

REPORT NUMBER: NCAP-CAL-23-007

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

**Hyundai Motor Company
2023 Genesis GV70
5 Door SUV**

NHTSA No: M20234203

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



August 16, 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**

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Matthew Pronko, Senior Test Engineer

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 Genesis GV70 5 Door SUV in accordance with the specifications of the Office of Crashworthiness Standards Laboratory Procedure for NCAP Full Frontal Rigid Barrier Impact Testing. The test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on August 4, 2023. The impact velocity of the vehicle was 56.29 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 429 mm at crush zone 5. The test vehicle's occupant performance data is as follows:																																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <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>274.367</td> <td>700</td> <td>249.058</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-30.722</td> <td>52</td> <td>-15.468</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.305</td> <td>1</td> <td>0.285</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4170</td> <td>863.938</td> <td>2620</td> <td>631.442</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4000</td> <td>-105.545</td> <td>2520</td> <td>-440.257</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10008</td> <td>-1239.716</td> <td>6805</td> <td>-2330.659</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10008</td> <td>-1411.194</td> <td>6805</td> <td>-1574.467</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	274.367	700	249.058	Maximum Chest Compression	mm	63	-30.722	52	-15.468	Nij		1	0.305	1	0.285	Neck Tension	N	4170	863.938	2620	631.442	Neck Compression	N	4000	-105.545	2520	-440.257	Left Femur Force	N	10008	-1239.716	6805	-2330.659	Right Femur Force	N	10008	-1411.194	6805	-1574.467
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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 Genesis GV70 5 Door SUV at a velocity of 56.29 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on August 4, 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 shoulder belts to measure dummy torso 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 429 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 air bag.

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

The occupant data is summarized below.

ATD Position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50th)	274.367	0.305	863.938	-105.545	47.419	-30.722	-1239.716	-1411.194
Passenger (5th)	249.058	0.285	631.442	-440.257	46.327	-15.468	-2330.659	-1574.467

GENERAL COMMENTS:

1. P1 (Driver) serial number - 142
2. P2 (Passenger) serial number - 137
3. During pre-test vehicle preparation, it was discovered that the frontal test vehicle windshield was damaged during vehicle delivery, so the COR requested that the frontal and side pole test vehicles be swapped. A camera mount was already installed on the side pole test vehicle hood. Due to the nature of the frontal test were the hood likely impacts the barrier; the hood with the camera mount could not be used. Therefore it was necessary to also swap the hoods. The hoods from the frontal and side test vehicle were identical except for color and were swapped/reinstalled following vehicle manufacturer specifications.

Data Anomalies:

- No Questionable Channels

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

This section contains information reporting for the following Data Sheets:

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

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

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Seat Belt Positioning Data

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

Data Sheet No. 7 – Vehicle Accelerometer Locations

Data Sheet No. 8 – Photographic Reference Target Locations

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

Data Sheet No. 10 – Test Vehicle Summary of Results

Data Sheet No. 11 – Post-Test Observations

Data Sheet No. 12 – Vehicle Profile Measurements

Data Sheet No. 13 – Accident Investigation Division Data

Data Sheet No. 14 – Vehicle Intrusion Measurements

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

Data Sheet No. 16 – FMVSS 301 Barrier Impact and 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 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20234203	Traction Control System (TCS)	Yes
Model Year	2023	Power Steering	Yes
Make	Genesis	Power Window Auto-Reverse	Yes
Model	GV70	Driver Frontal Airbag	Yes
Body Style	5 Door SUV	Driver Curtain Airbag	Yes
VIN	KMUMADTB9PU133844	Driver Head/Torso Airbag	No
Body Color	Uyuni White	Driver Torso Airbag	No
Odometer Reading (km /mi)	12 miles	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.5	Driver Pelvis Airbag	No
Type / No. Cylinders	14 Turbo	Driver Knee Airbag	Yes
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	All Wheel Drive	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	Yes-Removed	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	Yes	Front Pass. Knee Airbag	No
Running Boards	No	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 – Front Center Seat Airbag	Yes

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	Hyundai Motor Company	GVWR (KG)	2495
Date of Manufacture	May/2023	GVWR Front (KG)	1245
		GVWR Rear (KG)	1420

VEHICLE SEATING AND WEIGHT CAPACITY DATA

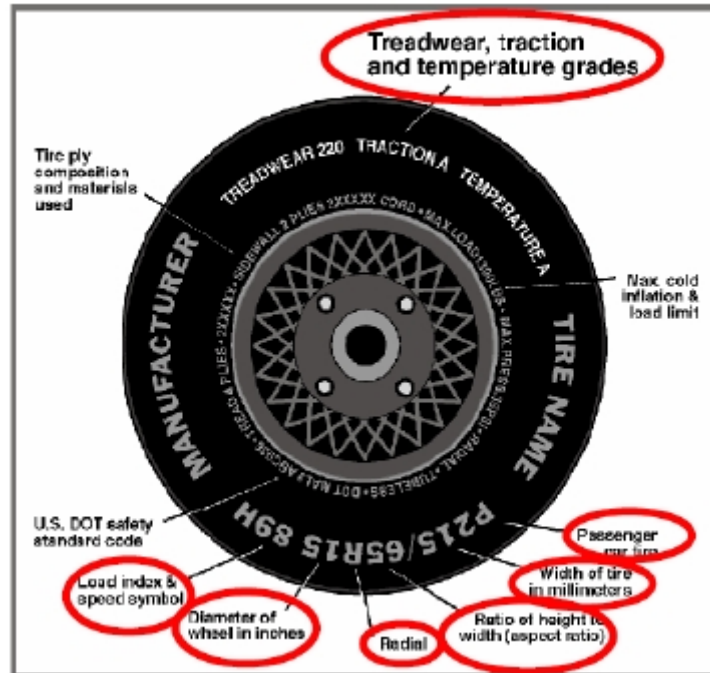
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	N/A	
Number of Occupants	2	3	N/A	5
Capacity Wt. (VCW) (kg)				462
Cargo Wt. (RCLW) (kg)				122

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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

Collect items circled in red, tire manufacturer, and tire name.



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	340	340
Cold Pressure (kPa)	230	250
Recommended Tire Size	235/55R19	235/55R19
Tire Size on Vehicle	235/55R19	235/55R19
Tire Manufacturer	Michelin	Michelin
Tire Model	Primacy Tour	Primacy Tour
Treadwear	540	540
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Polyamide	2 Polyester, 2 Steel, 1 Polyamide
Load Index / Speed Symbol	105W	105W
Tire Material	Rubber	Rubber
DOT Safety Code Left	0C8F 048X 4522	0C8F 048X 4522
DOT Safety Code Right	0C8F 048X 4522	0C8F 048X 4522

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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	502	479		549	572	
Right	kg	511	465		545	548	
Ratio	%	51.8	48.2		49.4	50.6	
Total	kg	1013	944	1957	1094	1120	2214

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1957	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	142	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	122	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2221	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	878	878	895	896	1387
As Tested	mm	868	874	873	876	1454
Post-Test	mm	900	893	872	880	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2875
Total Vehicle Length at Left Side	mm	4638
Total Vehicle Length at Centerline	mm	4712
Total Vehicle Length at Right Side	mm	4638
Weight of Ballast in Cargo Area	kg	81
Weight of Vehicle Components Removed	kg	34
Amount of Stoddard Solvent in Fuel Tank	L	61.4

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

None.

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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	4712
2	Total Width	1891
3*	Bumper Top Height	654
4*	Bumper Bottom Height	545
5*	Longitudinal Member Top Height	769
6	Distance Between Longitudinal Members	1290
7	Longitudinal Member Width	74
8*	Engine Top Height	931
9*	Engine Bottom Height	235
10	Engine and Gearbox Width	310
11	Front Bumper-Engine Distance	718
12*	Front Shock Absorber Fixing Height	971
13*	Bonnet Leading Edge Height	907
14	Front Shock Absorber Fixing Width	1097
15	Front Bumper – Front Axle Distance	840
16	Front Axle – A Pillar Distance	676
17	A-Pillar – B-Pillar Distance	1105
18	B-Pillar – Rear Axle Distance	1092
19	B-Pillar – C-Pillar Distance	1014
20*	Roof Sill Bottom Height	1524
21*	Roof Sill Top Height	1574
22*	Floor Sill Bottom Height	386
23*	Floor Sill Top Height	445

*Height Measurements are taken from the ground
 Note: All measurements are in millimeters

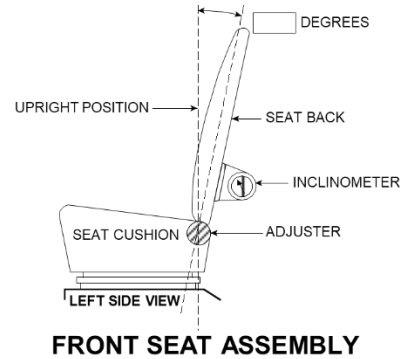
DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

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	-1.3
Passenger Seat Back Angle	-5.4

SEAT FORE / AFT POSITIONS

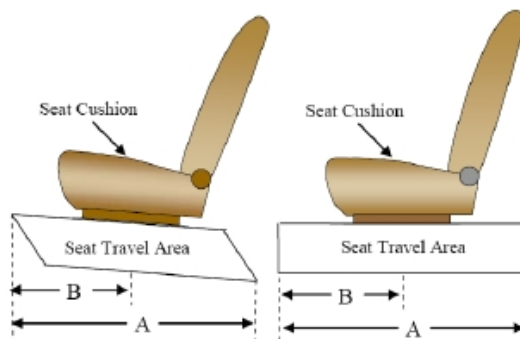
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	329	164.5
Passenger Seat	248	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 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

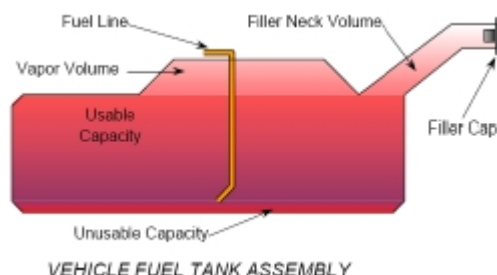
NHTSA No.: M20234203
 Test Date: 08/04/2023

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	66.0
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	60.7 - 62.0
Actual Amount of Solvent Used	61.4
1/3 of Usable Capacity	22.0

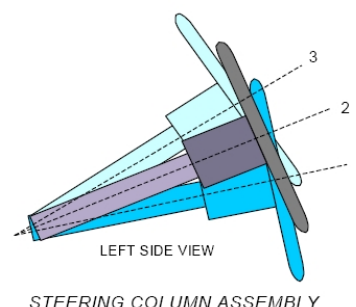
FUEL PUMP

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.



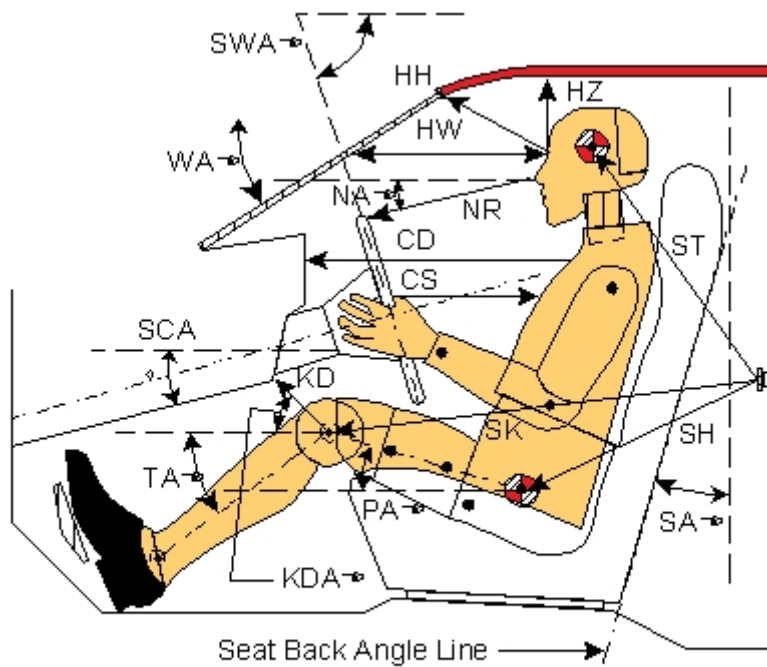
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	21.3	
Geometric center position No. 2	23.5	
Uppermost position No. 3	25.7	
Telescoping Steering Wheel Travel		60
Test Position	23.5	30

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2023 Genesis GV70 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
Test Date: 08/04/2023



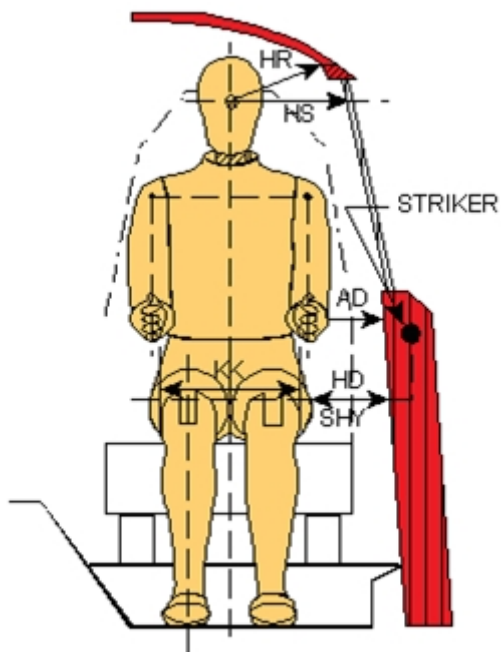
Left Side View

Code	Measurement Description	Driver (SN: 142)		Passenger (SN: 137)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		30.15		
SWA°	Steering Wheel Angle		23.45		
SCA°	Steering Column Angle		66.55		
SA°	Seat Back Angle (on headrest post)		-1.3		-5.4
HZ	Head to Roof (Z)	208	90.0	215	90.1
HH	Head to Header	401	22.65	326	44.5
HW	Head to Windshield	705	0.2	604	0.1
NR	Nose to Rim / Dash	413	8.95	453	33.2
CD	Chest to Dash	550		384	
CS	Chest to Steering Hub	315	4.95		
RA	Rim to Abdomen	212	0.3		
KDL	Left Knee to Dash	213	35.3	112	35.0
KDR	Right Knee to Dash	179	21.2	113	34.2
PA°	Pelvic Angle		23.9		22.0
TA°	Tibia Angle		27.1		46.2
SK	Striker to Knee	560	17.35	652	10.9
ST	Striker to Head	425	84.4	445	62.3
SH	Striker to H-Point	288	59.05	265	24.5

**DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS**

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023



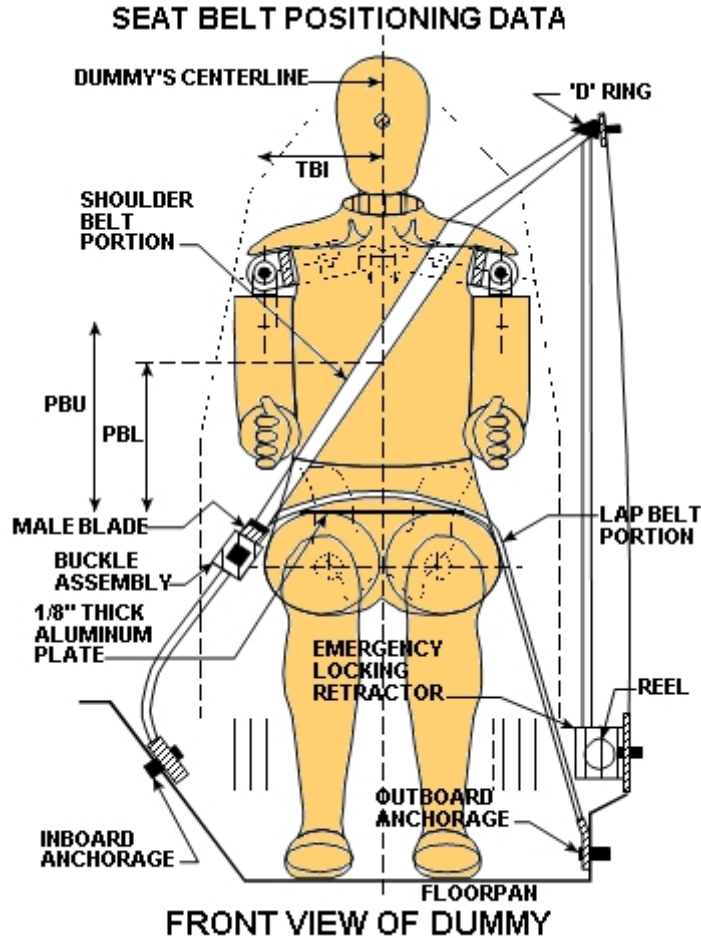
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	70	78
HD	H-Point to Door	160	248
HR	Head to Side Header	229	256
HS	Head to Side Window	362	383
KK	Knee to Knee	308	215
SHY	Striker to H-Point (Y Direction)	293	300
AA	Ankle to Ankle	321	187

**DATA SHEET NO. 5
SEAT BELT POSITIONING DATA**

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	340	336
PBL — Top surface of reference to belt lower edge	mm	250	246

BELT LENGTH DATA

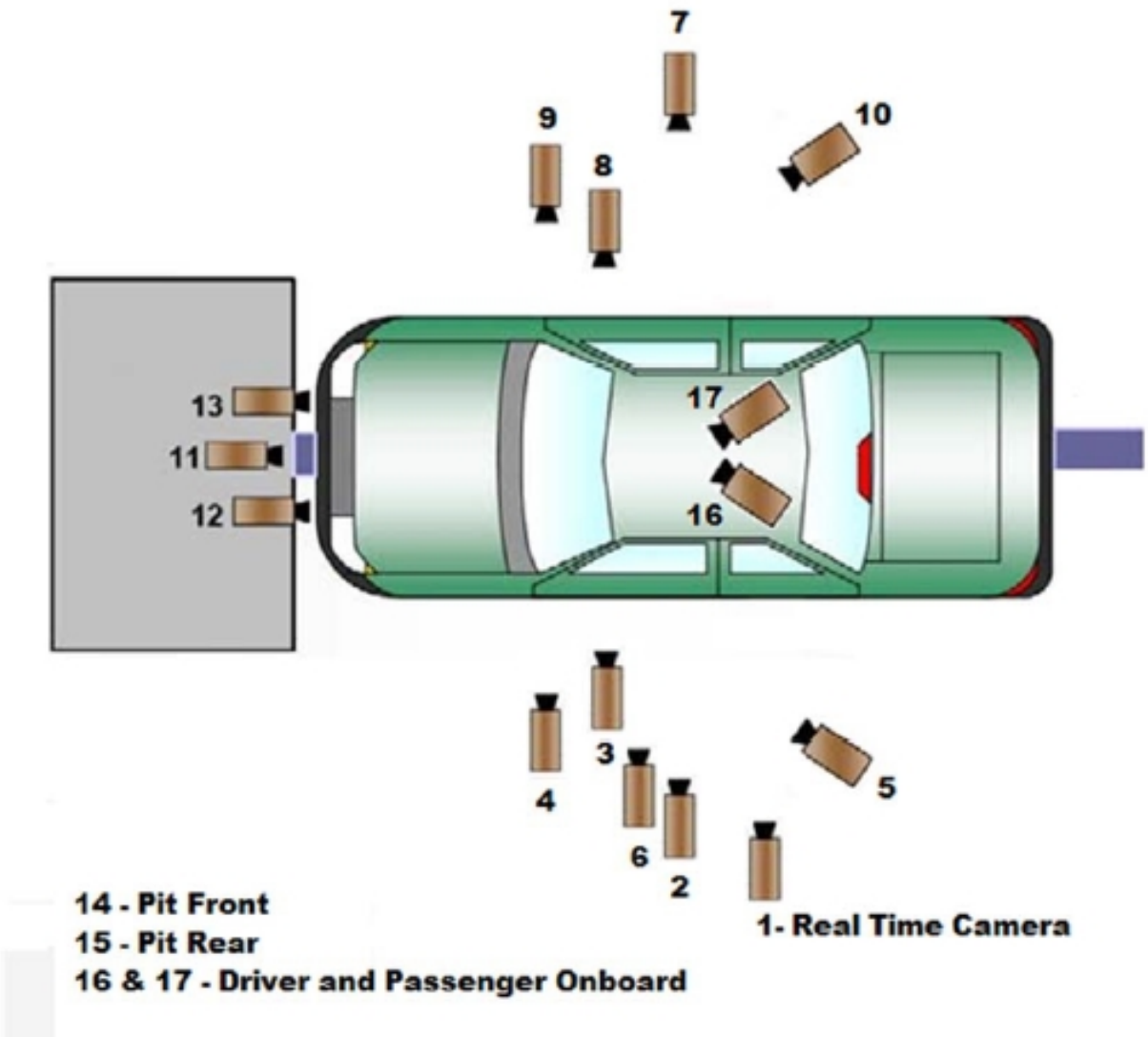
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	864	955
Lap Belt Length as measured on ATD	mm	350	350
Remainder of belt on reel	mm	1136	1045
Total belt length for continuous webbing systems	mm	2350	2350

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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
Test Date: 08/04/2023

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

CAMERA LOCATIONS

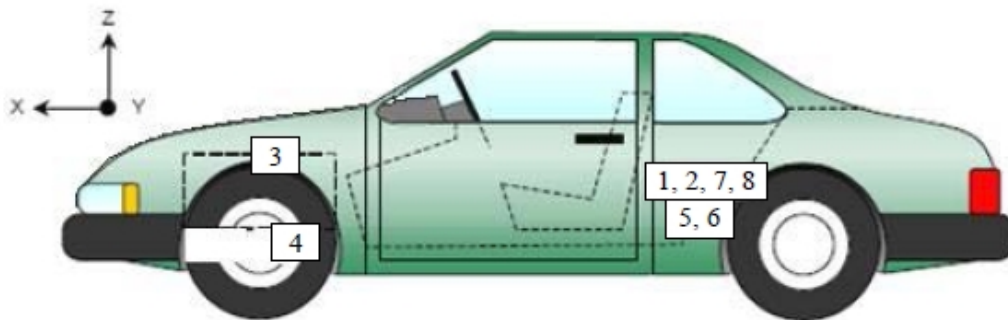
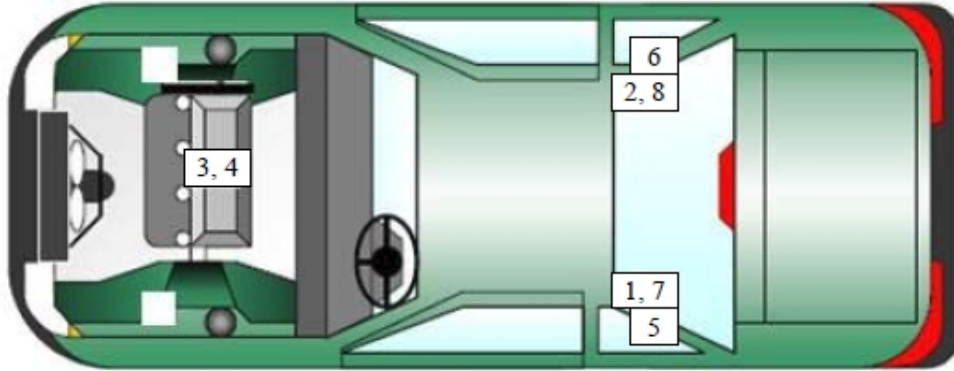
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall				Zoom	60
2	Left Overall	-2170	-7342	-1455	24	1000
3	Driver Close-Up	-1618	-6652	-1533	50	1000
4	Left Front Half	-1168	-6367	-1467	28	1000
5	Left Angle	-4244	-5097	-2424	50	1000
6	Steering Column	-1909	-7577	-2359	75	1000
7	Right Overall	-2077	7349	-1528	24	1000
8	Passenger Close-Up	-1466	6304	-1502	50	1000
9	Right Front Half	-1099	6373	-1529	28	1000
10	Right Angle	-4189	4756	-2513	50	1000
11	Windshield	-1124	0	-3471	12.5	1000
12	Driver Windshield	-793	-356	-2171	25	1000
13	Passenger Windshield	-793	401	-2751	25	1000
14	Pit Front	-1101	0	2066	12.5	1000
15	Pit Rear	-2914	0	2063	12.5	1000
16	Onboard Driver Airbag (Optional)				8	1000
17	Onboard Passenger Airbag (Optional)				8	1000

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

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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1835	-405	98
2	Right Rear Accelerometer – X Direction	1835	369	86
3	Engine Top X	3797	-114	-443
4	Engine Bottom X	4454	41	270
5	Left Rear Accelerometer – Z Direction	1835	-405	98
6	Right Rear Accelerometer – Z Direction	1835	369	86
7	Left Rear Accelerometer – X Direction Redundant	1835	-417	100
8	Right Rear Accelerometer – X Direction Redundant	1835	383	87

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

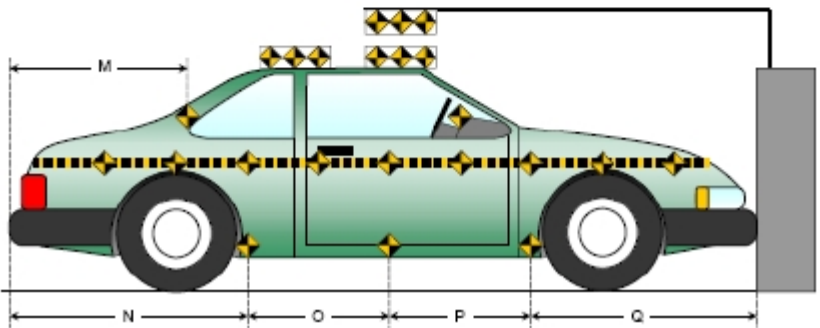
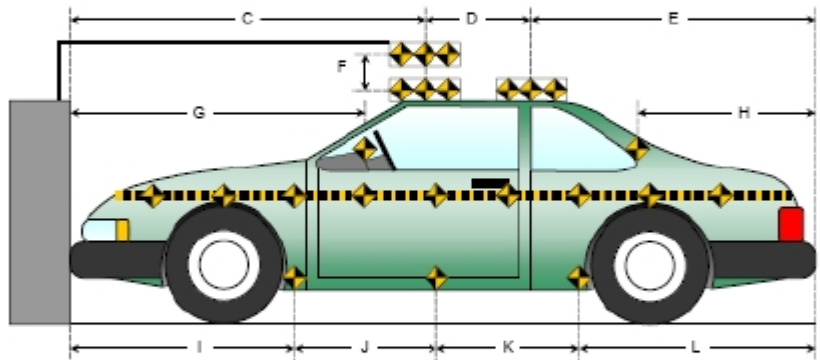
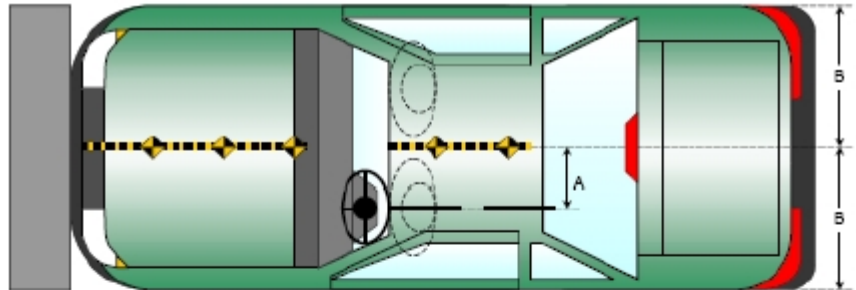
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

Item	Value
A	388
B	946
C	2723
D	609
E	1380
F	343
G	1917
H	1045
I	1329
J	952
K	951
L	1480
M	1045
N	1480
O	953
P	948
Q	1331

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

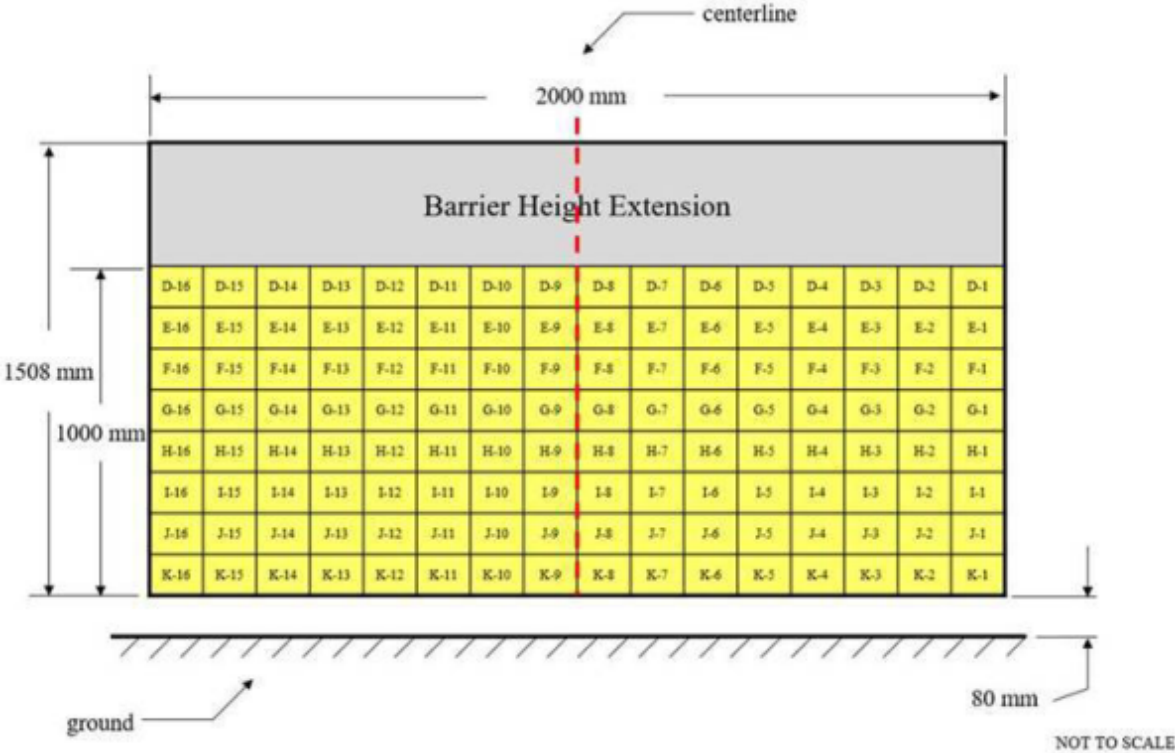


Figure 1 - Load Cell Locations on a 128-Load Cell Barrier with Plywood Height Extension*
 Please note above diagram is not actual representation of load cell barrier used.

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2023 Genesis GV70 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
Test Date: 08/04/2023

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 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

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 Airbag	Glove Box
Right Knee Contact	Knee Airbag	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger	Other
Locked / Unlocked Doors	Locked	Locked	Locked
Front Door Opening	Remained Closed and Operational	Remained Closed and Operational	
Rear Door Opening	Remained Closed and Operational	Remained 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 Throughout
Window Damage	None
Other	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	960
Center	mm	949
Right Side	mm	947
Average	mm	952

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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

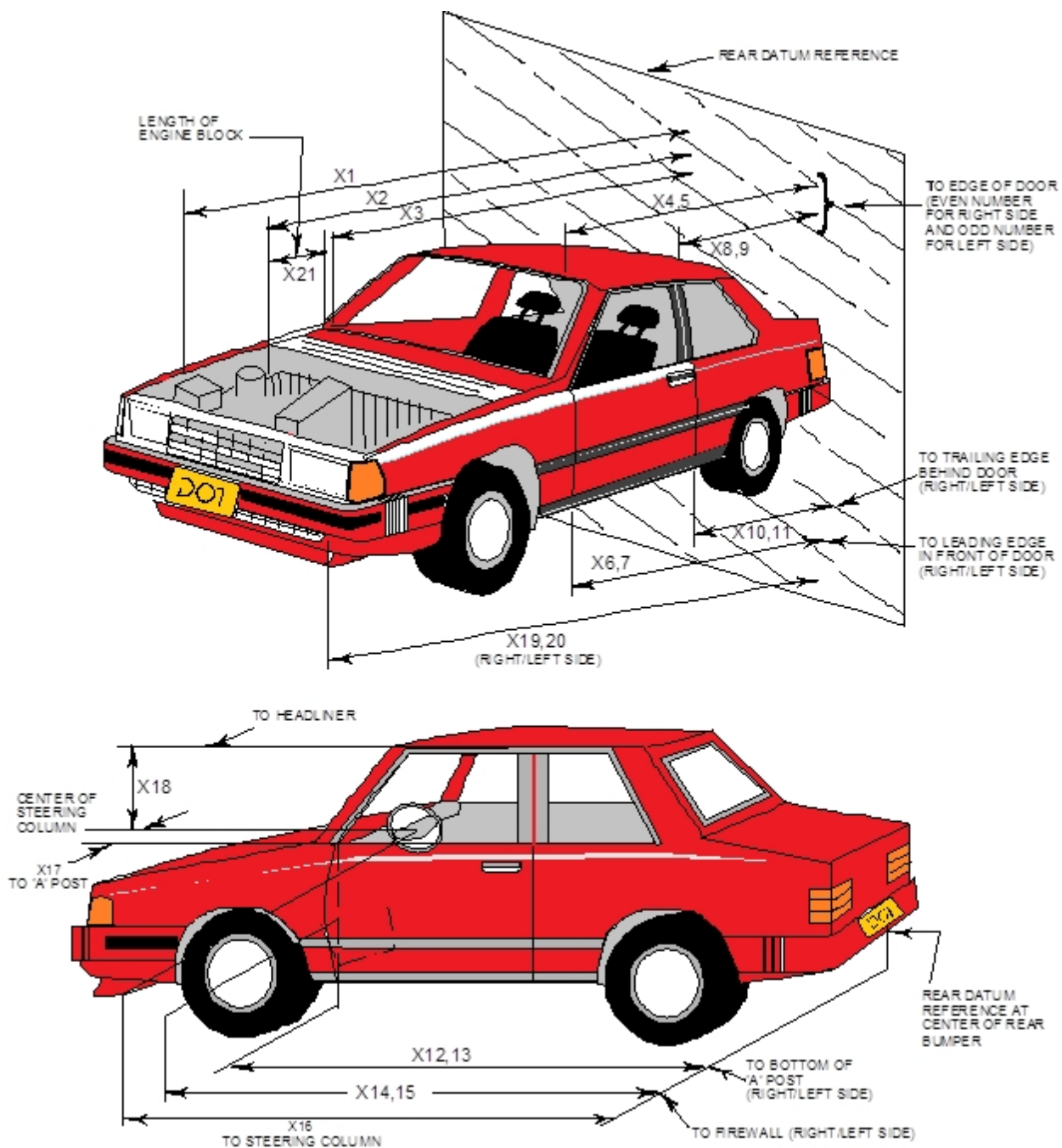
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023



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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

No.	Measurement Description	Pre-Test	Post-Test	Change
1	Total Length of Vehicle at Centerline	4712	4340	-372
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3994	3904	-90
3	RSOV to Firewall	3565	3554	-11
4	RSOV to Upper Leading Edge of Right Door	3196	3194	-2
5	RSOV to Upper Leading Edge of Left Door	3196	3197	1
6	RSOV to Lower Leading Edge of Right Door	3212	3214	2
7	RSOV to Lower Leading Edge of Left Door	3215	3214	-1
8	RSOV to Upper Trailing Edge of Right Door	2099	2101	2
9	RSOV to Upper Trailing Edge of Left Door	2100	2101	1
10	RSOV to Lower Trailing Edge of Right Door	2143	2142	-1
11	RSOV to Lower Trailing Edge of Left Door	2142	2144	2
12	RSOV to Bottom of "A" Post of Right Side	3222	3220	-2
13	RSOV to Bottom of "A" Post of Left Side	3221	3206	-15
14	RSOV to Firewall, Right Side	3695	3677	-18
15	RSOV to Firewall, Left Side	3694	3671	-23
16	RSOV to Steering Column	2688	2734	46
17	Center of Steering Column to "A" Post	311	314	3
18	Center of Steering Column to Headliner	435	452	17
19	RSOV to Right Side of Front Bumper	4677	4238	-439
20	RSOV to Left Side of Front Bumper	4677	4388	-289
21	Length of Engine Block	382	382	0
RD	RSOV to Right Side of Dash Panel	2934	2935	1
CD	RSOV to Center of Dash Panel	2967	2969	2
LD	RSOV to Left Side of Dash Panel	2934	2936	2

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2023 Genesis GV70 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

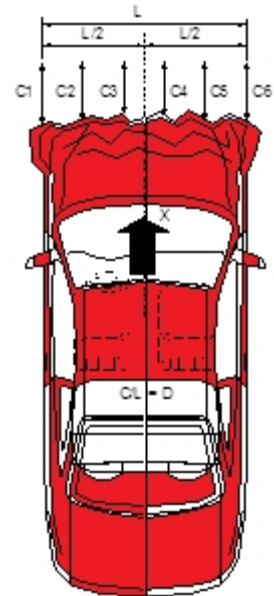
NHTSA No.: M20234203
Test Date: 08/04/2023

VEHICLE INFORMATION

VIN: KMUMADTB9PU133844 Wheelbase (mm): 2875
Vehicle Size Category: MPV Test Weight (kg): 2214

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): 56.29
Velocity Change (km/h): 65.27
Time of Separation (ms): 118



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: C4
Damage Region Length (mm): 1565
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Crush
C1	Crush Zone 1 at Left Side	mm	4484	4191	293
C2	Crush Zone 2 at Left Side	mm	4663	4280	383
C3	Crush Zone 3 at Left Side	mm	4697	4317	380
C4	Crush Zone 4 at Right Side	mm	4697	4302	395
C5	Crush Zone 5 at Right Side	mm	4663	4234	429
C6	Crush Zone 6 at Right Side	mm	4489	4198	291
L	C1 to C6	mm	1516	1565	-49

**DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS**

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

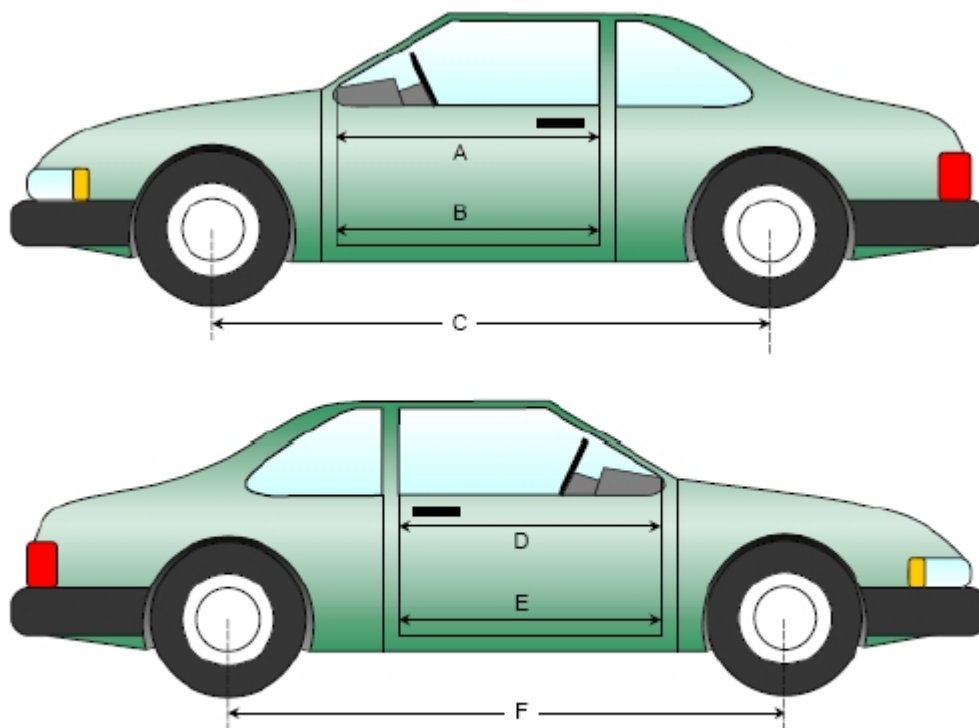
NHTSA No.: M20234203
 Test Date: 08/04/2023

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Change
A	Left Side Upper	mm	997	996	-1
B	Left Side Lower	mm	902	901	-1
D	Right Side Upper	mm	996	995	-1
E	Right Side Lower	mm	899	899	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Change
C	Left Side Wheelbase	mm	2875	2789	-86
F	Right Side Wheelbase	mm	2875	2788	-87



Left & Right Side Views

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

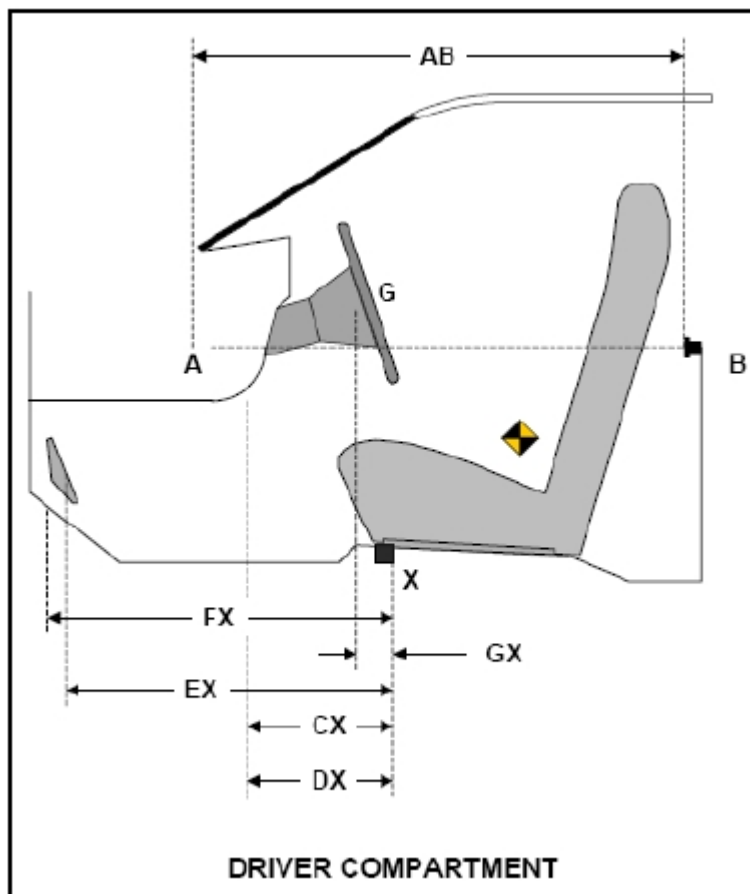
Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Change
AB	Door Opening (Inside Window Jam)	mm	679	681	2
CX	Left Knee Bolster to X	mm	339	340	1
DX	Right Knee Bolster to X	mm	331	331	0
EX	Brake Pedal to X	mm	575	552	-23
FX	Foot Rest to X	mm	620	611	-9
GX	Center of Steering Column Wheel Hub to X	mm	62	109	47

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023

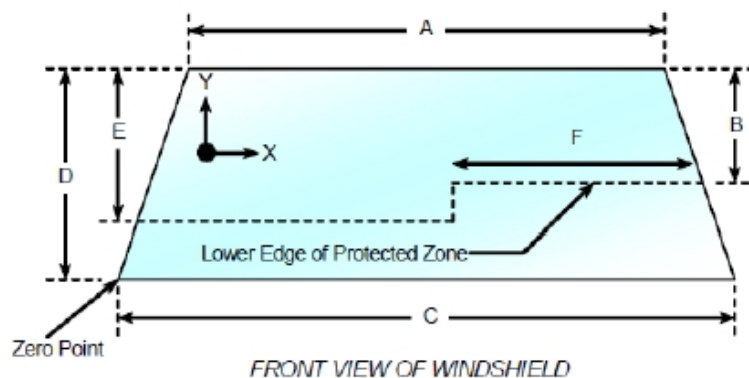
Windshield Mounting Details: A trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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	2074.5	2074.5	100%
Right Side	2074.5	2074.5	100%
Total	4149	4149	100%



Item	Units	Value
A	mm	1295
B	mm	402
C	mm	1152
D	mm	851
E	mm	533
F	mm	502

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: 2023 Genesis GV70 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
Test Date: 08/04/2023

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21°C

Test Time: 10:38 AM

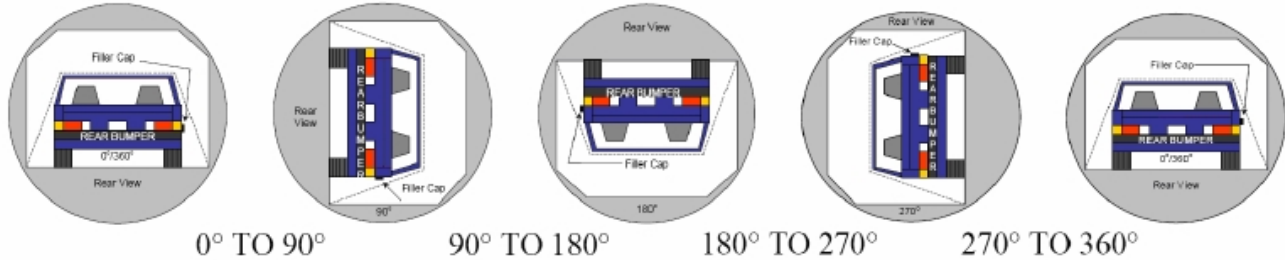
STODDARD SOLVENT SPILLAGE MEASUREMENTS

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

**DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS**

Test Vehicle: 2023 Genesis GV70 5 Door SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
 Test Date: 08/04/2023



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°	65	300	365
90° to 180°	65	300	365
180° to 270°	65	300	365
270° to 360°	70	300	370

FMVSS 301 SPILLAGE TABLE

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

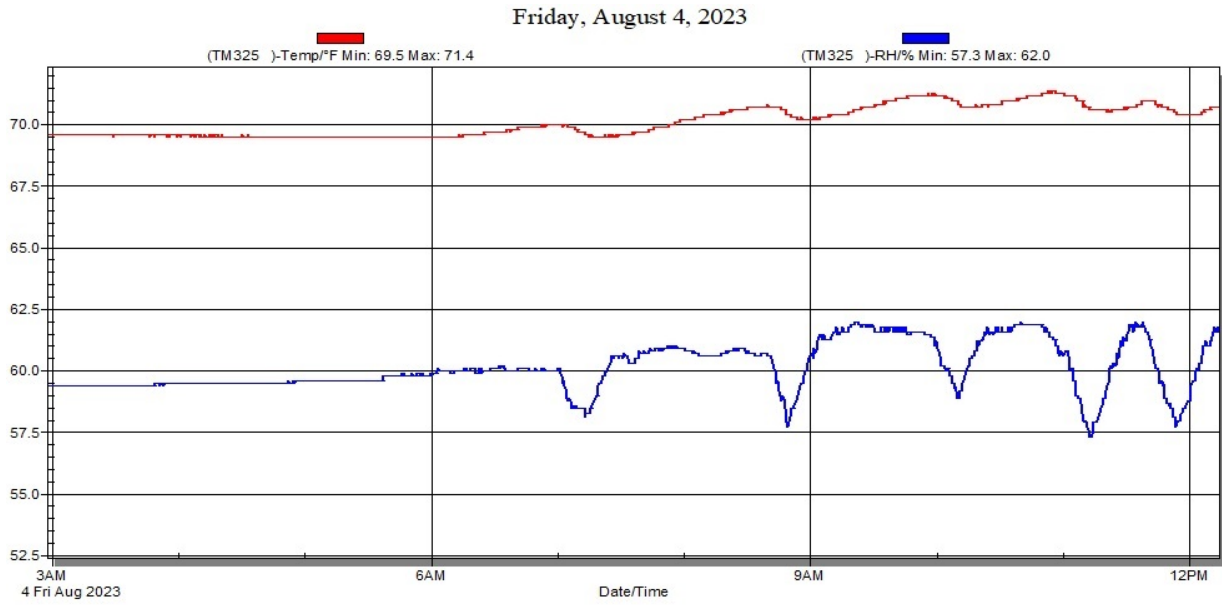
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2023 Genesis GV70 5 Door SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20234203
Test Date: 08/04/2023



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

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

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3	Post-Test Load Cell Wall	A-6
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5	Tire Placard	A-7
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13	Post-Test Right View of Test Vehicle	A-11
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Fig.	Description	Page
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82	2023 Genesis GV70 Frontal Impact Event	A-45
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¹NOTE: *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*

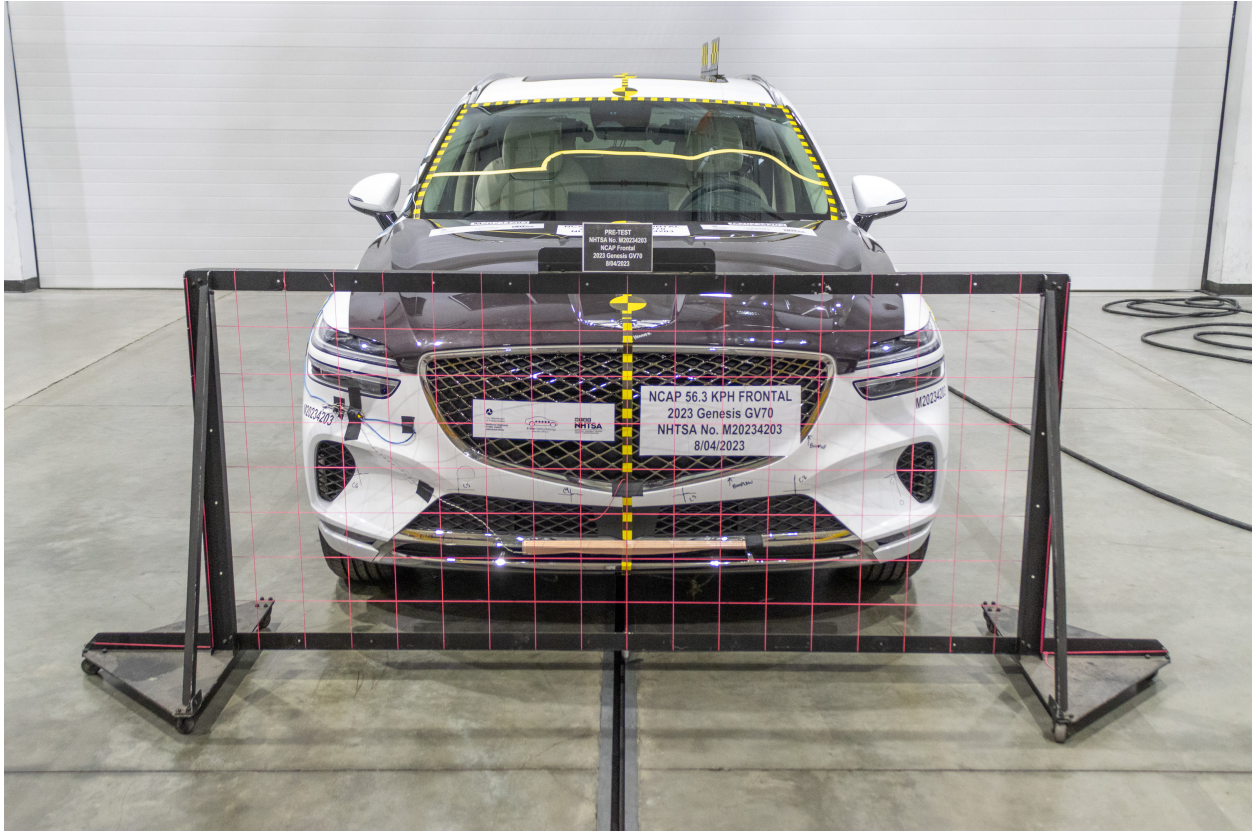


Figure A-1: Load Cell Location



Figure A-2: Pre-Test Load Cell Wall



Figure A-3: Post-Test Load Cell Wall

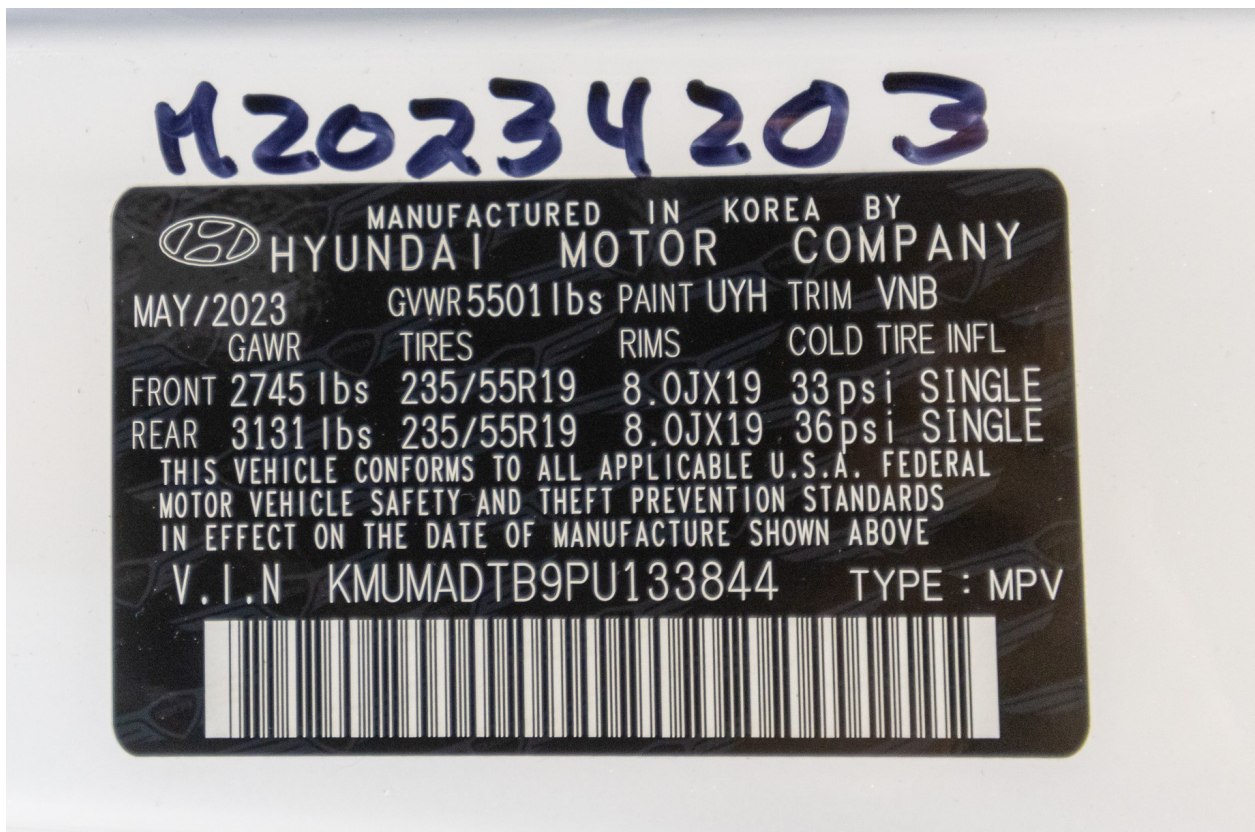


Figure A-4: Manufacturer's Label



Figure A-5: Tire Placard



Figure A-6: 2023 Genesis GV70 Frontal As Delivered

M20234203



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

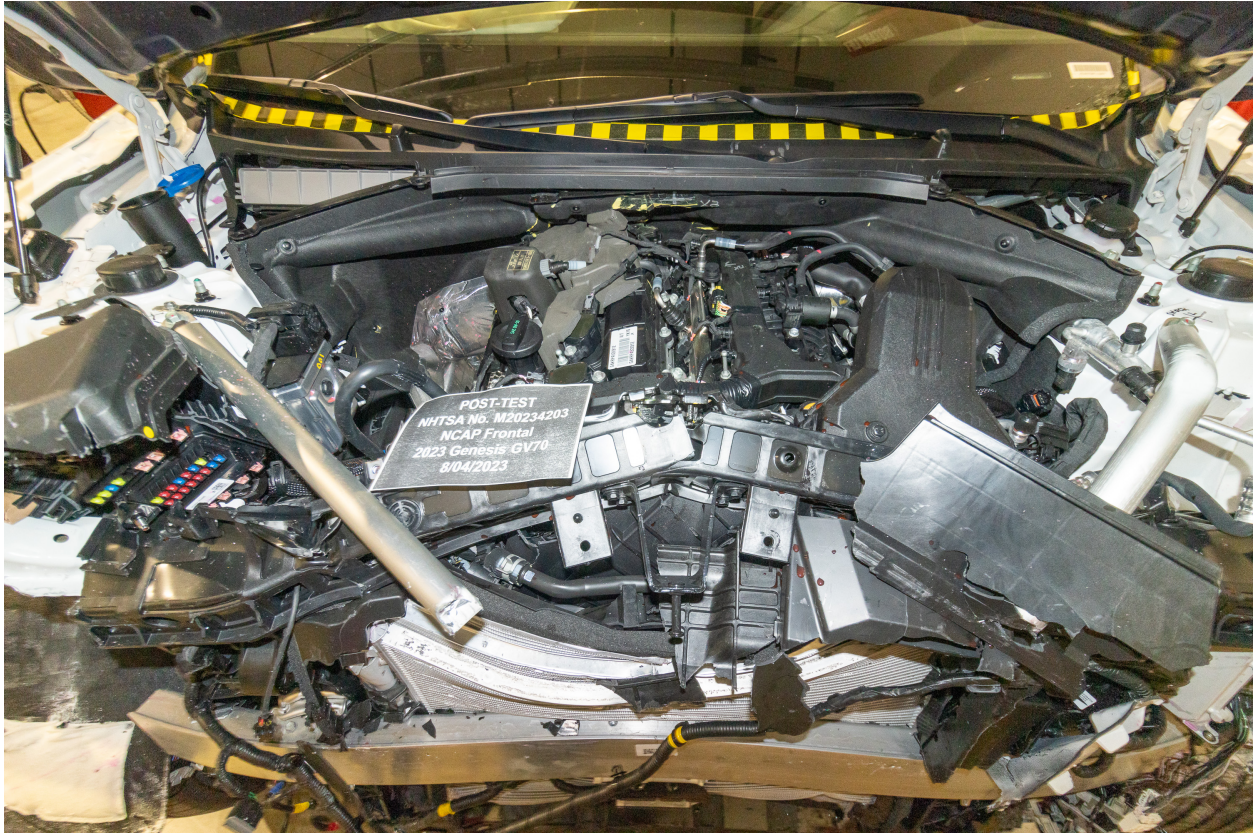


Figure A-21: Post-Test Engine Compartment View



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



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

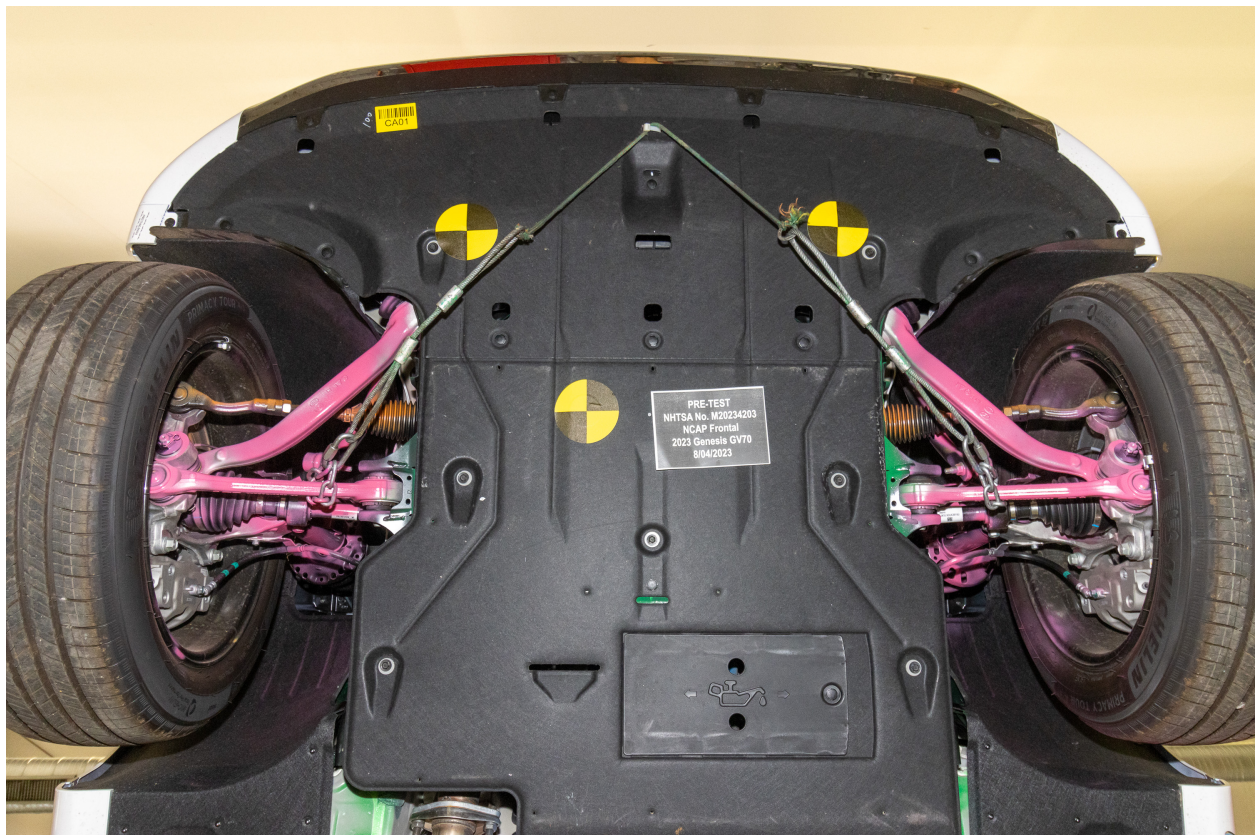


Figure A-24: Pre-Test Front Underbody View¹

¹NOTE: The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.

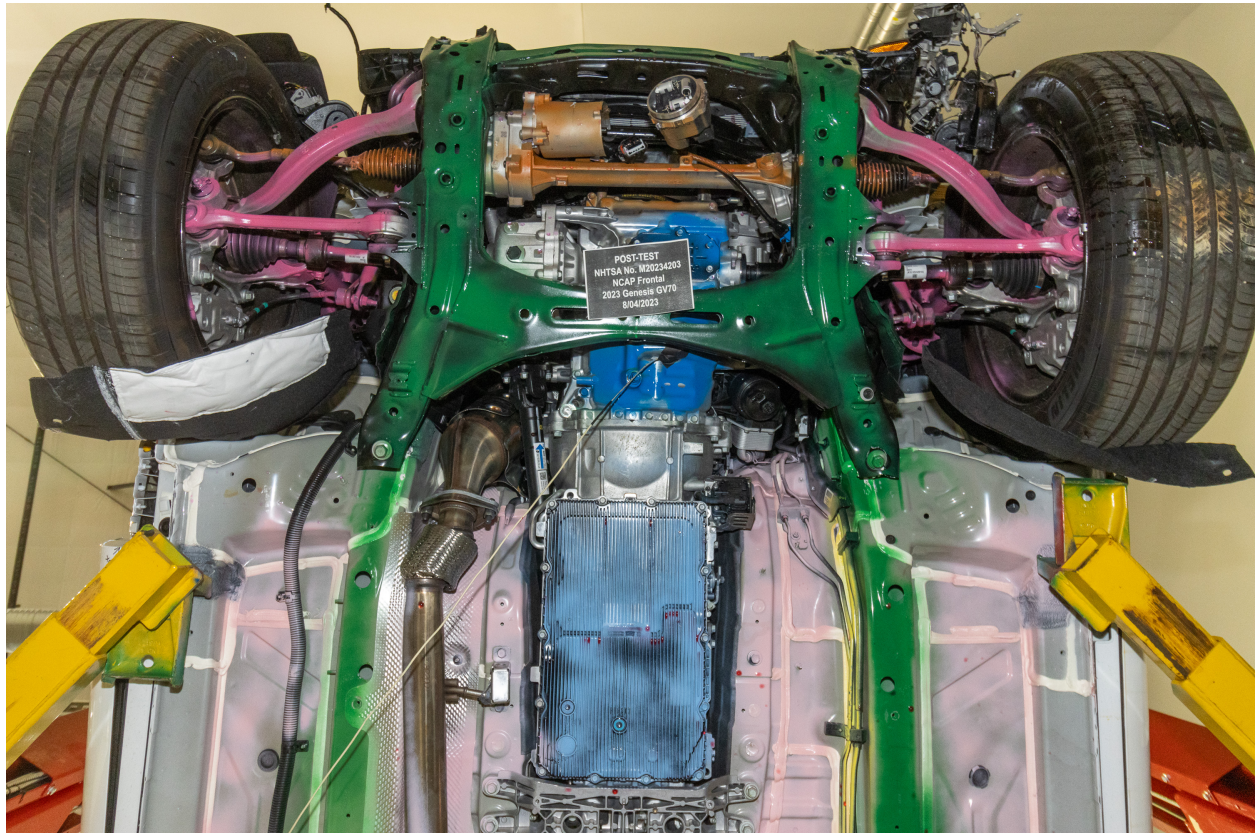


Figure A-25: Post-Test Front Underbody View¹

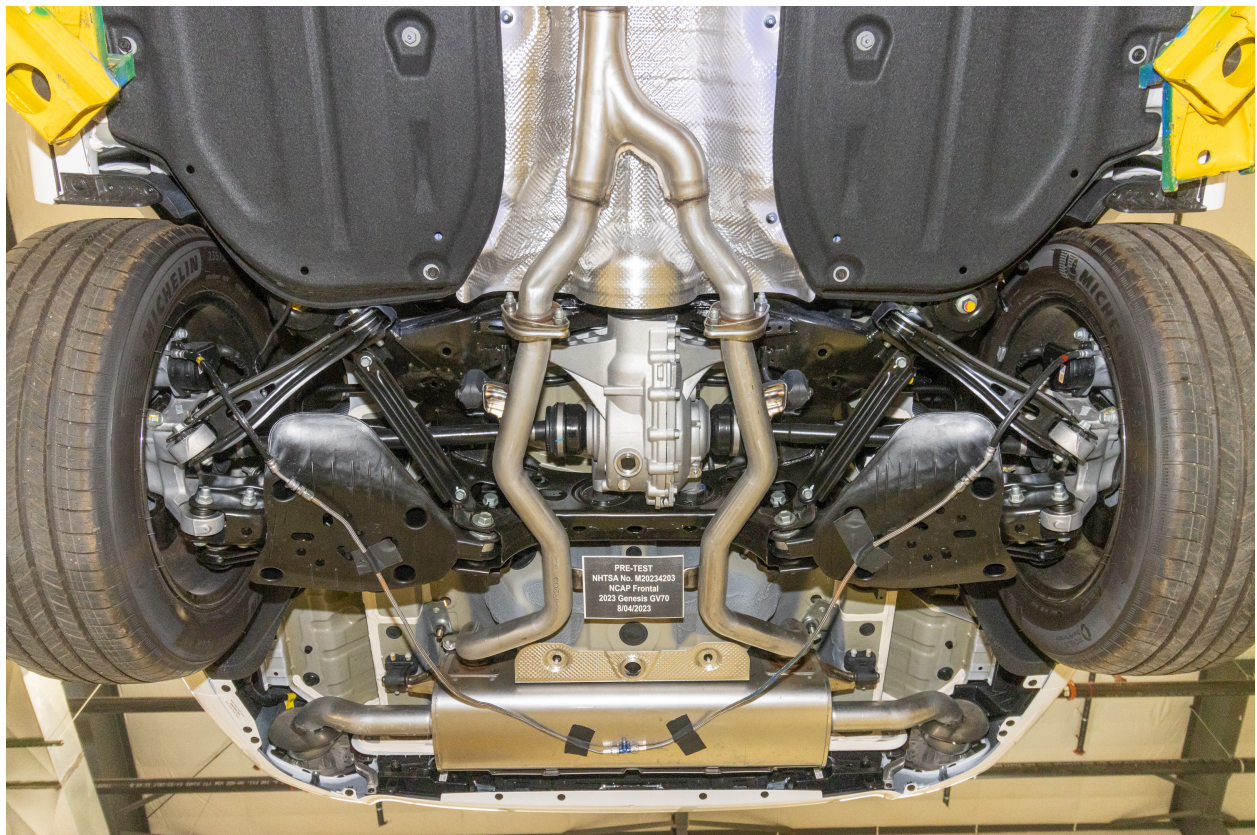


Figure A-26: Pre-Test Rear Underbody View¹

¹NOTE: The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.

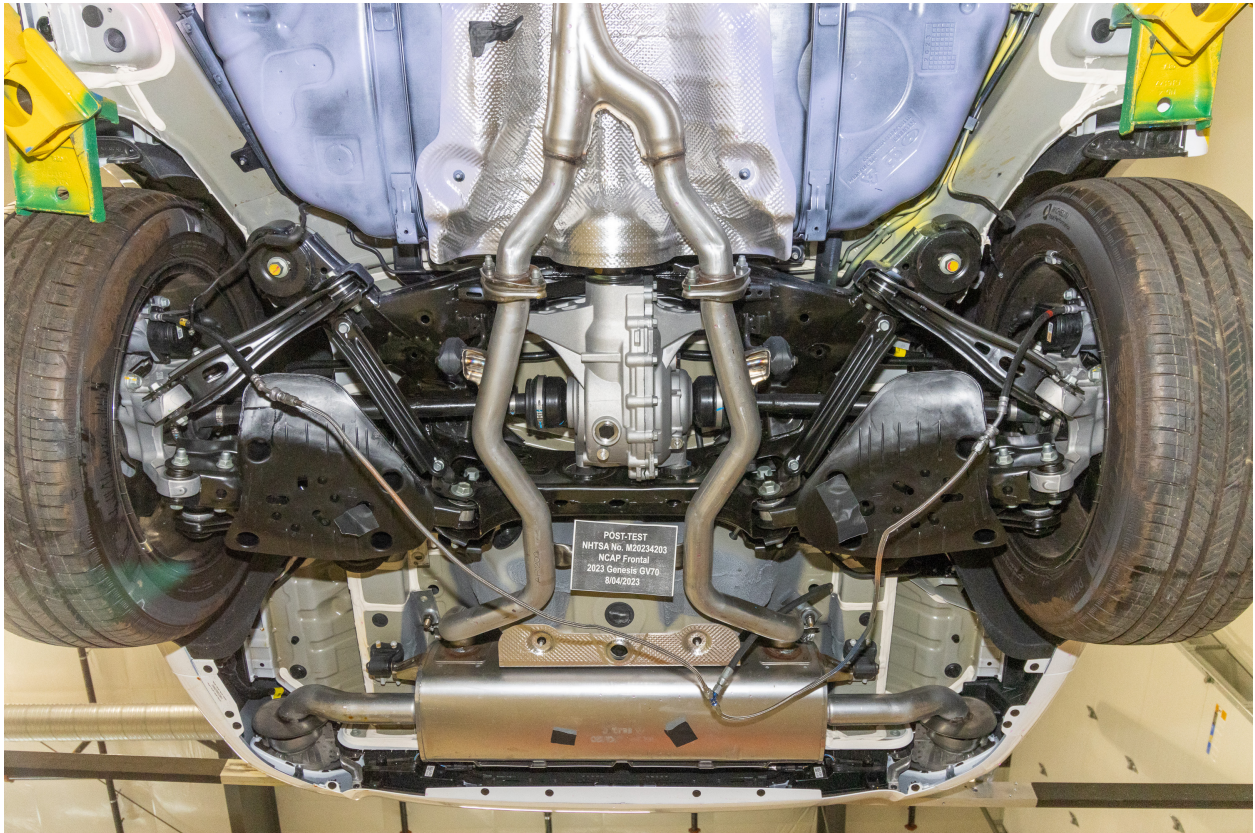


Figure A-27: Post-Test Rear Underbody View¹



Figure A-28: Pre-Test Dummy Cable Routing

¹NOTE: The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.



Figure A-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

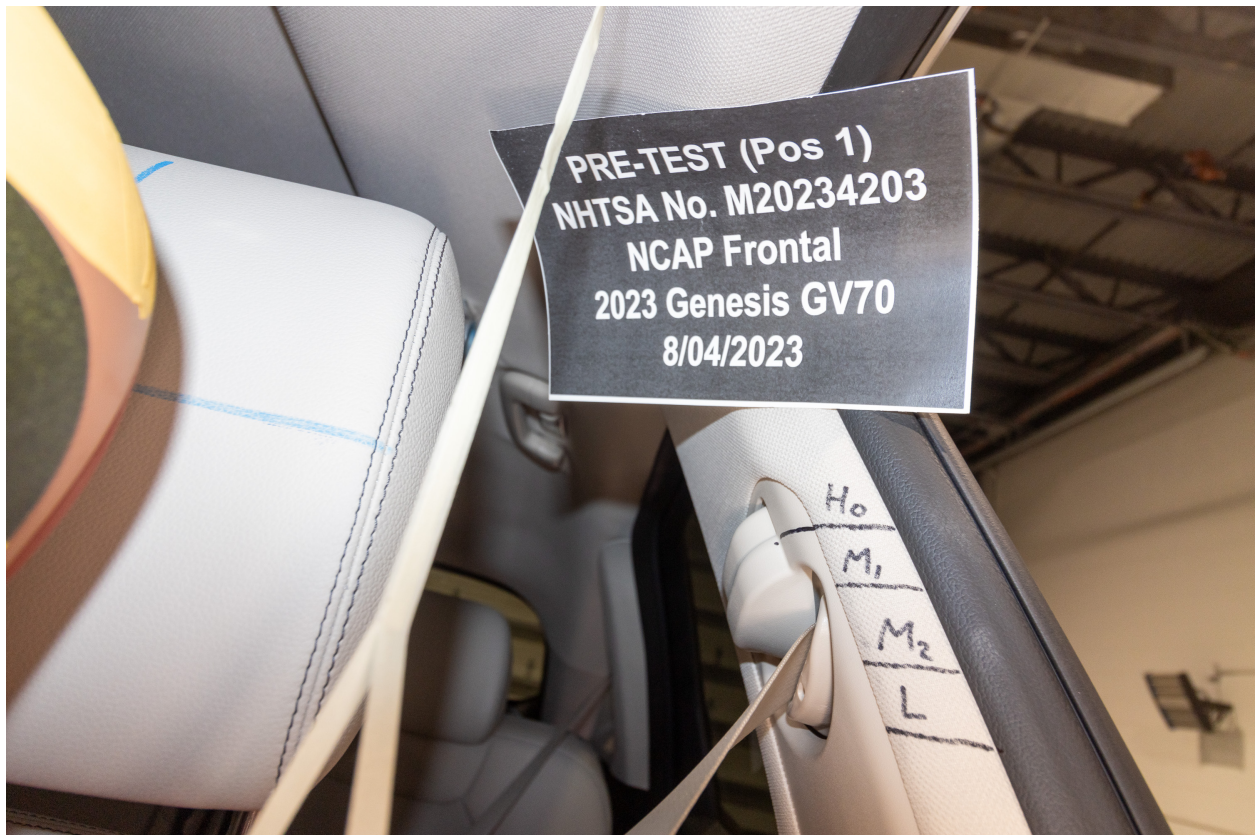


Figure A-38: Pre-Test View of Belt Anchorage for Driver Dummy



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

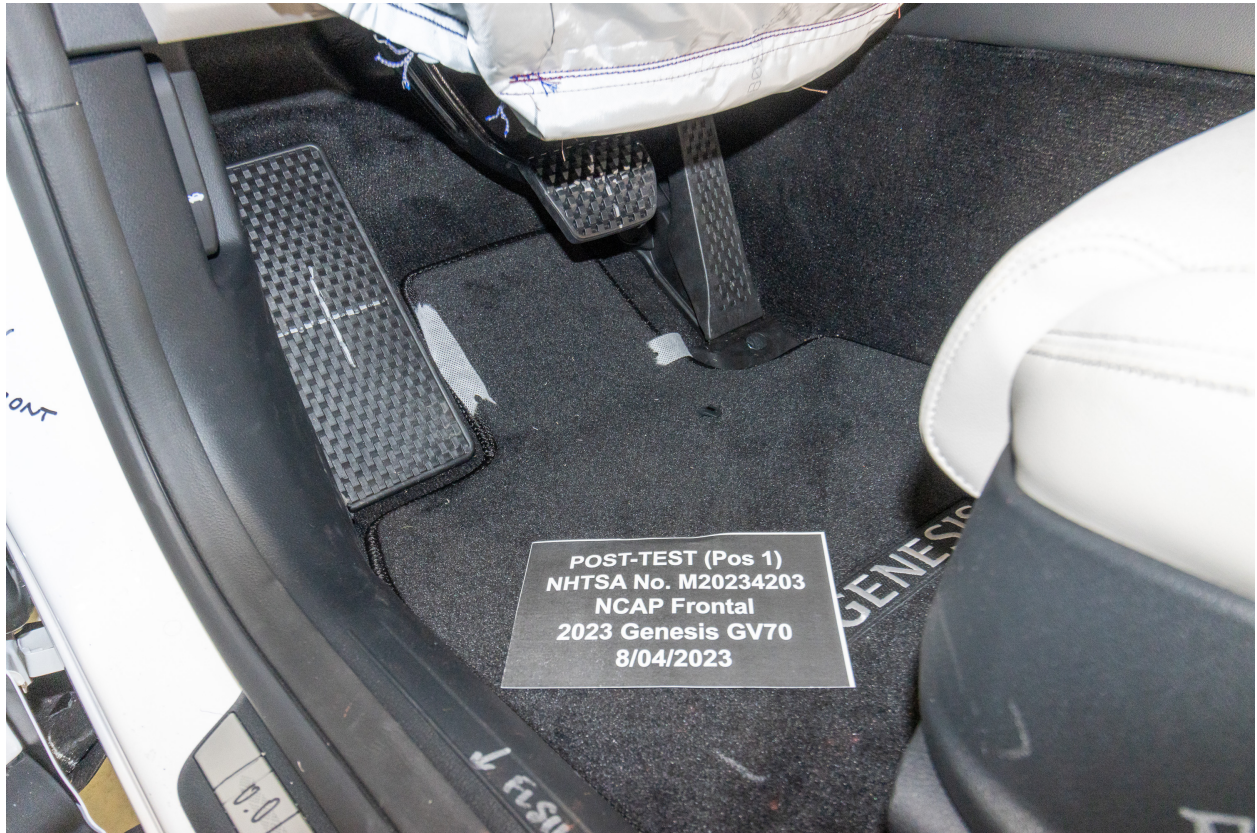


Figure A-47: Post-Test Driver's Side Floorpan



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

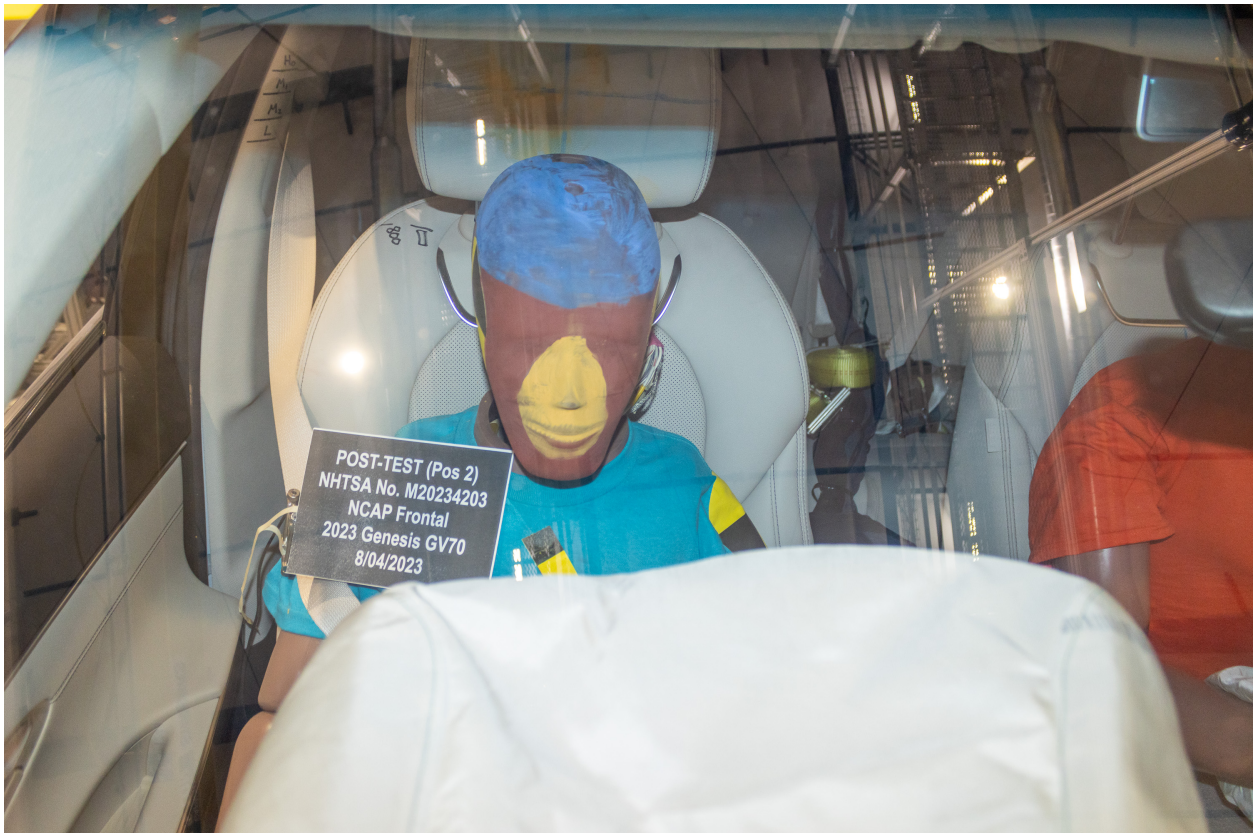


Figure A-54: Post-Test Passenger Dummy Front View



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

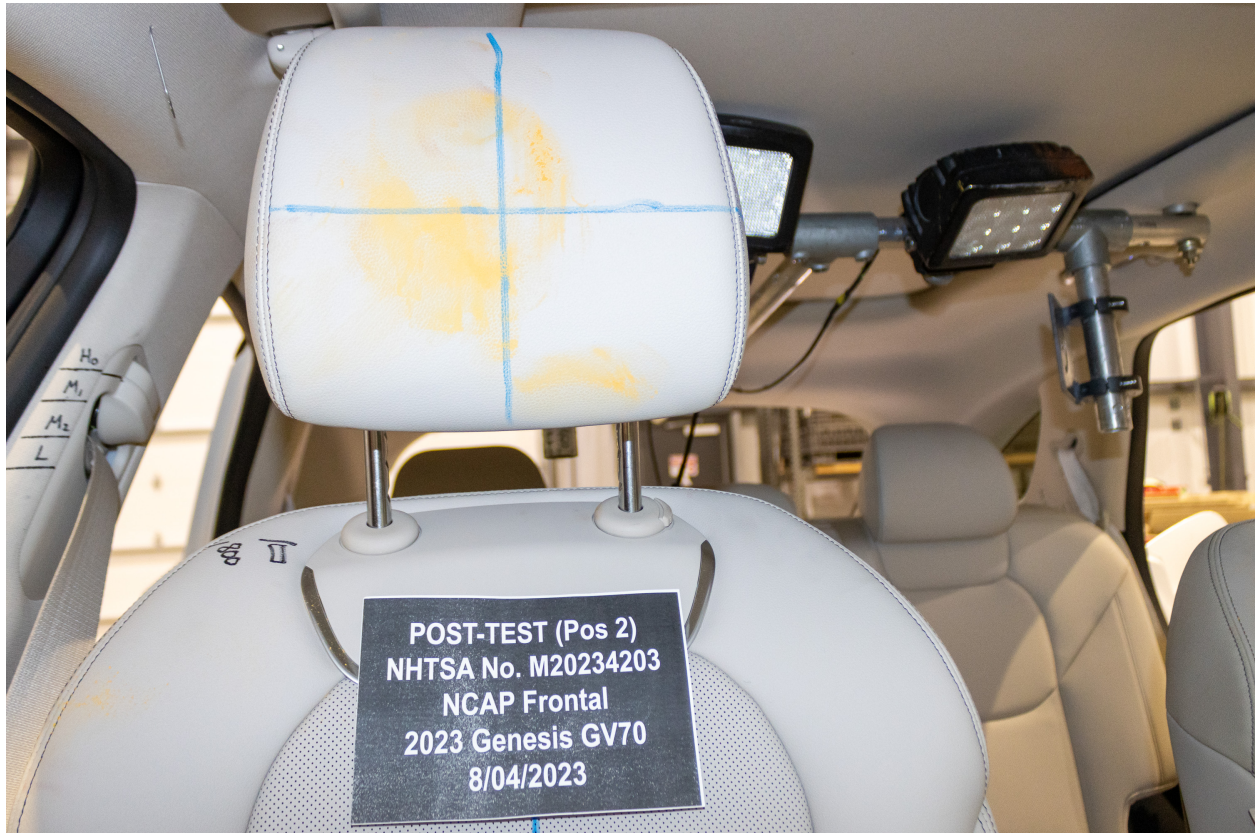


Figure A-73: Post-Test Passenger Dummy Contact With Headrest



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

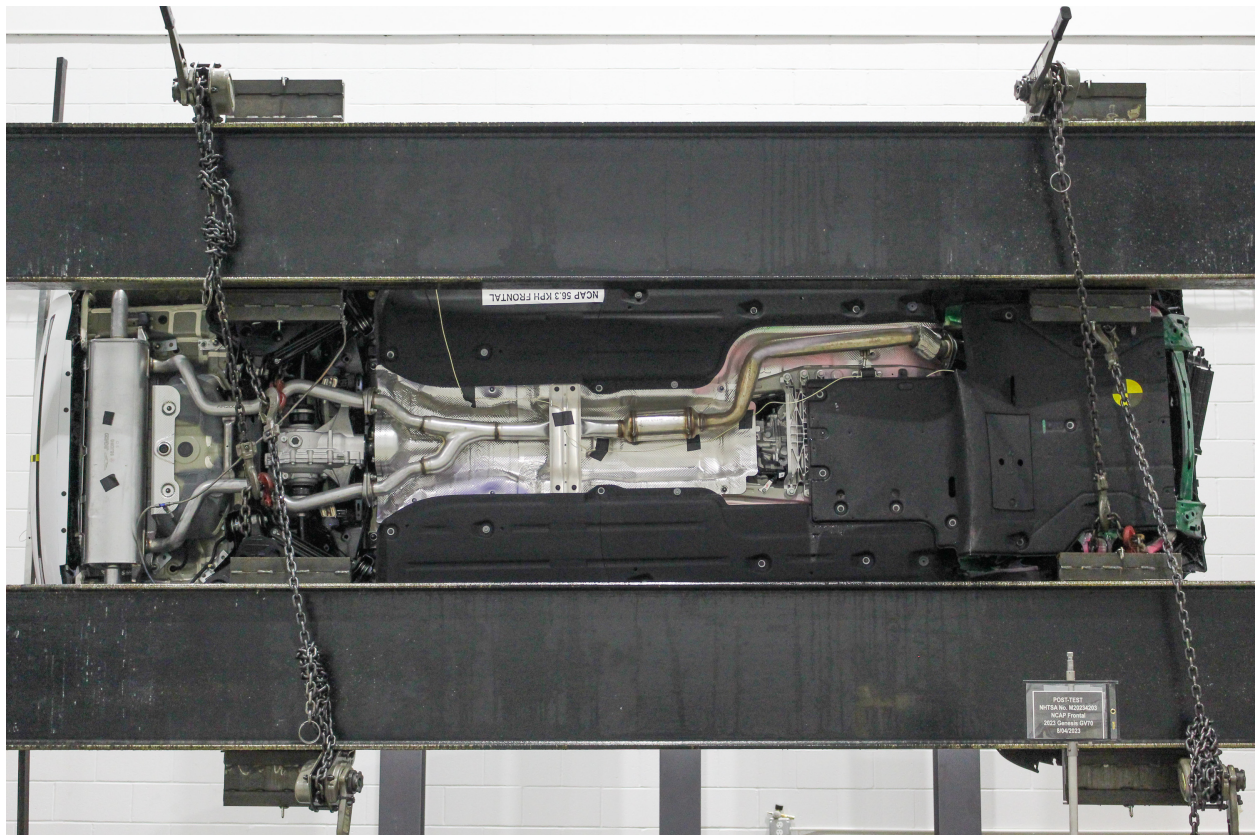


Figure A-78: Vehicle at 90° on Static Rollover Device



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

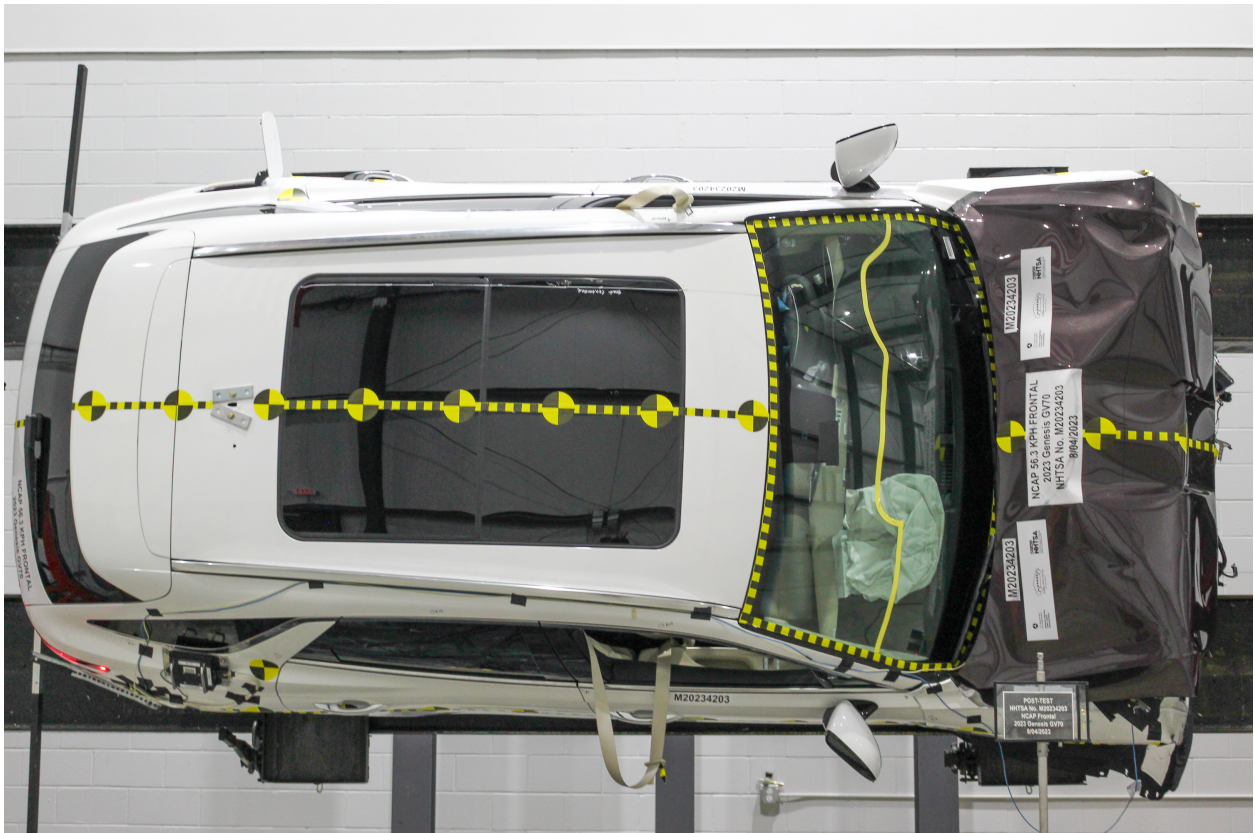


Figure A-80: Vehicle at 270° on Static Rollover Device



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



Figure A-82: 2023 Genesis GV70 Frontal Impact Event

2023 GV70 AWD 2.5T SELECT

THE GENESIS EXPERIENCE

- 3 Yr / 36K Complimentary Maintenance
- 3 Yr / 36K Complimentary Service Valet*
- 3 Yr Complimentary Map Care
- Complimentary Genesis Connected Services*
- * Exclusions may apply, see retailer for details

STANDARD FEATURES:

ADVANCED SAFETY TECHNOLOGY

- Forward Collision-Avoidance Assist
- Lane Keeping Assist
- Lane Following Assist
- Blind Spot Collision Avoidance-Assist
- Rear Cross-Traffic Collision Avoidance-Assist
- Highway Driving Assist
- Smart Cruise Control w/ Stop & Go
- Intelligent Speed Limit Assist
- Driver Attention Warning
- High Beam Assist
- Rearview Camera w/Dynamic Guidelines
- Parking Distance Warning - Reverse
- Safe Exit Assist
- Tire Pressure Monitoring System & Temp Spare

POWERTRAIN TECHNOLOGY

- 2.5L In-line 4 Turbo GDI (300 HP / 311 lb.-ft)
- 8-speed Automatic Transmission

EXTERIOR

- 18-inch Alloy Wheels
- Power Hands-Free Smart Liftgate w/ Auto Open
- Heated Outside Mirrors w/ Turn-Signal Indicator
- Towing Pre-Wiring

INTERIOR & CONVENIENCE

- Leatherette Seating Surfaces
- Power Driver's Seat with 4-Way Power Lumbar
- Power Front Passenger Seat
- Heated Front Seats
- 60/40 2nd Row Folding Seats

MULTIMEDIA & TECHNOLOGY

- Navigation System w/ 14.5" HD Screen
- 8" Digital Cluster + Analog Gauges

MULTIMEDIA & TECHNOLOGY(cont.)

- AM/FM/SiriusXM Radio**/HD Radio*
- Apple CarPlay (TM) & Android Auto (TM)
- Wireless Device Charger
- Fingerprint Authentication System
- Genesis Connected Services

Additional Standard Features

- Carpeted Floor Mats

Full Tank of Gas

GENESIS WARRANTY

- 5-year/60,000-mile New Vehicle Warranty*
- 10-year/100,000-mile Powertrain Warranty*
- 7-year/Unlimited-mile Anti-perforation Warranty*
- ** Limited warranties, see dealer for details

Manufacturer's Suggested Retail Price: \$43,150.00

ADDED FEATURES:

- *LIVINI WHITE(LV19) Paint \$575.00
- **Select Package: \$3,750.00
- 19-inch Alloy Wheels
- Panoramic Sunroof
- Ventilated Front Seats / Heated Steering Wheel
- Aluminum Trim w/ Spin Brushed Pattern

Accessories

- *Reversible Cargo Tray \$160.00
- **Cargo Cover \$200.00
- *Roof Rack Cross Bars \$450.00
- **Wheel Locks \$85.00

SOLD TO: W1704
GENESIS OF WAUKESHA
1583 EAST MORELAND BOULEVARD
WAUKESHA WI 53186

SHIPPED TO: W1704

VIN: KMU1MADT89PUI33844	ENGINE: G6K9PA322812	EXTERIOR COLOR: LVYINI WHITE	INTERIOR/SEAT COLOR: VANILLA BEIGE/VANILLA
MODEL: U0422A45	PORT OF ENTRY: TC	TRANSPORT: TRUCK	ACCESSORY WEIGHT: 29 lbs./ 13 kgs.

Inland Freight & Handling: \$1,125.00

TOTAL PRICE: \$49,495.00

140 A 1443TLIBER

EPA DOT Fuel Economy and Environment Gasoline Vehicle

Fuel Economy

24 MPG
combined city/hwy
4.2 gallons per 100 miles

Small SUVs range from 14 to 123 MPG.
The best vehicle rates 132 MPG.

You spend \$3,500
more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel Cost \$2,300

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

5 (Best)

This vehicle emits 395 grams CO₂ per mile. The best emits 8 grams per mile (tailpipe only). Producing and transporting fuel also create emissions. Learn more at fuelconomy.gov.

Smog Rating (tailpipe only)

5 (Best)

Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 24 MPG and costs \$8,000 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.65 per gallon. MPG is miles per gallon (tailpipe only). Vehicle emissions are a significant cause of climate change and smog.

fuelconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

Manufacturer's suggested retail price includes manufacturer's recommended pre-delivery service. Gasoline license and title fees state and local taxes and dealer installed options and accessories are not included in the manufacturer's suggested retail price. This label has been affixed to this vehicle by Genesis Motor America, pursuant to the requirements of 15 U.S.C. 1231 et seq which prohibits its removal or alteration prior to delivery to the ultimate purchaser.

Scan this QR code for general model information and options

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 4 %

MAJOR SOURCES OF FOREIGN PARTS CONTENT: KOREA: 90 %

FOR THIS VEHICLE: FINAL ASSEMBLY POINT: ULSAN, KOREA

COUNTRY OF ORIGIN:

ENGINE: KOREA TRANSMISSION: KOREA

Note: Parts content does not include final assembly, distribution, or other non-parts costs.

Figure A-83: Monroney Label Photograph

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

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Plot 3	Driver Head Z Acceleration vs. Time Primary	B-5
Plot 4	Driver Head Resultant Acceleration vs. Time Primary	B-5
Plot 5	Driver Chest X Deflection vs. Time	B-6
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Plot 7	Driver Chest Y Acceleration vs. Time Primary	B-6
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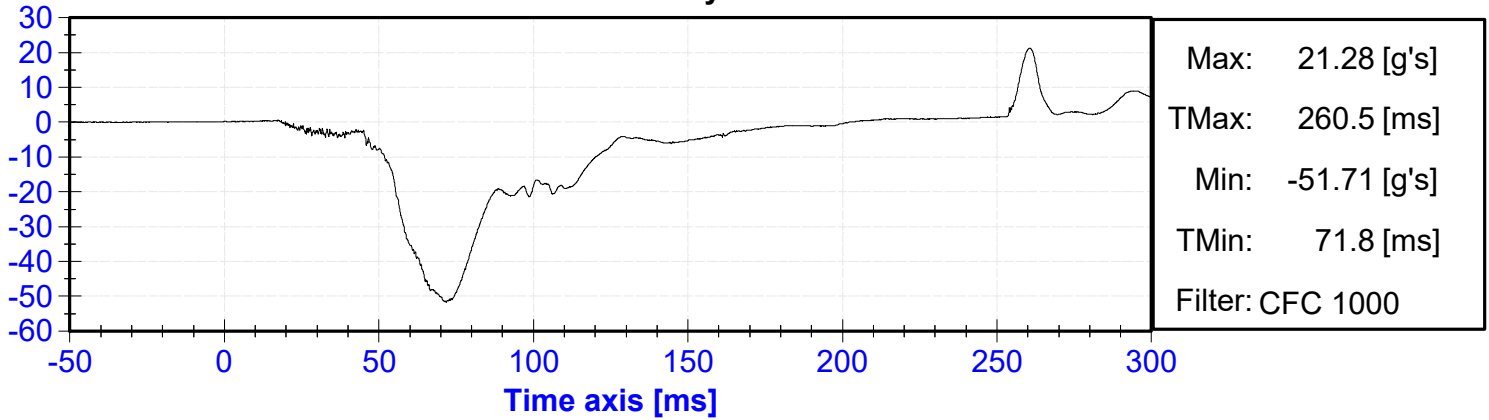
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.NHTSA.gov

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

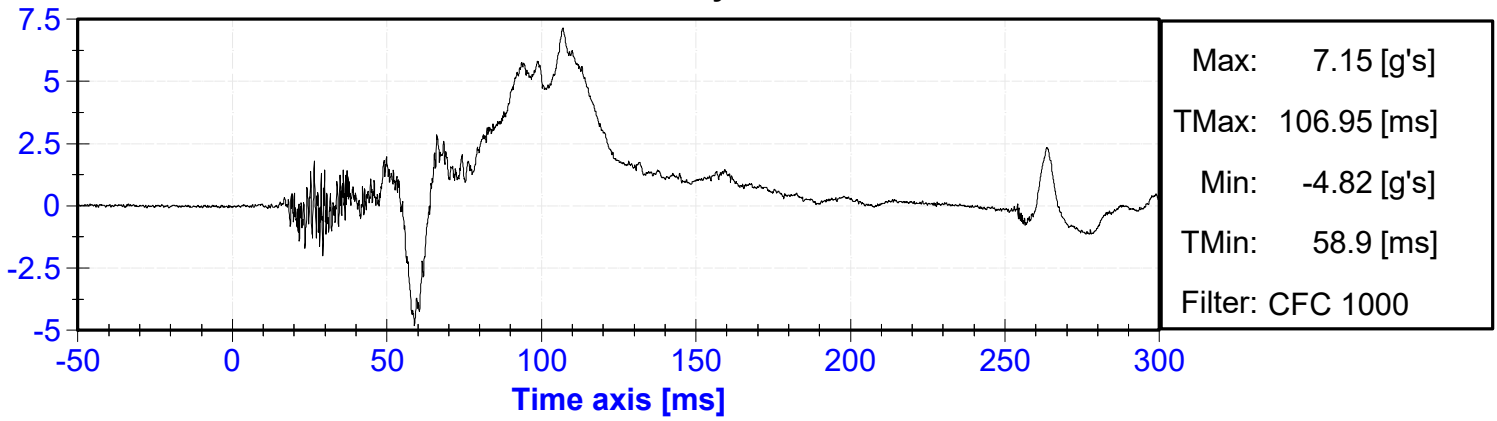
Driver Left Upper Tibia Force Z
Driver Left Lower Tibia Moment X
Driver Left Lower Tibia Moment Y
Driver Left Lower Tibia Force Z
Driver Right Upper Tibia Moment X
Driver Right Upper Tibia Moment Y
Driver Right Upper Tibia Force Z
Driver Right Lower Tibia Moment X
Driver Right Lower Tibia Moment Y
Driver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

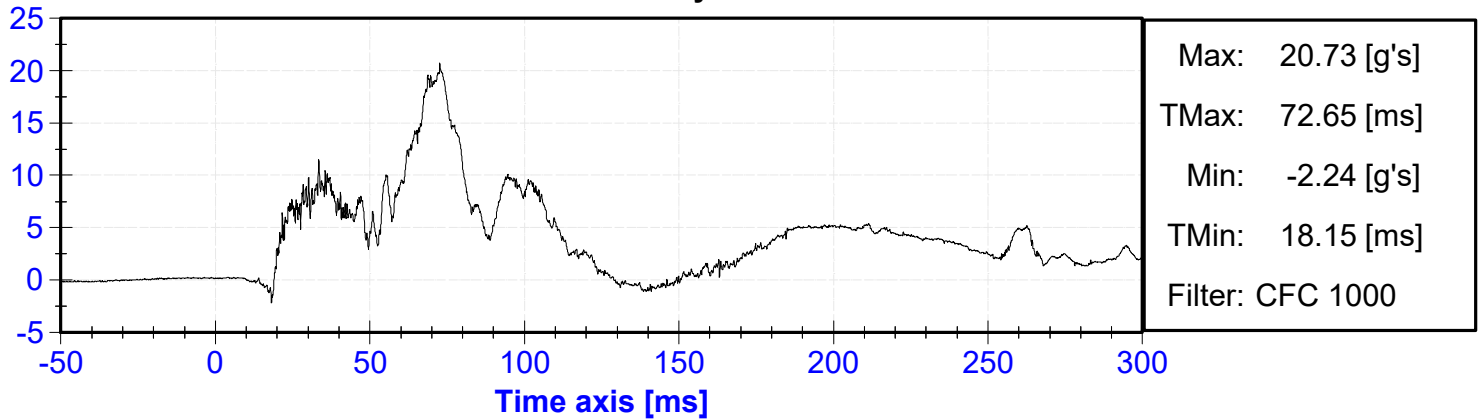
Driver Head X Acceleration vs. Time Primary



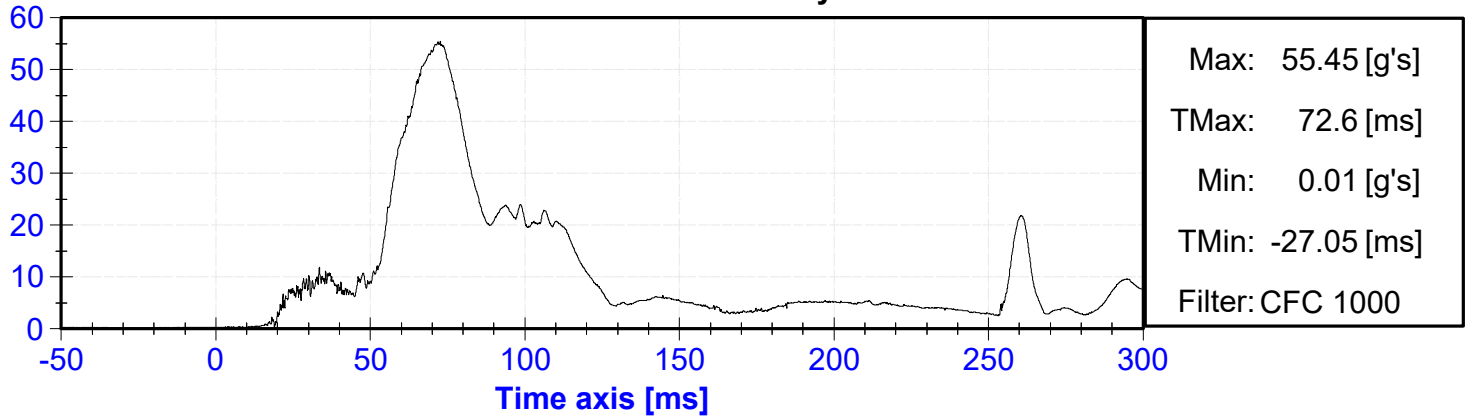
Driver Head Y Acceleration vs. Time Primary



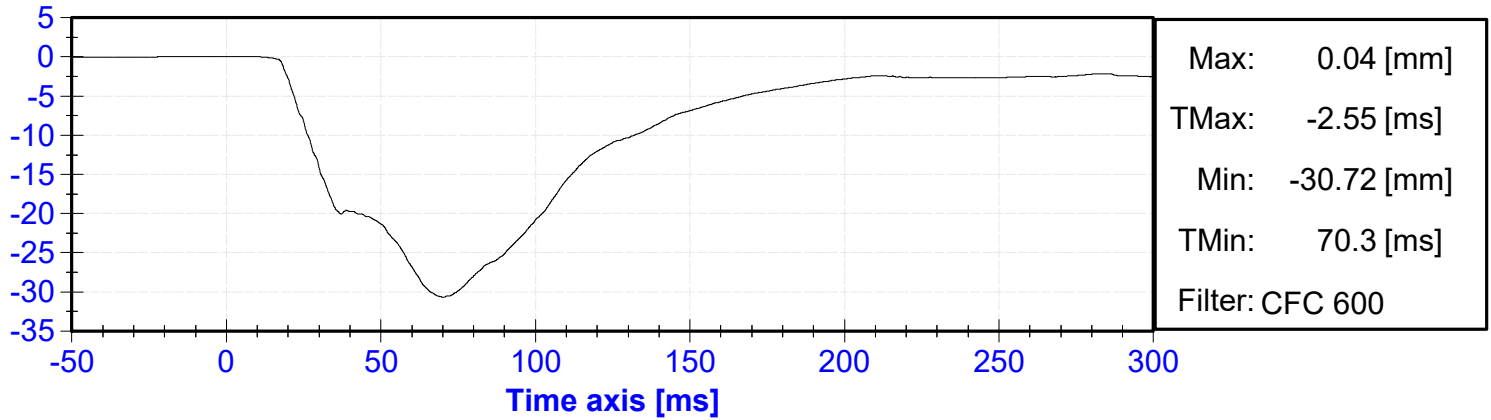
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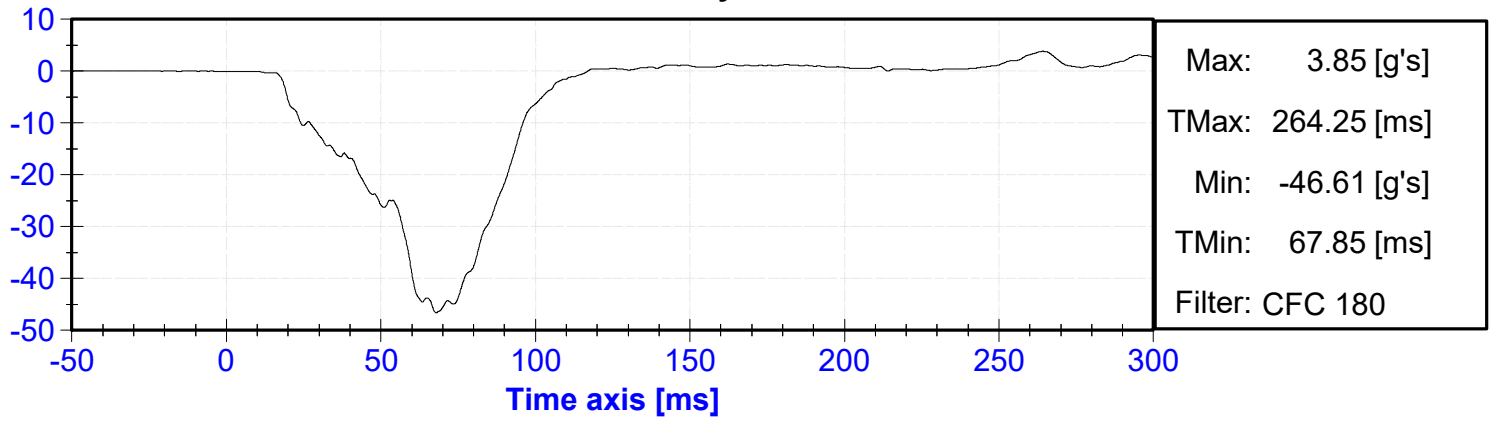
Driver Head Resultant Acceleration vs. Time Primary



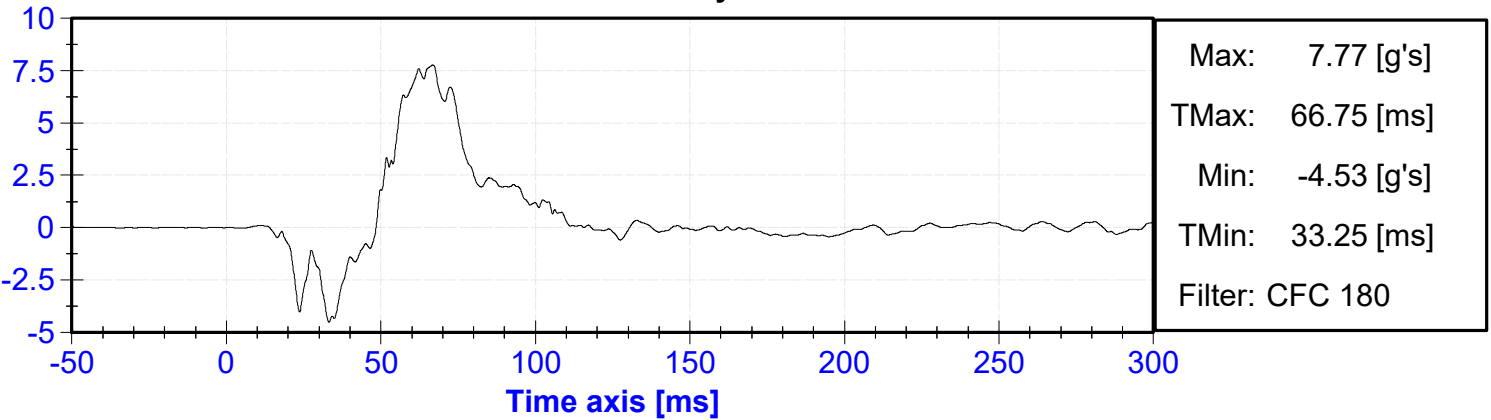
Driver Chest X Deflection vs. Time



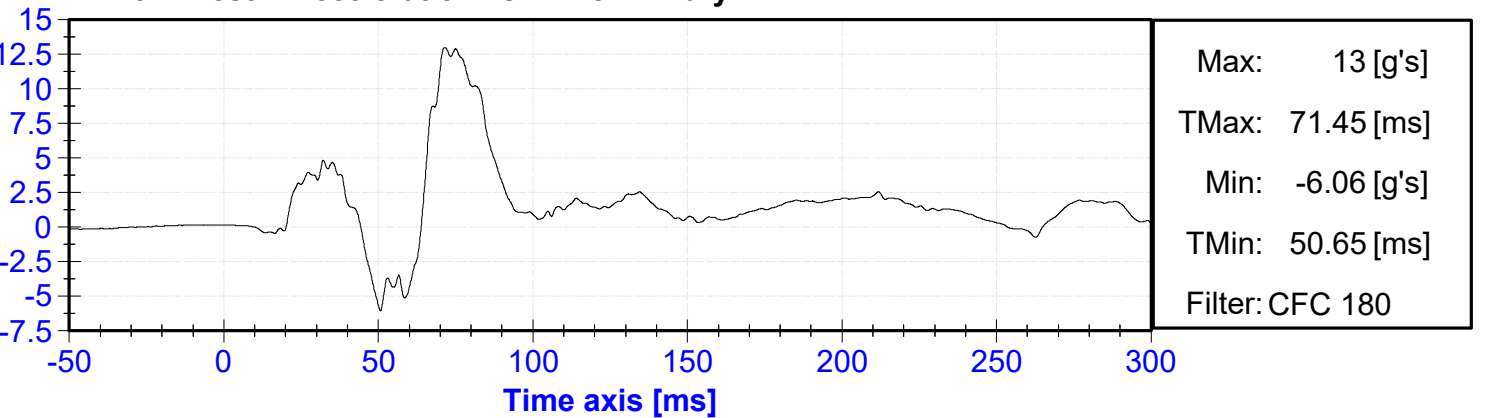
Driver Chest X Acceleration vs. Time Primary



Driver Chest Y Acceleration vs. Time Primary

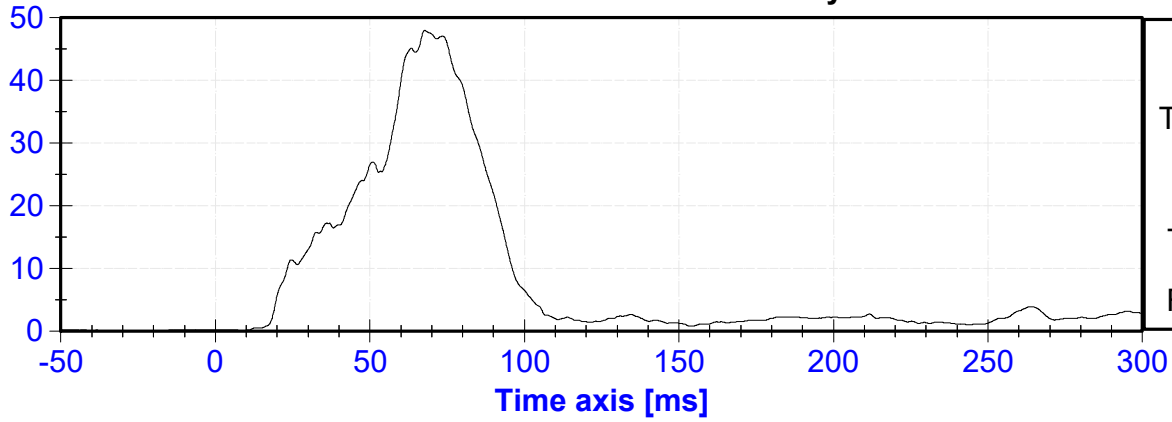


Driver Chest Z Acceleration vs. Time Primary



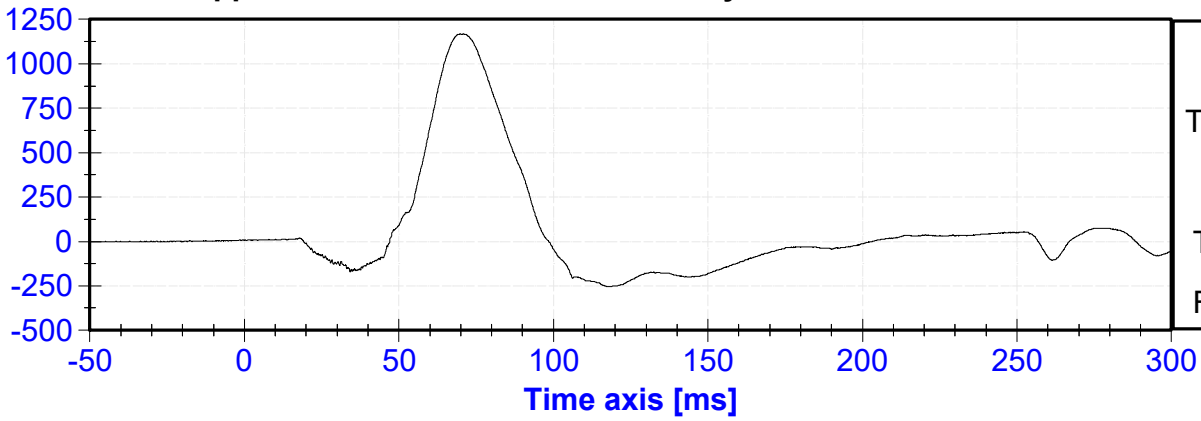
Driver Chest Resultant Acceleration vs. Time Primary

ACCELERATION [g's]



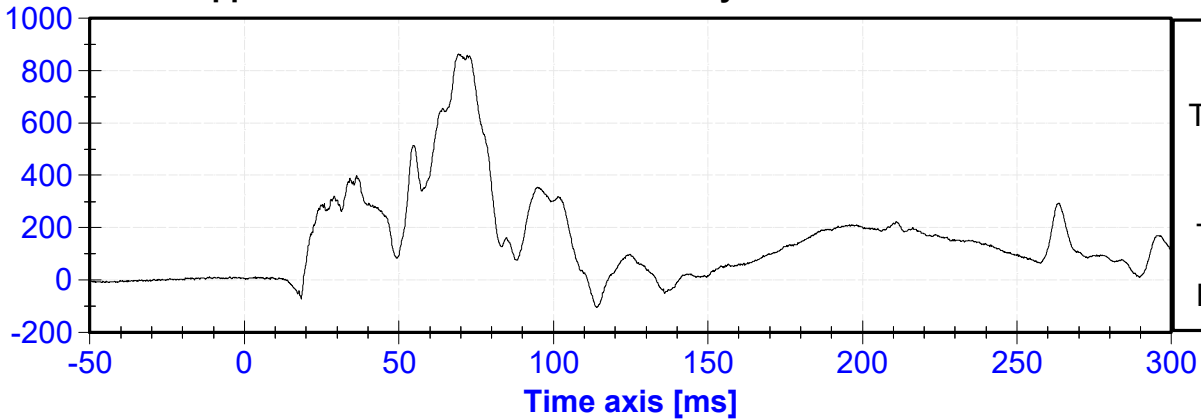
Driver Upper Neck Force X vs. Time Primary

FORCE [N]



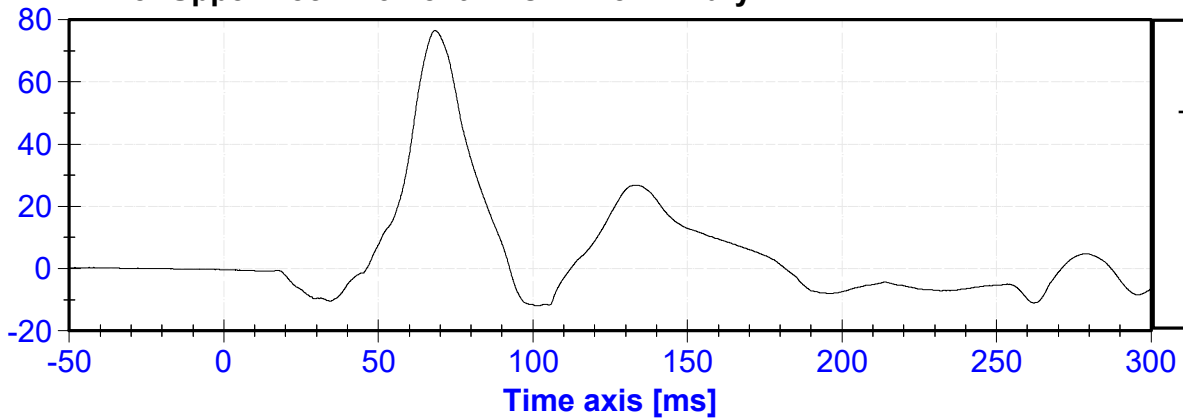
Driver Upper Neck Force Z vs. Time Primary

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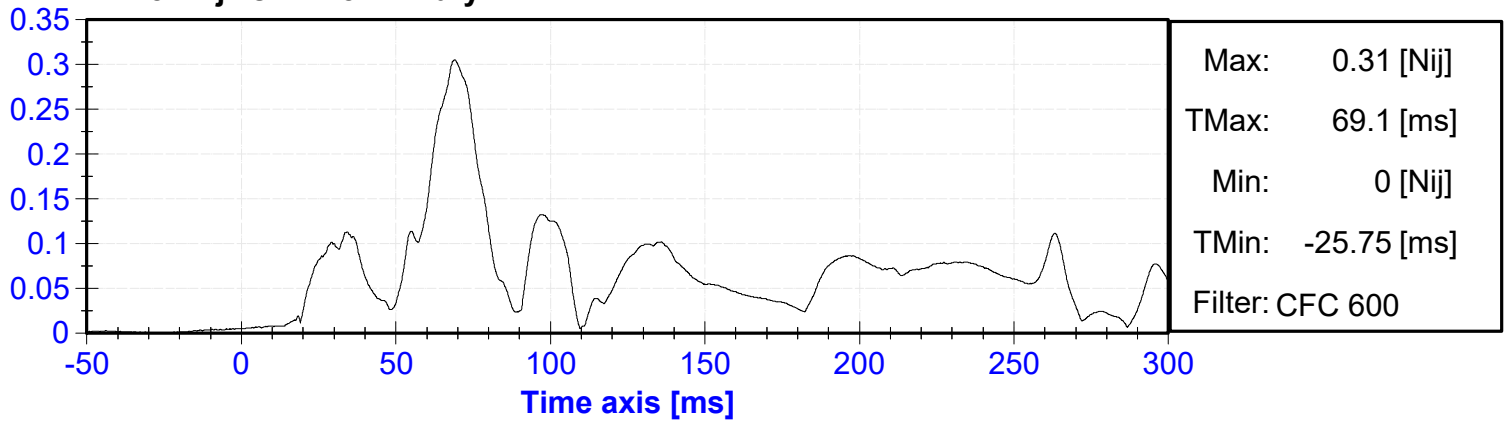


Driver Upper Neck Moment Y vs. Time Primary

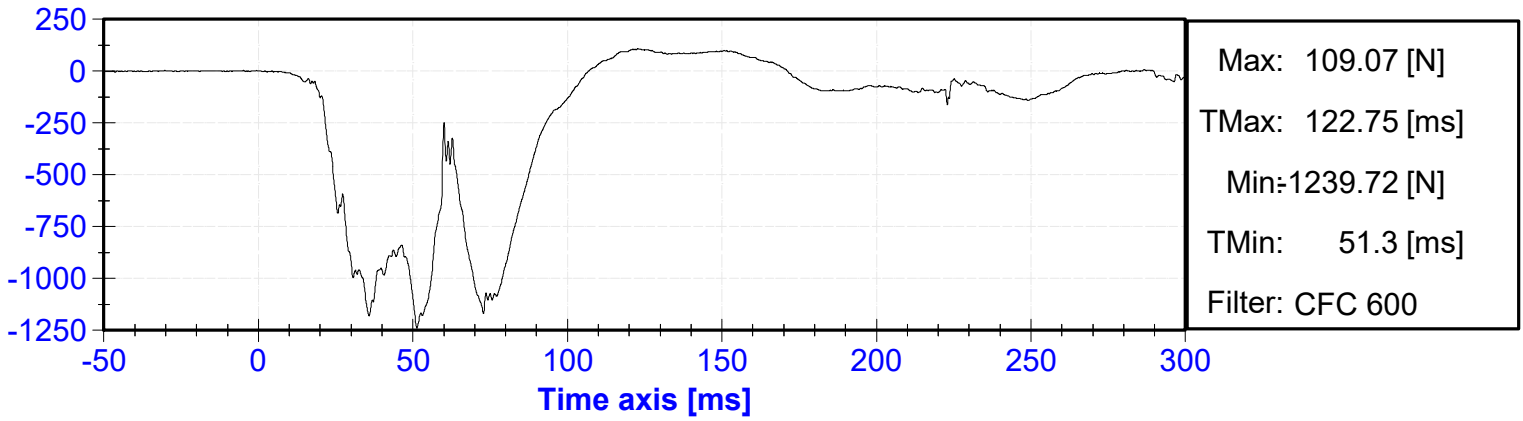
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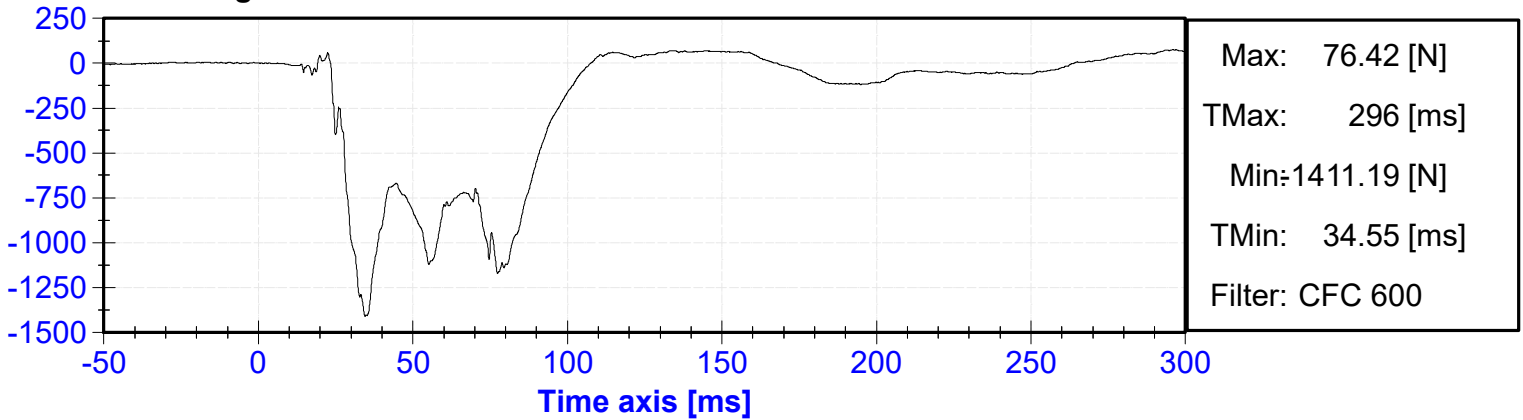
Driver Nij vs. Time Primary



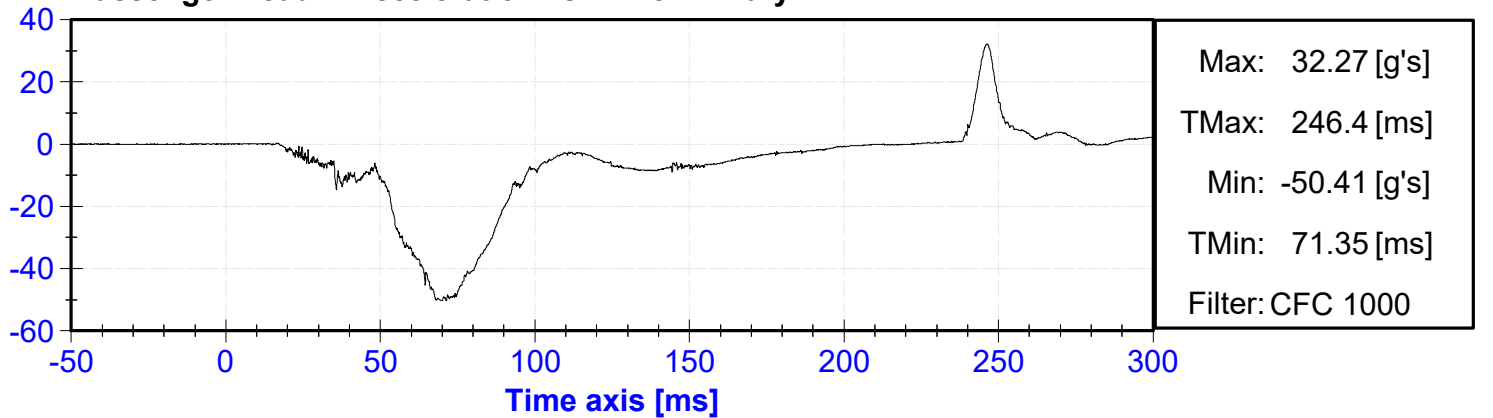
Driver Left Femur Force vs. Time



Driver Right Femur Force vs. Time

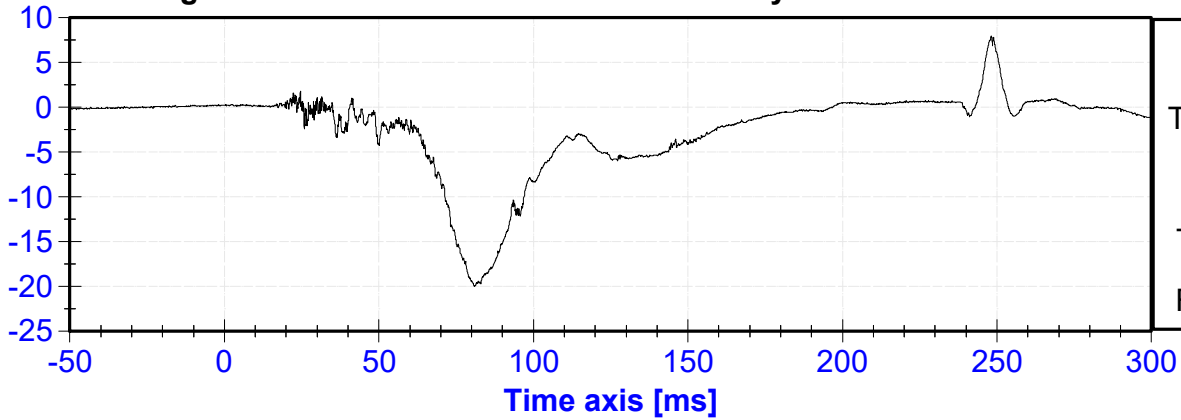


Passenger Head X Acceleration vs. Time Primary



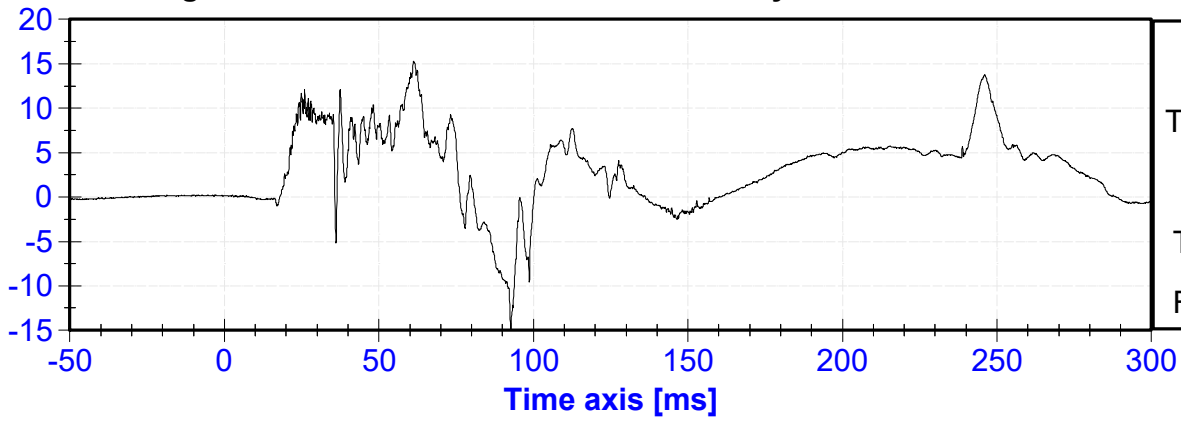
Passenger Head Y Acceleration vs. Time Primary

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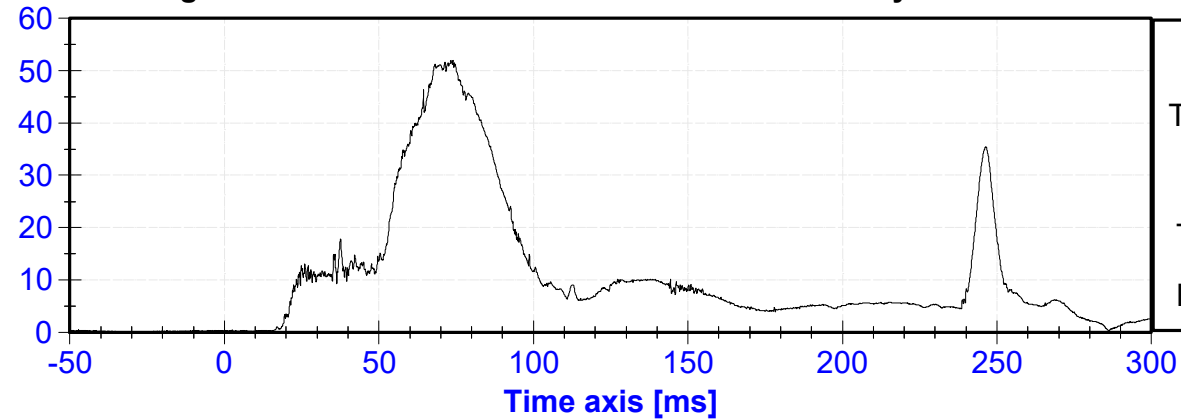
Passenger Head Z Acceleration vs. Time Primary

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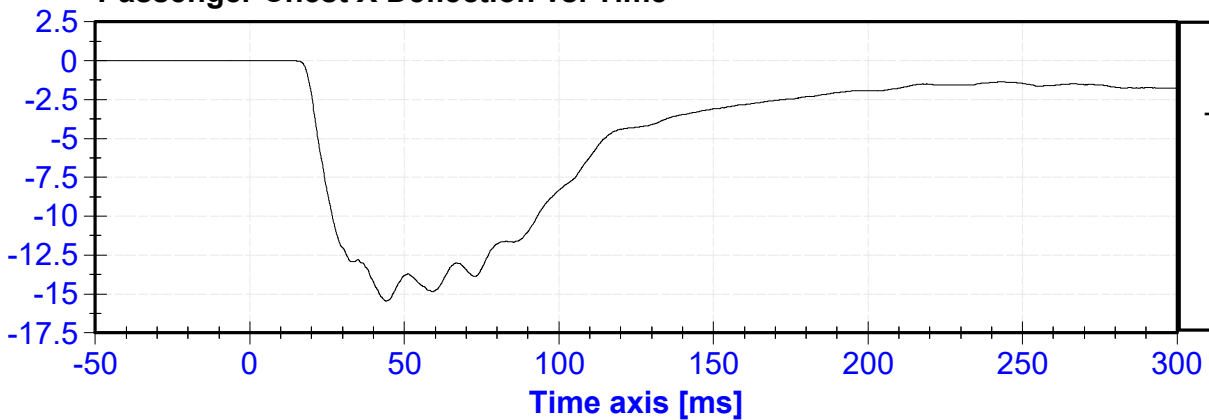
Passenger Head Resultant Acceleration vs. Time Primary

ACCELERATION [g's]



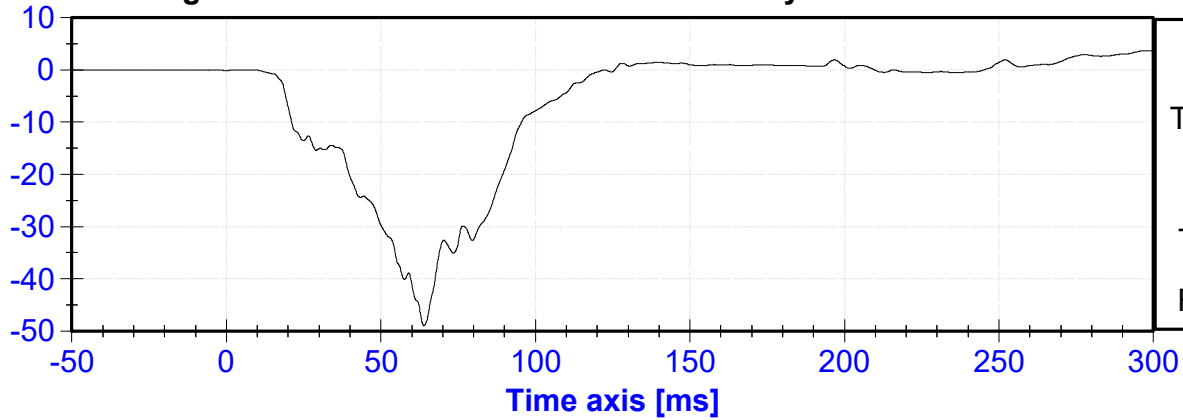
Passenger Chest X Deflection vs. Time

DISPLACEMENT [mm]



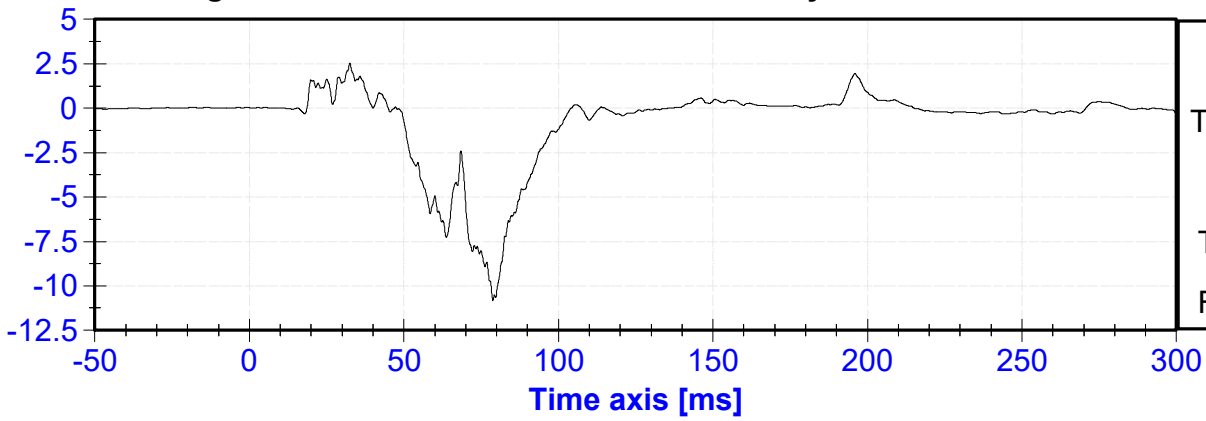
Passenger Chest X Acceleration vs. Time Primary

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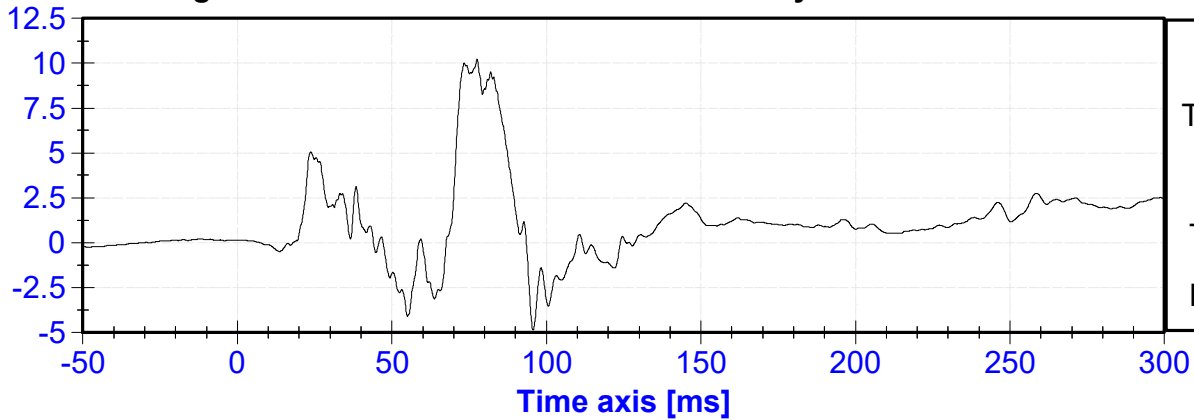
Passenger Chest Y Acceleration vs. Time Primary

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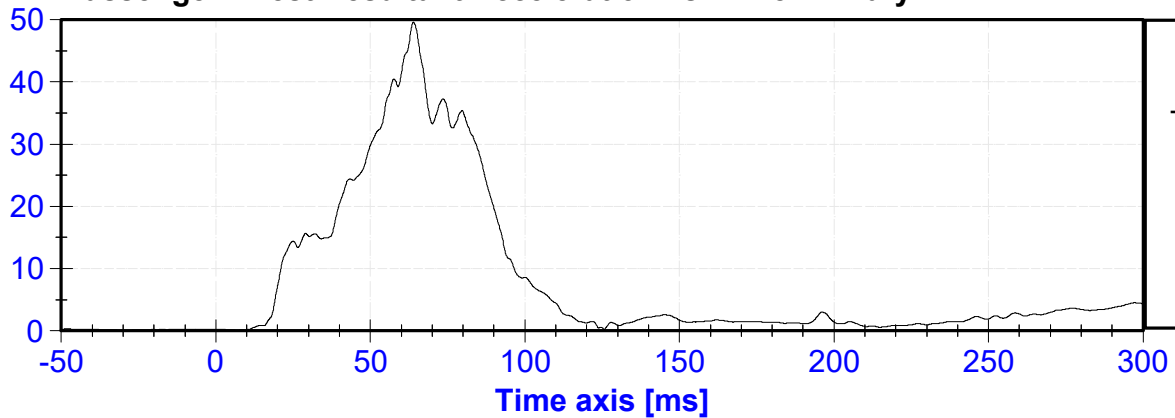
Passenger Chest Z Acceleration vs. Time Primary

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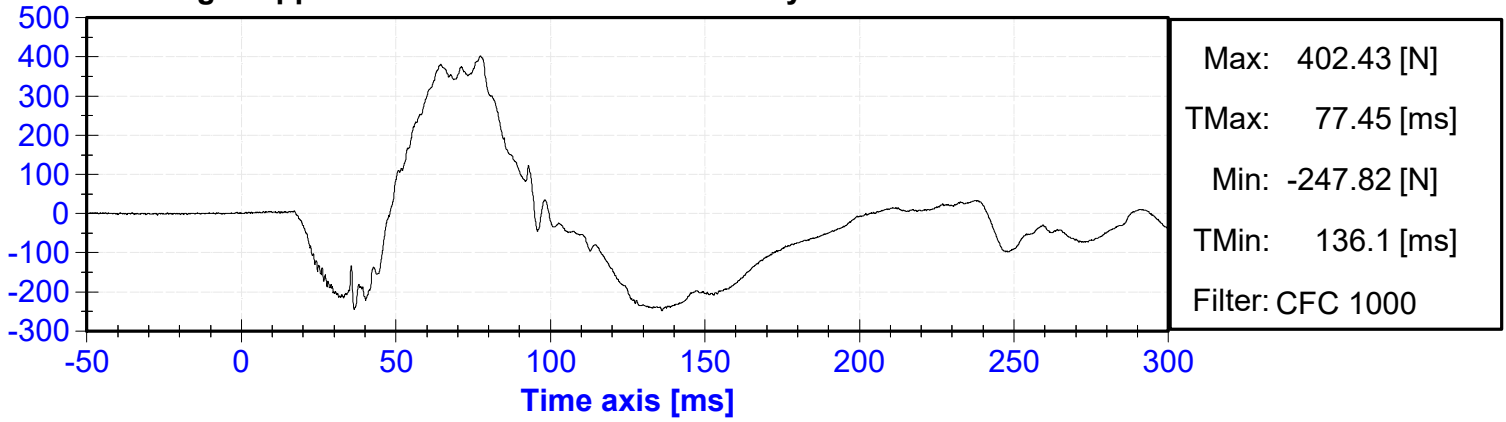


Passenger Chest Resultant Acceleration vs. Time Primary

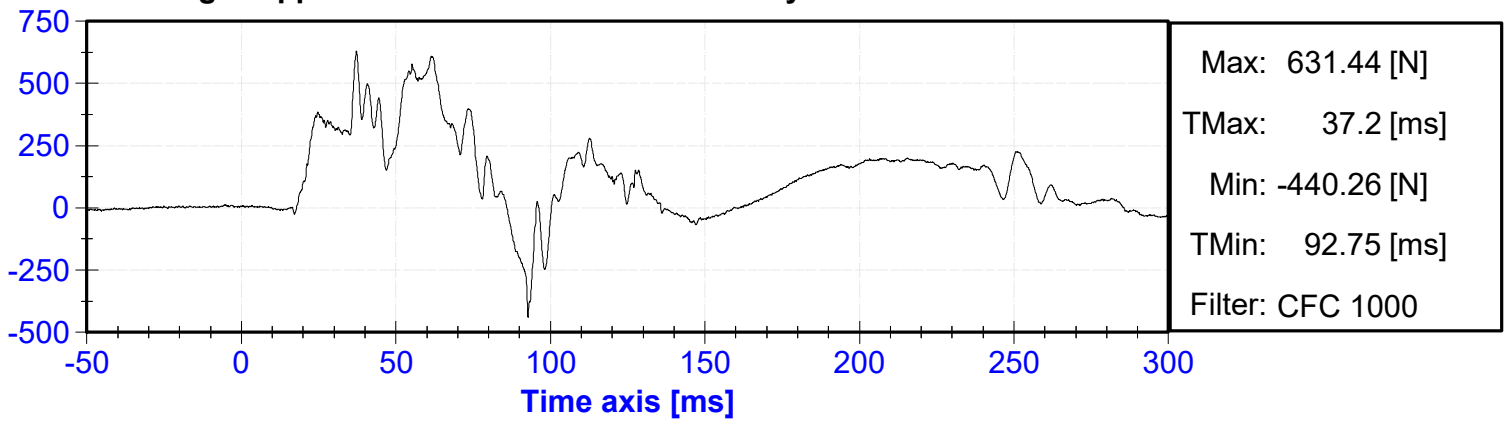
ACCELERATION [g's]



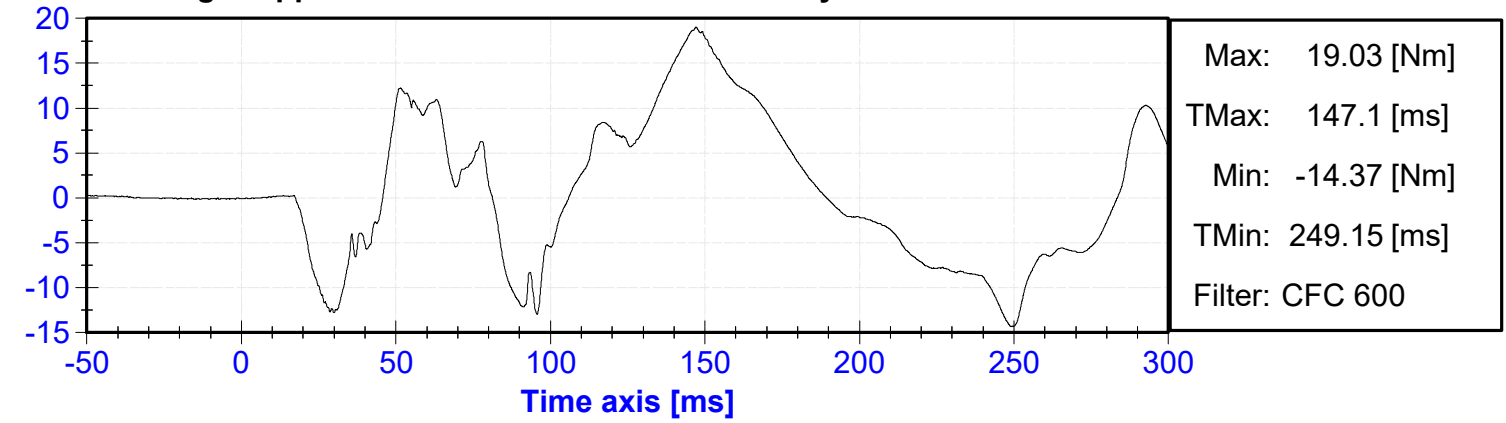
Passenger Upper Neck Force X vs. Time Primary



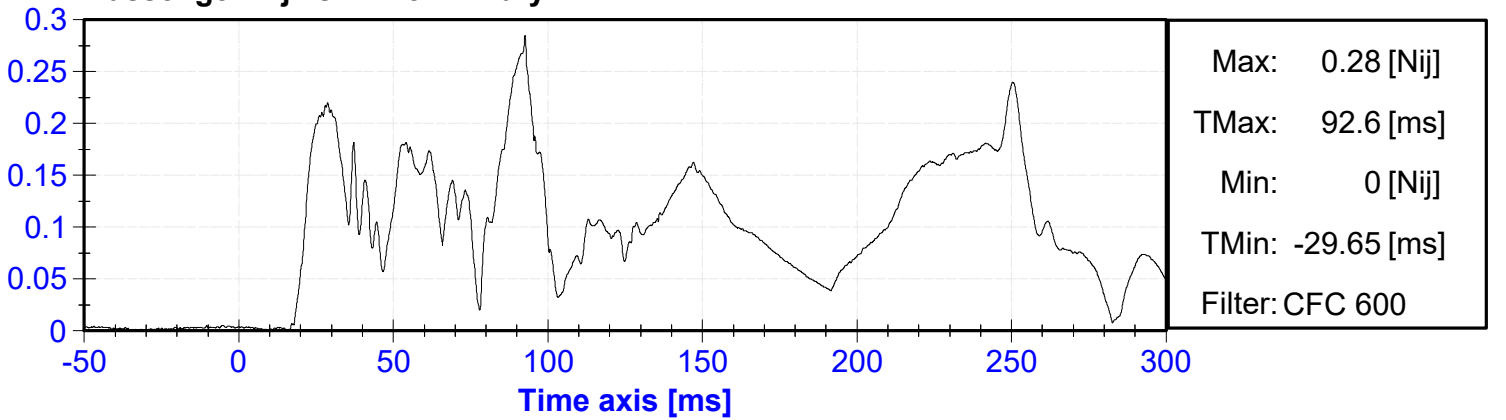
Passenger Upper Neck Force Z vs. Time Primary



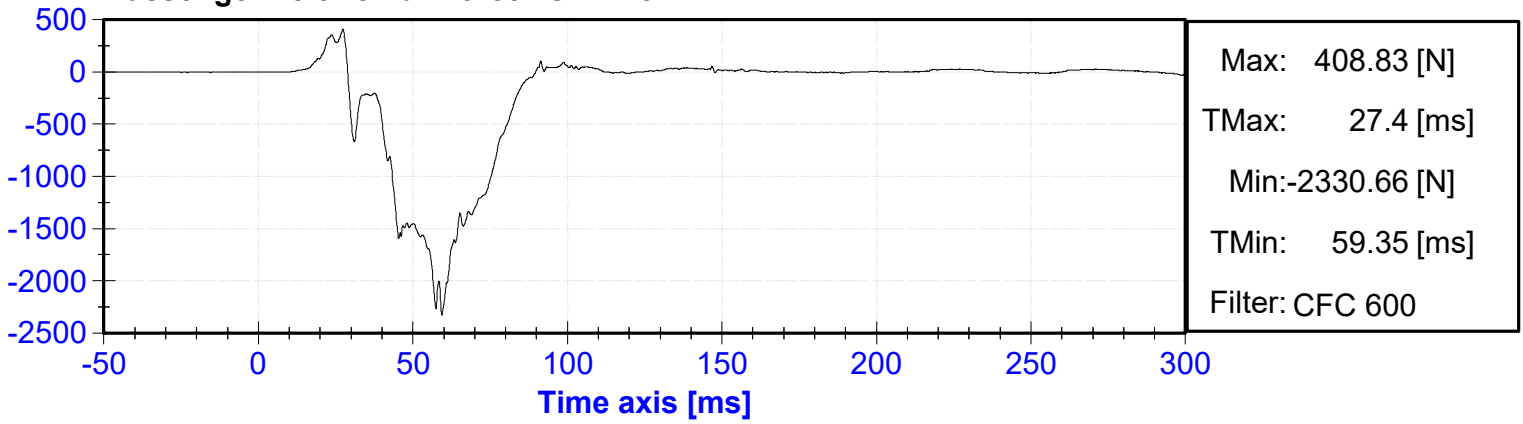
Passenger Upper Neck Moment Y vs. Time Primary



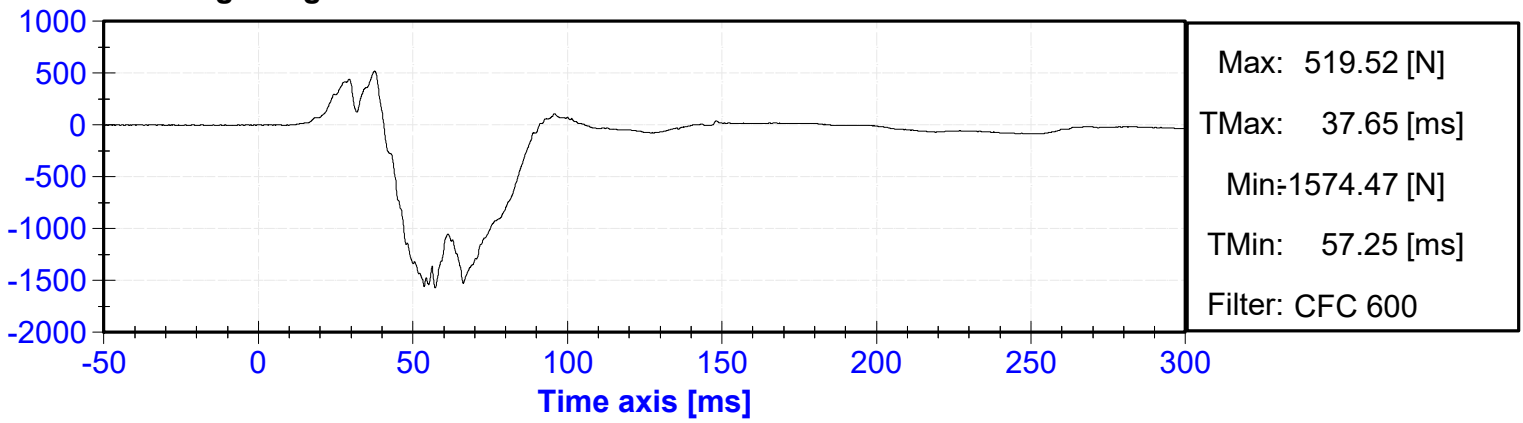
Passenger Nij vs. Time Primary



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

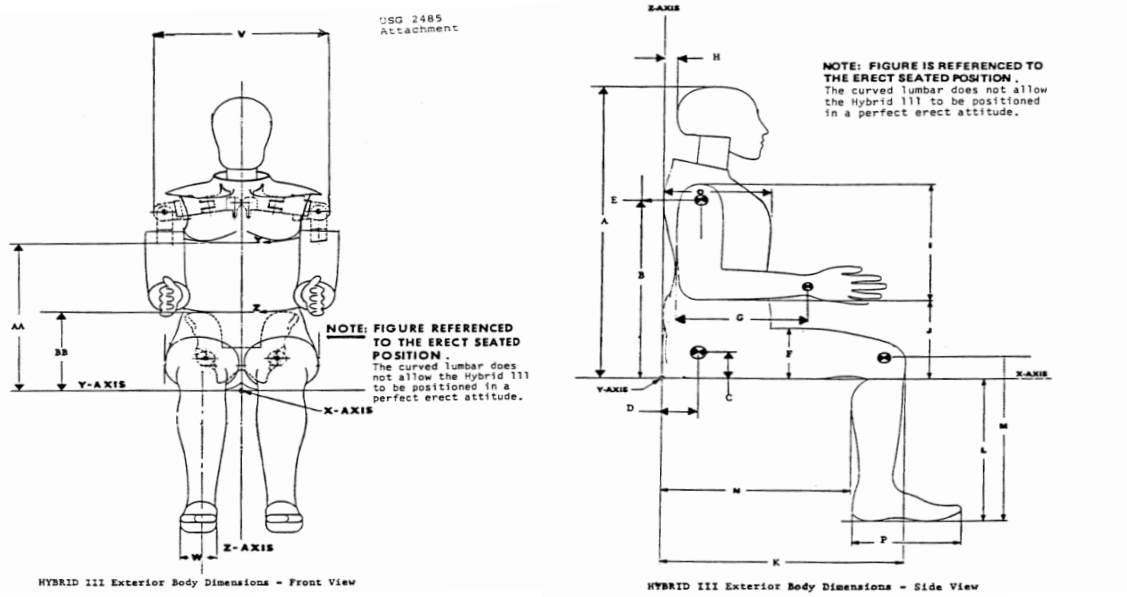


External Measurements - Hybrid 3 - 50th Male

Technician: K. Brogan

Date: 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

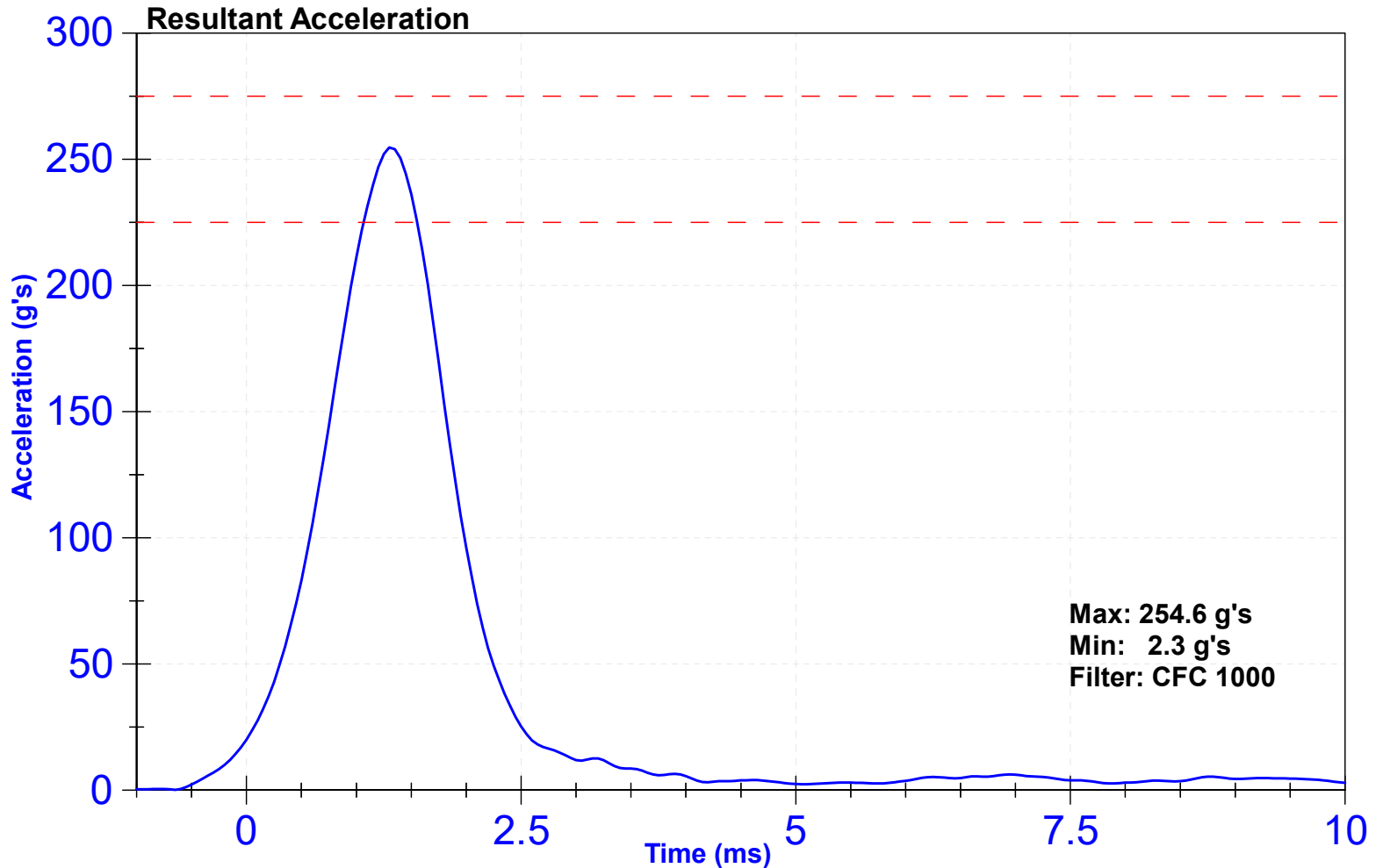
ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	142	Laboratory Supervisor	C.Mantel

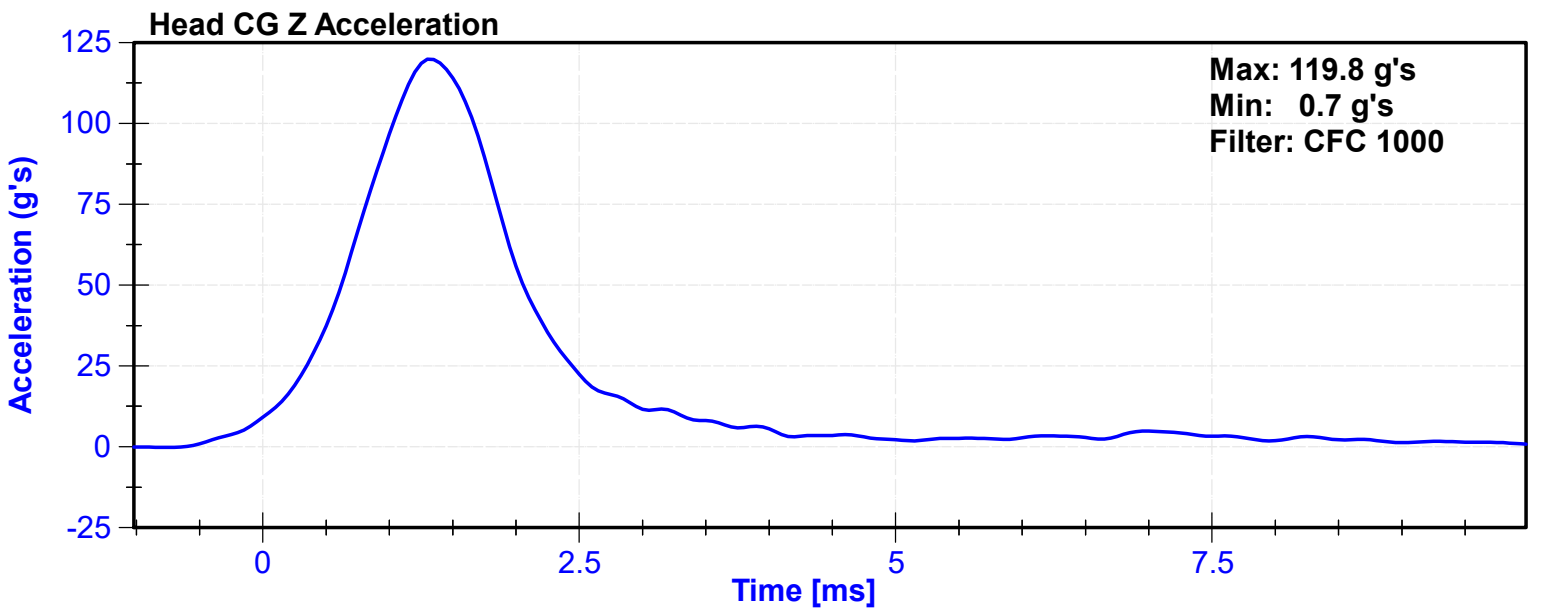
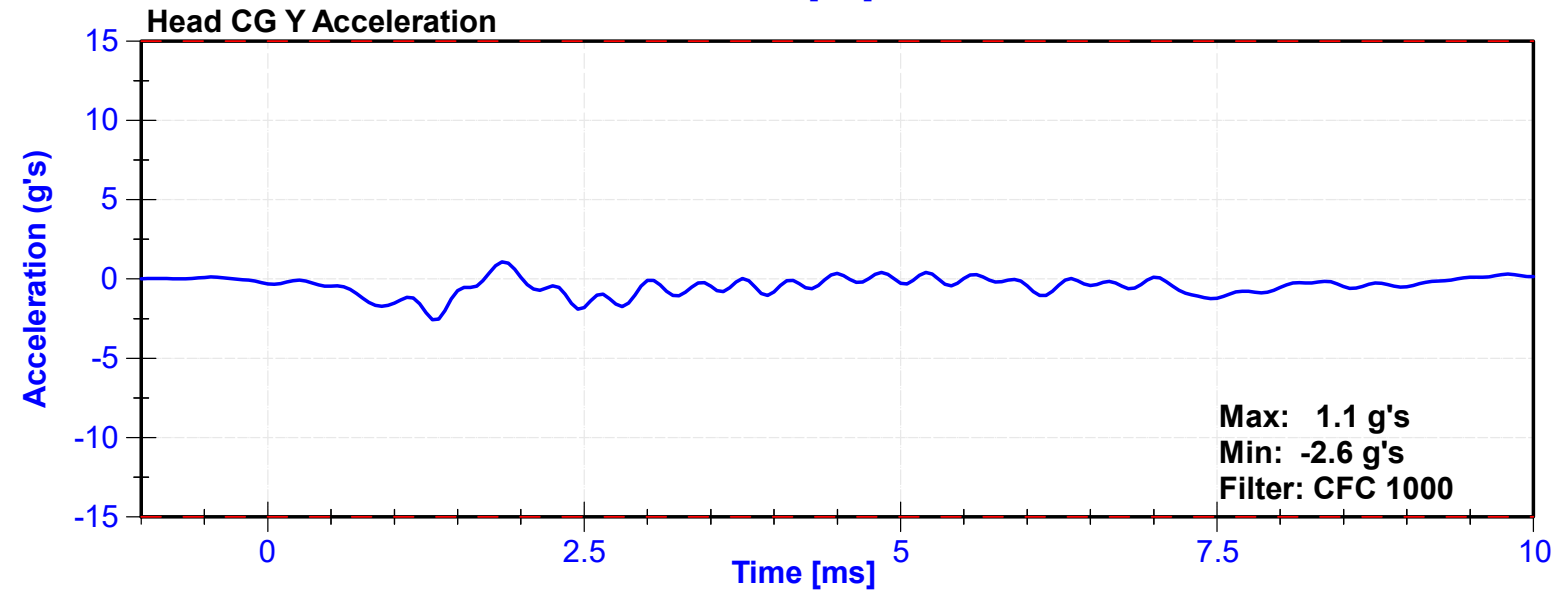
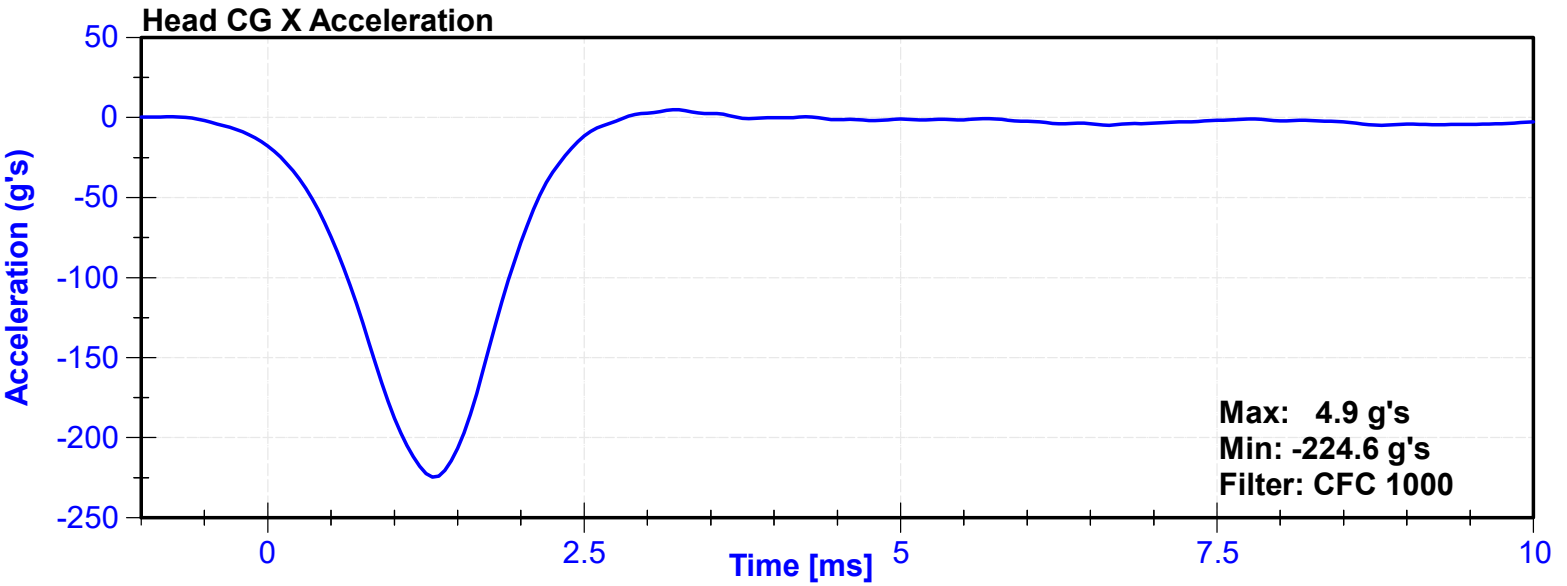
Results

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





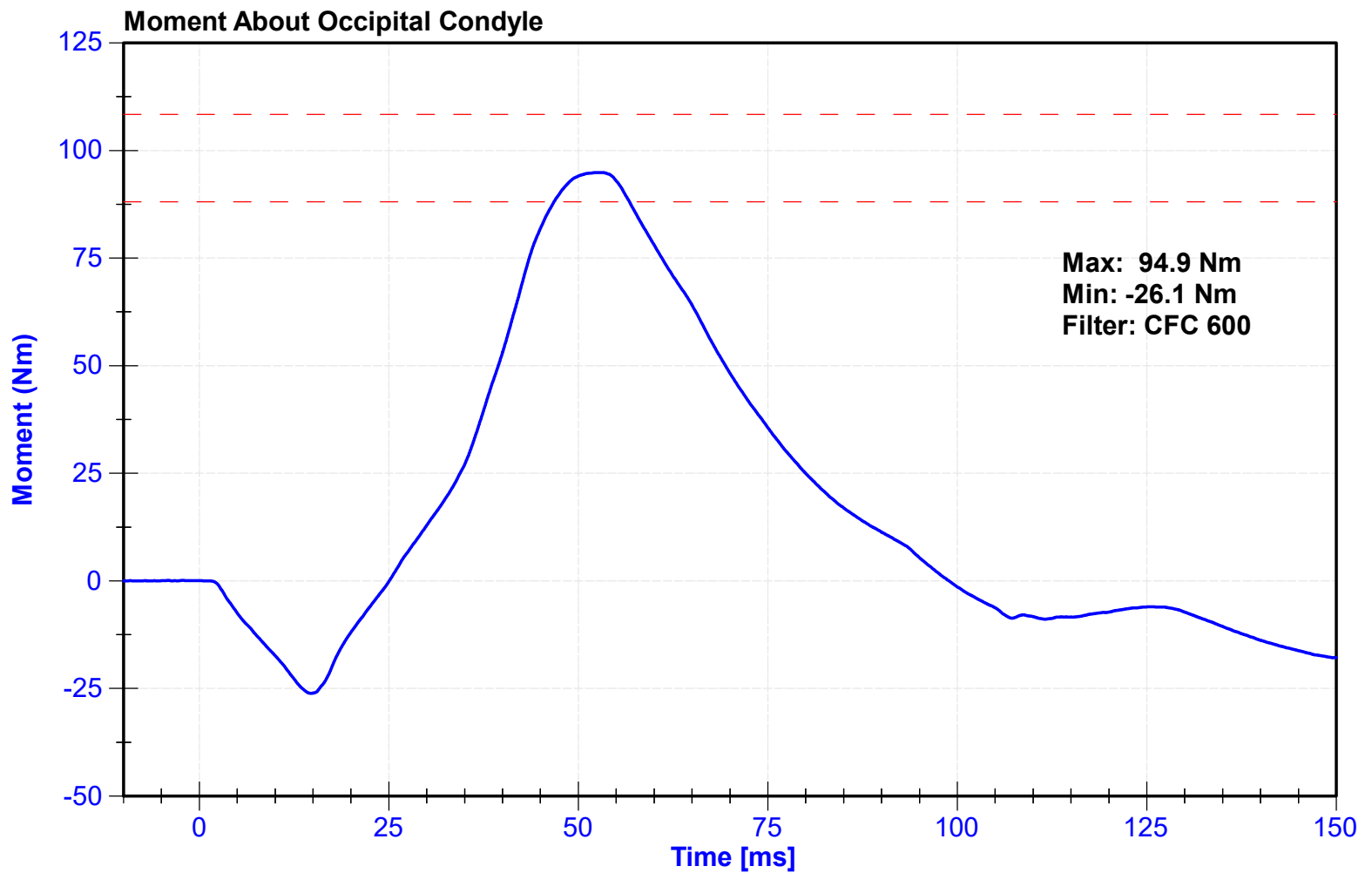
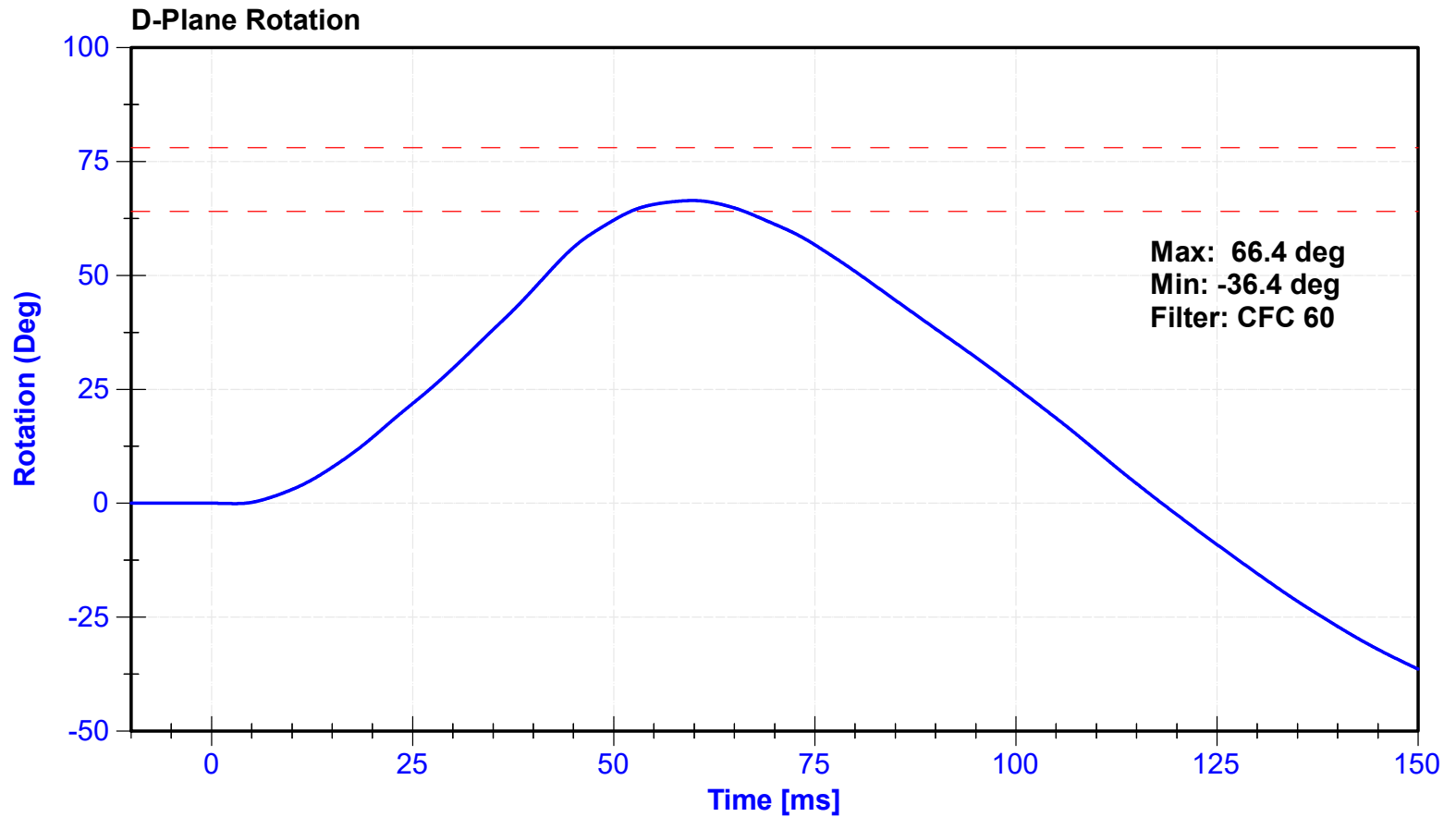
ATD Manufacturer	Humanetics	Test Technician	C. Mantell
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

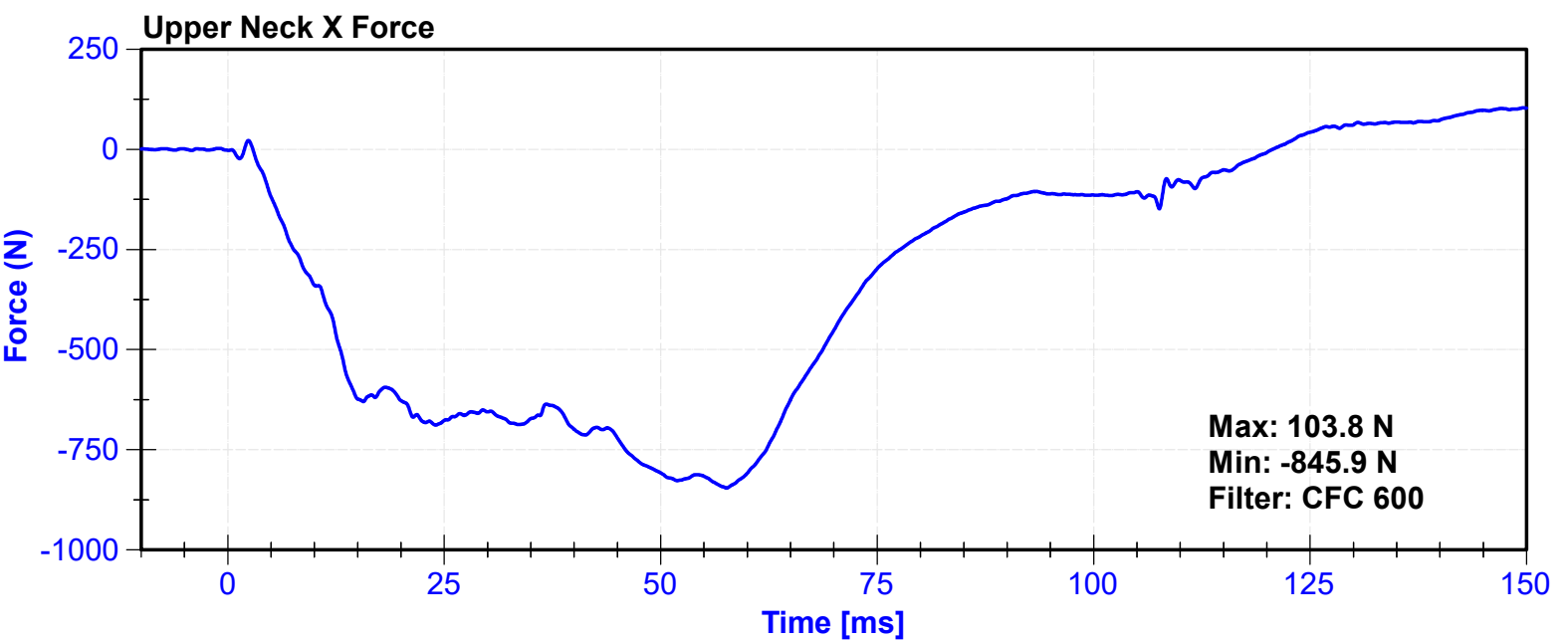
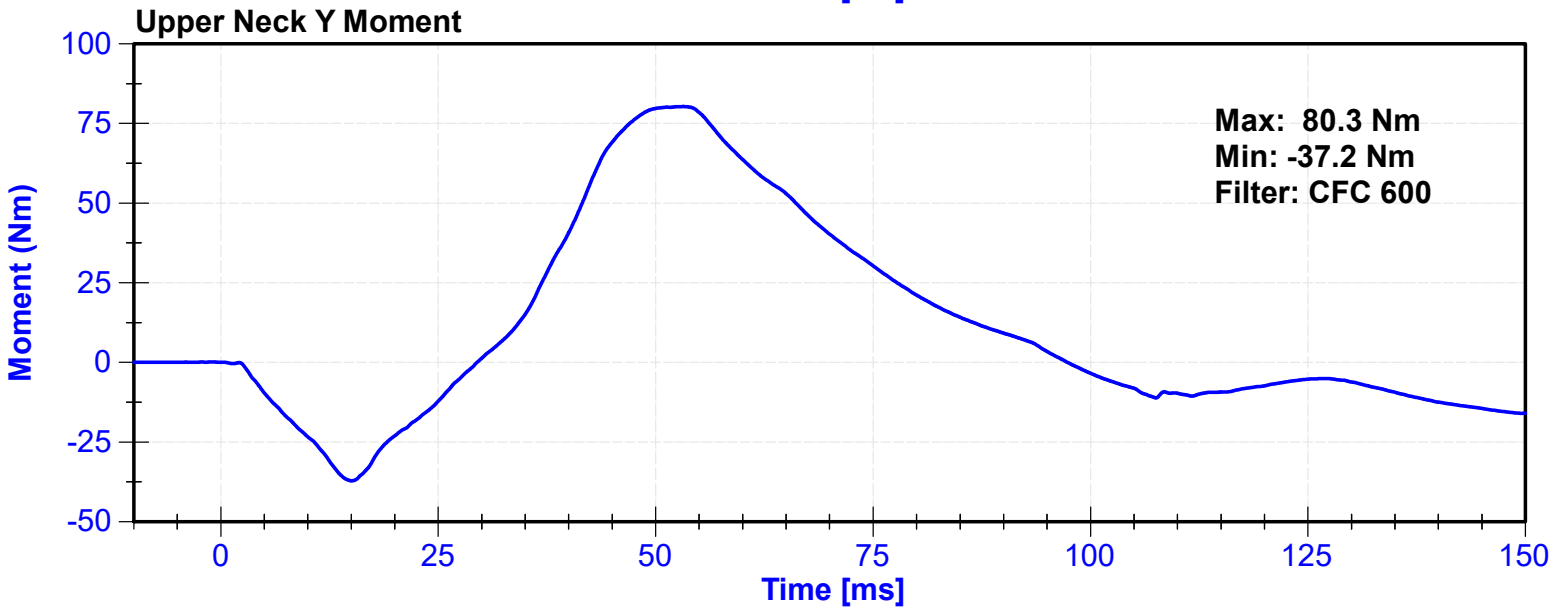
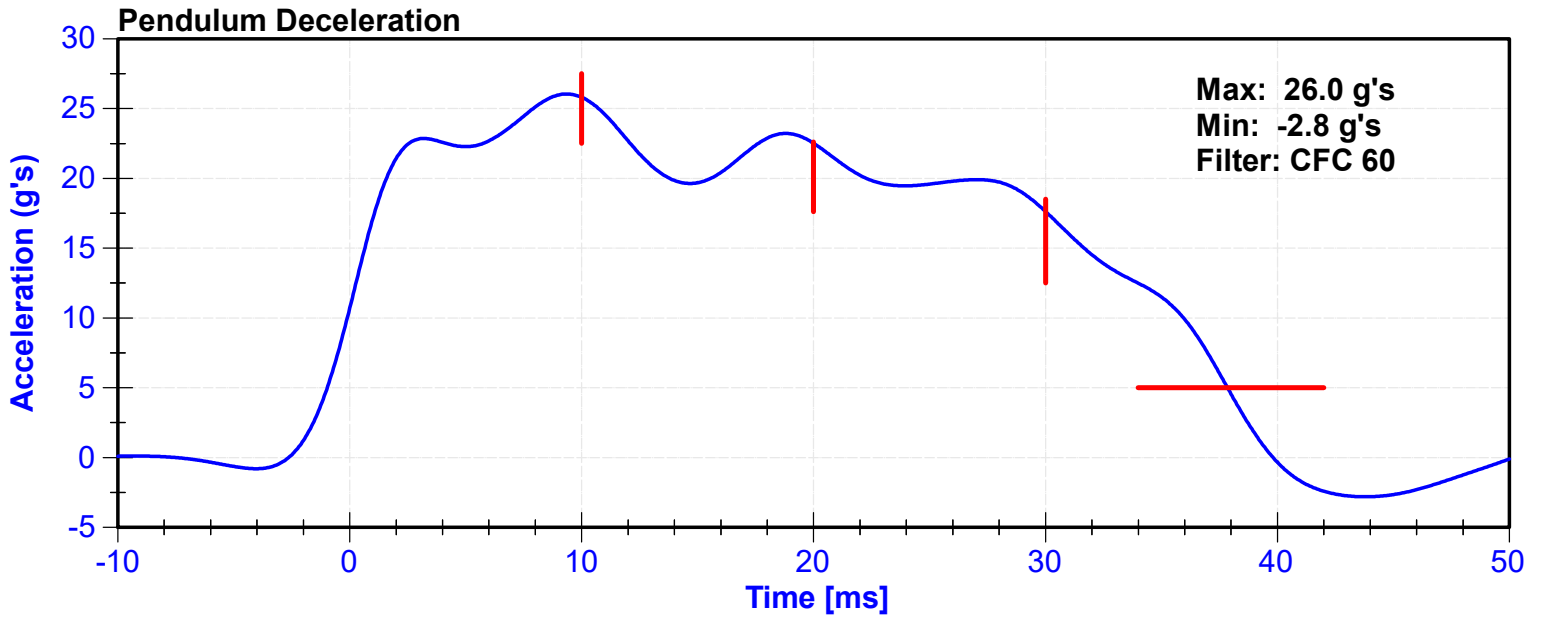
Results

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





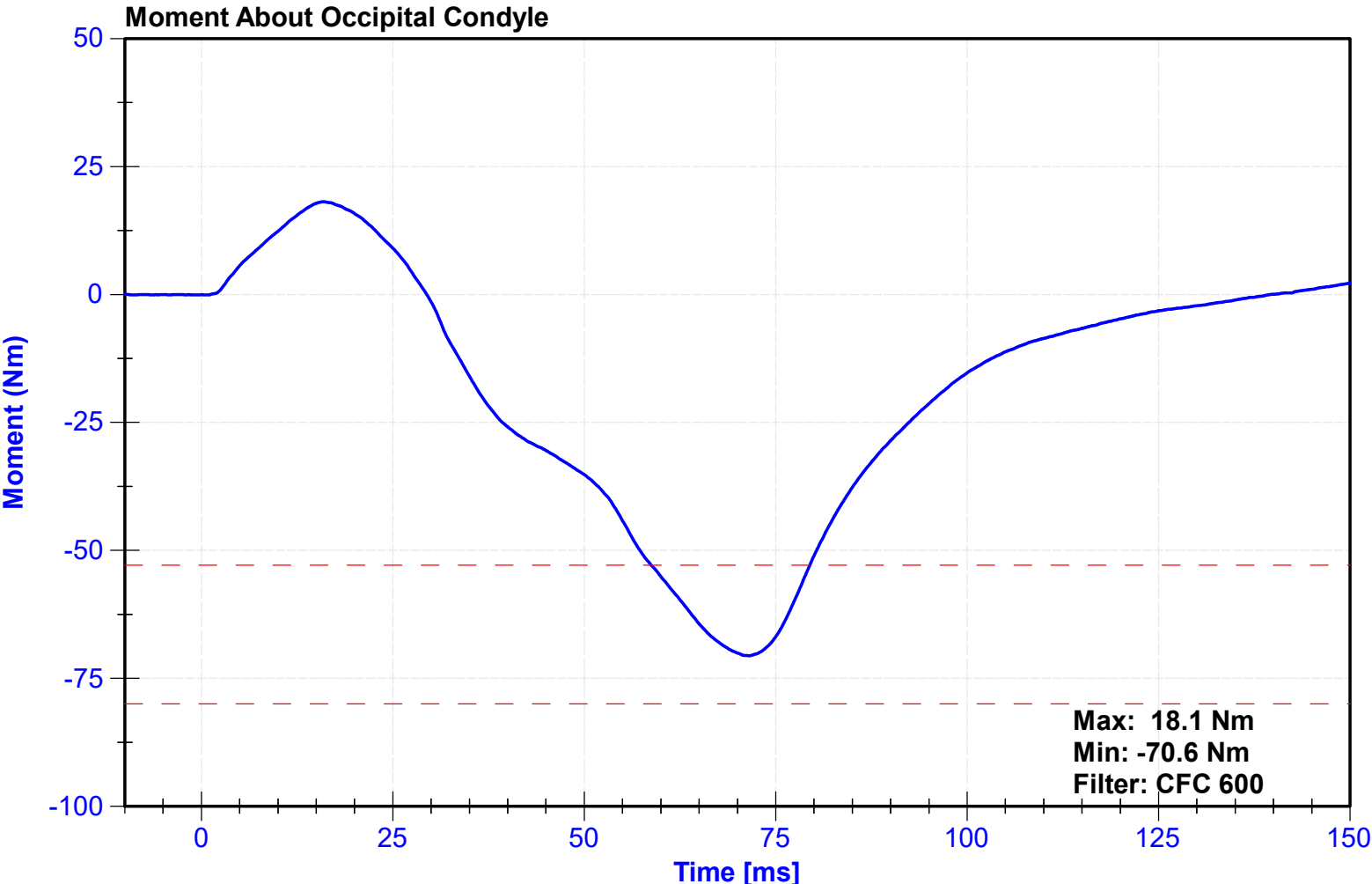
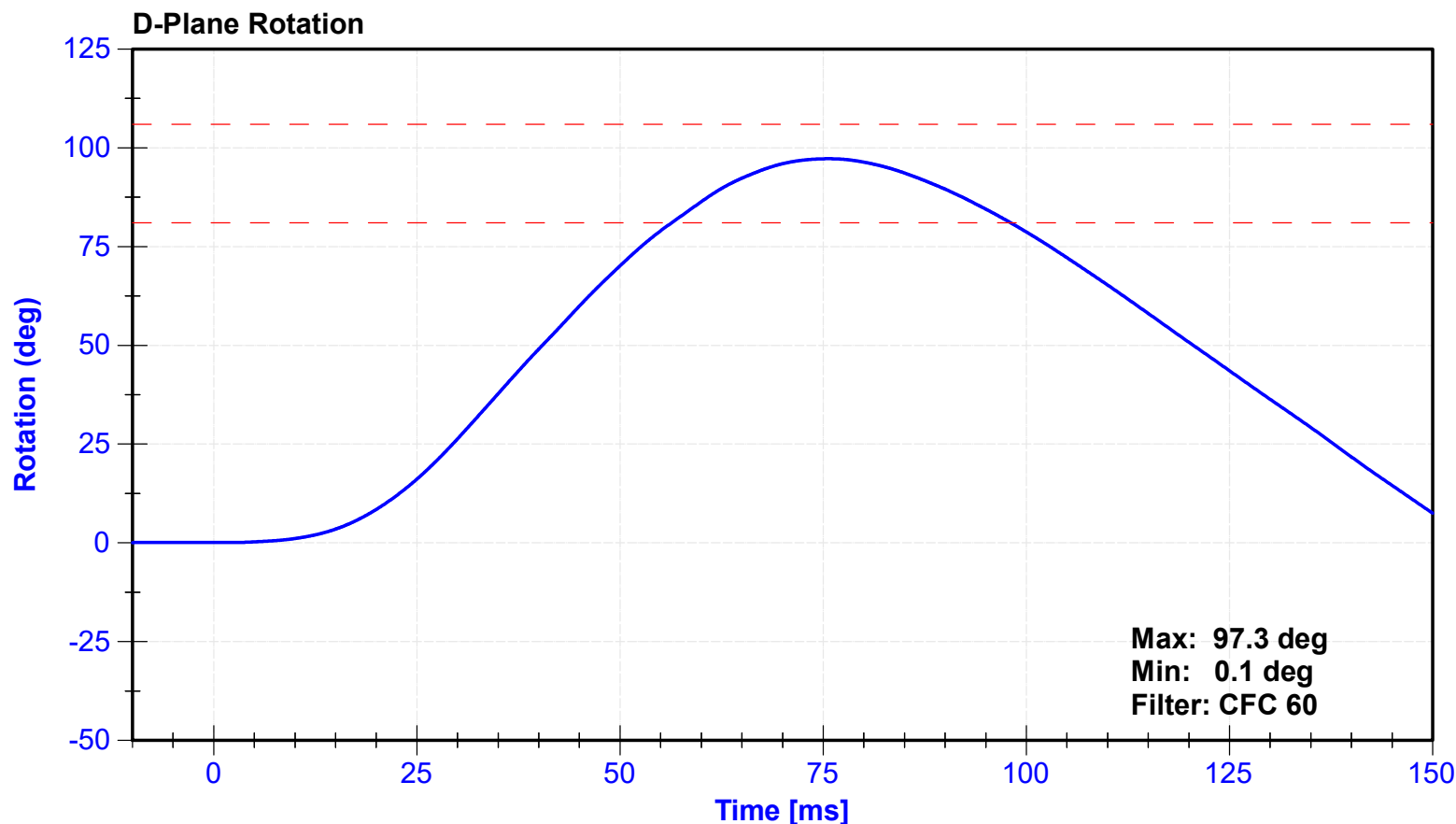
ATD Manufacturer	Humanetics	Test Technician	C. Mantell
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

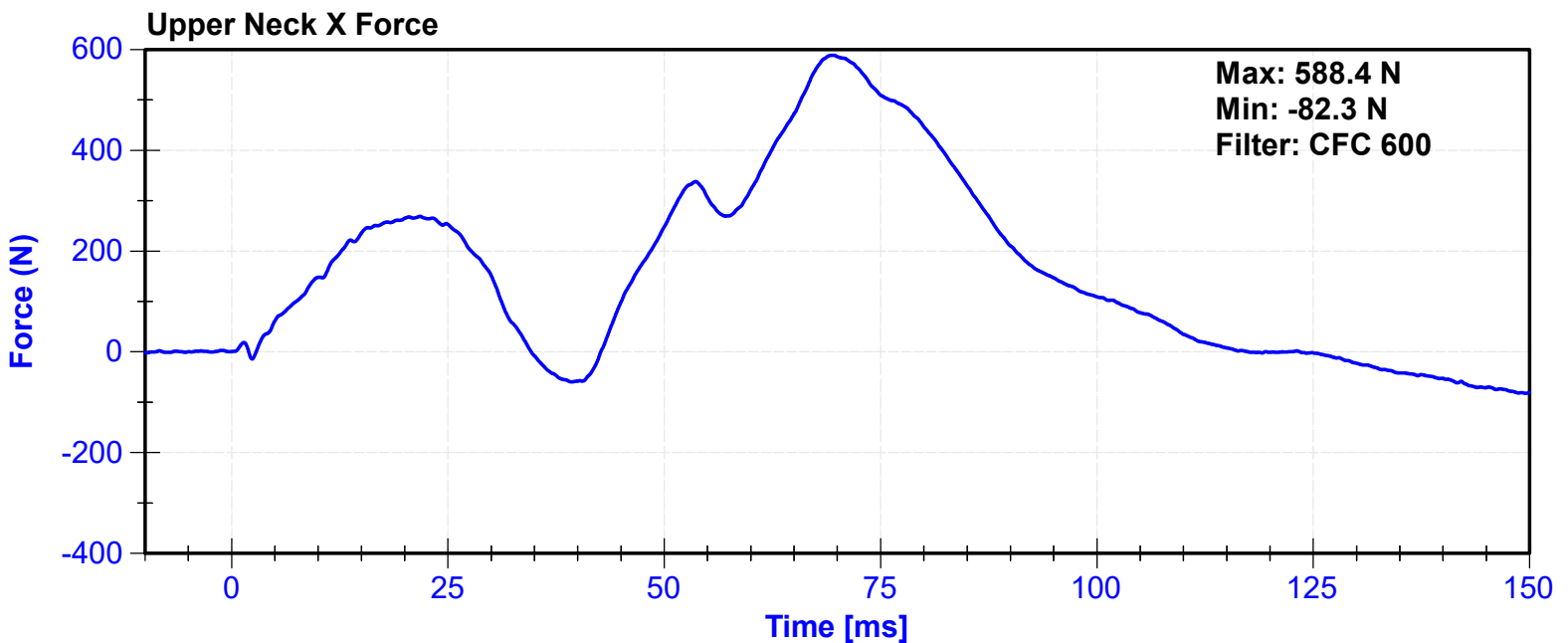
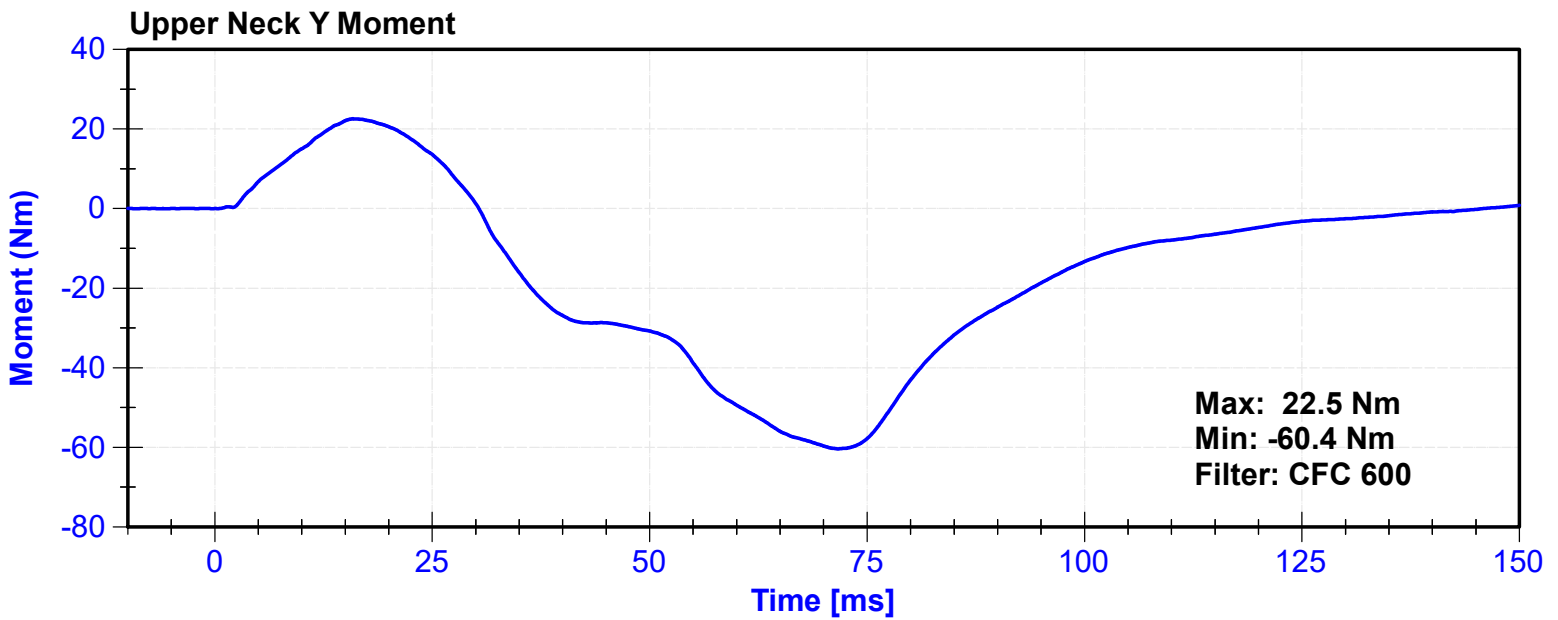
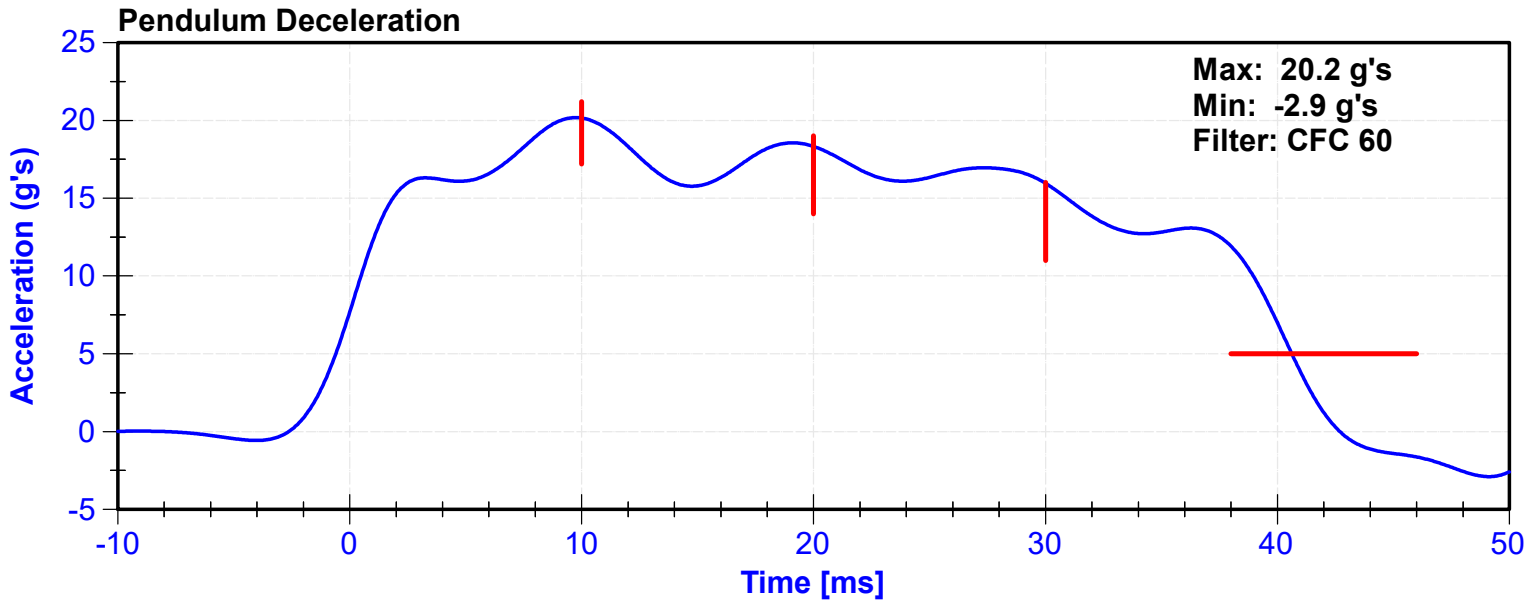
Results

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

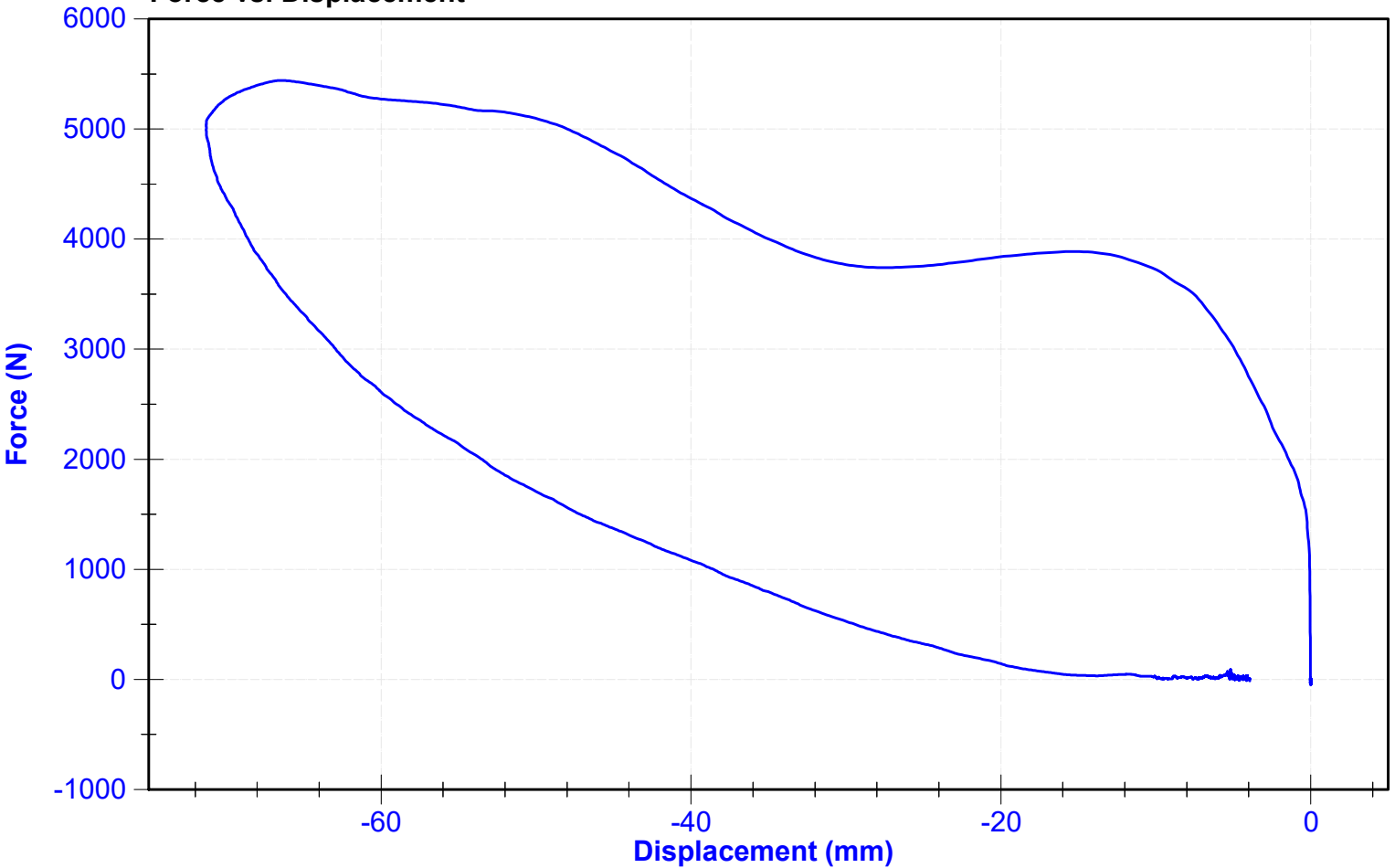
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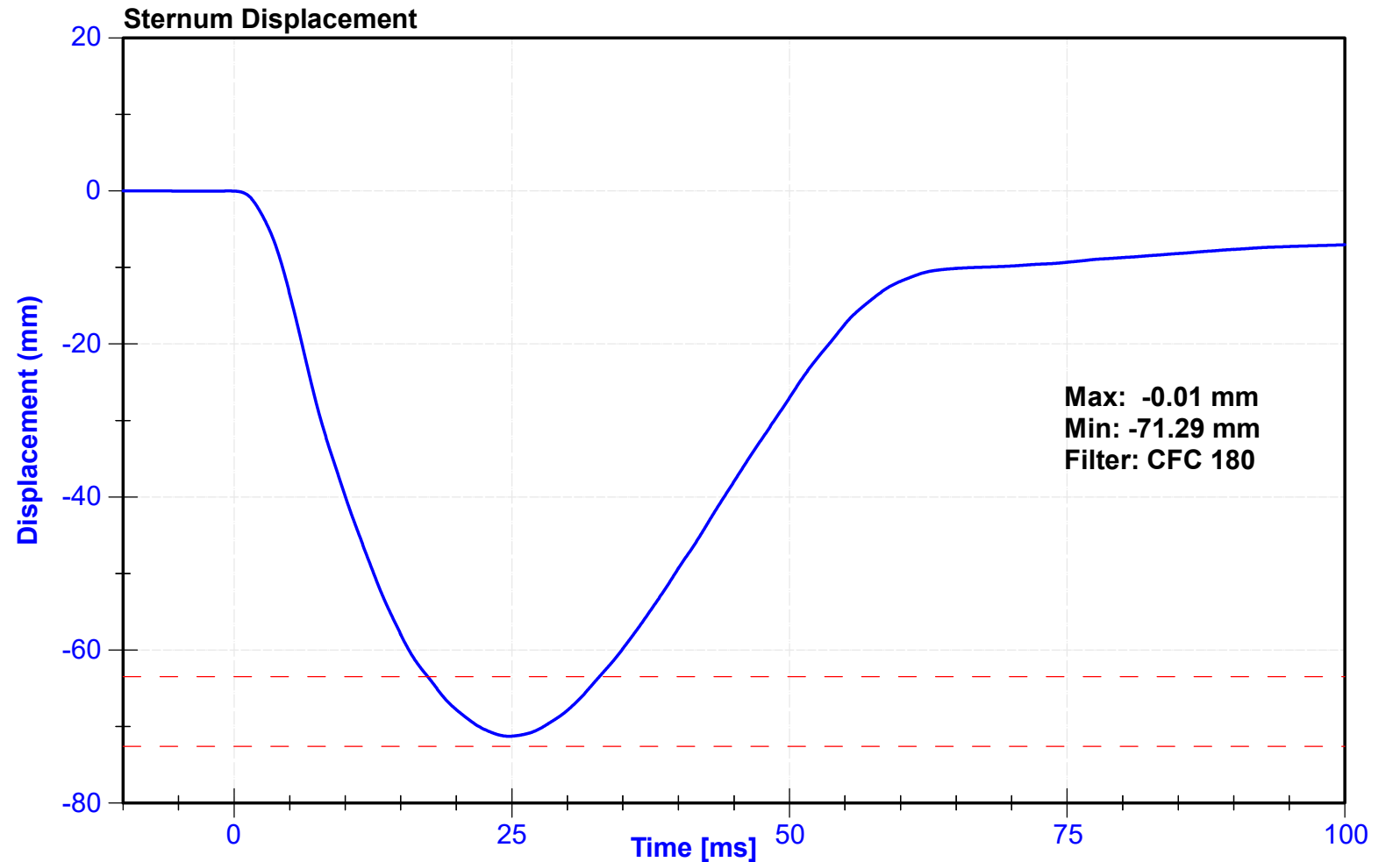
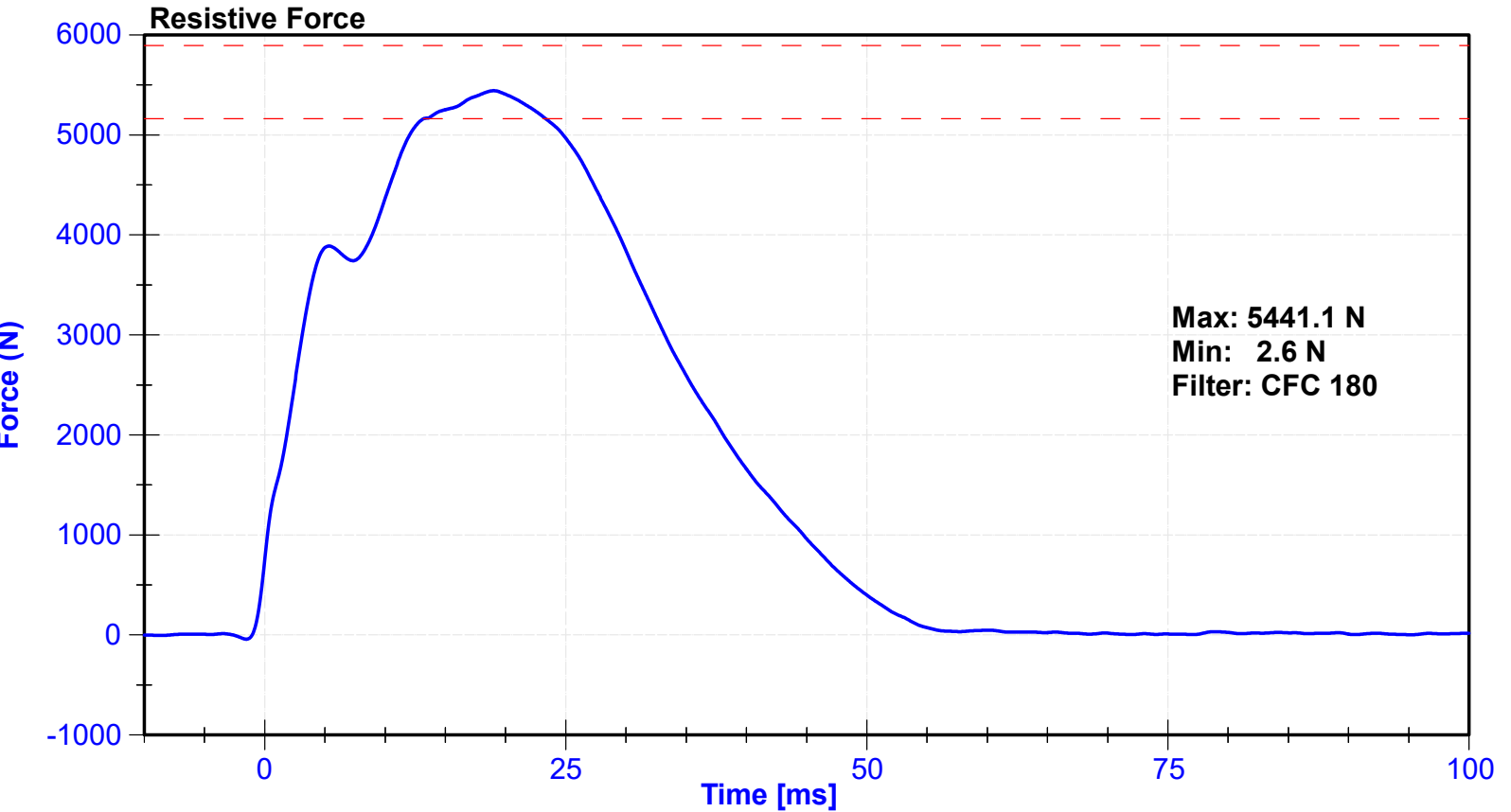
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	57	Pass
Velocity	6.59	6.83	m/s	6.719	Pass
Chest Displacement	-72.6	-63.5	mm	-71.29	Pass
Resistive Force	5160	5894	N	5441.1	Pass
Hysteresis	69	85	%	71.6	Pass

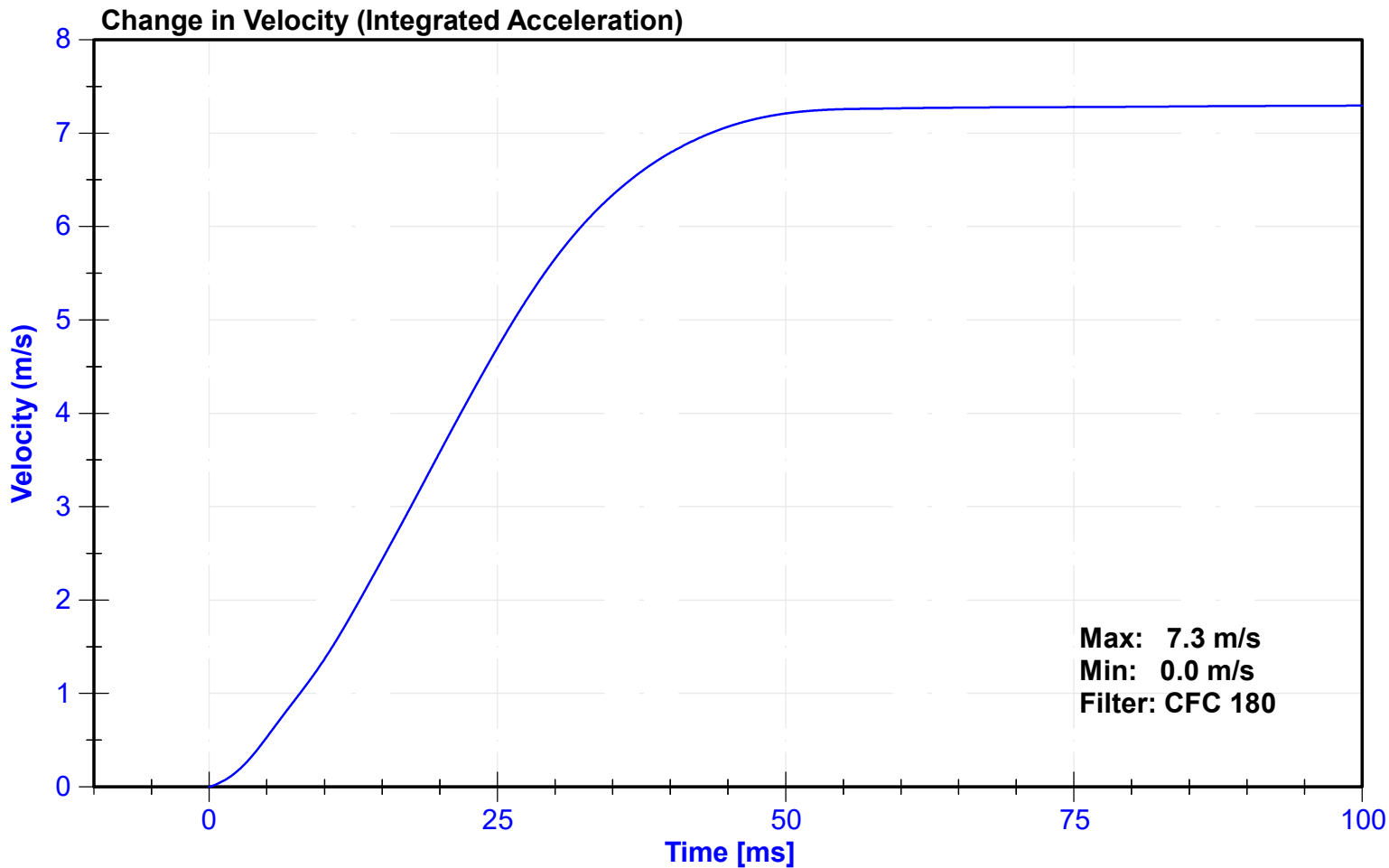
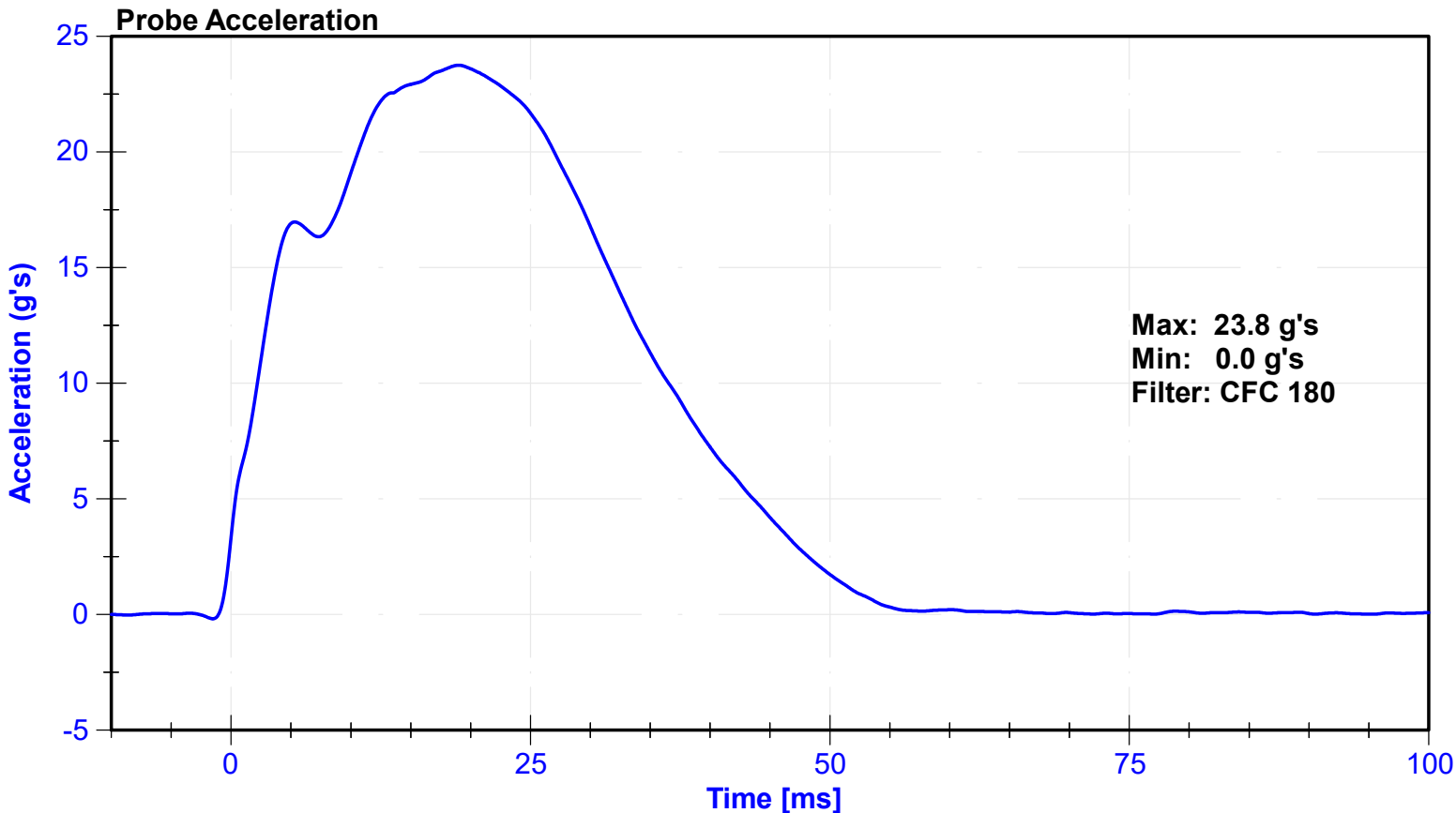
Transducer Calibrations

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

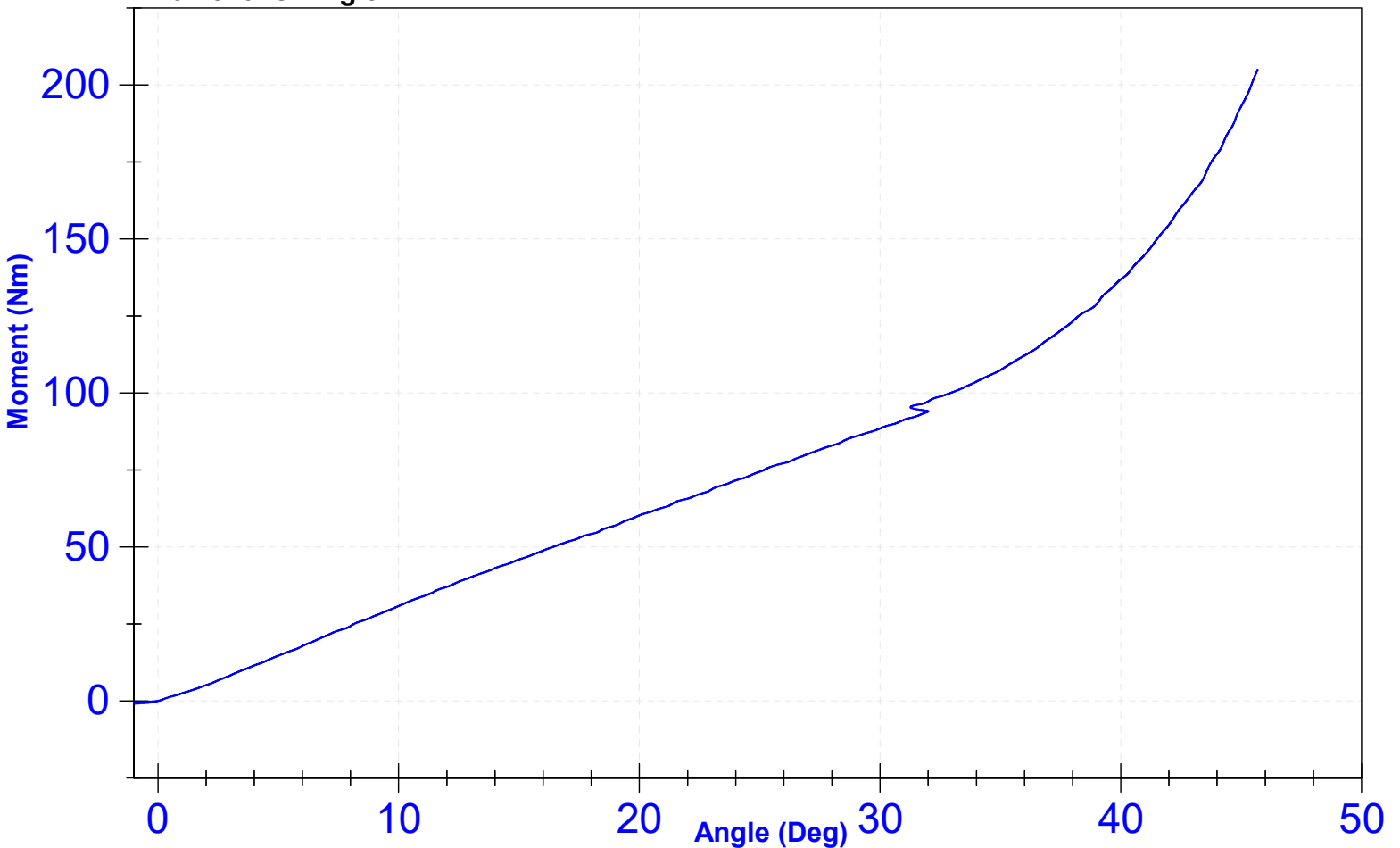
Results

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

Moment vs. Angle

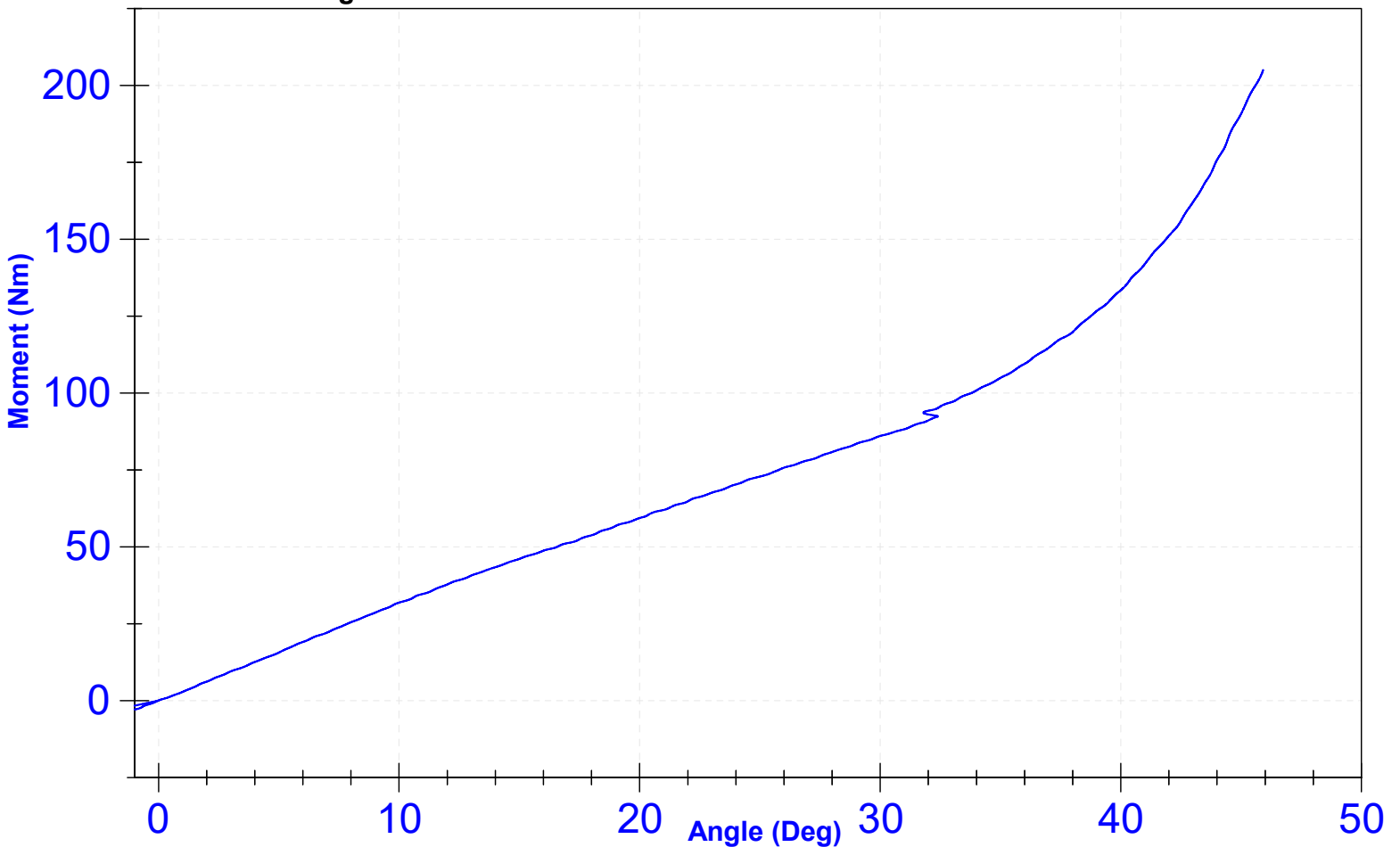


ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

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



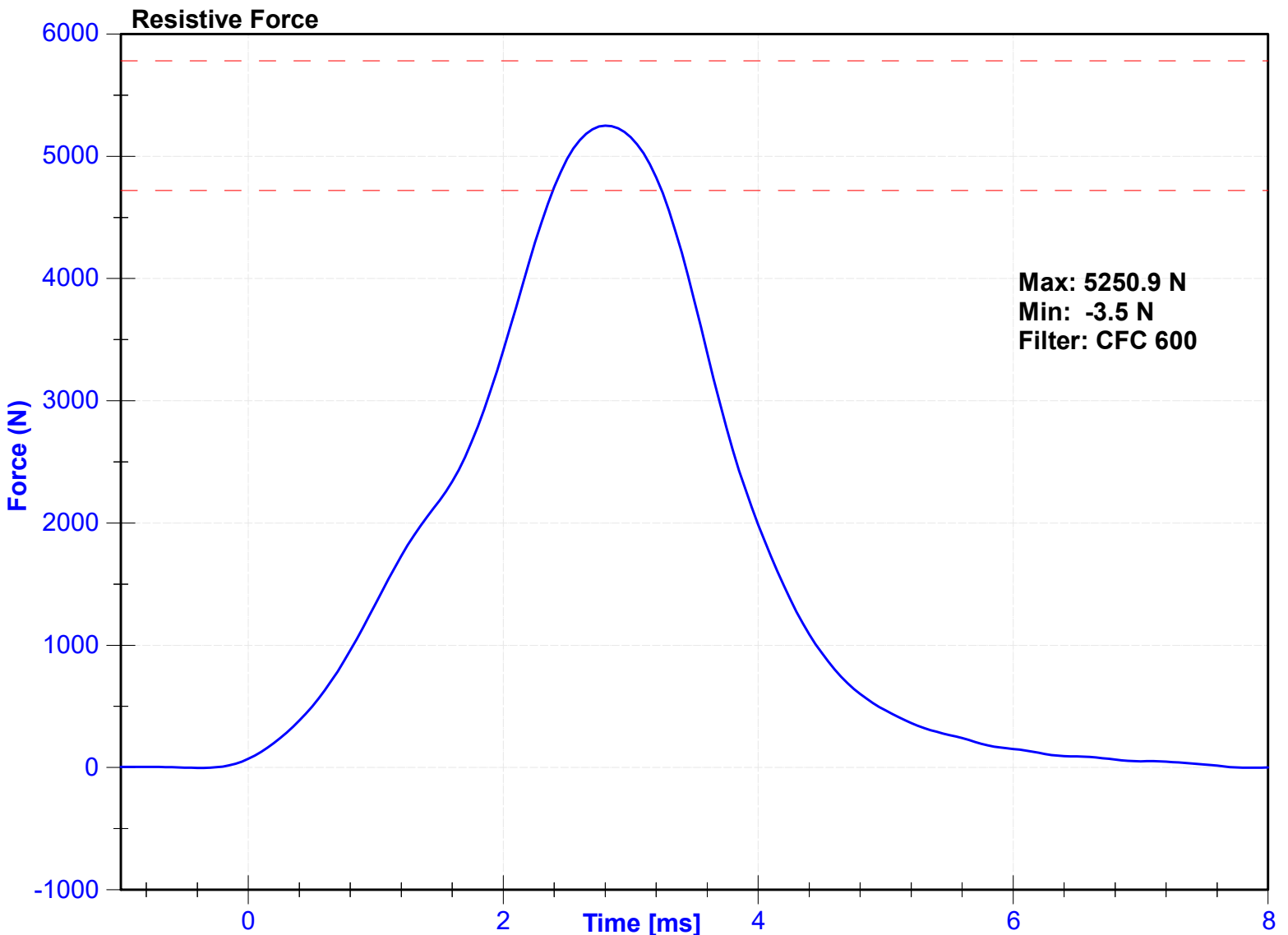
ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

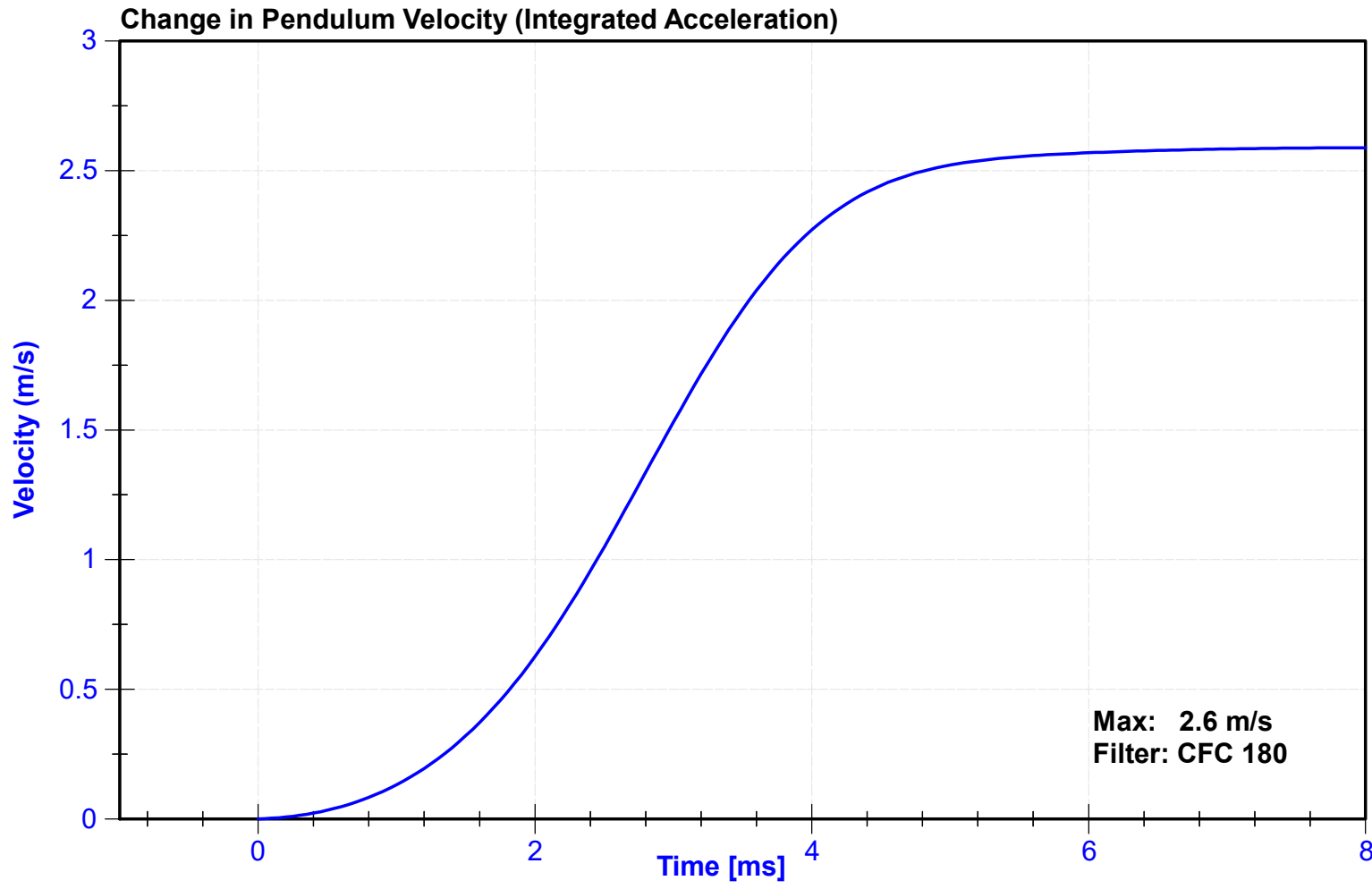
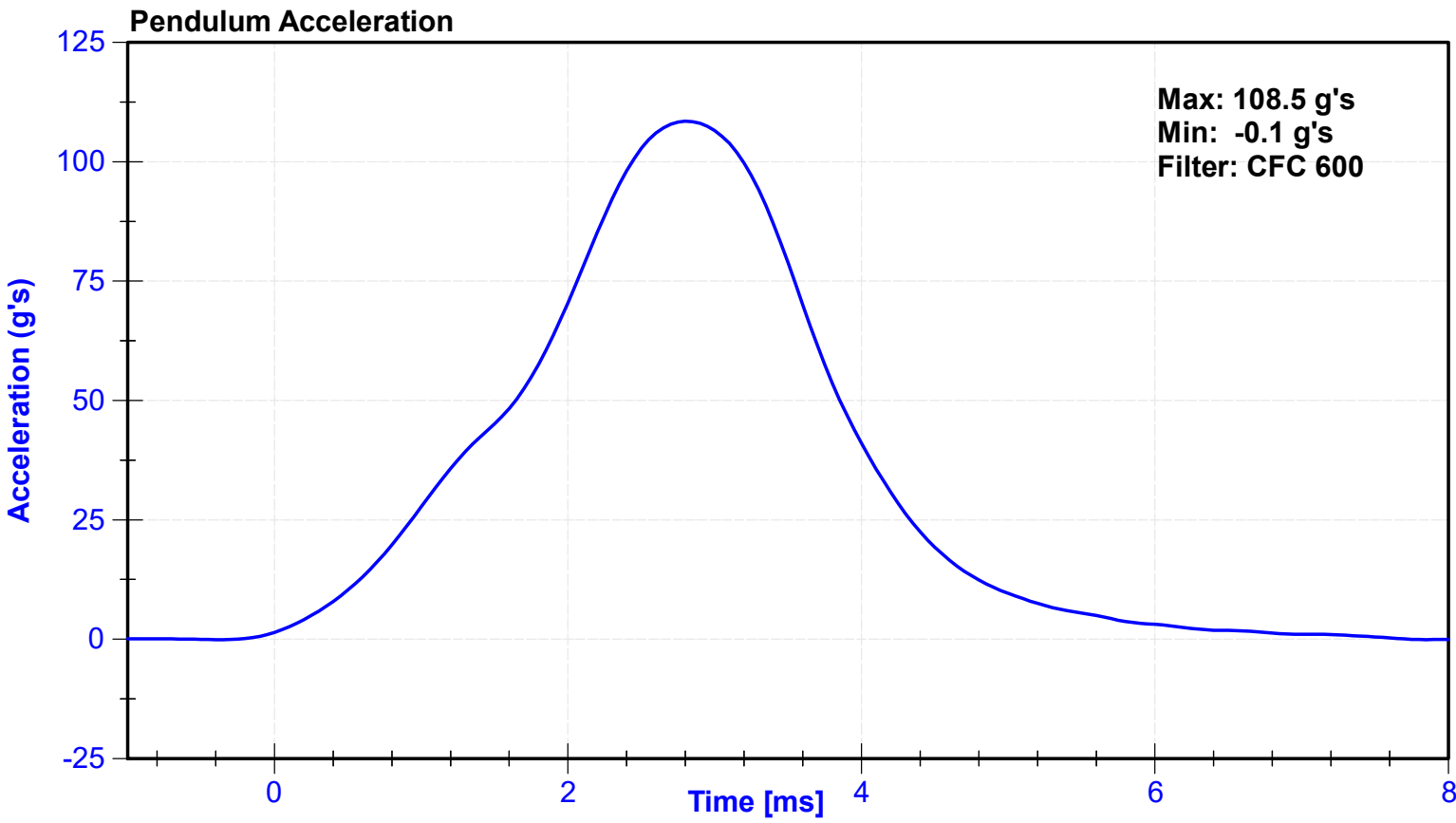
Results

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





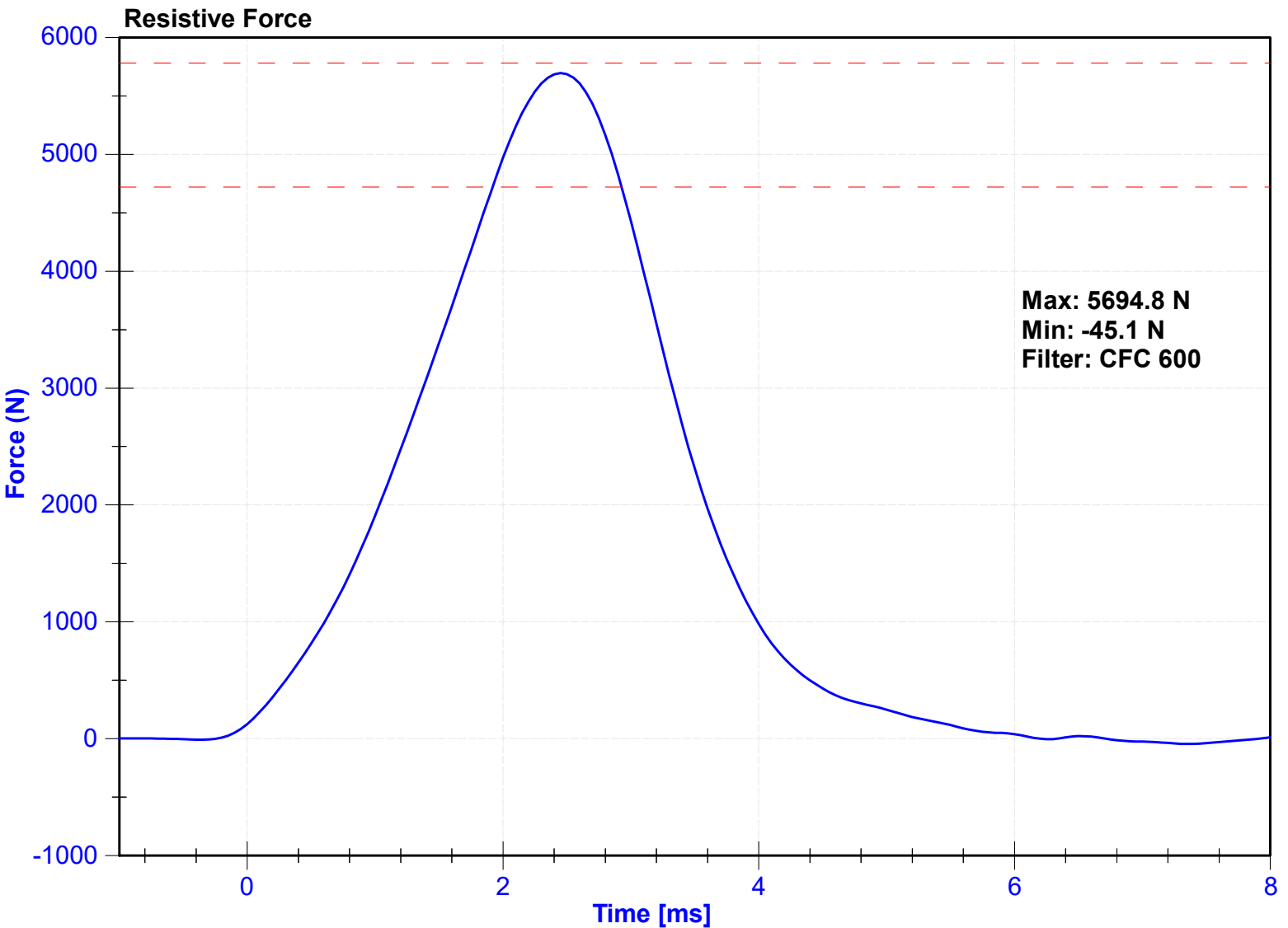
ATD Manufacturer	Humanetics	Test Technician	O.Vail
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

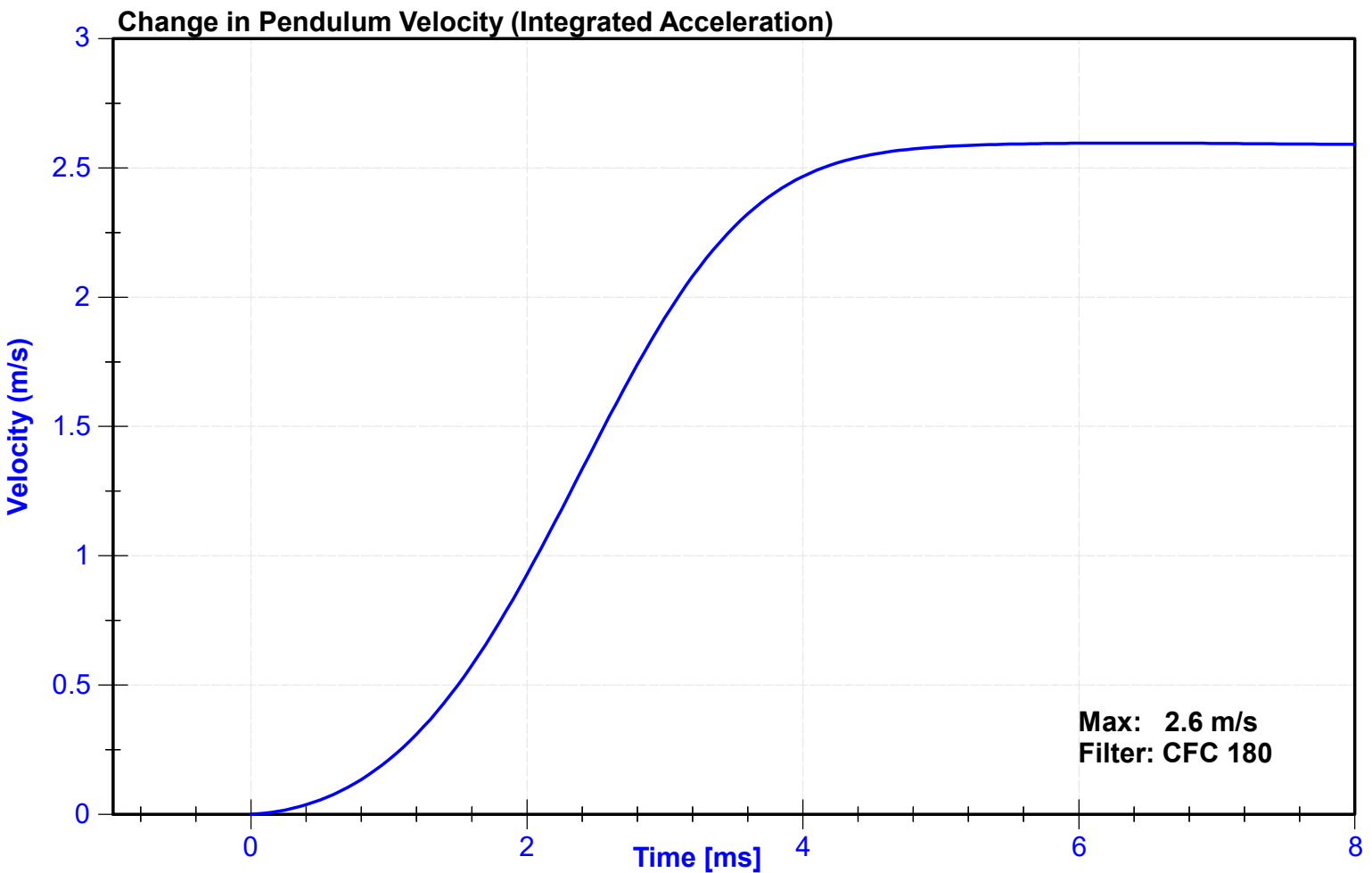
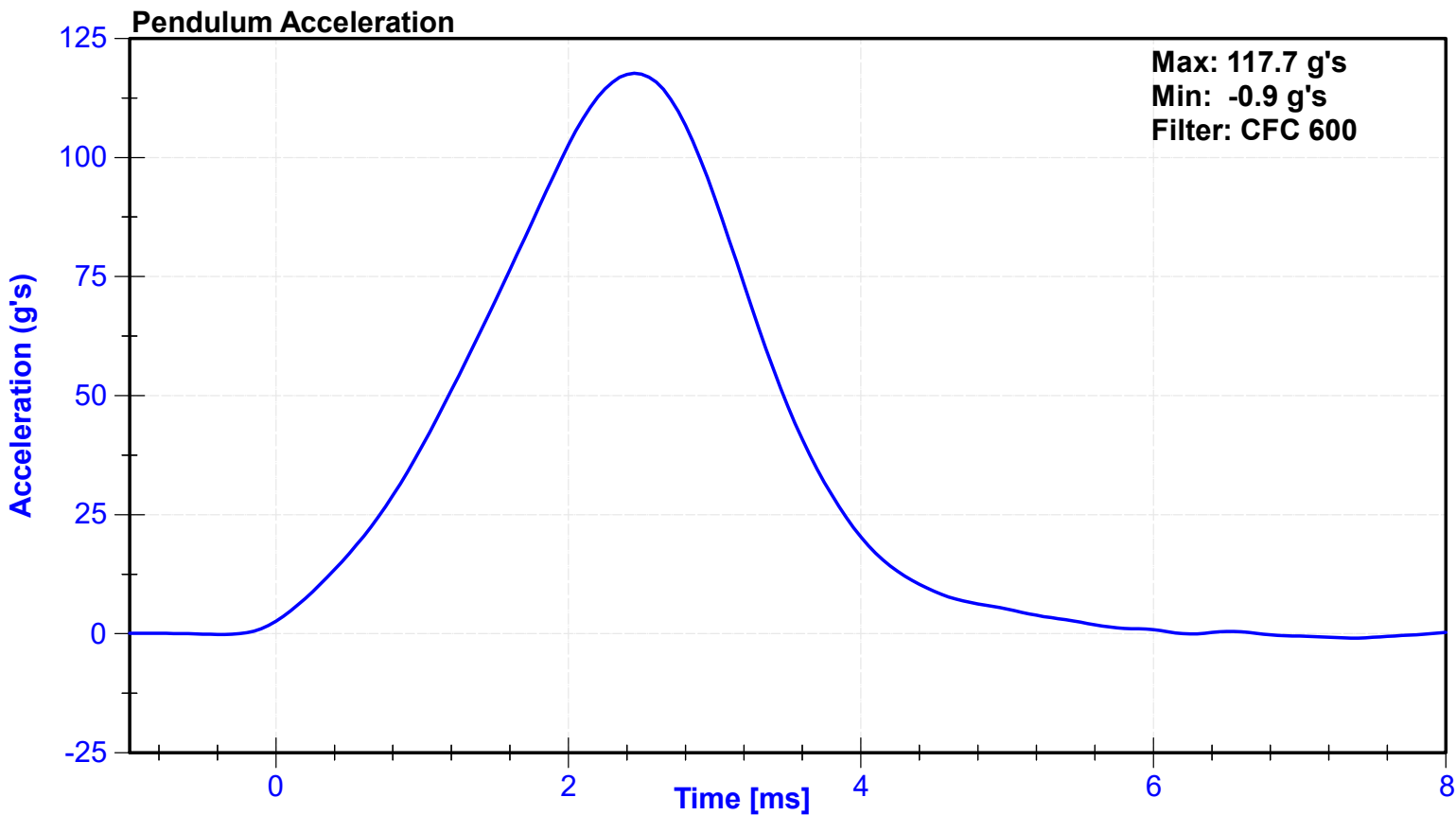
Results

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

PRE-TEST

HYBRID III 5TH PERCENTILE - PASSENGER ATD

SERIAL NO: 137

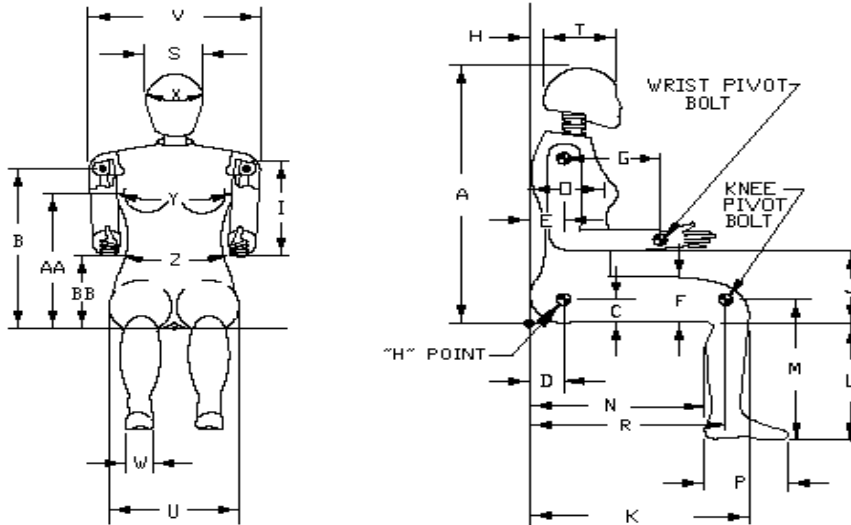


External Measurements - Hybrid 3 - 5th Female

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

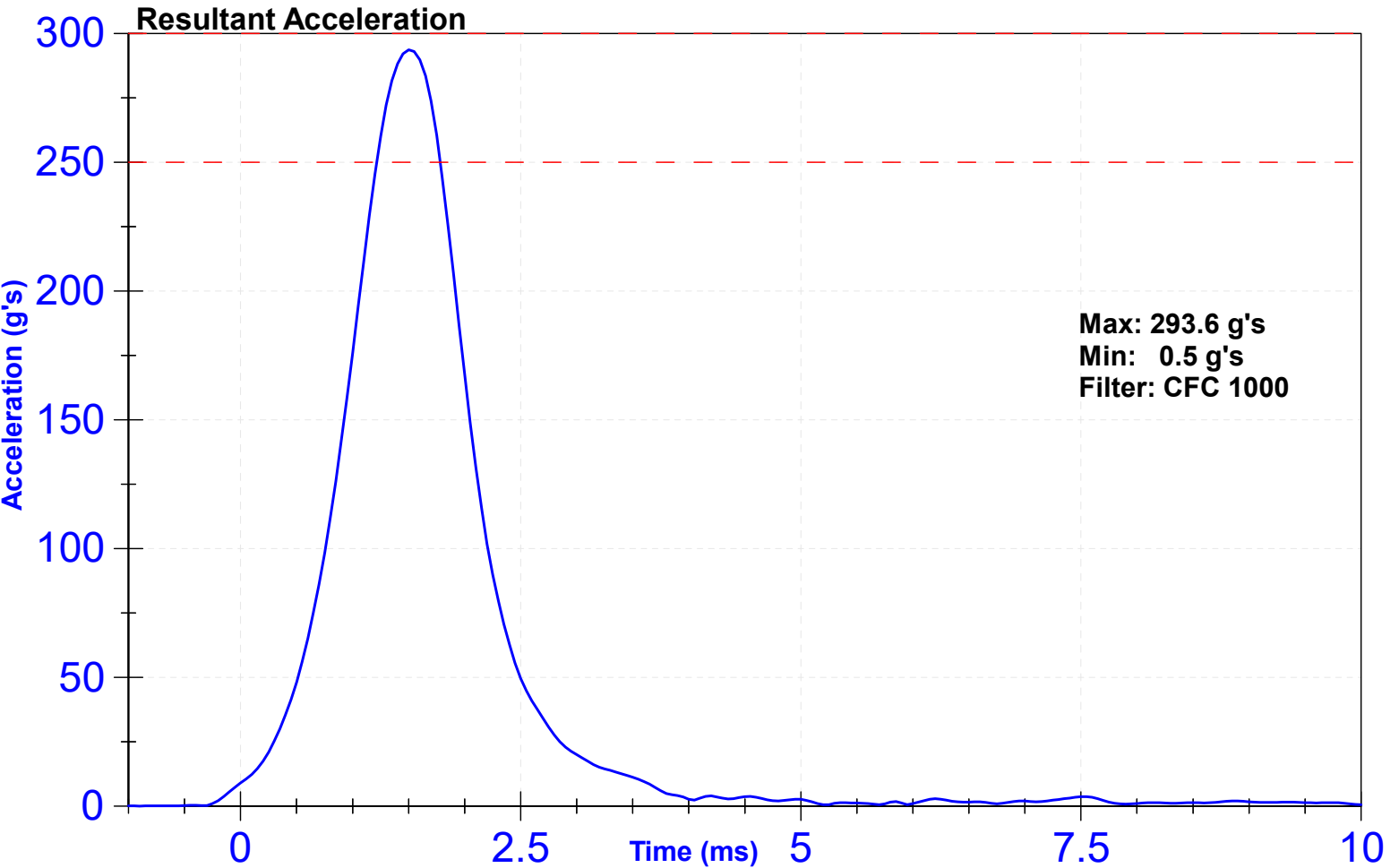
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	137	Laboratory Supervisor	K. Brogan

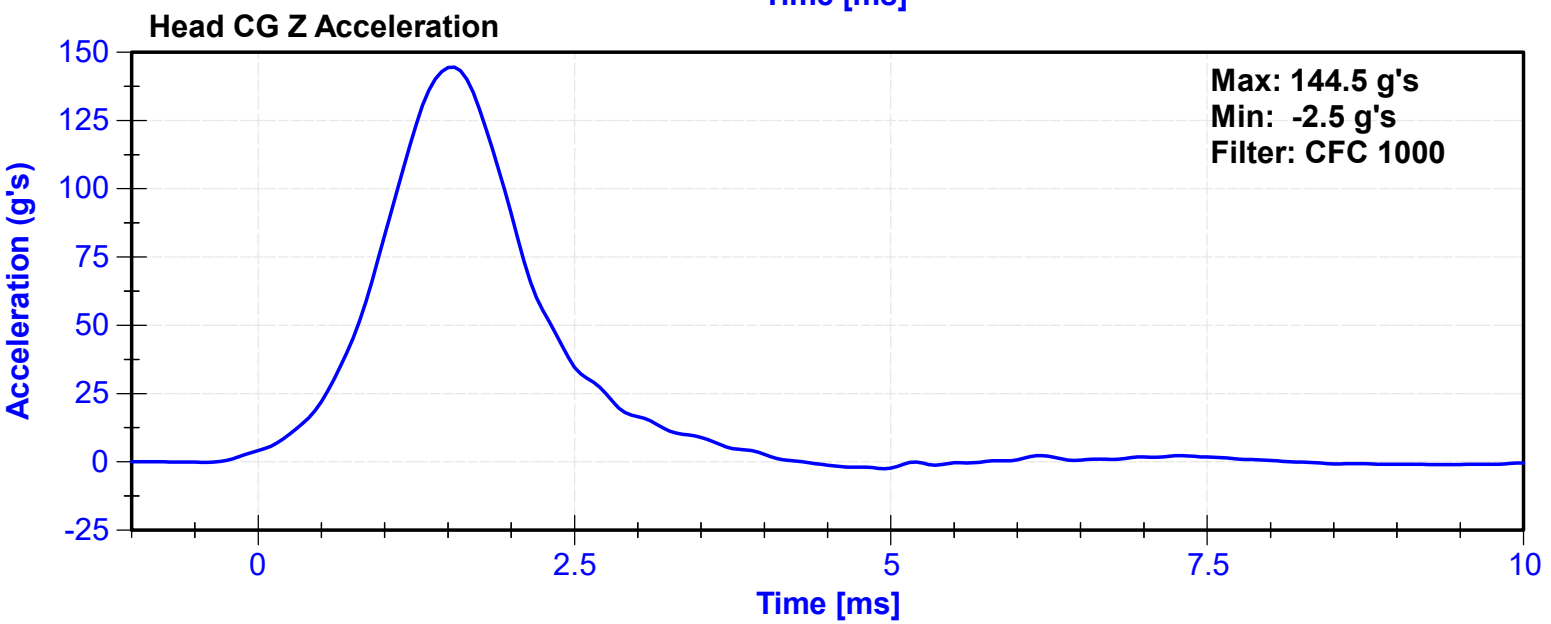
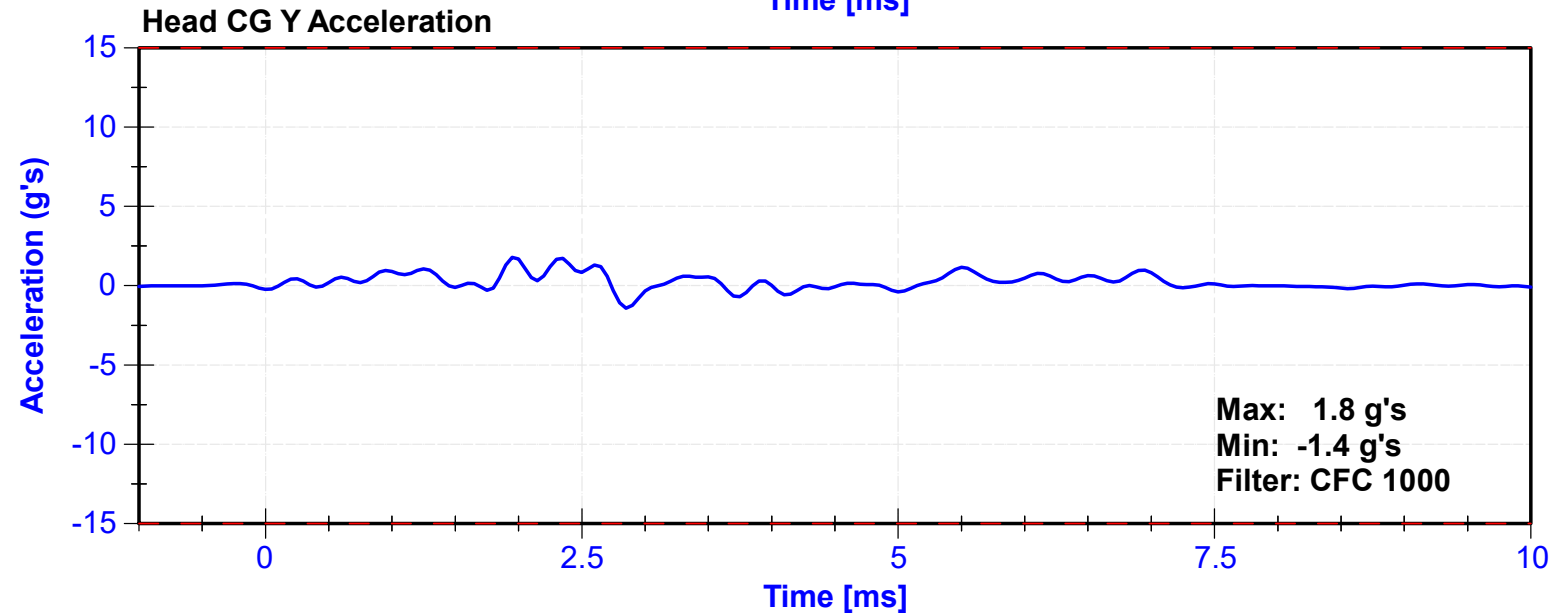
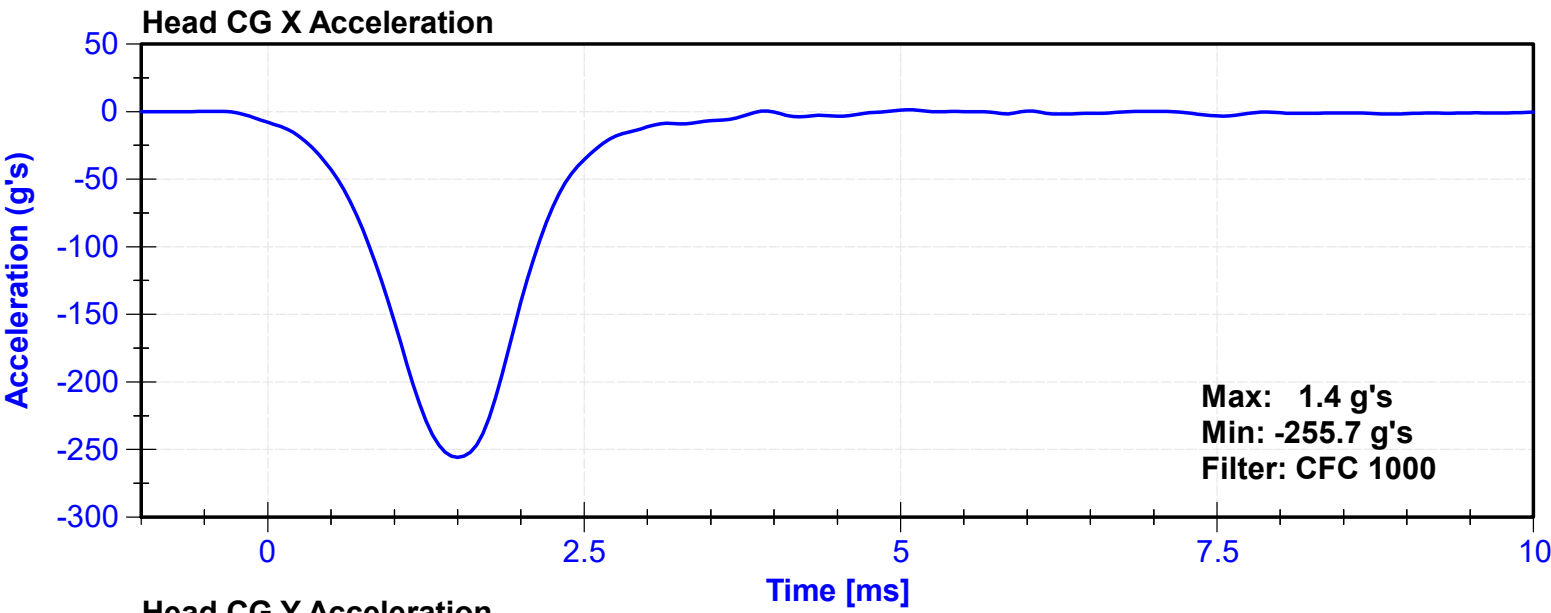
Results

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





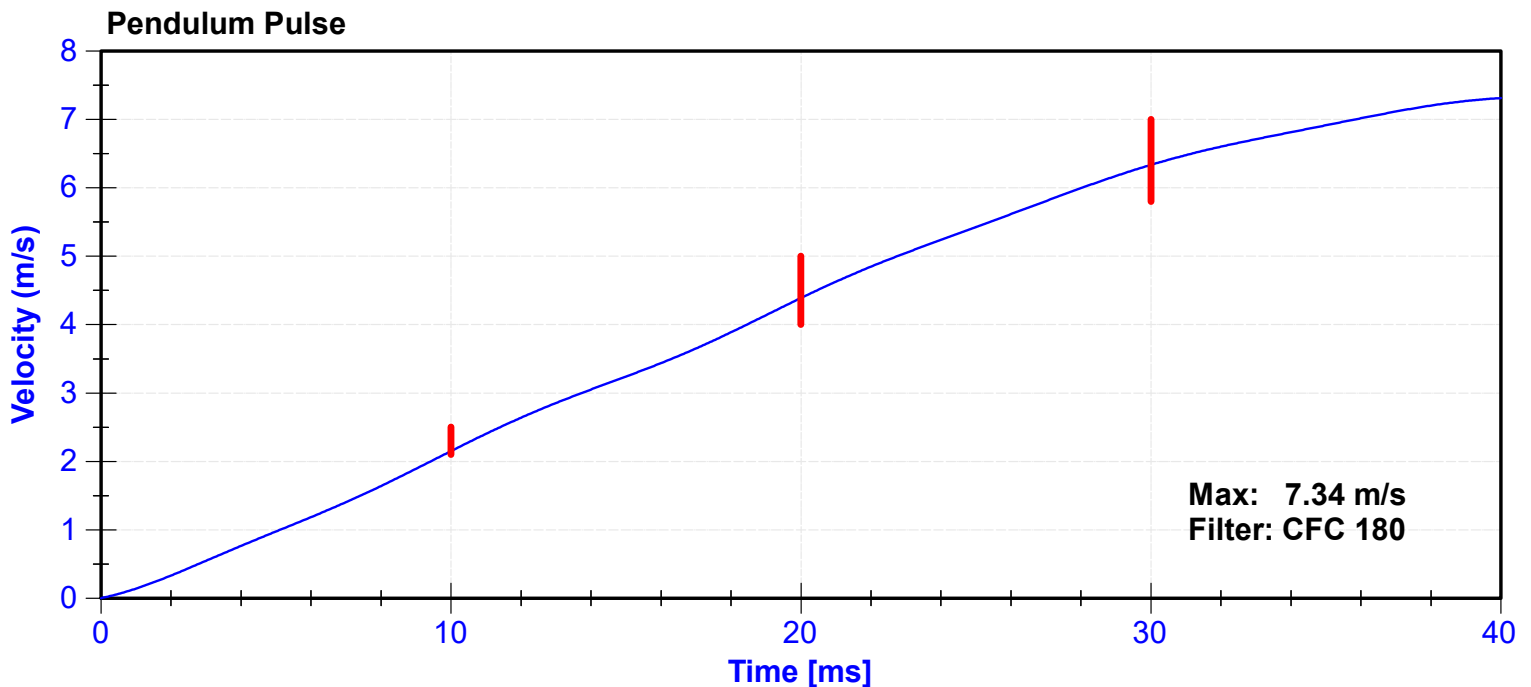
ATD Manufacturer	Humanetics	Test Technician	J. Miller
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

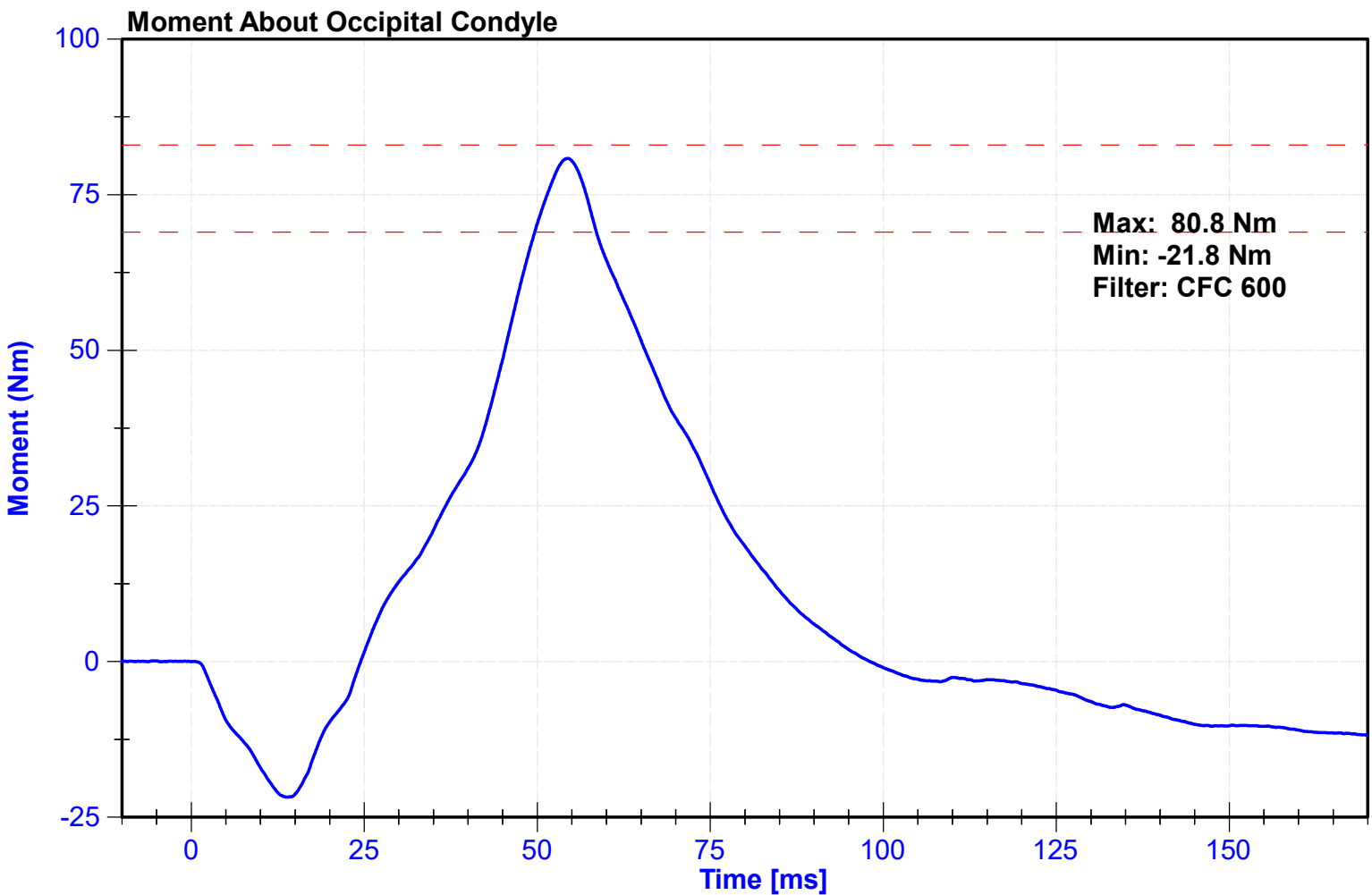
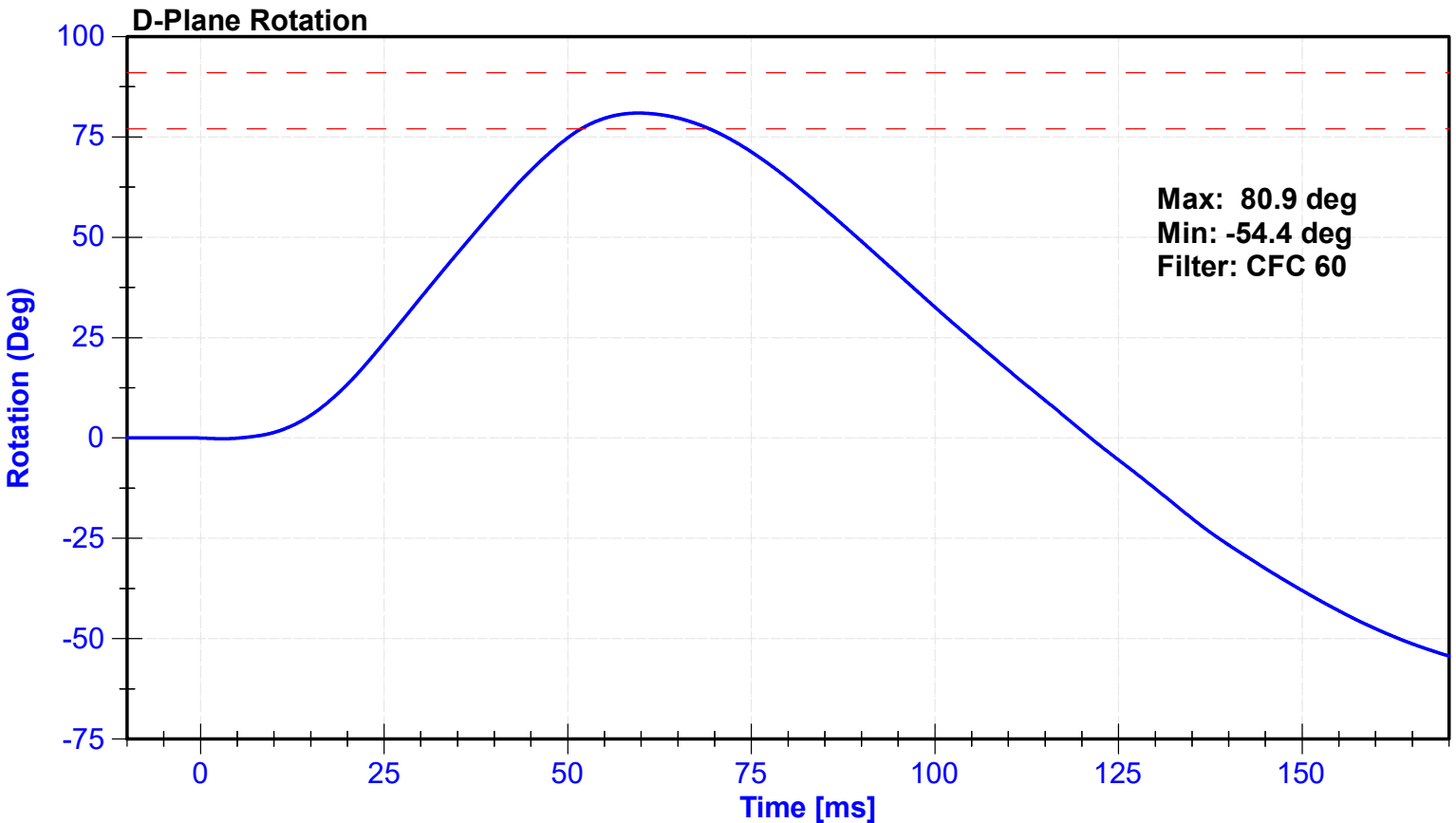
Results

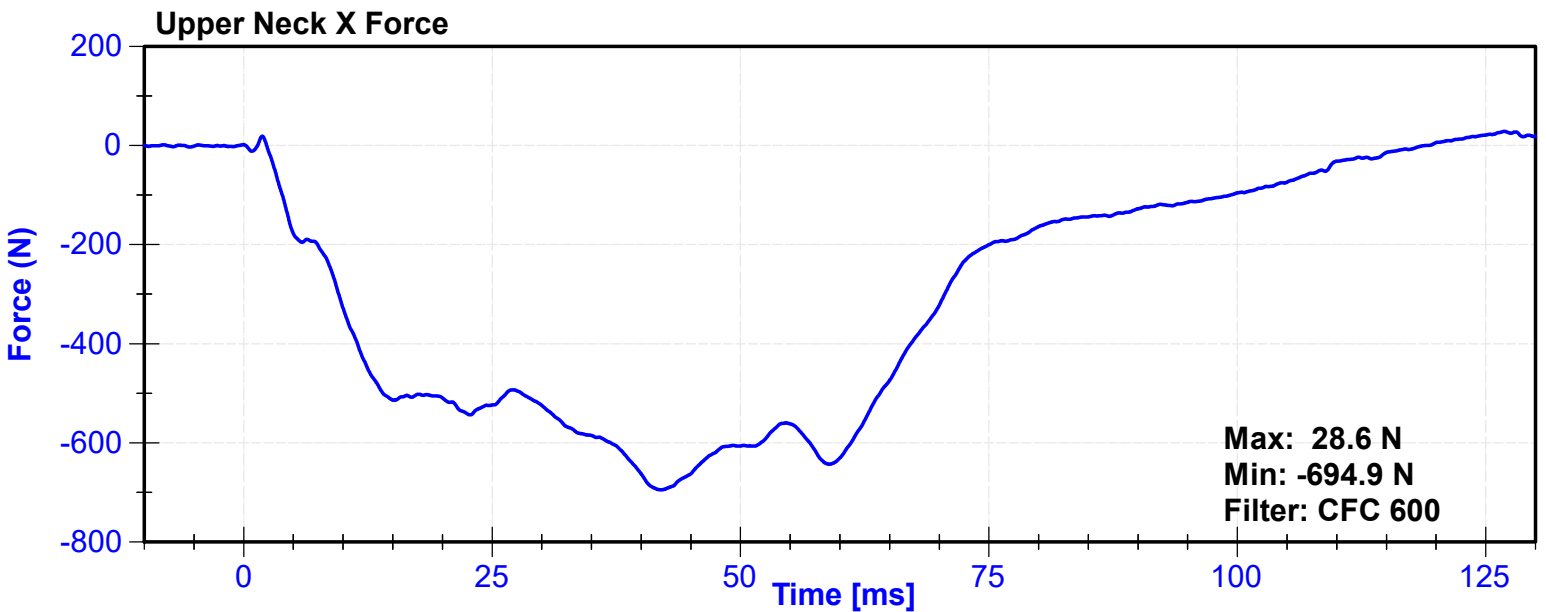
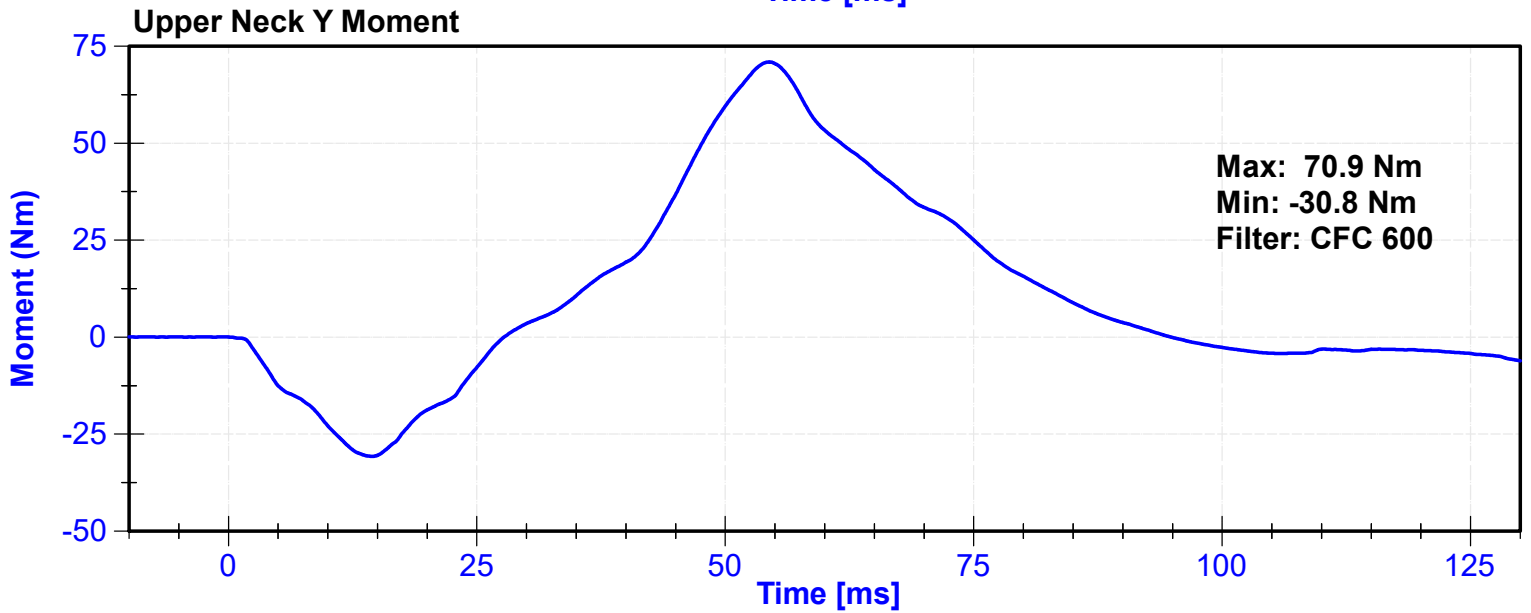
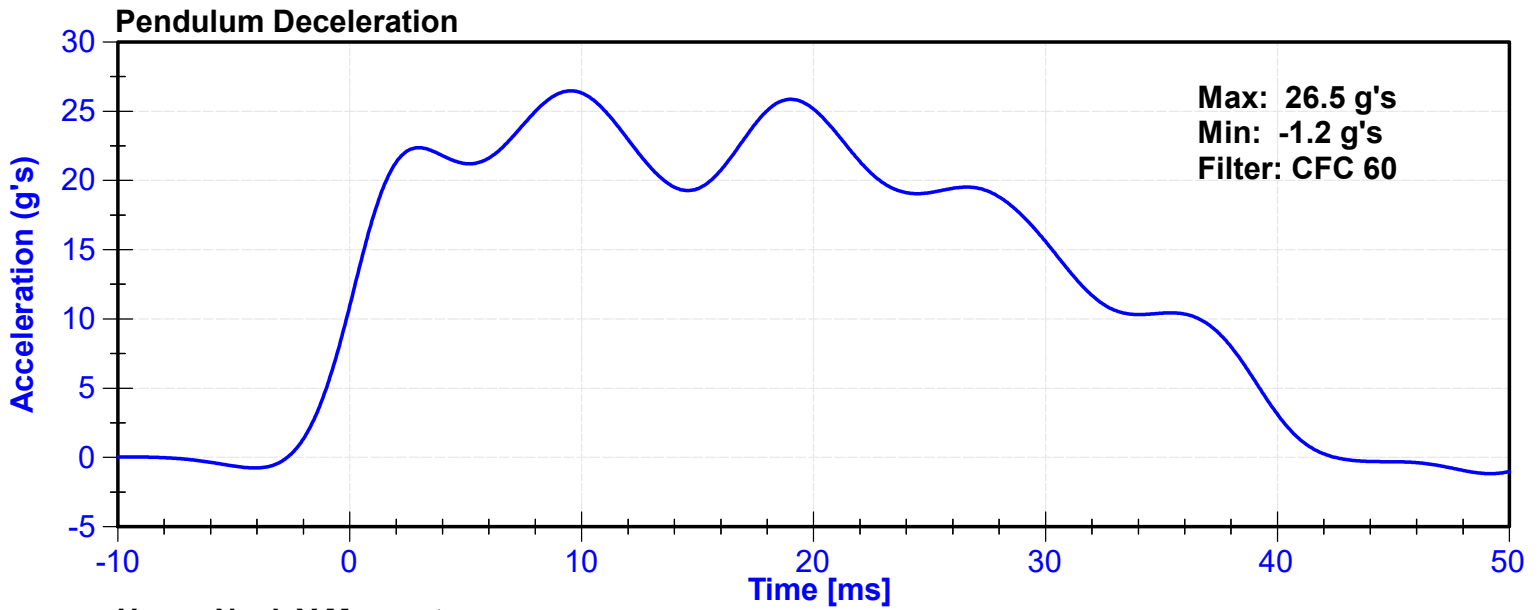
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.0	Pass
Humidity	10	70	%	63.9	Pass
Velocity	6.89	7.13	m/s	7.058	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.15	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.39	Pass
Pendulum Impulse at 30ms	5.8	7.0	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







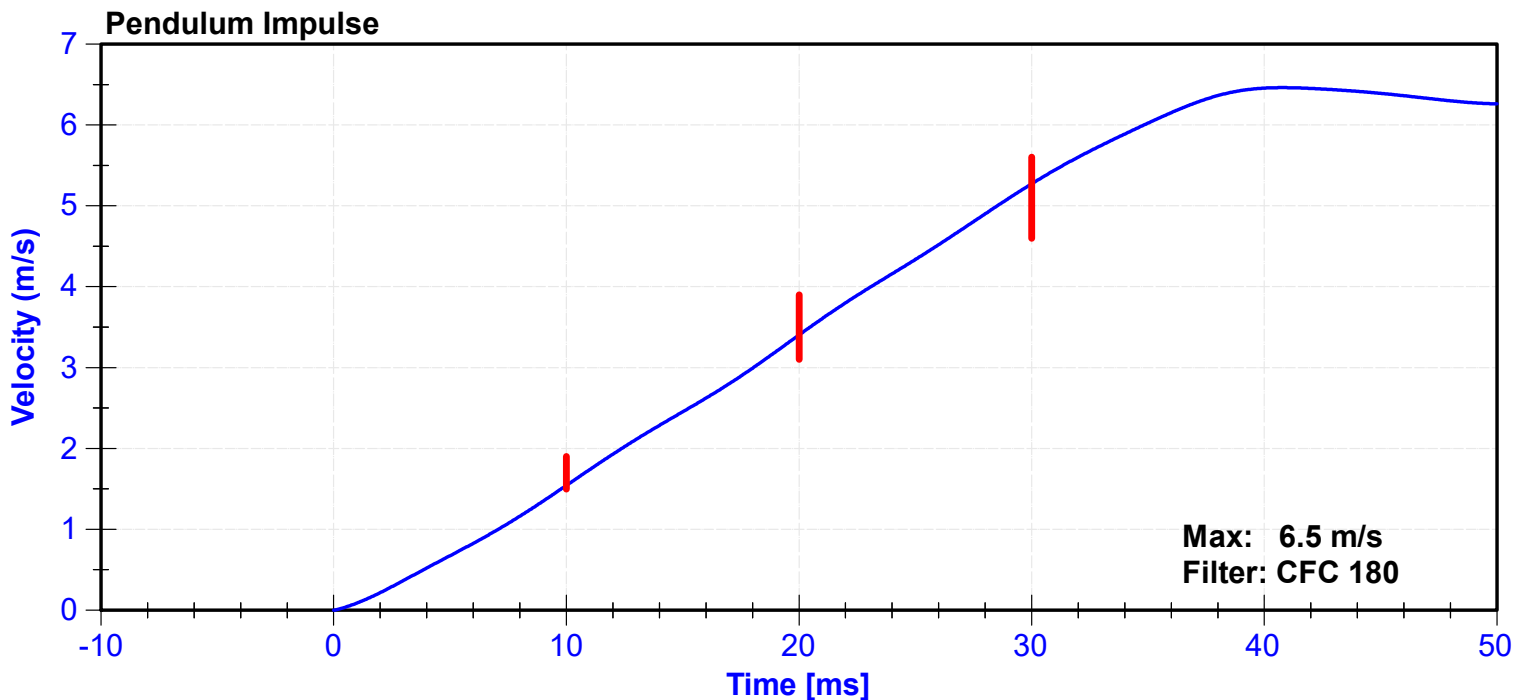
ATD Manufacturer	Humanetics	Test Technician	A. Genzel
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

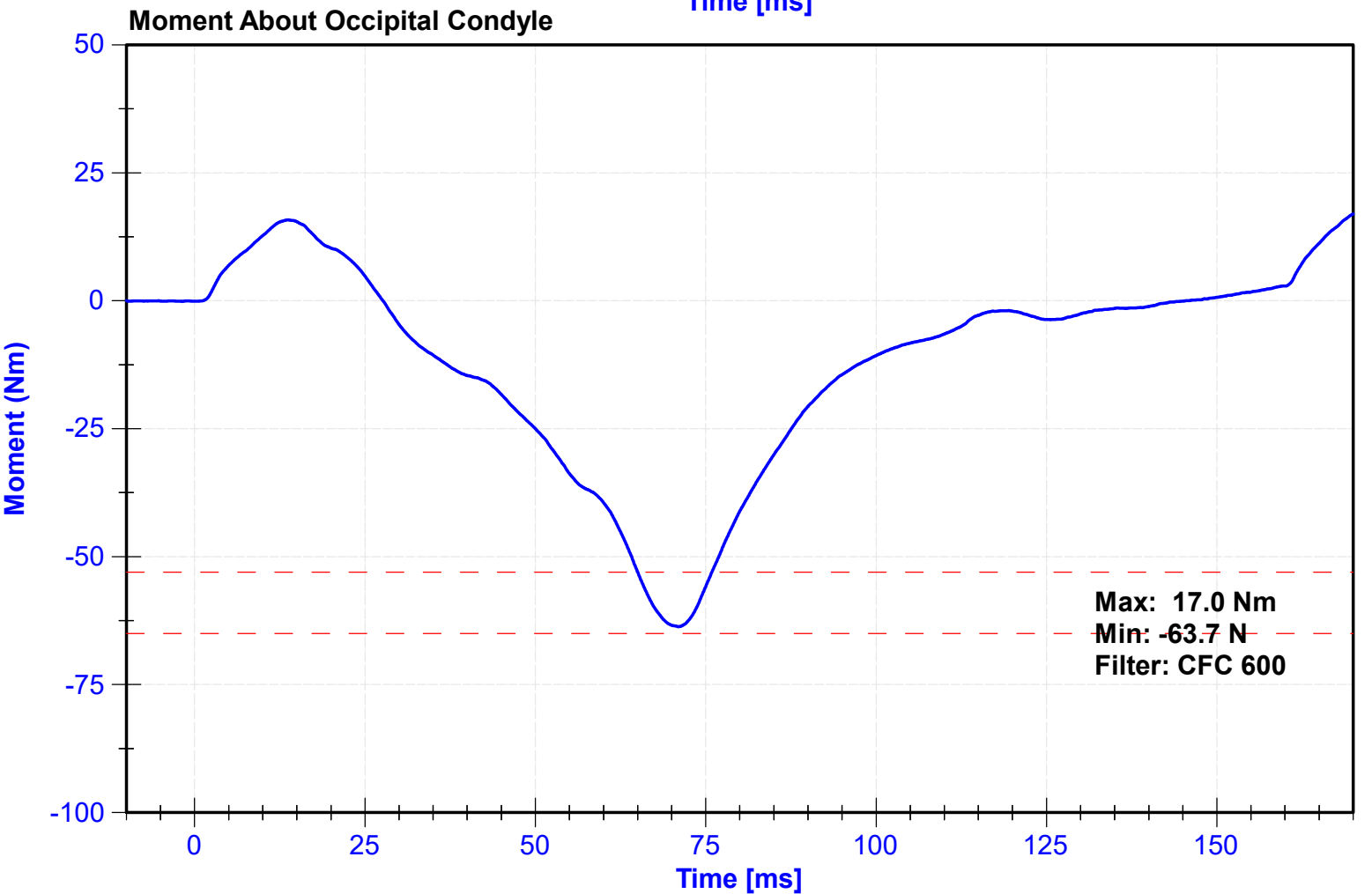
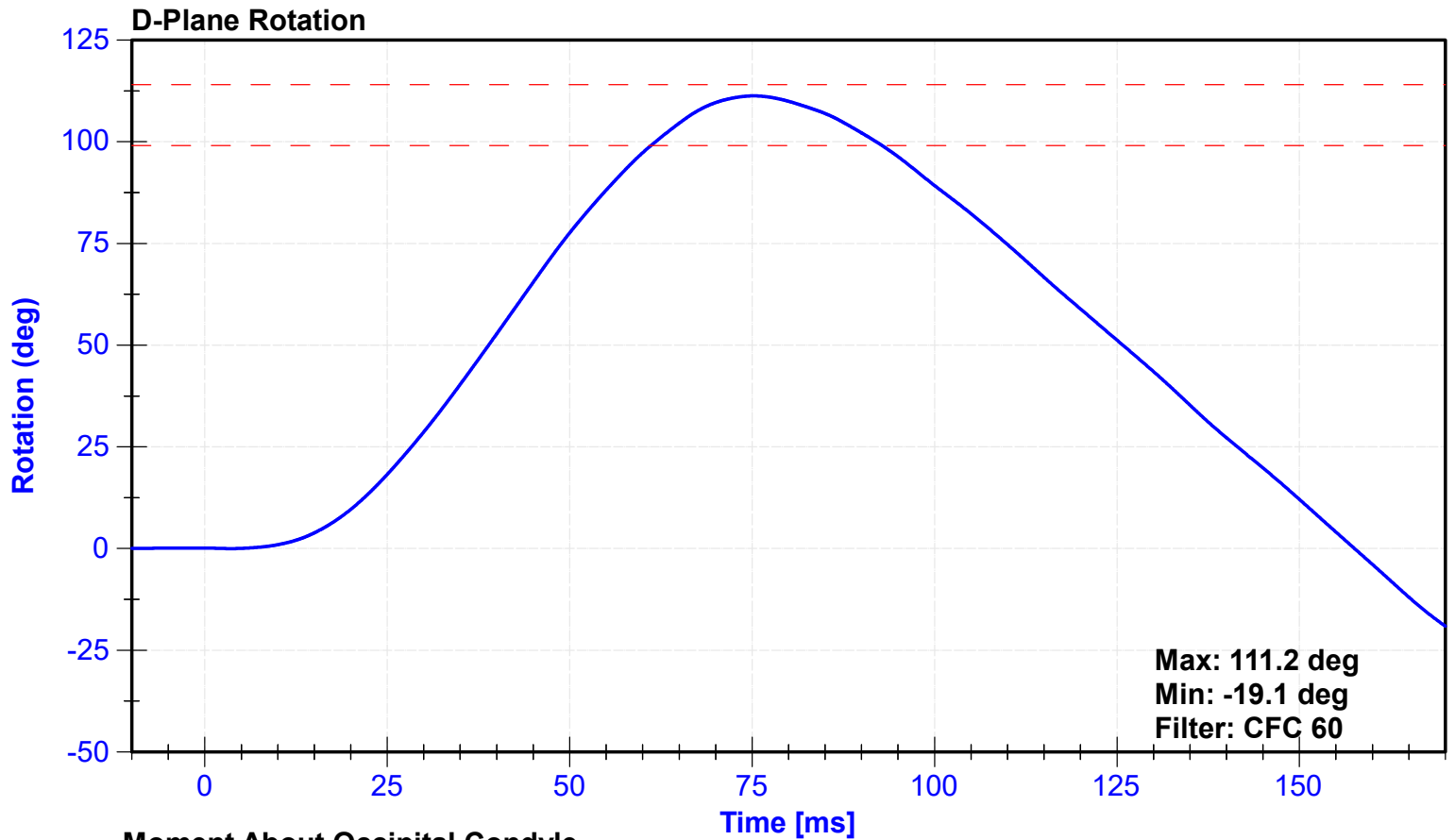
Results

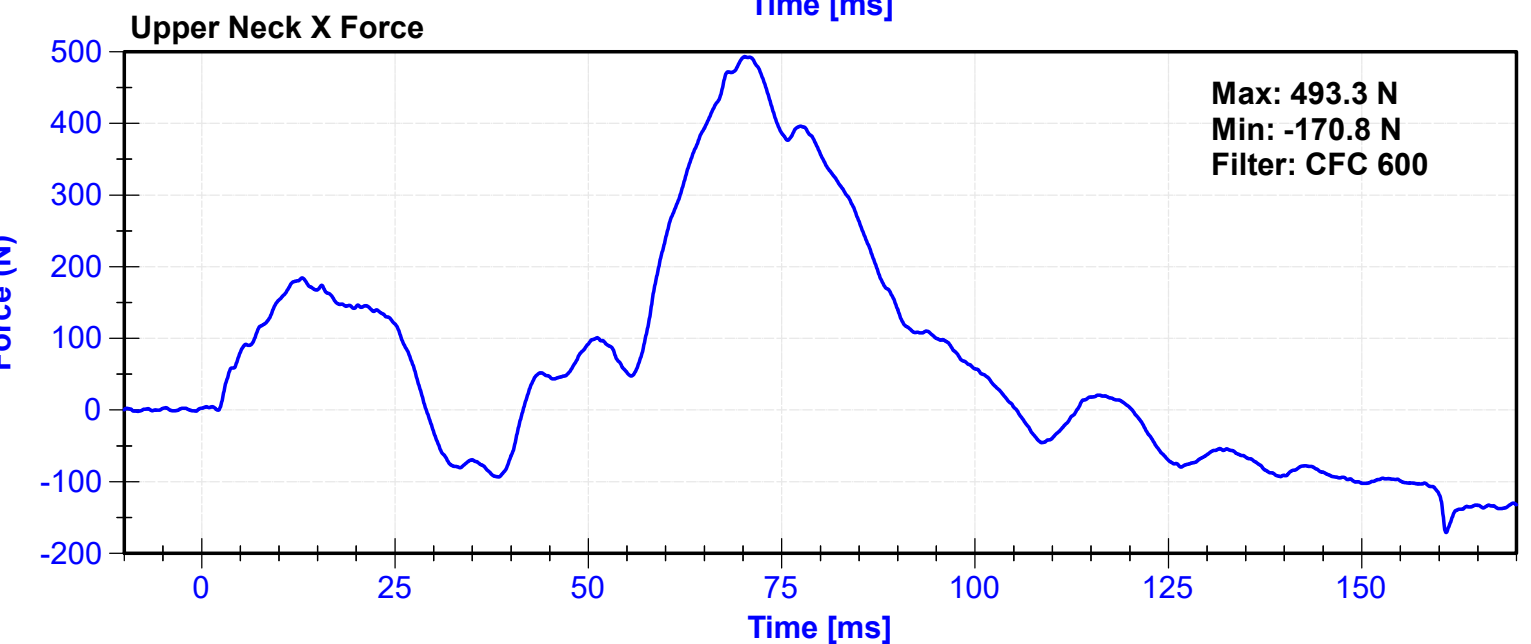
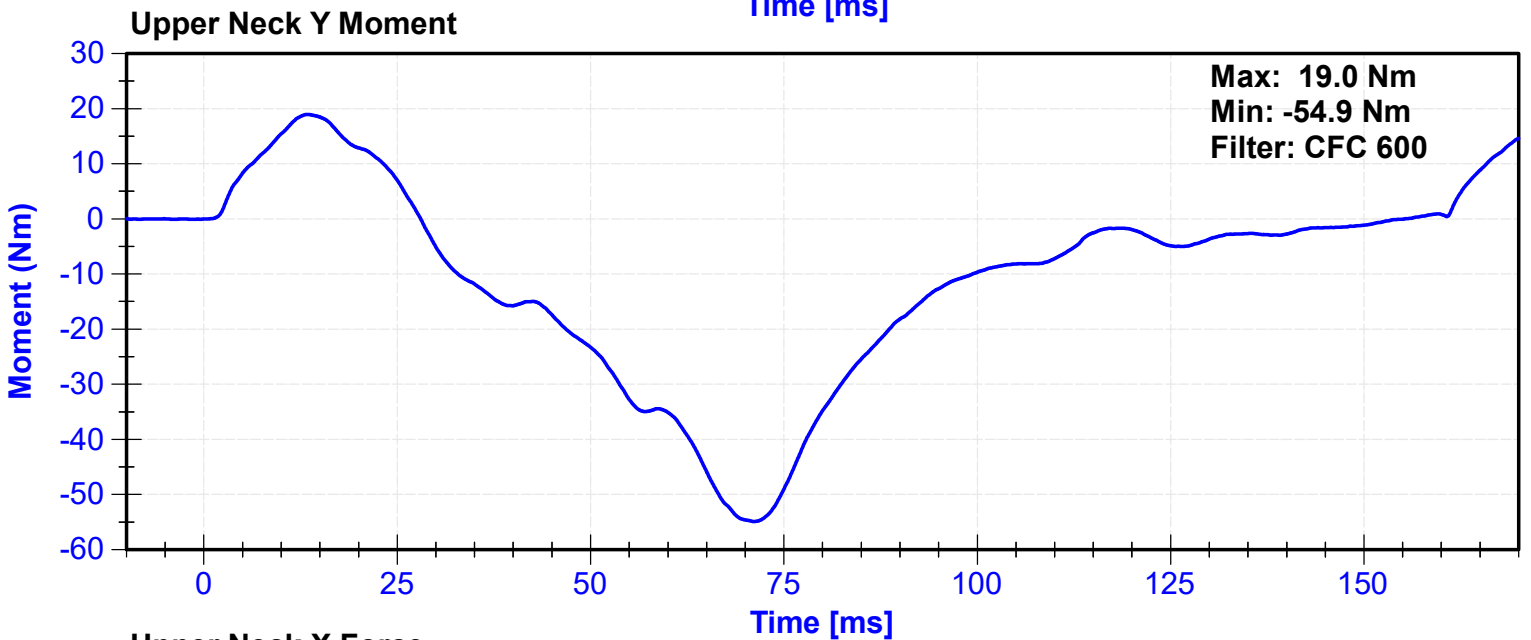
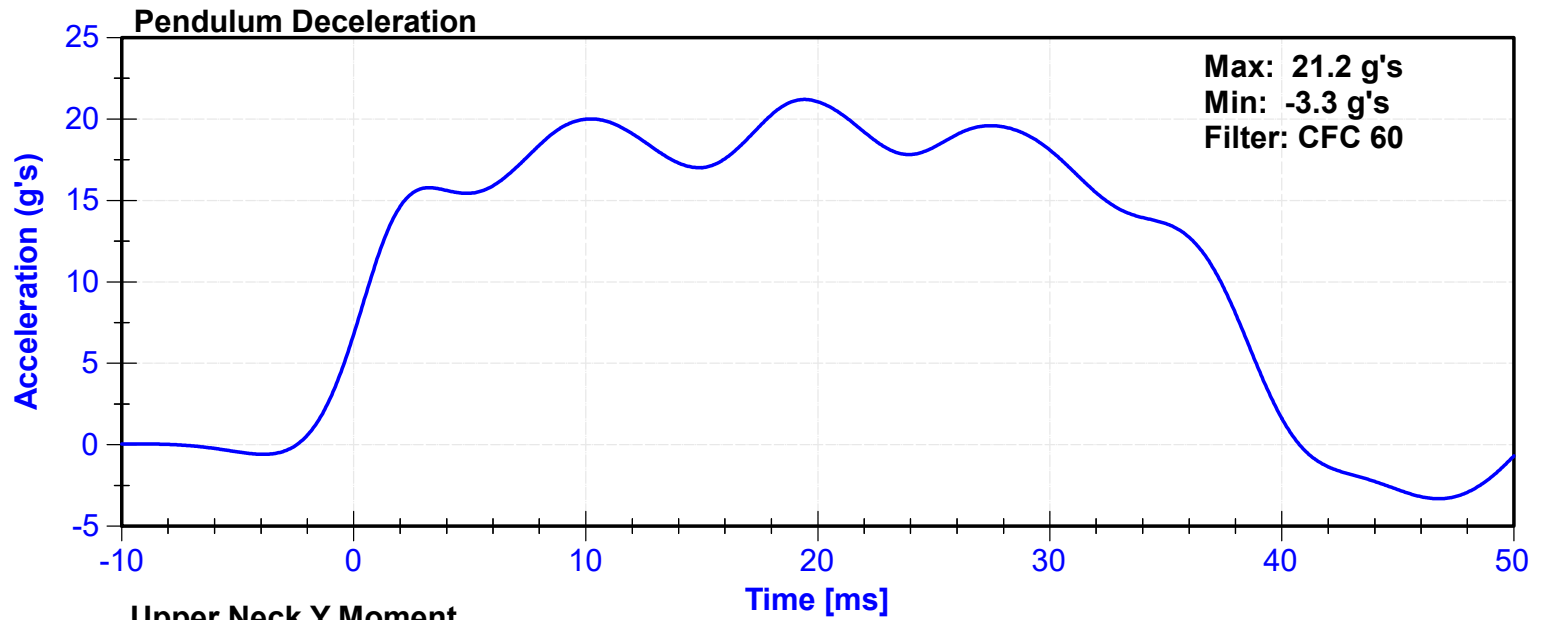
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	64.4	Pass
Velocity	5.95	6.19	m/s	6.125	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.54	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.40	Pass
Pendulum Impulse at 30ms	4.6	5.6	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

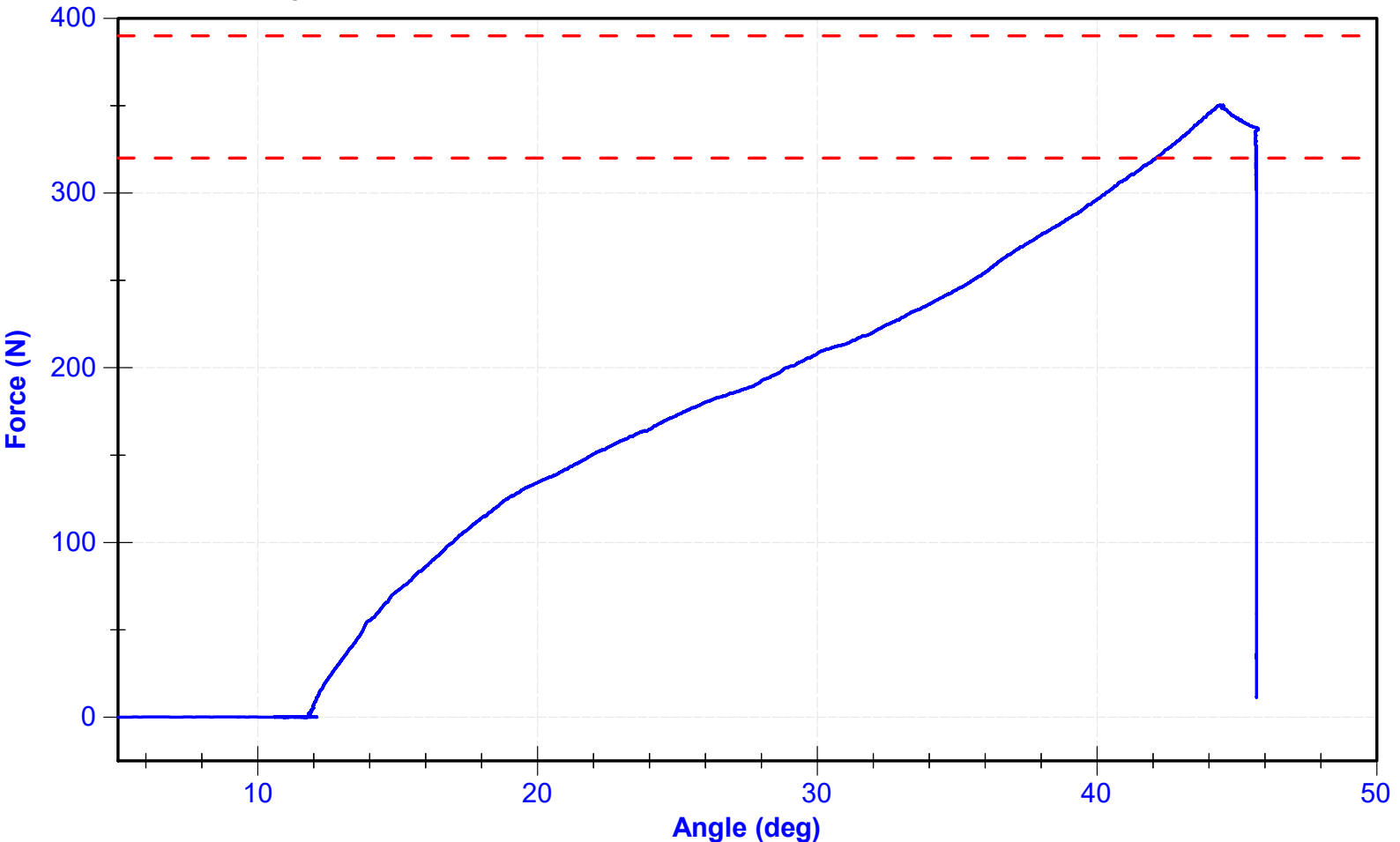
Results

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



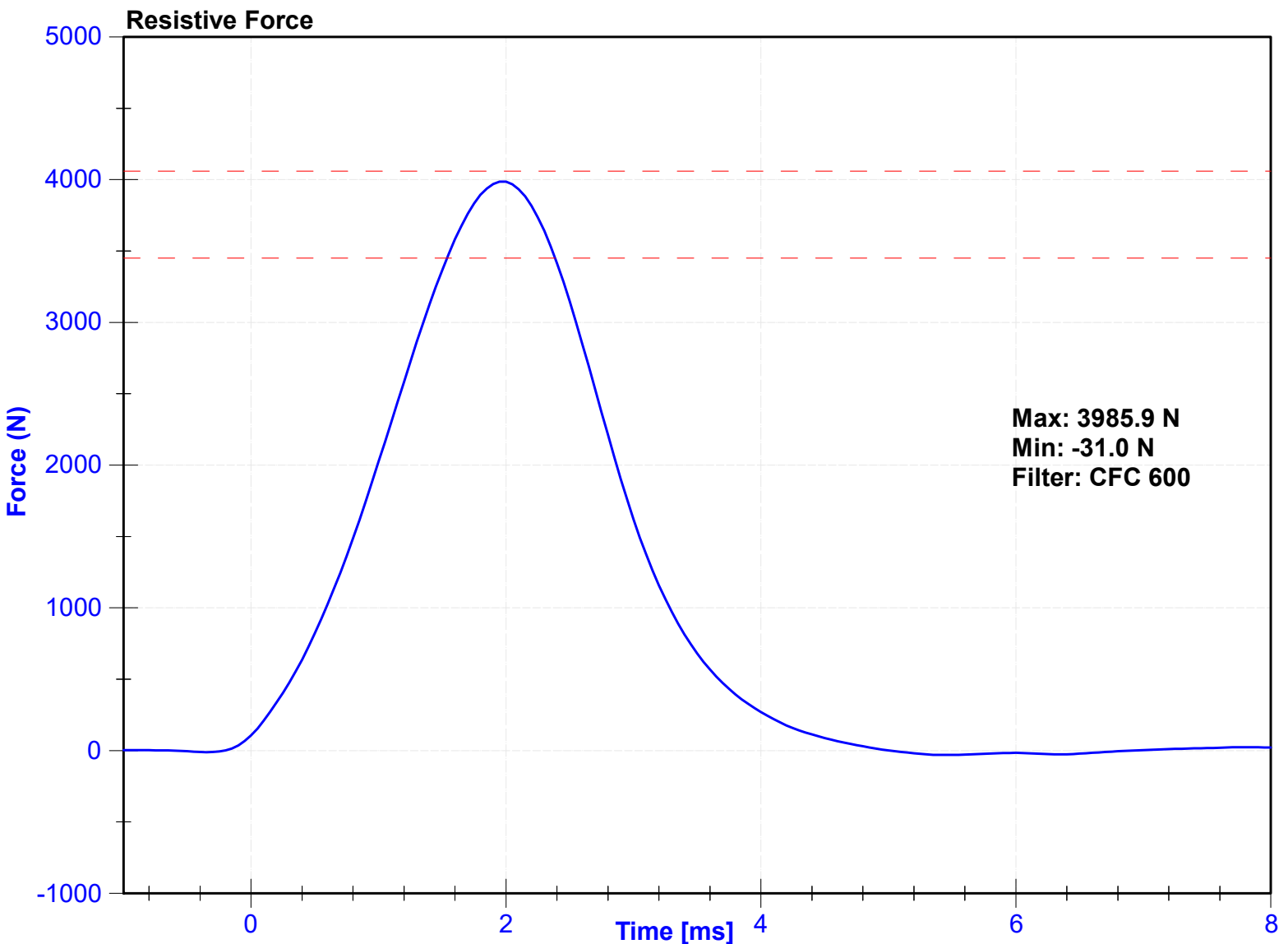
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

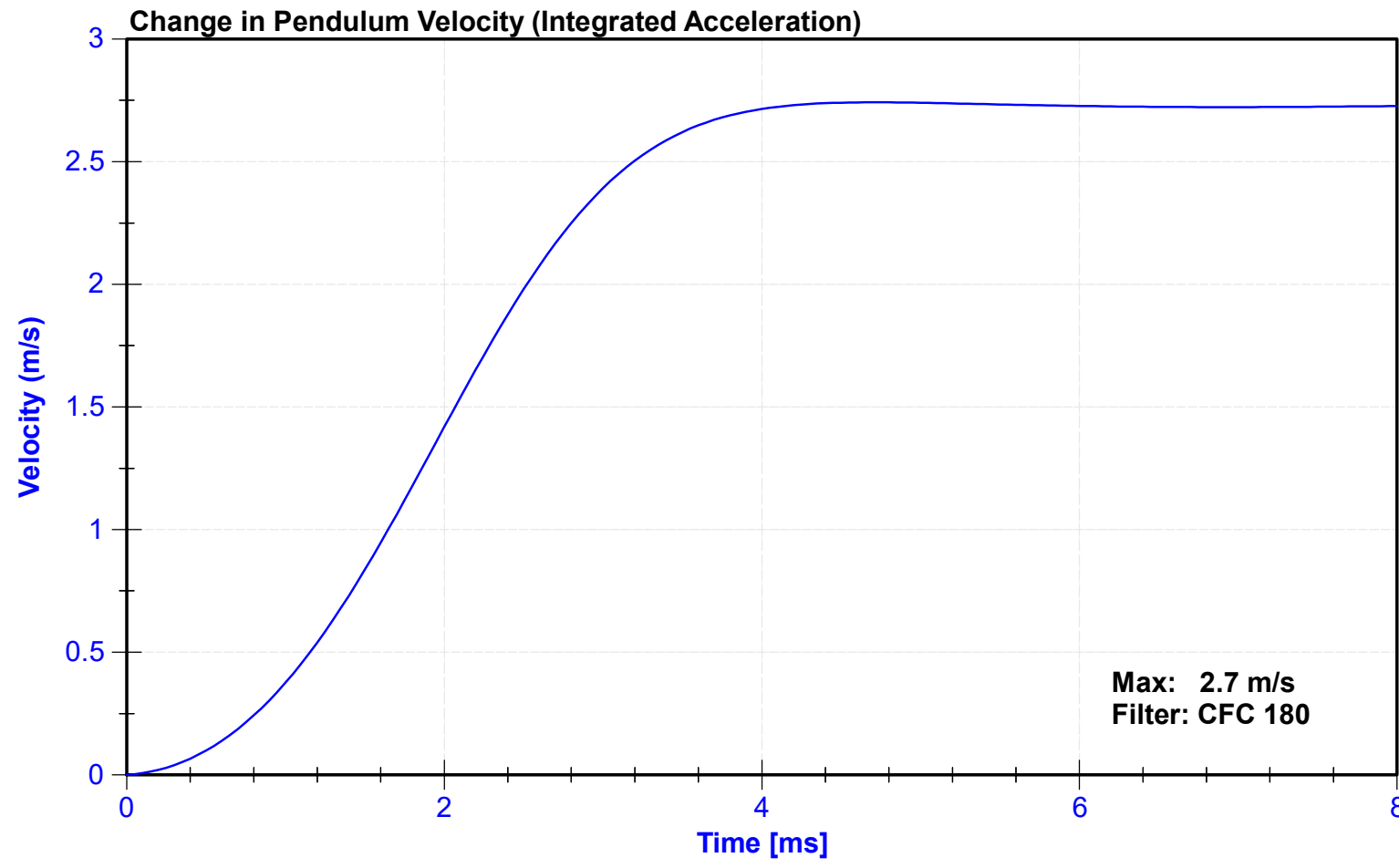
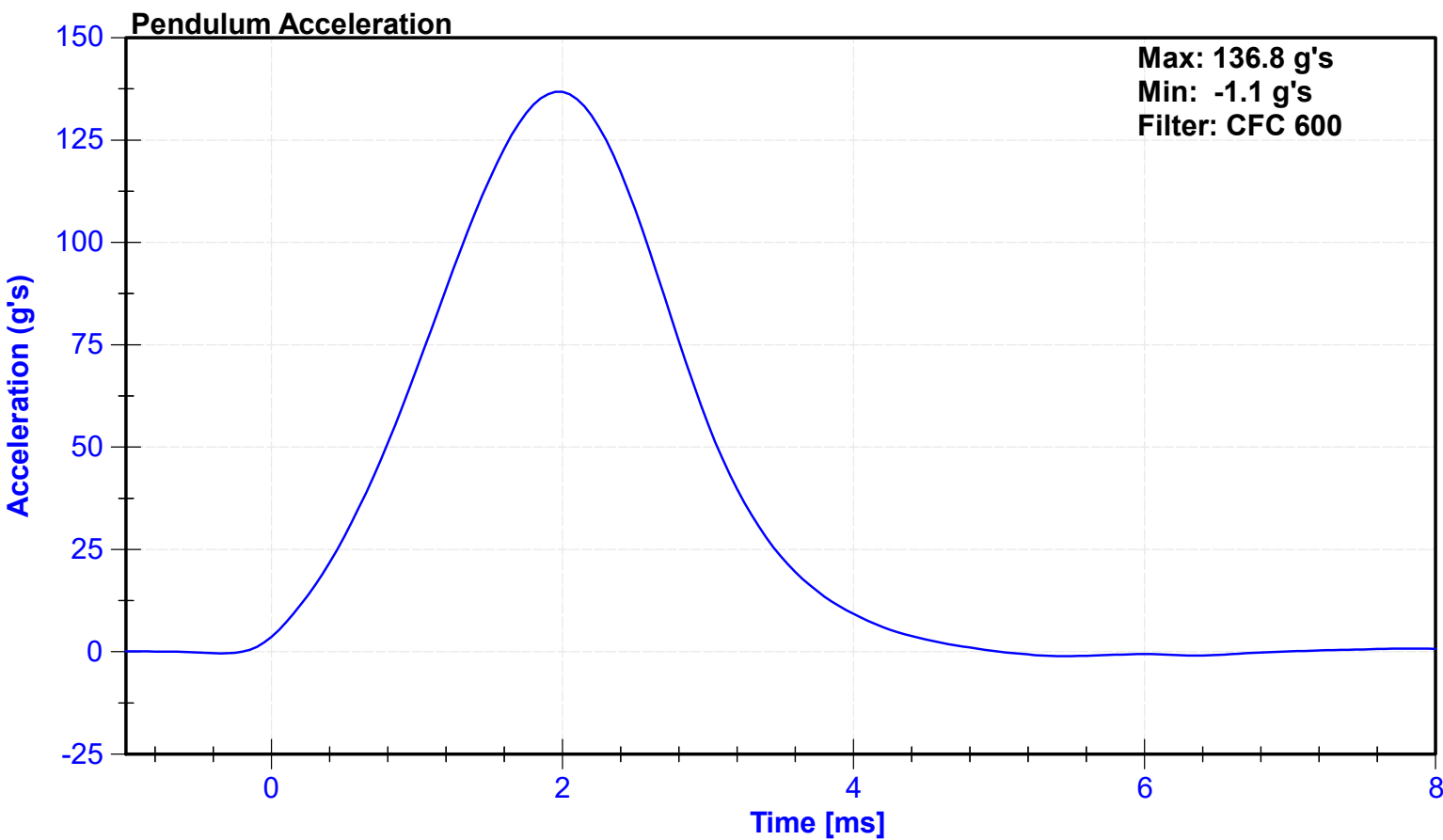
Results

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





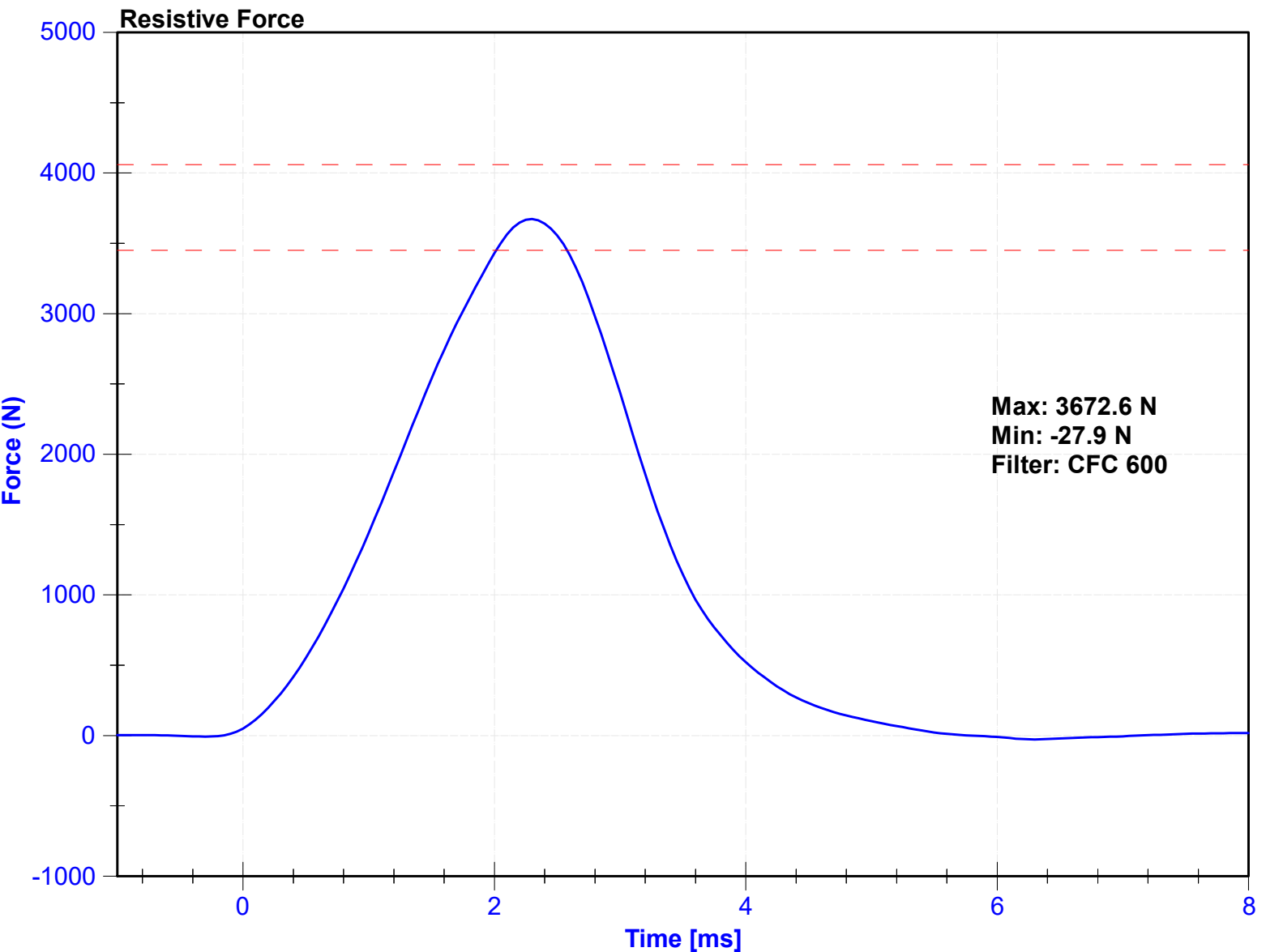
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

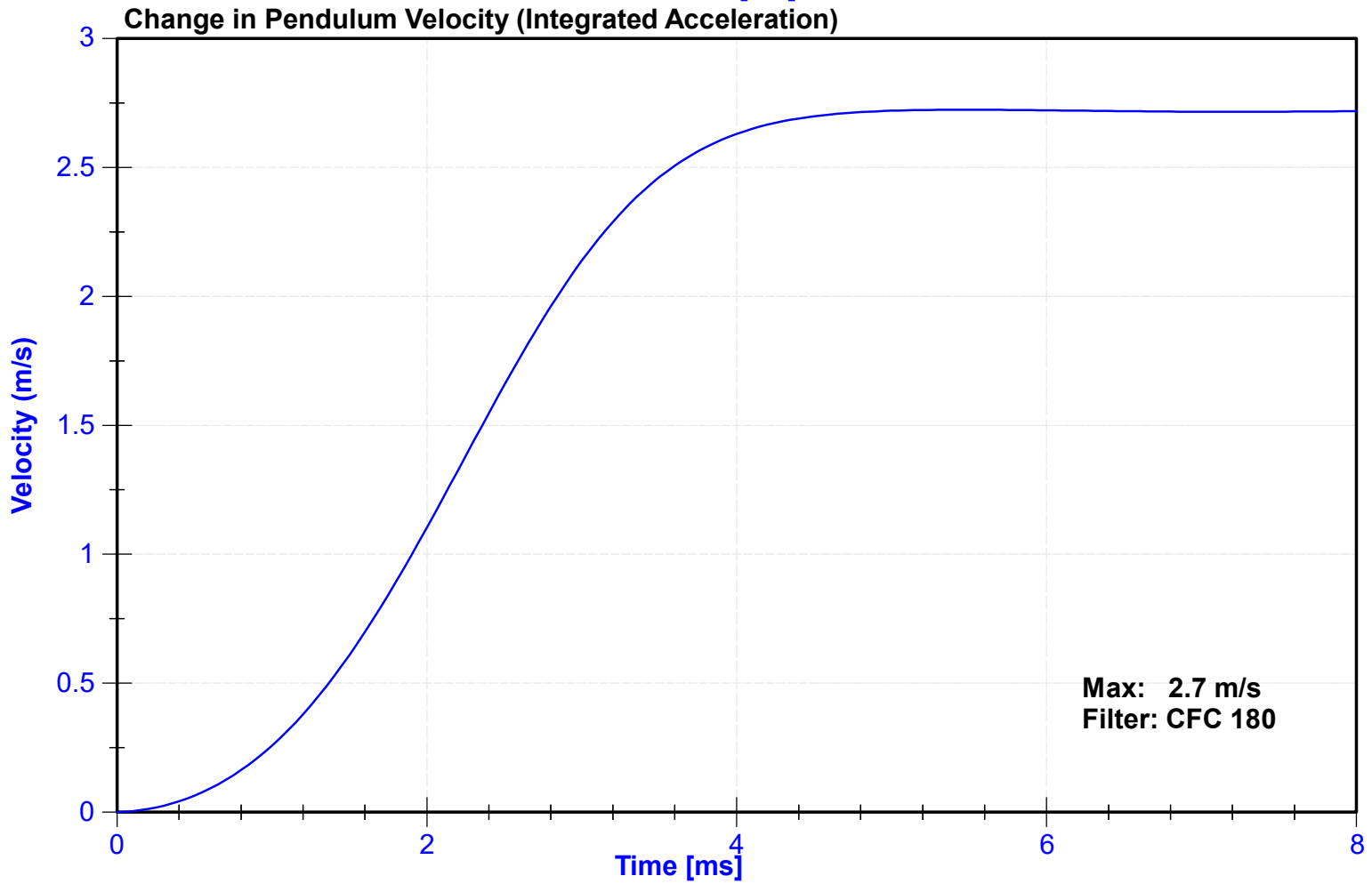
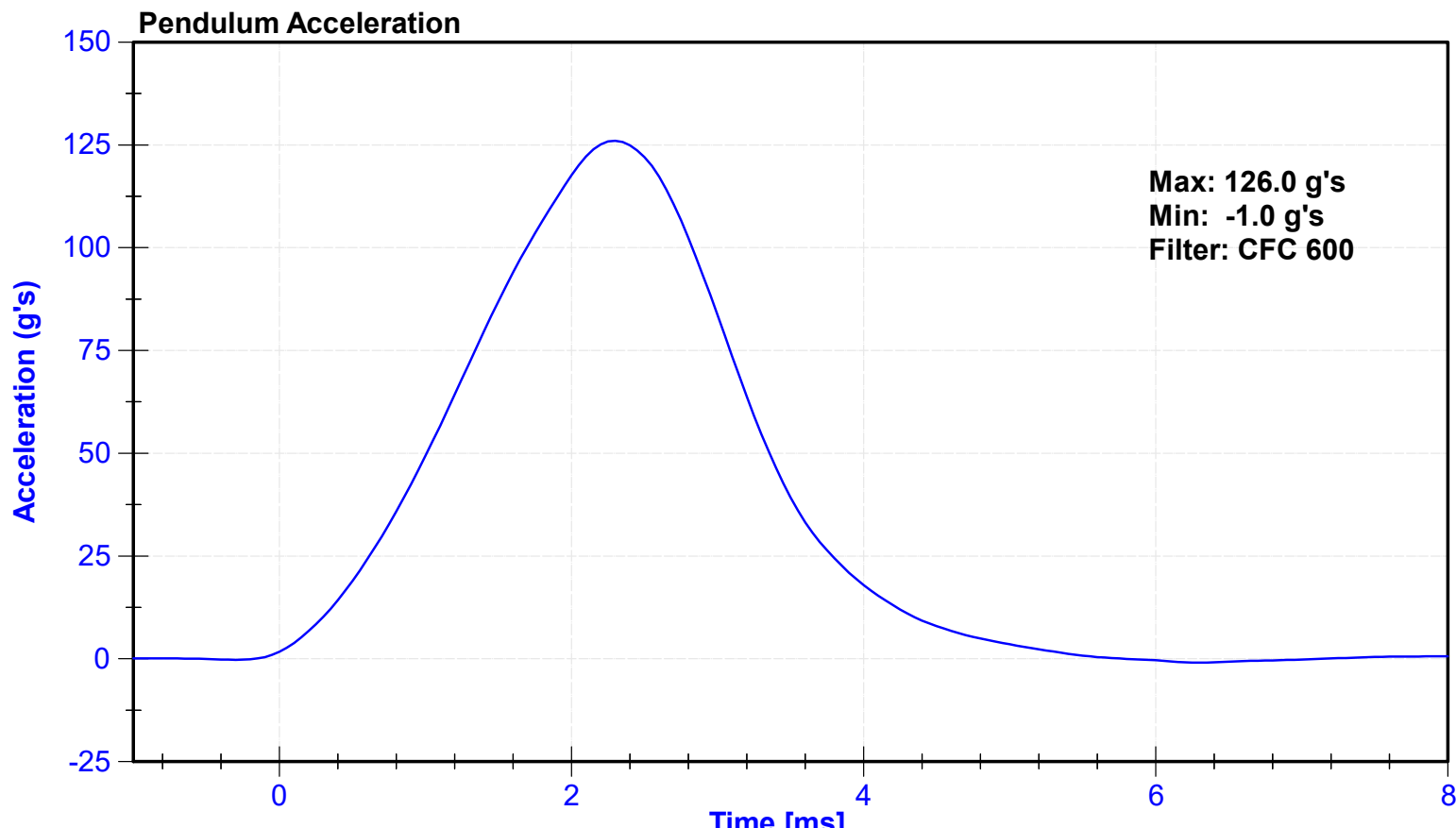
Results

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

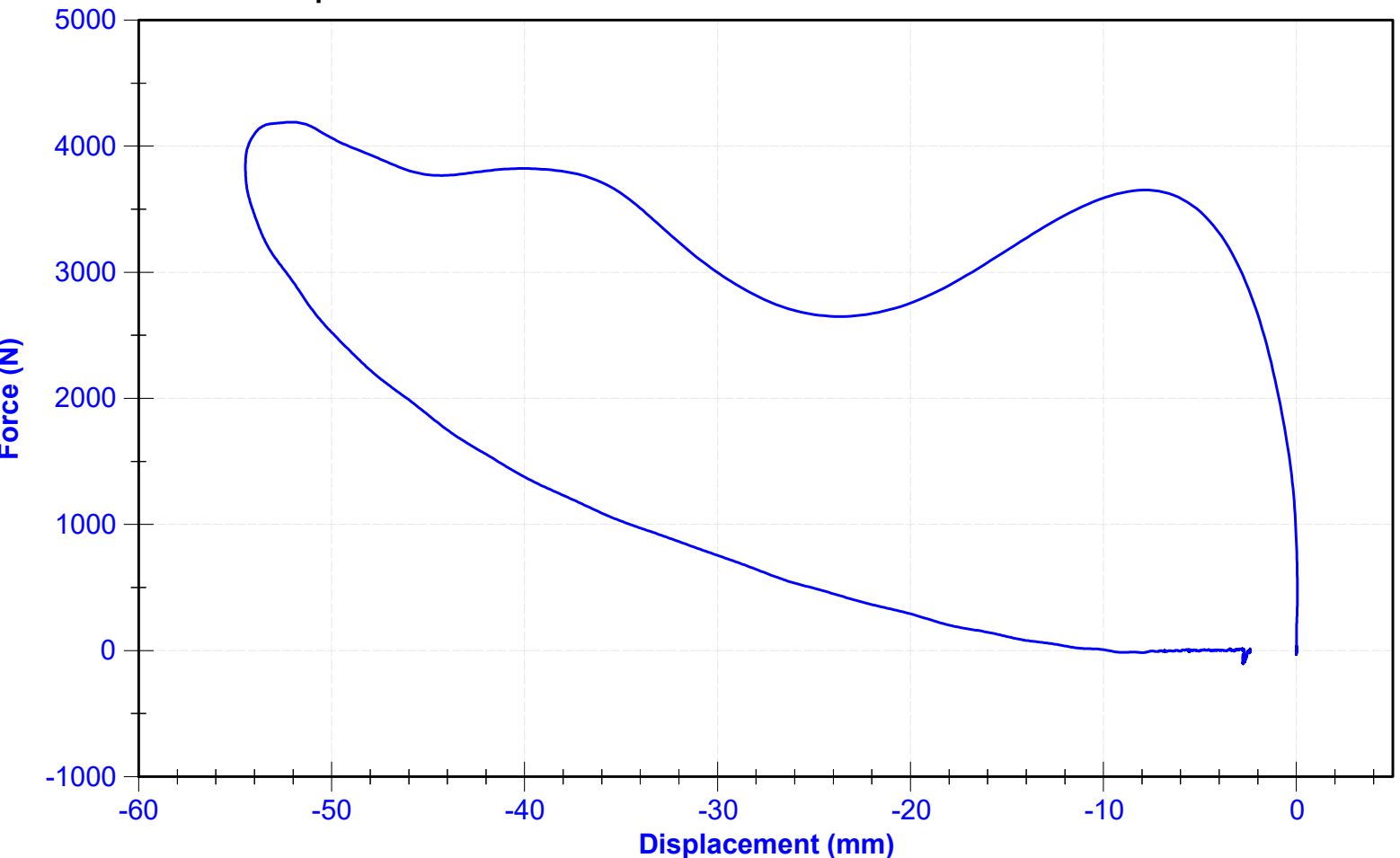
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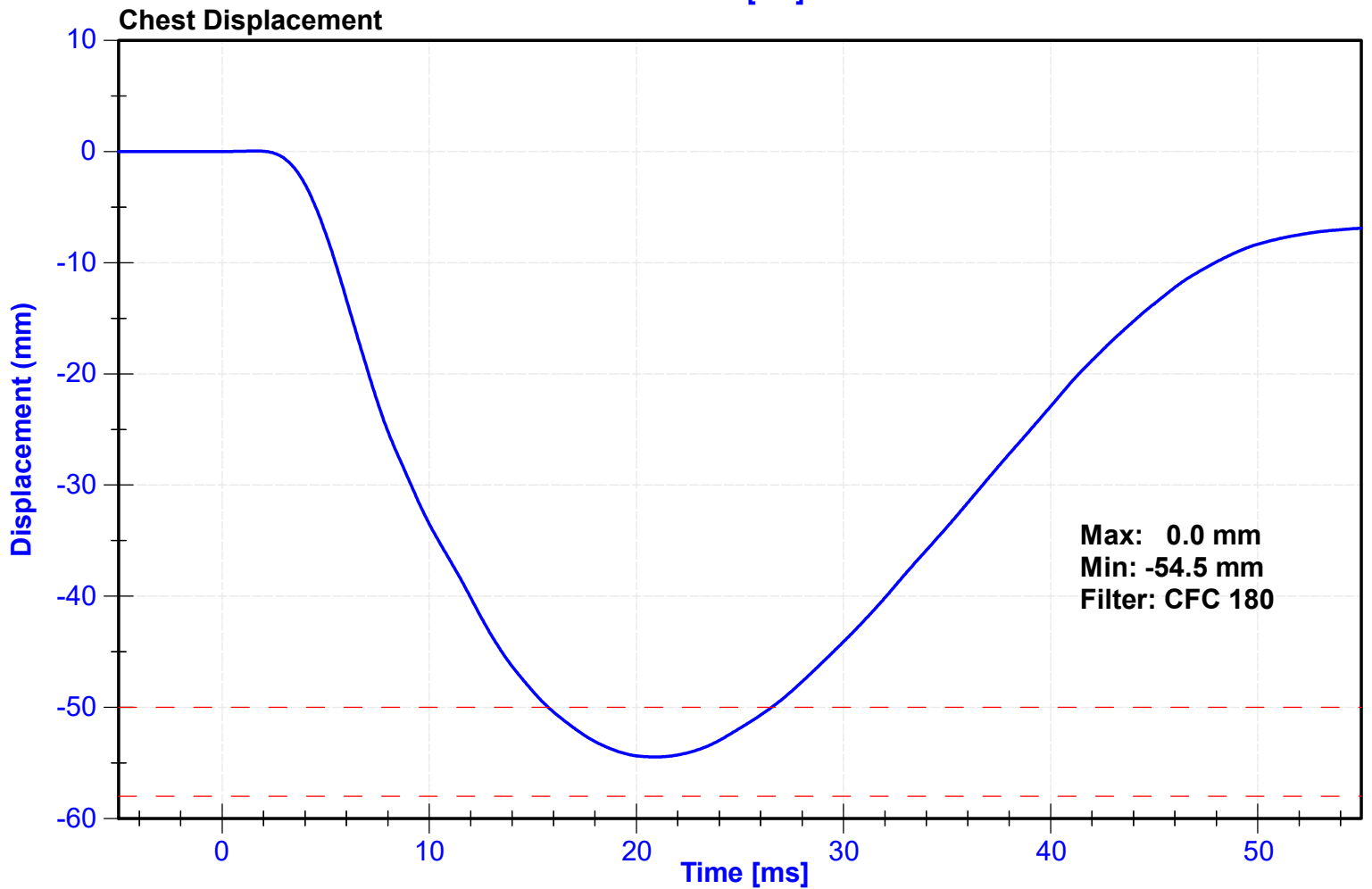
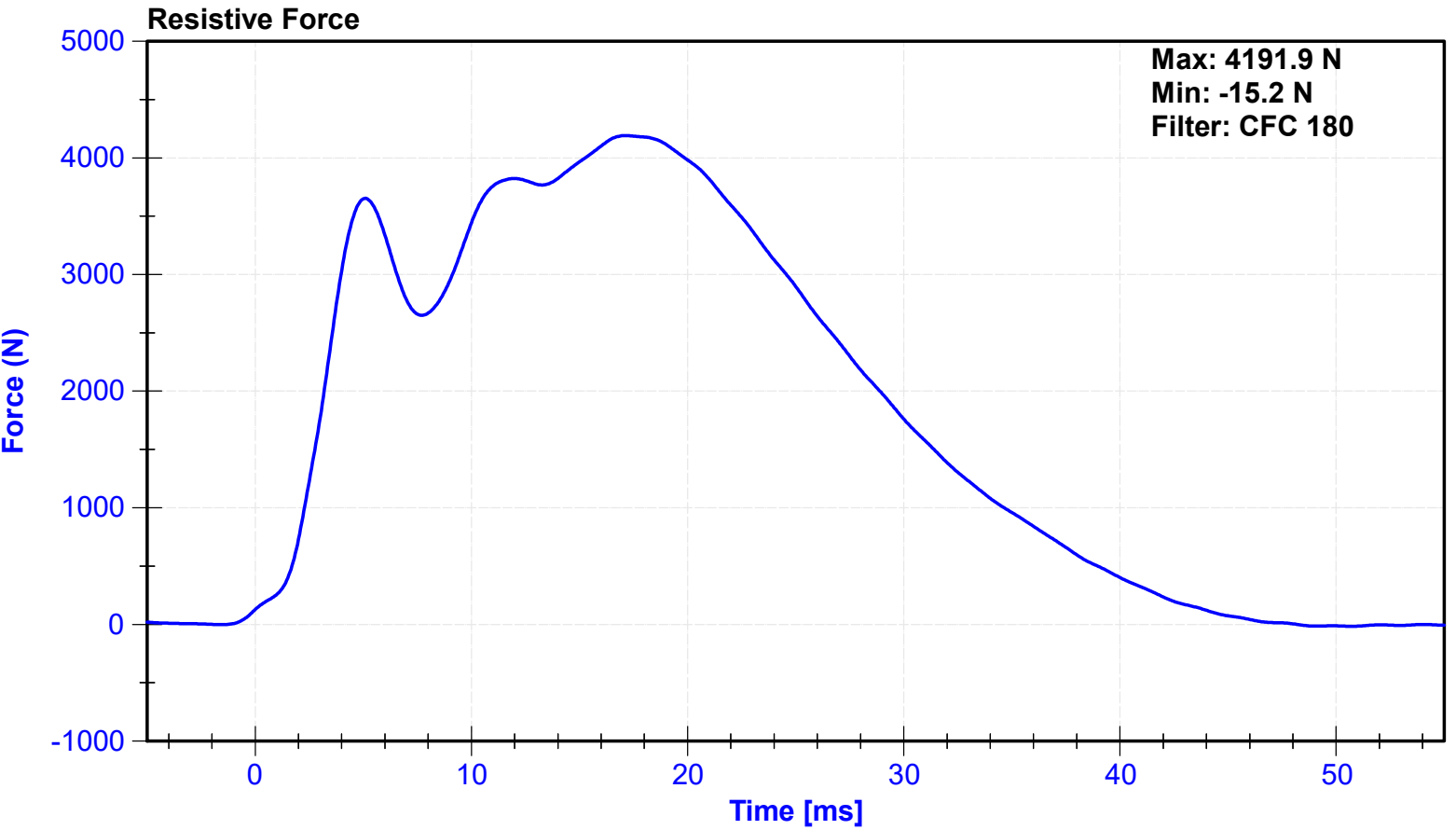
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	63.4	Pass
Velocity	6.59	6.83	m/s	6.658	Pass
Chest Deflection	-58	-50	mm	-54.5	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4191.9	Pass
Maximum Resistive Force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

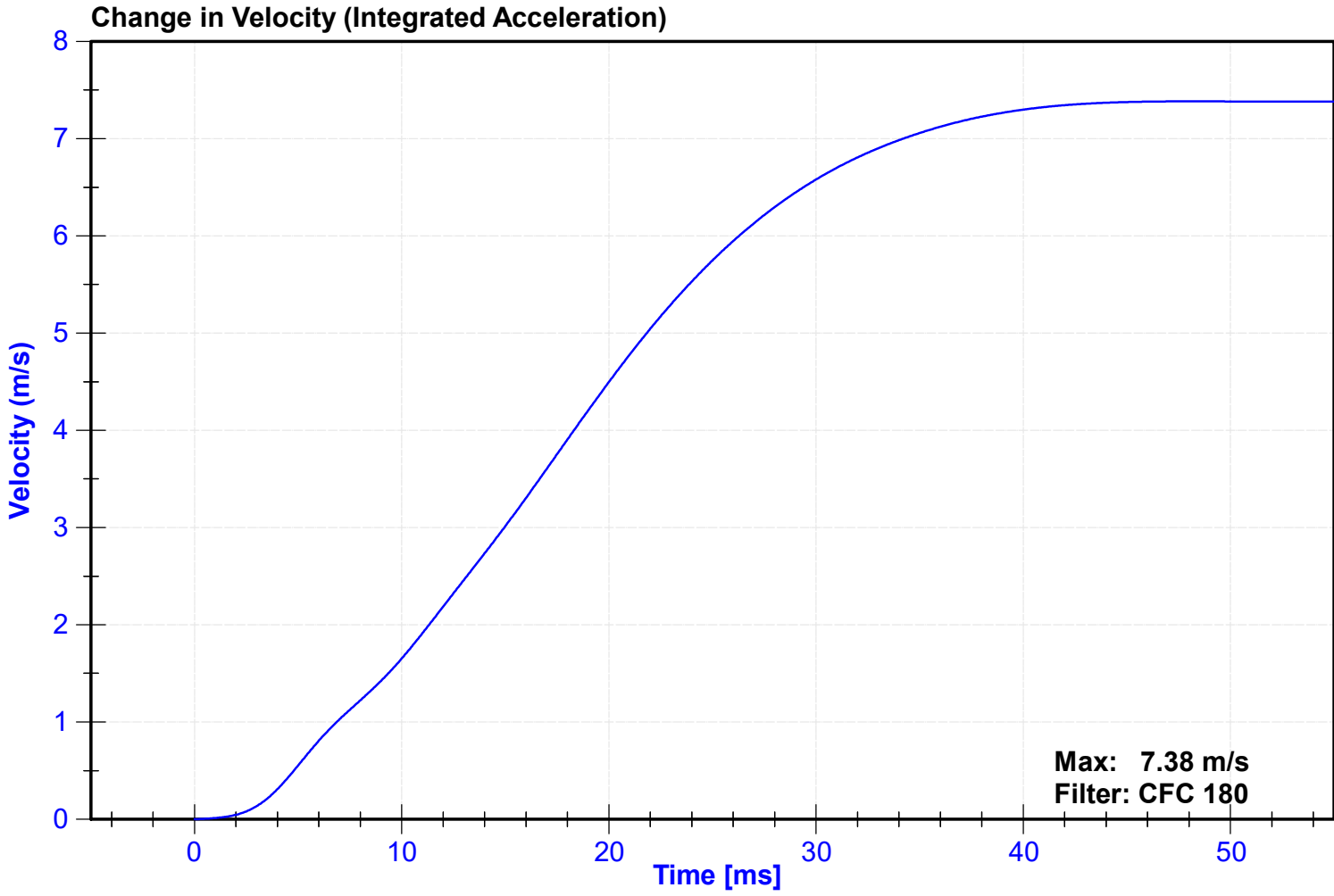
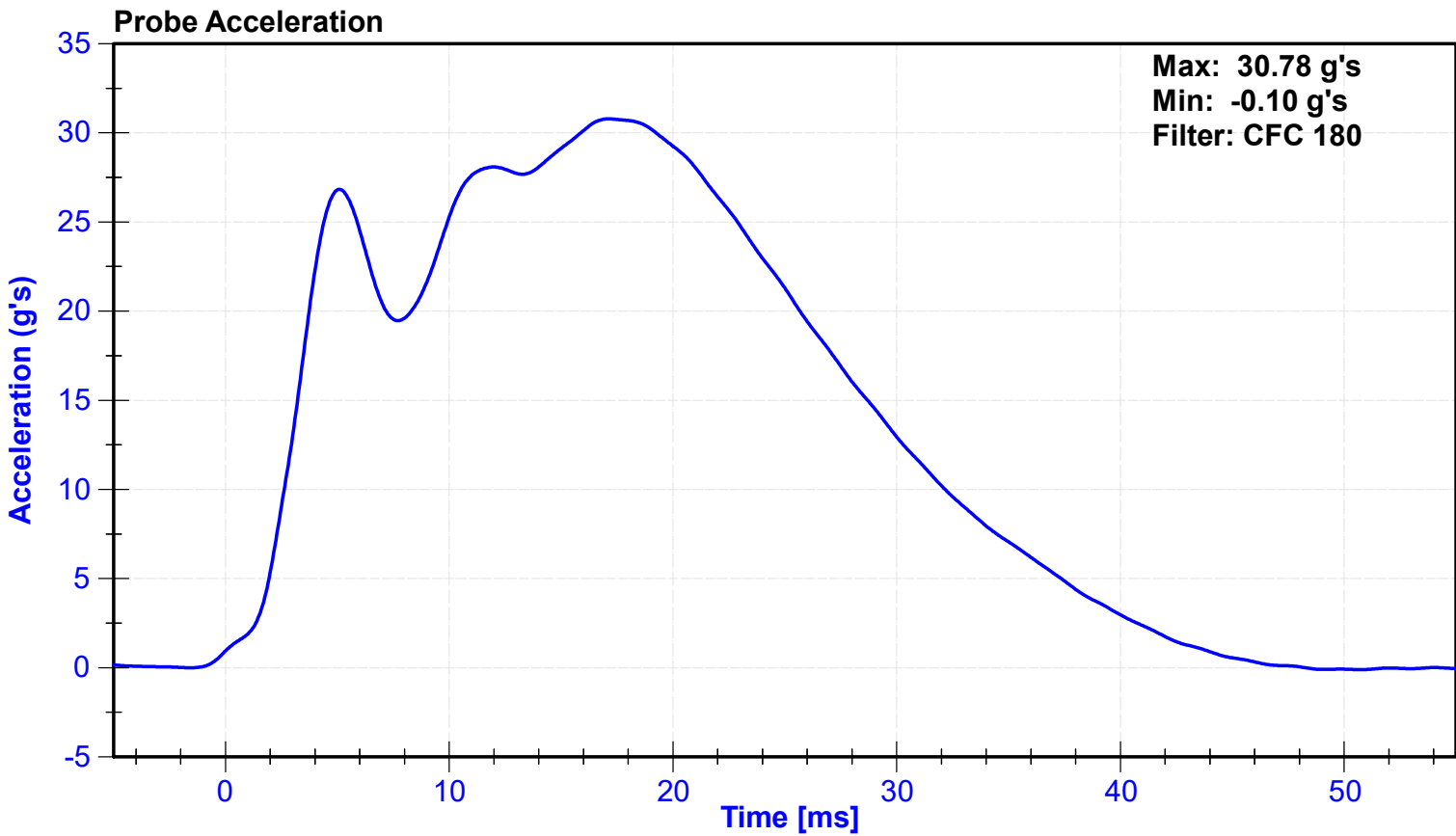
Transducer Calibrations

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

Force vs. Displacement







CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 142

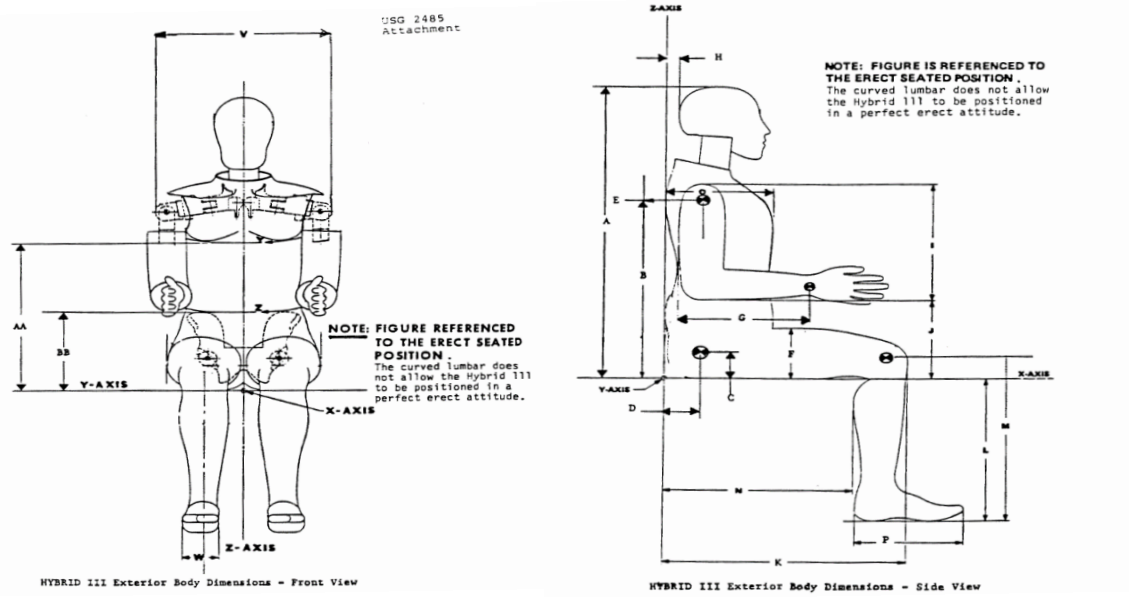


External Measurements - Hybrid 3 - 50th Male

Technician: K. Brogan

Date: 08/10/2023

Dummy Serial Number: 142



Symbol	Description	Specification (in)		Result (in)	Pass/Fail
A	Sitting Height	34.6	35.0	34.8	Pass
B	Shoulder Pivot Height	19.9	20.5	20.2	Pass
C	H-Point Height	3.3	3.5	3.4	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	6.0	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	13.5	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	17.5	Pass
M	Knee Pivot Height	19.1	19.7	19.5	Pass
N	Buttock Popliteal Length	17.8	18.8	18.3	Pass
O	Chest Depth without Jacket	8.4	9.0	8.8	Pass
P	Foot Length (right)	9.9	10.5	10.3	Pass
V	Shoulder Breadth	16.3	17.2	16.9	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	33.6	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

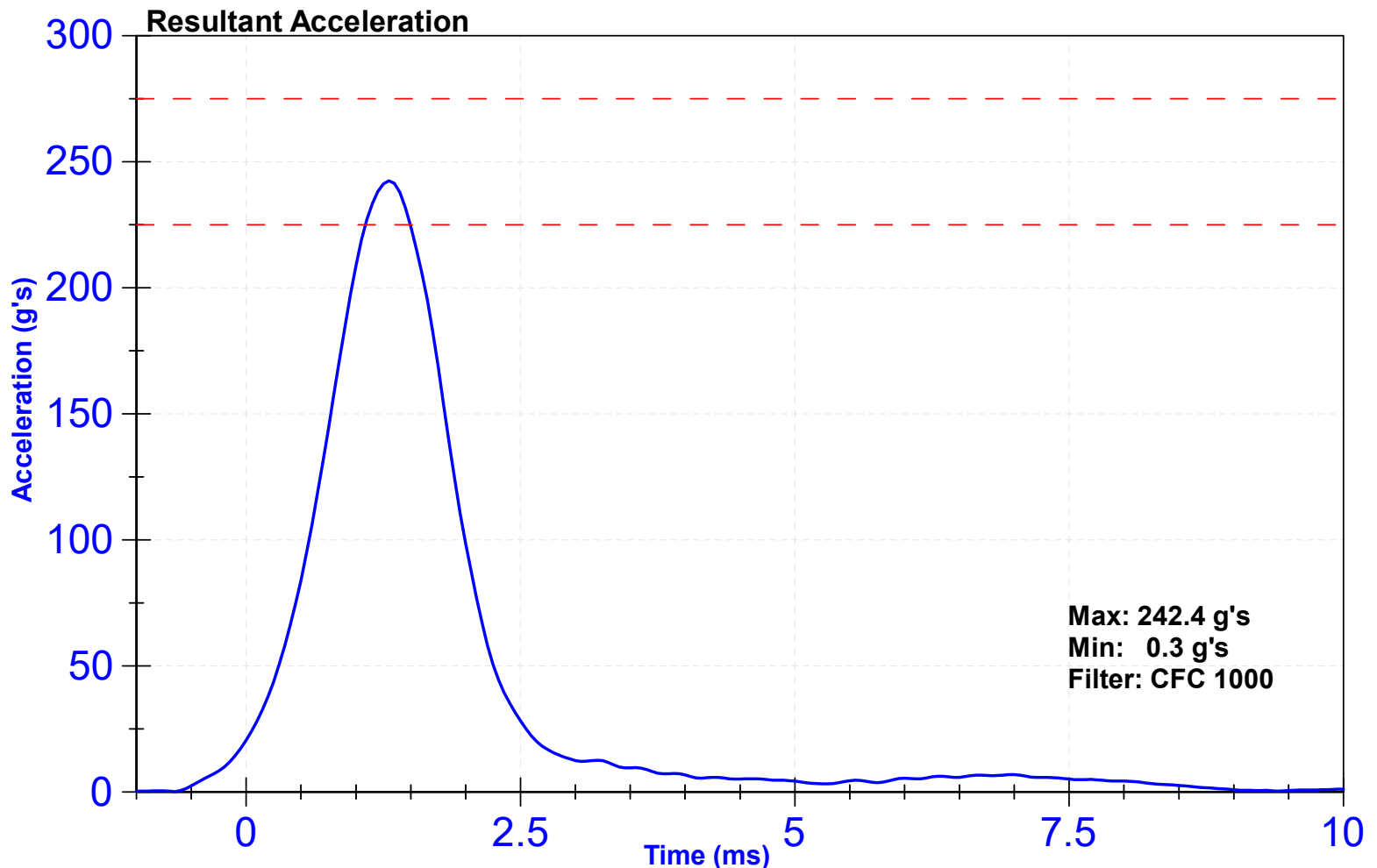
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	142	Laboratory Supervisor	C.Mantel

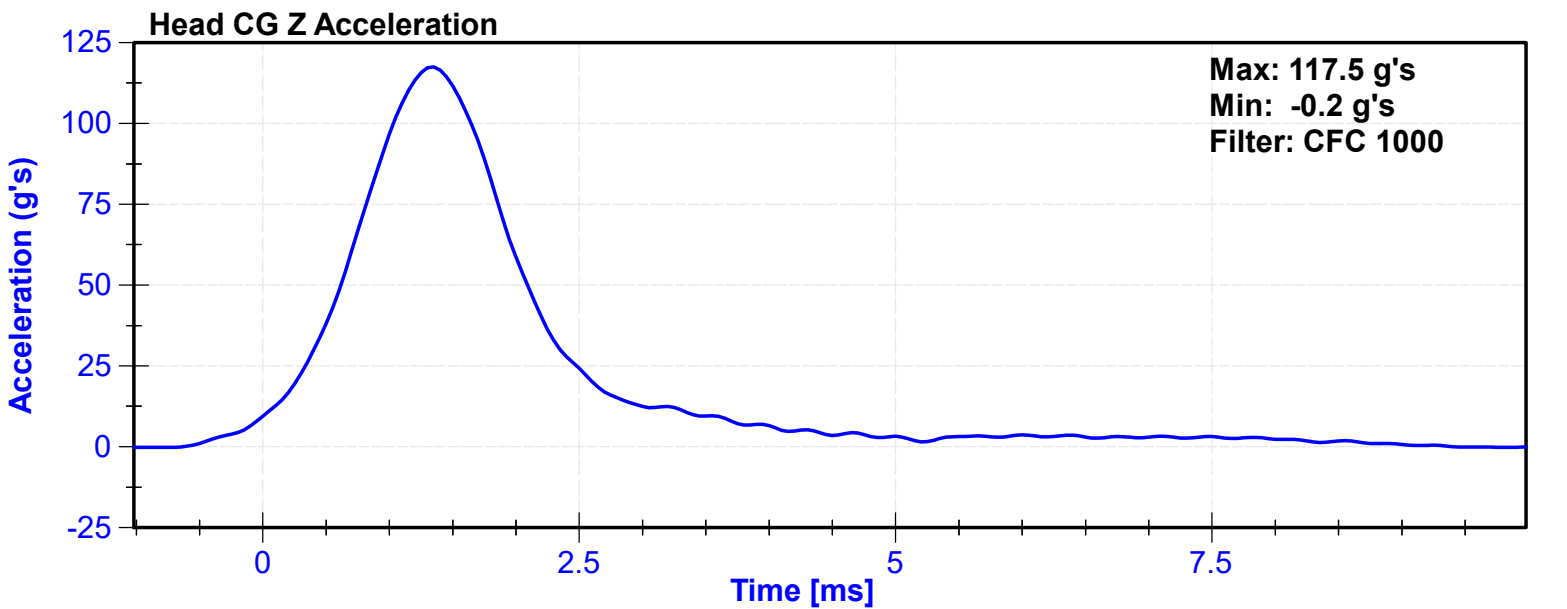
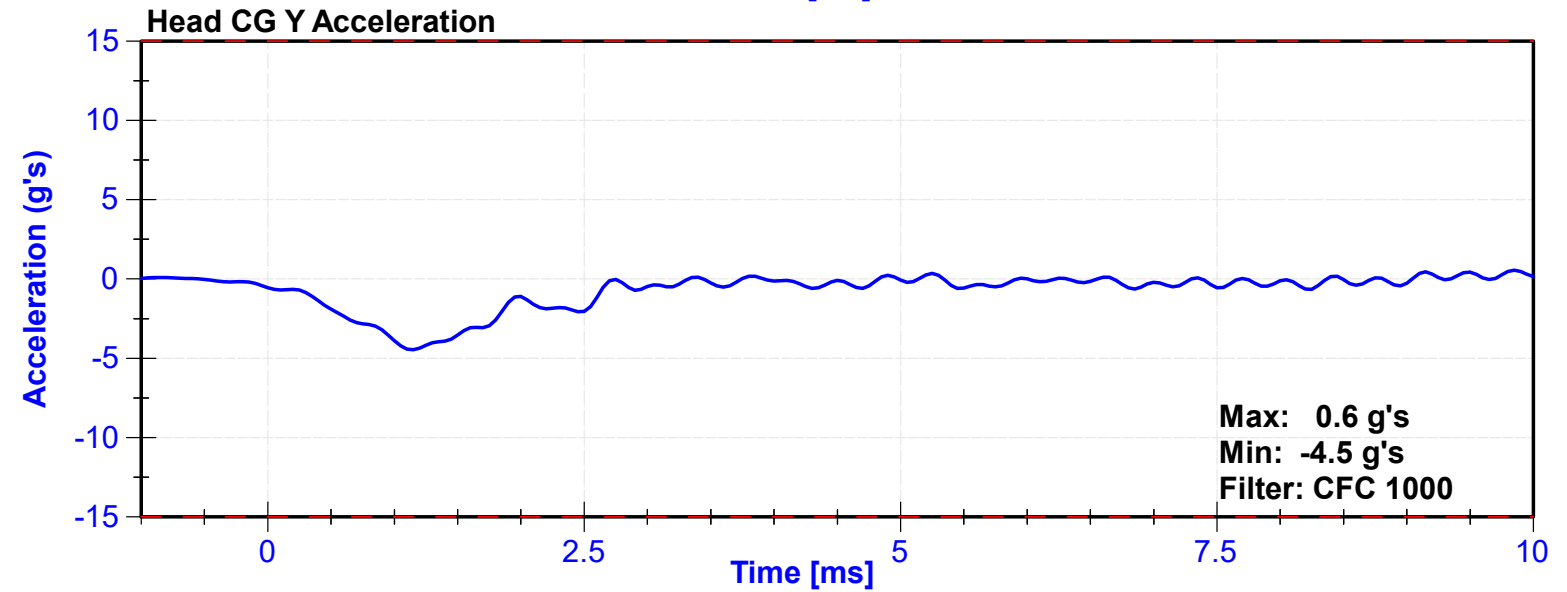
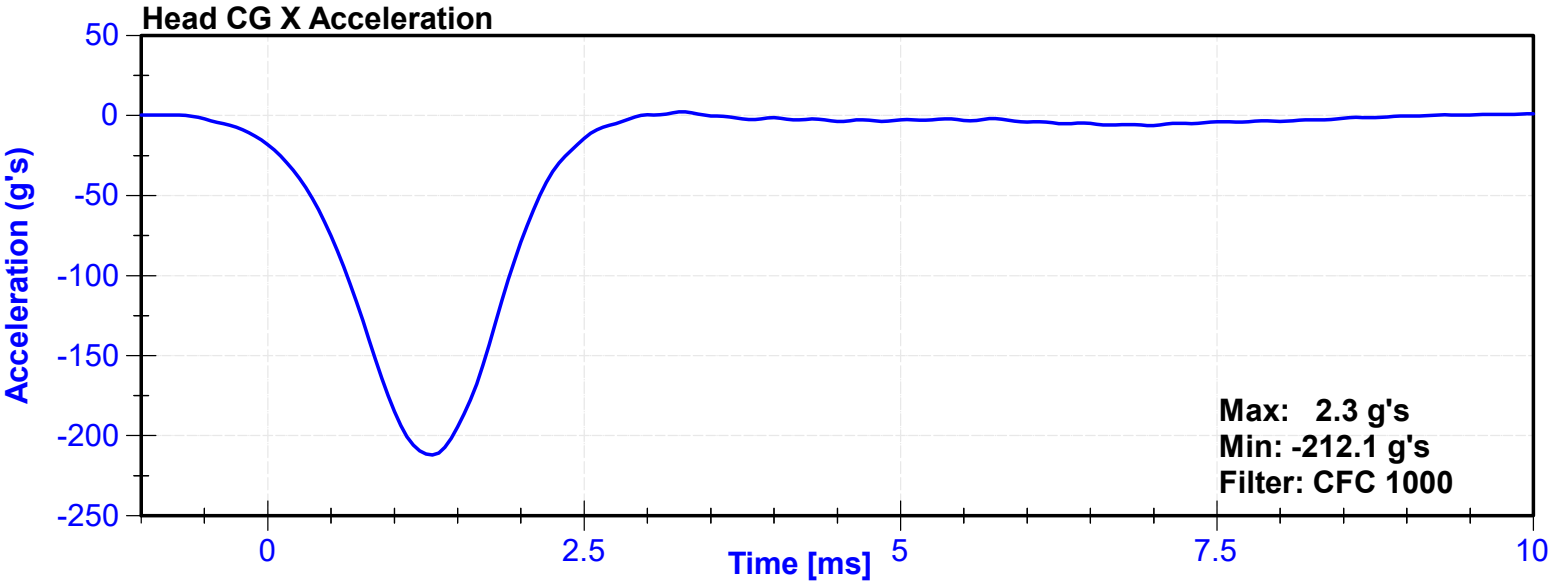
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.3	Pass
Humidity	10	70	%	62.3	Pass
Resultant Acceleration	225	275	g's	242.4	Pass
Oscillation	0	10	%	5.1	Pass
Lateral Acceleration	-15	15	g's	-4.5	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





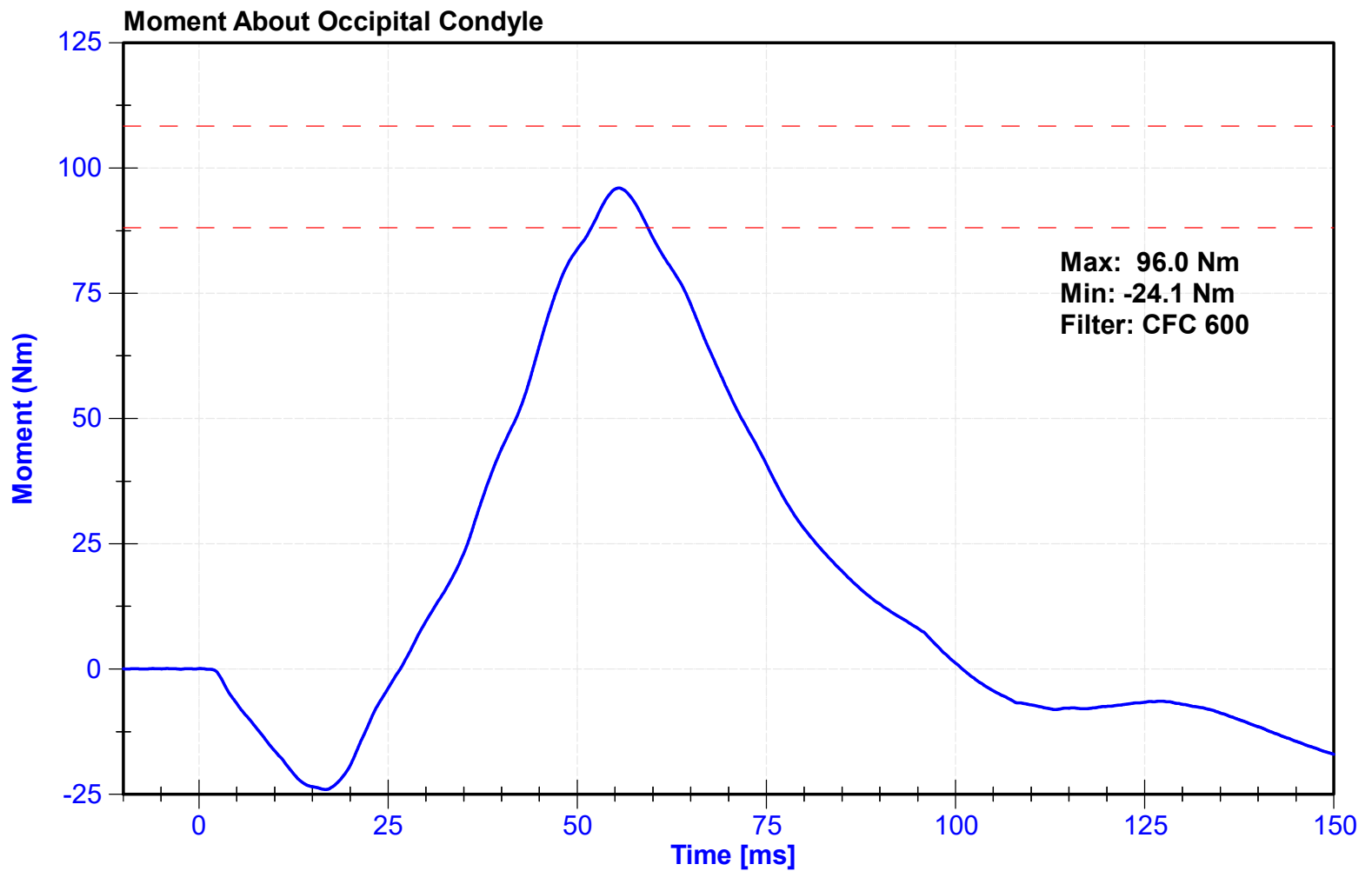
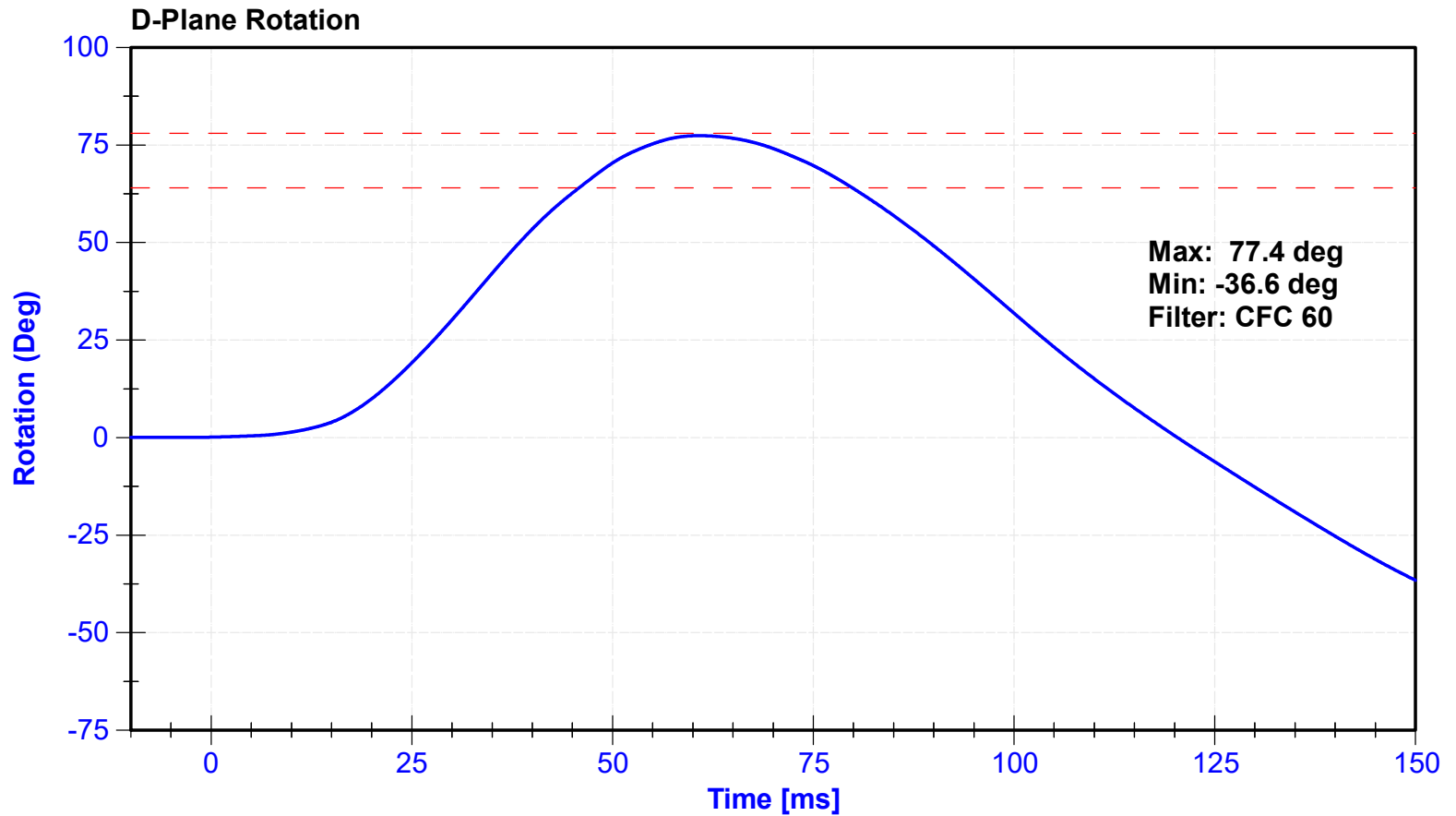
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

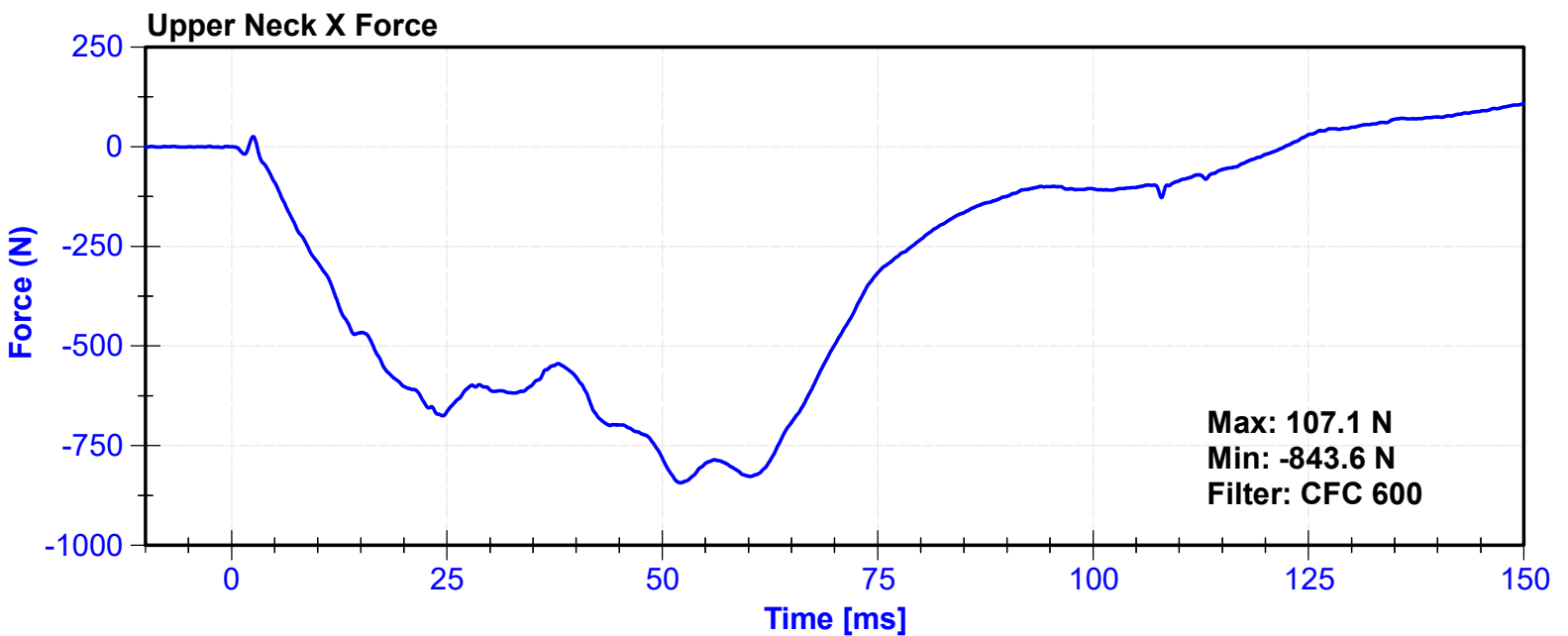
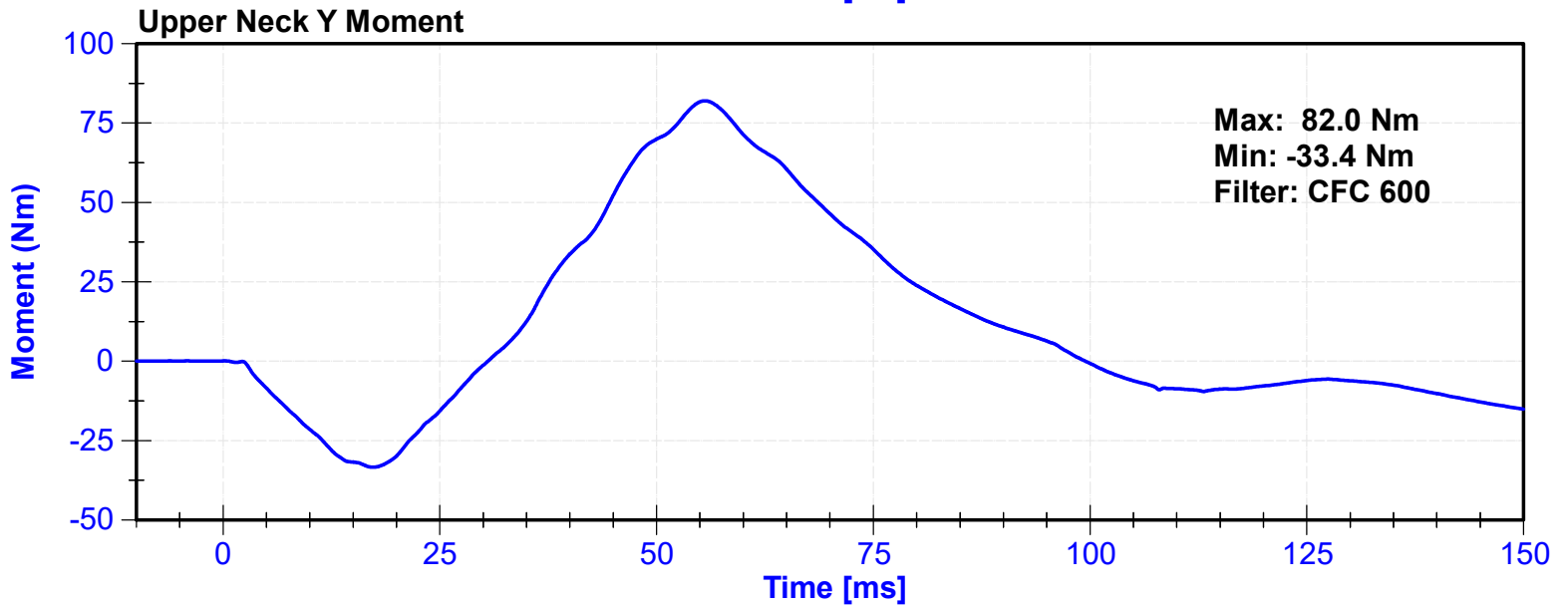
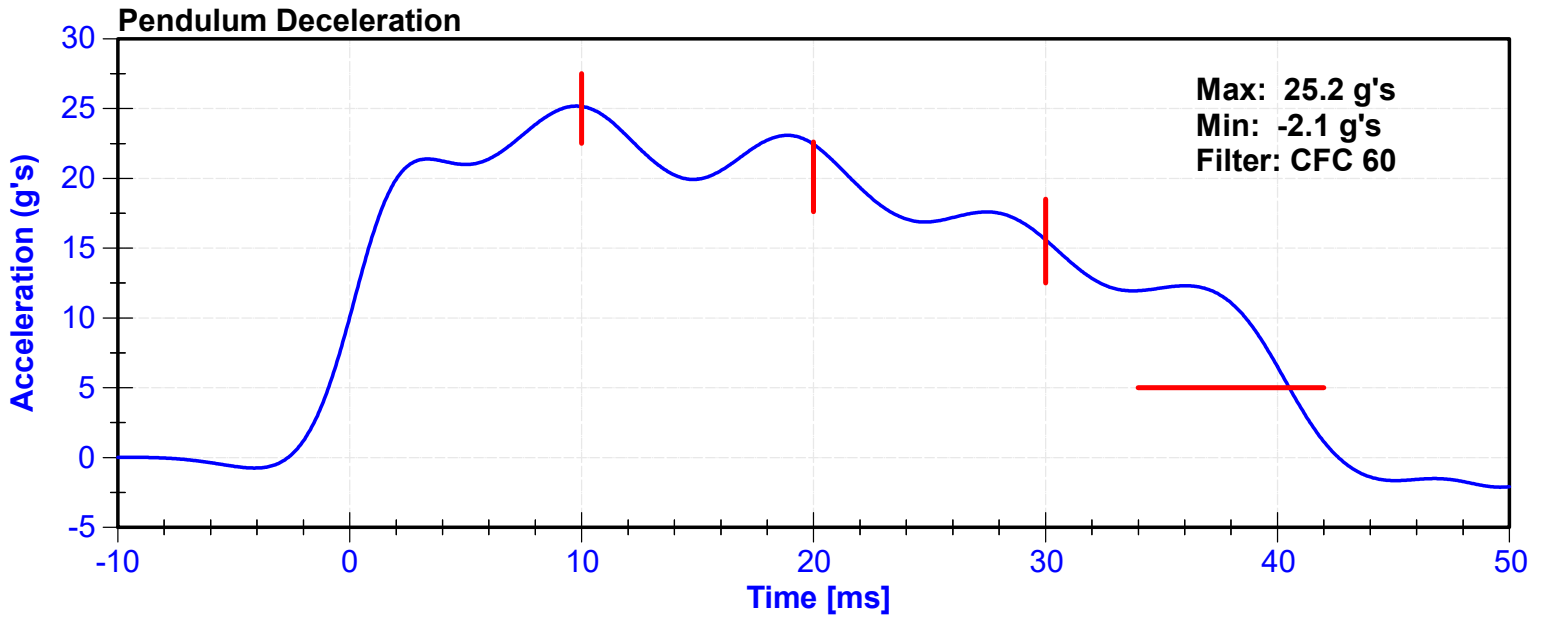
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	59.9	Pass
Velocity	6.89	7.13	m/s	6.948	Pass
Pendulum Deceleration at 10ms	22.5	27.5	g's	25.15	Pass
Pendulum Deceleration at 20ms	17.6	22.6	g's	22.43	Pass
Pendulum Deceleration at 30ms	12.5	18.5	g's	15.60	Pass
Max. Pendulum Deceleration After 30ms	0	29	g's	25.2	Pass
Pendulum Deceleration Time to 5 g's	34	42	ms	40.5	Pass
Maximum D Plane Rotation	64	78	deg	77.4	Pass
Time to Maximum Rotation	57	64	ms	60.7	Pass
Rotation Decay to Zero	113	127	ms	120.3	Pass
Moment About Occipital Condyle	88.1	108.4	Nm	96.03	Pass
Time to Maximum Moment	47	58	ms	55.5	Pass
Moment Decay to Zero	97	107	ms	100.9	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	ETI	LABPOT2	7/19/2023	7/18/2024
Upper Neck Load Cell	Humanetics	851-FX	5/18/2023	5/17/2024





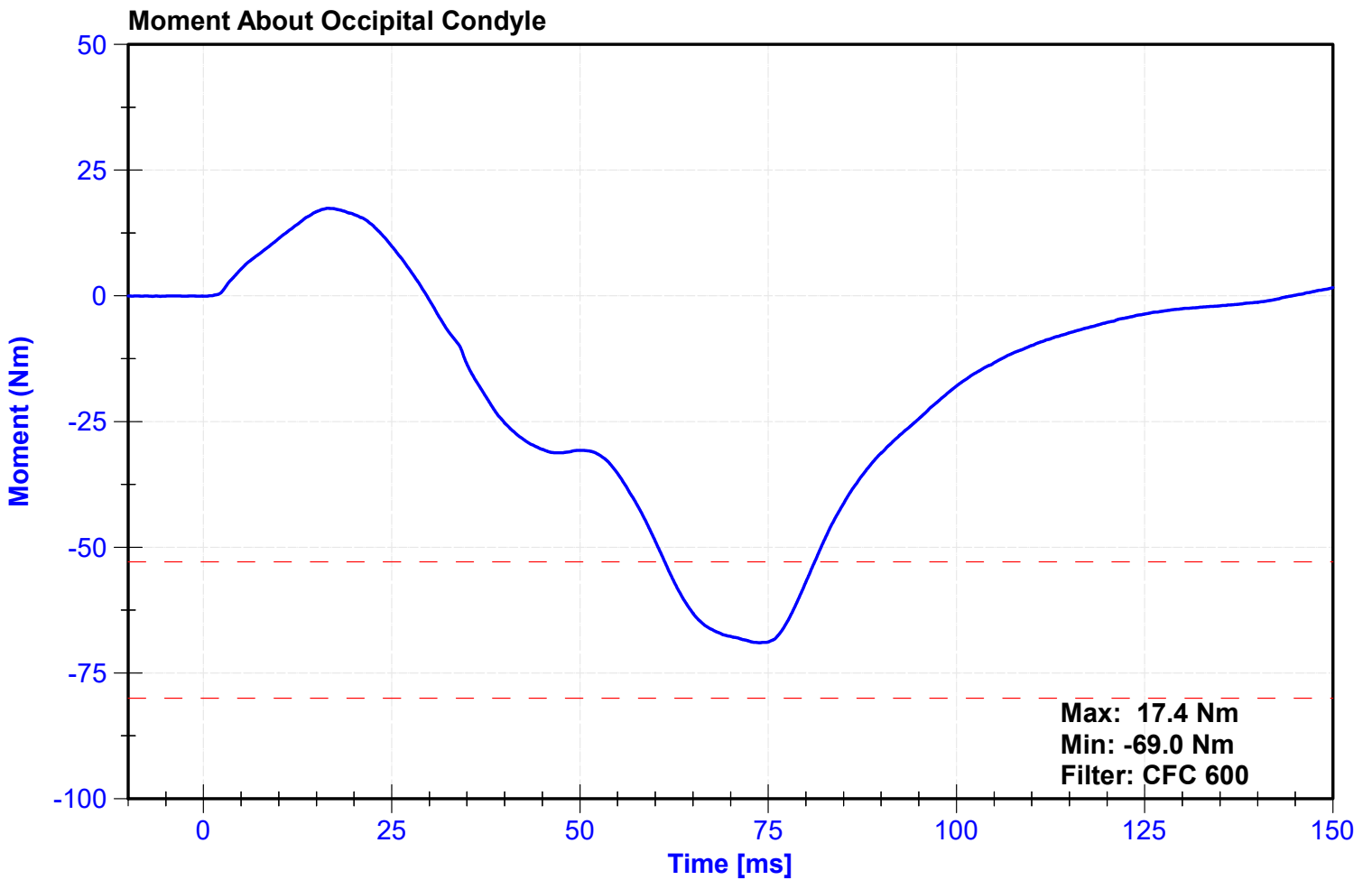
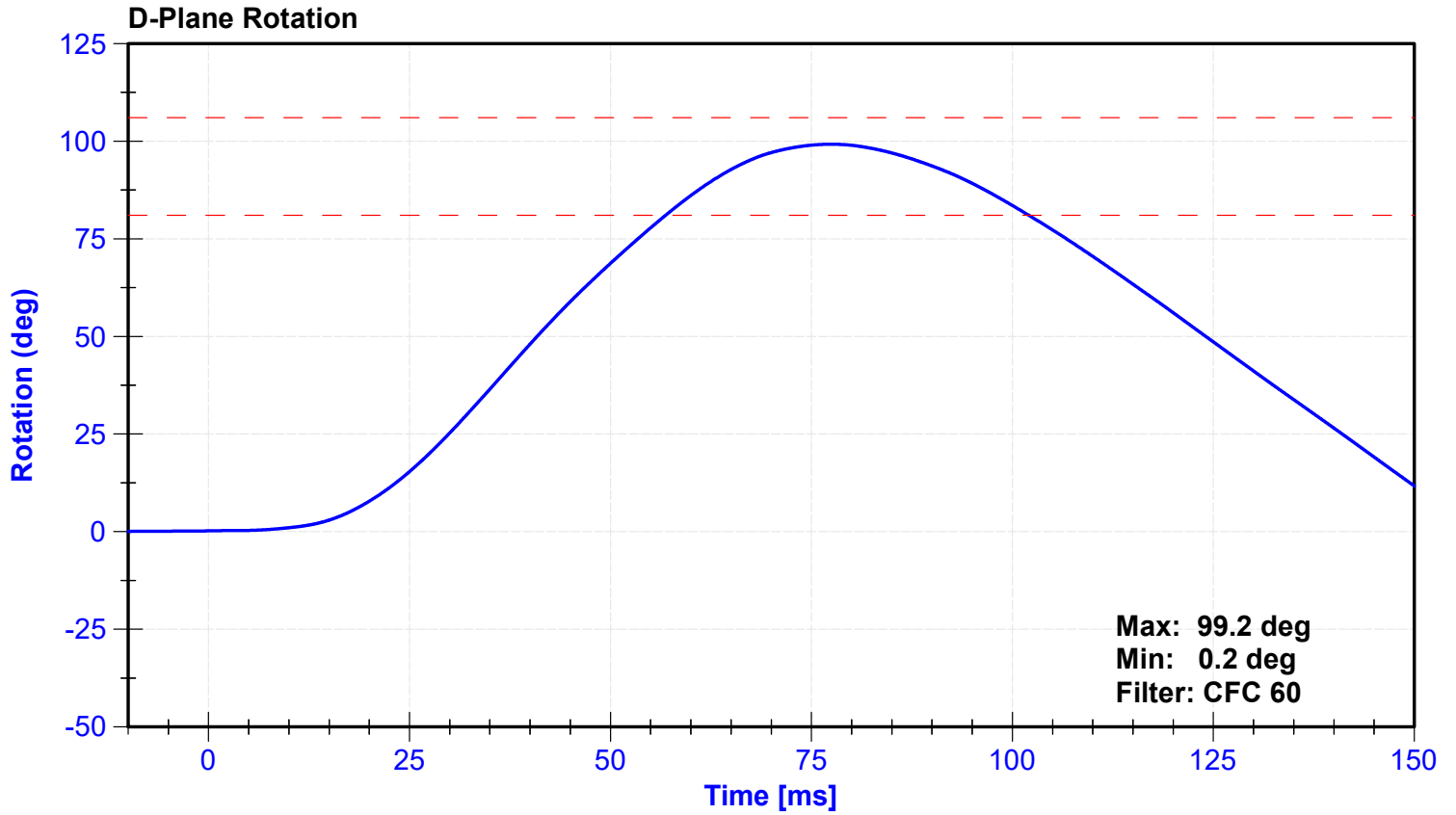
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

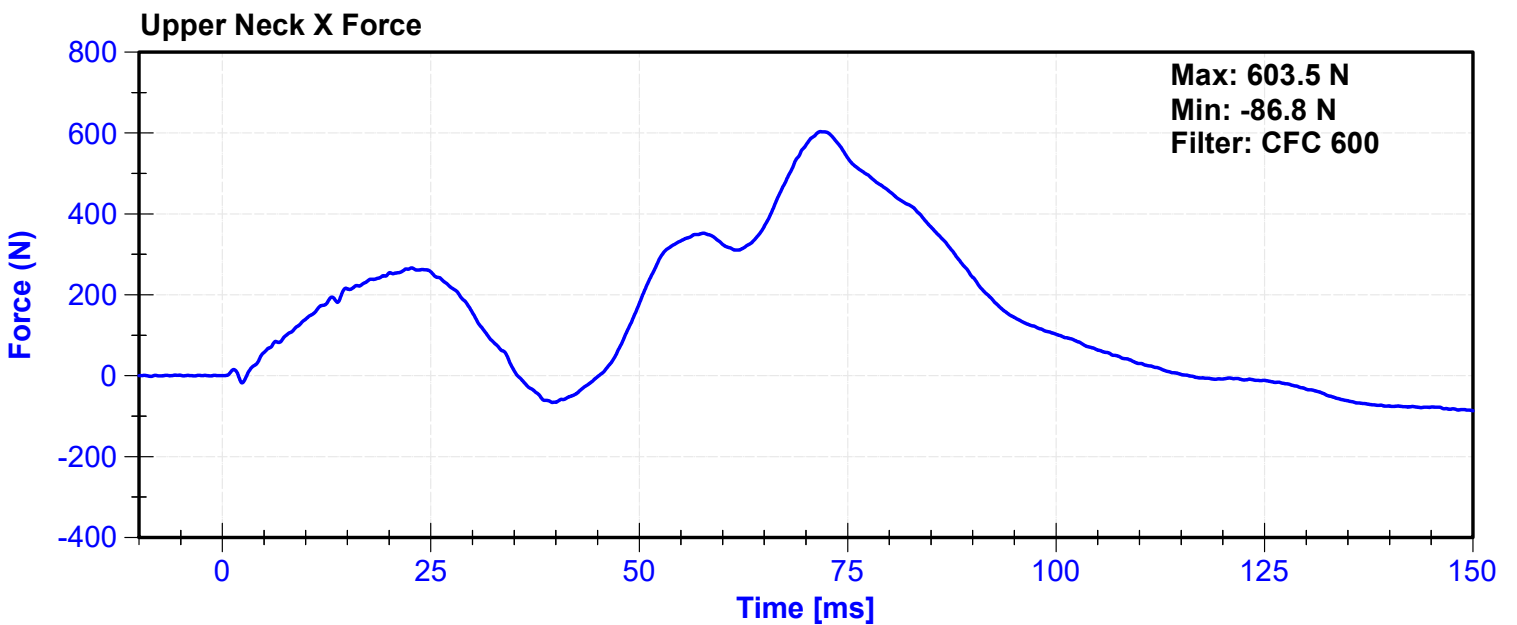
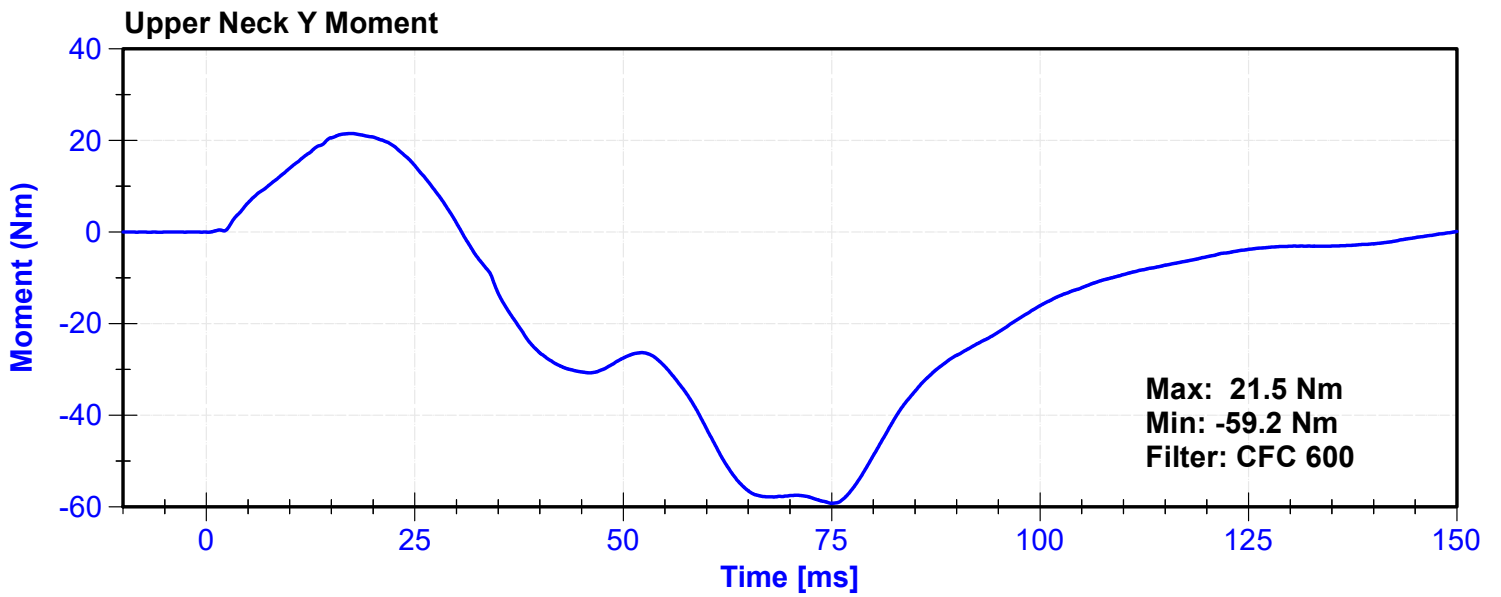
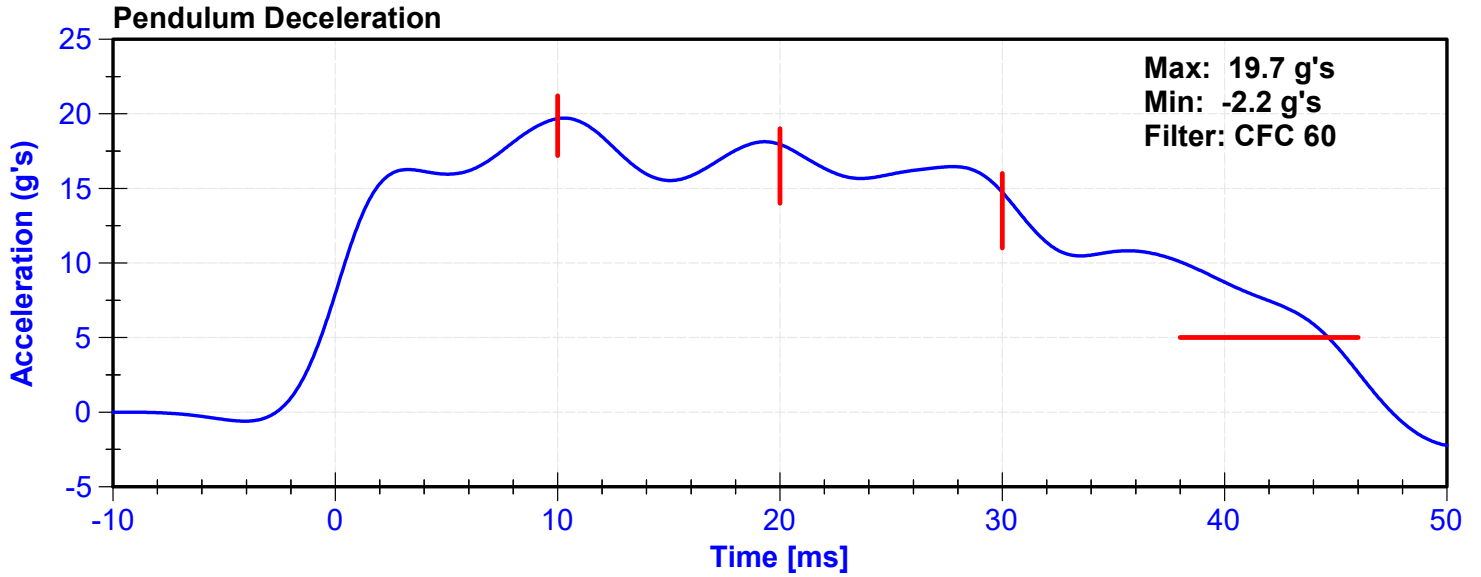
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	59.9	Pass
Velocity	5.94	6.19	m/s	6.035	Pass
Pendulum Deceleration at 10ms	17.2	21.2	g's	19.68	Pass
Pendulum Deceleration at 20ms	14	19	g's	17.9	Pass
Pendulum Deceleration at 30ms	11	16	g's	14.7	Pass
Max. Pendulum Deceleration After 30ms	0	22	g's	19.7	Pass
Pendulum Deceleration Time to 5 g's	38	46	ms	44.7	Pass
Maximum D Plane Rotation	81	106	deg	99.2	Pass
Time to Maximum Rotation	72	82	ms	77.4	Pass
Rotation Decay to Zero	147	174	ms	157.9	Pass
Minimum Moment About OC	-80	-52.9	Nm	-68.98	Pass
Time to Minimum Moment	65	79	ms	73.8	Pass
Moment Decay to Zero	120	148	ms	144.6	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	ETI	LABPOT2	7/19/2023	7/18/2024
Upper Neck Load Cell	Humanetics	851-FX	5/18/2023	5/17/2024





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

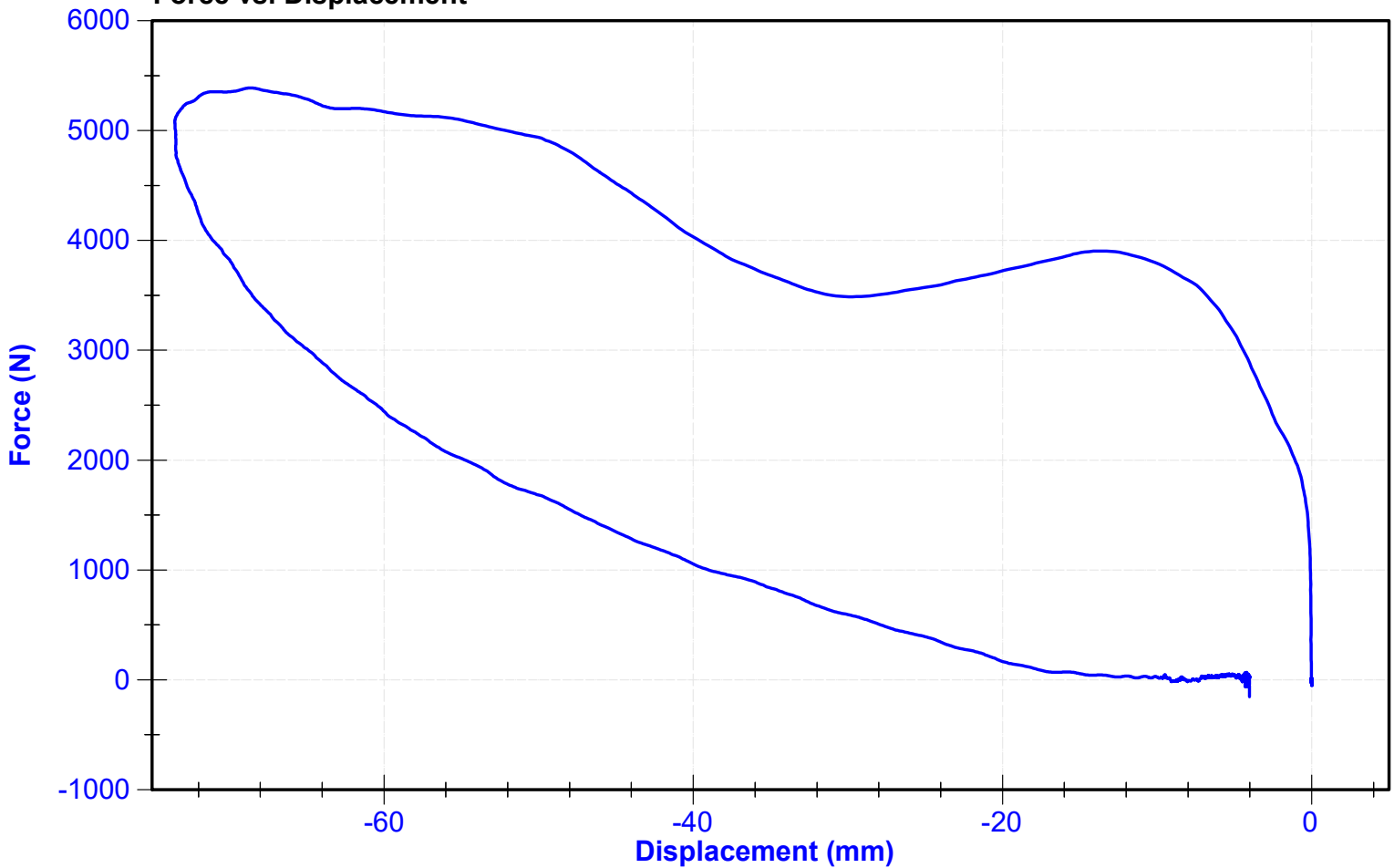
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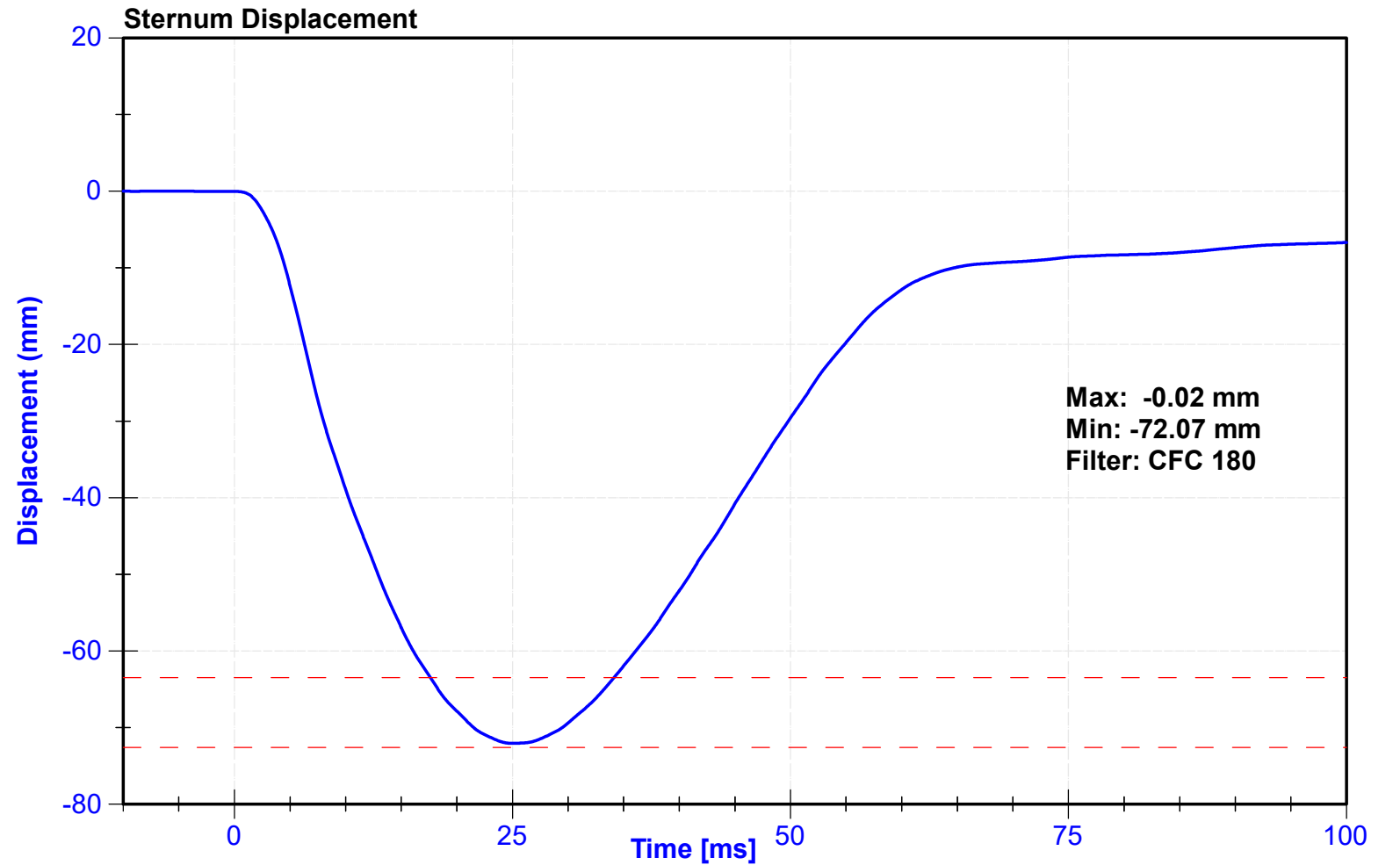
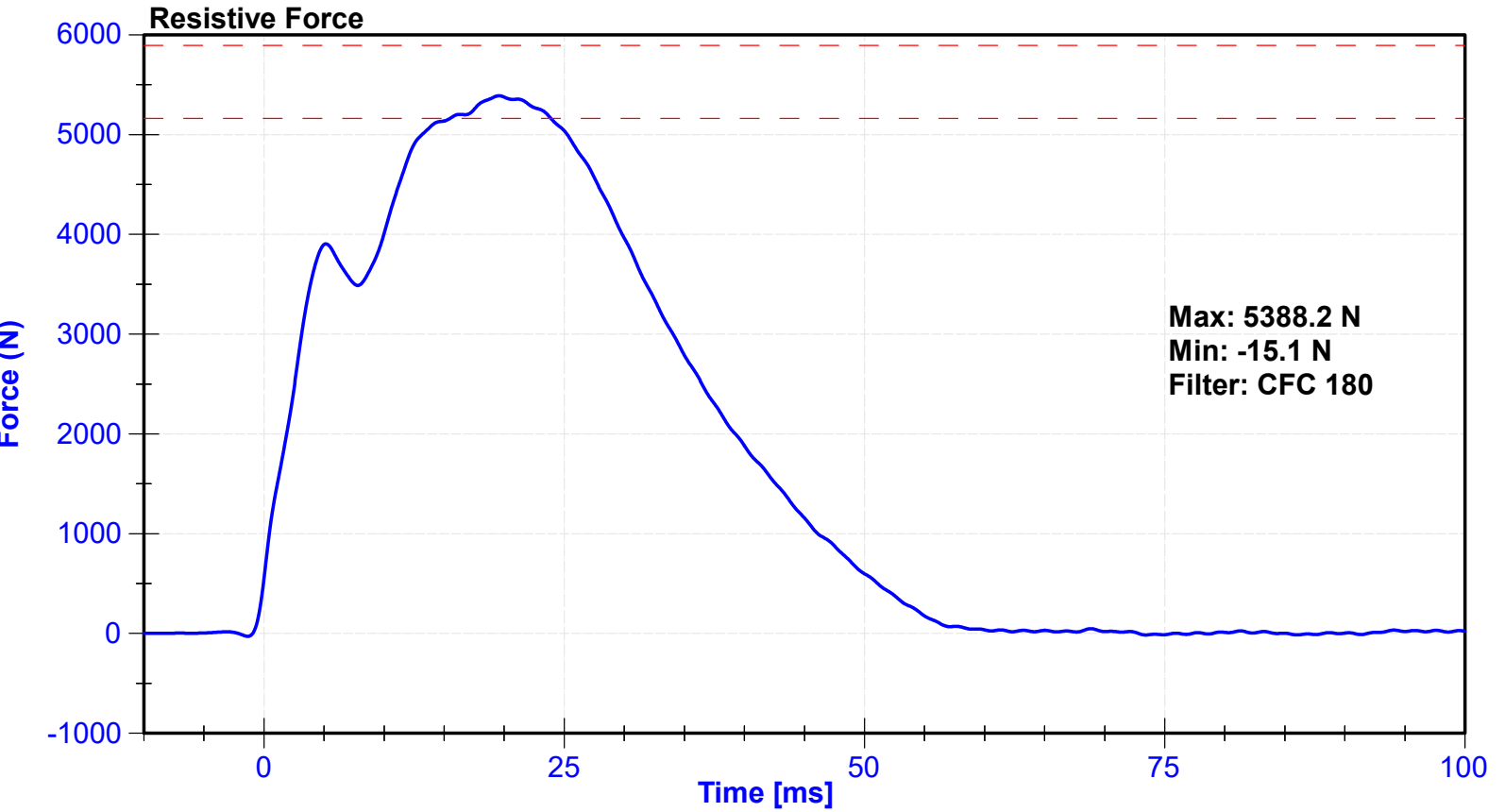
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	60.5	Pass
Velocity	6.59	6.83	m/s	6.723	Pass
Chest Displacement	-72.6	-63.5	mm	-72.07	Pass
Resistive Force	5160	5894	N	5388.2	Pass
Hysteresis	69	85	%	70.1	Pass

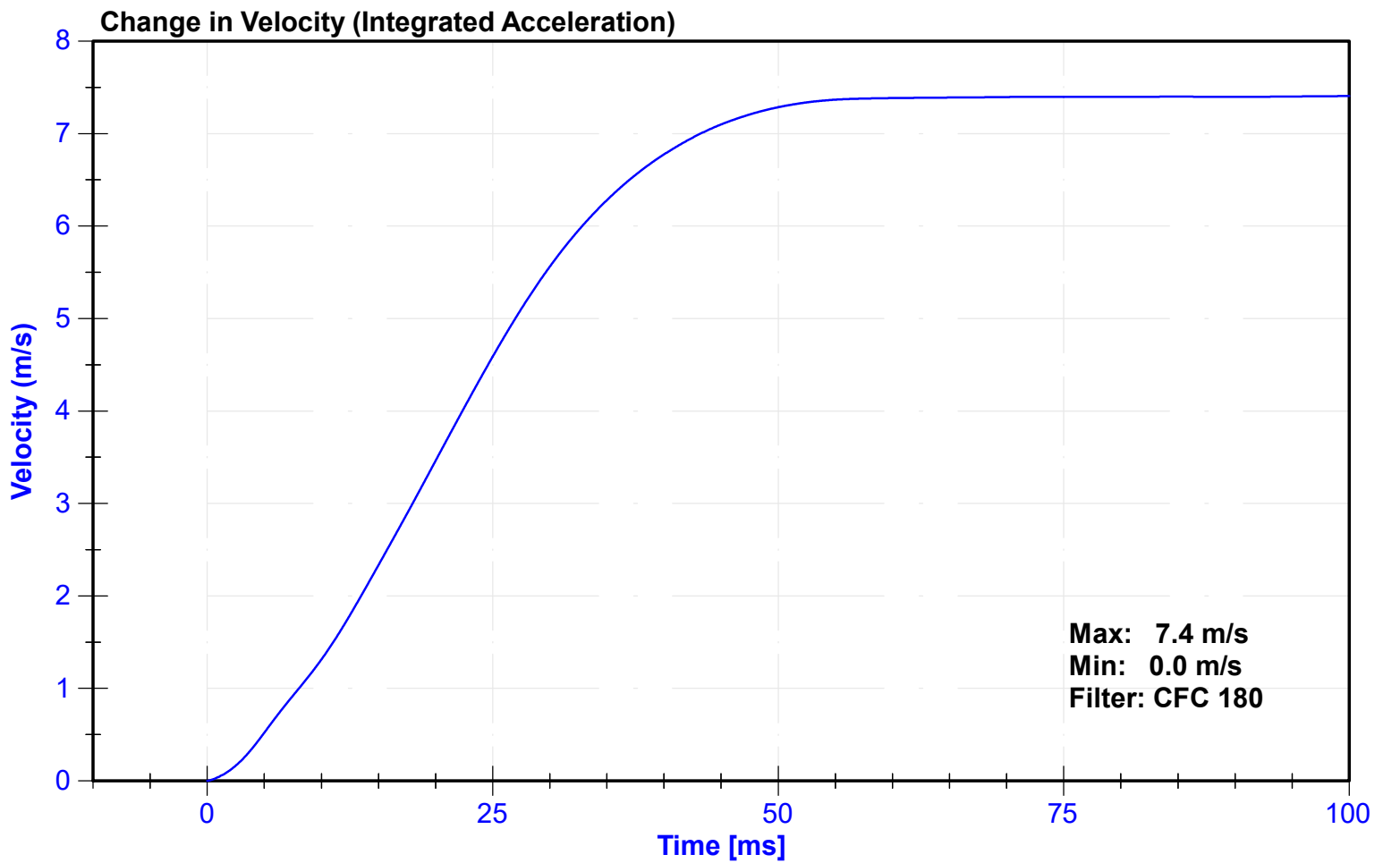
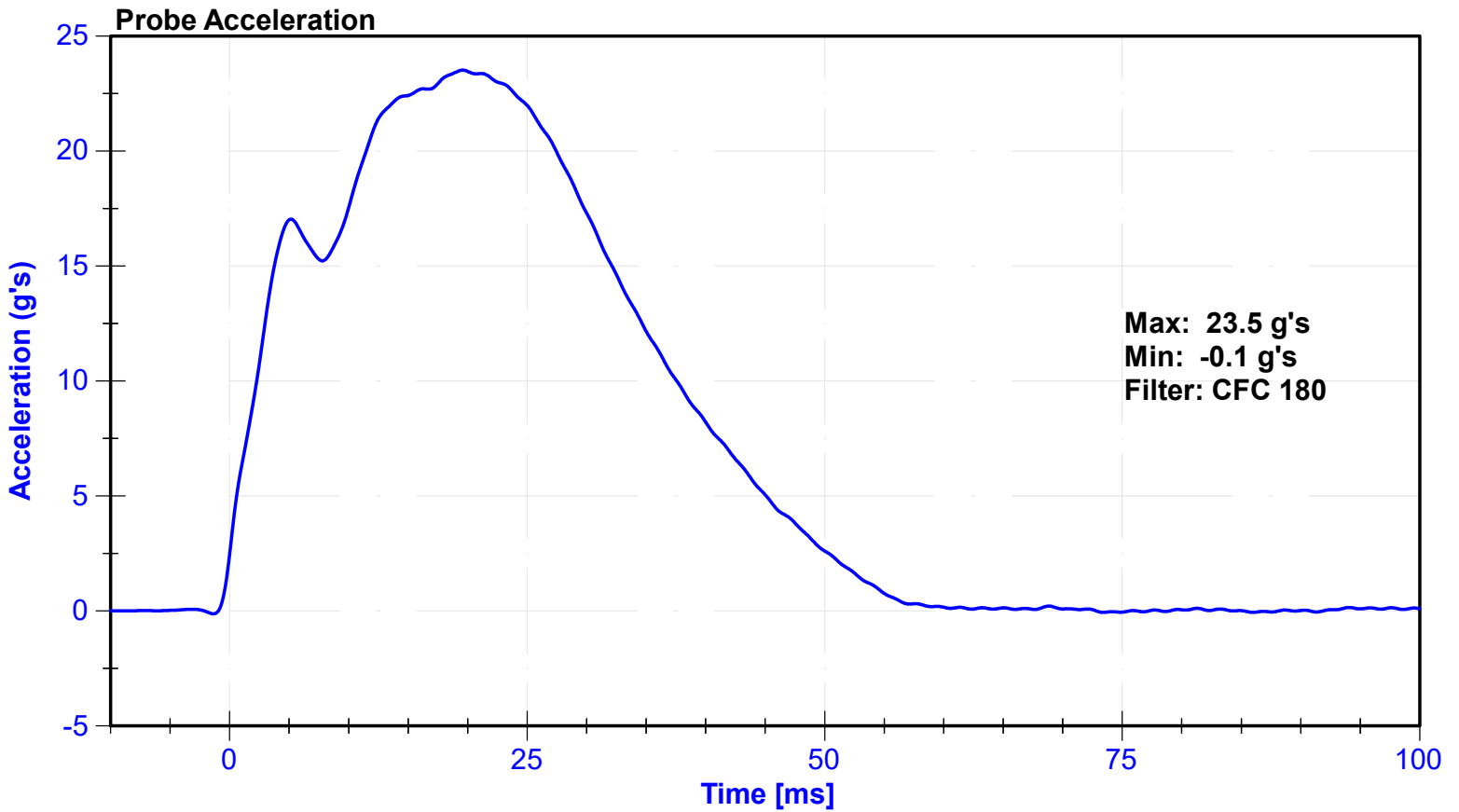
Transducer Calibrations

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

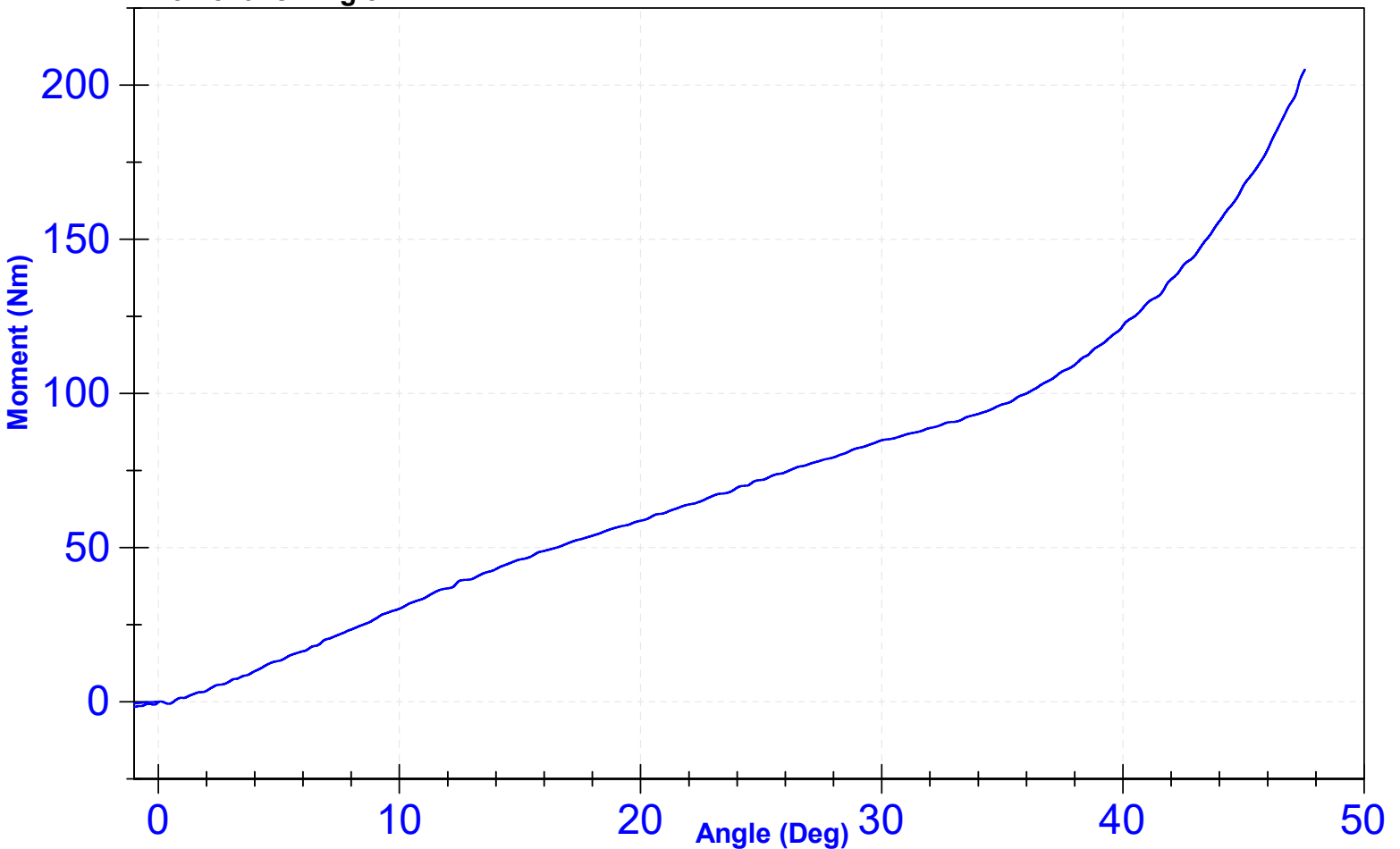
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.8	Pass
Humidity	10	70	%	62.3	Pass
Average Velocity	5	10	deg/s	7.5	Pass
Angle at 203Nm	40	50	deg	47.4	Pass
Moment at 30 degrees	0	94.9	Nm	84.8	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

Moment vs. Angle



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

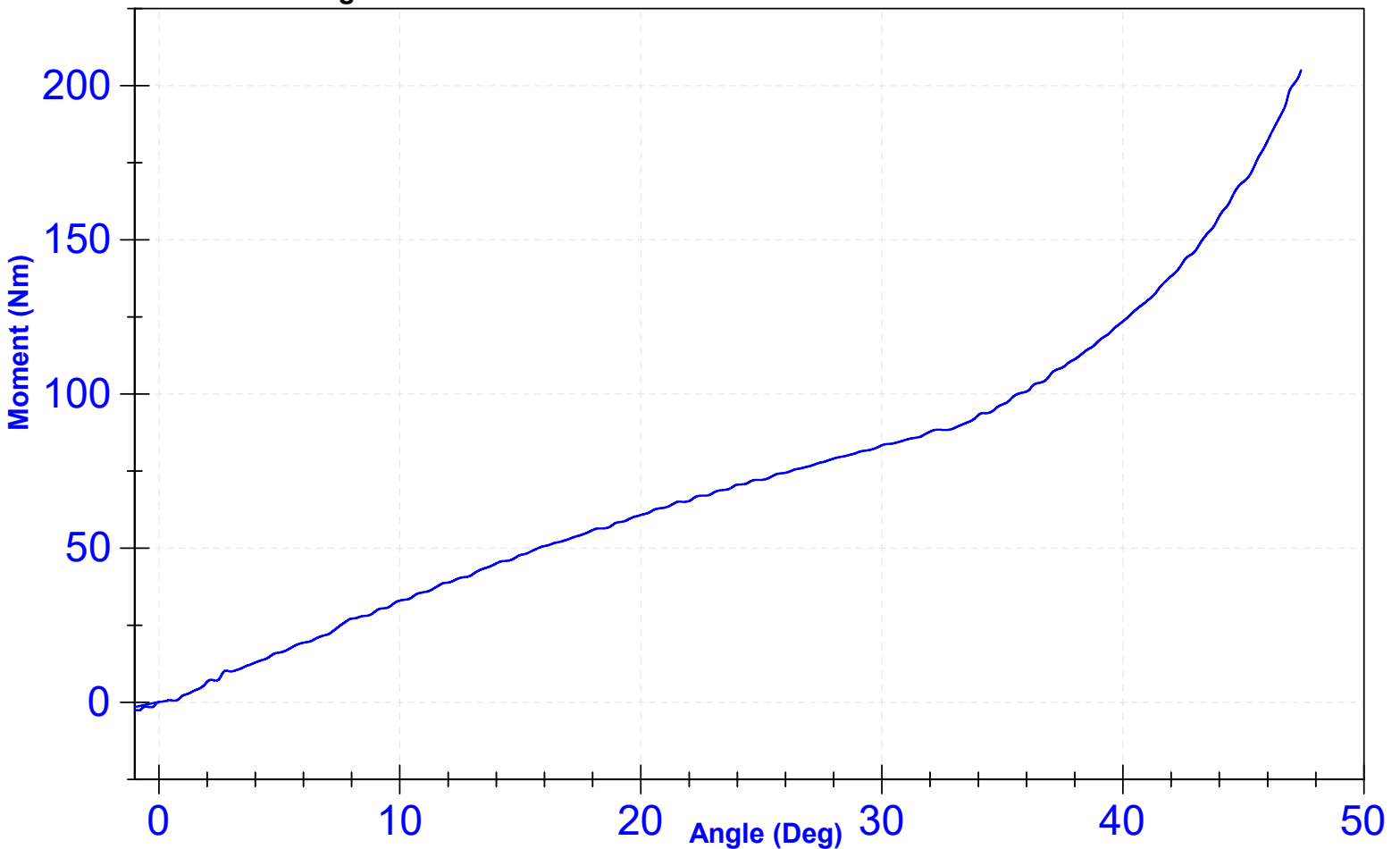
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.8	Pass
Humidity	10	70	%	62.3	Pass
Average Velocity	5	10	deg/s	7.6	Pass
Angle at 203Nm	40	50	deg	47.3	Pass
Moment at 30 degrees	0	94.9	Nm	83.3	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



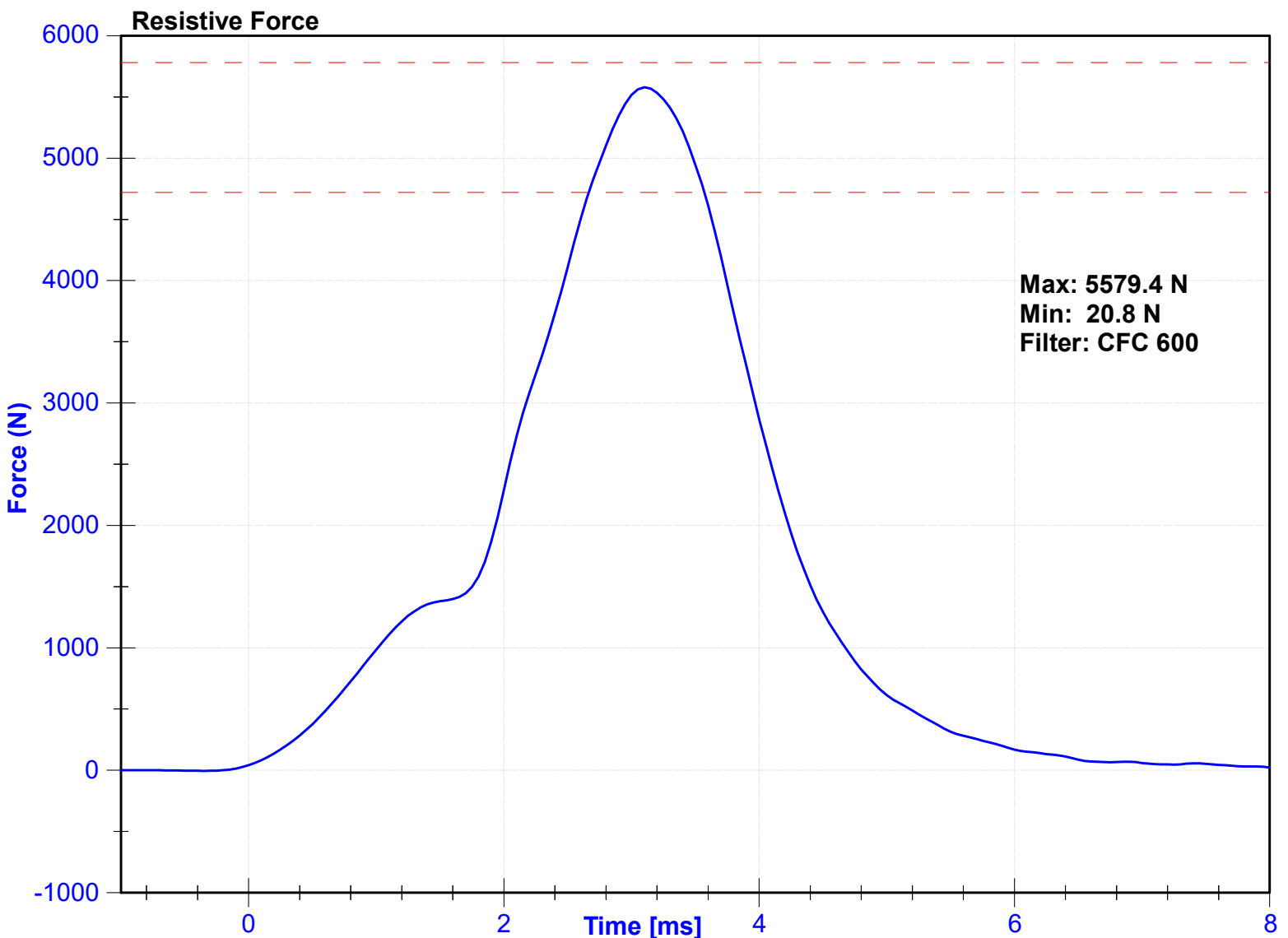
ATD Manufacturer	Humanetics	Test Technician	Z.Schneider
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

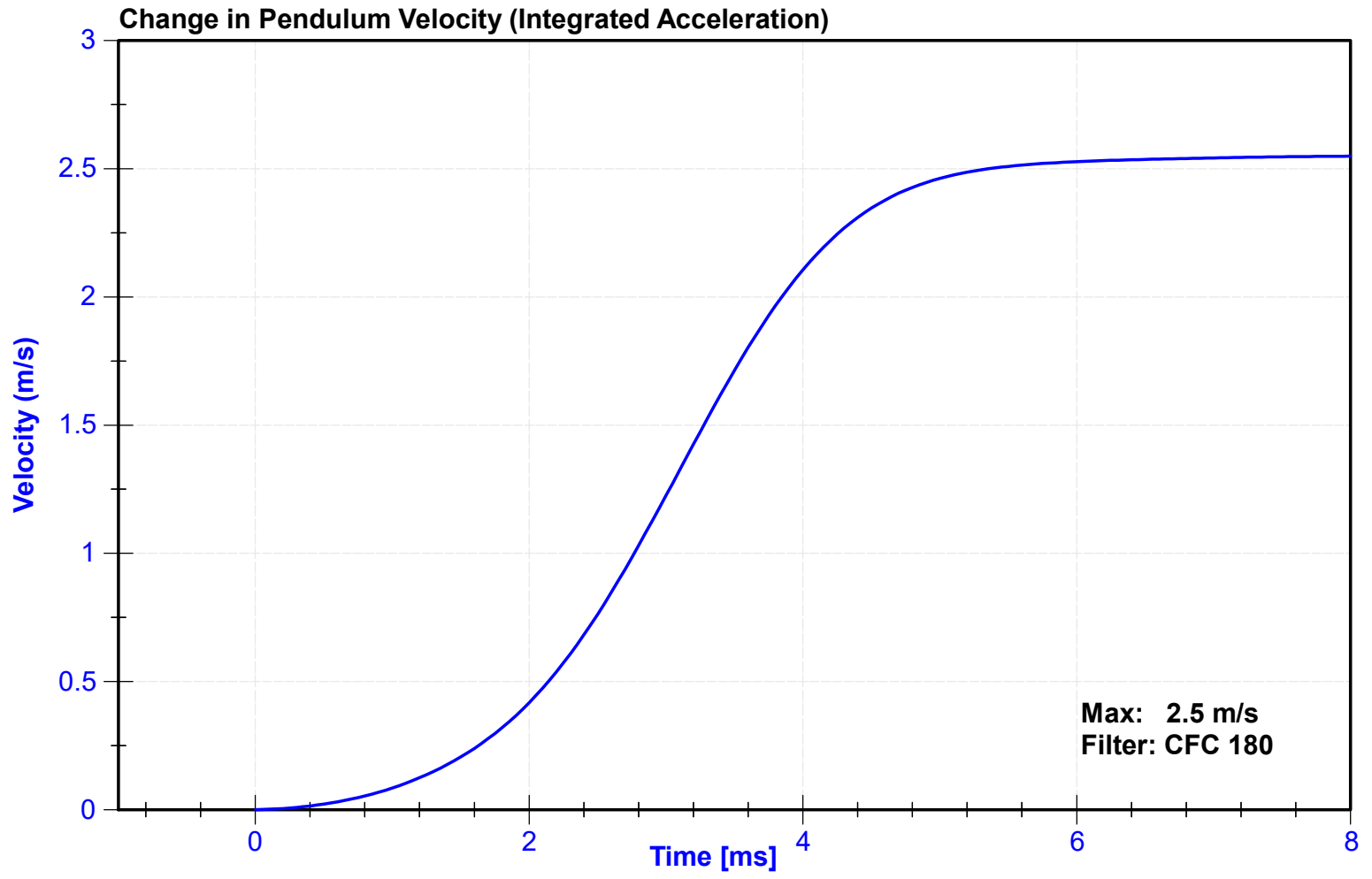
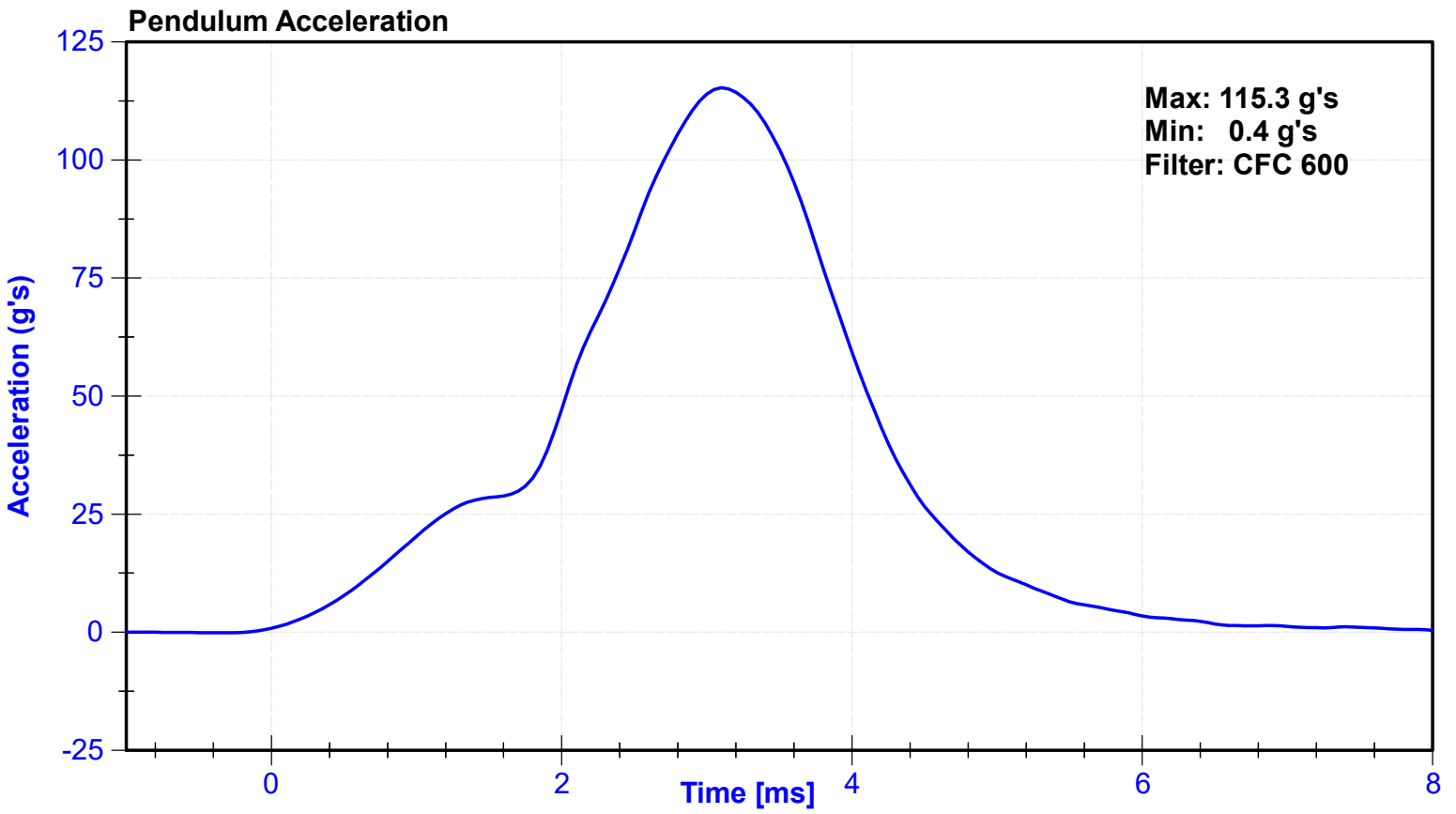
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.0	Pass
Humidity	10	70	%	65.1	Pass
Velocity	2.07	2.13	m/s	2.099	Pass
Maximum Resistive Force	4720	5780	N	5579.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P51736	10/25/2022	10/25/2023





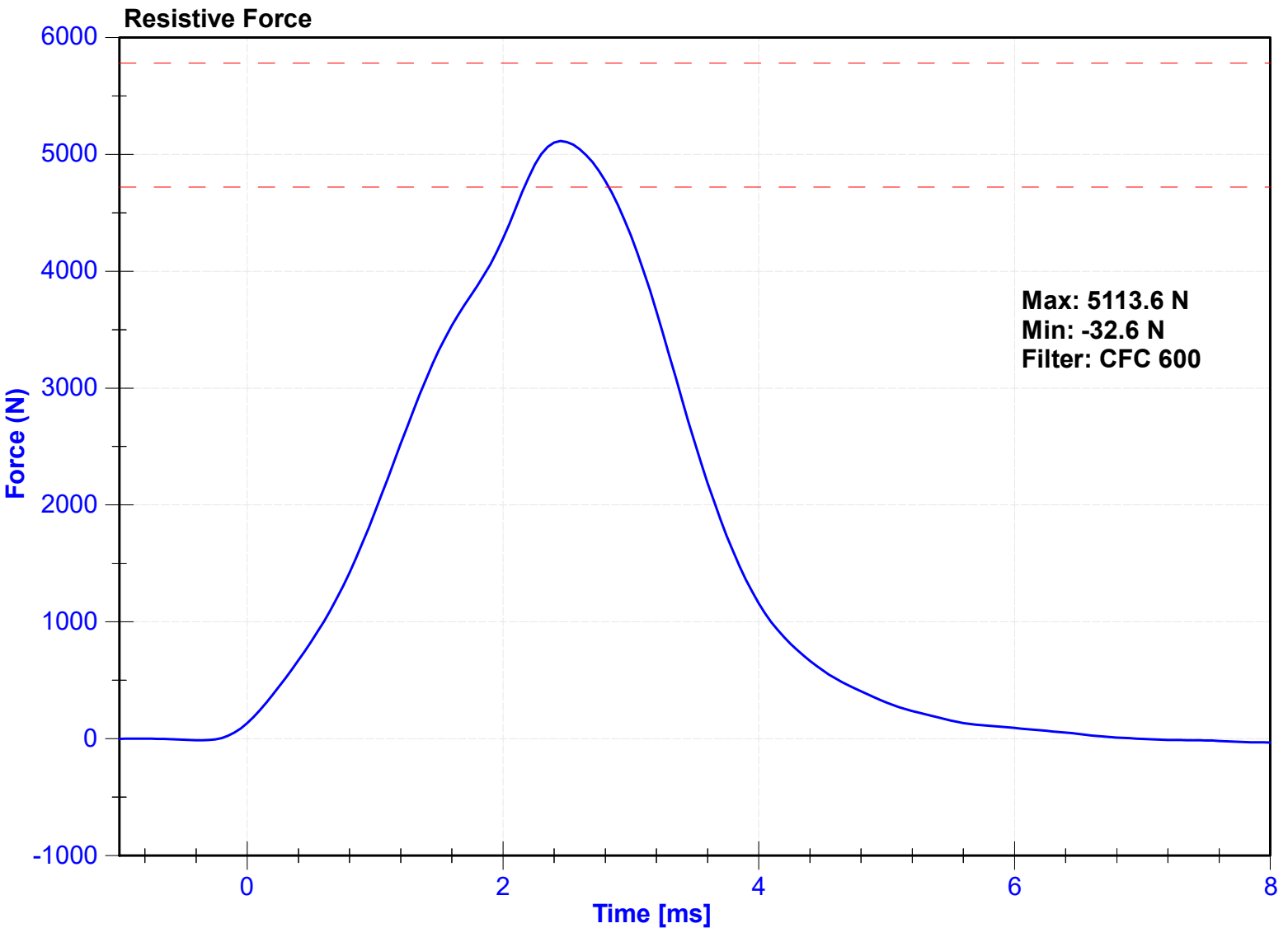
ATD Manufacturer	Humanetics	Test Technician	Z.Schneider
ATD Serial Number	142	Laboratory Supervisor	C. Mantell

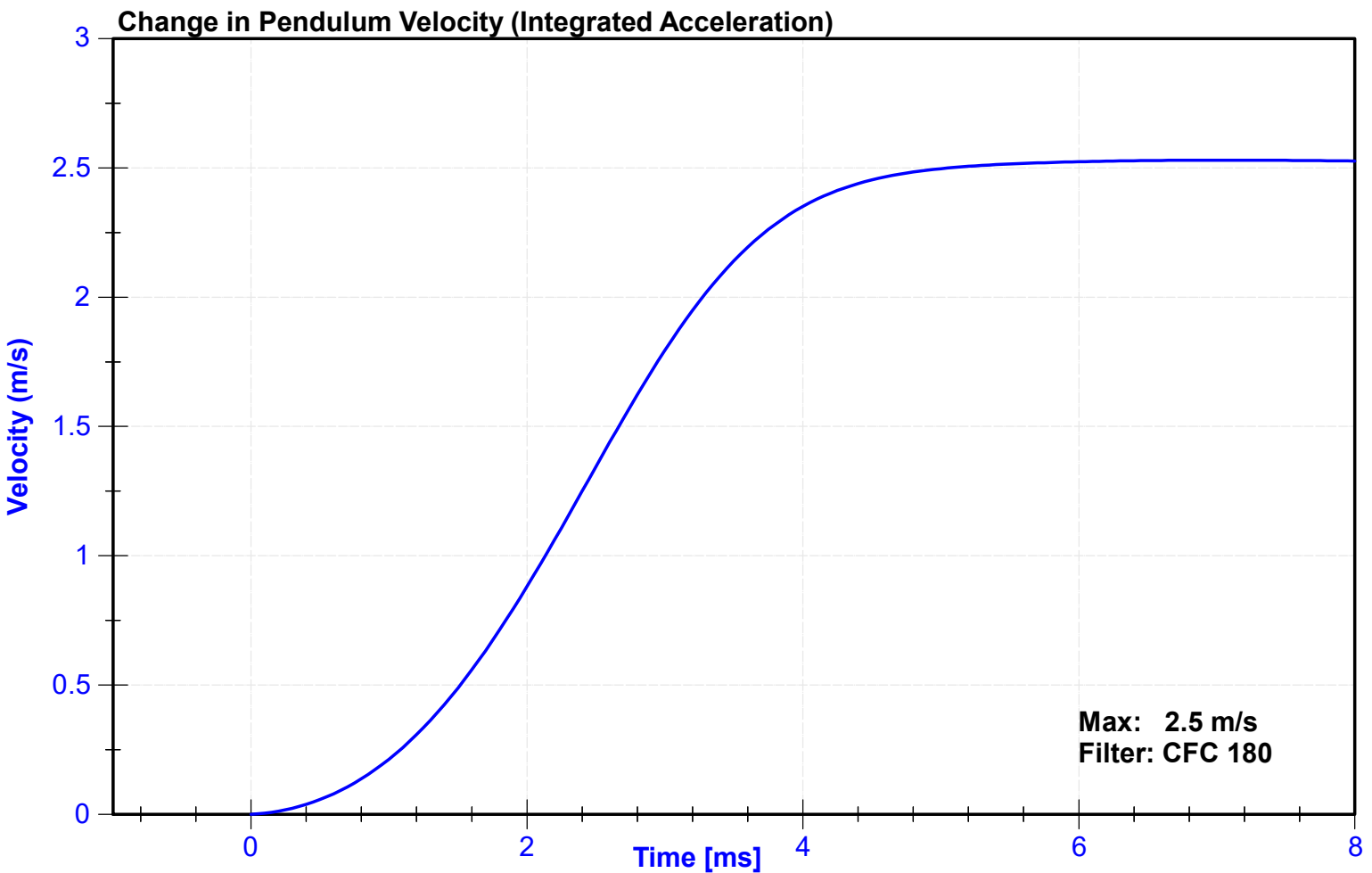
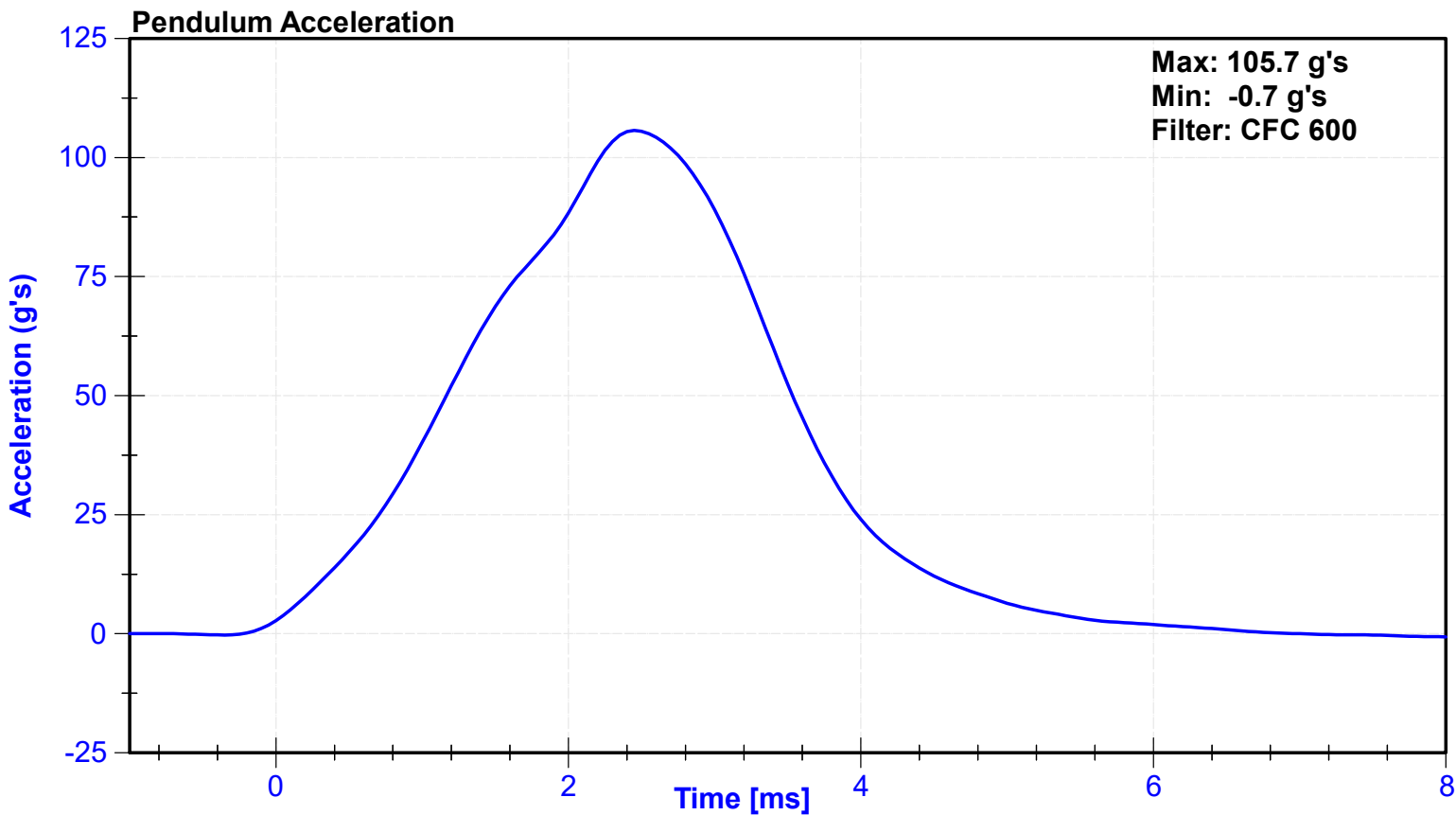
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.0	Pass
Humidity	10	70	%	65.1	Pass
Velocity	2.07	2.13	m/s	2.099	Pass
Maximum Resistive Force	4720	5780	N	5113.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P51736	10/25/2022	10/25/2023





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 137

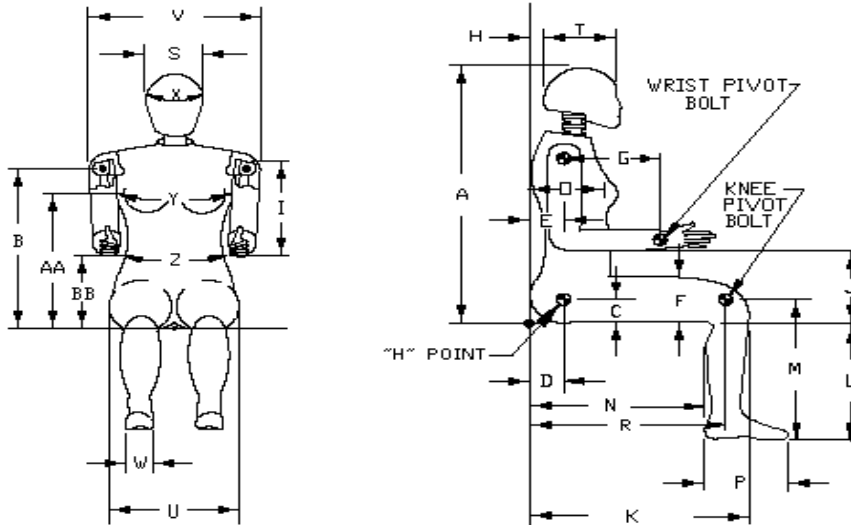


External Measurements - Hybrid 3 - 5th Female

Technician: K. Brogan

Date: 08/09/2023

Dummy Serial Number: 137



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	788	Pass
B	Shoulder Pivot Height	432	457	445	Pass
C	H-Point Height	81	86	85	Pass
D	H-Point from Backline	145	150	147	Pass
E	Shoulder Pivot from Backline	69	84	75	Pass
F	Thigh Clearance	119	135	129	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	288	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	409	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	181	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	537	Pass
Y	Chest Circumference with Jacket	851	881	872	Pass
Z	Waist Circumference	460	790	650	Pass
AA	Reference Location (Chest Circumference)	333	358	346	Pass
BB	Reference Location (Waist Circumference)	160	170	167	Pass

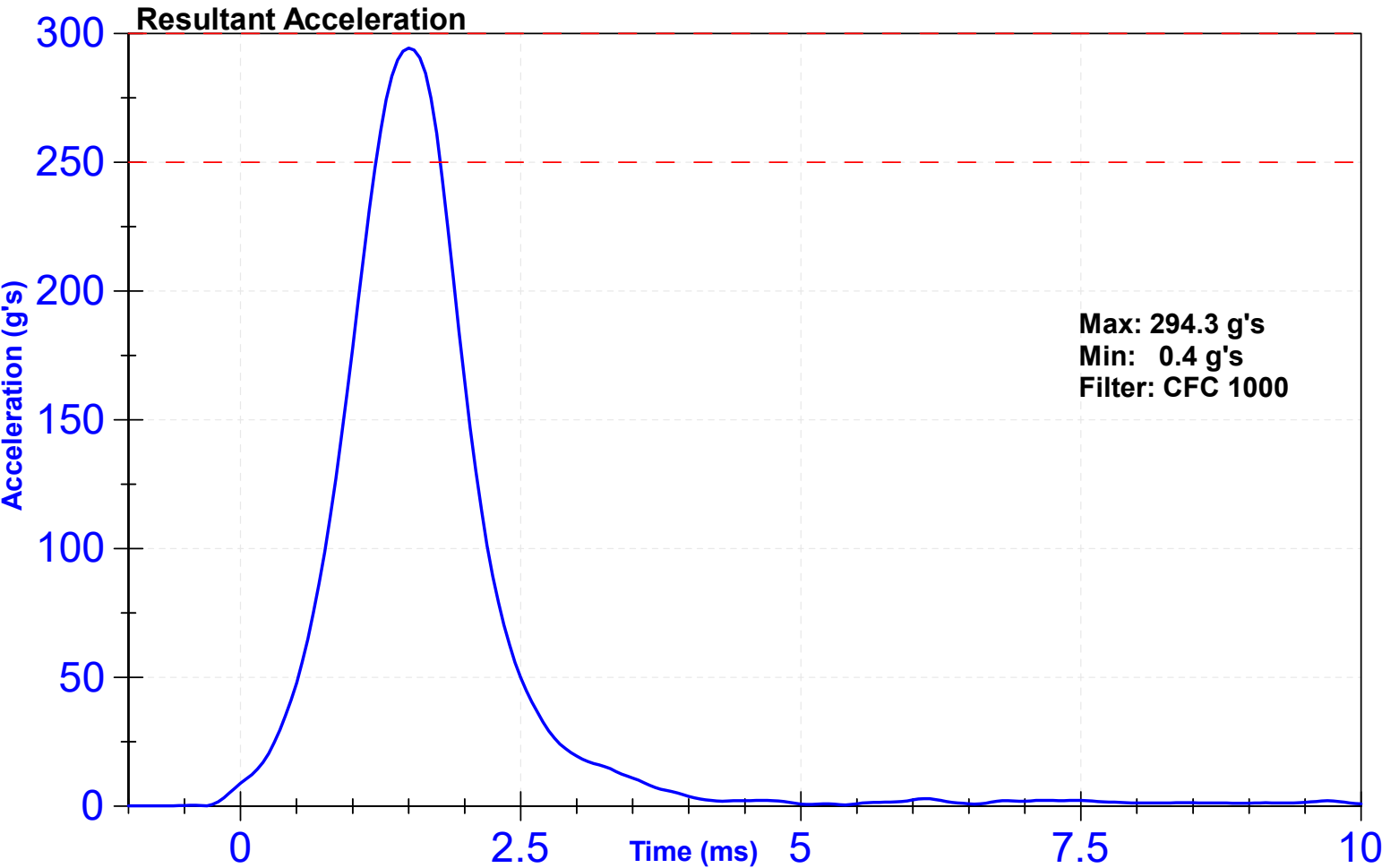
ATD Manufacturer	Humanetics	Test Technician	T. Roseman
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

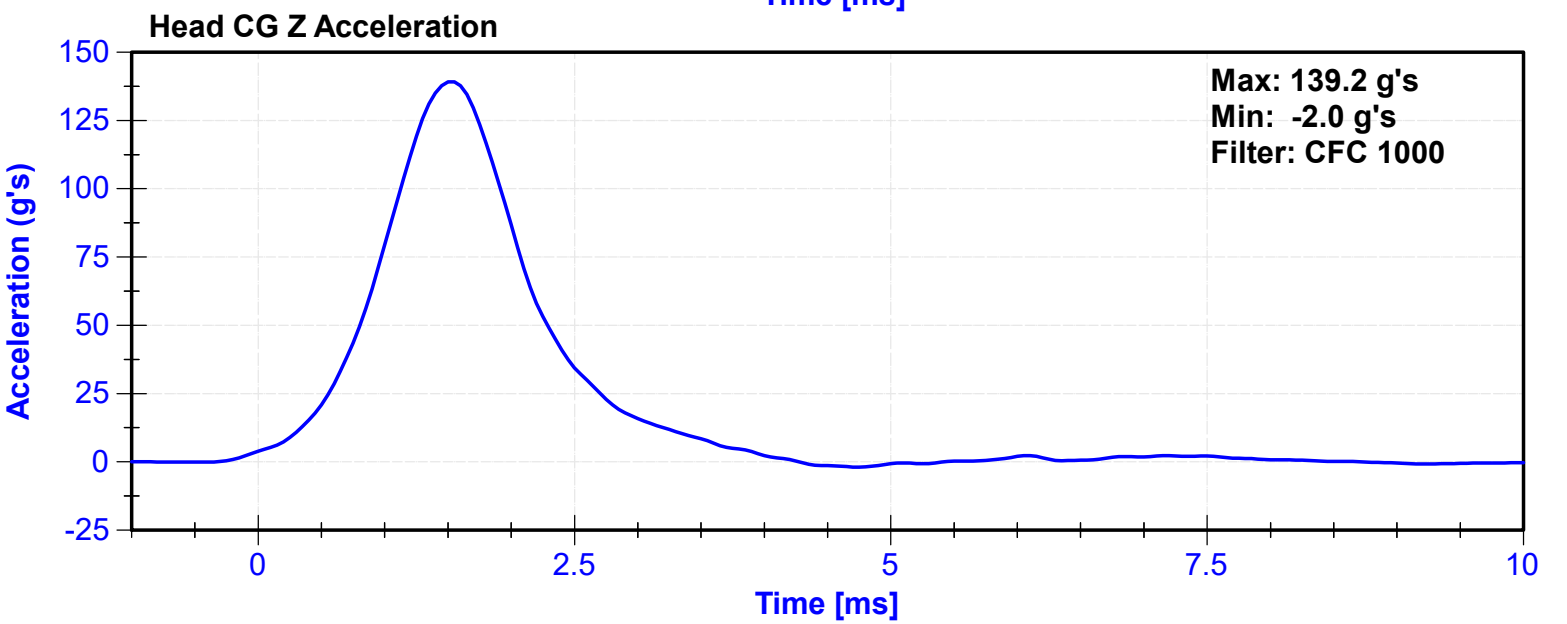
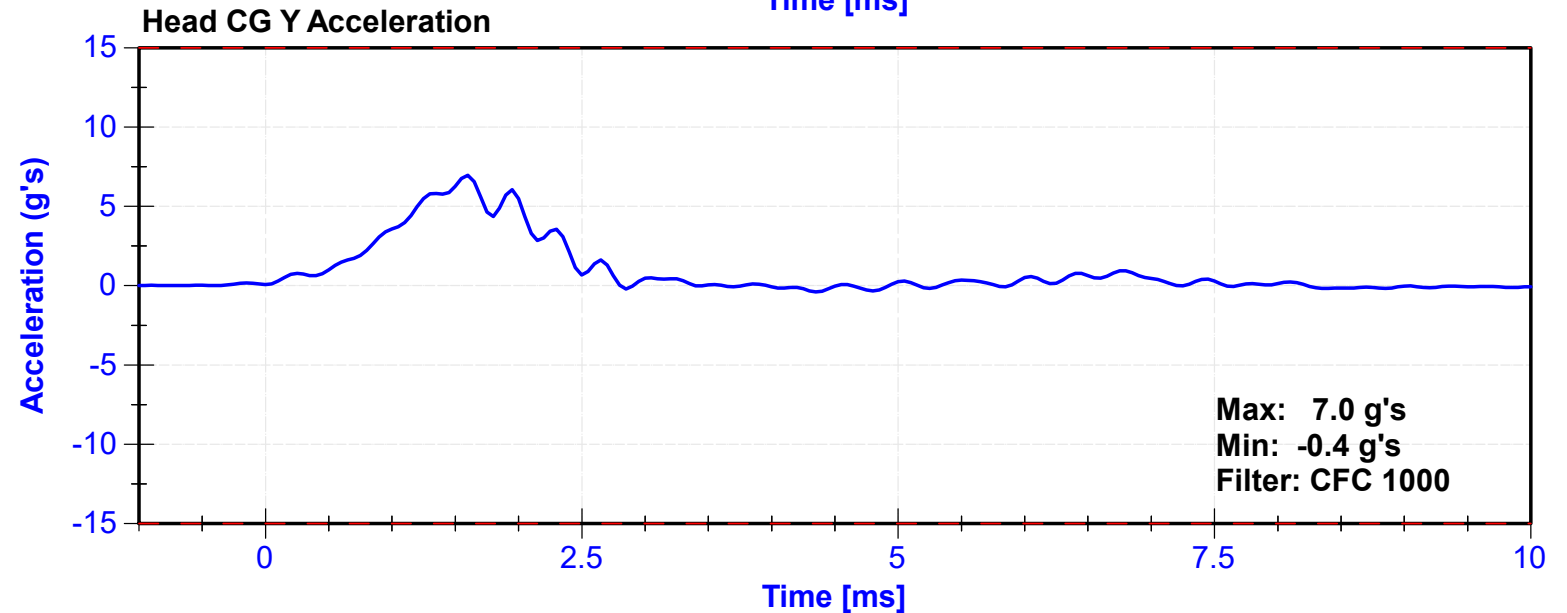
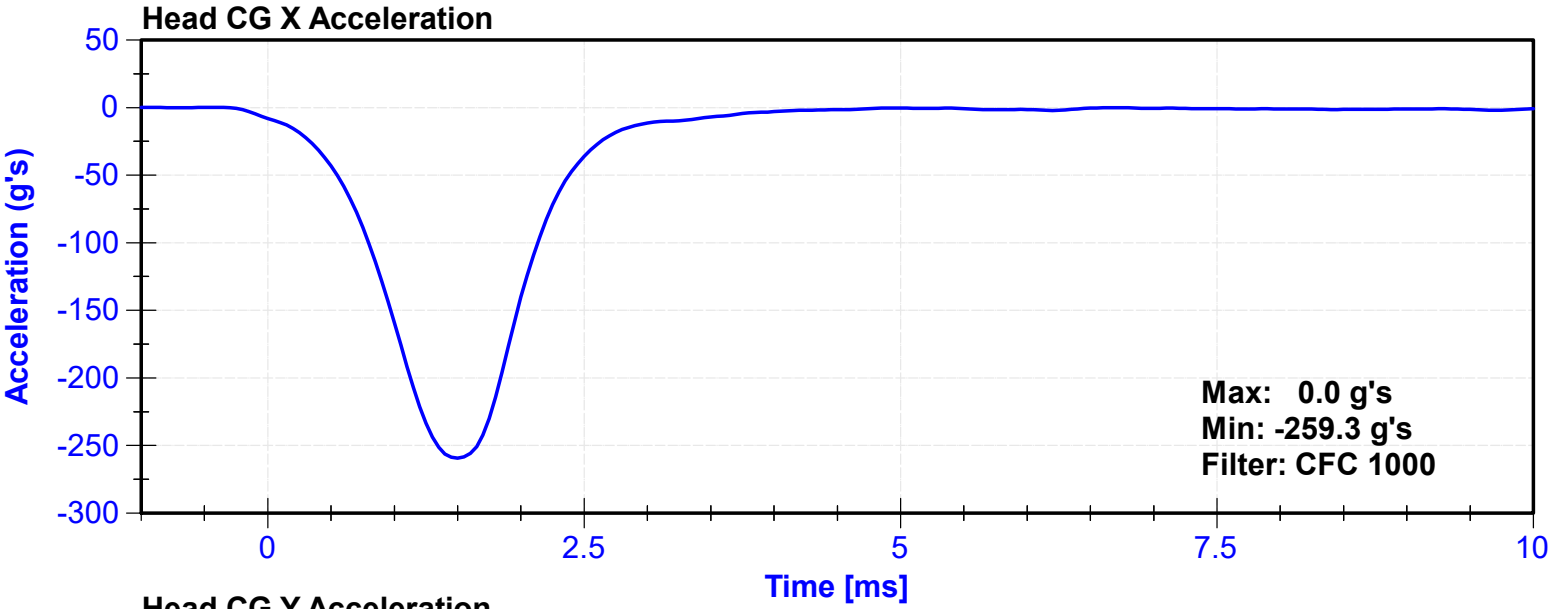
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.4	Pass
Humidity	10	70	%	62.3	Pass
Resultant Acceleration	250	300	g's	294.3	Pass
Oscillation	0	10	%	1.0	Pass
Lateral Acceleration	-15	15	g's	7.0	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





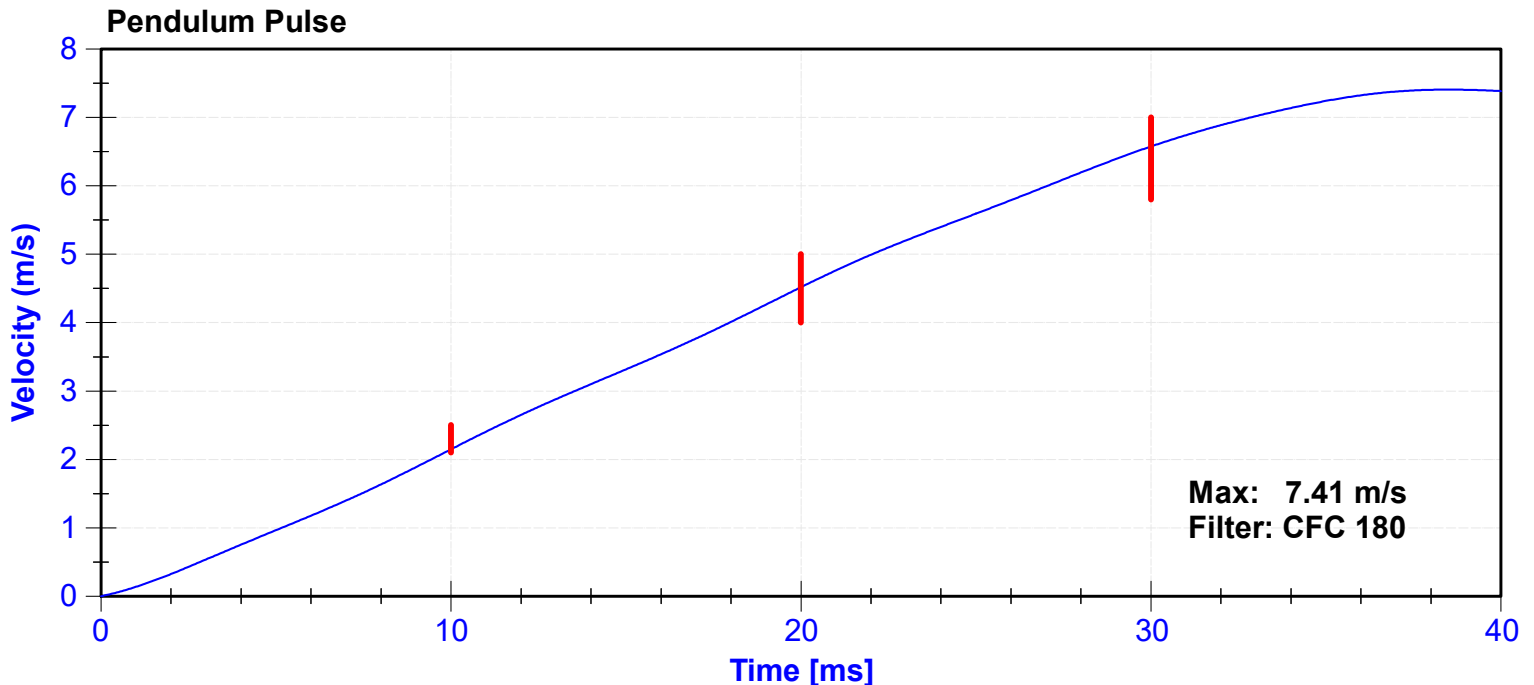
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

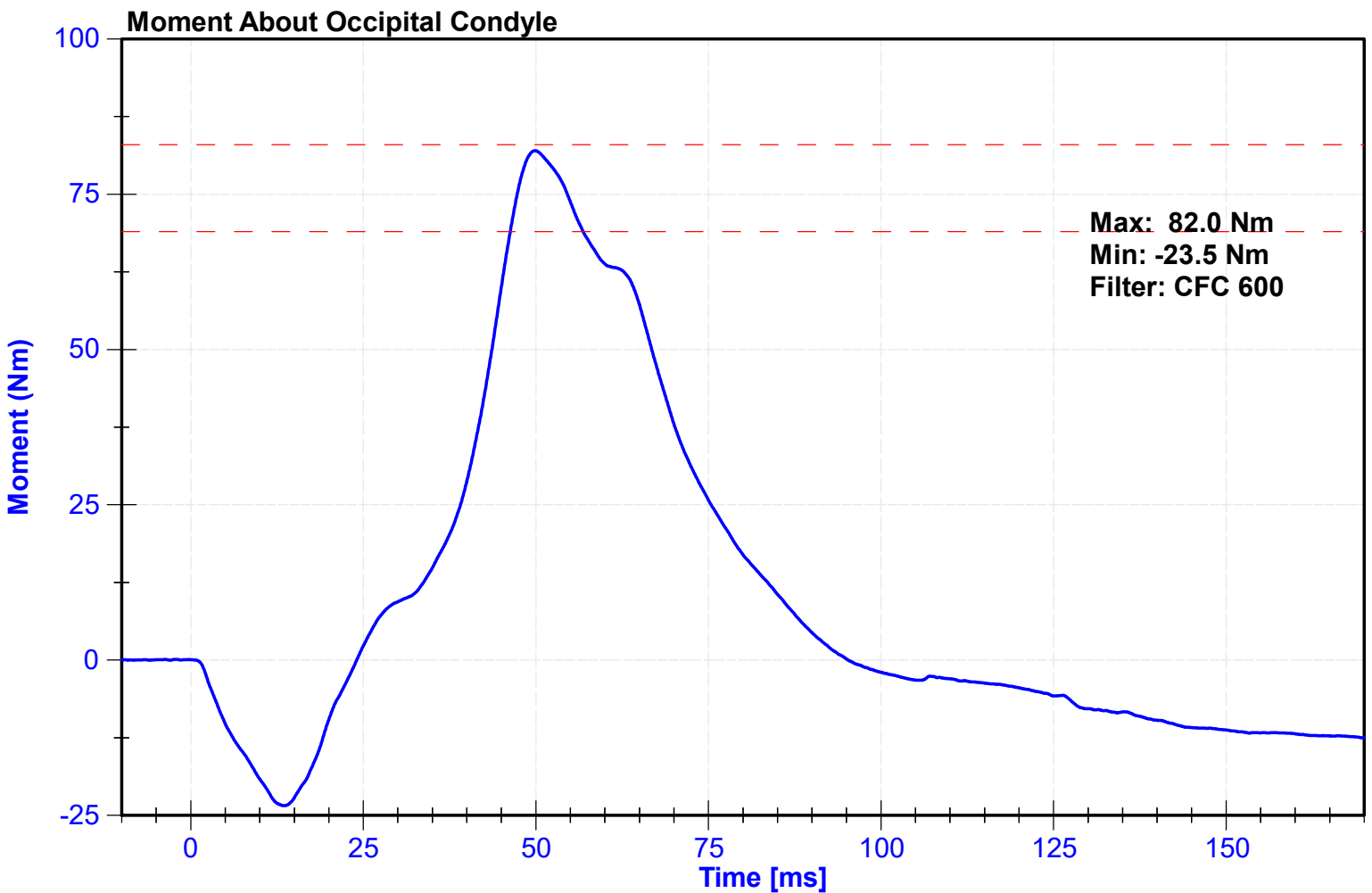
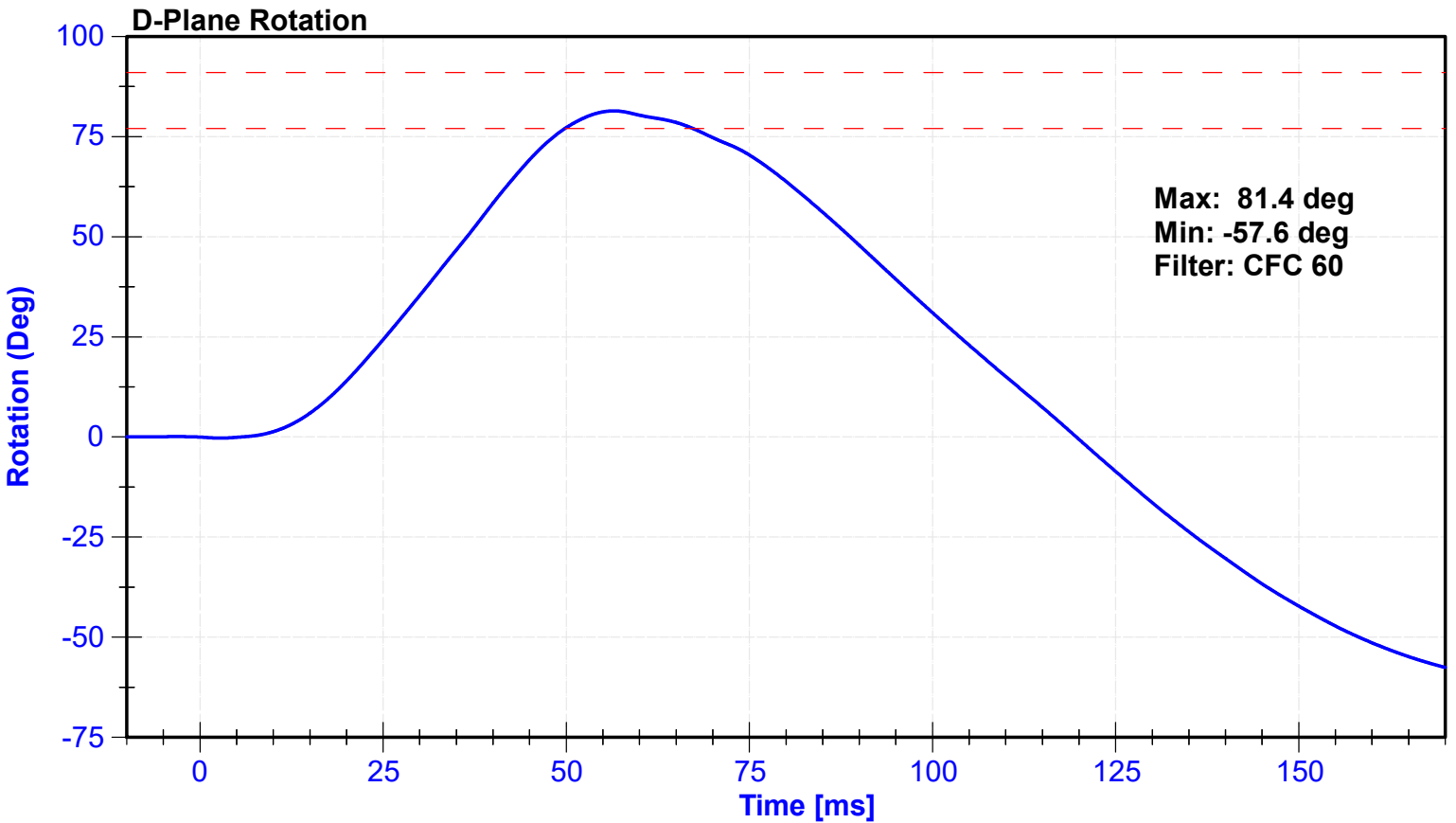
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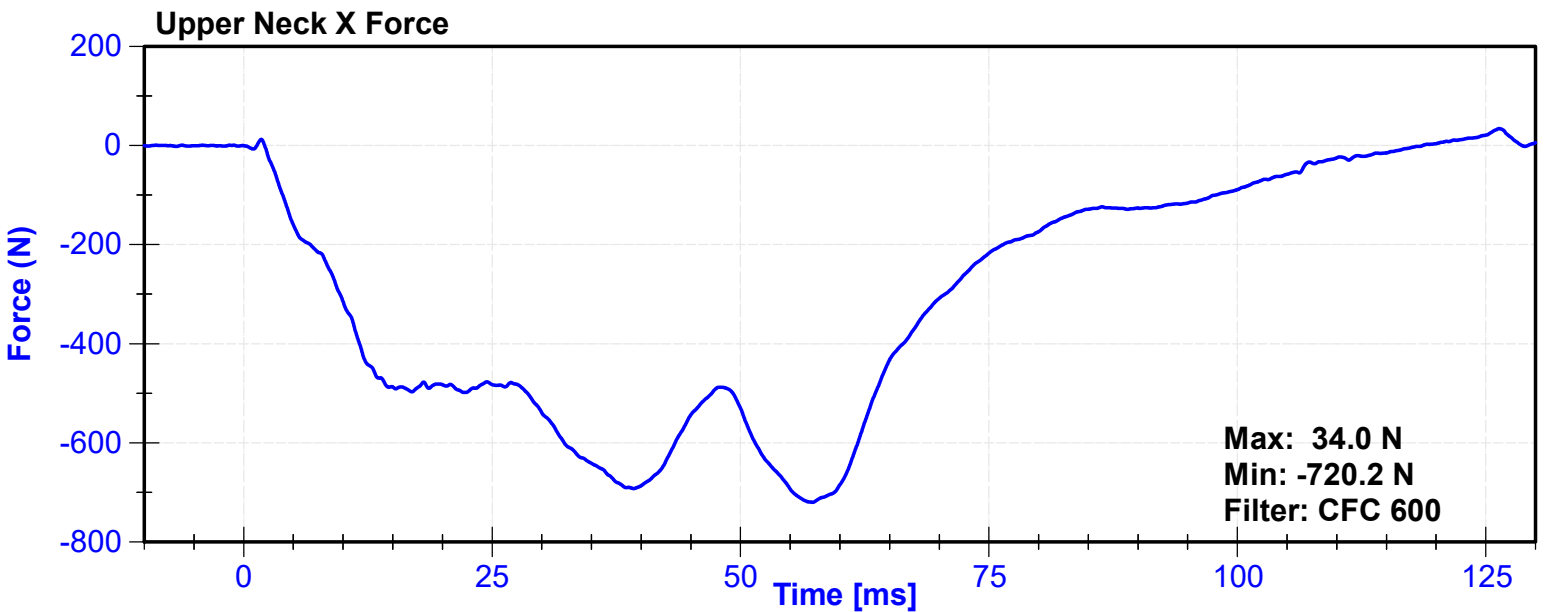
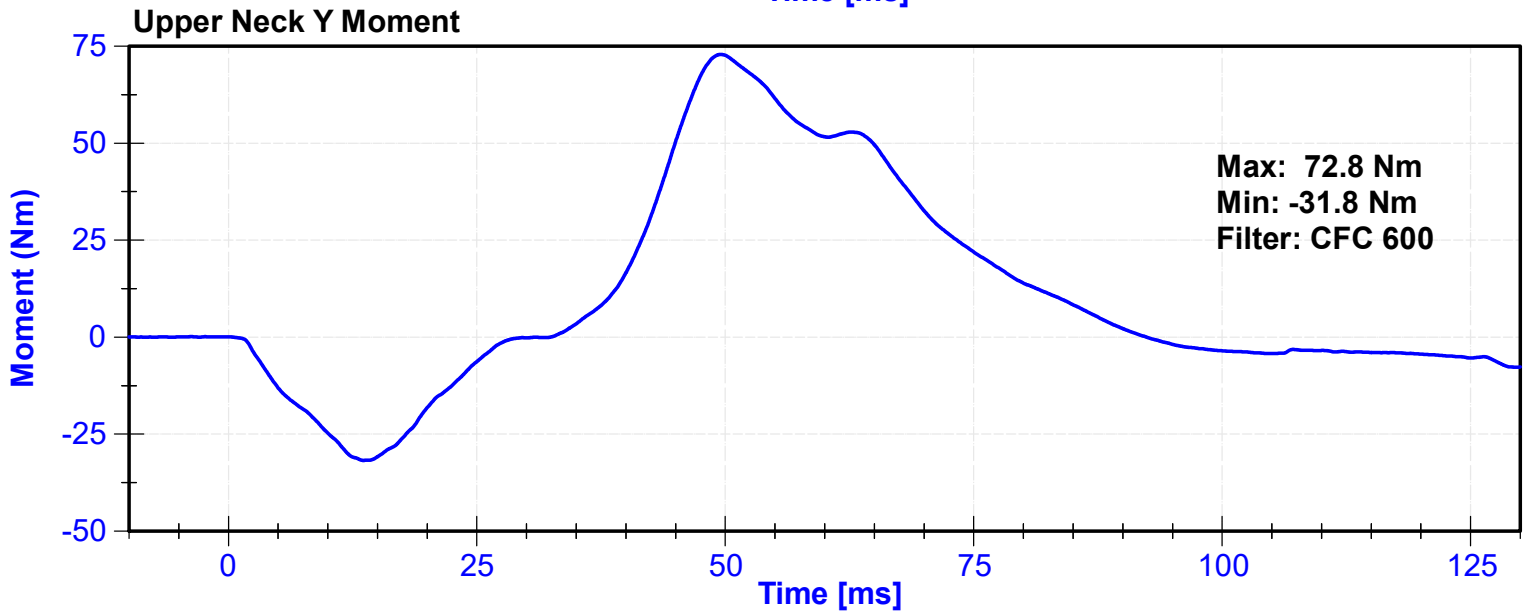
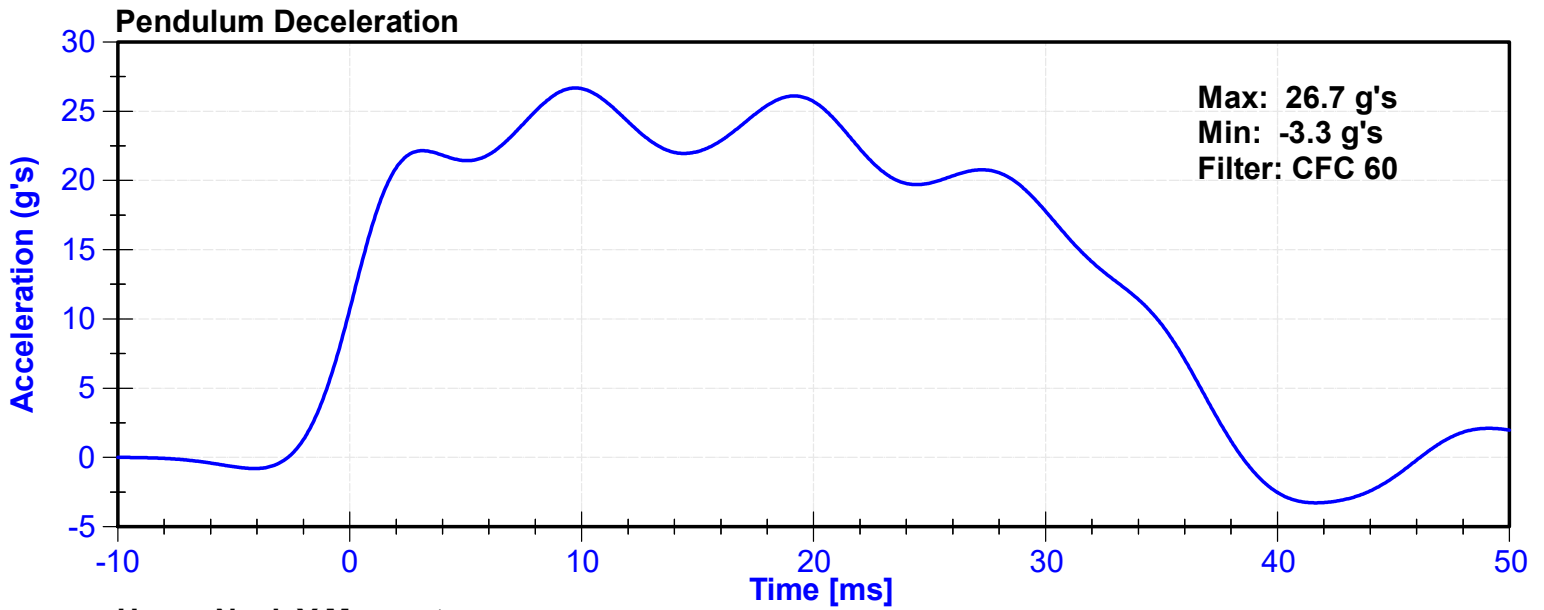
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	59.9	Pass
Velocity	6.89	7.13	m/s	7.066	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.15	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.52	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.57	Pass
Max D Plane Rotation	77	91	deg	81.4	Pass
Max Moment During Rotation Interval	69	83	Nm	82.0	Pass
Moment Decay to 10.0 Nm	80	100	ms	85.5	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	7/19/2023	7/18/2024
Upper Neck Load Cell	Denton	2207-FX	6/23/2023	6/22/2024







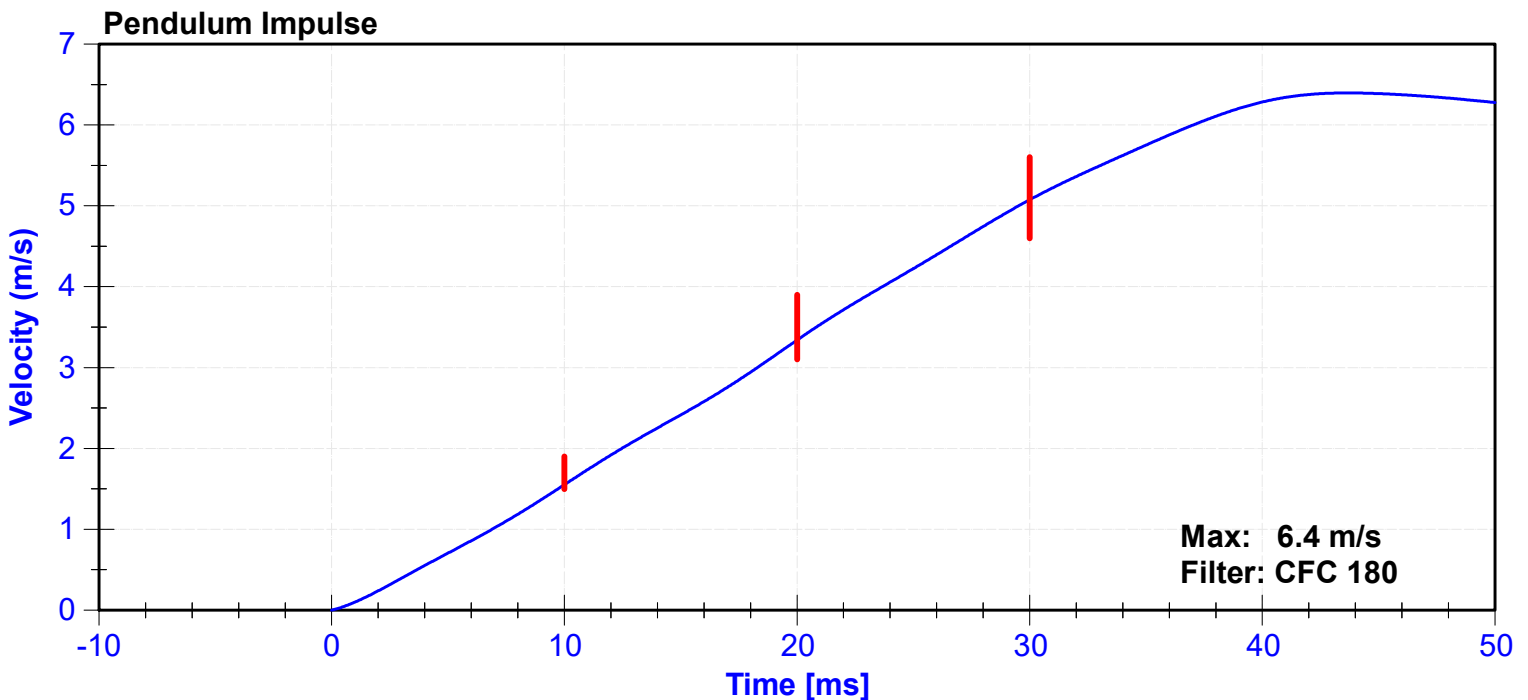
ATD Manufacturer	Humanetics	Test Technician	D. Sakona
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

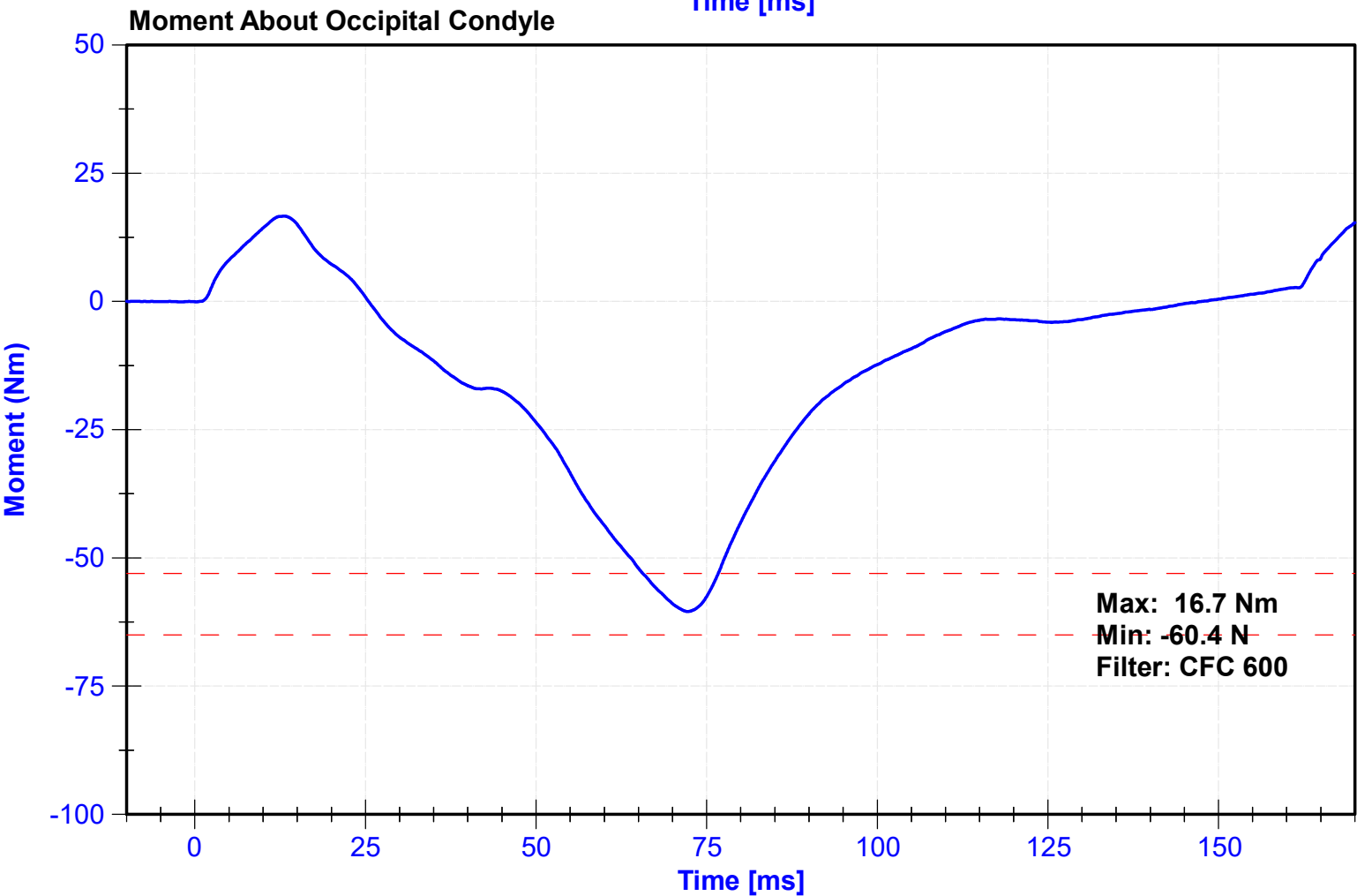
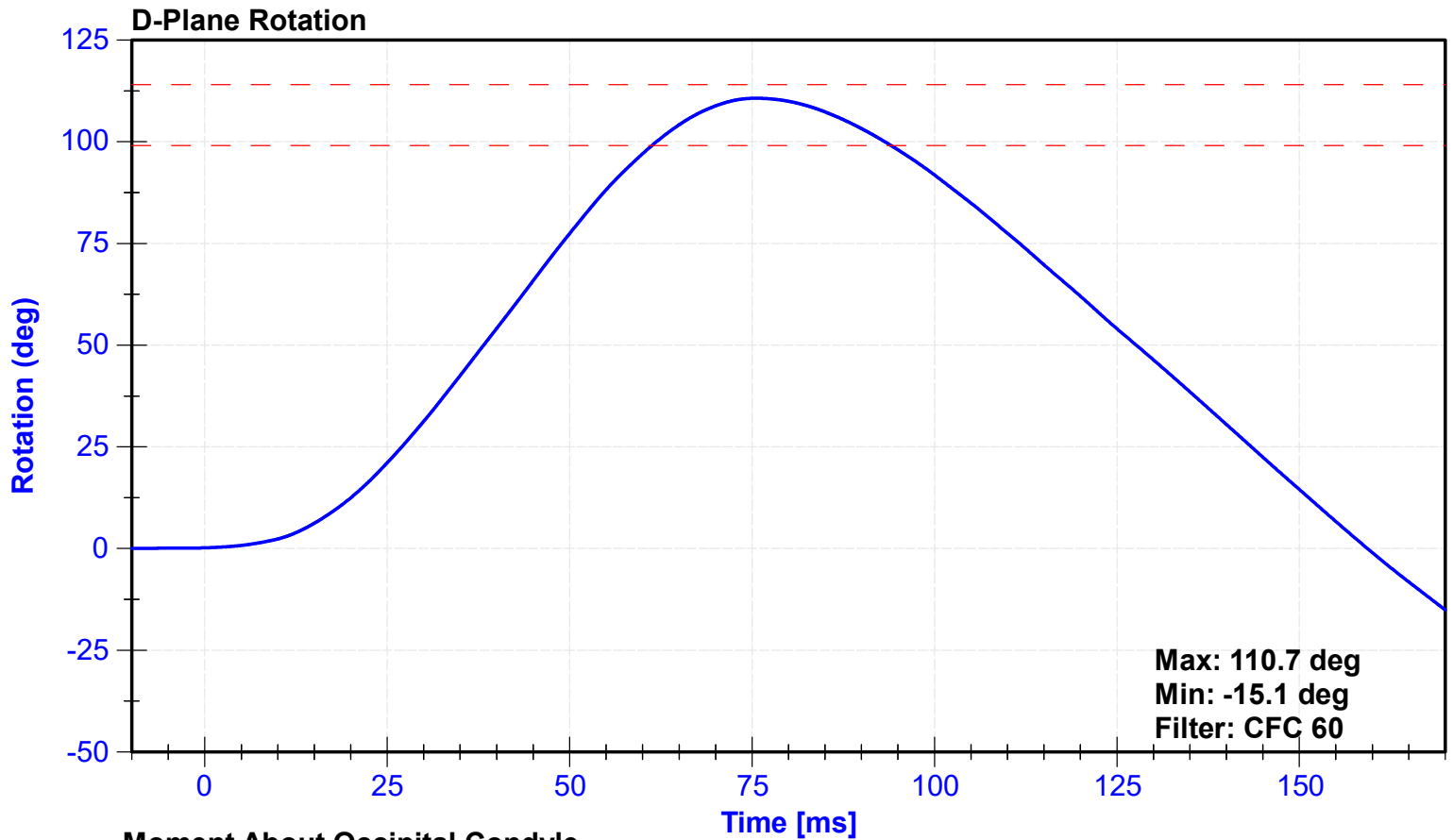
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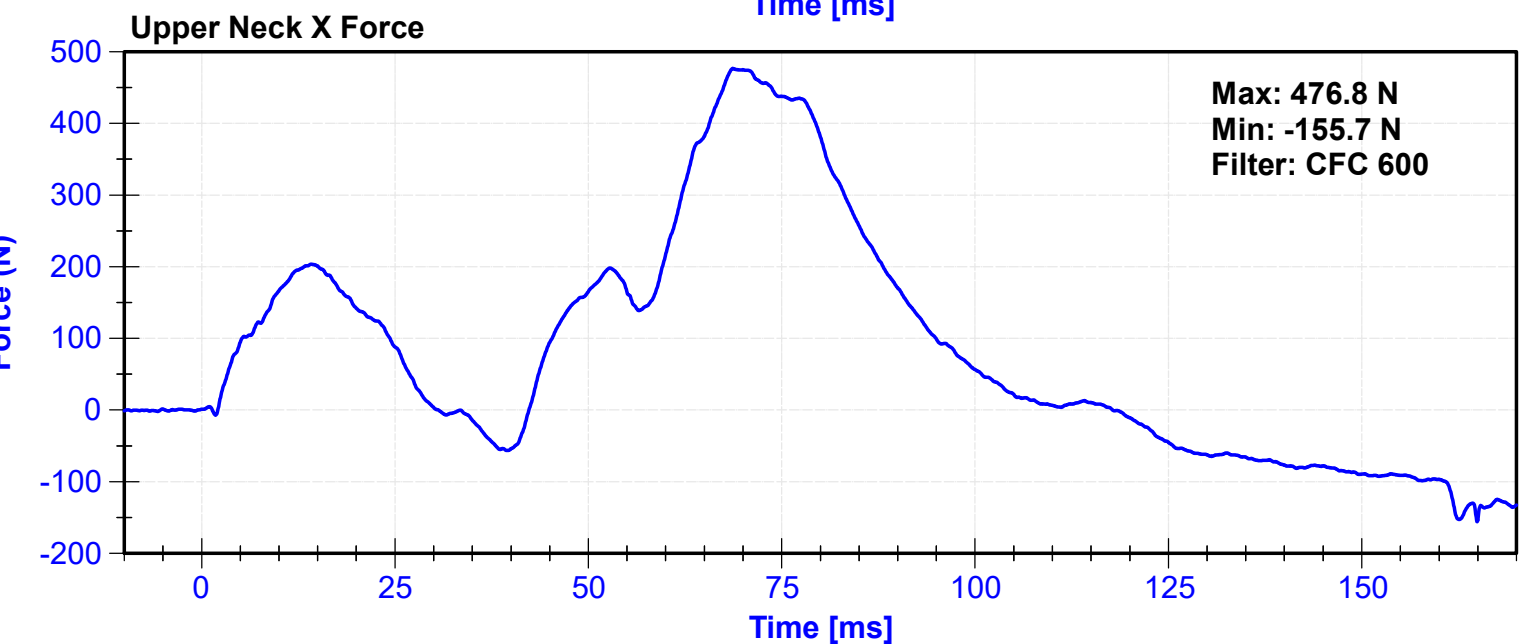
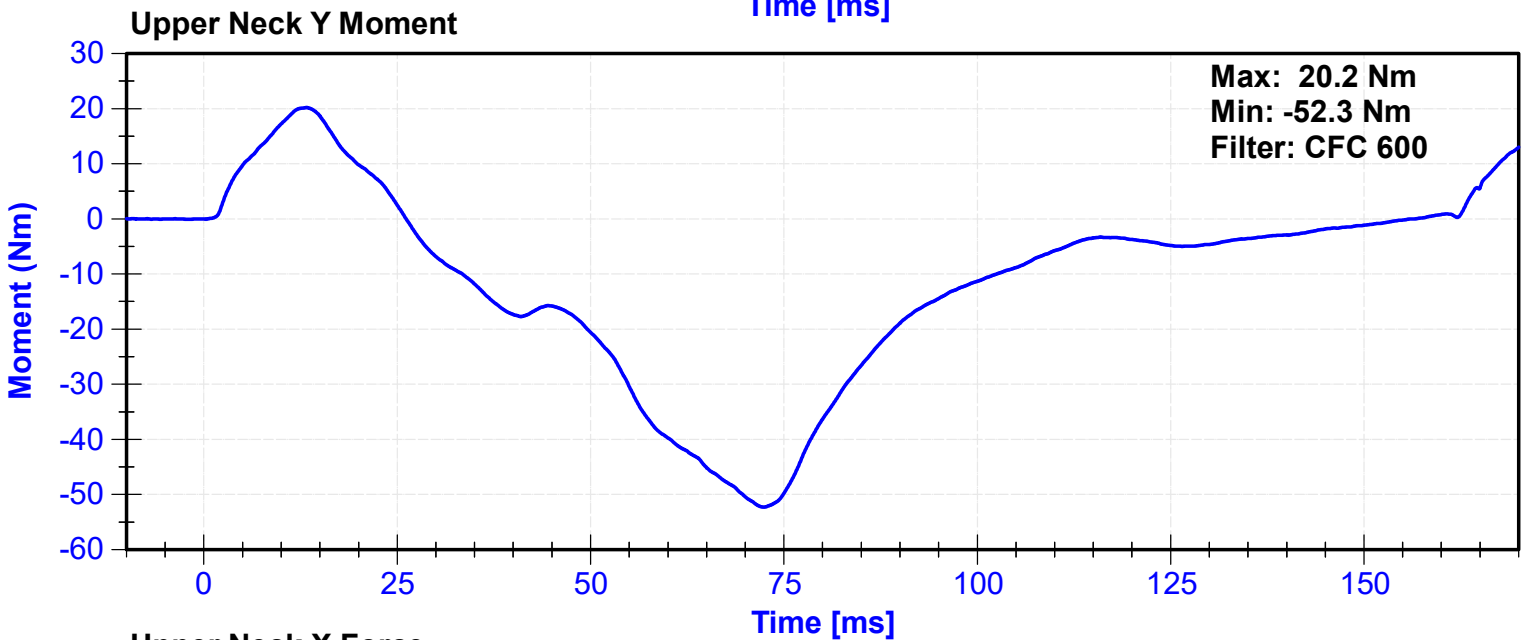
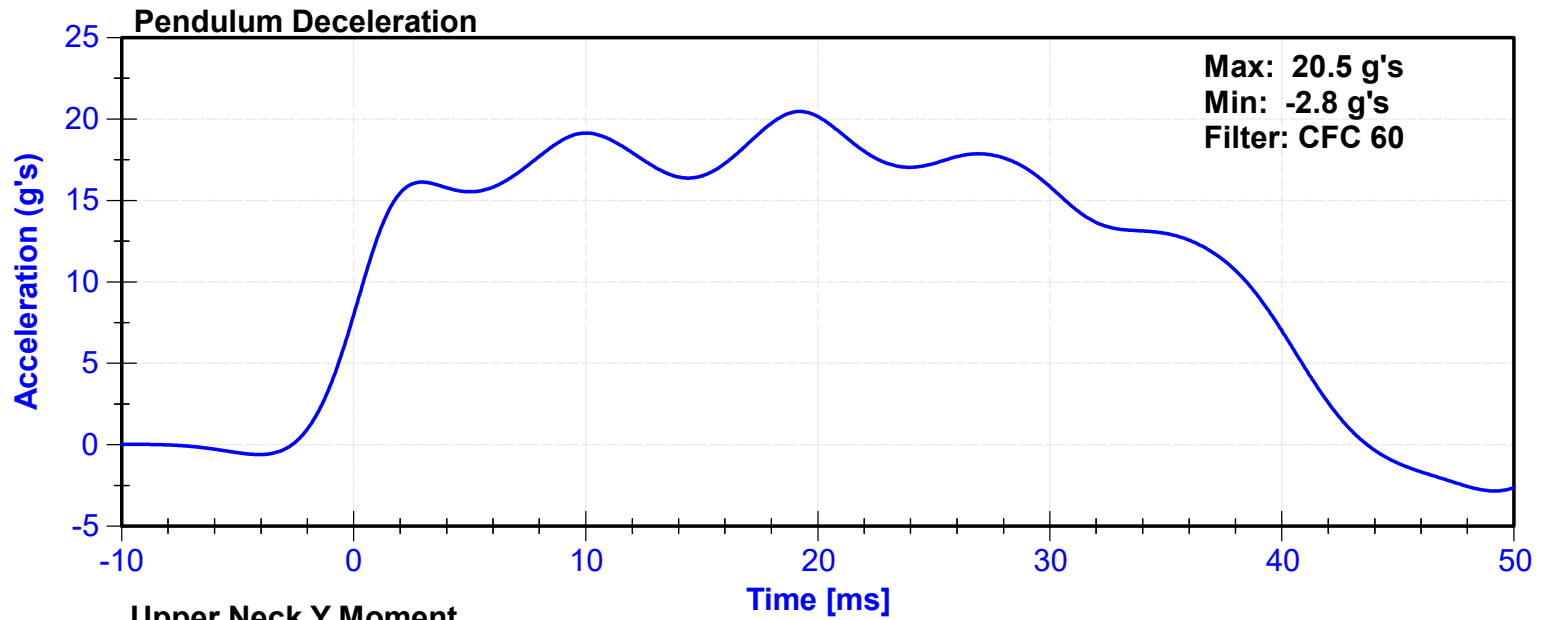
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	59.9	Pass
Velocity	5.95	6.19	m/s	6.115	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.55	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.34	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.07	Pass
D Plane Rotation	99	114	deg	110.7	Pass
Moment During Rotation Interval	-65	-53	Nm	-60.4	Pass
Moment Decay to -10Nm	94	114	ms	103.7	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	7/19/2023	7/18/2024
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. Mantel

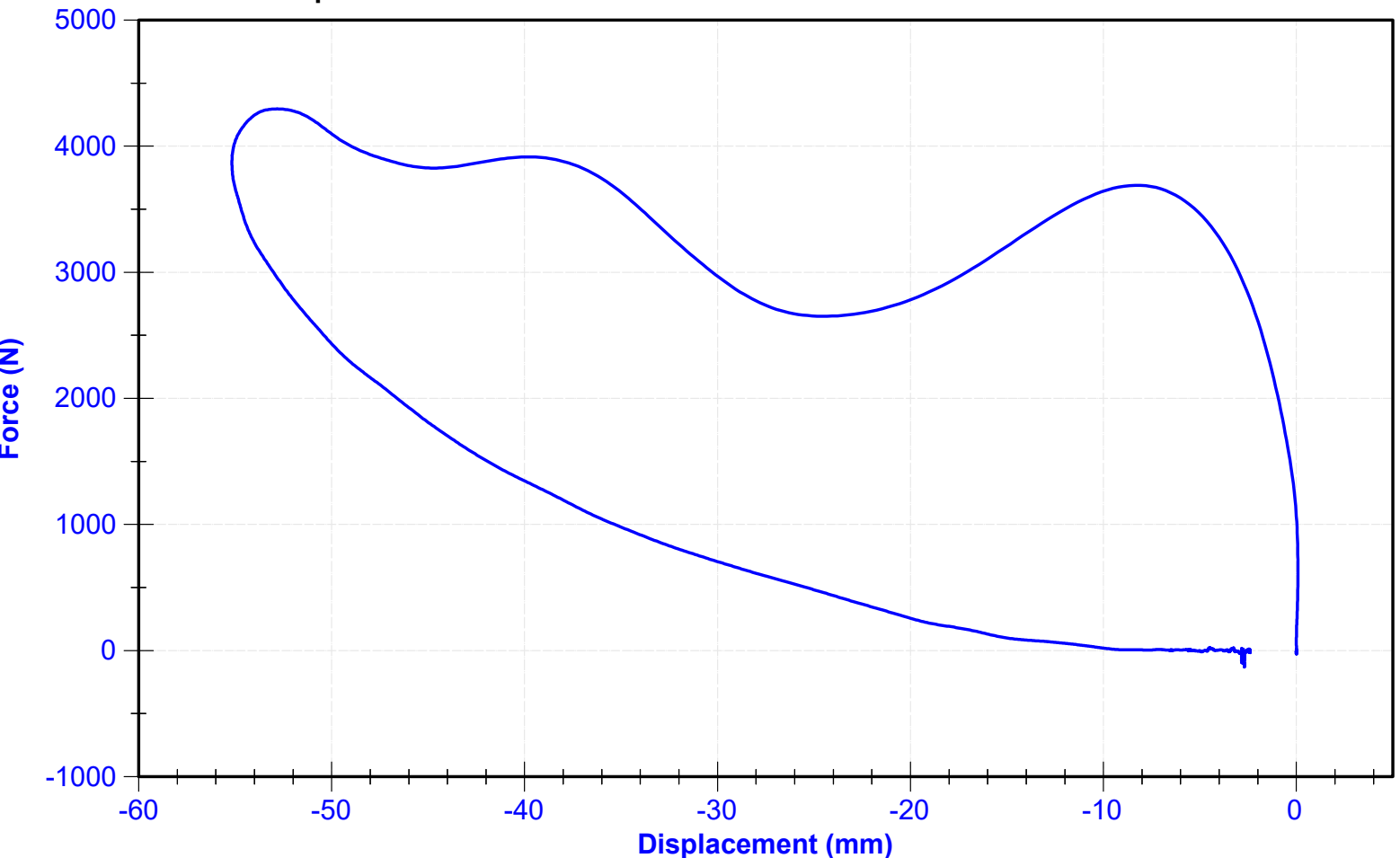
Results

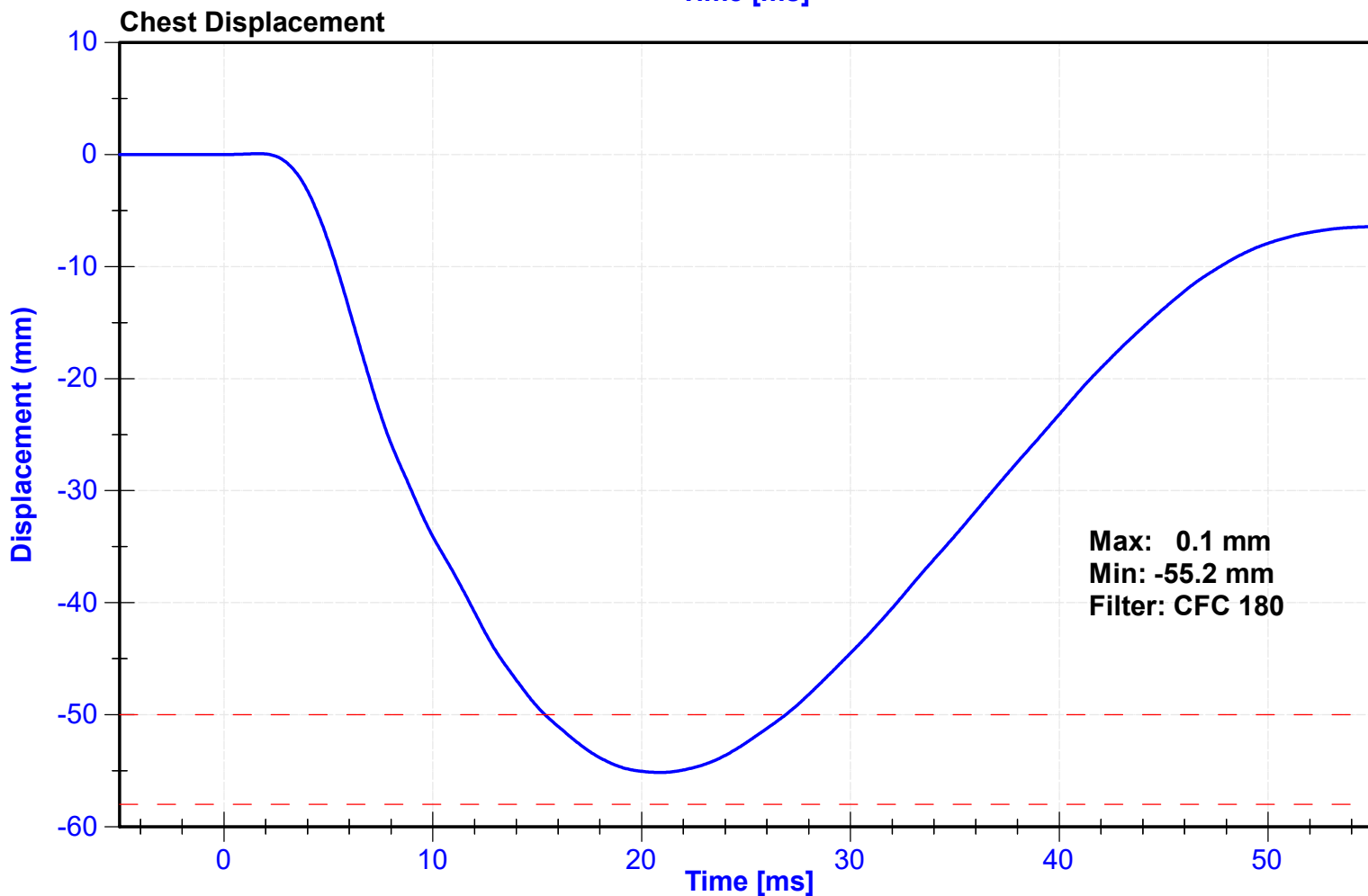
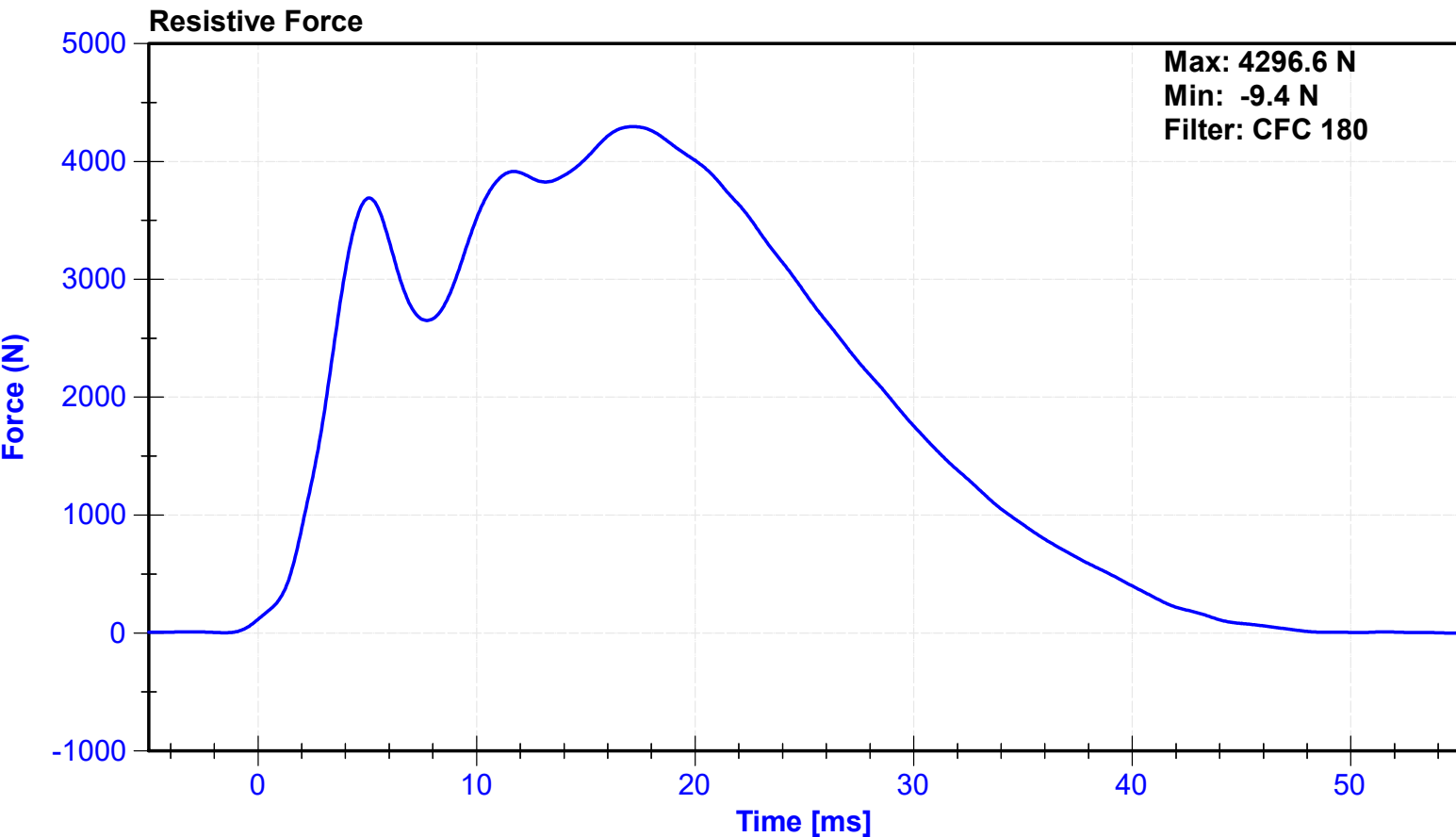
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	63.4	Pass
Velocity	6.59	6.83	m/s	6.705	Pass
Chest Deflection	-58	-50	mm	-55.2	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4296.6	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4095.3	Pass
Hysteresis	69	85	%	73.5	Pass

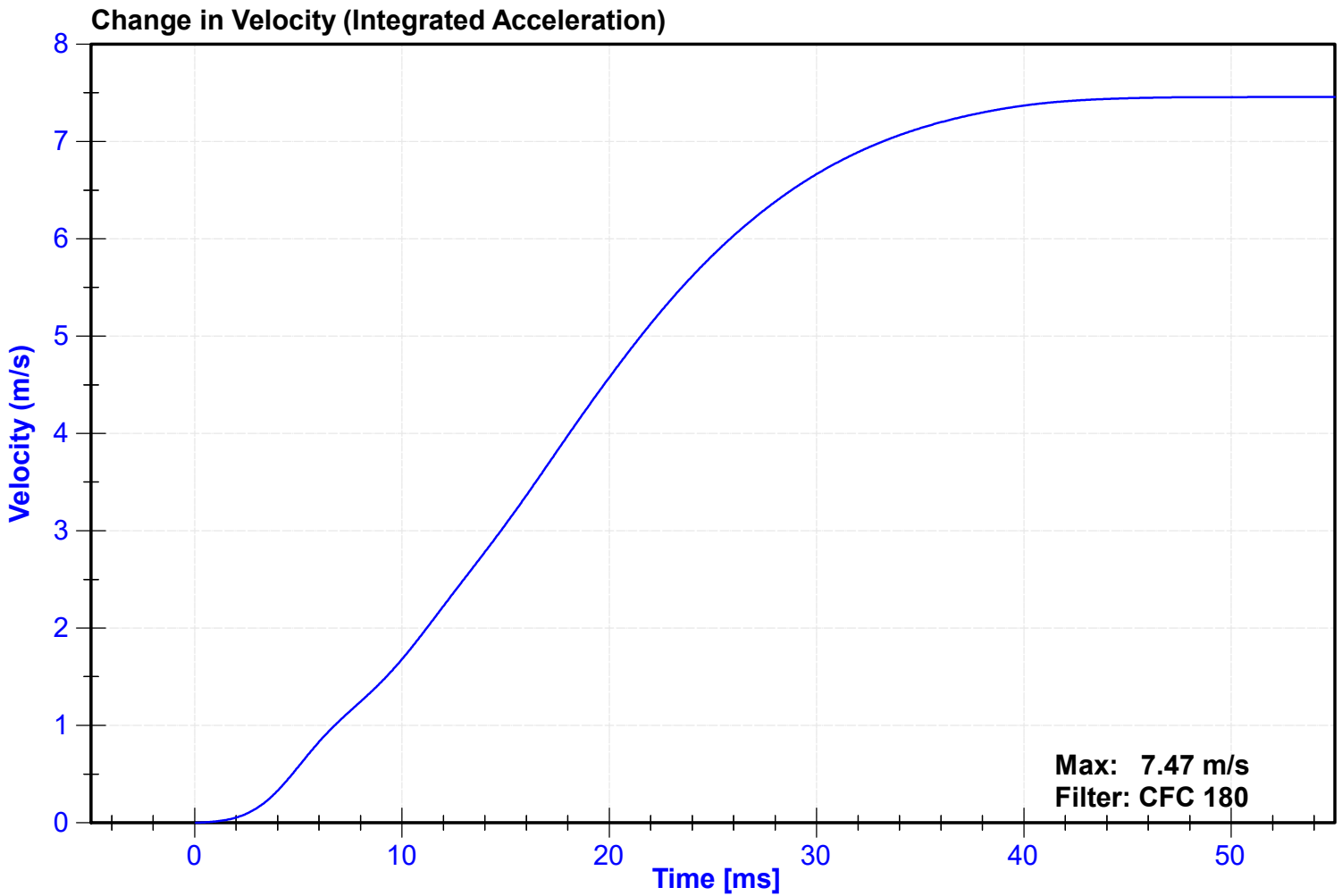
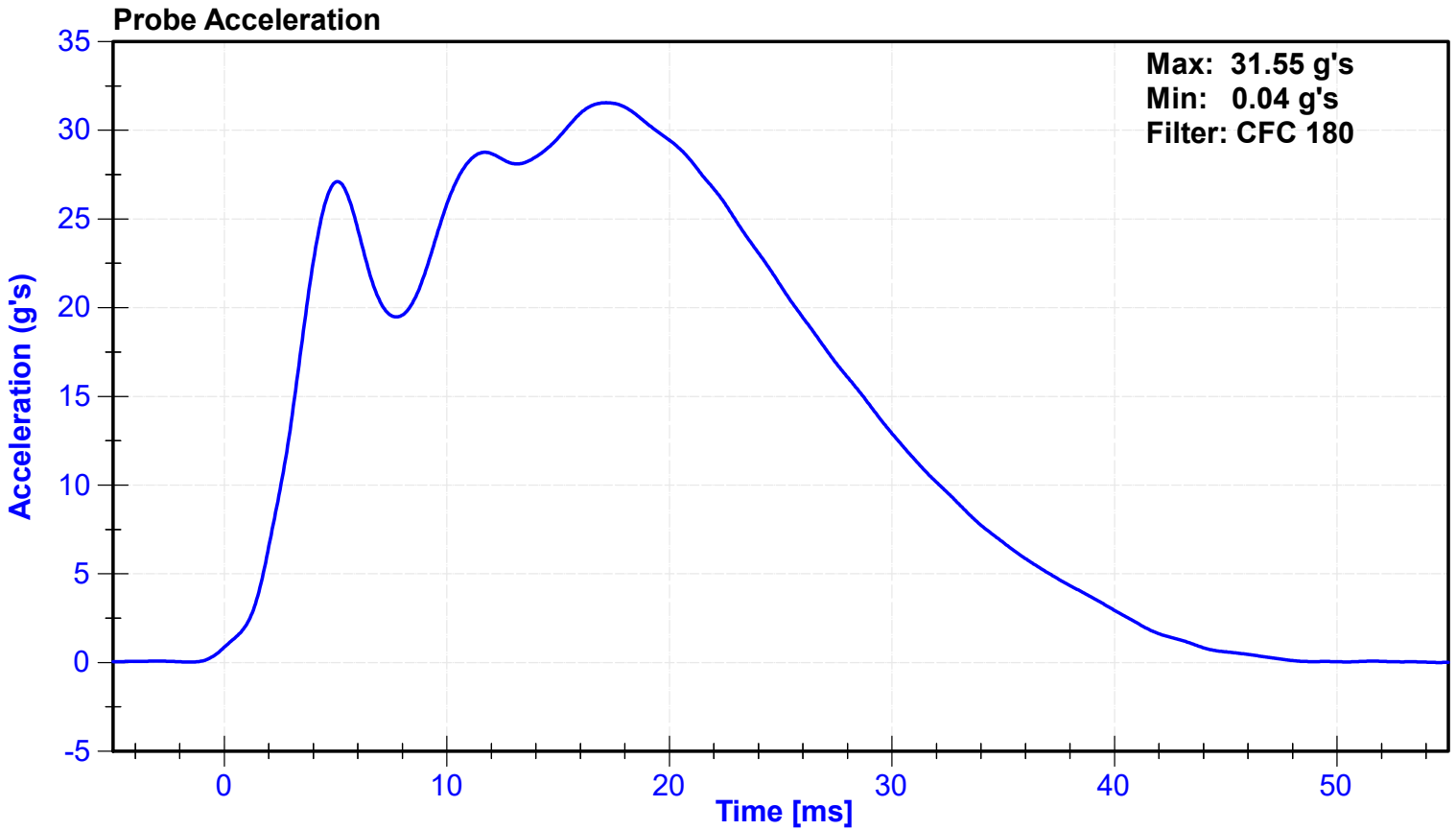
Transducer Calibrations

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

Force vs. Displacement







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

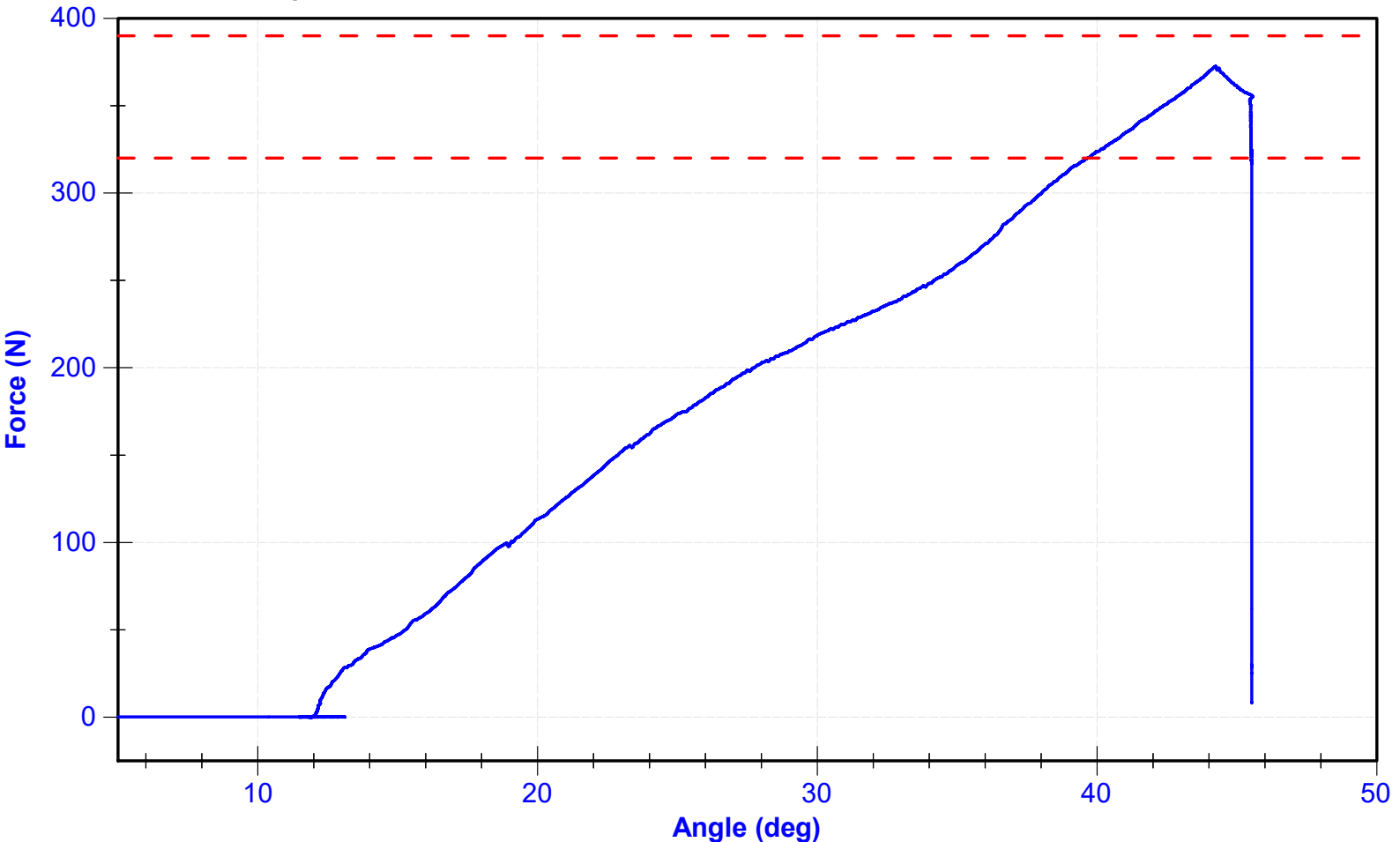
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.6	Pass
Humidity	10	70	%	56.5	Pass
Initial Angle	0	20	deg	11.9	Pass
Force at 45 Degrees	320	390	N	372.5	Pass
Return Angle Relative to Initial	0	8	deg	7.4	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



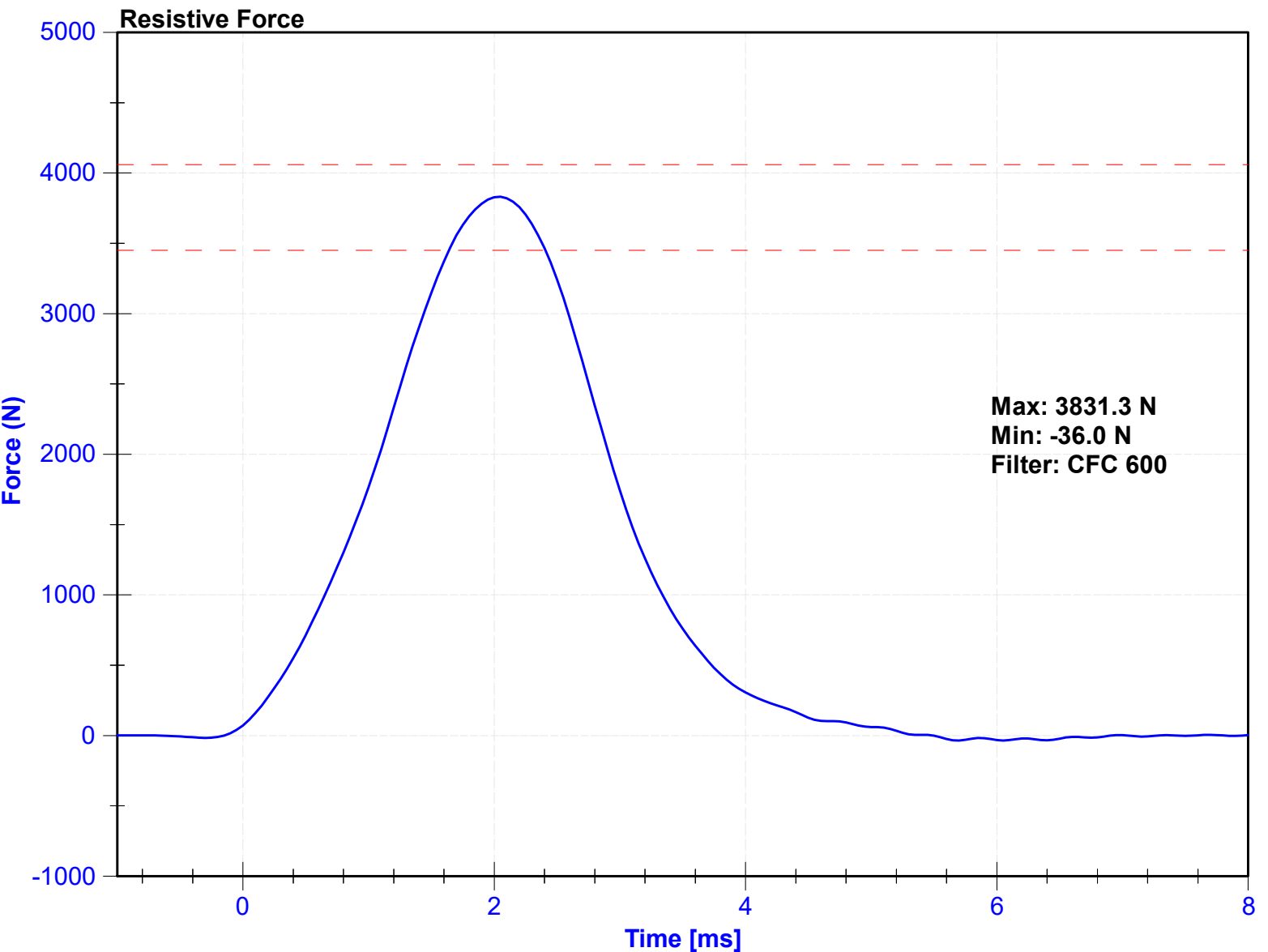
ATD Manufacturer	Humanetics	Test Technician	Z.Schneider
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

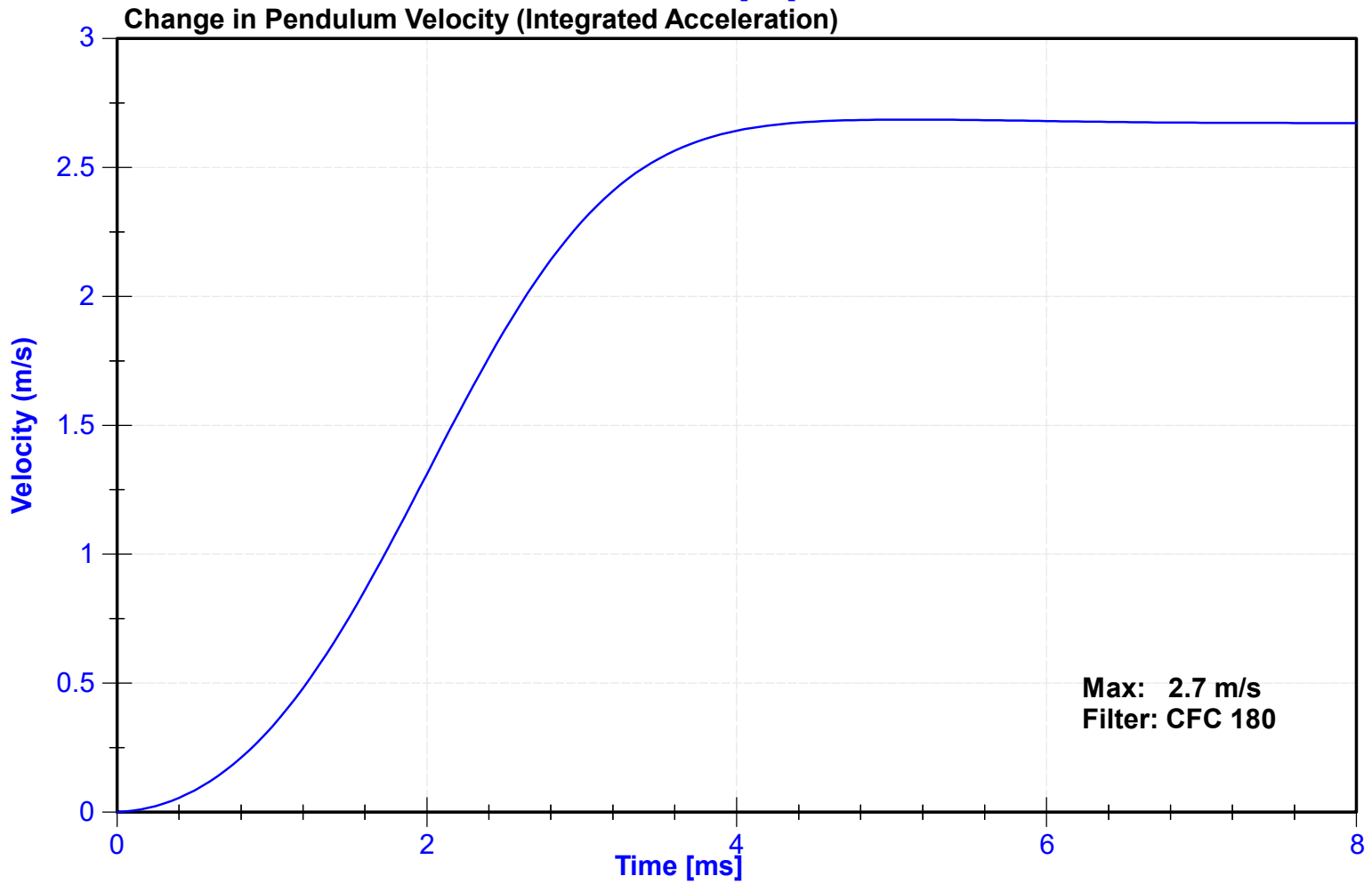
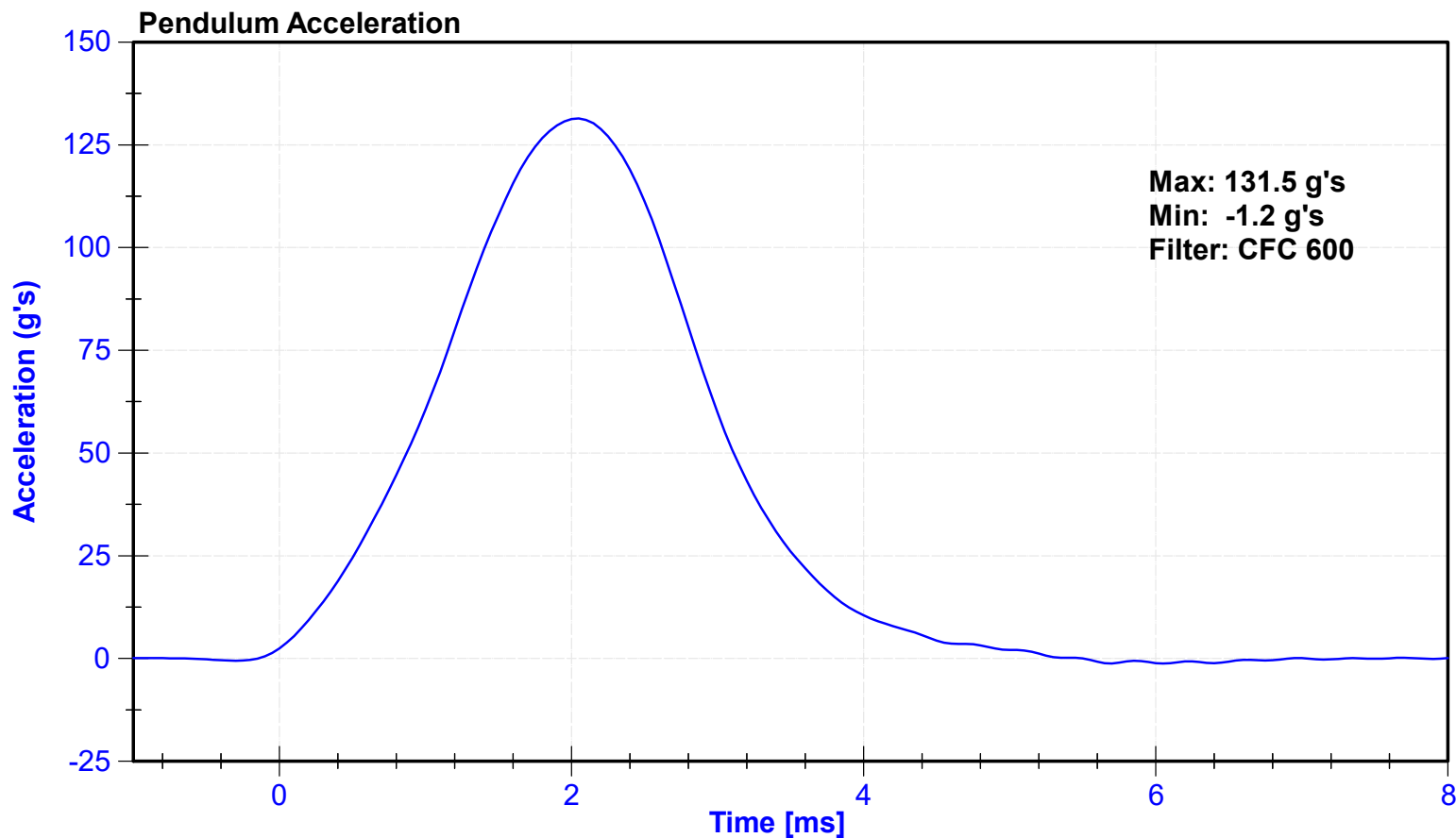
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.0	Pass
Humidity	10	70	%	65.3	Pass
Velocity	2.07	2.13	m/s	2.096	Pass
Resistive Force	3450	4060	N	3831.3	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P51736	10/25/2022	10/25/2023





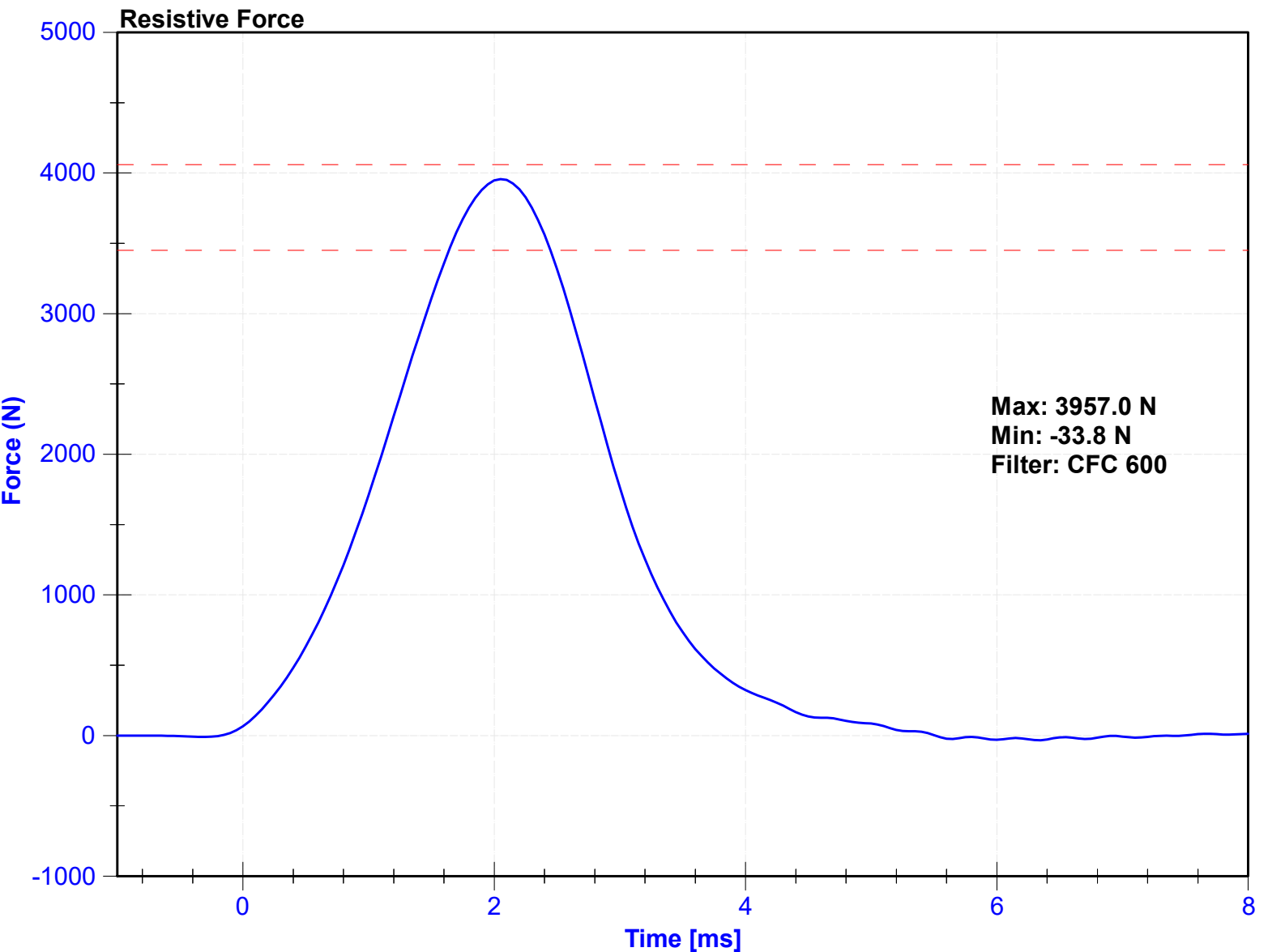
ATD Manufacturer	Humanetics	Test Technician	Z.Schneider
ATD Serial Number	137	Laboratory Supervisor	C. Mantell

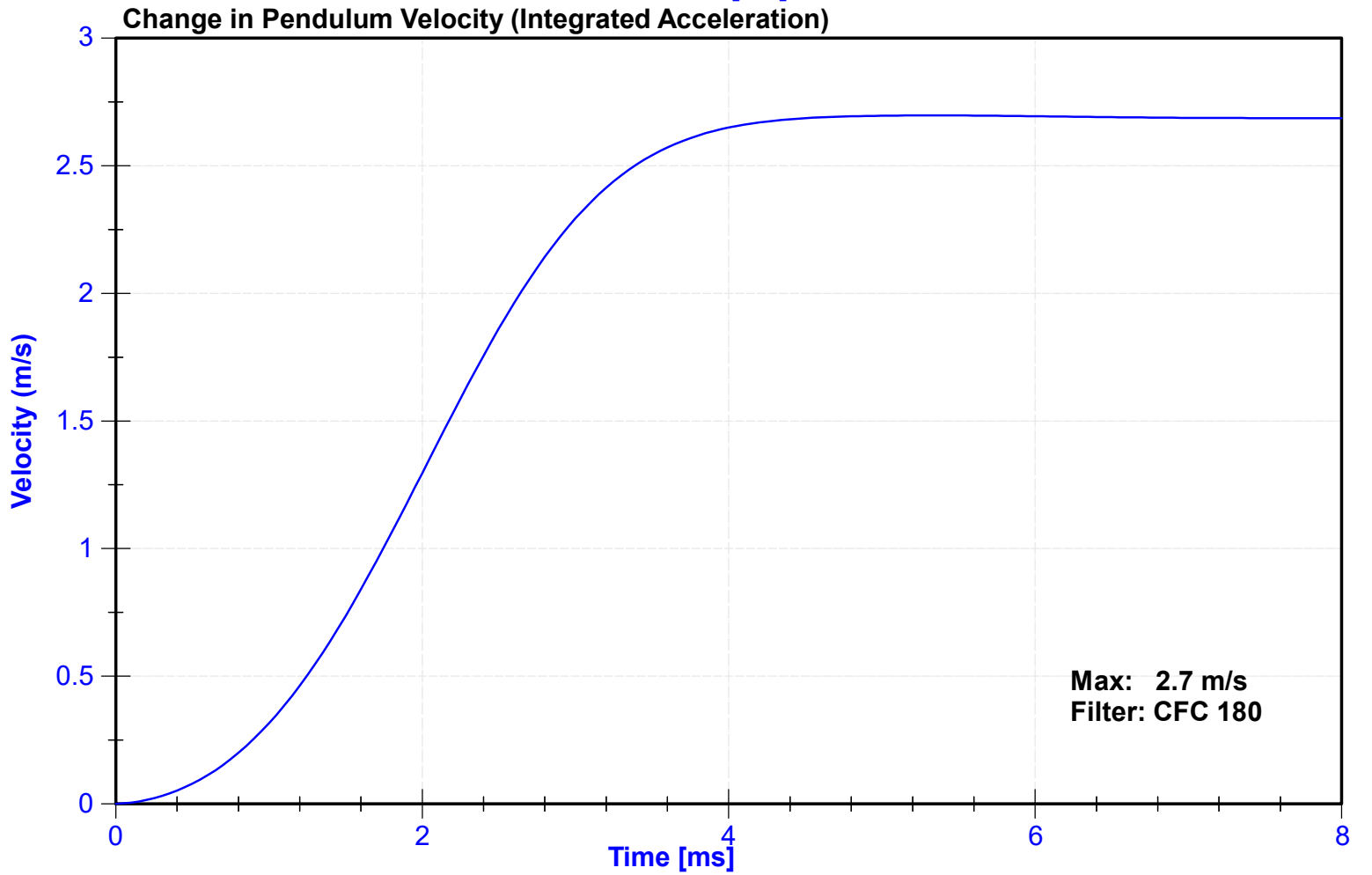
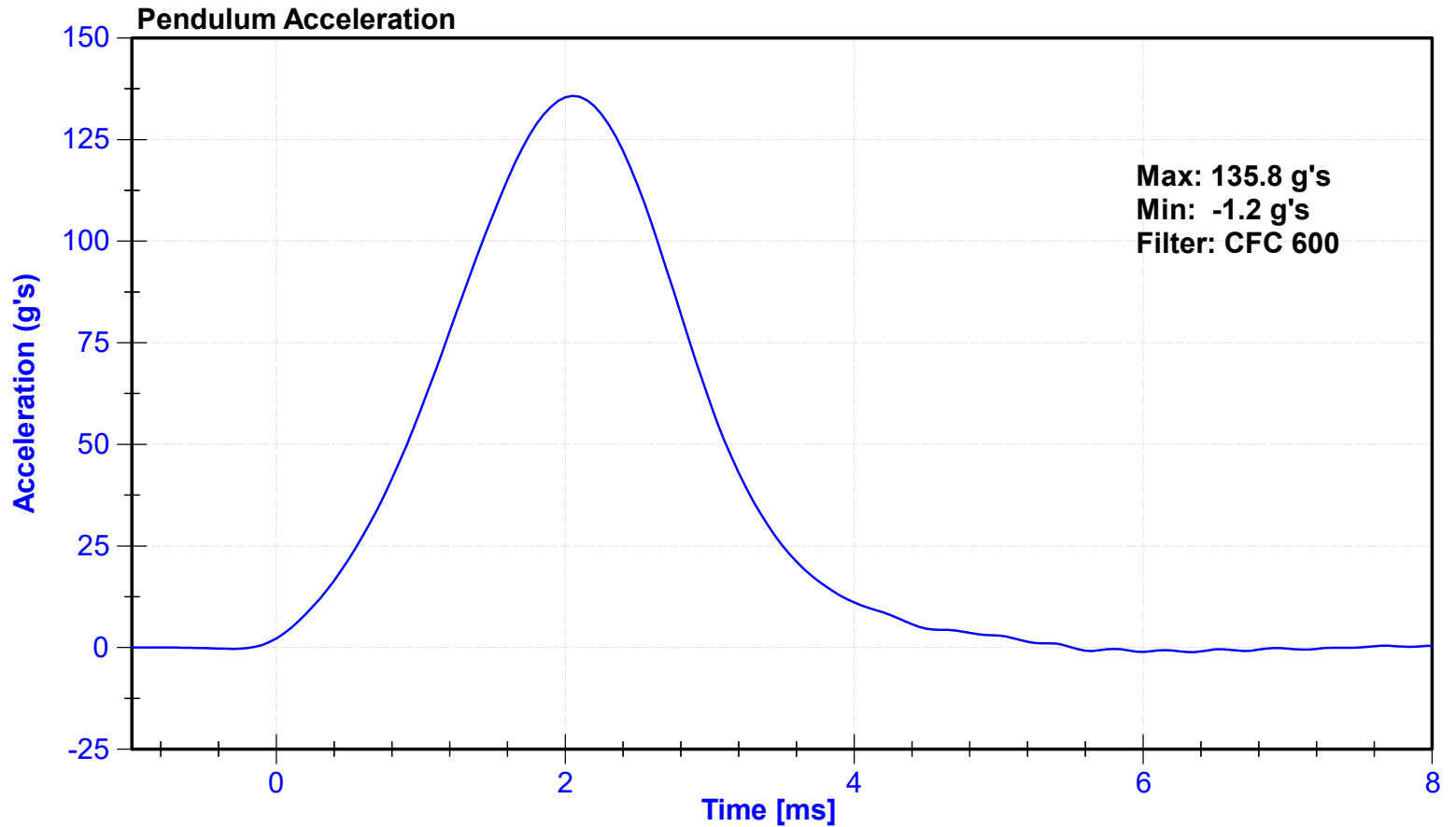
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.0	Pass
Humidity	10	70	%	65.3	Pass
Velocity	2.07	2.13	m/s	2.093	Pass
Resistive Force	3450	4060	N	3957.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	Endevco	P51736	10/25/2022	10/25/2023





APPENDIX D

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

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	04/06/2023
		Y	P64151	Endevco	04/06/2023
		Z	P52114	Endevco	04/06/2023
	Redundant	X	P52079	Endevco	04/06/2023
		Y	P58905	Endevco	04/06/2023
		Z	P63996	Endevco	04/06/2023
Head Angular Rate Sensors		X	7603	DTS ARS	09/06/2022
		Y	15692	DTS ARS	09/06/2022
		Z	15695	DTS ARS	09/06/2022
Upper Neck Load Cell		FX, Fy, Fz MX,MY, MZ	851-FX	Humanetics	05/18/2023
Chest Accelerometers	Primary	X	P51991	Endevco	04/06/2023
		Y	P51269	Endevco	04/06/2023
		Z	P49185	Endevco	04/06/2023
	Redundant	X	P68059	Endevco	04/06/2023
		Y	P51713	Endevco	04/06/2023
		Z	P78824	Endevco	04/06/2023
Chest Potentiometer		X	0075	JDK	04/10/2023
Pelvis Accelerometer		X	P58800	Endevco	04/06/2023
		Y	P52157	Endevco	04/06/2023
		Z	P83317	Endevco	04/06/2023
Femur Load Cells - Left	Primary	Z	DH3271-FZ1	Denton	05/18/2023
	Redundant	Z	DH3271-FZ2	Denton	05/18/2023
Femur Load Cells - Right	Primary	Z	DI4213-FZ1	Denton	05/18/2023
	Redundant	Z	DI4213-FZ2	Denton	05/18/2023
Tibia Load Cells - Left	Upper	MX, MY, FZ	652-FZ	Denton	05/22/2023
	Lower	MX, MY, FZ	673-FZ	Denton	05/22/2023
Tibia Load Cells – Right	Upper	MX, MY, FZ	651-FZ	Denton	05/22/2023
	Lower	MX, MY, FZ	505-FZ	Denton	05/22/2023
Foot Accelerometers - Left	Rear	X	P82756	Endevco	04/06/2023
	Front	Z	P51872	Endevco	04/06/2023
Foot Accelerometers - Right	Rear	X	P66942	Endevco	04/06/2023
	Front	Z	P58779	Endevco	04/06/2023
Seat belt Load Cells	Lap		NA	NA	NA
	Shoulder		174	GFE	02/17/2023

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	06/20/2023
		Y	P83335	Endevco	06/20/2023
		Z	P64149	Endevco	06/20/2023
	Redundant	X	P52008	Endevco	06/20/2023
		Y	P52045	Endevco	06/20/2023
		Z	P74774	Endevco	06/20/2023
Head Angular Rate Sensors		X	15212	DTS ARS	09/06/2022
		Y	6731	DTS ARS	09/06/2022
		Z	7521	DTS ARS	09/06/2022
Upper Neck Load Cell		FX, Fy, Fz MX, MY, MZ	2207-FX	Denton	06/23/2023
Chest Accelerometers	Primary	X	T21142	Endevco	06/20/2023
		Y	P83346	Endevco	06/20/2023
		Z	P49190	Endevco	06/20/2023
	Redundant	X	P58794	Endevco	06/20/2023
		Y	P69791	Endevco	06/20/2023
		Z	T11253	Endevco	06/20/2023
Chest Potentiometer		X	0720	Servo	06/20/2023
Pelvis Accelerometer		X	P58735	Endevco	06/20/2023
		Y	P77587	Endevco	06/20/2023
		Z	P51285	Endevco	06/20/2023
Femur Load Cells - Left	Primary	Z	DT0998-FZ1	Denton	05/18/2023
	Redundant	Z	DT0998-FZ2	Denton	05/18/2023
Femur Load Cells - Right	Primary	Z	109-FZ1	Denton	05/18/2023
	Redundant	Z	109-FZ2	Denton	05/18/2023
Tibia Load Cells - Left	Upper	MX, MY, FZ	361-FZ	Denton	05/22/2023
	Lower	MX, MY, FZ	363-FZ	Denton	05/22/2023
Tibia Load Cells – Right	Upper	MX, MY, FZ	406-FZ	Denton	05/22/2023
	Lower	MX, MY, FZ	362-FZ	Denton	05/22/2023
Foot Accelerometers - Left	Rear	X	P78959	Endevco	06/20/2023
	Front	Z	P83418	Endevco	06/20/2023
Foot Accelerometers - Right	Rear	X	P63998	Endevco	06/29/2023
	Front	Z	P80265	Endevco	06/20/2023
Seat belt Load Cells	Lap		NA	NA	NA
	Shoulder		295	GFE	02/17/2023

Table 3 – Vehicle Instrumentation

Instrumentation		Axis	Serial Number	Manufacturer	Calibration Date	
Crossmember/Rear Seat Accelerometers	Left	Primary	X	A255886	Measurement Specialties	07/18/2023
			Z	A280017	Measurement Specialties	07/18/2023
		Redundant	X	A284231	Measurement Specialties	07/18/2023
	Right	Primary	X	A398644	Measurement Specialties	03/22/2023
			Z	G21412	Endevco	03/22/2023
		Redundant	X	G22233	Endevco	03/22/2023
Engine Accelerometers	Top	X	G23444	Endevco	04/26/2023	
	Bottom	X	A352366	Measurement Specialties	07/26/2023	