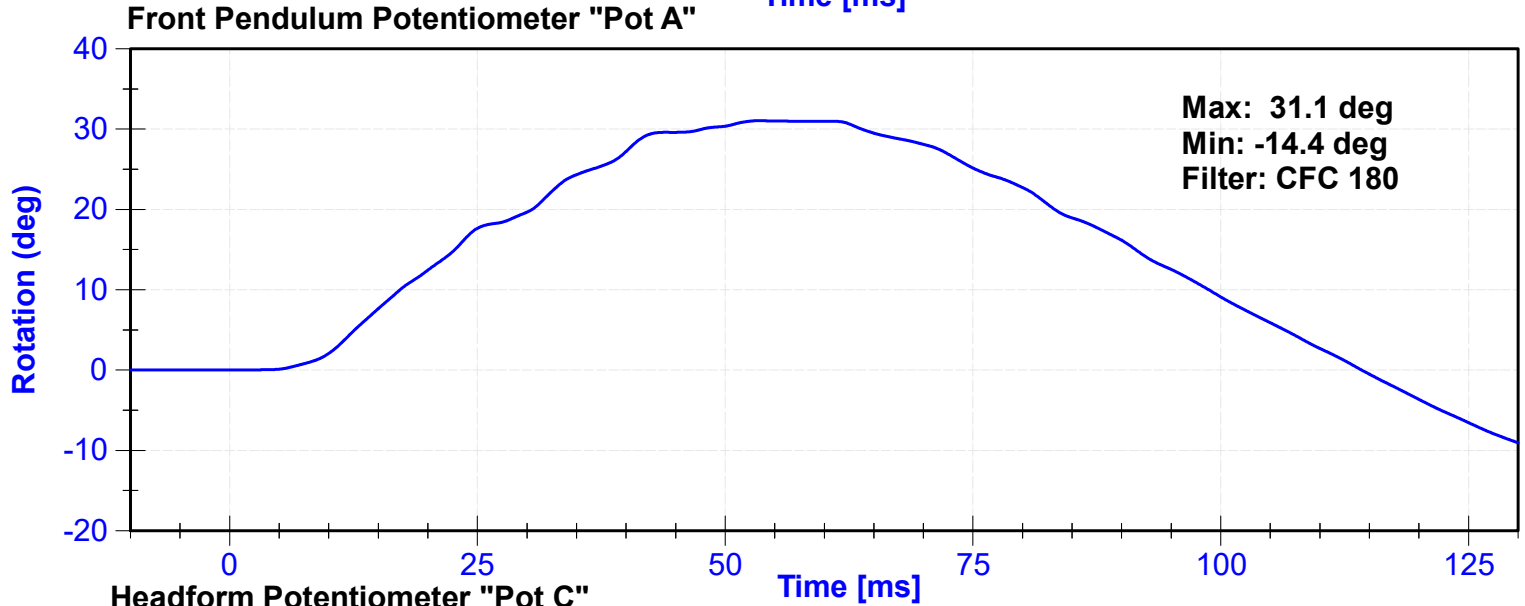
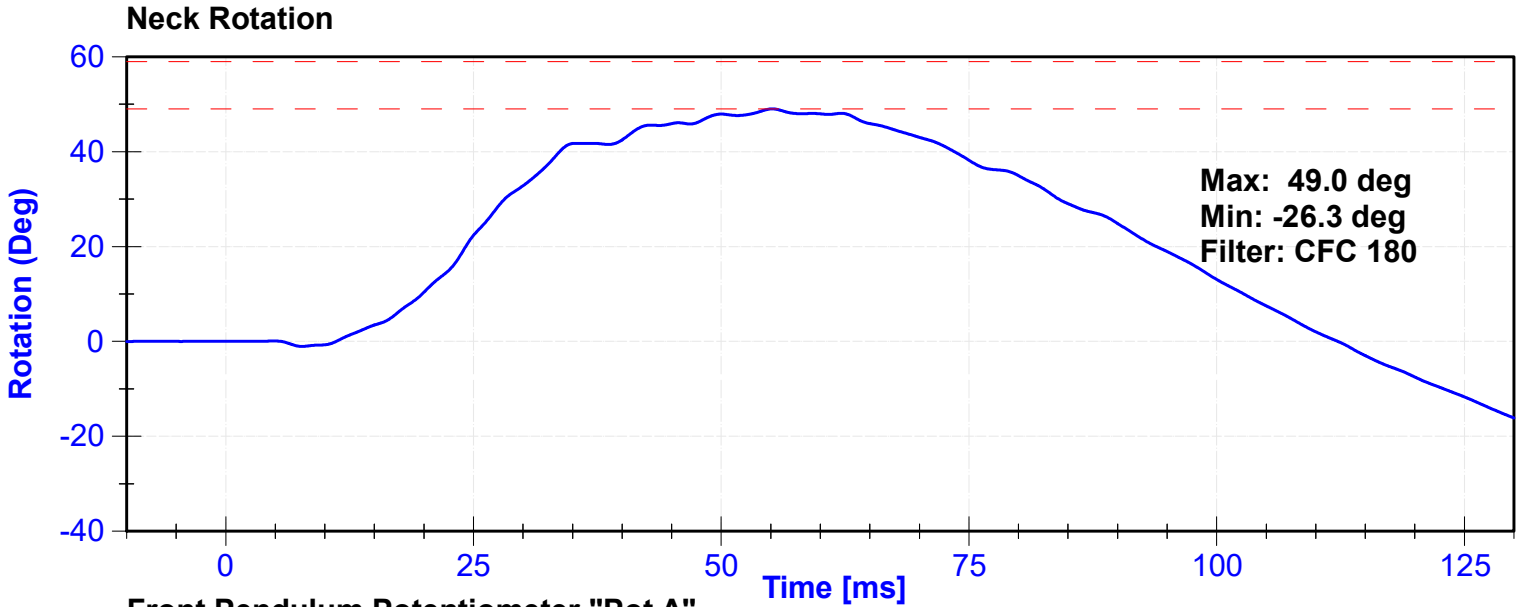
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	55	Pass
Velocity	3.3	3.5	m/s	3.42	Pass
Lateral Neck Rotation	49	59	deg	49.0	Pass
Time at Maximum Rotation	54	66	ms	55.2	Pass
Time of Rotation Decay from Maximum	53	88	ms	57.1	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	C16503	4/29/2024	10/26/2024
Front Pendulum Potentiometer	Sfernice	2247	12/5/2023	12/4/2024
Headform Potentiometer	Sfernice	095	9/29/2023	9/28/2024



^{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
3.0	-0.25	2.5	-0.375
14.0	-3.20	13.5	-3.7
		17.0	-3.7

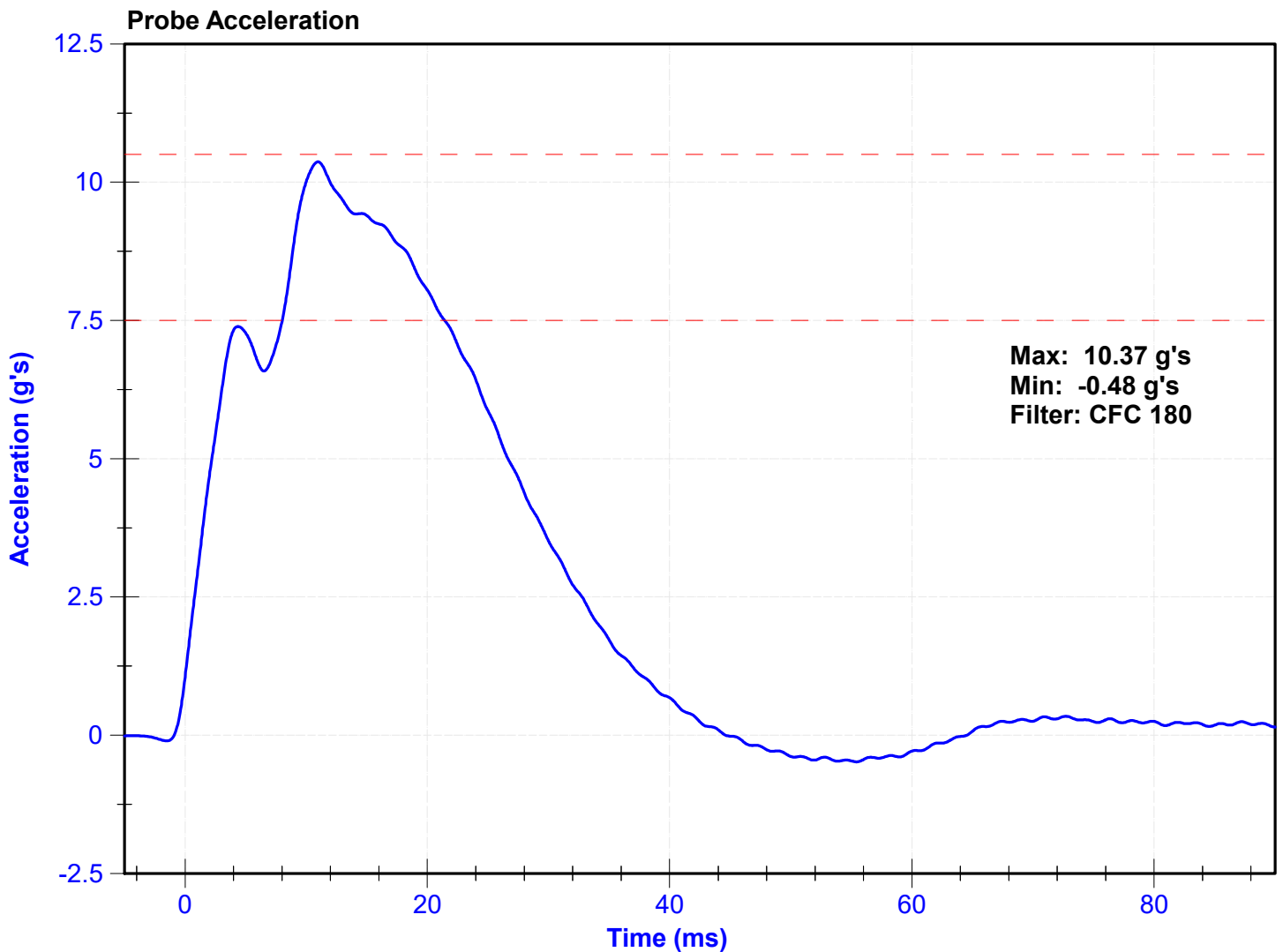
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	47	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	7.5	10.5	g's	10.37	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18619	3/29/2024	9/25/2024



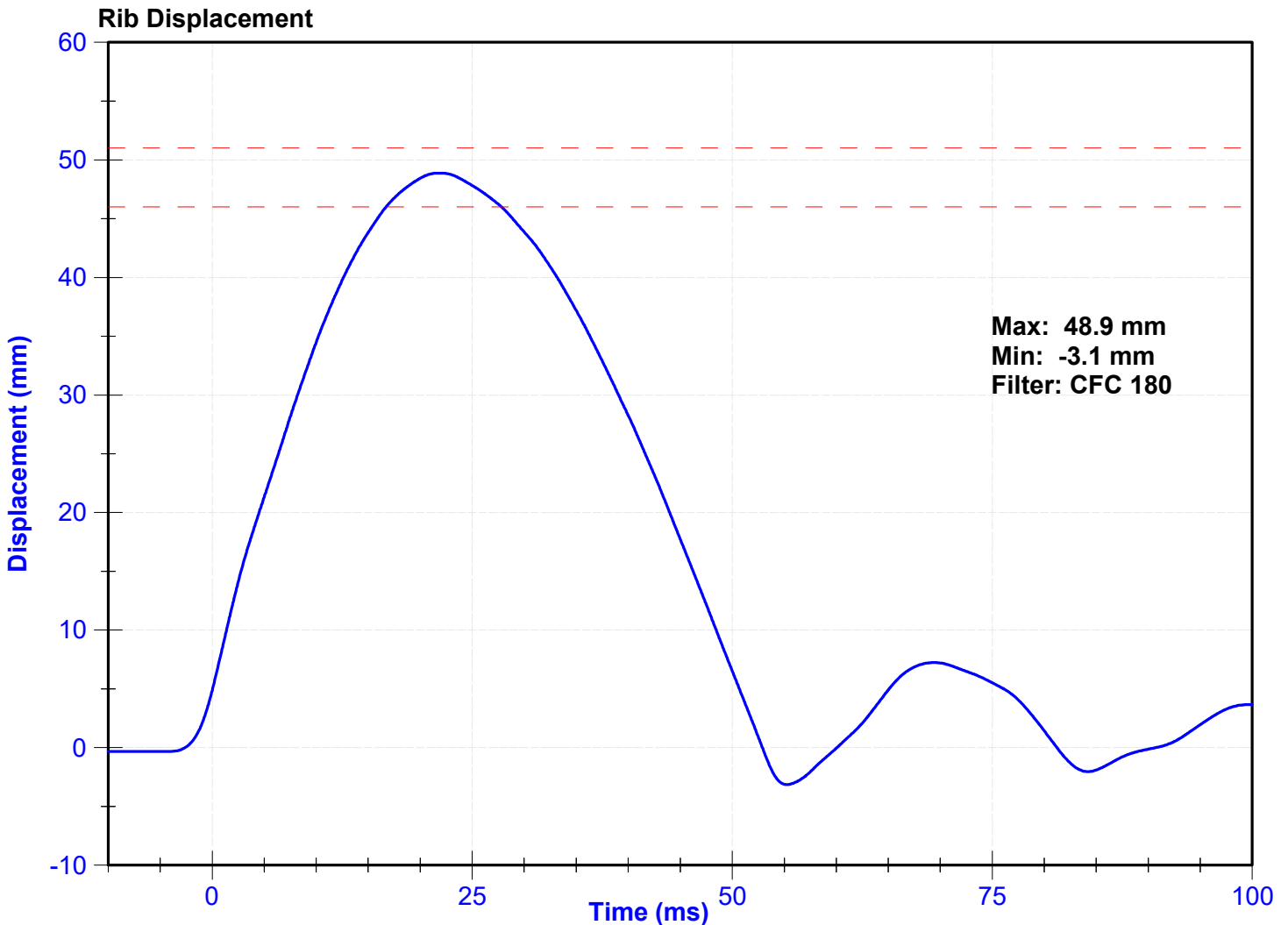
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	60	Pass
Rib Displacement	46	51	mm	48.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	268GFE	7/30/2024	1/28/2025



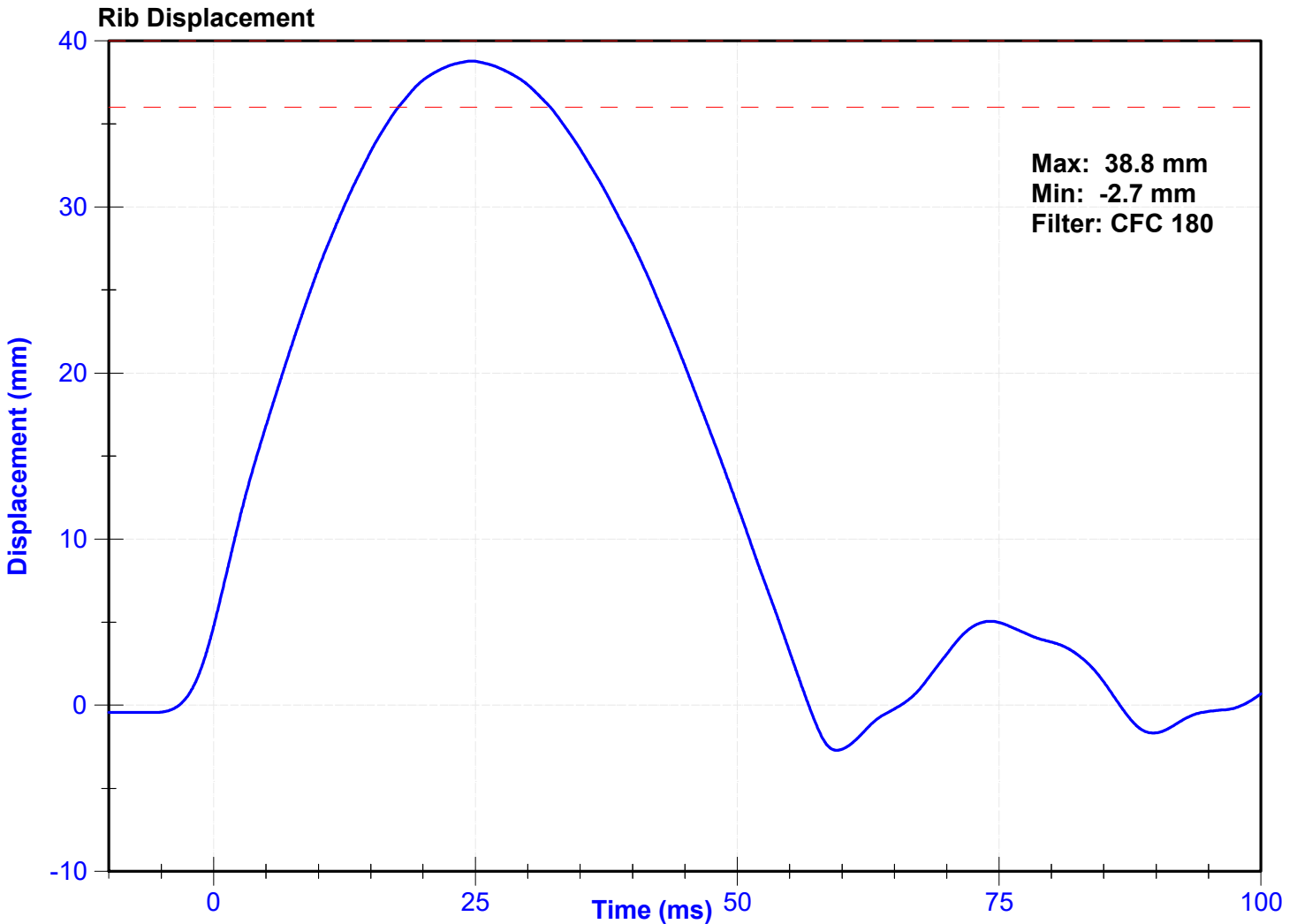
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	60	Pass
Rib Displacement	36	40	mm	38.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	268GFE	7/30/2024	1/28/2025



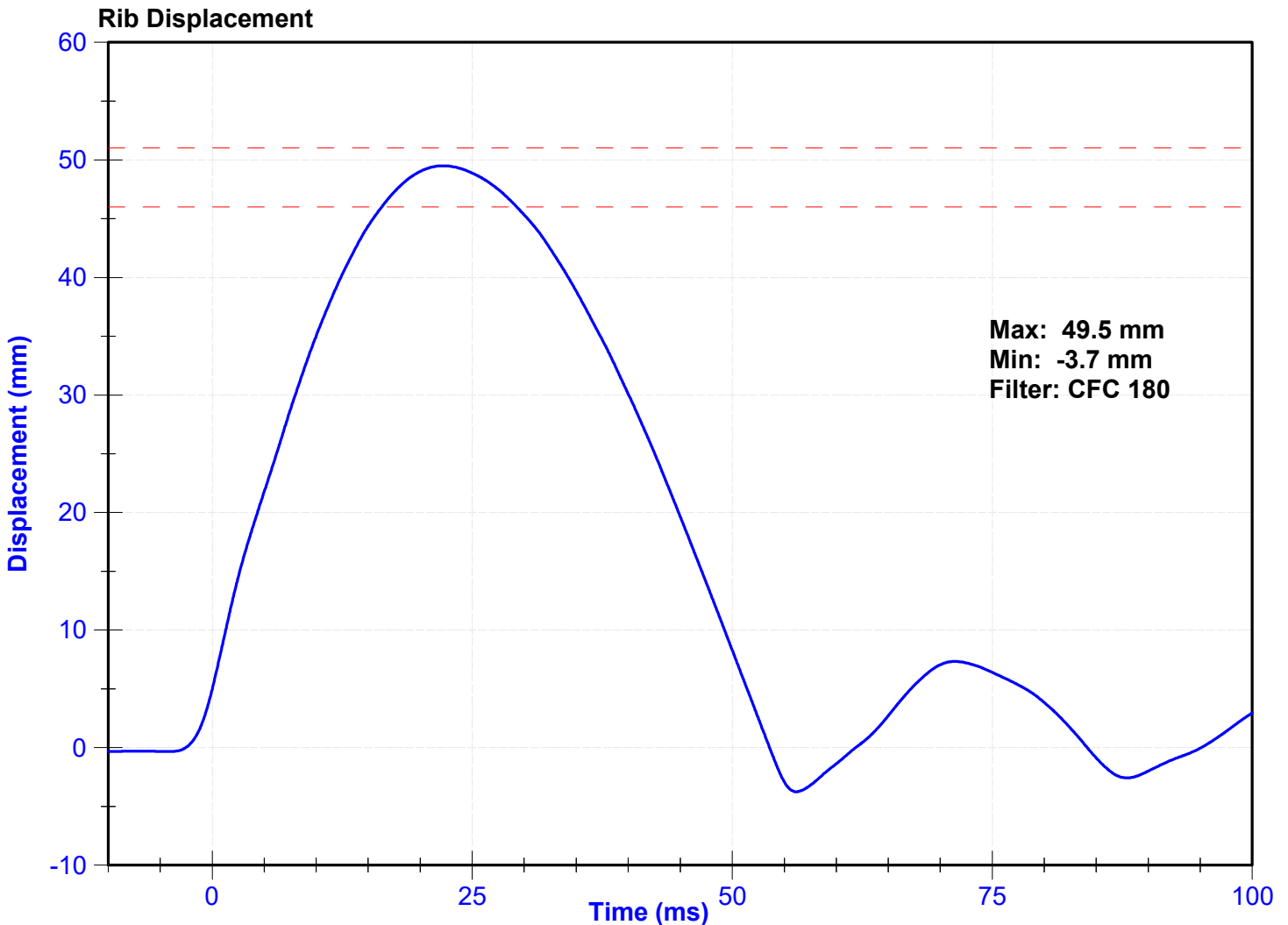
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	60	Pass
Rib Displacement	46	51	mm	49.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	269GFE	7/30/2024	1/28/2025



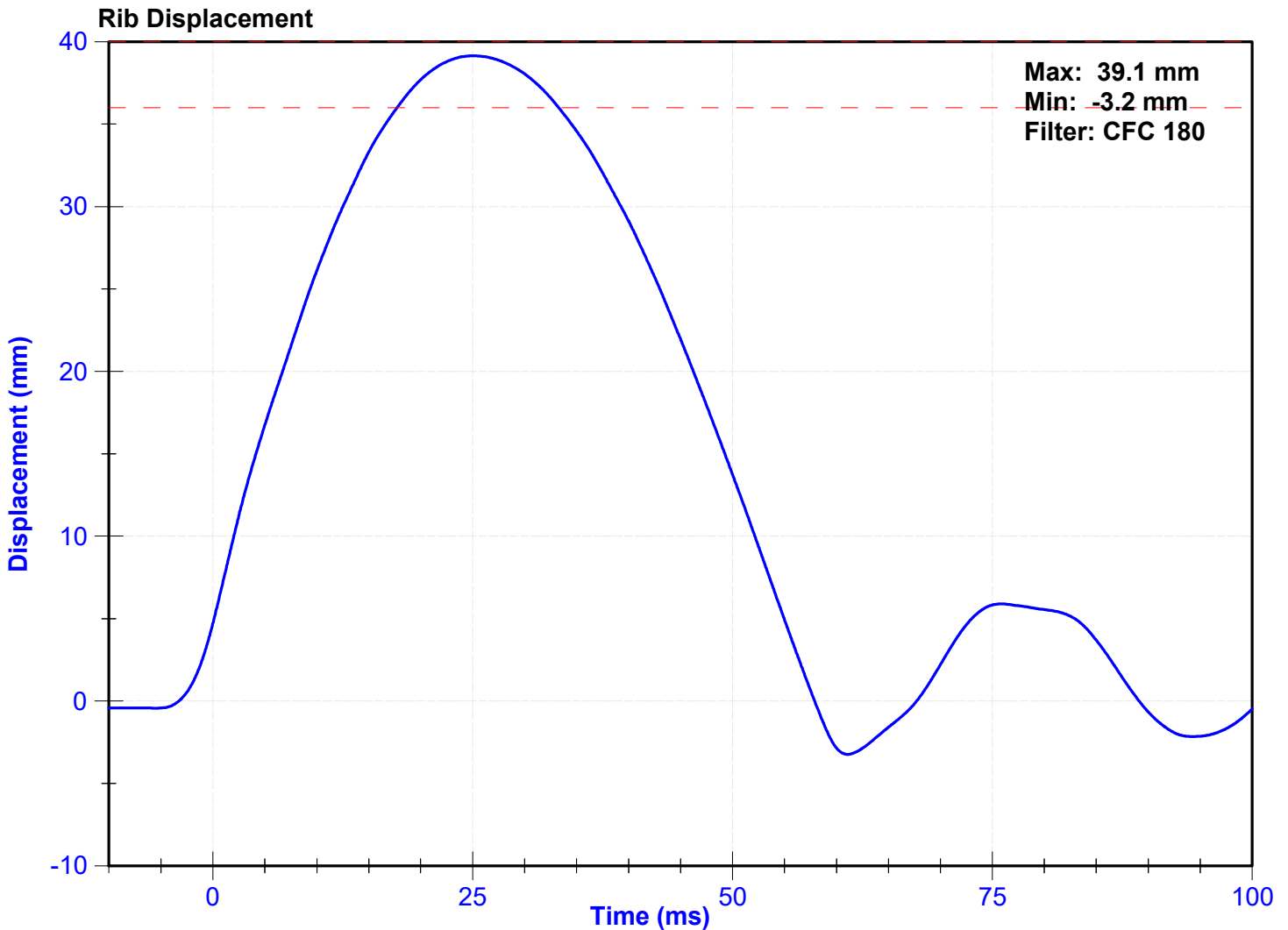
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	60	Pass
Rib Displacement	36	40	mm	39.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	269GFE	7/30/2024	1/28/2025



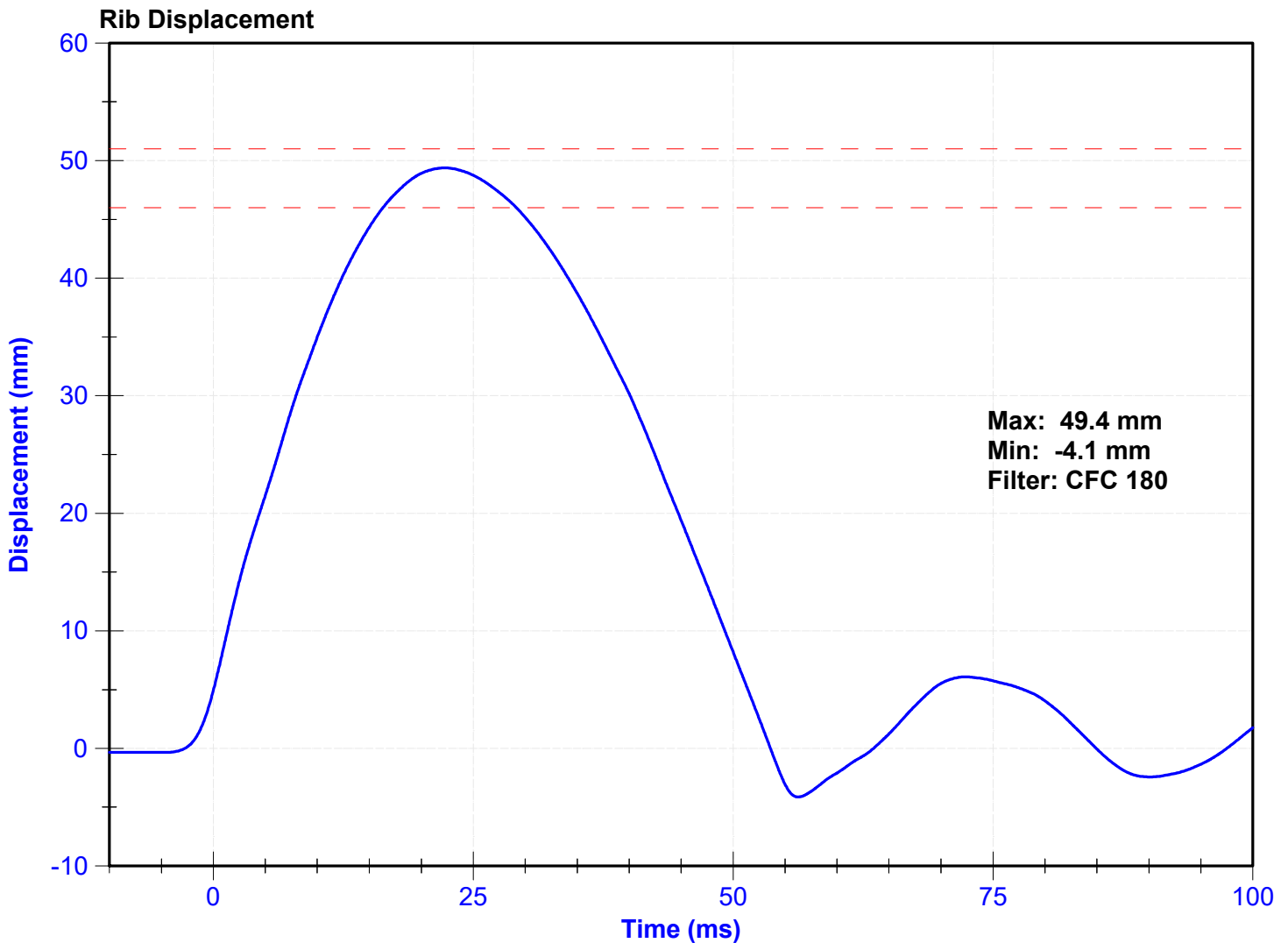
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	60	Pass
Rib Displacement	46	51	mm	49.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	270GFE	7/30/2024	1/28/2025



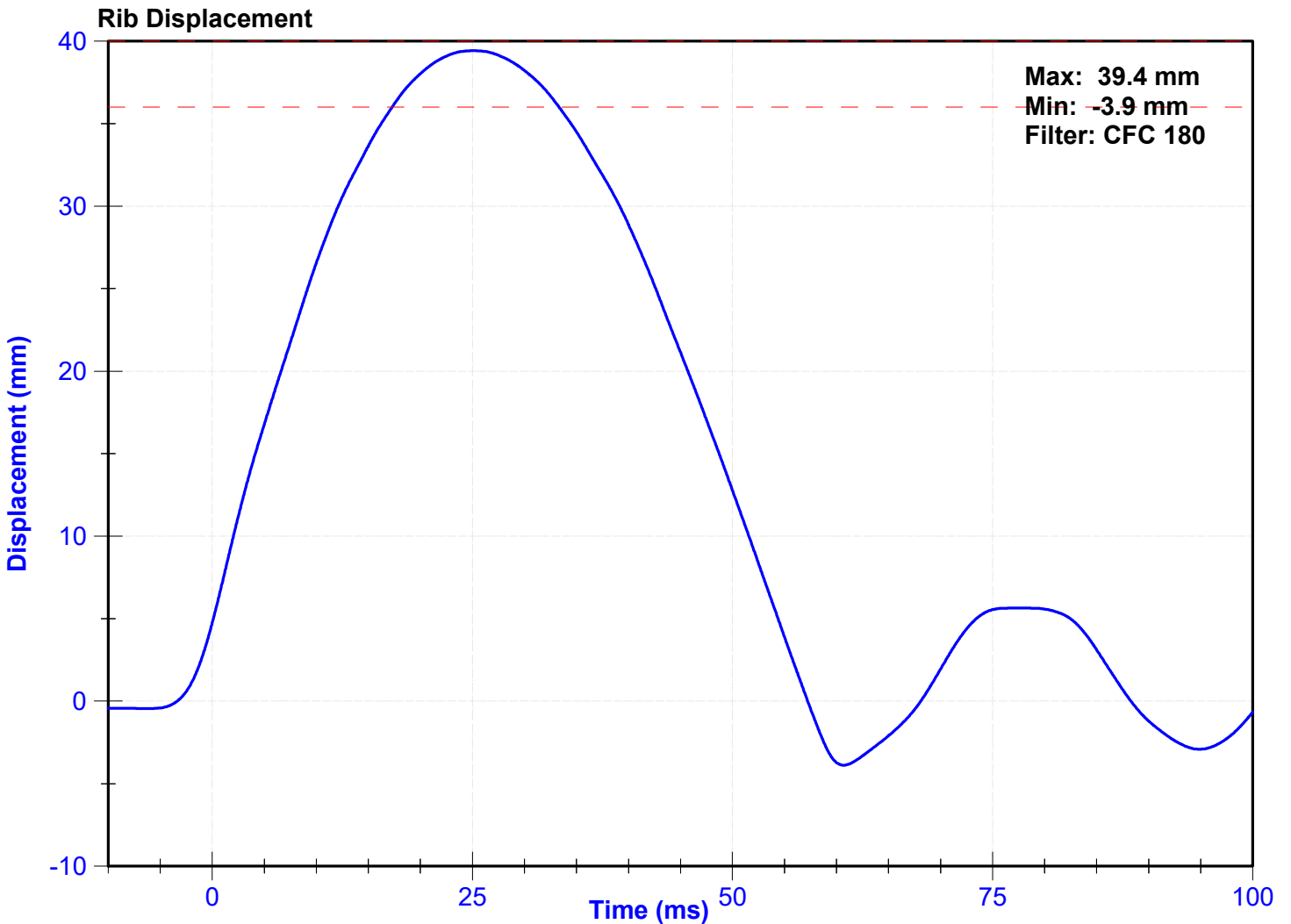
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	60	Pass
Rib Displacement	36	40	mm	39.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	270GFE	7/30/2024	1/28/2025



ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

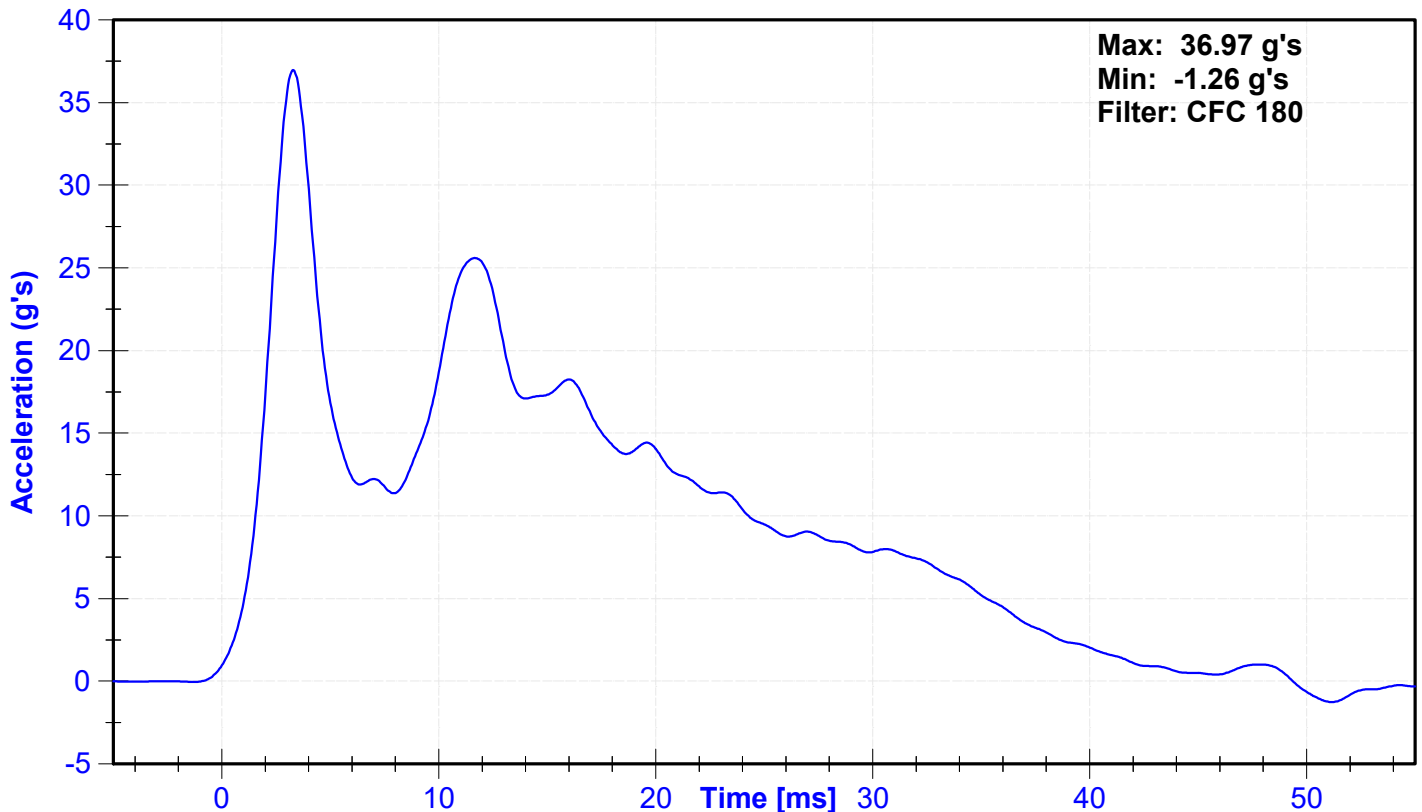
Results

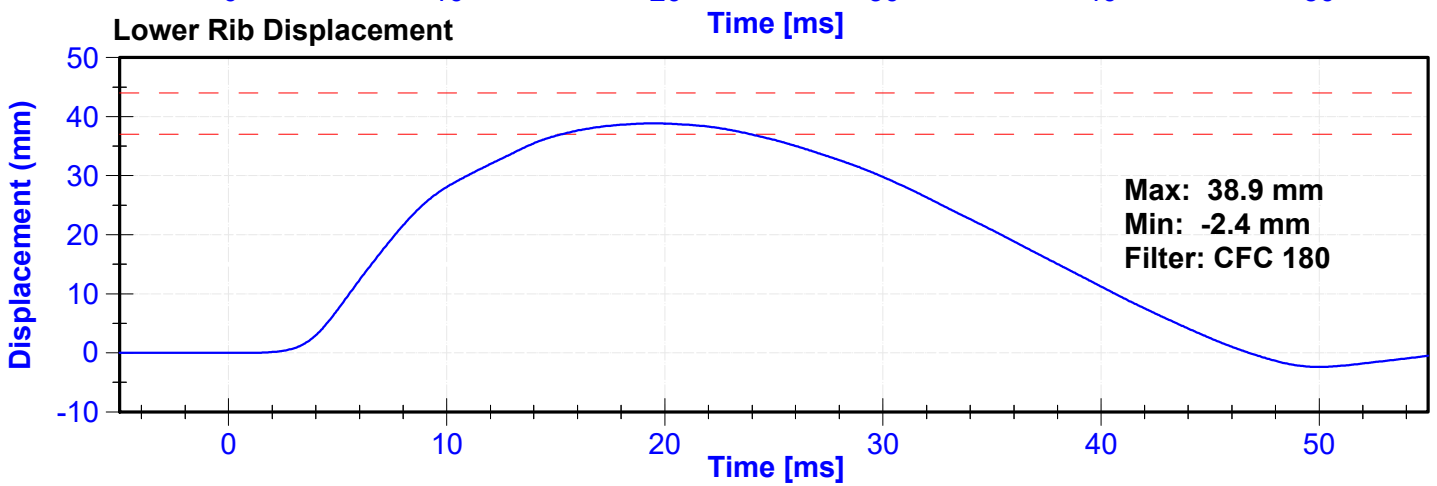
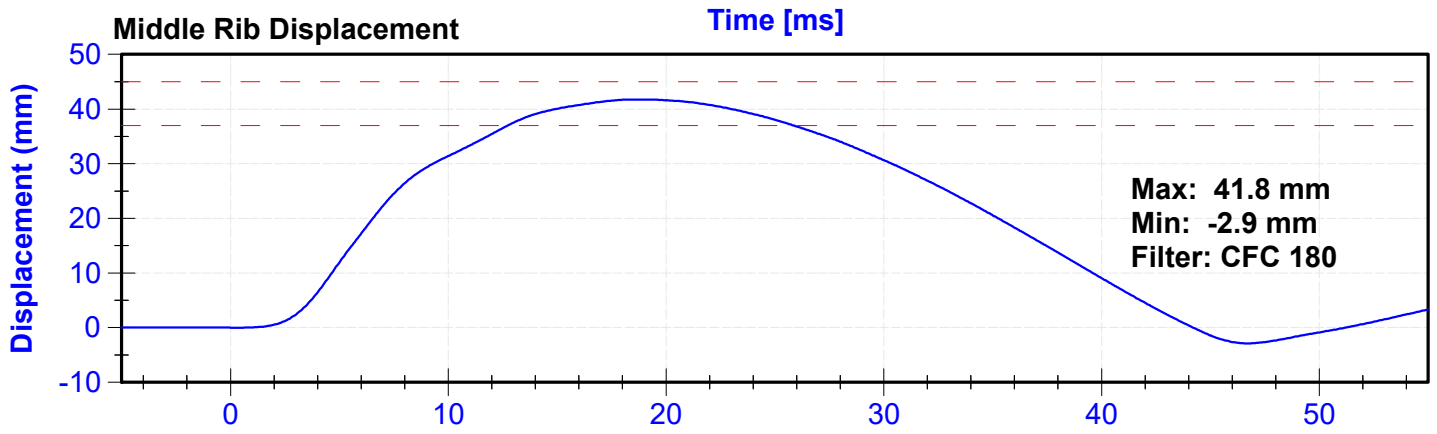
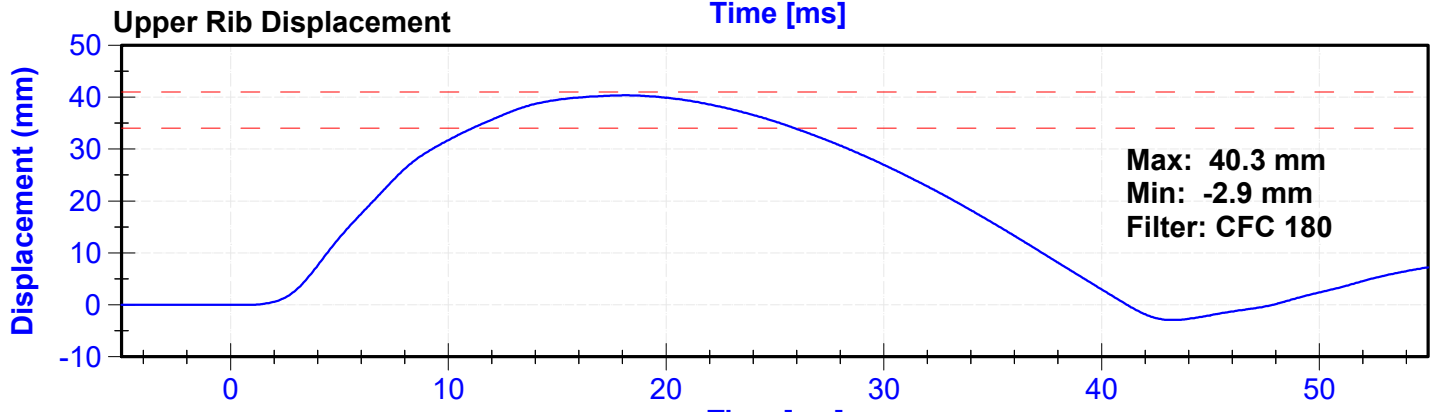
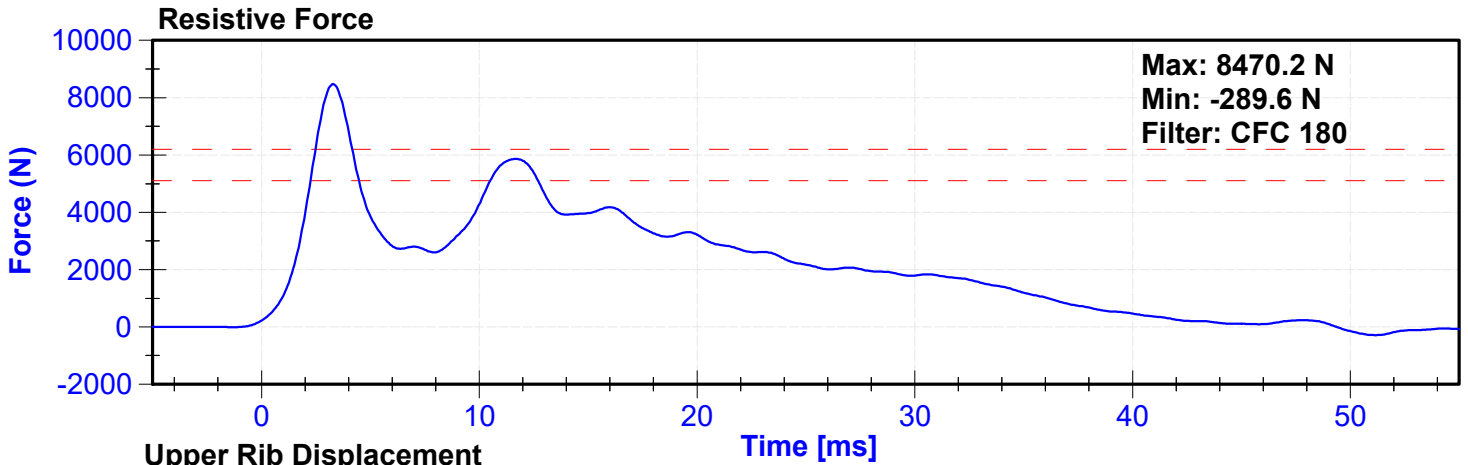
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	47	Pass
Velocity	5.4	5.6	m/s	5.52	Pass
Resistive Force after 6ms	5100	6200	N	5861.8	Pass
Upper Thorax Rib Deflection	34	41	mm	40.3	Pass
Mid Thorax Rib Deflection	37	45	mm	41.8	Pass
Lower Thorax Rib Deflection	37	44	mm	38.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Thorax Rib Potentiometer	Honeywell	268GFE	7/30/2024	1/28/2025
Middle Thorax Rib Potentiometer	Honeywell	269GFE	7/30/2024	1/28/2025
Lower Thorax Rib Potentiometer	Honeywell	270GFE	7/30/2024	1/28/2025

Probe Acceleration





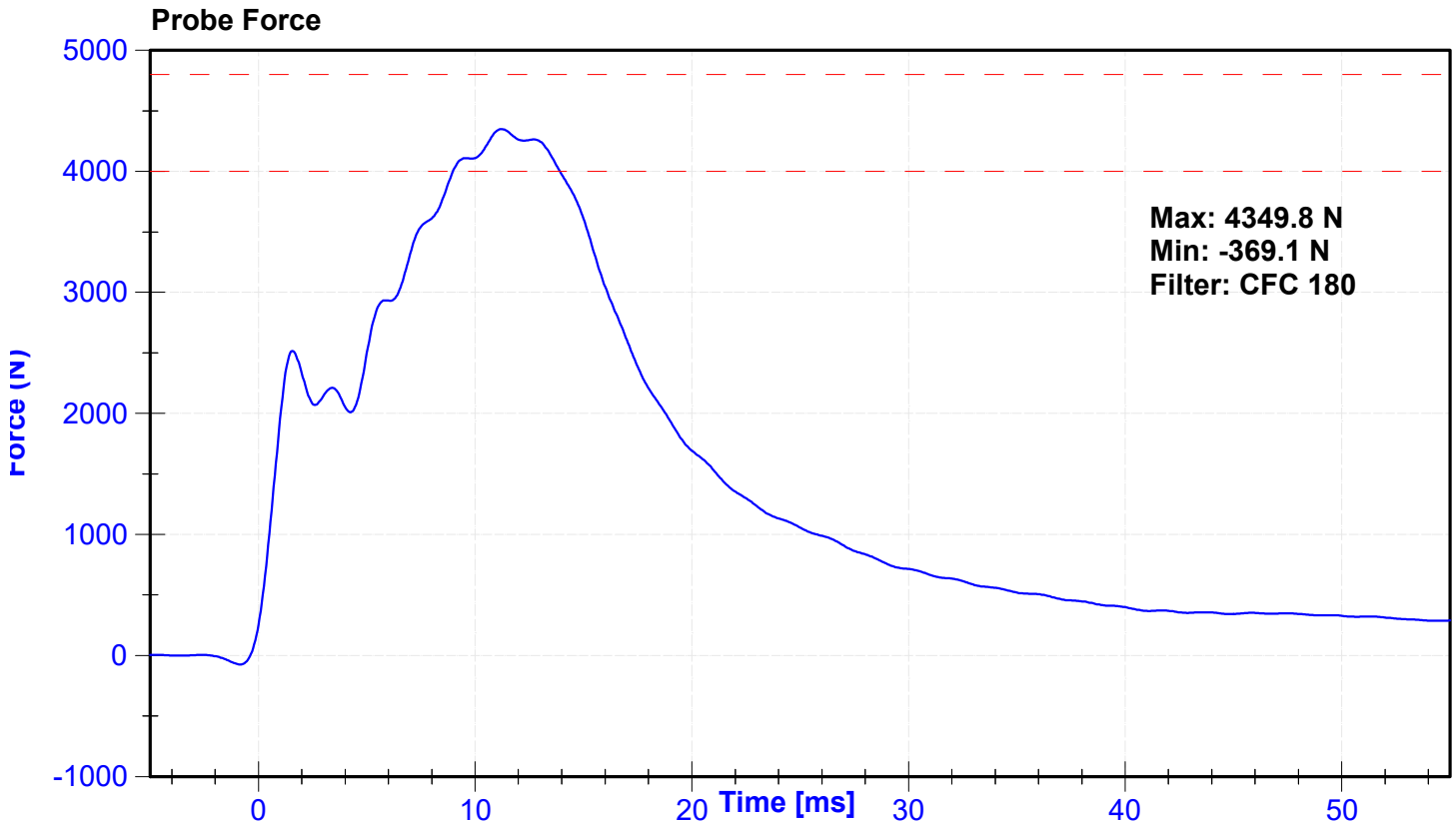
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

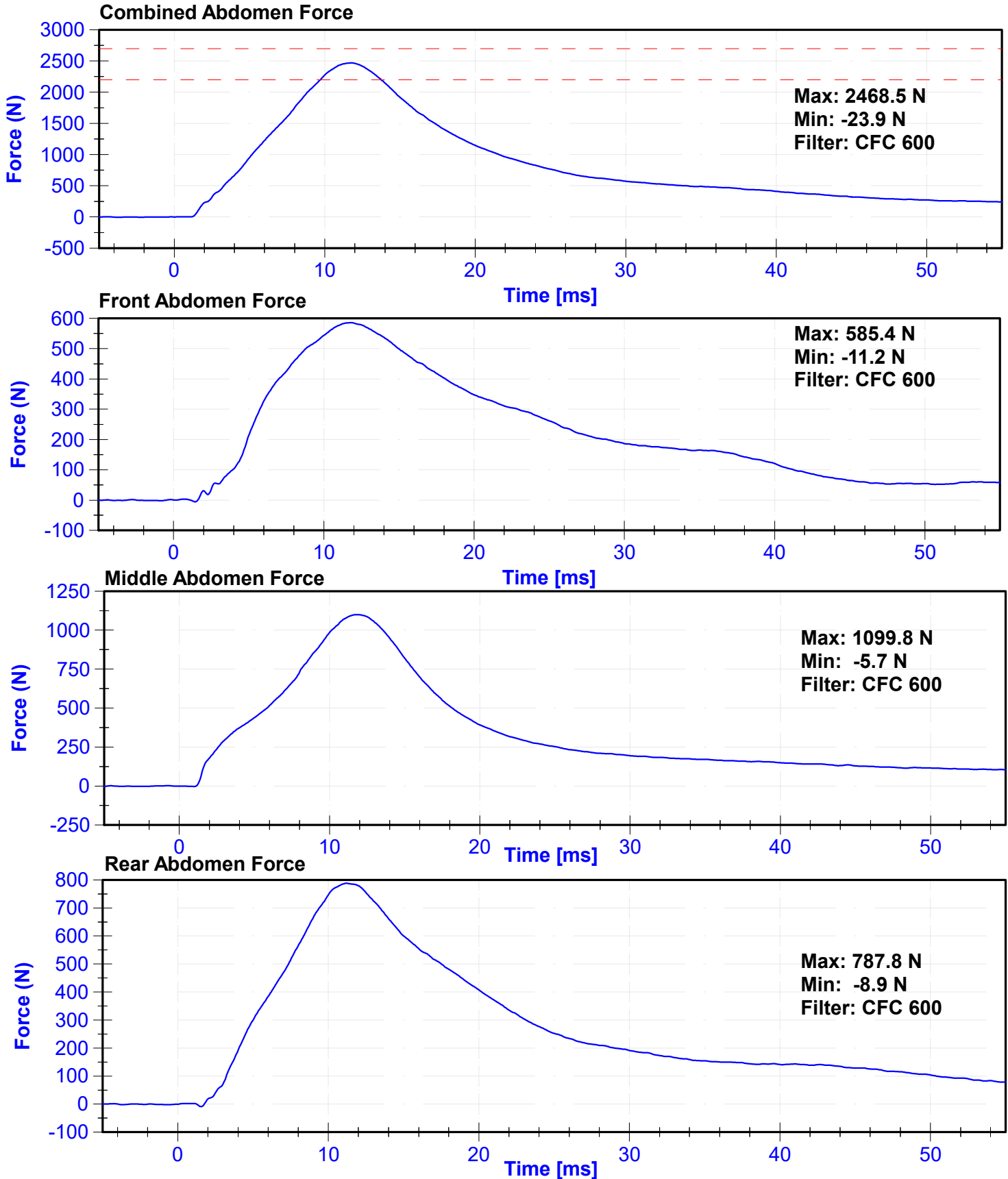
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	47	Pass
Velocity	3.9	4.1	m/s	4.03	Pass
Combined Abdomen Force	2200	2700	N	2468.5	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.75	Pass
Resistive Probe Force	4000	4800	N	4349.8	Pass
Time at Peak Resistive Force	10.6	13.0	ms	11.20	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Front Abdomen Load Cell	Denton	1512	8/15/2023	8/14/2024
Middle Abdomen Load Cell	Denton	1526	8/15/2023	8/14/2024
Rear Abdomen Load Cell	Denton	1516	8/15/2023	8/14/2024





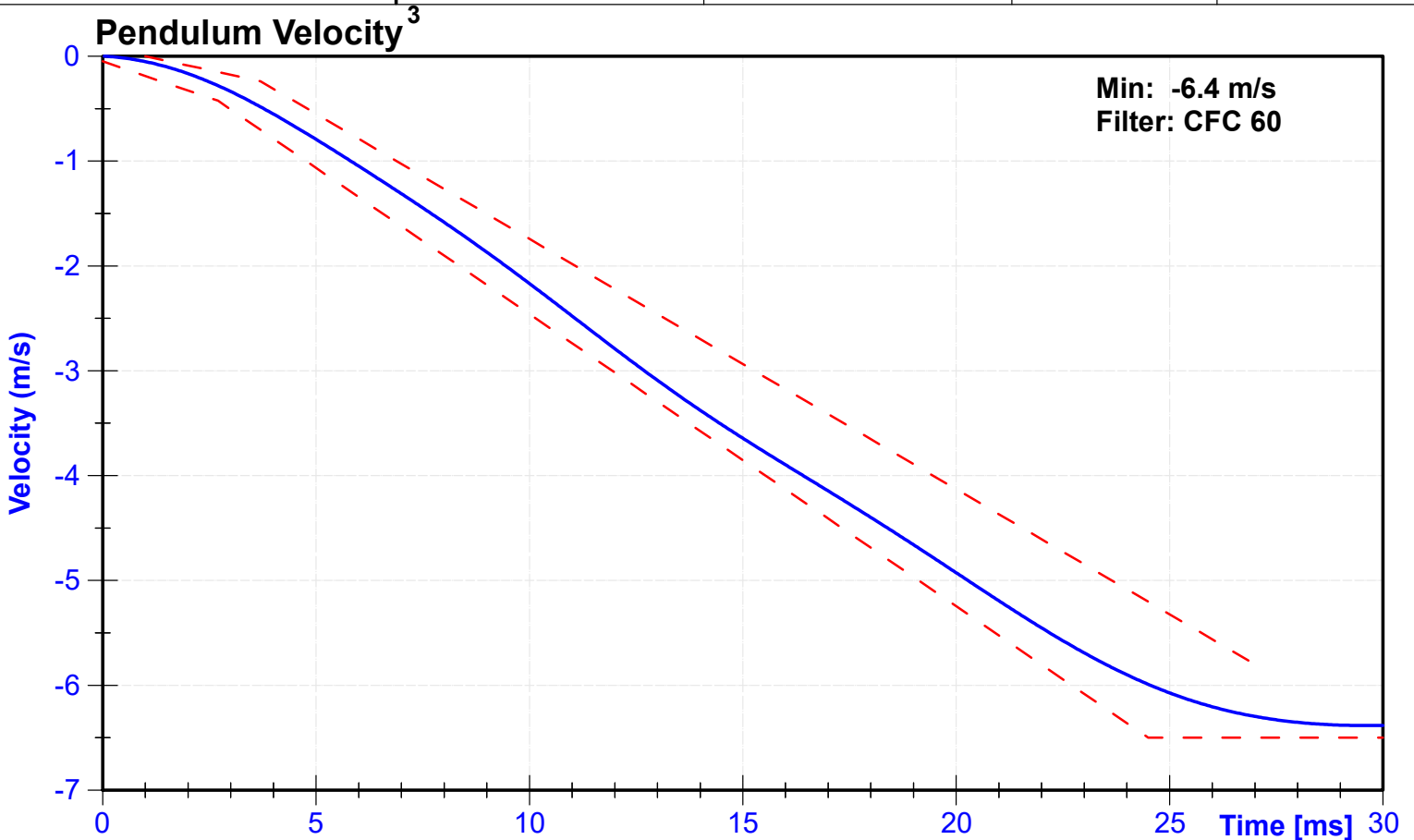
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

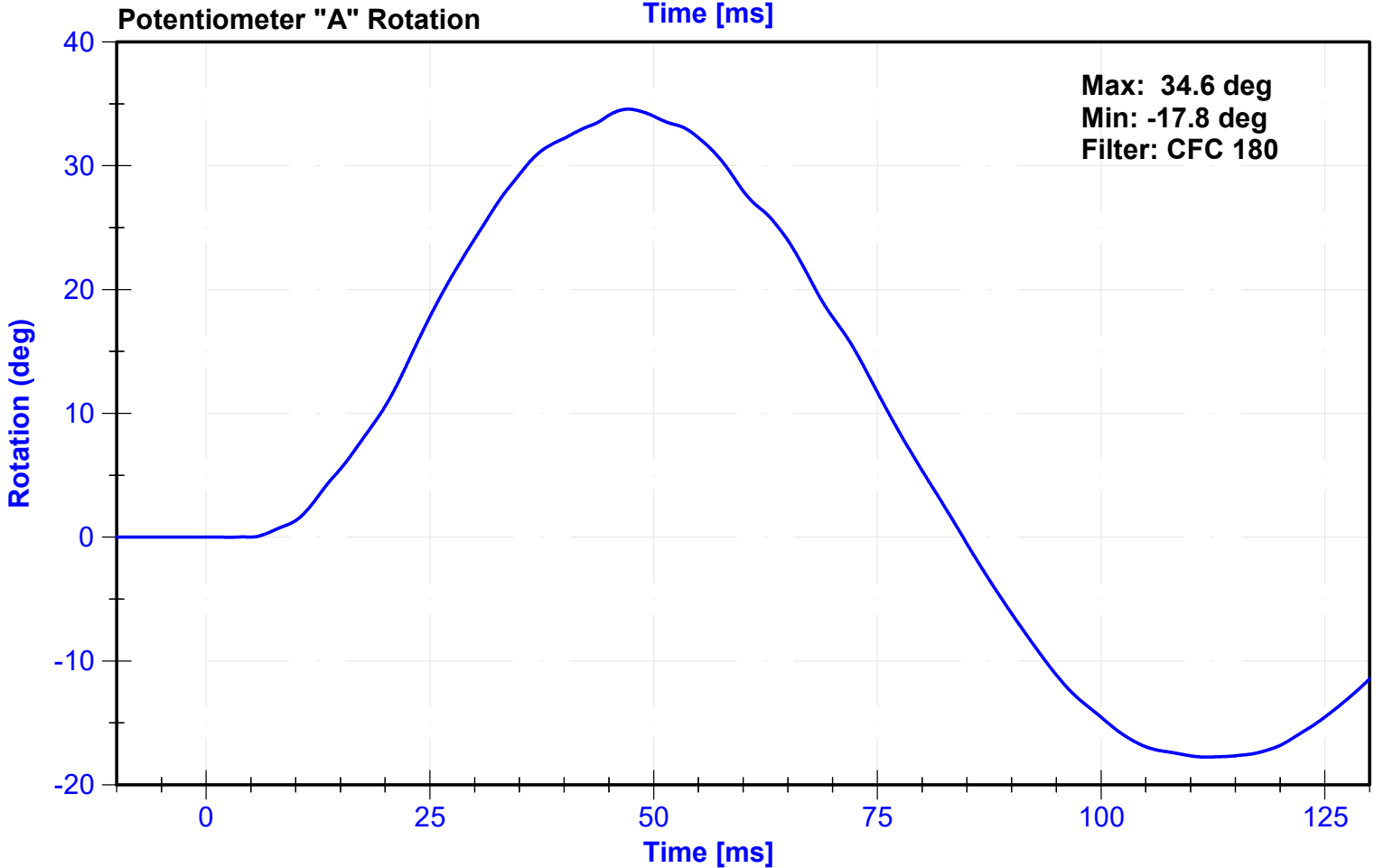
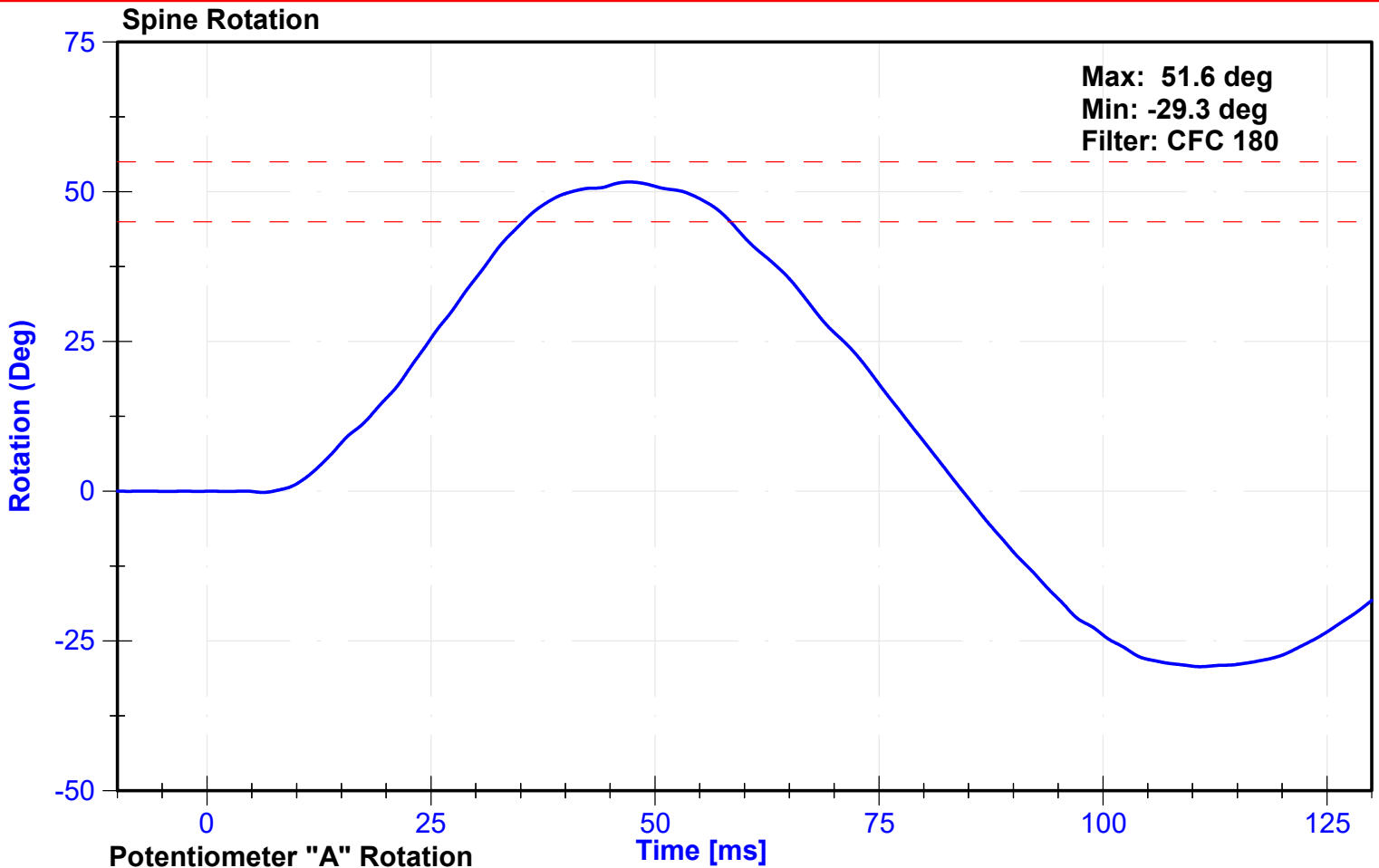
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	58	Pass
Velocity	5.95	6.15	m/s	6.015	Pass
Lateral Spine Rotation	45	55	deg	51.6	Pass
Time at Maximum Rotation	39	53	ms	47.1	Pass
Time of Decay to Zero Degrees	37	57	ms	37.3	Pass
Pendulum Velocity Overall Corridor	Lower Boundary ¹	Upper Boundary ²	m/s	See Plot ³	Pass

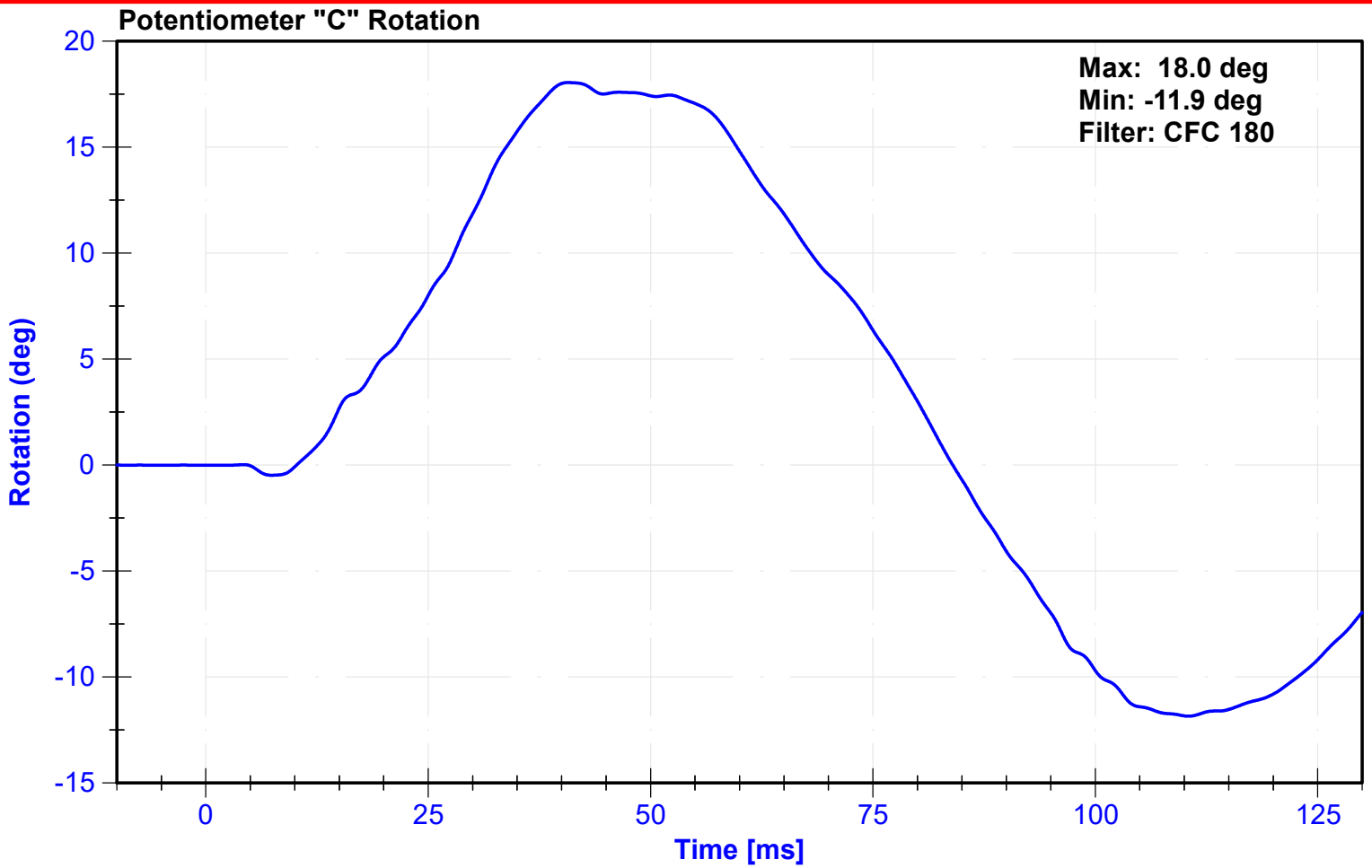
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16503	4/29/2024	10/26/2024
Pendulum "A" Potentiometer	Sfernice	2247	12/5/2023	12/4/2024
Condyle "B" Potentiometer	Sfernice	095	9/29/2023	9/28/2024



^{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	FTSS	Test Technician	J.Kinderman
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

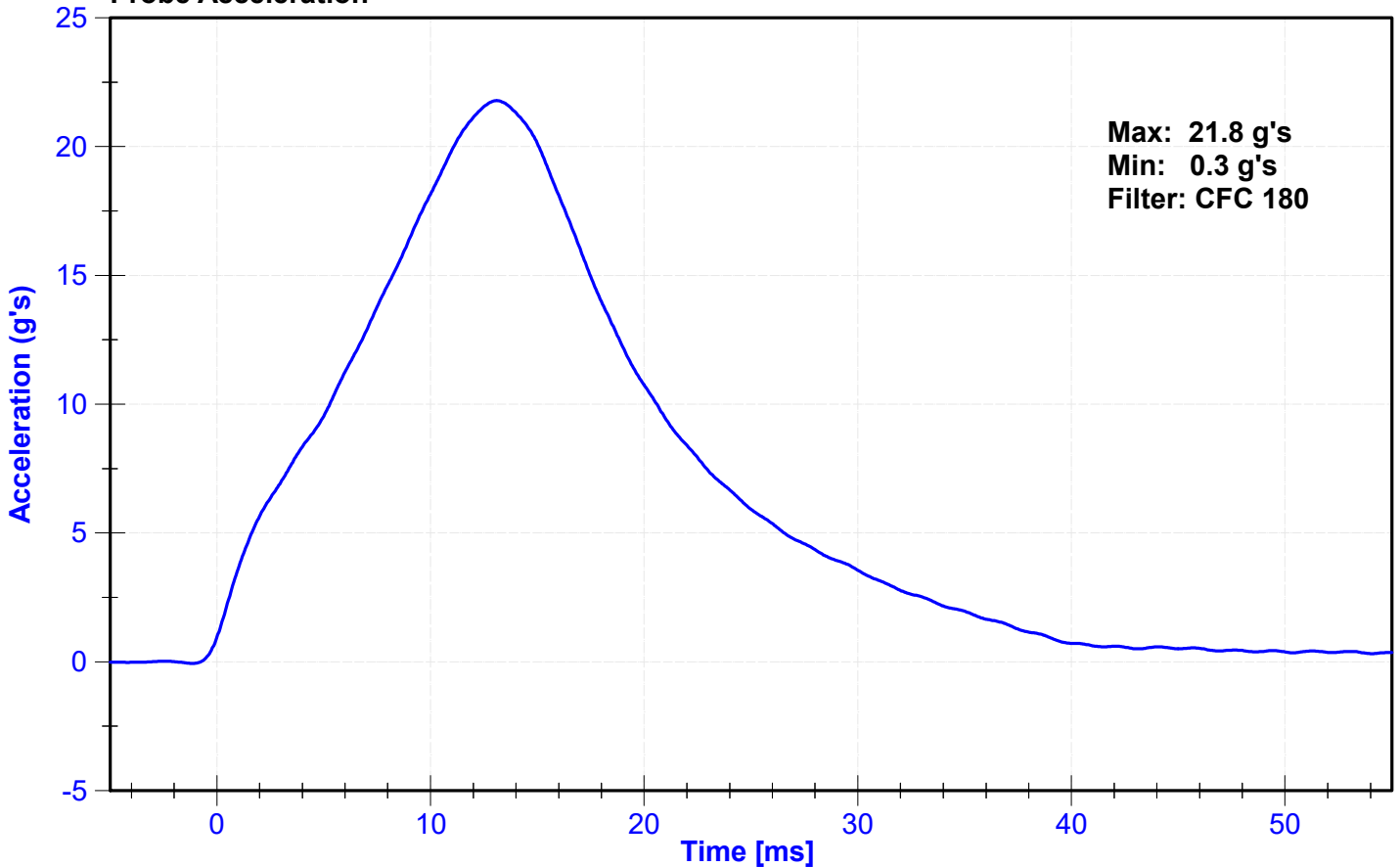
Results

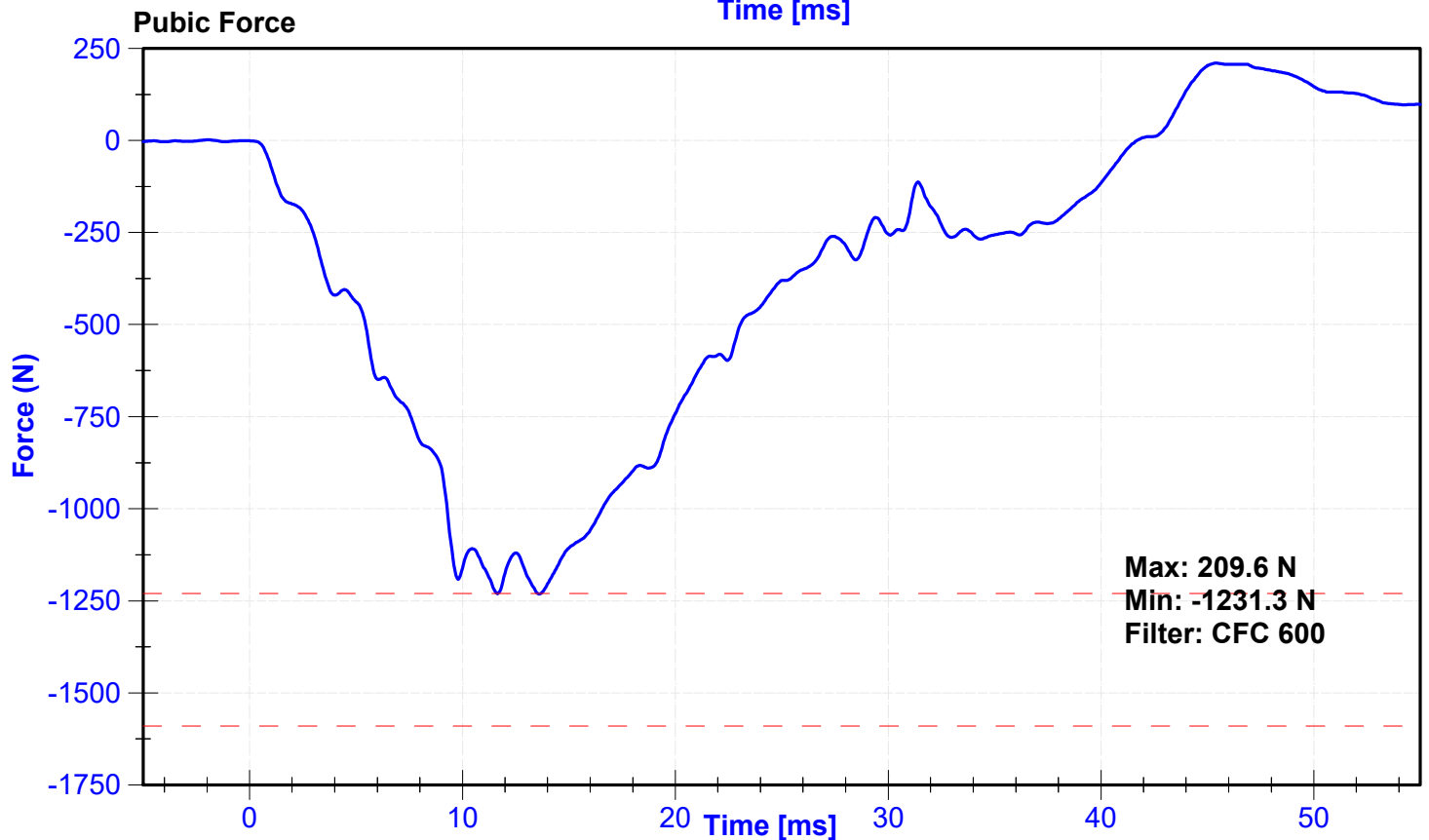
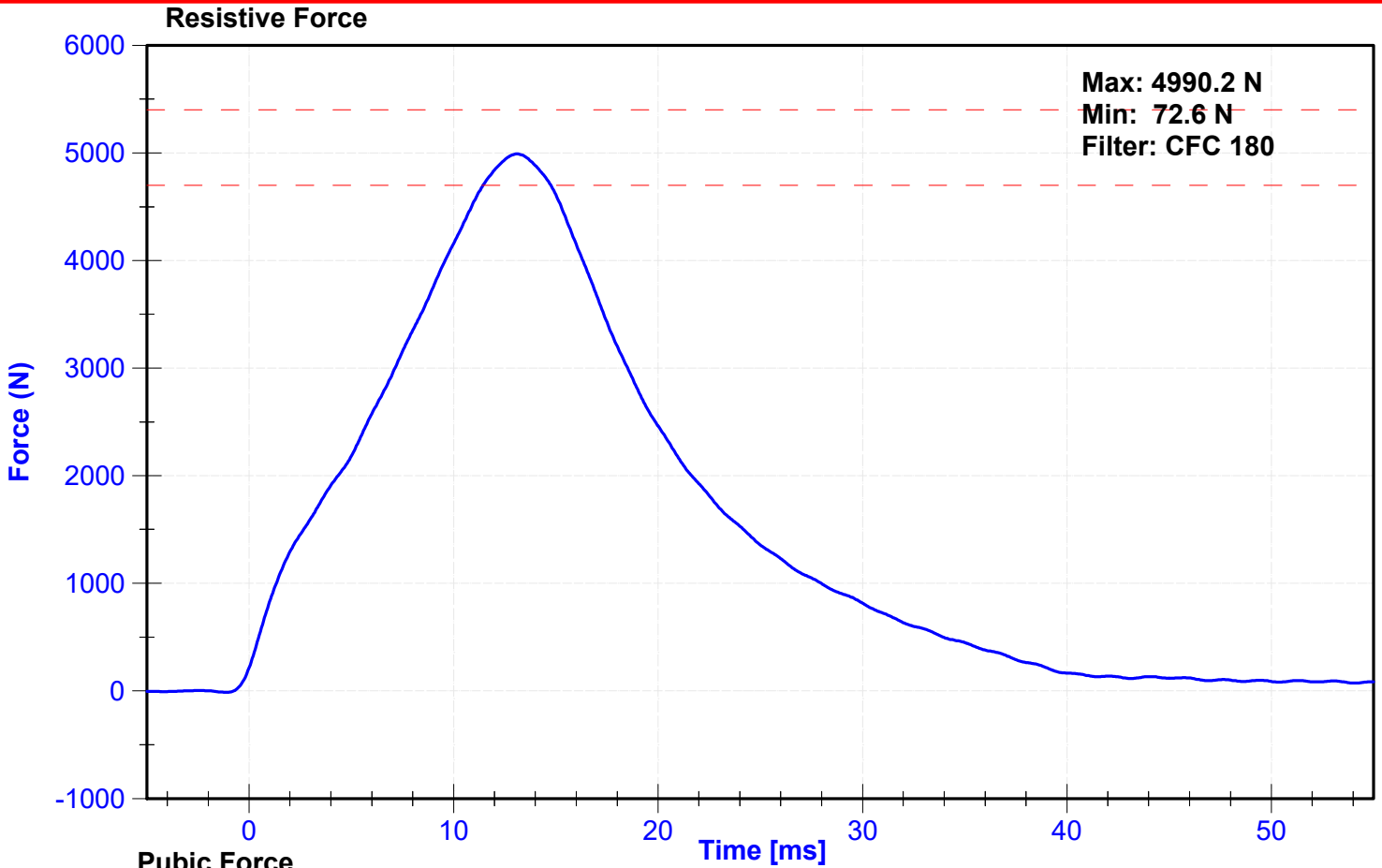
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	47	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Resistive Force	4700	5400	N	4990.2	Pass
Time at Peak Resistive Force	11.8	16.1	ms	13.10	Pass
Pubic Force	-1590	-1230	N	-1231.3	Pass
Time at Peak Pubic Force	12.2	17.0	ms	13.60	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Pubic Load Cell	Denton	464-FY	8/15/2023	8/14/2024

Probe Acceleration



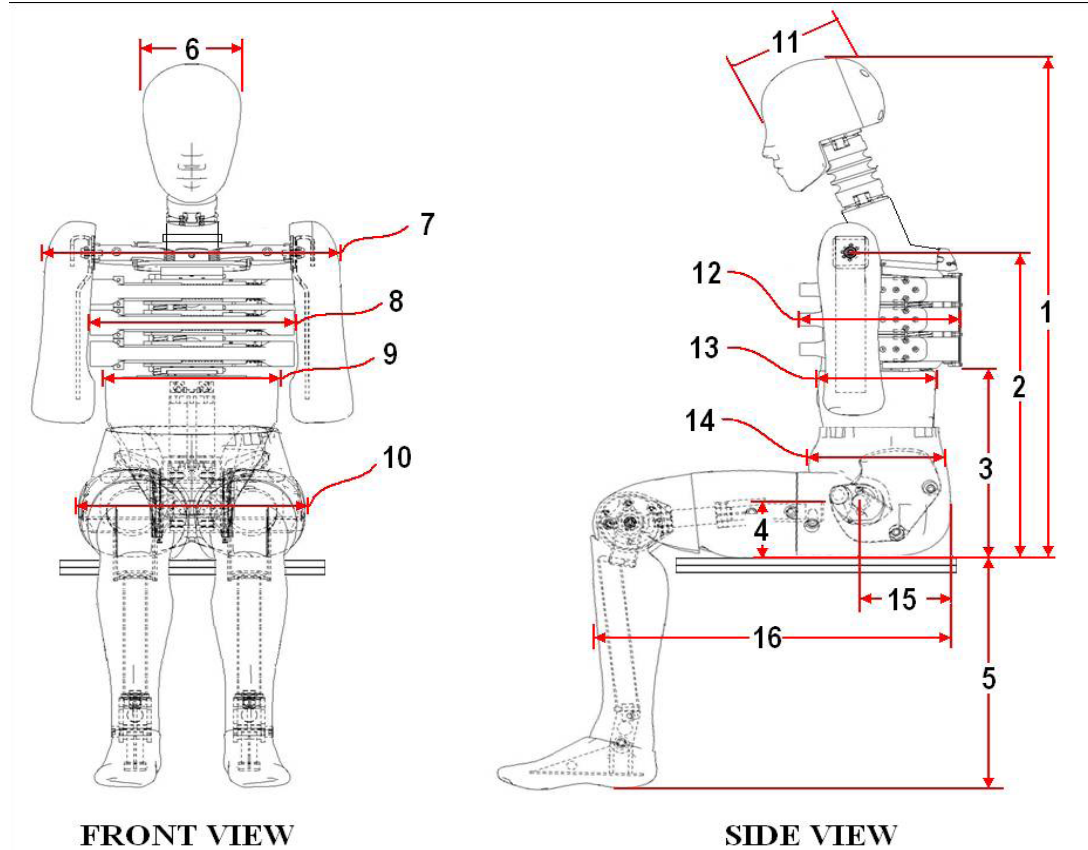


**POST-TEST
ES-2re PERFORMANCE CALIBRATION TEST DATA**

Technician: J. Rios

Date: 08/07/2024

Dummy Serial Number: DG5348



FRONT VIEW

SIDE VIEW

Dim. No.	Description	Specification (mm)		Result (mm)	Pass/Fail
1	Sitting Height	900	918	913	Pass
2	Seat to Shoulder Joint	558	572	568	Pass
3	Seat to Lower Face of Thoracic Spine Box	346	356	350	Pass
4	Seat to Hip Joint (center of bolt)	97	103	102	Pass
5	Sole to Seat, Sitting	333	451	414	Pass
6	Head Width	152	158	153	Pass
7	Shoulder/Arm Width	461	479	470	Pass
8	Thorax Width	322	332	327	Pass
9	Abdomen Width	273	287	281	Pass
10	Pelvis Lap Width	359	373	367	Pass
11	Head Depth	196	206	200	Pass
12	Thorax Depth	262	272	267	Pass
13	Abdomen Depth	194	204	198	Pass
14	Pelvis Depth	235	245	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	601	Pass

ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

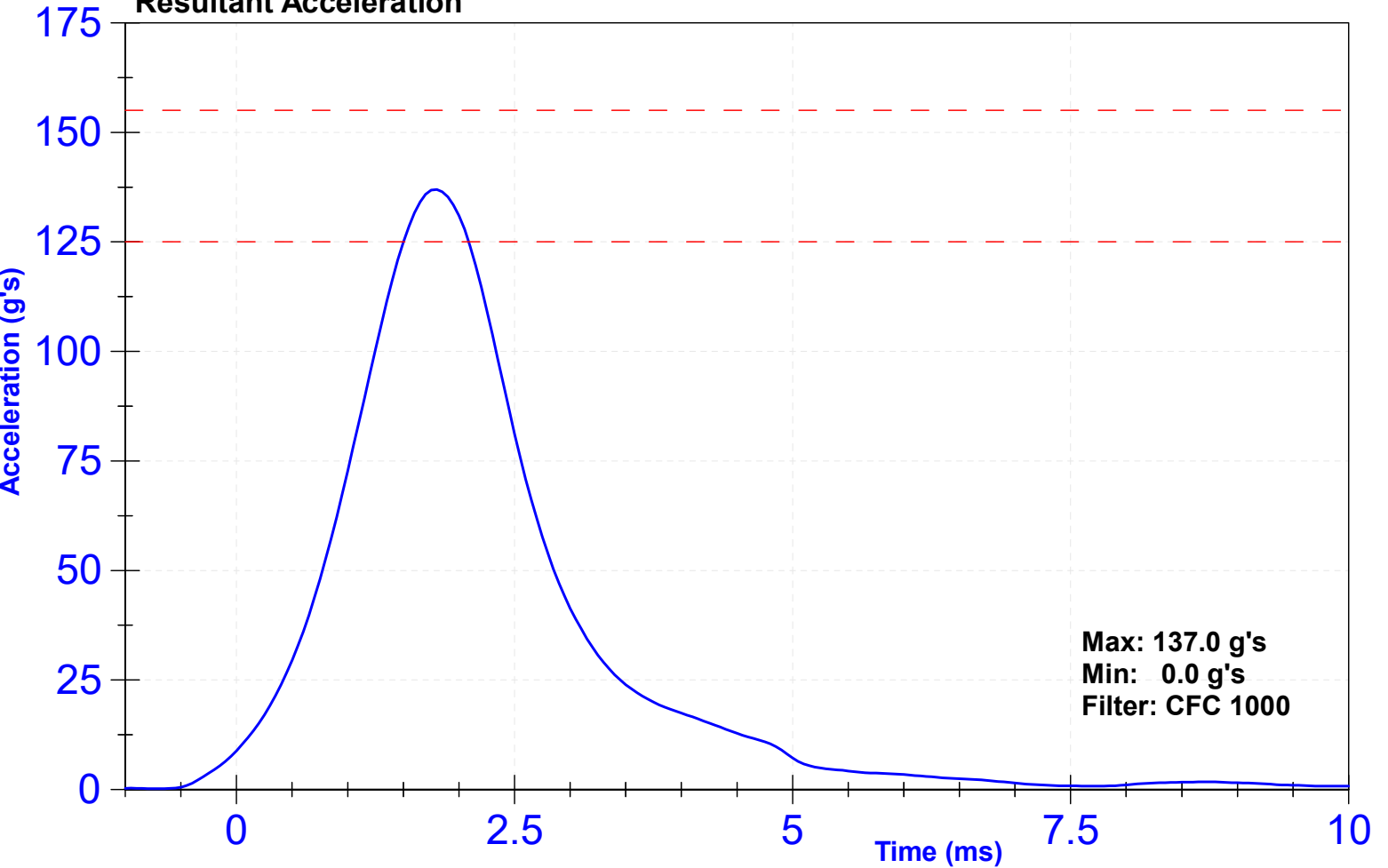
Results

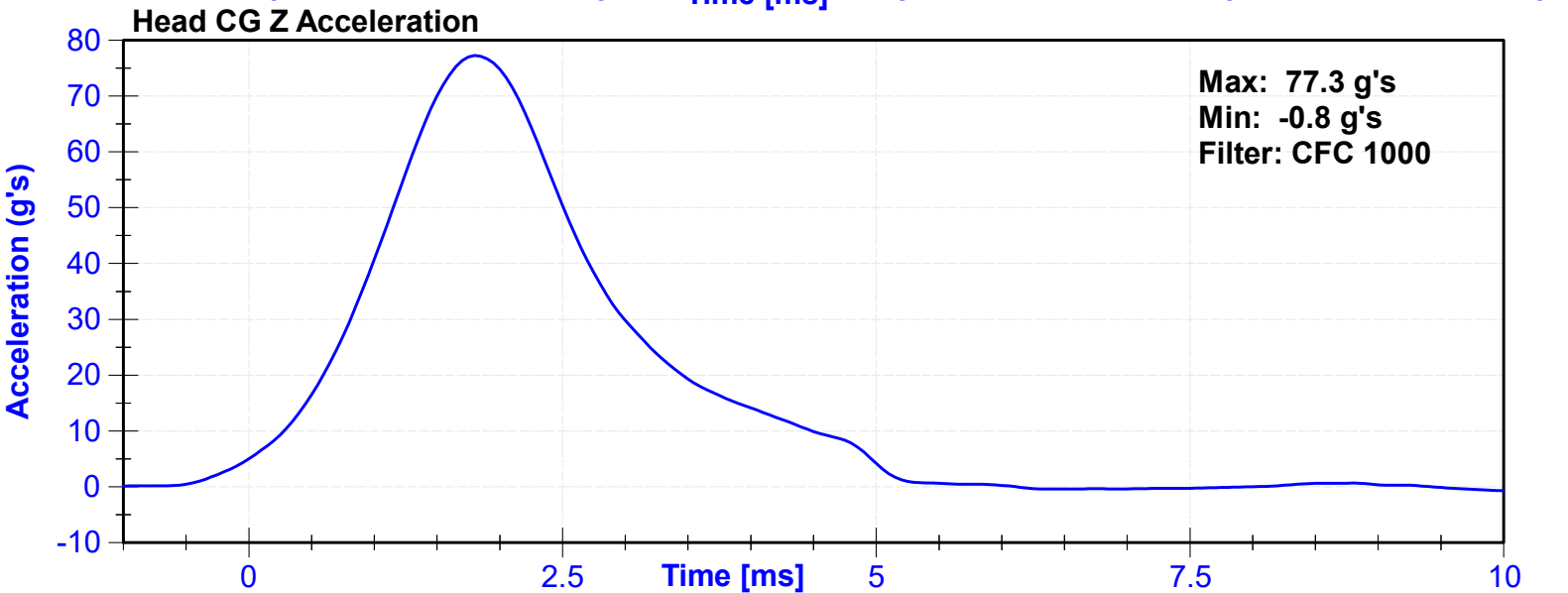
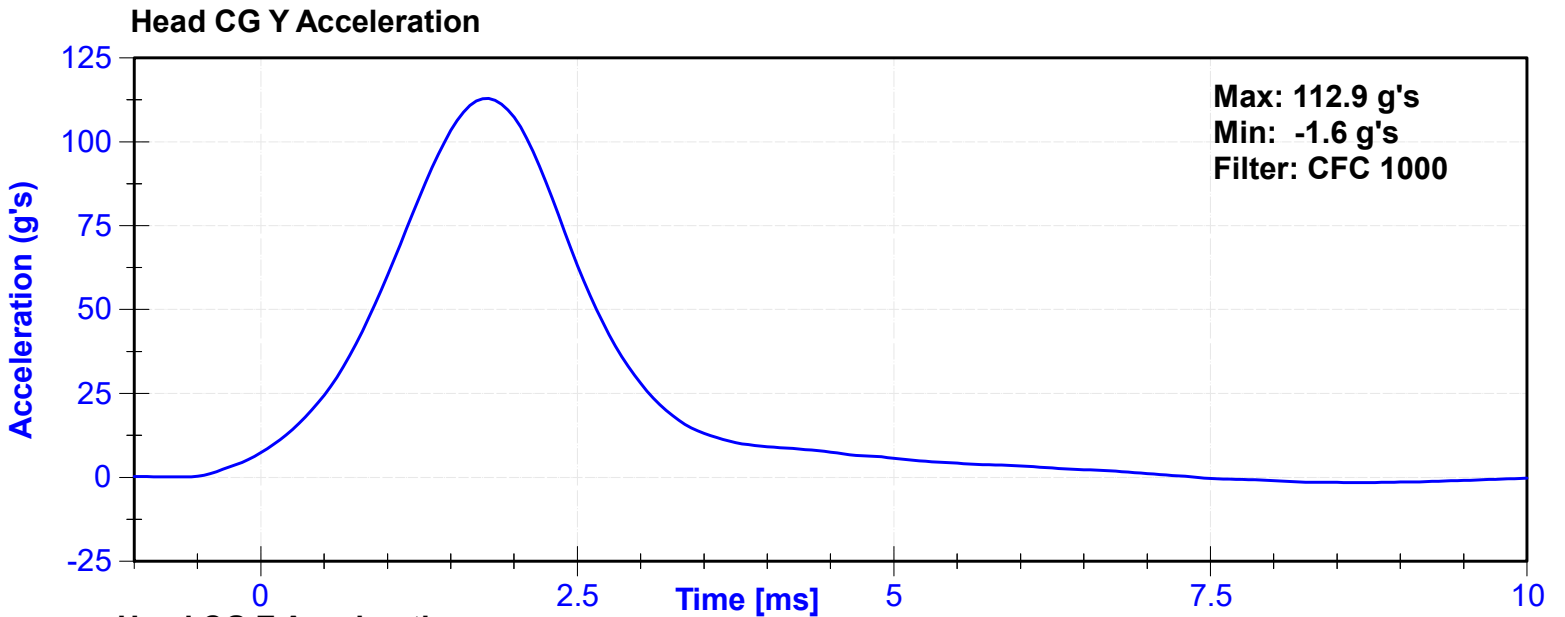
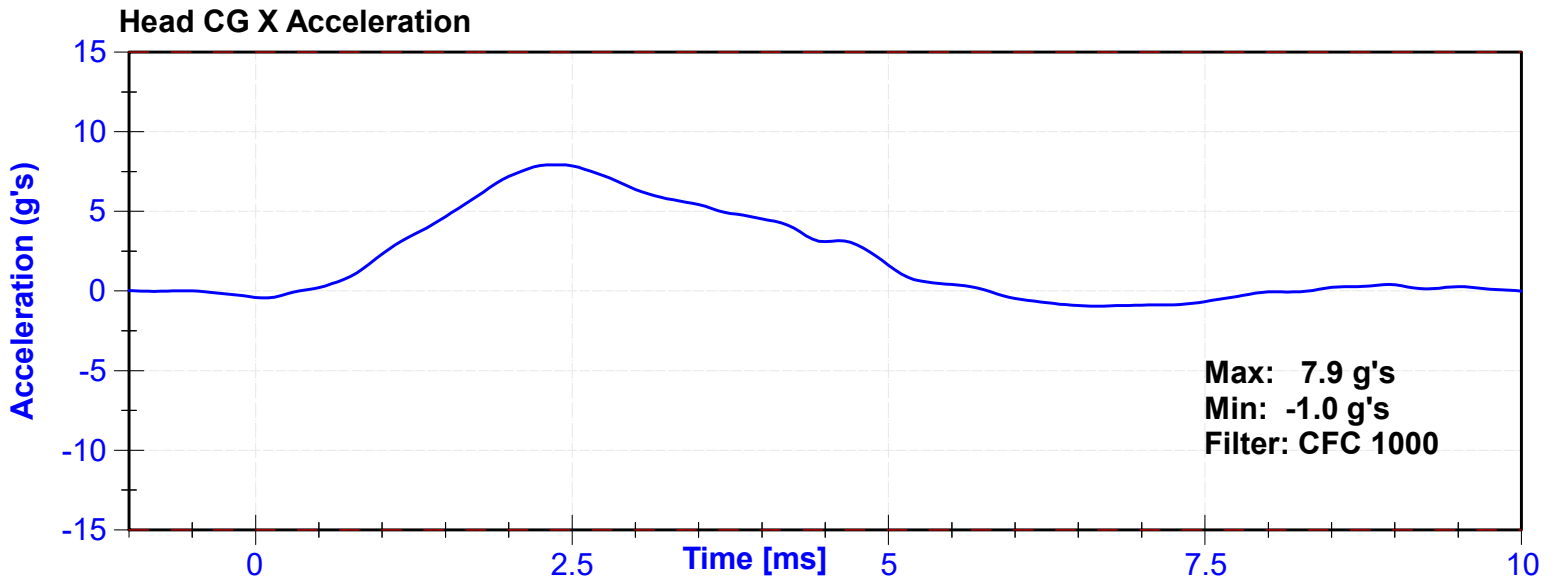
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	62	Pass
Resultant Acceleration	125	155	g's	137.0	Pass
Oscillation	0	15	%	1.28	Pass
Fore-Aft Acceleration	-15	15	g's	7.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	18613	7/30/2024	1/26/2025
Y Accelerometer	Endevco	18472	7/30/2024	1/26/2025
Z Accelerometer	Endevco	18663	7/30/2024	1/26/2025

Resultant Acceleration





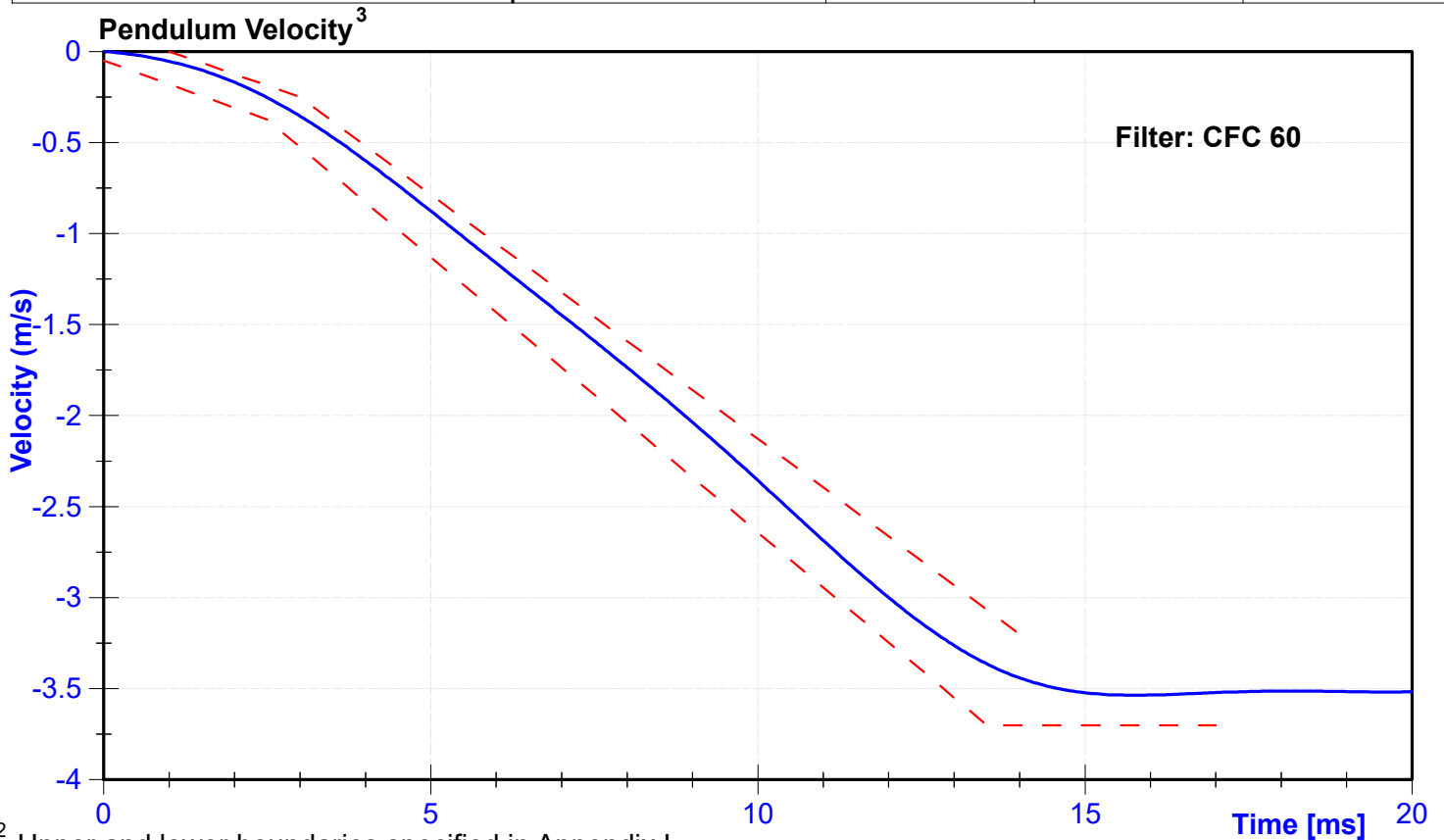
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	58	Pass
Velocity	3.3	3.5	m/s	3.31	Pass
Lateral Neck Rotation	49	59	deg	49.4	Pass
Time at Maximum Rotation	54	66	ms	57.7	Pass
Time of Rotation Decay from Maximum	53	88	ms	57.0	Pass
Pendulum Velocity Overall Corridor	Lower Boundary ¹	Upper Boundary ²	m/s	See Plot ³	Pass

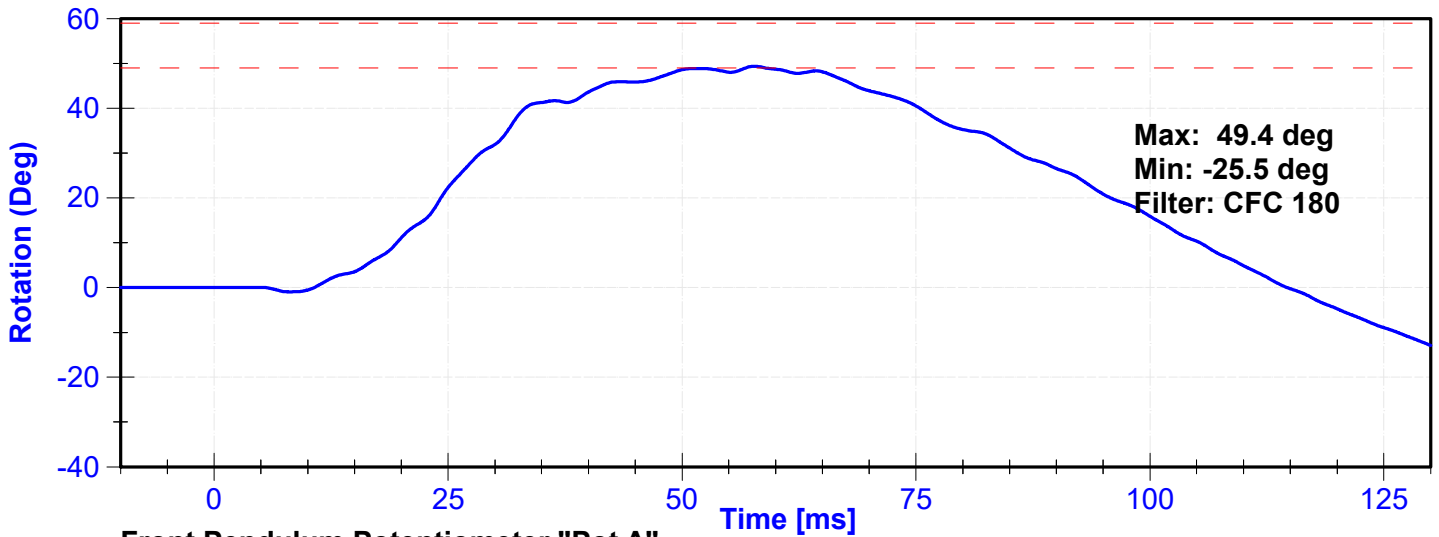
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16503	4/29/2024	10/26/2024
Front Pendulum Potentiometer	Sfernice	2247	12/5/2023	12/4/2024
Headform Potentiometer	Sfernice	095	9/29/2023	9/28/2024

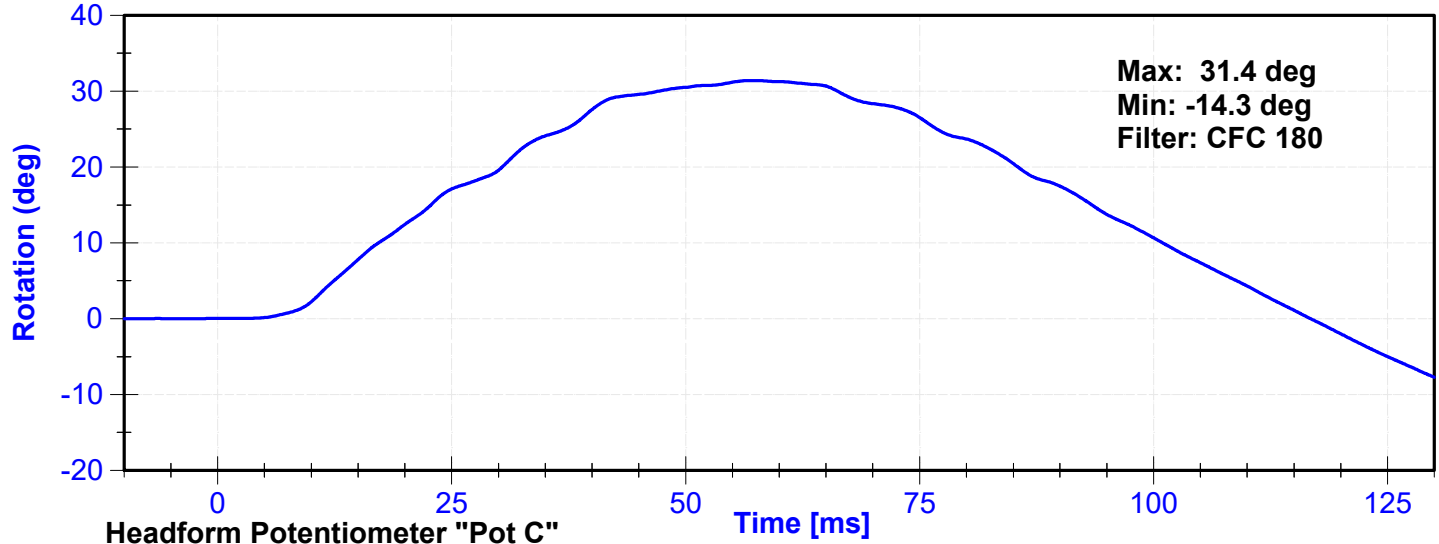


^{1,2} Upper and lower boundaries specified in Appendix I

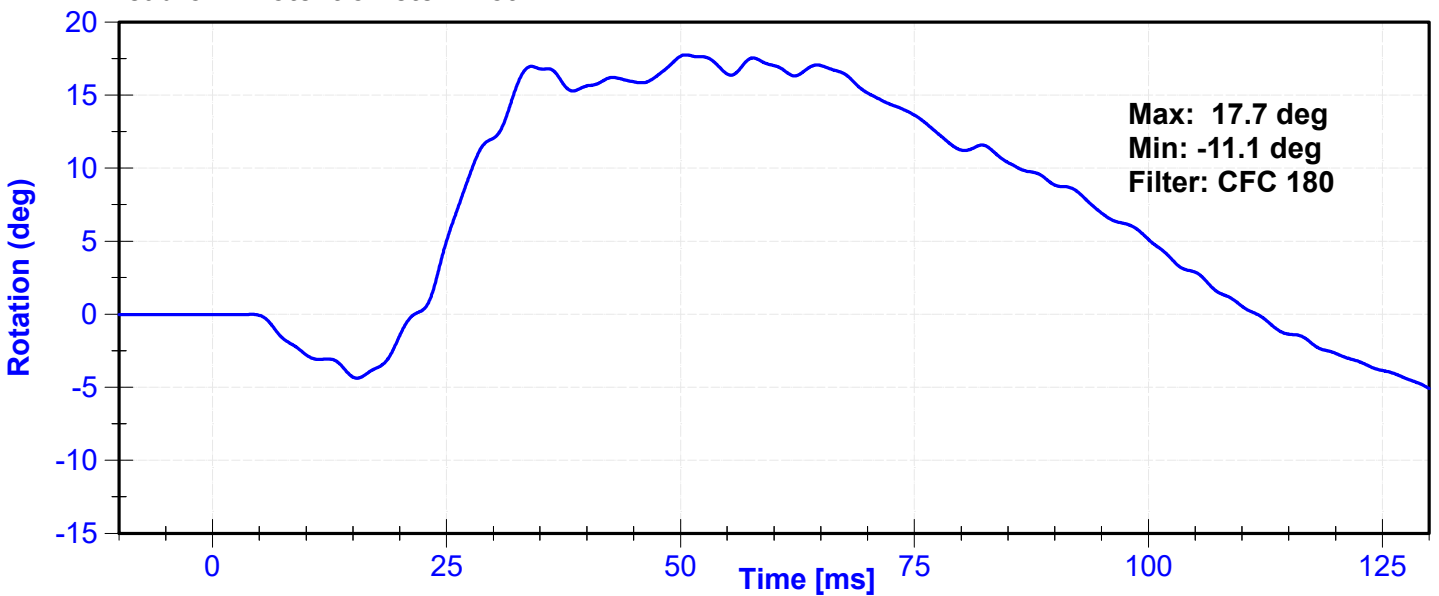
Neck Rotation



Front Pendulum Potentiometer "Pot A"



Headform Potentiometer "Pot C"



Appendix I

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

ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

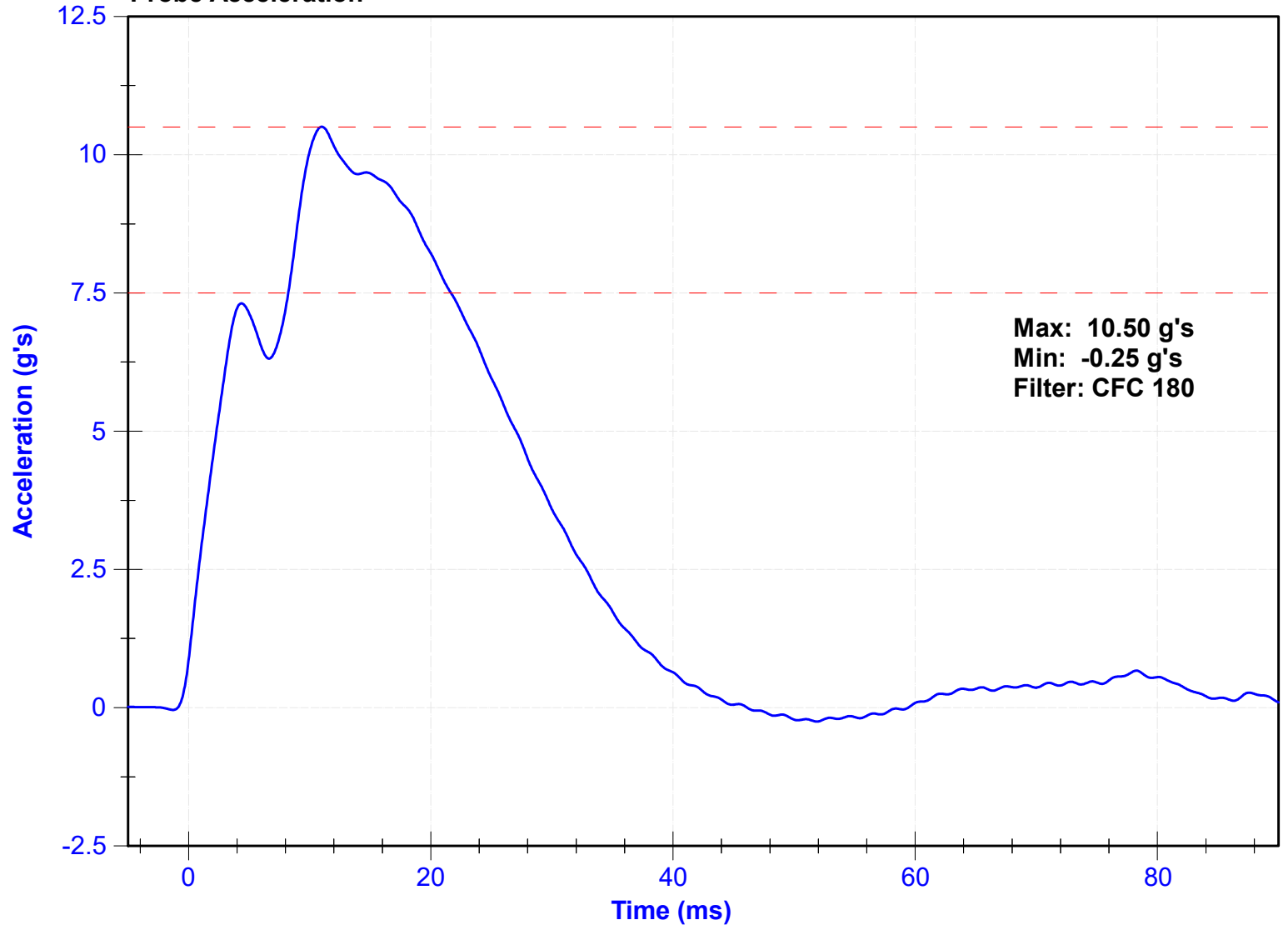
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	61	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	7.5	10.5	g's	10.50	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18619	3/29/2024	9/25/2024

Probe Acceleration



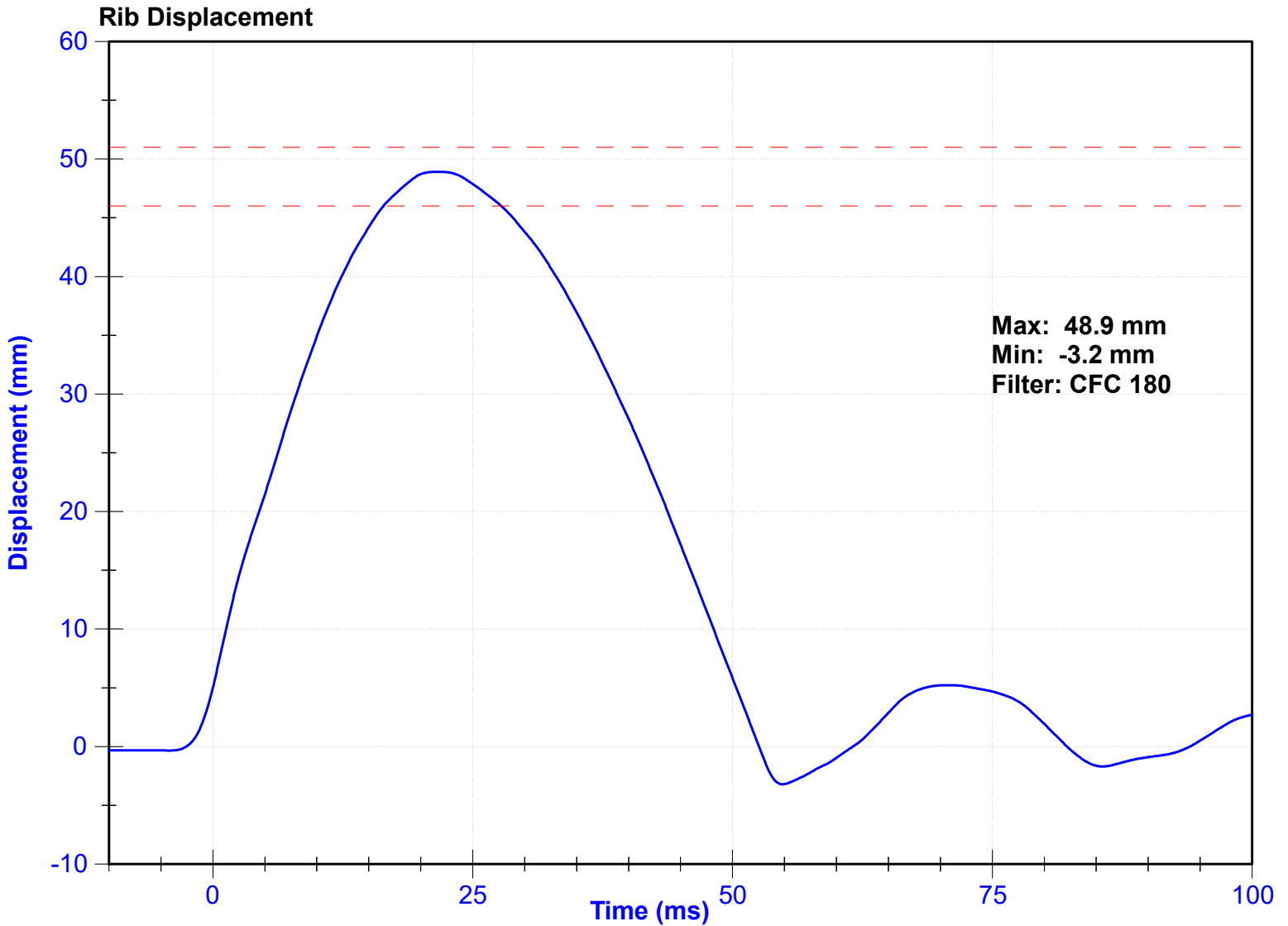
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	61	Pass
Rib Displacement	46	51	mm	48.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	268GFE	7/30/2024	1/28/2025



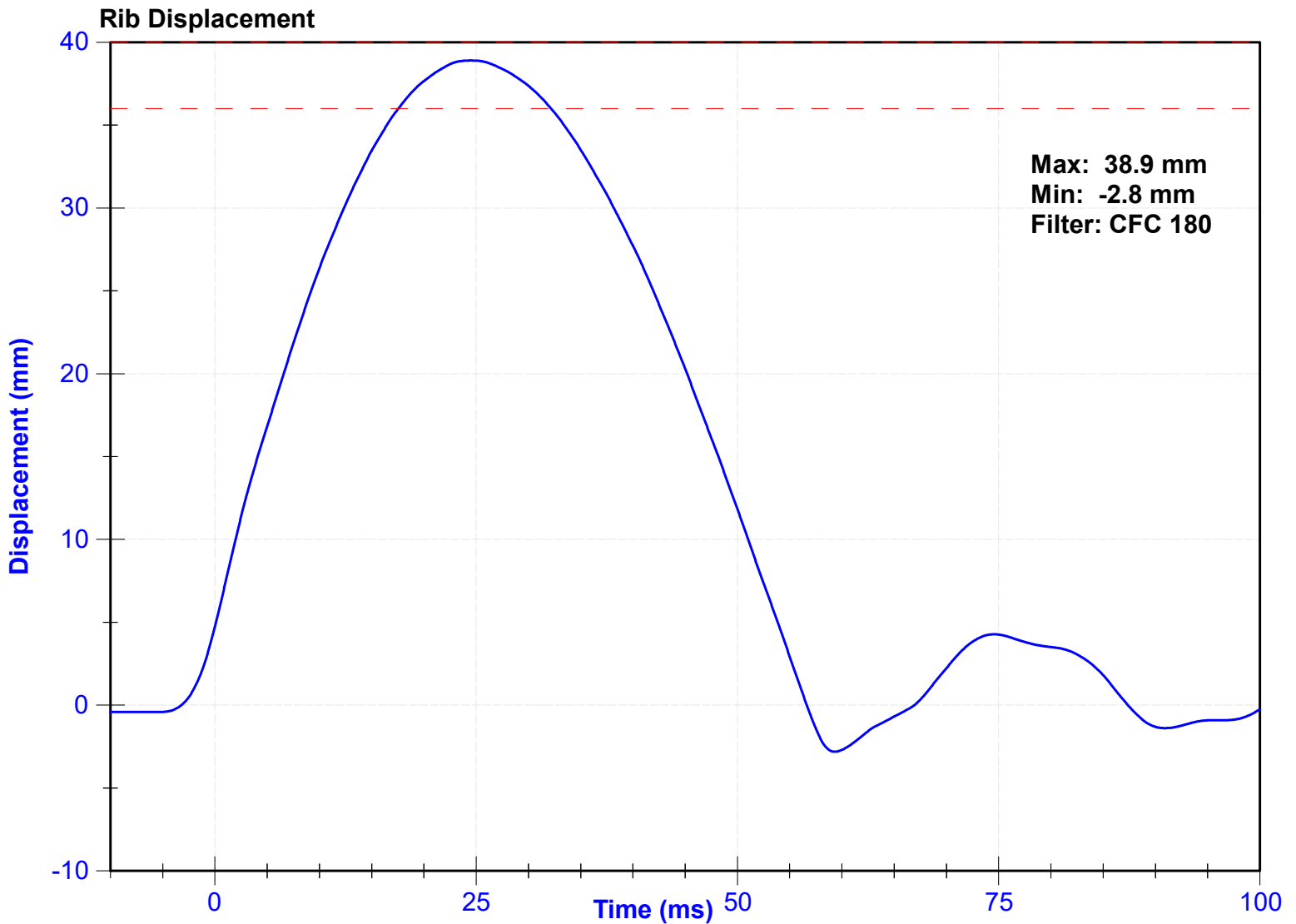
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	61	Pass
Rib Displacement	36	40	mm	38.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	268GFE	7/30/2024	1/28/2025



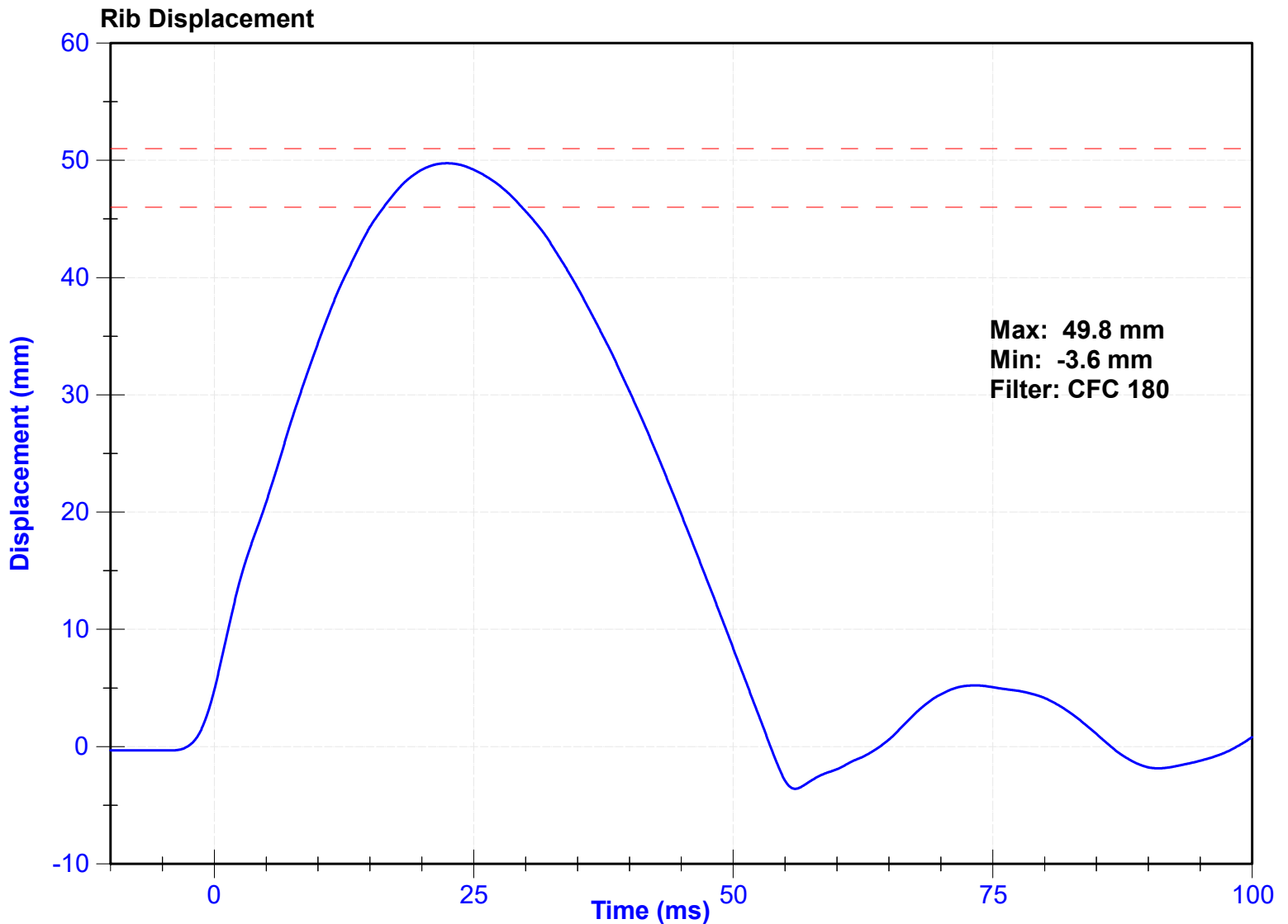
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	61	Pass
Rib Displacement	46	51	mm	49.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	269GFE	7/30/2024	1/28/2025



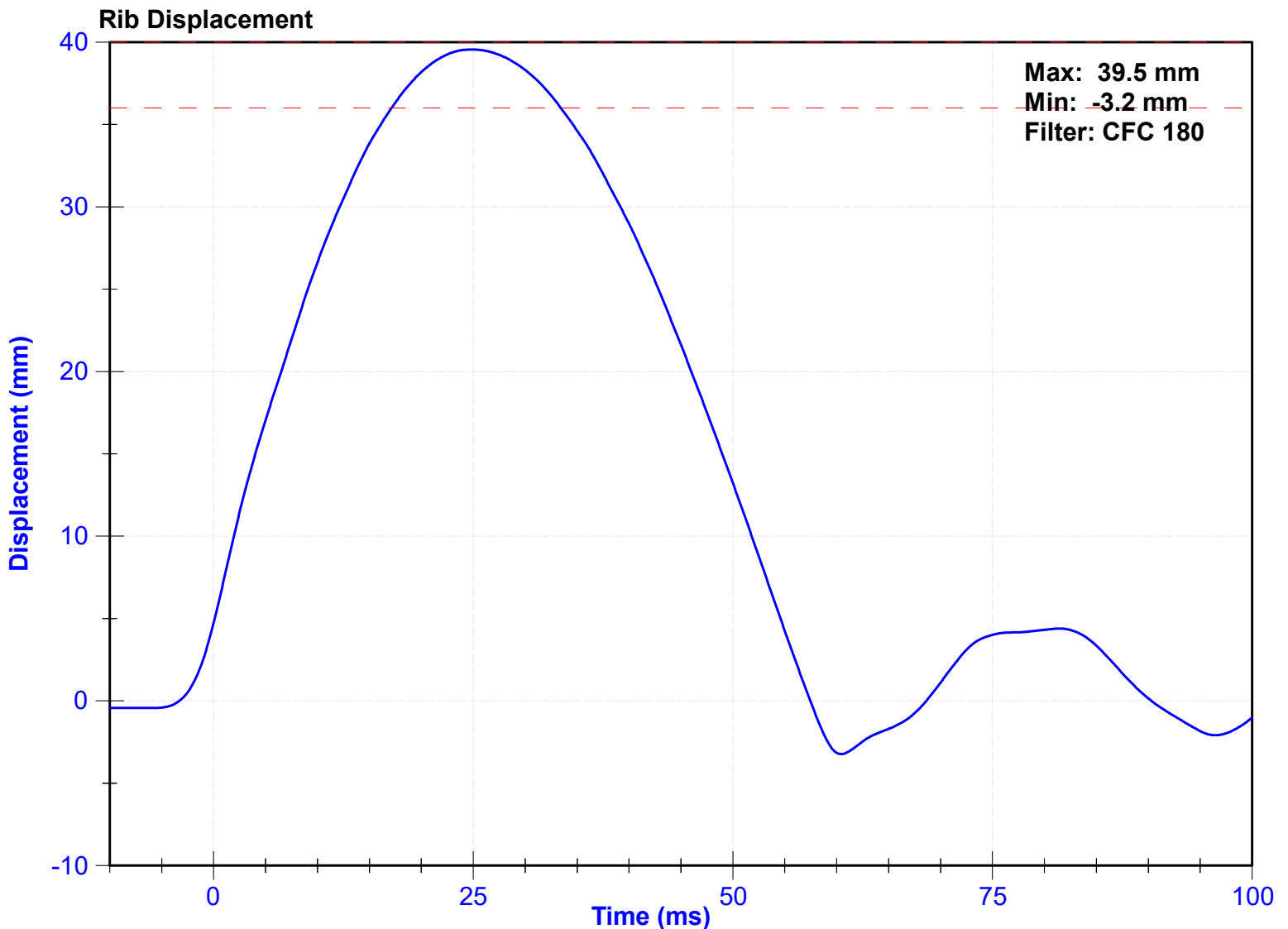
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	61	Pass
Rib Displacement	36	40	mm	39.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	269GFE	7/30/2024	1/28/2025



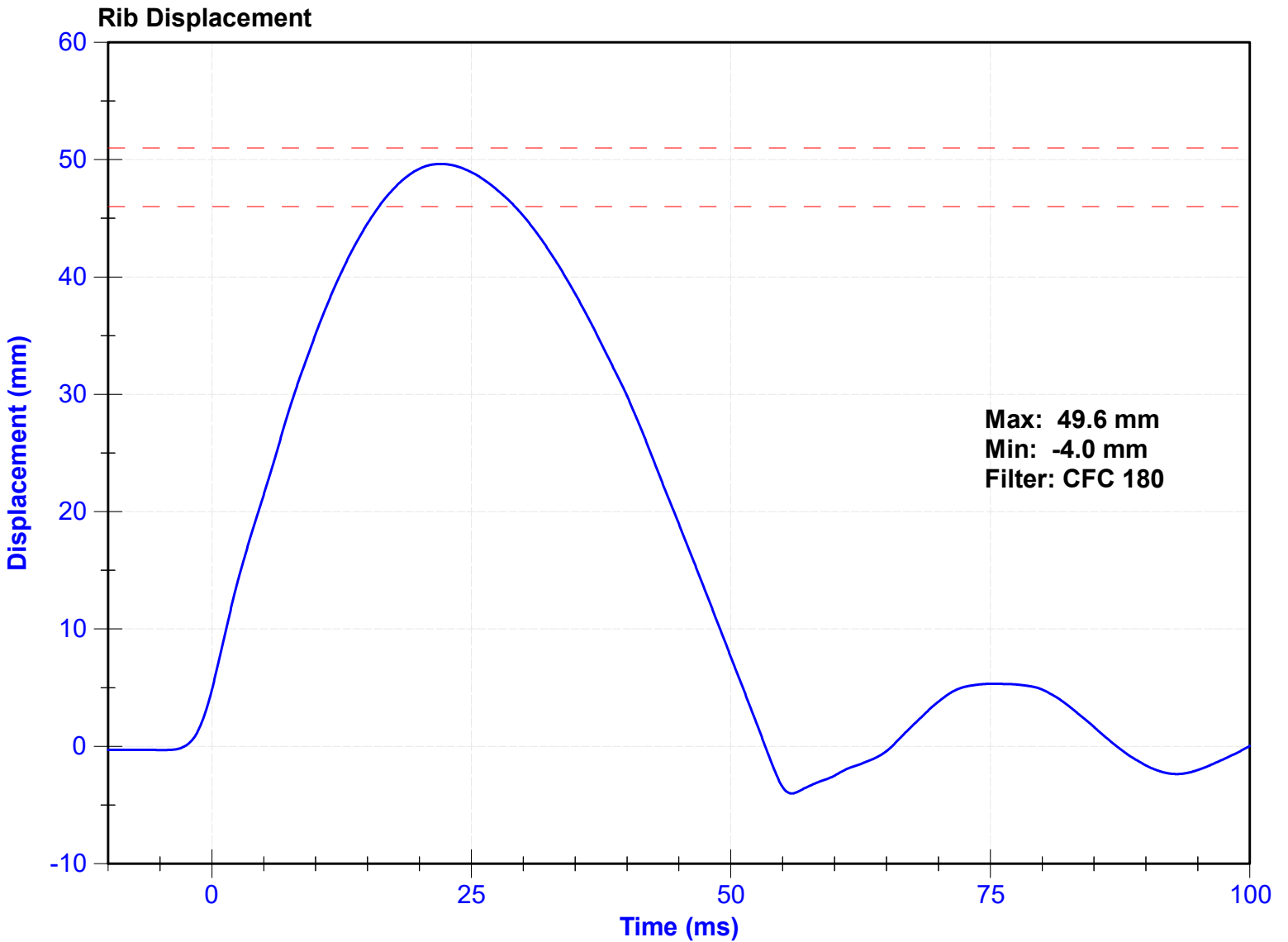
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	61	Pass
Rib Displacement	46	51	mm	49.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	270GFE	7/30/2024	1/28/2025



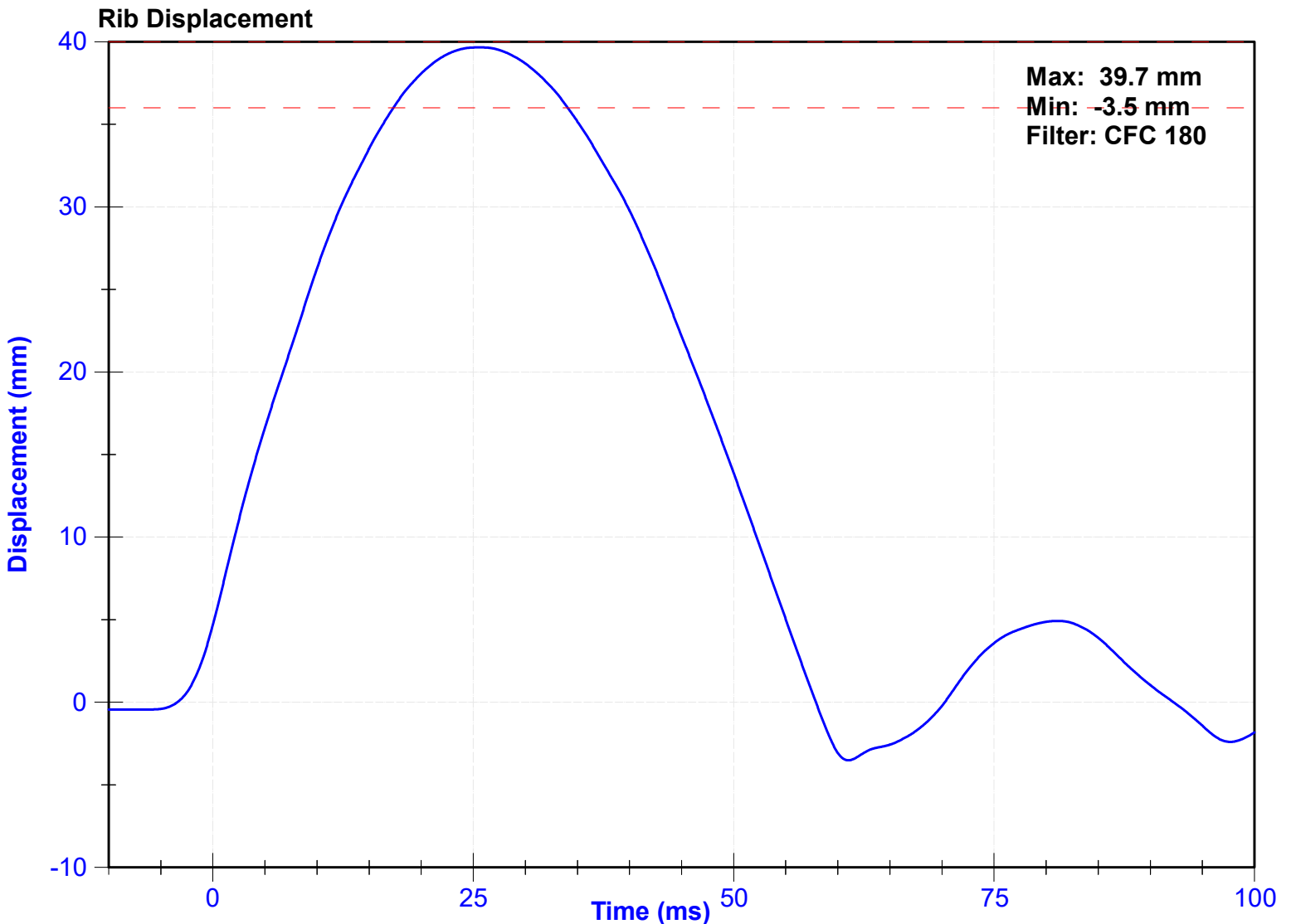
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	61	Pass
Rib Displacement	36	40	mm	39.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Rib Potentiometer	Honeywell	270GFE	7/30/2024	1/28/2025



ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

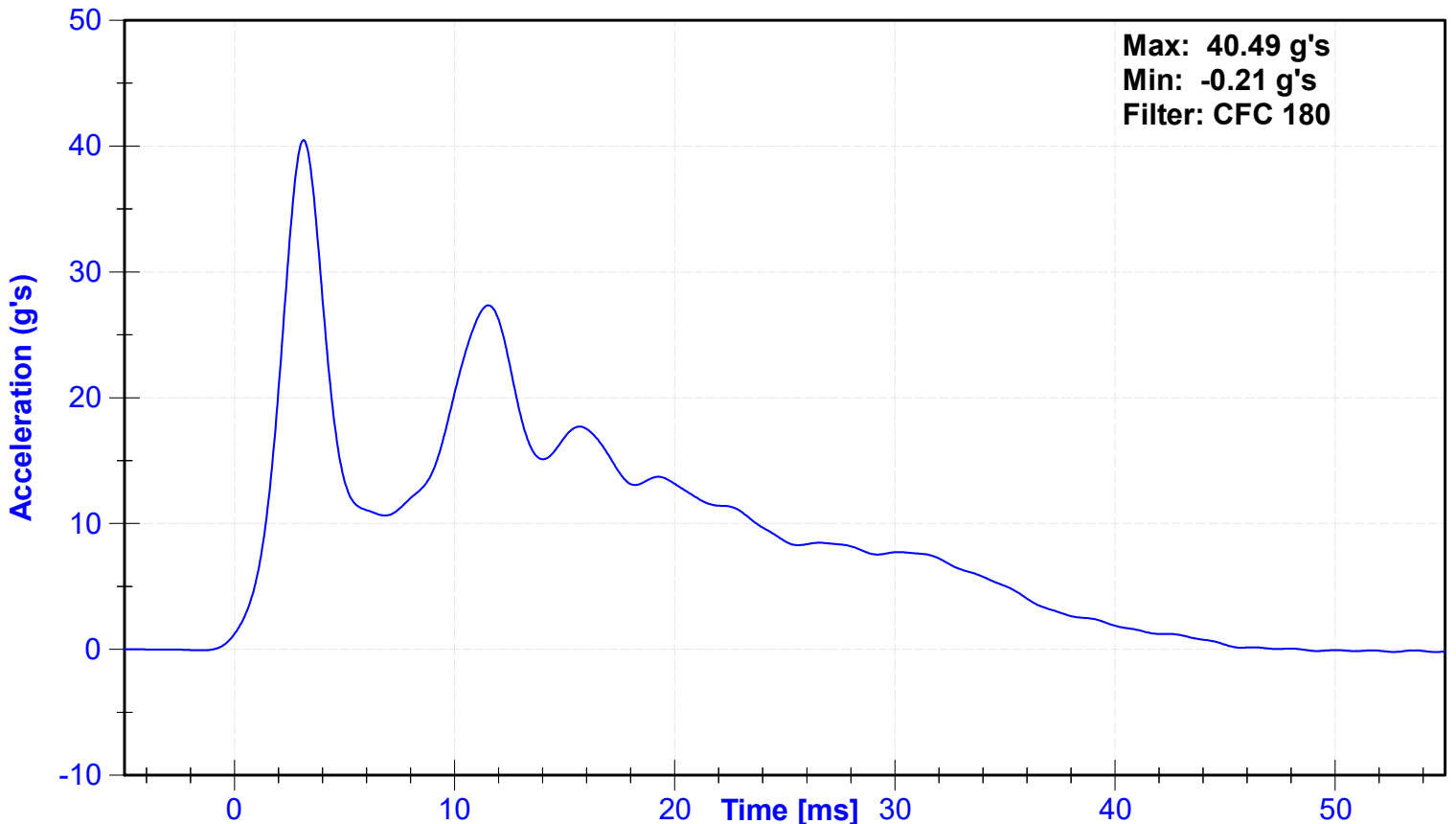
Results

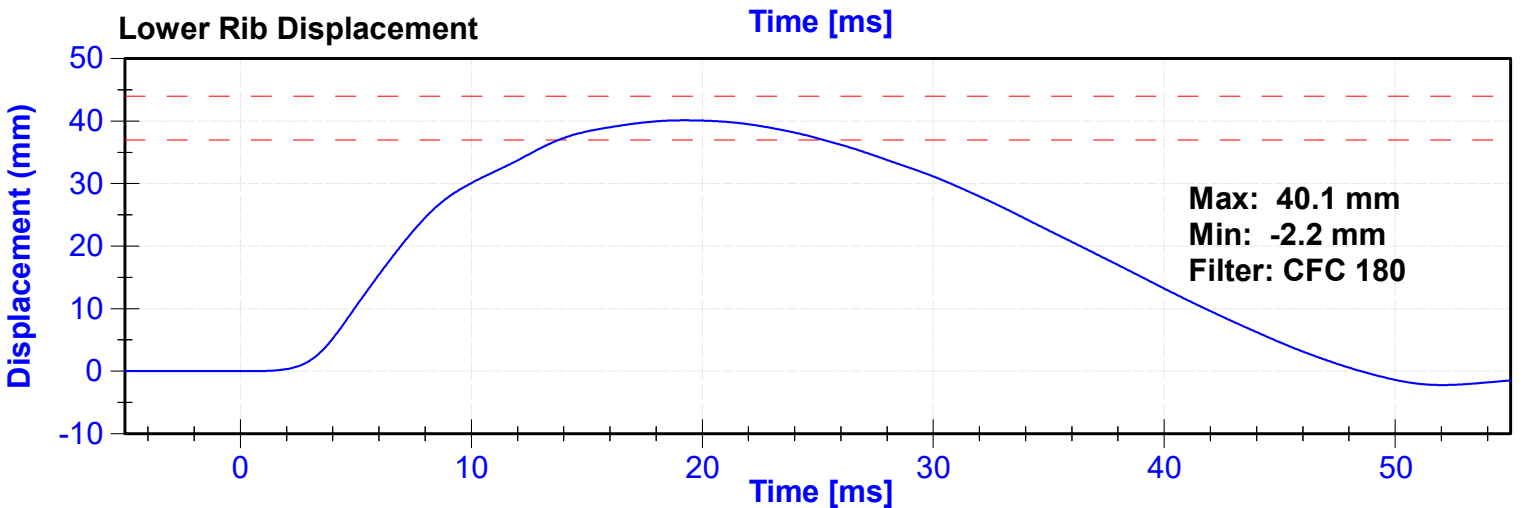
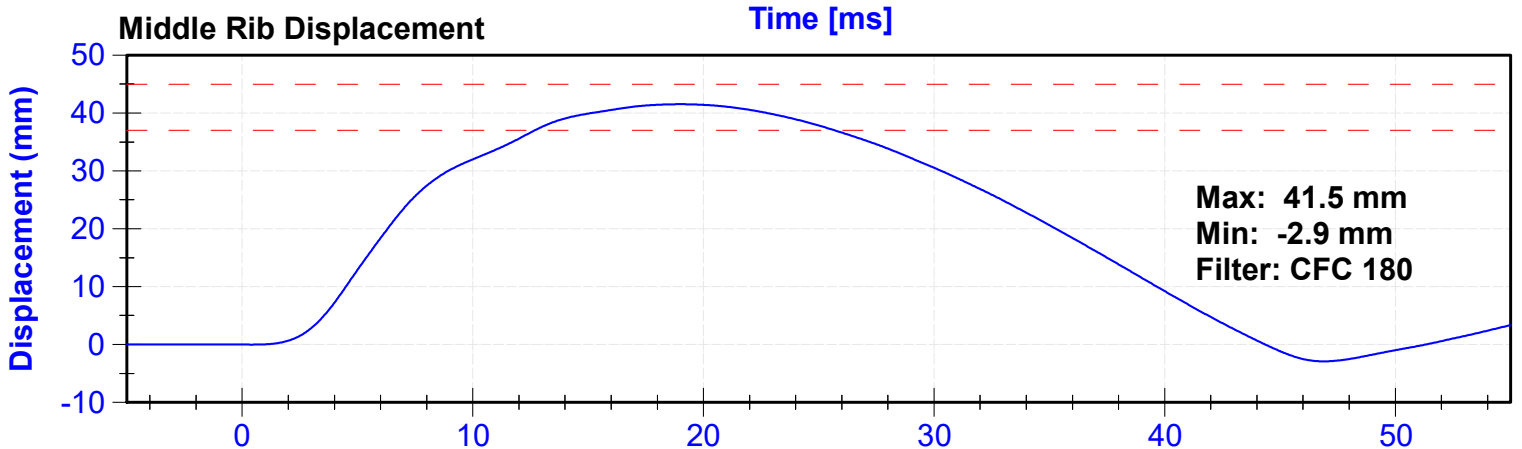
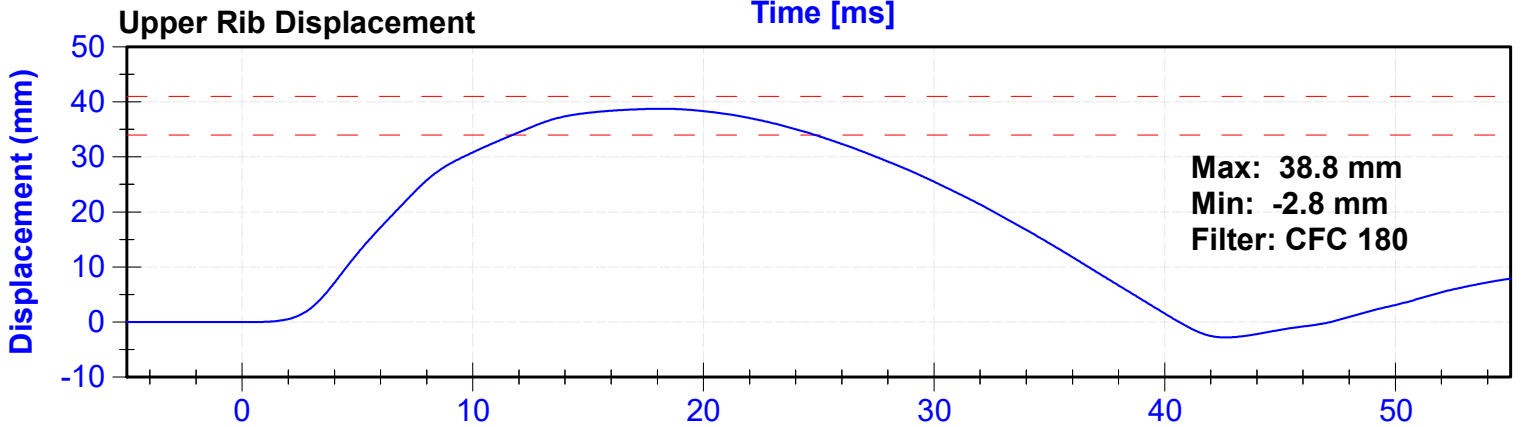
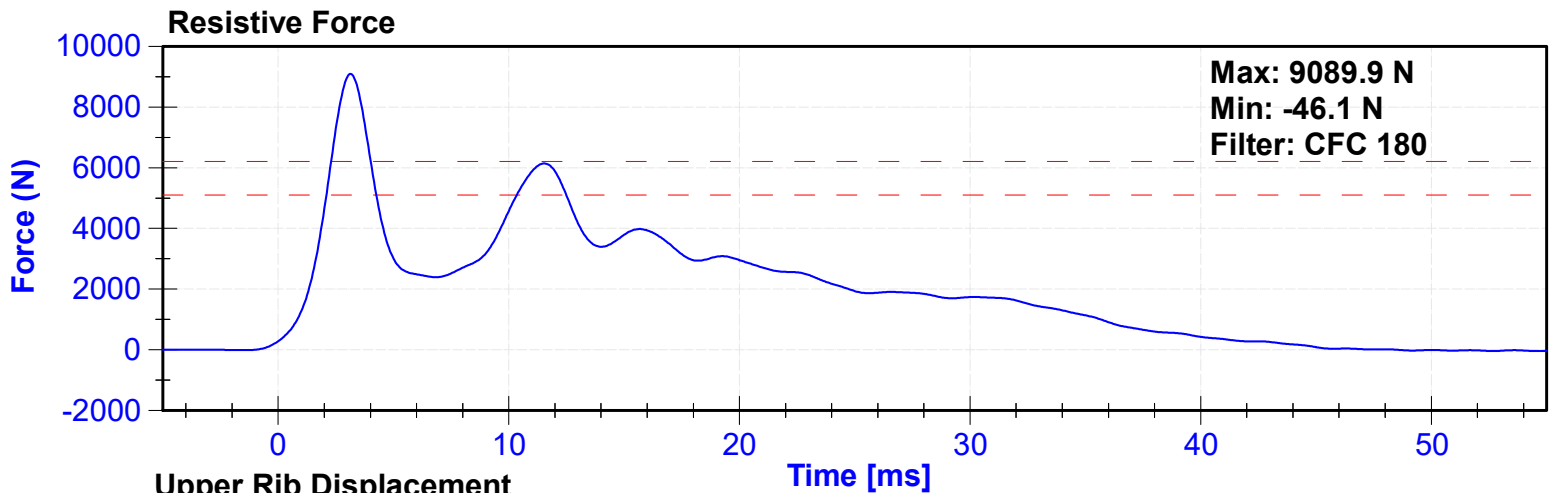
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	61	Pass
Velocity	5.4	5.6	m/s	5.48	Pass
Resistive Force after 6ms	5100	6200	N	6139.8	Pass
Upper Thorax Rib Deflection	34	41	mm	38.8	Pass
Mid Thorax Rib Deflection	37	45	mm	41.5	Pass
Lower Thorax Rib Deflection	37	44	mm	40.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Thorax Rib Potentiometer	Honeywell	268GFE	7/30/2024	1/28/2025
Middle Thorax Rib Potentiometer	Honeywell	269GFE	7/30/2024	1/28/2025
Lower Thorax Rib Potentiometer	Honeywell	270GFE	7/30/2024	1/28/2025

Probe Acceleration





ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

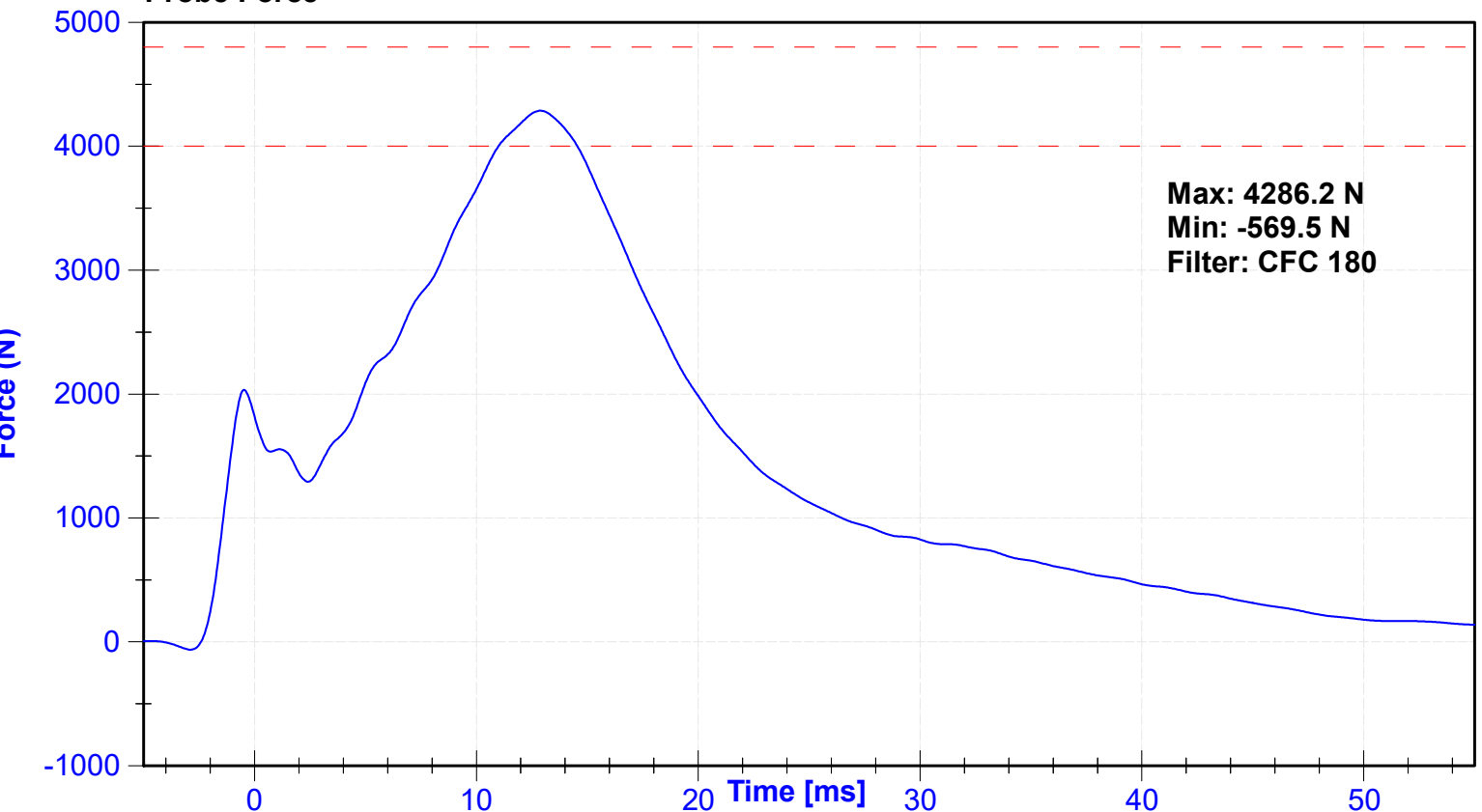
Results

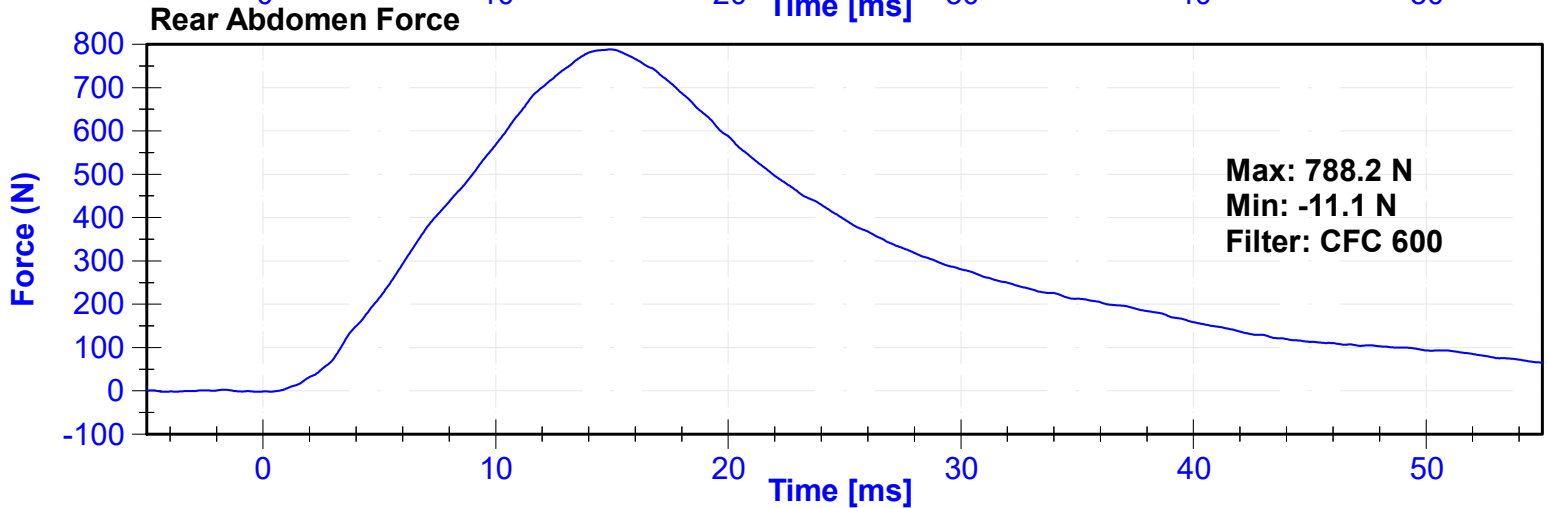
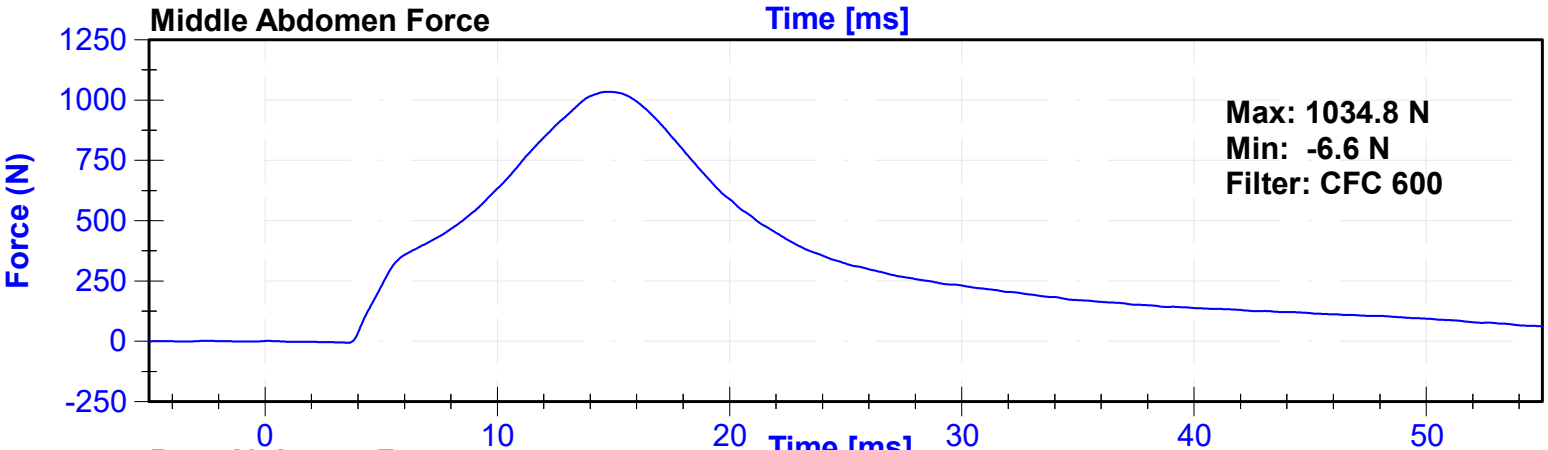
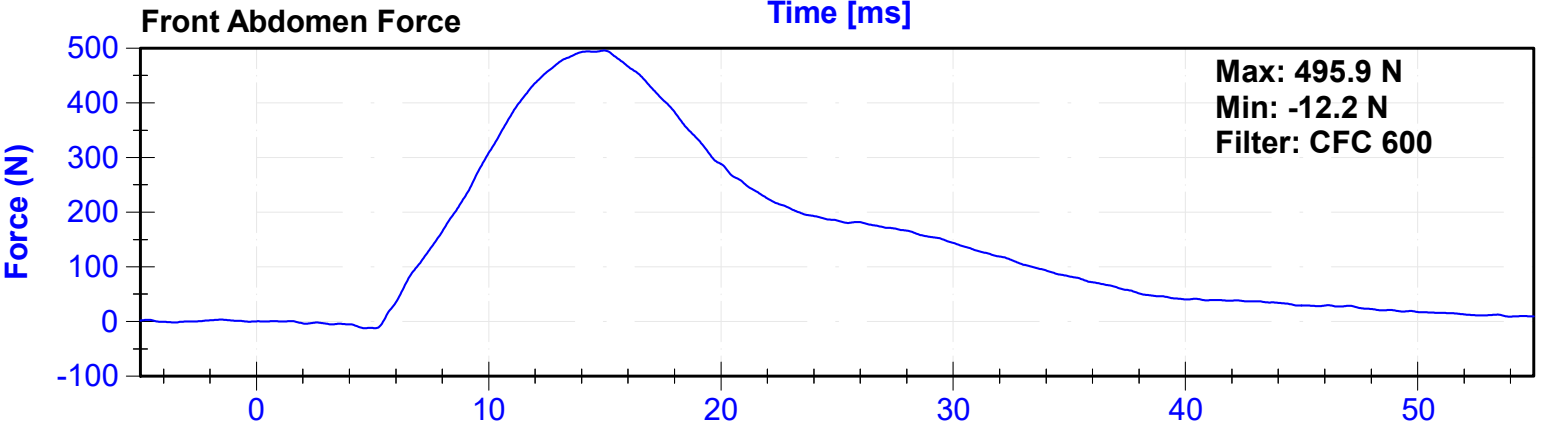
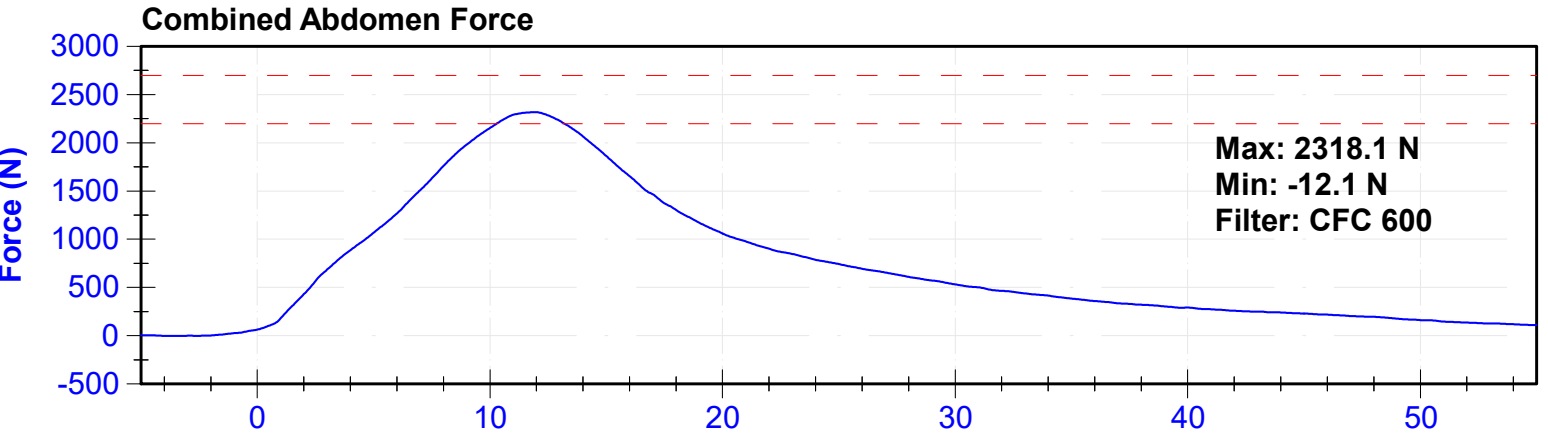
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	61	Pass
Velocity	3.9	4.1	m/s	4.02	Pass
Combined Abdomen Force	2200	2700	N	2318.1	Pass
Time at Peak Abdomen Force	10.0	12.3	ms	11.90	Pass
Resistive Probe Force	4000	4800	N	4286.2	Pass
Time at Peak Resistive Force	10.6	13.0	ms	12.90	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Front Abdomen Load Cell	Denton	1512	8/15/2023	8/14/2024
Middle Abdomen Load Cell	Denton	1526	8/15/2023	8/14/2024
Rear Abdomen Load Cell	Denton	1516	8/15/2023	8/14/2024

Probe Force





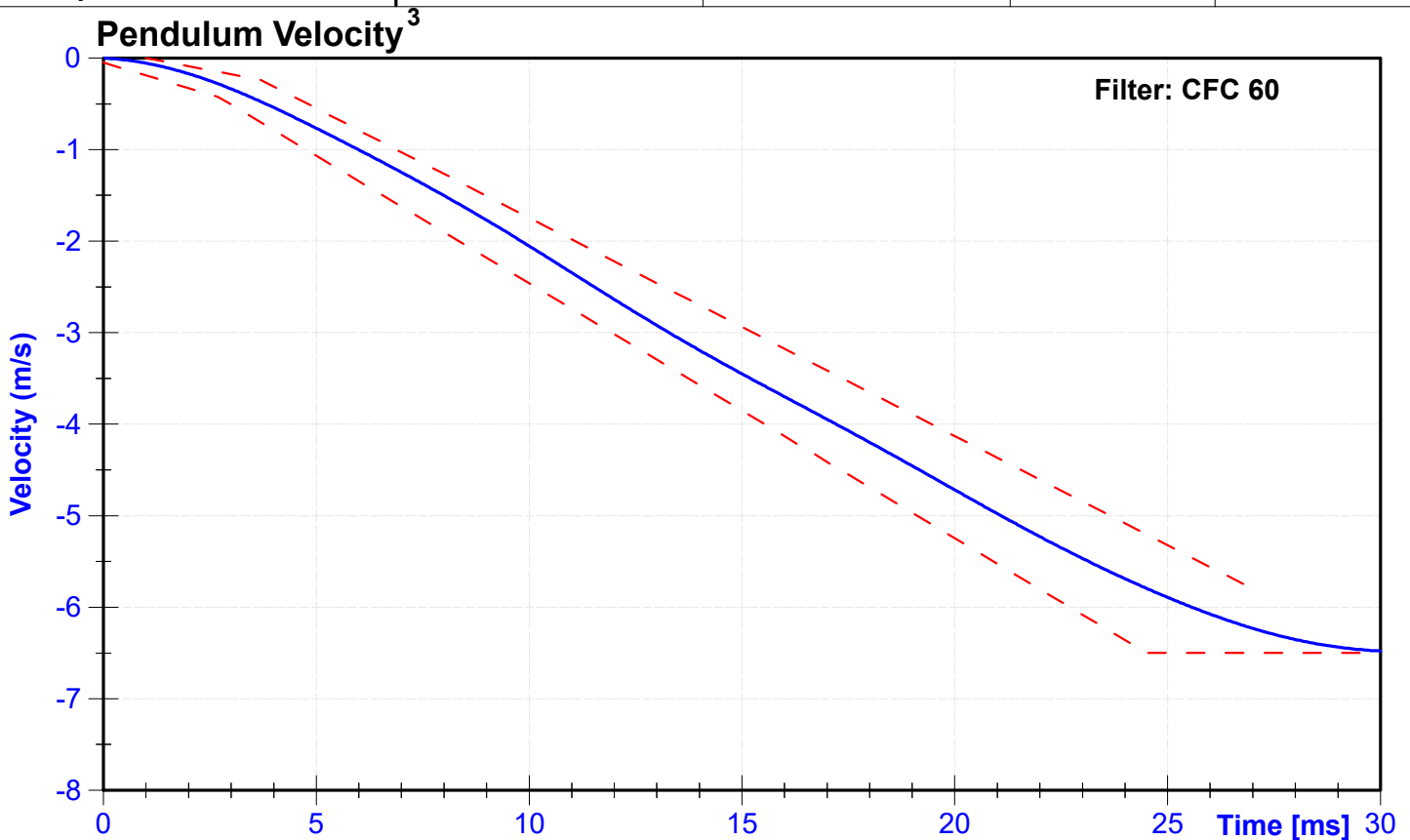
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

Results

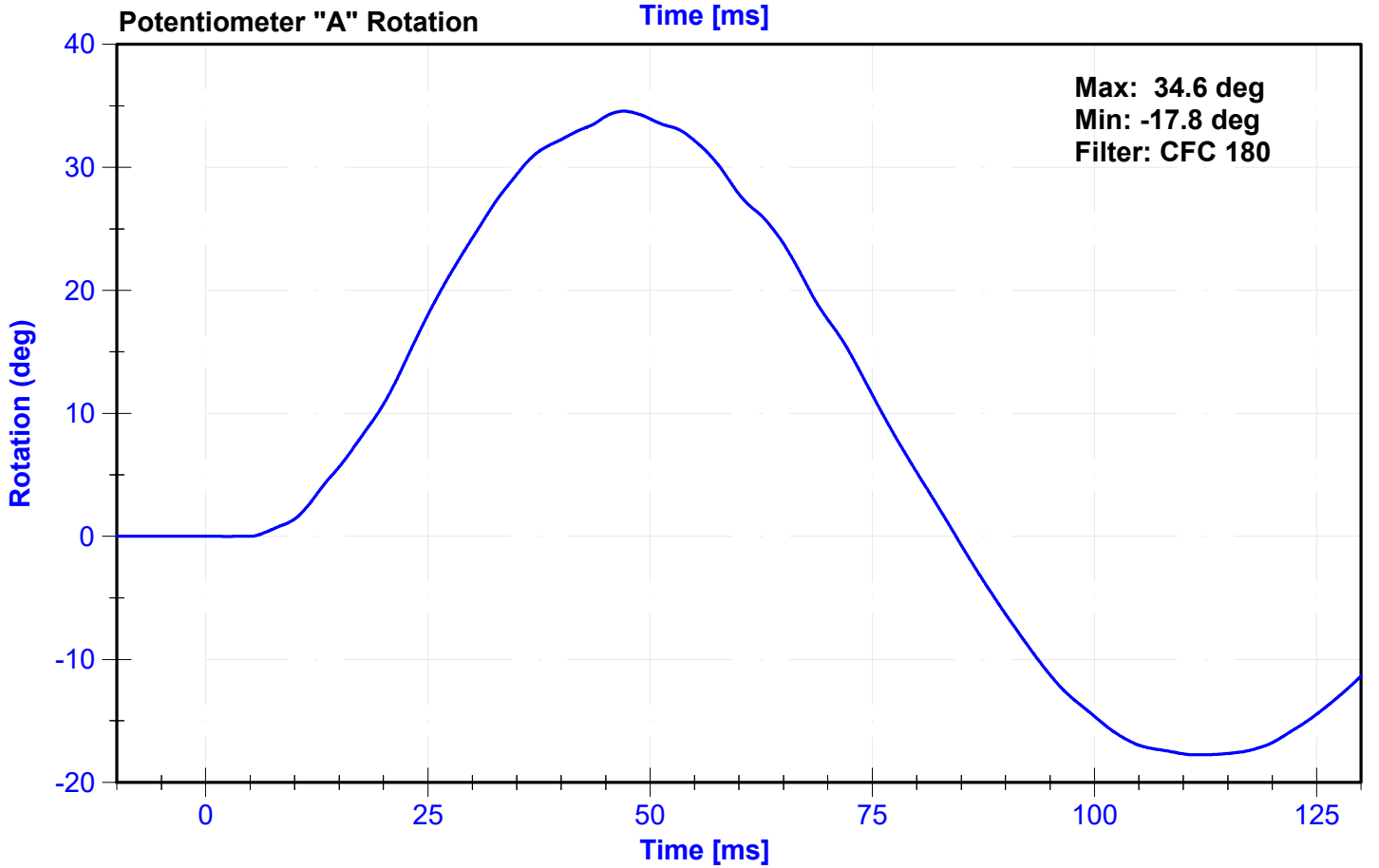
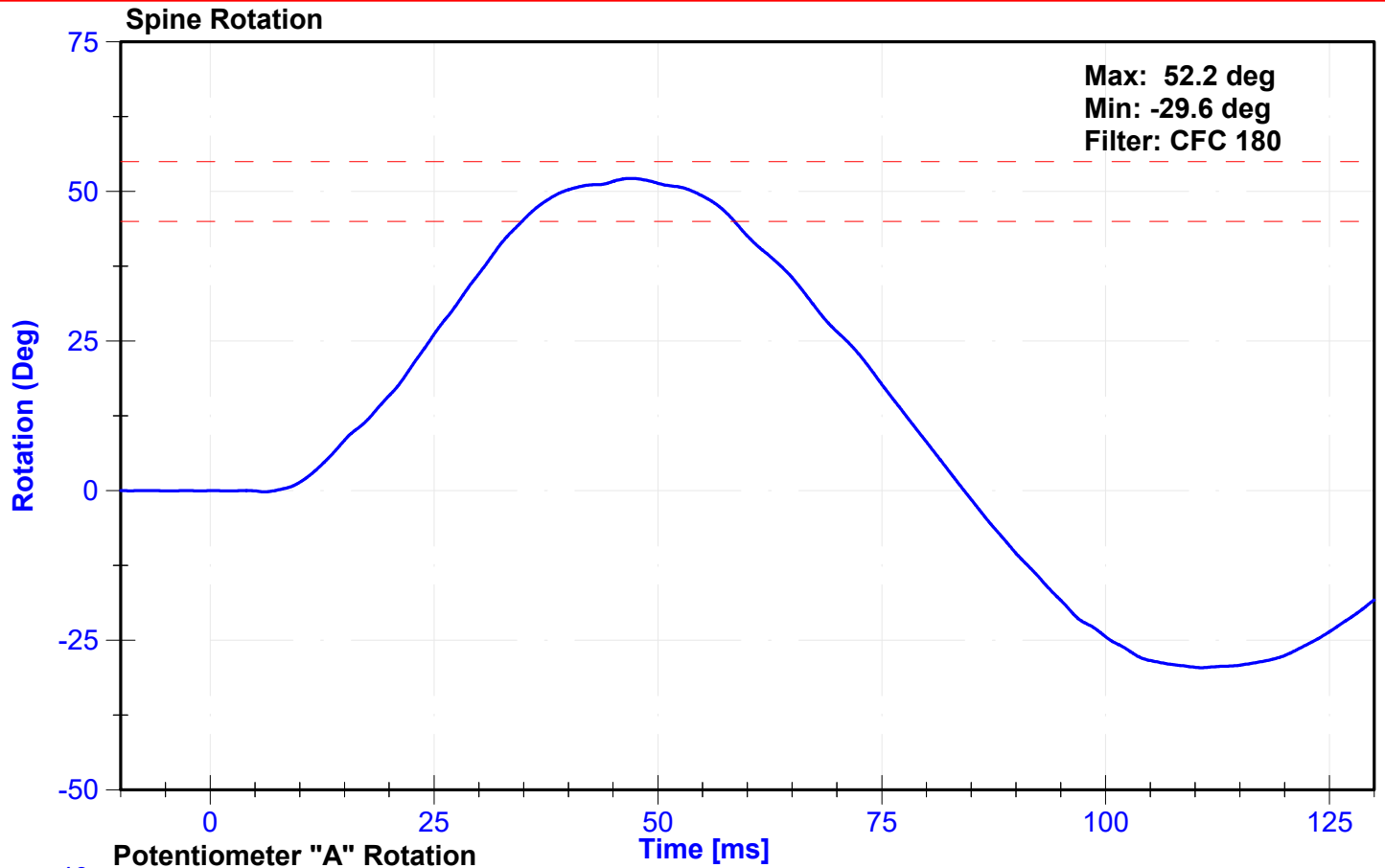
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	58	Pass
Velocity	5.95	6.15	m/s	6.015	Pass
Lateral Spine Rotation	45	55	deg	52.2	Pass
Time at Maximum Rotation	39	53	ms	46.9	Pass
Time of Decay to Zero Degrees	37	57	ms	37.3	Pass
Pendulum Velocity Overall Corridor	Lower Boundary ¹	Upper Boundary ²	m/s	See Plot ³	Pass

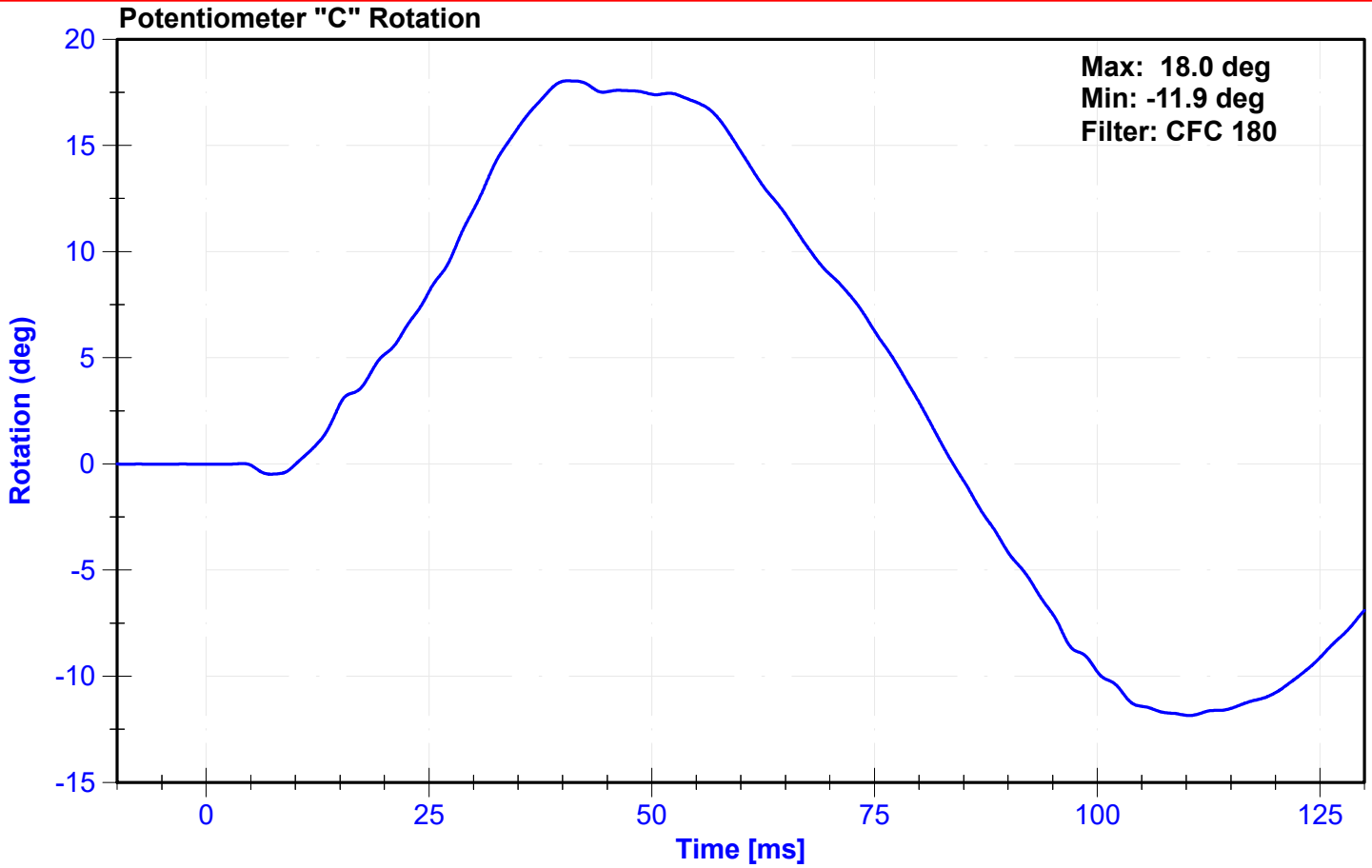
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16503	4/29/2024	10/26/2024
Pendulum "A" Potentiometer	Sfernice	2247	12/5/2023	12/4/2024
Condyle "B" Potentiometer	Sfernice	095	9/29/2023	9/28/2024



^{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	FTSS	Test Technician	J. Rios
ATD Serial Number	DG5348	Laboratory Supervisor	C. Mantell

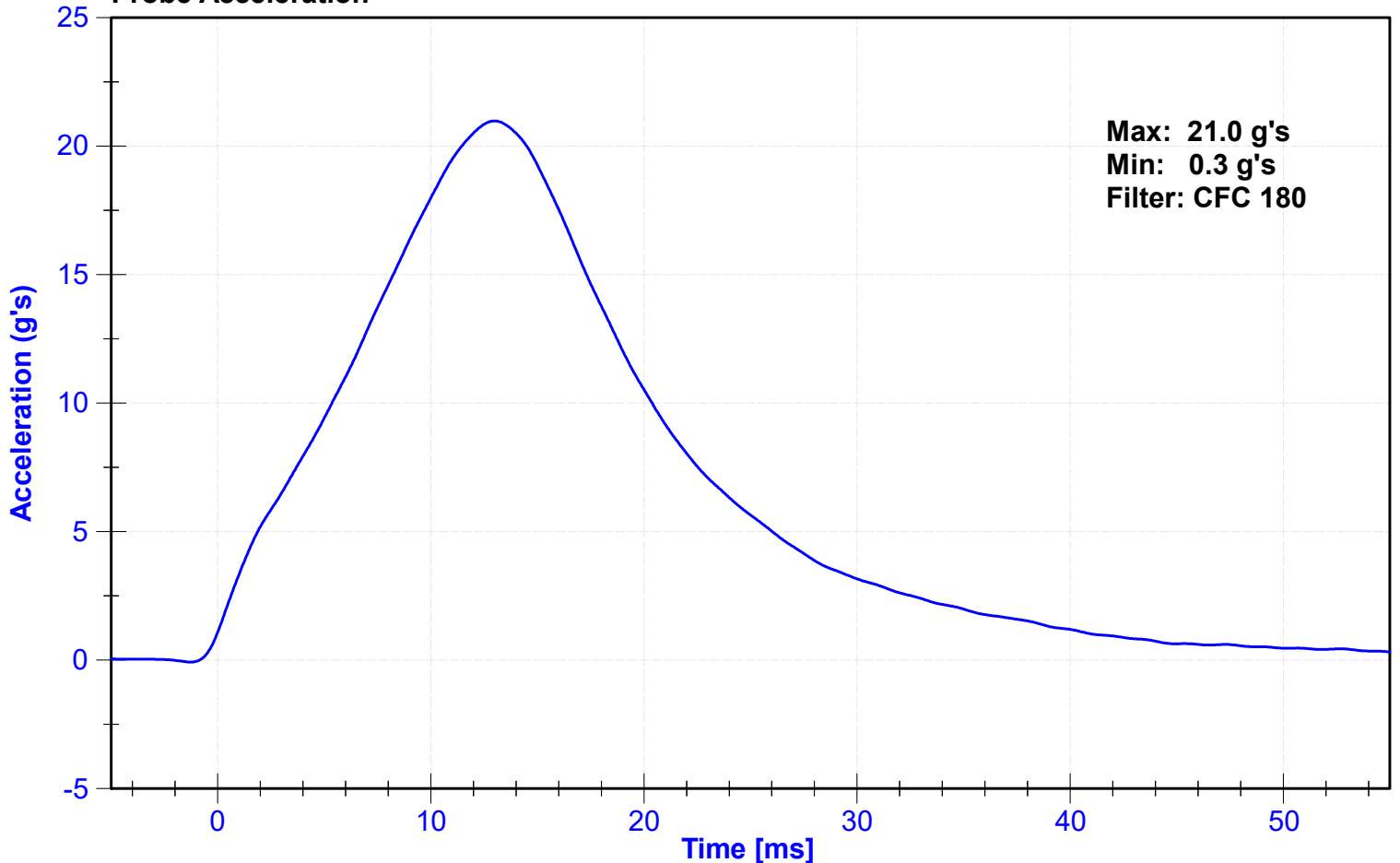
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	61	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Resistive Force	4700	5400	N	4805.1	Pass
Time at Peak Resistive Force	11.8	16.1	ms	13.00	Pass
Pubic Force	-1590	-1230	N	-1234.8	Pass
Time at Peak Pubic Force	12.2	17.0	ms	12.95	Pass

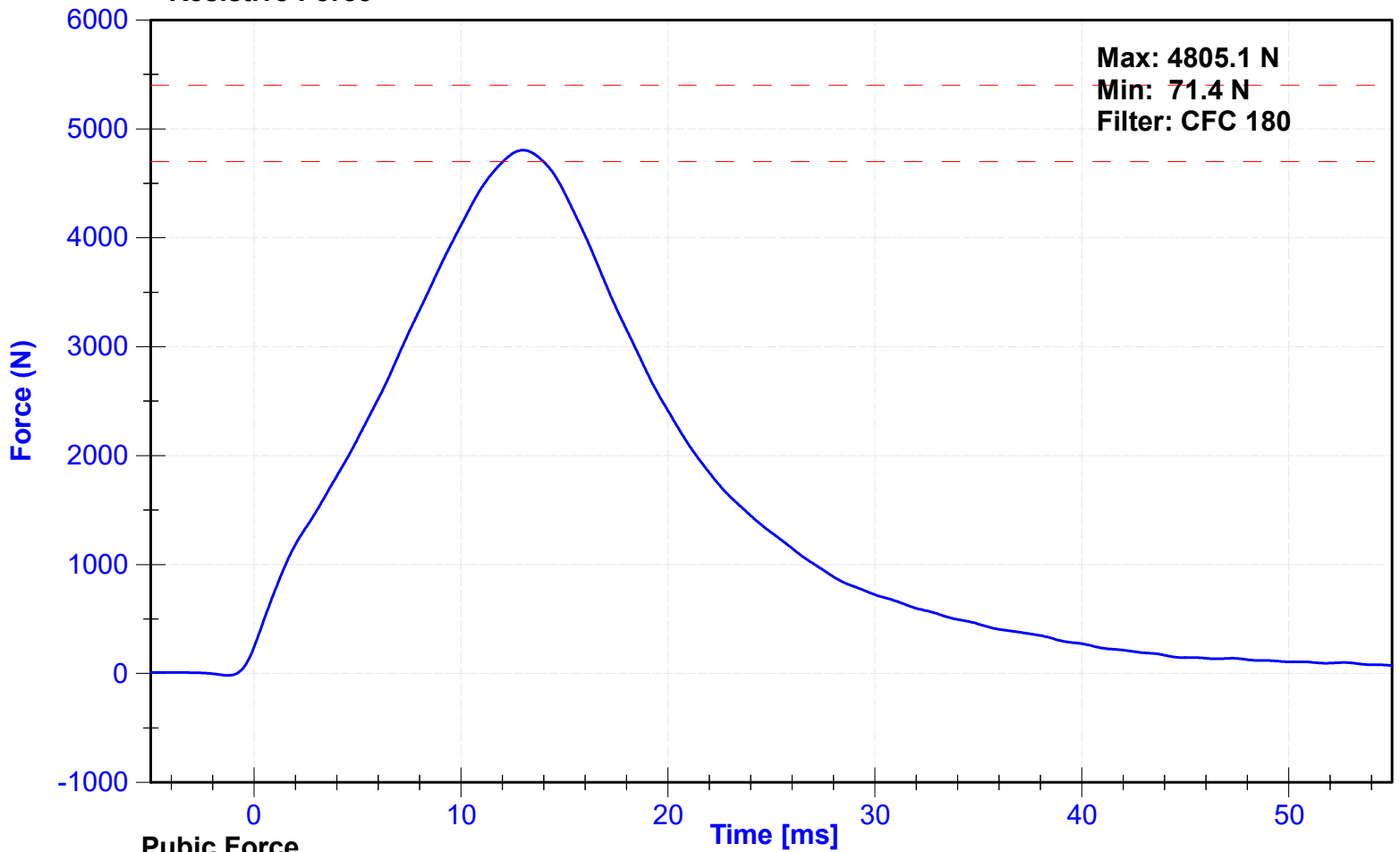
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Pubic Load Cell	Denton	464-FY	8/15/2023	8/14/2024

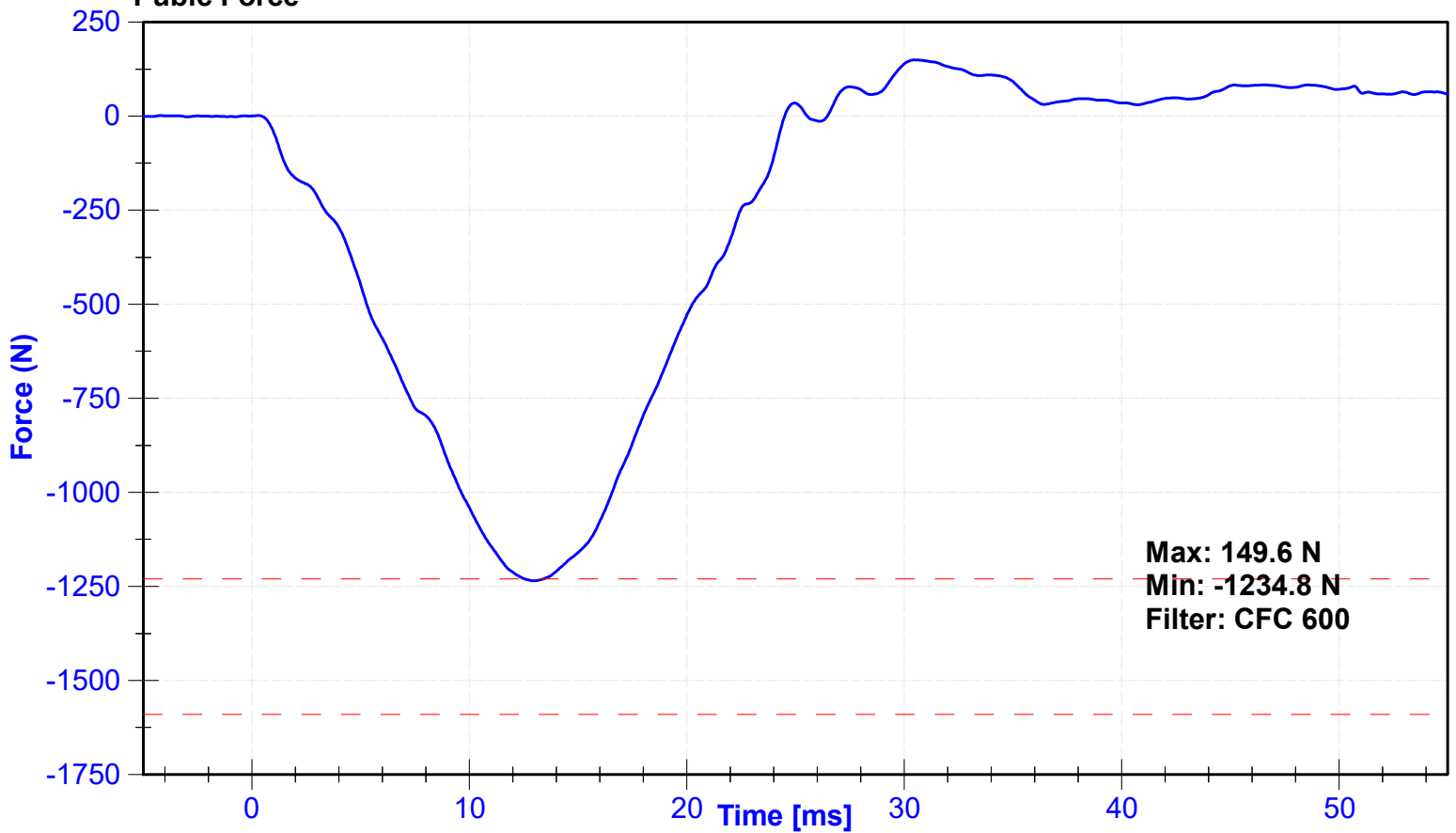
Probe Acceleration



Resistive Force



Pubic Force



APPENDIX VI
SID-Its PERFORMANCE CALIBRATION TEST DATA

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

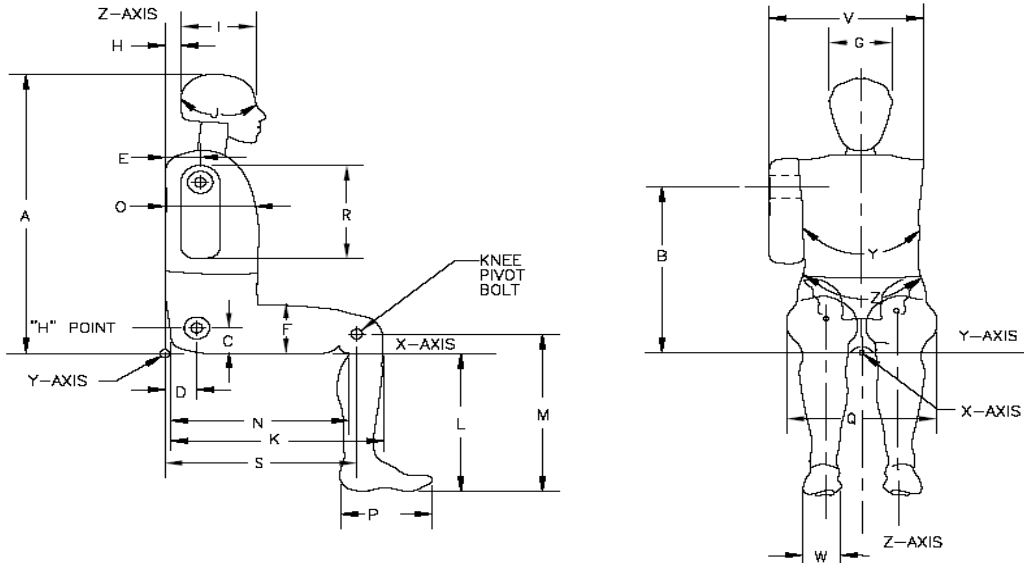


External Measurements - SID-IIs

Technician: T. Roseman

Date: 06/13/2024

Dummy Serial Number: 261



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	445	Pass
C	H-point Height	79	89	82	Pass
D	H-point from seatback	141	151	146	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	43	Pass
I	Head Depth	178	188	180	Pass
J	Head Circumference	541	551	548	Pass
K	Buttock to Knee Length	514	540	531	Pass
L	Popliteal Height	343	369	354	Pass
M	Knee Pivot to floor height	392	409	400	Pass
N	Buttock Popliteal Length	416	442	431	Pass
O	Chest Depth w/o jacket	195	211	206	Pass
P	Foot Length	216	232	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	483	Pass
V	Shoulder Width	341	357	349	Pass
W	Foot Width	78	94	84	Pass
Y	Chest Circumference w/jacket	851	881	871	Pass
Z	Waist Circumference	761	791	775	Pass

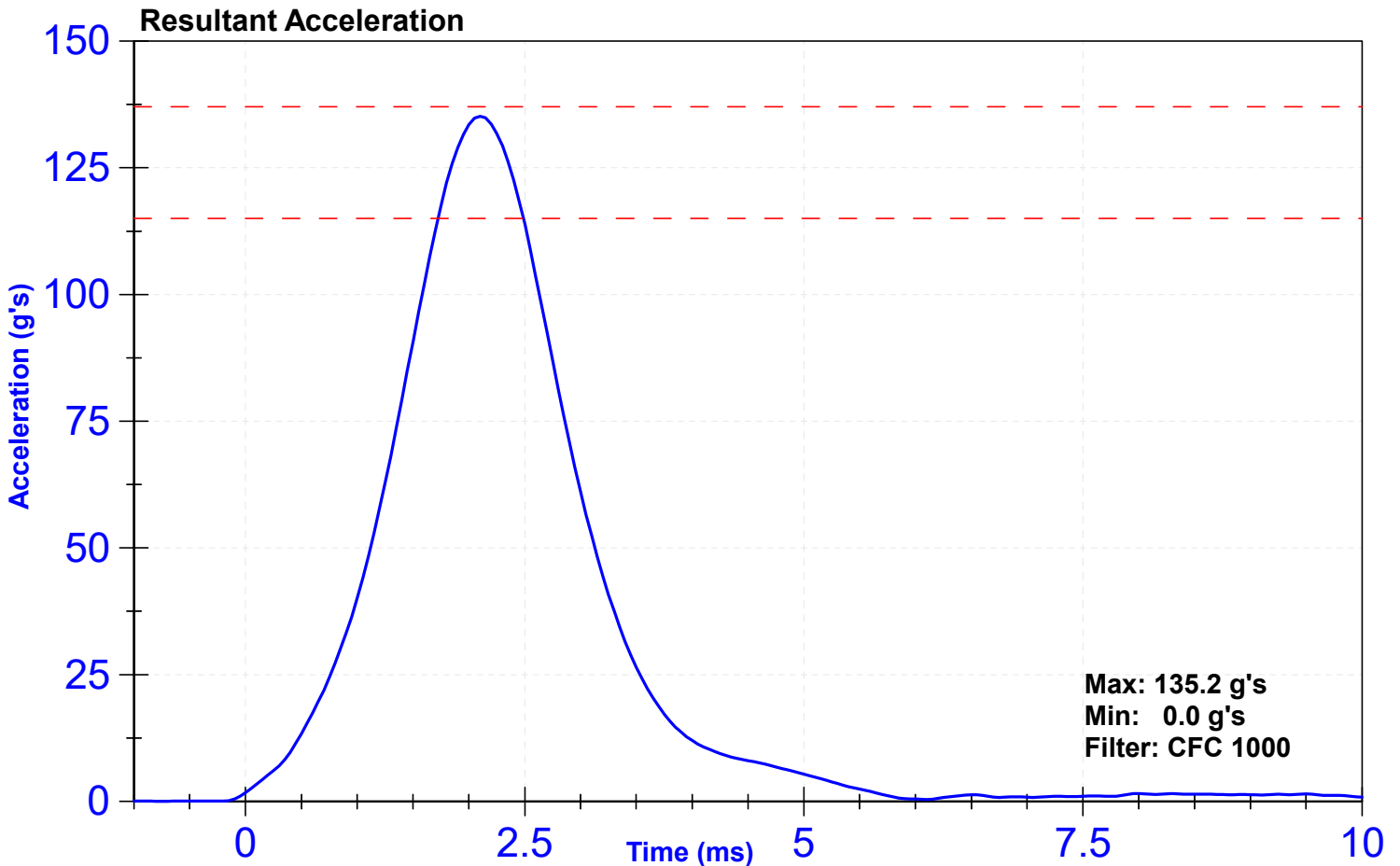
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C .Mantell

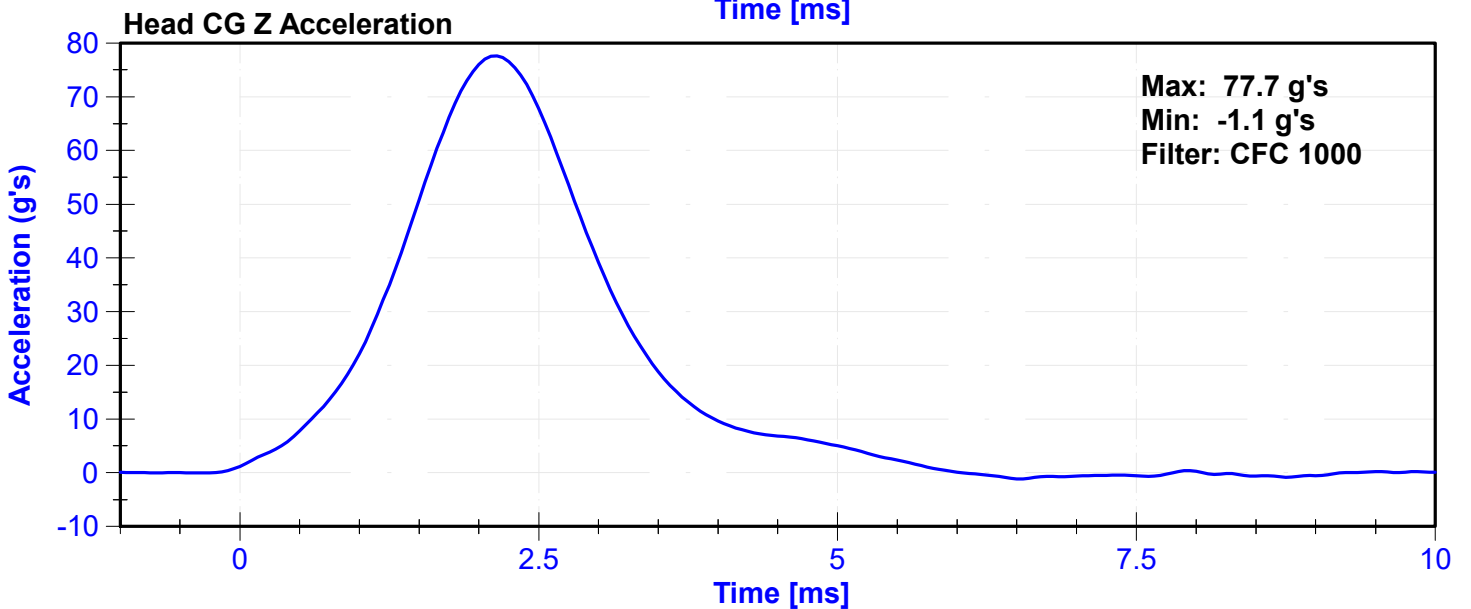
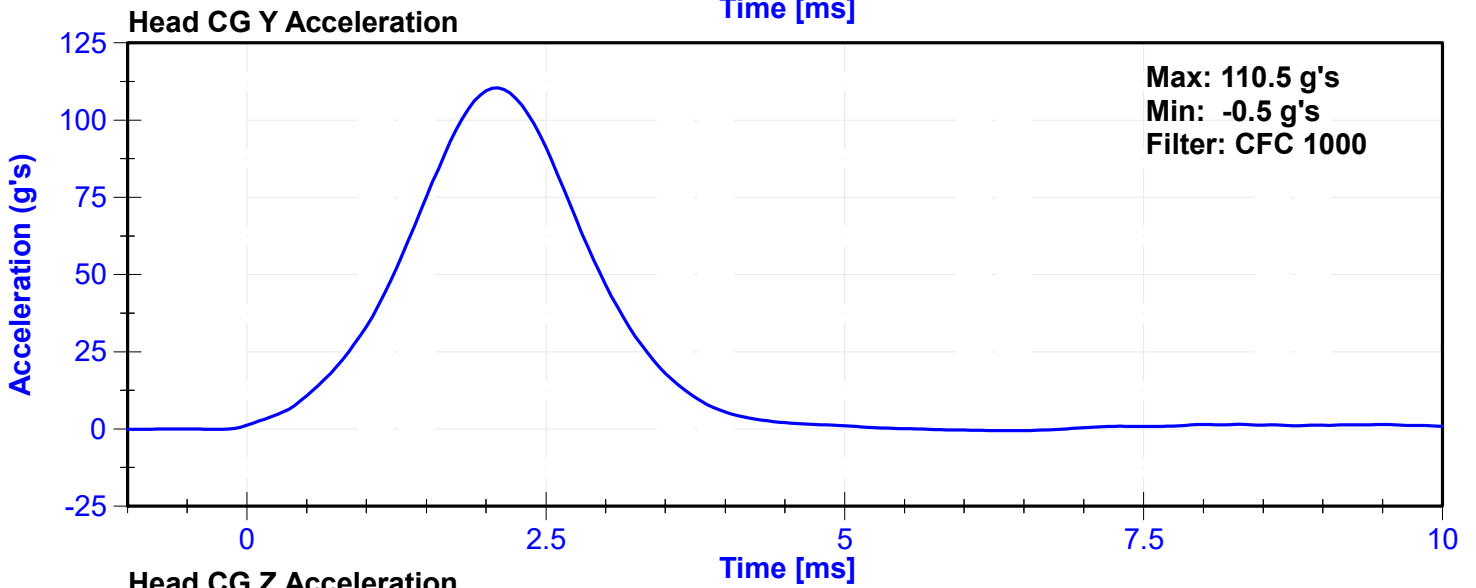
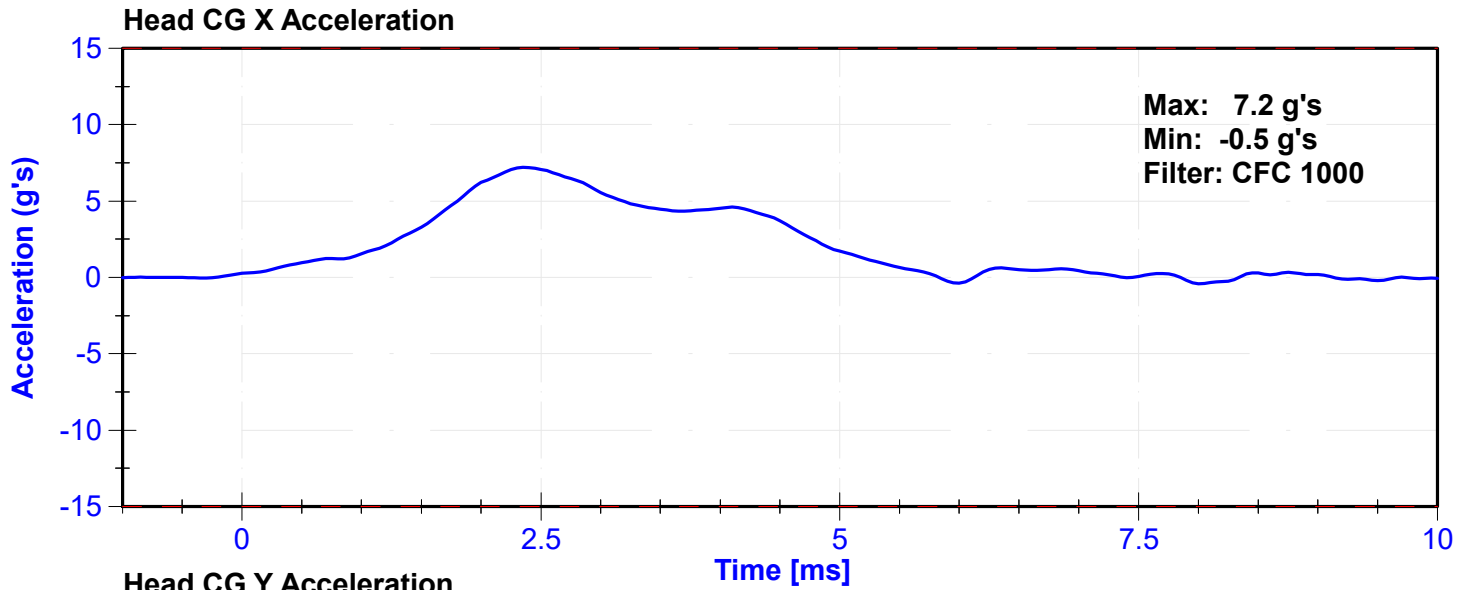
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	48	Pass
Resultant Acceleration	115	137	g's	135.2	Pass
Oscillation	0	15	%	1.1	Pass
Fore-Aft Acceleration	-15	15	g's	7.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P68067	5/15/2024	11/11/2024
Y Accelerometer	Endevco	P18567	5/15/2024	11/11/2024
Z Accelerometer	Endevco	P49163	5/15/2024	11/11/2024





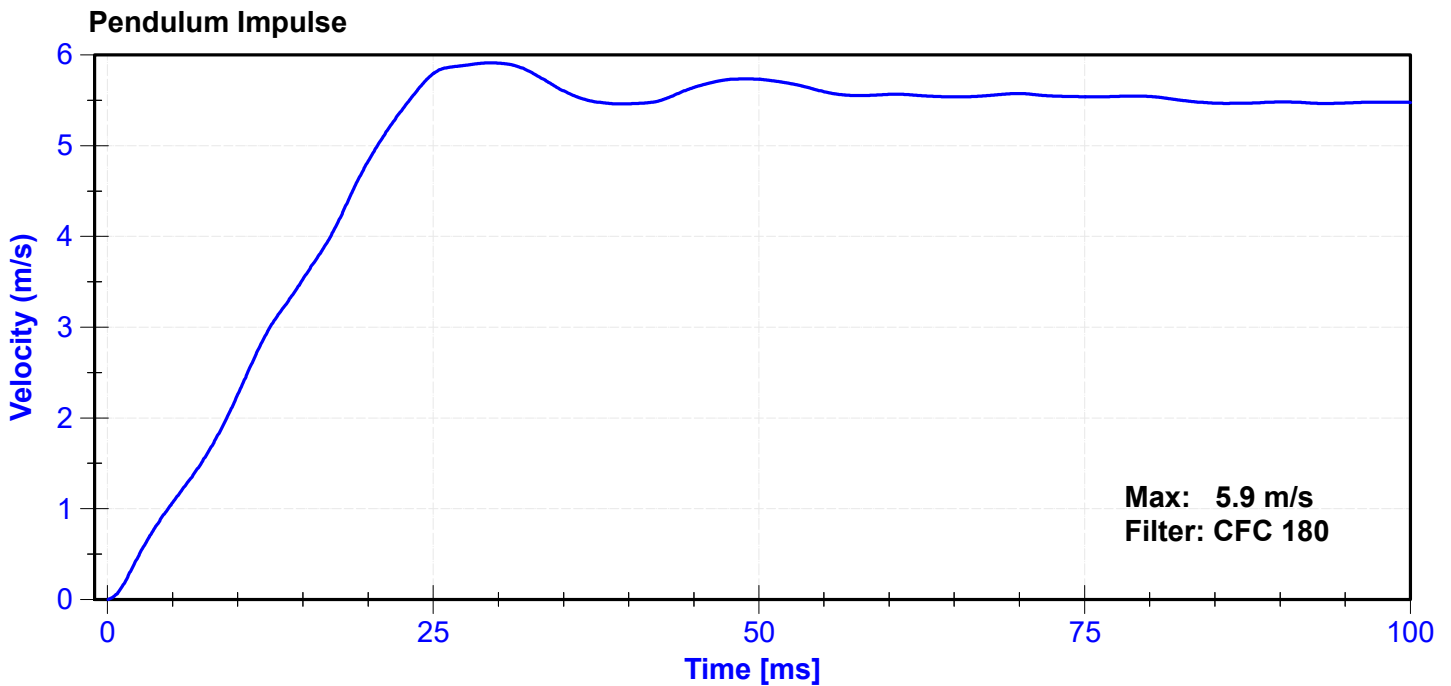
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

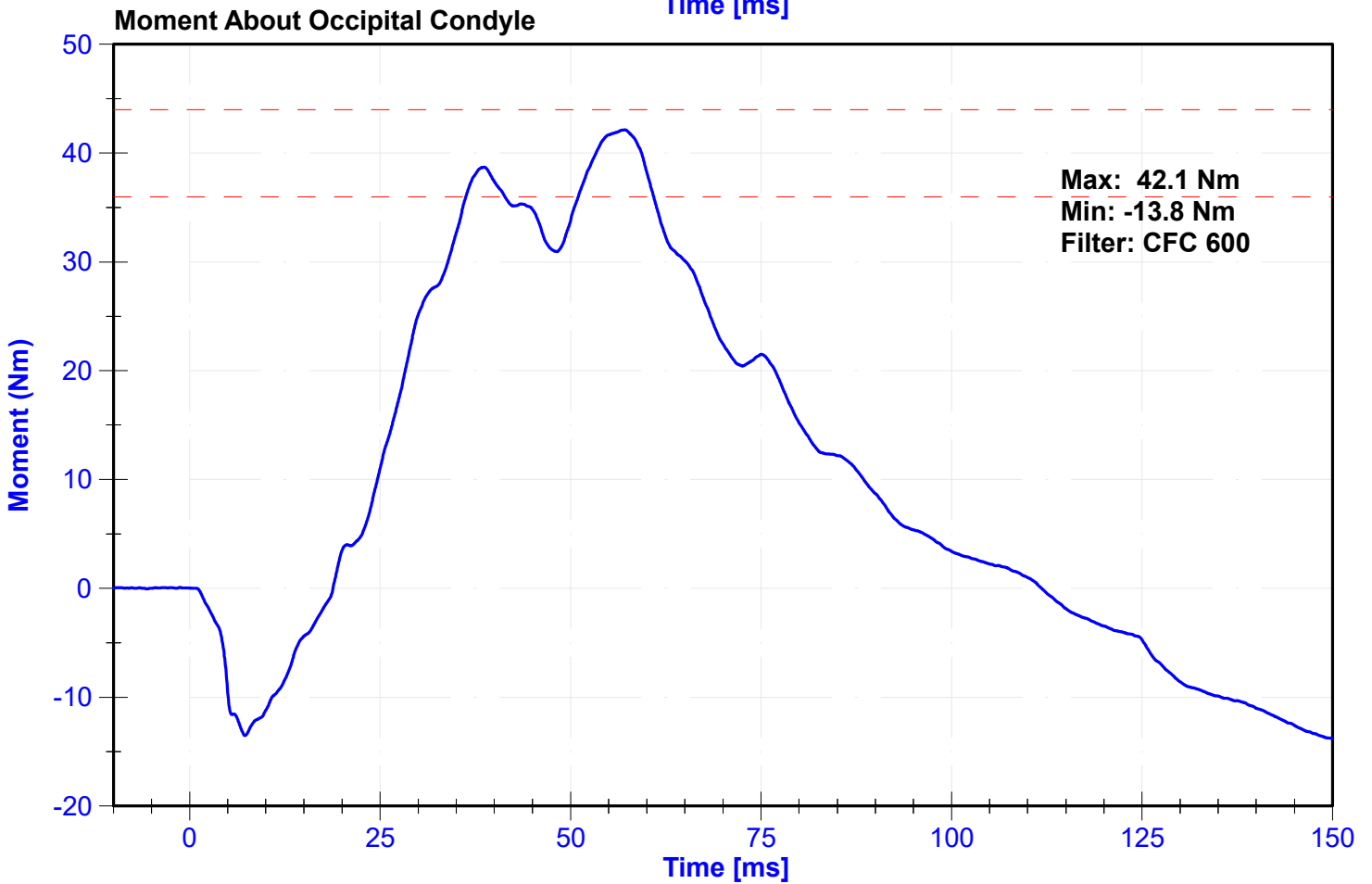
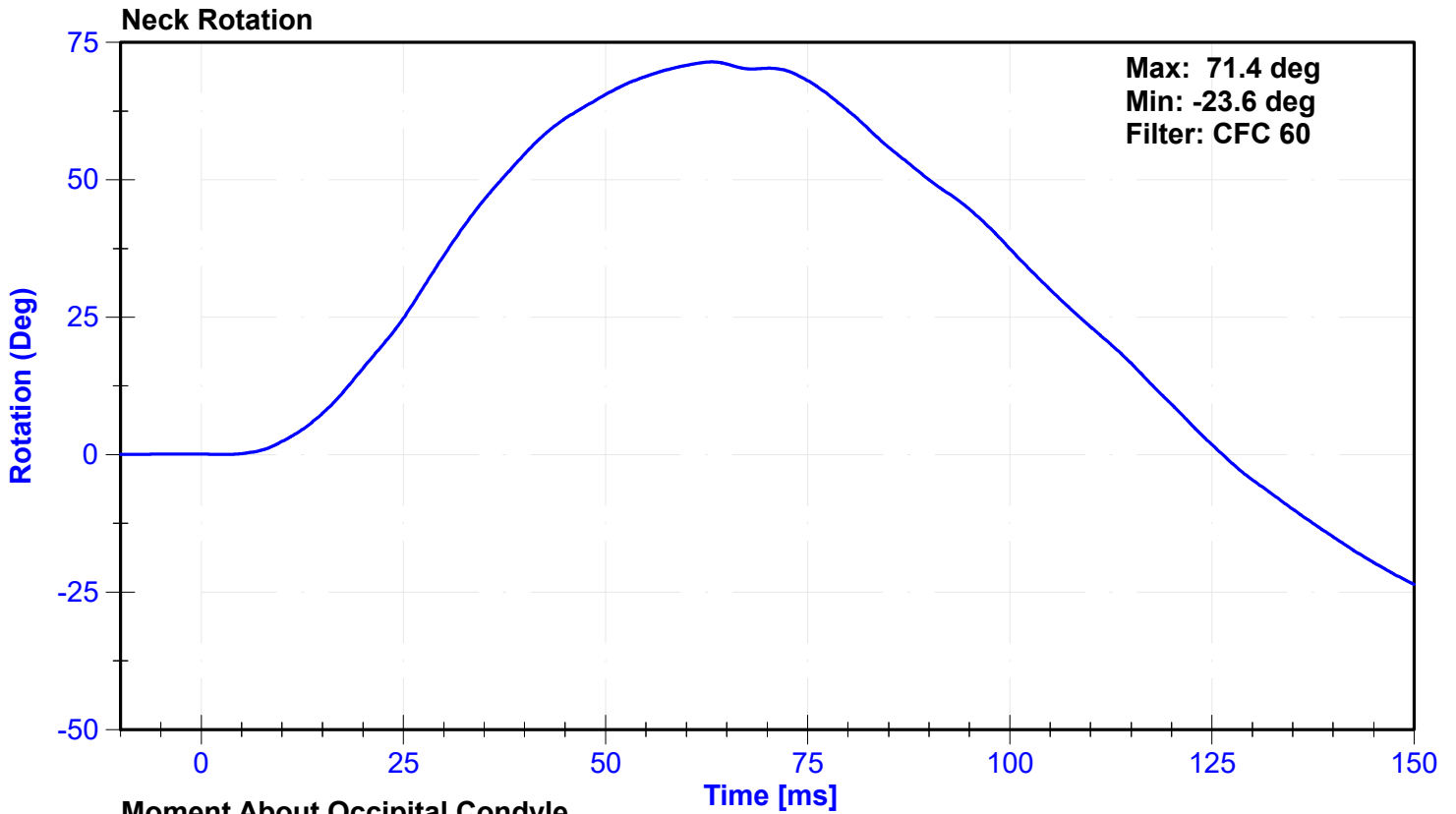
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	52	Pass
Velocity	5.51	5.63	m/s	5.535	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.26	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.53	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.83	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.79	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.91	Pass
Neck Rotation	71	81	deg	71.4	Pass
Time at Maximum Rotation	50	70	ms	63.1	Pass
Moment about the OC	36	44	Nm	42.1	Pass
Moment Decay to 0 Nm	102	126	ms	111.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	4/29/2024	10/26/2024
Pendulum Potentiometer	Servo	4961	10/2/2023	10/1/2024
Condyle Potentiometer	Servo	DS185	10/2/2023	10/1/2024
Upper Neck Load Cell	Denton	1716A_2187-FY	12/5/2023	12/4/2024





ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

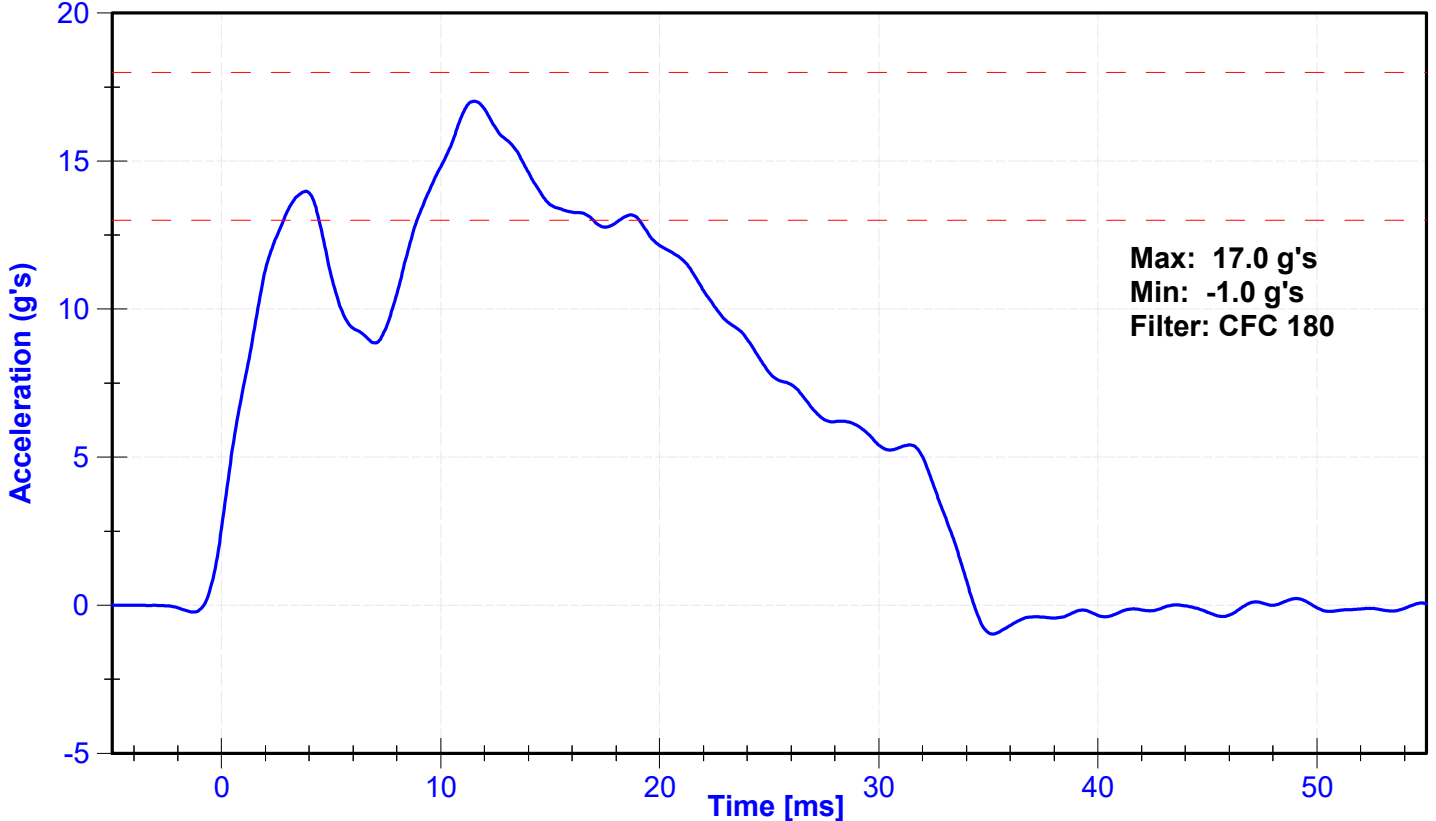
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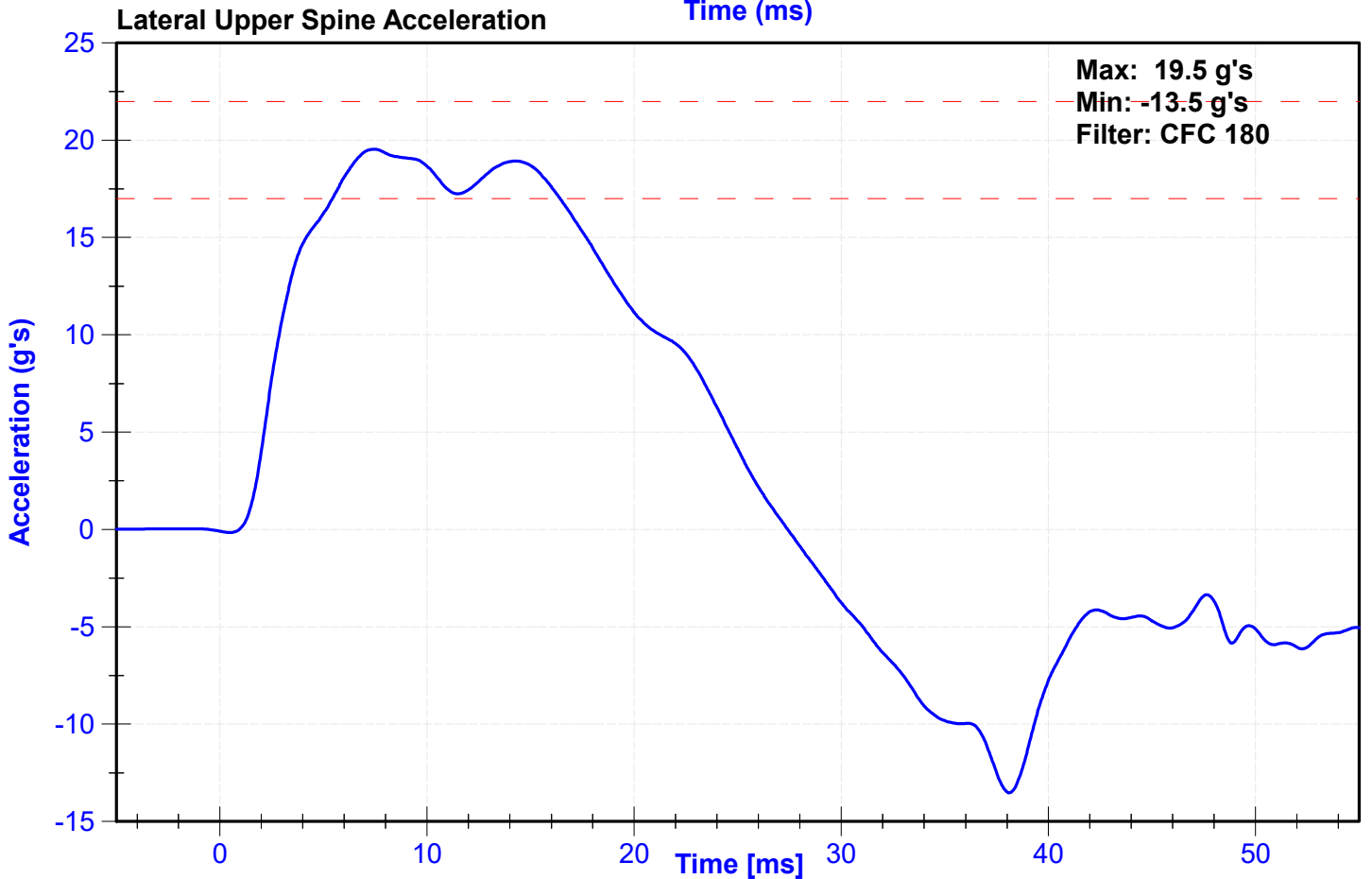
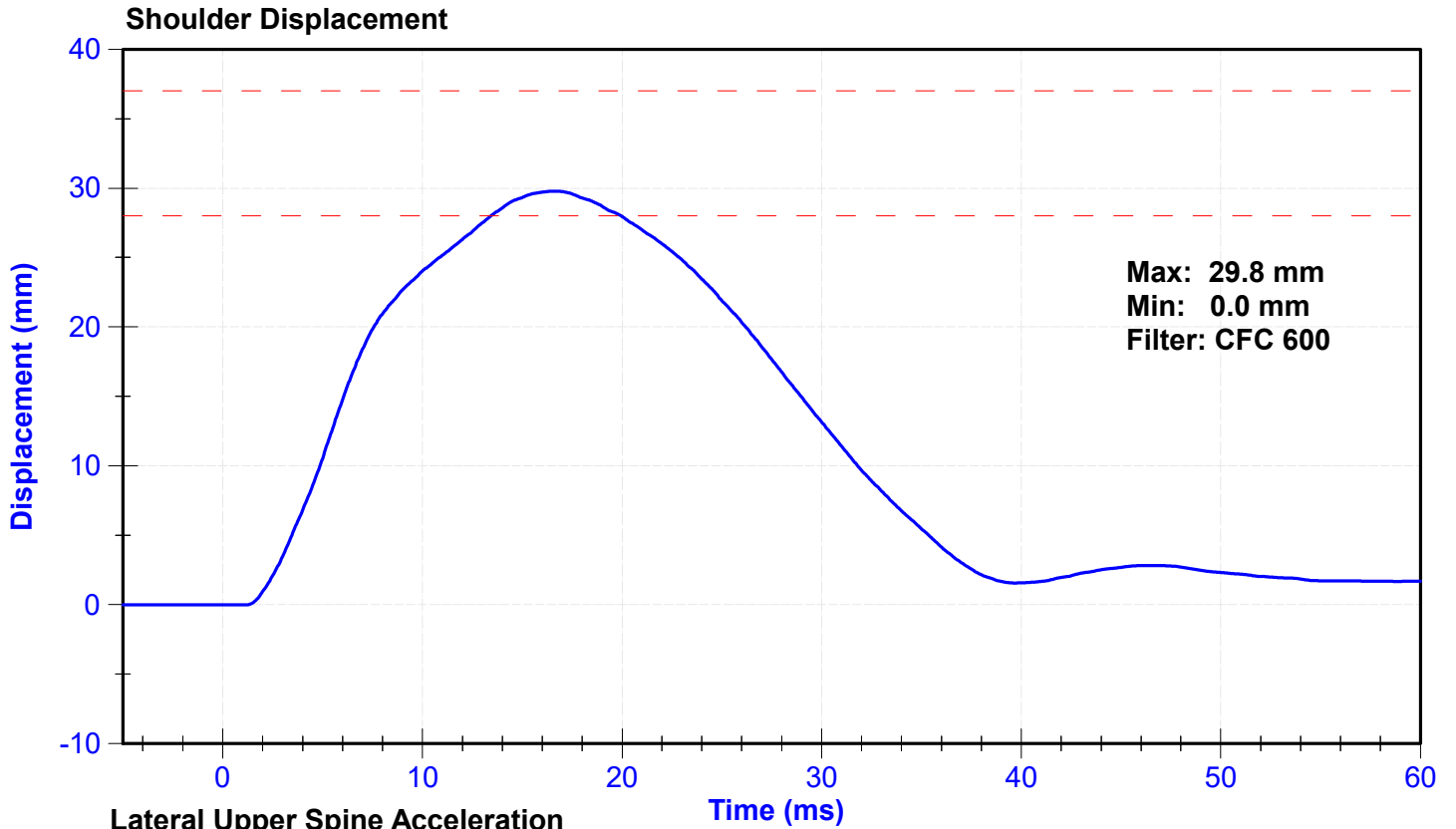
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	45.0	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	13	18	g's	17.0	Pass
Shoulder Deflection	28	37	mm	29.8	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Shoulder Potentiometer	Servo	572GFE	5/16/2024	11/14/2024
Upper Spine Y Accelerometer	Endevco	P94678	5/15/2024	11/11/2024

Probe Acceleration





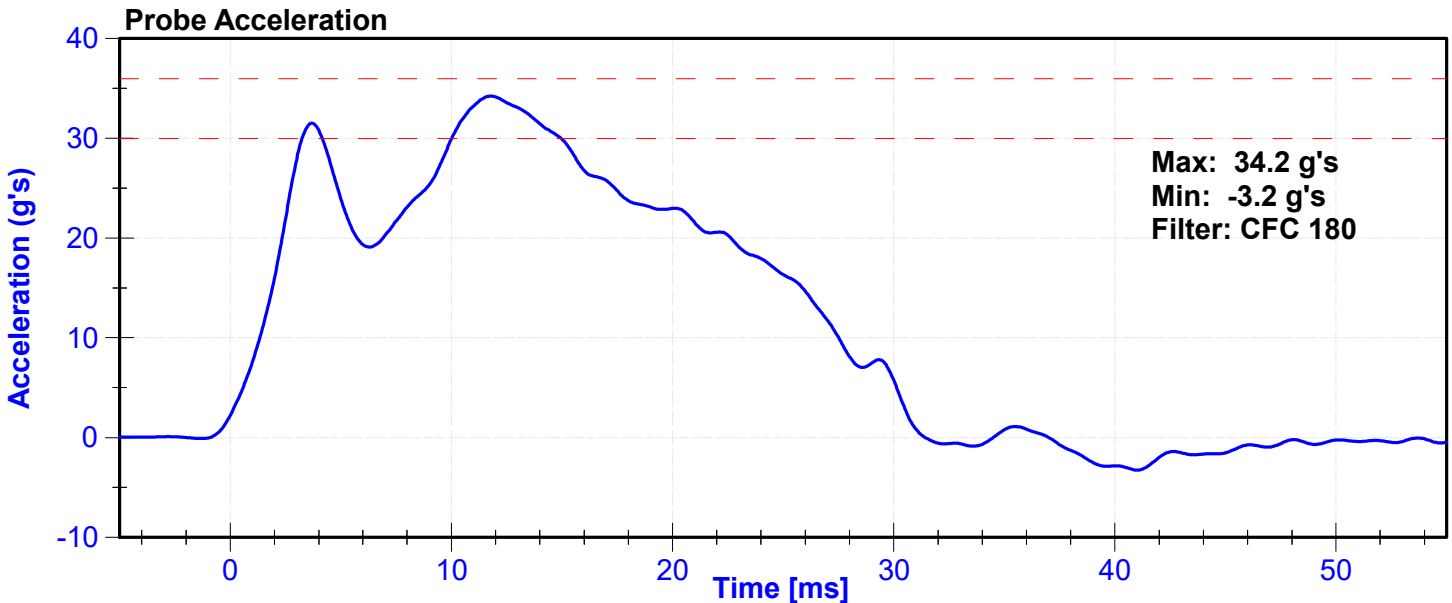
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

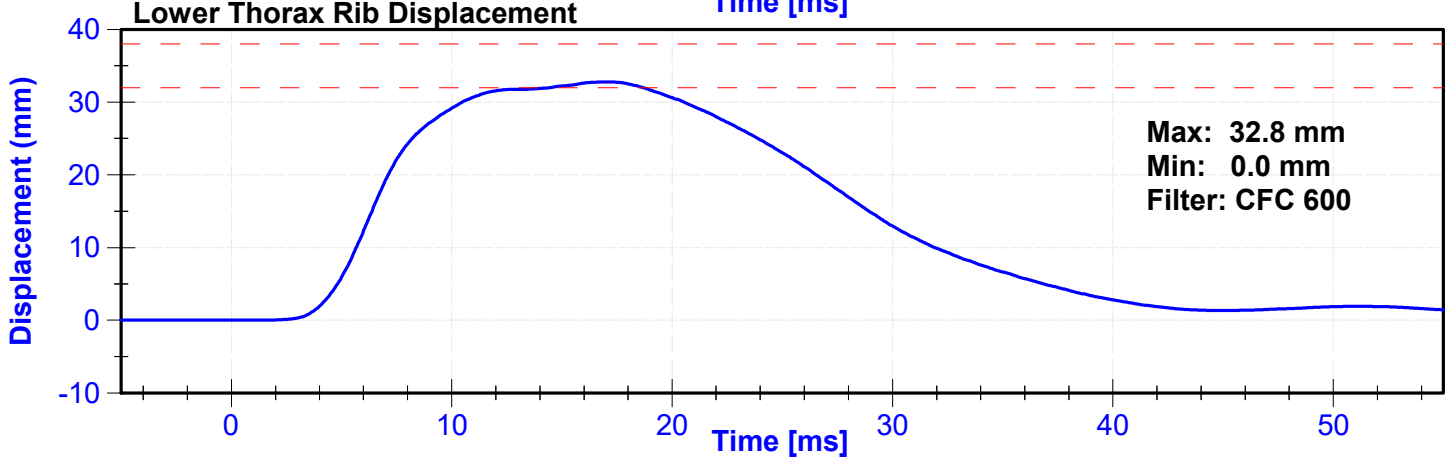
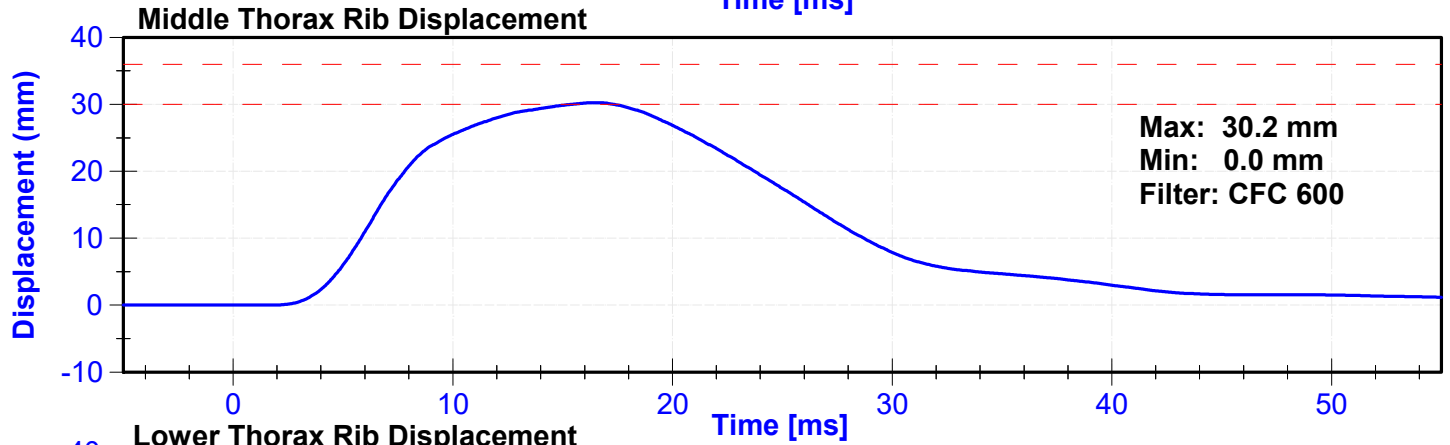
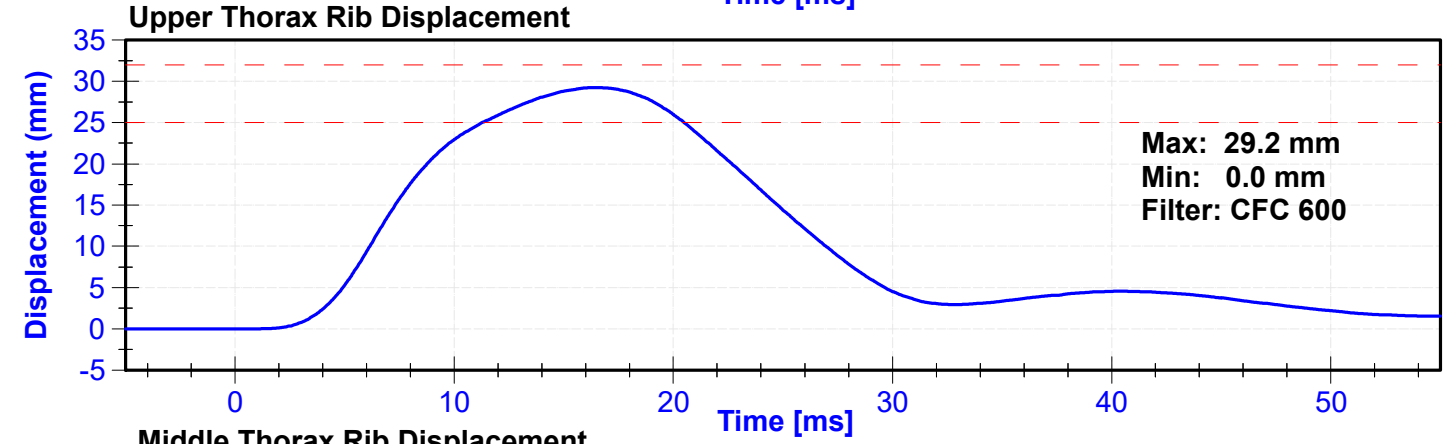
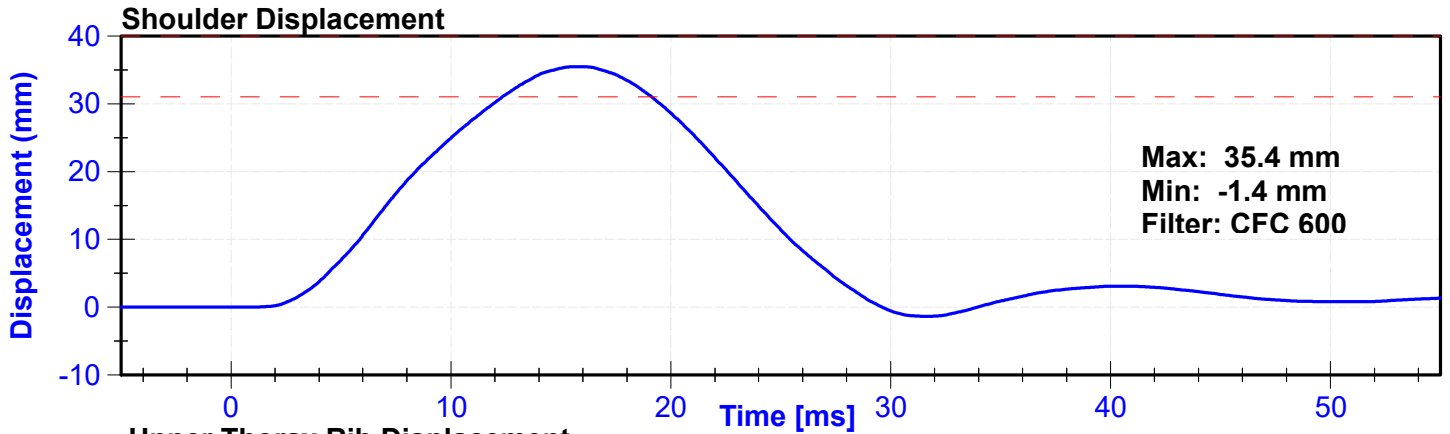
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	45.0	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration after 5 ms	30	36	g's	34.2	Pass
Lateral Upper Spine Acceleration	34	43	g's	39.6	Pass
Lateral Lower Spine Acceleration	29	37	g's	33.0	Pass
Shoulder Deflection	31	40	mm	35.4	Pass
Upper Thorax Rib Deflection	25	32	mm	29.2	Pass
Mid Thorax Rib Deflection	30	36	mm	30.2	Pass
Lower Thorax Rib Deflection	32	38	mm	32.8	Pass

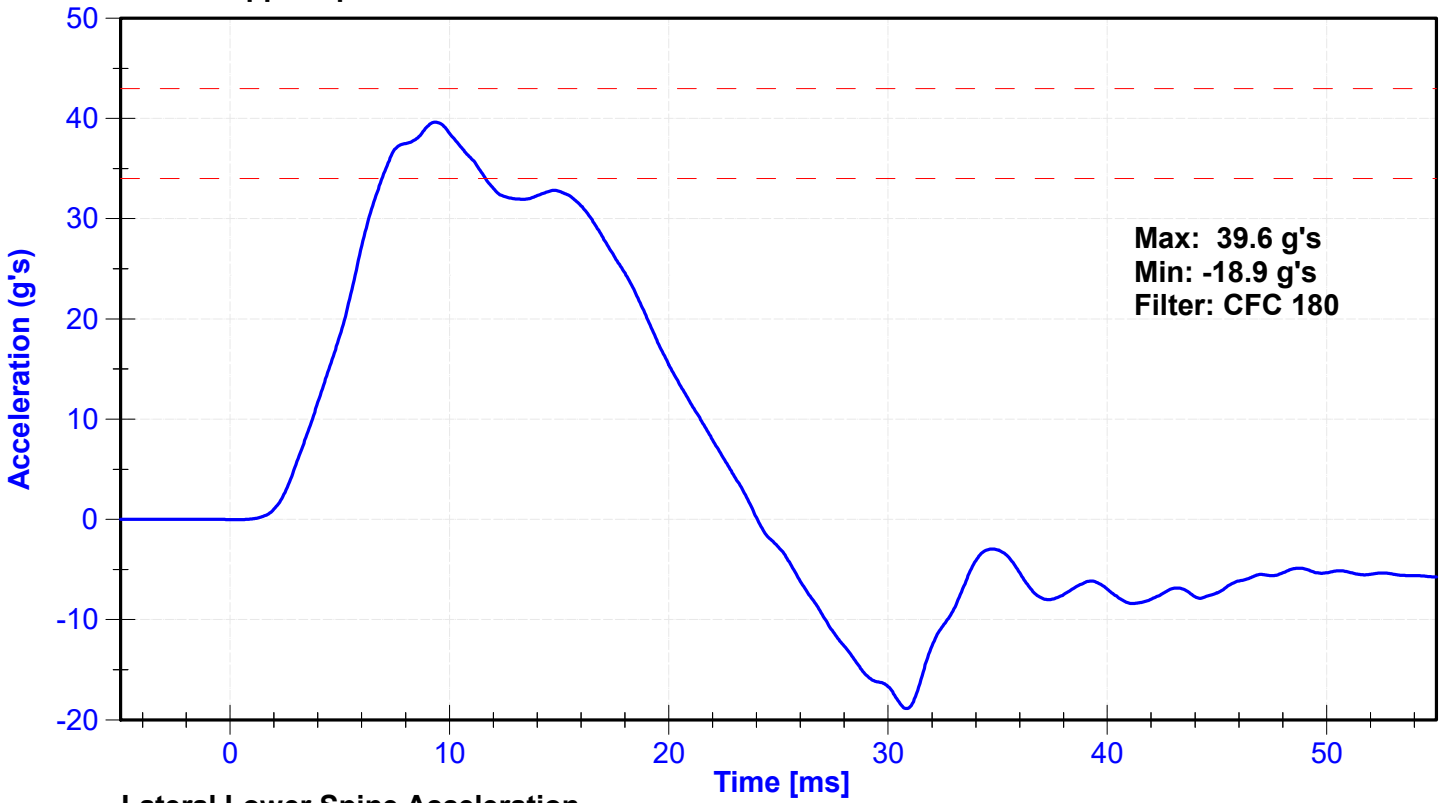
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Spine T1 Y Accelerometer	Endevco	P94678	5/15/2024	11/11/2024
Upper Spine T12 Y Accelerometer	Endevco	P58744	5/15/2024	11/11/2024
Shoulder Potentiometer	Servo	572GFE	5/16/2024	11/14/2024
Upper Thorax Rib Potentiometer	Servo	062GFE	5/16/2024	11/14/2024
Middle Thorax Rib Potentiometer	Servo	528GFE	5/16/2024	11/14/2024
Lower Thorax Rib Potentiometer	Servo	513GFE	5/16/2024	11/14/2024

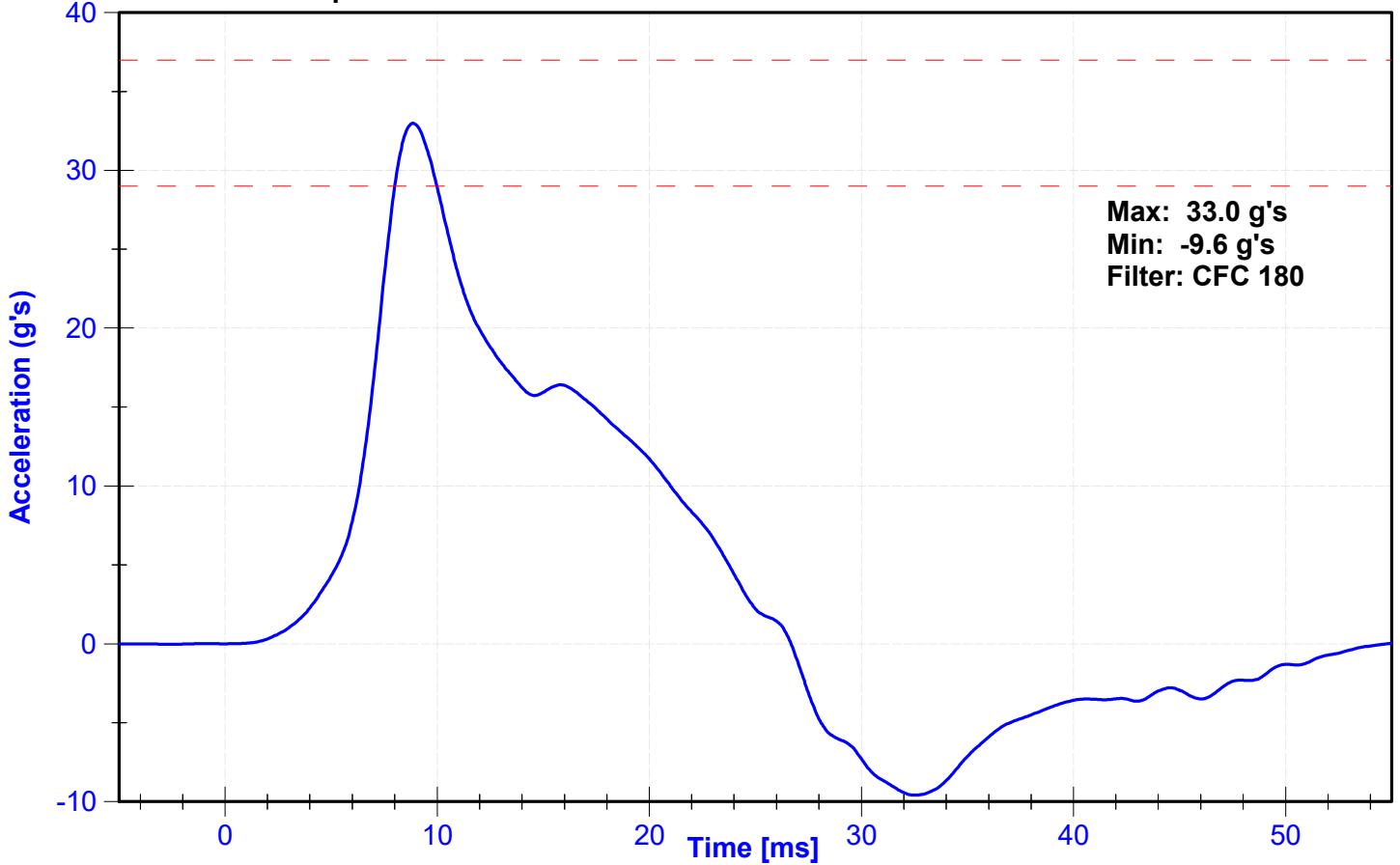




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



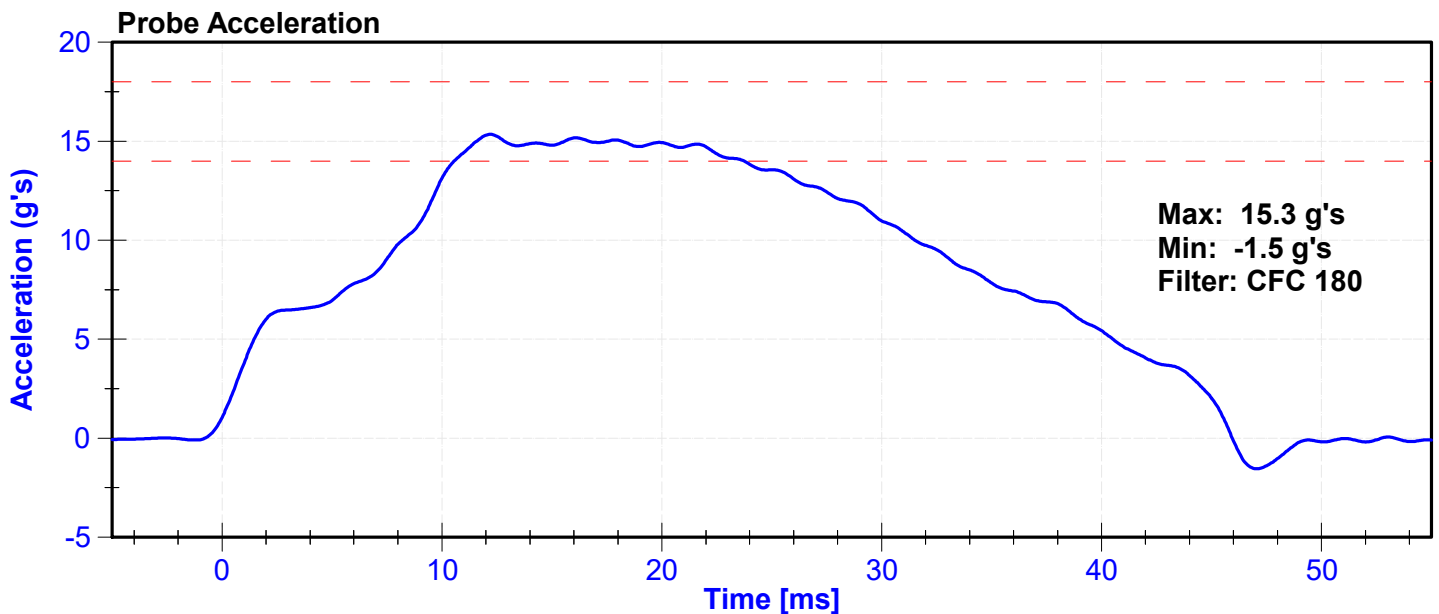
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

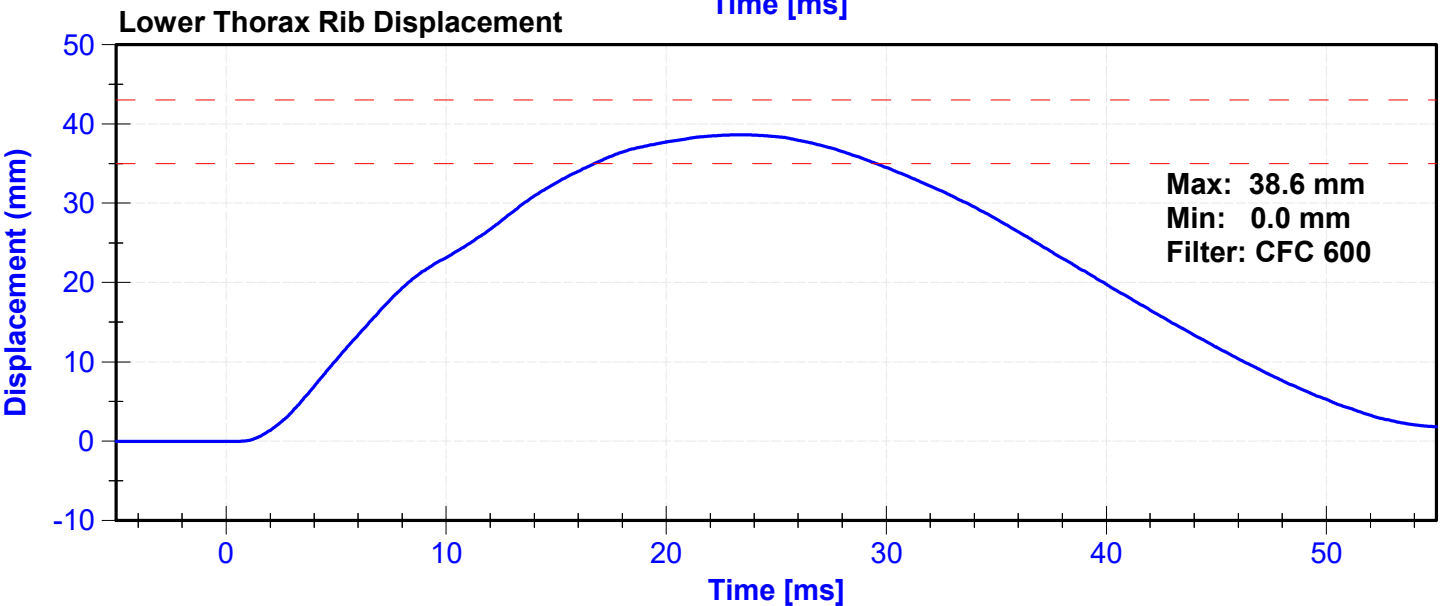
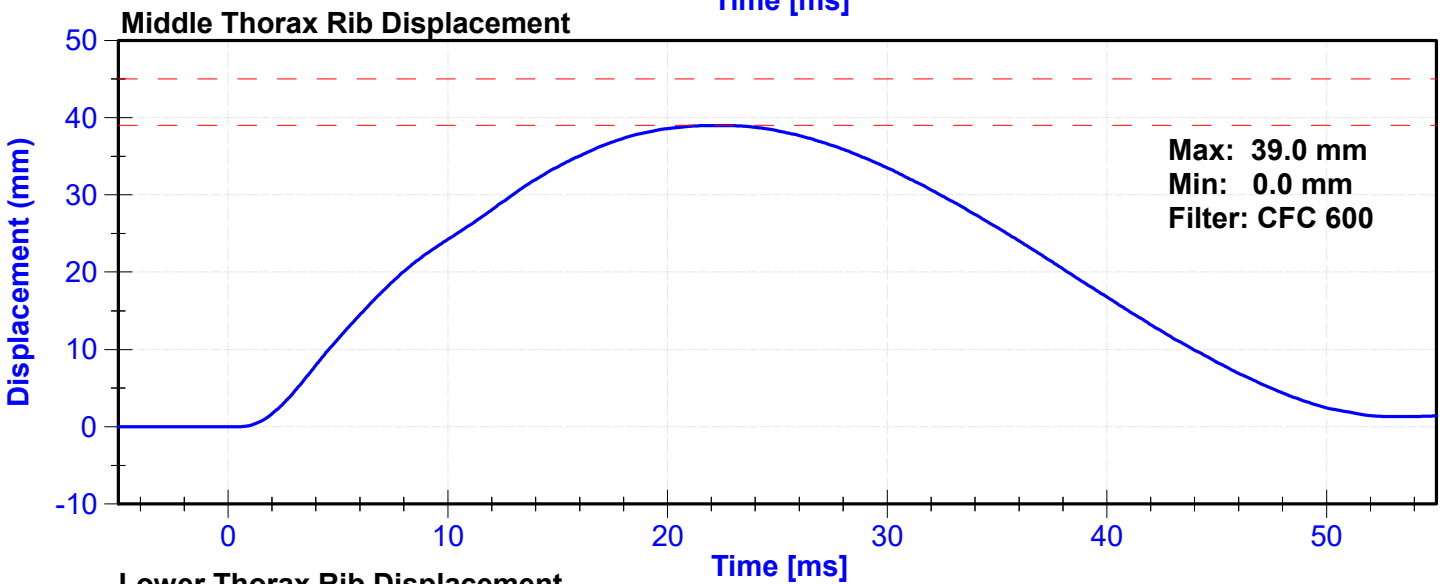
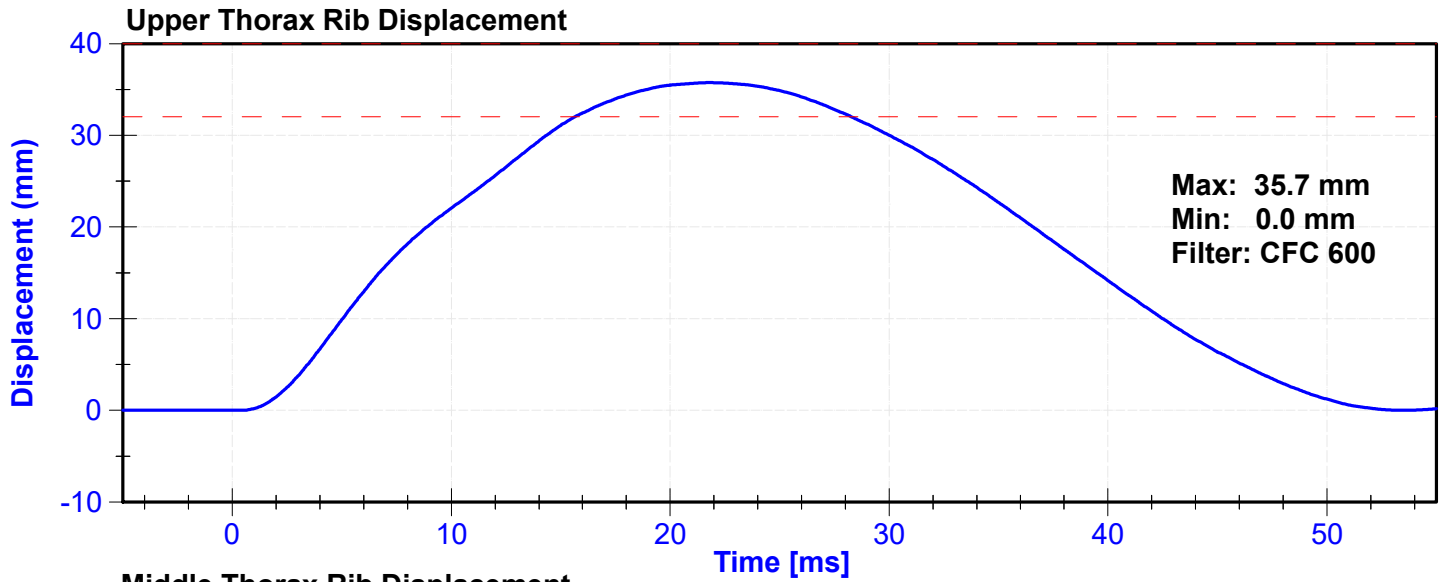
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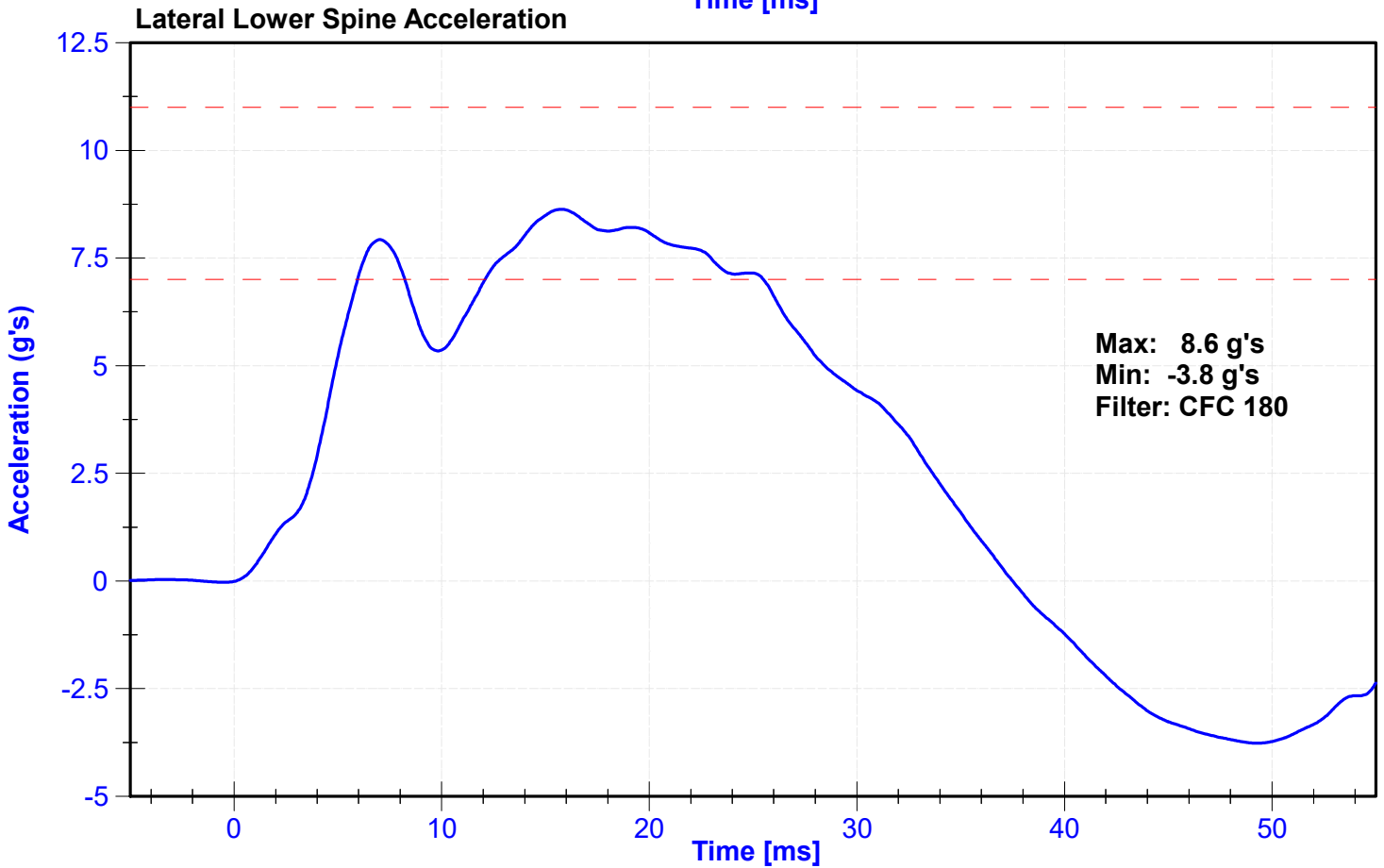
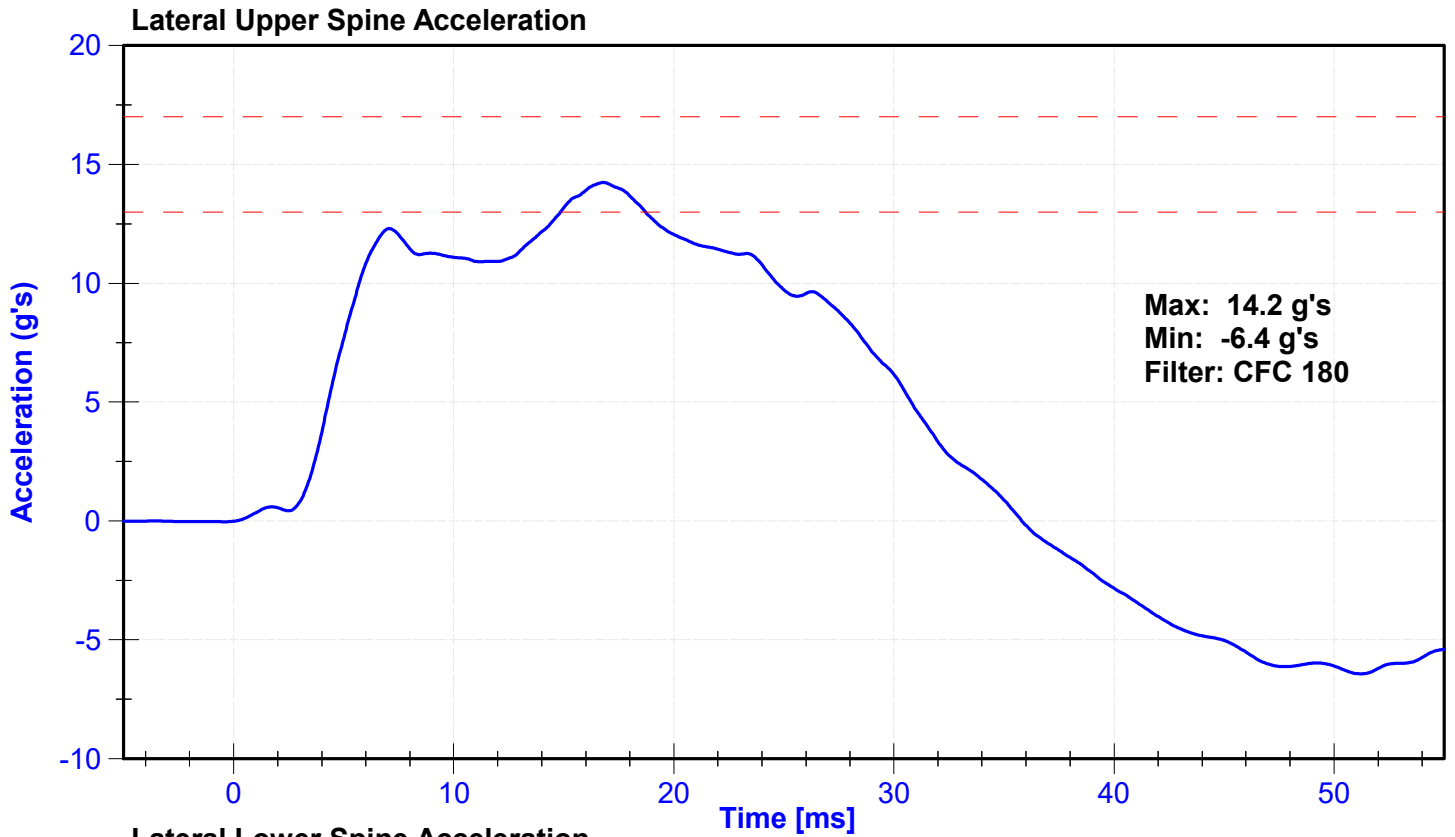
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	45.0	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	14	18	g's	15.3	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.2	Pass
Lateral Lower Spine Acceleration	7	11	g's	8.6	Pass
Upper Thorax Rib Deflection	32	40	mm	35.7	Pass
Middle Thorax Rib Deflection	39	45	mm	39.0	Pass
Lower Thorax Rib Deflection	35	43	mm	38.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Spine Y Accelerometer	Endevco	P94678	5/15/2024	11/11/2024
Lower Spine Y Accelerometer	Endevco	P58744	5/15/2024	11/11/2024
Upper Thorax Rib Potentiometer	Servo	062GFE	5/16/2024	11/14/2024
Middle Thorax Rib Potentiometer	Servo	528GFE	5/16/2024	11/14/2024
Lower Thorax Rib Potentiometer	Servo	513GFE	5/16/2024	11/14/2024







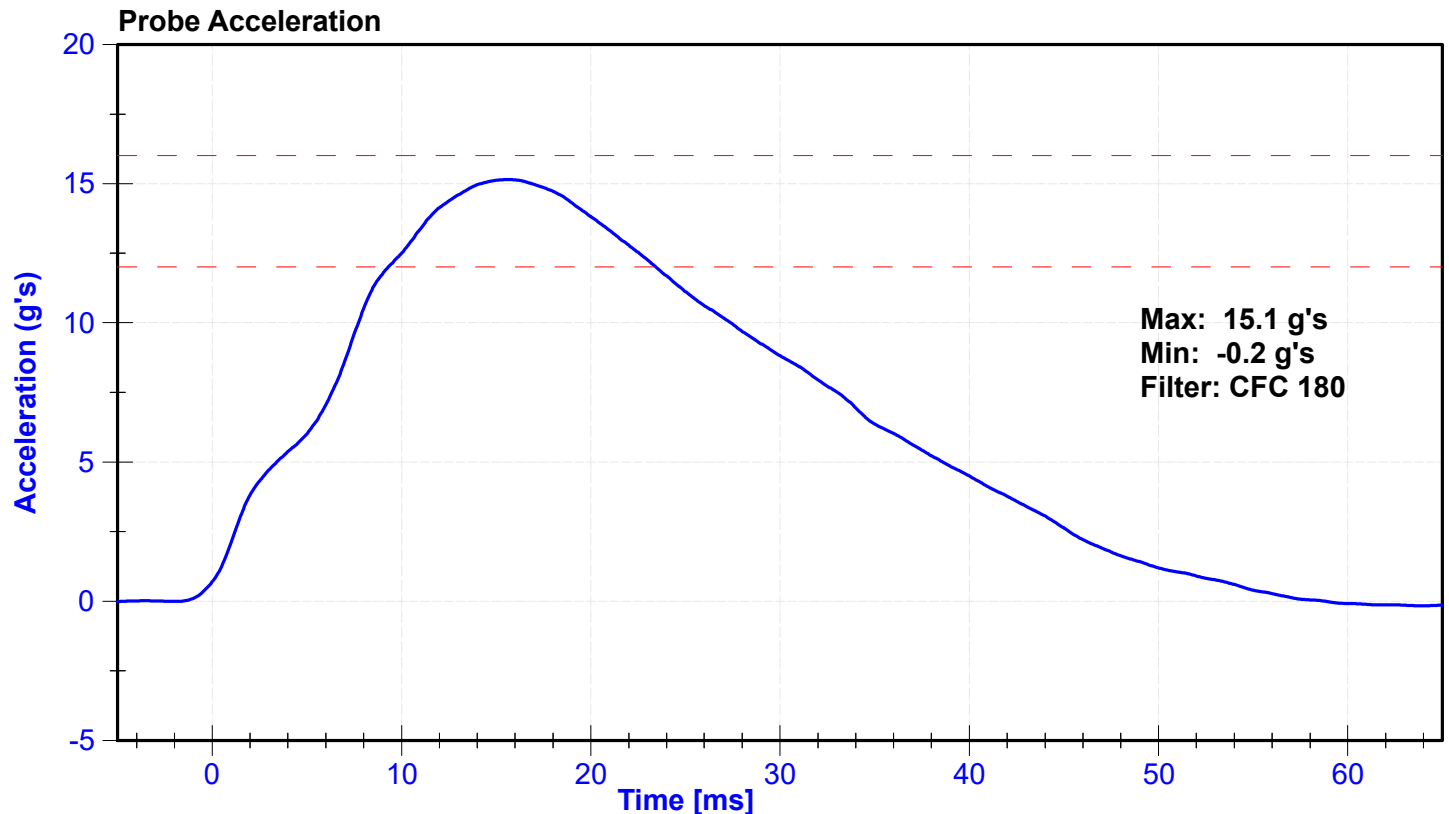
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

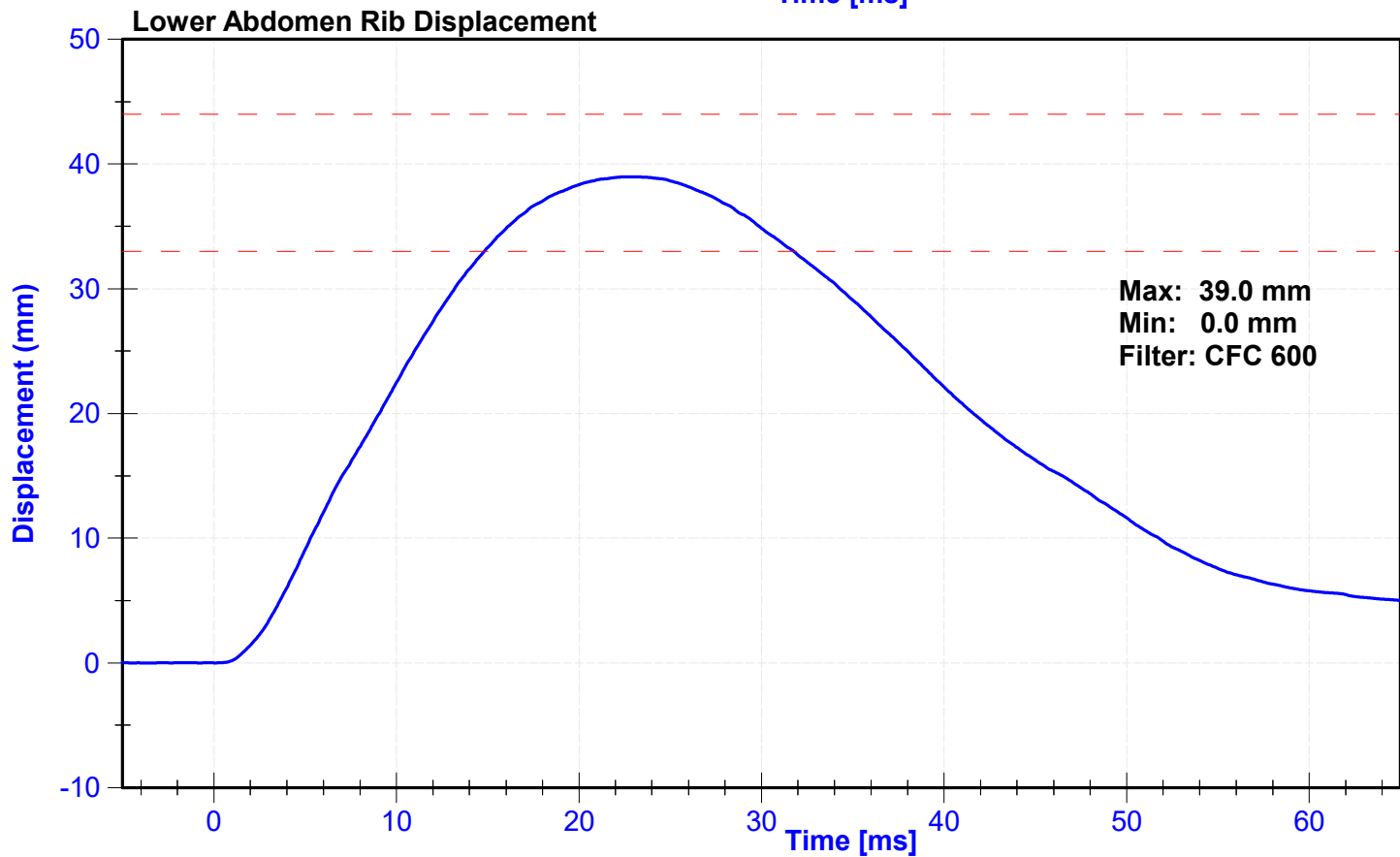
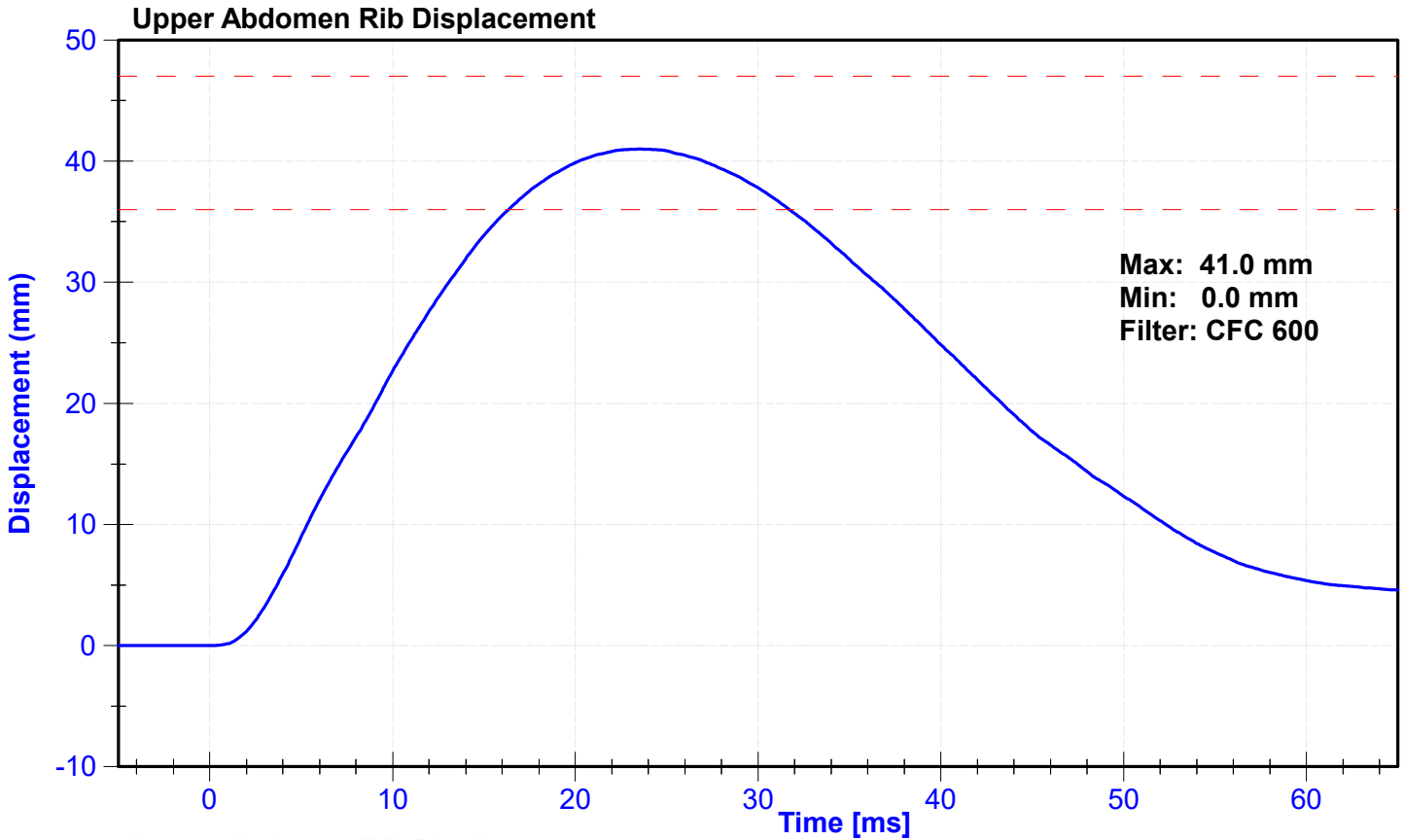
Results

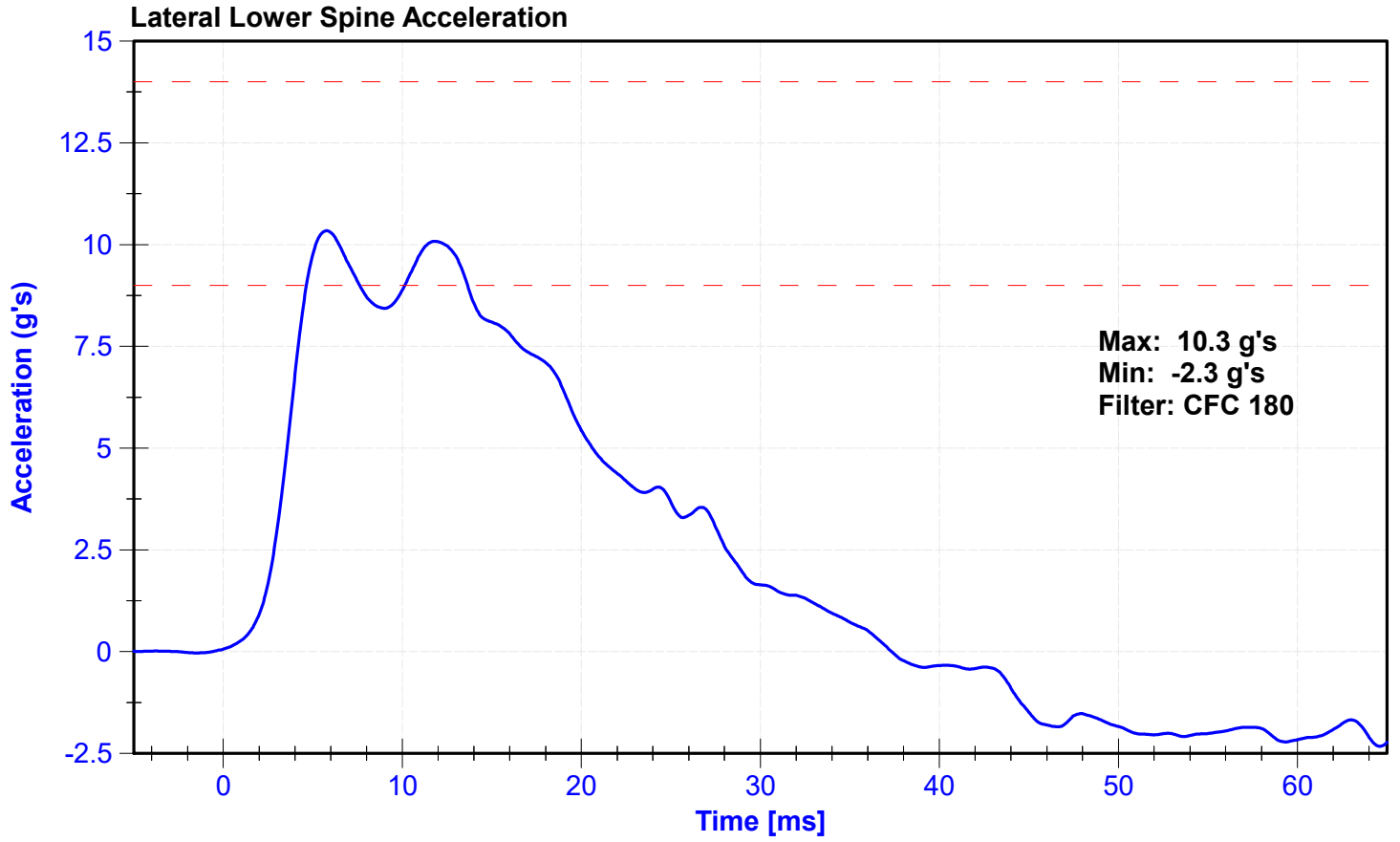
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	45.0	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	12	16	g's	15.1	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.3	Pass
Upper Abdomen Rib Deflection	36	47	mm	41.0	Pass
Lower Abdomen Rib Deflection	33	44	mm	39.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Lower Spine Y Accelerometer	Endevco	P58744	5/15/2024	11/11/2024
Upper Abdomen Rib Potentiometer	Servo	342GFE	5/16/2024	11/14/2024
Lower Abdomen Rib Potentiometer	Servo	512GFE	5/16/2024	11/14/2024







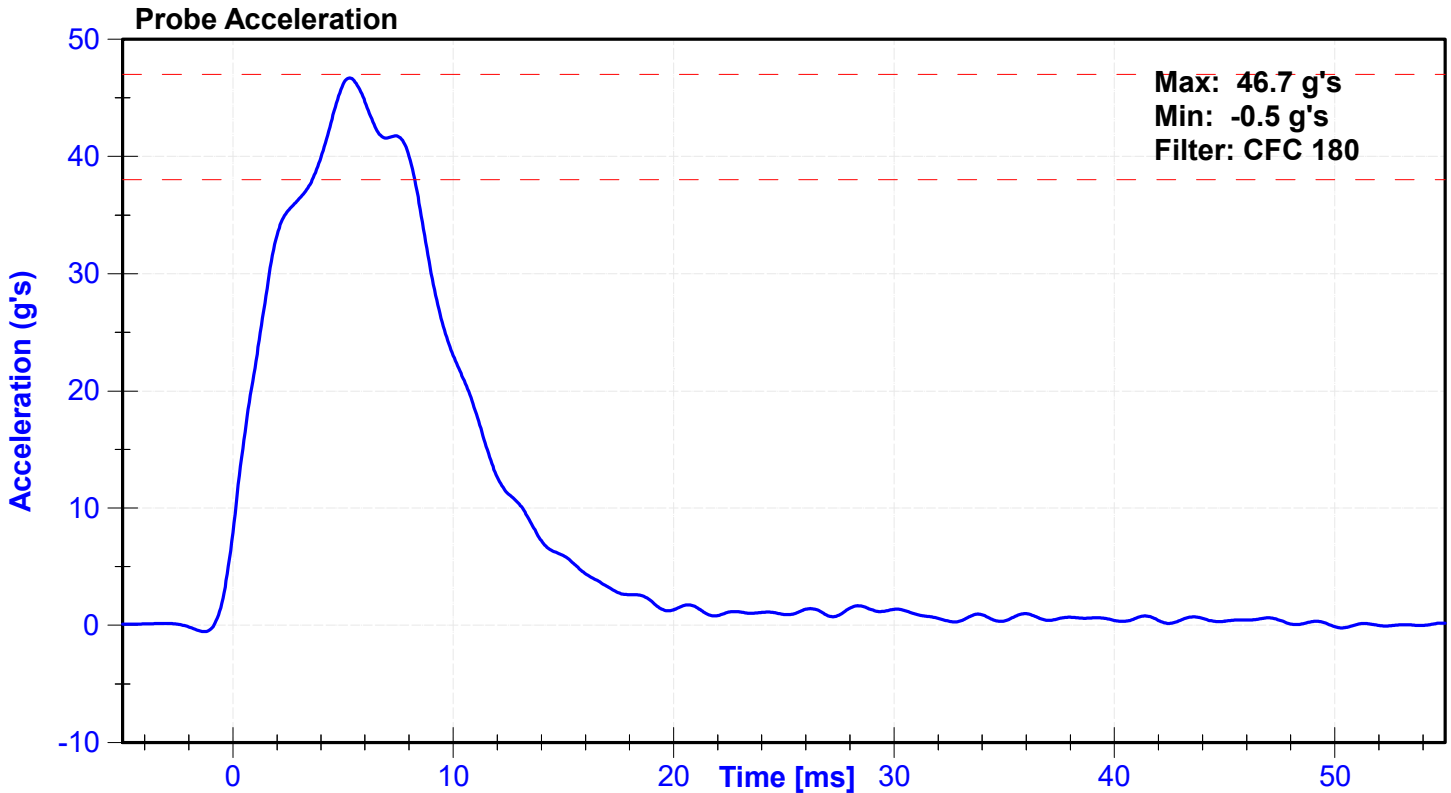
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

Results

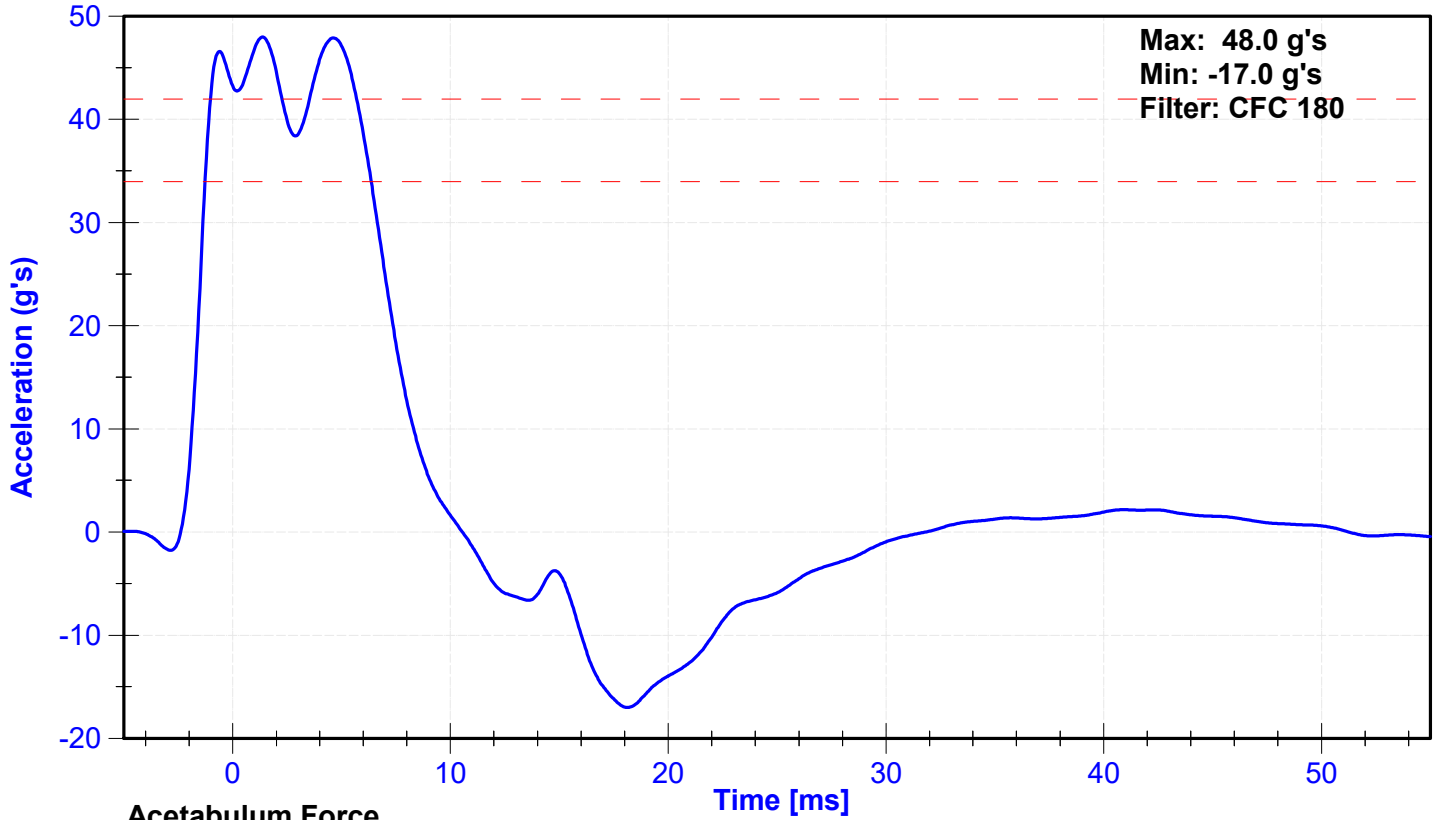
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	45.0	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	46.7	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	38.7	Pass
Acetabulum Force	3600	4300	N	4190.5	Pass

Transducer Calibrations

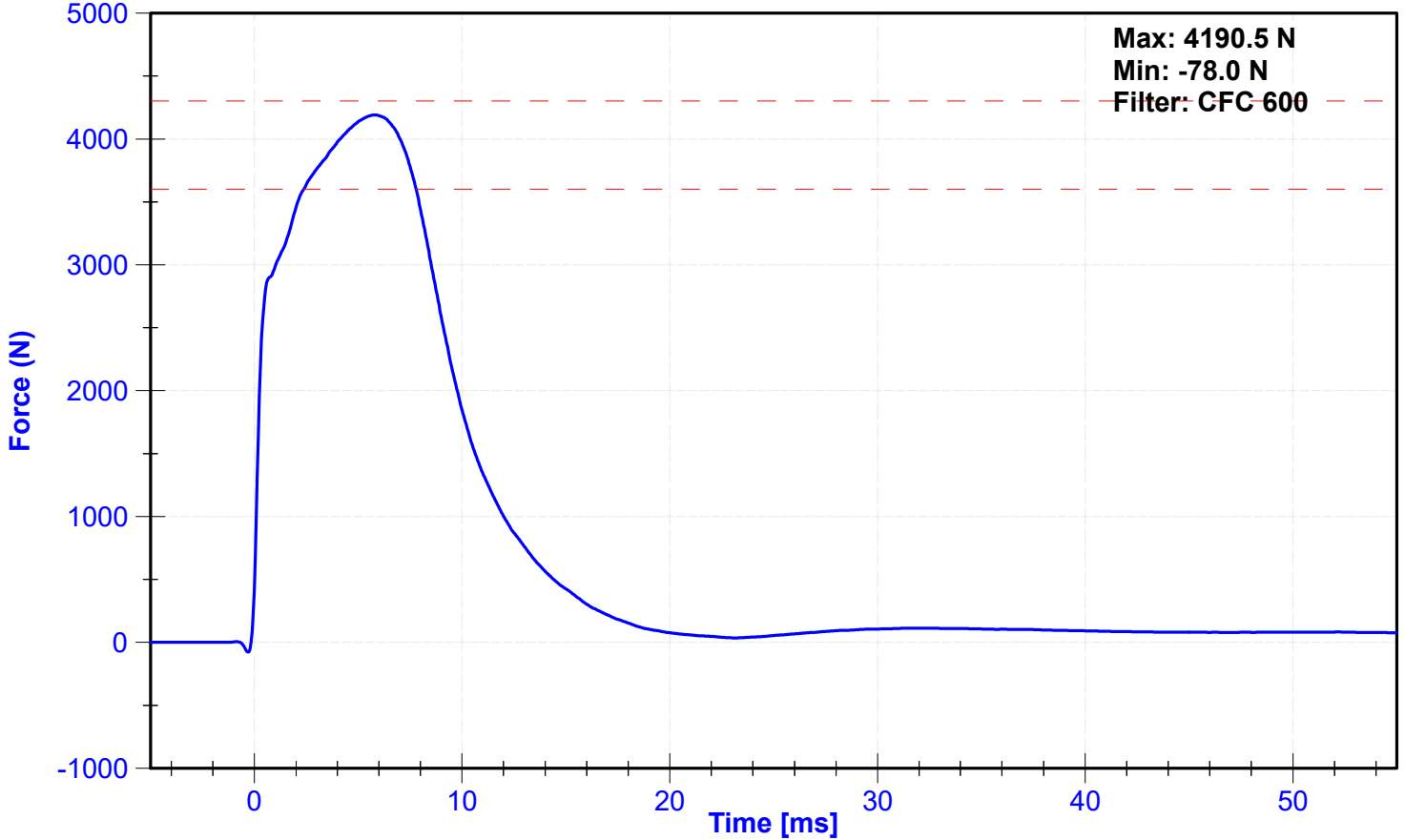
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Pelvis Y Accelerometer	Endevco	T29392	5/15/2024	11/11/2024
Acetabulum Load Cell	FTSS	236-FY	12/5/2023	12/4/2024
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A



Lateral Pelvis Acceleration



Acetabulum Force





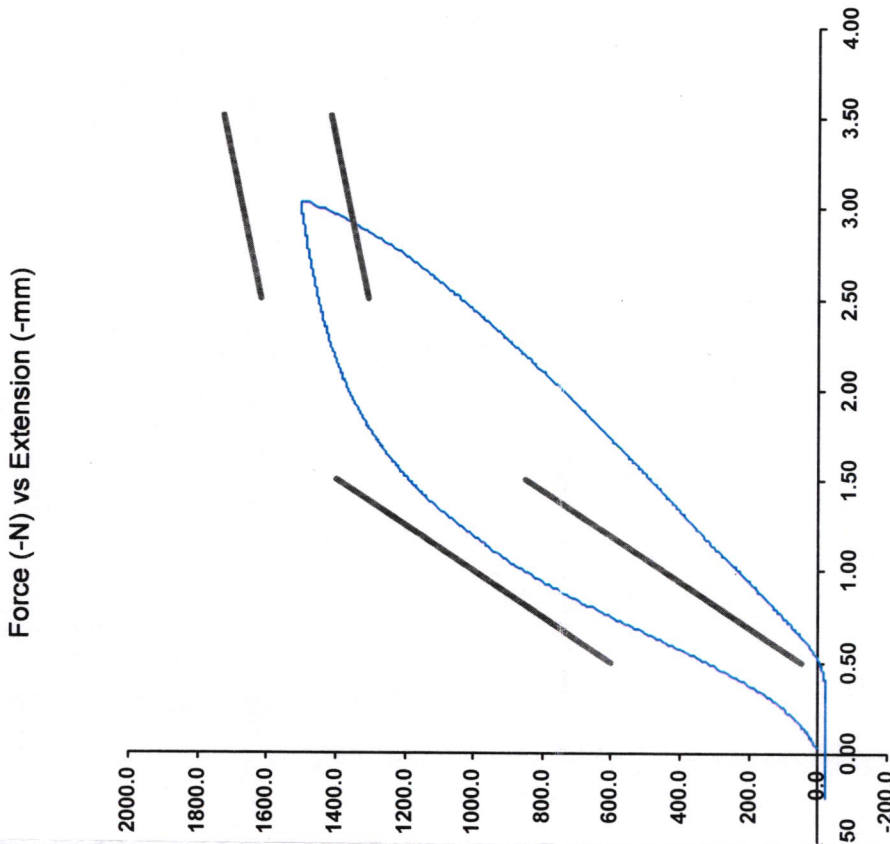
SID-IIs Pelvis Plug Certification Test

Plug S/N 16452
 Test Number 23021
 Report Number 23079
 Test Date 5/23/2022 12:29:54 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 Plug*



Operator _____
 Part Number 180-4450

Template No 107 23-May-22
 SACO Research

By: *DR* Date: *5/23/2022*



SID-IIs Pelvis Plug Certification Test

Plug S/N 16401

Test Number 22970

Report Number 23028

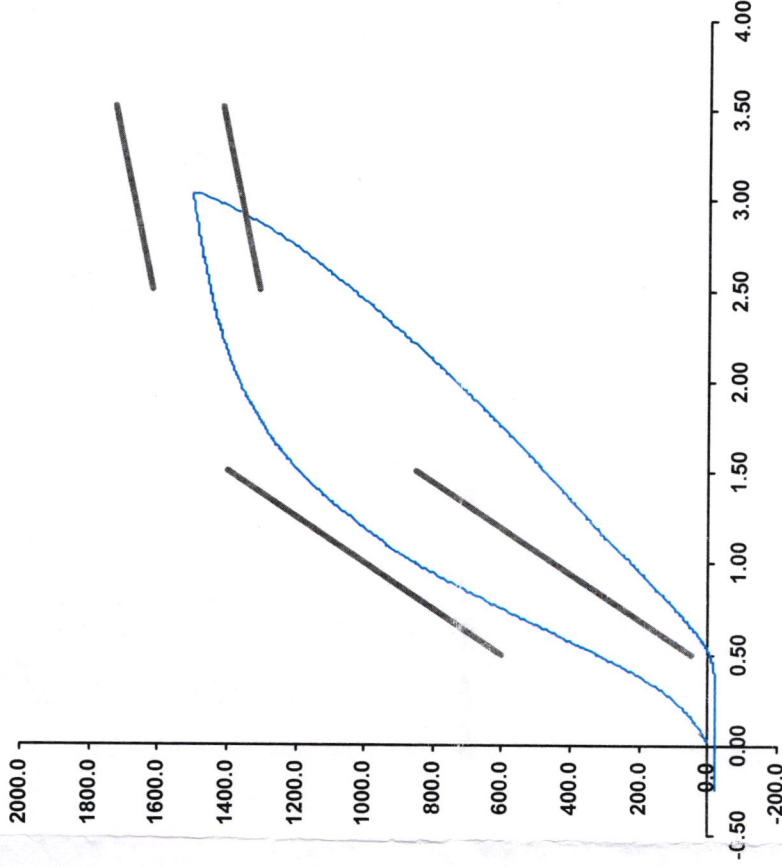
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Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50	600
Force @ 1.5 mm (N)	850	1,400
Force @ 2.5 mm (N)	1,306	1,618
Force @ 3.0 mm (N)	1,361	1,673

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

Notes: *Impact Side*

Force (-N) vs Extension (-mm)



Operator _____
 Part Number 180-4450

Template No 107 23-May-22
 SACO Research

Date: *5/23/2022*
 By: *DC*



SID-IIs Pelvis Plug Certification Test

Plug S/N 16340

Test Number 22907

Report Number 22964

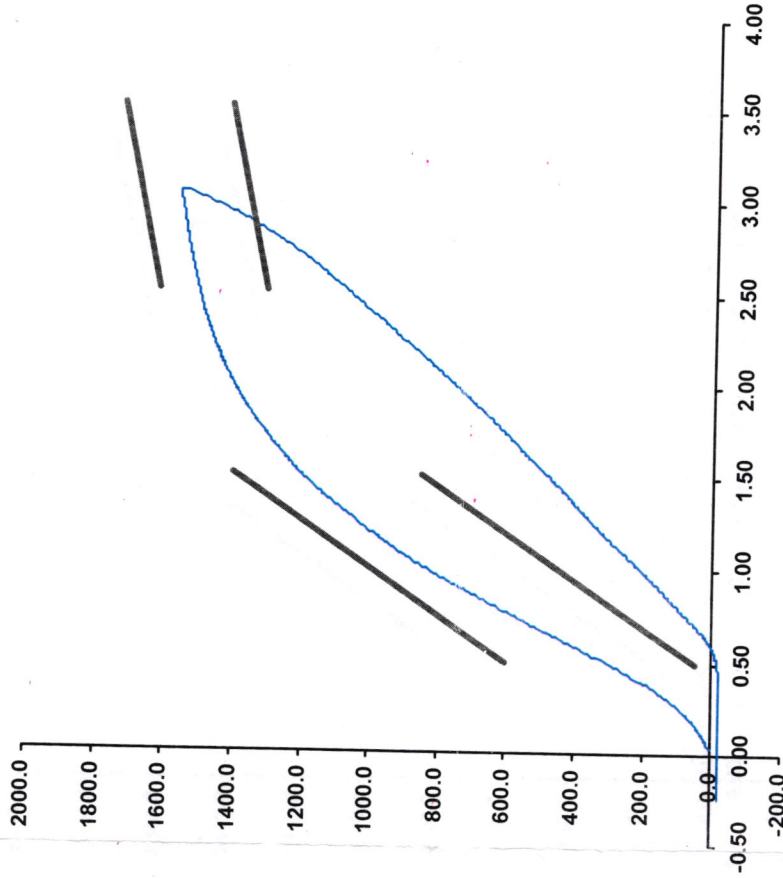
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	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	319	50	600
Force @ 1.5 mm (N)	1,202	850	1,400
Force @ 2.5 mm (N)	1,507	1,306	1,618
Force @ 3.0 mm (N)	1,560	1,361	1,673

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*

Force (-N) vs Extension (-mm)



Operator _____
 Part Number 180-4450

By: *DC* Date: *5/20/22*

Template No 107 20-May-22
 SACO Research

ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

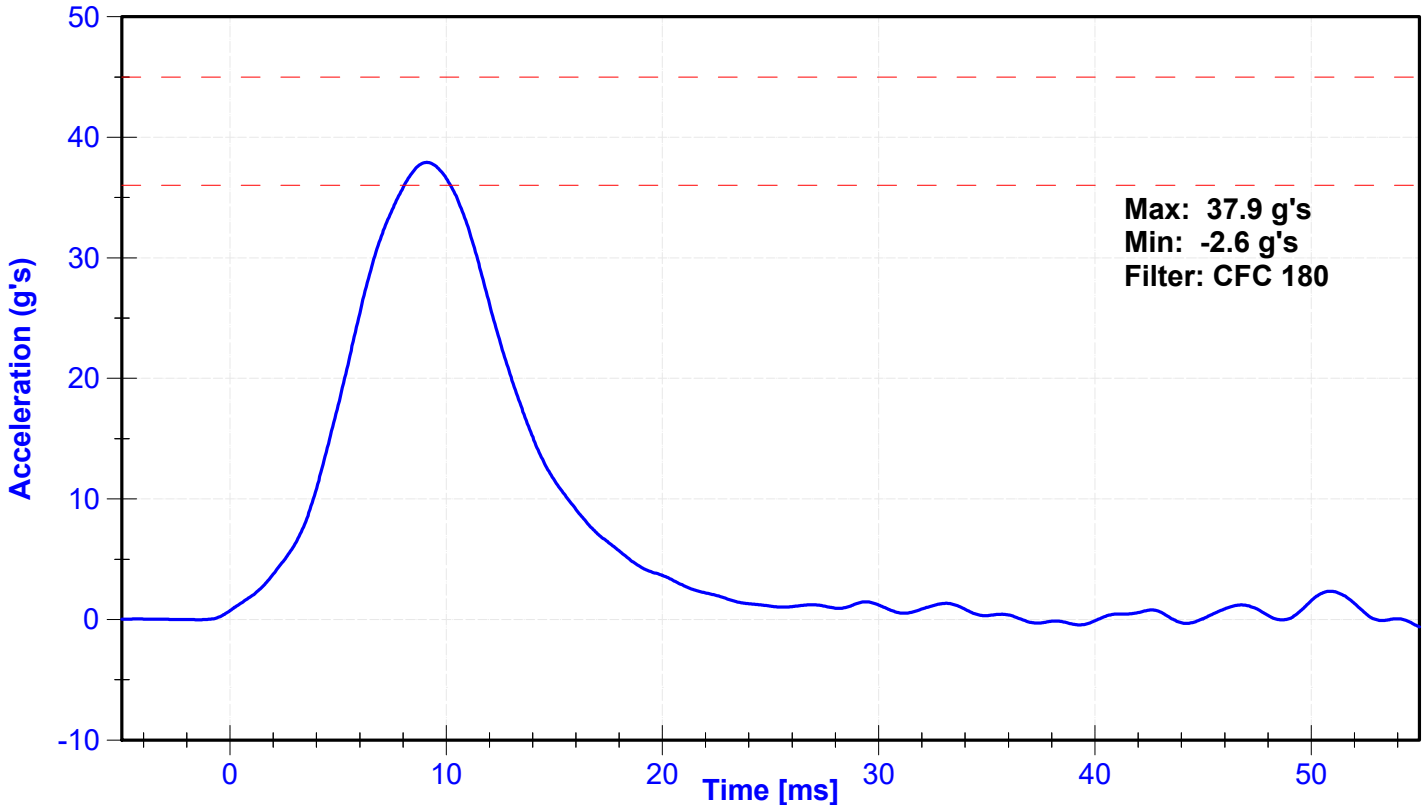
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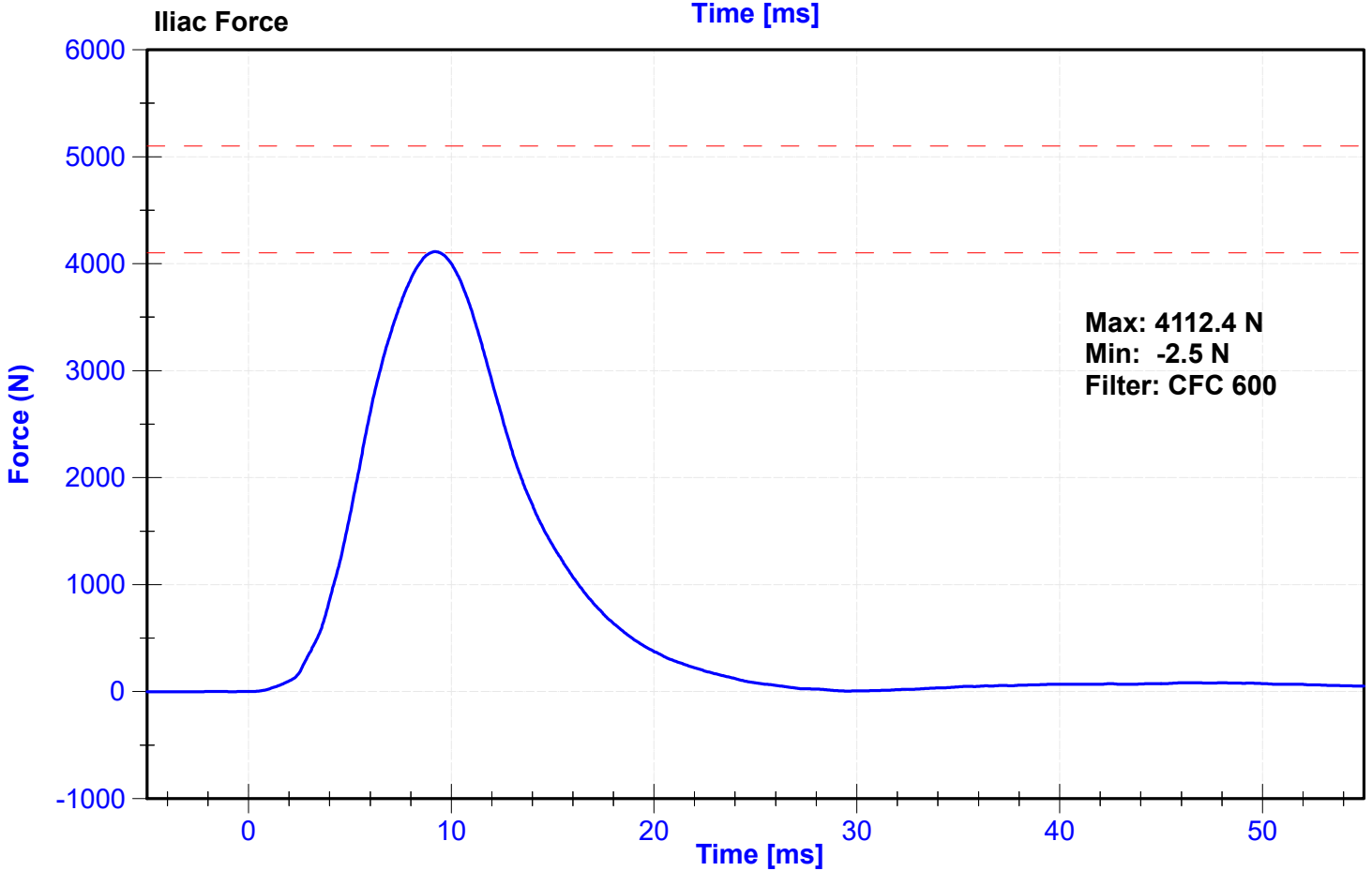
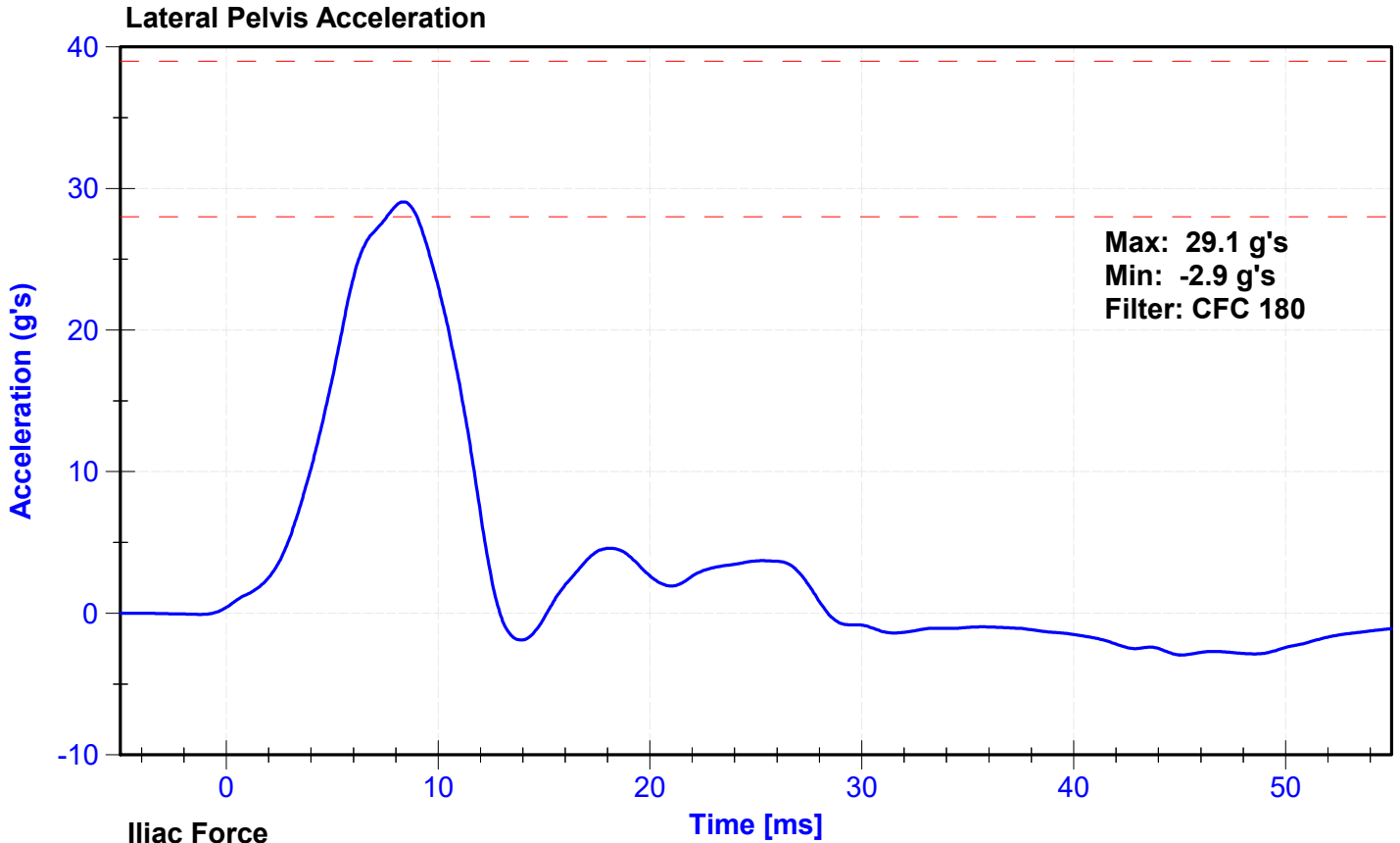
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	45.0	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	36	45	g's	37.9	Pass
Lateral Pelvis Acceleration	28	39	g's	29.1	Pass
Iliac Force	4100	5100	N	4112.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Pelvis Y Accelerometer	Endevco	T29392	5/15/2024	11/11/2024
Iliac Load Cell	Denton	290-FY	12/5/2023	12/4/2024

Probe Acceleration





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

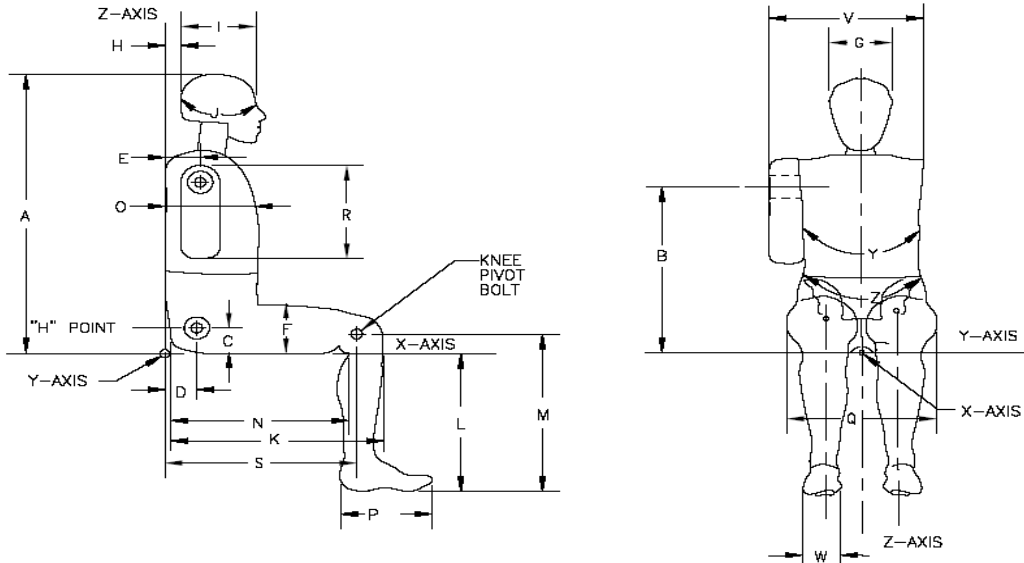


External Measurements - SID-IIs

Technician: J. Rios

Date: 08/07/2024

Dummy Serial Number: 261



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	778	Pass
B	Shoulder Pivot Height	437	453	445	Pass
C	H-point Height	79	89	83	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	42	Pass
I	Head Depth	178	188	180	Pass
J	Head Circumference	541	551	548	Pass
K	Buttock to Knee Length	514	540	527	Pass
L	Popliteal Height	343	369	354	Pass
M	Knee Pivot to floor height	392	409	403	Pass
N	Buttock Popliteal Length	416	442	431	Pass
O	Chest Depth w/o jacket	195	211	206	Pass
P	Foot Length	216	232	225	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	253	Pass
S	Knee Joint to seatback	477	493	483	Pass
V	Shoulder Width	341	357	348	Pass
W	Foot Width	78	94	83	Pass
Y	Chest Circumference w/jacket	851	881	871	Pass
Z	Waist Circumference	761	791	776	Pass

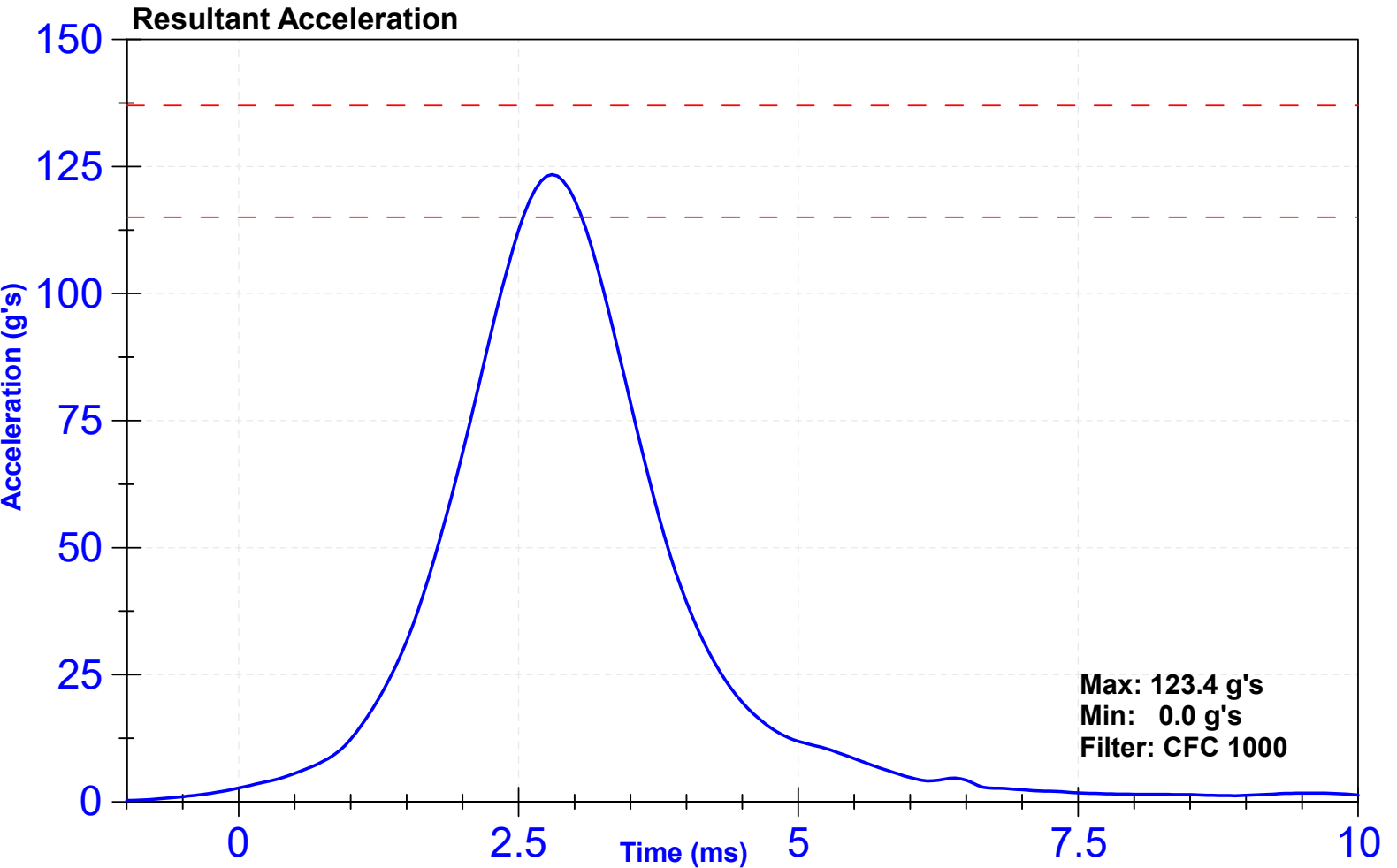
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C .Mantell

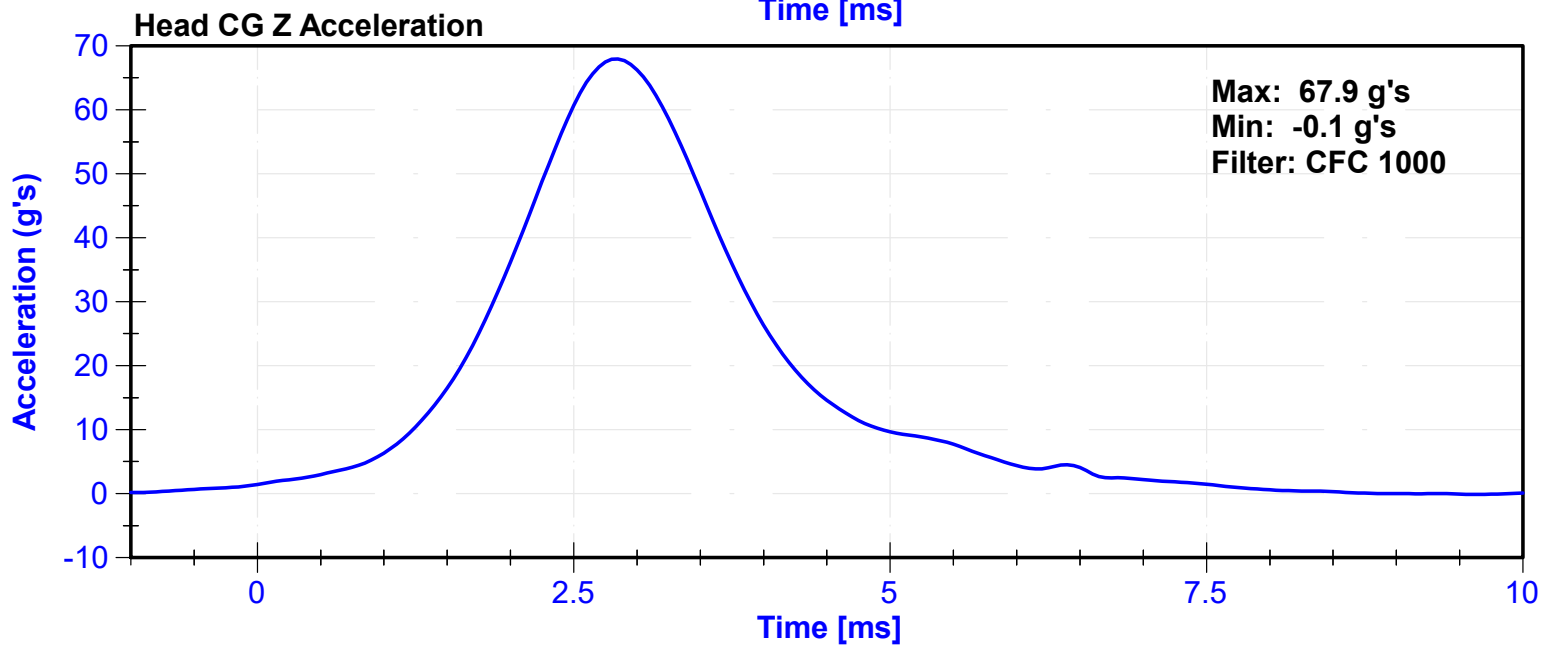
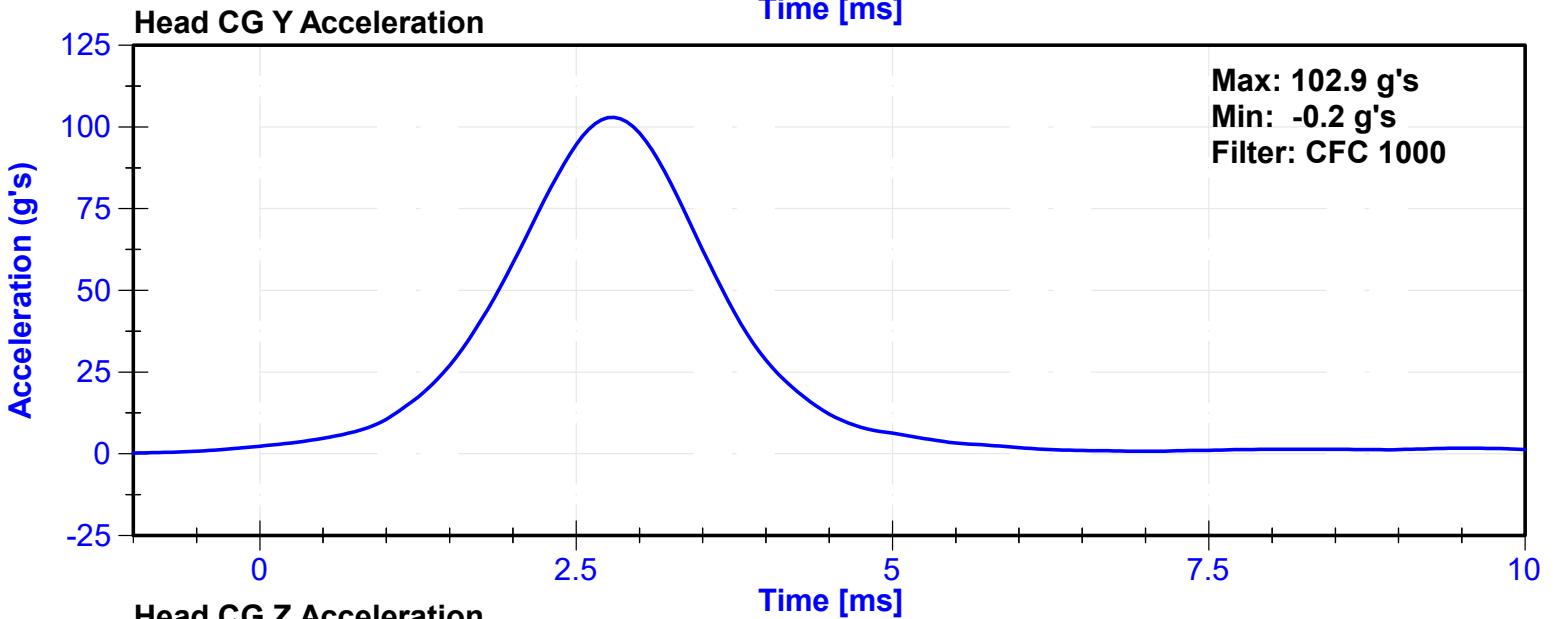
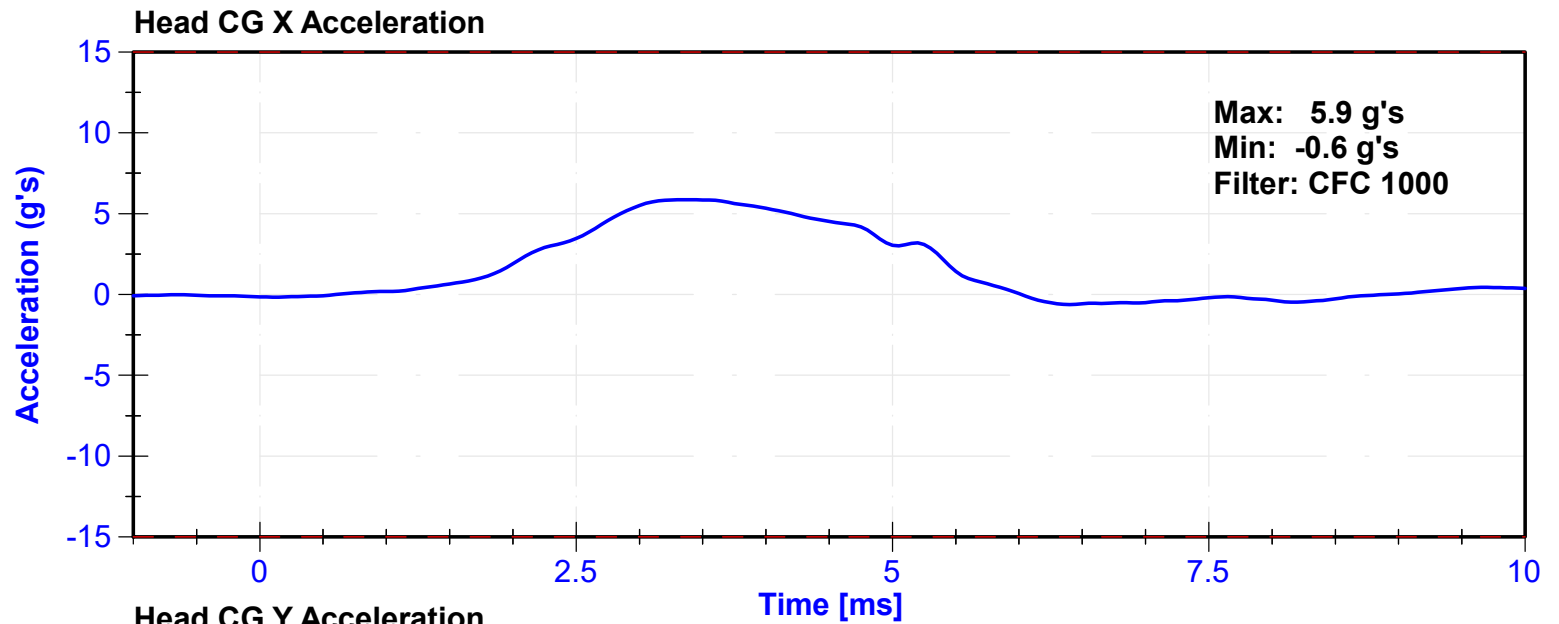
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	60	Pass
Resultant Acceleration	115	137	g's	123.4	Pass
Oscillation	0	15	%	3.7	Pass
Fore-Aft Acceleration	-15	15	g's	5.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P68067	5/15/2024	11/11/2024
Y Accelerometer	Endevco	P18567	5/15/2024	11/11/2024
Z Accelerometer	Endevco	P49163	5/15/2024	11/11/2024





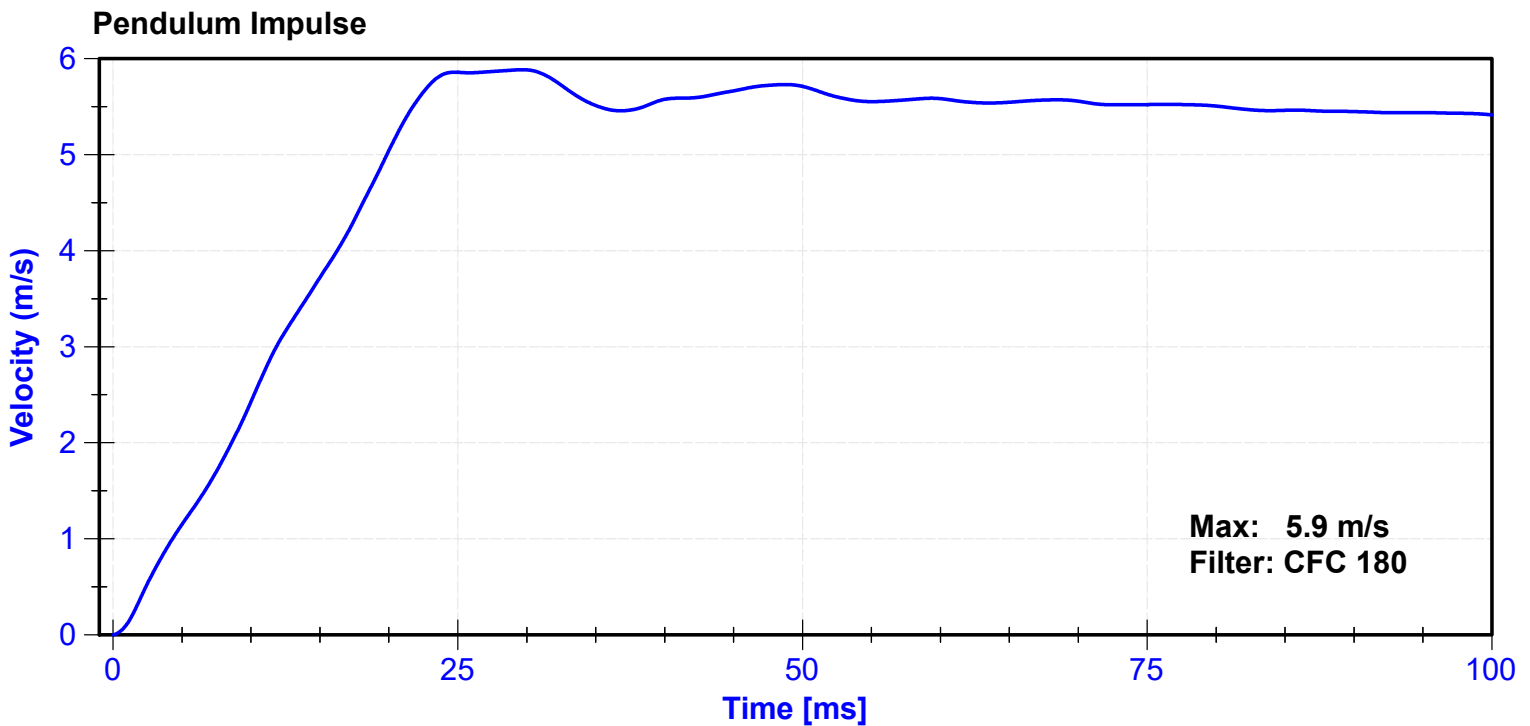
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

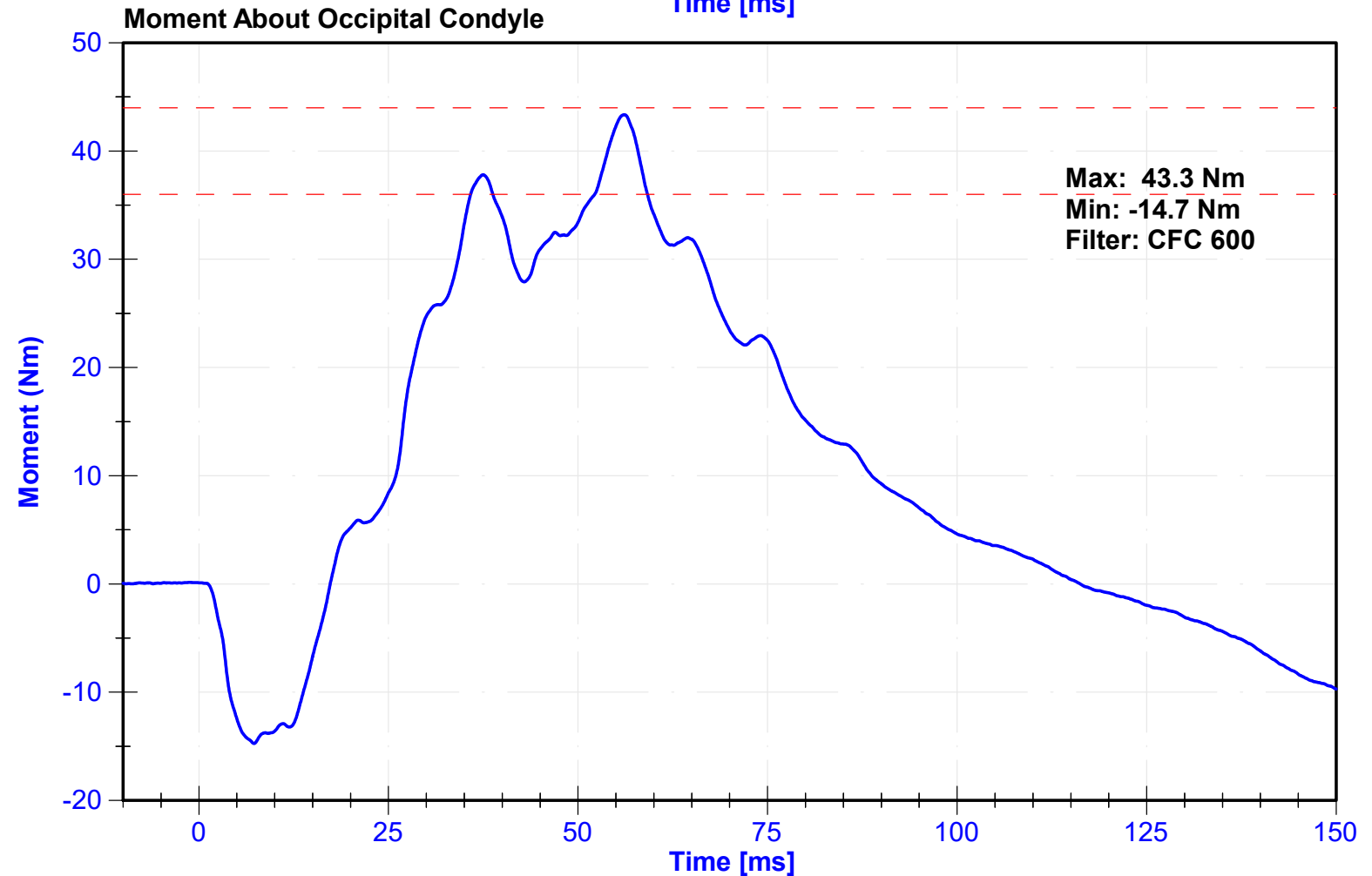
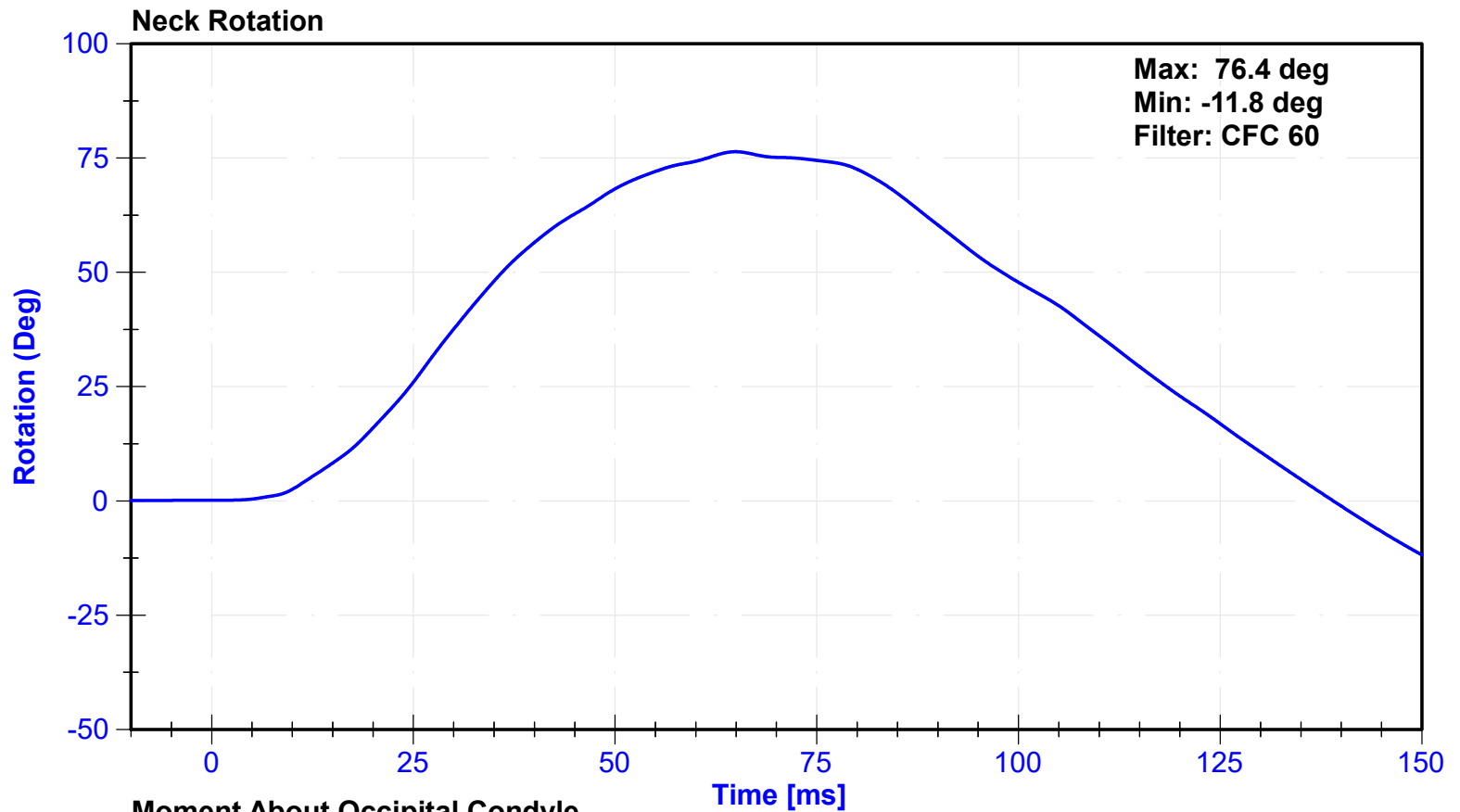
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	58	Pass
Velocity	5.51	5.63	m/s	5.533	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.43	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.72	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	5.04	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.86	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.88	Pass
Neck Rotation	71	81	deg	76.4	Pass
Time at Maximum Rotation	50	70	ms	64.9	Pass
Moment about the OC	36	44	Nm	43.3	Pass
Moment Decay to 0 Nm	102	126	ms	116.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	4/29/2024	10/26/2024
Pendulum Potentiometer	Servo	4961	10/2/2023	10/1/2024
Condyle Potentiometer	Servo	DS185	10/2/2023	10/1/2024
Upper Neck Load Cell	Denton	1716A_2187-FY	12/5/2023	12/4/2024





ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

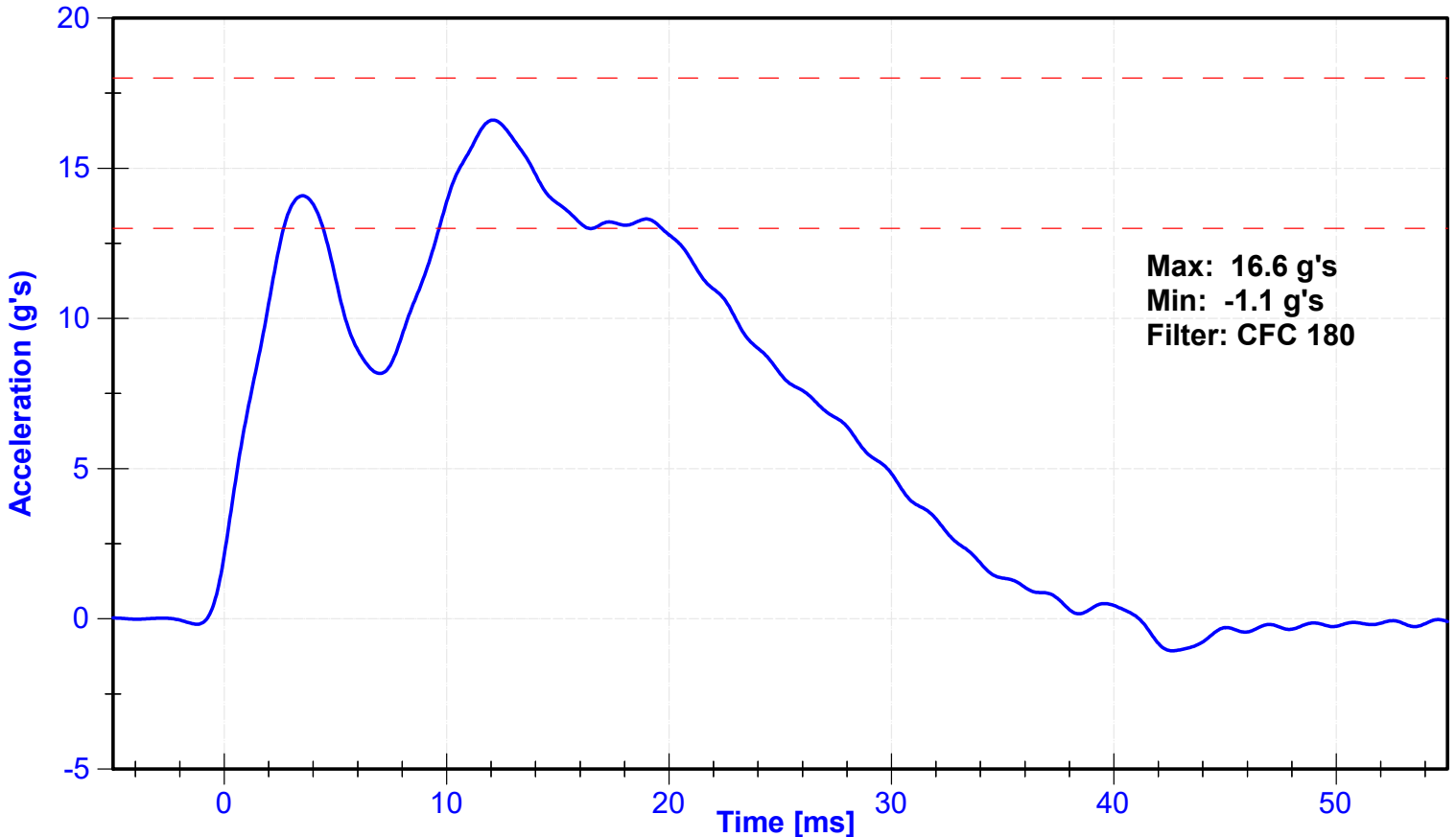
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	59.0	Pass
Velocity	4.2	4.4	m/s	4.35	Pass
Probe Acceleration	13	18	g's	16.6	Pass
Shoulder Deflection	28	37	mm	30.9	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.4	Pass

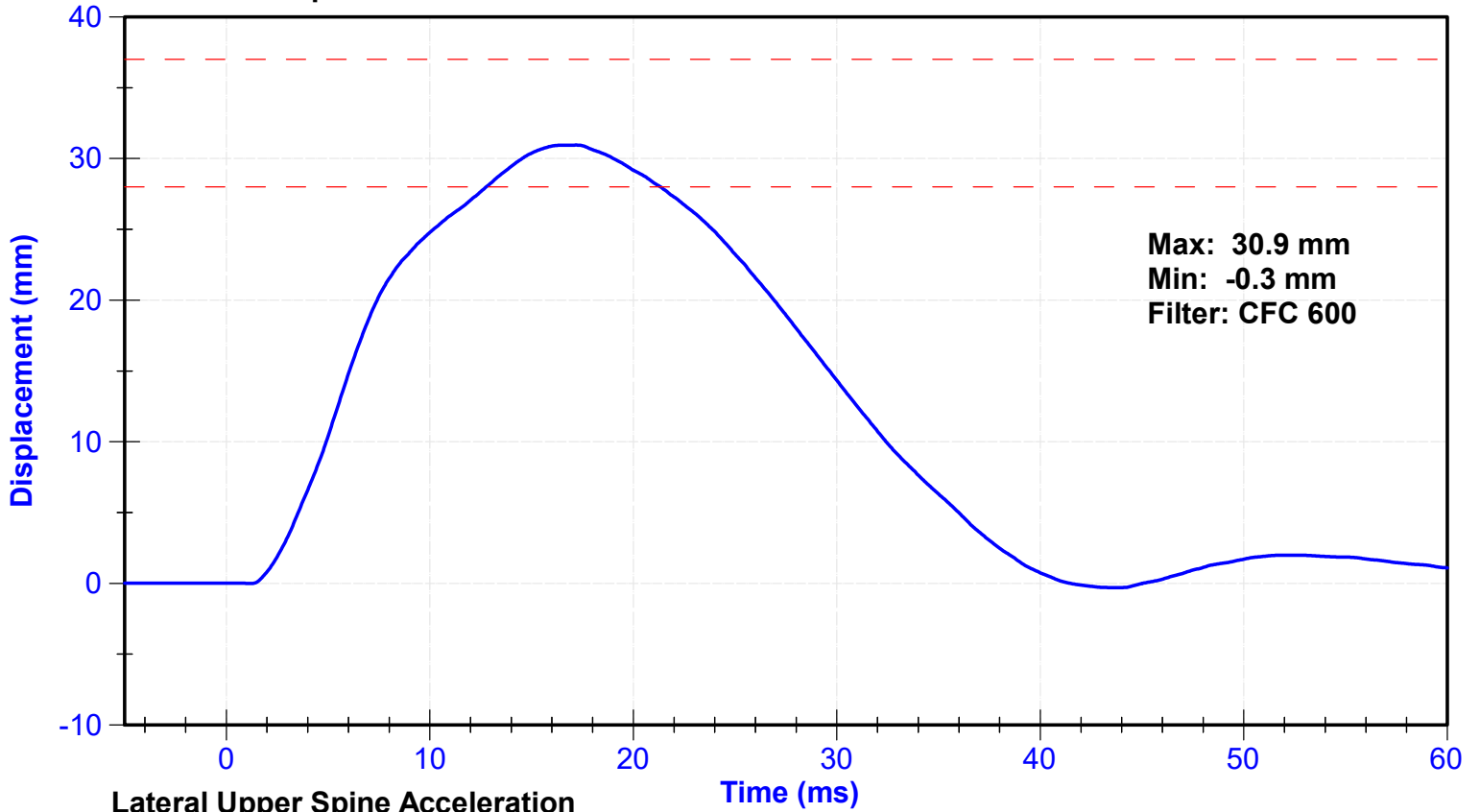
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Shoulder Potentiometer	Servo	572GFE	5/16/2024	11/14/2024
Upper Spine Y Accelerometer	Endevco	P94678	5/15/2024	11/11/2024

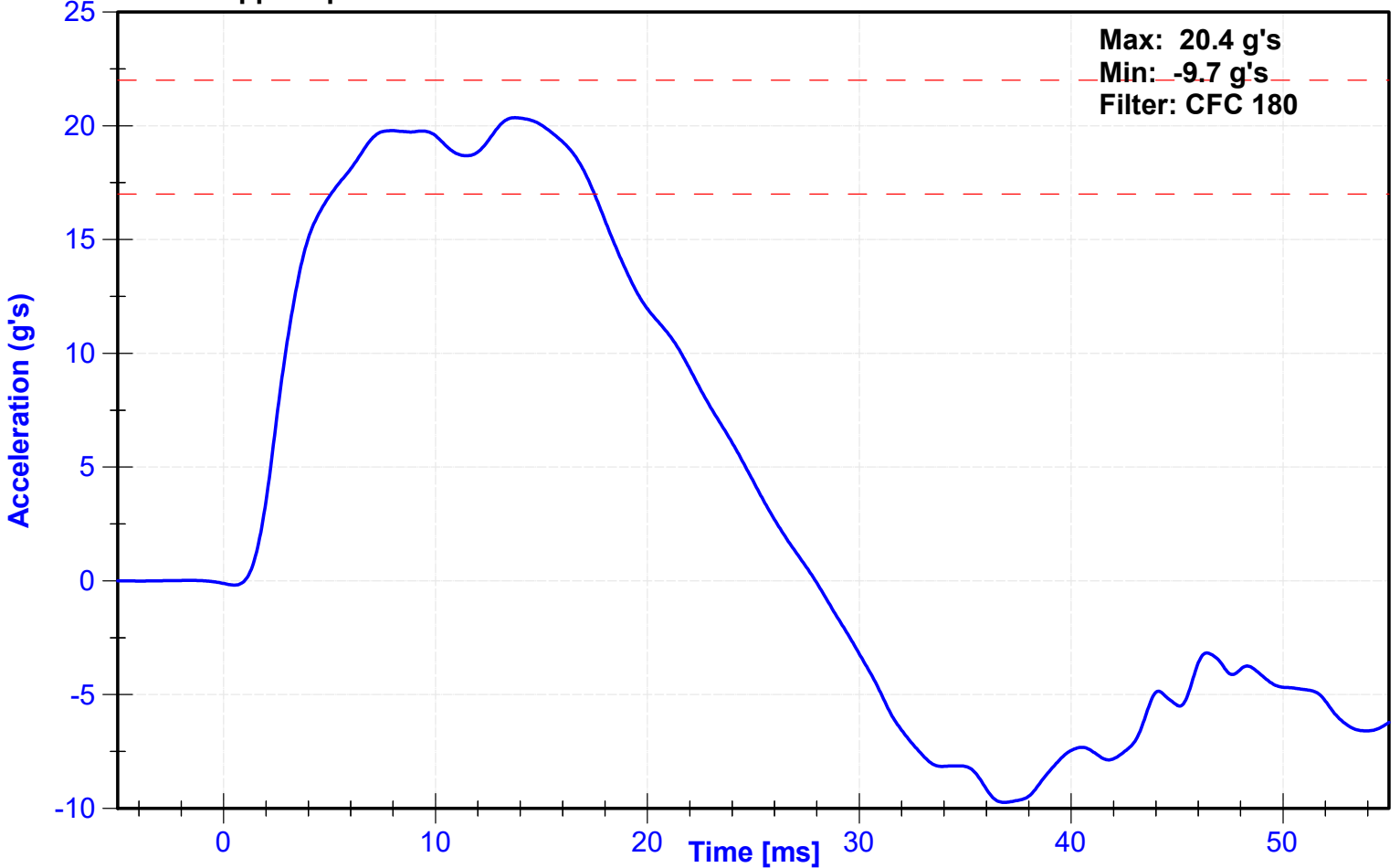
Probe Acceleration



Shoulder Displacement



Lateral Upper Spine Acceleration



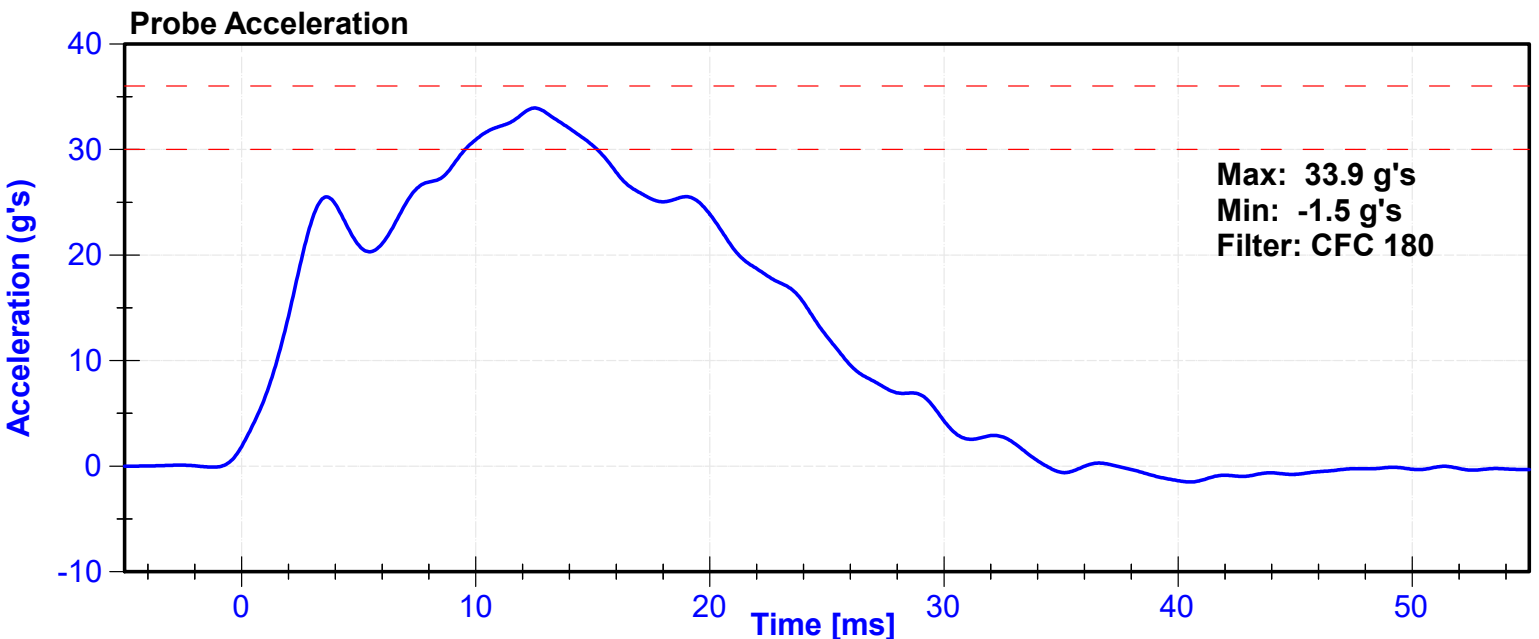
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

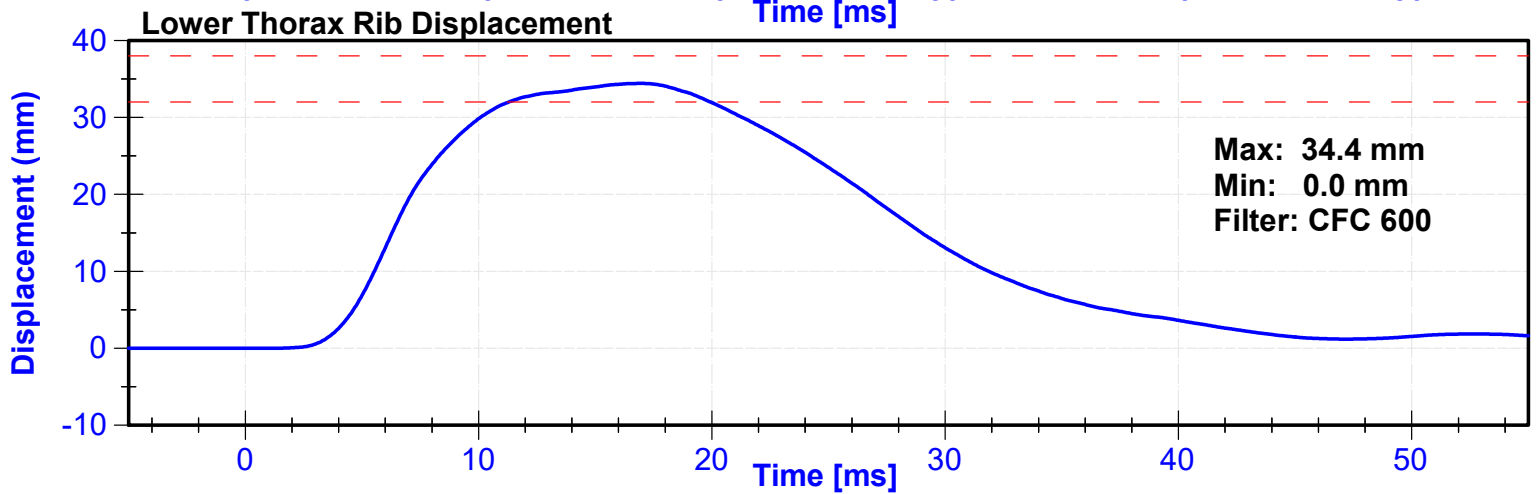
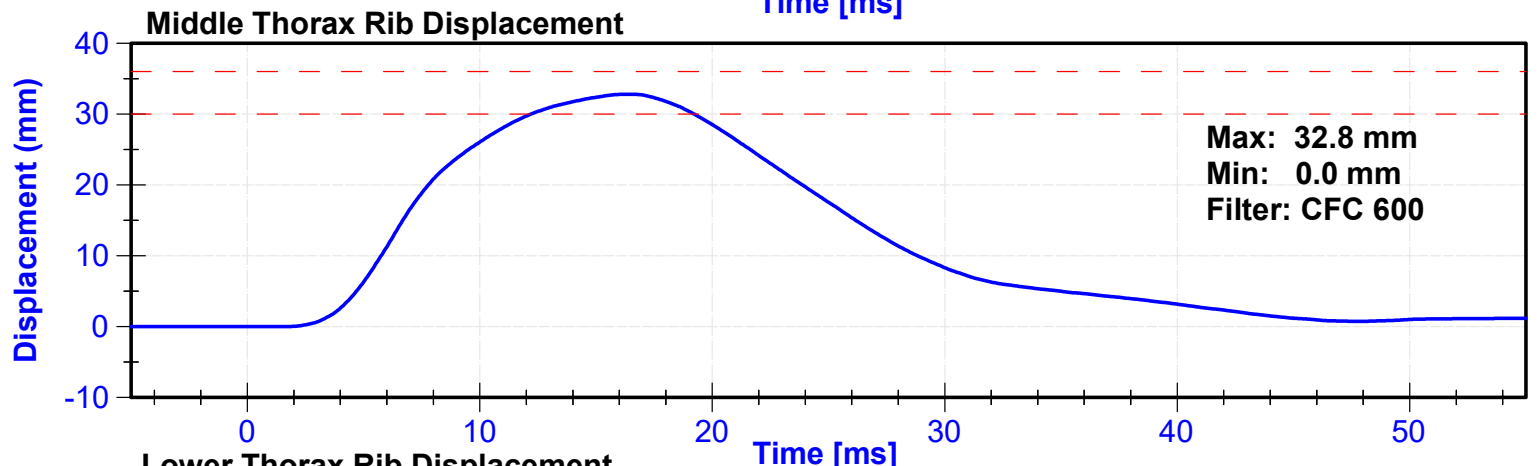
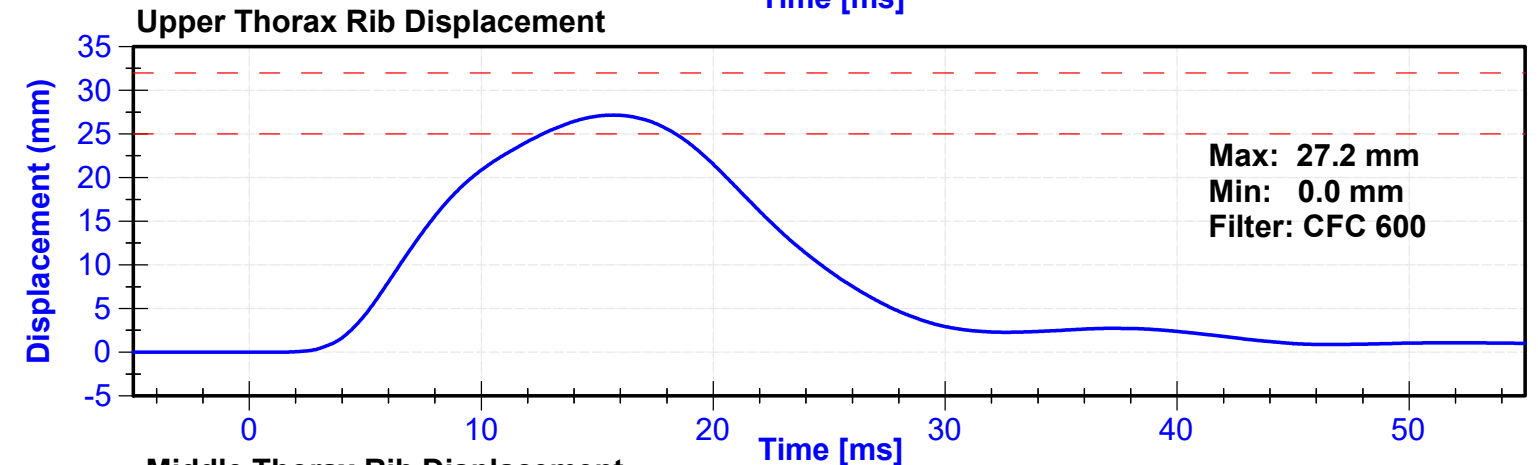
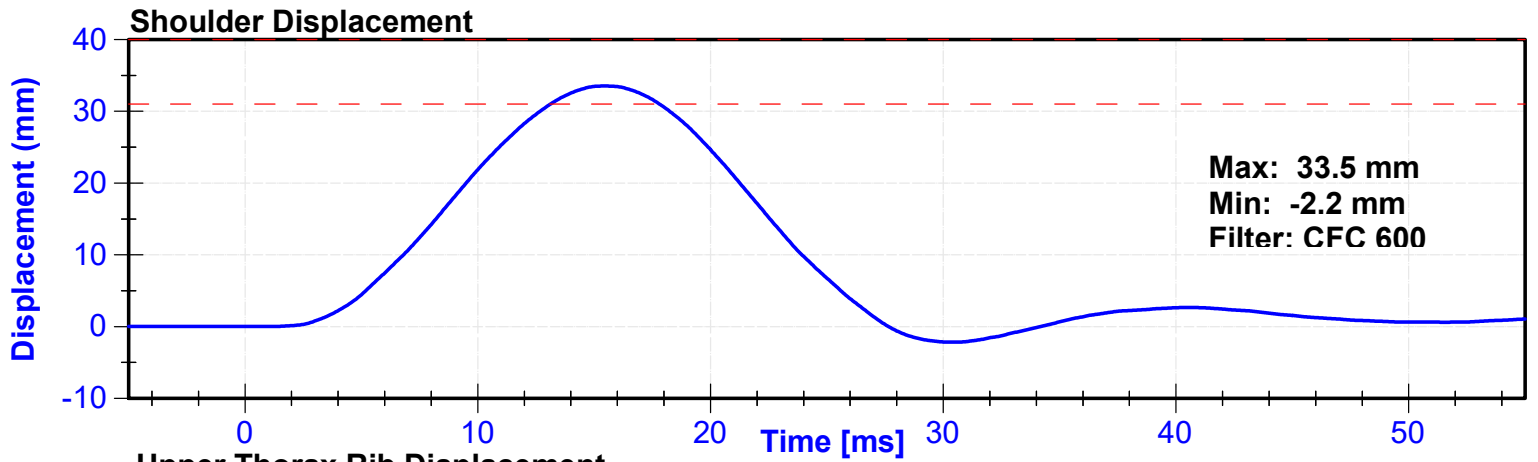
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	59.0	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration after 5 ms	30	36	g's	33.9	Pass
Lateral Upper Spine Acceleration	34	43	g's	41.1	Pass
Lateral Lower Spine Acceleration	29	37	g's	30.1	Pass
Shoulder Deflection	31	40	mm	33.5	Pass
Upper Thorax Rib Deflection	25	32	mm	27.2	Pass
Mid Thorax Rib Deflection	30	36	mm	32.8	Pass
Lower Thorax Rib Deflection	32	38	mm	34.4	Pass

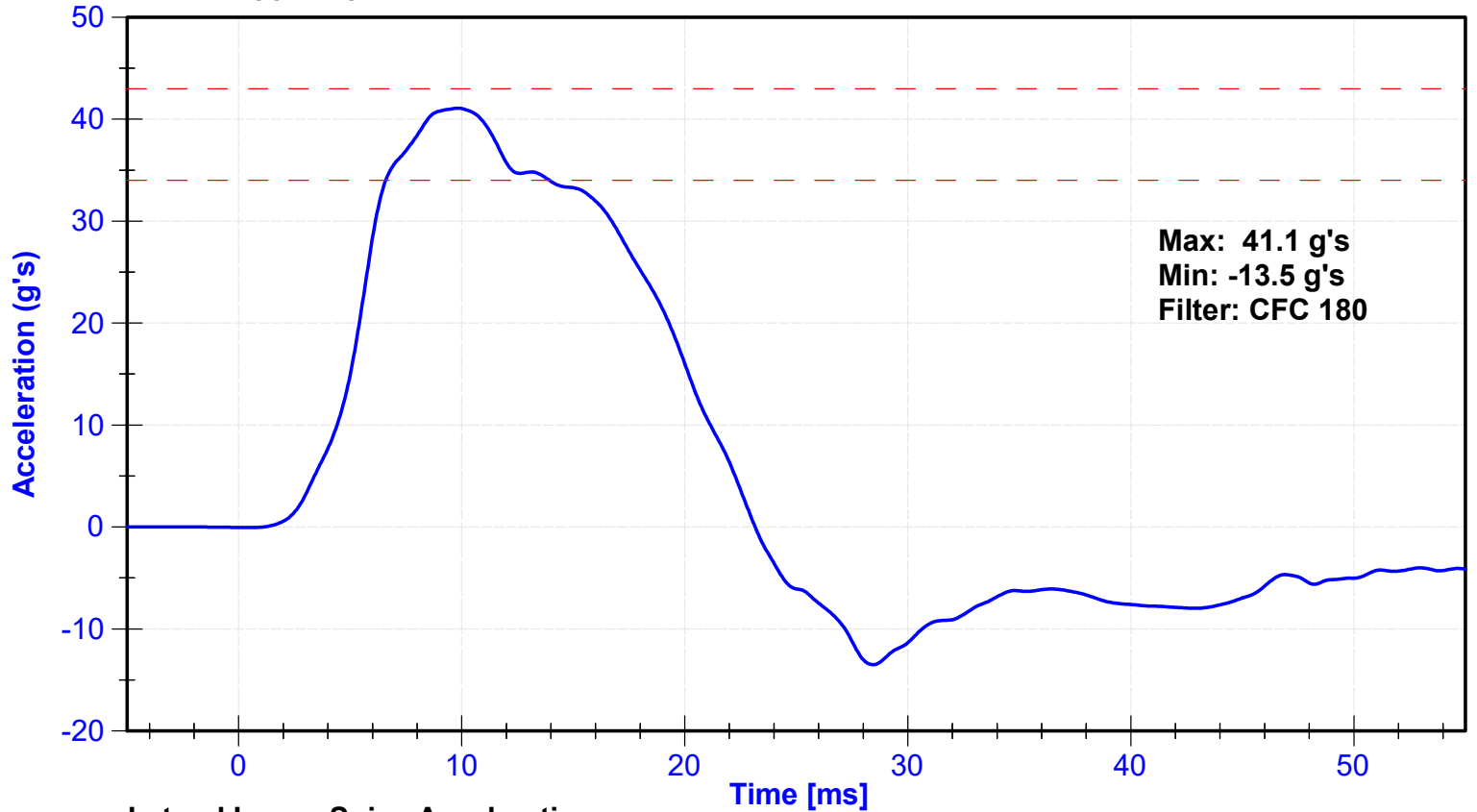
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Spine T1 Y Accelerometer	Endevco	P94678	5/15/2024	11/11/2024
Upper Spine T12 Y Accelerometer	Endevco	P58744	5/15/2024	11/11/2024
Shoulder Potentiometer	Servo	572GFE	5/16/2024	11/14/2024
Upper Thorax Rib Potentiometer	Servo	062GFE	5/16/2024	11/14/2024
Middle Thorax Rib Potentiometer	Servo	528GFE	5/16/2024	11/14/2024
Lower Thorax Rib Potentiometer	Servo	513GFE	5/16/2024	11/14/2024

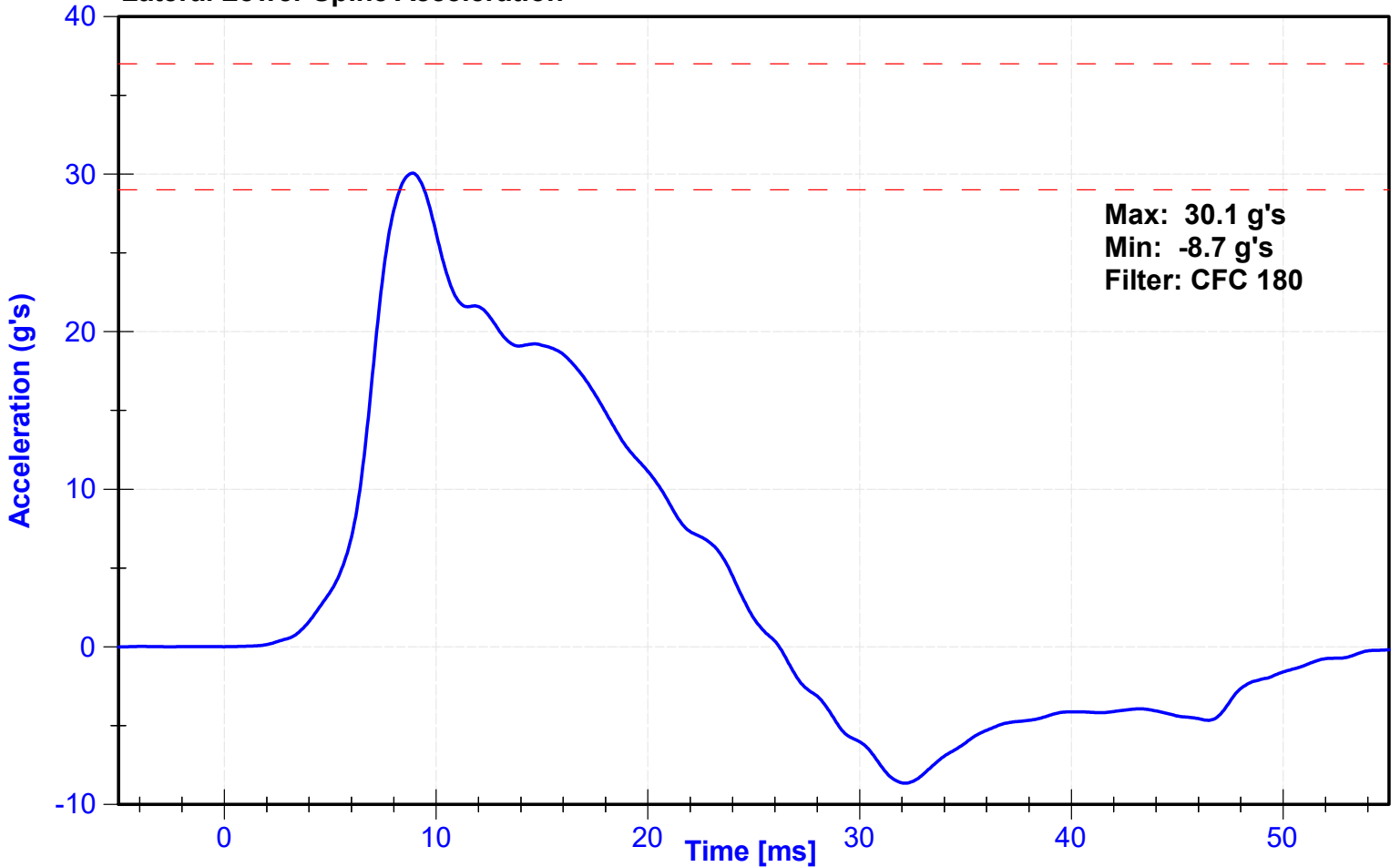




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



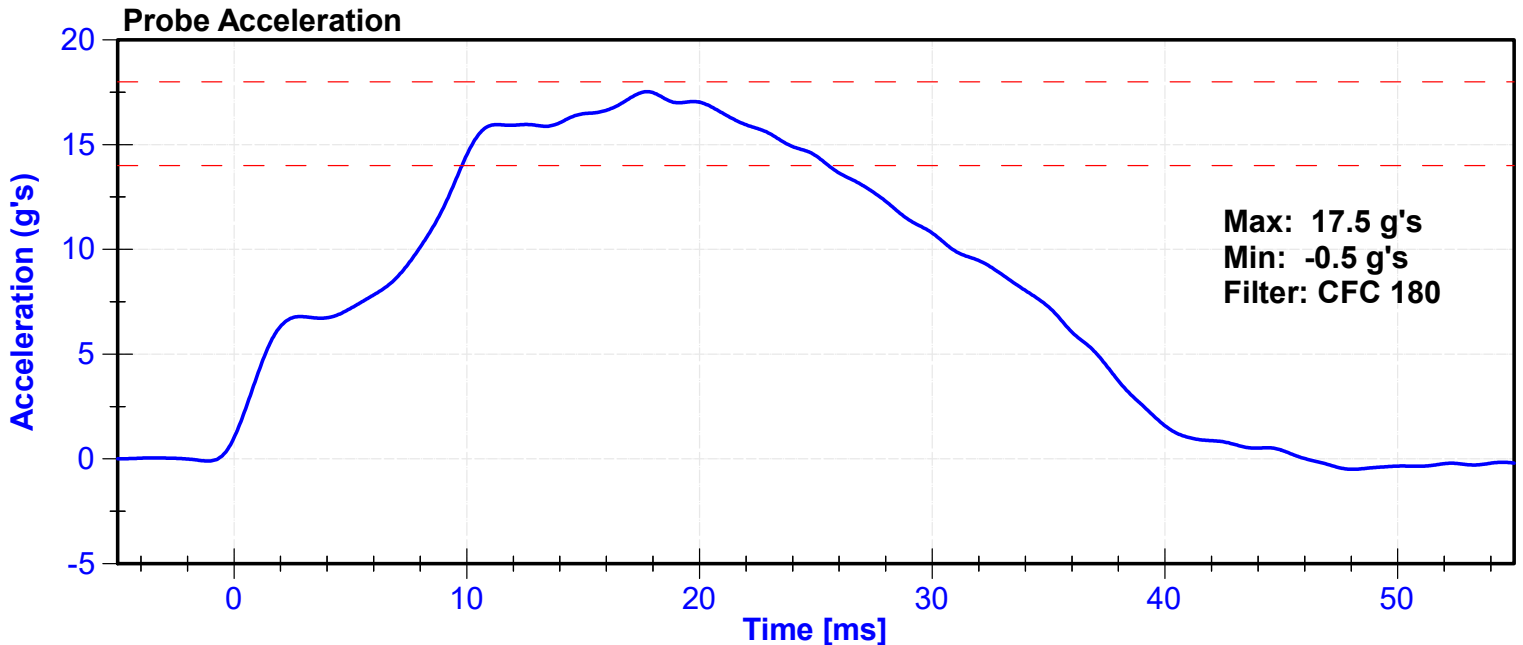
ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

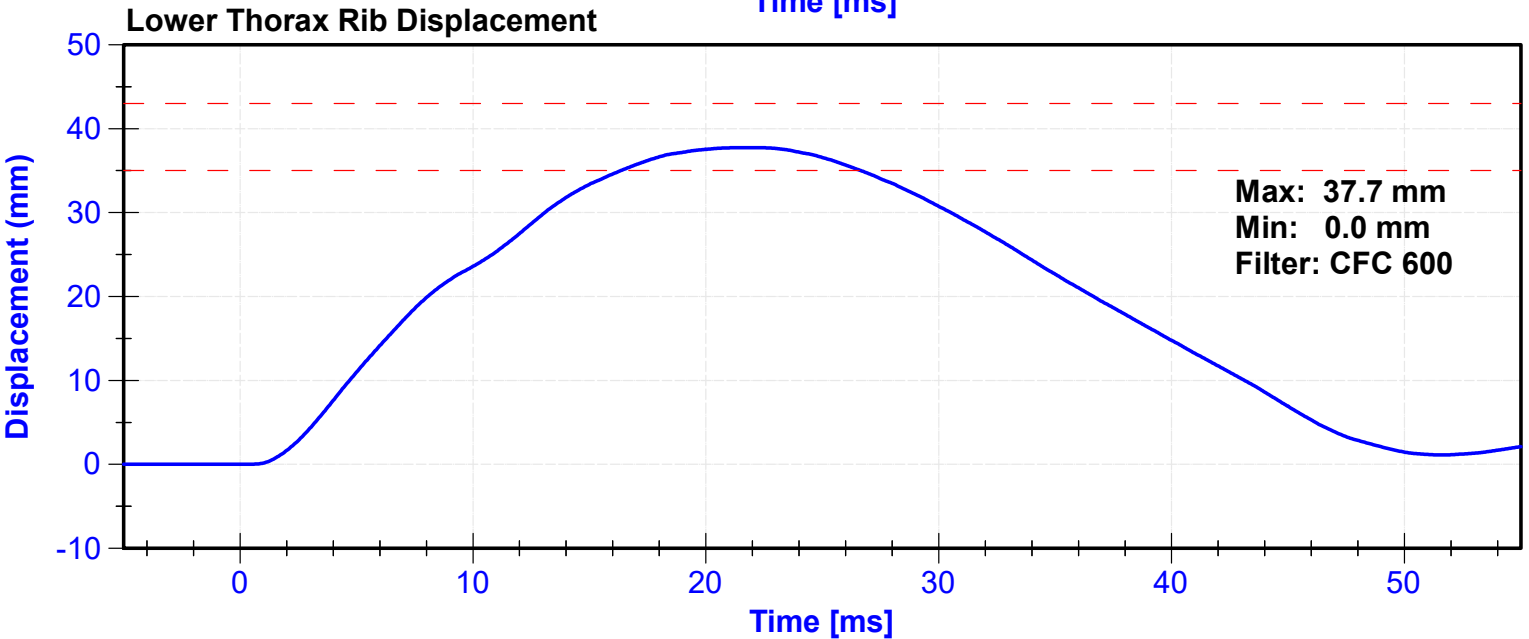
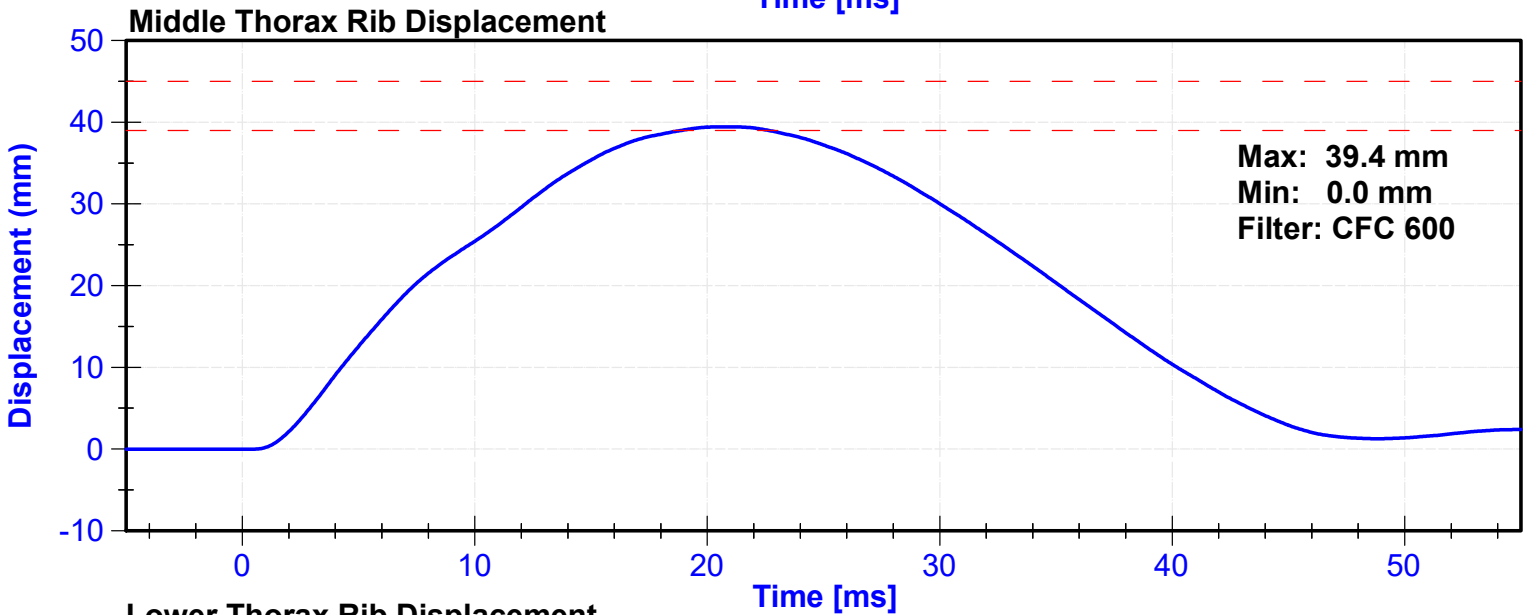
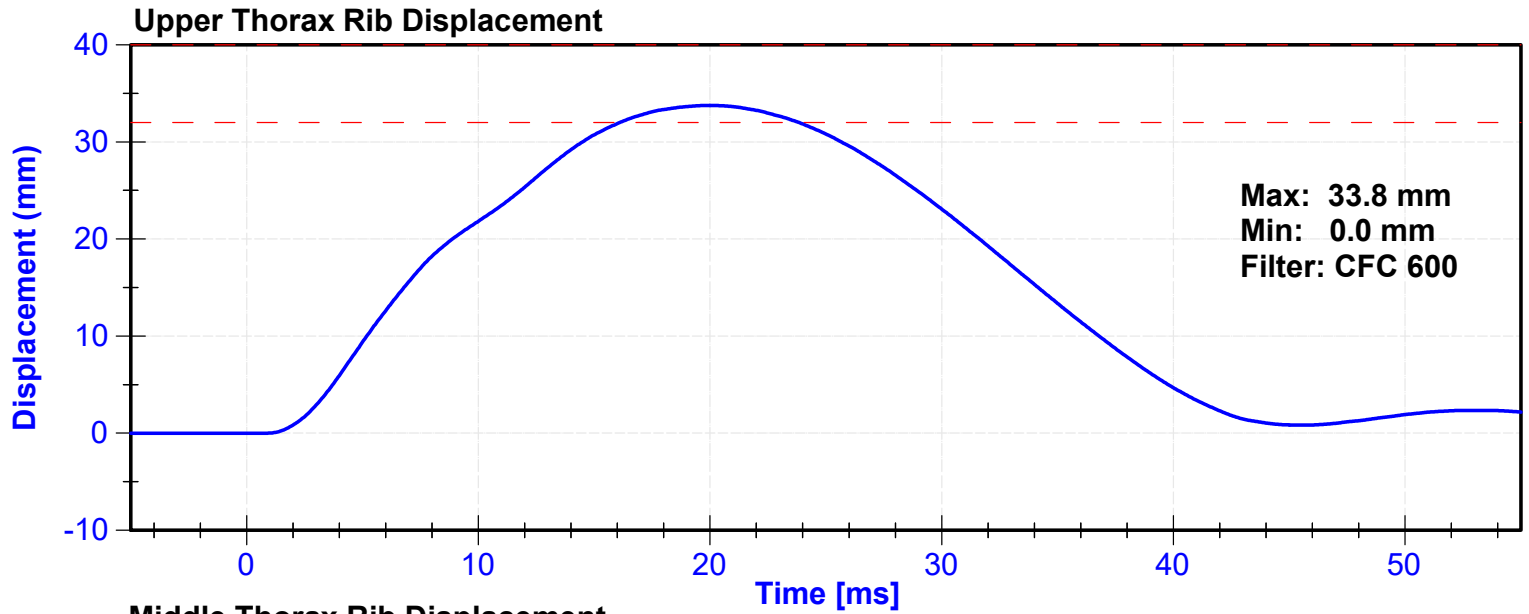
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	59.0	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	14	18	g's	17.5	Pass
Lateral Upper Spine Acceleration	13	17	g's	16.4	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.8	Pass
Upper Thorax Rib Deflection	32	40	mm	33.8	Pass
Middle Thorax Rib Deflection	39	45	mm	39.4	Pass
Lower Thorax Rib Deflection	35	43	mm	37.7	Pass

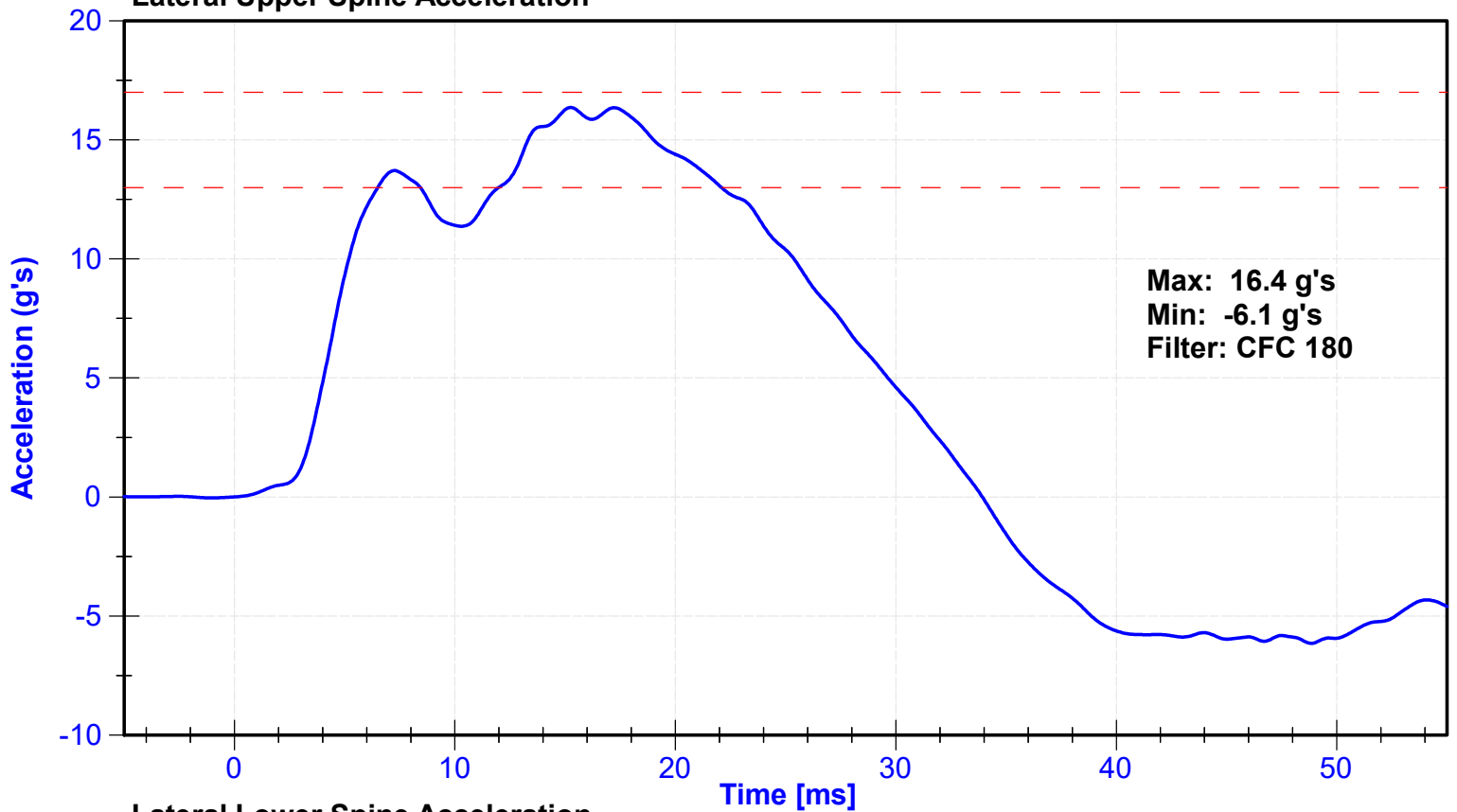
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Spine Y Accelerometer	Endevco	P94678	5/15/2024	11/11/2024
Lower Spine Y Accelerometer	Endevco	P58744	5/15/2024	11/11/2024
Upper Thorax Rib Potentiometer	Servo	062GFE	5/16/2024	11/14/2024
Middle Thorax Rib Potentiometer	Servo	528GFE	5/16/2024	11/14/2024
Lower Thorax Rib Potentiometer	Servo	513GFE	5/16/2024	11/14/2024

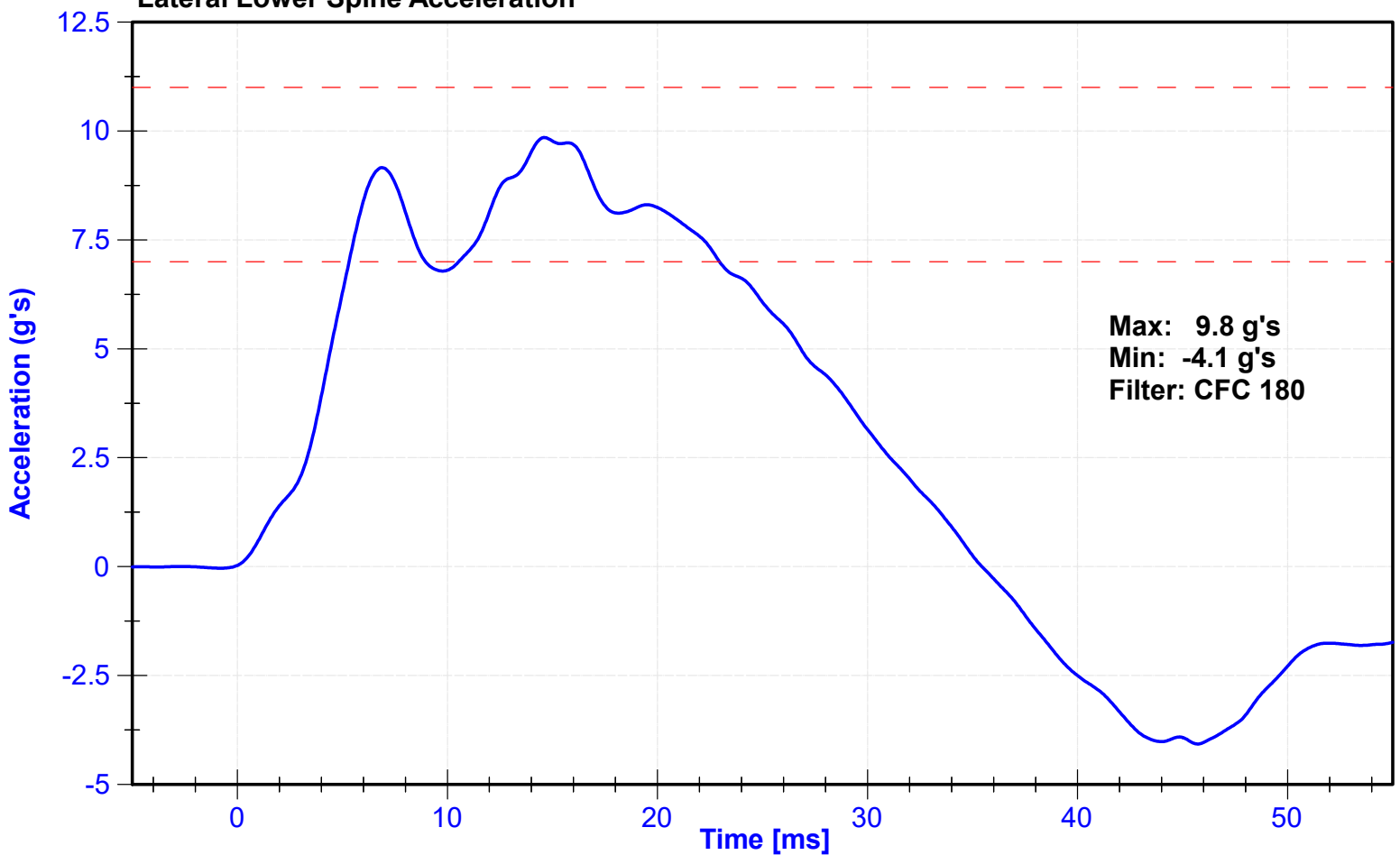




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

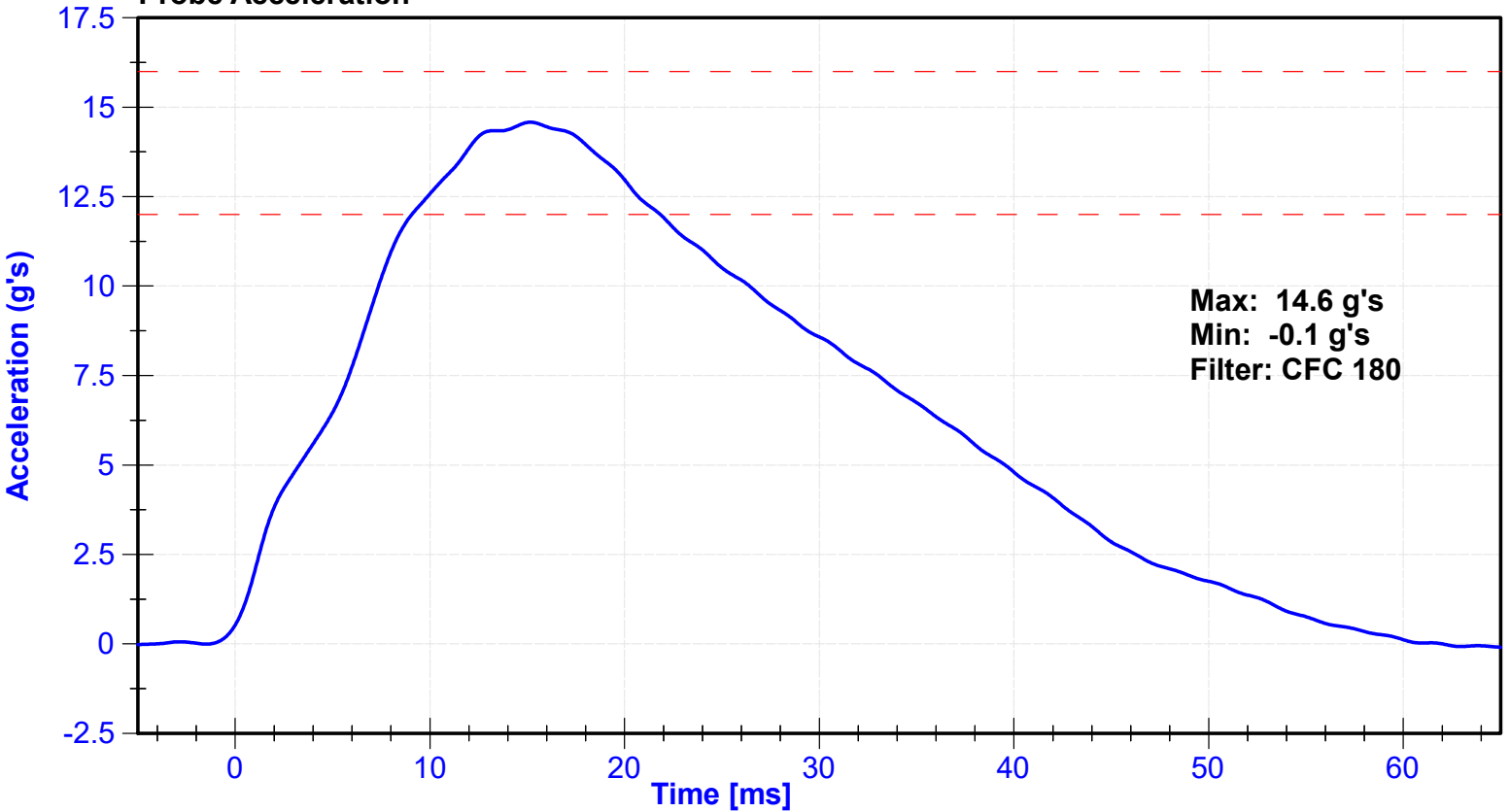
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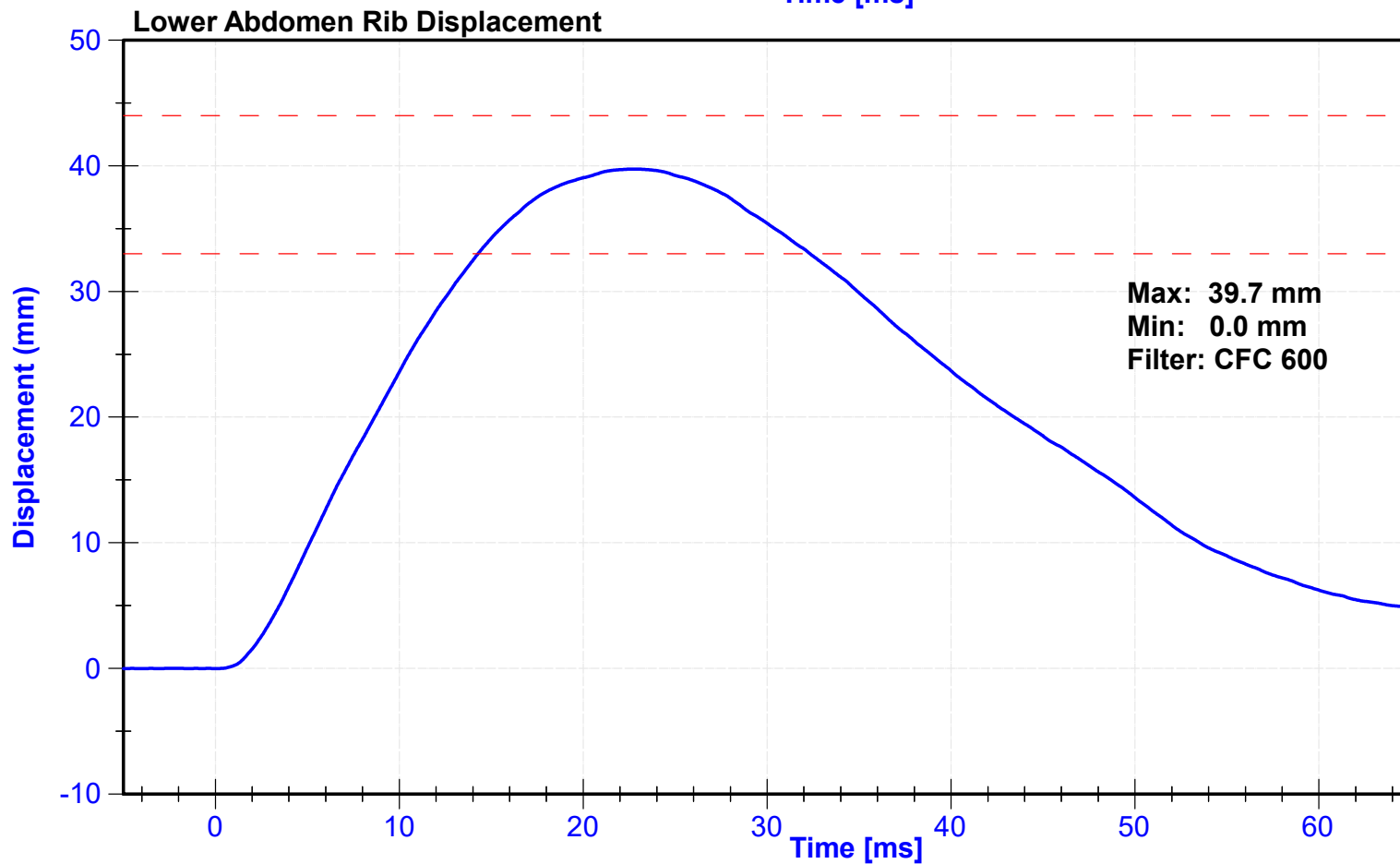
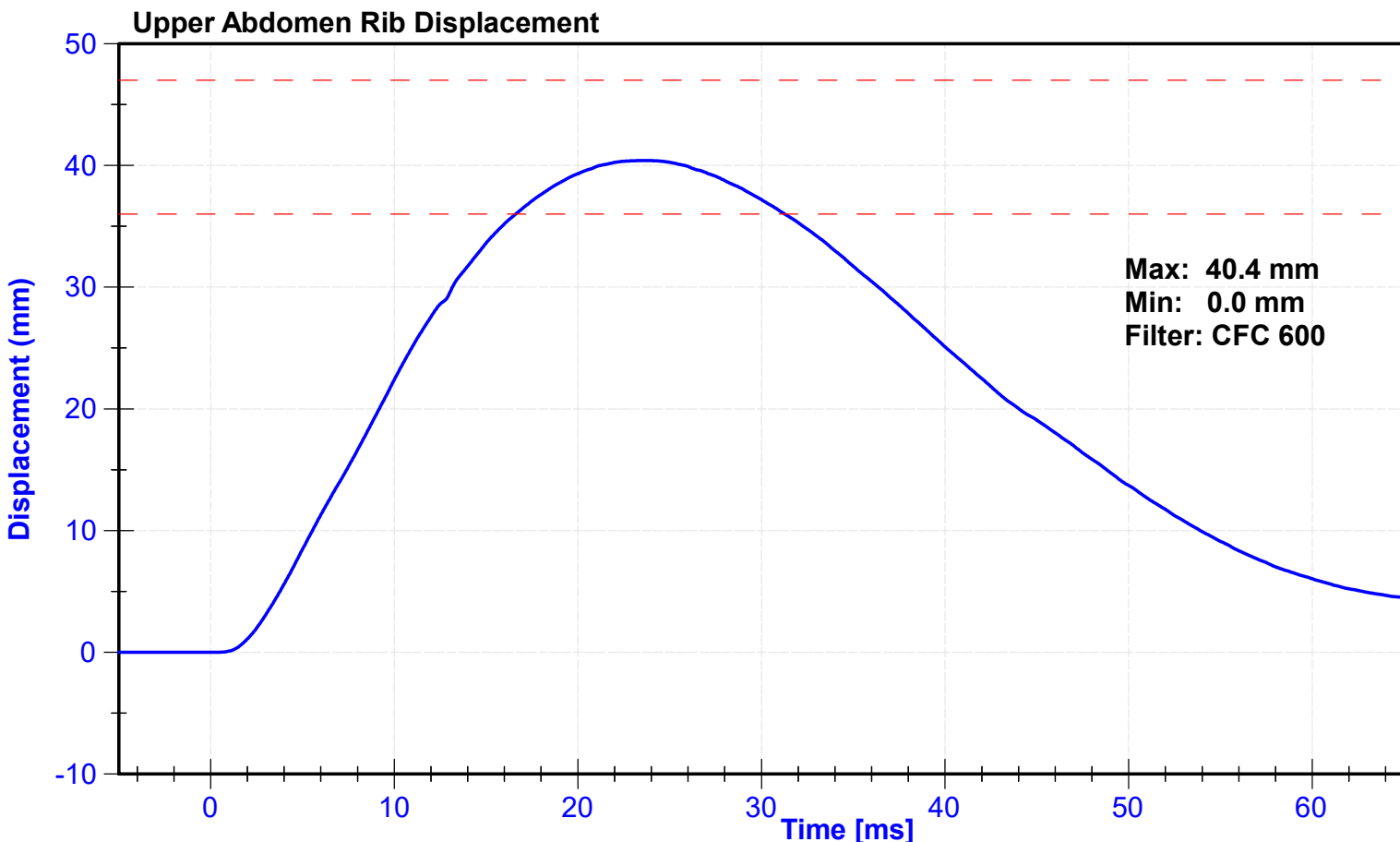
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	59.0	Pass
Velocity	4.2	4.4	m/s	4.36	Pass
Probe Acceleration	12	16	g's	14.6	Pass
Lateral Lower Spine Acceleration	9	14	g's	10.5	Pass
Upper Abdomen Rib Deflection	36	47	mm	40.4	Pass
Lower Abdomen Rib Deflection	33	44	mm	39.7	Pass

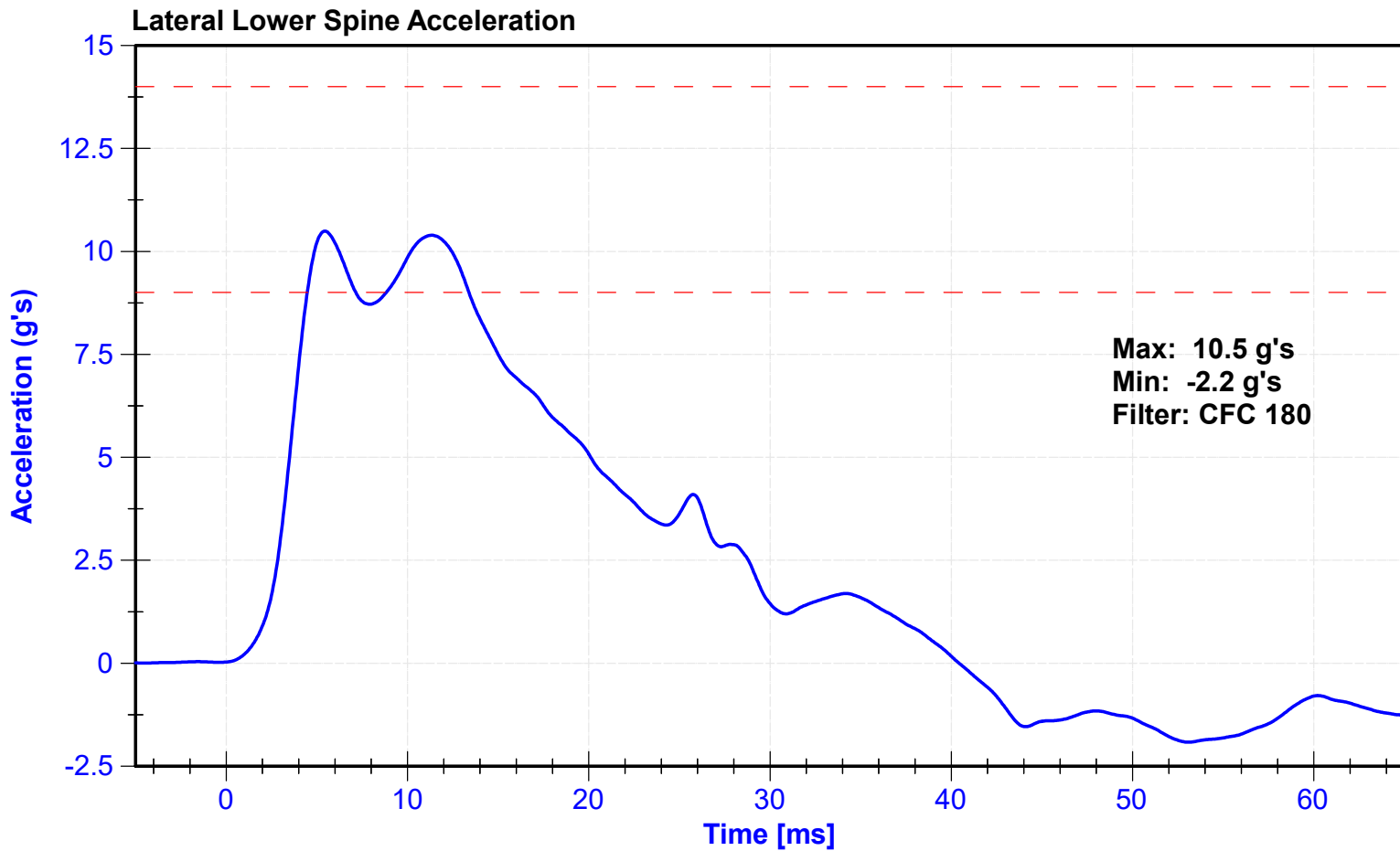
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Lower Spine Y Accelerometer	Endevco	P58744	5/15/2024	11/11/2024
Upper Abdomen Rib Potentiometer	Servo	342GFE	5/16/2024	11/14/2024
Lower Abdomen Rib Potentiometer	Servo	512GFE	5/16/2024	11/14/2024

Probe Acceleration







ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

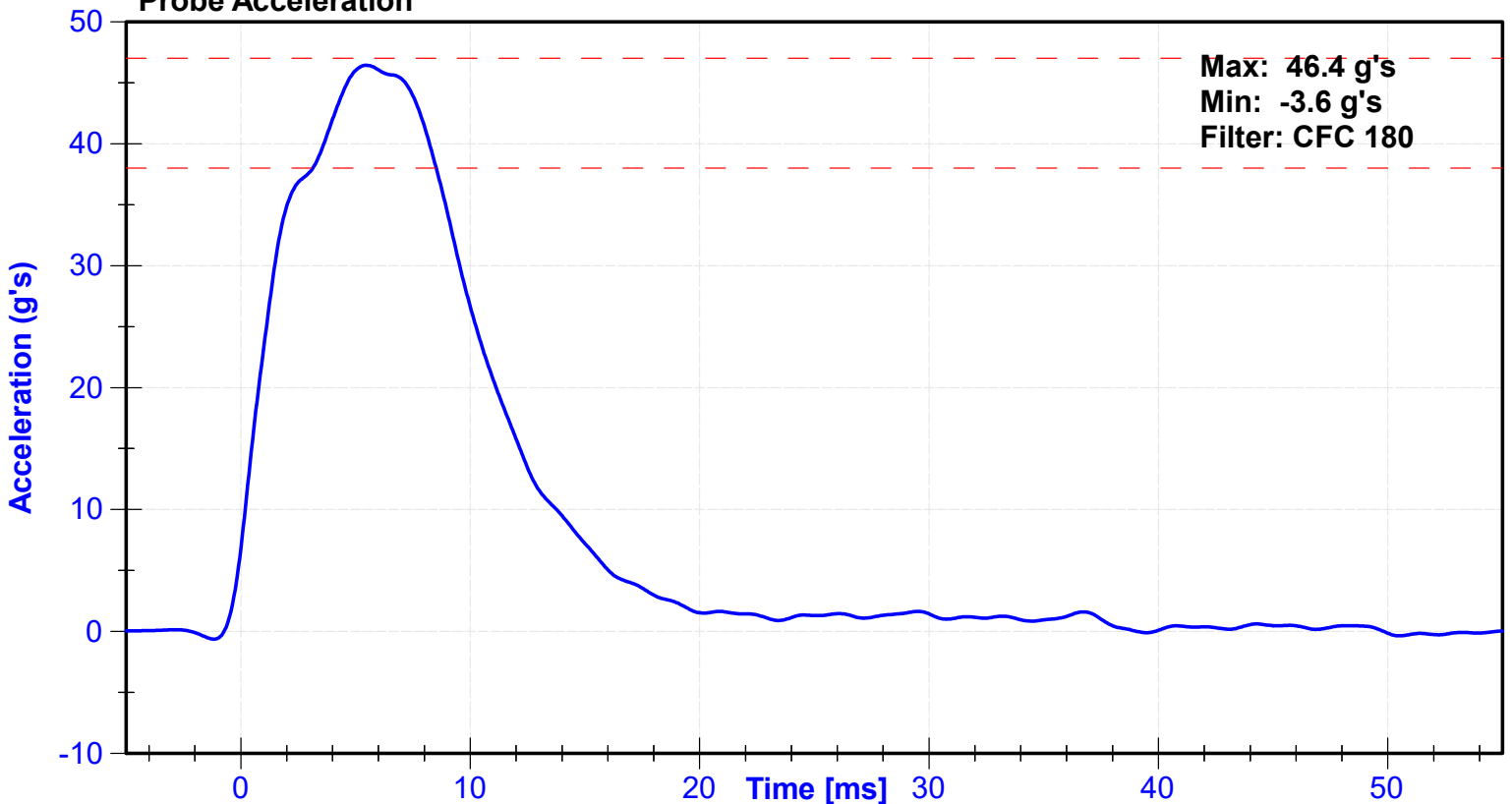
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	59.0	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	46.4	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.5	Pass
Acetabulum Force	3600	4300	N	4134.9	Pass

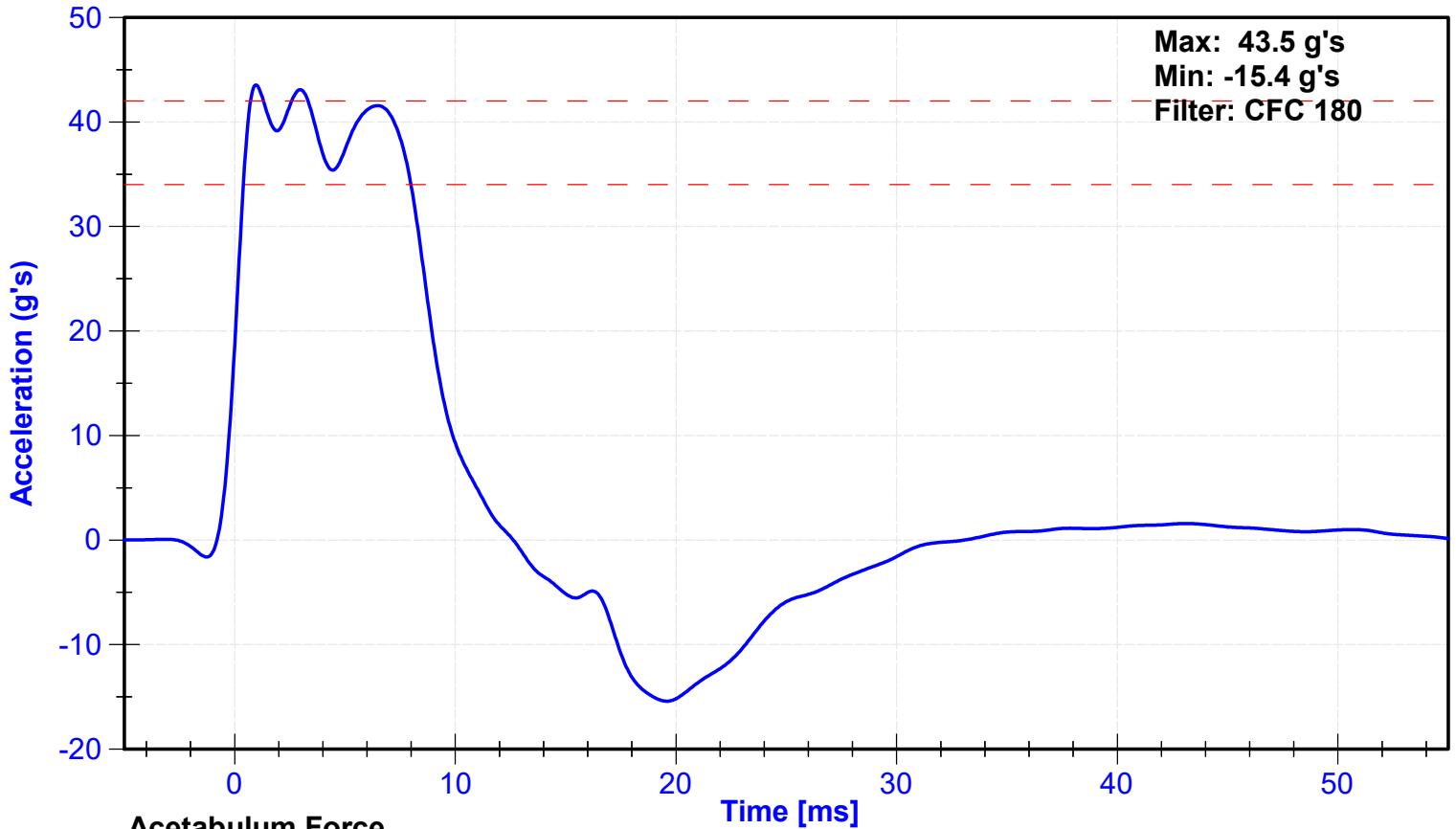
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Pelvis Y Accelerometer	Endevco	T29392	5/15/2024	11/11/2024
Acetabulum Load Cell	FTSS	236-FY	12/5/2023	12/4/2024
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A

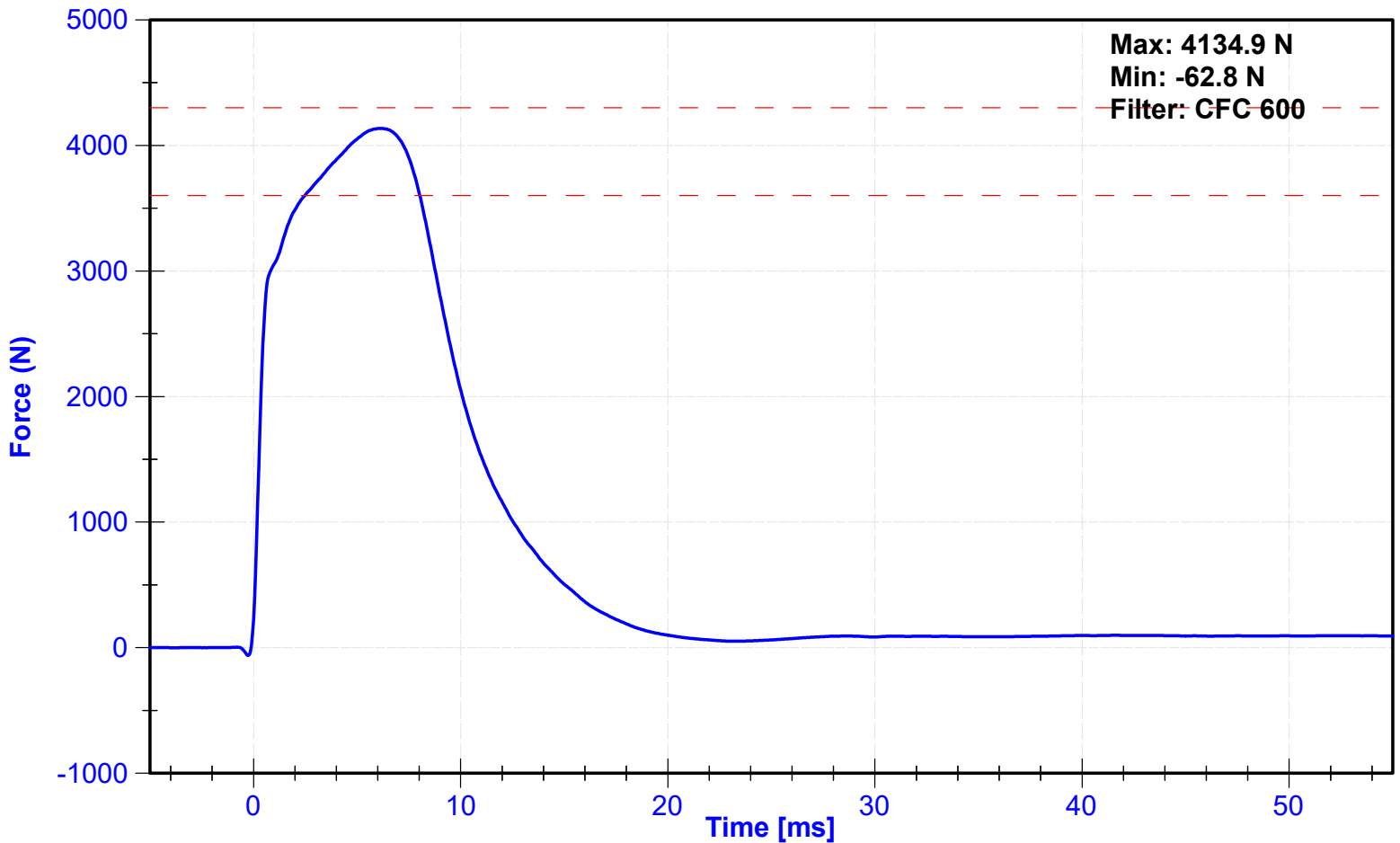
Probe Acceleration



Lateral Pelvis Acceleration



Acetabulum Force





SID-IIs Pelvis Plug Certification Test

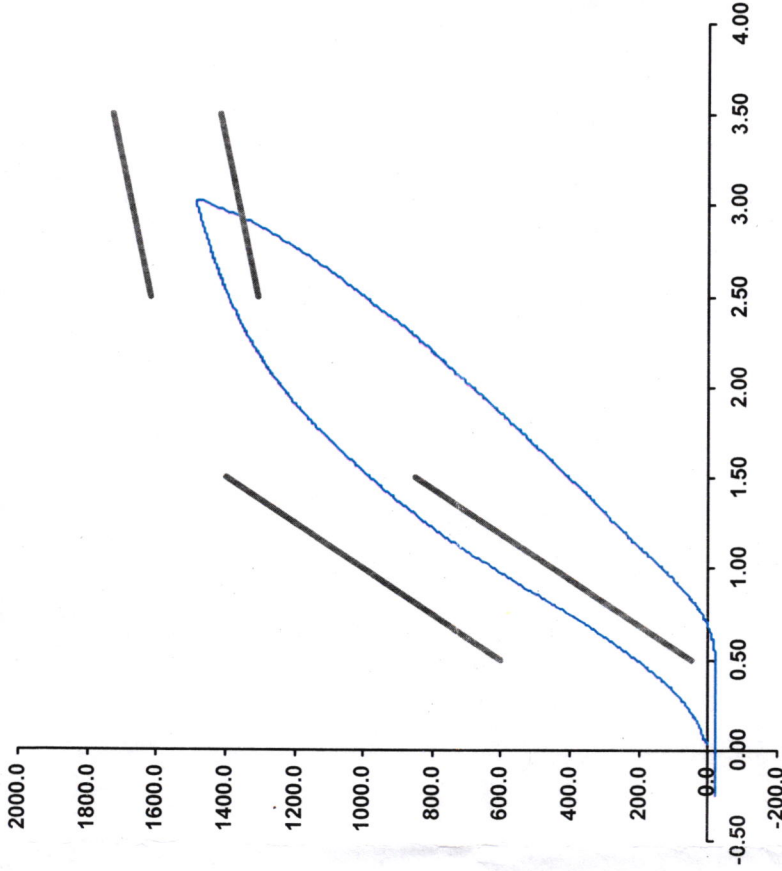
Plug S/N 16565

Test Number 23349

Report Number 23406

Test Date 7/15/2022 10:06:37 AM

Force (-N) vs Extension (-mm)



Cert

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:

Operator _____
 Part Number 180-4450

Template No 107 15-Jul-22
 SACO Research

By: *DC* Date: *7/15/22*

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



SID-Ils Pelvis Plug Certification Test

Clash

Plug S/N 14180

Test Number 14218

Report Number 14263

Test Date 6/28/2020 1:04:44 PM

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

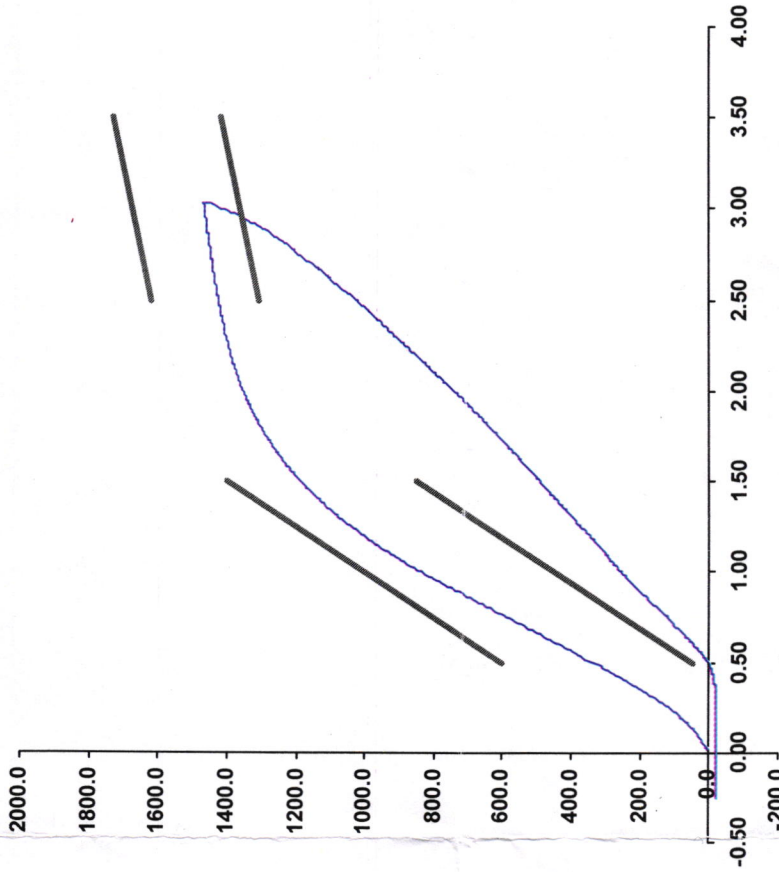
Testing Machine STM-20 5965542

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

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

Notes:

Force (-N) vs Extension (-mm)



Operator _____ Part Number 180-4450

Template No 107 28-Jun-20
 SACO Research

By: *[Signature]* Date: **6-28-2020**

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



NON-Impact

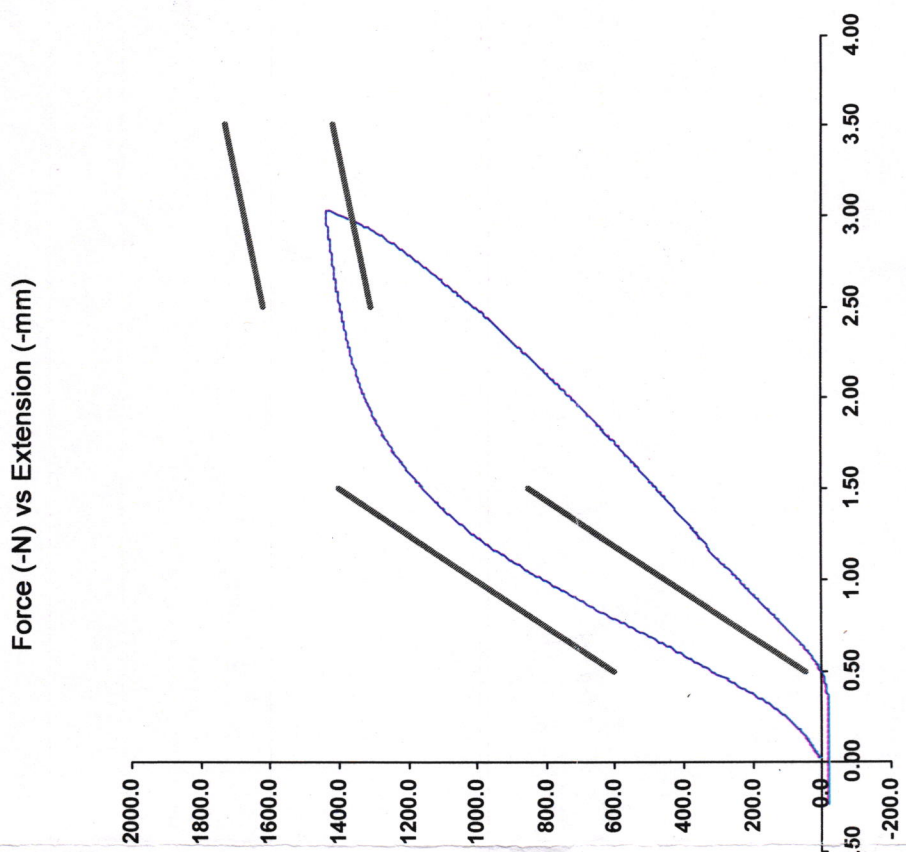
SID-Ils Pelvis Plug Certification Test

Plug S/N 14181
 Test Number 14219
 Report Number 14264
 Test Date 6/28/2020 1:06:04 PM

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

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

Notes:



Operator
 Part Number 180-4450

Template No 107 28-Jun-20
 SACO Research

By: *DC* Date: **6-28-2020**
 SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

ATD Manufacturer	FTSS	Test Technician	C. Mantell
ATD Serial Number	261	Laboratory Supervisor	C. Mantell

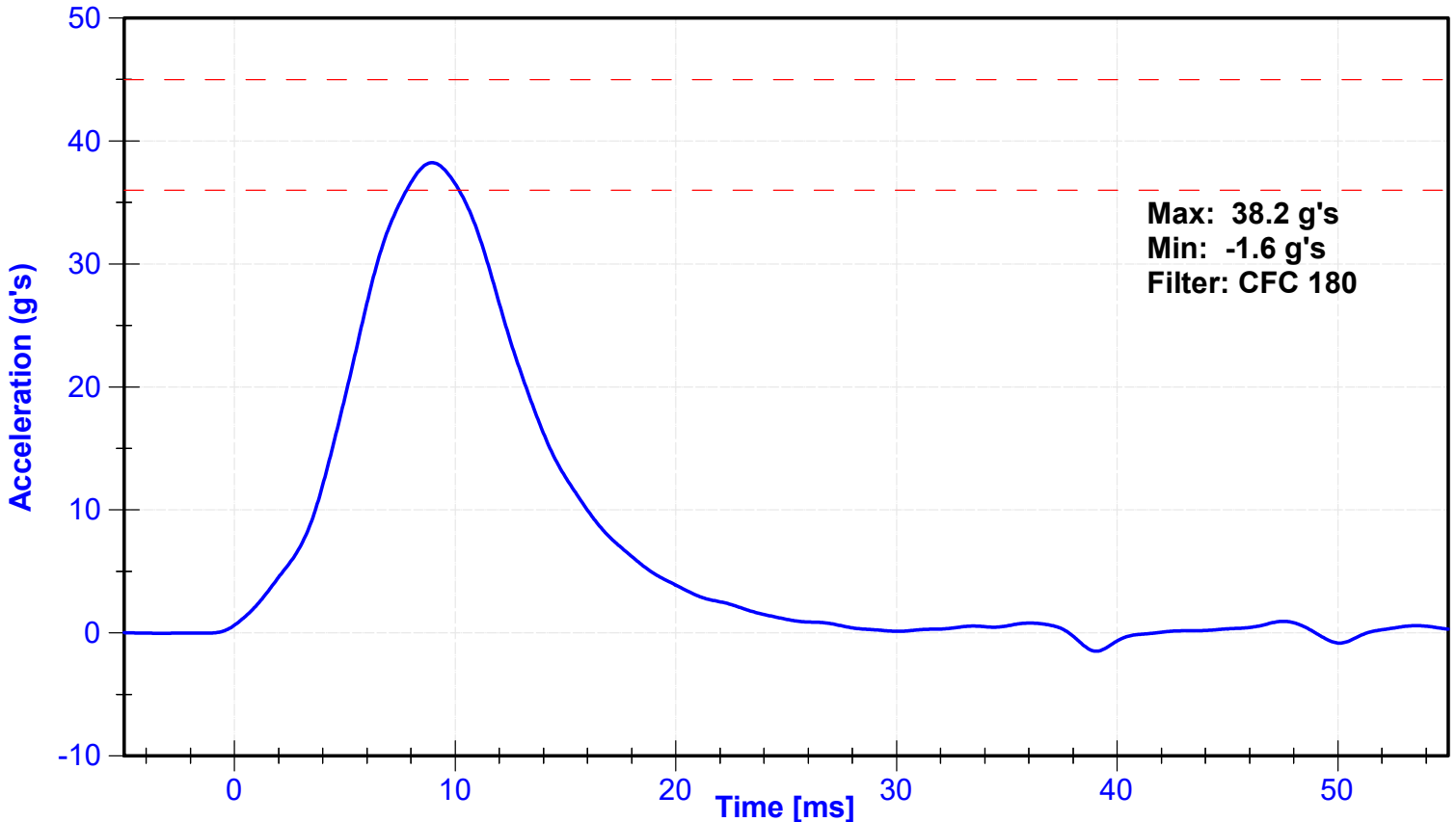
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	59.0	Pass
Velocity	4.2	4.4	m/s	4.37	Pass
Probe Acceleration	36	45	g's	38.2	Pass
Lateral Pelvis Acceleration	28	39	g's	28.3	Pass
Iliac Force	4100	5100	N	4390.9	Pass

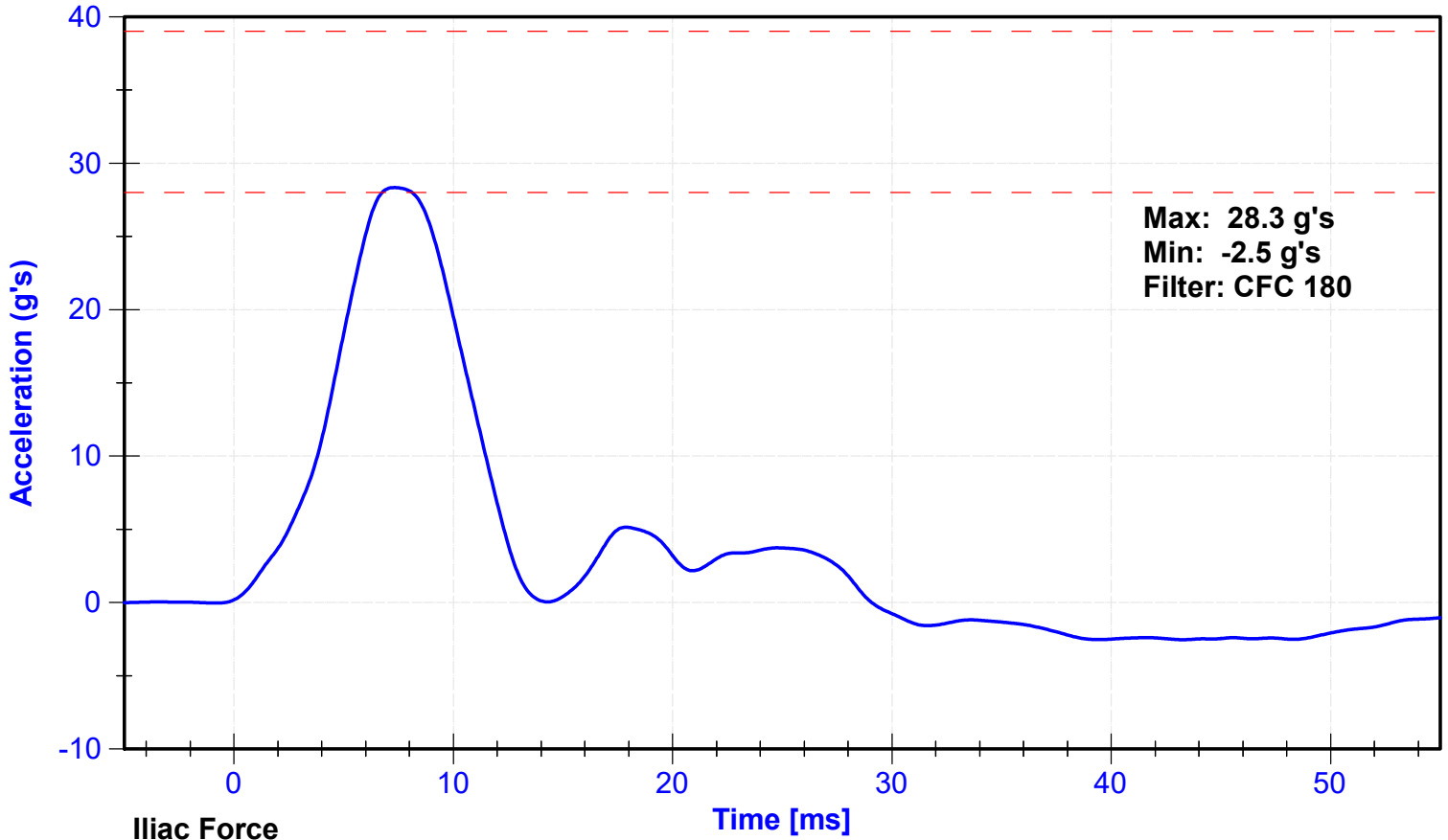
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Pelvis Y Accelerometer	Endevco	T29392	5/15/2024	11/11/2024
Iliac Load Cell	Denton	290-FY	12/5/2023	12/4/2024

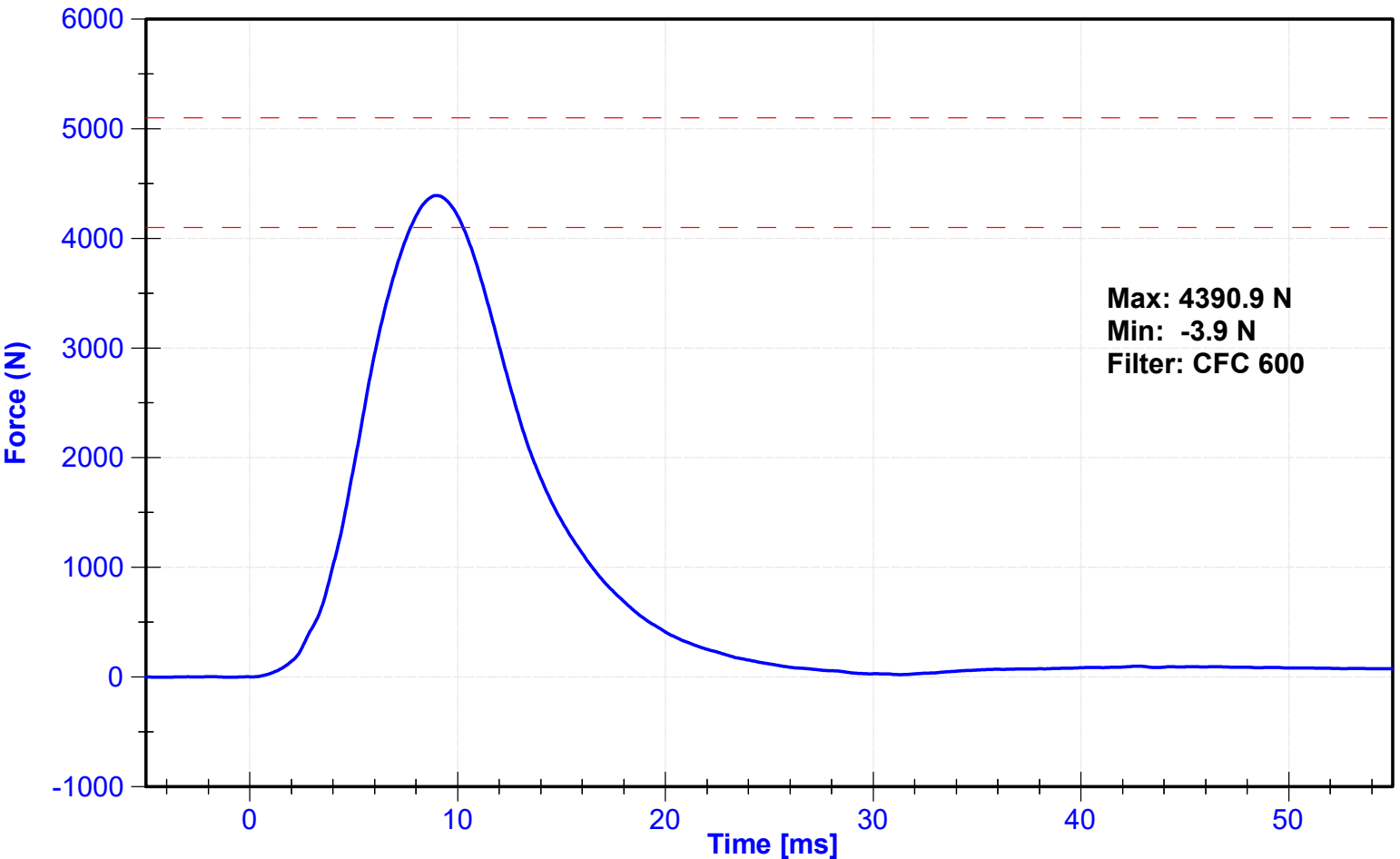
Probe Acceleration



Lateral Pelvis Acceleration



Iliac Force



APPENDIX VII

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

TABLE 1 – Dummy Instrumentation (ES-2re)

			ES-2re S/N _DG5348_		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	18613	Endevco	07/30/2024
		Y	18472	Endevco	07/30/2024
		Z	18663	Endevco	07/30/2024
	Redundant	X	18666	Endevco	07/30/2024
		Y	18664	Endevco	07/30/2024
		Z	18675	Endevco	07/30/2024
Thorax Rib Displacement Potentiometers	Upper	Y	268GFE	Honeywell	07/30/2024
	Middle	Y	269GFE	Honeywell	07/30/2024
	Lower	Y	270GFE	Honeywell	07/30/2024
Abdomen Load Cells	Forward	Y	1512	Denton	08/15/2023
	Middle	Y	1526	Denton	08/15/2023
	Rear	Y	1516	Denton	08/15/2023
Lower Spine Accelerometers (T12)		X	T30049	Endevco	07/30/2024
		Y	18573	Endevco	07/30/2024
		Z	18657	Endevco	07/30/2024
Pubic Symphysis Load Cell		Y	464-FY	Denton	08/15/2023

TABLE 2 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N _261_			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers	Primary	X	P68067	Endevco	05/15/2024	
		Y	P18567	Endevco	05/15/2024	
		Z	P49163	Endevco	05/15/2024	
	Redundant	X	T26041	Endevco	05/15/2024	
		Y	T22409	Endevco	05/15/2024	
		Z	T26086	Endevco	05/15/2024	
Displacement Potentiometers	Thoracic Rib	Upper	Y	062GFE	Servo	05/16/2024
		Middle	Y	528GFE	Servo	05/16/2024
		Lower	Y	513GFE	Servo	05/16/2024
	Abdominal Rib	Upper	Y	342GFE	Servo	05/16/2024
		Lower	Y	512GFE	Servo	05/16/2024
Lower Spine Accelerometers (T12)		X	T22340	Endevco	05/15/2024	
		Y	P58744	Endevco	05/15/2024	
		Z	T22124	Endevco	05/15/2024	
Acetabulum Load Cell		Y	236-FY	FTSS	12/05/2023	
Iliac Wing Load Cell		Y	290-FY	Denton	12/05/2023	
Pelvis Plug (struck side)			16401	SACO	05/23/2022	
Pelvis Plug (non-struck side)			16340	SACO	05/20/2022	

TABLE 3 – Vehicle Instrumentation

Vehicle Instrumentation			Serial Number	Manufacturer	Calibration Date
1	Vehicle Center of Gravity	X	A274227	Measurement Specialties	05/21/2024
	Vehicle Center of Gravity	Y	A274252	Measurement Specialties	05/21/2024
	Vehicle Center of Gravity	Z	A293488	Measurement Specialties	05/21/2024
2	Right Sill at Front Seat	X	G22775	Endevco	05/31/2024
	Right Sill at Front Seat	Y	A374270	Measurement Specialties	05/31/2024
	Right Sill at Front Seat	Z	A374367	Measurement Specialties	05/31/2024
3	Right Sill at Rear Seat	X	A405546	Measurement Specialties	03/21/2024
	Right Sill at Rear Seat	Y	A413593	Measurement Specialties	03/21/2024
	Right Sill at Rear Seat	Z	A413602	Measurement Specialties	03/21/2024
4	Left Sill at Front Door	Y	A370931	Measurement Specialties	06/10/2024
5	Left Sill at Rear Door	Y	A290939	Measurement Specialties	04/15/2024
6	Left A-Post Lower	Y	A431211	Measurement	06/07/2024
7	Left A-Post Middle	Y	G22799	Endevco	05/03/2024
8	Left B-Post Lower	Y	A374254	Measurement Specialties	04/04/2024
9	Left B-Post Middle	Y	G23664	Endevco	06/21/2024
10	Front Seat Track	Y	A352407	Measurement Specialties	04/08/2024
11	Rear Seat Track or Structure	Y	G24957	Endevco	06/10/2024
12	Right Rear Occ. Compartment	Y	A335442	Measurement Specialties	06/13/2024
13	Rear Floorpan Above Axle	X	A315119	Measurement Specialties	03/29/2024
	Rear Floorpan Above Axle	Y	A315796	Measurement Specialties	03/29/2024
	Rear Floorpan Above Axle	Z	A370946	Measurement Specialties	04/01/2024

TABLE 4 – MDB Instrumentation

MDB Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle CG Acceleration vs. Time	X	A374299	Measurement Specialties	08/01/2024
Vehicle CG Acceleration vs. Time	Y	A399983	Measurement Specialties	08/01/2024
Vehicle CG Velocity vs. Time	Y	Calculated	Measurement Specialties	08/01/2024
Vehicle CG Acceleration vs. Time	Z	G23881	Endevco	08/01/2024
Vehicle CG Velocity vs. Time	Z	Calculated	Endevco	08/01/2024
Vehicle CG Resultant Acceleration vs. Time	R	Calculated	Endevco	08/01/2024