

REPORT NUMBER: NCAP-CAL-25-006

**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**Volkswagen de Mexico S.A. de C.V. Mexico
2025 Volkswagen Tiguan
5 Door SUV**

NHTSA No: M20255803

**PREPARED BY:
CALSPAN CORPORATION
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March 23, 2026

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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FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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Date: _____

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16. Abstract A 56.30 km/h (35 mph), NCAP frontal rigid barrier impact test was conducted on a 2025 Volkswagen Tiguan 5 Door SUV in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. The test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on July 24, 2025. The impact velocity of the vehicle was 56.34 km/h, and the ambient temperature at the barrier face at the time of impact was 21.9°C. The target vehicle post-test maximum crush was 308 mm at crush zone 3. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD (Serial No. 065)</th> <th colspan="2">Passenger ATD (Serial No. 137)</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC15)</td> <td></td> <td>700</td> <td>185.919</td> <td>700</td> <td>259.137</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-22.016</td> <td>52</td> <td>-17.049</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.347</td> <td>1</td> <td>0.429</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1534.266</td> <td>2620</td> <td>1230.734</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-99.119</td> <td>2520</td> <td>-110.459</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-1002.944</td> <td>6805</td> <td>-492.461</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-928.512</td> <td>6805</td> <td>-388.505</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD (Serial No. 065)		Passenger ATD (Serial No. 137)		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC15)		700	185.919	700	259.137	Maximum Chest Compression	mm	63	-22.016	52	-17.049	Nij		1	0.347	1	0.429	Neck Tension	N	4170	1534.266	2620	1230.734	Neck Compression	N	4000	-99.119	2520	-110.459	Left Femur Force	N	10008	-1002.944	6805	-492.461	Right Femur Force	N	10008	-928.512	6805	-388.505
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SECTION 1

PURPOSE AND SUMMARY OF THE TEST

PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. 693JJ919D000005. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Test Procedure dated May 2018.

SUMMARY

A load cell barrier consisting of 128 load cells was impacted by a 2025 Volkswagen Tiguan 5 Door SUV at a velocity of 56.34 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on July 24, 2025. Pre- and post-test photographs of the vehicle and dummies to document the test can be found in Appendix A. One real-time camera and 16 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

One Part 572E, 50th percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5th percentile female ATD was placed in the right-front passenger seating position according to dummy placement instructions specified in the Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, femur load cells, and lower leg instrumentation. Seat belt load cells were installed on the driver's and passenger's shoulder belts to measure dummy torso section loading. The driver (position 1) ATD (Serial No. 065) and the right-front passenger (position 2) ATD (Serial No. 137) were qualified prior to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

The 230 channels of data were recorded on an on-board data acquisition system. Appendix B contains the vehicle, load cell barrier and dummy response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was a total of 0.0 grams of Stoddard solvent leakage after the event or during any phase of the static rollover. The maximum static crush of the vehicle was 308 mm and both driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: The driver's head contacted the frontal airbag, curtain airbag and the head restraint. The upper torso contacted the frontal airbag. Both knees contacted the knee air bag.

The passenger's visible contact points were as follows: The passenger's head contacted the frontal airbag and the head restraint. The upper torso contacted the frontal airbag. Both knees contacted the glove box.

The occupant data is summarized below.

ATD Position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50th)	185.919	0.347	1534.266	-99.119	38.677	-22.016	-1002.944	-928.512
Passenger (5th)	259.137	0.429	1230.734	-110.459	44.047	-17.049	-492.461	-388.505

GENERAL COMMENTS:

1. P1 (Driver) serial number - 065
2. P2 (Passenger) serial number - 137

Data Anomalies:

- No Questionable Channels

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

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 Adjustment, Fuel System, and Steering Wheel Data

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Seat Belt Positioning Data

Data Sheet No. 6 – High-Speed Camera Locations and Data

Data Sheet No. 7 – Vehicle Accelerometer Locations

Data Sheet No. 8 – Photographic Reference Target Locations

Data Sheet No. 9 – Load Cell Locations on Fixed Barrier

Data Sheet No. 10 – Test Vehicle Summary of Results

Data Sheet No. 11 – Post-Test Observations

Data Sheet No. 12 – Vehicle Profile Measurements

Data Sheet No. 13 – Accident Investigation Division Data

Data Sheet No. 14 – Vehicle Intrusion Measurements

Data Sheet No. 15 – Summary of Indicant FMVSS No. 212 and FMVSS No. 219 (Partial)

Data Sheet No. 16 – FMVSS 301 Static Rollover Results

Data Sheet No. 17 – Dummy/Vehicle Temperature Stabilization Chart

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20255803	Traction Control System (TCS)	Yes
Model Year	2025	Power Steering	Yes
Make	Volkswagen	Power Window Auto-Reverse	Yes
Model	Tiguan	Driver Frontal Airbag	Yes
Body Style	5Dr SUV	Driver Curtain Airbag	Yes
VIN	3VVBR7RM6SM008568	Driver Head/Torso Airbag	No
Body Color	Pyrite Silver Metallic	Driver Torso Airbag	No
Odometer Reading (km /mi)	10 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.0	Driver Pelvis Airbag	No
Type / No. Cylinders	I4	Driver Knee Airbag	Yes
Engine Placement	Transverse	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	8-Speed	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	All Wheel Drive	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	No	Front Pass. Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	No	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other – Driver Center Seat Airbag	Yes

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Volkswagen de Mexico S.A. de C.V. Mexico	GVWR (KG)	2320
Date of Manufacture	04/25	GAWR Front (KG)	1210
		GAWR Rear (KG)	1160

VEHICLE SEATING AND WEIGHT CAPACITY DATA

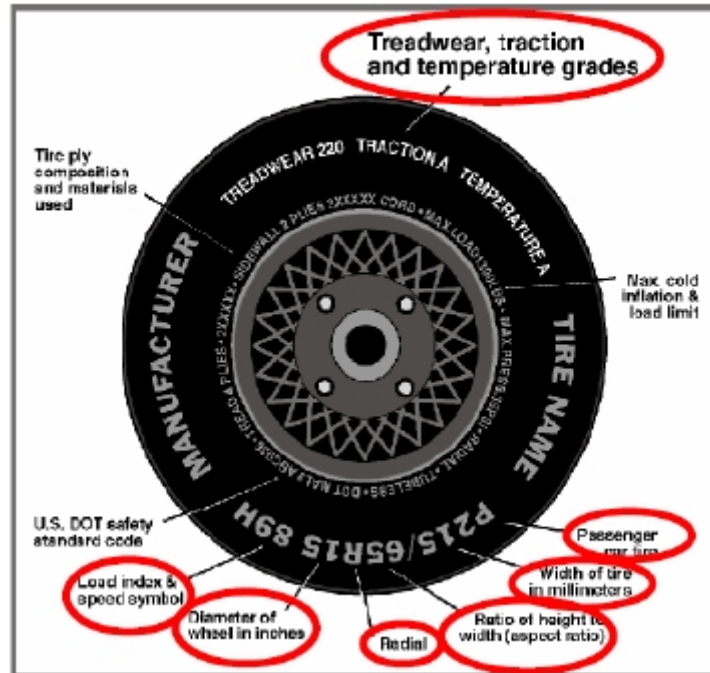
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				460
Cargo Wt. (RCLW) (kg)				120

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

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025

Collect 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)	260	260
Recommended Tire Size	215/65R17	215/65R17
Tire Size on Vehicle	215/65R17	215/65R17
Tire Manufacturer	Bridgestone	Bridgestone
Tire Model	ECopia H/L 422 Plus	ECopia H/L 422 Plus
Treadwear	700	700
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	99H	99H
Tire Material	Rubber	Rubber
DOT Safety Code Left	1V6E3EC110525	1V6E3EC110525
DOT Safety Code Right	1V6E3EC110525	1V6E3EC110525

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

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	505	360		547	458	
Right	kg	512	347		545	428	
Ratio	%	59.0	41.0		55.2	44.8	
Total	kg	1017	707	1724	1092	886	1978

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1724	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	142	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	120	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1986	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	854	855	884	886	1145
As Tested	mm	839	843	849	849	1250
Post-Test	mm	856	829	851	839	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2791
Total Vehicle Length at Left Side	mm	4610
Total Vehicle Length at Centerline	mm	4688
Total Vehicle Length at Right Side	mm	4610
Weight of Ballast in Cargo Area	kg	57
Weight of Vehicle Components Removed	kg	29
Amount of Stoddard Solvent in Fuel Tank	L	54.0

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk carpeting, spare tire, and jack.

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

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV

NHTSA No.: M20255803

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/24/2025

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	4688
2	Total Width	1844
3*	Bumper Top Height	580
4*	Bumper Bottom Height	499
5*	Longitudinal Member Top Height	615
6	Distance Between Longitudinal Members	1030
7	Longitudinal Member Width	61
8*	Engine Top Height	819
9*	Engine Bottom Height	241
10	Engine and Gearbox Width	424
11	Front Bumper-Engine Distance	508
12*	Front Shock Absorber Fixing Height	933
13*	Bonnet Leading Edge Height	1013
14	Front Shock Absorber Fixing Width	1153
15	Front Bumper – Front Axle Distance	952
16	Front Axle – A Pillar Distance	536
17	A-Pillar – B-Pillar Distance	1062
18	B-Pillar – Rear Axle Distance	1193
19	B-Pillar – C-Pillar Distance	1062
20*	Roof Sill Bottom Height	1553
21*	Roof Sill Top Height	1592
22*	Floor Sill Bottom Height	362
23*	Floor Sill Top Height	439

*Height Measurements are taken from the ground

Note: All measurements are in millimeters

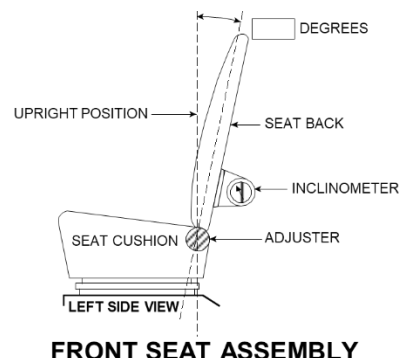
DATA SHEET NO. 2 SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
Test Date: 07/24/2025

NOMINAL DESIGN RIDING POSITION

The driver's seat back was set to the manufacturer's designated angle. The passenger's seat back was positioned in a similar manner as the driver's seat back. Seat back angles are measured at the headrest post bezel using a digital inclinometer.



Seating Position	Degrees
Driver Seat Back Angle	-13.8
Passenger Seat Back Angle	-15.1

SEAT FORE / AFT POSITIONS

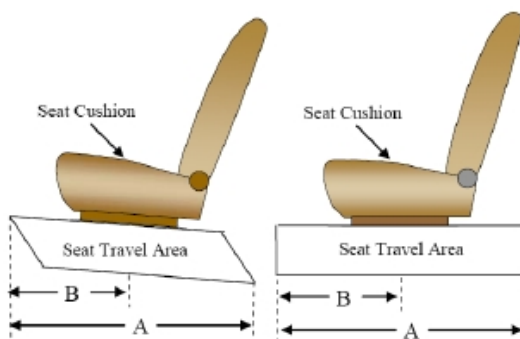
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	319 (0-38)	15
Passenger Seat	216 (0-27)	0

SEAT BELT UPPER ANCHORAGE

The driver's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 50th percentile adult male ATD. The passenger's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 5th percentile adult female ATD. For this test zero is defined as the uppermost position.

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



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

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV

NHTSA No.: M20255803

Test Program: NCAP Frontal Barrier Impact Test

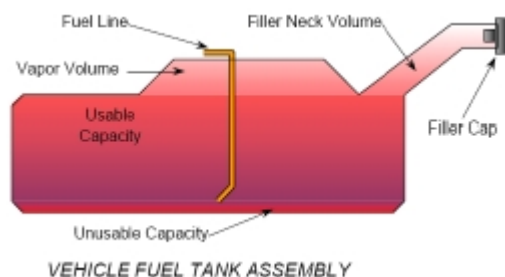
Test Date: 07/24/2025

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	58.0
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	53.4 - 54.5
Actual Amount of Solvent Used	54.0
1/3 of Usable Capacity	19.3

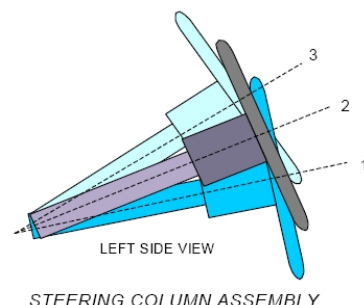
FUEL PUMP

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



STEERING COLUMN ADJUSTMENT

Steering wheel and column adjustments are made so that the steering wheel hub is at the geometric center of the locus it describes when moved through its full range of motion. For angular measurements, a digital inclinometer was used to measure a plate which was placed across the steering wheel rim. A tape measure was used to measure the telescoping steering wheel travel.



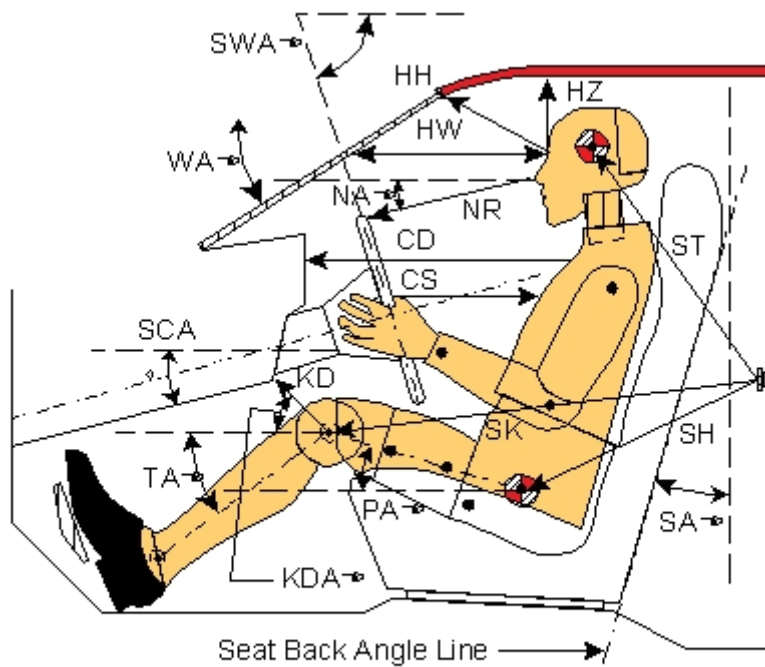
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	23.5	
Geometric center position No. 2	26.2	
Uppermost position No. 3	28.8	
Telescoping Steering Wheel Travel		60
Test Position	26.2	30

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025



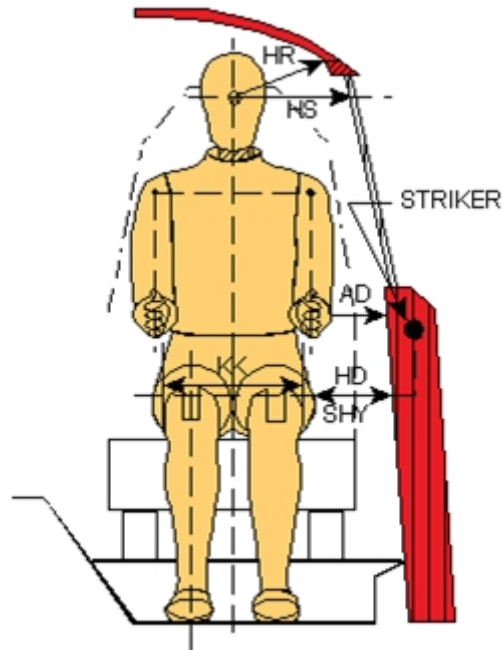
Left Side View

Code	Measurement Description	Driver (SN: 065)		Passenger (SN: 137)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		30.3		
SWA°	Steering Wheel Angle		26.2		
SCA°	Steering Column Angle		63.8		
SA°	Seat Back Angle (on headrest post)		-13.8		-15.1
HZ	Head to Roof (Z)	231	90	274	90
HH	Head to Header	406	22.6	389	38.0
HW	Head to Windshield	698	0.2	674	0.0
NR	Nose to Rim / Dash	426	7.4	468	30.3
CD	Chest to Dash	602		395	
CS	Chest to Steering Hub	342	1.2		
RA	Rim to Abdomen	229	0.2		
KDL	Left Knee to Dash	200	29.0	139	38.5
KDR	Right Knee to Dash	183	26.5	149	38.1
PA°	Pelvic Angle		24.5		21.4
TA°	Tibia Angle		35.2		45.8
SK	Striker to Knee	600	13.9	677	10.5
ST	Striker to Head	432	68.6	398	70.0
SH	Striker to H-Point	316	49.1	403	36.8

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025



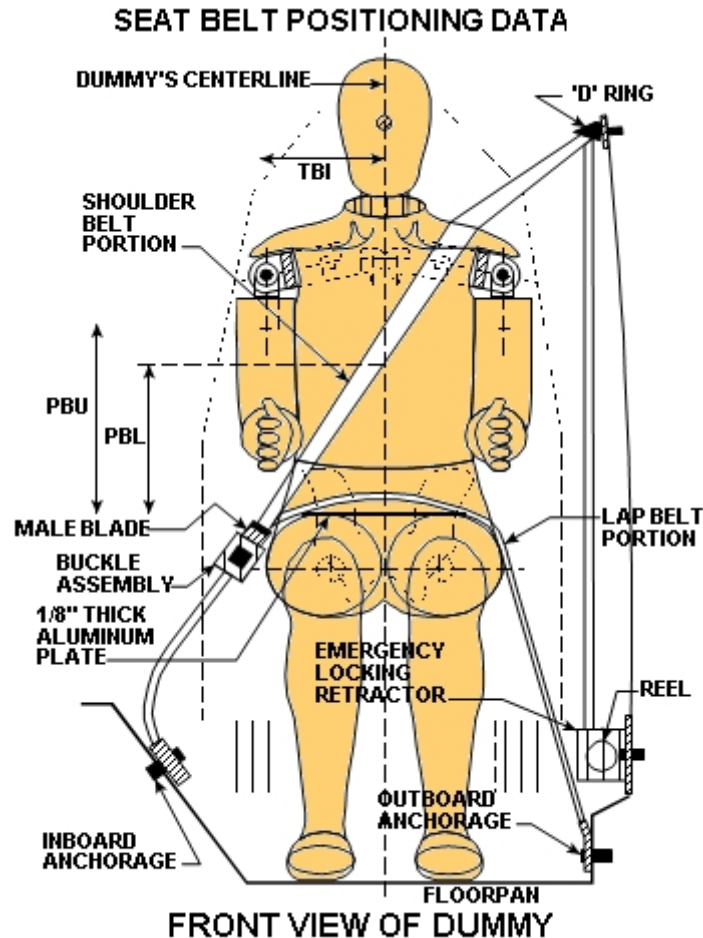
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	80	110
HD	H-Point to Door	144	190
HR	Head to Side Header	239	294
HS	Head to Side Window	368	386
KK	Knee to Knee	321	213
SHY	Striker to H-Point (Y Direction)	342	285
AA	Ankle to Ankle	330	165

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
Test Date: 07/24/2025



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	346	320
PBL — Top surface of reference to belt lower edge	mm	252	230

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	860	890
Lap Belt Length as measured on ATD	mm	560	615
Remainder of belt on reel	mm	1150	1125
Total belt length for continuous webbing systems	mm	2570	2630

DATA SHEET NO. 6
HIGH-SPEED CAMERA LOCATIONS AND DATA

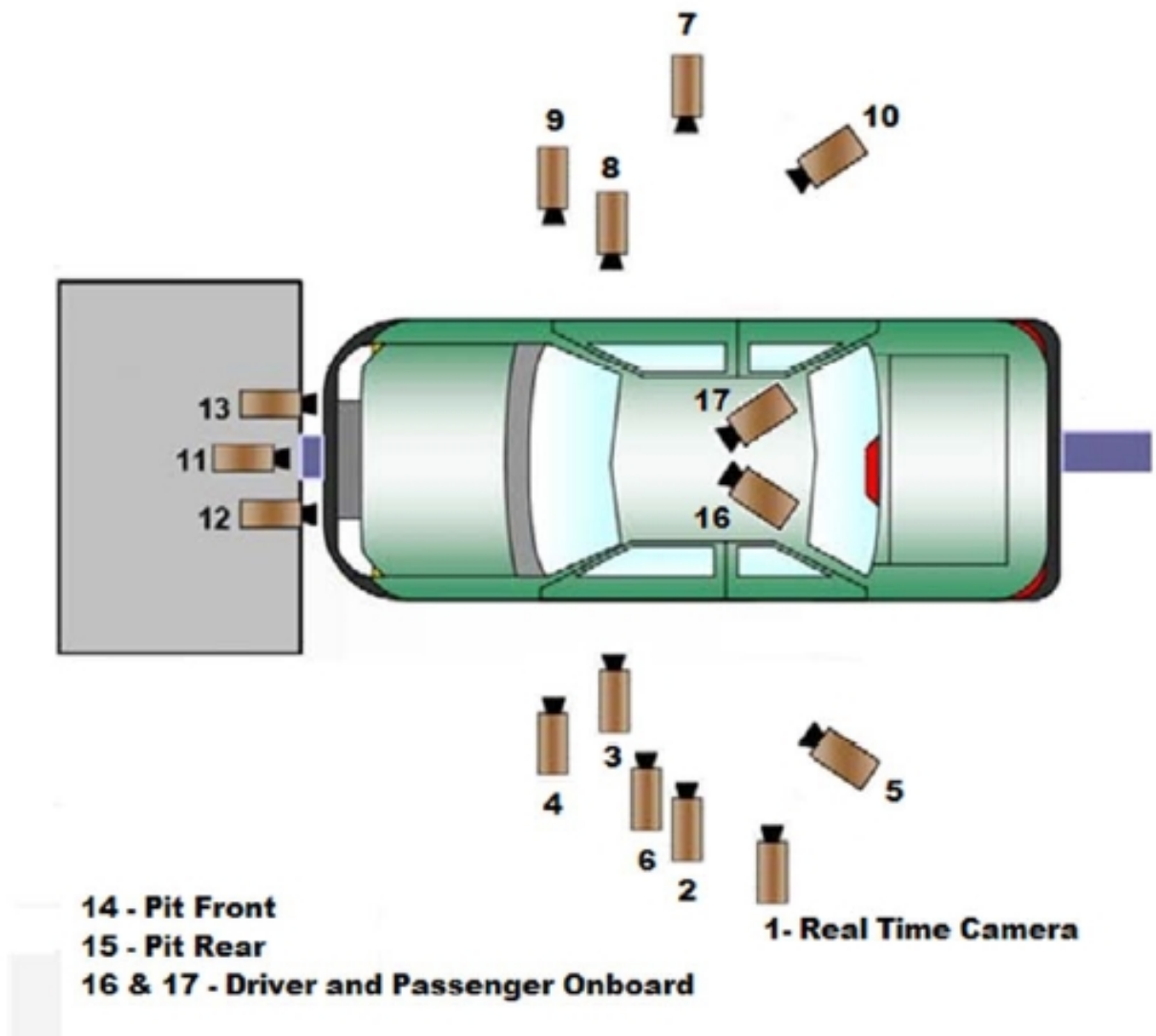
Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV

NHTSA No.: M20255803

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/24/2025

CAMERA POSITIONS FOR FRONTAL IMPACTS



DATA SHEET NO. 6 ... (CONTINUED)
HIGH-SPEED CAMERA LOCATIONS AND DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV

NHTSA No.: M20255803

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/24/2025

CAMERA LOCATIONS

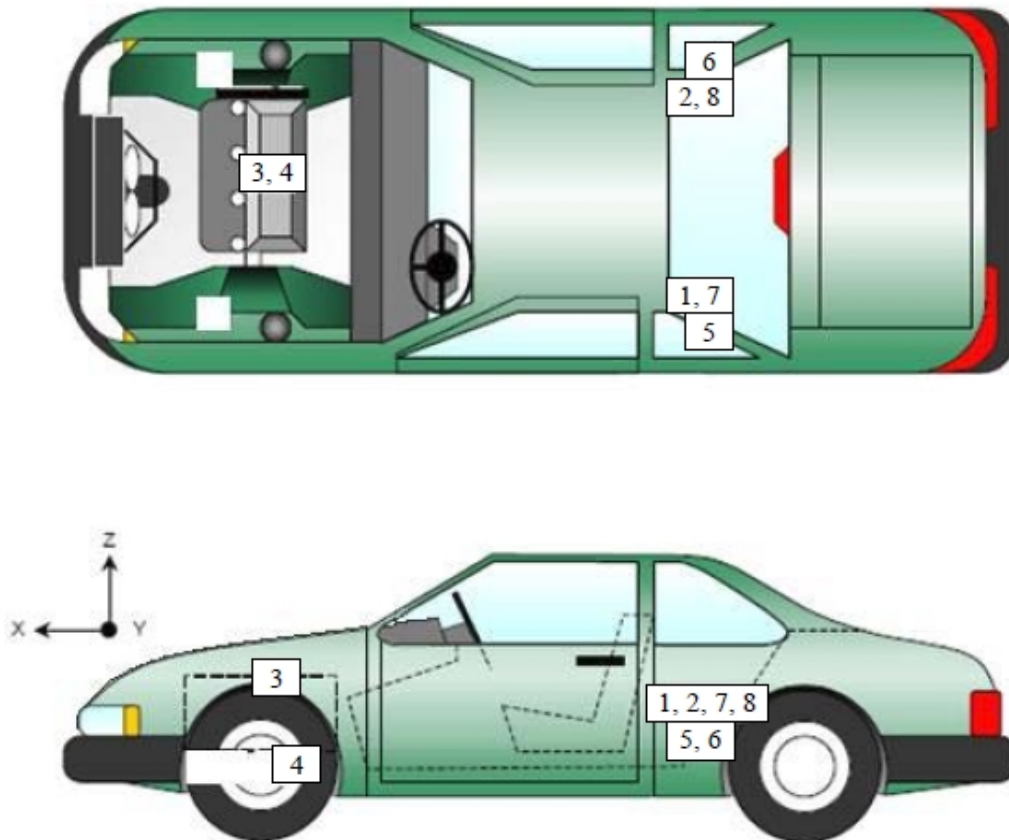
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall				Zoom	30
2	Left Overall	-1257	-7340	-1501	24	1000
3	Driver Close-Up	-1380	-6340	-1492	50	1000
4	Left Front Half	-902	-6295	-1486	28	1000
5	Left Angle	-3926	-4704	-2459	50	1000
6	Steering Column	-1406	-7242	-2350	75	1000
7	Right Overall	-1306	7032	-1520	24	1000
8	Passenger Close-Up	-1391	5958	-1490	50	1000
9	Right Front Half	-1002	6056	-1460	35	1000
10	Right Angle	-3942	4571	-2450	50	1000
11	Windshield	1168	0	-3471	12.5	1000
12	Driver Windshield	958	-458	-2204	25	1000
13	Passenger Windshield	958	458	-2204	25	1000
14	Pit Front	-830	0	2226	12.5	1000
15	Pit Rear	-3020	0	2232	12.5	1000
16	Onboard Driver Airbag (Optional)				8	1000
17	Onboard Passenger Airbag (Optional)				8	1000

* COORDINATES: +X = forward of impact plane
 +Y = right of monorail center
 +Z = into ground

DATA SHEET NO. 7 **VEHICLE ACCELEROMETER LOCATIONS**

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1790	-346	158
2	Right Rear Accelerometer – X Direction	1792	368	174
3	Engine Top X	3931	245	-313
4	Engine Bottom X	3949	163	284
5	Left Rear Accelerometer – Z Direction	1790	-346	158
6	Right Rear Accelerometer – Z Direction	1792	368	174
7	Left Rear Accelerometer – X Direction Redundant	1790	-346	158
8	Right Rear Accelerometer – X Direction Redundant	1792	368	174

Reference Points: *X – Rear Surface of Vehicle (+ forward)*
 Y – Vehicle Centerline (+ to right)
 Z – Ground Plane (+ down)

DATA SHEET NO. 8 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV

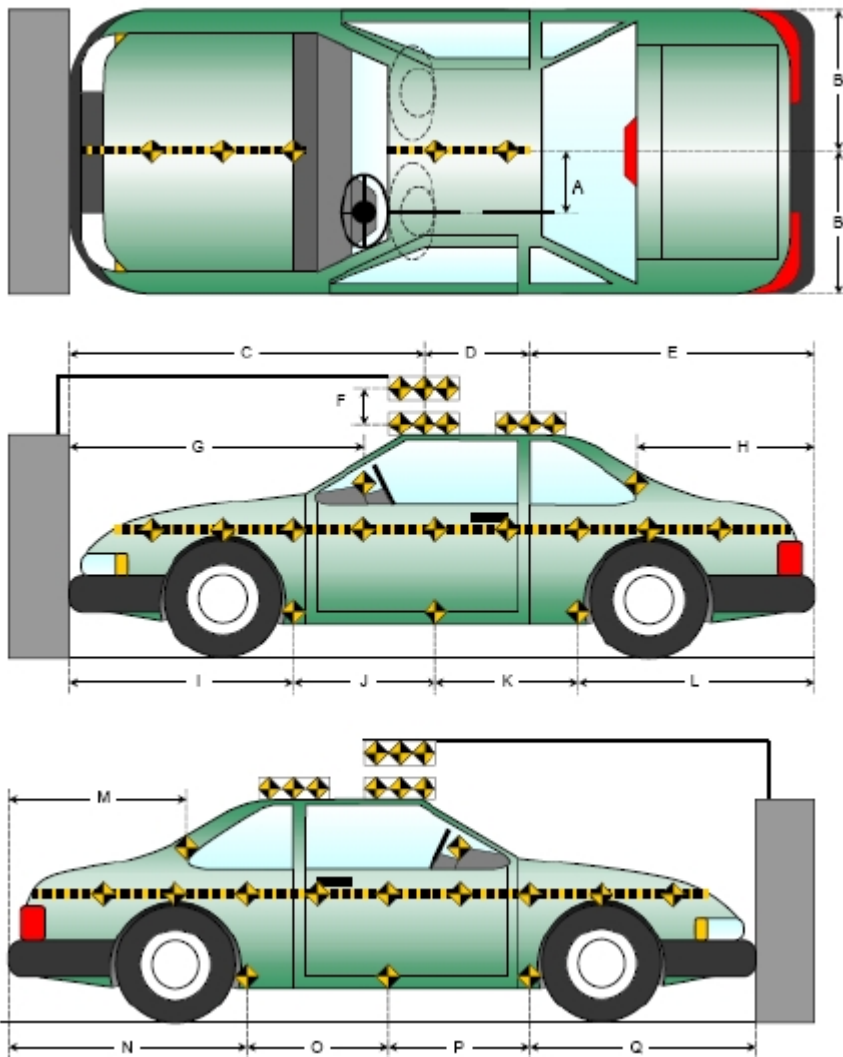
NHTSA No.: M20255803

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/24/2025

Item	Value
A	365
B	922
C	2126
D	607
E	1955
F	340
G	1735
H	1000
I	1417
J	936
K	929
L	1406
M	999
N	1411
O	930
P	934
Q	1413

All units in millimeters



DATA SHEET NO. 9 **LOAD CELL LOCATIONS ON FIXED BARRIER**

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025

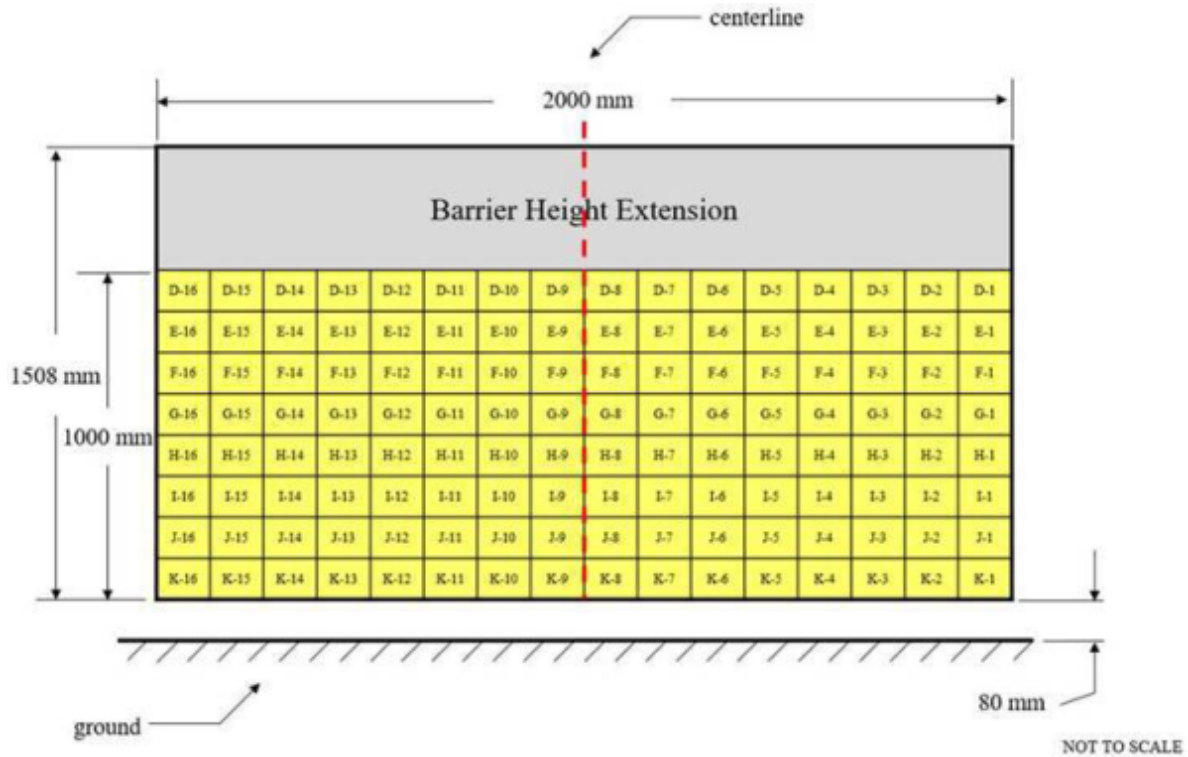


Figure 1 - Load Cell Locations on a 128-Load Cell Barrier with Plywood Height Extension*
 Please note above diagram is not actual representation of load cell barrier used.

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
Test Date: 07/24/2025

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	47
Passenger Dummy Accelerometers	47
Vehicle Structure Accelerometers	8
Load Cell Barrier	128
Total	230

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	2
High-Speed Offboard	14
Real-Time Panning	1
Total	17

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
Test Date: 07/24/2025

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	Hybrid III 50th Male / 065	Hybrid III 5th Female / 137
Head Contact	Frontal Airbag, Curtain Airbag, and Head Restraint	Frontal Airbag & Head Restraint
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Glove Box
Right Knee Contact	Knee Airbag	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger	Other
Locked / Unlocked Doors	Unlocked	Unlocked	
Front Door Opening	Closed & Operational	Closed & Operational	
Rear Door Opening	Closed & Operational	Closed & Operational	
Trunk/Hatch/Tailgate Opening			Closed & Operational
Seat Track Shift (mm)	0	0	
Seat Back Movement from Initial Position	None	None	

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Cracked Throughout
Window Damage	None
Other	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	1151
Center	mm	1055
Right Side	mm	968
Average	mm	1058

DATA SHEET NO. 11 ... (CONTINUED)
POST-TEST OBSERVATIONS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
Test Date: 07/24/2025

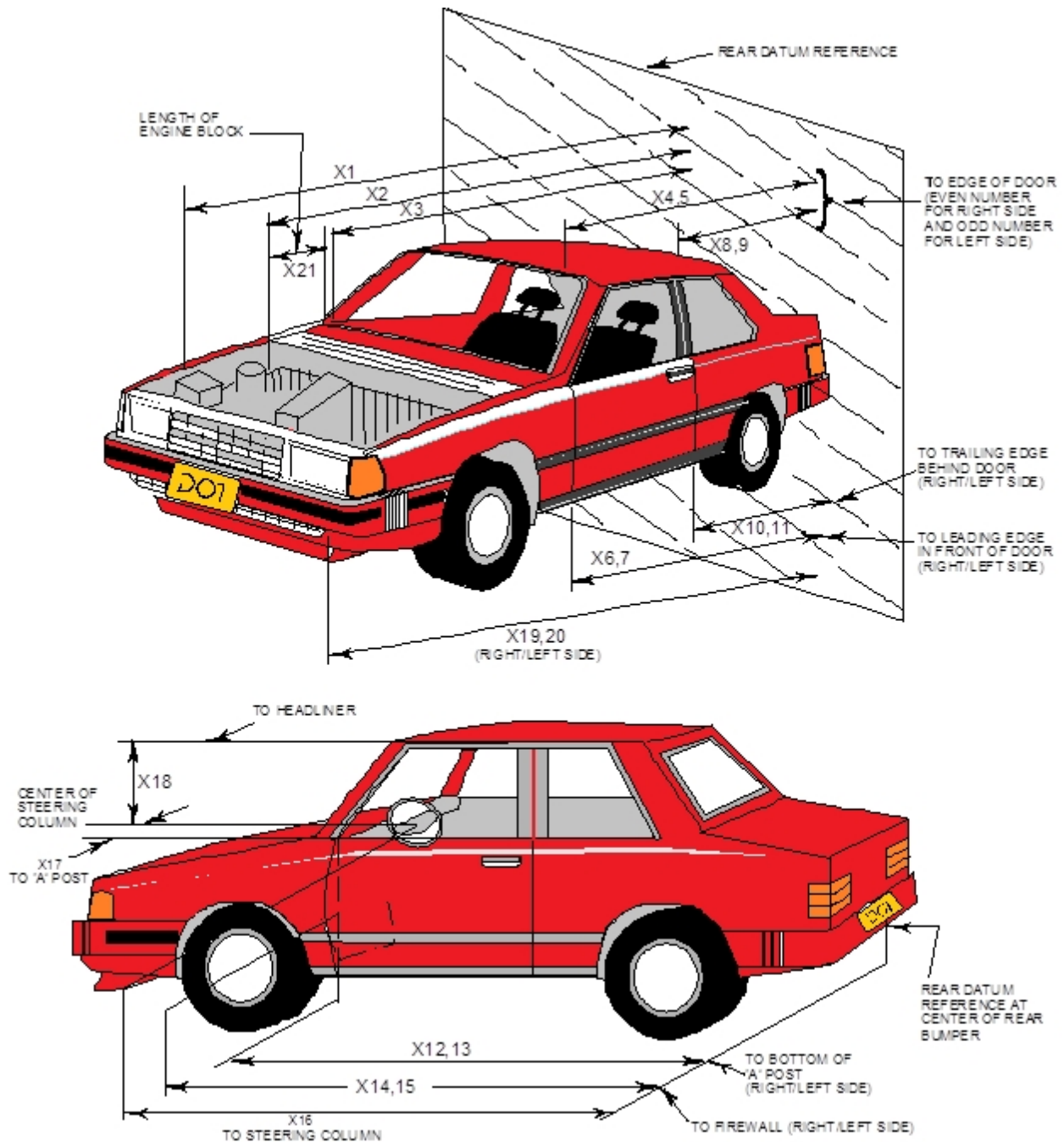
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12 **VEHICLE PROFILE MEASUREMENTS**

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025



DATA SHEET NO. 12 ... (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV

NHTSA No.: M20255803

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/24/2025

No.	Measurement Description	Pre-Test	Post-Test	Change
1	Total Length of Vehicle at Centerline	4688	4438	-250
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4180	4066	-114
3	RSOV to Firewall	3603	3544	-59
4	RSOV to Upper Leading Edge of Right Door	3199	3199	0
5	RSOV to Upper Leading Edge of Left Door	3200	3198	-2
6	RSOV to Lower Leading Edge of Right Door	3206	3205	-1
7	RSOV to Lower Leading Edge of Left Door	3203	3203	0
8	RSOV to Upper Trailing Edge of Right Door	2139	2139	0
9	RSOV to Upper Trailing Edge of Left Door	2138	2135	-3
10	RSOV to Lower Trailing Edge of Right Door	2203	2204	1
11	RSOV to Lower Trailing Edge of Left Door	2202	2202	0
12	RSOV to Bottom of "A" Post of Right Side	3194	3194	0
13	RSOV to Bottom of "A" Post of Left Side	3192	3193	1
14	RSOV to Firewall, Right Side	3548	3546	-2
15	RSOV to Firewall, Left Side	3524	3490	-34
16	RSOV to Steering Column	2792	2871	79
17	Center of Steering Column to "A" Post	299	302	3
18	Center of Steering Column to Headliner	420	442	22
19	RSOV to Right Side of Front Bumper	4640	4413	-227
20	RSOV to Left Side of Front Bumper	4644	4449	-195
21	Length of Engine Block	468	468	0
RD	RSOV to Right Side of Dash Panel	2949	2951	2
CD	RSOV to Center of Dash Panel	2939	2948	9
LD	RSOV to Left Side of Dash Panel	2949	2954	5

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

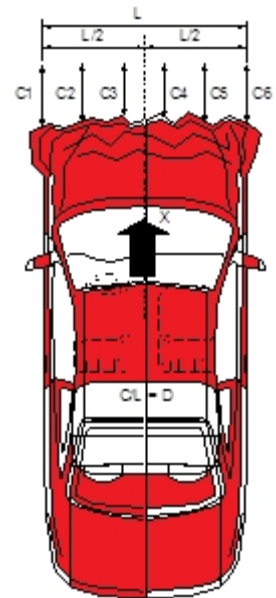
NHTSA No.: M20255803
Test Date: 07/24/2025

VEHICLE INFORMATION

VIN: 3VVBR7RM6SM008568 Wheelbase (mm): 2791
Vehicle Size Category: MPV Test Weight (kg): 1978

ACCELEROMETER DATA

Accelerometer Locations: Please See Data Sheet No. 7
Cal. Procedure / Interval: Calspan Procedure / 6 month
Integration Algorithm: Trapezoidal
Linearity: > 99%
Impact Velocity (km/h): 56.34
Velocity Change (km/h): 64.1
Time of Separation (ms): 131



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: C3
Damage Region Length (mm): 1492
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Crush
C1	Crush Zone 1 at Left Side	mm	4484	4337	147
C2	Crush Zone 2 at Left Side	mm	4643	4367	276
C3	Crush Zone 3 at Left Side	mm	4670	4362	308
C4	Crush Zone 4 at Right Side	mm	4667	4369	298
C5	Crush Zone 5 at Right Side	mm	4642	4374	268
C6	Crush Zone 6 at Right Side	mm	4480	4327	153
L	C1 to C6	mm	1424	1492	-68

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

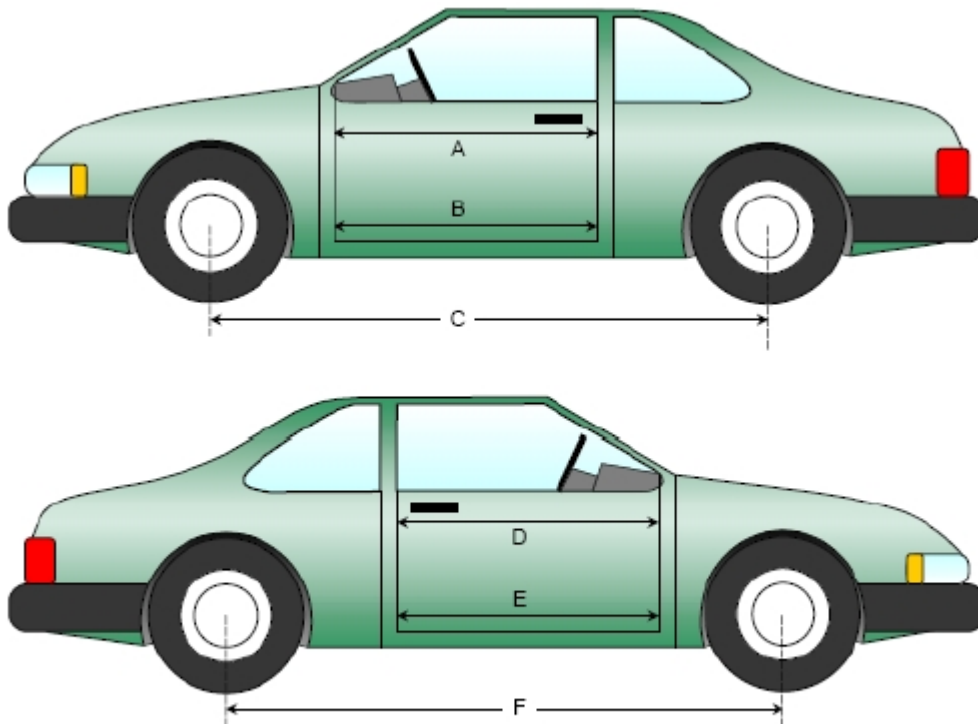
NHTSA No.: M20255803
Test Date: 07/24/2025

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	942	943	1
B	Left Side Lower	mm	858	857	-1
D	Right Side Upper	mm	941	942	1
E	Right Side Lower	mm	854	854	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	2791	2769	-22
F	Right Side Wheelbase	mm	2791	2816	25



Left & Right Side Views

DATA SHEET NO.14 ... (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

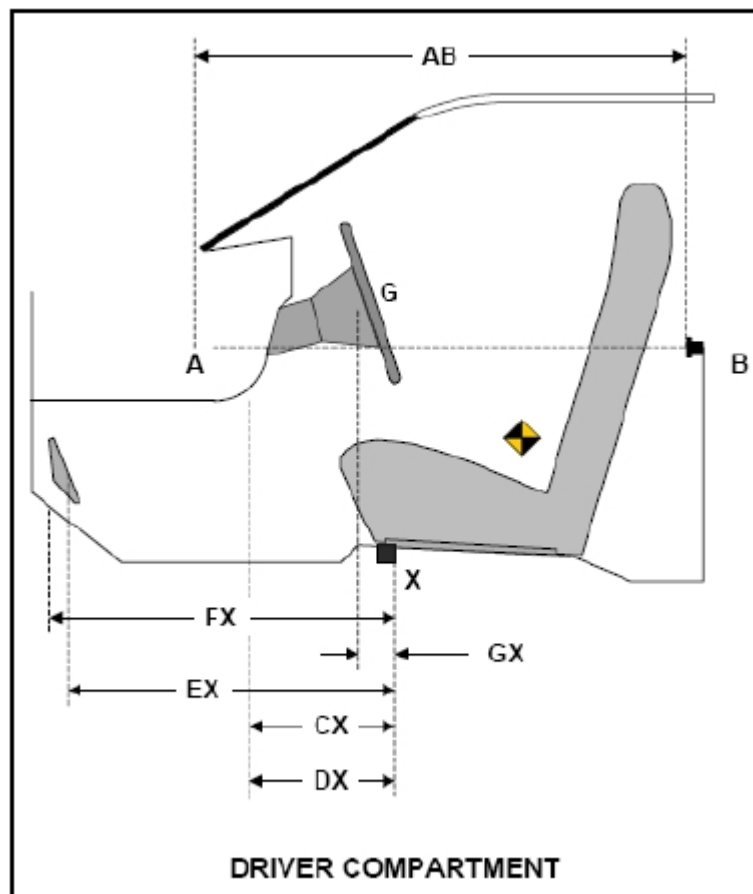
Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Change
AB	Door Opening (Inside Window Jam)	mm	718	-718	-1436
CX	Left Knee Bolster to X	mm	339	339	0
DX	Right Knee Bolster to X	mm	330	335	5
EX	Brake Pedal to X	mm	547	550	3
FX	Foot Rest to X	mm	557	546	-11
GX	Center of Steering Column Wheel Hub to X	mm	88	165	77

X = Front of Seat Track (Stationary)



DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025

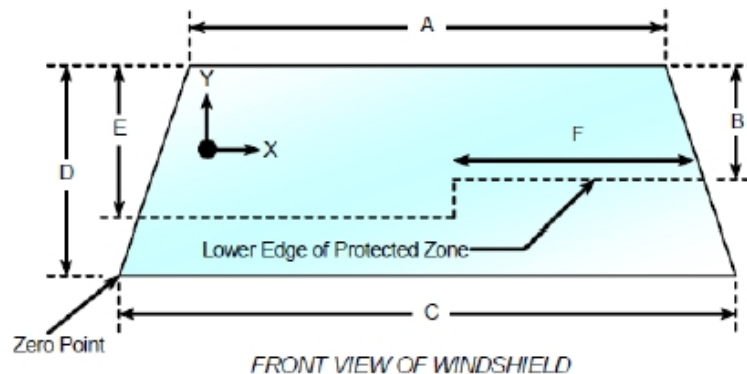
Windshield Mounting Details: A trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21.9 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2166	2166	100%
Right Side	2166	2166	100%
Total	4332	4332	100%



Item	Units	Value
A	mm	1274
B	mm	401
C	mm	1608
D	mm	725
E	mm	390
F	mm	520

AREAS OF PROTECTED ZONE FAILURES

- A. Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.
- No Penetration
- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.
- No Penetration

X	Y
X	Y

DATA SHEET NO. 15 ... (CONTINUED)
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV

NHTSA No.: M20255803

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/24/2025

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21.9°C

Test Time: 11:27 AM

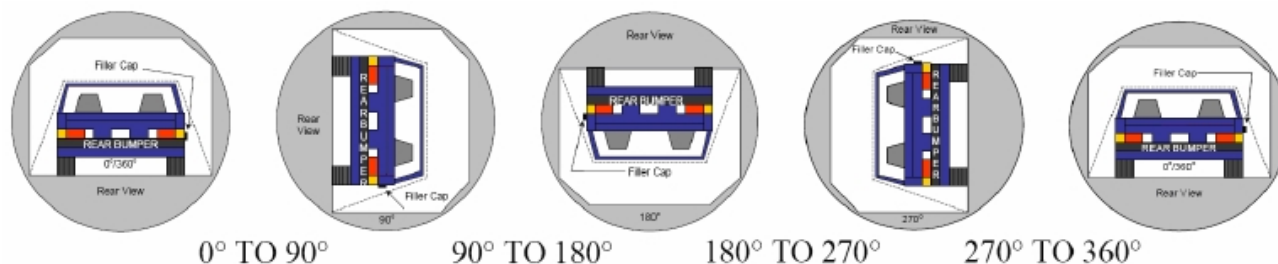
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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: No Spillage Occurred

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2025 Volkswagen Tiguan 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20255803
 Test Date: 07/24/2025



1. The specified fixture rollover rate for each 90° of rotation is 60 to 180 seconds.
2. The position hold time at each position is 300 seconds (minimum).
3. Details of Stoddard Solvent Spillage: No Spillage Occurred

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	72	300	372
90° to 180°	62	300	362
180° to 270°	64	300	364
270° to 360°	67	300	367

FMVSS 301 SPILLAGE TABLE

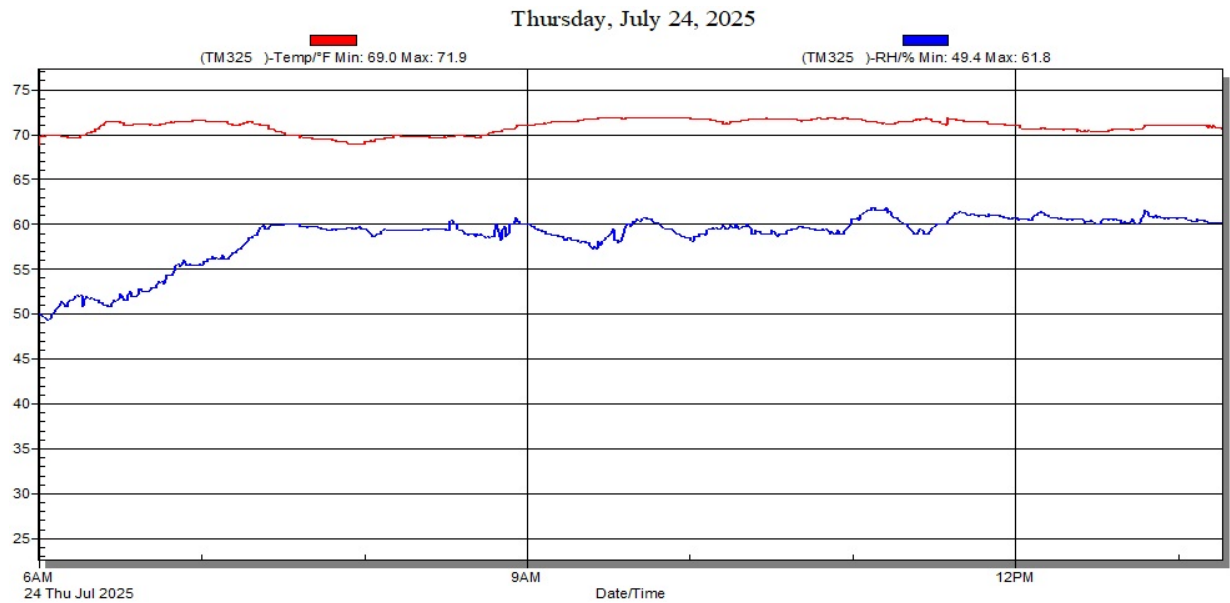
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	0	
90° to 180°	0	0	0	
180° to 270°	0	0	0	
270° to 360°	0	0	0	

SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle:	2025 Volkswagen Tiguan 5 Door SUV	NHTSA No.:	M20255803
Test Program:	NCAP Frontal Barrier Impact Test	Test Date:	07/24/2025



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

APPENDIX A
PHOTOGRAPHS

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45	Post-Test Driver's Side Knee Bolster	A-27
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Fig.	Description	Page
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¹NOTE: *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*



Figure A-1: Load Cell Location



Figure A-2: Pre-Test Load Cell Wall



Figure A-3: Post-Test Load Cell Wall

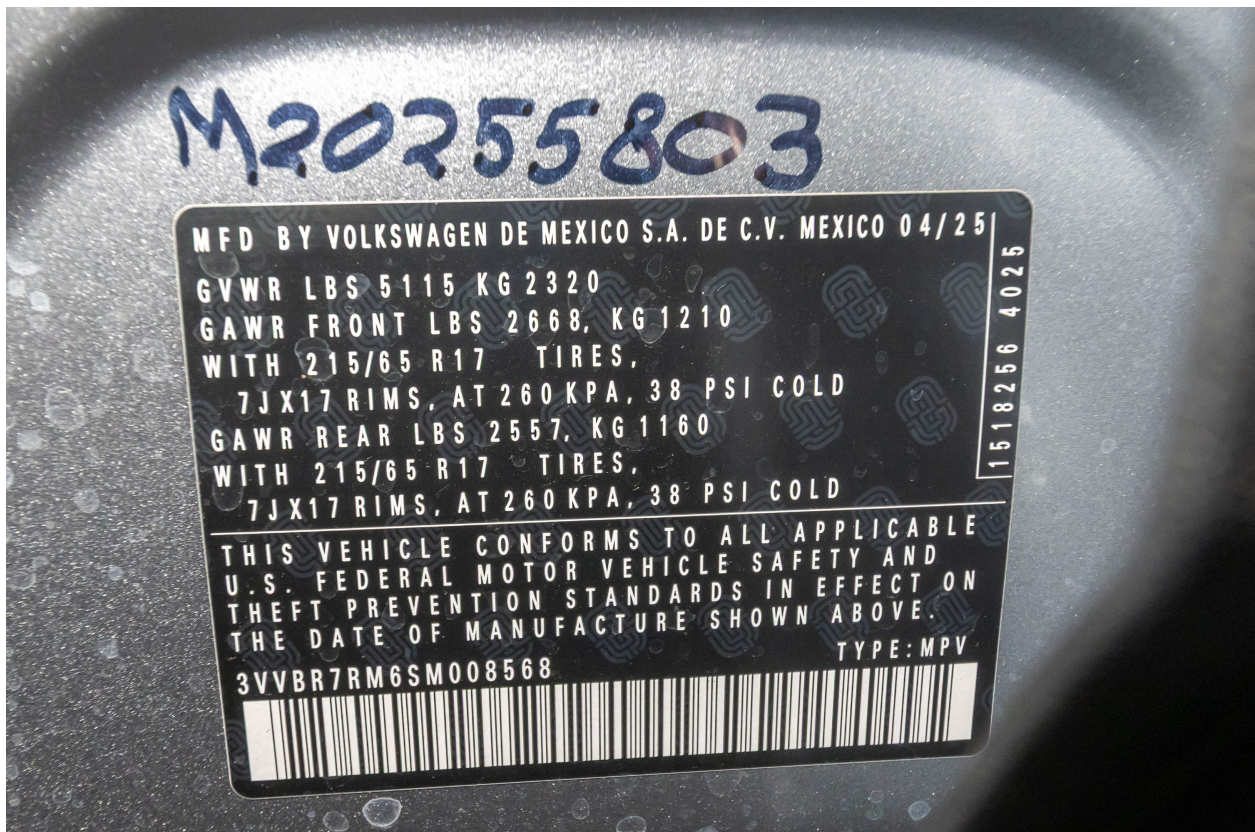


Figure A-4: Manufacturer's Label



Figure A-5: Tire Placard



Figure A-6: 2025 Volkswagen Tiguan Frontal As Delivered



M20255803

Figure A-7: Left Rear 3-4 View, As Received



Figure A-8: Pre-Test Front View of Test Vehicle

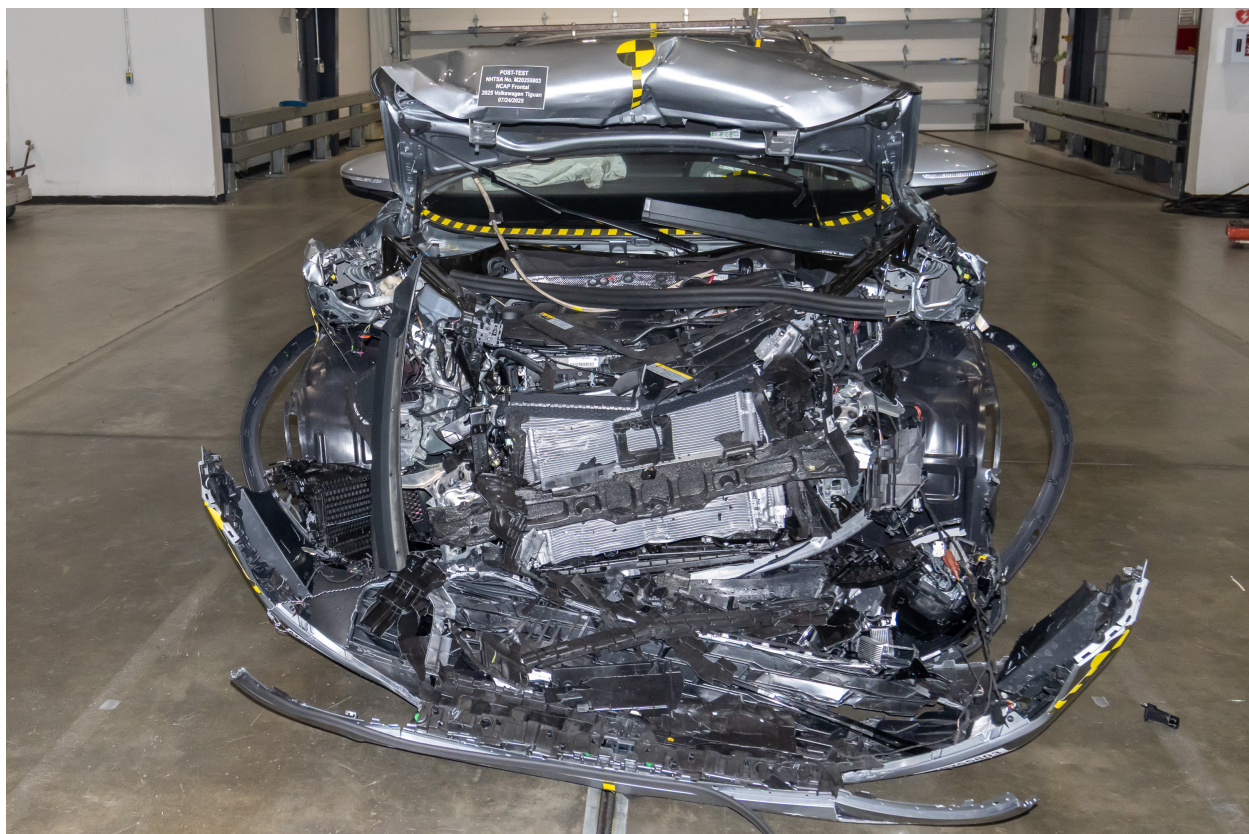


Figure A-9: Post-Test Front View of Test Vehicle



Figure A-10: Pre-Test Left View of Test Vehicle



Figure A-11: Post-Test Left View of Test Vehicle



Figure A-12: Pre-Test Right View of Test Vehicle



Figure A-13: Post-Test Right View of Test Vehicle



Figure A-14: Pre-Test Right Front 3-4 View



Figure A-15: Post-Test Right Front 3-4 View



Figure A-16: Pre-Test Left Rear 3-4 View



Figure A-17: Post-Test Left Rear 3-4 View



Figure A-18: Pre-Test Windshield View



Figure A-19: Post-Test Windshield View



Figure A-20: Pre-Test Engine Compartment View



Figure A-21: Post-Test Engine Compartment View

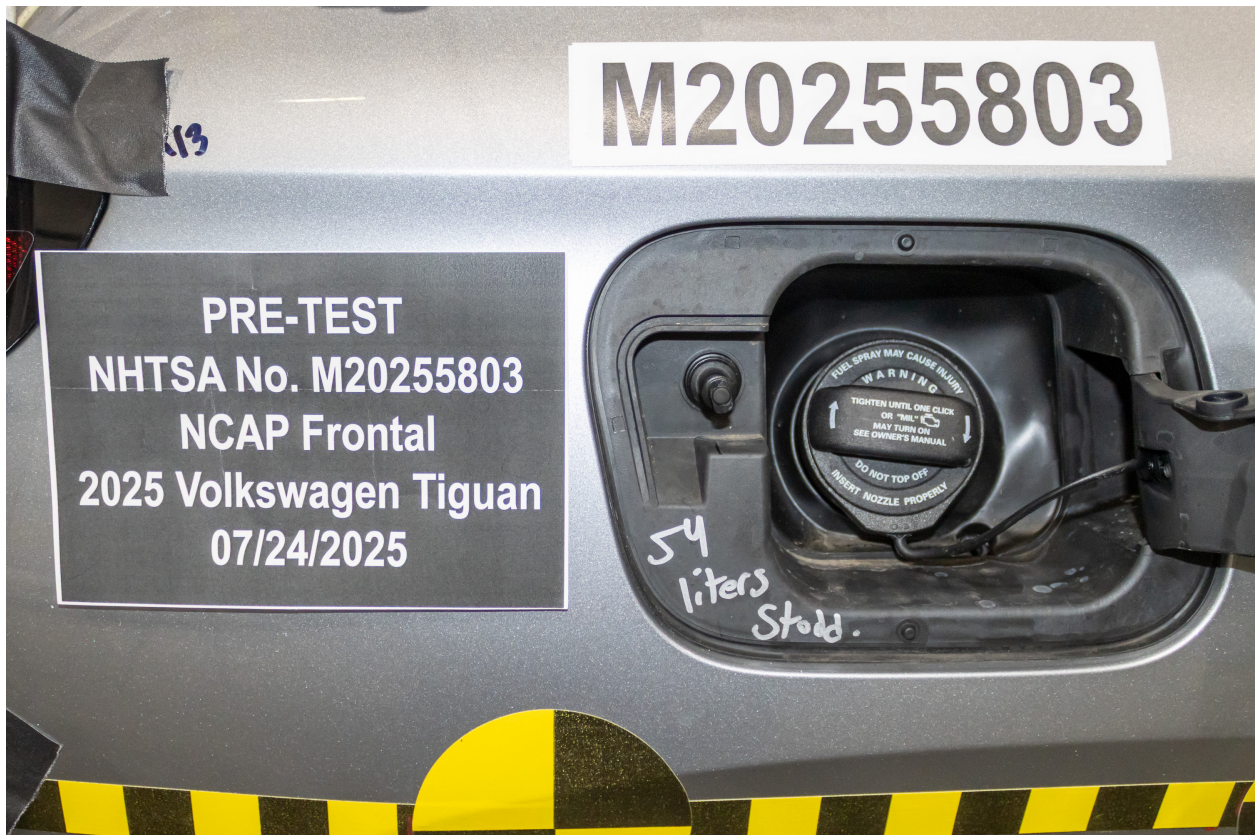


Figure A-22: Pre-Test Fuel Filler Cap View



Figure A-23: Post-Test Fuel Filler Cap View



Figure A-24: Pre-Test Front Underbody View

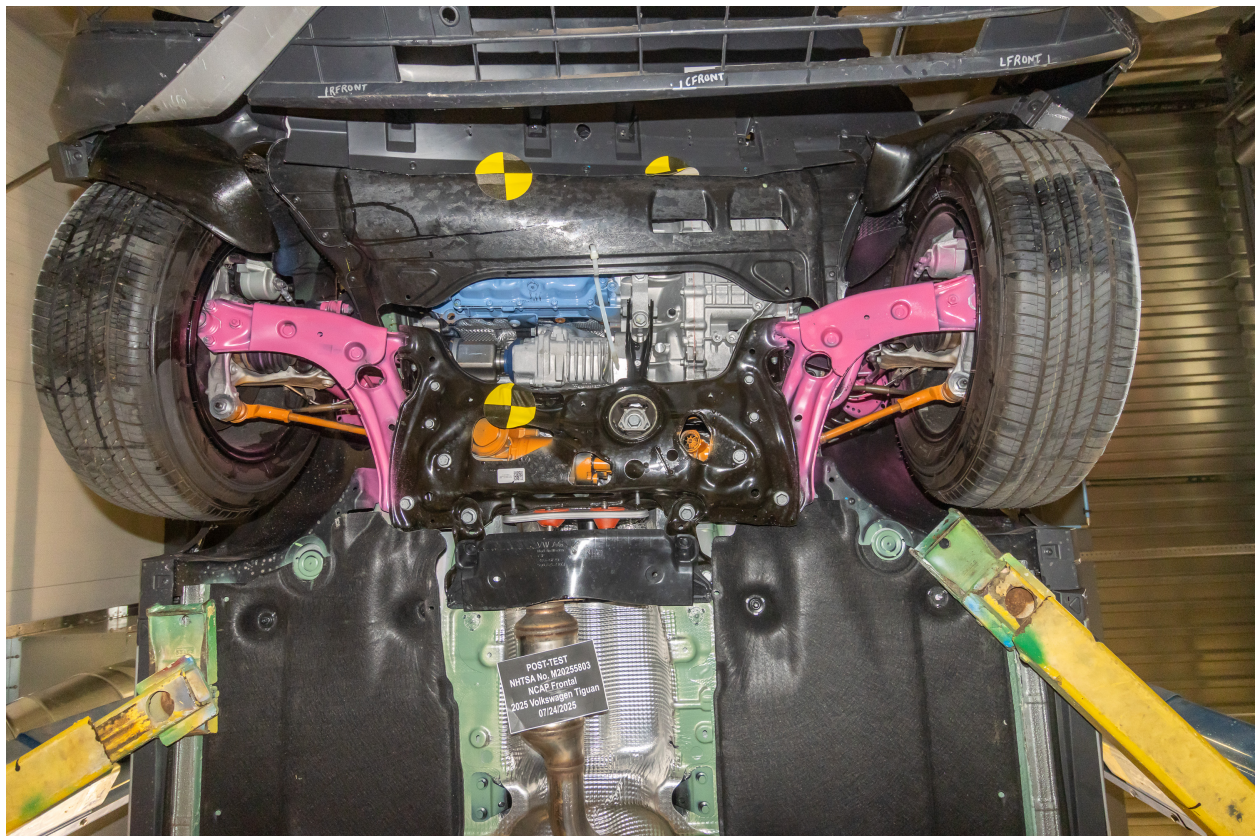


Figure A-25: Post-Test Front Underbody View

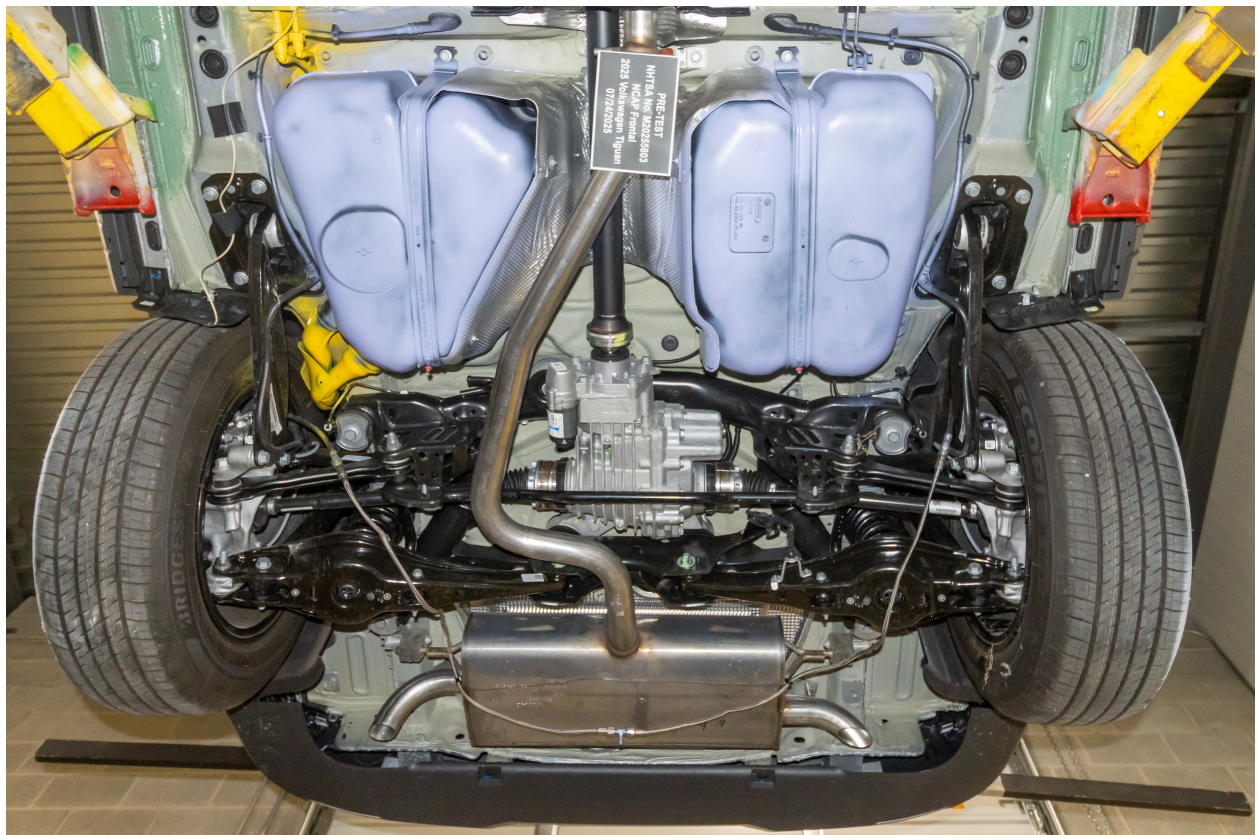


Figure A-26: Pre-Test Rear Underbody View

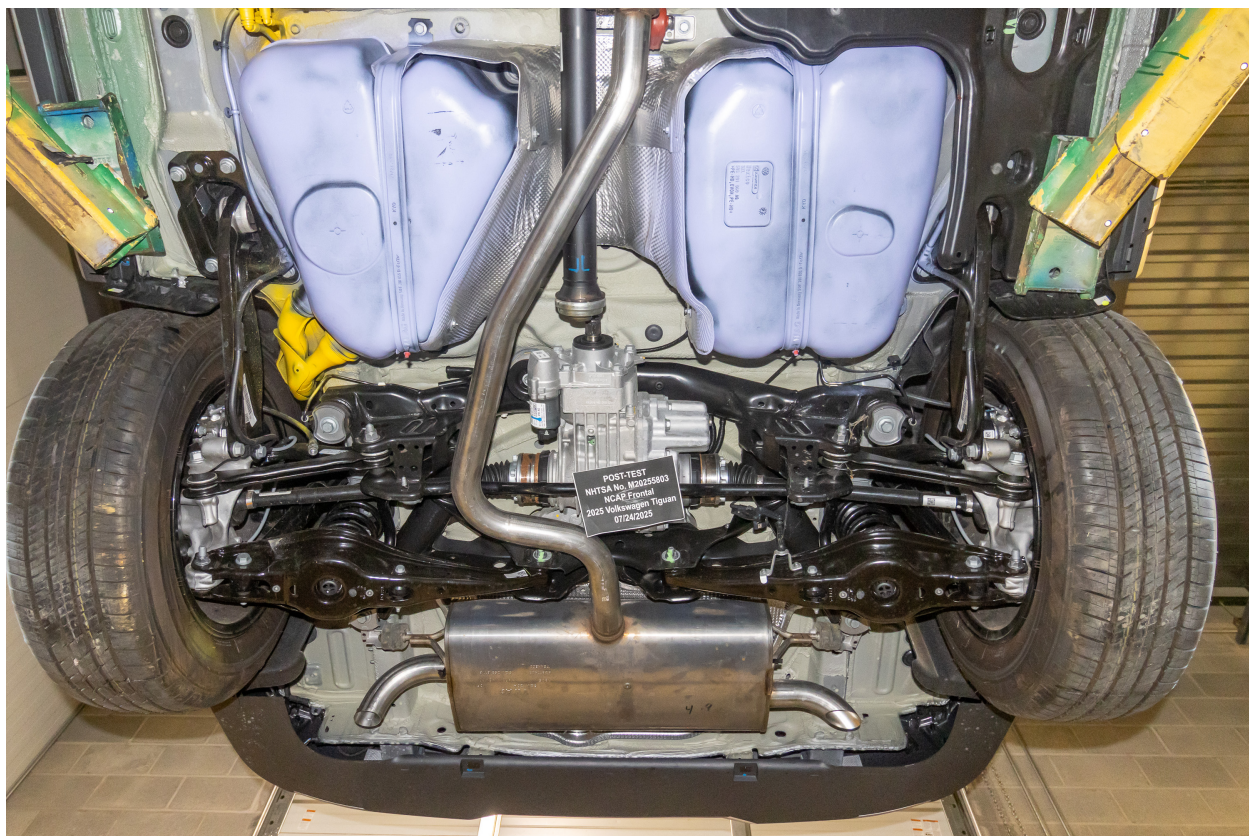


Figure A-27: Post-Test Rear Underbody View



Figure A-28: Pre-Test Dummy Cable Routing



Figure A-29: Post-Test Dummy Cable Routing



Figure A-30: Pre-Test Driver Dummy Front View

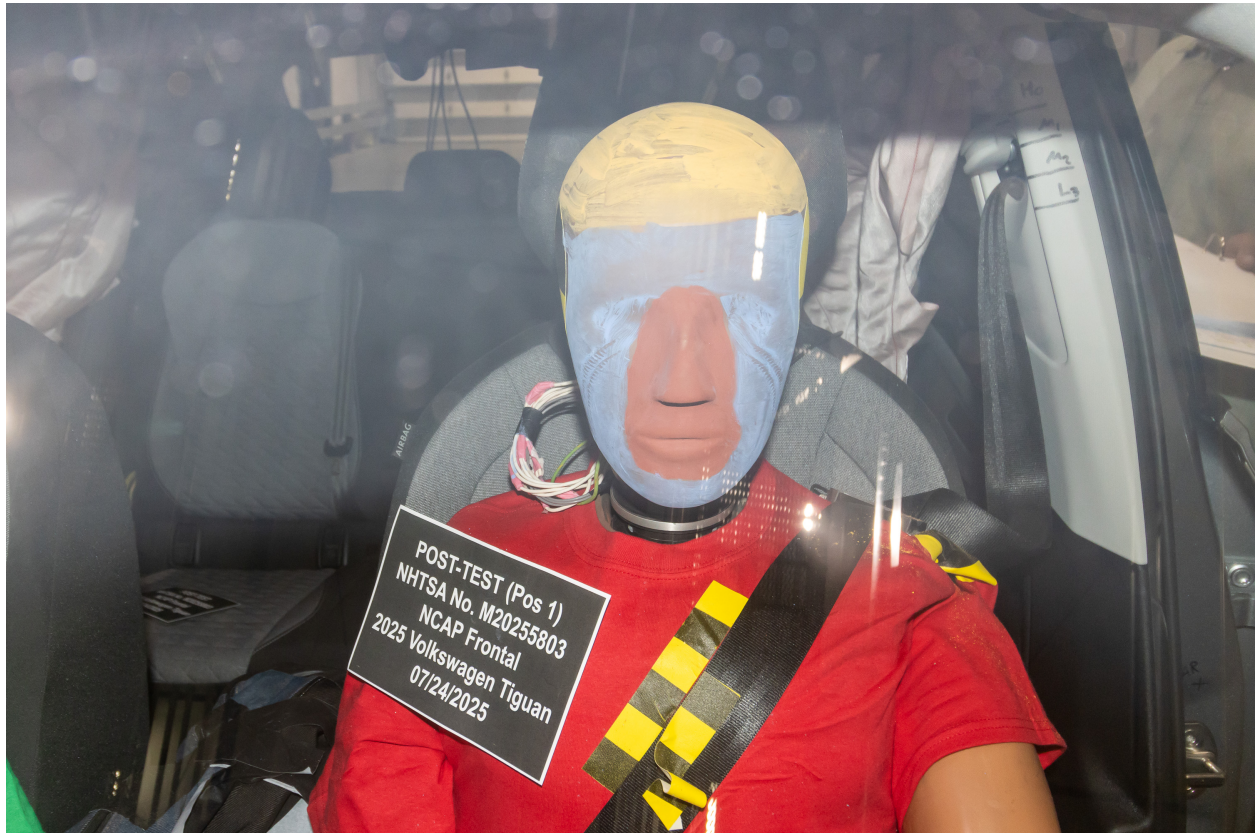


Figure A-31: Post-Test Driver Dummy Front View



Figure A-32: Pre-Test Driver Dummy Window View



Figure A-33: Post-Test Driver Dummy Window View



Figure A-34: Pre-Test Driver Dummy and Vehicle Interior View



Figure A-35: Post-Test Driver Dummy and Vehicle Interior View

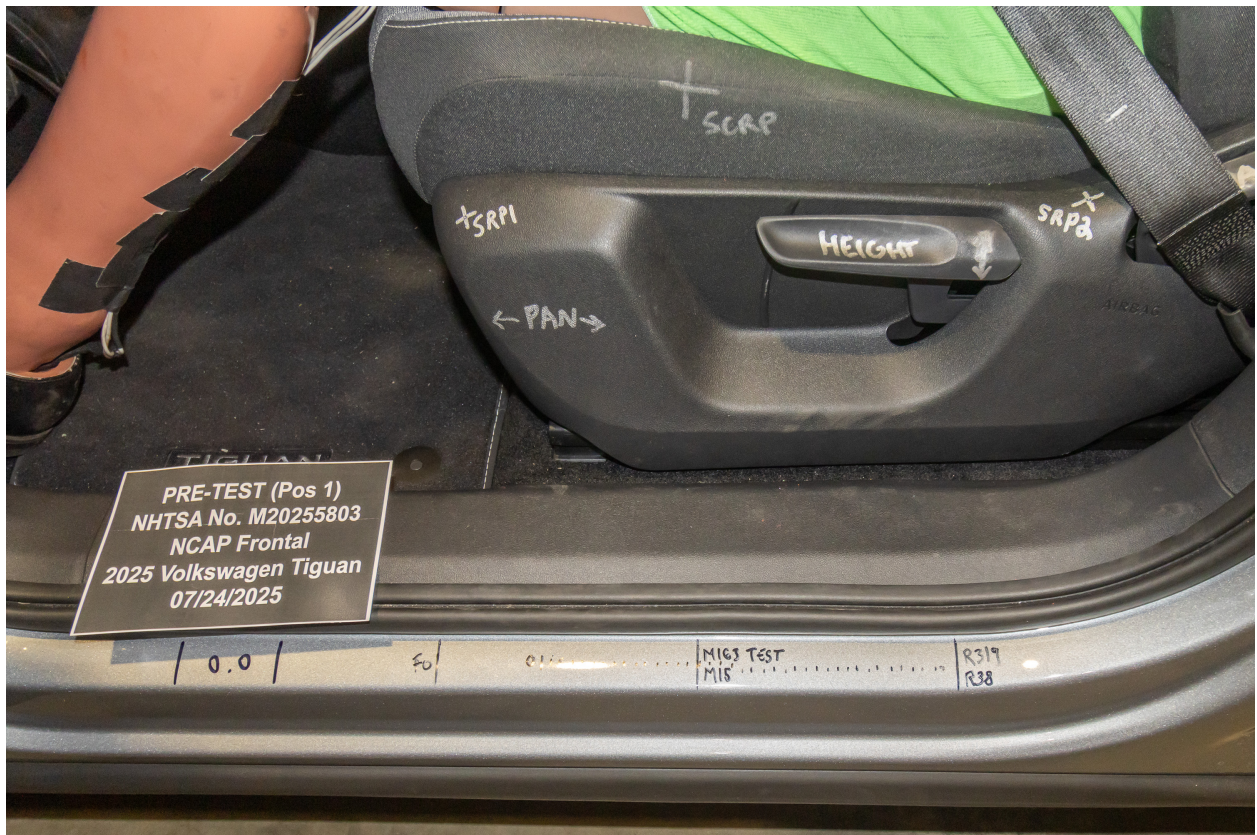


Figure A-36: Pre-Test Driver's Seat Fore-Aft Markings



Figure A-37: Post-Test Driver's Seat Fore-Aft Markings



Figure A-38: Pre-Test View of Belt Anchorage for Driver Dummy

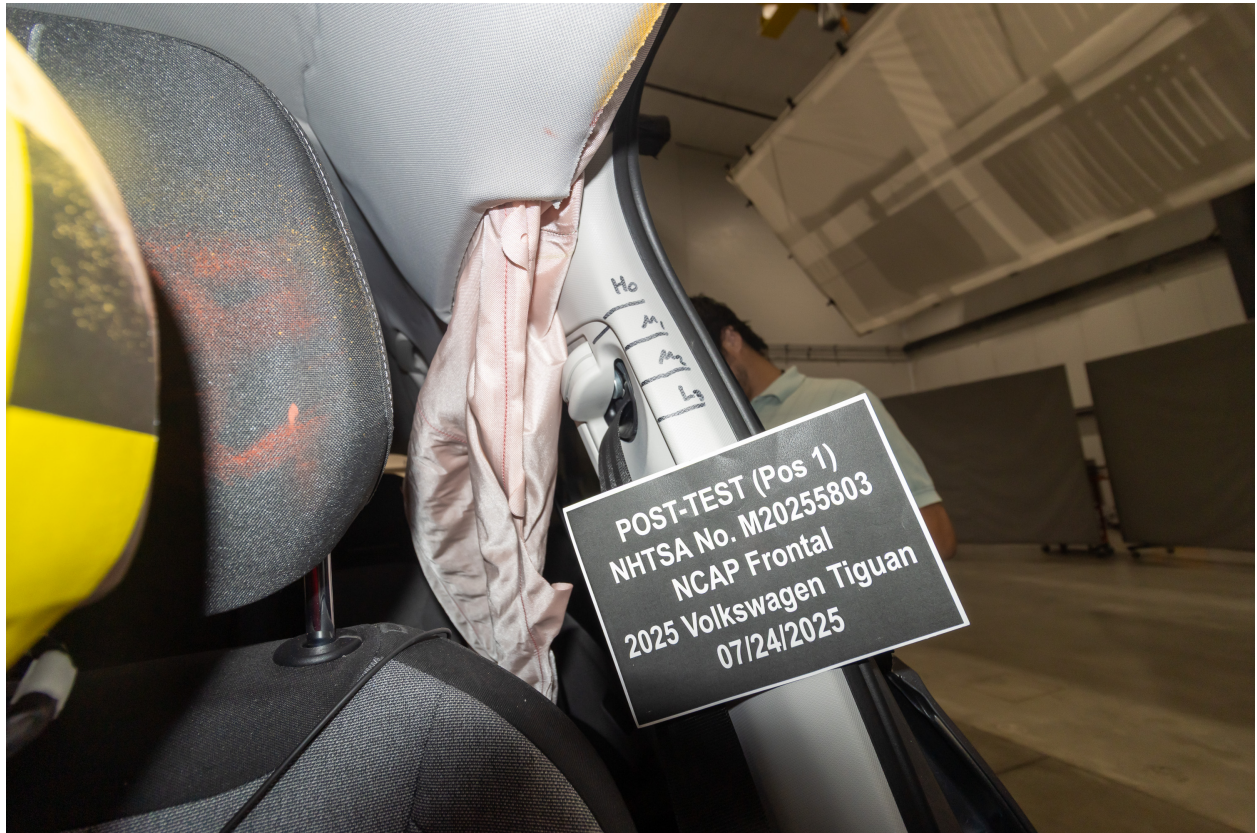


Figure A-39: Post-Test View of Belt Anchorage for Driver Dummy



Figure A-40: Pre-Test View of Belt Buckle and Latch Plate for Driver Dummy



Figure A-41: Post-Test View of Belt Buckle and Latch Plate for Driver Dummy



Figure A-42: Pre-Test Driver Dummy Feet



Figure A-43: Post-Test Driver Dummy Feet



Figure A-44: Pre-Test Driver's Side Knee Bolster



Figure A-45: Post-Test Driver's Side Knee Bolster



Figure A-46: Pre-Test Driver's Side Floorpan



Figure A-47: Post-Test Driver's Side Floorpan

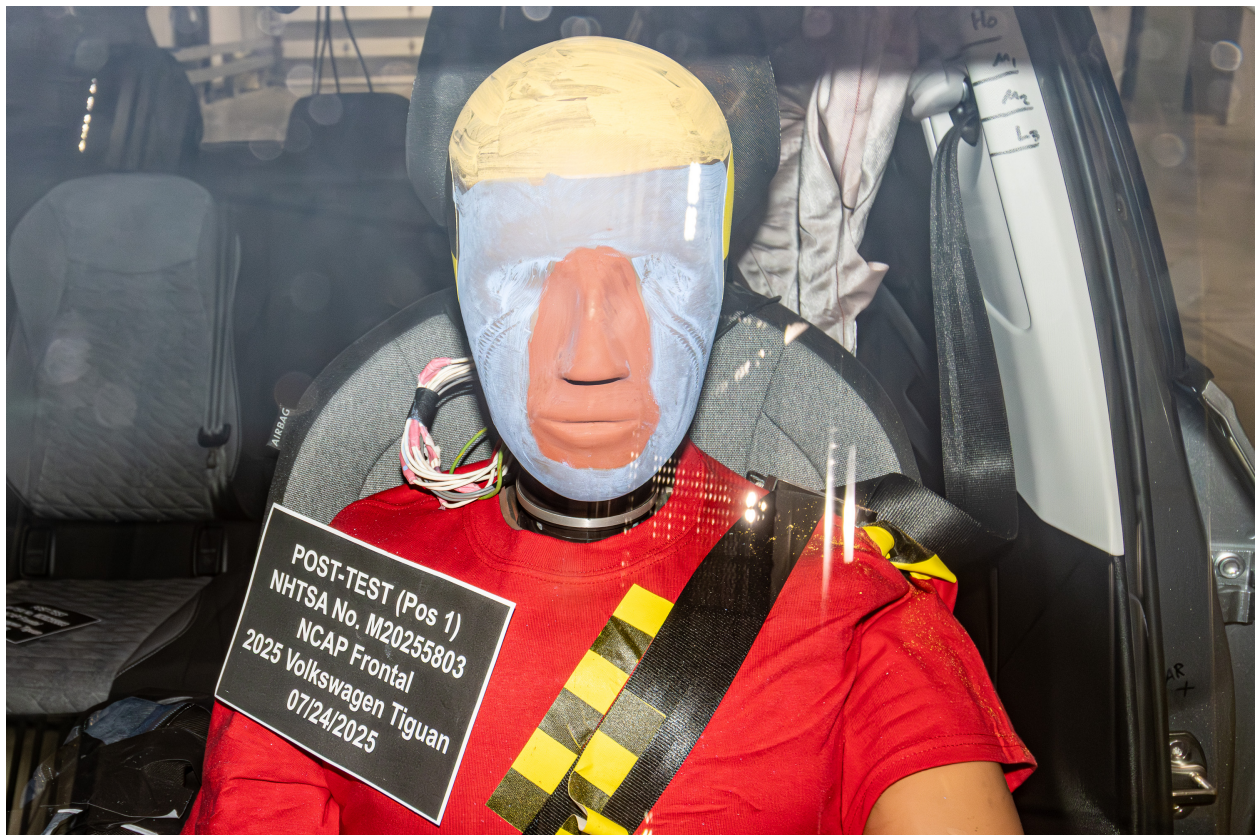


Figure A-48: Post-Test Driver Dummy Face

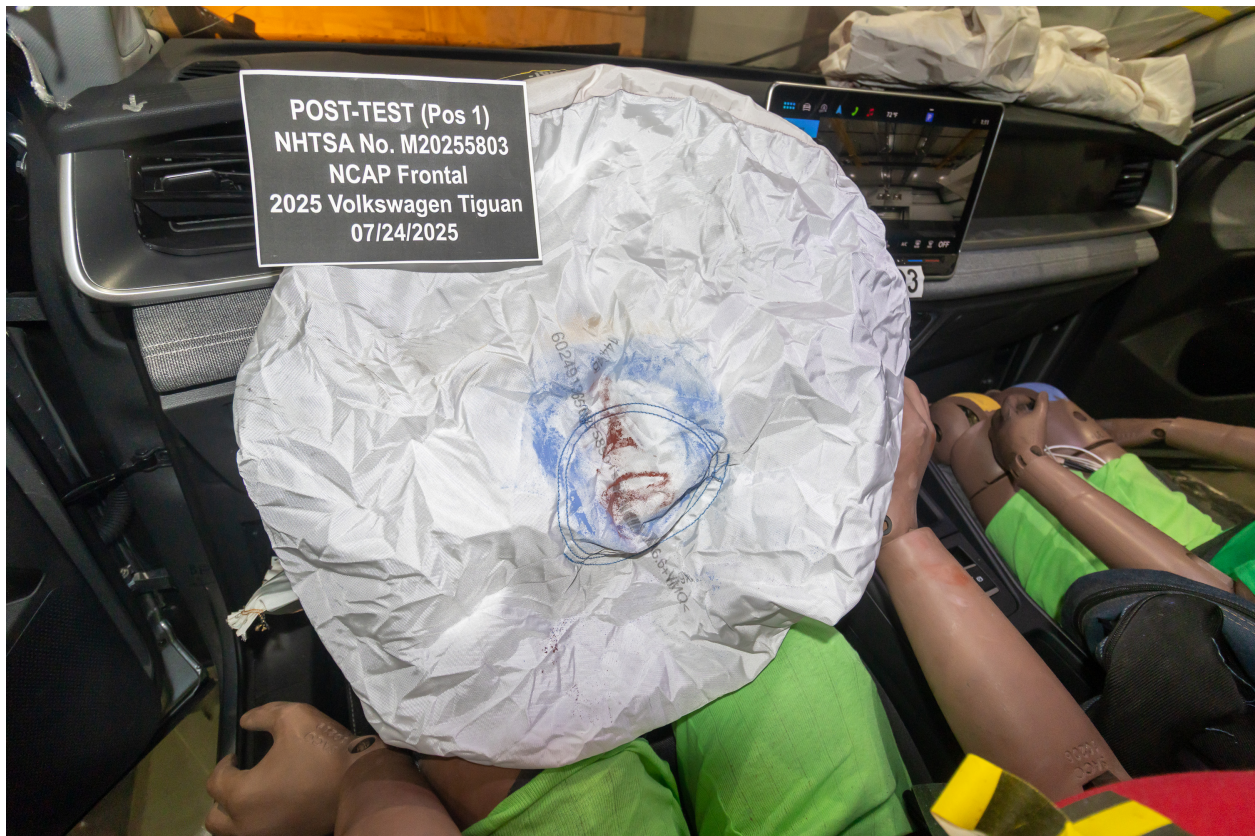


Figure A-49: Post-Test Driver Dummy Contact With Airbag



Figure A-50: Post-Test Driver Dummy Contact With Headrest



Figure A-51: Pre-Test View of the Steering Wheel



Figure A-52: Post-Test View of the Steering Wheel



Figure A-53: Pre-Test Passenger Dummy Front View

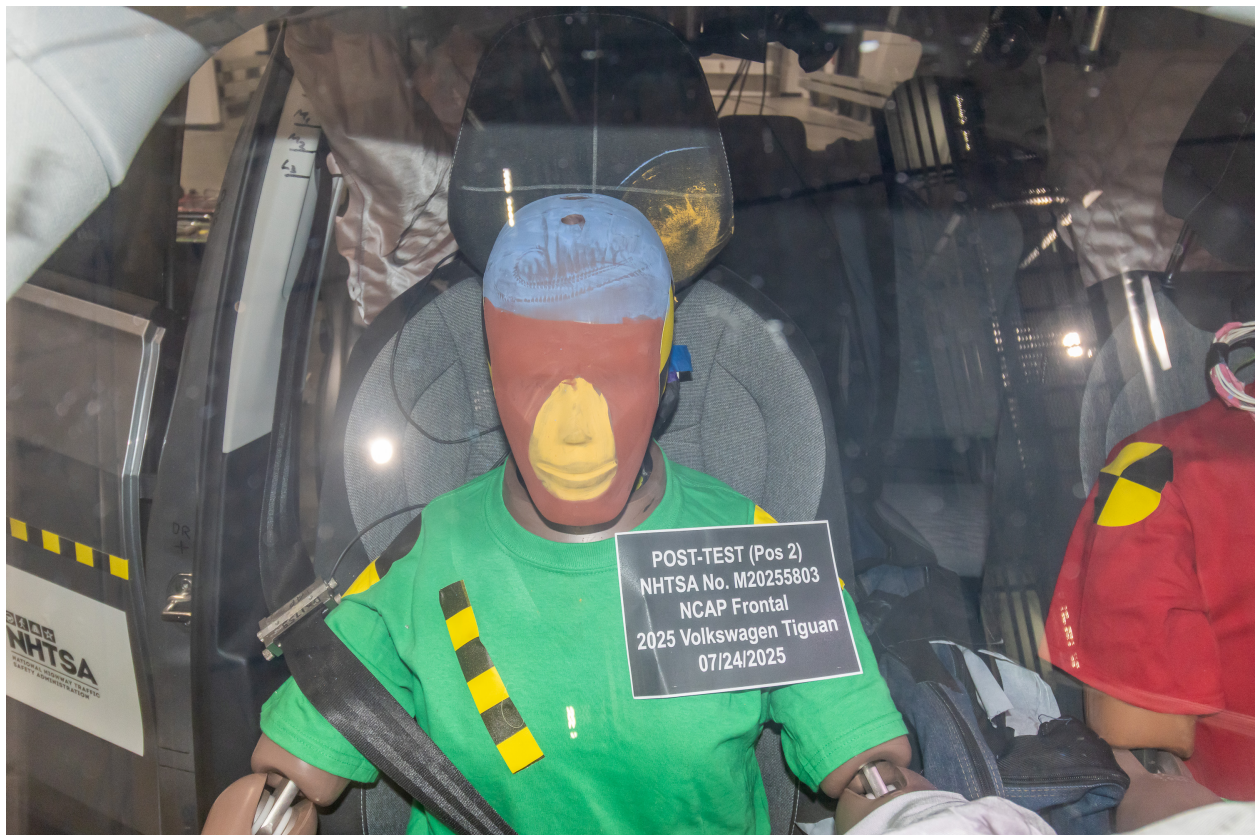


Figure A-54: Post-Test Passenger Dummy Front View



Figure A-55: Pre-Test Passenger Dummy Window View



Figure A-56: Post-Test Passenger Dummy Window View



Figure A-57: Pre-Test Passenger Dummy and Vehicle Interior View



Figure A-58: Post-Test Passenger Dummy and Vehicle Interior View



Figure A-59: Pre-Test Passenger's Seat Fore-Aft Markings



Figure A-60: Post-Test Passenger's Seat Fore-Aft Markings



Figure A-61: Pre-Test View of Belt Anchorage for Passenger Dummy



Figure A-62: Post-Test View of Belt Anchorage for Passenger Dummy



Figure A-63: Pre-Test View of Belt Buckle and Latch Plate for Passenger Dummy



Figure A-64: Post-Test View of Belt Buckle and Latch Plate for Passenger Dummy



Figure A-65: Pre-Test Passenger Dummy Feet



Figure A-66: Post-Test Passenger Dummy Feet



Figure A-67: Pre-Test Passenger's Side Knee Bolster



Figure A-68: Post-Test Passenger's Side Knee Bolster



Figure A-69: Pre-Test Passenger's Side Floorpan



Figure A-70: Post-Test Passenger's Side Floorpan



Figure A-71: Post-Test Passenger Dummy Face



Figure A-72: Post-Test Passenger Dummy Contact With Airbag

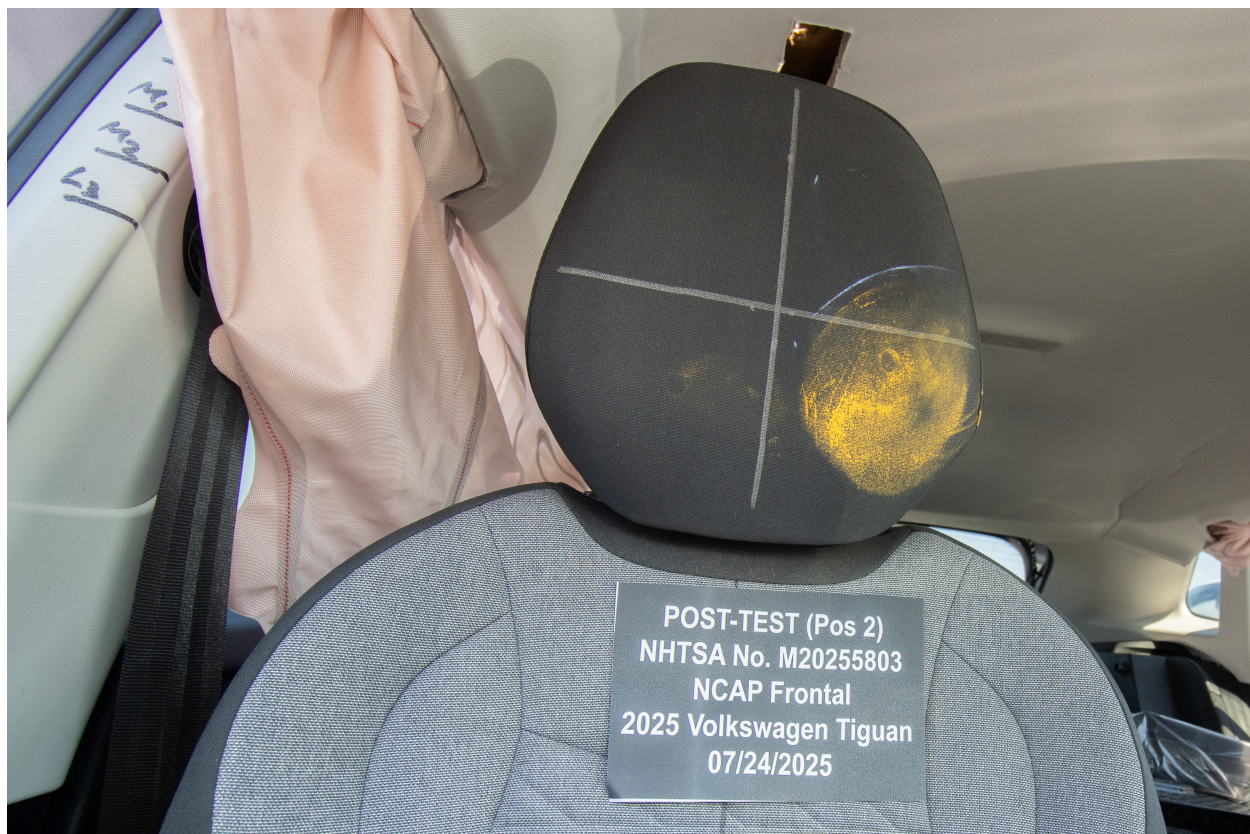


Figure A-73: Post-Test Passenger Dummy Contact With Headrest



Figure A-74: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

Figure A-75: Post-Test Stoddard Solvent Spillage Location View, If Required



Figure A-76: Post-Test Speed Trap Read-Out



Figure A-77: Vehicle at 0° on Static Rollover Device

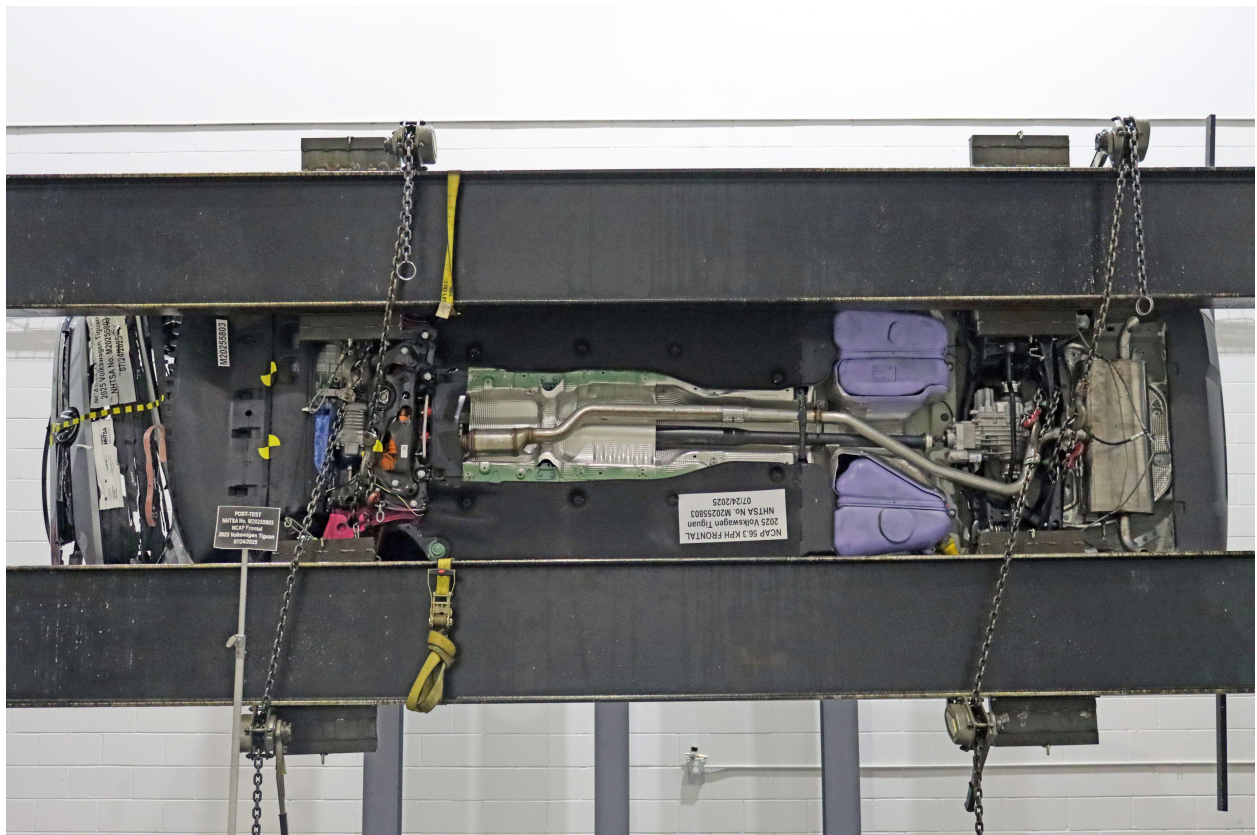


Figure A-78: Vehicle at 90° on Static Rollover Device

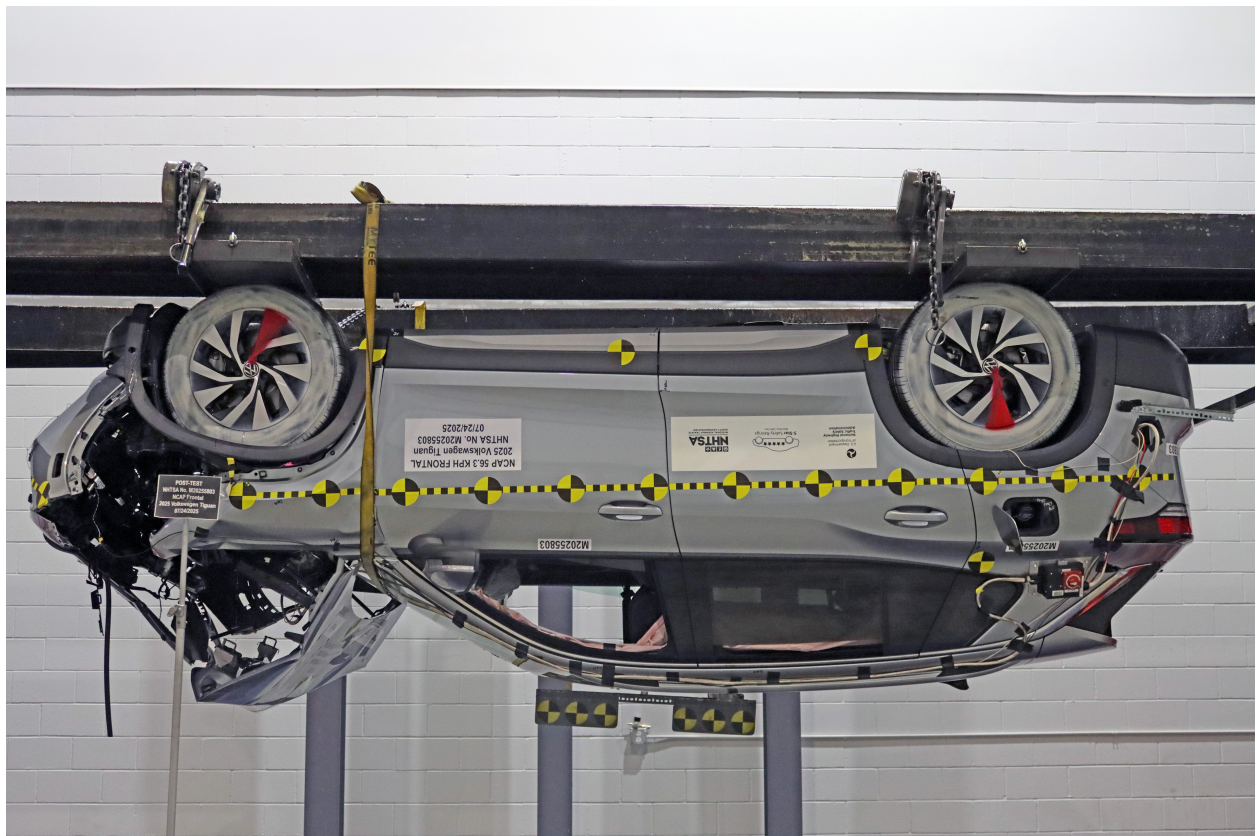


Figure A-79: Vehicle at 180° on Static Rollover Device

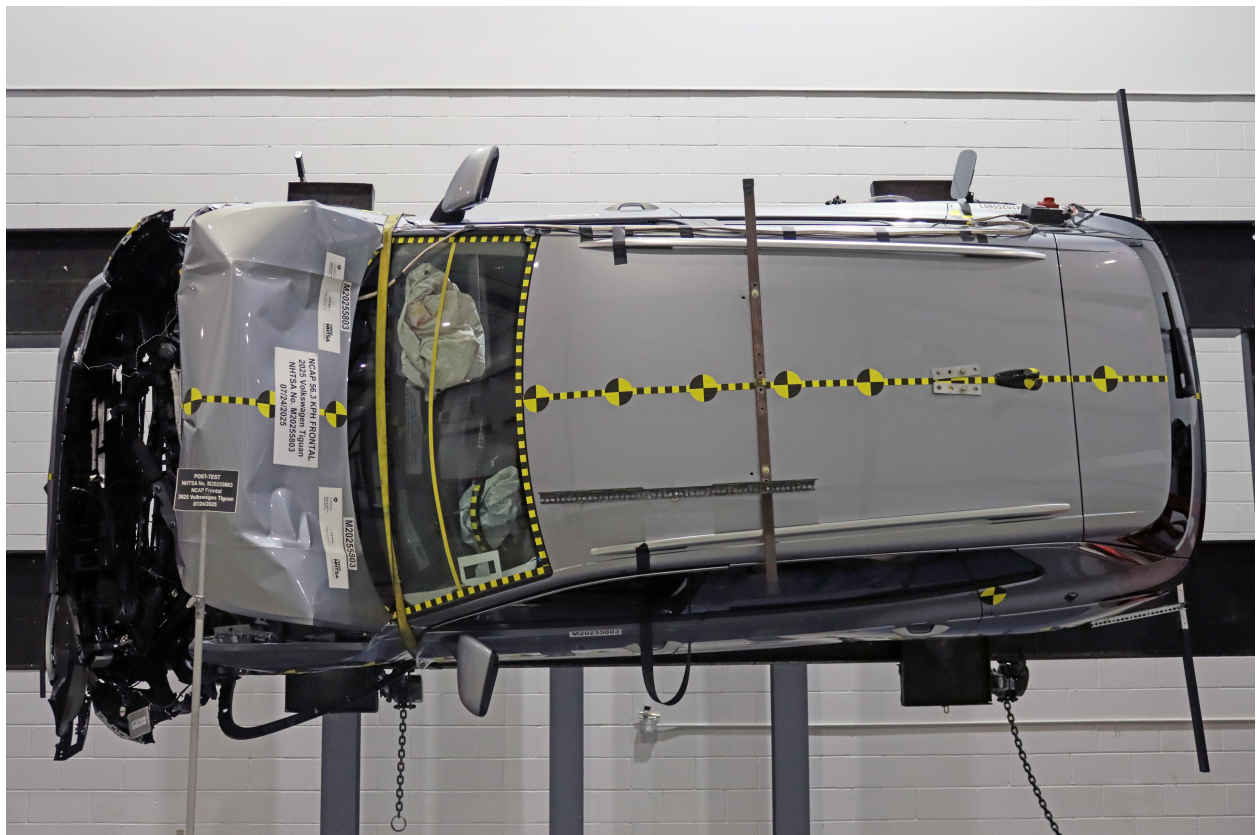


Figure A-80: Vehicle at 270° on Static Rollover Device



Figure A-81: Vehicle at 360° on Static Rollover Device



Figure A-82: 2025 Volkswagen Tiguan Frontal Impact Event

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA TRACES

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Plot 2	Driver Head Y Acceleration vs. Time Primary	B-5
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Plot 4	Driver Head Resultant Acceleration vs. Time Primary	B-5
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Plot 9	Driver Chest Resultant Acceleration vs. Time Primary	B-7
Plot 10	Driver Upper Neck Force X vs. Time Primary	B-7
Plot 11	Driver Upper Neck Force Z vs. Time Primary	B-7
Plot 12	Driver Upper Neck Moment Y vs. Time Primary	B-7
Plot 13	Driver Nij vs. Time Primary	B-8
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Plot 27	Passenger Upper Neck Moment Y vs. Time Primary	B-11
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Plot 29	Passenger Left Femur Force vs. Time	B-12
Plot 30	Passenger Right Femur Force vs. Time	B-12

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

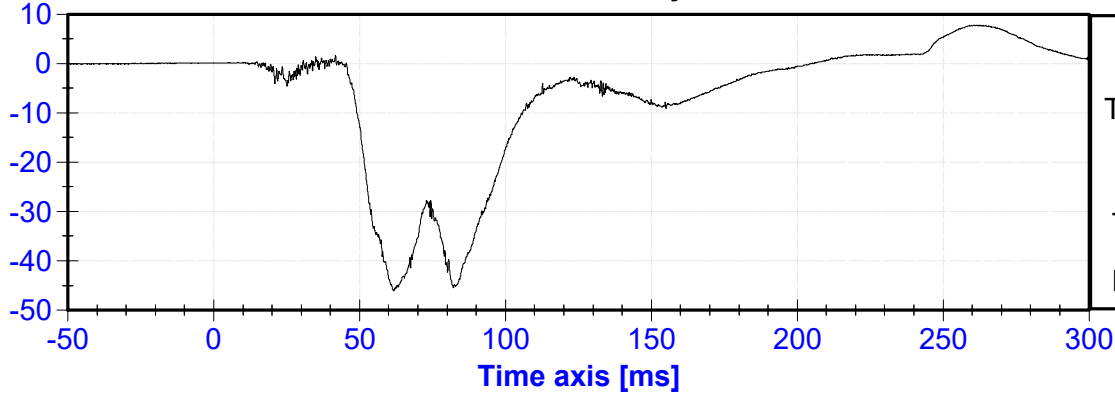
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 Driver Head Y Acceleration Redundant
 Driver Head Z Acceleration Redundant
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Acceleration Redundant
 Driver Chest Y Acceleration Redundant
 Driver Chest Z Acceleration Redundant
 Driver Pelvis X
 Driver Pelvis Y
 Driver Pelvis Z
 Driver Left Femur Redundant
 Driver Right Femur Redundant
 Driver Left Upper Tibia Moment X
 Driver Left Upper Tibia Moment Y

Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver Right Lower Tibia Force Z
Driver Left Foot Fore Z
Driver Left Foot Aft X
Driver Left Foot Aft Z
Driver Right Foot Fore Z
Driver Right Foot Aft X
Driver Right Foot Aft Z
Driver Shoulder Belt Force
Driver Lap Belt Force
Driver Head Angular Velocity X
Driver Head Angular Velocity Y
Driver Head Angular Velocity Z
Passenger Head X Acceleration Redundant
Passenger Head Y Acceleration Redundant
Passenger Head Z Acceleration Redundant
Passenger Upper Neck Force X
Passenger Upper Neck Force Z
Passenger Upper Neck Moment Y
Passenger Chest X Acceleration Redundant
Passenger Chest Y Acceleration Redundant
Passenger Chest Z Acceleration Redundant
Passenger Pelvis X
Passenger Pelvis Y
Passenger Pelvis Z
Passenger Left Femur Redundant
Passenger Right Femur Redundant
Passenger Left Upper Tibia Moment X
Passenger Left Upper Tibia Moment Y
Passenger Left Upper Tibia Force Z
Passenger Left Lower Tibia Moment X
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Passenger Left Lower Tibia Force Z
Passenger Right Upper Tibia Moment X
Passenger Right Upper Tibia Moment Y
Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z

Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Passenger Shoulder Belt Force
Passenger Lap Belt Force
Passenger Head Angular Velocity X
Passenger Head Angular Velocity Y
Passenger Head Angular Velocity Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Left Rear Seat Crossmember X Redundant
Right Rear Seat Crossmember X Redundant
Vehicle Engine Top X
Vehicle Engine Bottom X
Load Cell Barrier Forces and Moments

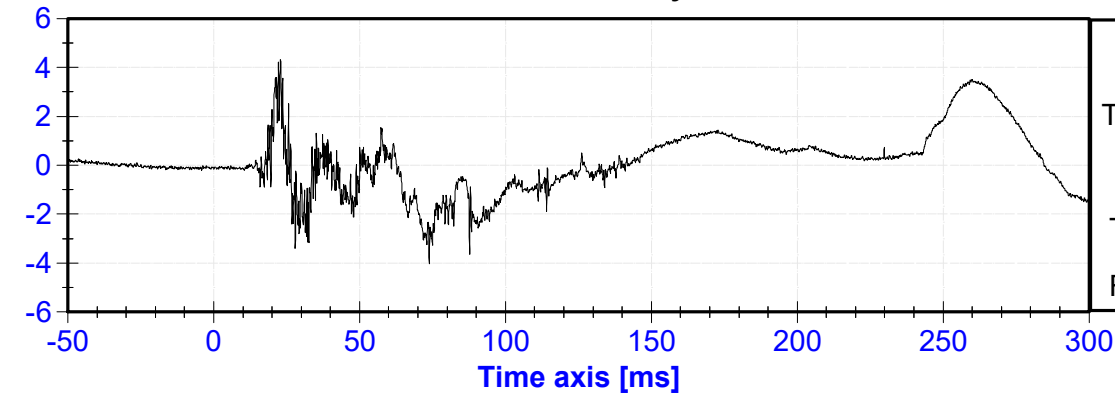
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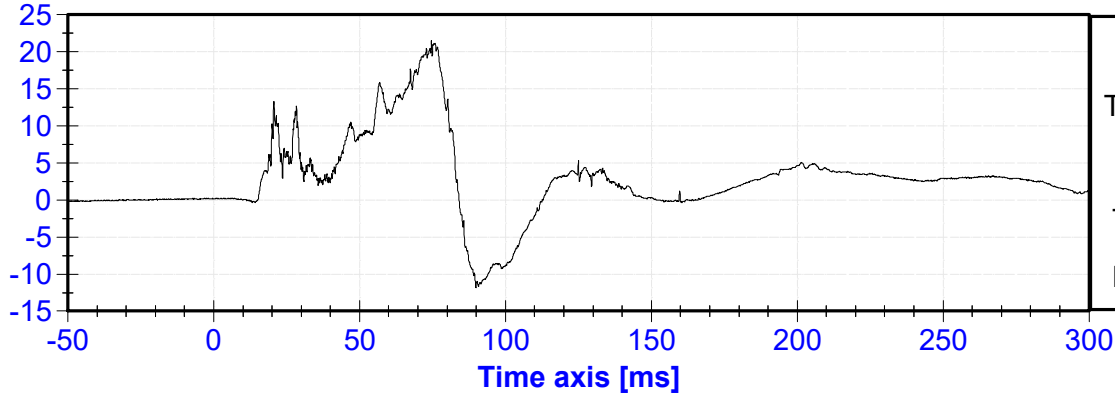
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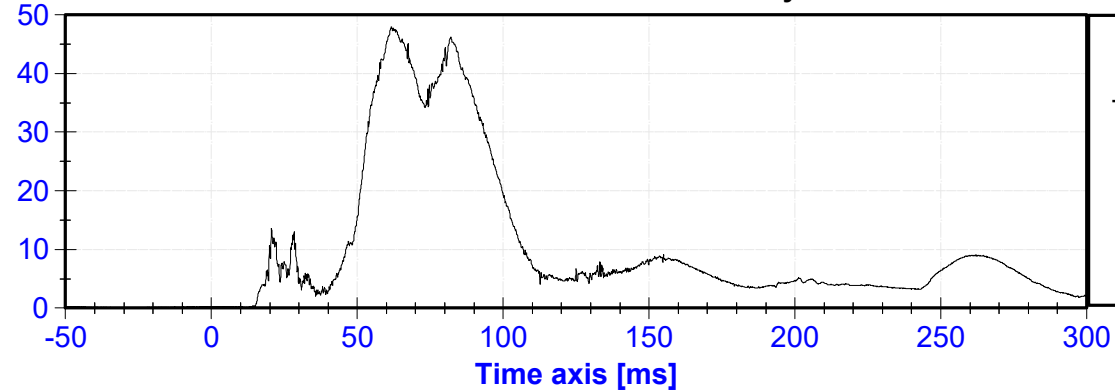
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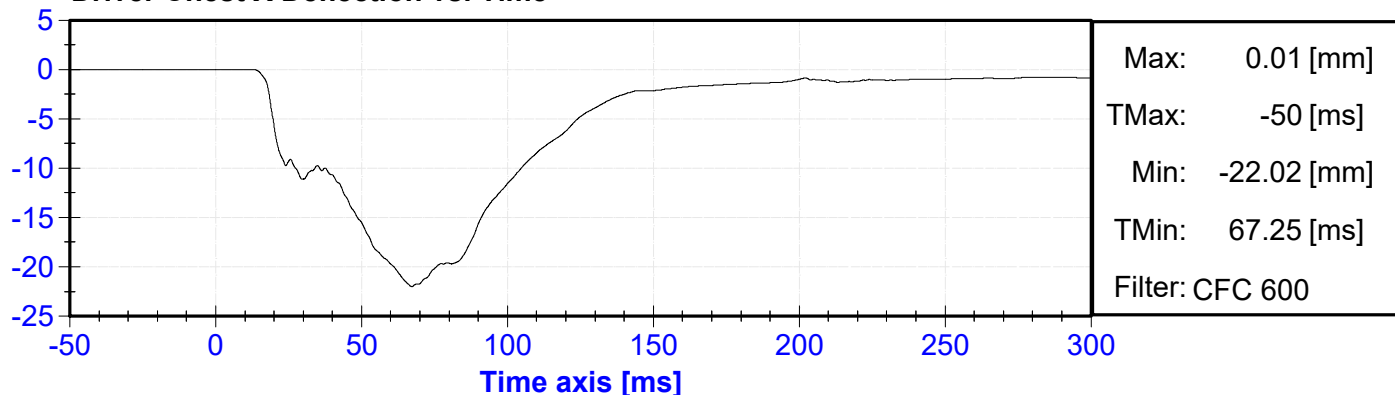
ACCELERATION [g's]

Driver Head Resultant Acceleration vs. Time Primary



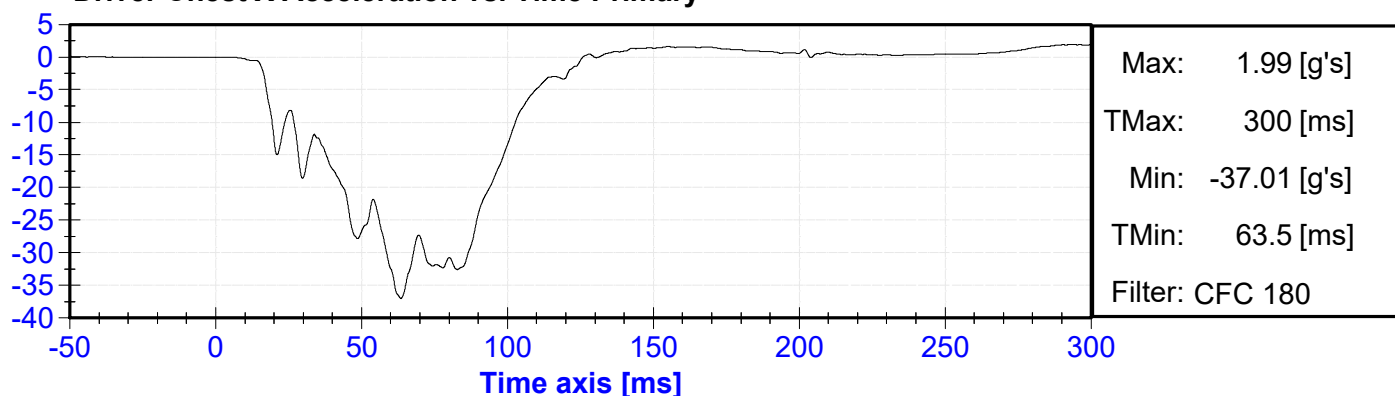
DISPLACEMENT [mm]

Driver Chest X Deflection vs. Time



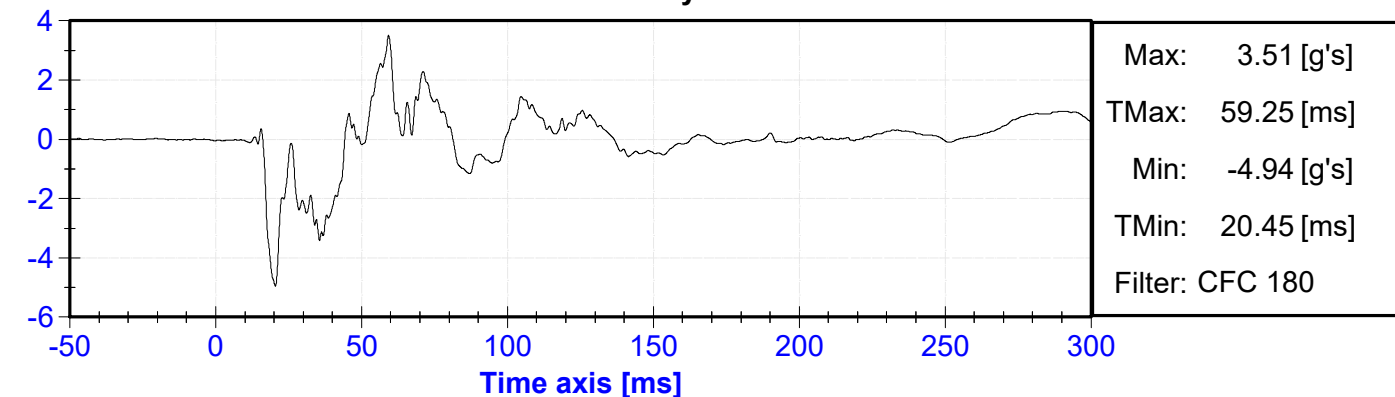
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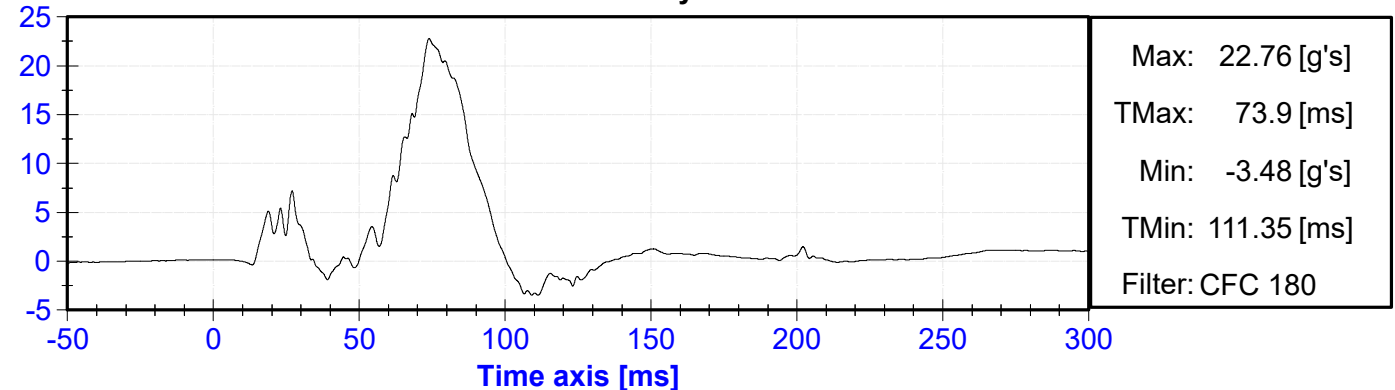
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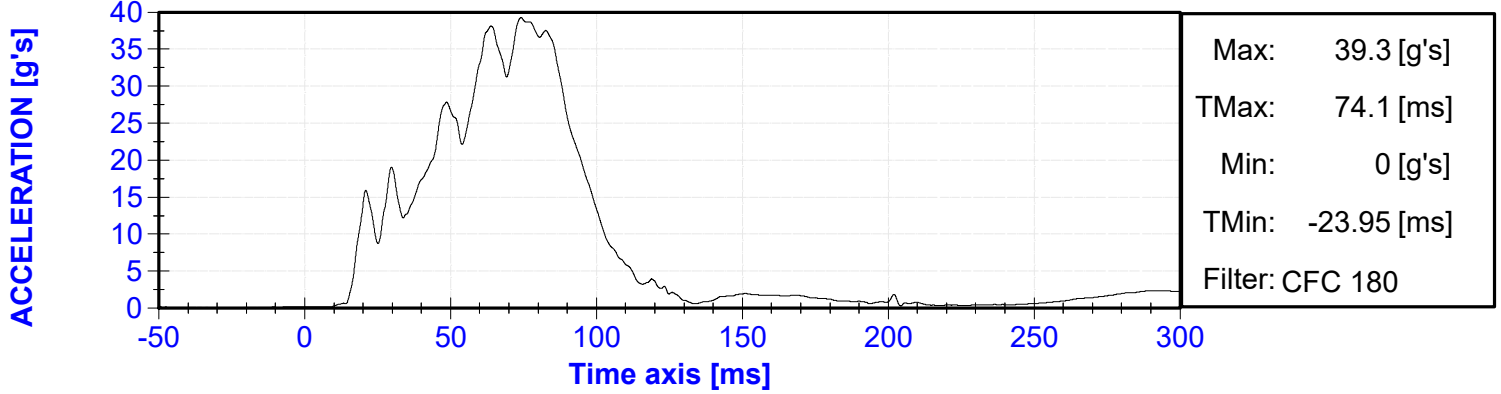


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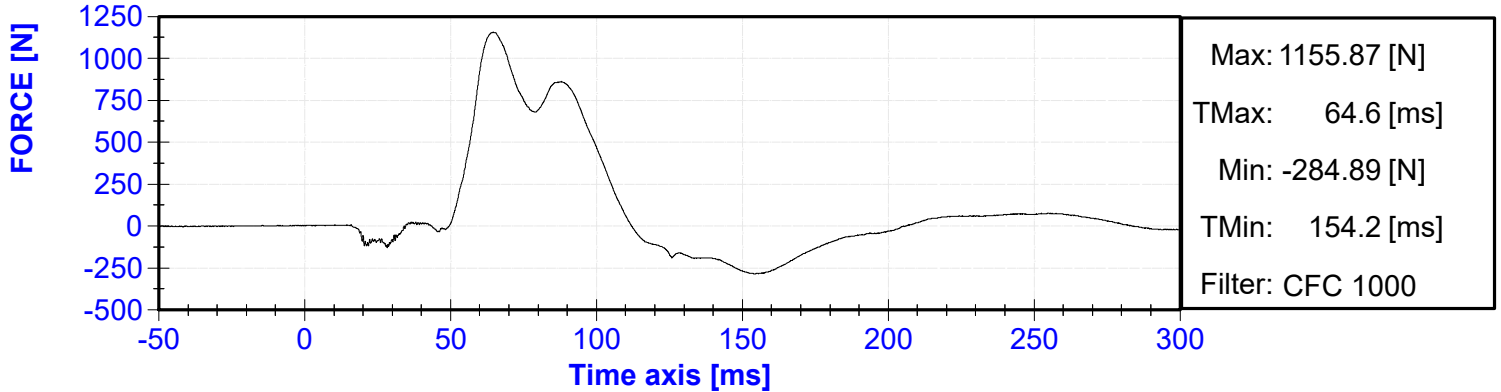
Driver Chest Z Acceleration vs. Time Primary



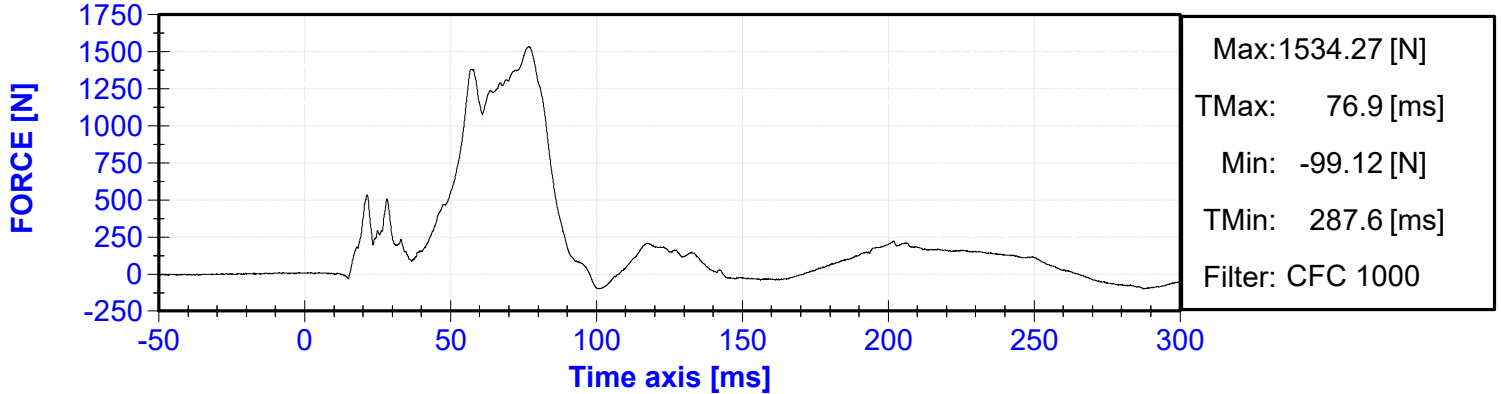
Driver Chest Resultant Acceleration vs. Time Primary



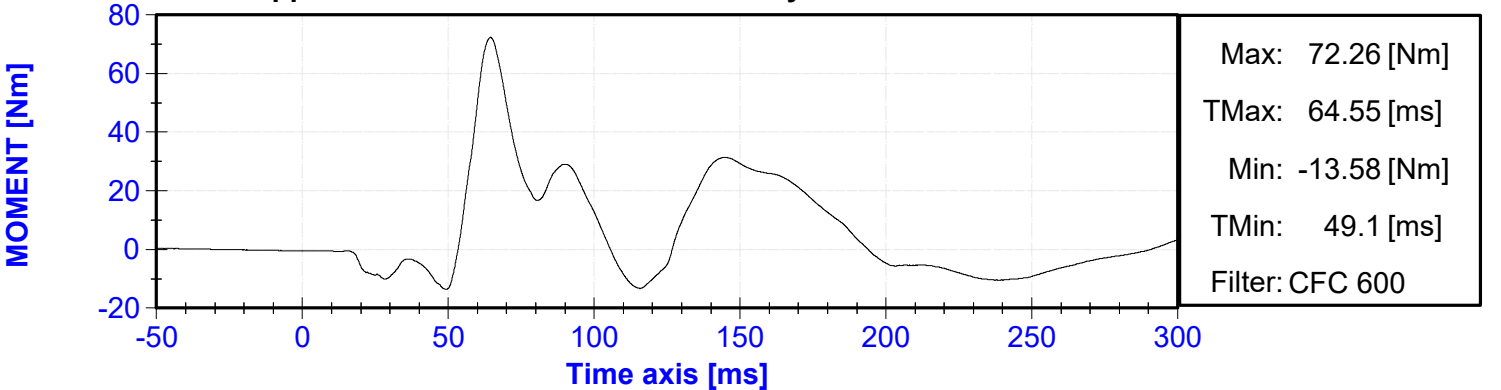
Driver Upper Neck Force X vs. Time Primary



Driver Upper Neck Force Z vs. Time Primary

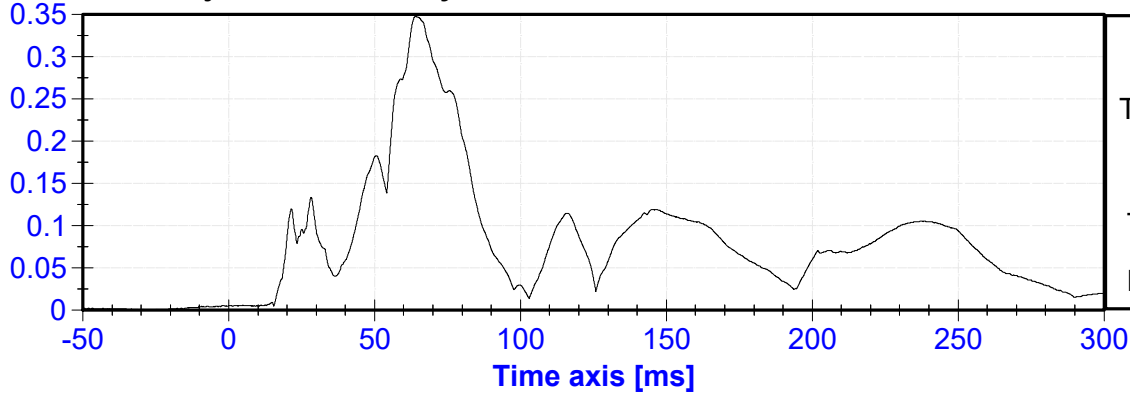


Driver Upper Neck Moment Y vs. Time Primary



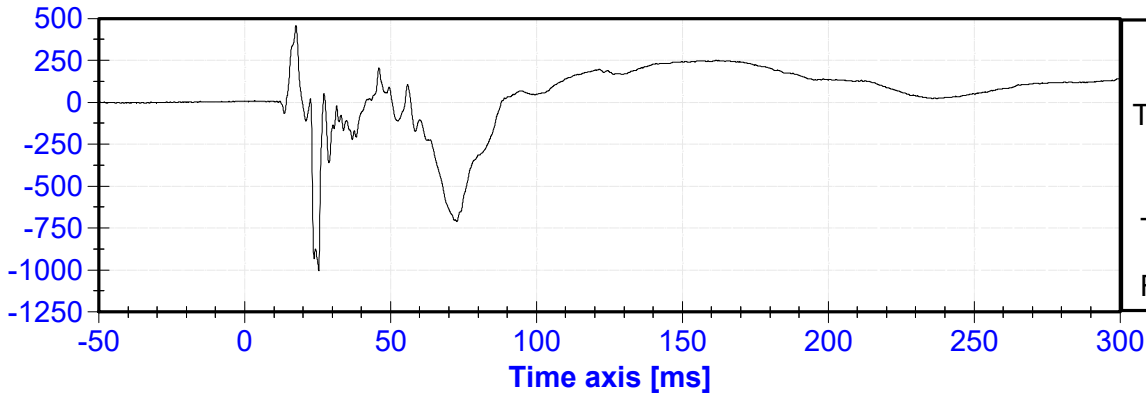
NECK INJURY CRITERIA

Driver Nij vs. Time Primary



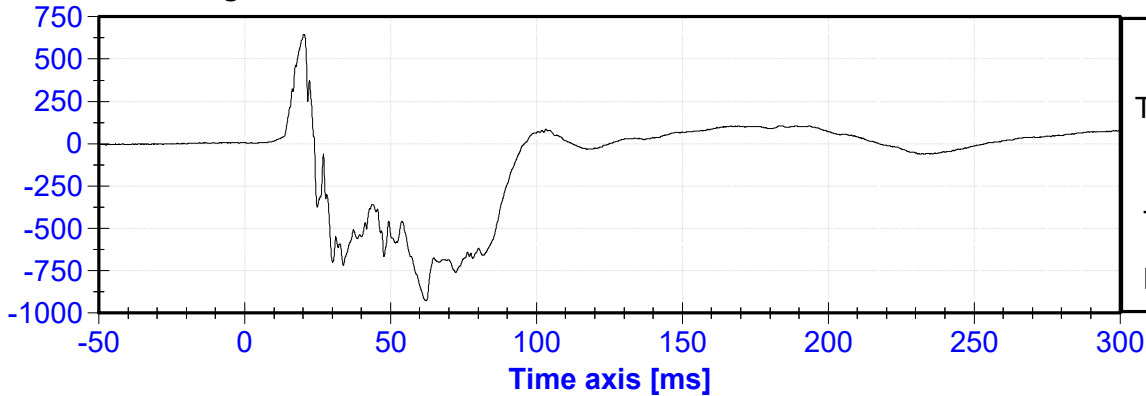
FORCE [N]

Driver Left Femur Force vs. Time



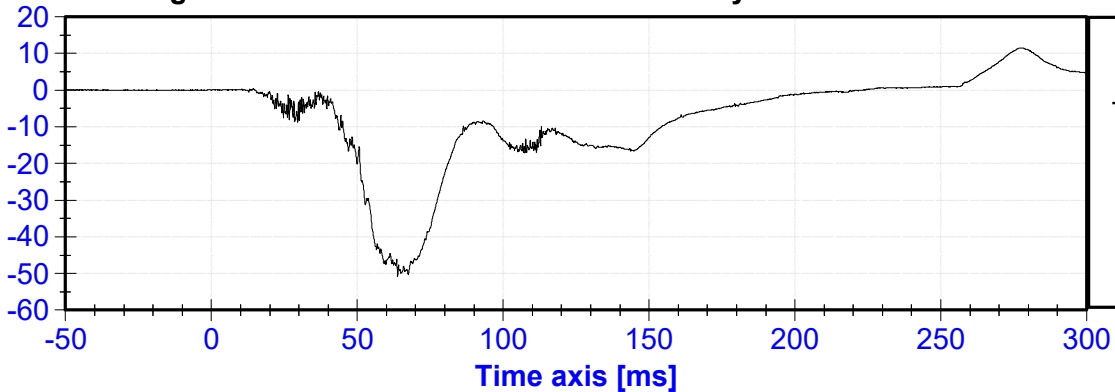
FORCE [N]

Driver Right Femur Force vs. Time



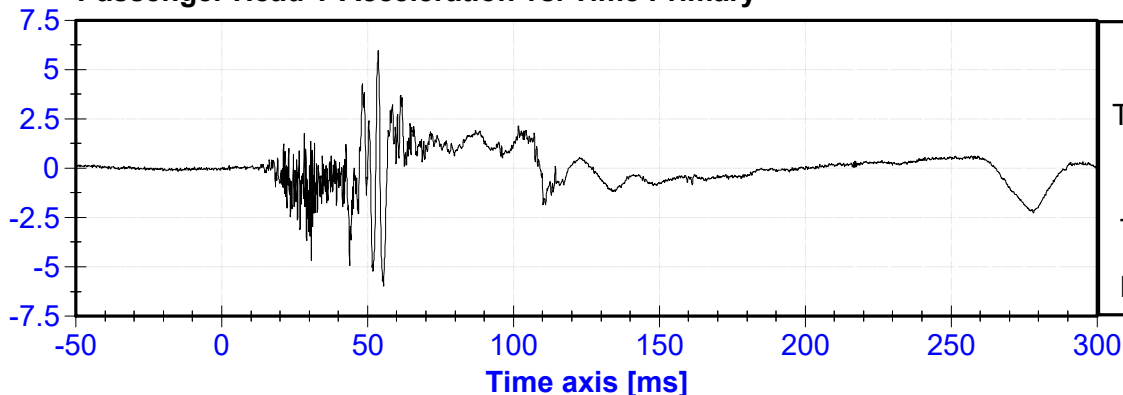
ACCELERATION [g's]

Passenger Head X Acceleration vs. Time Primary



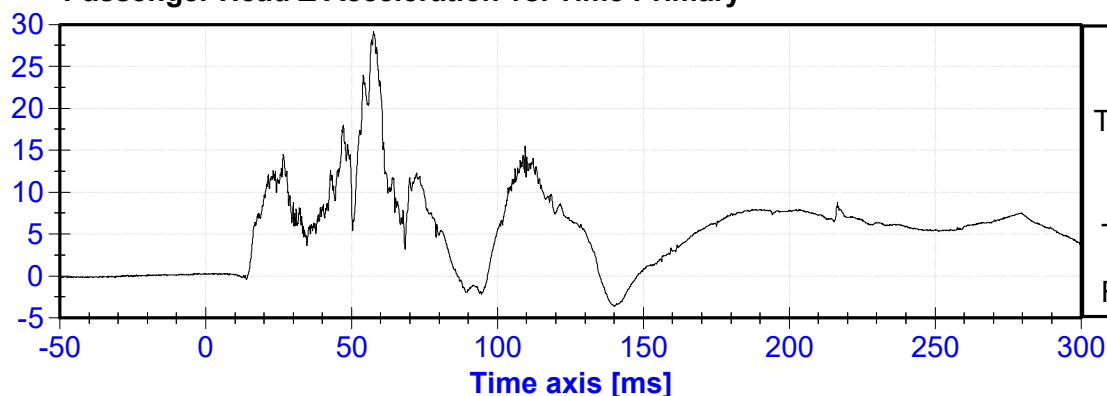
ACCELERATION [g's]

Passenger Head Y Acceleration vs. Time Primary



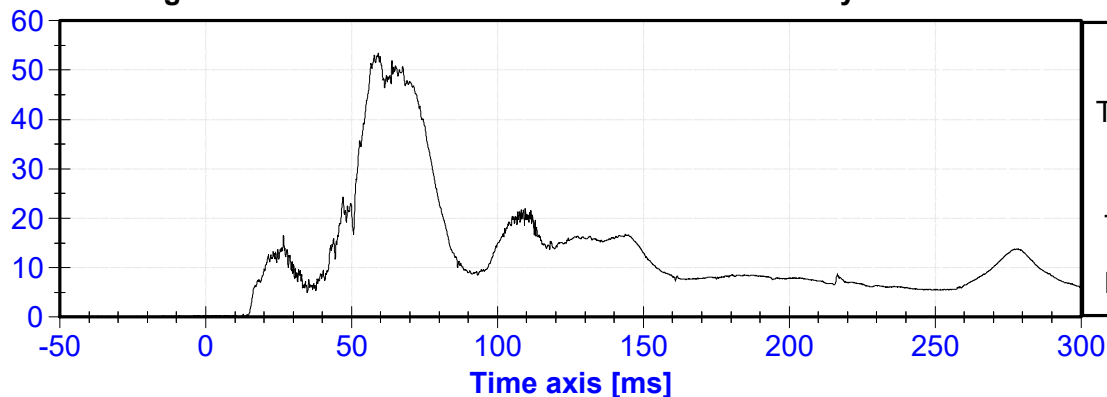
ACCELERATION [g's]

Passenger Head Z Acceleration vs. Time Primary



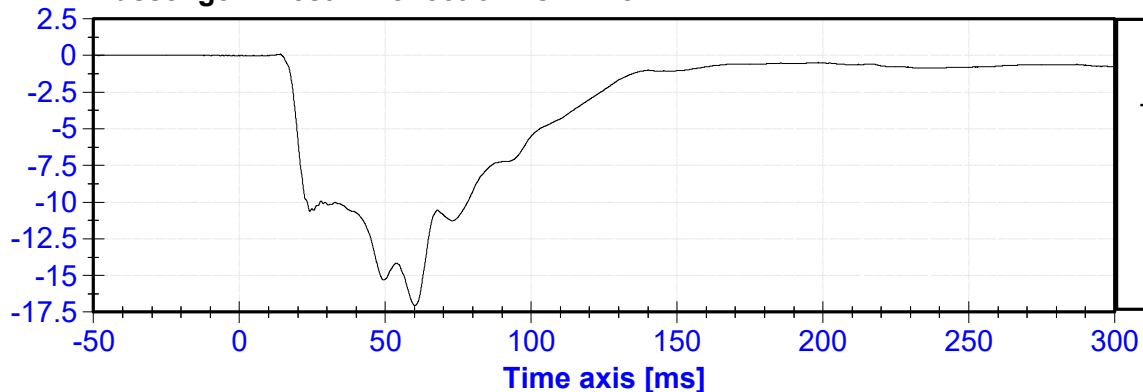
ACCELERATION [g's]

Passenger Head Resultant Acceleration vs. Time Primary



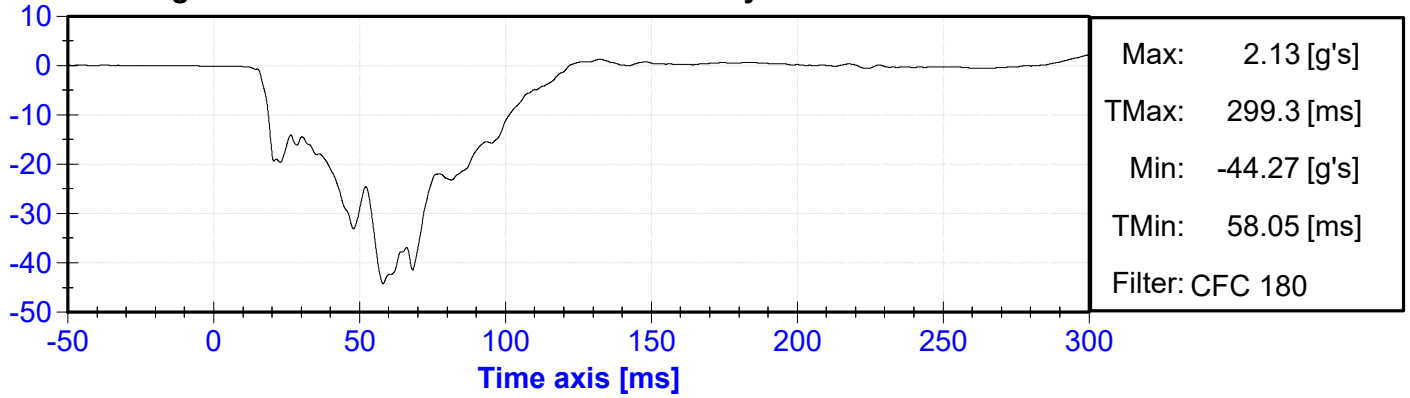
DISPLACEMENT [mm]

Passenger Chest X Deflection vs. Time



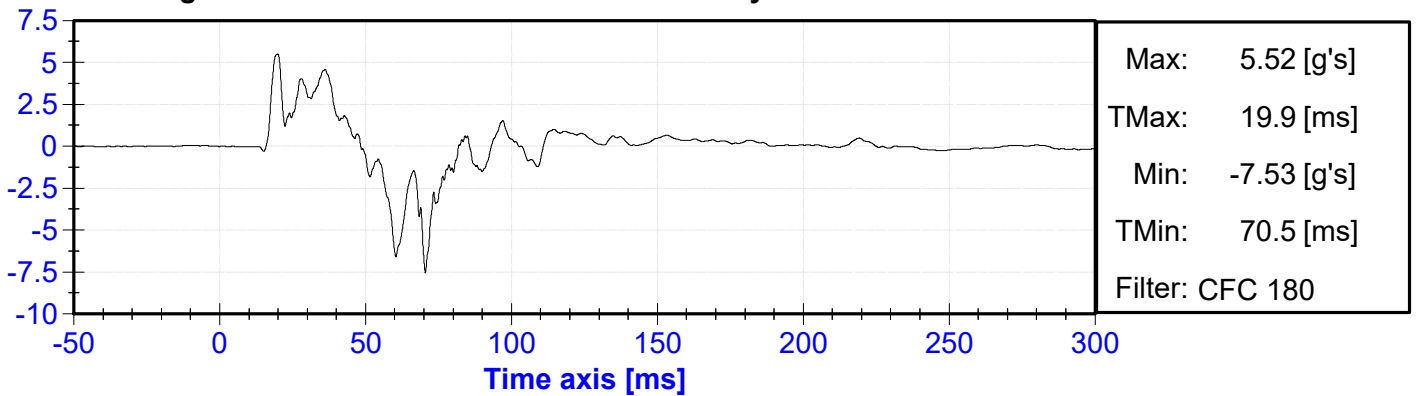
ACCELERATION [g's]

Passenger Chest X Acceleration vs. Time Primary



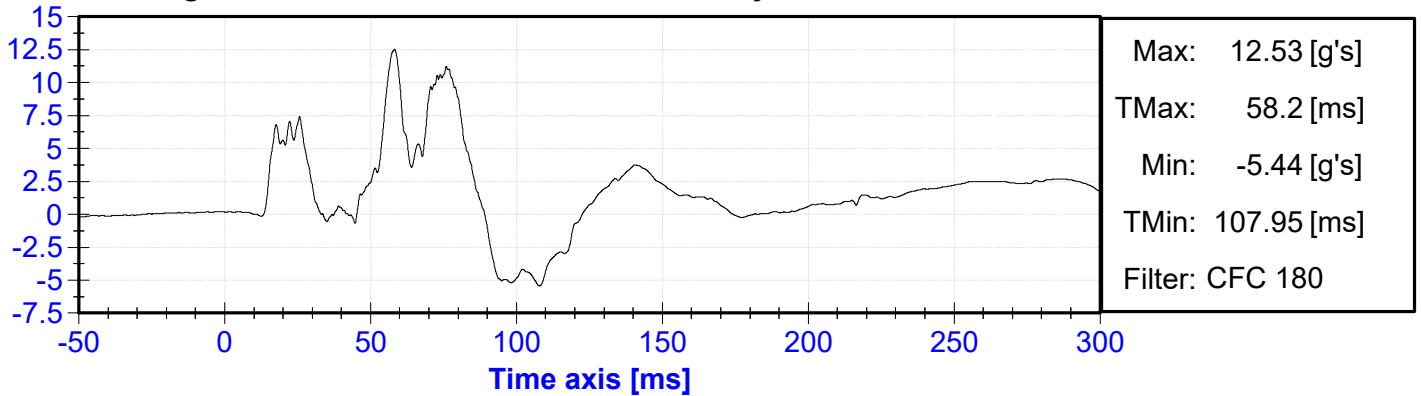
ACCELERATION [g's]

Passenger Chest Y Acceleration vs. Time Primary



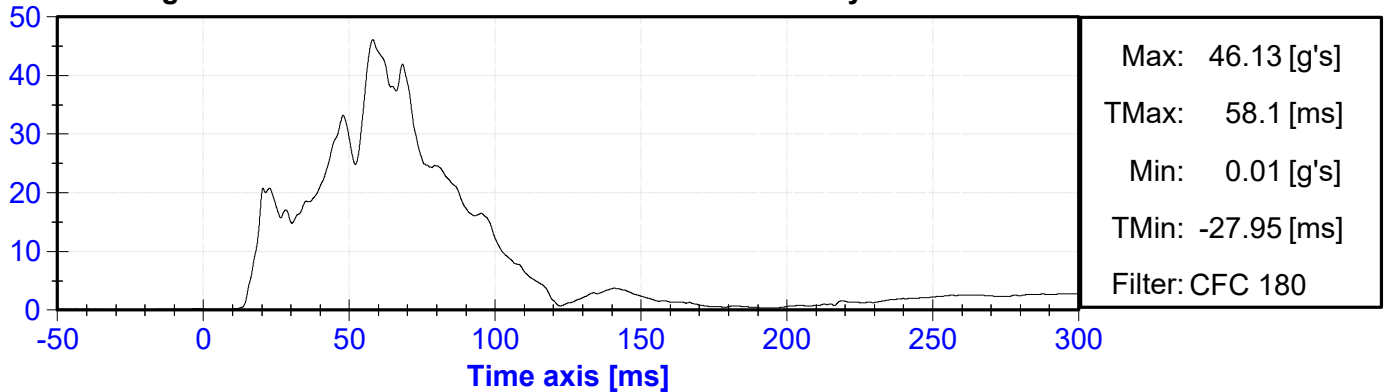
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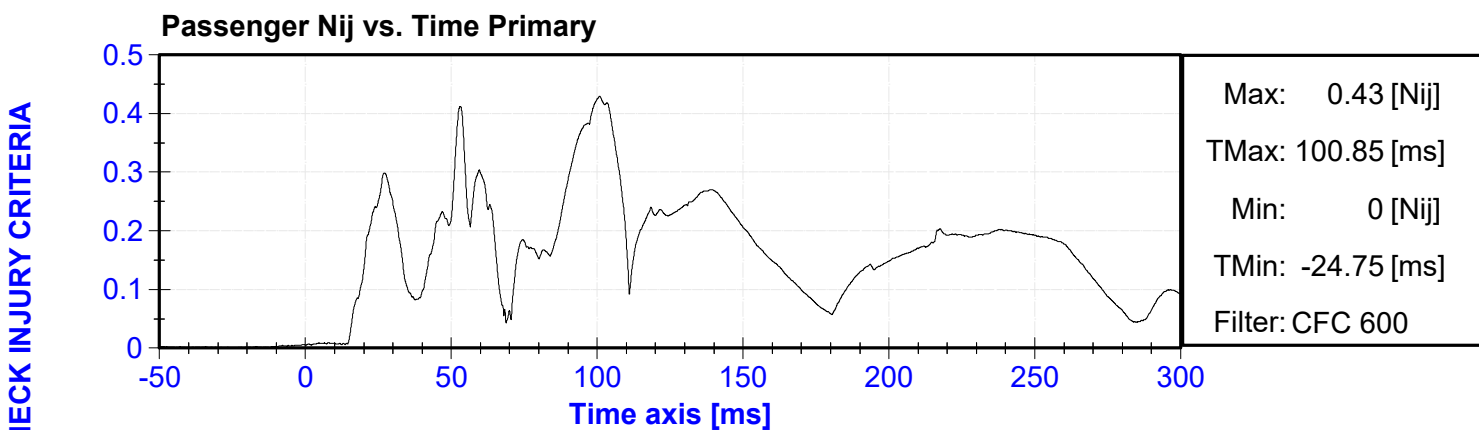
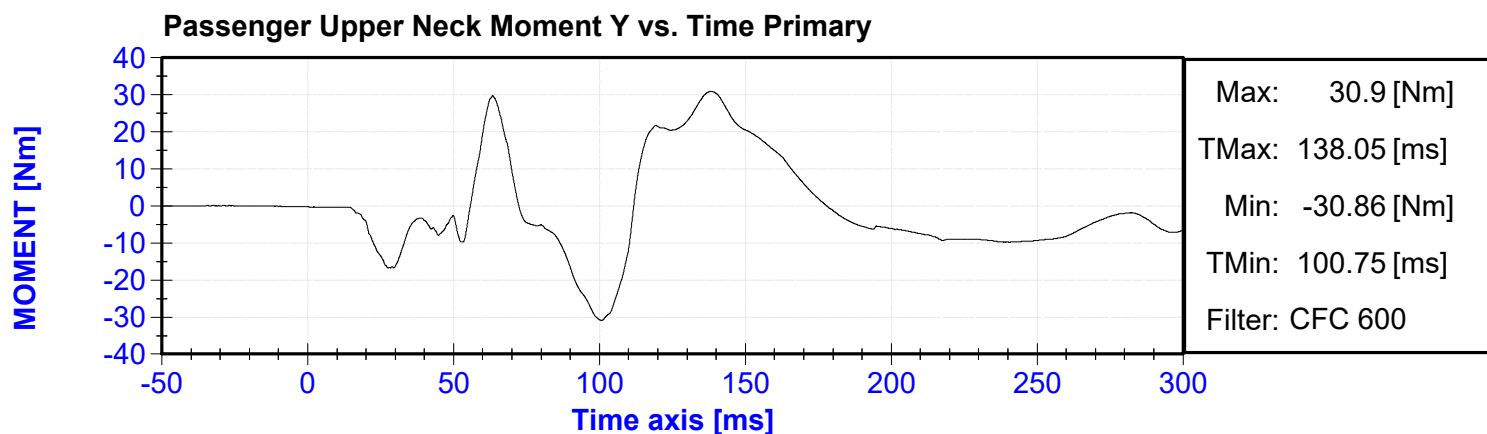
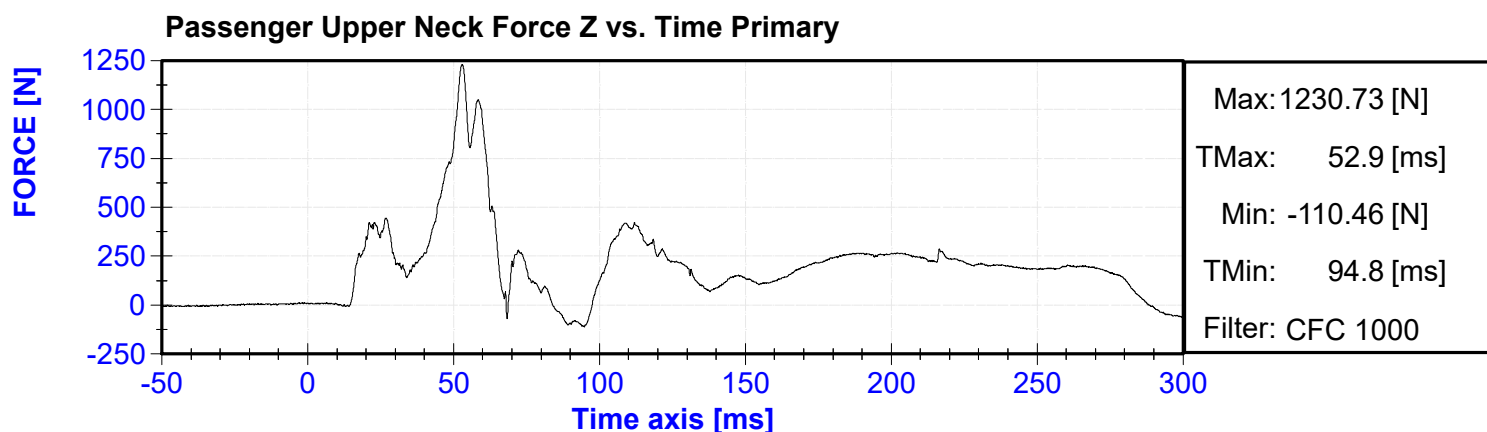
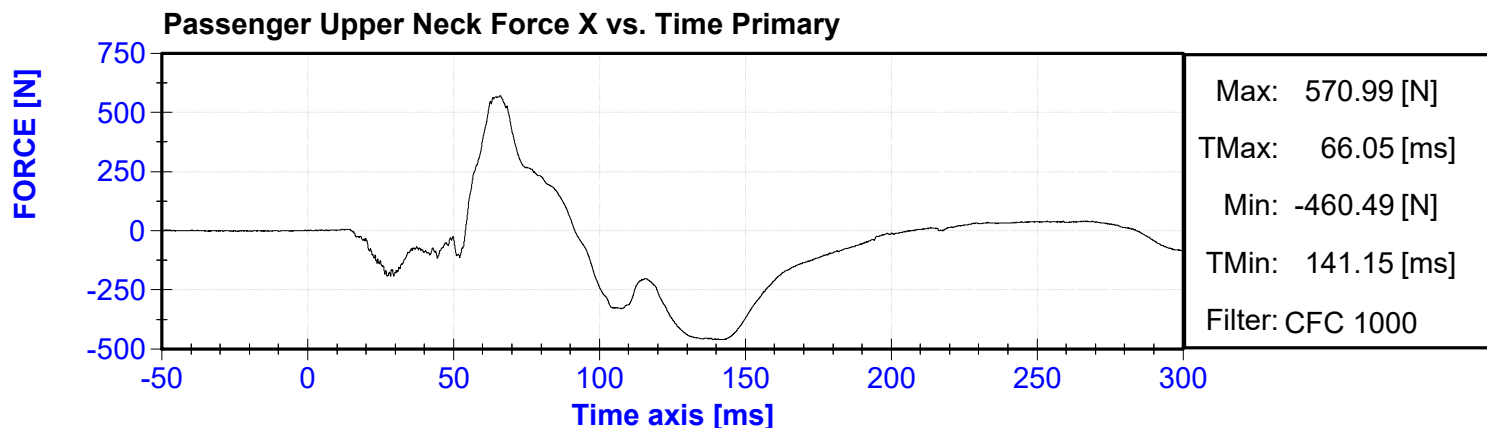
Passenger Chest Z Acceleration vs. Time Primary

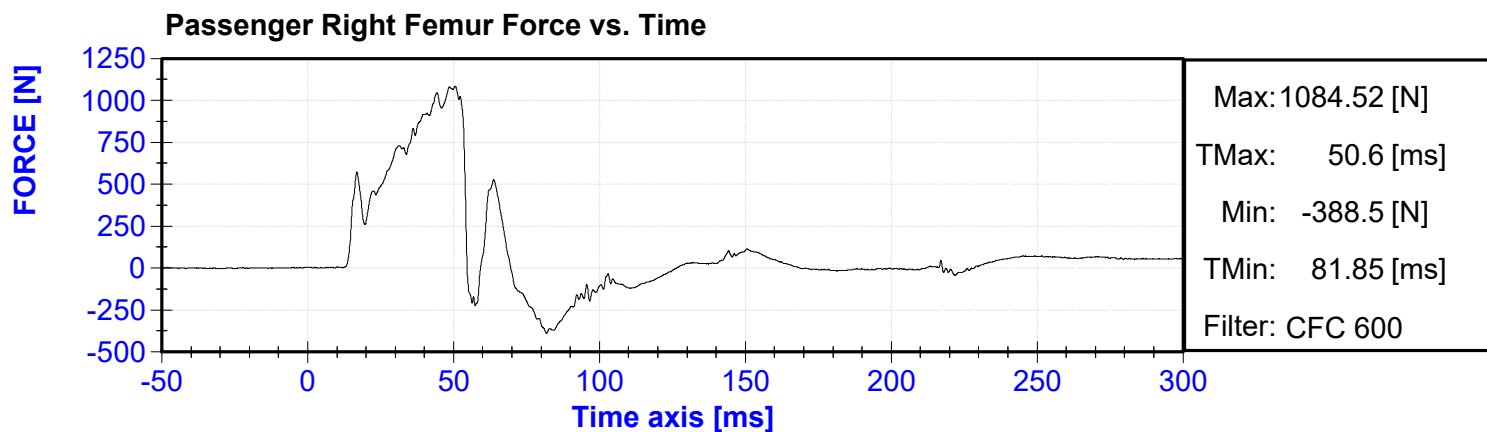
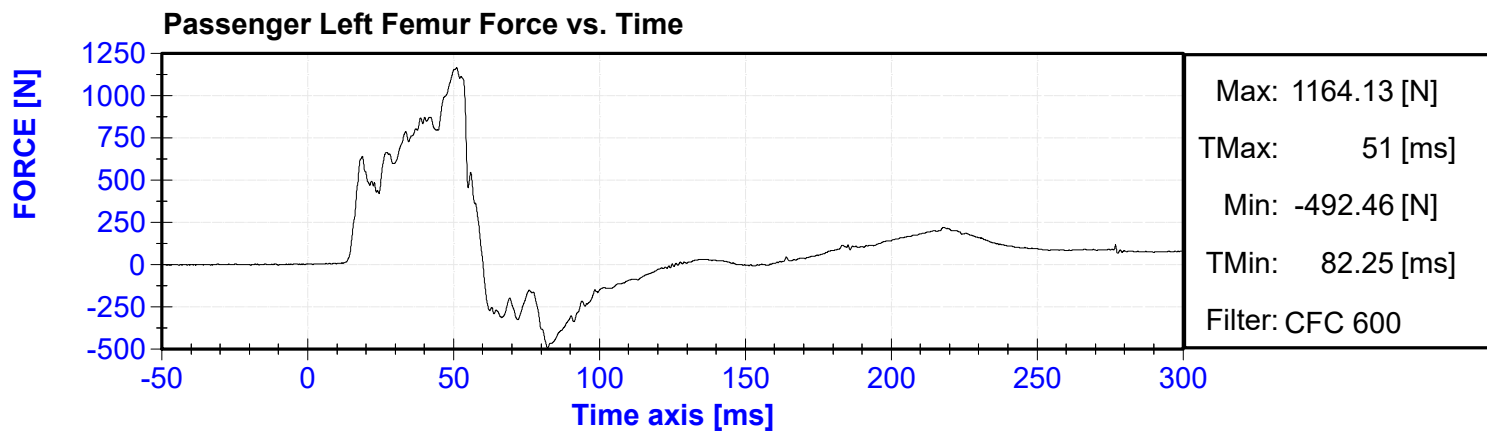


ACCELERATION [g's]

Passenger Chest Resultant Acceleration vs. Time Primary







APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 065

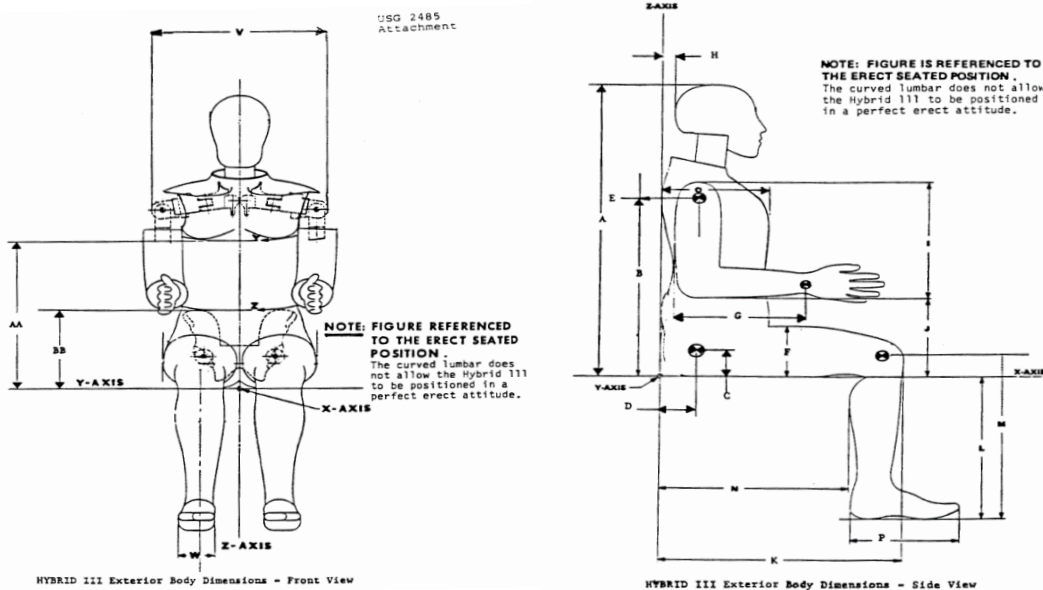


External Measurements - Hybrid 3 - 50th Male

Technician: J. Rios

Date: 07/19/2025

Dummy Serial Number: 065



Symbol	Description	Specification (in)		Result (in)	Pass/Fail
A	Sitting Height	34.6	35.0	34.8	Pass
B	Shoulder Pivot Height	19.9	20.5	20.2	Pass
C	H-Point Height	3.3	3.5	3.5	Pass
D	H-Point from Backline	5.3	5.5	5.3	Pass
E	Shoulder Pivot from Backline	3.3	3.7	3.5	Pass
F	Thigh Clearance	5.5	6.1	5.8	Pass
G	Back of Elbow to Wrist Pivot	11.4	12.0	11.6	Pass
H	Head Back to Backline	1.6	1.8	1.7	Pass
I	Shoulder to Elbow Length	13.0	13.6	13.2	Pass
J	Elbow Rest Height	7.5	8.3	8.1	Pass
K	Buttock to Knee Length	22.8	23.8	23.1	Pass
L	Popliteal Height	16.9	17.9	17.3	Pass
M	Knee Pivot Height	19.1	19.7	19.4	Pass
N	Buttock Popliteal Length	17.8	18.8	18.3	Pass
O	Chest Depth without Jacket	8.4	9.0	8.8	Pass
P	Foot Length (right)	9.9	10.5	10.3	Pass
V	Shoulder Breadth	16.3	17.2	16.7	Pass
W	Foot Breadth	3.6	4.2	4.0	Pass
Y	Chest Circumference with Jacket	38.2	39.4	38.8	Pass
Z	Waist Circumference	32.9	34.1	33.8	Pass
AA	Reference Location (Chest Circumference)	16.9	17.1	17.0	Pass
BB	Reference Location (Waist Circumference)	8.9	9.1	9.0	Pass

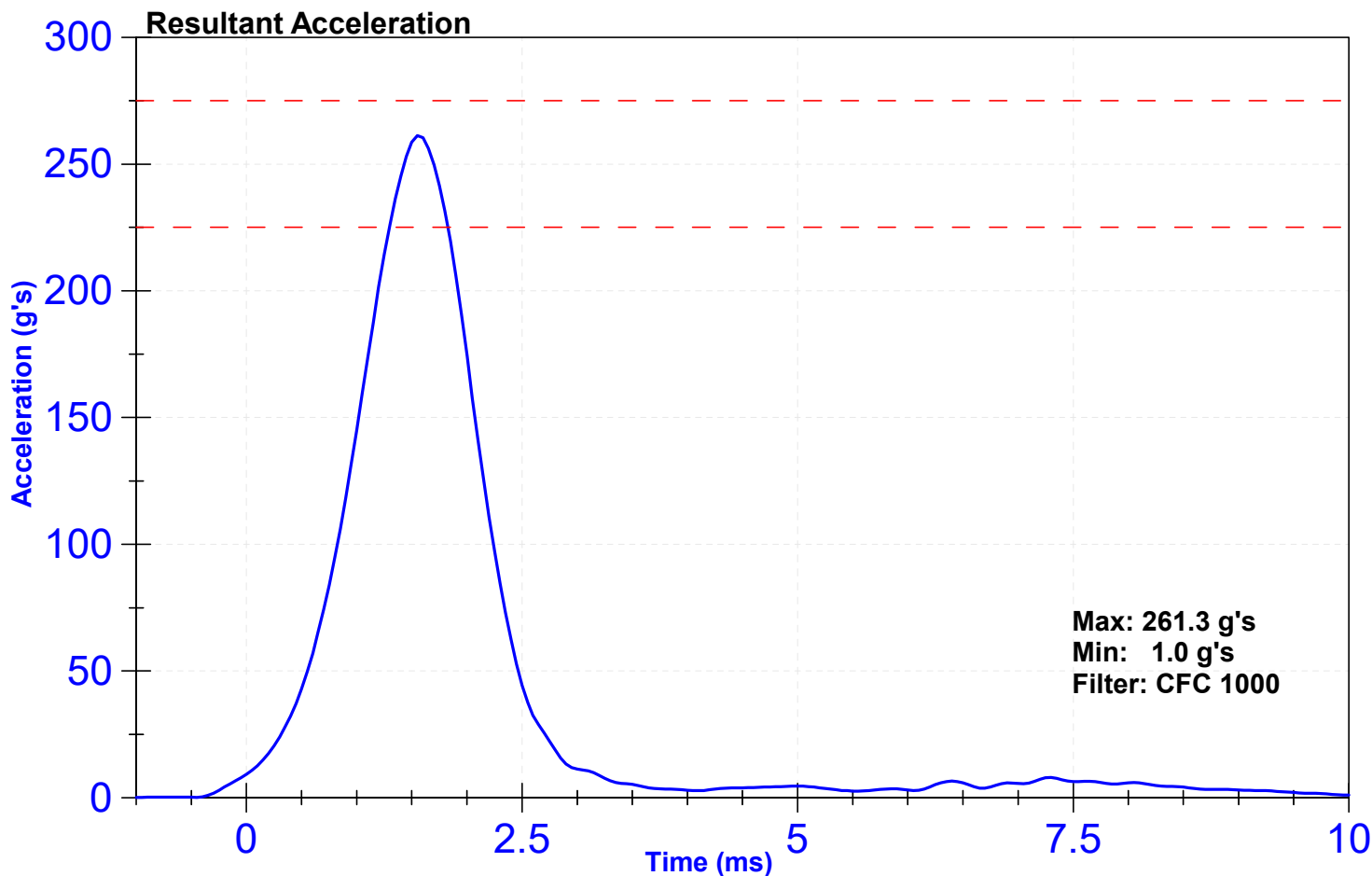
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

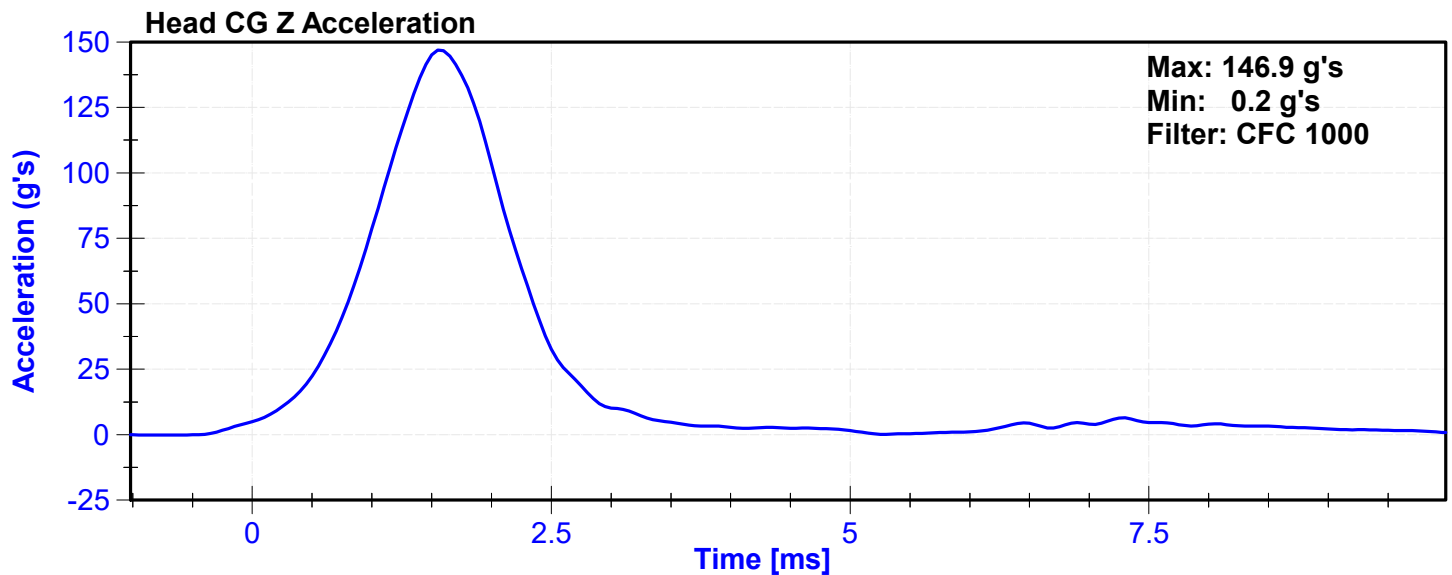
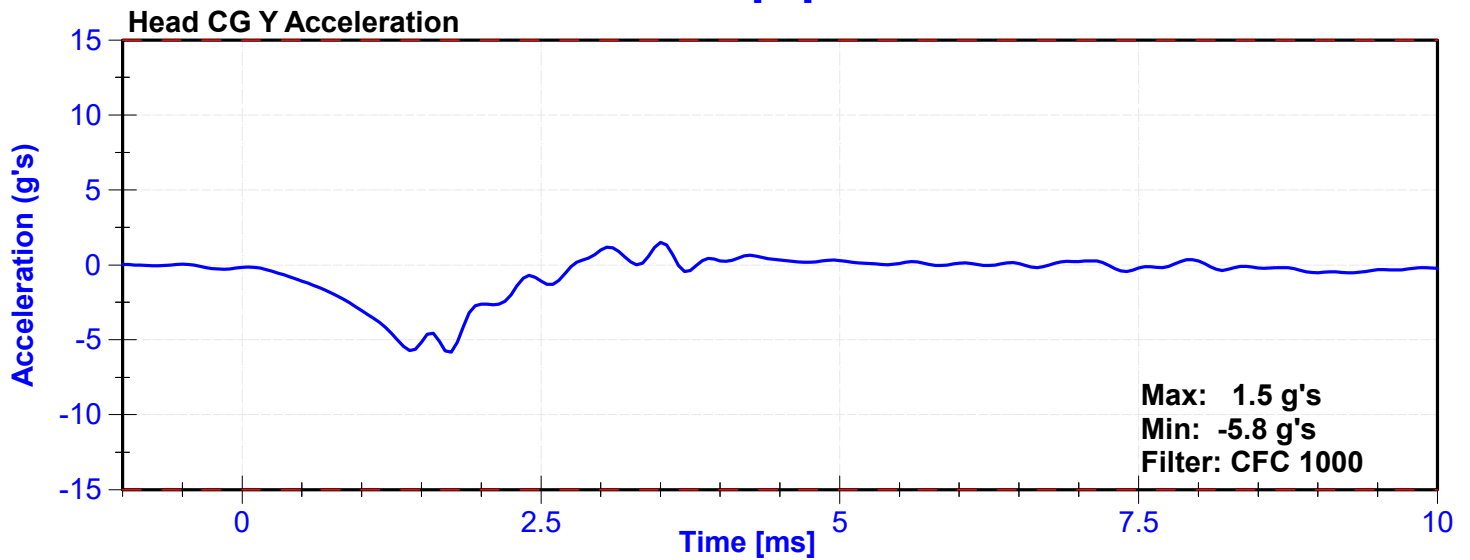
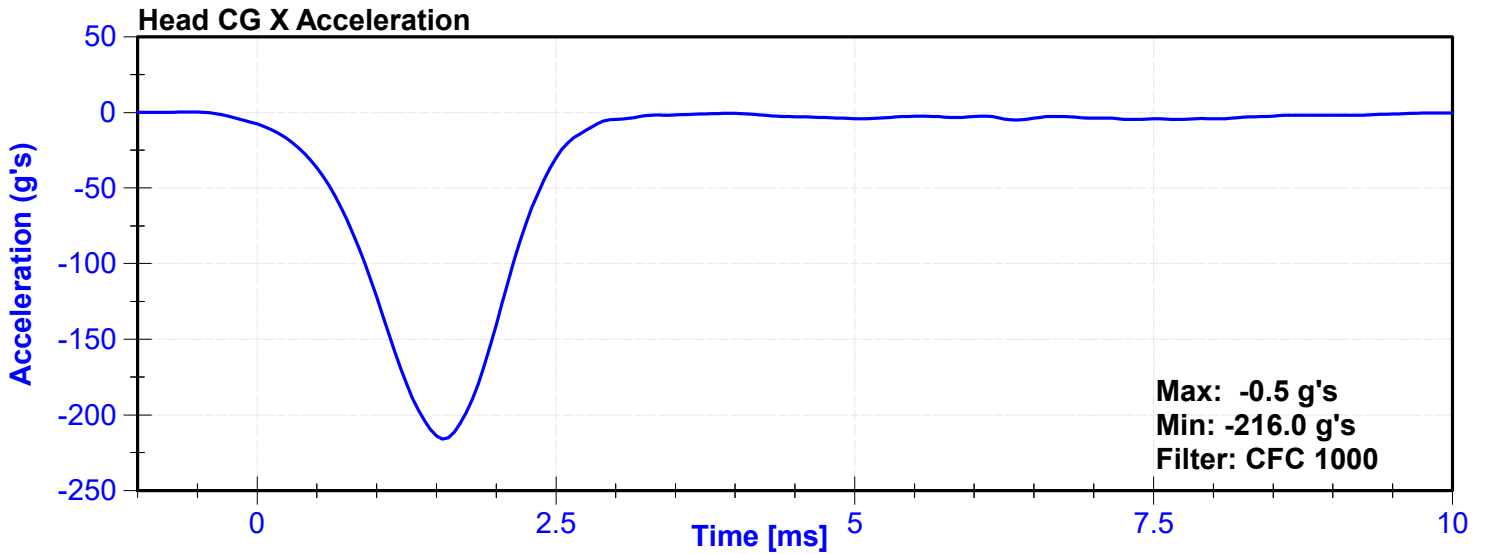
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.8	Pass
Humidity	10	70	%	44	Pass
Resultant Acceleration	225	275	g's	261.3	Pass
Oscillation	0	10	%	3.0	Pass
Lateral Acceleration	-15	15	g's	-5.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P52152	6/10/2025	12/7/2025
Y Accelerometer	Endevco	P58888	6/10/2025	12/7/2025
Z Accelerometer	Endevco	P58911	6/10/2025	12/7/2025





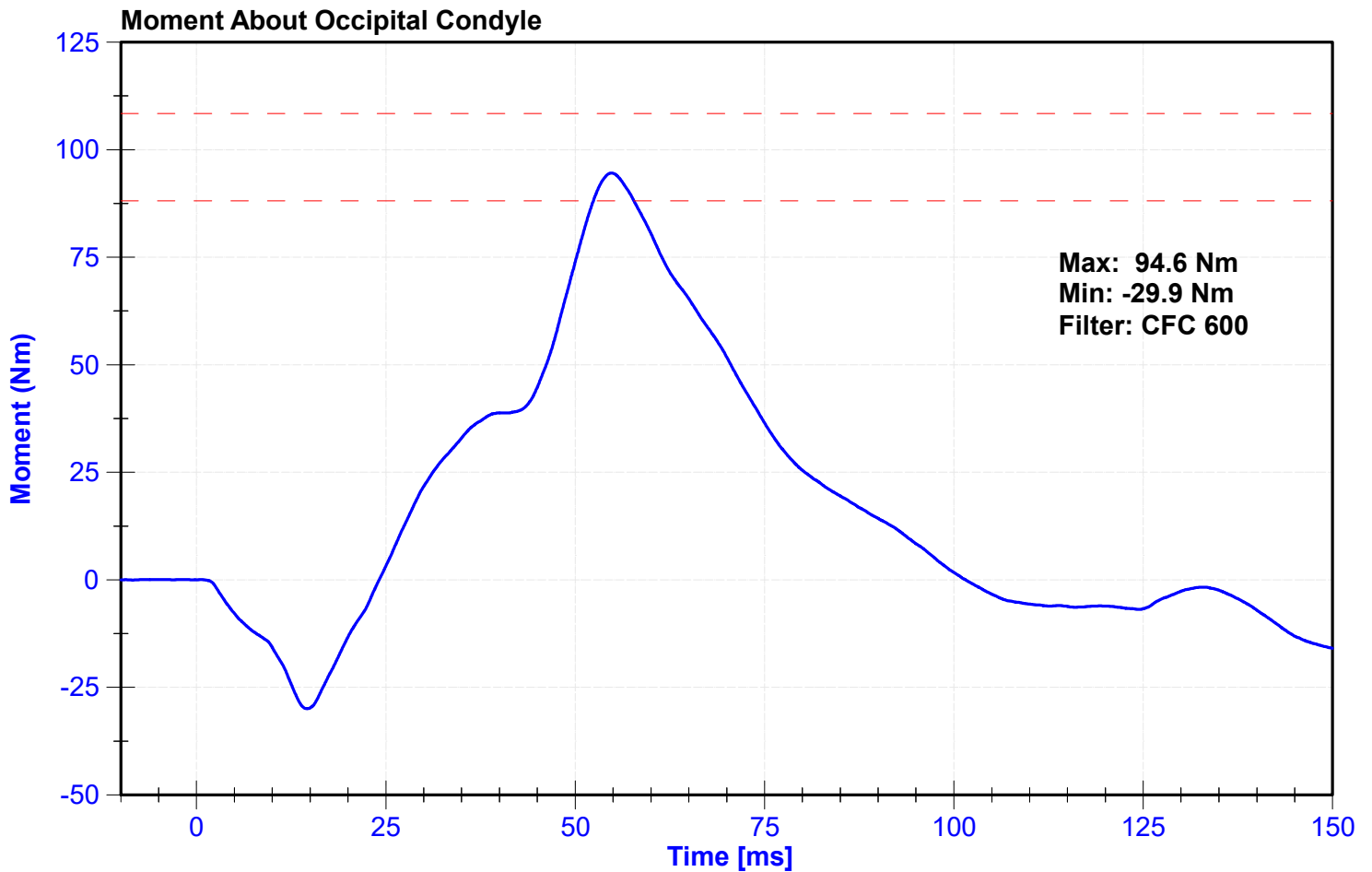
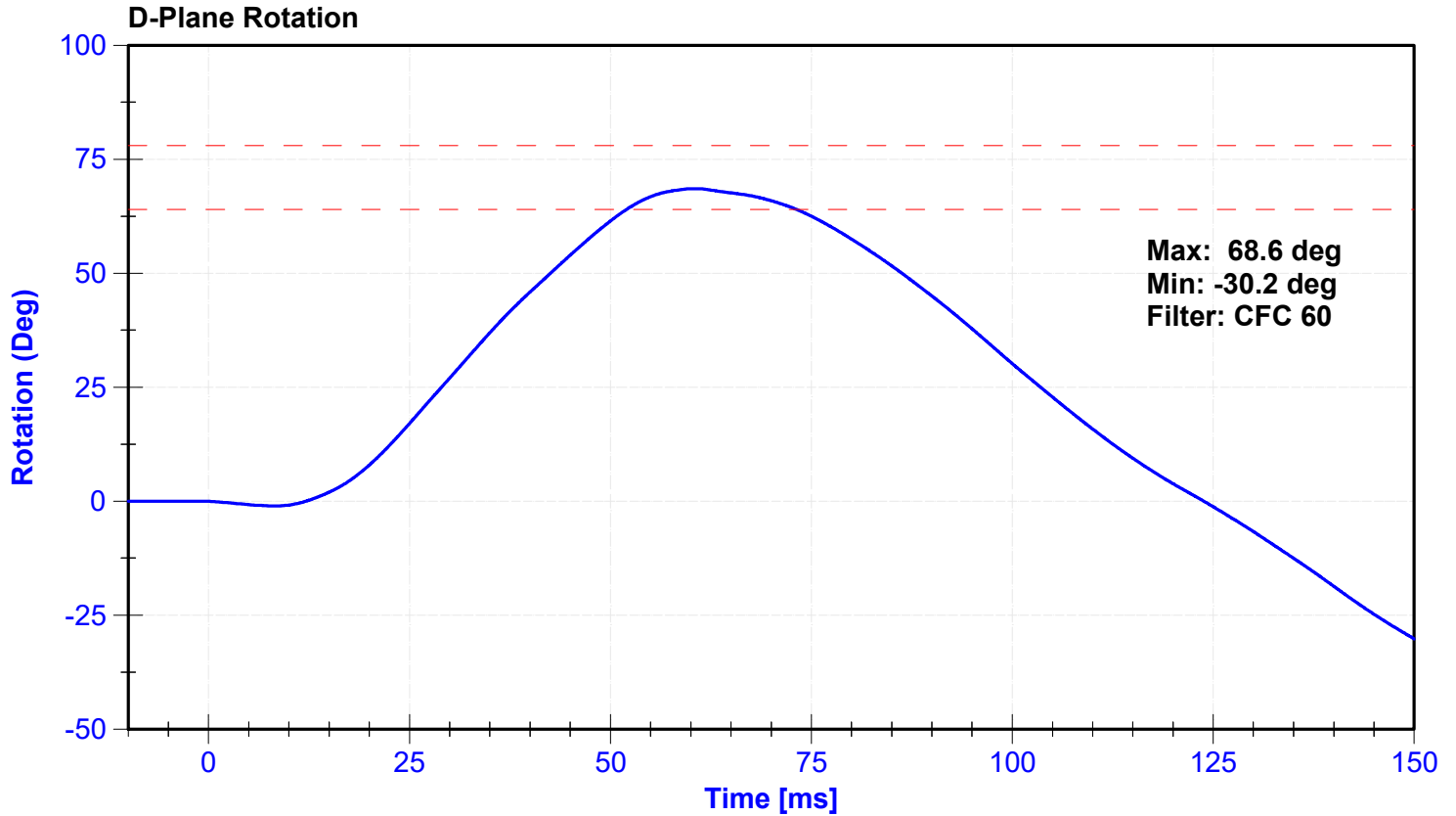
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

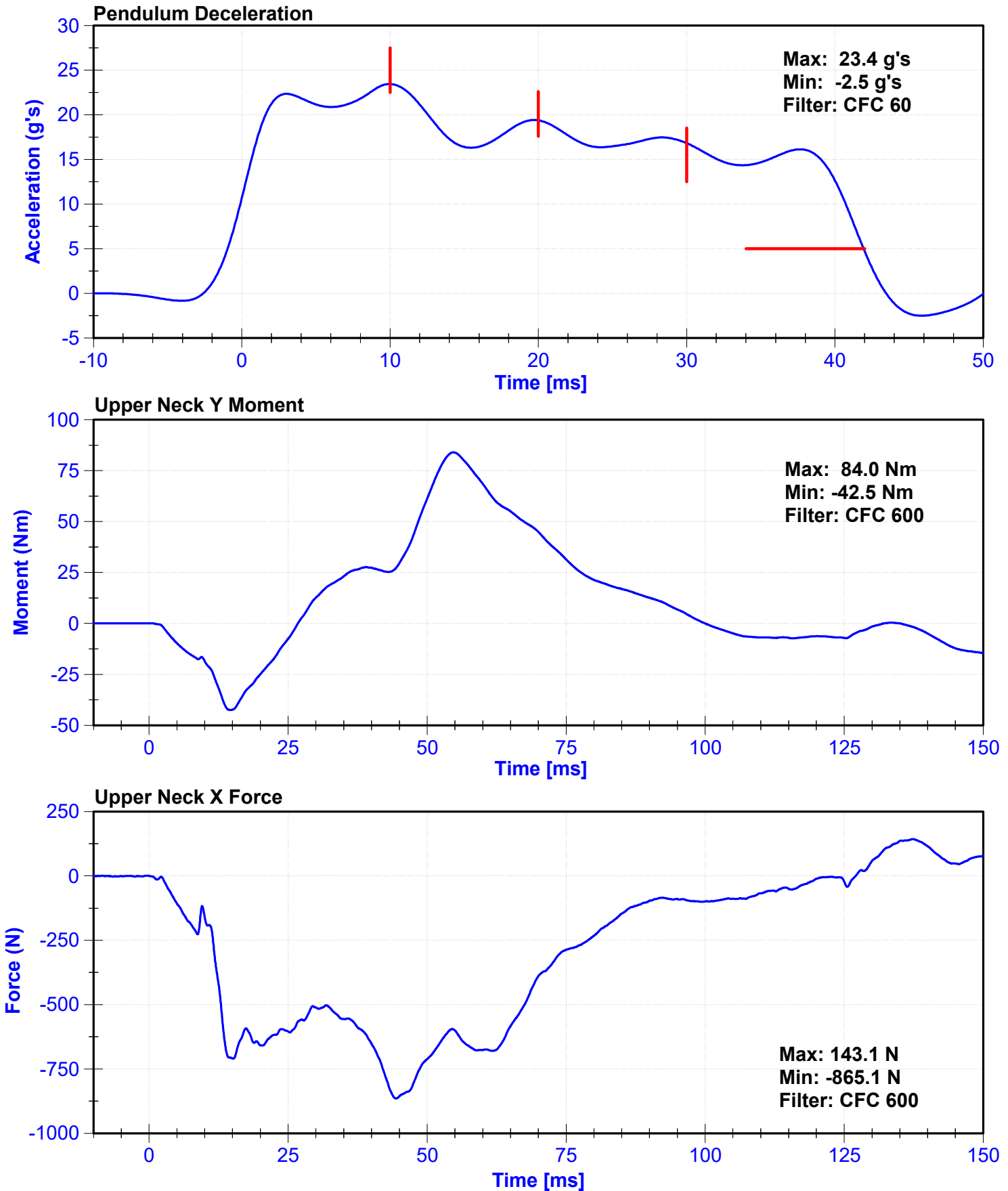
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	47	Pass
Velocity	6.89	7.13	m/s	6.984	Pass
Pendulum Deceleration at 10ms	22.5	27.5	g's	23.44	Pass
Pendulum Deceleration at 20ms	17.6	22.6	g's	19.38	Pass
Pendulum Deceleration at 30ms	12.5	18.5	g's	16.82	Pass
Max. Pendulum Deceleration After 30ms	0	29	g's	23.4	Pass
Pendulum Deceleration Time to 5 g's	34	42	ms	42.0	Pass
Maximum D Plane Rotation	64	78	deg	68.6	Pass
Time to Maximum Rotation	57	64	ms	60.5	Pass
Rotation Decay to Zero	113	127	ms	123.9	Pass
Moment About Occipital Condyle	88.1	108.4	Nm	94.58	Pass
Time to Maximum Moment	47	58	ms	54.8	Pass
Moment Decay to Zero	97	107	ms	101.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	2019-FX	9/12/2024	9/12/2025





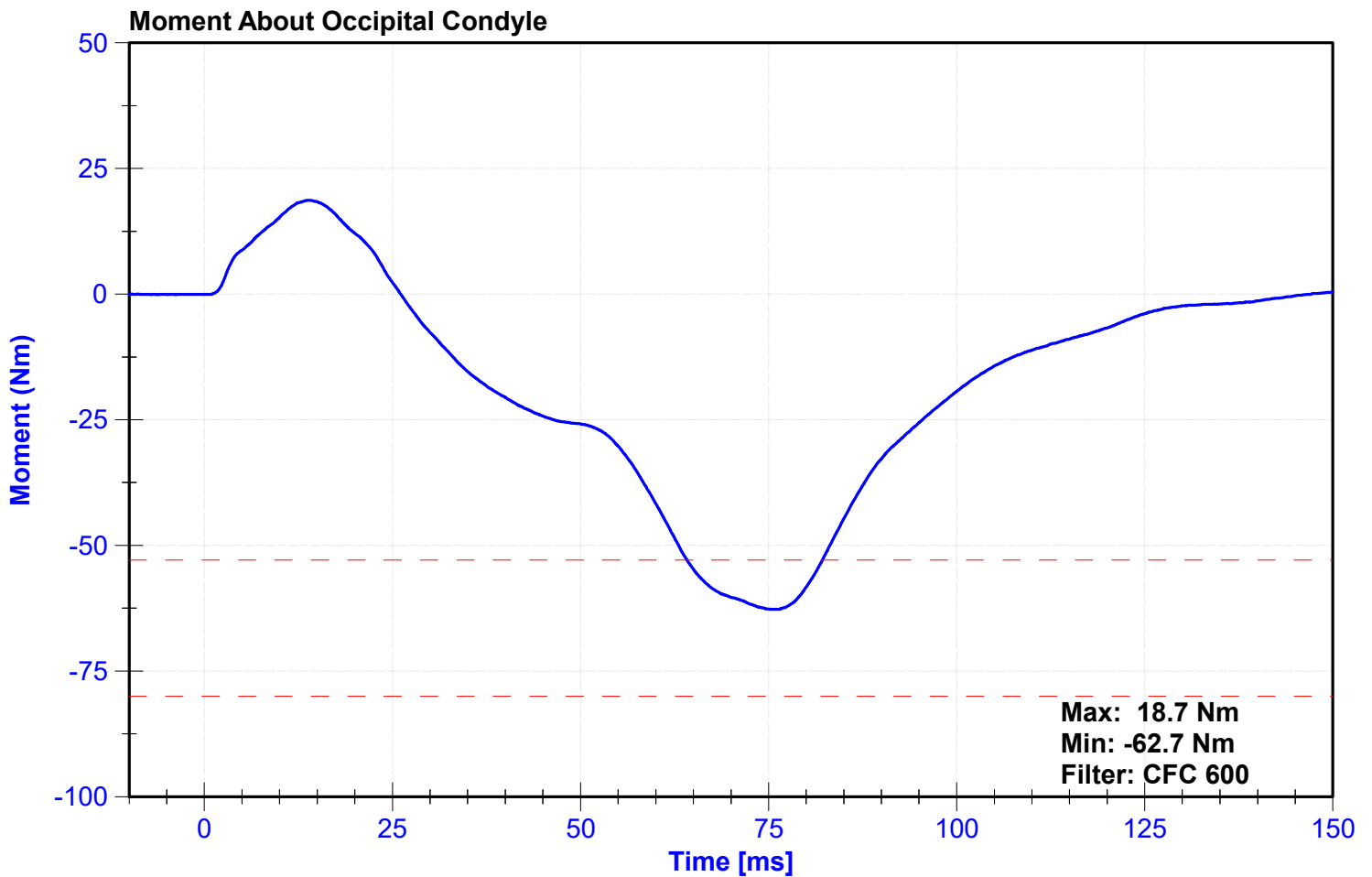
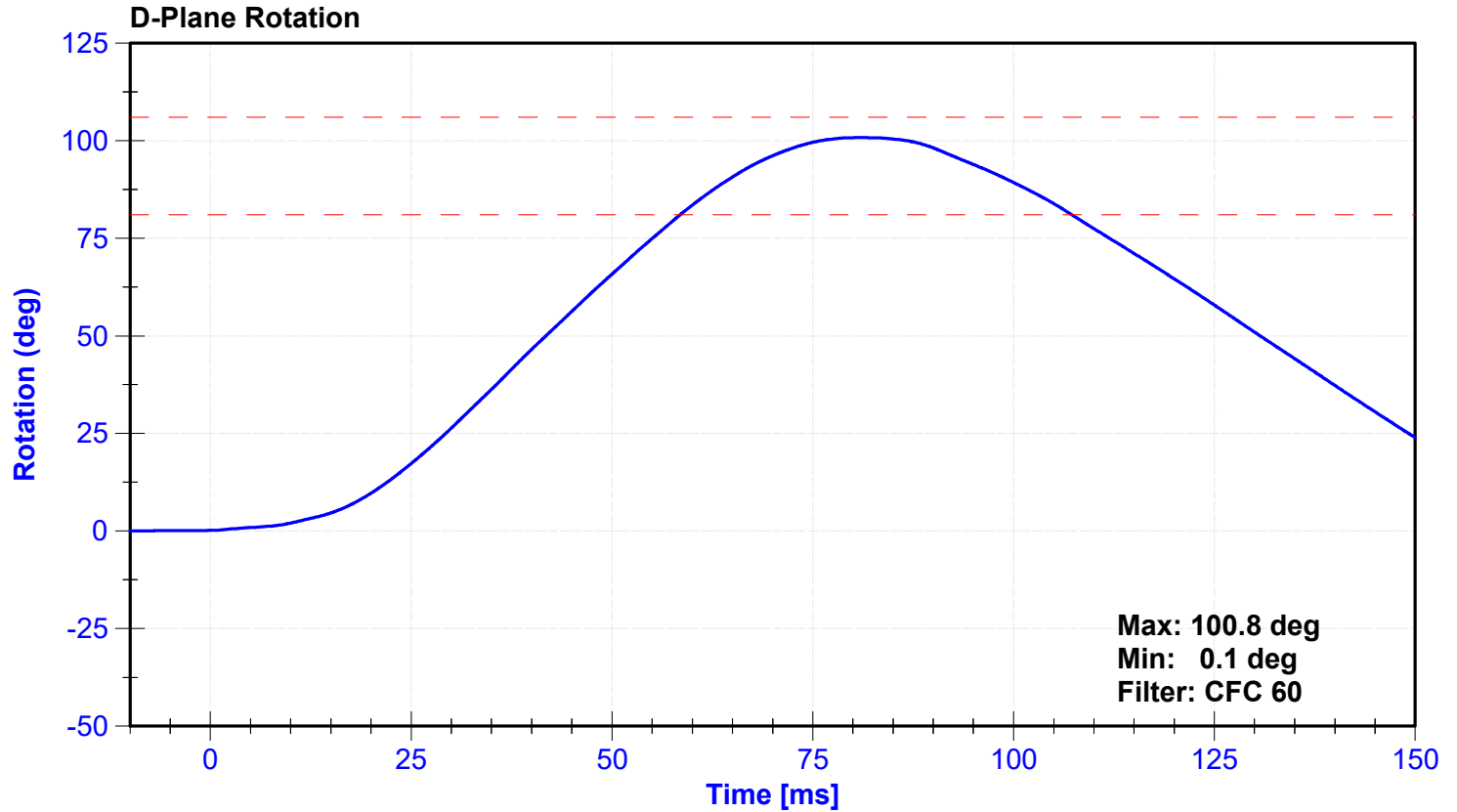
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

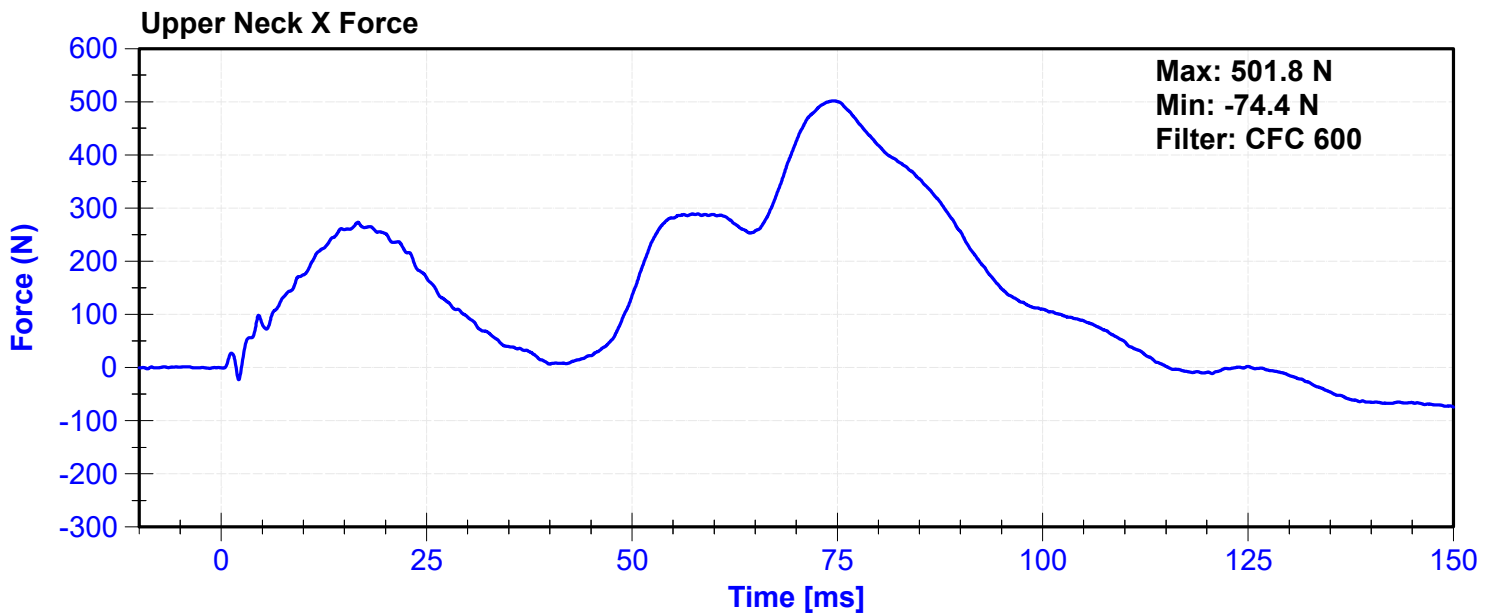
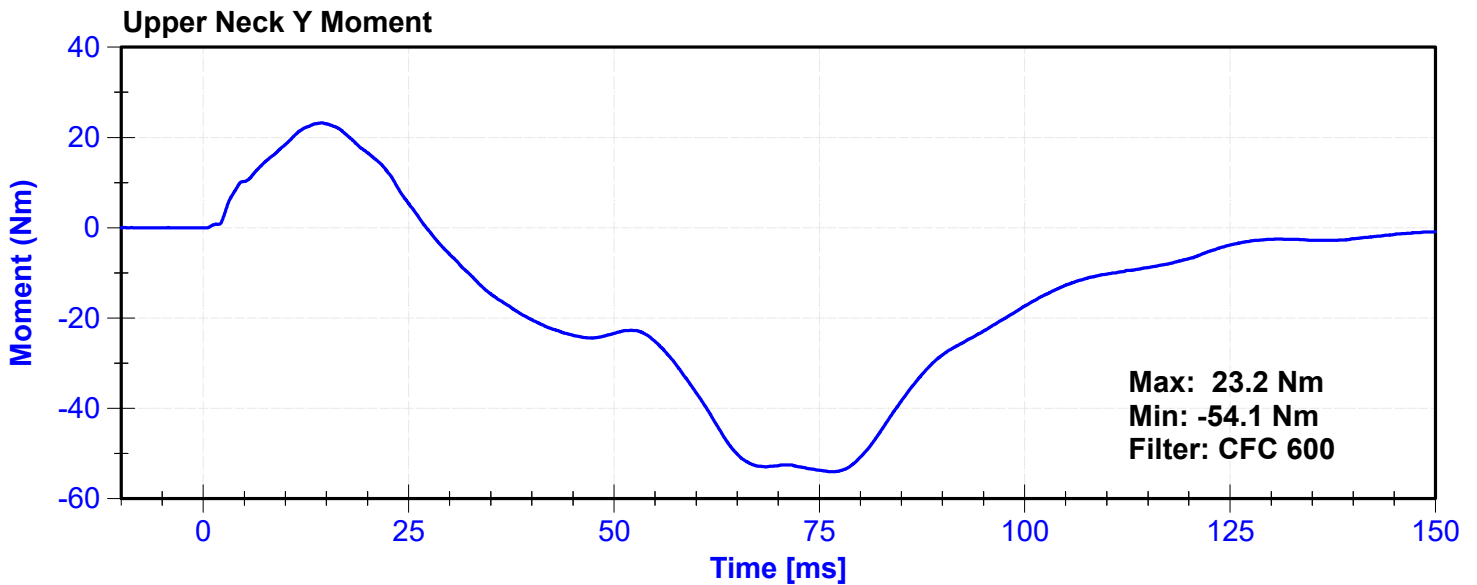
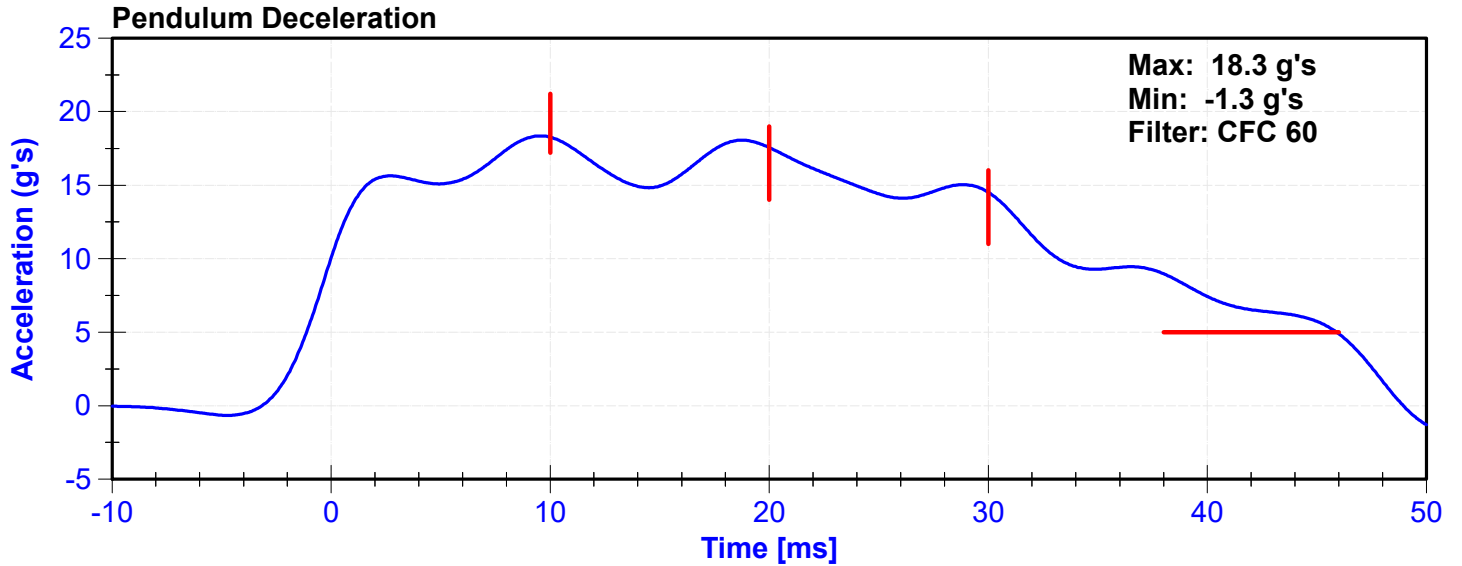
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	47	Pass
Velocity	5.94	6.19	m/s	6.004	Pass
Pendulum Deceleration at 10ms	17.2	21.2	g's	18.26	Pass
Pendulum Deceleration at 20ms	14	19	g's	17.6	Pass
Pendulum Deceleration at 30ms	11	16	g's	14.5	Pass
Max. Pendulum Deceleration After 30ms	0	22	g's	18.3	Pass
Pendulum Deceleration Time to 5 g's	38	46	ms	45.9	Pass
Maximum D Plane Rotation	81	106	deg	100.8	Pass
Time to Maximum Rotation	72	82	ms	80.9	Pass
Rotation Decay to Zero	147	174	ms	168.0	Pass
Minimum Moment About OC	-80	-52.9	Nm	-62.71	Pass
Time to Minimum Moment	65	79	ms	75.5	Pass
Moment Decay to Zero	120	148	ms	147.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	SP22G_LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	SP22G_LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	2019-FX	9/12/2024	9/12/2025





ATD Manufacturer	Humanetics	Test Technician	J.Kinderman
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

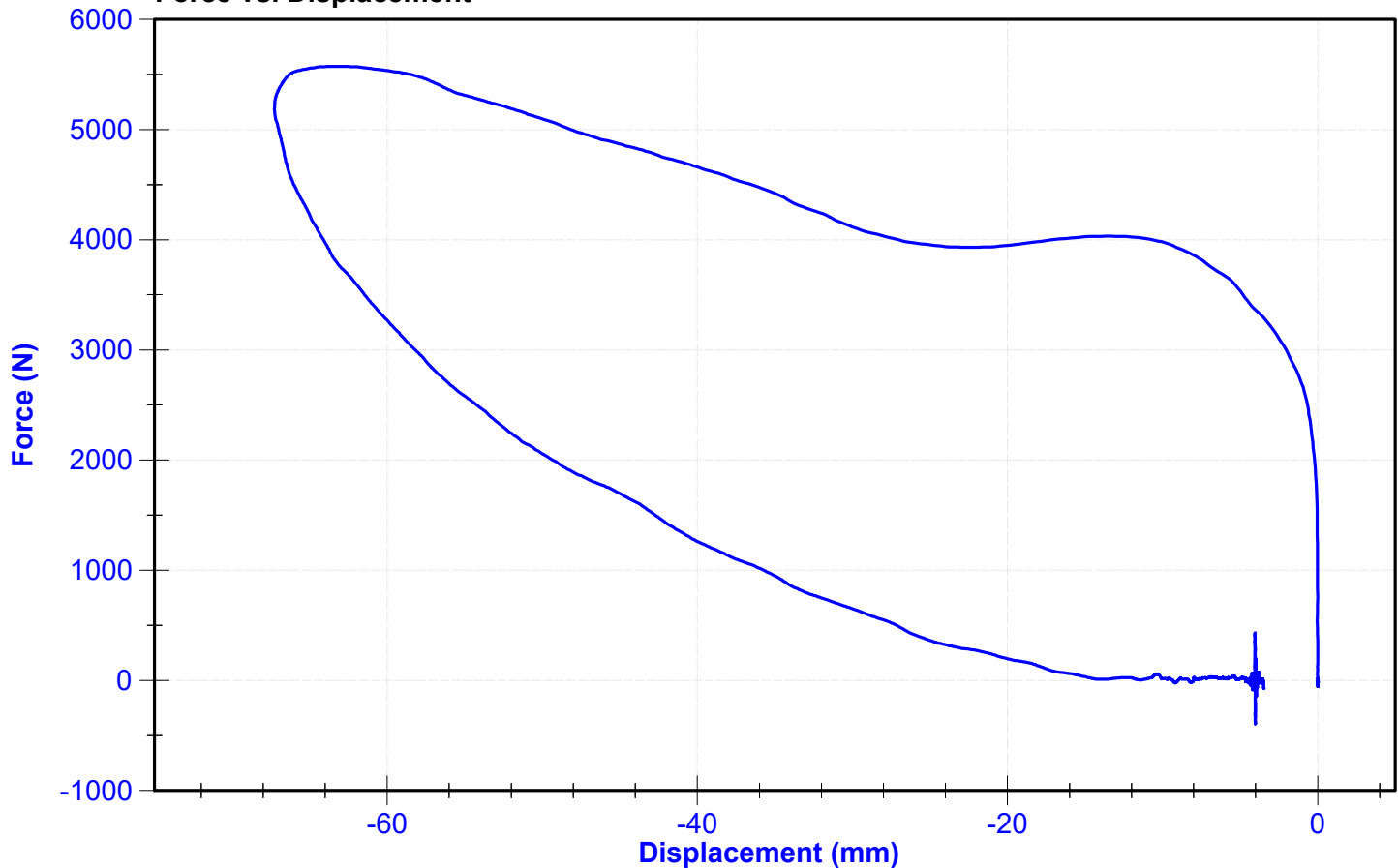
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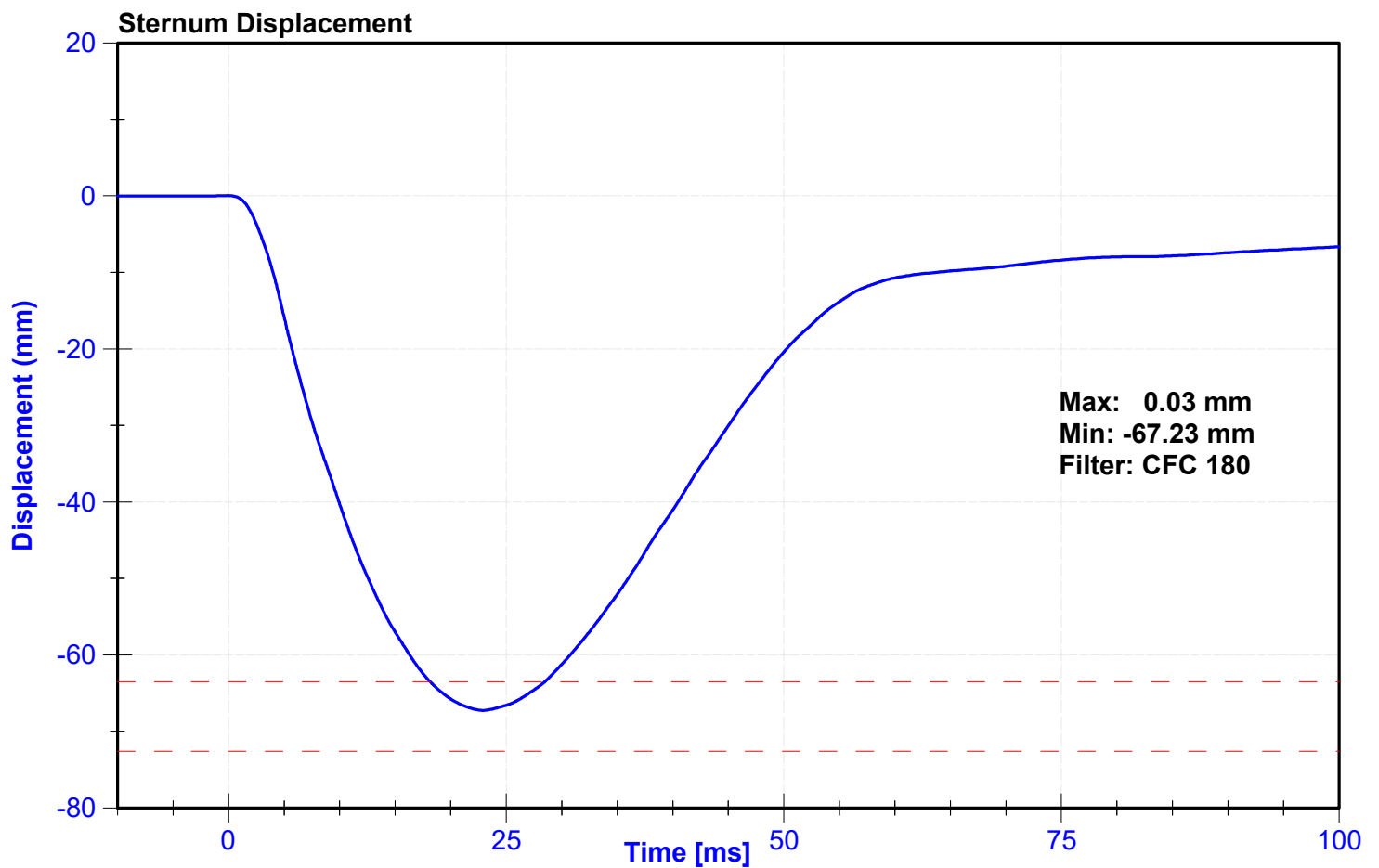
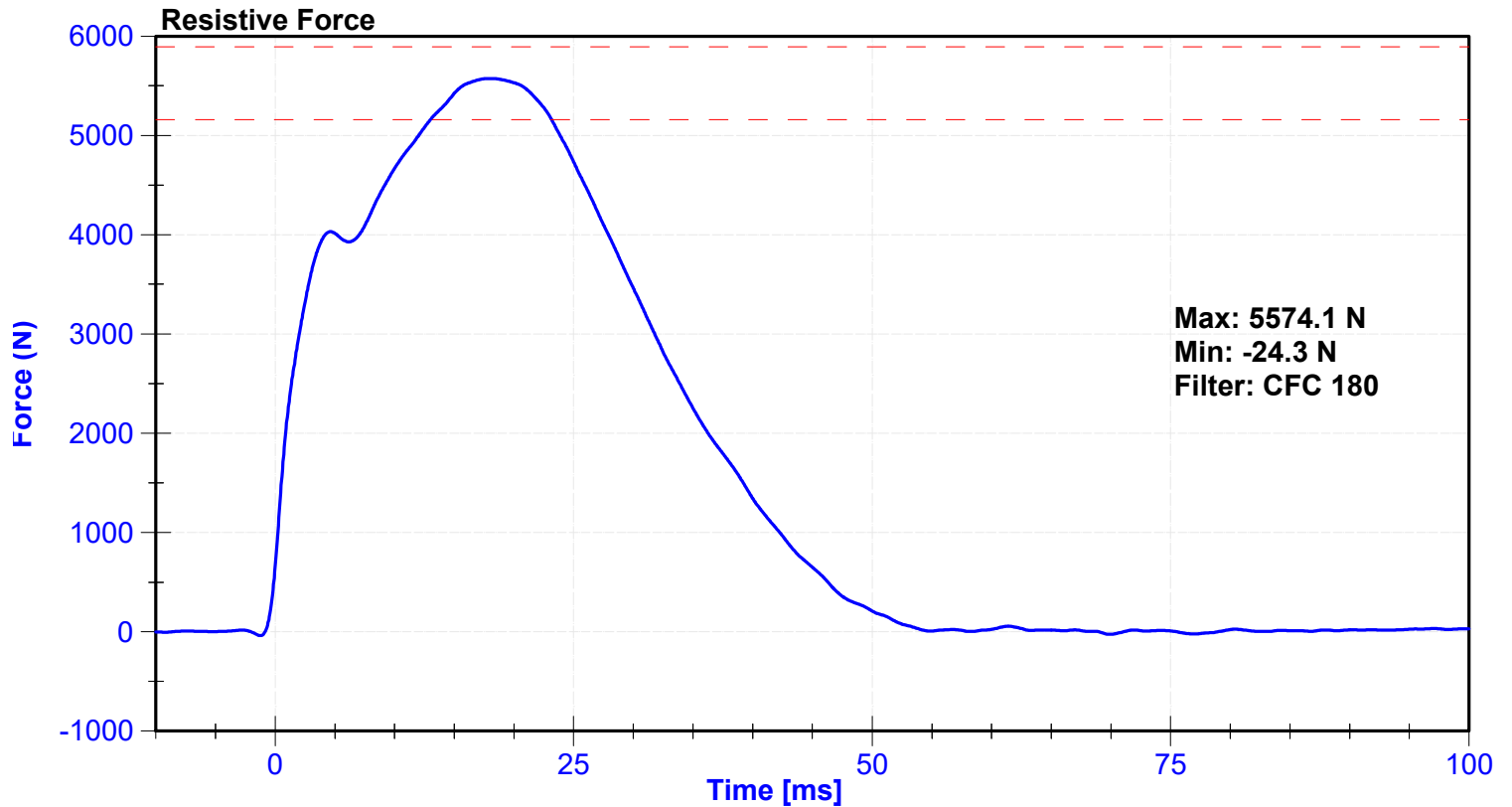
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	52	Pass
Velocity	6.59	6.83	m/s	6.717	Pass
Chest Displacement	-72.6	-63.5	mm	-67.23	Pass
Resistive Force	5160	5894	N	5574.1	Pass
Hysteresis	69	85	%	71.4	Pass

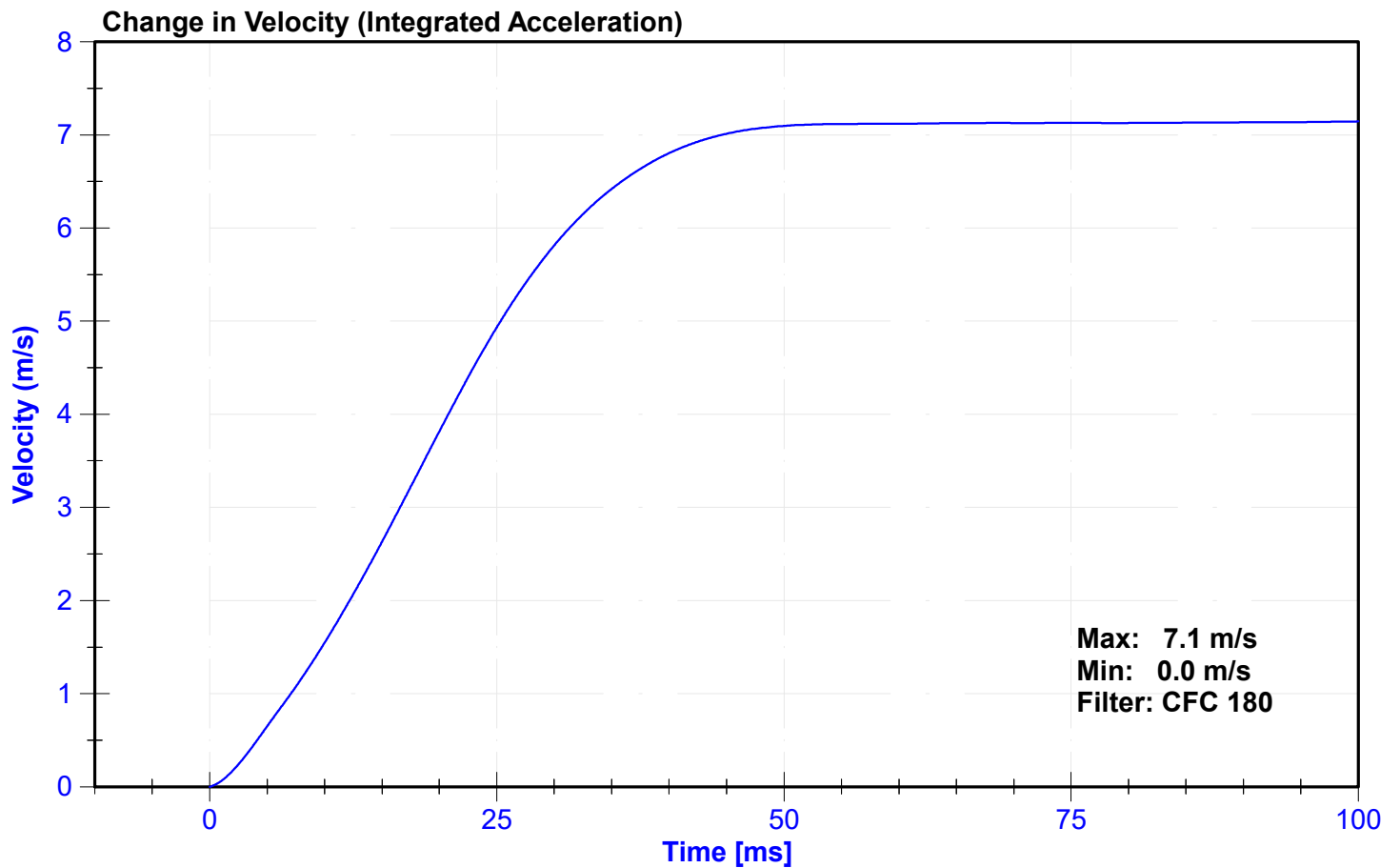
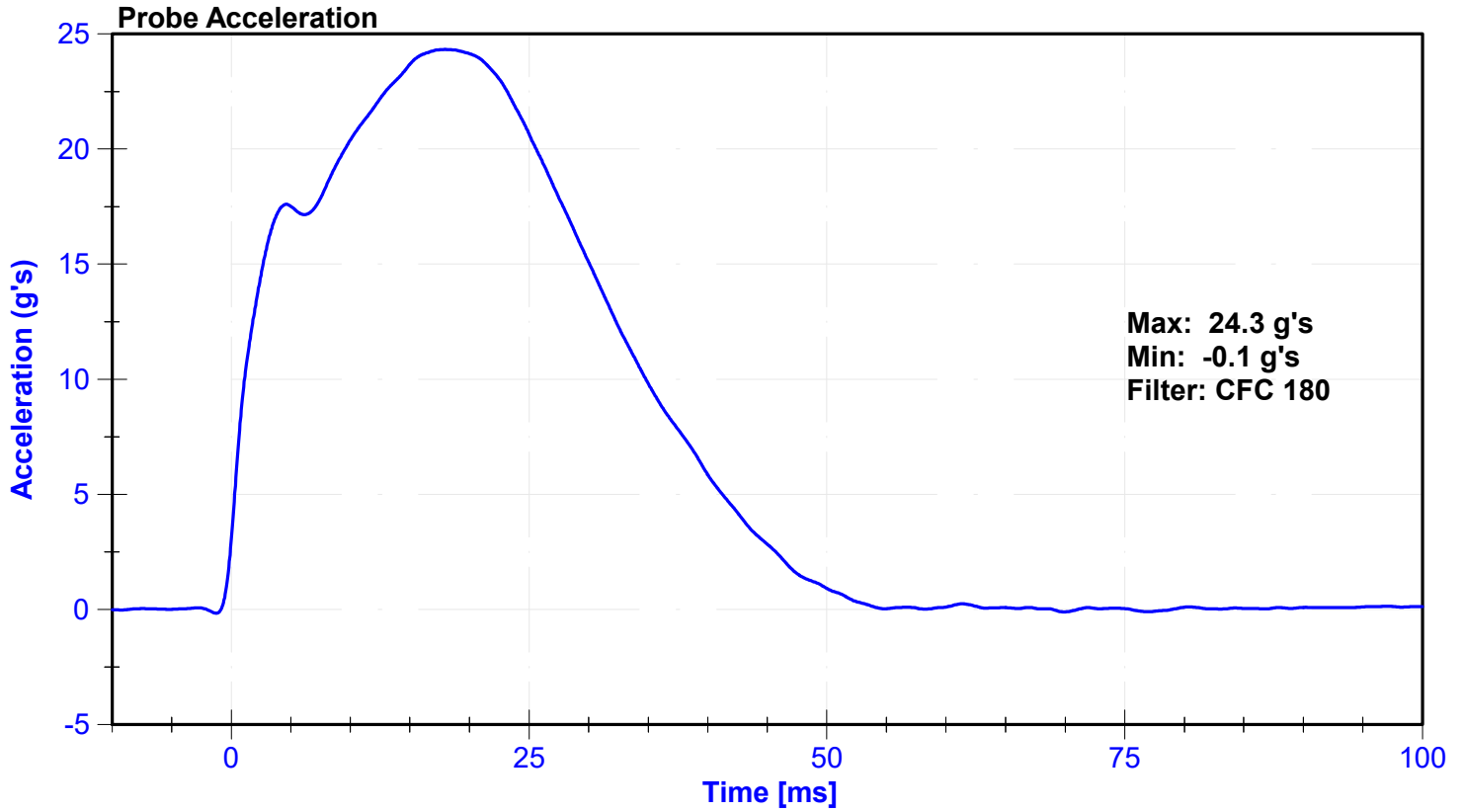
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Chest Potentiometer	Servo	1046	6/10/2025	12/9/2025

Force vs. Displacement







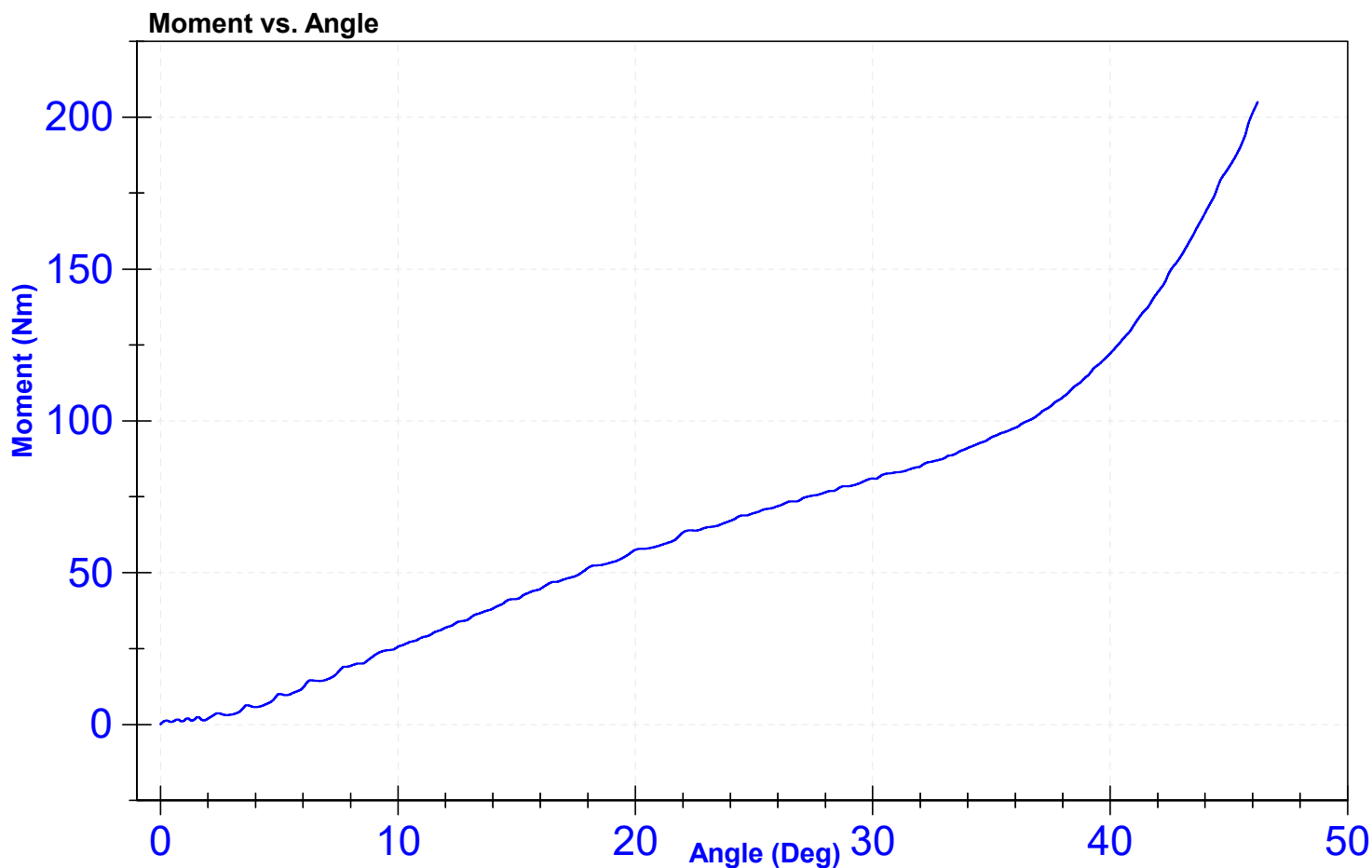
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	45	Pass
Average Velocity	5	10	deg/s	7.2	Pass
Angle at 203Nm	40	50	deg	46.1	Pass
Moment at 30 degrees	0	94.9	Nm	80.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS0008	9/23/2024	9/23/2025
Load Cell	PCB 2301-02	115	2024-11-11	2025-11-11



ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

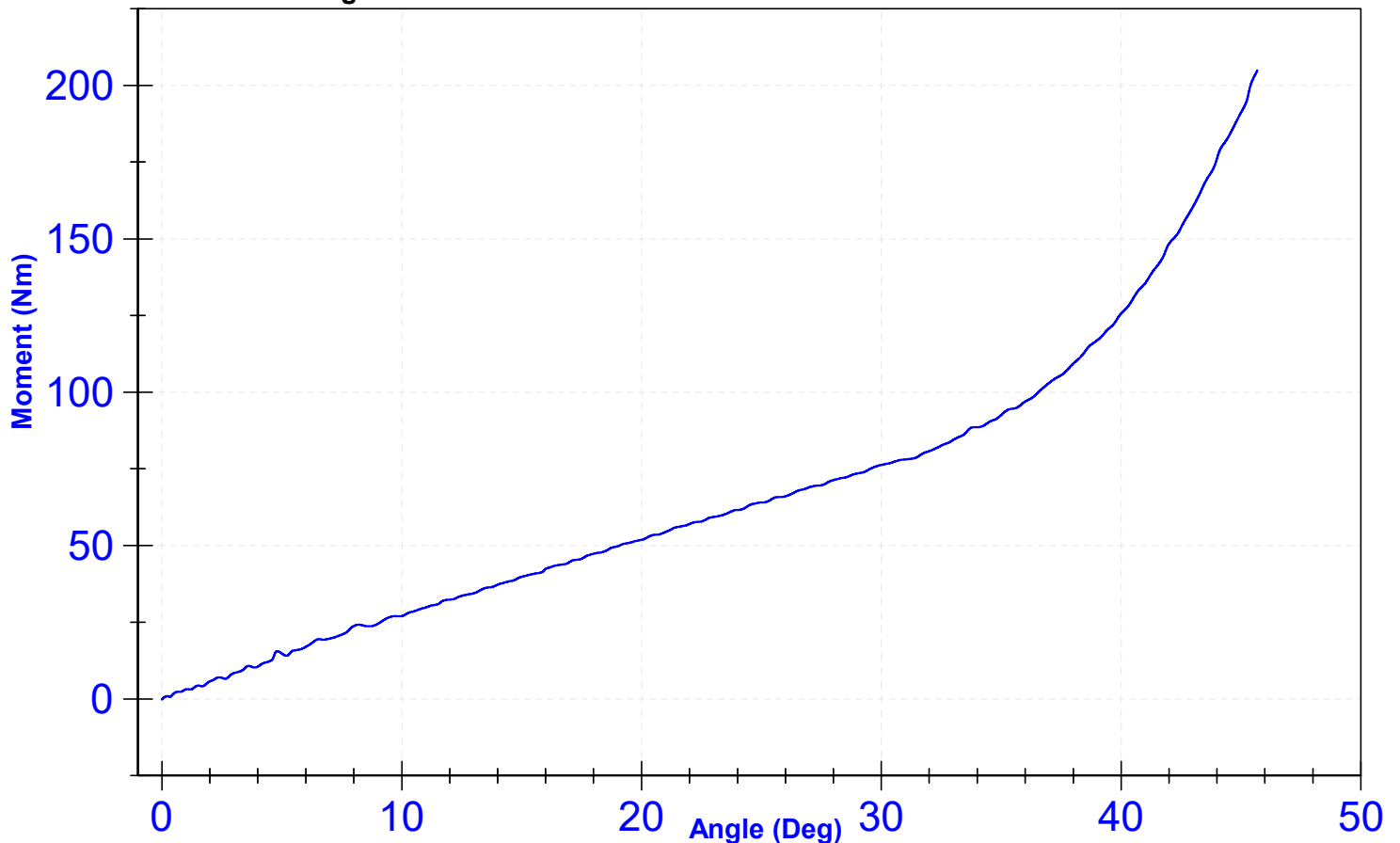
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	45	Pass
Average Velocity	5	10	deg/s	7.2	Pass
Angle at 203Nm	40	50	deg	45.6	Pass
Moment at 30 degrees	0	94.9	Nm	76.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS0008	9/23/2024	9/23/2025
Load Cell	PCB 2301-02	115	2024-11-11	2025-11-11

Moment vs. Angle



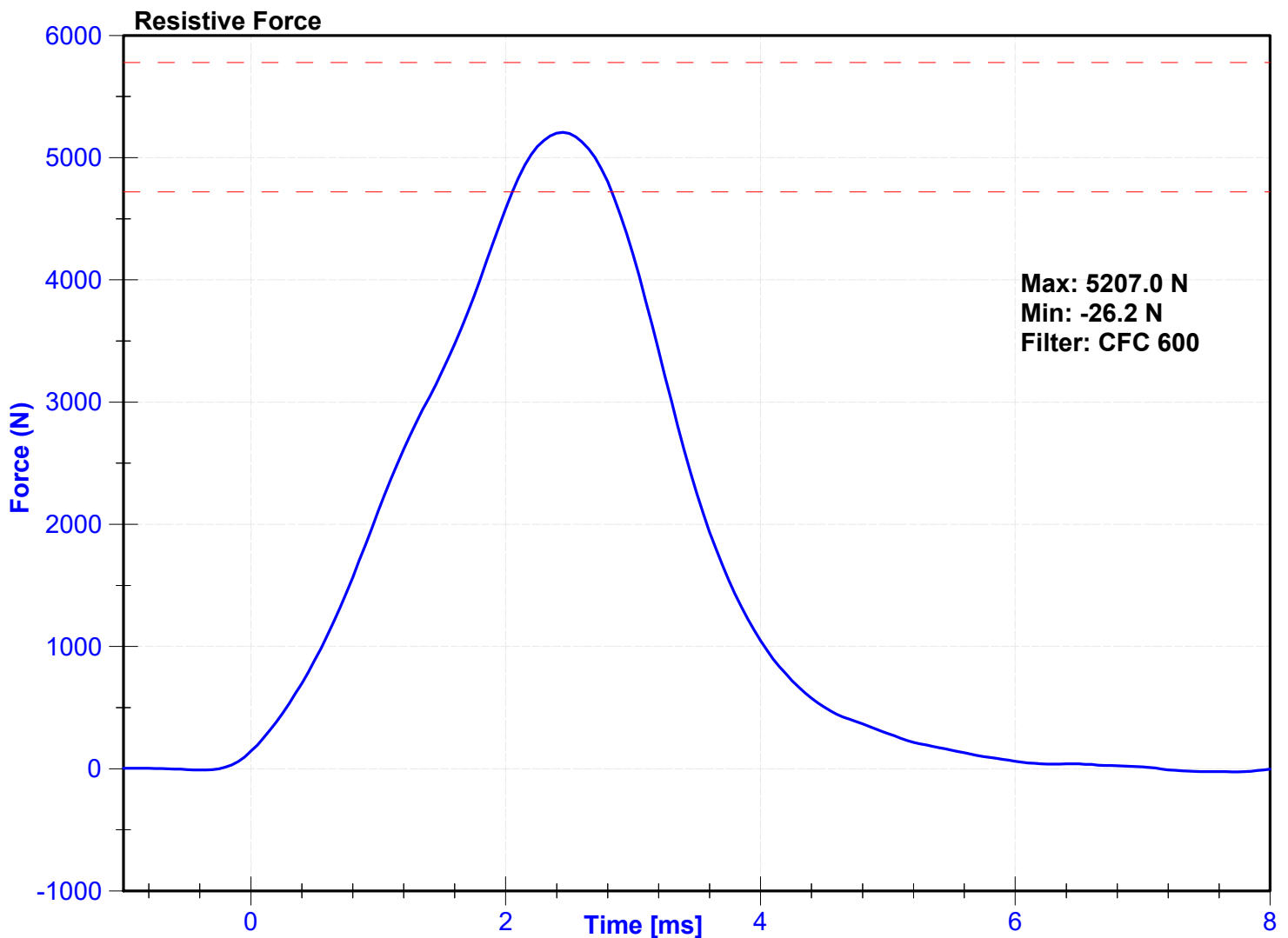
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

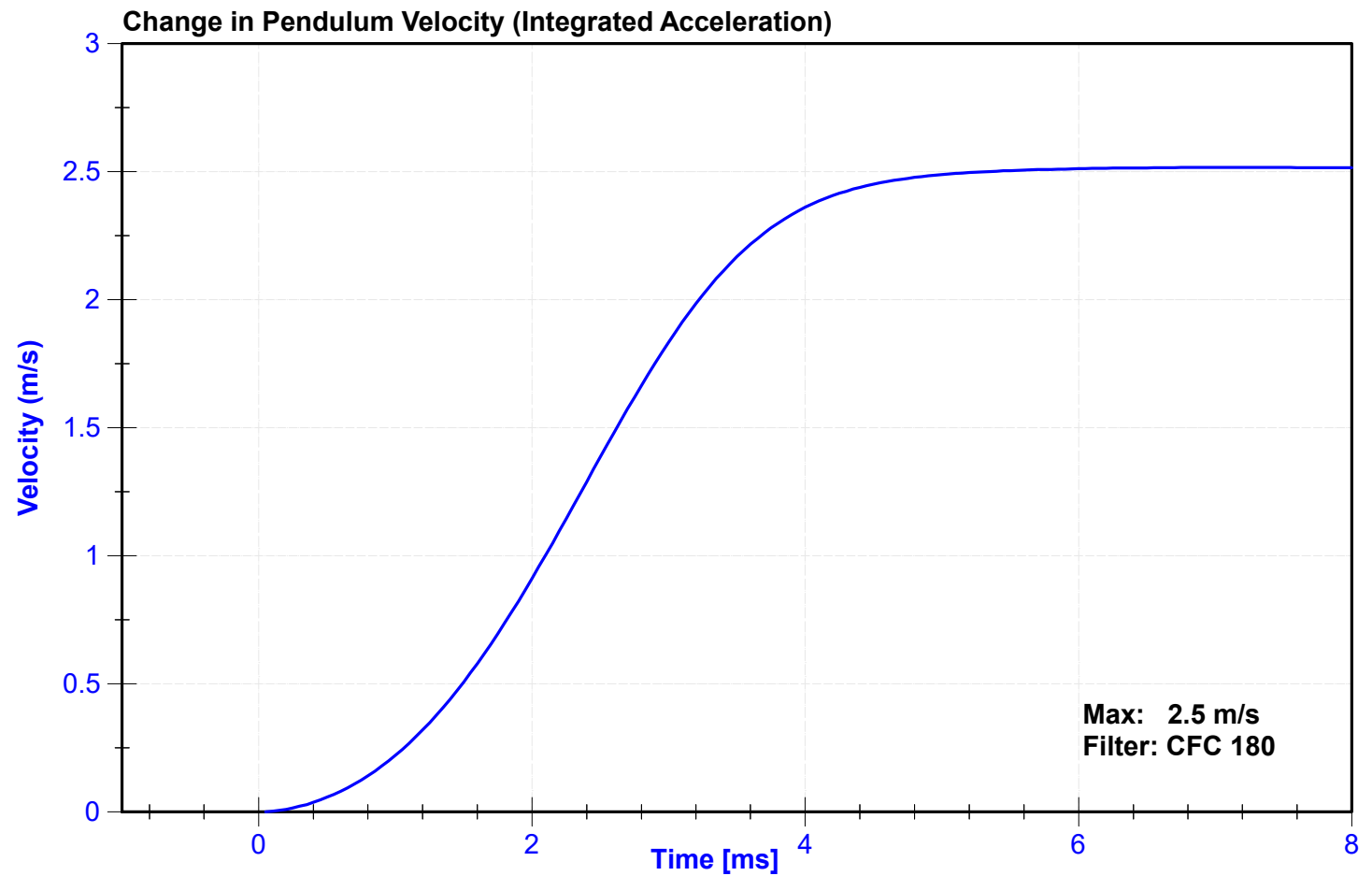
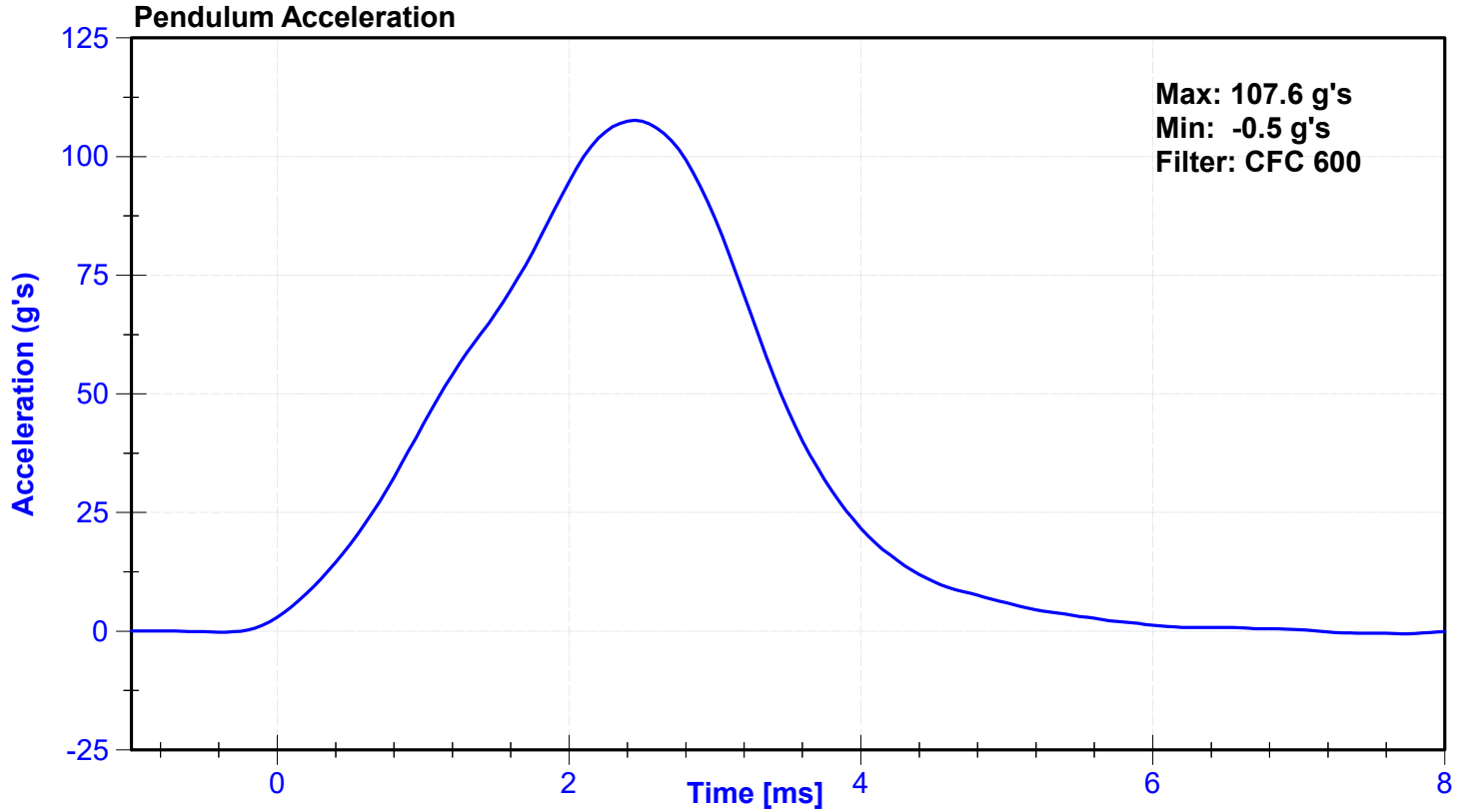
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	49	Pass
Velocity	2.07	2.13	m/s	2.090	Pass
Maximum Resistive Force	4720	5780	N	5207.0	Pass

Transducer Calibrations

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





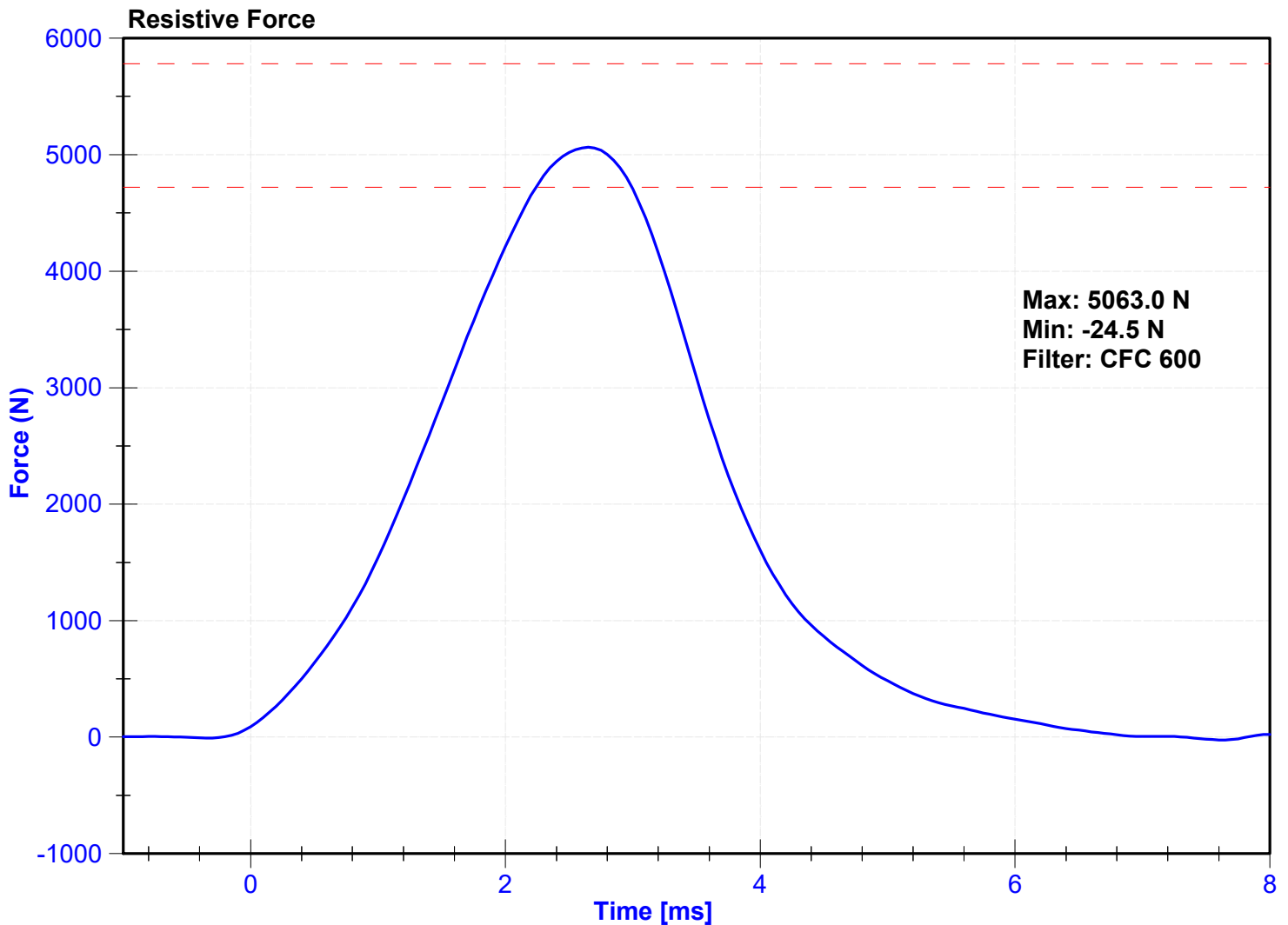
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

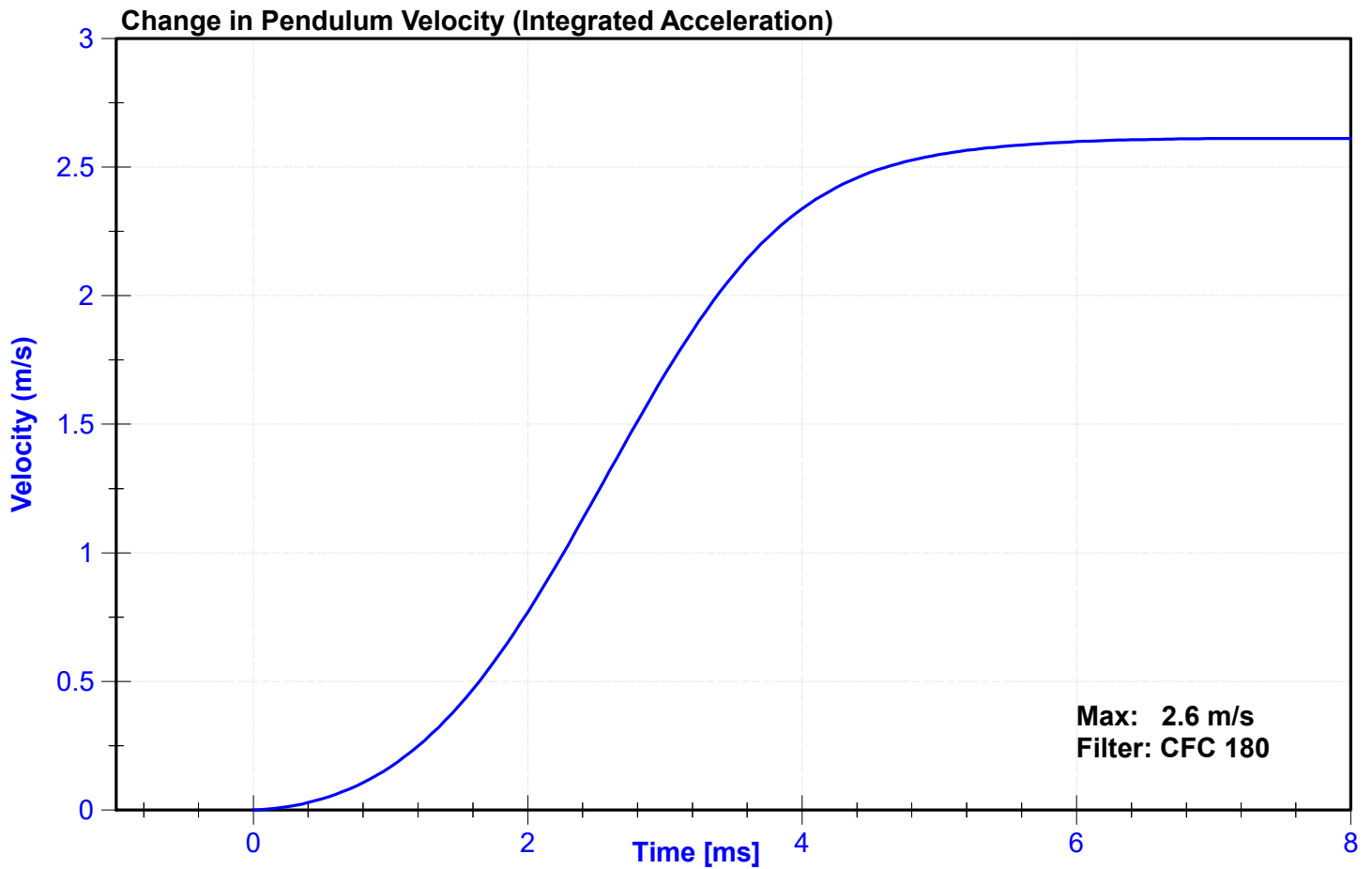
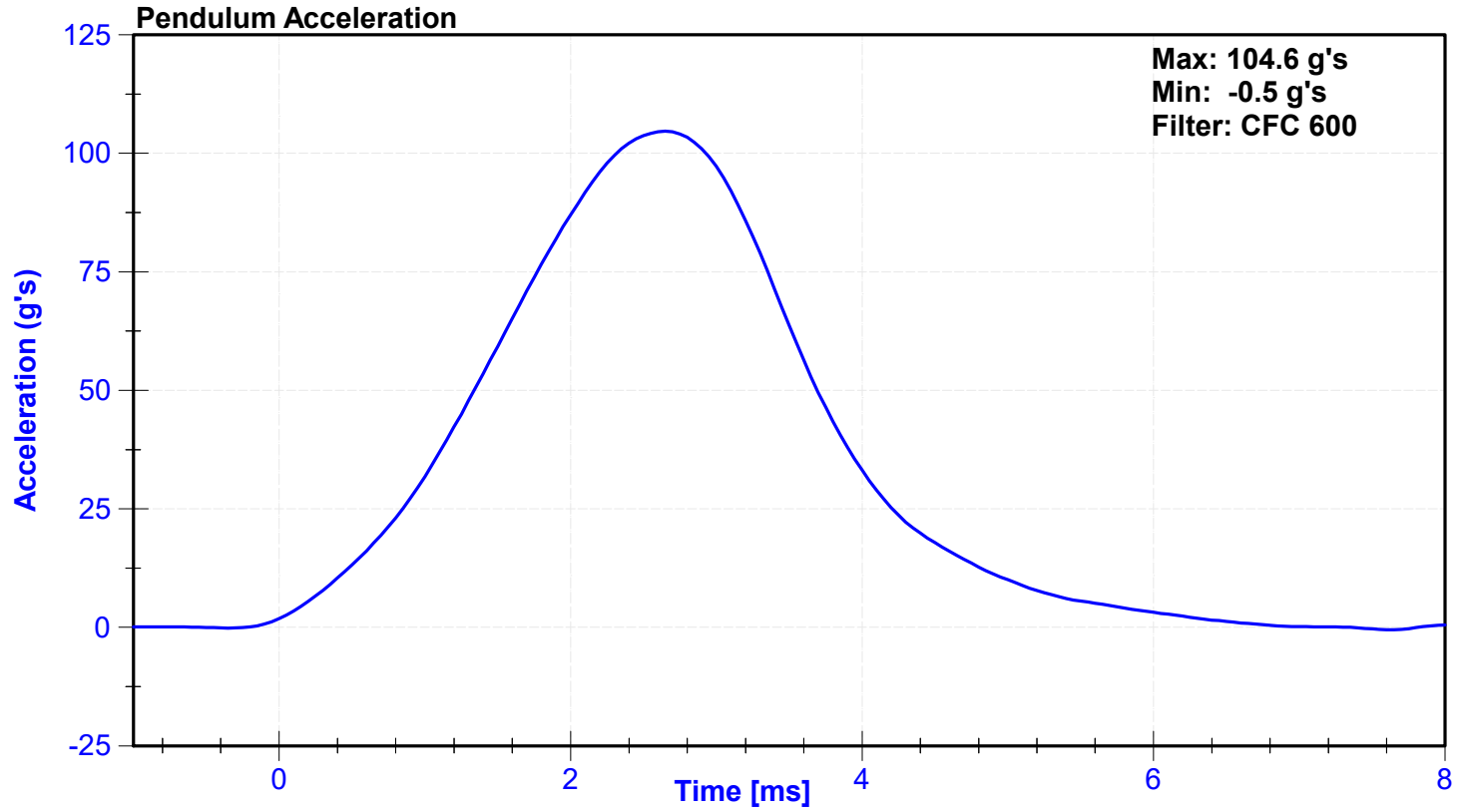
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	49	Pass
Velocity	2.07	2.13	m/s	2.091	Pass
Maximum Resistive Force	4720	5780	N	5063.0	Pass

Transducer Calibrations

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





CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE - PASSENGER ATD

SERIAL NO: 137

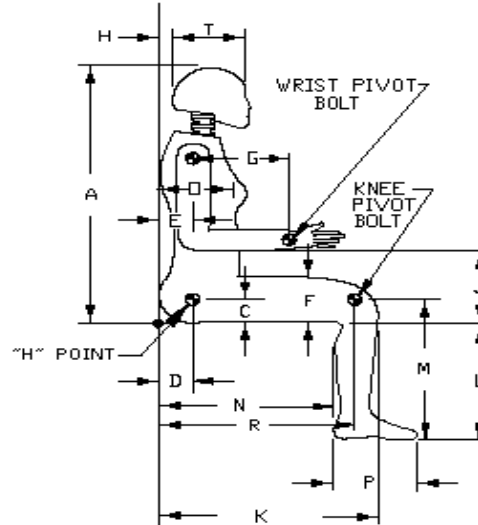
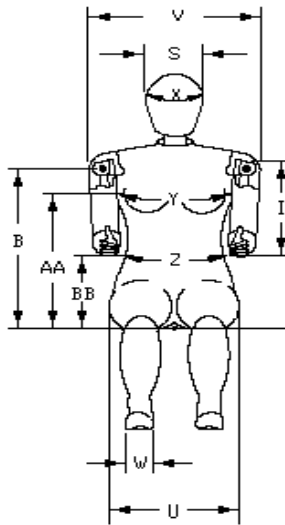


External Measurements - Hybrid 3 - 5th Female

Technician: **J. Rios**

Date: **07/21/2025**

Dummy Serial Number: **137**



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	791	Pass
B	Shoulder Pivot Height	432	457	445	Pass
C	H-Point Height	81	86	85	Pass
D	H-Point from Backline	145	150	146	Pass
E	Shoulder Pivot from Backline	69	84	79	Pass
F	Thigh Clearance	119	135	125	Pass
G	Back of Elbow to Wrist Pivot	244	259	253	Pass
H	Head Back to Backline	43	48	45	Pass
I	Shoulder to Elbow Length	277	297	288	Pass
J	Elbow Rest Height	183	203	191	Pass
K	Buttock to Knee Length	521	546	532	Pass
L	Popliteal Height	356	376	362	Pass
M	Knee Pivot Height	394	419	405	Pass
N	Buttock Popliteal Length	414	439	427	Pass
O	Chest Depth without Jacket	175	191	180	Pass
P	Foot Length (right)	219	234	225	Pass
R	Buttock To Knee Pivot Length	457	483	466	Pass
S	Head Breadth	137	147	146	Pass
T	Head Depth	178	188	183	Pass
U	Hip Breadth	300	315	309	Pass
V	Shoulder Breadth	351	366	355	Pass
W	Foot Breadth	79	94	85	Pass
X	Head Circumference	528	549	539	Pass
Y	Chest Circumference with Jacket	851	881	874	Pass
Z	Waist Circumference	460	790	638	Pass
AA	Reference Location (Chest Circumference)	333	358	340	Pass
BB	Reference Location (Waist Circumference)	160	170	163	Pass

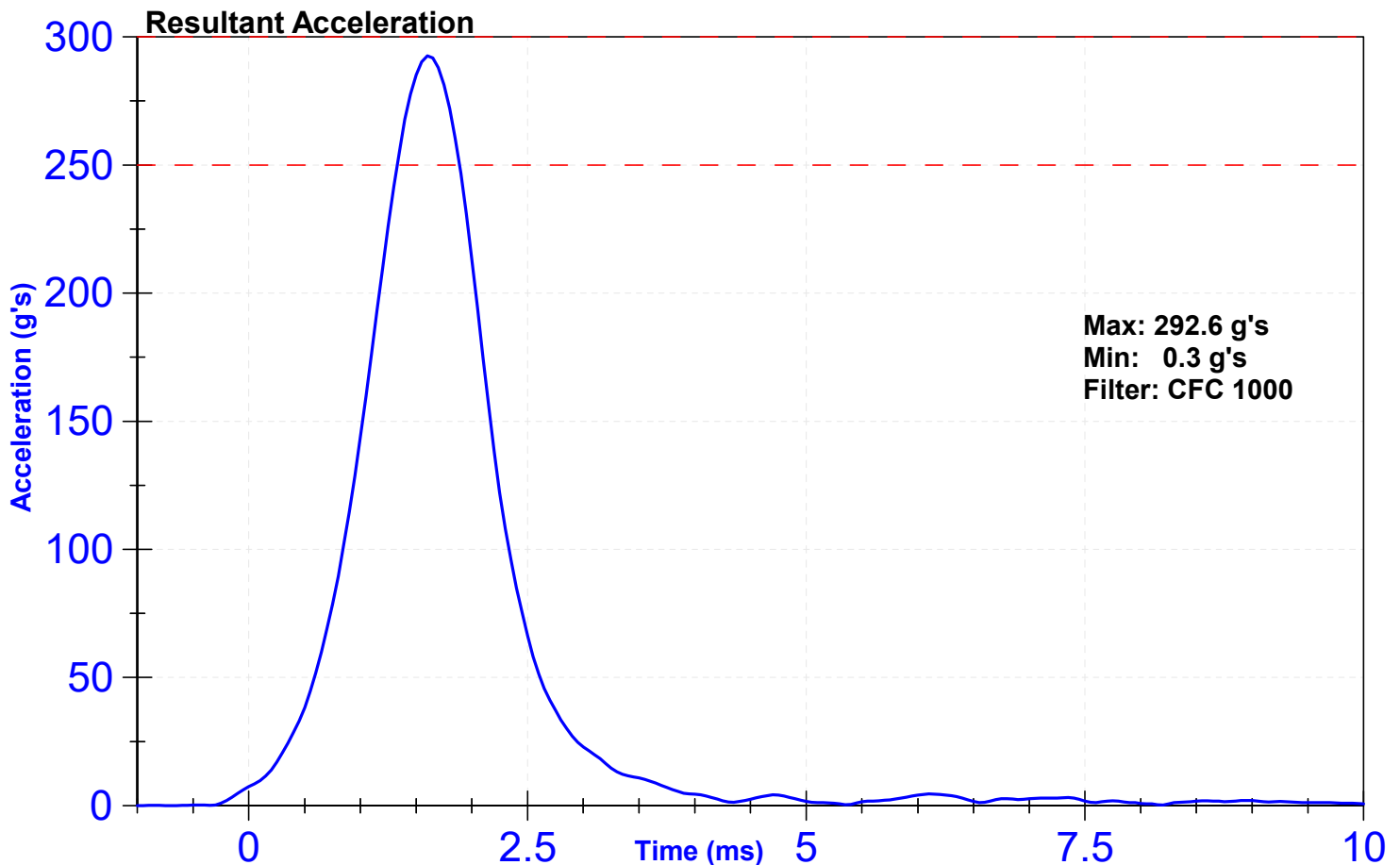
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

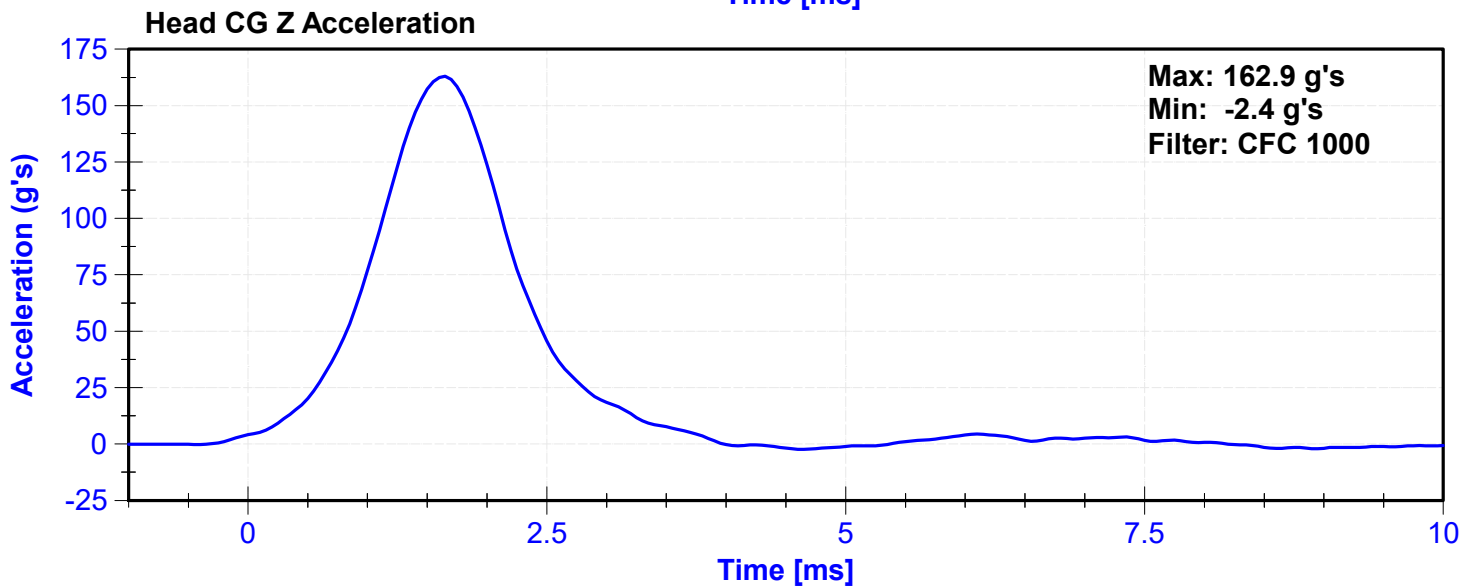
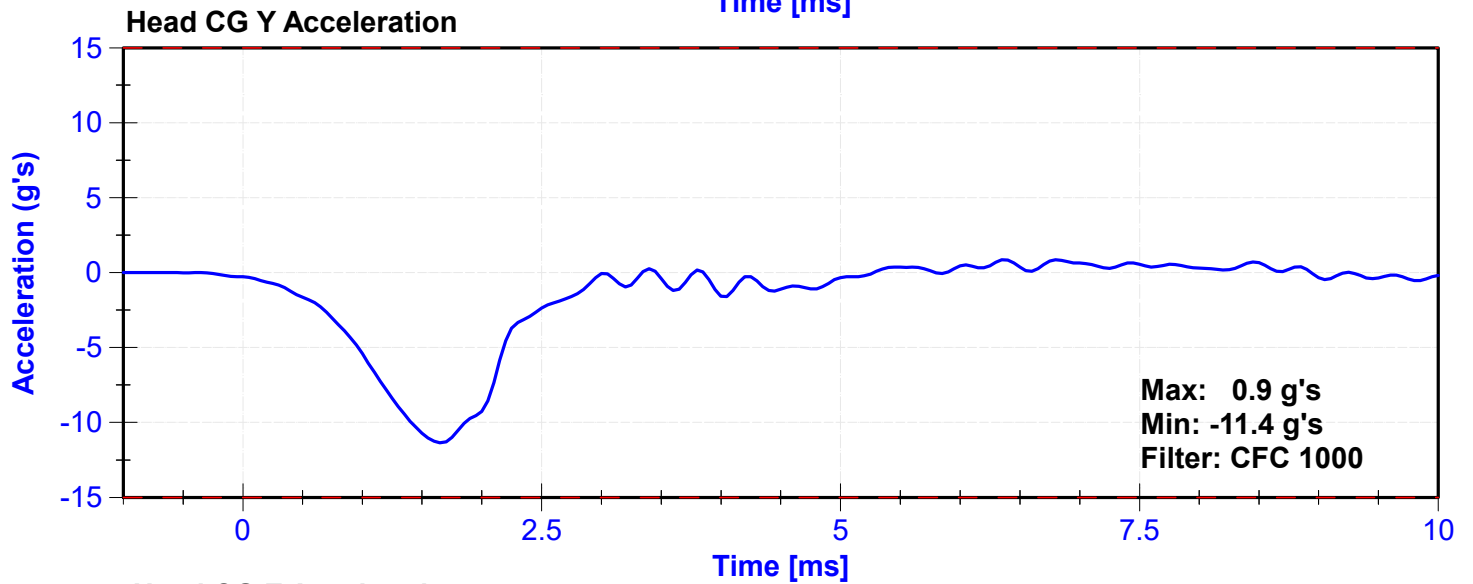
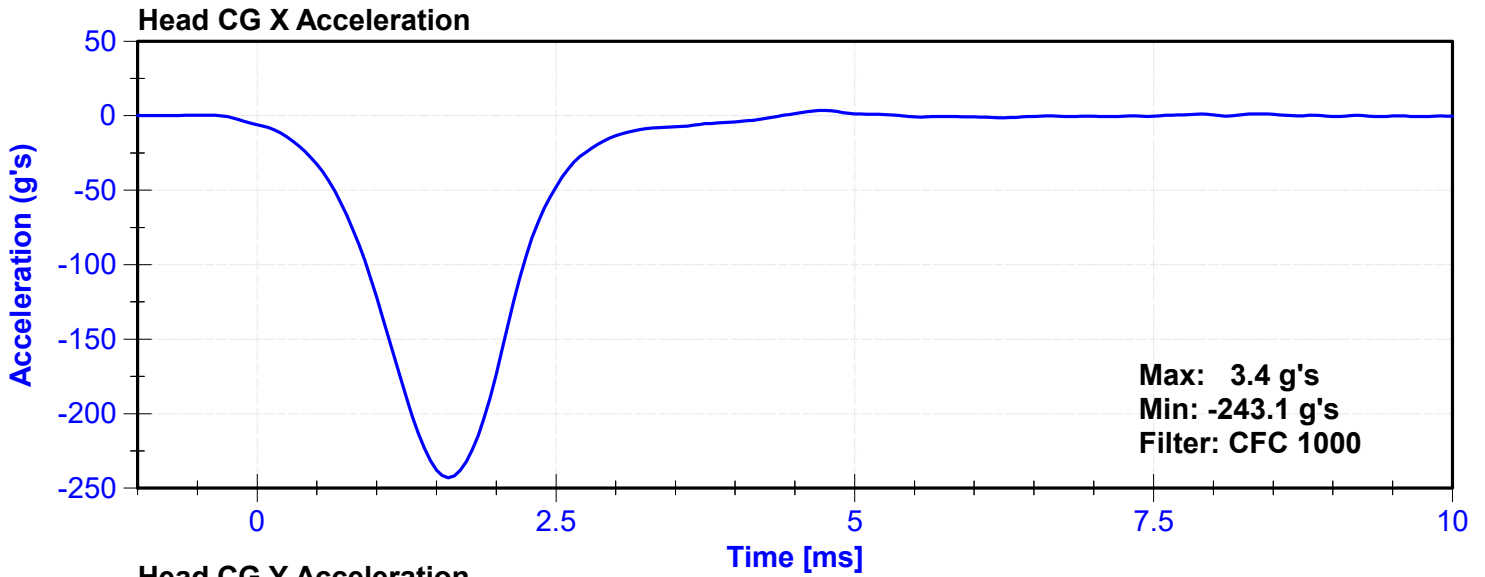
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	44	Pass
Resultant Acceleration	250	300	g's	292.6	Pass
Oscillation	0	10	%	1.5	Pass
Lateral Acceleration	-15	15	g's	-11.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P79417	6/11/2025	12/11/2025
Y Accelerometer	Endevco	P83335	6/11/2025	12/11/2025
Z Accelerometer	Endevco	P64149	6/11/2025	12/11/2025





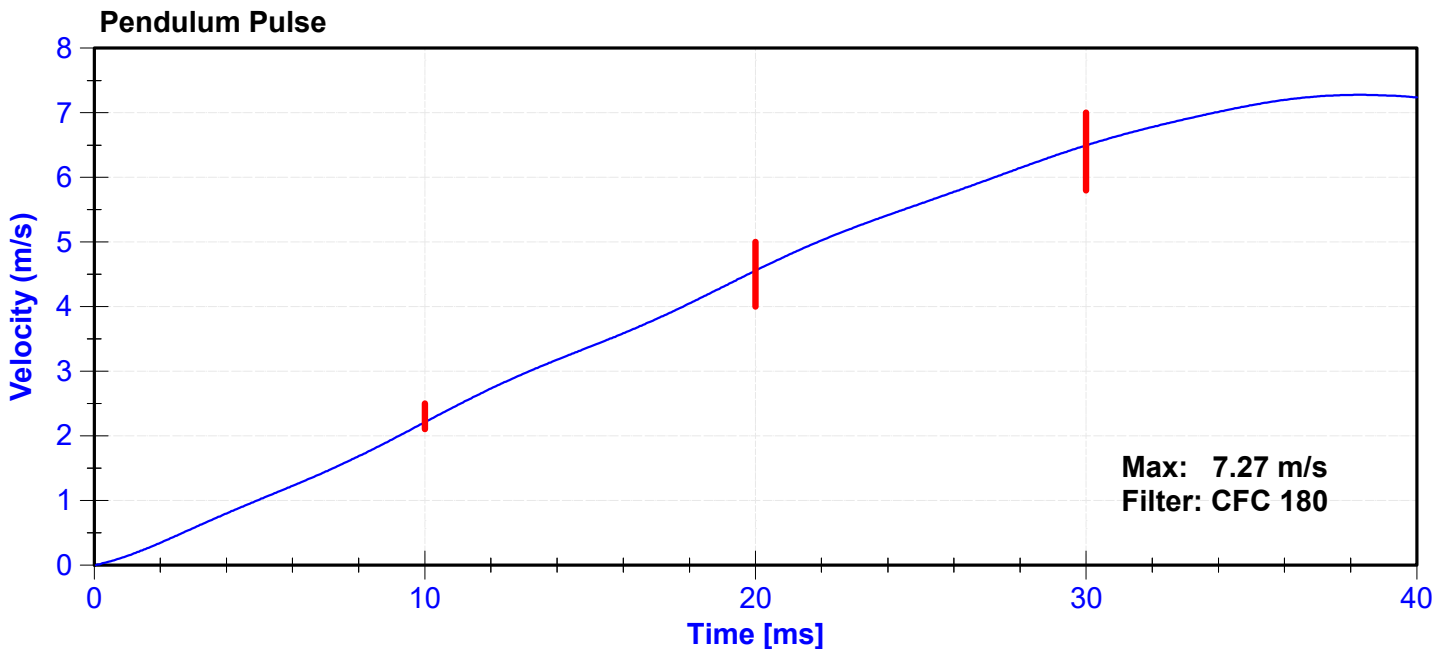
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

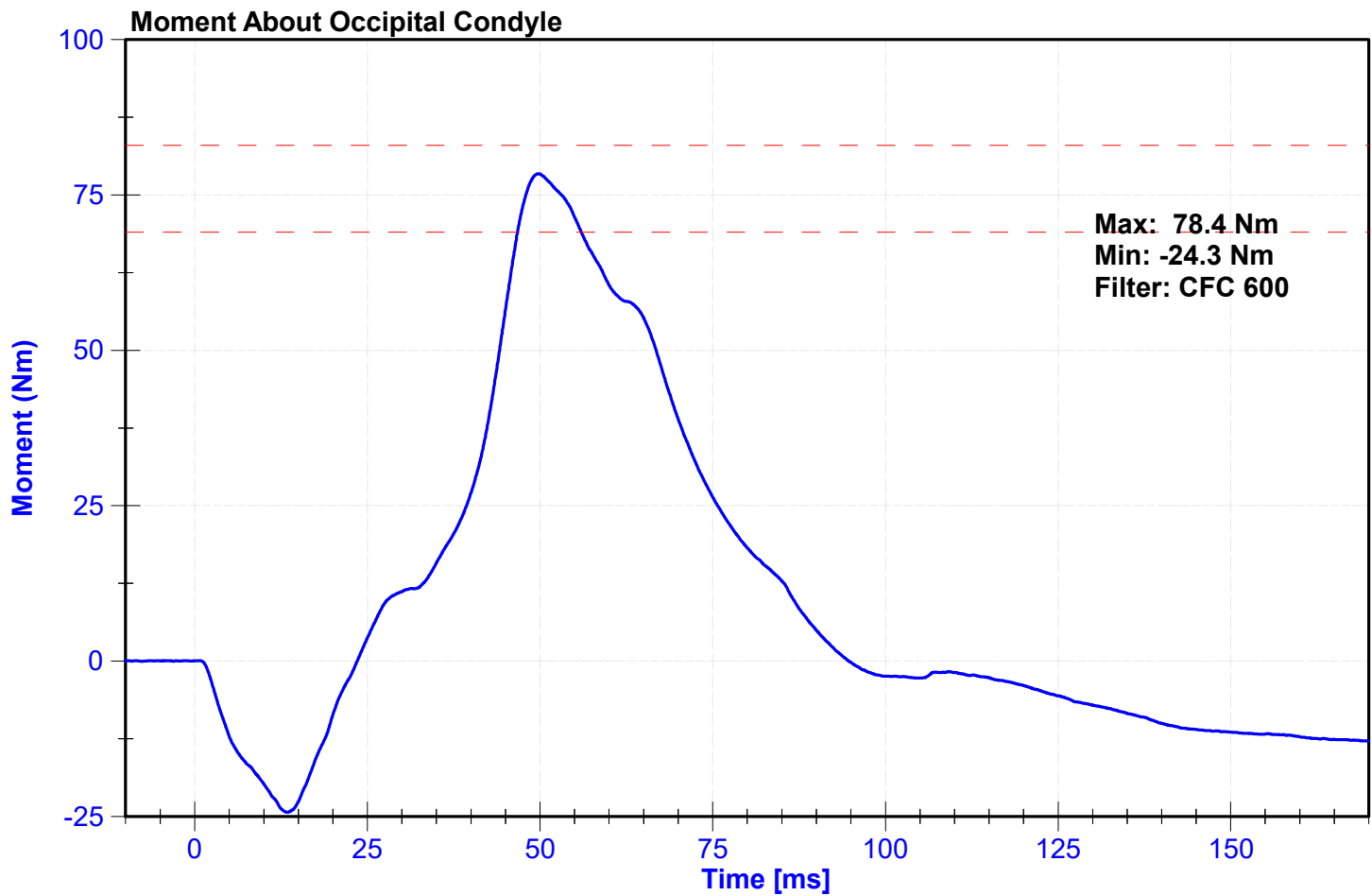
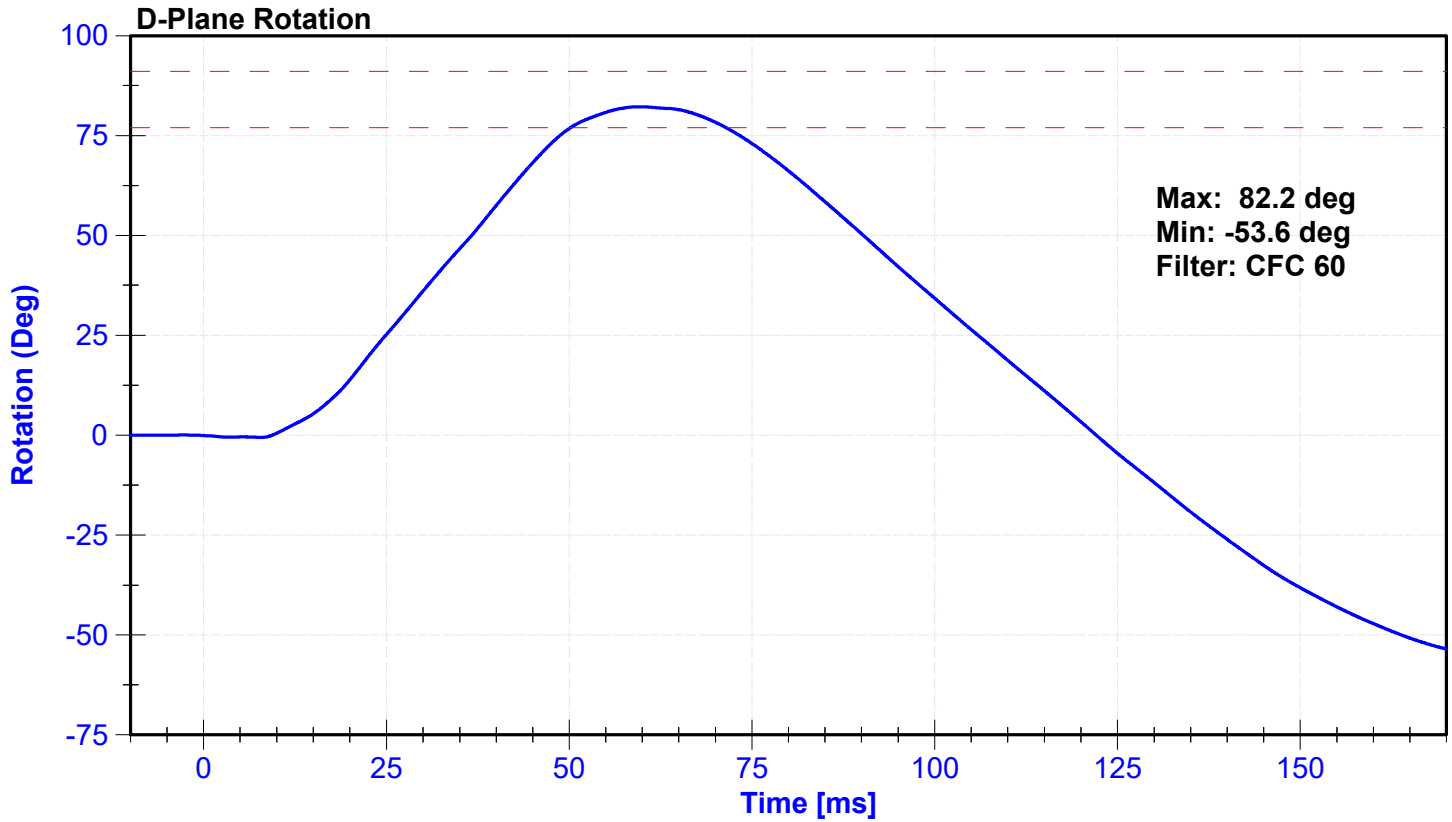
Results

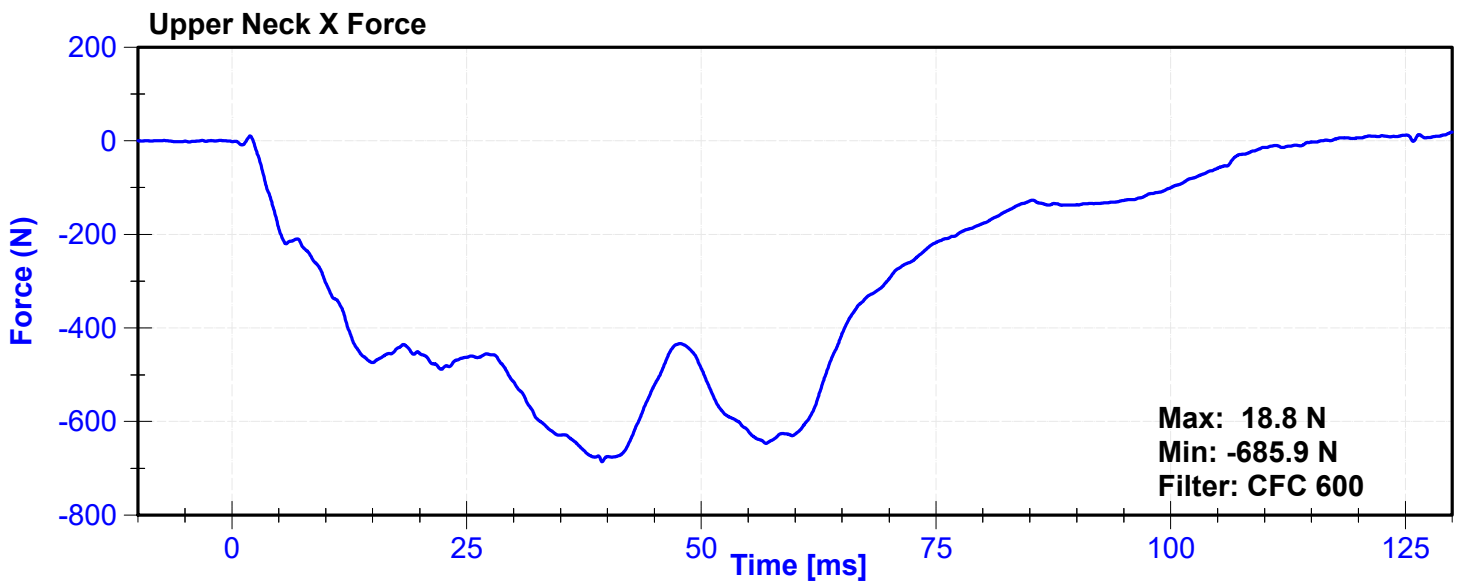
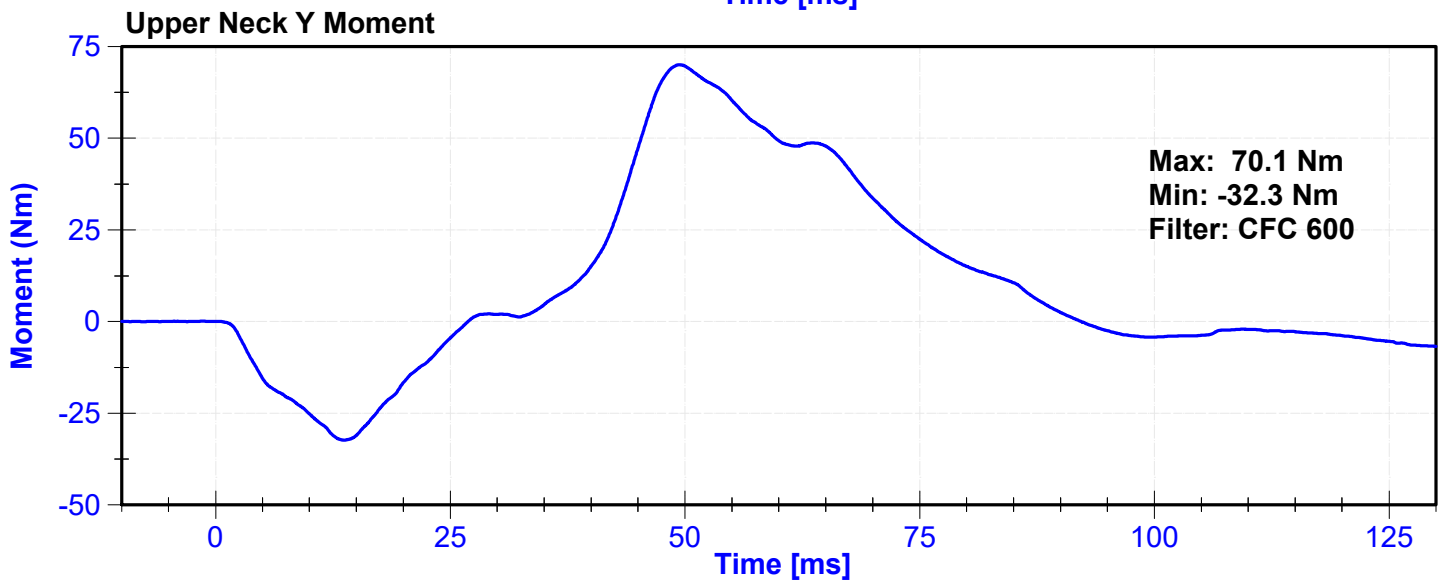
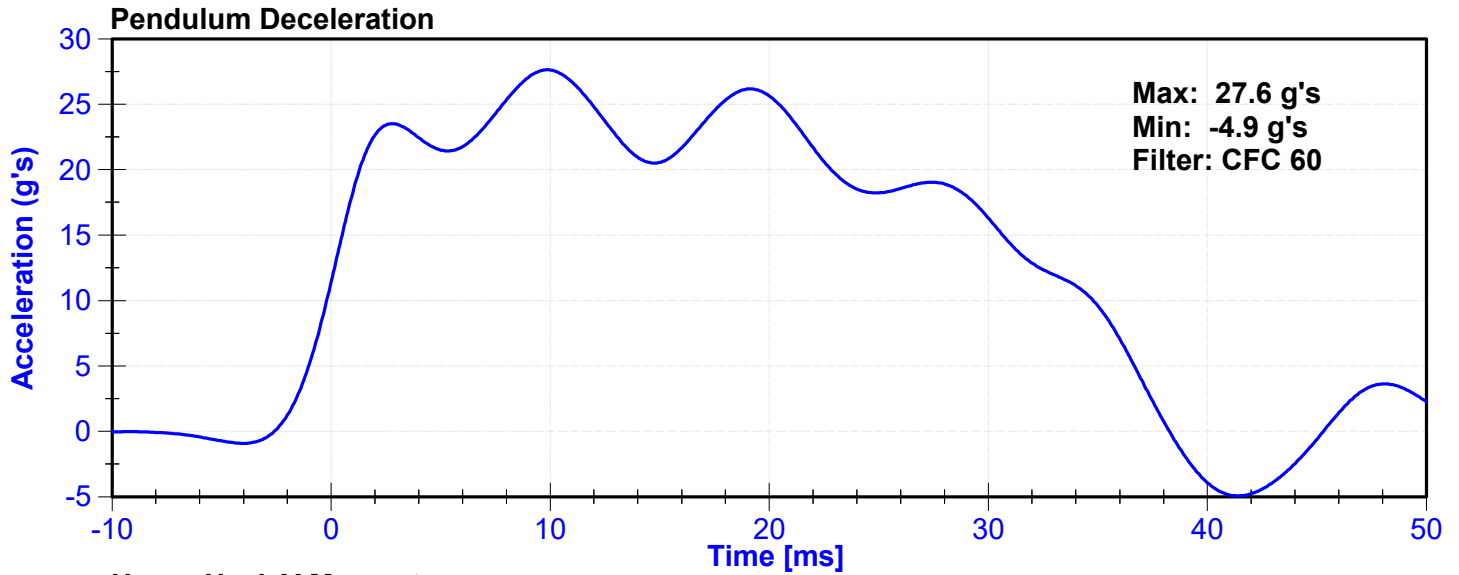
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	46	Pass
Velocity	6.89	7.13	m/s	7.004	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.21	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.56	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.49	Pass
Max D Plane Rotation	77	91	deg	82.2	Pass
Max Moment During Rotation Interval	69	83	Nm	78.4	Pass
Moment Decay to 10.0 Nm	80	100	ms	86.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	SP22G_LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	SP22G_LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	1916-FX	9/12/2024	9/12/2025







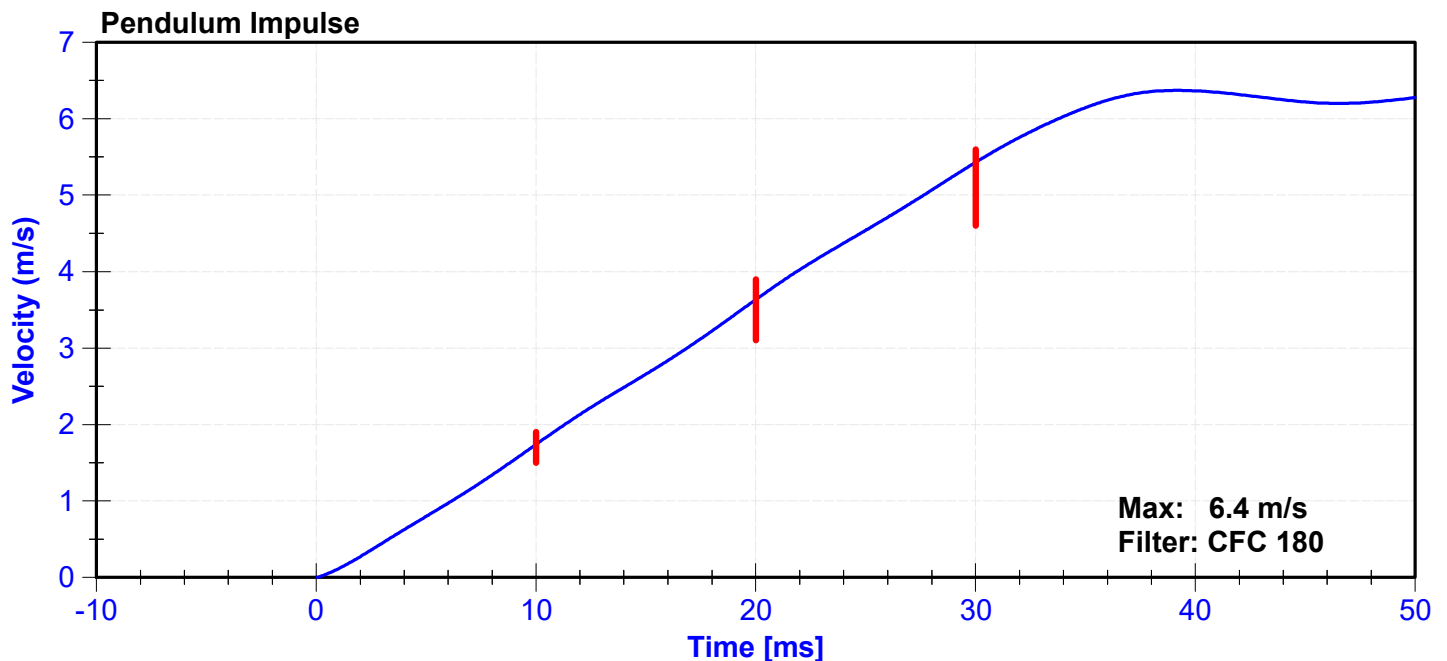
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

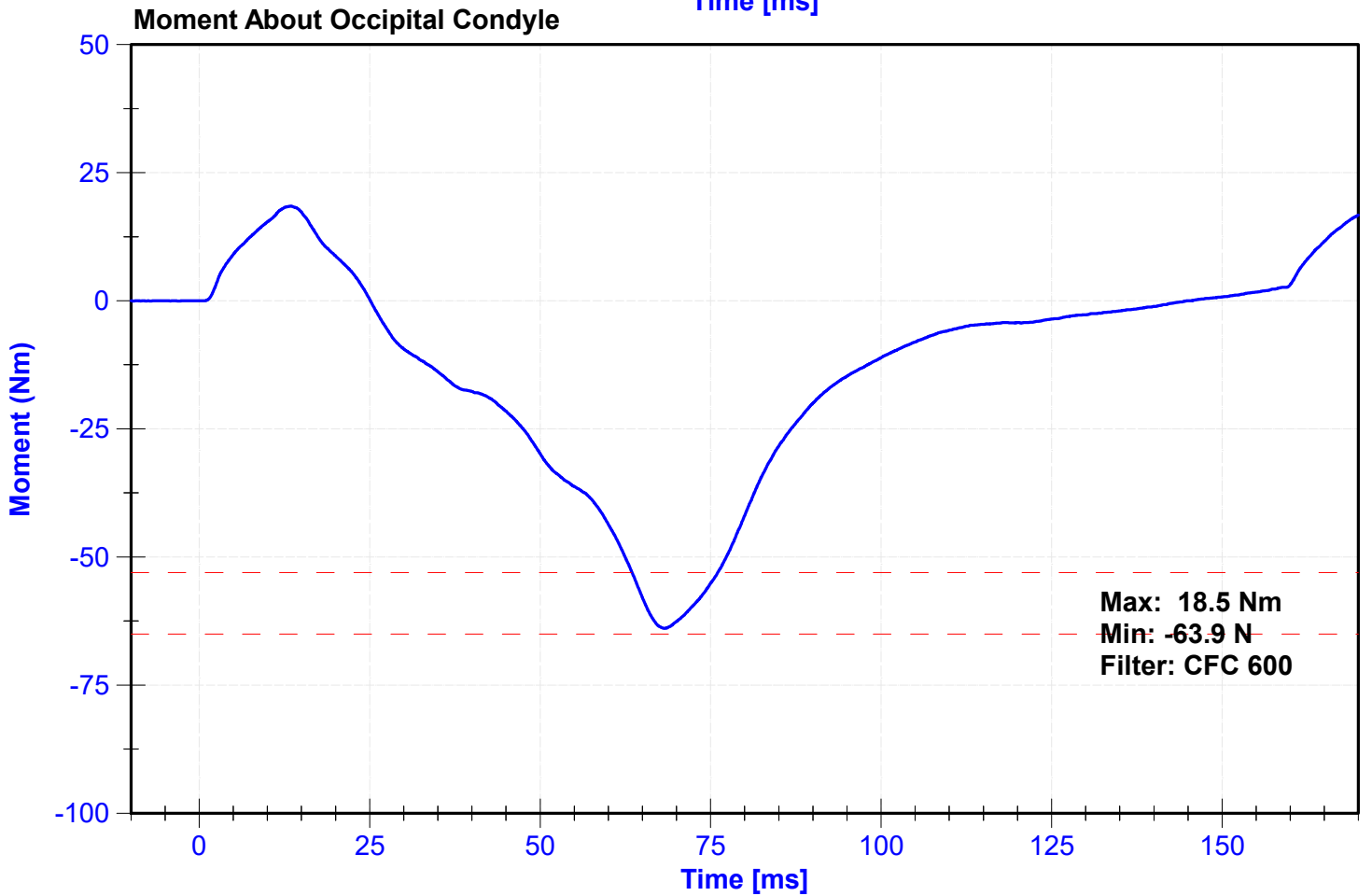
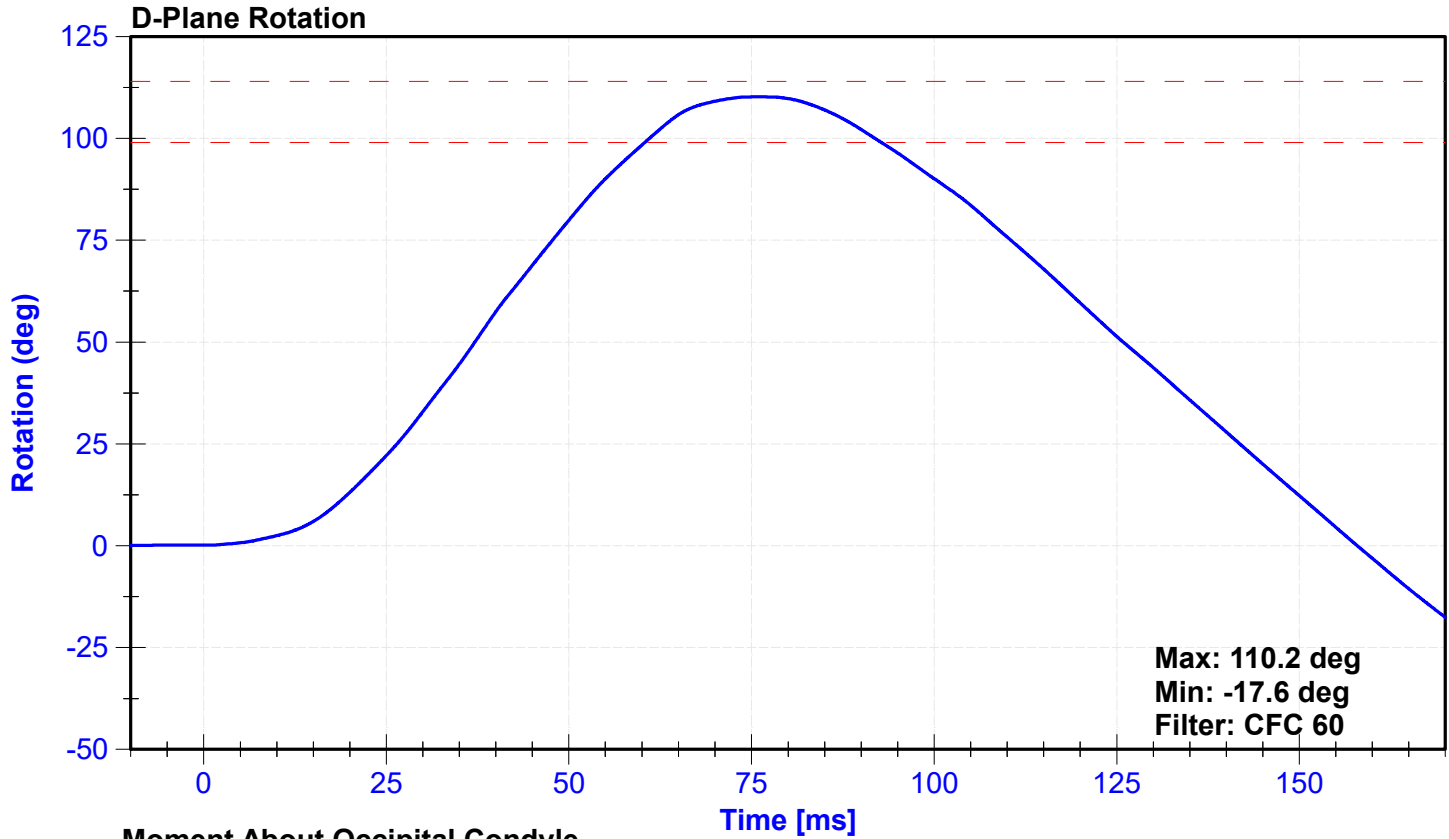
Results

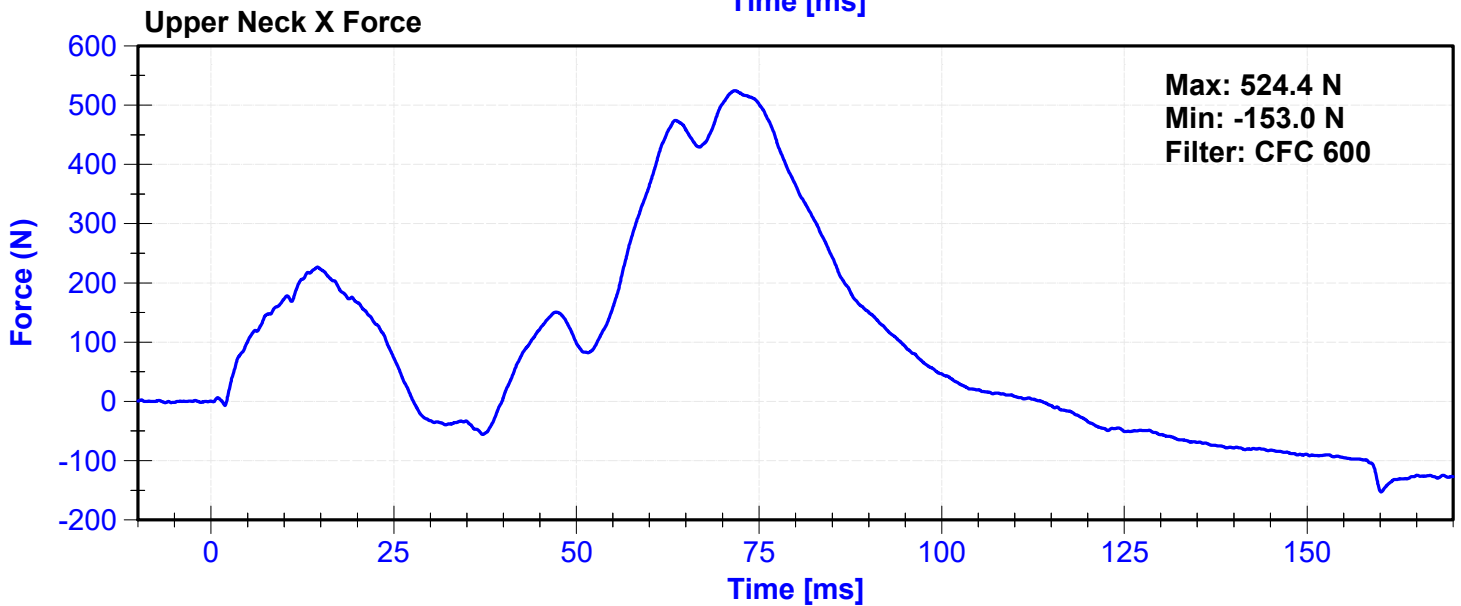
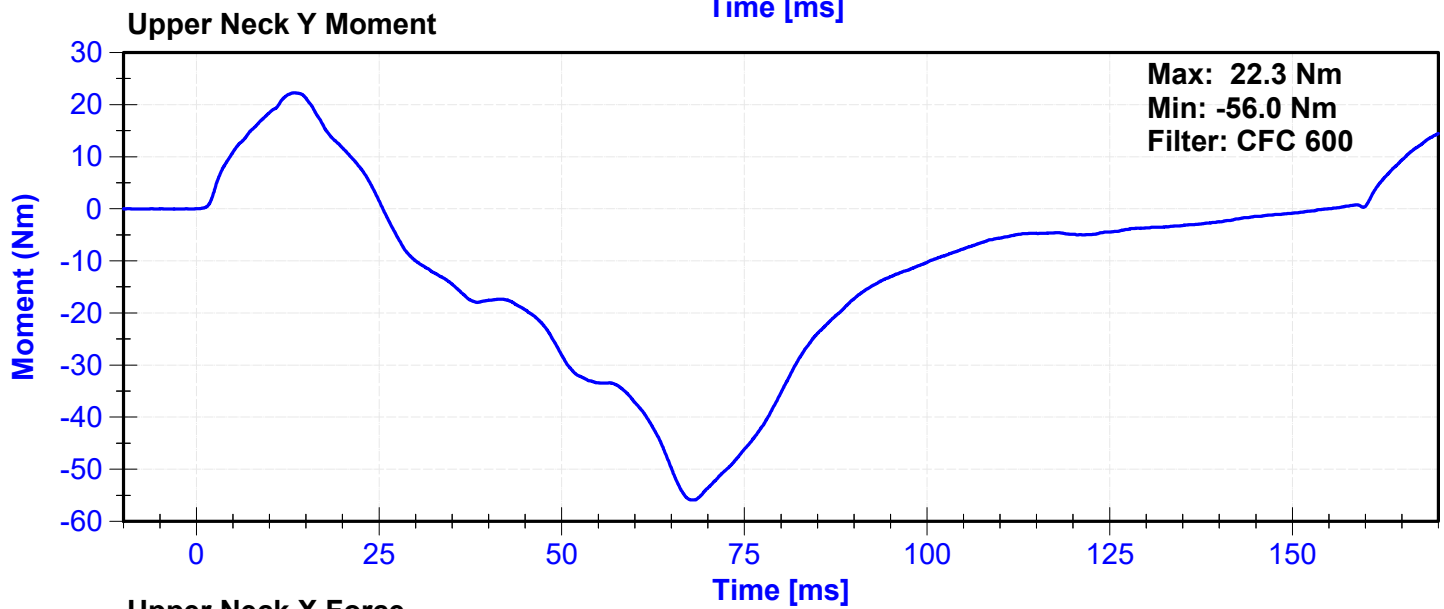
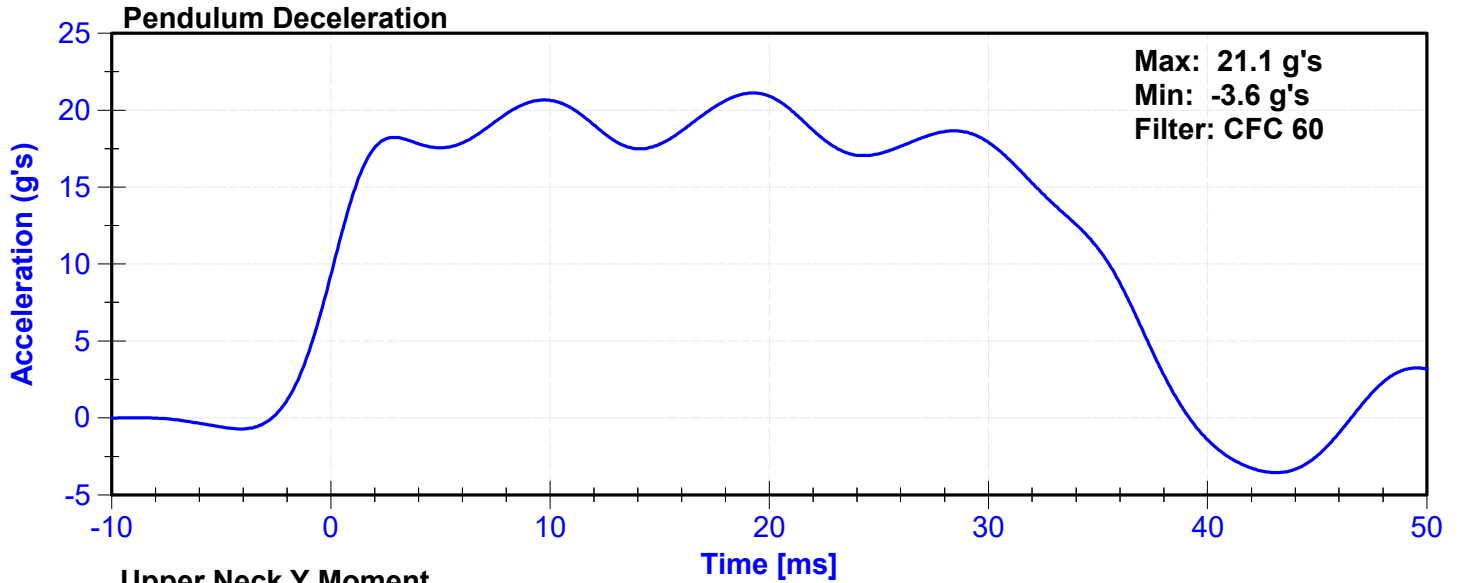
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	46	Pass
Velocity	5.95	6.19	m/s	6.013	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.74	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.64	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.43	Pass
D Plane Rotation	99	114	deg	110.2	Pass
Moment During Rotation Interval	-65	-53	Nm	-63.9	Pass
Moment Decay to -10Nm	94	114	ms	101.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	SP22G_LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	SP22G_LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	1716A	9/12/2024	9/12/2025







ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

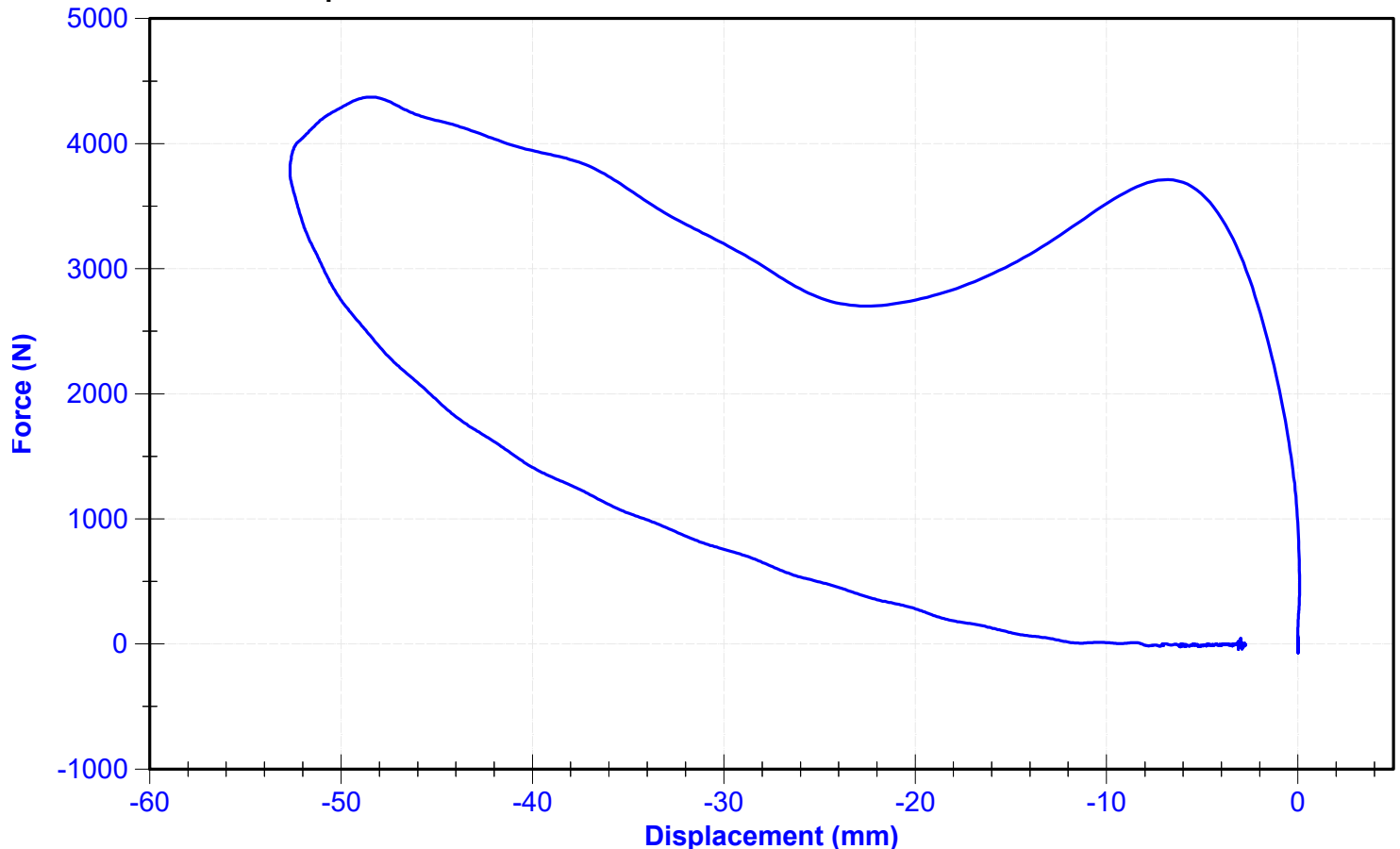
Results

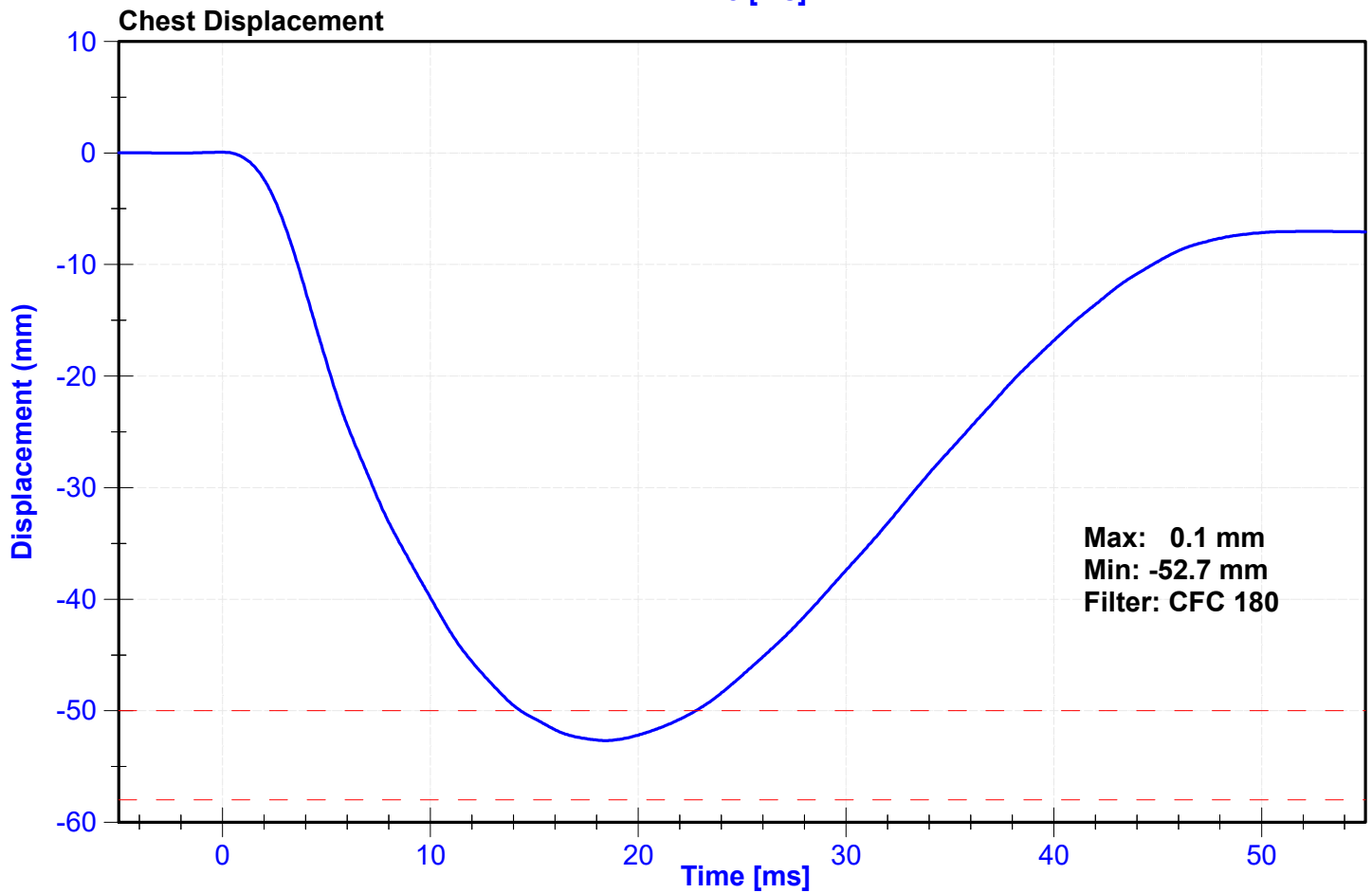
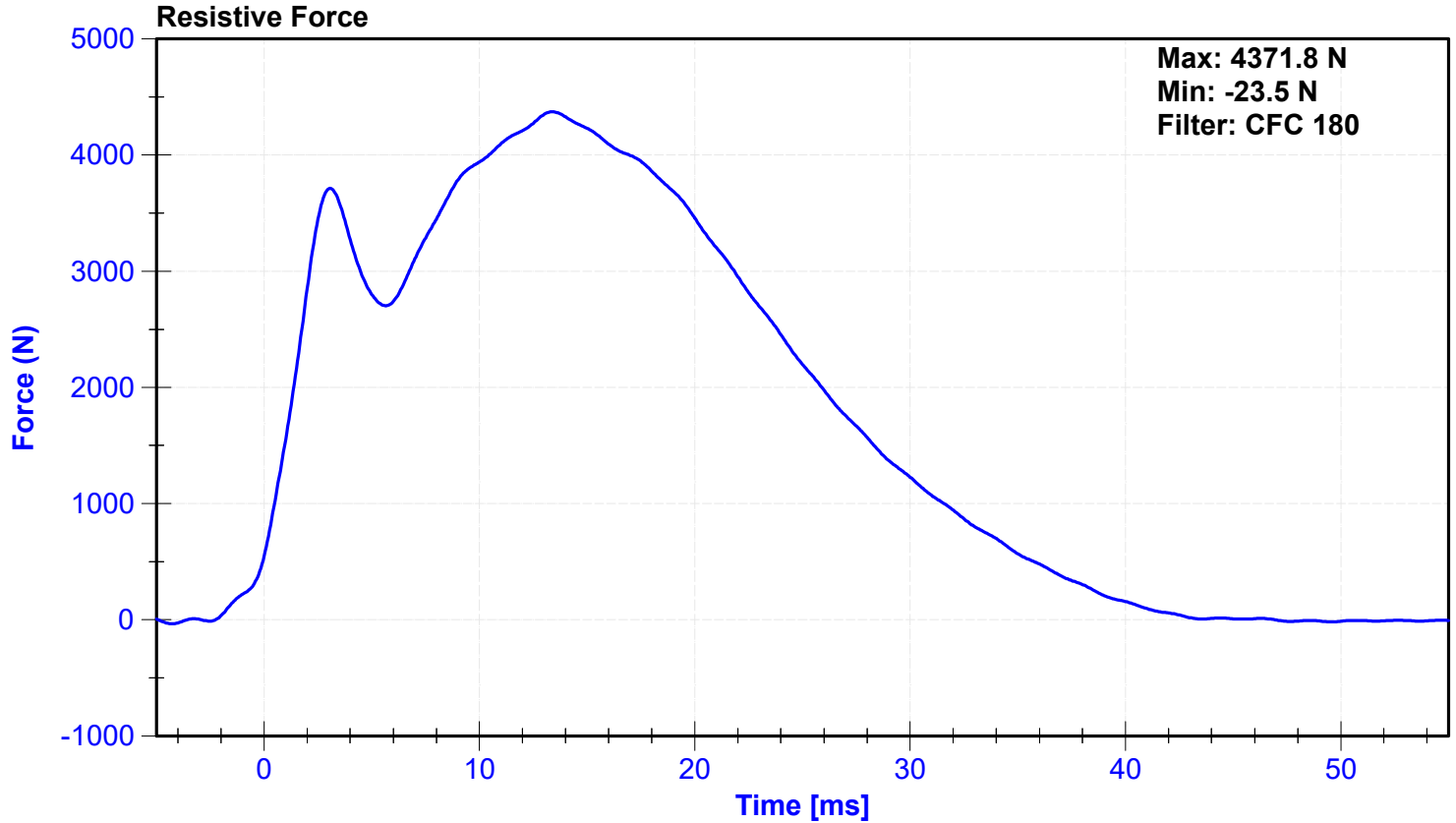
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	46	Pass
Velocity	6.59	6.83	m/s	6.597	Pass
Chest Deflection	-58	-50	mm	-52.7	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4292.3	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4371.8	Pass
Hysteresis	69	85	%	75.0	Pass

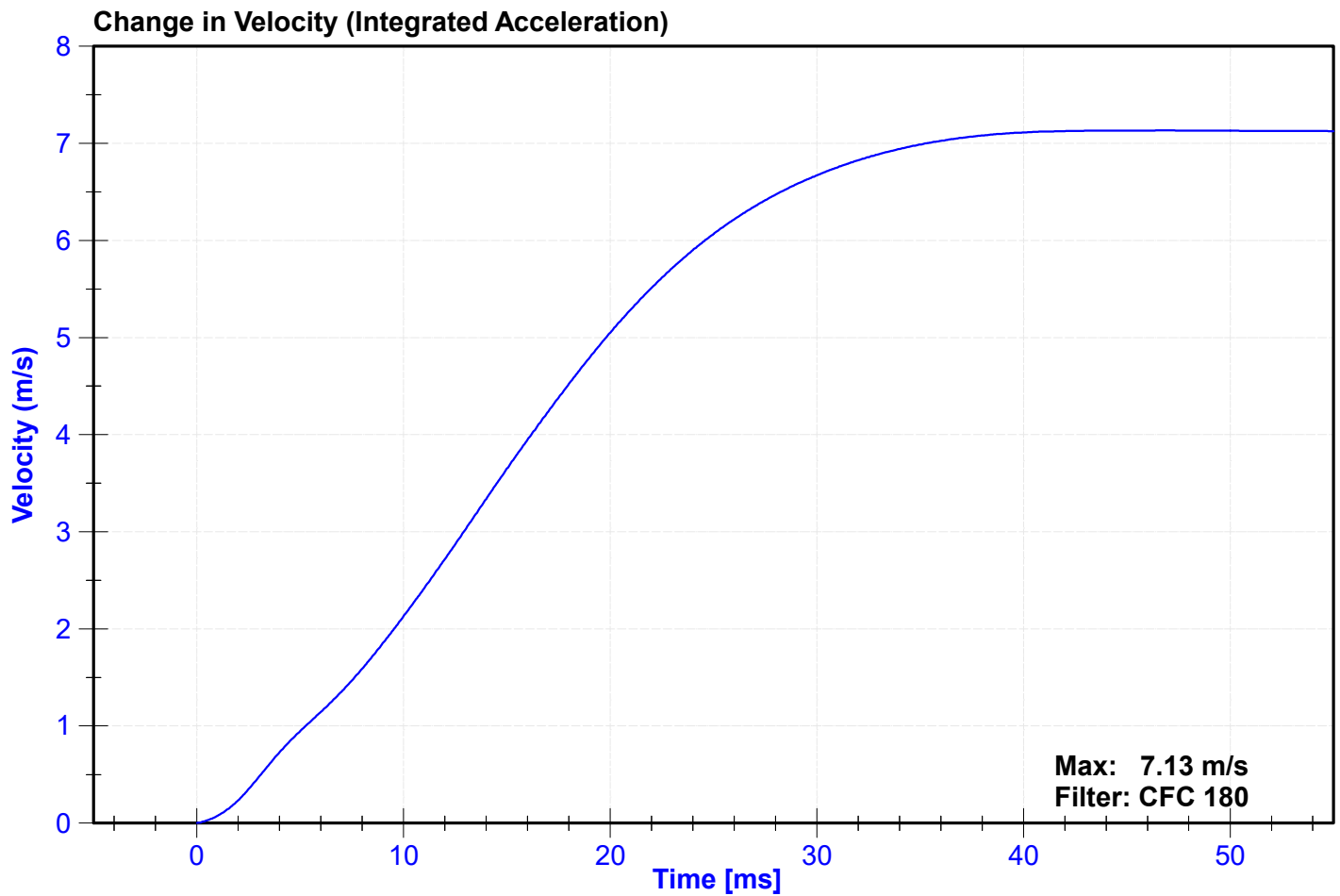
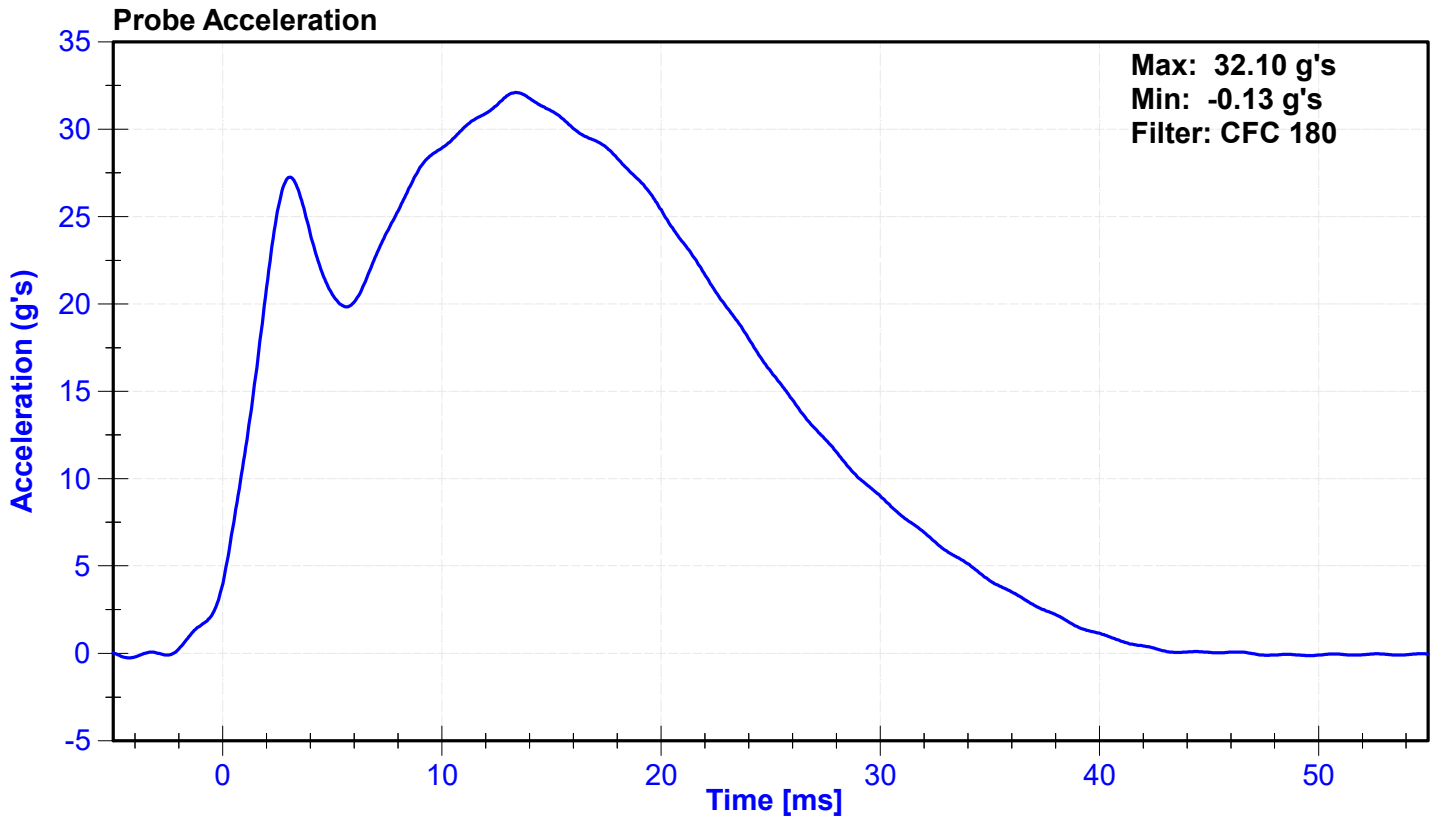
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P40997	5/7/2025	11/3/2025
Chest Potentiometer	Servo	0720	6/17/2025	12/16/2025

Force vs. Displacement







ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

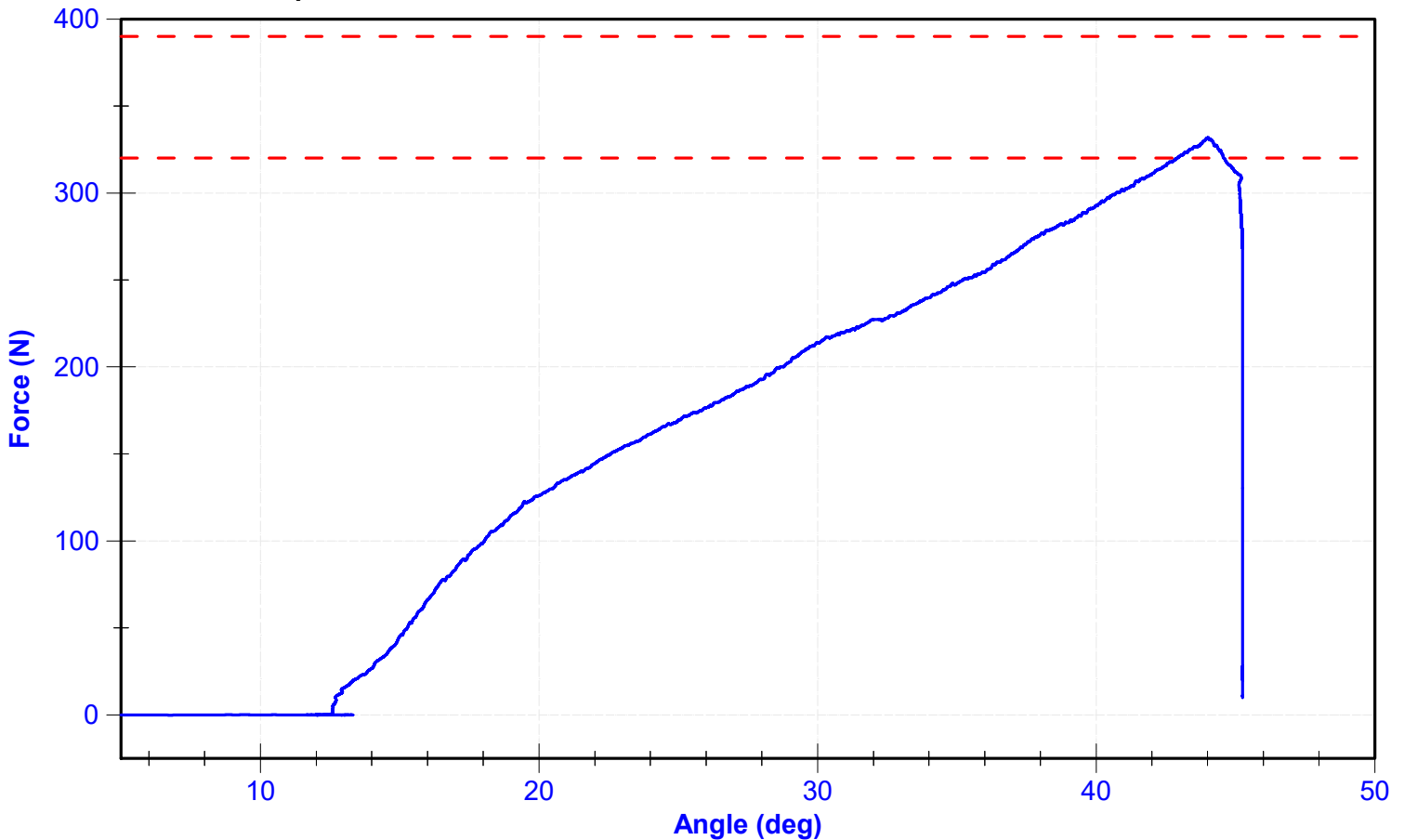
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.4	Pass
Humidity	10	70	%	47	Pass
Initial Angle	0	20	deg	12.5	Pass
Force at 45 Degrees	320	390	N	331.8	Pass
Return Angle Relative to Initial	0	8	deg	6.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker	DS-1905226	2024-11-16	2025-11-16
Load Cell	Interface	493319	2024-08-14	2025-08-14

Force vs. Displacement



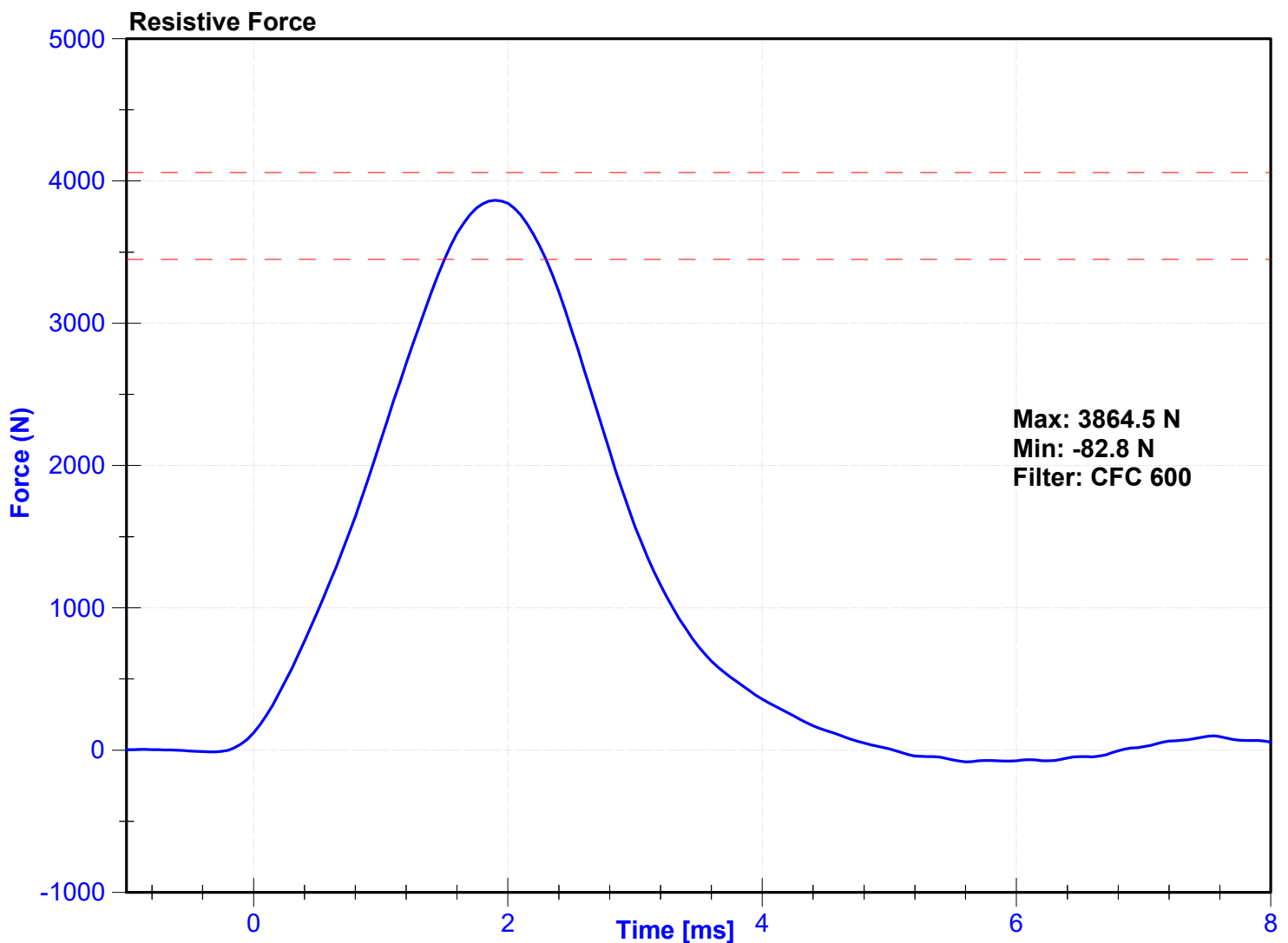
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

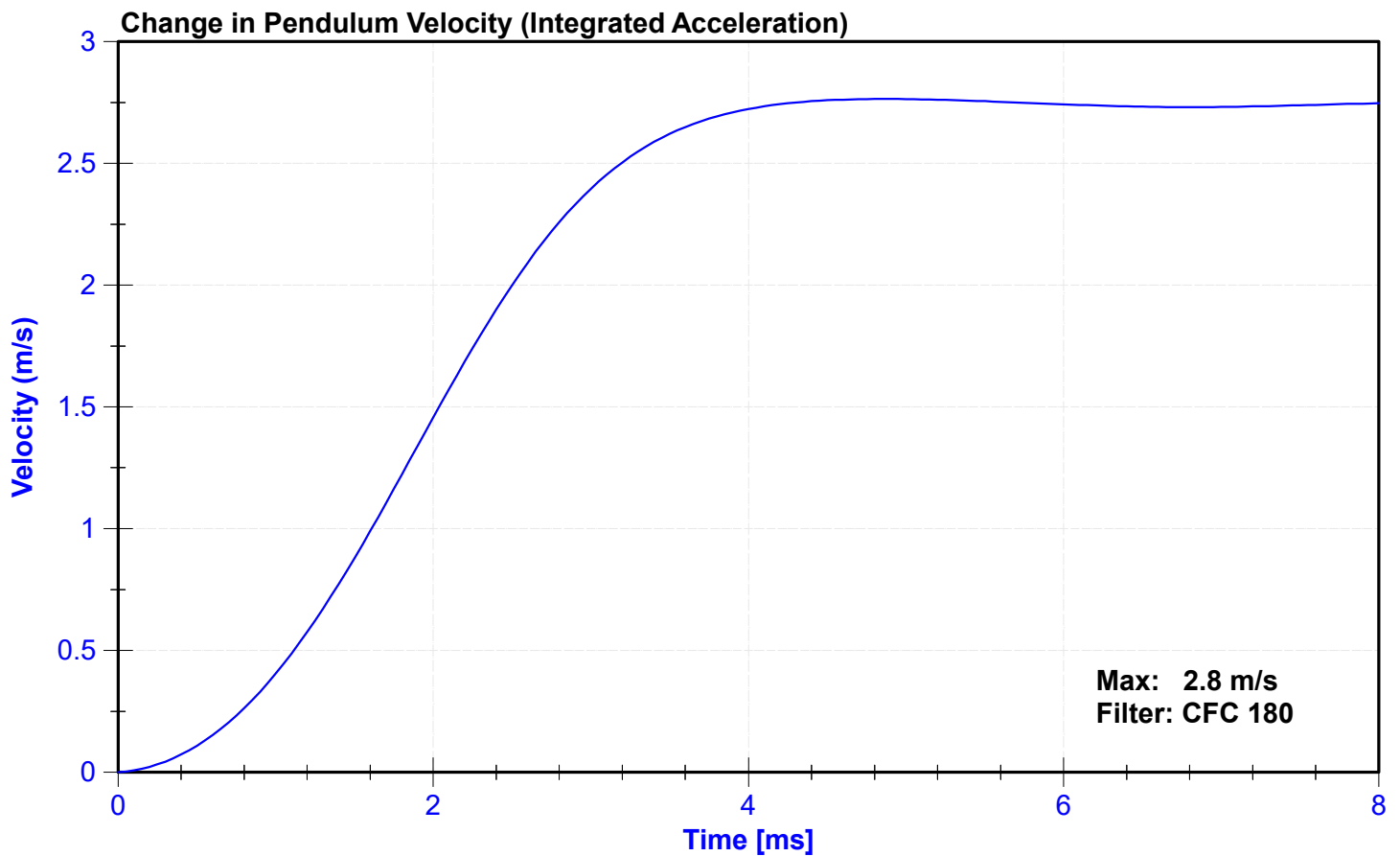
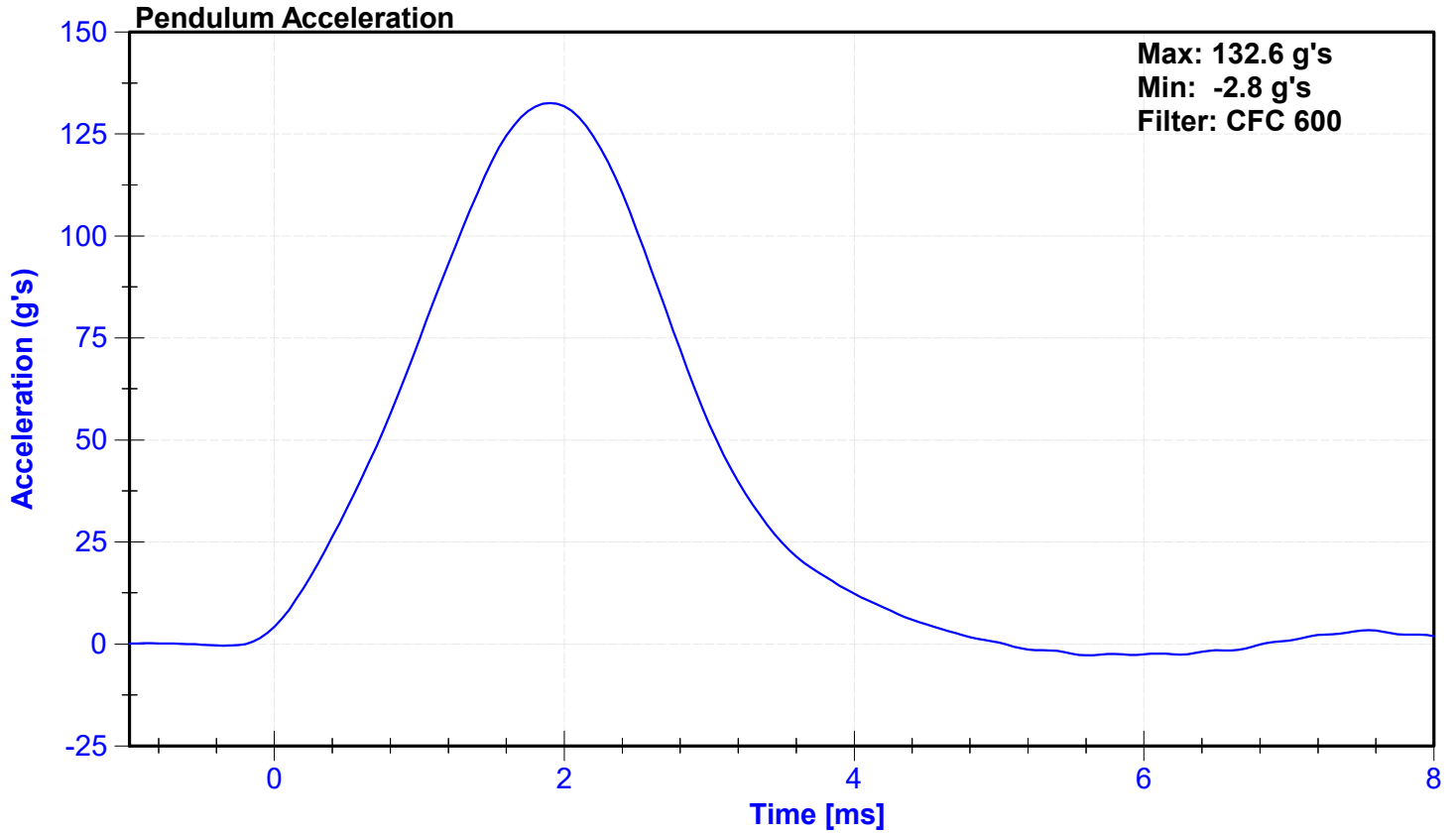
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.1	Pass
Humidity	10	70	%	52	Pass
Velocity	2.07	2.13	m/s	2.112	Pass
Resistive Force	3450	4060	N	3864.5	Pass

Transducer Calibrations

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





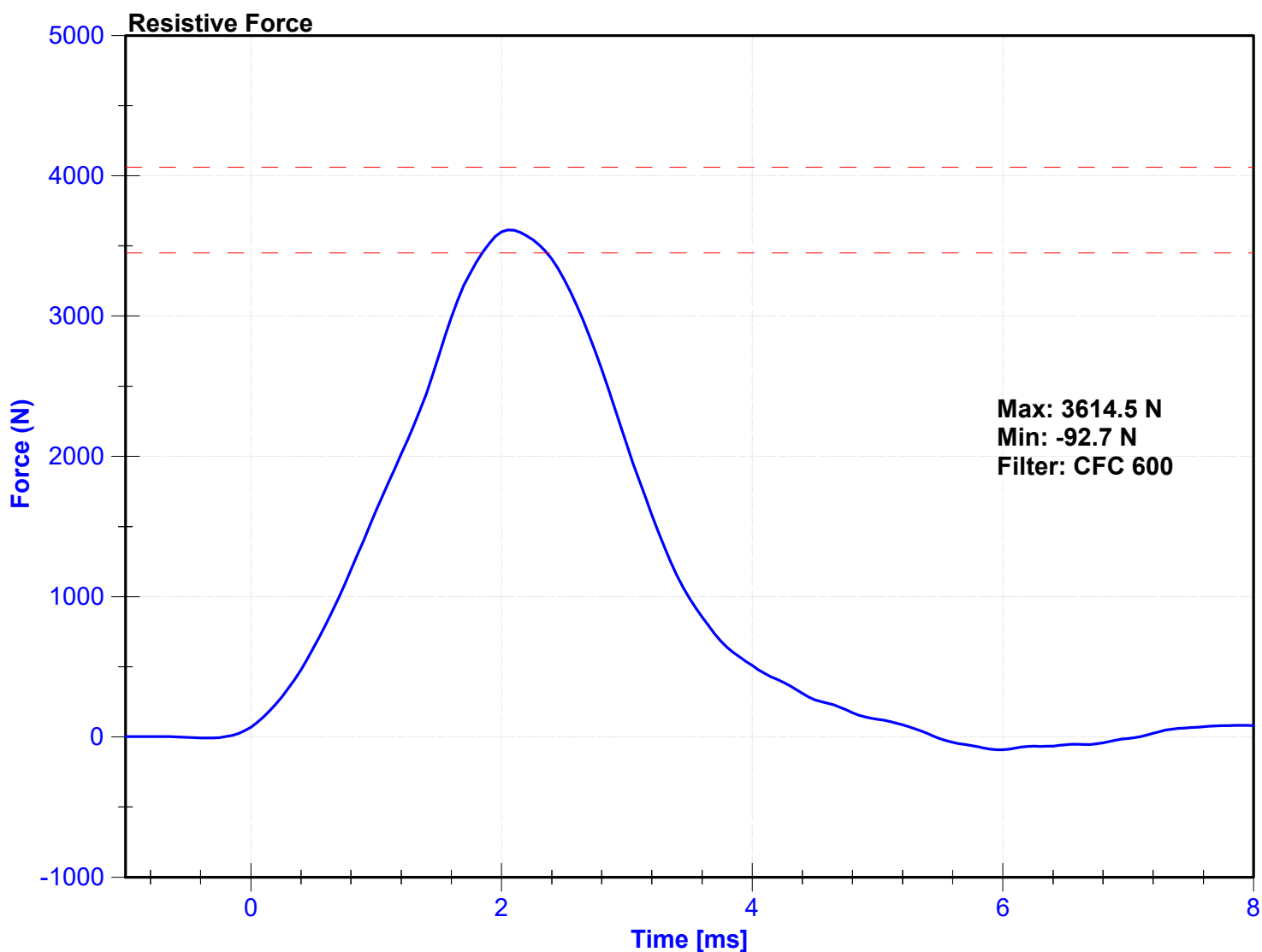
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

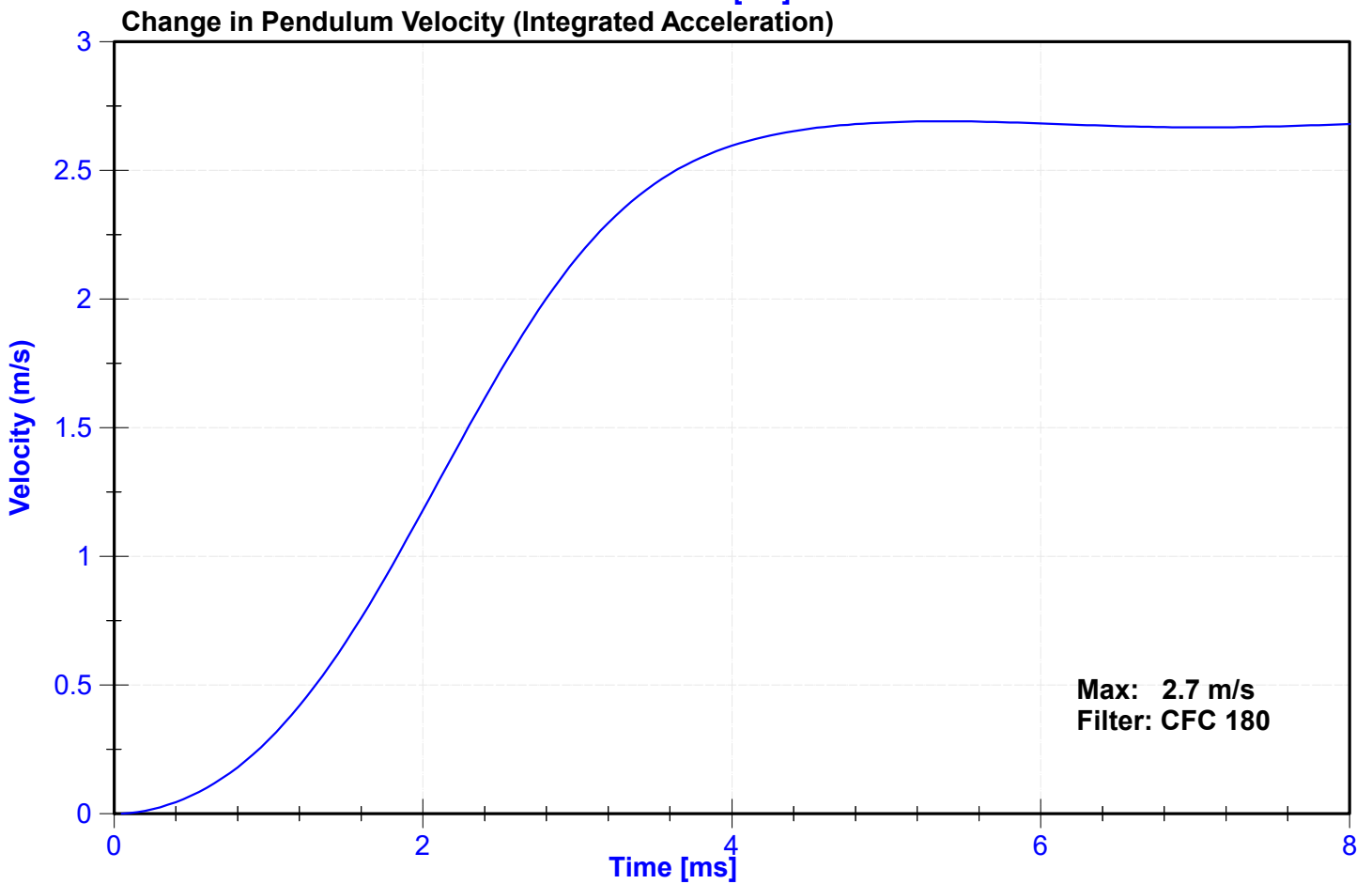
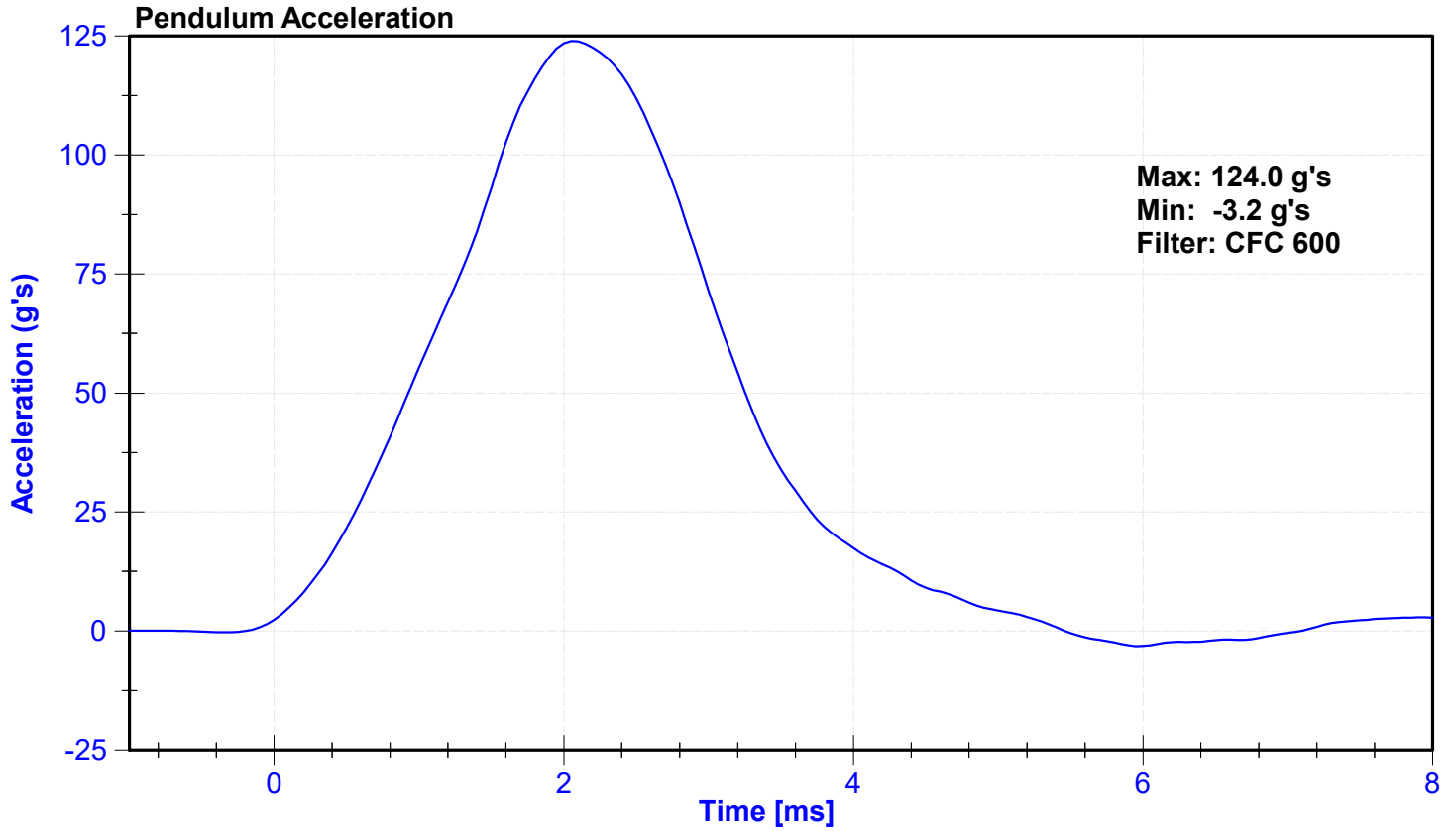
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.1	Pass
Humidity	10	70	%	52	Pass
Velocity	2.07	2.13	m/s	2.078	Pass
Resistive Force	3450	4060	N	3614.5	Pass

Transducer Calibrations

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





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 065

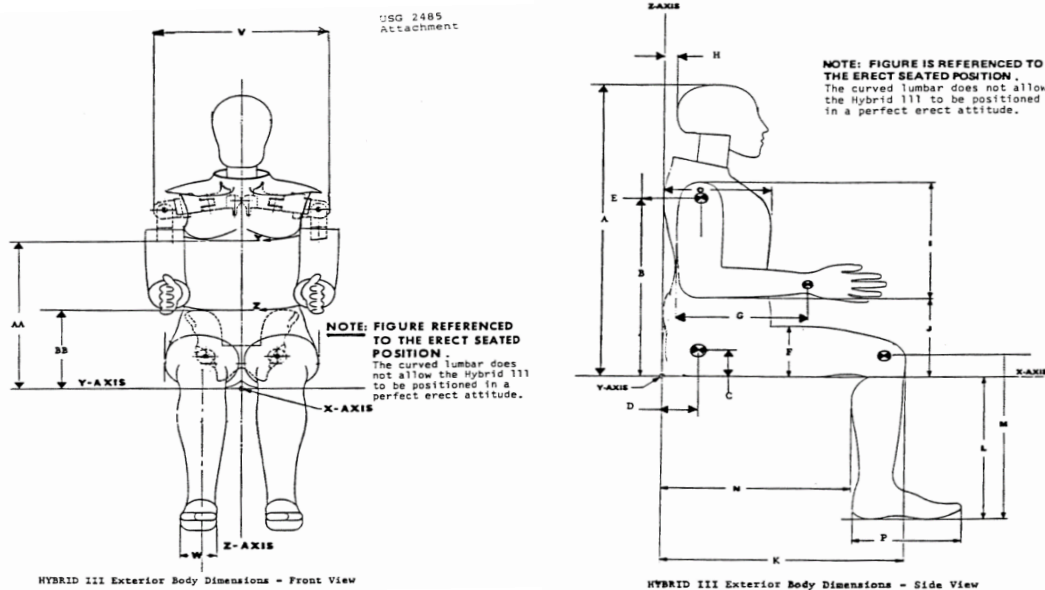


External Measurements - Hybrid 3 - 50th Male

Technician: J. Rios

Date: 07/30/2025

Dummy Serial Number: 065



Symbol	Description	Specification (in)		Result (in)	Pass/Fail
A	Sitting Height	34.6	35.0	34.9	Pass
B	Shoulder Pivot Height	19.9	20.5	20.0	Pass
C	H-Point Height	3.3	3.5	3.3	Pass
D	H-Point from Backline	5.3	5.5	5.3	Pass
E	Shoulder Pivot from Backline	3.3	3.7	3.6	Pass
F	Thigh Clearance	5.5	6.1	5.9	Pass
G	Back of Elbow to Wrist Pivot	11.4	12.0	11.8	Pass
H	Head Back to Backline	1.6	1.8	1.7	Pass
I	Shoulder to Elbow Length	13.0	13.6	13.4	Pass
J	Elbow Rest Height	7.5	8.3	7.8	Pass
K	Buttock to Knee Length	22.8	23.8	23.2	Pass
L	Popliteal Height	16.9	17.9	17.4	Pass
M	Knee Pivot Height	19.1	19.7	19.5	Pass
N	Buttock Popliteal Length	17.8	18.8	18.4	Pass
O	Chest Depth without Jacket	8.4	9.0	8.8	Pass
P	Foot Length (right)	9.9	10.5	10.1	Pass
V	Shoulder Breadth	16.3	17.2	16.5	Pass
W	Foot Breadth	3.6	4.2	3.9	Pass
Y	Chest Circumference with Jacket	38.2	39.4	38.5	Pass
Z	Waist Circumference	32.9	34.1	33.4	Pass
AA	Reference Location (Chest Circumference)	16.9	17.1	17.0	Pass
BB	Reference Location (Waist Circumference)	8.9	9.1	9.0	Pass

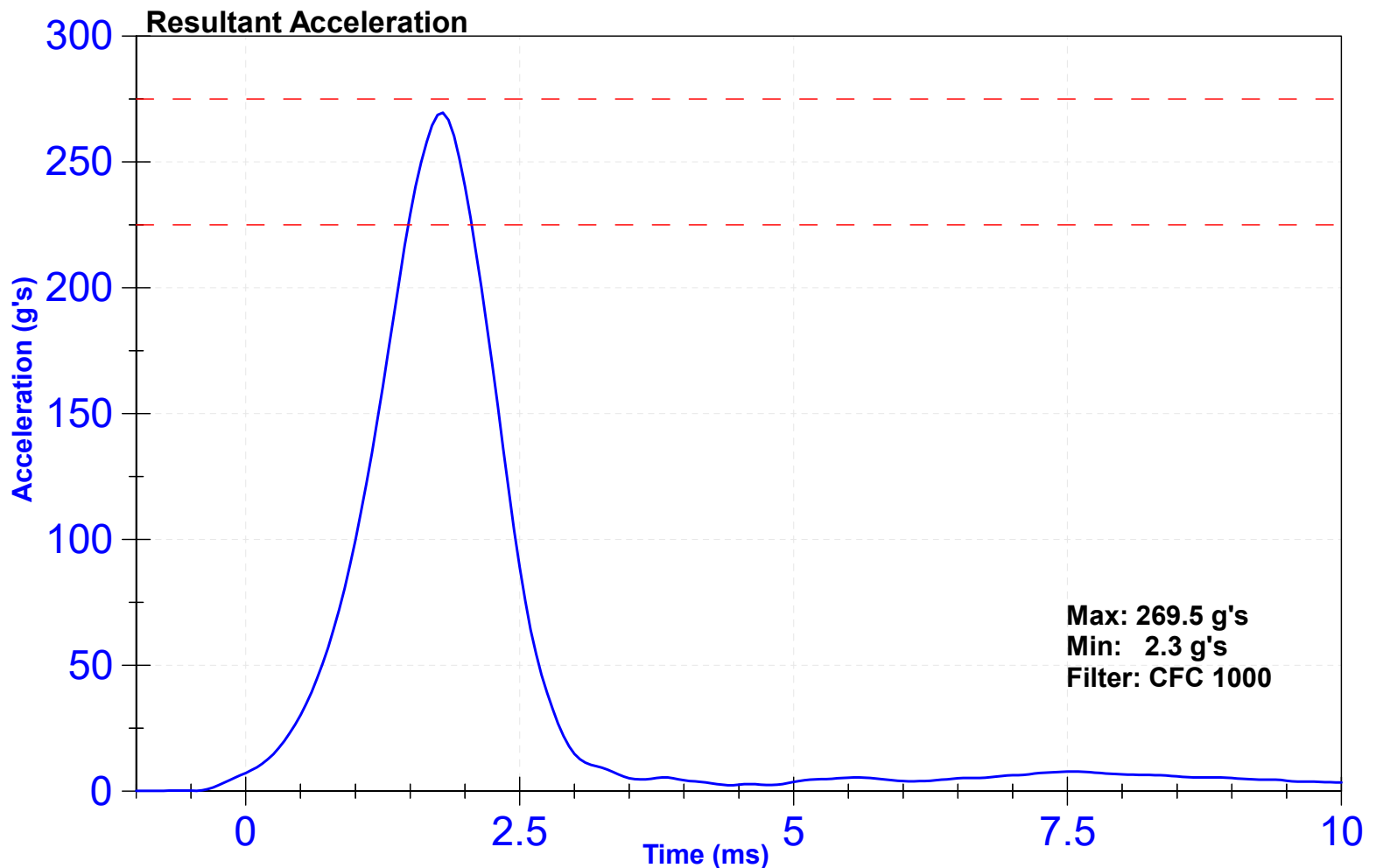
ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

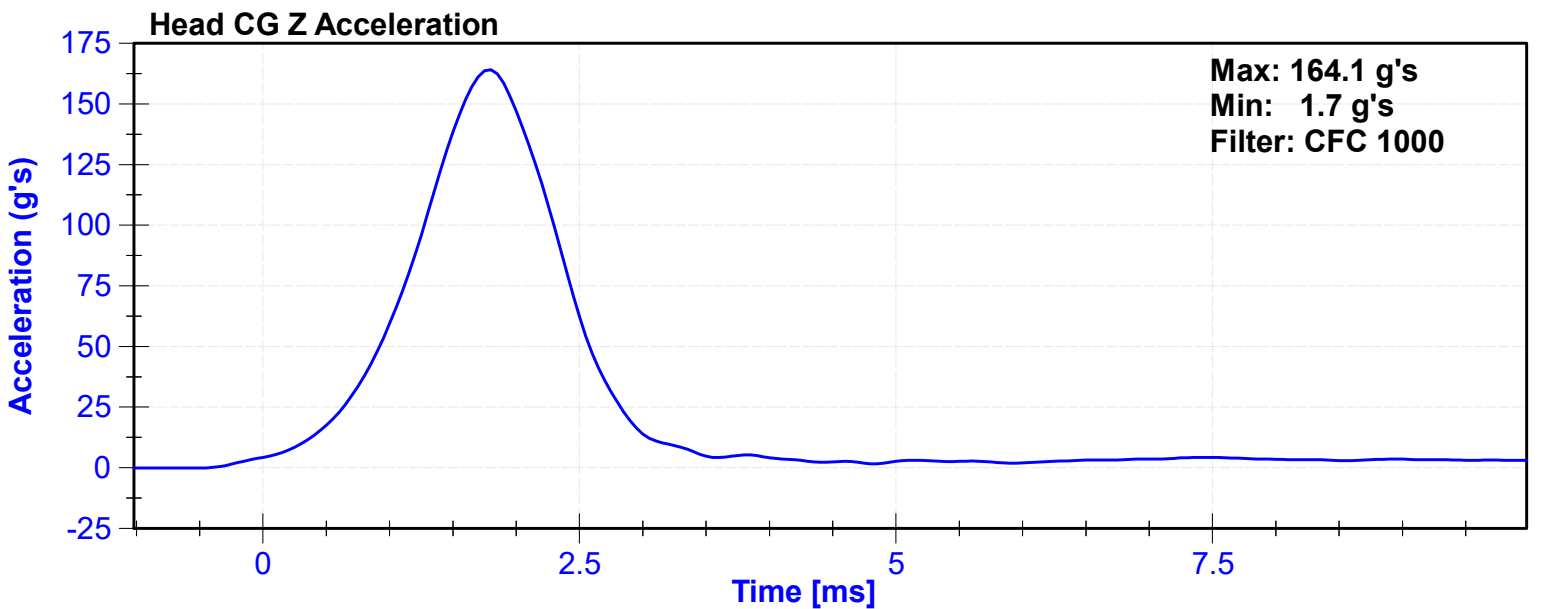
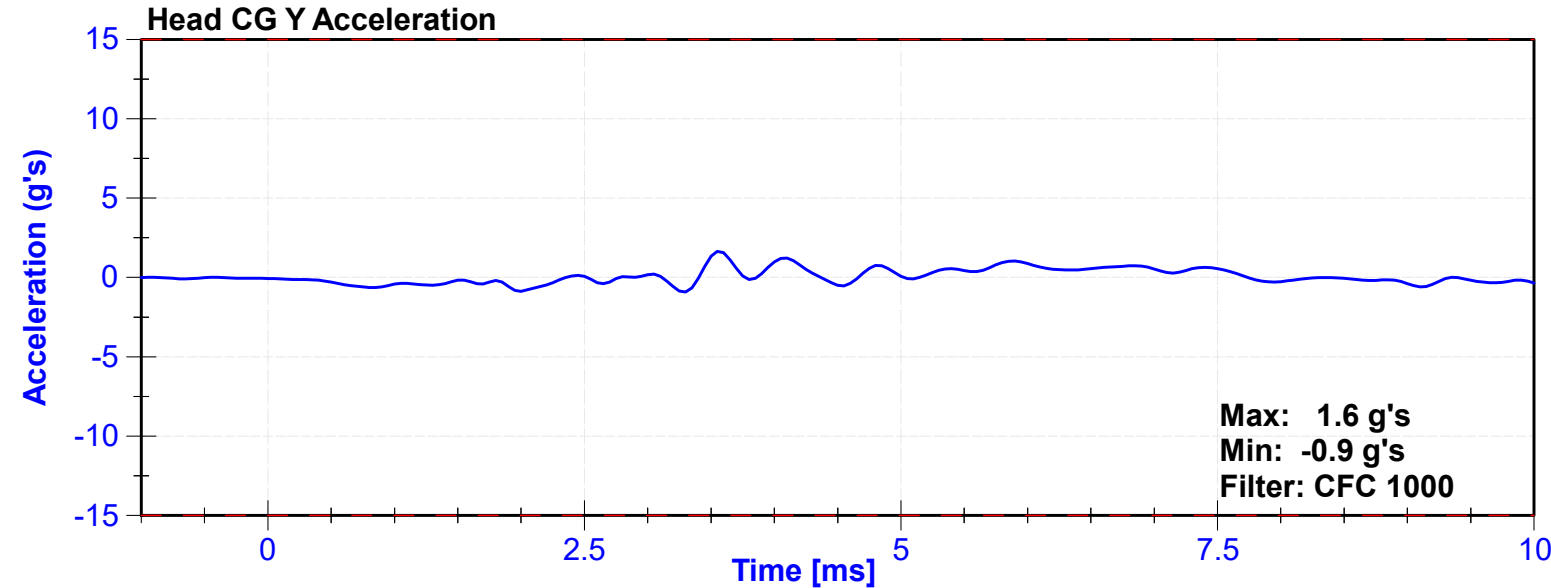
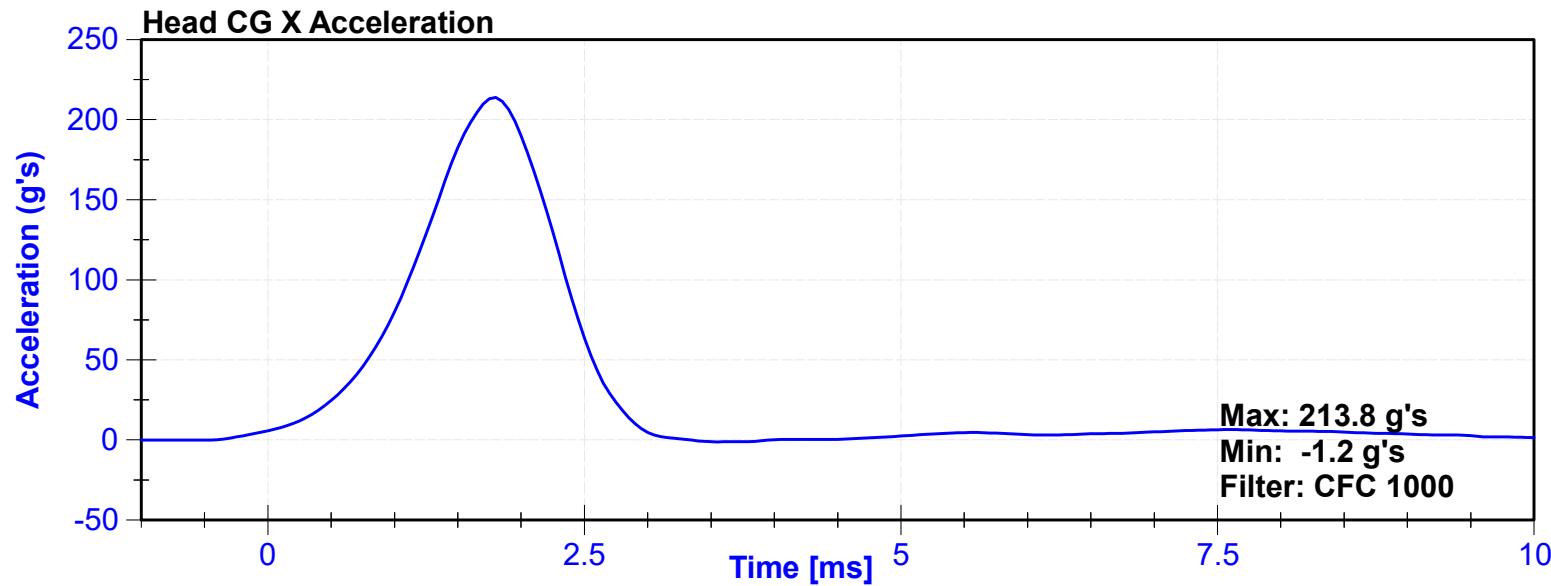
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.2	Pass
Humidity	10	70	%	55	Pass
Resultant Acceleration	225	275	g's	269.5	Pass
Oscillation	0	10	%	2.8	Pass
Lateral Acceleration	-15	15	g's	1.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P52152	6/10/2025	12/7/2025
Y Accelerometer	Endevco	P58888	6/10/2025	12/7/2025
Z Accelerometer	Endevco	P58911	6/10/2025	12/7/2025





ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

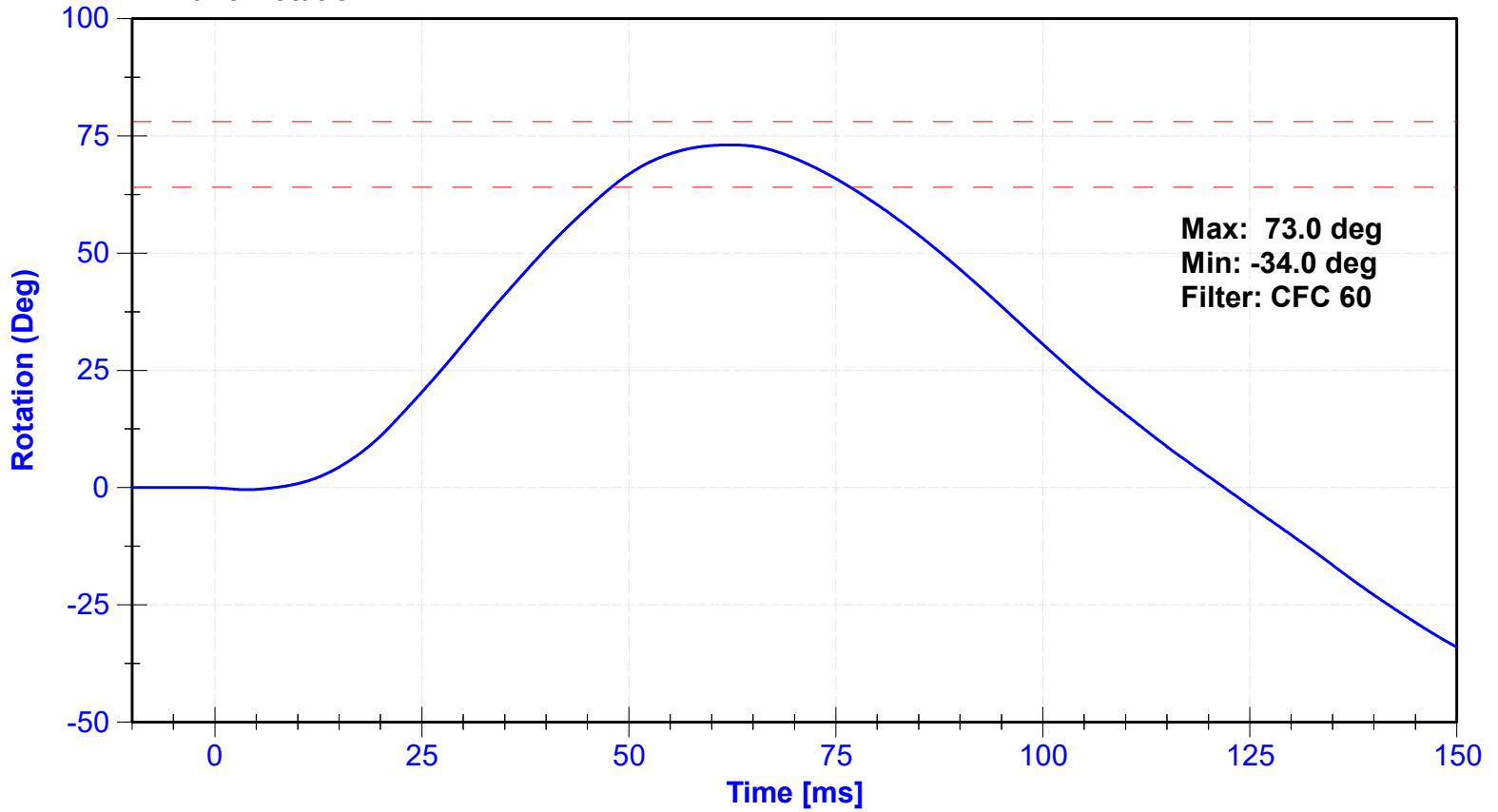
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	6.89	7.13	m/s	6.965	Pass
Pendulum Deceleration at 10ms	22.5	27.5	g's	25.89	Pass
Pendulum Deceleration at 20ms	17.6	22.6	g's	20.99	Pass
Pendulum Deceleration at 30ms	12.5	18.5	g's	16.76	Pass
Max. Pendulum Deceleration After 30ms	0	29	g's	26.0	Pass
Pendulum Deceleration Time to 5 g's	34	42	ms	39.7	Pass
Maximum D Plane Rotation	64	78	deg	73.0	Pass
Time to Maximum Rotation	57	64	ms	62.3	Pass
Rotation Decay to Zero	113	127	ms	122.0	Pass
Moment About Occipital Condyle	88.1	108.4	Nm	91.48	Pass
Time to Maximum Moment	47	58	ms	53.8	Pass
Moment Decay to Zero	97	107	ms	100.0	Pass

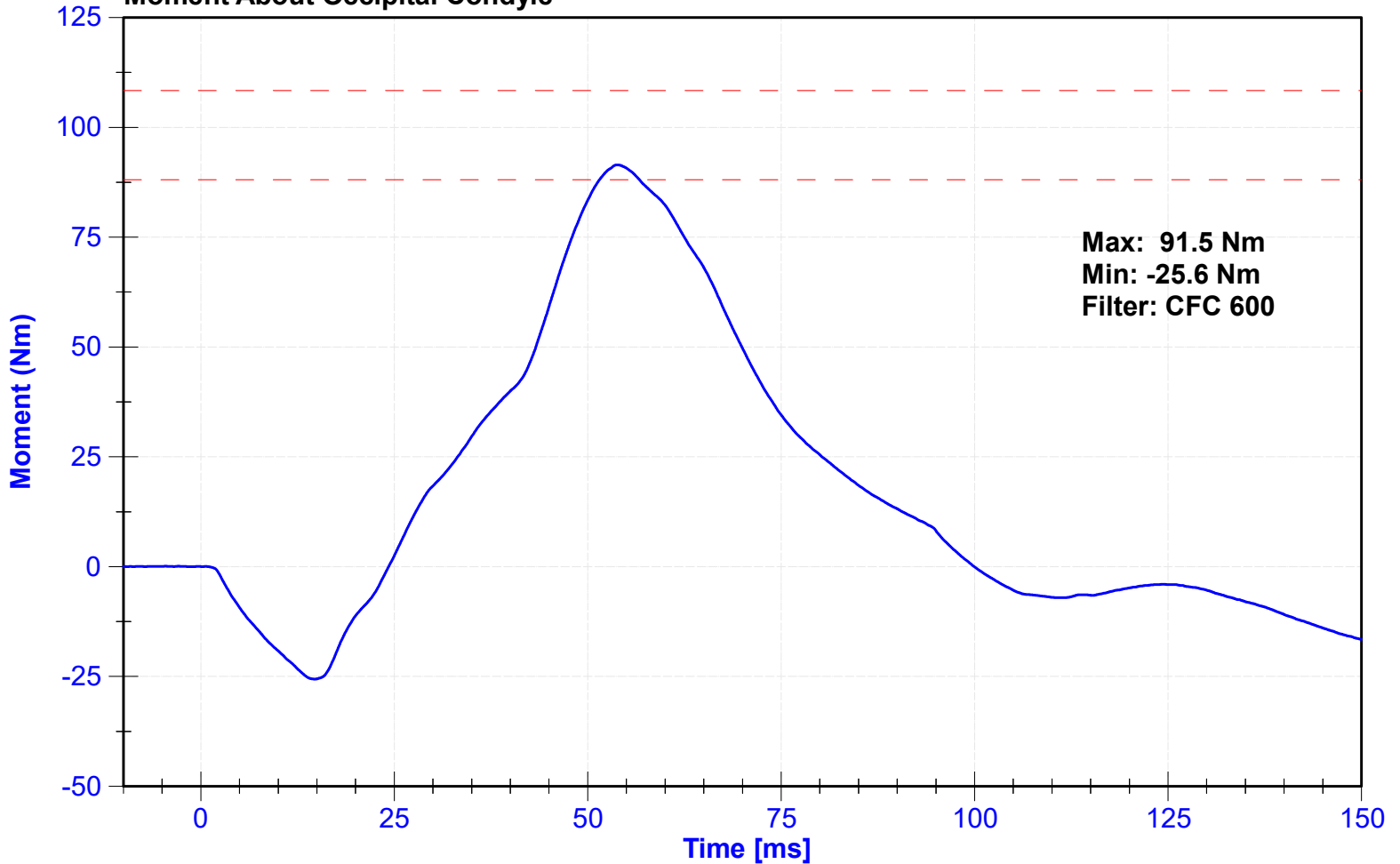
Transducer Calibrations

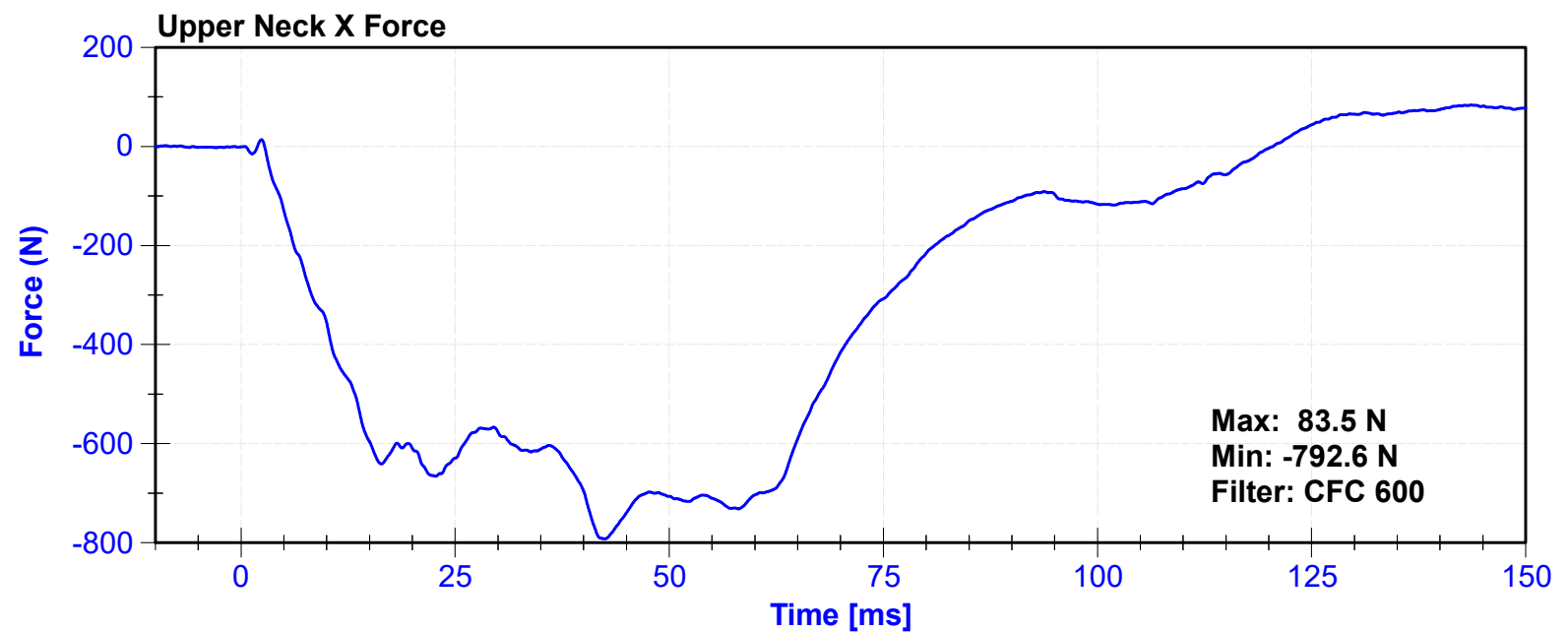
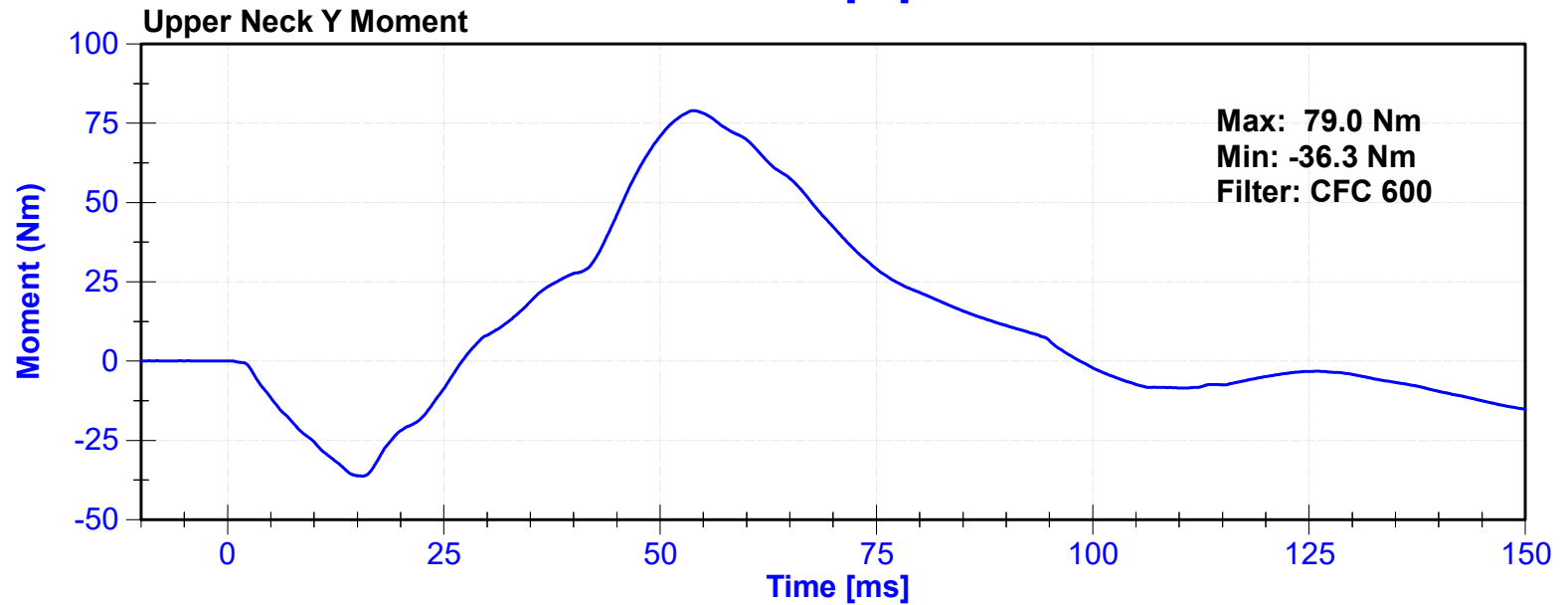
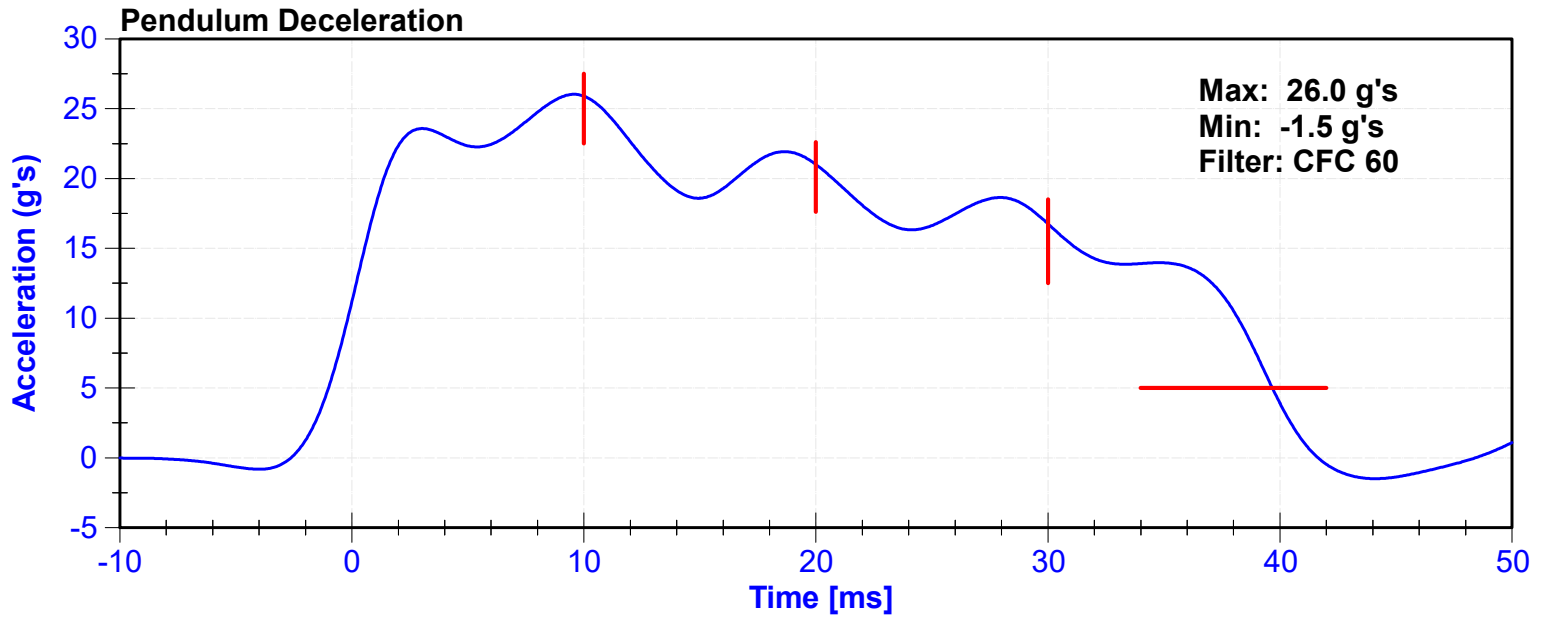
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	2019-FX	9/12/2024	9/12/2025

D-Plane Rotation



Moment About Occipital Condyle





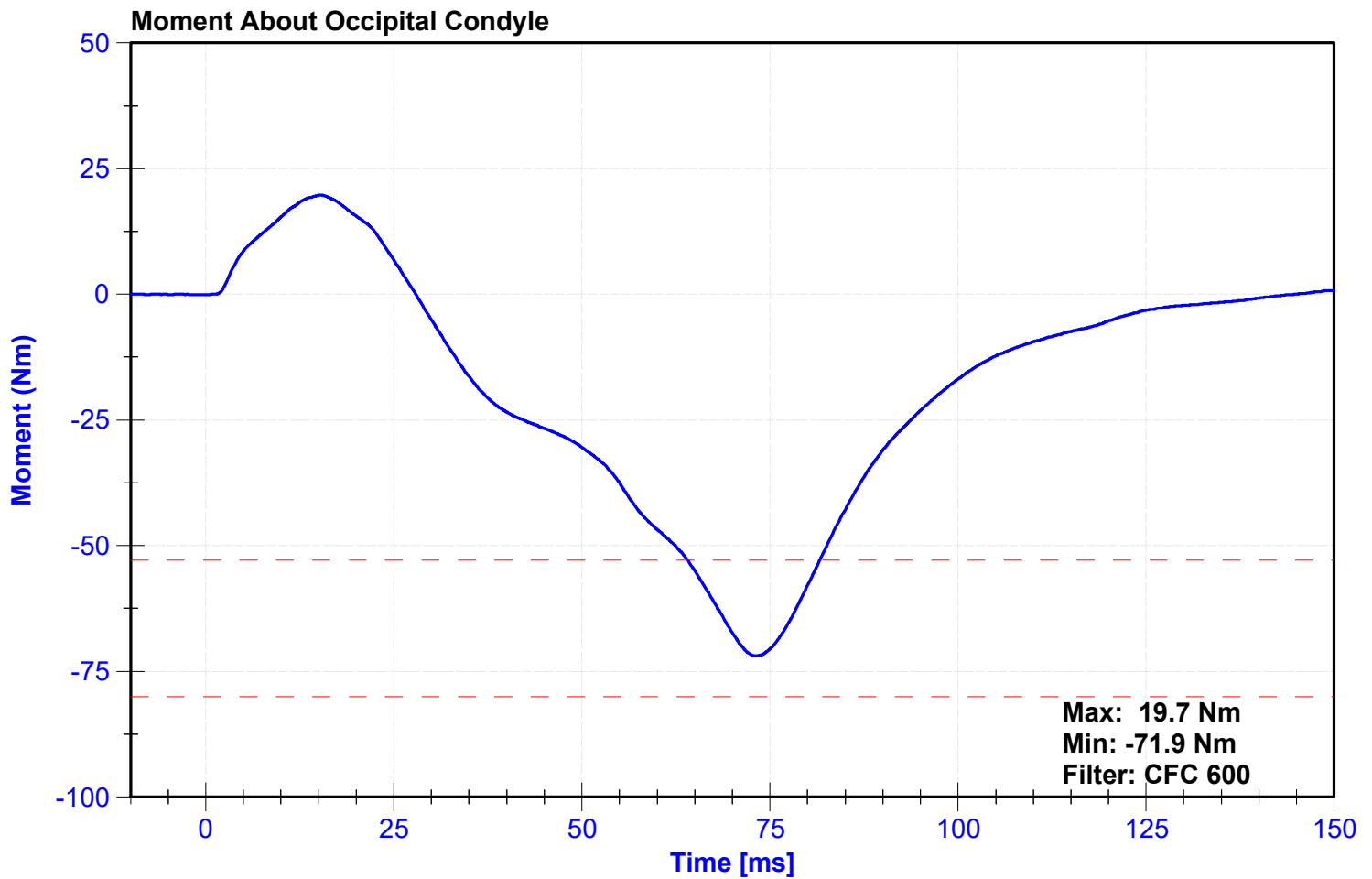
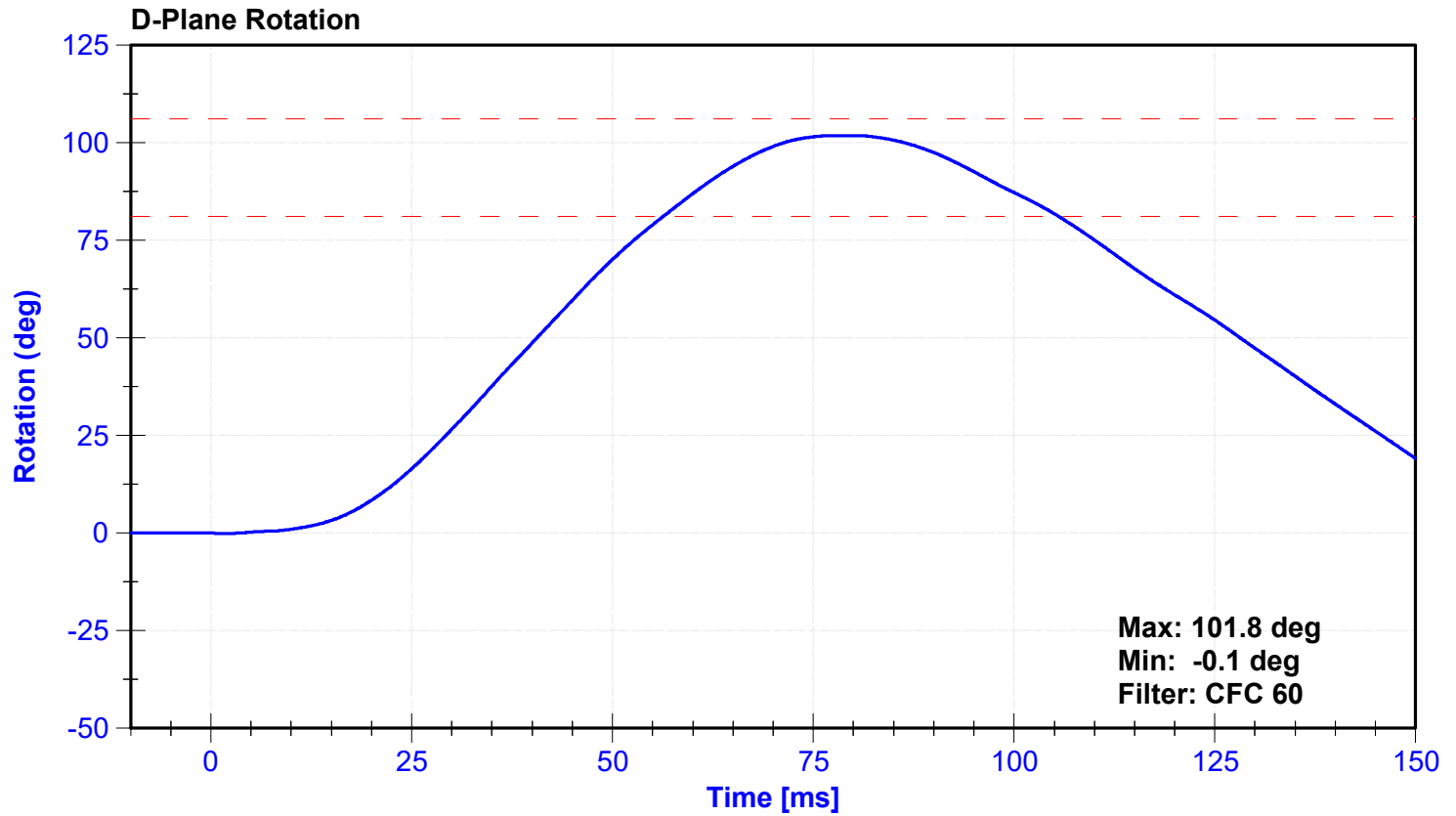
ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

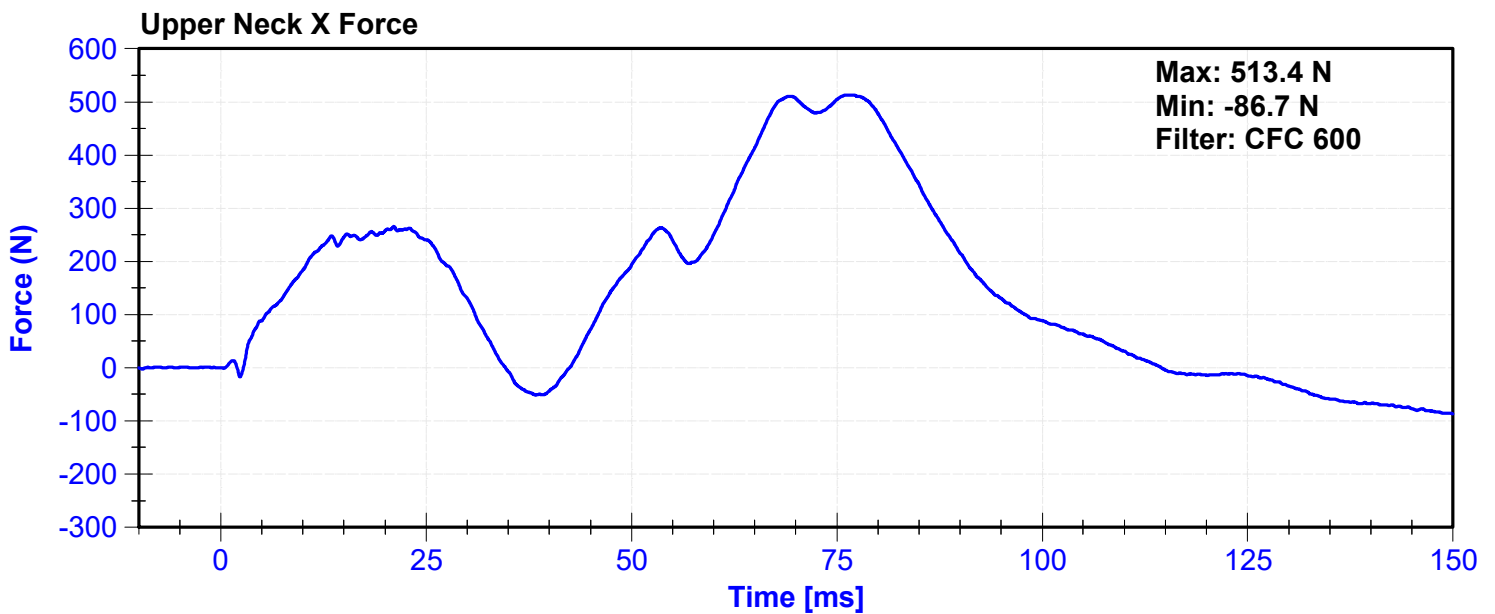
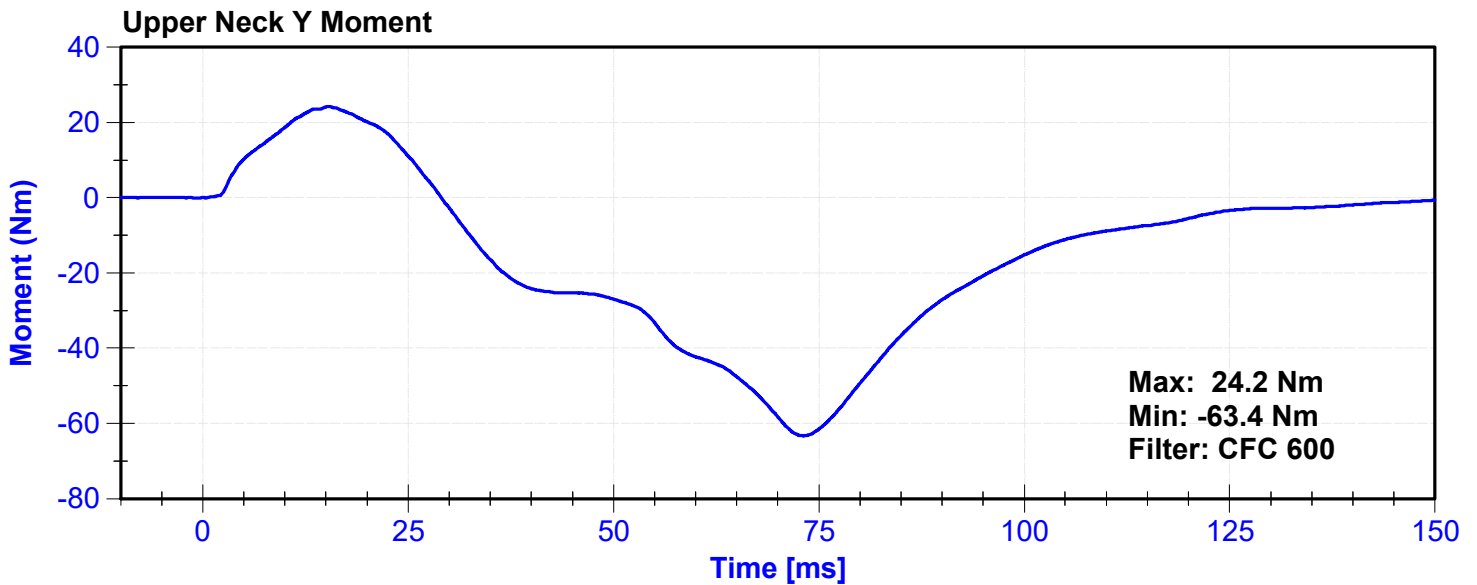
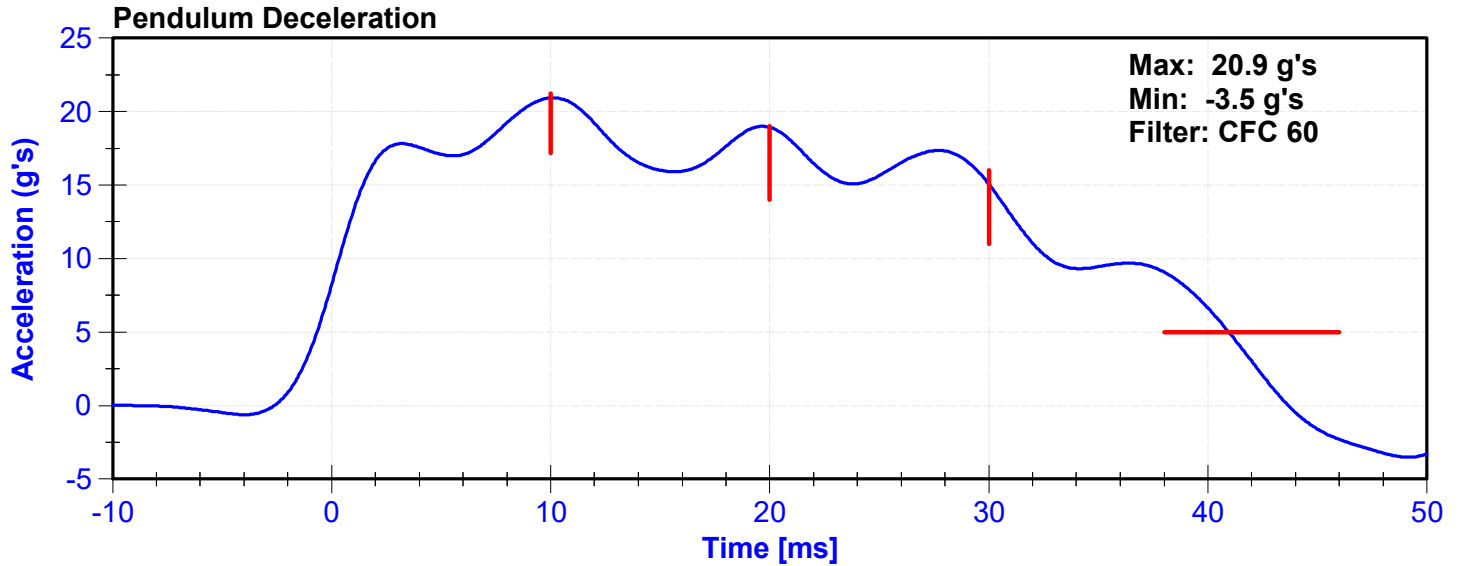
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	5.94	6.19	m/s	6.001	Pass
Pendulum Deceleration at 10ms	17.2	21.2	g's	20.93	Pass
Pendulum Deceleration at 20ms	14	19	g's	18.9	Pass
Pendulum Deceleration at 30ms	11	16	g's	15.1	Pass
Max. Pendulum Deceleration After 30ms	0	22	g's	20.9	Pass
Pendulum Deceleration Time to 5 g's	38	46	ms	41.0	Pass
Maximum D Plane Rotation	81	106	deg	101.8	Pass
Time to Maximum Rotation	72	82	ms	79.2	Pass
Rotation Decay to Zero	147	174	ms	163.8	Pass
Minimum Moment About OC	-80	-52.9	Nm	-71.93	Pass
Time to Minimum Moment	65	79	ms	73.2	Pass
Moment Decay to Zero	120	148	ms	144.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	SP22G_LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	SP22G_LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	2019-FX	9/12/2024	9/12/2025





ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

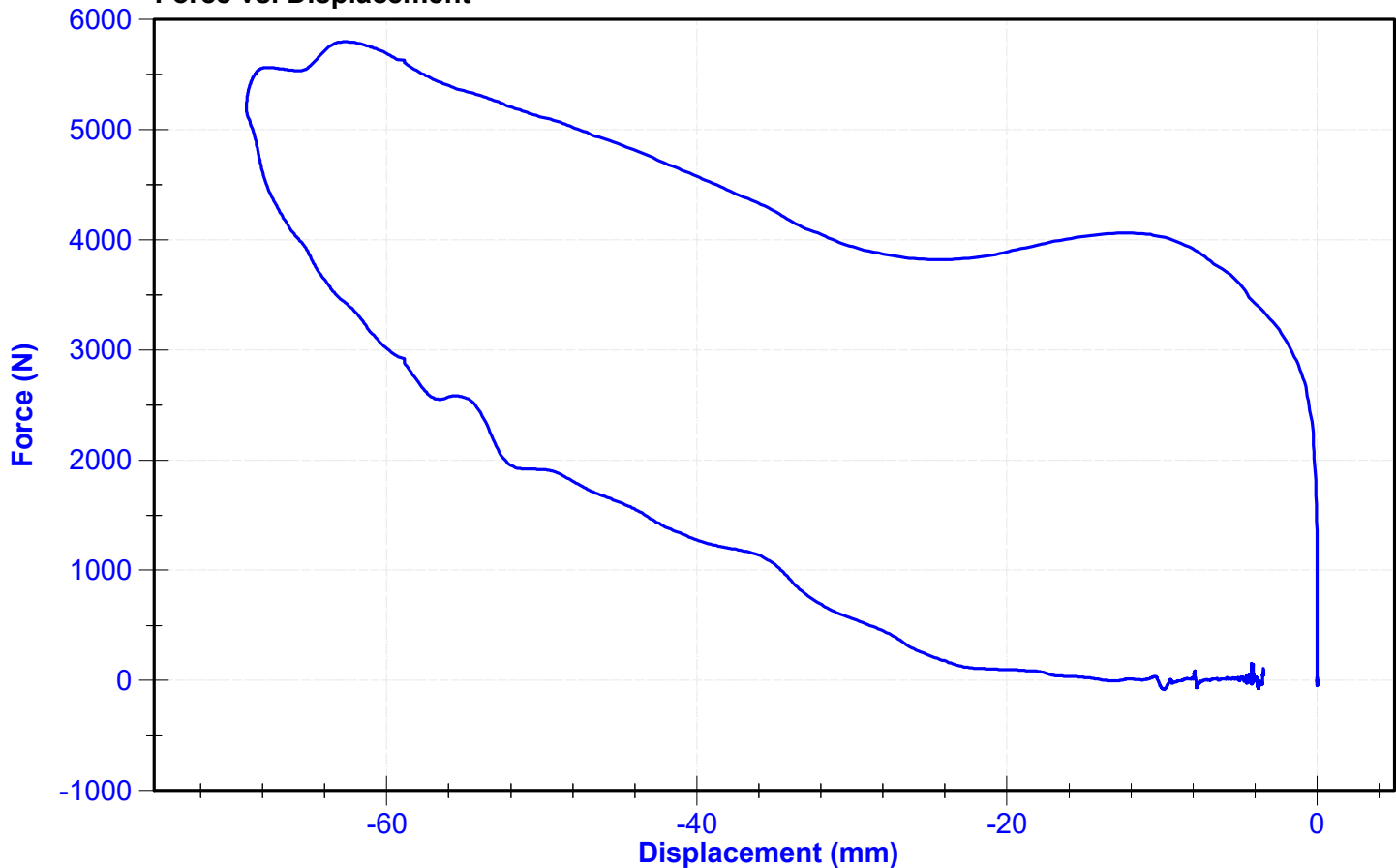
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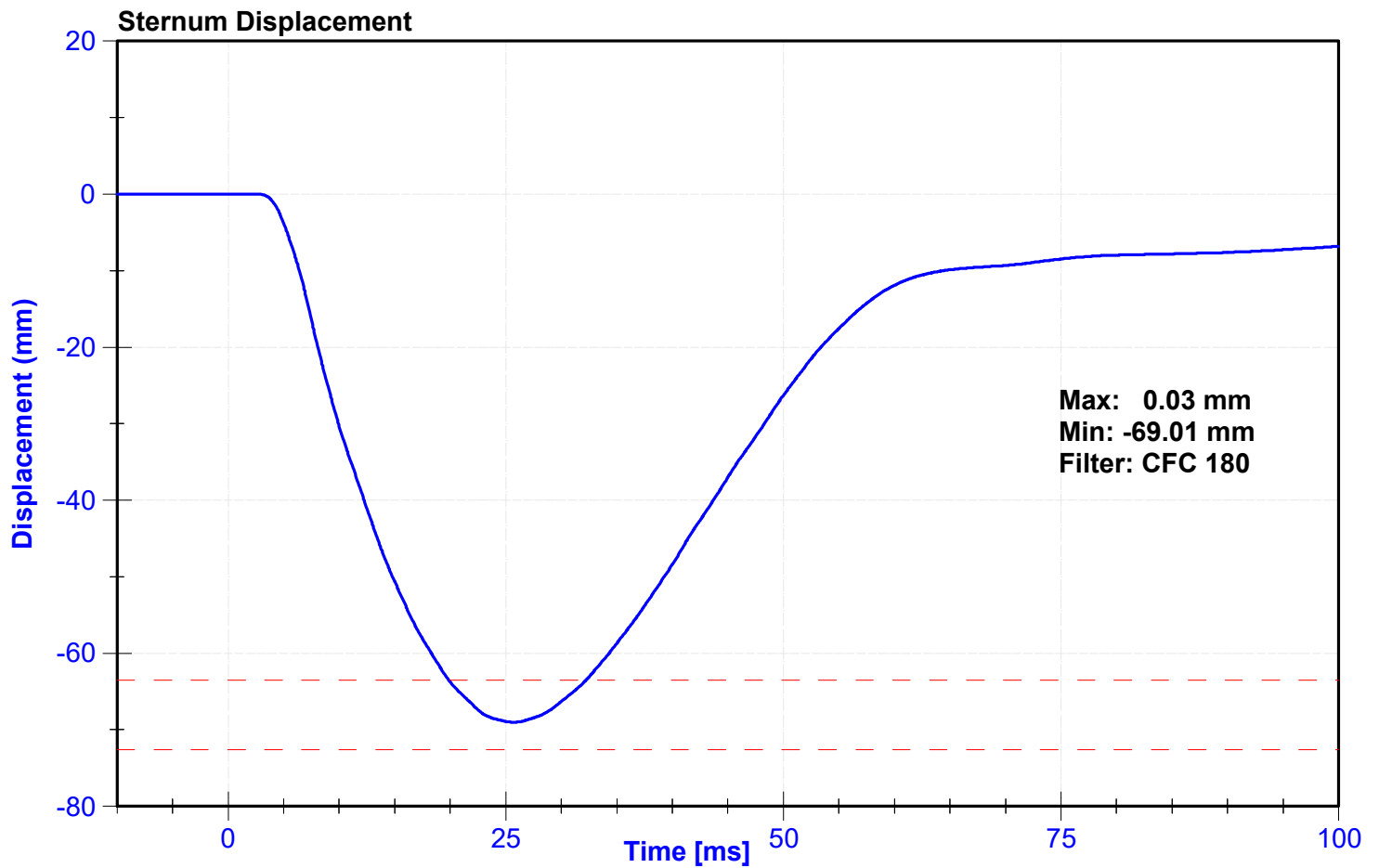
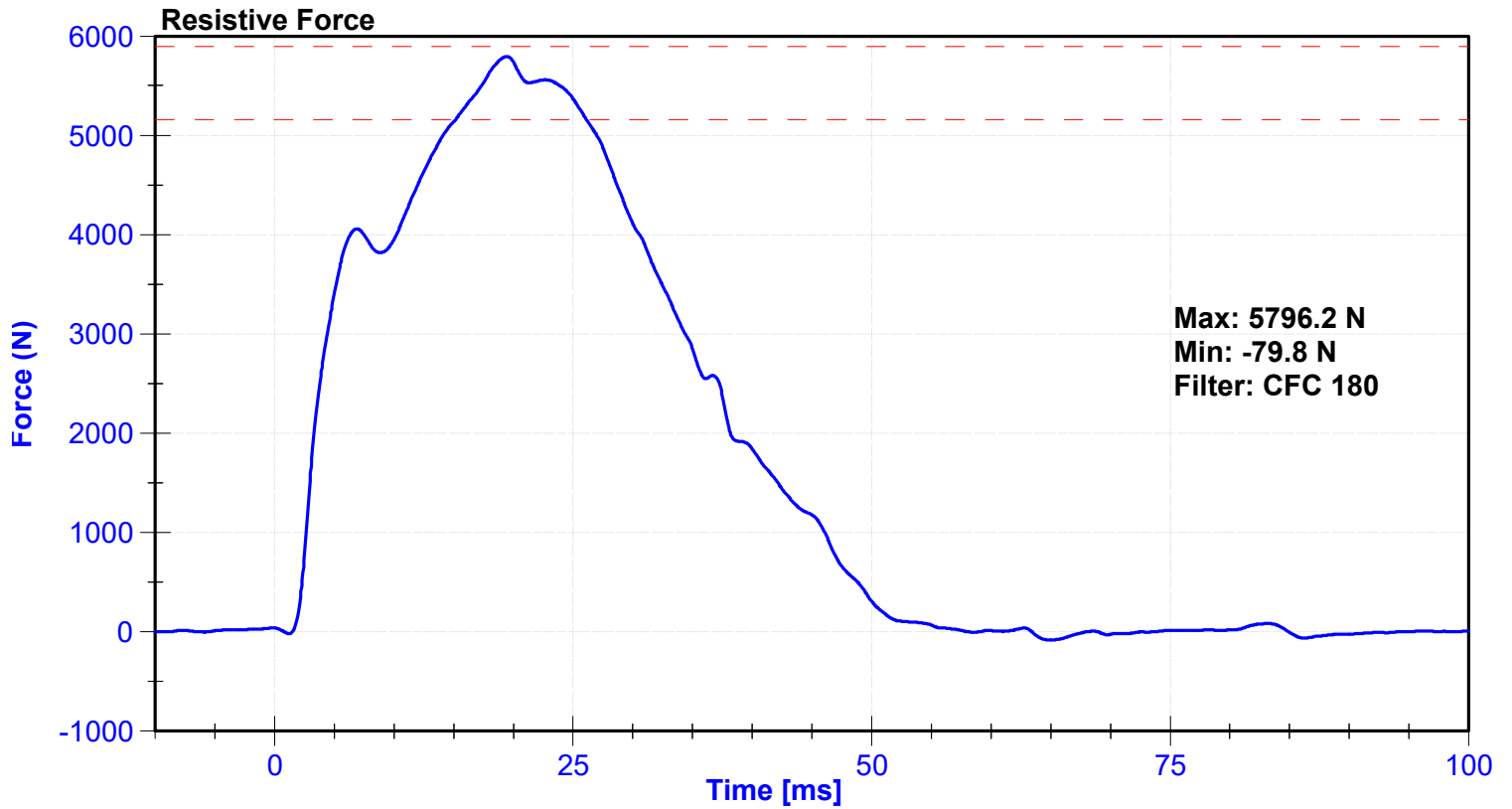
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	52	Pass
Velocity	6.59	6.83	m/s	6.672	Pass
Chest Displacement	-72.6	-63.5	mm	-69.01	Pass
Resistive Force	5160	5894	N	5796.2	Pass
Hysteresis	69	85	%	71.6	Pass

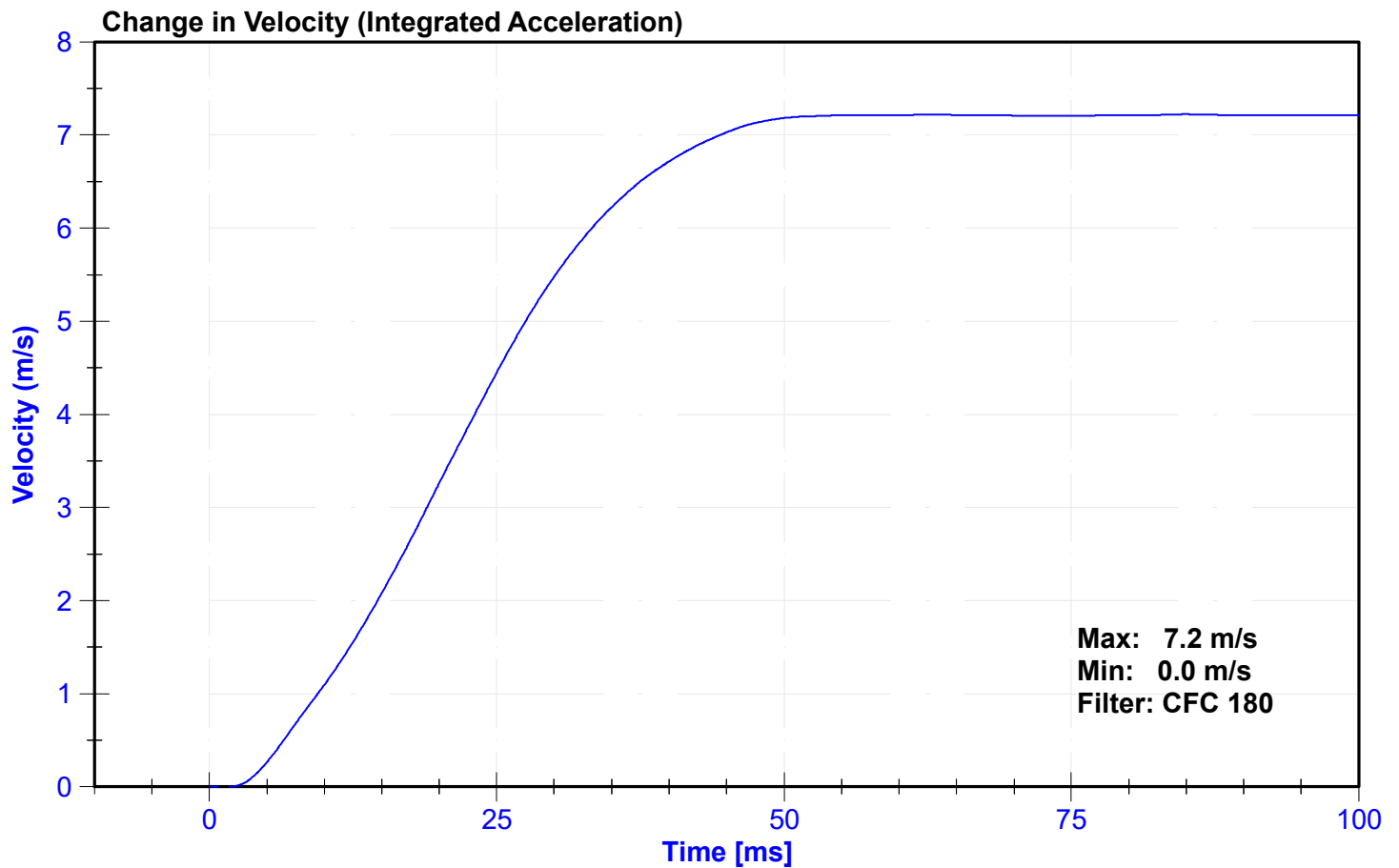
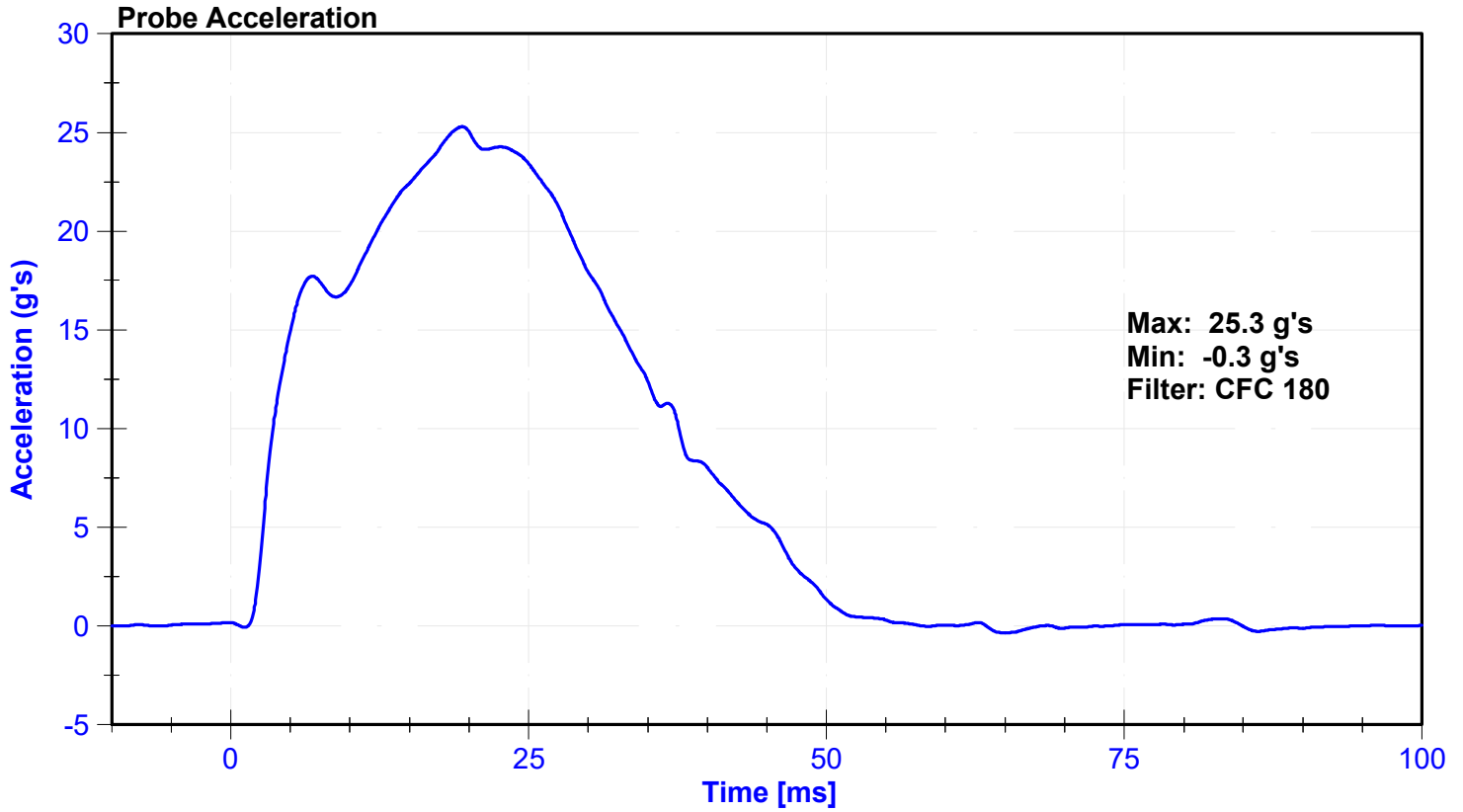
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Chest Potentiometer	Servo	1046	6/10/2025	12/9/2025

Force vs. Displacement







ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

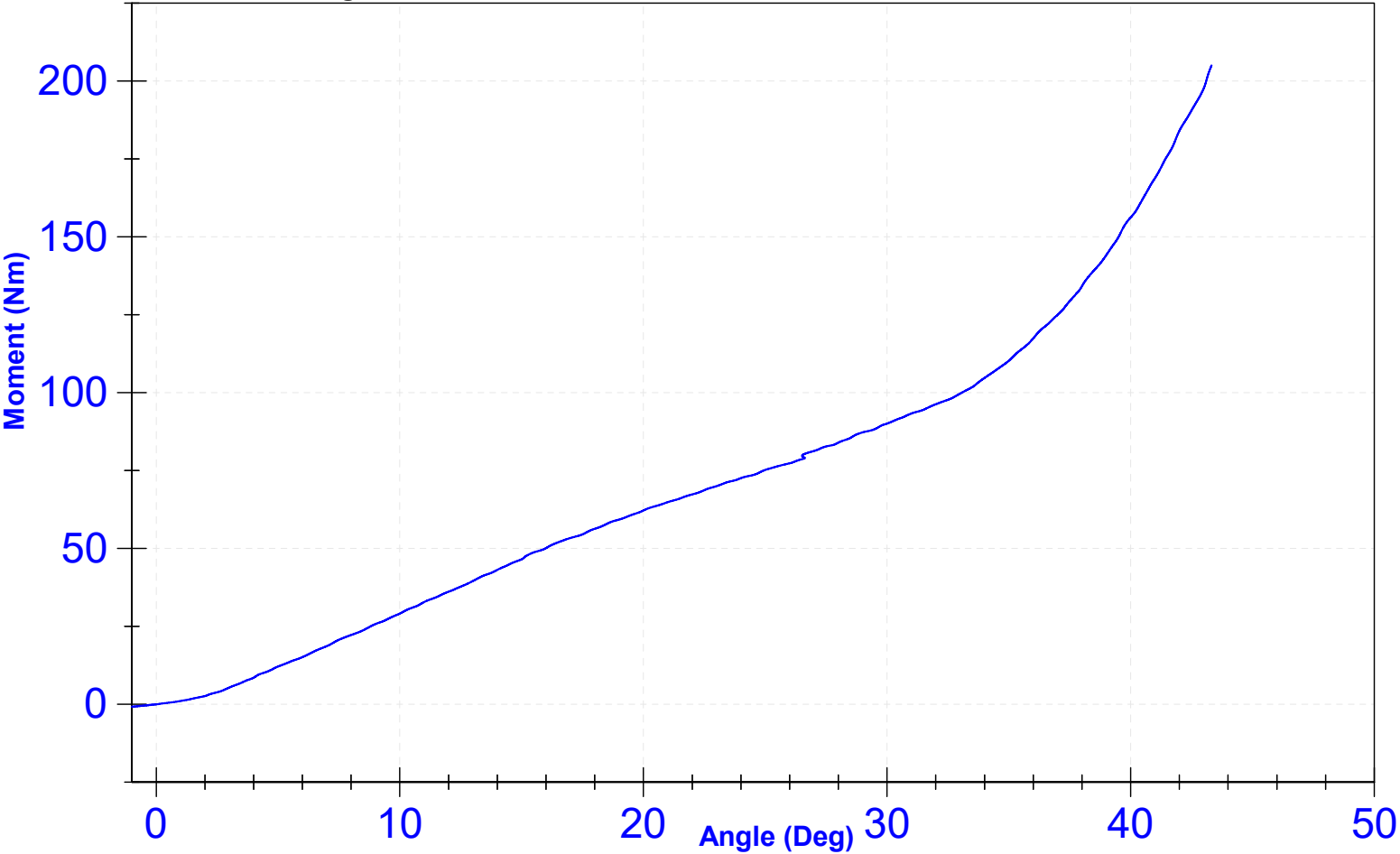
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.2	Pass
Humidity	10	70	%	55	Pass
Average Velocity	5	10	deg/s	7.1	Pass
Angle at 203Nm	40	50	deg	43.2	Pass
Moment at 30 degrees	0	94.9	Nm	90.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS0008	9/23/2024	9/23/2025
Load Cell	PCB 2301-02	115	2024-11-11	2025-11-11

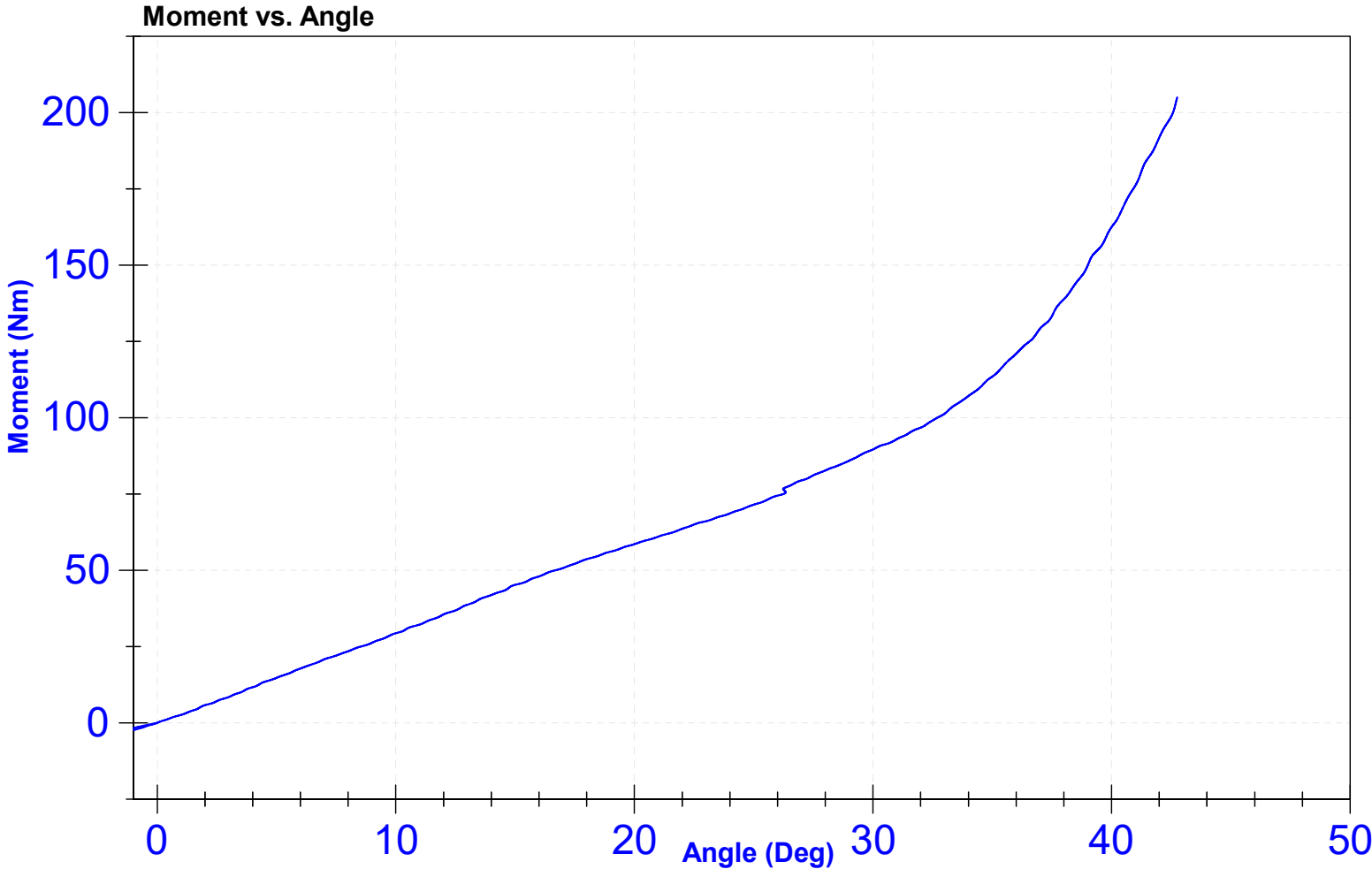
Moment vs. Angle



ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

Test Parameter	Results		Unit	Result	Pass/Fail
	Minimum Specification	Maximum Specification			
Temperature	18.9	25.6	°C	22.2	Pass
Humidity	10	70	%	55	Pass
Average Velocity	5	10	deg/s	7.1	Pass
Angle at 203Nm	40	50	deg	42.7	Pass
Moment at 30 degrees	0	94.9	Nm	89.6	Pass

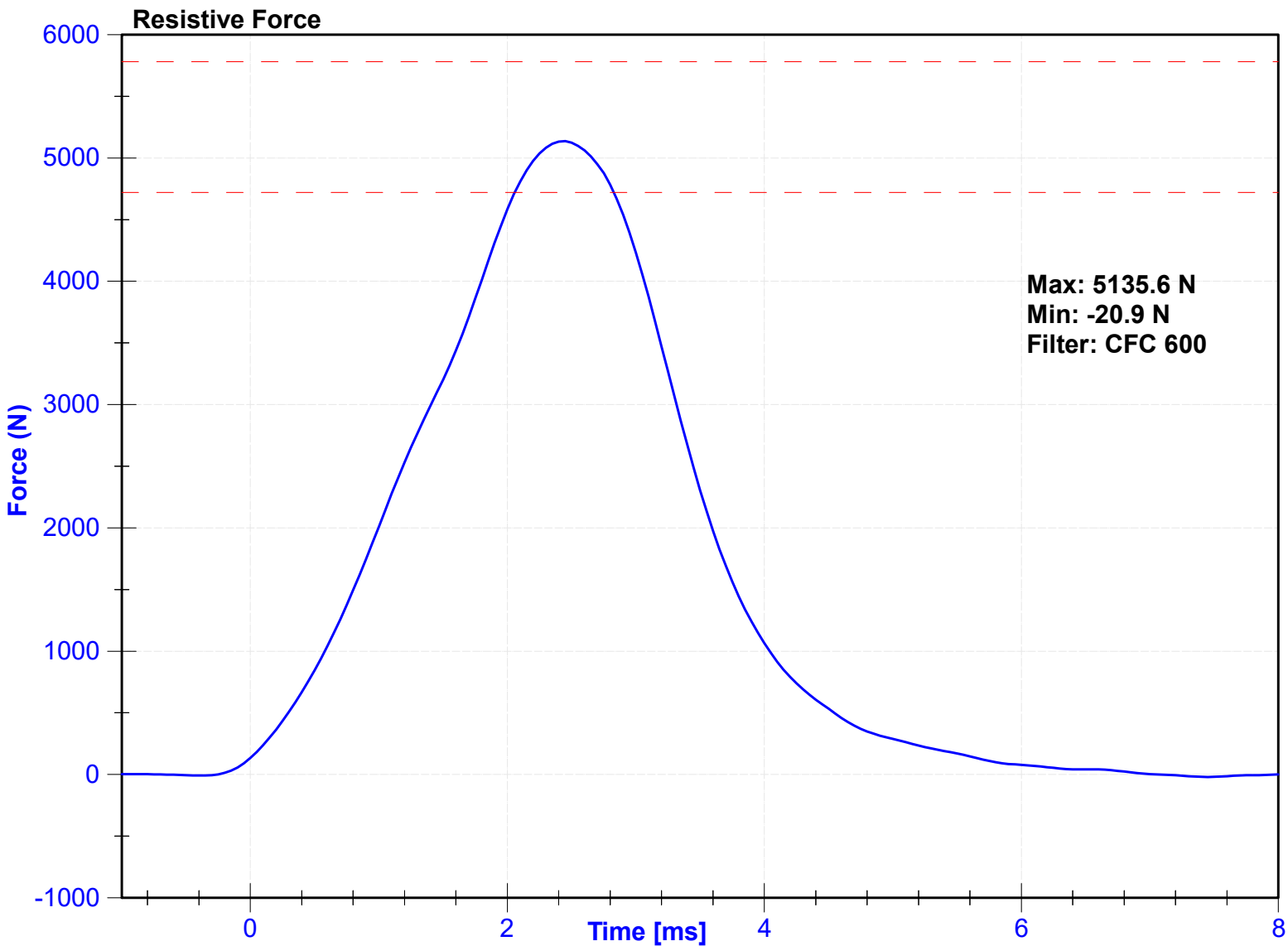
Transducer Calibrations				
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS0008	9/23/2024	9/23/2025
Load Cell	PCB 2301-02	115	2024-11-11	2025-11-11

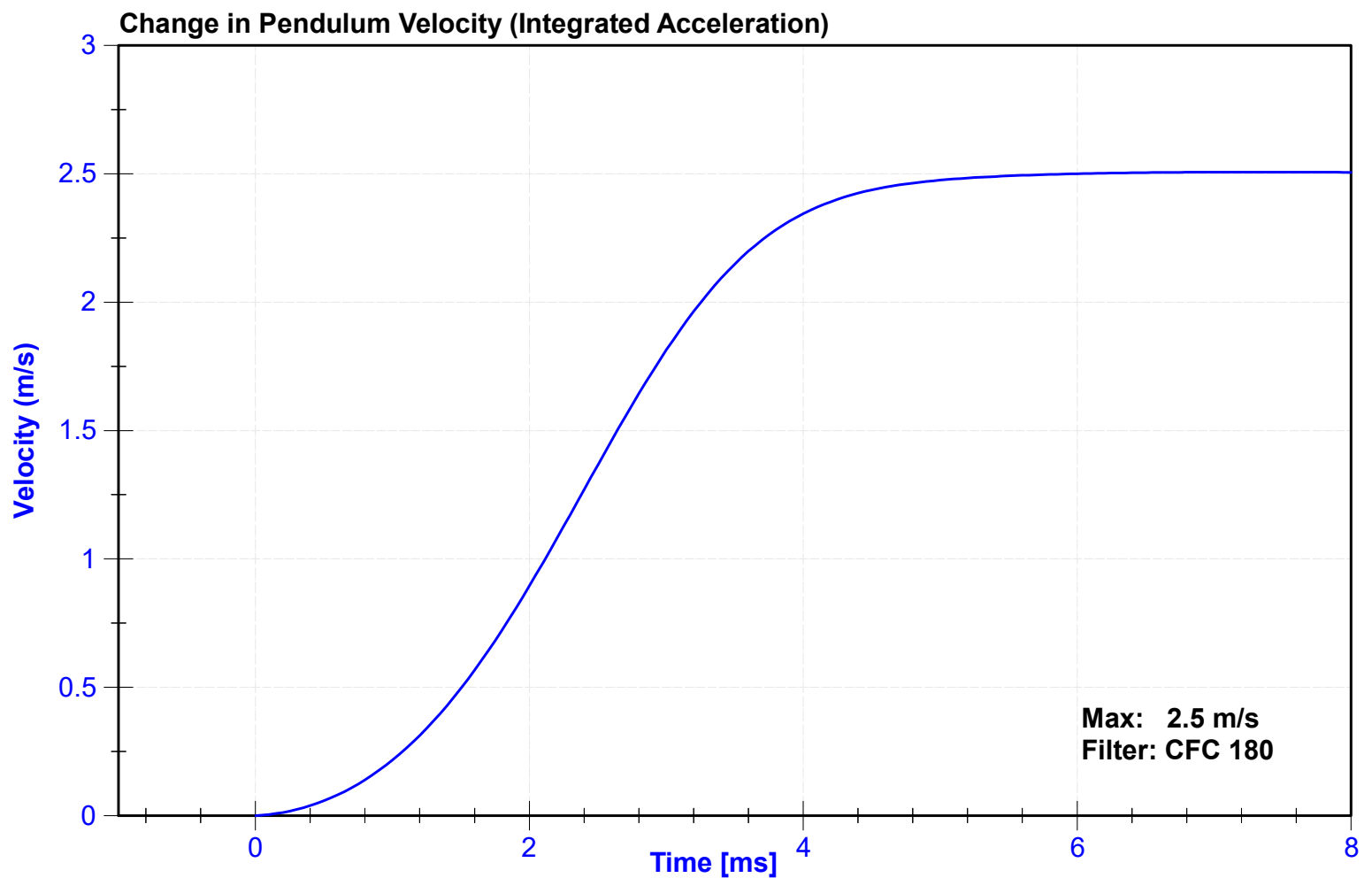
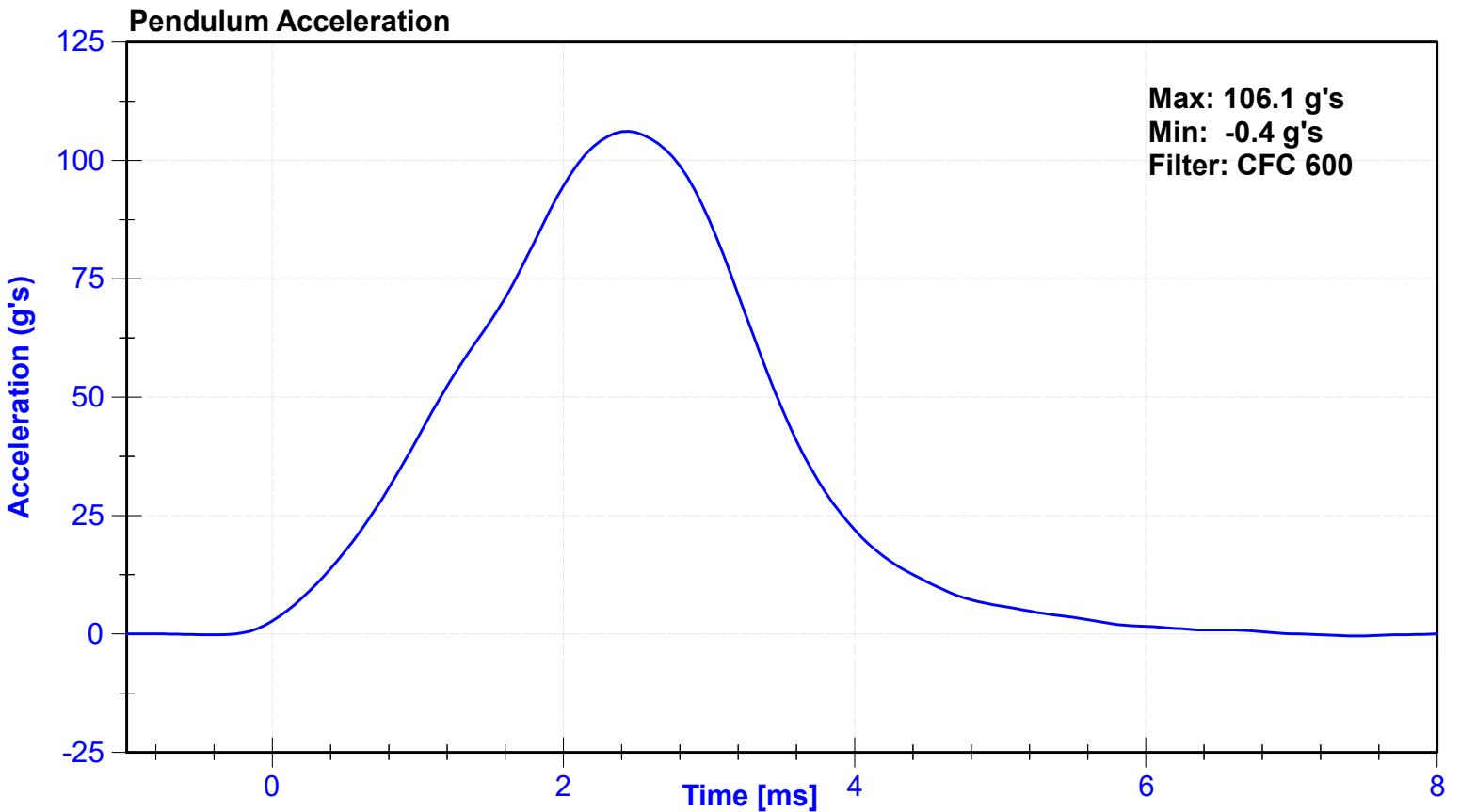


ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

Results					
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.1	Pass
Humidity	10	70	%	55	Pass
Velocity	2.07	2.13	m/s	2.083	Pass
Maximum Resistive Force	4720	5780	N	5135.6	Pass

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





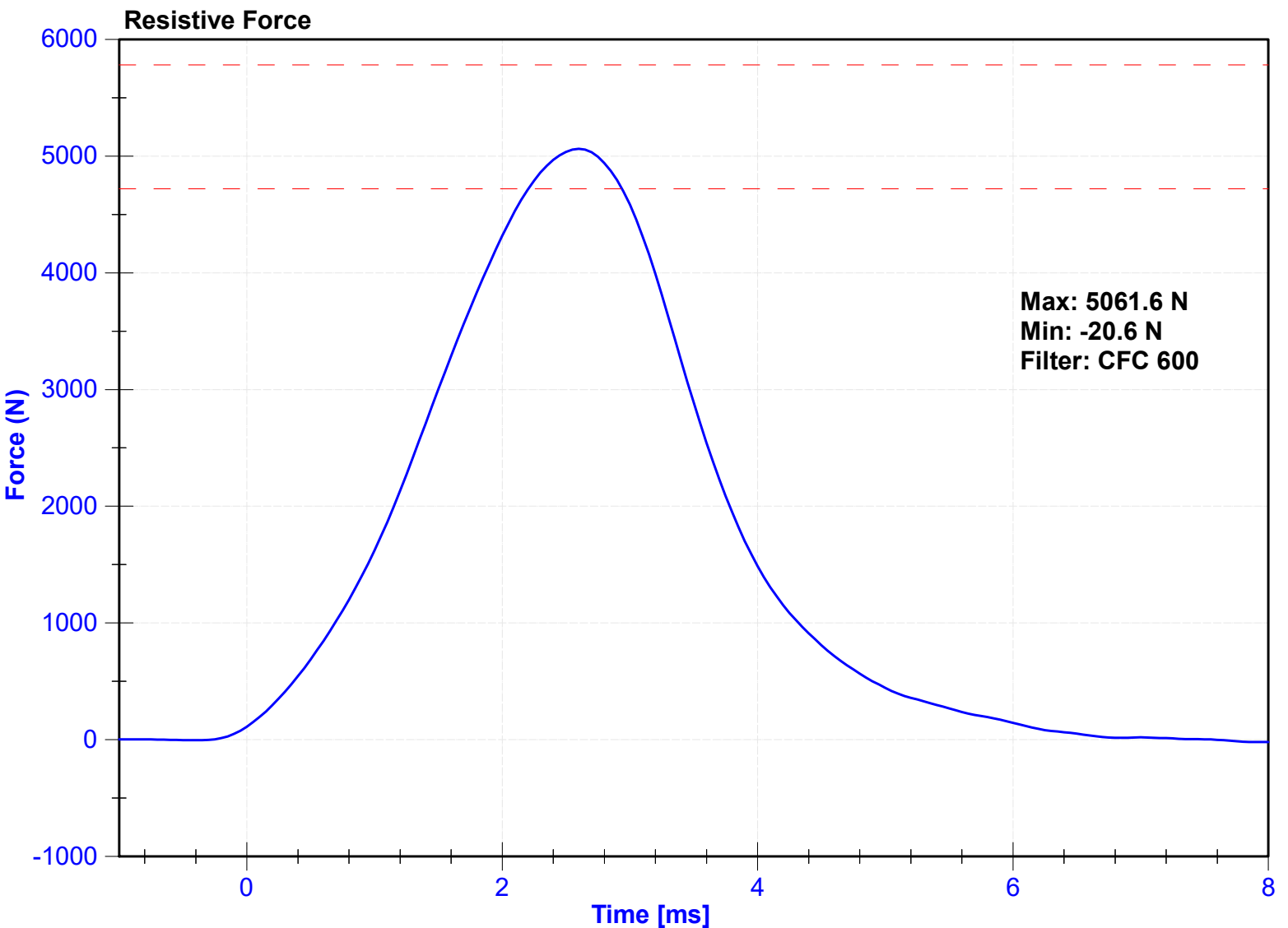
ATD Manufacturer	Humanetics	Test Technician	Z. Nyhart
ATD Serial Number	065	Laboratory Supervisor	J. Kinderman

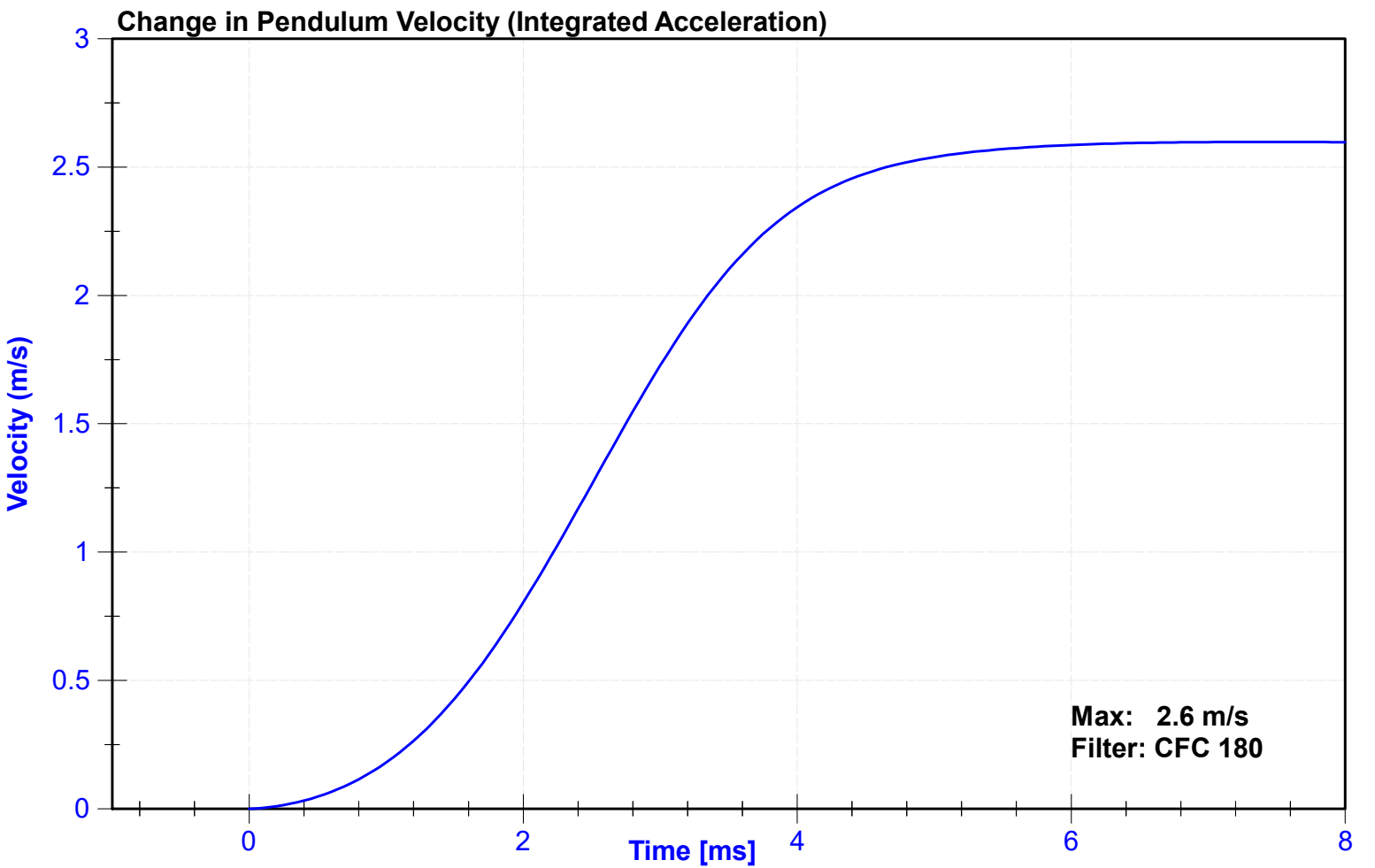
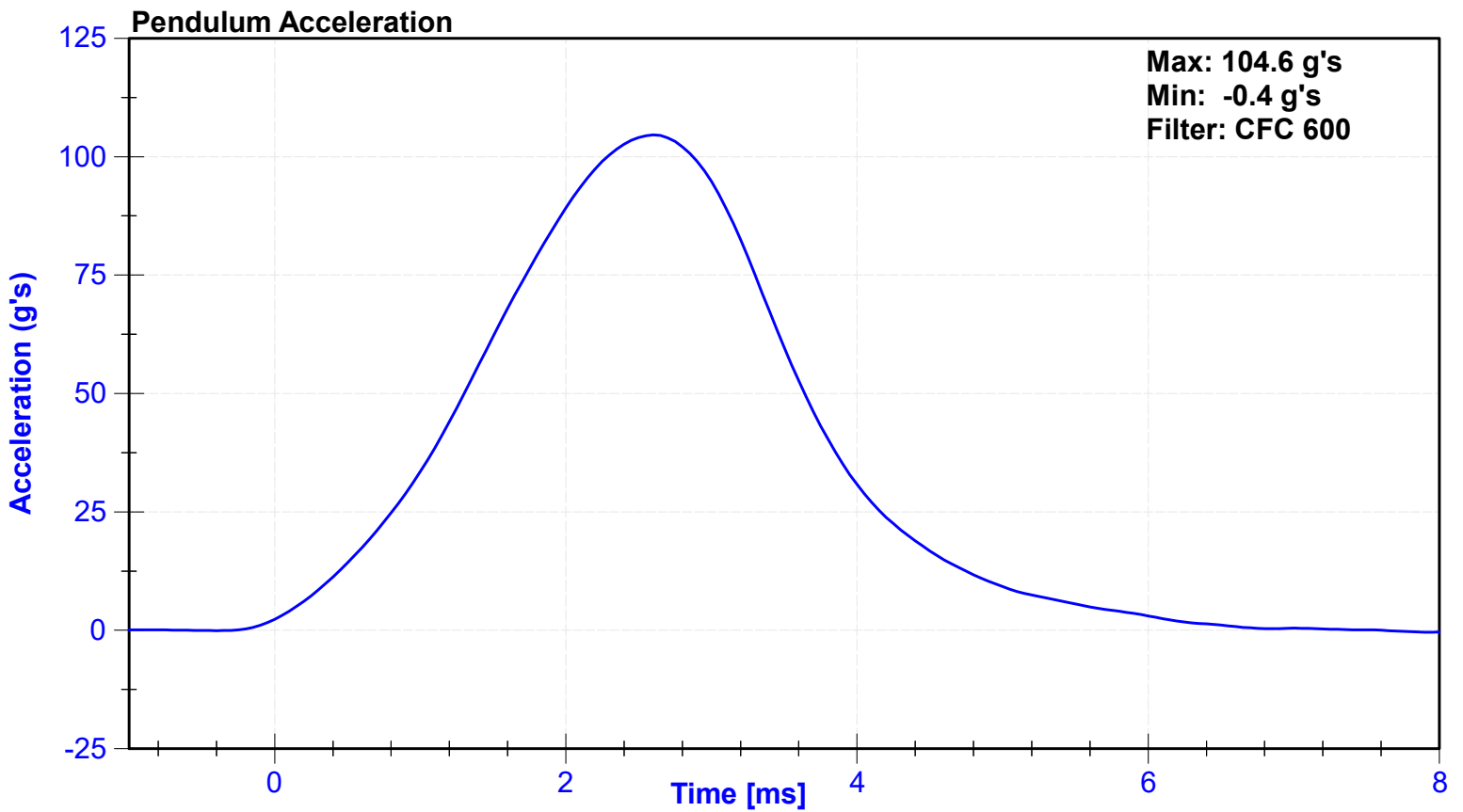
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.1	Pass
Humidity	10	70	%	55	Pass
Velocity	2.07	2.13	m/s	2.085	Pass
Maximum Resistive Force	4720	5780	N	5061.6	Pass

Transducer Calibrations

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





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 137

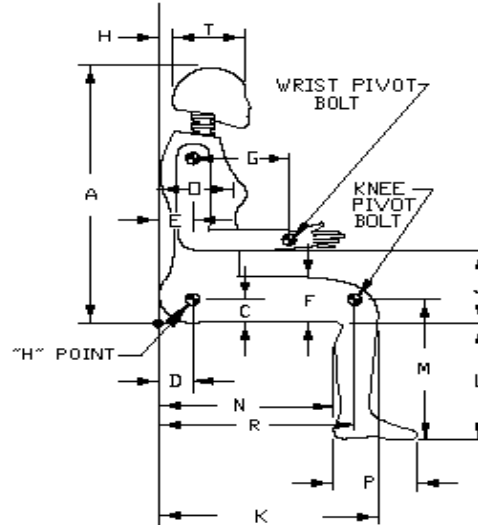
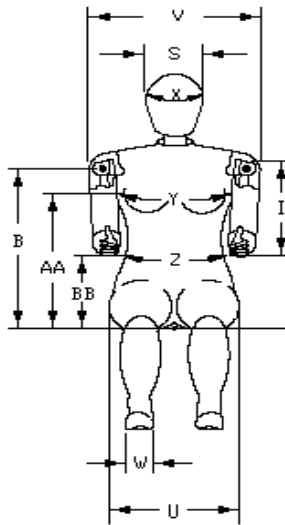


External Measurements - Hybrid 3 - 5th Female

Technician: **J. Rios**

Date: **07/30/2025**

Dummy Serial Number: **137**



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	788	Pass
B	Shoulder Pivot Height	432	457	442	Pass
C	H-Point Height	81	86	85	Pass
D	H-Point from Backline	145	150	148	Pass
E	Shoulder Pivot from Backline	69	84	80	Pass
F	Thigh Clearance	119	135	122	Pass
G	Back of Elbow to Wrist Pivot	244	259	253	Pass
H	Head Back to Backline	43	48	46	Pass
I	Shoulder to Elbow Length	277	297	285	Pass
J	Elbow Rest Height	183	203	195	Pass
K	Buttock to Knee Length	521	546	541	Pass
L	Popliteal Height	356	376	364	Pass
M	Knee Pivot Height	394	419	408	Pass
N	Buttock Popliteal Length	414	439	425	Pass
O	Chest Depth without Jacket	175	191	179	Pass
P	Foot Length (right)	219	234	224	Pass
R	Buttock To Knee Pivot Length	457	483	468	Pass
S	Head Breadth	137	147	144	Pass
T	Head Depth	178	188	184	Pass
U	Hip Breadth	300	315	307	Pass
V	Shoulder Breadth	351	366	358	Pass
W	Foot Breadth	79	94	84	Pass
X	Head Circumference	528	549	539	Pass
Y	Chest Circumference with Jacket	851	881	870	Pass
Z	Waist Circumference	460	790	627	Pass
AA	Reference Location (Chest Circumference)	333	358	340	Pass
BB	Reference Location (Waist Circumference)	160	170	162	Pass

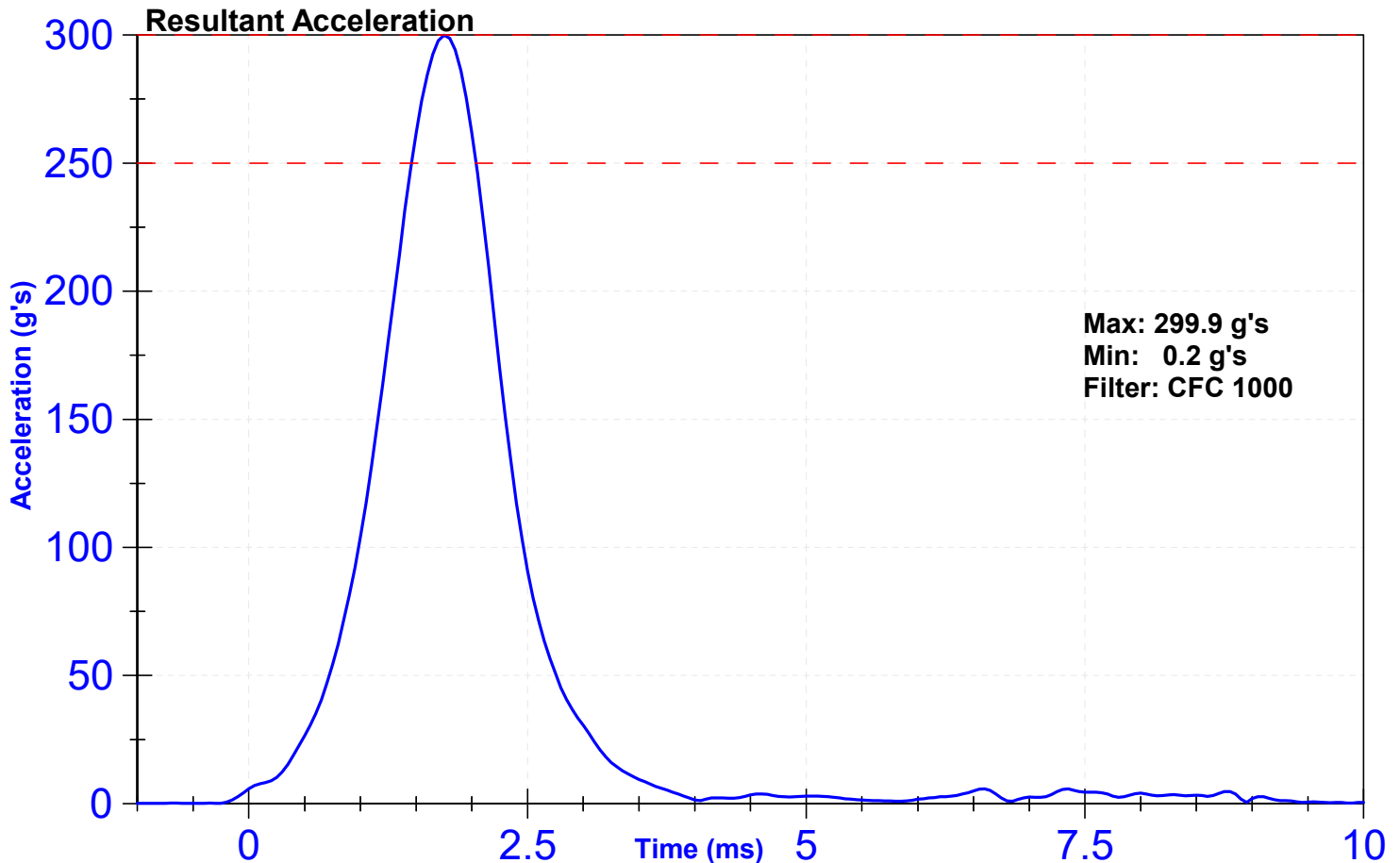
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

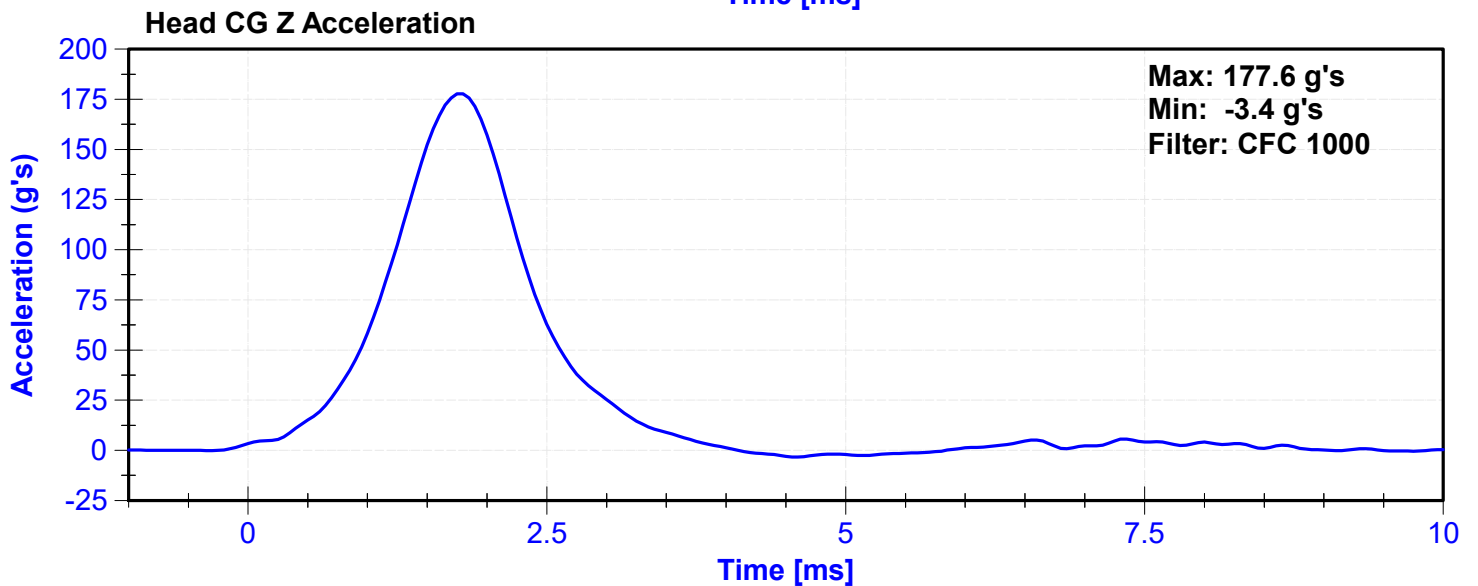
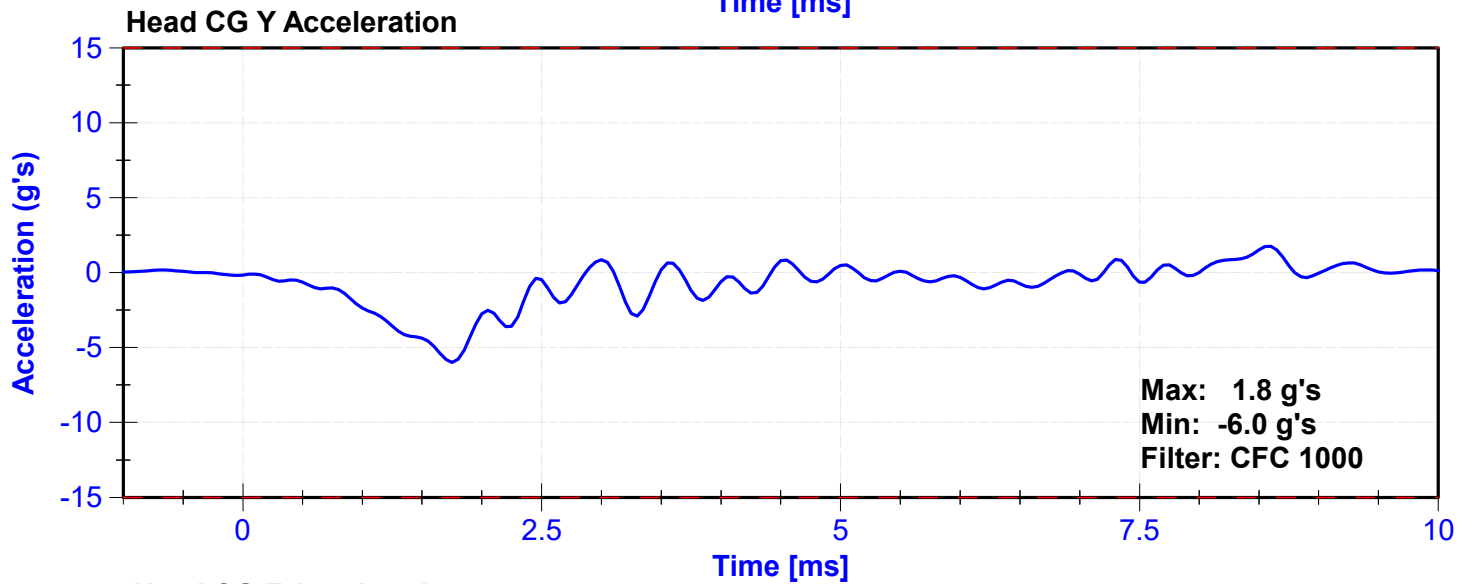
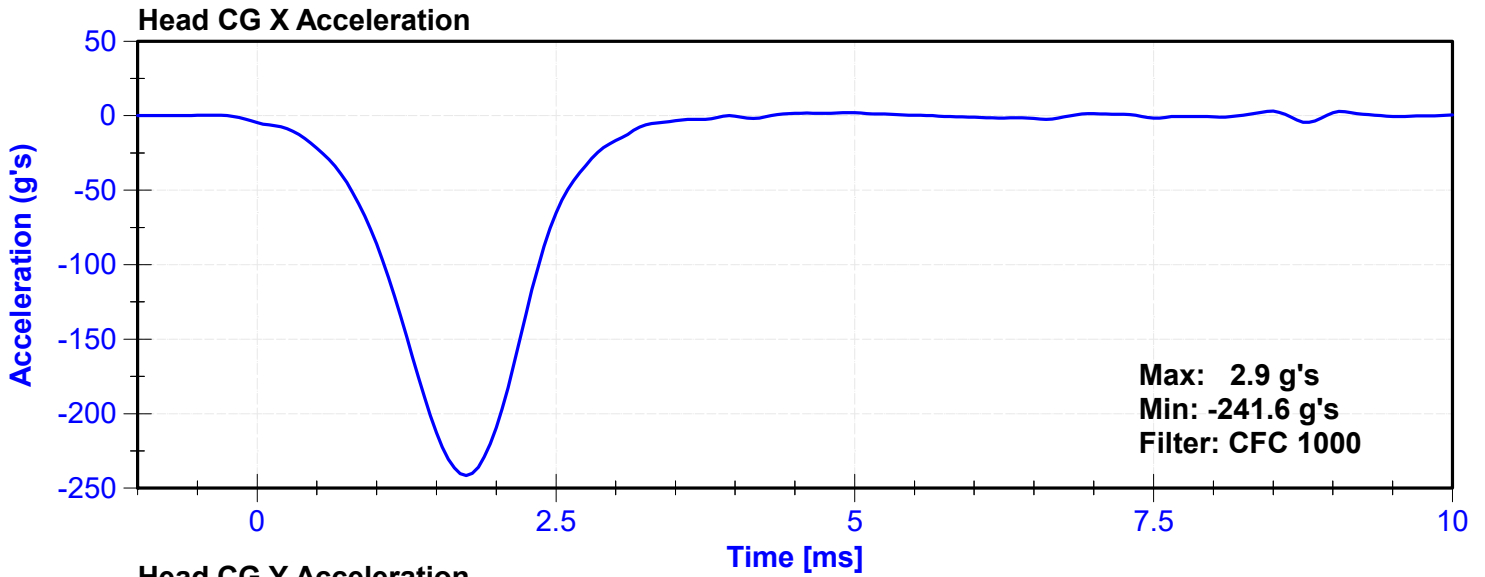
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.1	Pass
Humidity	10	70	%	52	Pass
Resultant Acceleration	250	300	g's	299.9	Pass
Oscillation	0	10	%	1.9	Pass
Lateral Acceleration	-15	15	g's	-6.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P79417	6/11/2025	12/8/2025
Y Accelerometer	Endevco	P83335	6/11/2025	12/8/2025
Z Accelerometer	Endevco	P64149	6/11/2025	12/8/2025





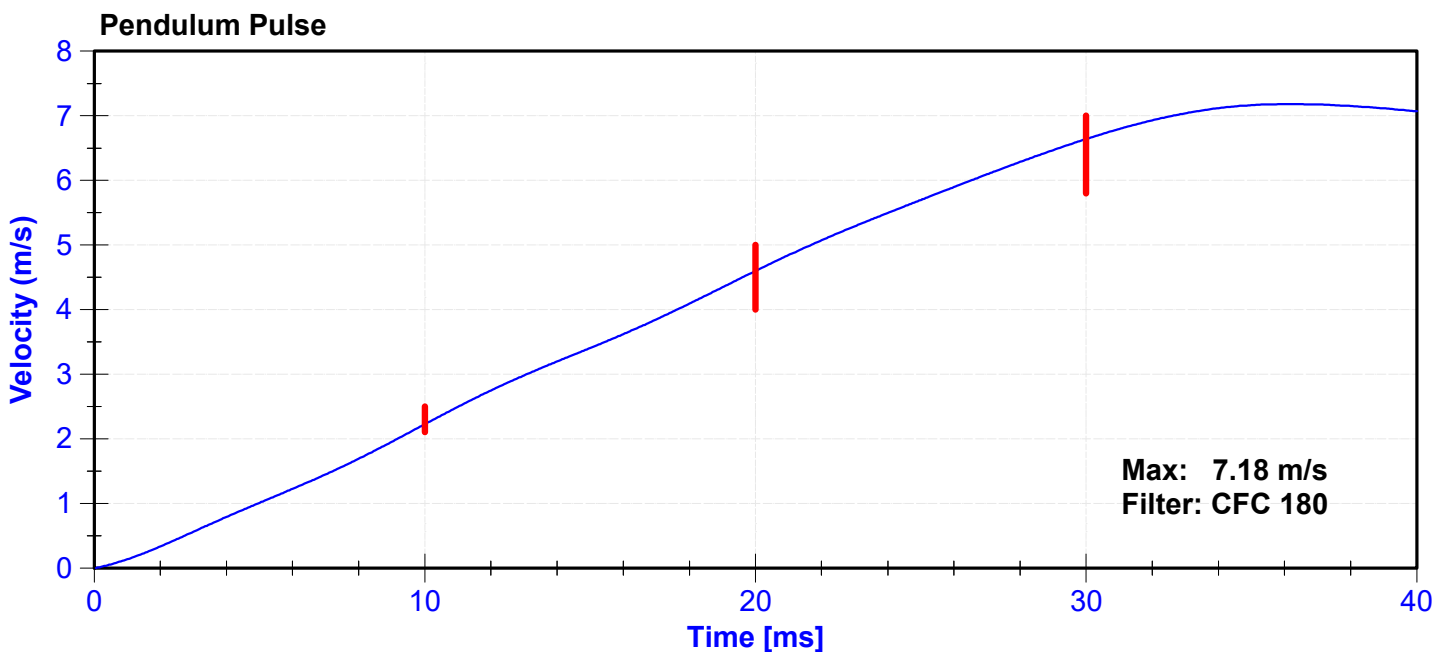
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

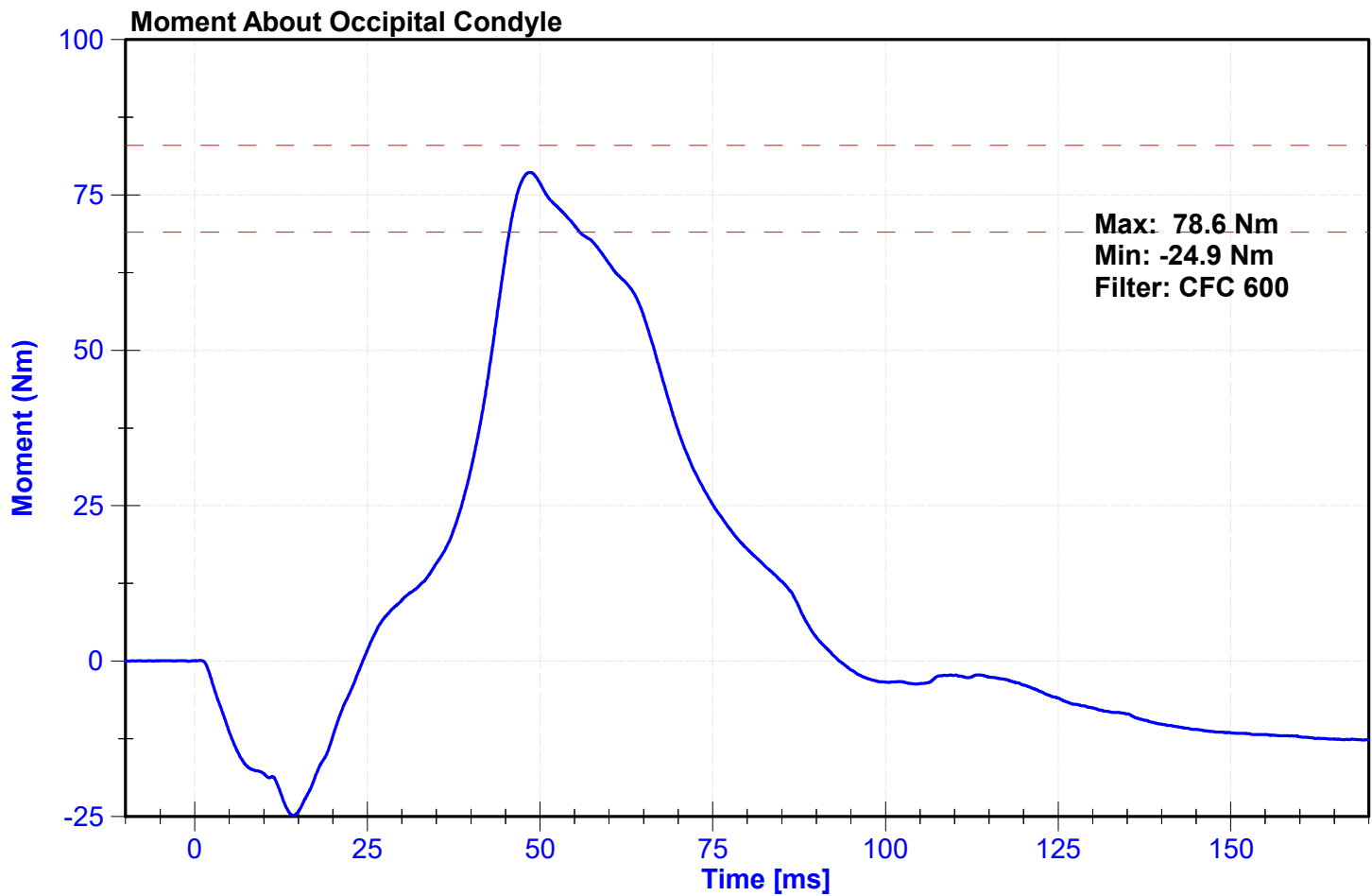
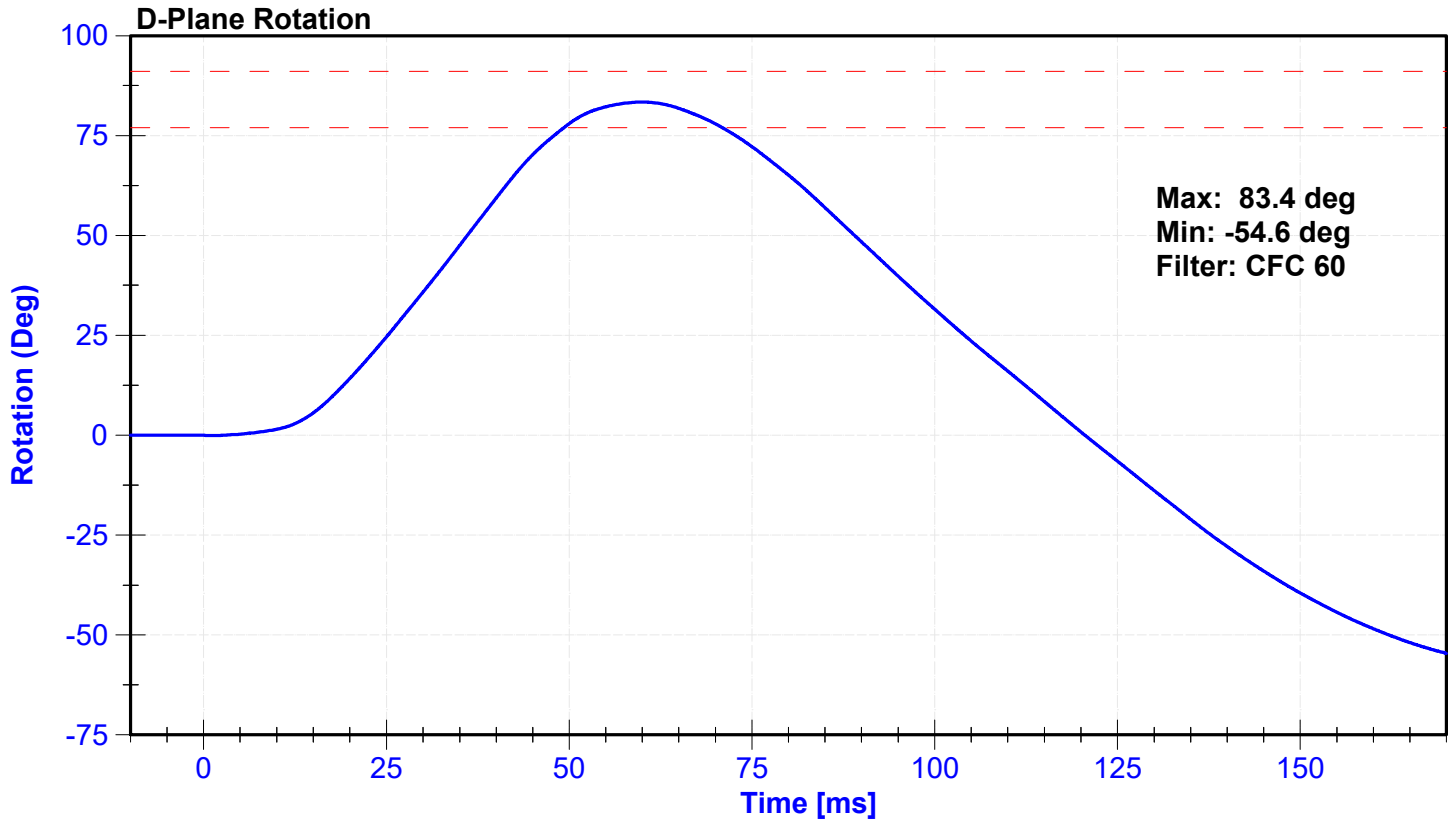
Results

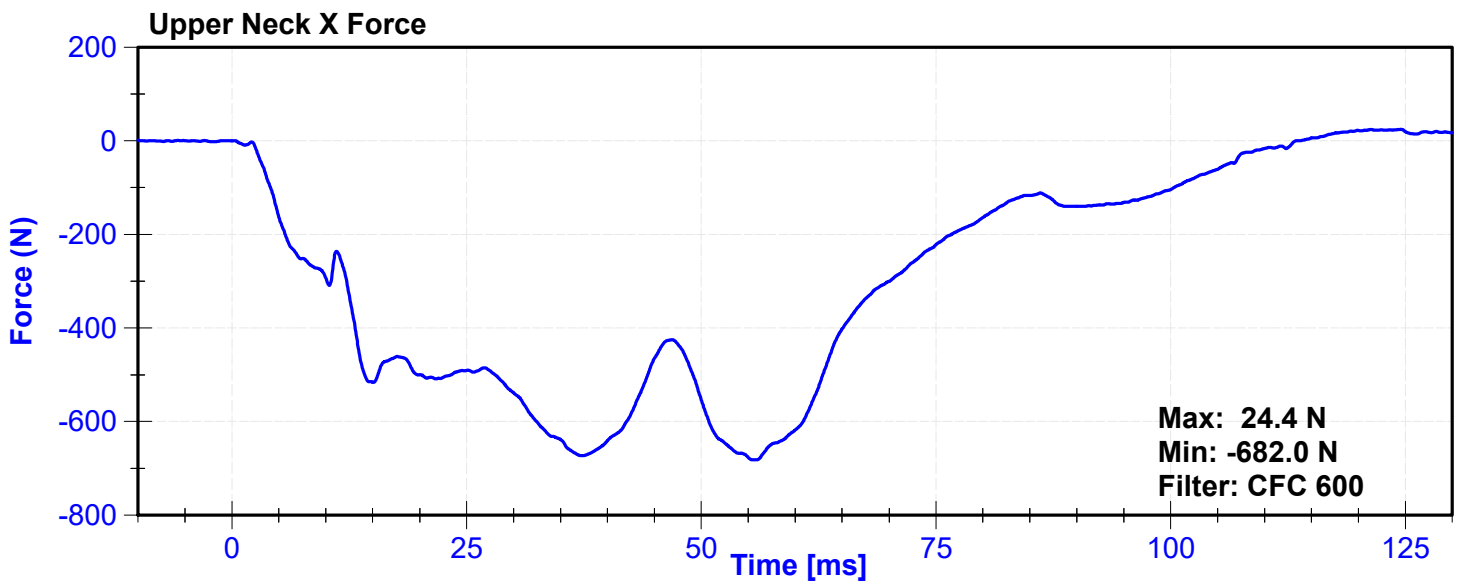
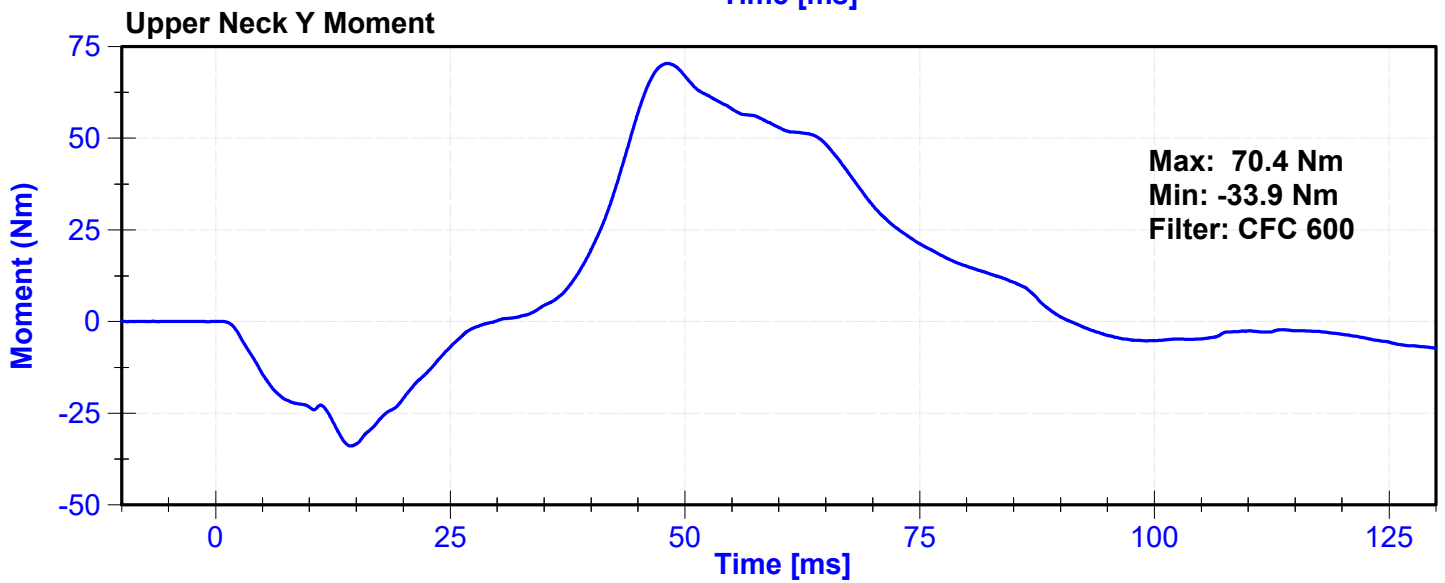
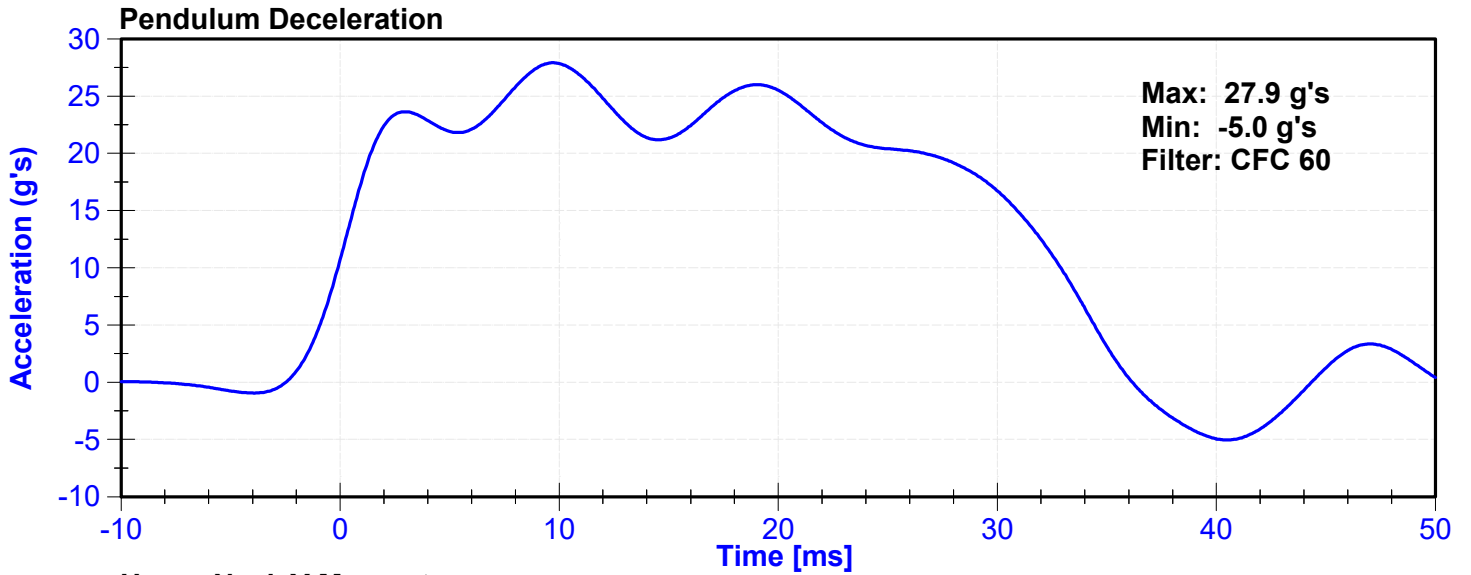
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	54	Pass
Velocity	6.89	7.13	m/s	7.004	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.23	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.60	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.64	Pass
Max D Plane Rotation	77	91	deg	83.4	Pass
Max Moment During Rotation Interval	69	83	Nm	78.6	Pass
Moment Decay to 10.0 Nm	80	100	ms	86.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	SP22G_LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	SP22G_LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	1916-FX	9/12/2024	9/12/2025







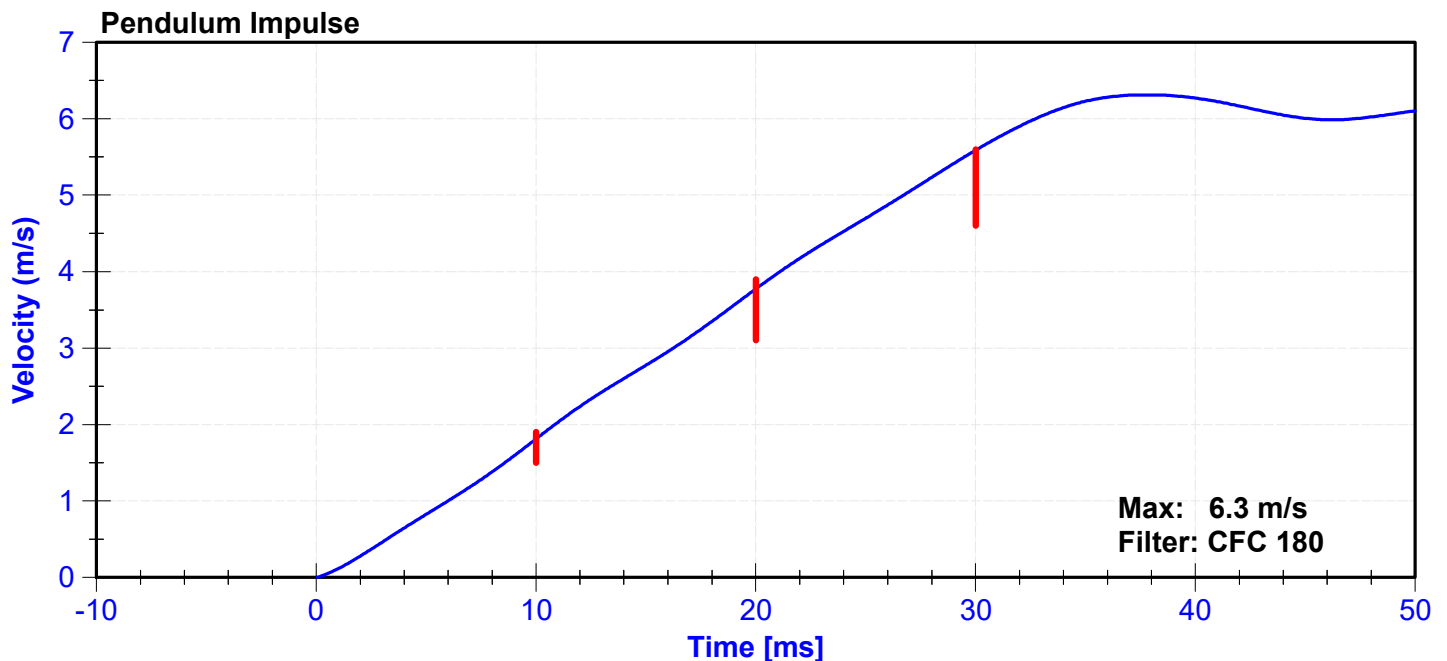
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

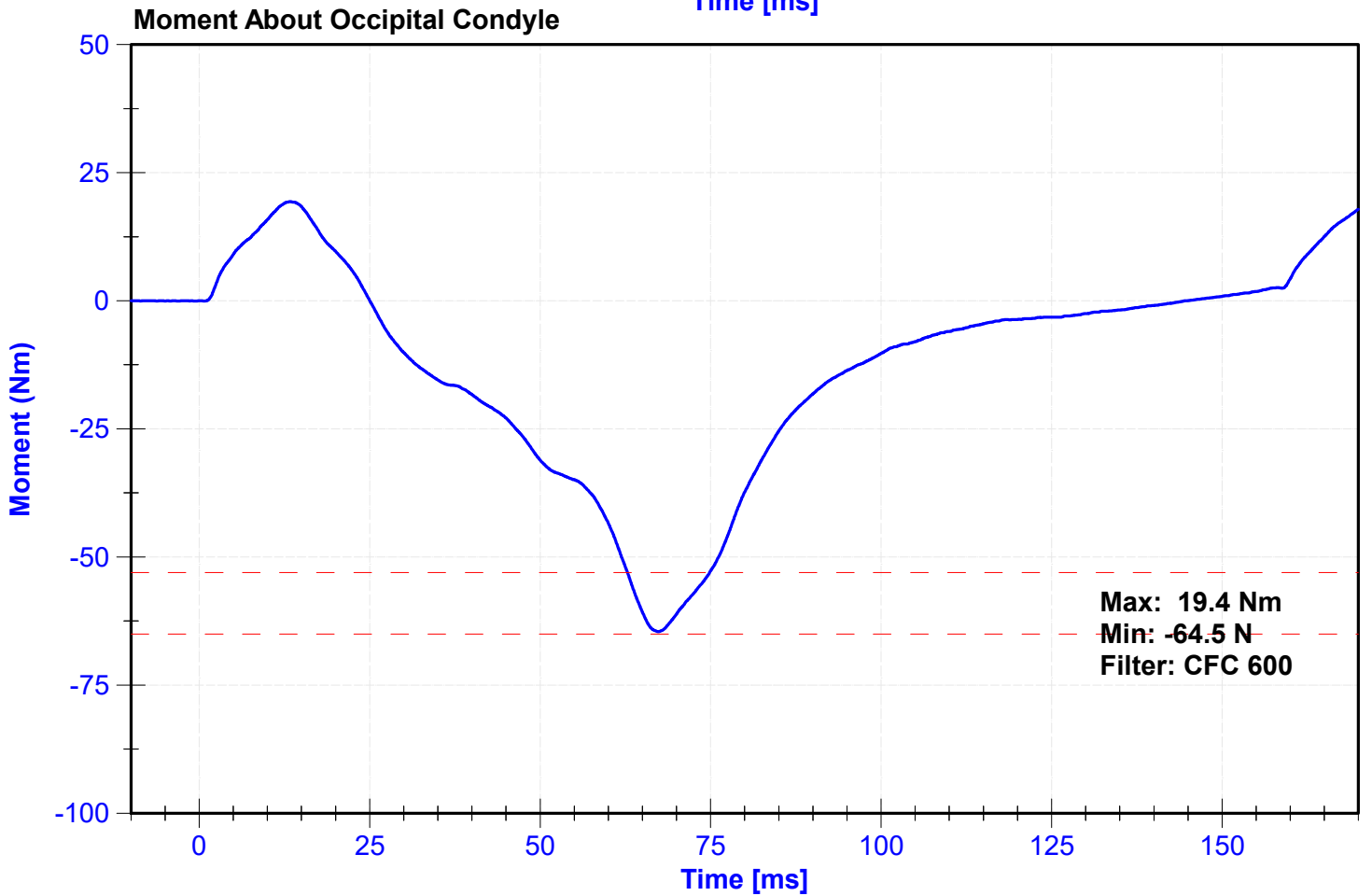
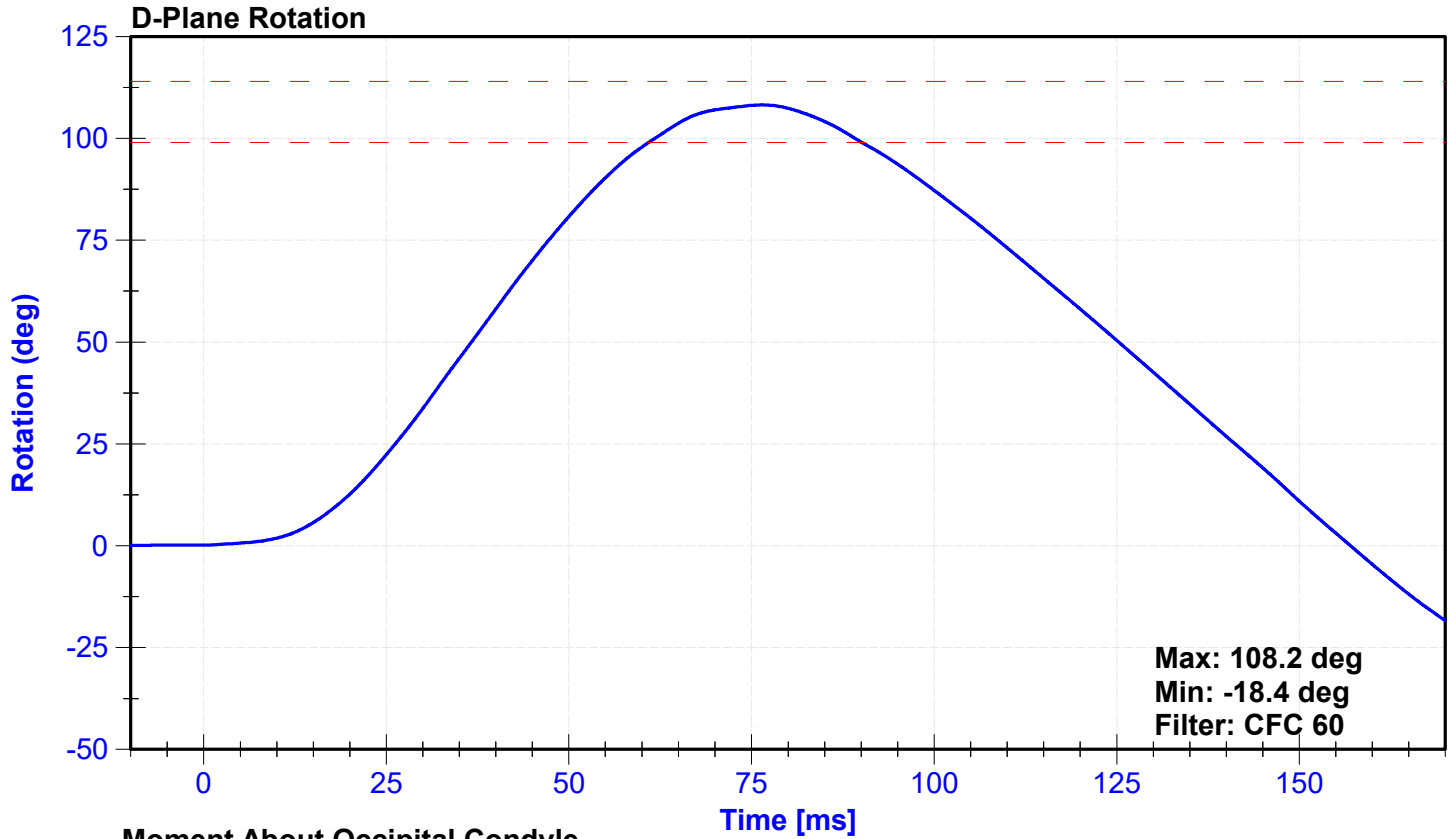
Results

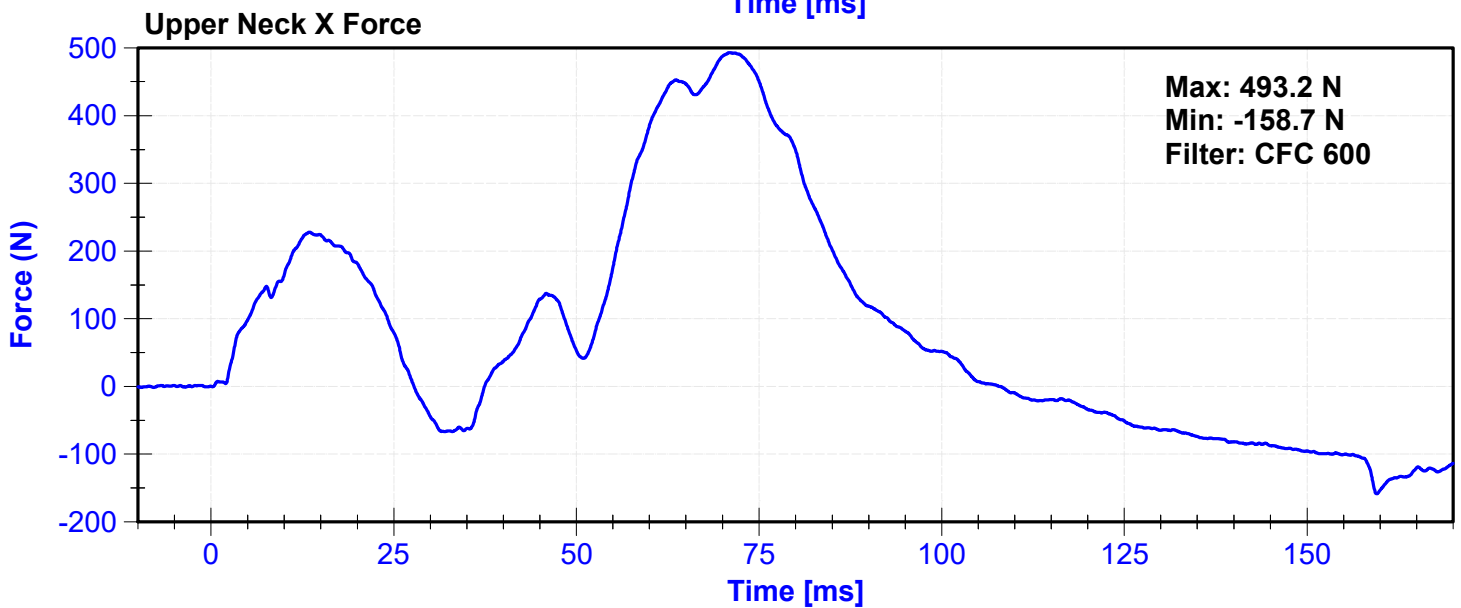
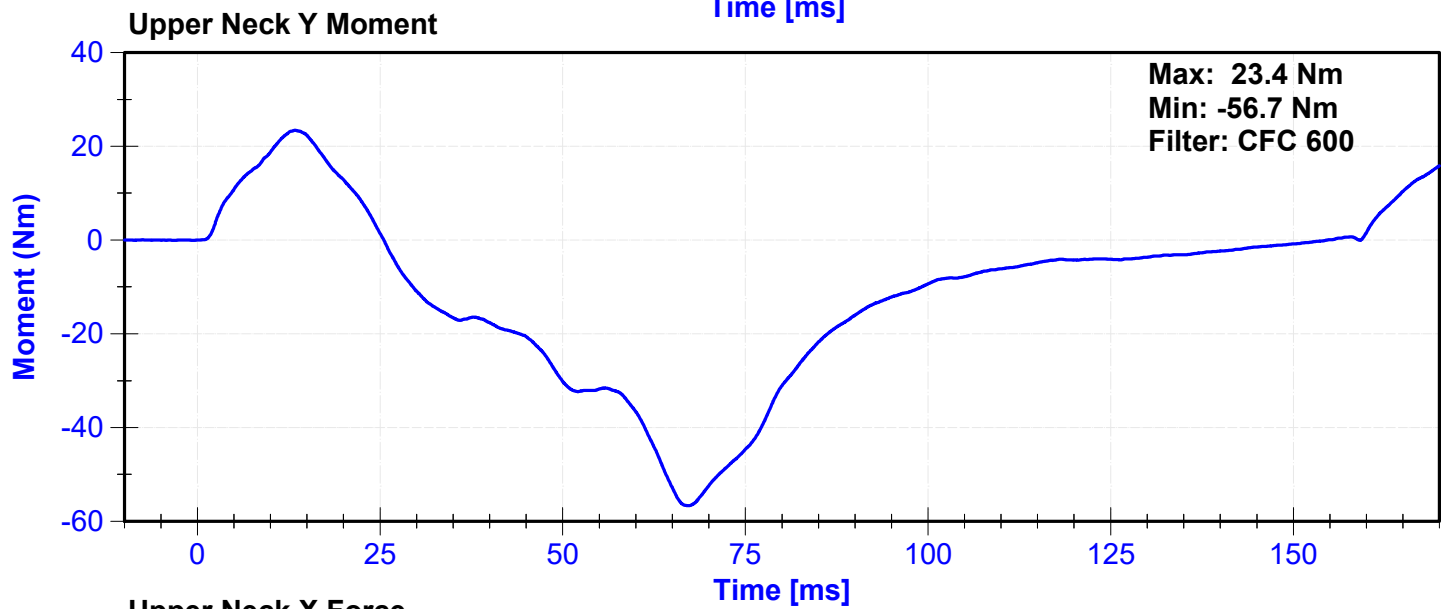
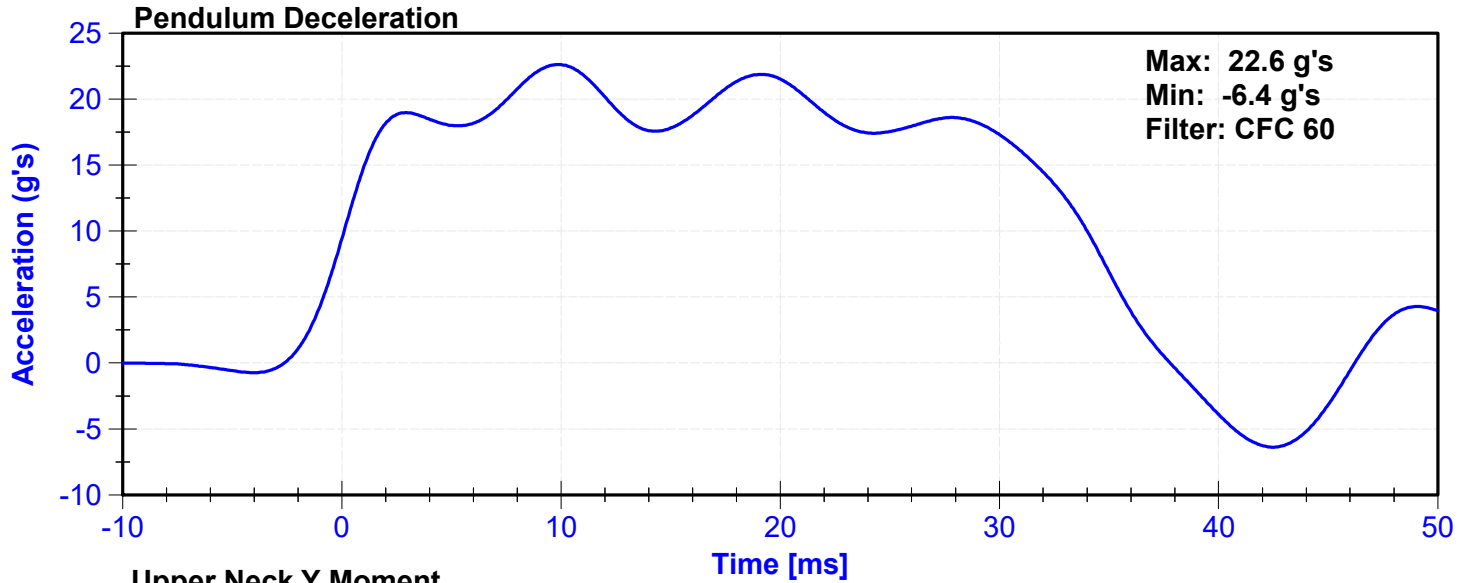
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.1	Pass
Humidity	10	70	%	54	Pass
Velocity	5.95	6.19	m/s	6.013	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.81	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.77	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.59	Pass
D Plane Rotation	99	114	deg	108.2	Pass
Moment During Rotation Interval	-65	-53	Nm	-64.5	Pass
Moment Decay to -10Nm	94	114	ms	100.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16646	10/17/2024	10/17/2025
Pendulum Potentiometer	ETI	SP22G_LABPOT1	5/14/2025	5/14/2026
Condyle Potentiometer	ETI	SP22G_LABPOT2	5/14/2025	5/14/2026
Upper Neck Load Cell	Humanetics	1716A	9/12/2024	9/12/2025







ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

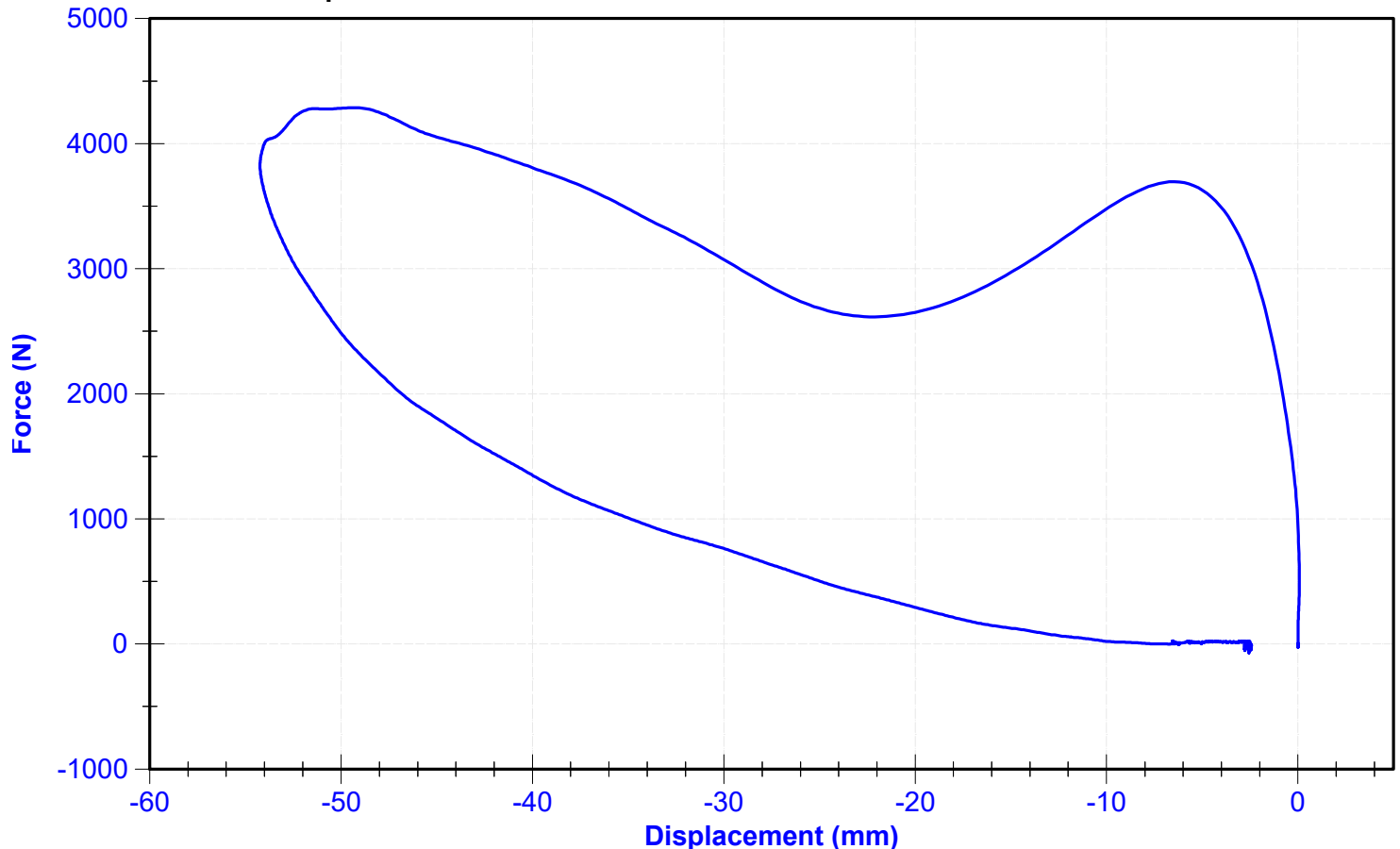
Results

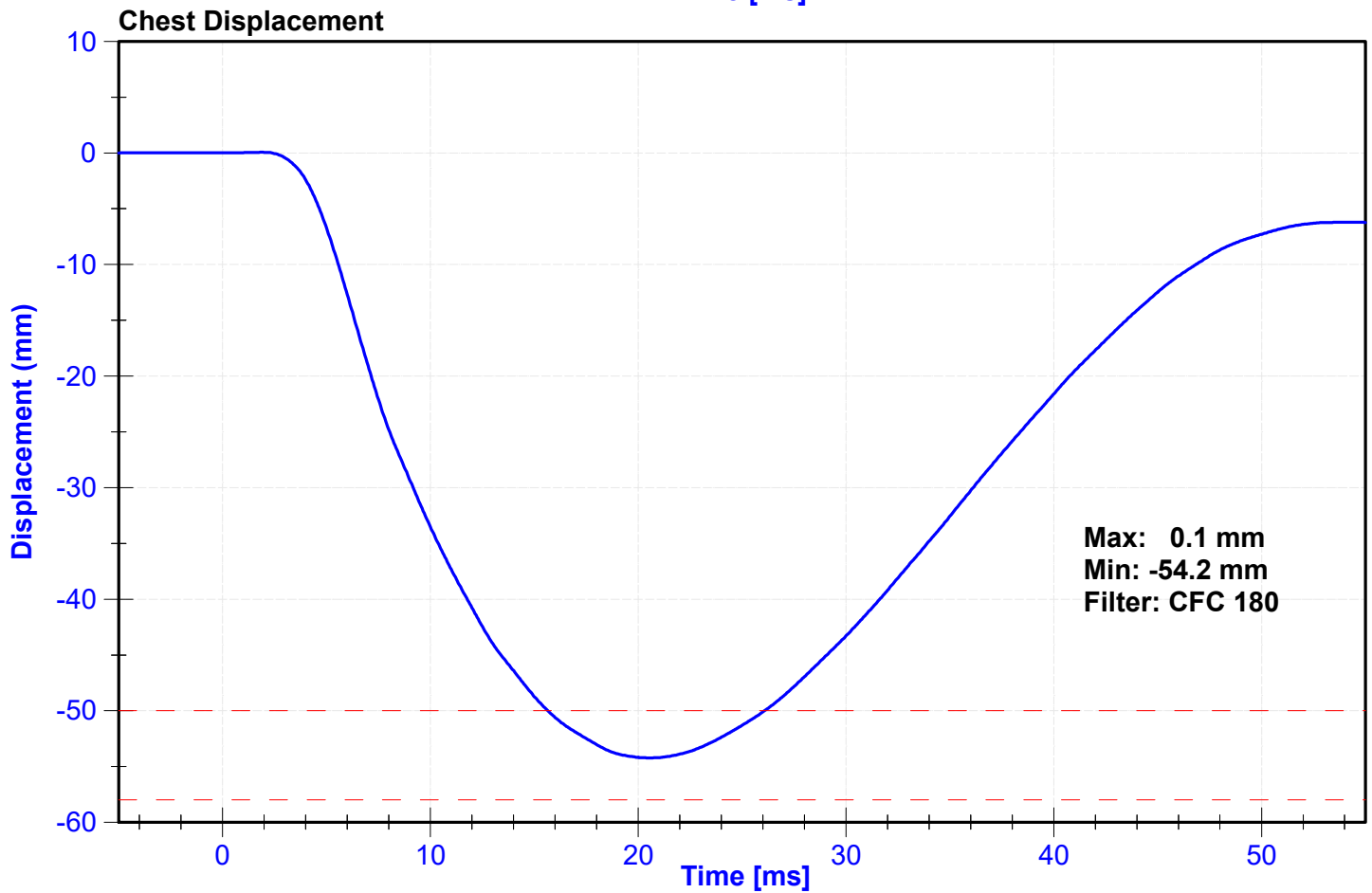
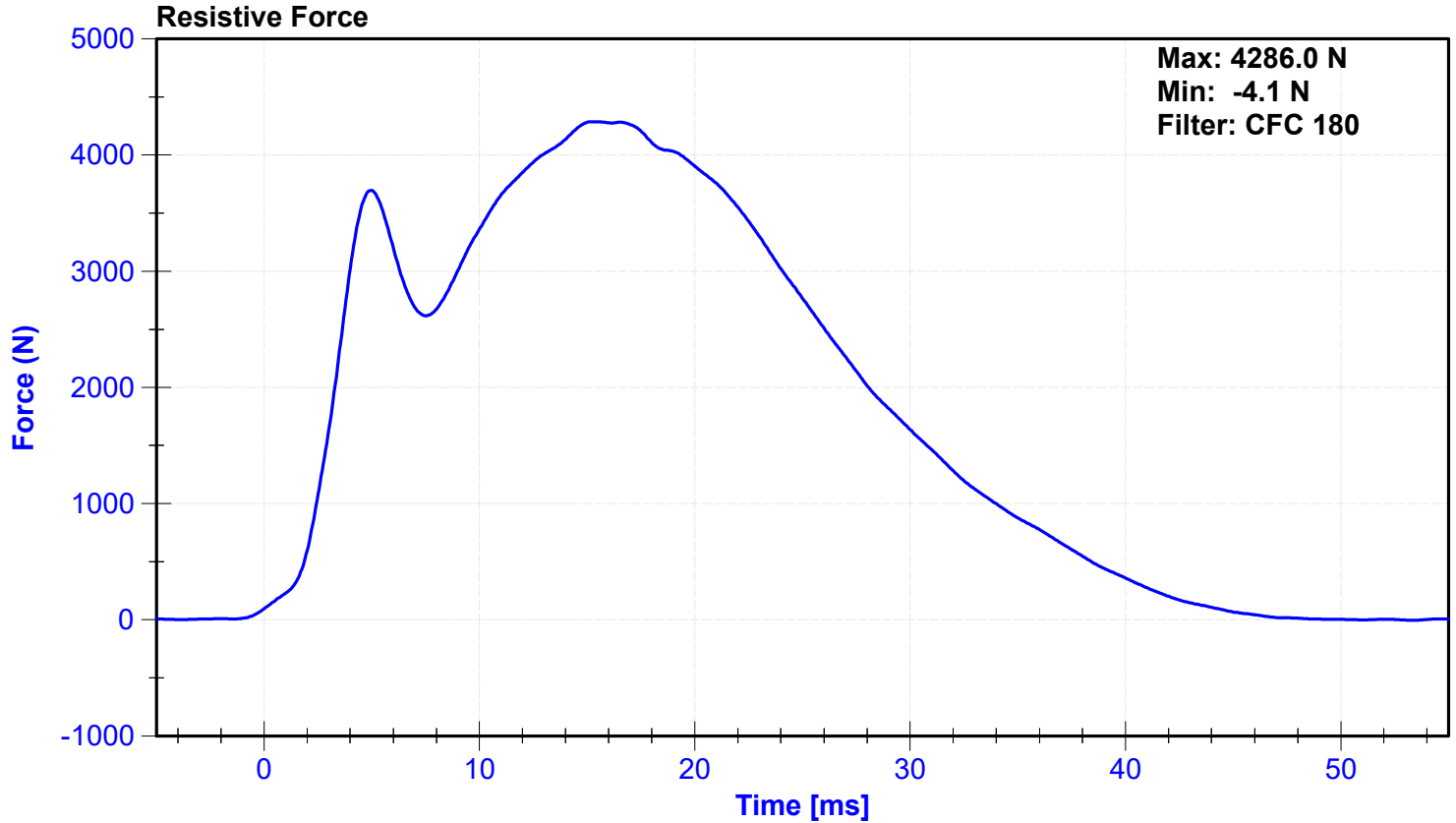
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	52	Pass
Velocity	6.59	6.83	m/s	6.688	Pass
Chest Deflection	-58	-50	mm	-54.2	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4283.7	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4286.0	Pass
Hysteresis	69	85	%	73.8	Pass

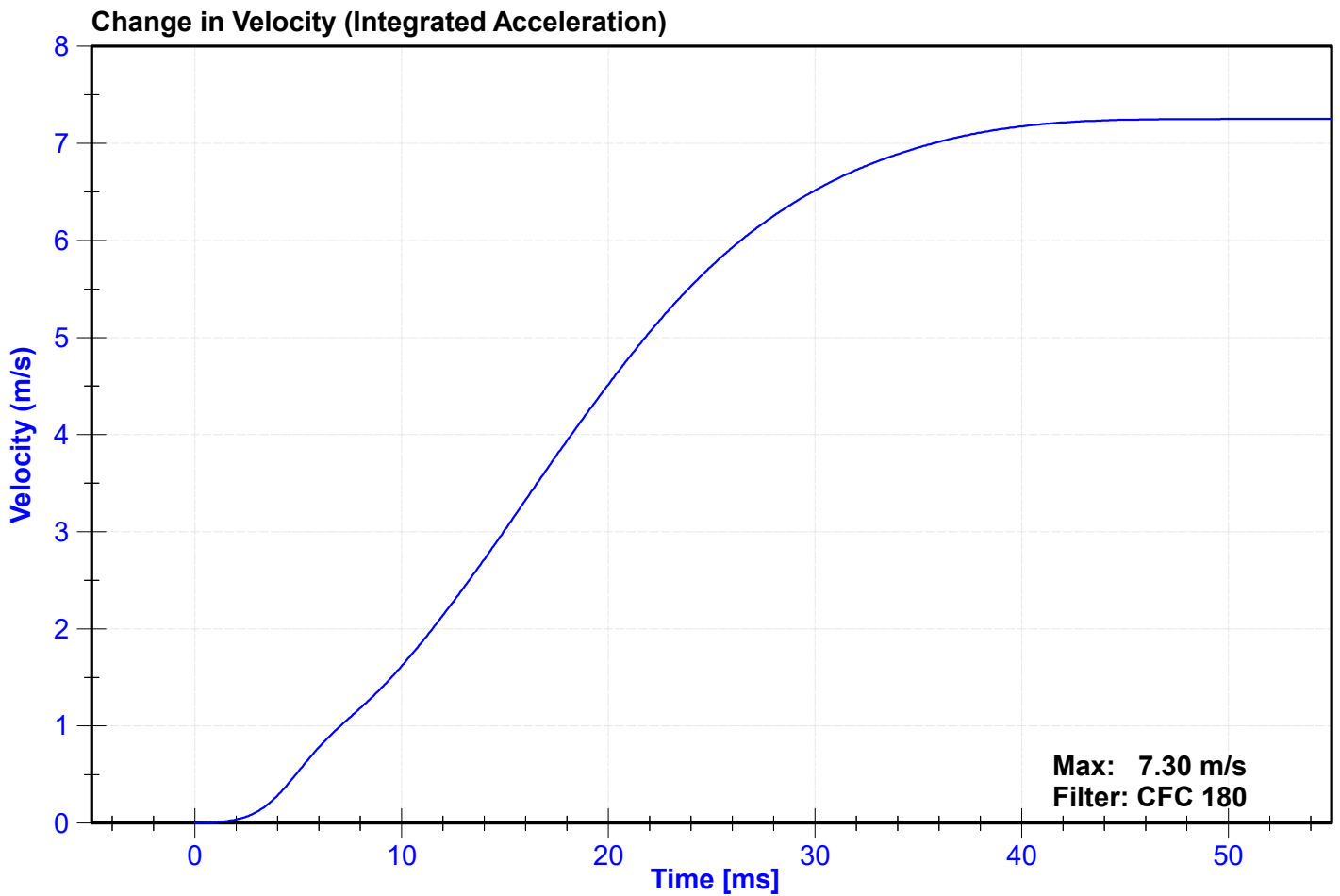
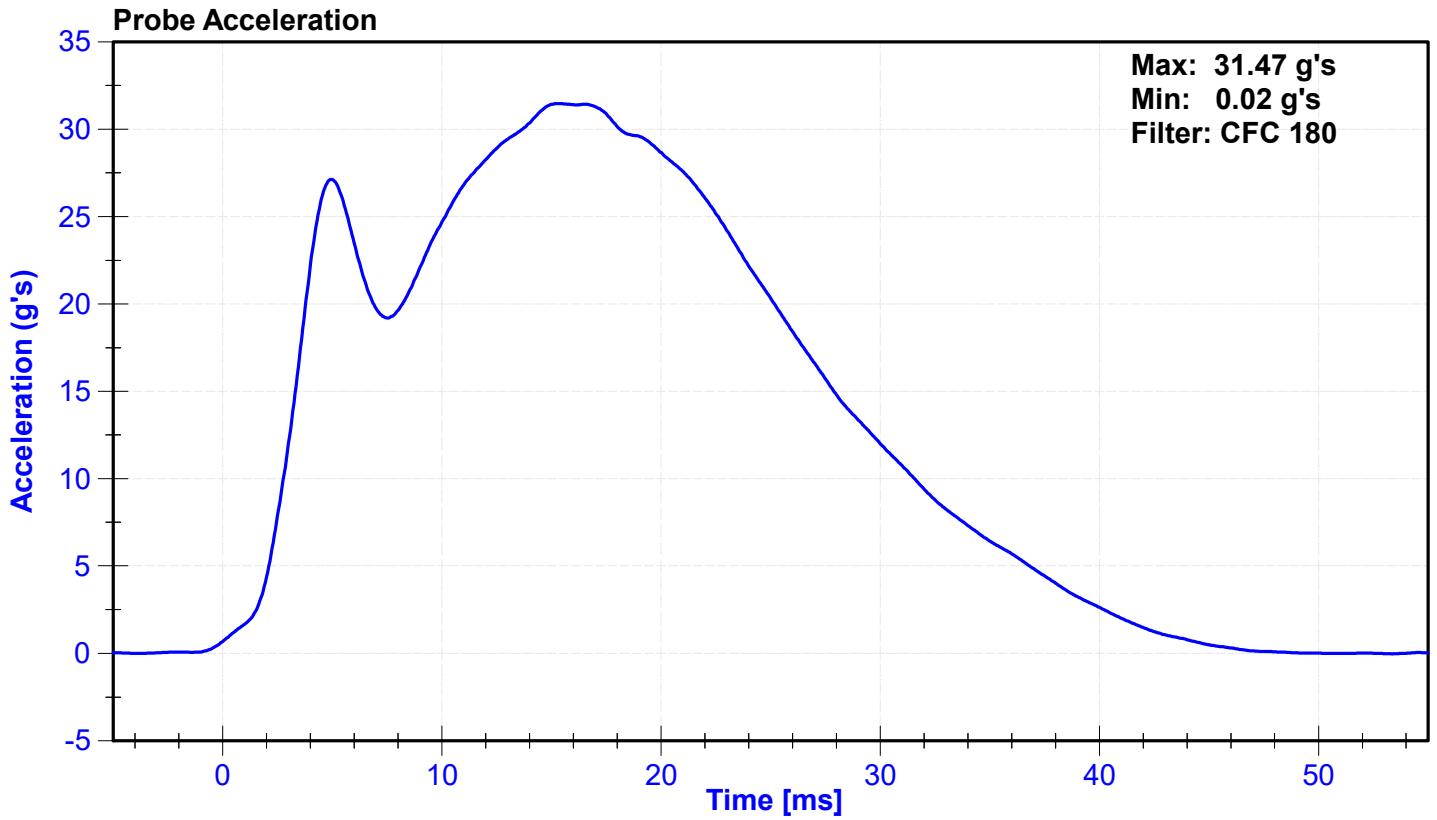
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18566	5/7/2025	11/3/2025
Chest Potentiometer	Servo	0720	6/17/2025	12/16/2025

Force vs. Displacement







ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

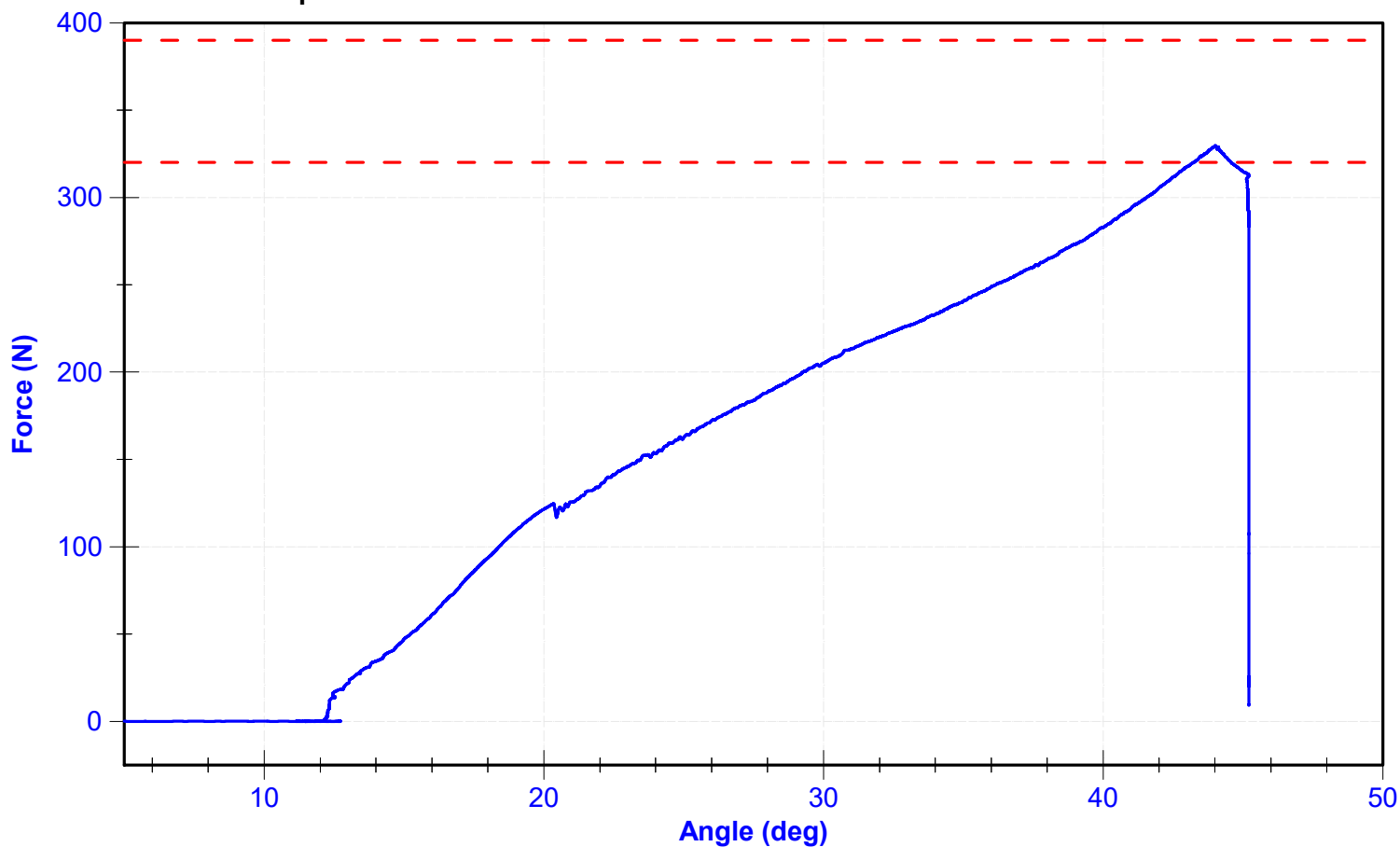
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.5	Pass
Humidity	10	70	%	59	Pass
Initial Angle	0	20	deg	12.0	Pass
Force at 45 Degrees	320	390	N	329.8	Pass
Return Angle Relative to Initial	0	8	deg	6.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker	DS-1905226	2024-11-16	2025-11-16
Load Cell	Interface	493319	2024-08-14	2025-08-14

Force vs. Displacement



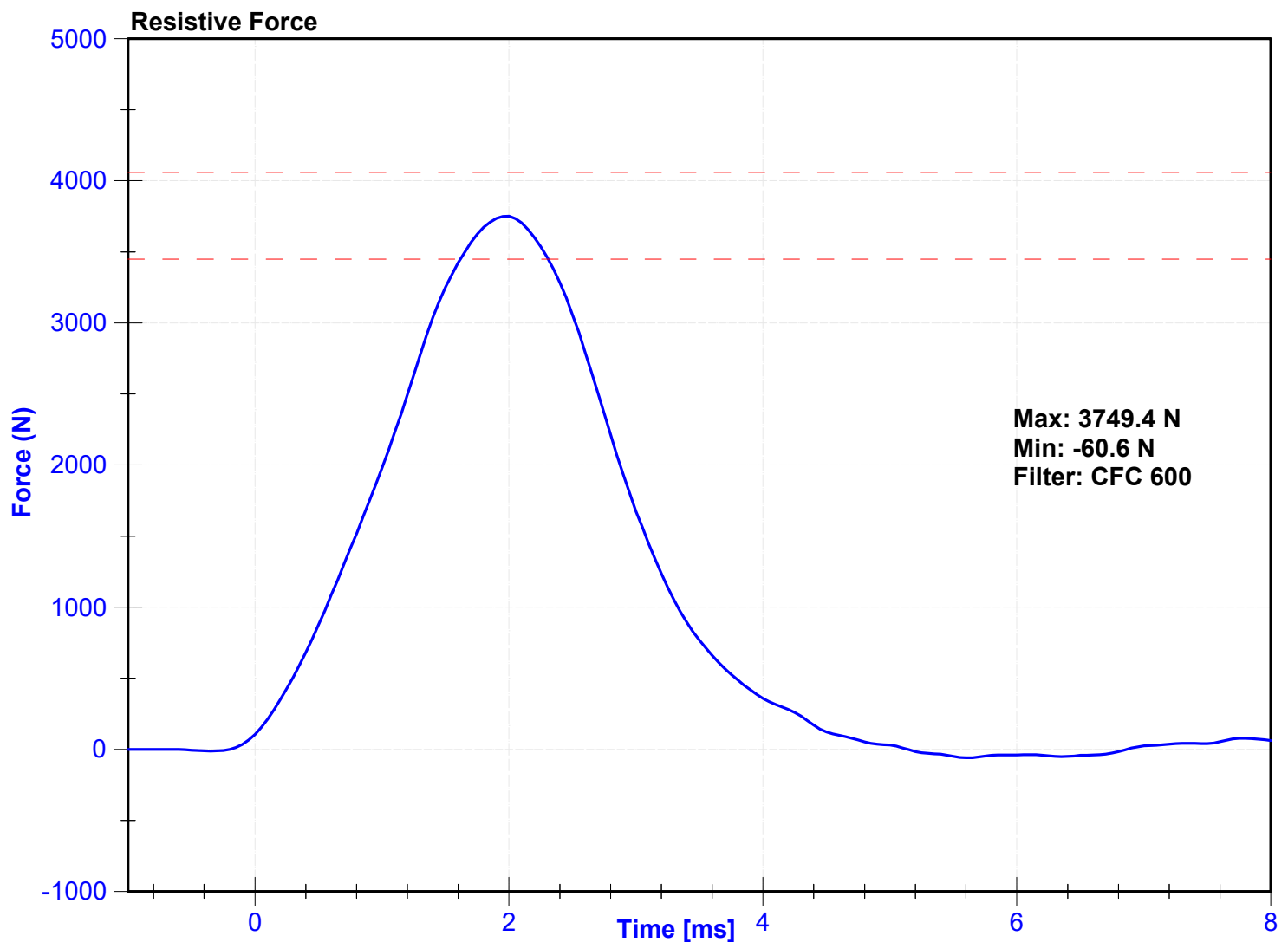
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

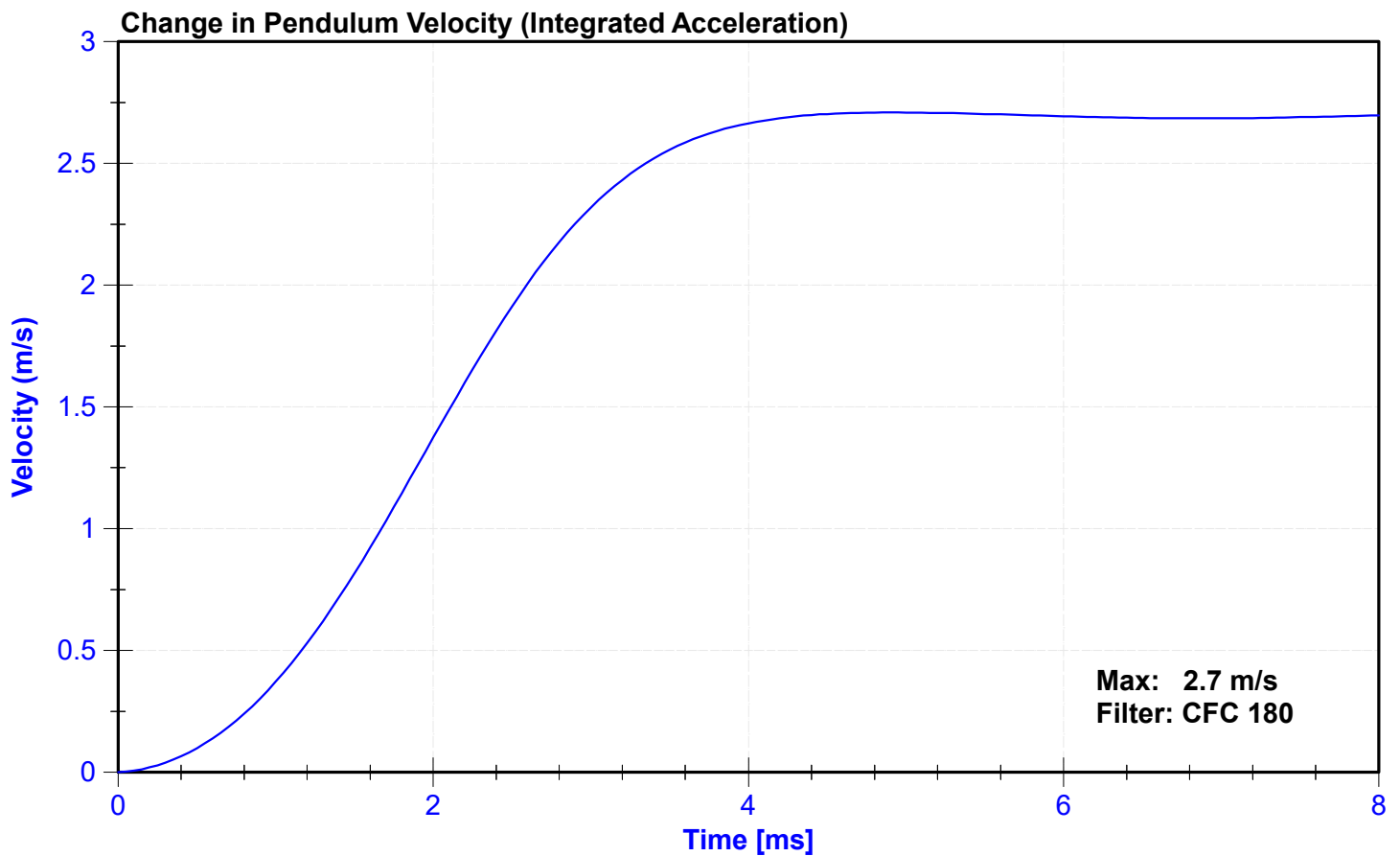
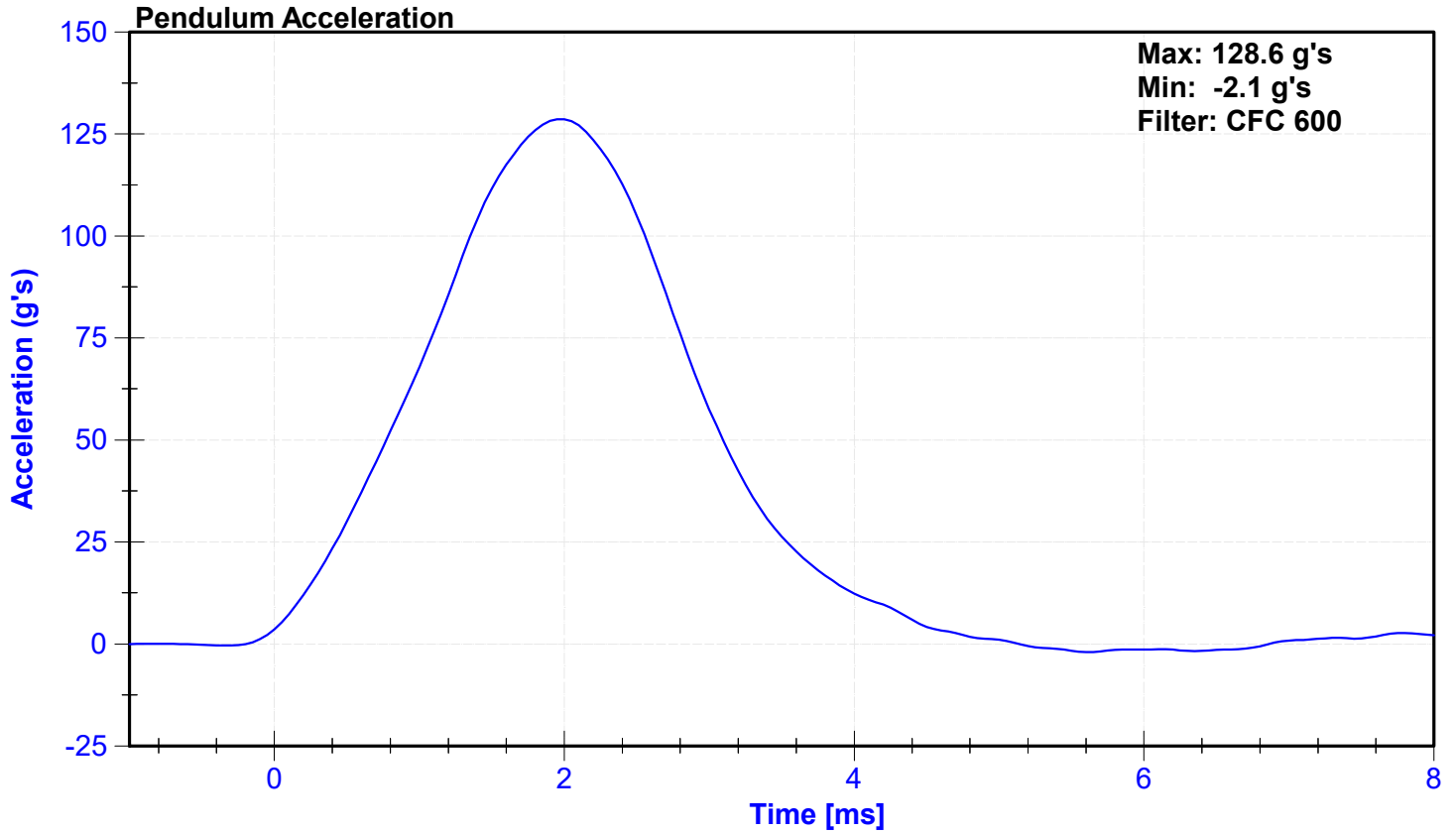
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.1	Pass
Humidity	10	70	%	54	Pass
Velocity	2.07	2.13	m/s	2.080	Pass
Resistive Force	3450	4060	N	3749.4	Pass

Transducer Calibrations

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





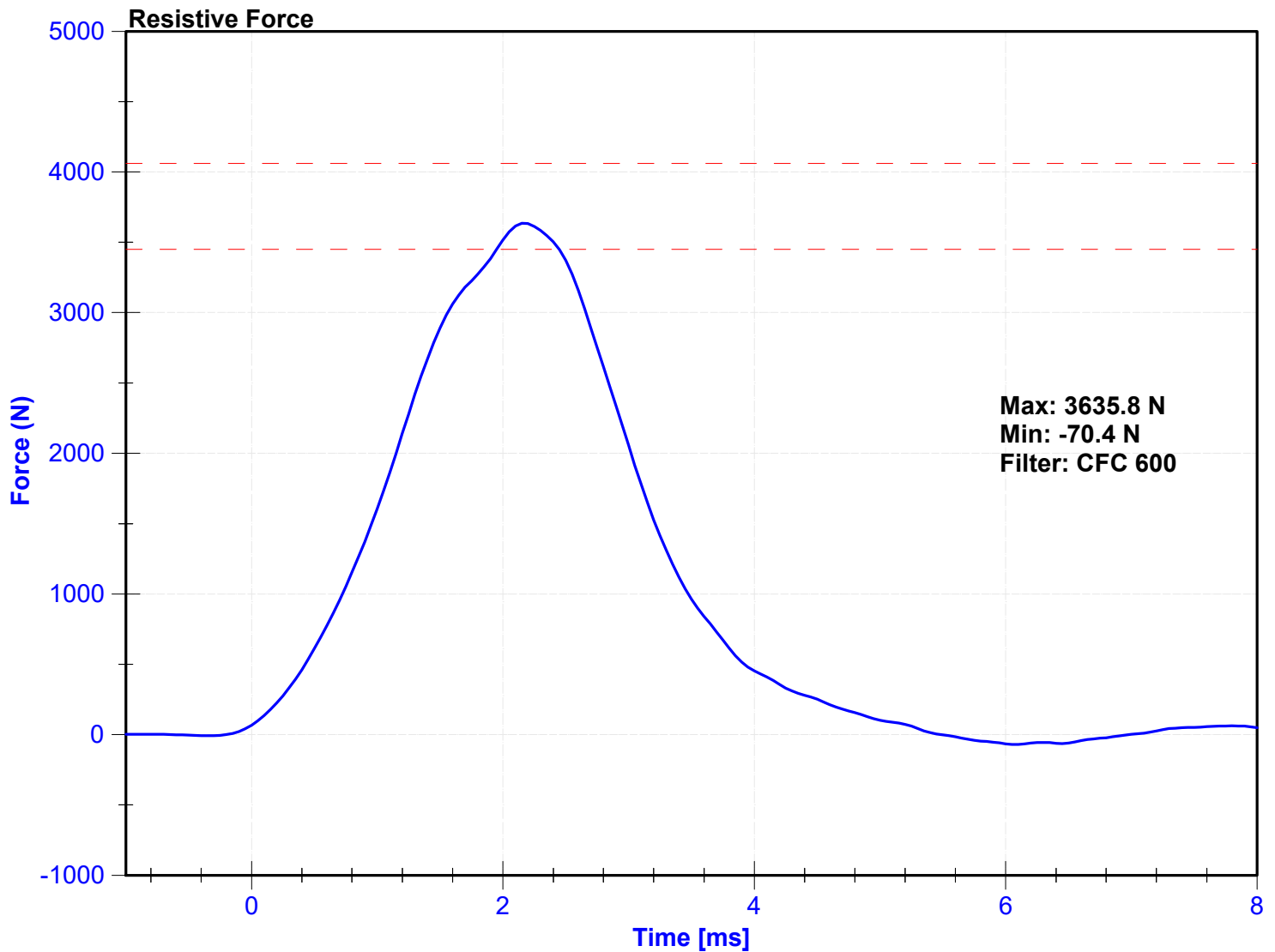
ATD Manufacturer	Humanetics	Test Technician	W. Brokx
ATD Serial Number	137	Laboratory Supervisor	J. Kinderman

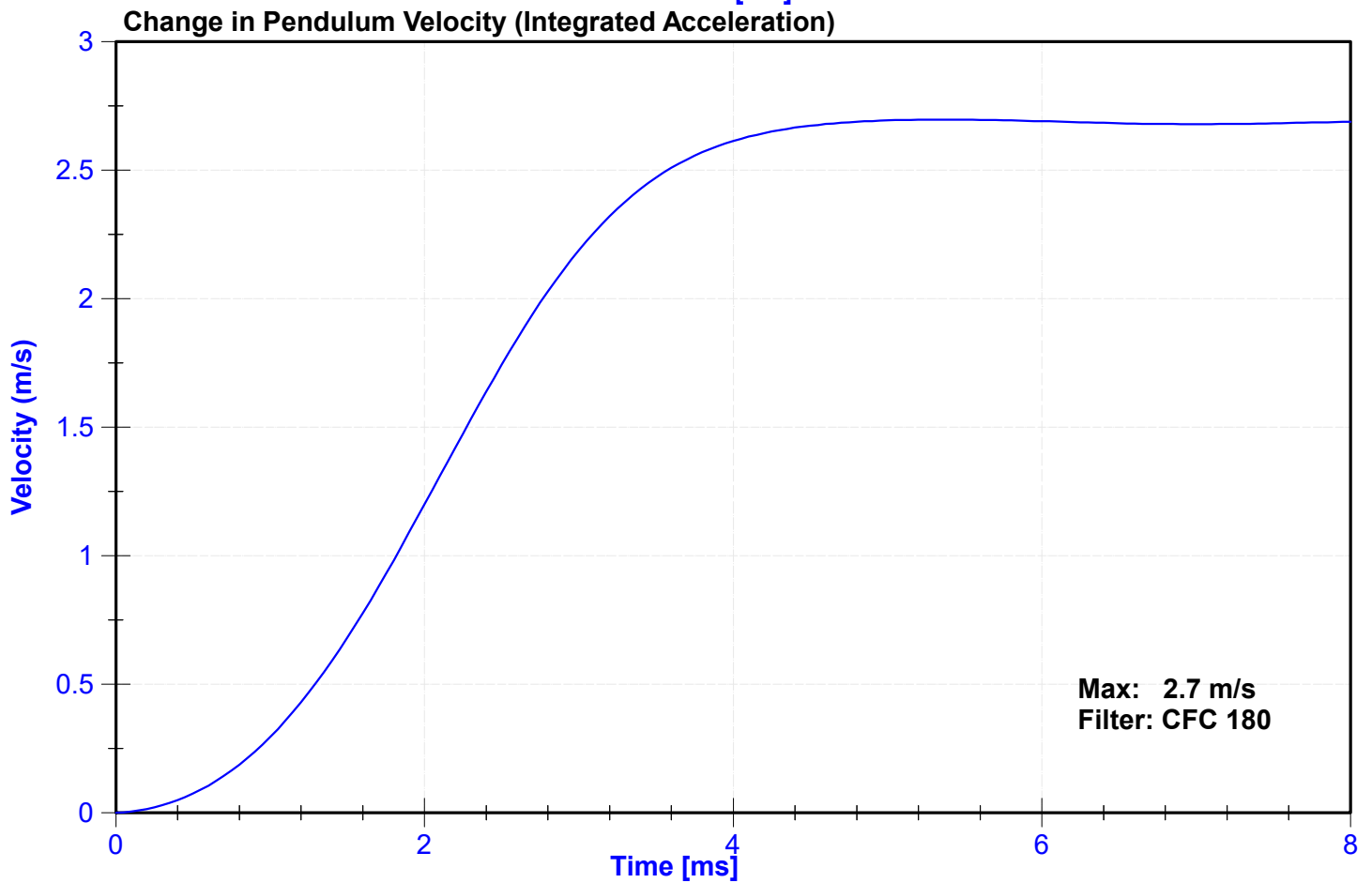
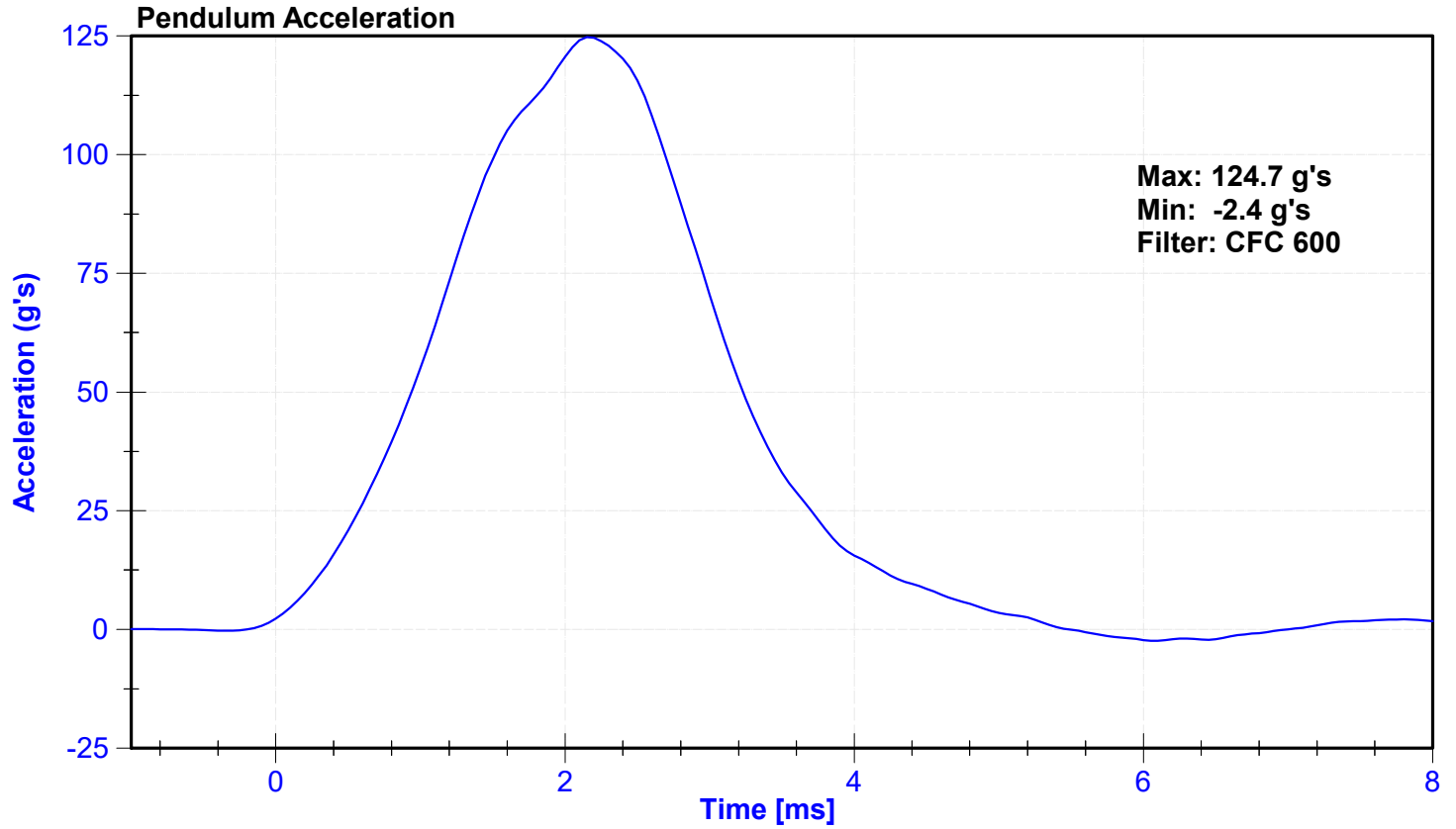
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.1	Pass
Humidity	10	70	%	54	Pass
Velocity	2.07	2.13	m/s	2.080	Pass
Resistive Force	3450	4060	N	3635.8	Pass

Transducer Calibrations

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





APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

Table 1 – Driver Dummy Instrumentation

Instrumentation		Axis/Location	Hybrid III 50 th S/N: 065		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P52152	Endevco	06/10/2025
		Y	P58888	Endevco	06/10/2025
		Z	P58911	Endevco	06/10/2025
	Redundant	X	P52012	Endevco	06/10/2025
		Y	P51979	Endevco	06/10/2025
		Z	P49204	Endevco	06/10/2025
Head Angular Rate Sensors		X	7603	DTS ARS	03/03/2025
		Y	15692	DTS ARS	03/03/2025
		Z	7589	DTS ARS	03/03/2025
Upper Neck Load Cell		FX, Fy, Fz MX,MY, MZ	2019-FX	Humanetics	09/12/2024
Chest Accelerometers	Primary	X	P58887	Endevco	06/09/2025
		Y	P66917	Endevco	06/09/2025
		Z	P49197	Endevco	06/09/2025
	Redundant	X	P49213	Endevco	06/09/2025
		Y	P63840	Endevco	06/09/2025
		Z	P83313	Endevco	06/09/2025
Chest Potentiometer		X	1046	Servo	06/10/2025
Pelvis Accelerometer		X	P51699	Endevco	06/09/2025
		Y	P94090	Endevco	06/09/2025
		Z	P83437	Endevco	06/09/2025
Femur Load Cells - Left	Primary	Z	DI4211-FZ1	Denton	09/16/2024
	Redundant	Z	DI4211-FZ2	Denton	09/16/2024
Femur Load Cells - Right	Primary	Z	136-FZ1	Denton	09/16/2024
	Redundant	Z	136-FZ2	Denton	09/16/2024
Tibia Load Cells - Left	Upper	MX, MY, FZ	364-FZ	Denton	09/13/2024
	Lower	MX, MY, FZ	364-FZ	Denton	09/13/2024
Tibia Load Cells – Right	Upper	MX, MY, FZ	407-FZ	Denton	09/13/2024
	Lower	MX, MY, FZ	396-FZ	Denton	09/13/2024
Foot Accelerometers - Left	Rear	X	P69807	Endevco	06/09/2025
	Front	Z	P51729	Endevco	06/09/2025
Foot Accelerometers - Right	Rear	X	P52255	Endevco	06/09/2025
	Front	Z	P51685	Endevco	06/09/2025
Seat belt Load Cells	Lap		NA	NA	
	Shoulder		292	GFE	02/11/2025

Table 2 – Front Passenger Dummy Instrumentation

Instrumentation		Axis/Location	Hybrid III 5 th S/N: 137		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P79417	Endevco	06/11/2025
		Y	P83335	Endevco	06/11/2025
		Z	P64149	Endevco	06/11/2025
	Redundant	X	P52008	Endevco	06/11/2025
		Y	P52045	Endevco	06/11/2025
		Z	P74774	Endevco	06/11/2025
Head Angular Rate Sensors		X	15212	DTS ARS	03/03/2025
		Y	14921	DTS ARS	03/03/2025
		Z	7370	DTS ARS	03/03/2025
Upper Neck Load Cell		FX, Fy, Fz MX,MY, MZ	1916-FX	Humanetics	09/12/2024
Chest Accelerometers	Primary	X	P58780	Endevco	06/11/2025
		Y	P83346	Endevco	06/11/2025
		Z	P49190	Endevco	06/11/2025
	Redundant	X	P58794	Endevco	06/11/2025
		Y	P69791	Endevco	06/11/2025
		Z	T11253	Endevco	06/11/2025
Chest Potentiometer		X	0720	Servo	06/17/2025
Pelvis Accelerometer		X	P58735	Endevco	06/11/2025
		Y	P77587	Endevco	06/11/2025
		Z	P51285	Endevco	06/11/2025
Femur Load Cells - Left	Primary	Z	115-FZ1	Denton	09/16/2024
	Redundant	Z	115-FZ2	Denton	09/16/2024
Femur Load Cells - Right	Primary	Z	135-FZ1	Denton	09/16/2024
	Redundant	Z	135-FZ2	Denton	09/16/2024
Tibia Load Cells - Left	Upper	MX, MY, FZ	368-FZ	Denton	09/13/2024
	Lower	MX, MY, FZ	492-FZ	Denton	09/13/2024
Tibia Load Cells – Right	Upper	MX, MY, FZ	362-FZ	Denton	09/13/2024
	Lower	MX, MY, FZ	490-FZ	Denton	09/13/2024
Foot Accelerometers - Left	Rear	X	P78959	Endevco	06/11/2025
	Front	Z	T29381	Endevco	07/11/2025
Foot Accelerometers - Right	Rear	X	P63998	Endevco	06/11/2025
	Front	Z	P80265	Endevco	06/11/2025
Seat belt Load Cells	Lap		NA	NA	
	Shoulder		DK1753	GFE	02/11/2025

Table 3 – Vehicle Instrumentation

Instrumentation			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember/Rear Seat Accelerometers	Left	Primary	X	A281023	Measurement Specialties	02/11/2025
			Z	A405571	Measurement Specialties	04/22/2025
		Redundant	X	A374276	Measurement Specialties	02/12/2025
	Right	Primary	X	A283612	Measurement Specialties	05/12/2025
			Z	A350945	Measurement Specialties	05/12/2025
		Redundant	X	A315008	Measurement Specialties	05/12/2025
Engine Accelerometers	Top		X	G22398	Endevco	06/20/2025
	Bottom		X	G25366	Endevco	06/25/2025