REPORT NUMBER: SPNCAP-CAL-24-001

NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST

General Motors LLC
2024 Cadillac LYRIQ
5 Door SUV

NHTSA No: M20240120

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

December 9, 2024

FINAL REPORT

PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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Date: December 9, 2024

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Date: December 9, 2024

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: _____

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7. *Author(s)* Alex Rudniski, Test Engineer Vanessa Hansen, Operations Manager	8. *Performing Organization Report No.* CAL-DOT-2024-001
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15. *Supplementary Notes*

16. *Abstract*

A 32.20 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2024 Cadillac LYRIQ 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 May 17, 2024.

The impact velocity of the vehicle was 32.33 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 188 mm located at level 3. The test vehicle's occupant performance data is as follows:

M easurement Description	Driver ATD (SID-IIs) (Serial No.300)		
	Units	Threshold	Result
Head Injury Criteria (HIC36)		1000	347.597
Resultant Lower Spine Acceleration	G	82	38.709
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3196.547
Maximum Thoracic Rib Deflection	mm	38	24.790
Maximum Abdominal Rib Deflection	mm	45*	19.085

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*	18. *Distribution Statement*
New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs	Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, 1200 New Jersey Ave. SE Washington, D.C. 20590

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Form DOT F1700.7 (8-72)

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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 Cadillac LYRIQ 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 Cadillac LYRIQ 5 Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.33 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on May 17, 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 (HIC36)		1000	347.597
Resultant Lower Spine Acceleration	G	82	38.709
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	3196.547
Maximum Thoracic Rib Deflection	mm	38	24.790
Maximum Abdominal Rib Deflection	mm	45*	19.085

*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
Front Airbag	Yes	No		
Knee Airbag	Yes	No		
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 - Torso/Pelvis Airbag	Yes	Yes	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

GENERAL COMMENTS:

1. P1 serial number - 300

Data Anomalies:

- Left Lower A-Pillar Y Acceleration, Exceeded calibration range at 50.3 ms
- Load Cell Pole Barrier #8 Fy, Questionable data spikes before T0
- Load Cell Pole Barrier #7 Fy, Questionable data spikes before T0

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. 305-1 - General Test and Parameter Data for Indicant FMVSS No. 305 Testing

Data Sheet No. 305-2 - Pre-Impact Data for Indicant FMVSS No. 305 Testing

Data Sheet No. 305-3 - Pre-Impact Electrical Isolation Measurements and Calculations for Indicant FMVSS No. 305 Testing

Data Sheet No. 305-4 - Post-Impact Data for Indicant FMVSS No. 305 Testing

Data Sheet No. 305-5 - Static Rollover Test Data for Indicant FMVSS No. 305 Testing

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV
NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test
Test Date: 05/17/2024

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20240120
Model Year	2024
Make	Cadillac
Model	LYRIQ
Body Style	5 Door SUV
VIN	1GYKPPRK9RZ123266
Body Color	Celestial Metallic
Odometer Reading (km/mi)	14 mi
Engine Displacement (L)	Electric Vehicle
Type / No. Cylinders	N/A
Engine Placement	Transverse
Transmission Type	Automatic
Transmission Speeds	Direct Drive
Overdrive	No
Final Drive	Rear Wheel Drive
Roof Rack	No
Sunroof / T-Top	Yes
Running Boards	No
Tilt Steering Wheel	Yes
Power Seats	Yes
Anti-Lock Brakes (ABS)	Yes

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

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

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC
Date of Manufacture	02/24
Vehicle Type	MPV

GVWR (KG)	3050
GVWR Front (KG)	1550
GVWR Rear (KG)	1700

VEHICLE SEATING AND WEIGHT CAPACITY DATA

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	2	3	N/A	5	
Vehicle Capacity Weight (VCW) (kg)				484	(A)
DSC x 68.0 kg				340	(B)
Cargo Weight (RCLW) (kg)				136	

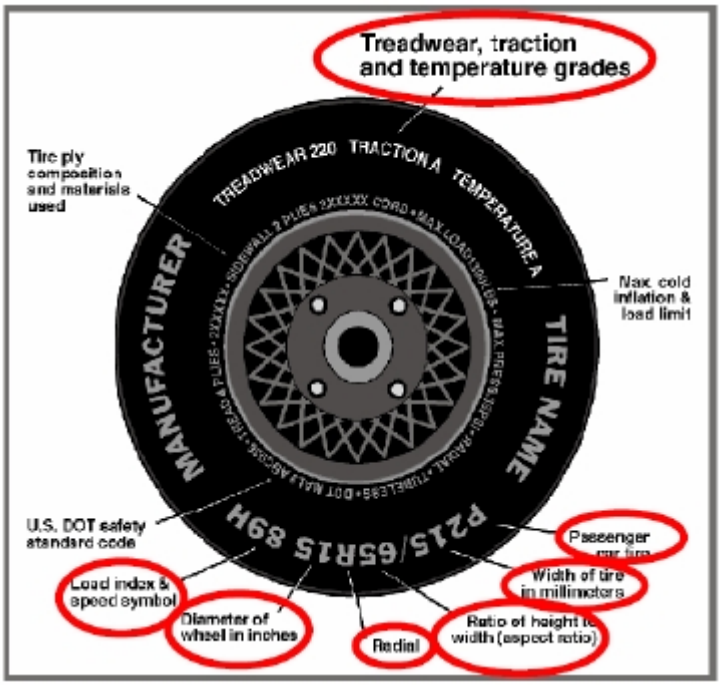
VEHICLE SEAT TYPE

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

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

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

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)	350	350
Cold Pressure (kPa)	290	290
Recommended Tire Size	265/50R20	265/50R20
Tire Size on Vehicle	265/50R20	265/50R20
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy	Primacy
Treadwear	540	540
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index / Speed Symbol	107H	107H
Tire Material	Rubber	Rubber
DOT Safety Code Left	03LUR01AX2923	03LUR01AX4623
DOT Safety Code Right	03LUR01AX4523	03LUR01AX4623

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

Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV
NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test
Test Date: 05/17/2024

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	301	303	297	298
Tire Placard	kPa	290	290	290	290
Owner's Manual	kPa	290	290	290	290
As Tested	kPa	290	290	290	290

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	616	656		630	722		641	740	
Right	kg	607	643		628	722		614	716	
Ratio	%	48.5	51.5		46.6	53.4		46.3	53.7	
Totals	kg	1223	1299	2522	1258	1444	2702	1255	1456	2711

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2522	(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	2708	(A+B+C)

Does the measured As Test Vehicle Weight lie within the required weight range

(i.e. Calculated Test Vehicle Target Weight – 4.5 kg to – 9 kg)? [X] **Yes** [ ] **No**

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Rqmt***
Driver Door Sill Angle (front-to-rear)*	Deg	+0.25	+0.1	-0.15	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	-0.45	-0.45	-0.6	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	-0.05	-0.05	-0.15	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	+0.75	+0.6	+0.6	Yes
Vehicle CG (Aft of Front Axle)	mm	1525	1652	1661	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	7	1	16	

* 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 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	23
Charging Kit	4
Ballast / Equipment Added	72

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

TEST SURFACE MARKING

	Distance from 75° Impact Location Line (mm)
Fore 25 mm target	998
Aft 25 mm target	1001

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

Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV
NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test
Test Date: 05/17/2024

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	20.7	12.8	16.8
Front Passenger Seat	17.5	13.2	15.4
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed

SEAT HEIGHT AND ANGLE

Seat	As Tested SCRL Angle (Mid) (°)	As Tested SCRP Height (mm)	SCRP Height Position	SCRP Height (mm)		
				Rearmost	Mid-Fore / Aft	Forward-Most
Driver Seat	16.8	37	Max	64	64	68
			Mid	34	34	37
			Min	2	3	6
Front Passenger Seat	15.4	18	Max	-	-	-
			Mid	-	-	-
			Min	13	14	18
Front Center Seat*			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Non-Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Rear Center Seat*	Fixed	Fixed	Max			
			Mid			
			Min			

**If applicable*

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

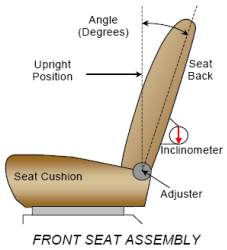
Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV | NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test | Test Date: 05/17/2024

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	260	Power	0	Power
Front Passenger Seat	258	Power	0	Power
Front Center Seat				
Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed	Fixed
Rear Center Seat	Fixed	Fixed	Fixed	Fixed

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.



FRONT SEAT ASSEMBLY

Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat	55.8	Power	12.3	Power
Front Passenger Seat	55.8	Power	12.3	Power
Front Center Seat				
Struck Side Rear Seat	4.6	2 (0-1)	24.8	0
Non-Struck Side Rear Seat	4.6	2 (0-1)	24.8	0
Rear Center Seat	4.6	2 (0-1)	24.8	0

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	4 (0-3)	Lowermost

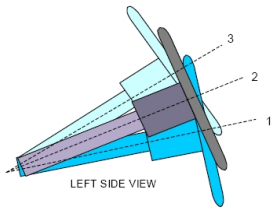
DATA SHEET NO. 2 … (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

STEERING COLUMN POSITIONS

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	16.5	
Geometric center position No. 2	18.6	
Uppermost position No. 3	20.6	
Telescoping Steering Wheel Travel		54
Test Position	18.6	27

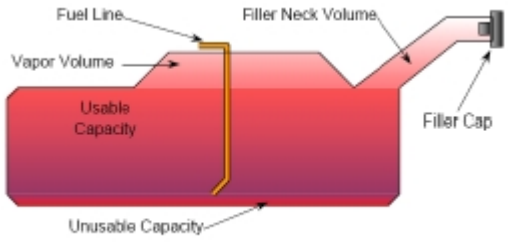


STEERING COLUMN ASSEMBLY

FUEL PUMP

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

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



VEHICLE FUEL TANK ASSEMBLY

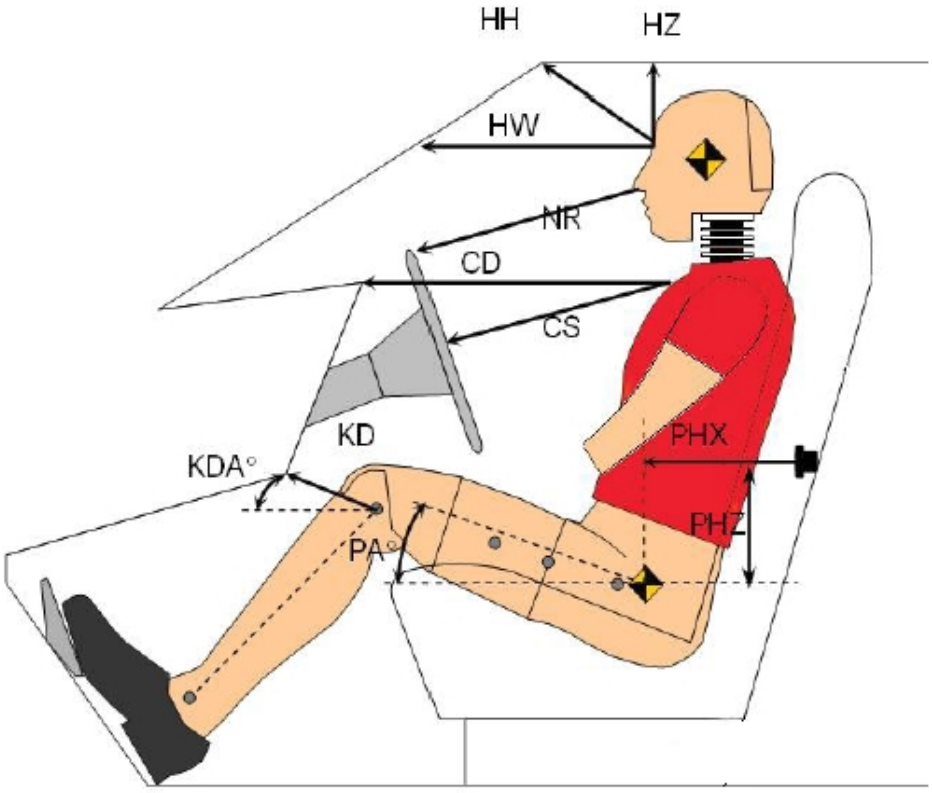
FUEL TANK CAPACITY

Description	Liters
Usable Capacity of “Standard Tank” - see Form No. 1	
Usable Capacity of “Optional Tank” - see Form No. 1	
Usable Capacity of “Standard Tank” - see Owner’s Manual	
Usable Capacity of “Optional Tank” - see Owner’s Manual	
93% of Usable Capacity	
Actual Amount of Solvent Used in Test	Electric Vehicle
1/3 of Usable Capacity	

Is the Actual Amount of Solvent Used in the test equal to 93% ±1% of the Usable Capacity stated in Form No. 1? ☐ **Yes** ☐ **No** ☒ **N/A**

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024



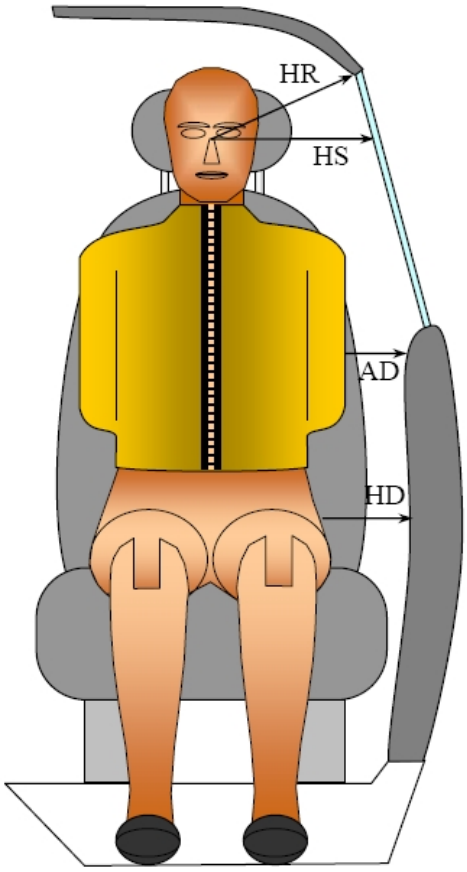
Left Side View

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. 300)	
		Length (mm)	Angle (°)
HH	Head to Header	281	
HW	Head to Windshield	629	
HZ	Head to Roof Liner	199	
NR	Nose to Rim	204	
CD	Chest to Dash	427	
CS	Chest to Steering Wheel	178	
KD(L) / KDA(L)◦	Left Knee to Dash	172	32.8
KD(R) / KDA(R)◦	Right Knee to Dash	166	33.2
PAX◦	Pelvic Tilt Angle (X-Axis)		17.8
PAY◦	Pelvic Tilt Angle (Y-Axis)		0.4
PHX	Hip Point to Striker (X-Axis)	351	
PHZ	Hip Point to Striker (Z-Axis)	131	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024



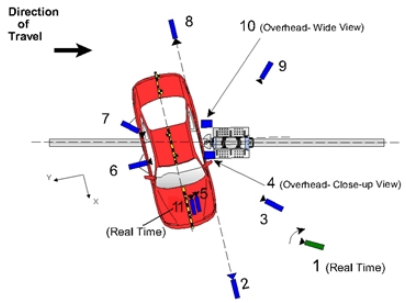
FRONT VIEW OF DUMMY

DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver – Length (Serial No. 300)
HR	Head to Side Header	mm	270
HS	Head to Side Window	mm	410
AD	Arm to Door	mm	169
HD	H-Point to Door	mm	165

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV
NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test
Test Date: 05/17/2024



CAMERA LOCATIONS AND DATA

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-time (24 - 30 fps) pan view of impact				Zoom	30
2	Front ground level - impact view	7764	0	-1493	28	1000
3	Impact side 45º - forward pole view	5030	-720	-1403	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	-8906	0	-1483	28	1000
9	Impact side 45º - rearward pole view	-3924	-4100	-1540	24	1000
10	Overhead wide - view of impact	0	0	-9375	12.5	1000
11	Real-time (24 - 30 fps) - dummy front view				Zoom	60

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 75º angle to the rigid pole.*

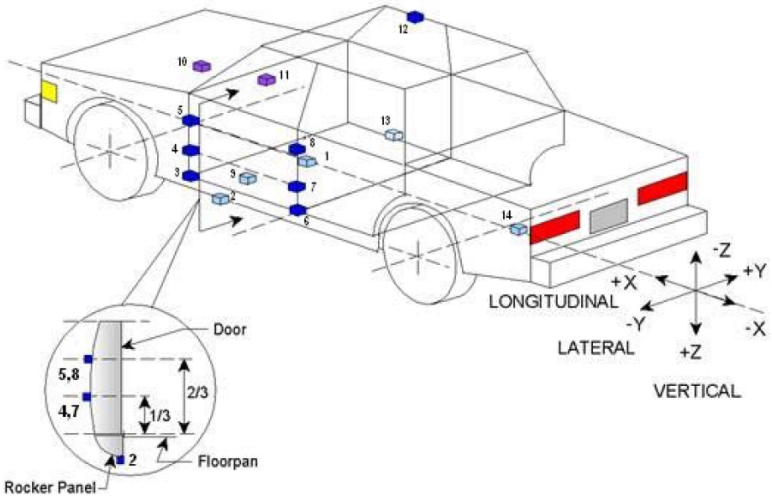
Comments: All cameras operated as intended.

INSTRUMENTATION

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

DATA SHEET NO. 6
TEST VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2140	2	267
2	Left Floor Sill	3106	-704	256
3	A-Pillar Sill	3340	-679	230
4	A-Pillar Low	3457	-690	-25
5	A-Pillar Mid	3338	-700	-469
6	B-Pillar Sill	2271	-720	190
7	B-Pillar Low	2305	-711	-18
8	B-Pillar Mid	2230	-702	-385
9	Seat	2475	-579	219
10	Engine	4140	-2	-88
11	Firewall	3911	168	-305
12	Roof	2412	606	-938
13	Right Floor Sill	2990	703	261
14	Rear Deck	660	-6	48

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 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

POLE BARRIER

RIGID POLE LOAD CELL LOCATION

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 Cadillac LYRIQ 5 Door SUV
NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test
Test Date: 05/17/2024

TEST DUMMY INFORMATION AND CONTACT POINTS

Dummy Body Part	Driver Seat Dummy (SID-IIs)
Face	None
Top of Head	Curtain Airbag
Left Side of Head	Curtain Airbag
Back of Head	Headrest
Left Shoulder	Seatback & Torso/Pelvis Airbag
Upper Torso	Seatback
Lower Torso	Seatback & Torso/Pelvis Airbag
Left Hip	Seatpan & Torso/Pelvis Airbag
Left Knee	Driver door

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	N/A	N/A
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 Cadillac LYRIQ 5 Door SUV | NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test | Test Date: 05/17/2024

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar Buckled
Sill Separation	None
Windshield Damage	None
Side Window Damage	Driver window cracked
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

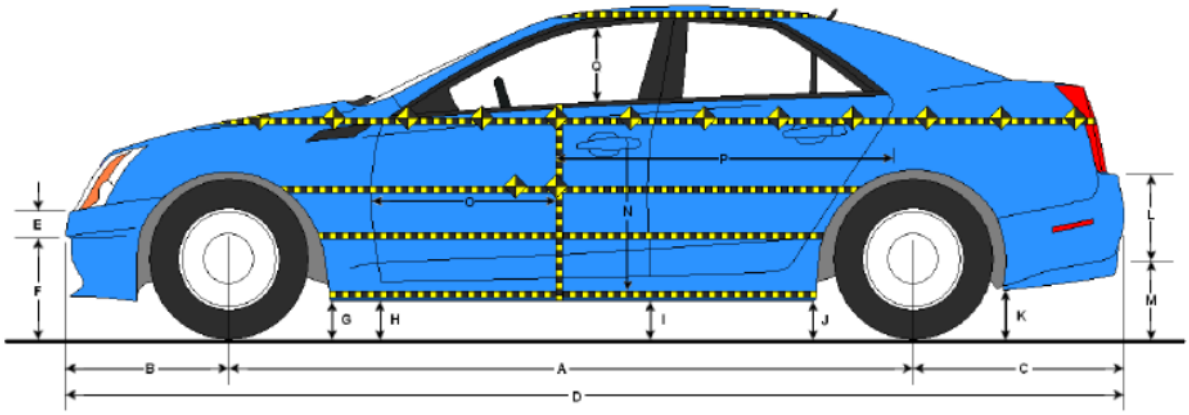
VEHICLE SPEED, VEHICLE ANGLE AT IMPACT AND IMPACT POINT LOCATION DATA

Measured Parameter	Units	Tolerance	Value
Vertical Impact Ref Line - Aft of Front Axle, Intended Impact Pt	mm		1294
Actual Impact Point - Aft of Front Axle	mm		1299
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	32.33
Trap No. 2 Velocity - Redundant	kph	31.4 to 33.0	32.36

*Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

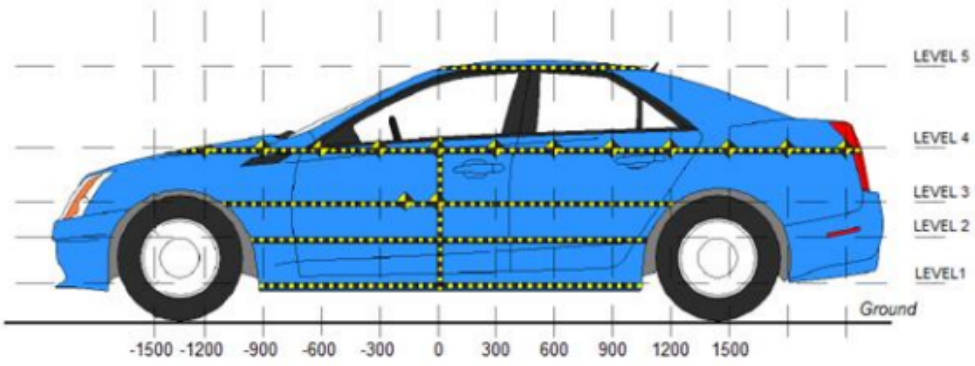
No.	Measurement Description	Pre-Test	Post-Test	Change
A	Vehicle Wheelbase	3092	3080	-12
B	Front Axle to FSOV	902	912	10
C	Rear Axle to RSOV	1004	998	-6
D	Total Vehicle Length at Centerline	4998	4990	-8
E	Front Bumper Thickness	95	95	0
F	Front Bumper Bottom to Ground	520	517	-3
G	Sill Height at Front Wheel Well	202	198	-4
H	Sill Height at Front Door Leading Edge	217	218	1
I	Sill Height at B Pillar	219	223	4
J1	Sill Height at Rear Wheel Well	220	225	5
J2	Pinch Weld Height at Rear Wheel Well	222	231	9
K	Sill Height Aft of Rear Wheel Well	284	282	-2
L	Rear Bumper Thickness	110	110	0
M	Rear Bumper Bottom to Ground	444	434	-10
N	Sill Height to Window Bottom Sill	900	900	0
O	Front Door Leading Edge to Impact CL	652	624	-28
P	Rear Door Trailing Edge to Impact CL	1585	1566	-19
Q	Front Window Opening	345	338	-7
R	Right Side Length	4859	4859	0
S	Left Side Length	4861	4850	-11
T	Vehicle Width at B-Pillars	1958	1944	-14
U	Front Wheel Track width	1685	1685	0
V	Rear Wheel Track Width	1685	1691	6

* All measurements in mm with tolerance of ± 3mm

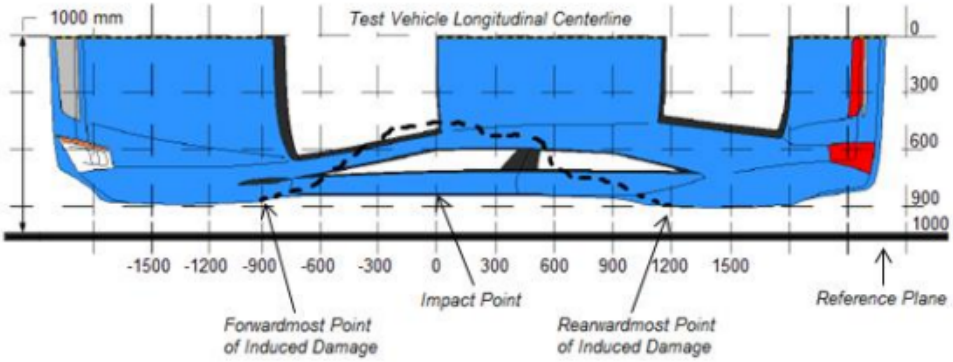
DATA SHEET NO.10
TEST VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

MAXIMUM EXTERIOR CRUSH MEASUREMENTS



Left Side View



Overhead View

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	360	101	0
2	Occupant H-Point	mm	677	185	0
3	Mid-Door	mm	737	188	0
4	Window Sill	mm	1105	137	0
5	Window Top	mm	1574	-3	1200

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 Cadillac LYRIQ 5 Door SUV NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test Test Date: 05/17/2024

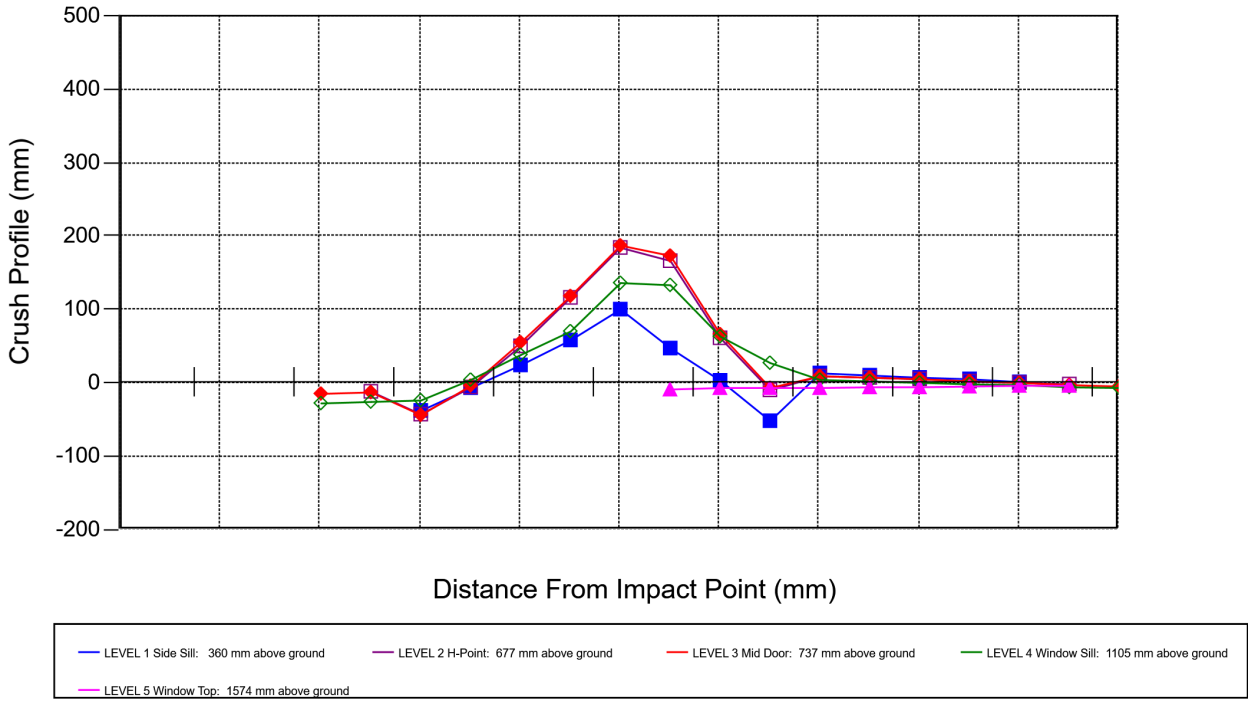
EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

	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			983	864				997	891				-14	-27	
-750		979	977	878			990	989	903			-11	-12	-25	
-600	946	974	977	888		983	1016	1020	911		-37	-42	-43	-23	
-450	945	973	977	895		951	978	980	890		-6	-5	-3	5	
-300	944	972	976	900		919	921	920	861		25	51	56	39	
-150	943	971	974	905		884	854	855	834		59	117	119	71	
0	942	969	973	908		841	784	785	771		101	185	188	137	
150	940	967	970	910	642	892	800	796	776	650	48	167	174	134	-8
300	939	964	966	911	653	935	902	899	847	659	4	62	67	64	-6
450	937	963	963	912	659	988	972	969	884	665	-51	-9	-6	28	-6
600	936	962	961	914	659	922	952	951	909	665	14	10	10	5	-6
750	934	963	960	913	656	923	955	952	910	661	11	8	8	3	-5
900	932	964	959	912	650	924	958	953	911	655	8	6	6	1	-5
1050	934	966	960	908	640	928	963	957	909	644	6	3	3	-1	-4
1200	936	974	969	907	625	934	973	968	909	628	2	1	1	-2	-3
1350		983	984	901	605		984	986	906	608		-1	-2	-5	-3
1500			987	897				991	903				-4	-6	

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 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

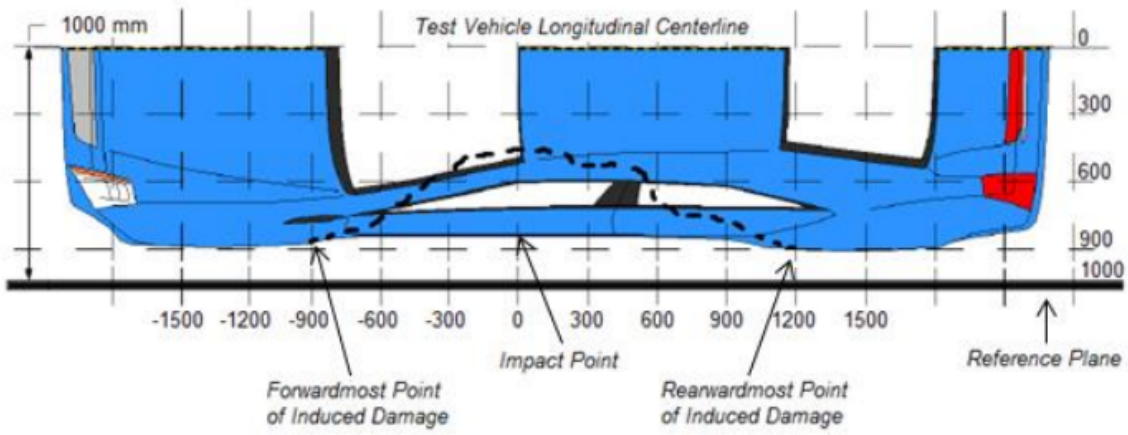


Vehicle Exterior Crush Measurements - Visual Representation

DATA SHEET NO.11
VEHICLE DAMAGE PROFILE DISTANCE

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

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



Overhead View

VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-900	3	3	17	-14
2	-420	3	32	23	9
3	60	3	211	28	183
4	540	3	42	38	4
5	1020	3	44	40	4
6	1500	3	9	13	-4

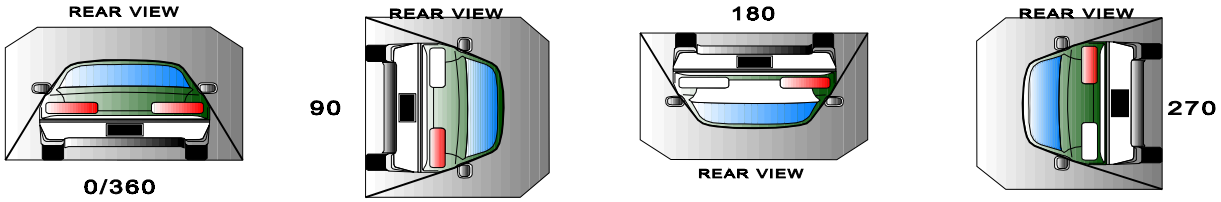
DATA SHEET NO.12
FMVSS NO.301 STATIC ROLLOVER RESULTS

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

Test Time: 9:21 AM Temperature: 21 °C

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

D. Spillage Detail: Electric Vehicle



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°			
90° to 180°			
180° to 270°			
270° to 360°			

FMVSS 301 SPILLAGE TABLE

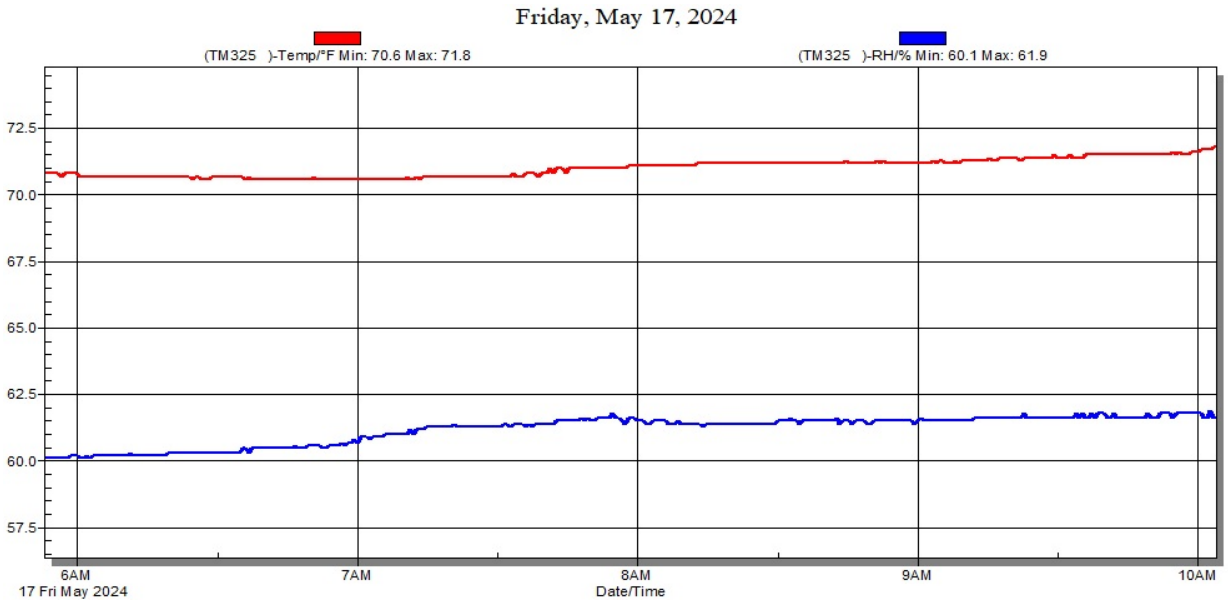
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°				
90° to 180°				
180° to 270°				
270° to 360°				

SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	
90° to 180°	
180° to 270°	
270° to 360°	

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

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024



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

DATA SHEET NO. 305-1
GENERAL TEST AND VEHICLE PARAMETER DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV
NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test
Test Date: 05/17/2024

ELECTRIC VEHICLE PROPULSION SYSTEM

Measured Parameter	Value
Type of Electric Vehicle (Electric/Gas-Electric Hybrid/Fuel Cell-Electric Hybrid)	Electric
Propulsion Battery Type	High Voltage Li-Ion
Nominal Voltage (Volts)	350
Is this Vehicle equipped with an Automatic Propulsion Battery Disconnect?	Yes
Physical Location of Automatic Propulsion Battery Disconnect, if applicable	Inside Battery Pack
Auxiliary Battery Type	AGM 12V

PROPULSION BATTERY SYSTEM DATA (COTR SUPPLIED)

Measured Parameter	Value
Electrolyte Fluid Type	Liquid
Electrolyte Fluid Specific Gravity	1.2 g/cm3 @ 25°C
Electrolyte Fluid Kinematic Viscosity (centistokes)	4cP @ 25°C
Electrolyte Fluid Color	Colorless/light yellow
Propulsion Battery Coolant Type, Color and Specific Gravity (if applicable)	50/50 Deionized water, Dexcool Mix
Location of Battery Modules (Inside or Outside of Passenger Compartment?)	Outside

PROPULSION BATTERY STATE OF CHARGE

Measured Parameter	Units	Value
For all battery types: Voltage Range corresponding to **useable energy** of the battery:		
Minimum State of Charge	V	289
Maximum State of Charge	V	398
95% of Maximum	V	378.1
Test Voltage *	V	396.9
For batteries that are rechargeable ONLY by an energy source on the vehicle: Voltage range corresponding to **useable energy** of the battery:		
Minimum State of Charge	V	
Maximum State of Charge	V	
95% of Maximum	V	
Test Voltage *	V	

* *For all battery types-No less than 95% of Maximum Operating Voltage; for batteries that are rechargeable ONLY by an energy source on the vehicle-maximum practicable state of charge within normal operating range.*

DATA SHEET NO. 305-2
PRE-IMPACT DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

VEHICLE CHASSIS GROUND PT(S) LOCATION(S) & PROPULSION BATTERY SYSTEM

Measured Parameter	Value
Details of Vehicle Chassis Ground Points & Locations	Ground point is located on the vehicle body
Details of Propulsion Battery Components	No details provided by OEM

DATA SHEET NO. 305-3
PRE-IMPACT ELECTRICAL ISOLATION MEASUREMENTS AND CALCULATIONS FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

VOLTMETER INFORMATION

Measured Parameter	Units	Value
Make & Model		Fluke 1587
Serial No.		51800115
Internal Impedance Value	MΩ	10
Resolution	V	0.001
Last Calibration Date		6/20/2023

NOTES:

- *The voltmeter used in this test shall measure DC values and have an internal impedance of at least 10 M Ω*
- *An oscilloscope meeting the above requirements may need to be used to adequately measure voltage in some vehicles.*

PROPULSION BATTERY VOLTAGE, RESISTANCE & ELECTRICAL ISOLATION MEASUREMENTS & CALCULATIONS

Measured Parameter	Symbol	Units	Value
Normal operating voltage range specified by the manufacturer	V_b	V	289-398
Propulsion Battery Voltage: (ready to drive position)	V_b	V	396.9
Propulsion Battery to Vehicle Chassis	V_1	V	130.4
Propulsion Battery to Vehicle Chassis	V_2	V	186.2
Propulsion Battery to Vehicle Chassis Across Known Resistor	R_o	Ω	200,200
Propulsion Battery to Vehicle Chassis with R_o installed	V_1'	V	41.1
Propulsion Battery to Vehicle Chassis with R_o installed	V_2'	V	58.3
$_{i1}= R_o*(1+V_2/V_1)*[(V_1-V_1')/V_1']$	R_{i1}	Ω	1,056,105
$R_{i2}= R_o*(1+V_1/V_2)*[(V_2-V_2')/V_2']$	R_{i2}	Ω	746,788
Lesser value of R_{i1} and R_{i2}	R_i	Ω	746,788
Electrical Isolation Value (Minimum E.I. Value is 500 Ω/V)	R_i/V_b	Ω/V	1,882

Is the Electrical Isolation Value ≥ 500 Ω/V (Yes/No)? [X] Yes [ ] No (Fail)

NOTES:

- *The measurement shall be made with the propulsion battery connected to the vehicle propulsion system, and the vehicle in the "ready-to-drive" (propulsion motor(s) activated) position.*
- *If the voltage measurement is not at the voltage or within the normal operating voltage range specified by the manufacturer, the battery must be charged.*
- *The known resistance Ro (in Ohms) should be approximately 500 times the nominal operating voltage of the vehicle (in volts) per SAE J1766*

If measured voltage is zero and results in a division by zero, record "Zero Volts." This "zero voltage" condition is considered as being compliant

DATA SHEET NO. 305-4
POST-IMPACT DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle:	2024 Cadillac LYRIQ 5 Door SUV	NHTSA No.:	M20240120
Test Program:	NCAP Side Pole Impact Test	Test Date:	05/17/2024

VOLTMETER INFORMATION

Measured Parameter	Units	Value
Make & Model		Fluke 1587
Serial No.		51800115
Internal Impedance Value	MΩ	10
Resolution	V	0.001
Last Calibration Date		06/20/2023

NOTES:

- *The voltmeter used in this test shall measure DC values and have an internal impedance of at least 10 M Ω*
- *An oscilloscope meeting the above requirements may need to be used to adequately measure voltage in some vehicles.*

ELECTRICAL ISOLATION MEASUREMENTS & IMPACT CALCULATIONS

Parameter	Value	Units		Value		Value	
V_b =	3.8	V	Time:	1	Minutes	56	Seconds
V_1 =	0.1	V	Time:	2	Minutes	3	Seconds
V_2 =	3.6	V	Time:	2	Minutes	9	Seconds
R_o =	200,200	Ω					
V_1' =	0.0	V	Time:	2	Minutes	14	Seconds
V_2' =	0.7	V	Time:	2	Minutes	20	Seconds
R_{i1} =	Zero Volts	Ω	Time:	2	Minutes	14	Seconds
R_{i2} =	852,439	Ω	Time:	2	Minutes	20	Seconds
R_i =	852,439	Ω	Time:	2	Minutes	20	Seconds
R_i/V_b =	224,326	Ω/V	Time:	2	Minutes	20	Seconds

Is the Electrical Isolation Value ≥ 500 Ω/V (Yes/No)?	X	Yes		No (Fail)

NOTES:

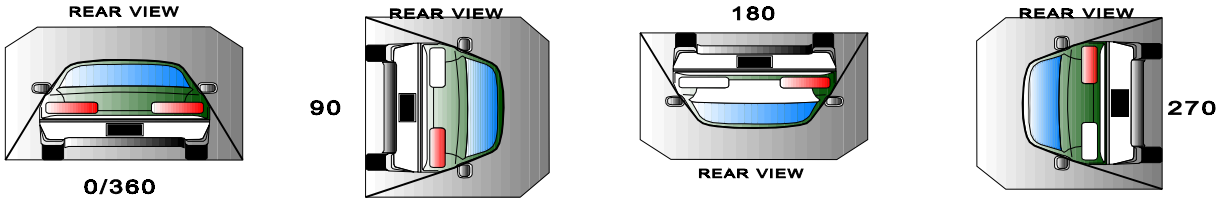
- *R_{i1}= R_o*(1+V_2/V_1)*[(V_1-V_1')/V_1'], R_{i2}= R_o*(1+V_1/V_2)*[(V_2-V_2')/V_2'], R_i = Lesser value of R_{i1} and R_{i2}*
- *If measured voltage is zero and results in a division by zero, record "Zero Volts." This "zero voltage" condition is considered as being compliant*
- *Minimum Electrical Isolation Value is 500 Ω/V*

PROPULSION BATTERY SYSTEM COMPONENTS

Measured Parameter	Comments	Passed	Failed
Propulsion Battery Module movement within the passenger compartment	None	X	
Intrusion of an outside Propulsion Battery Component into the passenger compartment	None	X	
Is propulsion battery electrolyte spillage visible in the passenger compartment?	None	X	

DATA SHEET NO. 305-5
STATIC ROLLOVER TEST DATA FOR INDICANT FMVSS NO. 305 TESTING

Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV
Test Program: NCAP Side Pole Impact Test
NHTSA No.: M20240120
Test Date: 05/17/2024



Rear View

DETERMINATION OF PROPULSION BATTERY ELECTROLYTE COLLECTION TIME PERIOD

Rollover Stage	Rotation Time (spec. 1 -3 min)		FMVSS 301 Hold Time	Total Time		Next Whole Minute Interval
	Minutes	Seconds	Minutes	Minutes	Seconds	Minutes
0° to 90°	1	8	5	6	8	7
90° to 180°	1	7	5	6	7	7
180° to 270°	1	4	5	6	4	7
270° to 360°	1	8	5	6	8	7

ACTUAL TEST VEHICLE PROPULSION BATTERY ELECTROLYTE SPILLAGE

Rollover Stage	Propulsion Battery Electrolyte Spillage	Units	Spillage Location
0° to 90°	0	Liters	No Spillage
90° to 180°	0	Liters	No Spillage
180° to 270°	0	Liters	No Spillage
270° to 360°	0	Liters	No Spillage
Total Spillage	0	Liters	No Spillage

** FMVSS 305 Requirements: Maximum allowable propulsion battery electrolyte spillage is **5.0 Liters***

Is the total spillage of propulsion battery electrolyte greater than 5.0 Liters? [ ] Yes (Fail) [X] No
Is propulsion battery electrolyte spillage visible in the passenger compartment? [ ] Yes (Fail) [X] No

VOLTMETER INFORMATION

Measured Parameter	Units	Value
Make & Model		Fluke 1587
Serial No.		51800115
Internal Impedance Value	MΩ	10
Resolution	V	0.001
Last Calibration Date		06/20/2023

NOTES:

- *The voltmeter used in this test shall measure DC values and have an internal impedance of at least 10 M Ω*
- *An oscilloscope meeting the above requirements may need to be used to adequately measure voltage in some vehicles.*

DATA SHEET NO. 305-5
STATIC ROLLOVER TEST DATA FOR INDICANT FMVSS NO. 305 TESTING (CONT'D)

Test Vehicle: 2024 Cadillac LYRIQ 5 Door SUV NHTSA No.: M20240120
Test Program: NCAP Side Pole Impact Test Test Date: 05/17/2024

ELECTRICAL ISOLATION MEASUREMENTS & CALCULATIONS

Parameter	Rollover Stage	Value	Units	R_o=200,200	Minutes	Seconds
V_b =	90°	3.8	V	Time:	2	52
	180°	3.8	V		10	21
	270°	3.8	V		15	45
	360°	3.8	V		21	59
V_1 =	90°	0.1	V	Time:	3	9
	180°	0.0	V		10	33
	270°	0.1	V		15	53
	360°	0.1	V		22	5
V_2 =	90°	3.6	V	Time:	3	34
	180°	3.6	V		10	41
	270°	3.6	V		16	2
	360°	3.6	V		22	10
V_1' =	90°	0.0	V	Time:	3	37
	180°	0.0	V		10	45
	270°	0.0	V		16	4
	360°	0.0	V		22	15
V_2' =	90°	0.7	V	Time:	3	45
	180°	0.7	V		10	52
	270°	0.7	V		16	13
	360°	0.7	V		22	22
R_{i1} =	90°	Zero Volts	Ω	Time:	3	37
	180°	Zero Volts	Ω		10	45
	270°	Zero Volts	Ω		16	4
	360°	Zero Volts	Ω		22	15
R_{i2} =	90°	852,439	Ω	Time:	3	45
	180°	829,400	Ω		10	52
	270°	852,439	Ω		16	13
	360°	852,439	Ω		22	22
R_i =	90°	852,439	Ω	Time:	3	45
	180°	829,400	Ω		10	52
	270°	852,439	Ω		16	13
	360°	852,439	Ω		22	22
R_i/V_b =	90°	224,326	Ω/V	Time:	3	45
	180°	218,263	Ω/V		10	52
	270°	224,326	Ω/V		16	13
	360°	224,326	Ω/V		22	22

Is the Electrical Isolation Value ≥ 500 Ω/V (Yes/No)? [X] Yes [ ] No (Fail)

APPENDIX A

PHOTOGRAPHS

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

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

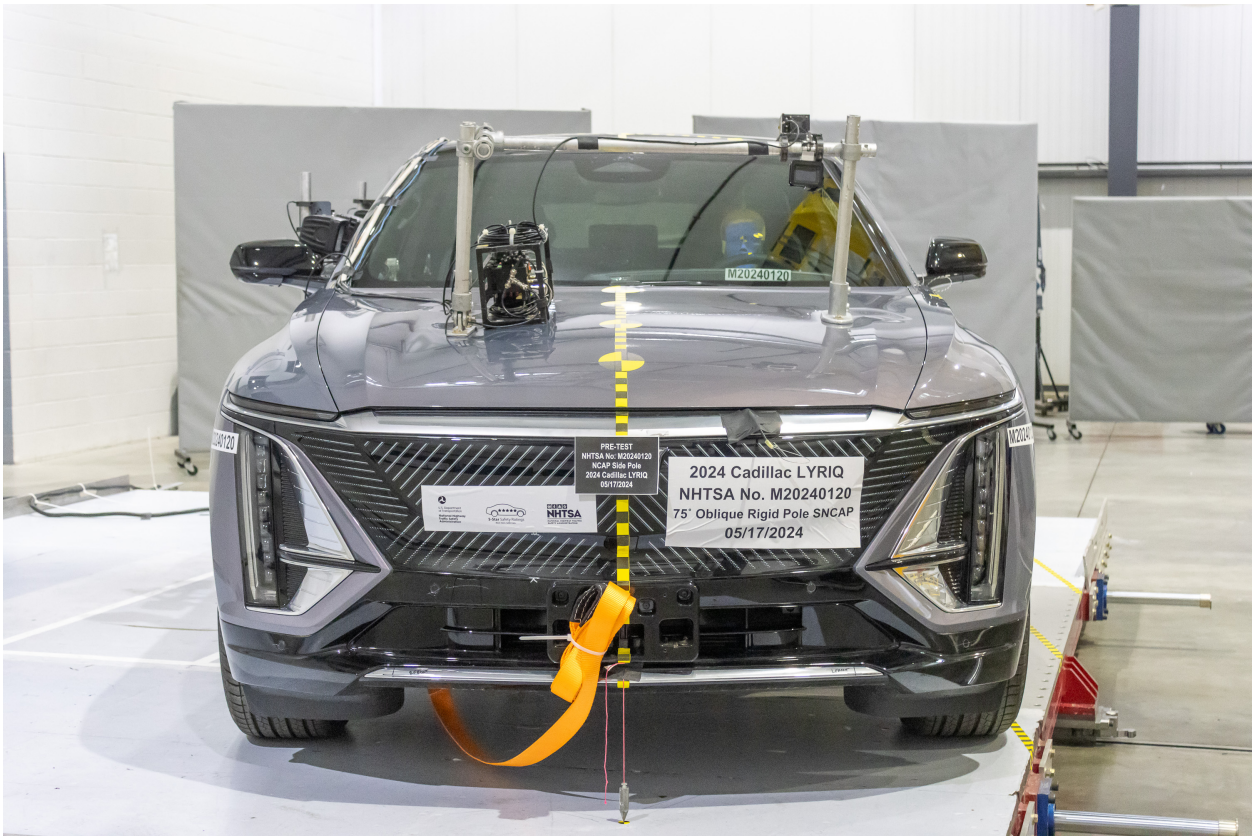

Figure A-3: Pre-Test Frontal View of Test Vehicle

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

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

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

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

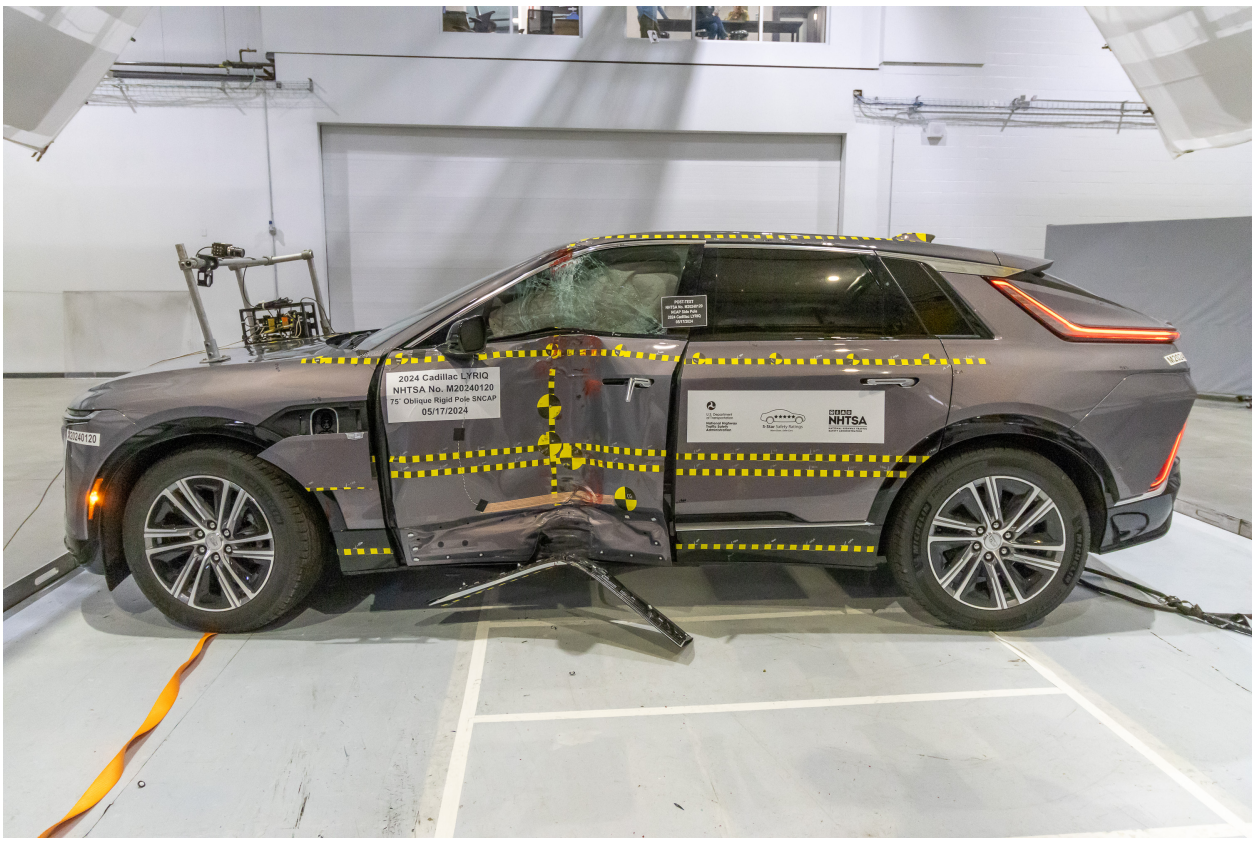

Figure A-8: Post-Test Left Side View of Test Vehicle

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

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

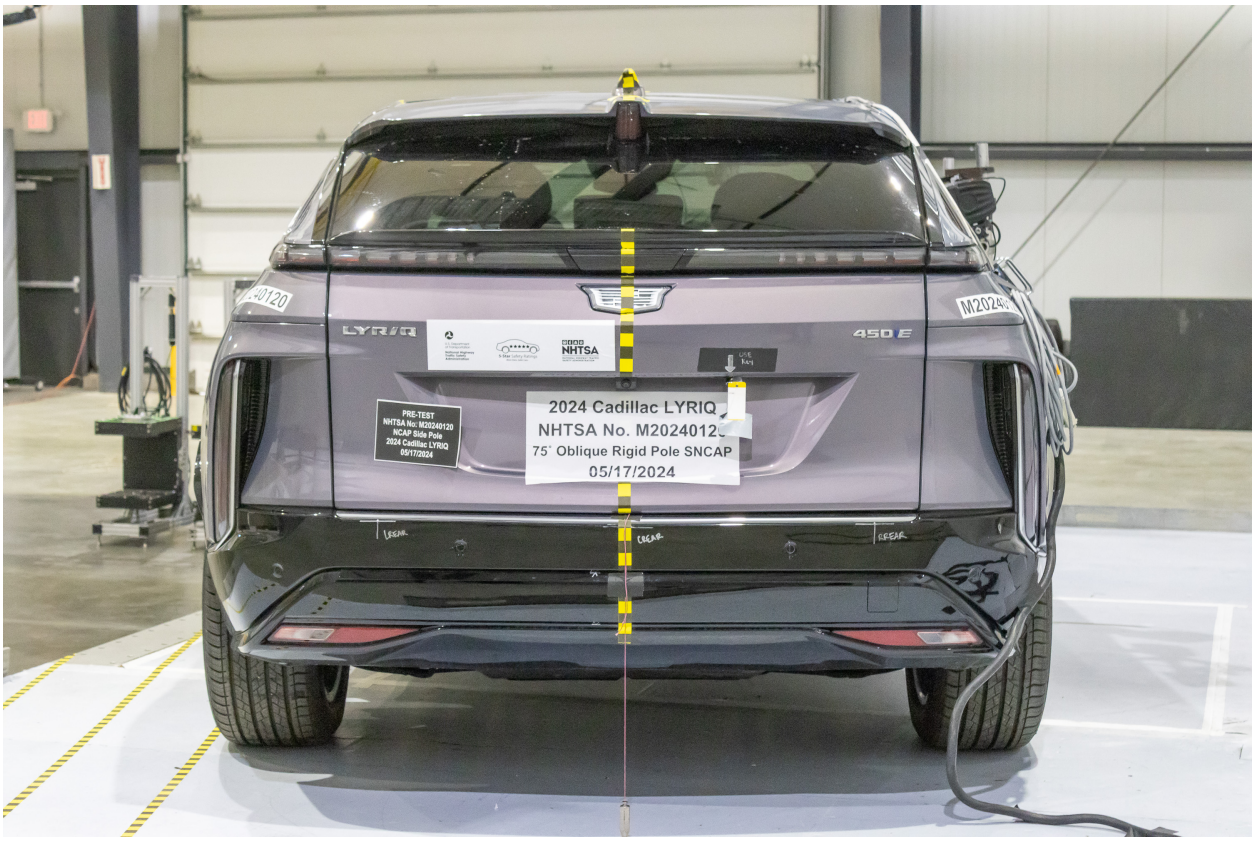

Figure A-11: Pre-Test Rear View of Test Vehicle

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

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

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

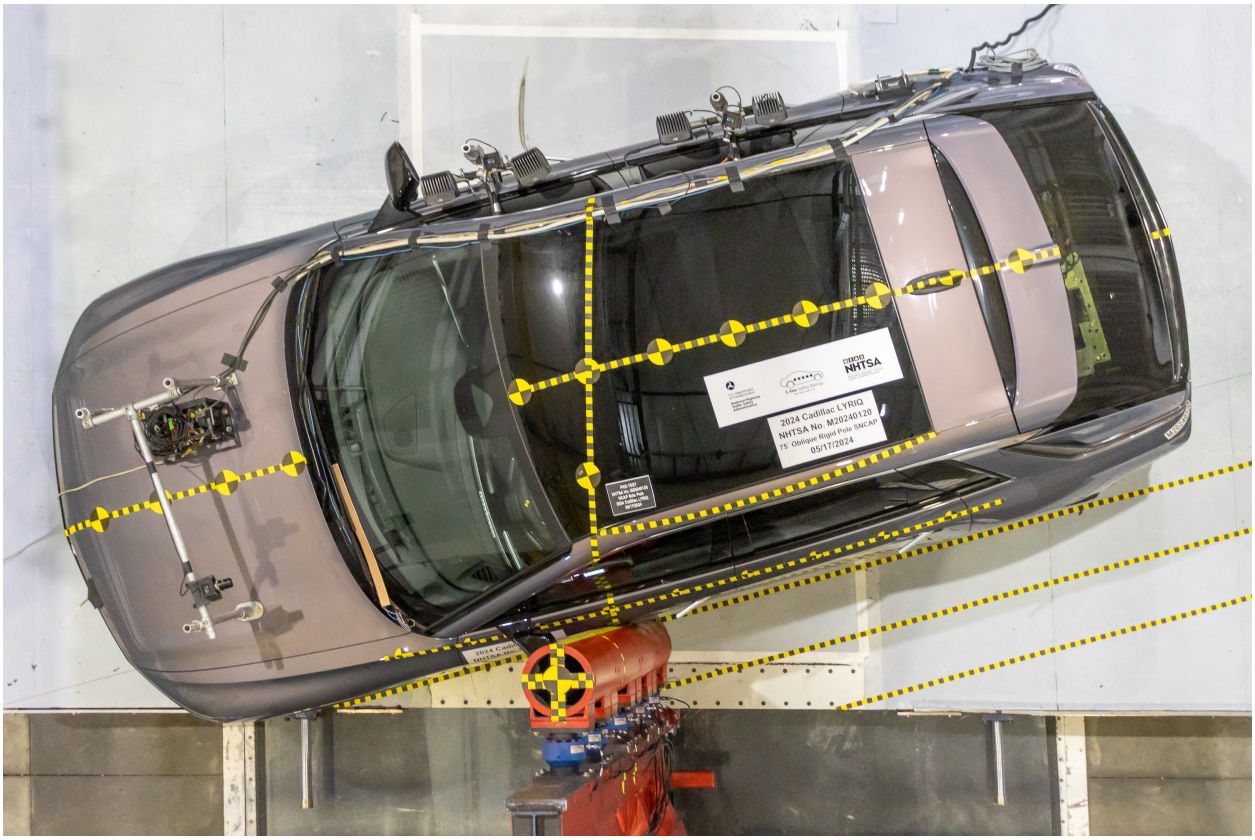

Figure A-15: Pre-Test Overhead View of Test Area

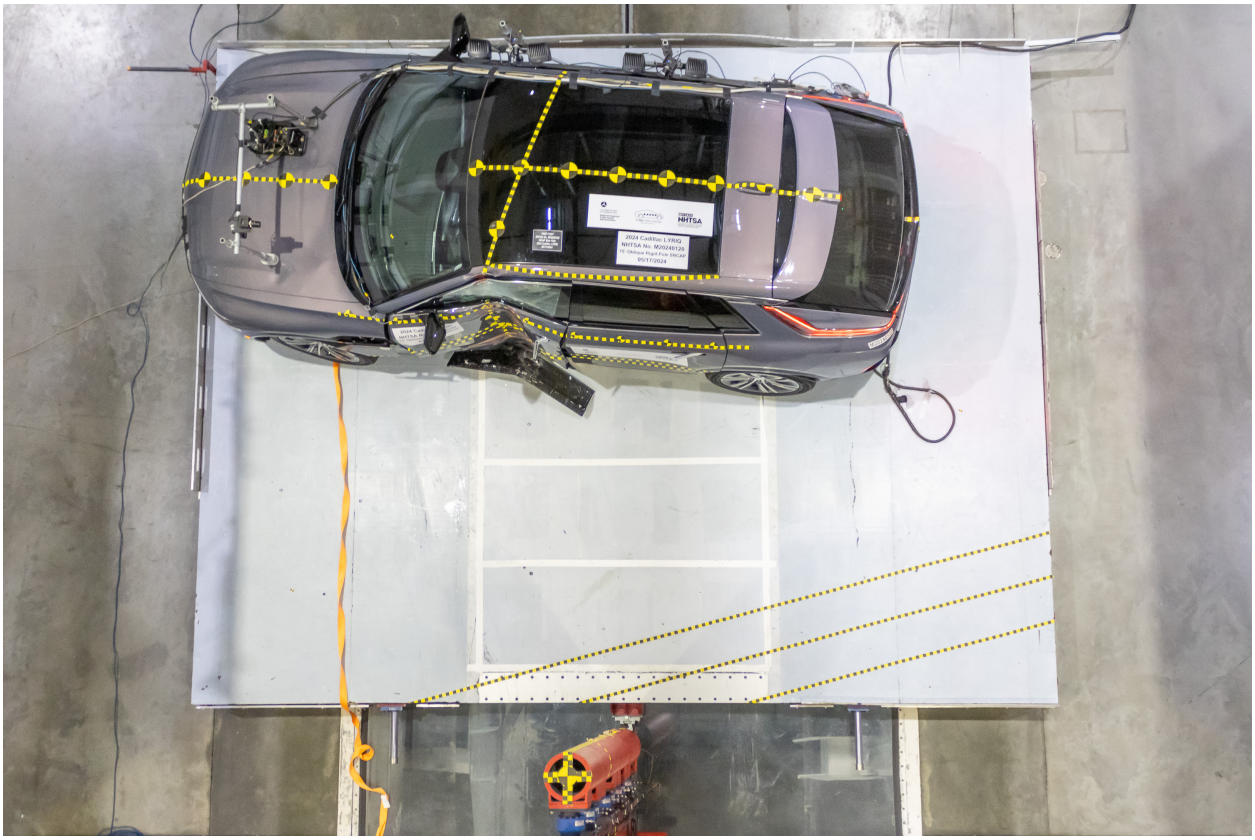

Figure A-16: Post-Test Overhead View of Test Area

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

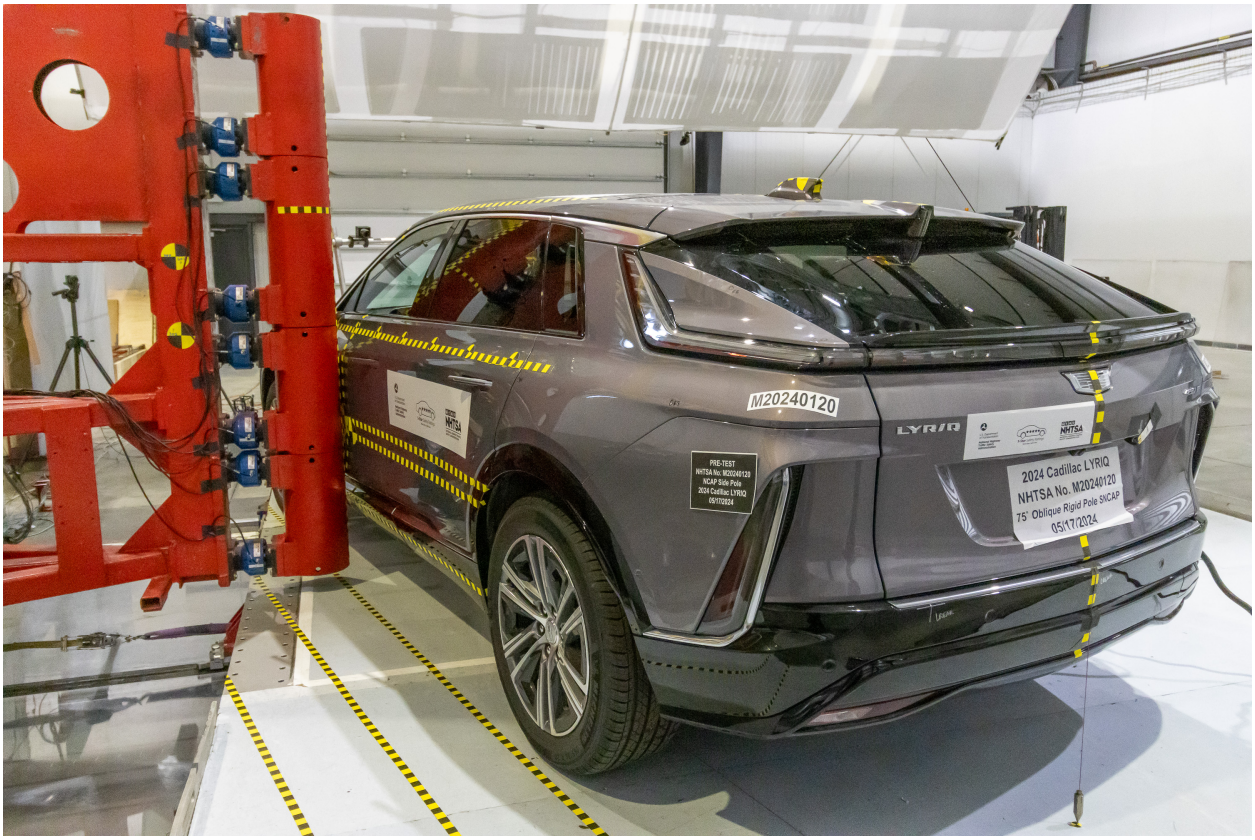

Figure A-18: Pre-Test Right Side View of Pole Positioned Against Side of Vehicle

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

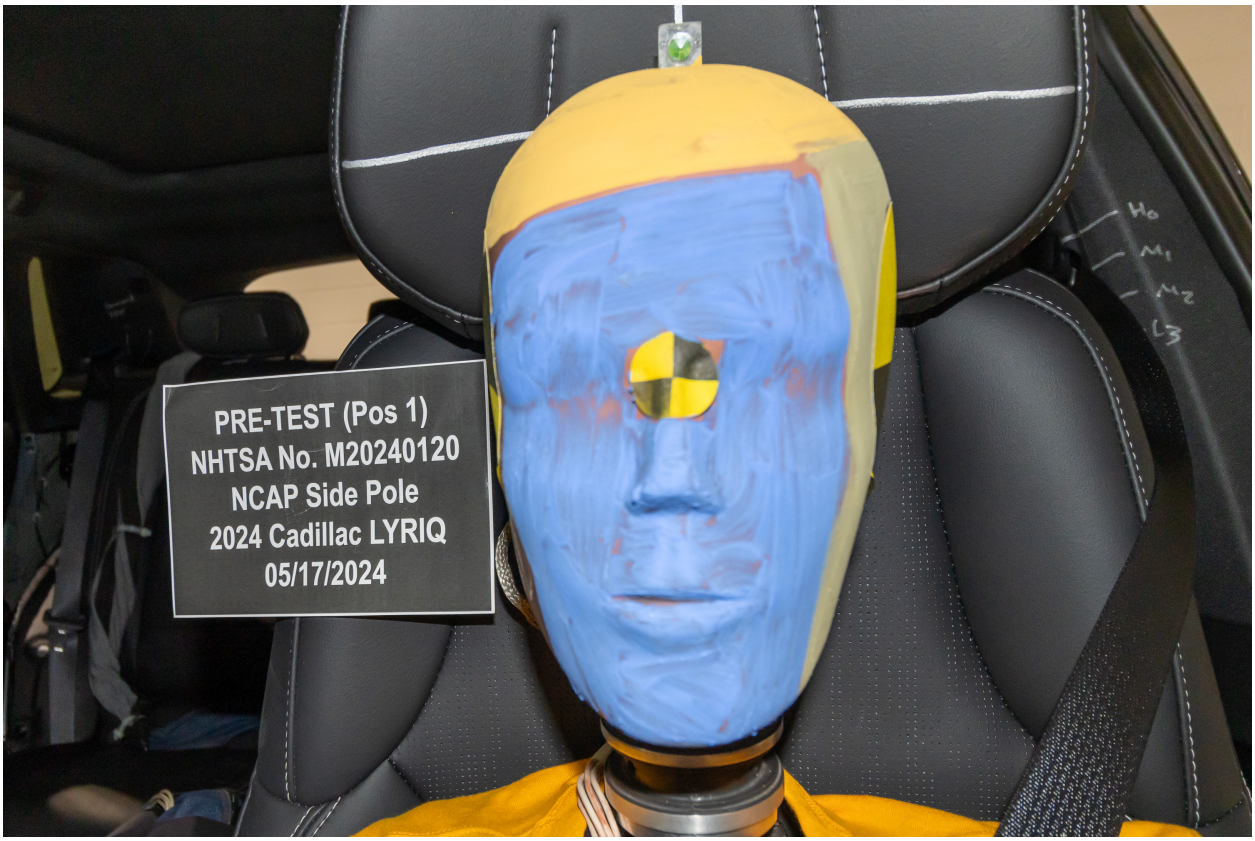

Figure A-27: Pre-Test Frontal Close-Up View of Dummy Head / Shoulders in Relation to Head Restraint

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

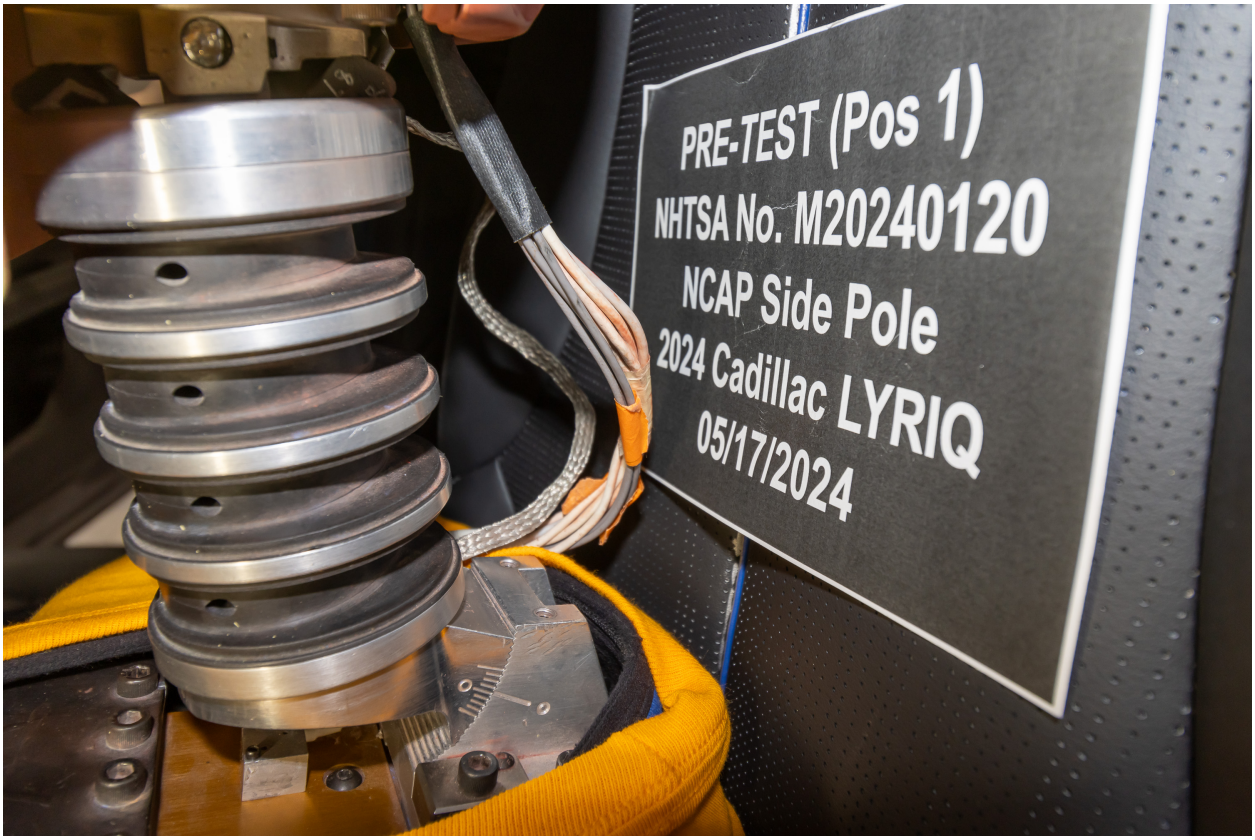

Figure A-30: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket

Photo Not Available

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 Charging Port

Figure A-56: Post-Test Charging Port

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

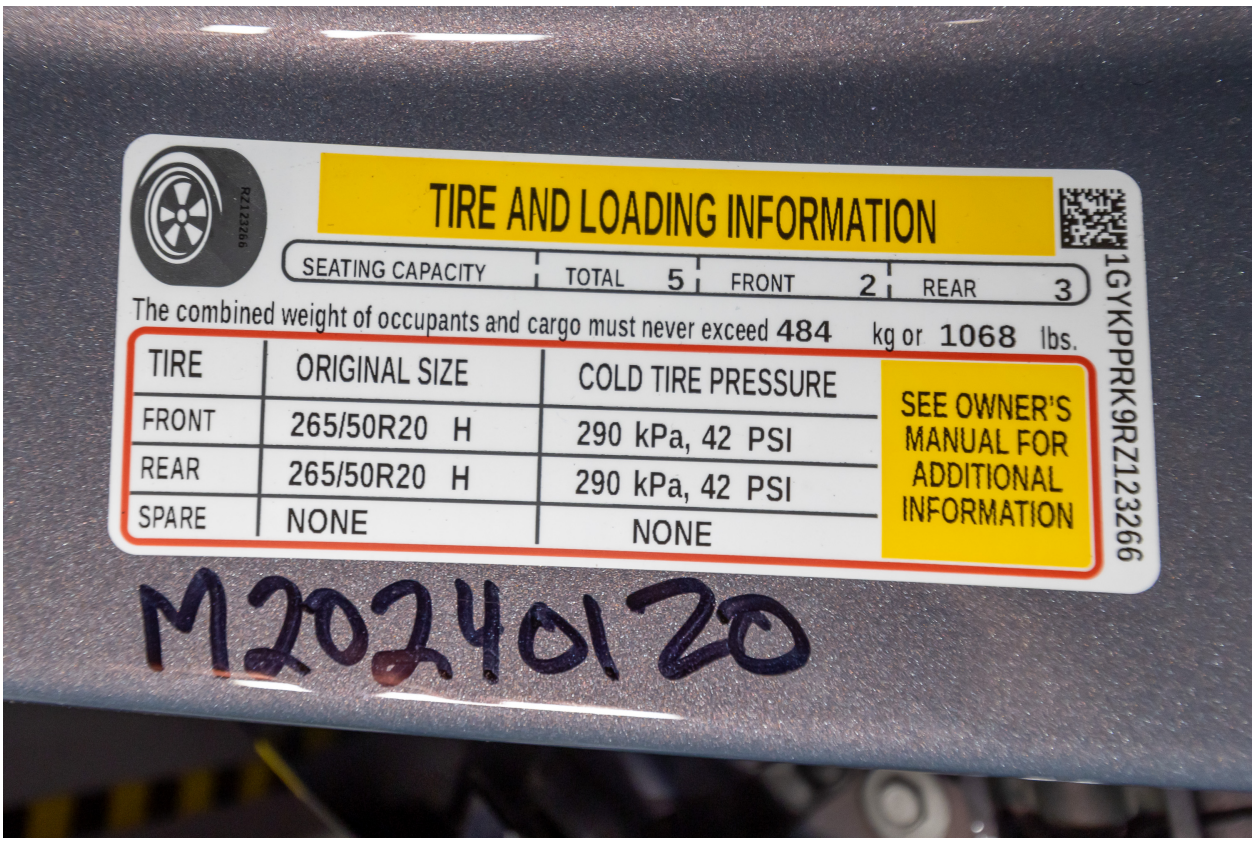

Figure A-58: Close-Up View of Vehicle's Tire Information Placard or Label

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

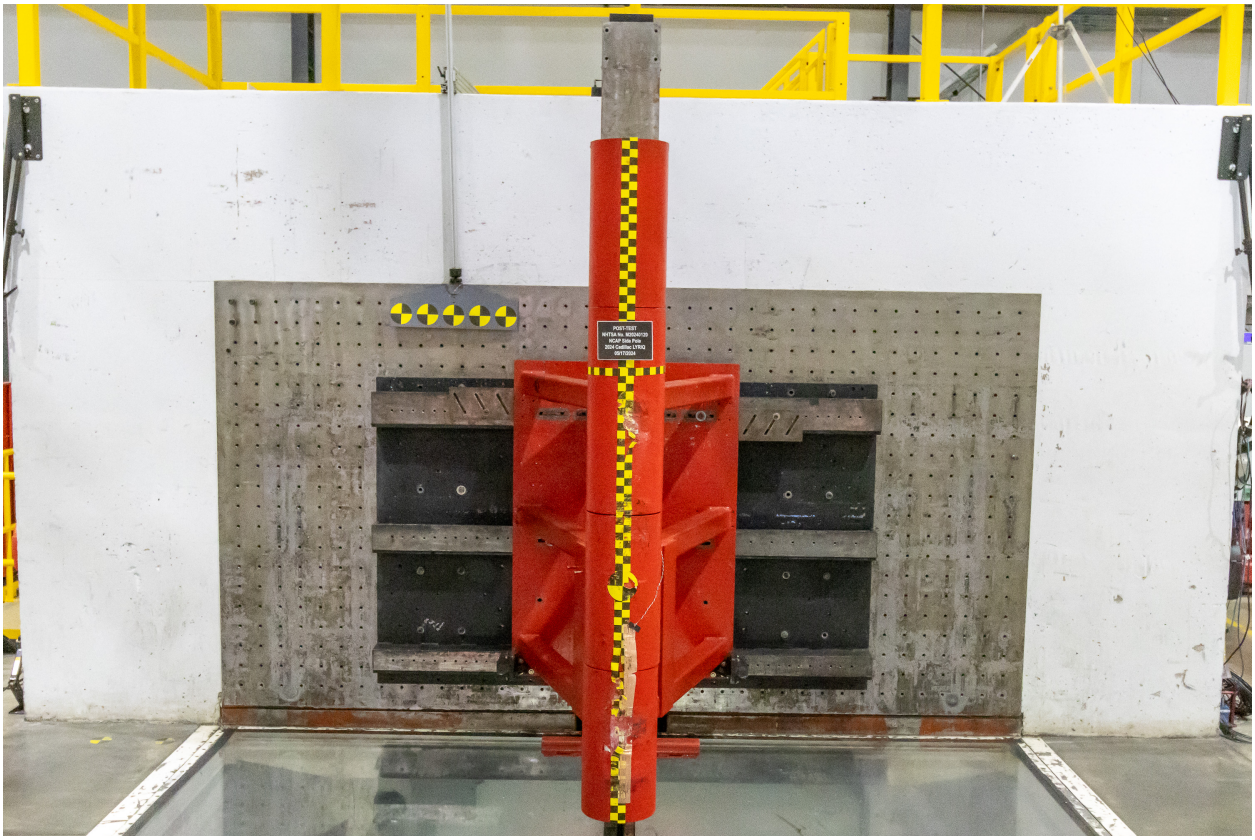

Figure A-60: Post-Test Pole Barrier Front View

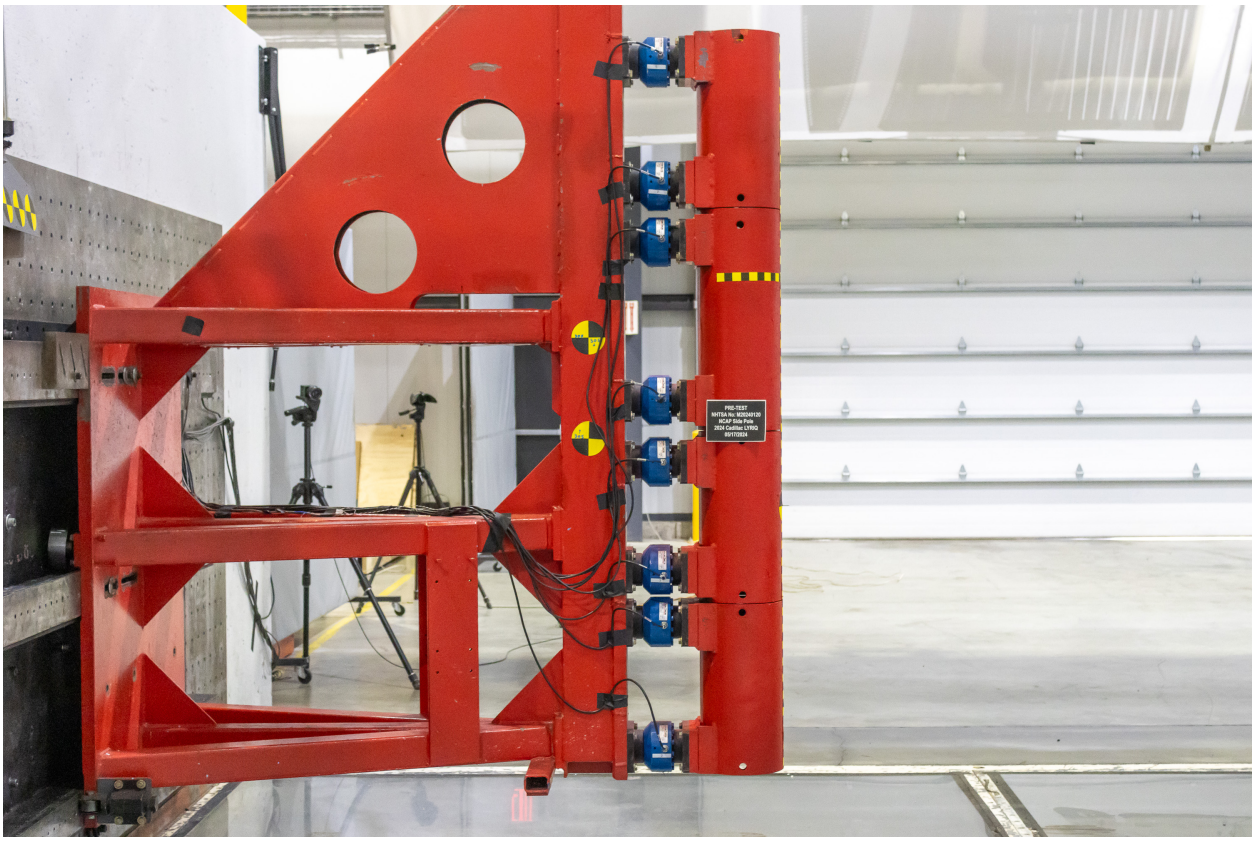

Figure A-61: Pre-Test Pole Barrier Side View

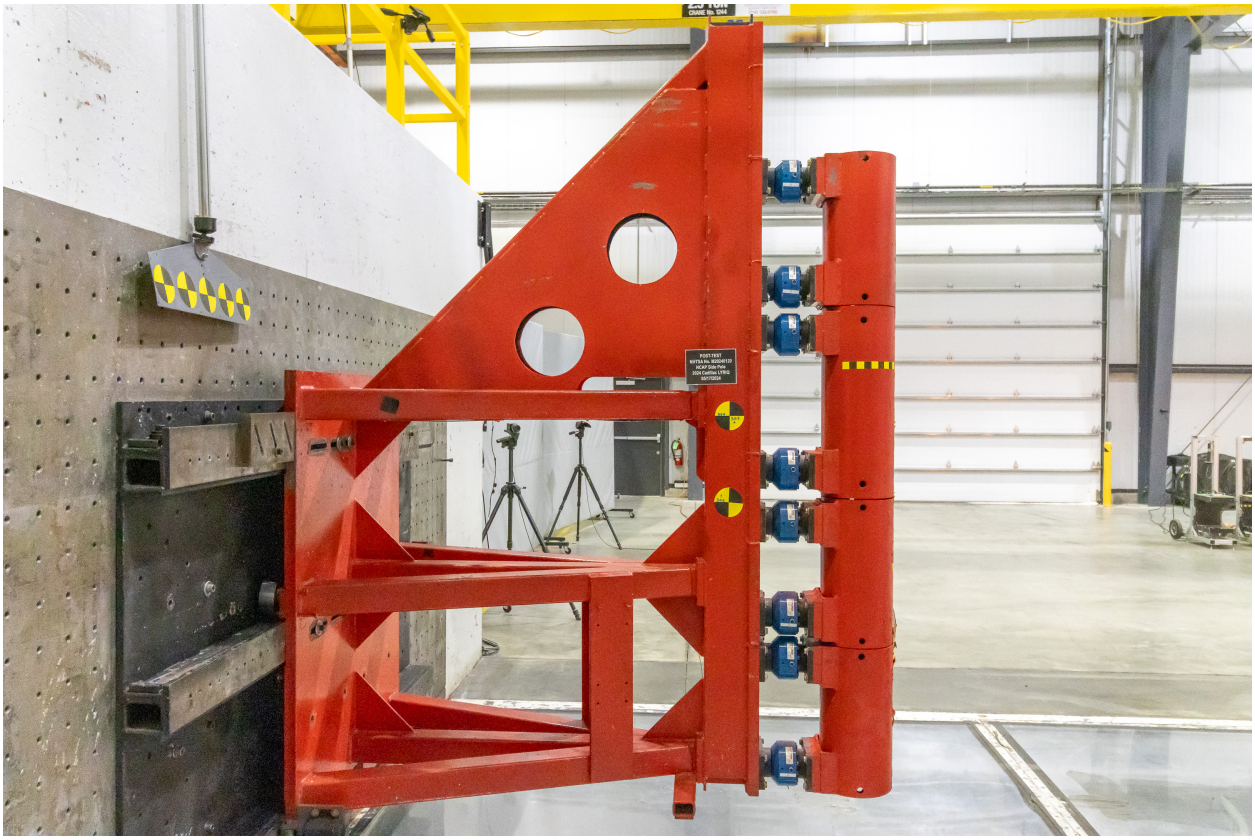

Figure A-62: Post-Test Pole Barrier Side View

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

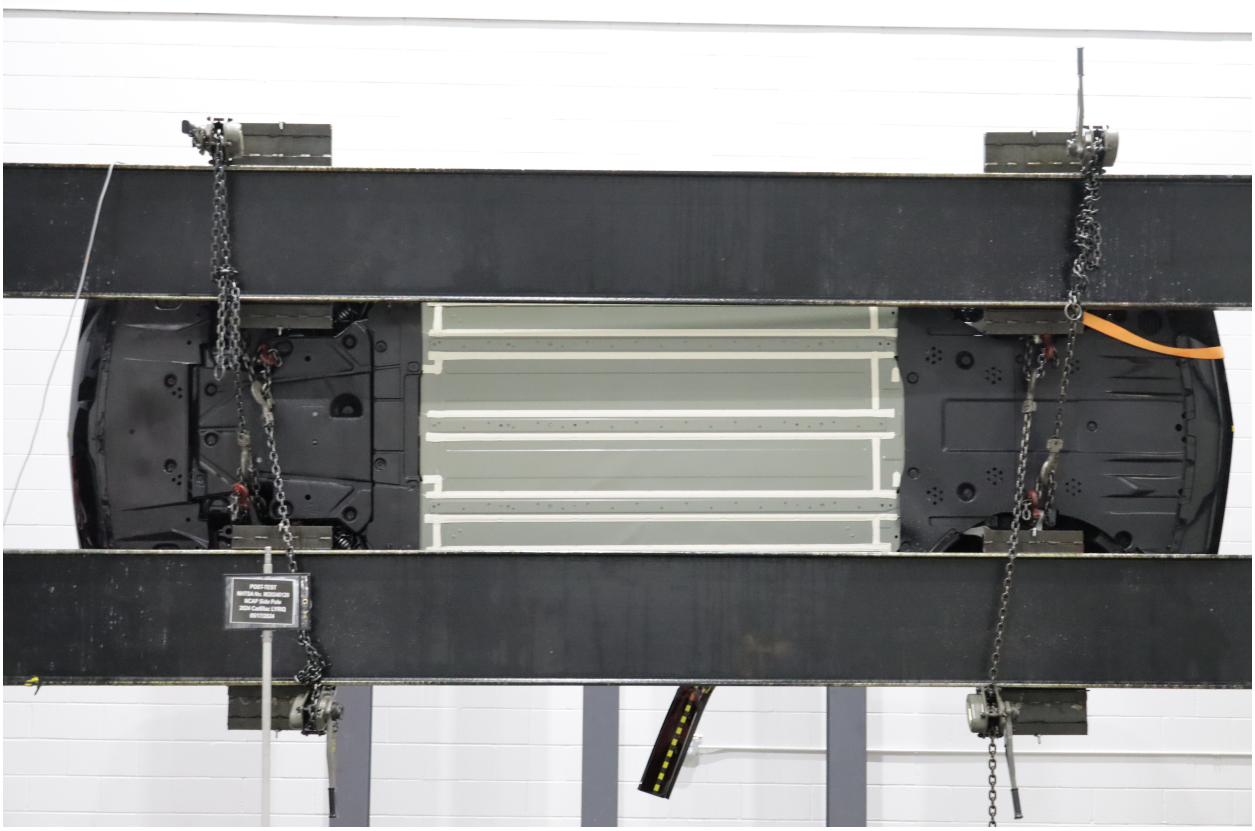

Figure A-66: FMVSS No. 301 Static Rollover 90 Degrees

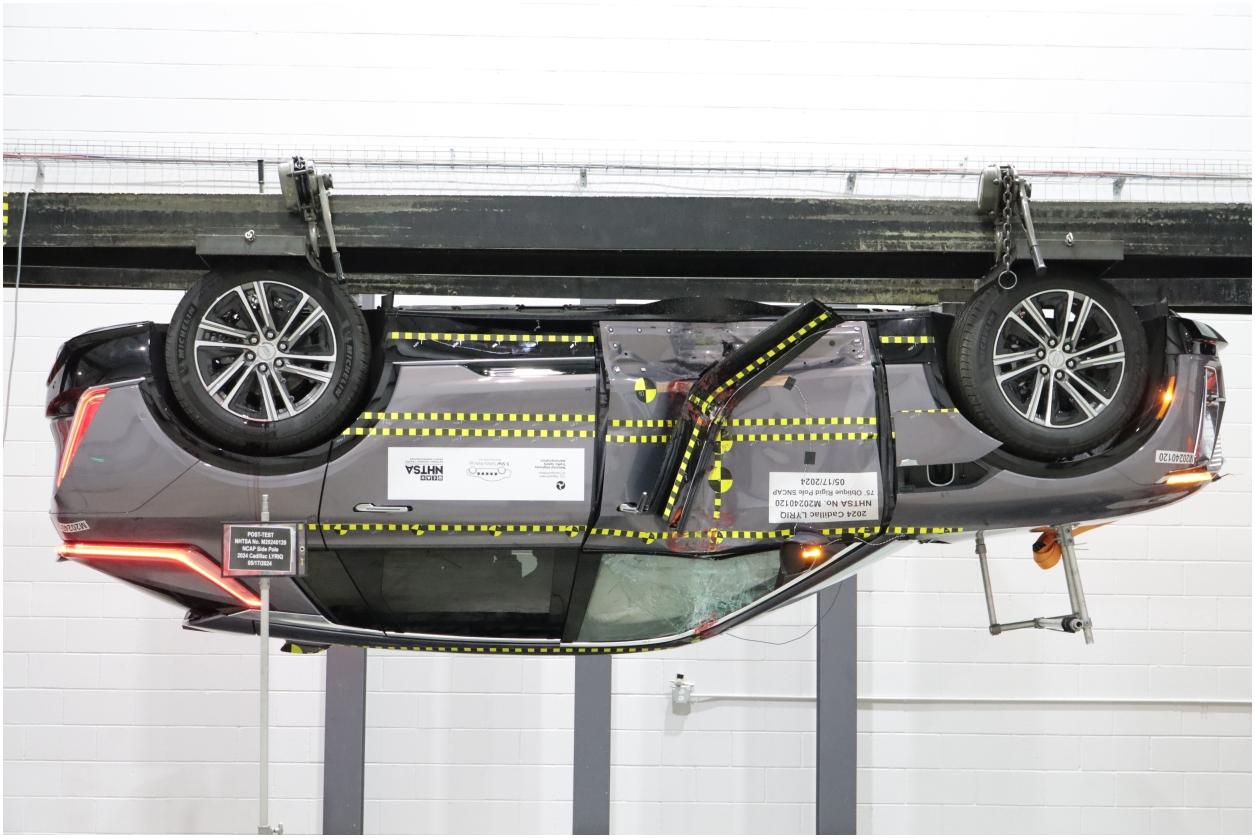

Figure A-67: FMVSS No. 301 Static Rollover 180 Degrees

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

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

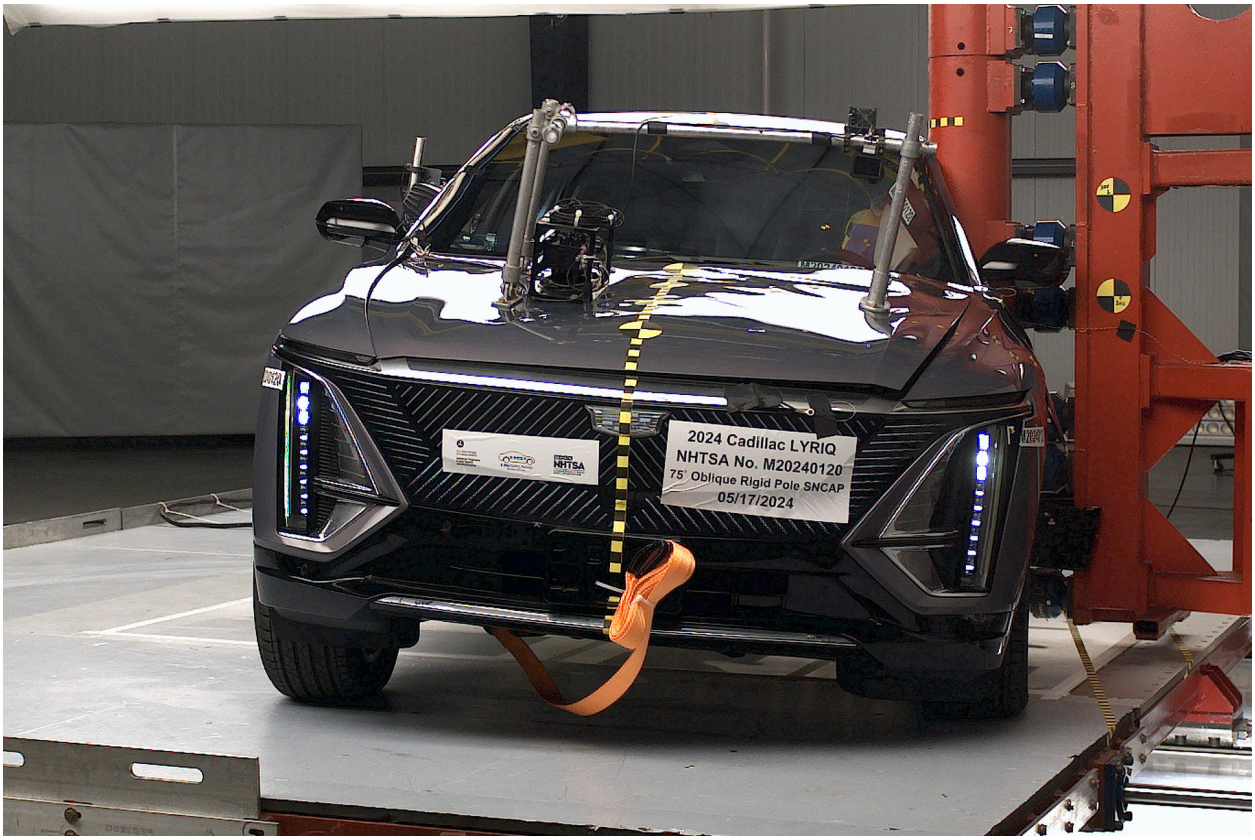

Figure A-70: Impact Event

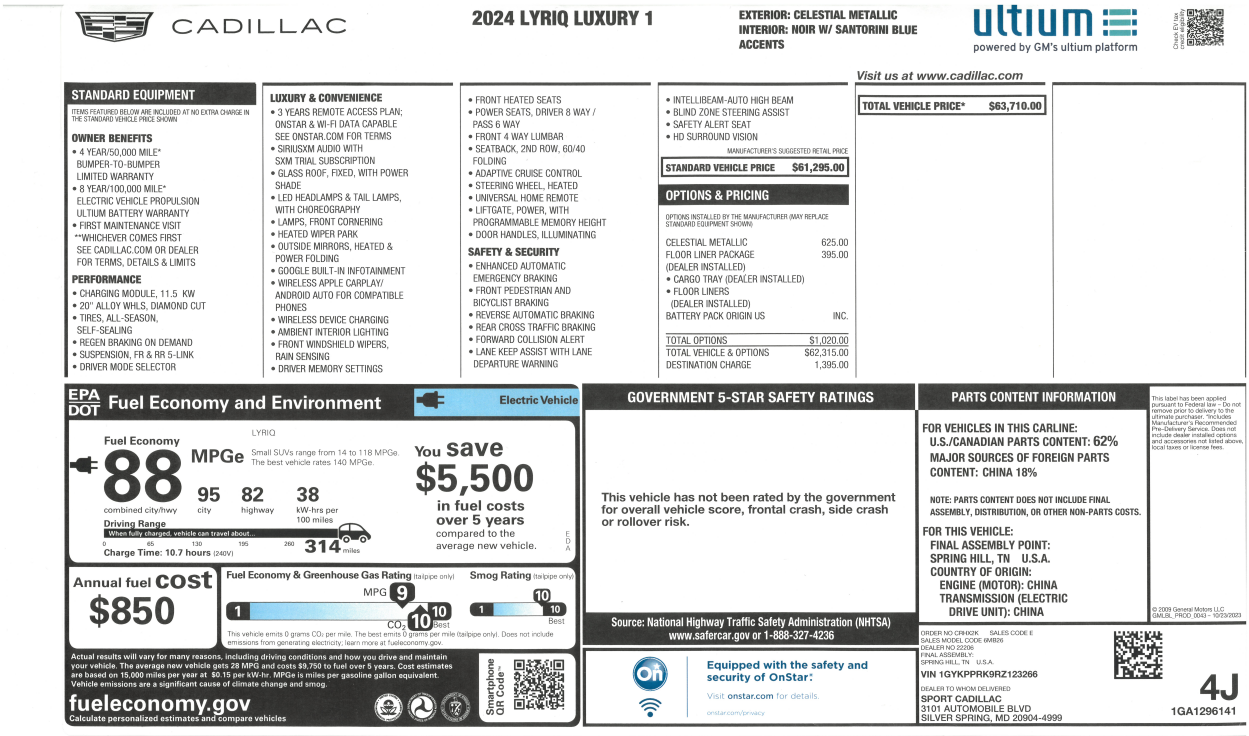

Figure A-71: Monroney Label

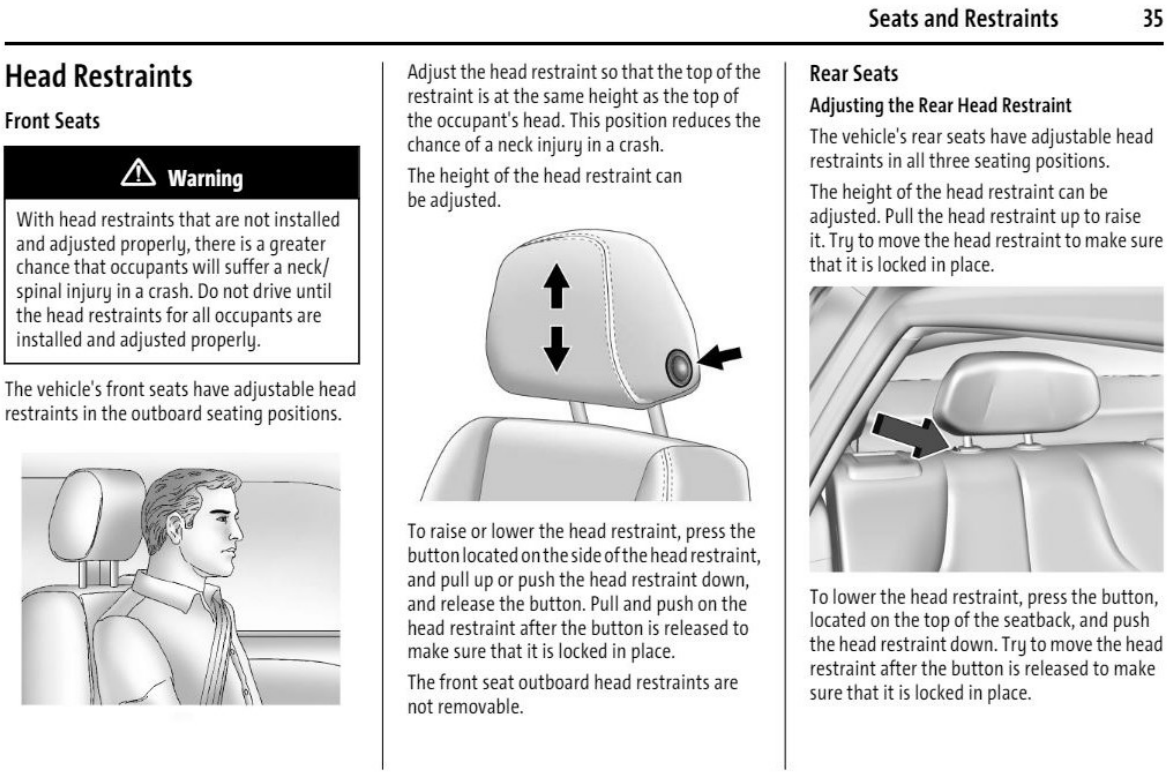

Figure A-72: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

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

Photo Not Applicable

Figure 305-1: Auxiliary Power Module Warning Label

Figure 305-2: Power Inverter Warning Label

Figure 305-3 First Responder Warning Label

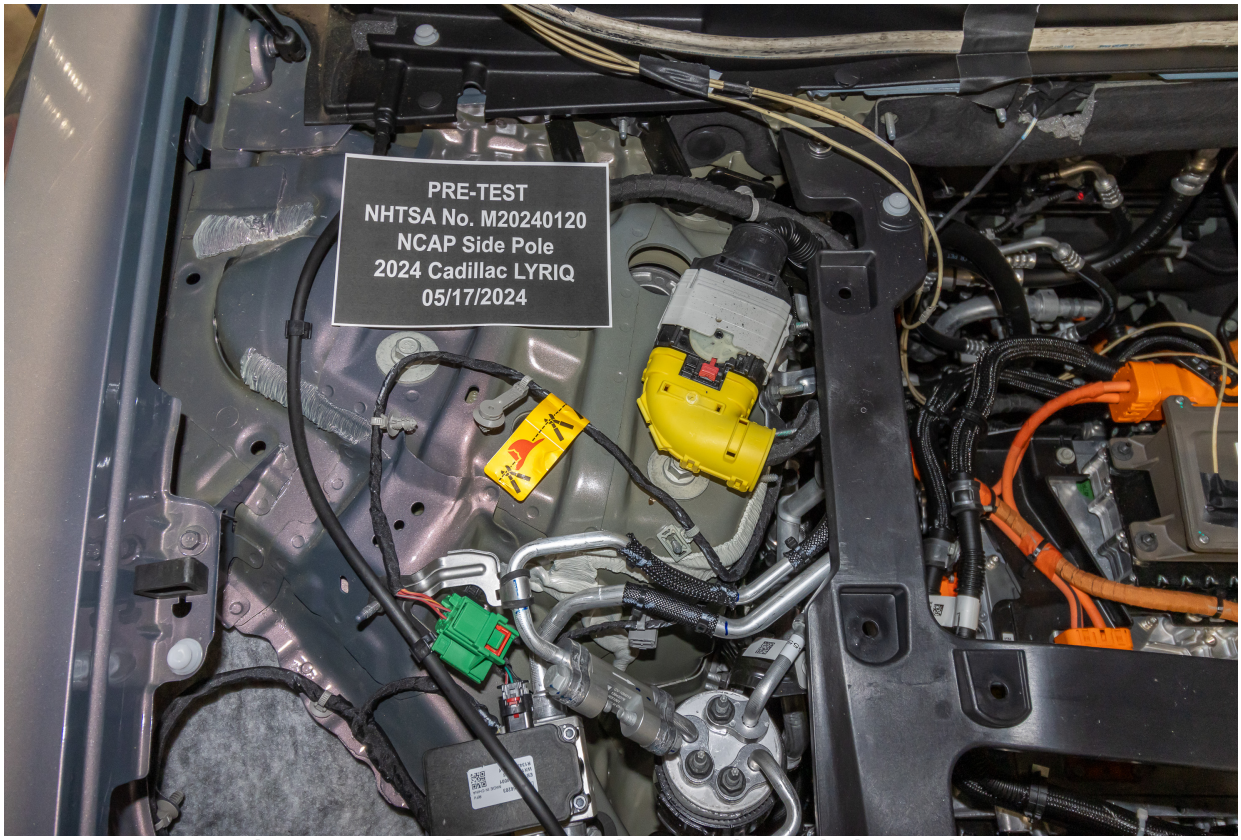

Figure 305-4: First Responder Warning Label Location

Photo Not Applicable

Figure 305-5: Other Vehicle Label Related to Electric Propulsion System

Figure 305-6: Manual High Voltage Service Disconnect in Place

Figure 305-7: Manual High Voltage Service Disconnect Removed (Show Plug)

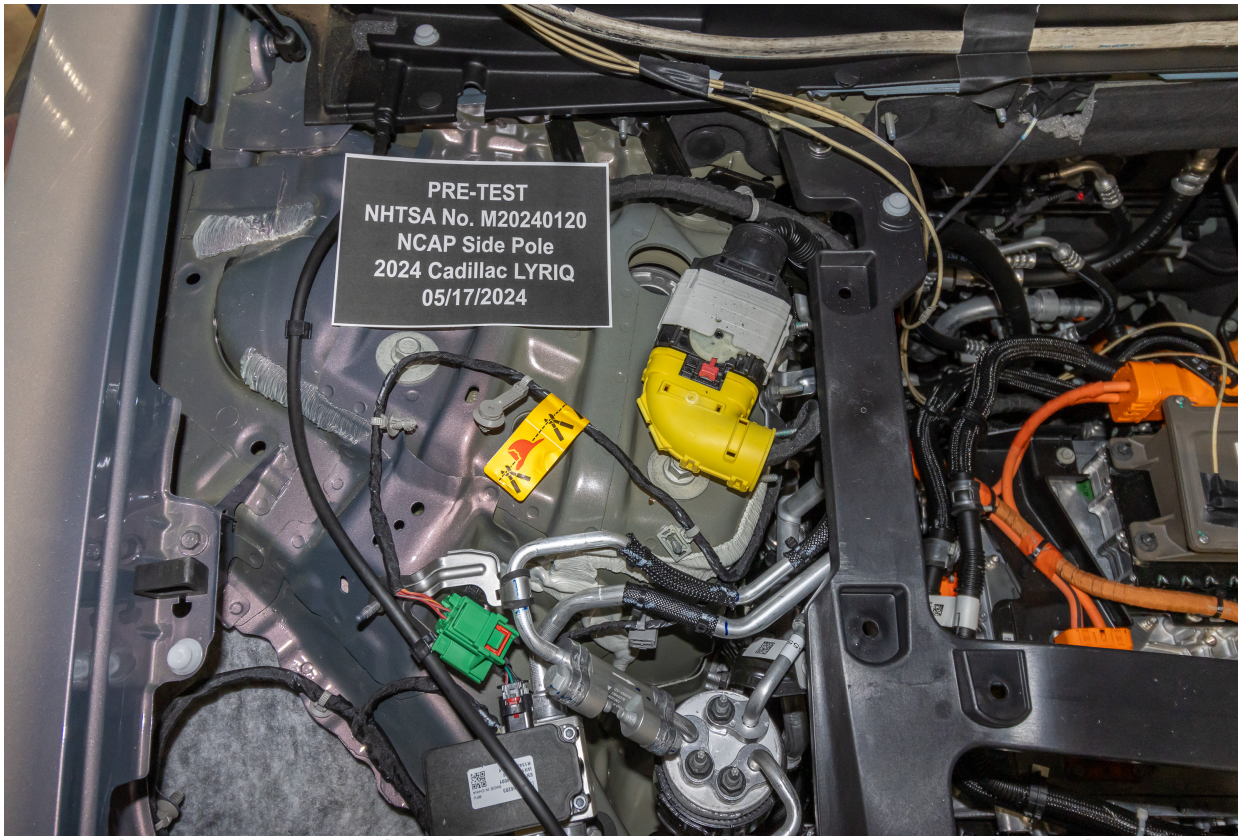

Figure 305-8: Manual High Voltage Service Disconnect Removed Location

Figure 305-9: Pre-Impact View of Propulsion Battery

Figure 305-10: Post-Impact Front View of Propulsion Battery

Figure 305-11: Post-Impact Rear View of Propulsion Battery (if any part of it is visible)

Photo Not Applicable

Figure 305-12: Pre-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules

Figure 305-13: Post-Impact View of Battery Box(s) or Container(s) Which Holds Individual Battery Modules

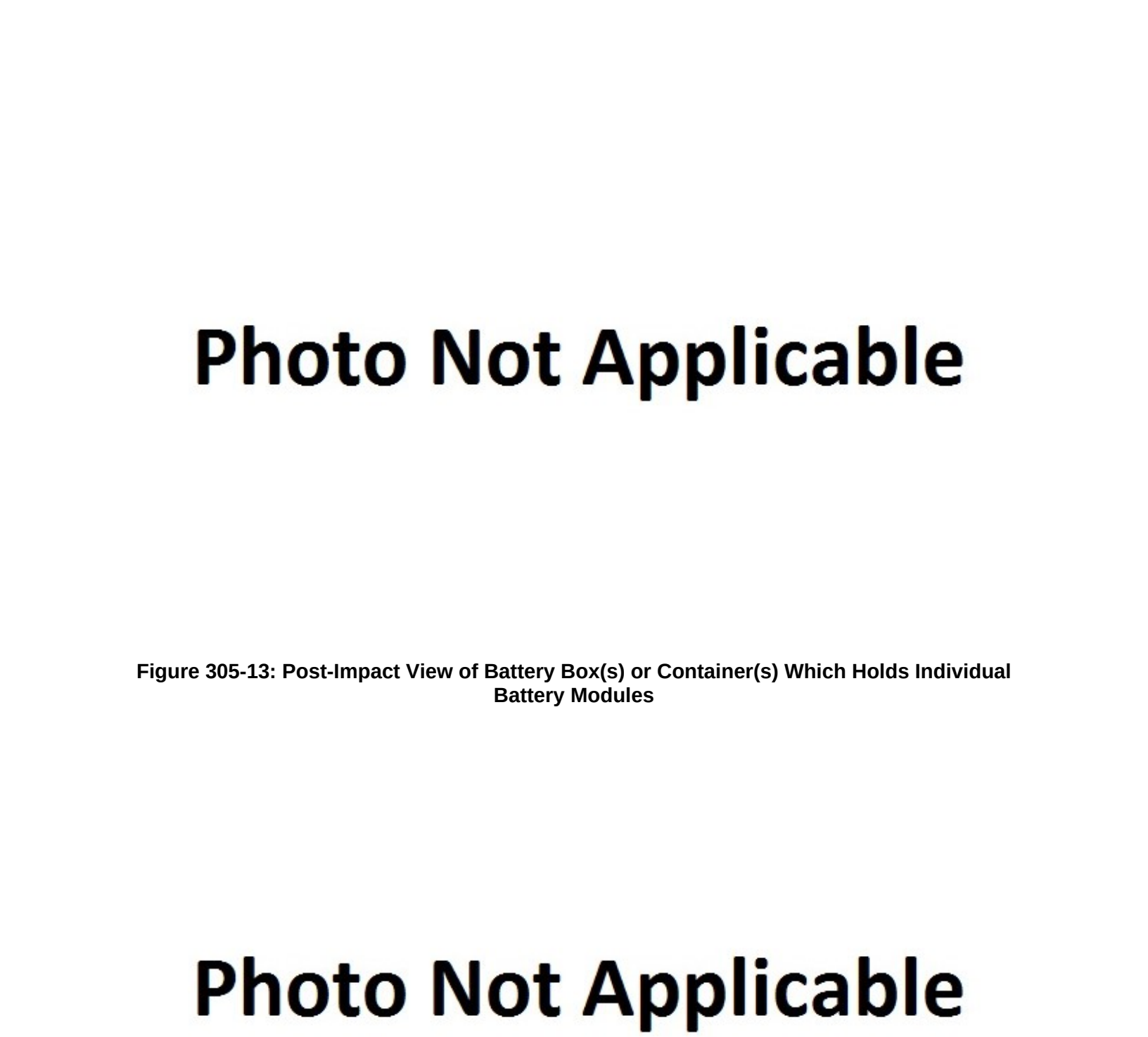

Figure 305-14: Pre-Impact View of Propulsion Battery Module(s)

Photo Not Applicable

Figure 305-15: Post-Impact View of Propulsion Battery Module(s)

Figure 305-16: Pre-Impact View of Electric Propulsion Drive

Figure 305-17: Post-Impact View of Electric Propulsion Drive

Photo Not Applicable

Figure 305-18: Pre-Impact View of High Voltage Interconnects

Photo Not Applicable

Figure 305-19: Pre-Impact View of Propulsion Battery Venting System

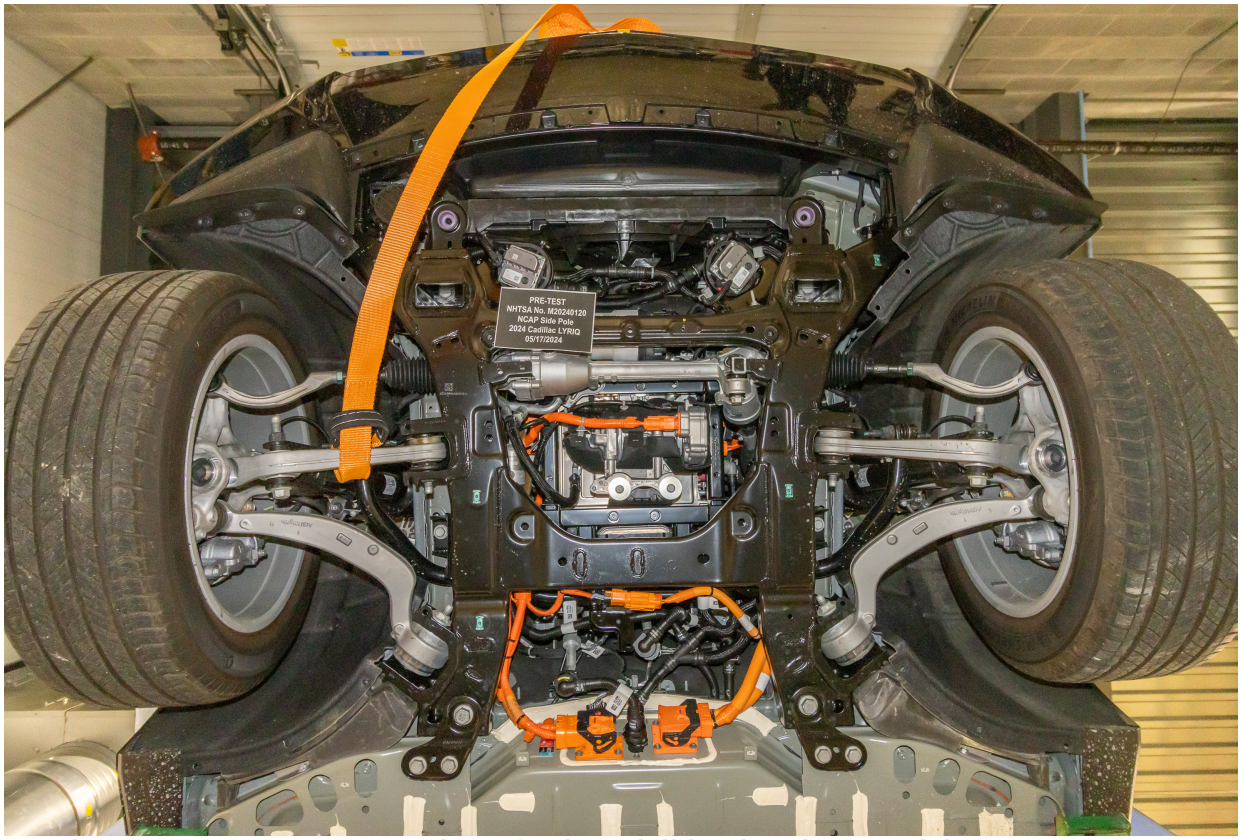

Figure 305-20: Pre-Impact View of Other Visible Electric Propulsion Components

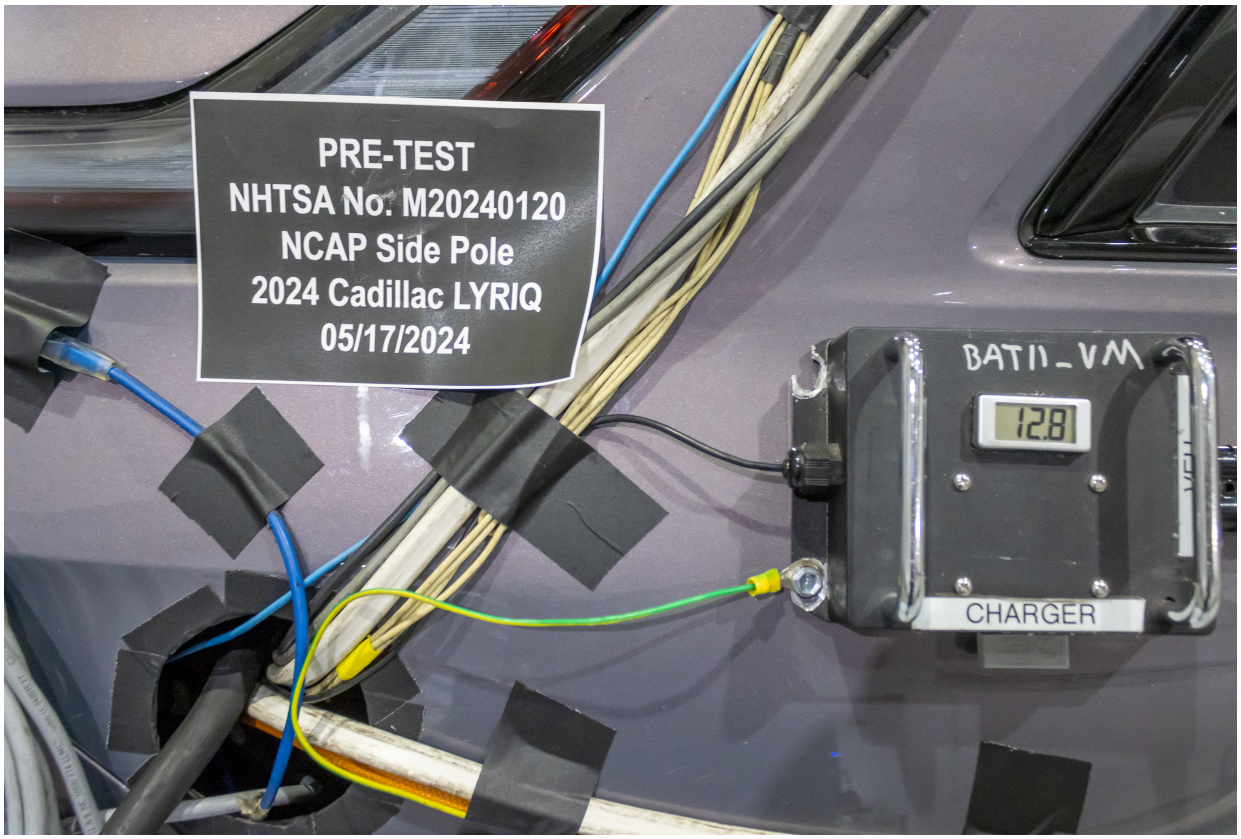

Figure 305-21: Pre-Impact View of Ground Lead Attached

Figure 305-22: Pre-Impact View of High Voltage Leads Attached

Figure 305-23: Pre-Impact Close Up View of High Voltage Leads Attached

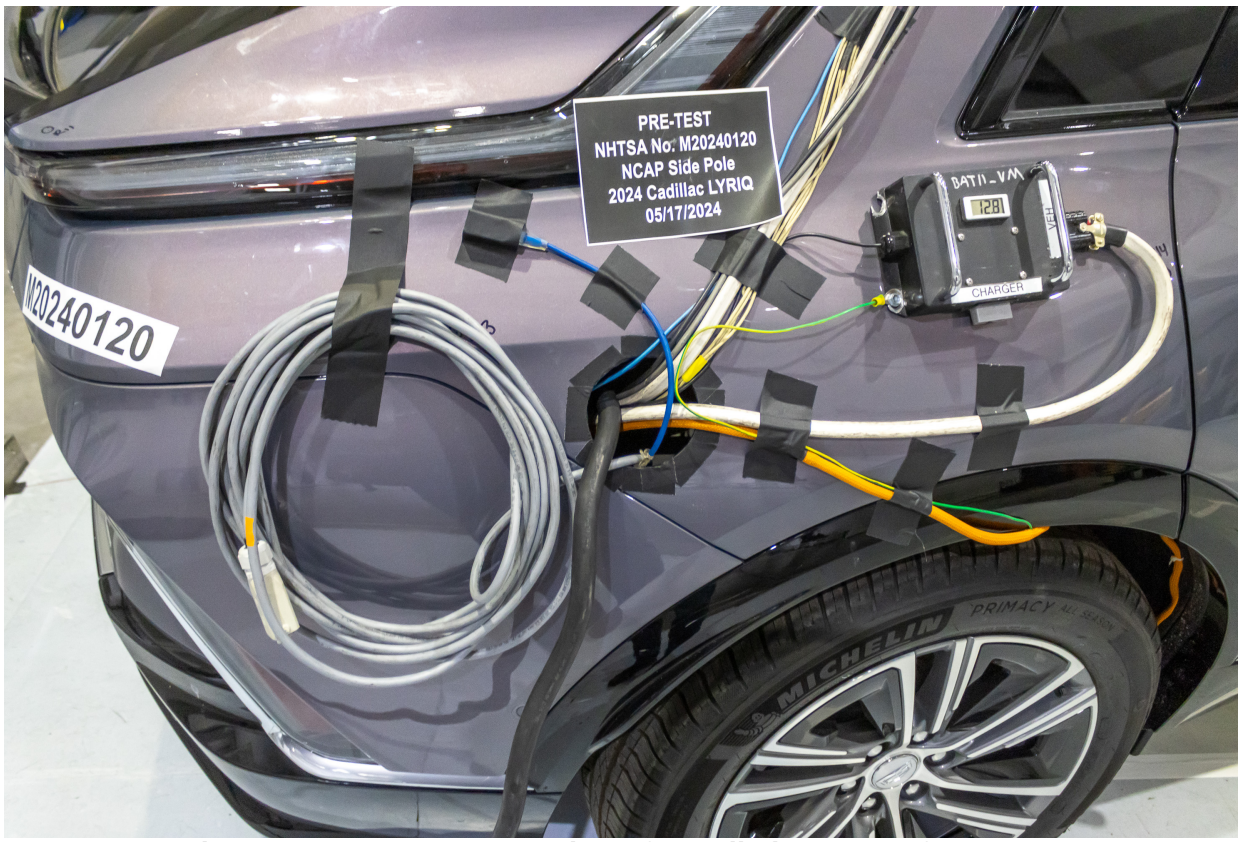

Figure 305-24: Pre-Impact View of Installed Test Interface Port

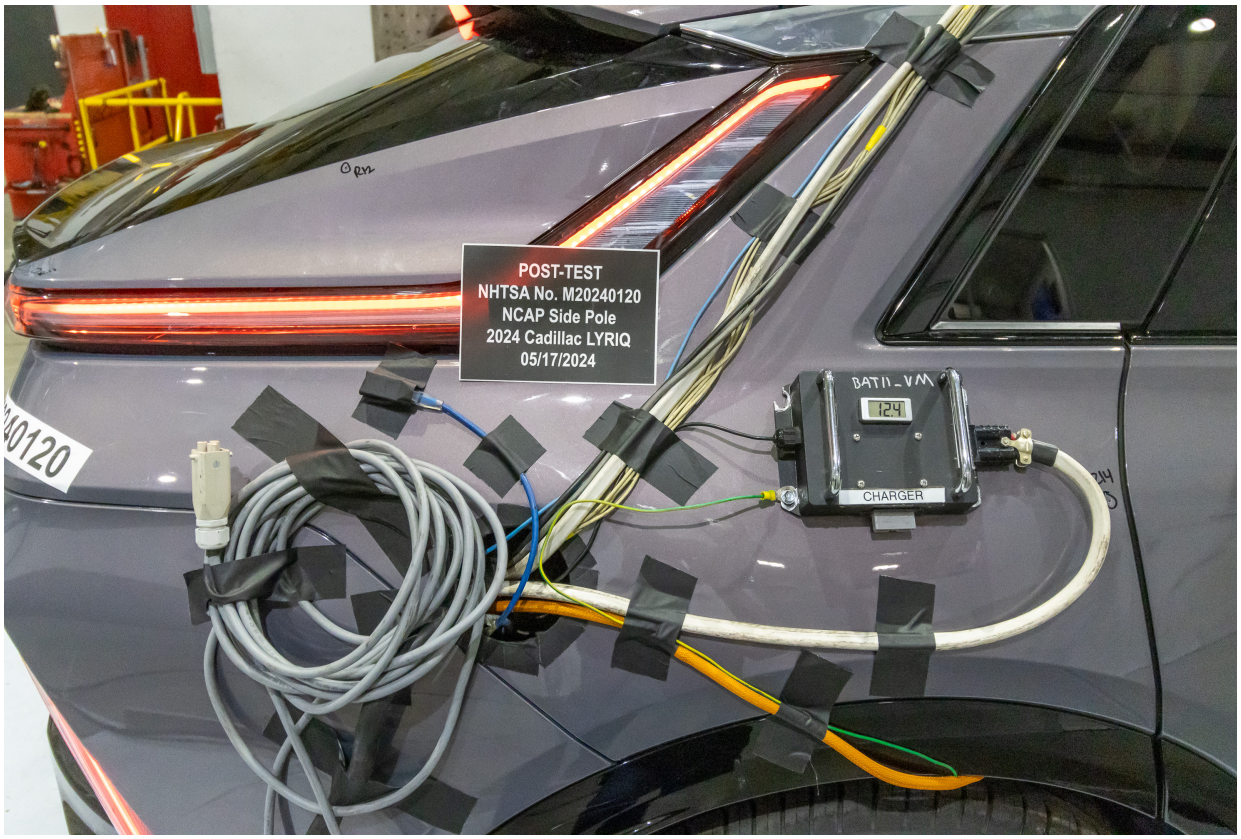

Figure 305-25: Post-Impact View of Installed Test Interface Port

Photo Not Applicable

Figure 305-26: Pre-Impact View of Other Test Devices

Photo Not Applicable

Figure 305-27: Post-Impact View of Other Test Devices

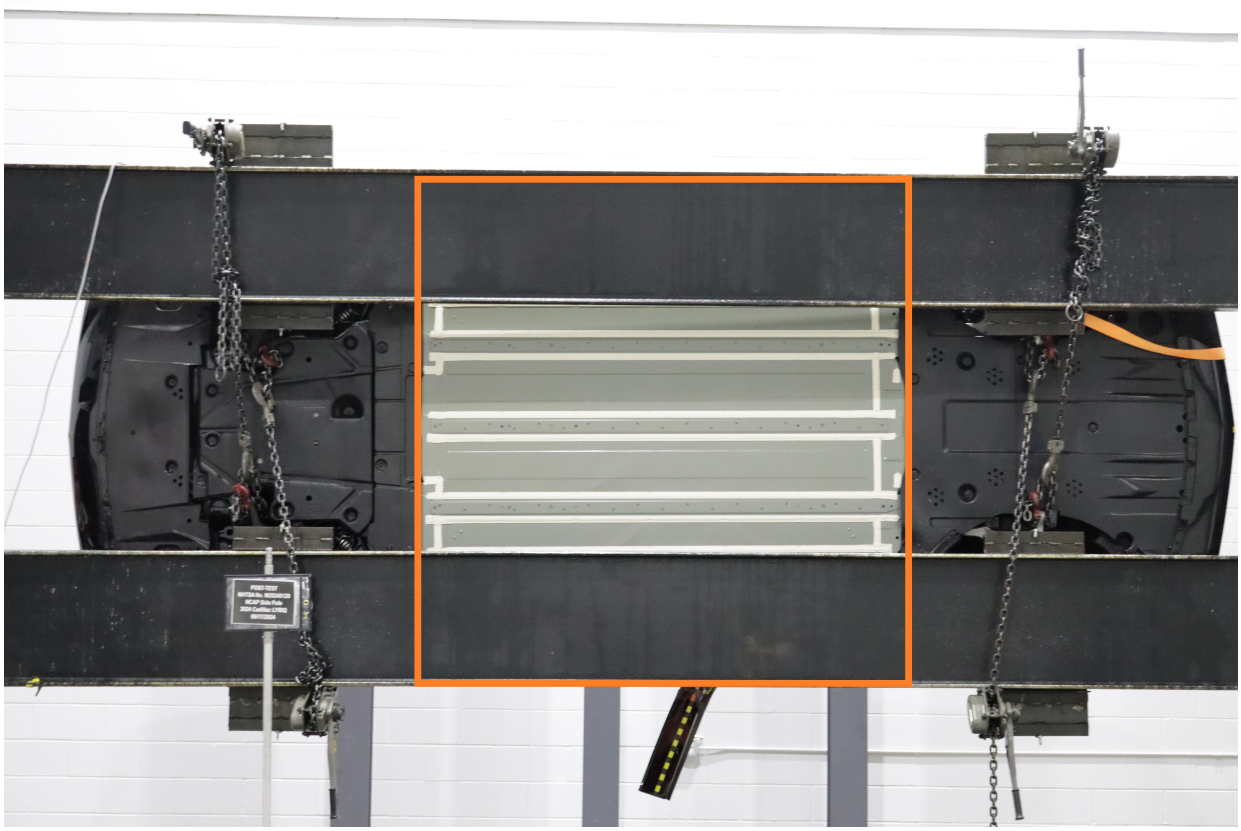

Figure 305-28: FMVSS No. 305 Static Rollover 90 Degrees

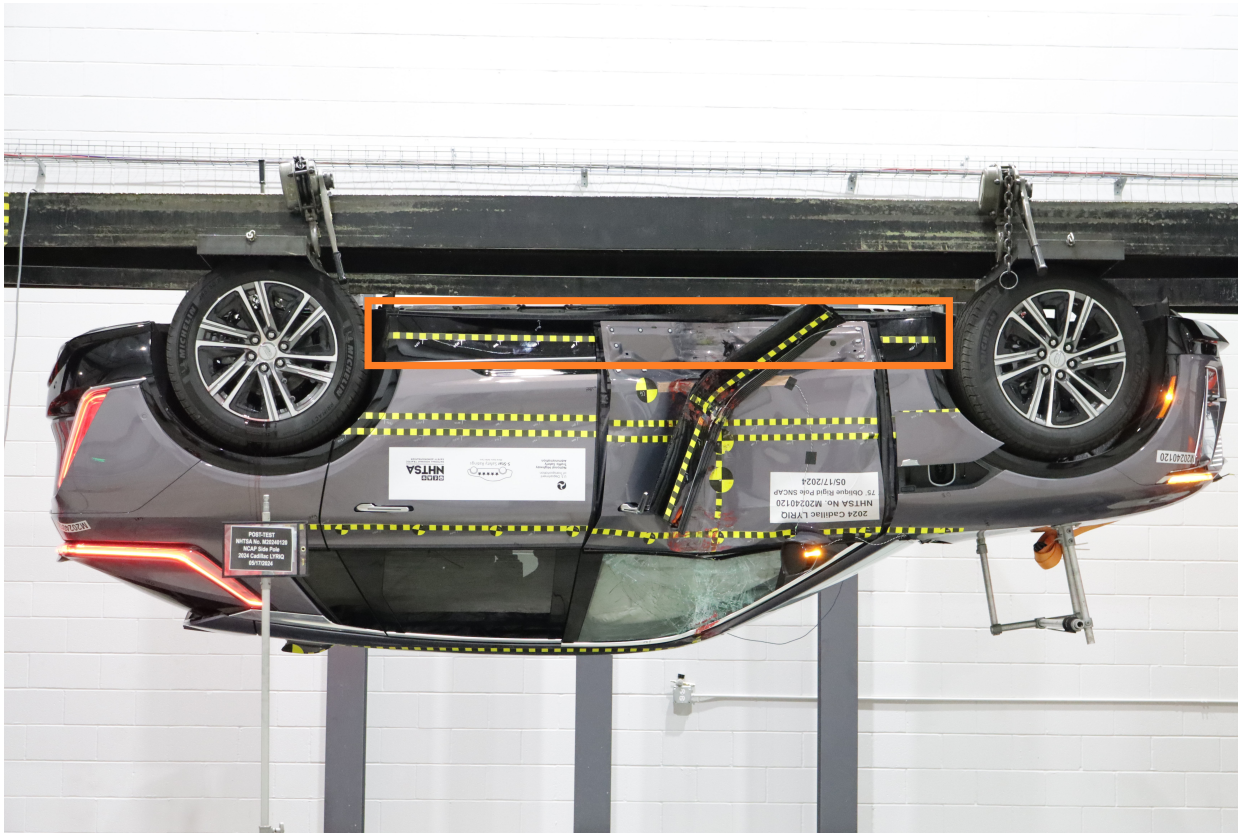

Figure 305-29: FMVSS No. 305 Static Rollover 180 Degrees

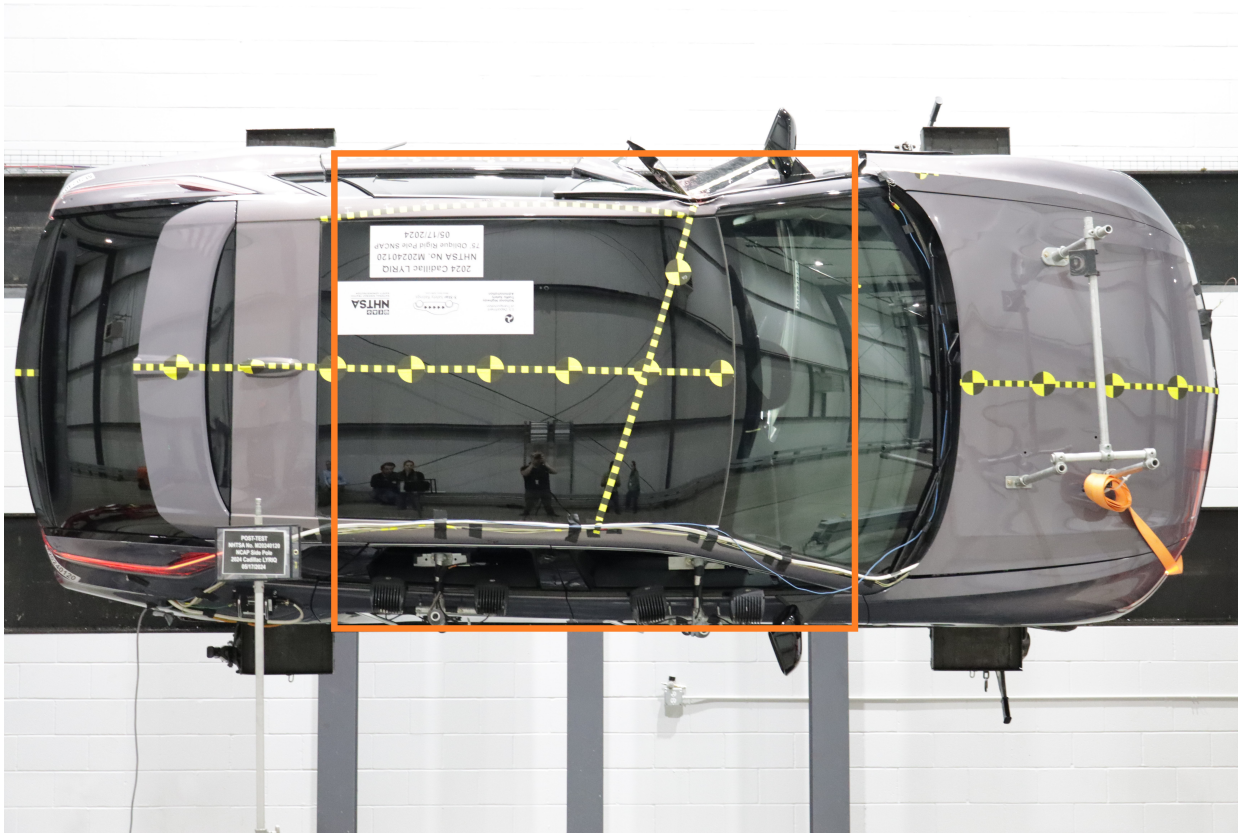

Figure 305-30: FMVSS No. 305 Static Rollover 270 Degrees

Figure 305-31: FMVSS No. 305 Static Rollover 360 Degrees

Figure 305-32: Pre-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery

Figure 305-33: Post-Impact View of the Vehicle Passenger Compartment Adjacent to Propulsion Battery

Photo Not Applicable

Figure 305-34: Post-Impact Propulsion Battery System Mounting and-or Intrusion Failure(s)

Figure 305-35: Post-Impact View of Battery Component Intrusion (if applicable)

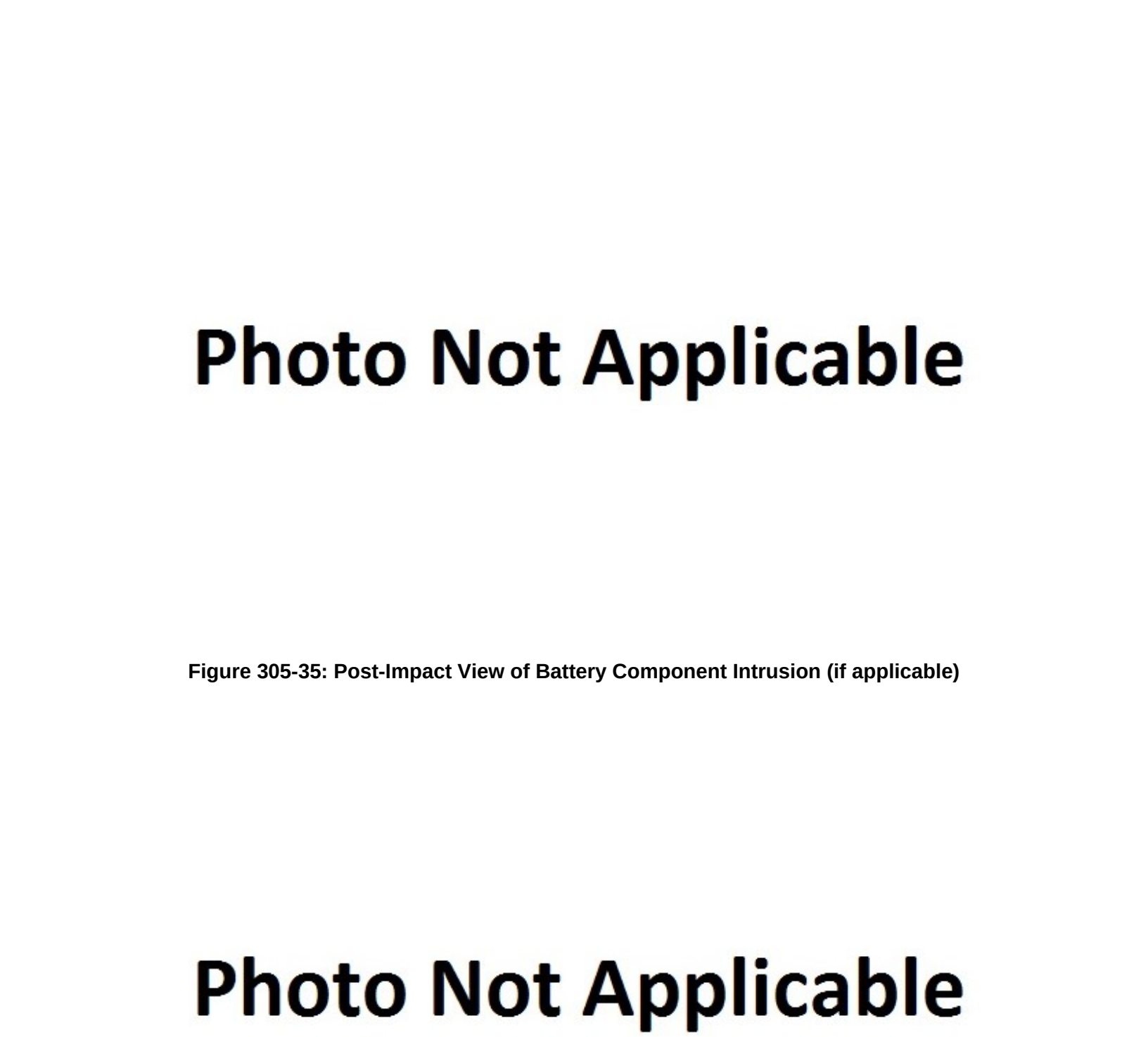

Figure 305-36: Post-Impact View of Battery Module Movement or Retention Loss (if applicable)

Figure 305-37: Post-Impact View of Propulsion Battery Electrolyte Spillage Location (if applicable)

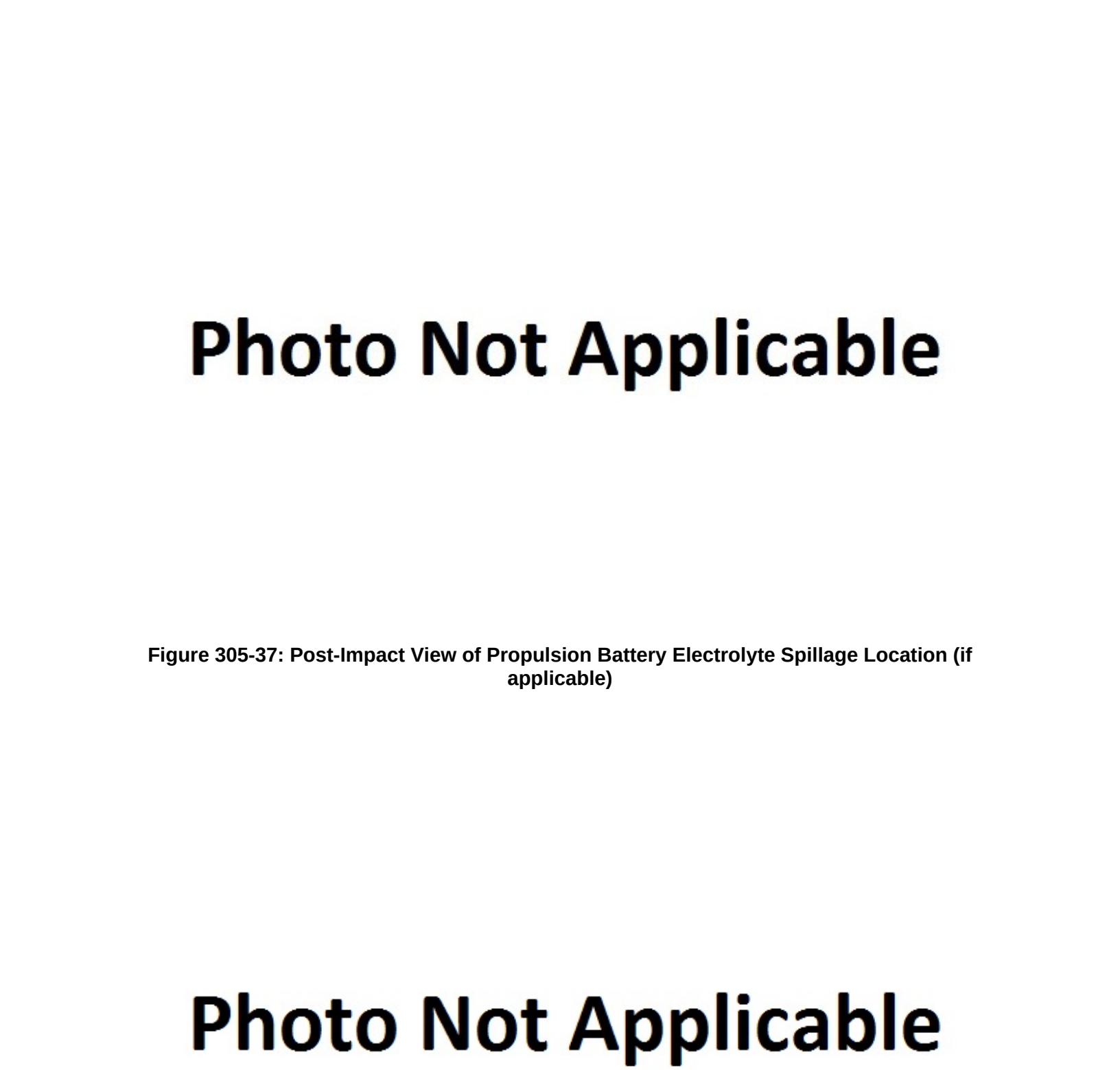

Figure 305-38: Post-Impact View of Propulsion Battery Electrolyte Spillage Location (after rollover)

Figure 305-39: Pre-Impact Charging Port View

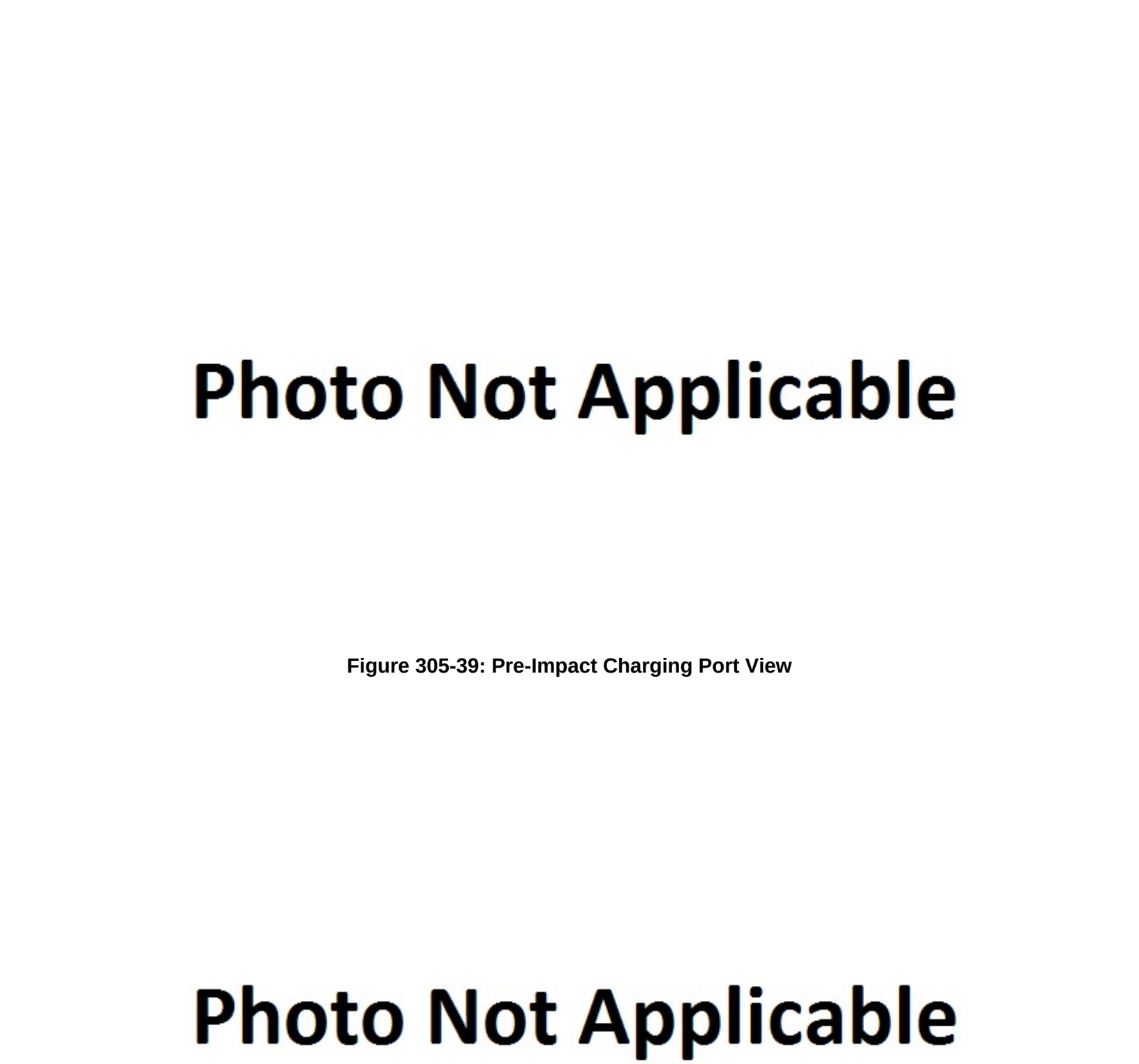

Figure 305-38: Post-Impact Charging Port View

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
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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)

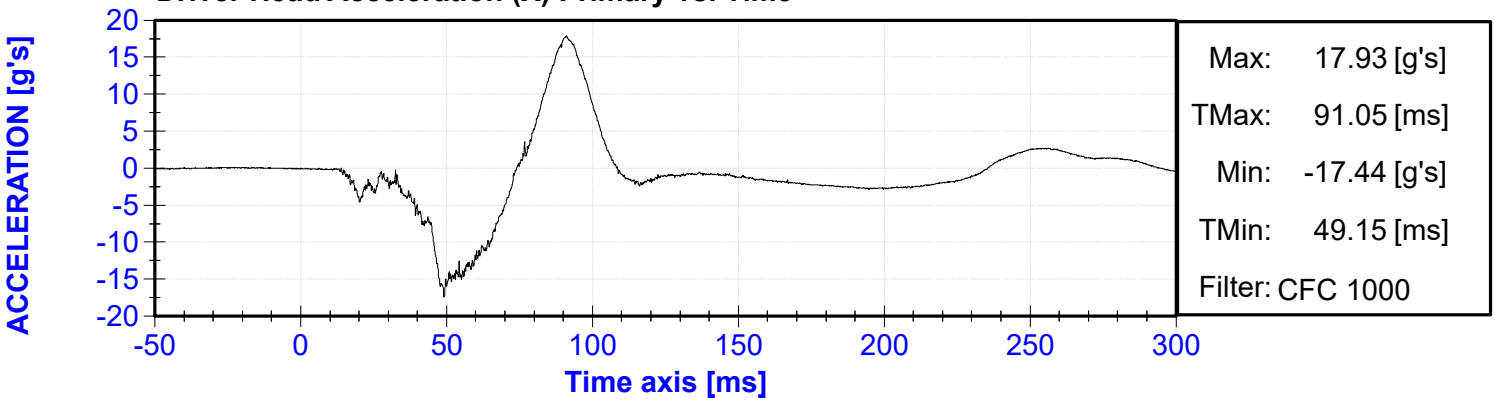
Vehicle Instrumentation Data

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)

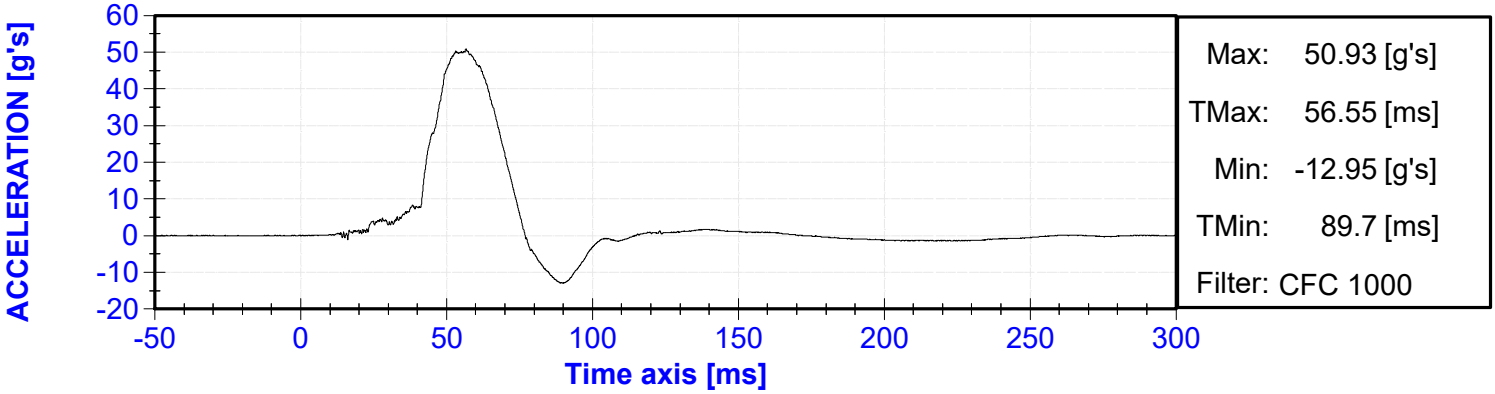
Pole Instrumentation Data

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)

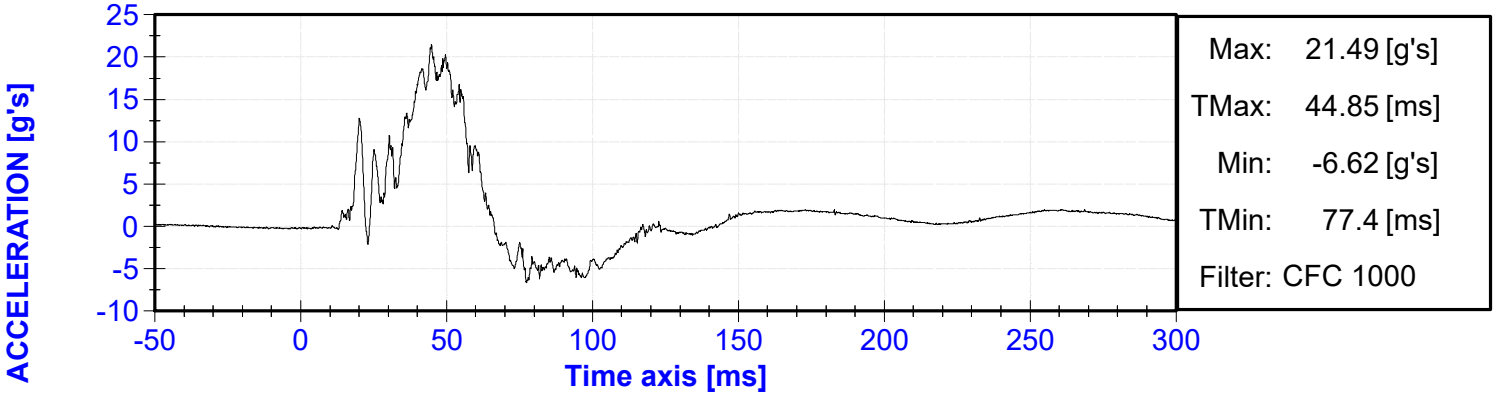
Driver Head Acceleration (X) Primary vs. Time



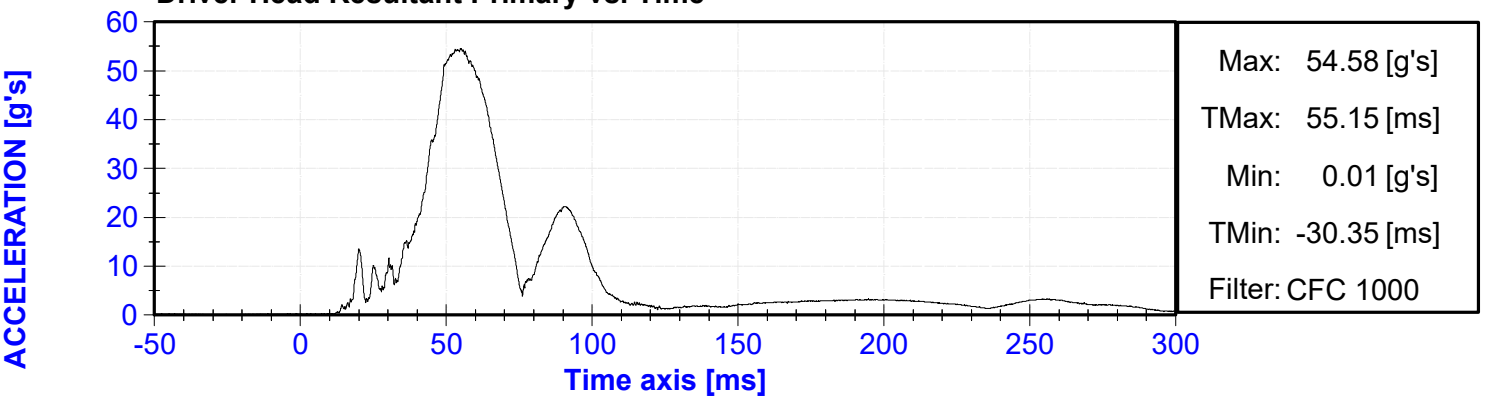
Driver Head Acceleration (Y) Primary vs. Time



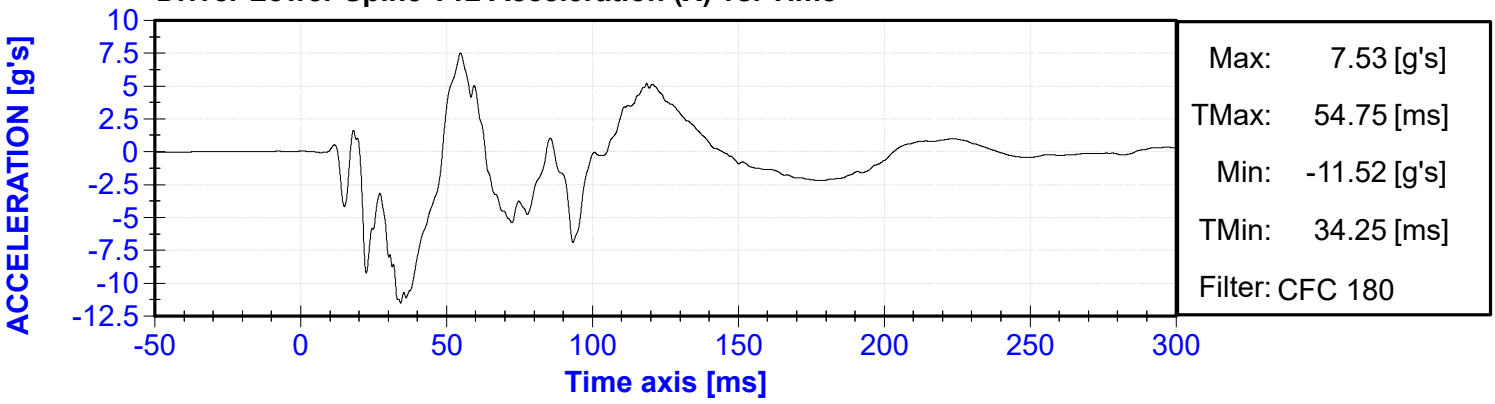
Driver Head Acceleration (Z) Primary vs. Time



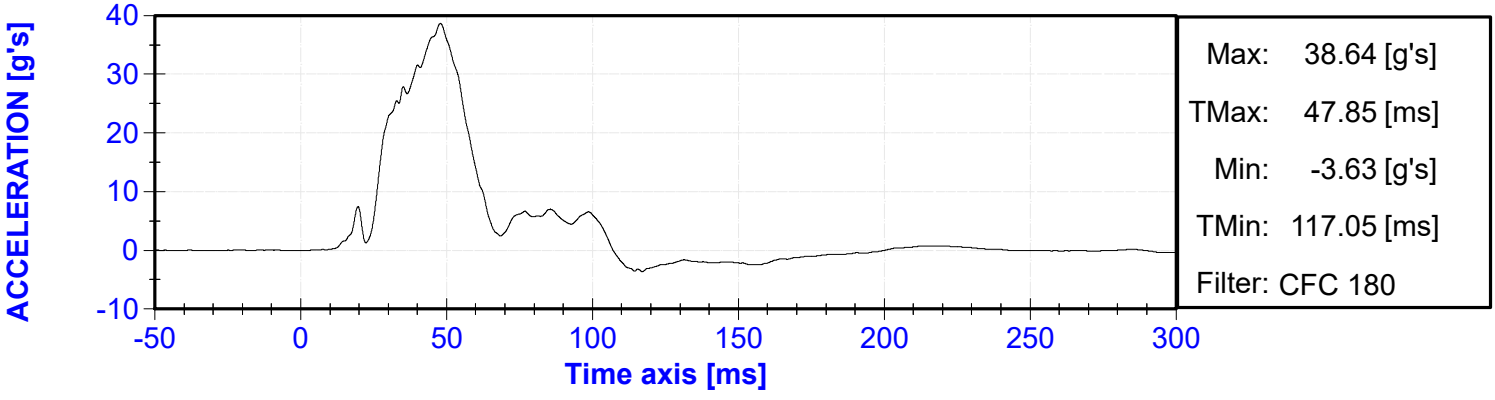
Driver Head Resultant Primary vs. Time



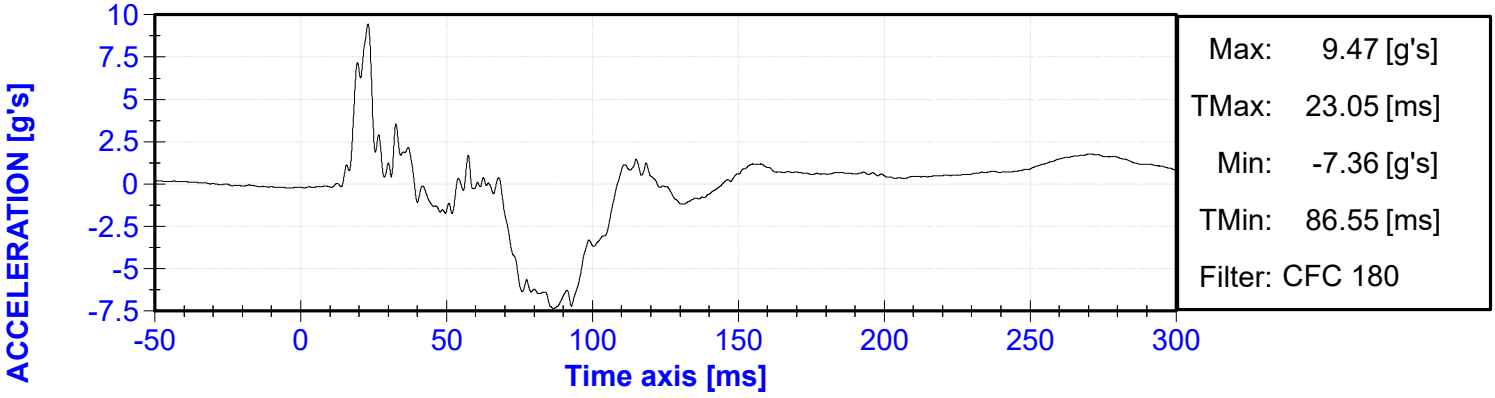
Driver Lower Spine T12 Acceleration (X) vs. Time



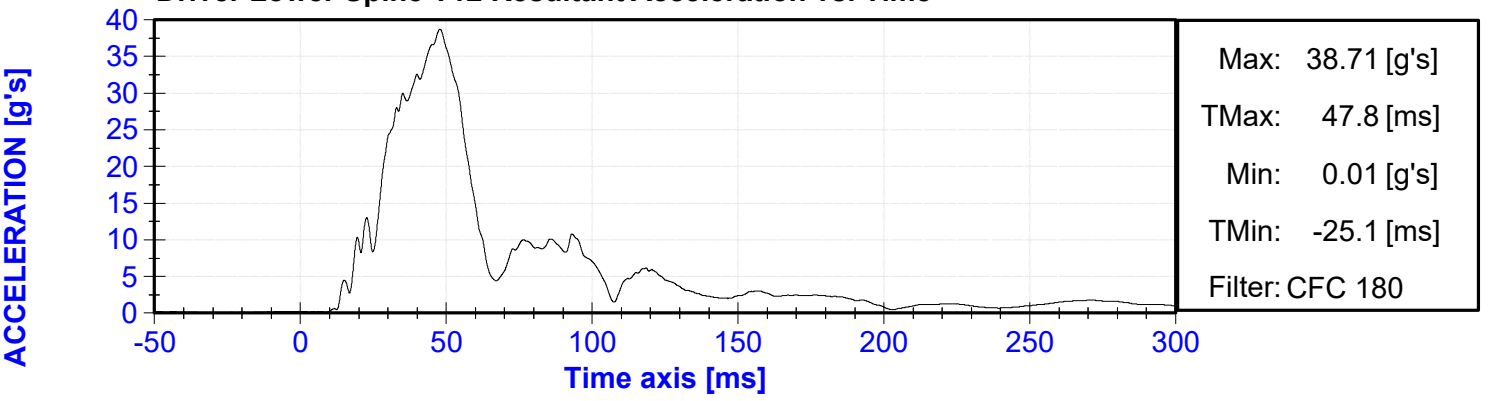
Driver Lower Spine T12 Acceleration (Y) vs. Time



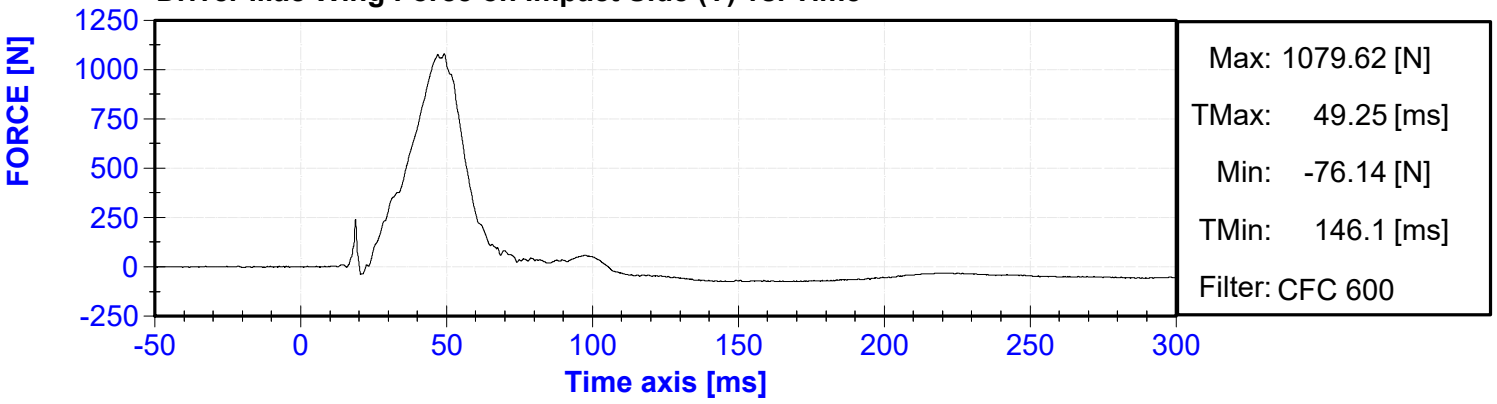
Driver Lower Spine T12 Acceleration (Z) vs. Time



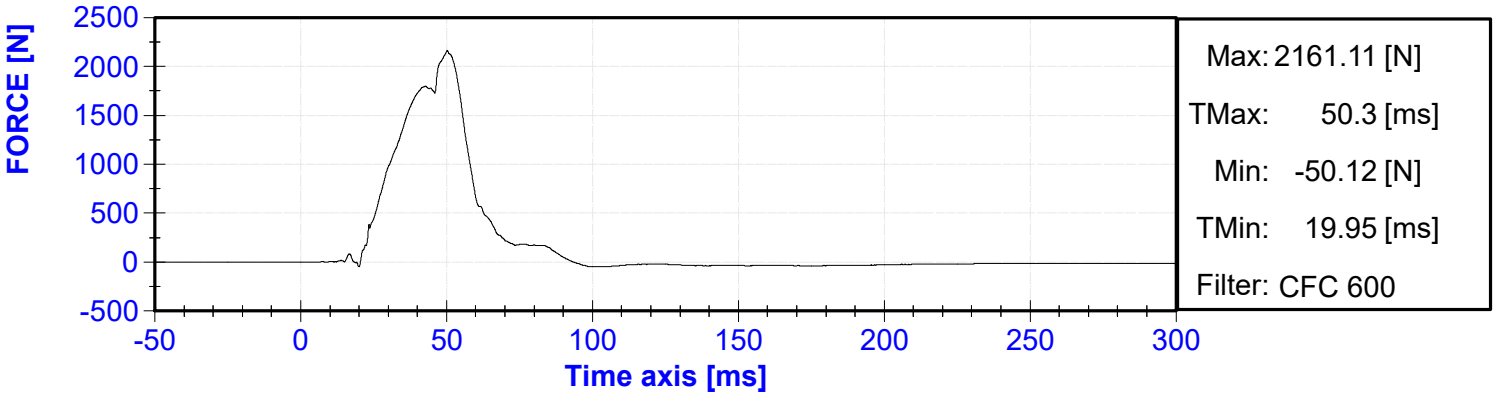
Driver Lower Spine T12 Resultant Acceleration vs. Time



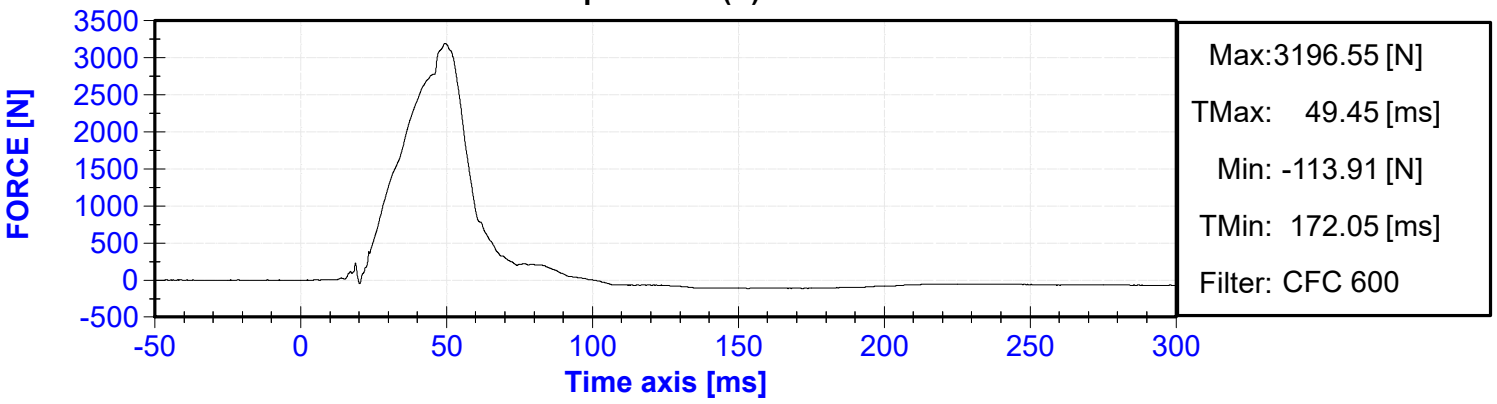
Driver Iliac Wing Force on Impact Side (Y) vs. Time



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



Driver Total Pelvis Force on Impact Side (Y) vs. Time



APPENDIX C

DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

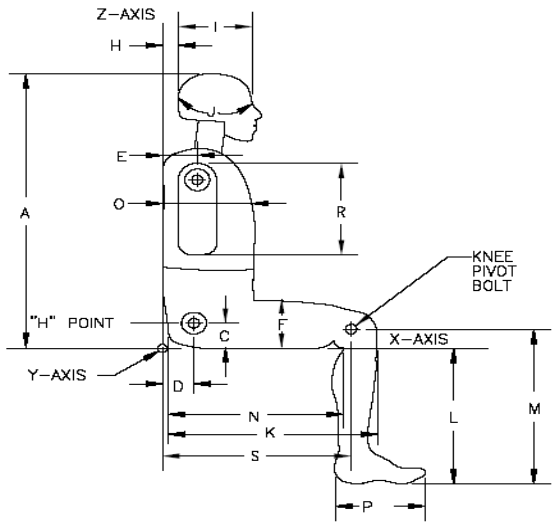
SERIAL NO:300

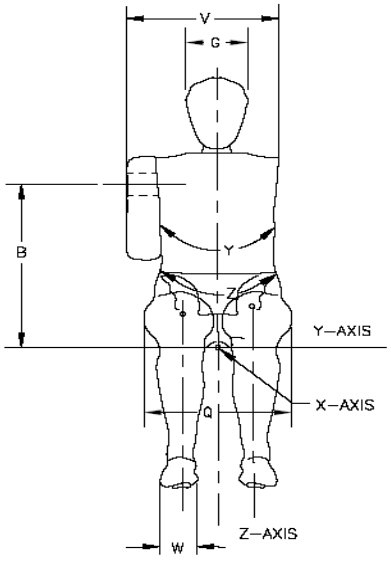
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: K. Brogan Date: 5/15/2024

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	446	Pass
C	H-point Height	79	89	84	Pass
D	H-point from seatback	141	151	146	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	43	Pass
I	Head Depth	178	188	182	Pass
J	Head Circumference	541	551	549	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	401	Pass
N	Buttock Popliteal Length	416	442	434	Pass
O	Chest Depth w/o jacket	195	211	198	Pass
P	Foot Length	216	232	224	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	319	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	488	Pass
V	Shoulder Width	341	357	352	Pass
W	Foot Width	78	94	86	Pass
Y	Chest Circumference w/jacket	851	881	877	Pass
Z	Waist Circumference	761	791	781	Pass

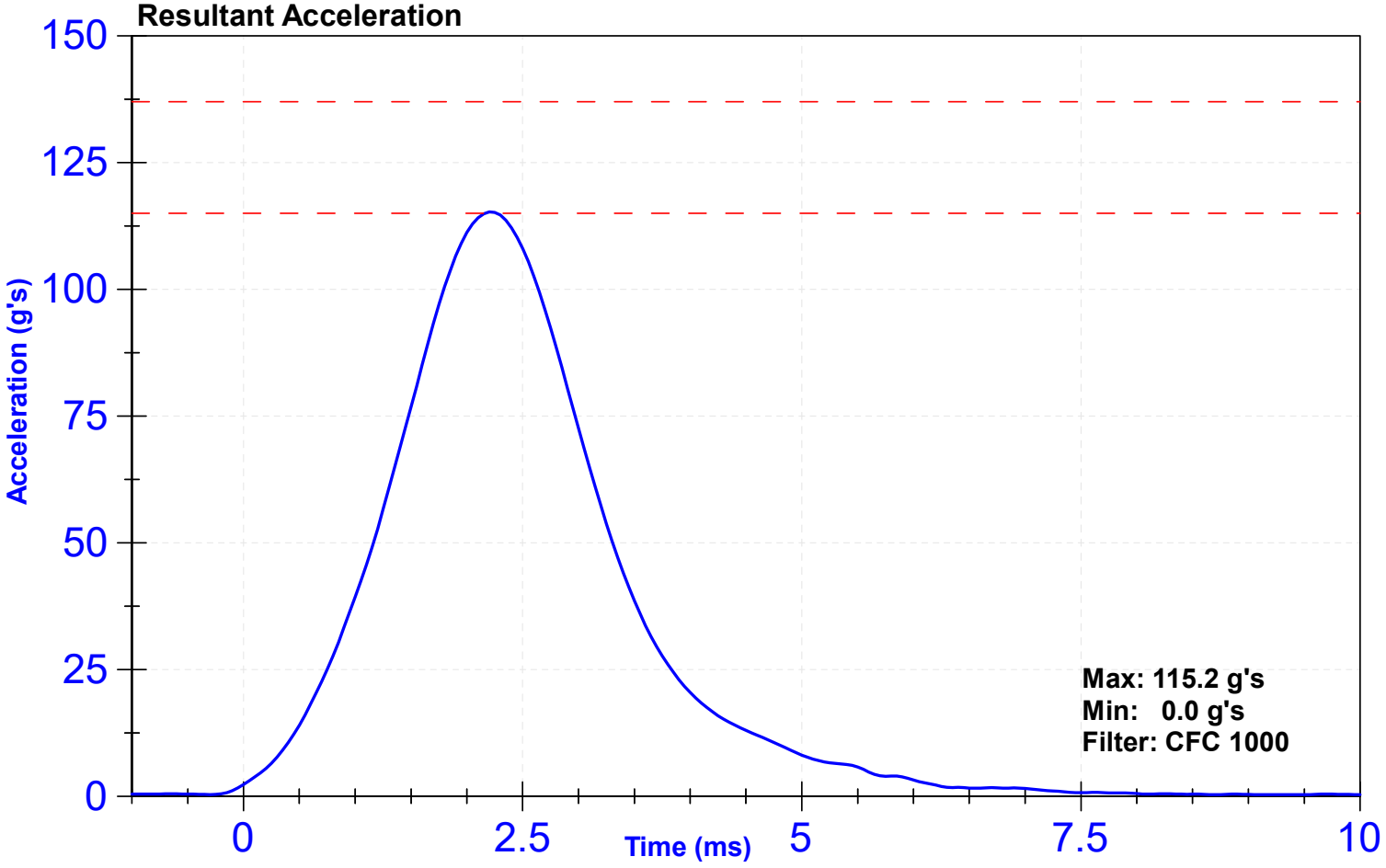
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

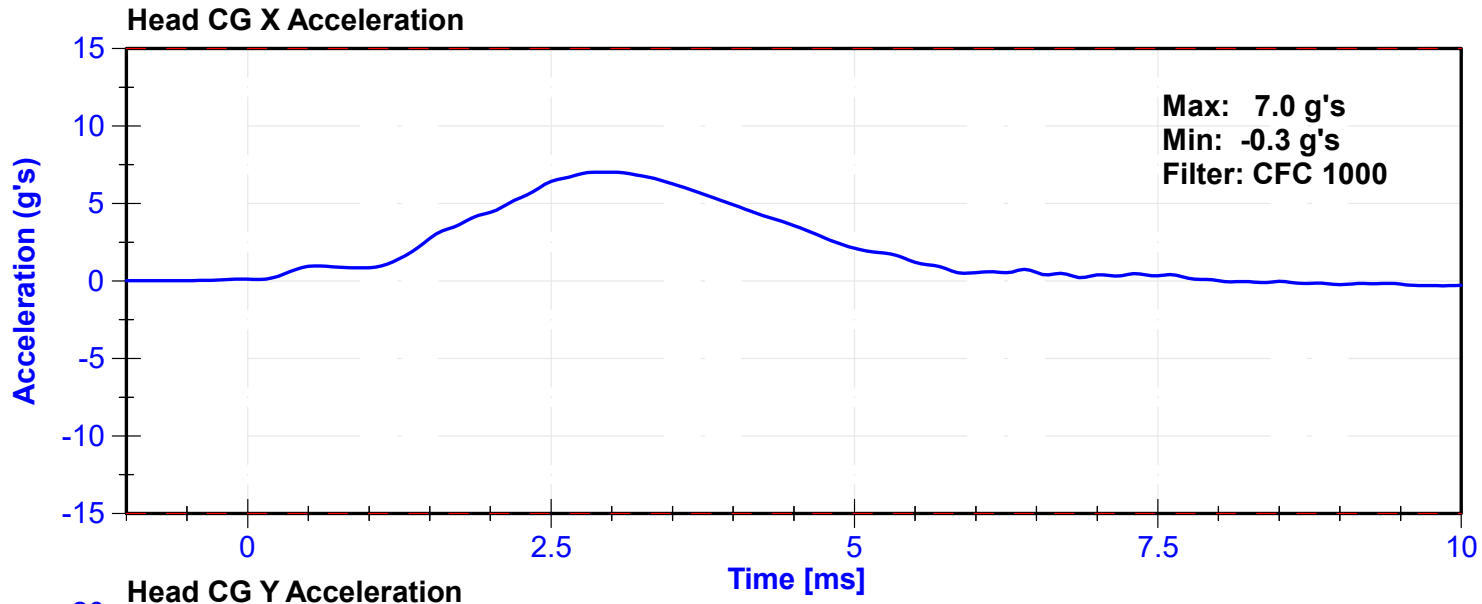
Results

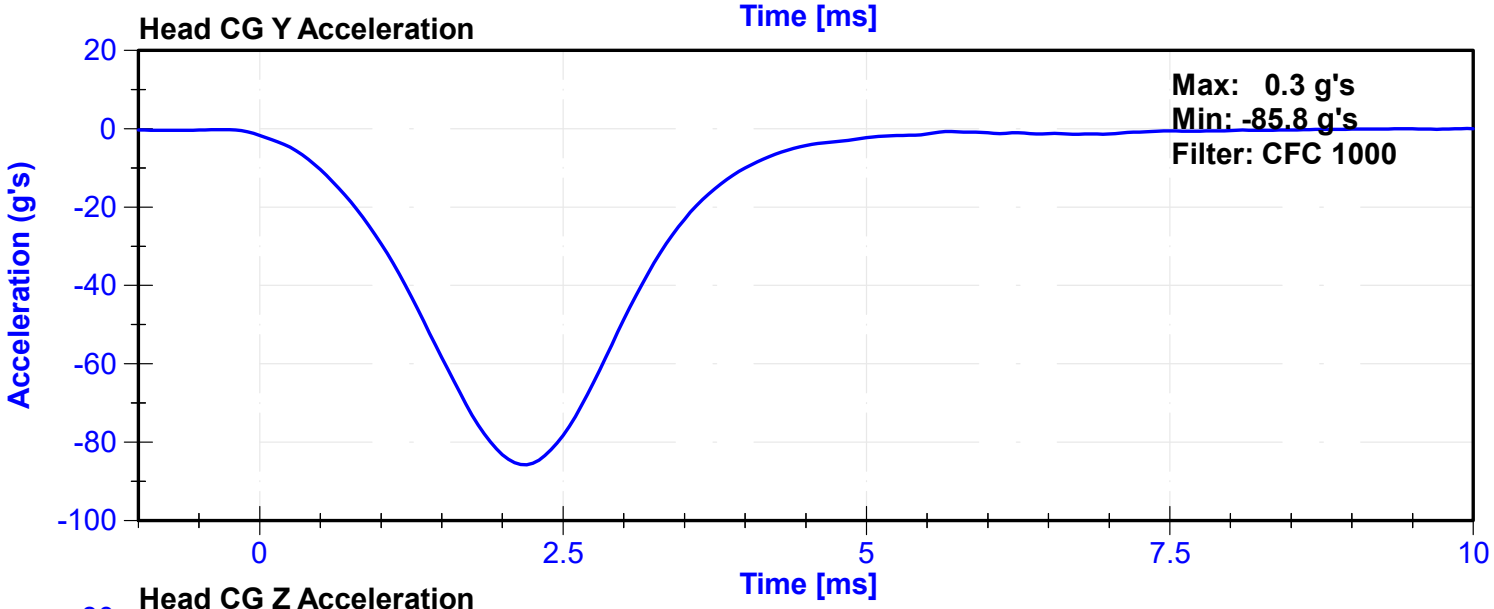
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	48	Pass
Resultant Acceleration	115	137	g's	115.2	Pass
Oscillation	0	15	%	3.4	Pass
Fore-Aft Acceleration	-15	15	g's	7.0	Pass

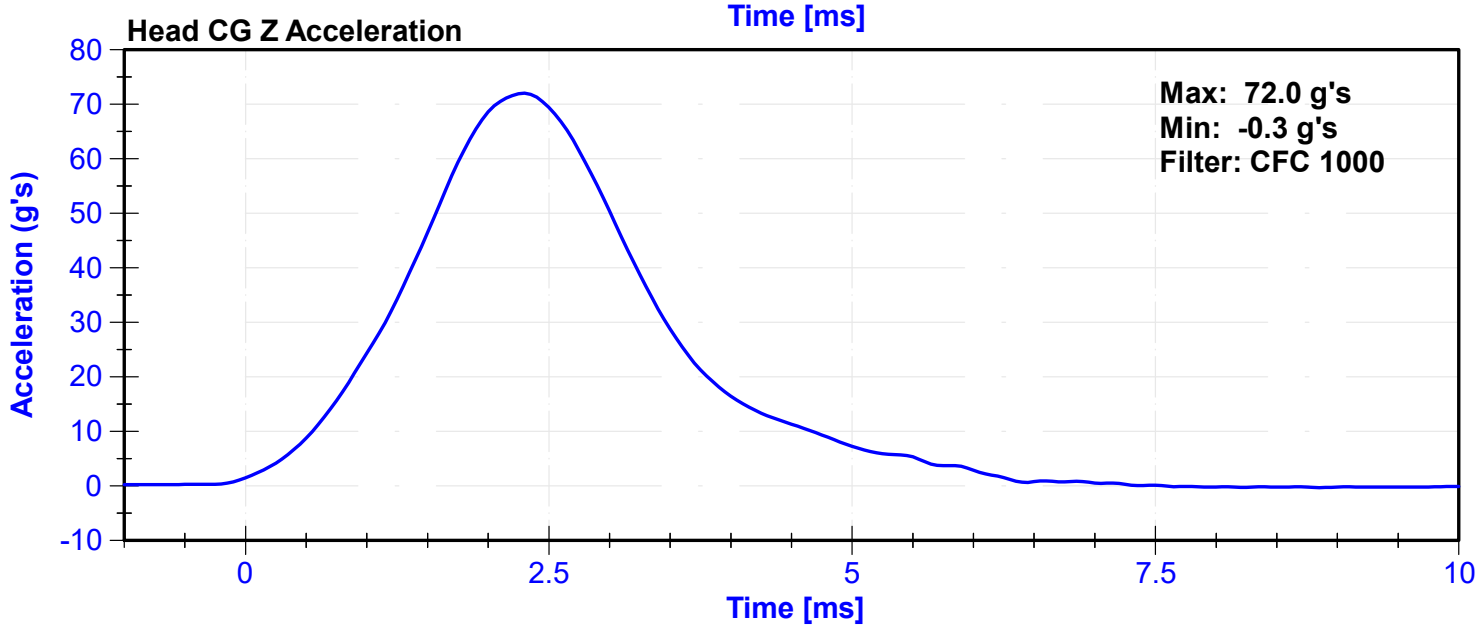
Transducer Calibrations

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




Head CG X Acceleration
Max: 7.0 g's
Min: -0.3 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Y Acceleration
Max: 0.3 g's
Min: -85.8 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]


Head CG Z Acceleration
Max: 72.0 g's
Min: -0.3 g's
Filter: CFC 1000
Acceleration (g's)
Time [ms]

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

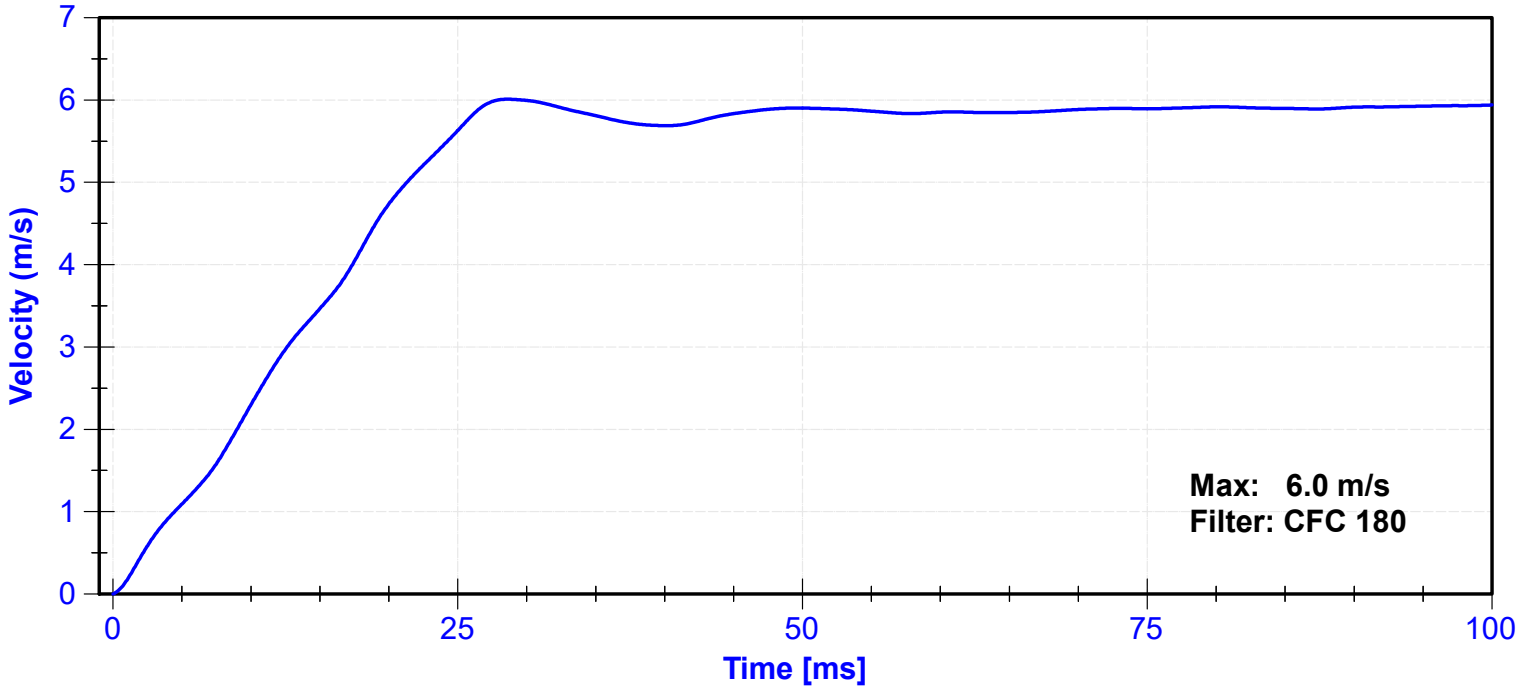
Results

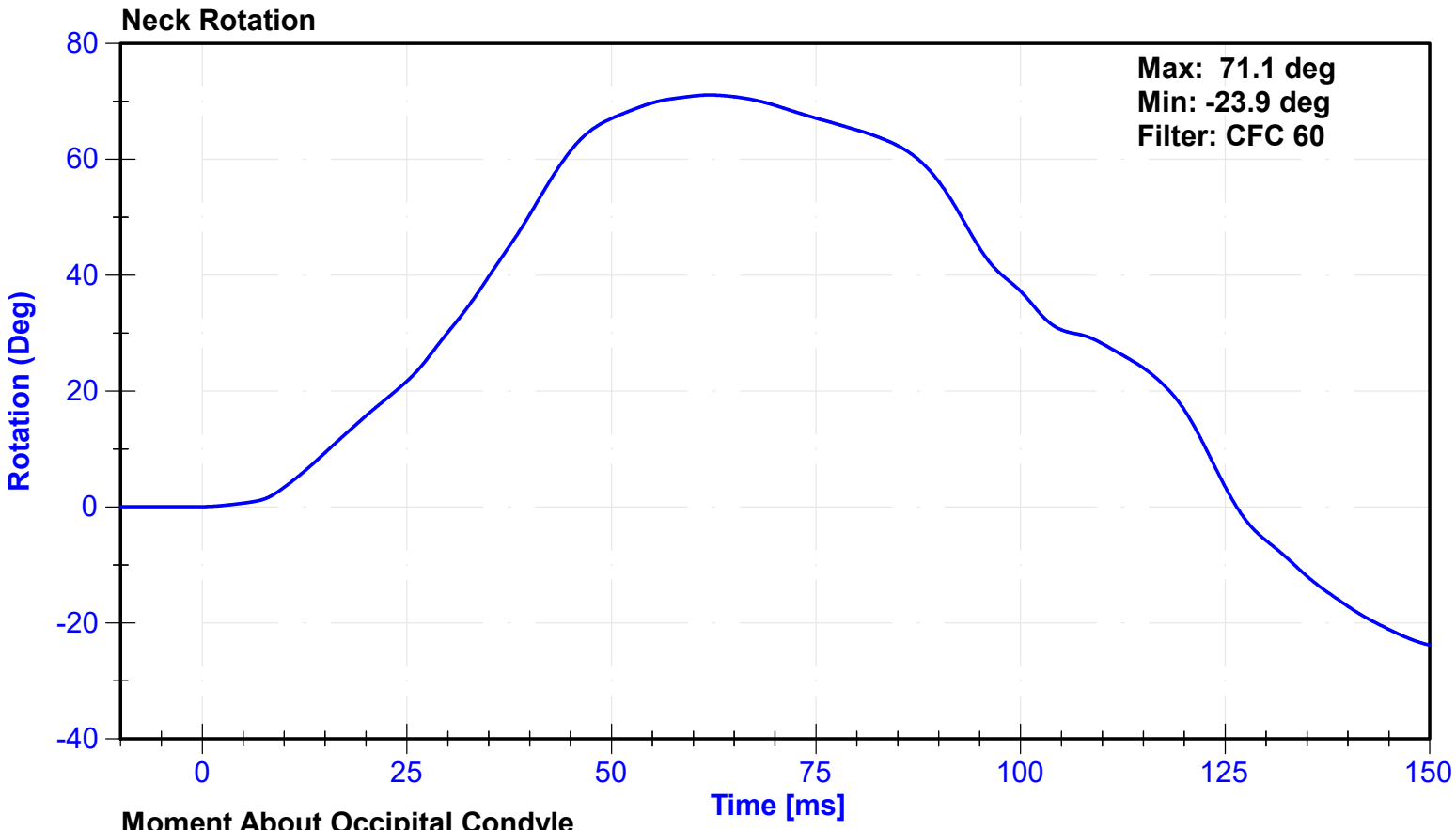
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	48	Pass
Velocity	5.51	5.63	m/s	5.587	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.30	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.47	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.74	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.63	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.01	Pass
Neck Rotation	71	81	deg	71.1	Pass
Time at Maximum Rotation	50	70	ms	62.0	Pass
Moment about the OC	36	44	Nm	39.9	Pass
Moment Decay to 0 Nm	102	126	ms	111.4	Pass

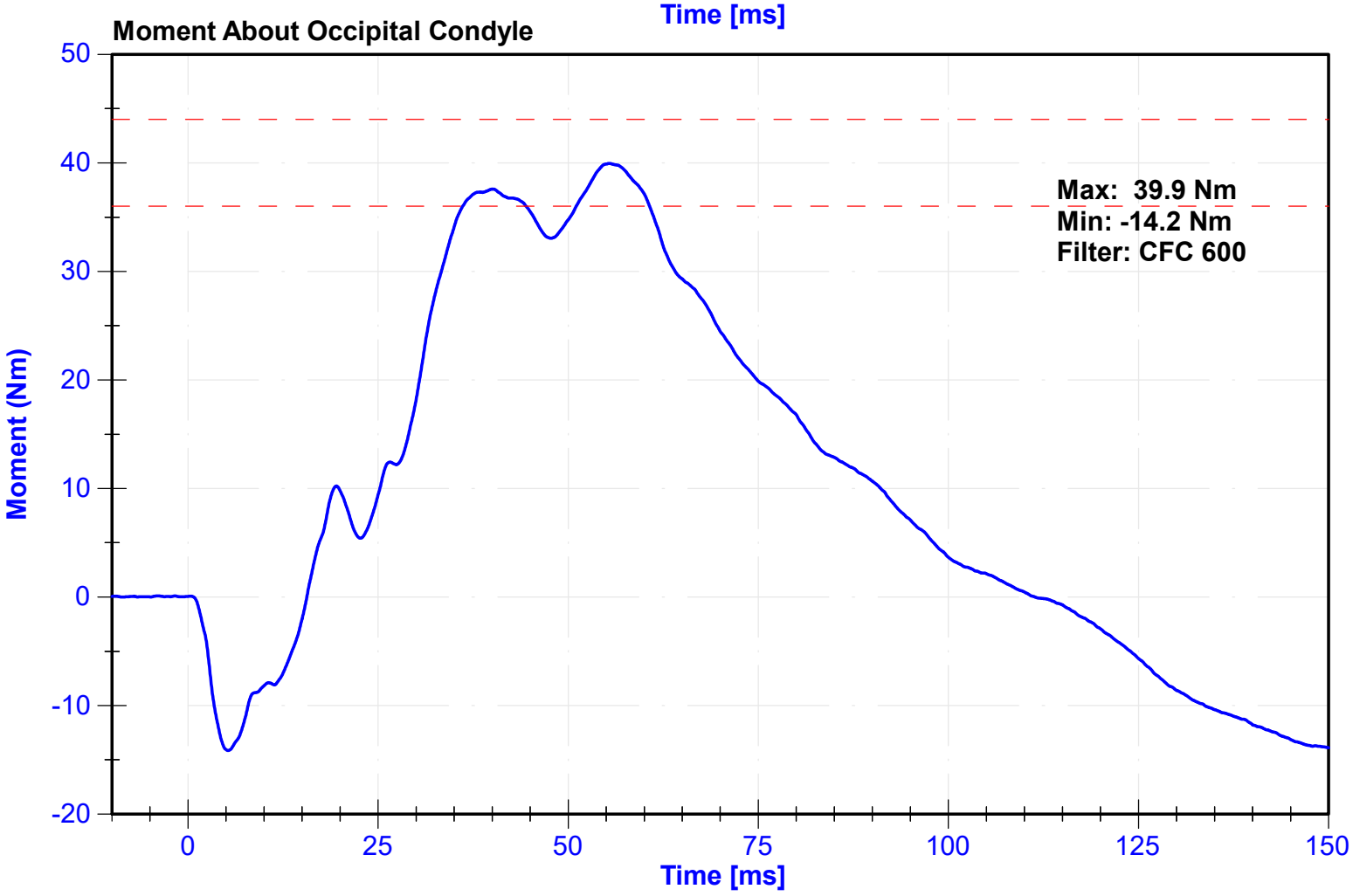
Transducer Calibrations

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	1716ATF_2184-FY	5/18/2023	5/17/2024

Pendulum Impulse




Neck Rotation
Max: 71.1 deg
Min: -23.9 deg
Filter: CFC 60
Rotation (Deg)
80
60
40
20
0
-20
-40
0
25
50
75
100
125
150
Time [ms]


Moment About Occipital Condyle
Max: 39.9 Nm
Min: -14.2 Nm
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

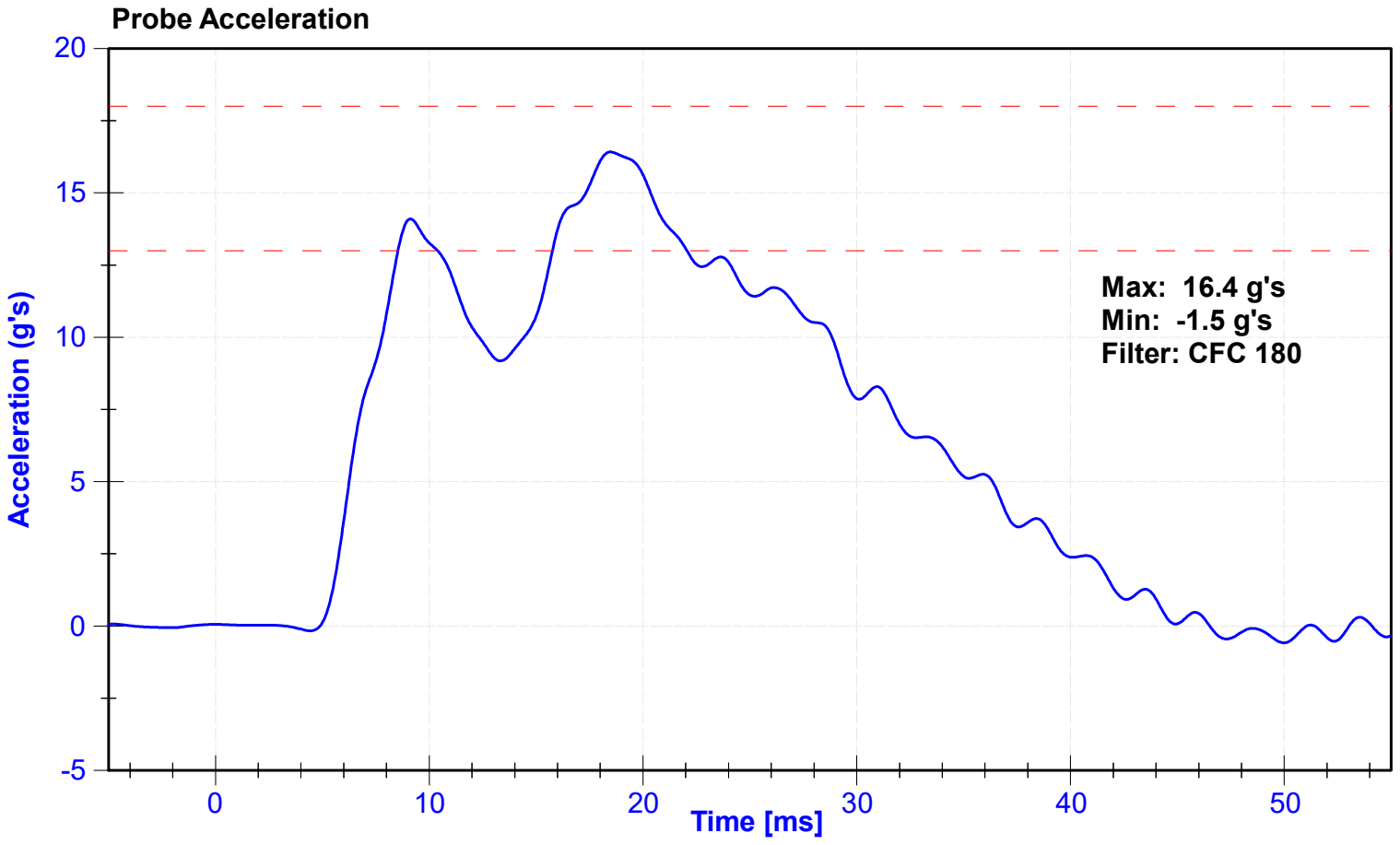
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

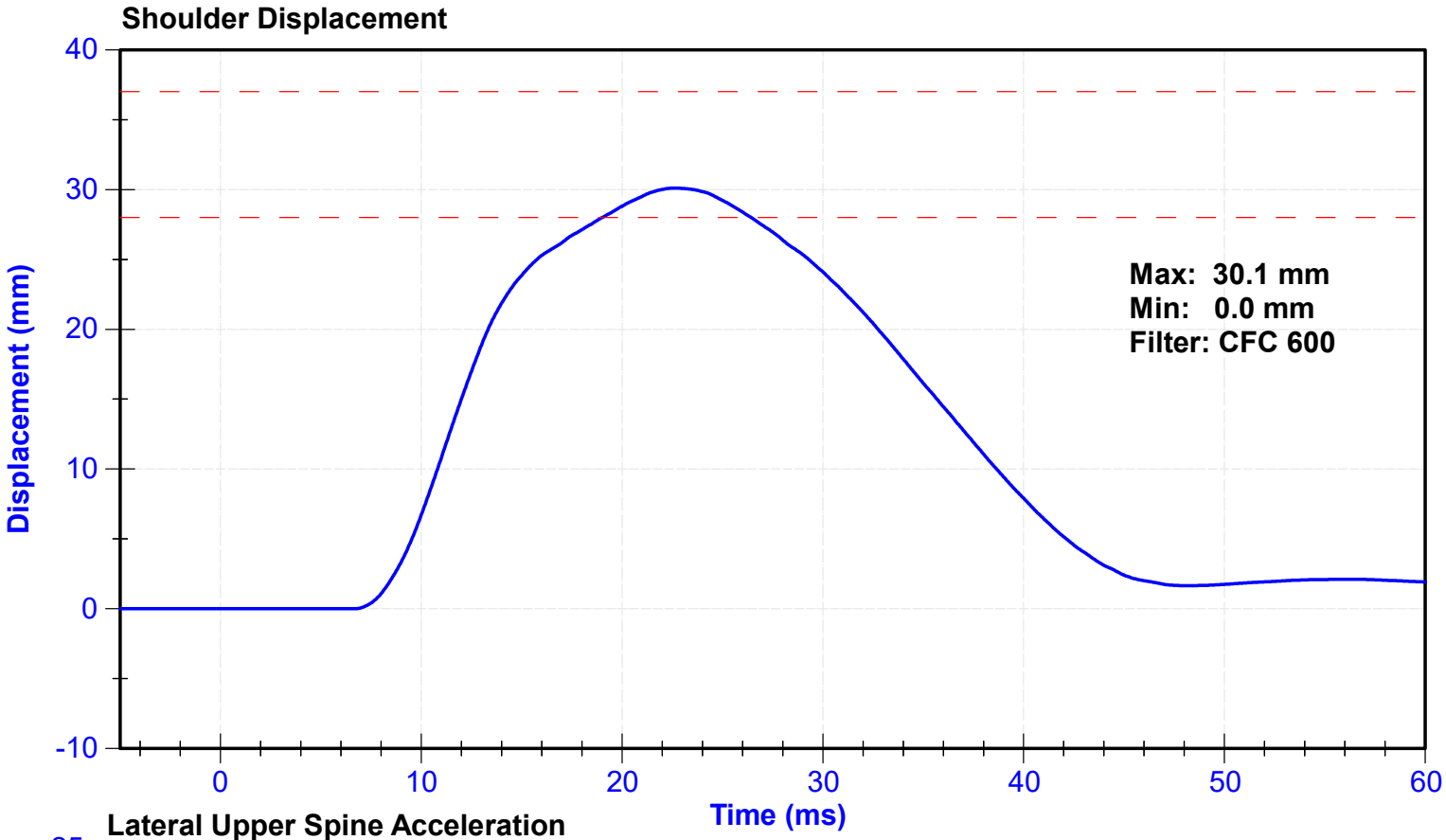
Results

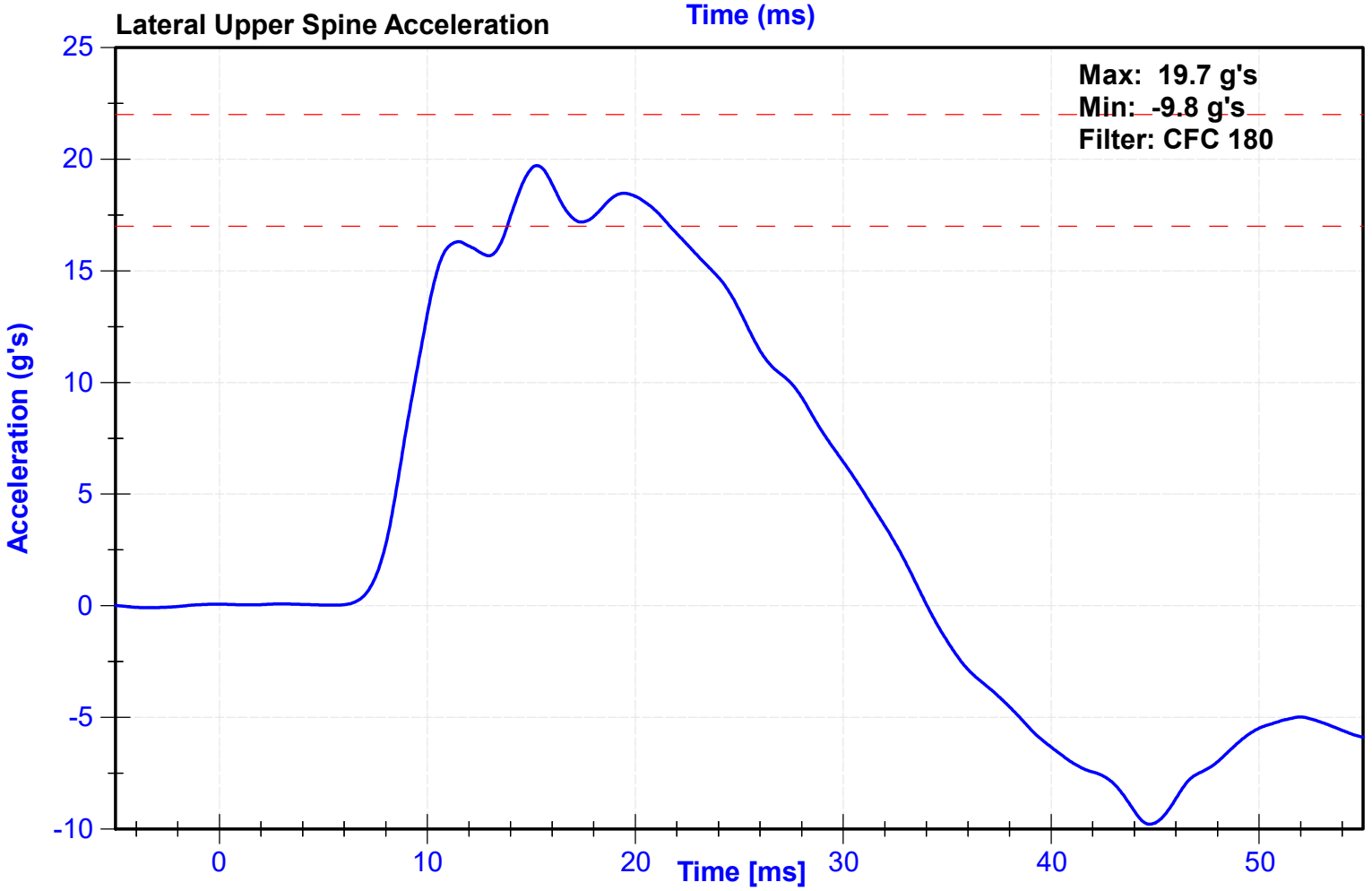
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.0	Pass
Humidity	10	70	%	39.0	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	13	18	g's	16.4	Pass
Shoulder Deflection	28	37	mm	30.1	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Shoulder Potentiometer	Servo	053GFE	5/9/2024	11/7/2024
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 30.1 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 19.7 g's
Min: -9.8 g's
Filter: CFC 180

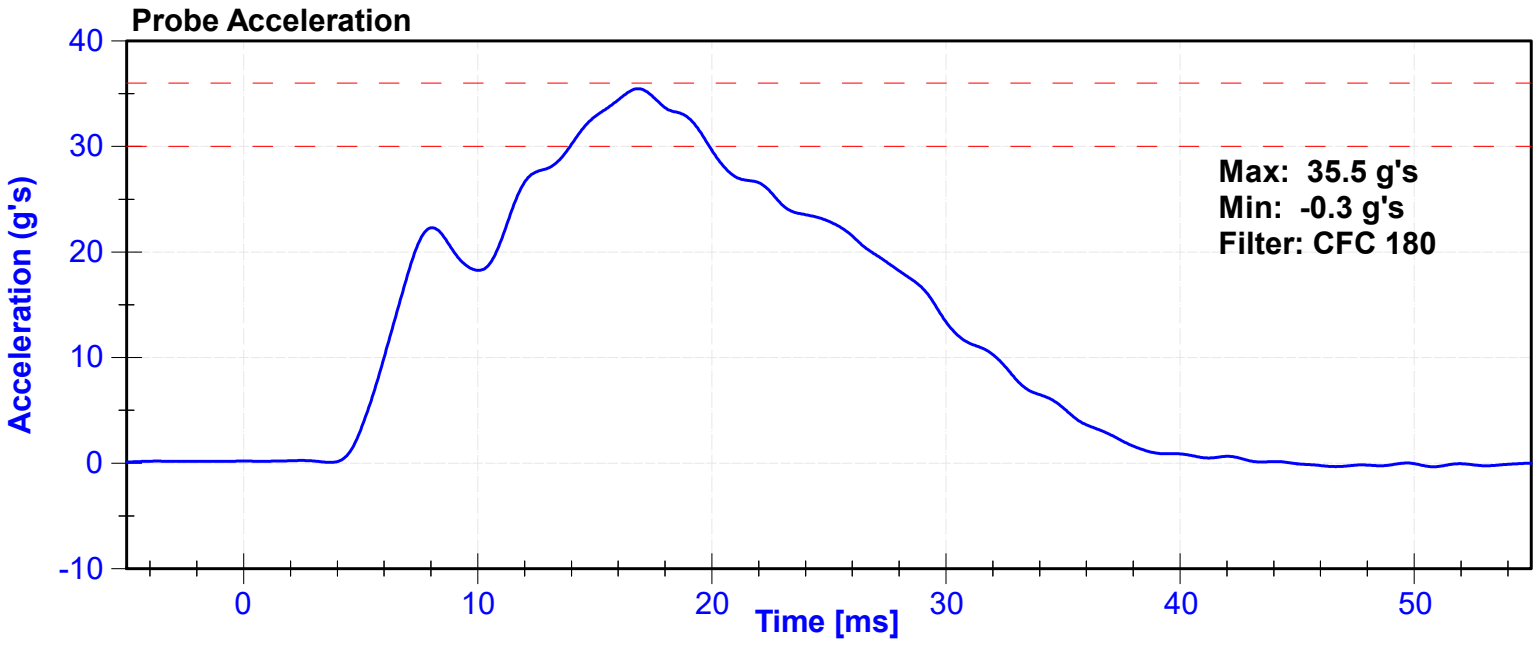
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

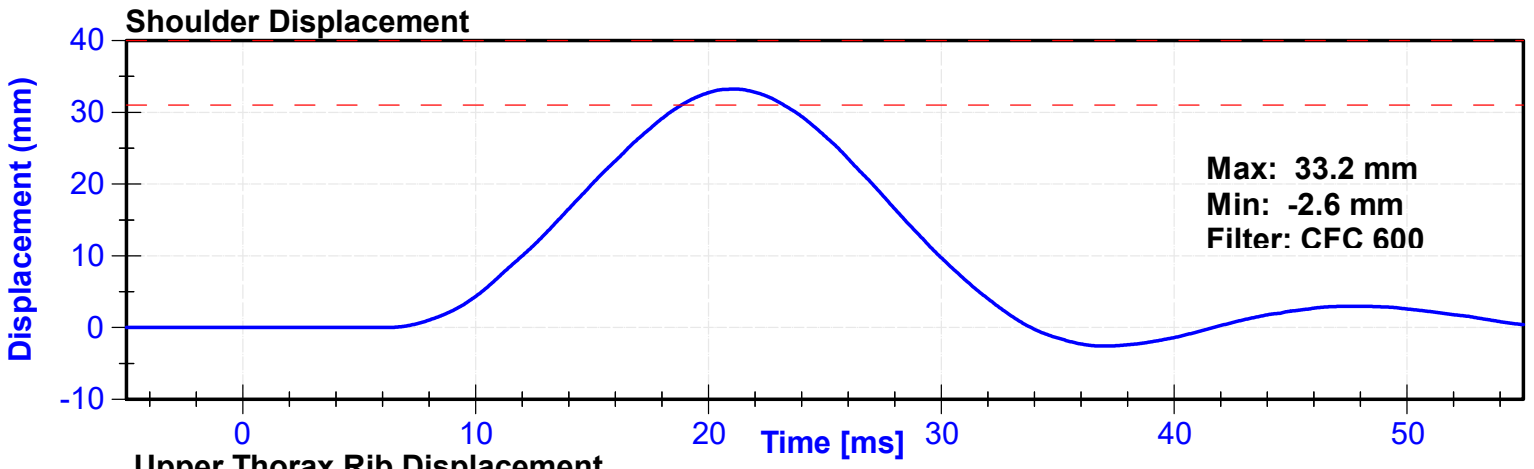
Results

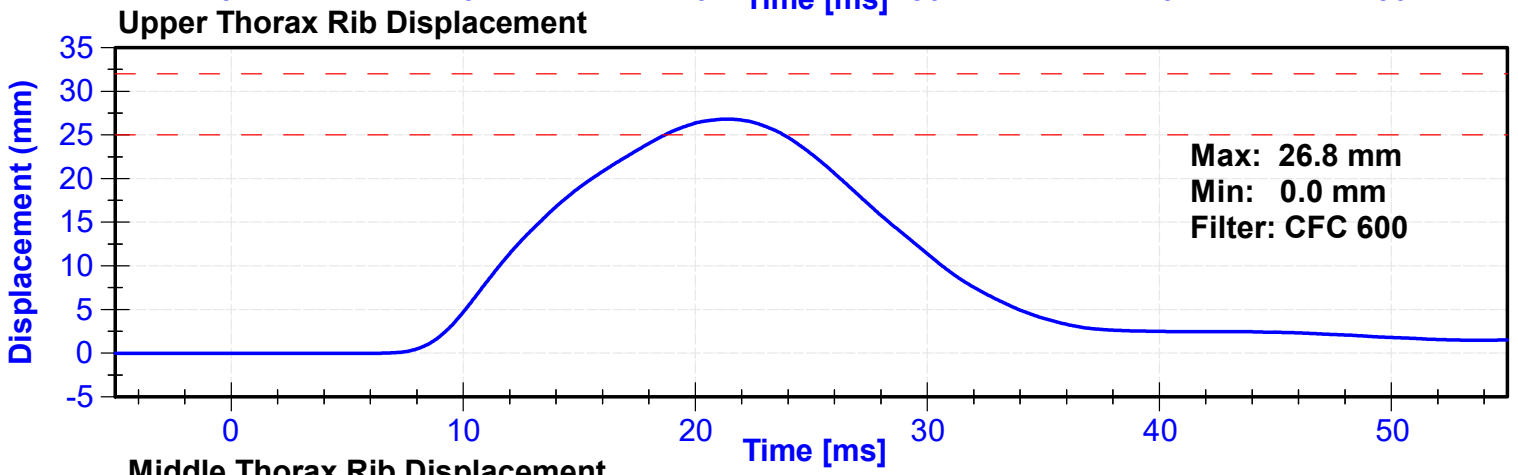
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.0	Pass
Humidity	10	70	%	39.0	Pass
Velocity	6.6	6.8	m/s	6.68	Pass
Probe Acceleration after 5 ms	30	36	g's	35.5	Pass
Lateral Upper Spine Acceleration	34	43	g's	34.8	Pass
Lateral Lower Spine Acceleration	29	37	g's	31.3	Pass
Shoulder Deflection	31	40	mm	33.2	Pass
Upper Thorax Rib Deflection	25	32	mm	26.8	Pass
Mid Thorax Rib Deflection	30	36	mm	32.1	Pass
Lower Thorax Rib Deflection	32	38	mm	34.1	Pass

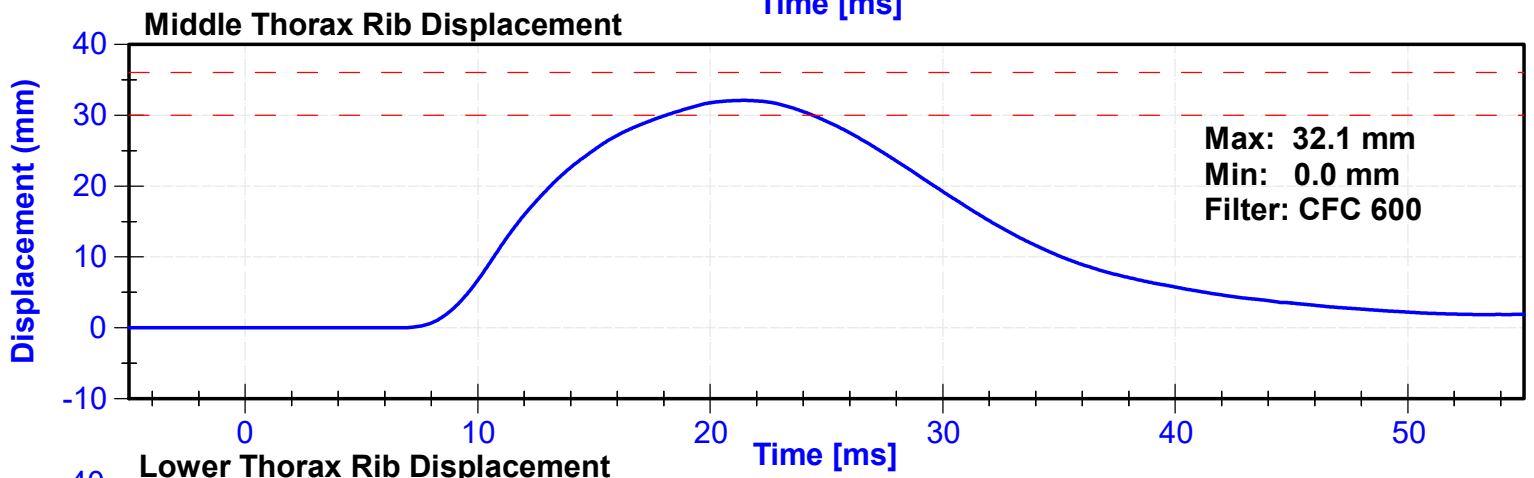
Transducer Calibrations

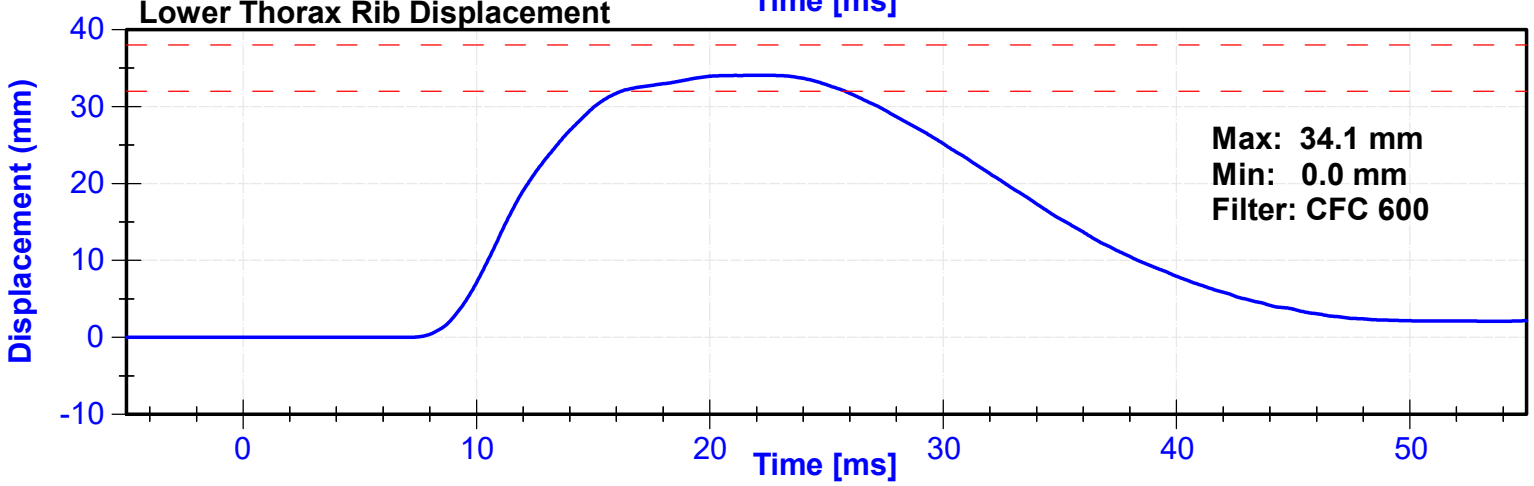
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Upper Spine T1 Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Upper Spine T12 Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Shoulder Potentiometer	Servo	053GFE	5/9/2024	11/7/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	5/9/2024	11/7/2024
Middle Thorax Rib Potentiometer	Servo	085GFE	5/9/24	11/7/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	5/9/2024	11/7/2024

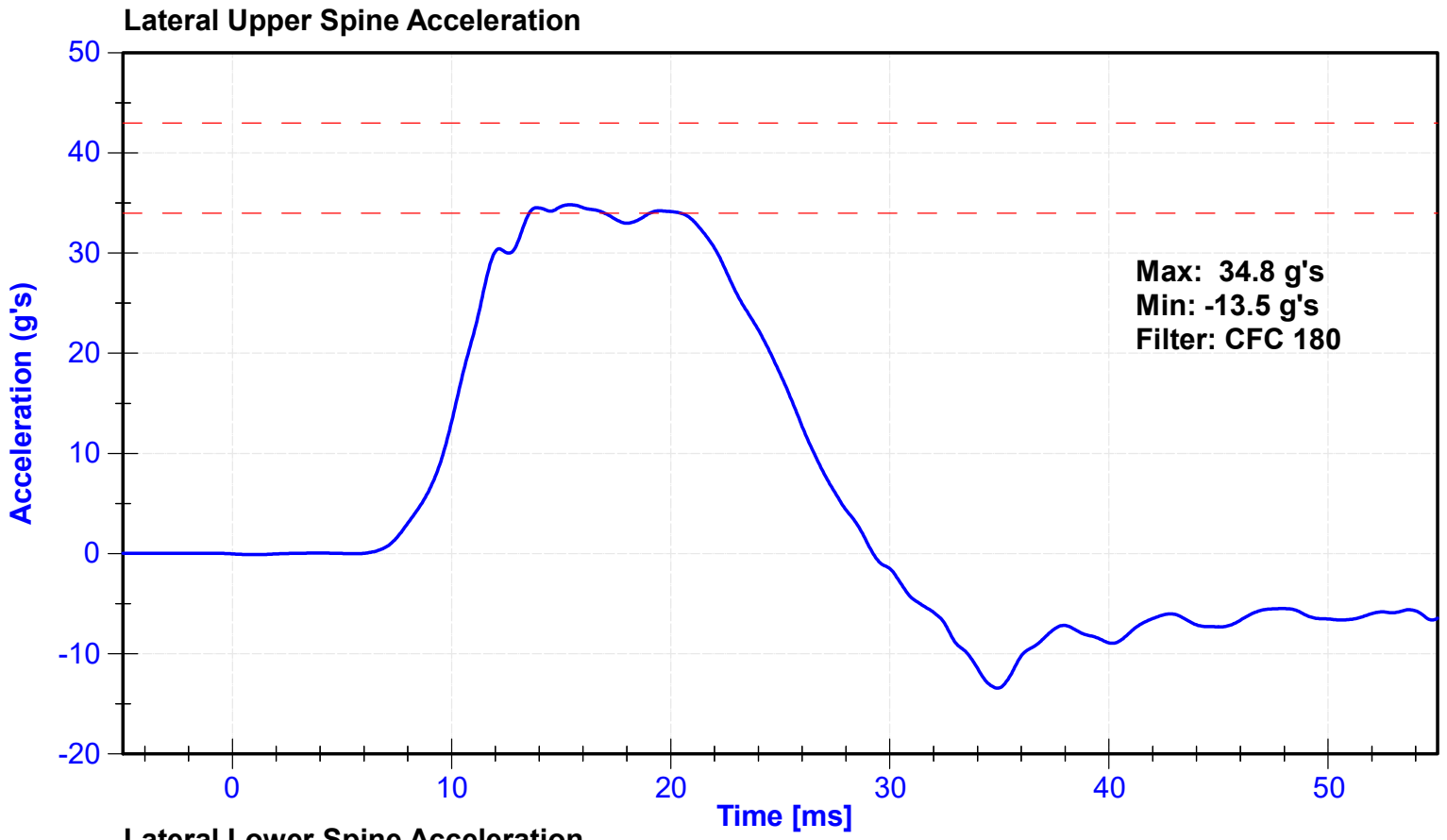


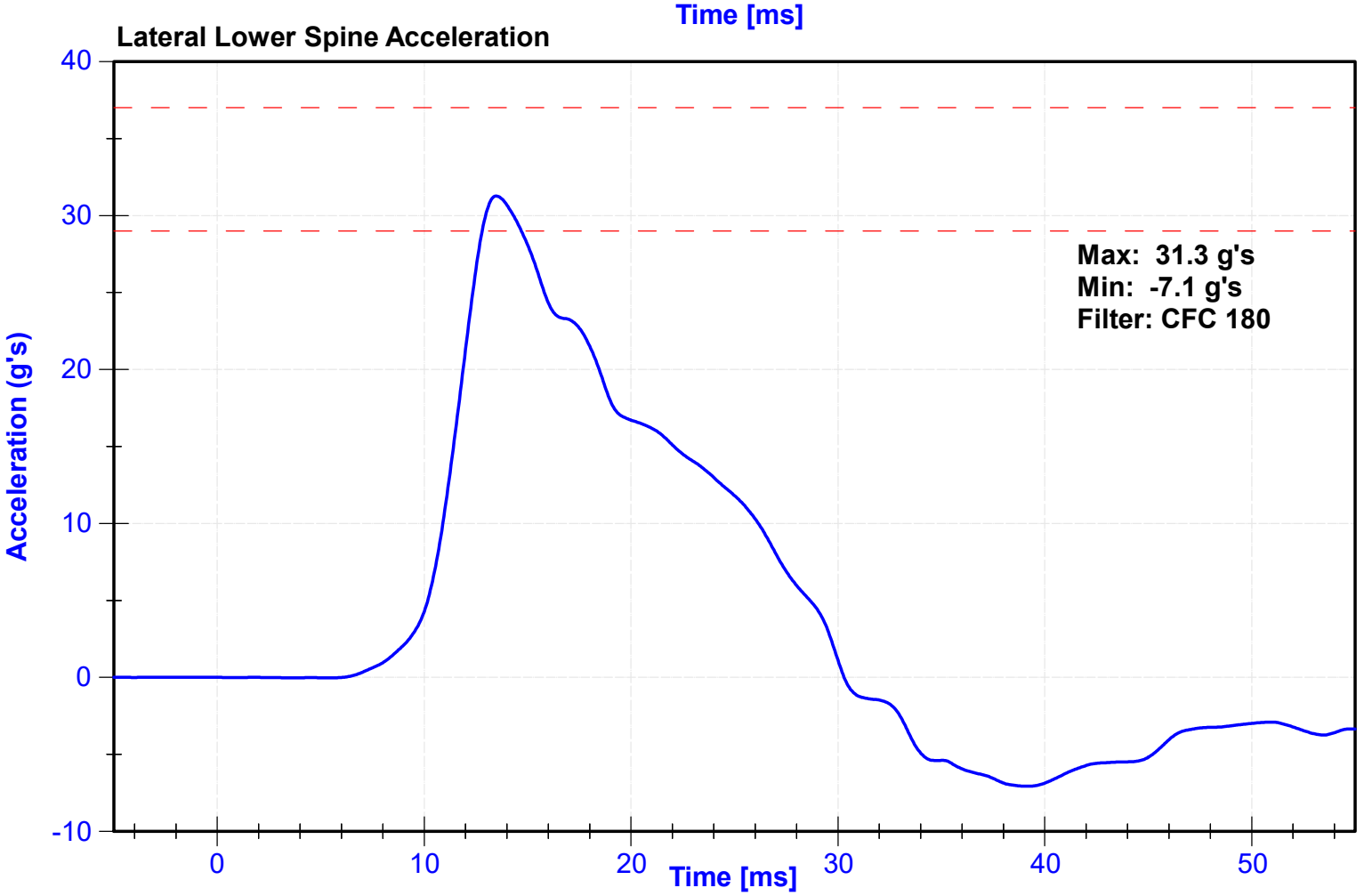

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 33.2 mm
Min: -2.6 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 26.8 mm
Min: 0.0 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 32.1 mm
Min: 0.0 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 34.1 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
50
40
30
20
10
0
-10
-20
0
10
20
30
40
50
Time [ms]
Max: 34.8 g's
Min: -13.5 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 31.3 g's
Min: -7.1 g's
Filter: CFC 180

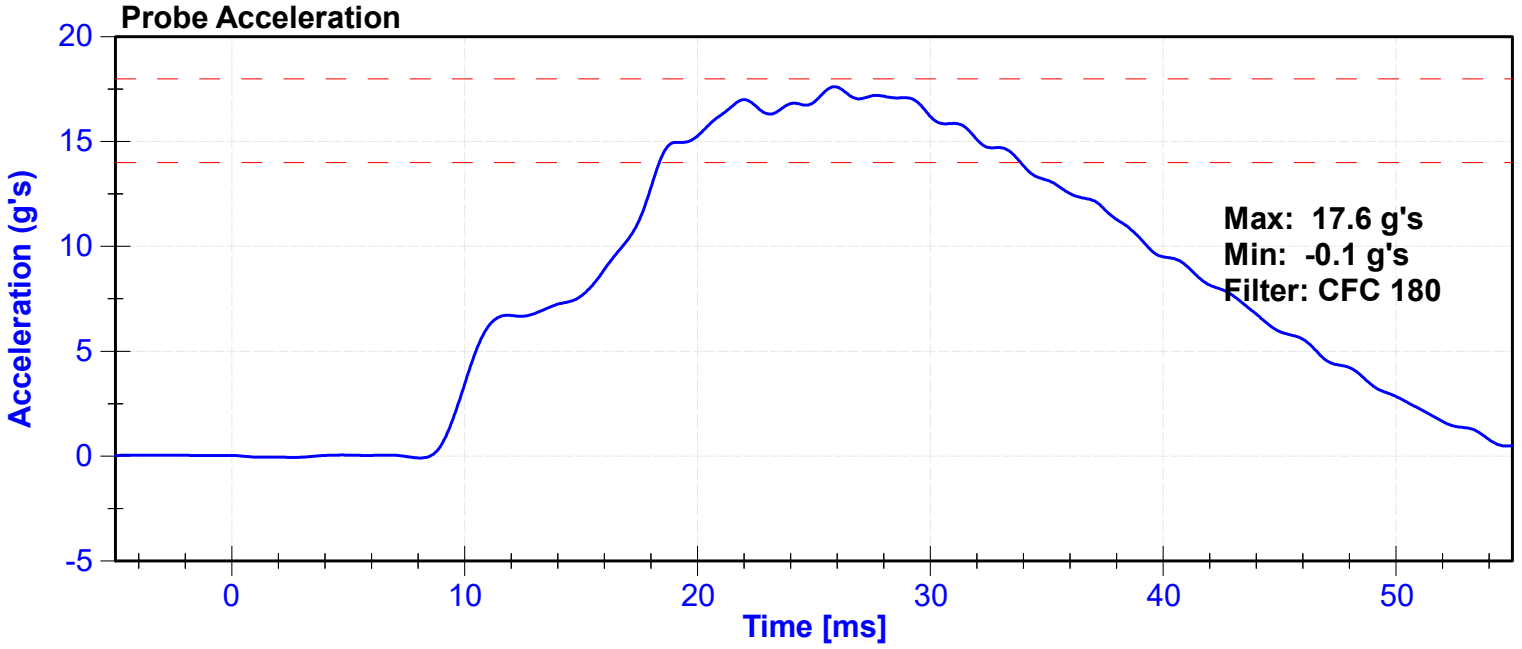
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

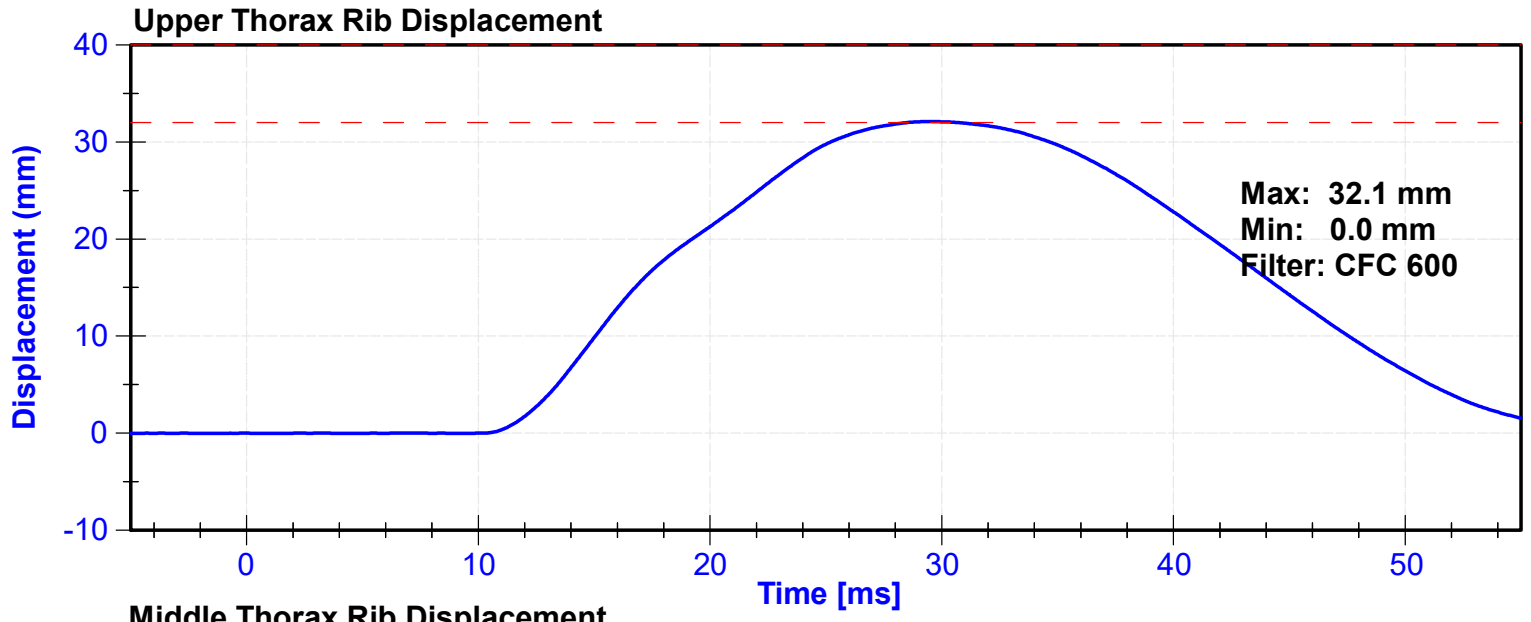
Results

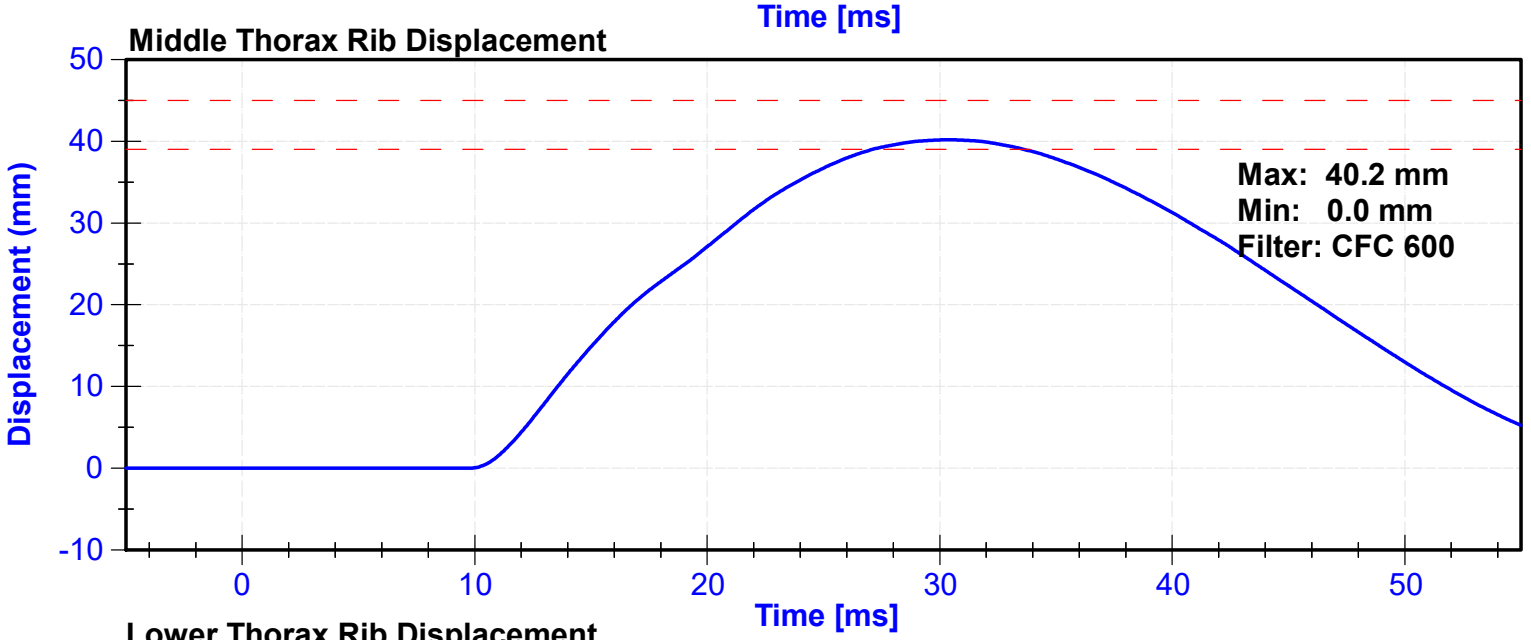
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.0	Pass
Humidity	10	70	%	39.0	Pass
Velocity	4.2	4.4	m/s	4.25	Pass
Probe Acceleration	14	18	g's	17.6	Pass
Lateral Upper Spine Acceleration	13	17	g's	13.6	Pass
Lateral Lower Spine Acceleration	7	11	g's	10.7	Pass
Upper Thorax Rib Deflection	32	40	mm	32.1	Pass
Middle Thorax Rib Deflection	39	45	mm	40.2	Pass
Lower Thorax Rib Deflection	35	43	mm	38.9	Pass

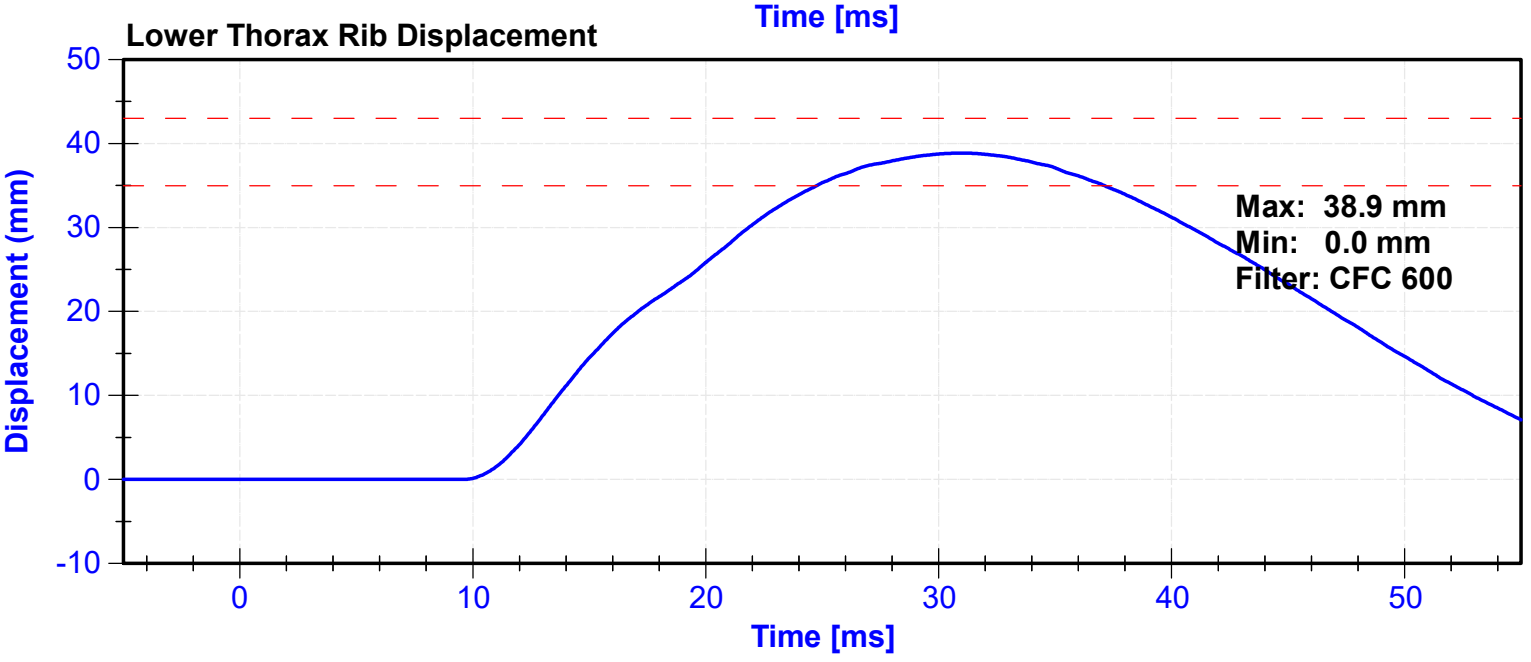
Transducer Calibrations

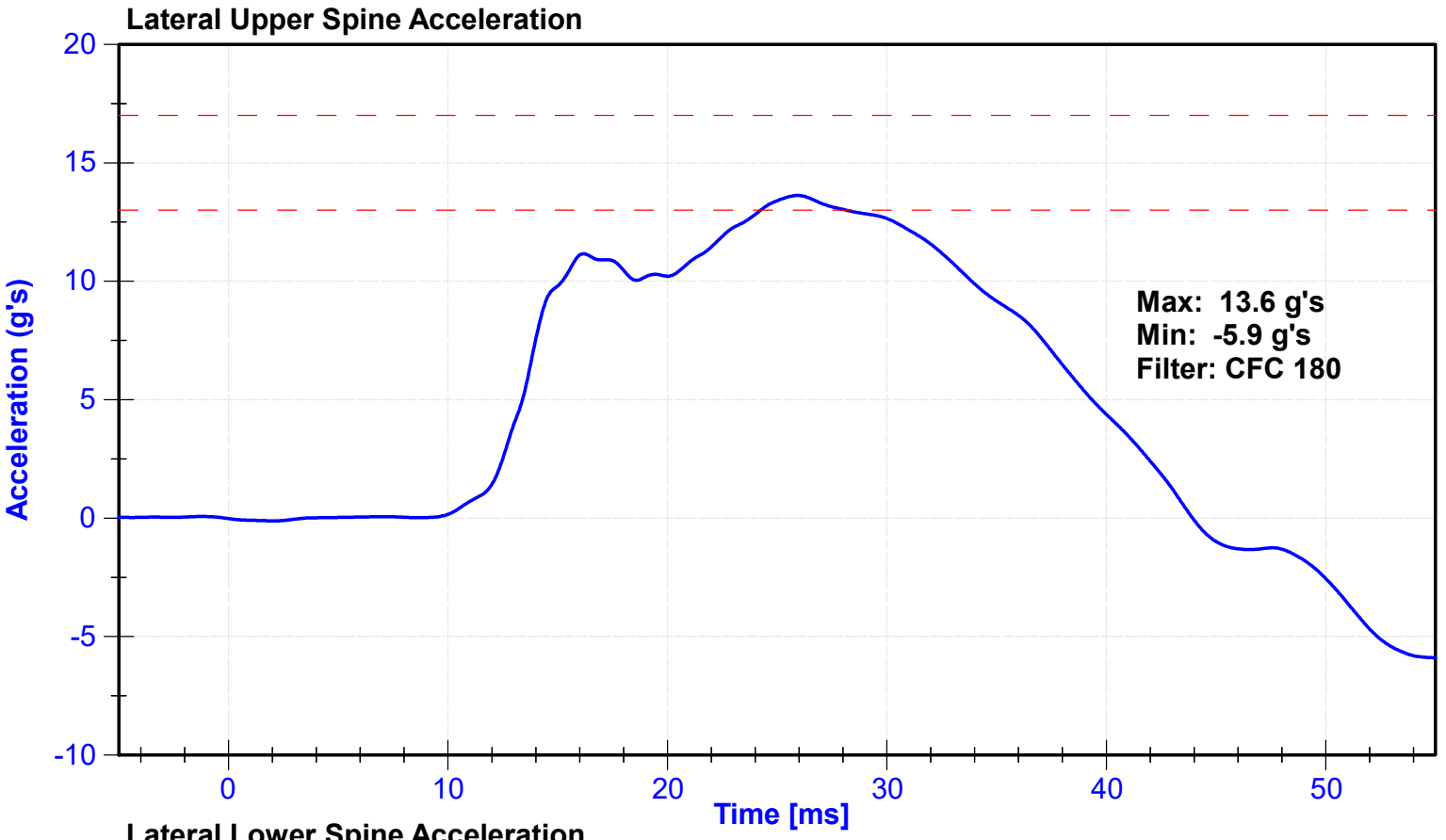
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	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

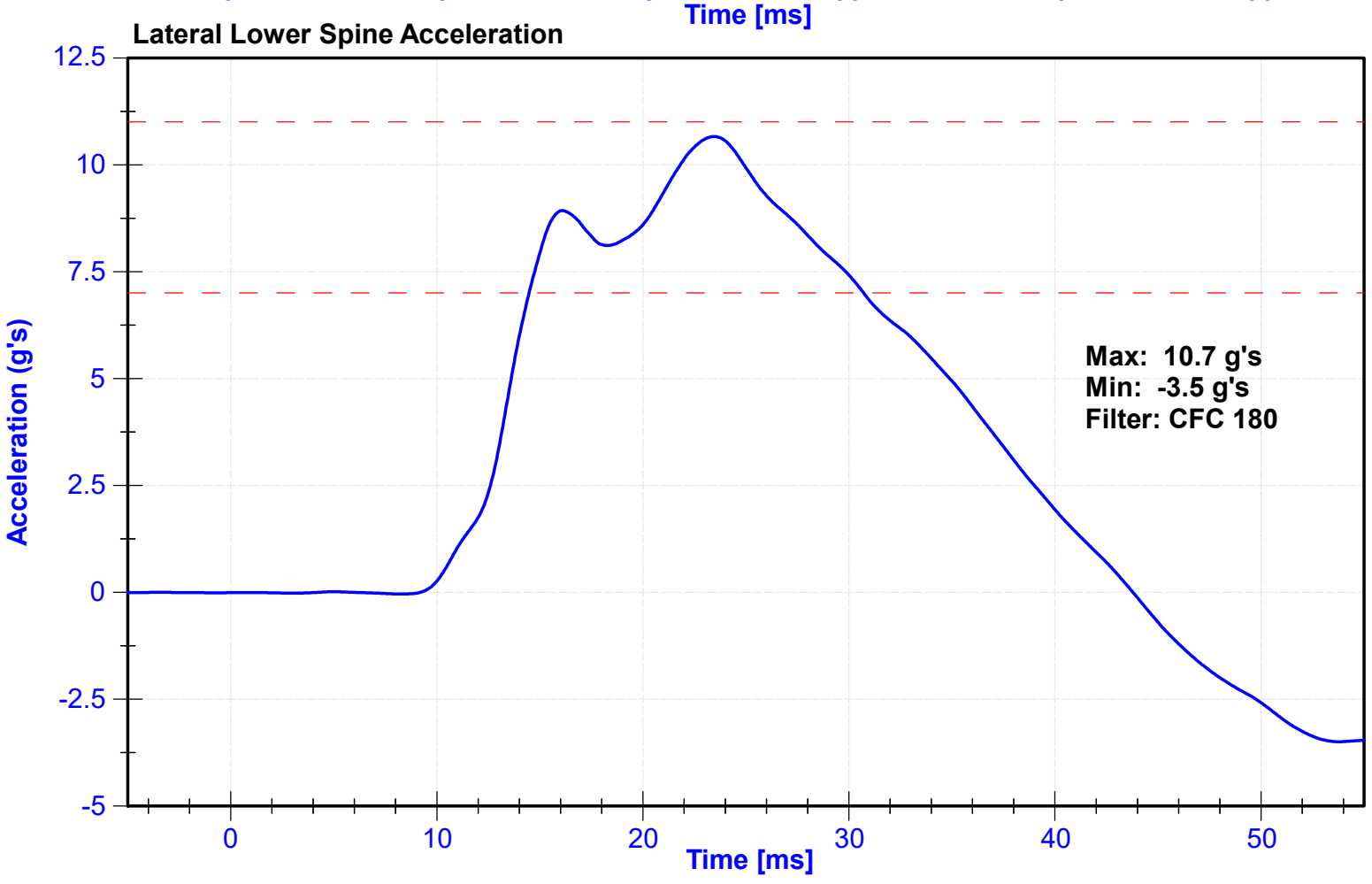



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 32.1 mm
Min: 0.0 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 40.2 mm
Min: 0.0 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 38.9 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time [ms]
Max: 13.6 g's
Min: -5.9 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
12.5
10
7.5
5
2.5
0
-2.5
-5
0
10
20
30
40
50
Time [ms]
Max: 10.7 g's
Min: -3.5 g's
Filter: CFC 180

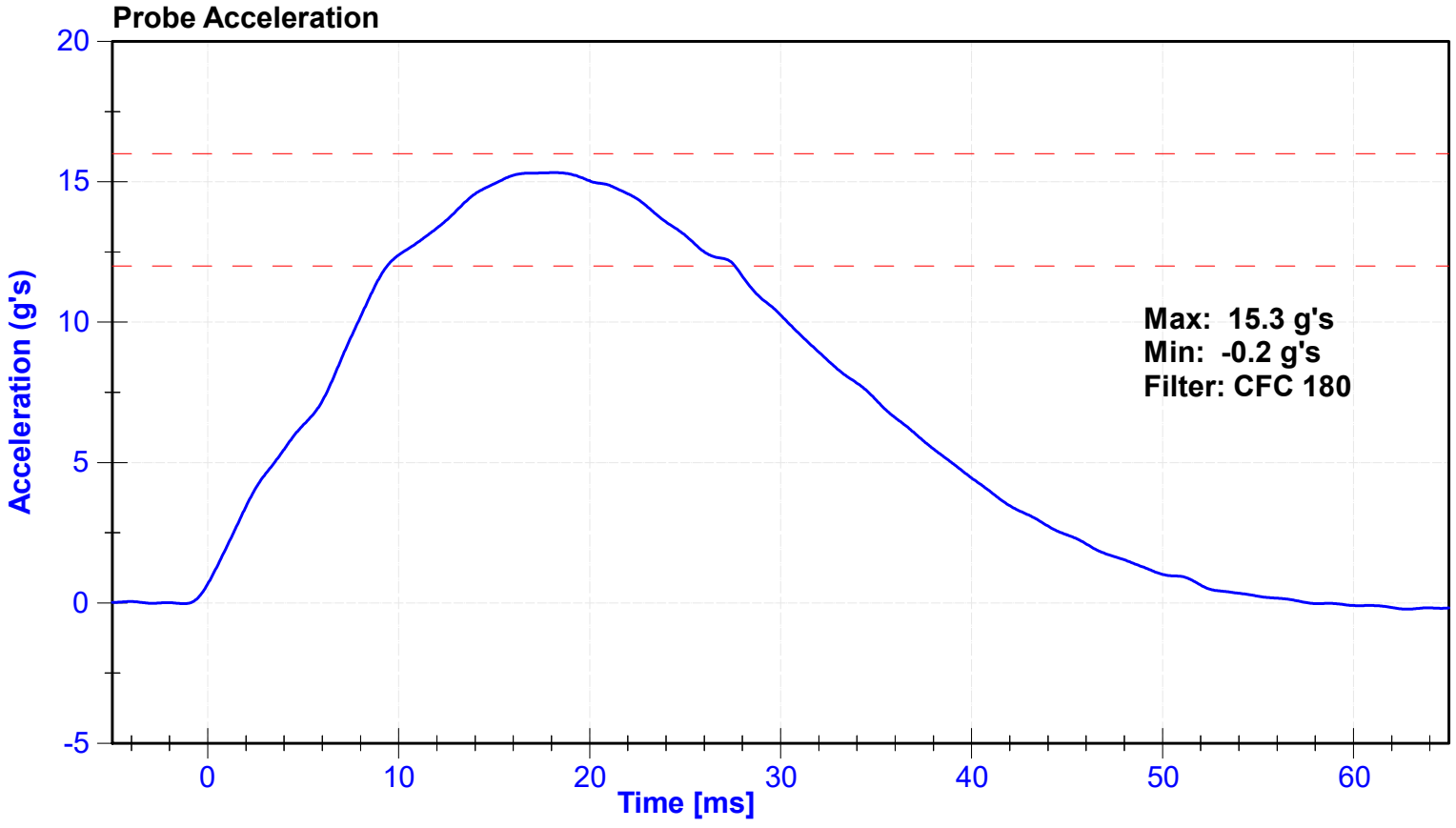
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

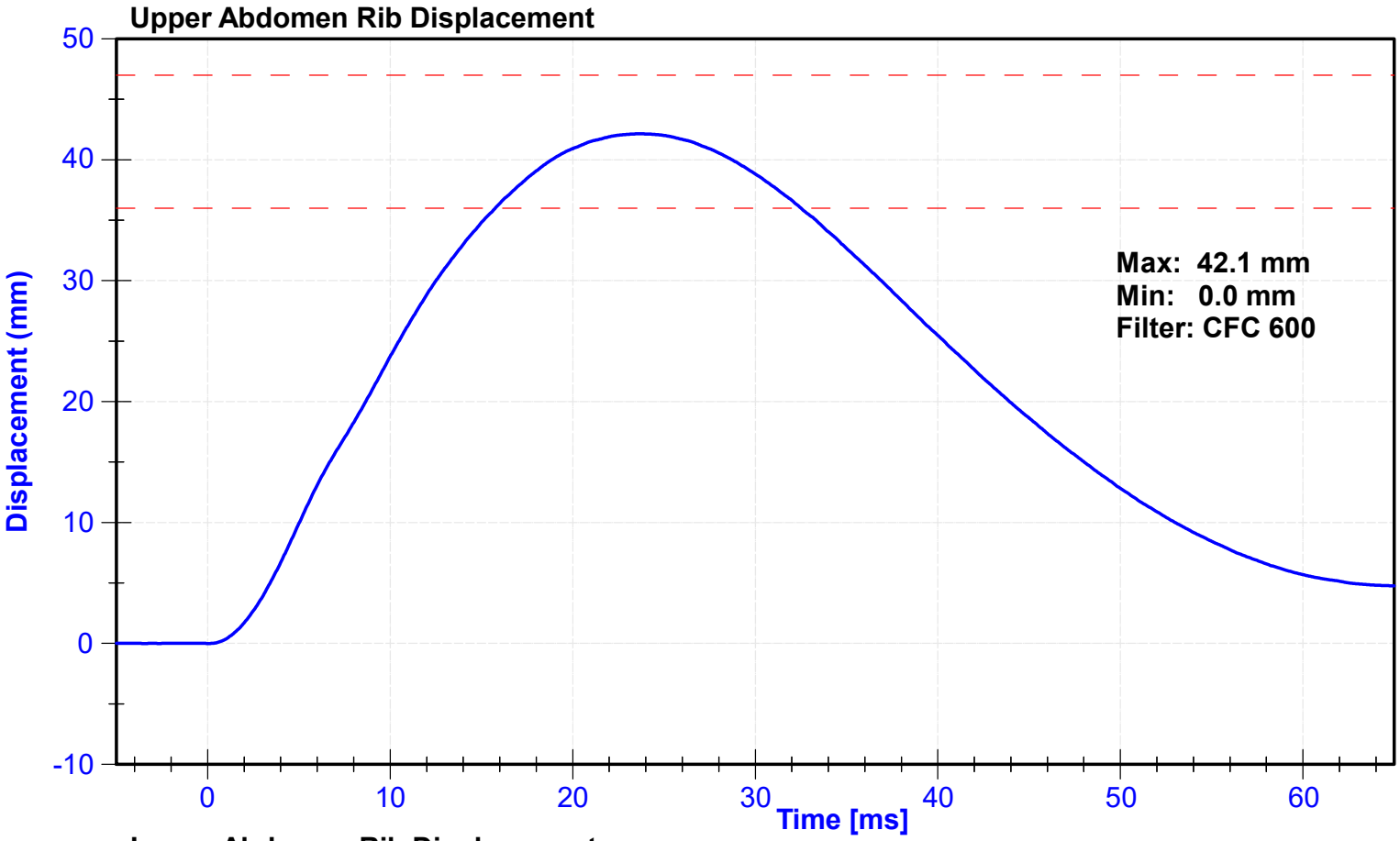
Results

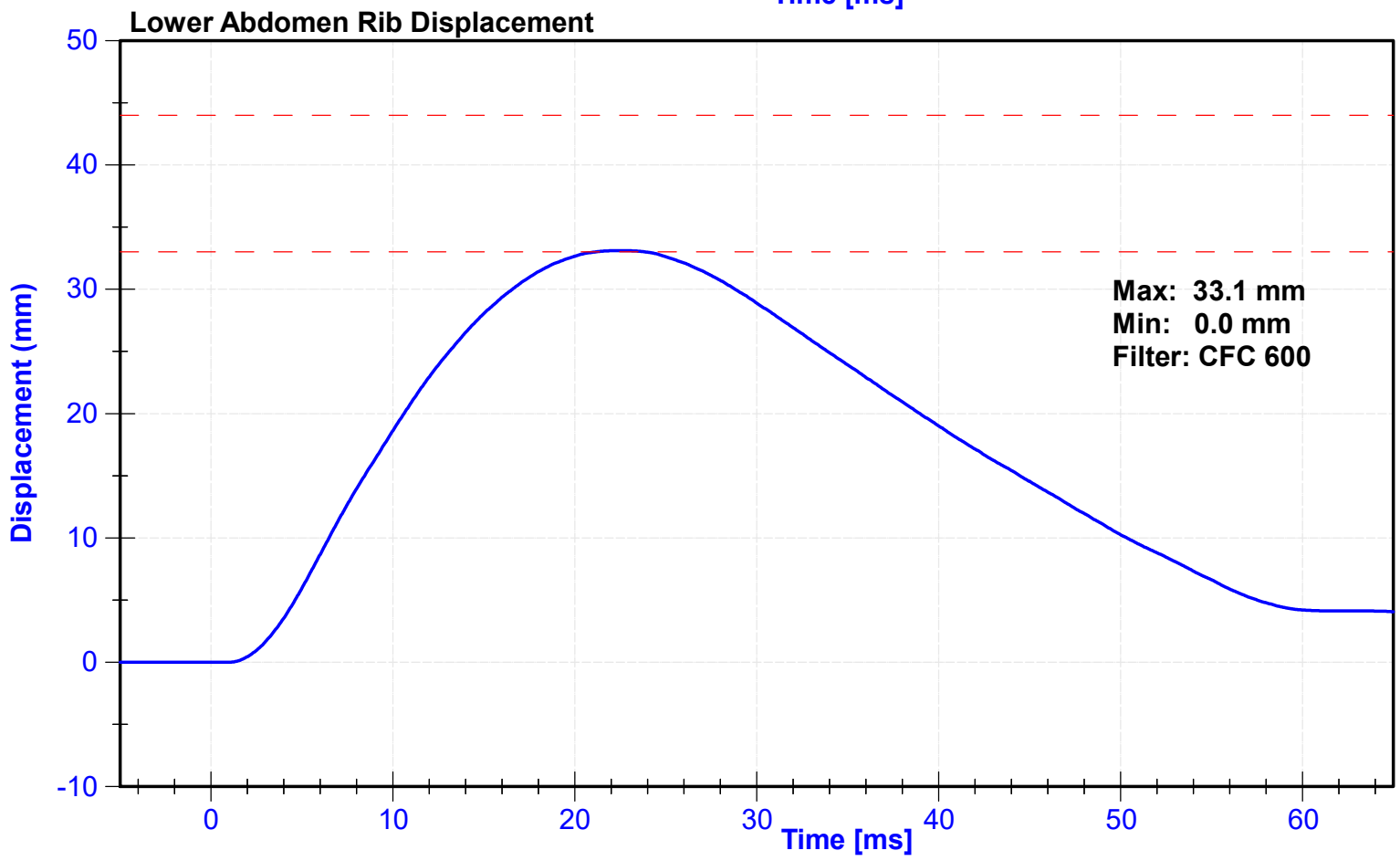
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.0	Pass
Humidity	10	70	%	39.0	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	12	16	g's	15.3	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.0	Pass
Upper Abdomen Rib Deflection	36	47	mm	42.1	Pass
Lower Abdomen Rib Deflection	33	44	mm	33.1	Pass

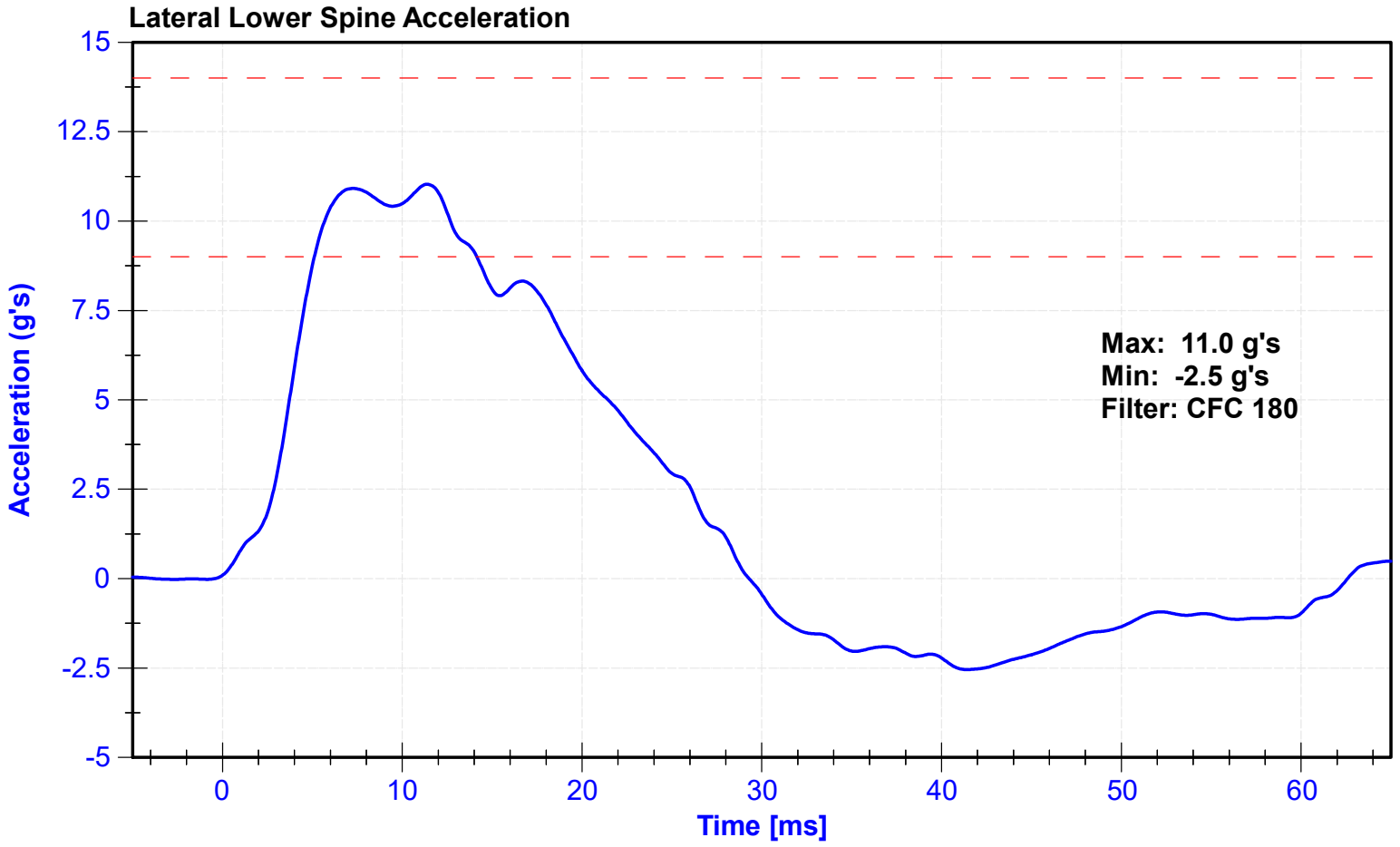
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Abdomen Rib Potentiometer	Servo	060GFE	5/9/2024	11/7/2024
Lower Abdomen Rib Potentiometer	Servo	075GFE	5/9/2024	11/7/2024




Upper Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 42.1 mm
Min: 0.0 mm
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 33.1 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Lower Spine Acceleration
Acceleration (g's)
15
12.5
10
7.5
5
2.5
0
-2.5
-5
0
10
20
30
40
50
60
Time [ms]
Max: 11.0 g's
Min: -2.5 g's
Filter: CFC 180

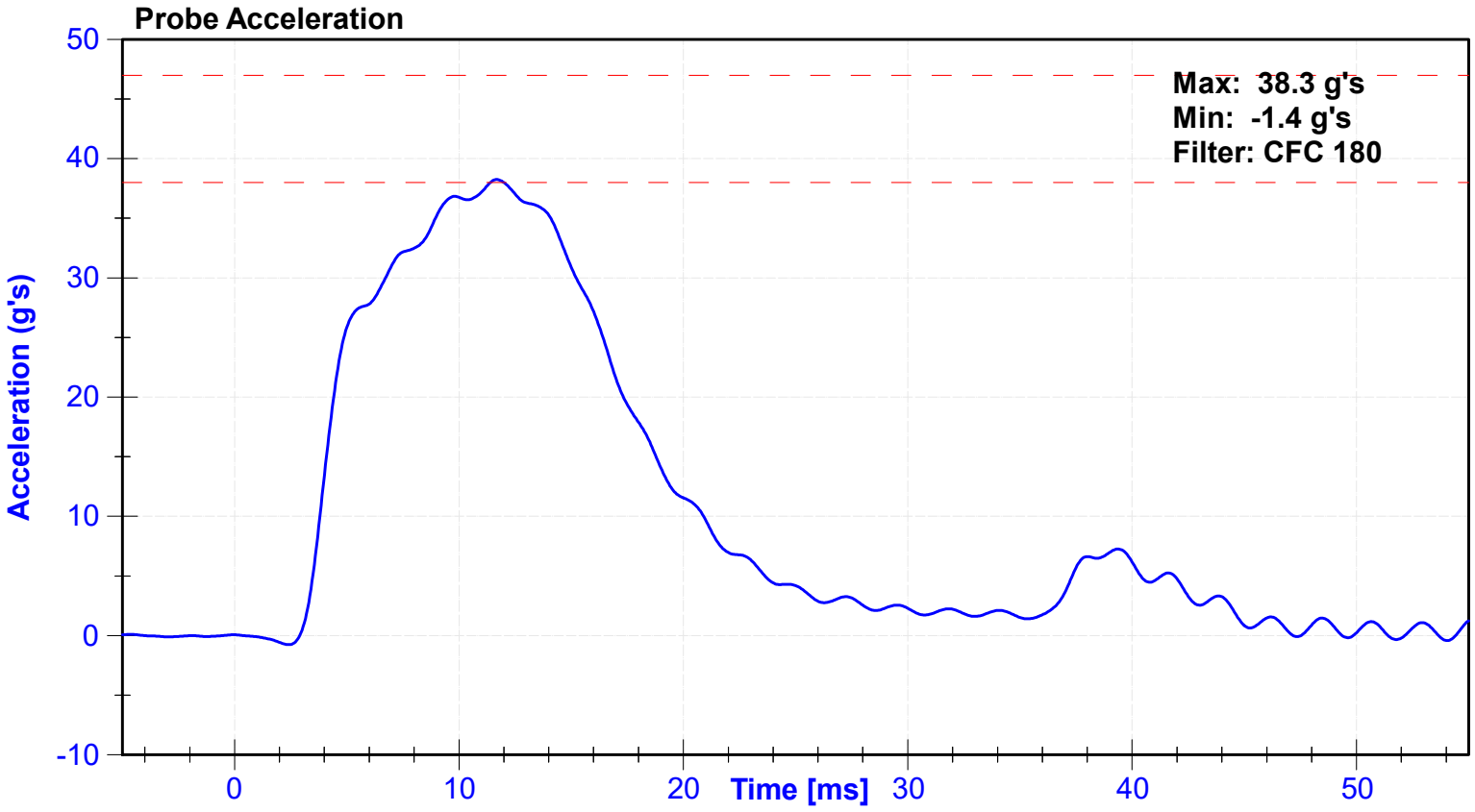
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

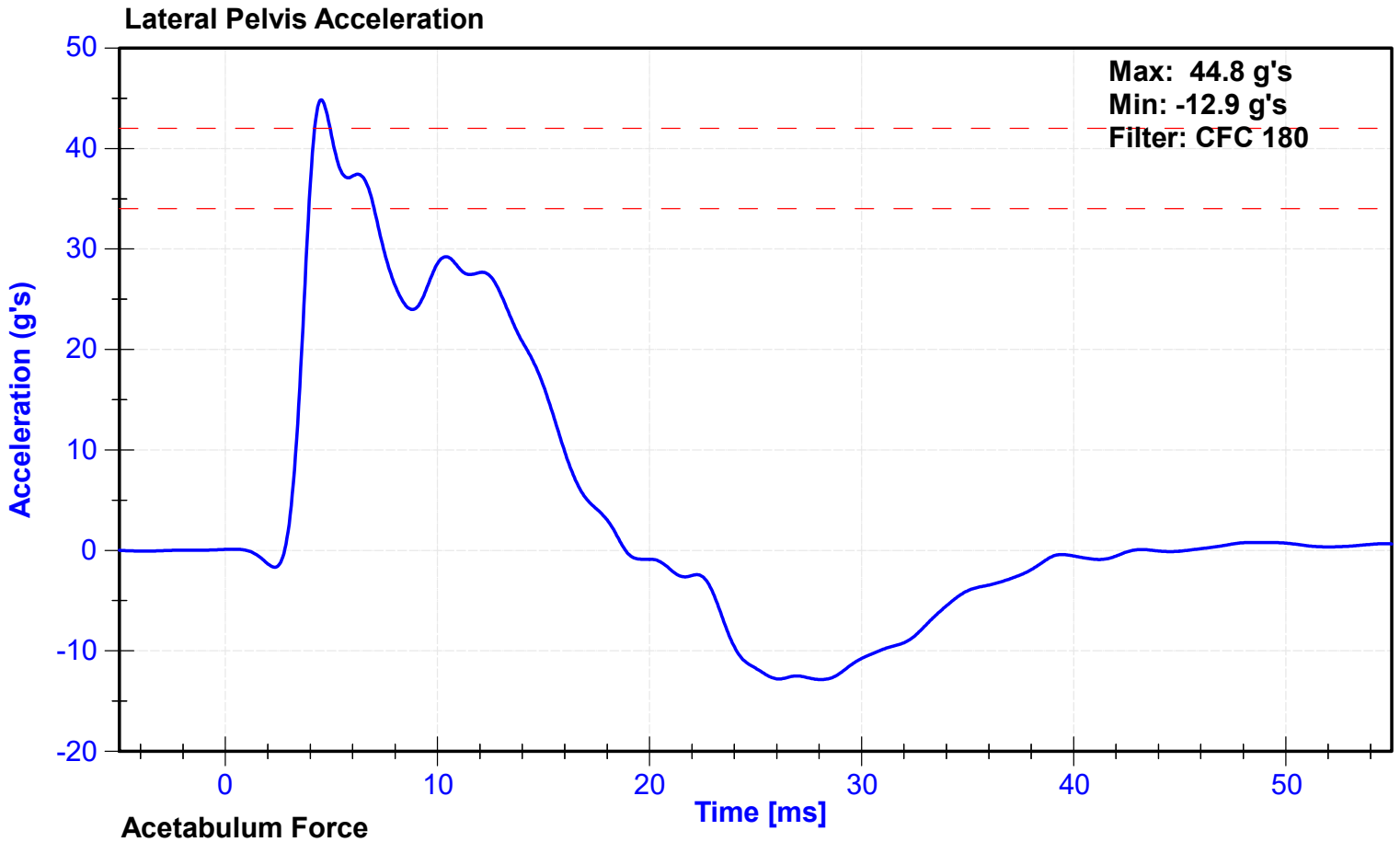
Results

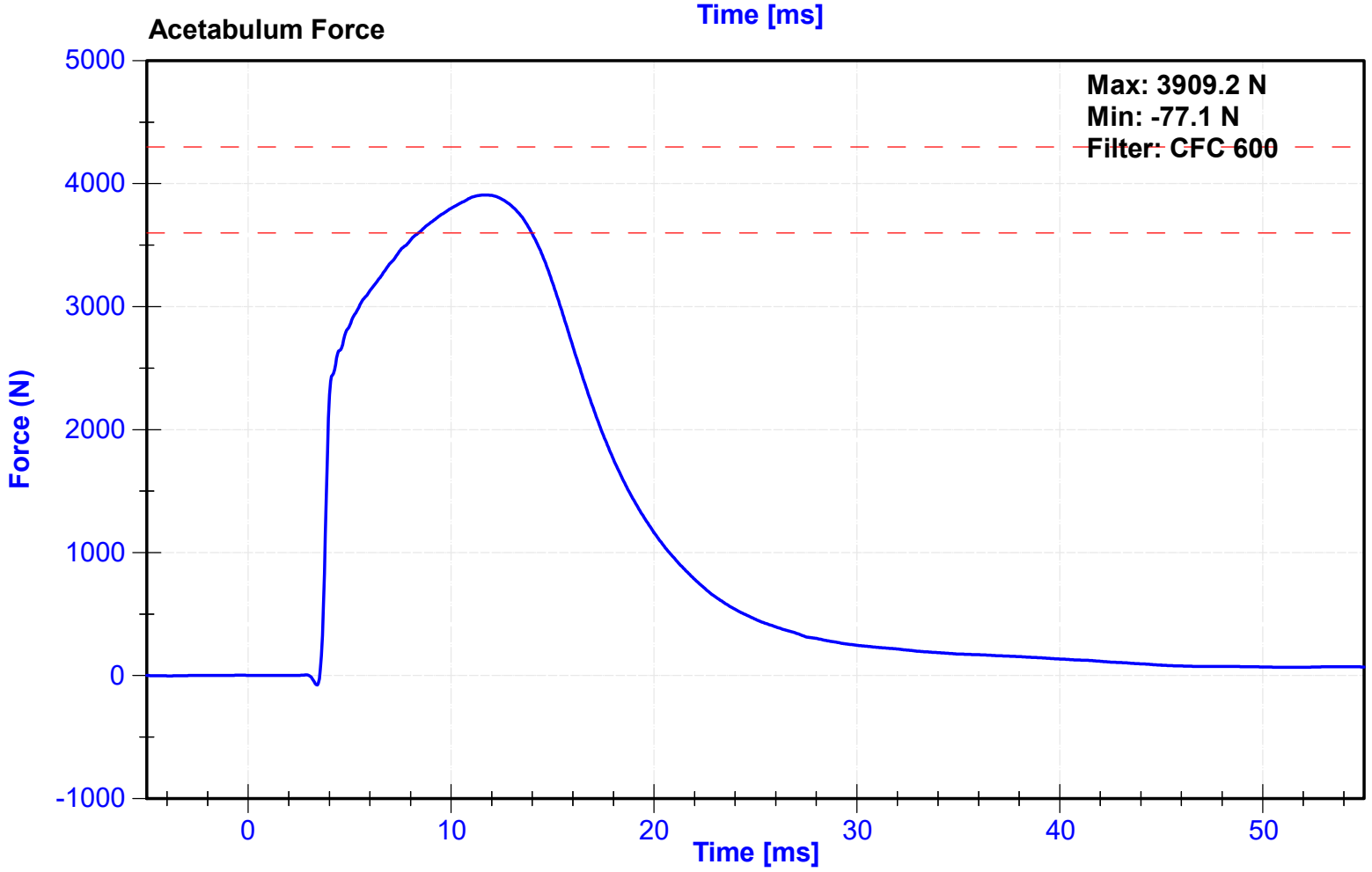
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.0	Pass
Humidity	10	70	%	39.0	Pass
Velocity	6.6	6.8	m/s	6.68	Pass
Probe Acceleration	38	47	g's	38.3	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	37.4	Pass
Acetabulum Force	3600	4300	N	3909.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Pelvis Y Accelerometer	Endevco	P51731	5/9/2024	11/5/2024
Acetabulum Load Cell	Denton	267-FY	9/11/2023	9/10/2024
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A




Lateral Pelvis Acceleration
Max: 44.8 g's
Min: -12.9 g's
Filter: CFC 180
Acceleration (g's)
50
40
30
20
10
0
-10
-20
0
10
20
30
40
50
Time [ms]


Acetabulum Force
Max: 3909.2 N
Min: -77.1 N
Filter: CFC 600
Force (N)
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]

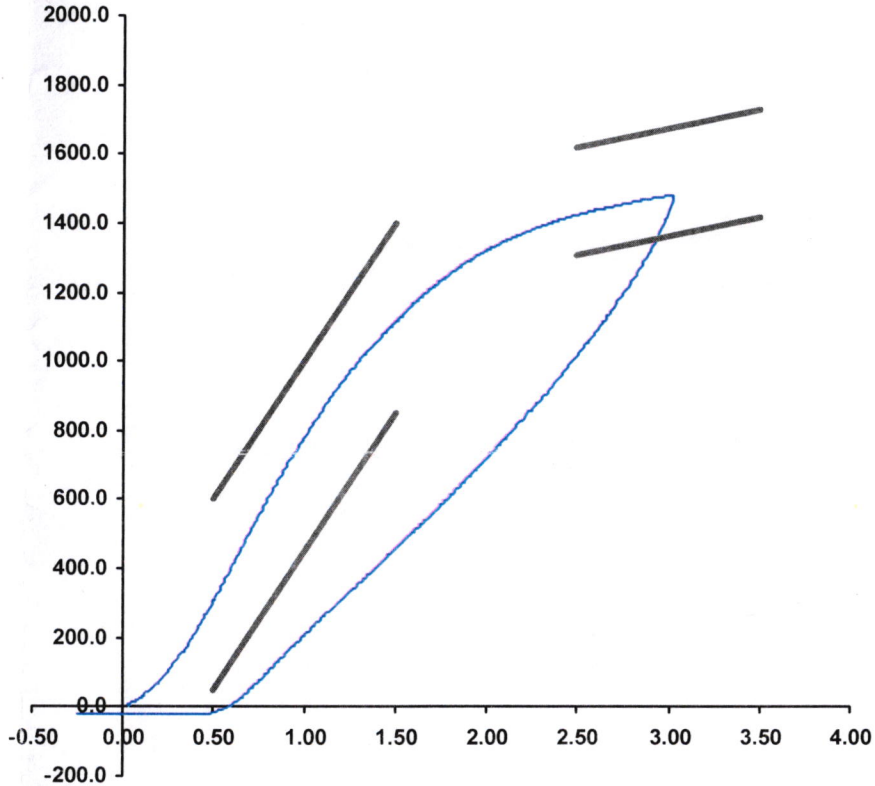
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16624
Test Number 23390
Report Number 23447
Test Date 7/20/2022 11:52:21 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	309	50	600
Force @ 1.5 mm (N)	1,118	850	1,400
Force @ 2.5 mm (N)	1,424	1,306	1,618
Force @ 3.0 mm (N)	1,479	1,361	1,673

Force (-N) vs Extension (-mm)



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

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

Notes: Cert Plug 05-15-2024

C-20

Operator

Part Number 180-4450

Template No 107 20-Jul-22
SACO Research

By : DC Date : 7/20/22

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

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 15769
Test Number 20669
Report Number 20723
Test Date 10/15/2021 7:52:49 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	275	50	600
Force @ 1.5 mm (N)	1,162	850	1,400
Force @ 2.5 mm (N)	1,486	1,306	1,618
Force @ 3.0 mm (N)	1,548	1,361	1,673

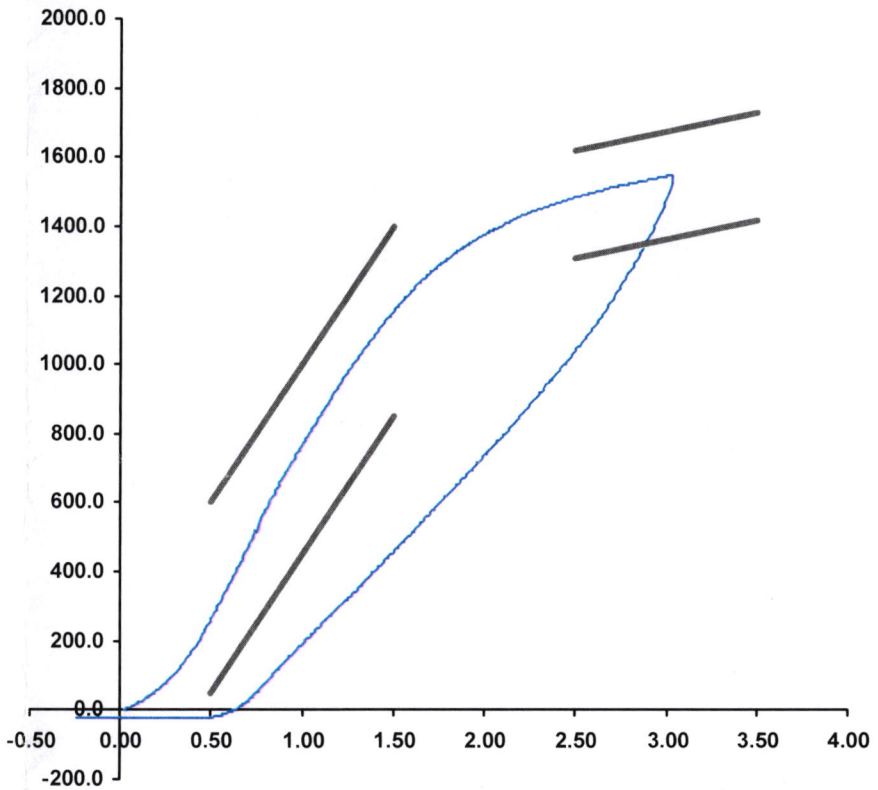
Testing Machine STM-20 5965542
Load Cell S/N (FI360947), Units (LBS) 1000

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

Notes: Impact Plug 05-17-2024

C21

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 15-Oct-21
SACO Research

By : DC Date : 10/15/21

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

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16533
Test Number 23317
Report Number 23374
Test Date 7/15/2022 8:49:05 AM

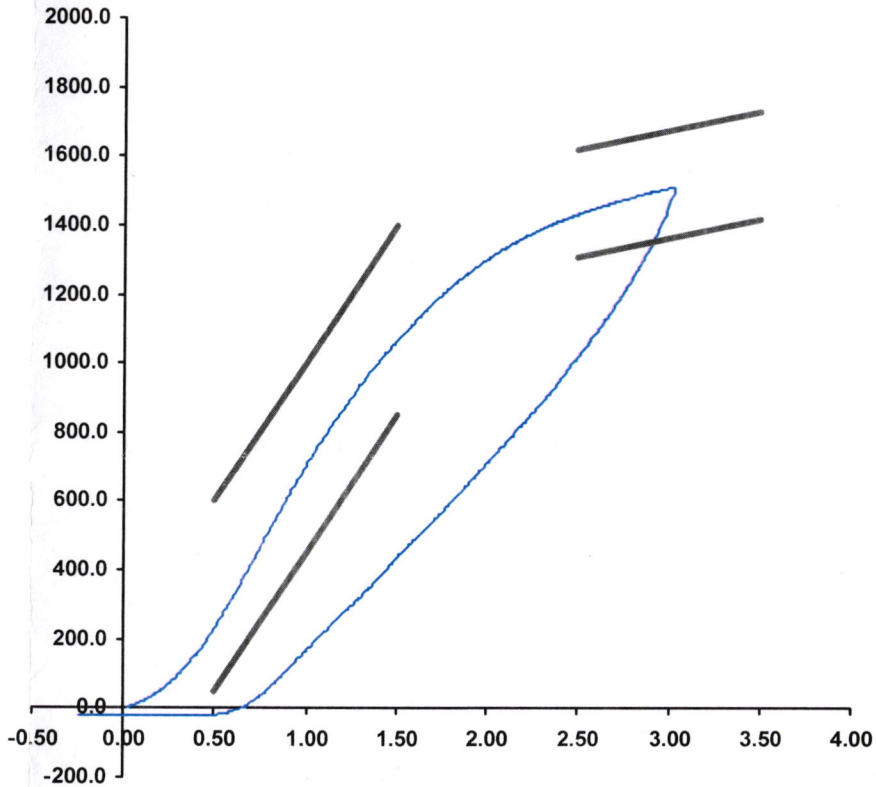
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	233	50	600
Force @ 1.5 mm (N)	1,066	850	1,400
Force @ 2.5 mm (N)	1,434	1,306	1,618
Force @ 3.0 mm (N)	1,508	1,361	1,673

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

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

Notes: Non Impact Plug 05-17-2024

Force (-N) vs Extension (-mm)



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

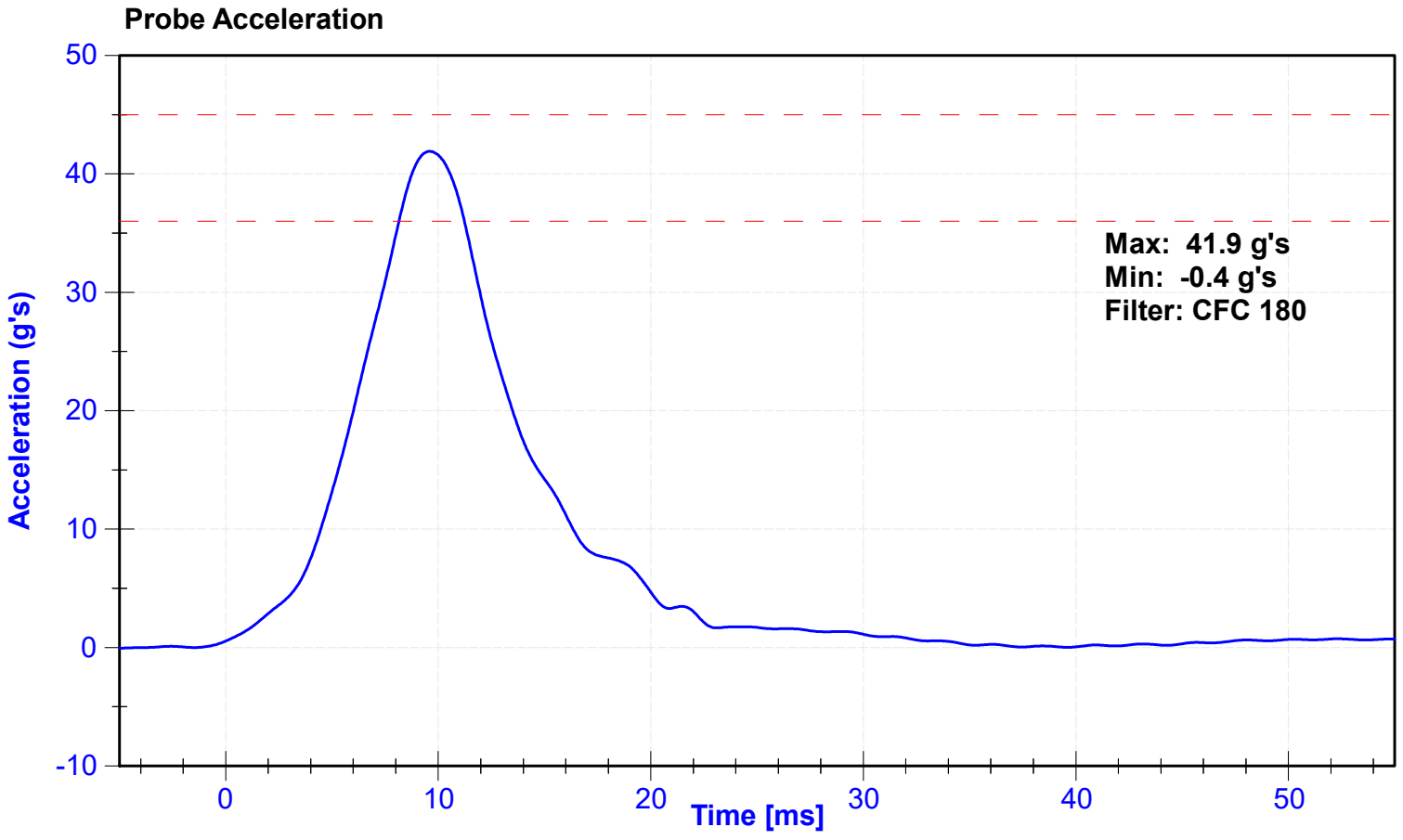
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

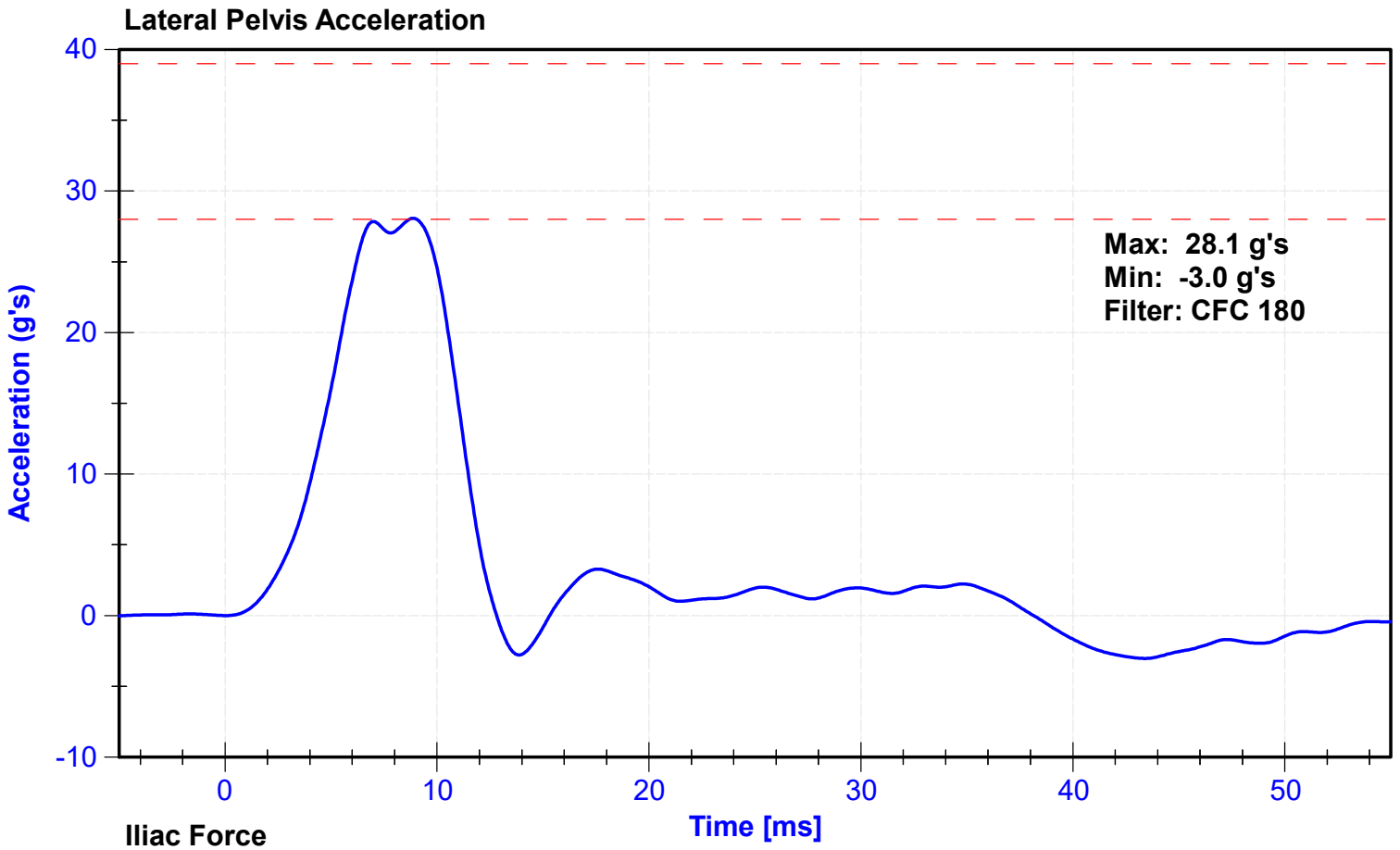
Results

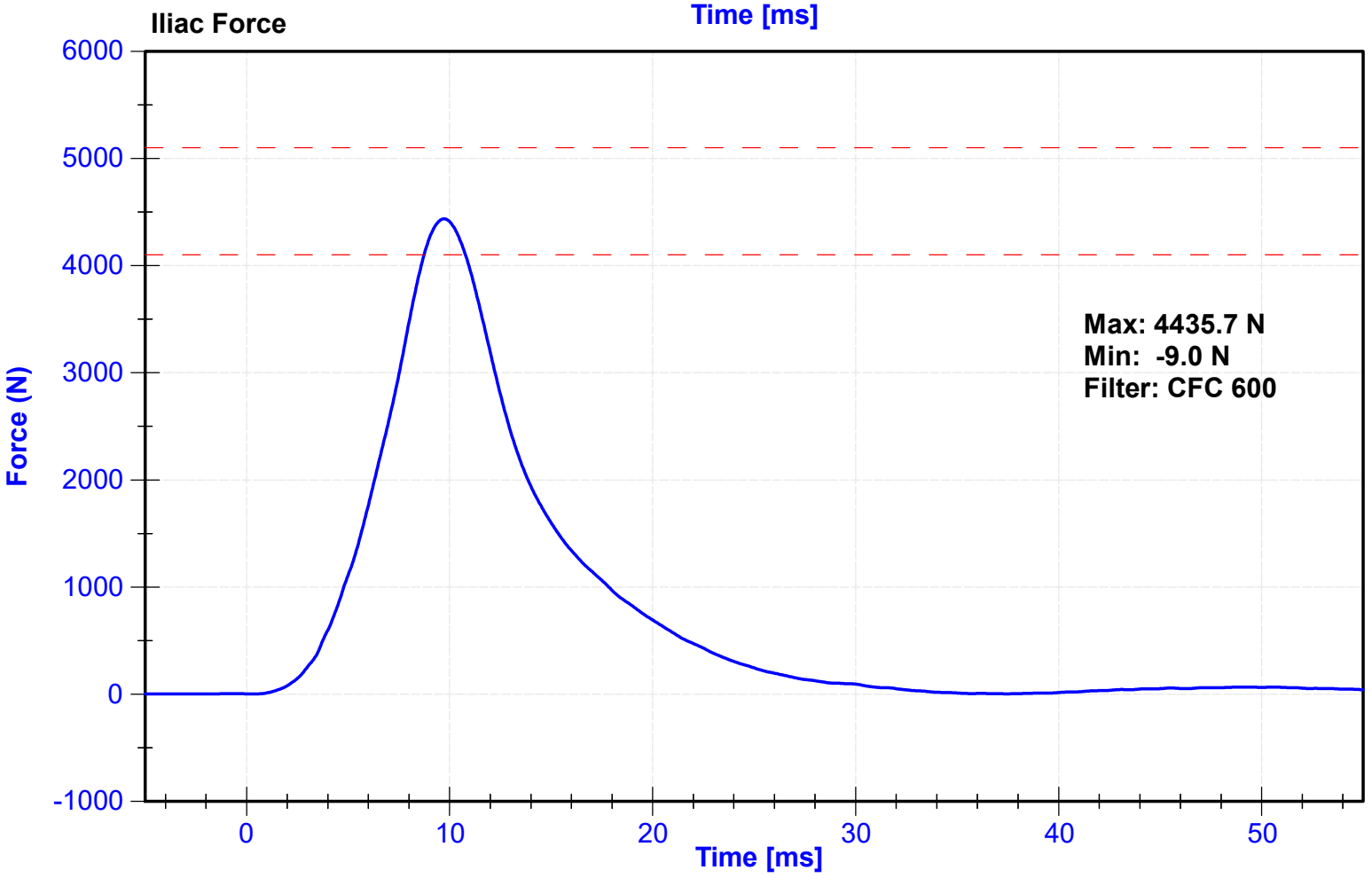
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	21.0	Pass
Humidity	10	70	%	39.0	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	36	45	g's	41.9	Pass
Lateral Pelvis Acceleration	28	39	g's	28.1	Pass
Iliac Force	4100	5100	N	4435.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Pelvis Y Accelerometer	Endevco	P51731	5/9/2024	11/5/2024
Iliac Load Cell	Denton	321	9/11/2023	9/10/2024




Lateral Pelvis Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 28.1 g's
Min: -3.0 g's
Filter: CFC 180


Iliac Force
Force (N)
6000
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]
Max: 4435.7 N
Min: -9.0 N
Filter: CFC 600

CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

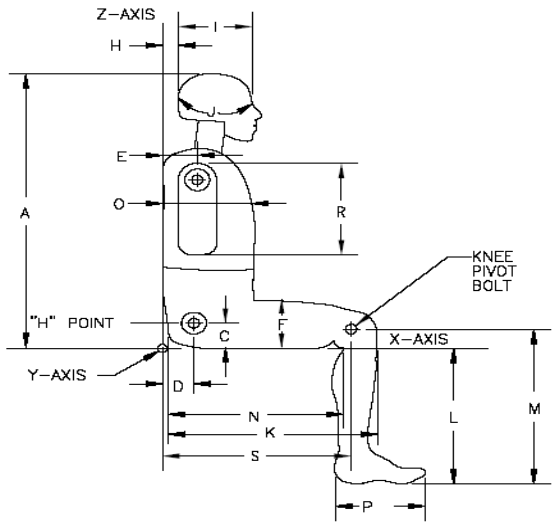
SERIAL NO:300

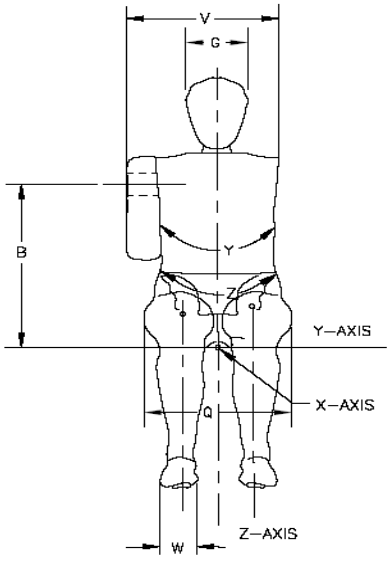
(CONFIGURED FOR LEFT SIDE IMPACT)

External Measurements - SID-IIs

Technician: K. Brogan Date: 5/21/2024

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	446	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	98	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	181	Pass
J	Head Circumference	541	551	550	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	357	Pass
M	Knee Pivot to floor height	392	409	401	Pass
N	Buttock Popliteal Length	416	442	435	Pass
O	Chest Depth w/o jacket	195	211	199	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	488	Pass
V	Shoulder Width	341	357	351	Pass
W	Foot Width	78	94	85	Pass
Y	Chest Circumference w/jacket	851	881	877	Pass
Z	Waist Circumference	761	791	780	Pass

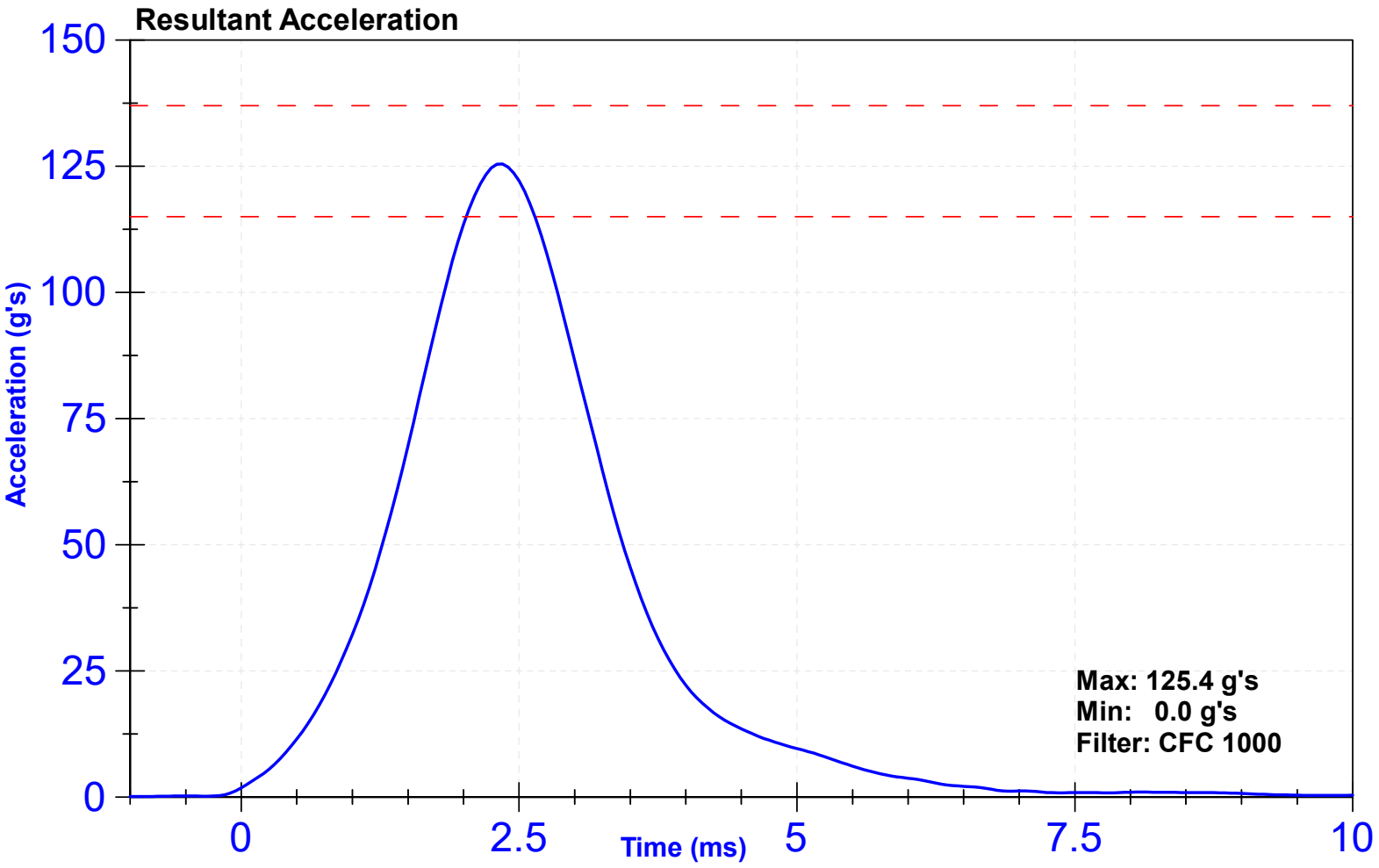
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

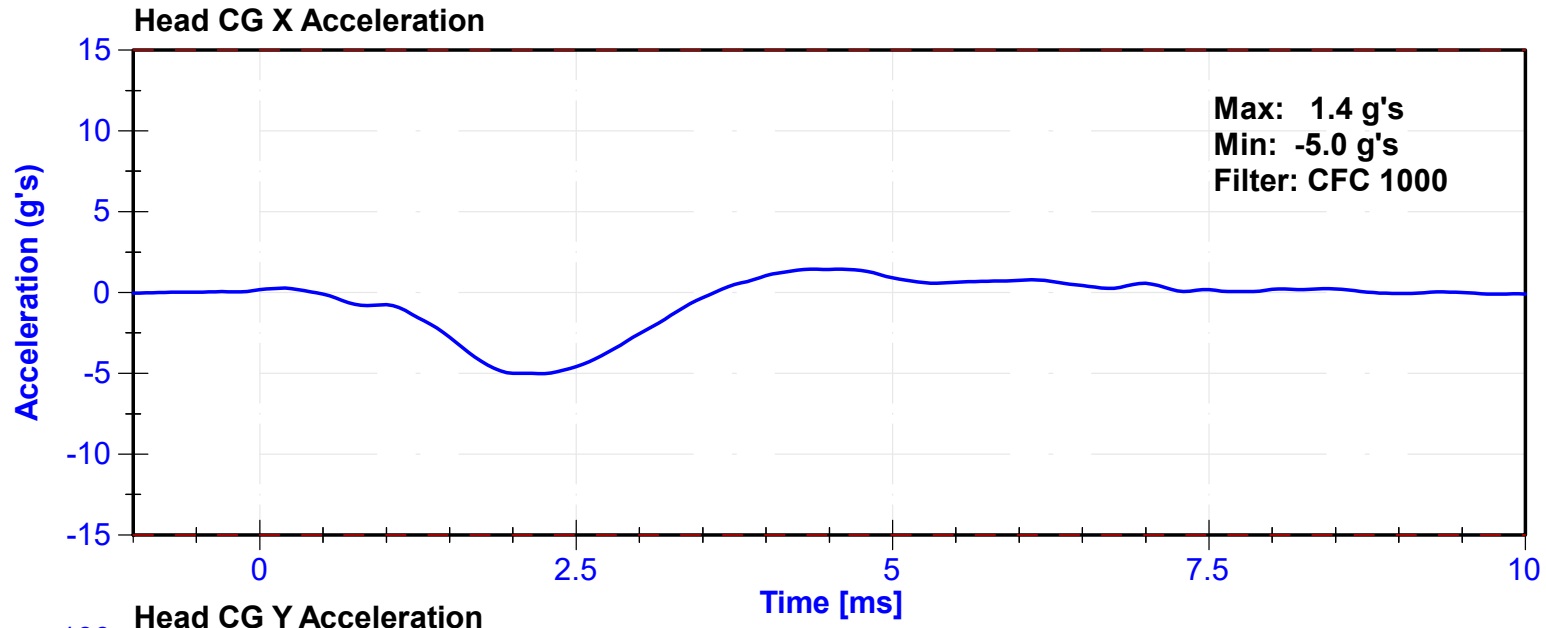
Results

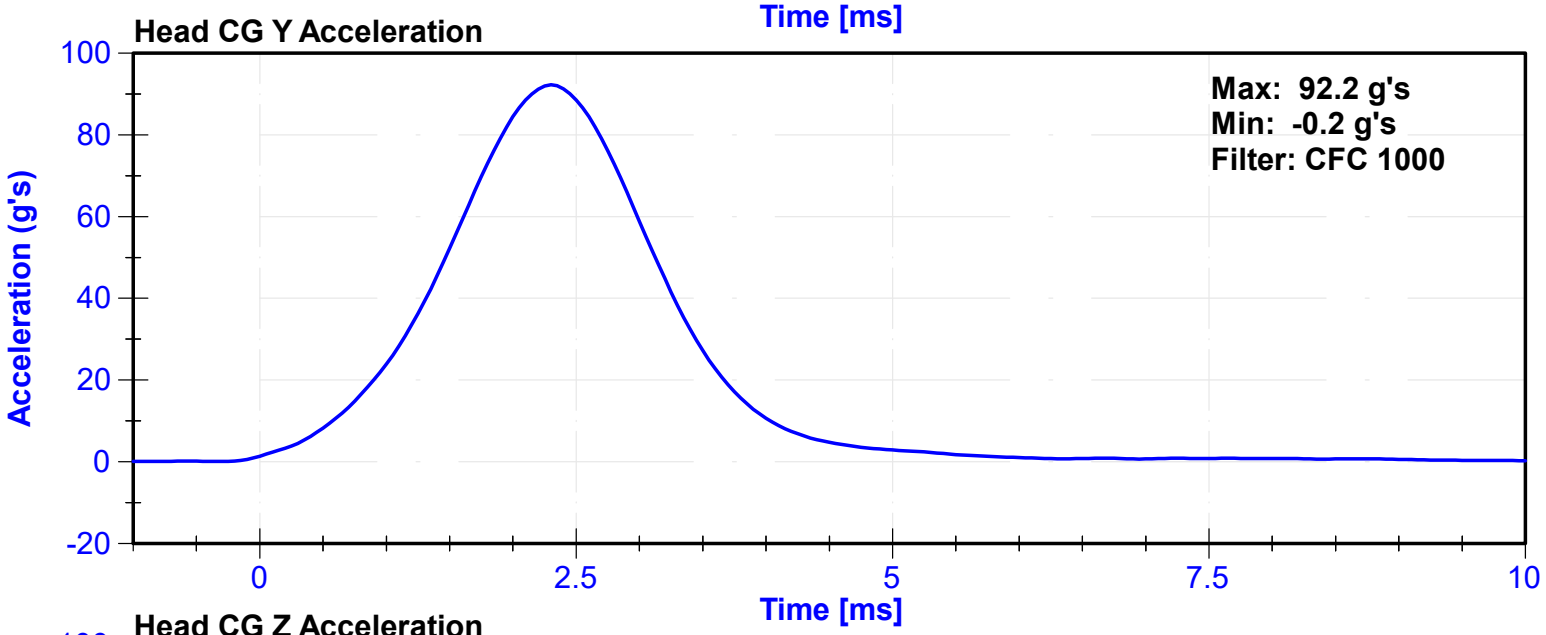
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	48	Pass
Resultant Acceleration	115	137	g's	125.4	Pass
Oscillation	0	15	%	0.9	Pass
Fore-Aft Acceleration	-15	15	g's	-5.0	Pass

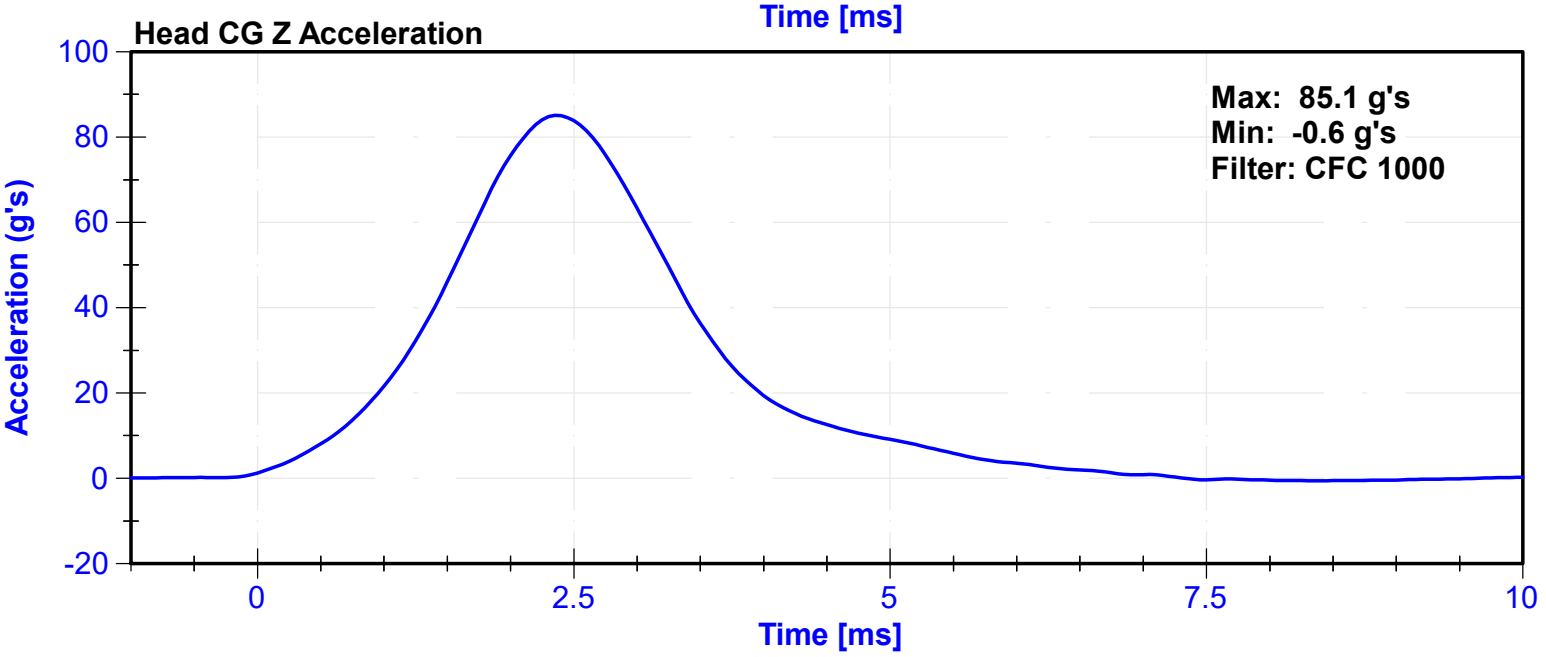
Transducer Calibrations

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




Head CG X Acceleration
Max: 1.4 g's
Min: -5.0 g's
Filter: CFC 1000
Acceleration (g's)
15
10
5
0
-5
-10
-15
0
2.5
5
7.5
10
Time [ms]


Head CG Y Acceleration
Max: 92.2 g's
Min: -0.2 g's
Filter: CFC 1000
Acceleration (g's)
100
80
60
40
20
0
-20
0
2.5
5
7.5
10
Time [ms]


Head CG Z Acceleration
Max: 85.1 g's
Min: -0.6 g's
Filter: CFC 1000
Acceleration (g's)
100
80
60
40
20
0
-20
0
2.5
5
7.5
10
Time [ms]

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

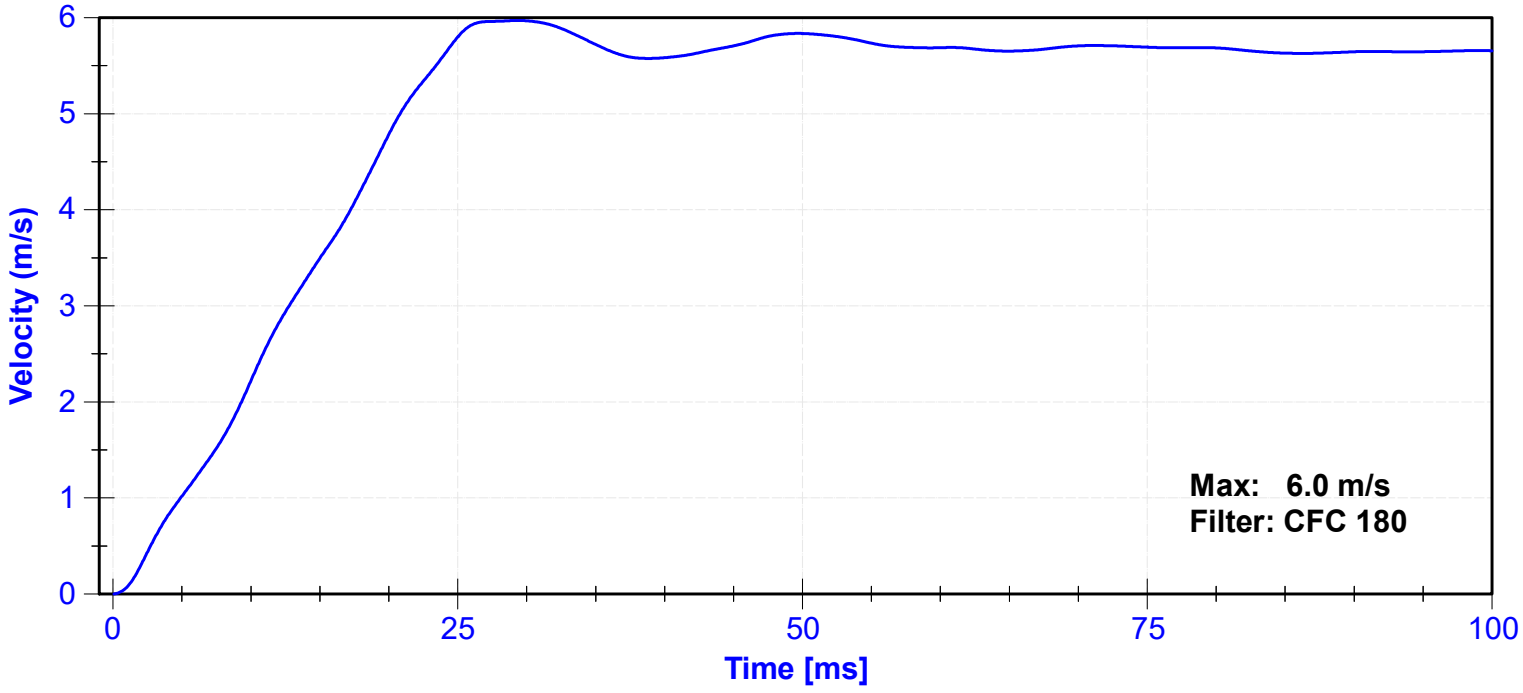
Results

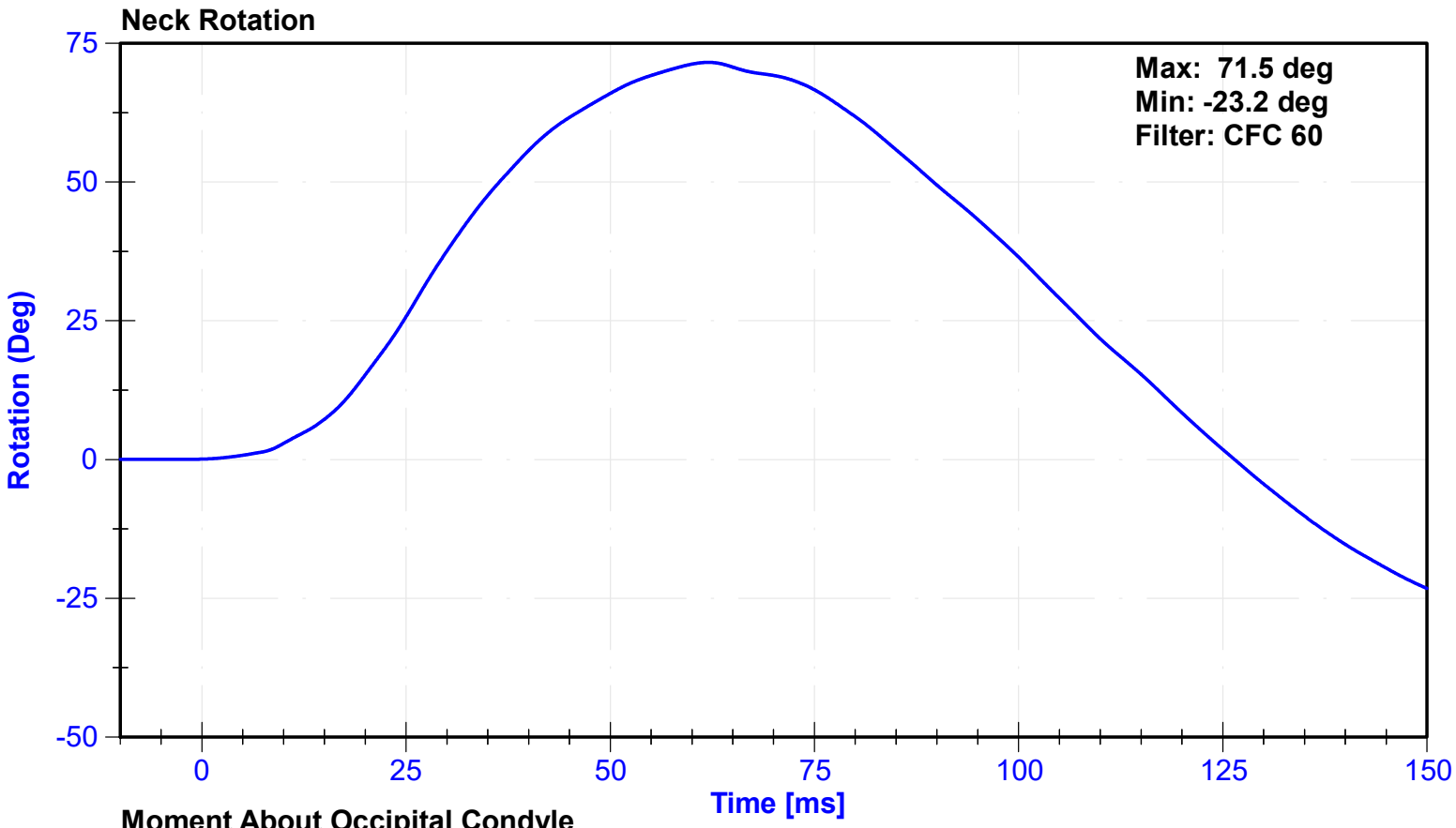
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	48	Pass
Velocity	5.51	5.63	m/s	5.596	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.22	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.50	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.78	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.80	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	5.97	Pass
Neck Rotation	71	81	deg	71.5	Pass
Time at Maximum Rotation	50	70	ms	62.0	Pass
Moment about the OC	36	44	Nm	43.1	Pass
Moment Decay to 0 Nm	102	126	ms	111.1	Pass

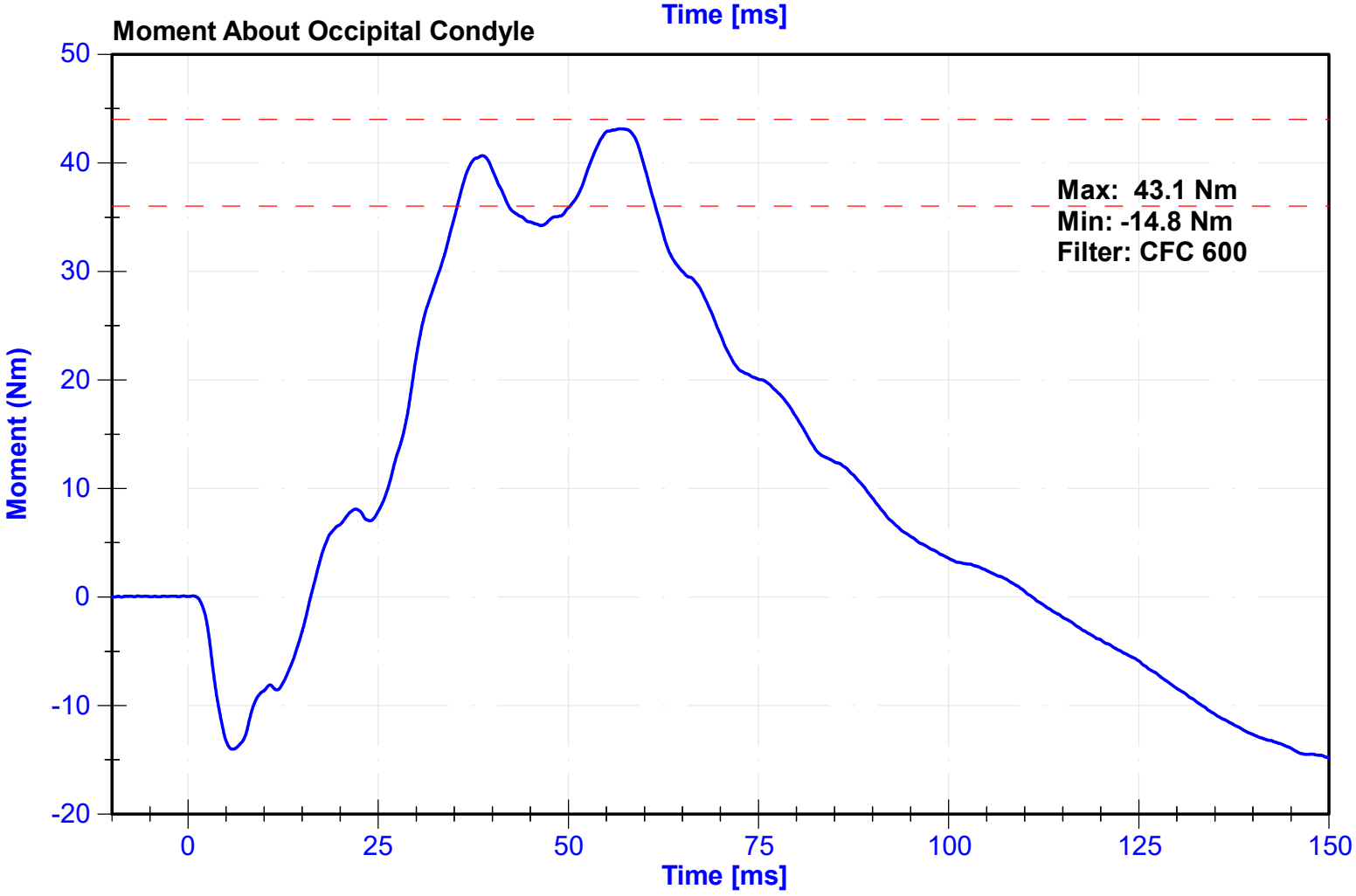
Transducer Calibrations

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	1716ATF_2184-FY	5/18/2023	5/17/2024

Pendulum Impulse




Neck Rotation
Max: 71.5 deg
Min: -23.2 deg
Filter: CFC 60
Rotation (Deg)
75
50
25
0
-25
-50
0
25
50
75
100
125
150
Time [ms]


Moment About Occipital Condyle
Max: 43.1 Nm
Min: -14.8 Nm
Filter: CFC 600
Moment (Nm)
50
40
30
20
10
0
-10
-20
0
25
50
75
100
125
150
Time [ms]

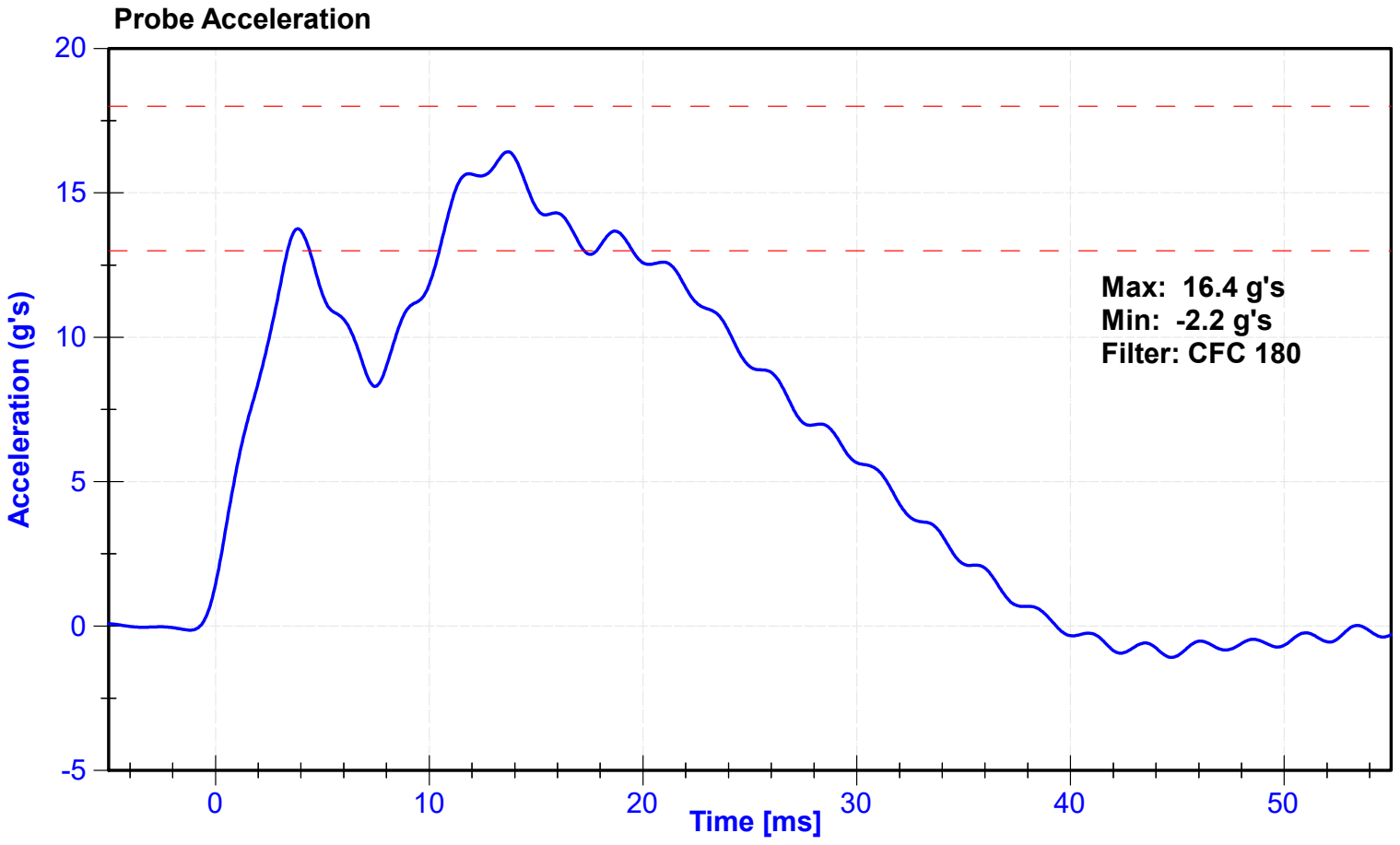
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

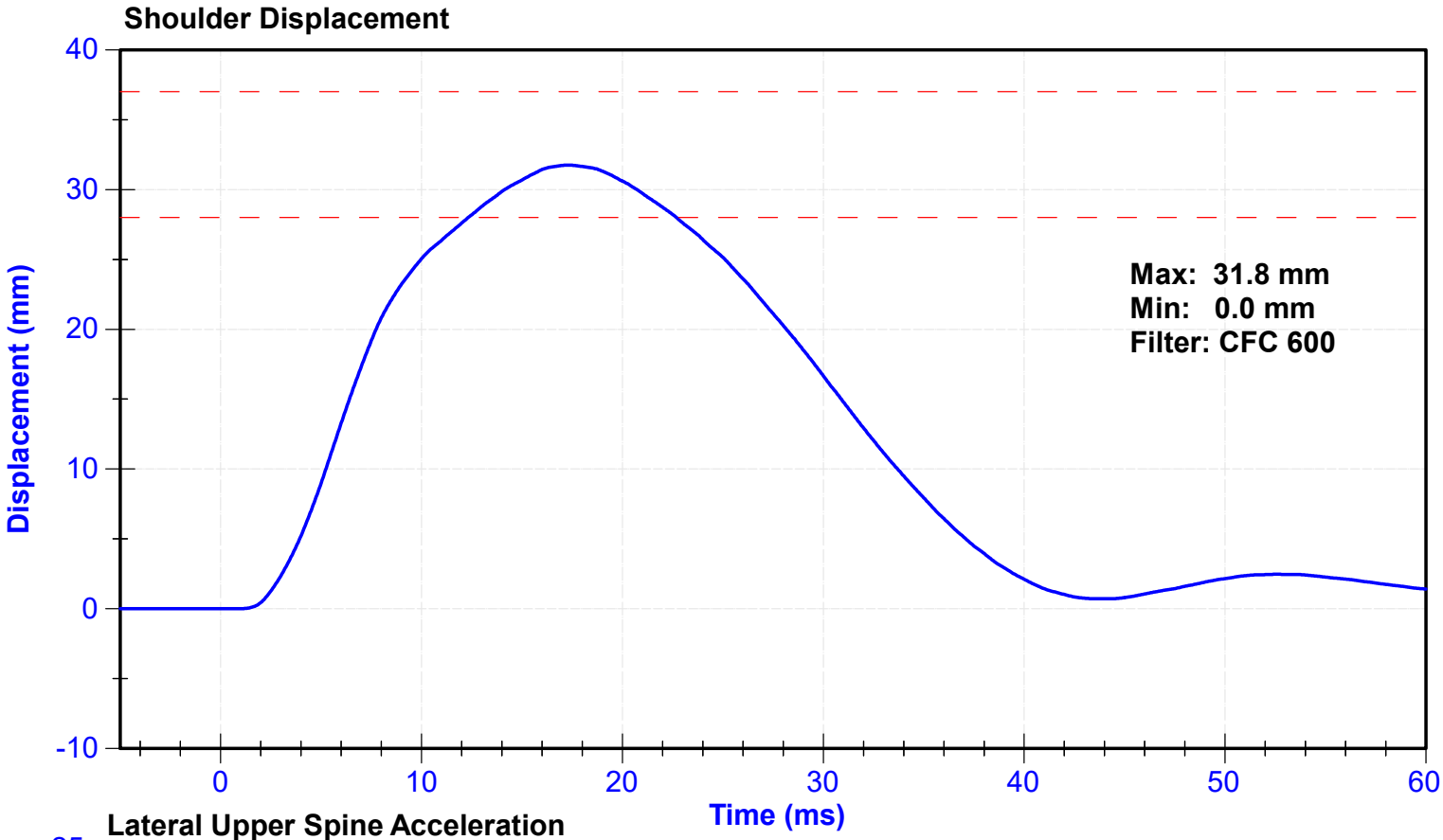
Results

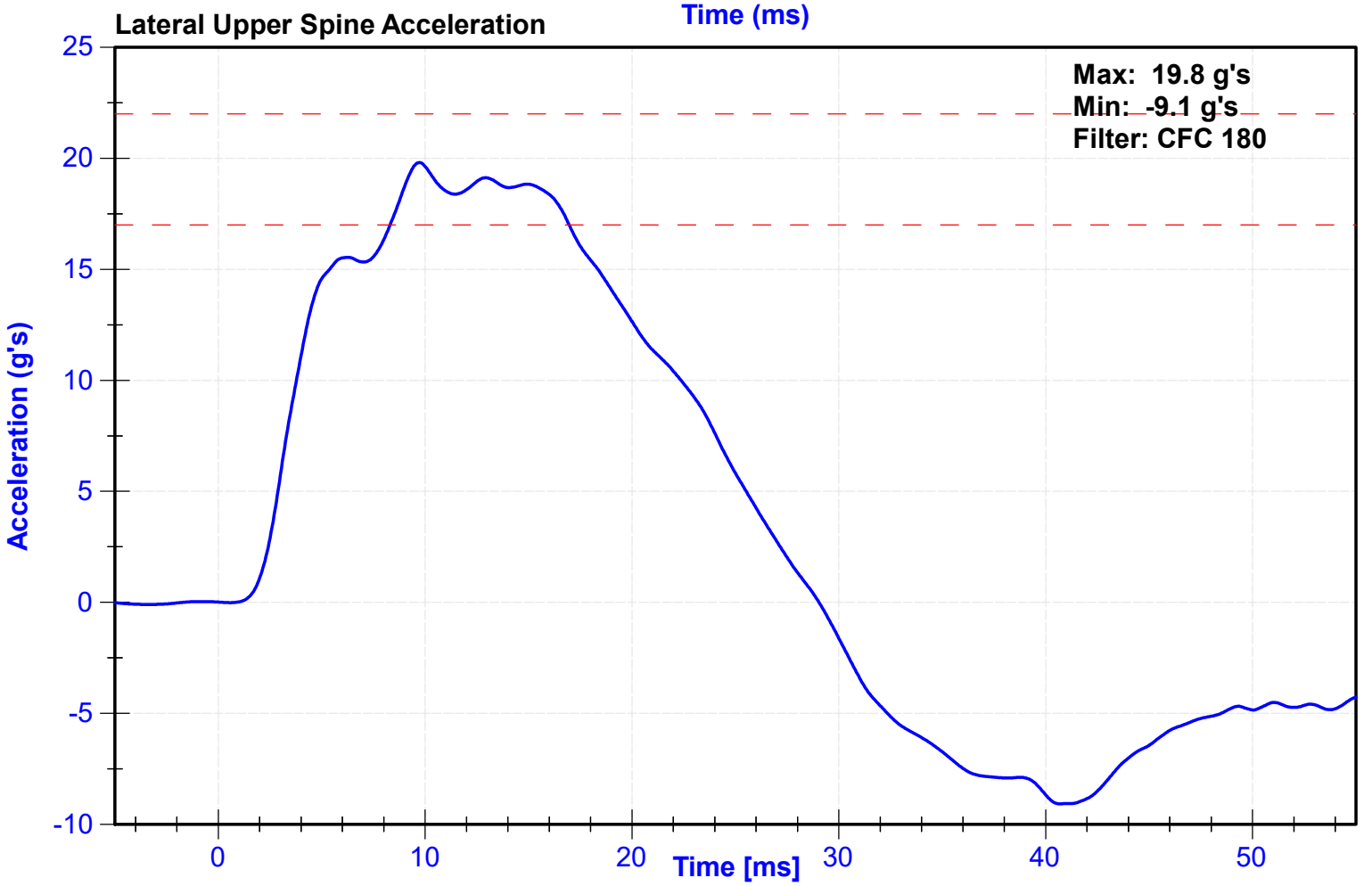
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.32	Pass
Probe Acceleration	13	18	g's	16.4	Pass
Shoulder Deflection	28	37	mm	31.8	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Shoulder Potentiometer	Servo	053GFE	5/9/2024	11/7/2024
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024




Shoulder Displacement
Displacement (mm)
Time (ms)
Max: 31.8 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 19.8 g's
Min: -9.1 g's
Filter: CFC 180

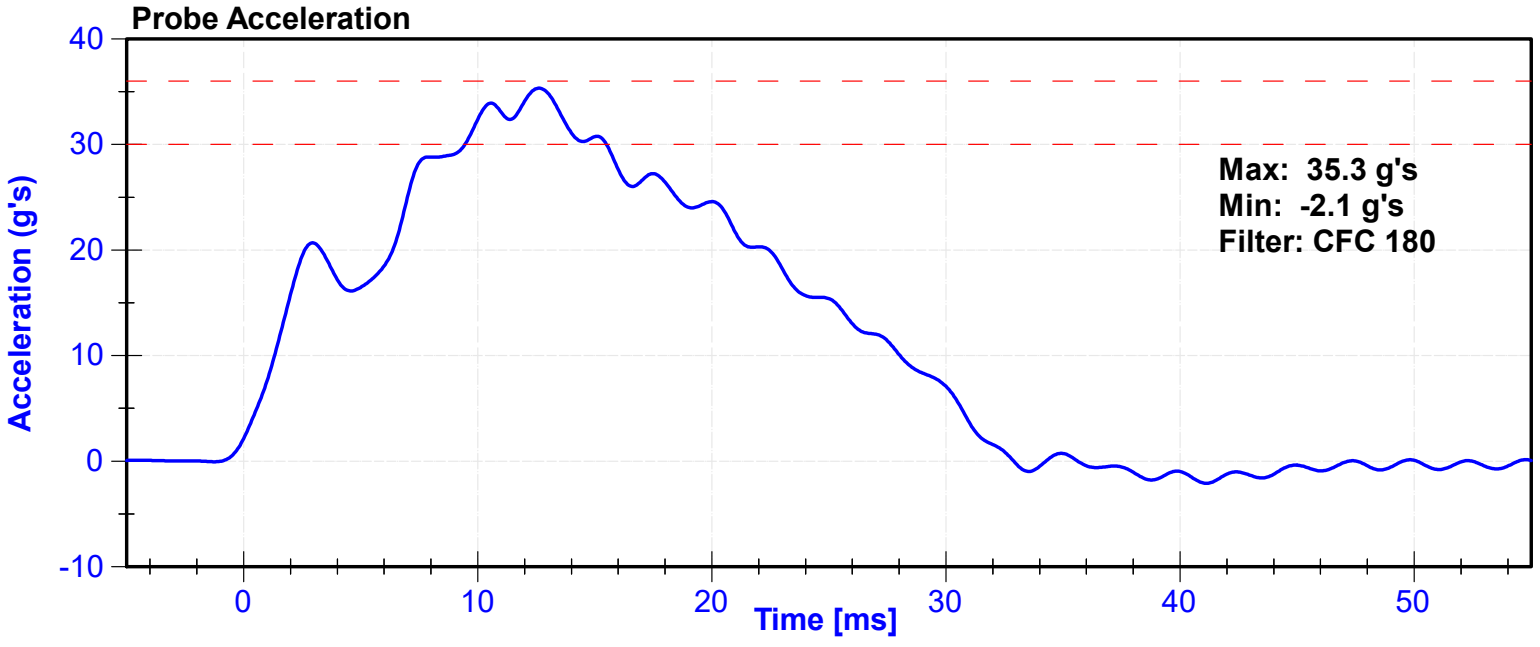
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

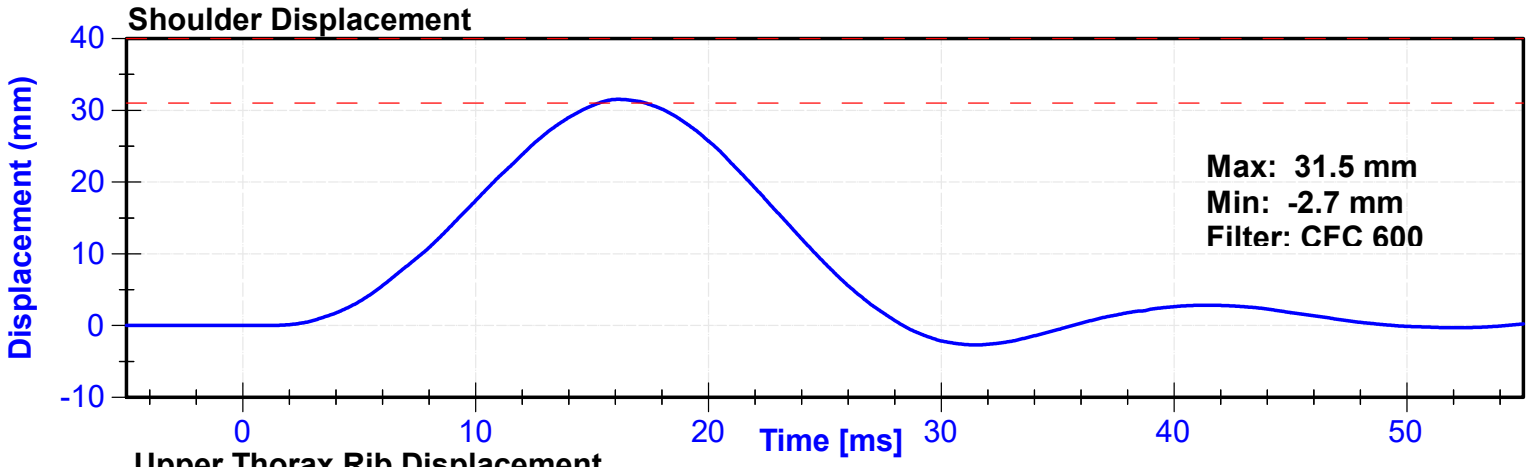
Results

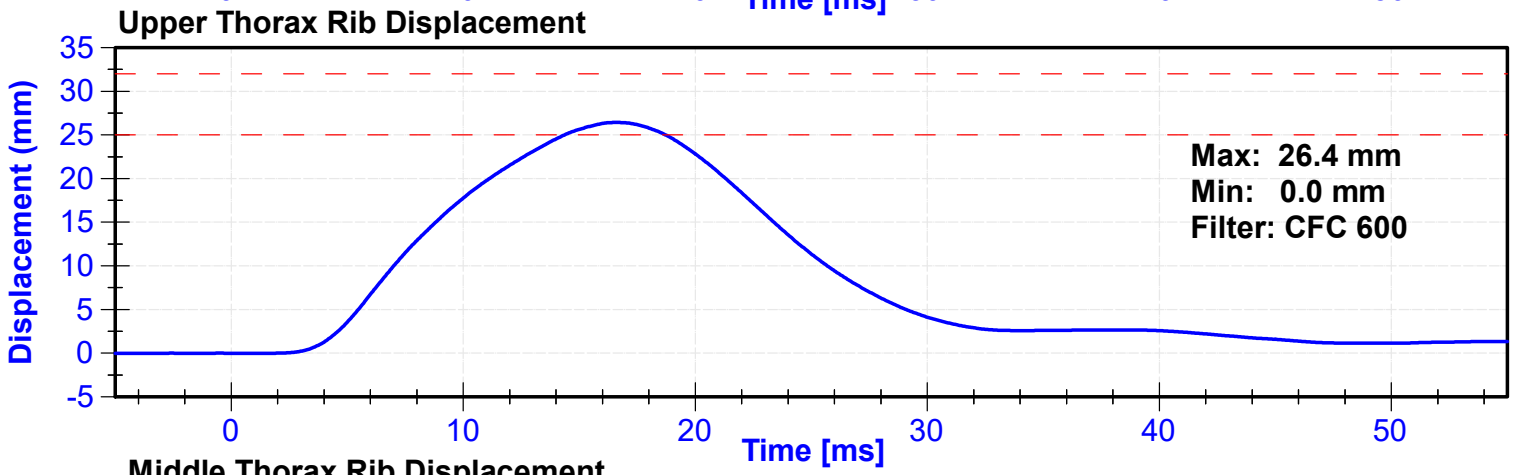
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	44	Pass
Velocity	6.6	6.8	m/s	6.65	Pass
Probe Acceleration after 5 ms	30	36	g's	35.3	Pass
Lateral Upper Spine Acceleration	34	43	g's	35.9	Pass
Lateral Lower Spine Acceleration	29	37	g's	30.6	Pass
Shoulder Deflection	31	40	mm	31.5	Pass
Upper Thorax Rib Deflection	25	32	mm	26.4	Pass
Mid Thorax Rib Deflection	30	36	mm	32.6	Pass
Lower Thorax Rib Deflection	32	38	mm	35.0	Pass

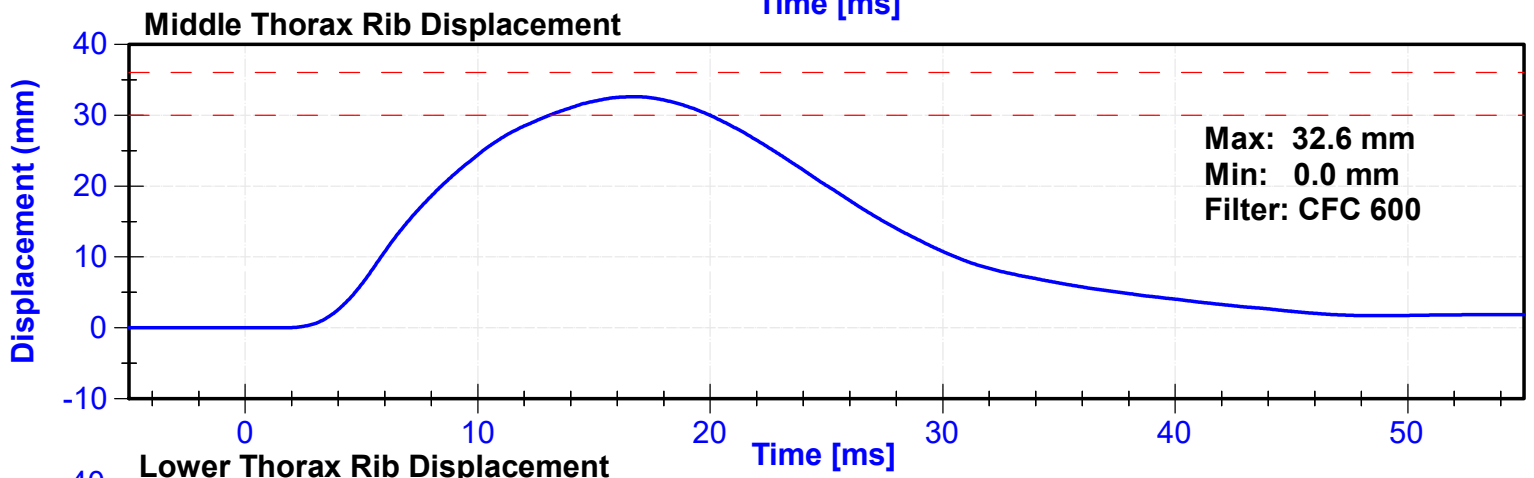
Transducer Calibrations

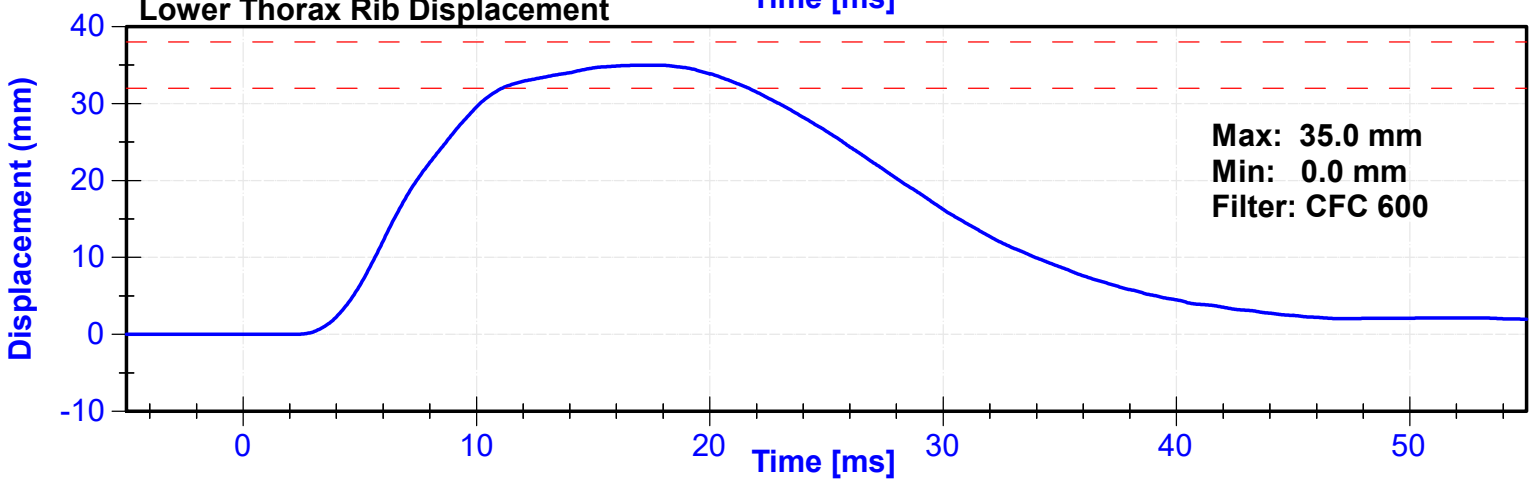
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Spine T1 Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Upper Spine T12 Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Shoulder Potentiometer	Servo	053GFE	5/9/2024	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

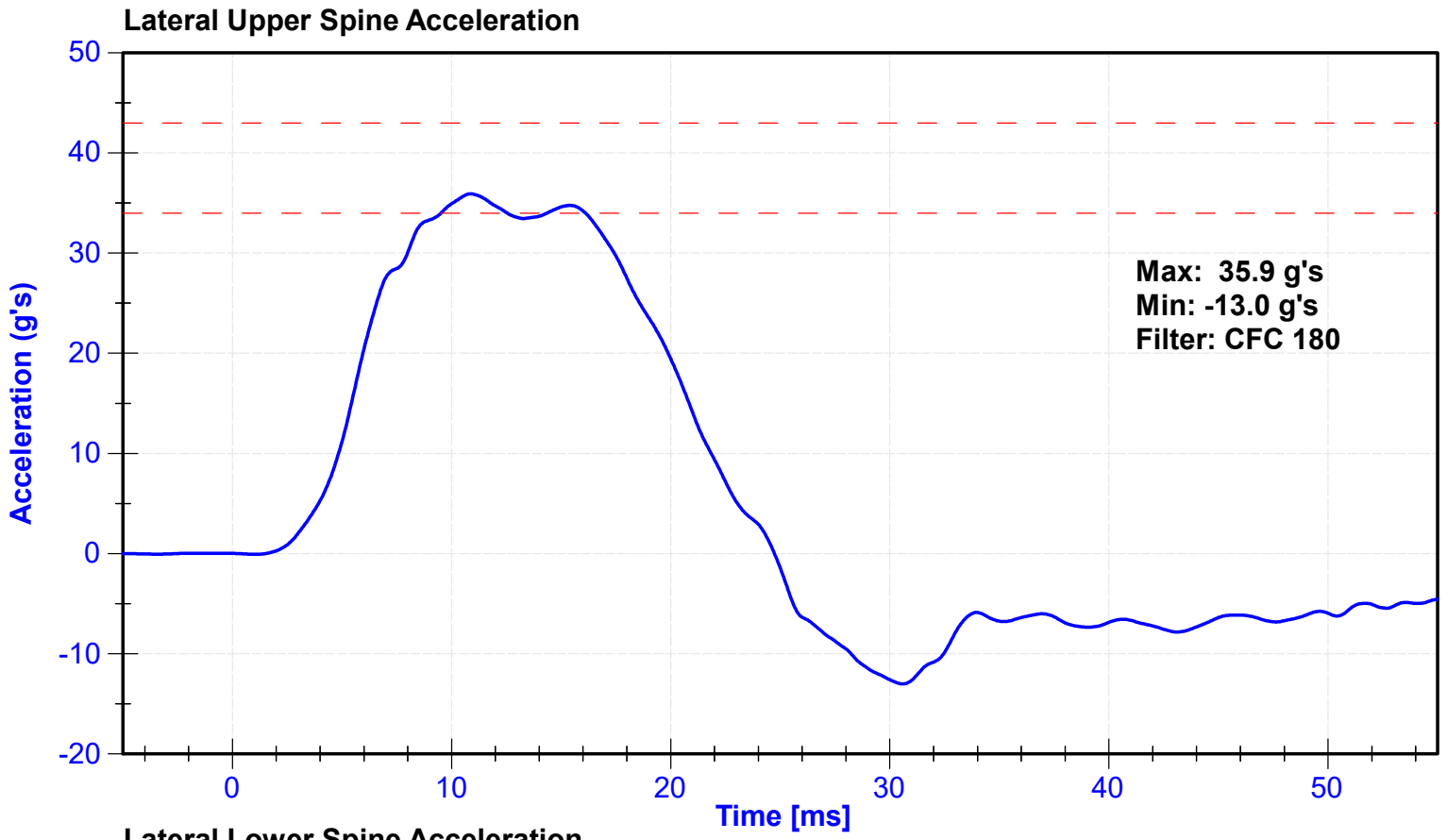


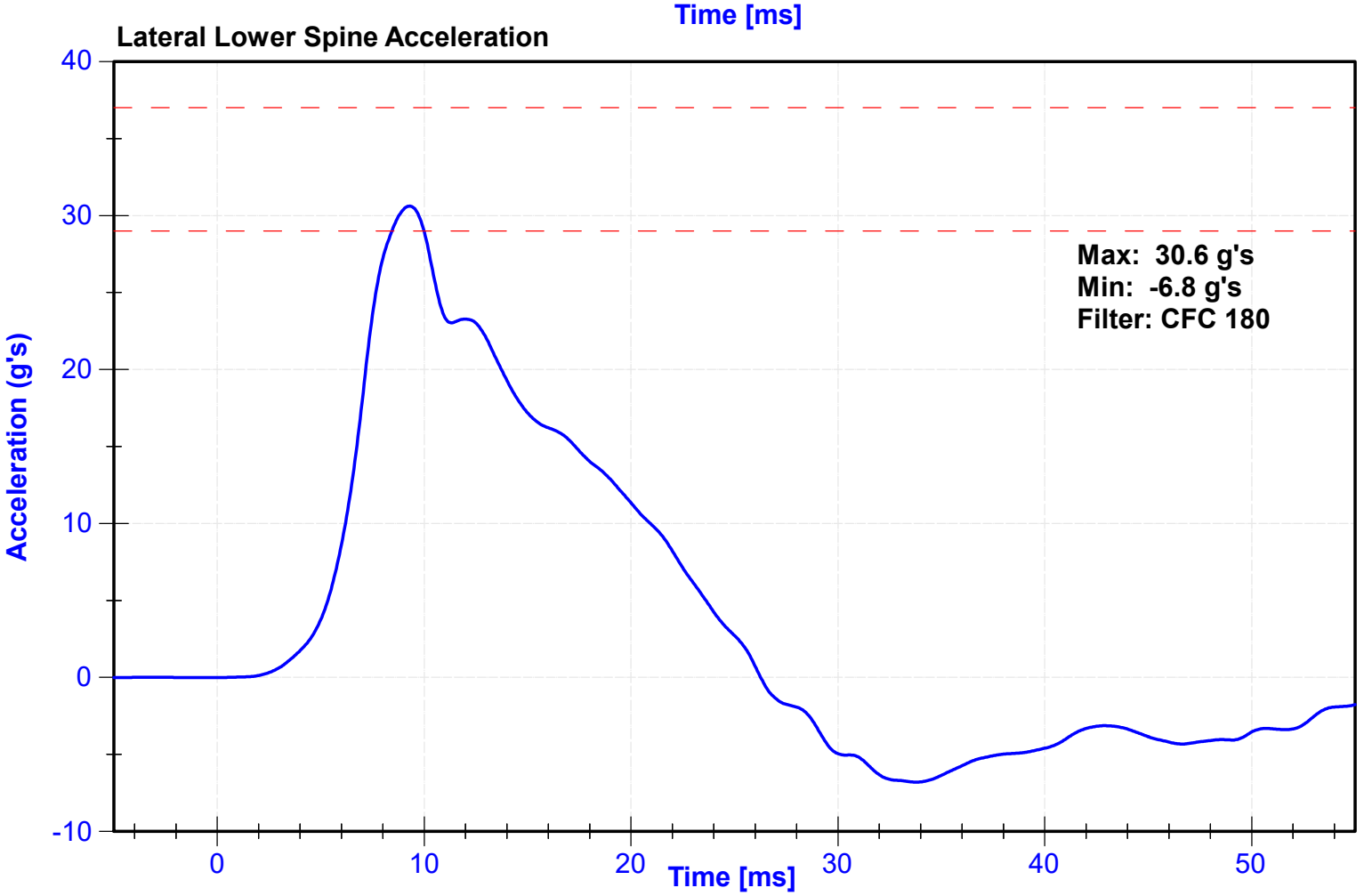

Shoulder Displacement
Displacement (mm)
Time [ms]
Max: 31.5 mm
Min: -2.7 mm
Filter: CFC 600


Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 26.4 mm
Min: 0.0 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 32.6 mm
Min: 0.0 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 35.0 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 35.9 g's
Min: -13.0 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
Time [ms]
Max: 30.6 g's
Min: -6.8 g's
Filter: CFC 180

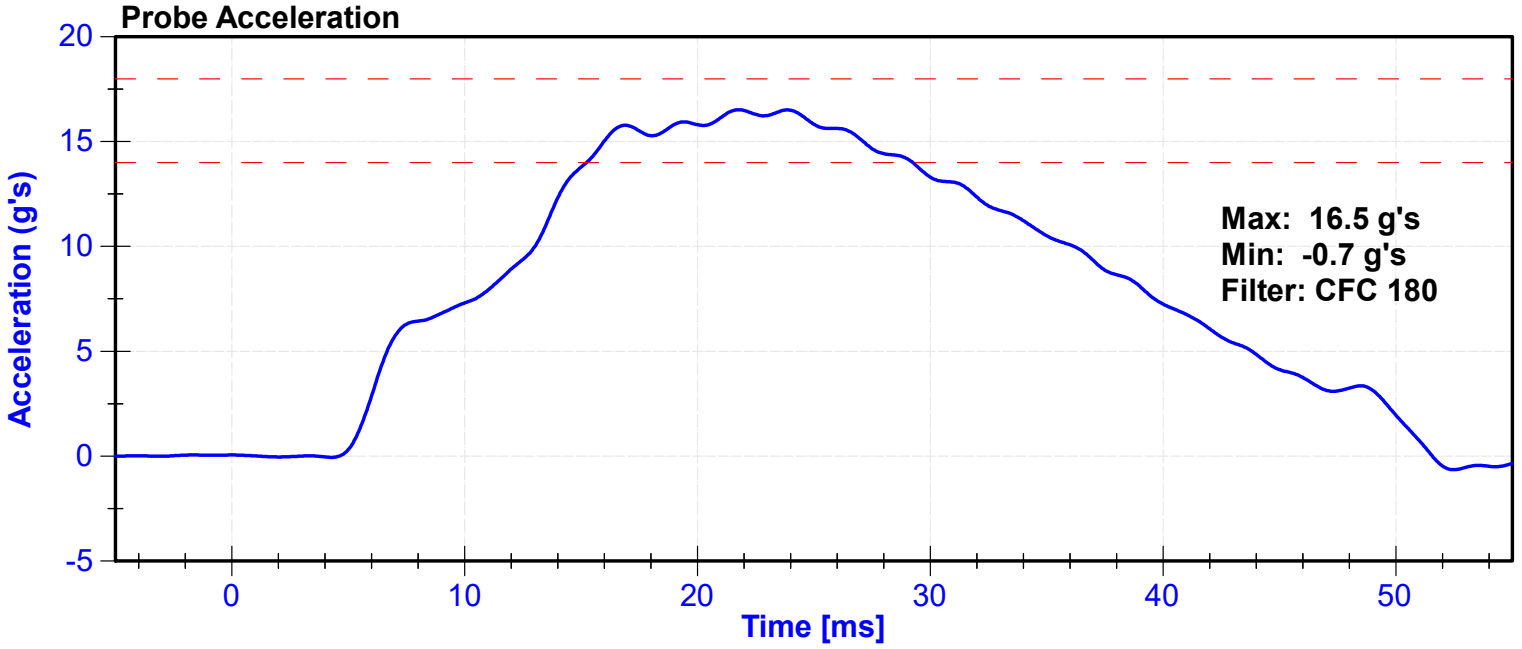
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

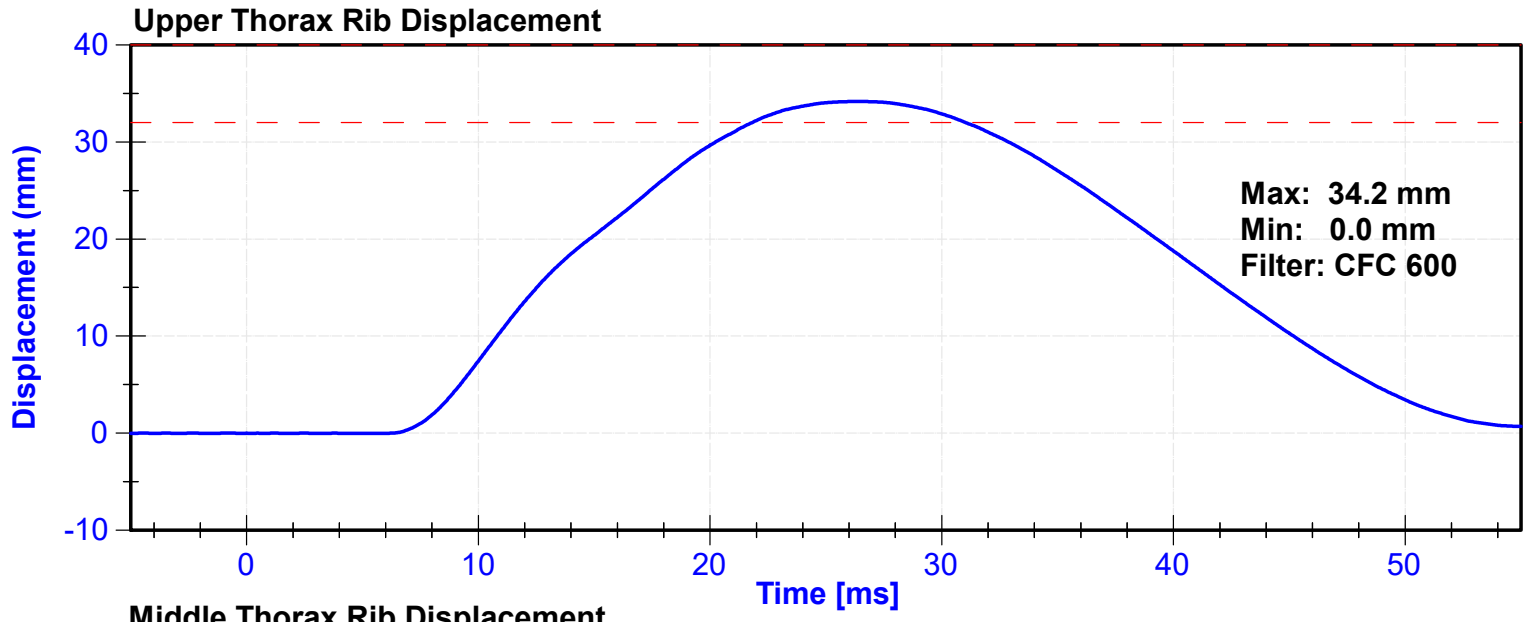
Results

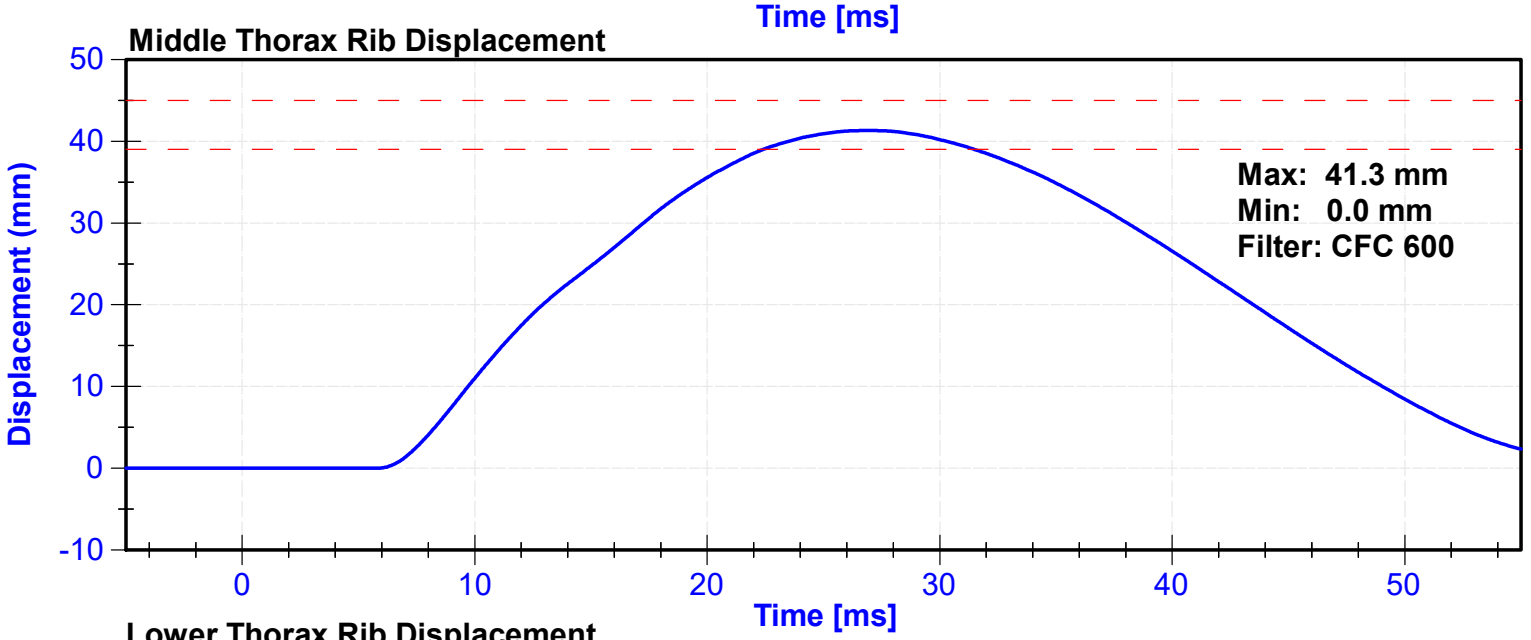
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.31	Pass
Probe Acceleration	14	18	g's	16.5	Pass
Lateral Upper Spine Acceleration	13	17	g's	14.2	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.7	Pass
Upper Thorax Rib Deflection	32	40	mm	34.2	Pass
Middle Thorax Rib Deflection	39	45	mm	41.3	Pass
Lower Thorax Rib Deflection	35	43	mm	38.5	Pass

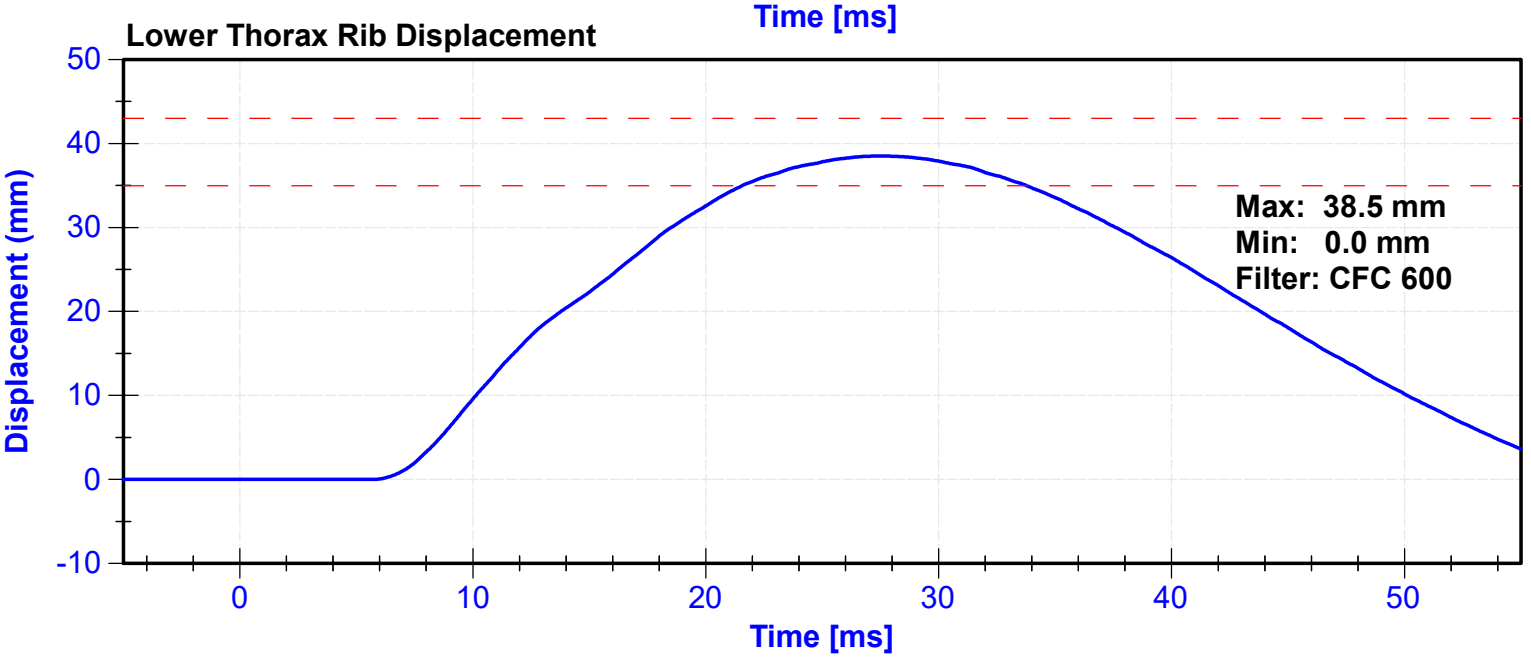
Transducer Calibrations

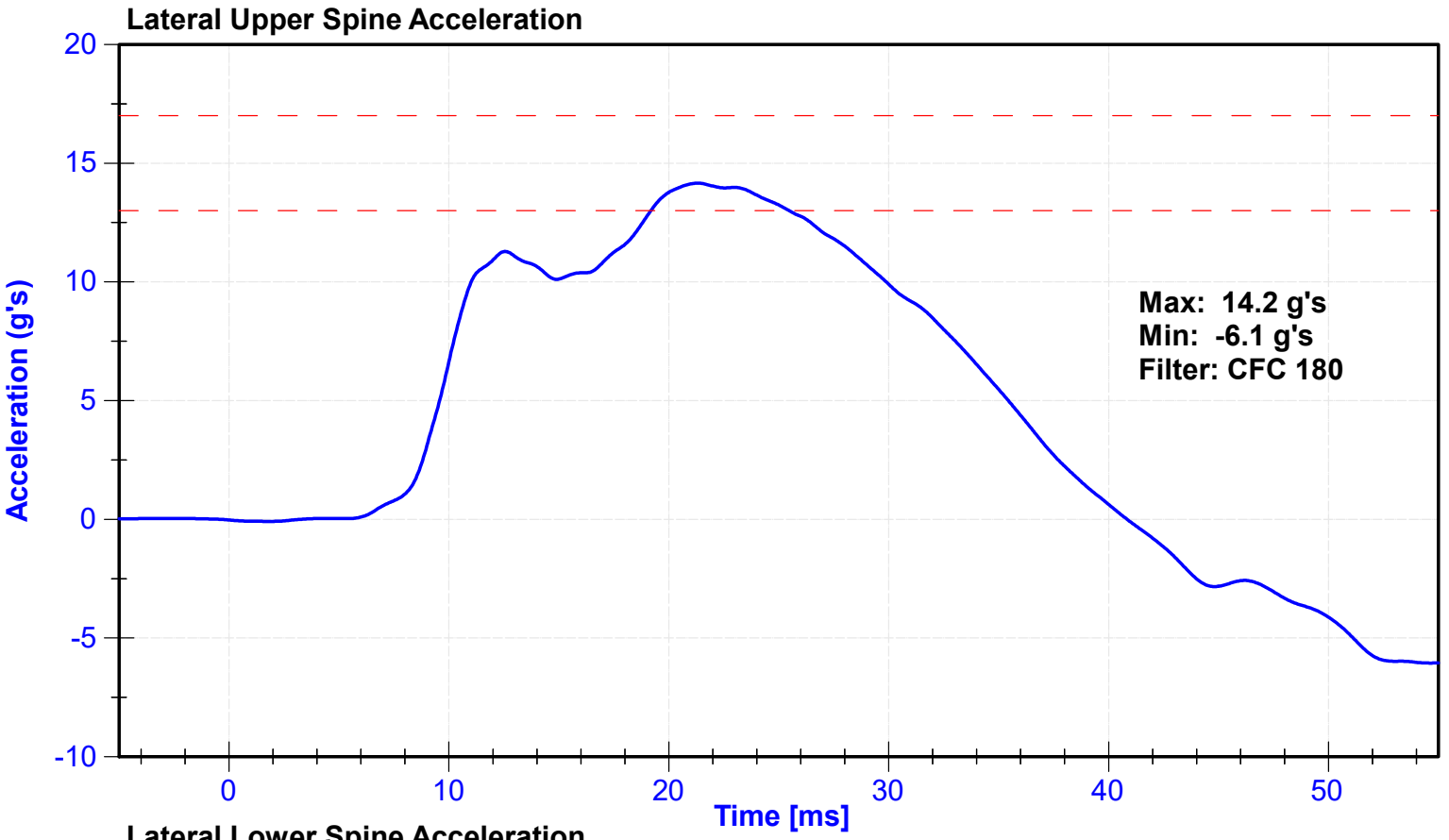
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Upper Spine Y Accelerometer	Endevco	T20880	5/9/2024	11/5/2024
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	5/9/2024	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

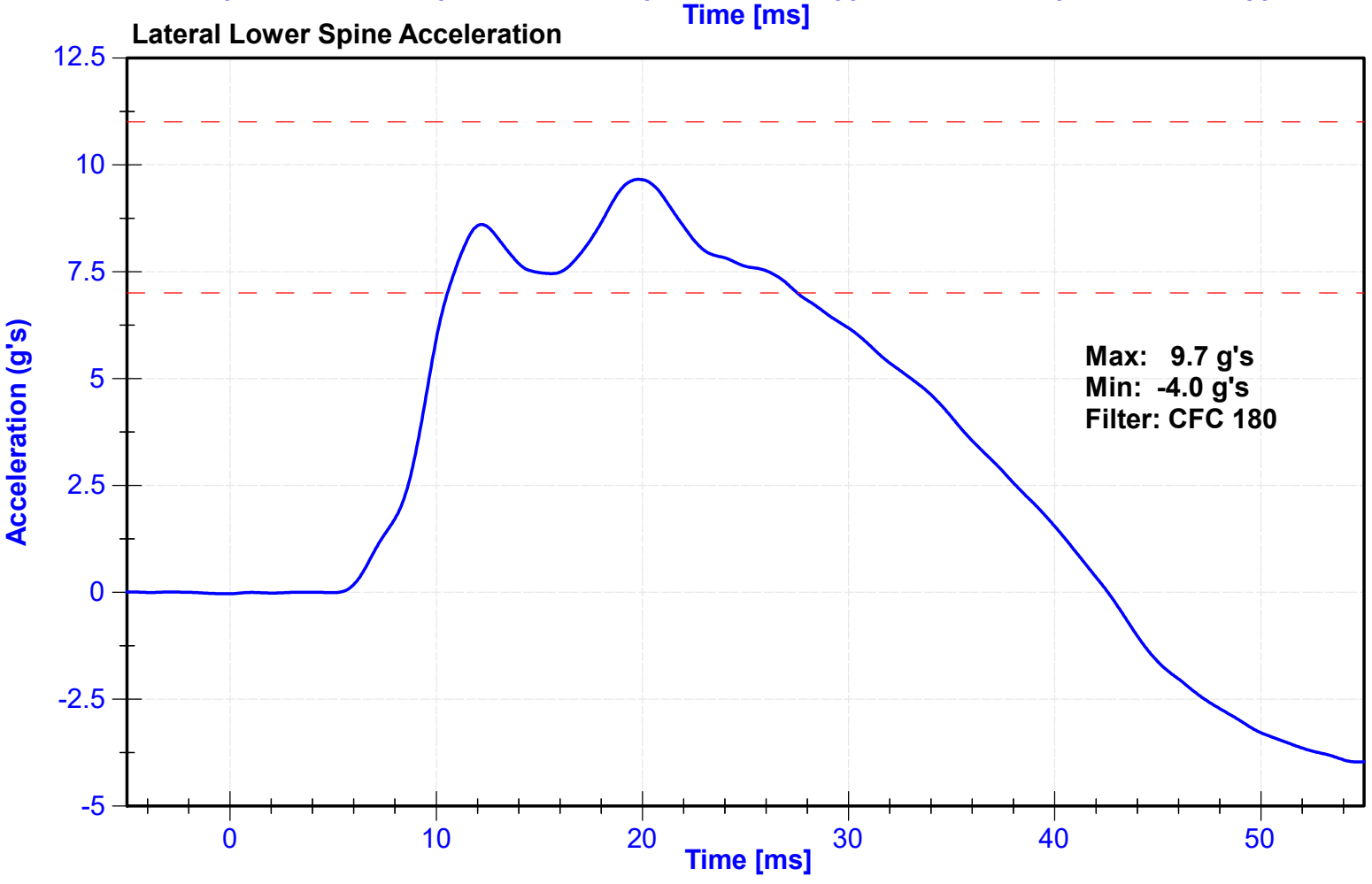



Upper Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 34.2 mm
Min: 0.0 mm
Filter: CFC 600


Middle Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 41.3 mm
Min: 0.0 mm
Filter: CFC 600


Lower Thorax Rib Displacement
Displacement (mm)
Time [ms]
Max: 38.5 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Upper Spine Acceleration
Acceleration (g's)
20
15
10
5
0
-5
-10
0
10
20
30
40
50
Time [ms]
Max: 14.2 g's
Min: -6.1 g's
Filter: CFC 180


Lateral Lower Spine Acceleration
Acceleration (g's)
12.5
10
7.5
5
2.5
0
-2.5
-5
0
10
20
30
40
50
Time [ms]
Max: 9.7 g's
Min: -4.0 g's
Filter: CFC 180

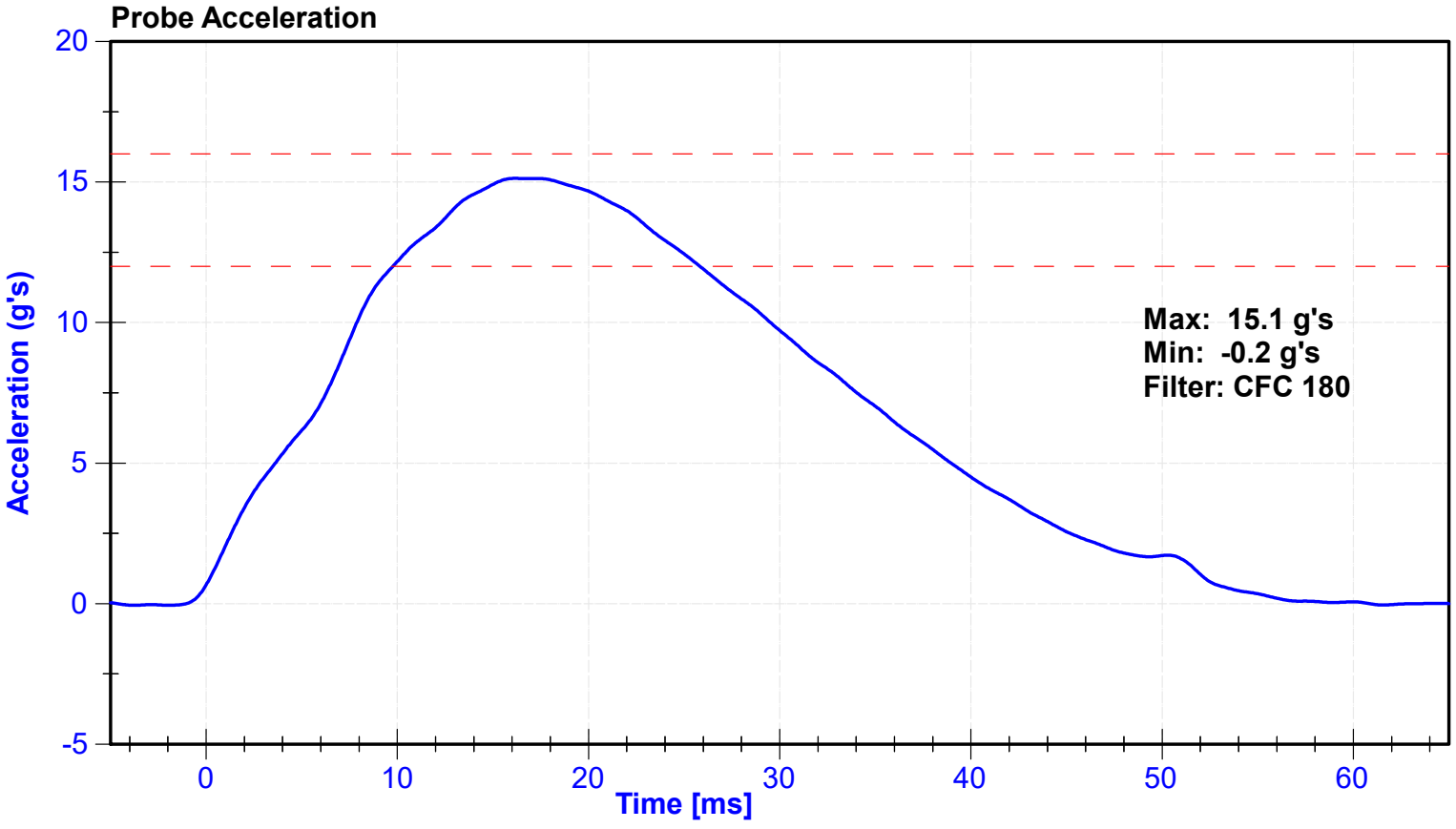
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

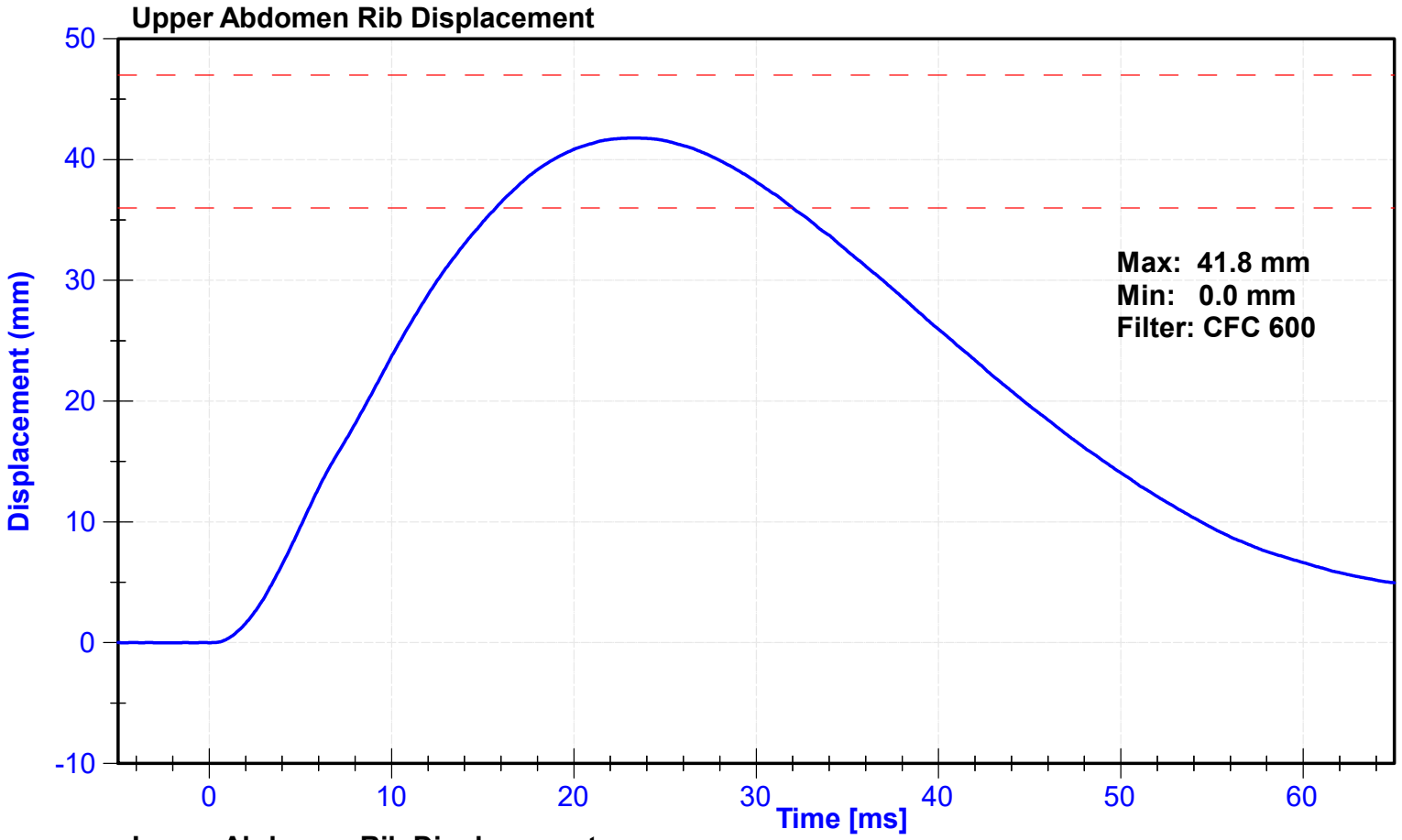
Results

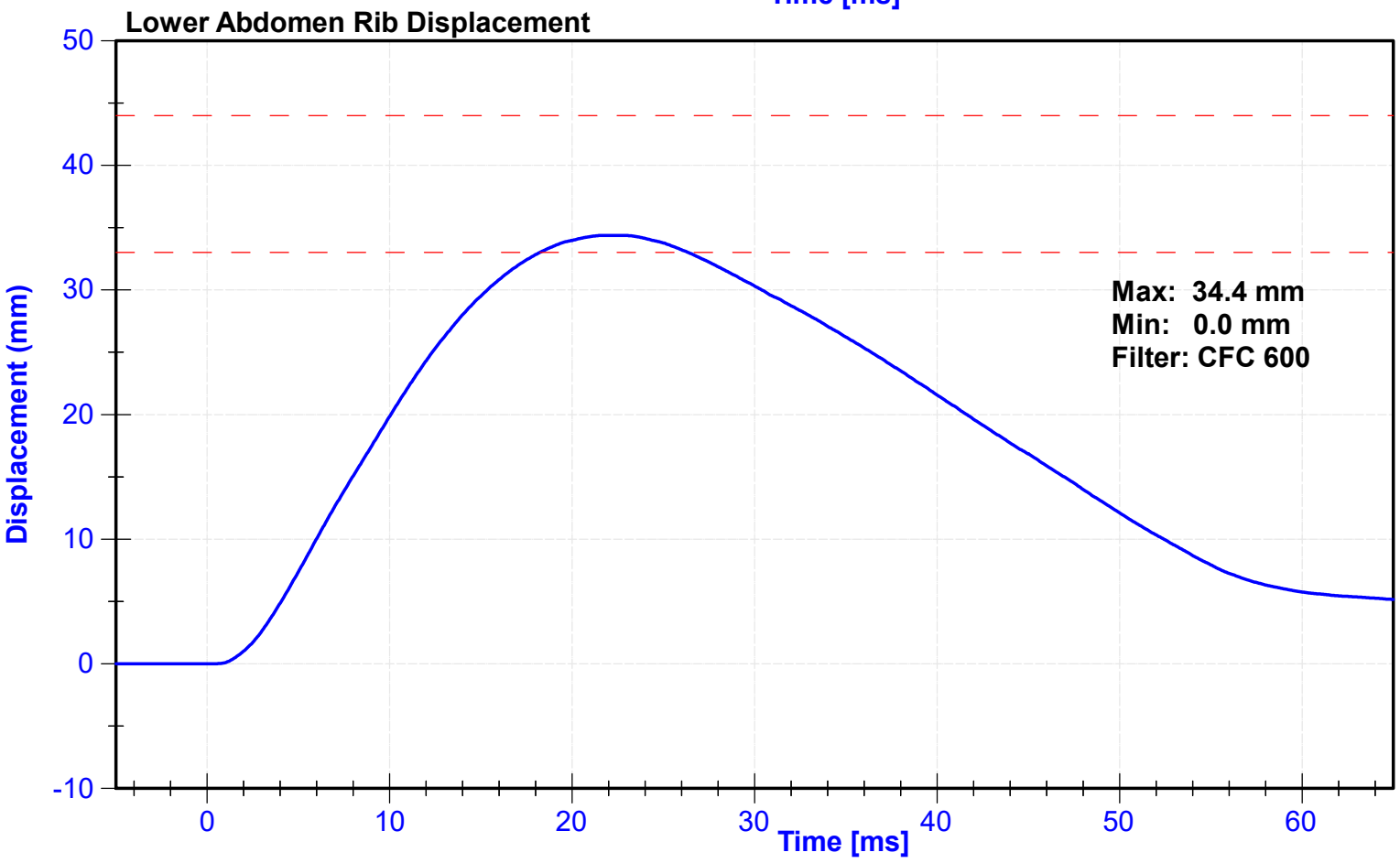
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.30	Pass
Probe Acceleration	12	16	g's	15.1	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.2	Pass
Upper Abdomen Rib Deflection	36	47	mm	41.8	Pass
Lower Abdomen Rib Deflection	33	44	mm	34.4	Pass

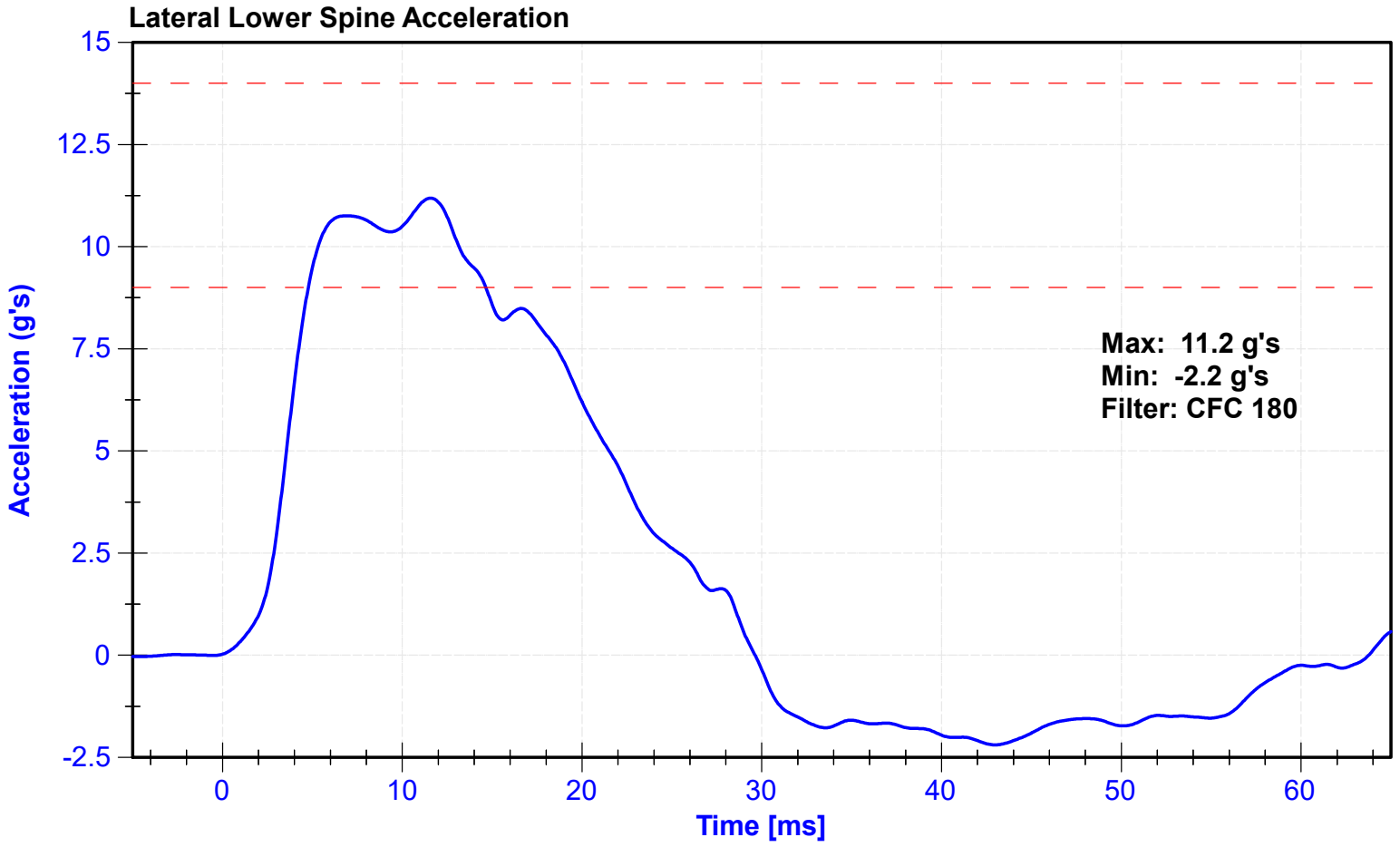
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Probe Accelerometer	Endevco	18619	3/29/2024	9/25/2024
Lower Spine Y Accelerometer	Endevco	P52071	5/9/2024	11/5/2024
Upper Abdomen Rib Potentiometer	Servo	060GFE	5/9/2024	11/7/2024
Lower Abdomen Rib Potentiometer	Servo	075GFE	5/9/2024	11/7/2024




Upper Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 41.8 mm
Min: 0.0 mm
Filter: CFC 600


Lower Abdomen Rib Displacement
Displacement (mm)
50
40
30
20
10
0
-10
0
10
20
30
40
50
60
Time [ms]
Max: 34.4 mm
Min: 0.0 mm
Filter: CFC 600


Lateral Lower Spine Acceleration
Acceleration (g's)
15
12.5
10
7.5
5
2.5
0
-2.5
0
10
20
30
40
50
60
Time [ms]
Max: 11.2 g's
Min: -2.2 g's
Filter: CFC 180

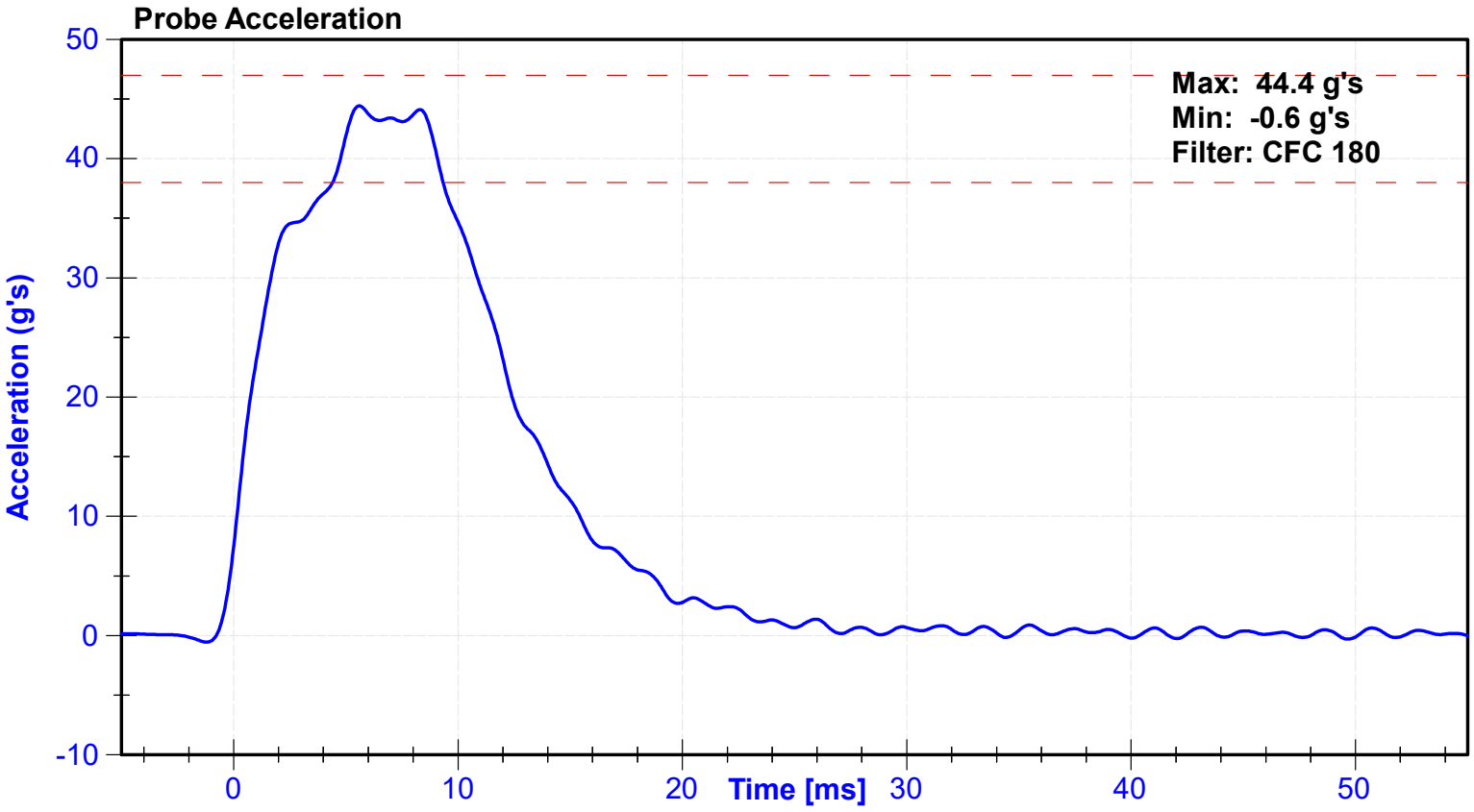
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

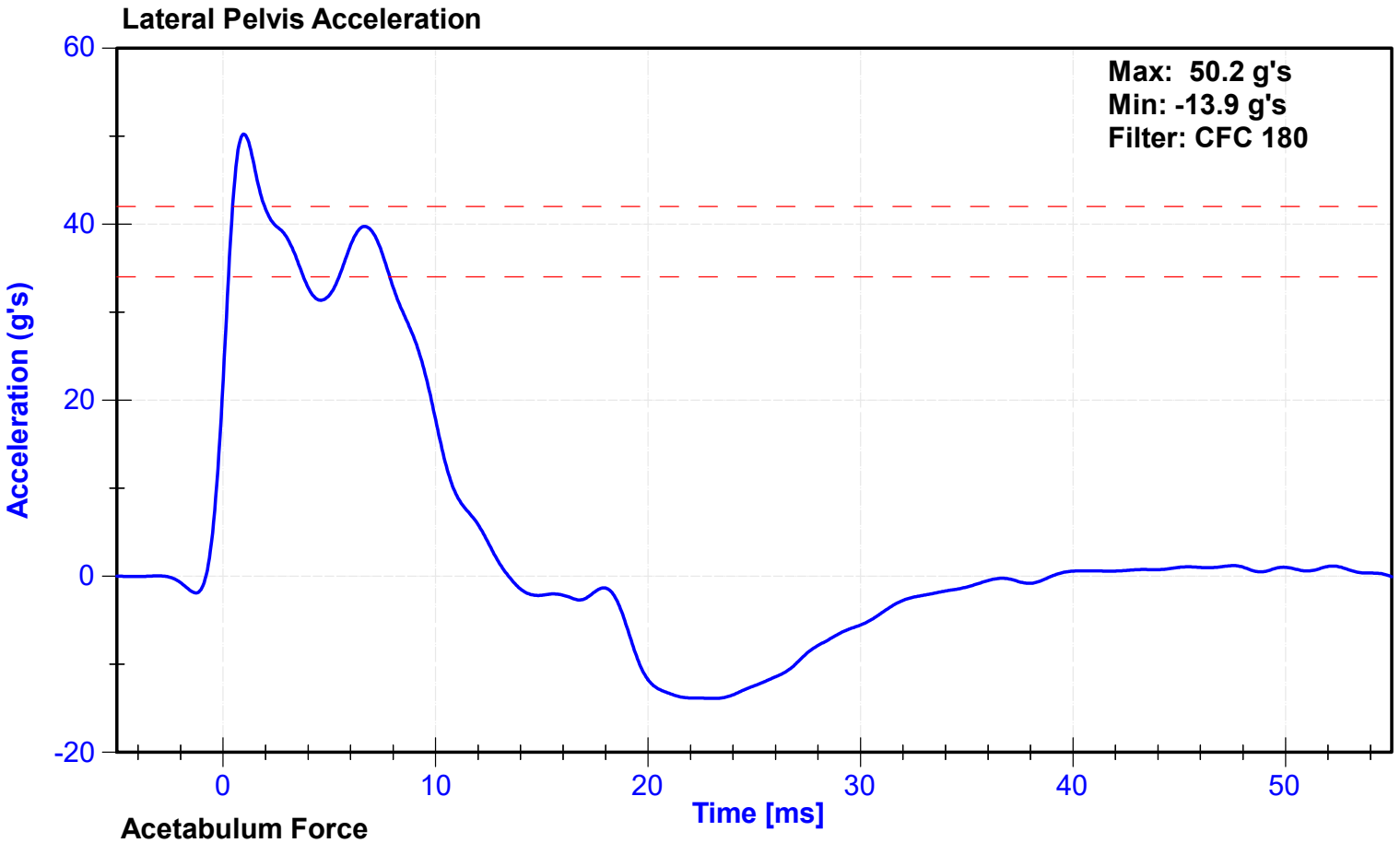
Results

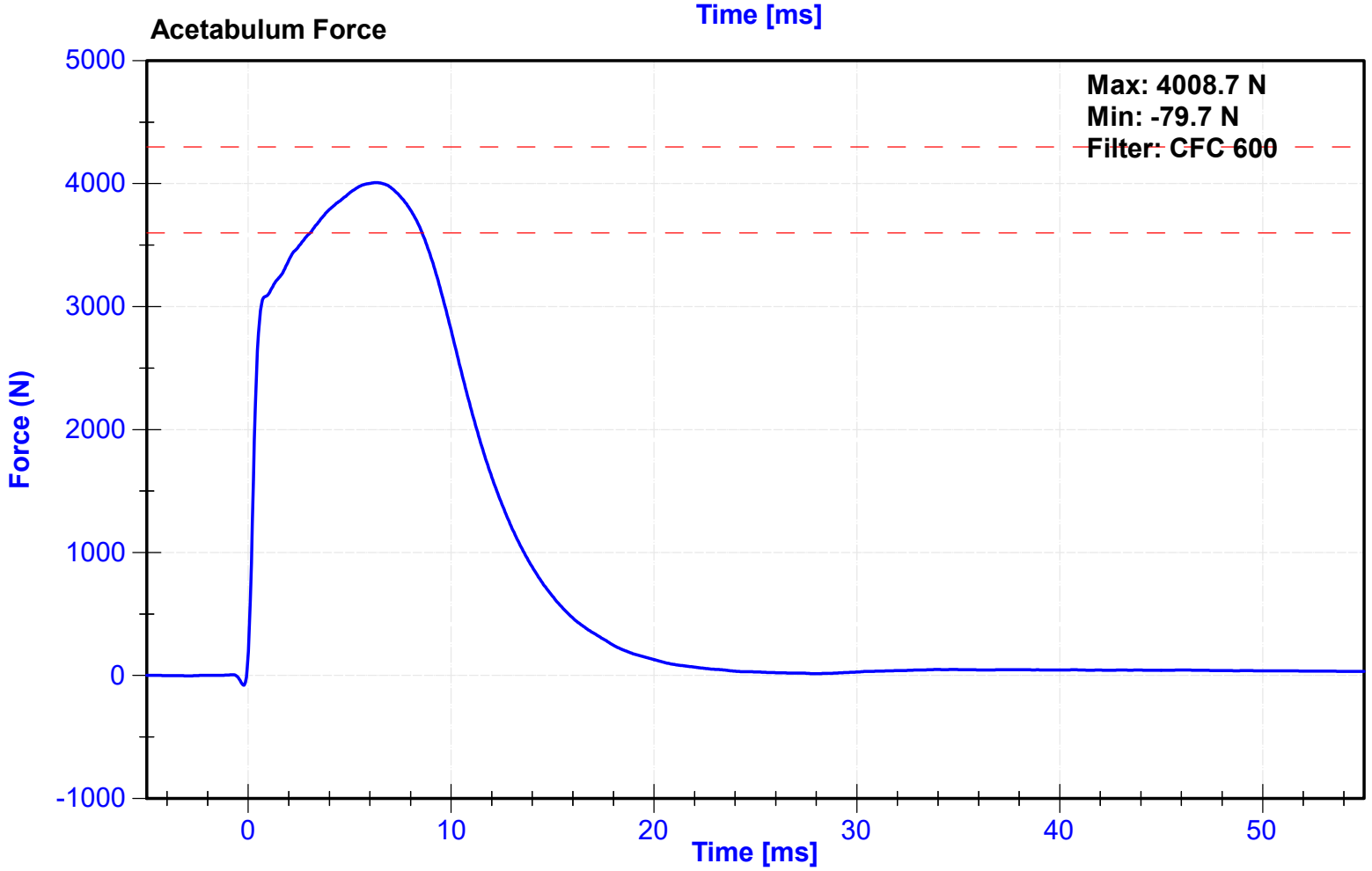
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	44	Pass
Velocity	6.6	6.8	m/s	6.65	Pass
Probe Acceleration	38	47	g's	44.4	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	39.7	Pass
Acetabulum Force	3600	4300	N	4008.7	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	P51731	5/9/2024	11/5/2024
Acetabulum Load Cell	Denton	267-FY	9/11/2023	9/10/2024
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A




Lateral Pelvis Acceleration
Max: 50.2 g's
Min: -13.9 g's
Filter: CFC 180
Acceleration (g's)
60
40
20
0
-20
0
10
20
30
40
50
Time [ms]


Acetabulum Force
Max: 4008.7 N
Min: -79.7 N
Filter: CFC 600
Force (N)
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 15768
Test Number 20668
Report Number 20722
Test Date 10/15/2021 7:51:31 AM

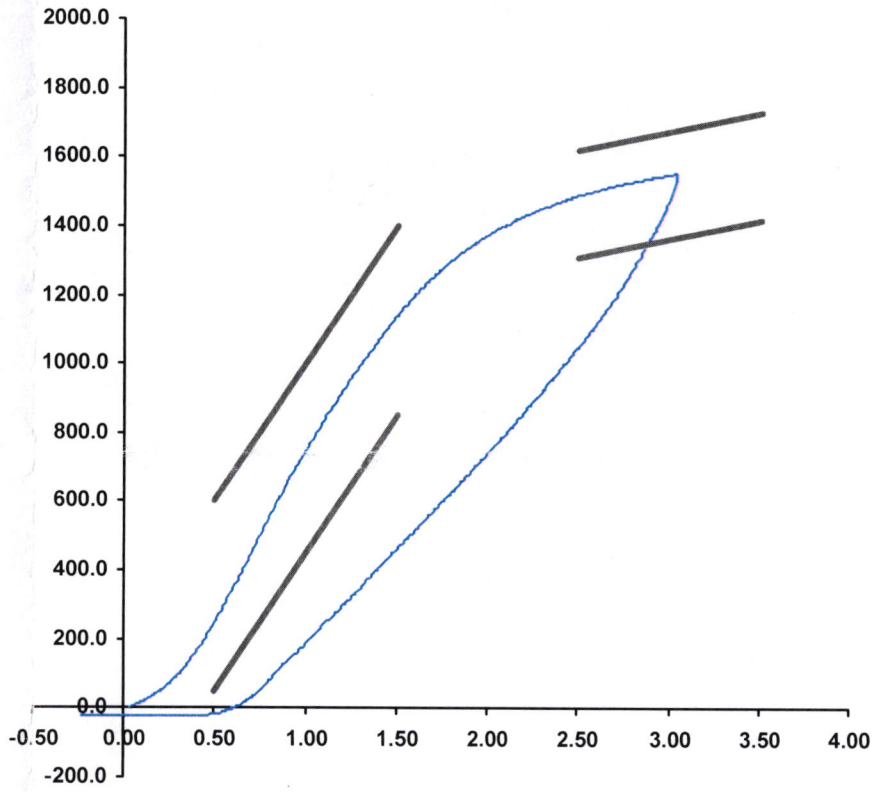
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	257	50	600
Force @ 1.5 mm (N)	1,147	850	1,400
Force @ 2.5 mm (N)	1,491	1,306	1,618
Force @ 3.0 mm (N)	1,552	1,361	1,673

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: 05-20-2024 Cert Plug

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 15-Oct-21
SACO Research

By : DC Date : 10/15/21

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

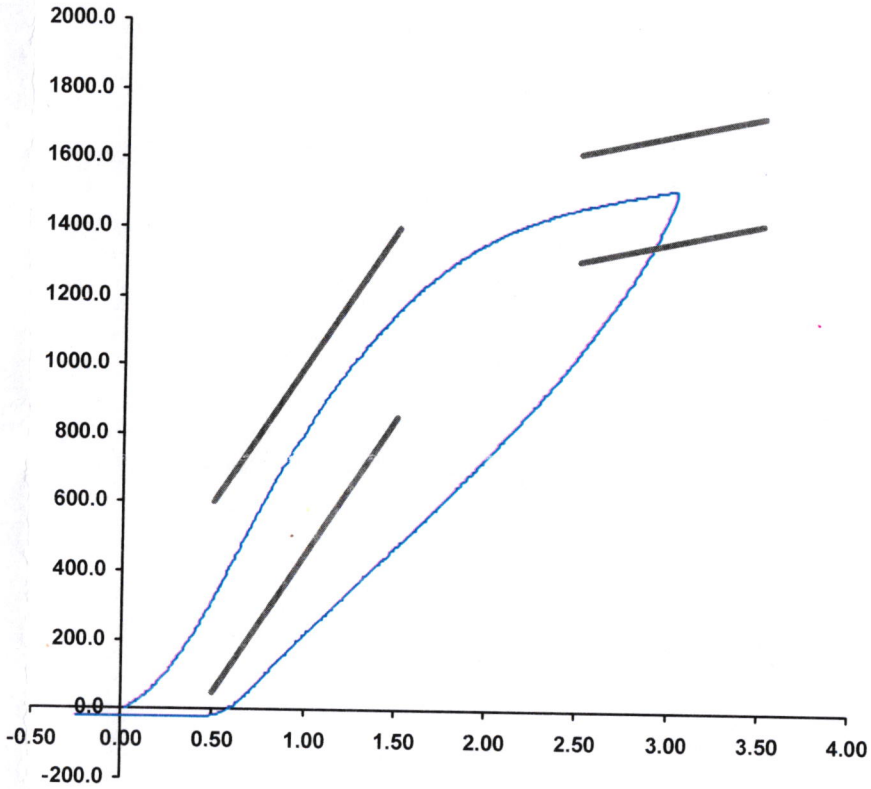
SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16620
Test Number 23386
Report Number 23443
Test Date 7/20/2022 11:42:52 AM

	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	319	50	600
Force @ 1.5 mm (N)	1,156	850	1,400
Force @ 2.5 mm (N)	1,461	1,306	1,618
Force @ 3.0 mm (N)	1,515	1,361	1,673

Force (-N) vs Extension (-mm)



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

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

Notes: Impact Plug Cal 6172
05-22-24

Operator

Part Number 180-4450

Template No 107 20-Jul-22
SACO Research

By : DC Date : 7/20/22

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

SACO RESEARCH

SID-IIs Pelvis Plug Certification Test

Plug S/N 16540
Test Number 23324
Report Number 23381
Test Date 7/15/2022 9:04:41 AM

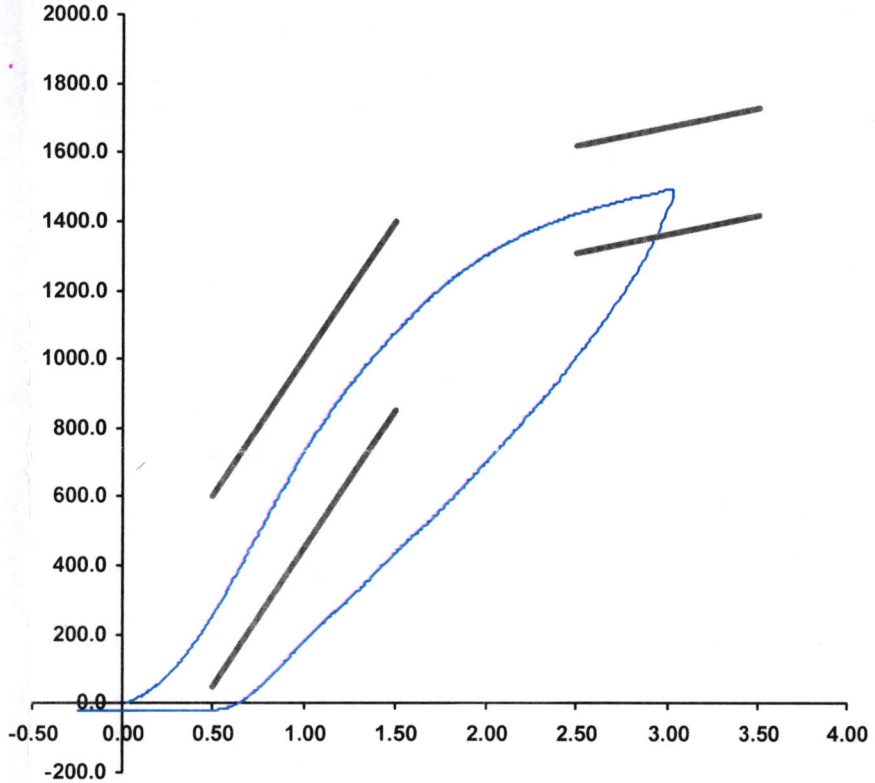
	Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	264	50	600
Force @ 1.5 mm (N)	1,081	850	1,400
Force @ 2.5 mm (N)	1,422	1,306	1,618
Force @ 3.0 mm (N)	1,491	1,361	1,673

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

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

Notes:
Non-Impact Plug Cal 6172
05-22-24

Force (-N) vs Extension (-mm)



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

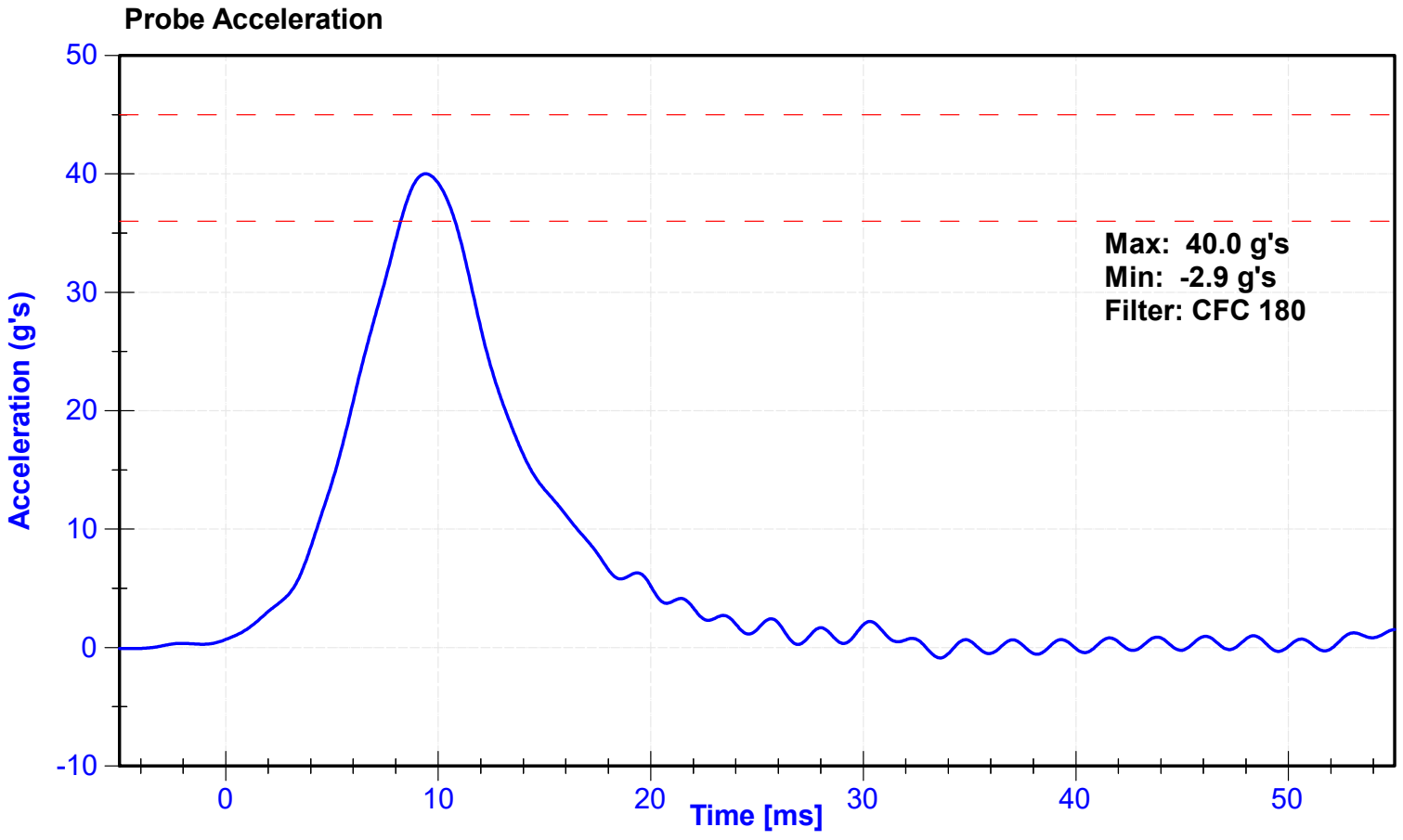
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

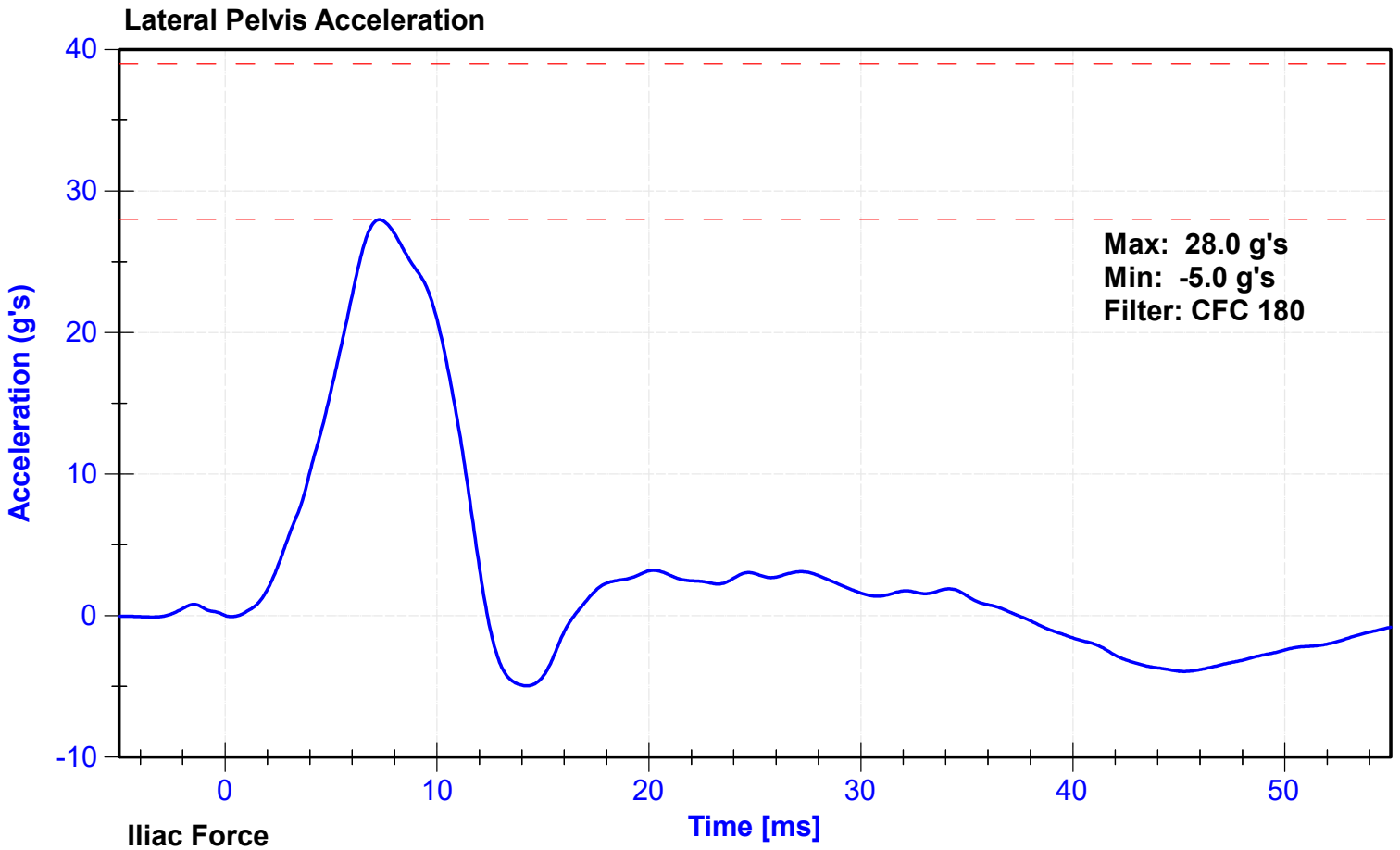
Results

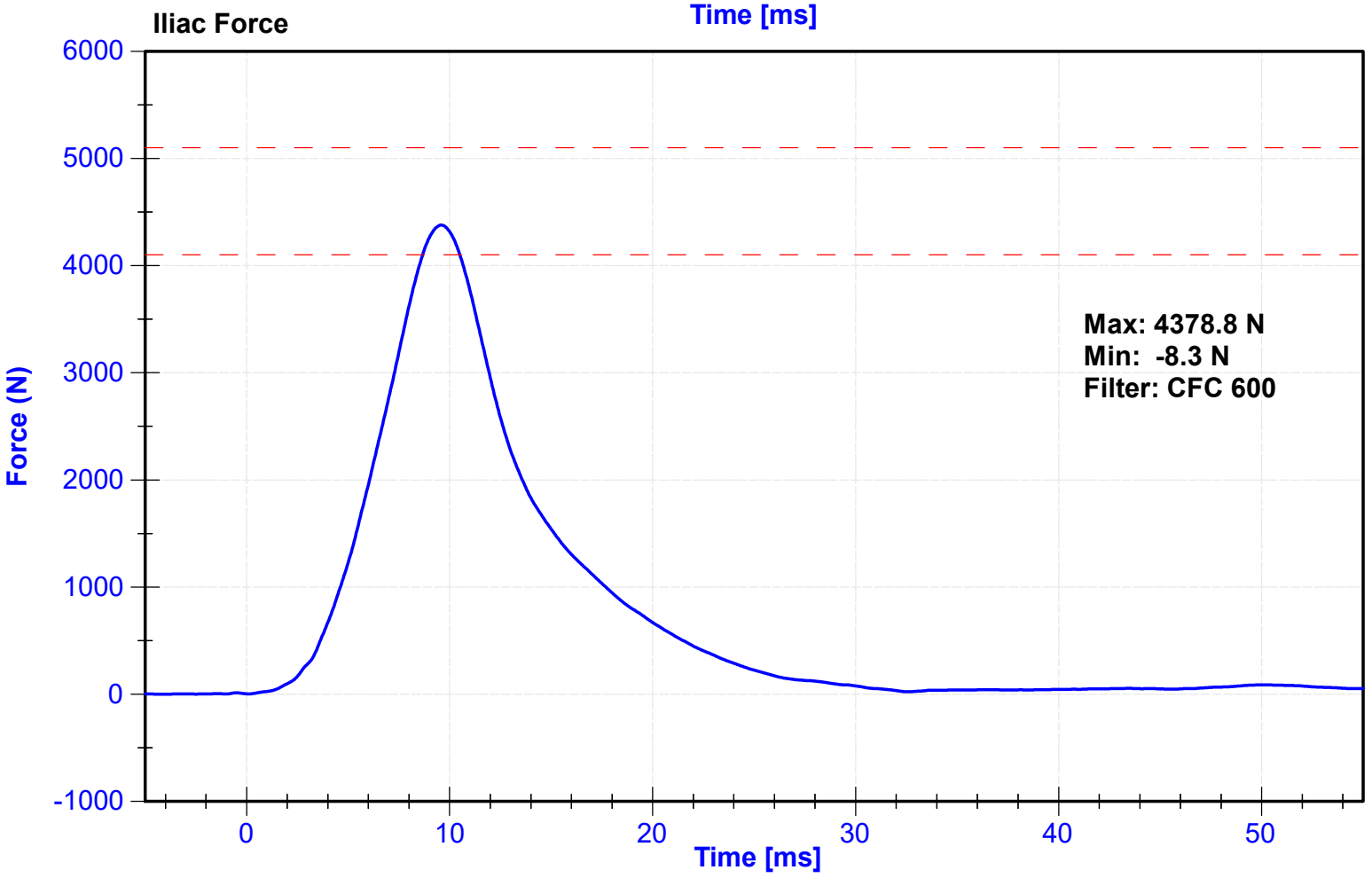
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	ºC	20.8	Pass
Humidity	10	70	%	44	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	36	45	g's	40.0	Pass
Lateral Pelvis Acceleration	28	39	g's	28.0	Pass
Iliac Force	4100	5100	N	4378.8	Pass

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	P51731	5/9/2024	11/5/2024
Iliac Load Cell	Denton	321	9/11/2023	9/10/2024




Lateral Pelvis Acceleration
Acceleration (g's)
40
30
20
10
0
-10
0
10
20
30
40
50
Time [ms]
Max: 28.0 g's
Min: -5.0 g's
Filter: CFC 180


Iliac Force
Force (N)
6000
5000
4000
3000
2000
1000
0
-1000
0
10
20
30
40
50
Time [ms]
Max: 4378.8 N
Min: -8.3 N
Filter: CFC 600

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	060GFE	Servo	05/09/2024
		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	267-FY	Denton	09/11/2023
Lilac Wing Load Cell			Y	321	Denton	09/11/2023
Pelvis Plug (Struck Side)				15769	SACO	10/15/2021
Pelvis Plug (Non-Struck Side)				16533	SACO	07/15/2022

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	A315118	Measurement Specialties	03/18/2024
Vehicle Center of Gravity	Y	A336634	Measurement Specialties	03/18/2024
Vehicle Center of Gravity	Z	A350976	Measurement Specialties	03/18/2024
Left Floor Sill	Y	A352423	Measurement Specialties	02/15/2024
A-Pillar Sill	Y	A374244	Measurement Specialties	02/15/2024
A-Pillar Low	Y	A315934	Measurement Specialties	01/23/2024
A-Pillar Mid	Y	A315874	Measurement Specialties	03/27/2024
B-Pillar Sill	Y	G22833	Endevco	02/19/2024
B-Pillar Low	Y	A284340	Measurement Specialties	05/07/2024
B-Pillar Mid	Y	A398317	Measurement Specialties	05/07/2024
Driver Seat	Y	A428006	Measurement Specialties	02/15/2024
Engine Top	X	A315020	Measurement Specialties	04/25/2024
Engine Top	Y	A315780	Measurement Specialties	04/25/2024
Firewall	Y	A370896	Measurement Specialties	05/02/2024
Right Roof	Y	A300135	Measurement Specialties	02/05/2024
Right Floor Sill	Y	A400747	Measurement Specialties	02/19/2024
Rear Floorpan	X	A290915	Measurement Specialties	01/25/2024
Rear Floorpan	Y	A428047	Measurement Specialties	01/25/2024

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 3	1220AF-1117025-F0	Interface	07/18/2023
Load Cell 4	1220AF-1130989-F0	Interface	07/18/2023
Load Cell 5	1220AF-1281288-F0	Interface	07/18/2023
Load Cell 6	1220AF-1281285-F0	Interface	07/18/2023
Load Cell 7	1220AF-1117035-F0	Interface	07/18/2023
Load Cell 8	1220AF-1117011-F0	Interface	07/18/2023