

REPORT NUMBER: NCAP-CAL-23-006

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

**General Motors LLC
2023 Chevrolet Colorado
4 Door Truck**

NHTSA No: M20230100

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



July 25, 2023

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**

This final test report was prepared for the U.S. Department of Transportation, National Highway Safety Traffic Administration, in response to Contract Number 693JJ919D000005.

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FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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16. Abstract A 56.30 km/h (35 mph), NCAP frontal rigid barrier impact test was conducted on a 2023 Chevrolet Colorado 4 Door Truck 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 11, 2023. The impact velocity of the vehicle was 56.27 km/h, and the ambient temperature at the barrier face at the time of impact was 21°C. The target vehicle post-test maximum crush was 448 mm at vehicle Centerline. 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. 142)</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>194.297</td> <td>700</td> <td>293.389</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-32.720</td> <td>52</td> <td>-20.237</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.261</td> <td>1</td> <td>0.349</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>1467.882</td> <td>2620</td> <td>793.022</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-45.175</td> <td>2520</td> <td>-409.507</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-667.692</td> <td>6805</td> <td>-172.498</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-315.170</td> <td>6805</td> <td>-660.651</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD (Serial No. 142)		Passenger ATD (Serial No. 137)		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC15)		700	194.297	700	293.389	Maximum Chest Compression	mm	63	-32.720	52	-20.237	Nij		1	0.261	1	0.349	Neck Tension	N	4170	1467.882	2620	793.022	Neck Compression	N	4000	-45.175	2520	-409.507	Left Femur Force	N	10008	-667.692	6805	-172.498	Right Femur Force	N	10008	-315.170	6805	-660.651
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SECTION 1

PURPOSE AND SUMMARY OF 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 Testing.

SUMMARY

A load cell barrier consisting of 128 load cells was impacted by a 2023 Chevrolet Colorado 4 Door Truck at a velocity of 56.27 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on July 11, 2023. 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 lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 142) 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 486 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 / electrolyte leakage after the event or during any phase of the static rollover. The maximum static crush of the vehicle was 448 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 and the head restraint. The upper torso contacted the frontal airbag. Both knees contacted the knee bolster.

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

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)	194.297	0.261	1467.882	-45.175	46.175	-32.720	-667.692	-315.170
Passenger (5th)	293.389	0.349	793.022	-409.507	51.779	-20.237	-172.498	-660.651

GENERAL COMMENTS:

1. P1 (Driver) serial number - 142
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 FMVSS 212, 219 (Partial), and 301 Data

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: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20230100	Traction Control System (TCS)	Yes
Model Year	2023	Power Steering	Yes
Make	Chevrolet	Power Window Auto-Reverse	Yes
Model	Colorado	Driver Frontal Airbag	Yes
Body Style	4 Door Truck	Driver Curtain Airbag	Yes
VIN	1GCPTCEK0P1144654	Driver Head/Torso Airbag	No
Body Color	Brown	Driver Torso Airbag	No
Odometer Reading (km /mi)	6 Miles	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.7 L	Driver Pelvis Airbag	No
Type / No. Cylinders	I4 Turbo	Driver Knee Airbag	No
Engine Placement	Inline	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	Four Wheel Drive	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	Yes	Front Pass. Knee Airbag	No
Running Boards	Yes	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other –	N/A

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC	GVWR	2835
Date of Manufacture	04/23	GVWR Front	1588
		GVWR Rear	1633

VEHICLE SEATING AND WEIGHT CAPACITY DATA

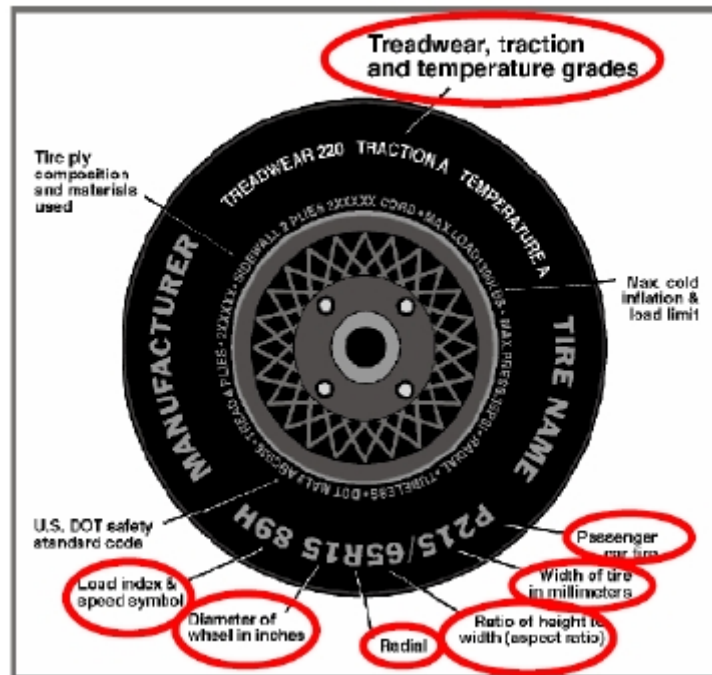
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				632
Cargo Wt. (RCLW) (kg)				136

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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

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)	240	240
Recommended Tire Size	265/60R18	265/60R18
Tire Size on Vehicle	265/60R18	265/60R18
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler Fortitude HT	Wrangler Fortitude HT
Treadwear	680	680
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel	2 Polyester, 2 Steel
Load Index / Speed Symbol	110T	110T
Tire Material	Rubber	Rubber
DOT Safety Code Left	M680JM1R1822	M680JM1R1822
DOT Safety Code Right	M680JM1R1822	M680JM1R1822

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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	599	475		641	581	
Right	kg	591	467		623	560	
Ratio	%	55.8	44.2		52.6	47.4	
Total	kg	1190	942	2132	1264	1141	2405

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2132	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	142	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2410	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	912	912	947	945	1474
As Tested	mm	905	904	918	916	1583
Post-Test	mm	910	917	902	904	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3337
Total Vehicle Length at Left Side	mm	5352
Total Vehicle Length at Centerline	mm	5417
Total Vehicle Length at Right Side	mm	5352
Weight of Ballast in Cargo Area	kg	36
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	75.3

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

None.

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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck

NHTSA No.: M20230100

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/11/2023

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	5417
2	Total Width	1902
3*	Bumper Top Height	555
4*	Bumper Bottom Height	449
5*	Longitudinal Member Top Height	551
6	Distance Between Longitudinal Members	1412
7	Longitudinal Member Width	92
8*	Engine Top Height	1059
9*	Engine Bottom Height	248
10	Engine and Gearbox Width	627
11	Front Bumper-Engine Distance	753
12*	Front Shock Absorber Fixing Height	779
13*	Bonnet Leading Edge Height	1097
14	Front Shock Absorber Fixing Width	837
15	Front Bumper – Front Axle Distance	882
16	Front Axle – A Pillar Distance	623
17	A-Pillar – B-Pillar Distance	1161
18	B-Pillar – Rear Axle Distance	1552
19	B-Pillar – C-Pillar Distance	856
20*	Roof Sill Bottom Height	1729
21*	Roof Sill Top Height	1757
22*	Floor Sill Bottom Height	539
23*	Floor Sill Top Height	569

*Height Measurements are taken from the ground

Note: All measurements are in millimeters

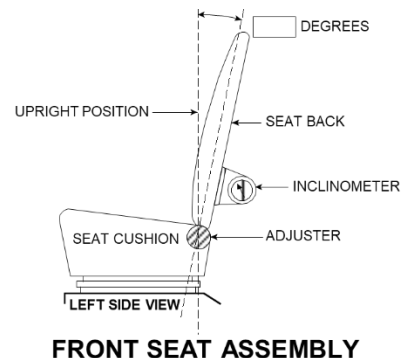
DATA SHEET NO. 2 SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
Test Date: 07/11/2023

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	13.2
Passenger Seat Back Angle	16.0

SEAT FORE / AFT POSITIONS

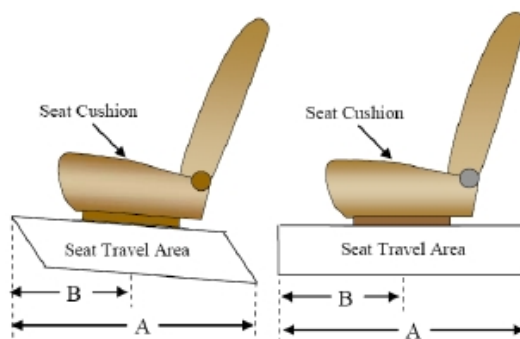
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	315	157.5
Passenger Seat	240	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: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

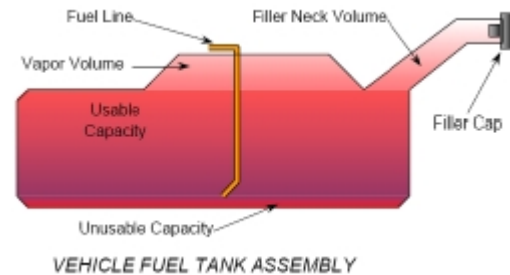
NHTSA No.: M20230100
 Test Date: 07/11/2023

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	81.4
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	74.9 - 76.5
Actual Amount of Solvent Used	75.3
1/3 of Usable Capacity	27.1

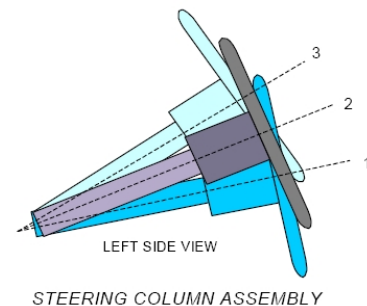
FUEL PUMP

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



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.



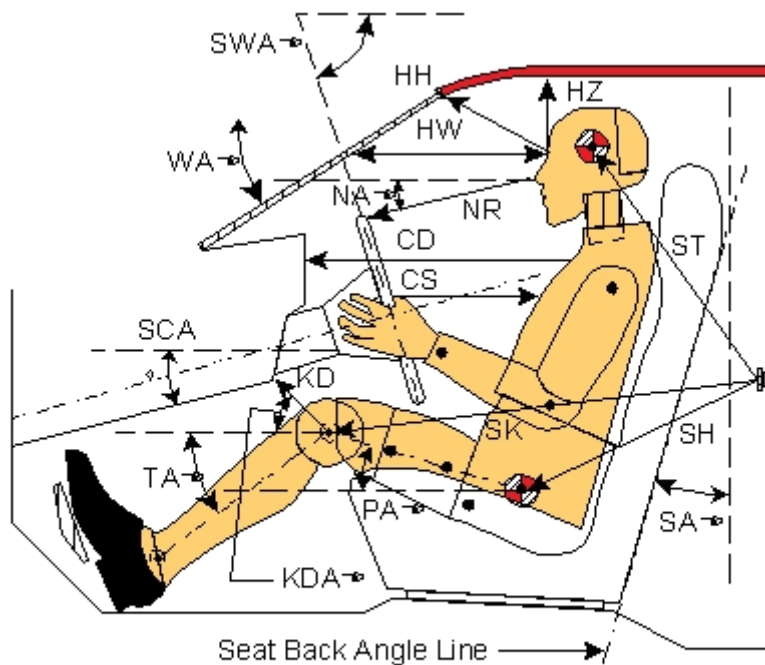
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	21.2	
Geometric center position No. 2	23.1	
Uppermost position No. 3	24.9	
Telescoping Steering Wheel Travel		42
Test Position	23.1	21

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023



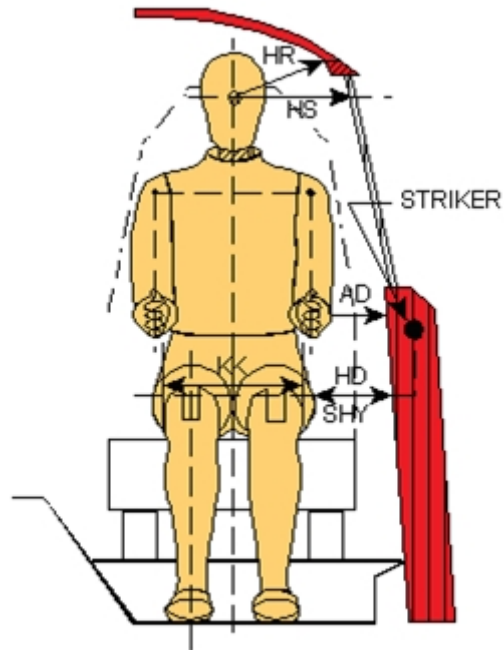
Left Side View

Code	Measurement Description	Driver (SN: 142)		Passenger (SN: 137)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		33.3		
SWA°	Steering Wheel Angle		23.5		
SCA°	Steering Column Angle		66.5		
SA°	Seat Back Angle (on headrest post)		13.2		16.0
HZ	Head to Roof (Z)	192	90.0	266	90.0
HH	Head to Header	456	21.7	419	39.1
HW	Head to Windshield	757	0.1	740	0.1
NR	Nose to Rim / Dash	457	7.5	484	19.35
CD	Chest to Dash	589		454	
CS	Chest to Steering Hub	394	3.2		
RA	Rim to Abdomen	256	0.0		
KDL	Left Knee to Dash	206	33.4	138	34.1
KDR	Right Knee to Dash	198	38.7	136	32.8
PA°	Pelvic Angle		23.4		19.9
TA°	Tibia Angle		43.9		53.6
SK	Striker to Knee	601	4.1	678	7.4
ST	Striker to Head	534	80.6	497	61.7
SH	Striker to H-Point	223	37.0	346	23.4

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
Test Date: 07/11/2023



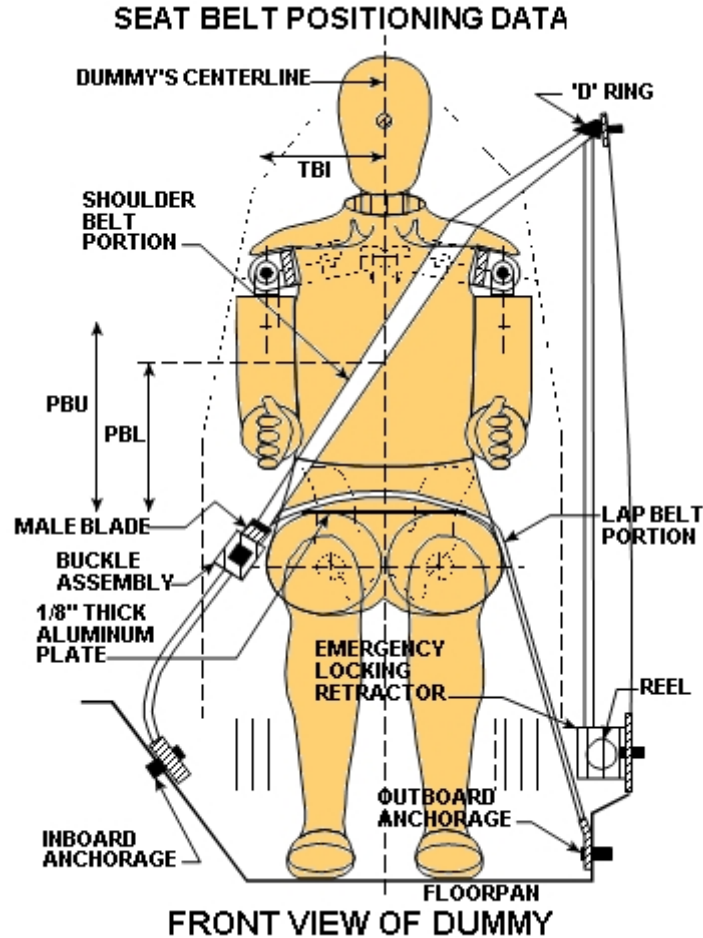
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	136	79
HD	H-Point to Door	142	198
HR	Head to Side Header	242	297
HS	Head to Side Window	352	321
KK	Knee to Knee	307	209
SHY	Striker to H-Point (Y Direction)	232	280
AA	Ankle to Ankle	300	175

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
Test Date: 07/11/2023



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	340	280
PBL — Top surface of reference to belt lower edge	mm	255	195

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	835	915
Lap Belt Length as measured on ATD	mm	510	495
Remainder of belt on reel	mm	865	800
Total belt length for continuous webbing systems	mm	2210	2210

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

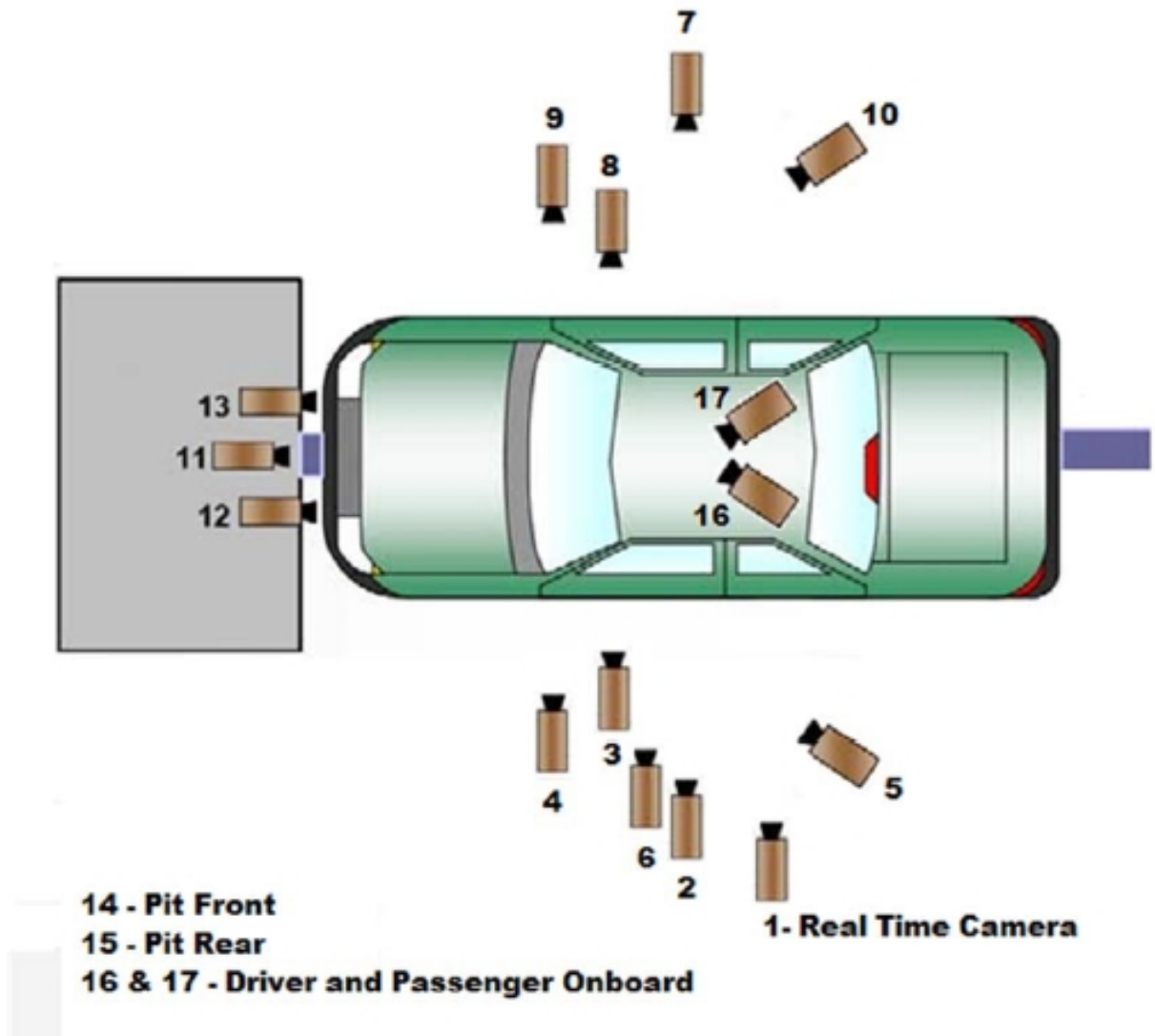
Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck

NHTSA No.: M20230100

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/11/2023

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

CAMERA LOCATIONS

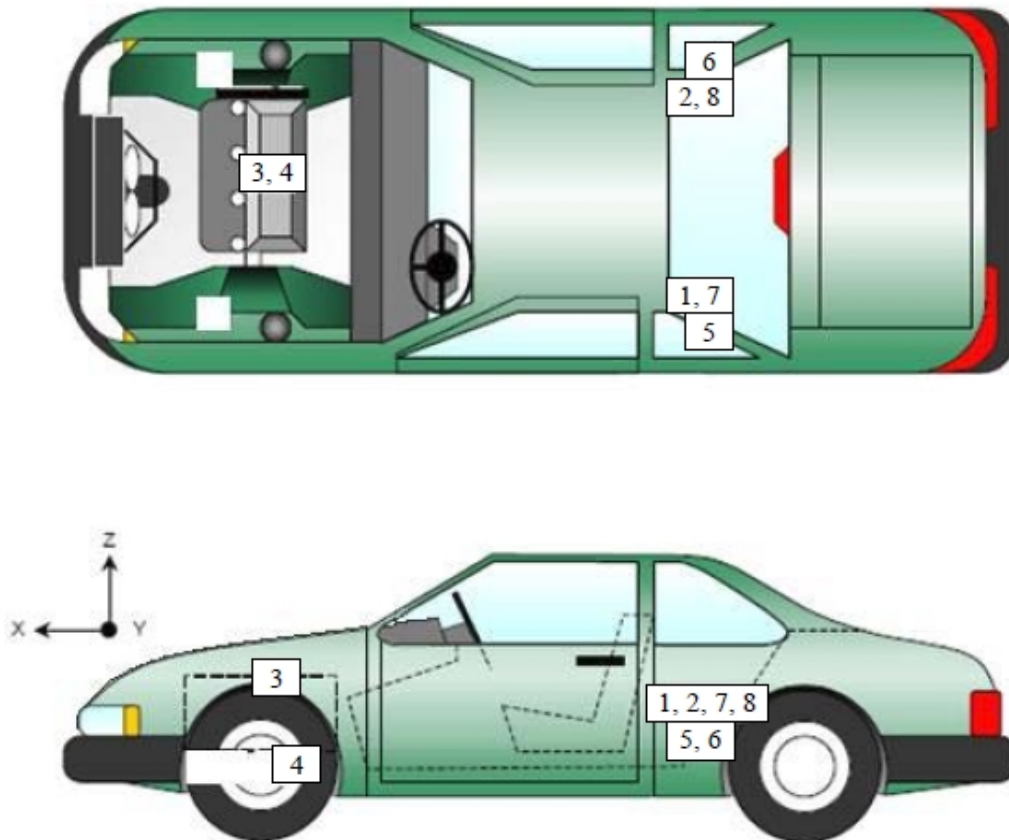
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall				Zoom	60
2	Left Overall	-2226	-7664	-1595	24	1000
3	Driver Close-Up	-1392	-6968	-1475	50	1000
4	Left Front Half	-970	-6917	-1444	28	1000
5	Left Angle	-4124	-4057	-2836	50	1000
6	Steering Column	-1820	-8325	-2184	75	1000
7	Right Overall	-2103	8137	-1610	24	1000
8	Passenger Close-Up	-1216	6818	-1446	50	1000
9	Right Front Half	-786	6520	-1453	28	1000
10	Right Angle	-3611	3960	-2791	50	1000
11	Windshield	1148	0	-2891	12	1000
12	Driver Windshield	844	-426	-2299	25	1000
13	Passenger Windshield	844	426	-2299	25	1000
14	Pit Front	-1086	0	2612	12	1000
15	Pit Rear	-2840	0	2591	12	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: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2514	-238	-142
2	Right Rear Accelerometer – X Direction	2506	234	-138
3	Engine Top X	4644	-16	-522
4	Engine Bottom X	4959	-11	290
5	Left Rear Accelerometer – Z Direction	2514	-238	-142
6	Right Rear Accelerometer – Z Direction	2506	234	-138
7	Left Rear Accelerometer – X Direction Redundant	2514	-226	-142
8	Right Rear Accelerometer – X Direction Redundant	2506	252	-140

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

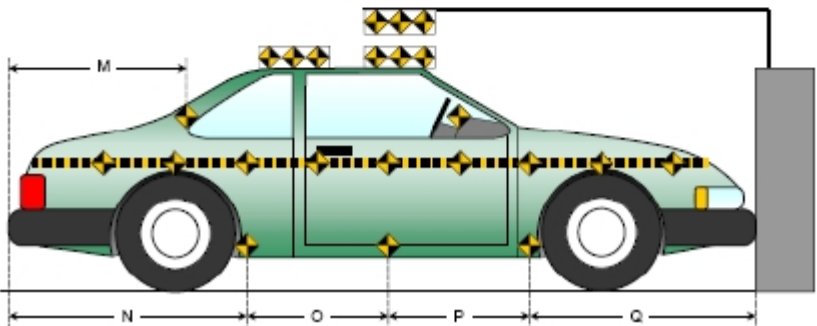
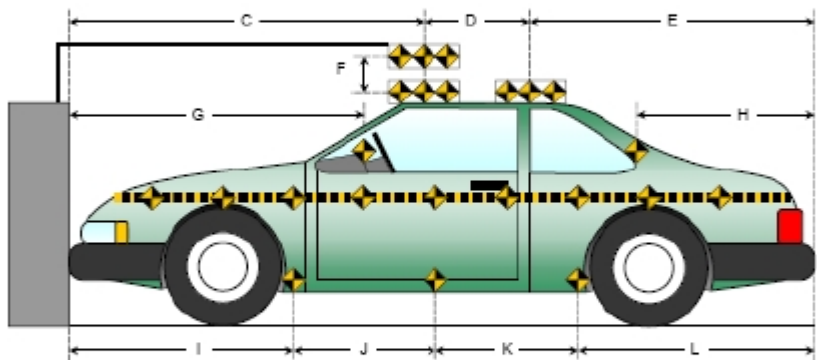
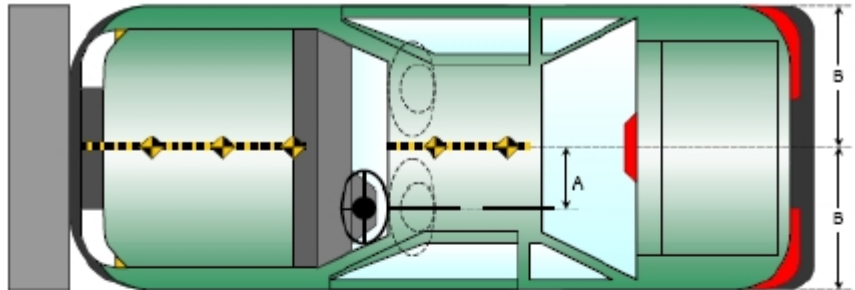
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

Item	Value
A	379
B	951
C	3223
D	608
E	1586
F	398
G	1901
H	1885
I	1464
J	1086
K	1089
L	1778
M	1882
N	1773
O	1090
P	1089
Q	1465

All units in millimeters



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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
Test Date: 07/11/2023

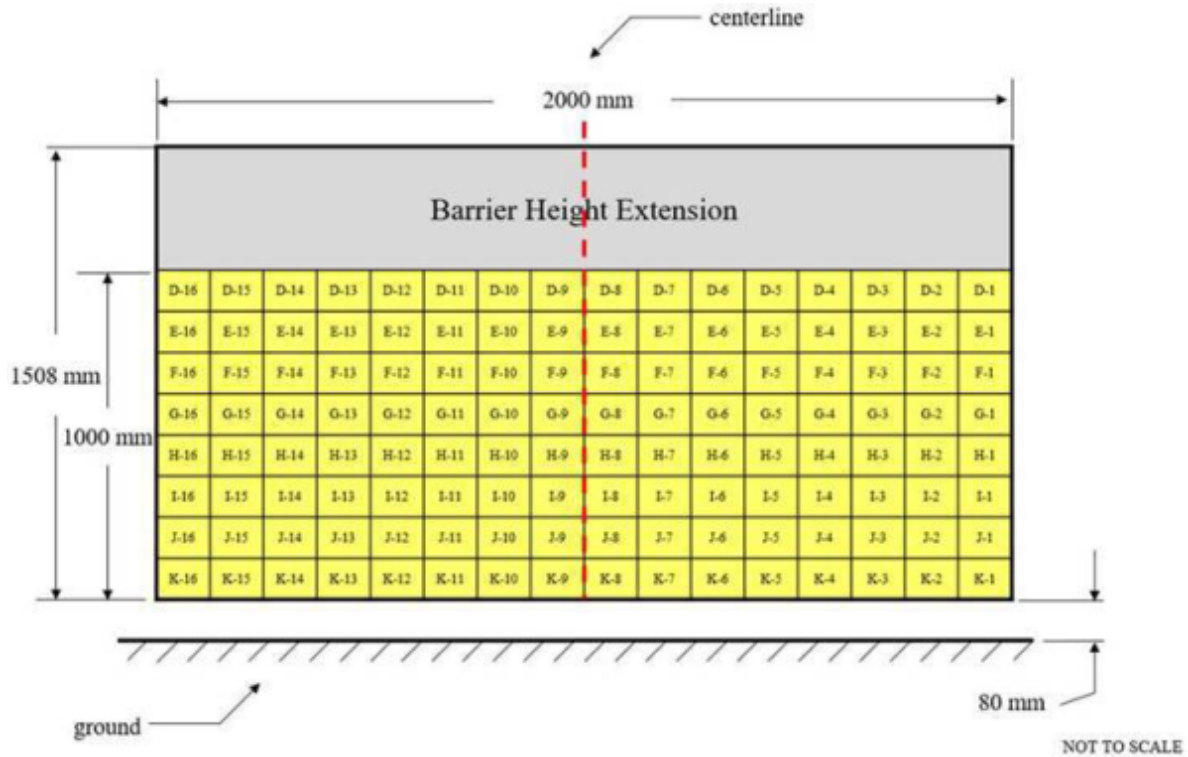


Figure 1 - Load Cell Locations on a 128-Load Cell Barrier with Plywood Height Extension*
Please note above diagram is not actual representation of load cell barrier used.

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
Test Date: 07/11/2023

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	47
Passenger Dummy Accelerometers	47
Vehicle Structure Accelerometers	8
Load Cell Barrier	384
Total	486

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: 2023 Chevrolet Colorado 4 Door Truck

NHTSA No.: M20230100

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/11/2023

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	H3-50th Male / SN: 142	H3-5th Female / SN: 137
Head Contact	Frontal Airbag & Head Restraint	Frontal Airbag & Head Restraint
Upper Torso Contact	Frontal Airbag	Frontal Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Knee Bolster
Right Knee Contact	Knee Bolster	Knee Bolster

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger	Other
Locked / Unlocked Doors	Unlocked	Unlocked	Unlocked
Front Door Opening	Closed and Operational	Closed and Operational	
Rear Door Opening	Closed and Operational	Closed and Operational	
Trunk/Hatch/Tailgate Opening			Remained Closed and 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 on bottom right
Window Damage	None
Other	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	366
Center	mm	402
Right Side	mm	470
Average	mm	413

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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

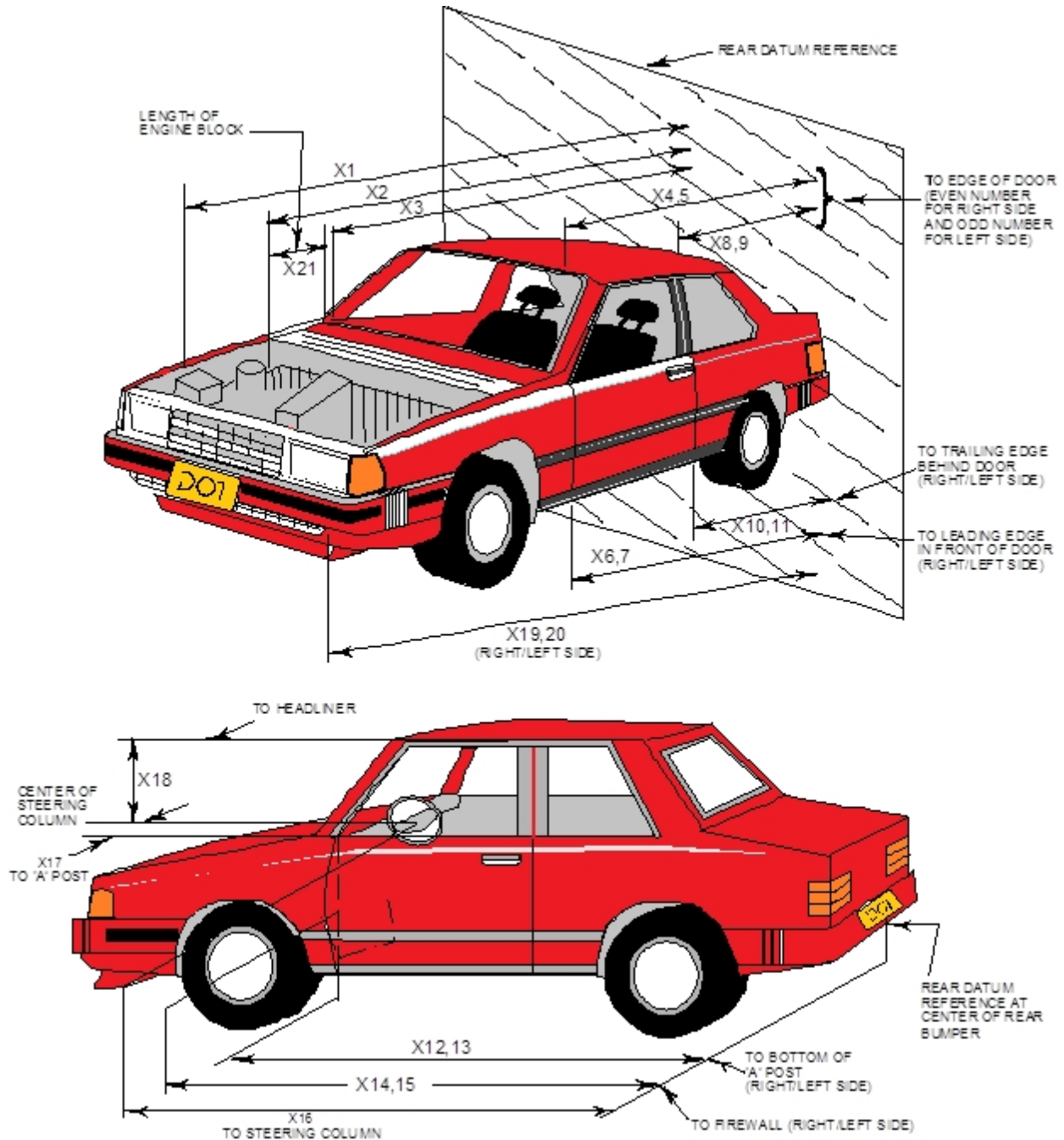
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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	Yes	No	Yes	No
Knee Airbag	No	N/A	No	N/A
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	Yes	Yes	Yes	Yes
Other	N/A	N/A	N/A	N/A

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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023



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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck

NHTSA No.: M20230100

Test Program: NCAP Frontal Barrier Impact Test

Test Date: 07/11/2023

No.	Measurement Description	Pre-Test	Post-Test	Crush
1	Total Length of Vehicle at Centerline	5417	4969	-448
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4664	4571	-93
3	RSOV to Firewall	4324	4305	-19
4	RSOV to Upper Leading Edge of Right Door	3907	3905	-2
5	RSOV to Upper Leading Edge of Left Door	3905	3891	-14
6	RSOV to Lower Leading Edge of Right Door	3854	3867	13
7	RSOV to Lower Leading Edge of Left Door	3850	3851	1
8	RSOV to Upper Trailing Edge of Right Door	2762	2758	-4
9	RSOV to Upper Trailing Edge of Left Door	2759	2745	-14
10	RSOV to Lower Trailing Edge of Right Door	2750	2762	12
11	RSOV to Lower Trailing Edge of Left Door	2747	2749	2
12	RSOV to Bottom of "A" Post of Right Side	3896	3886	-10
13	RSOV to Bottom of "A" Post of Left Side	3892	3874	-18
14	RSOV to Firewall, Right Side	4325	4272	-53
15	RSOV to Firewall, Left Side	4321	4274	-47
16	RSOV to Steering Column	3432	3484	52
17	Center of Steering Column to "A" Post	298	294	-4
18	Center of Steering Column to Headliner	433	459	26
19	RSOV to Right Side of Front Bumper	5373	4914	-459
20	RSOV to Left Side of Front Bumper	5370	4981	-389
21	Length of Engine Block	216	216	0
RD	RSOV to Right Side of Dash Panel	3665	3660	-5
CD	RSOV to Center of Dash Panel	3727	3719	-8
LD	RSOV to Left Side of Dash Panel	3662	3650	-12

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

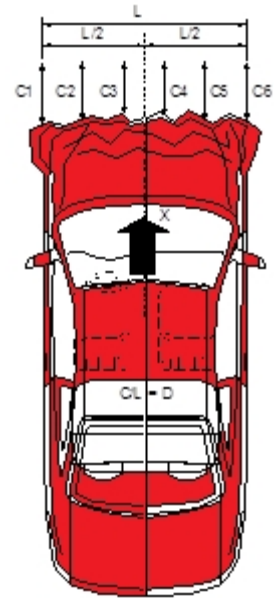
NHTSA No.: M20230100
Test Date: 07/11/2023

VEHICLE INFORMATION

VIN: 1GCPTCEK0P1144654 Wheelbase (mm): 3337
Vehicle Size Category: Truck Test Weight (kg): 2405

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): 56.27
Velocity Change (km/h): 66.78
Time of Separation (ms): 119



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: C4
Damage Region Length (mm): 1567
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Change
C1	Crush Zone 1 at Left Side	mm	5176	4844	332
C2	Crush Zone 2 at Left Side	mm	5358	4942	416
C3	Crush Zone 3 at Left Side	mm	5393	4964	429
C4	Crush Zone 4 at Right Side	mm	5394	4954	440
C5	Crush Zone 5 at Right Side	mm	5359	4917	442
C6	Crush Zone 6 at Right Side	mm	5175	4841	334
L	C1 to C6	mm	1466	1567	-101

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

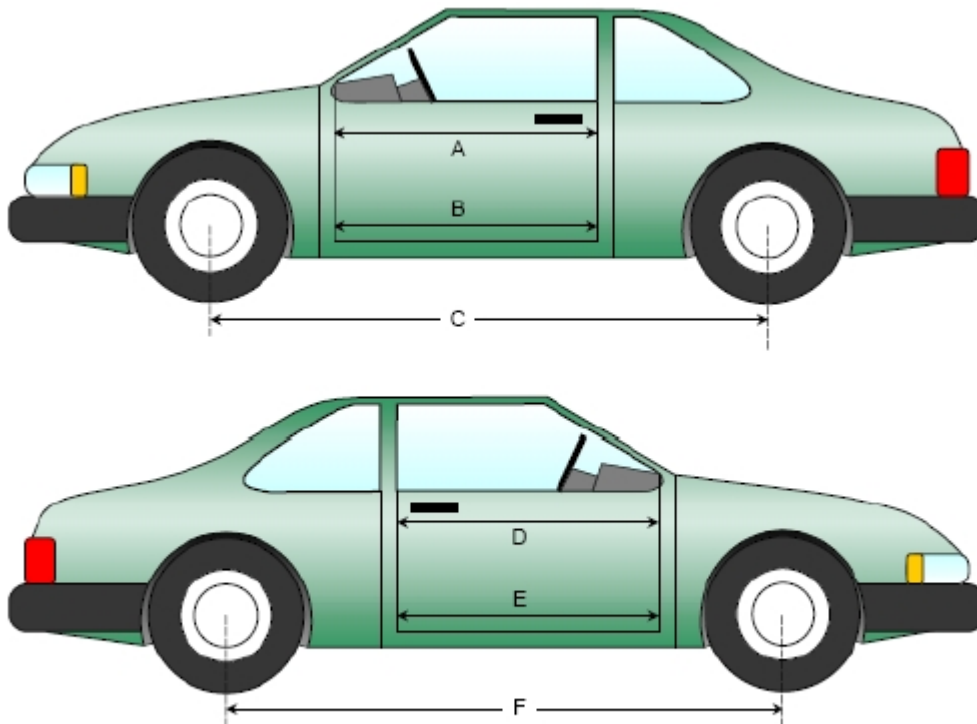
NHTSA No.: M20230100
Test Date: 07/11/2023

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	990	990	0
B	Left Side Lower	mm	939	939	0
D	Right Side Upper	mm	989	989	0
E	Right Side Lower	mm	943	943	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	3337	3227	-110
F	Right Side Wheelbase	mm	3337	3298	-39



Left & Right Side Views

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

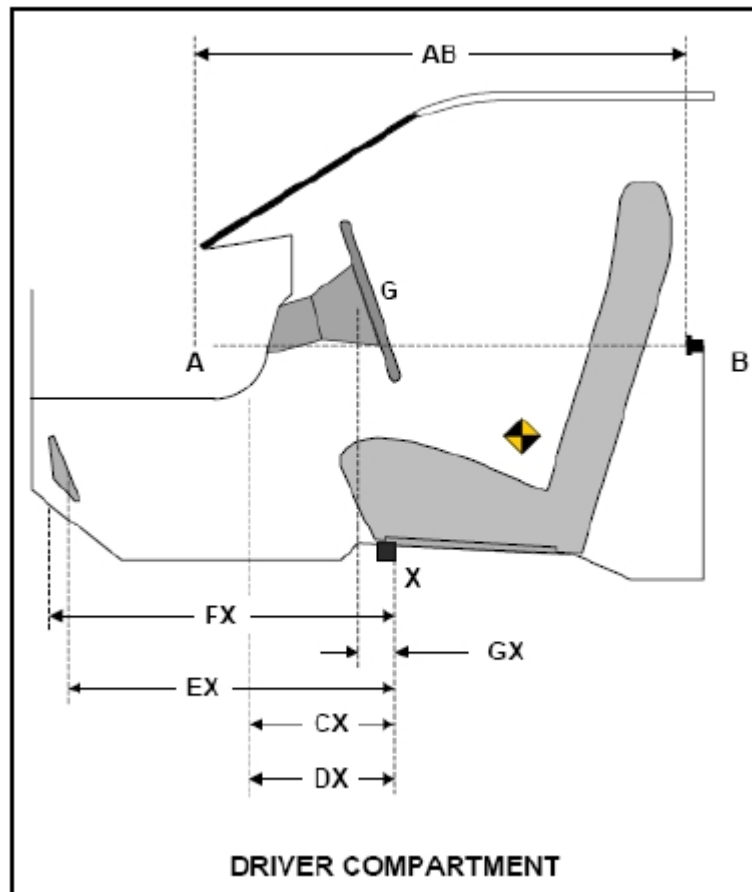
Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	769	767	-2
CX	Left Knee Bolster to X	mm	314	309	-5
DX	Right Knee Bolster to X	mm	309	307	-2
EX	Brake Pedal to X	mm	575	562	-13
FX	Foot Rest to X	mm	607	606	-1
GX	Center of Steering Column Wheel Hub to X	mm	115	168	53

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023

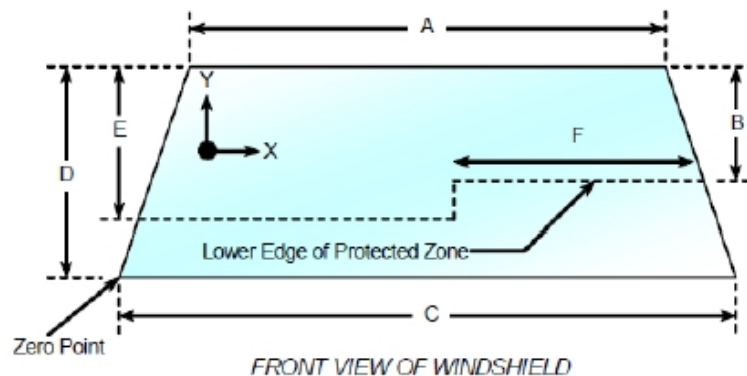
Windshield Mounting Details: A trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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 °C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2097.0	2097.0	100%
Right Side	2097.0	2097.0	100%
Total	4194	4194	100%



Item	Units	Value
A	mm	1212
B	mm	375
C	mm	1412
D	mm	785
E	mm	472
F	mm	541

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:	<u>2023 Chevrolet Colorado 4 Door Truck</u>	NHTSA No.:	<u>M20230100</u>
Test Program:	<u>NCAP Frontal Barrier Impact Test</u>	Test Date:	<u>07/11/2023</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact:	21°C	Test Time:	10:50 AM
--------------------------------	-------------	------------	-----------------

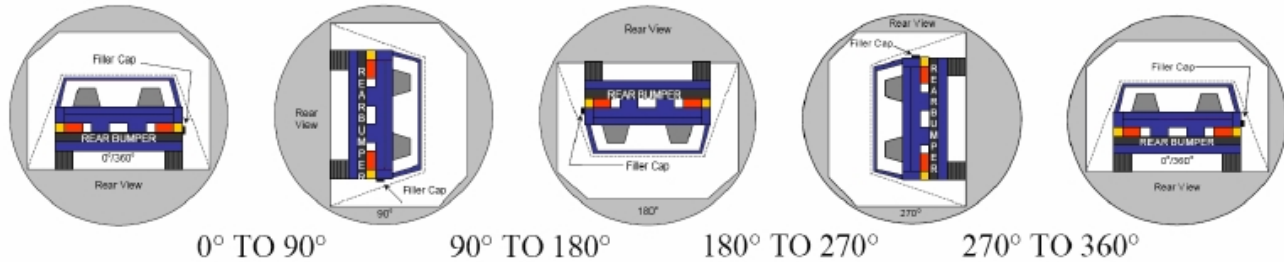
STODDARD SOLVENT SPILLAGE MEASUREMENTS

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

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
 Test Date: 07/11/2023



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°	67	300	367
90° to 180°	67	300	367
180° to 270°	65	300	365
270° to 360°	71	300	371

FMVSS 301 SPILLAGE TABLE

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

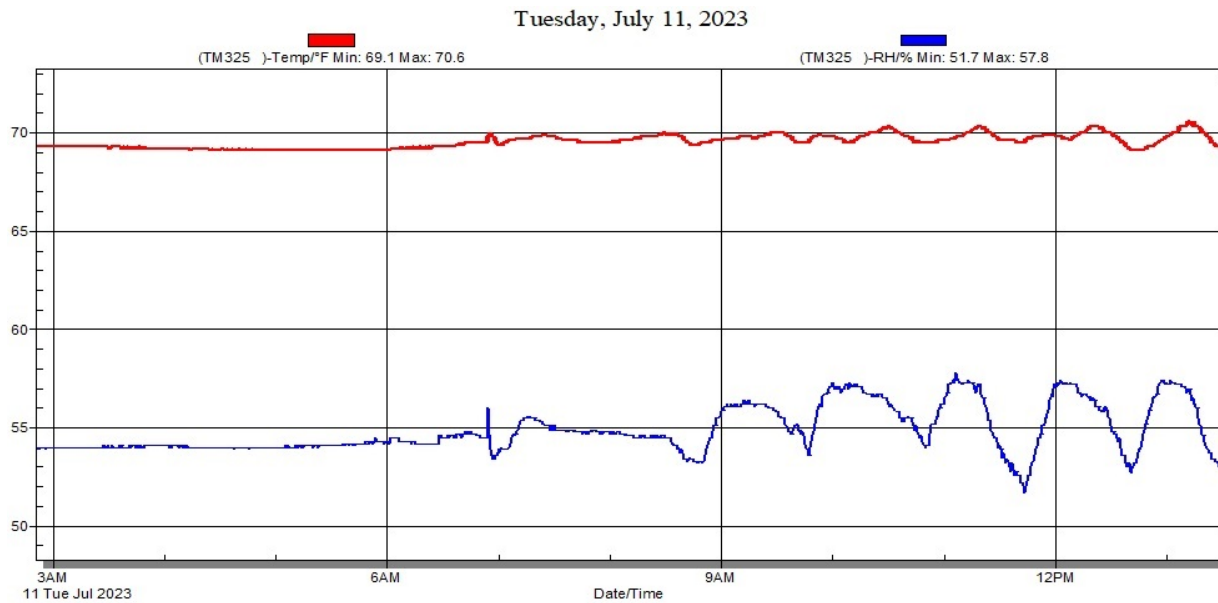
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2023 Chevrolet Colorado 4 Door Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20230100
Test Date: 07/11/2023



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

APPENDIX A
PHOTOGRAPHS

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¹**NOTE:** *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.*

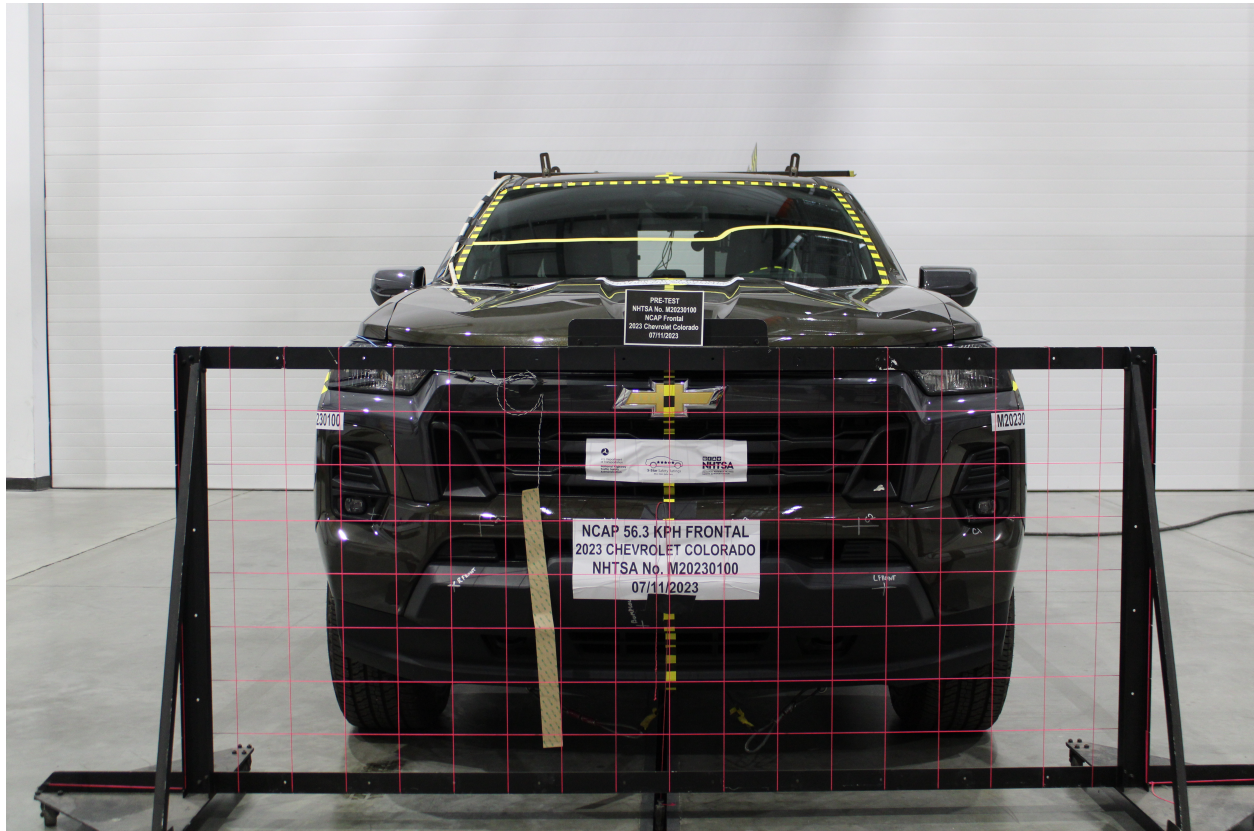


Figure A-1: Load Cell Location



Figure A-2: Pre-Test Load Cell Wall



Figure A-3: Post-Test Load Cell Wall

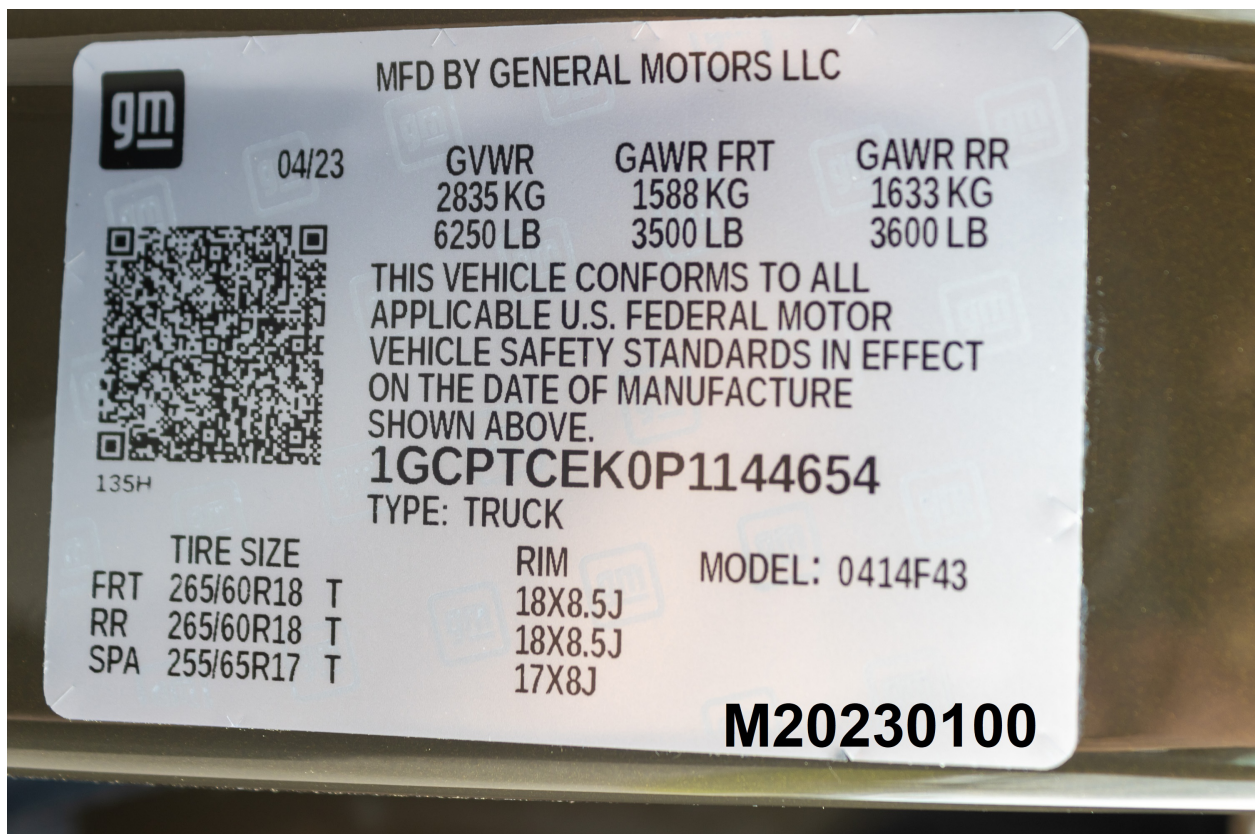


Figure A-4: Manufacturer's Label

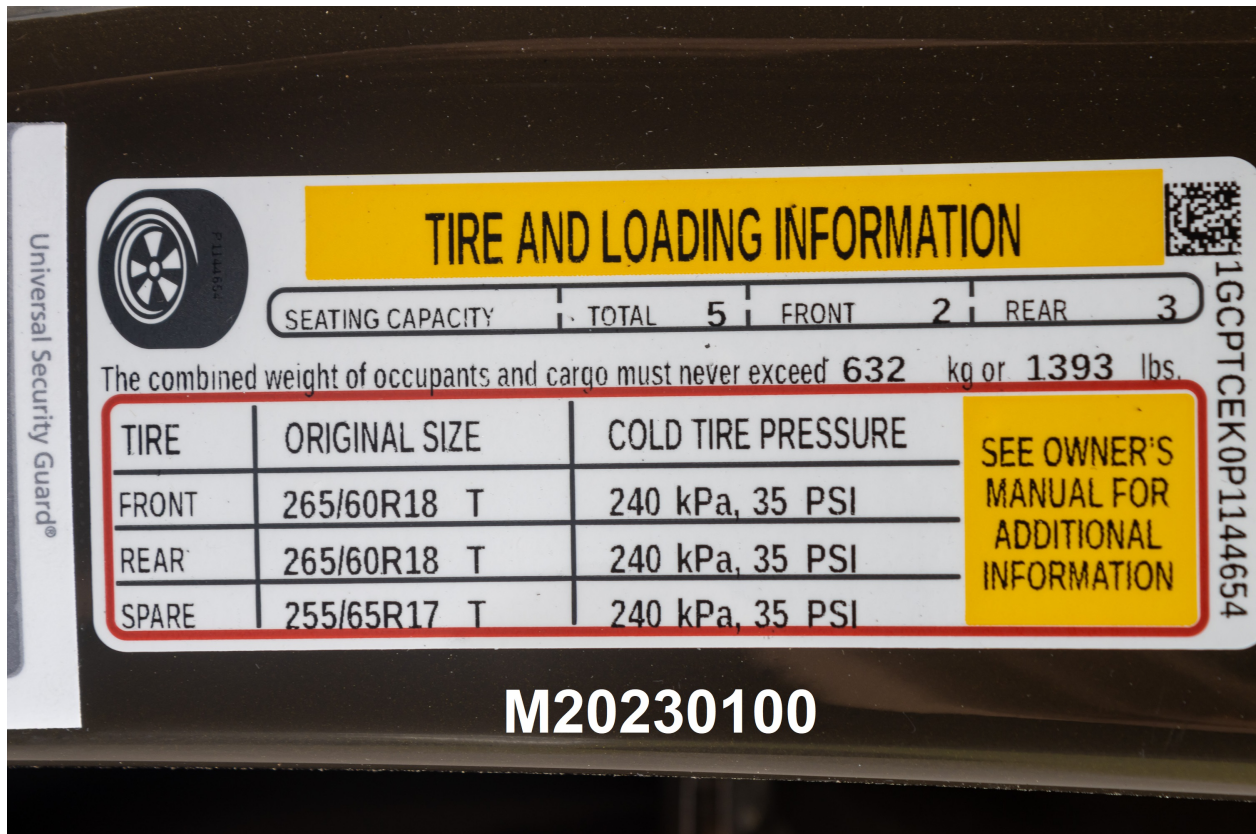


Figure A-5: Tire Placard



Figure A-6: 2023 Chevrolet Colorado Frontal As Delivered



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

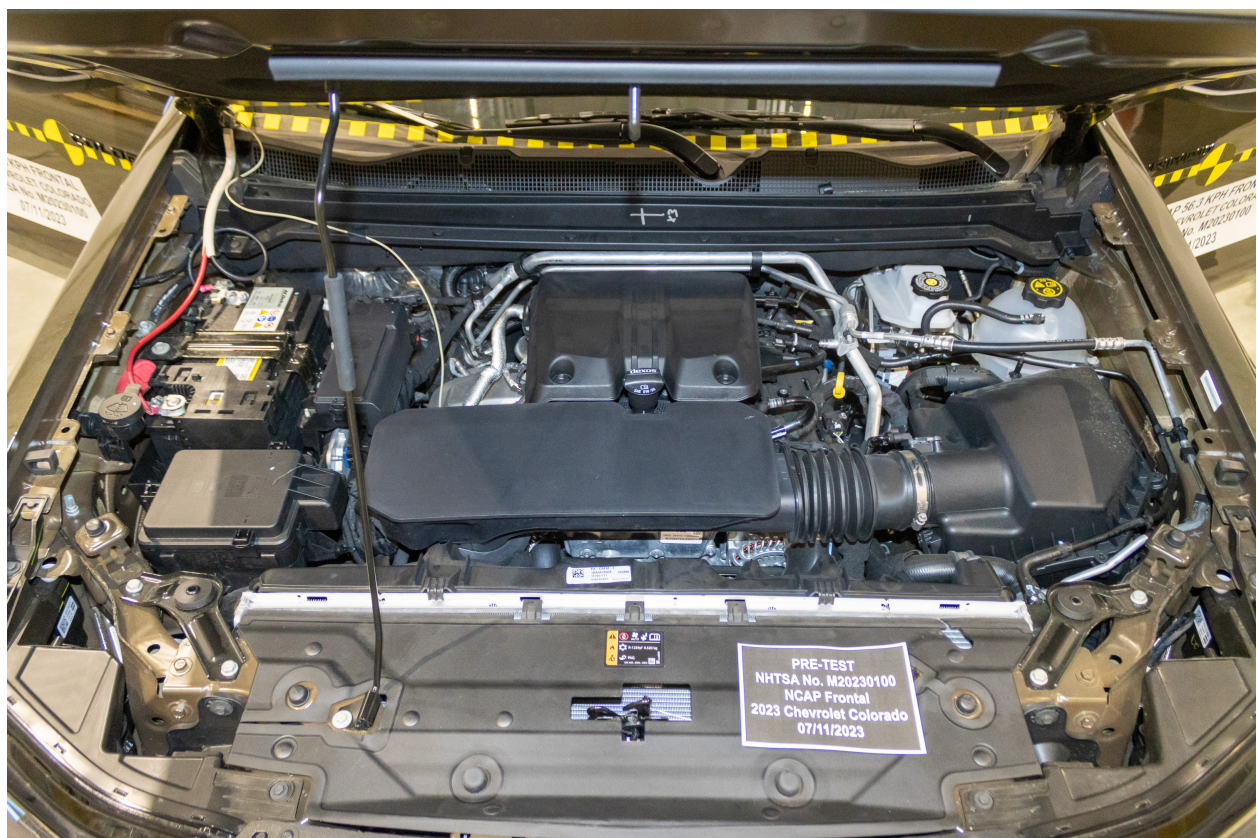


Figure A-20: Pre-Test Engine Compartment View



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

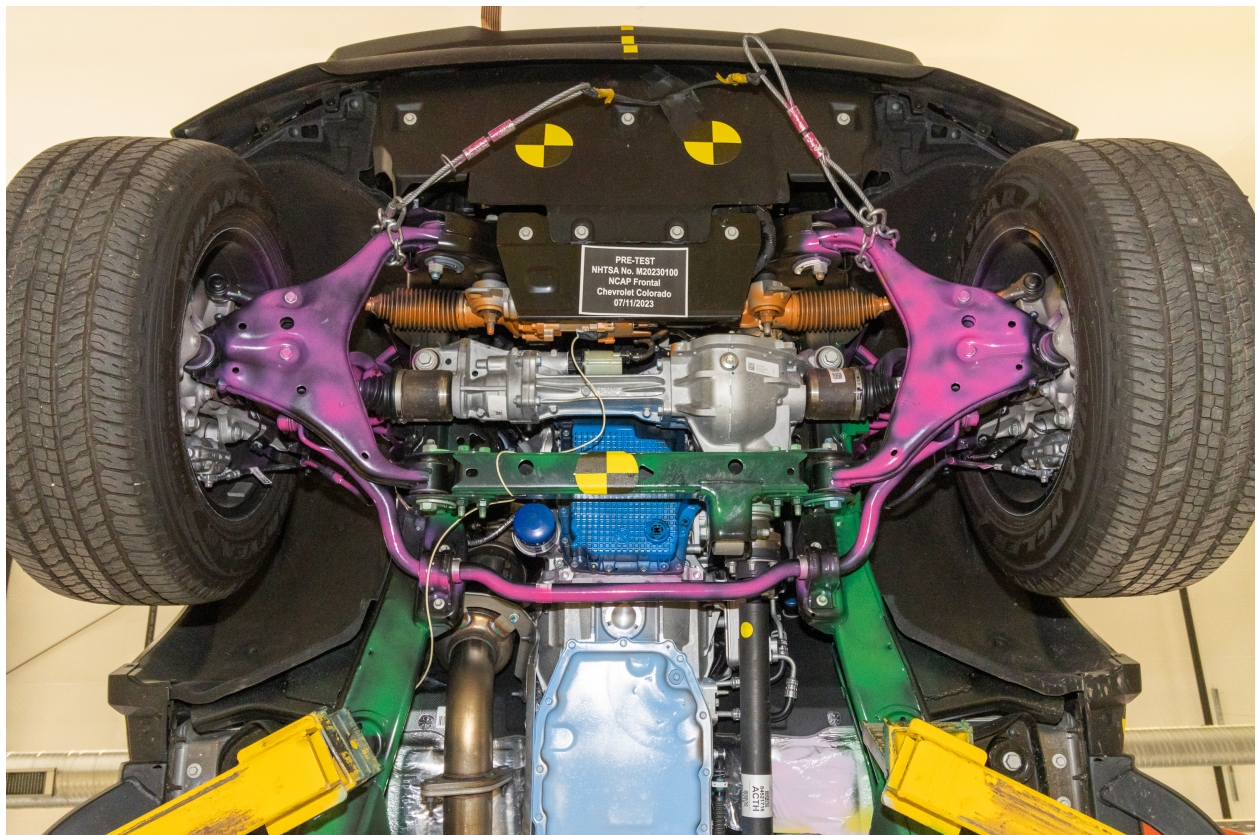


Figure A-24: Pre-Test Front Underbody View



Figure A-25: Post-Test Front Underbody View

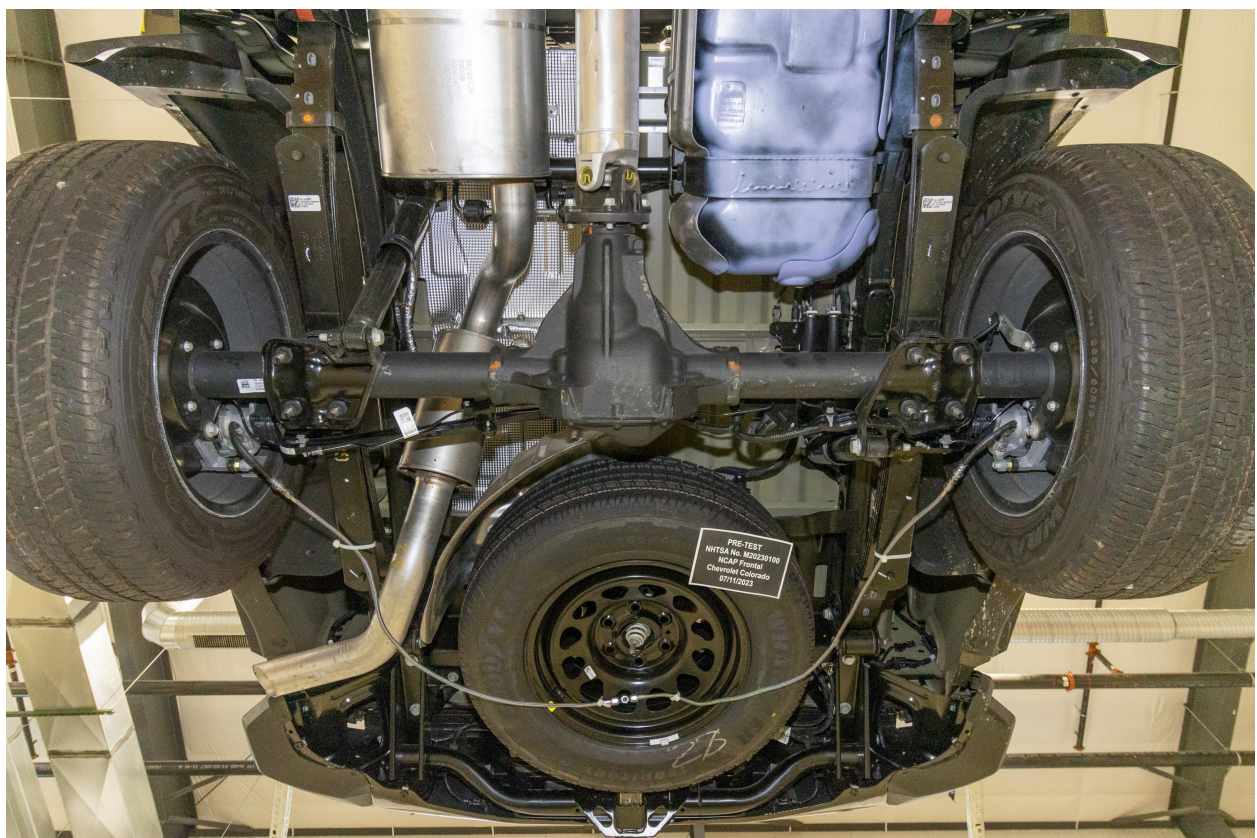


Figure A-26: Pre-Test Rear Underbody View

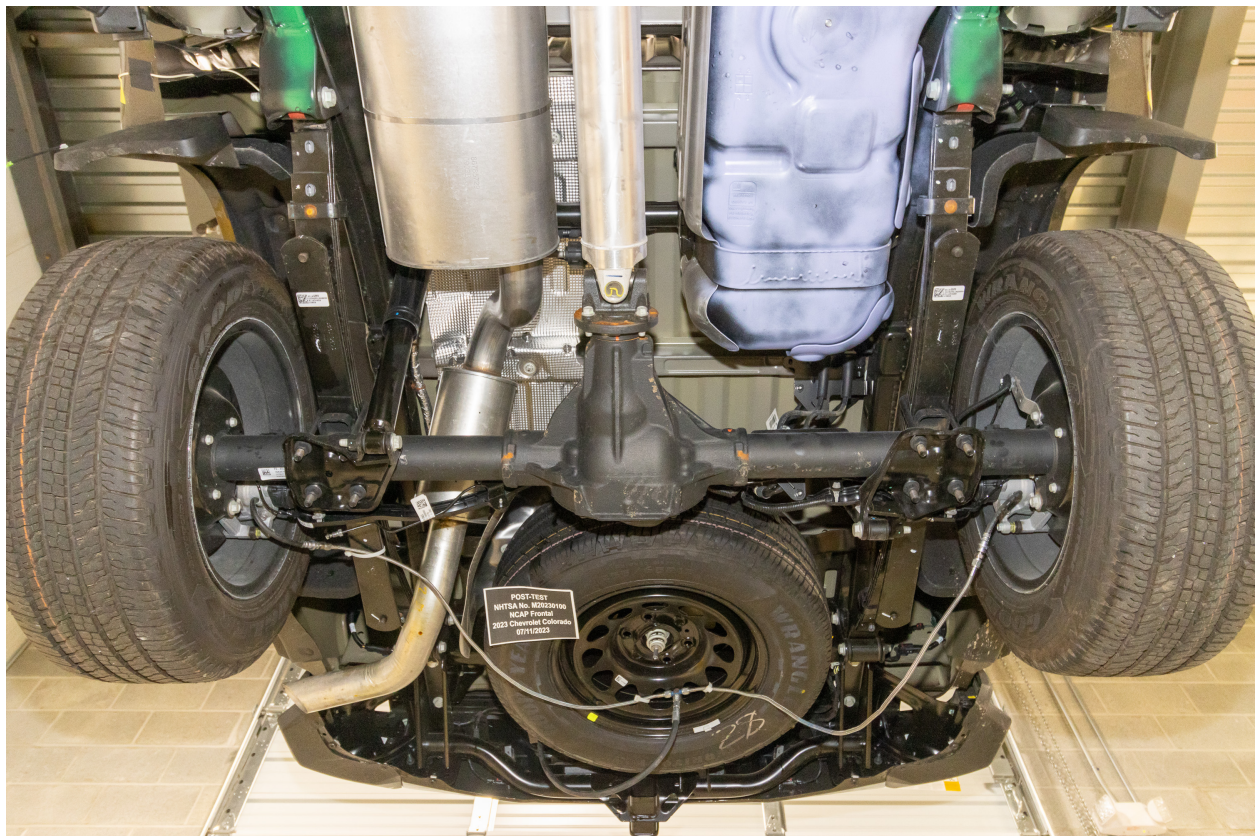


Figure A-27: Post-Test Rear Underbody View



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

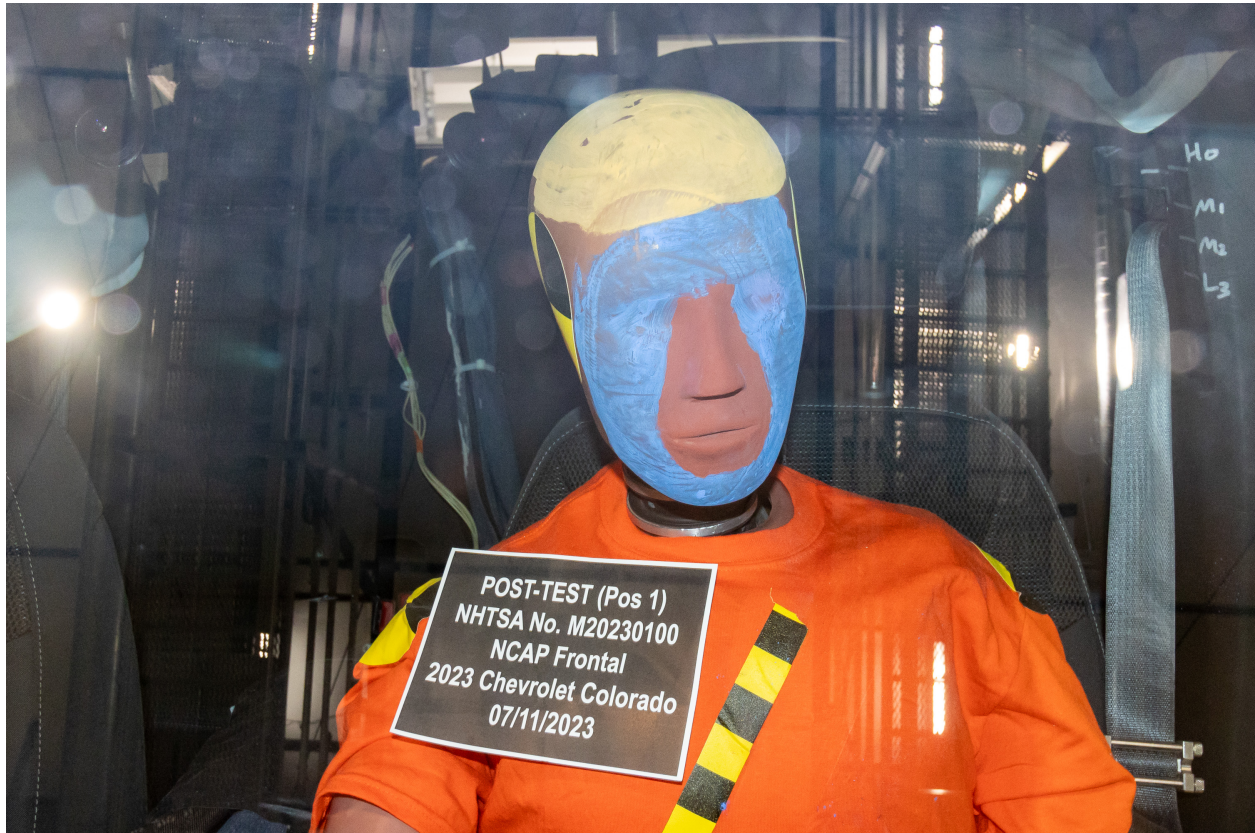


Figure A-31: Post-Test Driver Dummy Front View



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

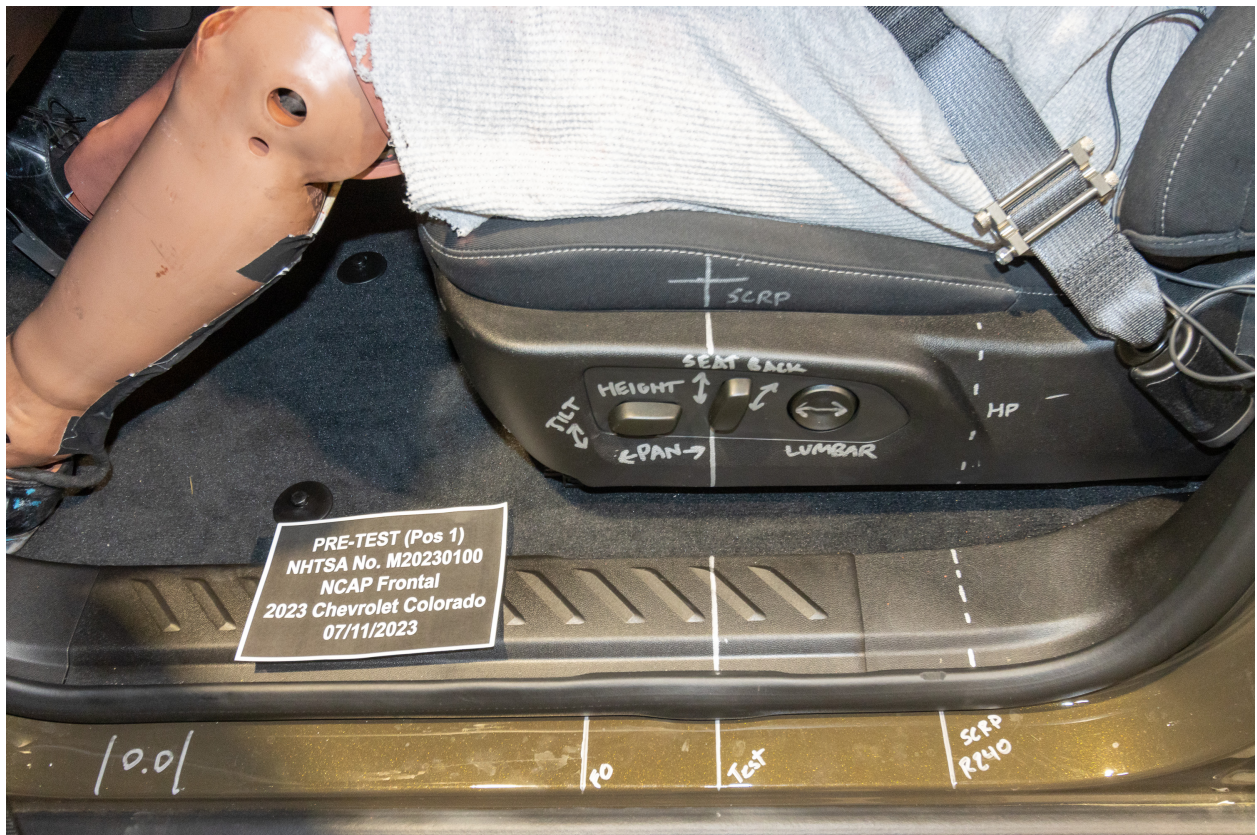


Figure A-36: Pre-Test Driver's Seat Fore-Aft Markings



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

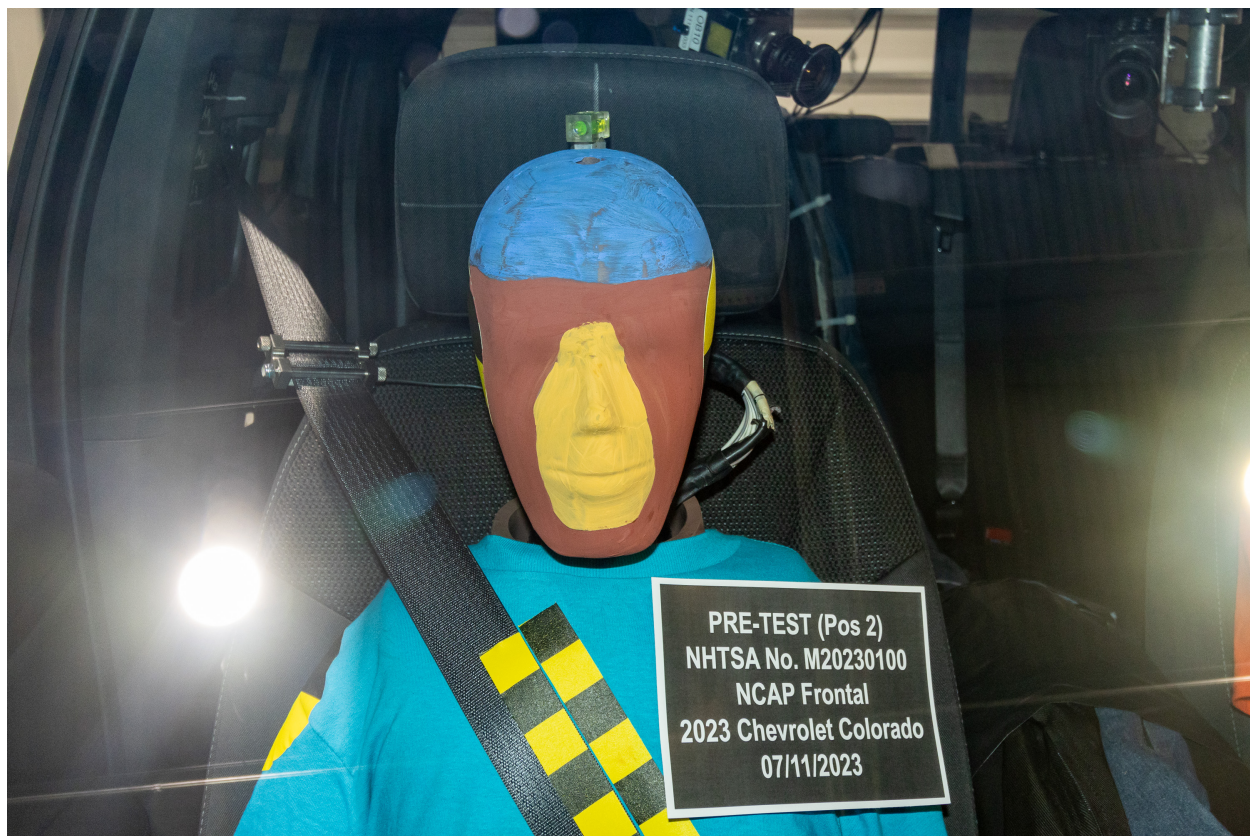


Figure A-53: Pre-Test Passenger Dummy Front View

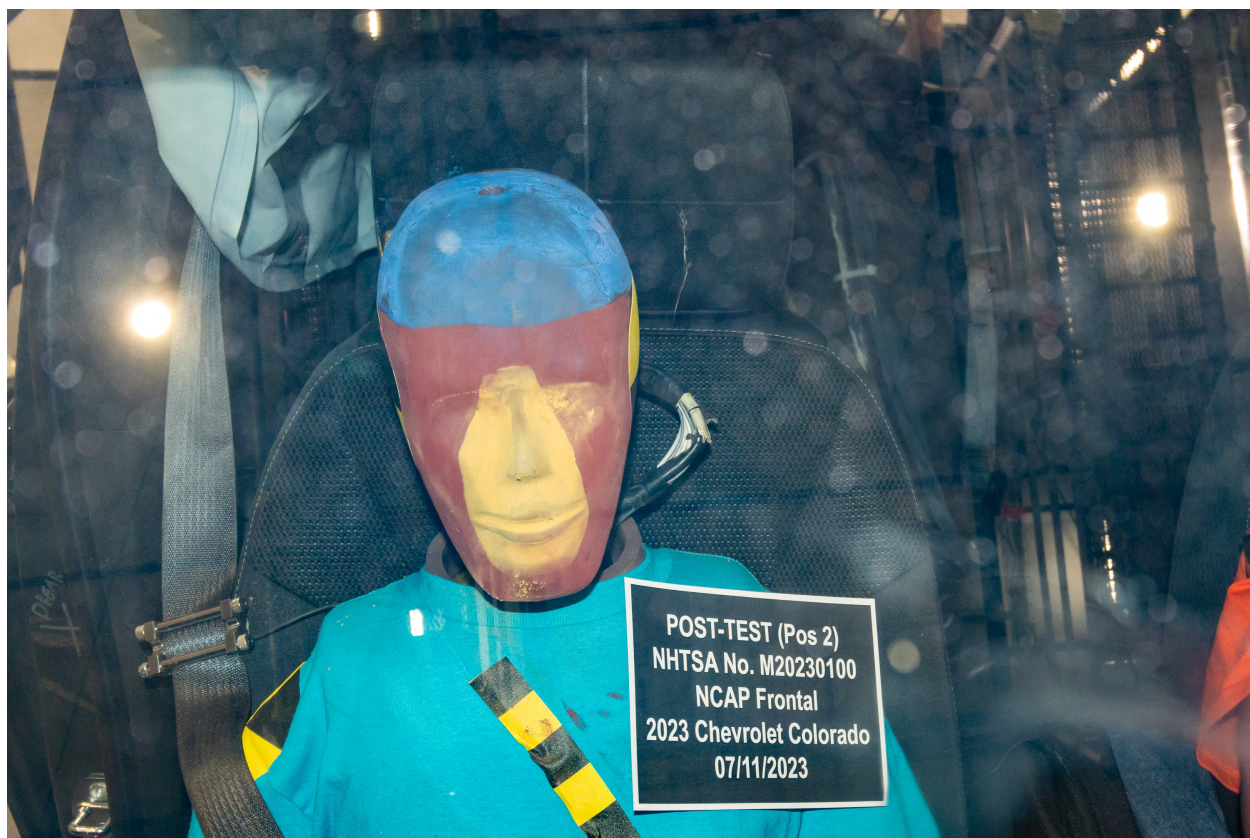


Figure A-54: Post-Test Passenger Dummy Front View



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

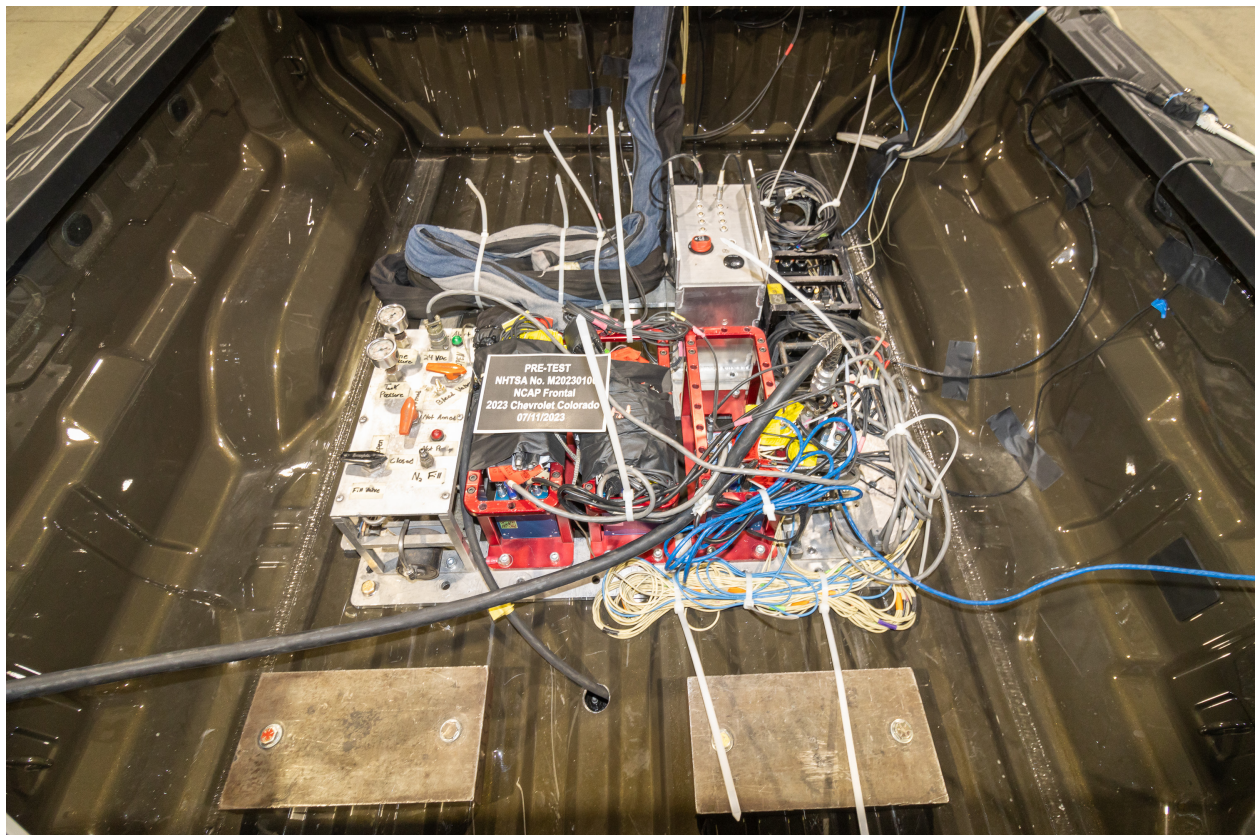


Figure A-74: Photograph of Ballast Installed in Vehicle

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

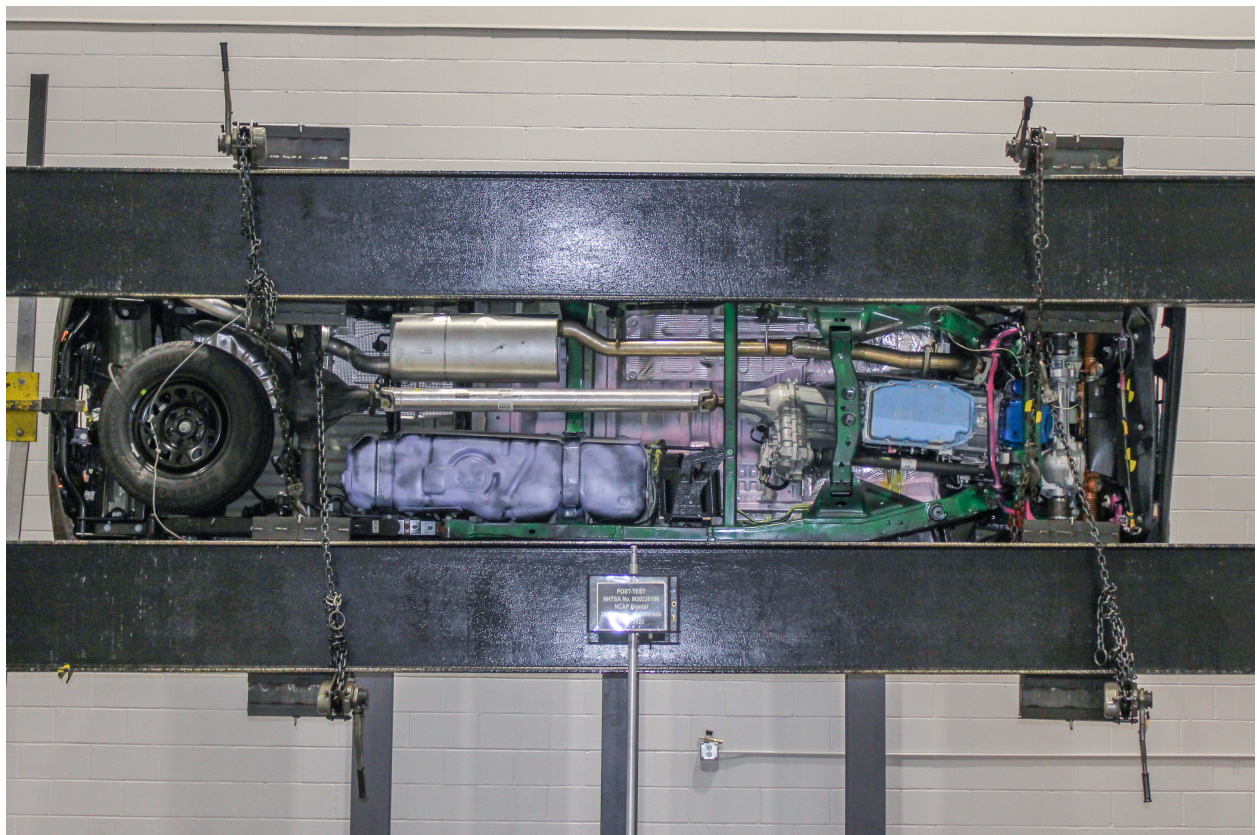


Figure A-78: Vehicle at 90° on Static Rollover Device

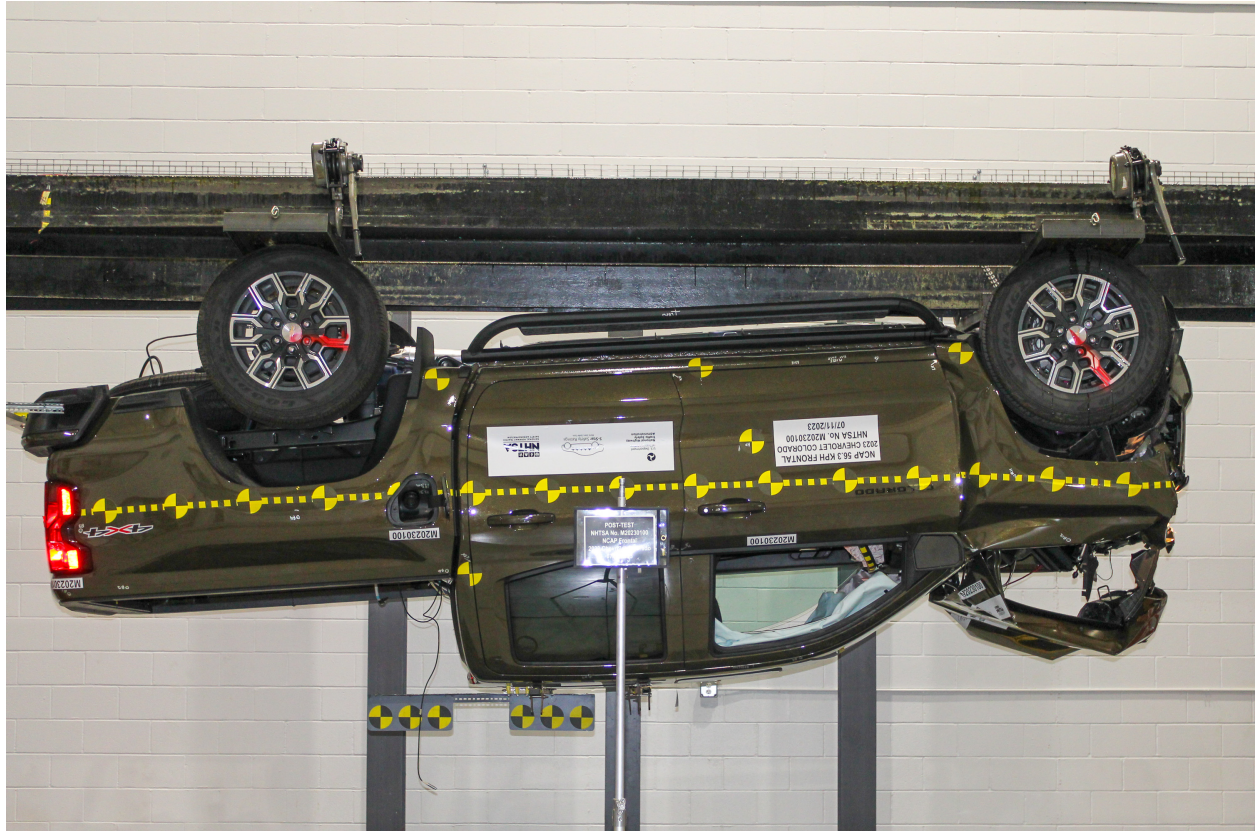


Figure A-79: Vehicle at 180° on Static Rollover Device

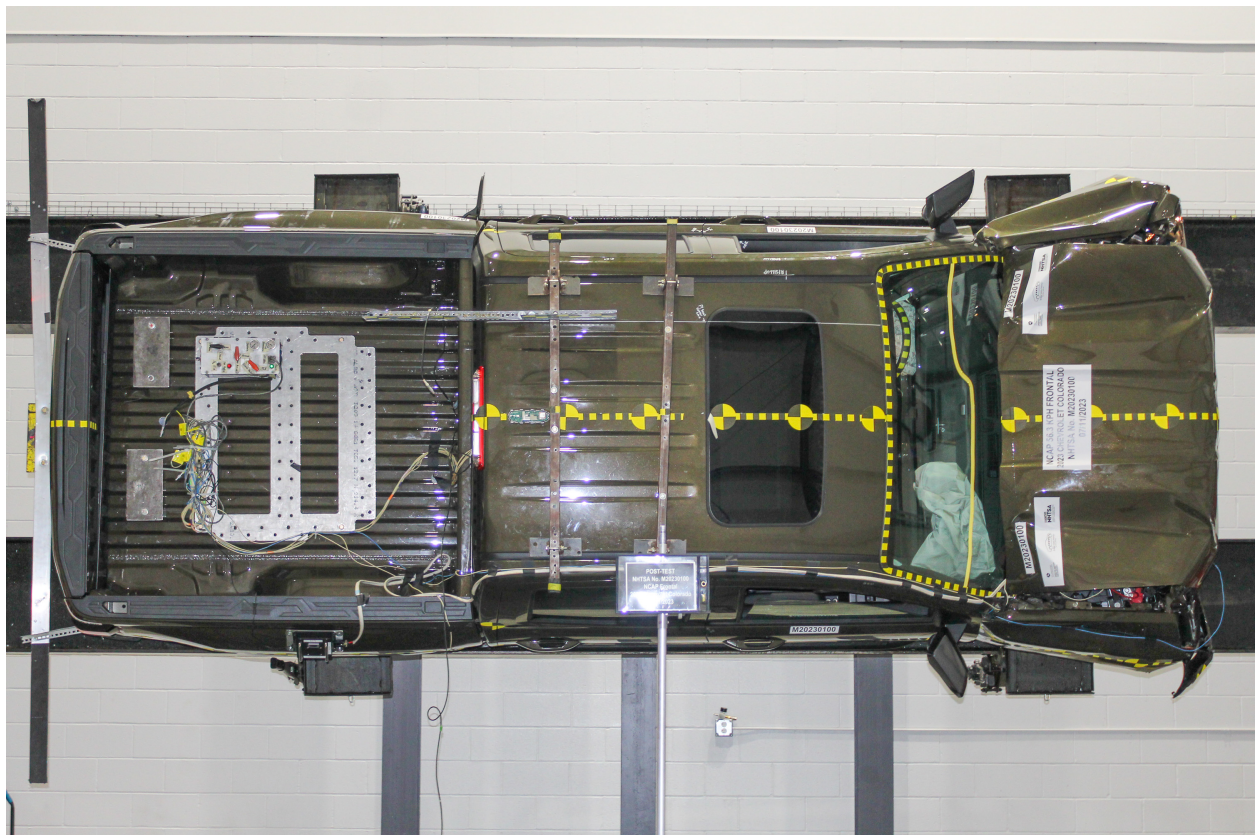


Figure A-80: Vehicle at 270° on Static Rollover Device



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



Figure A-82: 2023 Chevrolet Colorado Frontal Impact Event



CHEVROLET

2023 COLORADO 4WD LT CREW CAB

EXTERIOR: HARVEST BRONZE METALLIC

INTERIOR: JET BLACK CLOTH SEATS

ENGINE, 2.7L TURBO PLUS
AUTO TRANSMISSION

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STANDARD EQUIPMENT	
*ITEMS LISTED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN	
OWNER BENEFITS	
• 3 YEAR/36,000 MILE* BUMPER-TO-BUMPER LIMITED WARRANTY	
• 5 YEAR/60,000 MILE* POWERTRAIN LIMITED WARRANTY, ROADSIDE ASSISTANCE & COURTESY TRANSPORTATION	
• FIRST MAINTENANCE VISIT *WHICHEVER COMES FIRST SEE CHEVROLET.COM OR DEALER FOR TERMS, DETAILS & LIMITS	
PERFORMANCE & MECHANICAL	
• AUTOMATIC START/STOP	
• CAPLESS FUEL FILL	
• TRANSFER CASE SINGLE SPEED	
CONNECTIVITY & TECHNOLOGY	
• ONSTAR (R) SERVICES & Wi-Fi (R) HOTSPOT* CAPABLE	

SEE ONSTAR.COM FOR TERMS	
• SIRIUSXM AUDIO WITH 3XM TRIAL SUBSCRIPTION	
• KEYLESS OPEN AND START	
• KEYLESS START	
• HITCH GUIDANCE	
• HITCH VIEW	
INTERIOR	
• SEAT ADJUSTER, FRONT	
• PASSENGER 4-WAY MANUAL	
• WINDOW, POWER WITH FRONT PASS EXPRESS DOWN	
• SEAT, REAR 60/40 SPLIT-FOLD W/ FOLDING BENCH WITH STORAGE	
• LIGHTING, INTERIOR, DUAL READING LAMP	
• CENTER CONSOLE, FLOOR	
• JET BLACK CLOTH SEATS	
• 11.3" DIAG ADVANCED COLOR LCD DISPLAY WITH GOOGLE BUILT-IN COMPATIBILITY INCLUDING NAV CAPABILITY, CONNECTED APPS	

WIRELESS APPLE CARPLAY, ANDROID AUTO FOR COMPATIBLE PHONES	
• POWER OUTLET, 2ND ROW AUXILIARY, 12 VOLT	
• STEERING WHEEL, WRAPPED	
• DRIVER INFORMATION CENTER, 8" DIAGONAL DIGITAL DISPLAY	
• REAR SEAT REMINDER	
EXTERIOR	
• TAILGATE, REMOTE LOCKING	
• CORNERSTEP, REAR BUMPER	
• HEADLAMPS, HALOGEN	
SAFETY & SECURITY	
• CHEVY SAFETY ASSIST: *INTELLIBEAM-AUTO HIGH BEAM	
• *FOLLOWING DISTANCE INDICATOR, REQUIRES FUTURE SOFTWARE UPDATE	
• *FORWARD COLLISION ALERT	
• *LANE KEEP ASSIST W/ LANE DEPARTURE WARNING	
• *AUTOMATIC EMERGENCY BRAKING	

*FRONT PEDESTRIAN AND BICYCLIST BRAKING	
• TEEN DRIVER	
MANUFACTURER'S SUGGESTED RETAIL PRICE	
STANDARD VEHICLE PRICE \$34,900.00	
OPTIONS & PRICING	
OPTIONS INSTALLED BY THE MANUFACTURER MAY REPLACE STANDARD EQUIPMENT CHARGE	
LT CONVENIENCE PACKAGE II: 2,450.00	
• 8-WAY DRIVER POWER SEAT ADJUSTER	
• 17" SPARE WHEEL AND TIRE BLACKWALL	
• INSIDE REARVIEW MIRROR, AUTO DIMMING	
• ENGINE, 2.7L TURBO PLUS	
• DRIVER & FRONT PASSENGER HEATED SEATS	
• WIRELESS DEVICE CHARGING	
• POWER LUMBAR, DRIVER SEAT	

POWER DUAL OUTSIDE MIRRORS, HEATED	
LT CONVENIENCE PACKAGE: 1,270.00	
• EZ LIFT AND LOWER TAILGATE	
• FOX LAMPS, FRONT LED	
• TAILGATE KEYS CYLINDER LOCK	
• TILT AND TELESCOPING STEERING WHEEL	
• STOW/EX TAILGATE, STORAGE	
• VISORS, DRIVER & FRONT PASS, ILLUMINATED VANITY MIRRORS	
• REAR WINDOW, SLIDING	
• REAR WINDOW DEFROSTER	
• DUAL ZONE CLIMATE CONTROL	
• CRUISE CONTROL	
HARD-FOLDING TONNEAU COVER (DEALER INSTALLED): 1,250.00	
W/ MANUAL SHADE	
OFF-ROAD ASSIST STEPS (DEALER INSTALLED): 995.00	
SAFETY PACKAGE: 505.00	
• REAR CROSS TRAFFIC BRAKING	
• BLIND ZONE STEERING ASSIST	

REAR PARK ASSIST	
• POWER DUAL OUTSIDE MIRRORS, HEATED	
AUDIO SYSTEM - PREMIUM: 500.00	
TRAILERING EQUIPMENT PACKAGE: 480.00	
WHEELS, 18" ANDROID DARK FULL GLOSS ALUMINUM: 300.00	
ALL-WEATHER FLOOR LINER (DEALER INSTALLED): 200.00	
BLACK NAMEPLATE BADGE (DEALER INSTALLED): 195.00	
GENERATOR, 220 AMPS: 150.00	
REAR AXLE 3.42 RATIO: INC.	
TOTAL OPTIONS \$8,295.00	
TOTAL VEHICLE & OPTIONS \$44,195.00	
DESTINATION CHARGE: 1,495.00	
TOTAL VEHICLE PRICE* \$45,690.00	

EPA DOT Fuel Economy and Environment	
COLORADO 4WD	
Fuel Economy	
19 MPG combined city/hwy	
17 MPG city	
21 MPG highway	
5.3 gallons per 100 miles	
You spend \$3,750 more in fuel costs over 5 years compared to the average new vehicle.	
Annual fuel cost \$2,350	
Fuel Economy & Greenhouse Gas Rating (tailpipe only)	
1 4 10 Best	
This vehicle emits 467 grams CO ₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions, learn more at fuelconomy.gov .	
Smog Rating (tailpipe only)	
1 7 10 Best	
Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA) www.safercar.gov or 1-888-327-4236	

GOVERNMENT 5-STAR SAFETY RATINGS	
Overall Vehicle Score	
Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.	
To Be Rated	
Frontal Crash	
Driver Passenger	
To Be Rated	
Side Crash	
Front seat Rear seat	
To Be Rated	
Rollover	
Based on the risk of rollover in a single-vehicle crash.	
To Be Rated	

PARTS CONTENT INFORMATION	
FOR VEHICLES IN THIS COUNTRY: U.S./CANADIAN PARTS CONTENT: 45%	
MAJOR SOURCES OF FOREIGN PARTS CONTENT: MEXICO 23%	
NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.	
FOR THIS VEHICLE: FINAL ASSEMBLY POINT: WENTZVILLE, MO U.S.A.	
COUNTRY OF ORIGIN: ENGINE: UNITED STATES	
TRANSMISSION: UNITED STATES	
ORDER NO CH020Z SALES CODE E	
DEALER NO 1400Z	
DEALER NO 1400Z	
VIN 1G0PTEC0P1144654	
DEALER TO WHOM DELIVERED	
SPORT CHEVROLET COMPANY, LLC	
3101 AUTOMOBILE BLVD	
SILVER SPRING, MD 20904-4999	

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1GA4476428

Figure A-83: Monroney Label Photograph

APPENDIX B
VEHICLE AND DUMMY RESPONSE DATA TRACES

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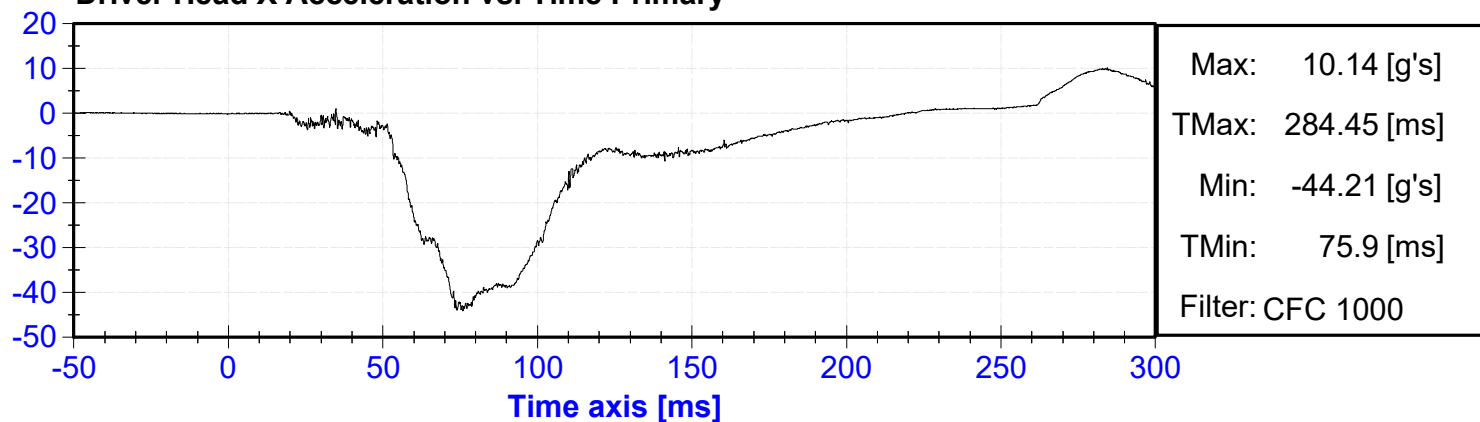
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.NHTSA.gov

Driver Head X Acceleration Redundant
 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

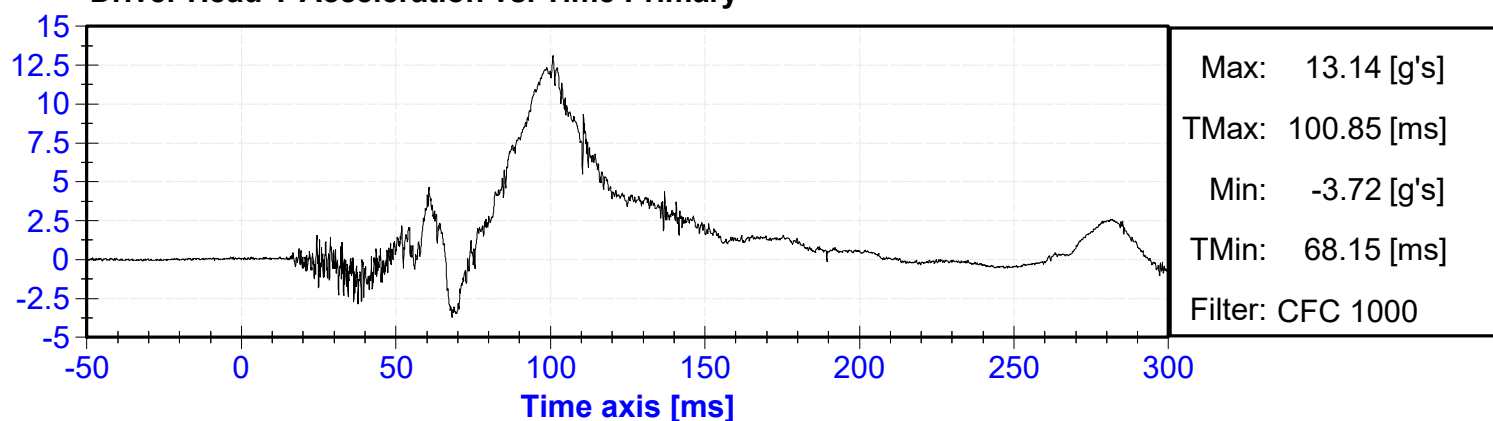
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver 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
Passenger Left Lower Tibia Moment Y
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

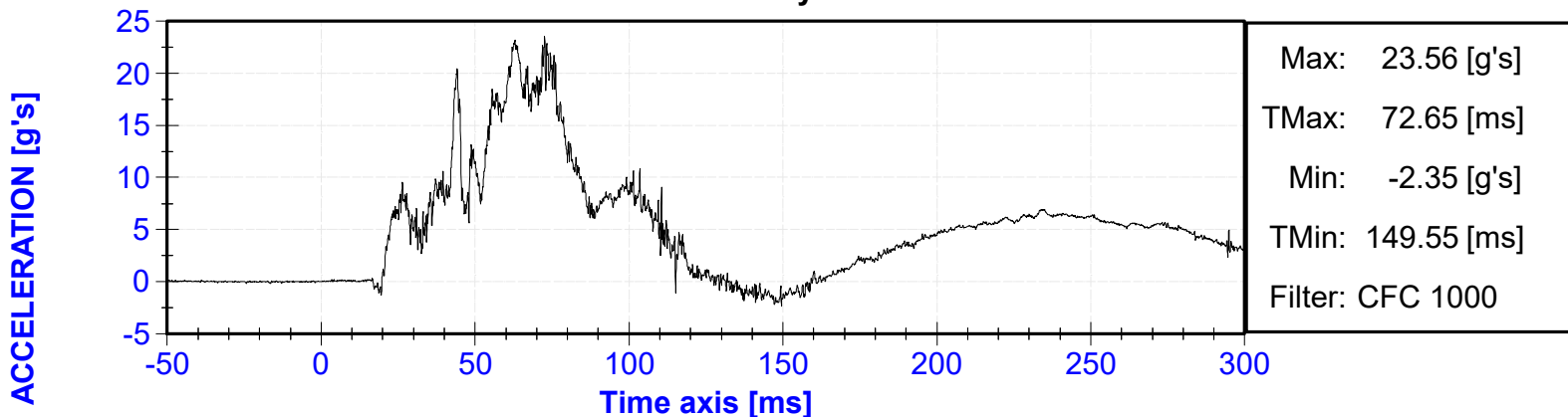
Driver Head X Acceleration vs. Time Primary



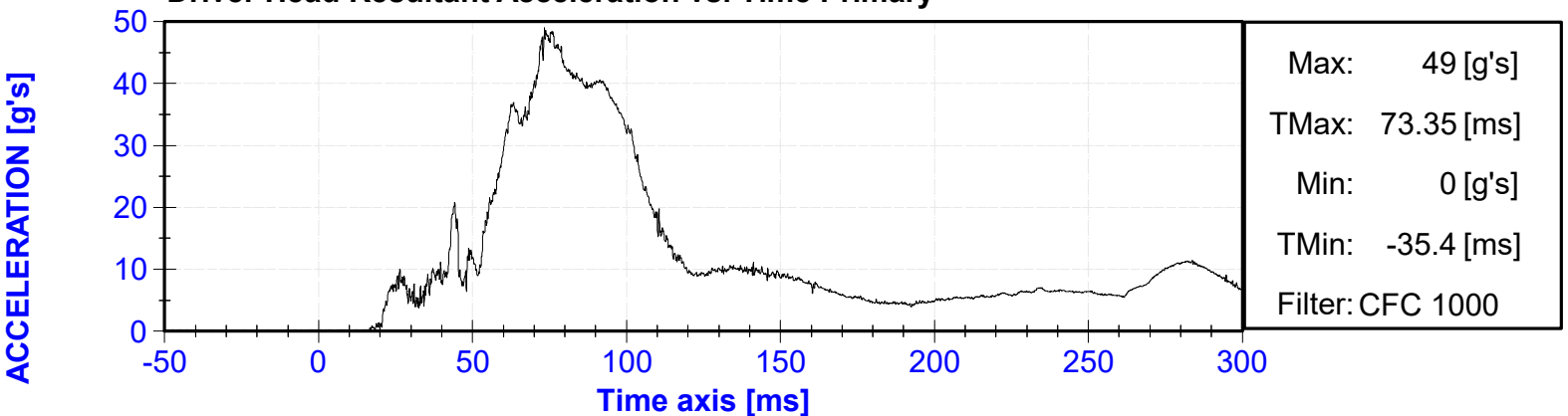
Driver Head Y Acceleration vs. Time Primary



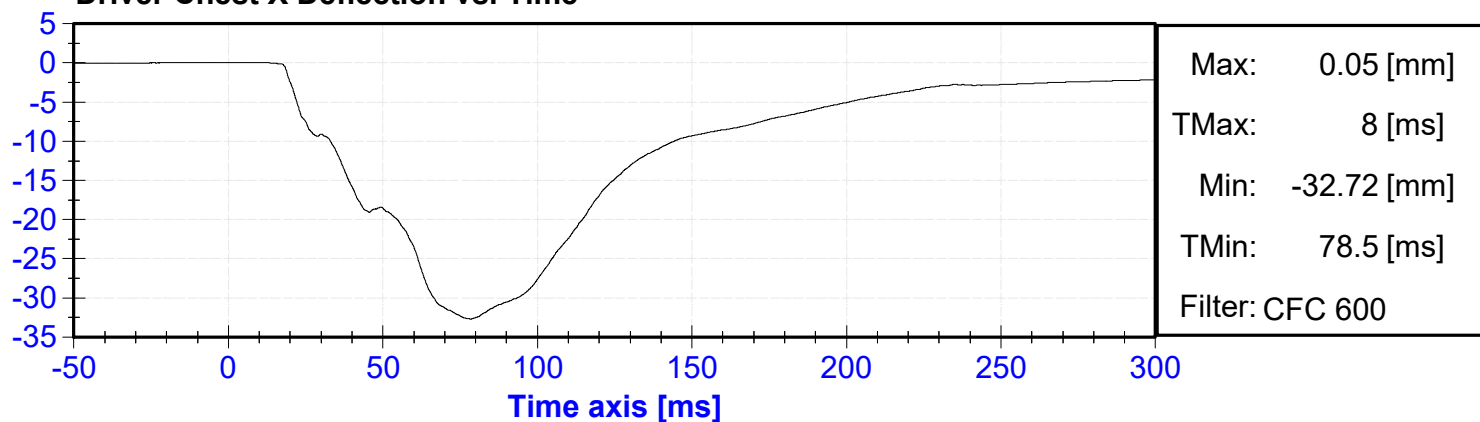
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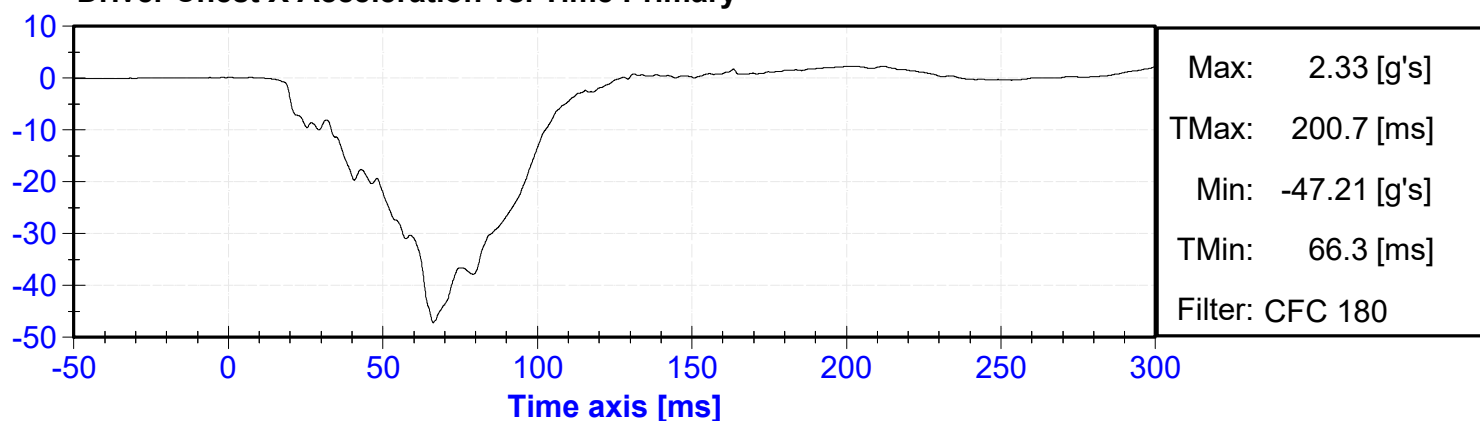
Driver Head Resultant Acceleration vs. Time Primary



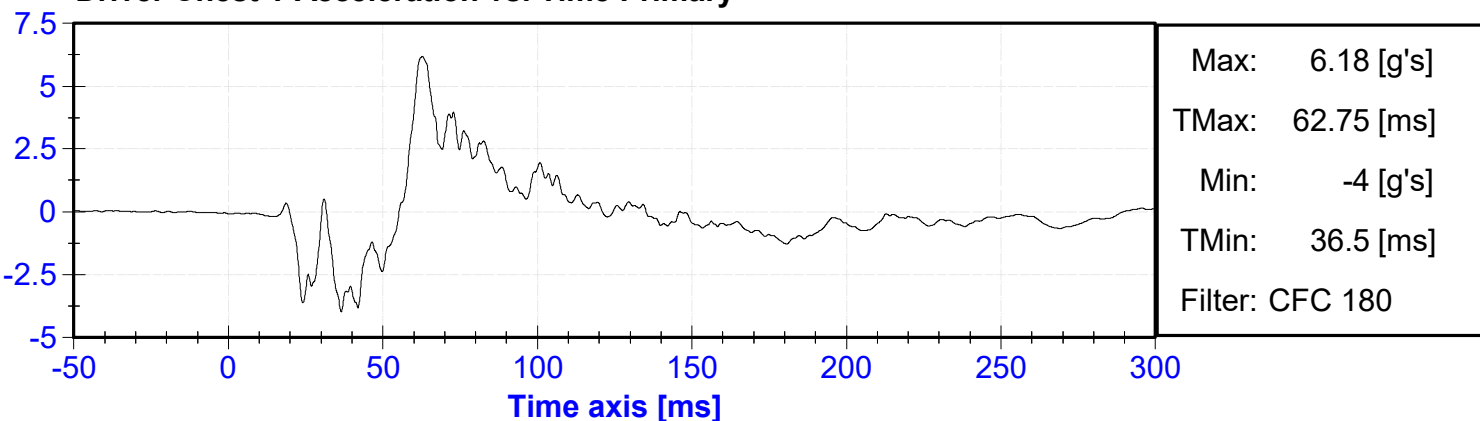
Driver Chest X Deflection vs. Time



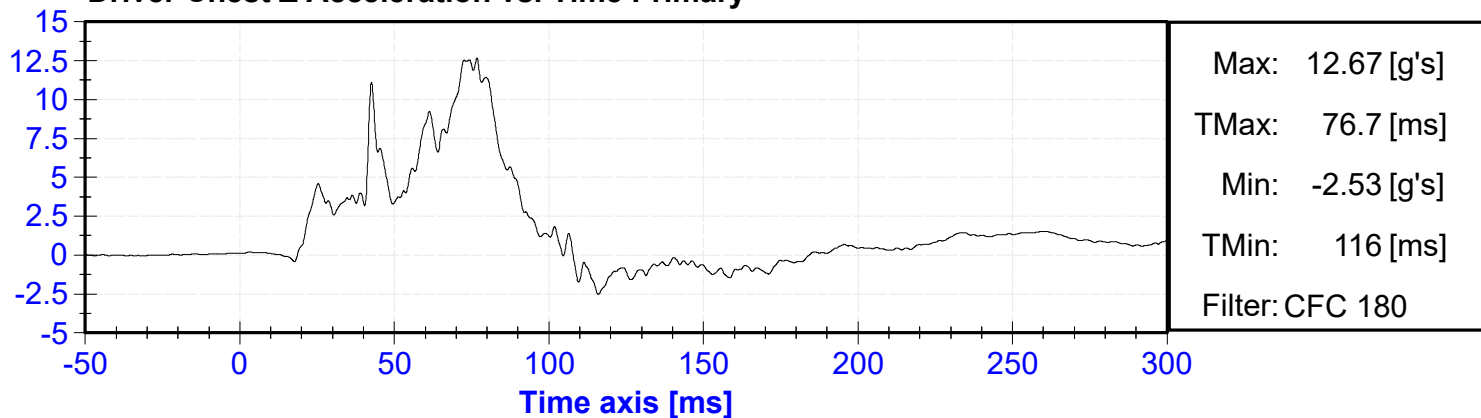
Driver Chest X Acceleration vs. Time Primary



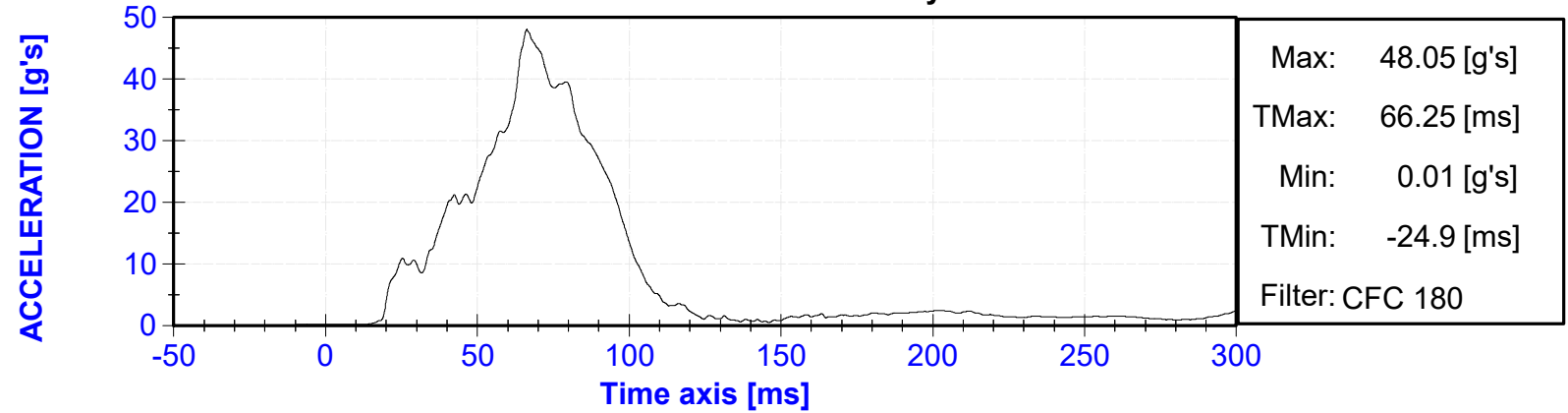
Driver Chest Y Acceleration vs. Time Primary



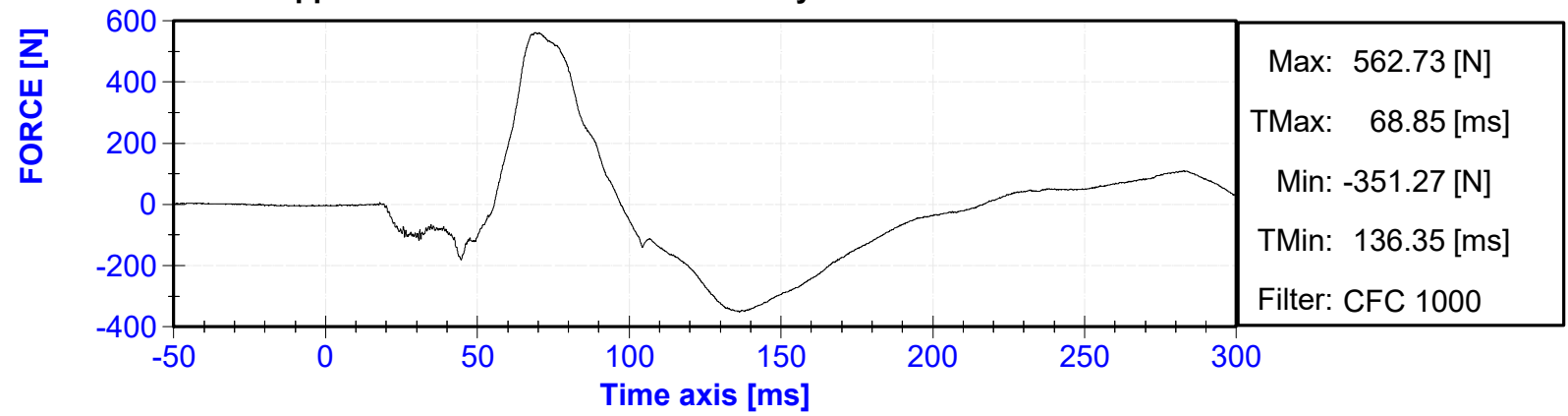
Driver Chest Z Acceleration vs. Time Primary



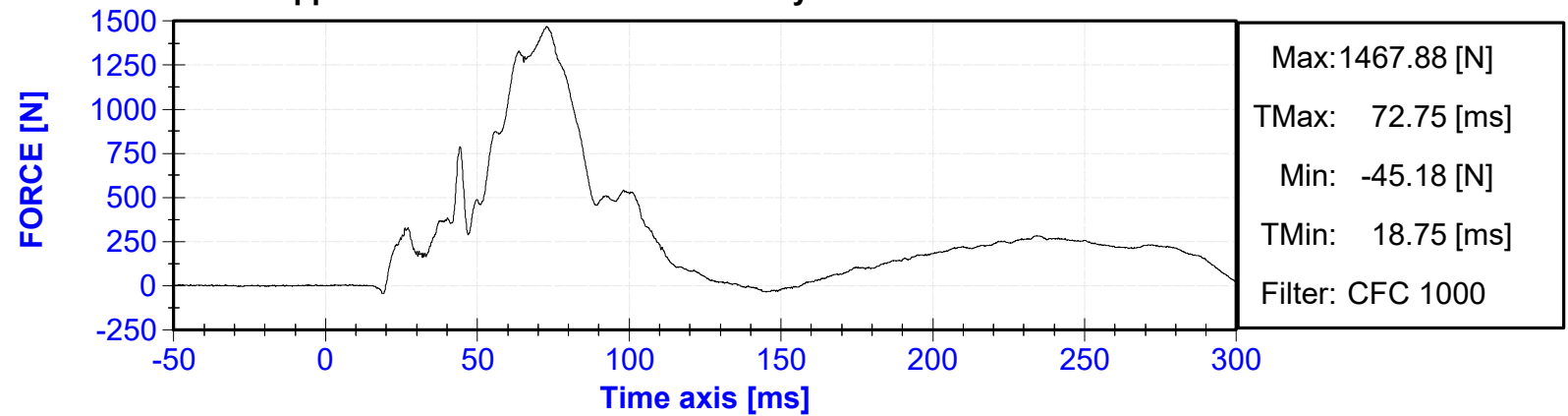
Driver Chest Resultant Acceleration vs. Time Primary



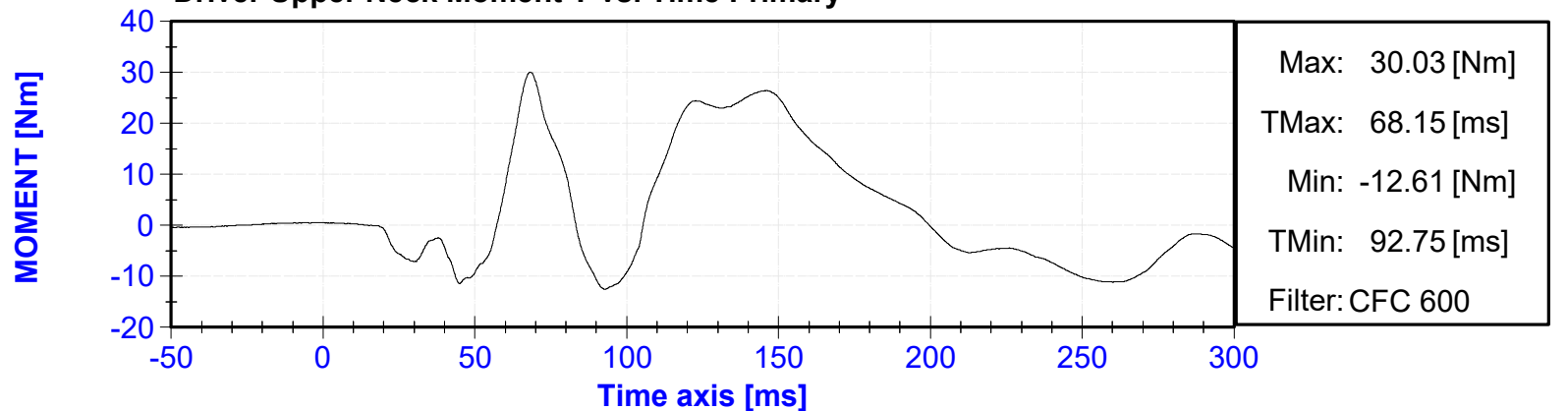
Driver Upper Neck Force X vs. Time Primary



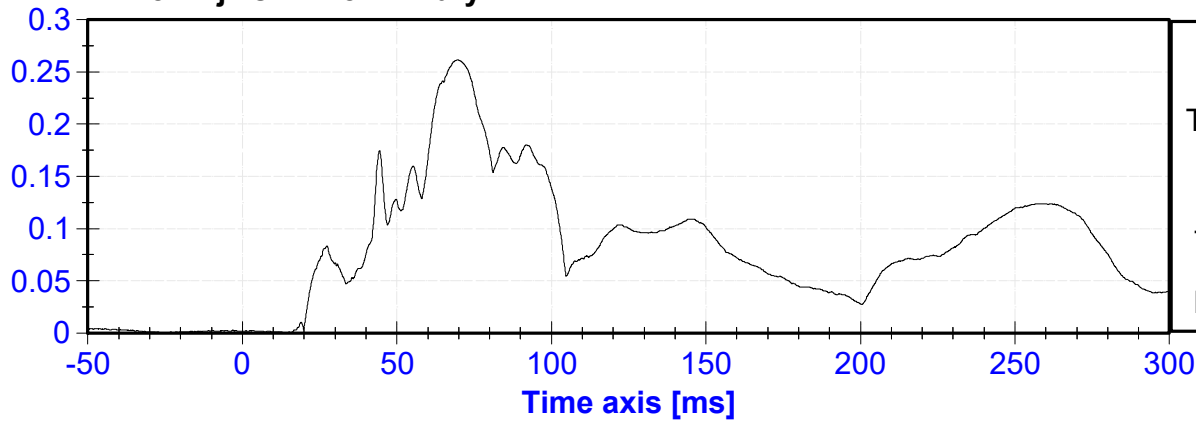
Driver Upper Neck Force Z vs. Time Primary



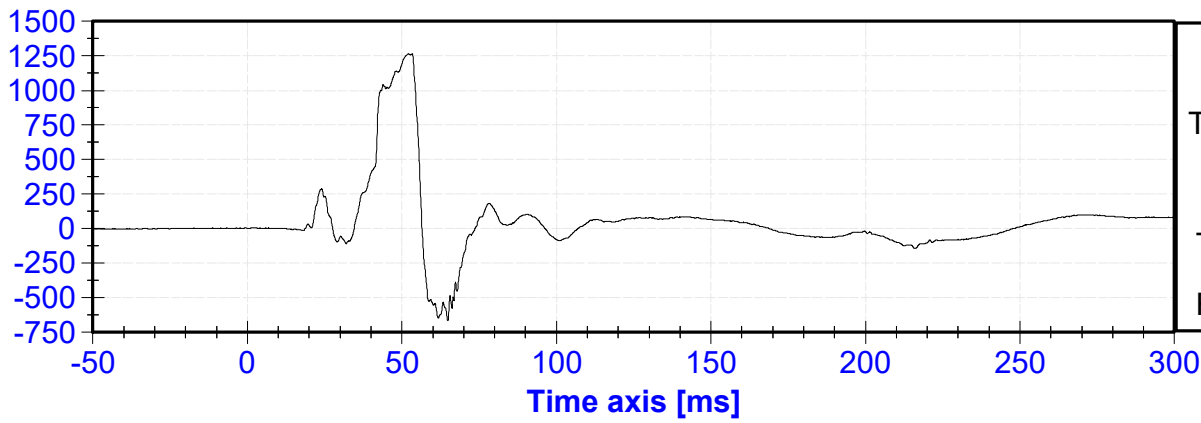
Driver Upper Neck Moment Y vs. Time Primary



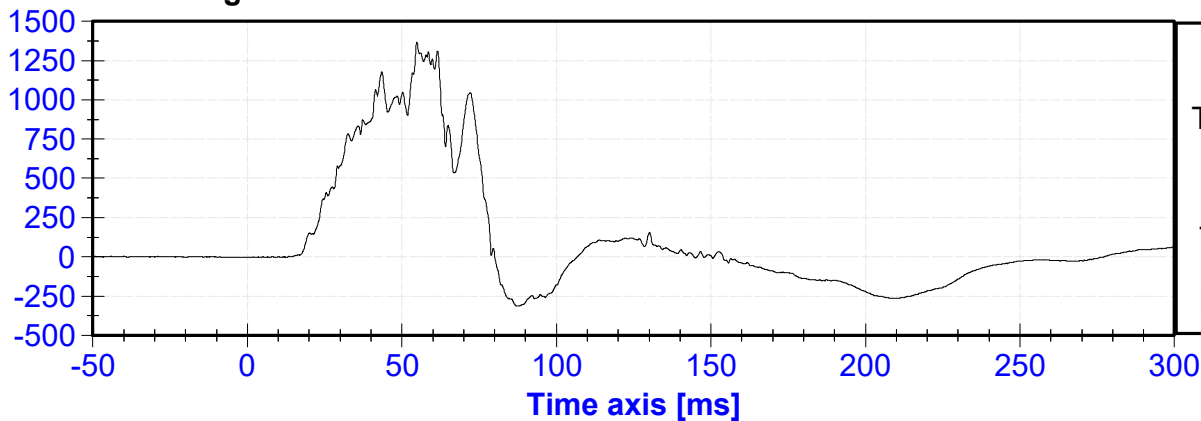
Driver Nij vs. Time Primary



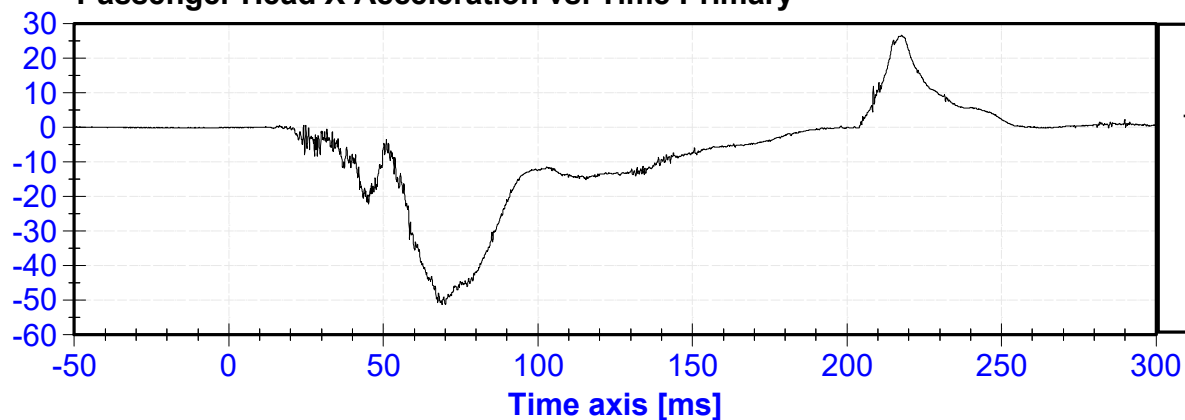
Driver Left Femur Force vs. Time



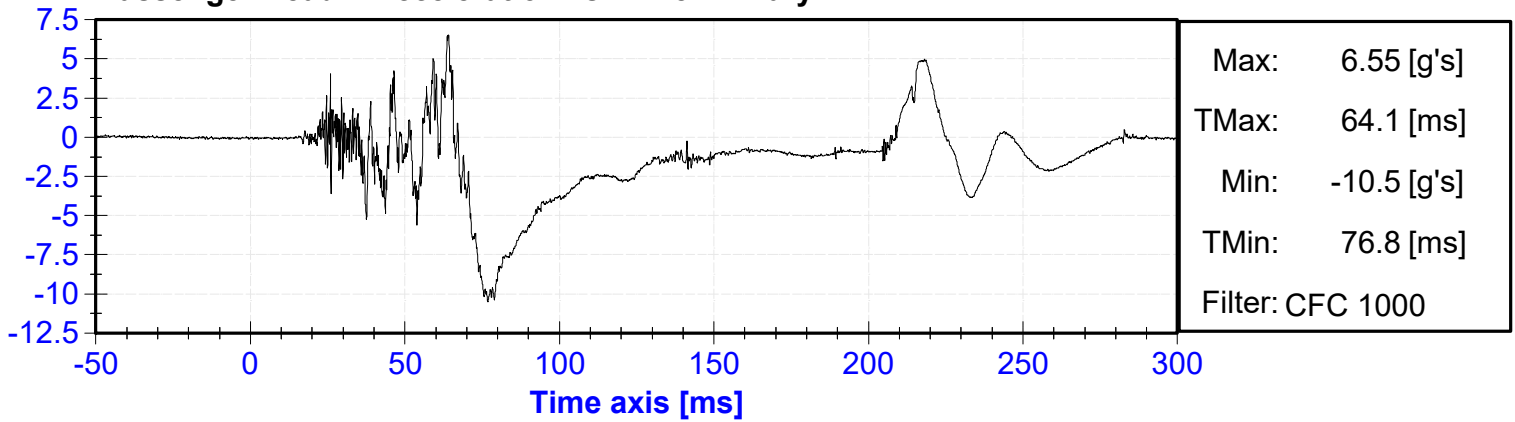
Driver Right Femur Force vs. Time



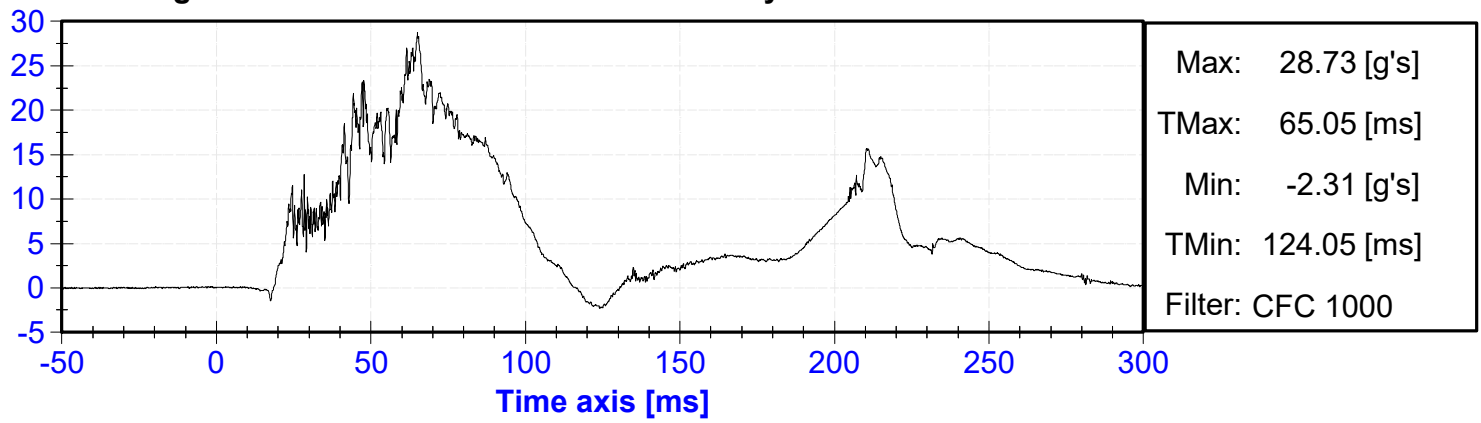
Passenger Head X Acceleration vs. Time Primary



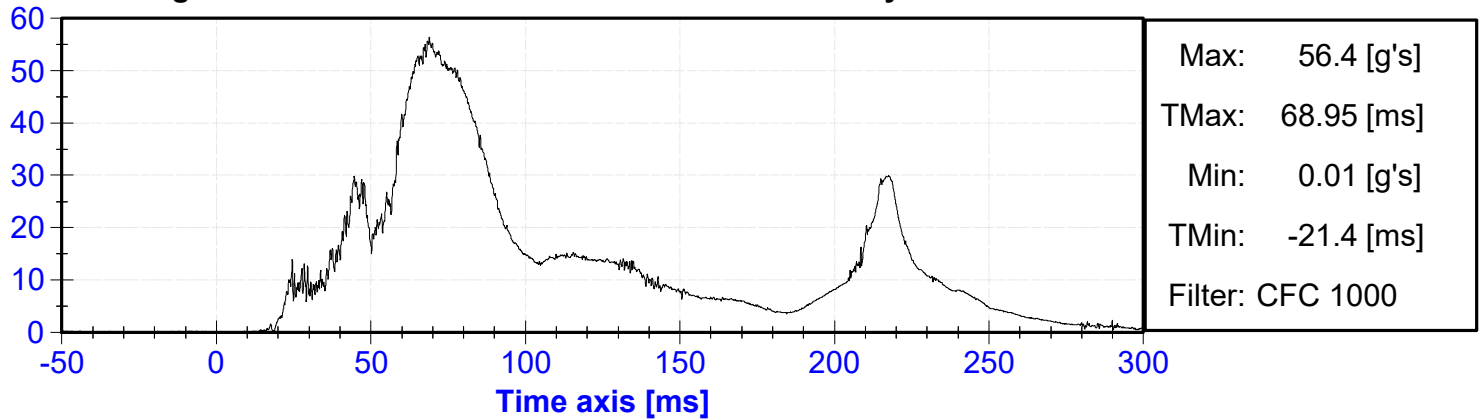
Passenger Head Y Acceleration vs. Time Primary



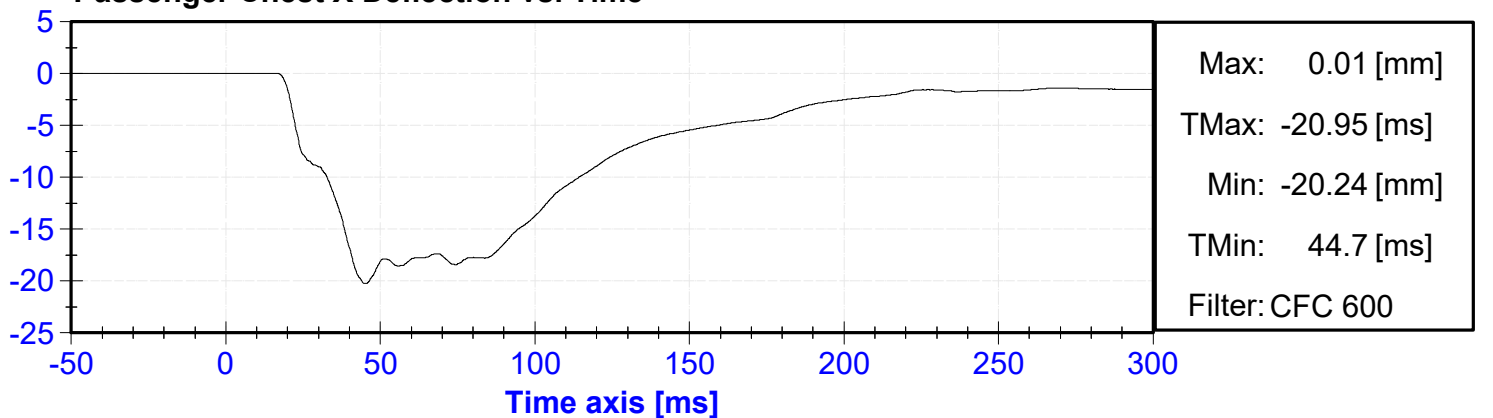
Passenger Head Z Acceleration vs. Time Primary



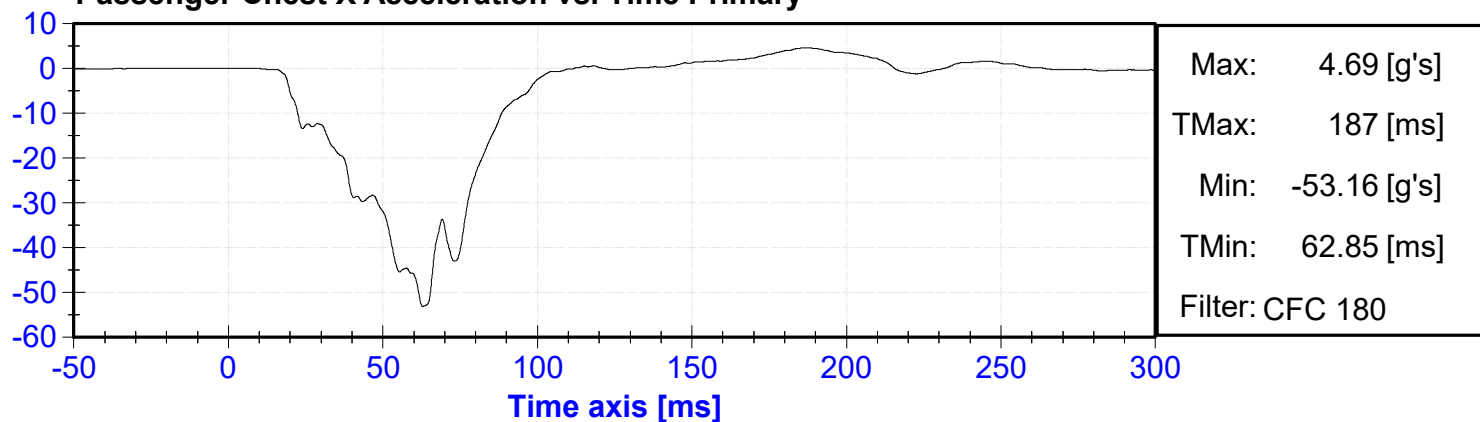
Passenger Head Resultant Acceleration vs. Time Primary



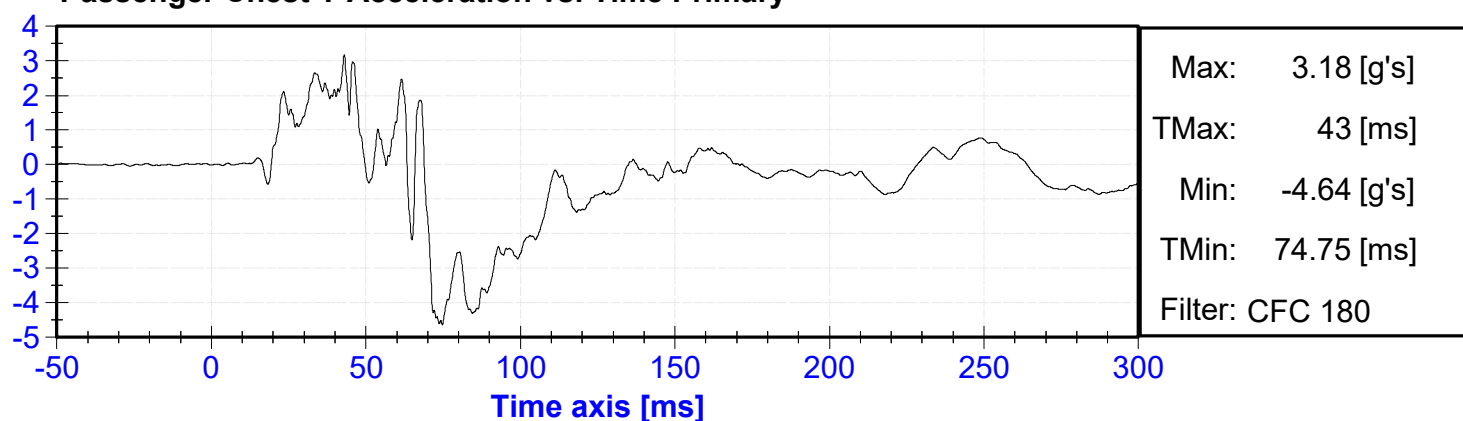
Passenger Chest X Deflection vs. Time



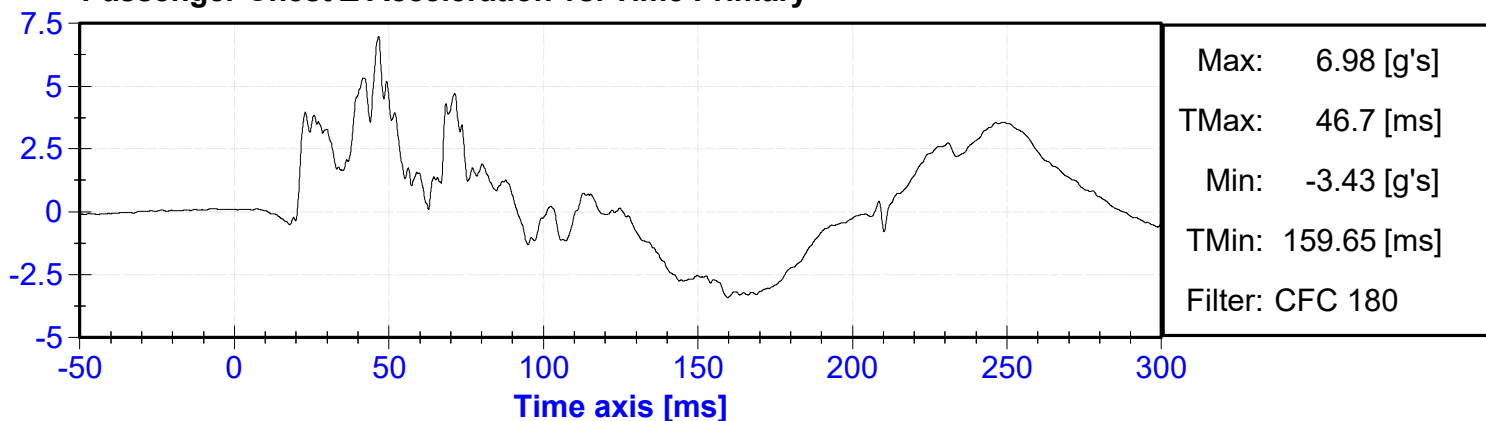
Passenger Chest X Acceleration vs. Time Primary



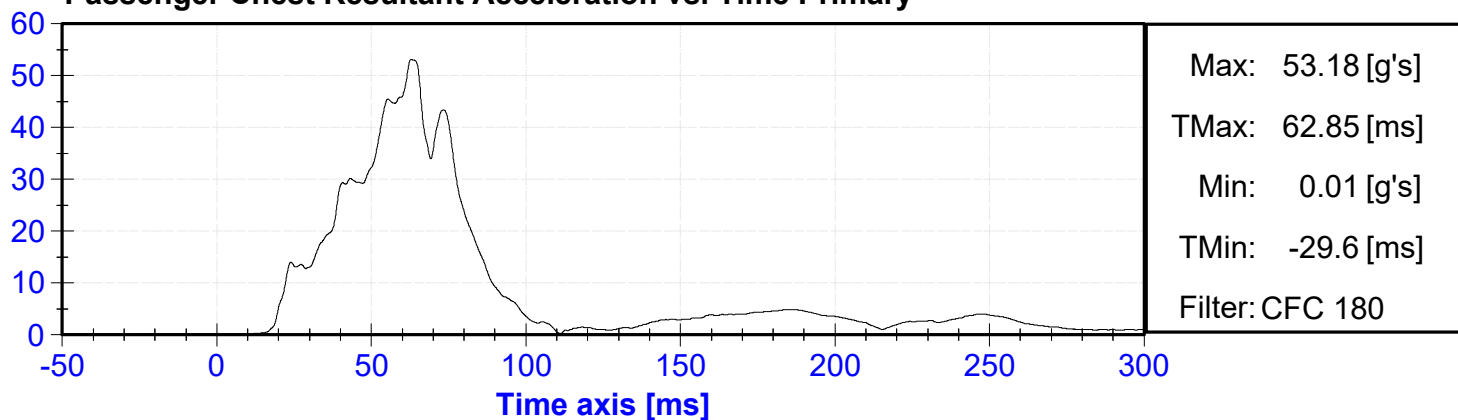
Passenger Chest Y Acceleration vs. Time Primary



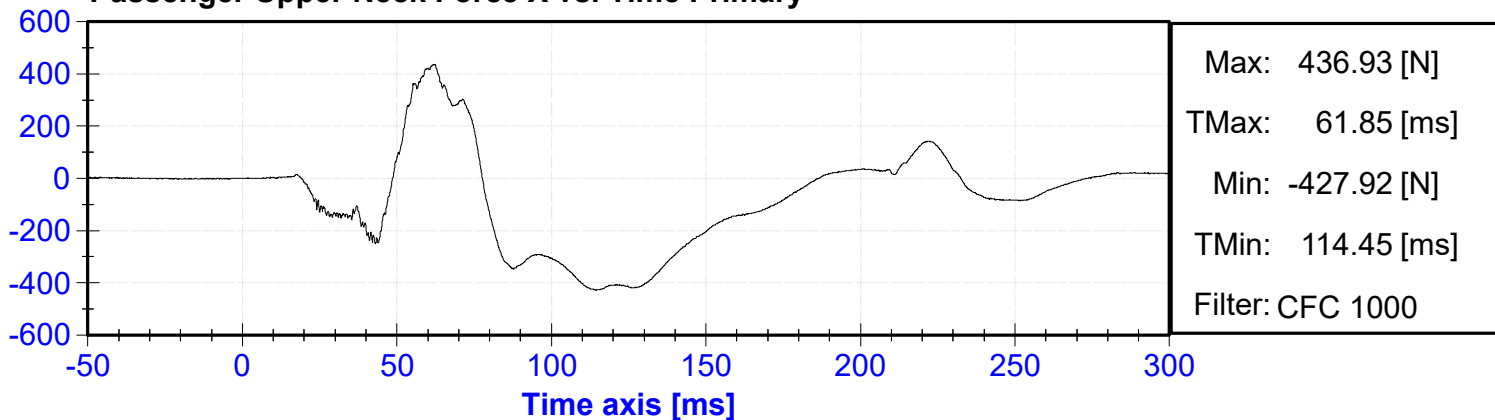
Passenger Chest Z Acceleration vs. Time Primary



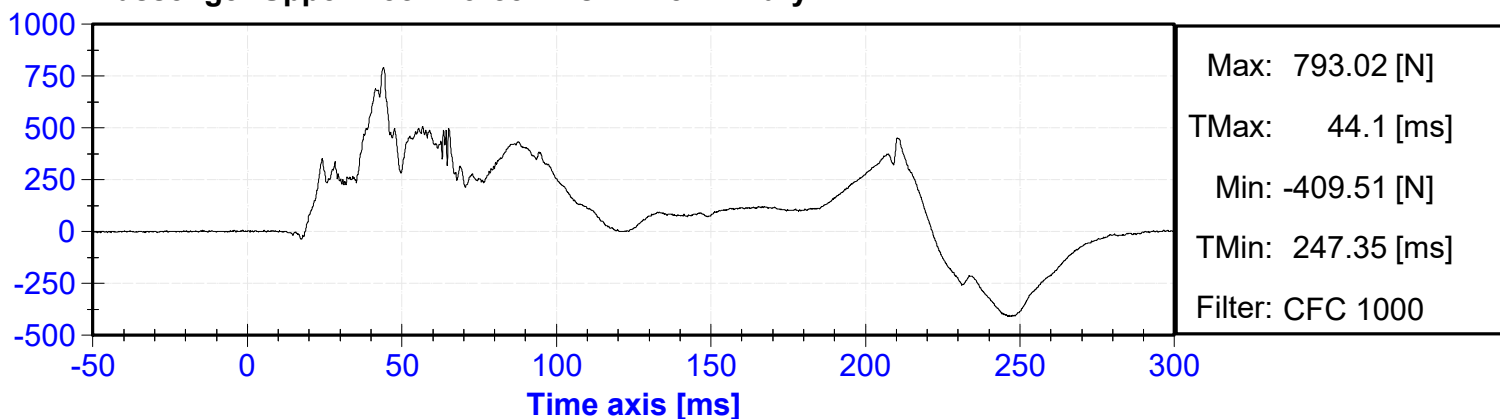
Passenger Chest Resultant Acceleration vs. Time Primary



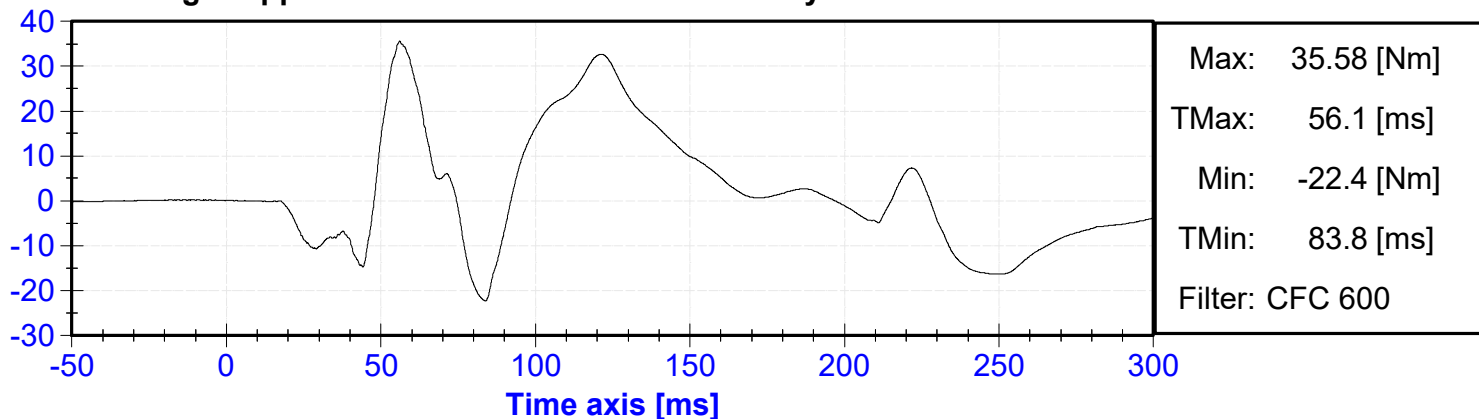
Passenger Upper Neck Force X vs. Time Primary



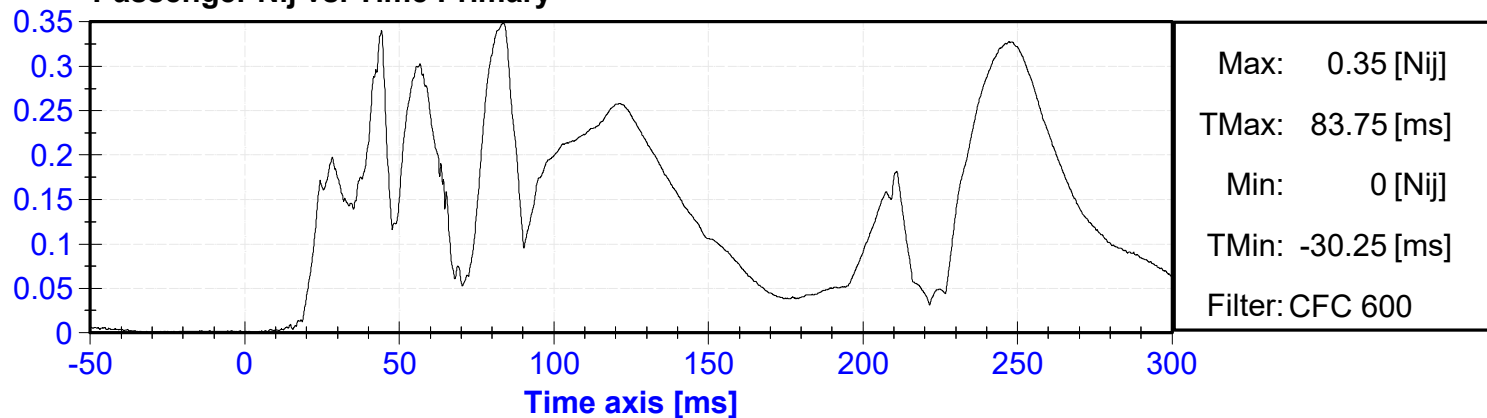
Passenger Upper Neck Force Z vs. Time Primary



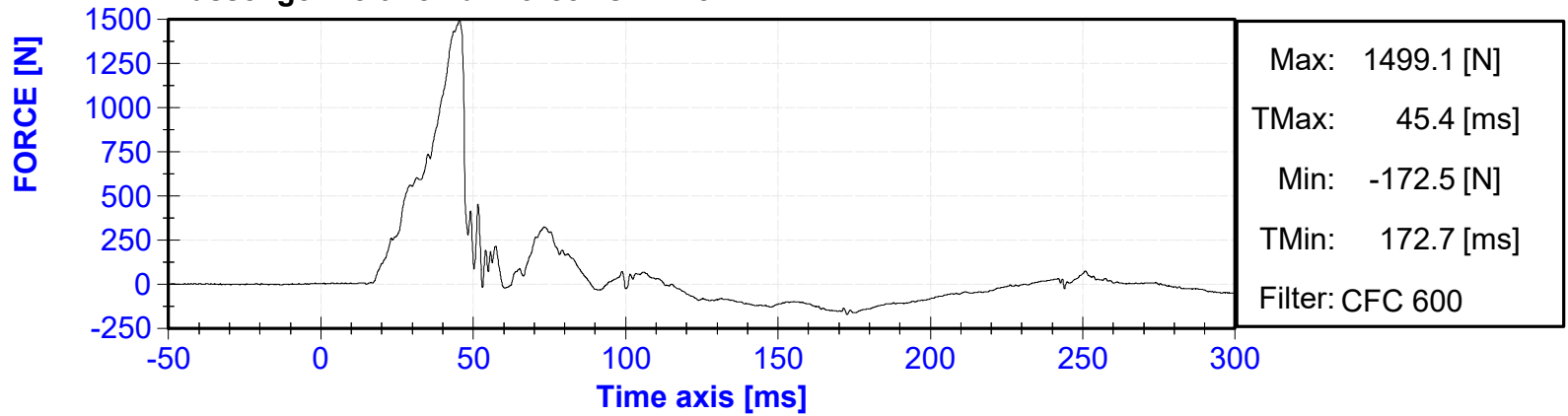
Passenger Upper Neck Moment Y vs. Time Primary



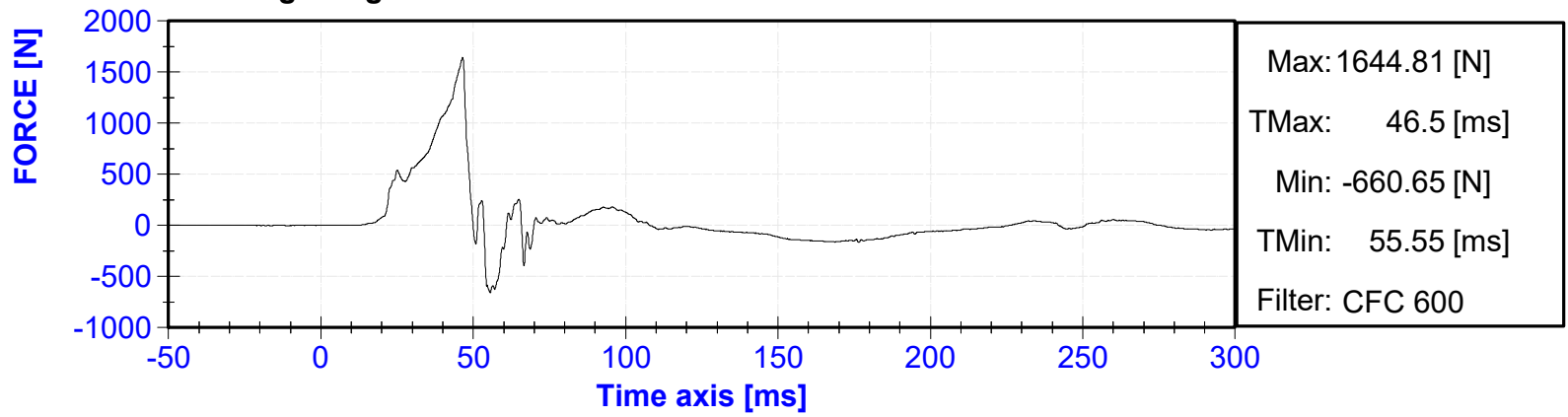
Passenger Nij vs. Time Primary



Passenger Left Femur Force vs. Time



Passenger Right Femur Force vs. Time



APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 142

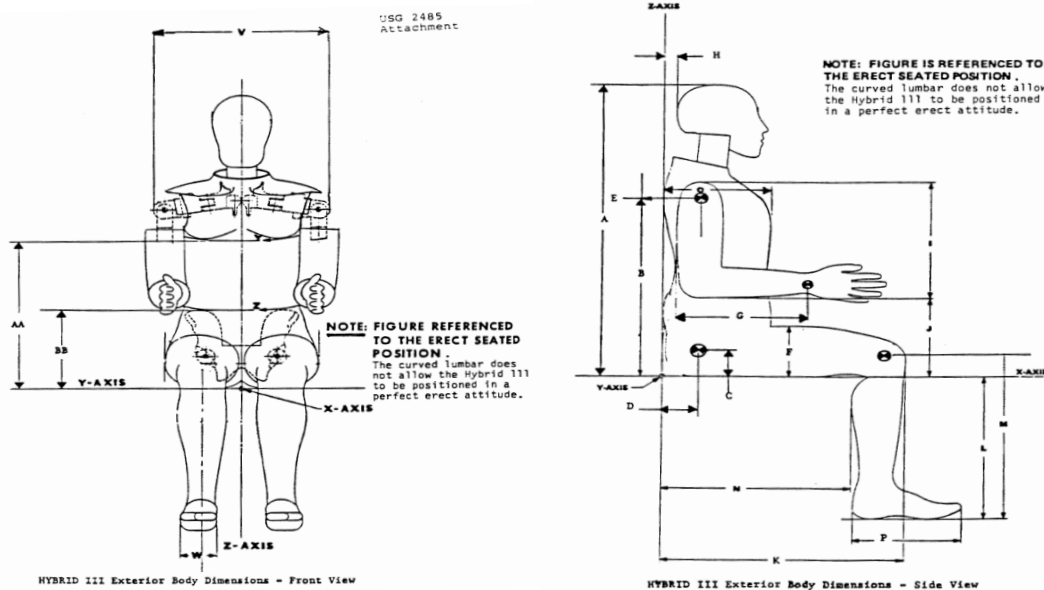


External Measurements - Hybrid 3 - 50th Male

Technician: K. Brogan

Date: 06/12/2023

Dummy Serial Number: 142



Symbol	Description	Specification (in)		Result (in)	Pass/Fail
A	Sitting Height	34.6	35.0	34.7	Pass
B	Shoulder Pivot Height	19.9	20.5	20.3	Pass
C	H-Point Height	3.3	3.5	3.3	Pass
D	H-Point from Backline	5.3	5.5	5.4	Pass
E	Shoulder Pivot from Backline	3.3	3.7	3.5	Pass
F	Thigh Clearance	5.5	6.1	5.9	Pass
G	Back of Elbow to Wrist Pivot	11.4	12.0	11.7	Pass
H	Head Back to Backline	1.6	1.8	1.7	Pass
I	Shoulder to Elbow Length	13.0	13.6	13.3	Pass
J	Elbow Rest Height	7.5	8.3	7.9	Pass
K	Buttock to Knee Length	22.8	23.8	23.6	Pass
L	Popliteal Height	16.9	17.9	17.3	Pass
M	Knee Pivot Height	19.1	19.7	19.5	Pass
N	Buttock Popliteal Length	17.8	18.8	18.2	Pass
O	Chest Depth without Jacket	8.4	9.0	8.8	Pass
P	Foot Length (right)	9.9	10.5	10.2	Pass
V	Shoulder Breadth	16.3	17.2	16.8	Pass
W	Foot Breadth	3.6	4.2	3.9	Pass
Y	Chest Circumference with Jacket	38.2	39.4	39.0	Pass
Z	Waist Circumference	32.9	34.1	33.5	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

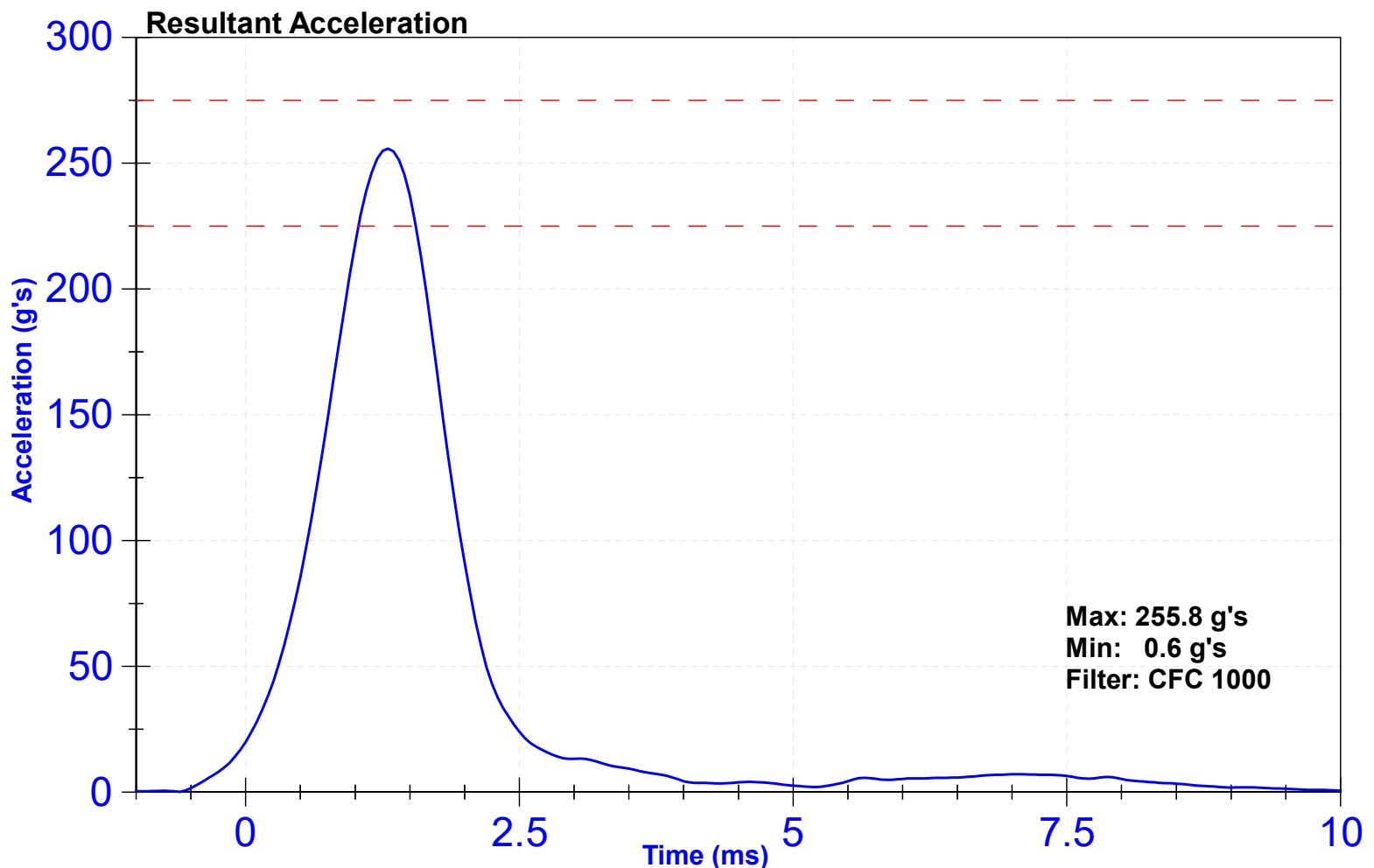
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	142	Laboratory Supervisor	K. Brogan

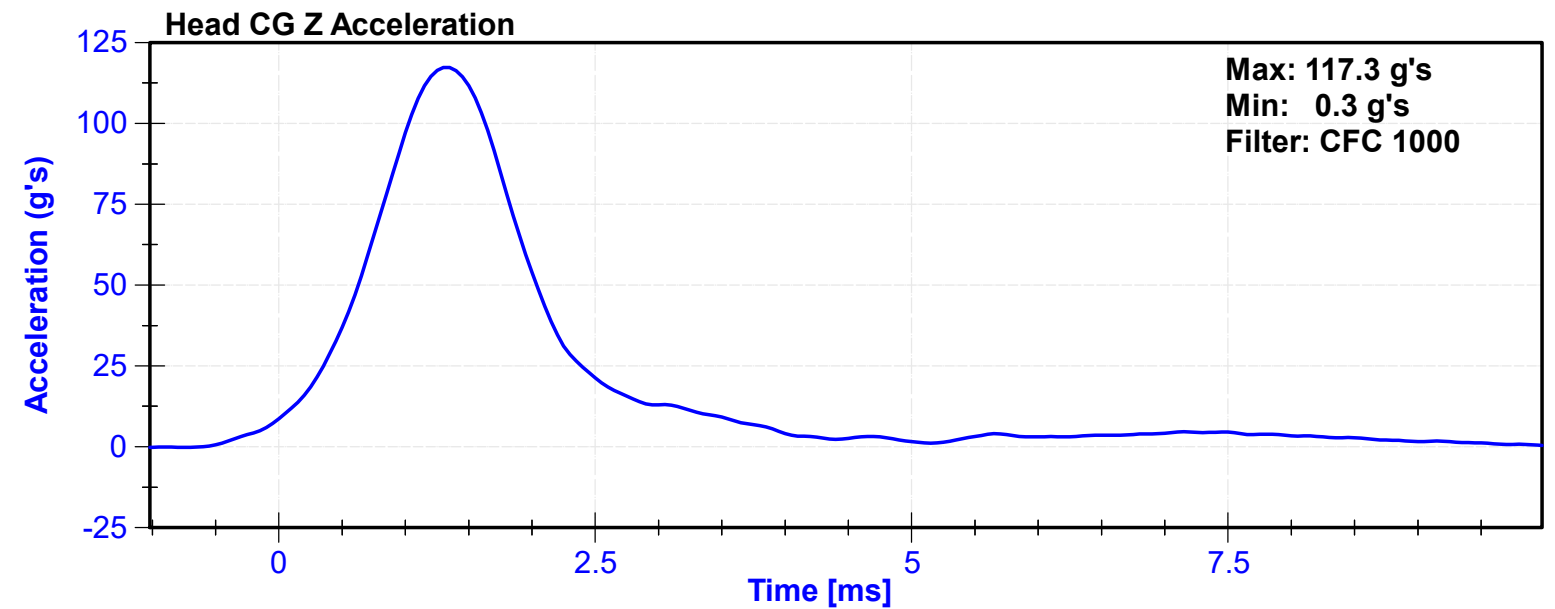
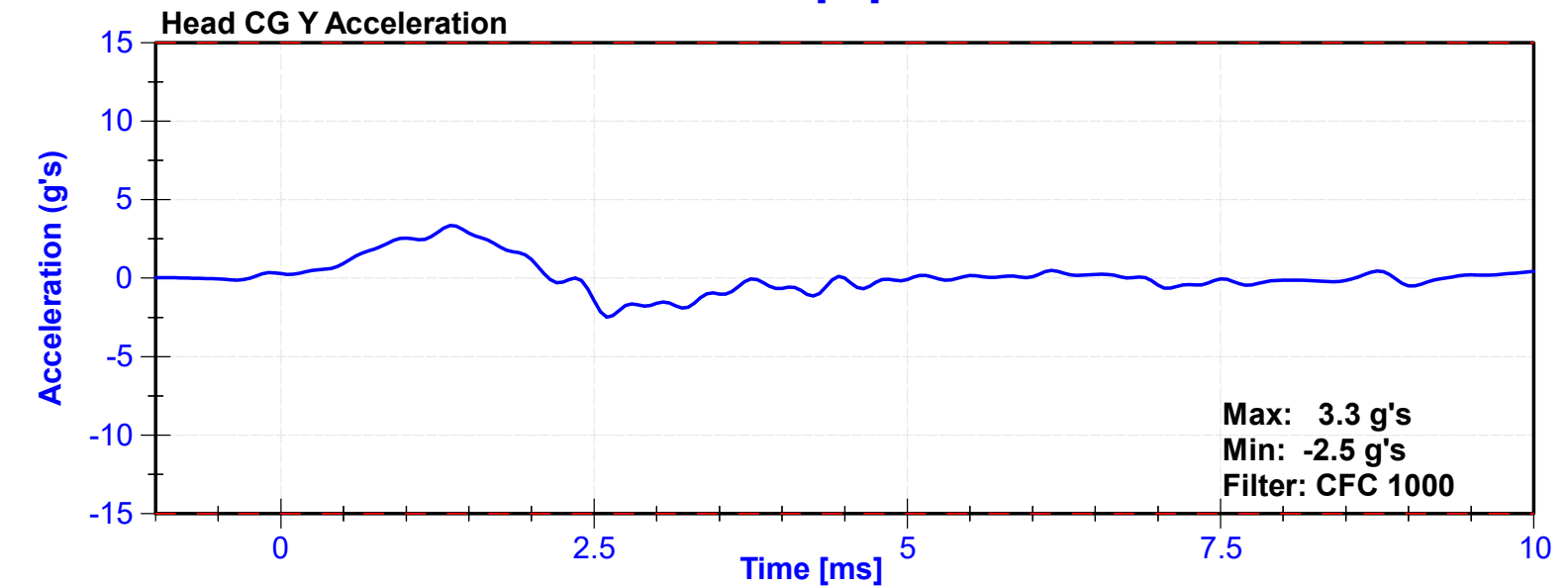
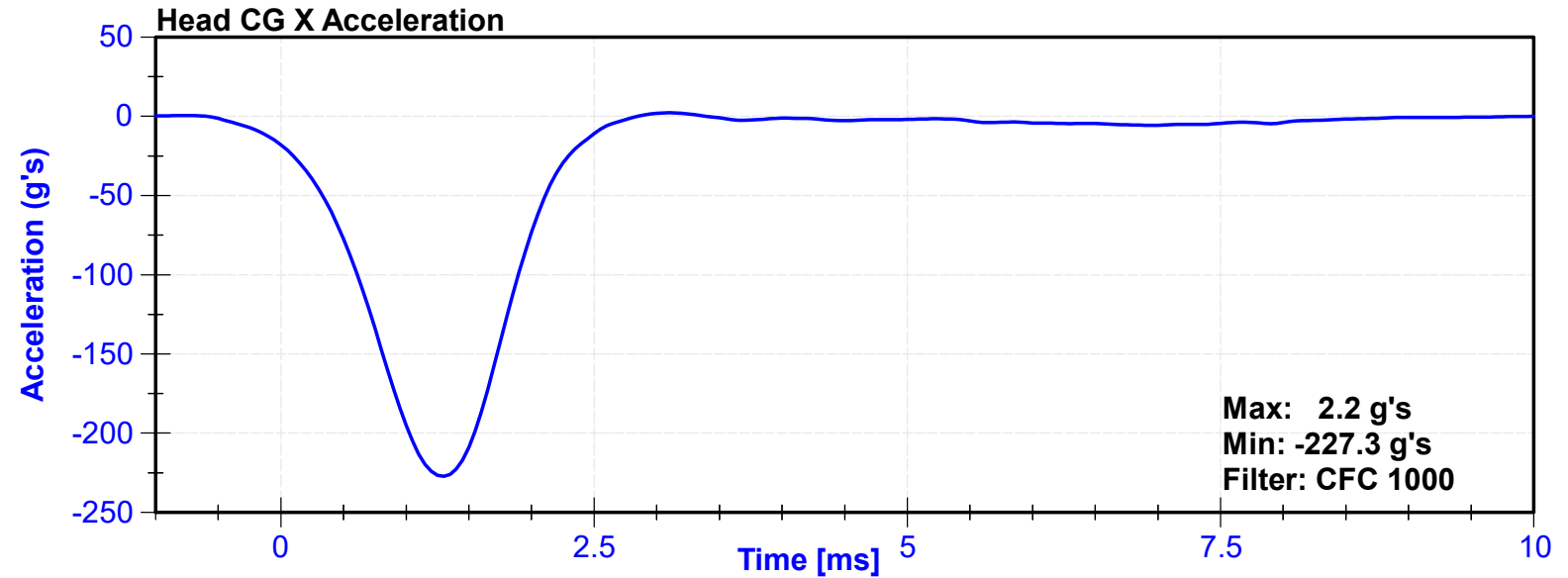
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.3	Pass
Humidity	10	70	%	31.5	Pass
Resultant Acceleration	225	275	g's	255.8	Pass
Oscillation	0	10	%	5.2	Pass
Lateral Acceleration	-15	15	g's	3.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P51681	4/6/2023	10/3/2023
Y Accelerometer	Endevco	P64151	4/6/2023	10/3/2023
Z Accelerometer	Endevco	P52114	4/6/2023	10/3/2023





ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	142	Laboratory Supervisor	K. Brogan

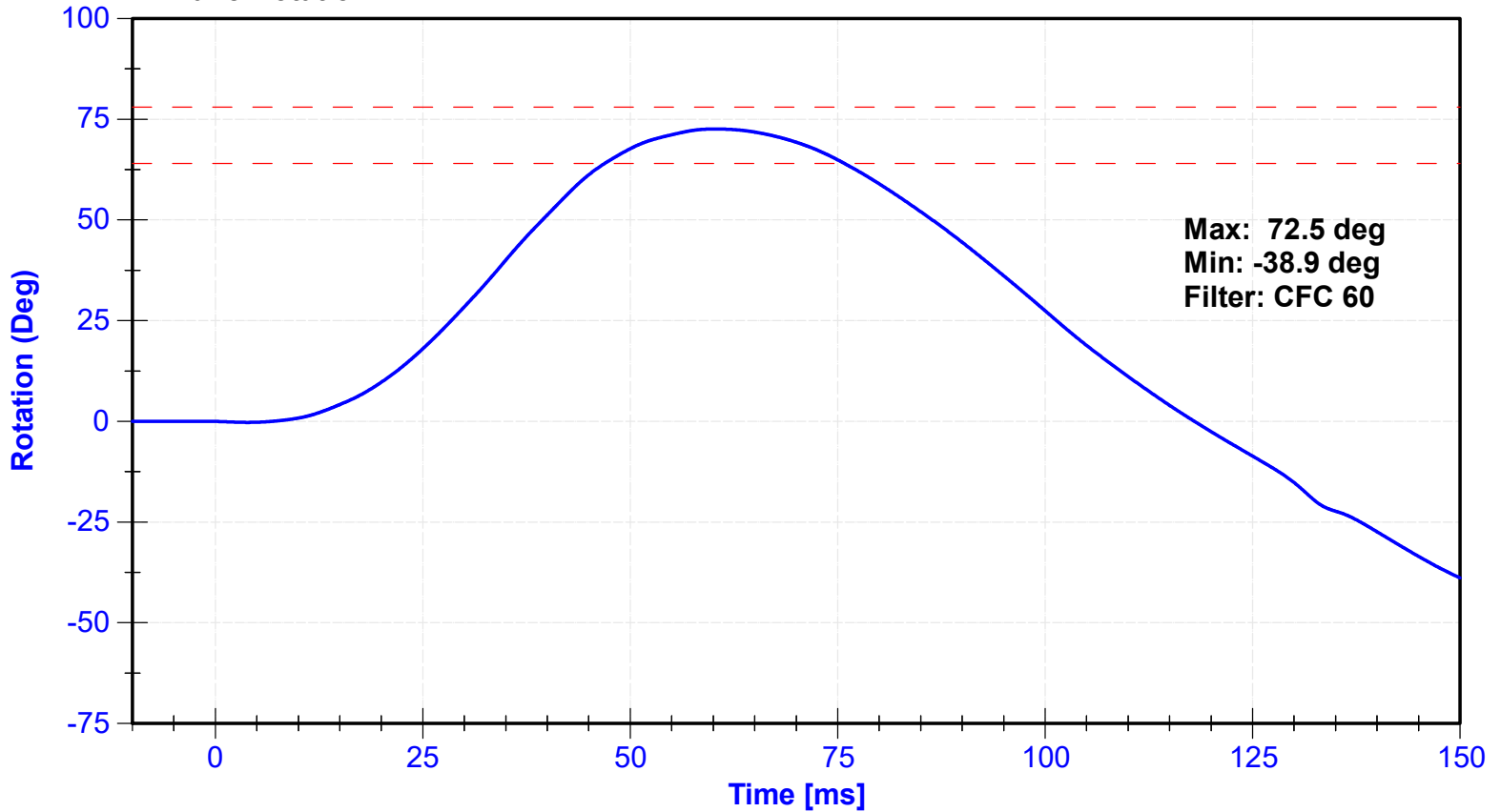
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	43.5	Pass
Velocity	6.89	7.13	m/s	6.985	Pass
Pendulum Deceleration at 10ms	22.5	27.5	g's	24.38	Pass
Pendulum Deceleration at 20ms	17.6	22.6	g's	21.88	Pass
Pendulum Deceleration at 30ms	12.5	18.5	g's	16.05	Pass
Max. Pendulum Deceleration After 30ms	0	29	g's	24.4	Pass
Pendulum Deceleration Time to 5 g's	34	42	ms	41.3	Pass
Maximum D Plane Rotation	64	78	deg	72.5	Pass
Time to Maximum Rotation	57	64	ms	60.2	Pass
Rotation Decay to Zero	113	127	ms	118.0	Pass
Moment About Occipital Condyle	88.1	108.4	Nm	94.60	Pass
Time to Maximum Moment	47	58	ms	55.0	Pass
Moment Decay to Zero	97	107	ms	101.3	Pass

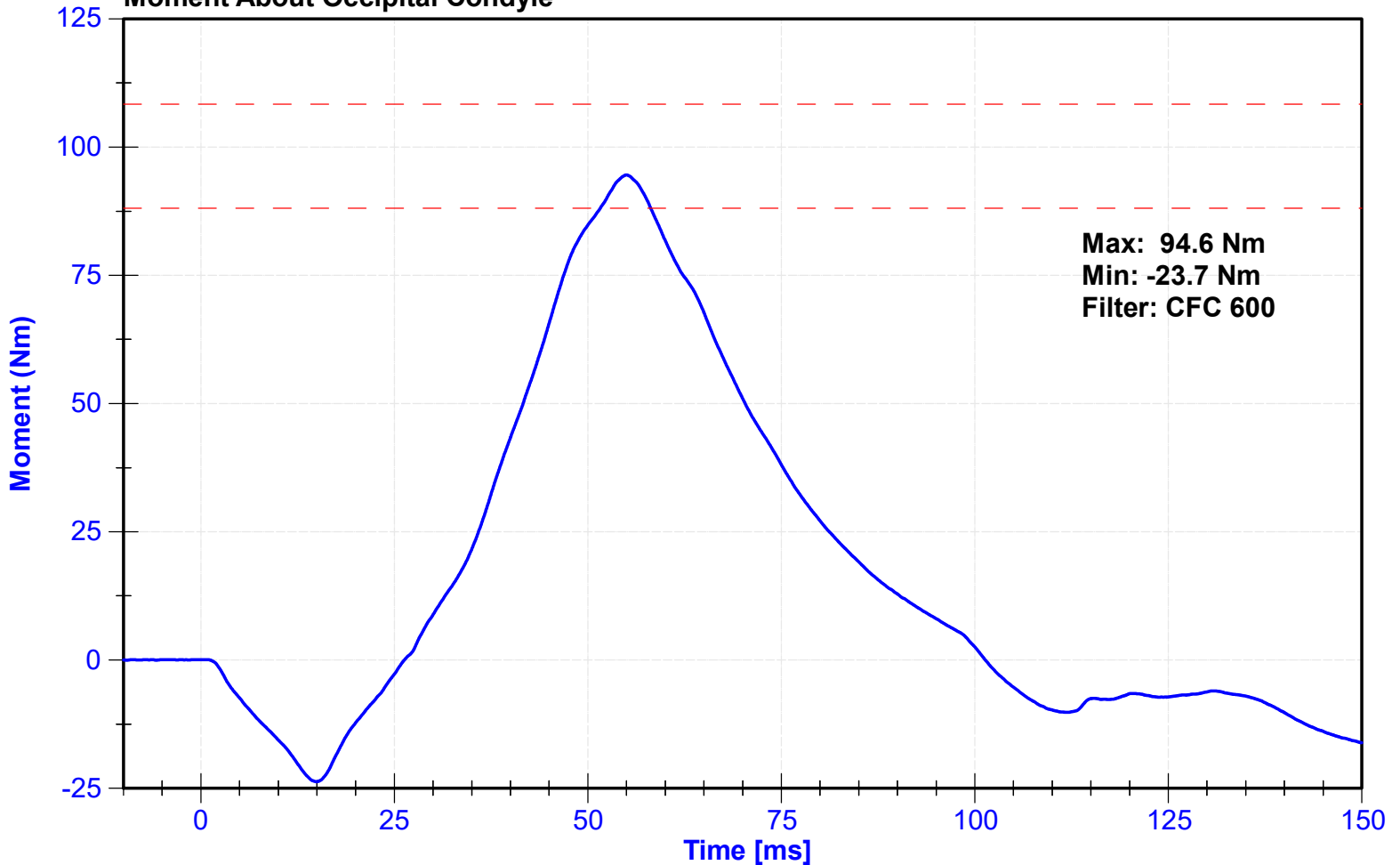
Transducer Calibrations

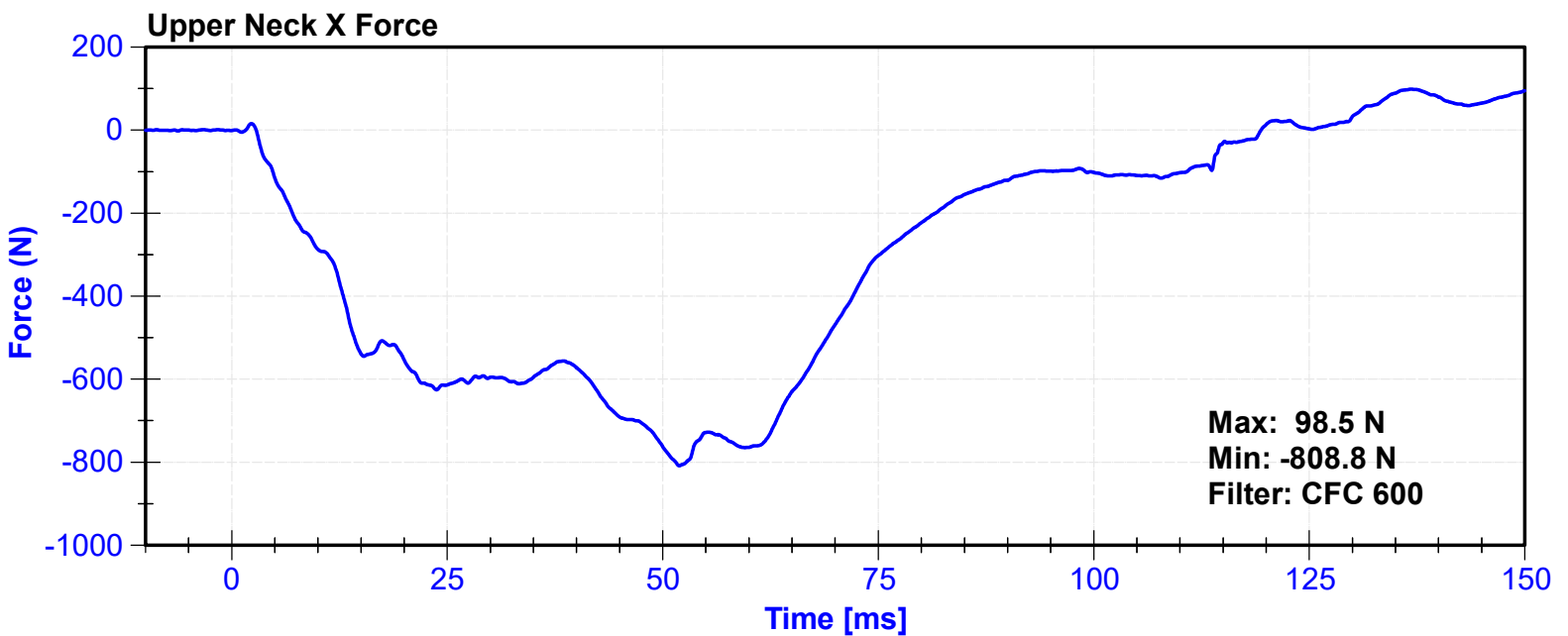
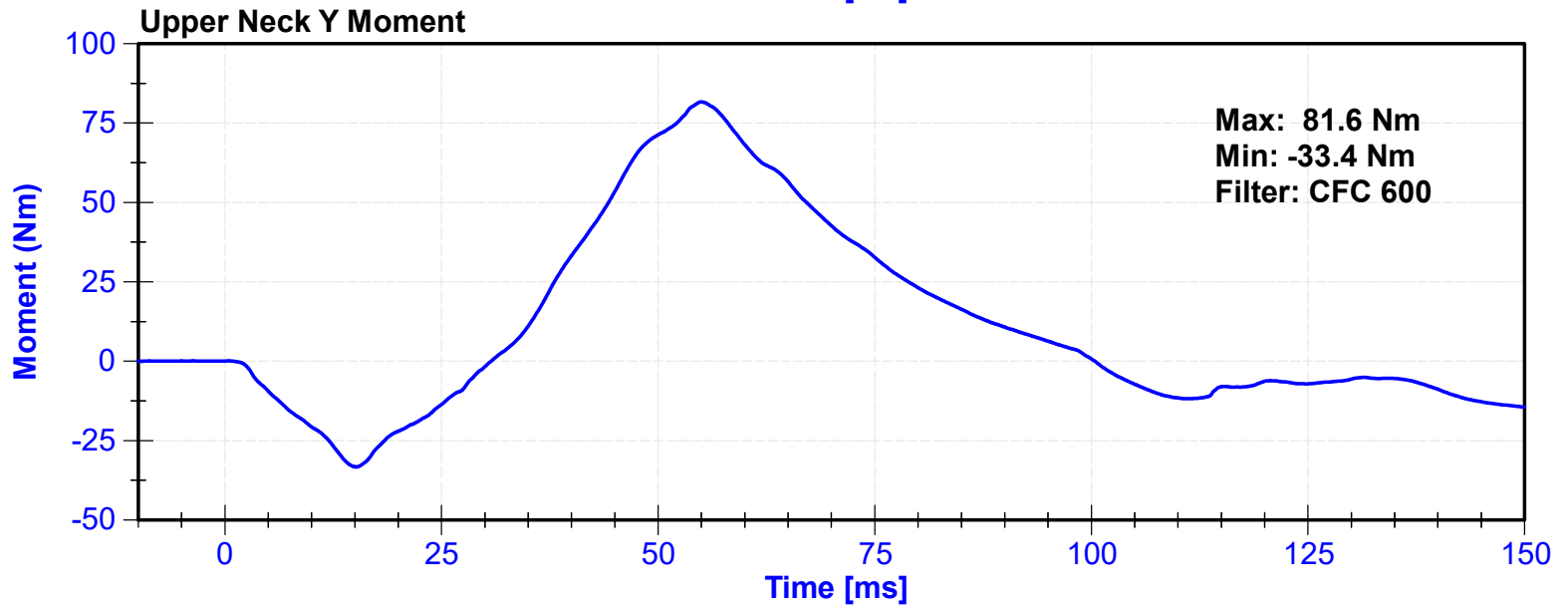
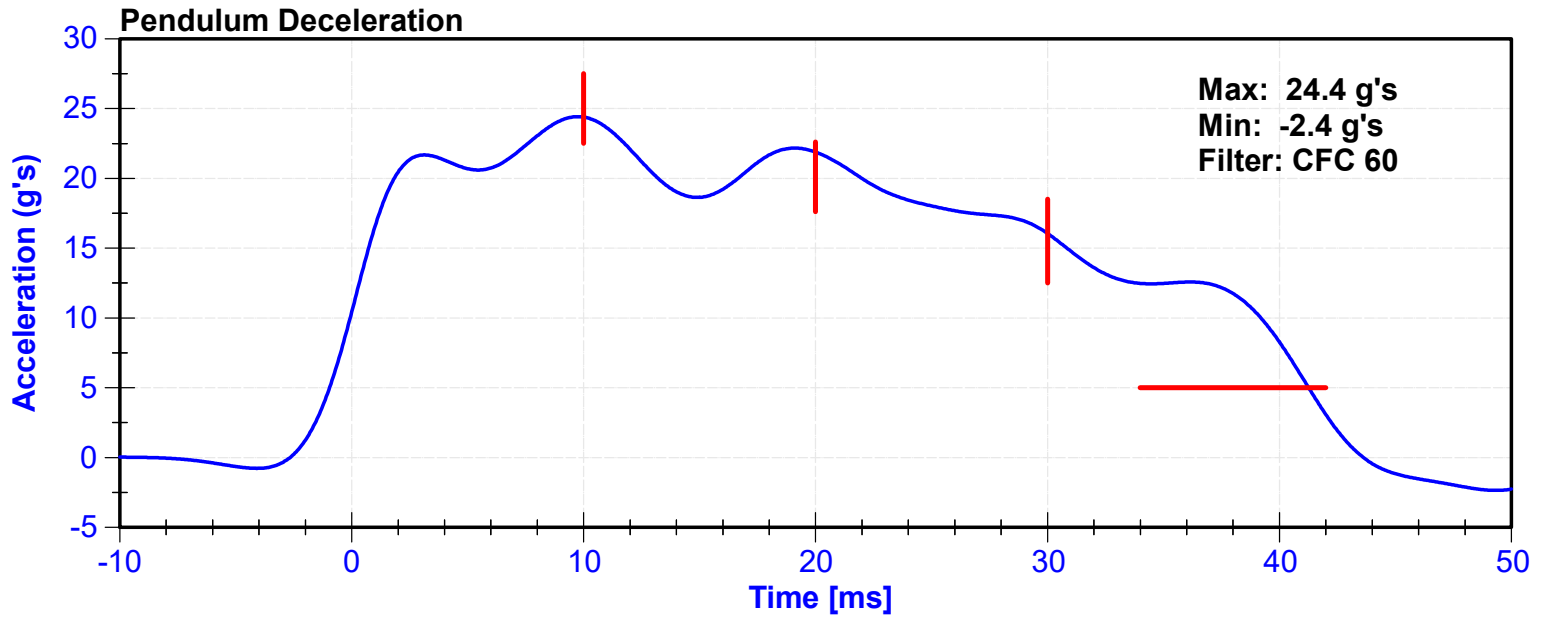
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	ETI	LABPOT2	5/5/2023	5/4/2024
Upper Neck Load Cell	Denton	2187-FX	6/13/2022	6/13/2023

D-Plane Rotation



Moment About Occipital Condyle





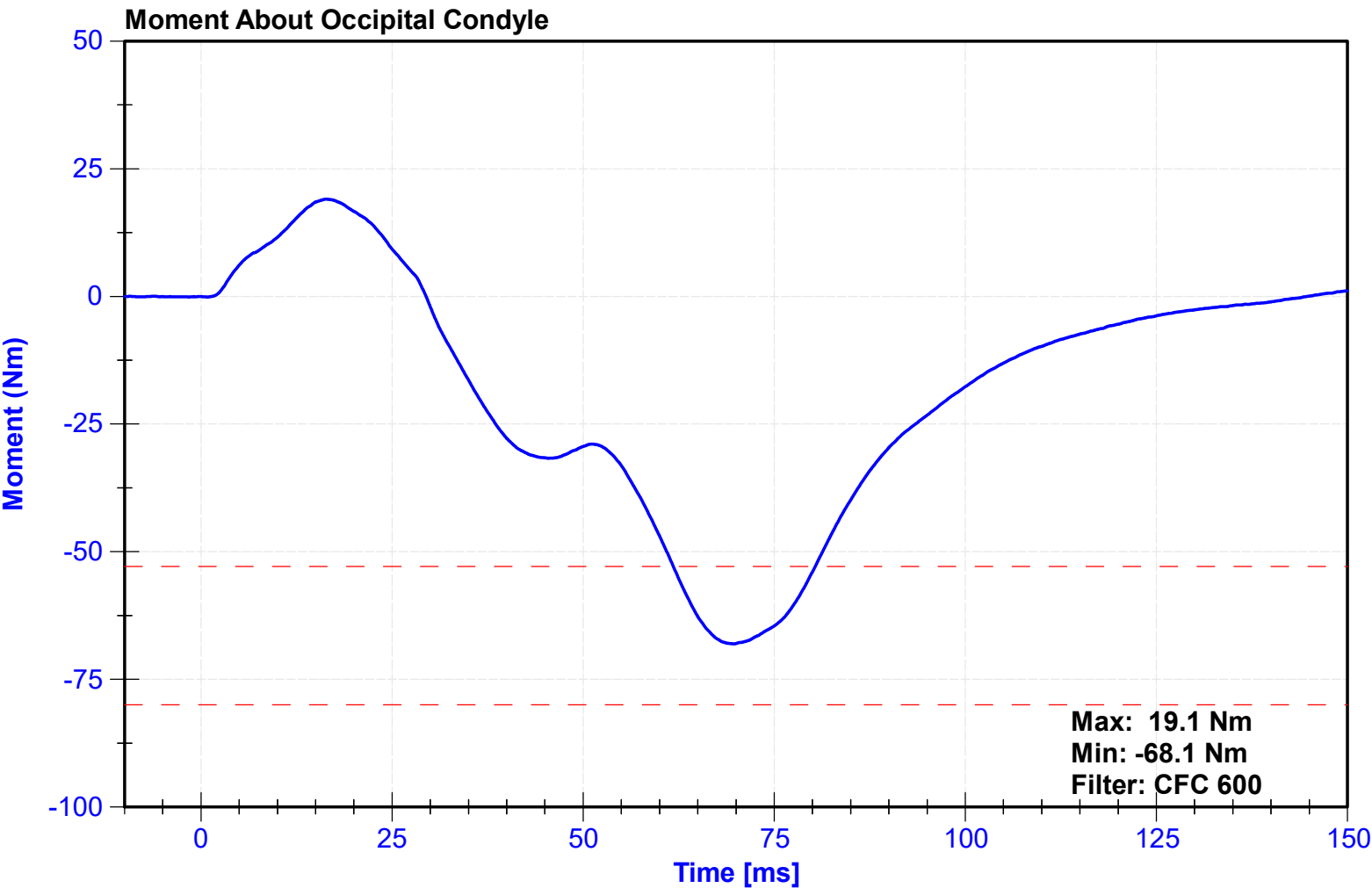
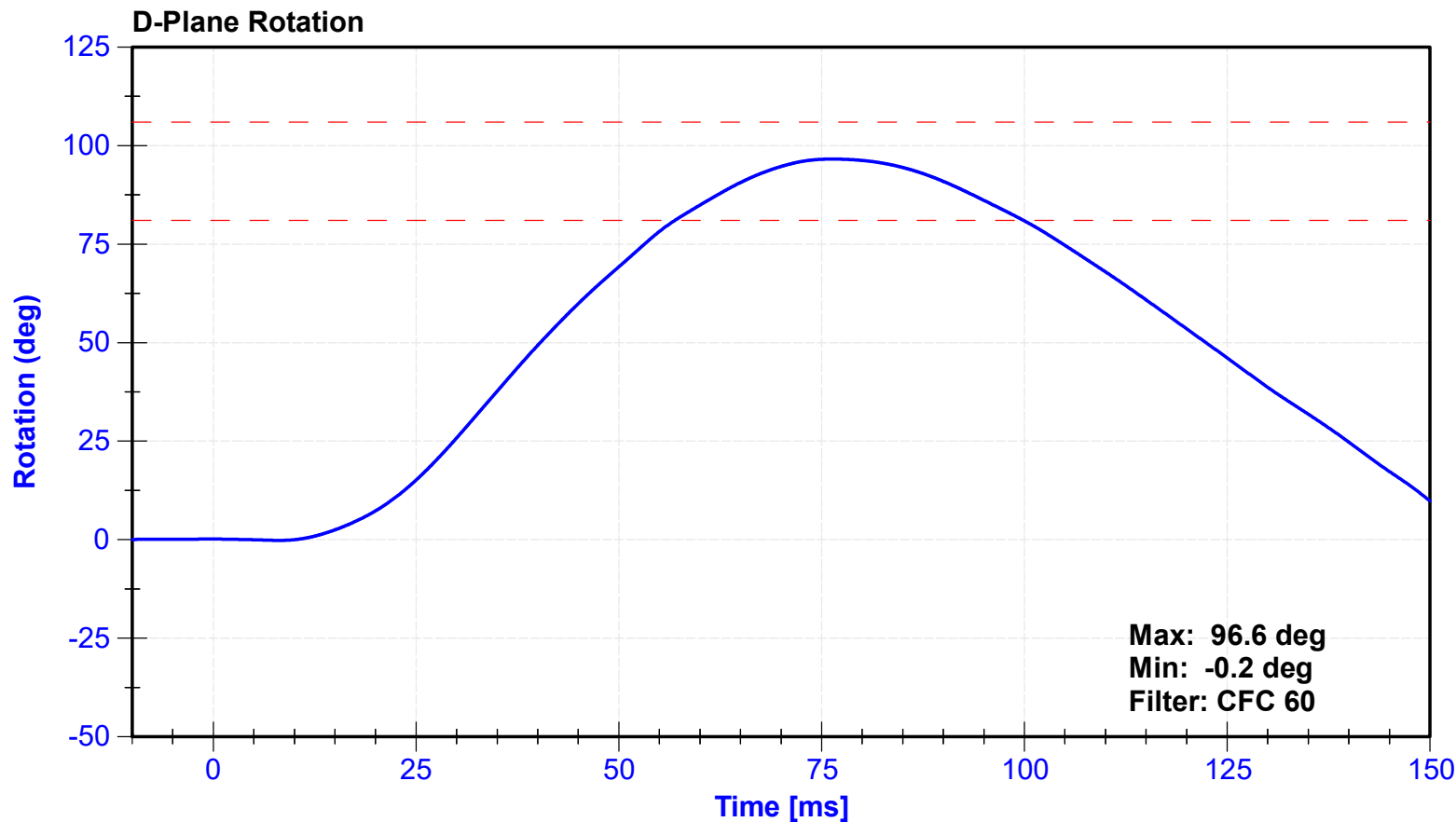
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	142	Laboratory Supervisor	K. Brogan

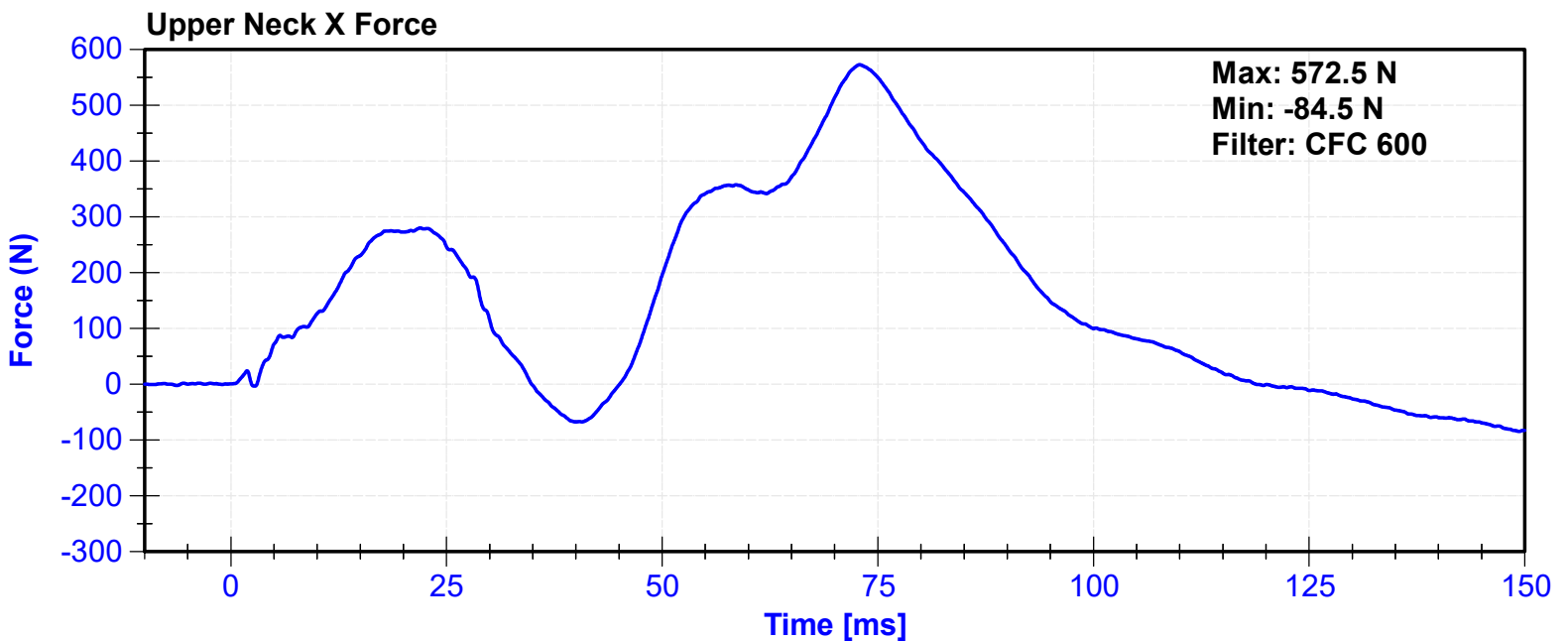
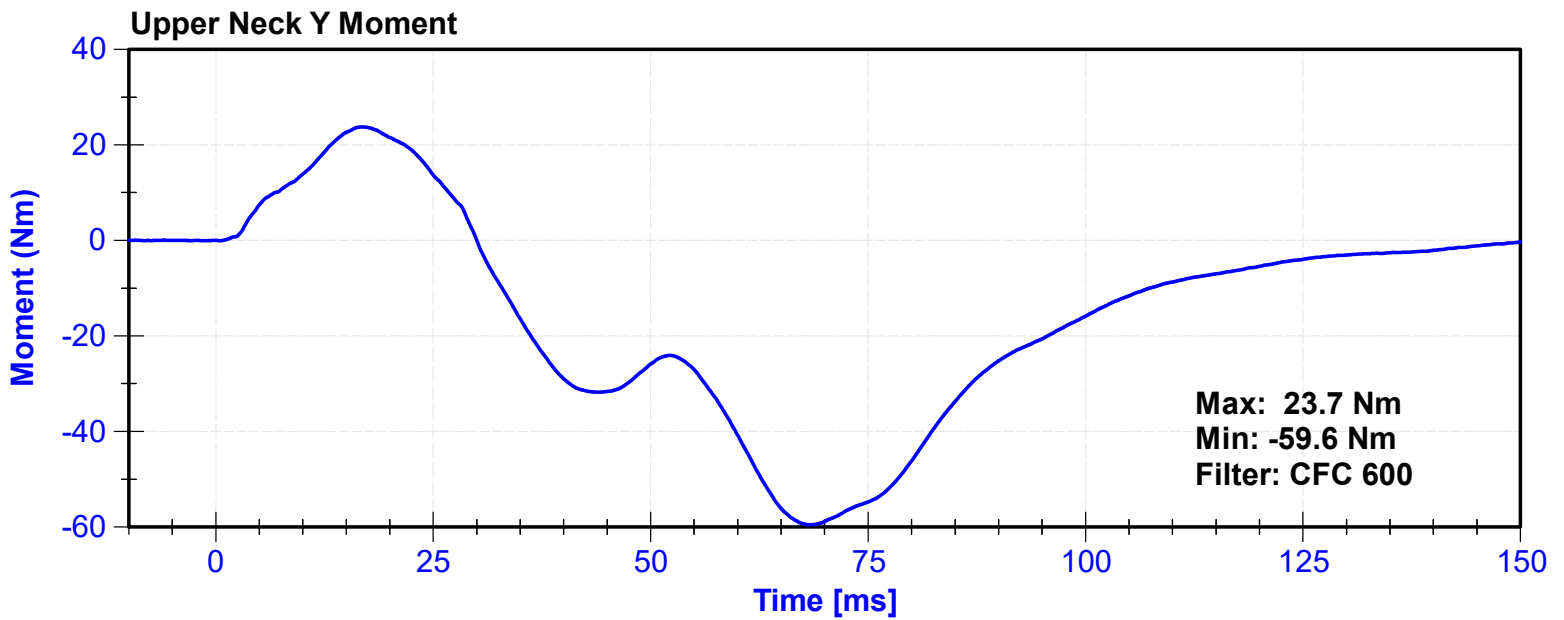
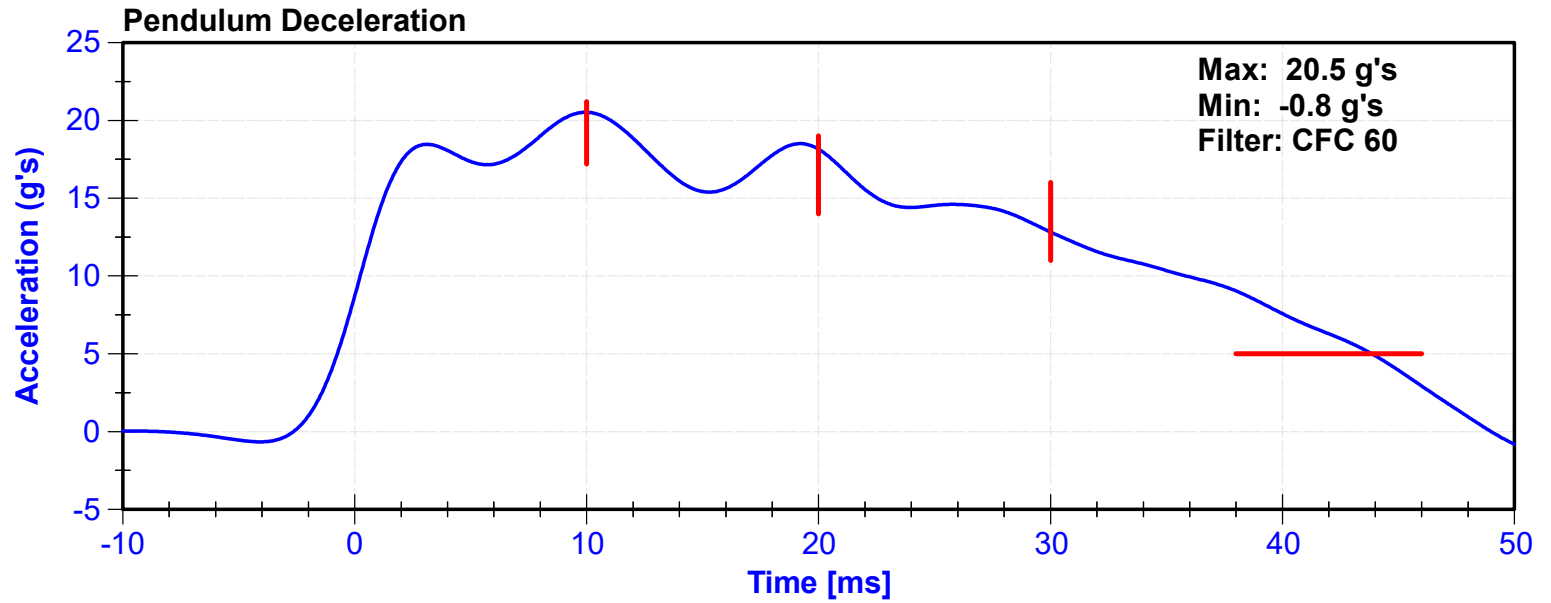
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	43.5	Pass
Velocity	5.94	6.19	m/s	6.046	Pass
Pendulum Deceleration at 10ms	17.2	21.2	g's	20.52	Pass
Pendulum Deceleration at 20ms	14	19	g's	18.1	Pass
Pendulum Deceleration at 30ms	11	16	g's	12.8	Pass
Max. Pendulum Deceleration After 30ms	0	22	g's	20.5	Pass
Pendulum Deceleration Time to 5 g's	38	46	ms	43.9	Pass
Maximum D Plane Rotation	81	106	deg	96.6	Pass
Time to Maximum Rotation	72	82	ms	76.3	Pass
Rotation Decay to Zero	147	174	ms	156.9	Pass
Minimum Moment About OC	-80	-52.9	Nm	-68.07	Pass
Time to Minimum Moment	65	79	ms	69.7	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	C16503	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	ETI	LABPOT2	5/5/2023	5/4/2024
Upper Neck Load Cell	Denton	2187-FX	6/13/2022	6/13/2023





ATD Manufacturer	Humanetics	Test Technician	Z. Schneider
ATD Serial Number	142	Laboratory Supervisor	K. Brogan

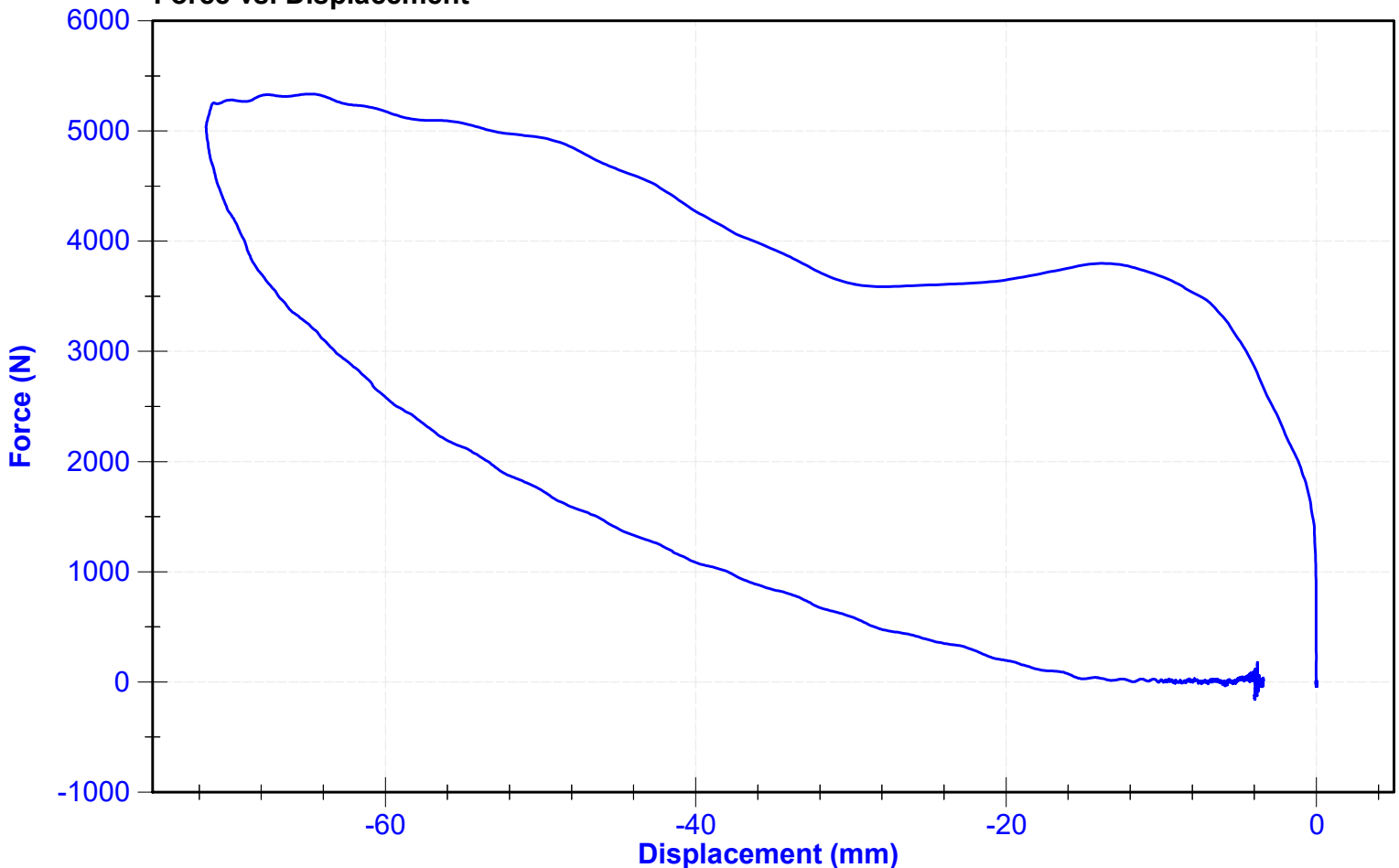
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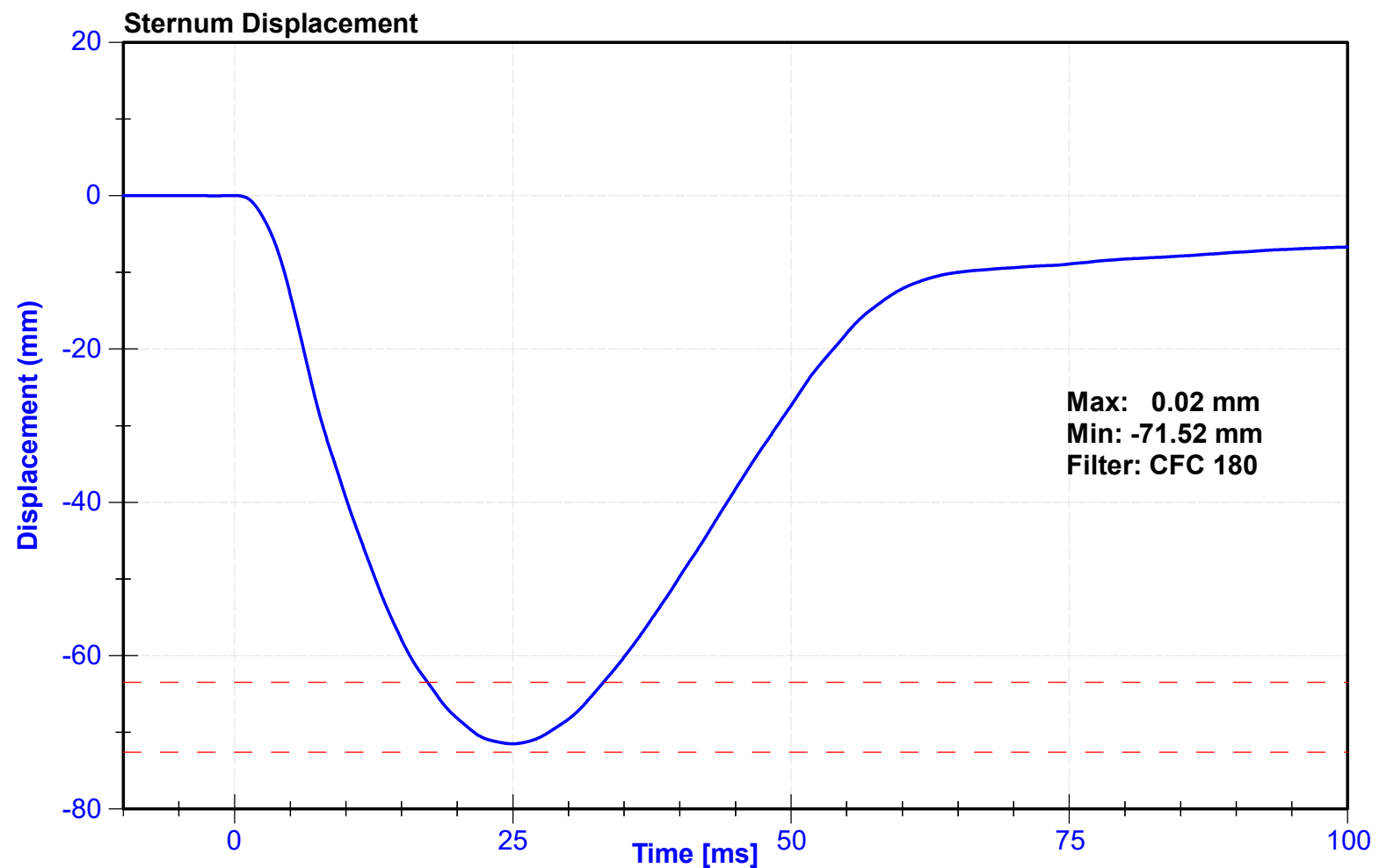
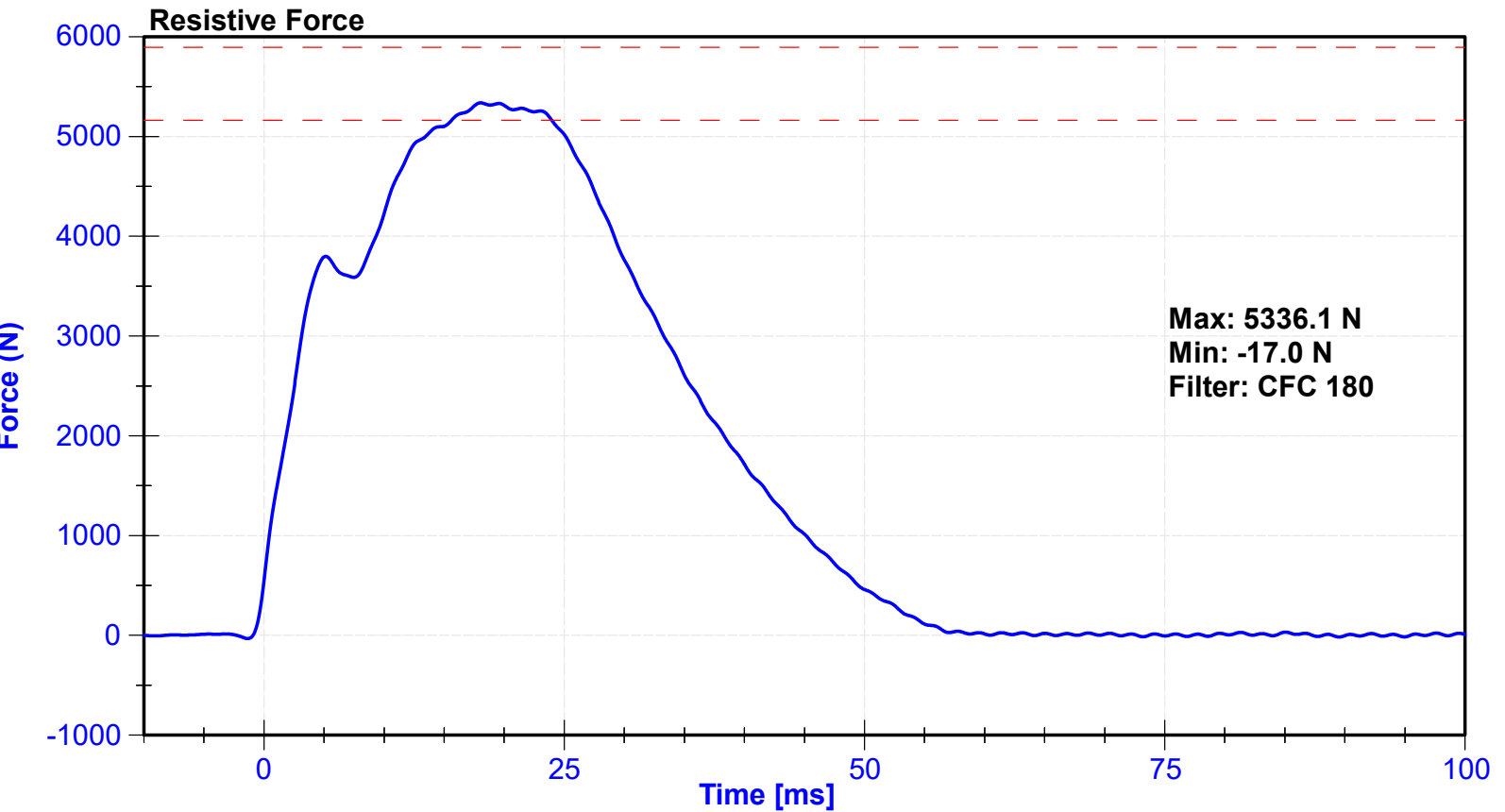
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22	Pass
Humidity	10	70	%	57	Pass
Velocity	6.59	6.83	m/s	6.702	Pass
Chest Displacement	-72.6	-63.5	mm	-71.52	Pass
Resistive Force	5160	5894	N	5336.1	Pass
Hysteresis	69	85	%	70.6	Pass

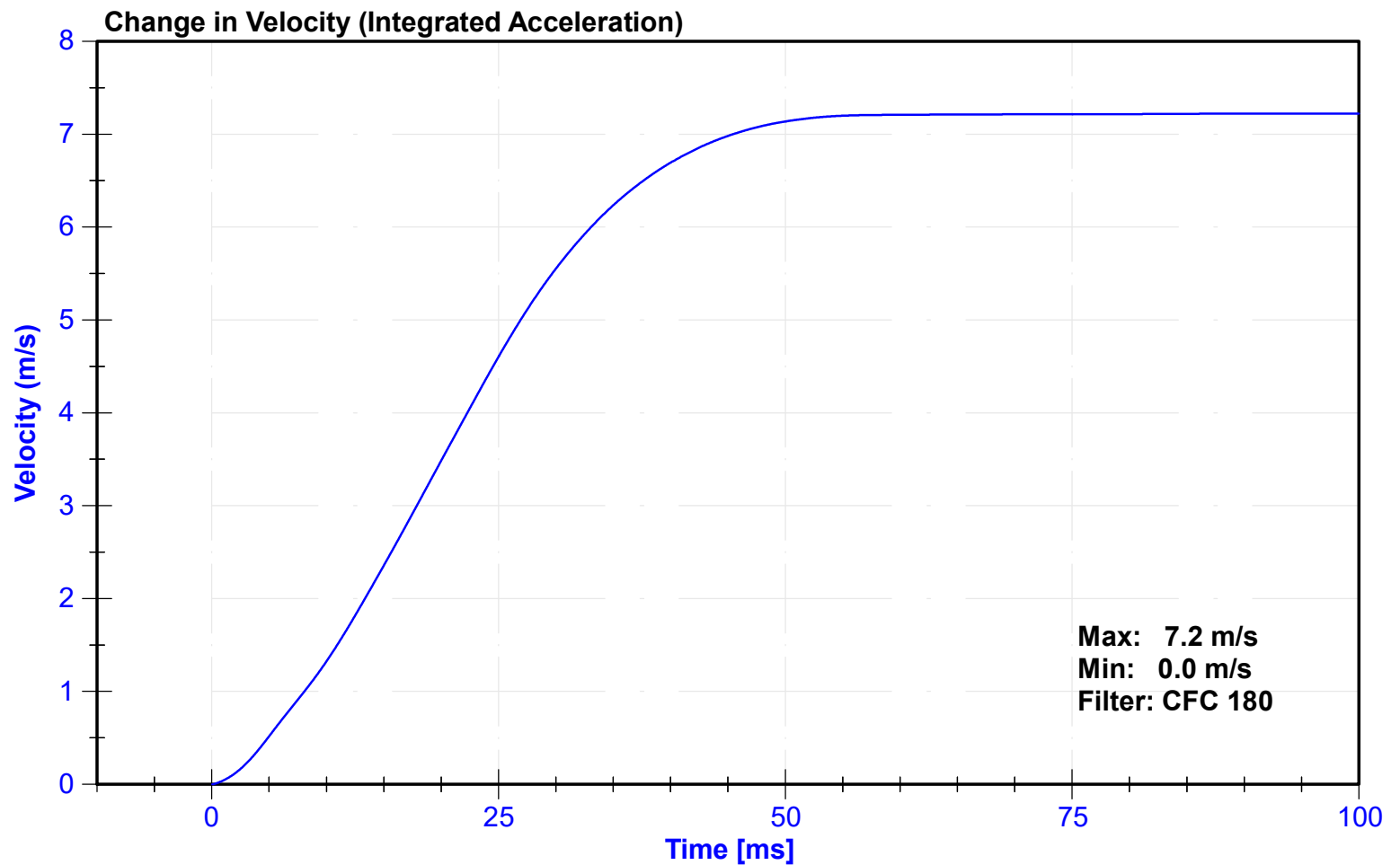
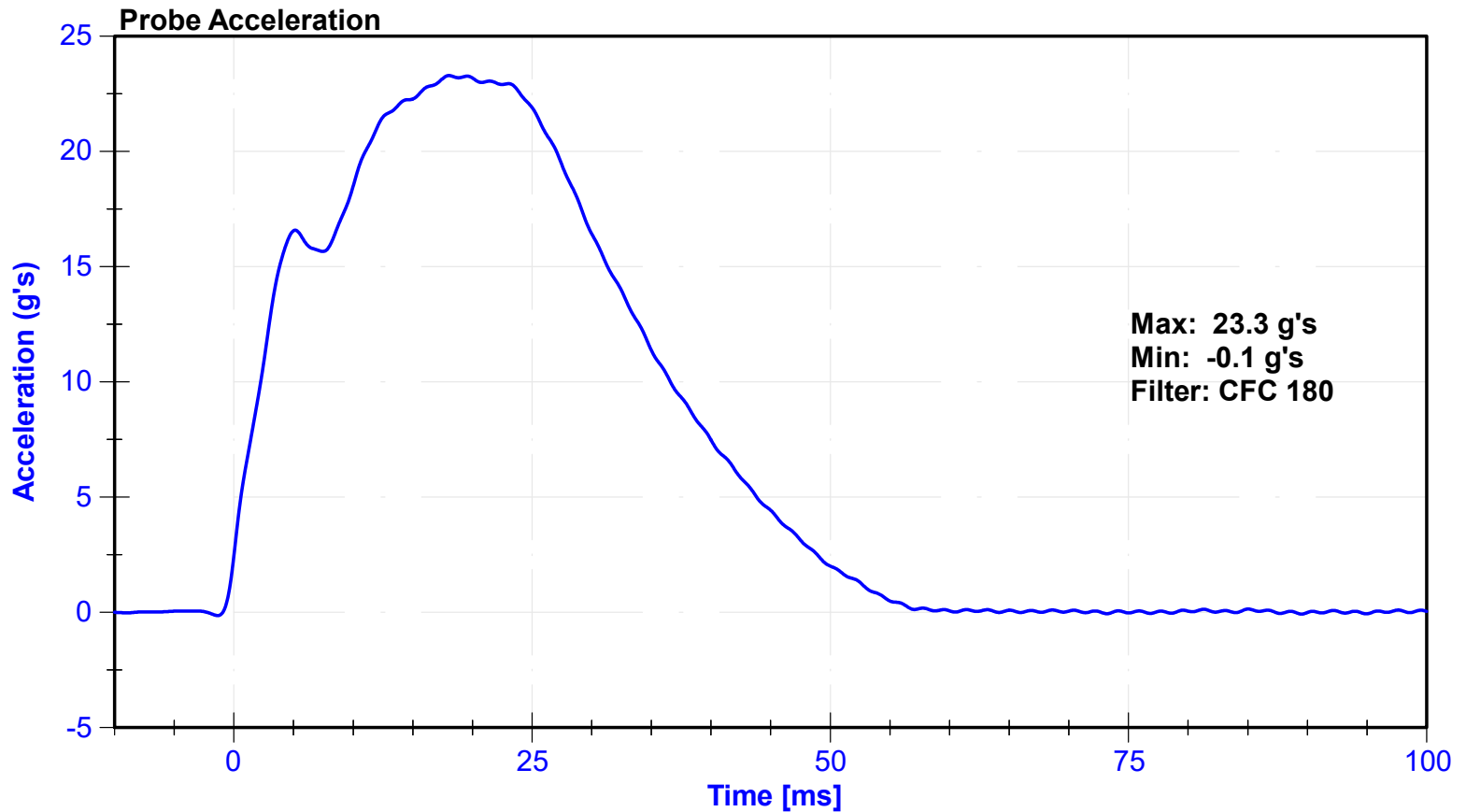
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P51736	10/25/2022	10/25/2023
Chest Potentiometer	JDK	0075	4/10/2023	10/9/2023

Force vs. Displacement



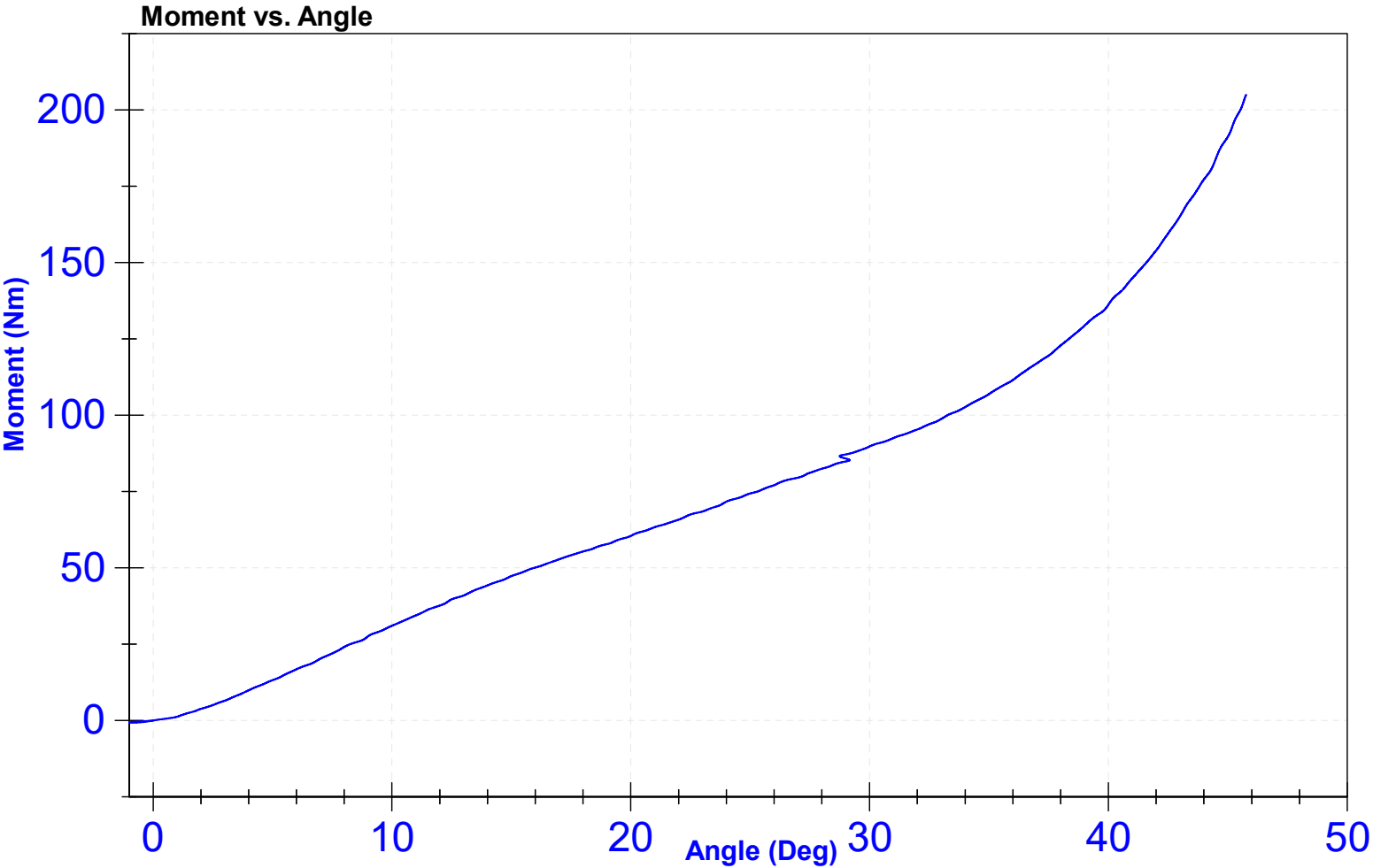




ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

Results					
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.6	Pass
Humidity	10	70	%	37.5	Pass
Average Velocity	5	10	deg/s	7.3	Pass
Angle at 203Nm	40	50	deg	45.7	Pass
Moment at 30 degrees	0	94.9	Nm	89.8	Pass

Transducer Calibrations				
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS-0008	10/4/2022	10/4/2023
Load Cell	PCB 2301-02	2301-02_115	2022-09-06	2023-09-06

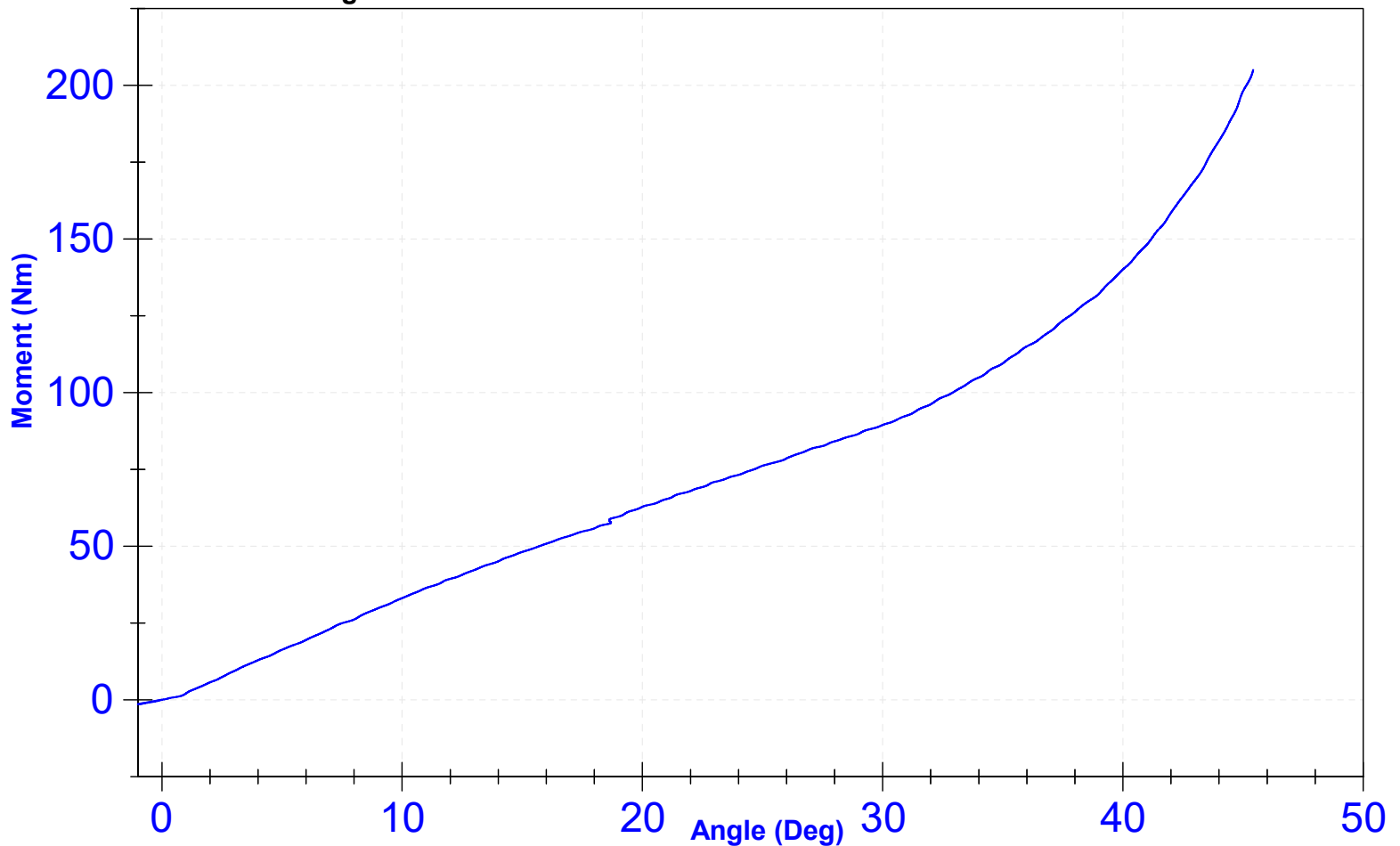


ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

Test Parameter	Results		Unit	Result	Pass/Fail
	Minimum Specification	Maximum Specification			
Temperature	18.9	25.6	°C	21.6	Pass
Humidity	10	70	%	37.5	Pass
Average Velocity	5	10	deg/s	7.3	Pass
Angle at 203Nm	40	50	deg	45.3	Pass
Moment at 30 degrees	0	94.9	Nm	89.4	Pass

Transducer Calibrations				
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS-0008	10/4/2022	10/4/2023
Load Cell	PCB 2301-02	2301-02_115	2022-09-06	2023-09-06

Moment vs. Angle



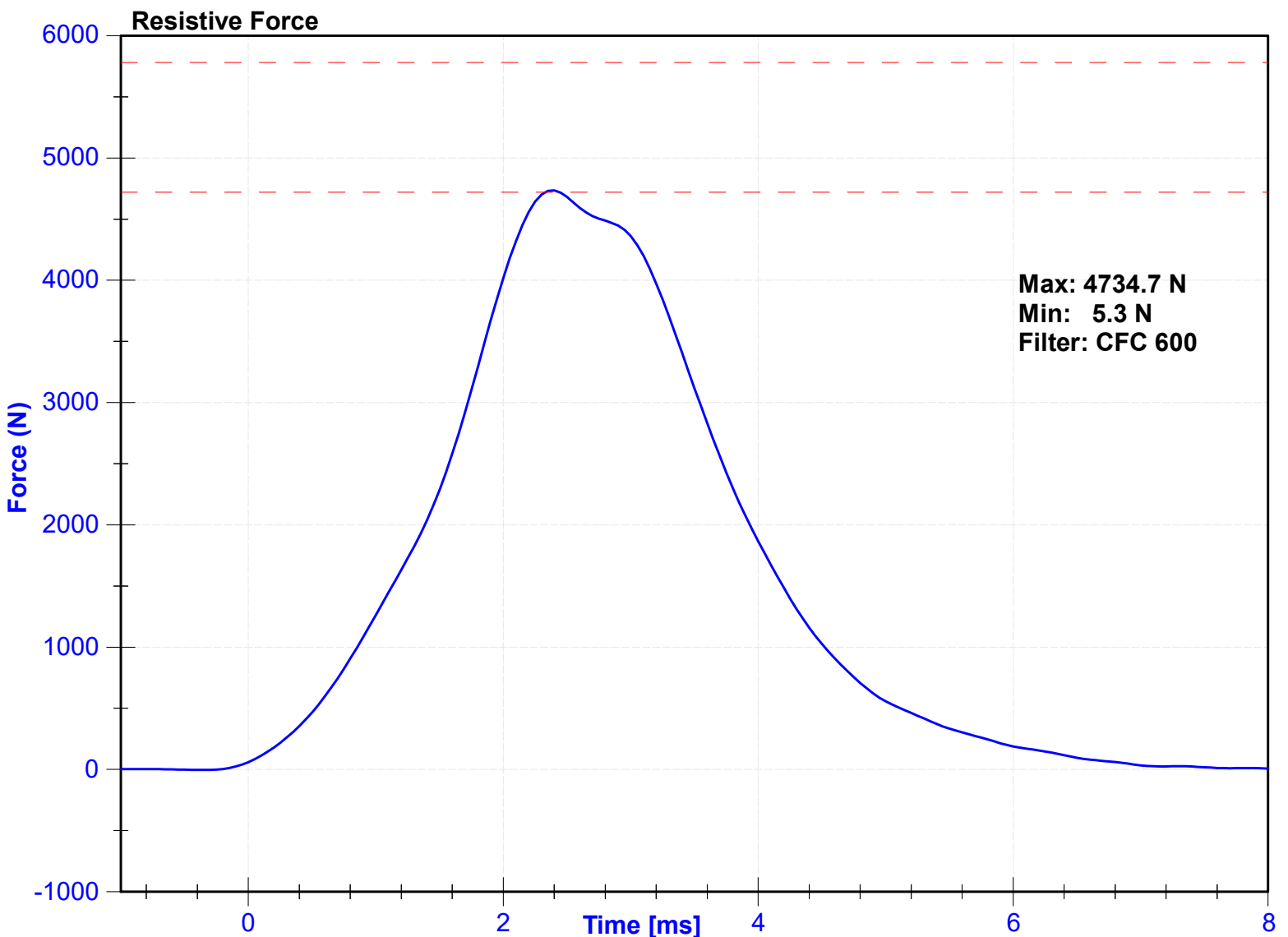
ATD Manufacturer	Humanetics	Test Technician	S. Phillips
ATD Serial Number	142	Laboratory Supervisor	K. Brogan

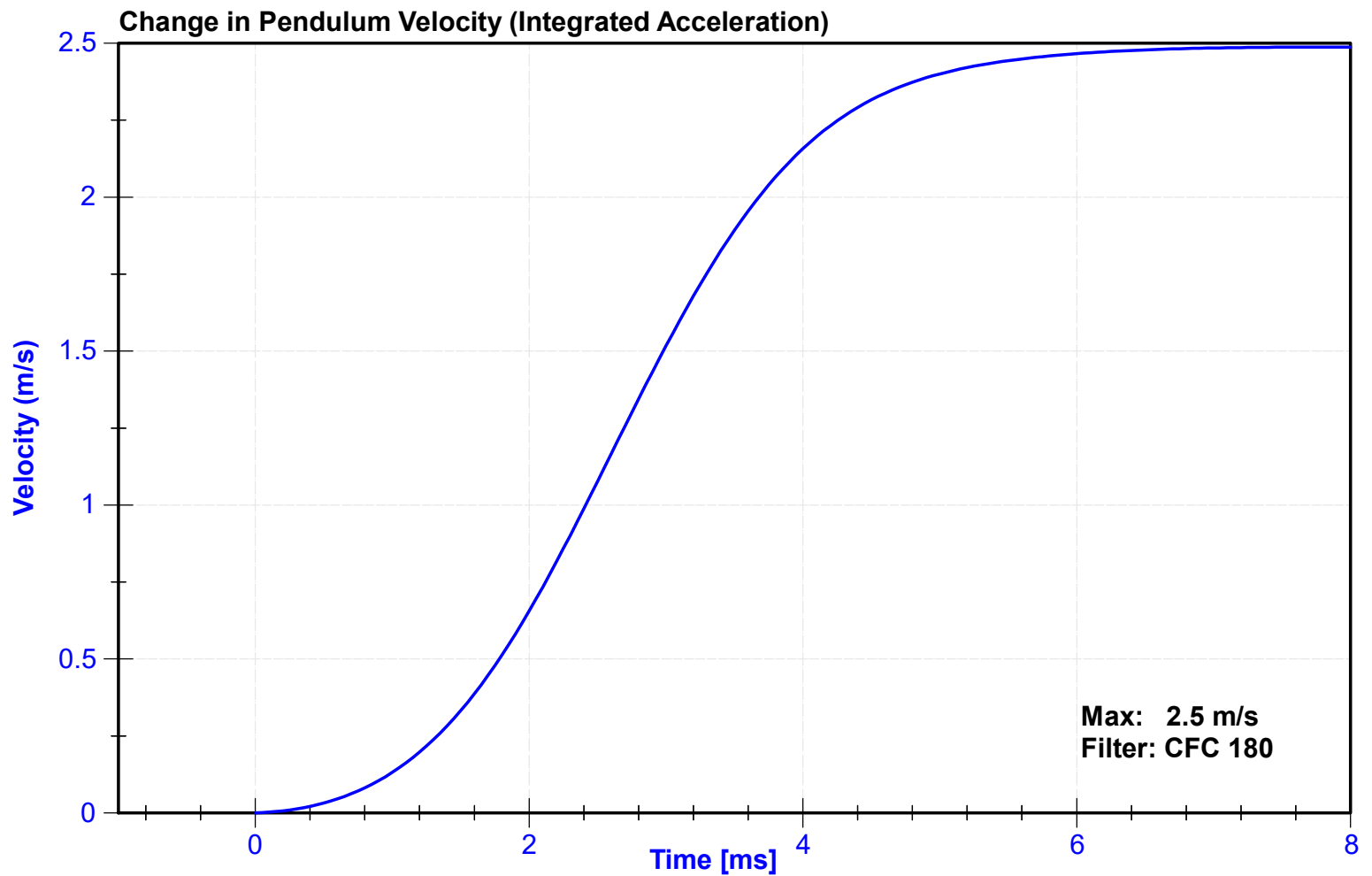
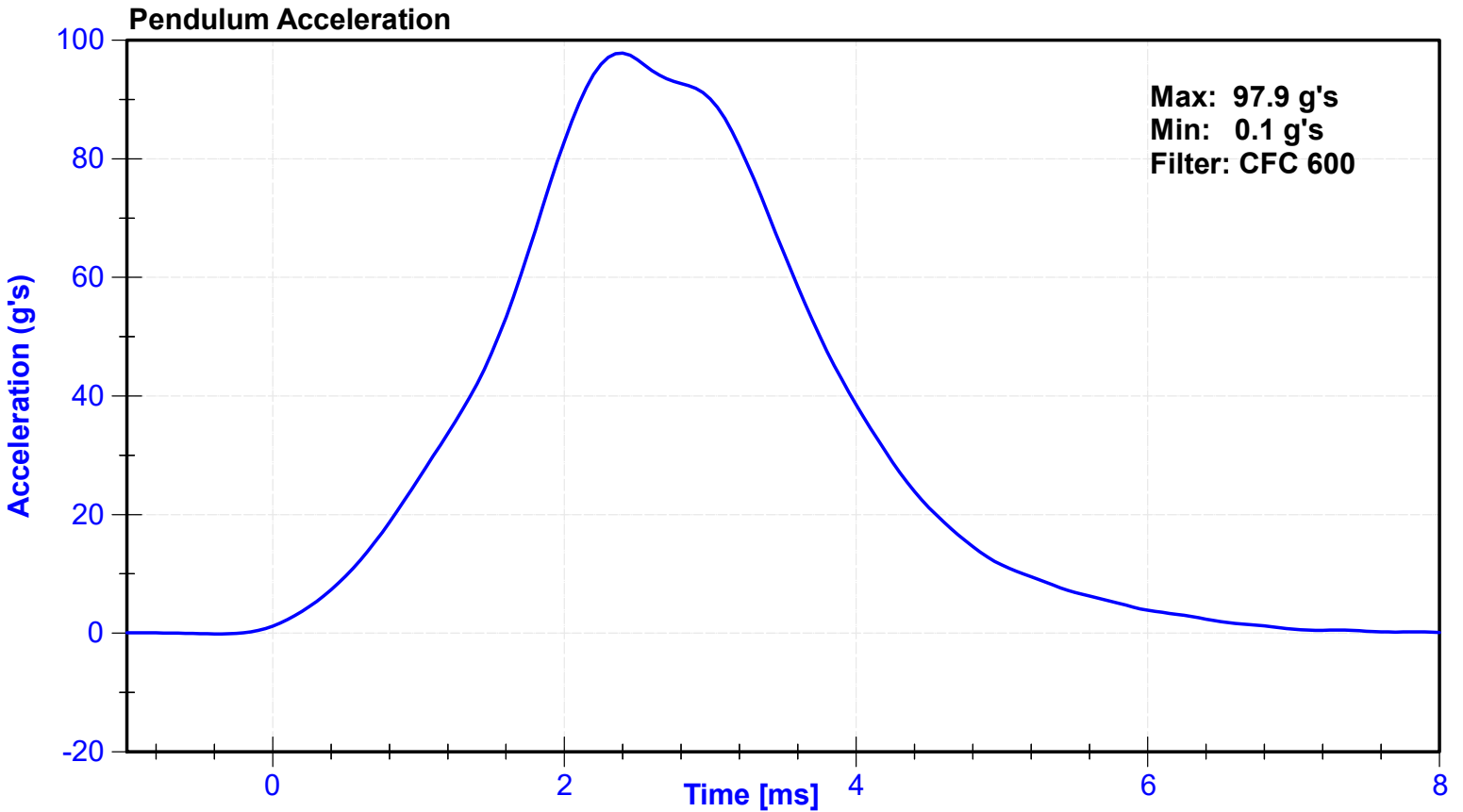
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	39	Pass
Velocity	2.07	2.13	m/s	2.074	Pass
Maximum Resistive Force	4720	5780	N	4734.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023





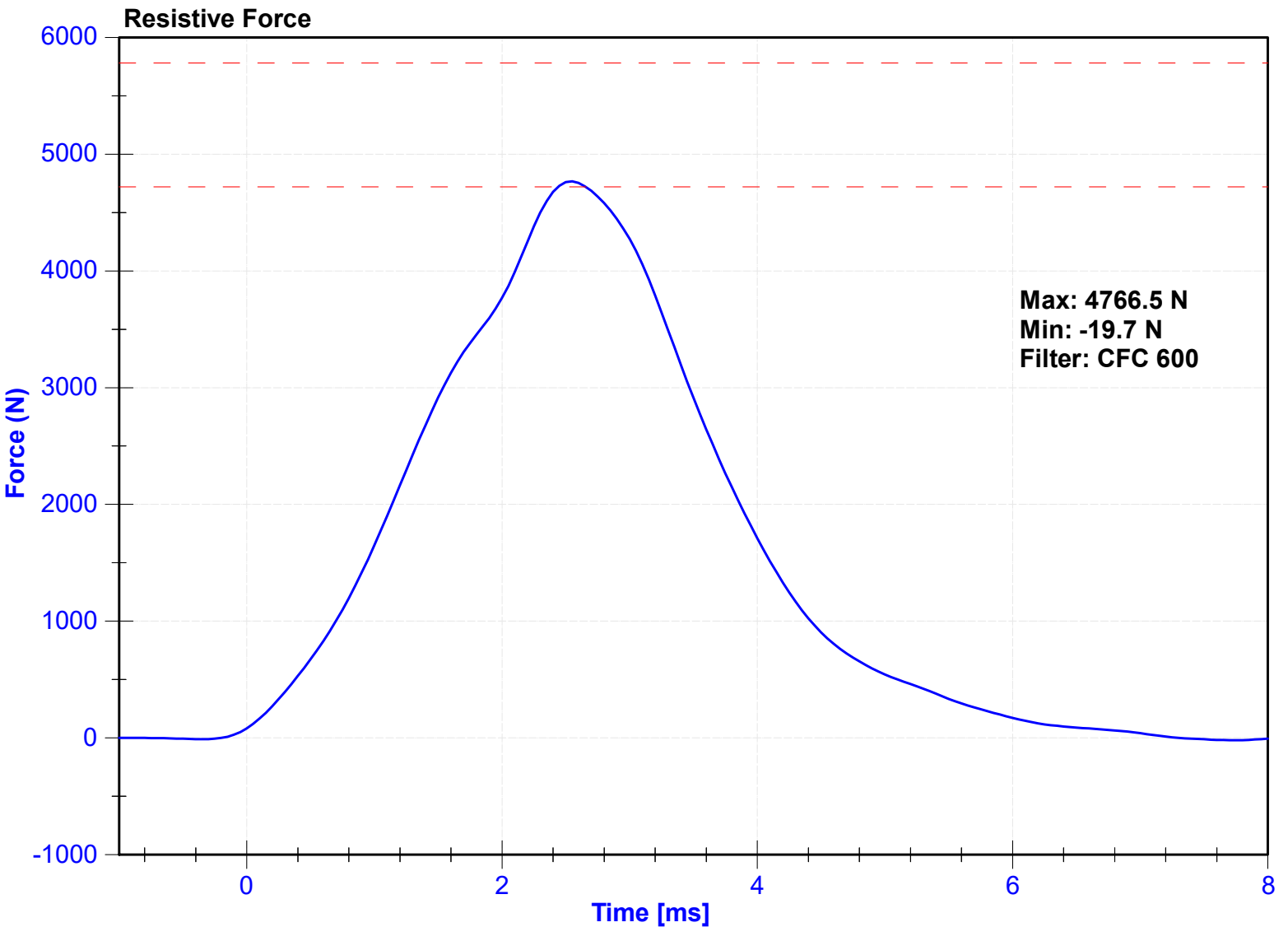
ATD Manufacturer	Humanetics	Test Technician	S. Phillips
ATD Serial Number	142	Laboratory Supervisor	K. Brogan

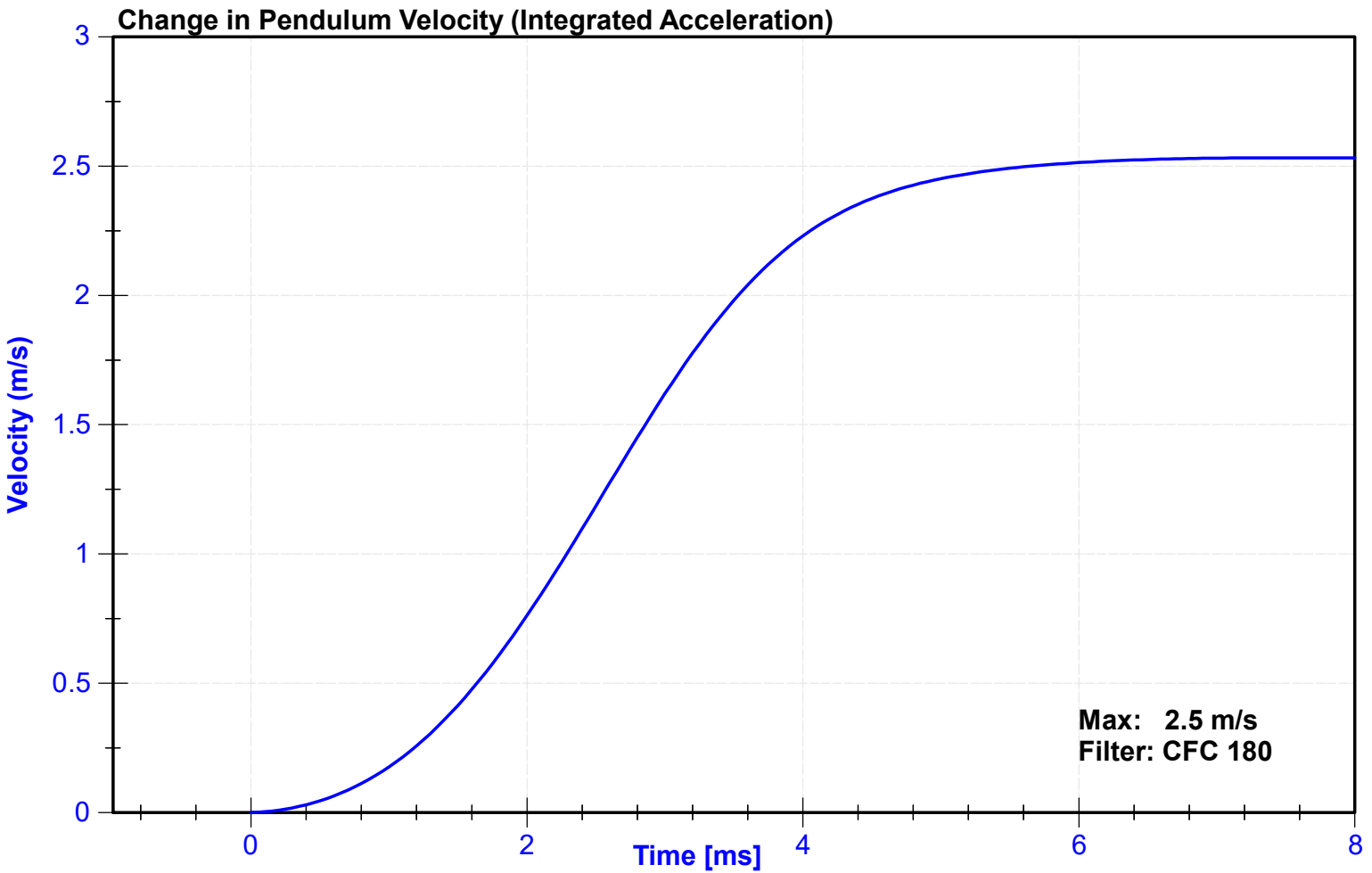
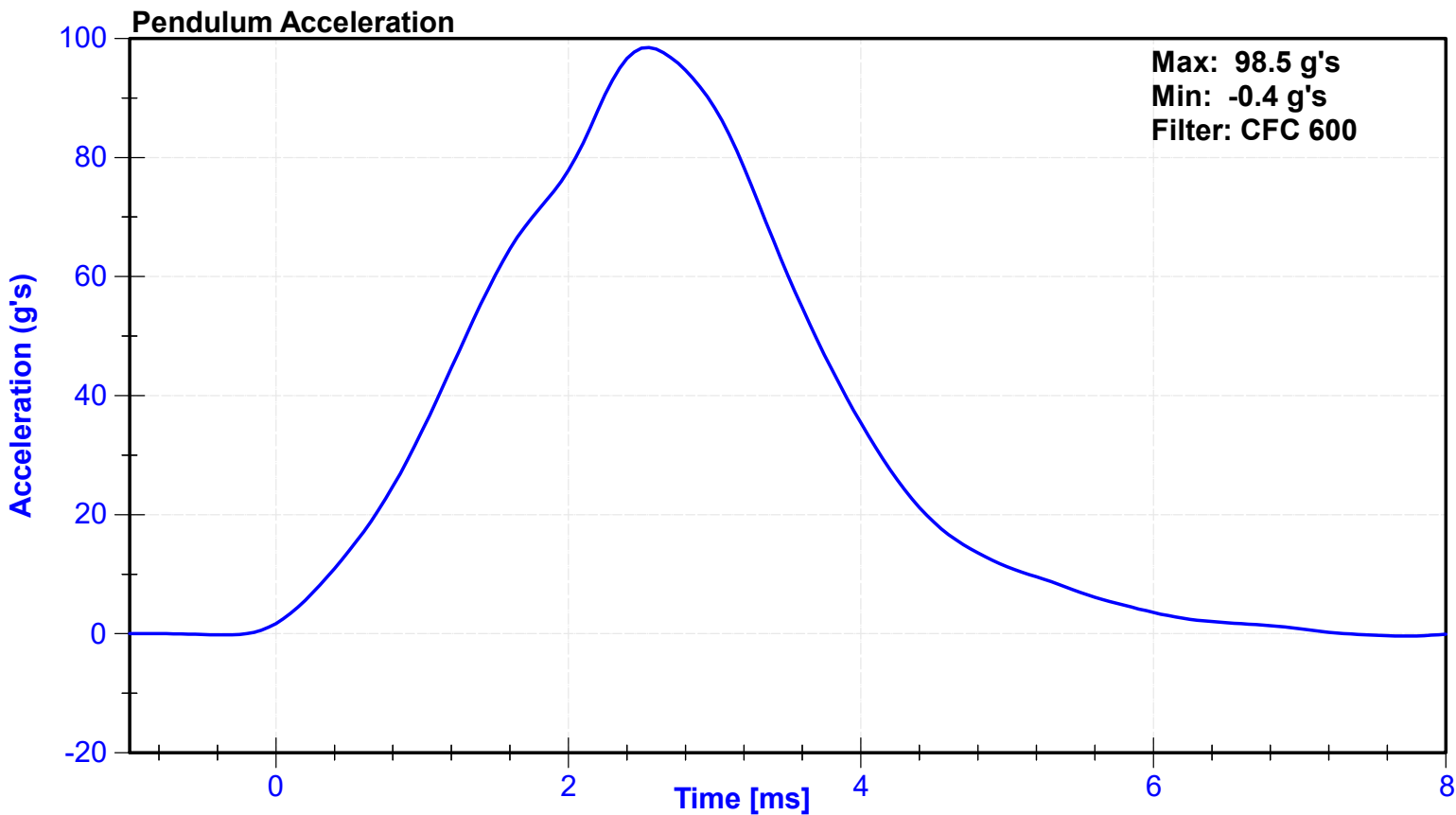
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	39	Pass
Velocity	2.07	2.13	m/s	2.117	Pass
Maximum Resistive Force	4720	5780	N	4766.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023





CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE - PASSENGER ATD

SERIAL NO: 137

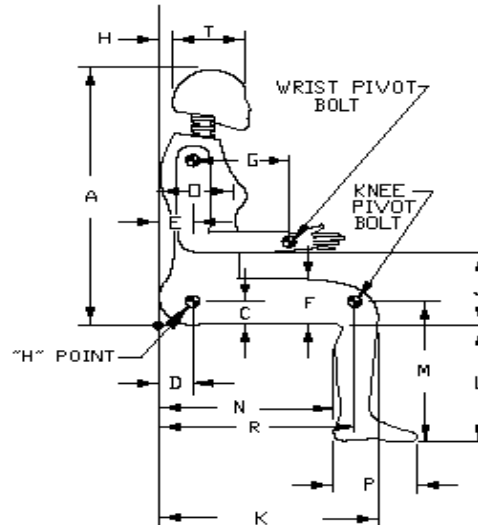
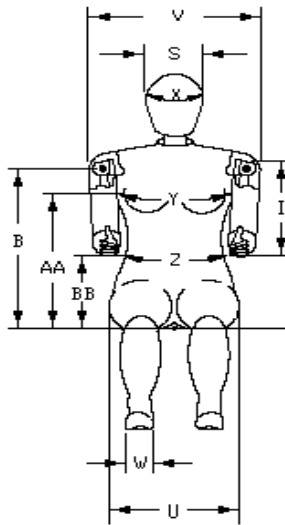


External Measurements - Hybrid 3 - 5th Female

Technician: K. Brogan

Date: 06/08/2023

Dummy Serial Number: 137



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	787	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	75	Pass
F	Thigh Clearance	119	135	130	Pass
G	Back of Elbow to Wrist Pivot	244	259	250	Pass
H	Head Back to Backline	43	48	45	Pass
I	Shoulder to Elbow Length	277	297	287	Pass
J	Elbow Rest Height	183	203	197	Pass
K	Buttock to Knee Length	521	546	535	Pass
L	Popliteal Height	356	376	368	Pass
M	Knee Pivot Height	394	419	408	Pass
N	Buttock Popliteal Length	414	439	427	Pass
O	Chest Depth without Jacket	175	191	182	Pass
P	Foot Length (right)	219	234	230	Pass
R	Buttock To Knee Pivot Length	457	483	466	Pass
S	Head Breadth	137	147	143	Pass
T	Head Depth	178	188	180	Pass
U	Hip Breadth	300	315	311	Pass
V	Shoulder Breadth	351	366	360	Pass
W	Foot Breadth	79	94	85	Pass
X	Head Circumference	528	549	544	Pass
Y	Chest Circumference with Jacket	851	881	872	Pass
Z	Waist Circumference	460	790	656	Pass
AA	Reference Location (Chest Circumference)	333	358	346	Pass
BB	Reference Location (Waist Circumference)	160	170	166	Pass

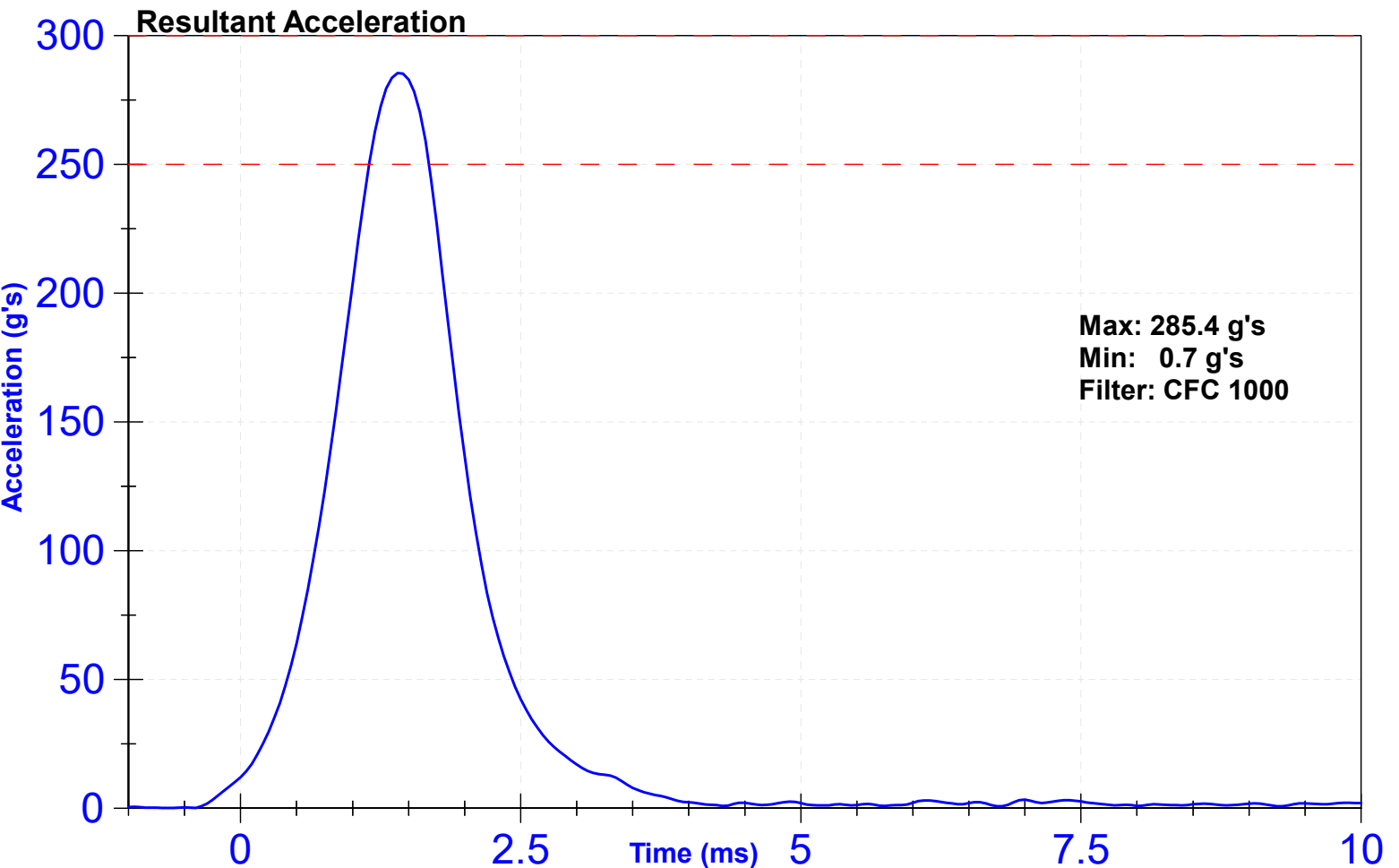
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

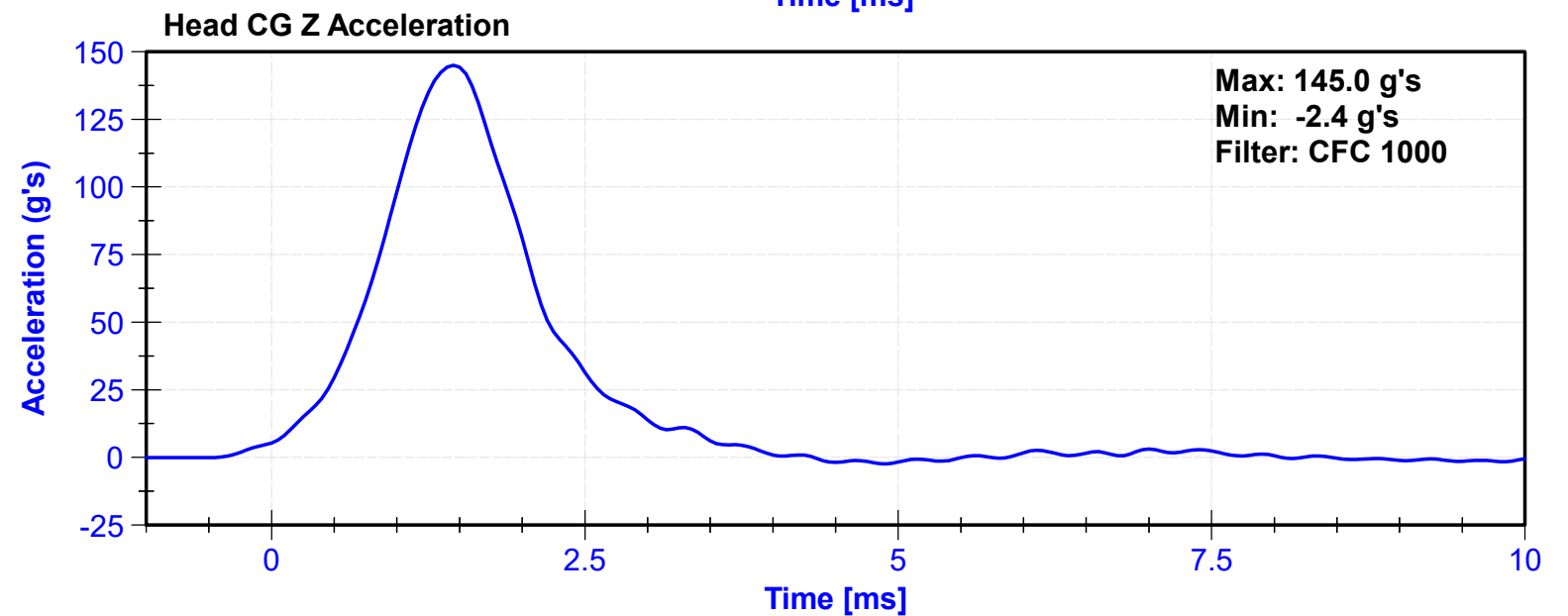
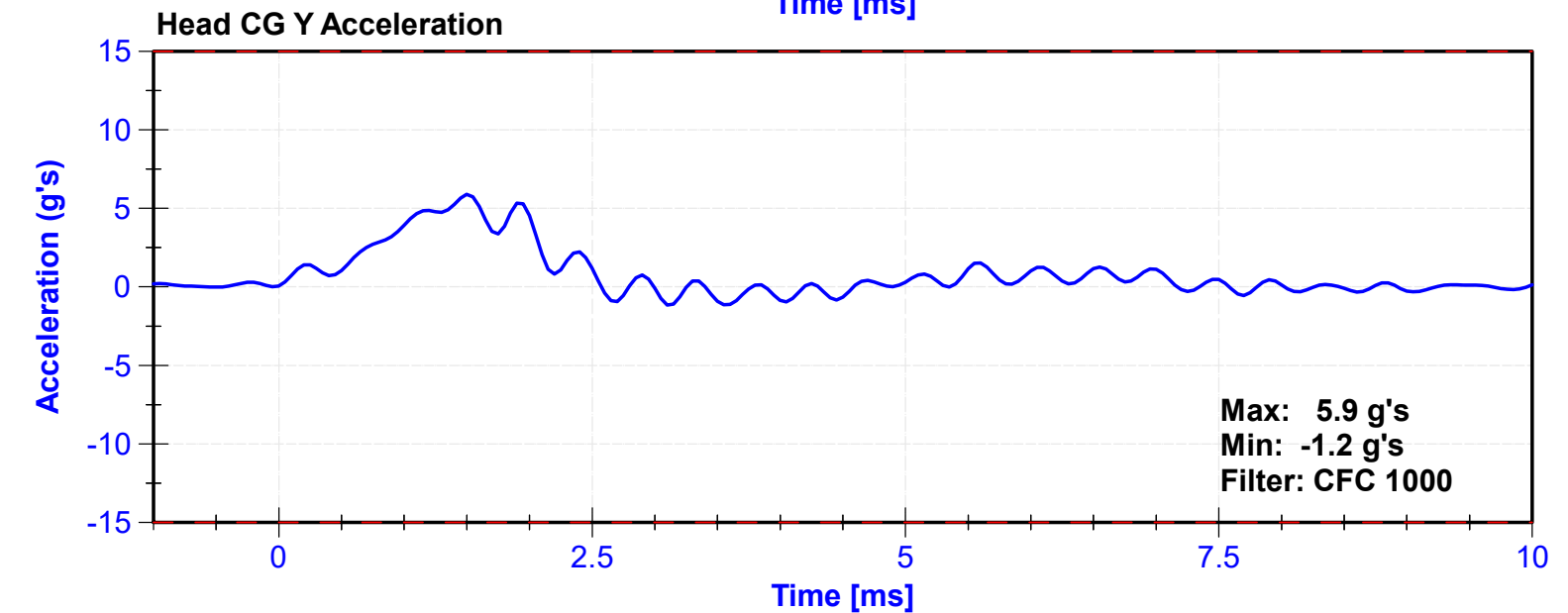
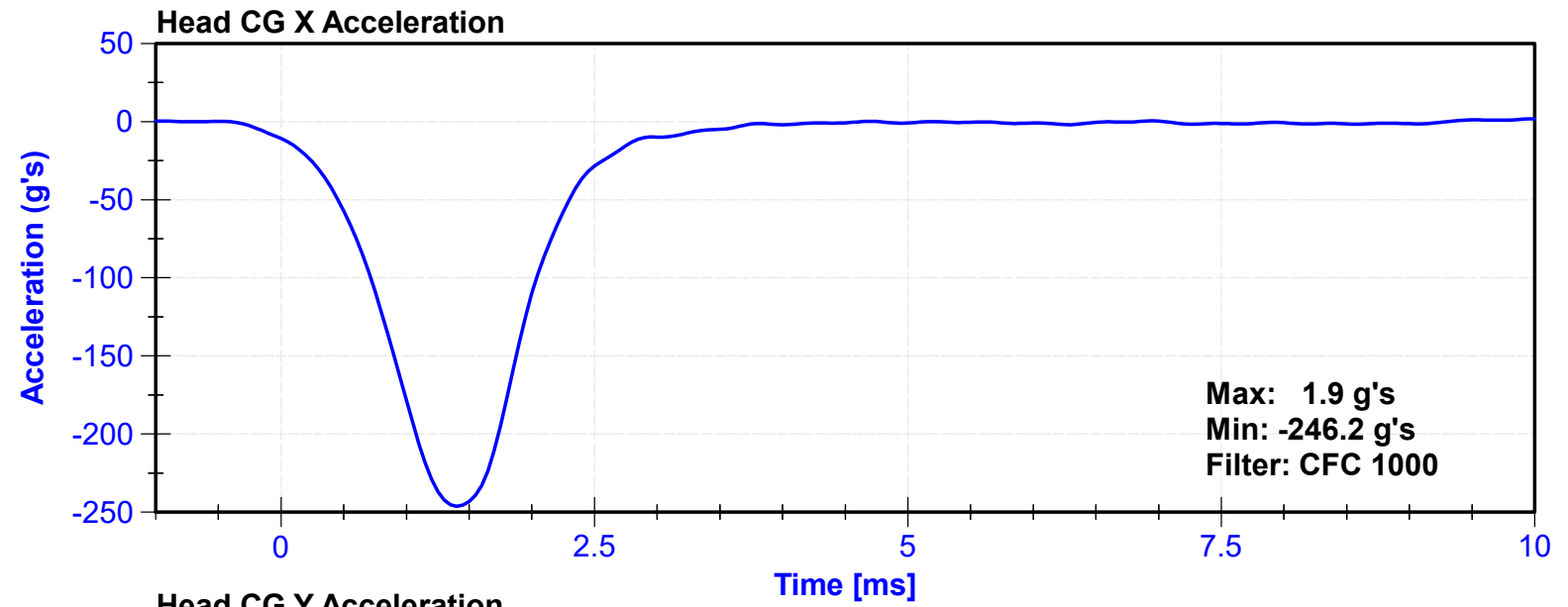
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	39.5	Pass
Resultant Acceleration	250	300	g's	285.4	Pass
Oscillation	0	10	%	1.1	Pass
Lateral Acceleration	-15	15	g's	5.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P79417	06/20/2023	12/17/2023
Y Accelerometer	Endevco	P83335	06/20/2023	12/17/2023
Z Accelerometer	Endevco	P64149	06/20/2023	12/17/2023





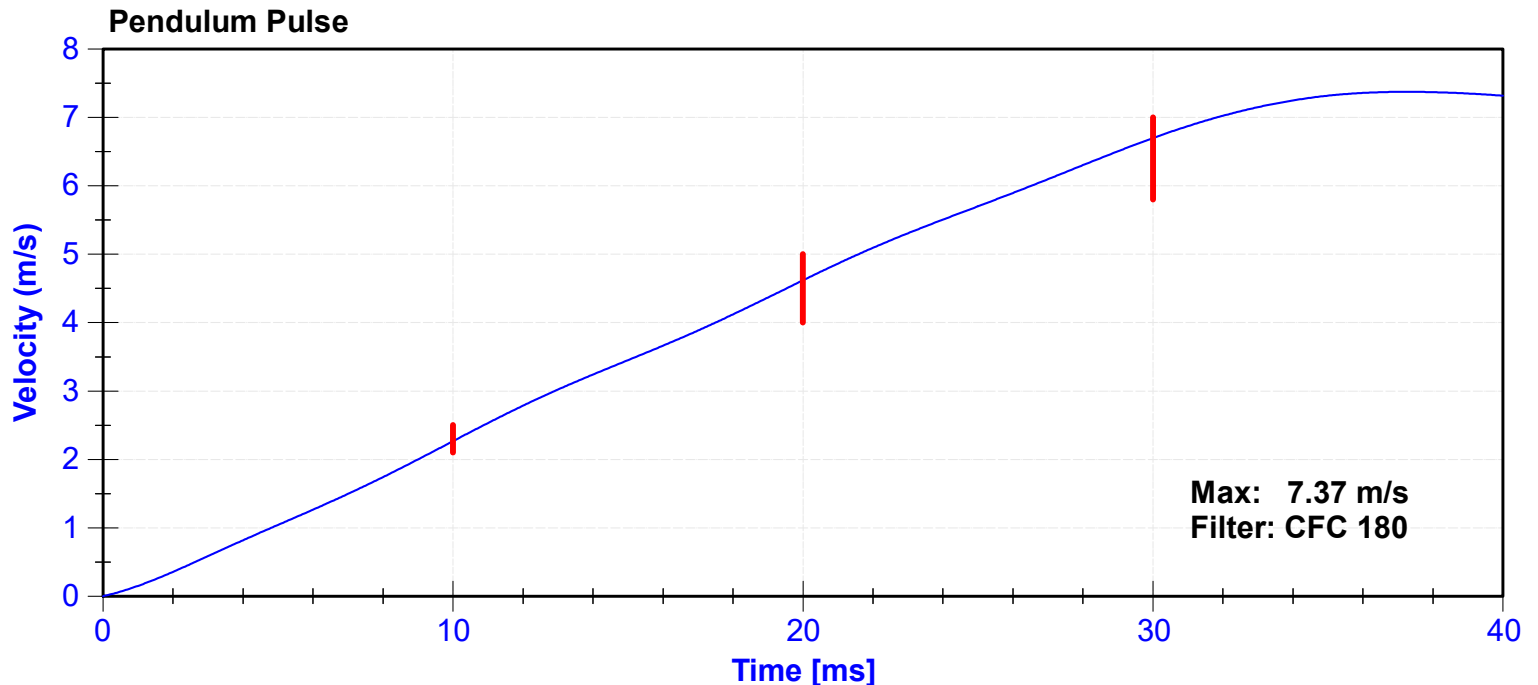
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

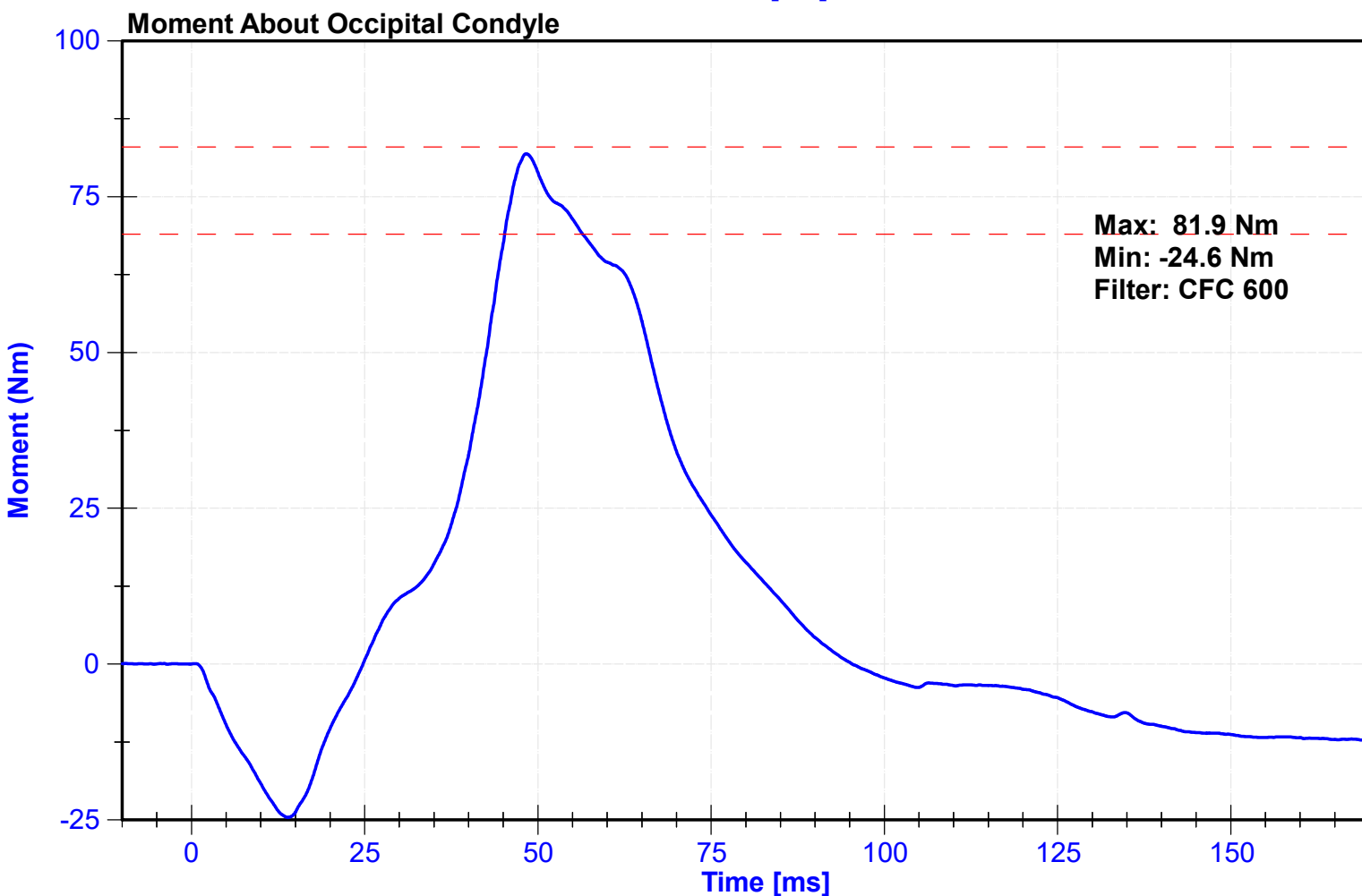
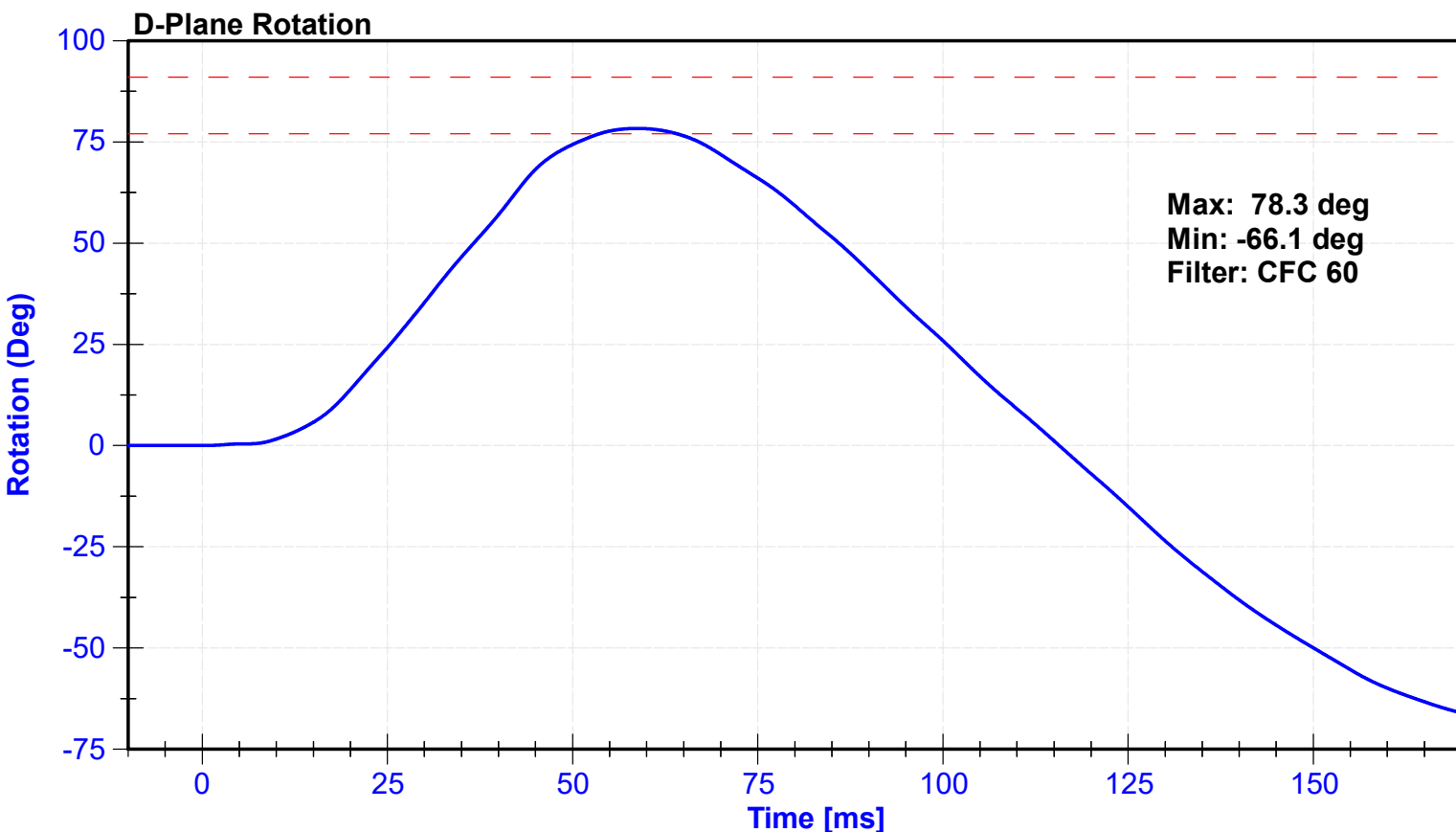
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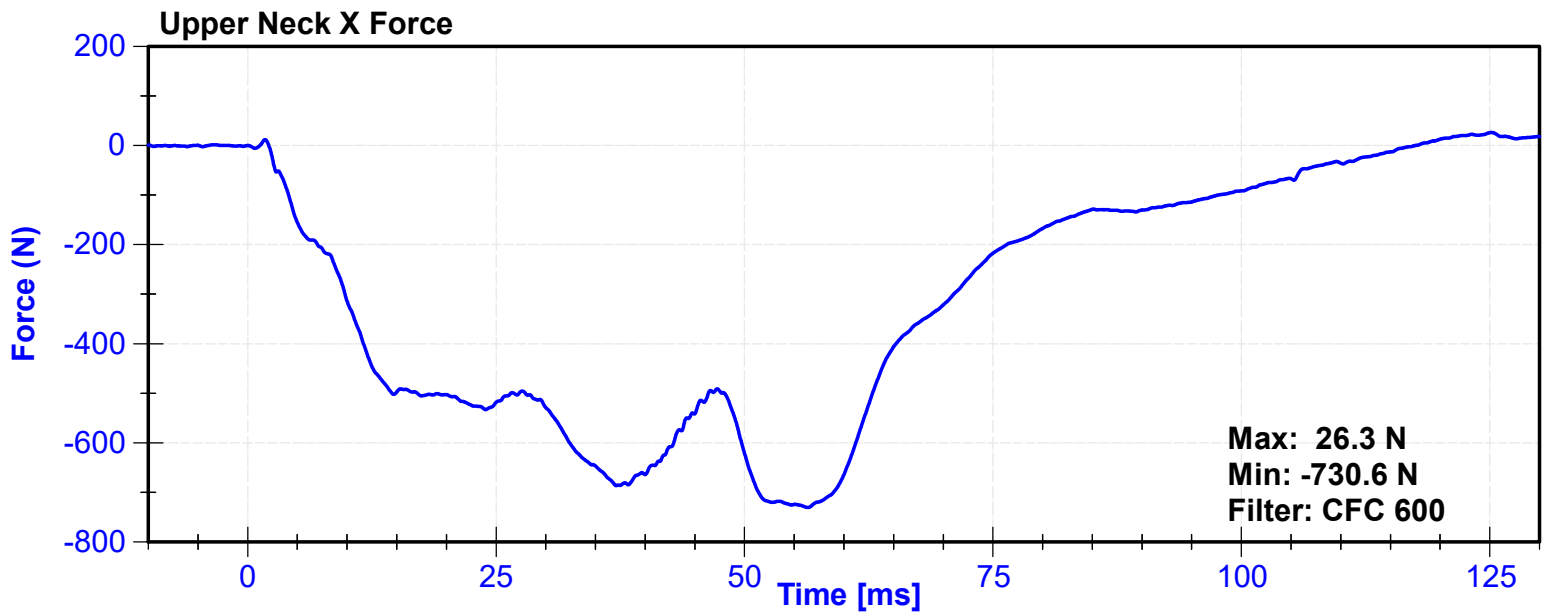
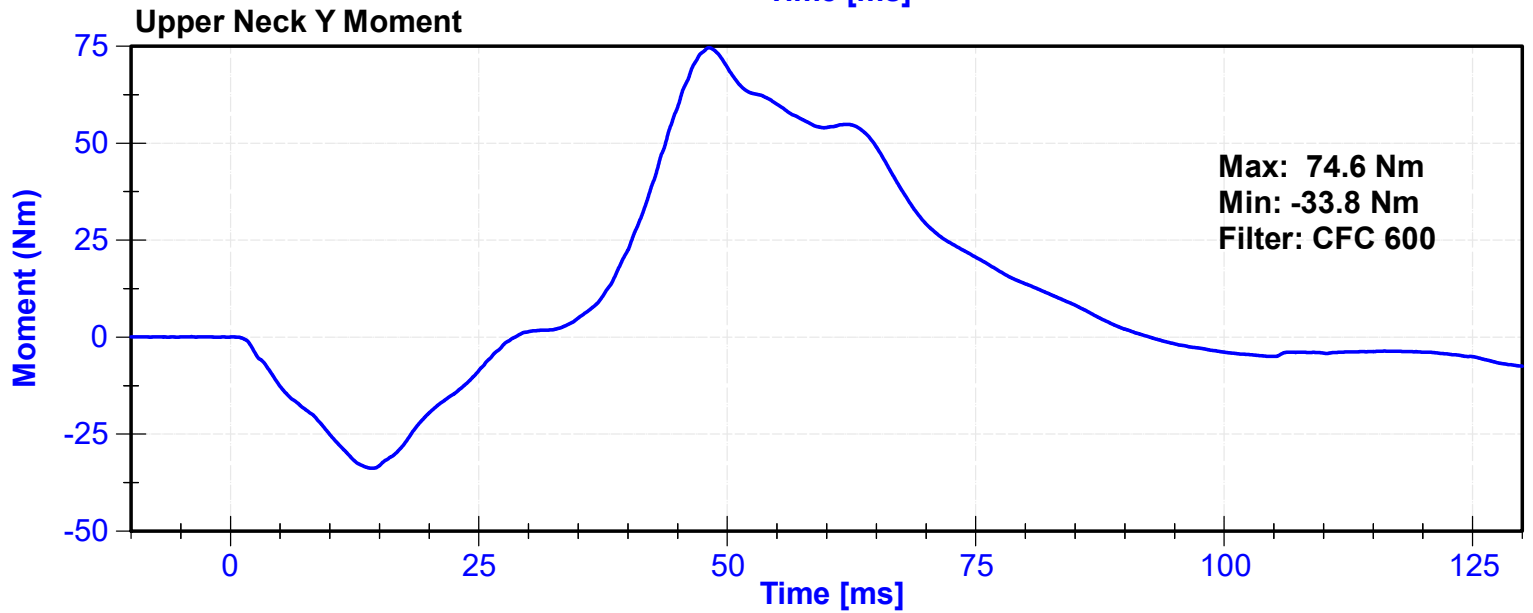
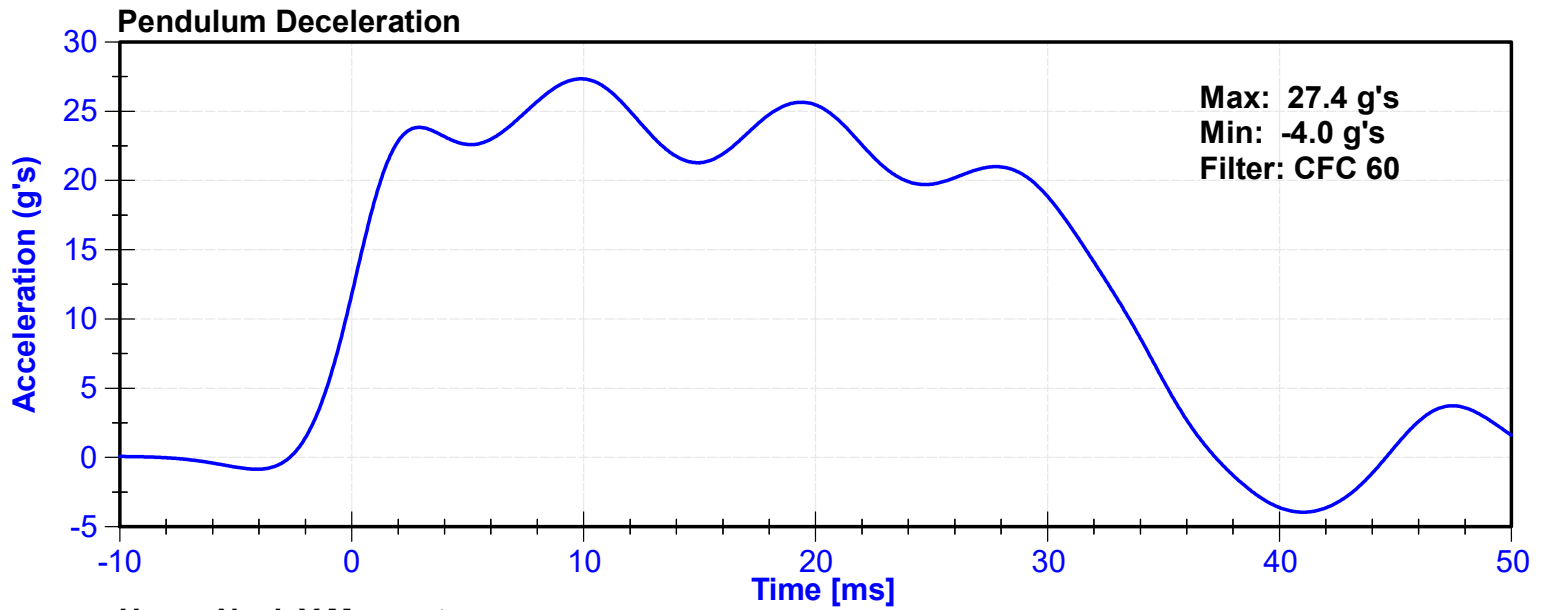
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	39,5	Pass
Velocity	6.89	7.13	m/s	7.082	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.27	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.62	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.70	Pass
Max D Plane Rotation	77	91	deg	78.3	Pass
Max Moment During Rotation Interval	69	83	Nm	81.9	Pass
Moment Decay to 10.0 Nm	80	100	ms	85.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	ETI	LABPOT2	5/5/2023	5/4/2024
Upper Neck Load Cell	Humanetics	1916-FX	6/10/2022	6/10/2023







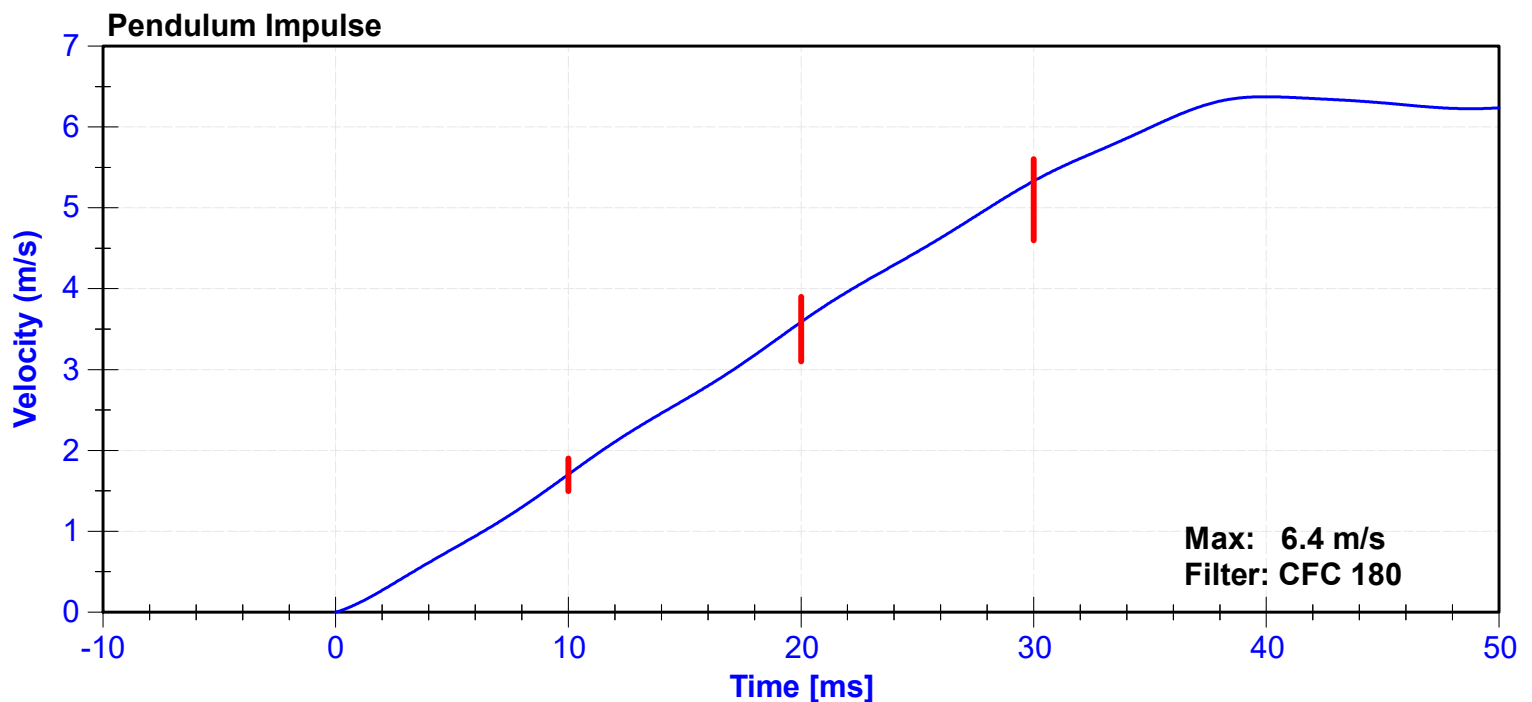
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

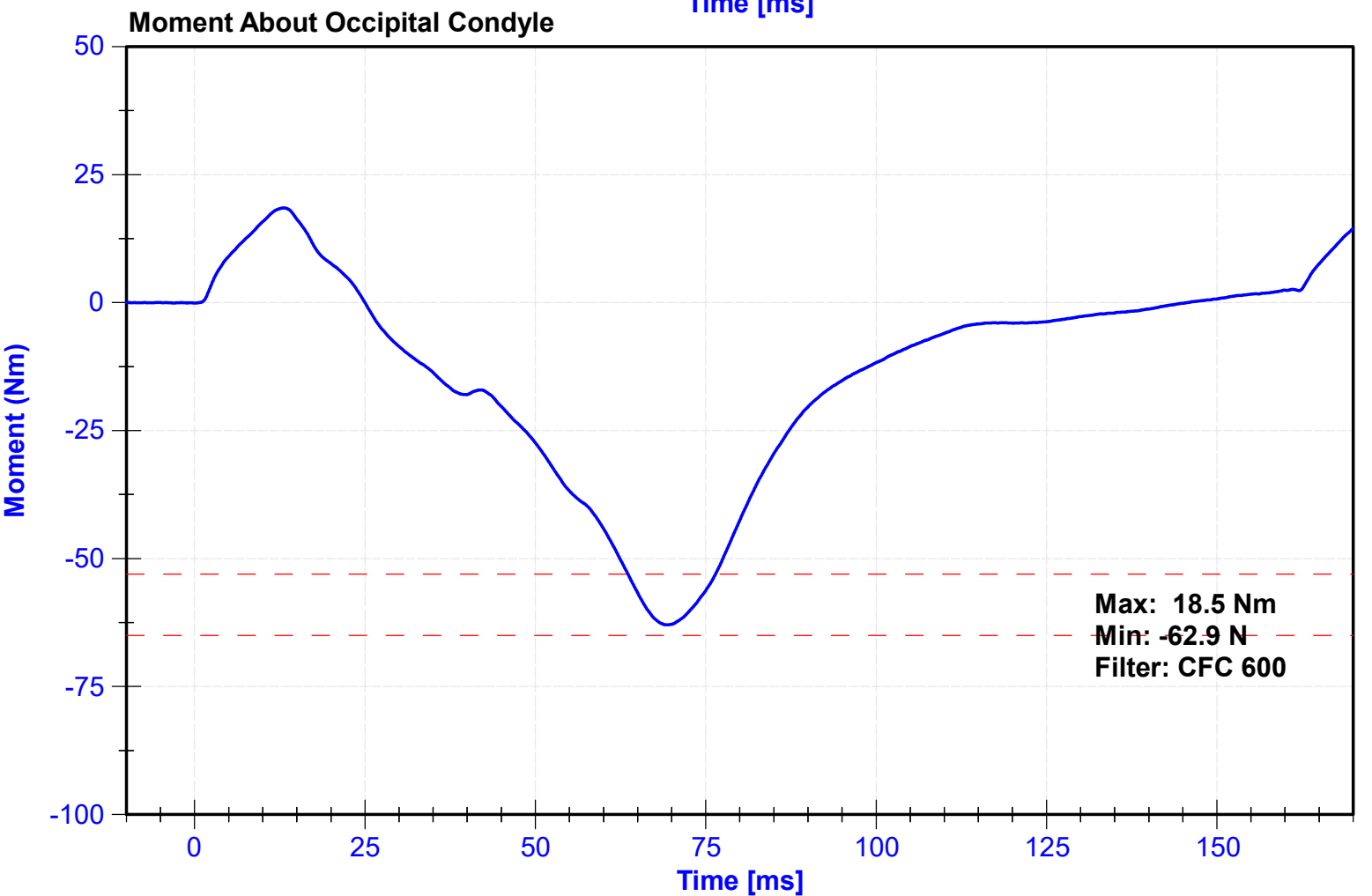
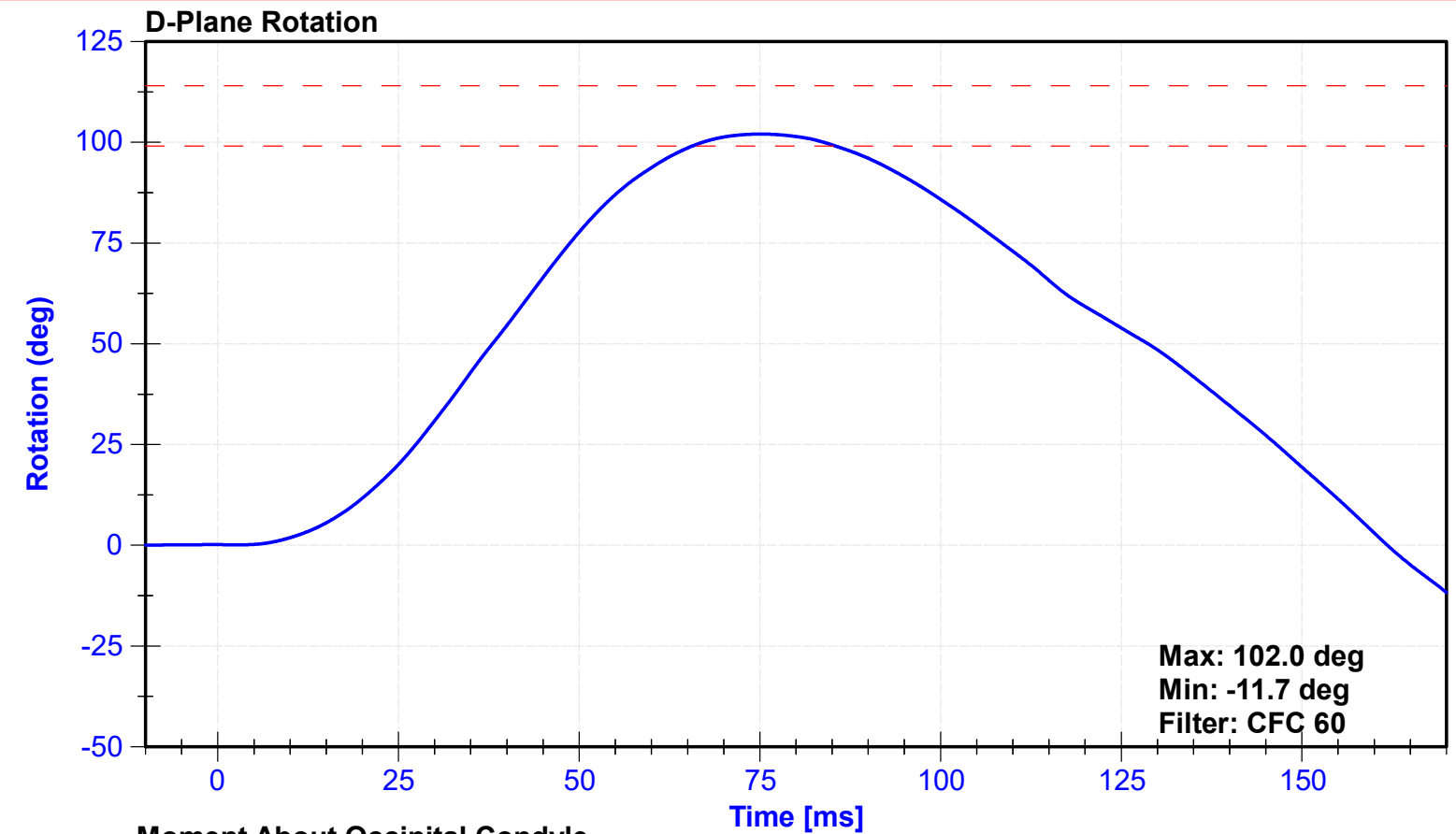
Results

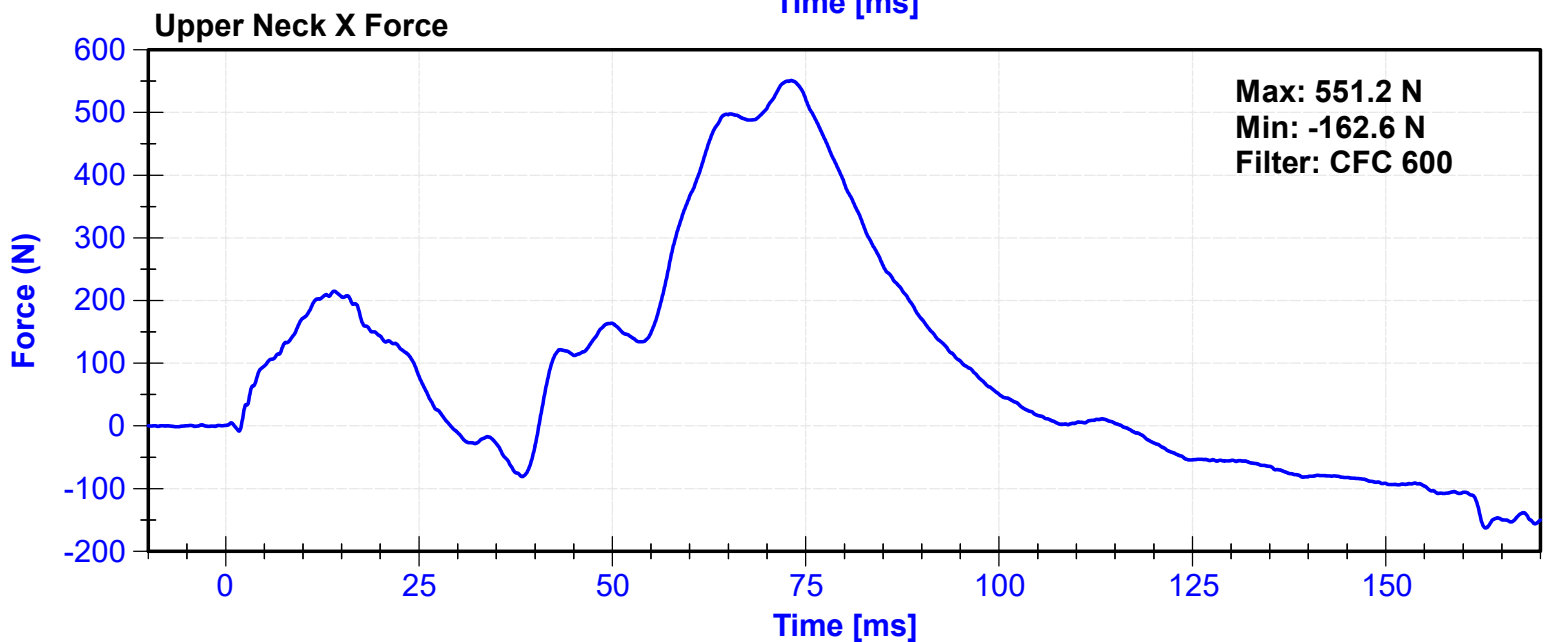
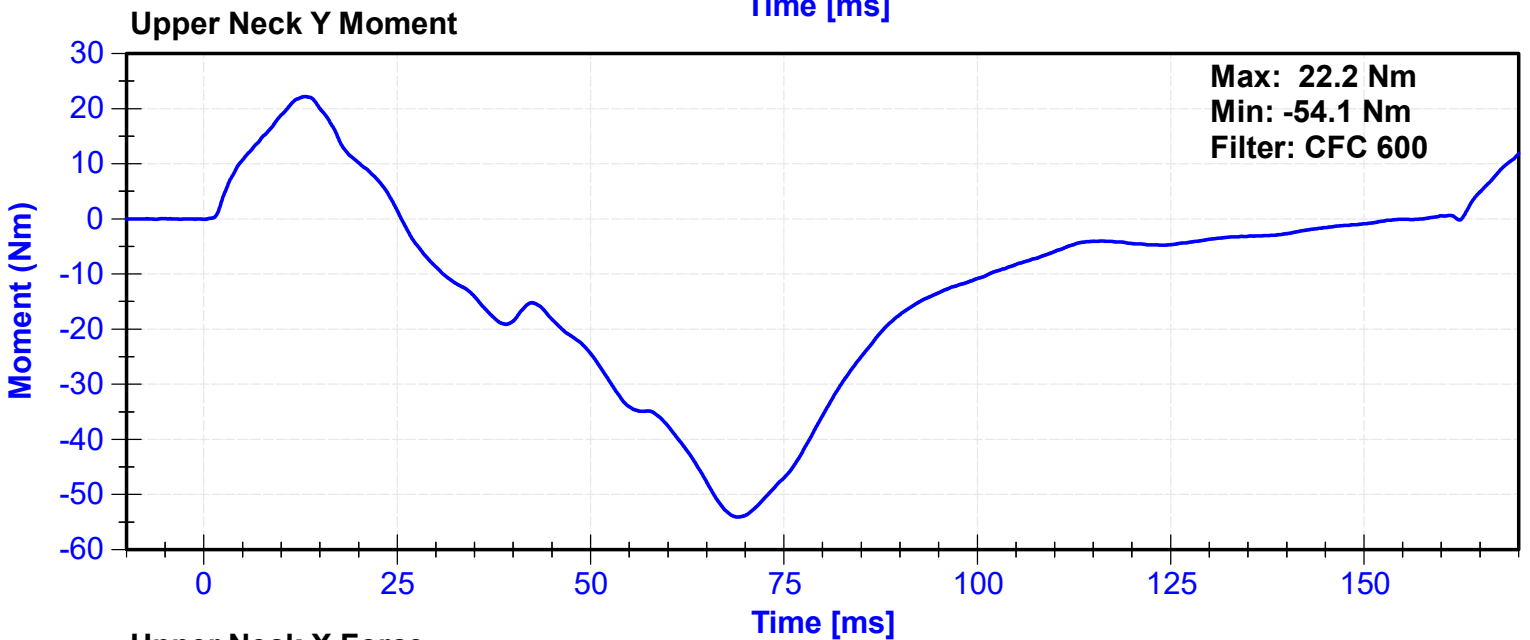
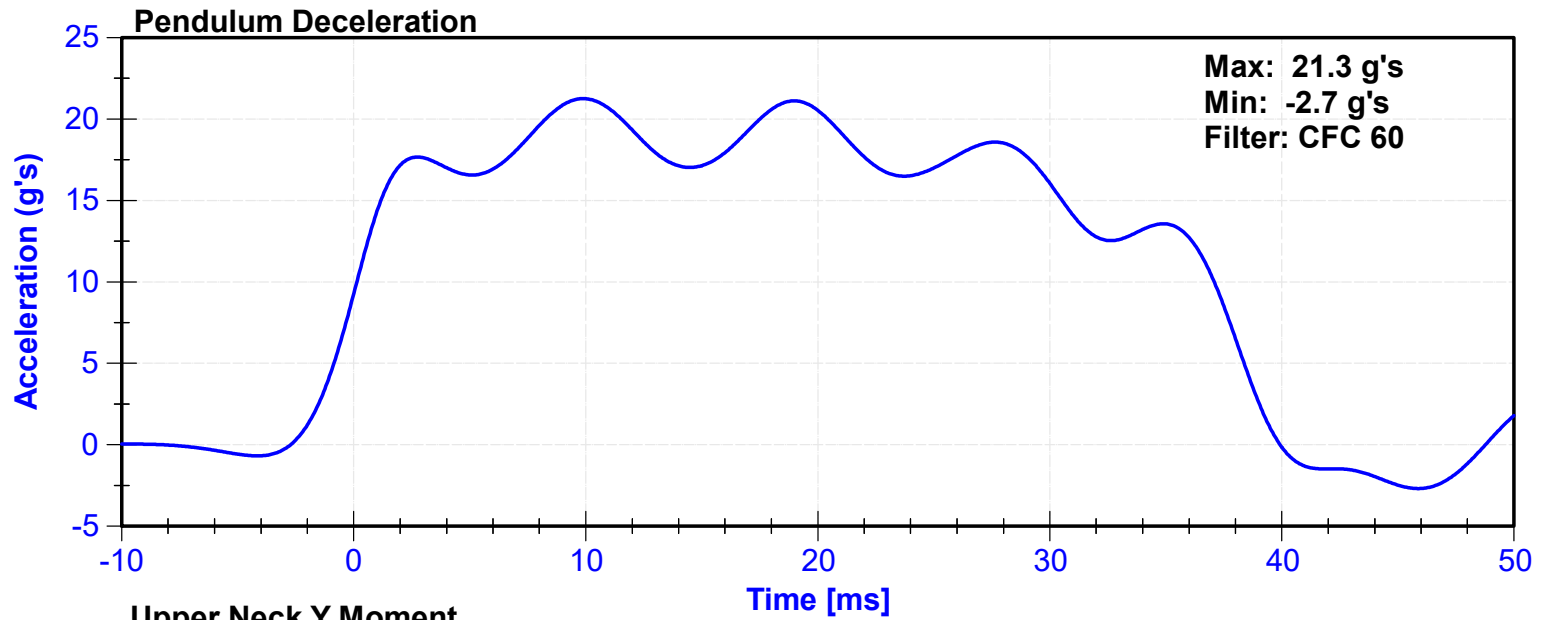
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	39,5	Pass
Velocity	5.95	6.19	m/s	6.126	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.70	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.59	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.33	Pass
D Plane Rotation	99	114	deg	102.0	Pass
Moment During Rotation Interval	-65	-53	Nm	-62.9	Pass
Moment Decay to -10Nm	94	114	ms	102.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16503	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	ETI	LABPOT2	5/5/2023	5/4/2024
Upper Neck Load Cell	Humanetics	1916-FX	6/10/2022	6/10/2023





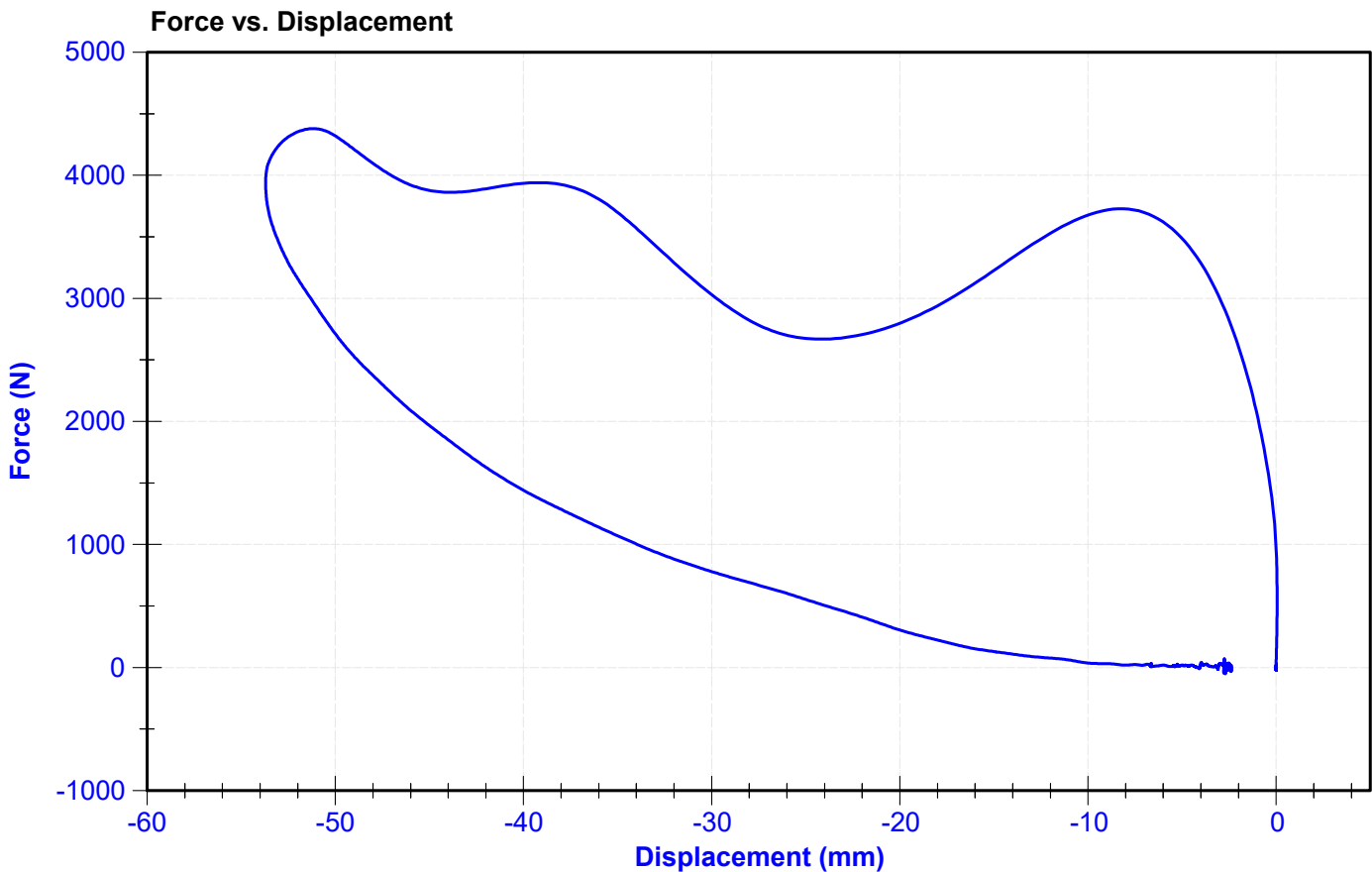


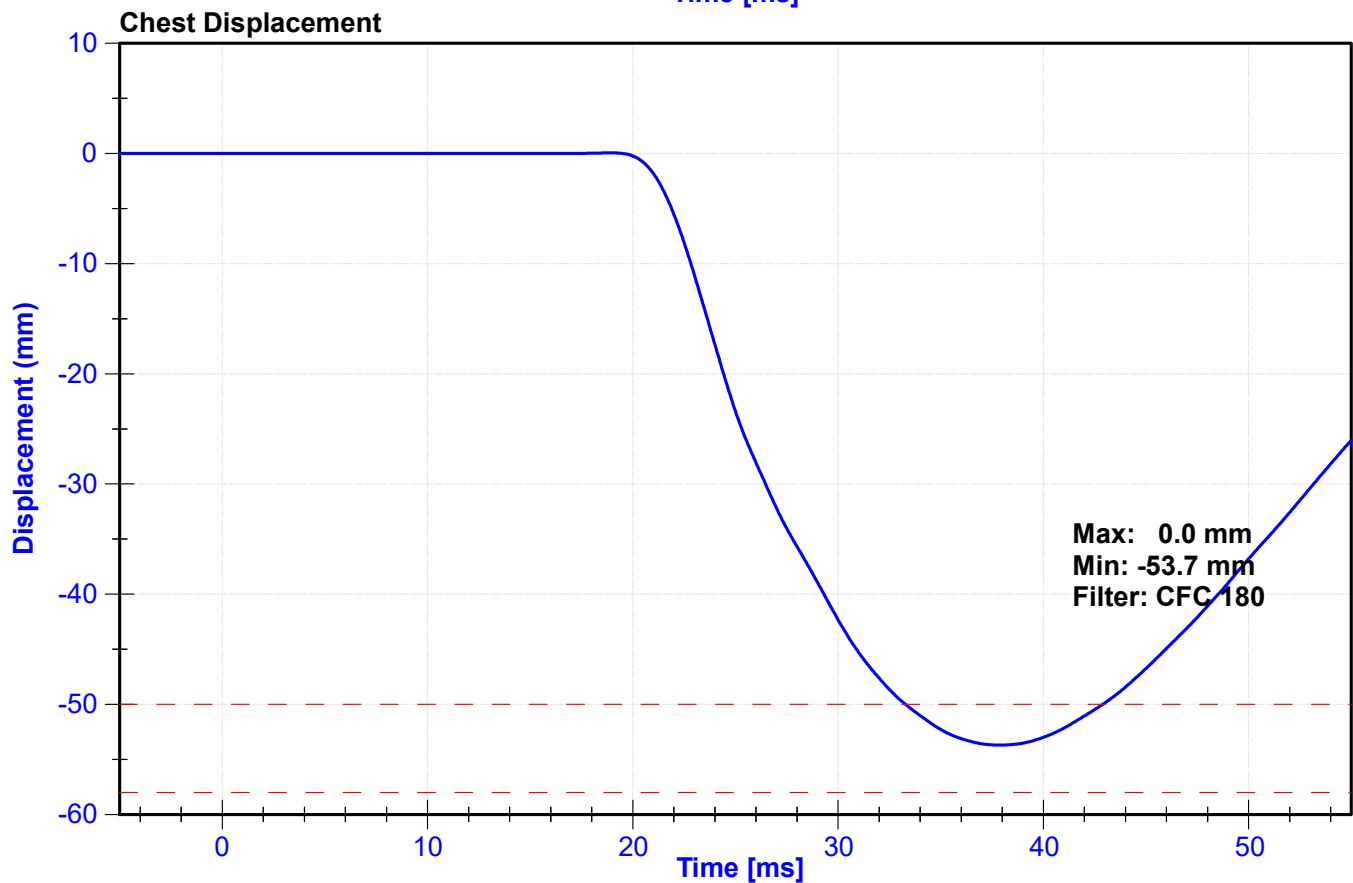
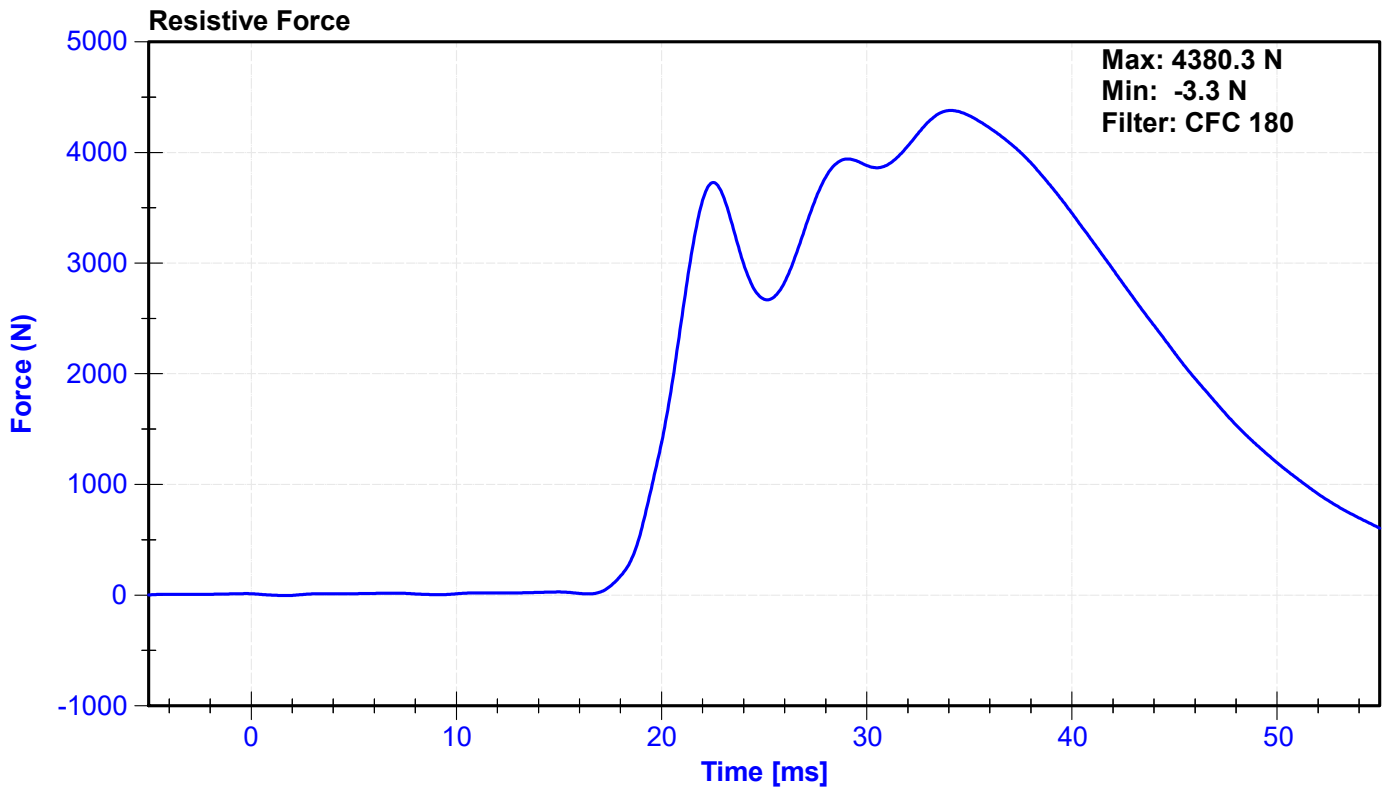
ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	137	Laboratory Supervisor	C. Mantel

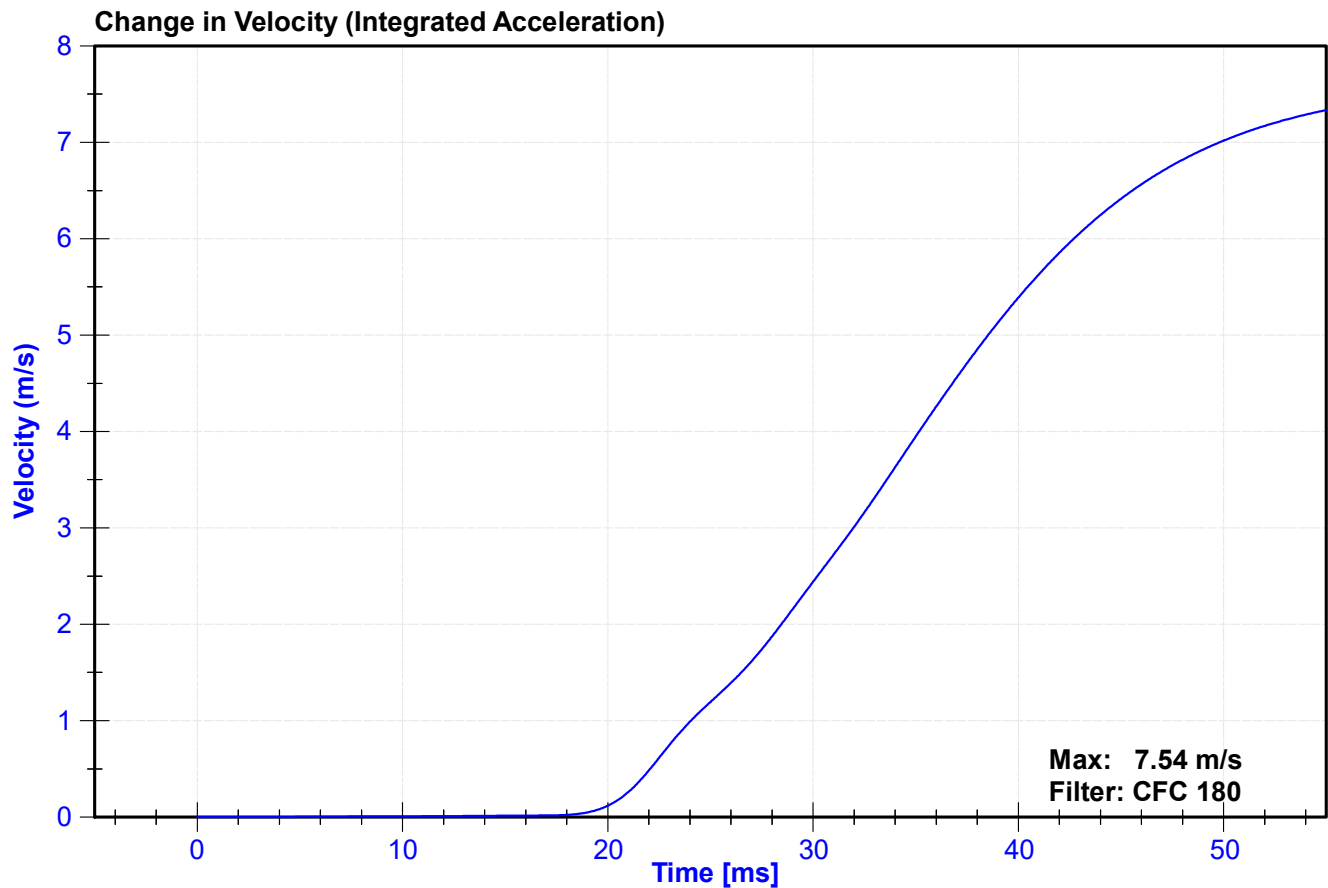
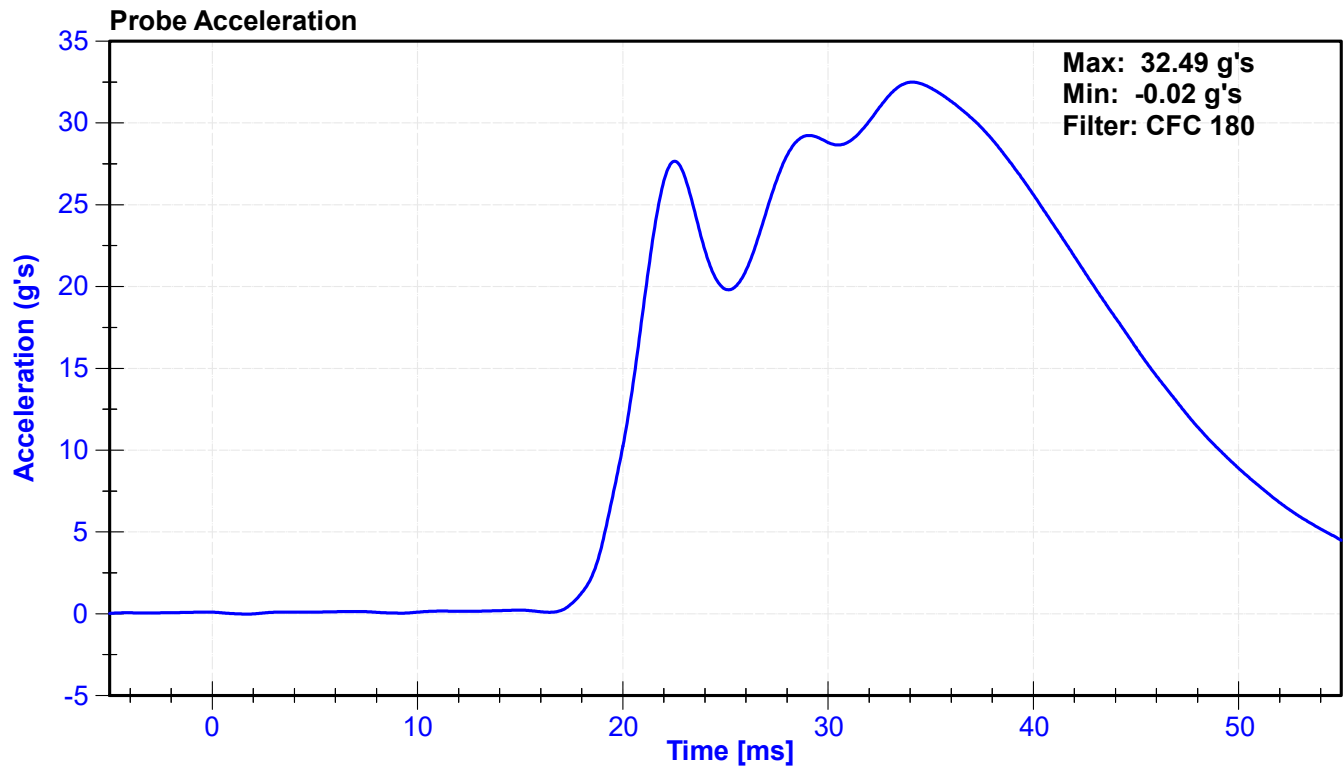
Test Parameter	Results				
	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.9	Pass
Humidity	10	70	%	49.0	Pass
Velocity	6.59	6.83	m/s	6.676	Pass
Chest Deflection	-58	-50	mm	-53.7	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4341.68	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4361.4	Pass
Hysteresis	69	85	%	72.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P51736	10/25/2022	10/25/2023
Chest Potentiometer	Servo	0720	6/20/2023	12/19/2023







ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

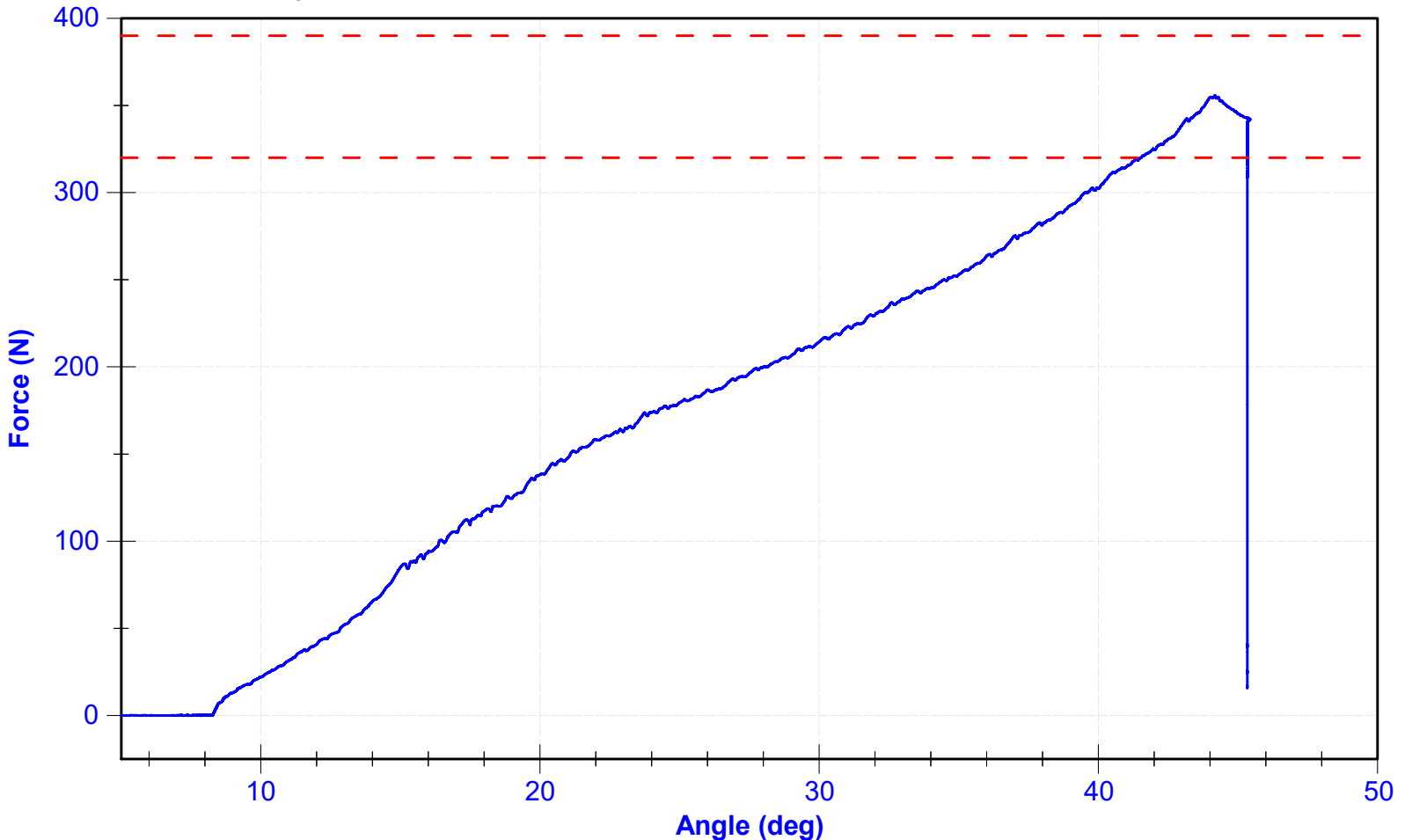
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.3	Pass
Humidity	10	70	%	44.5	Pass
Initial Angle	0	20	deg	7.5	Pass
Force at 45 Degrees	320	390	N	355.8	Pass
Return Angle Relative to Initial	0	8	deg	6.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker	DS-1905226	2022-11-09	2023-11-09
Load Cell	Interface	1134516	2022-09-27	2023-09-27

Force vs. Displacement



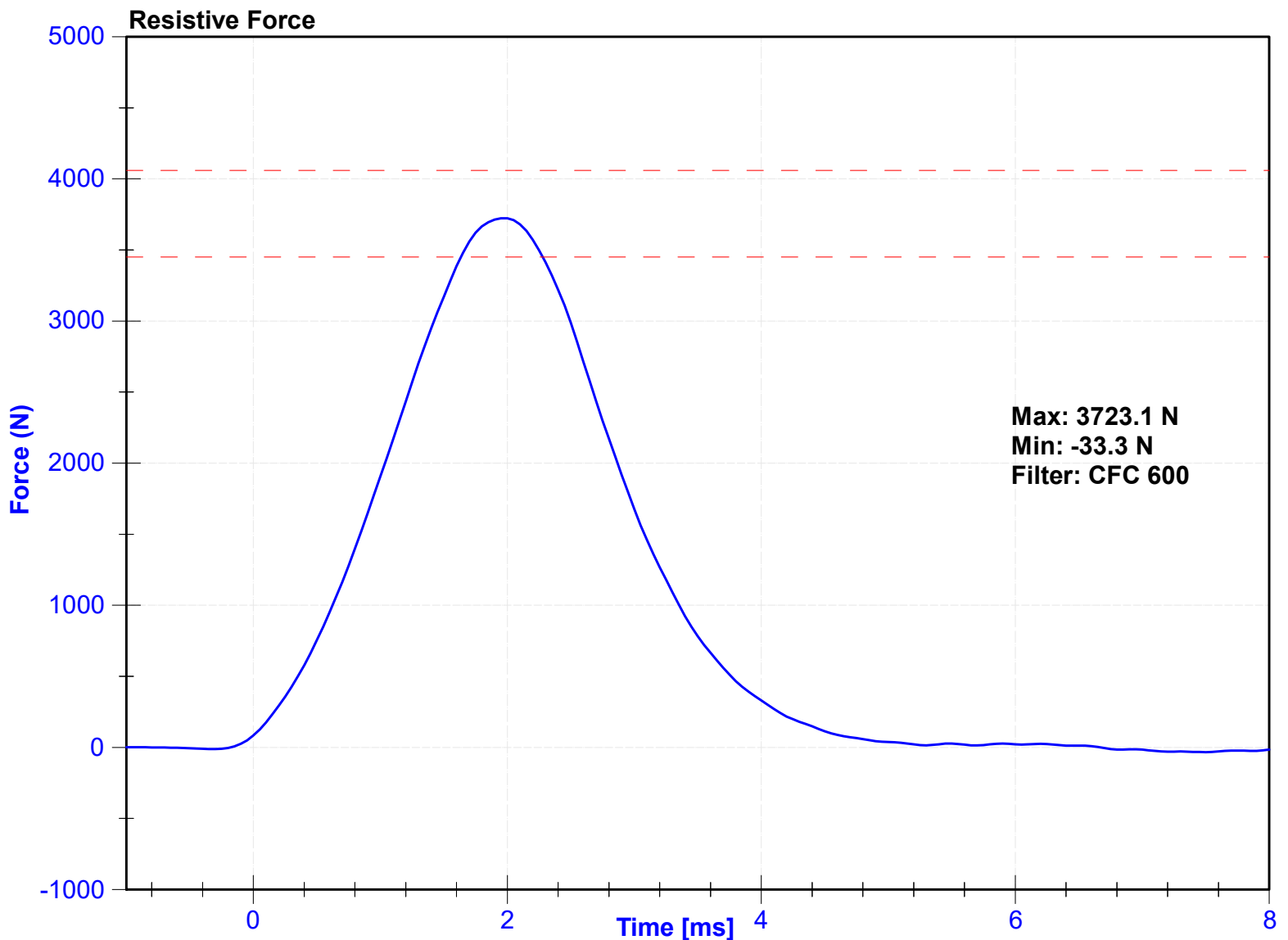
ATD Manufacturer	Humanetics	Test Technician	S.Phillips
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

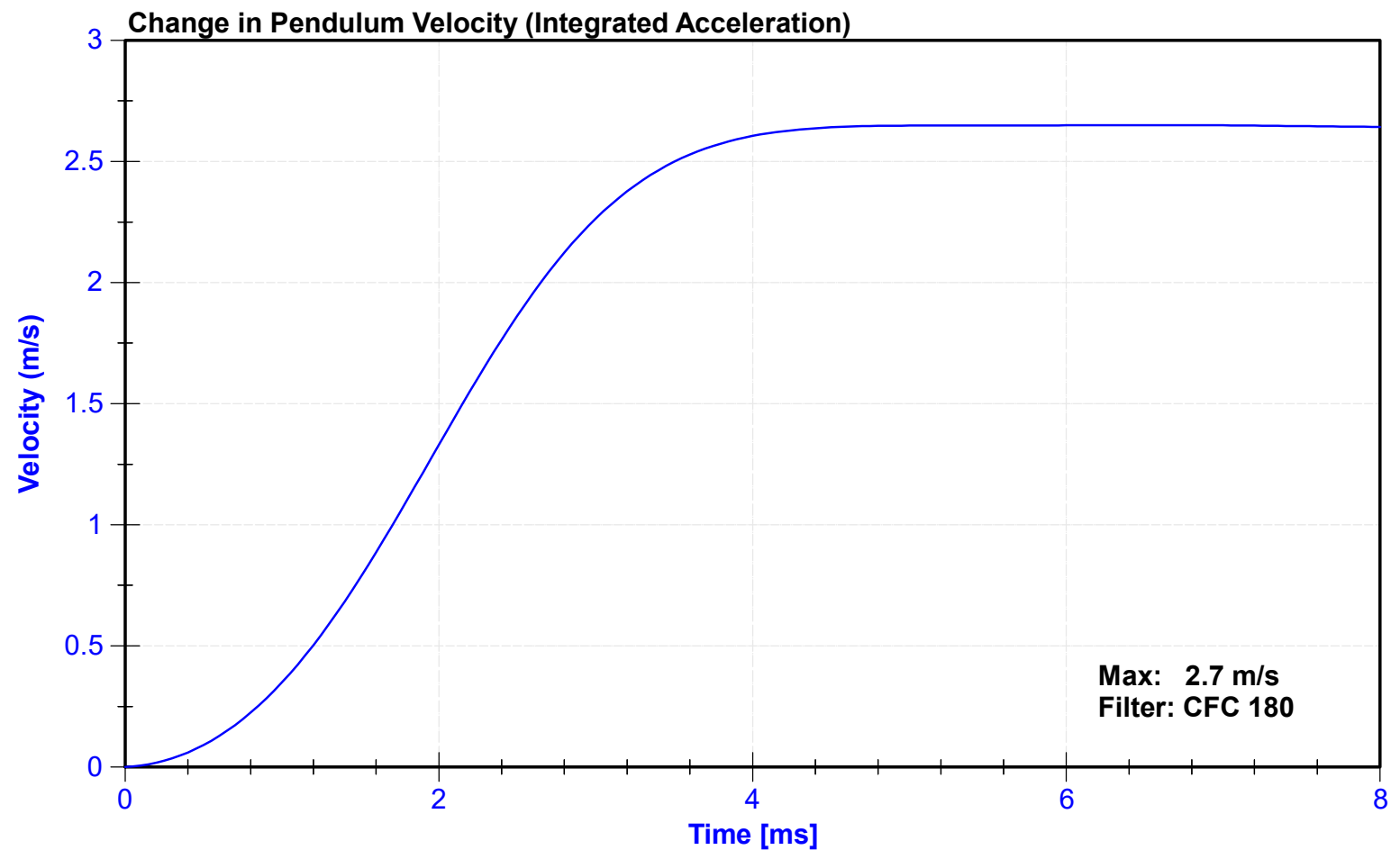
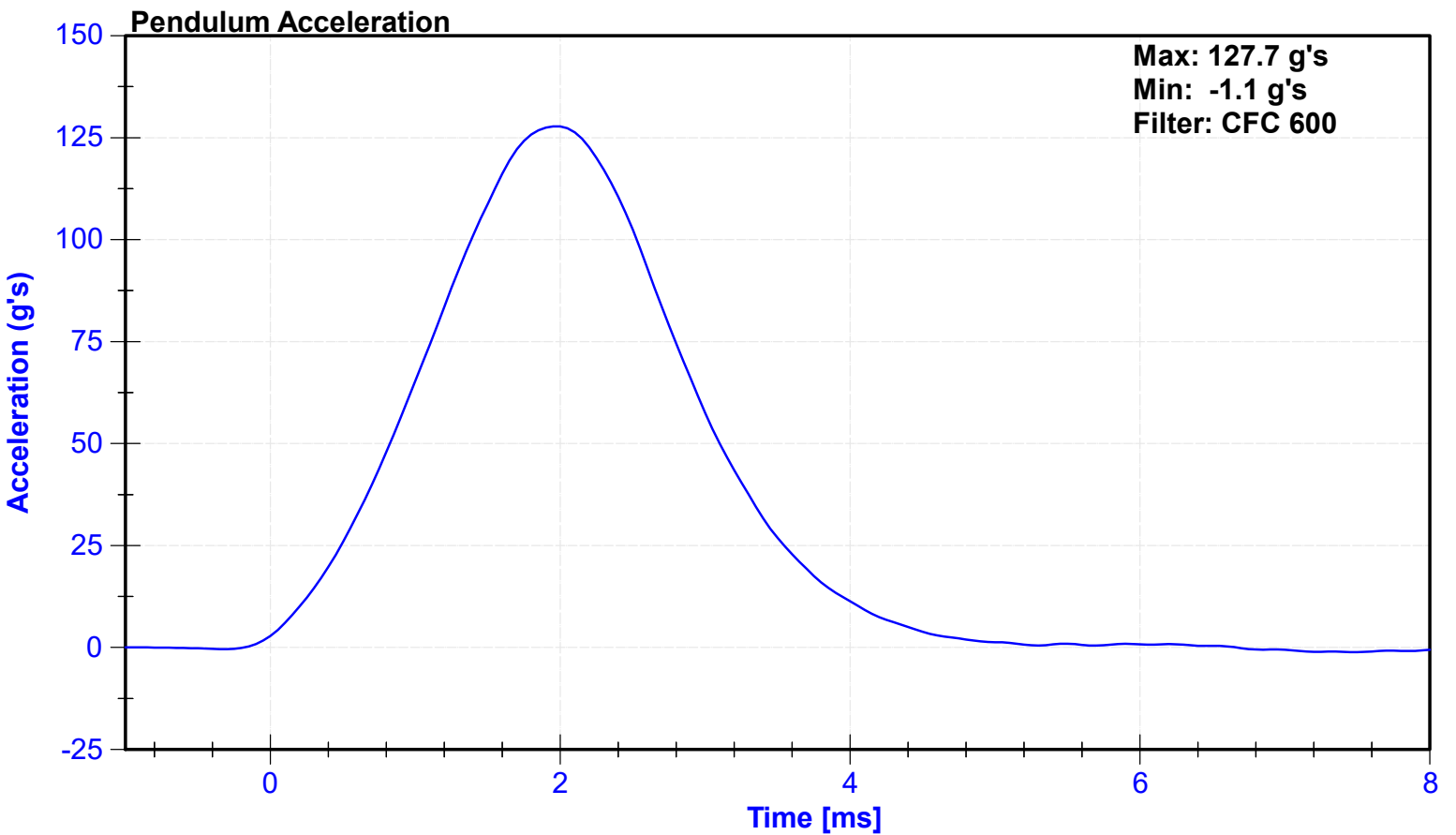
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	39	Pass
Velocity	2.07	2.13	m/s	2.092	Pass
Resistive Force	3450	4060	N	3723.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023





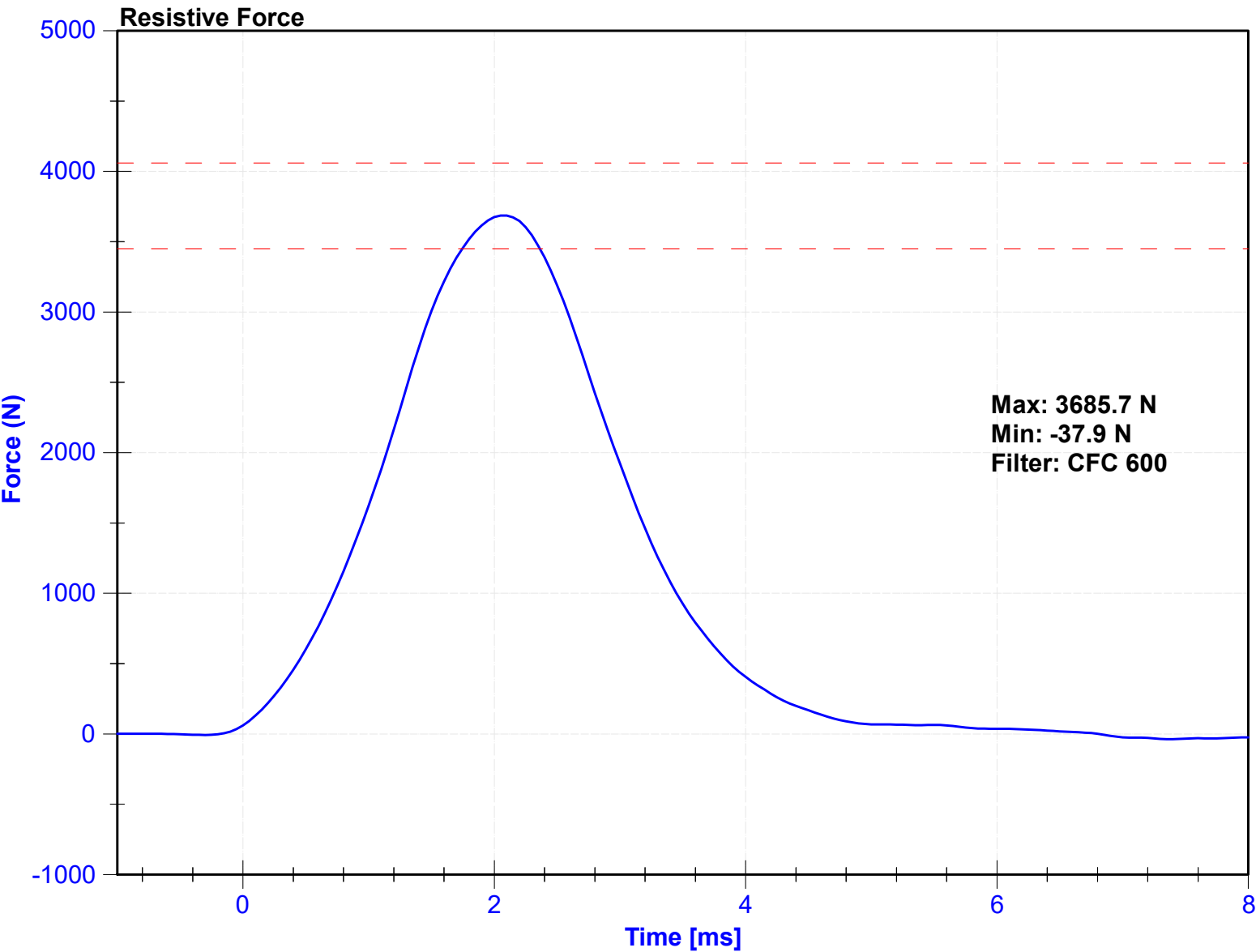
ATD Manufacturer	Humanetics	Test Technician	S.Phillips
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

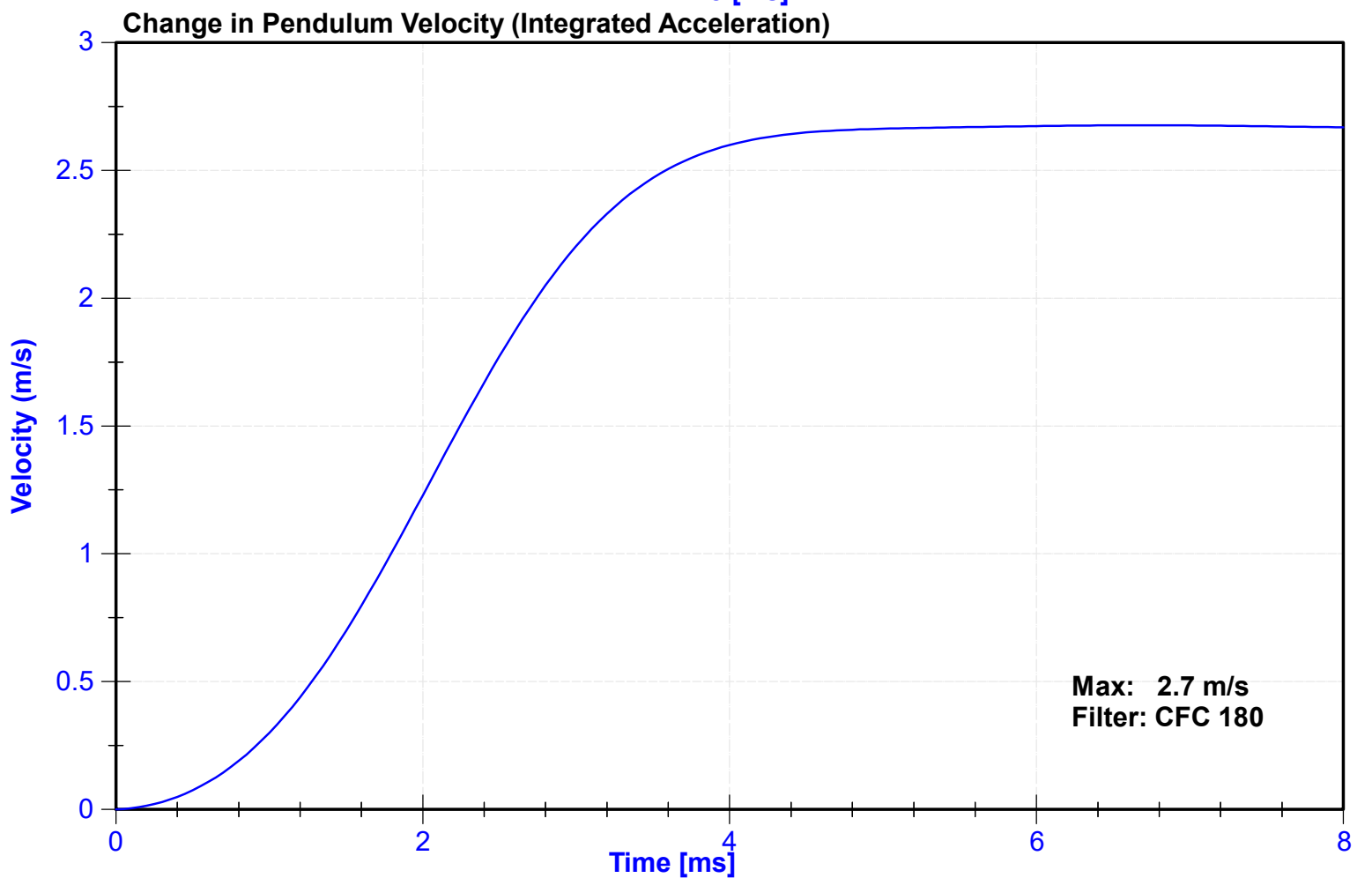
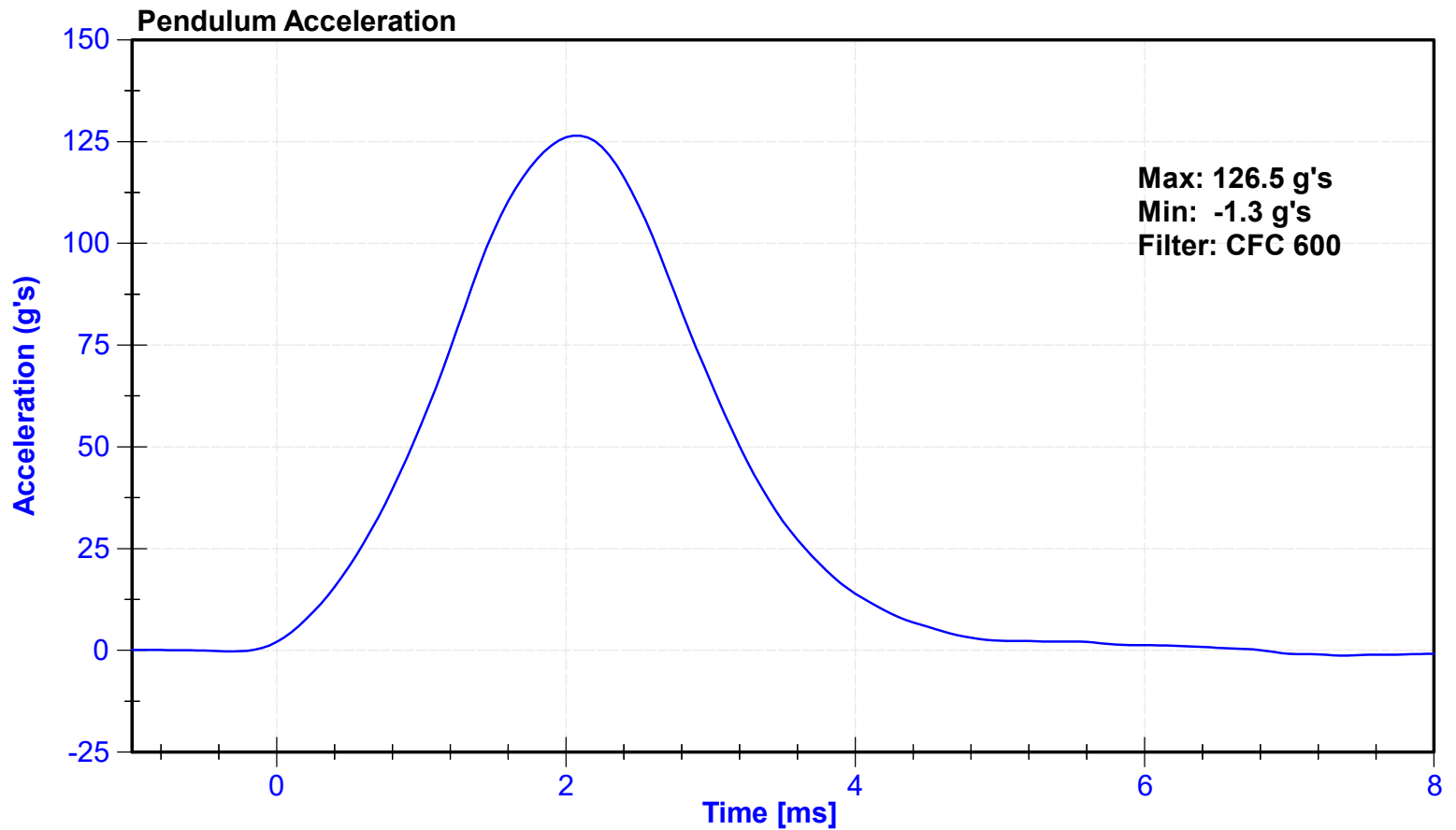
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	39	Pass
Velocity	2.07	2.13	m/s	2.094	Pass
Resistive Force	3450	4060	N	3685.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 142

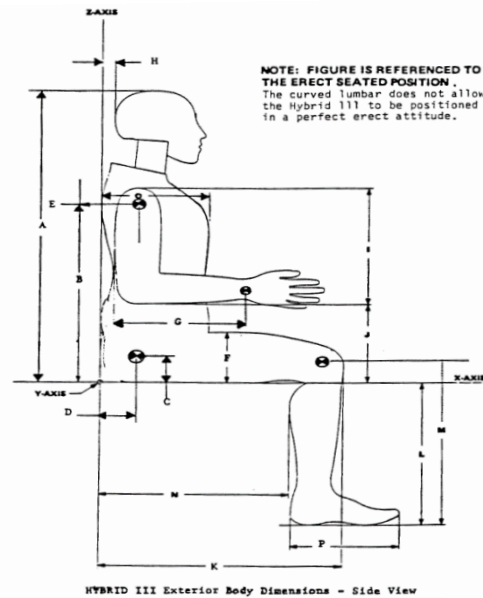
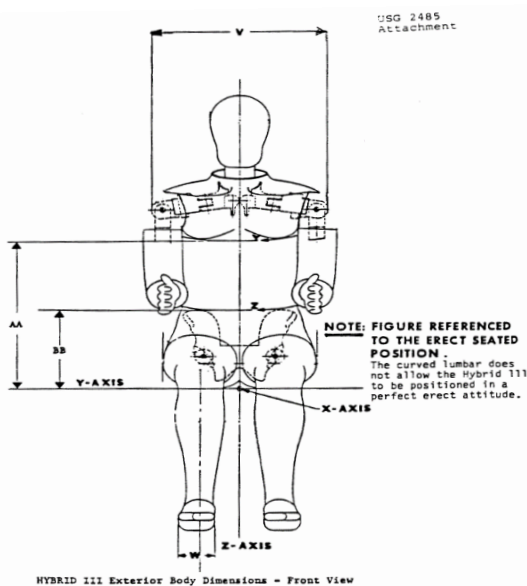


External Measurements - Hybrid 3 - 50th Male

Technician: K. Brogan

Date: 07/13/2023

Dummy Serial Number: 142



Symbol	Description	Specification (in)		Result (in)	Pass/Fail
A	Sitting Height	34.6	35.0	34.7	Pass
B	Shoulder Pivot Height	19.9	20.5	20.2	Pass
C	H-Point Height	3.3	3.5	3.3	Pass
D	H-Point from Backline	5.3	5.5	5.4	Pass
E	Shoulder Pivot from Backline	3.3	3.7	3.4	Pass
F	Thigh Clearance	5.5	6.1	5.9	Pass
G	Back of Elbow to Wrist Pivot	11.4	12.0	11.7	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	7.9	Pass
K	Buttock to Knee Length	22.8	23.8	23.6	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	18.2	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	16.8	Pass
W	Foot Breadth	3.6	4.2	3.9	Pass
Y	Chest Circumference with Jacket	38.2	39.4	38.9	Pass
Z	Waist Circumference	32.9	34.1	33.5	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

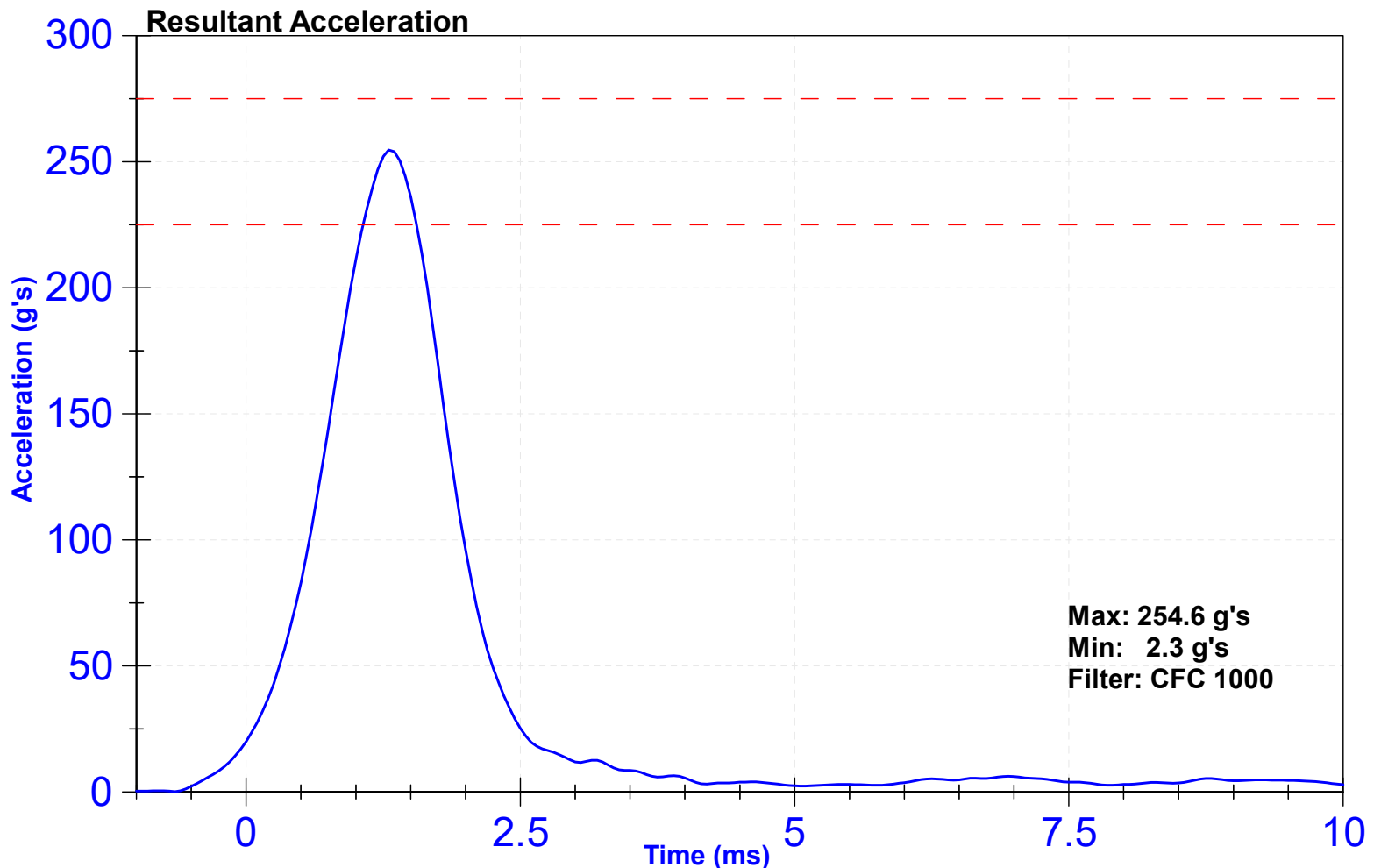
ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	142	Laboratory Supervisor	C.Mantel

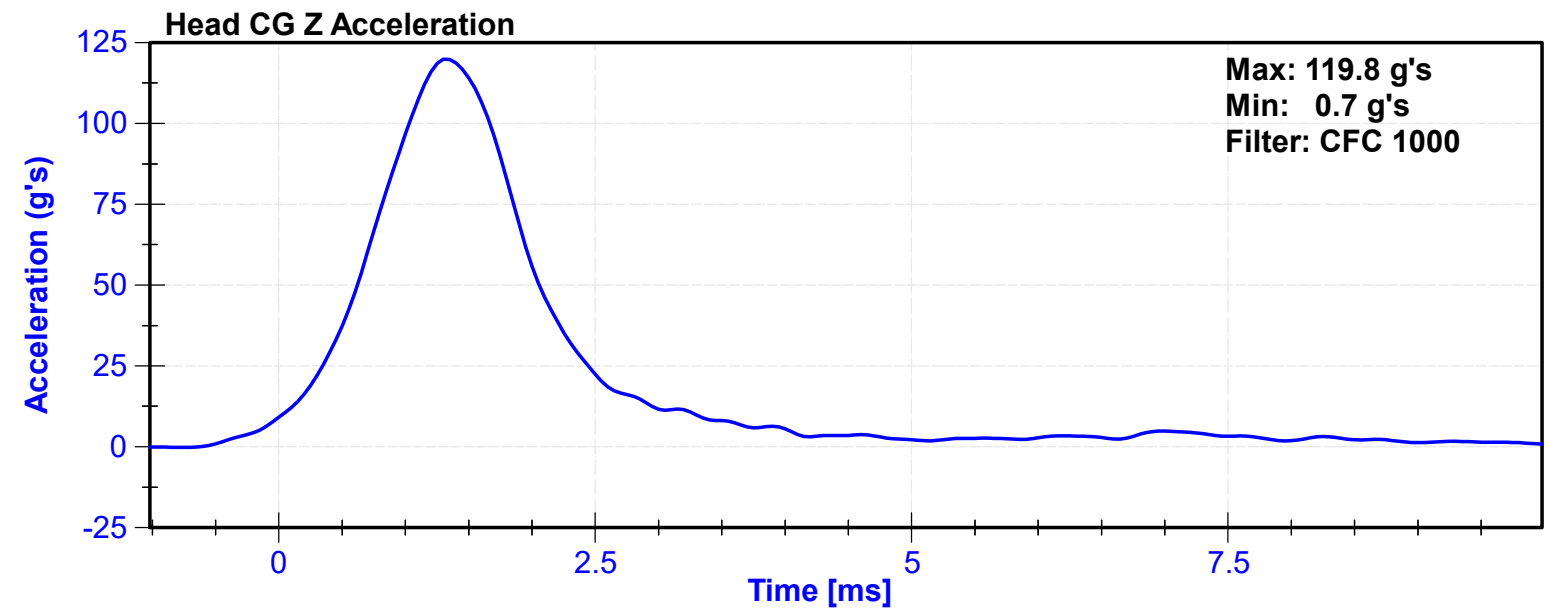
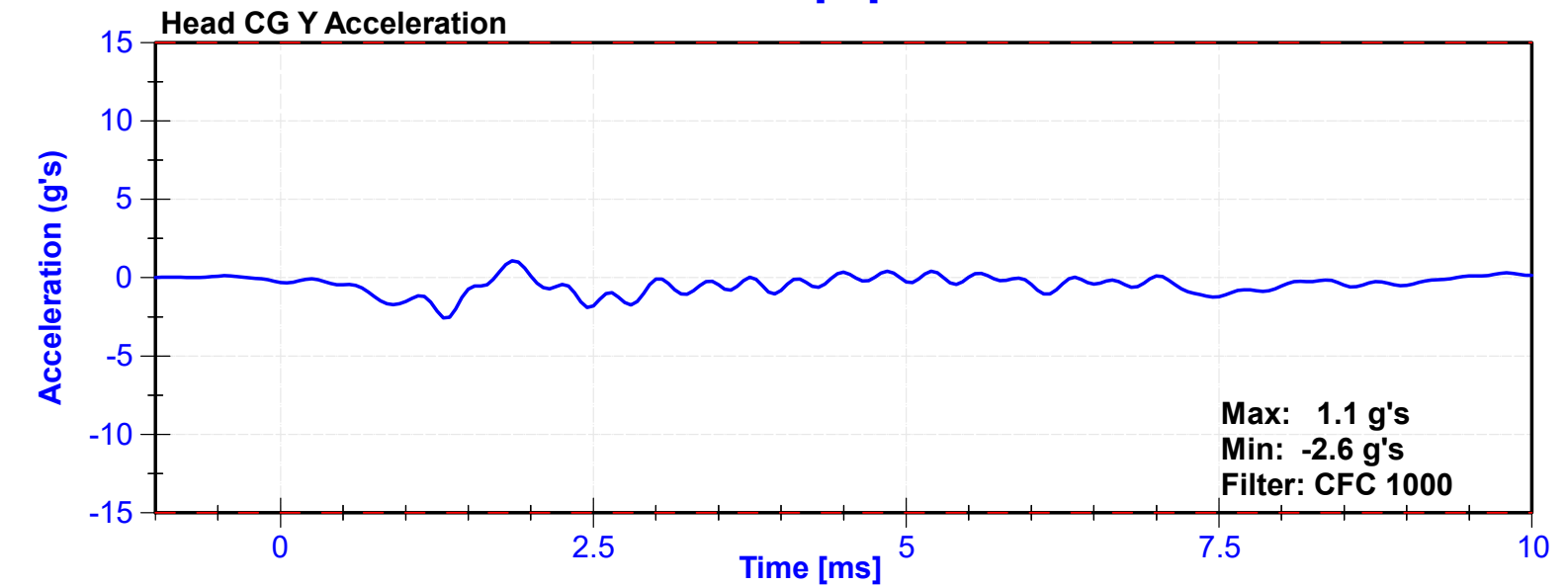
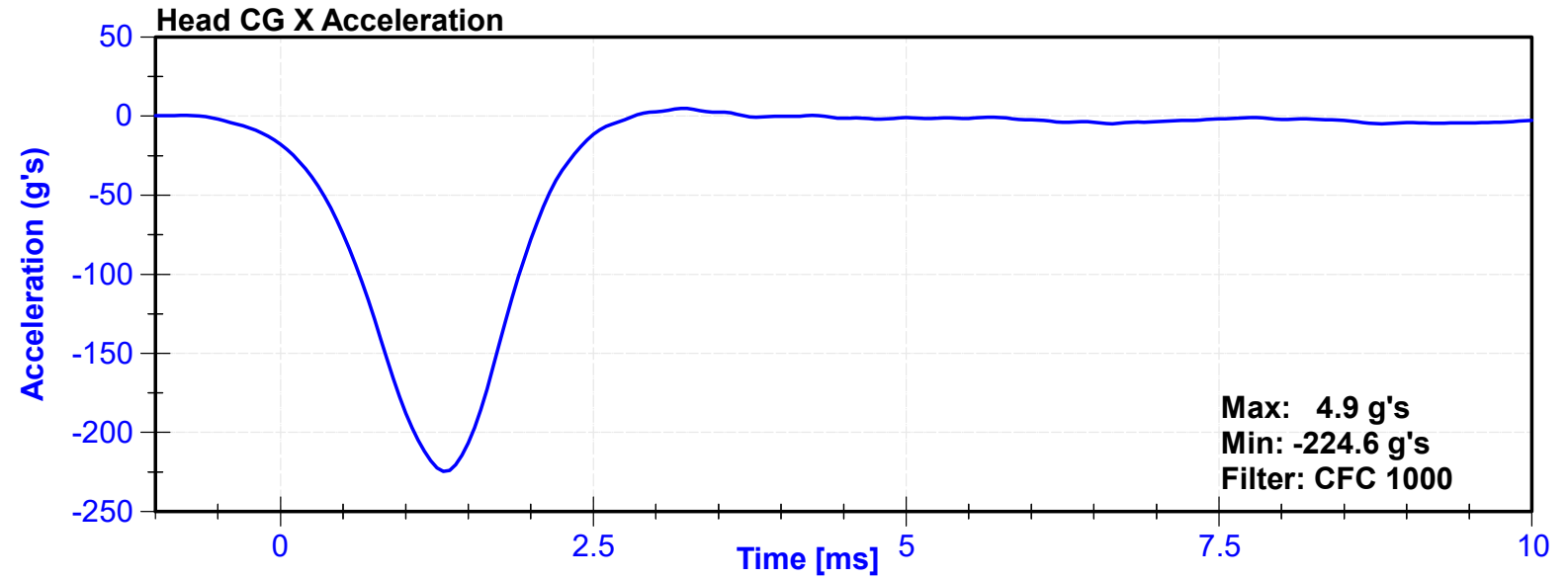
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.3	Pass
Humidity	10	70	%	31.5	Pass
Resultant Acceleration	225	275	g's	254.6	Pass
Oscillation	0	10	%	4.9	Pass
Lateral Acceleration	-15	15	g's	-2.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P51681	4/6/2023	10/3/2023
Y Accelerometer	Endevco	P64151	4/6/2023	10/3/2023
Z Accelerometer	Endevco	P52114	4/6/2023	10/3/2023





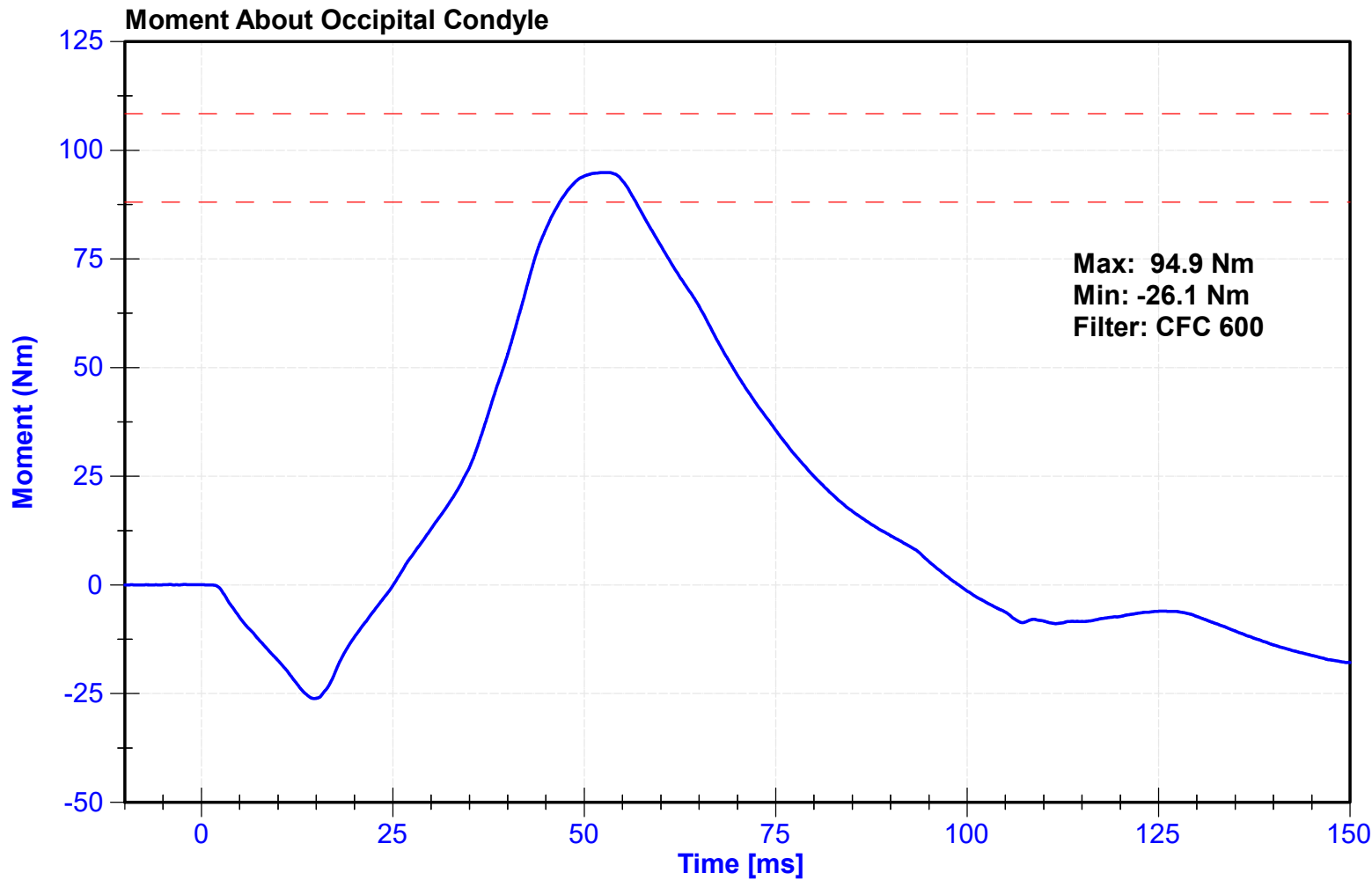
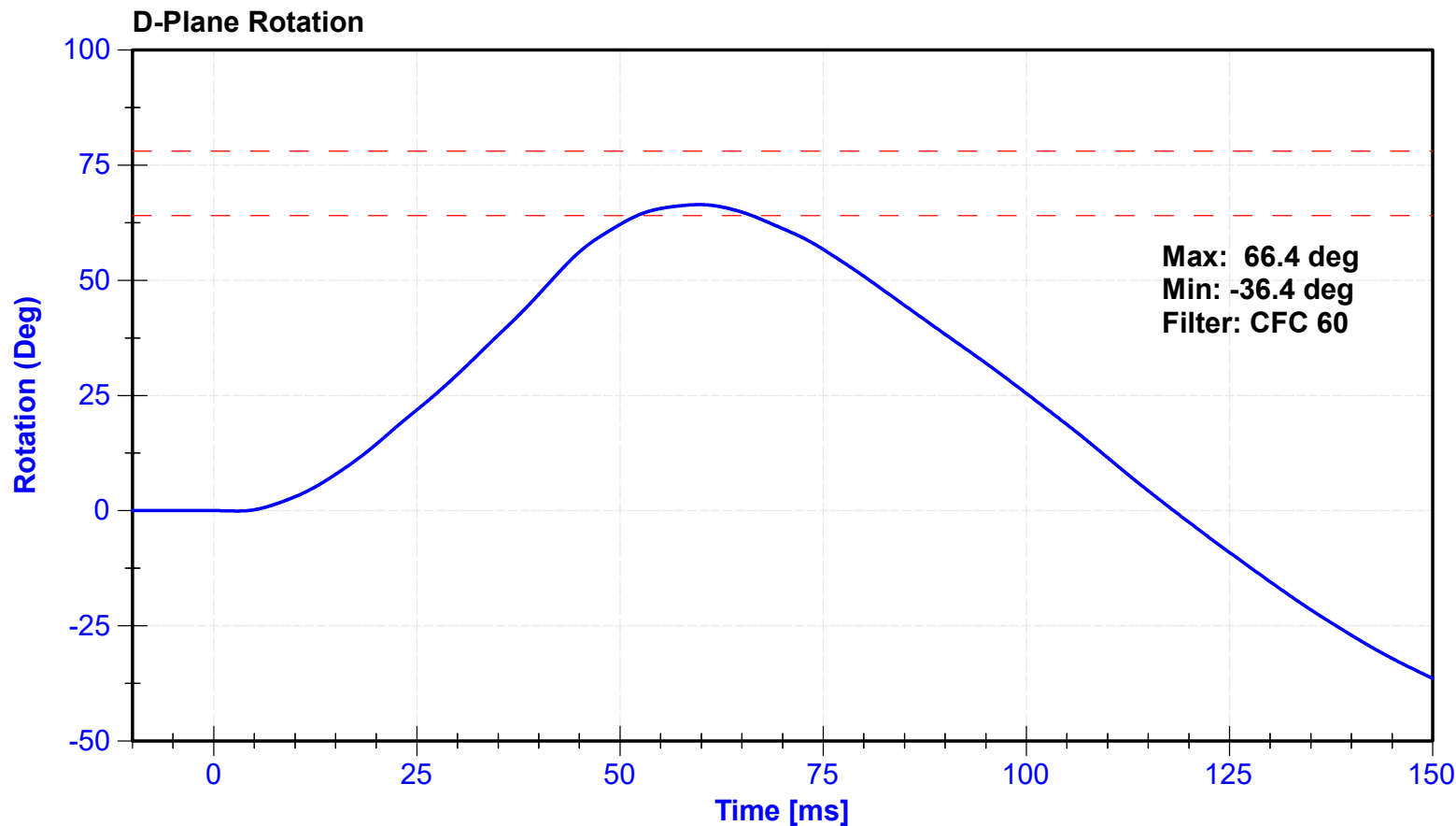
ATD Manufacturer	Humanetics	Test Technician	C. Mantell
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

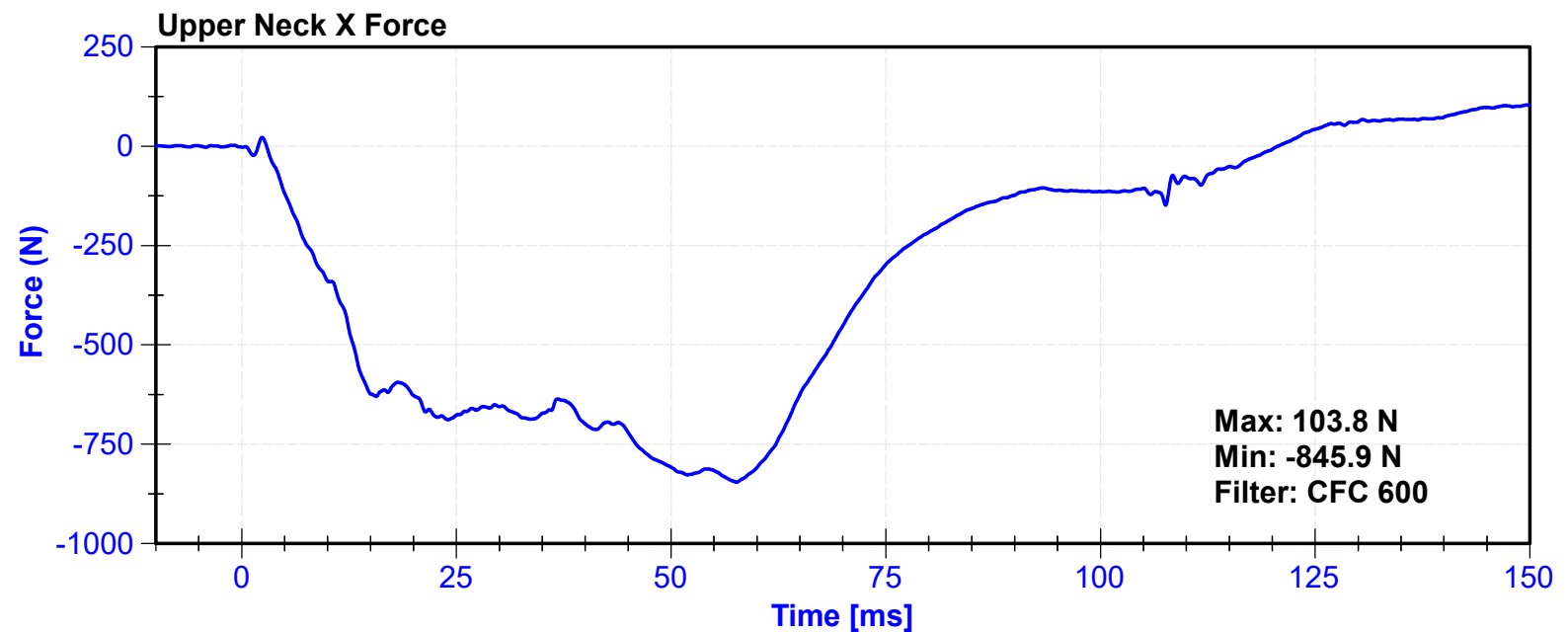
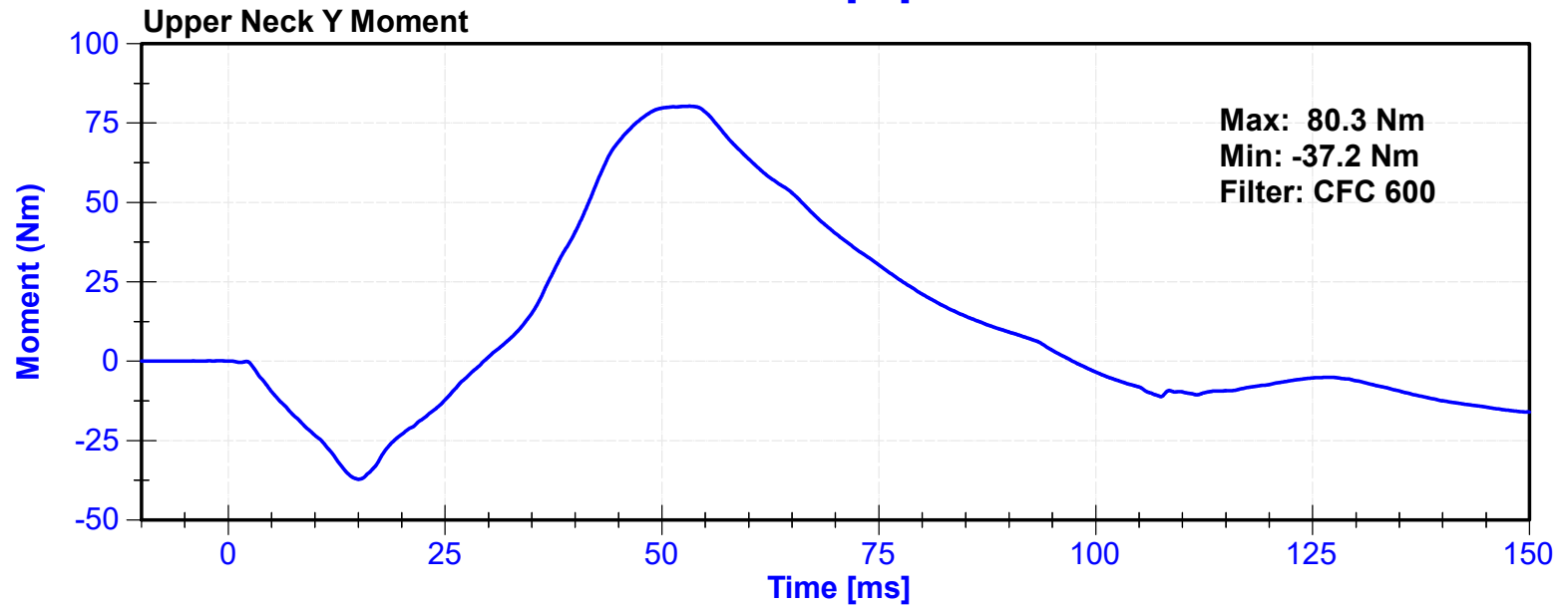
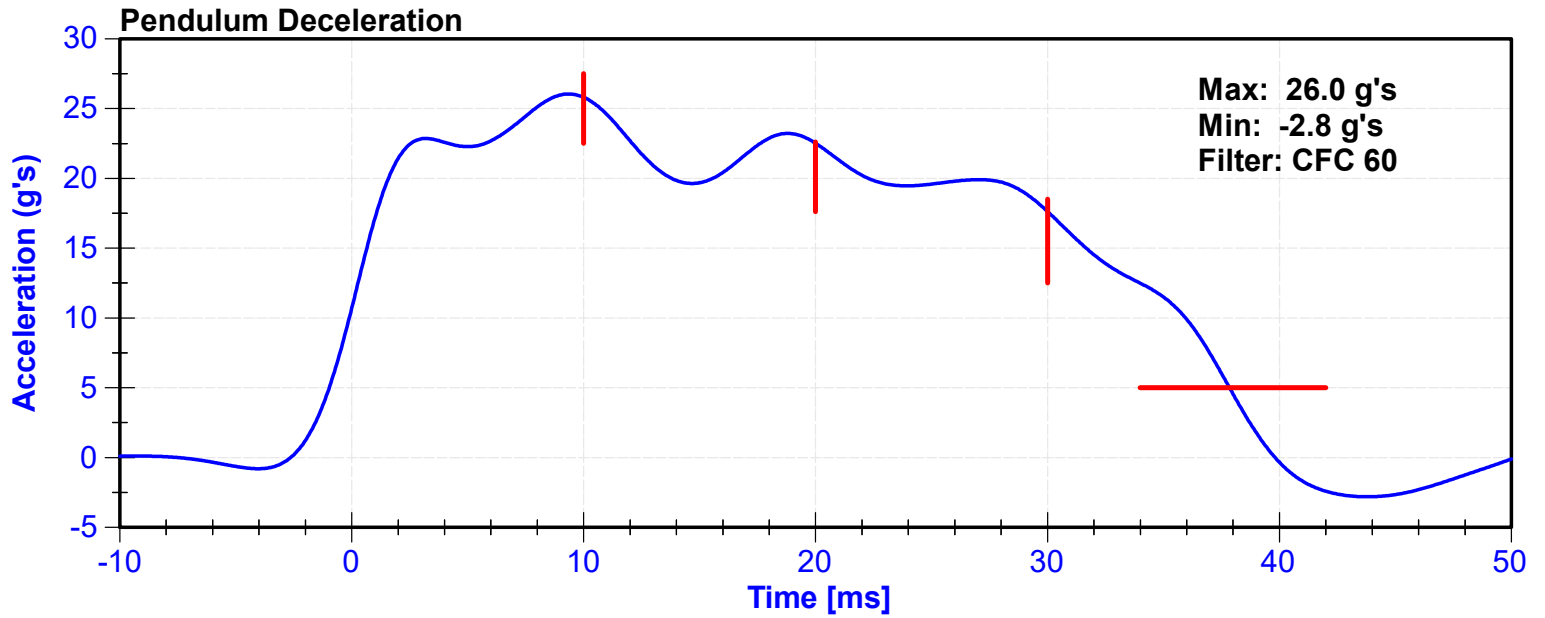
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	57.5	Pass
Velocity	6.89	7.13	m/s	6.952	Pass
Pendulum Deceleration at 10ms	22.5	27.5	g's	25.80	Pass
Pendulum Deceleration at 20ms	17.6	22.6	g's	22.50	Pass
Pendulum Deceleration at 30ms	12.5	18.5	g's	17.62	Pass
Max. Pendulum Deceleration After 30ms	0	29	g's	26.0	Pass
Pendulum Deceleration Time to 5 g's	34	42	ms	37.8	Pass
Maximum D Plane Rotation	64	78	deg	66.4	Pass
Time to Maximum Rotation	57	64	ms	59.8	Pass
Rotation Decay to Zero	113	127	ms	118.1	Pass
Moment About Occipital Condyle	88.1	108.4	Nm	94.91	Pass
Time to Maximum Moment	47	58	ms	52.3	Pass
Moment Decay to Zero	97	107	ms	98.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	Servo	14CB1-3615_DS-093	7/10/2023	7/8/2024
Upper Neck Load Cell	Humanetics	851-FX	5/18/2023	5/17/2024





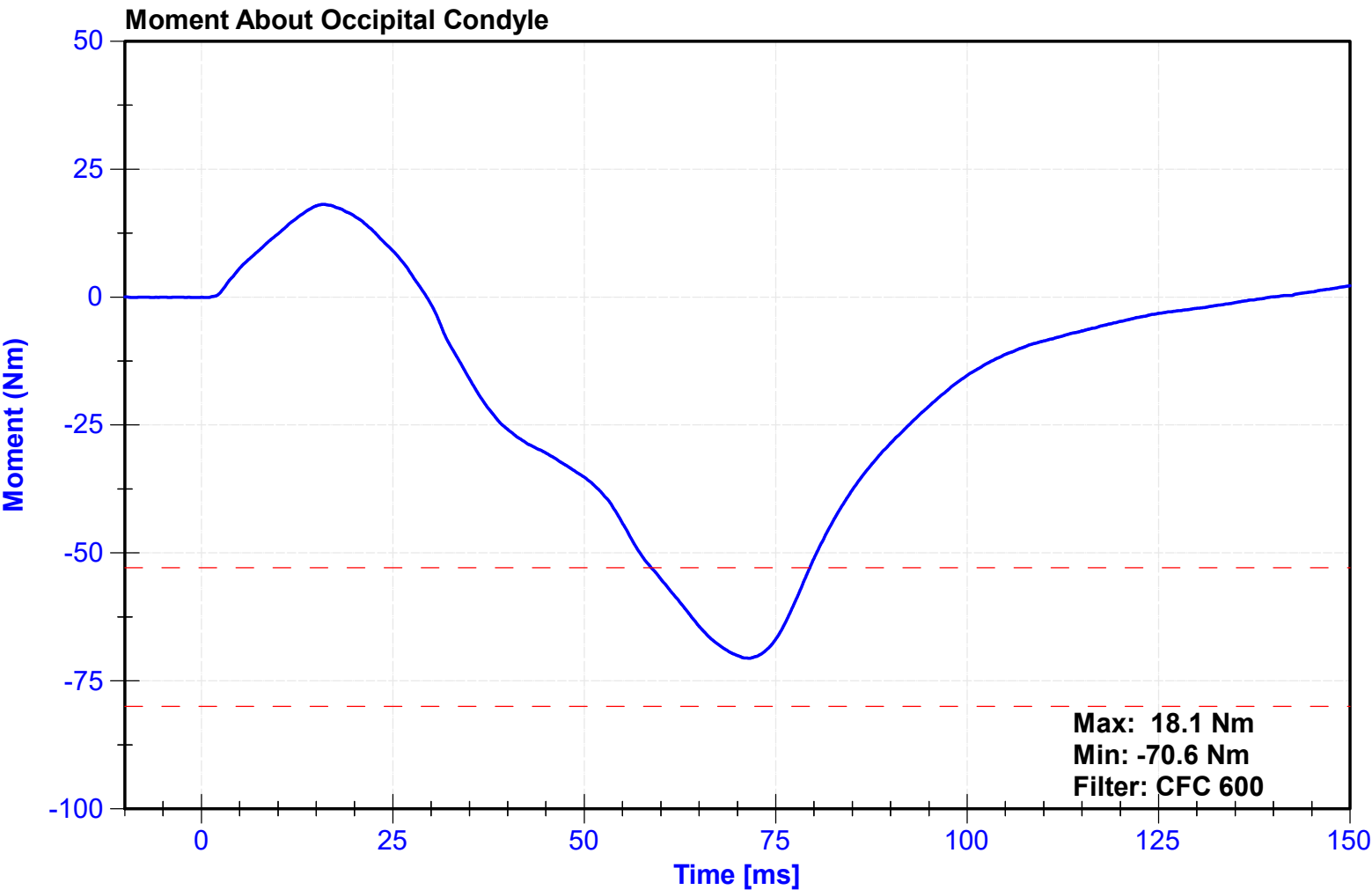
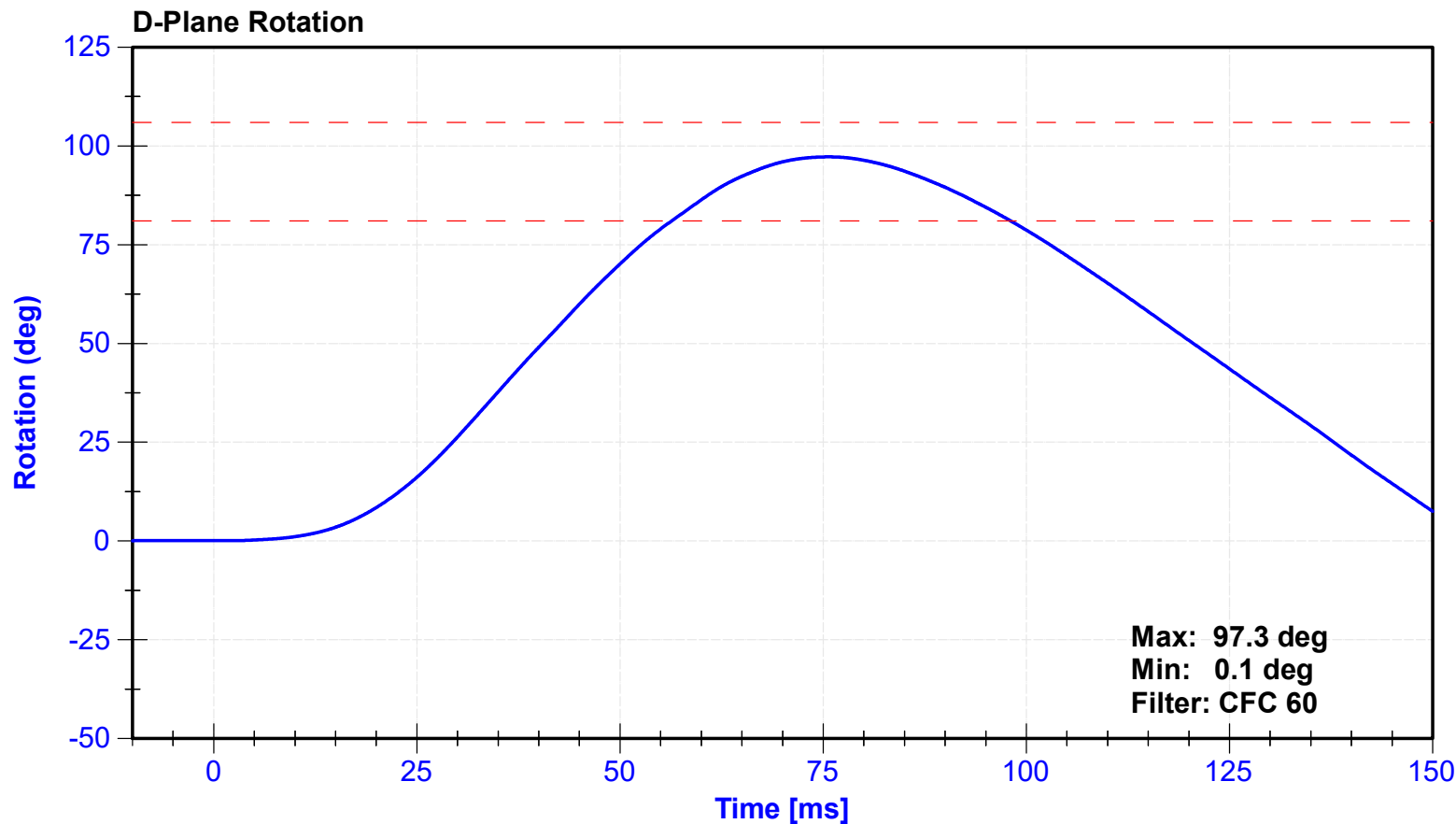
ATD Manufacturer	Humanetics	Test Technician	C. Mantell
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

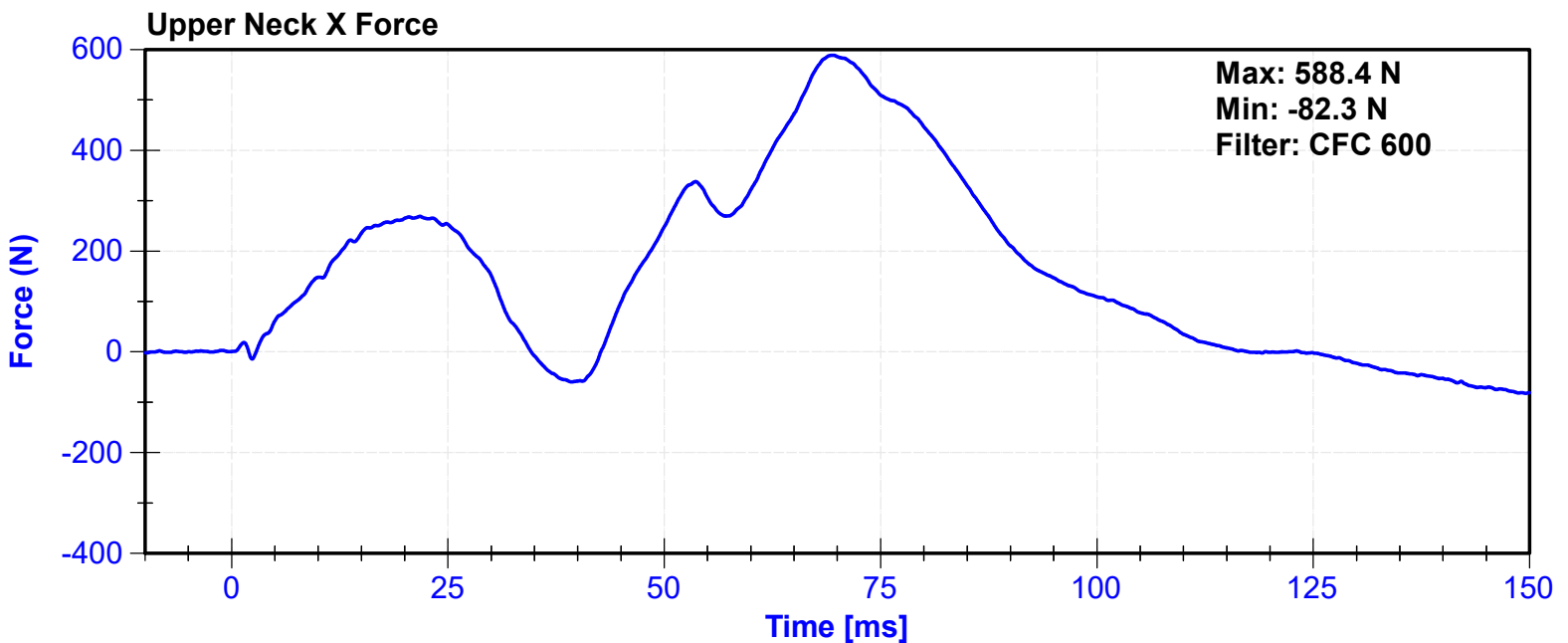
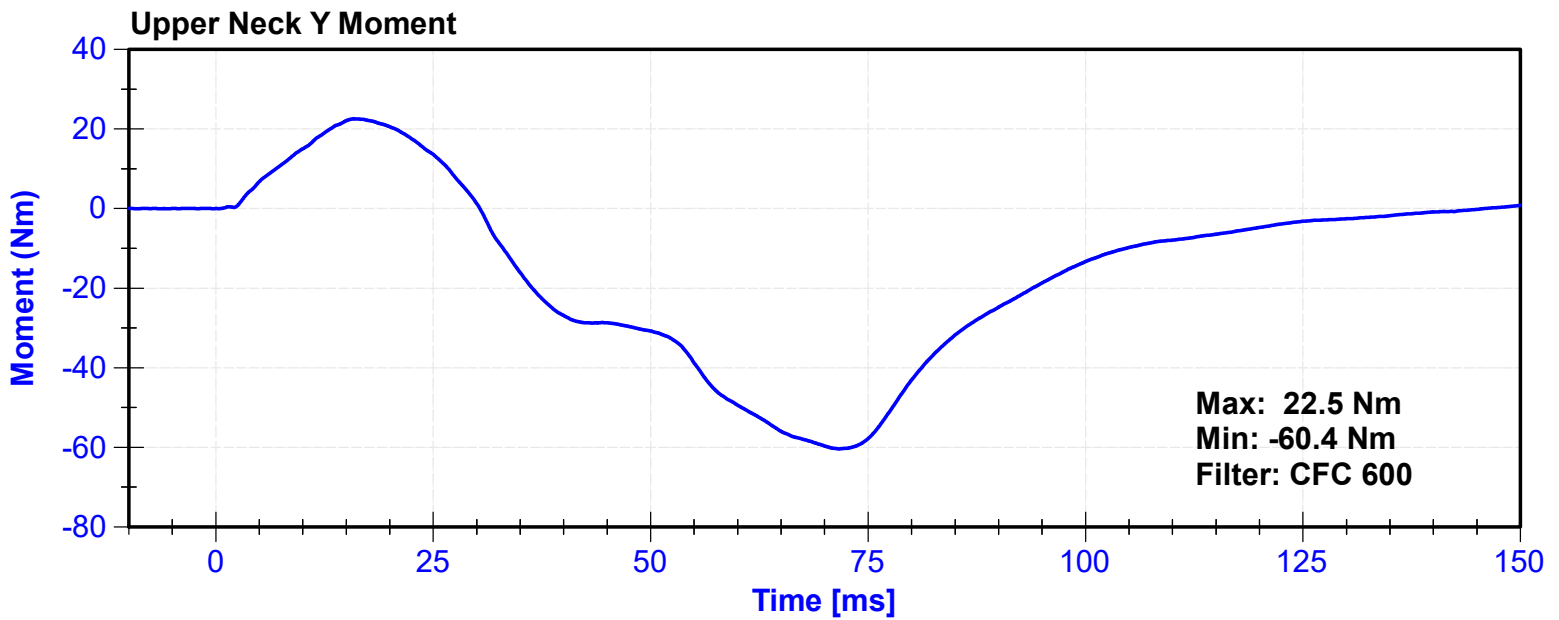
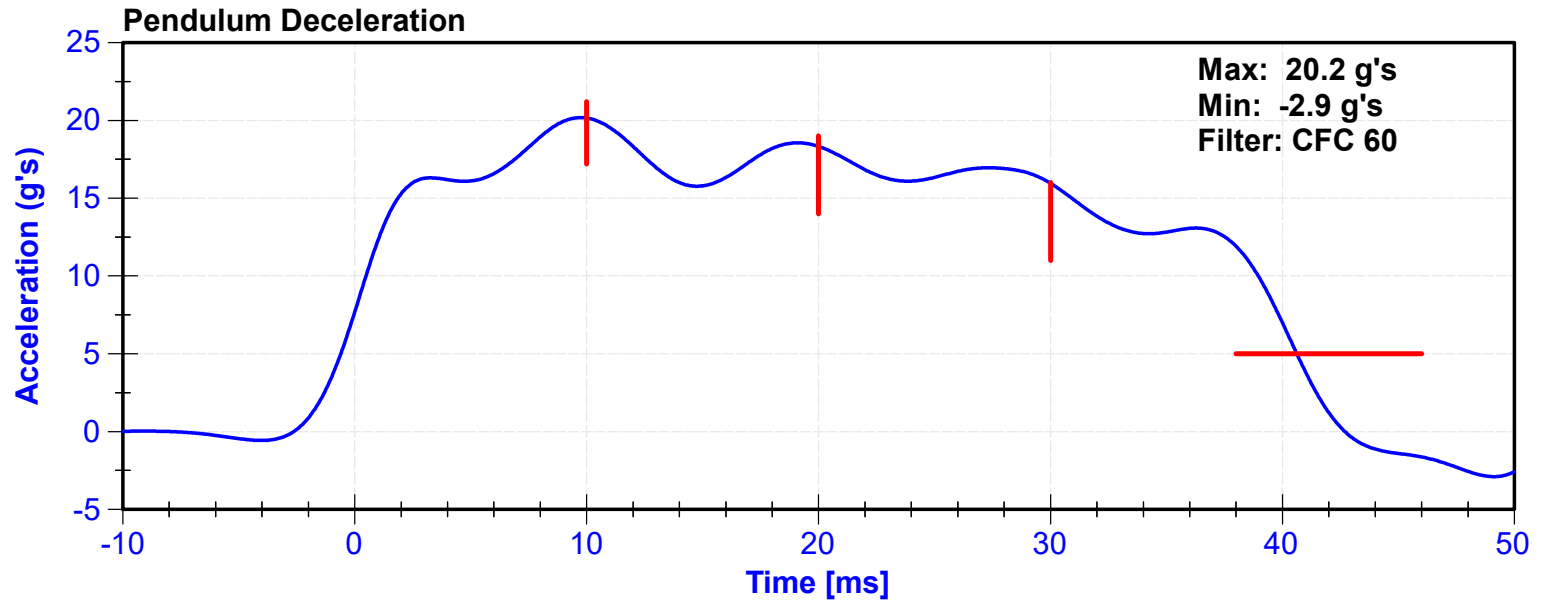
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.4	Pass
Humidity	10	70	%	57.5	Pass
Velocity	5.94	6.19	m/s	6.028	Pass
Pendulum Deceleration at 10ms	17.2	21.2	g's	20.14	Pass
Pendulum Deceleration at 20ms	14	19	g's	18.3	Pass
Pendulum Deceleration at 30ms	11	16	g's	16.0	Pass
Max. Pendulum Deceleration After 30ms	0	22	g's	20.2	Pass
Pendulum Deceleration Time to 5 g's	38	46	ms	40.6	Pass
Maximum D Plane Rotation	81	106	deg	97.3	Pass
Time to Maximum Rotation	72	82	ms	75.6	Pass
Rotation Decay to Zero	147	174	ms	155.2	Pass
Minimum Moment About OC	-80	-52.9	Nm	-70.59	Pass
Time to Minimum Moment	65	79	ms	71.6	Pass
Moment Decay to Zero	120	148	ms	139.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16503	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	Servo	14CB1-3615_DS-093	7/10/2023	7/8/2024
Upper Neck Load Cell	Humanetics	851-FX	5/18/2023	5/17/2024





ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	142	Laboratory Supervisor	C.Mantel

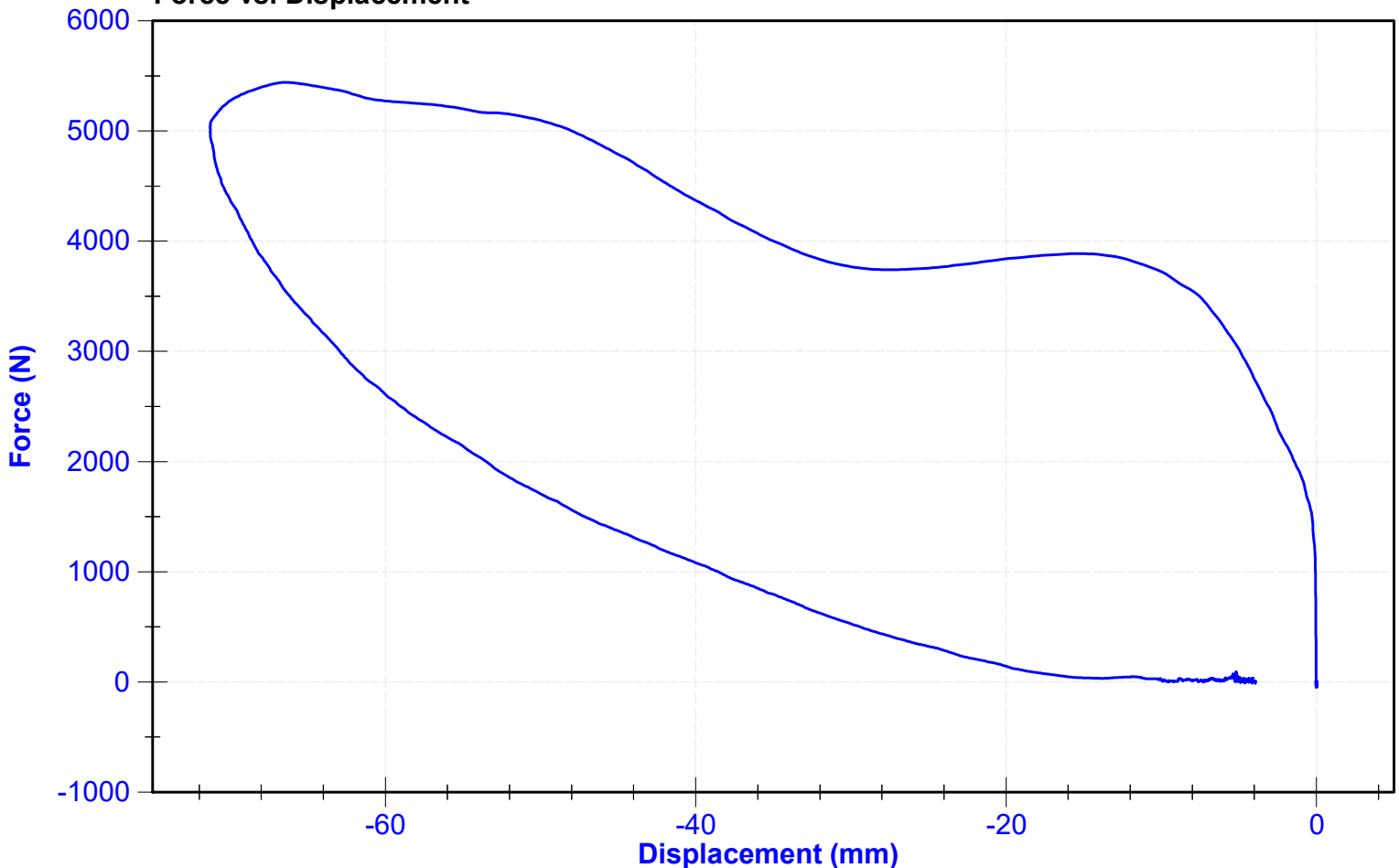
Results

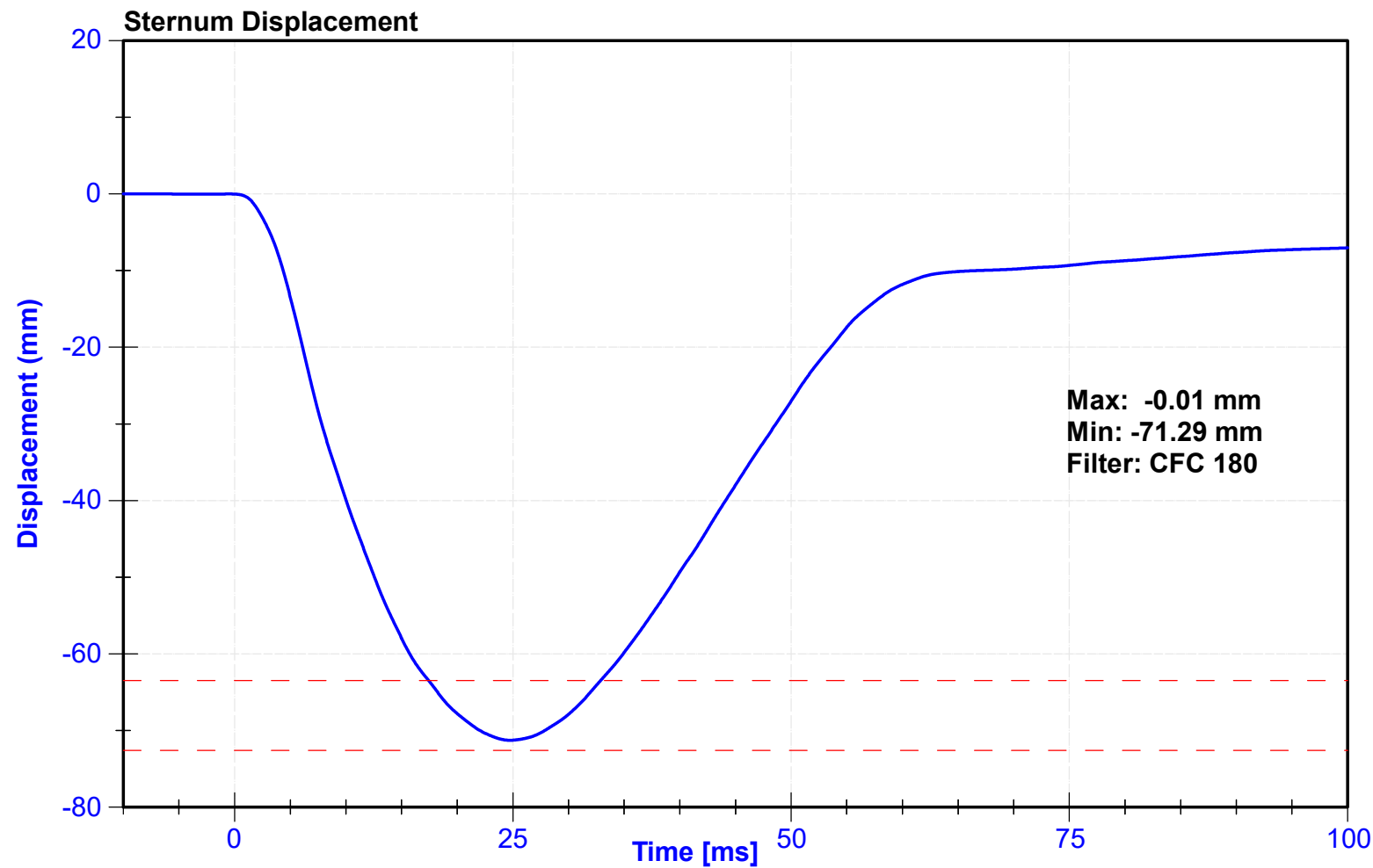
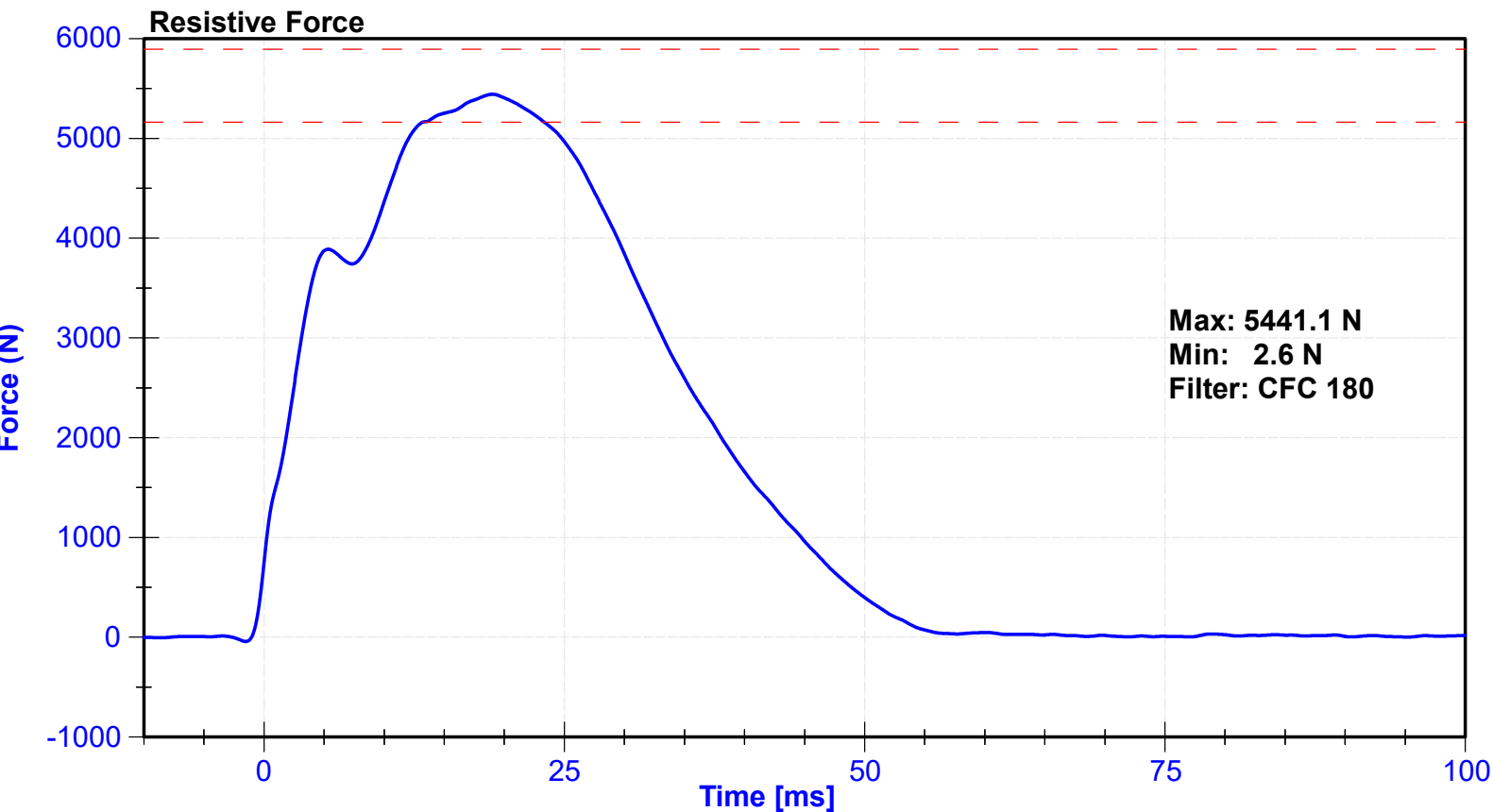
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	57	Pass
Velocity	6.59	6.83	m/s	6.719	Pass
Chest Displacement	-72.6	-63.5	mm	-71.29	Pass
Resistive Force	5160	5894	N	5441.1	Pass
Hysteresis	69	85	%	71.6	Pass

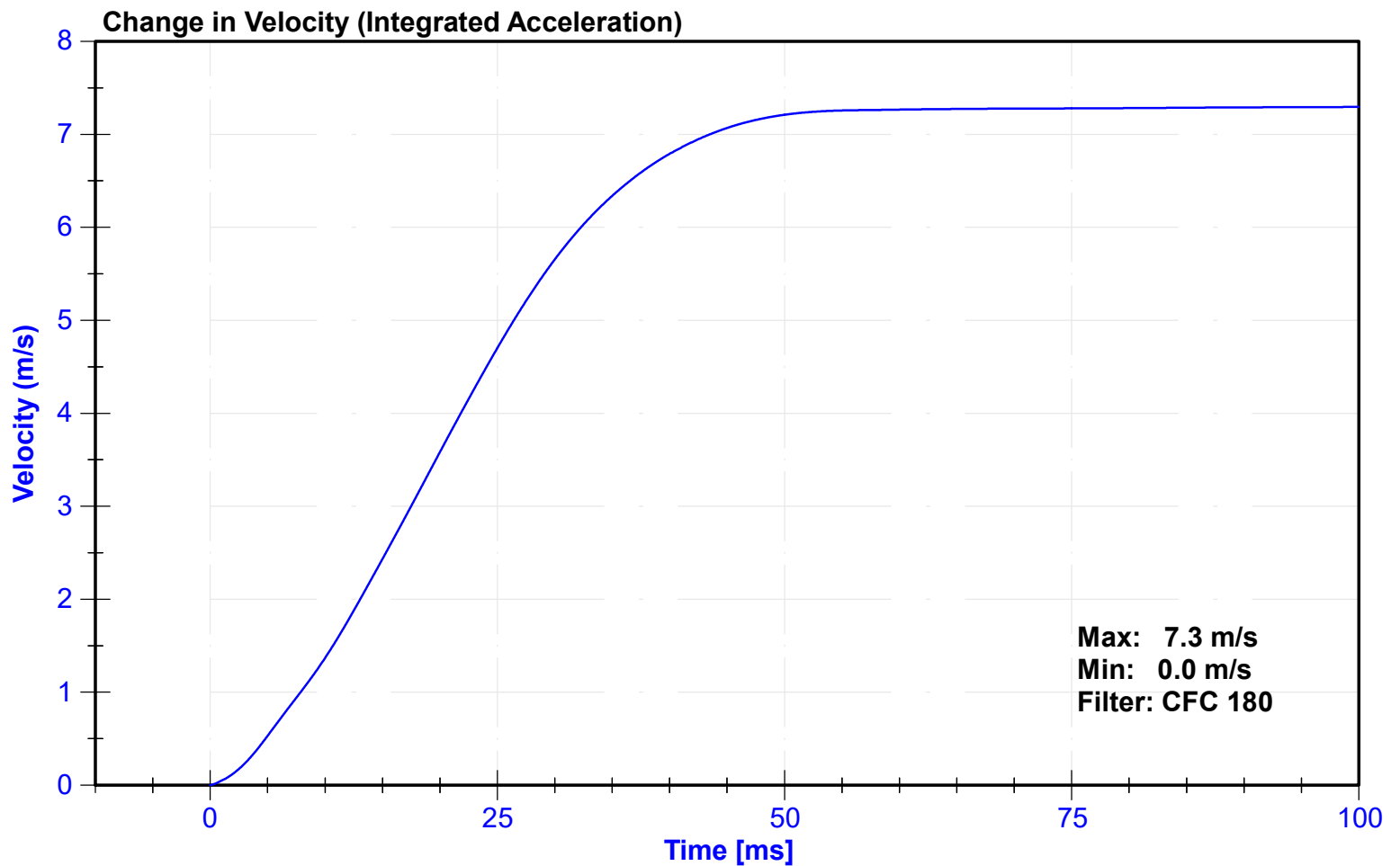
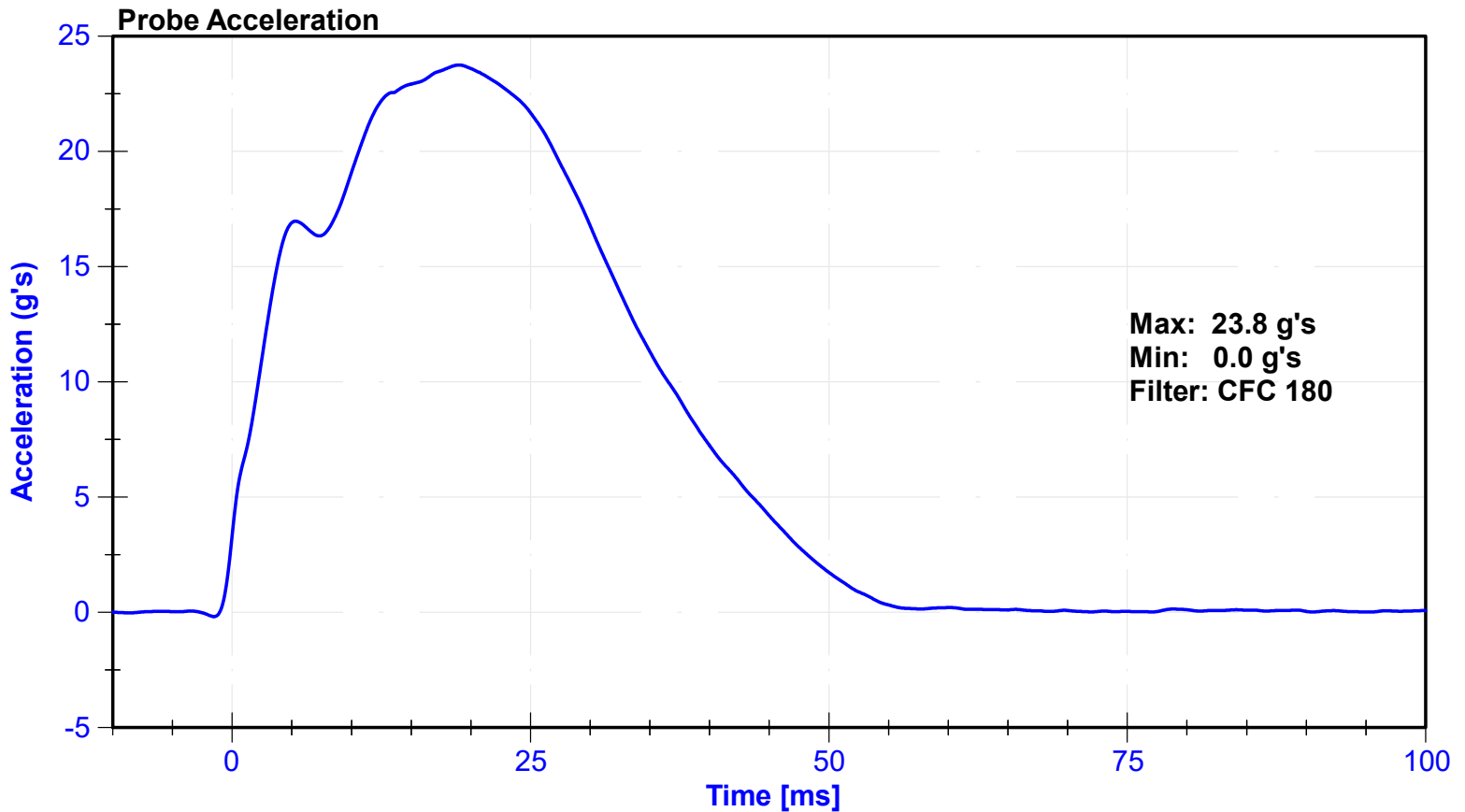
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P51736	10/25/2022	10/25/2023
Chest Potentiometer	JDK	0075	4/10/2023	10/9/2023

Force vs. Displacement



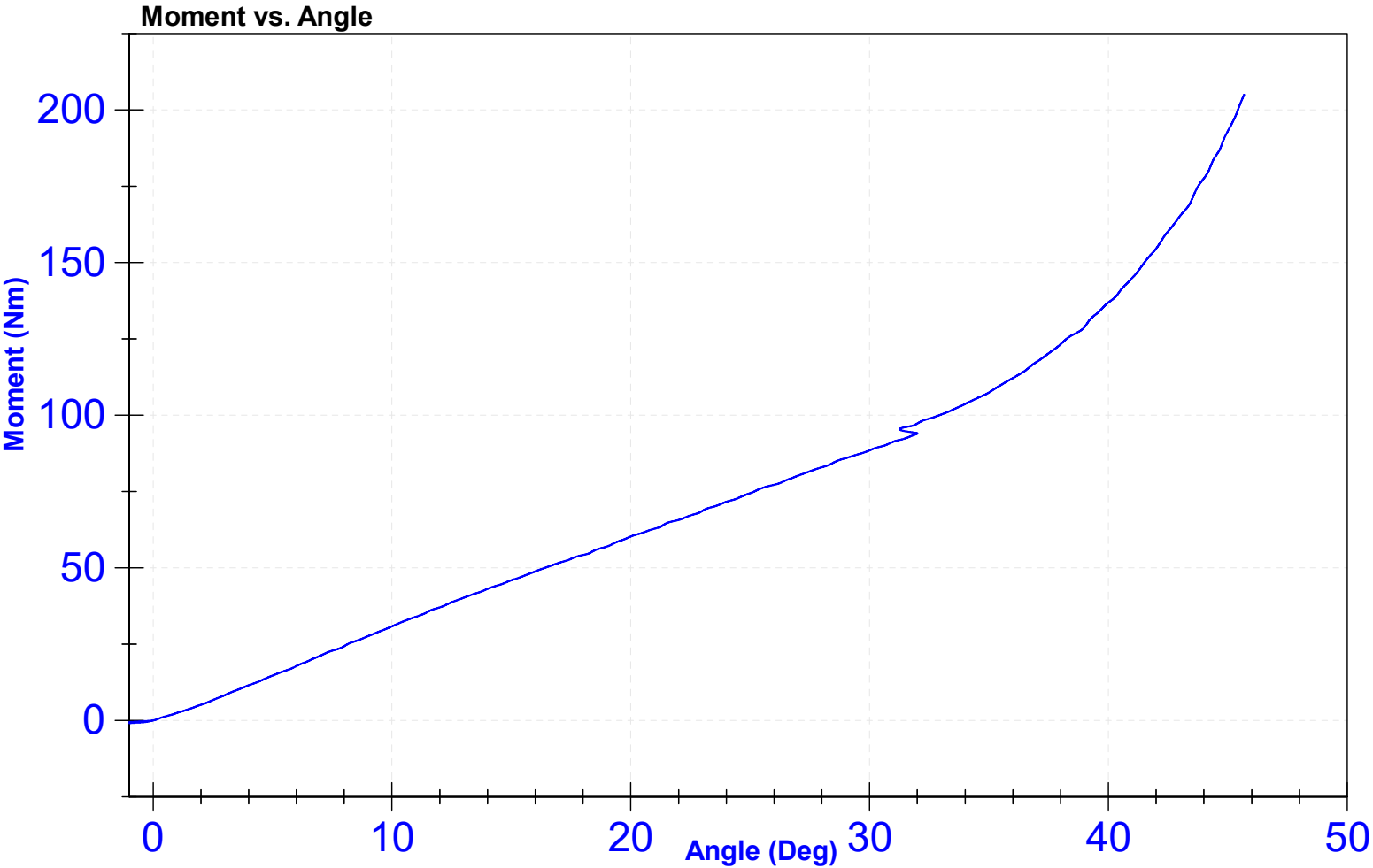




ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

Results					
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	51.2	Pass
Average Velocity	5	10	deg/s	7.3	Pass
Angle at 203Nm	40	50	deg	45.6	Pass
Moment at 30 degrees	0	94.9	Nm	88.5	Pass

Transducer Calibrations				
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS-0008	10/4/2022	10/4/2023
Load Cell	PCB 2301-02	2301-02_115	2022-09-06	2023-09-06

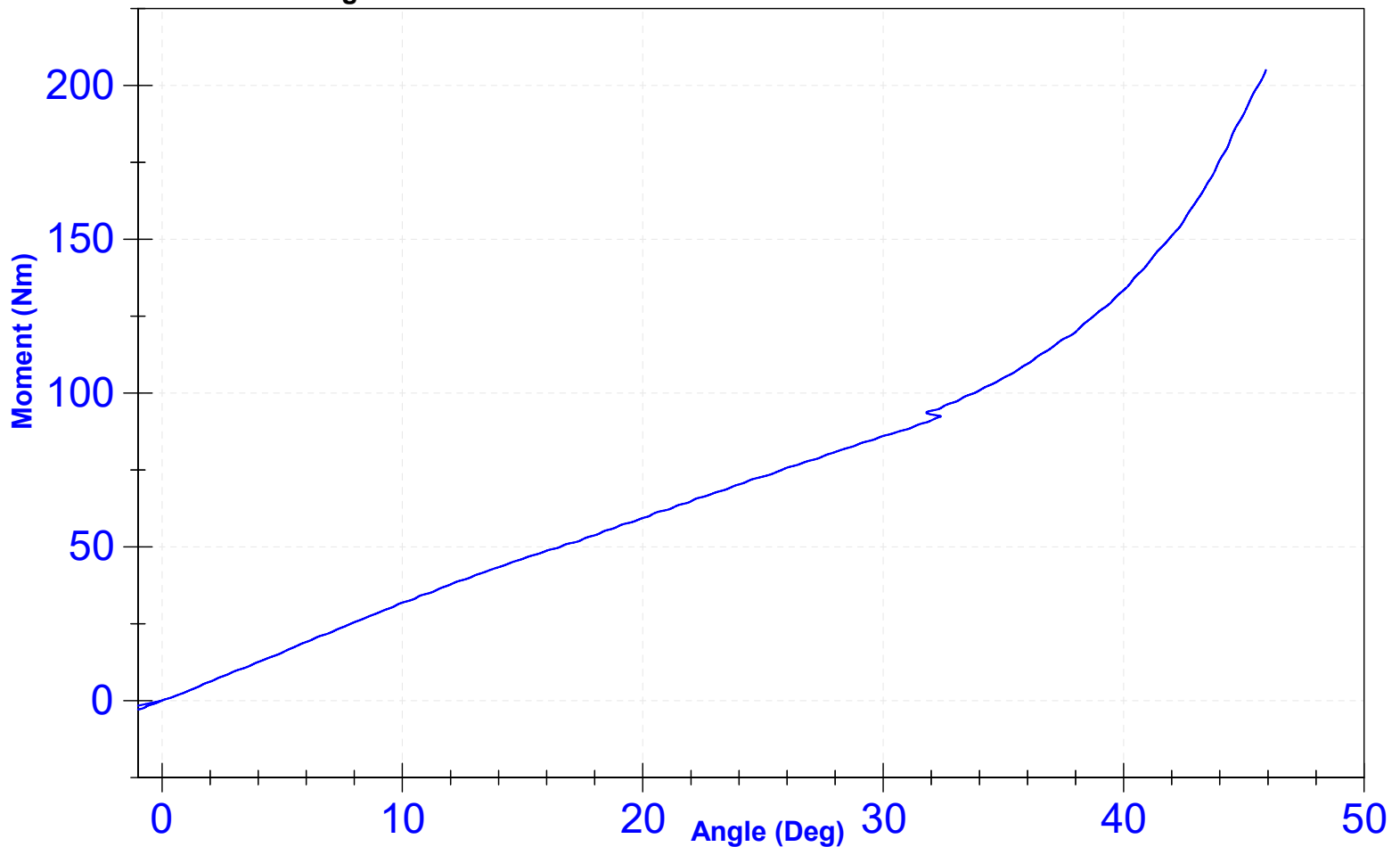


ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

Test Parameter	Results		Unit	Result	Pass/Fail
	Minimum Specification	Maximum Specification			
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	51.2	Pass
Average Velocity	5	10	deg/s	7.3	Pass
Angle at 203Nm	40	50	deg	45.8	Pass
Moment at 30 degrees	0	94.9	Nm	86.0	Pass

Transducer Calibrations				
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	ETI SP22	DS-0008	10/4/2022	10/4/2023
Load Cell	PCB 2301-02	2301-02_115	2022-09-06	2023-09-06

Moment vs. Angle



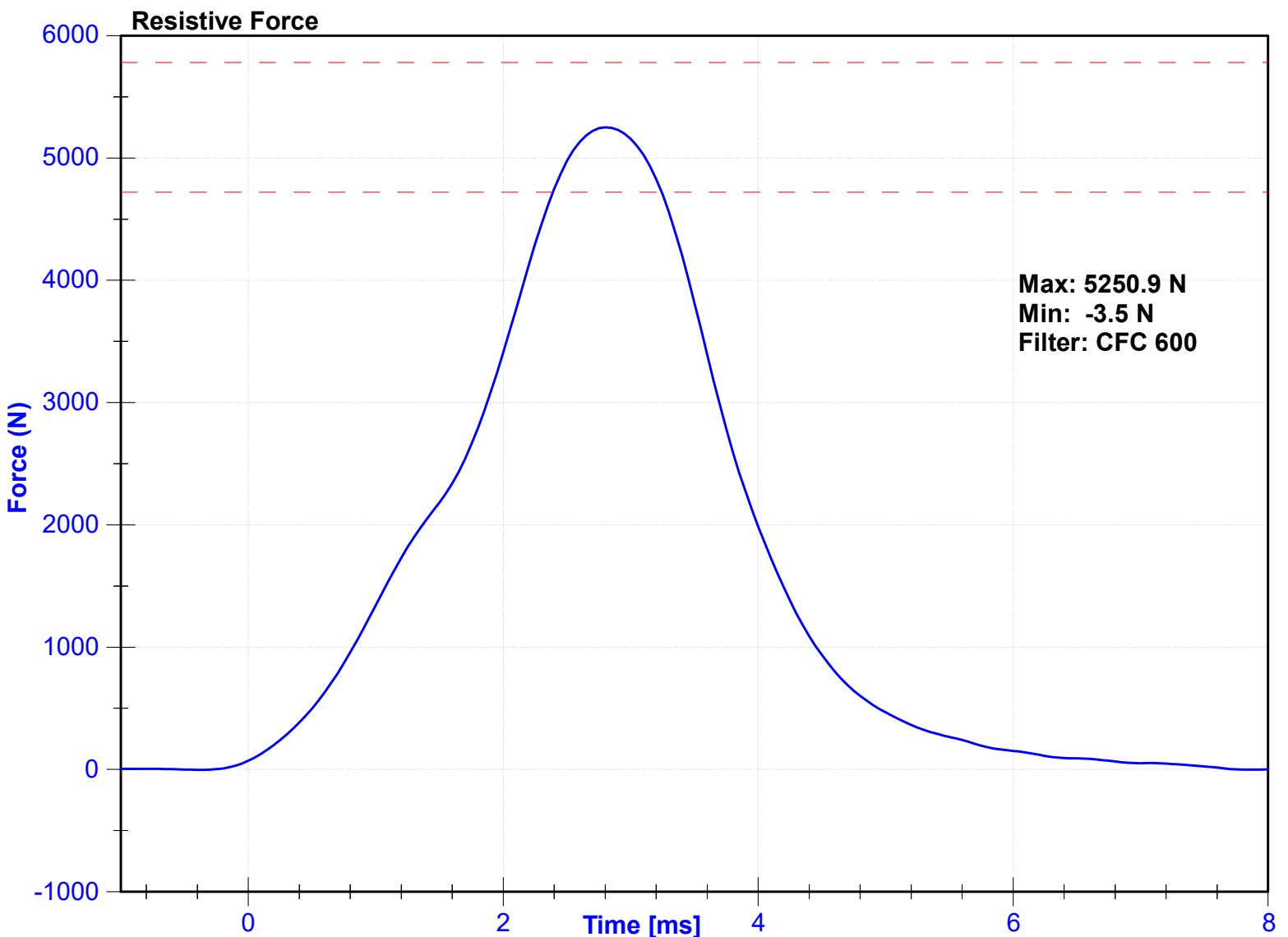
ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

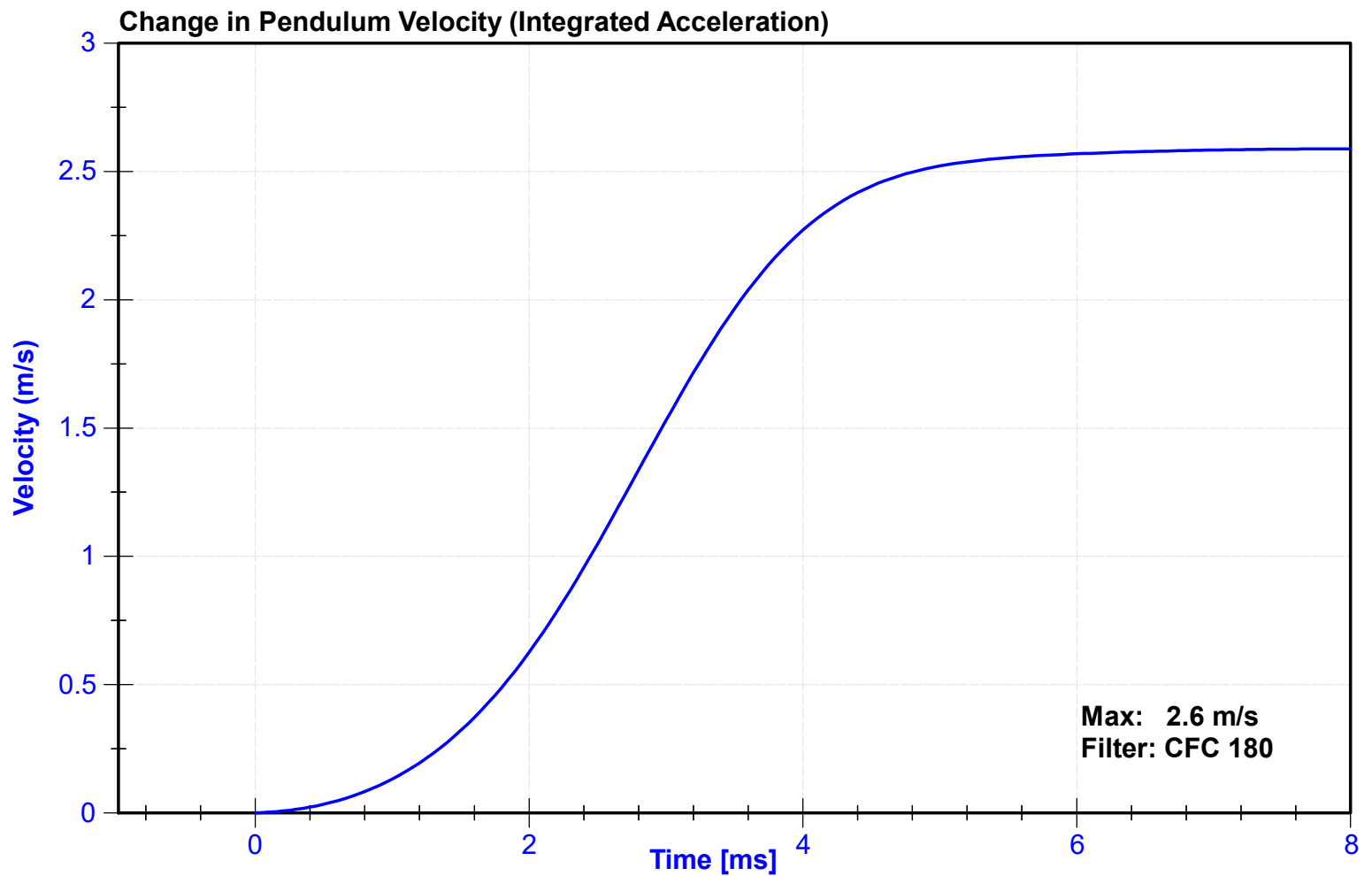
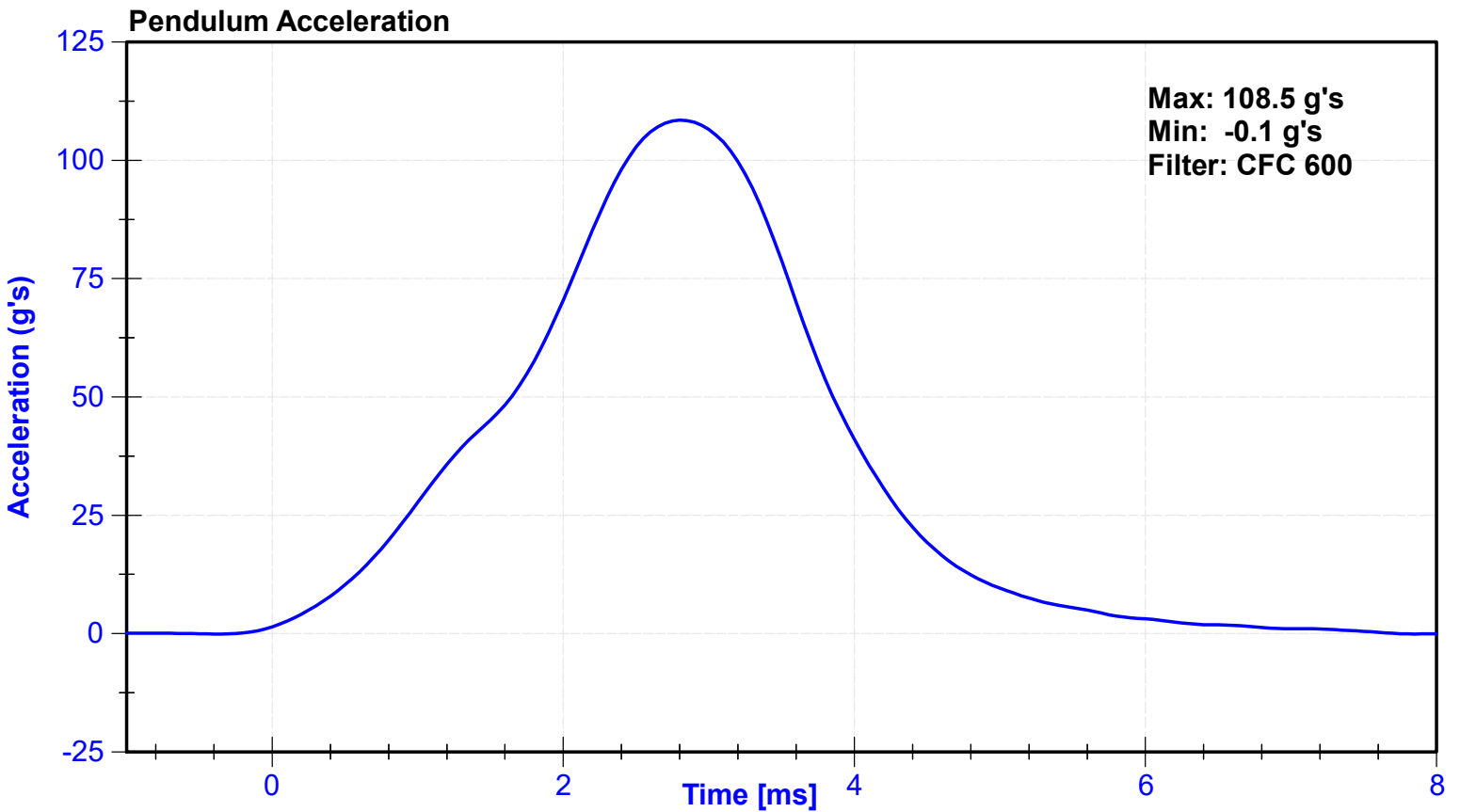
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.5	Pass
Humidity	10	70	%	52	Pass
Velocity	2.07	2.13	m/s	2.119	Pass
Maximum Resistive Force	4720	5780	N	5250.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023





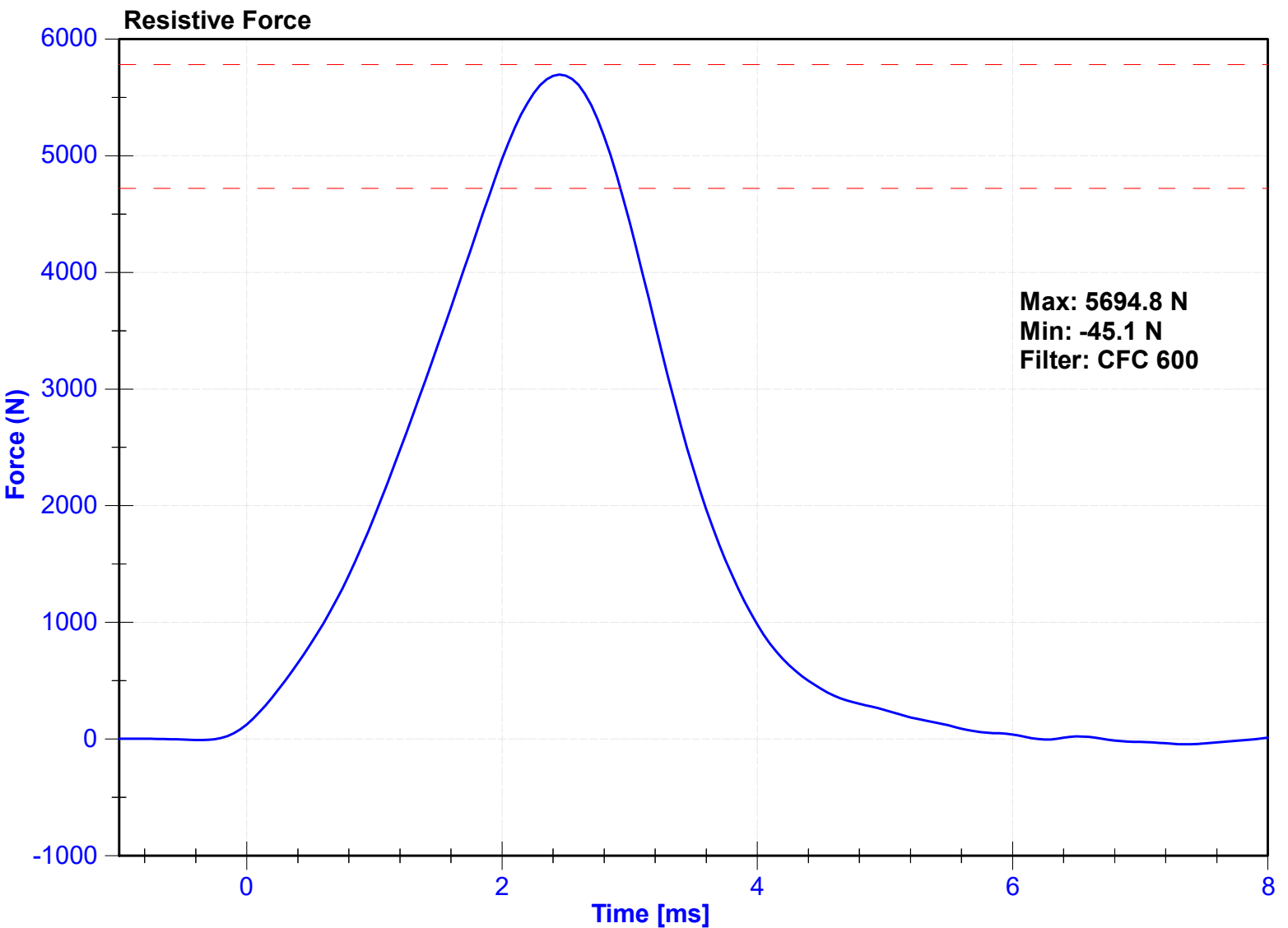
ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

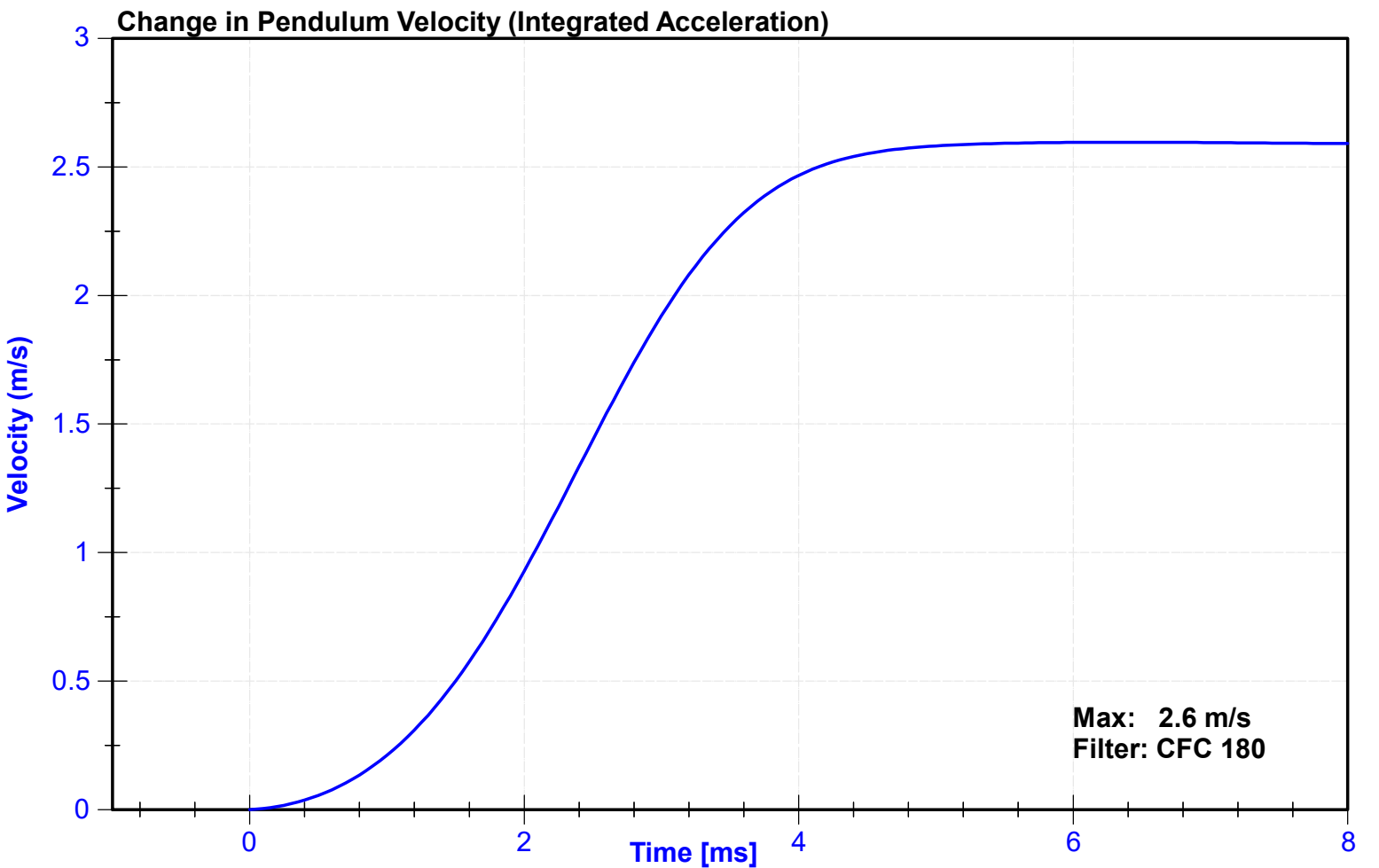
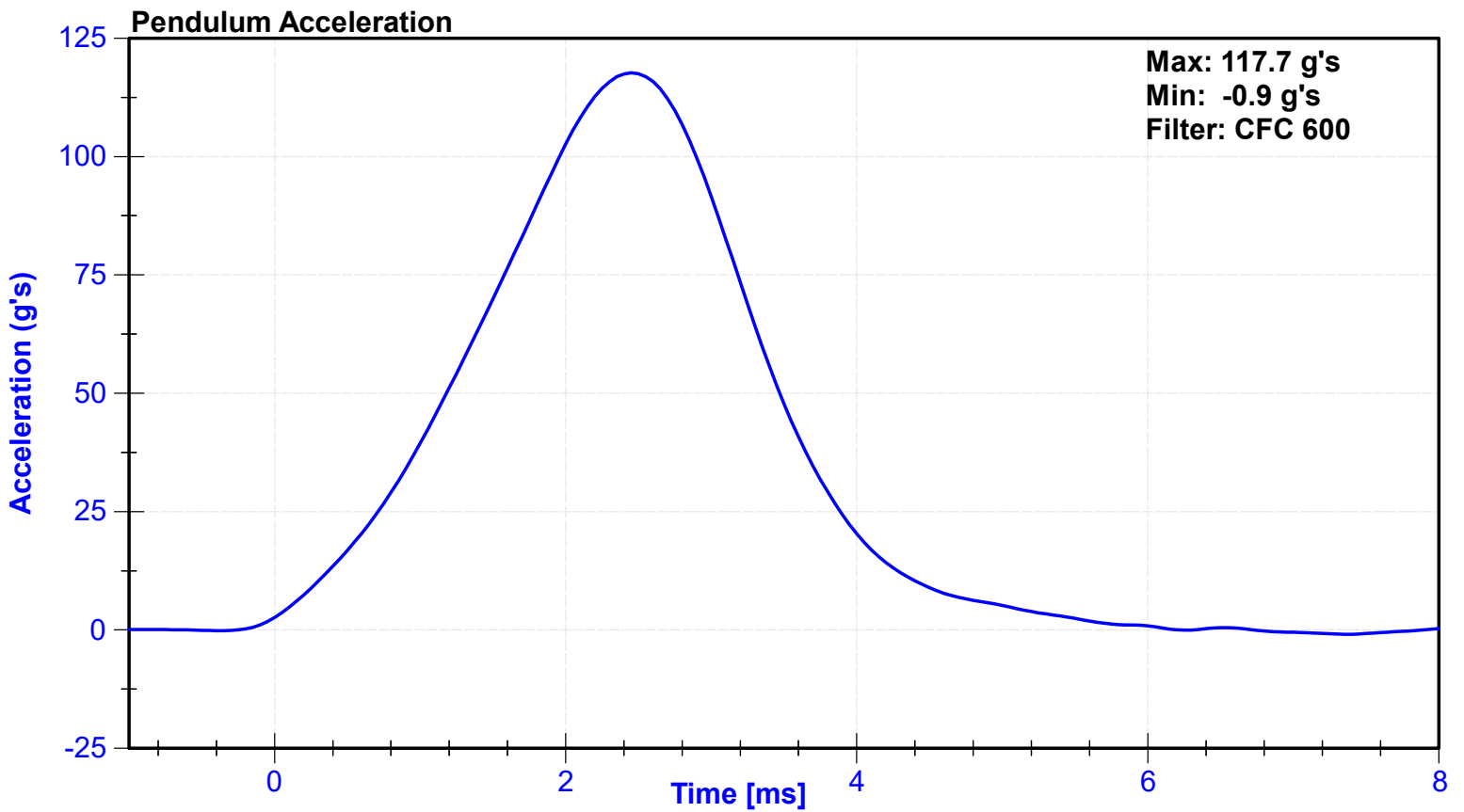
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.5	Pass
Humidity	10	70	%	52	Pass
Velocity	2.07	2.13	m/s	2.129	Pass
Maximum Resistive Force	4720	5780	N	5694.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 137

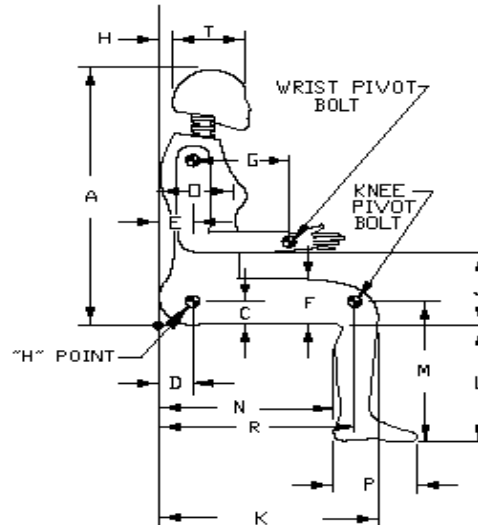
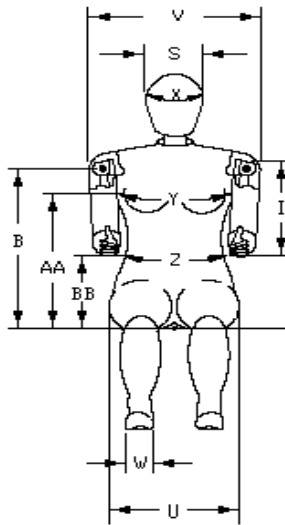


External Measurements - Hybrid 3 - 5th Female

Technician: K. Brogan

Date: 07/14/2023

Dummy Serial Number: 137



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	787	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	75	Pass
F	Thigh Clearance	119	135	130	Pass
G	Back of Elbow to Wrist Pivot	244	259	250	Pass
H	Head Back to Backline	43	48	45	Pass
I	Shoulder to Elbow Length	277	297	287	Pass
J	Elbow Rest Height	183	203	197	Pass
K	Buttock to Knee Length	521	546	535	Pass
L	Popliteal Height	356	376	369	Pass
M	Knee Pivot Height	394	419	408	Pass
N	Buttock Popliteal Length	414	439	427	Pass
O	Chest Depth without Jacket	175	191	182	Pass
P	Foot Length (right)	219	234	231	Pass
R	Buttock To Knee Pivot Length	457	483	466	Pass
S	Head Breadth	137	147	143	Pass
T	Head Depth	178	188	180	Pass
U	Hip Breadth	300	315	311	Pass
V	Shoulder Breadth	351	366	360	Pass
W	Foot Breadth	79	94	85	Pass
X	Head Circumference	528	549	544	Pass
Y	Chest Circumference with Jacket	851	881	872	Pass
Z	Waist Circumference	460	790	656	Pass
AA	Reference Location (Chest Circumference)	333	358	345	Pass
BB	Reference Location (Waist Circumference)	160	170	166	Pass

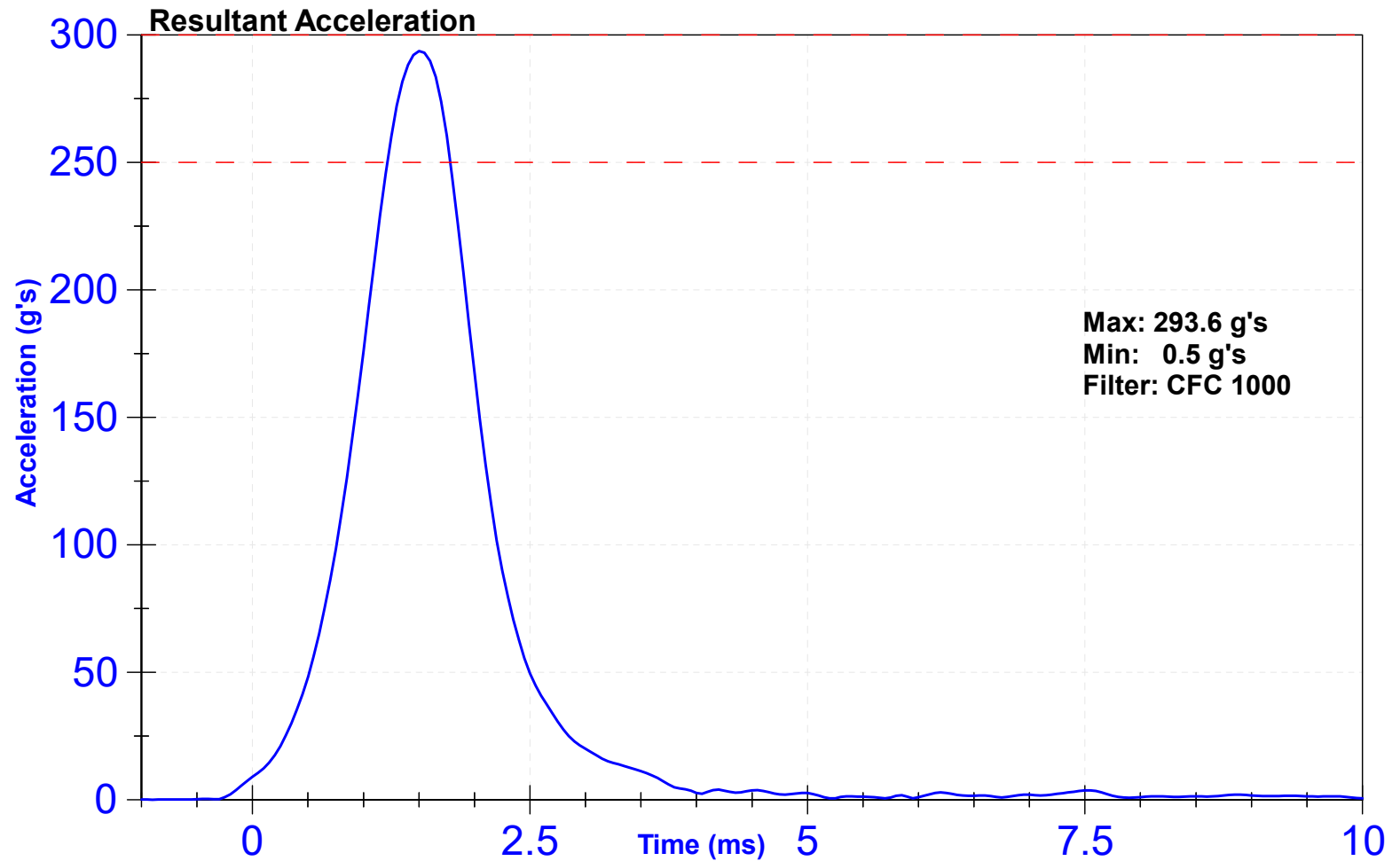
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

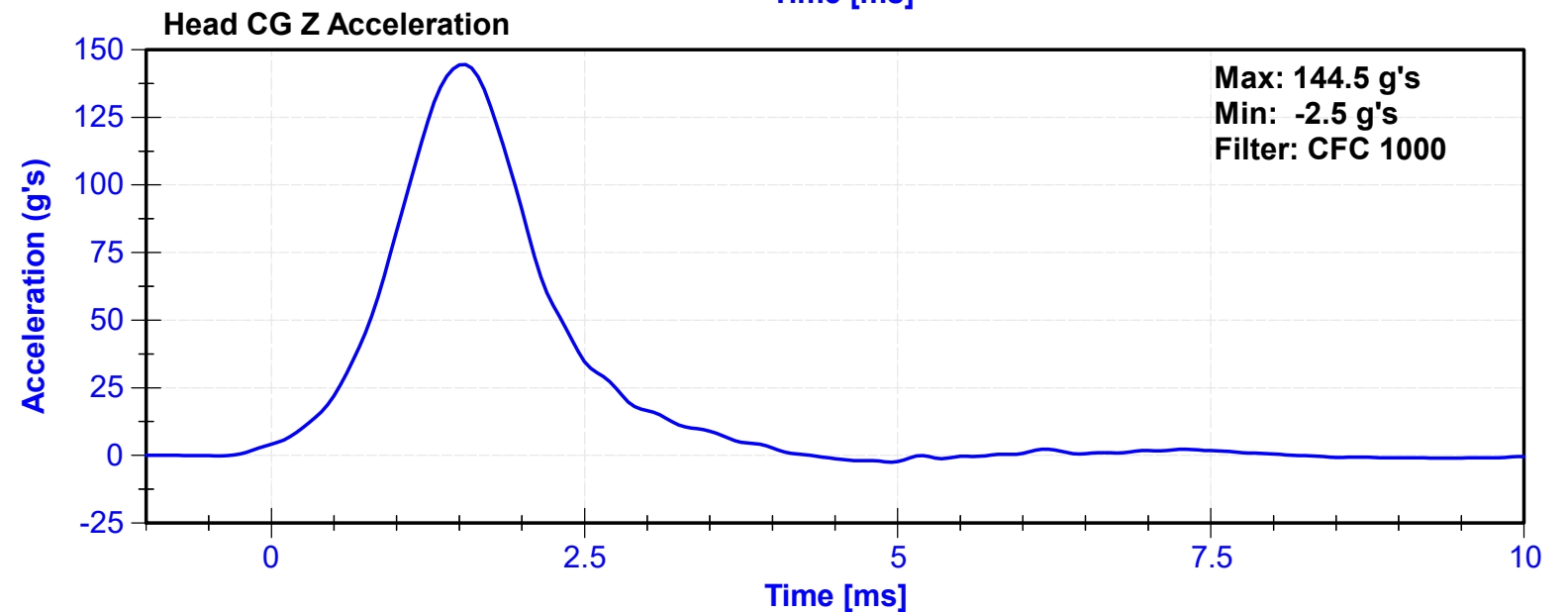
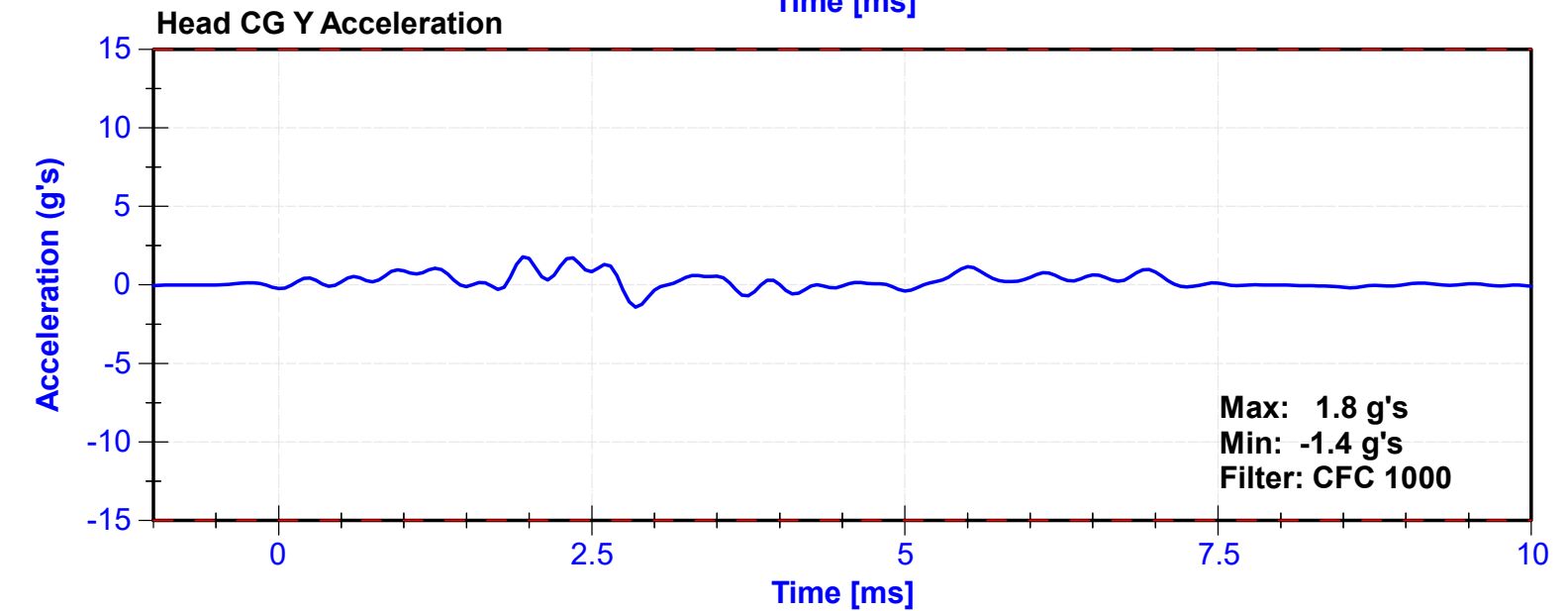
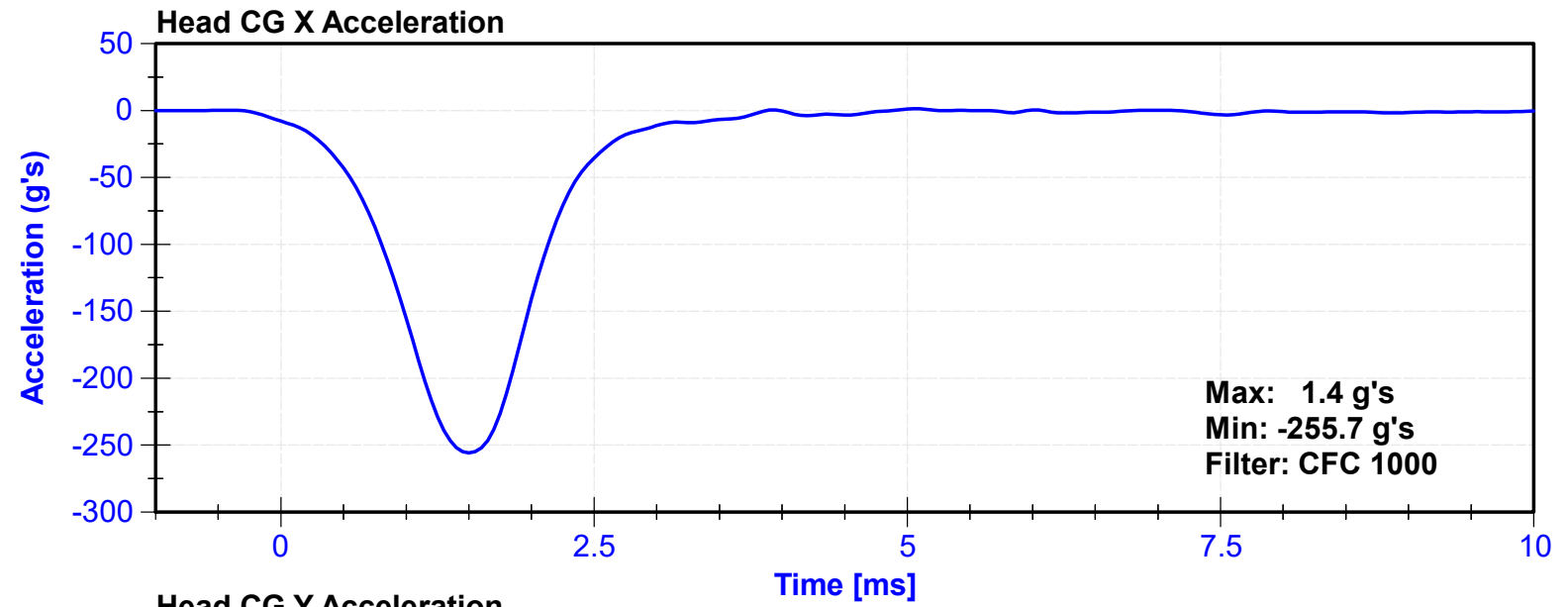
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	51.2	Pass
Resultant Acceleration	250	300	g's	293.6	Pass
Oscillation	0	10	%	1.3	Pass
Lateral Acceleration	-15	15	g's	1.8	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	Endevco	P79417	6/20/2023	12/17/2023
Y Accelerometer	Endevco	P83335	6/20/2023	12/17/2023
Z Accelerometer	Endevco	P64149	6/20/2023	12/17/2023





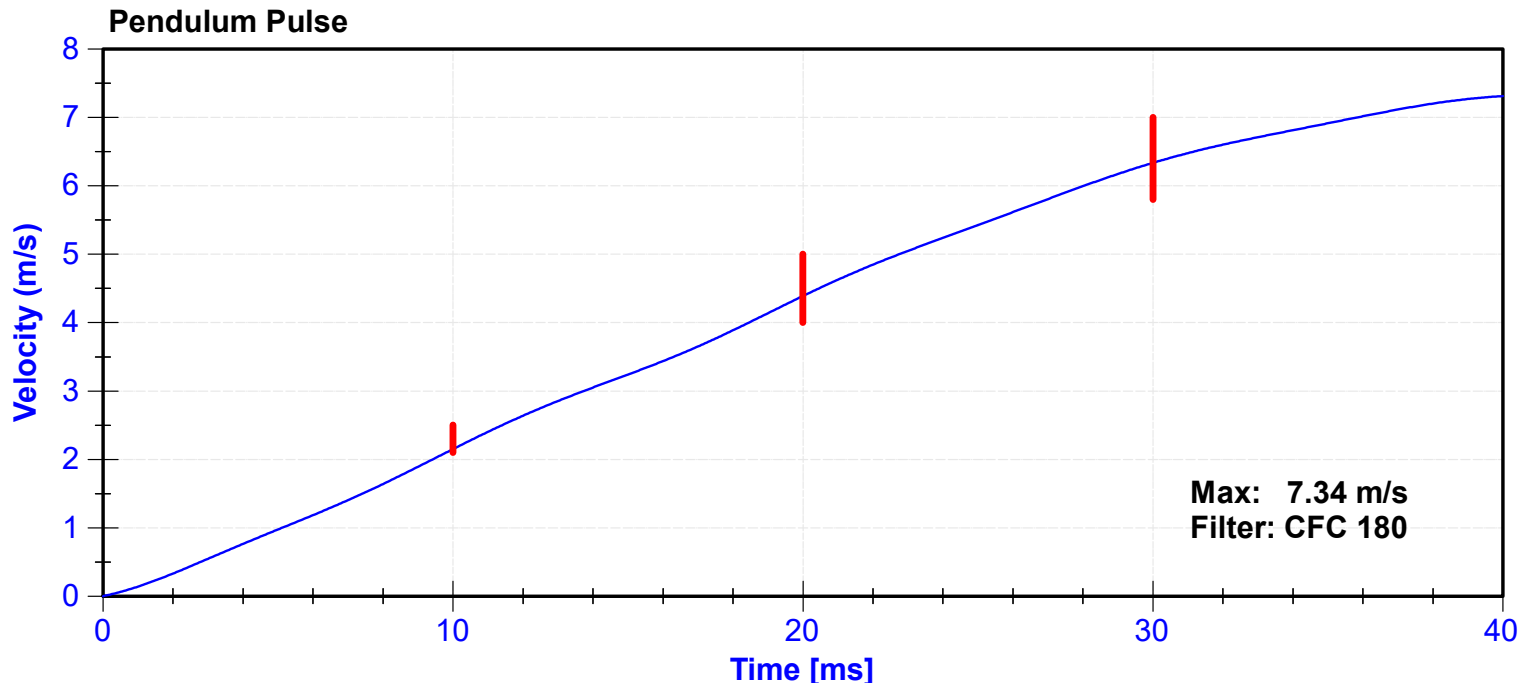
ATD Manufacturer	Humanetics	Test Technician	J. Miller
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

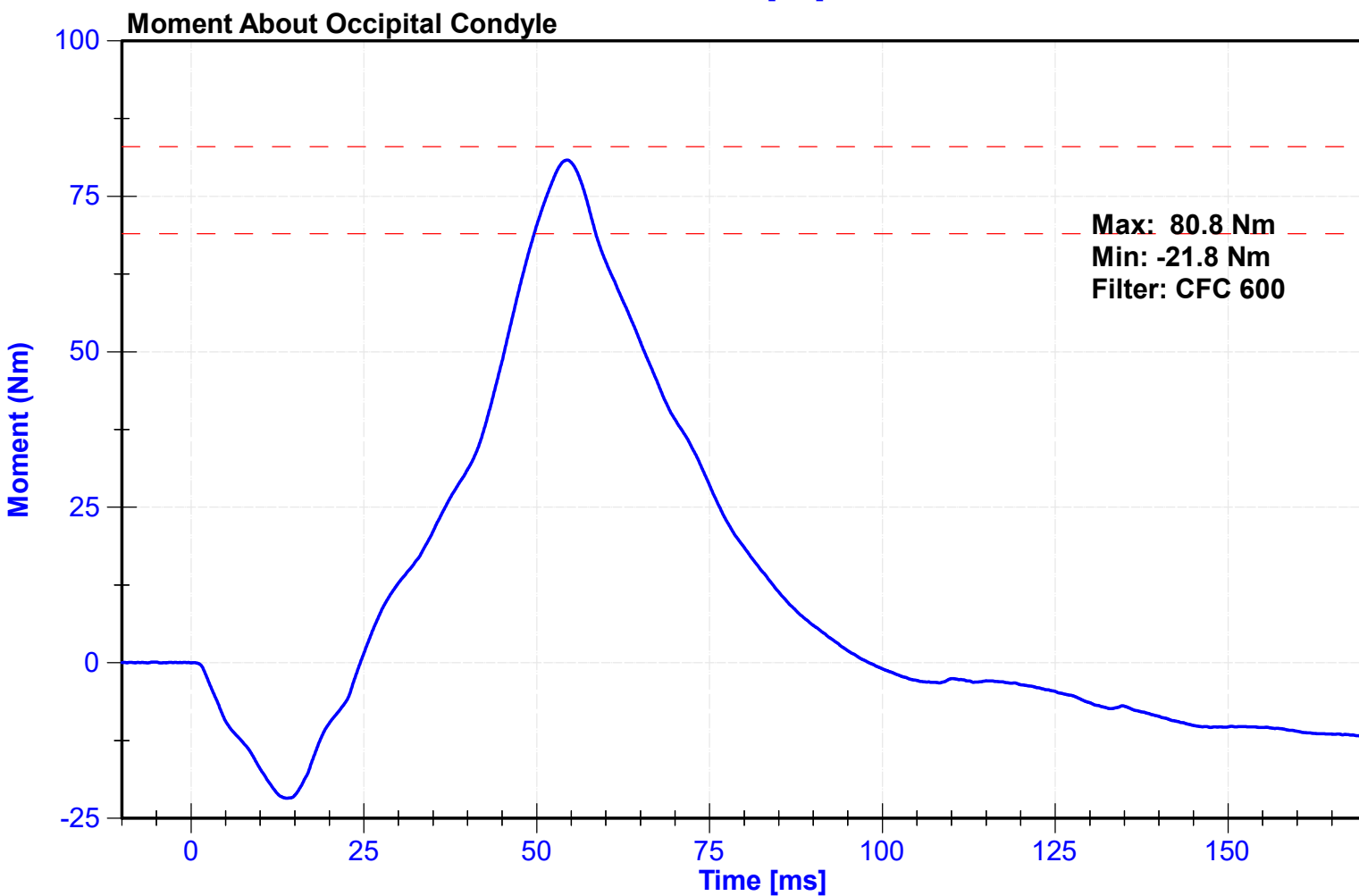
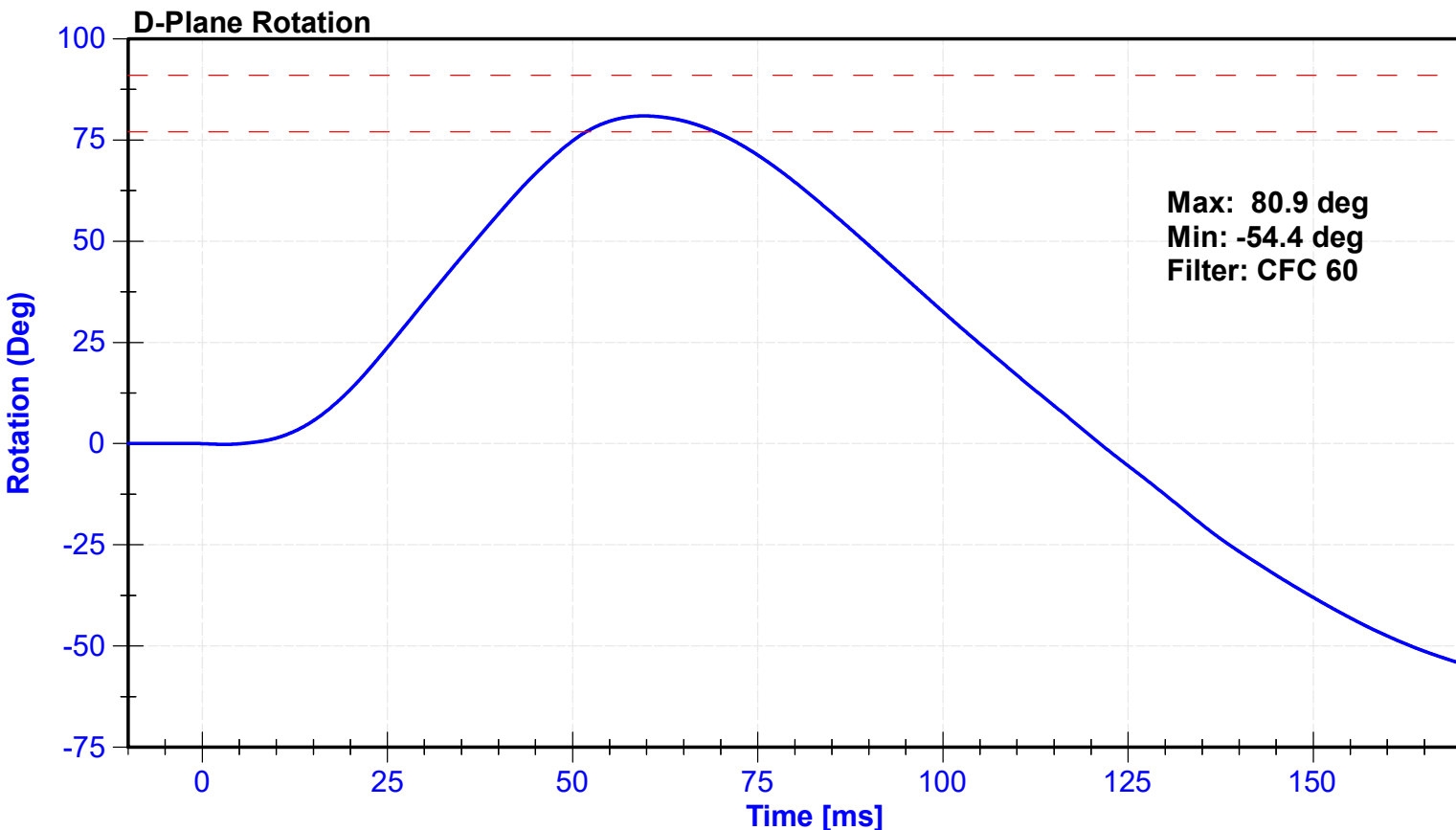
Results

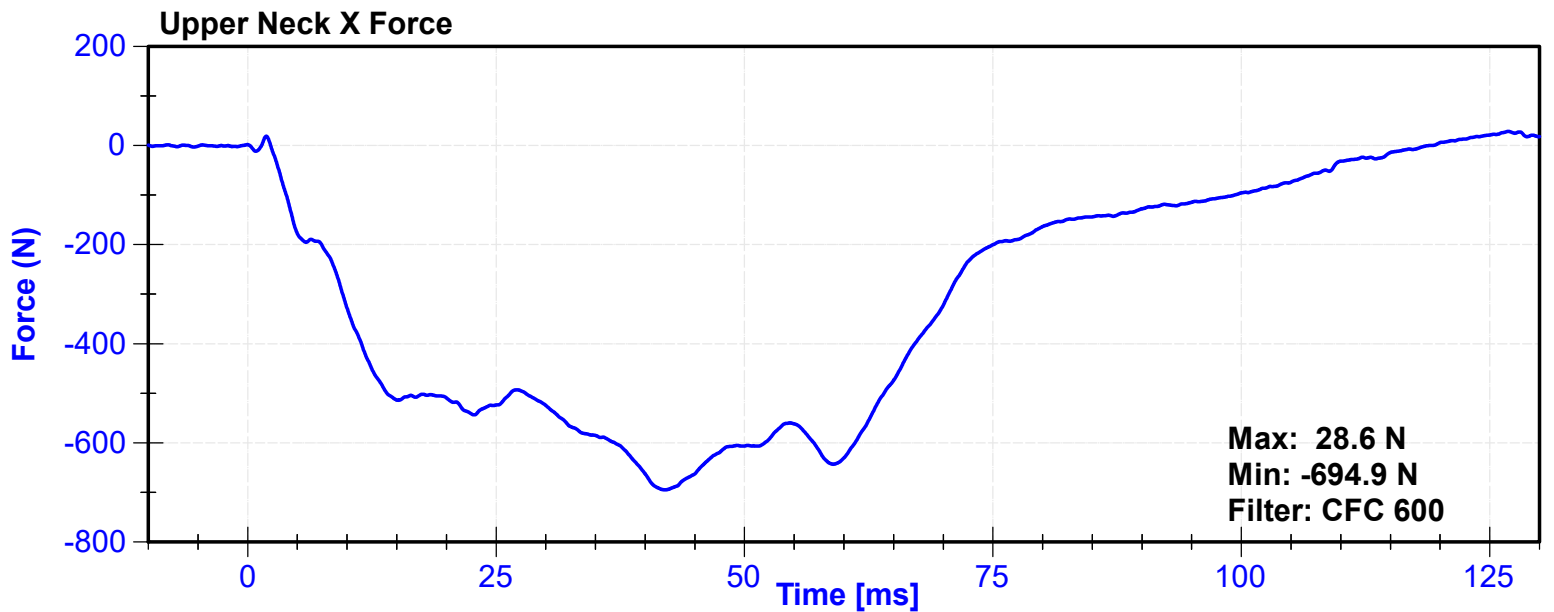
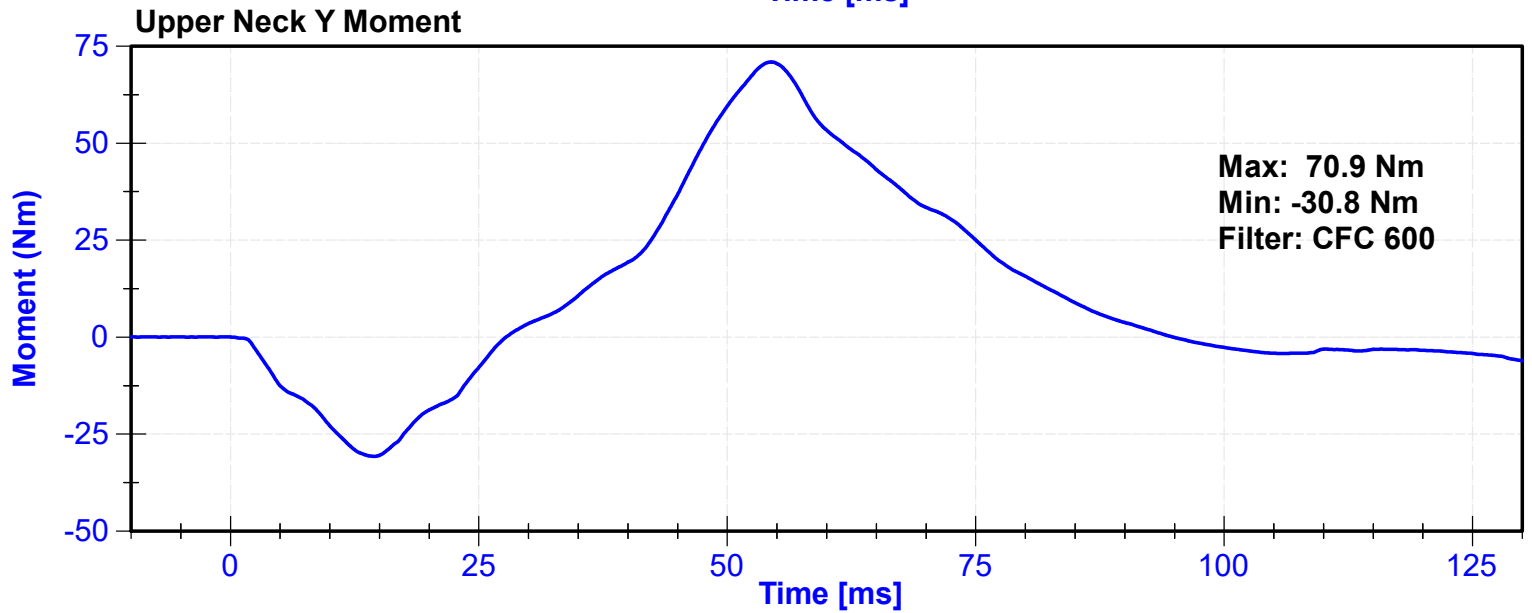
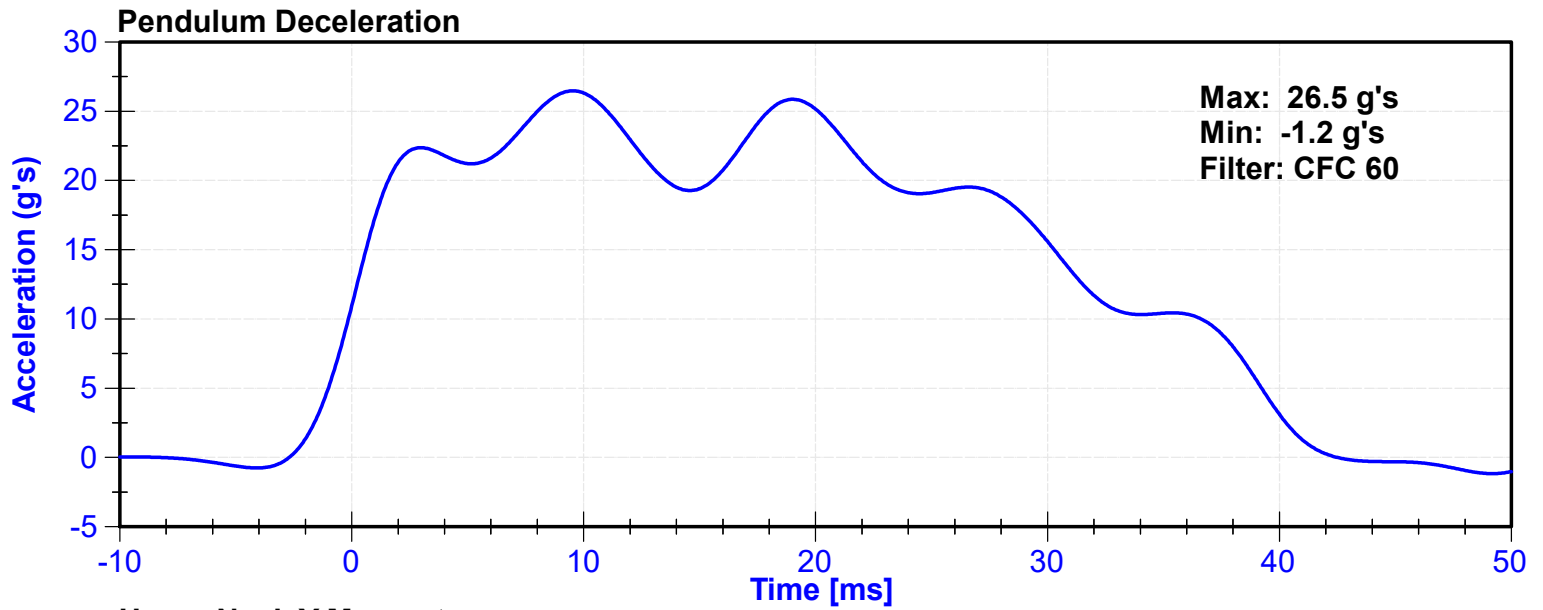
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	63.9	Pass
Velocity	6.89	7.13	m/s	7.058	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.15	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.39	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.34	Pass
Max D Plane Rotation	77	91	deg	80.9	Pass
Max Moment During Rotation Interval	69	83	Nm	80.8	Pass
Moment Decay to 10.0 Nm	80	100	ms	86.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	7231C-750	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	Servo	14CB1-3615_DS-093	7/10/2023	7/8/2024
Upper Neck Load Cell	Denton	2207-FX	6/23/2023	6/22/2024







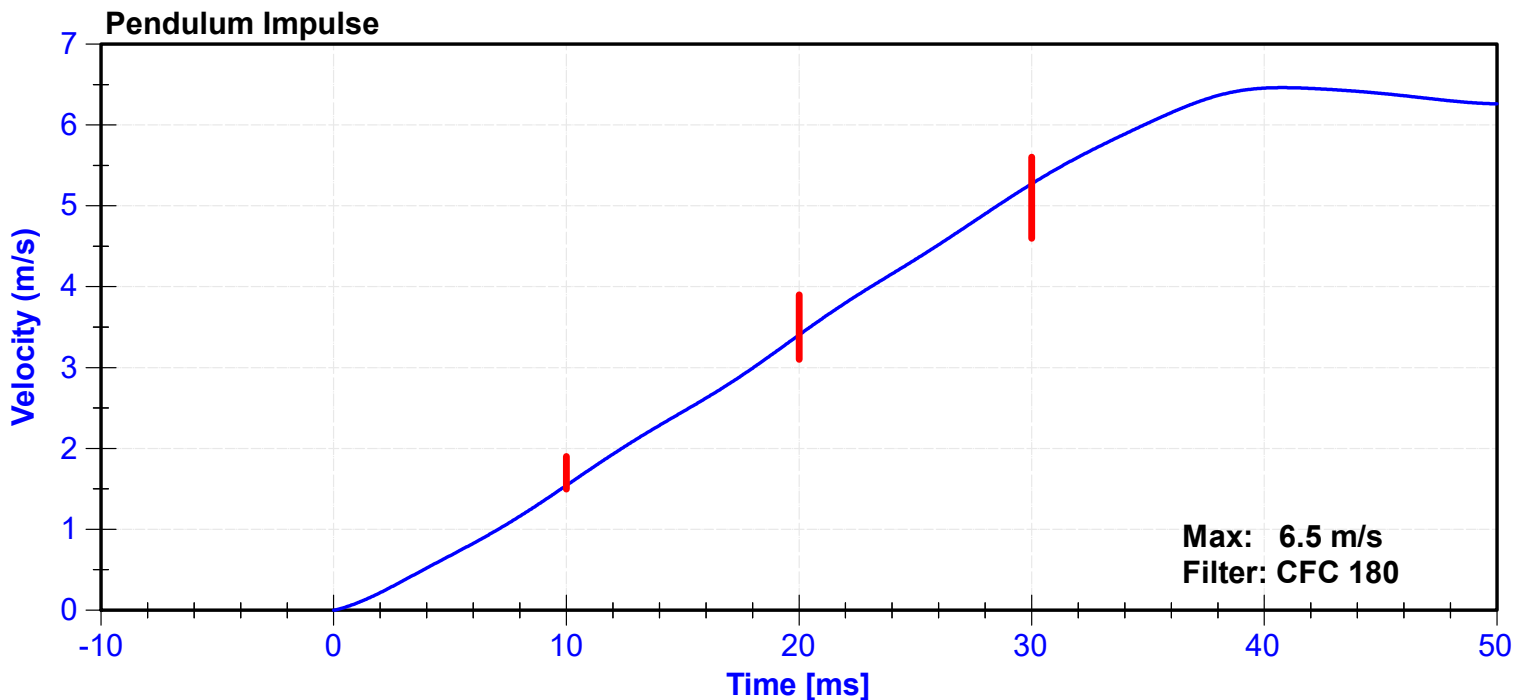
ATD Manufacturer	Humanetics	Test Technician	A. Genzel
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

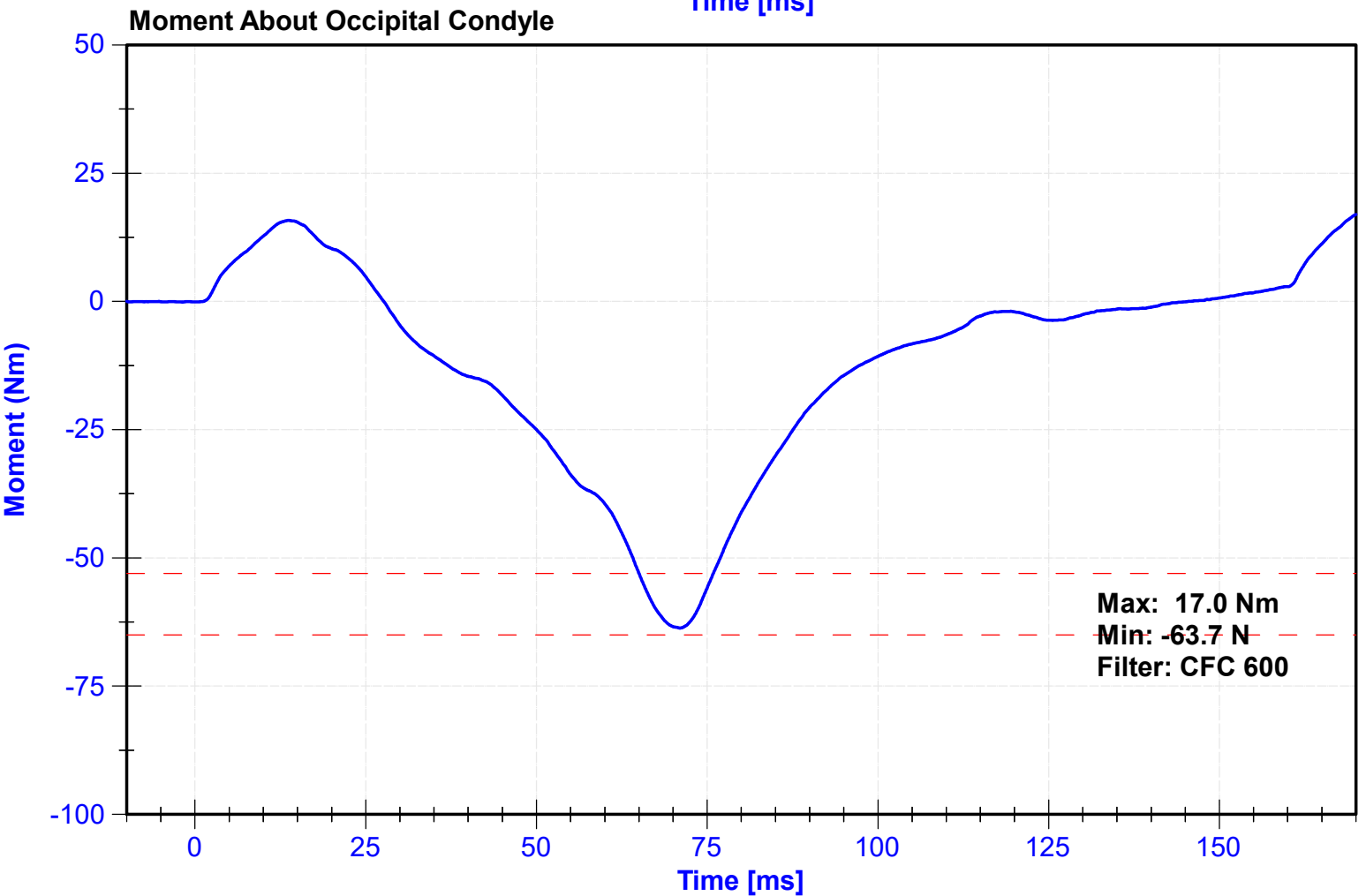
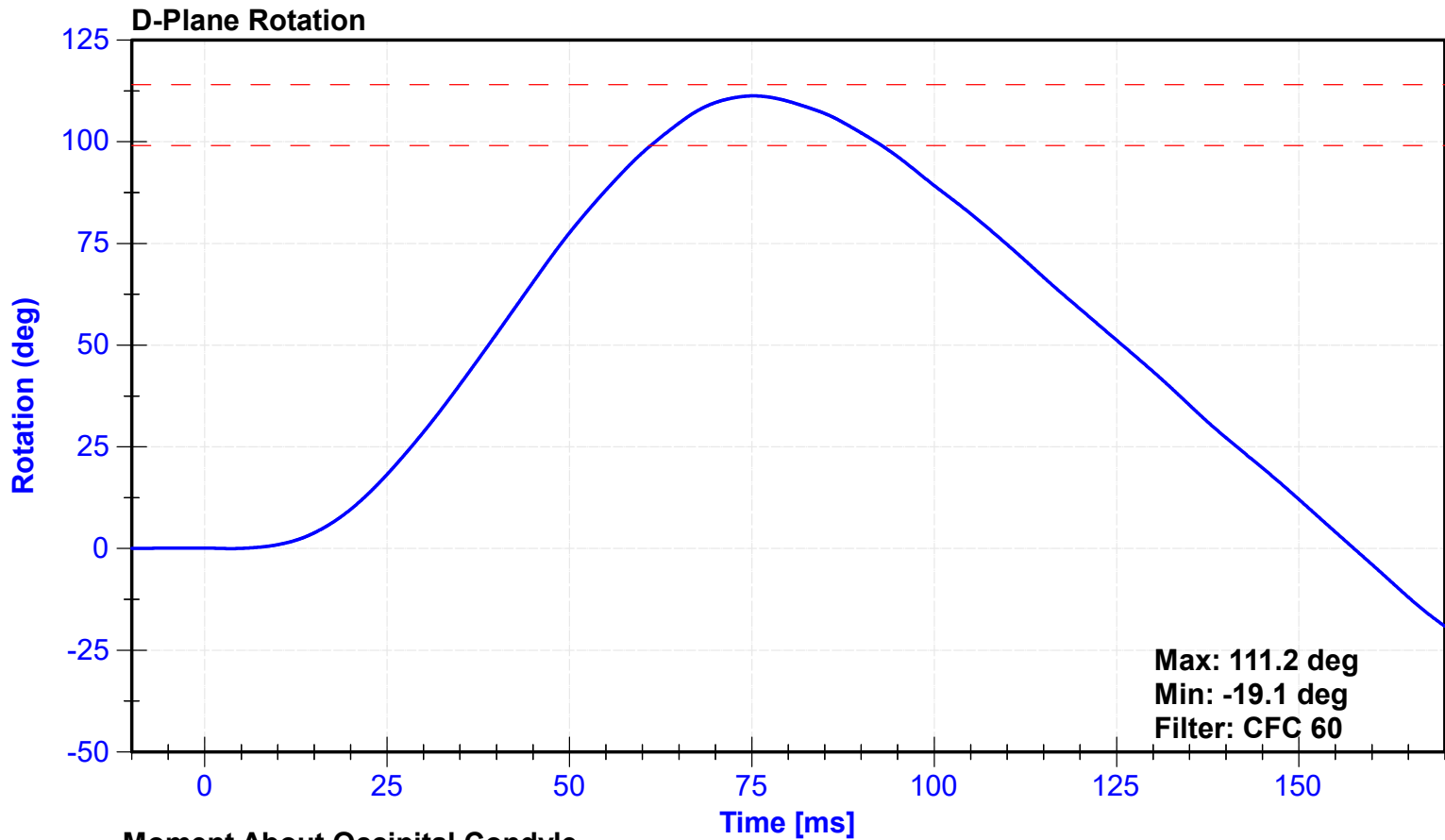
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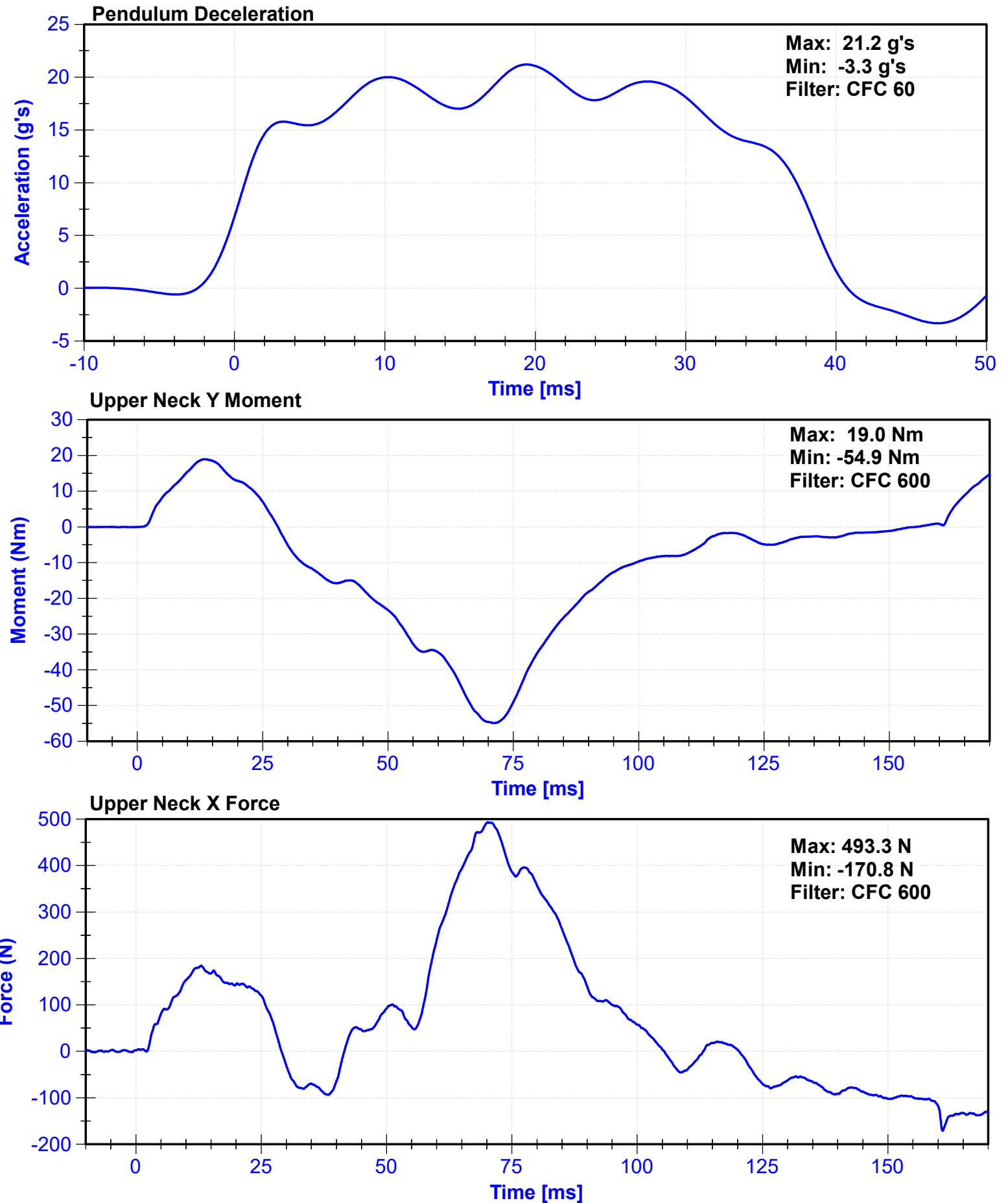
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	64.4	Pass
Velocity	5.95	6.19	m/s	6.125	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.54	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.40	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.27	Pass
D Plane Rotation	99	114	deg	111.2	Pass
Moment During Rotation Interval	-65	-53	Nm	-63.7	Pass
Moment Decay to -10Nm	94	114	ms	101.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	C16503	10/26/2022	10/26/2023
Pendulum Potentiometer	ETI	LABPOT1	5/5/2023	5/4/2024
Condyle Potentiometer	Servo	14CB1-3615_DS-093	7/10/2023	7/8/2024
Upper Neck Load Cell	Denton	2207-FX	6/23/2023	6/22/2024







ATD Manufacturer	Humanetics	Test Technician	J. Miller
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

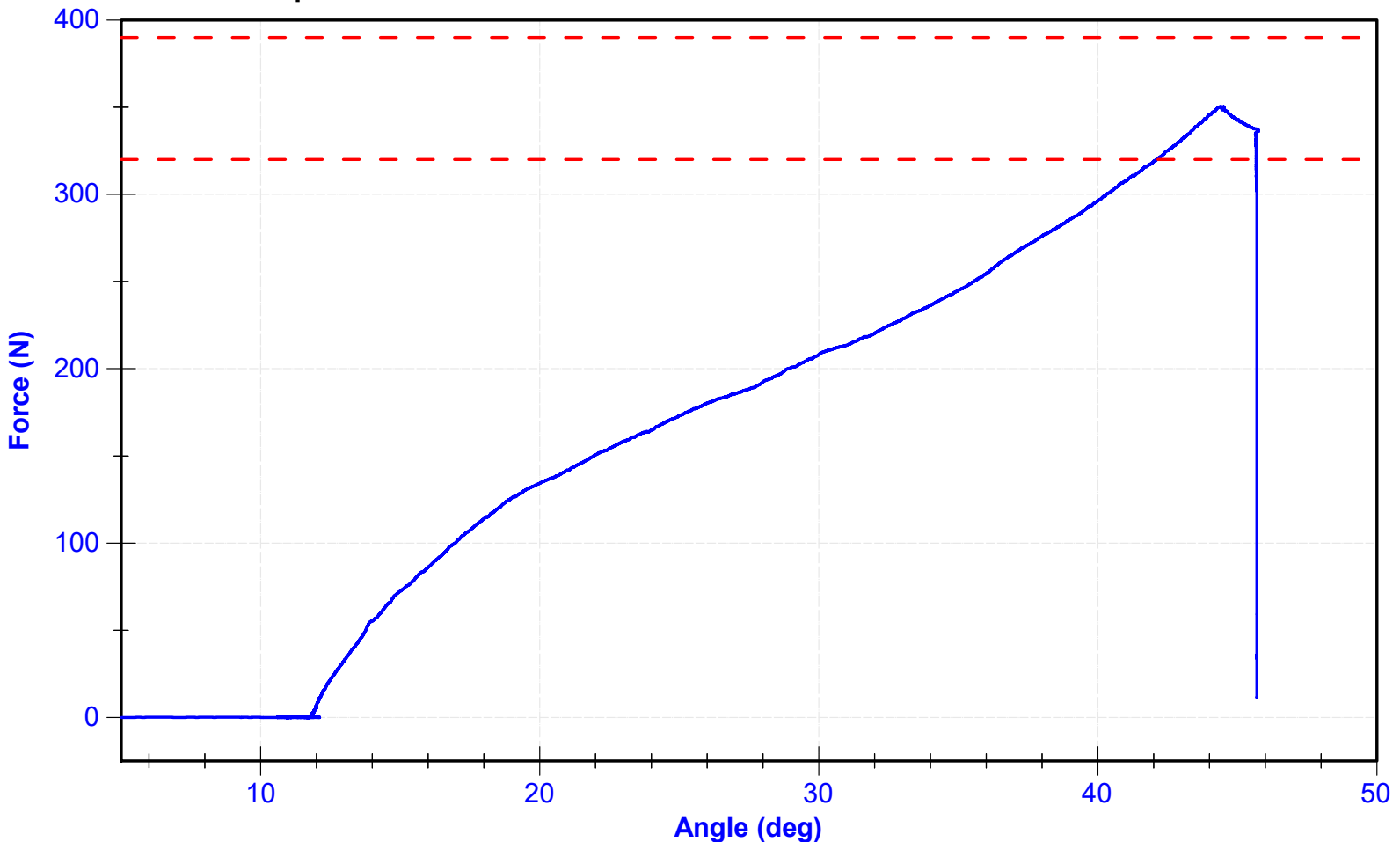
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.4	Pass
Humidity	10	70	%	64.1	Pass
Initial Angle	0	20	deg	11.4	Pass
Force at 45 Degrees	320	390	N	350.5	Pass
Return Angle Relative to Initial	0	8	deg	4.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker	DS-1905226	2022-11-09	2023-11-09
Load Cell	Interface	1134516	2022-09-27	2023-09-27

Force vs. Displacement



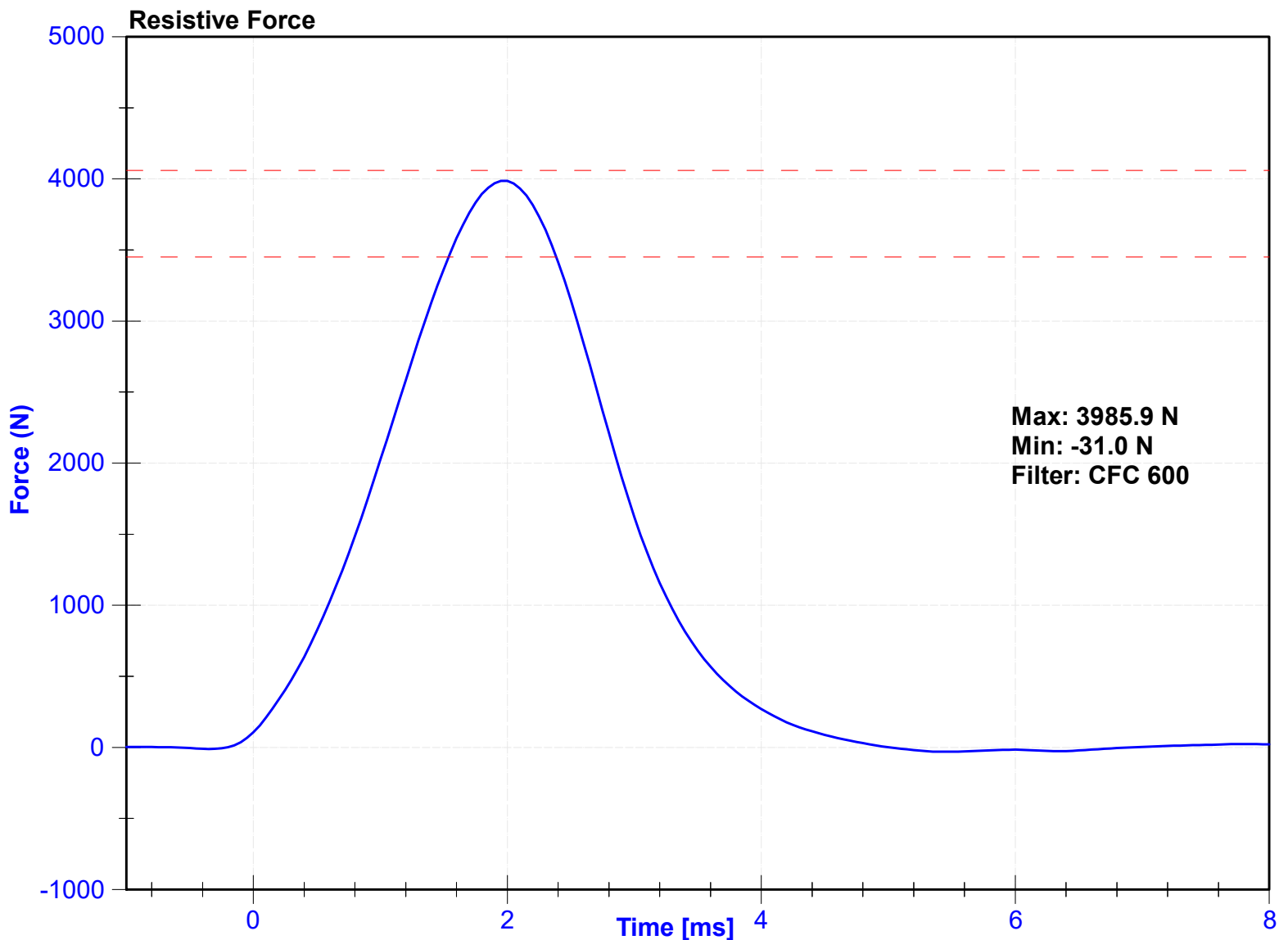
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

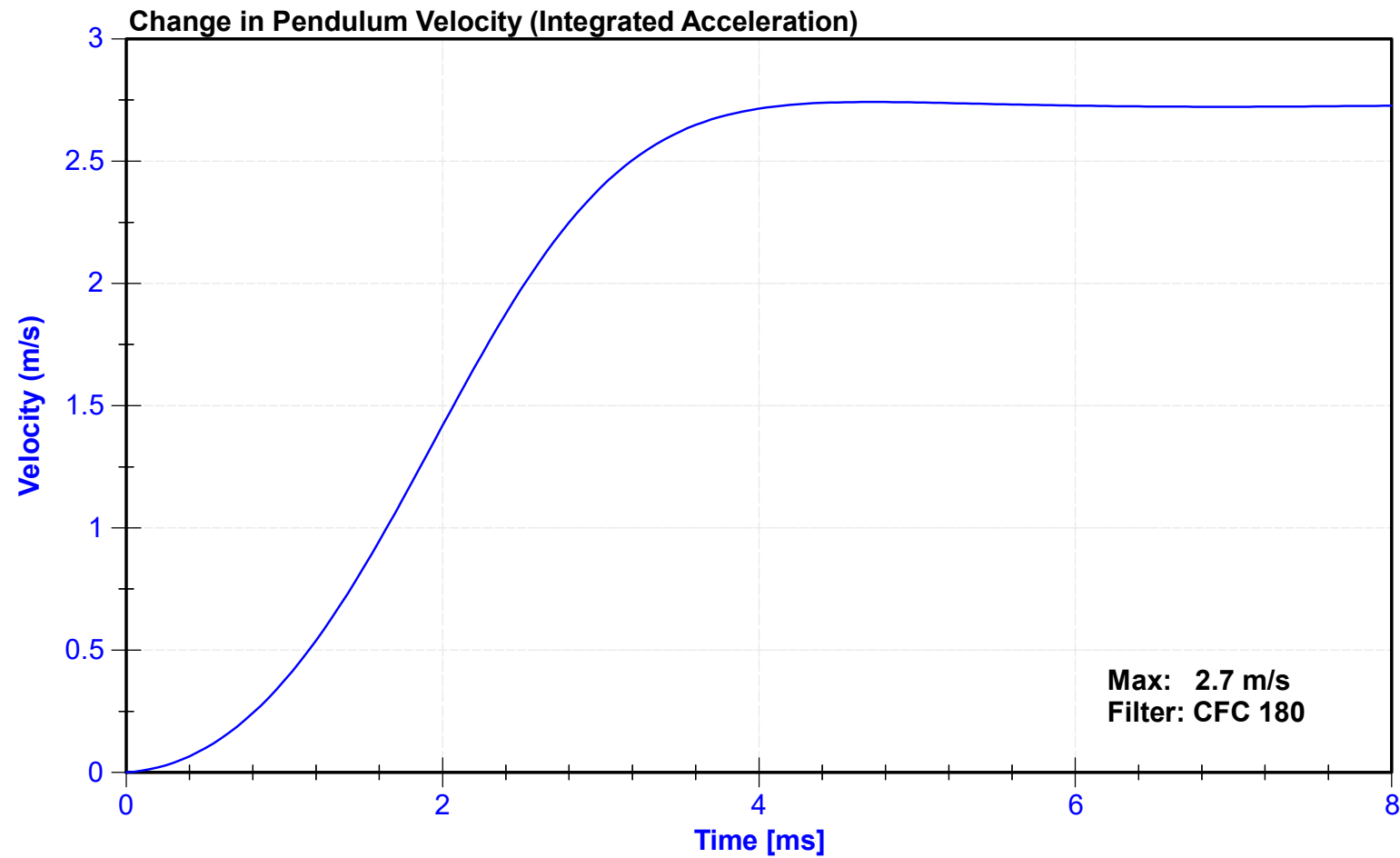
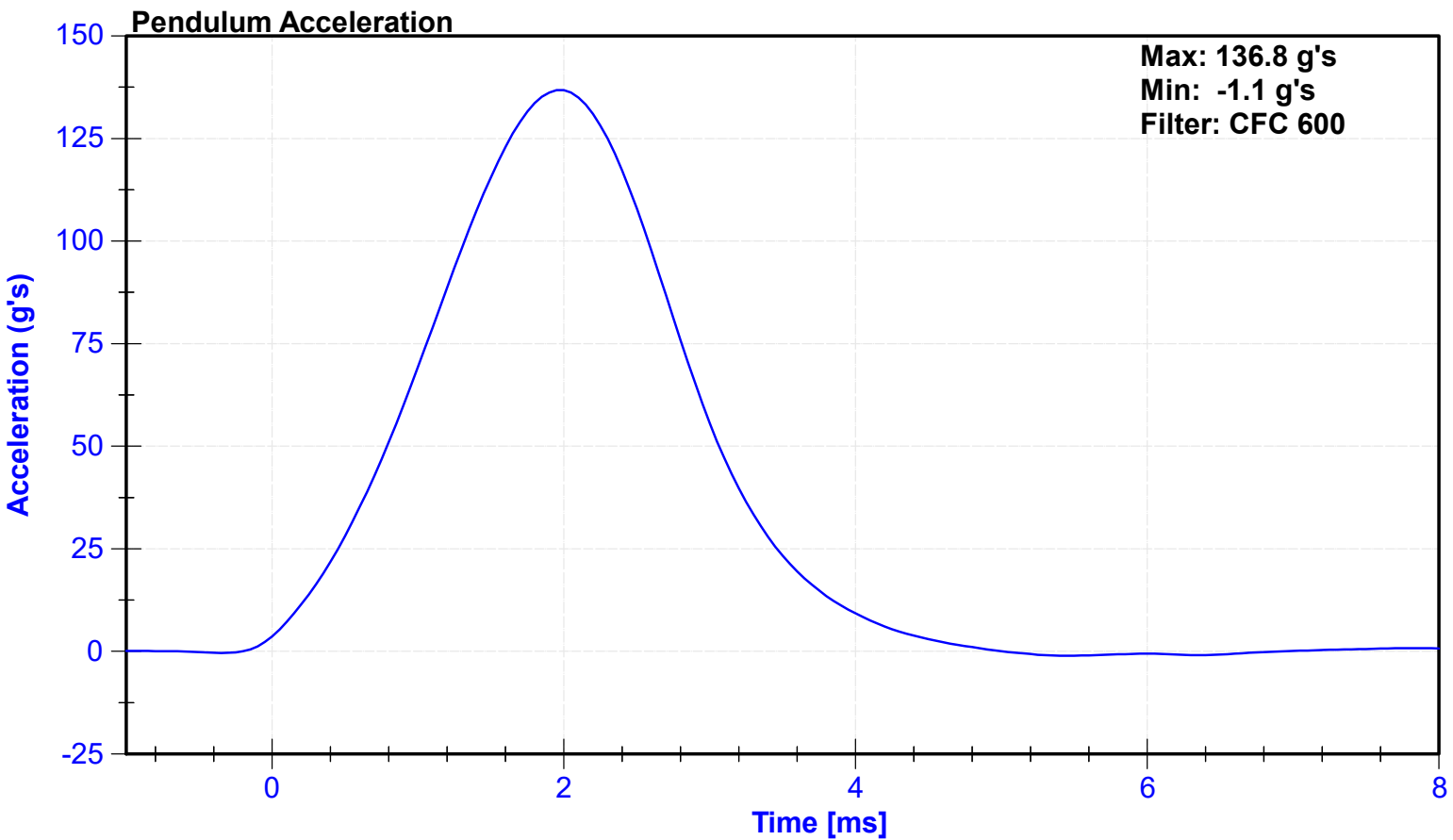
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.8	Pass
Humidity	10	70	%	52.3	Pass
Velocity	2.07	2.13	m/s	2.103	Pass
Resistive Force	3450	4060	N	3985.9	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023





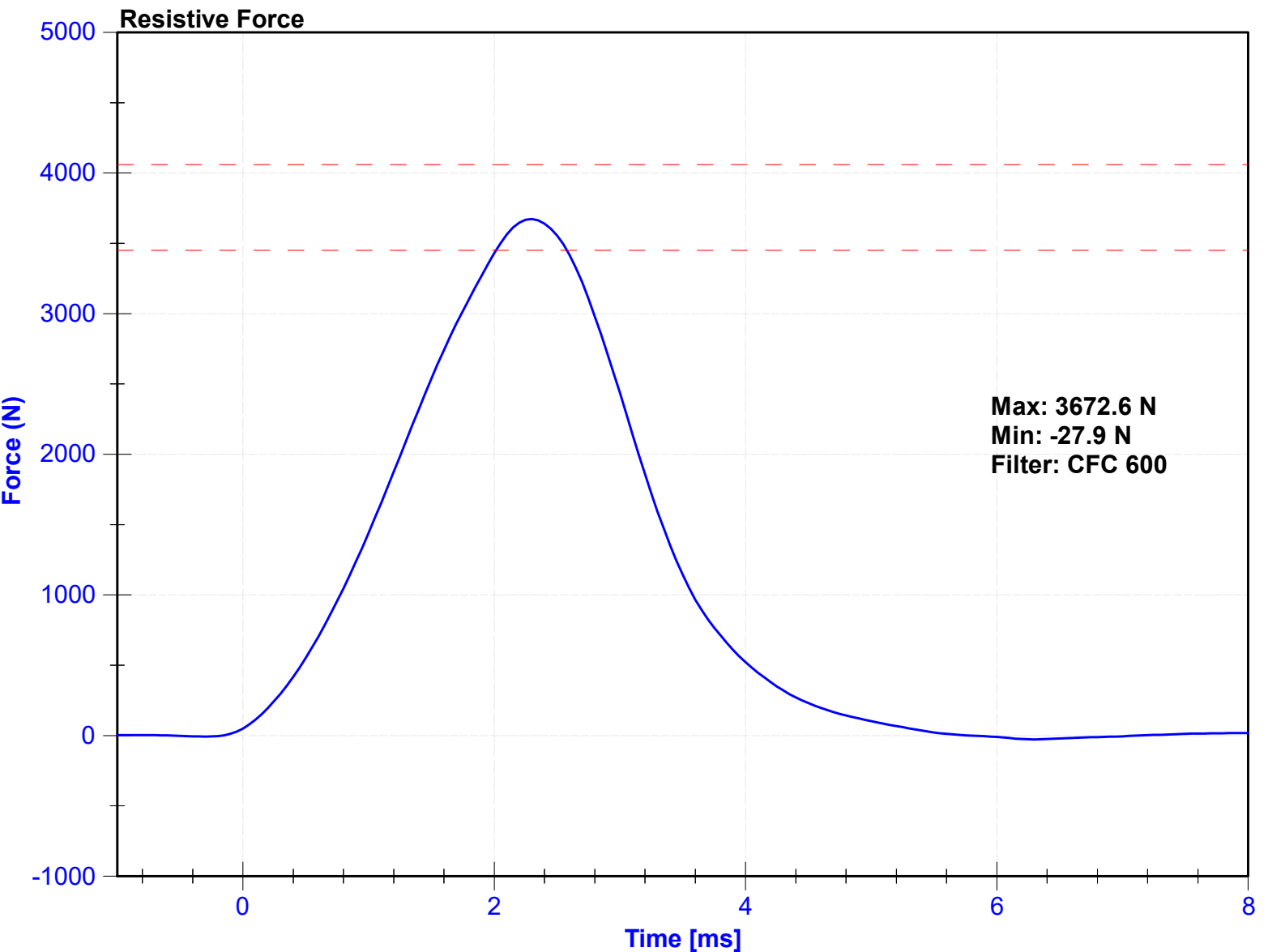
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

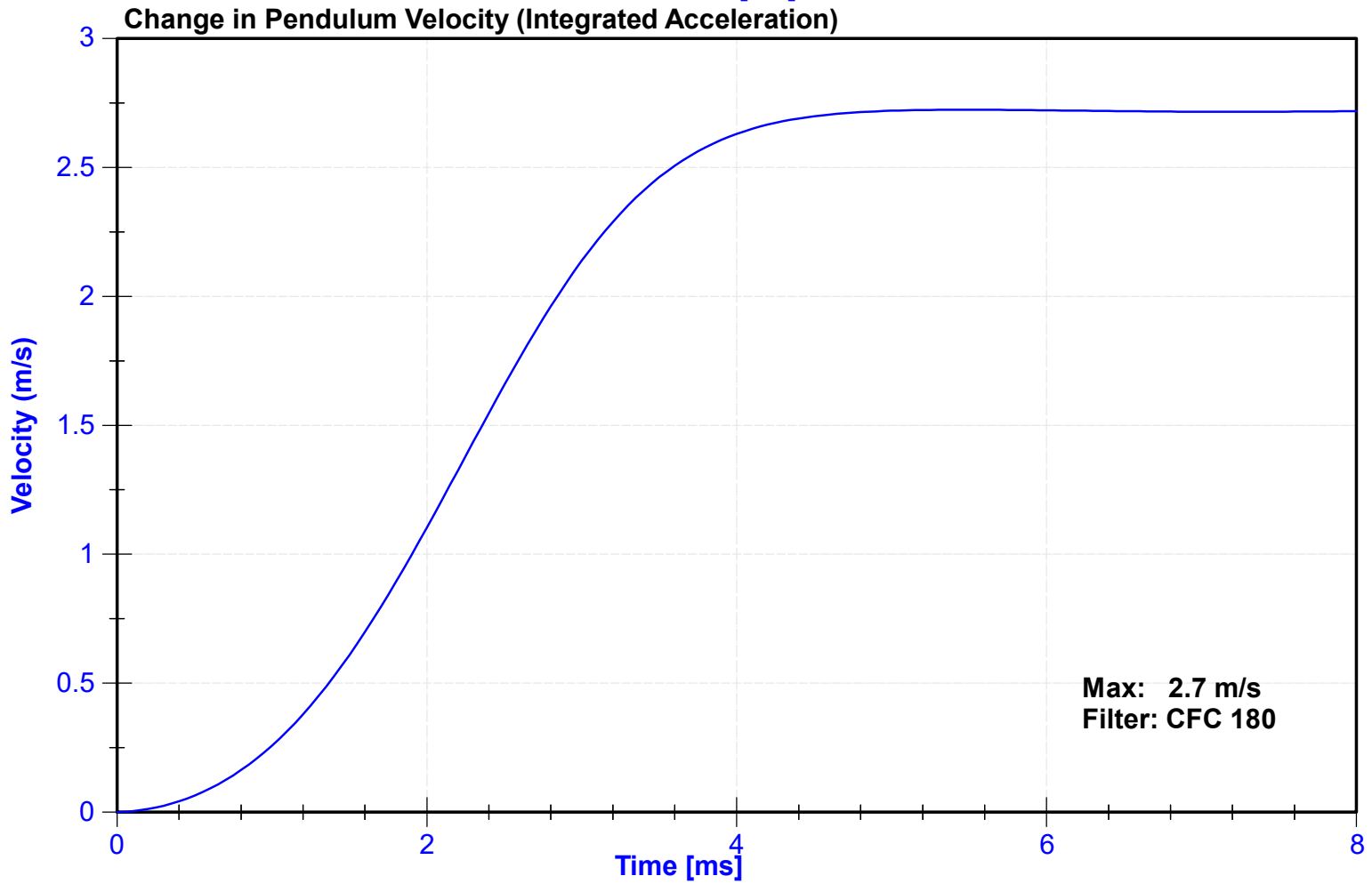
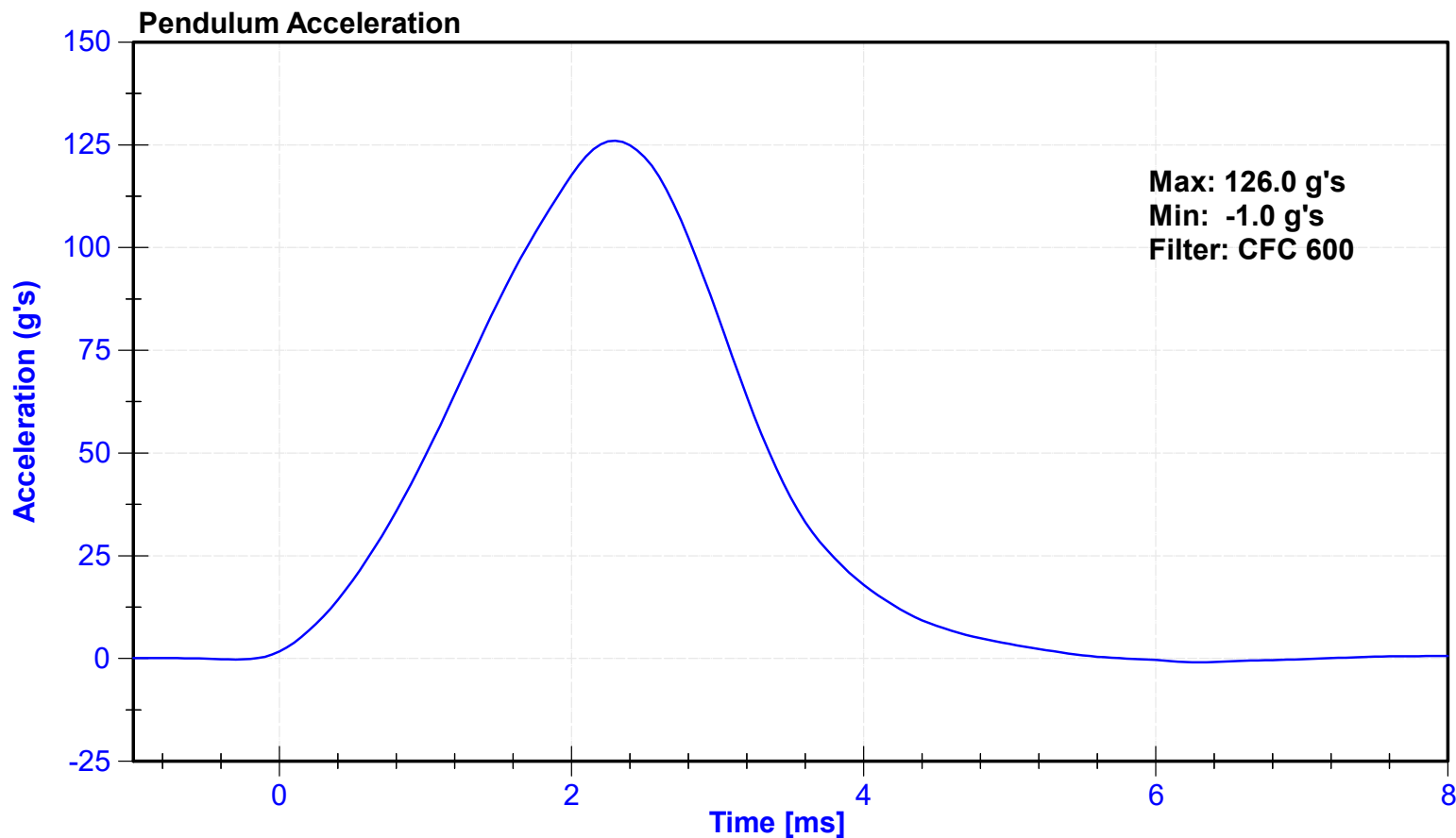
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.8	Pass
Humidity	10	70	%	52.3	Pass
Velocity	2.07	2.13	m/s	2.103	Pass
Resistive Force	3450	4060	N	3672.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023

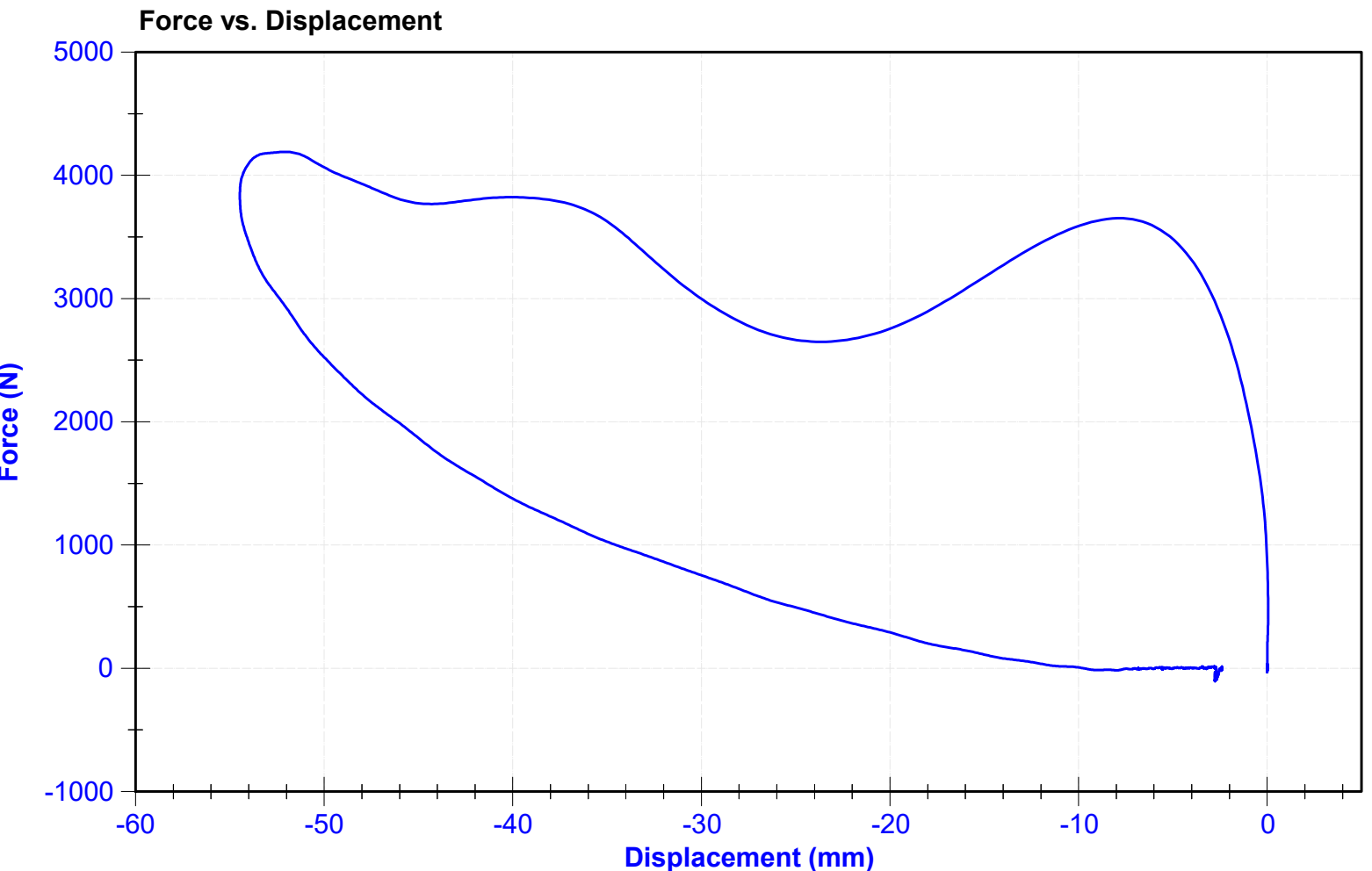


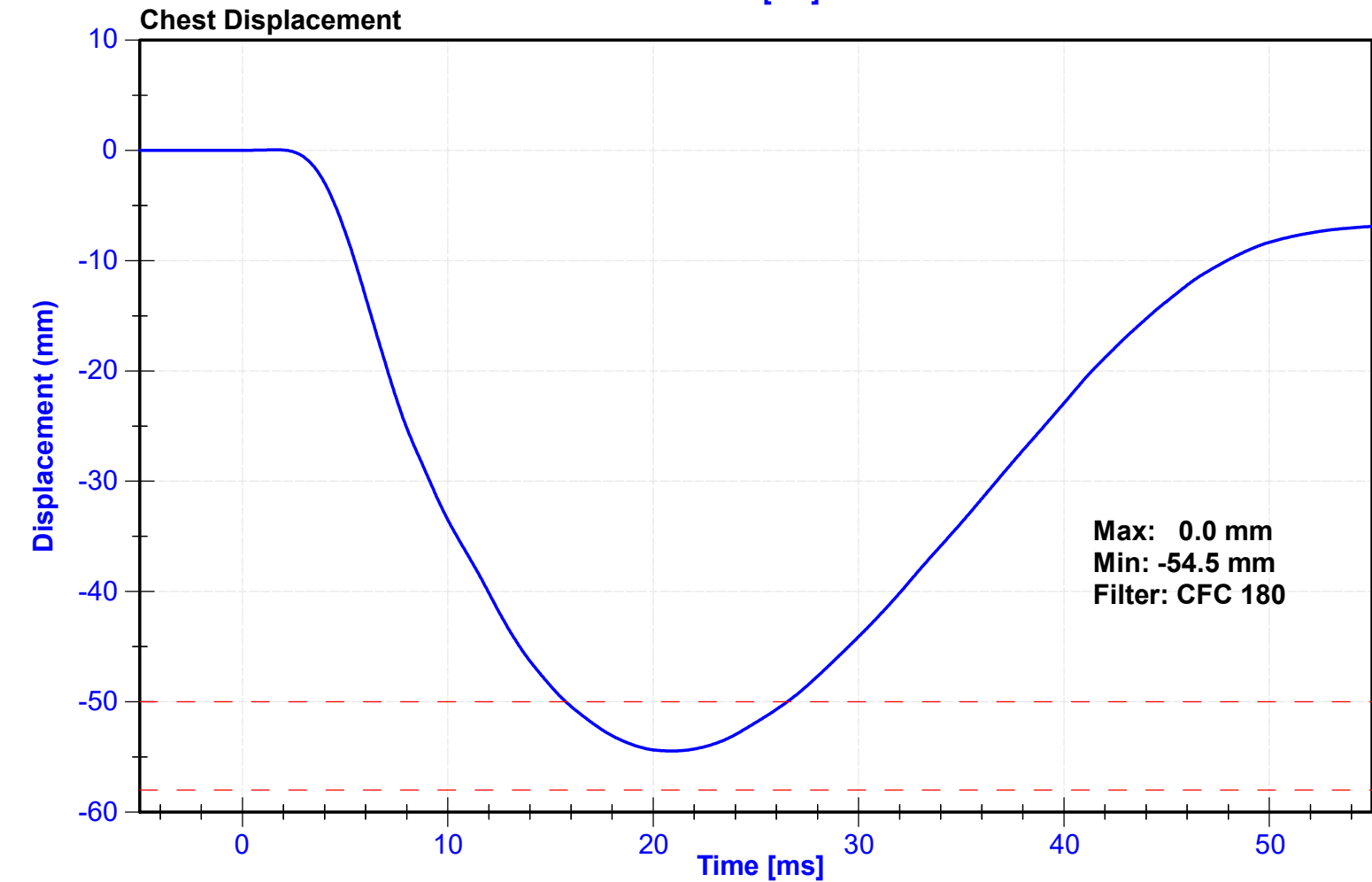
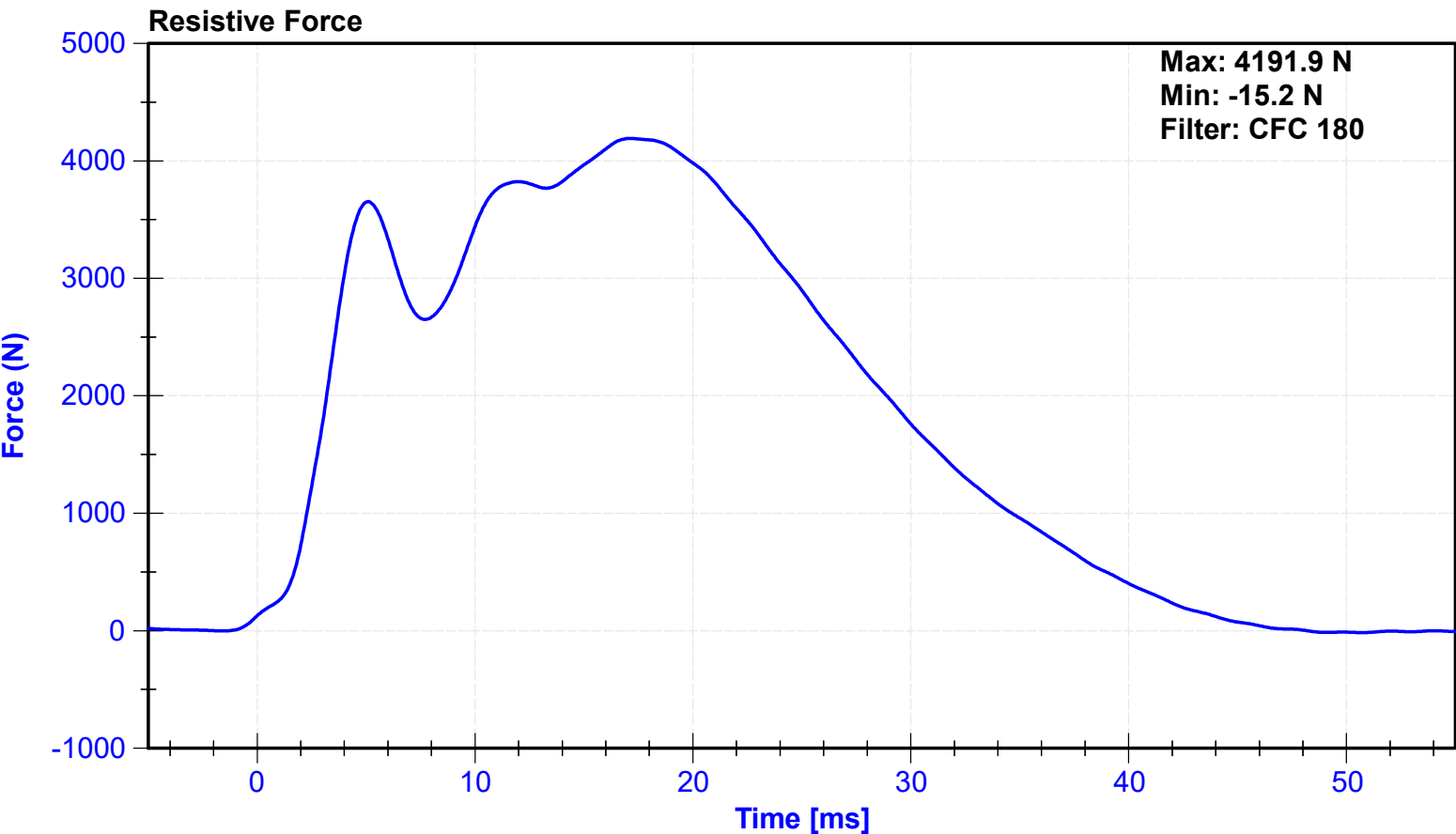


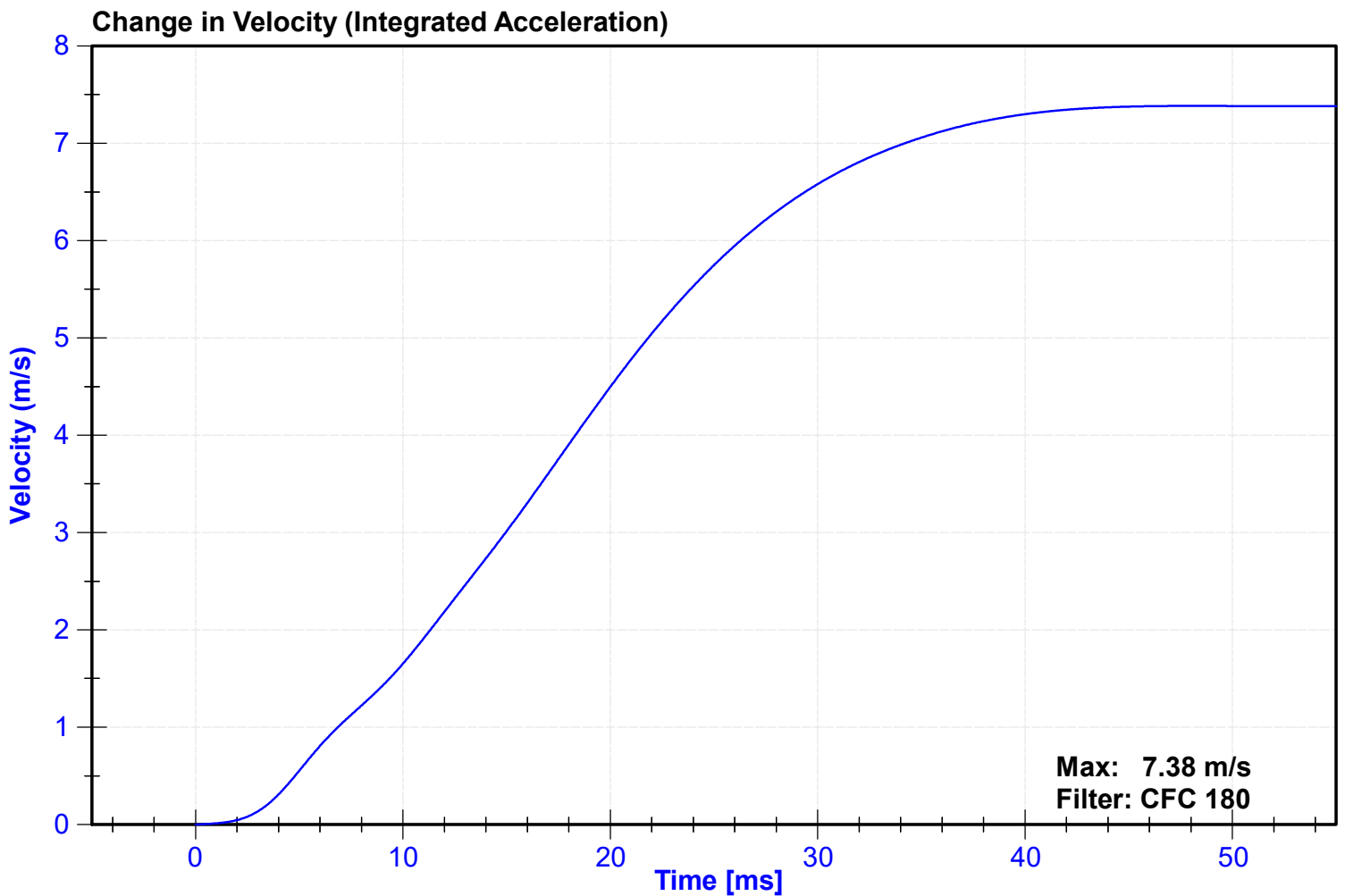
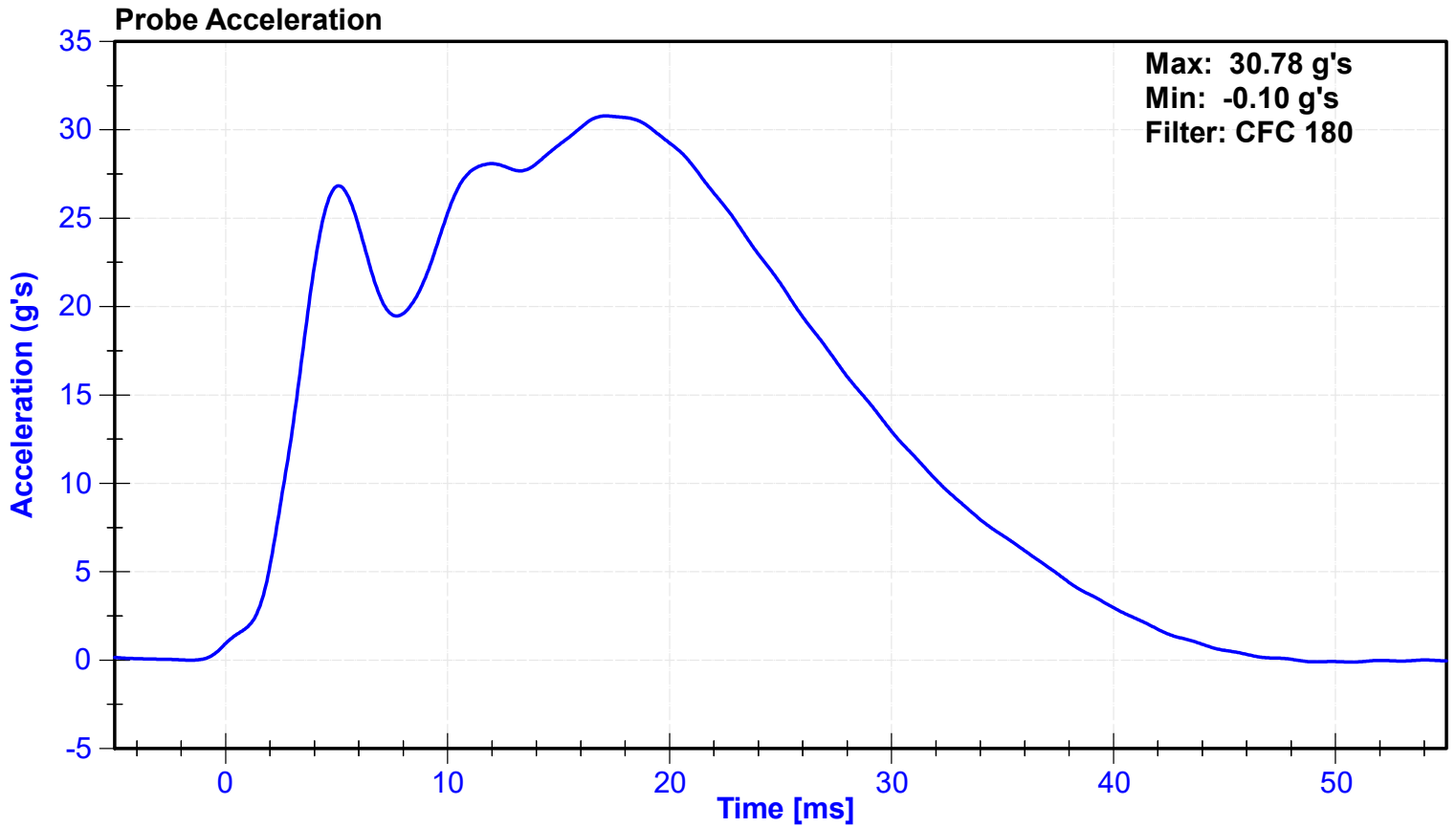
ATD Manufacturer	Humanetics	Test Technician	J. Miller
ATD Serial Number	137	Laboratory Supervisor	C. Mantel

Test Parameter	Results				
	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	63.4	Pass
Velocity	6.59	6.83	m/s	6.658	Pass
Chest Deflection	-58	-50	mm	-54.5	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4191.9	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4060.1	Pass
Hysteresis	69	85	%	73.2	Pass

Transducer Calibrations				
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	18546	11/19/2022	11/18/2023
Chest Potentiometer	Servo	0720	6/20/2023	12/19/2023







APPENDIX D

TEST EQUIPMENT AND INSTRUMENTATION CALIBRATION

Table 1 – Driver Dummy Instrumentation

Instrumentation		Axis/Location	Hybrid III 50 th S/N: 142		
			Serial Number	Manufacturer	Calibration Date
Head Accelerometers	Primary	X	P51681	Endevco	4/6/2023
		Y	P64151	Endevco	4/6/2023
		Z	P52114	Endevco	4/6/2023
	Redundant	X	P52079	Endevco	4/6/2023
		Y	P58905	Endevco	4/6/2023
		Z	P63996	Endevco	4/6/2023
Head Angular Rate Sensors		X	7603	DTS ARS	9/6/2022
		Y	15692	DTS ARS	9/6/2022
		Z	15695	DTS ARS	9/6/2022
Upper Neck Load Cell		FX, Fy, Fz MX,MY, MZ	851-FX	Humanetics	5/18/2023
Chest Accelerometers	Primary	X	P51991	Endevco	4/6/2023
		Y	P51269	Endevco	4/6/2023
		Z	P49185	Endevco	4/6/2023
	Redundant	X	P68059	Endevco	4/6/2023
		Y	P51713	Endevco	4/6/2023
		Z	P78824	Endevco	4/6/2023
Chest Potentiometer		X	0075	JDK	4/10/2023
Pelvis Accelerometer		X	P58800	Endevco	4/6/2023
		Y	P52157	Endevco	4/6/2023
		Z	P83317	Endevco	4/6/2023
Femur Load Cells - Left	Primary	Z	DH3271-FZ1	Denton	5/18/2023
	Redundant	Z	DH3271-FZ2	Denton	5/18/2023
Femur Load Cells - Right	Primary	Z	DI4213-FZ1	Denton	5/18/2023
	Redundant	Z	DI4213-FZ2	Denton	5/18/2023
Tibia Load Cells - Left	Upper	MX, MY, FZ	652-FZ	Denton	5/22/2023
	Lower	MX, MY, FZ	673-FZ	Denton	5/22/2023
Tibia Load Cells – Right	Upper	MX, MY, FZ	651-FZ	Denton	5/22/2023
	Lower	MX, MY, FZ	505-FZ	Denton	5/22/2023
Foot Accelerometers - Left	Rear	X	P82756	Endevco	4/6/2023
	Front	Z	P51872	Endevco	4/6/2023
Foot Accelerometers - Right	Rear	X	P66942	Endevco	4/6/2023
	Front	Z	P58779	Endevco	4/6/2023
Seat belt Load Cells	Lap		292	GFE	2/17/2023
	Shoulder		174	GFE	2/17/2023

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	6/20/2023
		Y	P83335	Endevco	6/20/2023
		Z	P64149	Endevco	6/20/2023
	Redundant	X	P52008	Endevco	6/20/2023
		Y	P52045	Endevco	6/20/2023
		Z	P74774	Endevco	6/20/2023
Head Angular Rate Sensors		X	15212	DTS ARS	9/6/2022
		Y	6731	DTS ARS	9/6/2022
		Z	7521	DTS ARS	9/6/2022
Upper Neck Load Cell		FX, Fy, Fz MX,MY, MZ	2025-FX	Humanetics	3/29/2023
Chest Accelerometers	Primary	X	T21142	Endevco	6/20/2023
		Y	P83346	Endevco	6/20/2023
		Z	P49190	Endevco	6/20/2023
	Redundant	X	P58794	Endevco	6/20/2023
		Y	P69791	Endevco	6/20/2023
		Z	T11253	Endevco	6/20/2023
Chest Potentiometer		X	0720	Servo	6/20/2023
Pelvis Accelerometer		X	P58735	Endevco	6/20/2023
		Y	P77587	Endevco	6/20/2023
		Z	P51285	Endevco	6/20/2023
Femur Load Cells - Left	Primary	Z	DT0998-FZ1	Denton	5/18/2023
	Redundant	Z	DT0998-FZ2	Denton	5/18/2023
Femur Load Cells - Right	Primary	Z	109-FZ1	Denton	5/18/2023
	Redundant	Z	109-FZ2	Denton	5/18/2023
Tibia Load Cells - Left	Upper	MX, MY, FZ	361-FZ	Denton	5/22/2023
	Lower	MX, MY, FZ	363-FZ	Denton	5/22/2023
Tibia Load Cells – Right	Upper	MX, MY, FZ	406-FZ	Denton	5/22/2023
	Lower	MX, MY, FZ	362-FZ	Denton	5/22/2023
Foot Accelerometers - Left	Rear	X	P78959	Endevco	6/20/2023
	Front	Z	P83418	Endevco	6/20/2023
Foot Accelerometers - Right	Rear	X	P63998	Endevco	6/29/2023
	Front	Z	P80265	Endevco	6/20/2023
Seat belt Load Cells	Lap		DK1753	GFE	2/17/2023
	Shoulder		295	GFE	2/17/2023

Table 3 – Vehicle Instrumentation

Instrumentation			Axis	Serial Number	Manufacturer	Calibration Date
Crossmember/Rear Seat Accelerometers	Left	Primary	X	A398338	Measurement Specialties	6/2/2023
			Z	A400005	Measurement Specialties	6/2/2023
		Redundant	X	A400015	Measurement Specialties	6/2/2023
	Right	Primary	X	A315183	Measurement Specialties	5/3/2023
			Z	A315719	Measurement Specialties	5/3/2023
		Redundant	X	A315878	Measurement Specialties	5/3/2023
Engine Accelerometers	Top		X	G22578	Endevco	3/9/2023
	Bottom		X	G23427	Endevco	4/24/2023