

REPORT NUMBER: SPNCAP-CAL-24-010

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**General Motors LLC
2024 Chevrolet Traverse
5 Door SUV**

NHTSA No: M20240107

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



January 2, 2025

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
MAIL CODE: NRM-110
1200 NEW JERSEY AVE SE, ROOM W43-410
WASHINGTON, D.C. 20590**

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Date: January 2, 2025

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Date: January 2, 2025

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

TECHNICAL REPORT DOCUMENTATION PAGE

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16. Abstract A 32.20 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2024 Chevrolet Traverse 5 Door SUV in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on September 20, 2024. The impact velocity of the vehicle was 32.17 km/h, and the ambient temperature at the struck (driver's) side of the target vehicle was 21°C. The target vehicle's maximum post-test static crush was 343 mm located at level 1. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs) (Serial No. 300)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₆)</td> <td></td> <td>1000</td> <td>345.777</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>47.789</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>3207.971</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>20.007</td> </tr> <tr> <td>Maximum Abdomen Rib Deflection</td> <td>mm</td> <td>45*</td> <td>14.345</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.						Measurement Description	Driver ATD (SID-IIs) (Serial No. 300)			Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)		1000	345.777	Resultant Lower Spine Acceleration	G	82	47.789	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3207.971	Maximum Thoracic Rib Deflection	mm	38	20.007	Maximum Abdomen Rib Deflection	mm	45*	14.345
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs			18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Technical Information Services Division, 1200 New Jersey Ave. SE Washington, D.C. 20590																													
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SECTION 1

TEST PURPOSE AND PROCEDURE

This side impact test was conducted as part of the MY 2024 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. 693JJ920D000016. The purpose of this test is to generate comparative side impact performance in a 2024 Chevrolet Traverse 5 Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated March 2020.

SECTION 2

SUMMARY OF TEST RESULTS

A rigid pole side impact test was conducted on a 2024 Chevrolet Traverse 5 Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.17 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on September 20, 2024. Pre-test and post-test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated March 2020. The side impact event was documented by 11 cameras. Camera locations and other pertinent camera information are included on page 3-11 in this report.

The Part 572V (SID-IIs) dummy was instrumented accordingly:

Head CG tri-axial accelerometers

Thorax upper, middle, and lower rib displacement potentiometers

Abdomen upper and lower rib displacement potentiometers

Lower spine tri-axial accelerometers

Iliac load cell

Acetabulum load cell

Appendix B contains the dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report. Appendix D identifies all serial numbers, manufacturers, and calibration dates for test equipment, dummy sensors, potentiometers, and load cells used to collect data during the test.

Injury readings for the SID-IIs dummy were recorded as follows:

INJURY READINGS

Measurement Description	Driver ATD (SID-IIs)		
	Units	IARV	Result
Head Injury Criteria (HIC ₃₆)		1000	345.777
Resultant Lower Spine Acceleration	g	82	47.789
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3207.971
Maximum Thoracic Rib Deflection	mm	38*	20.007
Maximum Abdominal Rib Deflection	mm	45*	14.345

*Proposed IARV

Supplemental restraint information was recorded as follows:

SUPPLEMENTAL RESTRAINT INFORMATION

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

GENERAL COMMENTS:

1. P1 serial number – 300

Data Anomalies:

- Vehicle CG Y Acceleration, Exceeded calibration range at 24.6 ms
- Left Sill A-Pillar Y Acceleration, Exceeded calibration range at 49.7 ms

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

Data Sheet No. 1 – General Test and Vehicle Parameter Data

Data Sheet No. 2 – Seat, Seat Belt, Steering Wheel Adjustment and Fuel Systems Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Camera and Instrumentation Data

Data Sheet No. 6 – Vehicle Accelerometer Data

Data Sheet No. 7 – Rigid Pole Load Cell Data

Data Sheet No. 8 – Post-Test Observations

Data Sheet No. 9 – Test Vehicle Profile Measurements

Data Sheet No. 10 – Test Vehicle Exterior Crush Measurements

Data Sheet No. 11 – Vehicle Damage Profile Distances

Data Sheet No. 12 – FMVSS No. 301 Static Rollover Results

Data Sheet No. 13 – Dummy / Vehicle Temperature and Humidity Stabilization Data

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20240107
Model Year	2024
Make	Chevrolet
Model	Traverse
Body Style	SUV
VIN	1GNERGKS6RJ151247
Body Color	Stardust Metallic
Odometer Reading (km/mi)	16 mi
Engine Displacement (L)	2.5
Type / No. Cylinders	I4
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	8-Speed
Overdrive	Yes
Final Drive	Front Wheel Drive
Roof Rack	No
Sunroof / T-Top	No
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

Traction Control System (TCS)	Yes
Auto-Leveling System	No
Automatic Door Locks (ADL)	Yes
Power Window Auto-Reverse	Yes
Other Optional Feature	N/A
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	No
Driver Torso / Pelvis Airbag	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head / Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso / Pelvis Airbag	Yes
Rear Pass. Pelvis Airbag	No
Driver Seat Belt Pretensioner	Yes
Rear Pass. Seat Belt Pretensioner	Yes
Driver Load Limiter	Yes
Rear Pass. Load Limiter	Yes
Other Safety Restraint*	Yes

*Driver Center Seat Airbag

Does owner's manual provide instructions to turn off automatic door locks?

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC
Date of Manufacture	03/24
Vehicle Type	MPV

GVWR (kg)	2800
GAWR Front (kg)	1450
GAWR Rear (kg)	1600

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	2	3	7
Capacity Weight (VCW) (kg)				770
DSC X 68.04 kg				476
Cargo Weight (RCLW) (kg)				136

(A)
(B)

VEHICLE SEAT TYPE

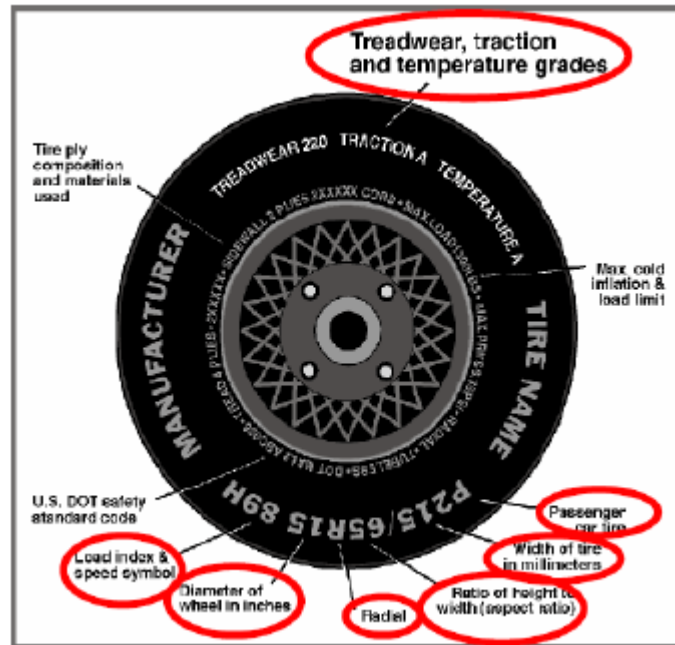
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X						X
Rear or Second Row Seat	X					X	
Third Row seat			X		X		

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

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024

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



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	255/65/R18	255/65/R18
Tire Size on Vehicle	255/65/R18	255/65/R18
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	Alenza	Alenza
Treadwear	700	700
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index/Speed Symbol	111T	111T
Tire Material	Rubber	Rubber
DOT Safety Code Left	17XAXAA020924	17XAXAA020924
DOT Safety Code Right	17XAXAA025323	17XAXAA025323

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

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	210	211	217	223
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	587	434		584	515		605	523	
Right	kg	569	424		590	504		571	501	
Ratio	%	57.4	42.6		53.5	46.5		53.5	46.5	
Totals	kg	1156	858	2014	1174	1019	2193	1176	1024	2200

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2014	(A)
Actual Weight of 1 P572V (SID-IIs) ATD Used	kg	50	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2200	(A+B+C)

Does the measured As Test Vehicle Weight lie within the required weight range
 (i.e. Calculated Test Vehicle Target Weight – 4.5 kg to – 9 kg)? ☒ Yes ☐ No

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Rqmt***
Driver Door Sill Angle (front-to-rear)*	Deg	-1.05	-0.65	-0.65	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	-1.05	-0.75	-0.70	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	+0.1	+0.1	-0.15	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	-0.05	-0.05	-0.10	Yes
Vehicle CG (Aft of Front Axle)	mm	1306	1425	1427	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	12	2	22	

* ND = Nose Down (-), NU = Nose Up (+)

** LD = Left Down (-), LU = Left Up (+)

*** The "As Tested" vehicle attitude measurements must be equal to or between the "As Delivered" and "Fully Loaded" vehicle attitude measurements. Indicate "Yes" or "No" for Meets Requirement

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

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	13
Spare Tire	18
Ballast / Equipment Added	106

Test Height – Adjustable Suspension Setting, if Applicable	N/A
--	-----

Test Surface Markings

	Distance from 75° Impact Location Line (mm)
Fore 25 mm target	1102
Aft 25 mm target	1105

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

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024

SEAT POSITIONING

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

SCRL ANGLE RANGE

Seat	SCRL (°)		
	Max	Min	Mid
Driver Seat	18.3	9.9	14.1
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	N/A	N/A	N/A

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore / Aft	Forward-Most
Driver Seat	14.1	38	Max	64	67	70
			Mid	32	35	38
			Min	1	3	6
Front Passenger Seat	Fixed	Fixed	Max	-	-	-
			Mid	-	-	-
			Min	-	-	-
Front Center Seat			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Non-Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Rear Center Seat	N/A	N/A	Max			
			Mid			
			Min			

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

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

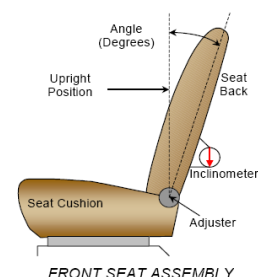
NHTSA No.: M20240107
 Test Date: 09/20/2024

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	240	Power	0	Power
Front Passenger Seat	260	27 (0-26)	0	0
Front Center Seat				
Struck Side Rear Seat	140	15 (0-14)	140	14
Non-Struck Side Rear Seat	140	15 (0-14)	140	14
Rear Center Seat	N/A	N/A	N/A	N/A

SEAT BACK ANGLE ADJUSTMENT

The driver's seat back is positioned such that the dummy's head is level. 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 passenger seat back is positioned in accordance with the information provided by the manufacturer on Form No. 1 for the 5th percentile female dummy in a Side NCAP MDB test. The rear center and non-struck side rear passenger's seat back are set to match the struck-side rear seat back.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/Seated Dummy	55.9	Power	25.75	Power
Front Passenger Seat	65.8	27 (0-26)	25.60	3
Front Center Seat				
Struck Side Rear Seat	11.9	7(0-6)	14.3	0
Non-Struck Side Rear Seat	11.9	7(0-6)	14.3	0
Rear Center Seat	N/A	N/A	N/A	N/A

SEAT BELT ANCHORAGE ADJUSTMENT

Seat belt anchorages are adjusted in accordance with the information provided by the manufacturer on Form No. 1. Zero is defined as the uppermost detent

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

HEAD RESTRAINT ADJUSTMENT

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

Seat	Total # of Positions	Placed in Position #
Driver Seat	9 (0-8)	Lowermost

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

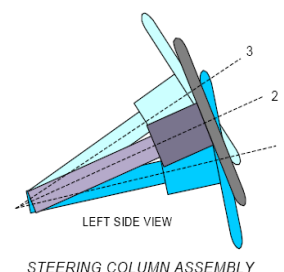
Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024

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.

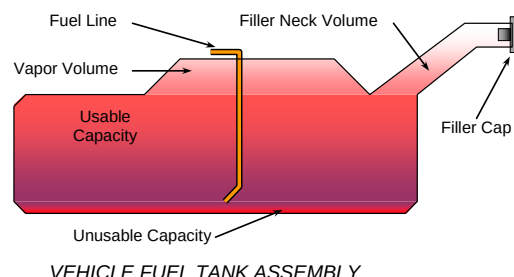
	Degrees	Fore / Aft Position (mm)
Lowermost – Position 1	20.1	
Geometric Center – Position 2	22.3	
Uppermost – Position 3	24.4	
Telescoping Steering Wheel Travel		68
Test Position	22.3	34



FUEL PUMP

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

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



FUEL TANK CAPACITY DATA

Description	Liters
Usable Capacity of "Standard Tank" - see Form No. 1	73.4
Usable Capacity of "Optional Tank" - see Form No. 1	N/A
Usable Capacity of "Standard Tank" - see Owner's Manual	73.4
Usable Capacity of "Optional Tank" - see Owner's Manual	N/A
93% of Usable Capacity	68.3
Actual Amount of Solvent Used in Test	68.3
1/3 of Usable Capacity	24.5

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



Yes

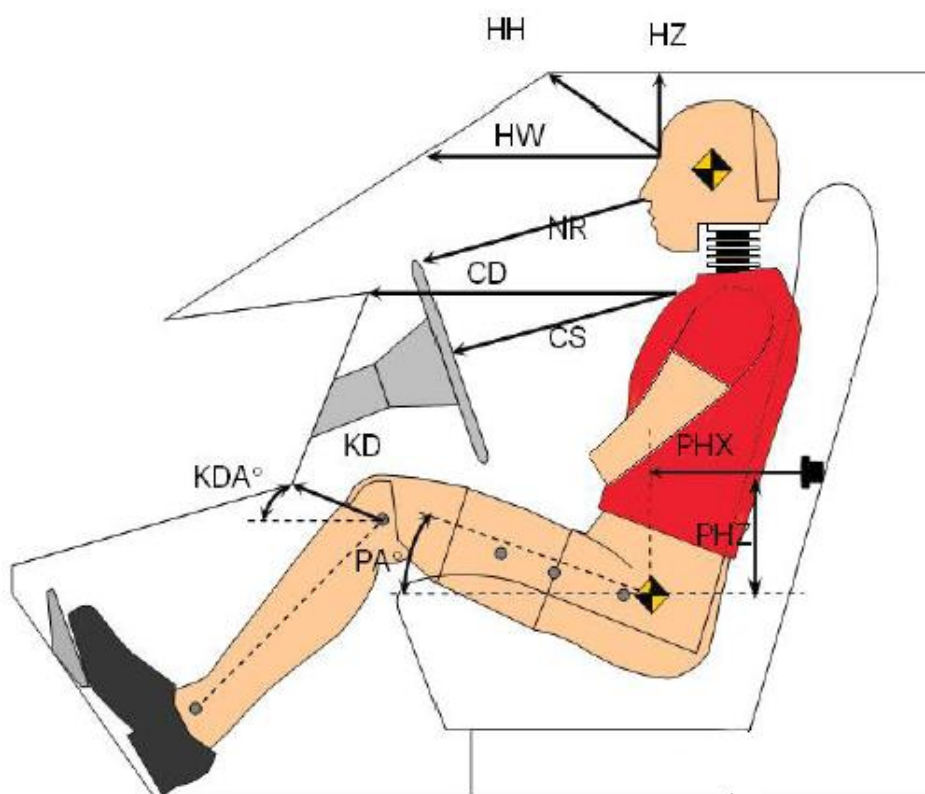


No

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024



Left Side View

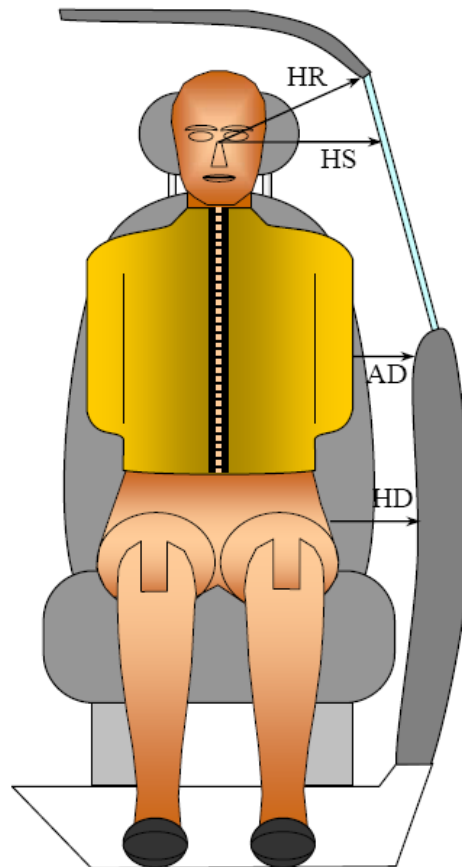
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. 300)	
		Length (mm)	Angle (°)
HH	Head to Header	366	
HW	Head to Windshield	695	
HZ	Head to Roof Liner	247	
NR	Nose to Rim	230	
CD	Chest to Dash	463	
CS	Chest to Steering Wheel	184	
KD(L) / KDA(L)°	Left Knee to Dash	112	40.0
KD(R) / KDA(R)°	Right Knee to Dash	112	35.9
PAX°	Pelvic Tilt Angle (X-Axis)		20.2
PAY°	Pelvic Tilt Angle (Y-Axis)		0.3
PHX	Hip Point to Striker (X-Axis)	336	
PHZ	Hip Point to Striker (Z-Axis)	25	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024



FRONT VIEW OF DUMMY

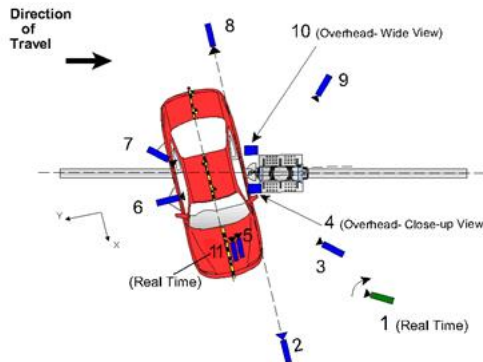
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver - Length (Serial No. 300)
HR	Head To Side Header	mm	293
HS	Head to Side Window	mm	412
AD	Arm to Door	mm	188
HD	Hip Point to Door	mm	187

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024



CAMERA LOCATIONS AND DATA

No.	Camera View	Coordinates (mm)			Lens Length (mm)	Operating Frame Rate (fps)
		X	Y	Z		
1	Real-time (24 - 30 fps) pan view of impact				Zoom	30
2	Front ground level - impact view	7760	0	-1496	28	1000
3	Impact side 45° - forward pole view	5032	-720	-1402	24	1000
4	Overhead Close-up view of impact	0	0	-9375	28	1000
5	Onboard - dummy front view				25	1000
6	Onboard - dummy side view				12.5	1000
7	Onboard - dummy rear oblique view				12.5	1000
8	Rear ground level - impact view	-8910	0	-1482	28	1000
9	Impact side 45° - rearward pole view	-3923	-4120	-1542	24	1000
10	Overhead wide - view of impact	0	0	-9375	12.5	1000
11	Real-time (24 - 30 fps) - dummy front view				Zoom	30

Notes: Reference - From Point of Impact for X and Y; from Ground for Z
+X = Forward of vehicle, +Y = Right of vehicle, +Z = Down
* All measurements accurate to ± 6 mm. Vehicle is at a 75° angle to the rigid pole.

Comments: All cameras operated as intended.

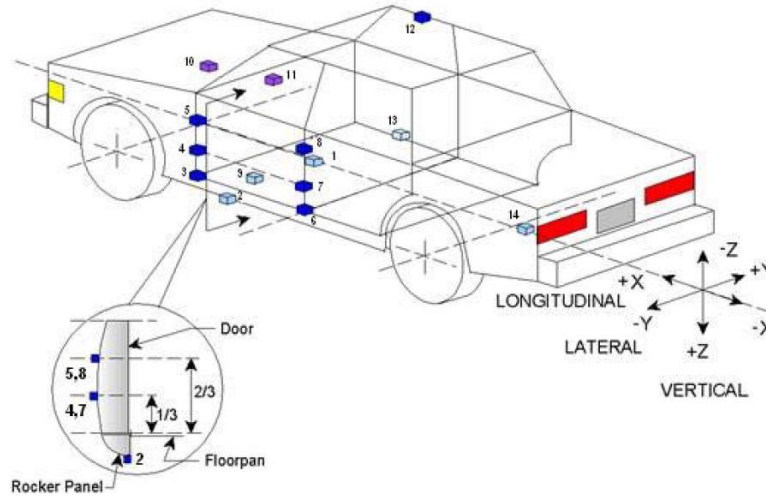
INSTRUMENTATION

Description	Number of Channels
Driver Dummy Channels	16
Vehicle Structure Accelerometers	18
Pole Load Cells	8
Total	42

DATA SHEET NO. 6 **VEHICLE ACCELEROMETER DATA**

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2540	0	91
2	Left Floor Sill	2540	0	91
3	A-Pillar Sill	3294	-713	93
4	A-Pillar Low	3571	-696	69
5	A-Pillar Mid	3714	-694	-177
6	B-Pillar Sill	3585	-705	-684
7	B-Pillar Low	2460	-717	69
8	B-Pillar Mid	2587	-732	-135
9	Driver Seat Track	2526	-723	-654
10	Engine Top	2777	-598	9
11	Firewall	4398	175	-486
12	Right Roof	4127	365	-432
13	Right Floor Sill	2586	630	-1220
14	Rear Floorpan	3318	710	93

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

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024

POLE BARRIER



RIGID POLE LOAD CELL LOCATIONS

ID	Units	Height From Ground
1	mm	200
2	mm	590
3	mm	750
4	mm	1075
5	mm	1260
6	mm	1740
7	mm	1920
8	mm	2300

DATA SHEET NO. 8
POST-TEST OBSERVATIONS

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver Seat Dummy (SID-IIs)
Face	Curtain Airbag
Top of Head	Curtain Airbag & Center Seat Airbag
Left Side of Head	Curtain Airbag
Back of Head	Curtain Airbag & Headrest
Left Shoulder	Torso/Pelvis Airbag & Seatback
Upper Torso	Torso/Pelvis Airbag & Seatback
Lower Torso	Torso/Pelvis Airbag & Seatback
Left Hip	Torso/Pelvis Airbag & Seatpan
Left Knee	Door Panel

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

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

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar & B-Pillar Buckled
Sill Separation	None
Windshield Damage	Cracked throughout with separation along Driver A-Pillar and roof
Side Window Damage	Driver window shattered
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

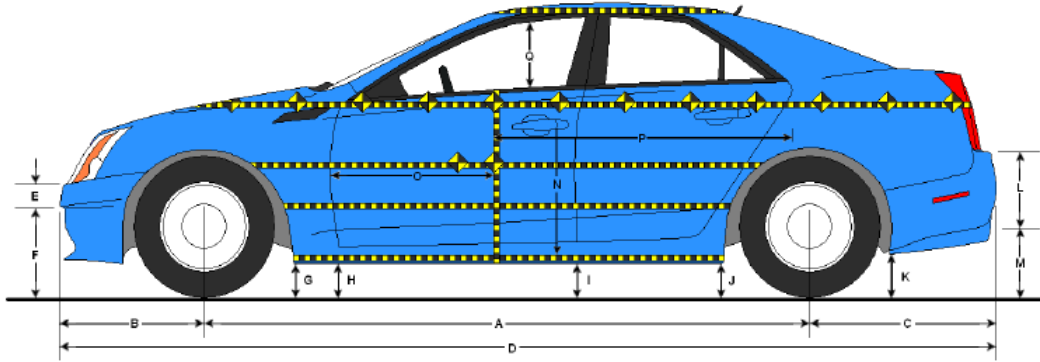
Measured Parameter	Units	Tolerance	Value
Vertical Impact Ref Line - Aft of Front Axle, Intended Impact Pt	mm		1101
Actual Impact Point - Aft of Front Axle	mm		1106
Horizontal Offset (+ forward / - rearward)	mm	+/- 38 *	-5
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75
Trap No. 1 Velocity - Primary	kph	31.4 to 33.0	32.17
Trap No. 2 Velocity - Redundant	kph	31.4 to 33.0	32.22

* Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

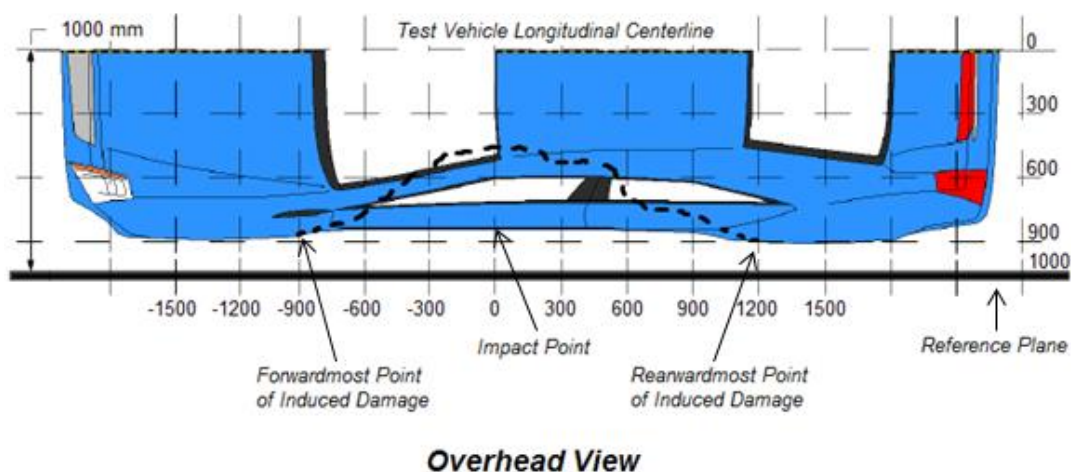
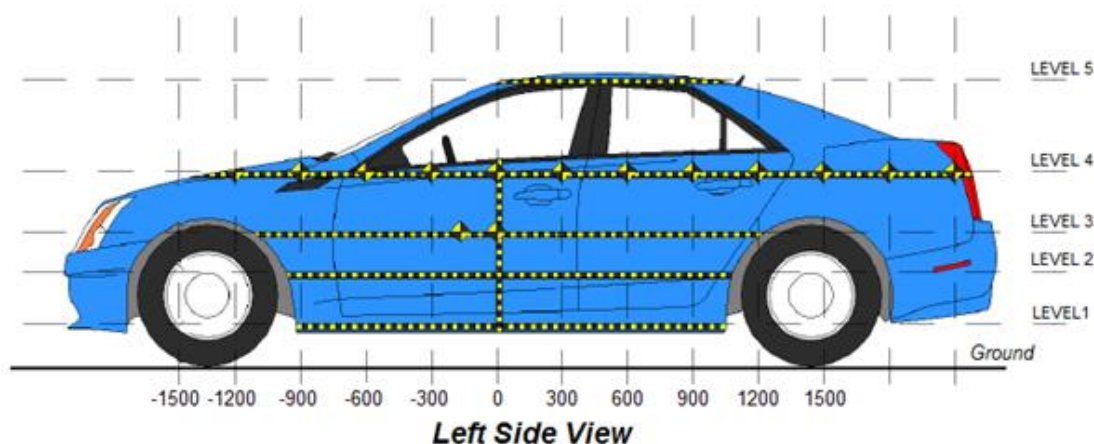
Code	Description	Pre-Test	Post-Test	Change
A	Vehicle Wheelbase	3066	3012	-54
B	Front Axle to FSOV	1022	1057	35
C	Rear Axle to RSOV	1100	1092	-8
D	Total Length at Centerline	5188	5161	-27
E	Front Bumper Thickness	95	95	0
F	Front Bumper Bottom to Ground	538	570	32
G	Sill Height at Front Wheel Well	261	262	1
H	Sill Height at Front Door Leading Edge	262	263	1
I	Sill Height at B-Pillar	280	285	5
J1	Sill Height at Rear Wheel Well	265	285	20
J2	Pinch Weld Height at Rear Wheel Well	294	312	18
K	Sill Height Aft of Rear Wheel Well	298	309	11
L	Rear Bumper Thickness	80	80	0
M	Rear Bumper Bottom to Ground	555	549	-6
N	Sill Height to Bottom of Front Window Sill	912	915	3
O	Front Door Leading Edge to Impact CL	588	514	-74
P	Rear Door Trailing Edge to Impact CL	1618	1545	-73
Q	Front Window Opening	433	429	-4
R	Right Side Length	5078	5071	-7
S	Left Side Length	5075	5024	-51
T	Vehicle Width at B-Pillars	1968	1920	-48
U	Front Wheel Track Width	1713	1715	2
V	Rear Wheel Track Width	1718	1725	7

* All measurements in mm with tolerance of ± 3 mm

DATA SHEET NO. 10 **TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS**

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	490	343	0
2	Occupant Hip Point	mm	794	337	0
3	Mid - Door	mm	860	335	0
4	Window Sill	mm	1172	282	0
5	Window Top	mm	1721	86	0

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. 10 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

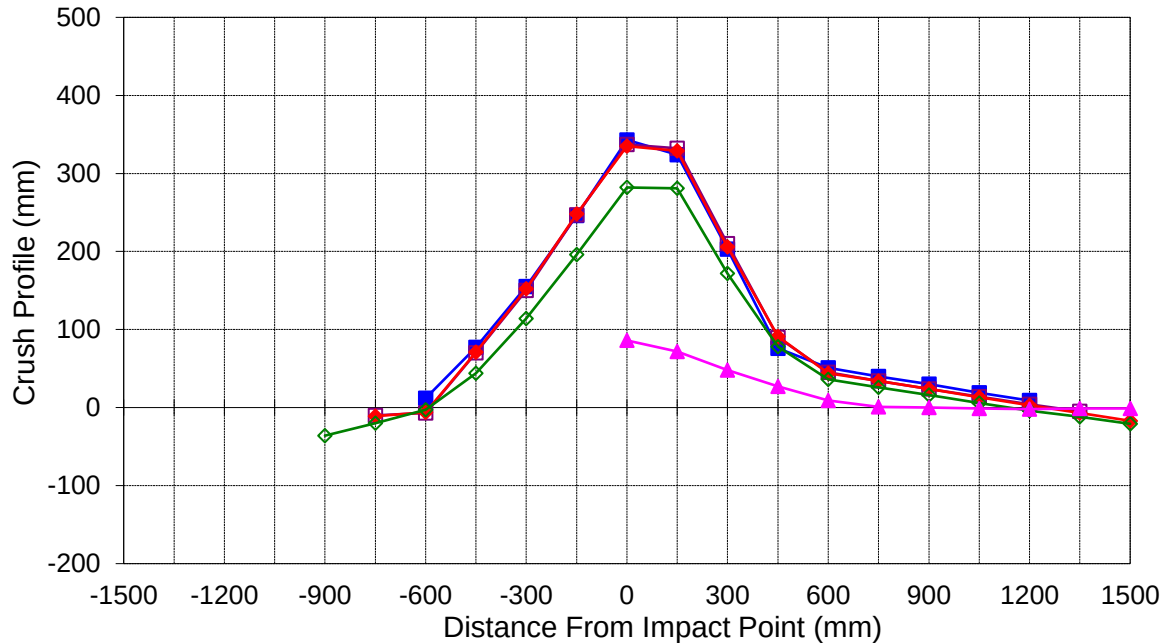
	Pre-Test					Post-Test					Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050															
-900				878					914					-36	
-750		995	992	884			1005	1003	904			-10	-11	-20	
-600	974	987	985	892		962	994	991	895		12	-7	-6	-3	
-450	971	977	976	896		894	907	905	852		77	70	71	44	
-300	972	971	971	901		817	821	819	787		155	150	152	114	
-150	974	968	968	907		728	721	720	711		246	247	248	196	
0	975	969	967	912	636	632	632	632	630	550	343	337	335	282	86
150	976	971	967	917	672	652	639	638	636	600	324	332	329	281	72
300	977	973	968	922	676	774	763	762	750	628	203	210	206	172	48
450	977	975	969	926	679	901	885	878	848	652	76	90	91	78	27
600	975	976	970	929	680	924	931	926	893	671	51	45	44	36	9
750	974	976	972	932	682	934	942	938	906	681	40	34	34	26	1
900	973	977	974	934	683	943	953	950	918	683	30	24	24	16	0
1050	972	977	976	937	683	953	963	963	931	684	19	14	13	6	-1
1200	971	979	981	939	681	962	975	978	943	683	9	4	3	-4	-2
1350		987	988	943	680		992	995	955	681		-5	-7	-12	-1
1500			997	950	677			1014	971	678			-17	-21	-1

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. 10 ... (CONTINUED)
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024



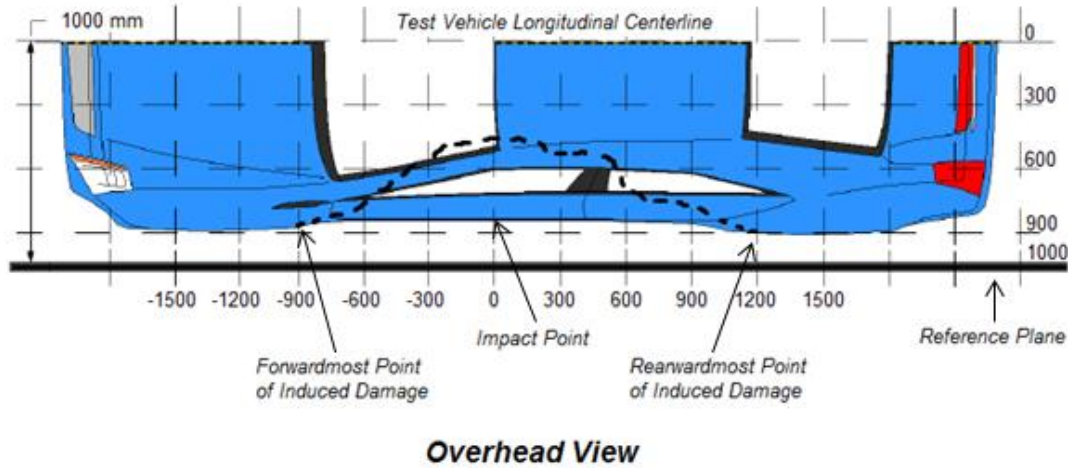
Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO. 11 **VEHICLE DAMAGE PROFILE DISTANCES**

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
 Test Date: 09/20/2024

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



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-750	3	-3	8	-11
2	-300	3	181	29	152
3	150	3	362	33	329
4	600	3	74	30	44
5	1050	3	37	24	13
6	1500	3	-14	3	-17

DATA SHEET NO. 12
FMVSS NO. 301 STATIC ROLLOVER RESULTS

Test Vehicle: <u>2024 Chevrolet Traverse 5 Door SUV</u>	NHTSA No.: <u>M20240107</u>
Test Program: <u>NCAP Side MDB Impact Test</u>	Test Date: <u>09/20/2024</u>
Test Time: <u>9:04 AM</u>	Temperature: <u>21°C</u>

- A. From impact until vehicle motion ceases: 0 oz.
 (Maximum allowable is 1 oz.)
- B. For the 5-minute period after motion ceases: 0 oz.
 (Maximum allowable is 5 oz.)
- C. For the following 25 minutes: 0 oz.
 (Maximum allowable is 1 oz./minute)
- D. Spillage Details: No Spillage Occurred

FMVSS NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	69	300	369
90° to 180°	68	300	368
180° to 270°	68	300	368
270° to 360°	65	300	365

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

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

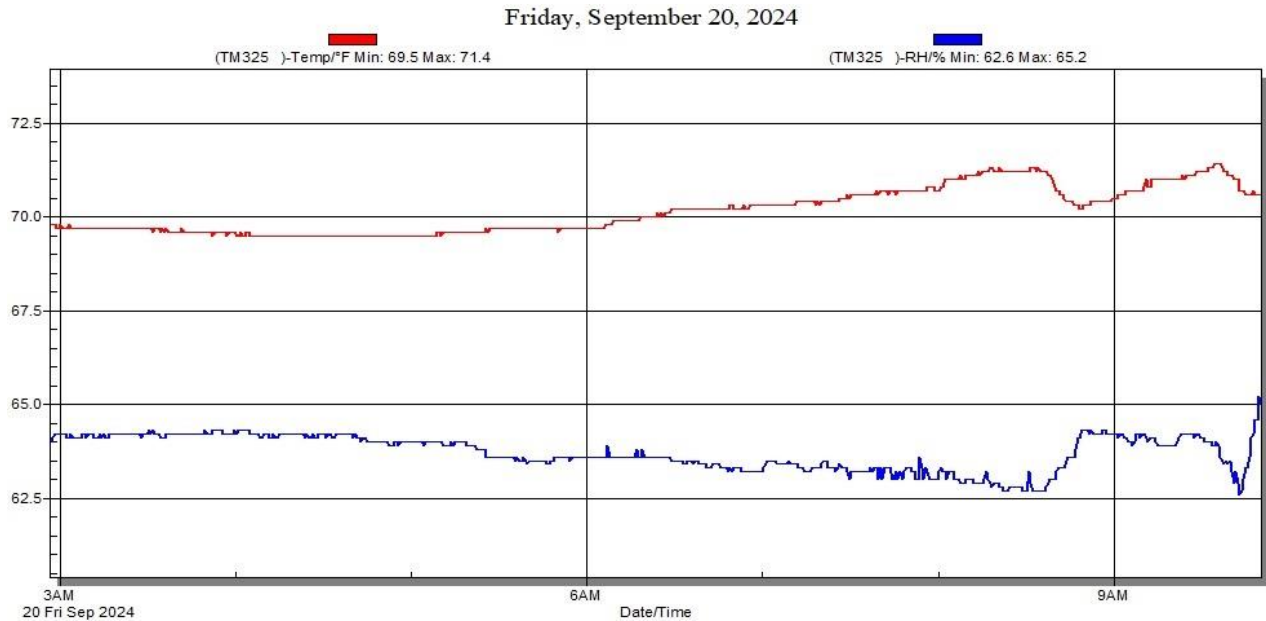
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	None
90° to 180°	None
180° to 270°	None
270° to 360°	None

DATA SHEET NO. 13
DUMMY / VEHICLE TEMPERATURE AND HUMIDITY STABILIZATION DATA

Test Vehicle: 2024 Chevrolet Traverse 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: M20240107
Test Date: 09/20/2024



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

APPENDIX A
PHOTOGRAPHS

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M20240107

Figure A-1: As Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



M20240107

Figure A-2: As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle

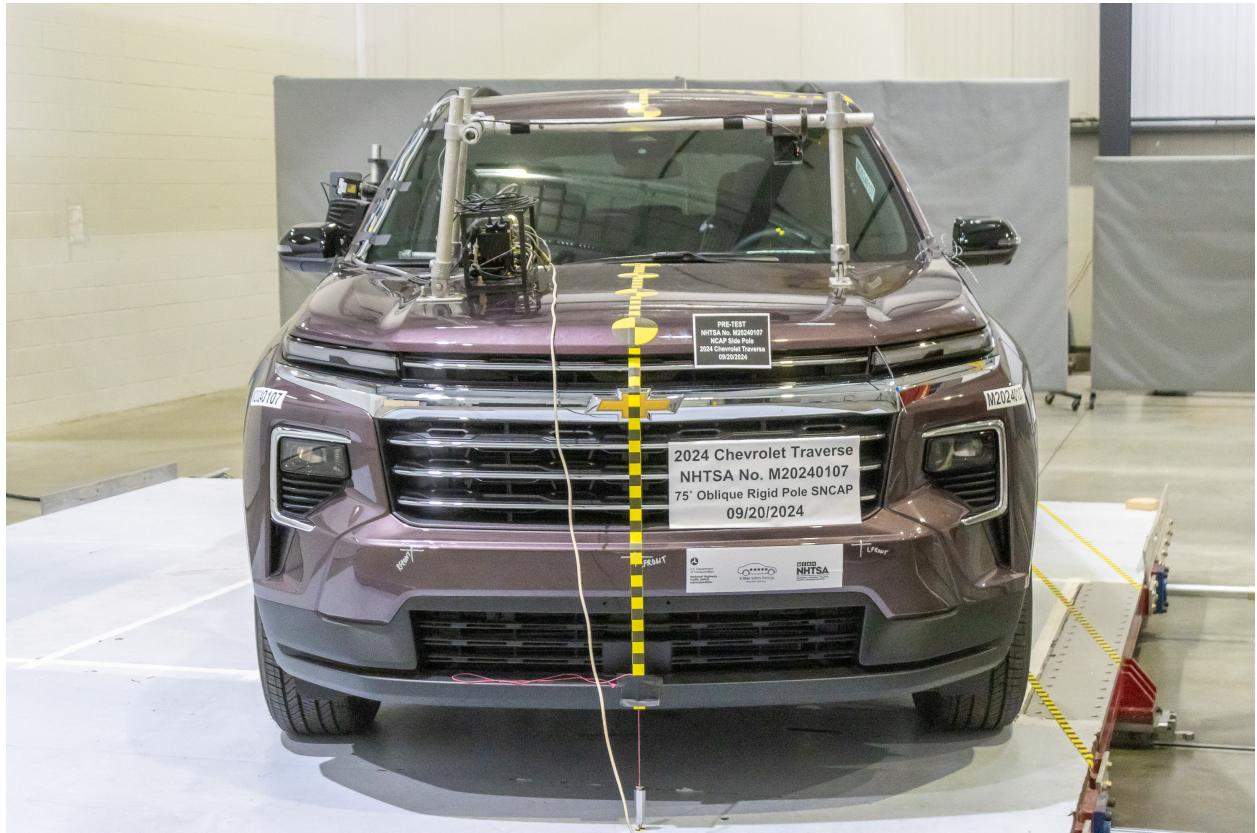


Figure A-3: Pre-Test Frontal View of Test Vehicle

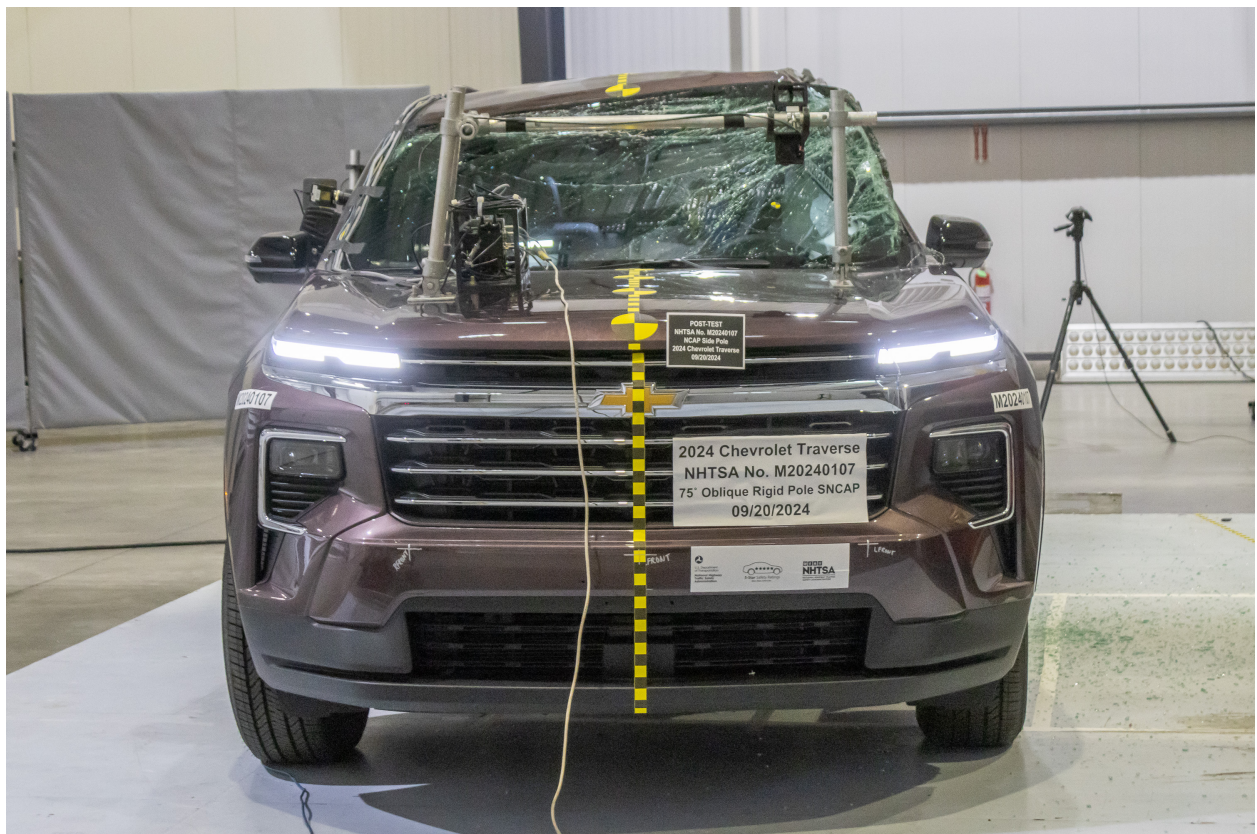


Figure A-4: Post-Test Frontal View of Test Vehicle



Figure A-5: Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle



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



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



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



Figure A-9: Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



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



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



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



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



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



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

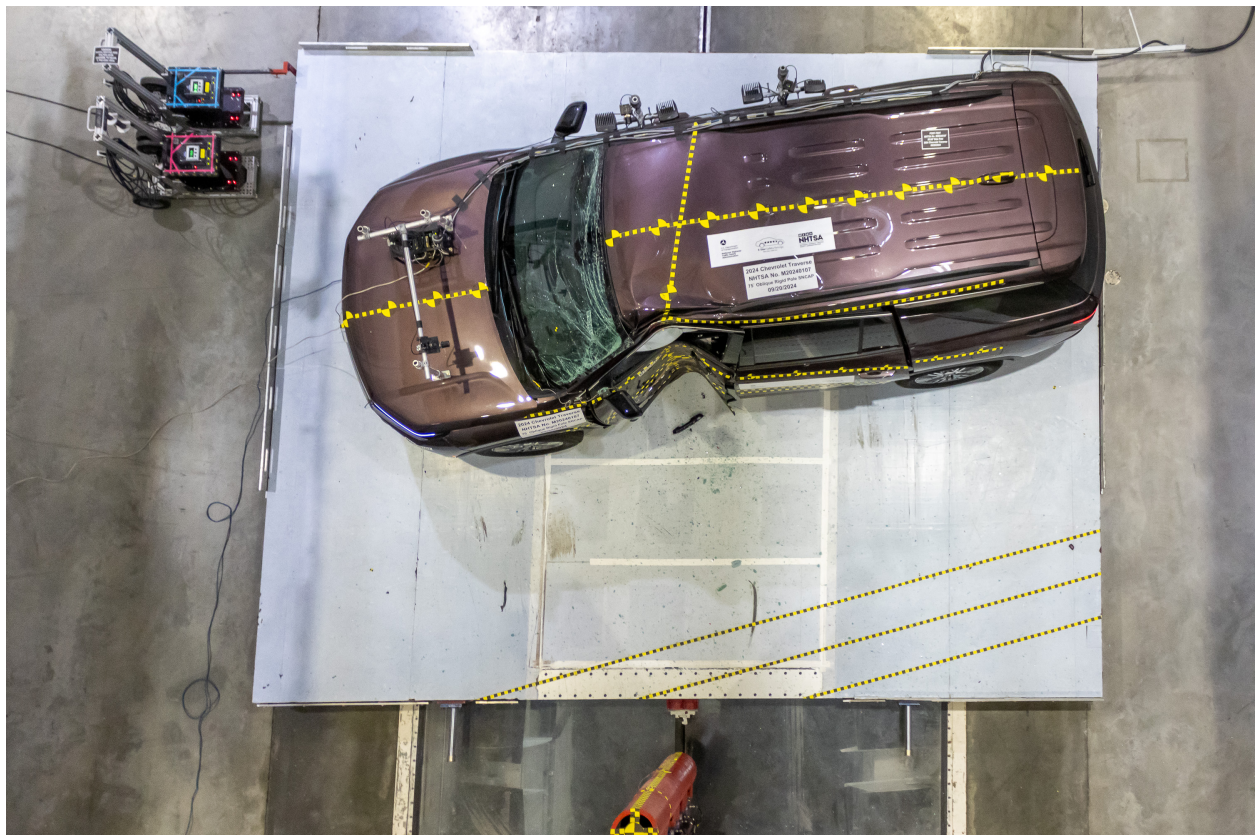


Figure A-16: Post-Test Overhead View of Test Area



Figure A-17: Pre-Test Left Side View of Pole Positioned Against Side of Vehicle



Figure A-18: Pre-Test Right Side View of Pole Positioned Against Side of Vehicle

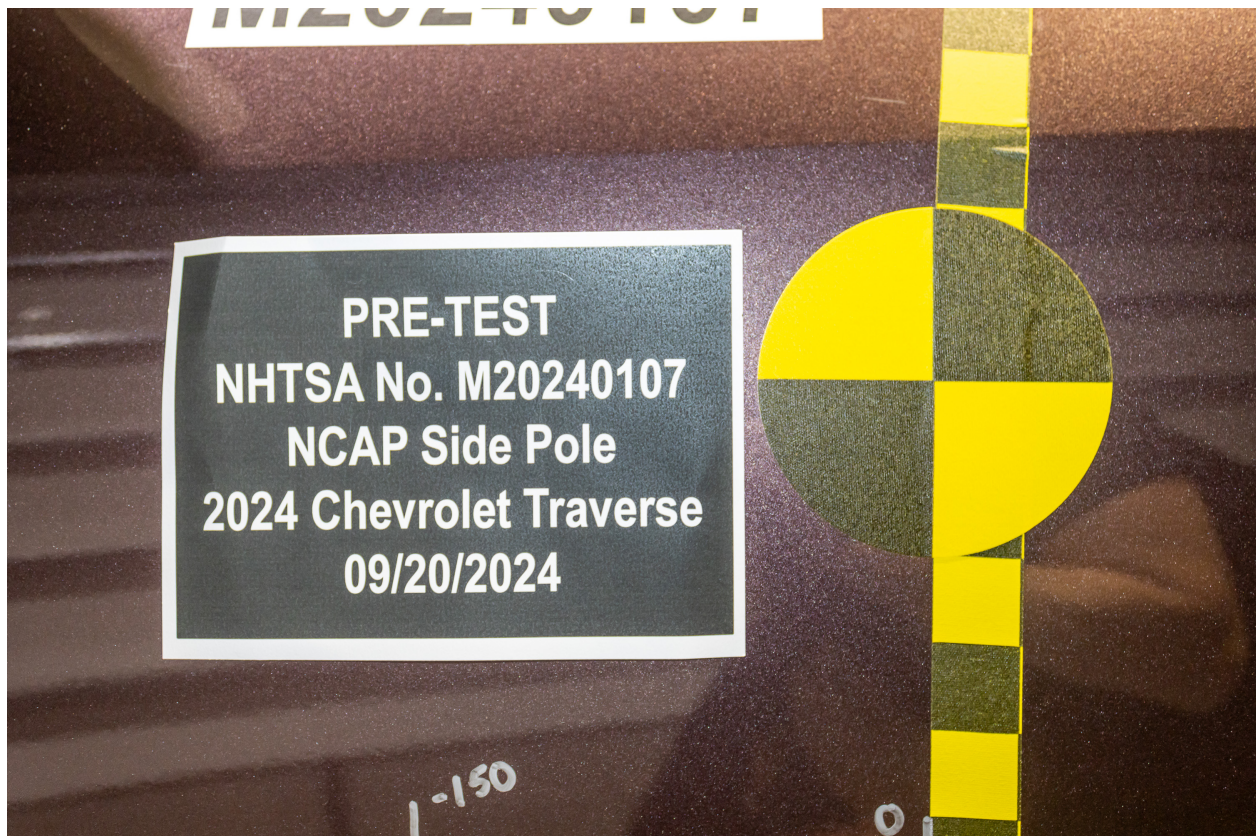


Figure A-19: Pre-Test Close-Up View of Impact Point Target



Figure A-20: Post-Test Close-Up View of Impact Point Target Showing Impact Location

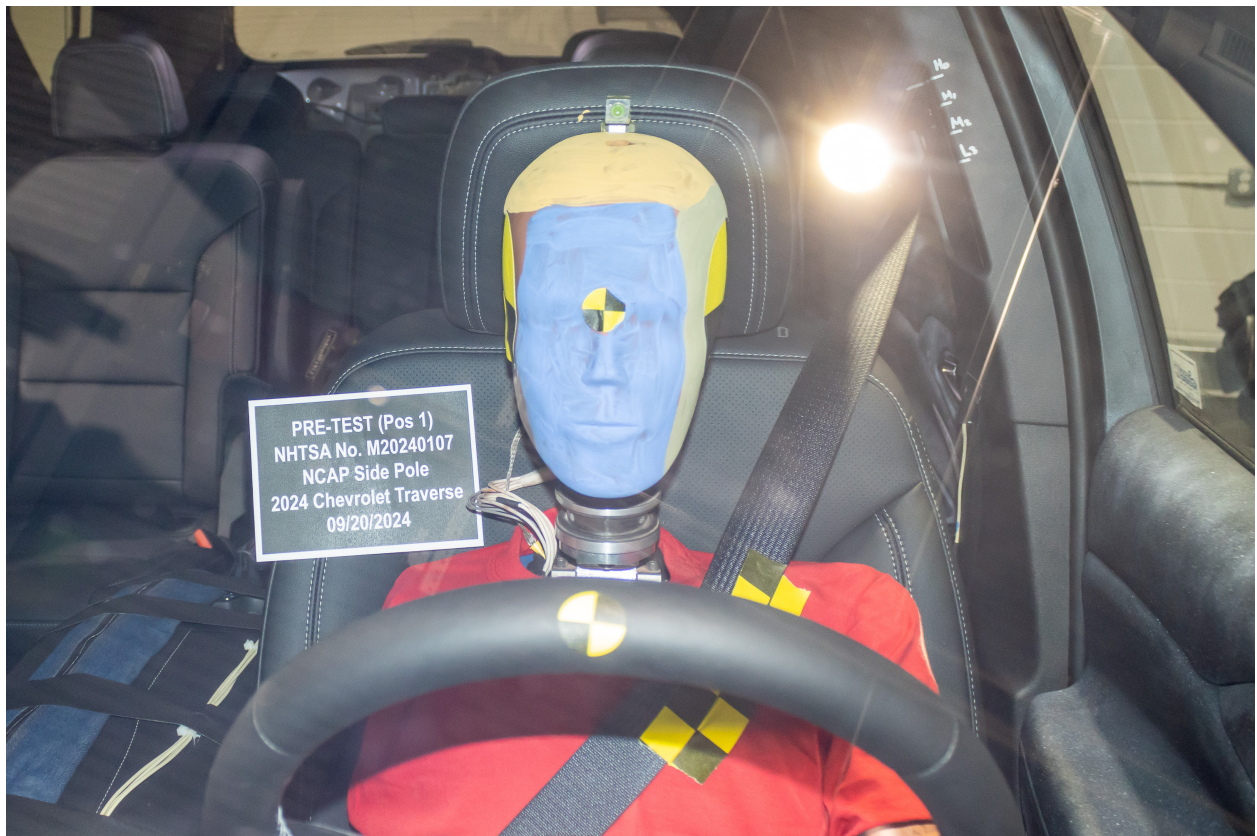


Figure A-21: Pre-Test Front Close-Up View of Dummy Head and Chest



Figure A-22: Post-Test Front Close-Up View of Dummy



Figure A-23: Pre-Test Left Side View of Dummy Showing Belt and Chalking



Figure A-24: Pre-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-25: Post-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-26: Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



Figure A-27: Pre-Test Frontal Close-Up View of Dummy Head / Shoulders in Relation to Head Restraint



Figure A-28: Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning



Figure A-29: Pre-Test Overhead View of Dummy Thighs on Seat Pan



Figure A-30: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-31: Pre-Test Left Side View of Dummy's Head Showing Dummy's Head is Level



Figure A-32: Pre-Test Placement of Dummy's Feet



Figure A-33: Pre-Test View of Belt Anchorage for Dummy



Figure A-34: Pre-Test Left Side View of Steering Wheel



Figure A-35: Pre-Test View of Disengaged Parking Brake

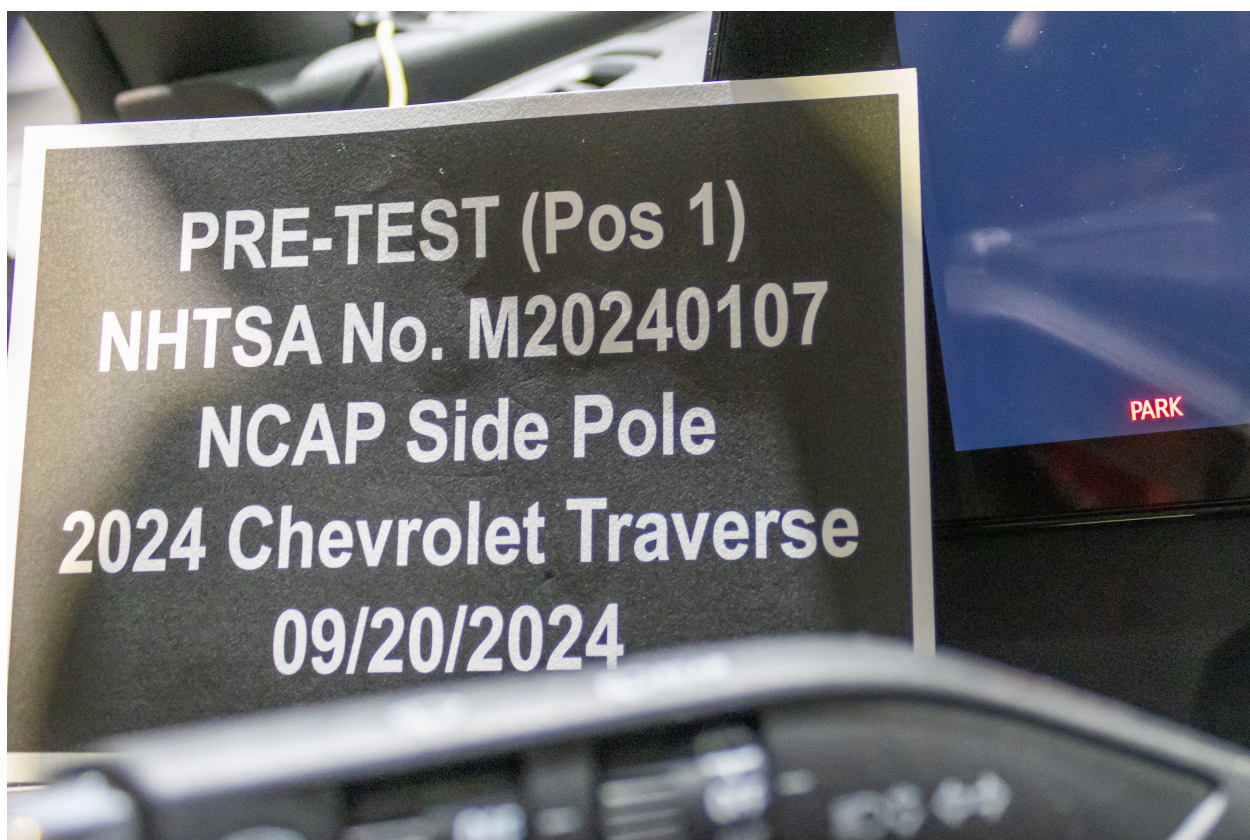


Figure A-36: Pre-Test View of Parking Brake



Figure A-37: Pre-Test Close-Up Left Side View of Driver Seat Track



Figure A-38: Pre-Test Close-Up Left Side View of Driver Seat Back

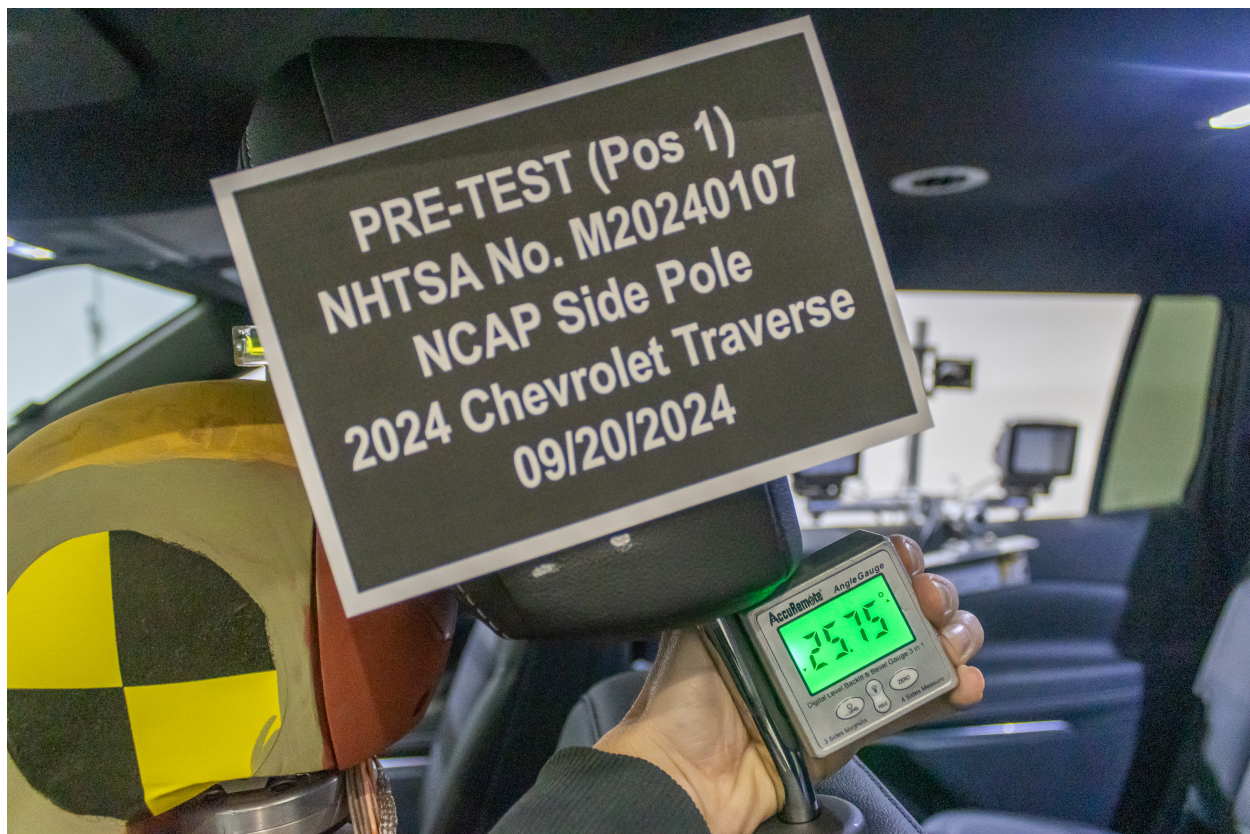


Figure A-39: Pre-Test Close-Up View of Driver Seat Back or Head Restraint



Figure A-40: Pre-Test Dummy and Door Clearance View



Figure A-41: Post-Test Dummy and Door Clearance View



Figure A-42: Pre-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-43: Post-Test Right Side View of Dummy and Front Seat of Occupant Compartment



Figure A-44: Pre-Test Inner Door Panel View



Figure A-45: Post-Test Inner Door Panel View Showing Dummy Contact Location



Figure A-46: Post-Test Dummy Close-Up Head Contact with Vehicle Interior View



Figure A-47: Post-Test Dummy Close-Up Head Contact with Side Airbag View



Figure A-48: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



Figure A-49: Post-Test Dummy Close-Up Torso Contact with Side Airbag View



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



Figure A-51: Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-52: Post-Test Dummy Close-Up Knee Contact with Vehicle Interior View



Figure A-53: Pre-Test Right Side View of Dummy and Rear Seat of Occupant Compartment



Figure A-54: Post-Test Inner Rear Passenger Torso Air Bag Deployment View



Figure A-55: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

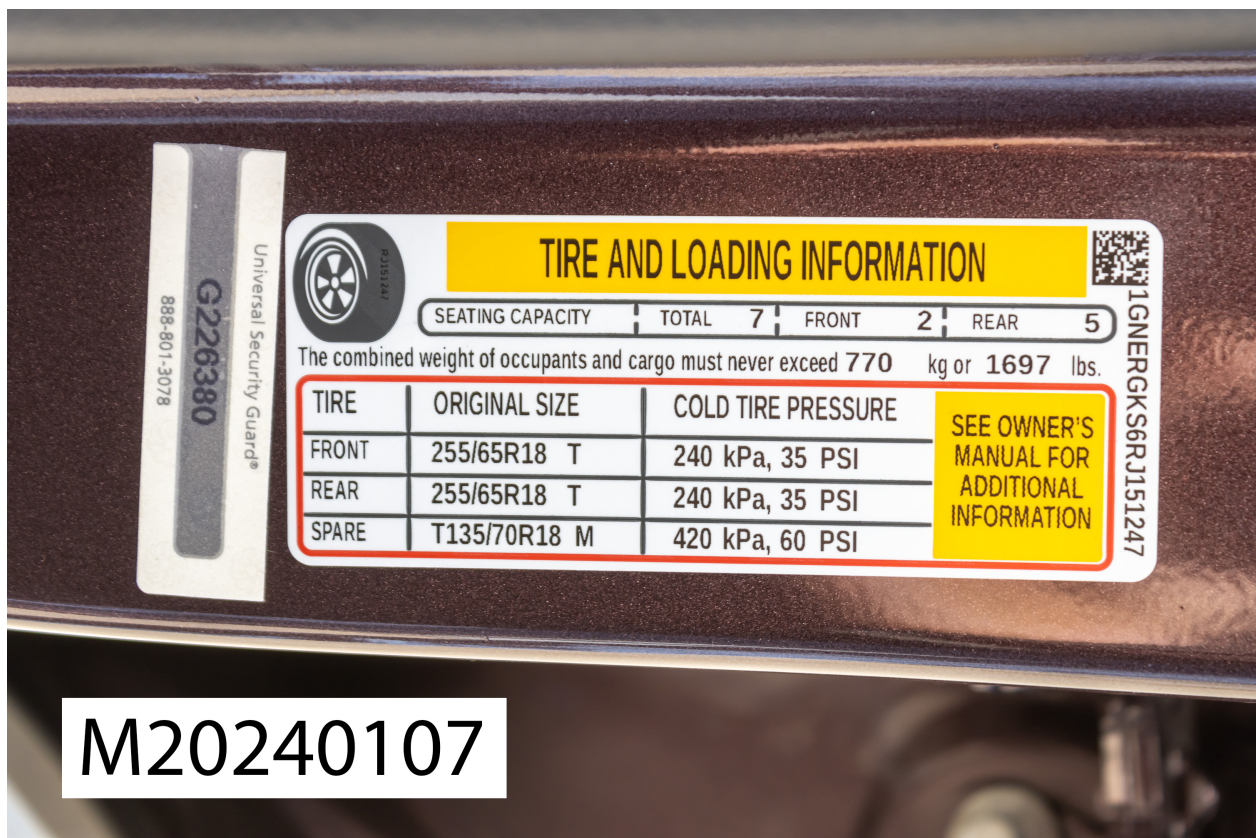


Figure A-56: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



M20240107

Figure A-57: Close-Up View of Vehicle's Certification Label



M20240107

Figure A-58: Close-Up View of Vehicle's Tire Information Placard or Label



Figure A-59: Pre-Test Pole Barrier Front View



Figure A-60: Post-Test Pole Barrier Front View

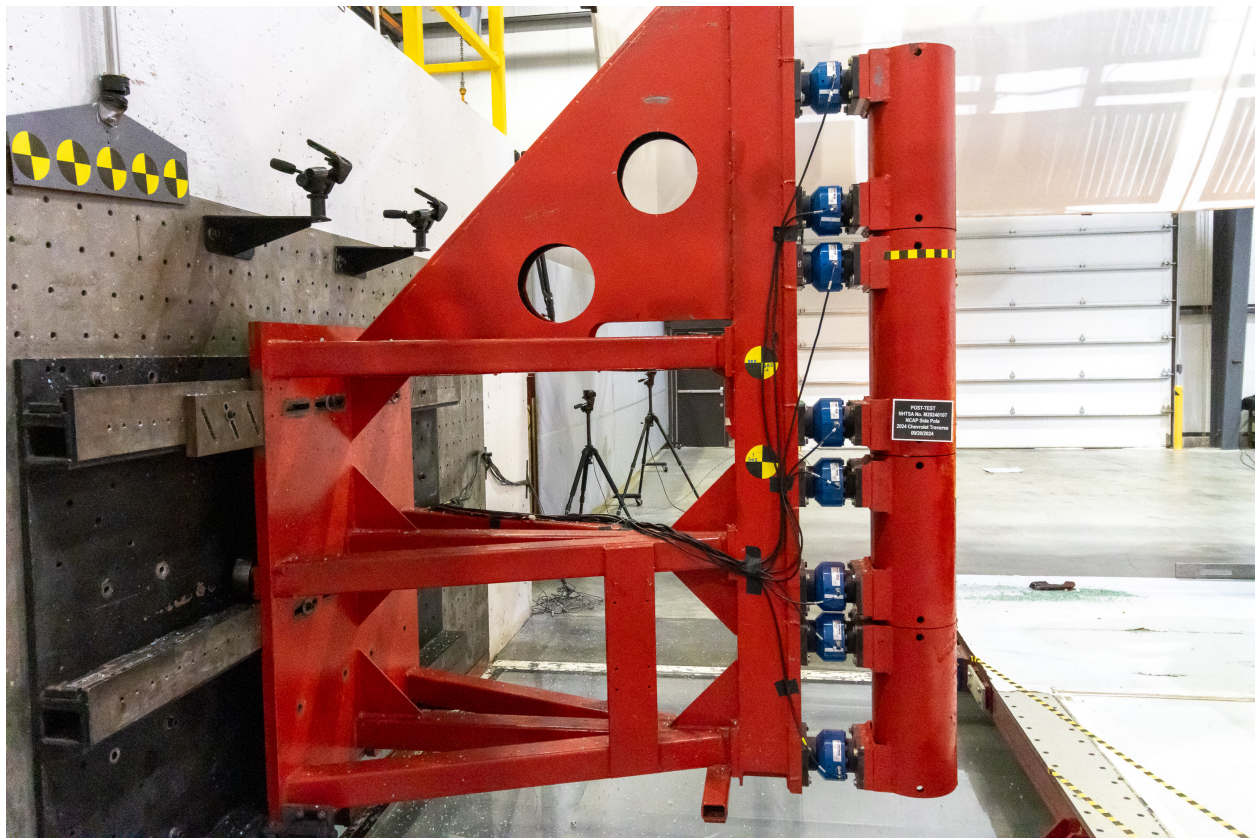


Figure A-61: Pre-Test Pole Barrier Side View

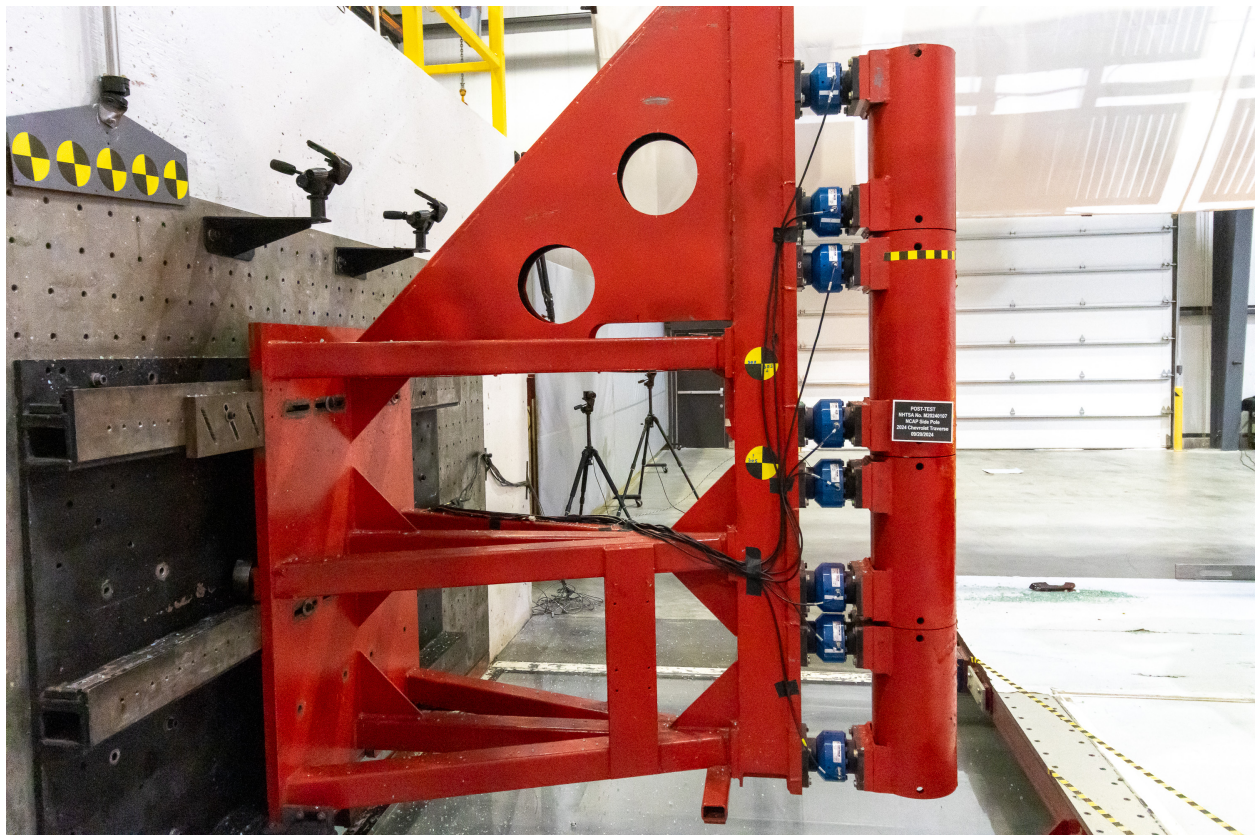


Figure A-62: Post-Test Pole Barrier Side View

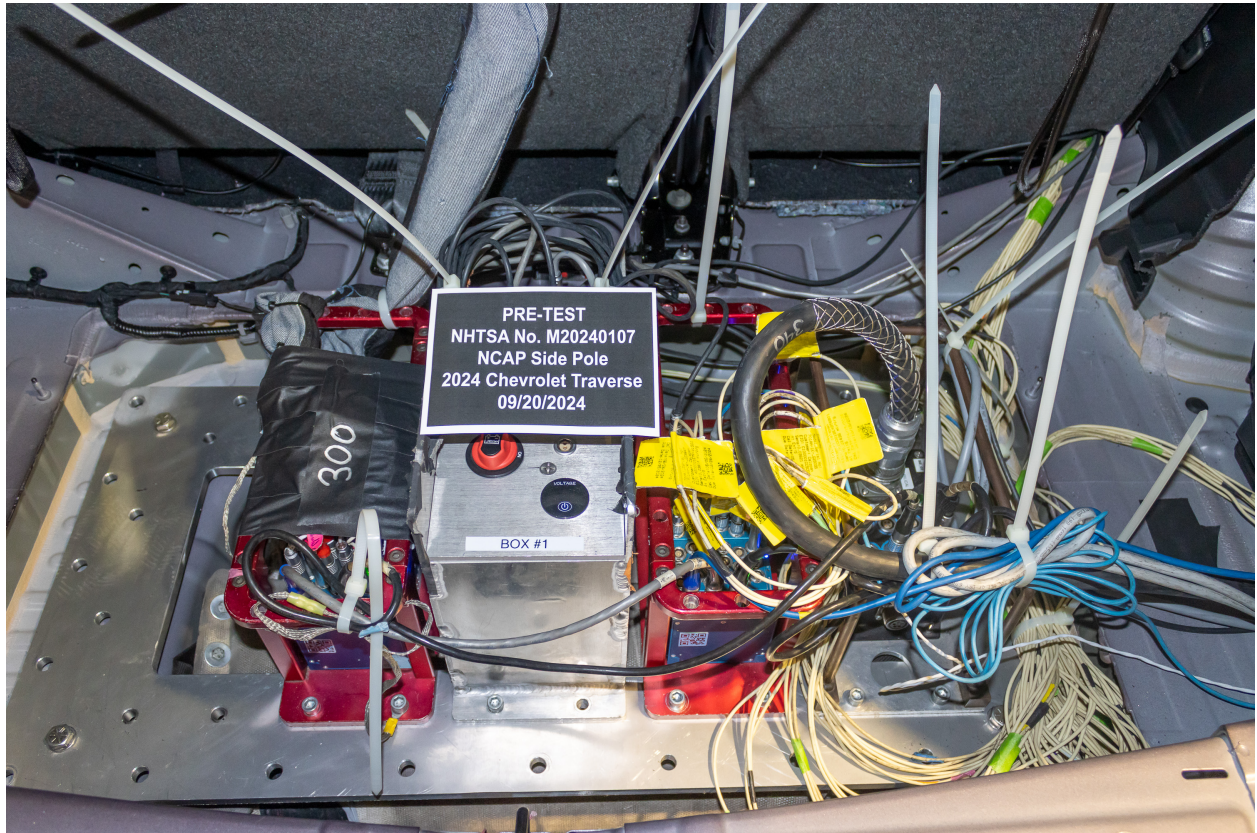


Figure A-63: Pre-Test Ballast View



Figure A-64: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-65: FMVSS No. 301 Static Rollover 0 Degrees

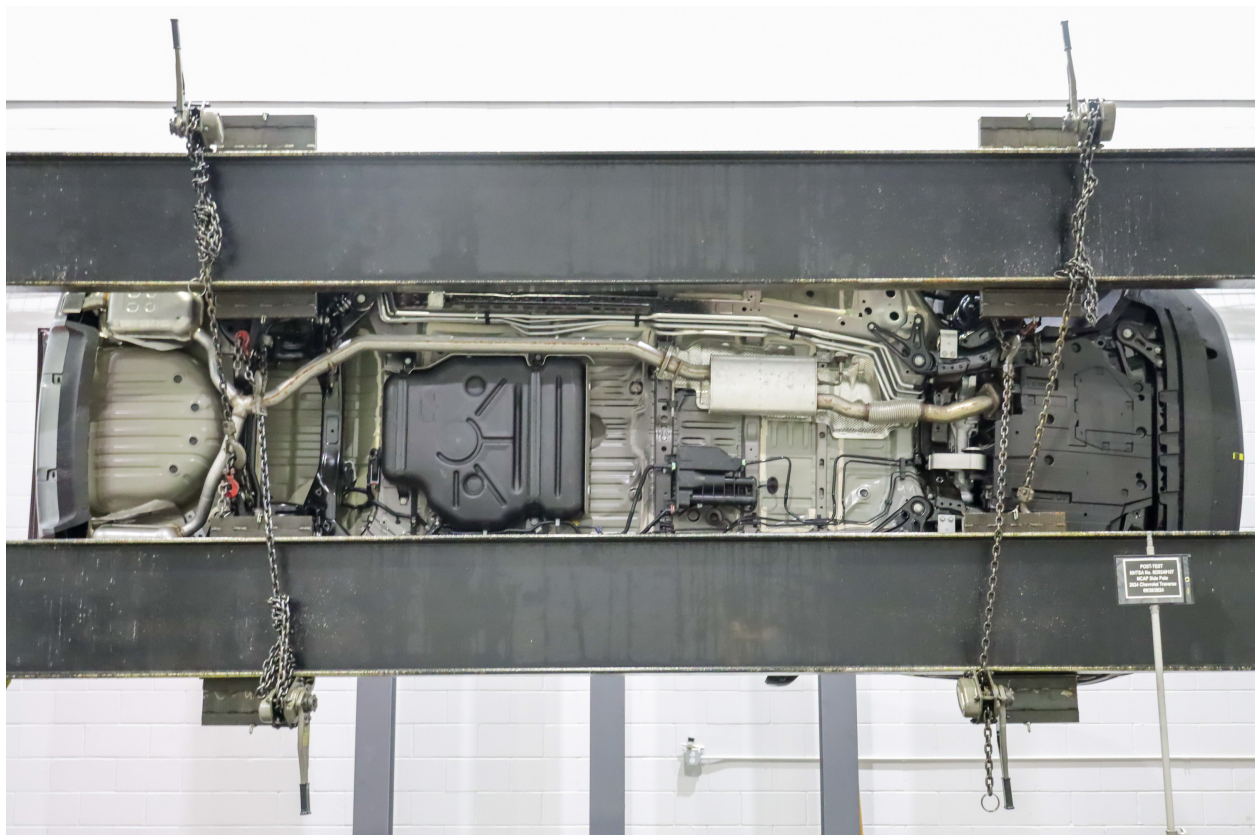


Figure A-66: FMVSS No. 301 Static Rollover 90 Degrees



Figure A-67: FMVSS No. 301 Static Rollover 180 Degrees



Figure A-68: FMVSS No. 301 Static Rollover 270 Degrees



Figure A-69: FMVSS No. 301 Static Rollover 360 Degrees



Figure A-70: Impact Event



2024 TRVERSE LT FWD

EXTERIOR: STARDUST METALLIC
INTERIOR: JET BLACK EVOTEX

ENGINE: 2.5L TURBO DOHC SIDI
TRANSMISSION: 8-SPEED AUTO

Visit us at www.chevy.com

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

OWNER BENEFITS

- 3 YEAR/36,000 MILE*
- BUMPER-TO-BUMPER LIMITED WARRANTY
- 5 YEAR/60,000 MILE*
- POWERTRAIN LIMITED WARRANTY, ROADSIDE ASSISTANCE & COURTESY TRANSPORTATION
- FIRST MAINTENANCE VISIT
- *WHICHEVER COMES FIRST
- SEE CHEVROLET.COM OR DEALER FOR TERMS, DETAILS & LIMITS

PERFORMANCE & MECHANICAL

- TIRE, COMPACT SPARE

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- 3 YEARS OF ONSTAR REMOTE ACCESS
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GOOGLE BUILT-IN COMPATIBILITY

- WI-FI (R) HOTSPOT CAPABLE
- TILT & TELESCOPING STEERING
- ACTIVE NOISE CANCELLATION
- AUTOSTEER POWER LIFTGATE
- 6 USB PORTS - TWO PER ROW
- DRIVER INFORMATION CENTER, 11" DIAGONAL DISPLAY

INTERIOR

- SEATING, 7-PASSENGER
- SEAT ADJUSTER, DRIVER 8-WAY POWER
- WIRELESS PHONE CHARGING
- HEADREST, 3RD ROW CENTER

EXTERIOR

- ROOF RAILS, BLACK
- WHEELS, 18" GRAZEN METALLIC MACHINED-FACE ALUMINUM

SAFETY & SECURITY

- REAR PARK ASSIST
- FOLLOWING DISTANCE INDICATOR

FORWARD COLLISION ALERT

- LANE KEEP ASSIST WITH LANE DEPARTURE WARNING
- INTELLIBEAM

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE	\$40,000.00
------------------------	-------------

OPTIONS & PRICING

OPTION RETAILED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT OPTION)

JET BLACK EVOTEX	1,000.00
TOTAL OPTIONS	\$1,000.00
TOTAL VEHICLE & OPTIONS	\$41,000.00
DESTINATION CHARGE	1,395.00
TOTAL VEHICLE PRICE*	\$42,395.00

EPA Fuel Economy and Environment

TRVERSE FWD

Fuel Economy

23 MPG
combined city/highway

20 city
27 highway

4.3 gallons per 100 miles

You spend \$2,000 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel COST \$2,350

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

5

Smog Rating (tailpipe only)

6

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 28 MPG and costs \$9.750 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.00 per gallon. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.

fueleconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

Equipped with the safety and security of OnStar.
Visit onstar.com for details.
onstar.com/privacy

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 35%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 27%

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

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT:
LANSING, MI U.S.A.
COUNTRY OF ORIGIN:
ENGINE: MEXICO
TRANSMISSION: UNITED STATES

This label has been applied pursuant to Federal law. Do not remove prior to delivery to the ultimate purchaser. This label is the property of the manufacturer and shall remain on the vehicle. Reproduction of this label is prohibited. © 2024 General Motors LLC. GM/LLS, PR022-0043-10700001

ORDER NO. DUHFMH SALES CODE E
SALES MODEL CODE 1U00
DEALER NO. 14005
FINAL ASSEMBLY
LANSING, MI U.S.A.
VIN 1GNERK0K60R151247
DEALER TO WHOM DELIVERED
SPORT CHEVROLET COMPANY, LLC
3101 AUTOMOBILE BLVD
SILVER SPRING, MD 20904-4999

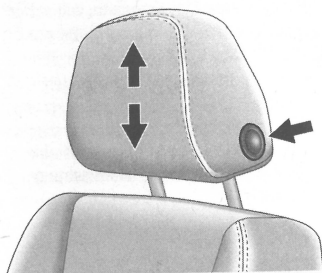
DV
1GA3665485

Figure A-71: Monroney Label

12 Seats and Restraints

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

The height of the head restraint can be adjusted.



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

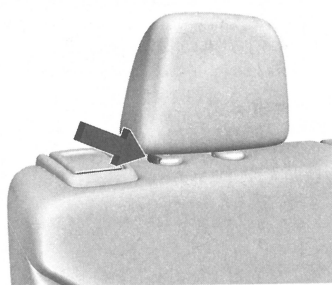
The front seat outboard head restraints are not removable.

Rear Seats

Second Row Seats

The vehicle's rear second row seats have adjustable head restraints in the outboard and center seating positions.

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



Outboard Shown, Center Similar

To lower the head restraint, press the button, located on the top of the seatback, and push the head restraint down. Try to

move the head restraint after the button is released to make sure that it is locked in place.

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

The rear second row outboard head restraints are not removable.

Third Row Seats

The vehicle's rear third row seats have head restraints in the outboard seating positions that cannot be adjusted up or down.

The rear third row outboard head restraints are not removable.

The rear third row outboard head restraints are designed to be folded.

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

When folding the seatback down, the head restraint will automatically fold out of the way as the seat is folded down.

Return the lowered head restraint to the upright position until it locks into place. Push and pull on the head restraint to make sure it is locked.

Figure A-72: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual



Figure A-73: Post-Test View of Shattered Vehicle Inner Door Panel

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA TRACES

Table of Data Plots

Driver Dummy Instrumentation Plots

Fig.	Description	Page
Plot 1	Driver Head Acceleration (X) Primary vs. Time	B-4
Plot 2	Driver Head Acceleration (Y) Primary vs. Time	B-4
Plot 3	Driver Head Acceleration (Z) Primary vs. Time	B-4
Plot 4	Driver Head Resultant Primary vs. Time	B-4
Plot 5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-5
Plot 6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-5
Plot 7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-5
Plot 8	Driver Lower Spine T12 Resultant Acceleration vs. Time	B-5
Plot 9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-6
Plot 10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-6
Plot 11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-6

The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.NHTSA.gov

Additional Driver Dummy Instrumentation Data

Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection (Y)

Vehicle Instrumentation Data

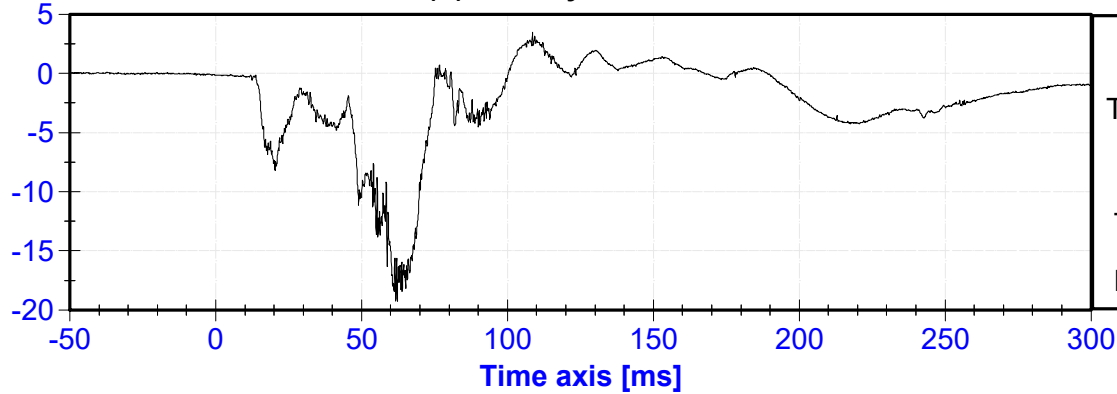
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy Hip Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)

Pole Instrumentation Data

Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

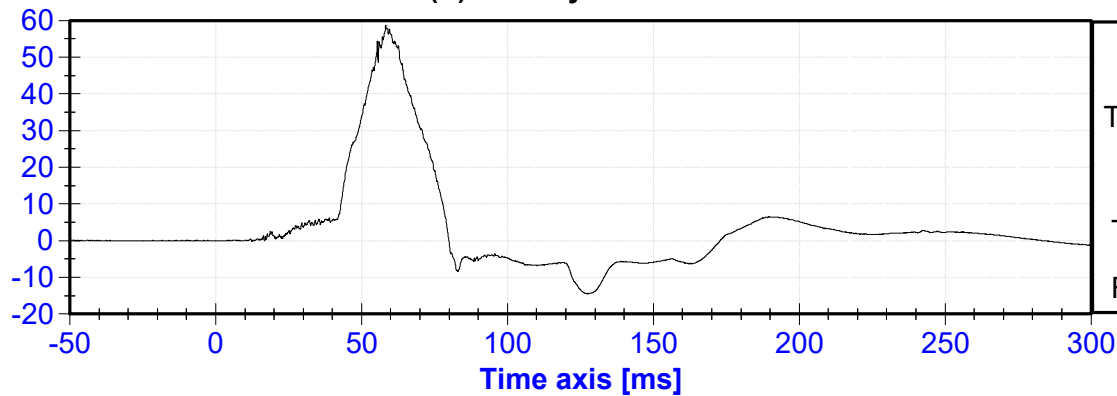
ACCELERATION [g's]

Driver Head Acceleration (X) Primary vs. Time



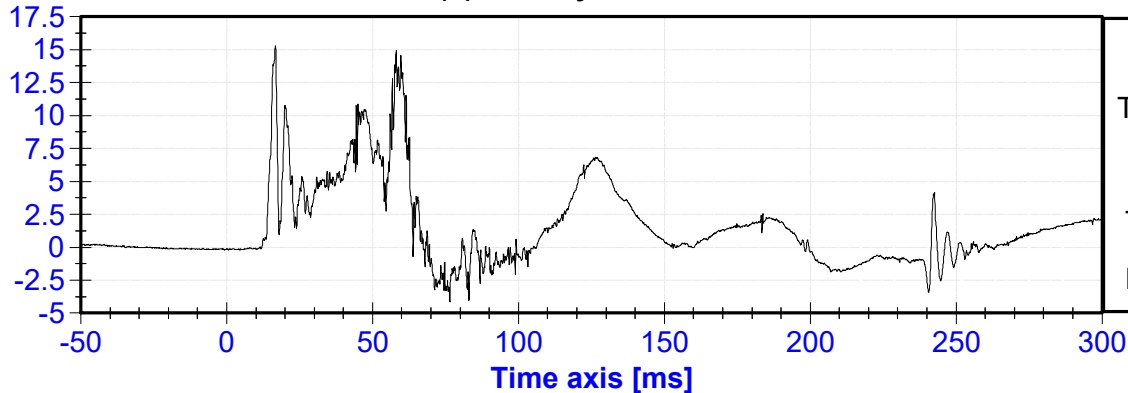
ACCELERATION [g's]

Driver Head Acceleration (Y) Primary vs. Time



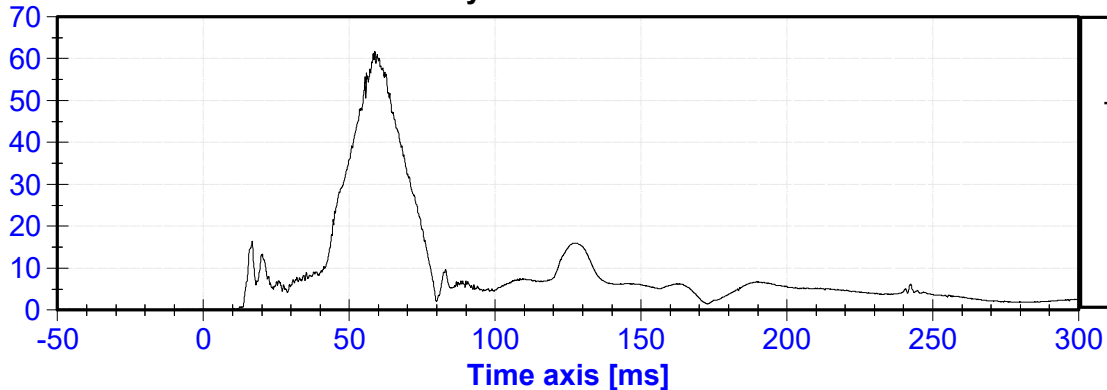
ACCELERATION [g's]

Driver Head Acceleration (Z) Primary vs. Time



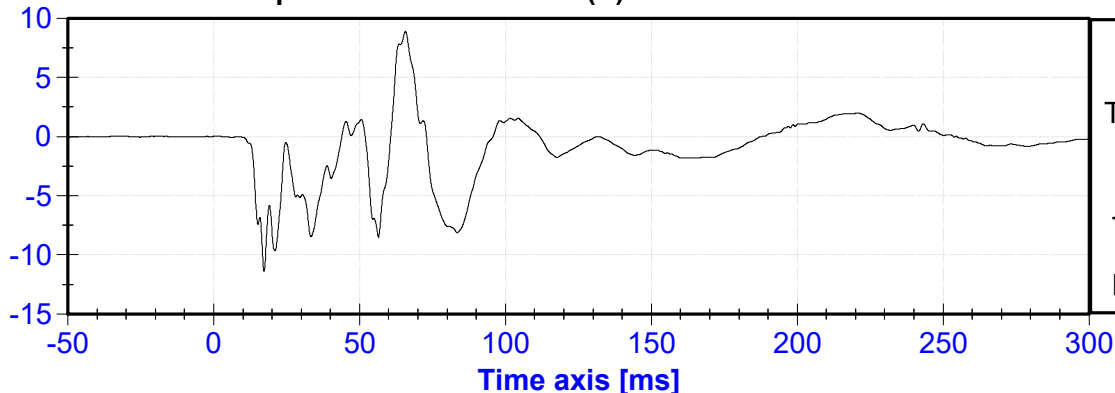
ACCELERATION [g's]

Driver Head Resultant Primary vs. Time



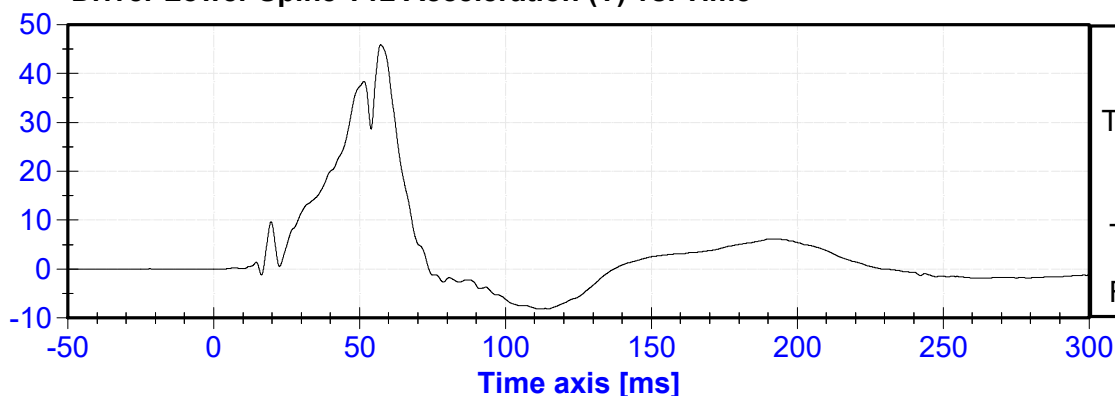
ACCELERATION [g's]

Driver Lower Spine T12 Acceleration (X) vs. Time



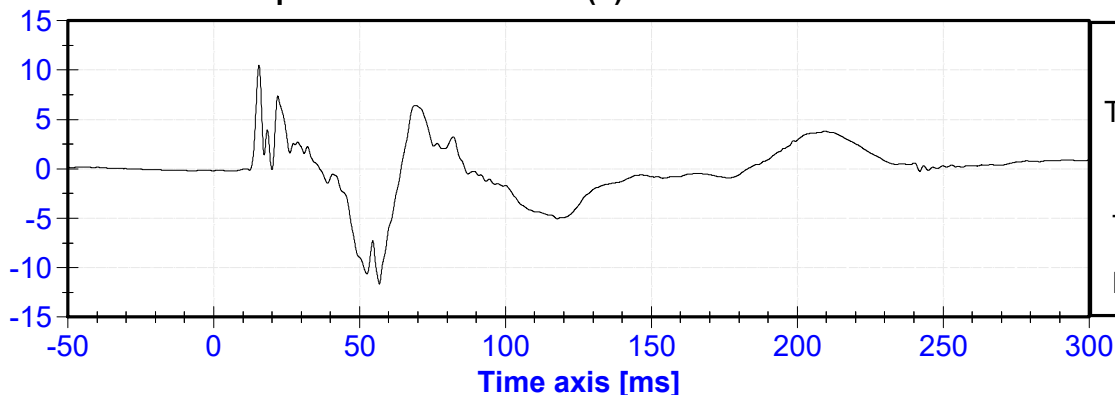
ACCELERATION [g's]

Driver Lower Spine T12 Acceleration (Y) vs. Time



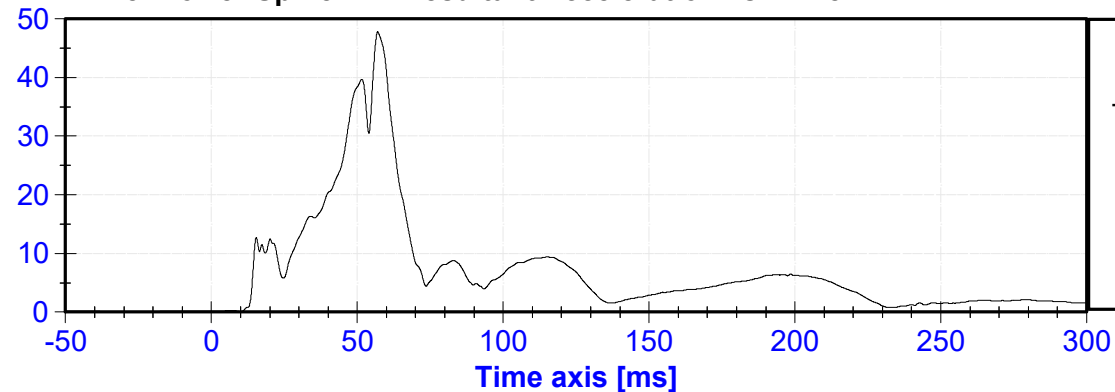
ACCELERATION [g's]

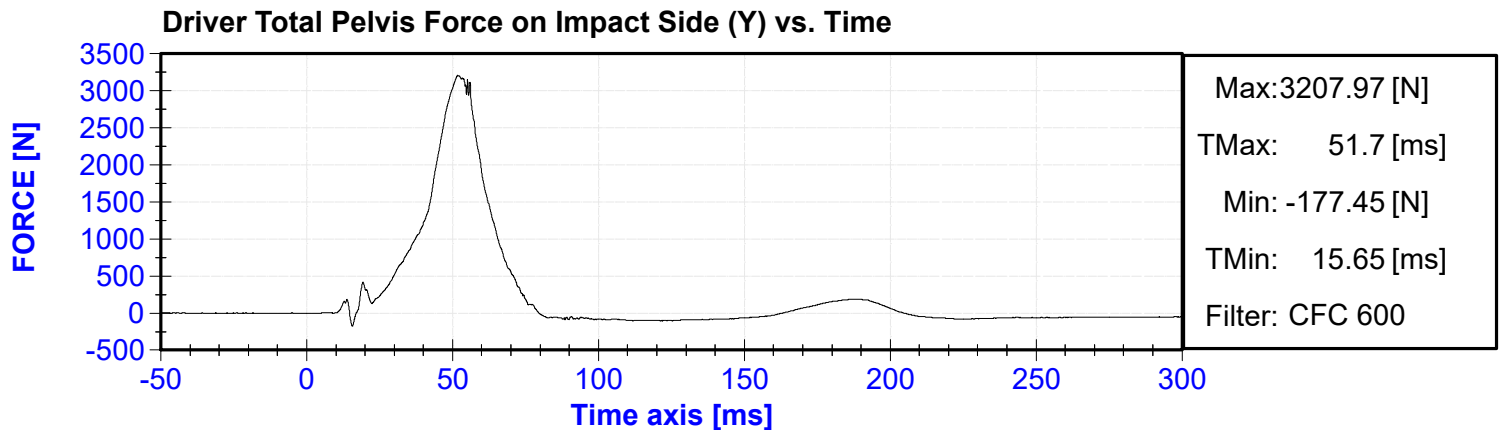
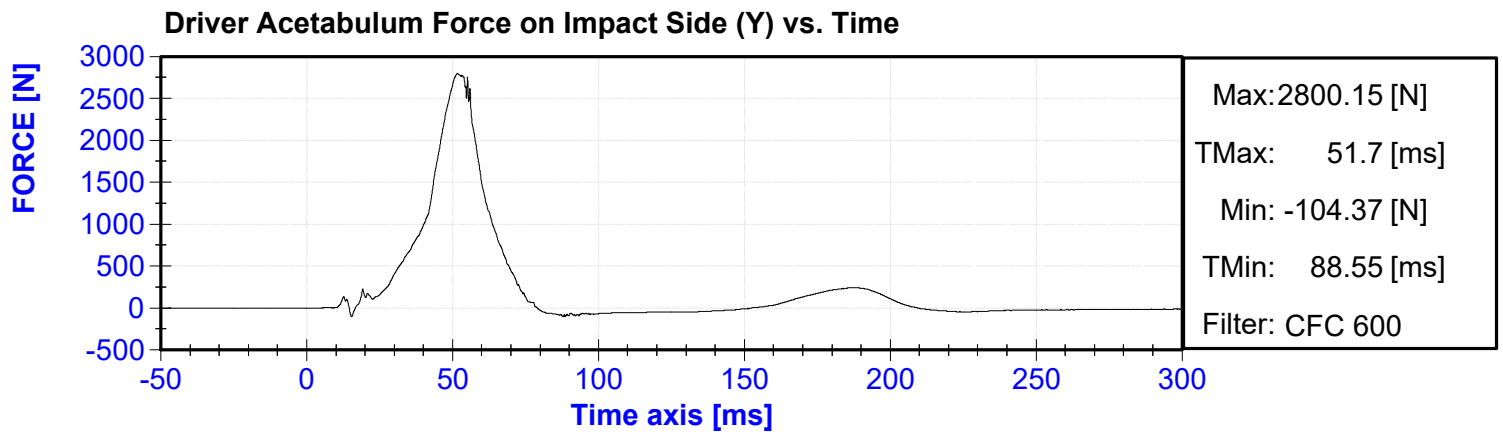
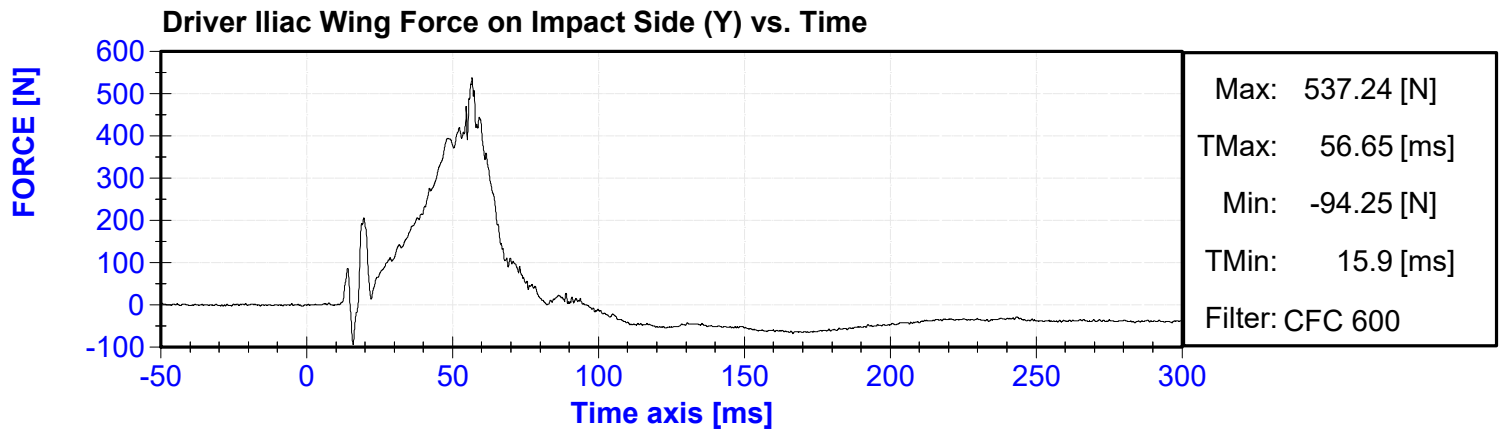
Driver Lower Spine T12 Acceleration (Z) vs. Time



ACCELERATION [g's]

Driver Lower Spine T12 Resultant Acceleration vs. Time





APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO:300

(CONFIGURED FOR LEFT SIDE IMPACT)

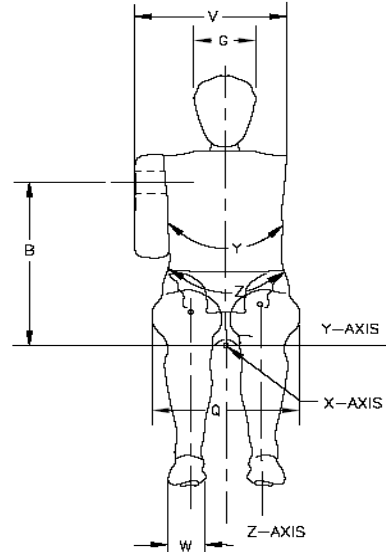
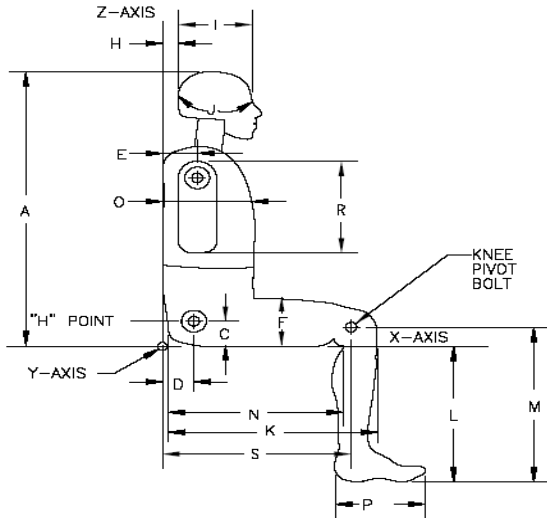


External Measurements - SID-IIs

Technician: J. Rios

Date: 9/13/2024

Dummy Serial Number: 300



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	446	Pass
C	H-point Height	79	89	83	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	101	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	145	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	181	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	355	Pass
M	Knee Pivot to floor height	392	409	398	Pass
N	Buttock Popliteal Length	416	442	431	Pass
O	Chest Depth w/o jacket	195	211	202	Pass
P	Foot Length	216	232	224	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	255	Pass
S	Knee Joint to seatback	477	493	484	Pass
V	Shoulder Width	341	357	350	Pass
W	Foot Width	78	94	86	Pass
Y	Chest Circumference w/jacket	851	881	874	Pass
Z	Waist Circumference	761	791	774	Pass

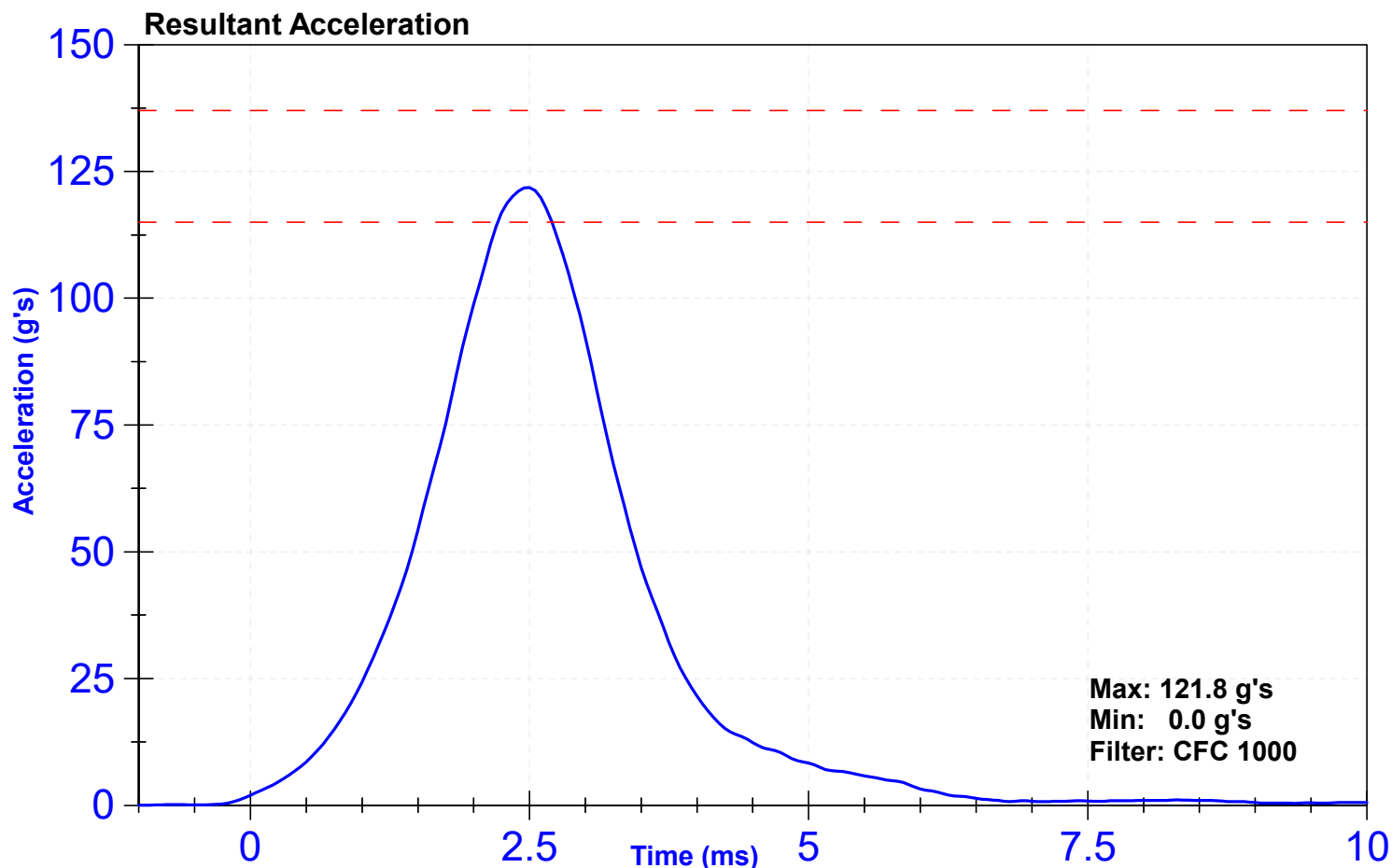
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

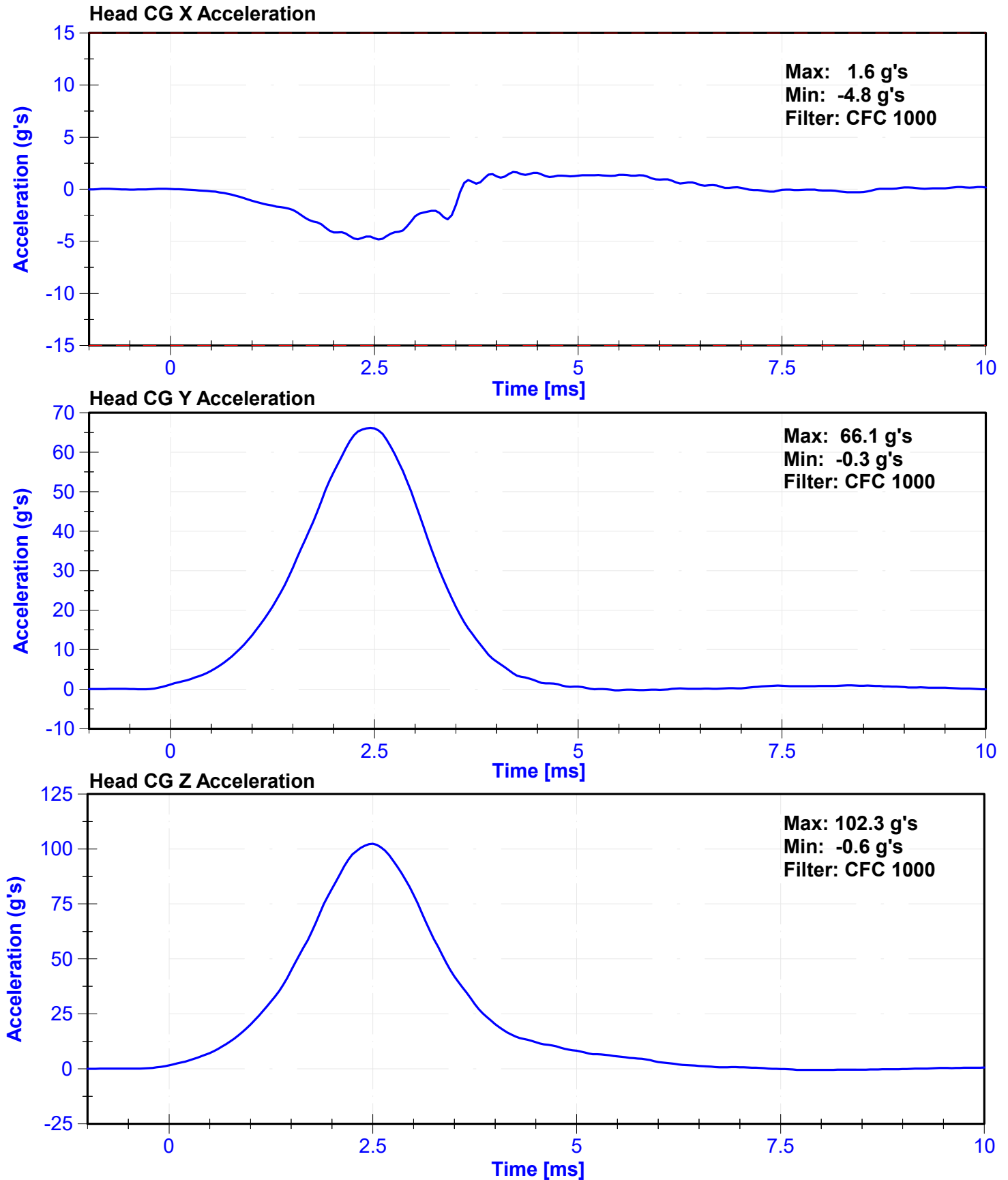
Results

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	115	137	g's	121.8	Pass
Oscillation	0	15	%	0.8	Pass
Fore-Aft Acceleration	-15	15	g's	-4.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P59018	5/9/2024	11/5/2024
Y Accelerometer	Endevco	P79189	5/9/2024	11/5/2024
Z Accelerometer	Endevco	P79587	5/9/2024	11/5/2024





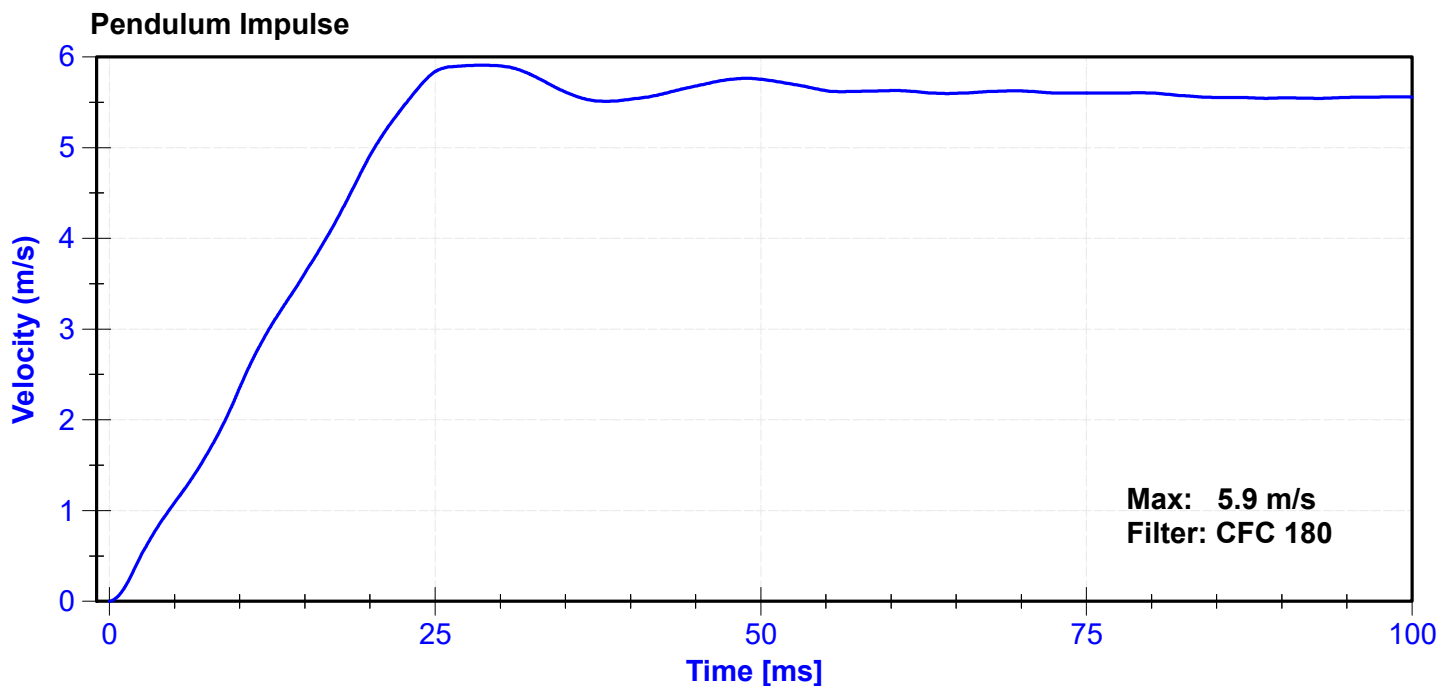
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

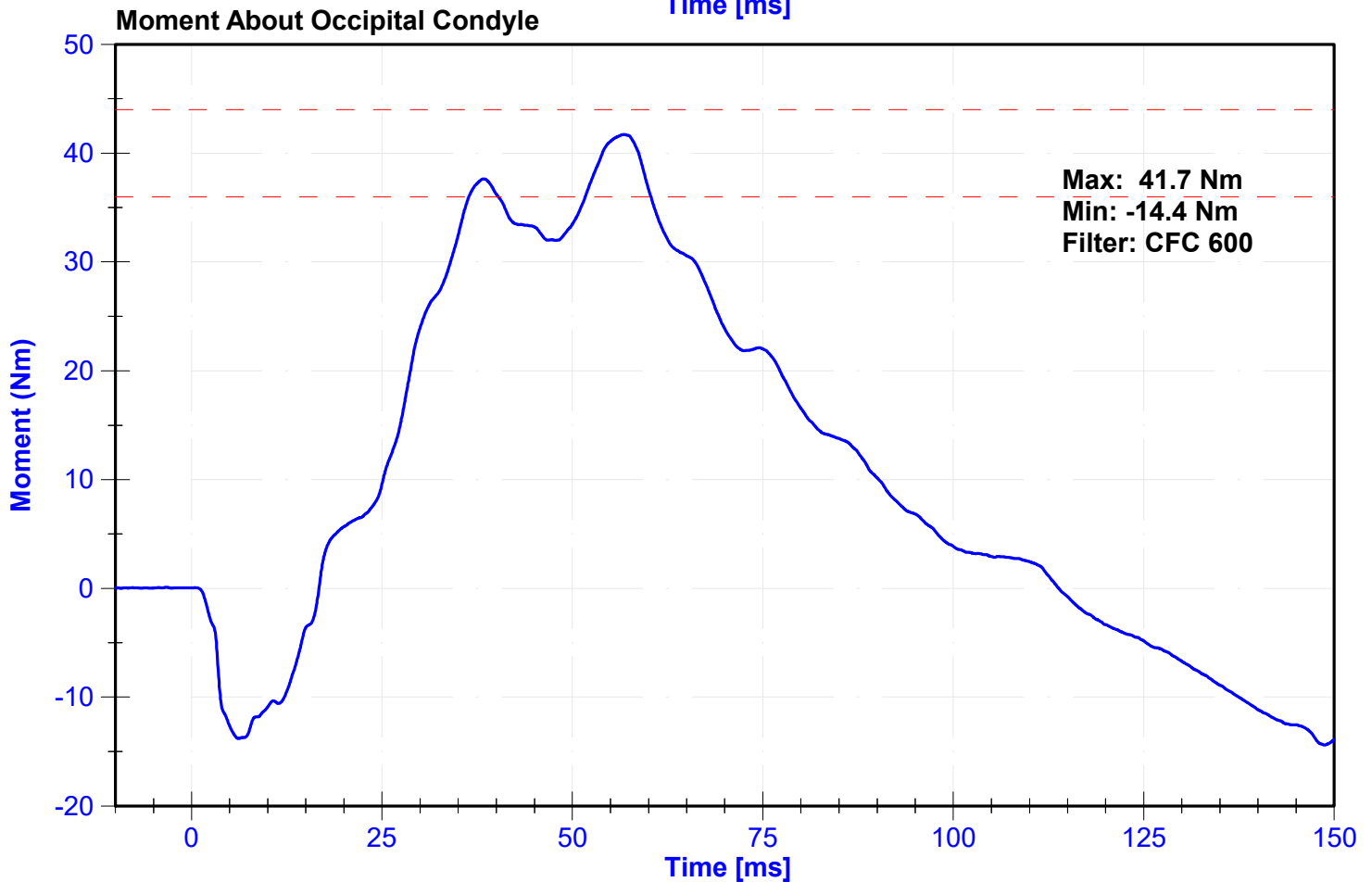
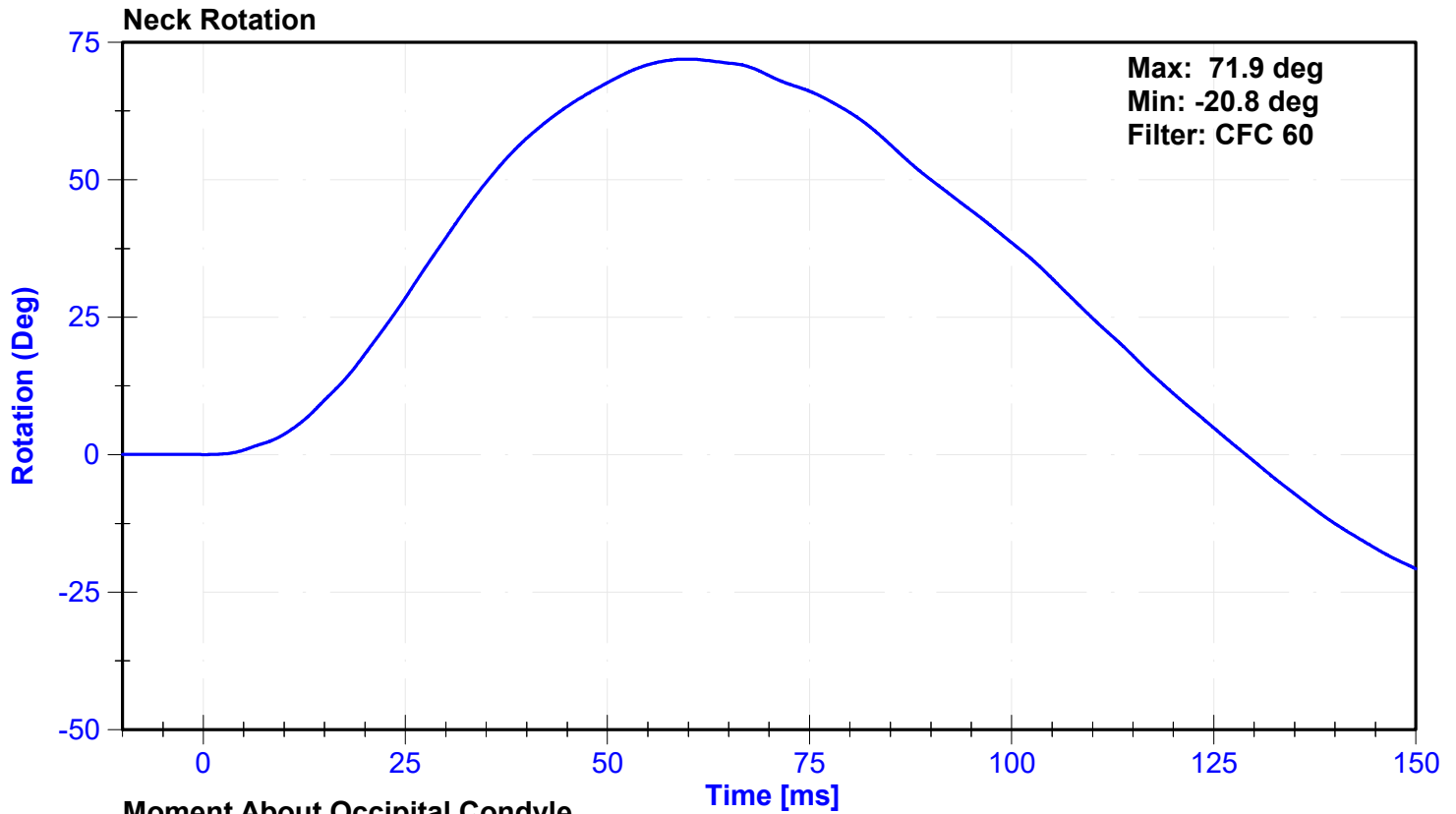
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.8	Pass
Humidity	10	70	%	60	Pass
Velocity	5.51	5.63	m/s	5.557	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.36	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.62	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.91	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.84	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.91	Pass
Neck Rotation	71	81	deg	71.9	Pass
Time at Maximum Rotation	50	70	ms	59.8	Pass
Moment about the OC	36	44	Nm	41.7	Pass
Moment Decay to 0 Nm	102	126	ms	113.9	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	300	Laboratory Supervisor	C. Mantell

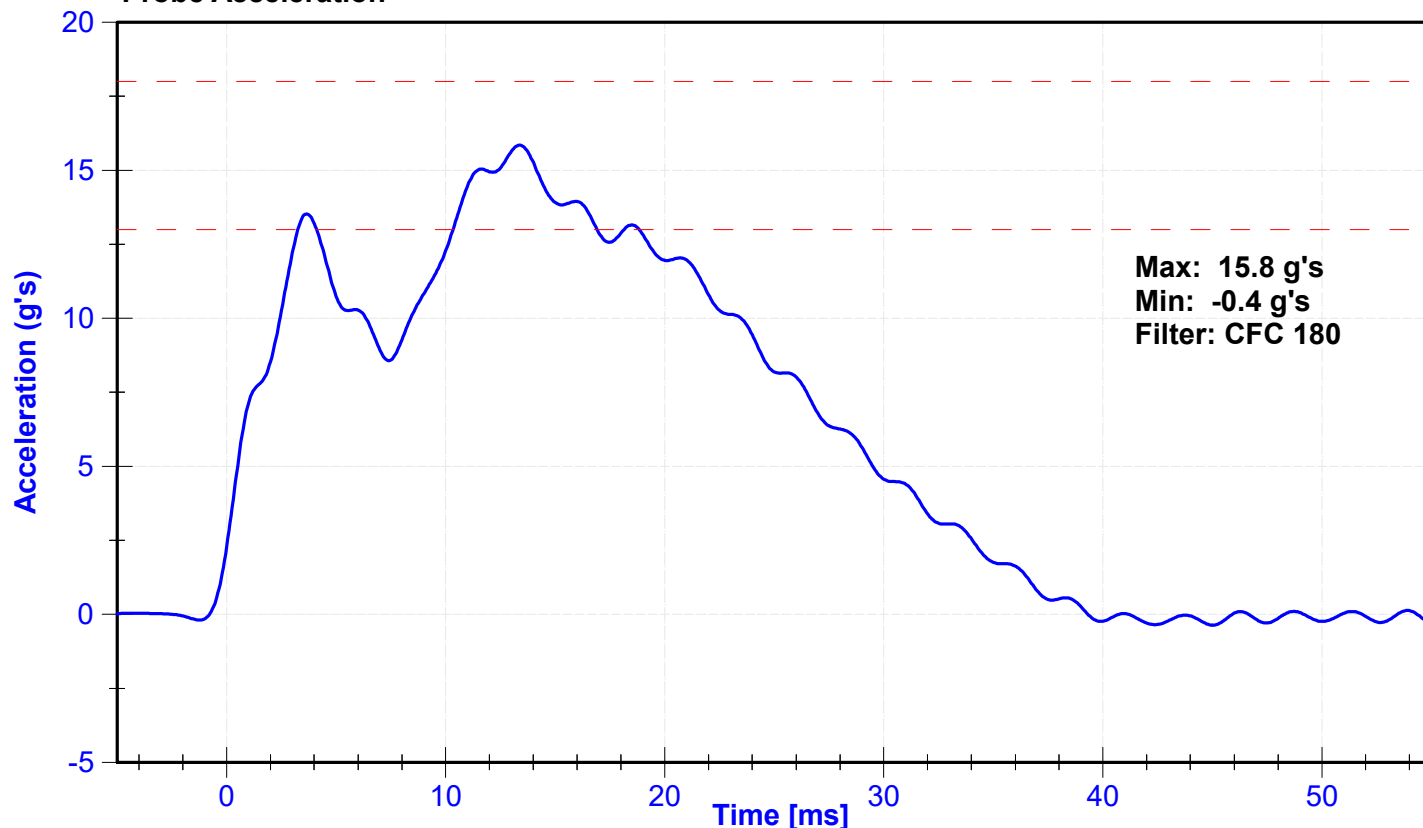
Results

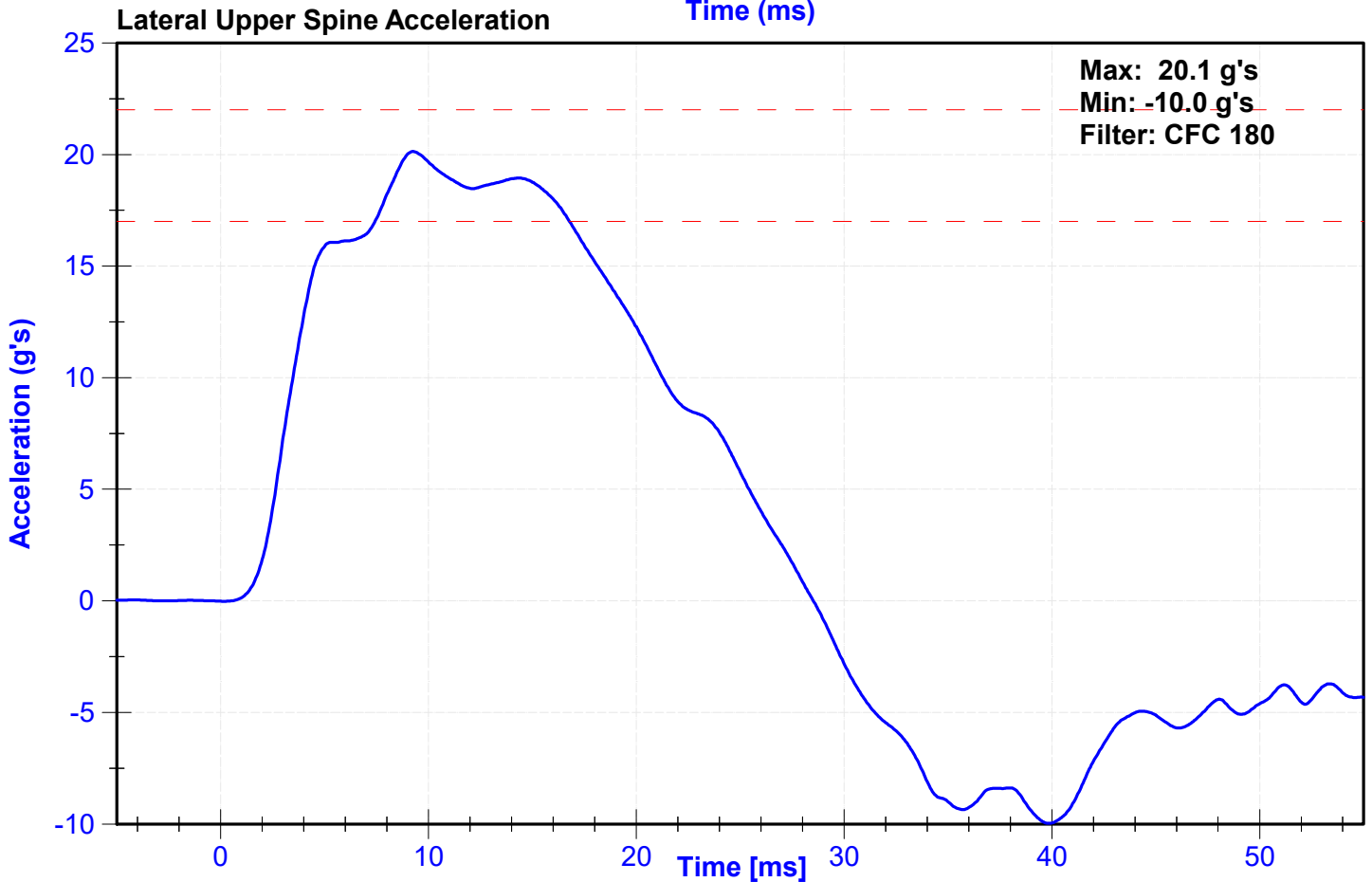
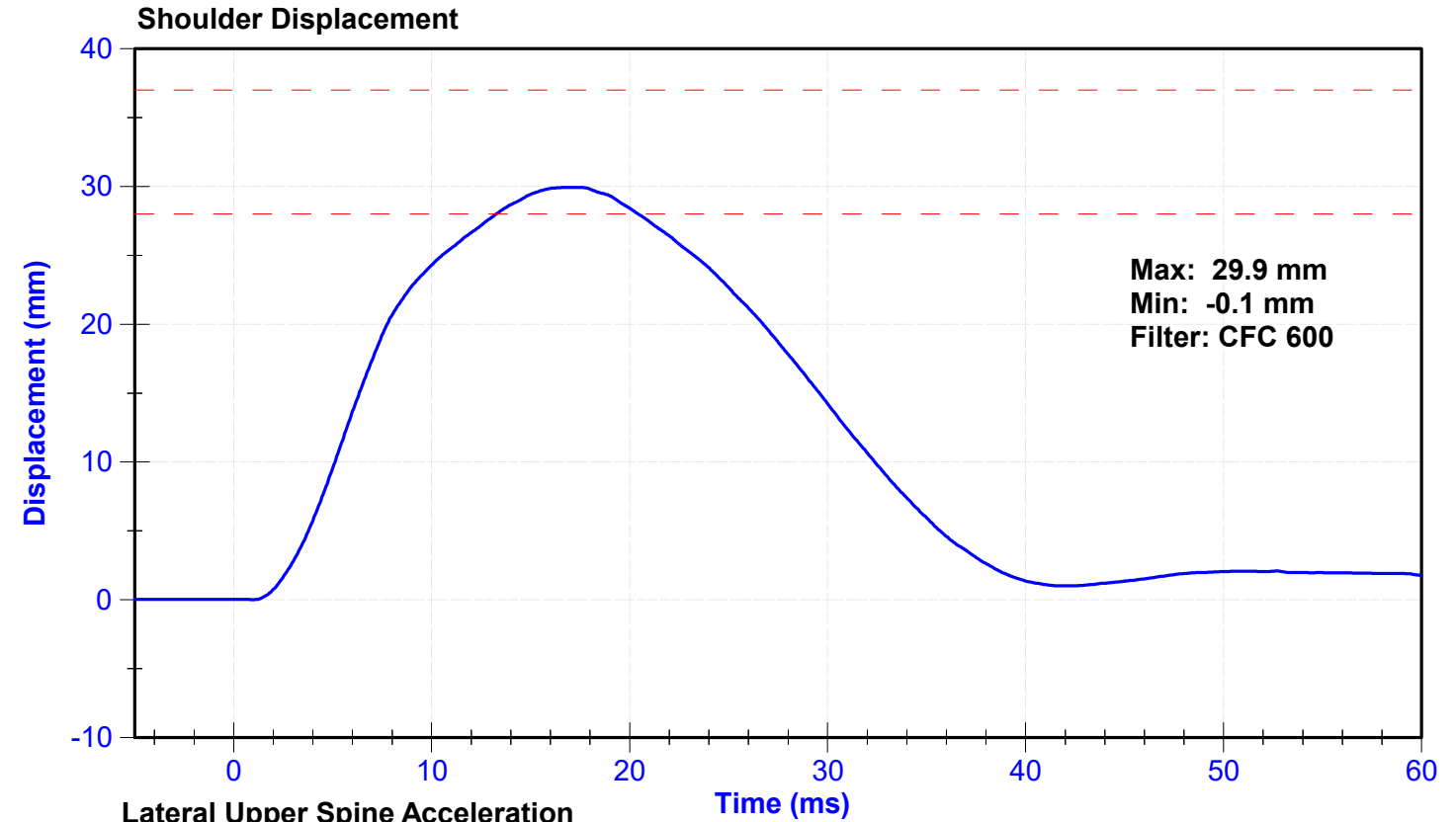
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	57	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	13	18	g's	15.8	Pass
Shoulder Deflection	28	37	mm	29.9	Pass
Lateral Upper Spine Acceleration	17	22	g's	20.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Shoulder Potentiometer	Servo	053GFE	5/9/2024	11/7/2024
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024

Probe Acceleration





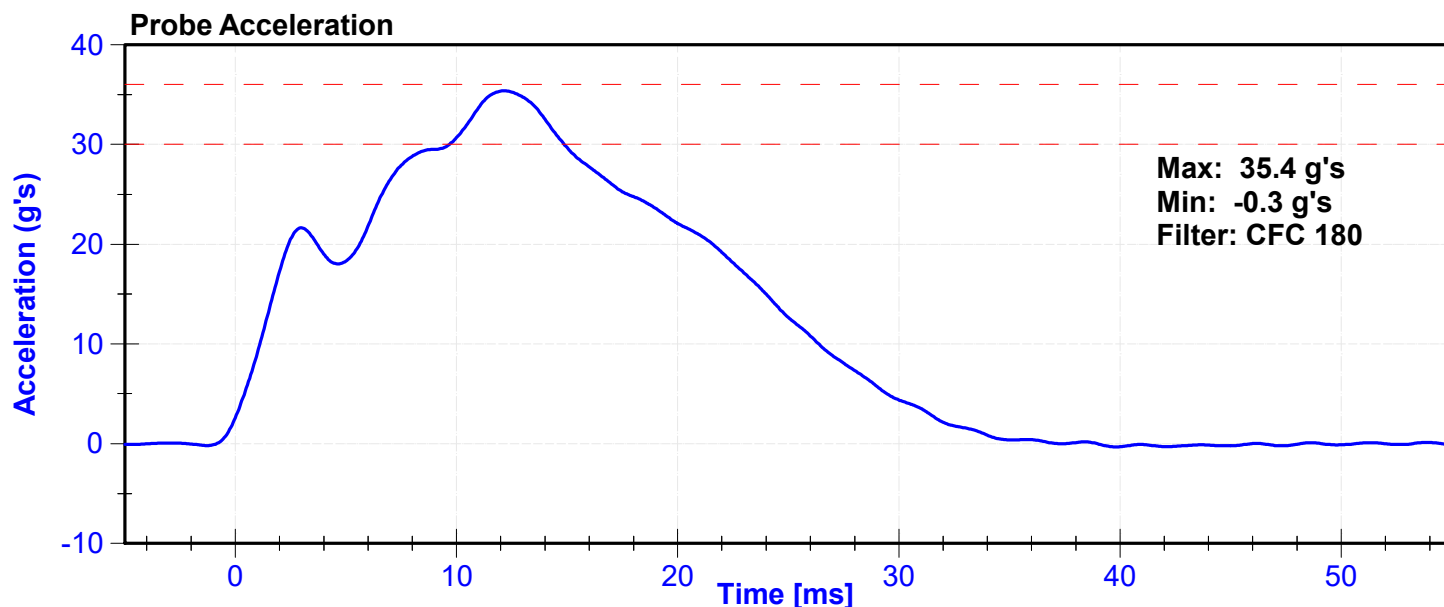
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

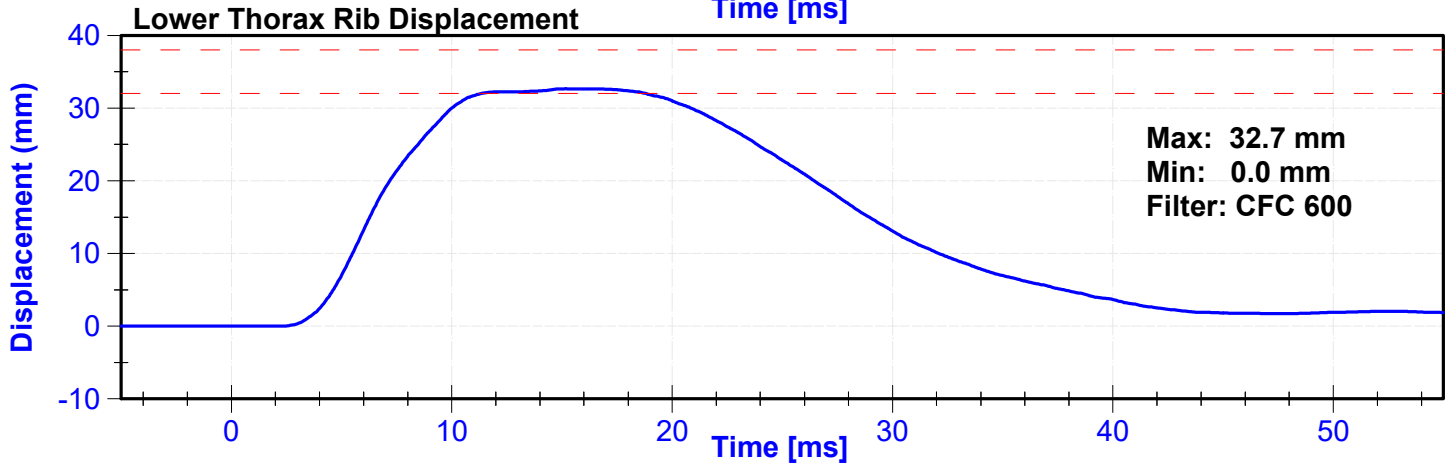
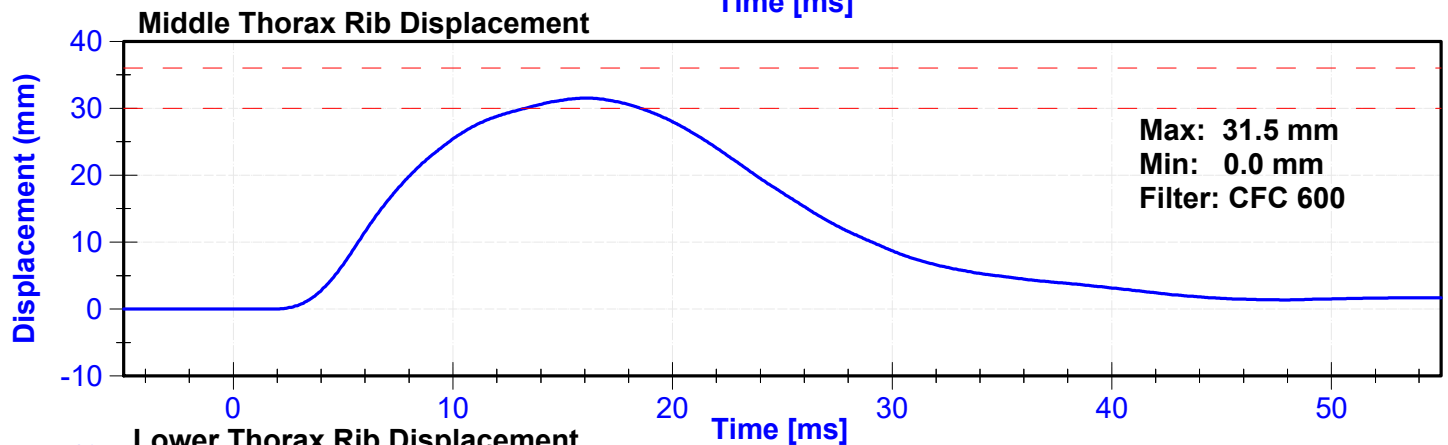
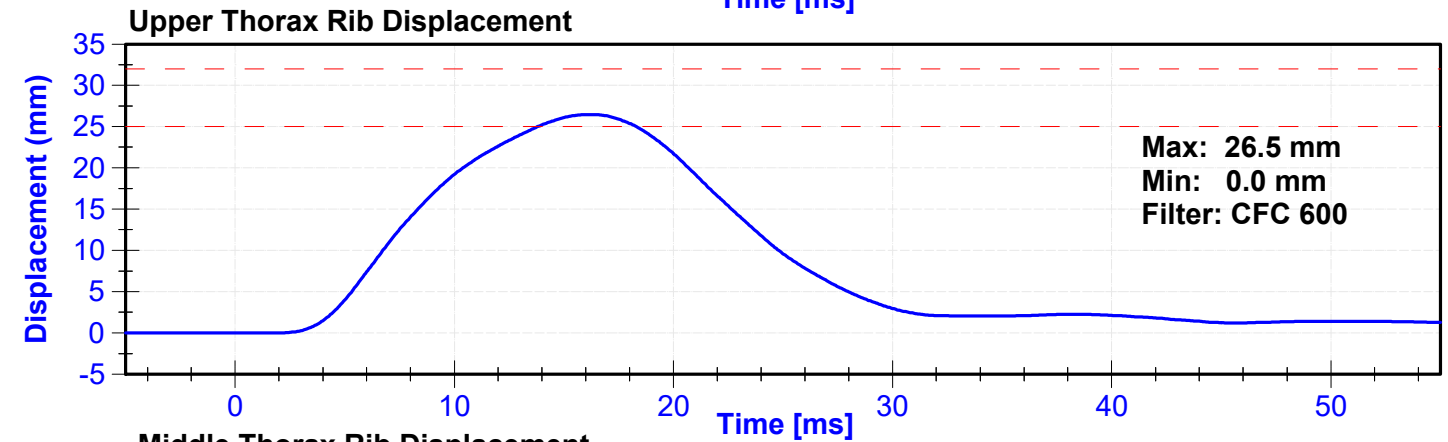
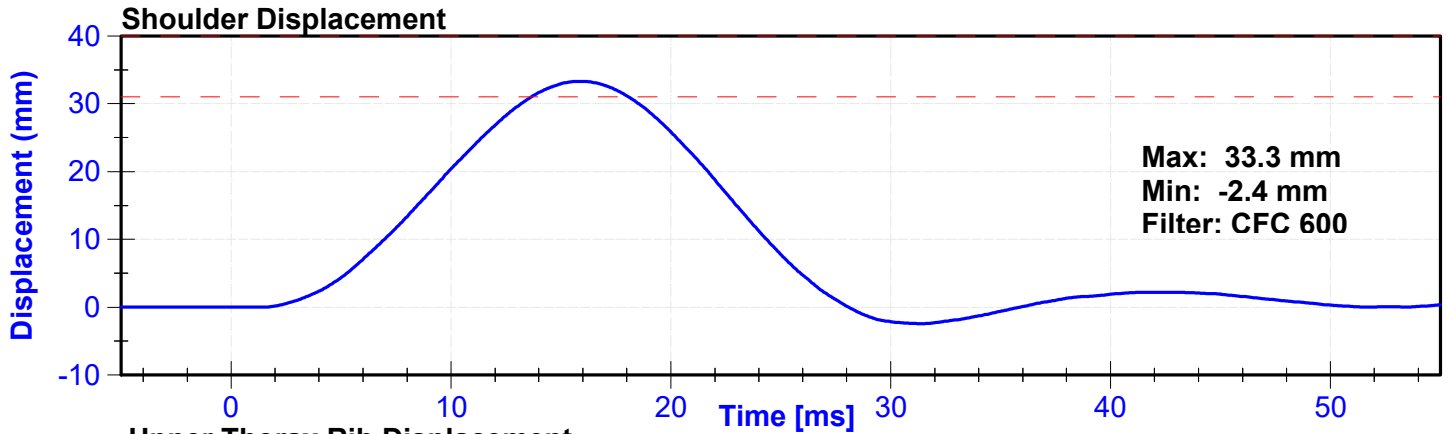
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	57	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration after 5 ms	30	36	g's	35.4	Pass
Lateral Upper Spine Acceleration	34	43	g's	36.5	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.9	Pass
Shoulder Deflection	31	40	mm	33.3	Pass
Upper Thorax Rib Deflection	25	32	mm	26.5	Pass
Mid Thorax Rib Deflection	30	36	mm	31.5	Pass
Lower Thorax Rib Deflection	32	38	mm	32.7	Pass

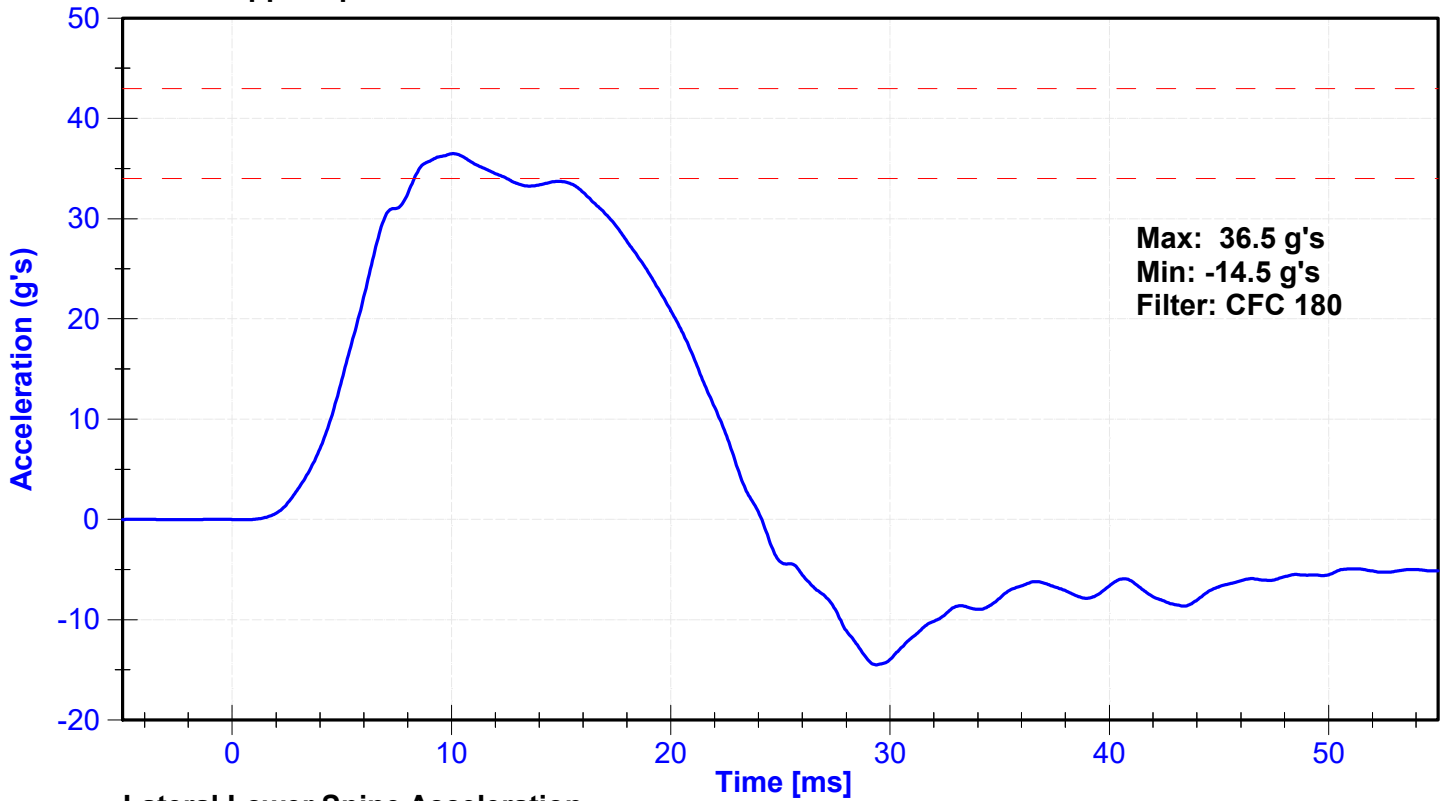
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Upper Spine T1 Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Upper Spine T12 Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Shoulder Potentiometer	Servo	053GFE	5/9/2024	11/7/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	5/9/2024	11/7/2024
Middle Thorax Rib Potentiometer	Servo	085GFE	5/9/2024	11/7/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	5/9/2024	11/7/2024

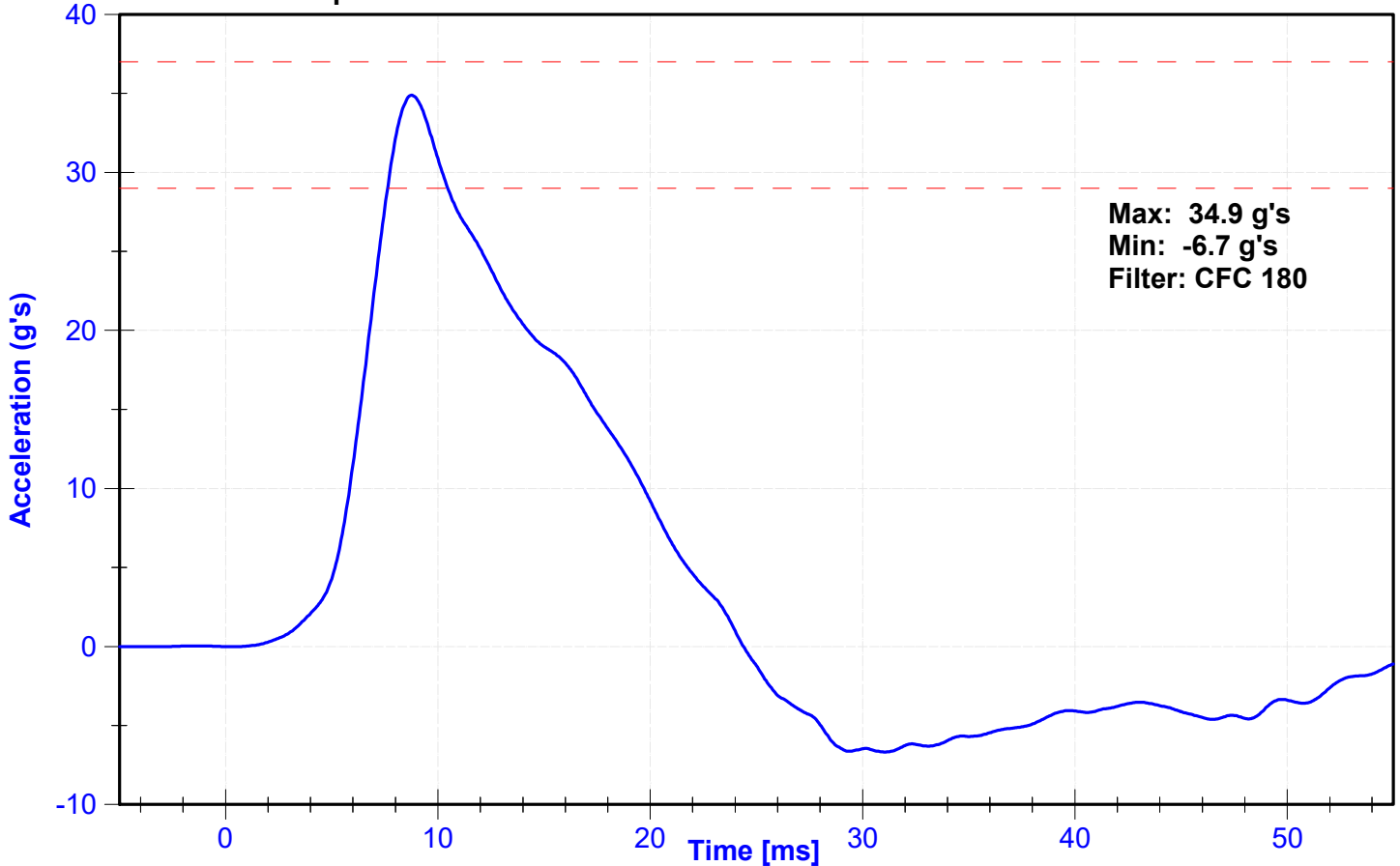




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



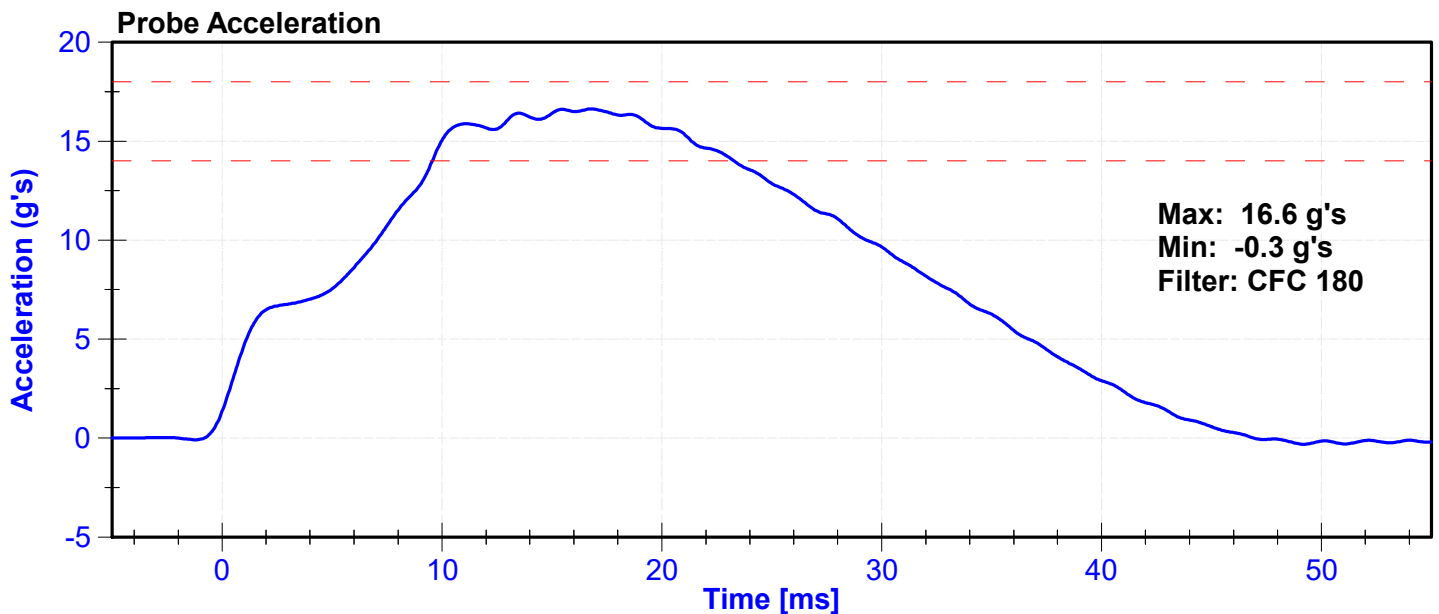
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

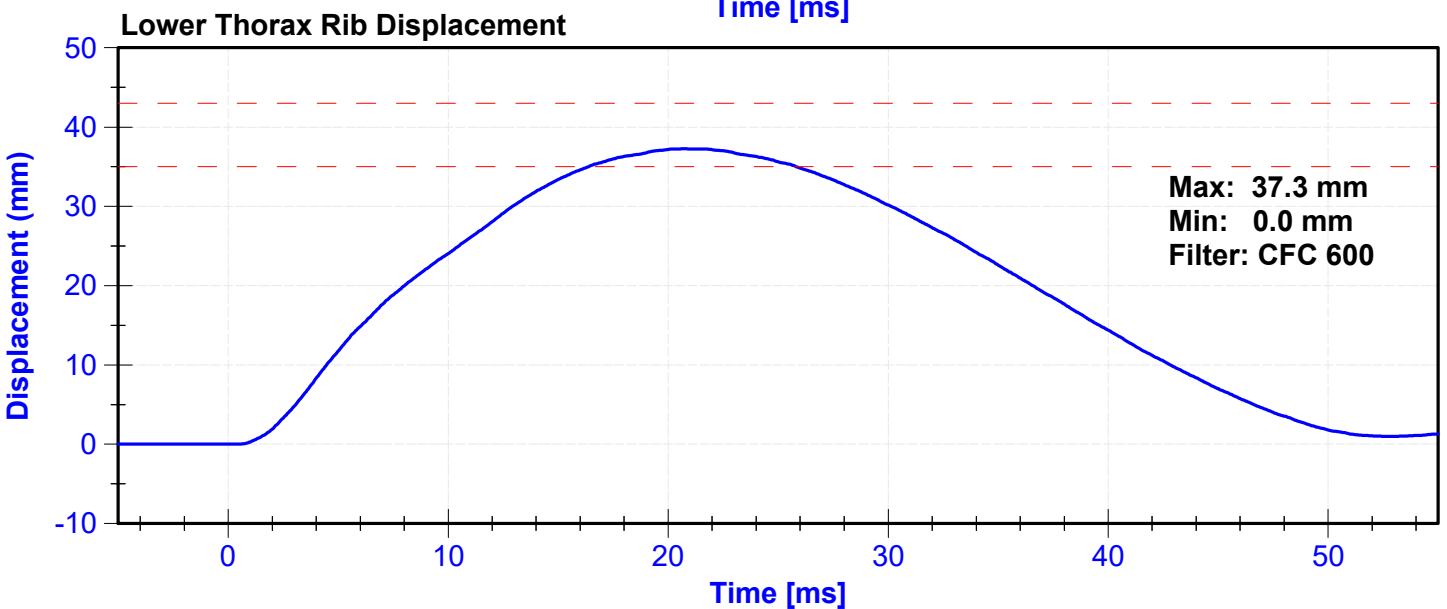
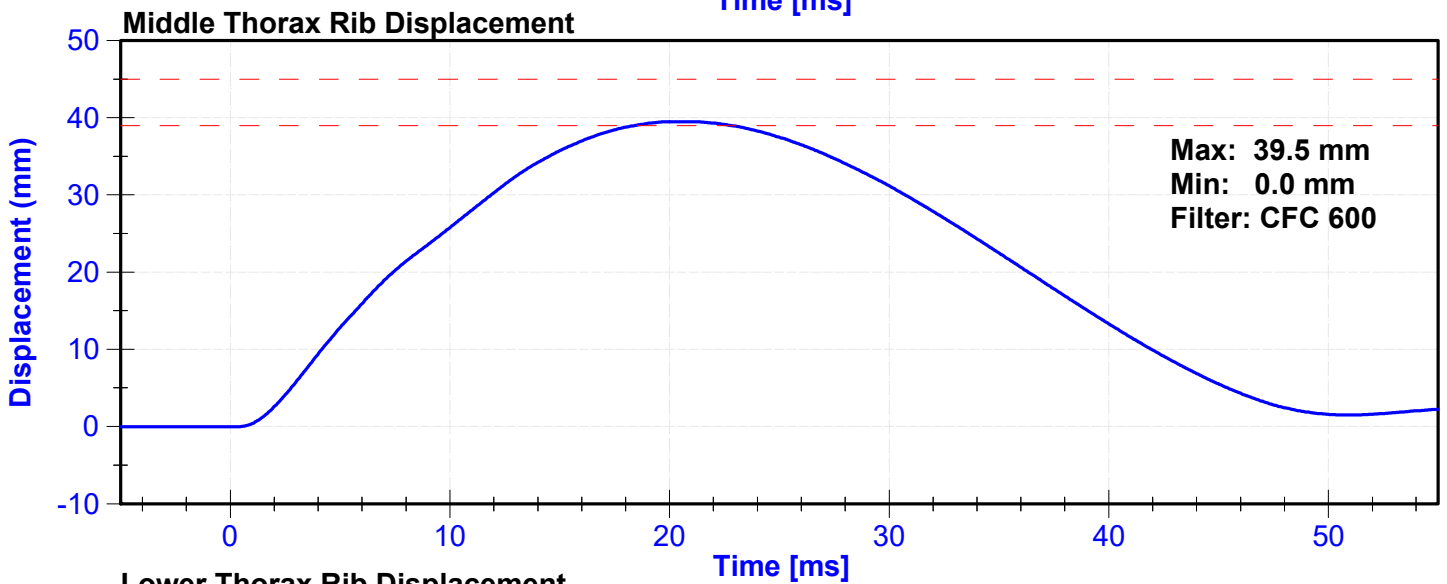
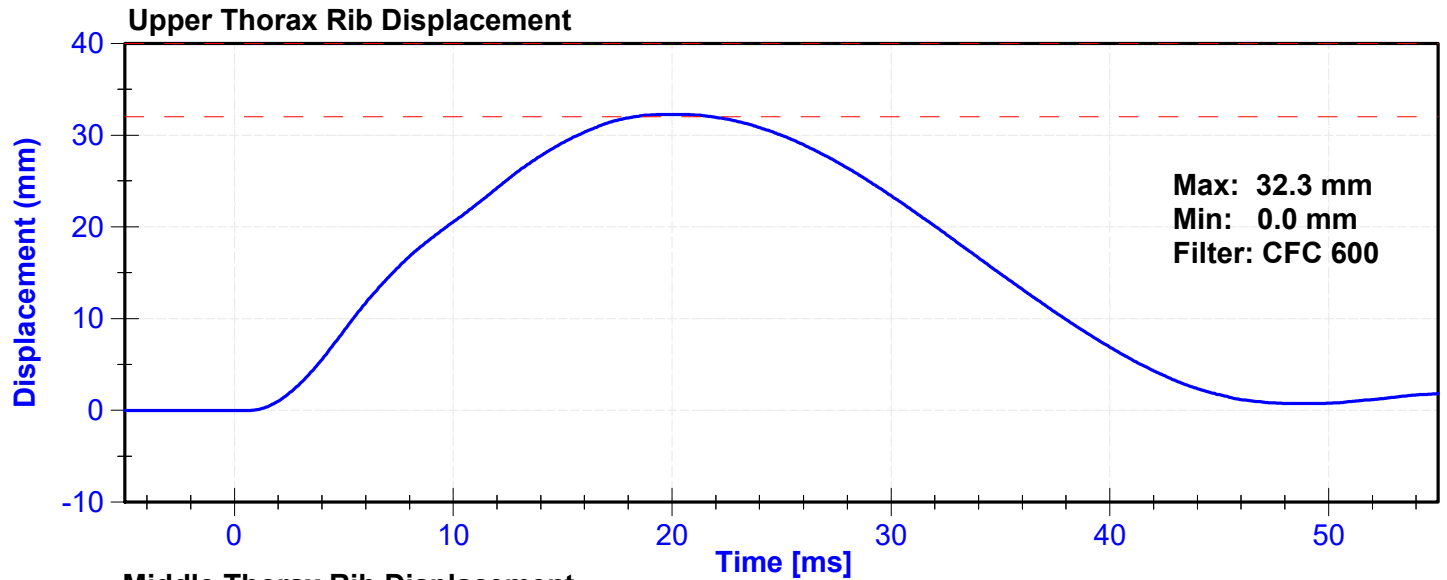
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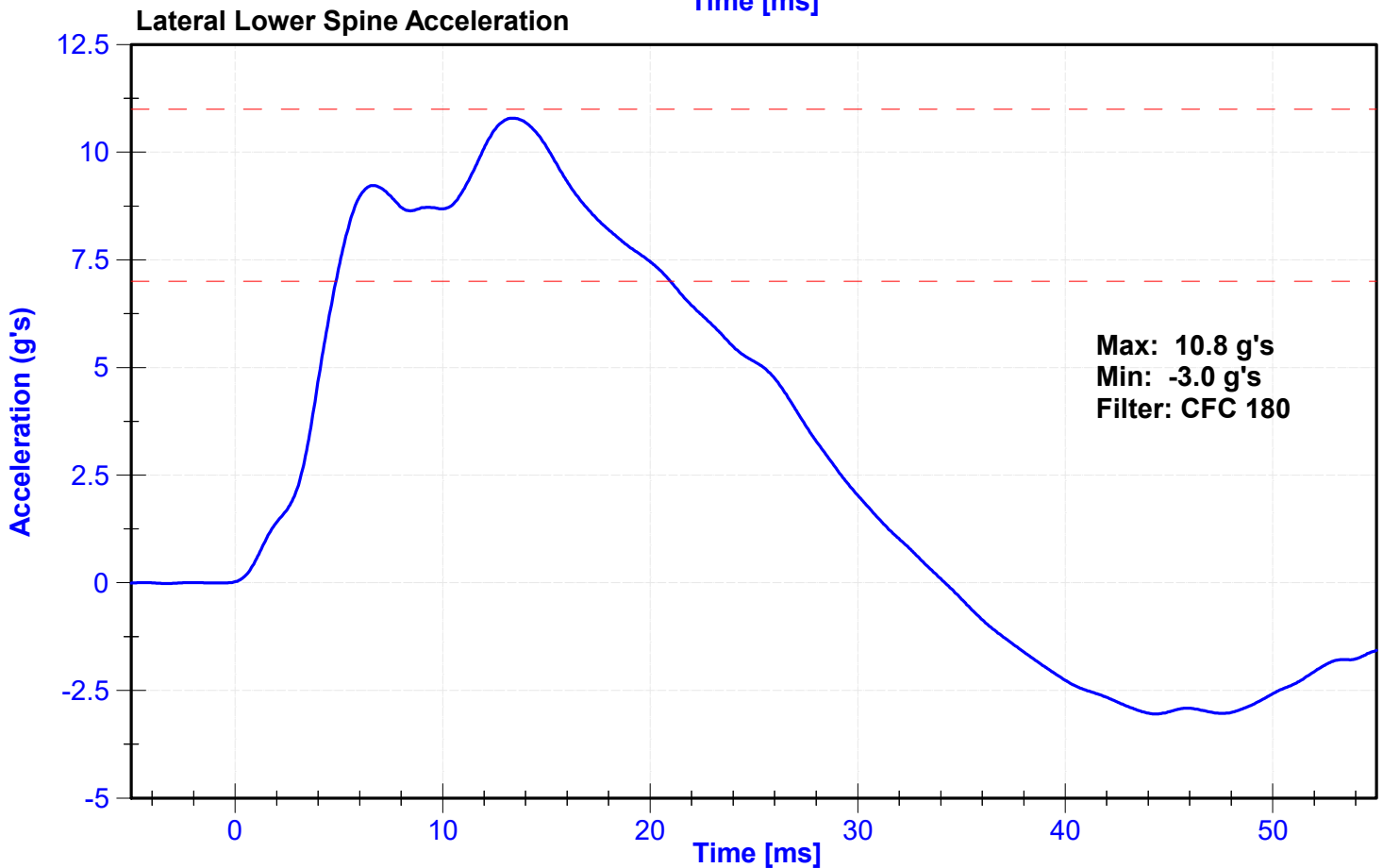
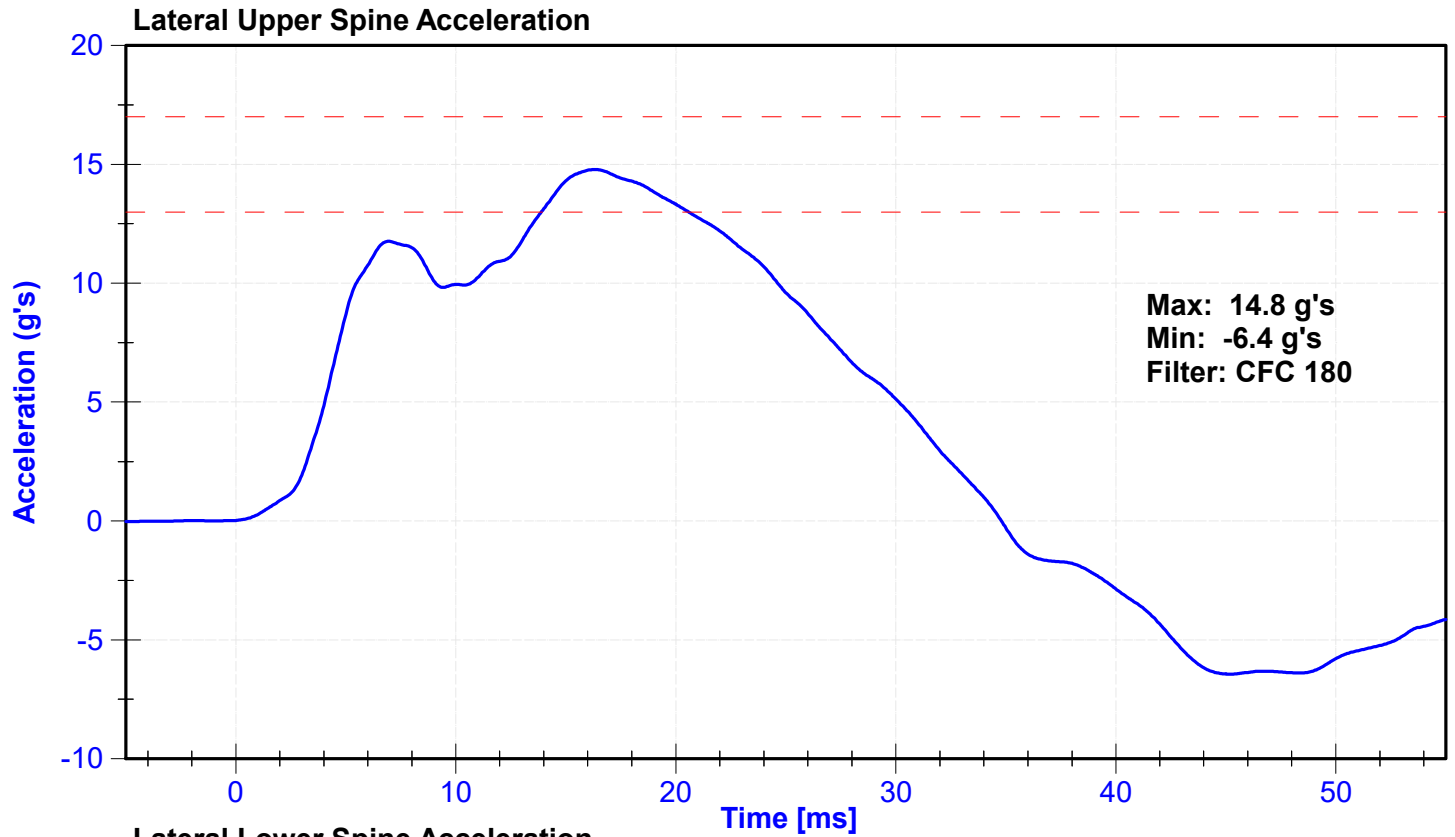
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	57	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	14	18	g's	16.6	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.8	Pass
Lateral Lower Spine Acceleration	7	11	g's	10.8	Pass
Upper Thorax Rib Deflection	32	40	mm	32.3	Pass
Middle Thorax Rib Deflection	39	45	mm	39.5	Pass
Lower Thorax Rib Deflection	35	43	mm	37.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	5/9/2024	11/7/2024
Middle Thorax Rib Potentiometer	Servo	085GFE	5/9/2024	11/7/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	5/9/2024	11/7/2024







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

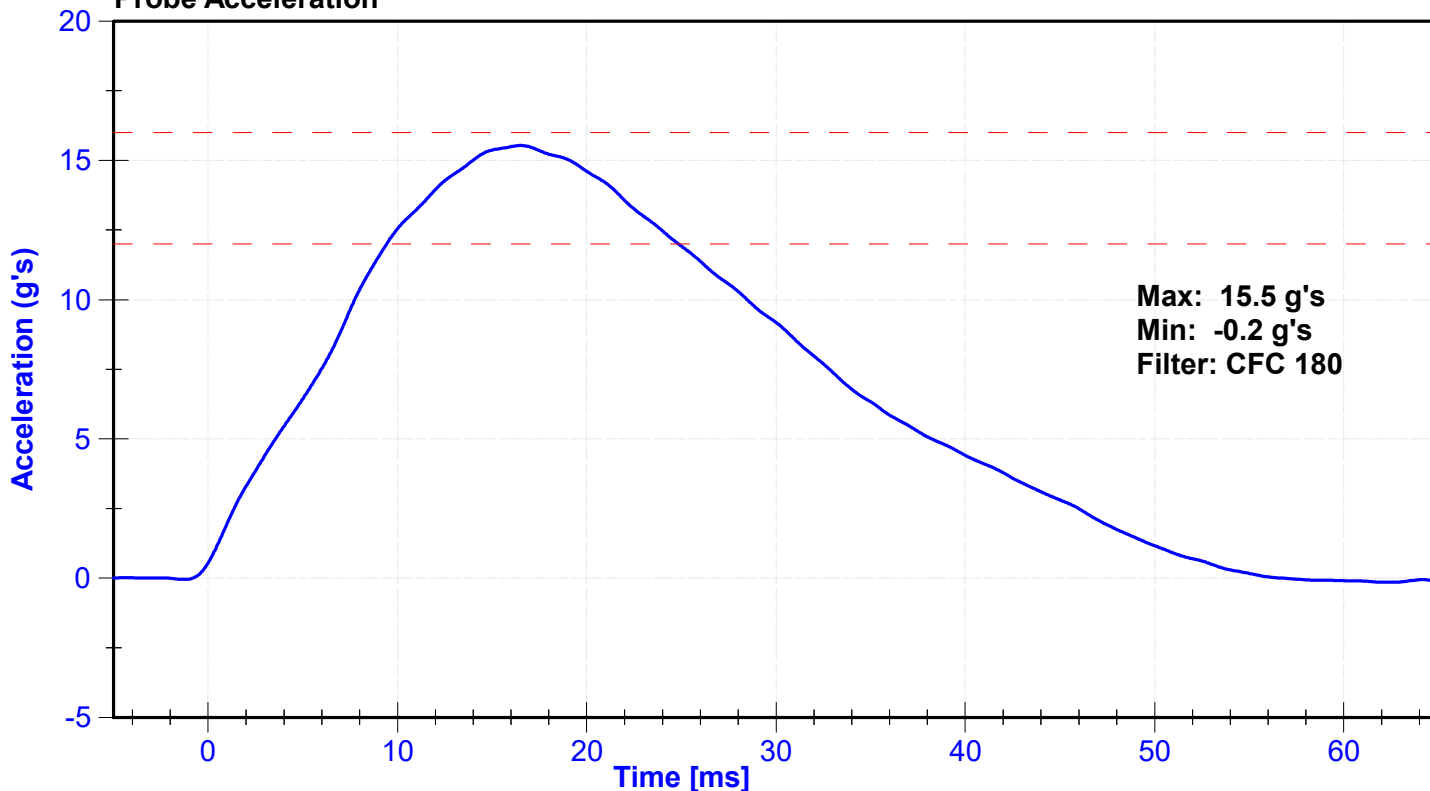
Results

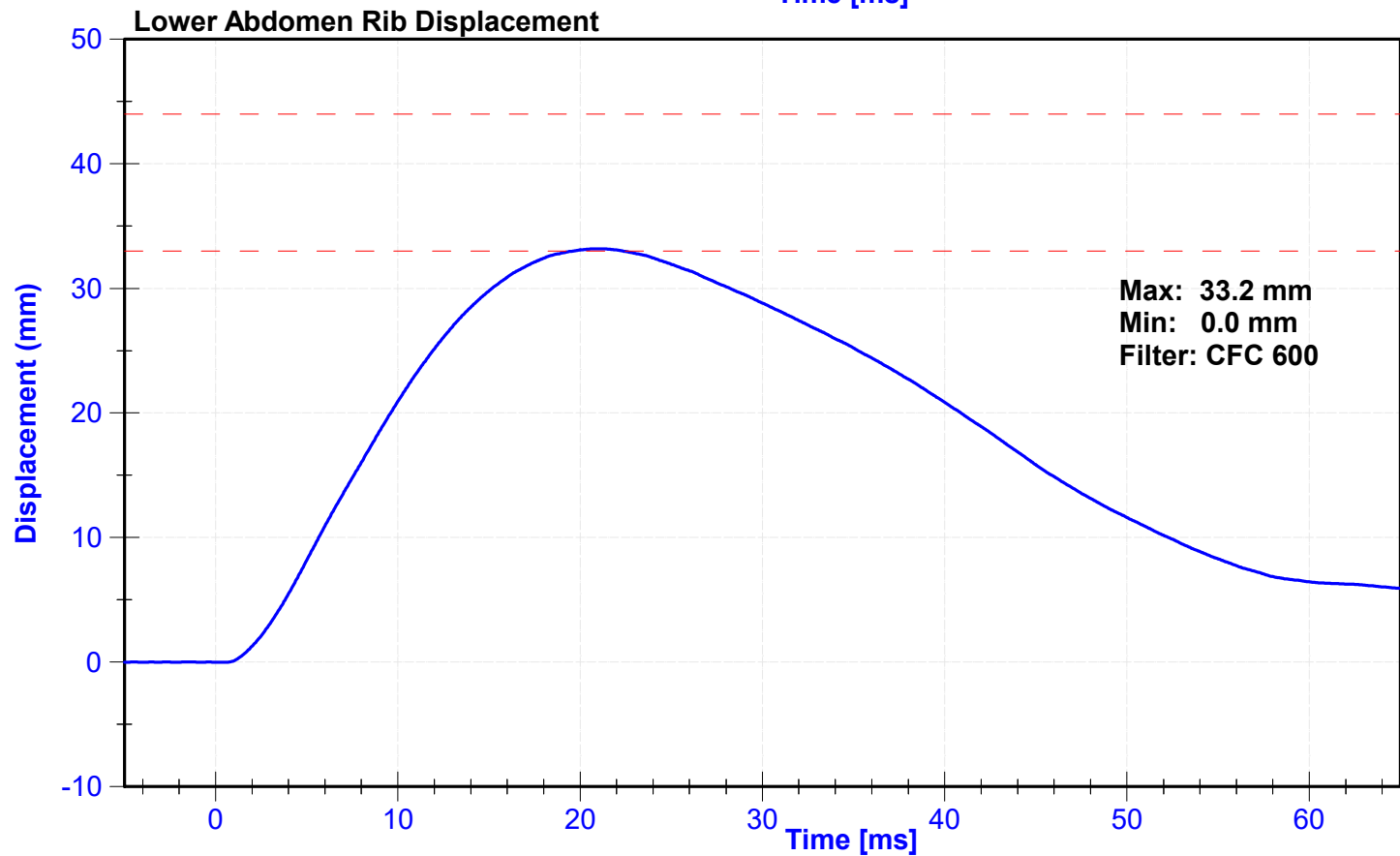
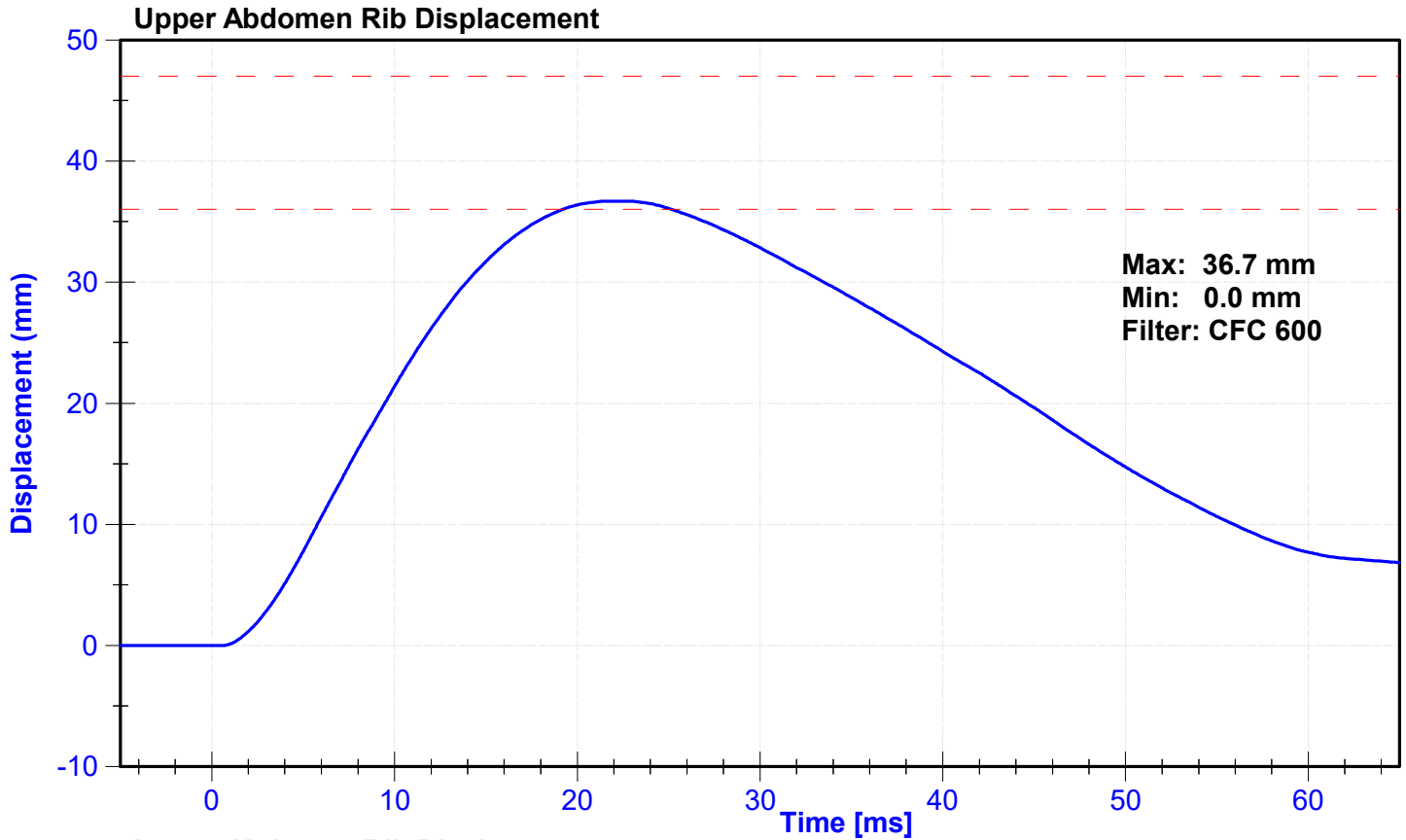
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	57	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	12	16	g's	15.5	Pass
Lateral Lower Spine Acceleration	9	14	g's	12.0	Pass
Upper Abdomen Rib Deflection	36	47	mm	36.7	Pass
Lower Abdomen Rib Deflection	33	44	mm	33.2	Pass

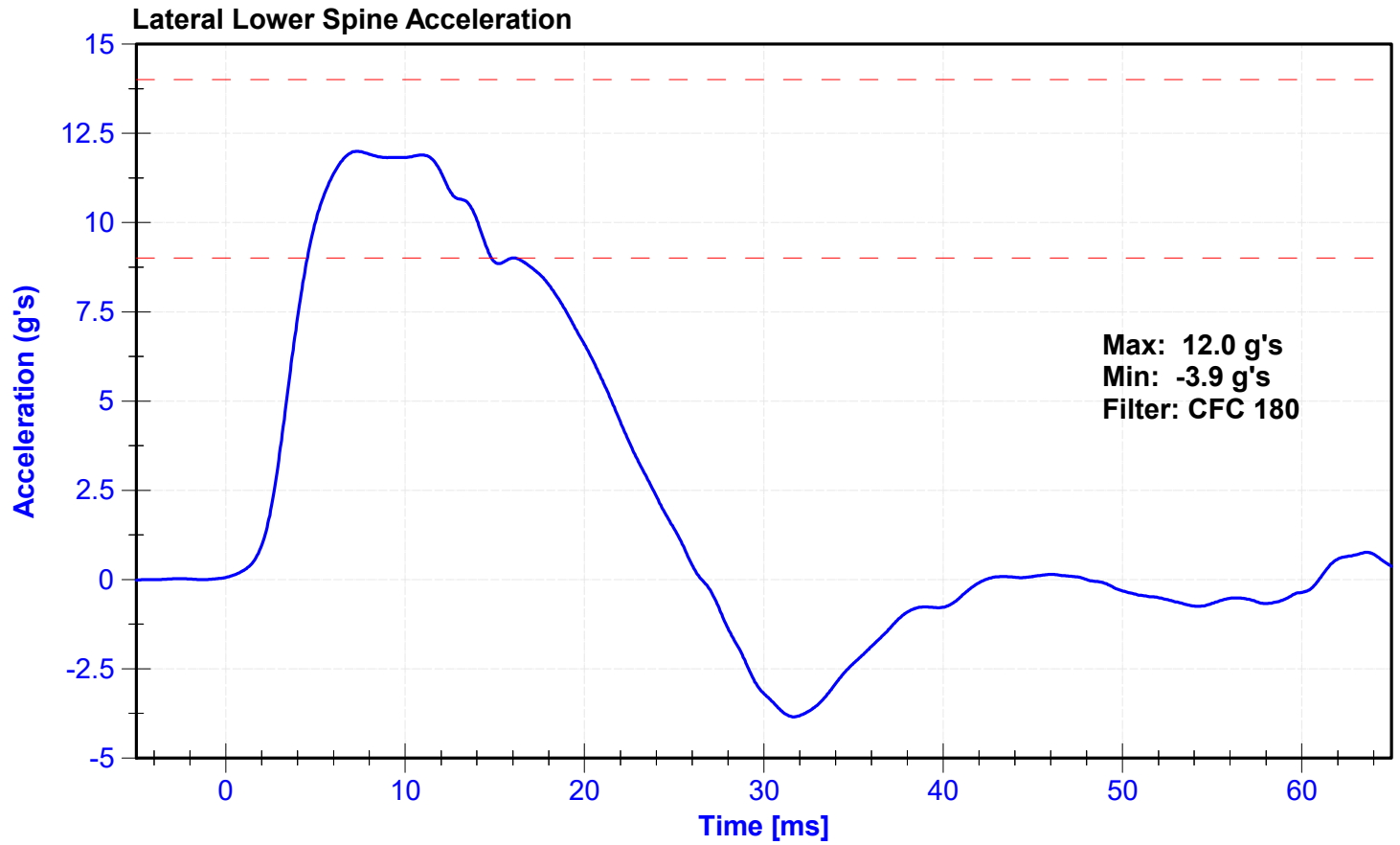
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Abdomen Rib Potentiometer	Servo	074GFE	5/28/2024	11/26/2024
Lower Abdomen Rib Potentiometer	Servo	075GFE	5/28/2024	11/26/2024

Probe Acceleration







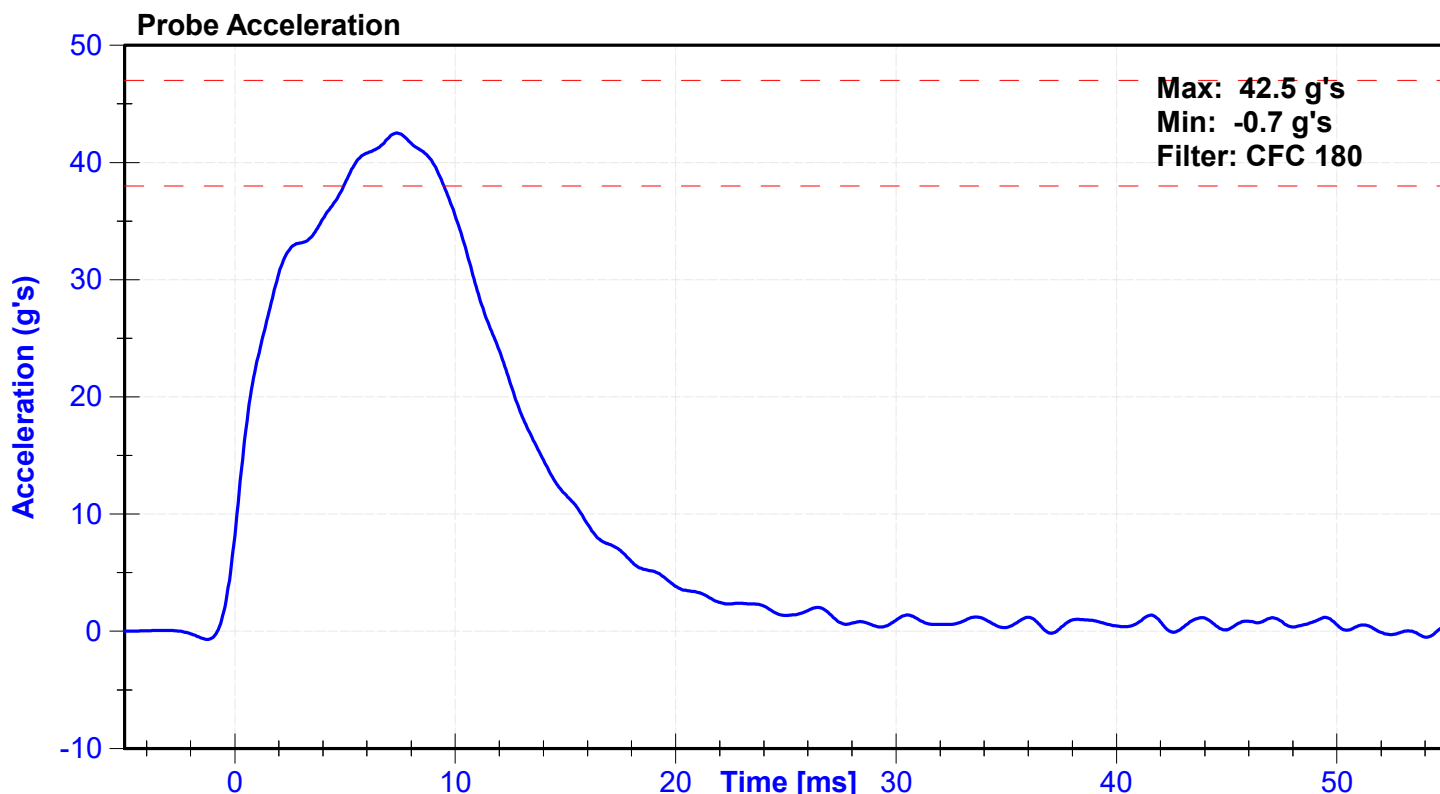
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

Results

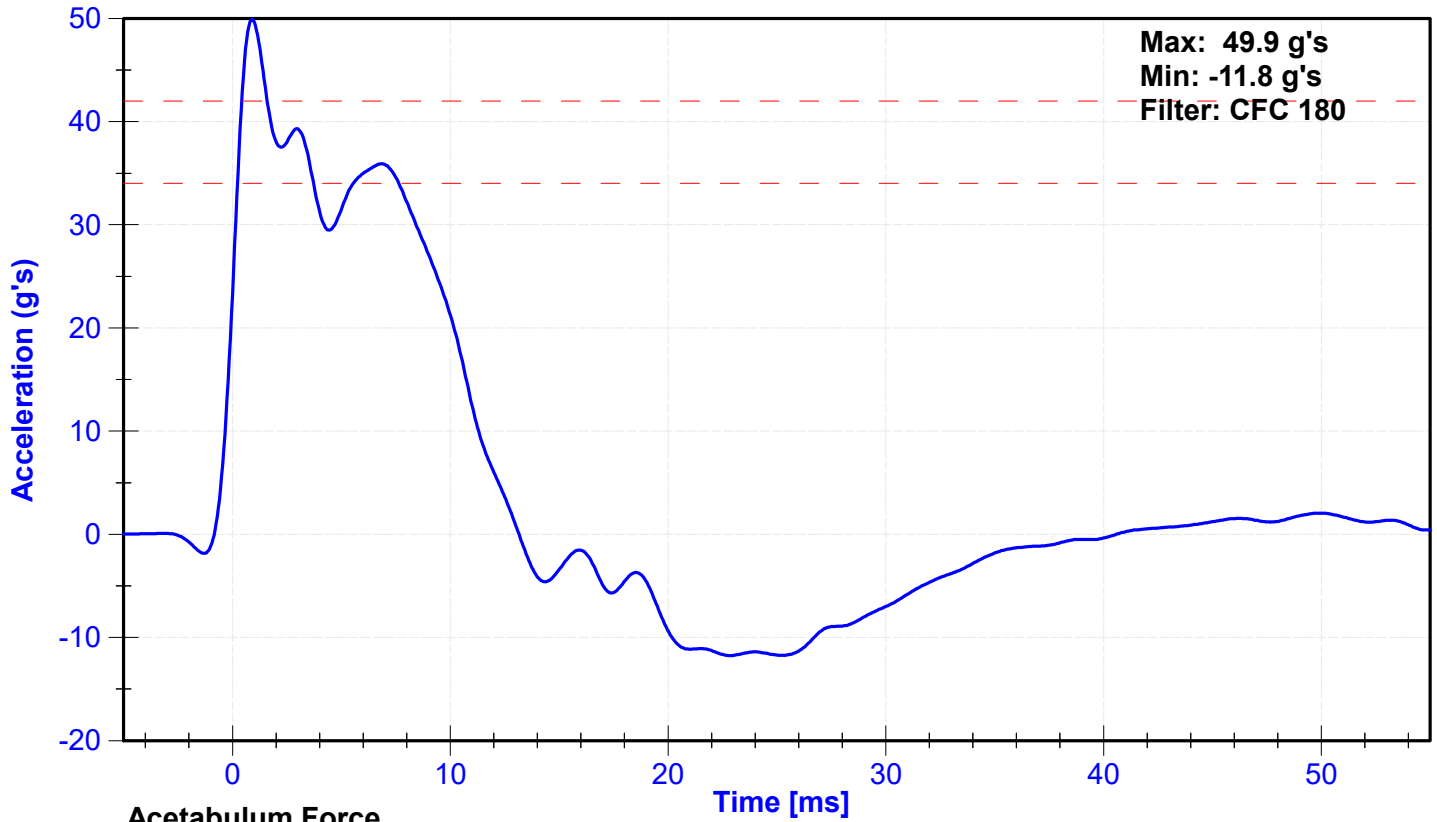
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	57	Pass
Velocity	6.6	6.8	m/s	6.66	Pass
Probe Acceleration	38	47	g's	42.5	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	35.9	Pass
Acetabulum Force	3600	4300	N	3939.0	Pass

Transducer Calibrations

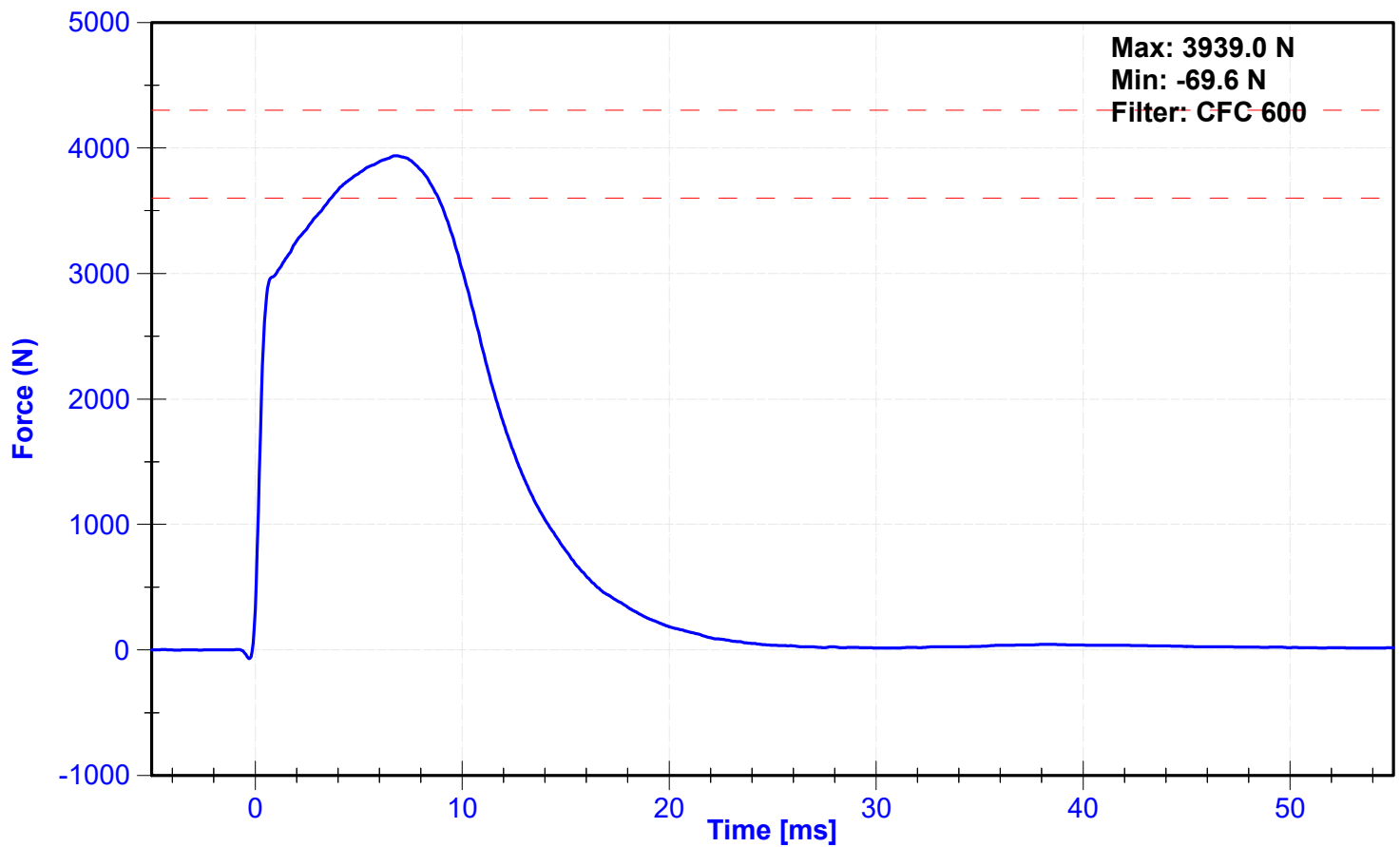
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Pelvis Y Accelerometer	Endevco	P51731	5/9/2024	11/5/2024
Acetabulum Load Cell	Denton	275-FY	7/12/2024	7/12/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A



Lateral Pelvis Acceleration



Acetabulum Force





SID-ILS Pelvis Plug Certification Test

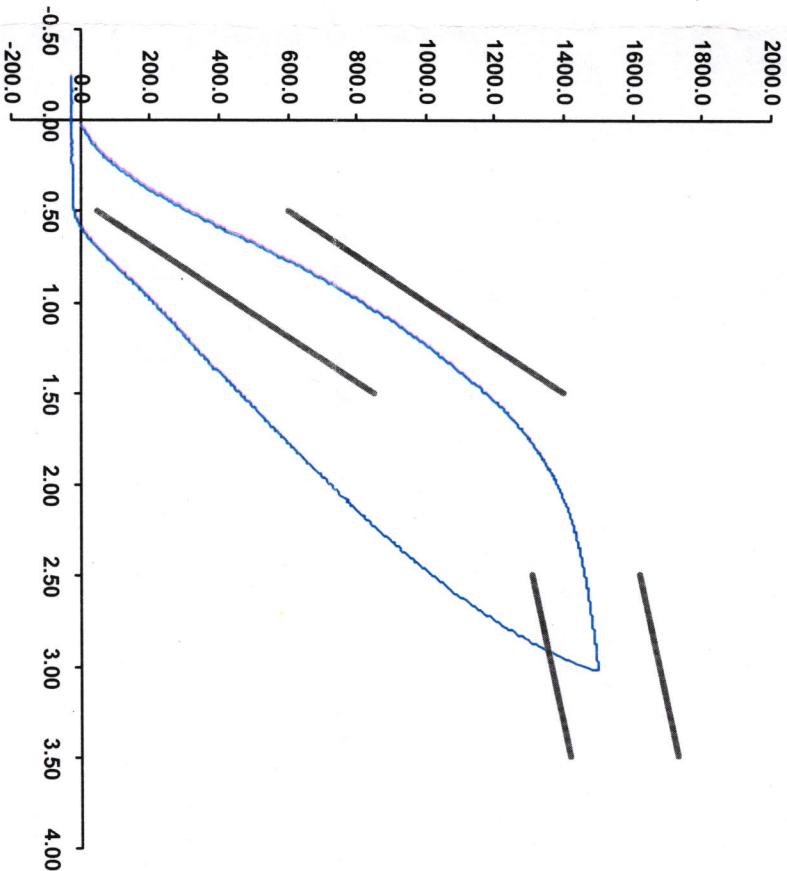
Plug S/N 16760
Test Number 23563
Report Number 23620
Test Date 7/22/2022 1:53:06 PM

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 (F1360947), Units (LBS) 1000
Crosshead Speed (mm / min) or Rate 12.7
Extension or Position Measured by XHD_100 (XHD100)

Notes:
300 Cert Plug 9/18/2024

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 22-Jul-22
SACO Research

By: DC Date: 7/22/22
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-11s Pelvis Plug Certification Test

Plug S/N 15783

Test Number 20683

Report Number 20737

Test Date 10/15/2021 8:22:25 AM

Force (-N) vs Extension (-mm)

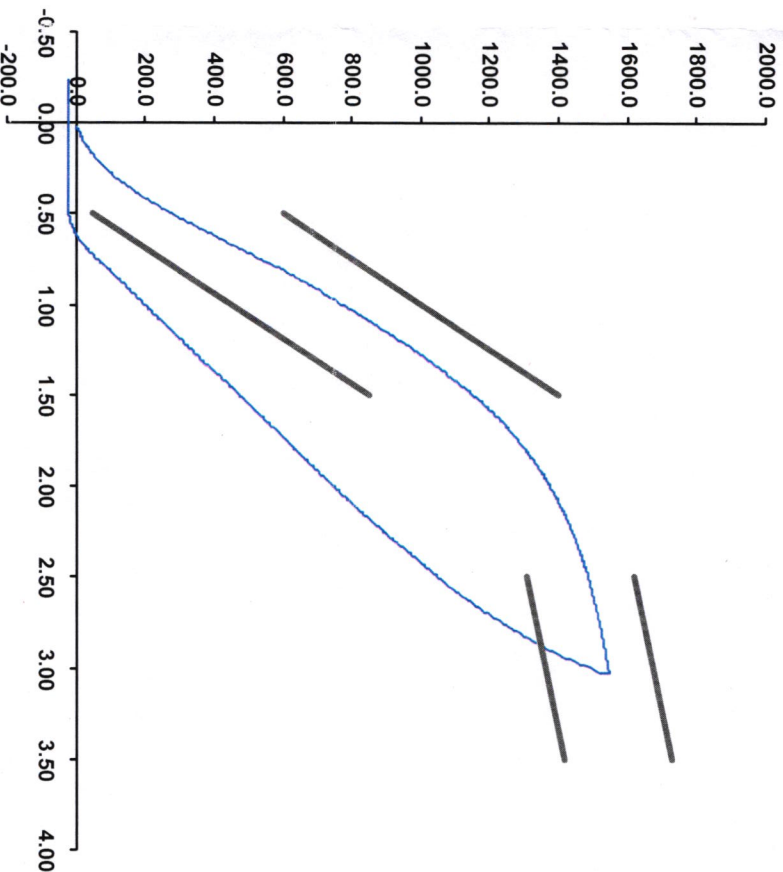
Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50	600
Force @ 1.5 mm (N)	850	1,400
Force @ 2.5 mm (N)	1,306	1,618
Force @ 3.0 mm (N)	1,361	1,673

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:

300 Impact 9/18/2024



Operator

Part Number 180-4450

Template No 107 15-Oct-21

SACO Research

By: DE

Date: 10/15/21

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



SID-ILIs Pelvis Plug Certification Test

Plug S/N 16460

Test Number 23029

Report Number 23087

Test Date 5/23/2022 12:52:01 PM

Force (-N) vs Extension (-mm)

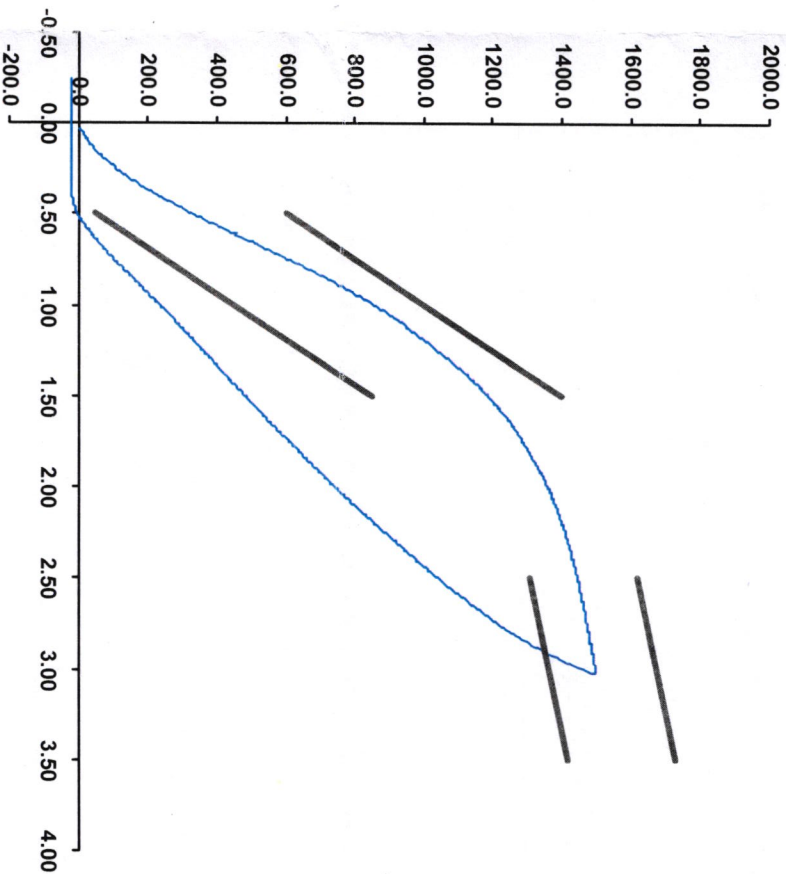
Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	50	600
Force @ 1.5 mm (N)	850	1,400
Force @ 2.5 mm (N)	1,306	1,618
Force @ 3.0 mm (N)	1,361	1,673

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:

300 Non Impact 9/12/2024



Operator

Part Number 180-4450

Template No 107 23-May-22

SACO Research

By: XC

Date: 5/23/2022

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

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

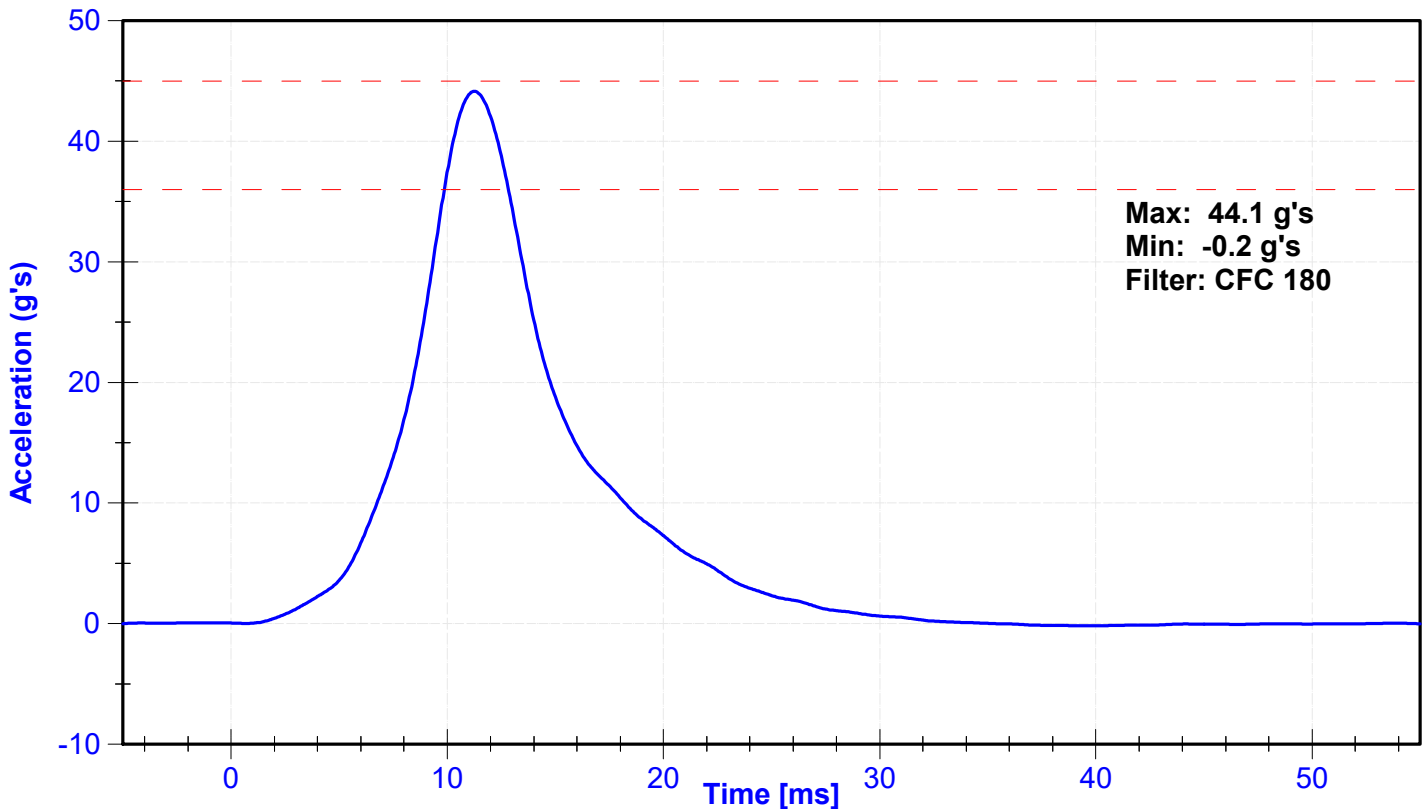
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	57	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	36	45	g's	44.1	Pass
Lateral Pelvis Acceleration	28	39	g's	33.4	Pass
Iliac Force	4100	5100	N	5005.9	Pass

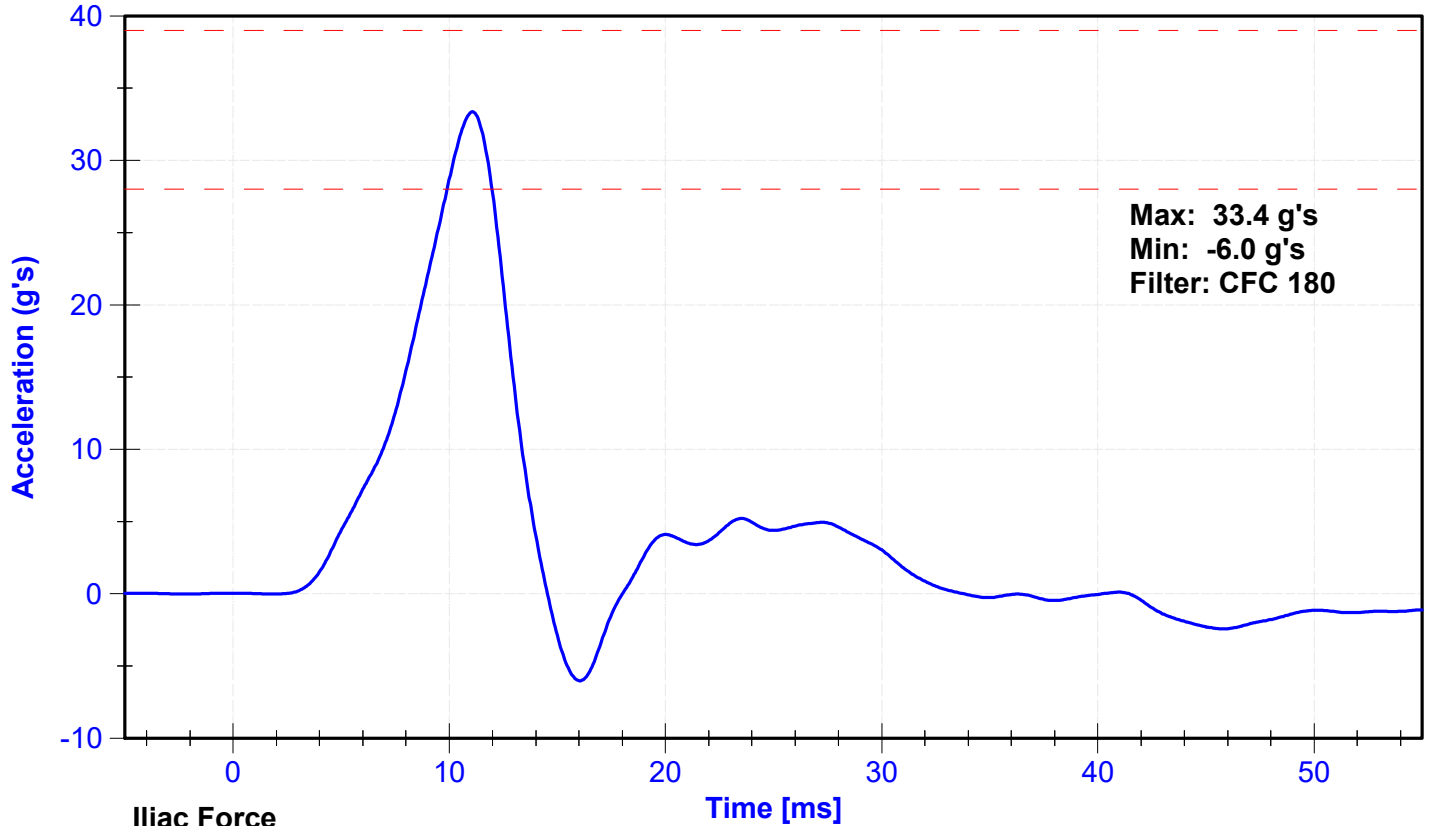
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Pelvis Y Accelerometer	Endevco	P51731	5/9/2024	11/5/2024
Iliac Load Cell	Denton	279-FY	12/5/2023	12/4/2024

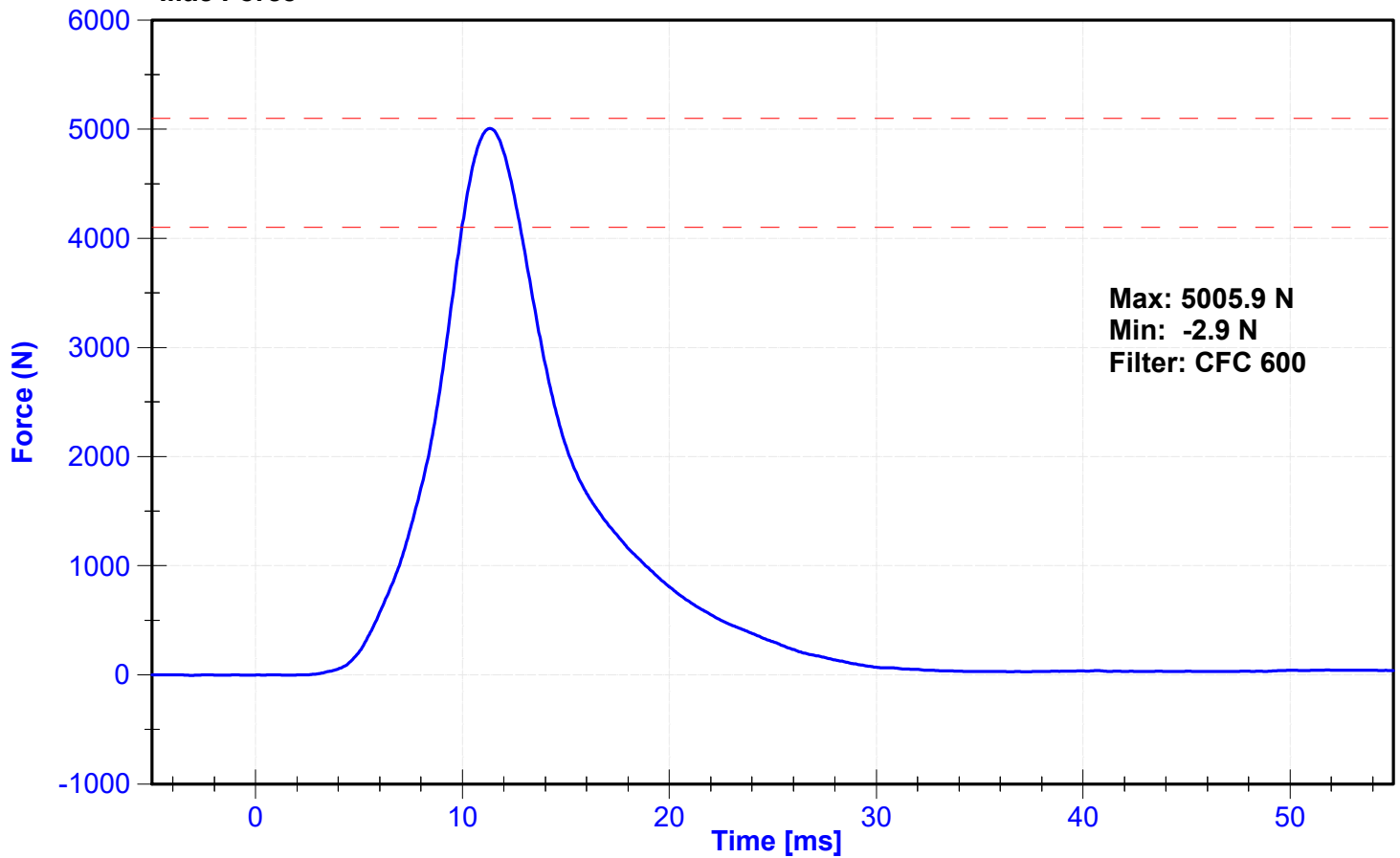
Probe Acceleration



Lateral Pelvis Acceleration



Iliac Force



CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO:300

(CONFIGURED FOR LEFT SIDE IMPACT)

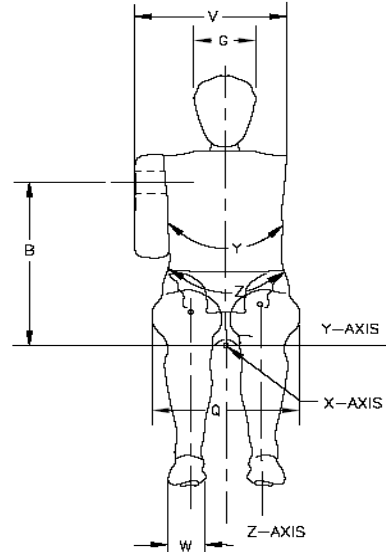
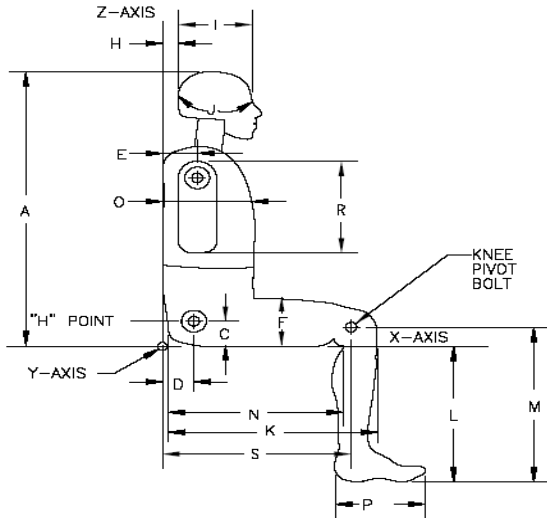


External Measurements - SID-IIs

Technician: J. Rios

Date: 9/23/2024

Dummy Serial Number: 300



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	781	Pass
B	Shoulder Pivot Height	437	453	447	Pass
C	H-point Height	79	89	84	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	99	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	44	Pass
I	Head Depth	178	188	183	Pass
J	Head Circumference	541	551	547	Pass
K	Buttock to Knee Length	514	540	528	Pass
L	Popliteal Height	343	369	355	Pass
M	Knee Pivot to floor height	392	409	399	Pass
N	Buttock Popliteal Length	416	442	431	Pass
O	Chest Depth w/o jacket	195	211	200	Pass
P	Foot Length	216	232	225	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	318	Pass
R	Arm Length	249	259	255	Pass
S	Knee Joint to seatback	477	493	485	Pass
V	Shoulder Width	341	357	351	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	872	Pass
Z	Waist Circumference	761	791	775	Pass

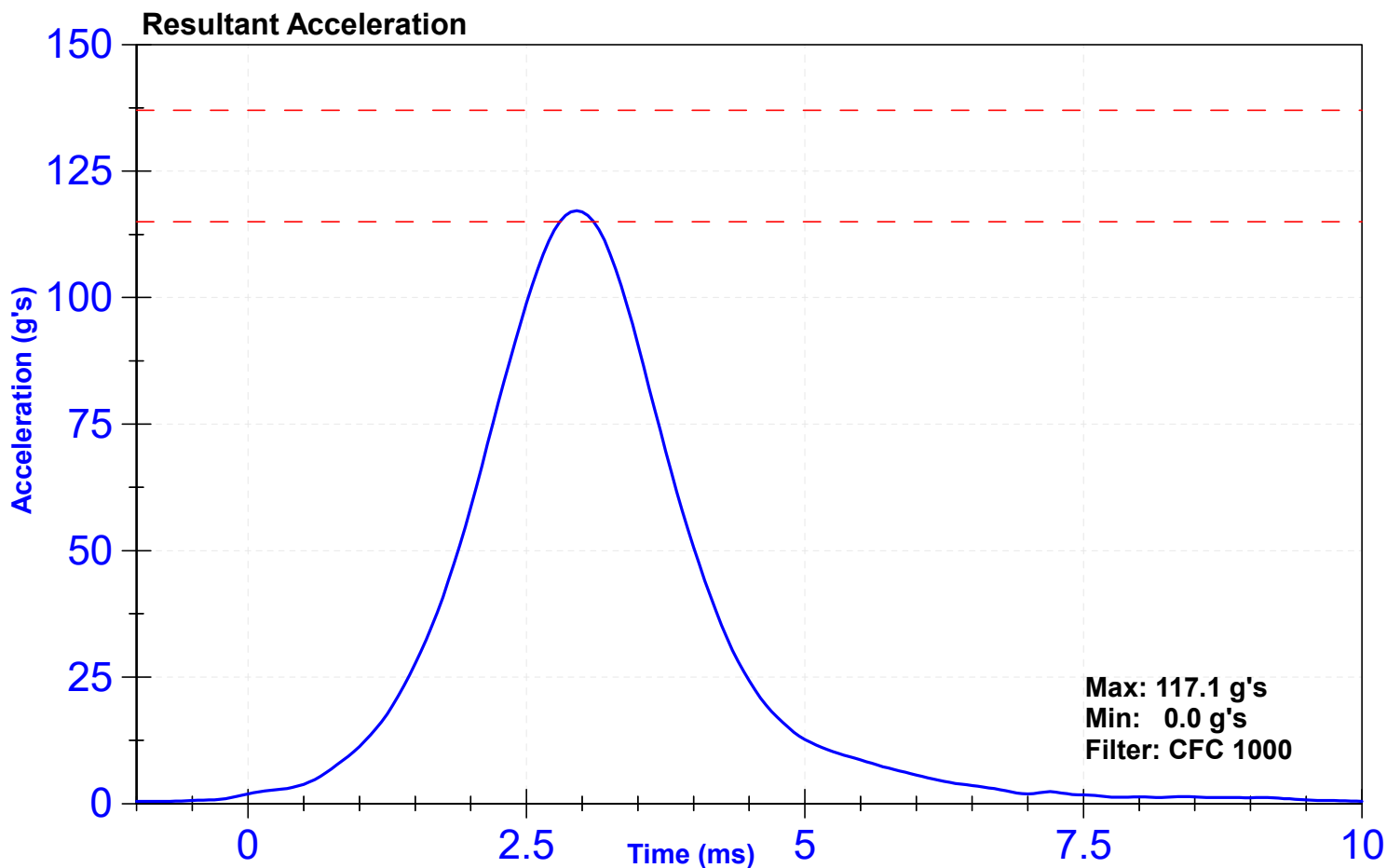
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

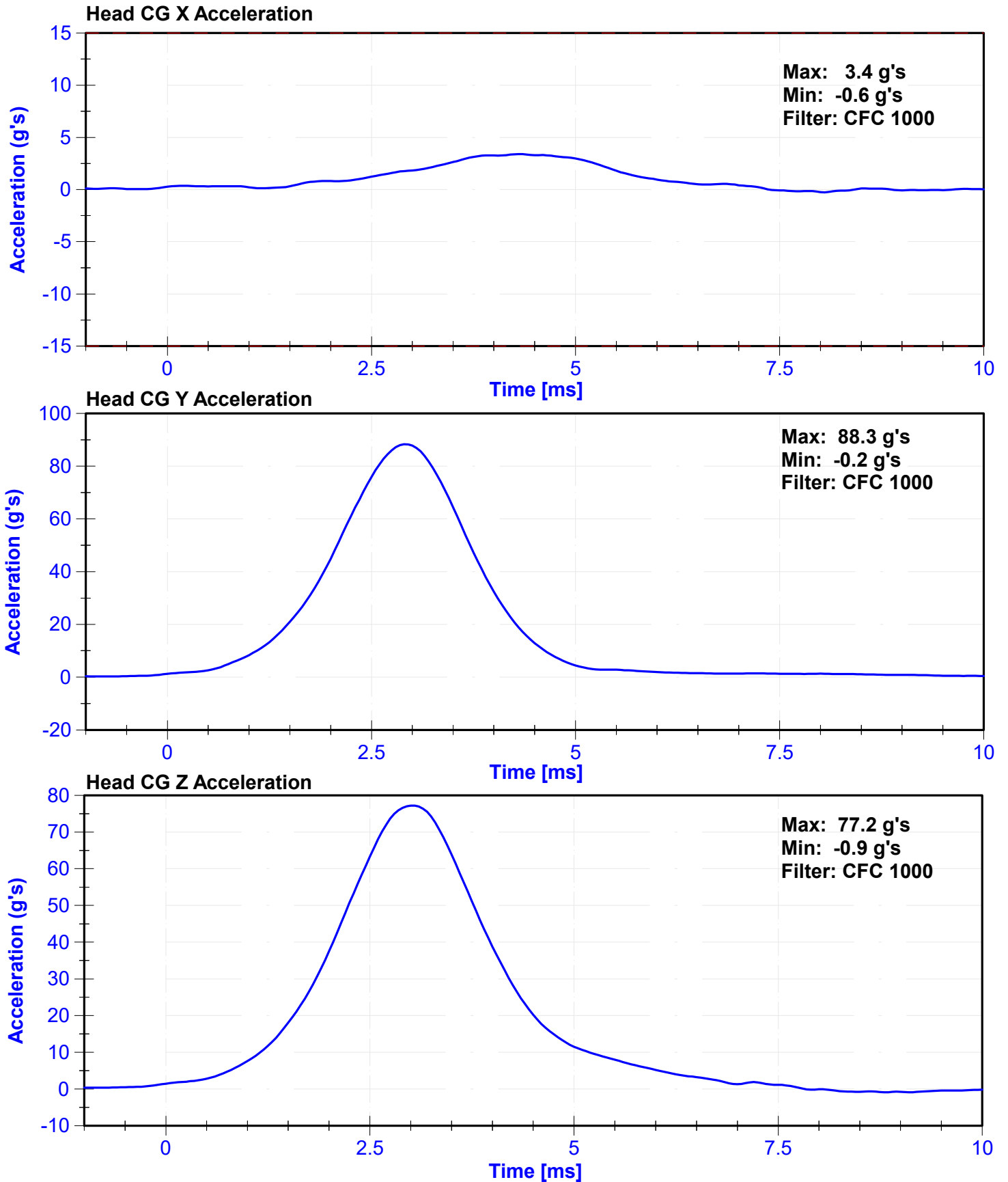
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.6	Pass
Humidity	10	70	%	60	Pass
Resultant Acceleration	115	137	g's	117.1	Pass
Oscillation	0	15	%	2.0	Pass
Fore-Aft Acceleration	-15	15	g's	3.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P59018	5/9/2024	11/5/2024
Y Accelerometer	Endevco	P79189	5/9/2024	11/5/2024
Z Accelerometer	Endevco	P79587	5/9/2024	11/5/2024





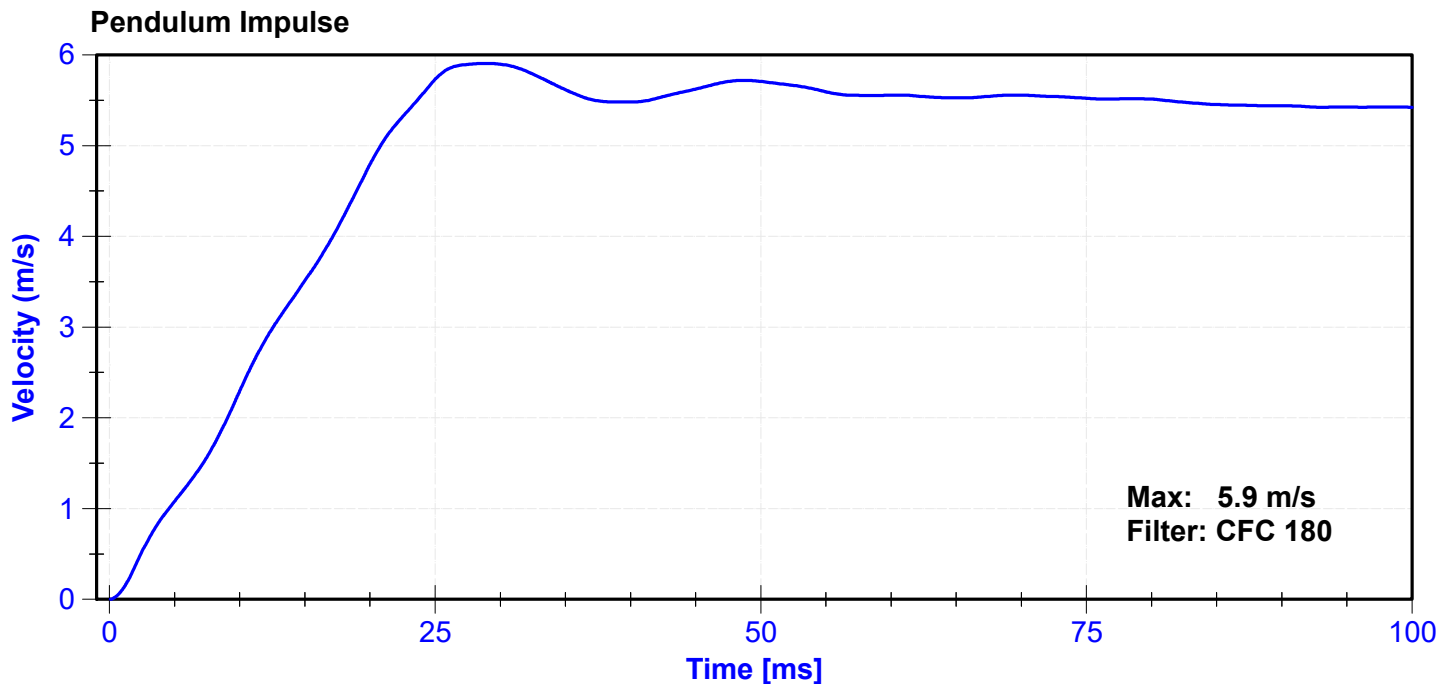
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

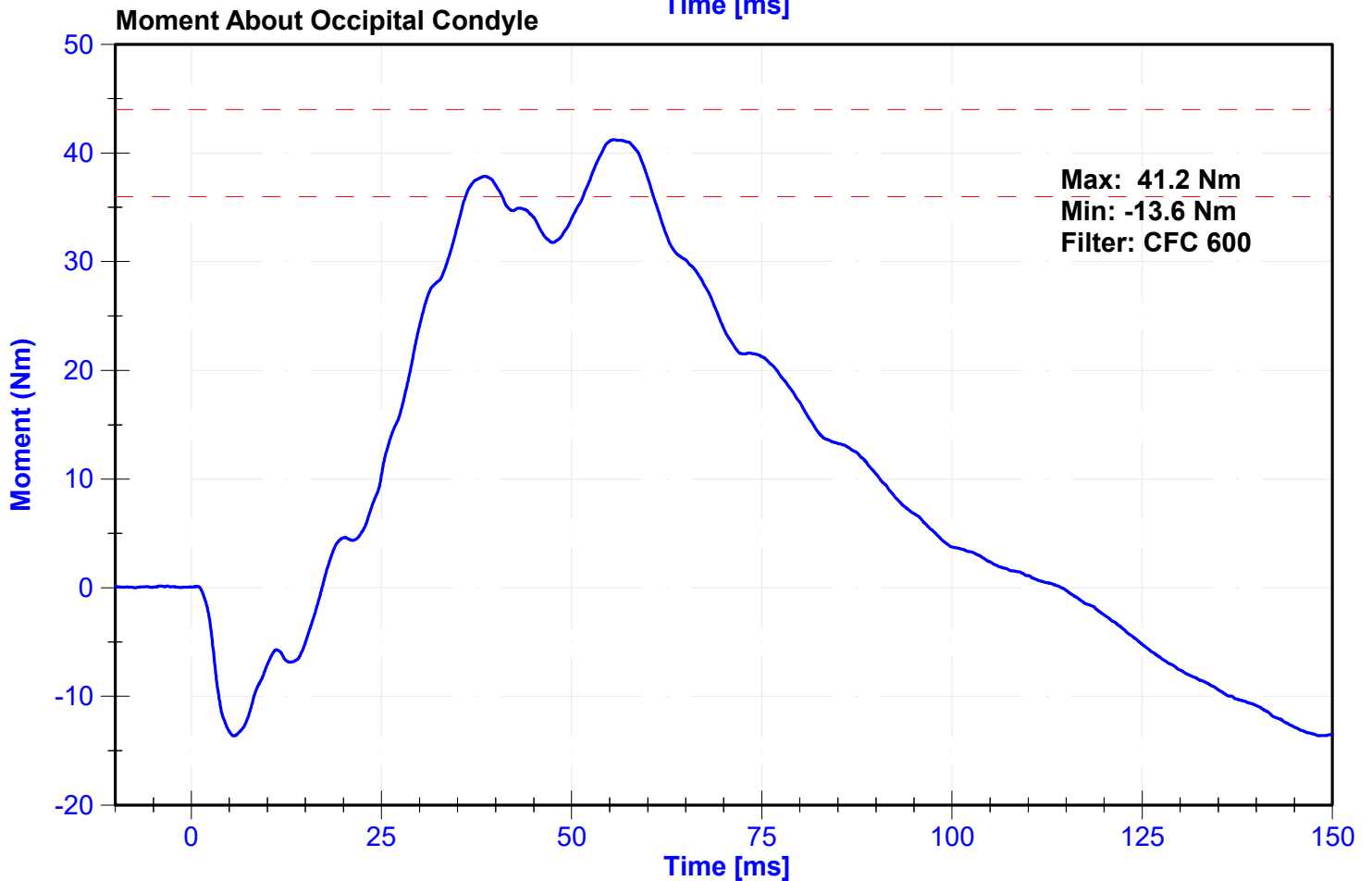
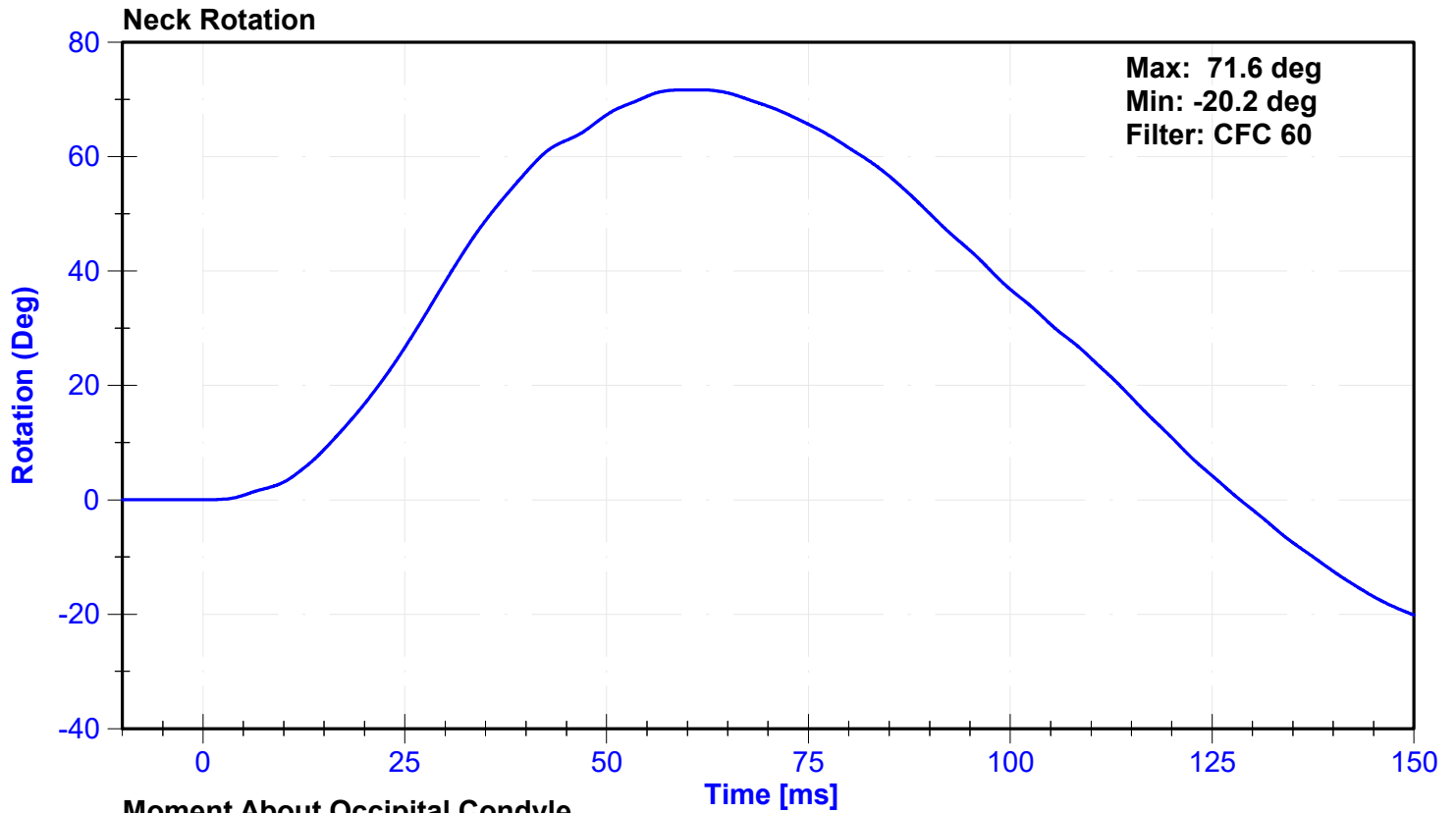
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	60	Pass
Velocity	5.51	5.63	m/s	5.554	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.30	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.51	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.79	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.73	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.90	Pass
Neck Rotation	71	81	deg	71.6	Pass
Time at Maximum Rotation	50	70	ms	61.4	Pass
Moment about the OC	36	44	Nm	41.2	Pass
Moment Decay to 0 Nm	102	126	ms	114.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	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	300	Laboratory Supervisor	C. Mantell

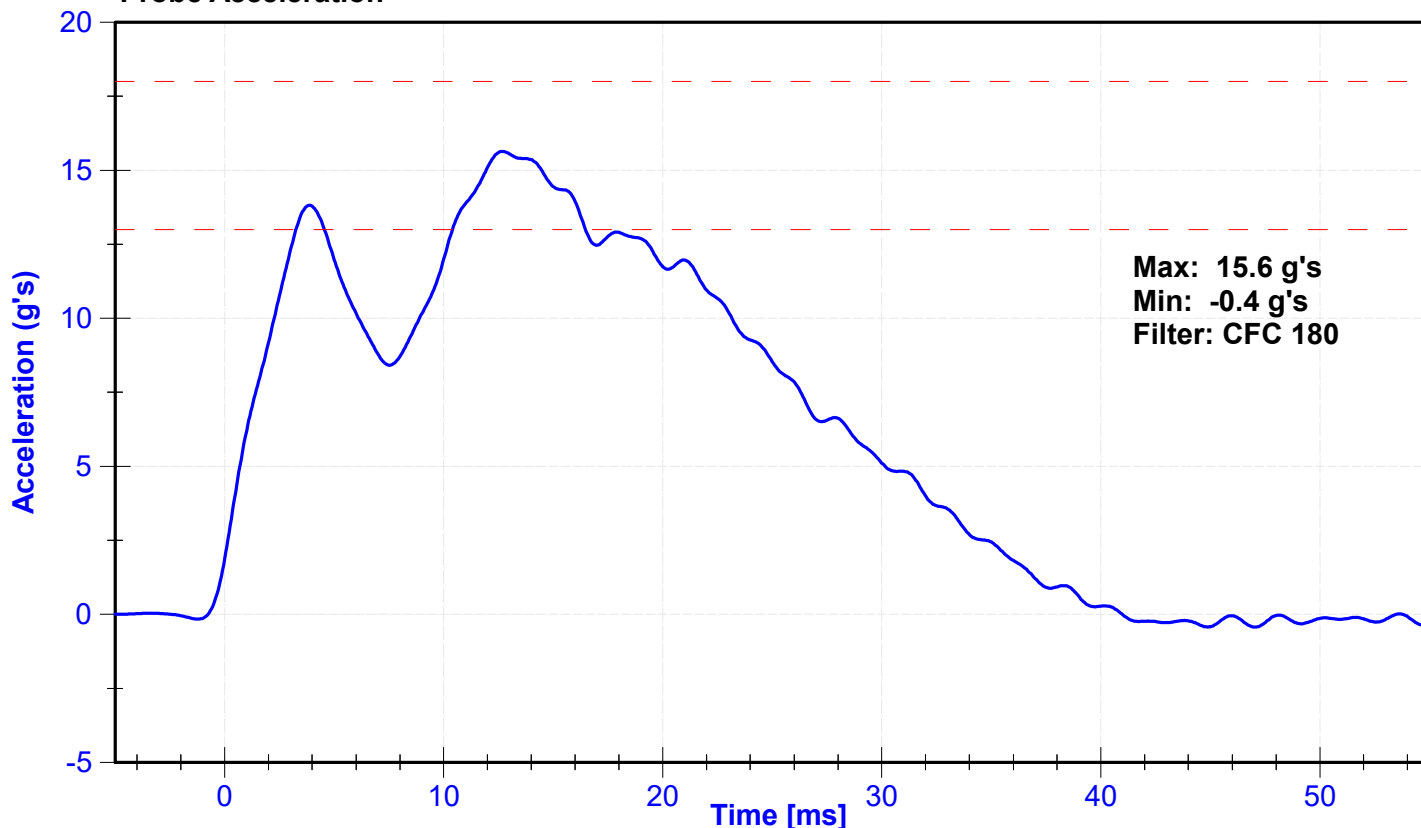
Results

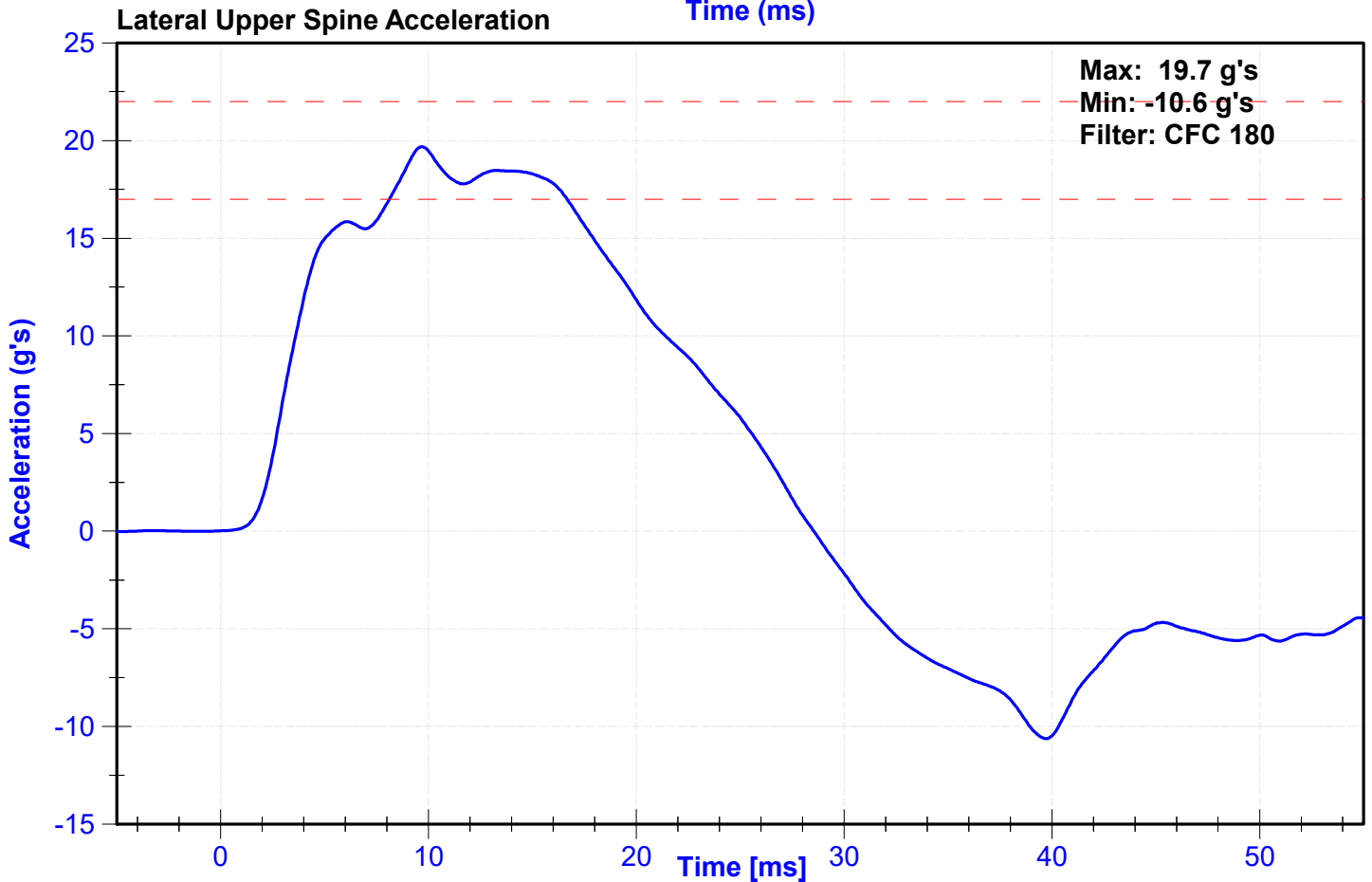
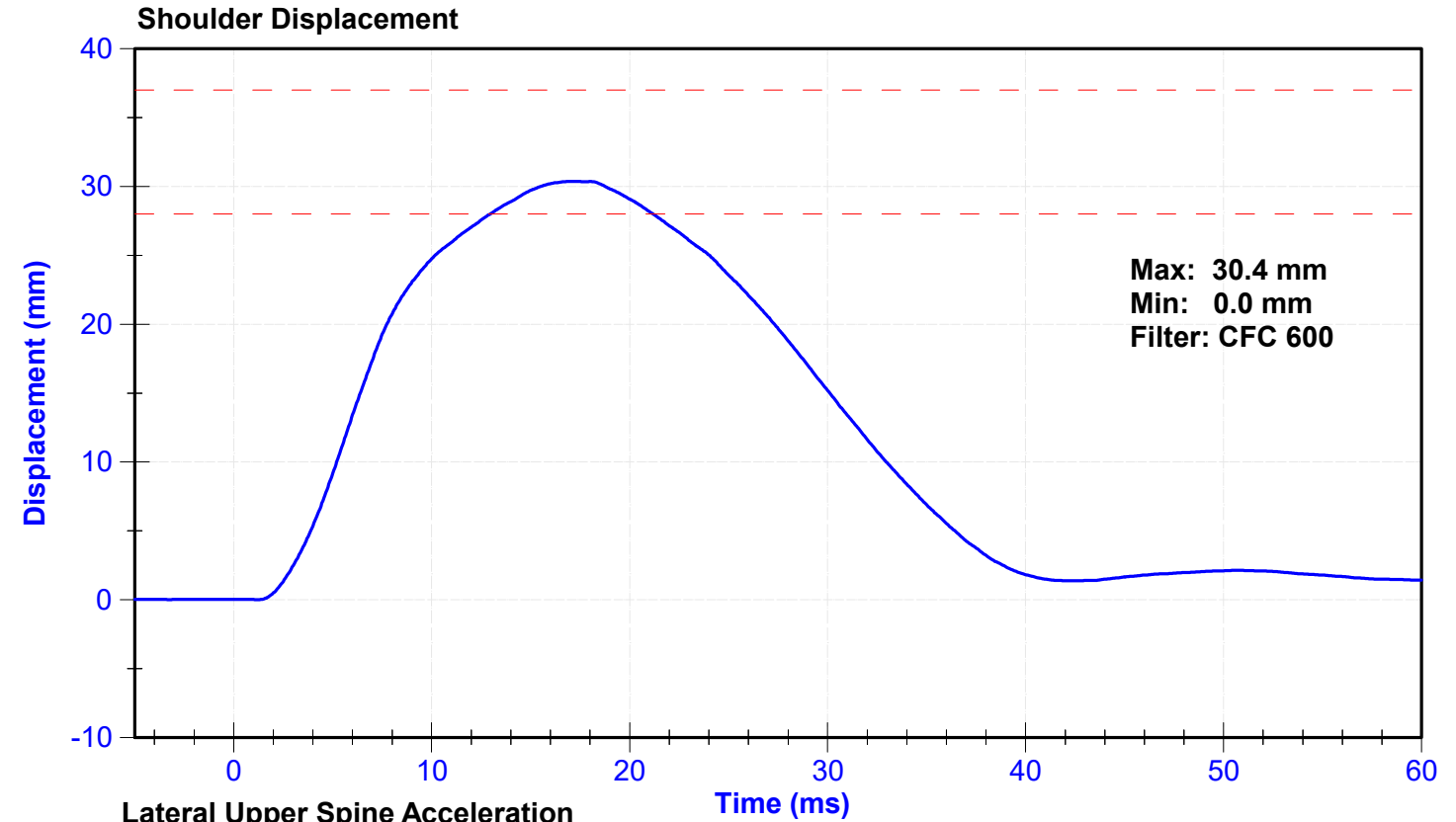
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	60	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	13	18	g's	15.6	Pass
Shoulder Deflection	28	37	mm	30.4	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Shoulder Potentiometer	Servo	053GFE	5/9/2024	11/7/2024
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024

Probe Acceleration





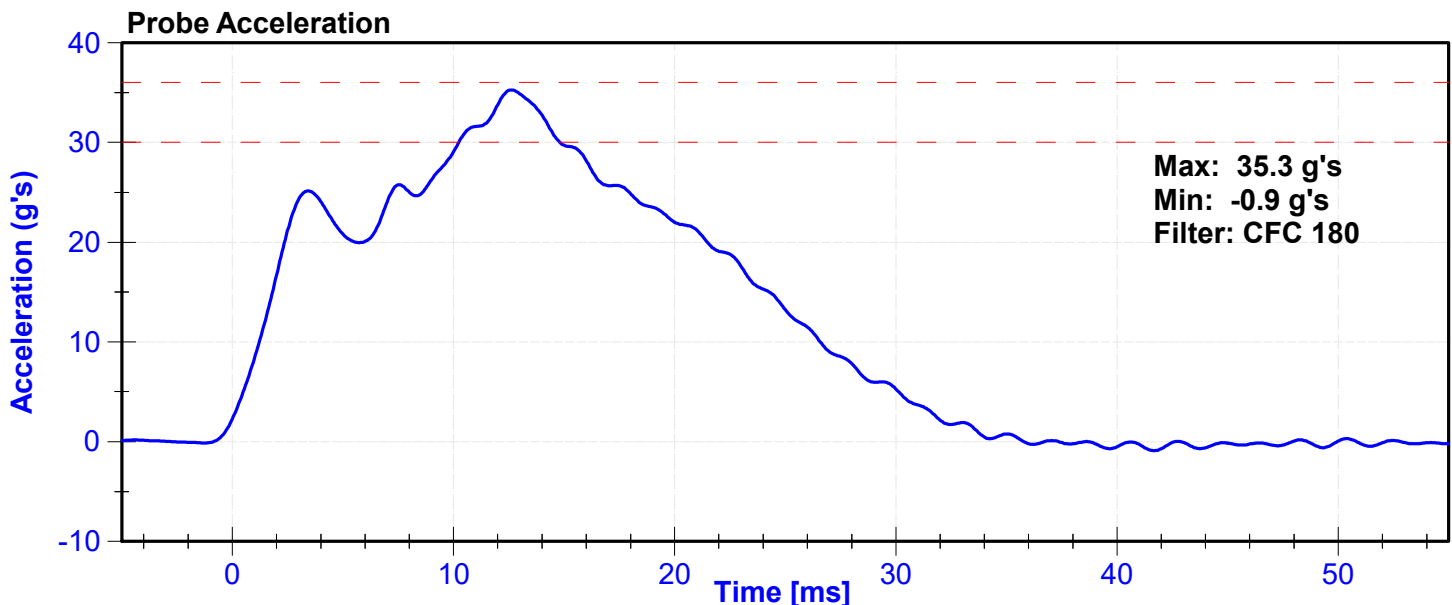
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

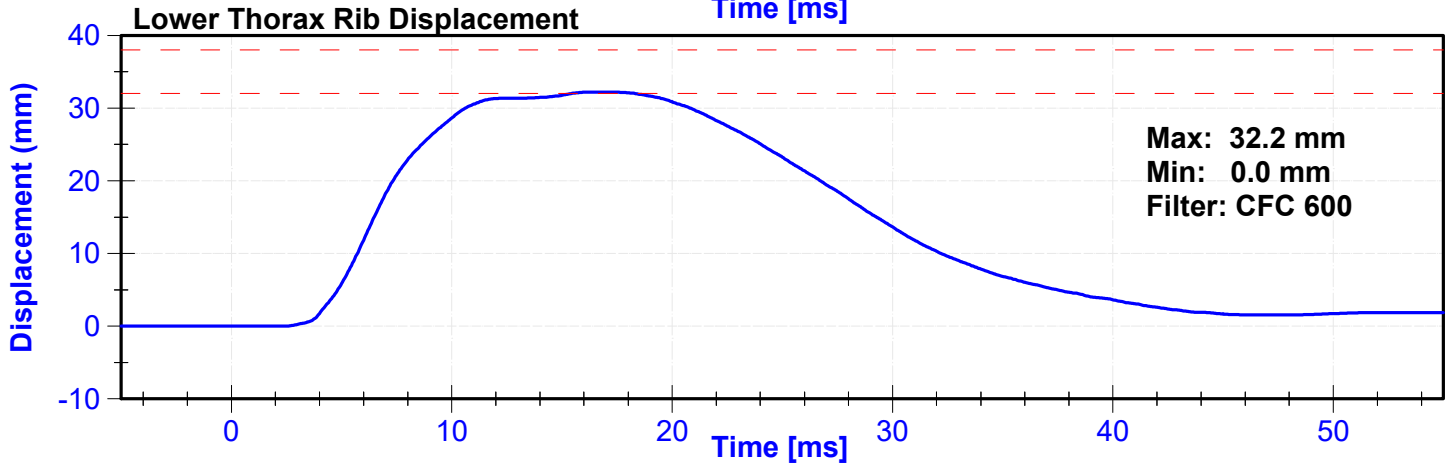
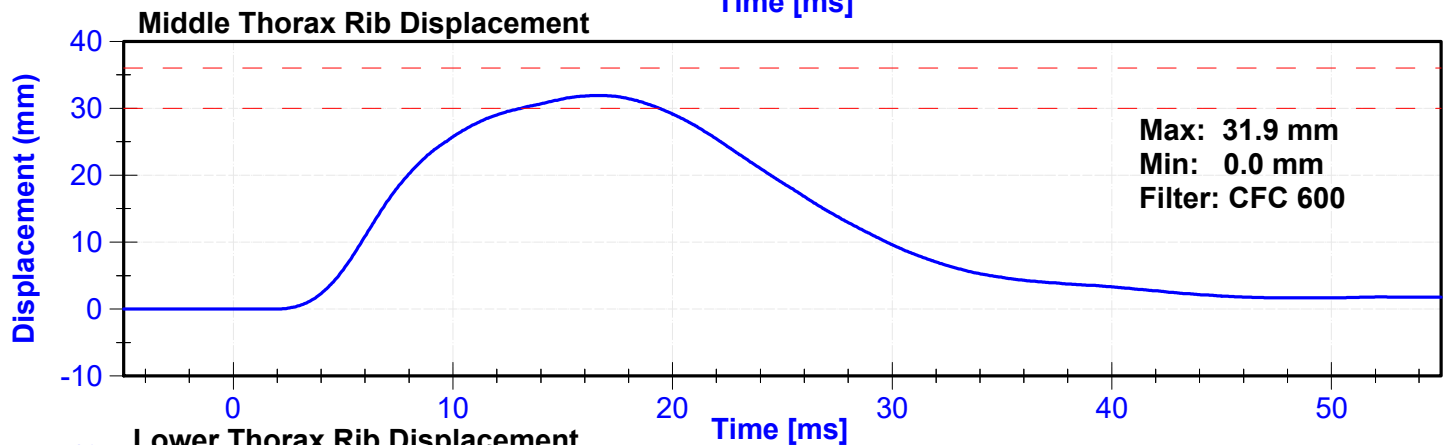
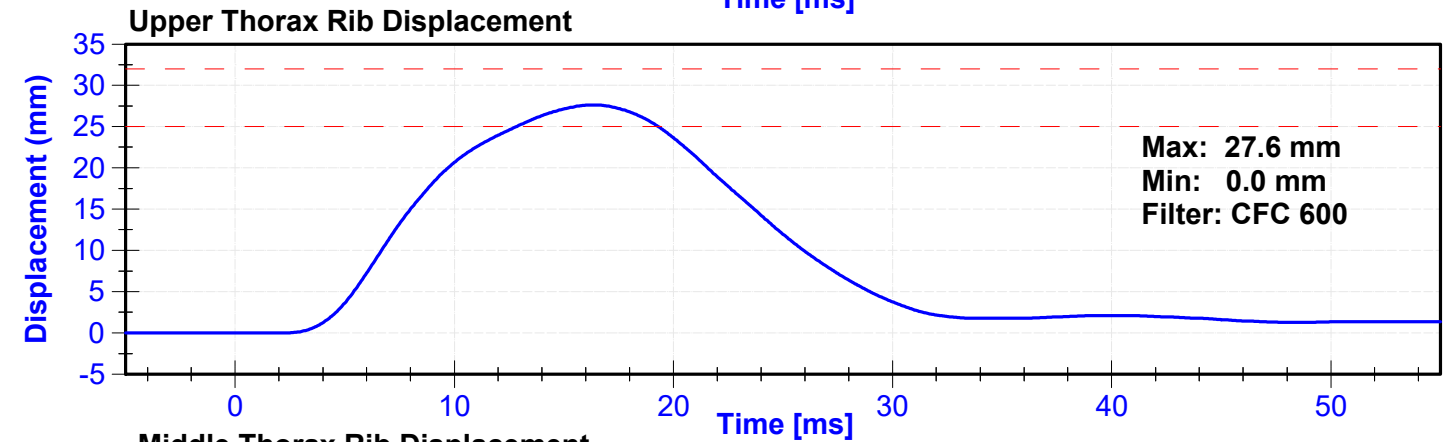
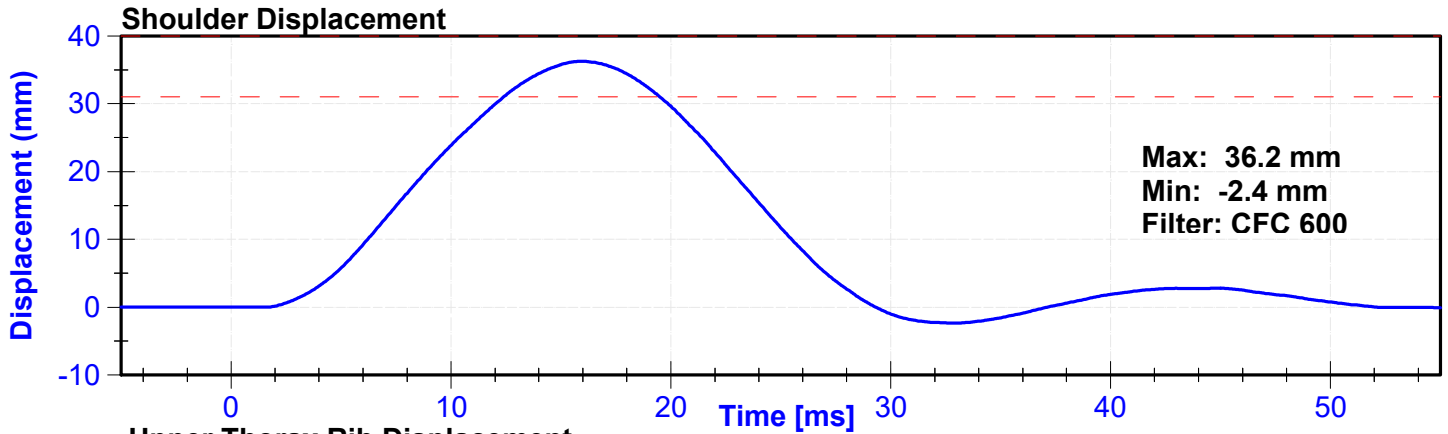
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	60	Pass
Velocity	6.6	6.8	m/s	6.65	Pass
Probe Acceleration after 5 ms	30	36	g's	35.3	Pass
Lateral Upper Spine Acceleration	34	43	g's	34.3	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.4	Pass
Shoulder Deflection	31	40	mm	36.2	Pass
Upper Thorax Rib Deflection	25	32	mm	27.6	Pass
Mid Thorax Rib Deflection	30	36	mm	31.9	Pass
Lower Thorax Rib Deflection	32	38	mm	32.2	Pass

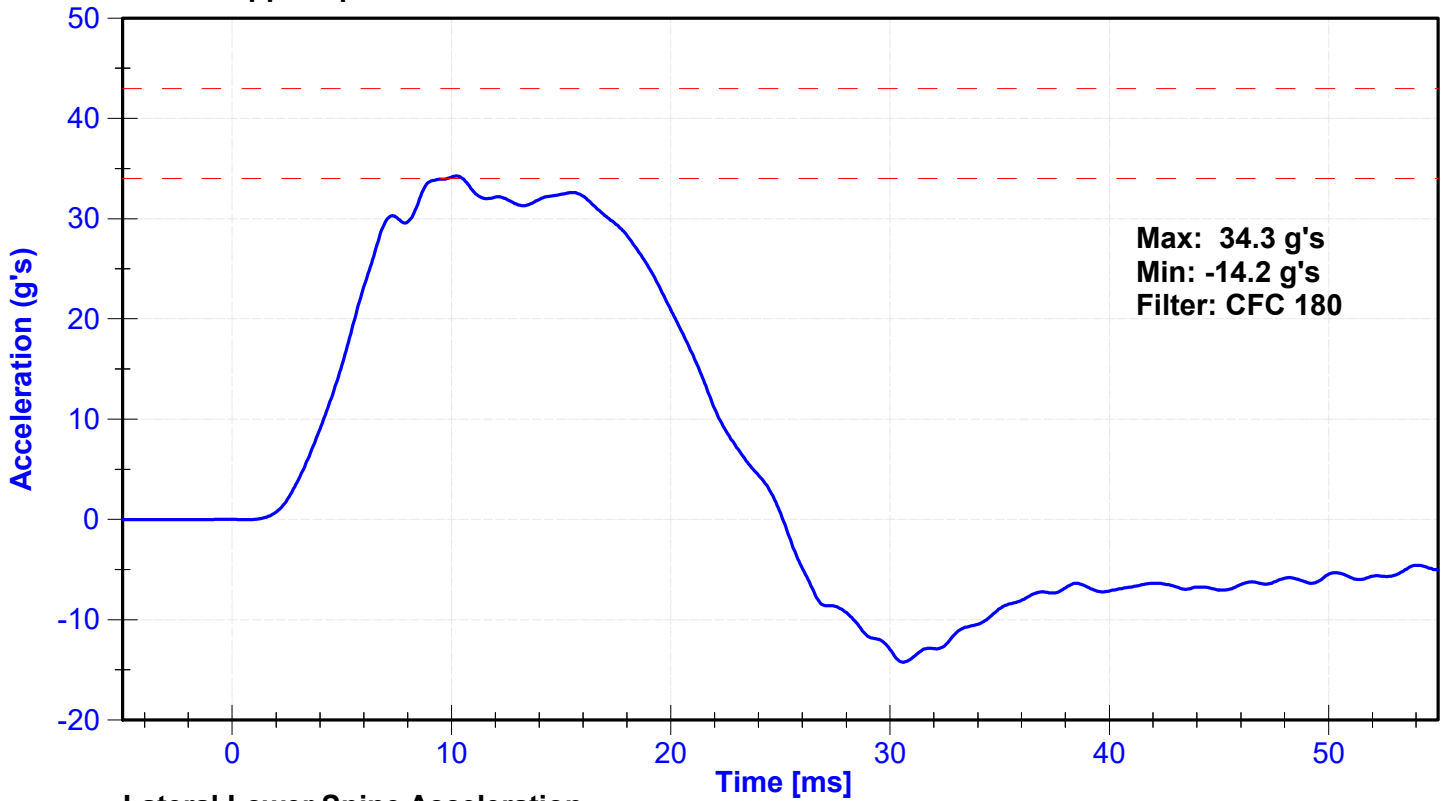
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Upper Spine T1 Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Upper Spine T12 Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Shoulder Potentiometer	Servo	053GFE	5/9/2024	11/7/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	5/9/2024	11/7/2024
Middle Thorax Rib Potentiometer	Servo	085GFE	5/9/2024	11/7/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	5/9/2024	11/7/2024

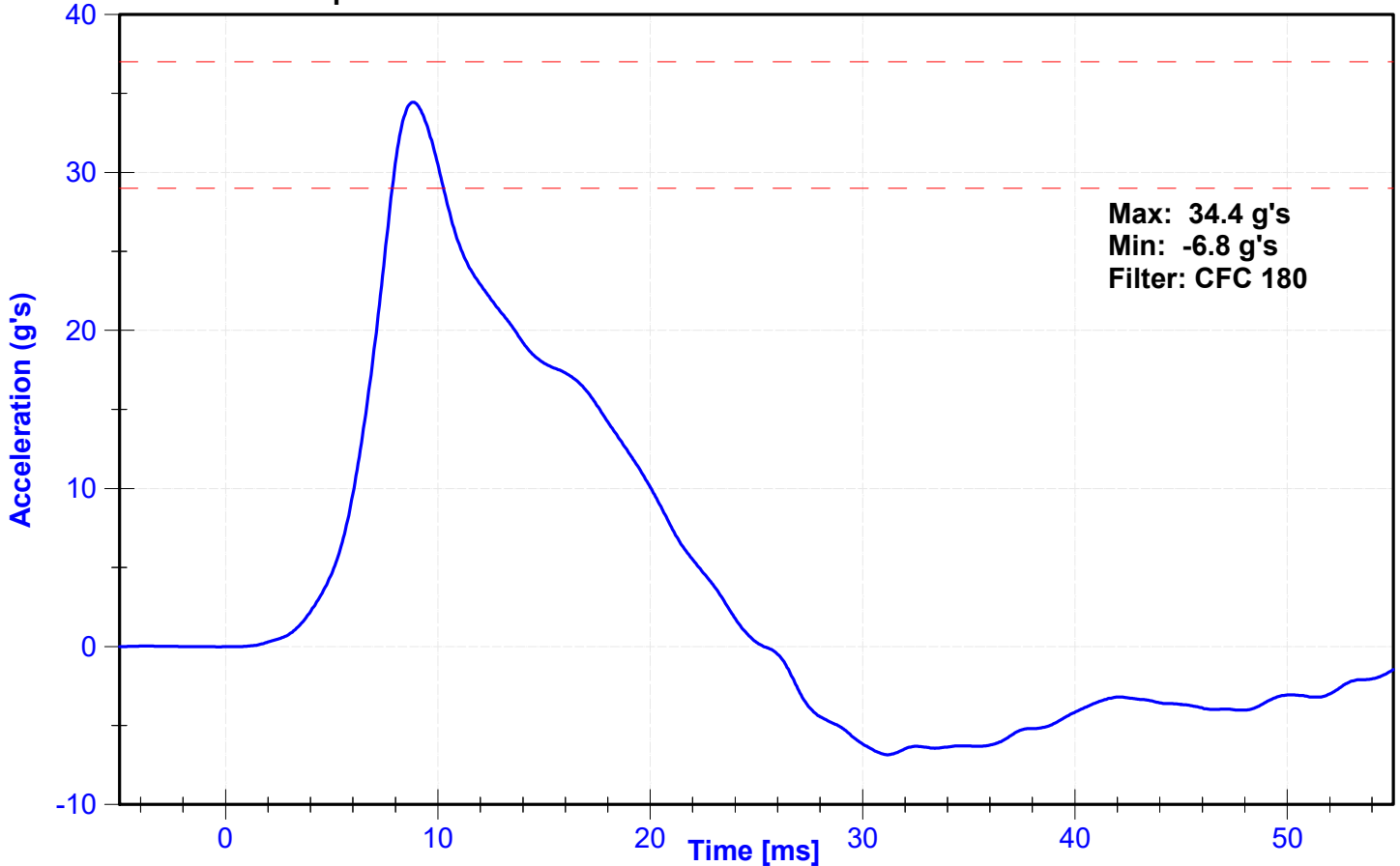




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



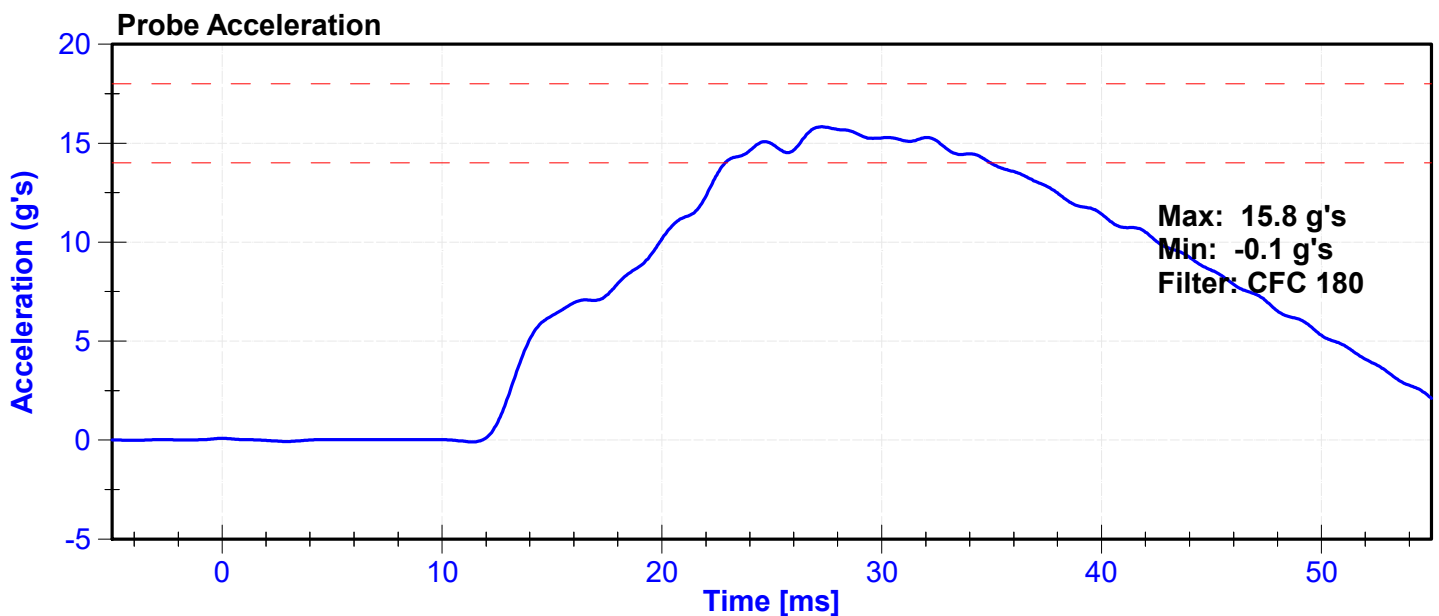
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

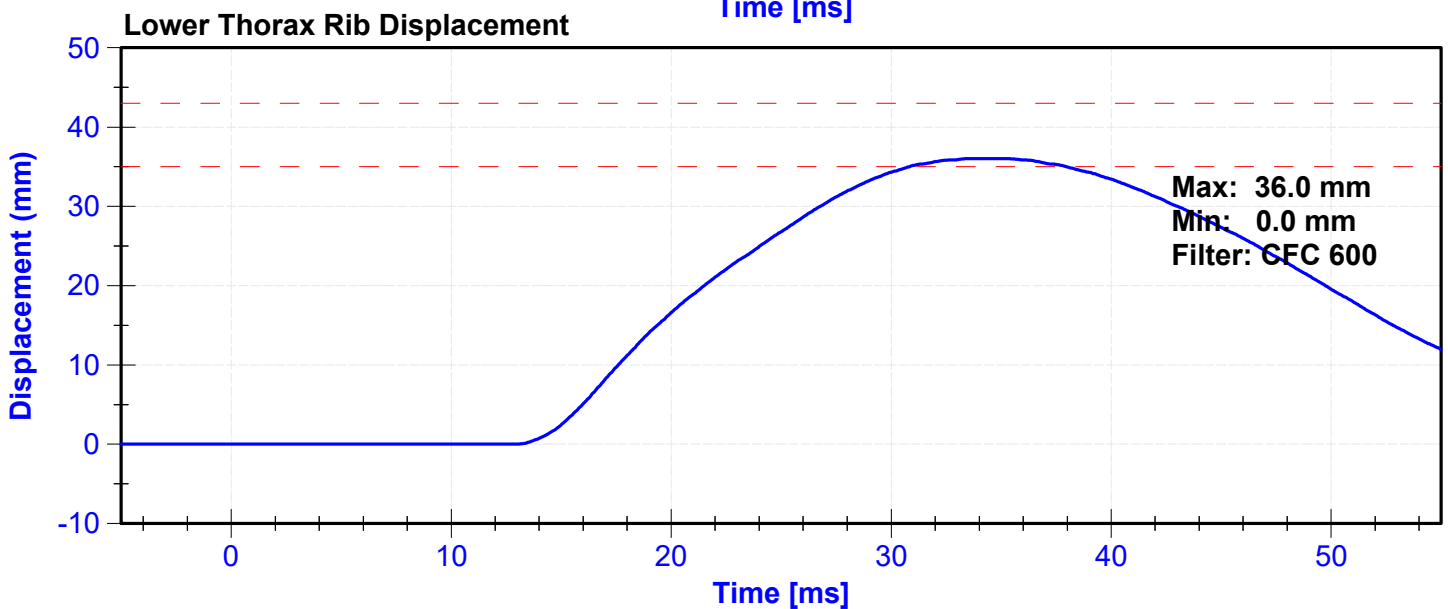
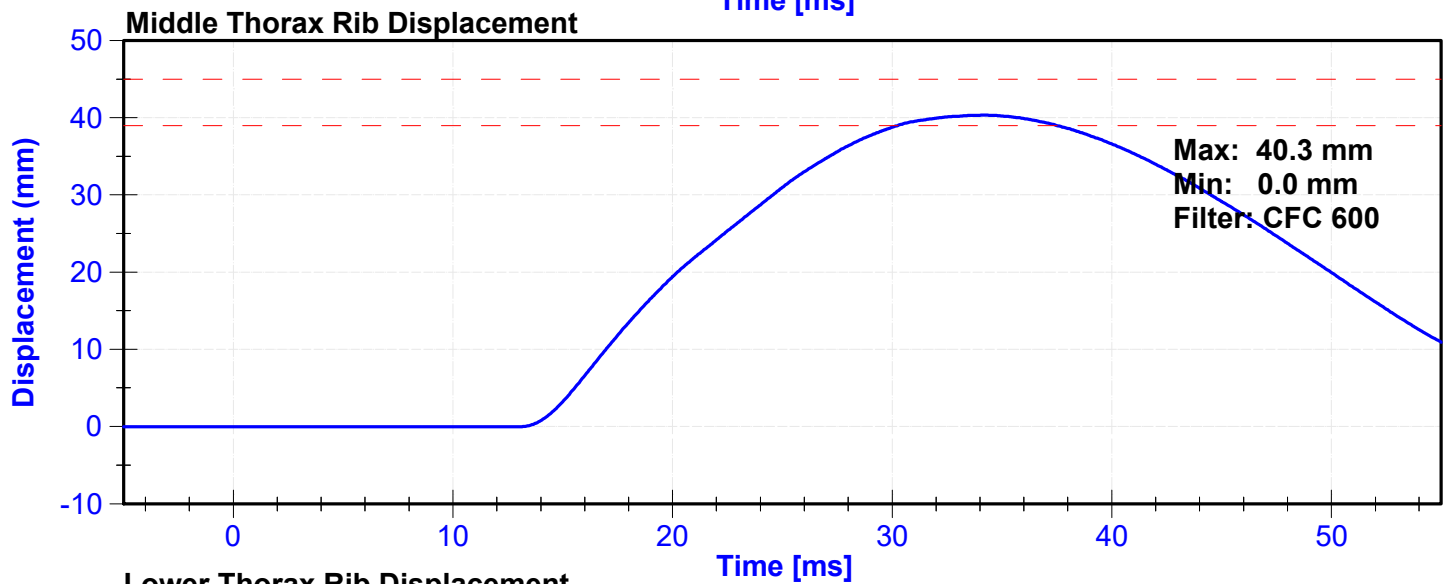
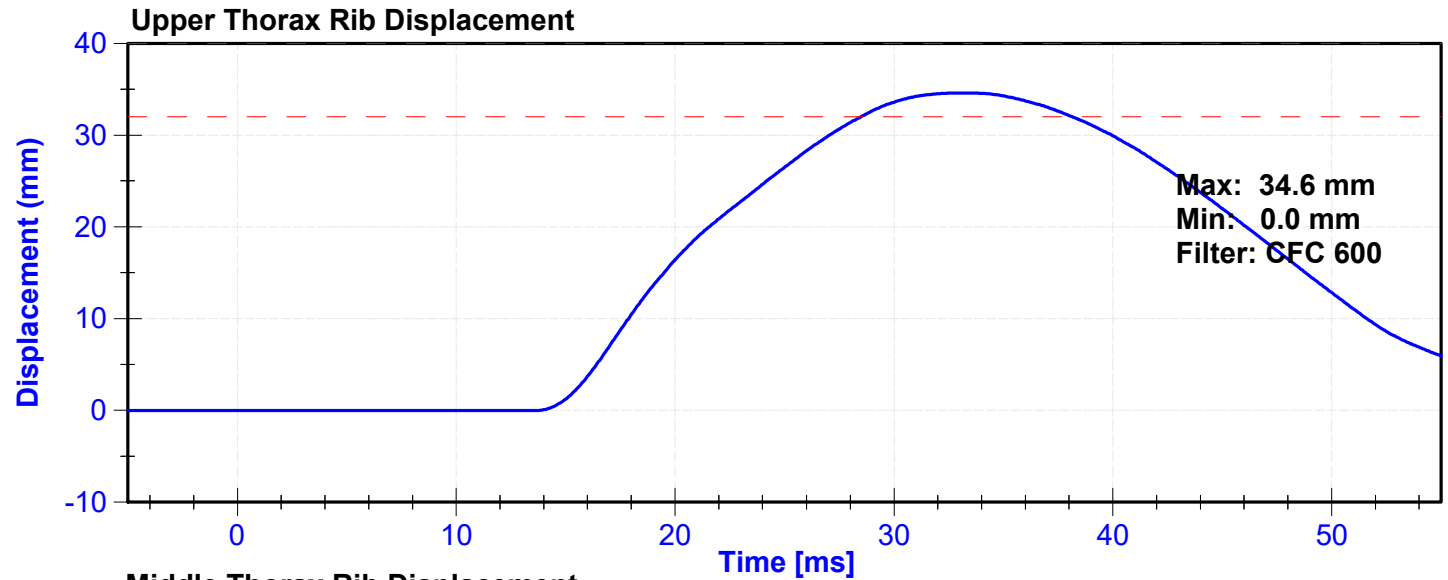
Results

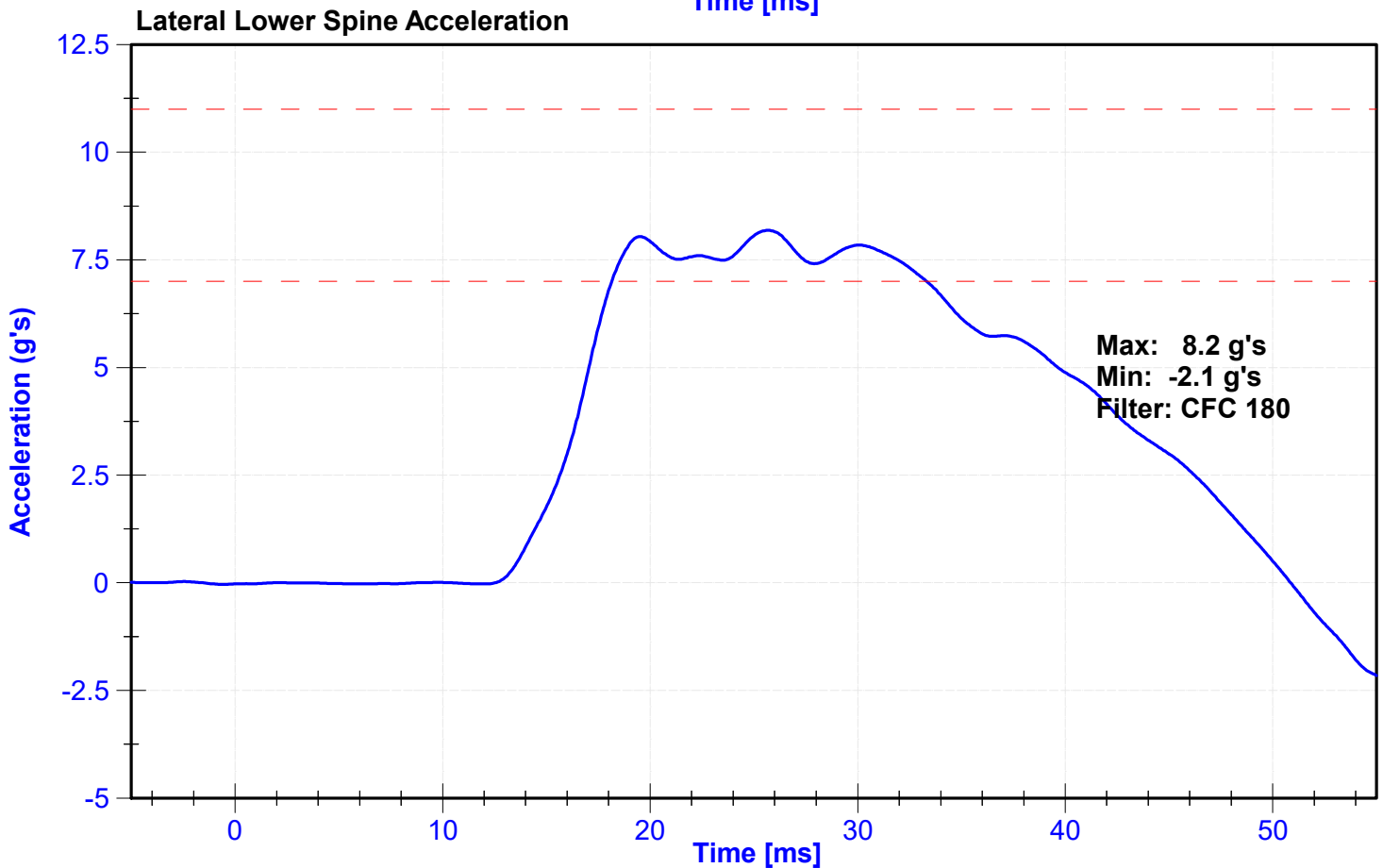
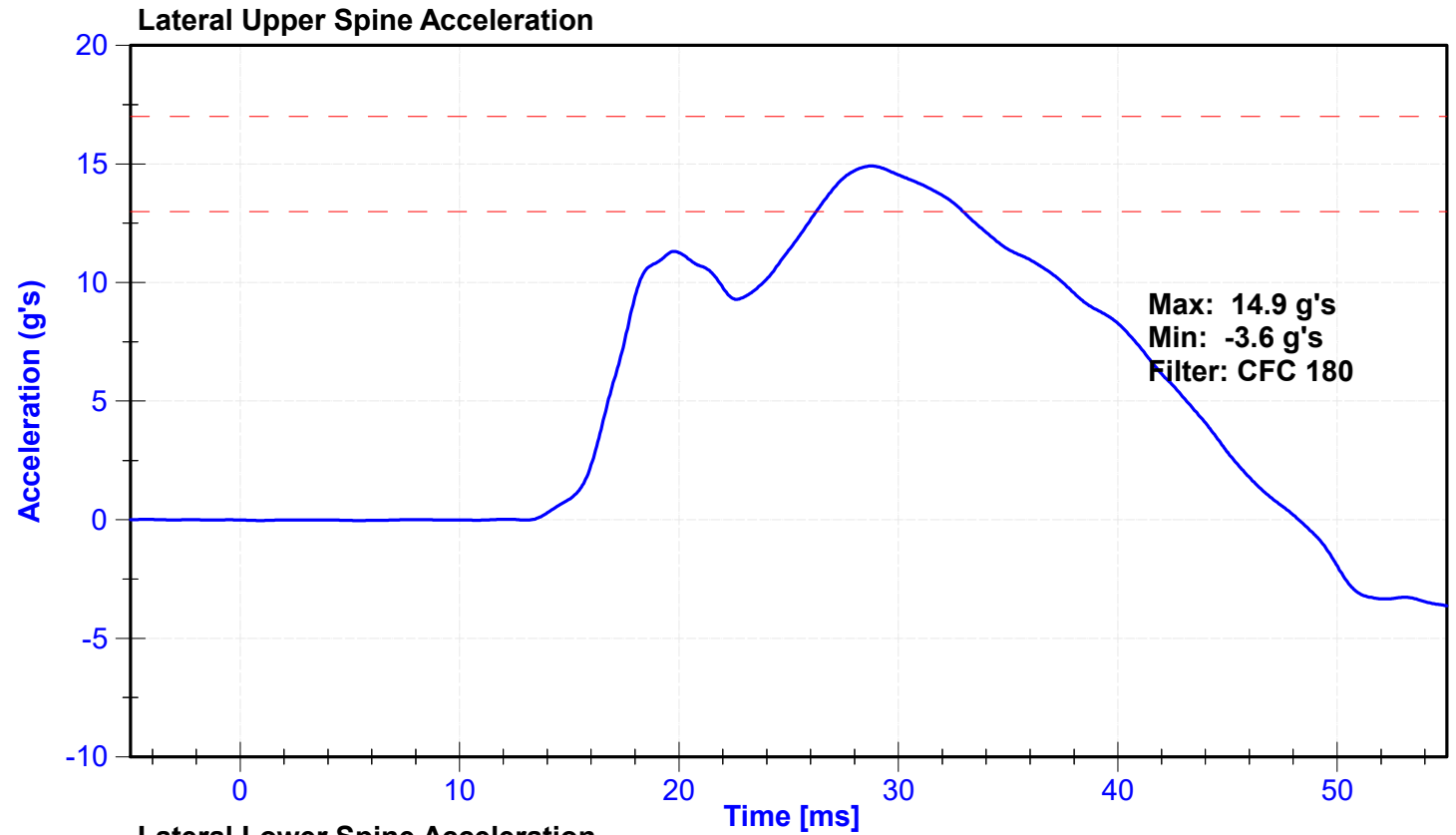
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	60	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	14	18	g's	15.8	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.9	Pass
Lateral Lower Spine Acceleration	7	11	g's	8.2	Pass
Upper Thorax Rib Deflection	32	40	mm	34.6	Pass
Middle Thorax Rib Deflection	39	45	mm	40.3	Pass
Lower Thorax Rib Deflection	35	43	mm	36.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	5/9/2024	11/7/2024
Middle Thorax Rib Potentiometer	Servo	085GFE	5/9/2024	11/7/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	5/9/2024	11/7/2024







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

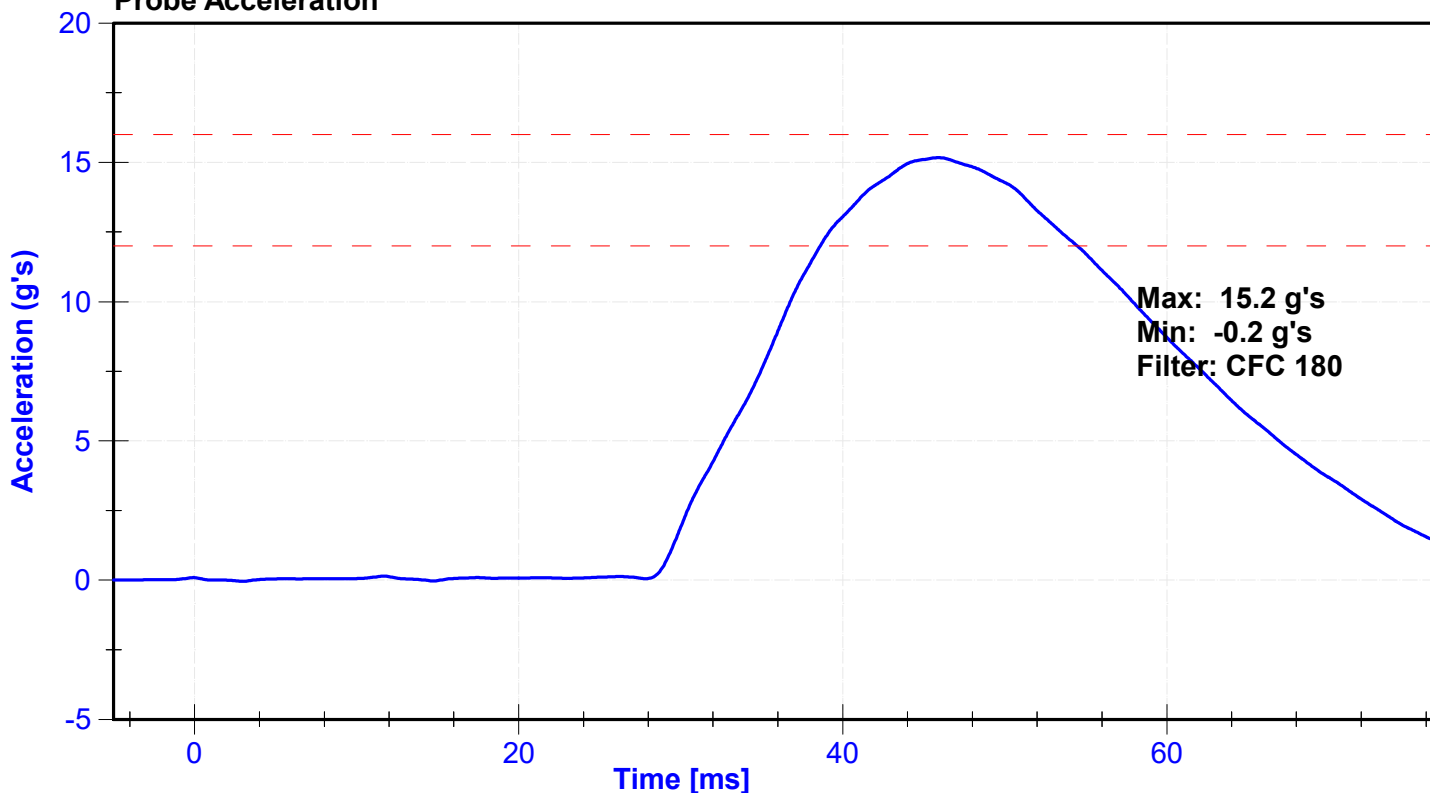
Results

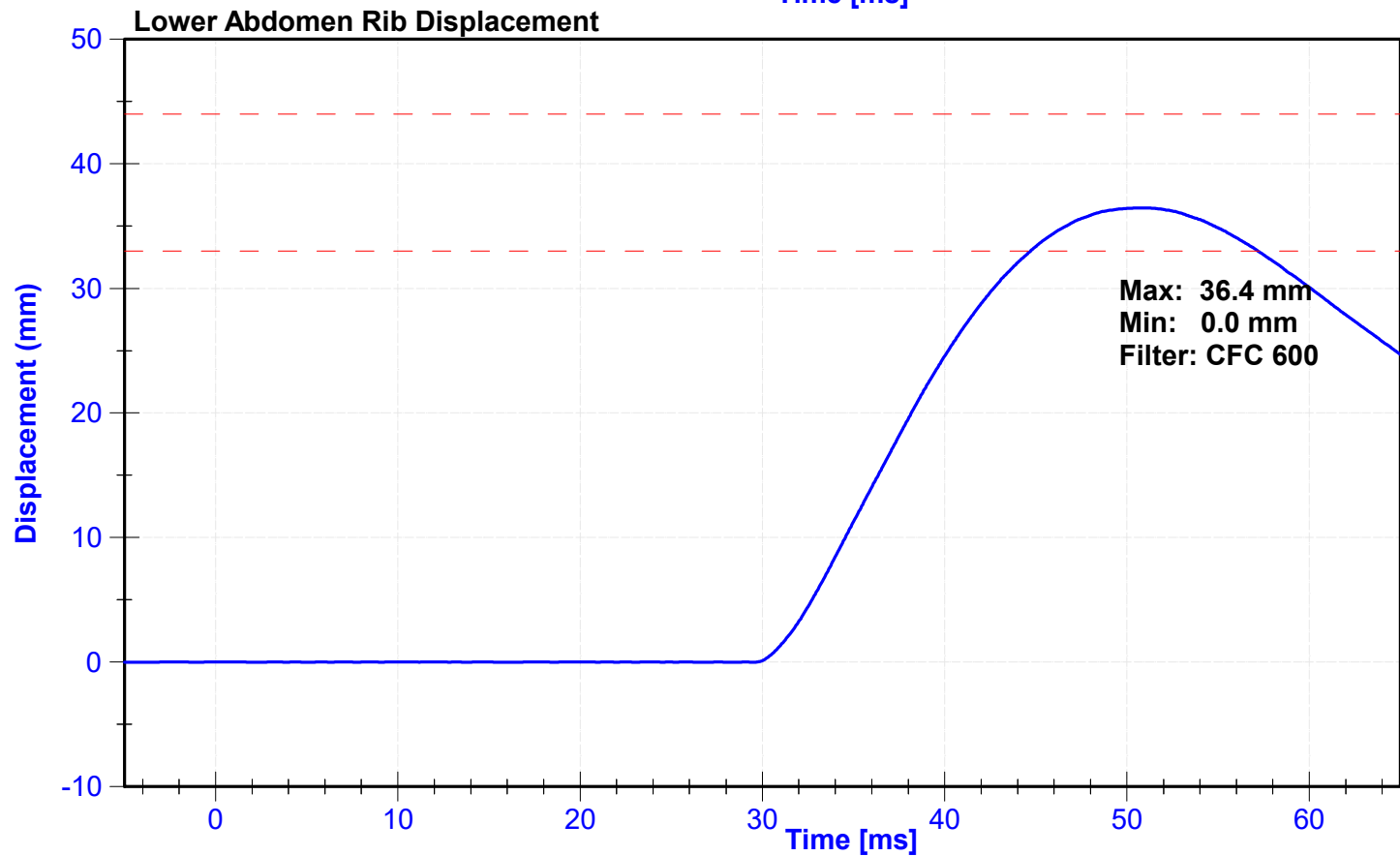
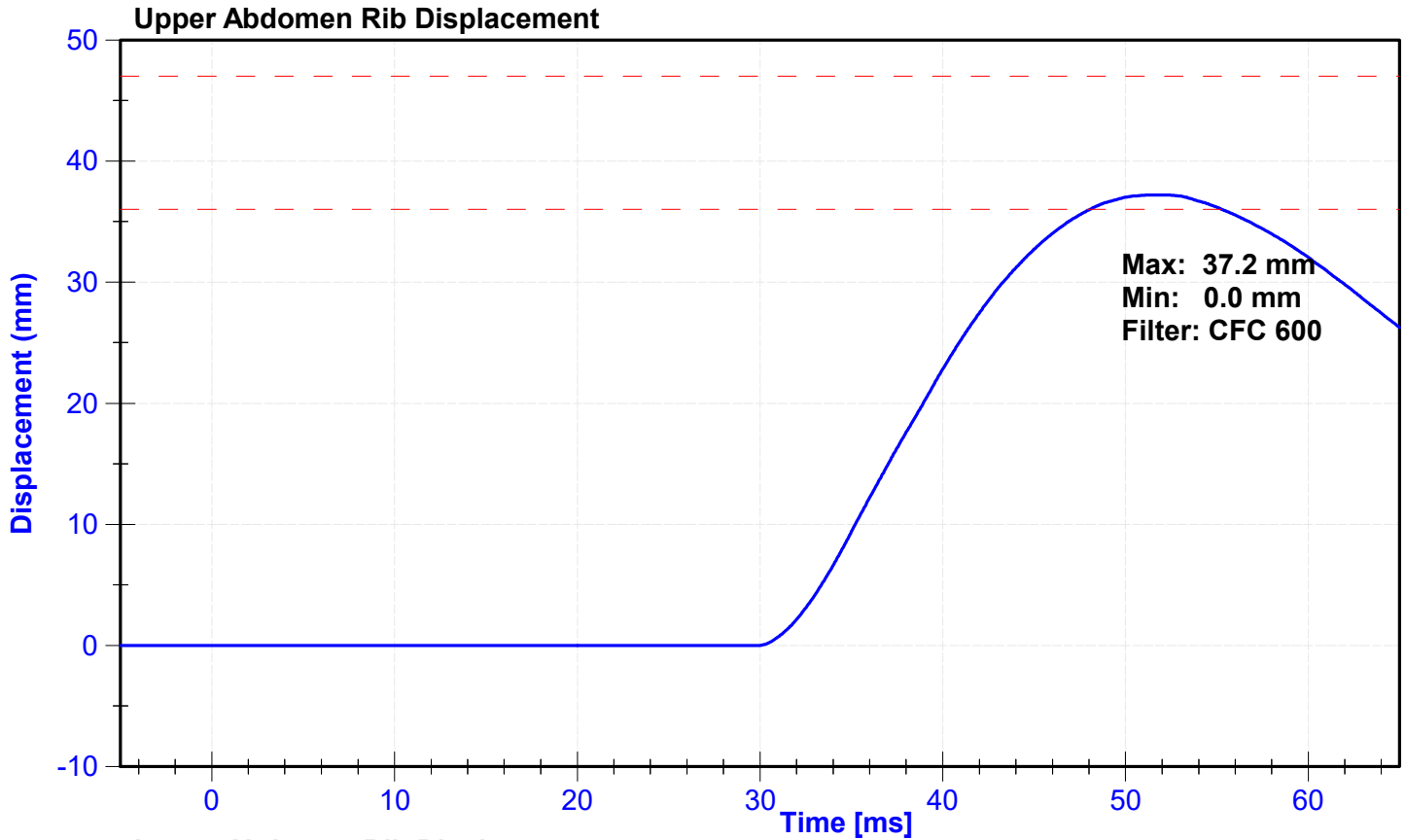
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	60	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	12	16	g's	15.2	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.3	Pass
Upper Abdomen Rib Deflection	36	47	mm	37.2	Pass
Lower Abdomen Rib Deflection	33	44	mm	36.4	Pass

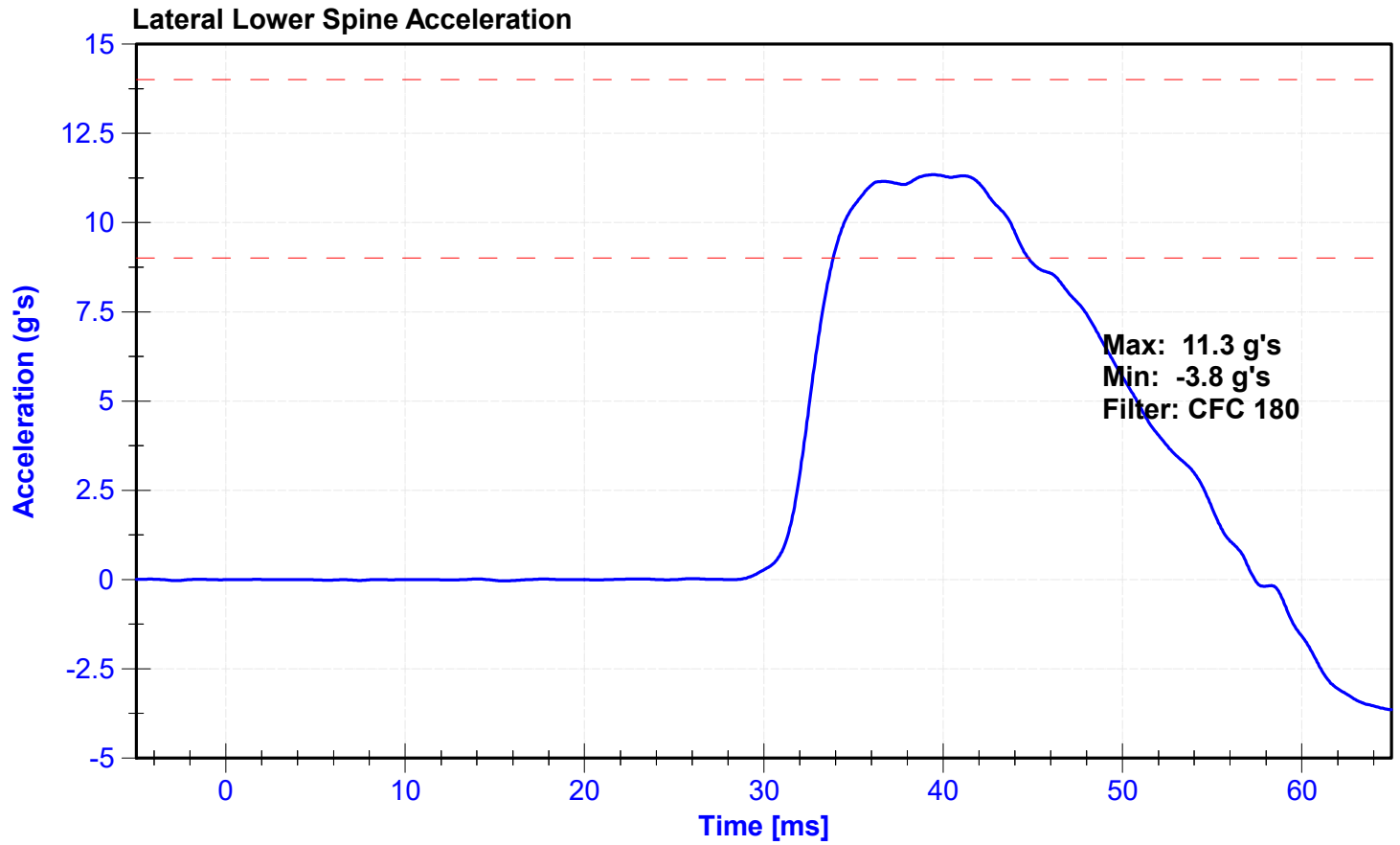
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Abdomen Rib Potentiometer	Servo	074GFE	5/28/2024	11/26/2024
Lower Abdomen Rib Potentiometer	Servo	075GFE	5/9/2024	11/7/2024

Probe Acceleration







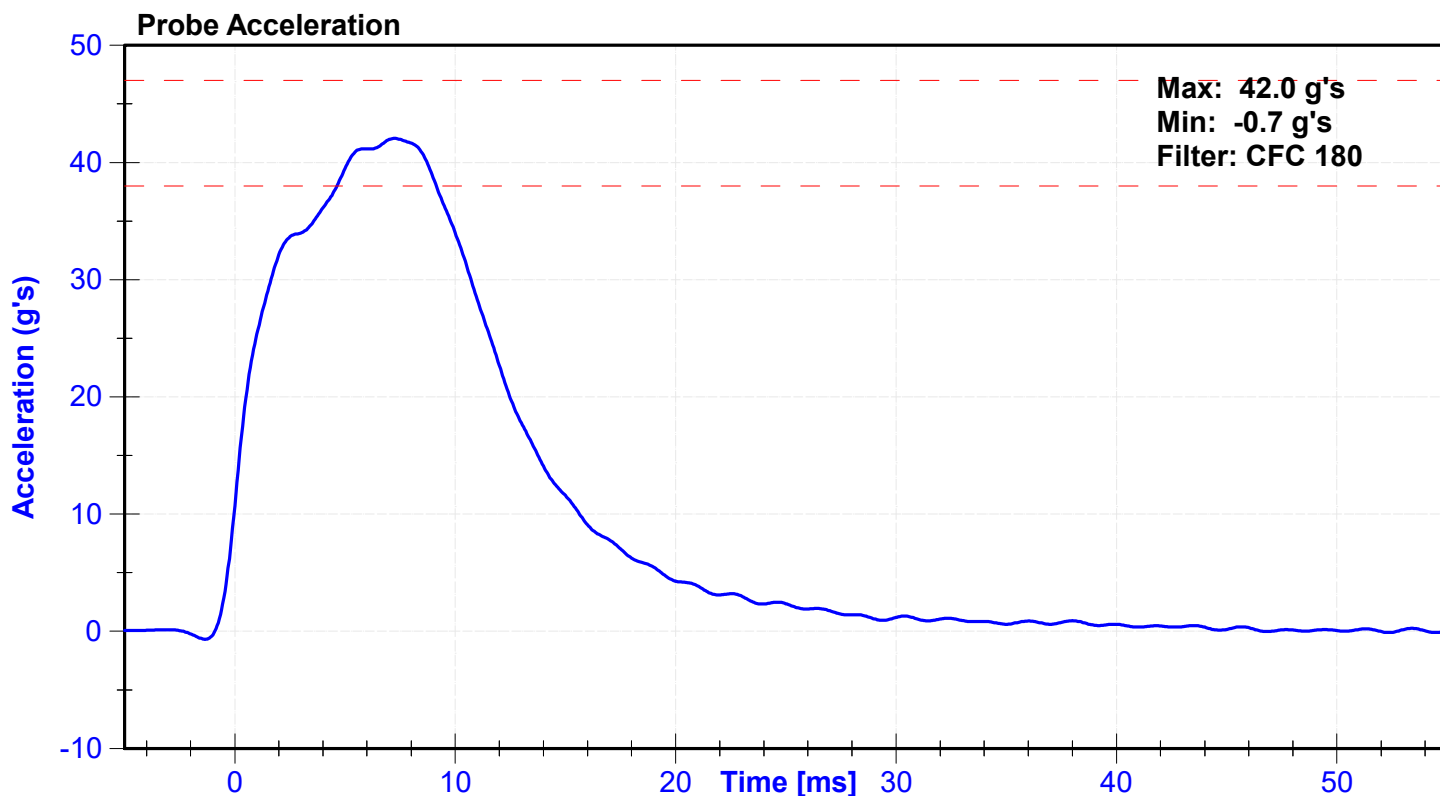
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

Results

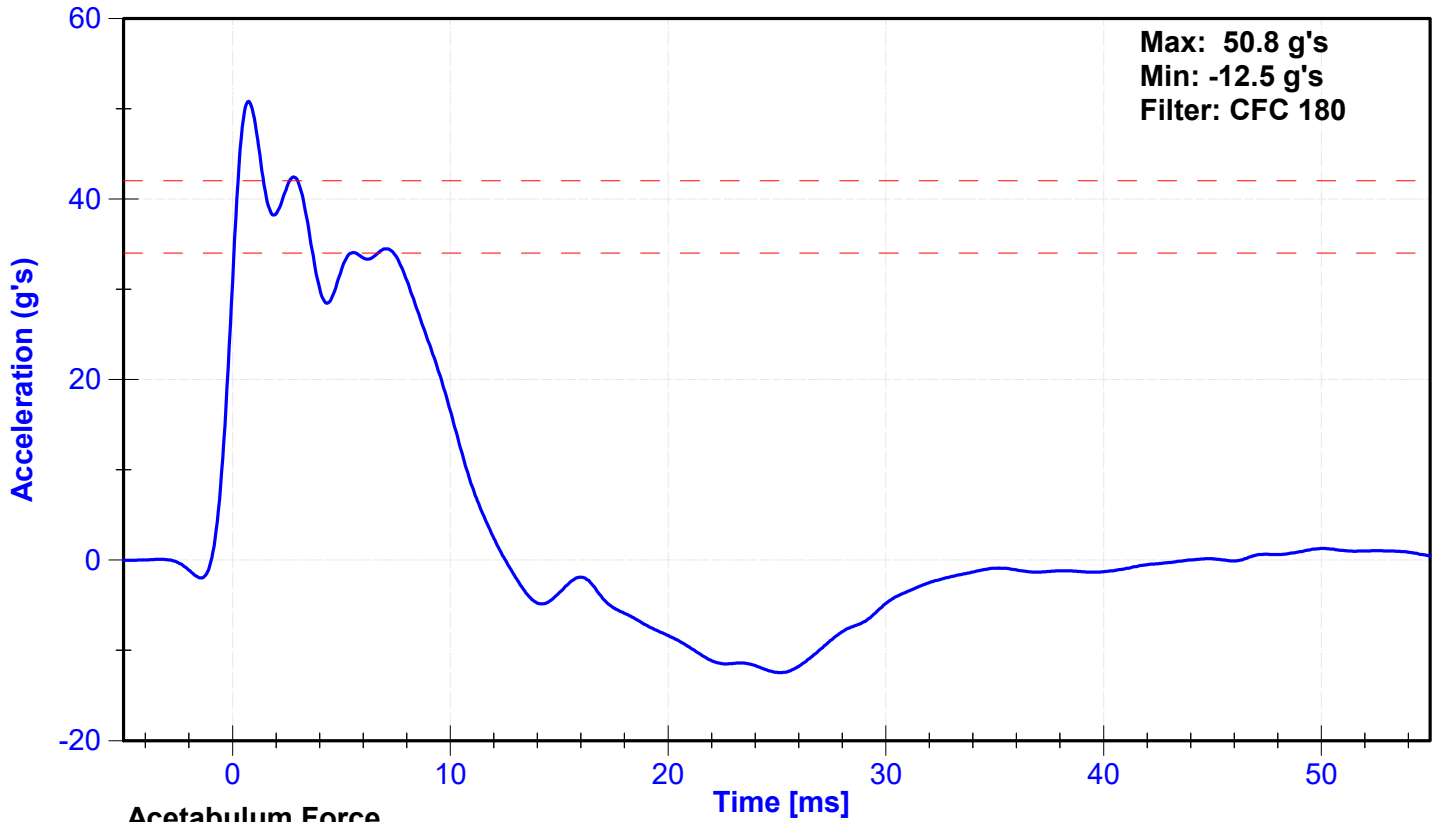
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	60	Pass
Velocity	6.6	6.8	m/s	6.65	Pass
Probe Acceleration	38	47	g's	42.0	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	34.5	Pass
Acetabulum Force	3600	4300	N	3992.1	Pass

Transducer Calibrations

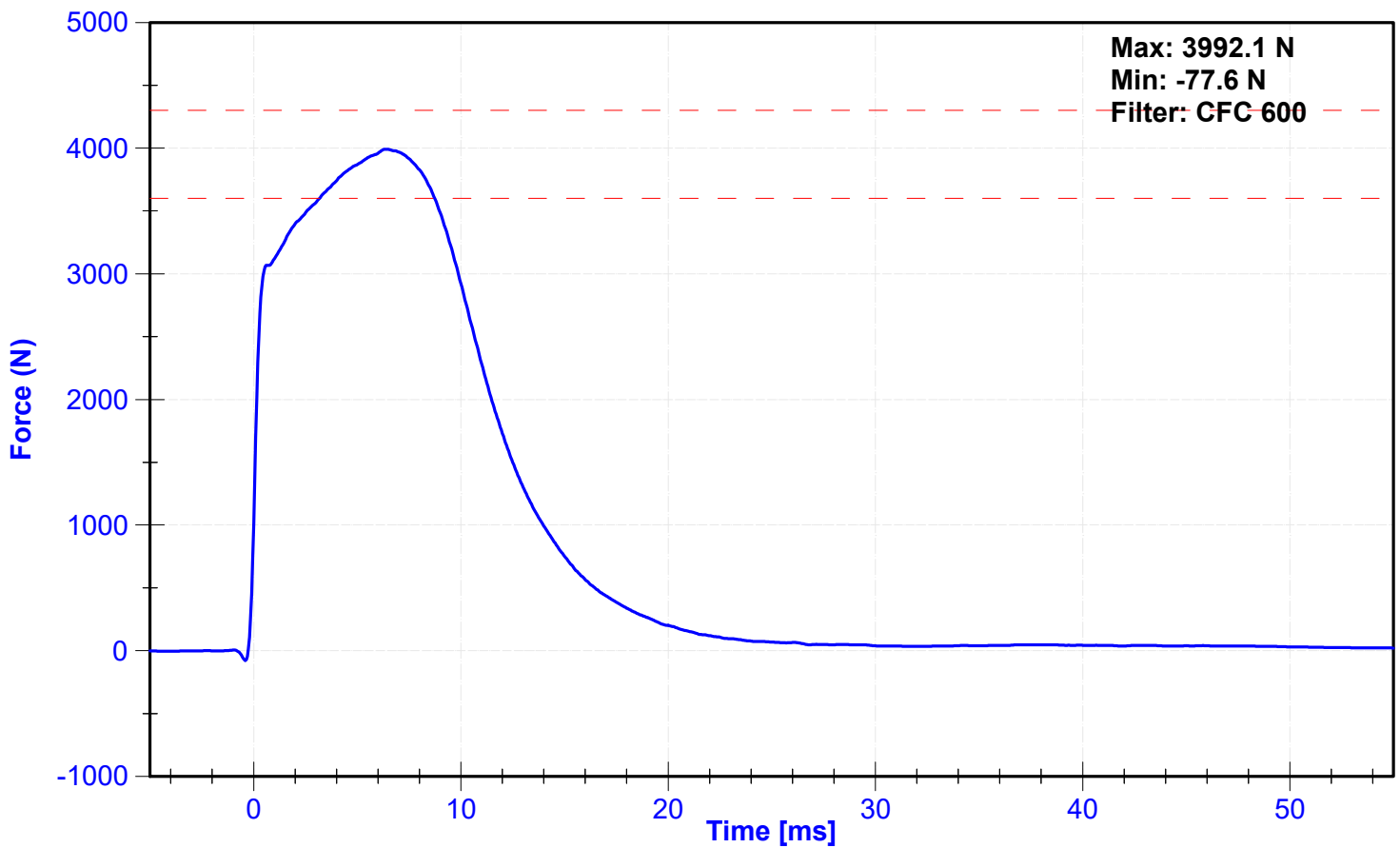
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Pelvis Y Accelerometer	Endevco	P51731	5/9/2024	11/5/2024
Acetabulum Load Cell	Denton	275-FY	7/12/2024	7/12/2025
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A



Lateral Pelvis Acceleration



Acetabulum Force





SID-IIs Pelvis Plug Certification Test

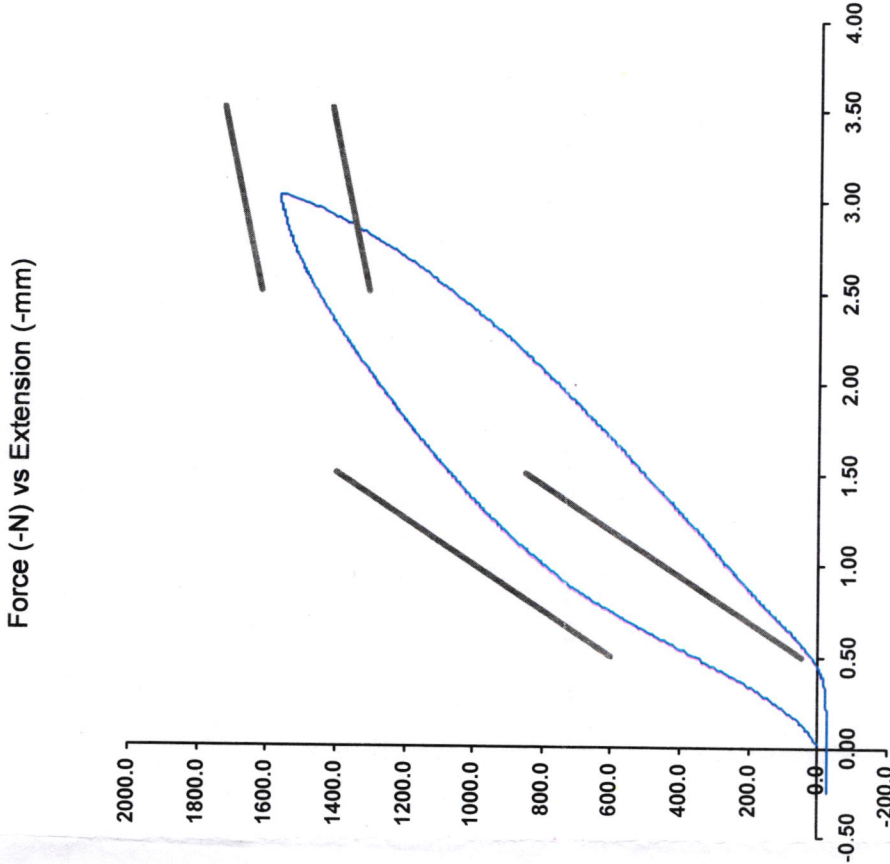
Plug S/N 16790
Test Number 23600
Report Number 23657

Test Date 7/25/2022 8:28:33 AM

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 300 9-23-24



Operator	
Part Number	180-4450
Template No 107	25-Jul-22
SACO Research	

By :  Date : 7/25/22
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-IIs Pelvis Plug Certification Test

Plug S/N 16778

Test Number 23588

Report Number 23645

Test Date 7/25/2022 7:53:38 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	334	600
Force @ 1.5 mm (N)	1,227	1,400
Force @ 2.5 mm (N)	1,518	1,618
Force @ 3.0 mm (N)	1,559	1,673

Testing Machine STM-20 5965542

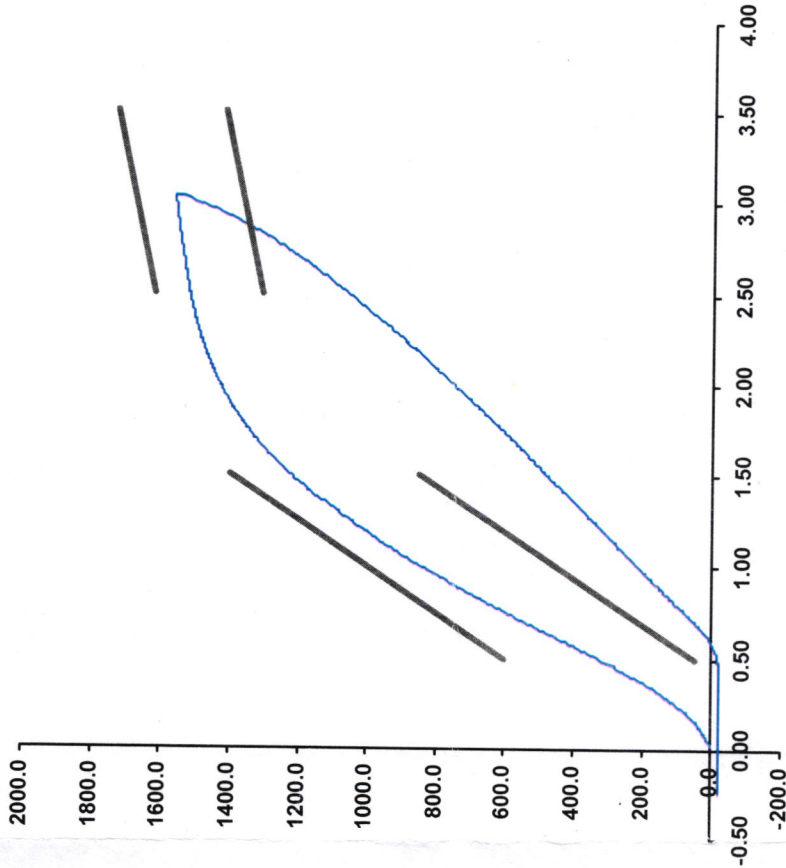
Load Cell S/N (FI360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes: Impact Plug 300 9-23-24

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 25-Jul-22

SACO Research

By: DC Date: 7/25/22
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX



SID-IIs Pelvis Plug Certification Test

Plug S/N 16781

Test Number 23591

Report Number 23648

Test Date 7/25/2022 7:59:26 AM

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

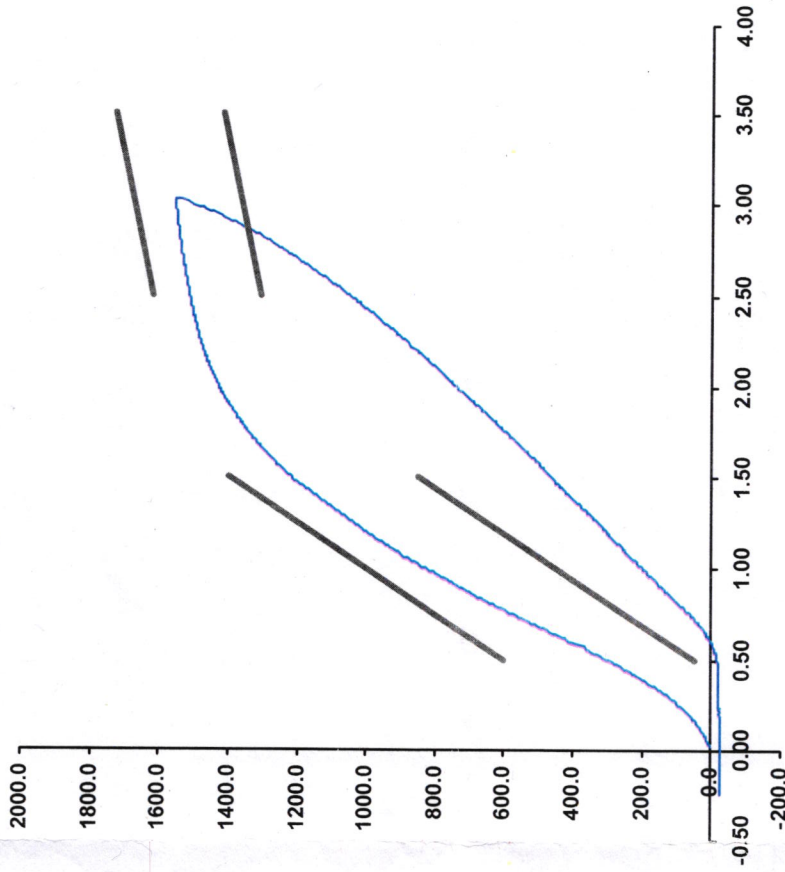
Load Cell S/N (F1360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes:
Non IMPACT PLUG 300 4-23-24

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 25-Jul-22

SACO Research

By: DC Date: 7/28/22
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

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

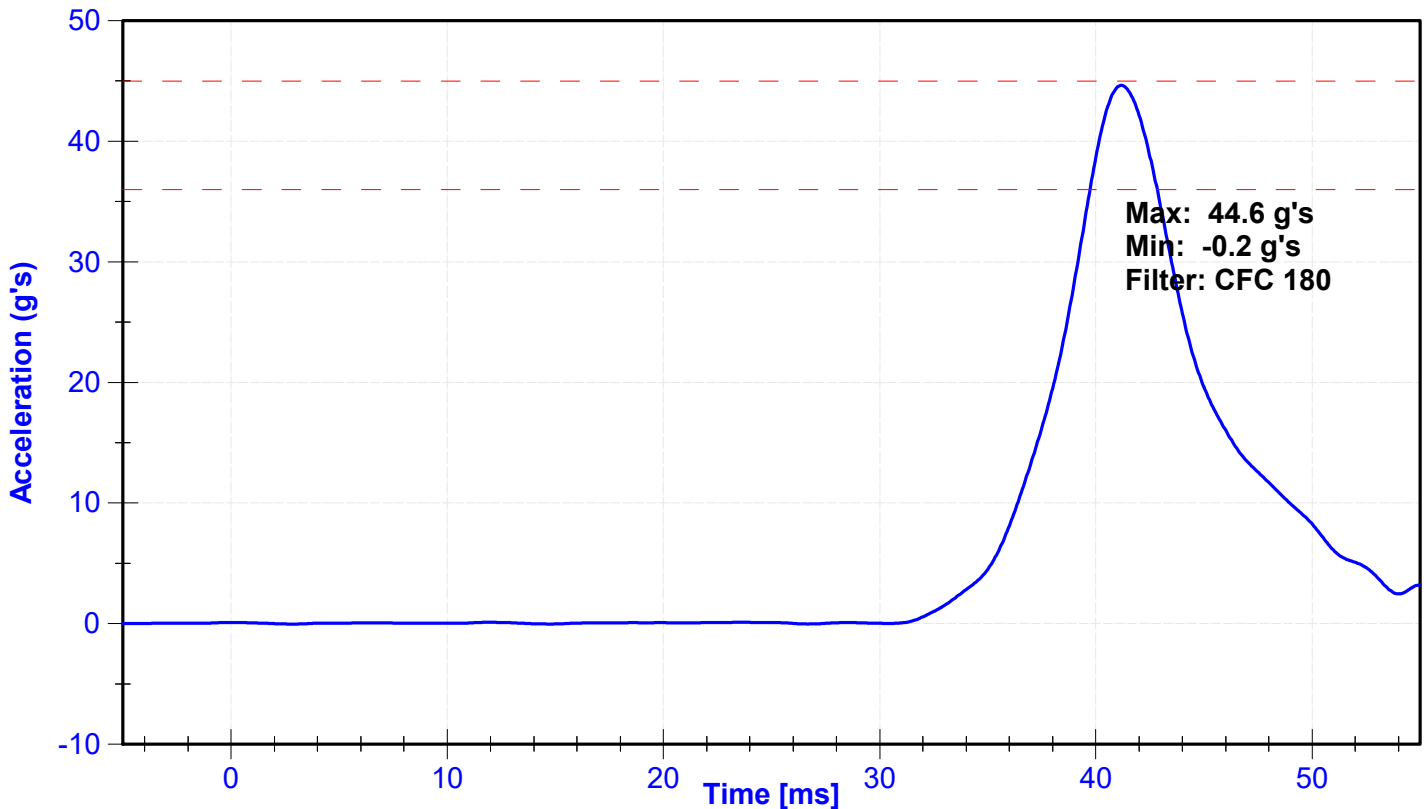
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.7	Pass
Humidity	10	70	%	60	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	36	45	g's	44.6	Pass
Lateral Pelvis Acceleration	28	39	g's	34.6	Pass
Iliac Force	4100	5100	N	4898.7	Pass

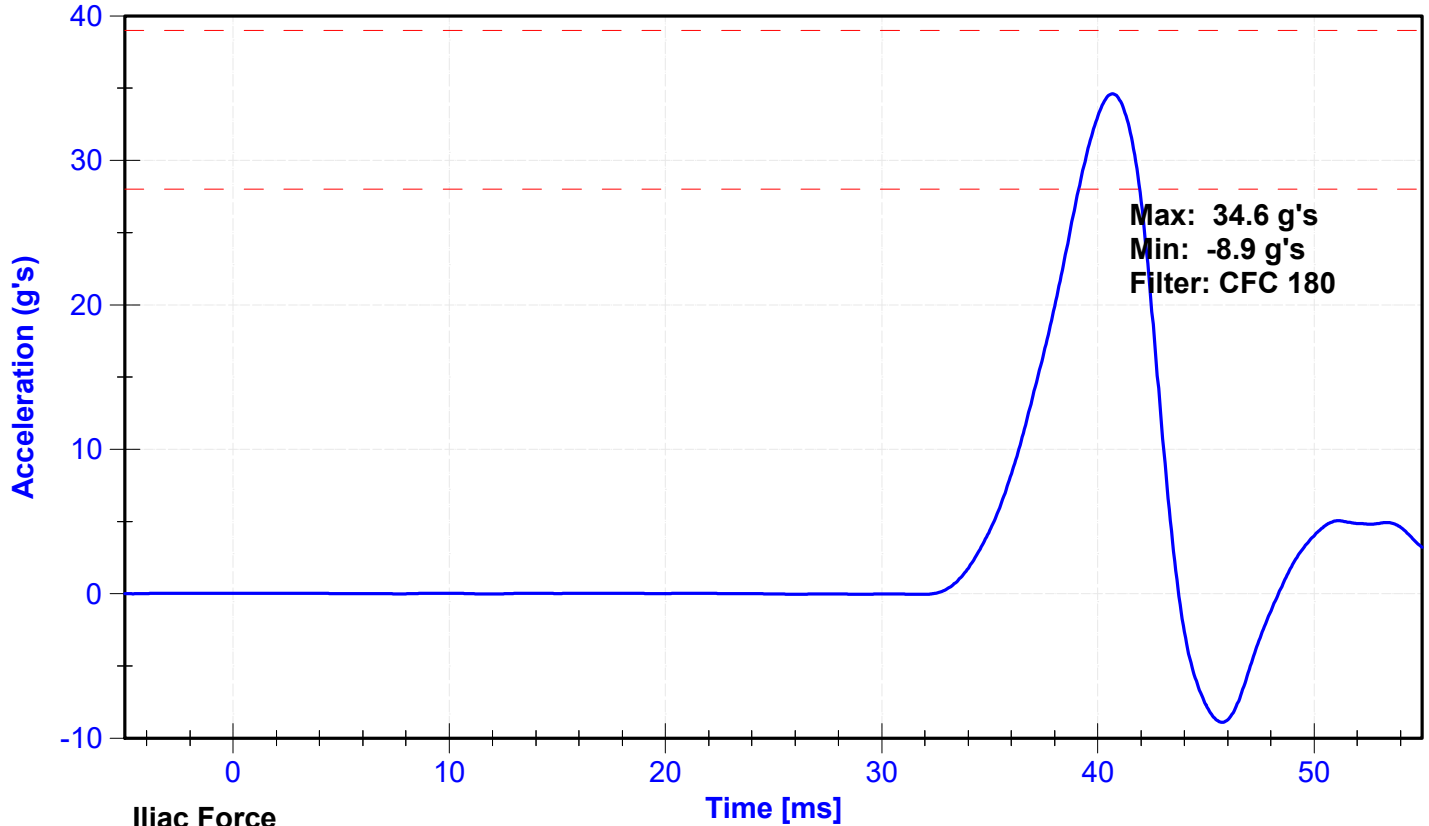
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18527	8/2/2024	1/29/2025
Pelvis Y Accelerometer	Endevco	P51731	5/9/2024	11/5/2024
Iliac Load Cell	Denton	279-FY	12/5/2023	12/4/2024

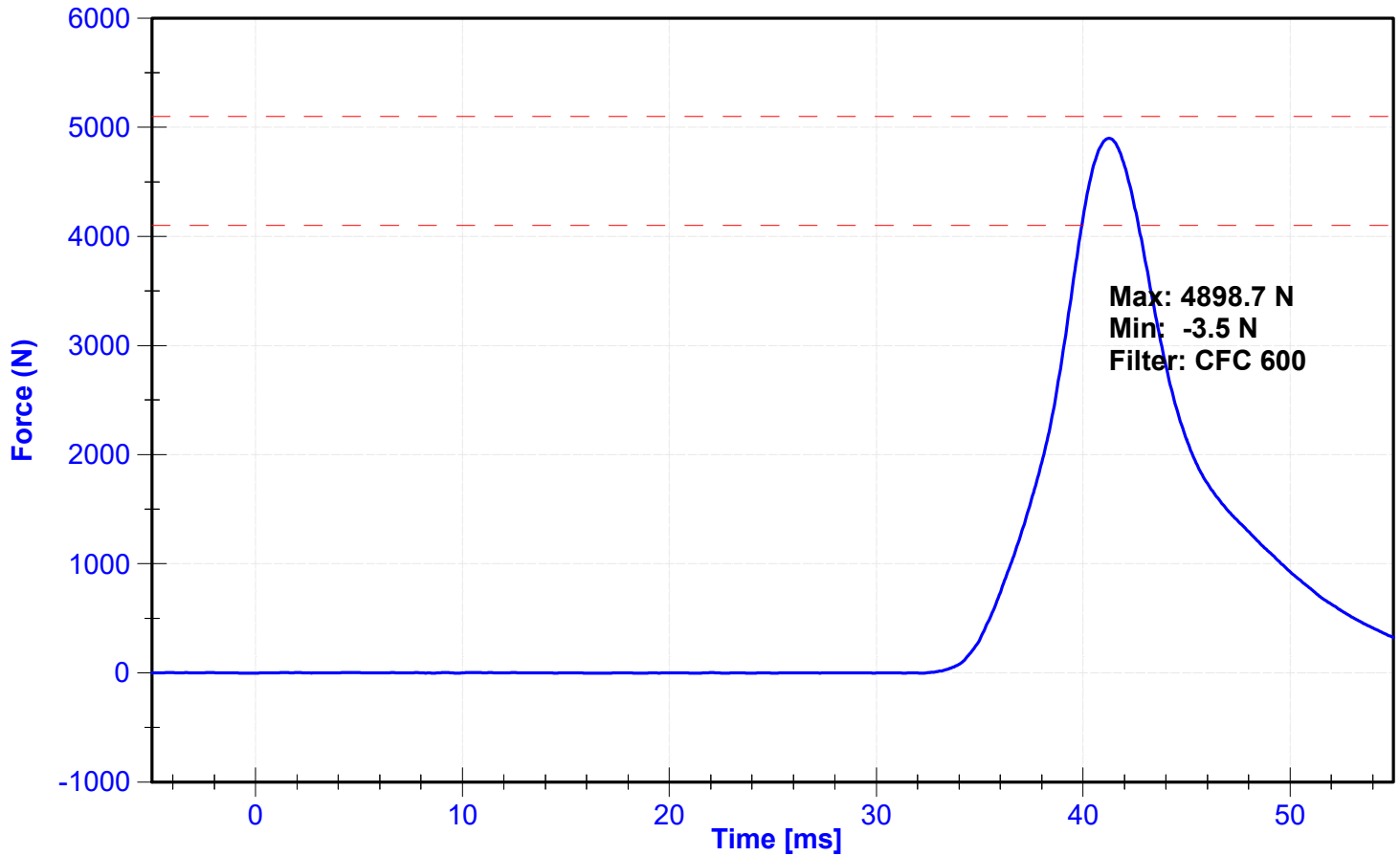
Probe Acceleration



Lateral Pelvis Acceleration



Iliac Force



APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N: 300			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers			X	P59018	Endevco	05/09/2024
			Y	P79189	Endevco	05/09/2024
			Z	P79587	Endevco	05/09/2024
Head Accelerometers - Redundant			X	P68057	Endevco	05/09/2024
			Y	P58986	Endevco	05/09/2024
			Z	P52025	Endevco	05/09/2024
Displacement Potentiometer	Shoulder		Y			
	Thoracic Rib	Upper	Y	2316GFE	Servo	05/09/2024
		Middle	Y	085GFE	Servo	05/09/2024
		Lower	Y	1156GFE	Servo	05/09/2024
	Abdominal Rib	Upper	Y	074GFE	Servo	05/28/2024
		Lower	Y	075GFE	Servo	05/09/2024
Lower Spine Accelerometers (T12)			X	P64003	Endevco	05/09/2024
			Y	P52071	Endevco	05/09/2024
			Z	P17283	Endevco	05/09/2024
Acetabulum Load Cell			Y	275-FY	Denton	07/12/2024
Lilac Wing Load Cell			Y	279-FY	Denton	12/05/2023
Pelvis Plug (Struck Side)				15783	SACO	10/15/2021
Pelvis Plug (Non-Struck Side)				16460	SACO	05/23/2022

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	G24614	Endevco	06/13/2024
Vehicle Center of Gravity	Y	G24640	Endevco	06/03/2024
Vehicle Center of Gravity	Z	G25035	Endevco	05/20/2024
Left Floor Sill	Y	G24310	Endevco	04/22/2024
A-Pillar Sill	Y	G24234	Endevco	05/03/2024
A-Pillar Low	Y	A428022	Measurement Specialties	04/04/2024
A-Pillar Mid	Y	G23638	Endevco	05/07/2024
B-Pillar Sill	Y	A315026	Measurement Specialties	04/15/2024
B-Pillar Low	Y	A399960	Measurement Specialties	04/15/2024
B-Pillar Mid	Y	G22190	Endevco	04/10/2024
Driver Seat	Y	G22120	Endevco	04/04/2024
Engine Top	X	A282720	Measurement Specialties	07/30/2024
Engine Top	Y	A374300	Measurement Specialties	07/30/2024
Firewall	Y	A431366	Measurement Specialties	04/15/2024
Right Roof	Y	G23410	Endevco	05/07/2024
Right Floor Sill	Y	A250357	Measurement Specialties	03/29/2024
Rear Floorpan	X	G23832	Endevco	06/26/2024
Rear Floorpan	Y	G23847	Endevco	06/26/2024

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	1220AF-1277329-F0	Interface	06/21/2024
Load Cell 2	1220AF-1117017-F0	Interface	06/21/2024
Load Cell 3	1220AF-1117025-F0	Interface	06/21/2024
Load Cell 4	1220AF-1130989-F0	Interface	06/21/2024
Load Cell 5	1220AF-1281288-F0	Interface	06/21/2024
Load Cell 6	1220AF-1281285-F0	Interface	06/21/2024
Load Cell 7	1220AF-1117035-F0	Interface	06/21/2024
Load Cell 8	1220AF-1117011-F0	Interface	06/21/2024