

REPORT NUMBER: SPNCAP-CAL-24-005

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

**KIA Georgia. INC.
2024 KIA Sportage
5 Door SUV**

NHTSA No: O20244215

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



October 23, 2024

FINAL REPORT

**PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVE SE
WASHINGTON, D.C. 20590**

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Date: October 23, 2024

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Date: October 23, 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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16. Abstract A 32.20 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2024 KIA Sportage 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 March 12, 2024. The impact velocity of the vehicle was 32.19 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 328 mm located at level 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD (SID-IIs) (Serial No.300)</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC36)</td> <td></td> <td>1000</td> <td>269.630</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>G</td> <td>82</td> <td>35.476</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td>N</td> <td>5525</td> <td>2135.411</td> </tr> <tr> <td>Maximum Thoracic Rib Deflection</td> <td>mm</td> <td>38</td> <td>24.605</td> </tr> <tr> <td>Maximum Abdominal Rib Deflection</td> <td>mm</td> <td>45*</td> <td>18.251</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.						Measurement Description	Driver ATD (SID-IIs) (Serial No.300)			Units	Threshold	Result	Head Injury Criteria (HIC36)		1000	269.630	Resultant Lower Spine Acceleration	G	82	35.476	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2135.411	Maximum Thoracic Rib Deflection	mm	38	24.605	Maximum Abdominal Rib Deflection	mm	45*	18.251
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17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs				18. Distribution Statement <u>Copies of this report are available from:</u> National Highway Traffic Safety Administration Technical Information Services Division 1200 New Jersey Ave. 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 KIA Sportage 5 Door SUV. The side impact test was conducted in accordance with the Office of Crashworthiness Standards 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 KIA Sportage 5 Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.19 km/h. The test was conducted by Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on March 12, 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 572U (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 572U (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	269.630
Resultant Lower Spine Acceleration	G	82	35.476
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	2135.411
Maximum Thoracic Rib Deflection	mm	38	24.605
Maximum Abdominal Rib Deflection	mm	45*	18.251

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

GENERAL COMMENTS:

1. P1 serial number - 300

Data Anomalies:

- Left Lower B-Pillar Y Acceleration, Exceeded calibration range at 23.7 ms
- Left Middle B-Pillar Y Acceleration, Exceeded calibration range and saturated at 13.8 ms

SECTION 3

OCCUPANT AND VEHICLE INFORMATION

This section contains information reporting for the following Data Sheets:

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

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

Data Sheet No. 3 - Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 - Dummy Lateral Clearance Dimensions

Data Sheet No. 5 - Camera and Instrumentation Data

Data Sheet No. 6 - Vehicle Accelerometer Data

Data Sheet No. 7- Rigid Pole Load Cell Data

Data Sheet No. 8 - Post-Test Observations

Data Sheet No. 9 - Test Vehicle Profile Measurements

Data Sheet No. 10 - Test Vehicle Exterior Crush Measurements

Data Sheet No. 11 - Vehicle Damage Profile Distances

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

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

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2024 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	O20244215	Traction Control System (TCS)	Yes
Model Year	2024	Auto-Leveling System	No
Make	KIA	Automatic Door Locks (ADL)	Yes
Model	Sportage	Power Window Auto-Reverse	Yes
Body Style	SUV	Other Optional Feature	N/A
VIN	5XYK33DF8RG175166	Driver Front Airbag	Yes
Body Color	Everlasting Silver	Driver Curtain Airbag	Yes
Odometer Reading (km/mi)	25 mi	Driver Head/Torso Airbag	No
Engine Displacement (L)	2.5	Driver Torso Airbag	No
Type / No. Cylinders	I4	Driver Torso / Pelvis Airbag	Yes
Engine Placement	Transverse	Driver Pelvis Airbag	No
Transmission Type	Automatic	Driver Knee Airbag	No
Transmission Speeds	8 Speed	Rear Pass. Curtain Airbag	Yes
Overdrive	Yes	Rear Pass. Head / Torso Airbag	No
Final Drive	Front Wheel Drive	Rear Pass. Torso Airbag	No
Roof Rack	No	Rear Pass. Torso / Pelvis Airbag	Yes
Sunroof / T-Top	No	Rear Pass. Pelvis Airbag	No
Running Boards	No	Driver Seat Belt Pretensioner	Yes
Tilt Steering Wheel	Yes	Rear Pass. Seat Belt Pretensioner	Yes
Power Seats	Yes	Driver Load Limiter	Yes
Anti-Lock Brakes (ABS)	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	KIA Georgia. INC.	GVWR (KG)	2120
Date of Manufacture	Nov/29/23	GAWR Front (KG)	1230
Vehicle Type	MPV	GAWR Rear (KG)	1200

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)				420
DSC x 68.0 kg				340
Cargo Weight (RCLW) (kg)				80

(A)

(B)

(A-B)

VEHICLE SEAT TYPE

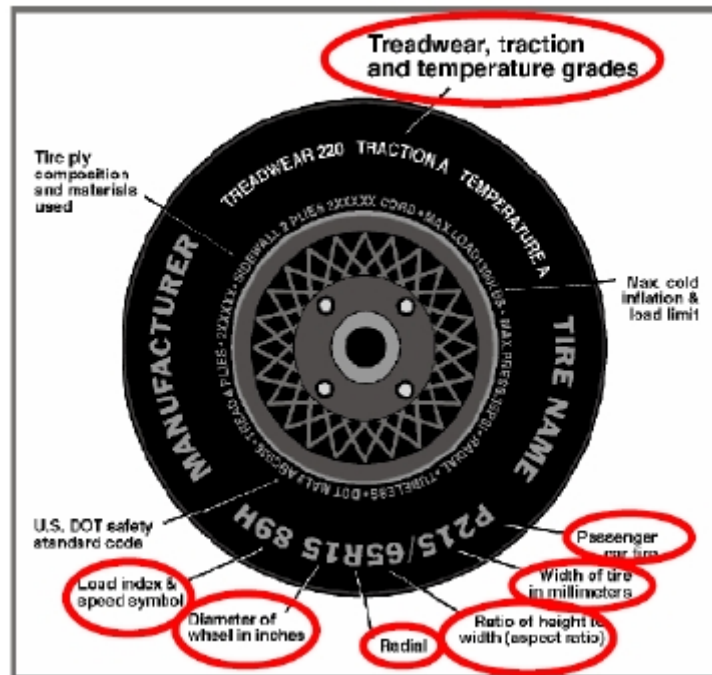
Seating Location	Type Of Seat Pan				Type Of Seat Back		
	Bucket	Bench	Split Bench	Contour	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front	X						X
Rear or Second Row Seat			X			X	
Third Row seat	N/A	N/A	N/A	N/A	N/A	N/A	N/A

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024

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)	240	240
Recommended Tire Size	235/60R18	235/60R18
Tire Size on Vehicle	235/60R18	235/60R18
Tire Manufacturer	Kumho	Kumho
Tire Model	Crugen Hp71	Crugen Hp71
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 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	103H	103H
Tire Material	Rubber	Rubber
DOT Safety Code Left	000CMYA8E4423	000CMYA8E4423
DOT Safety Code Right	000CMYA8E4423	000CMYA8E4423

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024

TIRE PRESSURES

	Units	LF	RF	LR	RR
As Delivered	kPa	255	256	251	248
Tire Placard	kPa	240	240	240	240
Owner's Manual	kPa	240	240	240	240
As Tested	kPa	240	240	240	240

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Rear	Total	Total	Front	Rear	Total
Left	kg	481.5	318.5		481	381		500.5	376.5	
Right	kg	471	310		487	354		476	361	
Ratio	%	60.2	39.8		56.8	43.2		57.0	43.0	
Totals	kg	952.5	628.5	1581	968	735	1703	976.5	737.5	1714

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1581	(A)
Actual Weight of 1 P572V (SID-IIs) ATD Used	kg	50	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	80	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1711	(A+B+C)

Does the measured As Test Vehicle Weight lie within the required weight range (i.e. Calculated

Test Vehicle Target Weight – 4.5 kg to – 9 kg)?



Yes



No

TEST VEHICLE ATTITUDES AND CG

Measurement Description	Units	As Delivered	As Tested	Fully Loaded	Meets Rqmt***
Driver Door Sill Angle (front-to-rear)*	Deg	-0.35	-0.15	-0.15	Yes
Front Passenger Sill Angle (front-to-rear)*	Deg	-0.85	-0.20	-0.20	Yes
Front Bumper-Line Angle (left-to-right)**	Deg	+0.10	-0.10	-0.10	Yes
Rear Bumper-Line Angle (left-to-right)**	Deg	-0.30	-0.30	-0.05	Yes
Vehicle CG (Aft of Front Axle)	mm	1096	1190	1187	
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	-10	-10	-19	

* 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 KIA Sportage 5 Door SUV	NHTSA No.: O20244215
Test Program: NCAP Side Pole Impact Test	Test Date: 03/12/2024

WEIGHT OF BALLAST AND VEHICLE COMPONENTS REMOVED TO MEET TVTW

Component Description	Weight (kg)
Trunk Carpeting	3
Spare Tire	14
Jack	1
Tail Light	1
Rear Trim	2
Tools	1
Ballast / Equipment Added	43.1

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

TEST SURFACE MARKING

	Distance from 75° Impact Location Line (mm)
Fore 25 mm target	232
Aft 25 mm target	230

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024

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	19.7	11.2	15.5
Front Passenger Seat	Fixed	Fixed	Fixed
Front Center Seat			
Struck Side Rear Seat	Fixed	Fixed	Fixed
Non-Struck Side Rear Seat	Fixed	Fixed	Fixed
Rear Center Seat	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	15.5	49	Max	70	76	82
			Mid	36	43	49
			Min	3	10	16
Front Passenger Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Front Center Seat*			Max			
			Mid			
			Min			
Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Non-Struck Side Rear Seat	Fixed	Fixed	Max			
			Mid			
			Min			
Rear Center Seat*	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 KIA Sportage 5 Door SUV

NHTSA No.: O20244215

Test Program: NCAP Side Pole Impact Test

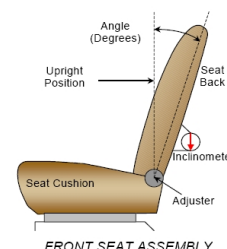
Test Date: 03/12/2024

SEAT FORE / AFT POSITION

Seat	Total Fore / Aft Travel		Test Position from Forward most Position	
	mm	Detents*	mm	Detents*
Driver Seat	240	Power	0	Power
Front Passenger Seat	240	38 (0-37)	0	0
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.



Seat	Total Seat Back Angle Range		Test Position from Most Upright	
	Degrees	Detents*	Degrees	Detents*
Driver Seat w/Seated Dummy	62.4	Power	-11.1	Power
Front Passenger Seat	60.2	31 (0-30)	-11.5	4
Front Center Seat				
Struck Side Rear Seat	26.5	14 (0-13)	2.5	0
Non-Struck Side Rear Seat	26.5	14 (0-13)	2.5	0
Rear Center Seat	26.5	14 (0-13)	2.5	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	6 (0-5)	Lowest

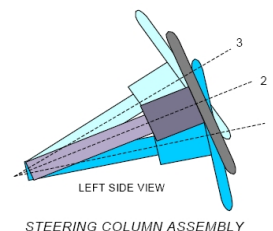
DATA SHEET NO. 2 ... (CONTINUED)
SEAT, SEAT BELT, STEERING WHEEL ADJUSTMENT AND FUEL SYSTEMS DATA

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024

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.

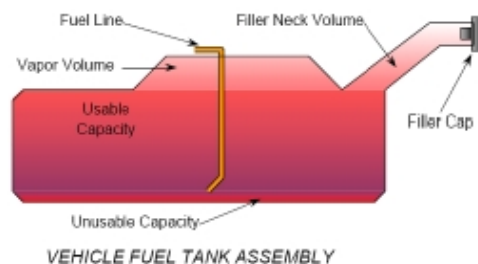


	Degrees	Fore / Aft Position (mm)
Lowermost - Position No. 1	23.3	
Geometric center - Position No. 2	25.7	
Uppermost - Position No. 3	28	
Telescoping Steering Wheel Travel		56
Test Position	25.7	28

FUEL PUMP

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

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



FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank" - see Form No. 1	54.1
Usable Capacity of "Optional Tank" - see Form No. 1	N/A
Usable Capacity of "Standard Tank" - see Owner's Manual	54.1
Usable Capacity of "Optional Tank" - see Owner's Manual	N/A
93% of Usable Capacity	50.3
Actual Amount of Solvent Used in Test	50.3
1/3 of Usable Capacity	18.0

Is the Actual Amount of Solvent Used in the test equal to 93% $\pm$ 1% of the Usable

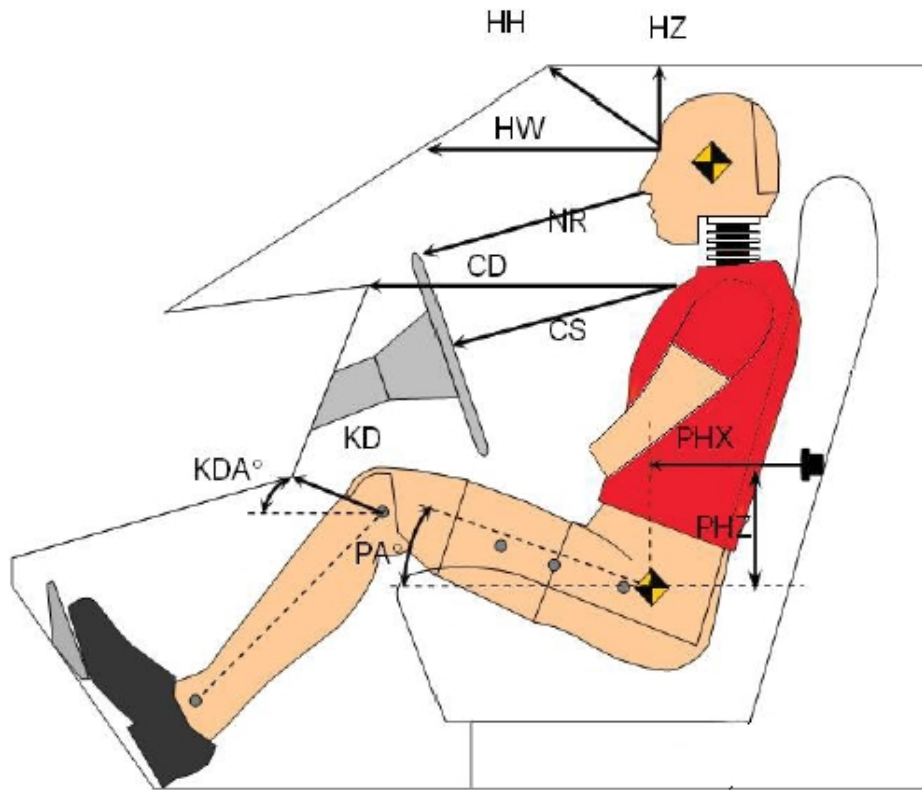
Capacity stated in Form No. 1?

☒ Yes ☐ No

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024



Left Side View

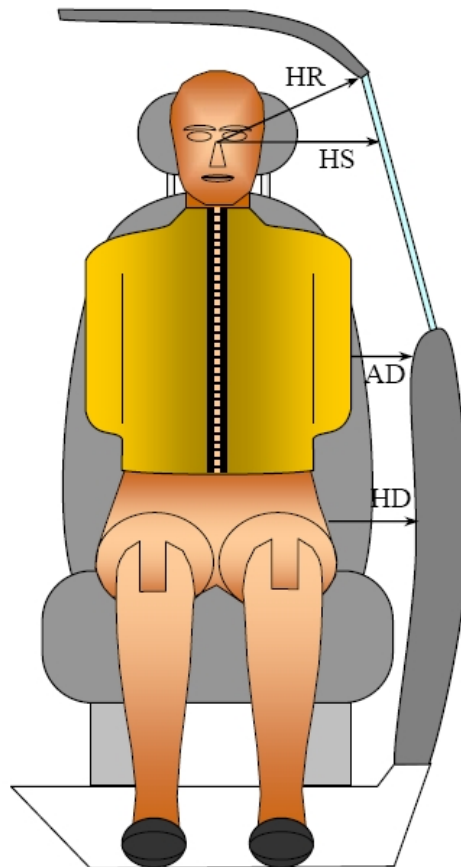
DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

Driver Code	Description	Driver (Serial No. 300)	
		Length (mm)	Angle (°)
HH	Head to Header	280	
HW	Head to Windshield	619	
HZ	Head to Roof Liner	197	
NR	Nose to Rim	256	
CD	Chest to Dash	471	
CS	Chest to Steering Wheel	185	
KD(L) / KDA(L)°	Left Knee to Dash	108	36.1
KD(R) / KDA(R)°	Right Knee to Dash	86	31.0
PAX°	Pelvic Tilt Angle (X-Axis)		18.8
PAY°	Pelvic Tilt Angle (Y-Axis)		0.1
PHX	Hip Point to Striker (X-Axis)	321	
PHZ	Hip Point to Striker (Z-Axis)	228	

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2024 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024



FRONT VIEW OF DUMMY

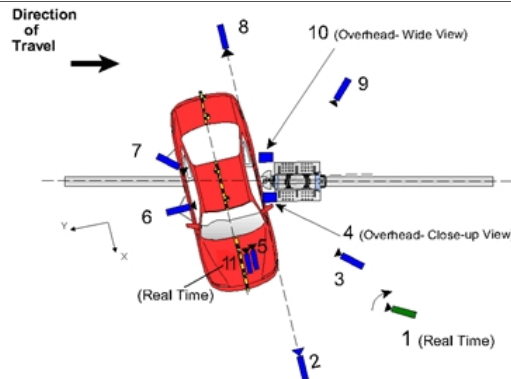
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Measurement Description	Units	Driver – Length (Serial No. 300)
HR	Head to Side Header	mm	252
HS	Head to Side Window	mm	378
AD	Arm to Door	mm	180
HD	H-Point to Door	mm	234

DATA SHEET NO. 5 CAMERA AND INSTRUMENTATION DATA

Test Vehicle: 2024 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024



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	60
2	Front ground level - impact view	7216	-183	-1430	28	1000
3	Impact side 45° - forward pole view	4884	1026	-1504	24	1000
4	Overhead Close-up view of impact	0	0	-8992	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	-8313	-184	-1471	28	1000
9	Impact side 45° - rearward pole view	-6137	3544	-1531	24	1000
10	Overhead wide - view of impact	0	-231	-8992	16	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 75° angle to the rigid pole.

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

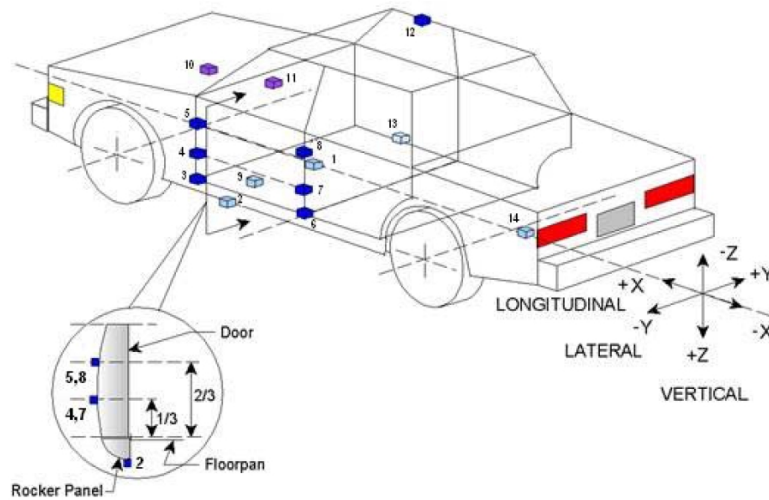
INSTRUMENTATION

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 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024



TEST VEHICLE ACCELEROMETER LOCATIONS

No.	Accelerometer Location	Coordinates (mm)		
		X	Y	Z
1	Vehicle CG	2826	3	-315
2	Left Floor Sill	2812	-663	62
3	A-Pillar Sill	3195	-661	62
4	A-Pillar Low	3236	-644	-182
5	A-Pillar Mid	3159	-653	-657
6	B-Pillar Sill	2166	-642	57
7	B-Pillar Low	2184	-682	-353
8	B-Pillar Mid	2151	-656	-653
9	Driver Seat Track	2502	-563	19
10	Engine Top	3959	381	-415
11	Firewall	3500	93	-238
12	Right Roof	2237	582	-1136
13	Right Floor Sill	2806	669	62
14	Rear Floor Pan	1027	1	0

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 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024

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 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024

TEST DUMMY INFORMATION AND CONTACT POINTS

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

POST-TEST DOOR PERFORMANCE

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

POST-TEST SEAT PERFORMANCE

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

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	A-Pillar, B-Pillar, and C-Pillars buckled
Sill Separation	340 mm of separation in impact zone
Windshield Damage	Cracked throughout, separated along A-pillar
Side Window Damage	Driver window shattered and fell out
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	No	N/A		
Side Airbag 1 - Curtain	Yes	Yes	Yes	Yes
Side Airbag 2 - Torso/Pelvis Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other				

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

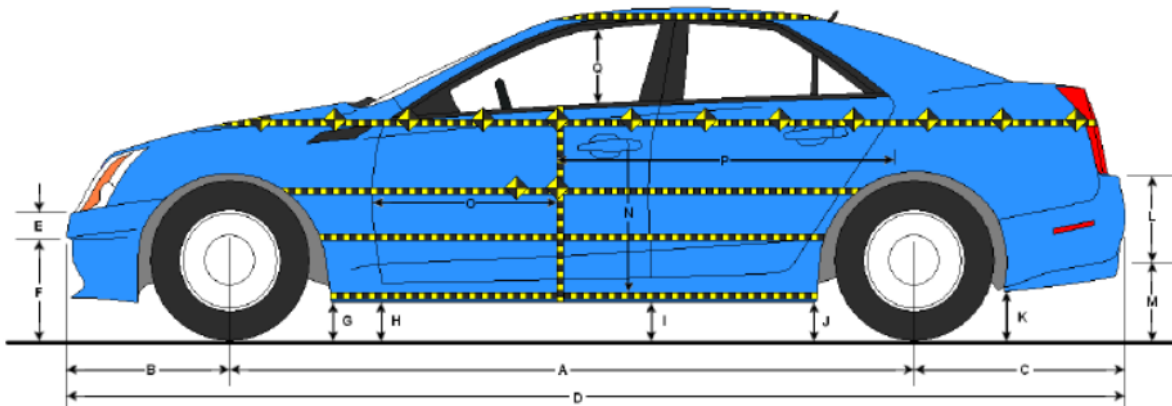
Measured Parameter	Units	Tolerance	Value
Vertical Impact Ref Line - Aft of Front Axle, Intended Impact Pt	mm		1107
Actual Impact Point - Aft of Front Axle	mm		1114
Horizontal Offset (+ forward / - rearward)	mm	+/- 38*	-7
Angle Between Vehicle's Longitudinal Centerline and Line of Forward Motion	deg	75 +/- 3	75
Trap No. 1 Velocity - Primary	kph	31.4 to 33.0	32.19
Trap No. 2 Velocity - Redundant	kph	31.4 to 33.0	32.31

*Of Intended Impact Point

DATA SHEET NO. 9
TEST VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2024 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024



LEFT SIDE VIEW

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

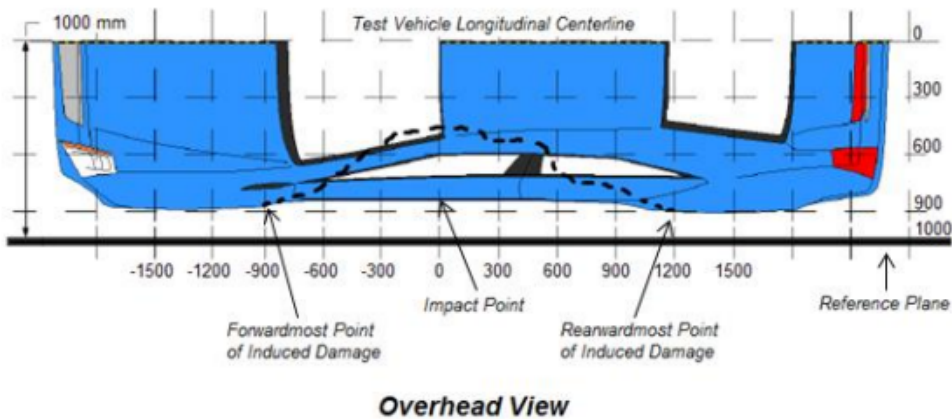
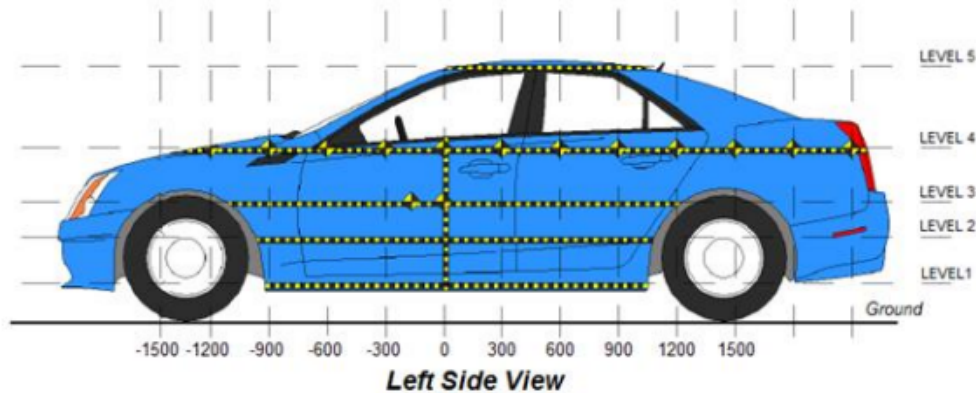
No.	Measurement Description	Pre-Test	Post-Test	Change
A	Vehicle Wheelbase	2758	2690	-68
B	Front Axle to FSOV	903	934	31
C	Rear Axle to RSOV	998	1005	7
D	Total Length at Centerline	4659	4629	-30
E	Front Bumper Thickness	145	145	0
F	Front Bumper Bottom to Ground	480	504	24
G	Sill Height at Front Wheel Well	256	236	-20
H	Sill Height at Front Door Leading Edge	257	249	-8
I	Sill Height at B Pillar	250	258	8
J1	Sill Height at Rear Wheel Well	246	273	27
J2	Pinch Weld Height at Rear Wheel Well	243	270	27
K	Sill Height Aft of Rear Wheel Well	279	286	7
L	Rear Bumper Thickness	158	158	0
M	Rear Bumper Bottom to Ground	464	455	-9
N	Sill Height to Bottom of Front Window Sill	899	902	3
O	Front Door Leading Edge to Impact CL	585	516	-69
P	Rear Door Trailing Edge to Impact CL	1530	1461	-69
Q	Front Window Opening	401	397	-4
R	Right Side Length	4570	4564	-6
S	Left Side Length	4570	4509	-61
T	Vehicle Width at B-Pillars	1841	1768	-73
U	Front Wheel Track width	1608	1610	2
V	Rear Wheel Track Width	1620	1624	4

* All measurements in mm with tolerance of ± 3 mm

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024



MAXIMUM EXTERIOR CRUSH MEASUREMENTS

Level	Measurement Description	Units	Height Above Ground	Maximum Exterior Static Crush	Distance from Impact
1	Sill Top	mm	376	251	0
2	Driver H-Point	mm	705	318	0
3	Mid-Door	mm	789	328	150
4	Window Sill	mm	1097	270	150
5	Window Top	mm	1595	99	150

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 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024

EXTERIOR CRUSH MEASUREMENTS AT EACH LEVEL

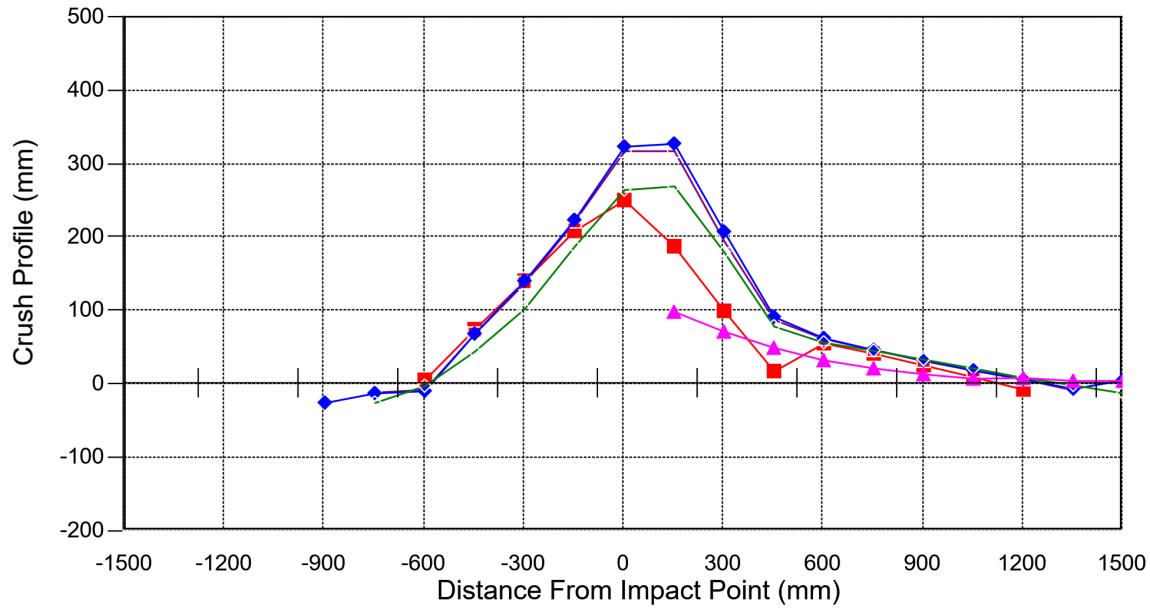
	Pre-Test					Post-Test					Crush				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500															
-1350															
-1200															
-1050															
-900			925					950					-25		
-750		923	917	798			934	929	823			-11	-12	-25	
-600	898	905	903	809		892	912	912	811		6	-7	-9	-2	
-450	897	899	903	856		822	830	834	811		75	69	69	45	
-300	895	899	905	825		754	761	764	722		141	138	141	103	
-150	894	902	907	832		685	680	683	644		209	222	224	188	
0	894	903	909	841		643	585	585	576		251	318	324	265	
150	895	904	909	846	602	707	586	581	576	503	188	318	328	270	99
300	896	904	910	850	614	796	709	702	670	542	100	195	208	180	72
450	899	902	909	853	617	881	814	817	774	567	18	88	92	79	50
600	900	901	907	855	616	844	839	844	798	583	56	62	63	57	33
750	902	902	904	854	612	860	855	857	808	590	42	47	47	46	22
900	901	910	904	851	608	875	878	871	817	594	26	32	33	34	14
1050	900	921	913	846	601	890	902	894	824	593	10	19	19	22	8
1200	904	933	927	853	592	911	926	920	844	583	-7	7	7	9	9
1350		933	933	868	577		941	939	869	572		-8	-6	-1	5
1500			935	880	557			929	892	552			6	-12	5

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 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024



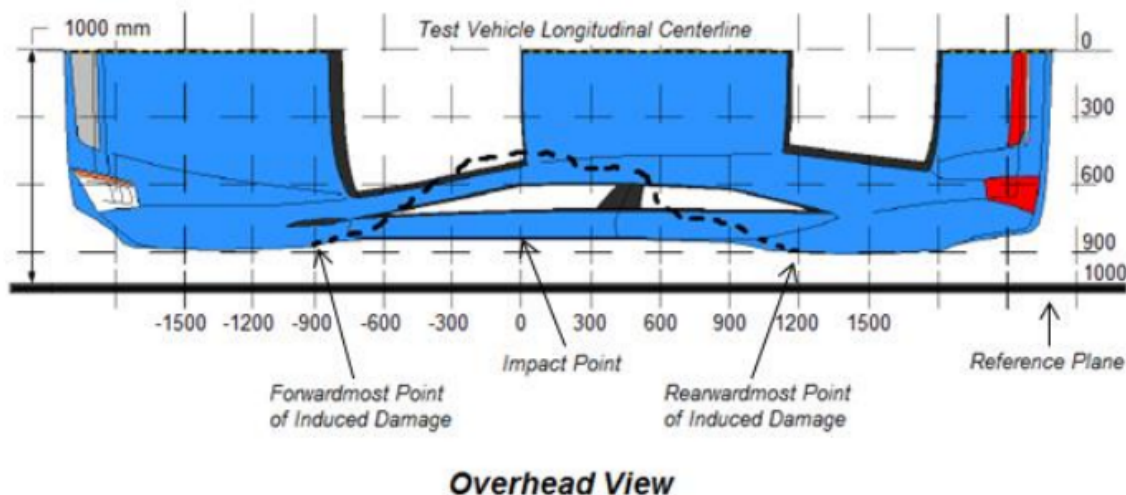
Vehicle Exterior Crush Measurements - Visual Representation

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
 Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
 Test Date: 03/12/2024

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



VEHICLE DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Post-Test (mm)	Pre-Test (mm)	Crush (mm)
1	-900	3	50	75	-25
2	-420	3	180	97	83
3	60	3	417	91	326
4	540	3	167	92	75
5	1020	3	111	89	22
6	1500	3	71	65	6

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024

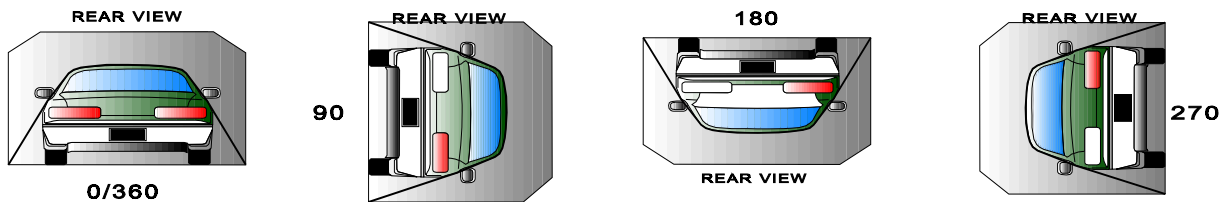
Test Time: 10:12 AM

Temperature: 21 °C

- A. From impact until vehicle motion ceases: 0 oz
(Maximum allowable is 1 oz.)
B. For the 5-minute period after motion ceases: 0 oz
(Maximum allowable is 5 oz.)
C. For the following 25 minutes: 0 oz
(Maximum allowable is 1 oz.)

D. Spillage Detail:

No Spillage Occurred



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	68	300	368
90° to 180°	67	300	367
180° to 270°	62	300	362
270° to 360°	70	300	370

FMVSS 301 SPILLAGE TABLE

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

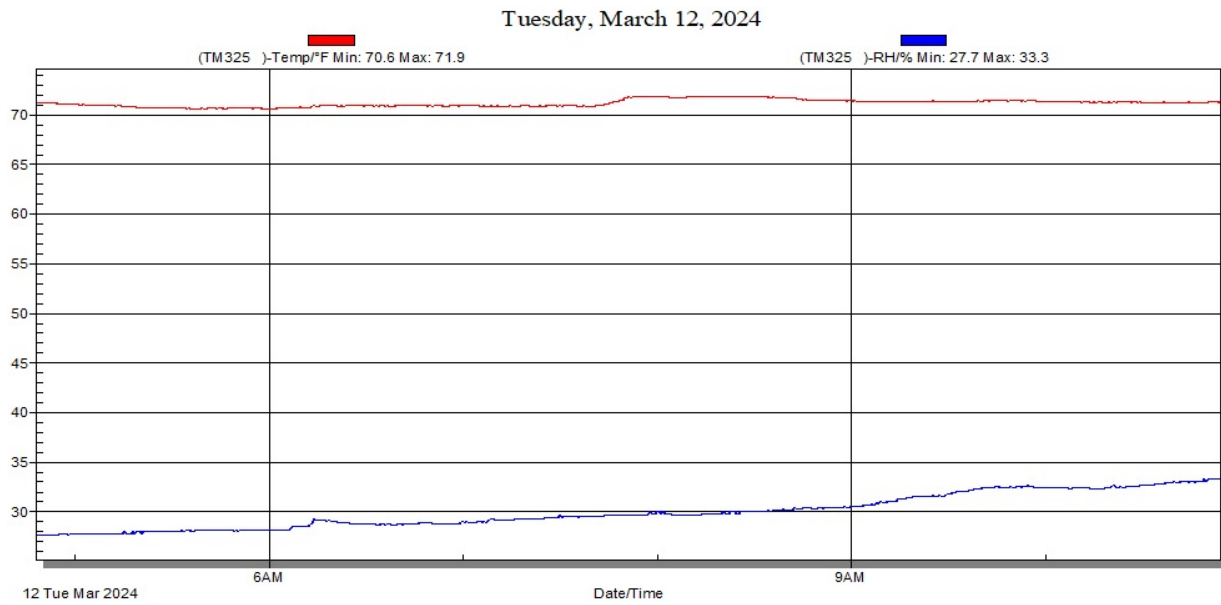
SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0° to 90°	No Spillage Occurred
90° to 180°	No Spillage Occurred
180° to 270°	No Spillage Occurred
270° to 360°	No Spillage Occurred

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

Test Vehicle: 2024 KIA Sportage 5 Door SUV
Test Program: NCAP Side Pole Impact Test

NHTSA No.: O20244215
Test Date: 03/12/2024



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

APPENDIX A
PHOTOGRAPHS

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



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

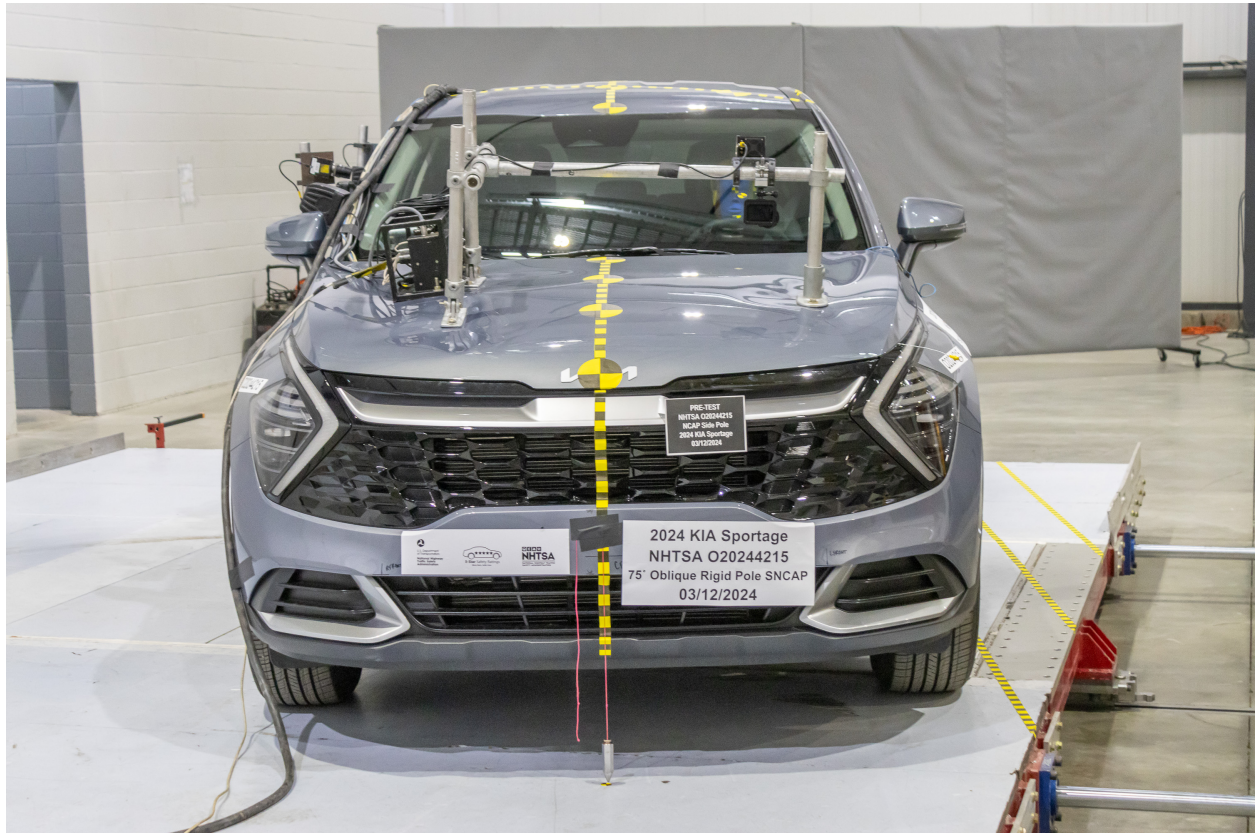


Figure A-3: Pre-Test Frontal View of Test Vehicle



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



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



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



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



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



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



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

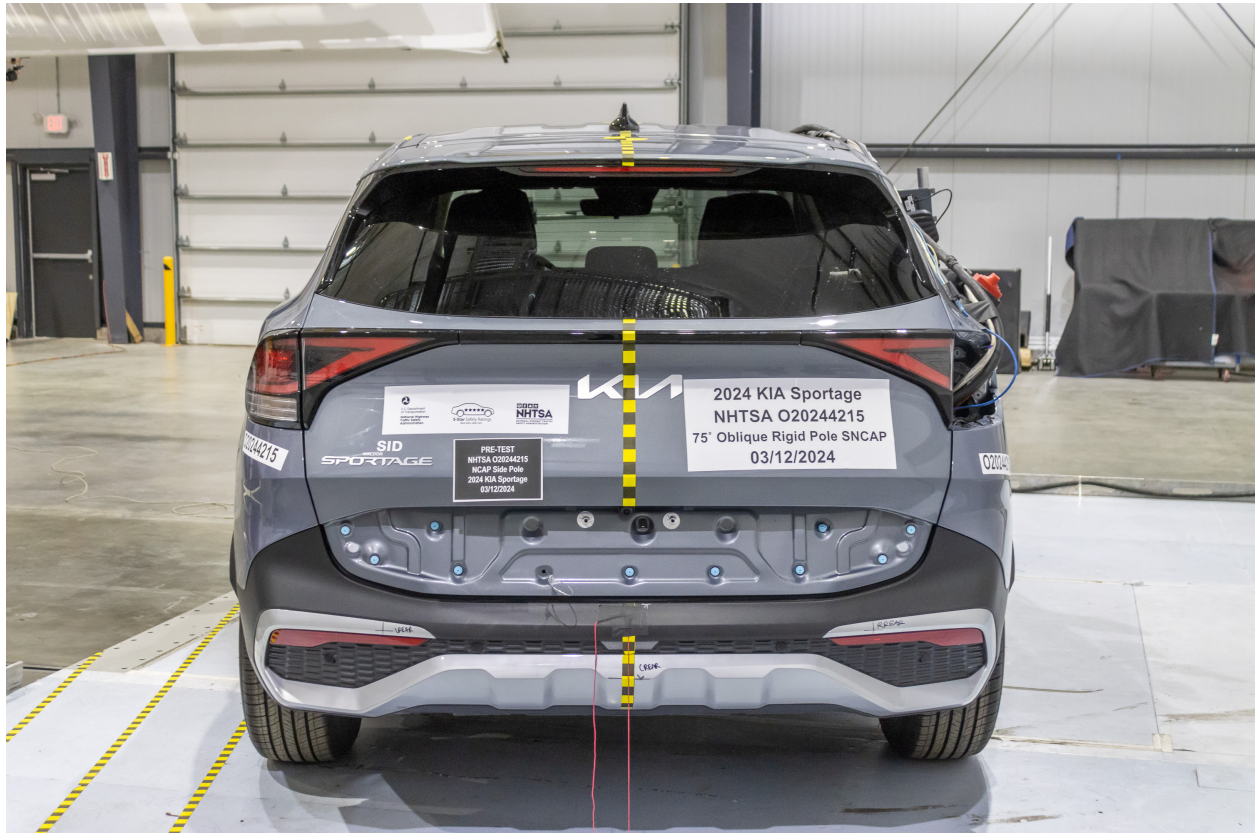


Figure A-11: Pre-Test Rear View of Test Vehicle

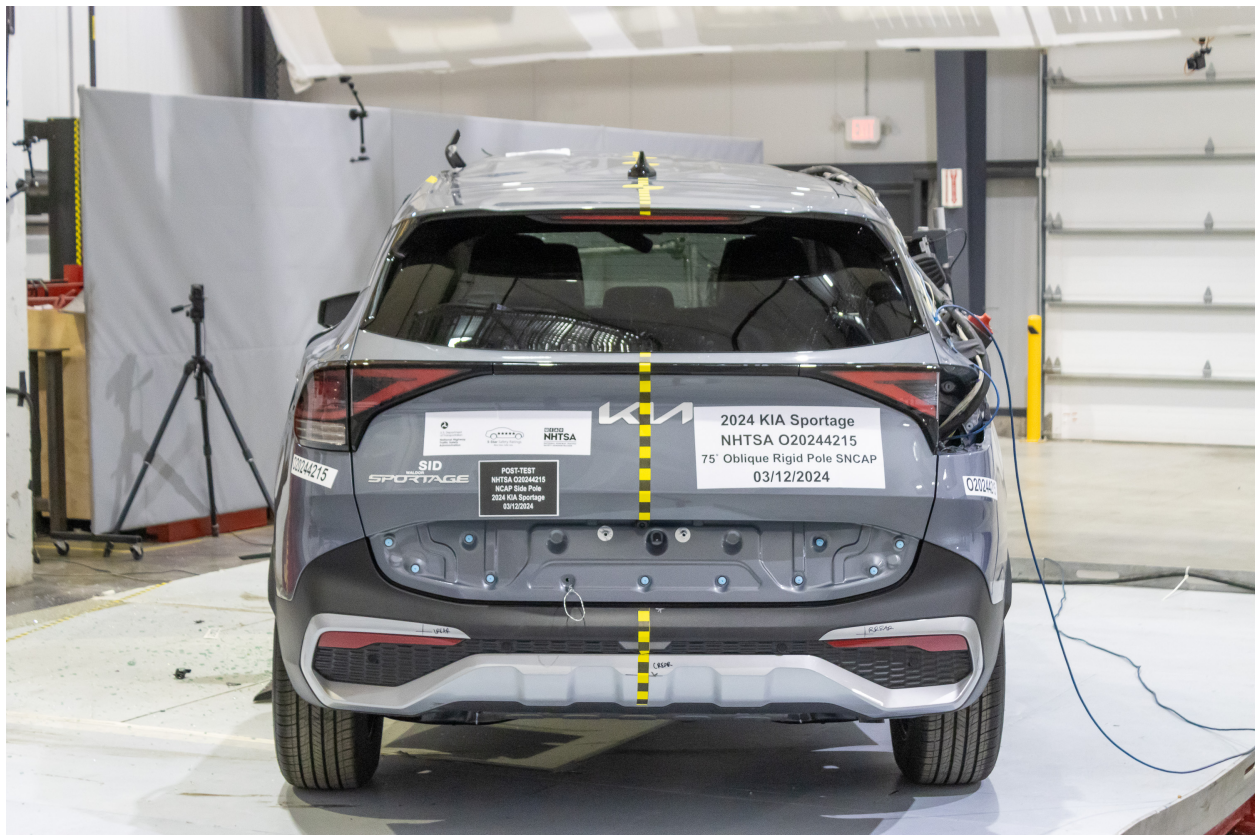


Figure A-12: Post-Test Rear View of Test Vehicle



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

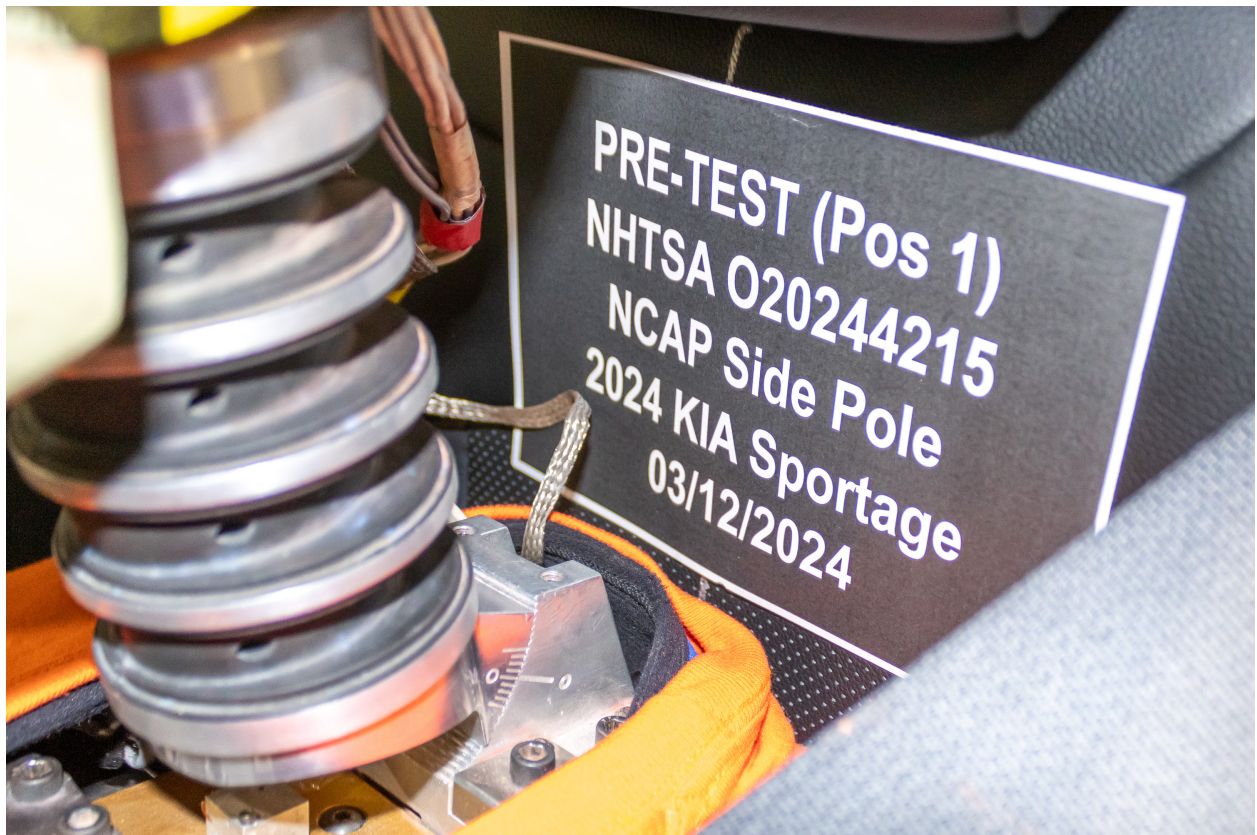


Figure A-30: Pre-Test Left Side View of Dummy's Neck Showing Position of Adjustable Neck Bracket



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



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



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



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



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

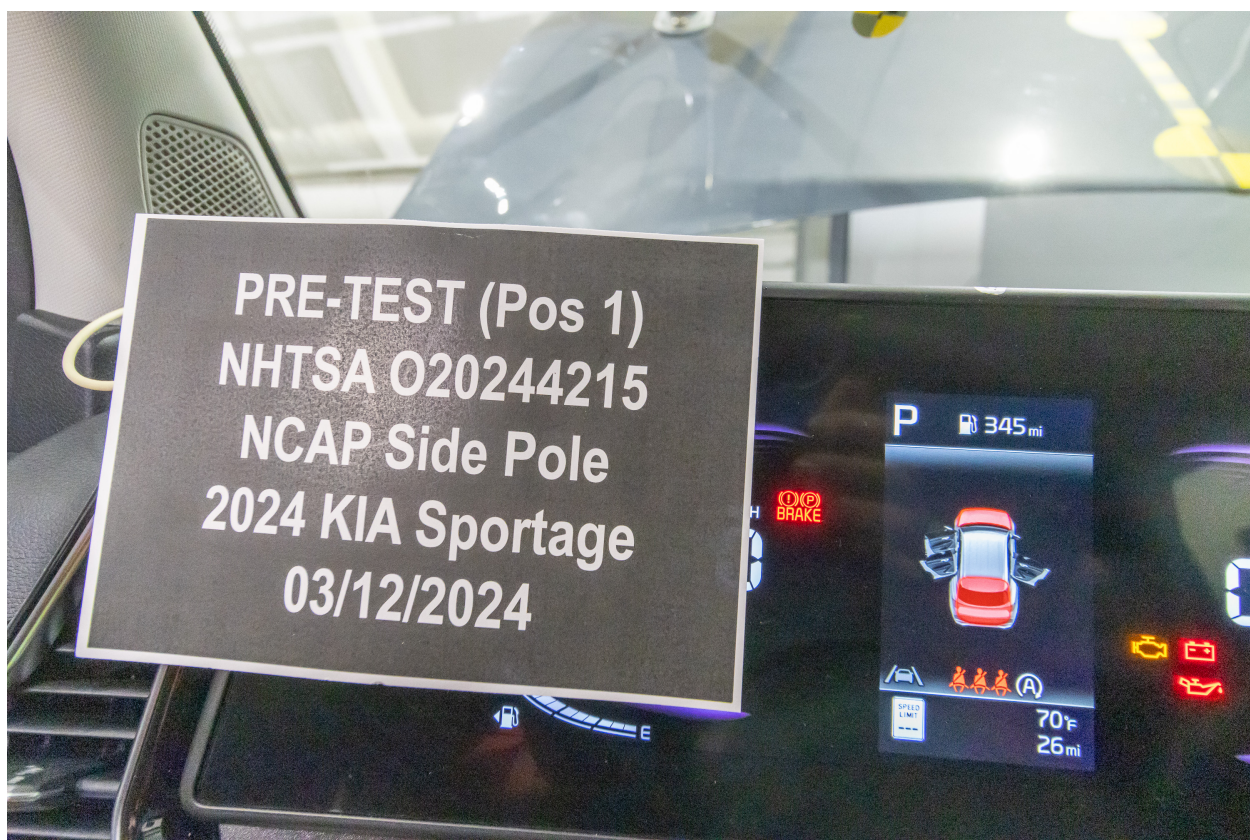


Figure A-36: Pre-Test View of Parking Brake



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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



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

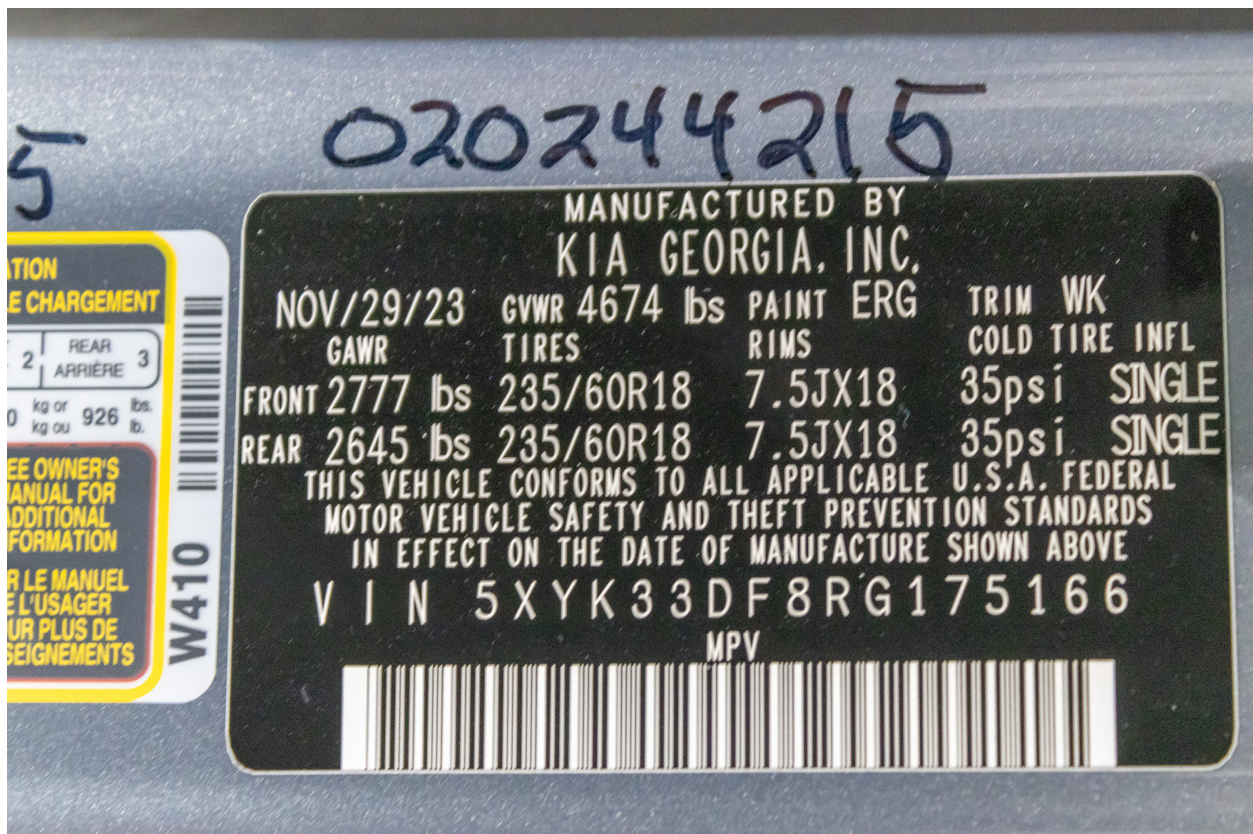


Figure A-57: Close-Up View of Vehicle's Certification Label

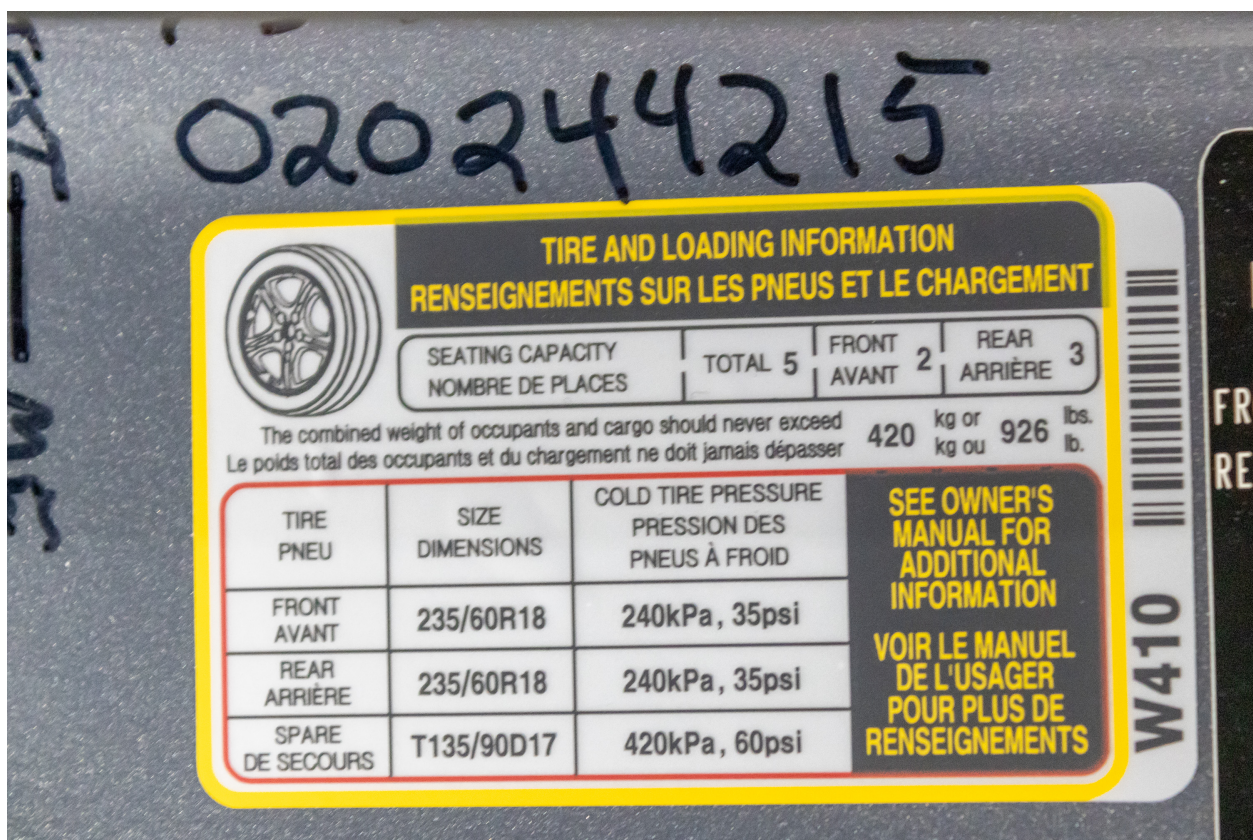


Figure A-58: Close-Up View of Vehicle's Tire Information Placard or Label

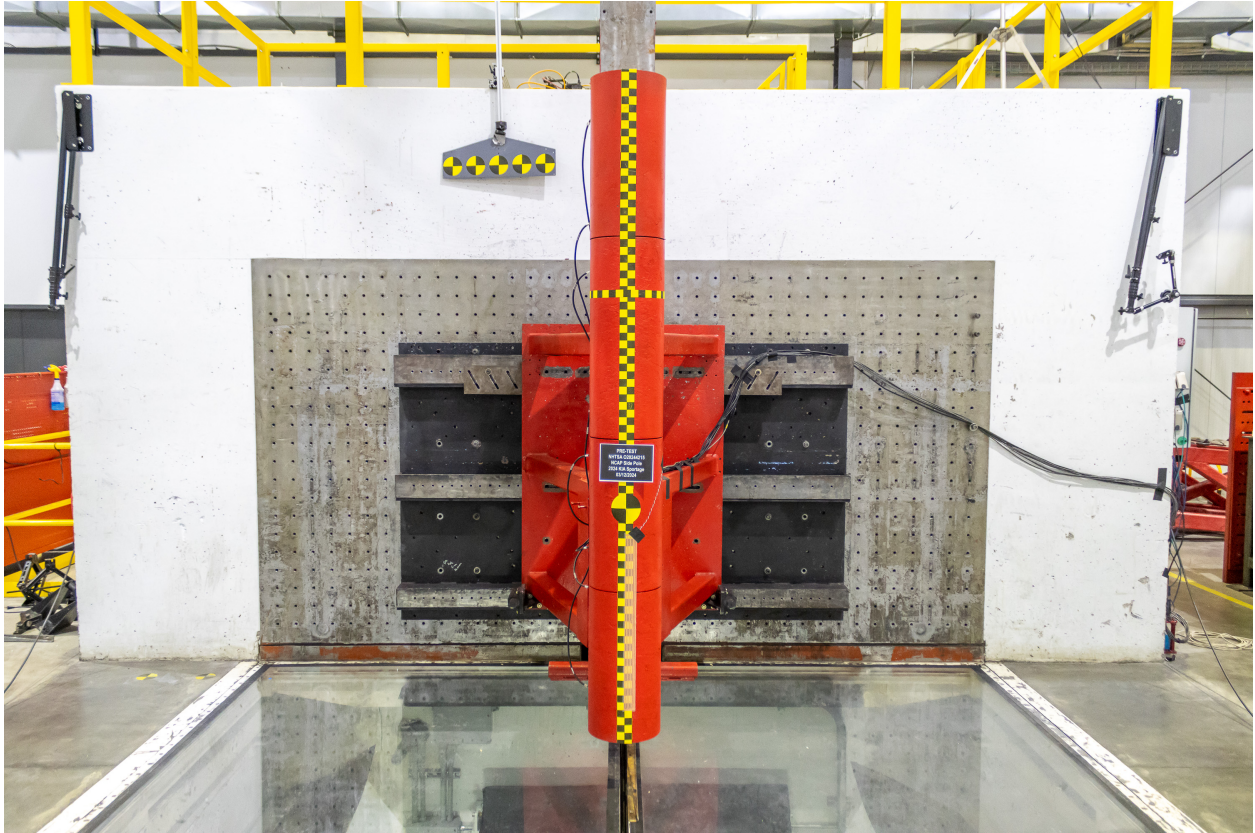


Figure A-59: Pre-Test Pole Barrier Front View



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

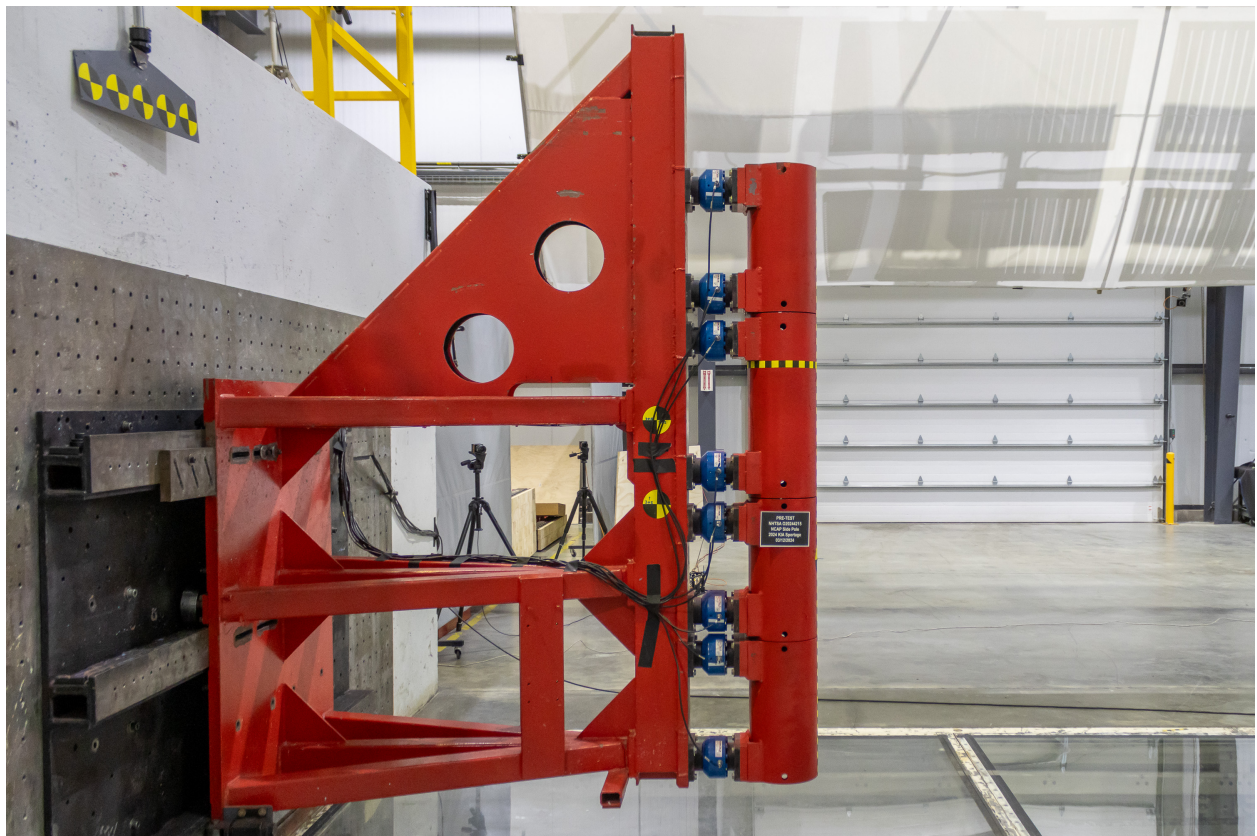


Figure A-61: Pre-Test Pole Barrier Side View

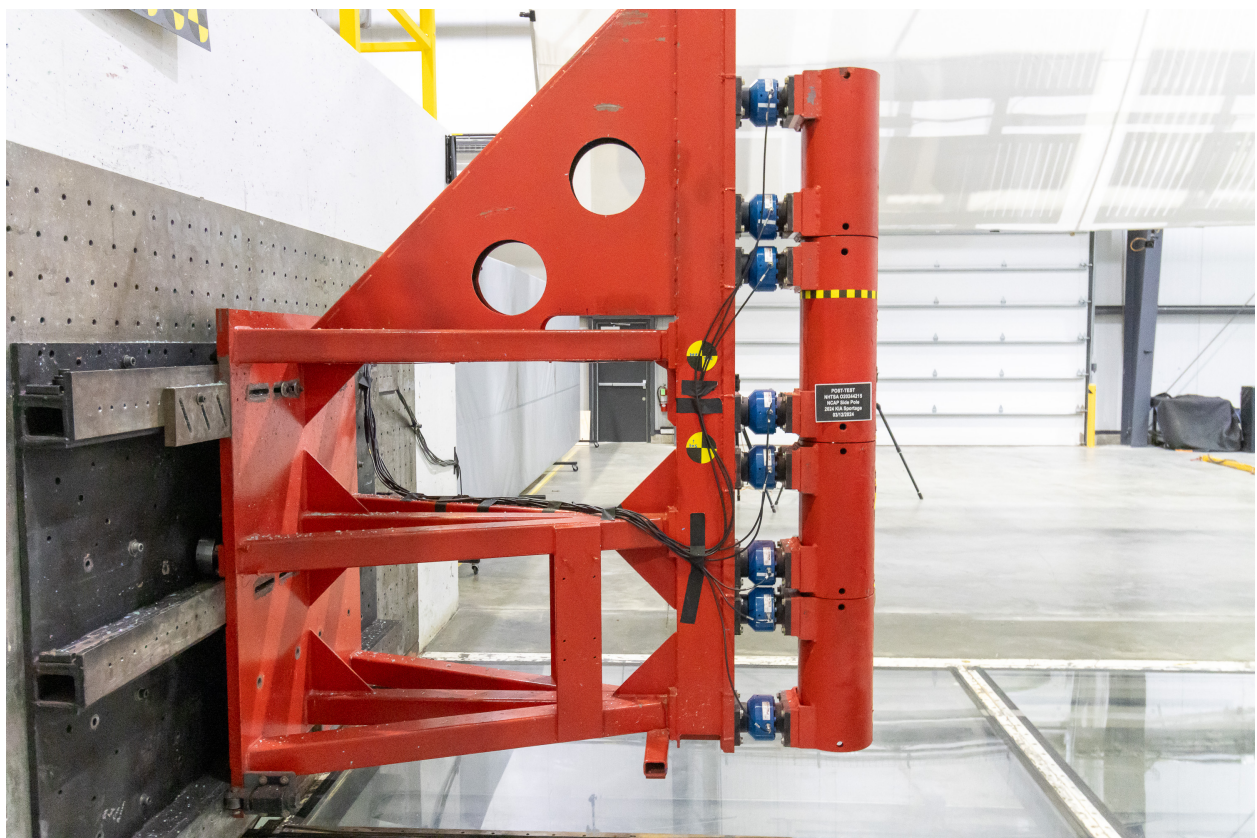


Figure A-62: Post-Test Pole Barrier Side View



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

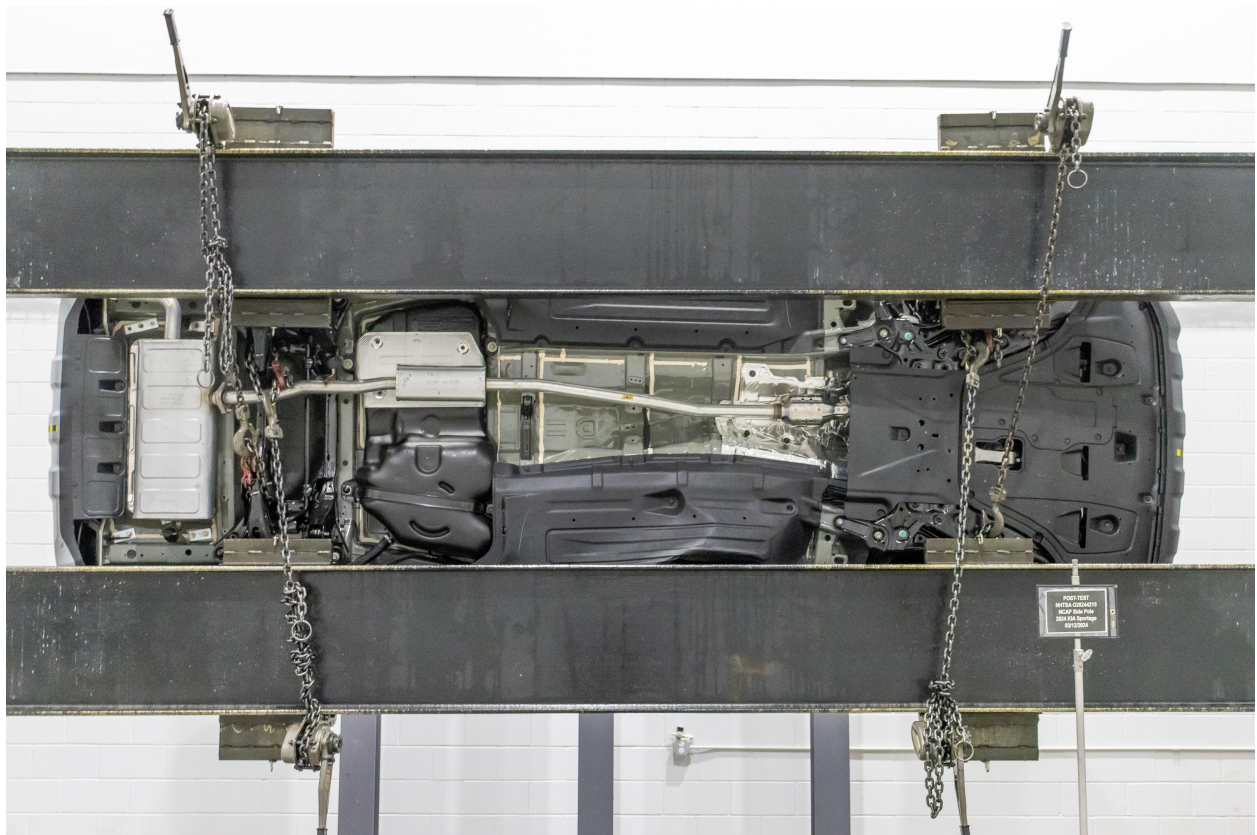


Figure A-66: FMVSS No. 301 Static Rollover 90 Degrees

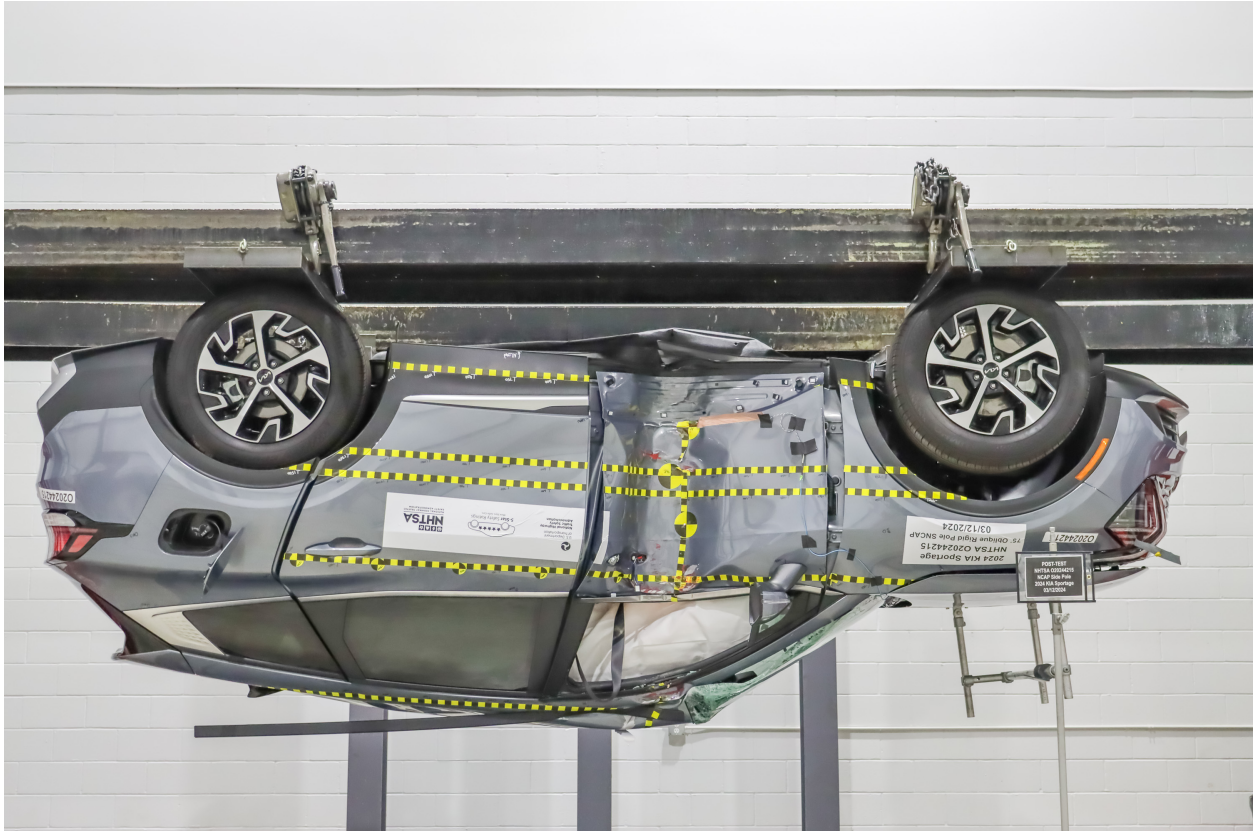


Figure A-67: FMVSS No. 301 Static Rollover 180 Degrees



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

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA TRACES

Table of Data Plots

Driver Dummy Instrumentation Plots

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

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)

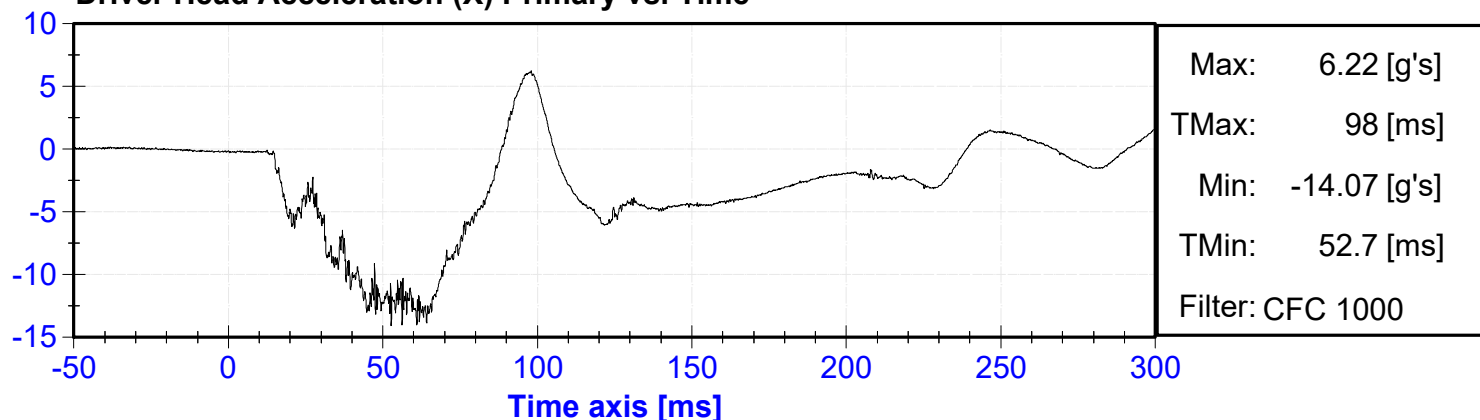
Vehicle Instrumentation Data

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)

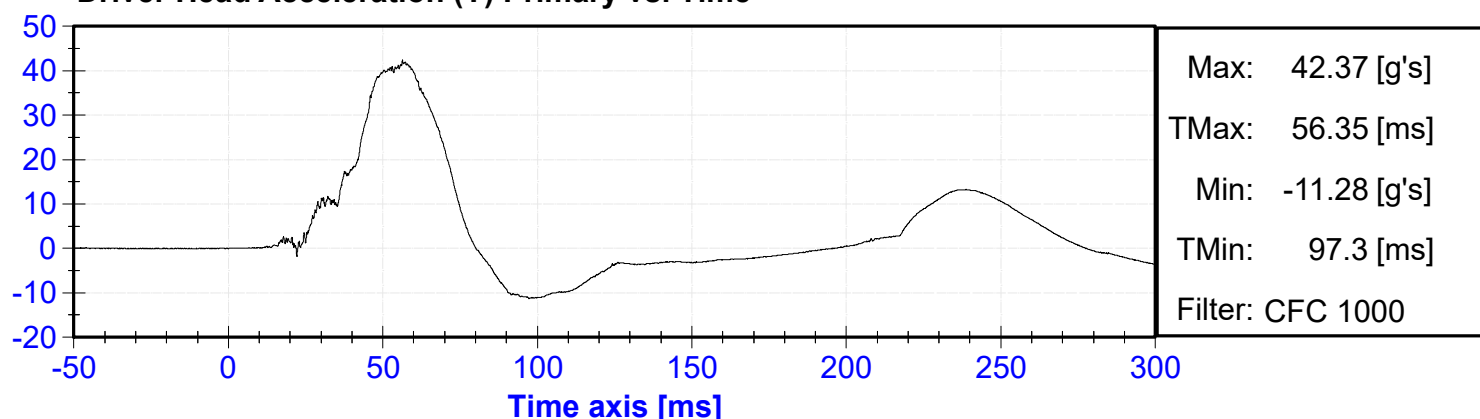
Pole Instrumentation Data

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)

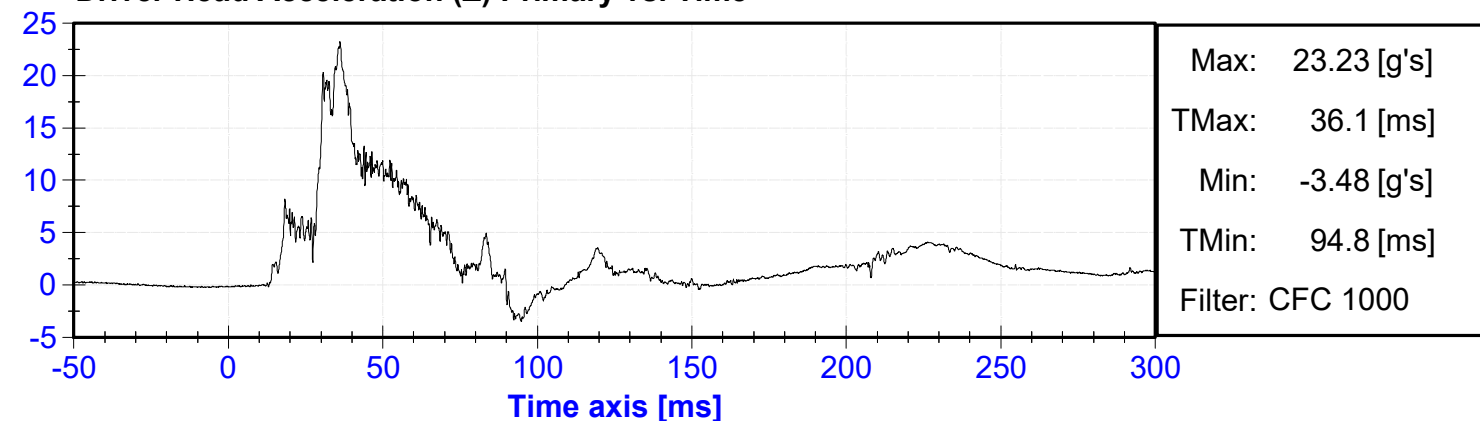
Driver Head Acceleration (X) Primary vs. Time



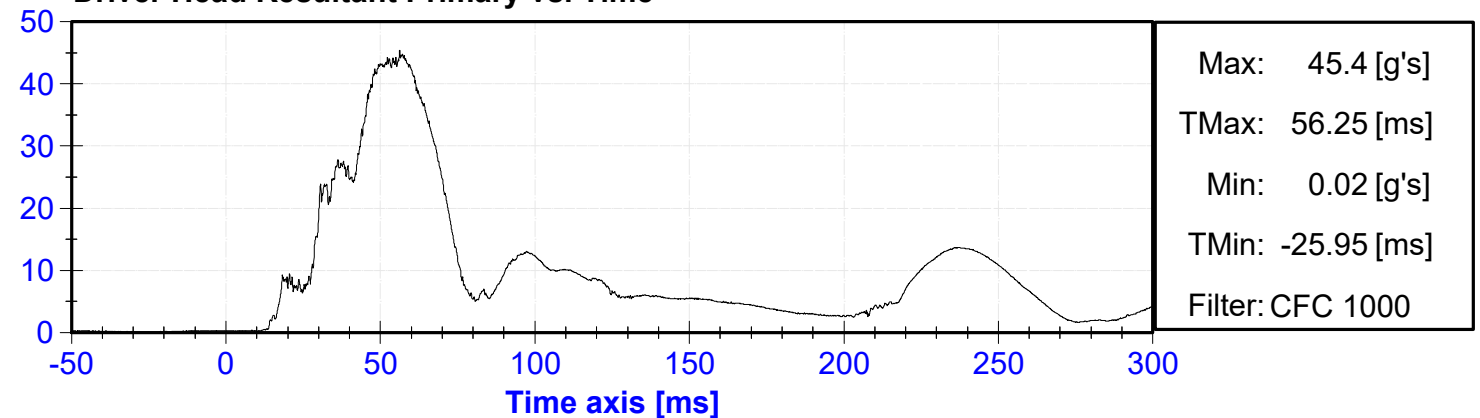
Driver Head Acceleration (Y) Primary vs. Time



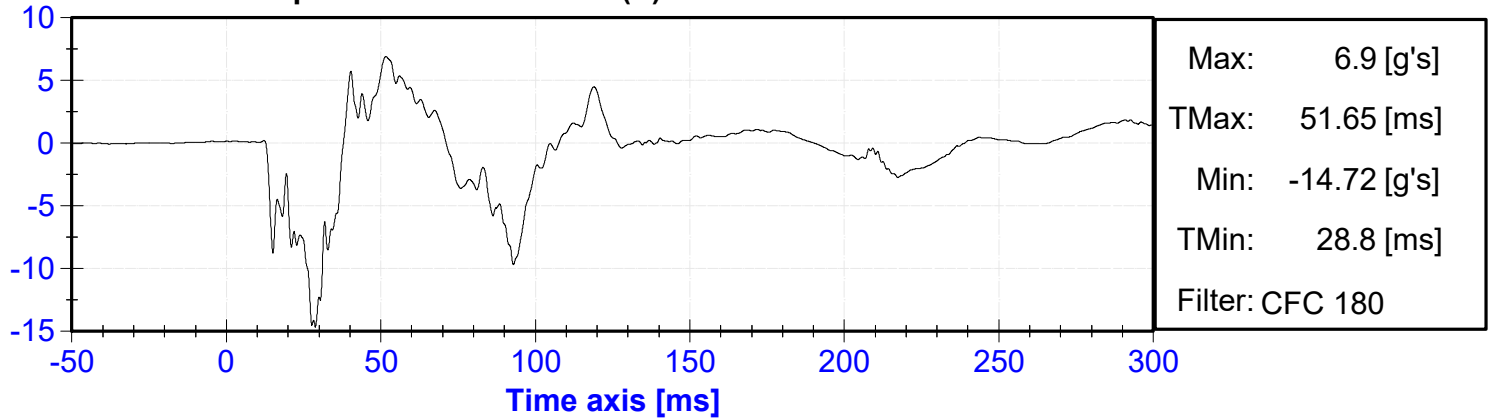
Driver Head Acceleration (Z) Primary vs. Time



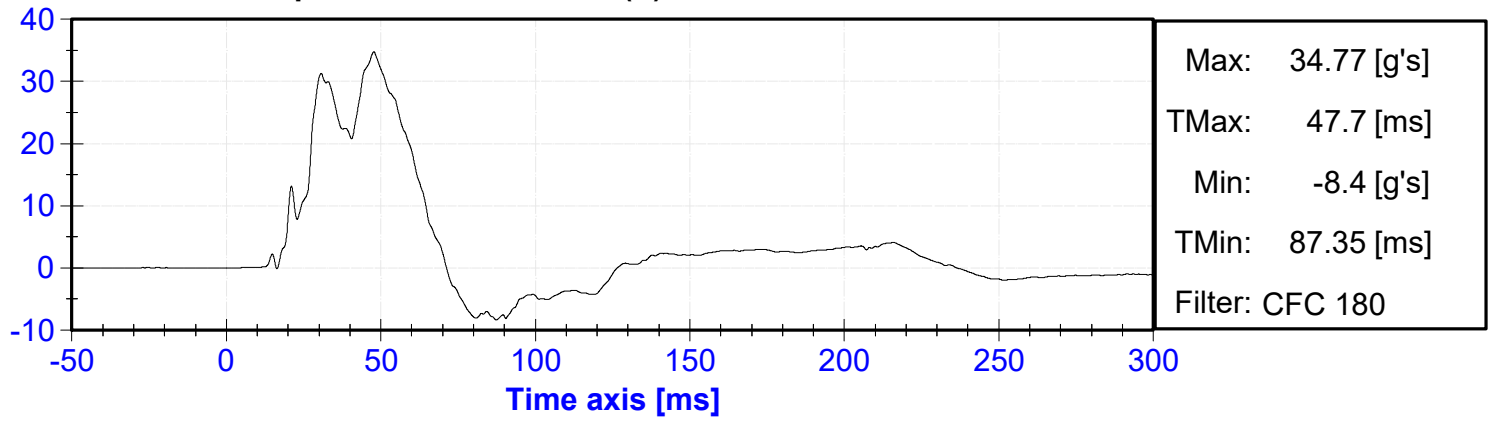
Driver Head Resultant Primary vs. Time



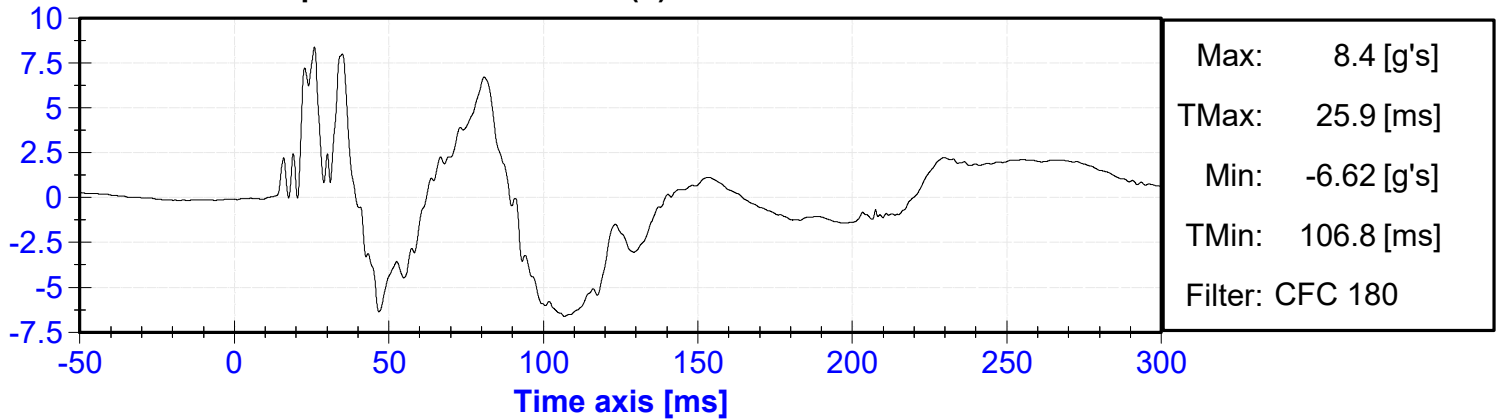
Driver Lower Spine T12 Acceleration (X) vs. Time



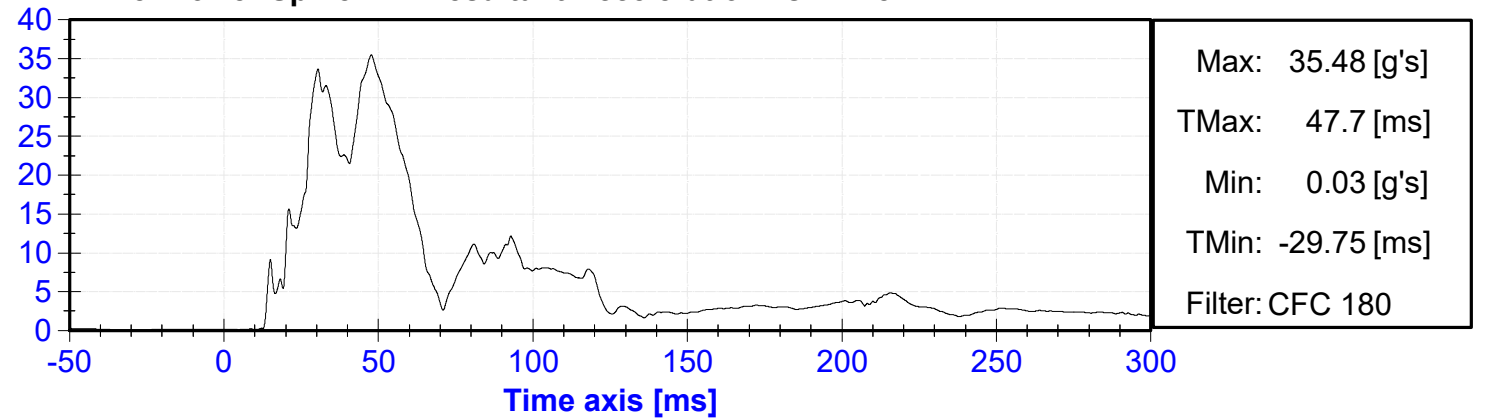
Driver Lower Spine T12 Acceleration (Y) vs. Time



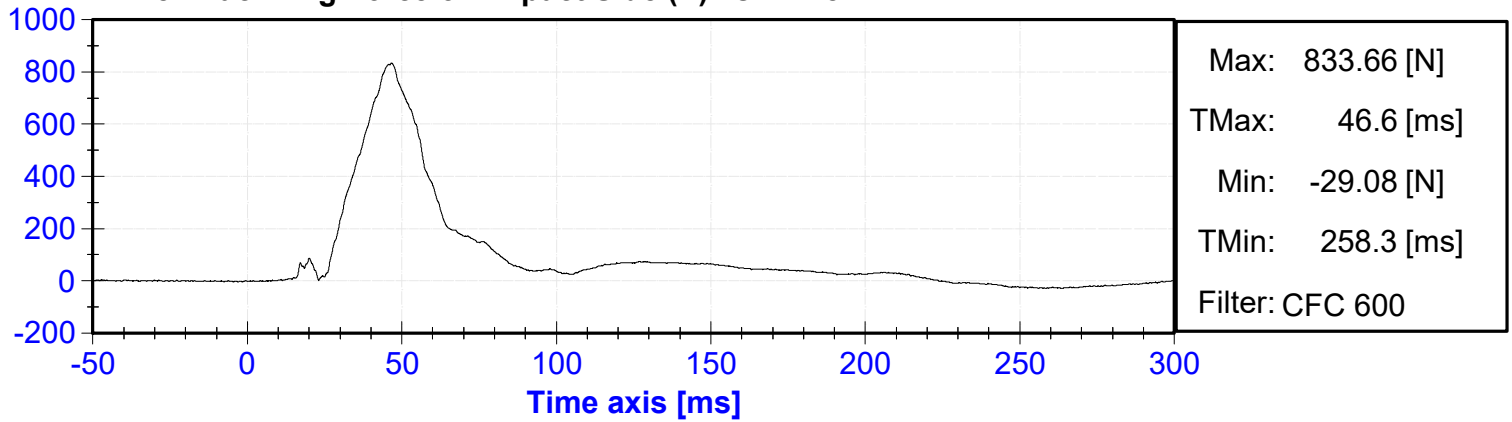
Driver Lower Spine T12 Acceleration (Z) vs. Time



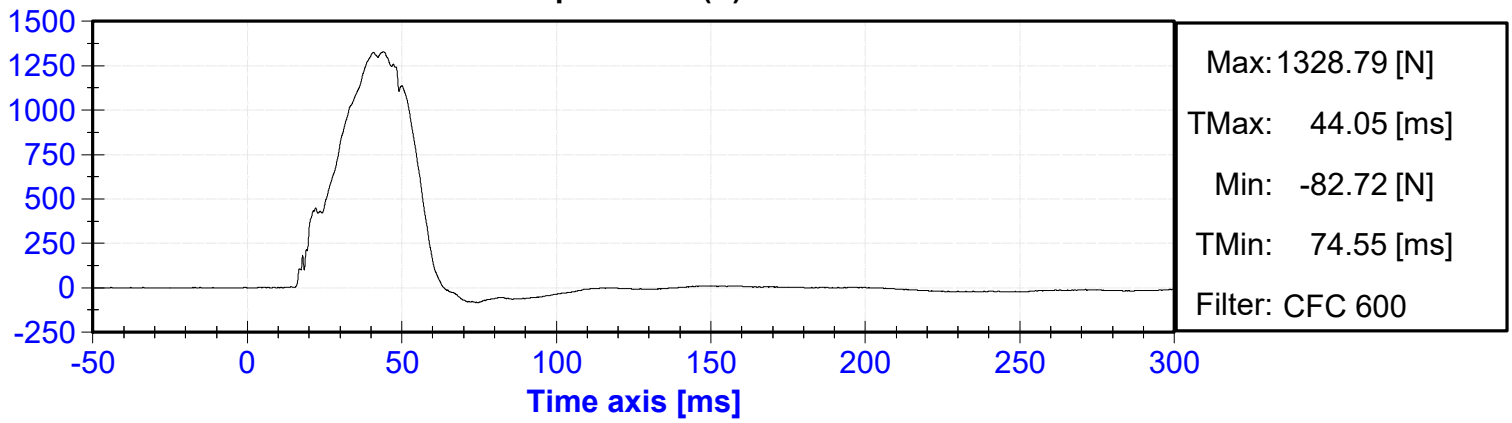
Driver Lower Spine T12 Resultant Acceleration vs. Time



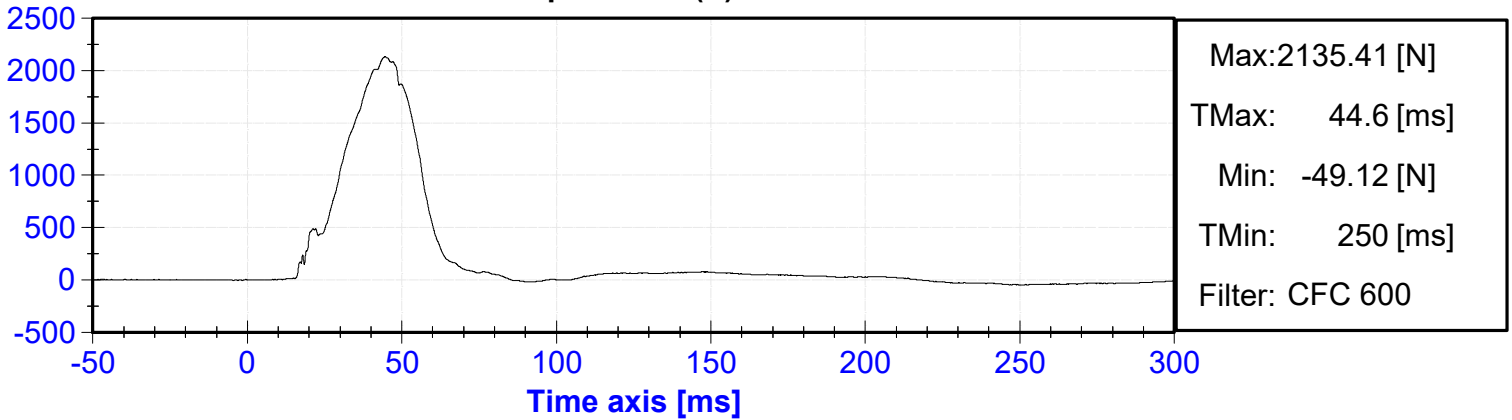
Driver Iliac Wing Force on Impact Side (Y) vs. Time



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)

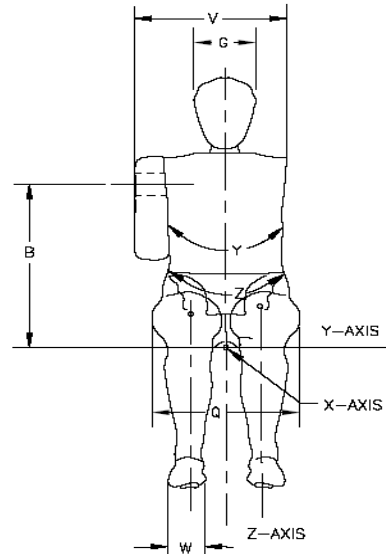
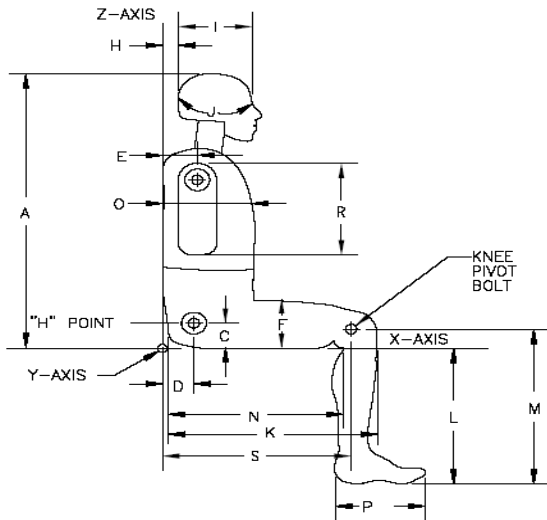


External Measurements - SID-IIs

Technician: K. Brogan

Date: 2/22/2024

Dummy Serial Number: 300



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	772	788	780	Pass
B	Shoulder Pivot Height	437	453	445	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	100	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	549	Pass
K	Buttock to Knee Length	514	540	530	Pass
L	Popliteal Height	343	369	356	Pass
M	Knee Pivot to floor height	392	409	400	Pass
N	Buttock Popliteal Length	416	442	434	Pass
O	Chest Depth w/o jacket	195	211	199	Pass
P	Foot Length	216	232	223	Pass
Q	Hip Breadth (w/pelvic plugs)	313	323	320	Pass
R	Arm Length	249	259	254	Pass
S	Knee Joint to seatback	477	493	488	Pass
V	Shoulder Width	341	357	351	Pass
W	Foot Width	78	94	86	Pass
Y	Chest Circumference w/jacket	851	881	877	Pass
Z	Waist Circumference	761	791	780	Pass

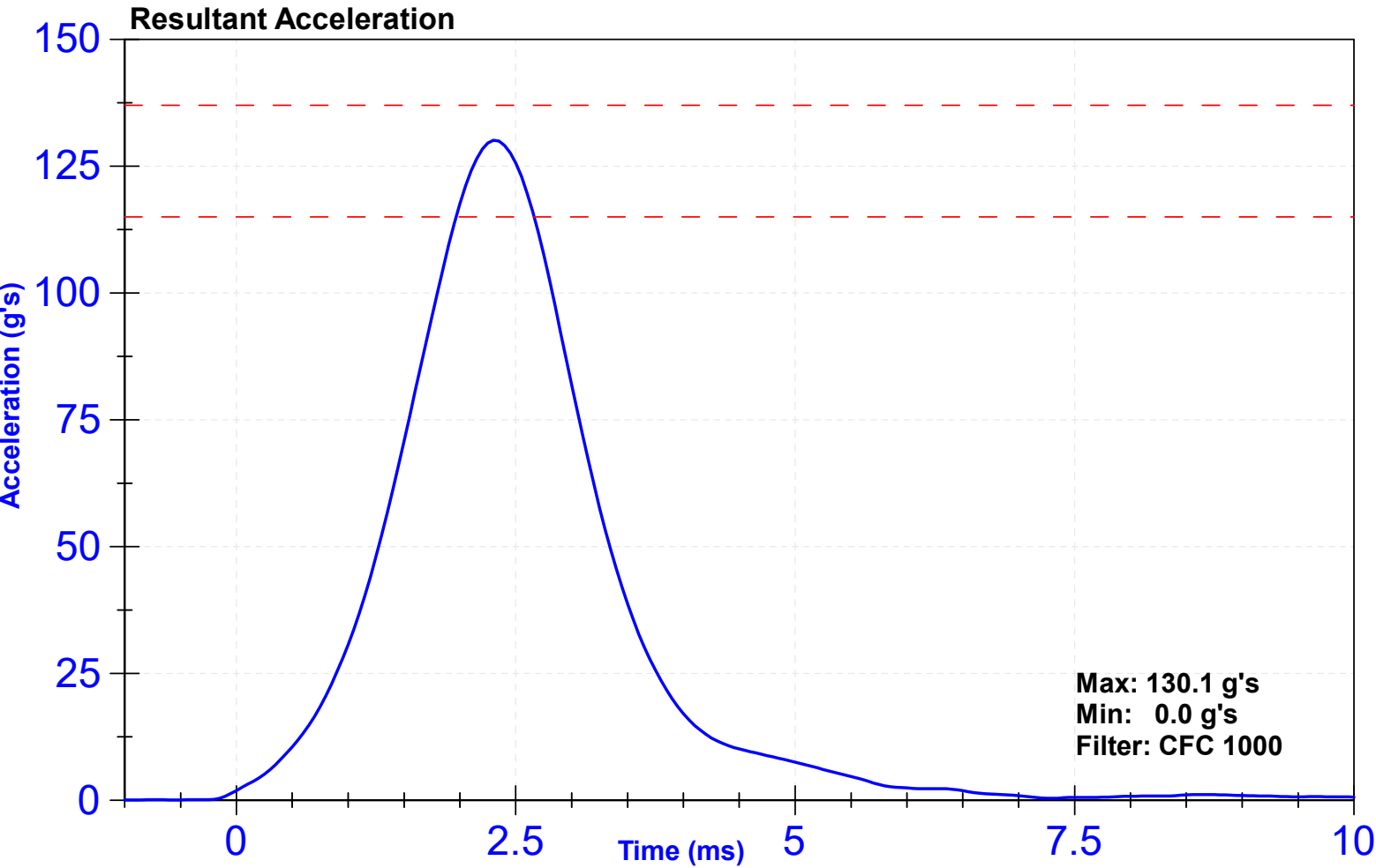
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

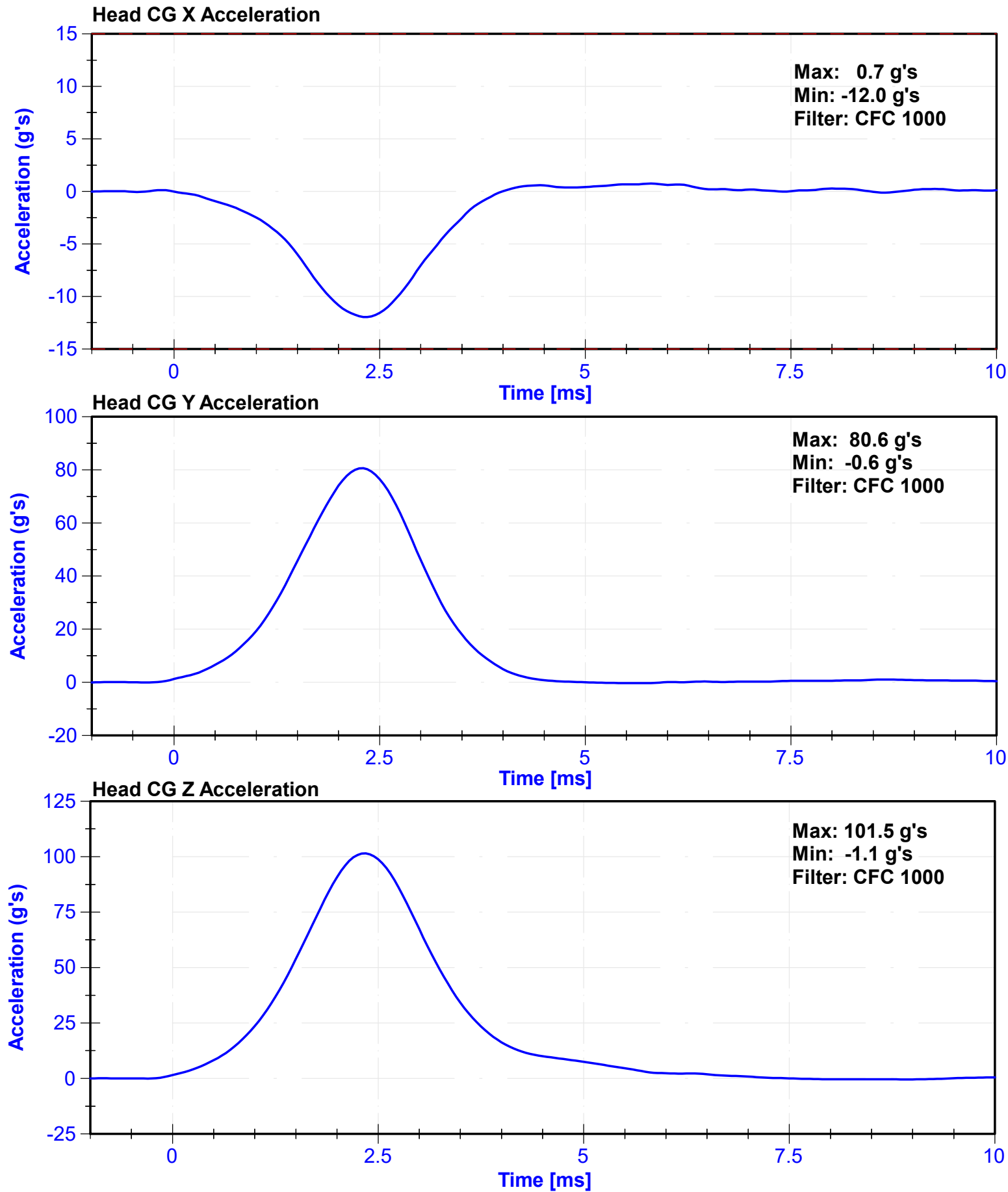
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	18	Pass
Resultant Acceleration	115	137	g's	130.1	Pass
Oscillation	0	15	%	1.7	Pass
Fore-Aft Acceleration	-15	15	g's	-12.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P59018	11/15/2023	5/13/2024
Y Accelerometer	Endevco	P79189	11/15/2023	5/13/2024
Z Accelerometer	Endevco	P79587	11/15/2023	5/13/2024





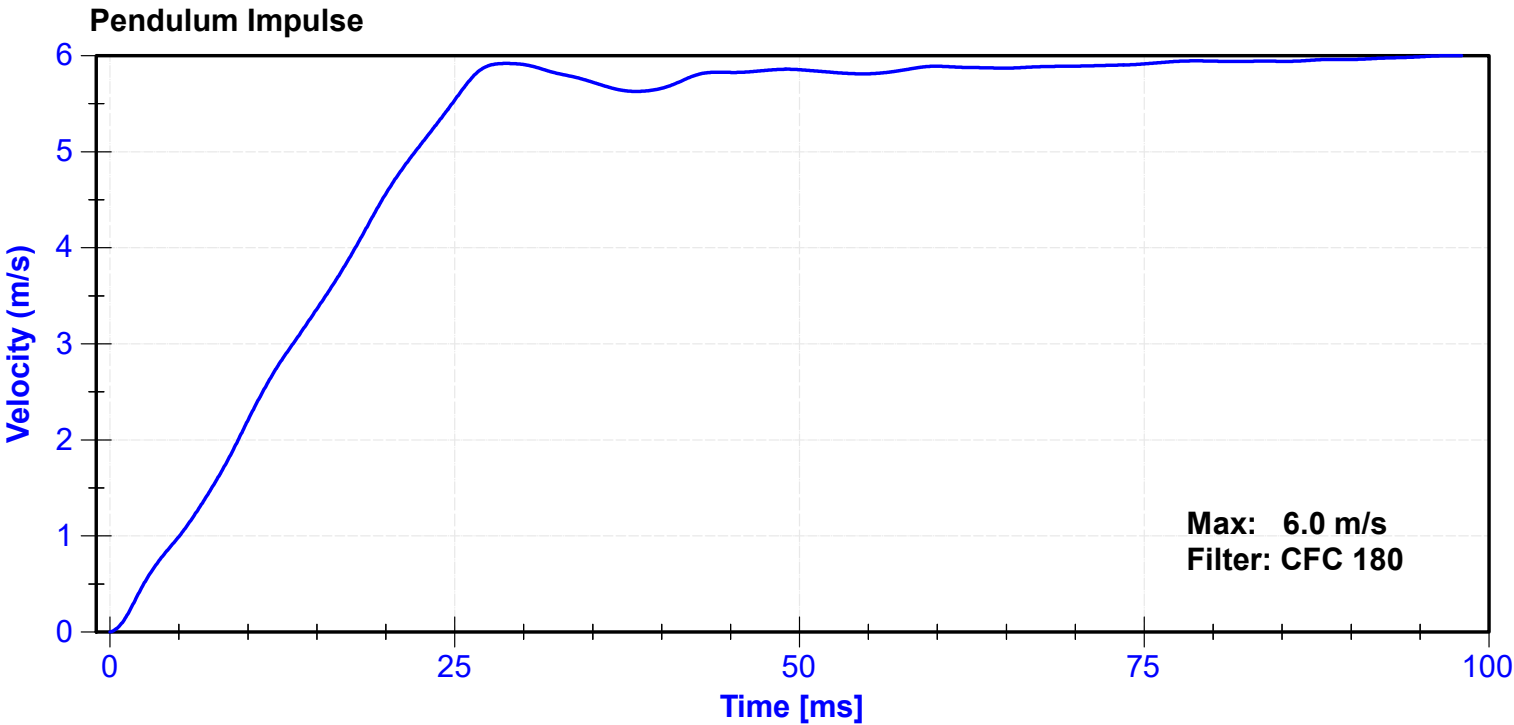
ATD Manufacturer	FTSS	Test Technician	J. Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

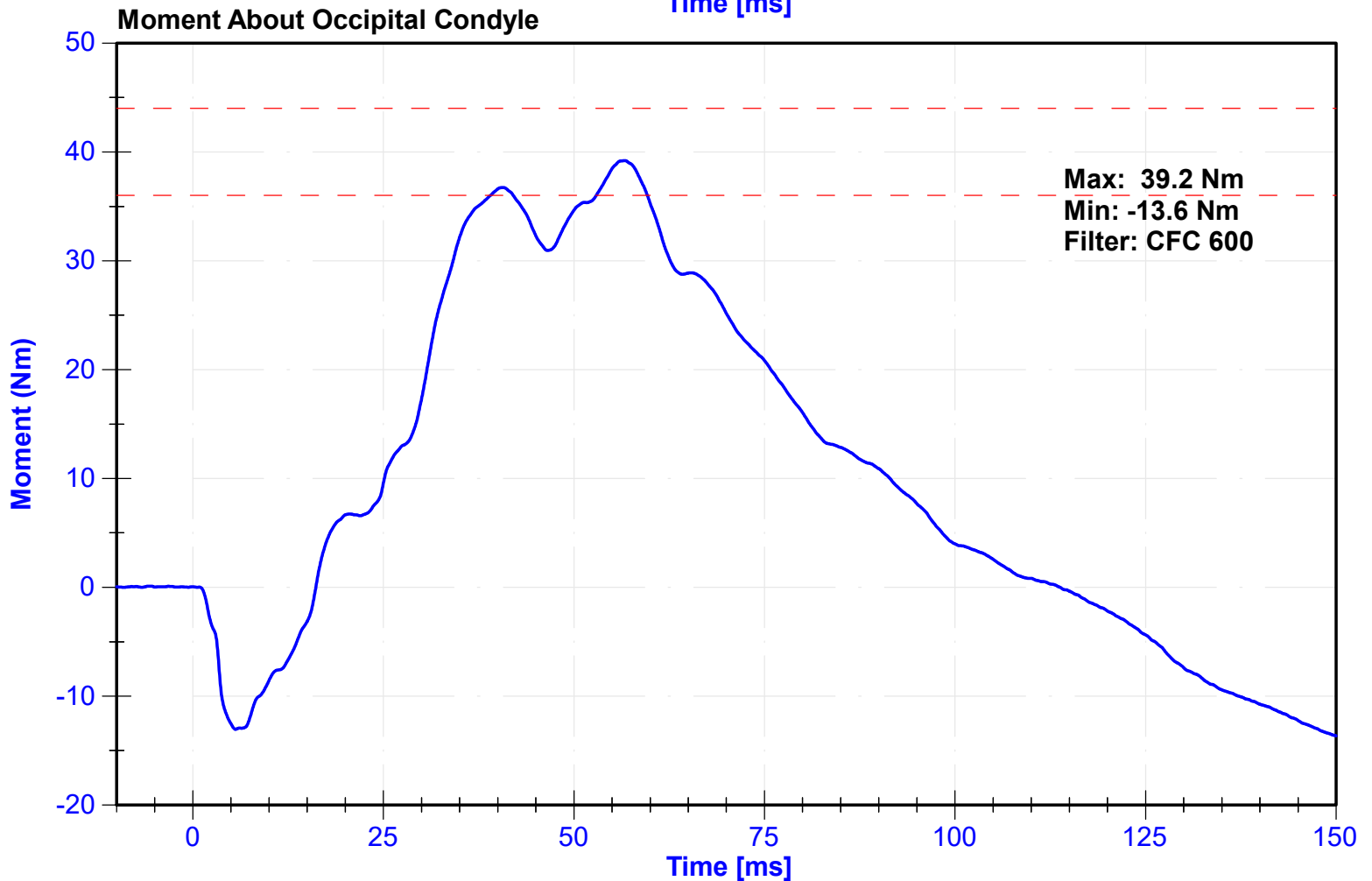
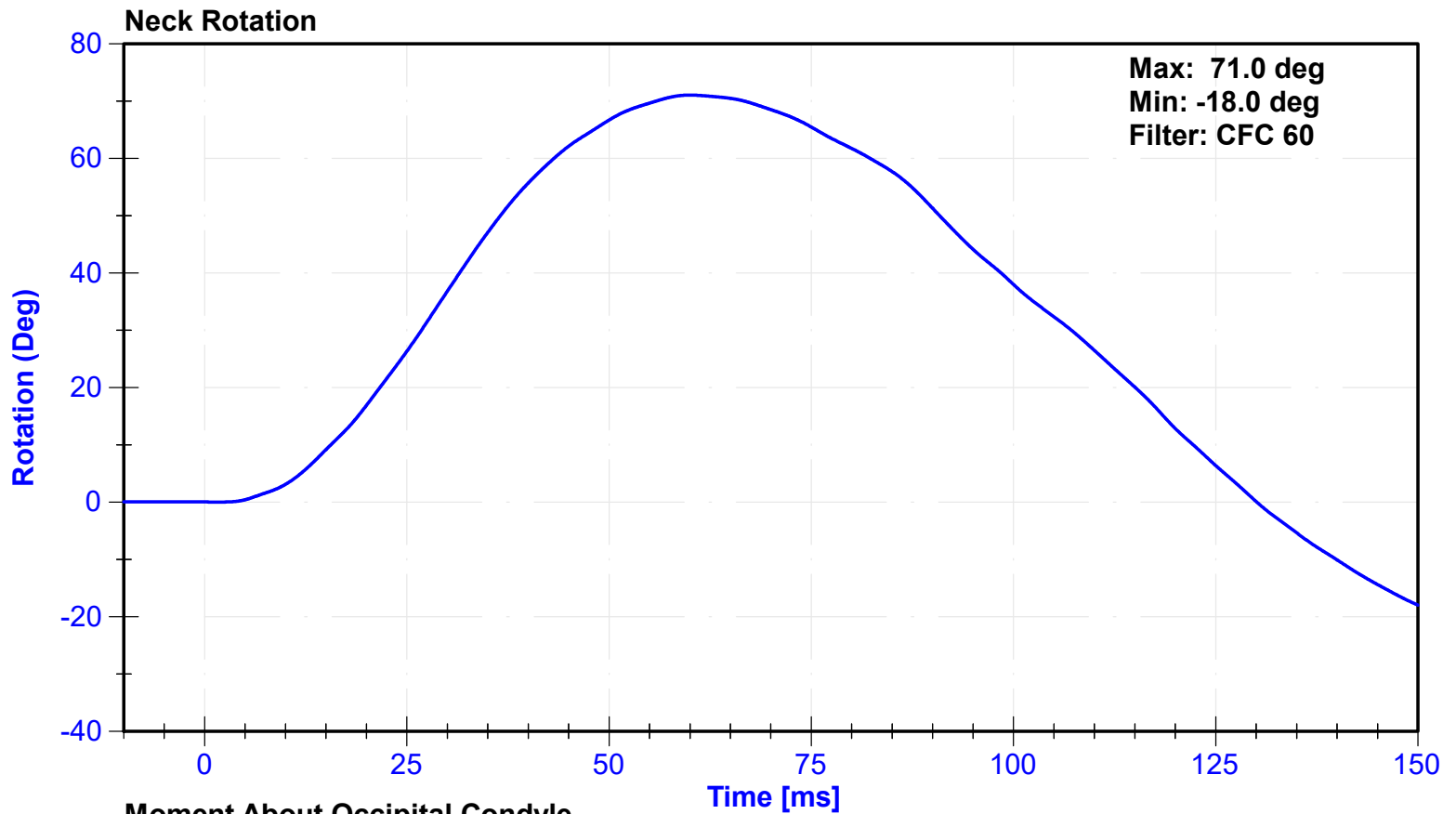
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.2	Pass
Humidity	10	70	%	30	Pass
Velocity	5.51	5.63	m/s	5.533	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.20	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.36	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.56	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.54	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.00	Pass
Neck Rotation	71	81	deg	71.0	Pass
Time at Maximum Rotation	50	70	ms	60.0	Pass
Moment about the OC	36	44	Nm	39.2	Pass
Moment Decay to 0 Nm	102	126	ms	113.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/31/2023	4/28/2024
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





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

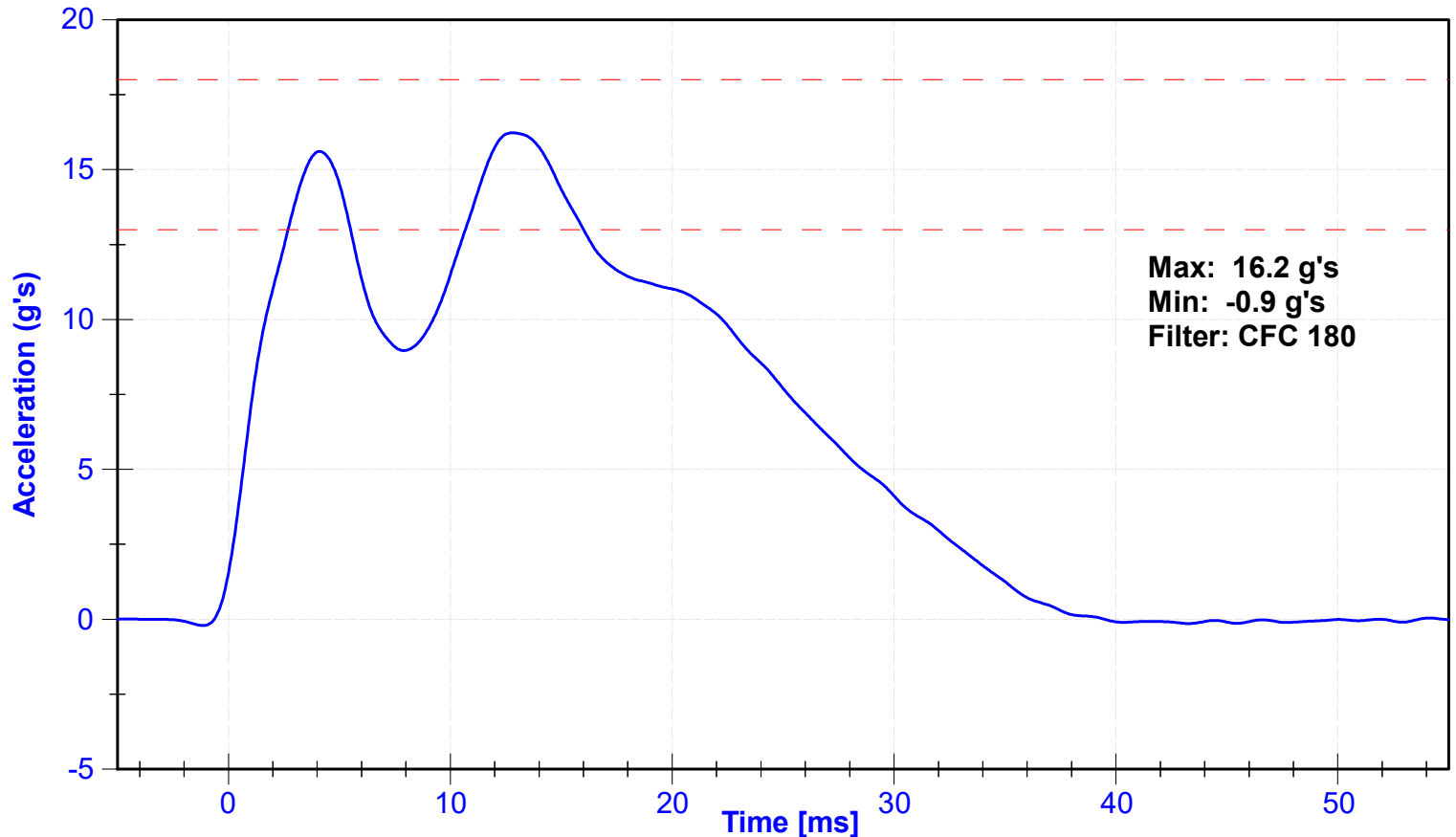
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.1	Pass
Velocity	4.2	4.4	m/s	4.28	Pass
Probe Acceleration	13	18	g's	16.2	Pass
Shoulder Deflection	28	37	mm	28.2	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.1	Pass

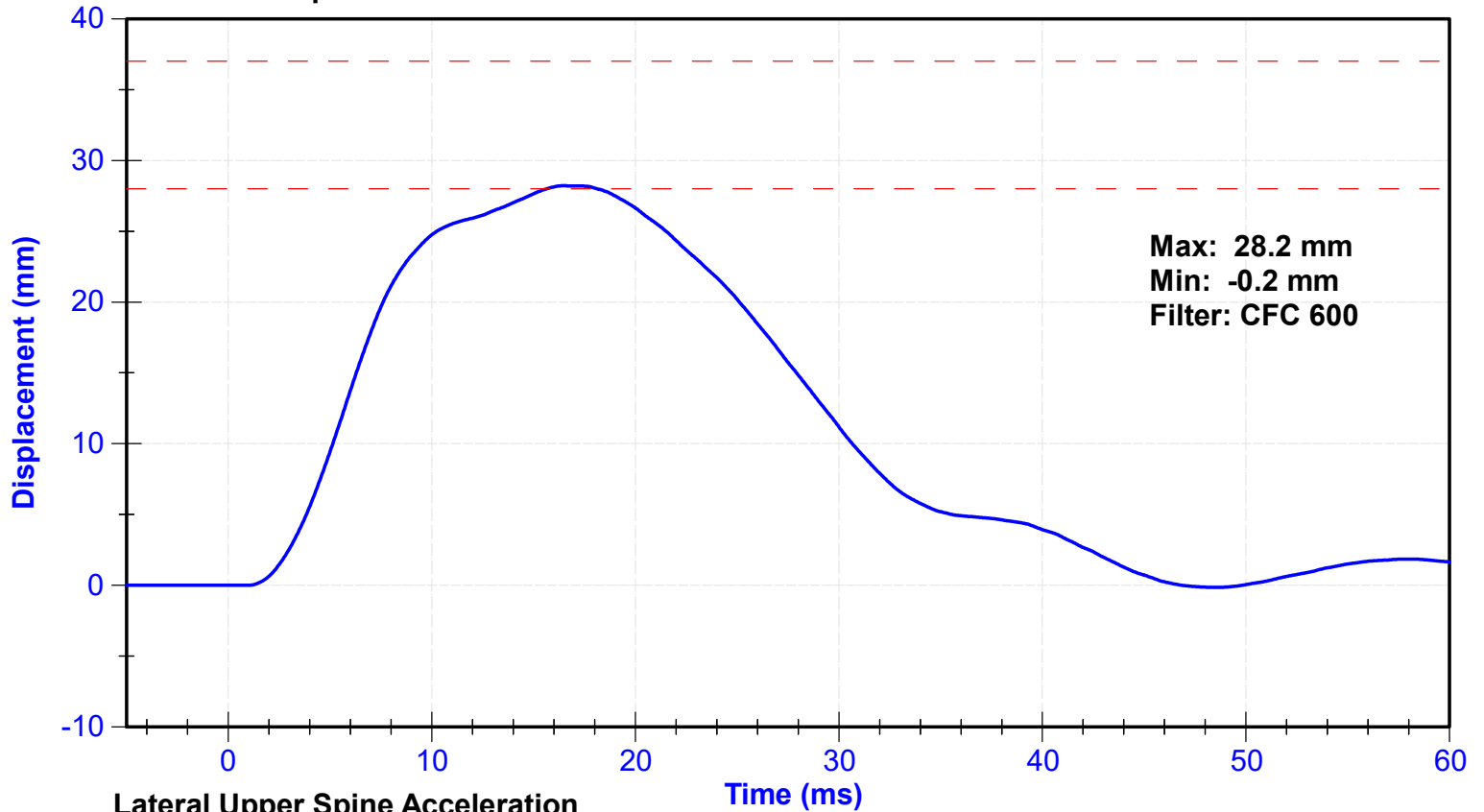
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Shoulder Potentiometer	Servo	053GFE	11/17/2023	5/17/2024
Upper Spine Y Accelerometer	Endevco	T20880	11/16/2023	5/14/2024

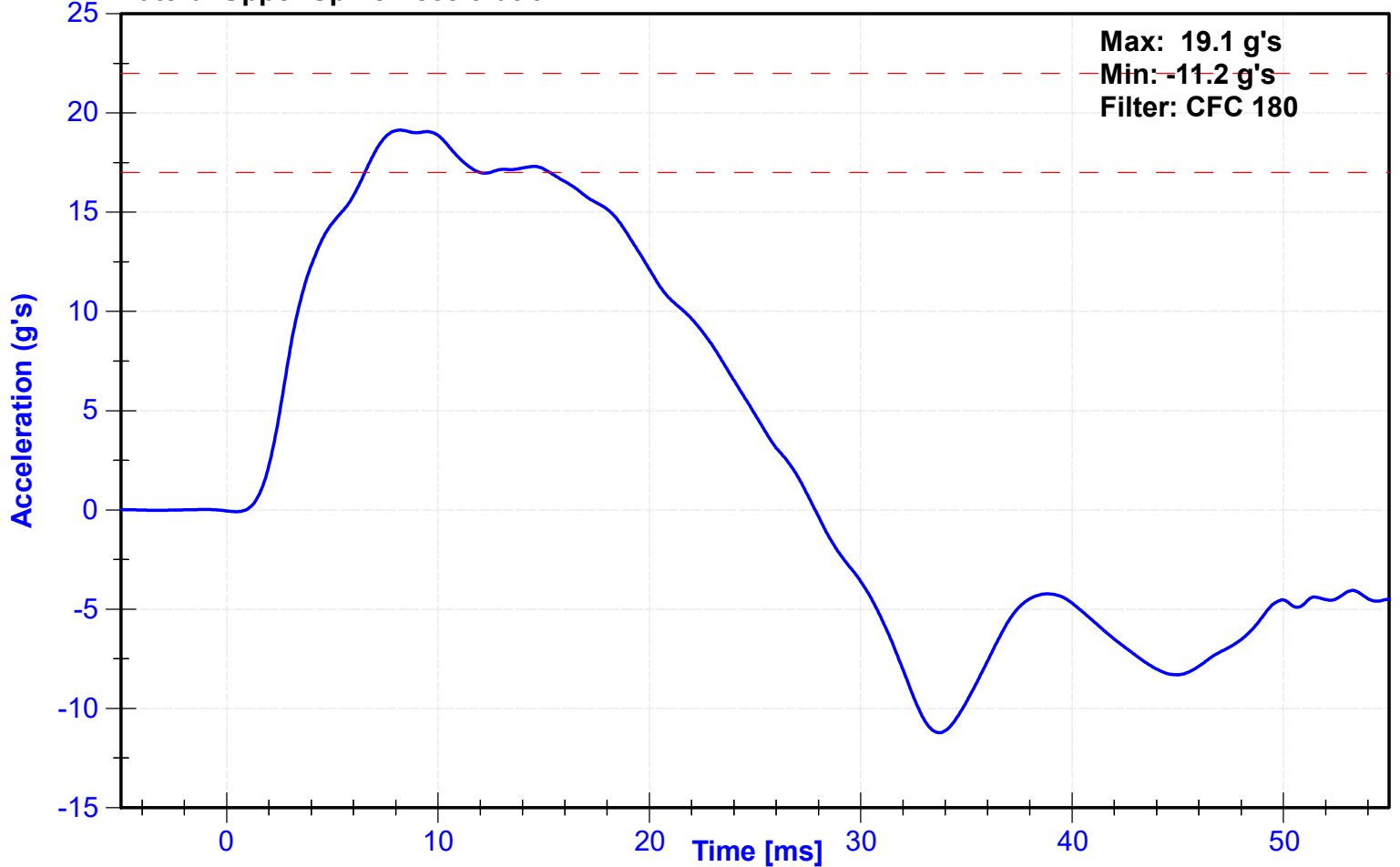
Probe Acceleration



Shoulder Displacement



Lateral Upper Spine Acceleration



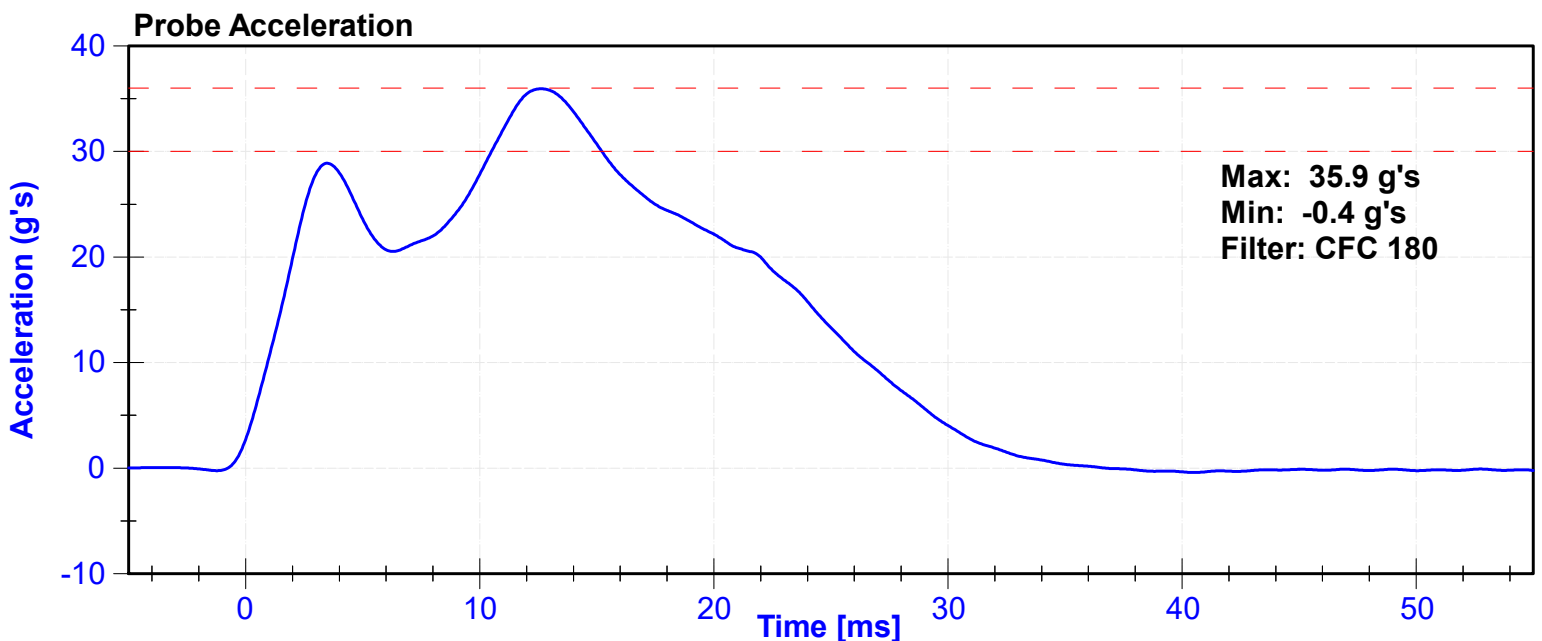
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

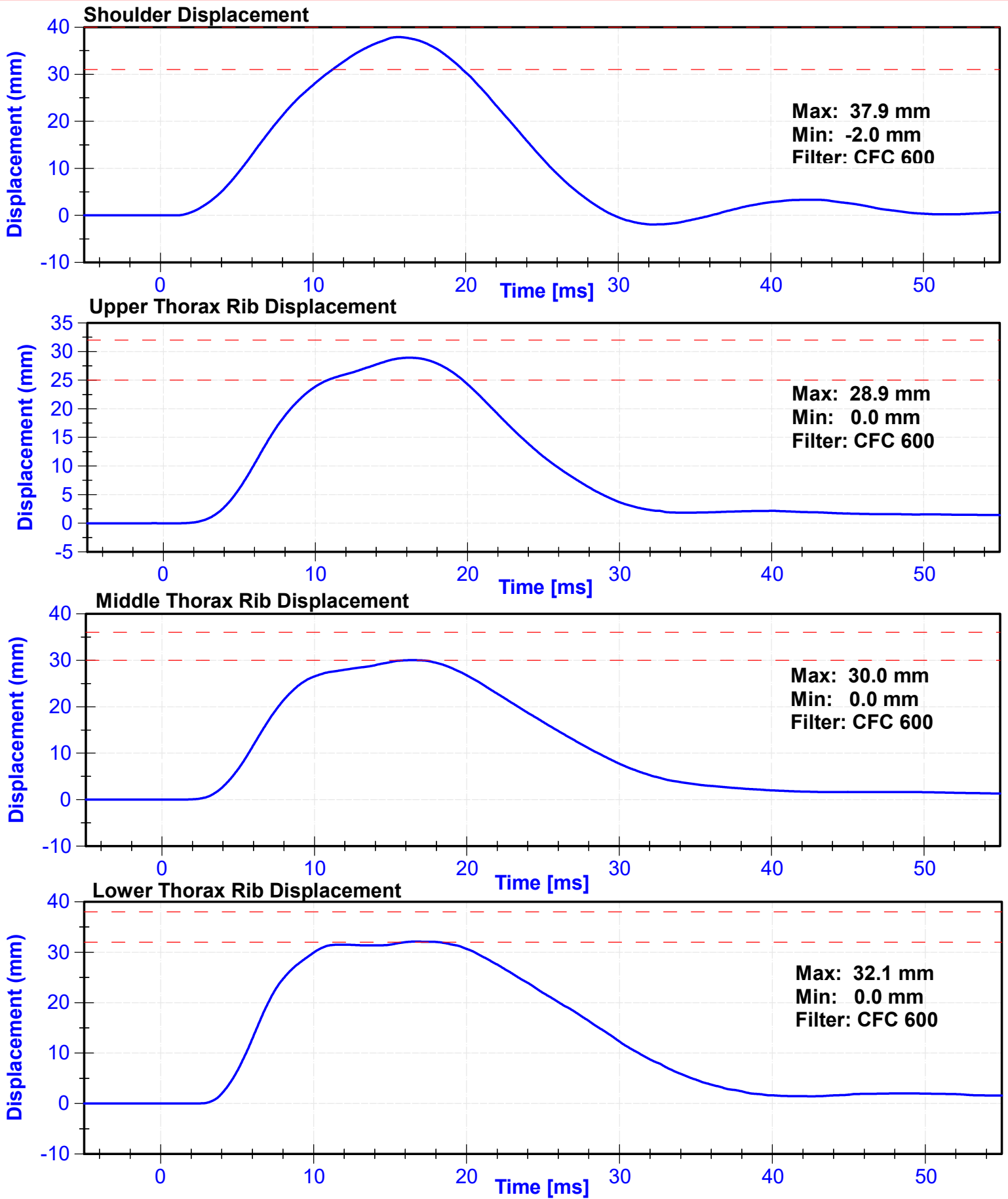
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.1	Pass
Velocity	6.6	6.8	m/s	6.67	Pass
Probe Acceleration after 5 ms	30	36	g's	35.9	Pass
Lateral Upper Spine Acceleration	34	43	g's	37.4	Pass
Lateral Lower Spine Acceleration	29	37	g's	34.6	Pass
Shoulder Deflection	31	40	mm	37.9	Pass
Upper Thorax Rib Deflection	25	32	mm	28.9	Pass
Mid Thorax Rib Deflection	30	36	mm	30.0	Pass
Lower Thorax Rib Deflection	32	38	mm	32.1	Pass

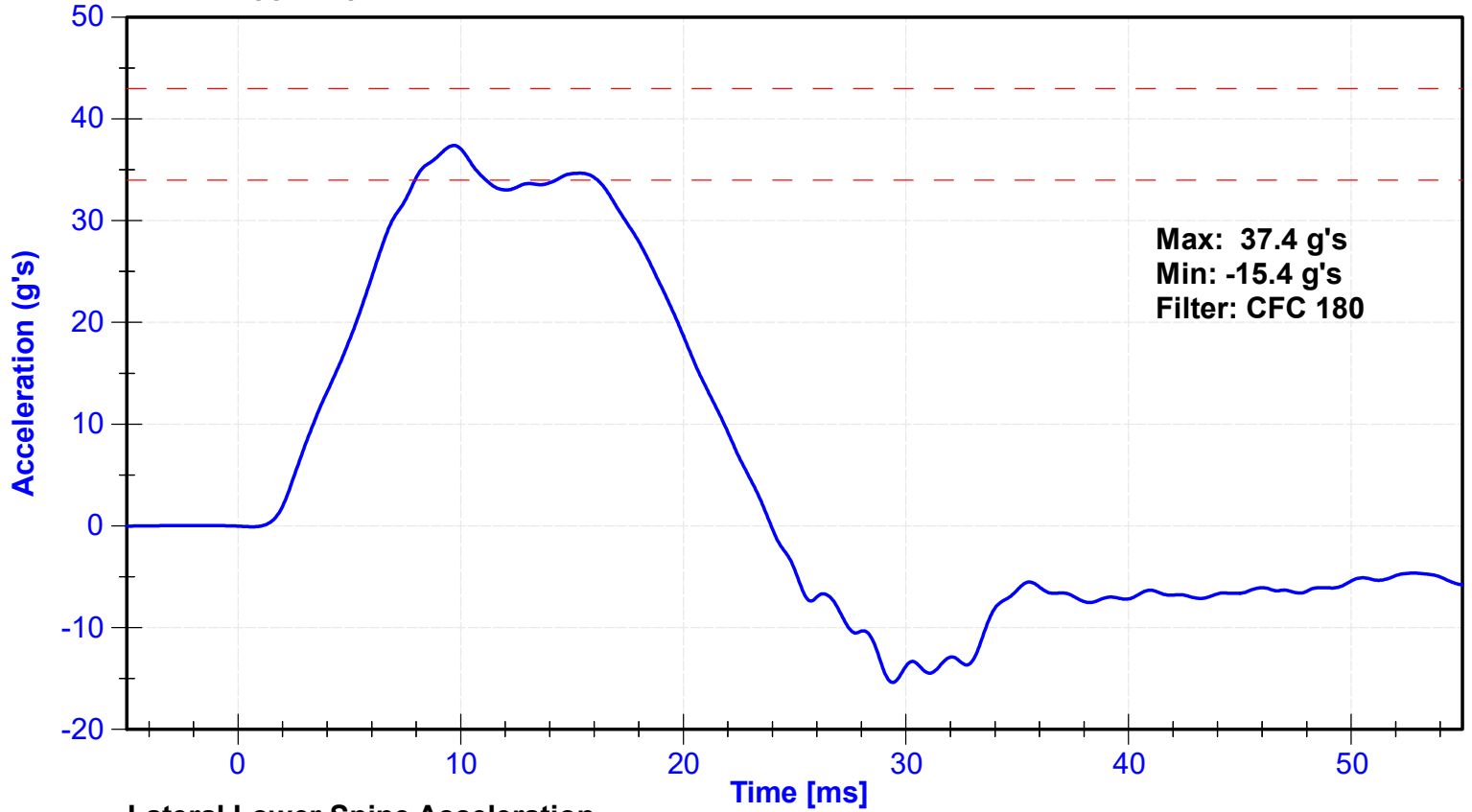
Transducer Calibrations

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	11/16/2023	5/14/2024
Upper Spine T12 Y Accelerometer	Endevco	P52071	11/16/2023	5/14/2024
Shoulder Potentiometer	Servo	053GFE	11/17/2023	5/17/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	11/17/2023	5/17/2024
Middle Thorax Rib Potentiometer	Servo	307GFE	11/17/2023	5/17/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	11/17/2023	5/17/2024

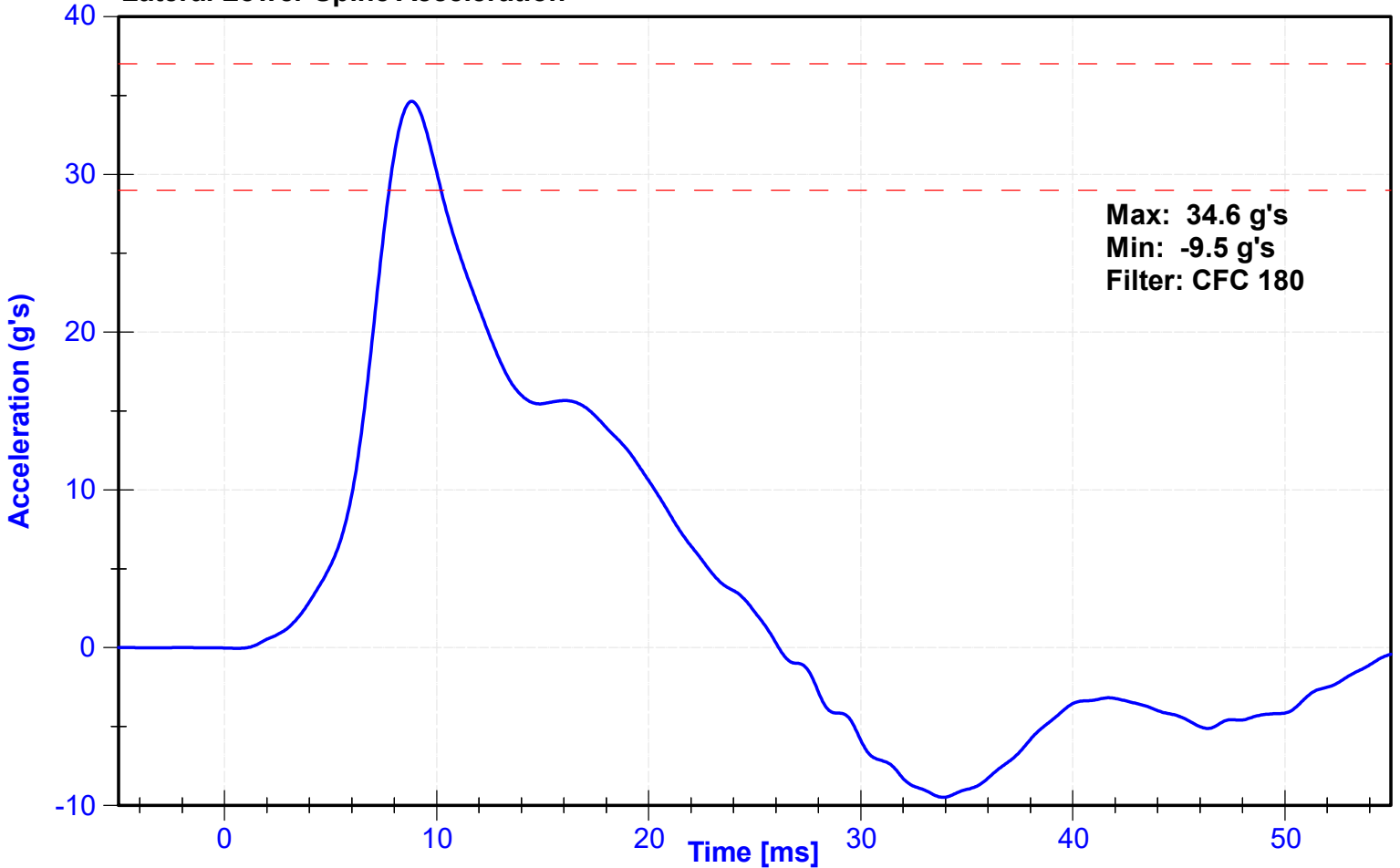




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



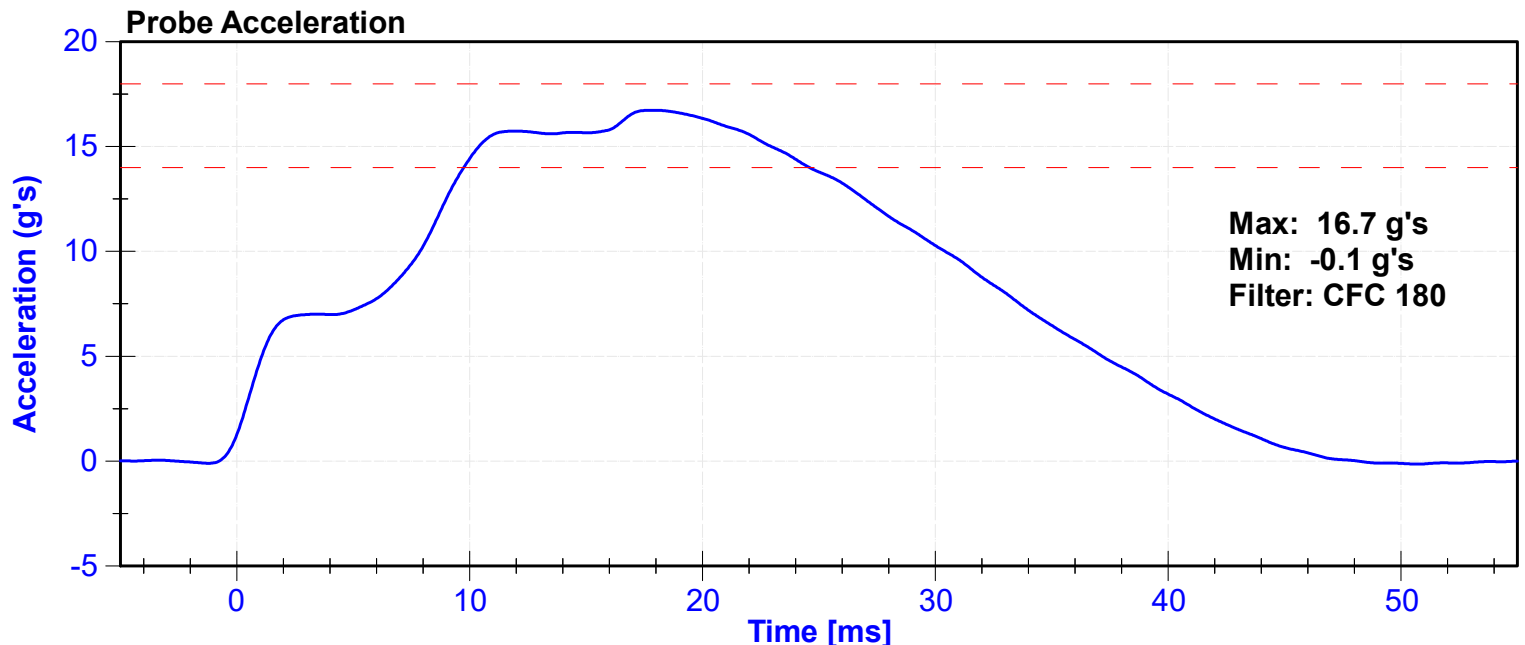
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

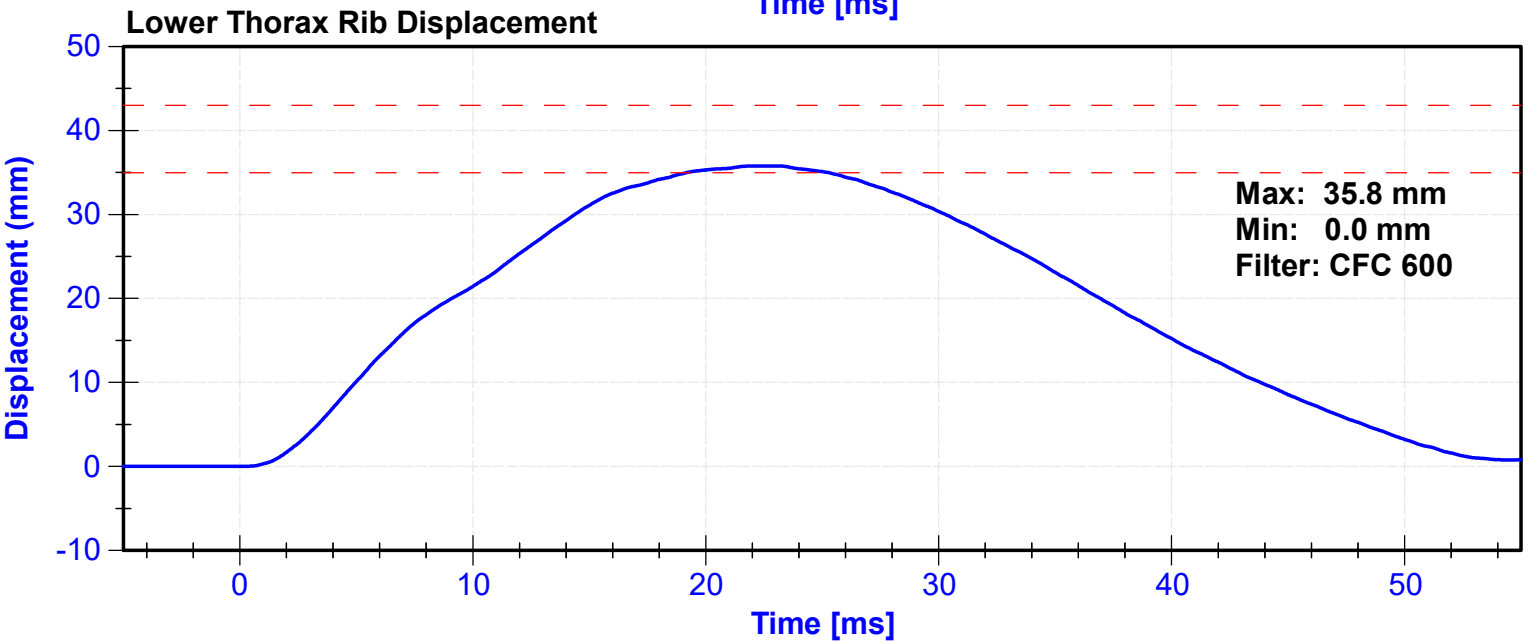
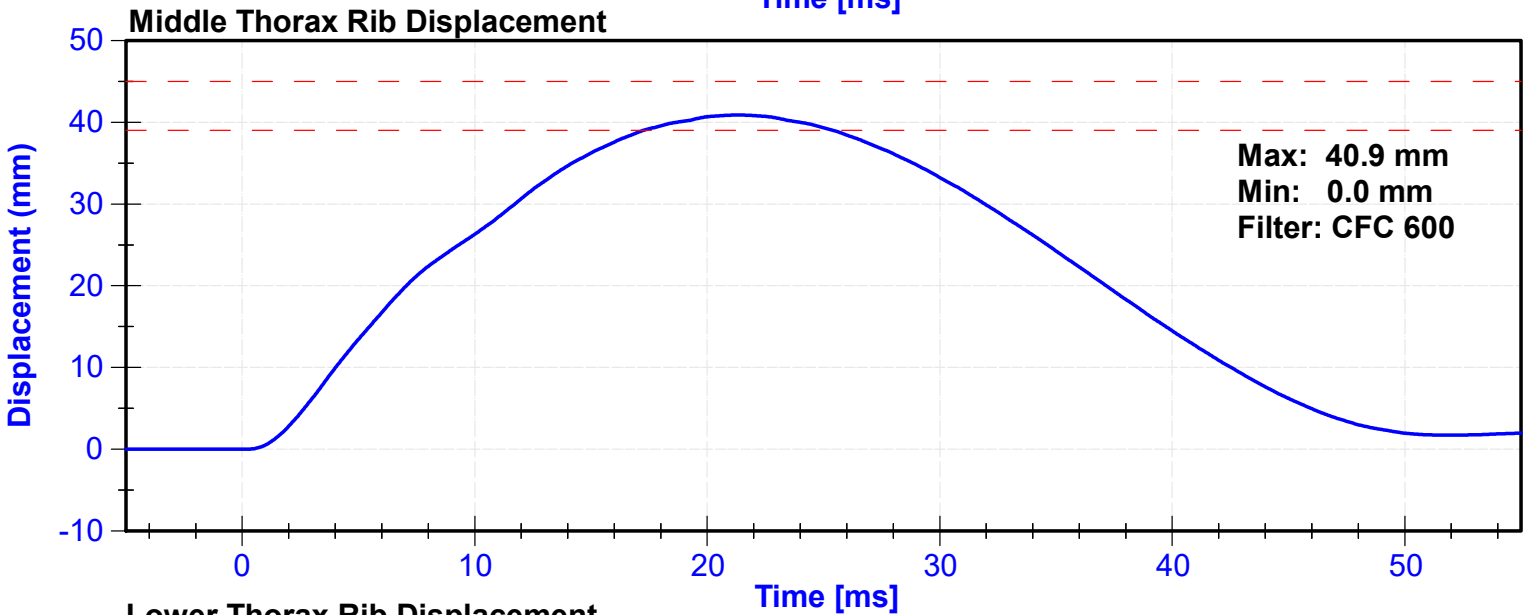
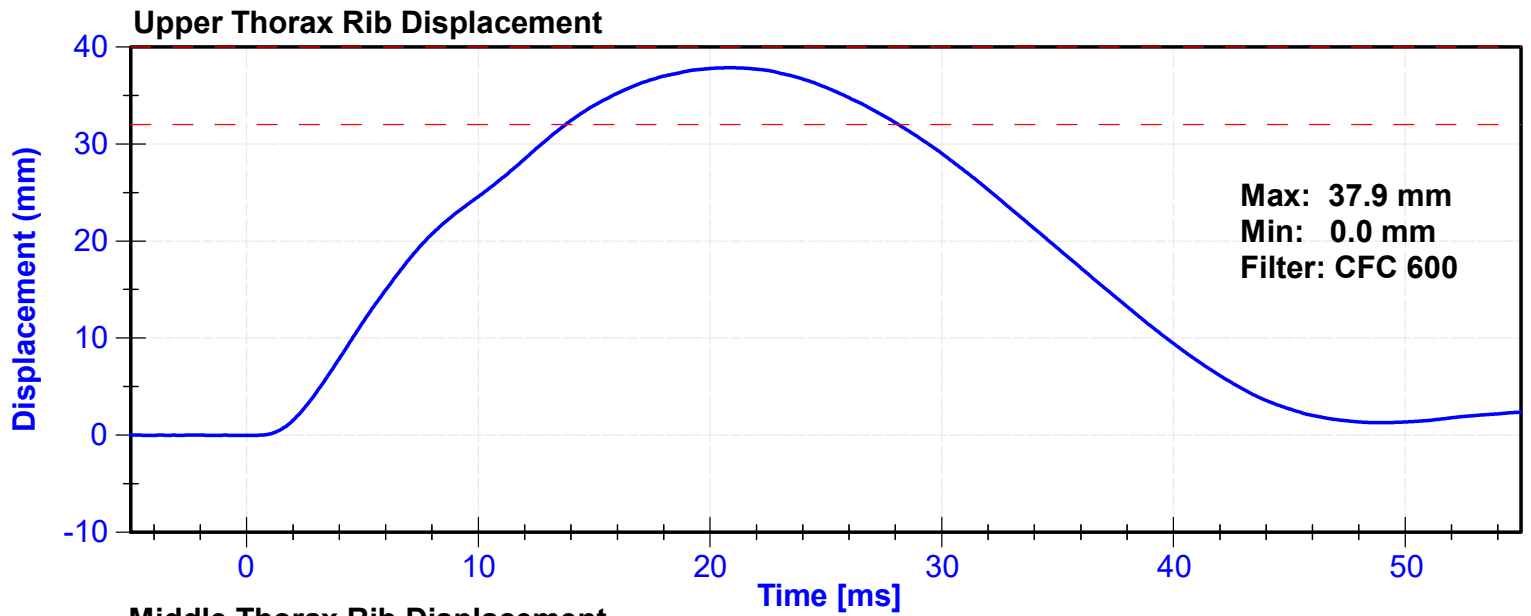
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.1	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	14	18	g's	16.7	Pass
Lateral Upper Spine Acceleration	13	17	g's	16.6	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.6	Pass
Upper Thorax Rib Deflection	32	40	mm	37.9	Pass
Middle Thorax Rib Deflection	39	45	mm	40.9	Pass
Lower Thorax Rib Deflection	35	43	mm	35.8	Pass

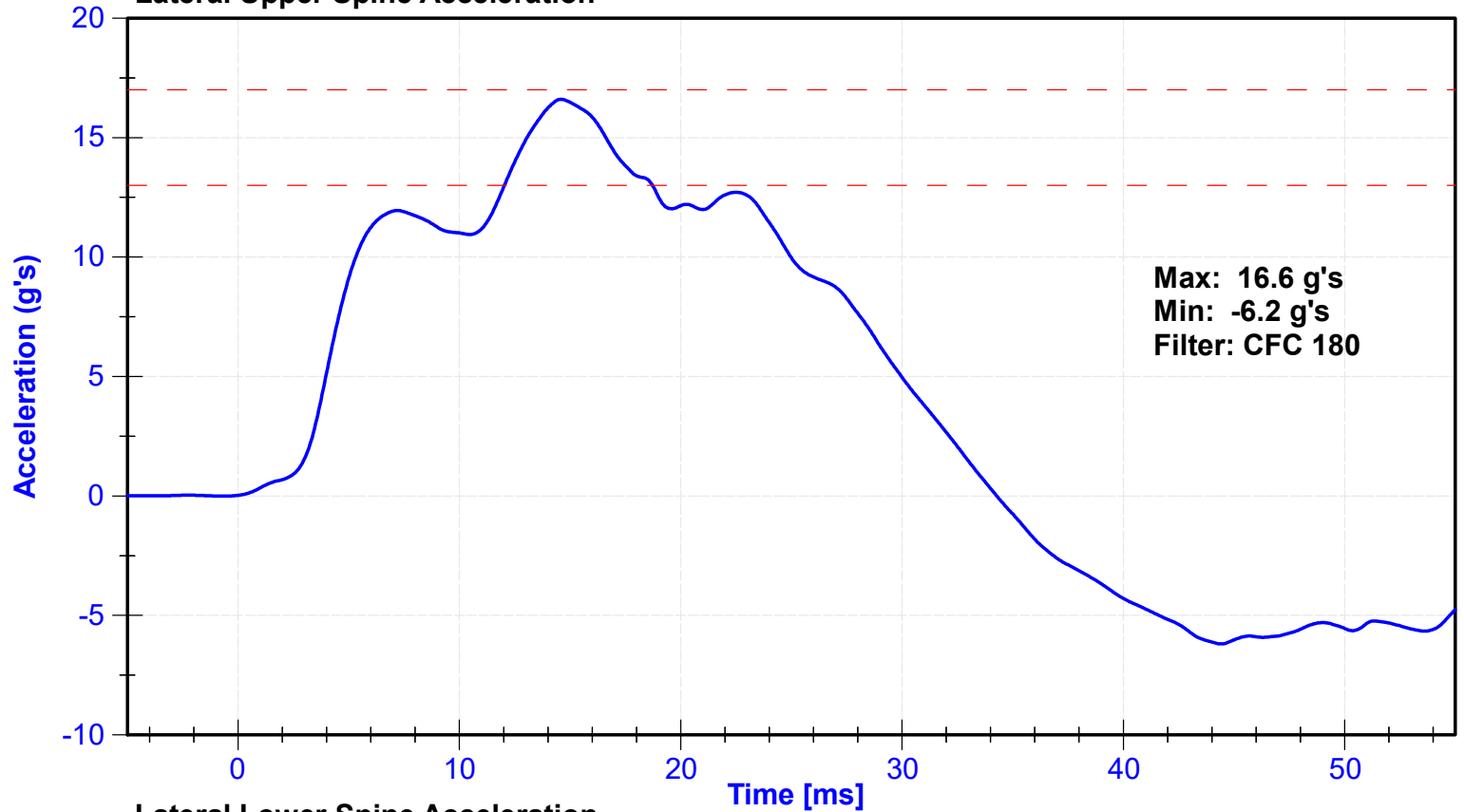
Transducer Calibrations

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	11/16/2023	5/14/2024
Lower Spine Y Accelerometer	Endevco	P52071	11/16/2023	5/14/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	11/17/2023	5/17/2024
Middle Thorax Rib Potentiometer	Servo	307GFE	11/17/2023	5/17/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	11/17/2023	5/17/2024

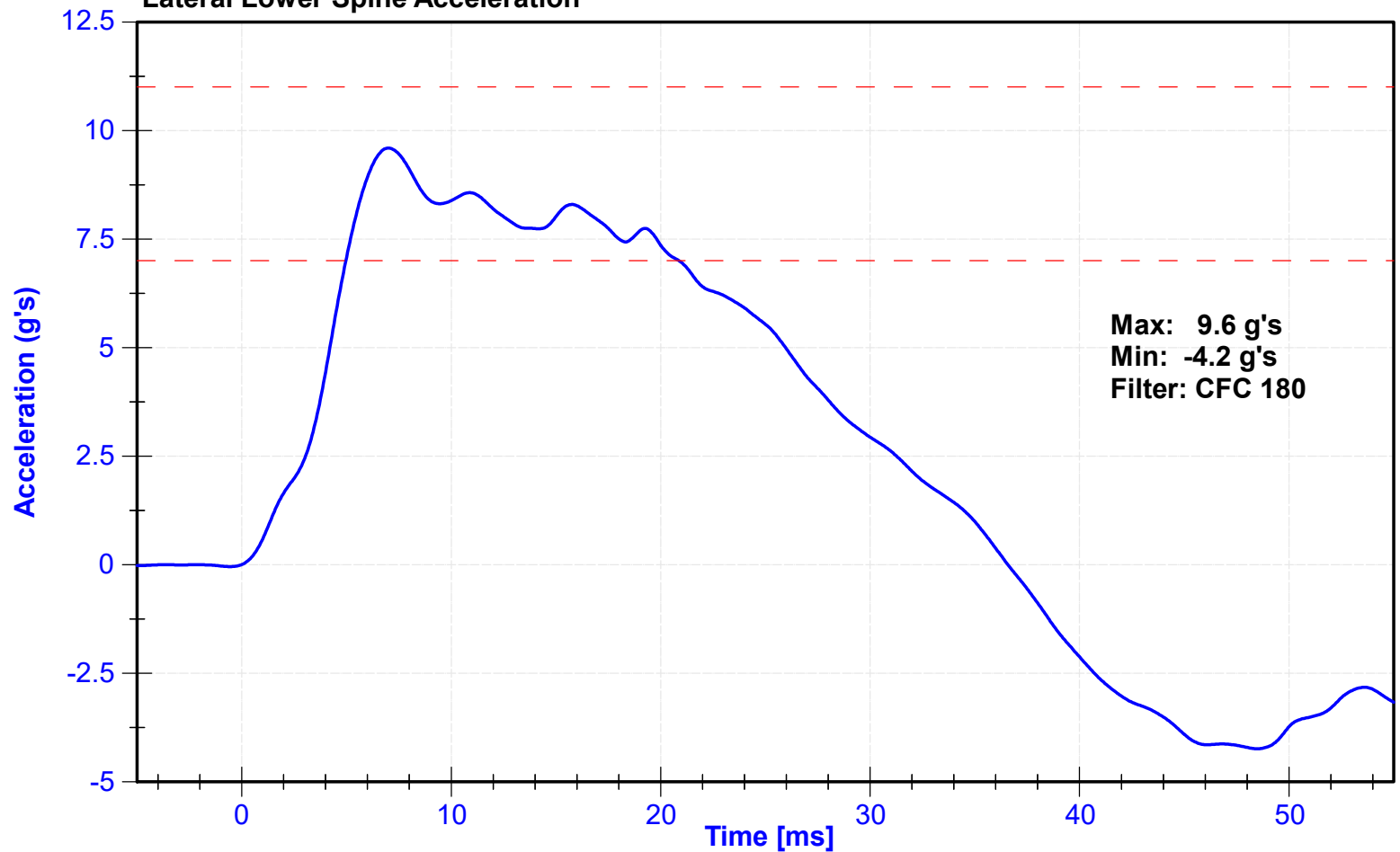




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



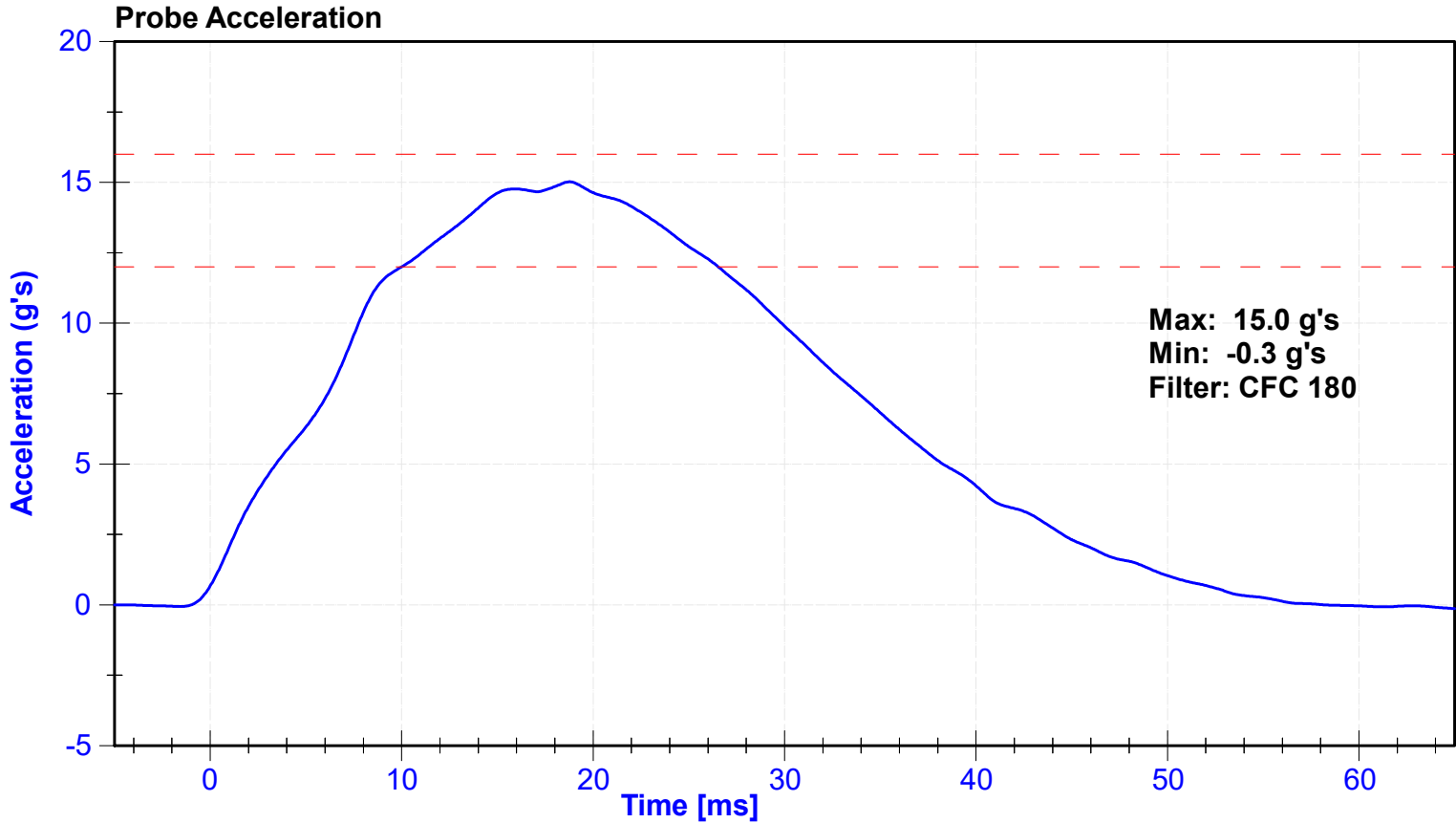
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

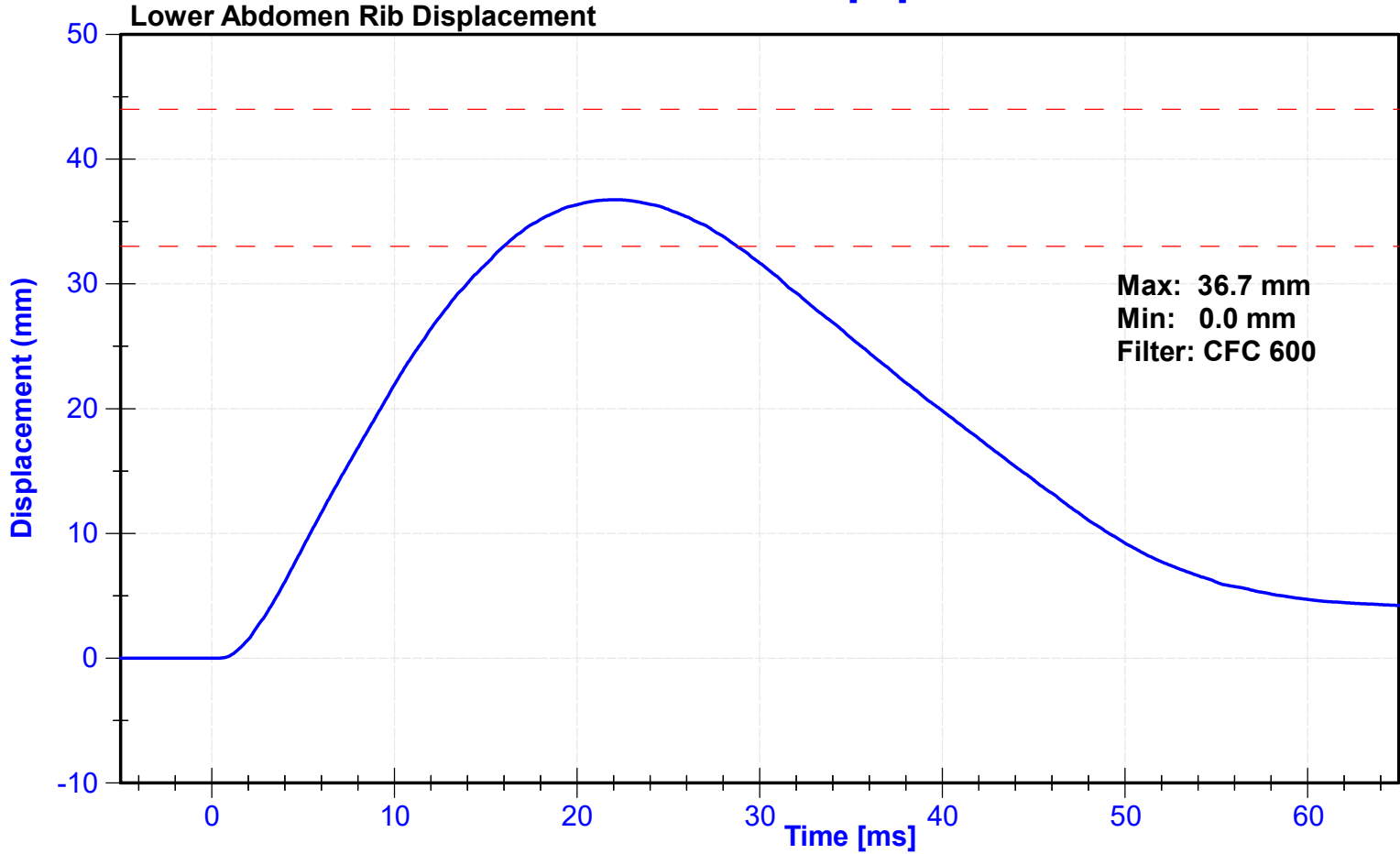
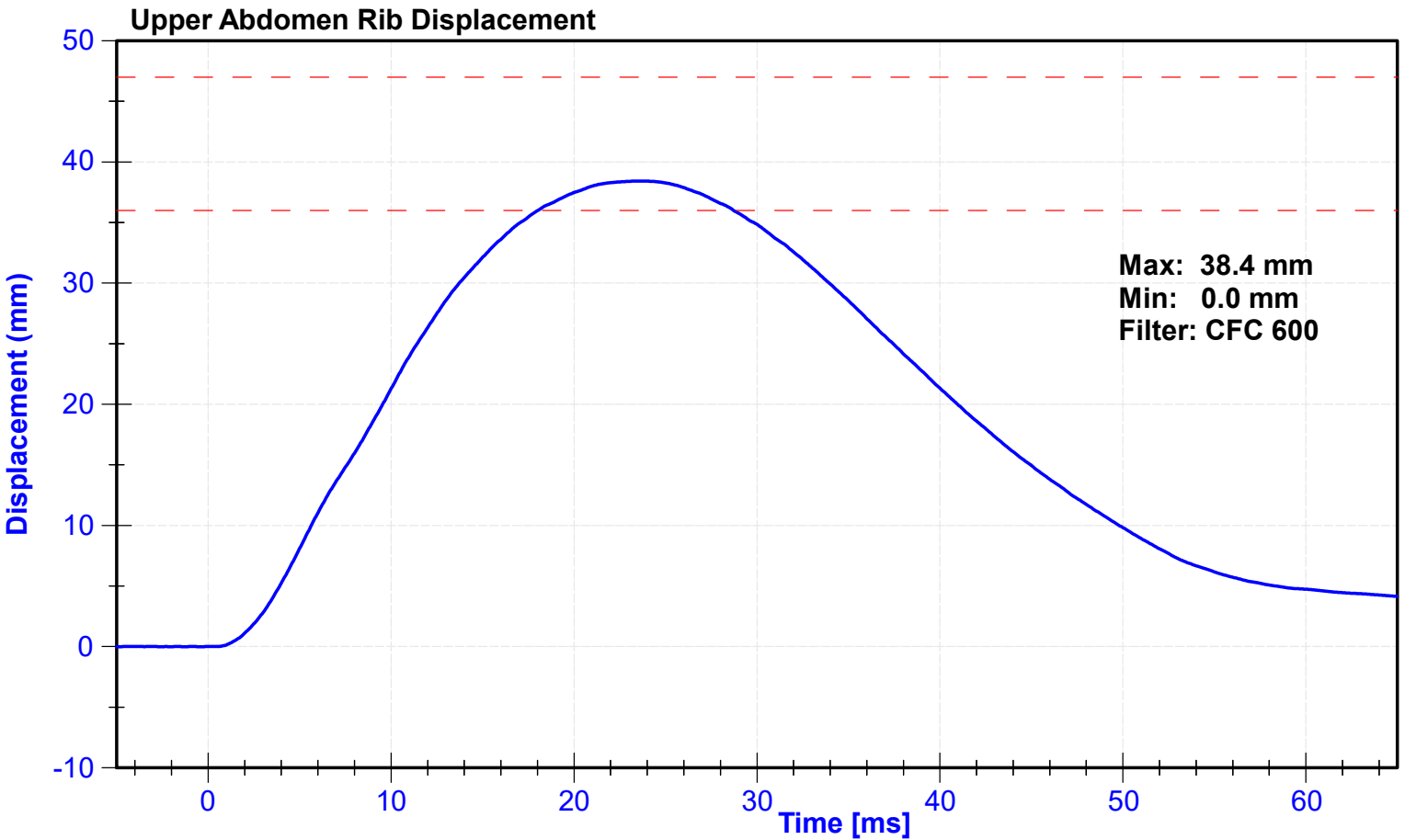
Results

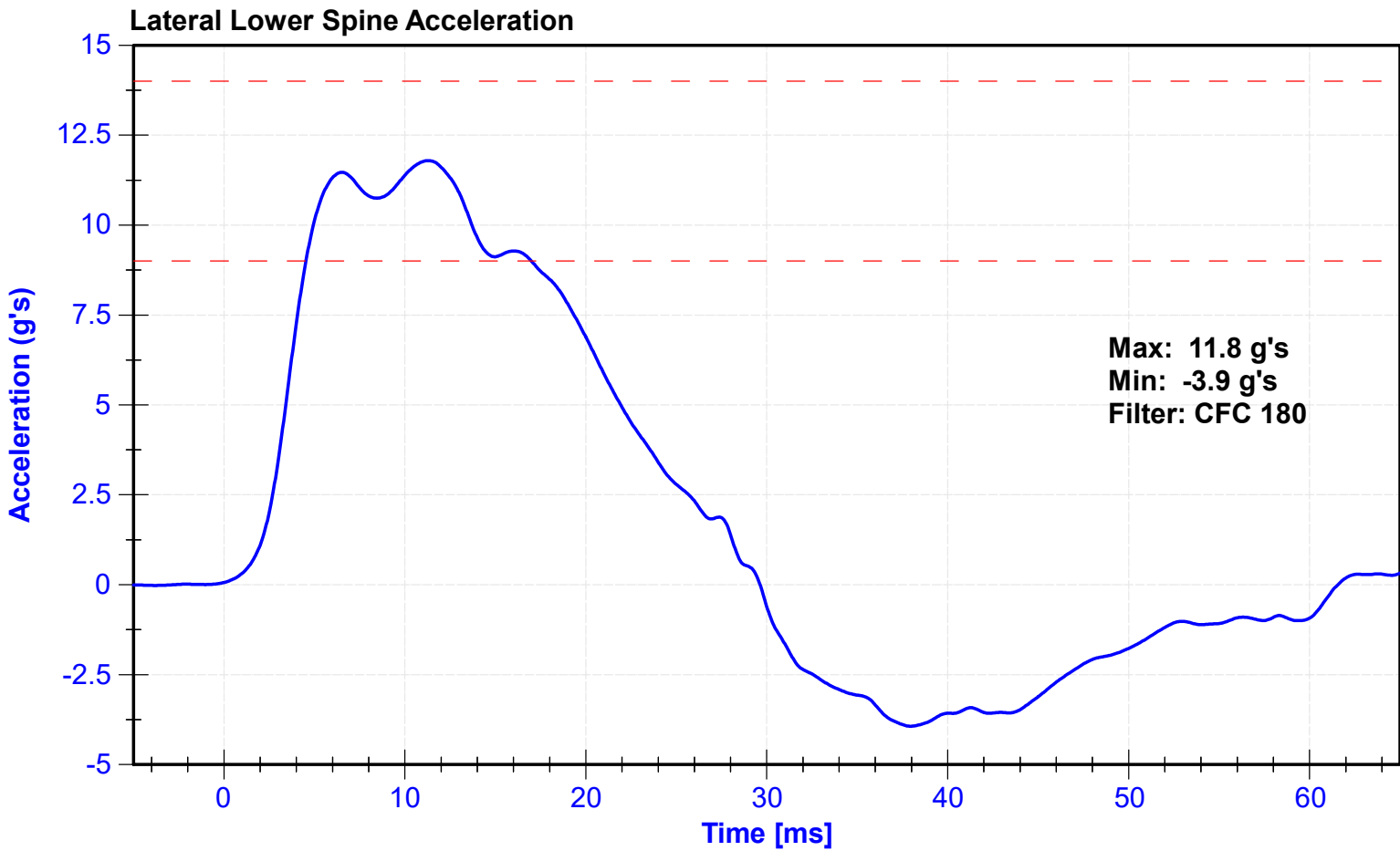
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.1	Pass
Velocity	4.2	4.4	m/s	4.29	Pass
Probe Acceleration	12	16	g's	15.0	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.8	Pass
Upper Abdomen Rib Deflection	36	47	mm	38.4	Pass
Lower Abdomen Rib Deflection	33	44	mm	36.7	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	11/16/2023	5/14/2024
Upper Abdomen Rib Potentiometer	Servo	060GFE	11/21/2023	5/21/2024
Lower Abdomen Rib Potentiometer	Servo	308GFE	11/17/2023	5/17/2024







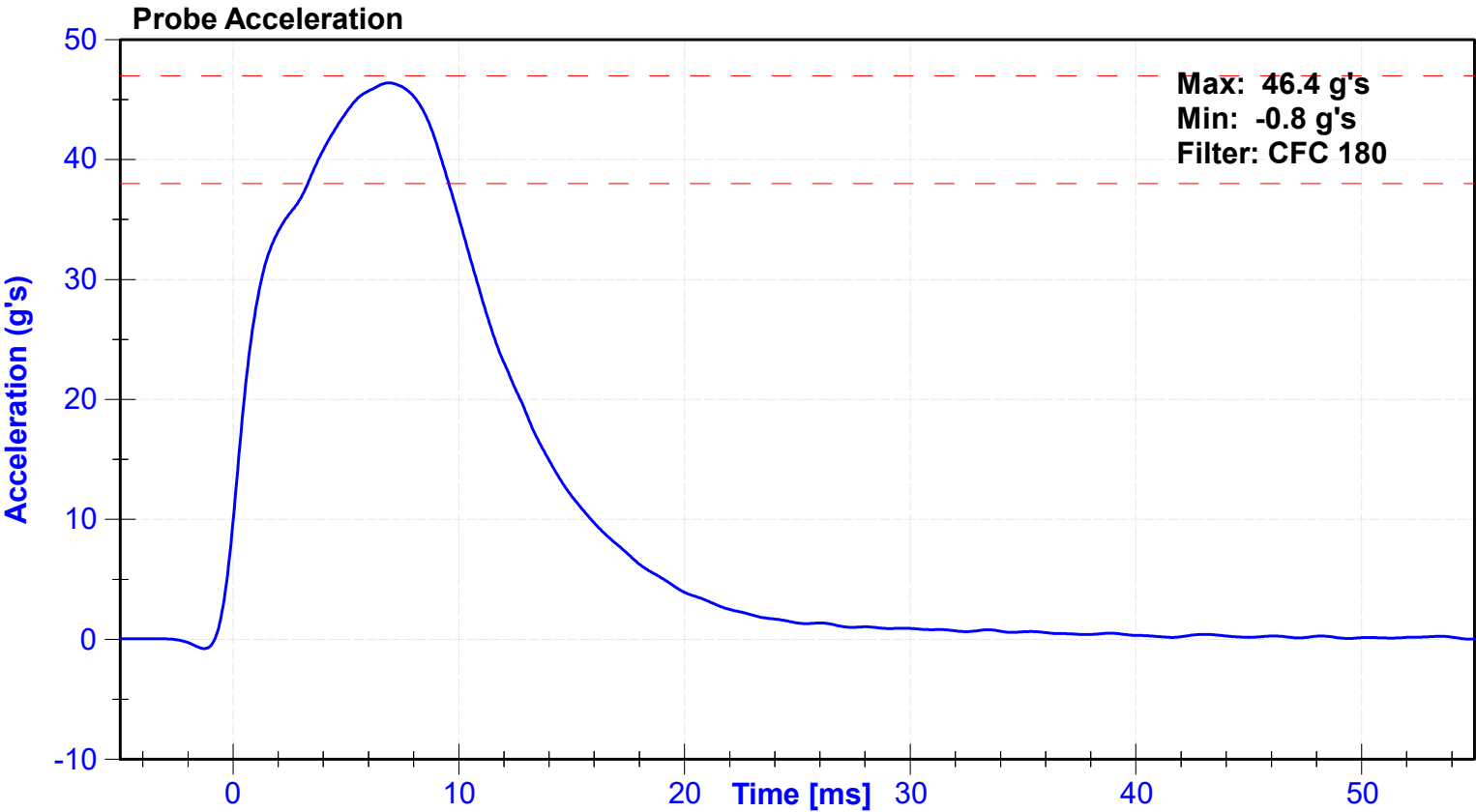
ATD Manufacturer	FTSS	Test Technician	J.Kinderman
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

Results

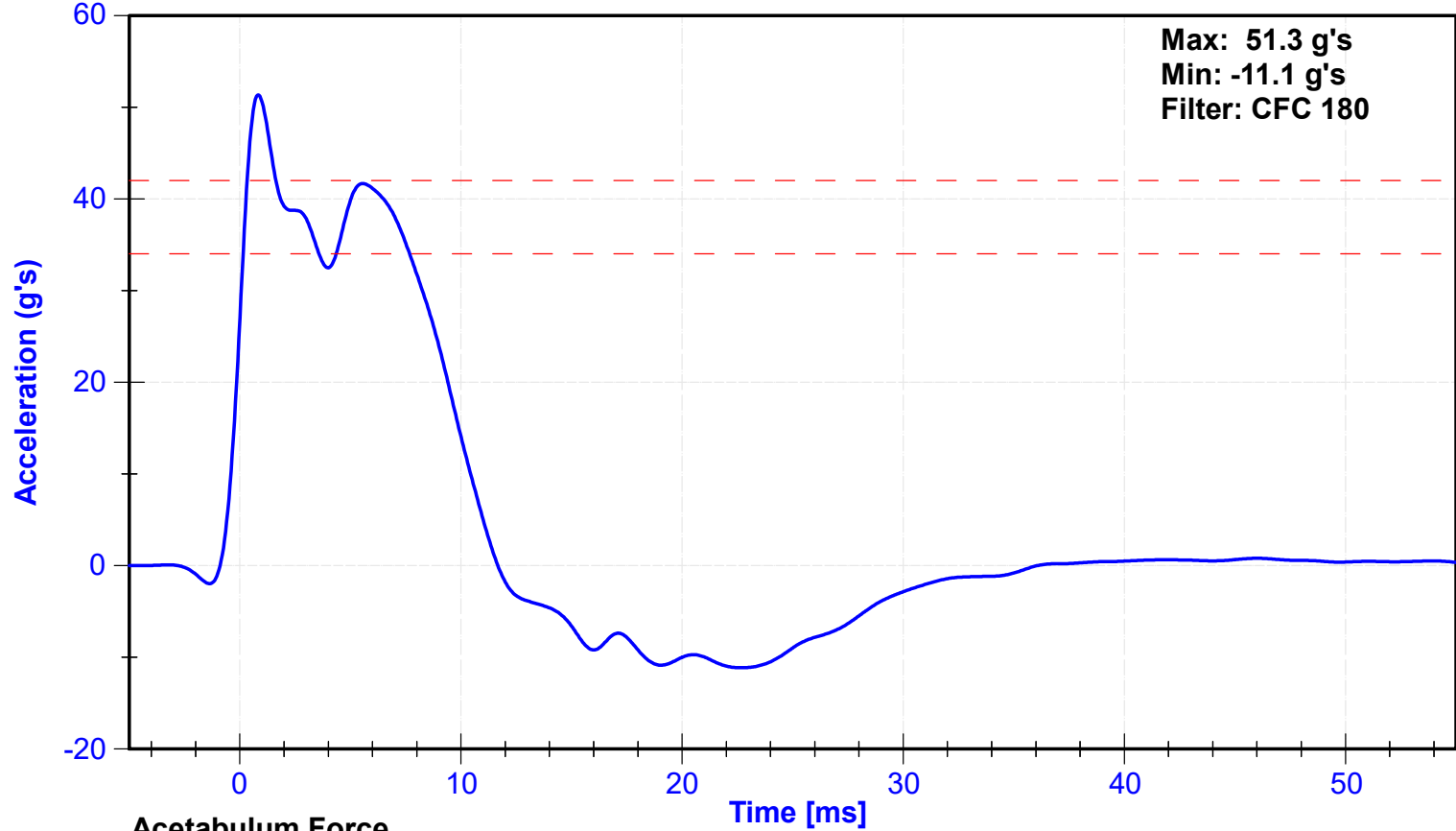
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.1	Pass
Velocity	6.6	6.8	m/s	6.67	Pass
Probe Acceleration	38	47	g's	46.4	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	41.1	Pass
Acetabulum Force	3600	4300	N	3958.4	Pass

Transducer Calibrations

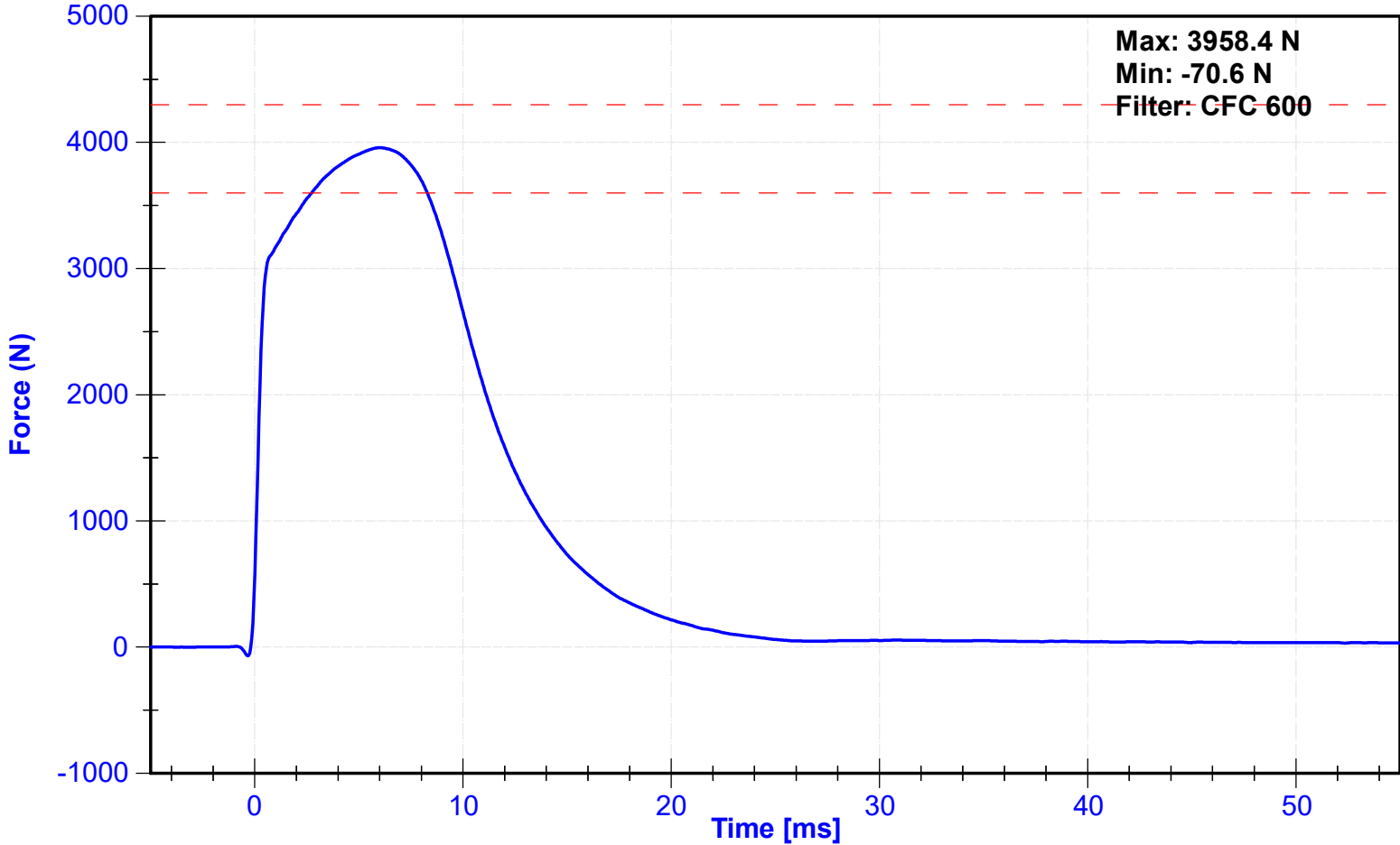
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Pelvis Y Accelerometer	Endevco	P51731	11/15/2023	5/13/2024
Acetabulum Load Cell	Denton	267-FY	9/11/2023	9/10/2024
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A



Lateral Pelvis Acceleration



Acetabulum Force





300 Cert
2-22-24

SID-IIs Pelvis Plug Certification Test

Plug S/N 16301

Test Number 22867

Report Number 22924

Test Date 5/20/2022 10:24:32 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	303	600
Force @ 1.5 mm (N)	1,183	1,400
Force @ 2.5 mm (N)	1,500	1,618
Force @ 3.0 mm (N)	1,558	1,673

Testing Machine STM-20 5965542

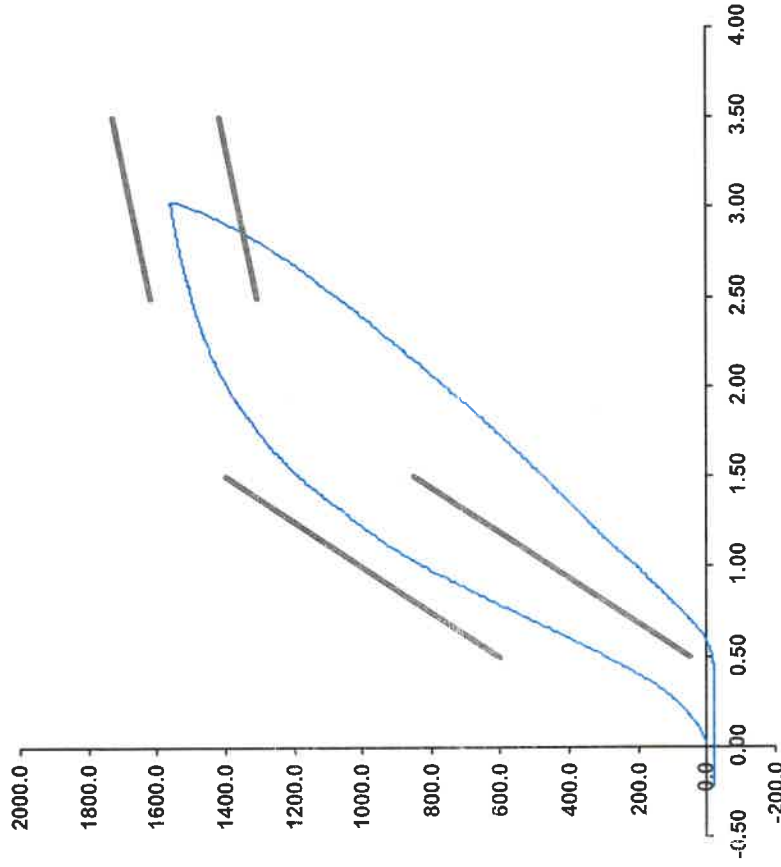
Load Cell S/N (FI360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes:

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

Template No 107 20-May-22

SACO Research

By : DO Date : 5/20/2022
SACO Research 41735 Elm St, #401 Murrieta, CA 92562 Tel 310-694-2082 FAX

SID-Ils Pelvis Plug Certification Test

Plug S/N 16541

Test Number 23325

Report Number 23382

Test Date 7/15/2022 9:06:10 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	269	600
Force @ 1.5 mm (N)	1,102	1,400
Force @ 2.5 mm (N)	1,453	1,618
Force @ 3.0 mm (N)	1,525	1,673

Testing Machine STM-20 5965542

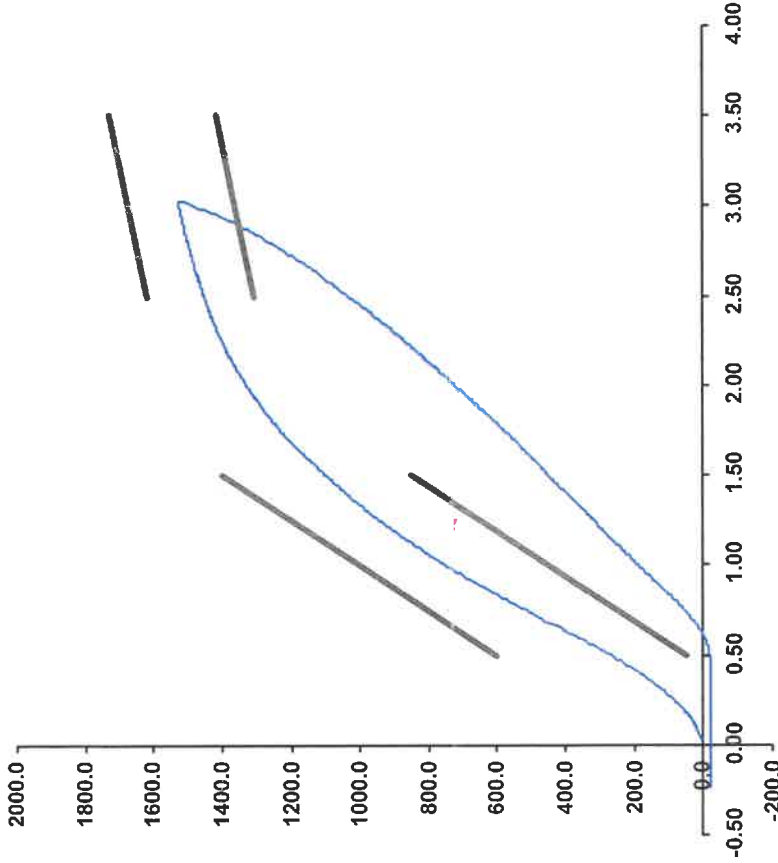
Load Cell S/N (F1360947), Units (LBS) 1000

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes:

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

SID-ILS Pelvis Plug Certification Test

Plug S/N 16478

Test Number 23261

Report Number 23318

Test Date 7/14/2022 12:03:43 PM

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

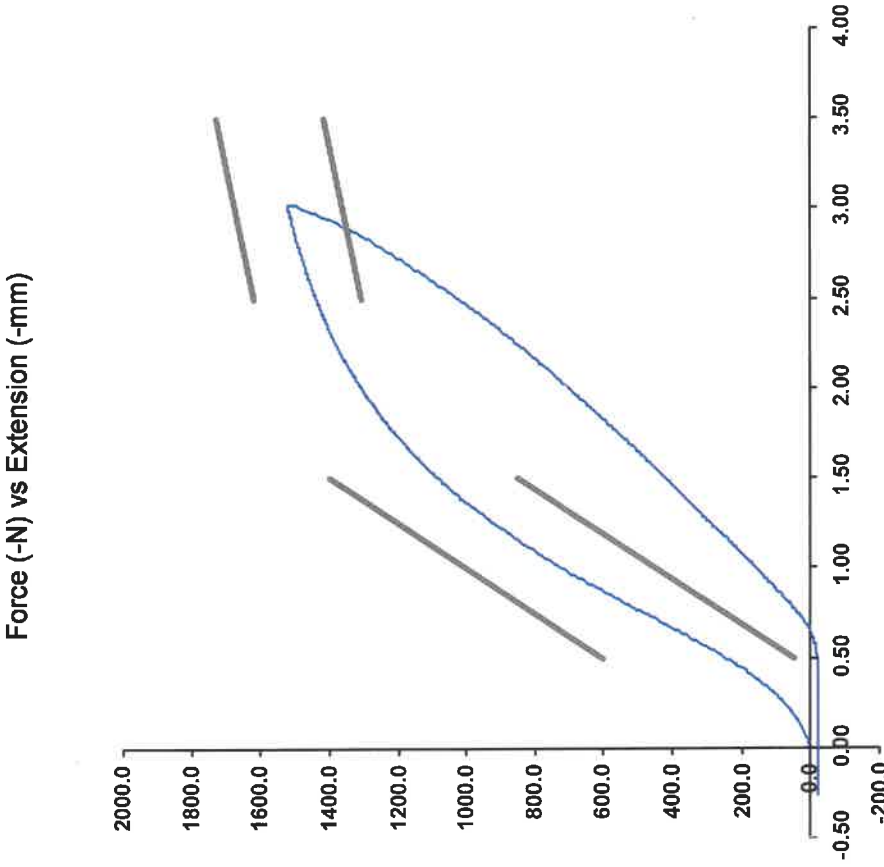
Testing Machine STM-20 5965542

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

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes:



Operator

Part Number 180-4450

Template No 107 14-Jul-22

SACO Research

By: DC Date: 7/14/2022

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

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

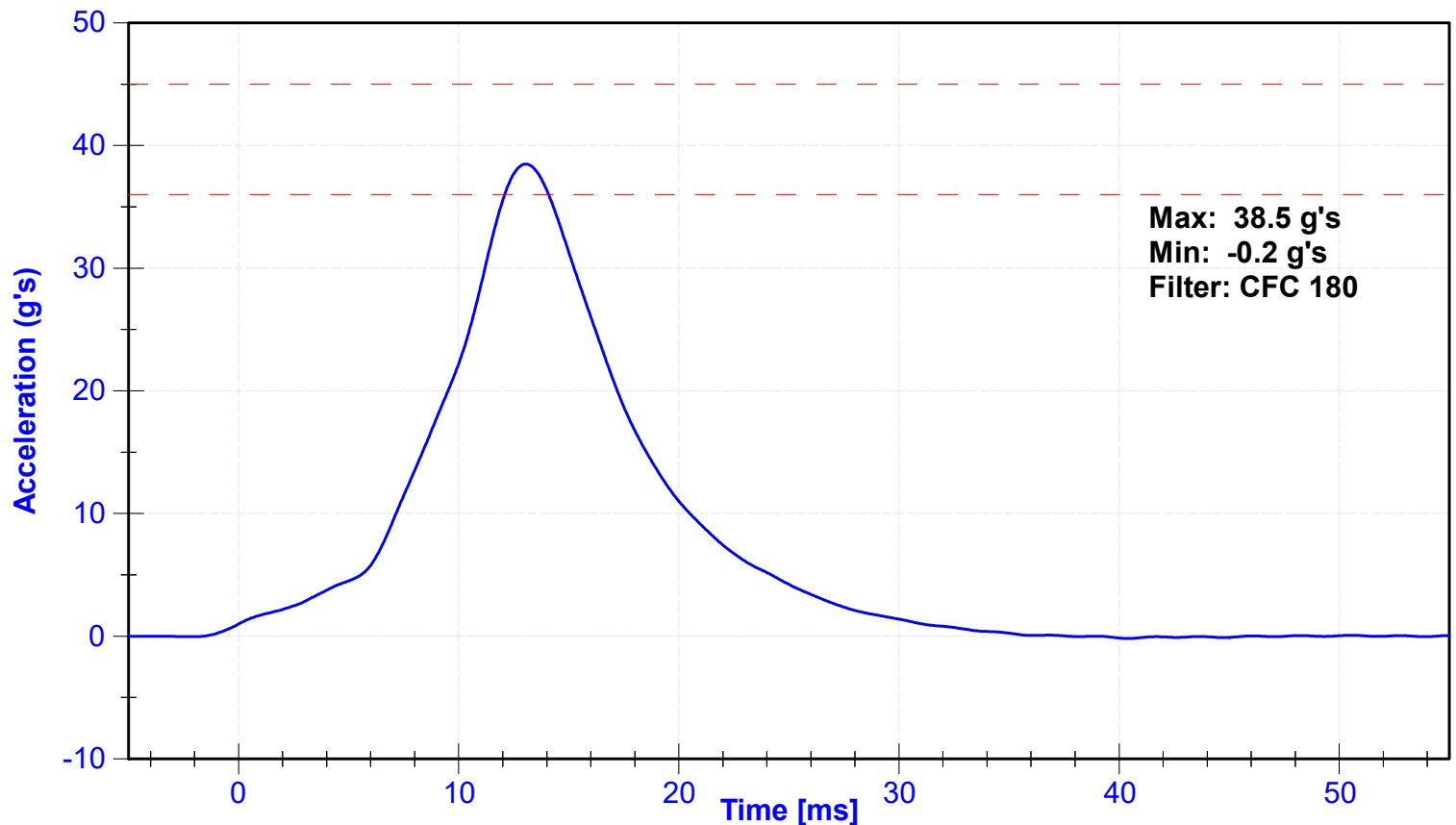
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.1	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	36	45	g's	38.5	Pass
Lateral Pelvis Acceleration	28	39	g's	28.8	Pass
Iliac Force	4100	5100	N	4166.4	Pass

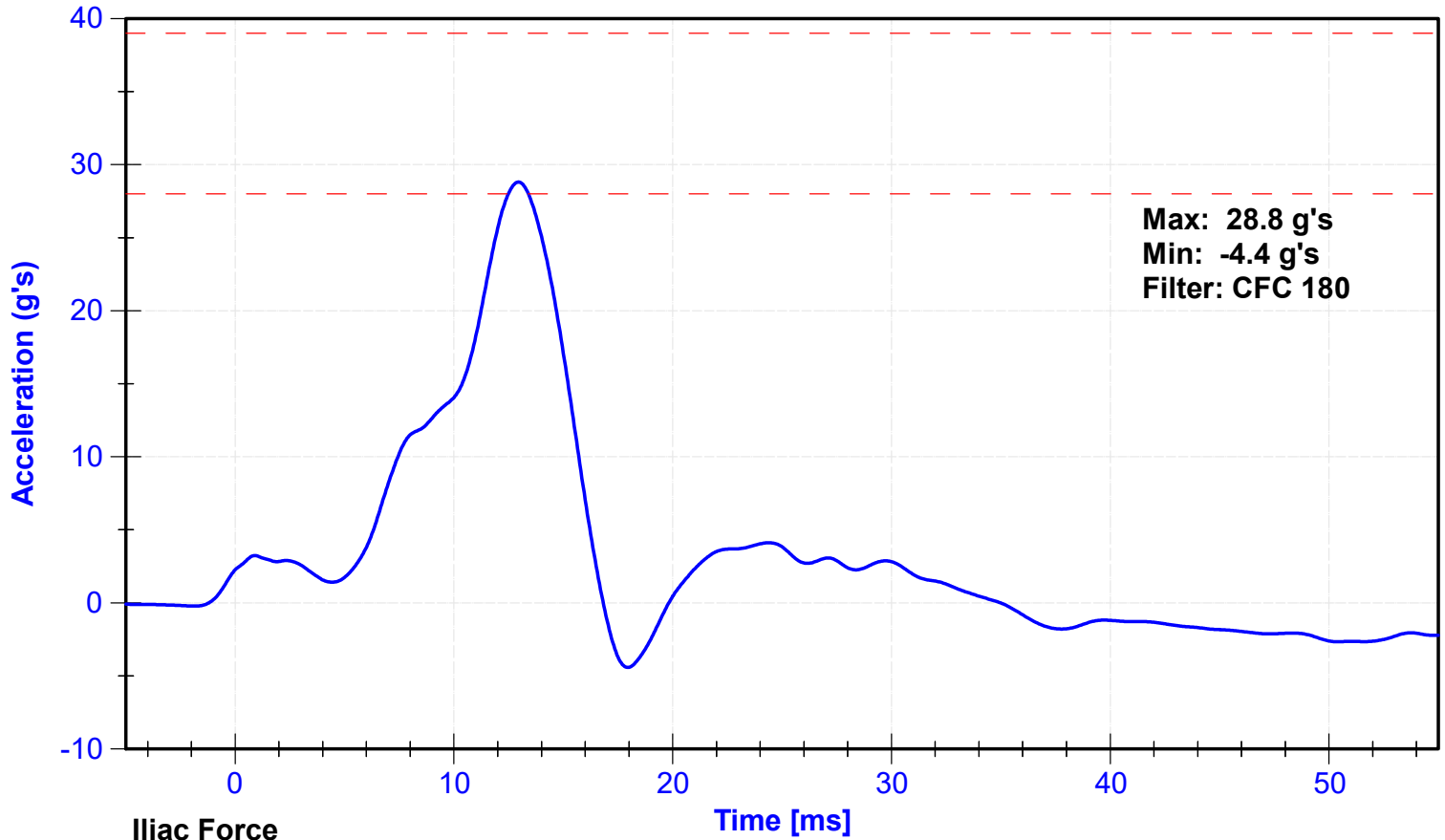
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Pelvis Y Accelerometer	Endevco	P51731	11/15/2023	5/13/2024
Iliac Load Cell	Denton	321	9/11/2023	9/10/2024

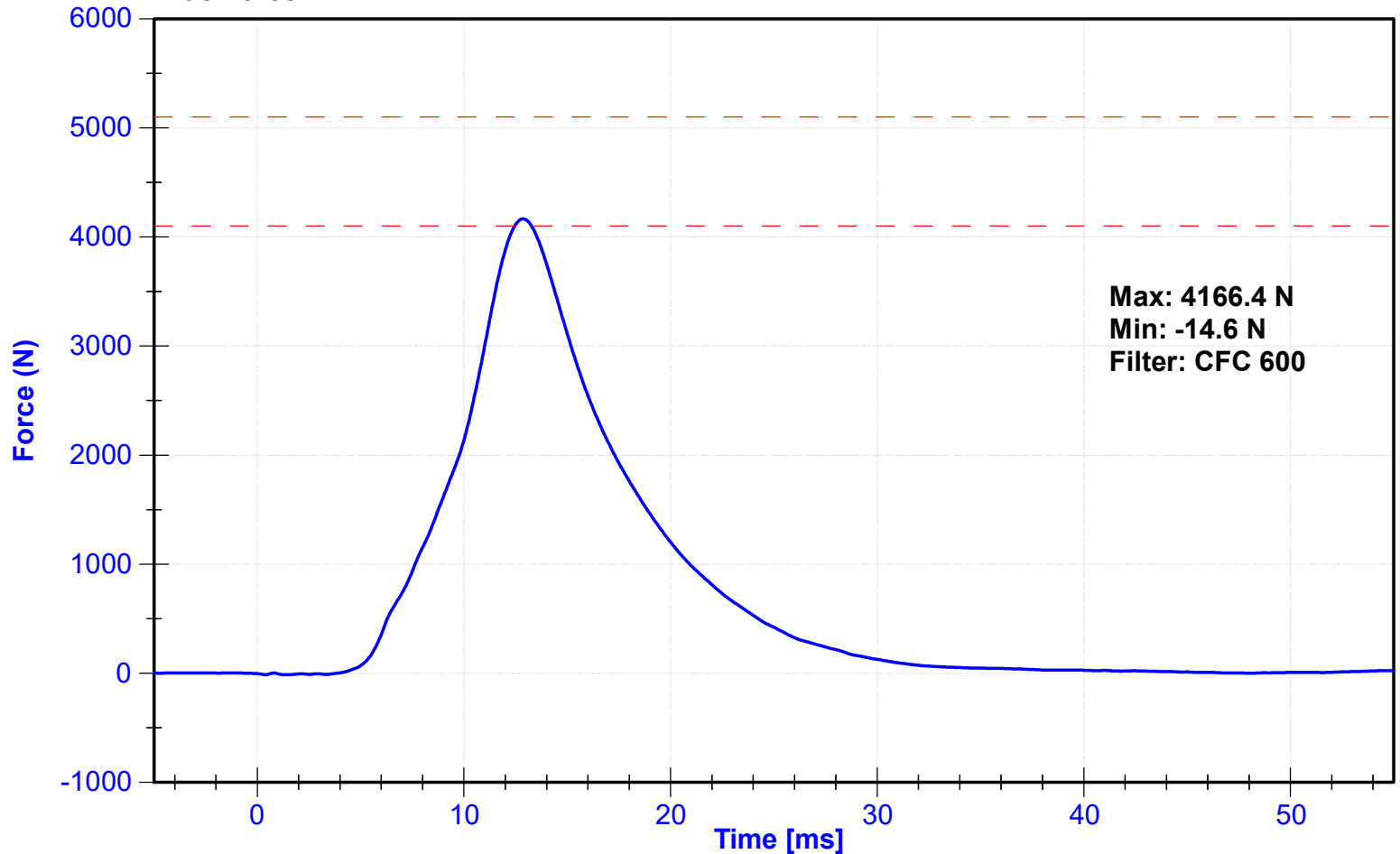
Probe Acceleration



Lateral Pelvis Acceleration



Iliac Force



CALIBRATION TEST RESULTS

POST-TEST

SID-IIS 5TH PERCENTILE FEMALE - DRIVER ATD

SERIAL NO:300

(CONFIGURED FOR LEFT SIDE IMPACT)

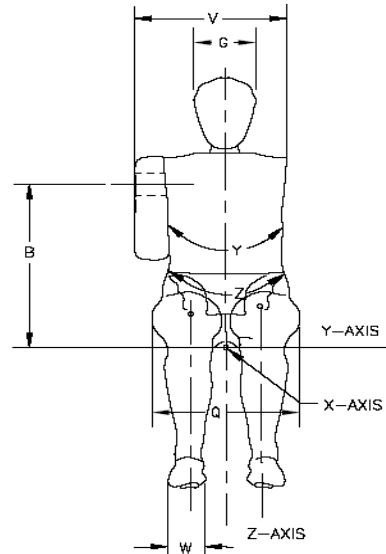
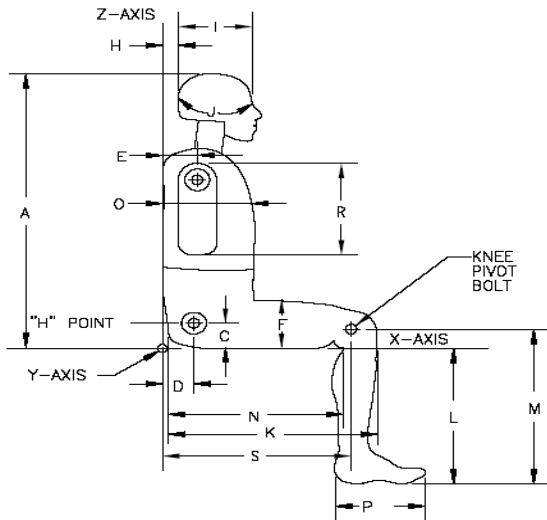


External Measurements - SID-IIs

Technician: K. Brogan

Date: 3/13/2024

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	445	Pass
C	H-point Height	79	89	84	Pass
D	H-point from seatback	141	151	145	Pass
E	Shoulder Pivot from Backline	97	107	99	Pass
F	Thigh Clearance	119	135	127	Pass
G	Head Breadth	140	148	144	Pass
H	Head Back from Backline	40	46	43	Pass
I	Head Depth	178	188	181	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	199	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	351	Pass
W	Foot Width	78	94	86	Pass
Y	Chest Circumference w/jacket	851	881	877	Pass
Z	Waist Circumference	761	791	780	Pass

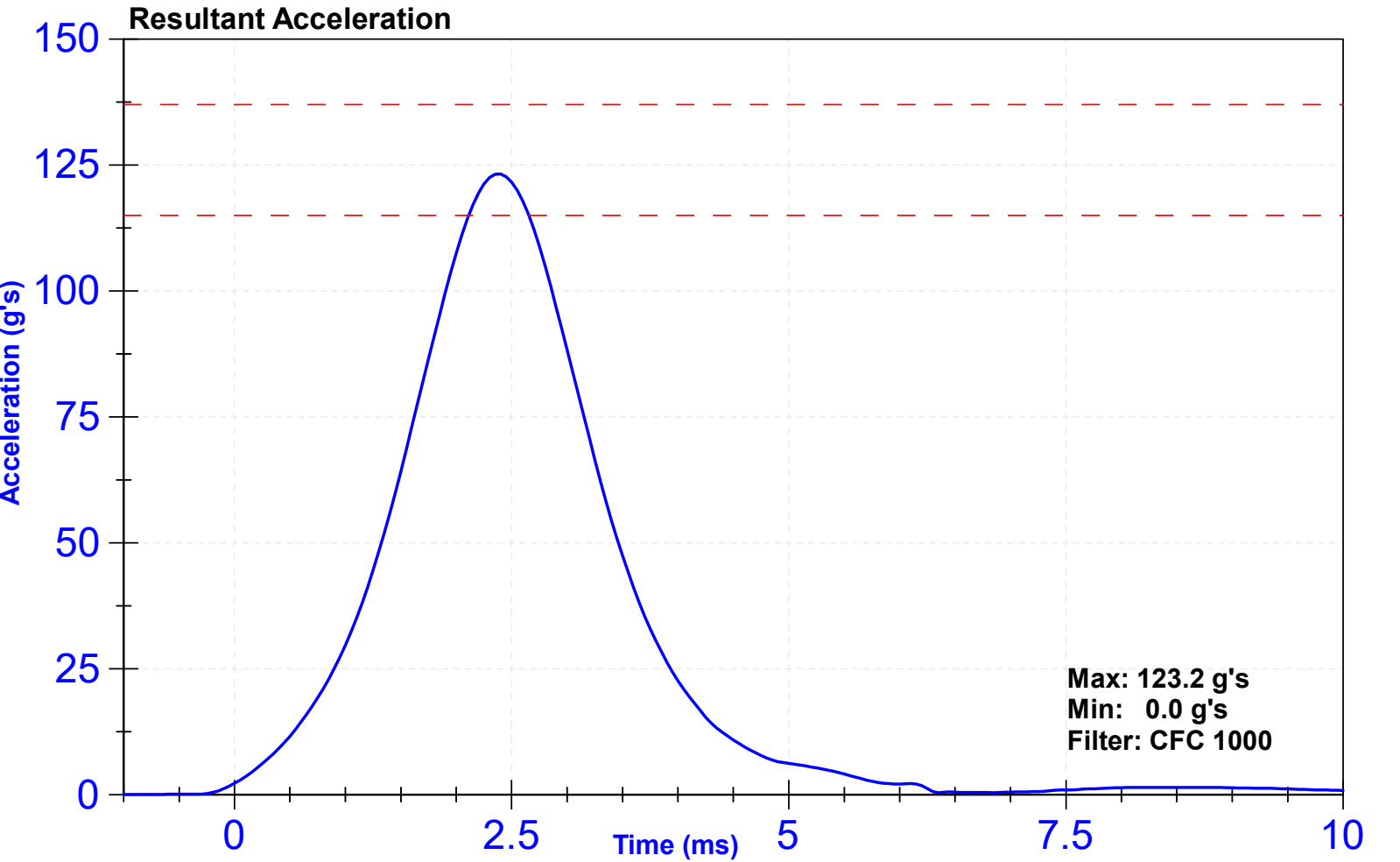
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

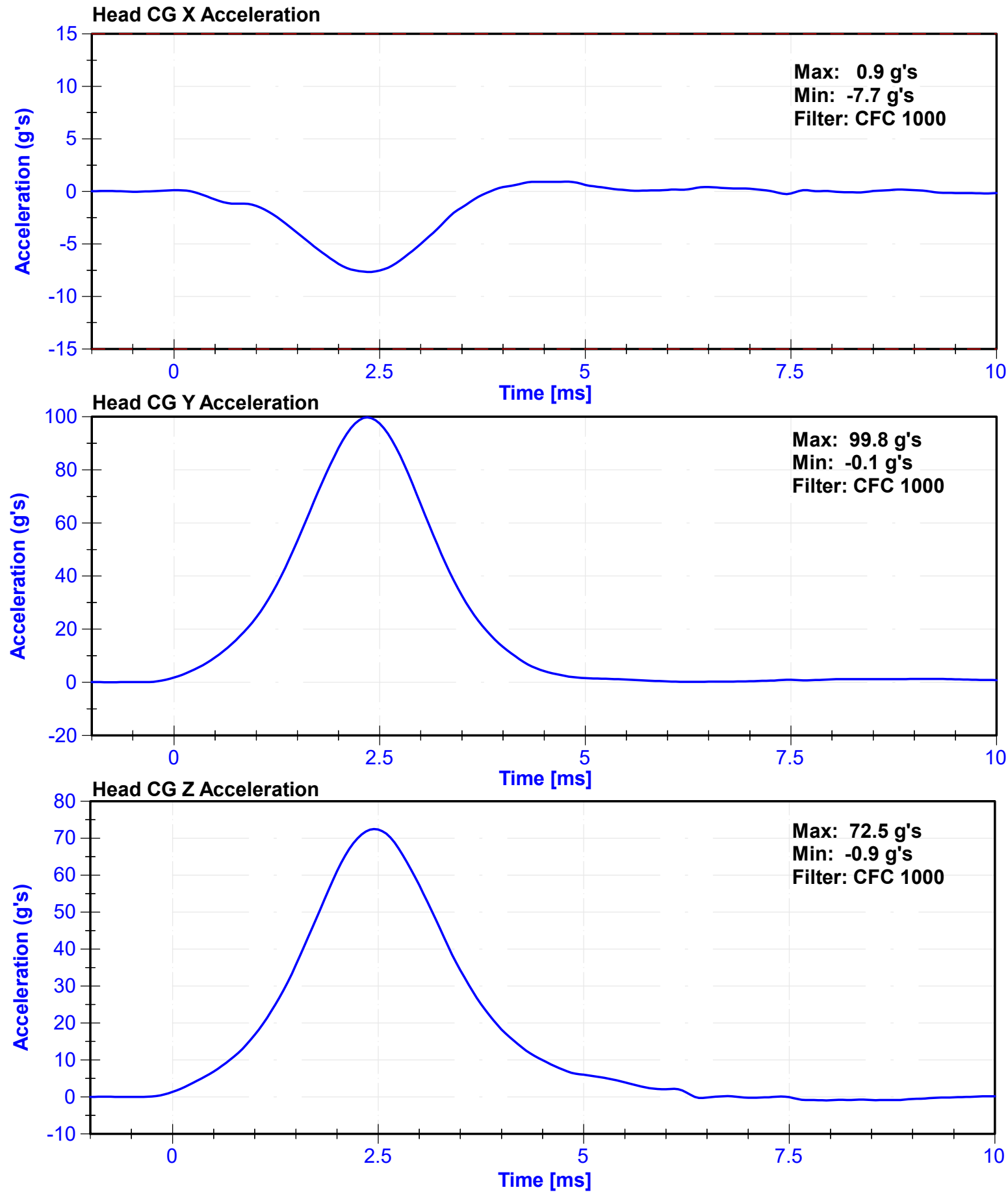
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	28	Pass
Resultant Acceleration	115	137	g's	123.2	Pass
Oscillation	0	15	%	1.8	Pass
Fore-Aft Acceleration	-15	15	g's	-7.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibratio Date	Calibratio Due Date
X Accelerometer	Endevco	P59018	11/15/2023	5/13/2024
Y Accelerometer	Endevco	P79189	11/15/2023	5/13/2024
Z Accelerometer	Endevco	P79587	11/15/2023	5/13/2024





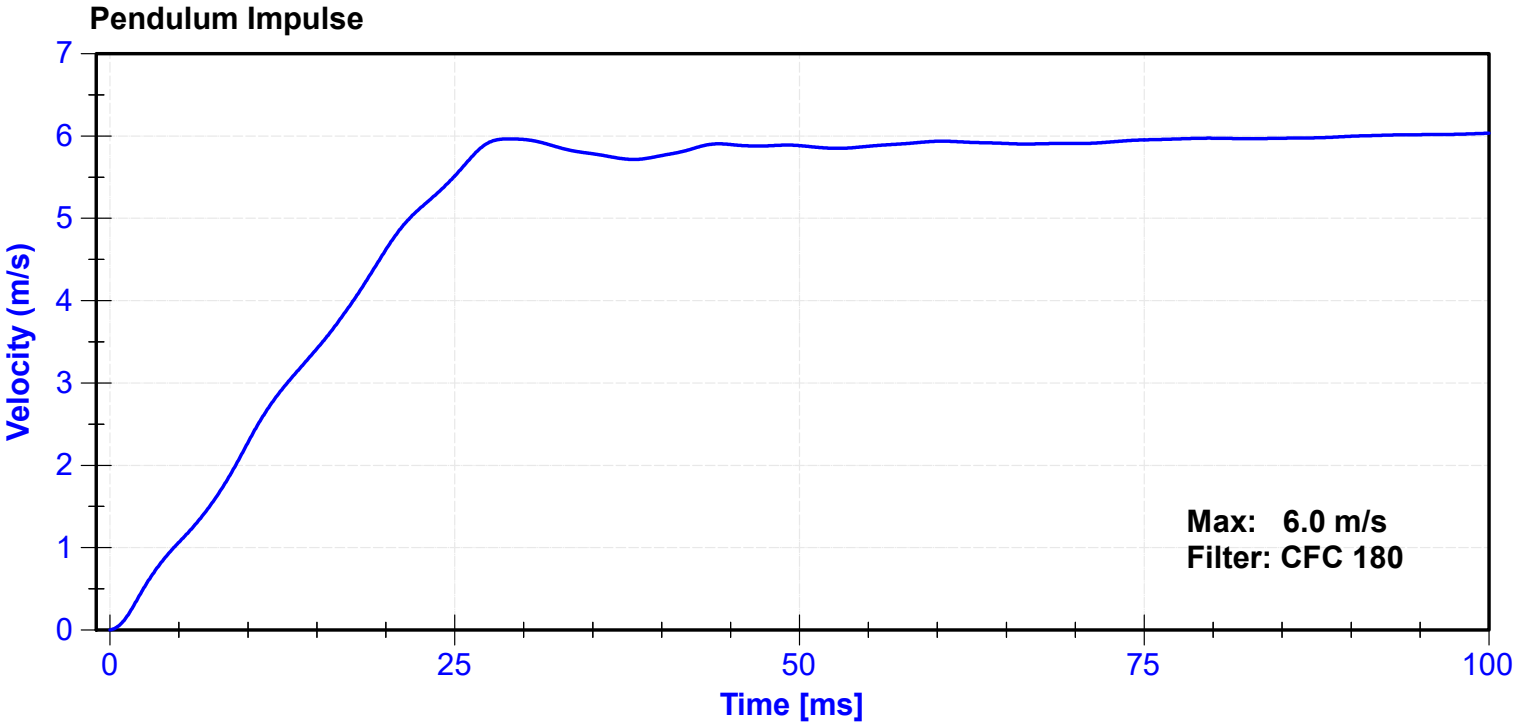
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

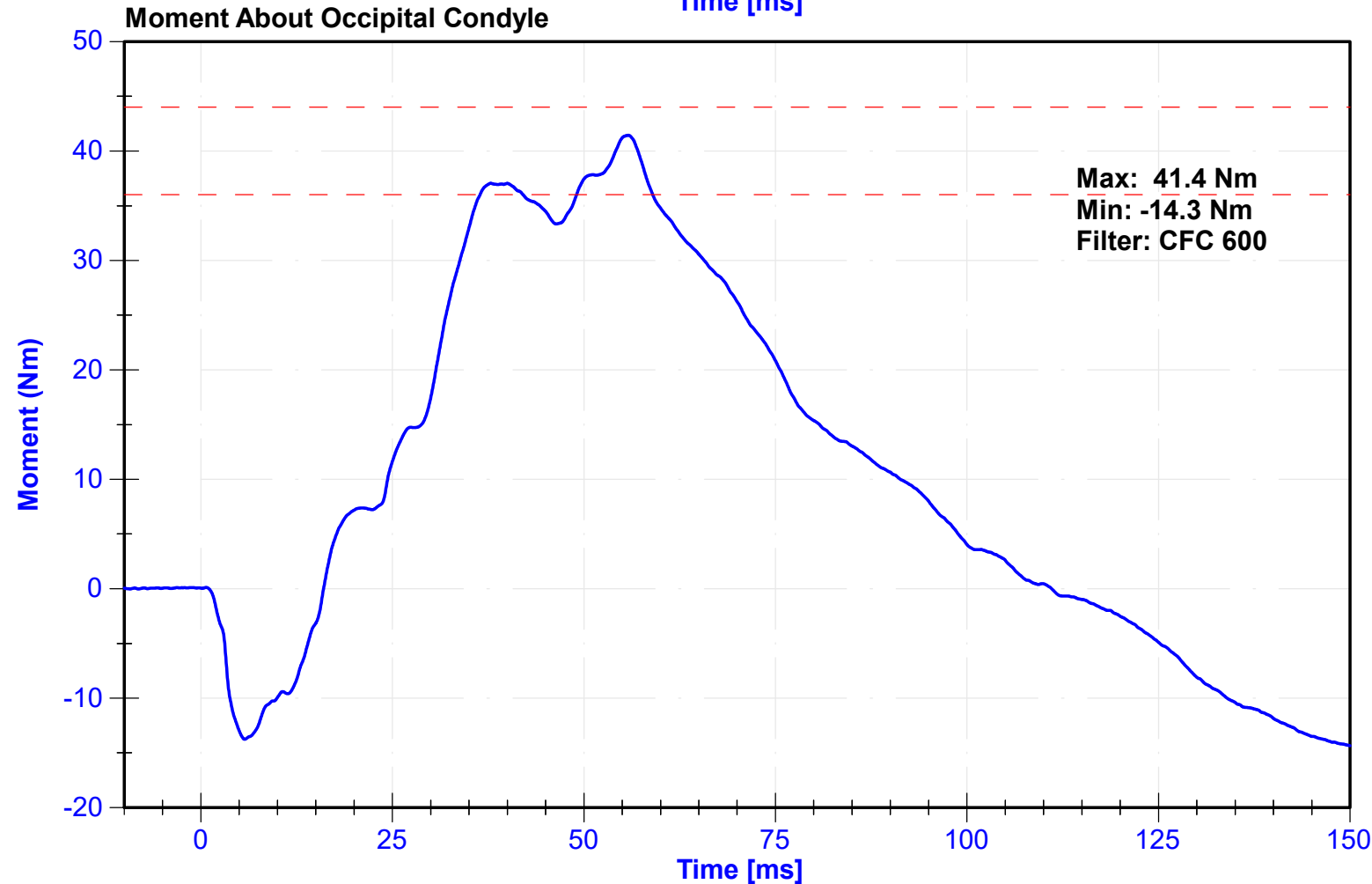
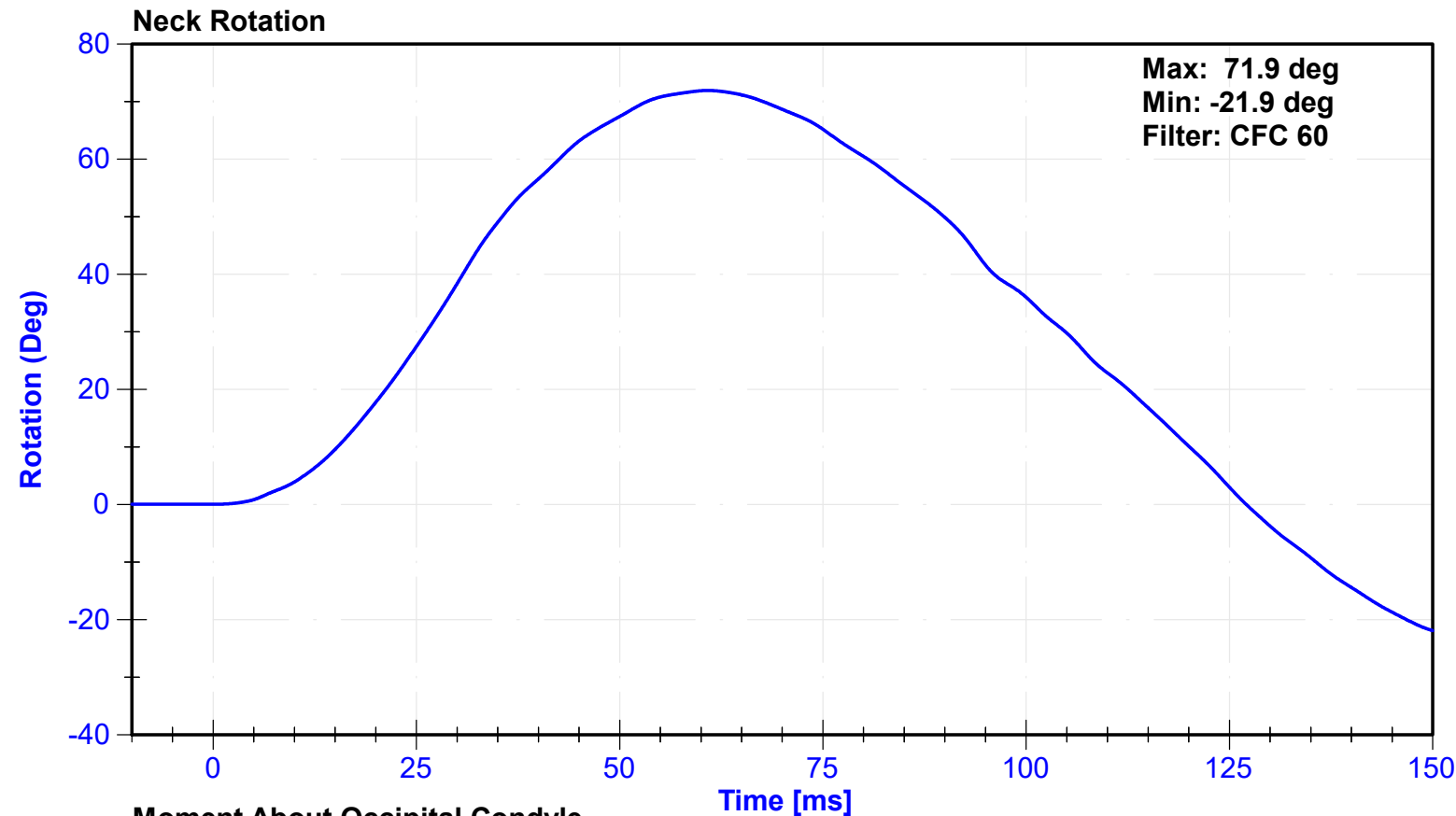
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21	Pass
Humidity	10	70	%	30	Pass
Velocity	5.51	5.63	m/s	5.586	Pass
Pendulum Impulse at 10ms	2.2	2.8	m/s	2.28	Pass
Pendulum Impulse at 15ms	3.3	4.1	m/s	3.42	Pass
Pendulum Impulse at 20ms	4.4	5.4	m/s	4.62	Pass
Pendulum Impulse at 25ms	5.4	6.1	m/s	5.51	Pass
Pendulum Impulse from 25 to 100ms	5.5	6.2	m/s	6.03	Pass
Neck Rotation	71	81	deg	71.9	Pass
Time at Maximum Rotation	50	70	ms	60.8	Pass
Moment about the OC	36	44	Nm	41.4	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	10/31/2023	4/28/2024
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





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

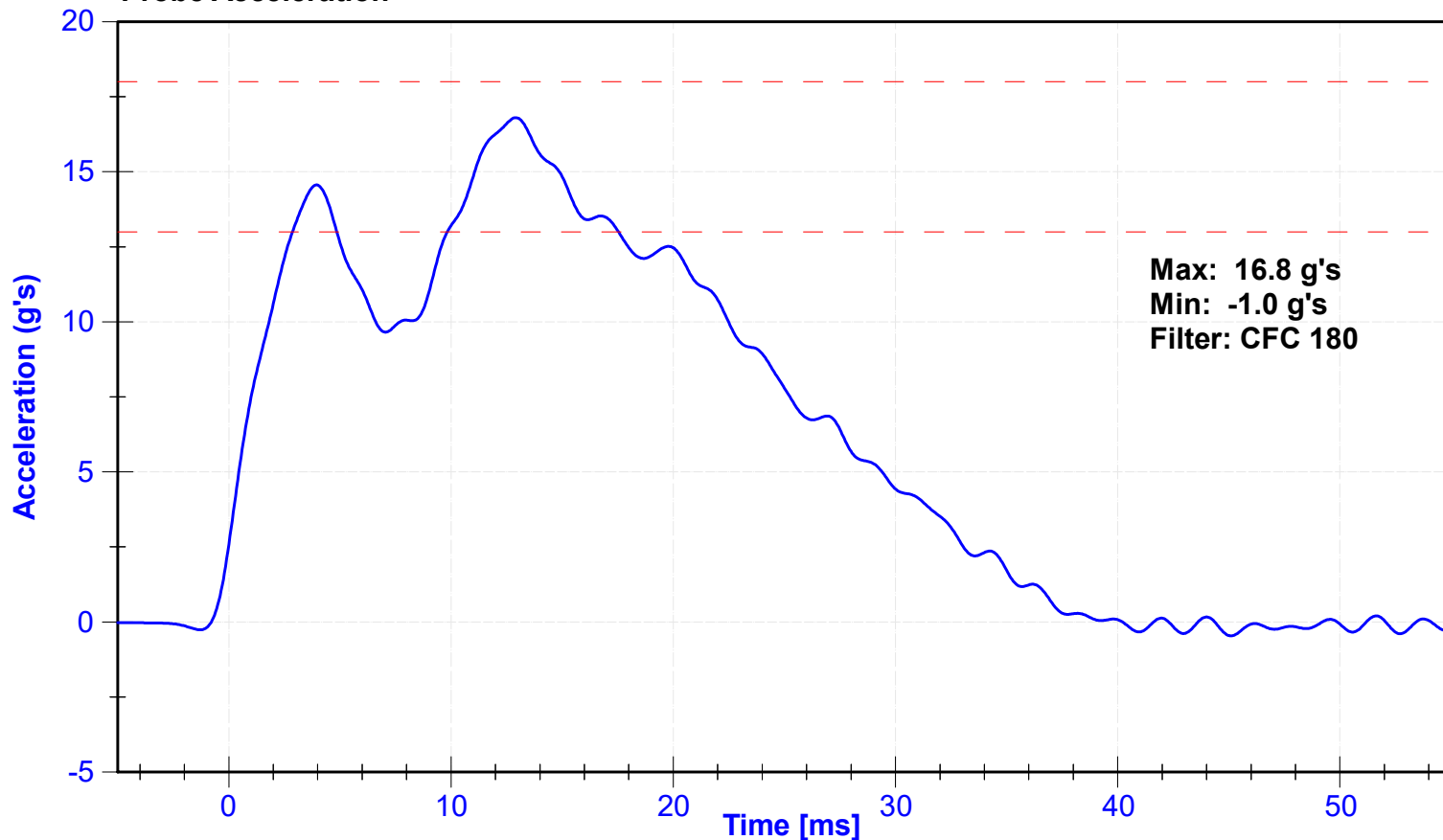
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	4.2	4.4	m/s	4.26	Pass
Probe Acceleration	13	18	g's	16.8	Pass
Shoulder Deflection	28	37	mm	29.0	Pass
Lateral Upper Spine Acceleration	17	22	g's	19.1	Pass

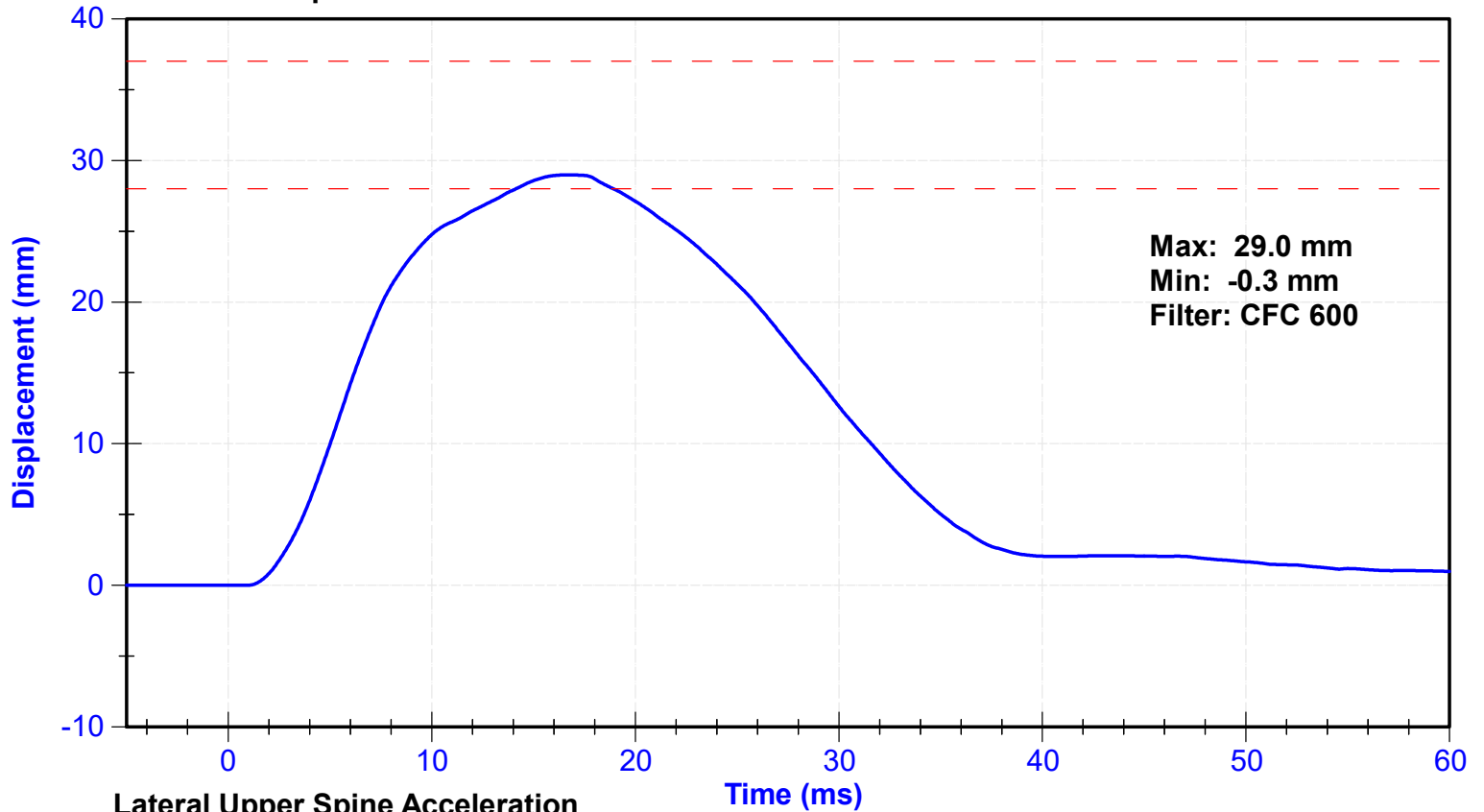
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Shoulder Potentiometer	Servo	053GFE	11/17/2023	5/17/2024
Upper Spine Y Accelerometer	Endevco	T20880	11/16/2023	5/14/2024

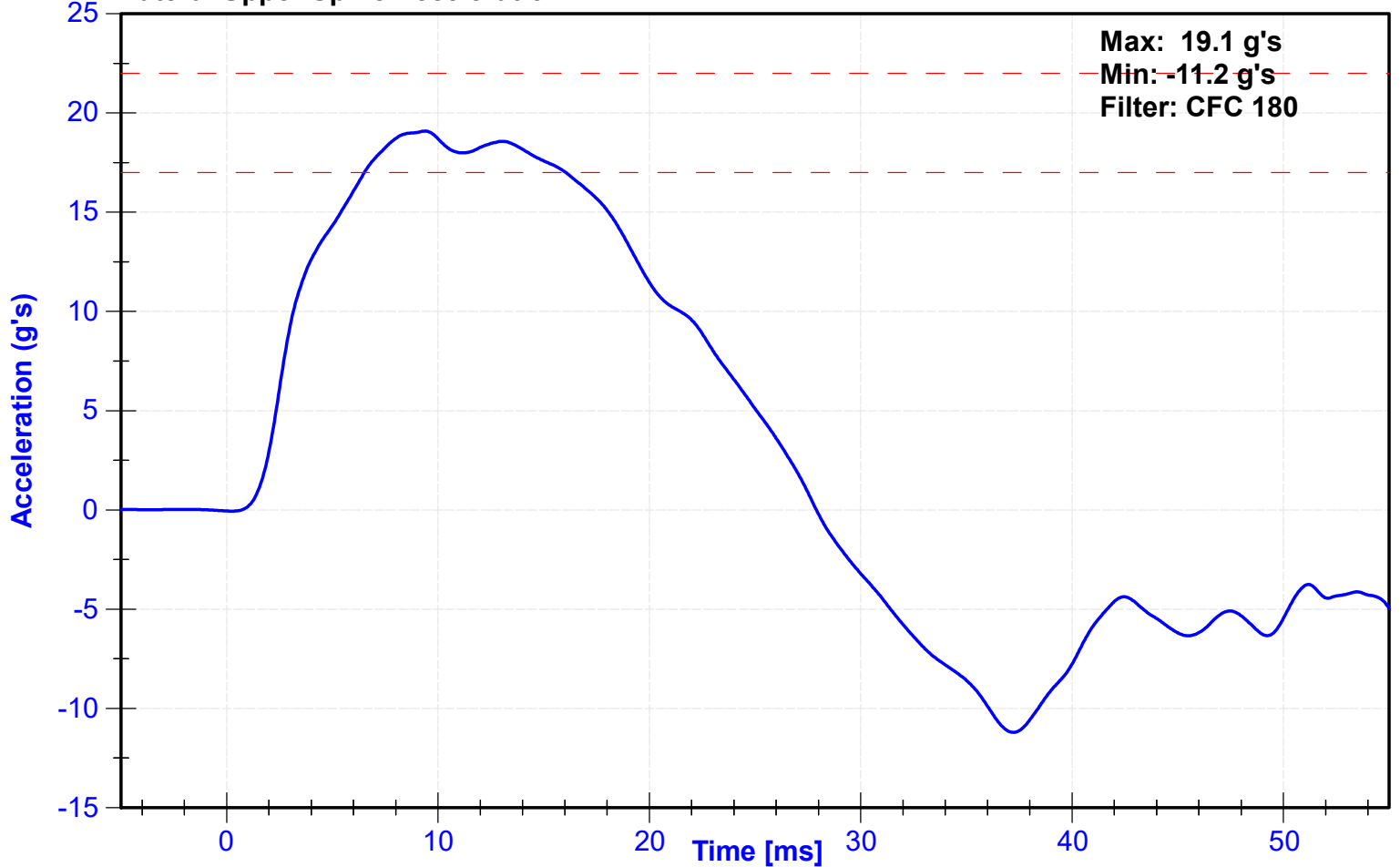
Probe Acceleration



Shoulder Displacement



Lateral Upper Spine Acceleration



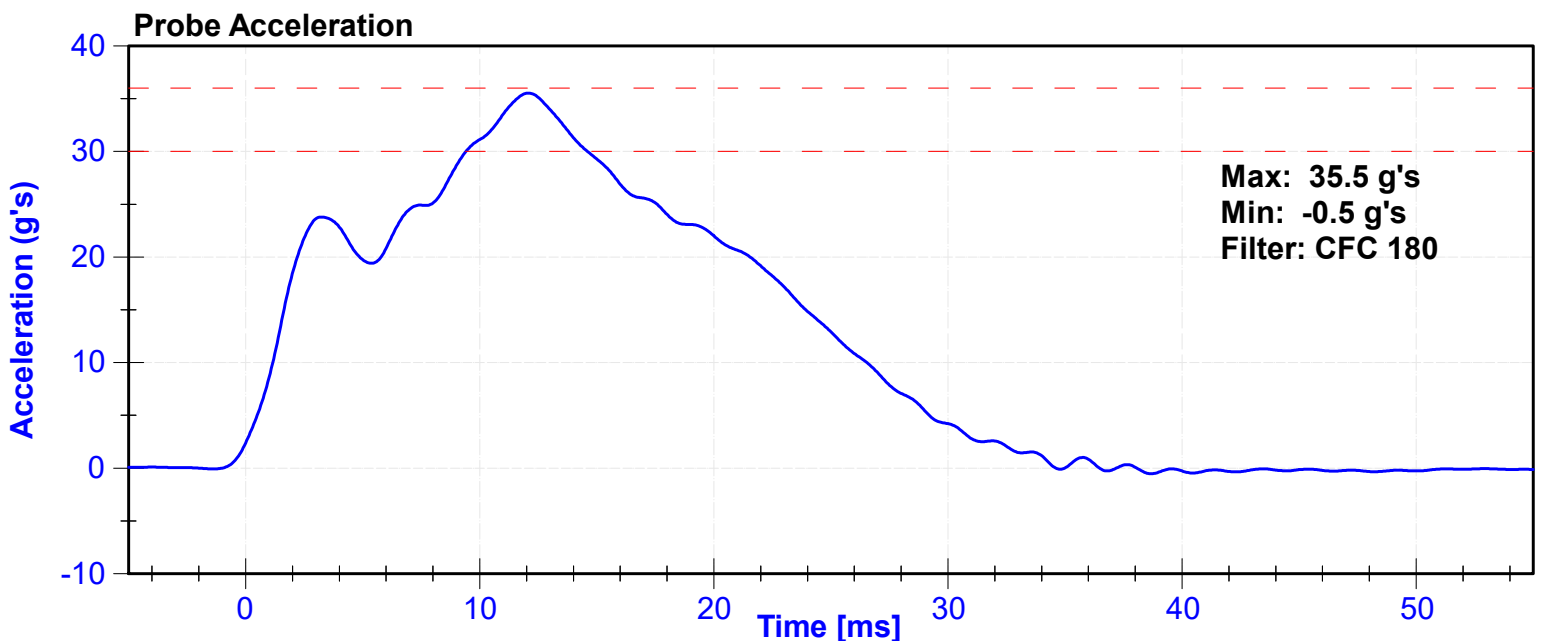
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

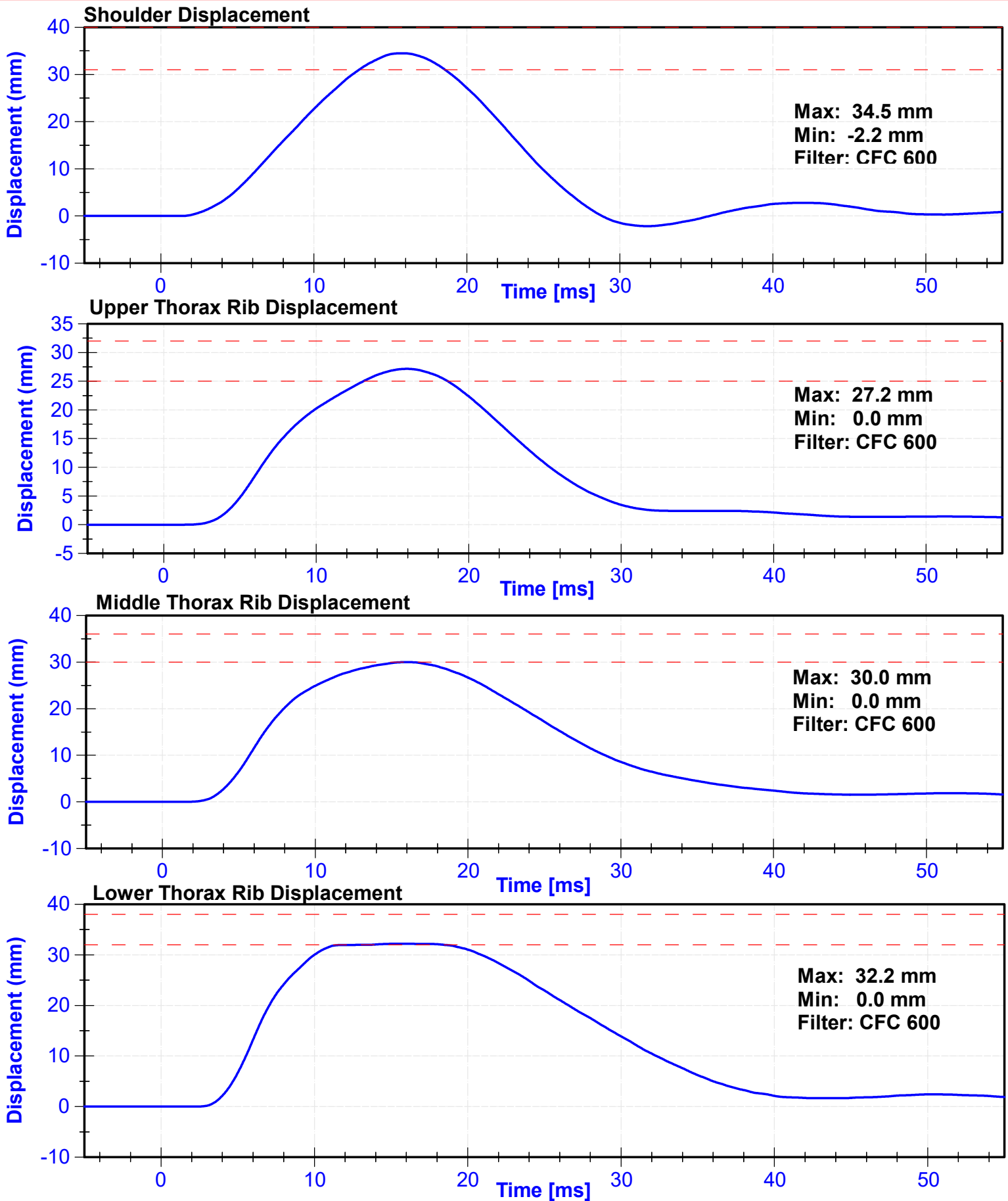
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	6.6	6.8	m/s	6.63	Pass
Probe Acceleration after 5 ms	30	36	g's	35.5	Pass
Lateral Upper Spine Acceleration	34	43	g's	35.3	Pass
Lateral Lower Spine Acceleration	29	37	g's	33.4	Pass
Shoulder Deflection	31	40	mm	34.5	Pass
Upper Thorax Rib Deflection	25	32	mm	27.2	Pass
Mid Thorax Rib Deflection	30	36	mm	30.0	Pass
Lower Thorax Rib Deflection	32	38	mm	32.2	Pass

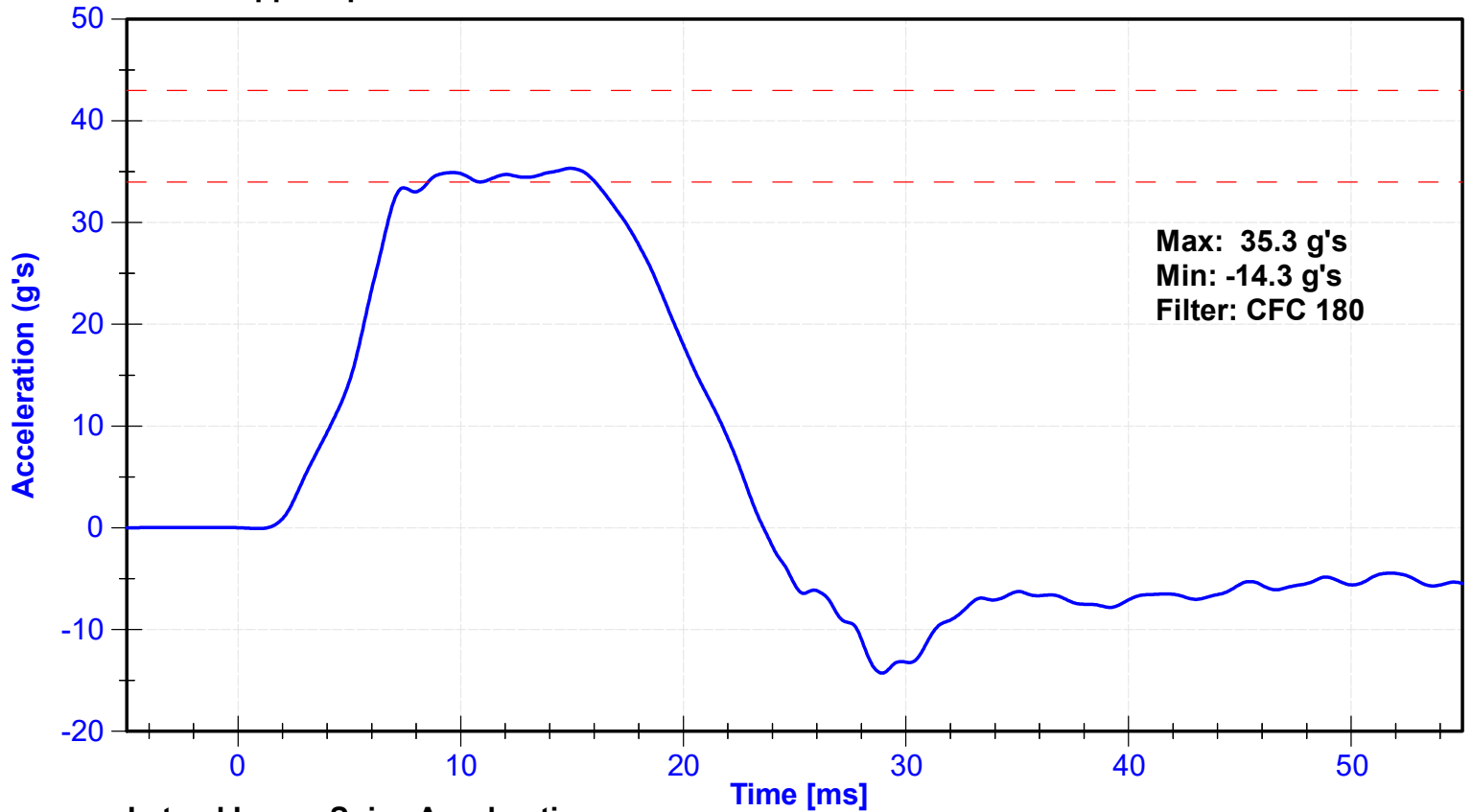
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Upper Spine T1 Y Accelerometer	Endevco	T20880	11/16/2023	5/14/2024
Upper Spine T12 Y Accelerometer	Endevco	P52071	11/16/2023	5/14/2024
Shoulder Potentiometer	Servo	053GFE	11/17/2023	5/17/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	11/17/2023	5/17/2024
Middle Thorax Rib Potentiometer	Servo	307GFE	11/17/2023	5/17/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	11/17/2023	5/17/2024

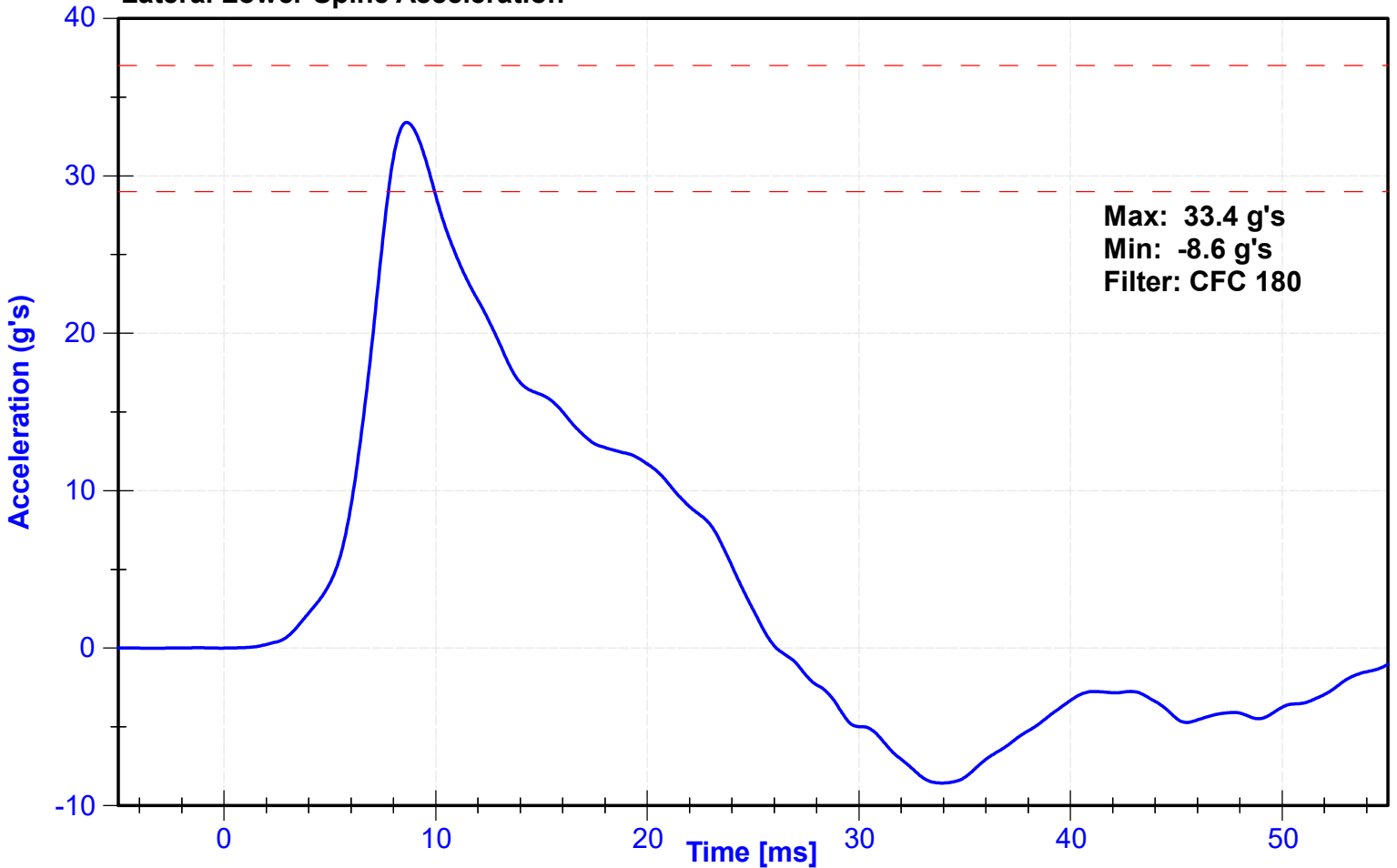




Lateral Upper Spine Acceleration



Lateral Lower Spine Acceleration



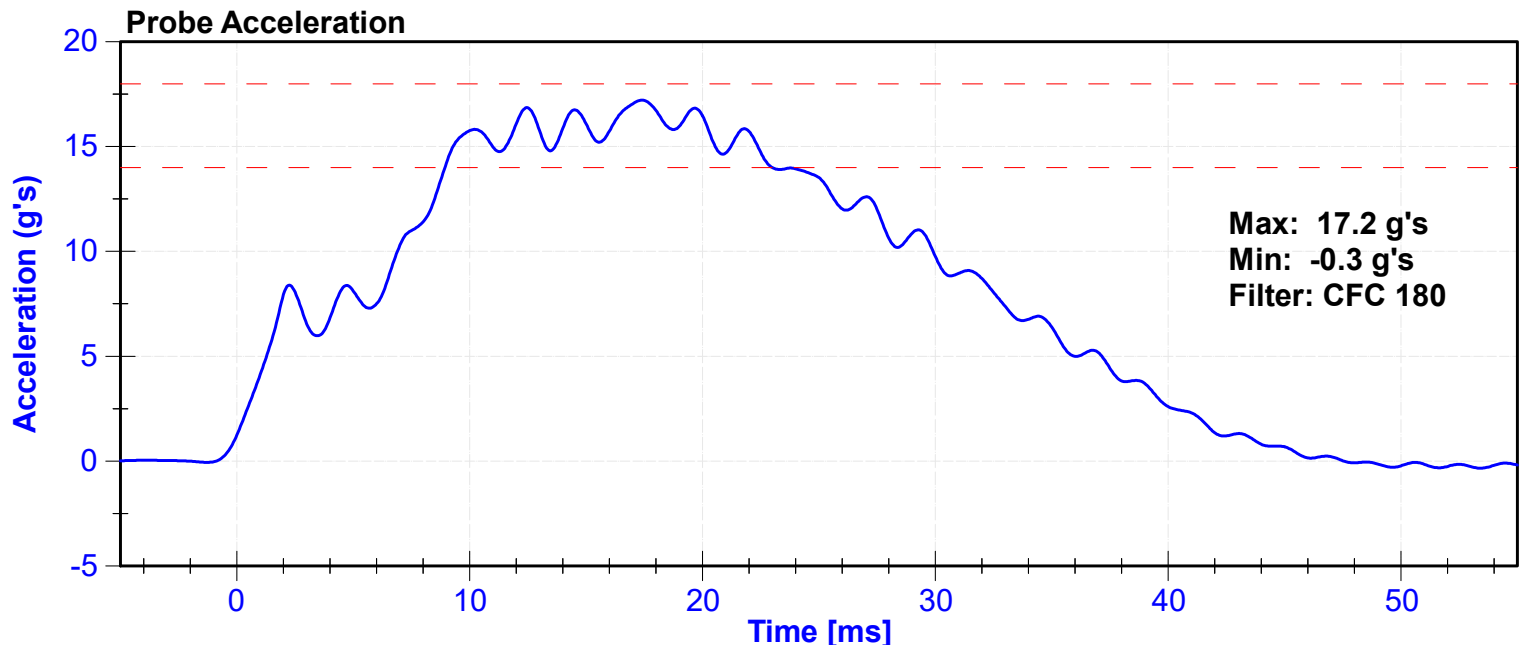
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

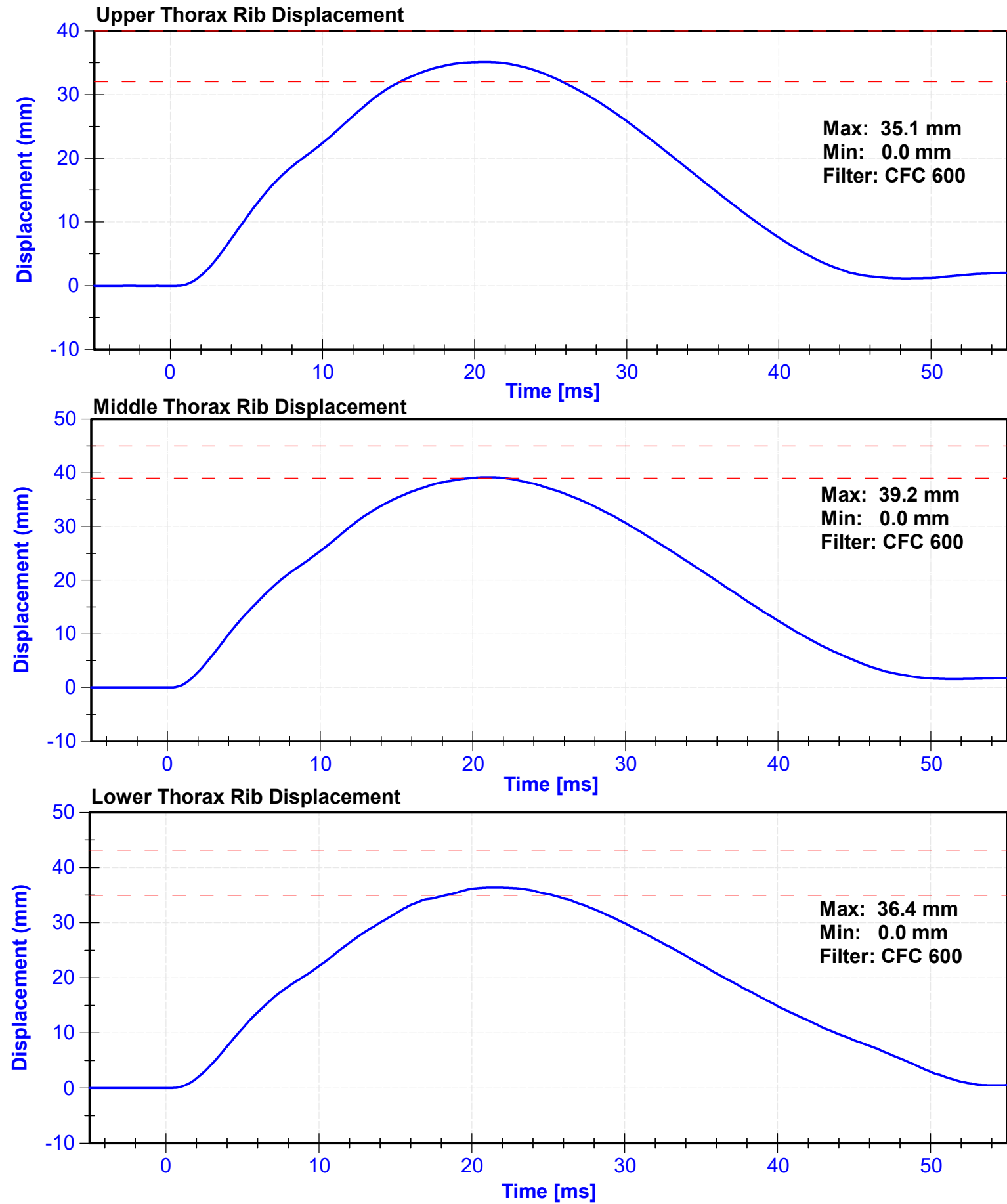
Results

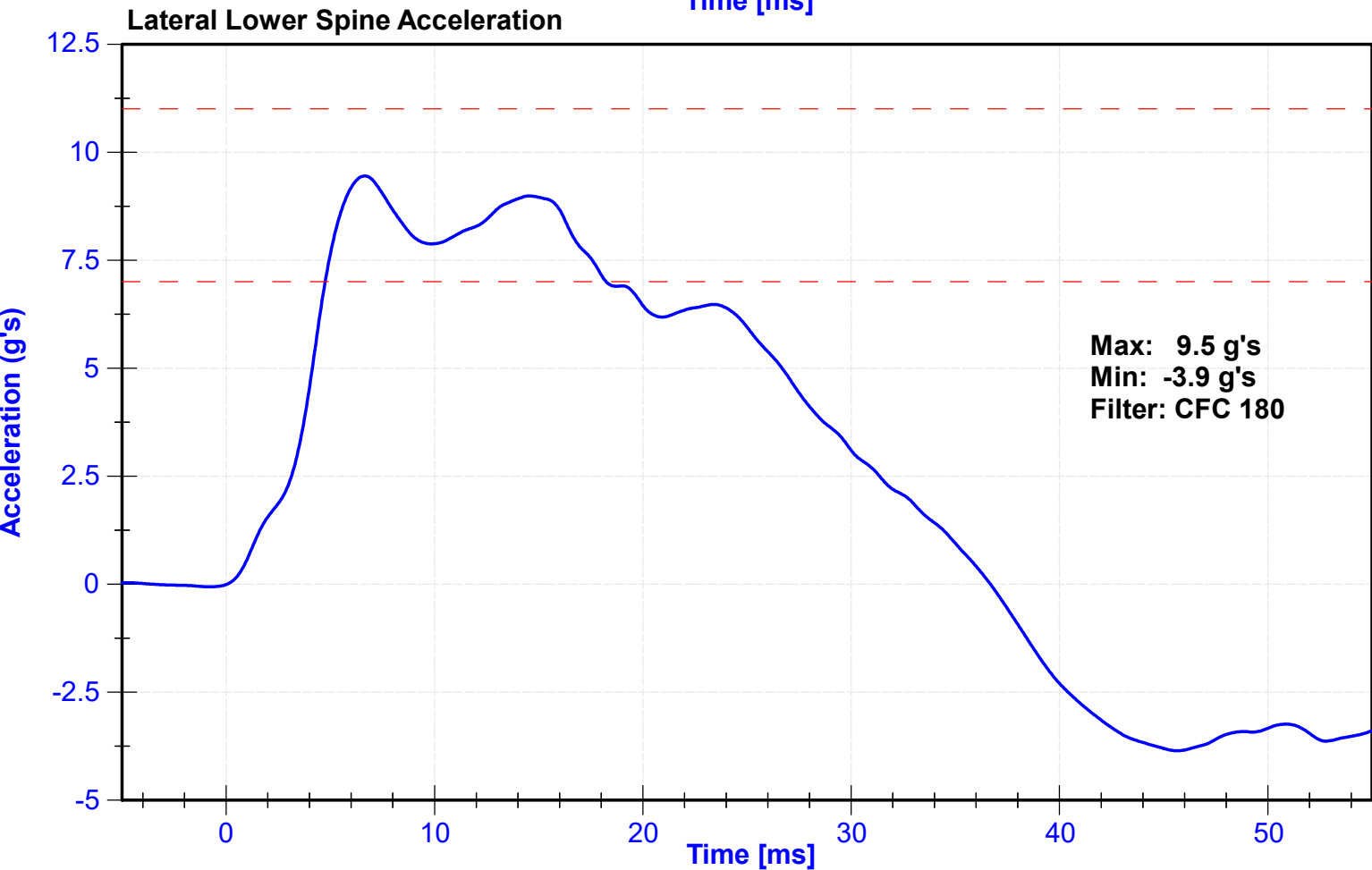
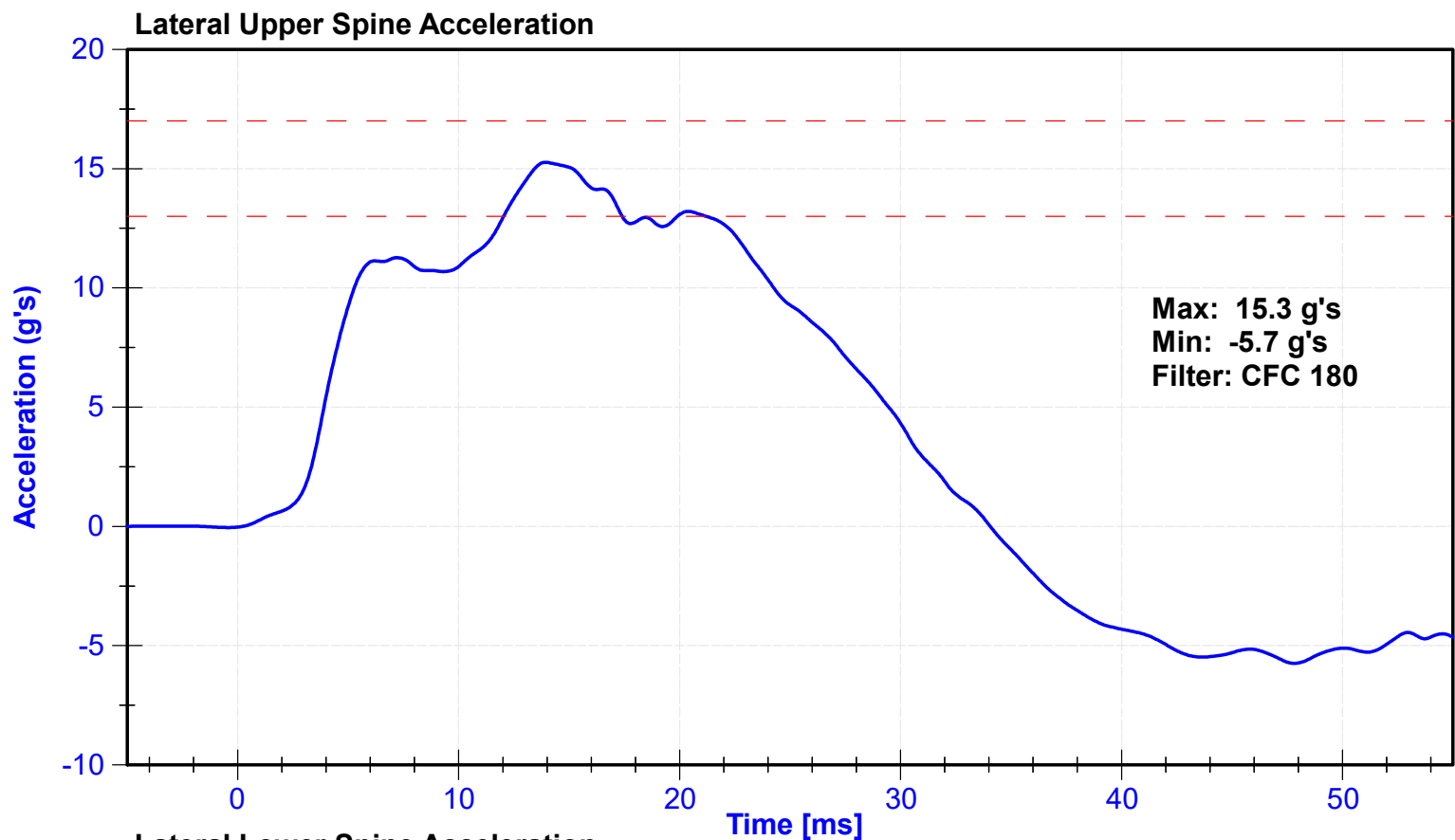
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	14	18	g's	17.2	Pass
Lateral Upper Spine Acceleration	13	17	g's	15.3	Pass
Lateral Lower Spine Acceleration	7	11	g's	9.5	Pass
Upper Thorax Rib Deflection	32	40	mm	35.1	Pass
Middle Thorax Rib Deflection	39	45	mm	39.2	Pass
Lower Thorax Rib Deflection	35	43	mm	36.4	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	11/16/2023	5/14/2024
Lower Spine Y Accelerometer	Endevco	P52071	11/16/2023	5/14/2024
Upper Thorax Rib Potentiometer	Servo	2316GFE	11/17/2023	5/17/2024
Middle Thorax Rib Potentiometer	Servo	307GFE	11/17/2023	5/17/2024
Lower Thorax Rib Potentiometer	Servo	1156GFE	11/17/2023	5/17/2024







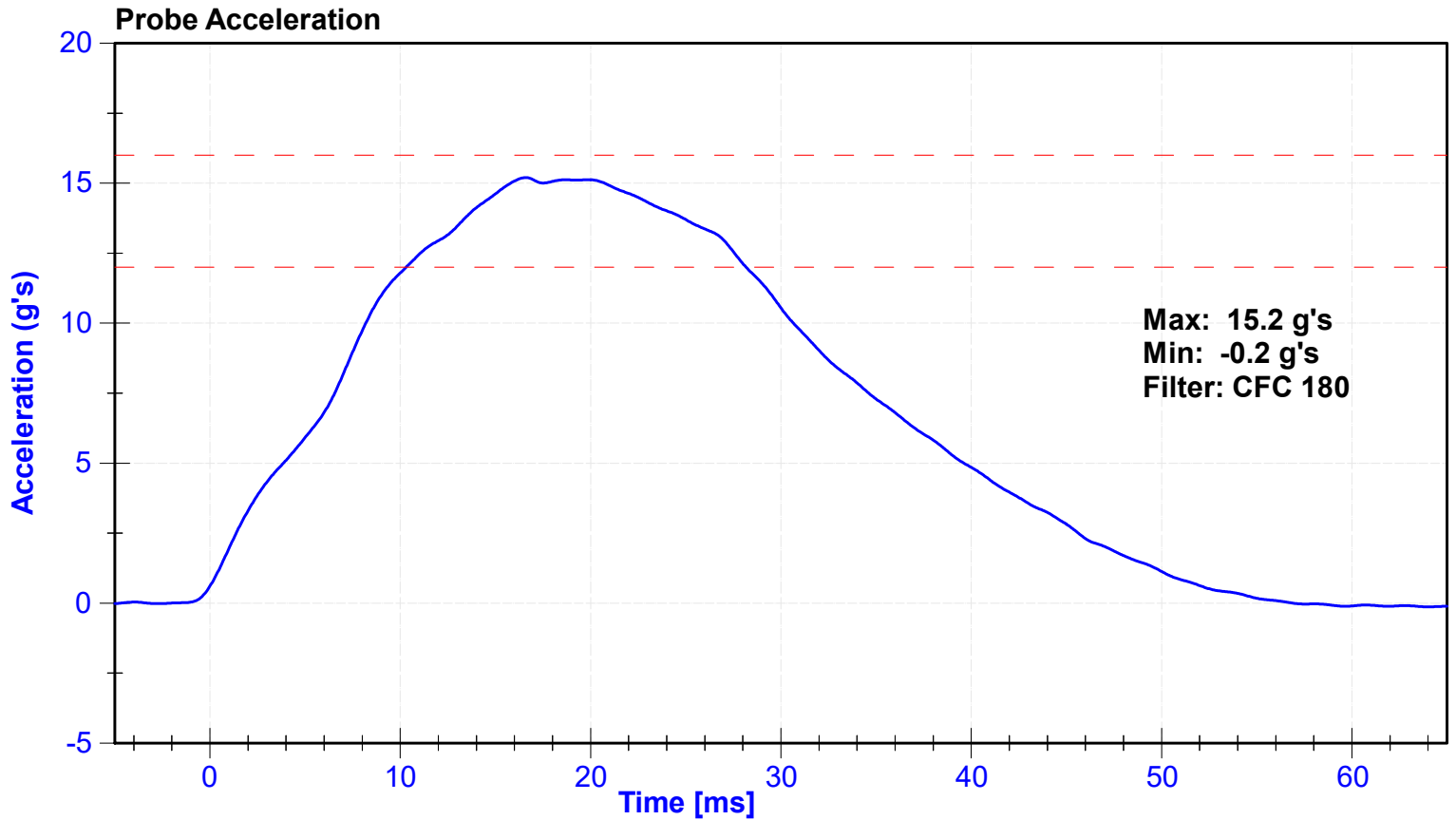
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

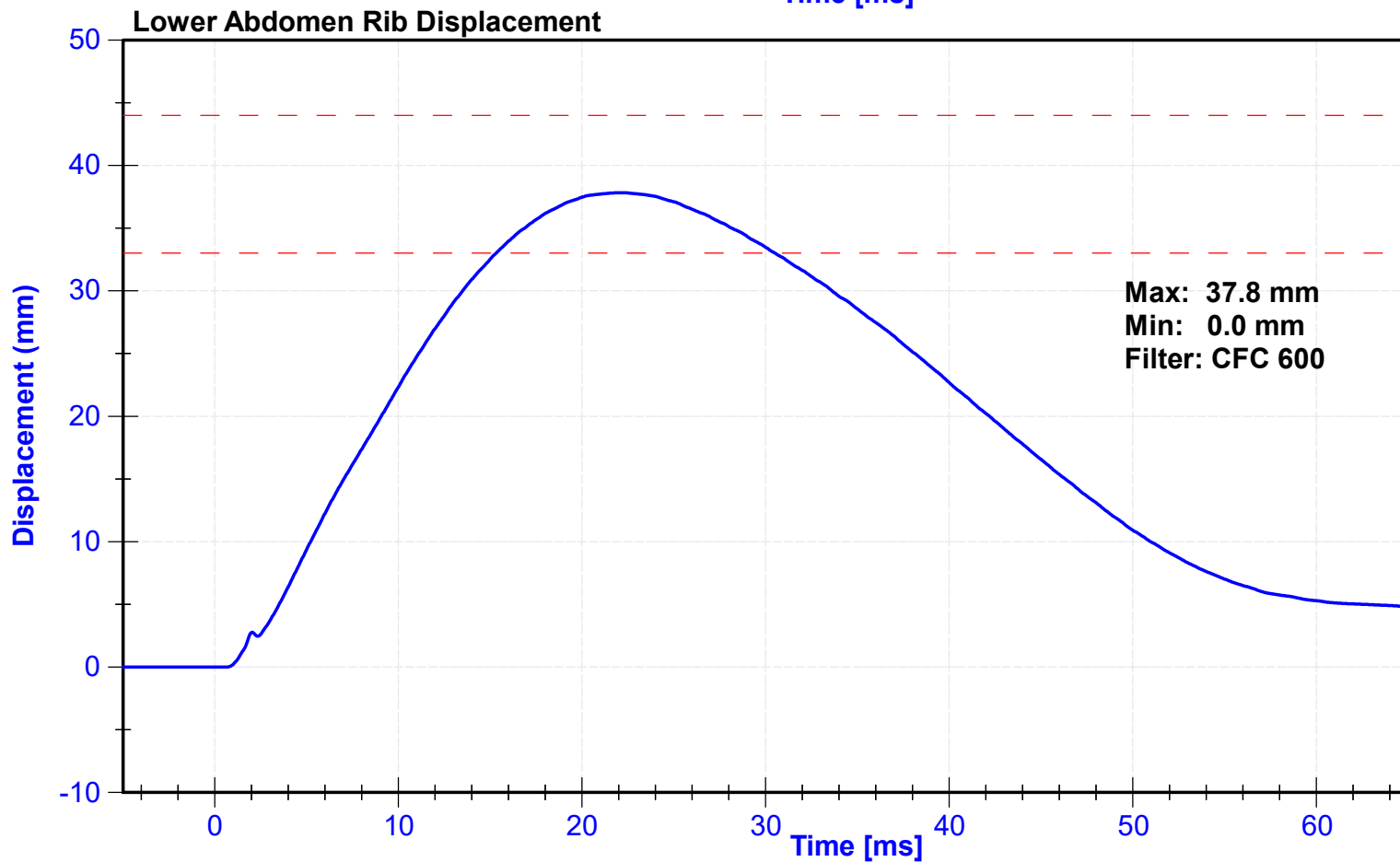
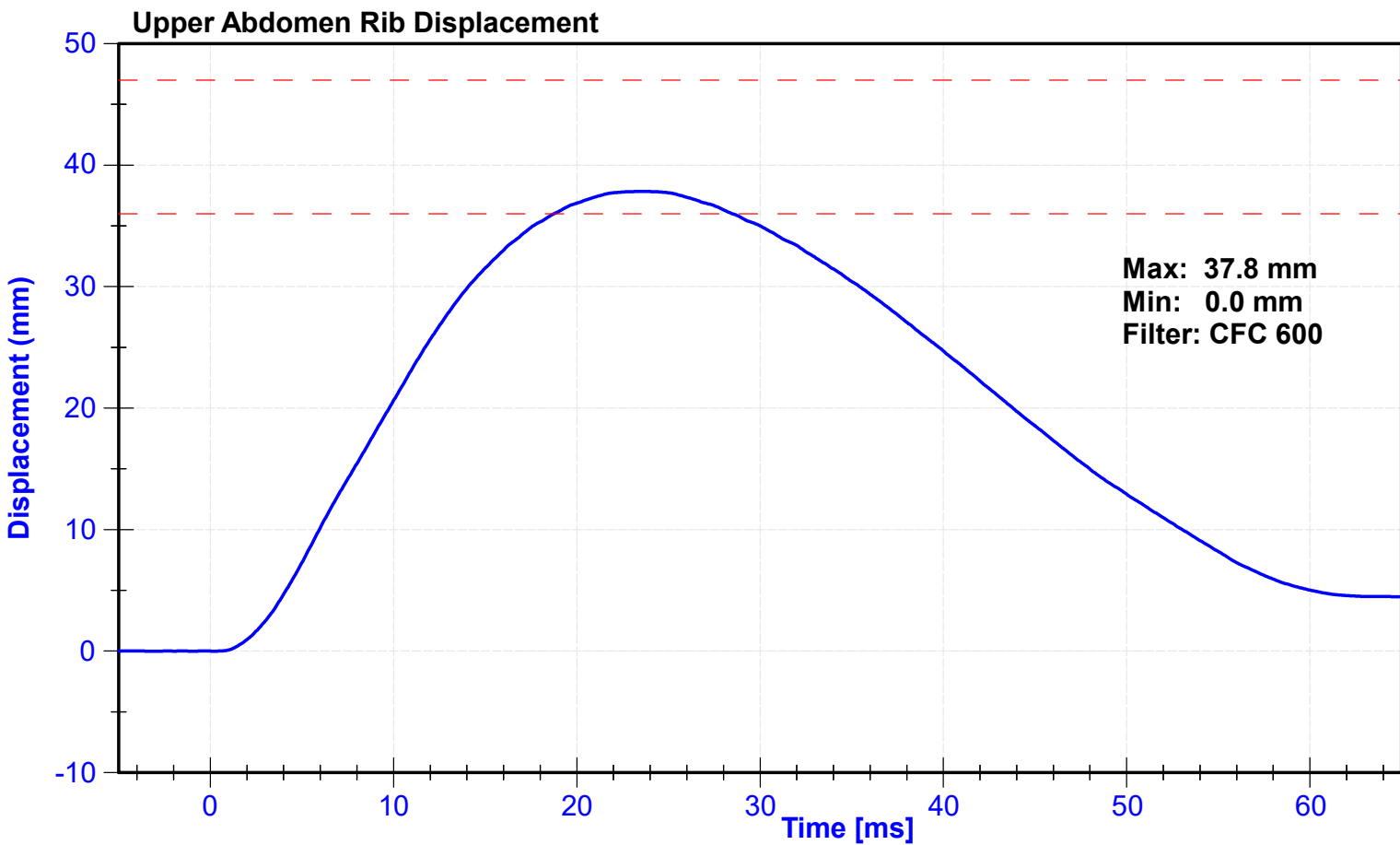
Results

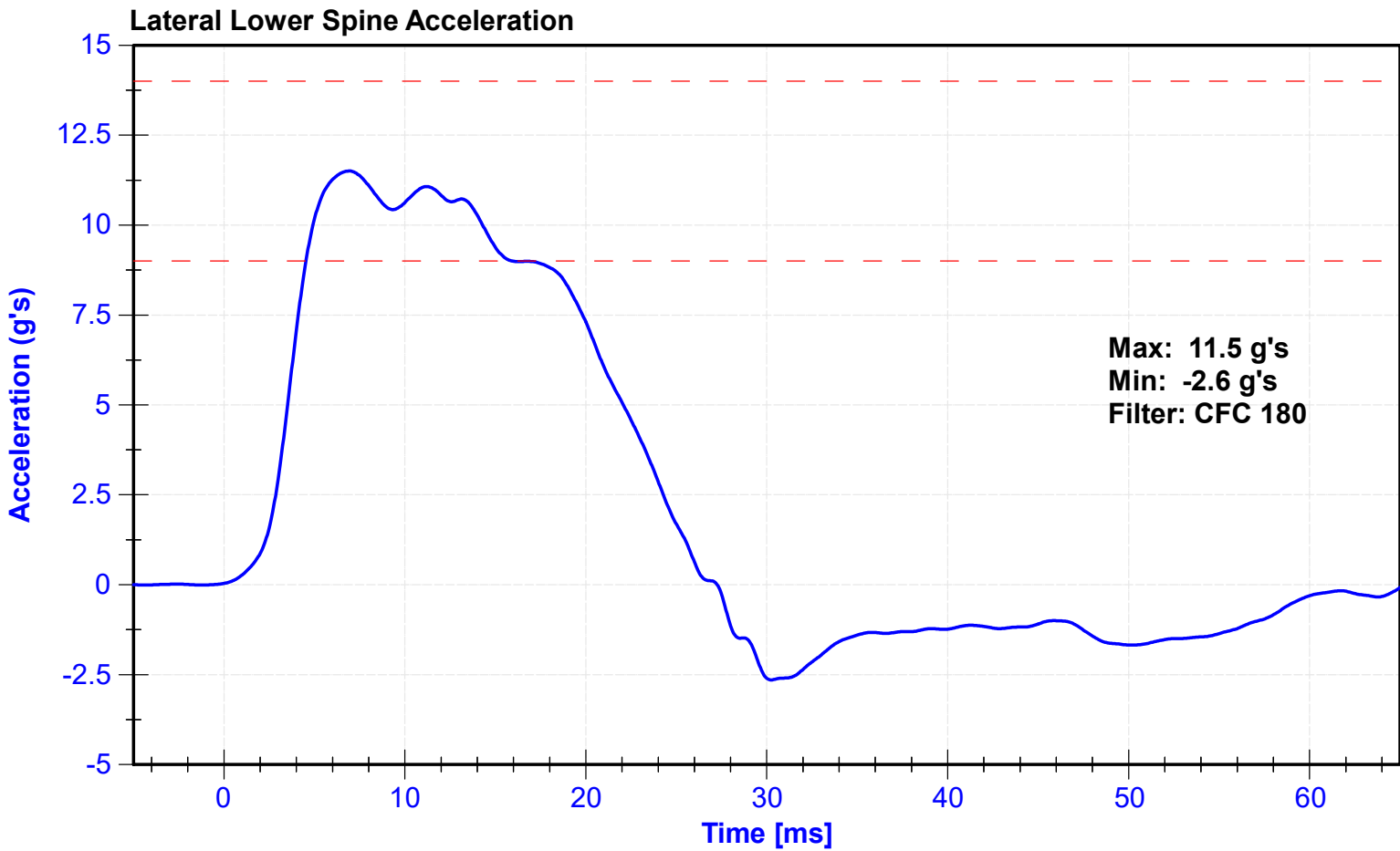
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	12	16	g's	15.2	Pass
Lateral Lower Spine Acceleration	9	14	g's	11.5	Pass
Upper Abdomen Rib Deflection	36	47	mm	37.8	Pass
Lower Abdomen Rib Deflection	33	44	mm	37.8	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	11/16/2023	5/14/2024
Upper Abdomen Rib Potentiometer	Servo	060GFE	11/21/2023	5/21/2024
Lower Abdomen Rib Potentiometer	Servo	308GFE	11/17/2023	5/17/2024







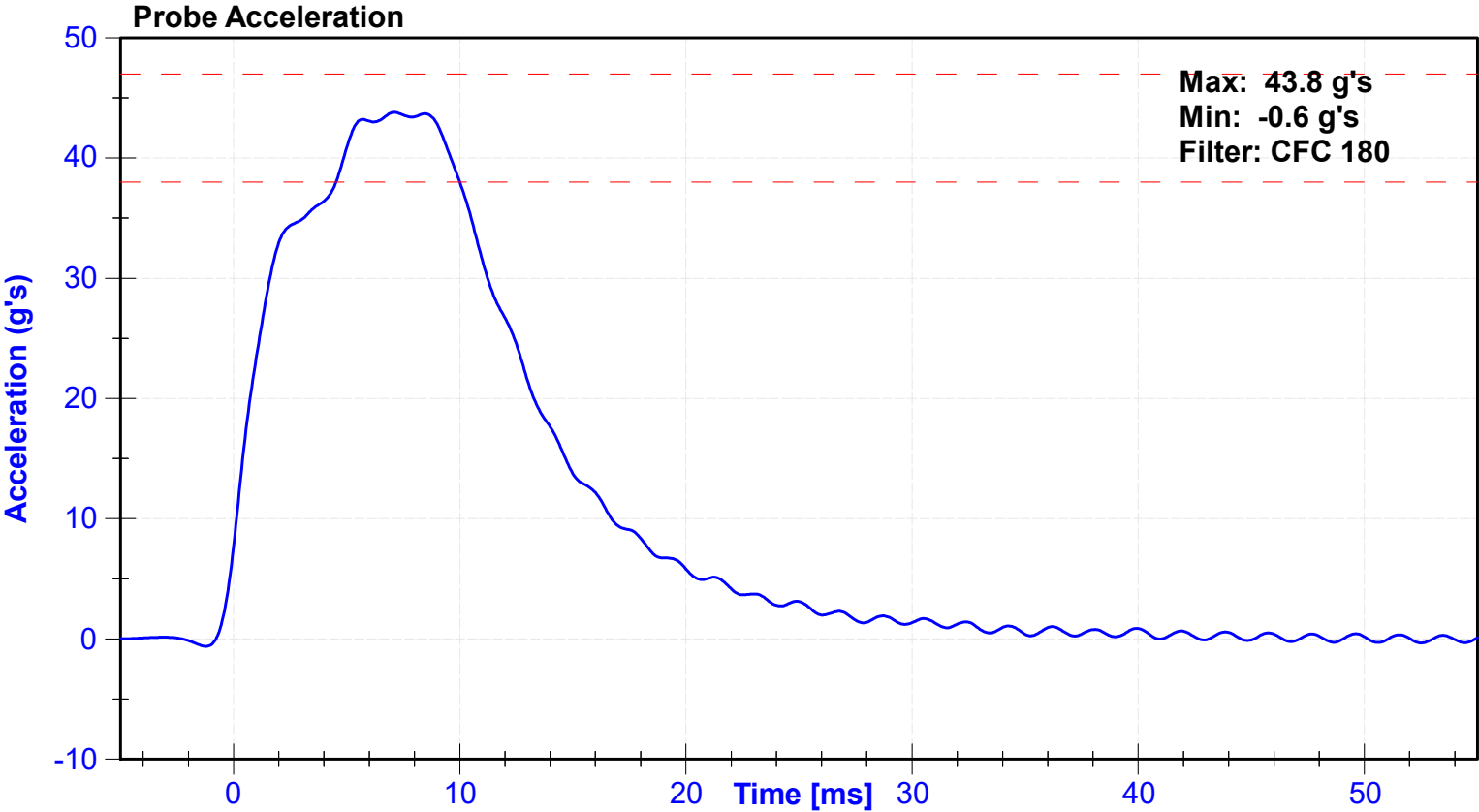
ATD Manufacturer	FTSS	Test Technician	J. Rios
ATD Serial Number	300	Laboratory Supervisor	C. Mantell

Results

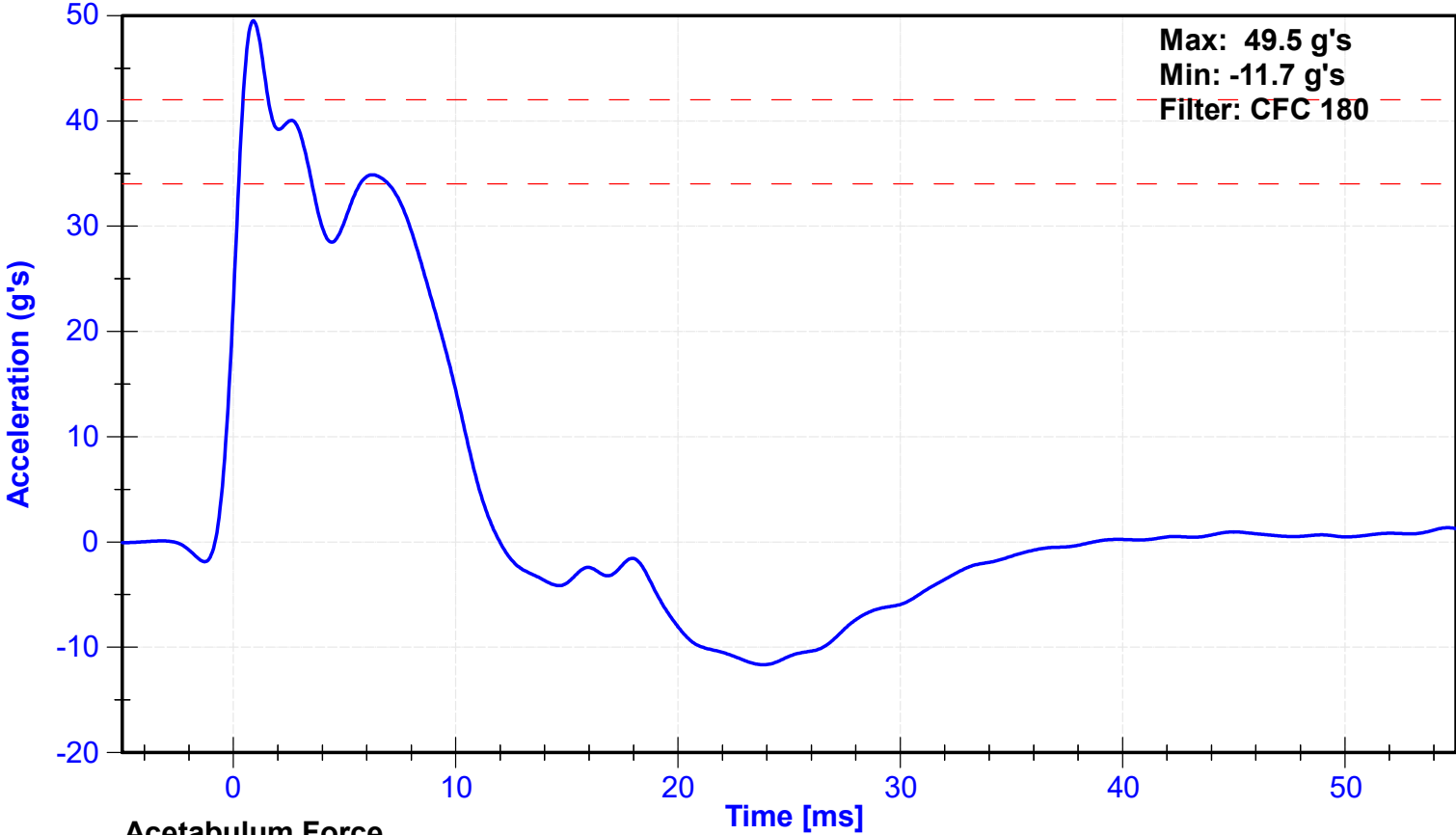
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	6.6	6.8	m/s	6.67	Pass
Probe Acceleration	38	47	g's	43.8	Pass
Lateral Pelvis Acceleration after 6ms	34	42	g's	34.9	Pass
Acetabulum Force	3600	4300	N	4057.5	Pass

Transducer Calibrations

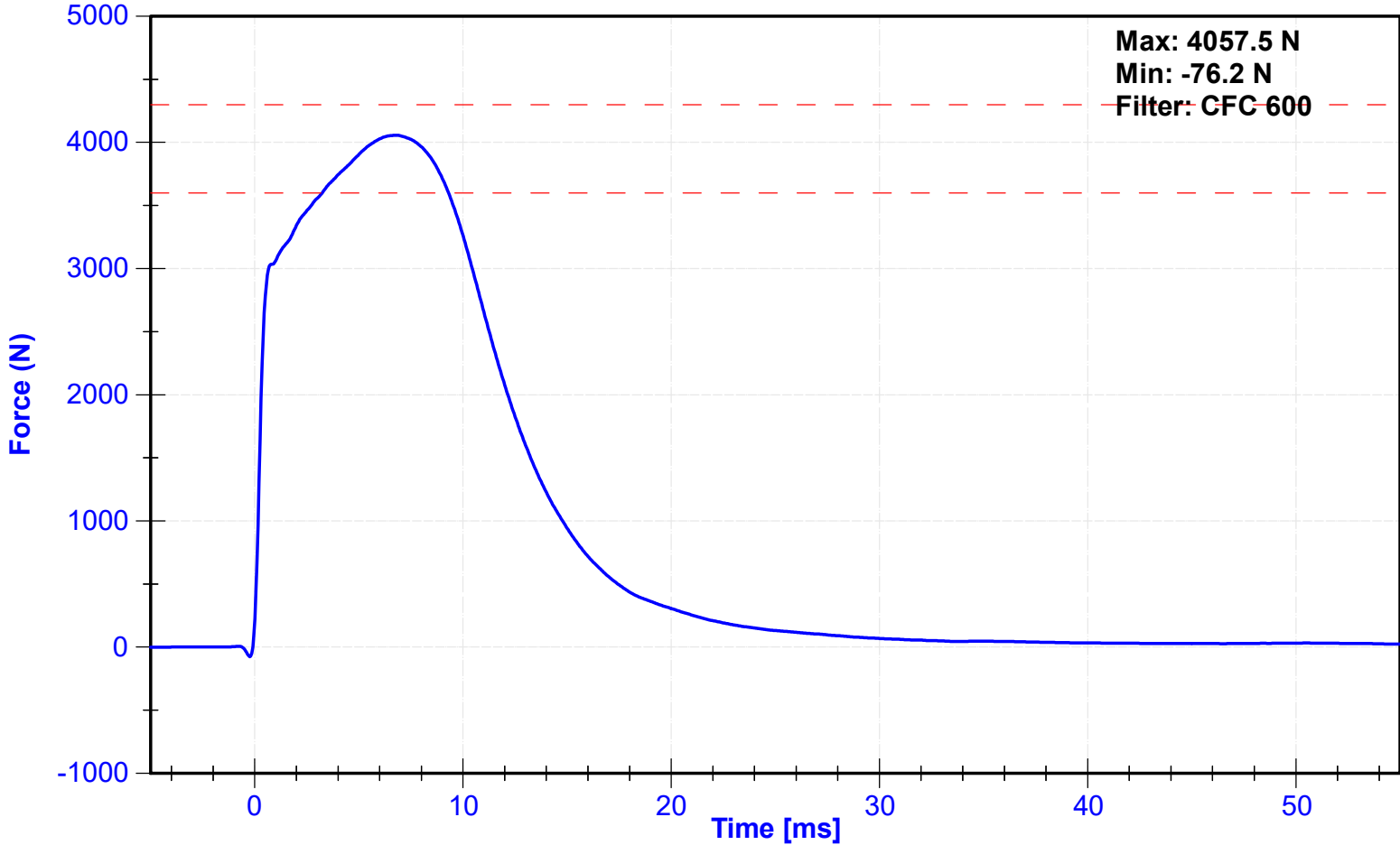
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Pelvis Y Accelerometer	Endevco	P51731	11/15/2023	5/13/2024
Acetabulum Load Cell	Denton	267-FY	9/11/2023	9/10/2024
Certification Plug	SACO			N/A
Crash Test Plug	SACO			N/A



Lateral Pelvis Acceleration



Acetabulum Force





SID-IIs Pelvis Plug Certification Test

Plug S/N 16615

Test Number 23380

Report Number 23437

Test Date 7/20/2022 11:29:06 AM

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

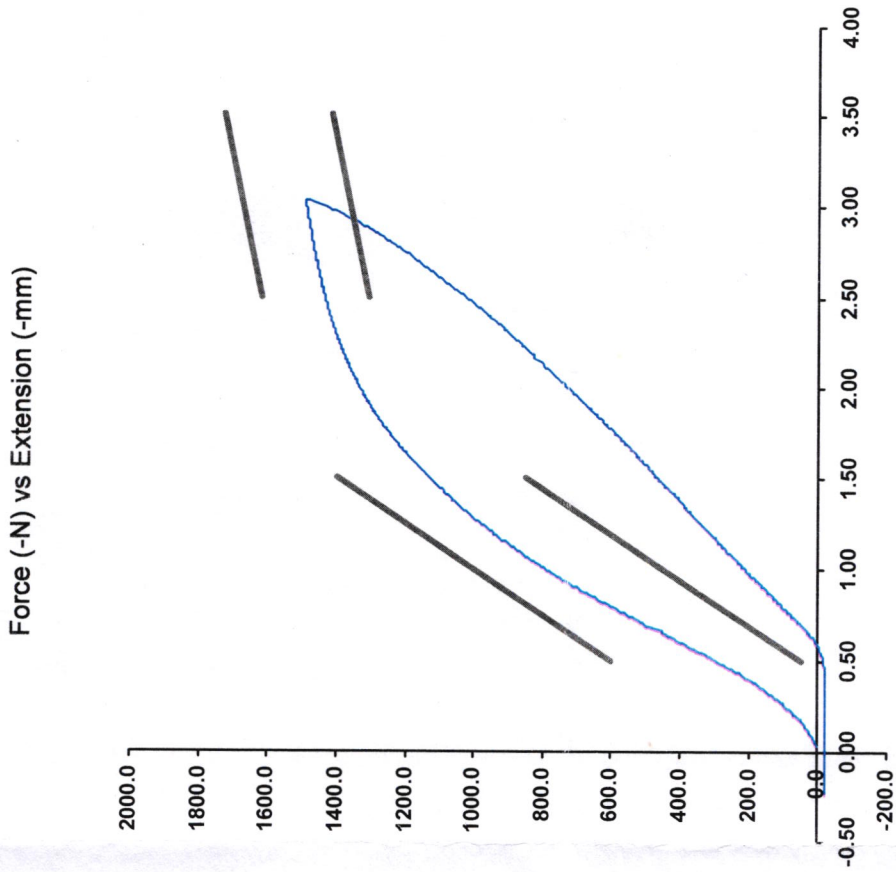
Testing Machine STM-20 5965542

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

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes: Cert plug 03-13-2024



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



SID-IIs Pelvis Plug Certification Test

Plug S/N 16566

Test Number 23350

Report Number 23407

Test Date 7/15/2022 10:08:33 AM

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

Testing Machine STM-20 5965542

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

Crosshead Speed (mm / min) or Rate 12.7

Extension or Position Measured by XHD_100 (XHD100)

Notes:

Impact side

Operator

Part Number 180-4450

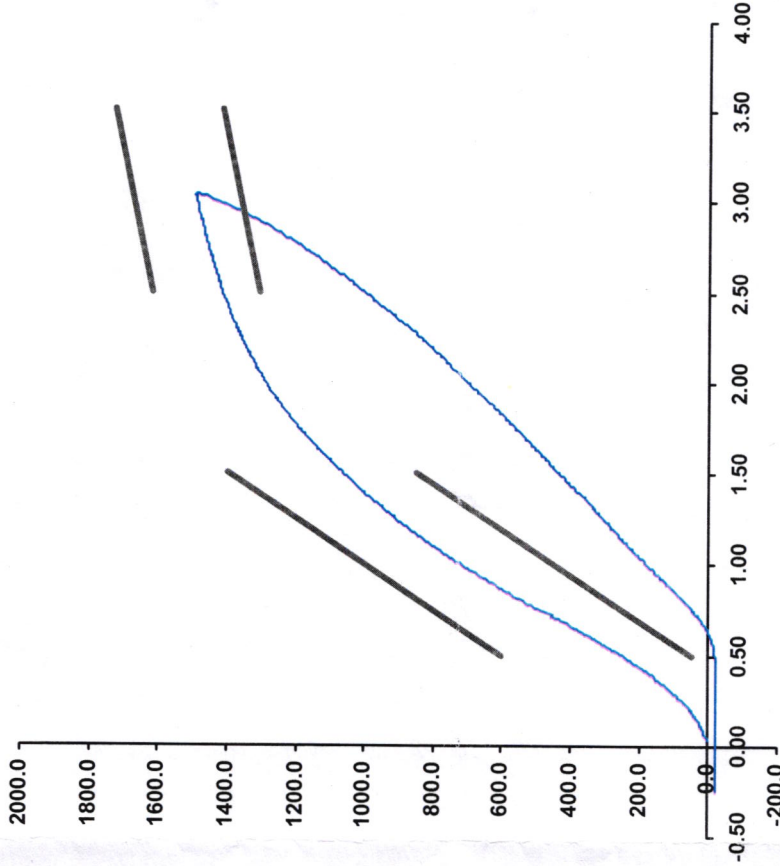
Template No 107 15-Jul-22

SACO Research

By: DC Date: 7/15/22

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

Force (-N) vs Extension (-mm)





SID-IIs Pelvis Plug Certification Test

Plug S/N 16323

Test Number 22889

Report Number 22946

Test Date 5/20/2022 11:18:04 AM

Test Results	Spec Min	Spec Max
Force @ 0.5 mm (N)	308	600
Force @ 1.5 mm (N)	1,179	1,400
Force @ 2.5 mm (N)	1,480	1,618
Force @ 3.0 mm (N)	1,535	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 Side

Template No 107

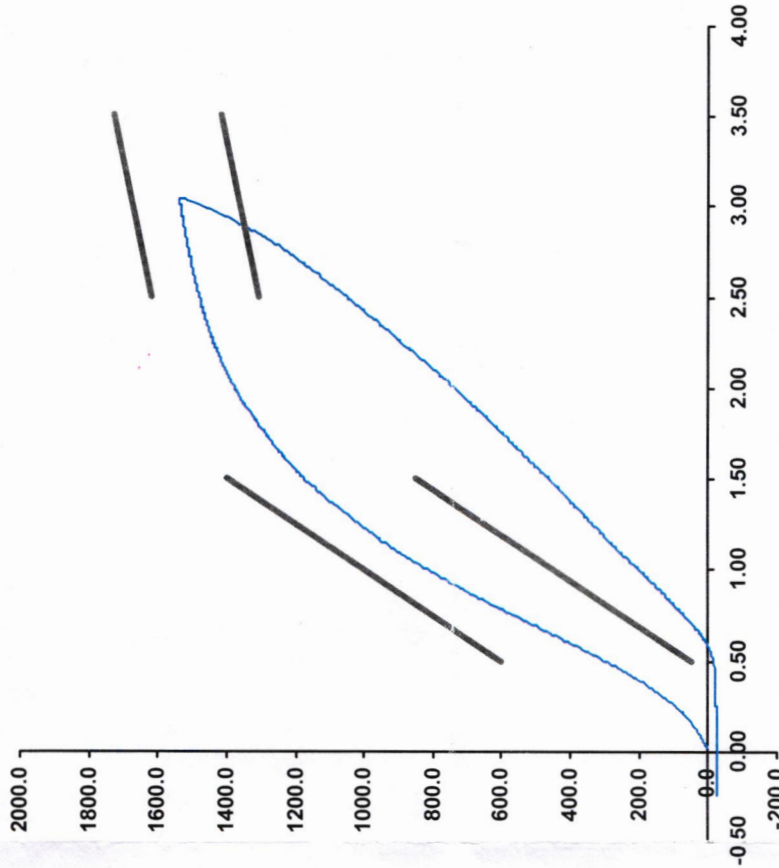
20-May-22

SACO Research

By : DC Date : 5/20/2022

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

Force (-N) vs Extension (-mm)



Operator

Part Number 180-4450

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

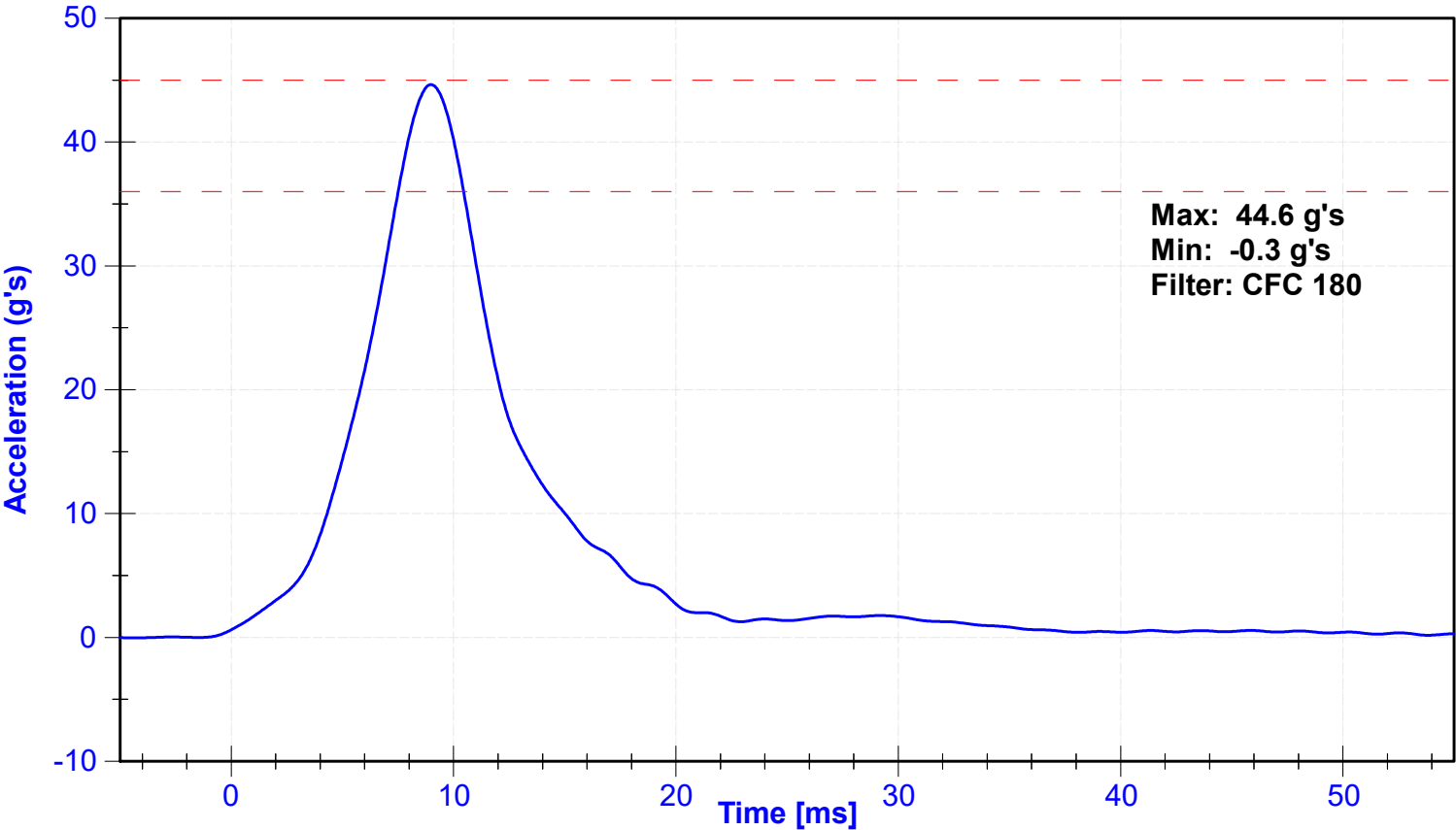
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	30.0	Pass
Velocity	4.2	4.4	m/s	4.27	Pass
Probe Acceleration	36	45	g's	44.6	Pass
Lateral Pelvis Acceleration	28	39	g's	37.1	Pass
Iliac Force	4100	5100	N	5076.2	Pass

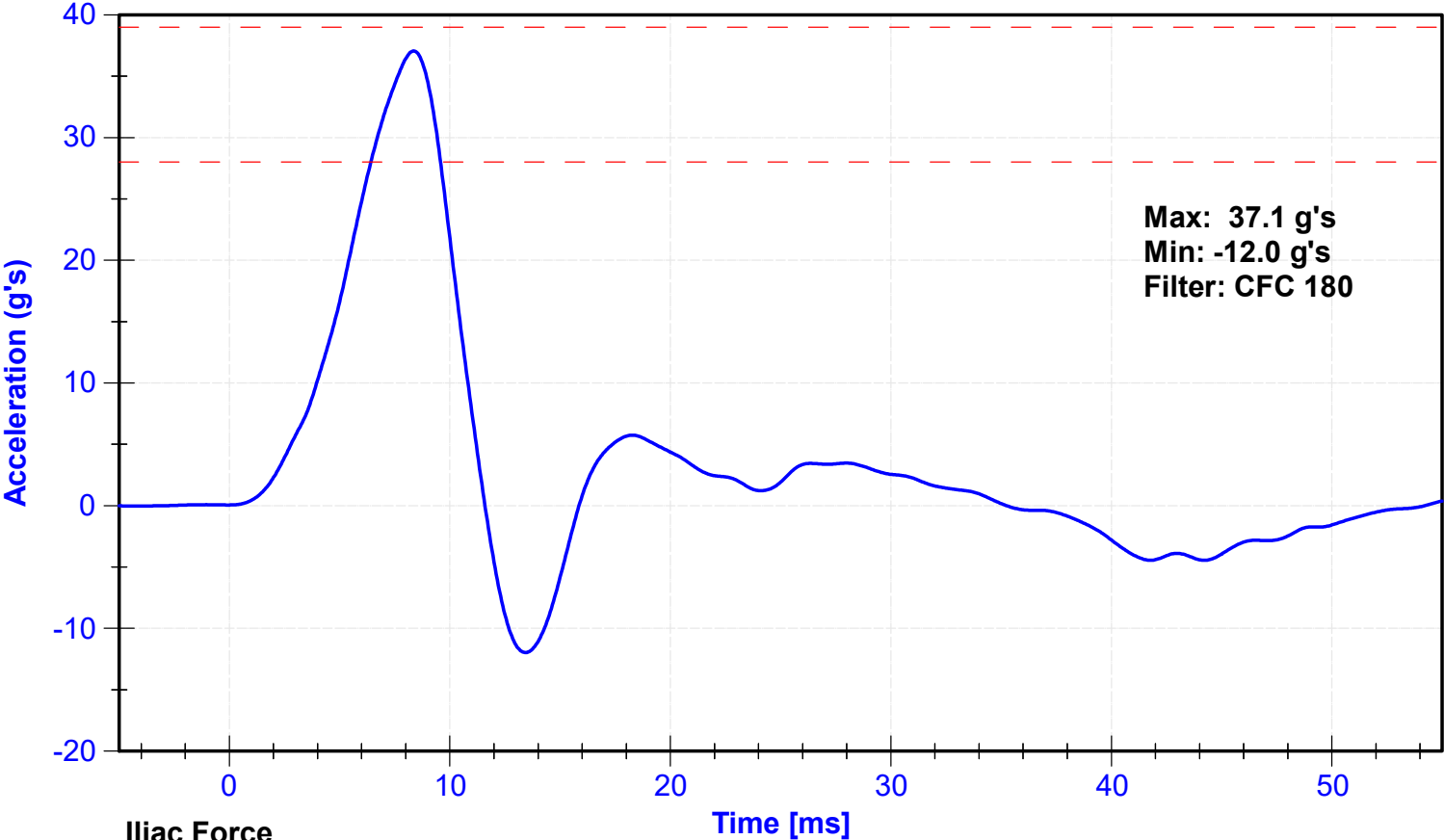
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18587	11/20/2023	11/19/2024
Pelvis Y Accelerometer	Endevco	P51731	11/15/2023	5/13/2024
Iliac Load Cell	Denton	321	9/11/2023	9/10/2024

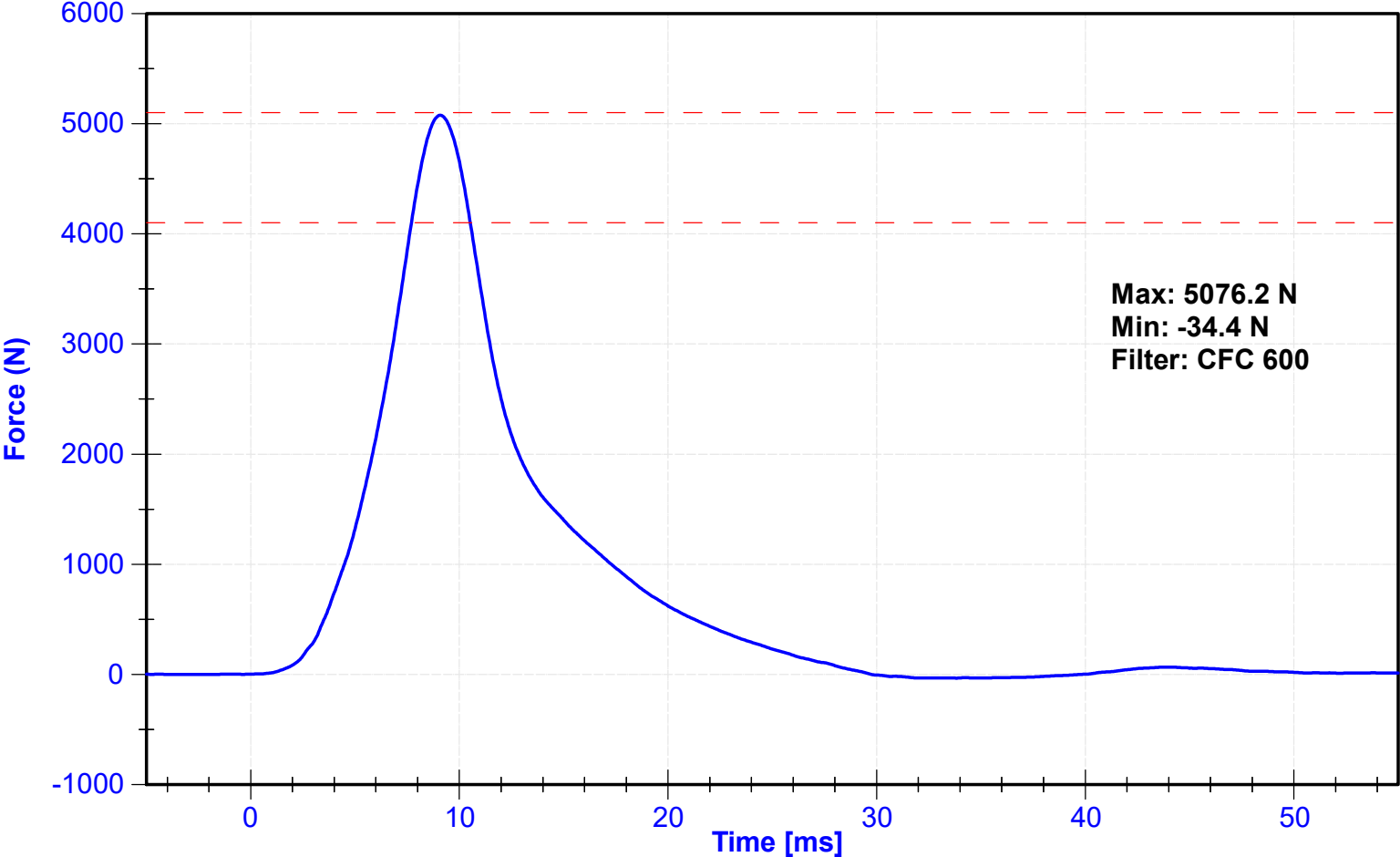
Probe Acceleration



Lateral Pelvis Acceleration



Iliac Force



APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION DATA

Table 1 – Dummy Instrumentation (SID-IIs)

			SID-IIs S/N: 300			
			Serial Number	Manufacturer	Calibration Date	
Head Accelerometers			X	P59018	Endevco	11/15/2023
			Y	P79189	Endevco	11/15/2023
			Z	P79587	Endevco	11/15/2023
Head Accelerometers - Redundant			X	P68057	Endevco	11/15/2023
			Y	P58986	Endevco	11/15/2023
			Z	P52025	Endevco	11/15/2023
Displacement Potentiometer	Shoulder		Y			
	Thoracic Rib	Upper	Y	2316GFE	Servo	11/17/2023
		Middle	Y	307GFE	Servo	11/17/2023
		Lower	Y	1156GFE	Servo	11/17/2023
	Abdominal Rib	Upper	Y	060GFE	Servo	11/21/2023
		Lower	Y	308GFE	Servo	11/17/2023
Lower Spine Accelerometers (T12)			X	P64003	Endevco	11/16/2023
			Y	P52071	Endevco	11/16/2023
			Z	P17283	Endevco	11/16/2023
Acetabulum Load Cell			Y	267-FY	Denton	09/11/2023
Lilac Wing Load Cell			Y	321	Denton	09/11/2023
Pelvis Plug (Struck Side)				16541	SACO	07/15/2022
Pelvis Plug (Non-Struck Side)				16478	SACO	07/14/2022

Table 2 – Vehicle Instrumentation

Vehicle Instrumentation		Serial Number	Manufacturer	Calibration Date
Vehicle Center of Gravity	X	G23886	Endevco	01/31/2024
Vehicle Center of Gravity	Y	G24221	Endevco	01/31/2024
Vehicle Center of Gravity	Z	G24225	Endevco	01/31/2024
Left Floor Sill	Y	G24607	Endevco	11/30/2023
A-Pillar Sill	Y	G24339	Endevco	11/10/2023
A-Pillar Low	Y	G24625	Endevco	11/29/2023
A-Pillar Mid	Y	G24627	Endevco	11/29/2023
B-Pillar Sill	Y	G24589	Endevco	11/30/2023
B-Pillar Low	Y	G24598	Endevco	11/30/2023
B-Pillar Mid	Y	G24617	Endevco	11/29/2023
Driver Seat	Y	G24601	Endevco	11/30/2023
Engine Top	X	A335481	Measurement Specialties	01/26/2024
Engine Top	Y	A374287	Measurement Specialties	01/26/2024
Firewall	Y	G24611	Endevco	11/30/2023
Right Roof	Y	G24609	Endevco	11/30/2023
Right Floor Sill	Y	G24616	Endevco	11/29/2023
Rear Floorpan	X	G22221	Endevco	02/06/2024
Rear Floorpan	Y	G22763	Endevco	02/06/2024

Table 3 – Pole Instrumentation

Pole Instrumentation	Serial Number	Manufacturer	Calibration Date
Load Cell 1	1220AF-1277329-F0	Interface	07/18/2023
Load Cell 2	1220AF-1117017-F0	Interface	07/18/2023
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