

REPORT NUMBER: NCAP-CAL-16-001

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

**General Motors LLC
2016 Chevrolet Colorado
Crew Cab Pickup Truck**

NHTSA No: M20160100

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



January 26, 2016

FINAL REPORT

**PREPARED FOR:
U. S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
1200 NEW JERSEY AVE SE, ROOM W43-410
WASHINGTON, D.C. 20590**

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Date: January 26, 2016

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Date: January 26, 2016

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 Impact Test was conducted on a 2016 Chevrolet Colorado Crew Cab Pickup Truck in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 17, 2015. The impact velocity of the vehicle was 56.26 km/h, and the ambient temperature at the barrier face at the time of impact was 21°C. The target vehicle's maximum post-test static crush was 406 mm at vehicle centerline. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD (Serial No. 1046)</th> <th colspan="2">Passenger ATD (Serial No. 288)</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>250.937</td> <td>700</td> <td>376.070</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-26.117</td> <td>52</td> <td>-20.035</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.290</td> <td>1</td> <td>0.422</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>1578.525</td> <td>2,620</td> <td>1549.429</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-521.510</td> <td>2,520</td> <td>-144.943</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-1522.540</td> <td>6,805</td> <td>-1659.272</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-1267.681</td> <td>6,805</td> <td>-1030.592</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD (Serial No. 1046)		Passenger ATD (Serial No. 288)		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)		700	250.937	700	376.070	Maximum Chest Compression	mm	63	-26.117	52	-20.035	Nij		1	0.290	1	0.422	Neck Tension	N	4,170	1578.525	2,620	1549.429	Neck Compression	N	4,000	-521.510	2,520	-144.943	Left Femur Force	N	10,008	-1522.540	6,805	-1659.272	Right Femur Force	N	10,008	-1267.681	6,805	-1030.592
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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. DTNH22-12-D-00260. 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 Frontal NCAP Laboratory Test procedure, dated October 2015.

SUMMARY

A ridged fixed barrier was impacted by a 2016 Chevrolet Colorado Crew Cab Pickup Truck at a velocity of 56.26 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 17, 2015. 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 14 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 Frontal NCAP Laboratory Test Procedure. Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right / left femur load cells, and lower leg instrumentation. The driver (position 1) ATD (Serial No. 1046) and the right-front passenger (position 2) ATD (Serial No. 288) were calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

The 136 channels of data were recorded on an on-board data acquisition system. Please refer to Appendix B for the dummy response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was a total of 0.0 grams of stoddard solvent leakage after the event and including all phases of the static rollover. The maximum static crush of the test vehicle was 406 mm at the vehicles centerline. During and after the impact event, the driver's and passenger's side doors were closed and operational.

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

The passenger's visible contact points were as follows: The passenger's head contacted the frontal airbag and then the head restraint and curtain airbag. 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 (50 th)	250.937	0.290	1578.525	-521.510	45.368	-26.117	-1522.540	-1267.681
Passenger (5 th)	376.070	0.422	1549.429	-144.943	41.460	-20.035	-1659.272	-1030.592

GENERAL COMMENTS:

1. P1 (Driver) serial number - 1046
2. P2 (Passenger) serial number - 288

Data Anomalies:

- Driver Pelvic Y Acceleration, Questionable magnitude 130ms to 166ms
- Driver Right Foot Aft X Acceleration, Questionable magnitude throughout
- Passenger Right Upper Tibia Z Force, Questionable spikes throughout
- Barrier Load Cell B3 Fx, Questionable data after 15.6ms
- Barrier Load Cell B7 Fx, Questionable data after 15ms

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

This section contains information reporting for the following Data Sheets:

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

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

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Seat Belt Positioning Data

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

Data Sheet No. 7 – Vehicle Accelerometer Locations

Data Sheet No. 8 – Photographic Reference Target Locations

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

Data Sheet No. 10 – Test Vehicle Summary of Results

Data Sheet No. 11 – Post-Test Observations

Data Sheet No. 12 – Vehicle Profile Measurements

Data Sheet No. 13 – Accident Investigation Division Data

Data Sheet No. 14 – Vehicle Intrusion Measurements

Data Sheet No. 15 – Summary of FMVSS 212, 219 (Partial), and 301 Data

Data Sheet No. 16 – FMVSS 301 Static Rollover Results

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

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20160100	Traction Control System (TCS)	Yes
Model Year	2016	Power Steering	Yes
Make	Chevrolet	Power Window Auto-Reverse	No
Model	Colorado	Driver Frontal Airbag	Yes
Body Style	Crew/Long Box	Driver Curtain Airbag	Yes
VIN	1GCGTBE35G1147732	Driver Head/Torso Airbag	No
Body Color	Brown	Driver Torso Airbag	No
Odometer Reading (km /mi)	801.5 km / 498 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	3.6	Driver Pelvis Airbag	No
Type / No. Cylinders	V6	Driver Knee Airbag	No
Engine Placement	Inline	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6-Speed	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	All Wheel Drive	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	No	Front Pass. Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	Yes	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	-

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC	GVWR (kg)	2722
Date of Manufacture	10/15	GAWR Front (kg)	1452
		GAWR Rear (kg)	1588

VEHICLE SEATING AND WEIGHT CAPACITY DATA

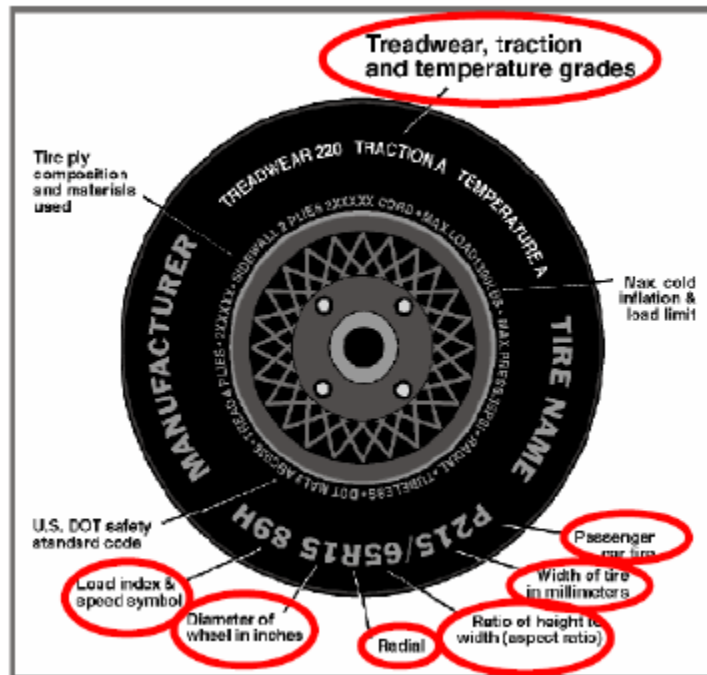
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	-	
Number of Occupants	2	3	-	5
Capacity Wt. (VCW) (kg)				675
Cargo Wt. (RCLW) (kg)				136

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

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



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	240	240
Recommended Tire Size	P265/70R16	P265/70R16
Tire Size on Vehicle	P265/70R16	P265/70R16
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler	Wrangler
Treadwear	680	680
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel	2 Polyester, 2 Steel
Load Index / Speed Symbol	112T	112T
Tire Material	Rubber	Rubber
DOT Safety Code Left	PJC2JY1R3415	PJC2JY1R3415
DOT Safety Code Right	PJC2JY1R3415	PJC2JY1R3415

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	606	434		672	506	
Right	kg	558	410		593	513	
Ratio	%	58%	42%		55%	45%	
Totals	kg	1164	844	2008	1265	1019	2284

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2008	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	147	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2291	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	893	908	938	952	1500
As Tested	mm	886	897	912	924	1592
Post-Test	mm	838	862	922	917	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3569
Total Vehicle Length at Left Side	mm	5655
Total Vehicle Length at Centerline	mm	5698
Total Vehicle Length at Right Side	mm	5655
Weight of Ballast in Cargo Area	kg	42
Weight of Vehicle Components Removed	kg	5
Amount of Stoddard Solvent in Fuel Tank	L	74.4

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Jack

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	5698
2	Total Width	1757
3*	Bumper Top Height	523
4*	Bumper Bottom Height	332
5*	Longitudinal Member Top Height	555
6	Distance Between Longitudinal Members	835
7	Longitudinal Member Width	61
8*	Engine Top Height	1070
9*	Engine Bottom Height	274
10	Engine and Gearbox Width	522
11	Front Bumper-Engine Distance	747
12*	Front Shock Absorber Fixing Height	791
13*	Bonnet Leading Edge Height	1037
14	Front Shock Absorber Fixing Width	820
15	Front Bumper – Front Axle Distance	951
16	Front Axle – A Pillar Distance	559
17	A-Pillar – B-Pillar Distance	1135
18	B-Pillar – Rear Axle Distance	1869
19	B-Pillar – C-Pillar Distance	914
20*	Roof Sill Bottom Height	1655
21*	Roof Sill Top Height	1695
22*	Floor Sill Bottom Height	520
23*	Floor Sill Top Height	560

*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

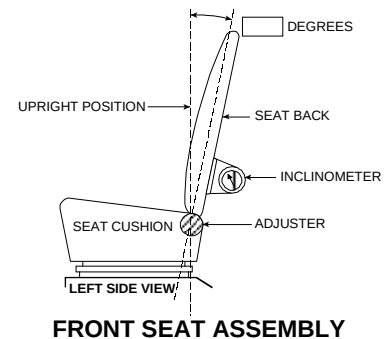
Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015

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	2.4
Passenger Seat Back Angle	3.1



SEAT FORE / AFT POSITIONS

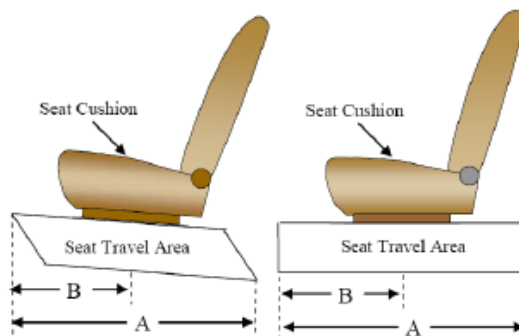
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	290	145
Passenger Seat	48 (0-47)	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 – Uppermost
Passenger Seat	4	0 – Uppermost



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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

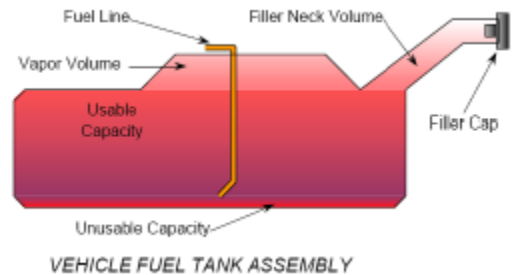
NHTSA No.: M20160100
 Test Date: 12/17/2015

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	80
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	73.6 – 75.2
Actual Amount of Solvent Used	74.4
1/3 of Usable Capacity	26.7

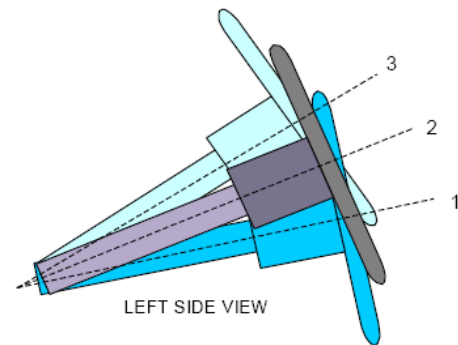
FUEL PUMP

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 ASSEMBLY

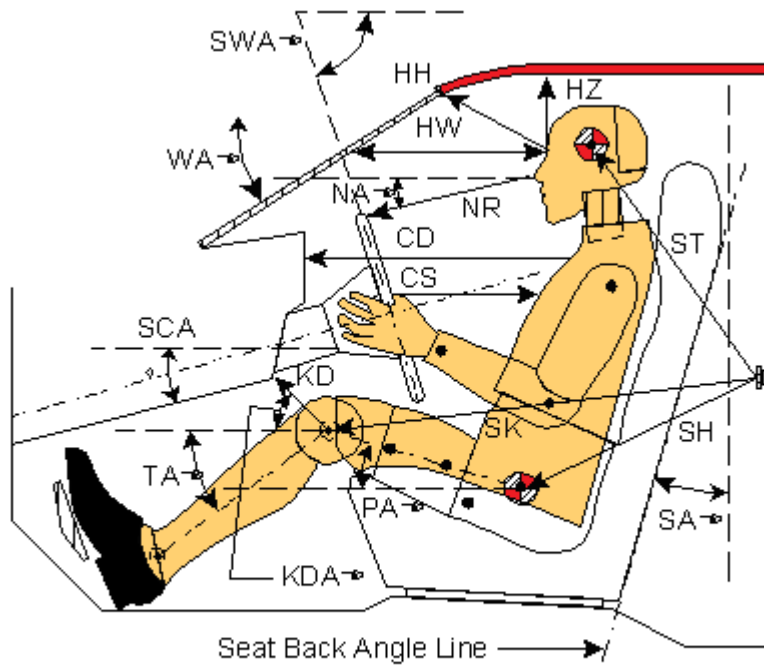
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	19.9	
Geometric center position No. 2	21.5	
Uppermost position No. 3	23.2	
Telescoping Steering Wheel Travel		N/A
Test Position	21.5	N/A

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015



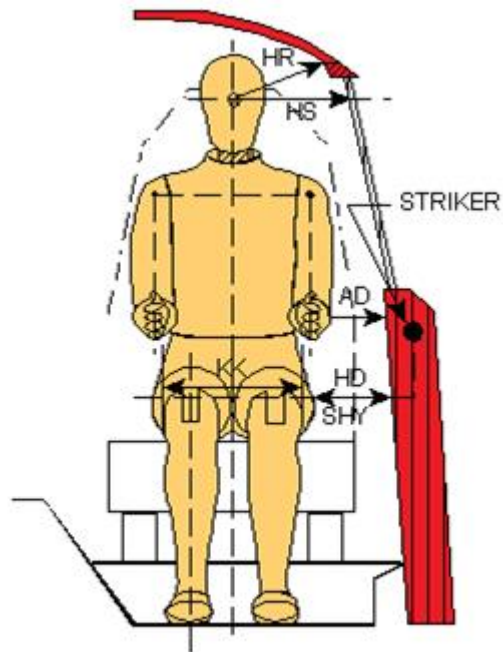
Left Side View

Code	Measurement Description	Driver (SN: 1046)		Passenger (SN: 288)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		33.3		
SWA°	Steering Wheel Angle		21.4		
SCA°	Steering Column Angle		68.6		
SA°	Seat Back Angle (on headrest post)		3.5		3.1
HZ	Head to Roof (Z)	267	90	260	90
HH	Head to Header	473	26.5	408	38.2
HW	Head to Windshield	762	0	705	0
NR	Nose to Rim	433	7.3	511	24.6
CD	Chest to Dash	584		452	
CS	Chest to Steering Hub	355	1.3		
RA	Rim to Abdomen	245	0		
KDL	Left Knee to Dash	200	28.7	132	29.8
KDR	Right Knee to Dash	191	26.5	132	29.4
PA°	Pelvic Angle		24.1		20.5
TA°	Tibia Angle		27.9		40.2
SK	Striker to Knee	580	2.4	682	3.7
ST	Striker to Head	541	83.9	530	64.2
SH	Striker to H-Point	235	35.3	357	16.0

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015



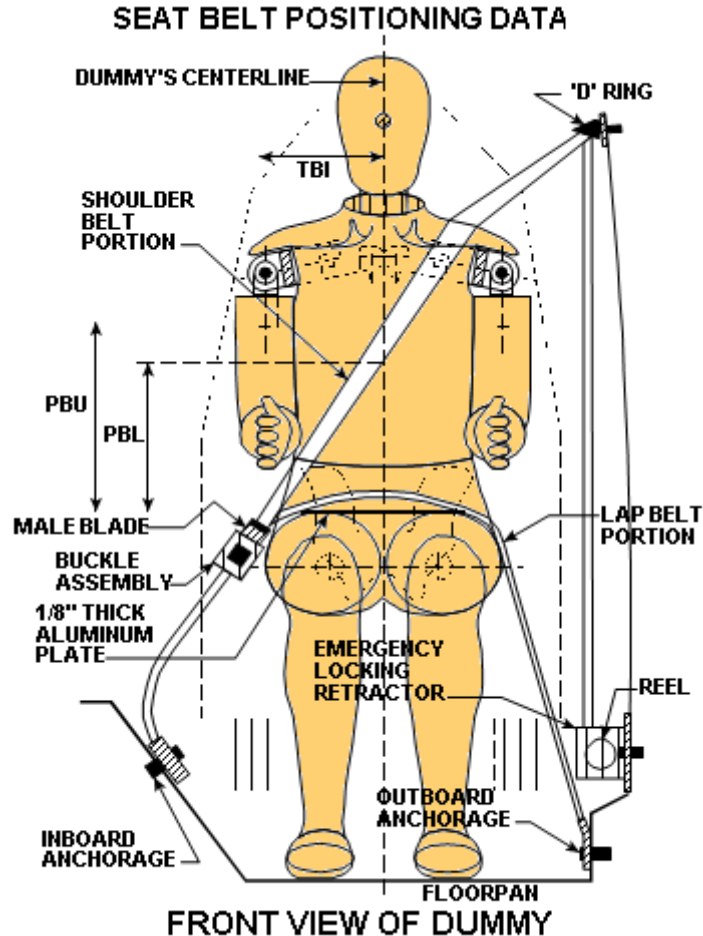
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	148	89
HD	H-Point to Door	154	165
HR	Head to Side Header	250	271
HS	Head to Side Window	360	365
KK	Knee to Knee	305	165
SHY	Striker to H-Point (Y Direction)	240	250
AA	Ankle to Ankle	317	165

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	350	320
PBL — Top surface of reference to belt lower edge	mm	280	250

BELT LENGTH DATA

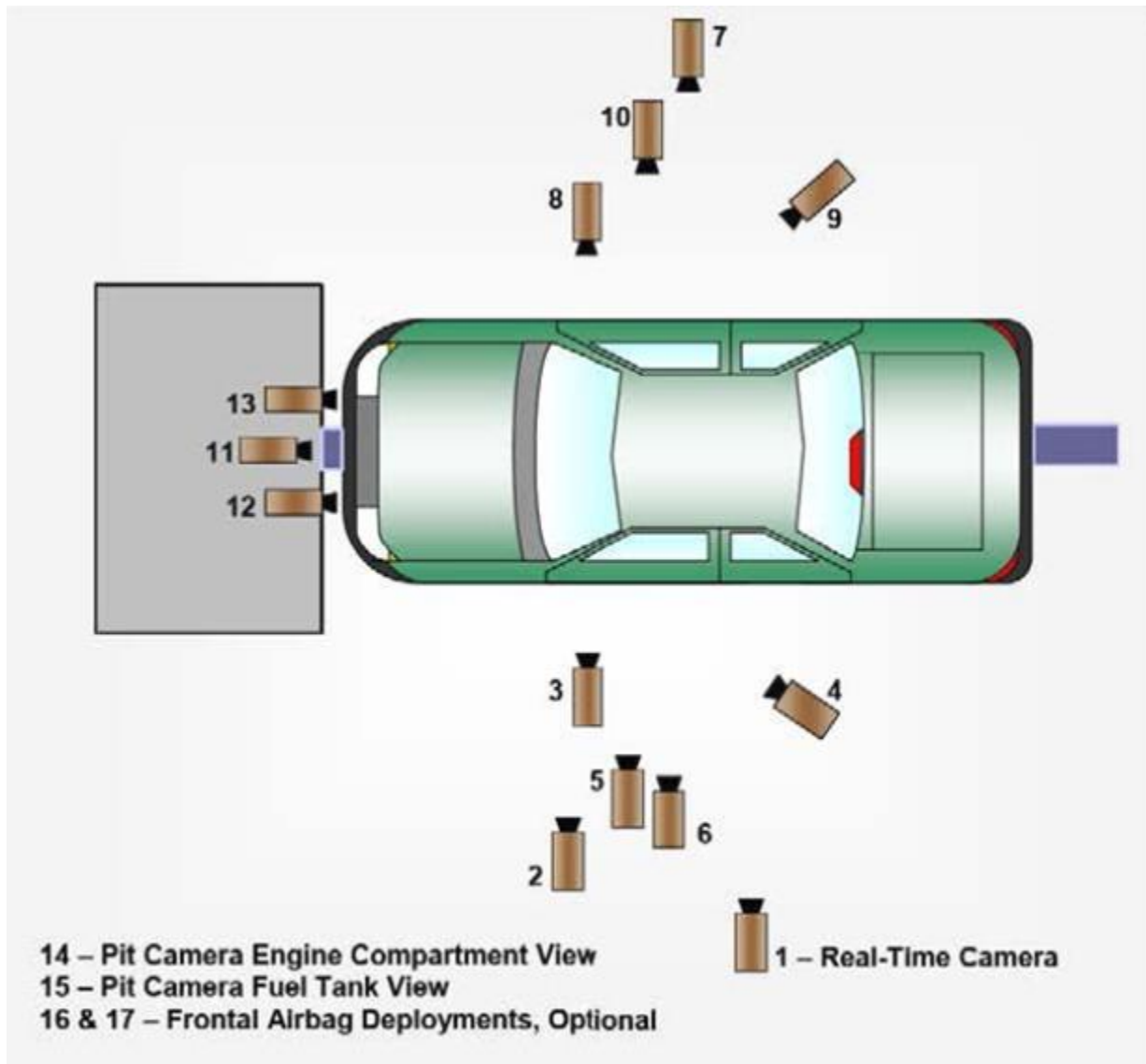
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	825	905
Lap Belt Length as measured on ATD	mm	450	450
Remainder of belt on reel	mm	955	875
Total belt length for continuous webbing systems	mm	2230	2230

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015

CAMERA POSITIONS FOR FRONTAL IMPACTS



Top View

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

CAMERA LOCATIONS

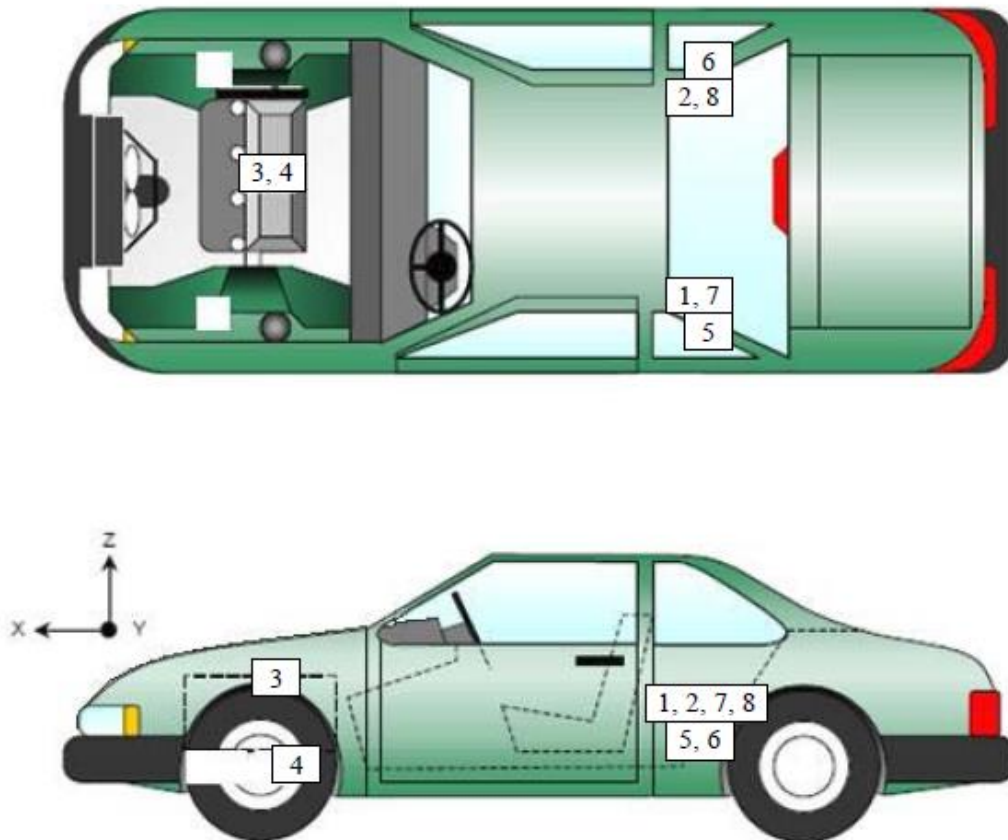
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-	-	-		60
2	Driver Close-Up	-1681	-9413	-1646	50	1000
3	Left Front Half	-1140	-10144	-1770	24-70	1000
4	Left Angle	-2777	-3118	-2266	24	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	-2325	9411	-1575	24	1000
8	Passenger Close-Up	-1530	7334	-1425	50	1000
9	Right Front Half	-1067	6347	-1326	28	1000
10	Right Angle	-2927	2928	-2123	24	1000
11	Windshield	954	0	-3505	20	1000
12	Driver Windshield	395	-600	-2051	12.5	1000
13	Passenger Windshield	395	600	-2051	12.5	1000
14	Pit Front	965	0	2041	12.5	1000
15	Pit Rear	2444	0	2050	12.5	1000
16	Onboard Driver Airbag (Optional)				12.5	1000
17	Onboard Passenger Airbag (Optional)				12.5	1000

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

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2810	-495	-57
2	Right Rear Accelerometer – X Direction	2812	490	-54
3	Engine Top X	4909	14	-417
4	Engine Bottom X	5081	144	292
5	Left Rear Accelerometer – Z Direction	2810	-495	-57
6	Right Rear Accelerometer – Z Direction	2812	490	-54
7	Left Rear Accelerometer – X Direction Redundant	2810	-487	-58
8	Right Rear Accelerometer – X Direction Redundant	2812	490	-50

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

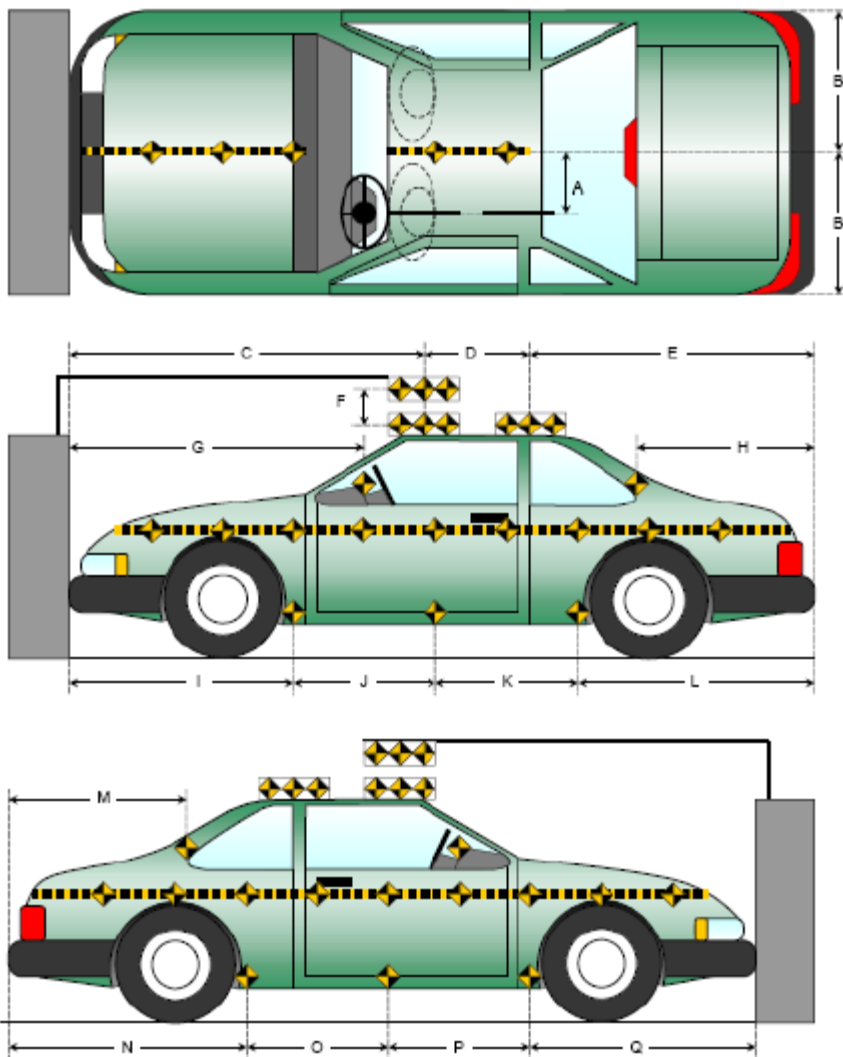
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

Item	Value
A	375
B	878
C	2800
D	610
E	2289
F	150
G	1823
H	2139
I	1433
J	1283
K	1289
L	1693
M	2139
N	1694
O	1278
P	1289
Q	1438

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

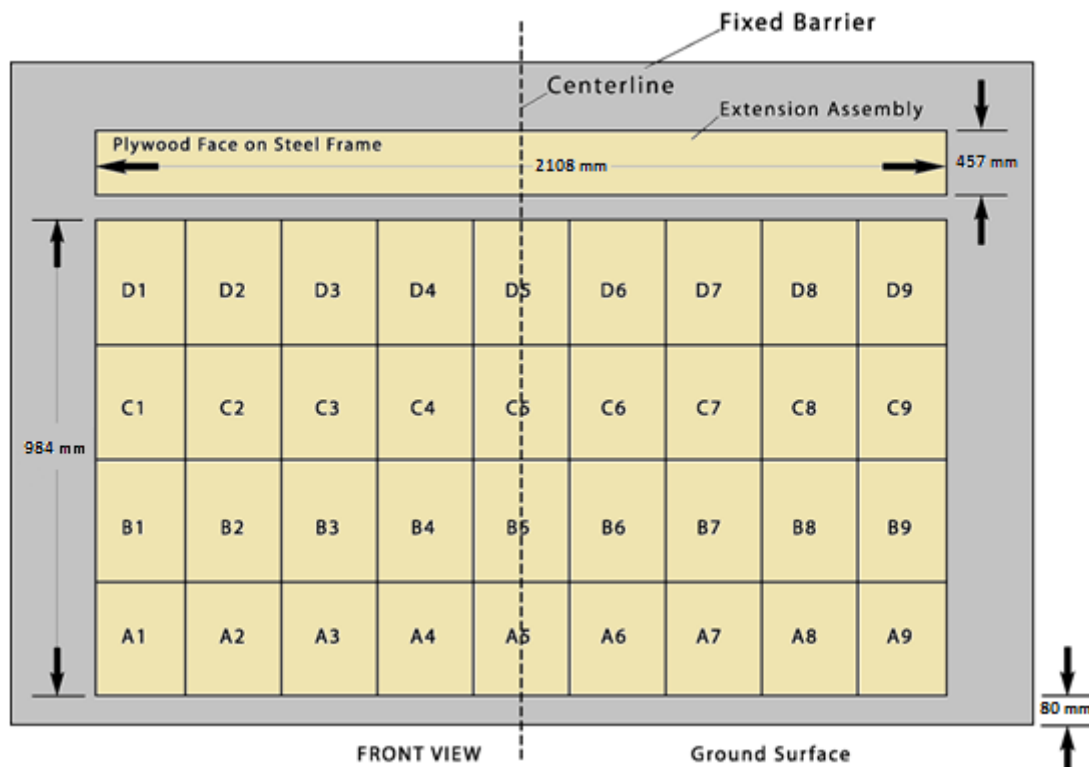


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension*

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	46
Passenger Dummy Accelerometers	46
Vehicle Structure Accelerometers	8
Load Cell Barrier	36
Total	136

CAMERA COVERAGE

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	2
High-Speed Offboard	12
Real-Time Panning	1
Total	15

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	P572E 50 th Male / 1046	P5720 5 th Female / 288
Head Contact	Front Airbag & Headrest	Front Airbag, Headrest & Curtain Airbag
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Locked	Locked
Front Door Opening	Closed & Operational	Closed & Operational
Rear Door Opening	Closed & Operational	Closed & Operational
Seat Track Shift (mm)	0	0
Seat Back Failure	No	0
Glazing Damage	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Minor Cracks
Window Damage	None
Other Notable Effects	Spare tire disconnected during impact event

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	510
Center	mm	508
Right Side	mm	512
Average	mm	510

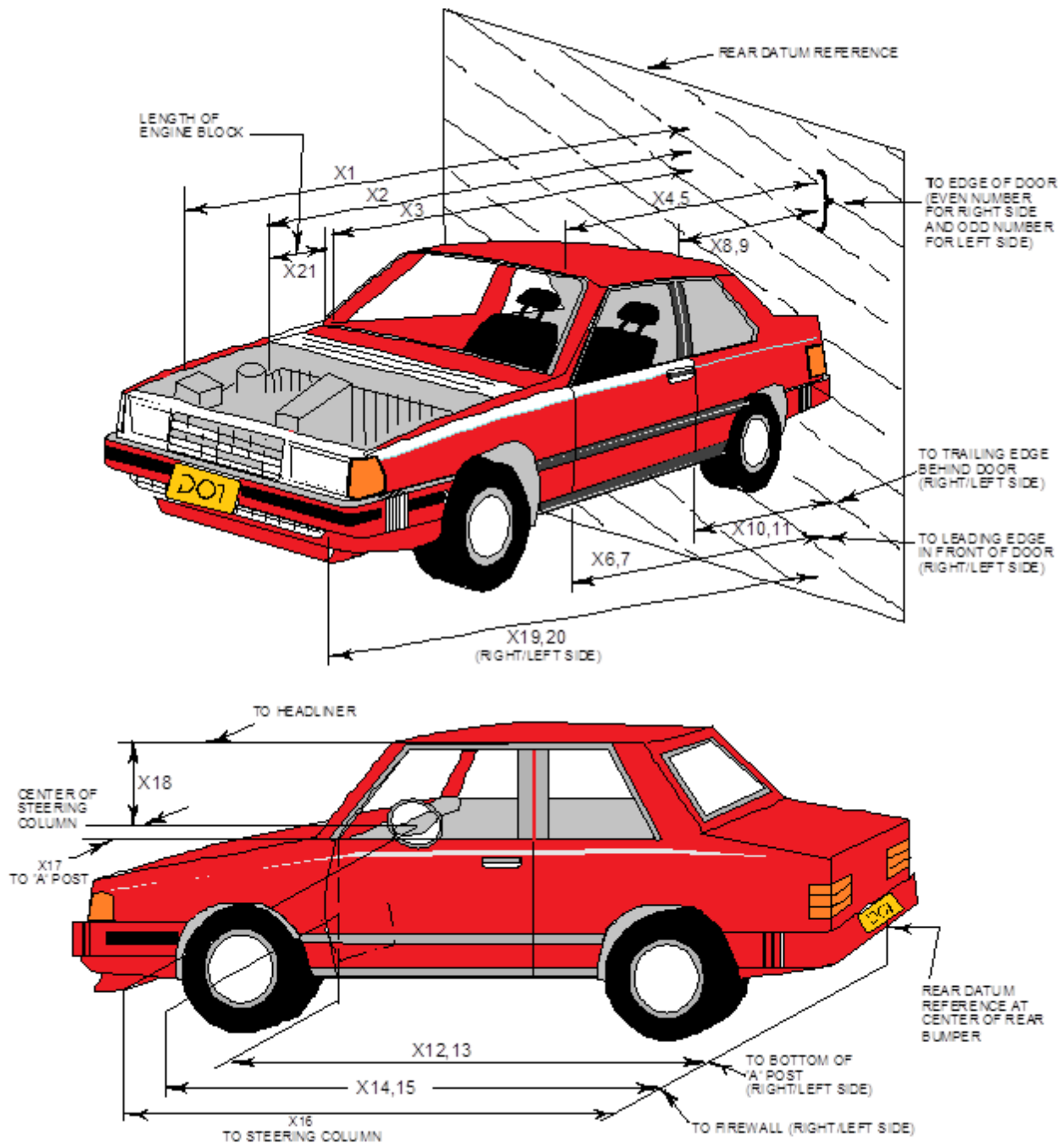
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015



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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5698	5292	-406
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4951	4798	-153
3	RSOV to Firewall	4547	4438	-109
4	RSOV to Upper Leading Edge of Right Door	4196	4173	-23
5	RSOV to Upper Leading Edge of Left Door	4199	4169	-30
6	RSOV to Lower Leading Edge of Right Door	4131	4153	22
7	RSOV to Lower Leading Edge of Left Door	4133	4149	15
8	RSOV to Upper Trailing Edge of Right Door	3056	3032	-24
9	RSOV to Upper Trailing Edge of Left Door	3059	3024	-34
10	RSOV to Lower Trailing Edge of Right Door	3033	3056	23
11	RSOV to Lower Trailing Edge of Left Door	3035	3050	15
12	RSOV to Bottom of "A" Post of Right Side	4225	4191	-34
13	RSOV to Bottom of "A" Post of Left Side	4227	4185	-42
14	RSOV to Firewall, Right Side	4608	4581	-27
15	RSOV to Firewall, Left Side	4629	4597	-32
16	RSOV to Steering Column	3715	3748	33
17	Center of Steering Column to "A" Post	288	283	-5
18	Center of Steering Column to Headliner	440	452	12
19	RSOV to Right Side of Front Bumper	5647	5247	-399
20	RSOV to Left Side of Front Bumper	5645	5298	-347
21	Length of Engine Block	404	404	0
RD	RSOV to Right Side of Dash Panel	3913	3896	-18
CD	RSOV to Center of Dash Panel	3872	3840	-32
LD	RSOV to Left Side of Dash Panel	3915	3887	-28

*UR= Unrecoverable data point
 All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015

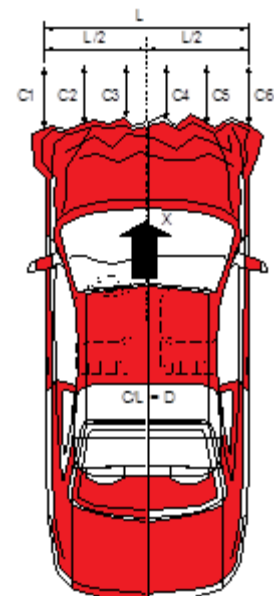
VEHICLE INFORMATION

VIN: 1GCGTBE35G1147732
Vehicle Size Category: Truck

Wheelbase (mm): 3569
Test Weight (kg): 2,284

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): 56.26
Velocity Change (km/h): 56.26
Time of Separation (ms): 160



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1513
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	5454	5273	181
C2	Crush Zone 2 at Left Side	mm	5654	5289	365
C3	Crush Zone 3 at Left Side	mm	5675	5301	374
C4	Crush Zone 4 at Right Side	mm	5672	5287	385
C5	Crush Zone 5 at Right Side	mm	5648	5250	398
C6	Crush Zone 6 at Right Side	mm	5447	5237	210
L	C1 to C6	mm	1513	1624	-111

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

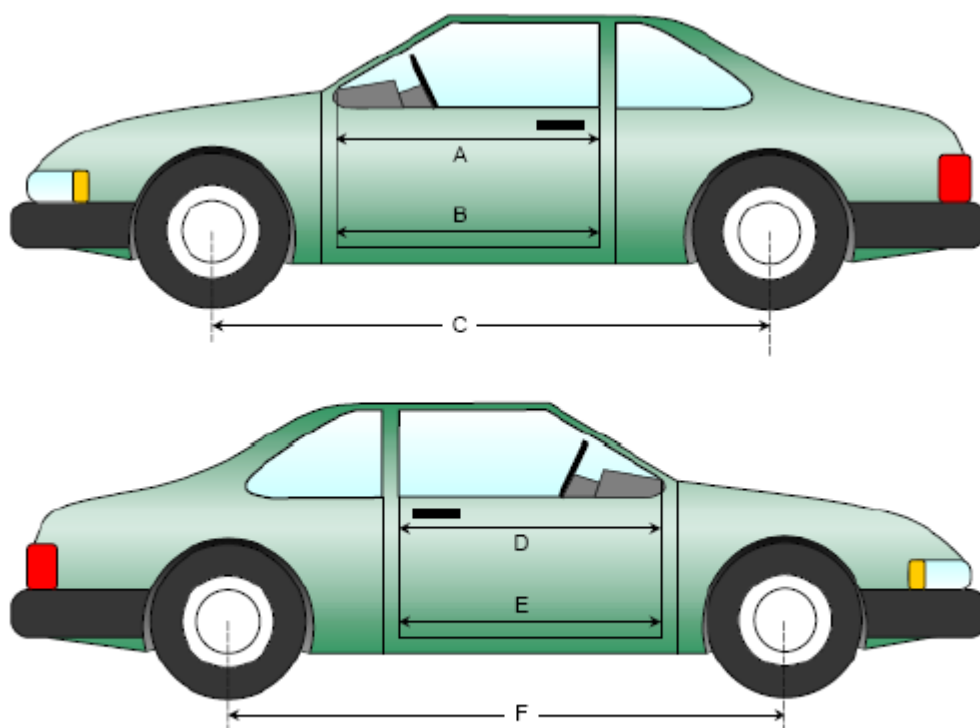
NHTSA No.: M20160100
Test Date: 12/17/2015

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	991	988	-3
B	Left Side Lower	mm	938	936	-2
D	Right Side Upper	mm	989	985	-4
E	Right Side Lower	mm	937	934	-3

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3569	3477	-92
F	Right Side Wheelbase	mm	3569	3489	-80



Left & Right Side Views

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

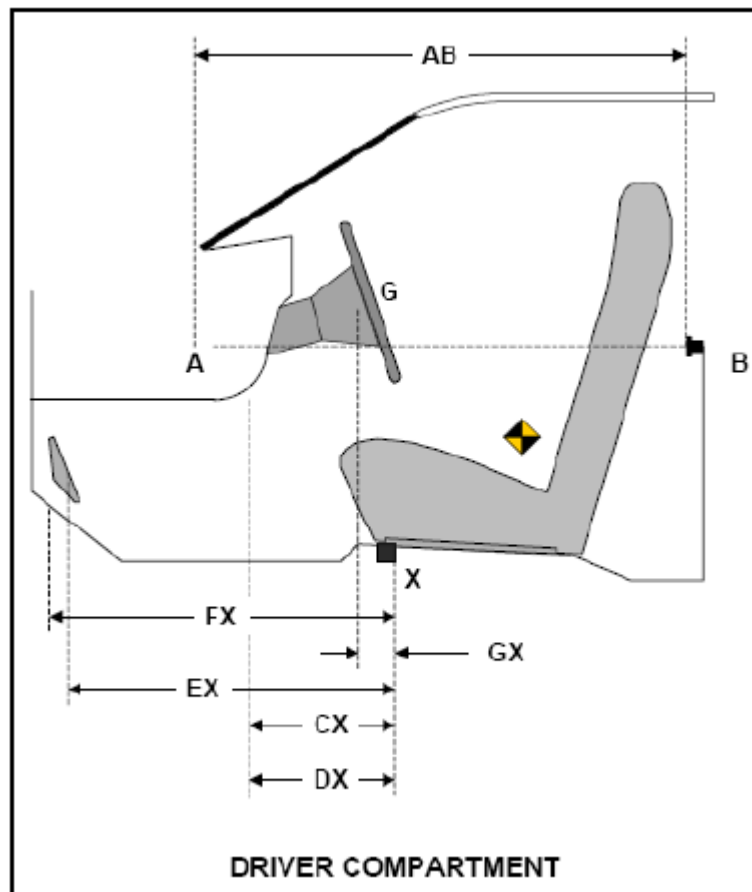
Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	777	775	-2
CX	Left Knee Bolster to X	mm	287	259	-28
DX	Right Knee Bolster to X	mm	288	255	-33
EX	Brake Pedal to X	mm	554	517	-37
FX	Foot Rest to X	mm	669	659	-10
GX	Center of Steering Column Wheel Hub to X	mm	87	114	27

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015

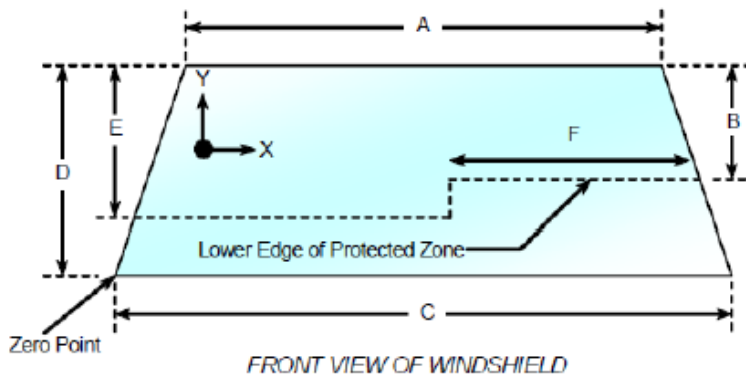
Windshield Mounting Details: A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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	2099.5	2099.5	100%
Right Side	2099.5	2099.5	100%
Total	4199	4199	100%



Item	Units	Value
A	mm	1201
B	mm	447
C	mm	1414
D	mm	792
E	mm	469
F	mm	506

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

X	Y

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

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

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21 ° C

Test Time: 1:55 PM

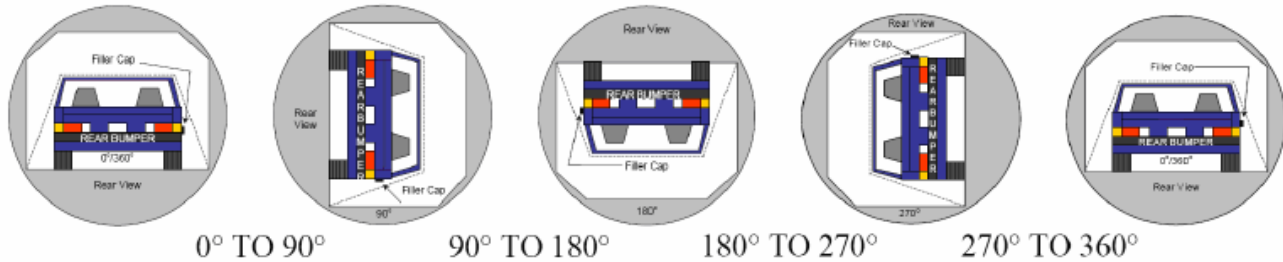
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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./minute)
- D. Spillage: No Spillage Occurred

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
 Test Date: 12/17/2015



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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	67	300	367
90° to 180°	65	300	365
180° to 270°	62	300	362
270° to 360°	72	300	372

FMVSS 301 SPILLAGE TABLE

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

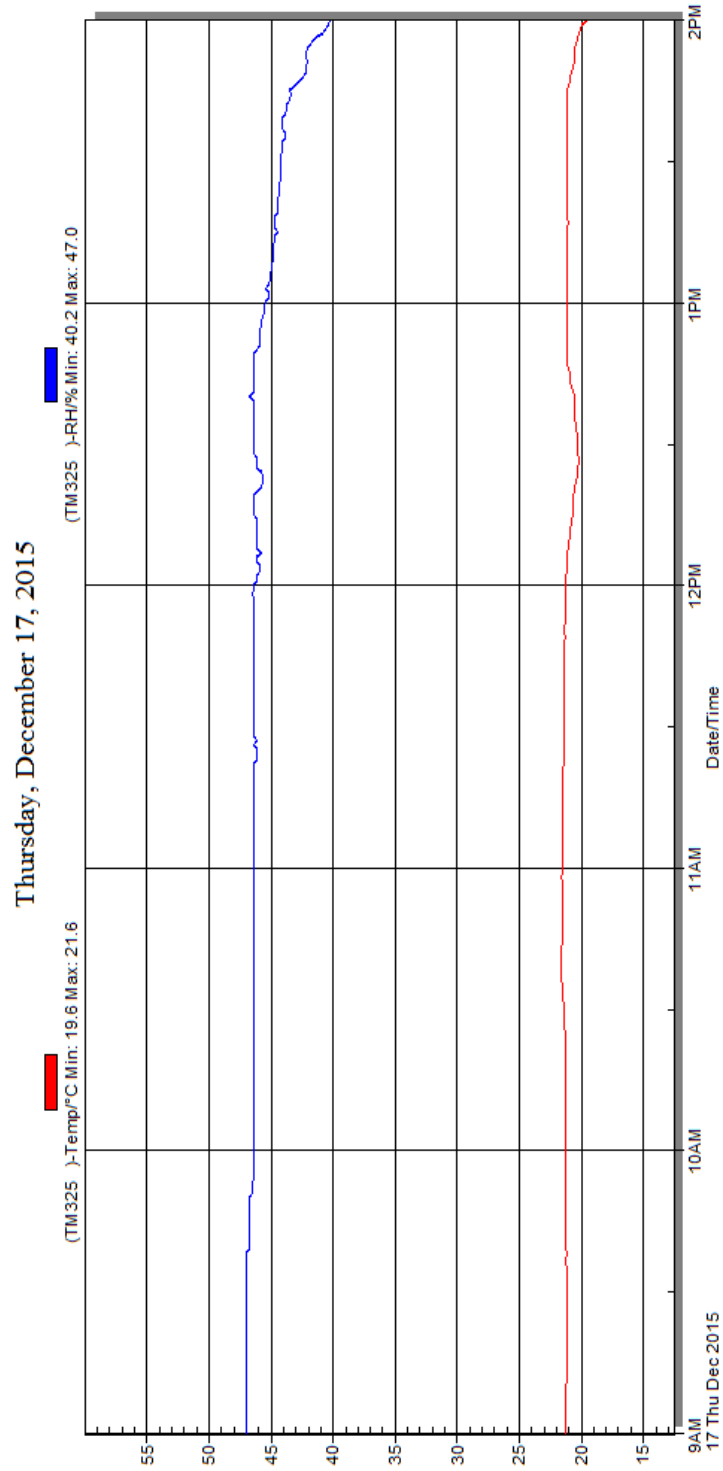
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2016 Chevrolet Colorado Crew Cab Pickup Truck
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20160100
Test Date: 12/17/2015



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

APPENDIX A
PHOTOGRAPHS

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



Figure A-1: Load Cell Location

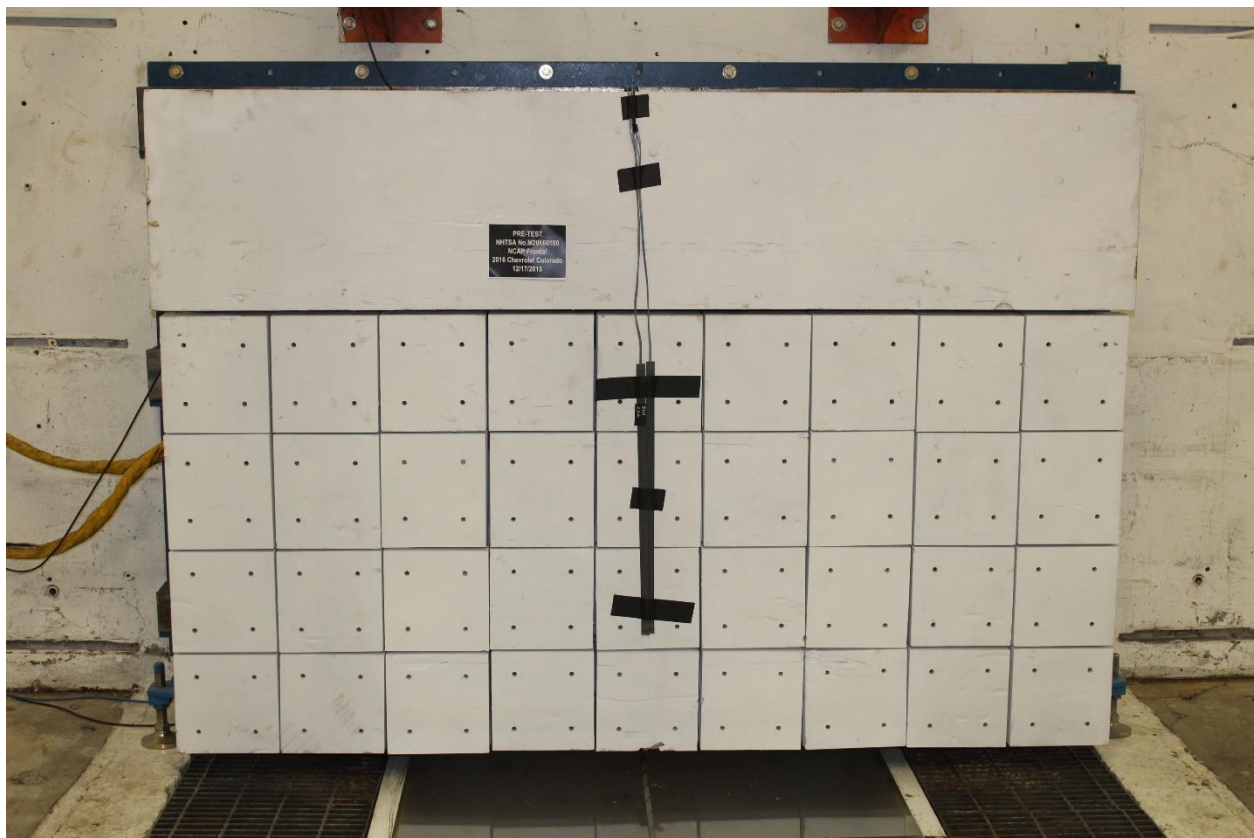


Figure A-2: Load Cell Wall

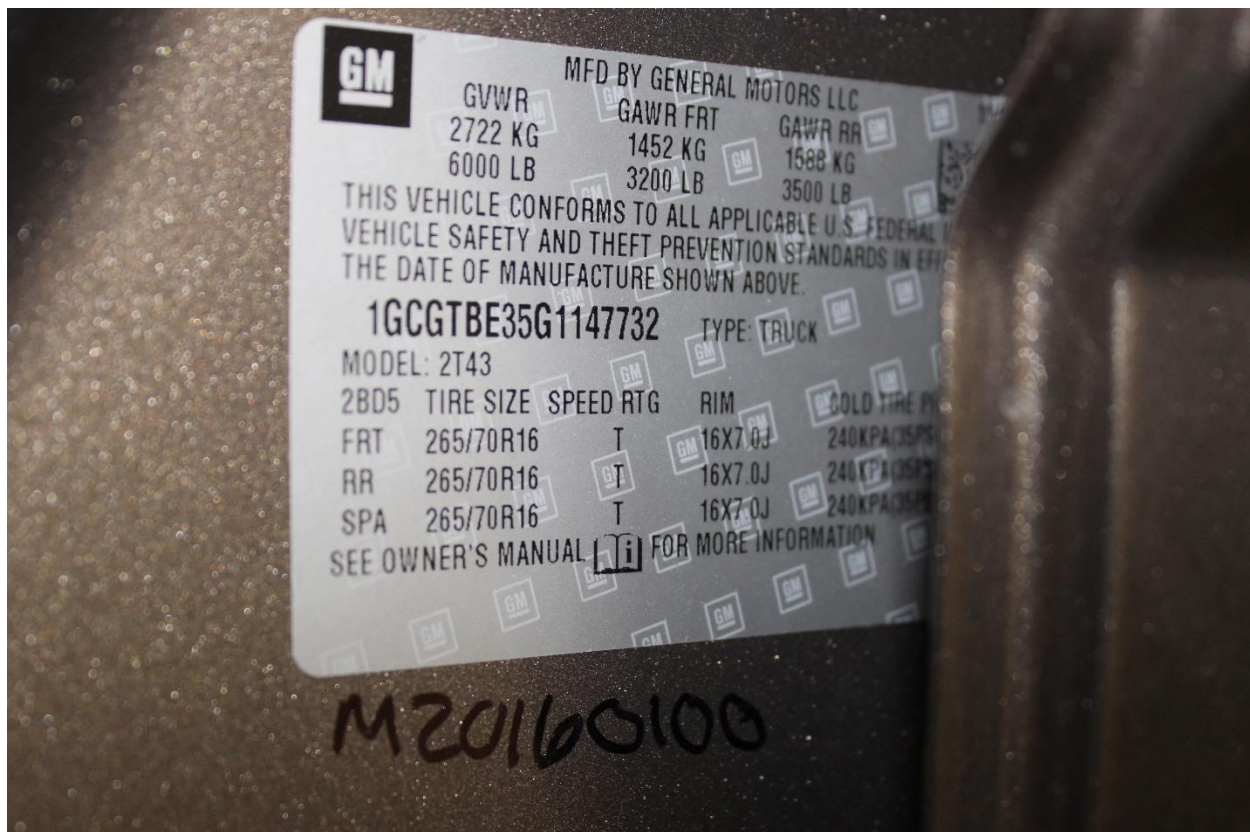


Figure A-3: Manufacturer's Label

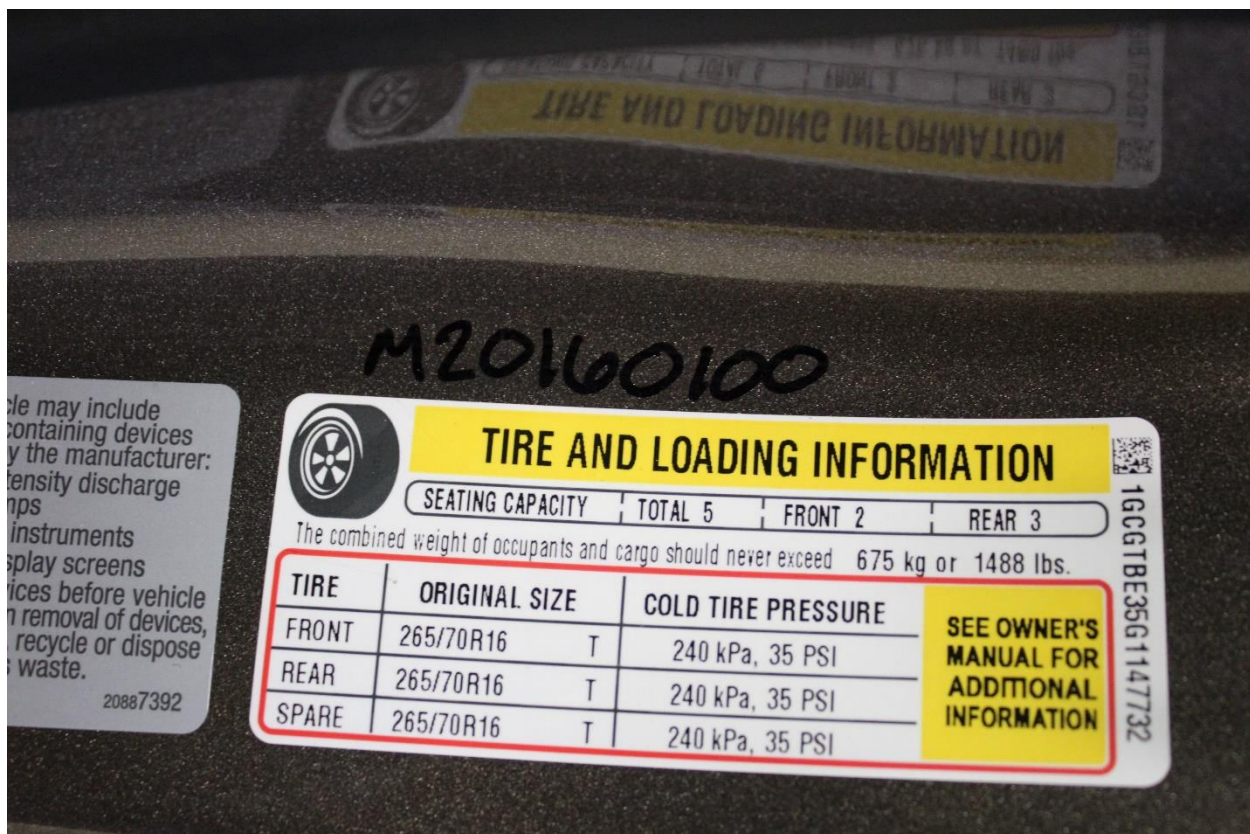


Figure A-4: Tire Placard



Figure A-5: 2016 Chevrolet Colorado Crew Cab Frontal As Delivered



Figure A-6: Left Rear 3-4 View, As Received



Figure A-7: Pre-Test Front View of Test Vehicle



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



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



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



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



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



Figure A-13: Pre-Test Right Front 3-4 View



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



Figure A-15: Pre-Test Left Rear 3-4 View



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



Figure A-17: Pre-Test Windshield View



Figure A-18: Post-Test Windshield View



Figure A-19: Pre-Test Engine Compartment View

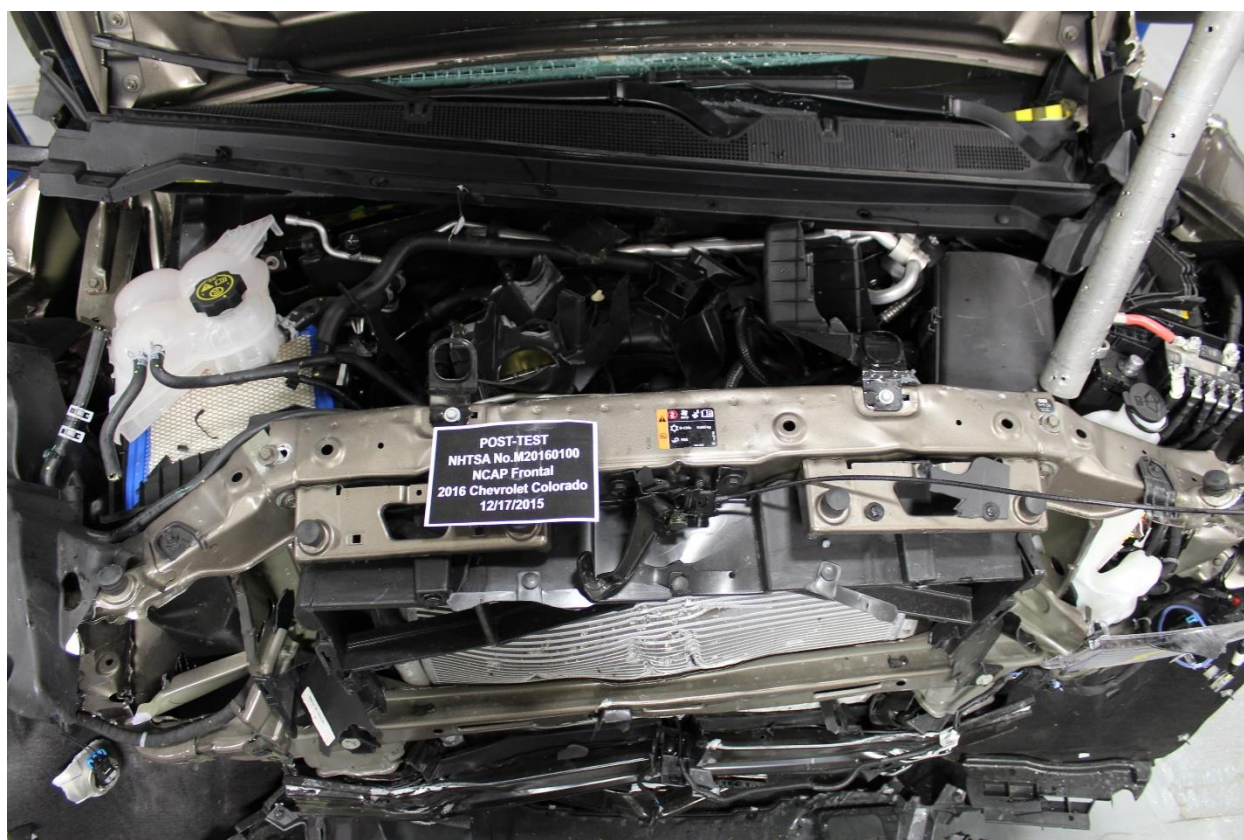


Figure A-20: Post-Test Engine Compartment View



Figure A-21: Pre-Test Fuel Filler Cap View



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



Figure A-23: Pre-Test Front Underbody View



Figure A-24: Post-Test Front Underbody View

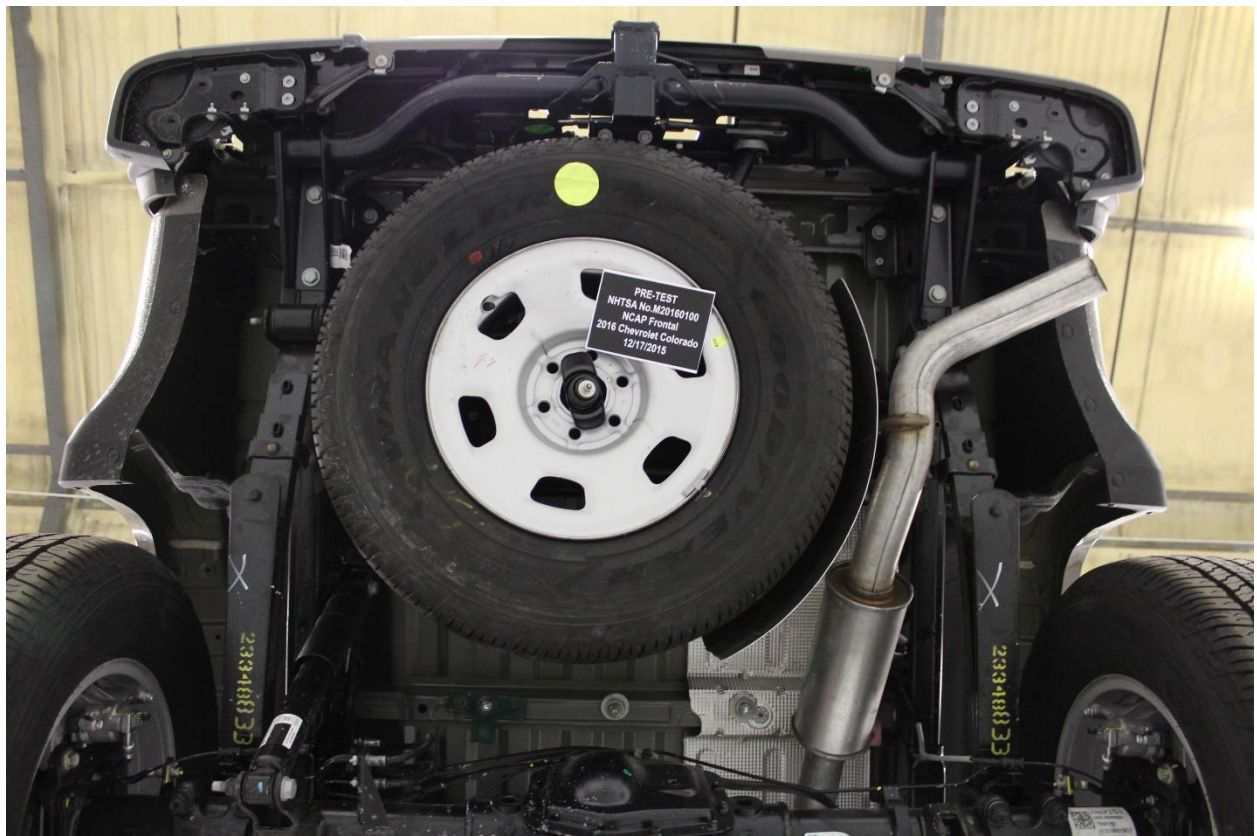


Figure A-25: Pre-Test Rear Underbody View



Figure A-26: Post-Test Rear Underbody View

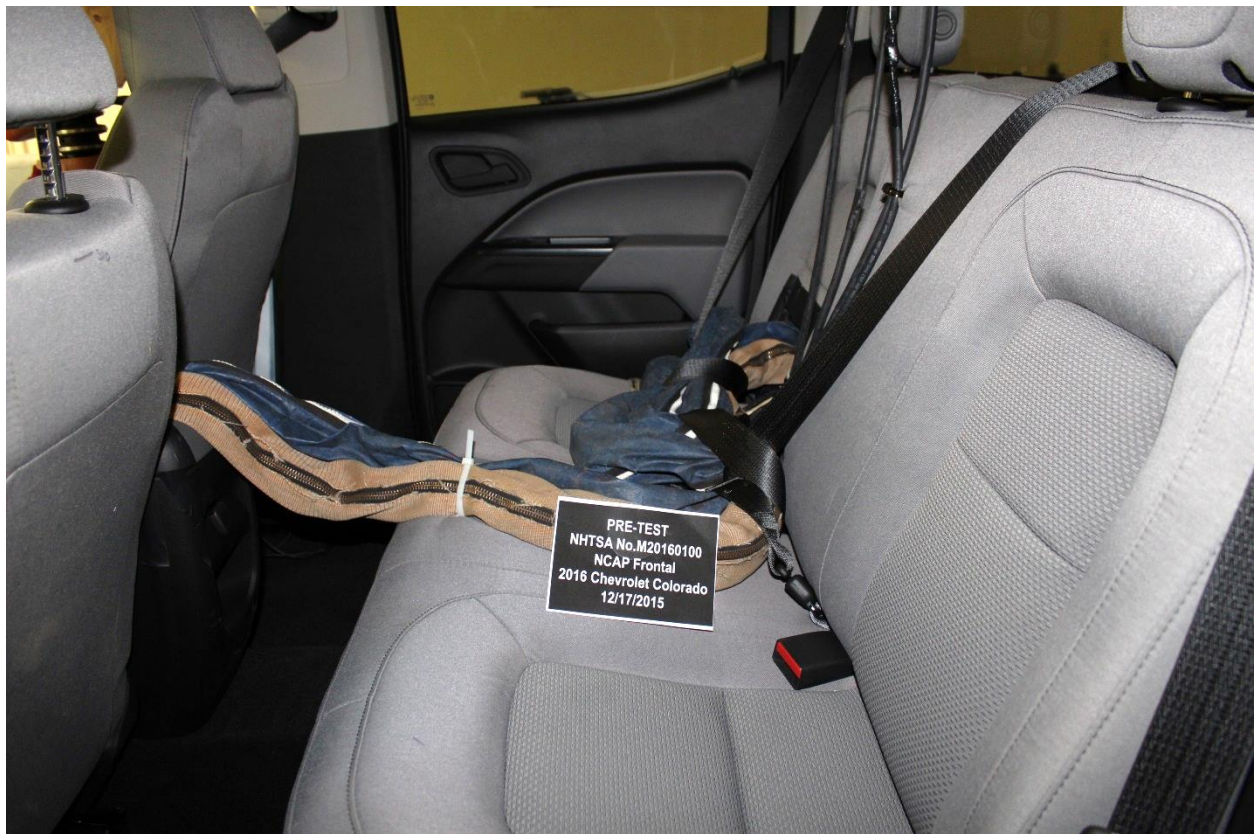


Figure A-27: Pre-Test Dummy Cable Routing

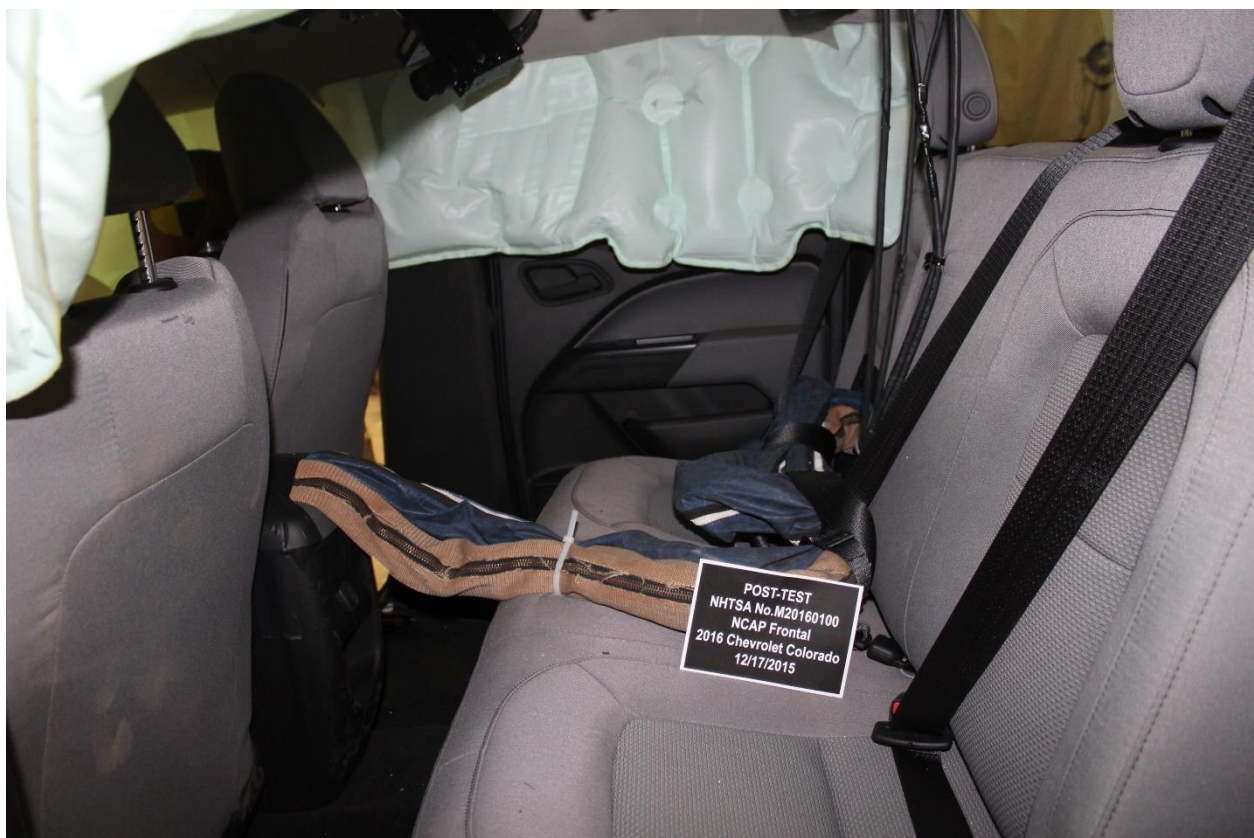


Figure A-28: Post-Test Dummy Cable Routing

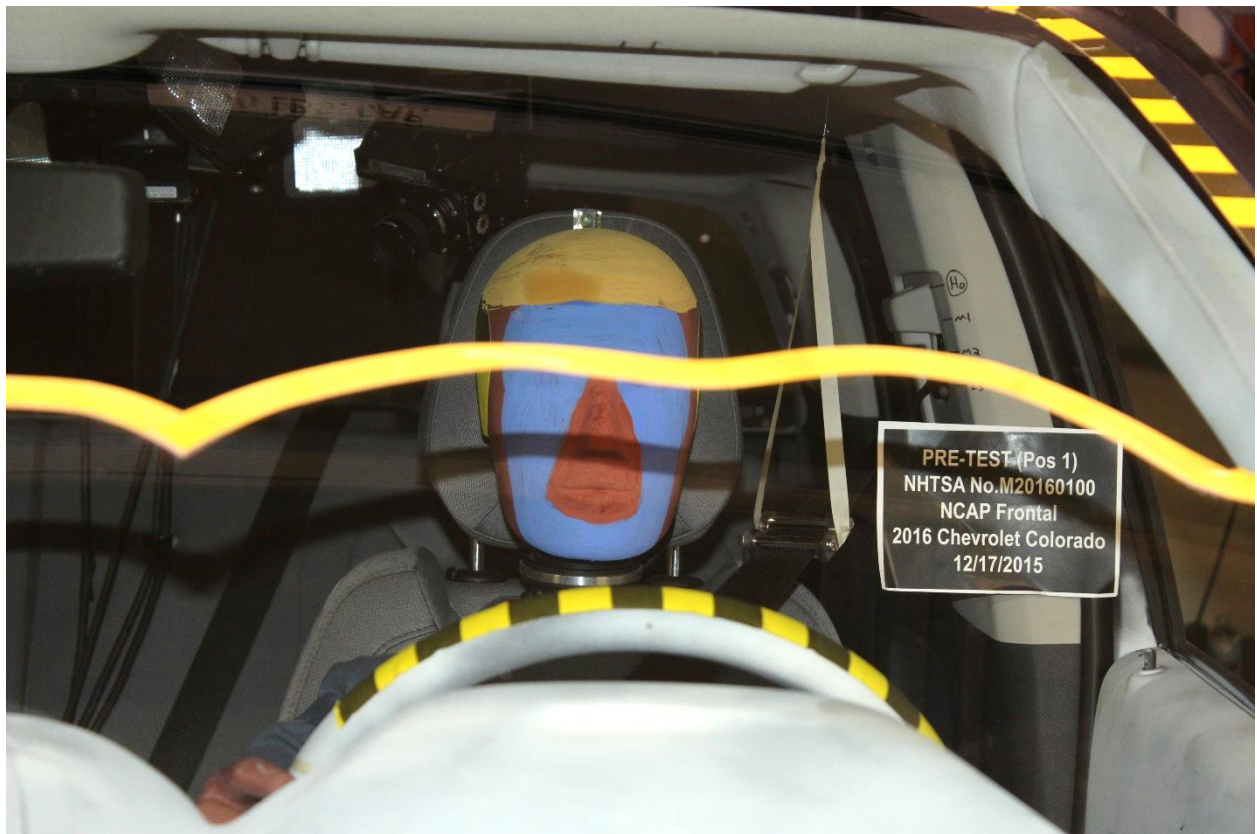


Figure A-29: Pre-Test Driver Dummy Front View



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



Figure A-31: Pre-Test Driver Dummy Window View



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



Figure A-33: Pre-Test Driver Dummy and Vehicle Interior View



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



Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings



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



Figure A-37: Pre-Test View of Belt Anchorage for Driver Dummy



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

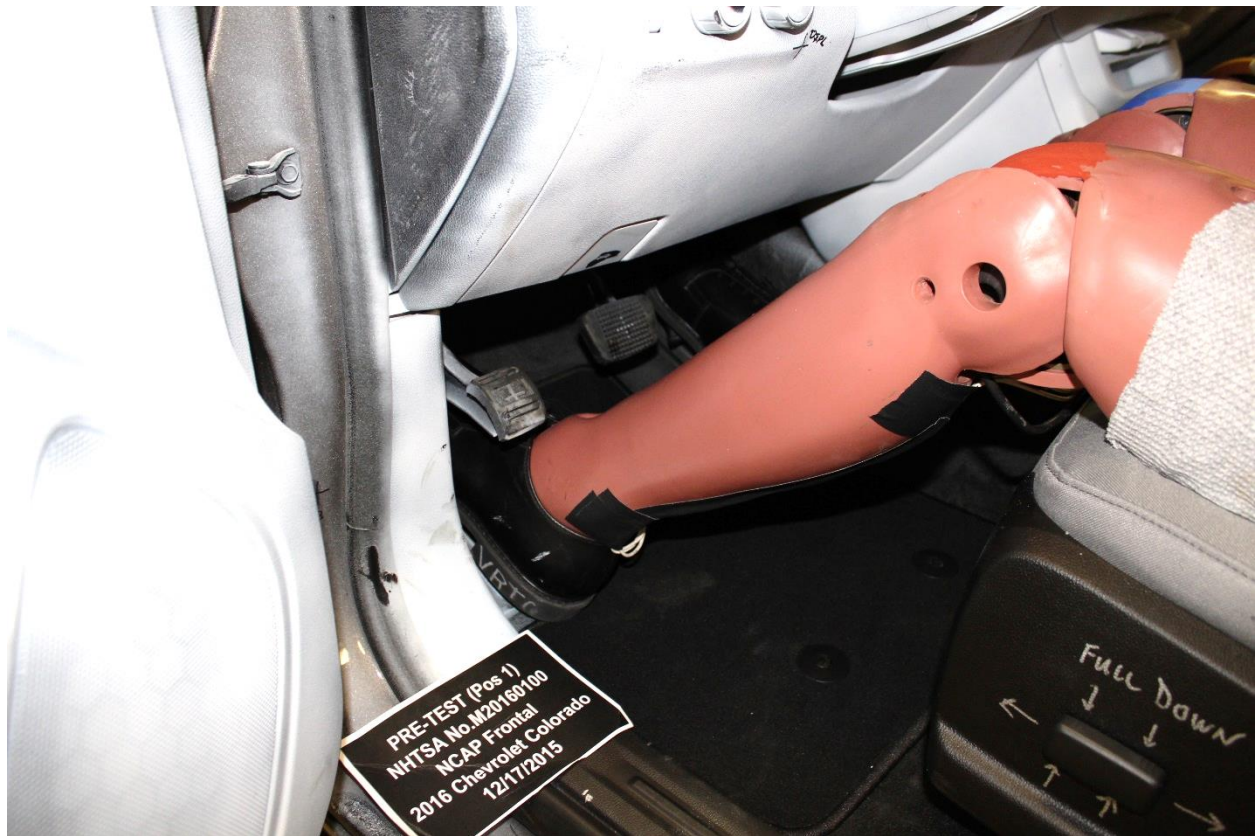


Figure A-39: Pre-Test Driver Dummy Feet



Figure A-40: Post-Test Driver Dummy Feet

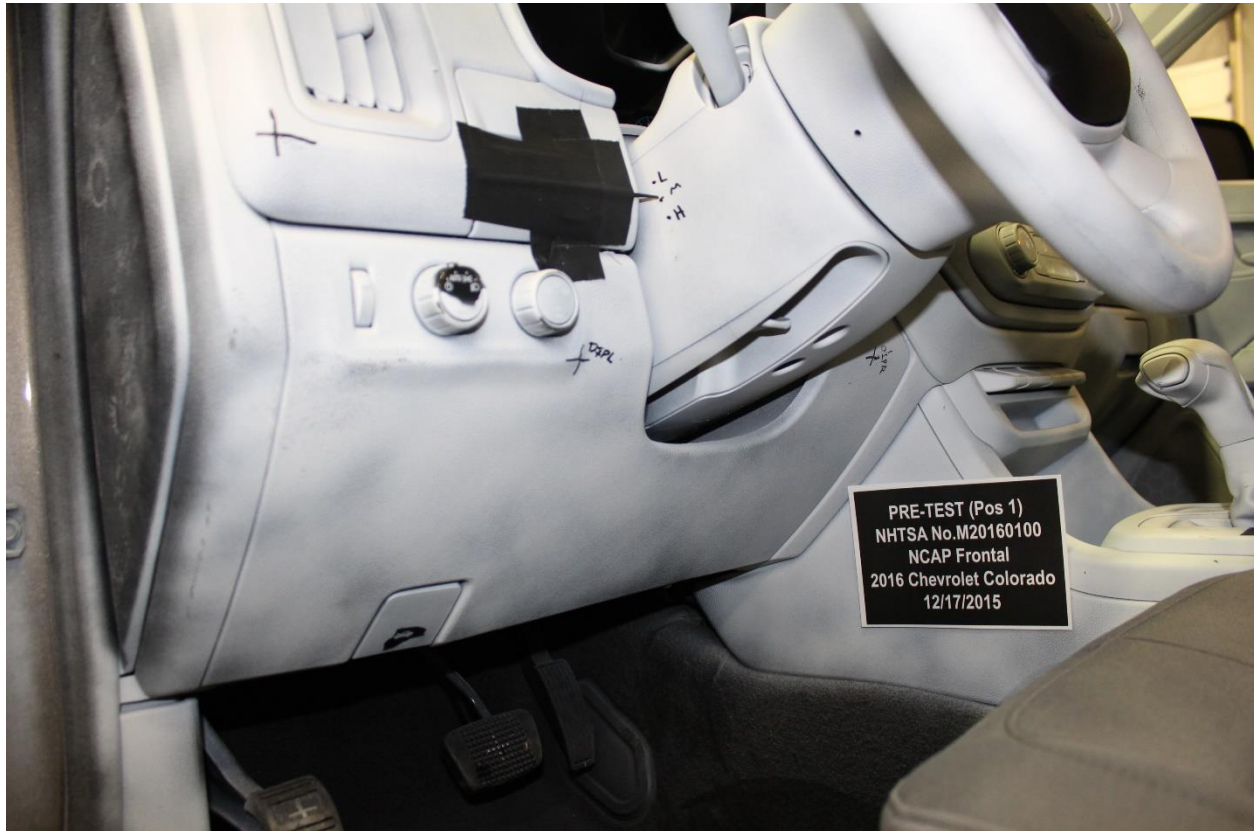


Figure A-41: Pre-Test Driver's Side Knee Bolster

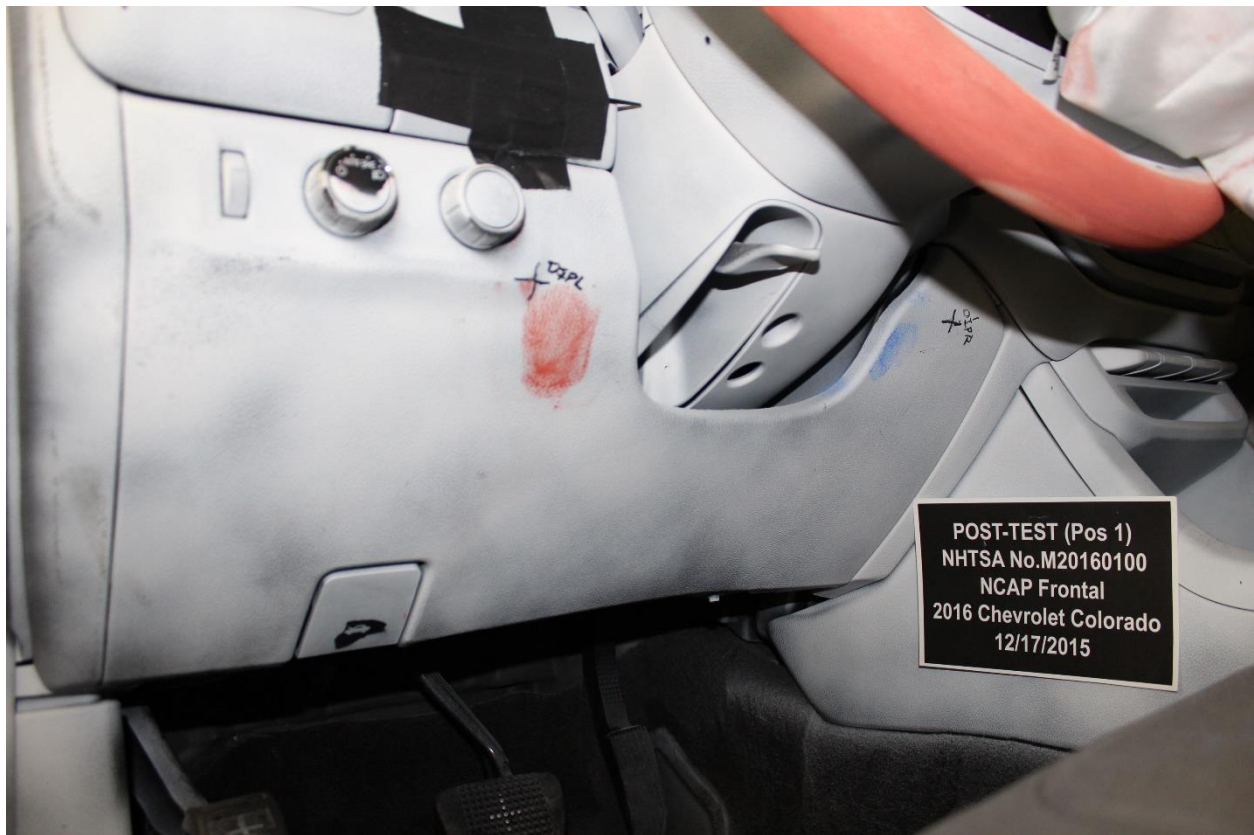


Figure A-42: Post-Test Driver's Side Knee Bolster



Figure A-43: Pre-Test Driver's Side Floorpan



Figure A-44: Post-Test Driver's Side Floorpan



Figure A-45: Post-Test Driver Dummy Face



Figure A-46: Post-Test Driver Dummy Contact With Airbag



Figure A-47: Post-Test Driver Dummy Contact With Headrest

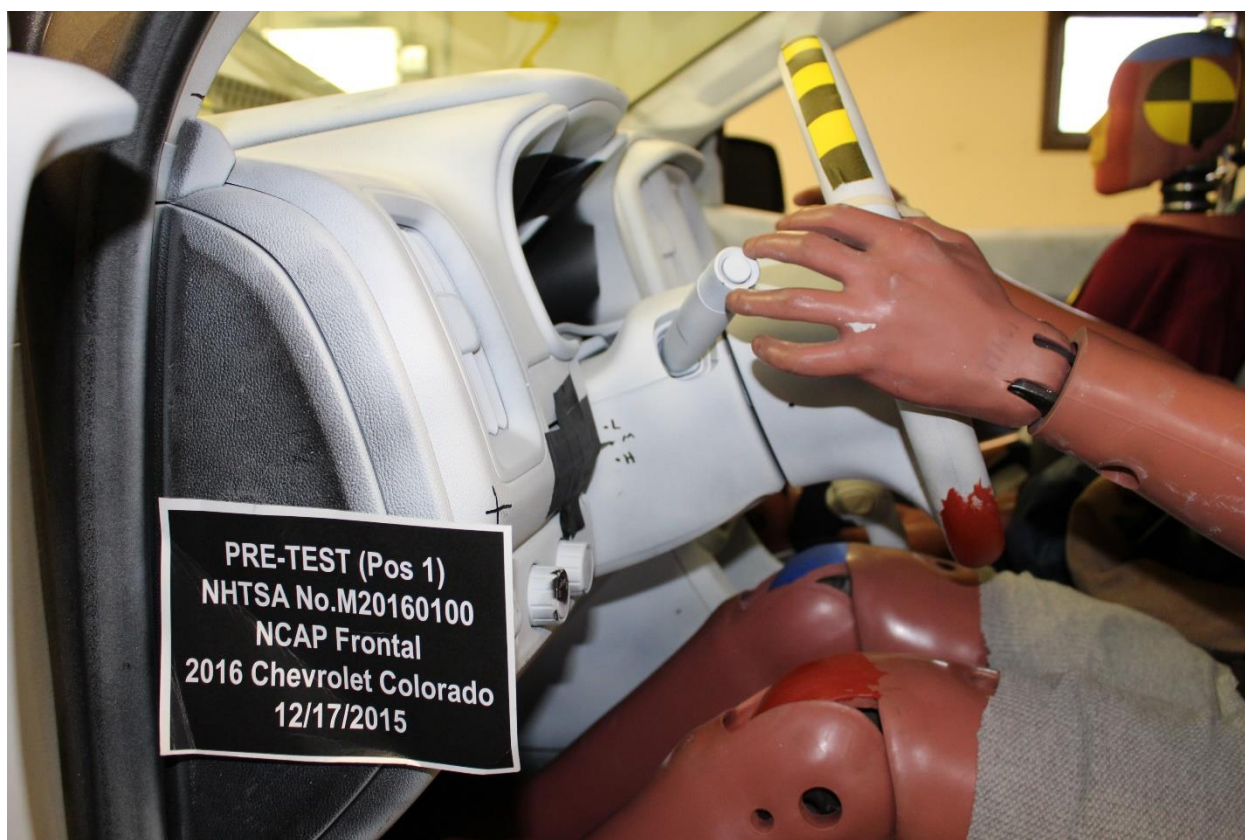


Figure A-48: Pre-Test View of the Steering Wheel



Figure A-49: Post-Test View of the Steering Wheel



Figure A-50: Pre-Test Passenger Dummy Front View

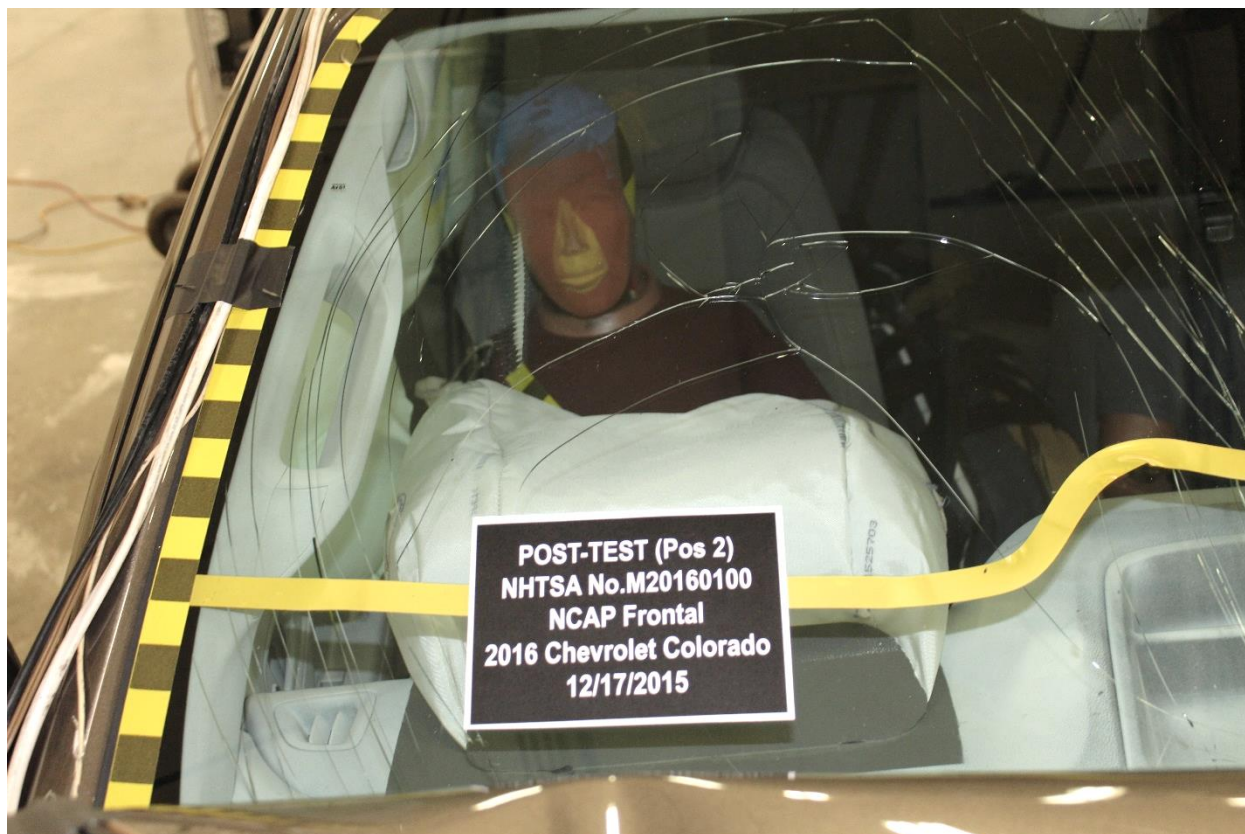


Figure A-51: Post-Test Passenger Dummy Front View



Figure A-52: Pre-Test Passenger Dummy Window View



Figure A-53: Post-Test Passenger Dummy Window View



Figure A-54: Pre-Test Passenger Dummy and Vehicle Interior View



Figure A-55: Post-Test Passenger Dummy and Vehicle Interior View



Figure A-56: Pre-Test Passenger's Seat Fore-Aft Markings



Figure A-57: Post-Test Passenger's Seat Fore-Aft Markings

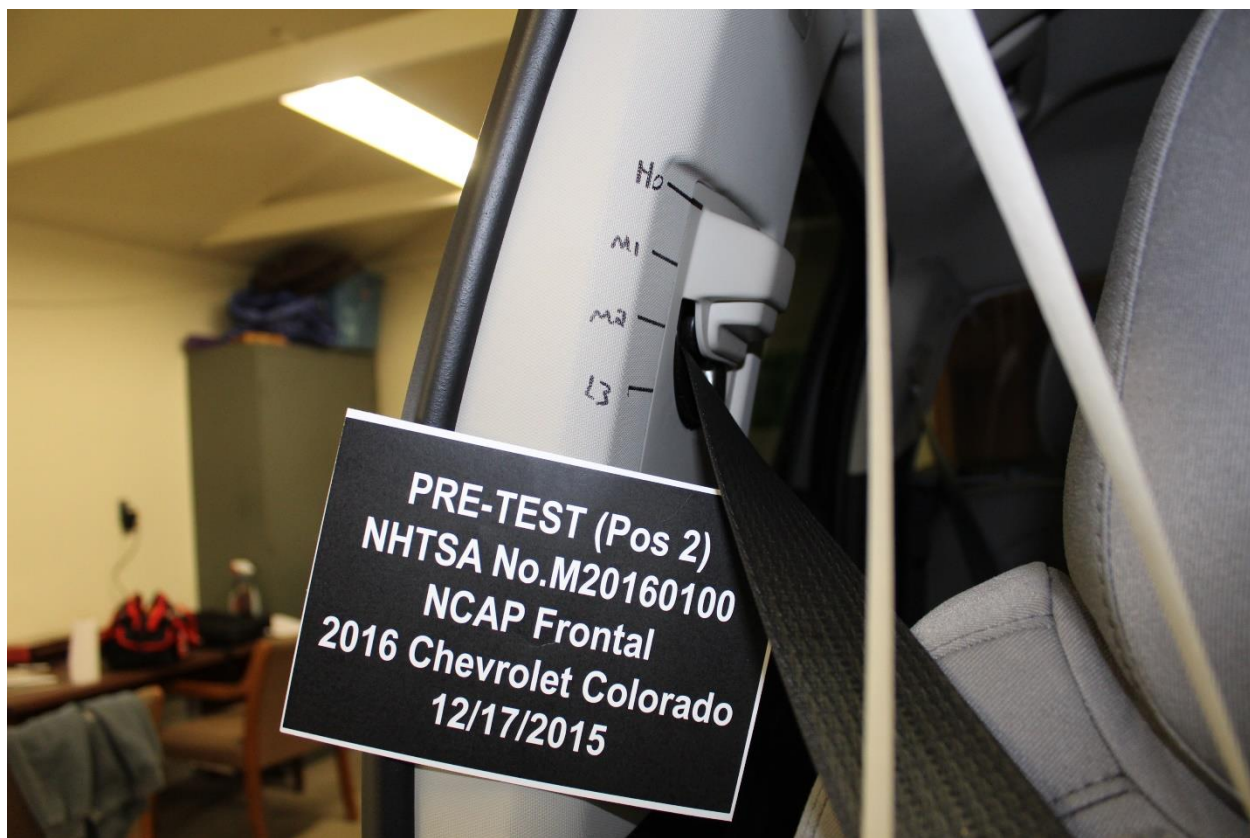


Figure A-58: Pre-Test View of Belt Anchorage for Passenger Dummy



Figure A-59: Post-Test View of Belt Anchorage for Passenger Dummy



Figure A-60: Pre-Test Passenger Dummy Feet

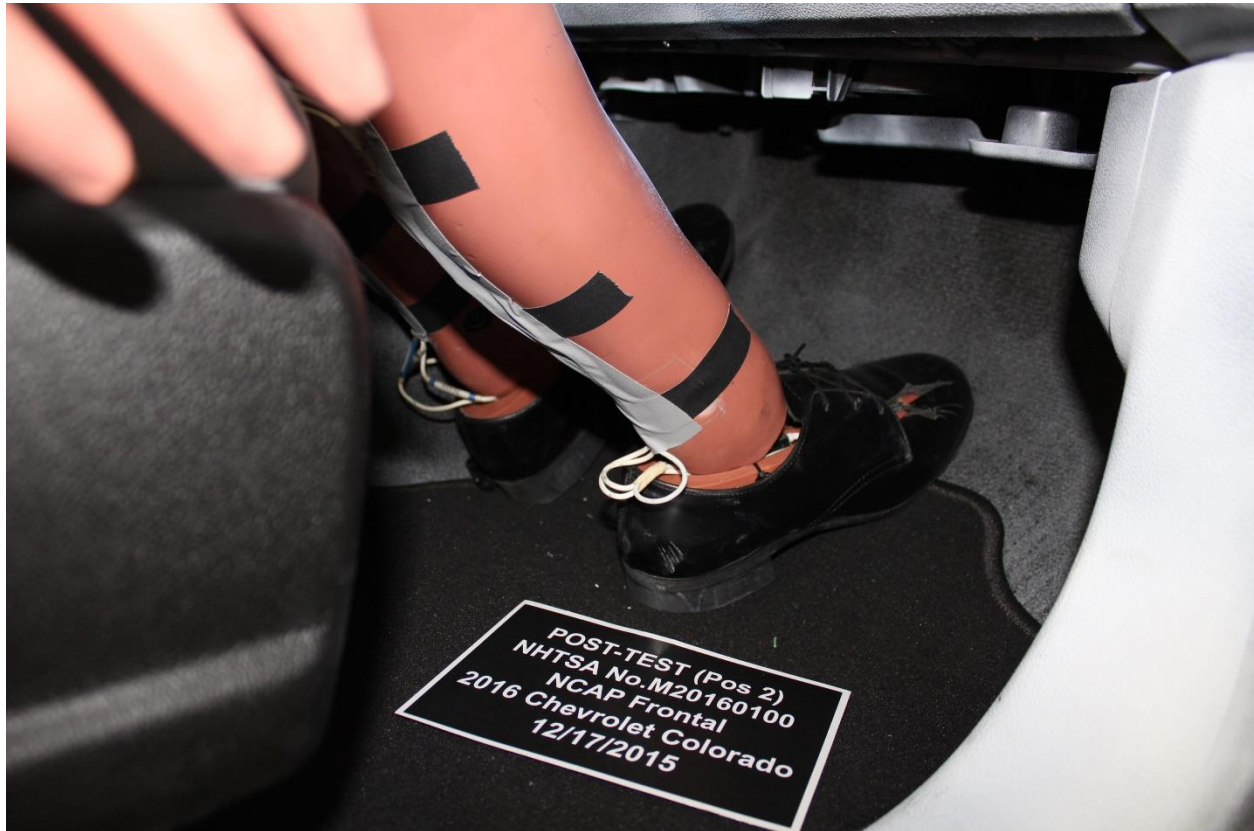


Figure A-61: Post-Test Passenger Dummy Feet



Figure A-62: Pre-Test Passenger's Side Knee Bolster



Figure A-63: Post-Test Passenger's Side Knee Bolster



Figure A-64: Pre-Test Passenger's Side Floorpan



Figure A-65: Post-Test Passenger's Side Floorpan



Figure A-66: Post-Test Passenger Dummy Face



Figure A-67: Post-Test Passenger Dummy Contact With Airbag



Figure A-68: Post-Test Passenger Dummy Contact With Headrest

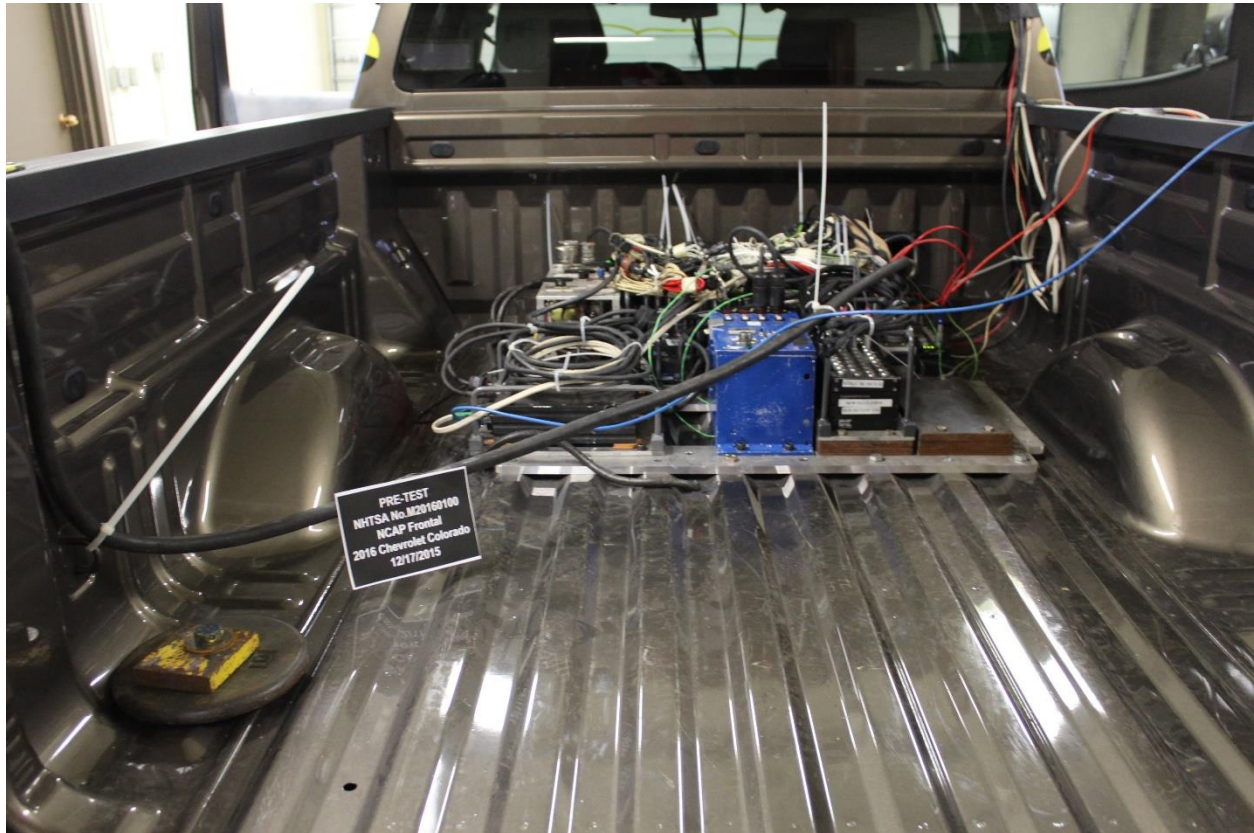


Figure A-69: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

Figure A-70: Post-Test Stoddard Solvent Spillage Location View, If Required



Figure A-71: Post-Test Speed Trap Read-Out



Figure A-72: Vehicle at 0° on Static Rollover Device



Figure A-73: Vehicle at 90° on Static Rollover Device



Figure A-74: Vehicle at 180° on Static Rollover Device



Figure A-75: Vehicle at 270° on Static Rollover Device



Figure A-76: Vehicle at 360° on Static Rollover Device



Figure A-77: 2016 Chevrolet Colorado Crew Cab Frontal Impact Event

**2016 COLORADO 4WD WT
CREW LONG BOX**

EXTERIOR: BROWNSTONE METALLIC
INTERIOR: JET BLACK / DARK ASH

ENGINE: 3.6L SIDI DOHC V6 VVT
TRANSMISSION: 6-SPD AUTOMATIC

STANDARD EQUIPMENT

ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE (\$30,305).

- CHEVROLET COMPLETE CARE
- SEE WWW.CHEVY.COM OR DEALER FOR TERMS, DETAILS & LIMITS
- TWO MAINTENANCE VISITS
- OIL & FILTER CHANGE
- 4-WHEEL TIRE ROTATION
- 27 POINT INSPECTION
- 3 YR/36,000 MILES BUMPER-TO-BUMPER WARRANTY
- 5 YR/60,000 MILES POWERTRAIN LIMITED WARRANTY
- ROADSIDE ASSISTANCE
- COURTESY TRANSPORTATION

MECHANICAL

- ENGINE: 3.6L SIDI DOHC V6 VVT
- TRANSMISSION: 6-SPD AUTOMATIC
- TRANS CASE: ELECTRIC, 2-SPD

SAFETY & SECURITY

- REAR VISION CAMERA

AIRBAGS: DRIVER & RT. FRONT PASS - FRONT/SIDE-IMPACT, OUTBOARD FR & REAR SEAT

- STABILITRAK: STABILITY CONTROL SYSTEM W/ TRACTION CONTROL
- BRAKES, 4-WHEEL ANTILOCK, 4-WHEEL DISC W/ DURALIFE ROTORS

EXTERIOR

- TAILGATE, LOCKING
- CORNERSTEP, REAR BUMPER
- MIRRORS, OUTSIDE WITH MANUAL FOLDING
- HEADLAMPS, HALOGEN
- RECOVERY HOOPS, FRONT
- WHEELS, 16" ULTRA SILVER METALLIC STEEL
- TIRES, ALL-SEASON, BLACKWALL
- SPARE WHEEL, 16" STEEL
- TIRE, 16" SPARE, ALL SEASON

INTERIOR

- SEAT ADJUST, DRIVER 4-WAY PWR
- REAR SEAT, FOLDING BENCH
- SEATS, FRONT BUCKET
- POWER WINDOW W/ EXPRESS DRIVER UP/DOWN
- COLOR KEYED CARPET
- AIR CONDITIONING
- MIRROR, MANUAL INSIDE RR VIEW
- VISORS, DRIVER & FRONT PASS.
- W/ PASSENGER VANITY MIRROR
- CLOTH FRONT & REAR SEATS

CONNECTIVITY FEATURES

- AUDIO SYSTEM, W/ 4.2" DIAGONAL COLOR SCREEN
- USB PORT INSTRUMENT PANEL

OPTIONS & PRICING

MANUFACTURER'S SUGGESTED RETAIL PRICE

STANDARD VEHICLE PRICE \$30,305.00

OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN)

WT CONVENIENCE PACKAGE INCL: 490.00

- REMOTE KEYLESS ENTRY
- CRUISE CONTROL
- EZ LIFT AND LOWER TAILGATE
- CONTENT THEFT ALARM, THEFT DETERRENT SYSTEM

WORK TRUCK APPEARANCE PACKAGE 435.00

INCLUDES:

- SPOTTER MIRROR, DRIVER SIDE
- MOLDINGS, CHROME BELTLINE
- OUTSIDE DOOR HANDLES BODY COLOR
- DUAL POWER OUTSIDE MIRRORS, POWER ADJUST, MANUAL FOLD
- WHEELS, 16" ULTRA SILVER METALLIC CAST ALUMINUM
- BUMPER, REAR BODY-COLOR
- DIFFERENTIAL, LOCKING REAR
- FULLY AUTOMATIC
- TRAILERING EQUIPMENT PACKAGE: 250.00

Visit us at www.chevy.com

TOTAL OPTIONS	\$1,500.00
TOTAL VEHICLE & OPTIONS	\$31,805.00
DESTINATION CHARGE	895.00
TOTAL VEHICLE PRICE*	\$32,700.00

EPA DOT Fuel Economy and Environment

Fuel Economy

20 MPG combined city/hwy

17 city 24 highway

5.0 gallons per 100 miles

You spend \$2,250 more in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$2,250

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

4 (1 to 10 scale)

Smog Rating (tailpipe only)

6 (1 to 10 scale)

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

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE:
U.S./CANADIAN PARTS CONTENT: 61%
MAJOR SOURCES OF FOREIGN PARTS CONTENT: THAILAND 15%

NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

FOR THIS VEHICLE:
FINAL ASSEMBLY POINT: WENTZVILLE, MO U.S.A.
COUNTRY OF ORIGIN: U.S.A.
ENGINE: UNITED STATES
TRANSMISSION: UNITED STATES

ORDER NO SUPPORT: 36418 CODE E
SALES MODEL: CORV 12140
DEALER NO 00991
FINAL ASSEMBLY: WENTZVILLE, MO U.S.A.
VIN 1GCGTBE35G1147732
DEALER TO WHOM ORDERED: JEFF WYLER CHEVROLET
PO BOX 345
BATAVIA, OH 45103-0345

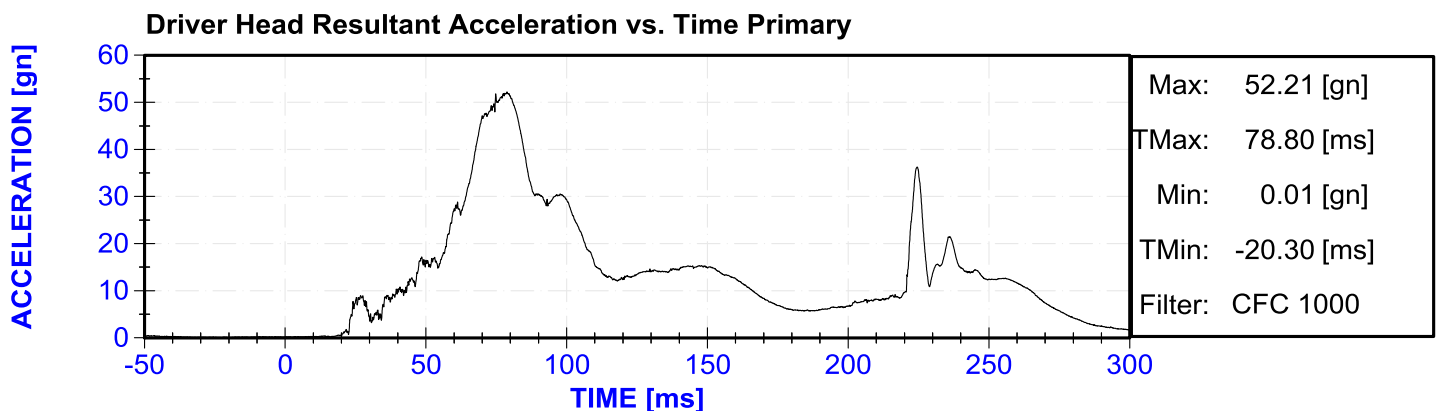
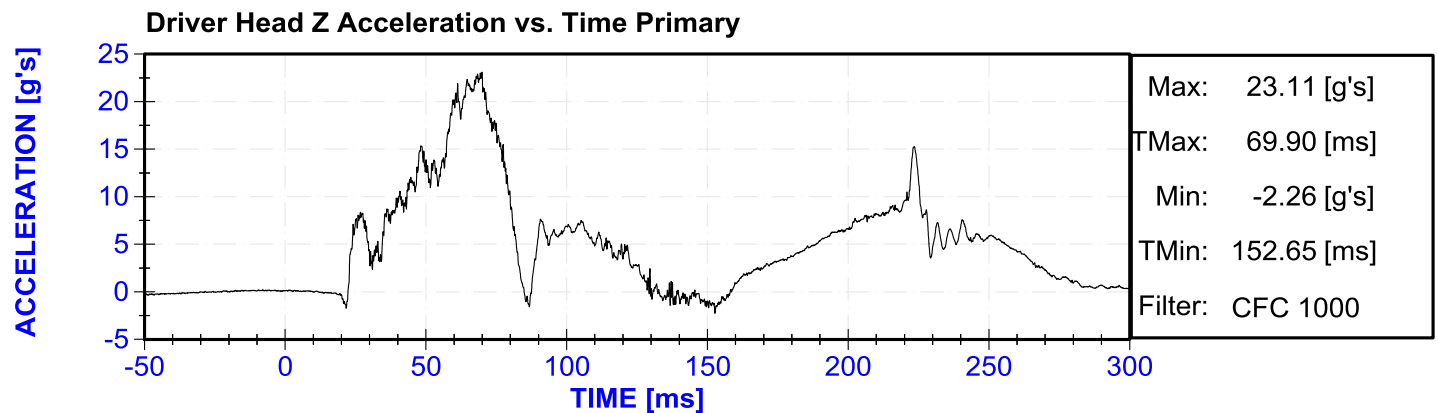
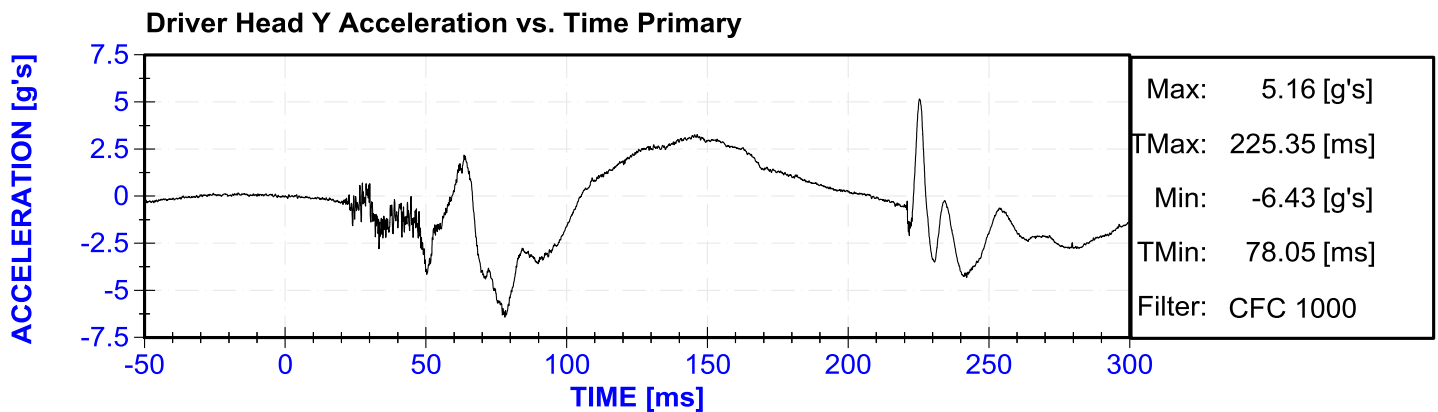
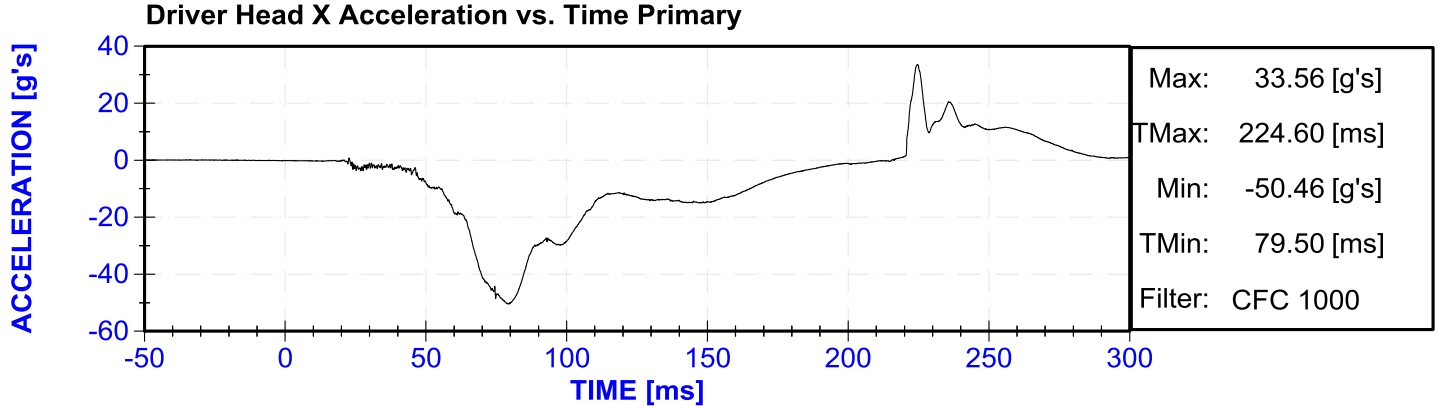
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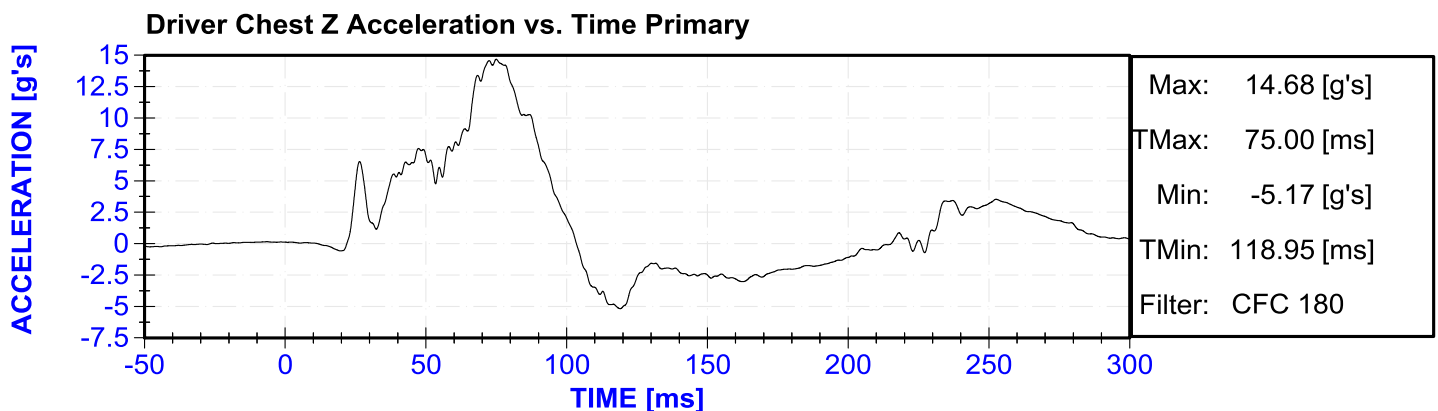
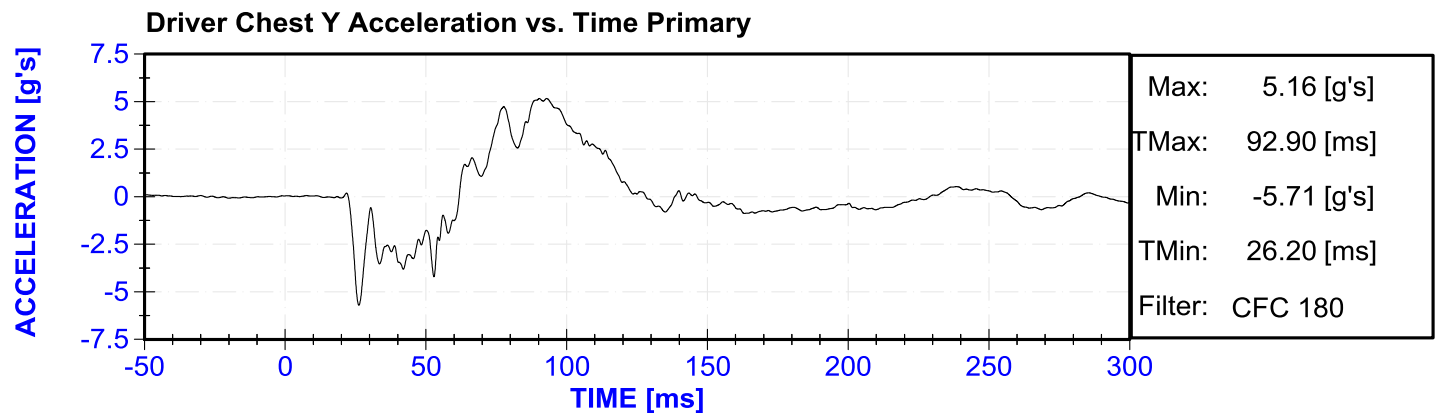
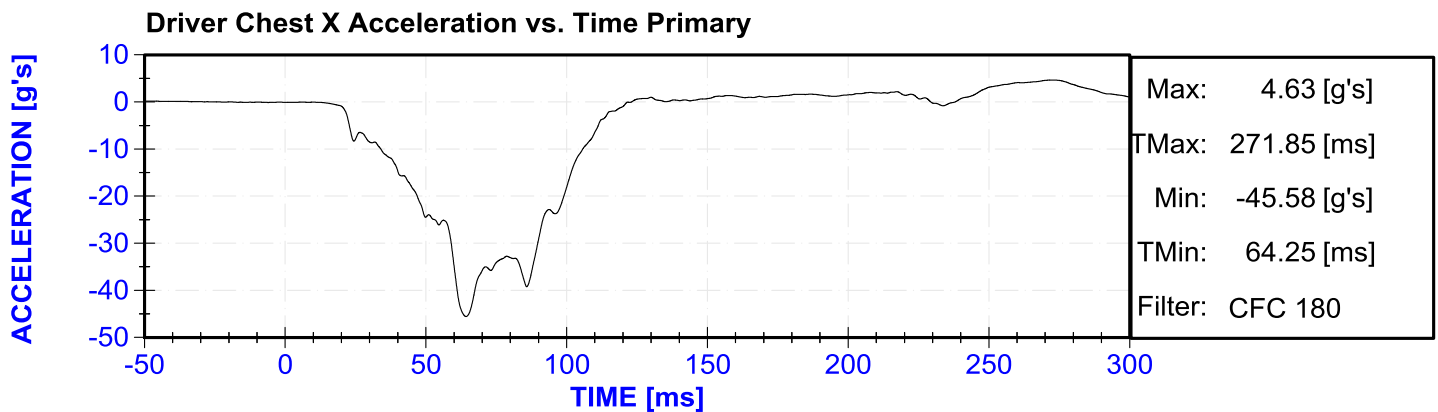
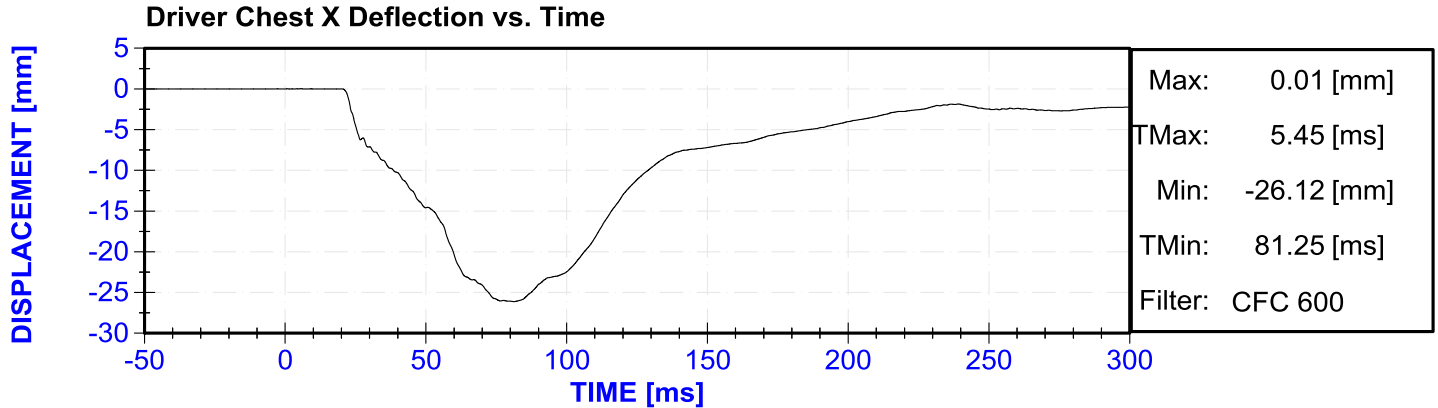
Figure A-78: Monroney Label Photograph

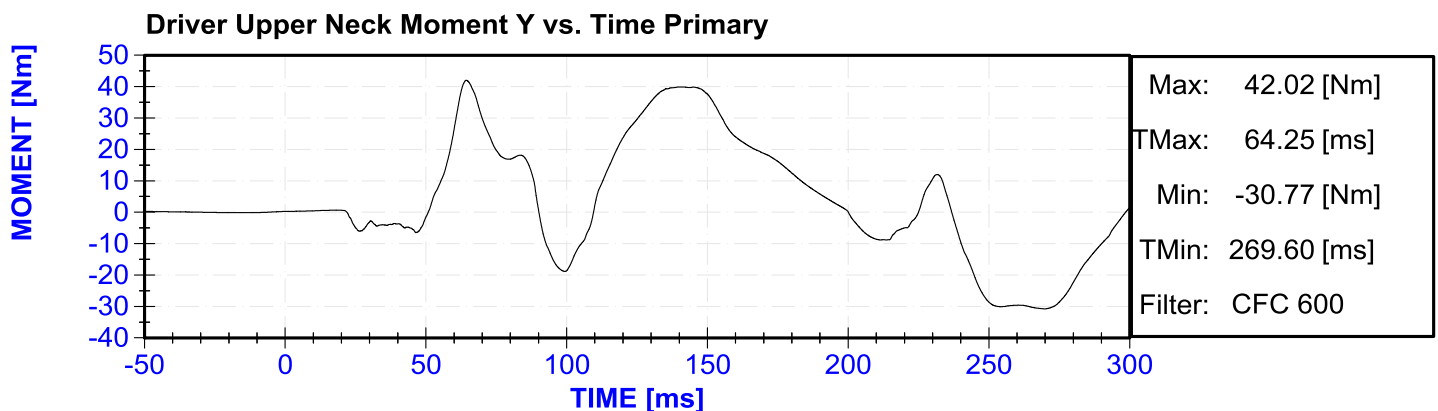
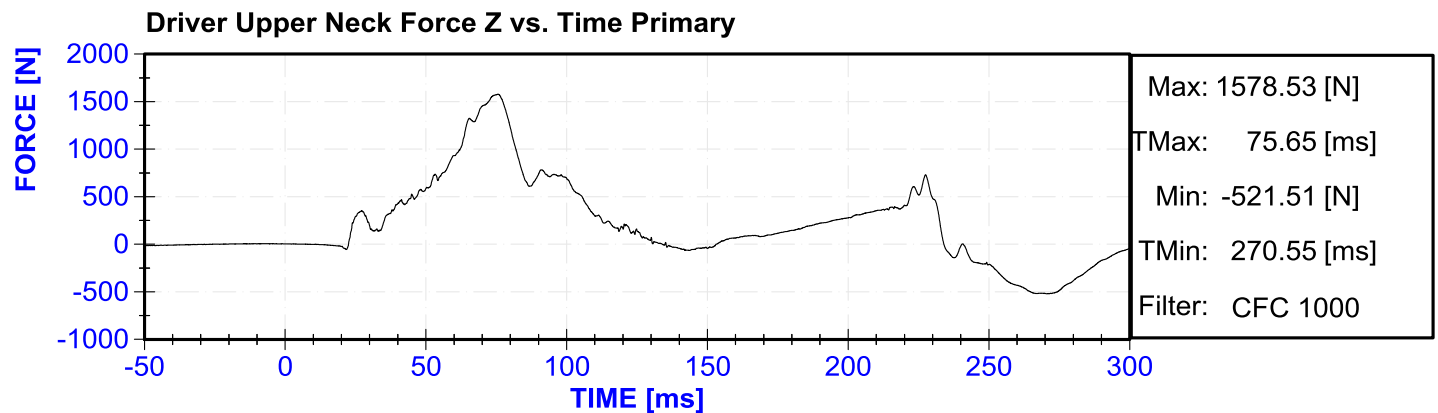
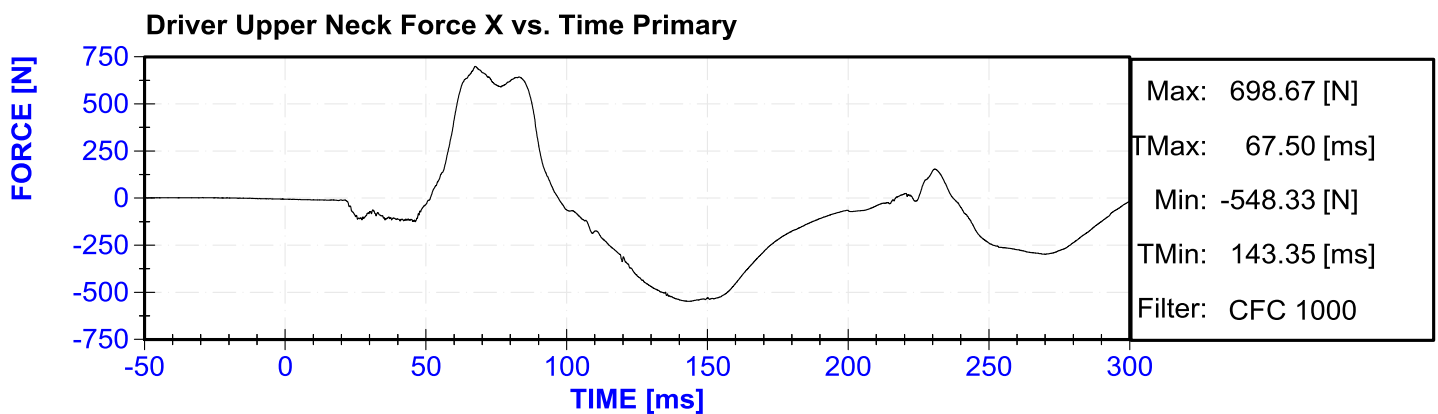
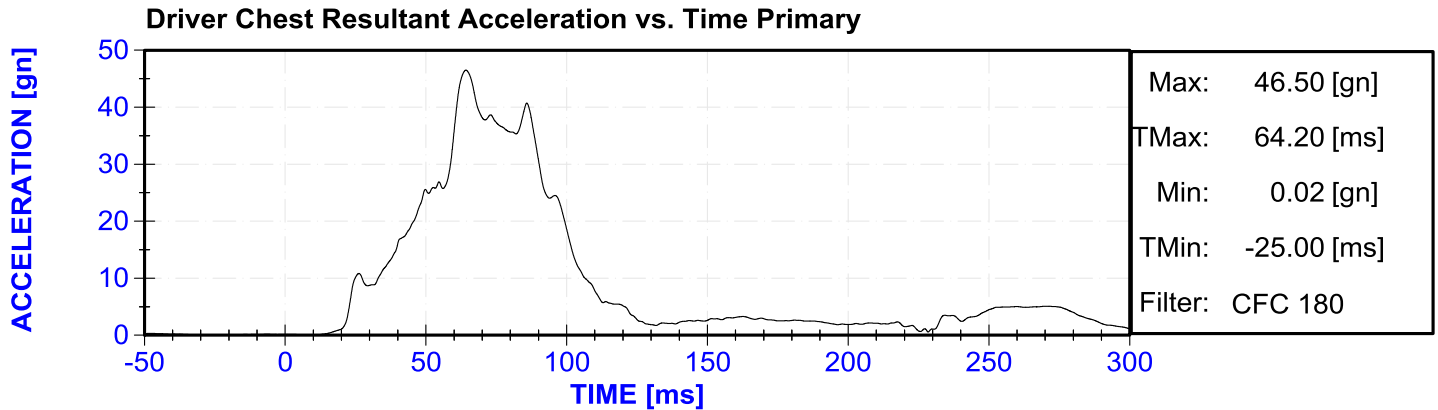
APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

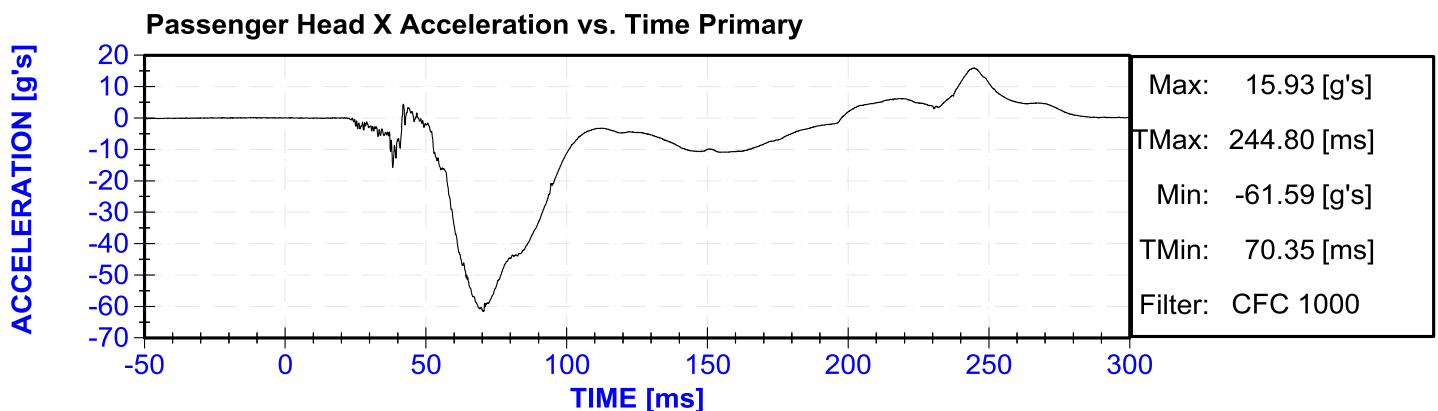
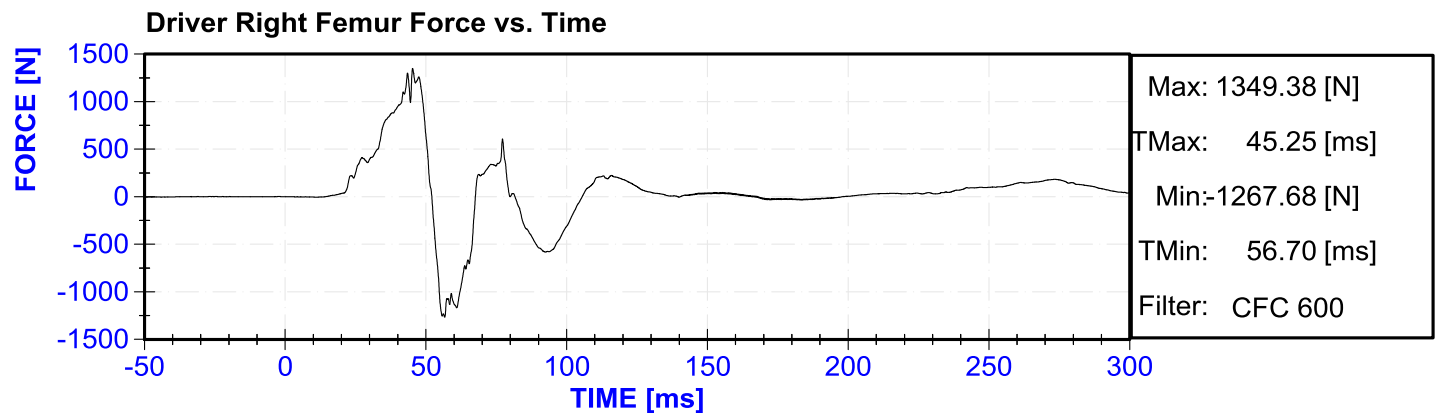
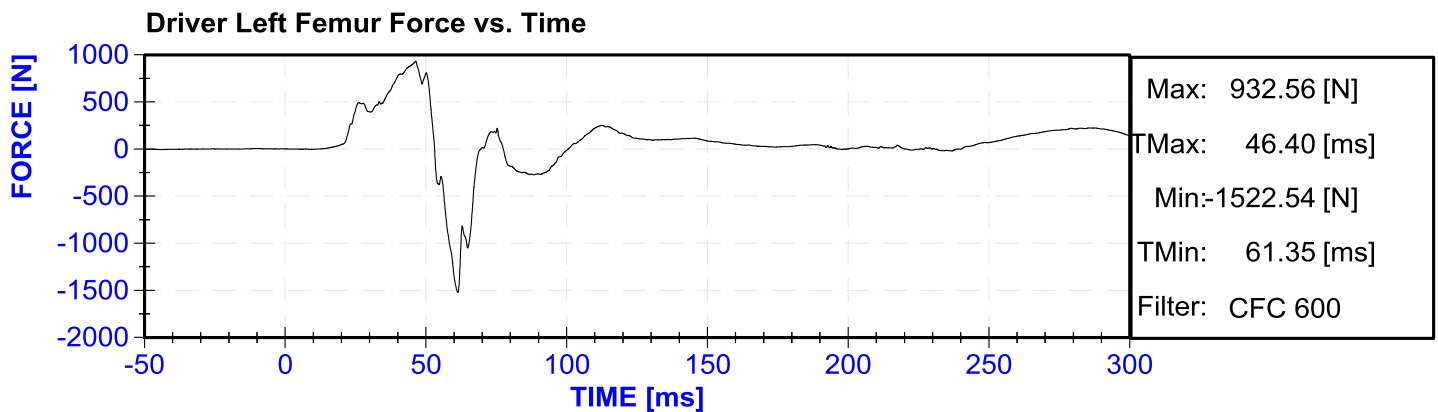
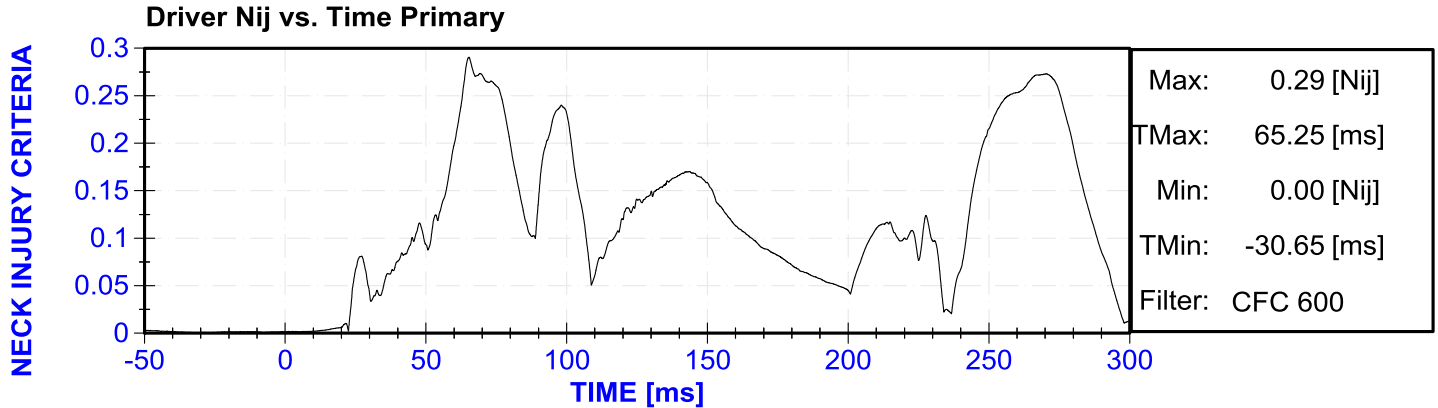
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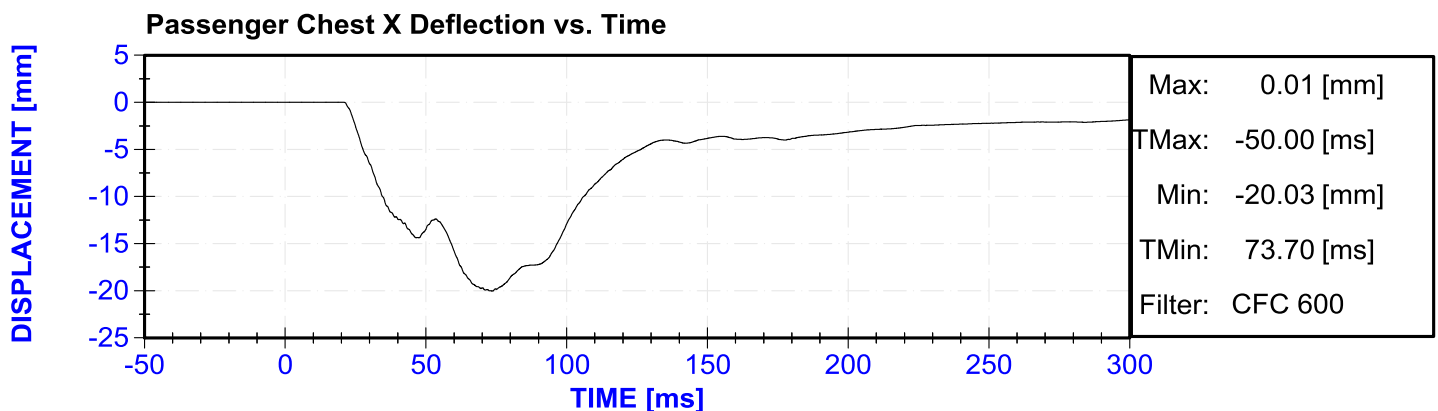
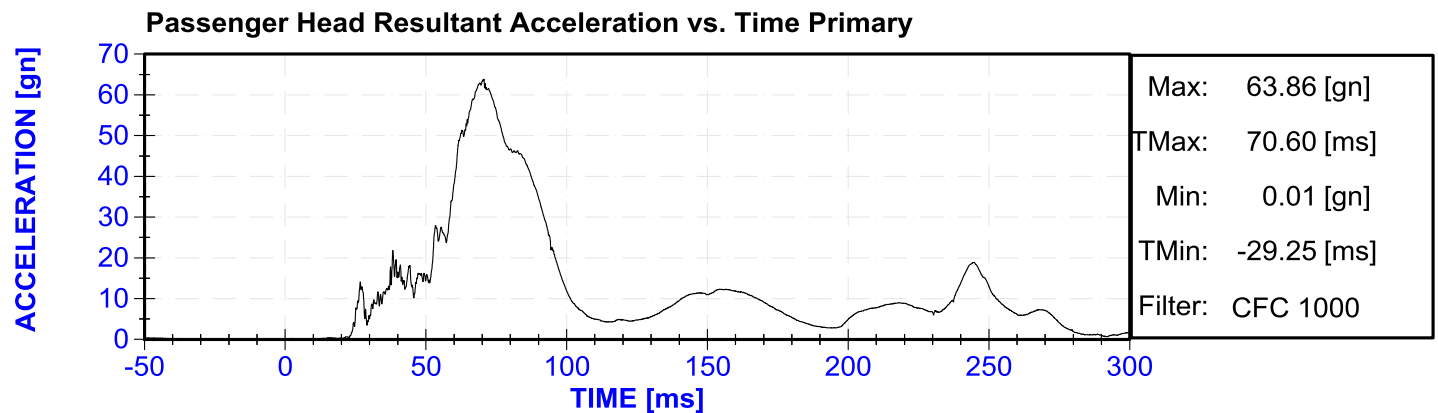
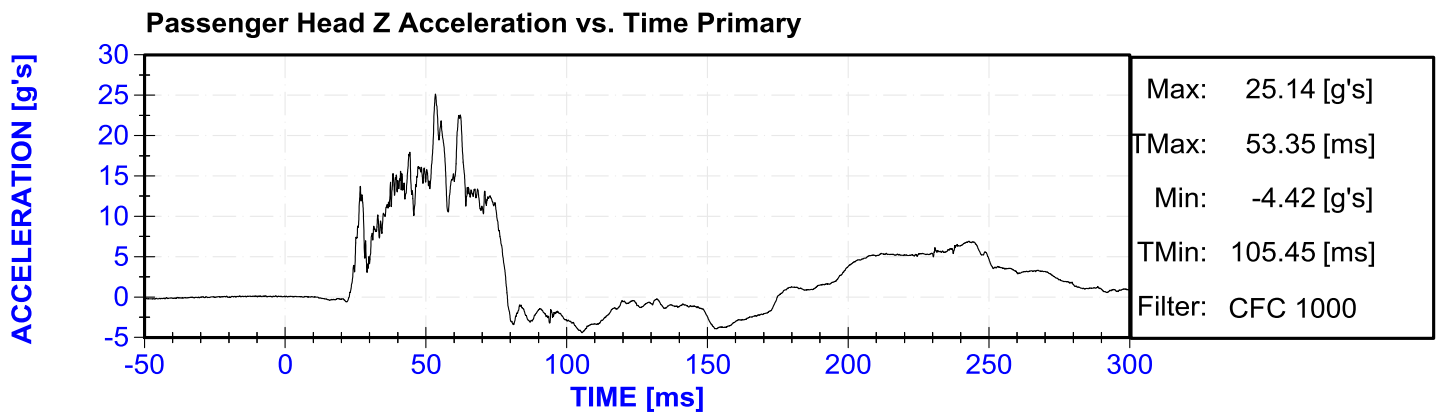
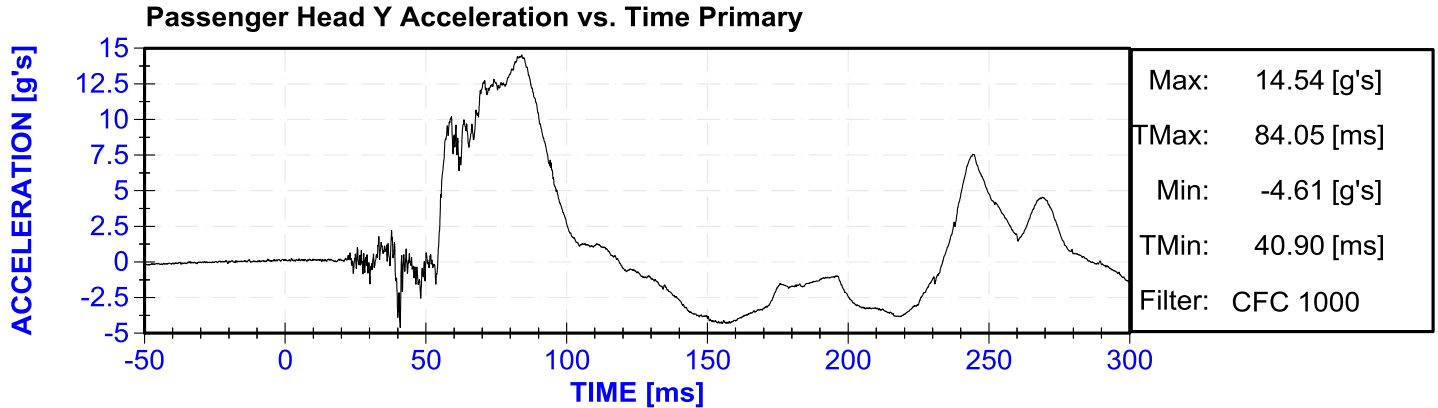
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Plot 2	Driver Head Y Acceleration vs. Time Primary	B-3
Plot 3	Driver Head Z Acceleration vs. Time Primary	B-3
Plot 4	Driver Head Resultant Acceleration vs. Time Primary	B-3
Plot 5	Driver Chest X Deflection vs. Time	B-4
Plot 6	Driver Chest X Acceleration vs. Time Primary	B-4
Plot 7	Driver Chest Y Acceleration vs. Time Primary	B-4
Plot 8	Driver Chest Z Acceleration vs. Time Primary	B-4
Plot 9	Driver Chest Resultant Acceleration vs. Time Primary	B-5
Plot 10	Driver Upper Neck Force X vs. Time Primary	B-5
Plot 11	Driver Upper Neck Force Z vs. Time Primary	B-5
Plot 12	Driver Upper Neck Moment Y vs. Time Primary	B-5
Plot 13	Driver Nij vs. Time Primary	B-6
Plot 14	Driver Left Femur Force vs. Time	B-6
Plot 15	Driver Right Femur Force vs. Time	B-6
Plot 16	Passenger Head X Acceleration vs. Time Primary	B-6
Plot 17	Passenger Head Y Acceleration vs. Time Primary	B-7
Plot 18	Passenger Head Z Acceleration vs. Time Primary	B-7
Plot 19	Passenger Head Resultant Acceleration vs. Time Primary	B-7
Plot 20	Passenger Chest X Deflection vs. Time	B-7
Plot 21	Passenger Chest X Acceleration vs. Time Primary	B-8
Plot 22	Passenger Chest Y Acceleration vs. Time Primary	B-8
Plot 23	Passenger Chest Z Acceleration vs. Time Primary	B-8
Plot 24	Passenger Chest Resultant Acceleration vs. Time Primary	B-8
Plot 25	Passenger Upper Neck Force X vs. Time Primary	B-9
Plot 26	Passenger Upper Neck Force Z vs. Time Primary	B-9
Plot 27	Passenger Upper Neck Moment Y vs. Time Primary	B-9
Plot 28	Passenger Nij vs. Time Primary	B-9
Plot 29	Passenger Left Femur Force vs. Time	B-10
Plot 30	Passenger Right Femur Force vs. Time	B-10

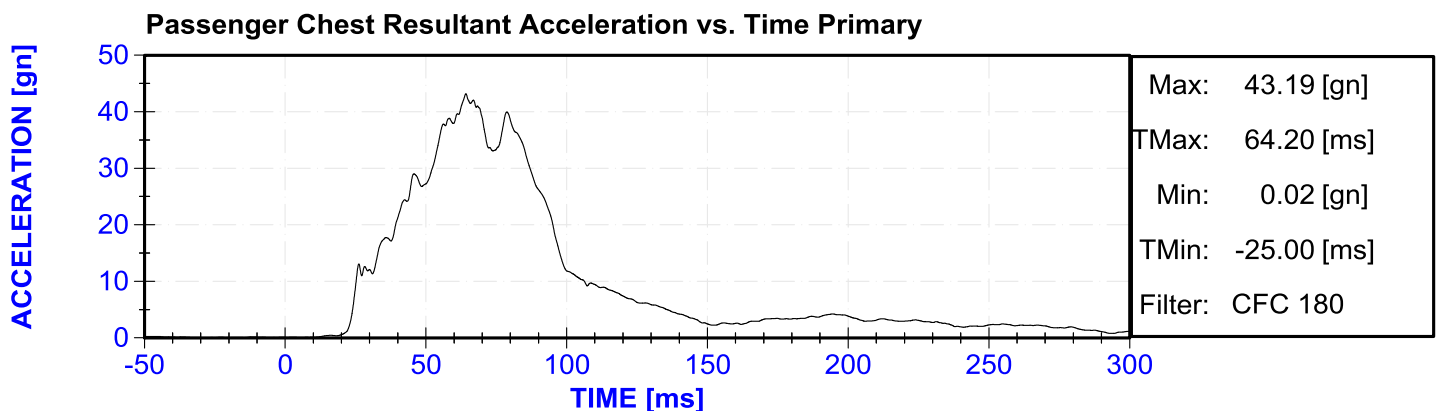
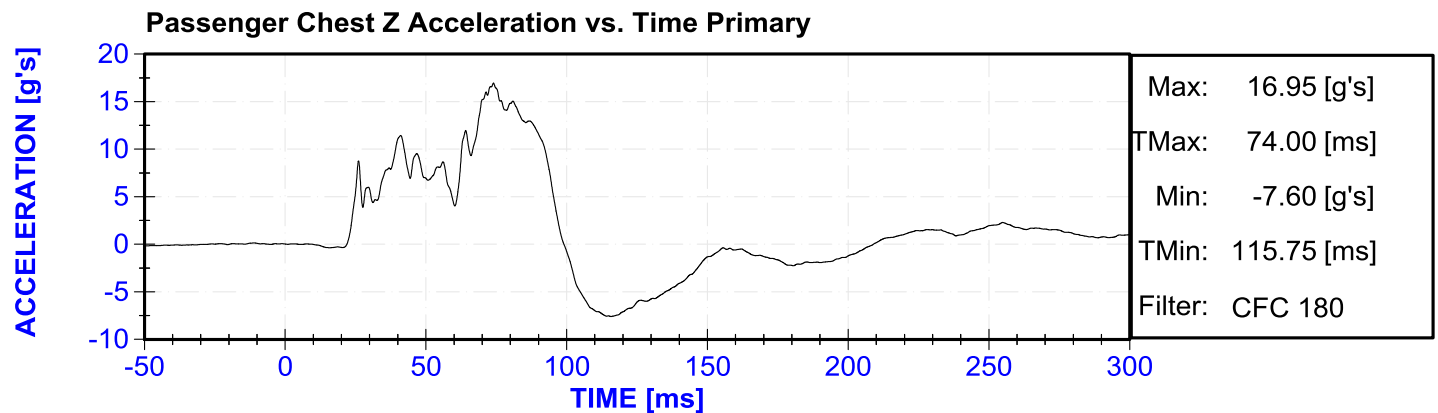
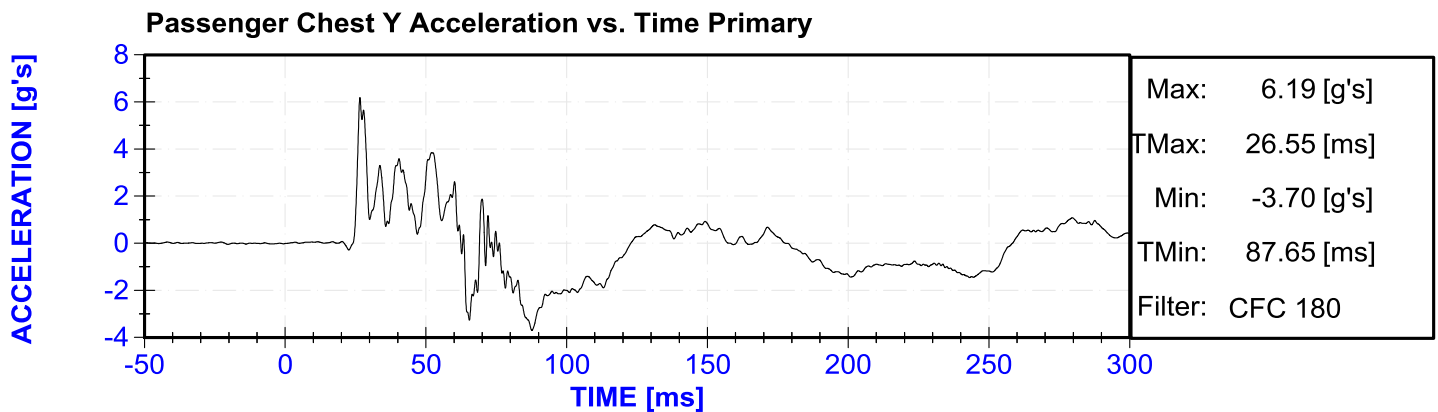
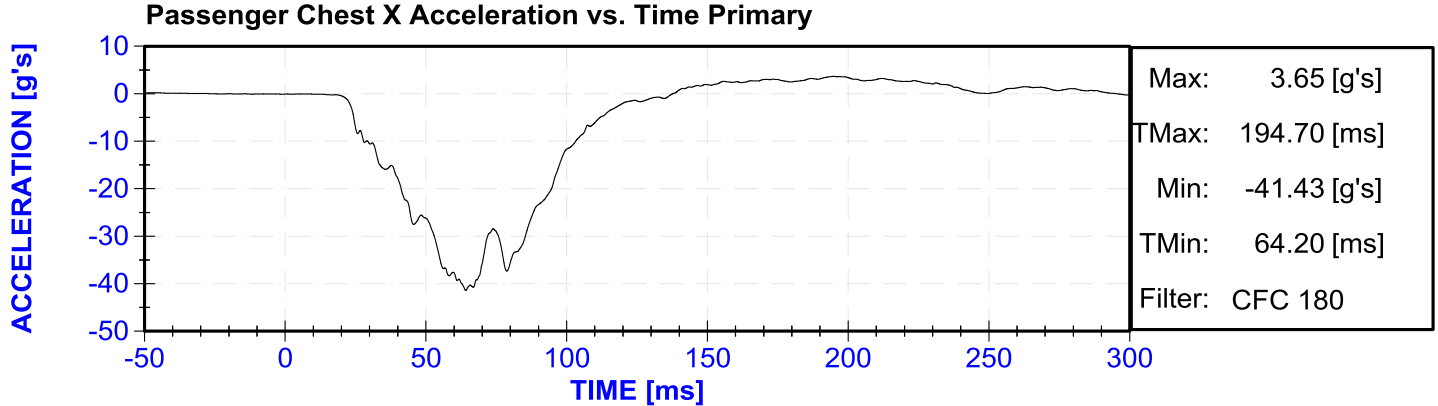


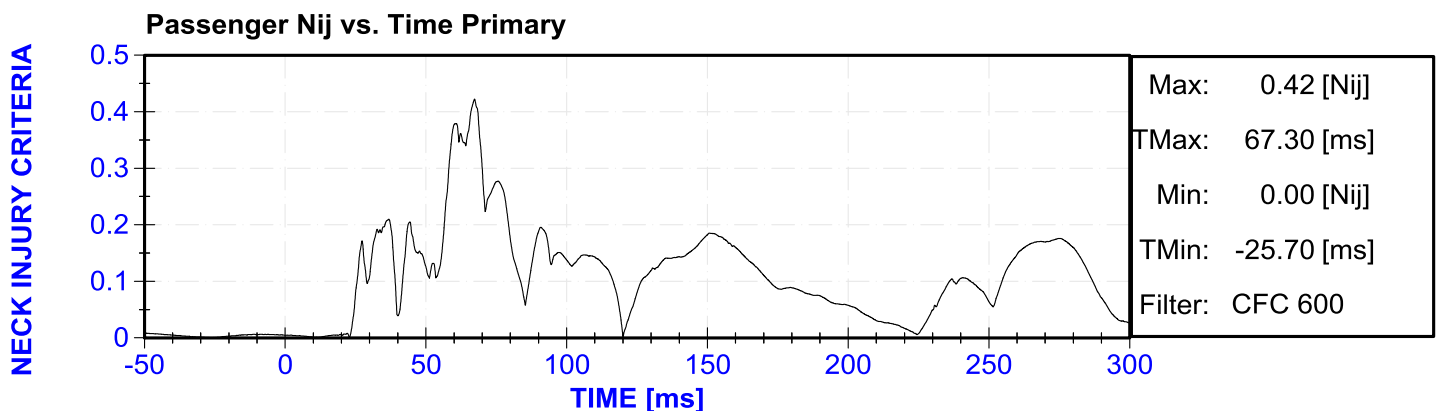
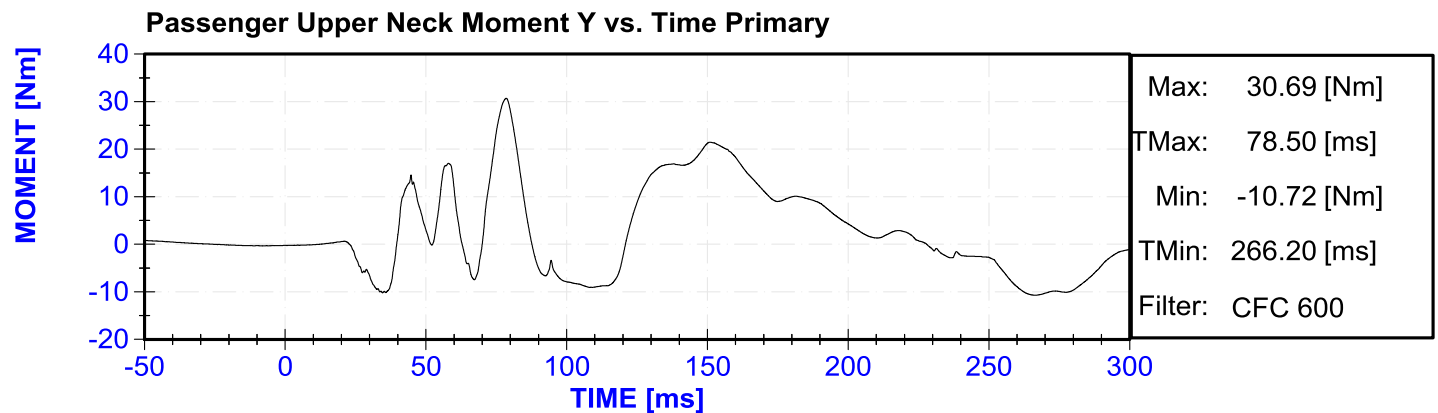
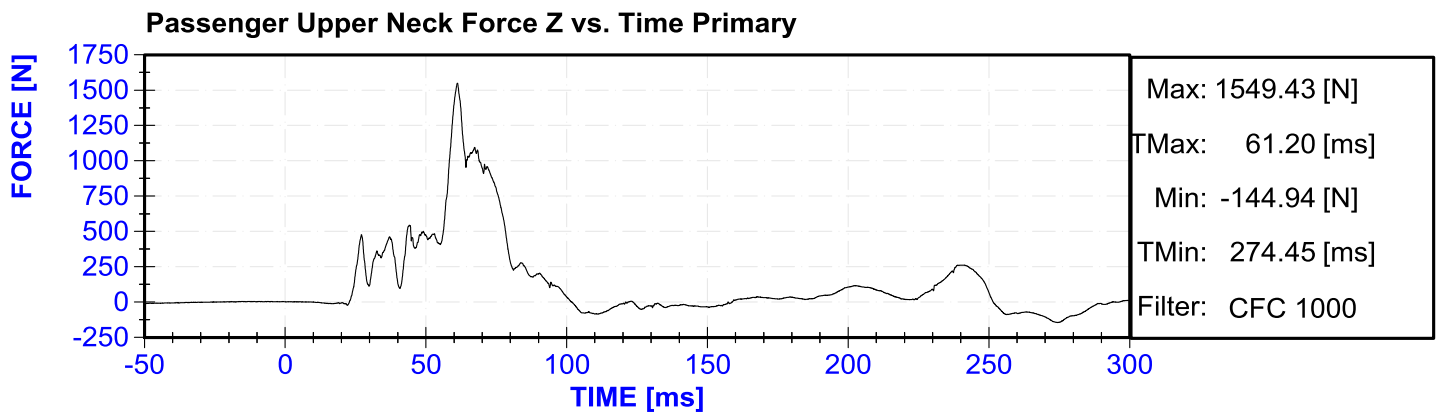
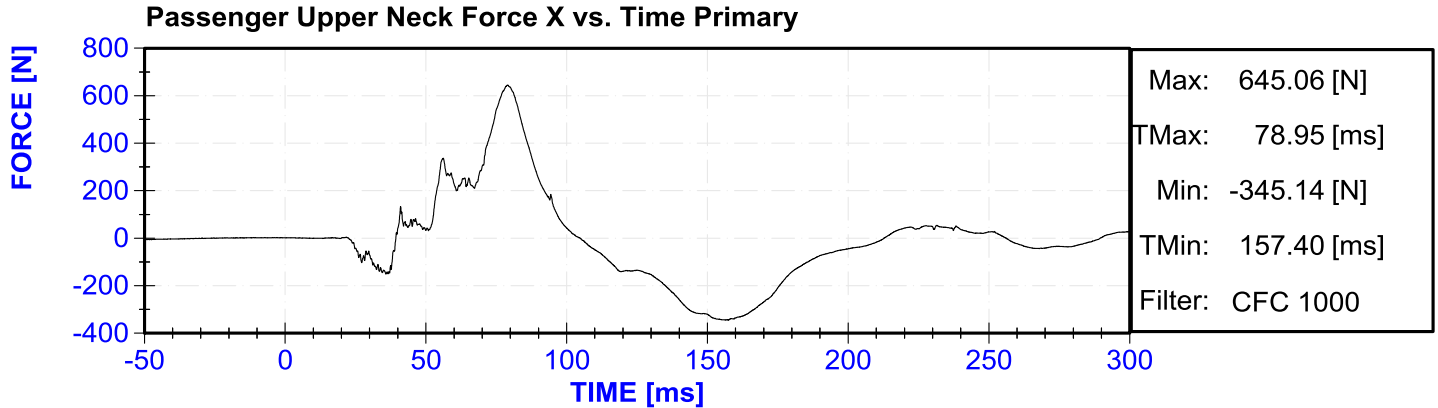




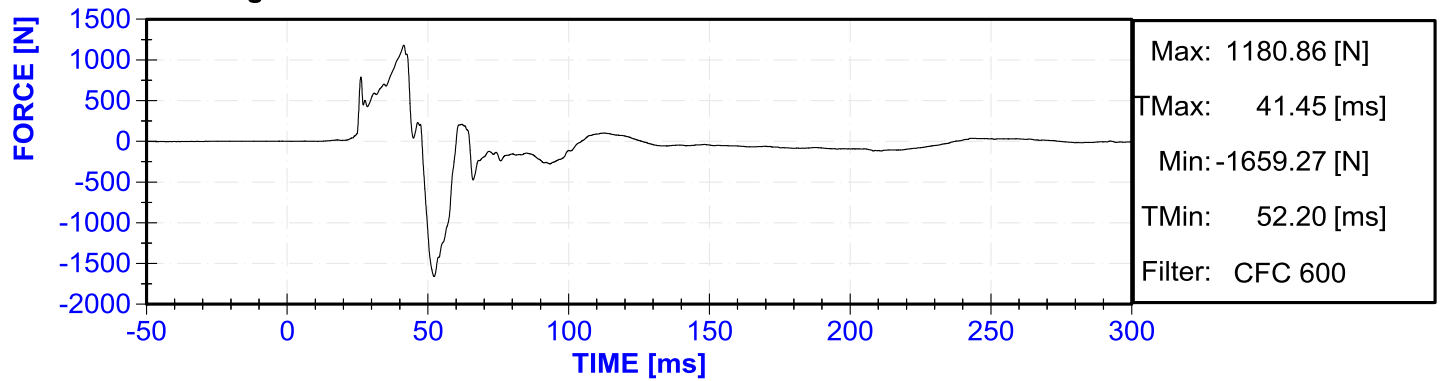




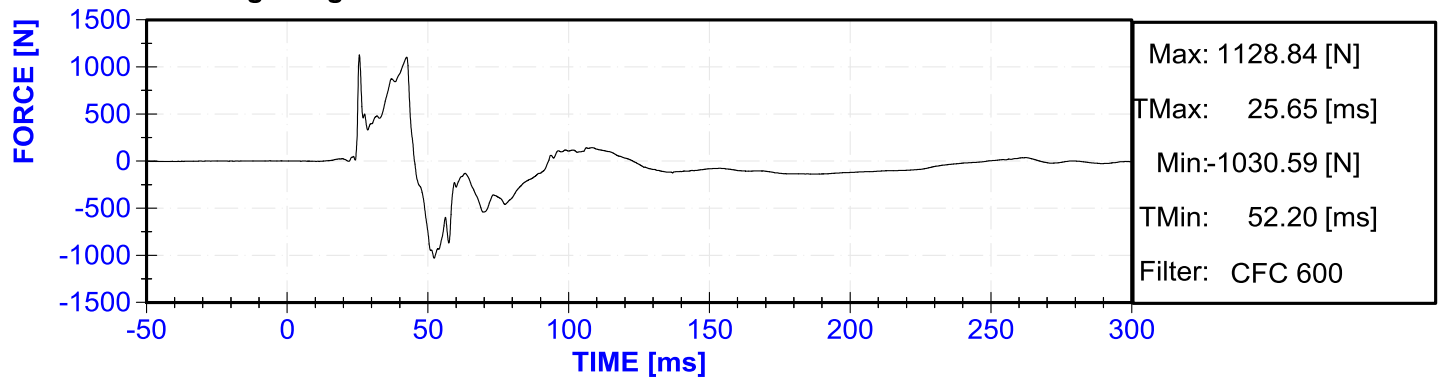




Passenger Left Femur Force vs. Time



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: 1046

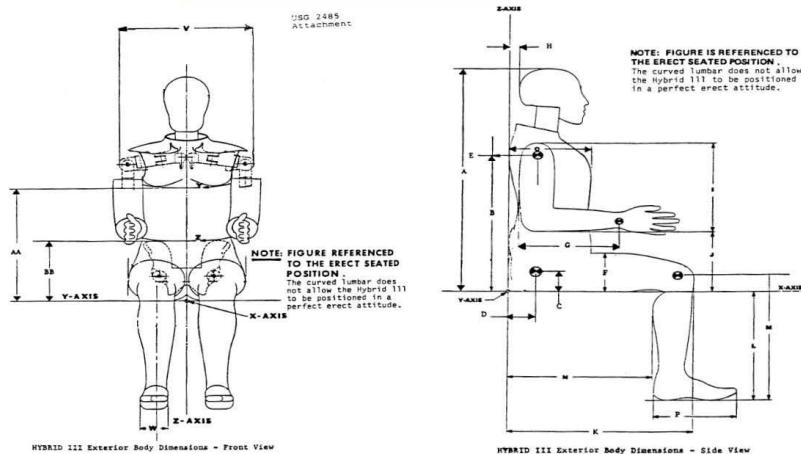


External Measurements - Hybrid 3 - 50th Male

Technician: M. Geesey

Date: 12/15/2015

Dummy Serial Number: 1046



Symbol	Description	Specification (in)		Result (in)	Pass/Fail
A	Sitting Height	34.6	35.0	34.9	Pass
B	Shoulder Pivot Height	19.9	20.5	20.0	Pass
C	H-Point Height	3.3	3.5	3.4	Pass
D	H-Point from Backline	5.3	5.5	5.4	Pass
E	Shoulder Pivot from Backline	3.3	3.7	3.5	Pass
F	Thigh Clearance	5.5	6.1	5.9	Pass
G	Back of Elbow to Wrist Pivot	11.4	12.0	11.8	Pass
H	Head Back to Backline	1.6	1.8	1.7	Pass
I	Shoulder to Elbow Length	13.0	13.6	13.3	Pass
J	Elbow Rest Height	7.5	8.3	7.9	Pass
K	Buttock to Knee Length	22.8	23.8	23.4	Pass
L	Popliteal Height	16.9	17.9	17.4	Pass
M	Knee Pivot Height	19.1	19.7	19.4	Pass
N	Buttock Popliteal Length	17.8	18.8	18.3	Pass
O	Chest Depth without Jacket	8.4	9.0	8.7	Pass
P	Foot Length (right)	9.9	10.5	10.1	Pass
V	Shoulder Breadth	16.3	17.2	16.8	Pass
W	Foot Breadth	3.6	4.2	3.8	Pass
Y	Chest Circumference with Jacket	38.2	39.4	38.7	Pass
Z	Waist Circumference	32.9	34.1	33.9	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

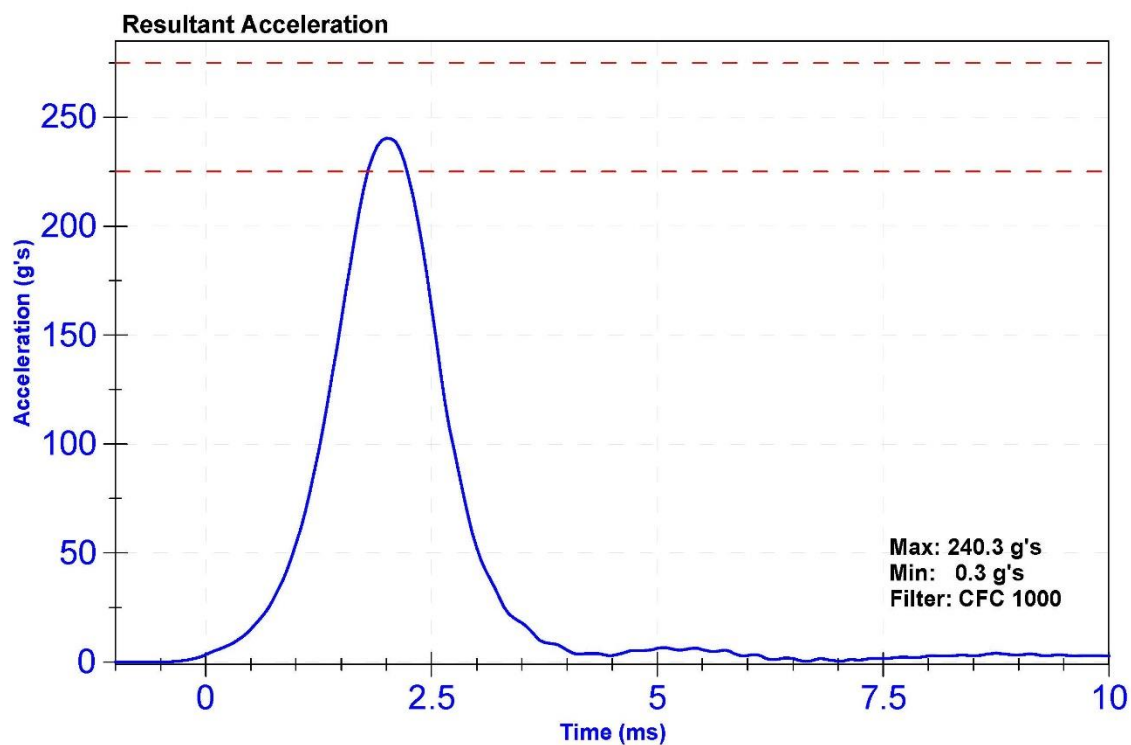
ATD Manufacturer		Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

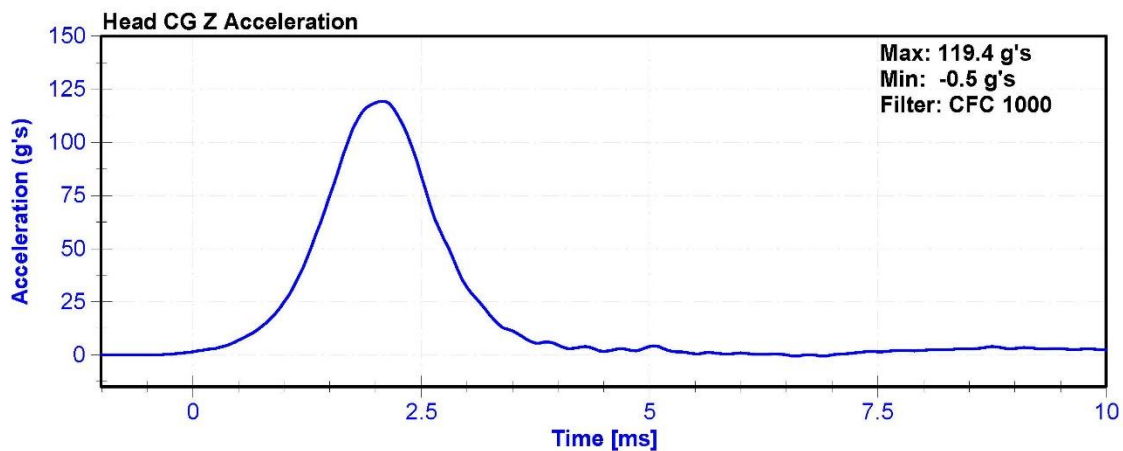
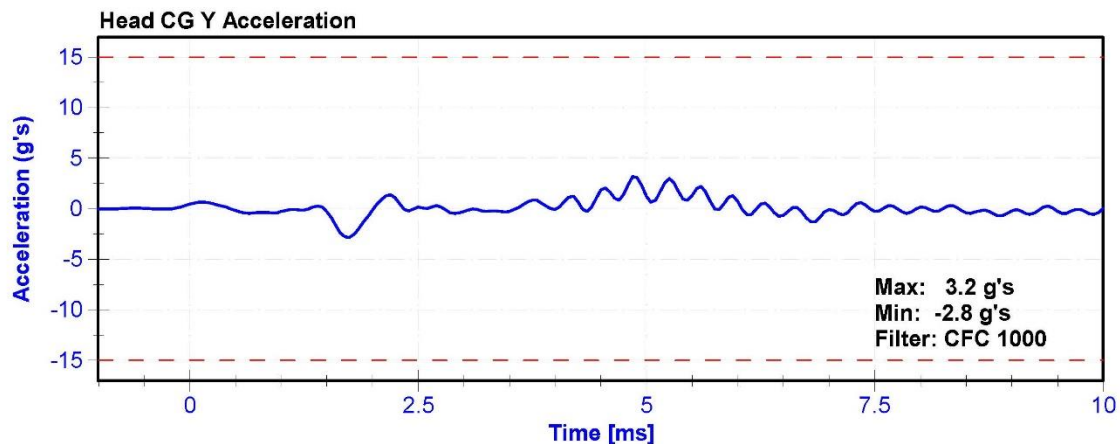
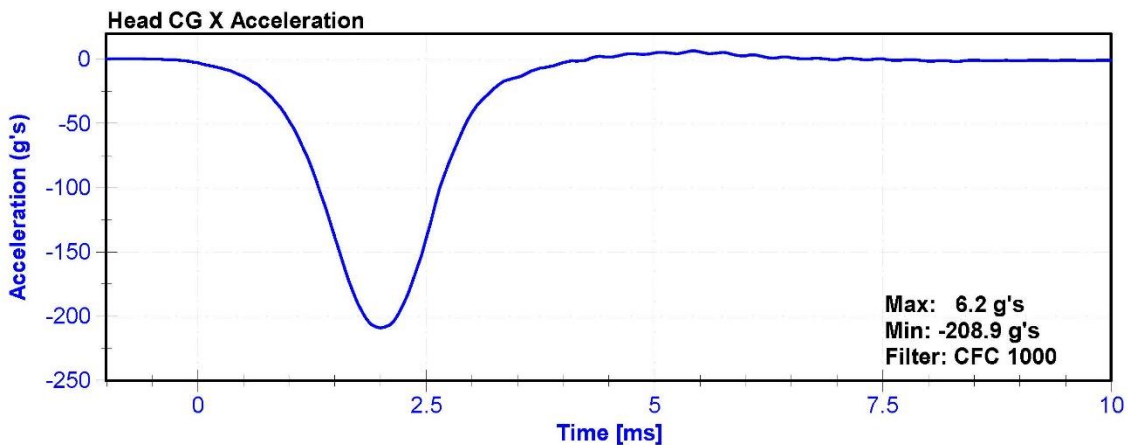
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.9	Pass
Humidity	10	70	%	21.3	Pass
Resultant Acceleration	225	275	g's	240.3	Pass
Oscillation	0	10	%	2.7	Pass
Lateral Acceleration	-15	15	g's	3.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58871	12/3/2015	6/2/2016
Y Accelerometer	ENDEVCO 7264	AC-P12359	12/3/2015	6/2/2016
Z Accelerometer	ENDEVCO 7264CT	AC-P52133	12/3/2015	6/2/2016





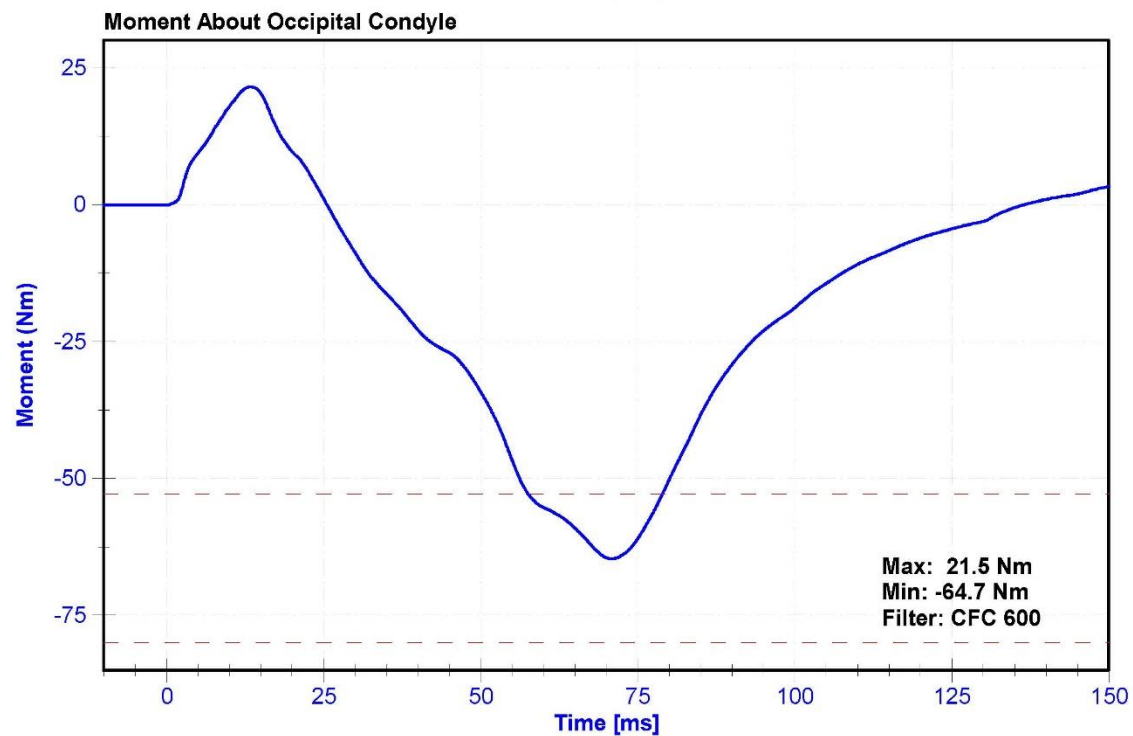
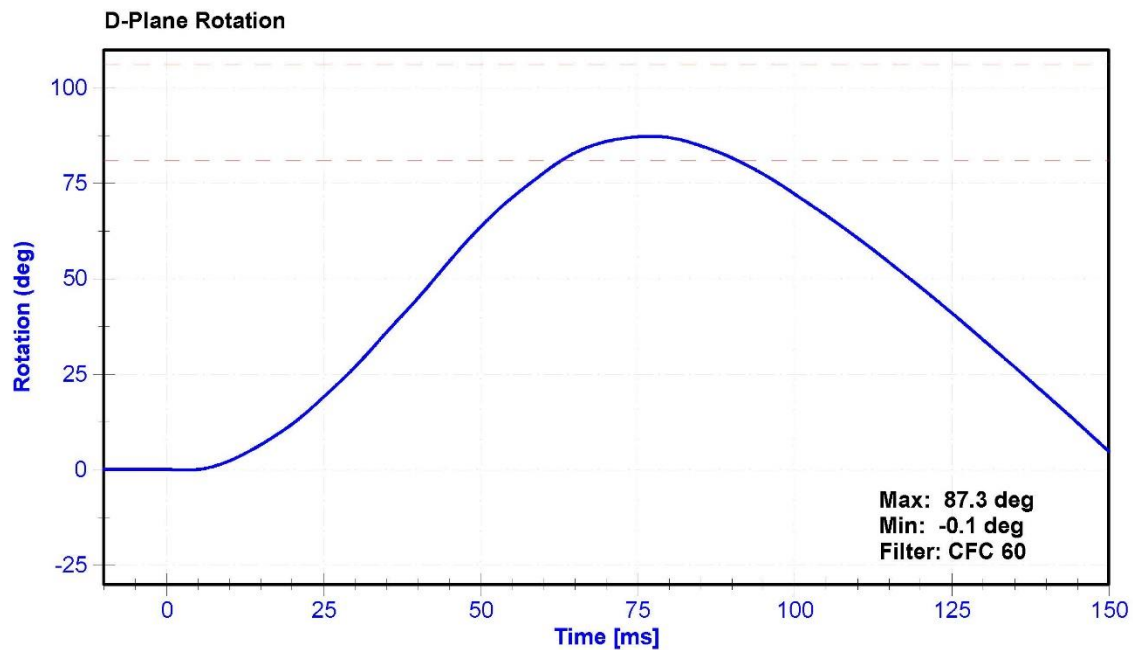
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

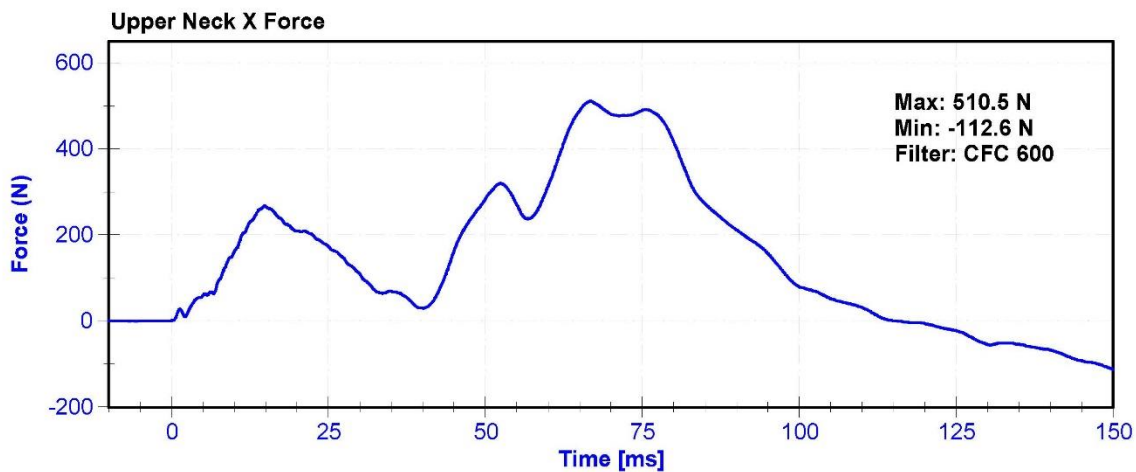
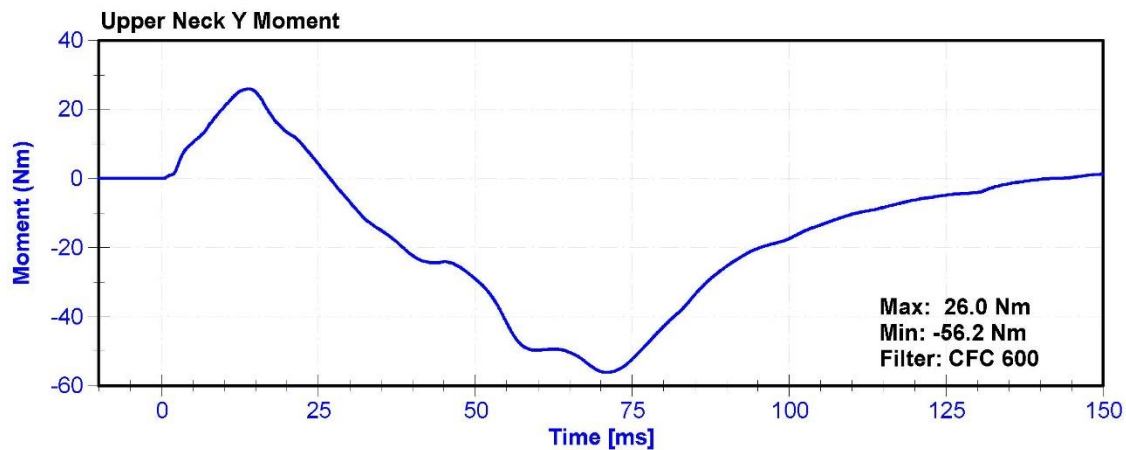
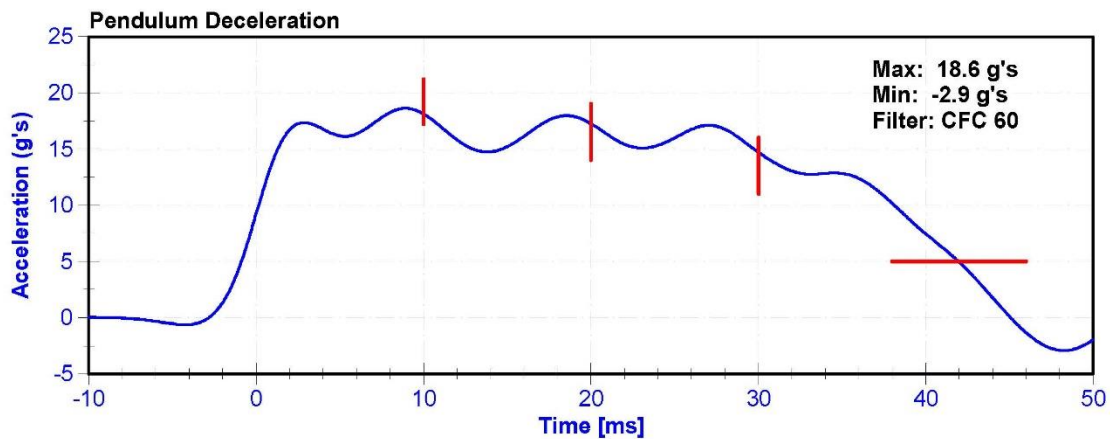
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.5	Pass
Humidity	10	70	%	28.2	Pass
Velocity	5.94	6.19	m/s	6.025	Pass
Pendulum Deceleration at 10ms	17.2	21.2	g's	18.11	Pass
Pendulum Deceleration at 20ms	14	19	g's	17.3	Pass
Pendulum Deceleration at 30ms	11	16	g's	14.7	Pass
Max. Pendulum Deceleration After 30ms	0	22	g's	18.6	Pass
Pendulum Deceleration Time to 5 g's	38	46	ms	41.9	Pass
Maximum D Plane Rotation	81	106	deg	87.3	Pass
Time to Maximum Rotation	72	82	ms	77.0	Pass
Rotation Decay to Zero	147	174	ms	153.4	Pass
Minimum Moment About OC	-80	-52.9	Nm	-64.66	Pass
Time to Minimum Moment	65	79	ms	70.9	Pass
Moment Decay to Zero	120	148	ms	136.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015 8:01:40 AM	5/16/2016 8:01:40 AM
Pendulum Potentiometer	ETI SP22G	DS-PendPo	9/28/2015 10:06:23 AM	9/22/2016 10:06:23 AM
Condyle Potentiometer	ETI SP22G	DS-CondPo	9/28/2015 11:57:25 AM	9/22/2016 11:57:25 AM
Upper Neck Load Cell	DENTON 1716A	LC-2186Fx	5/18/2015	5/17/2016





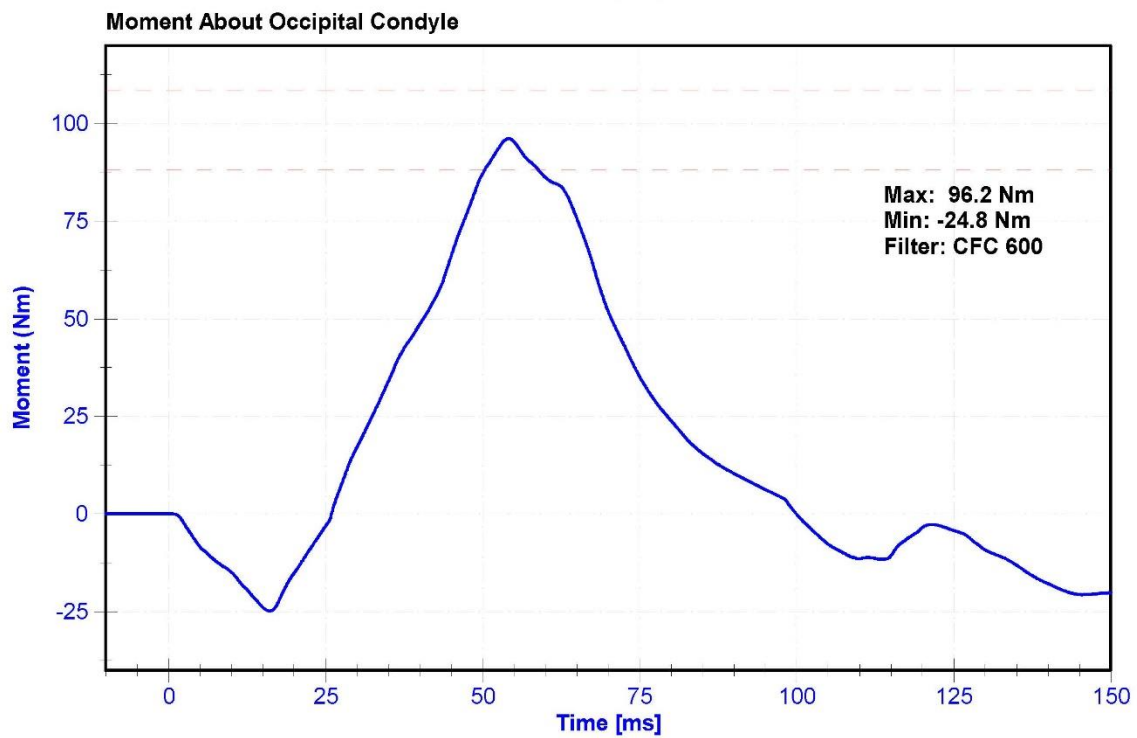
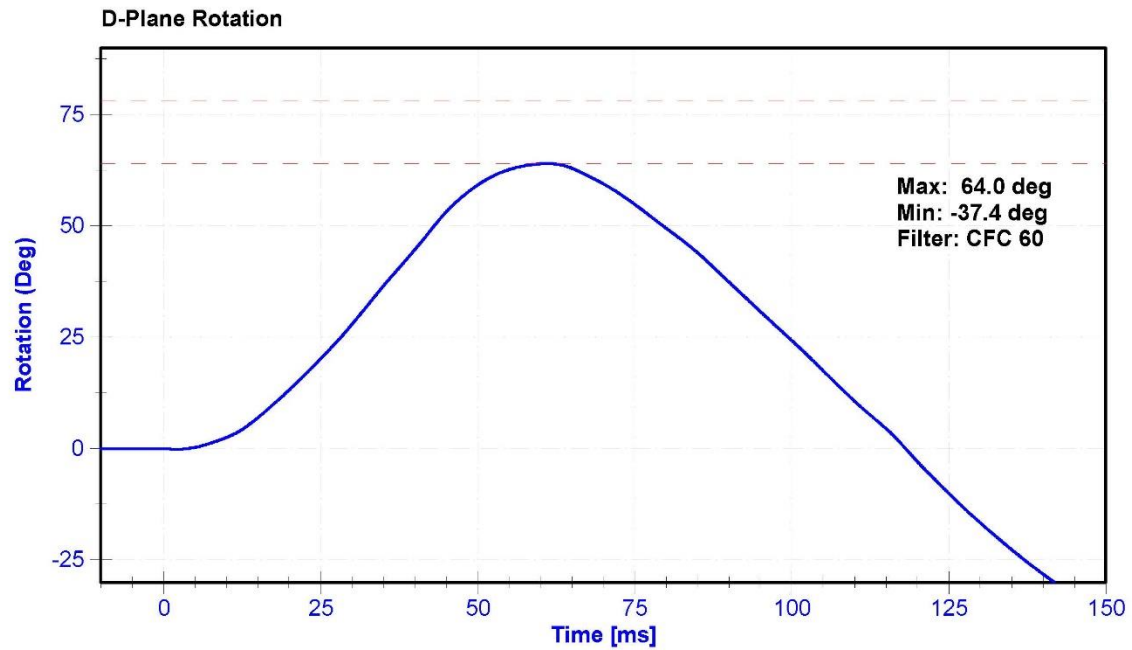
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

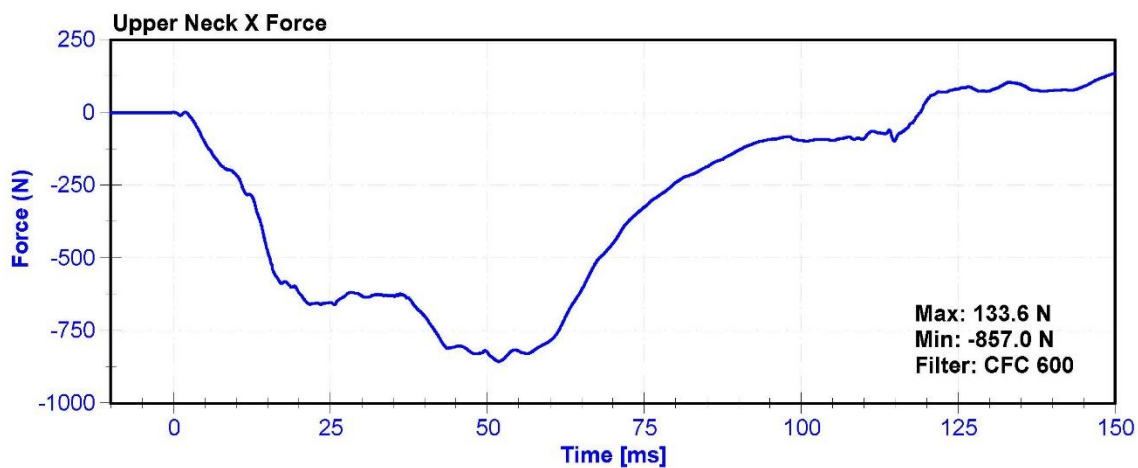
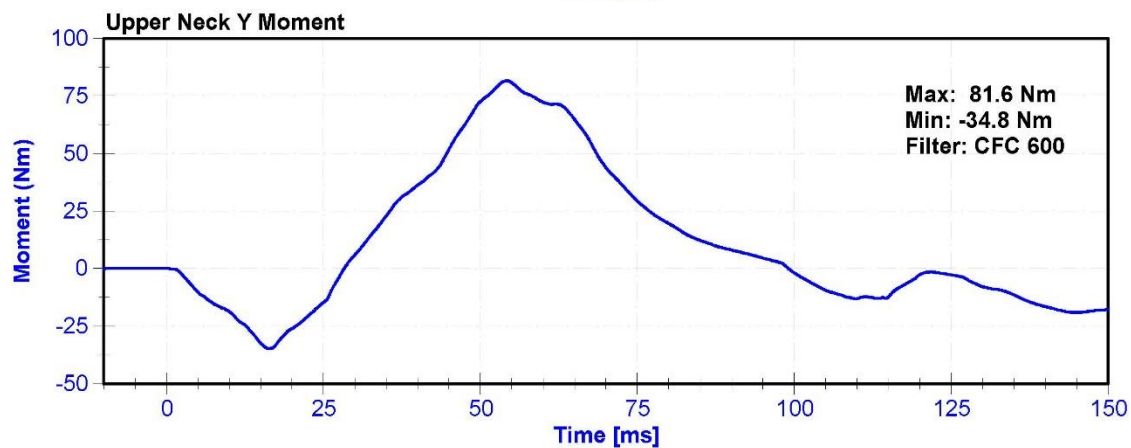
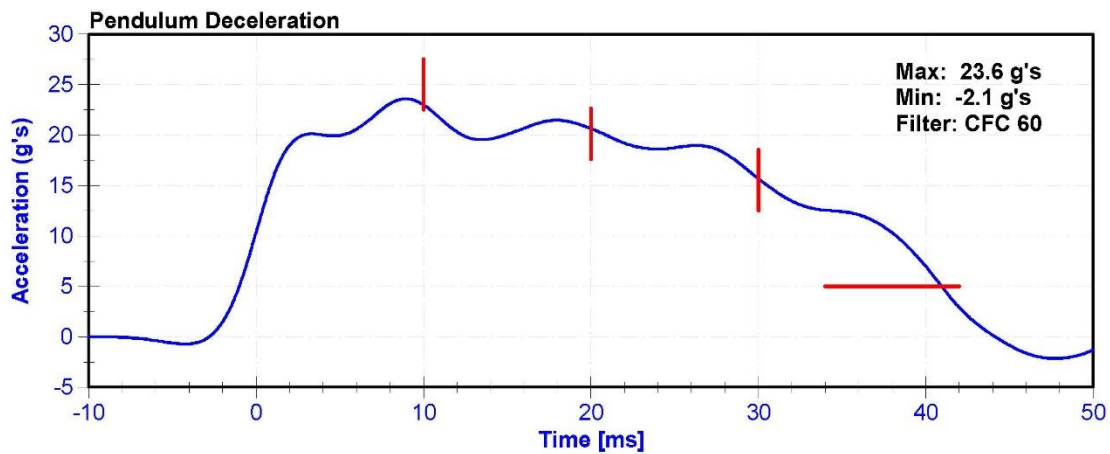
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.6	Pass
Humidity	10	70	%	28.2	Pass
Velocity	6.89	7.13	m/s	6.979	Pass
Pendulum Deceleration at 10ms	22.5	27.5	g's	22.96	Pass
Pendulum Deceleration at 20ms	17.6	22.6	g's	20.64	Pass
Pendulum Deceleration at 30ms	12.5	18.5	g's	15.68	Pass
Max. Pendulum Deceleration After 30ms	0	29	g's	23.6	Pass
Pendulum Deceleration Time to 5 g's	34	42	ms	41.0	Pass
Maximum D Plane Rotation	64	78	deg	64.0	Pass
Time to Maximum Rotation	57	64	ms	61.1	Pass
Rotation Decay to Zero	113	127	ms	118.2	Pass
Moment About Occipital Condyle	88.1	108.4	Nm	96.18	Pass
Time to Maximum Moment	47	58	ms	54.2	Pass
Moment Decay to Zero	97	107	ms	100.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716A	LC-2186Fx	5/18/2015	5/17/2016





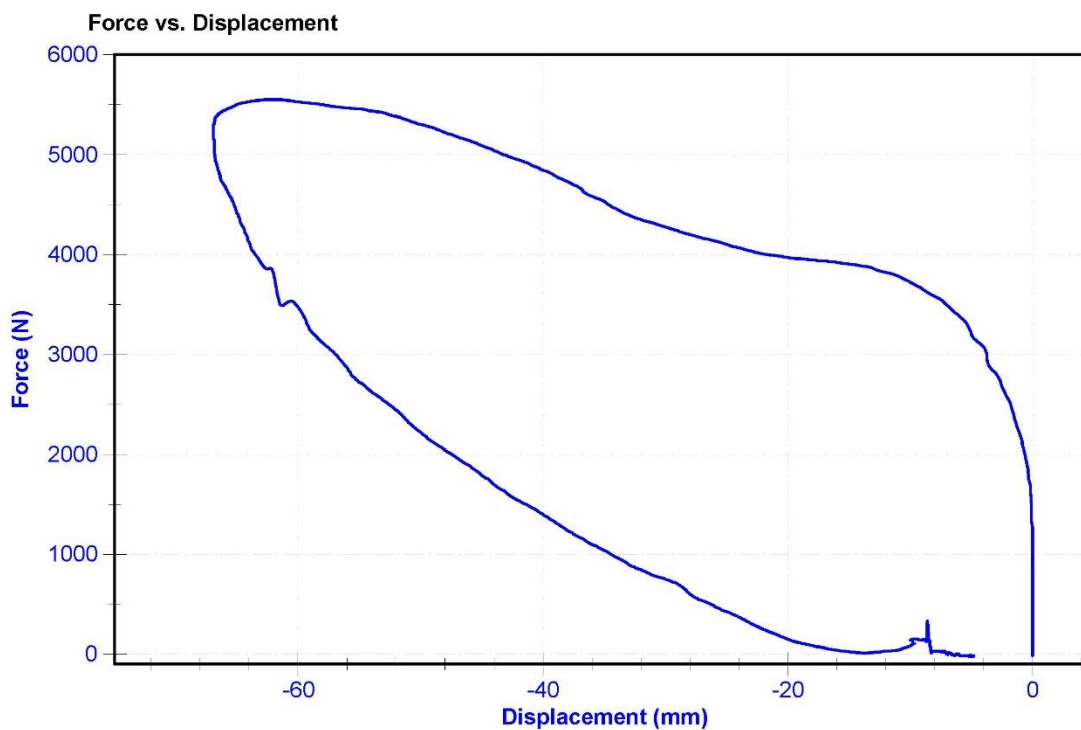
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	1046	Laboratory Supervisor	M. Goehle

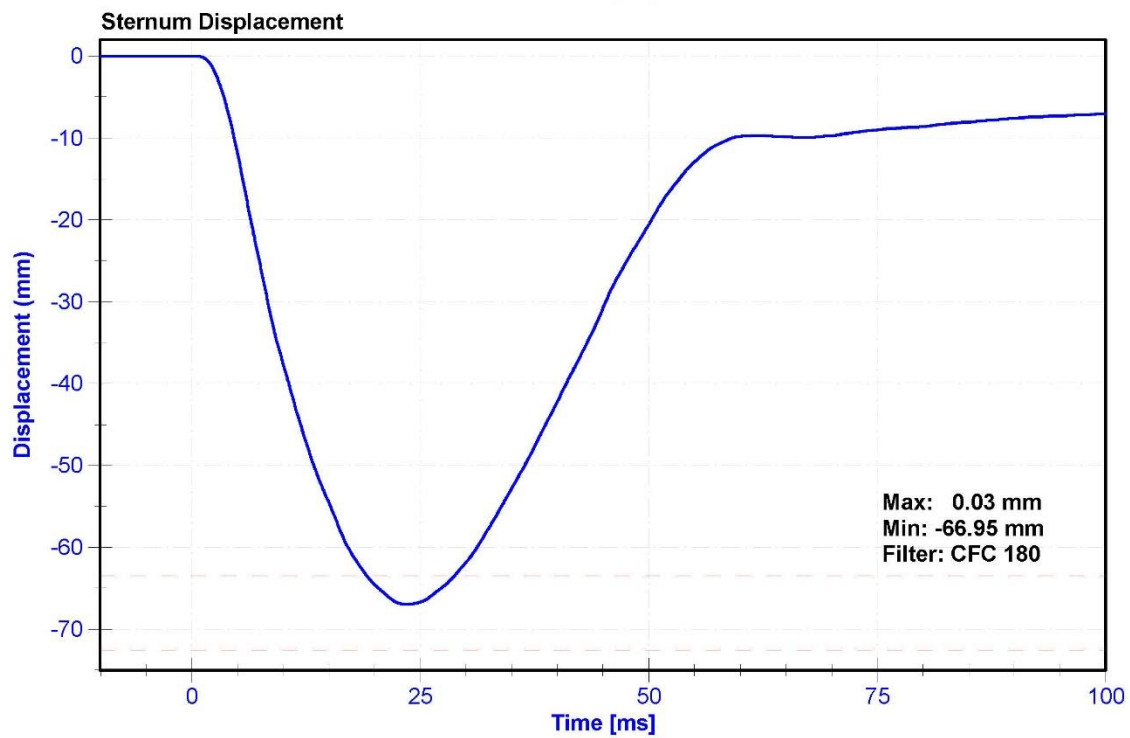
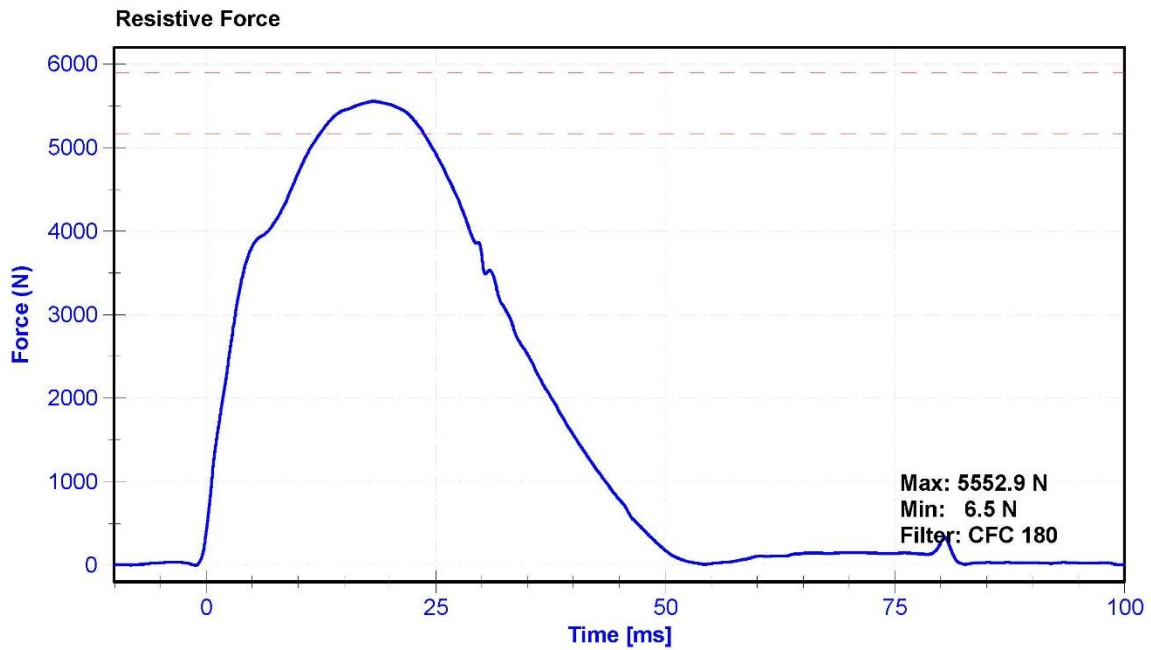
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	33.1	Pass
Velocity	6.59	6.83	m/s	6.728	Pass
Chest Displacement	-72.6	-63.5	mm	-66.95	Pass
Resistive Force	5160	5894	N	5552.9	Pass
Hysteresis	65	85	%	70.1	Pass

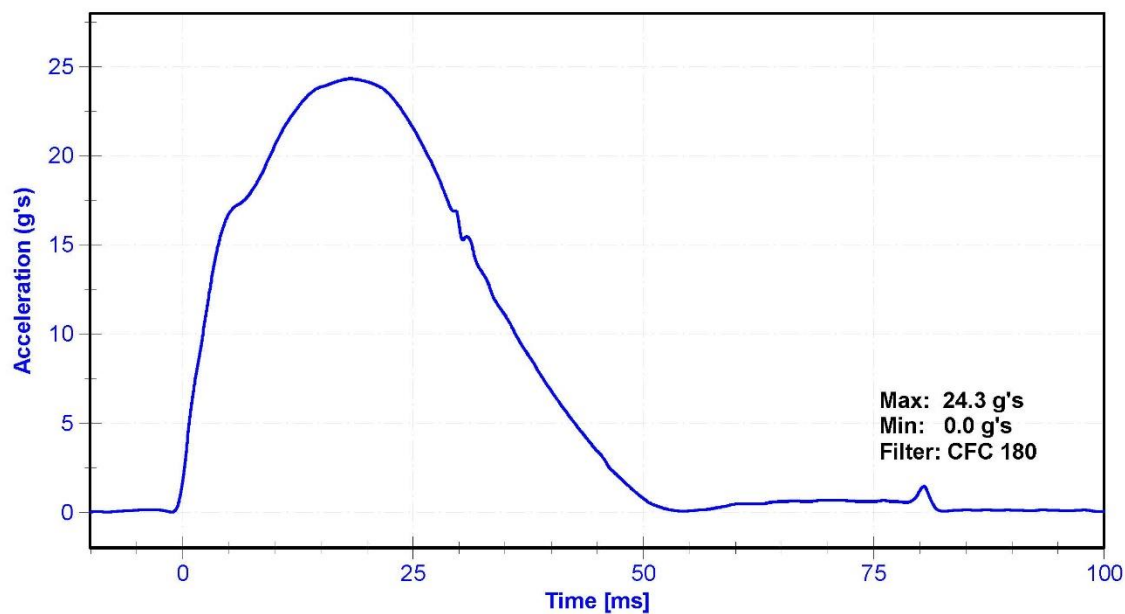
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Chest Potentiometer	Servo 14CB1-2897	DS-1046	6/2/2015	6/1/2016

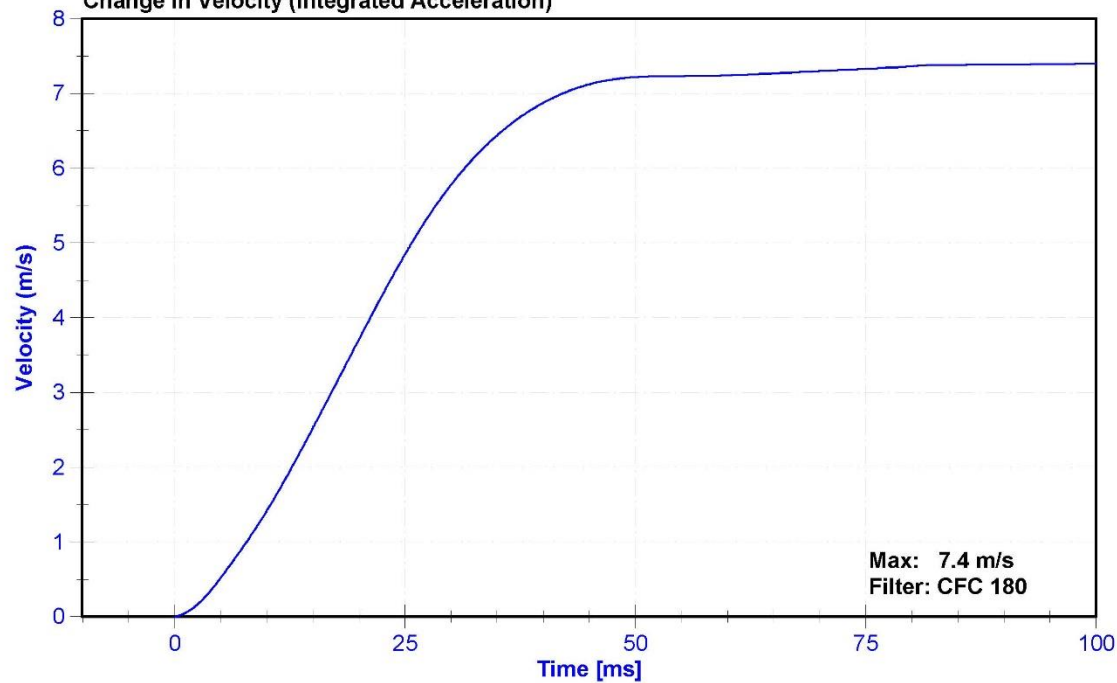




Probe Acceleration



Change in Velocity (Integrated Acceleration)



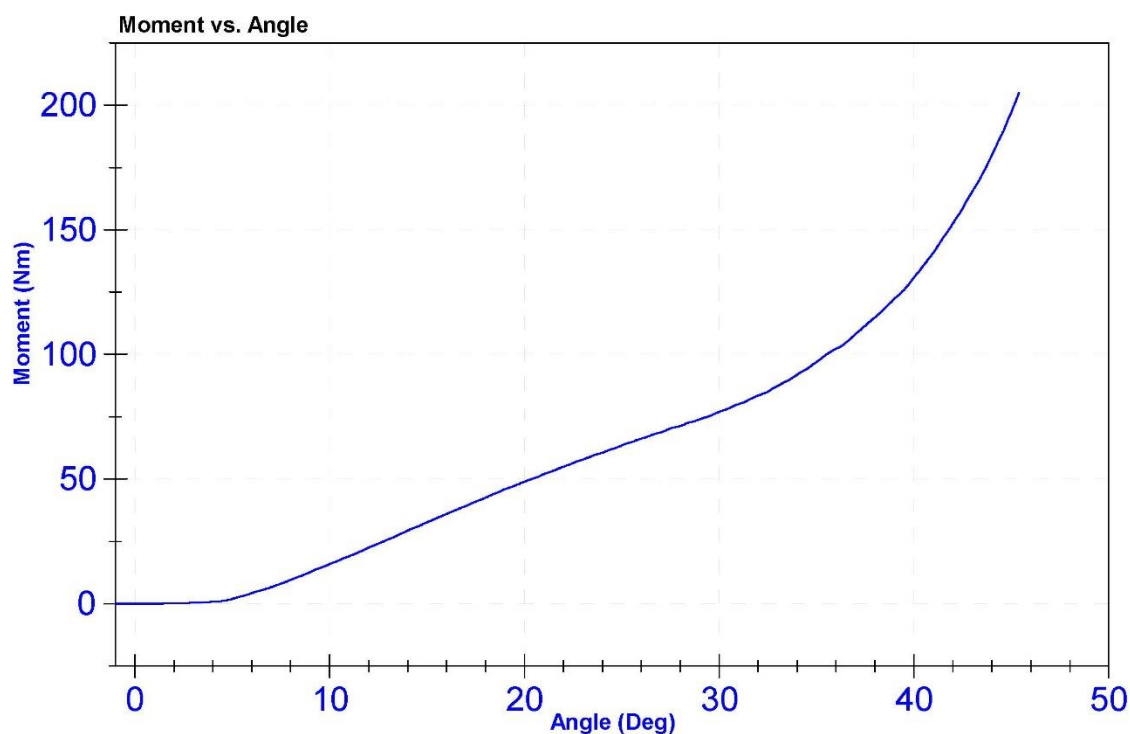
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	1046	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	31.6	Pass
Average Velocity	5	10	deg/s	7.6	Pass
Angle at 203Nm	40	50	deg	45.3	Pass
Moment at 30 degrees	0	94.9	Nm	77.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Servo 14CB1-3615	DS-0008	3/13/2015	3/12/2016
Load Cell	Key Trans 2301-02	LC-115 My	3/30/2015	3/29/2016



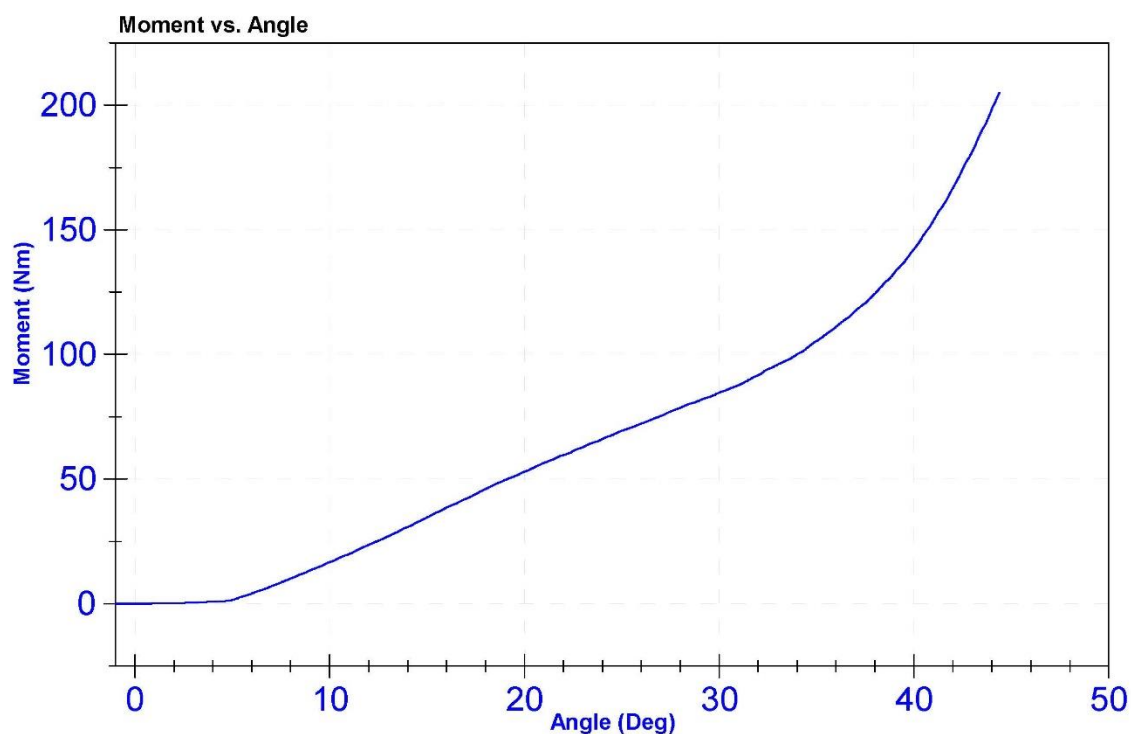
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	1046	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	31.6	Pass
Average Velocity	5	10	deg/s	7.4	Pass
Angle at 203Nm	40	50	deg	44.3	Pass
Moment at 30 degrees	0	94.9	Nm	84.7	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Servo 14CB1-3615	DS-0008	3/13/2015	3/12/2016
Load Cell	Key Trans 2301-02	LC-115 My	3/30/2015	3/29/2016



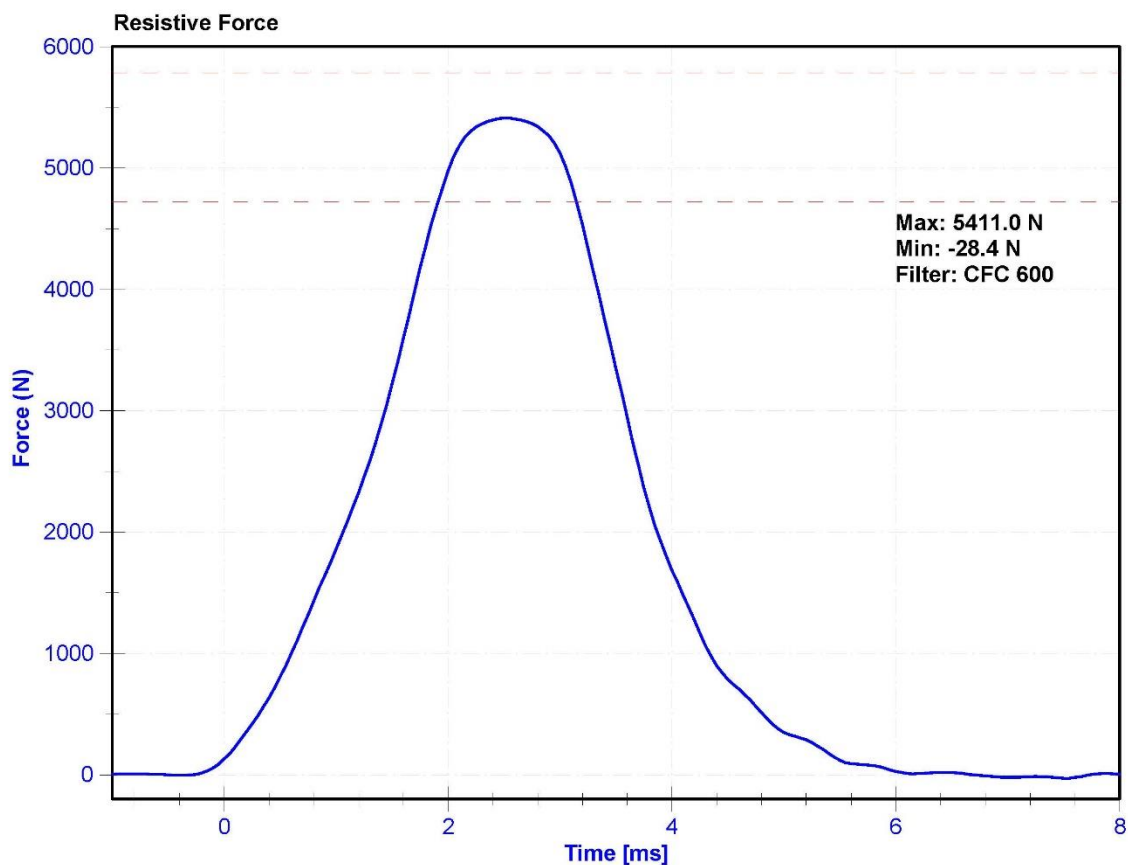
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	1046	Laboratory Supervisor	M. Goehle

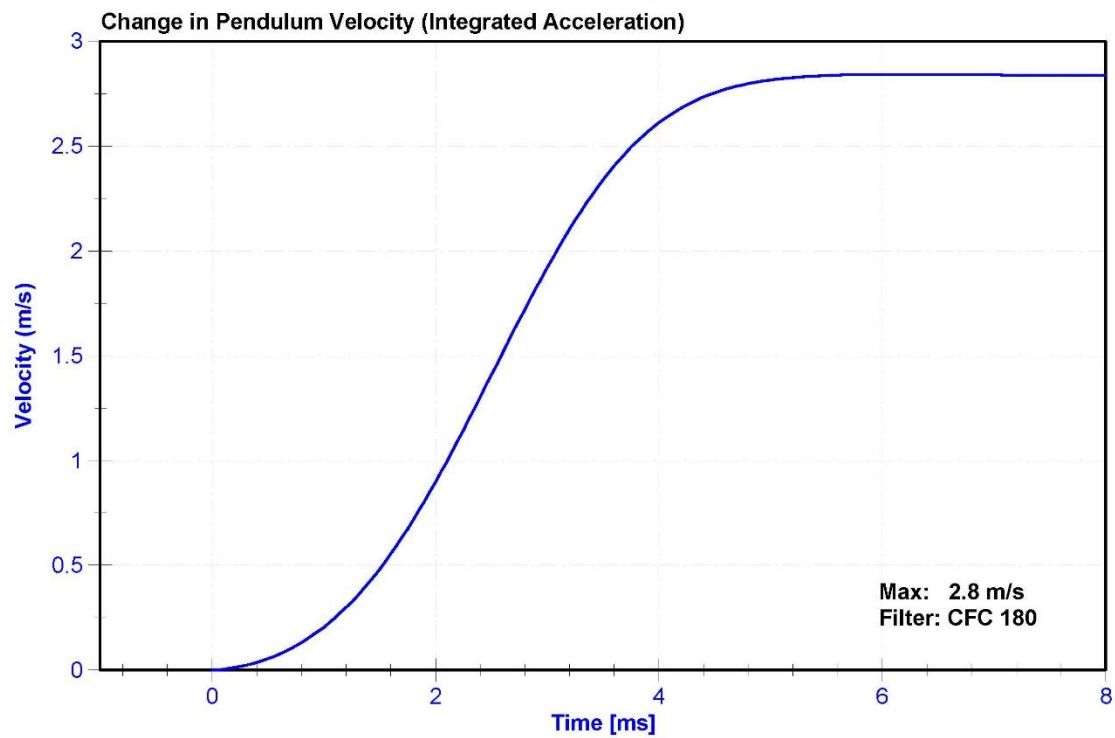
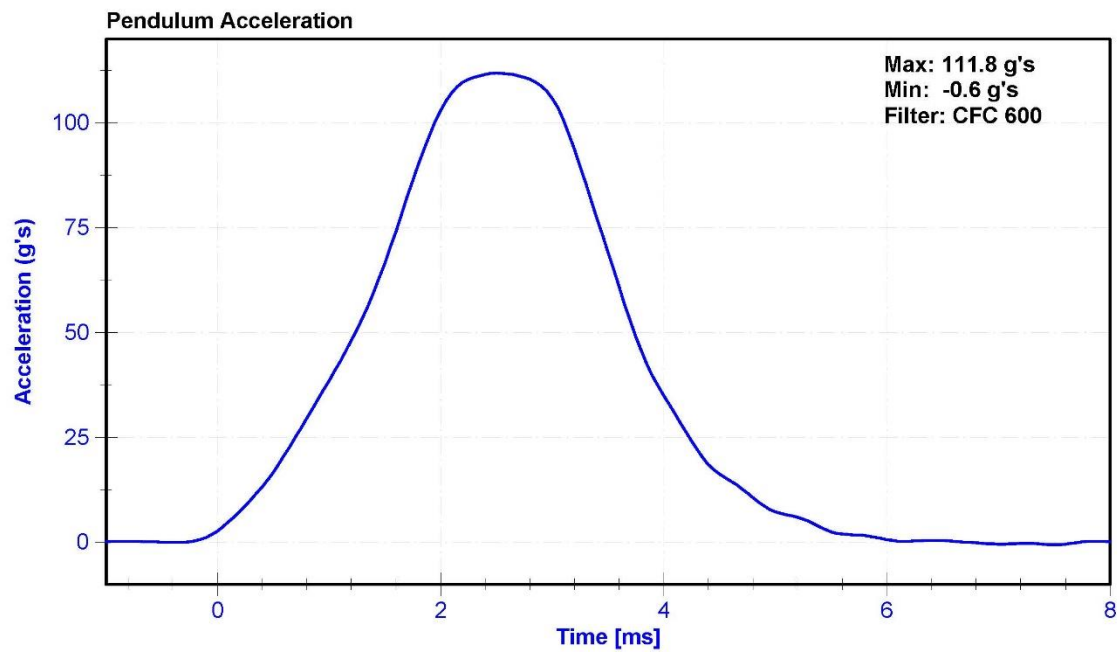
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.8	Pass
Humidity	10	70	%	38	Pass
Velocity	2.07	2.13	m/s	2.112	Pass
Maximum Resistive Force	4,720	5,780	N	5411.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





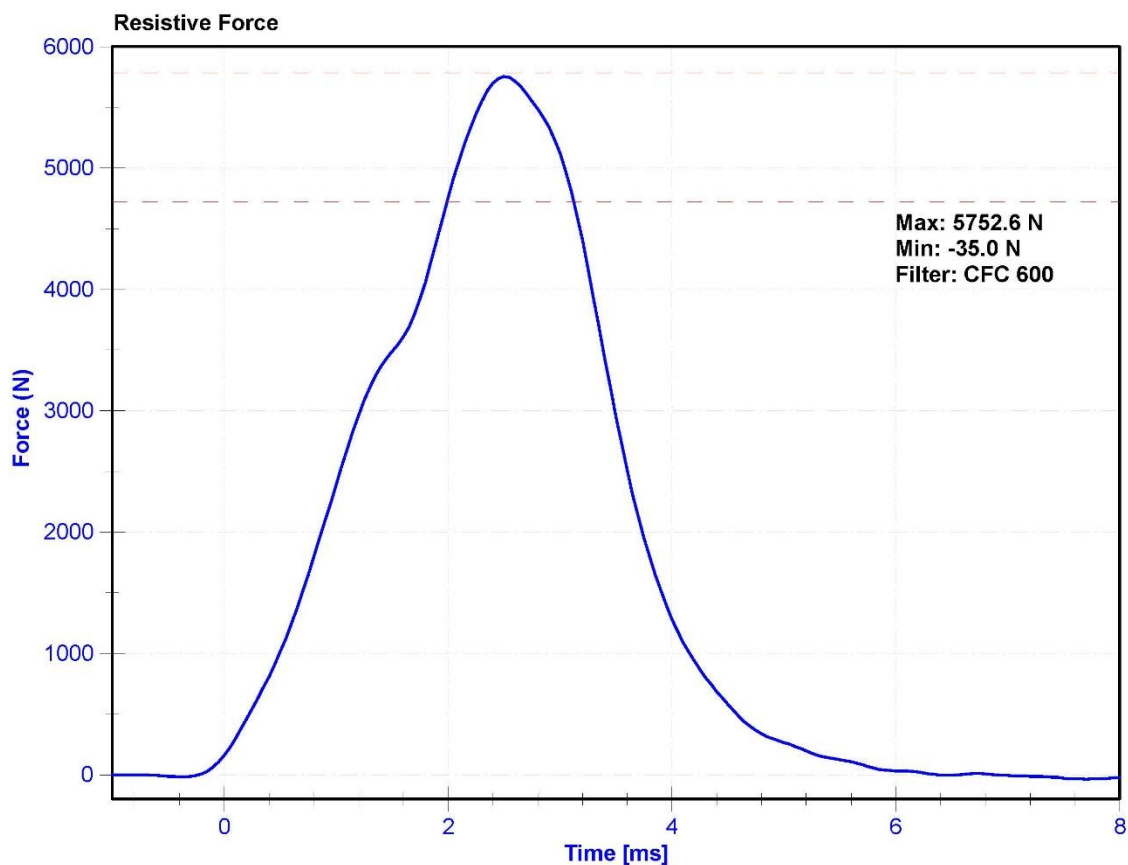
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	1046	Laboratory Supervisor	M. Goehle

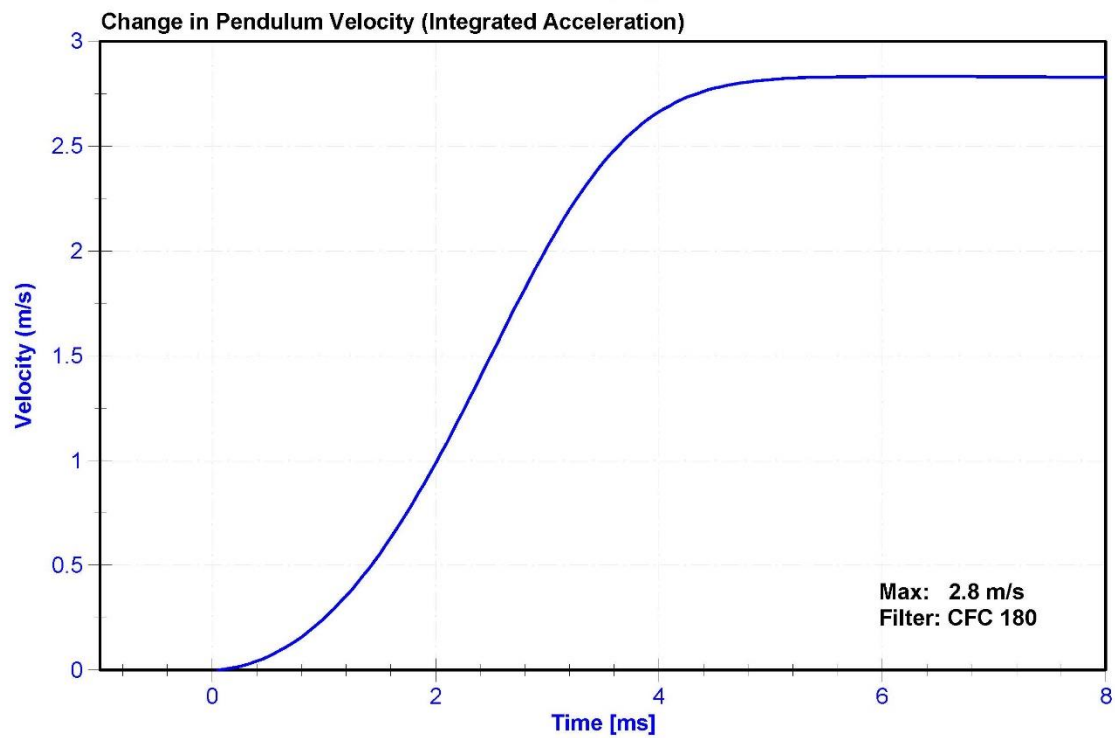
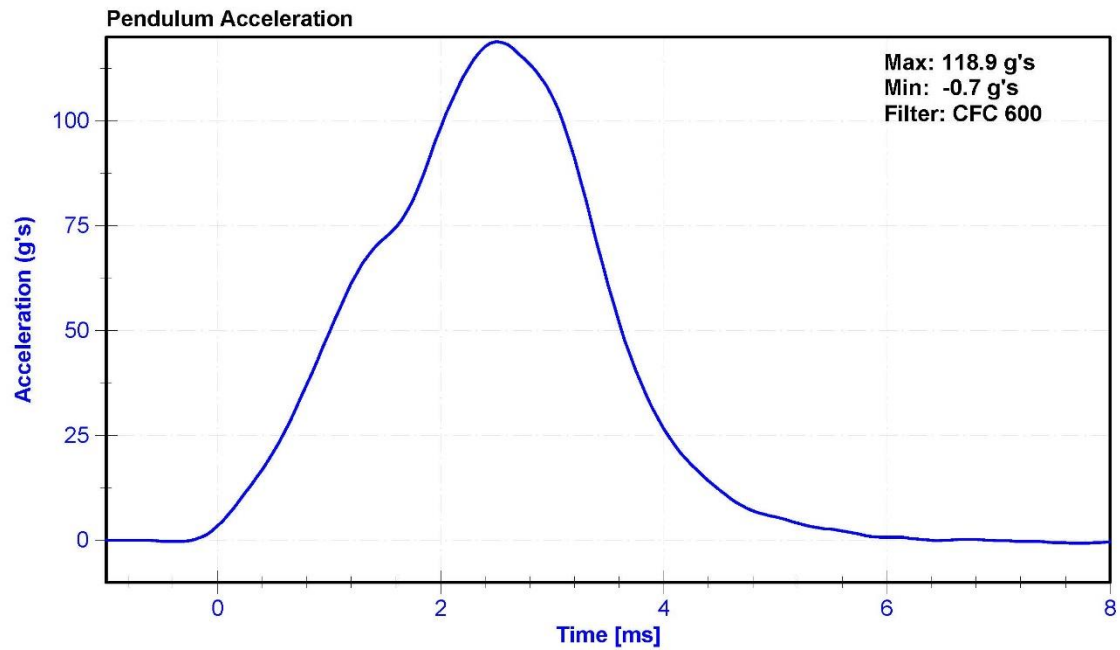
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	37.1	Pass
Velocity	2.07	2.13	m/s	2.105	Pass
Maximum Resistive Force	4720	5780	N	5752.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 288

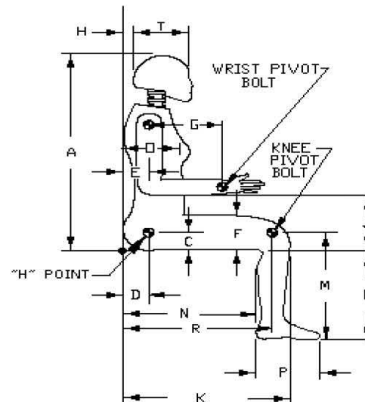
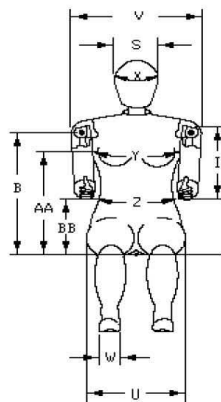


External Measurements - Hybrid 3 - 5th Female

Technician: M. Geesey

Date: 12/10/2015

Dummy Serial Number: 288



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	780	Pass
B	Shoulder Pivot Height	432	457	439	Pass
C	H-Point Height	81	86	83	Pass
D	H-Point from Backline	145	150	147	Pass
E	Shoulder Pivot from Backline	69	84	75	Pass
F	Thigh Clearance	119	135	124	Pass
G	Back of Elbow to Wrist Pivot	244	259	247	Pass
H	Head Back to Backline	43	48	46	Pass
I	Shoulder to Elbow Length	277	297	282	Pass
J	Elbow Rest Height	183	203	188	Pass
K	Buttock to Knee Length	521	546	540	Pass
L	Popliteal Height	356	376	367	Pass
M	Knee Pivot Height	394	419	399	Pass
N	Buttock Popliteal Length	414	439	431	Pass
O	Chest Depth without Jacket	175	191	178	Pass
P	Foot Length (right)	219	234	223	Pass
R	Buttock To Knee Pivot Length	457	483	460	Pass
S	Head Breadth	137	147	142	Pass
T	Head Depth	178	188	181	Pass
U	Hip Breadth	300	315	304	Pass
V	Shoulder Breadth	351	366	360	Pass
W	Foot Breadth	79	94	82	Pass
X	Head Circumference	528	549	540	Pass
Y	Chest Circumference with Jacket	851	881	855	Pass
Z	Waist Circumference	460	790	780	Pass
AA	Reference Location (Chest Circumference)	333	358	343	Pass
BB	Reference Location (Waist Circumference)	160	170	165	Pass

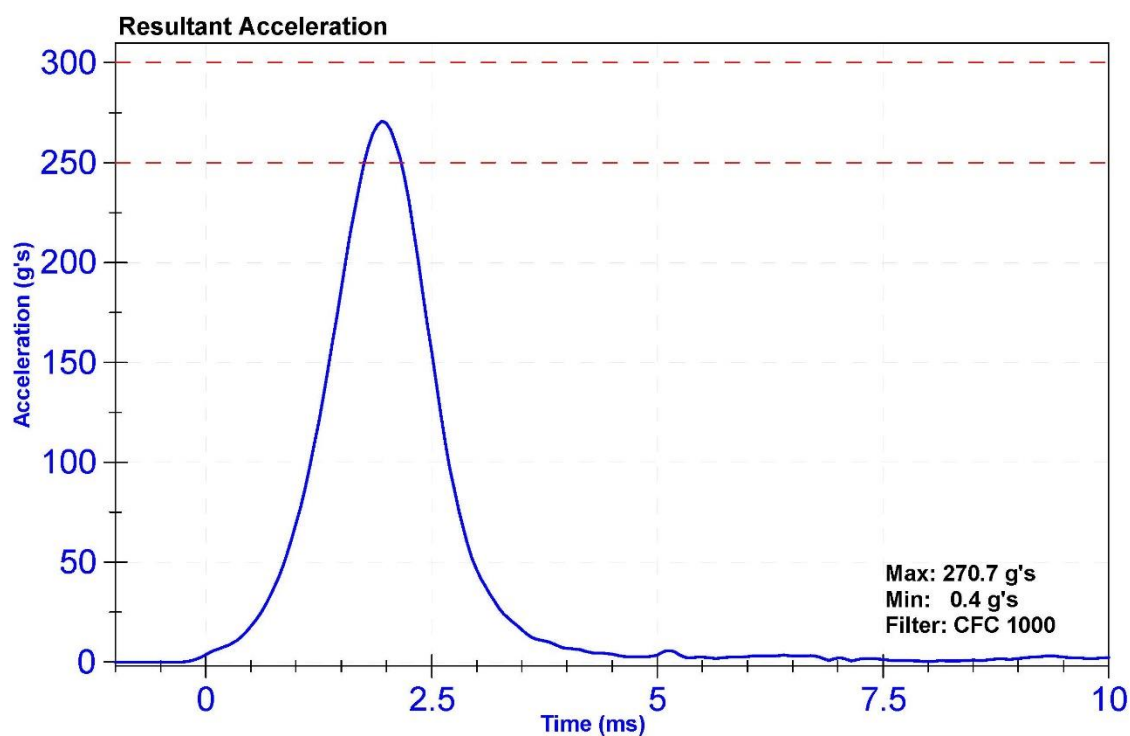
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

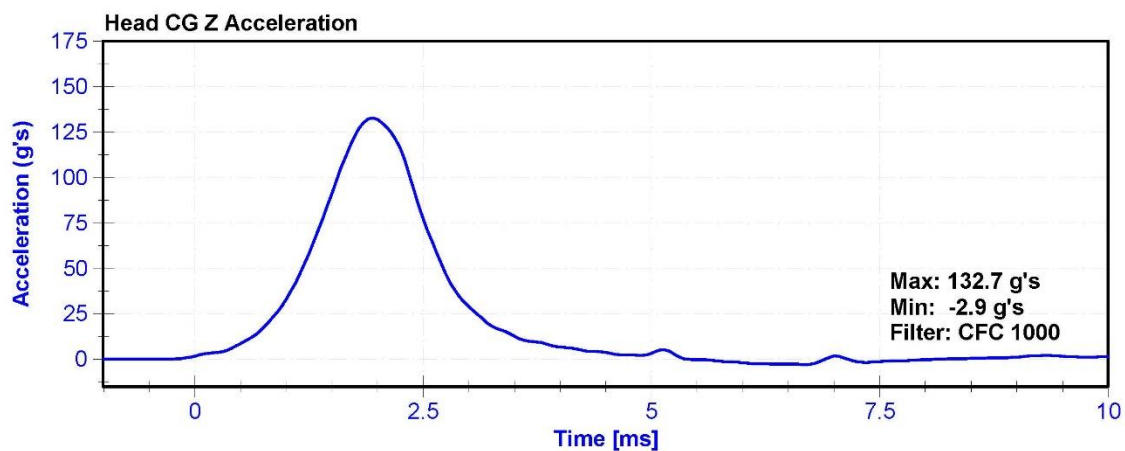
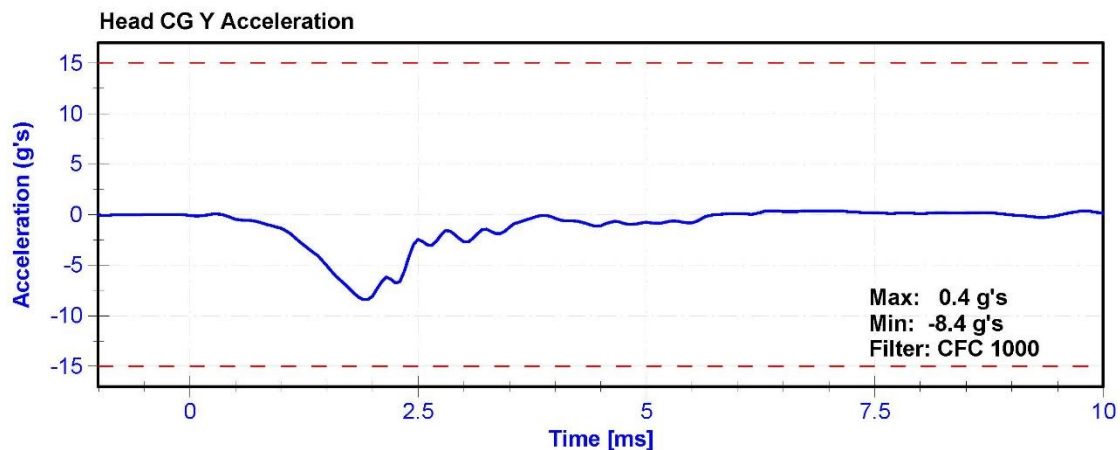
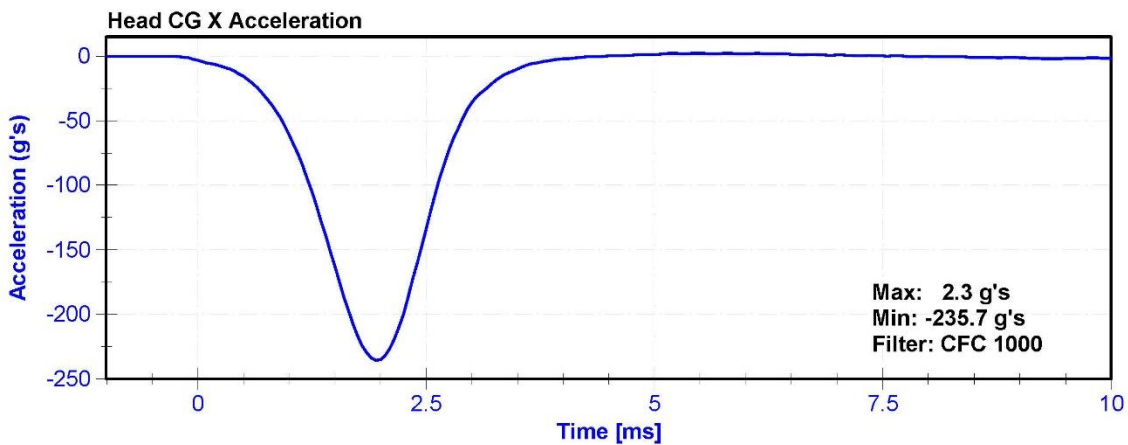
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	36.3	Pass
Resultant Acceleration	250	300	g's	270.7	Pass
Oscillation	0	10	%	2.1	Pass
Lateral Acceleration	-15	15	g's	-8.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P80337	12/9/2015	6/8/2016
Y Accelerometer	ENDEVCO 7264CT	AC-P80265	12/9/2015	6/8/2016
Z Accelerometer	ENDEVCO 7264CT	AC-P83418	12/9/2015	6/8/2016





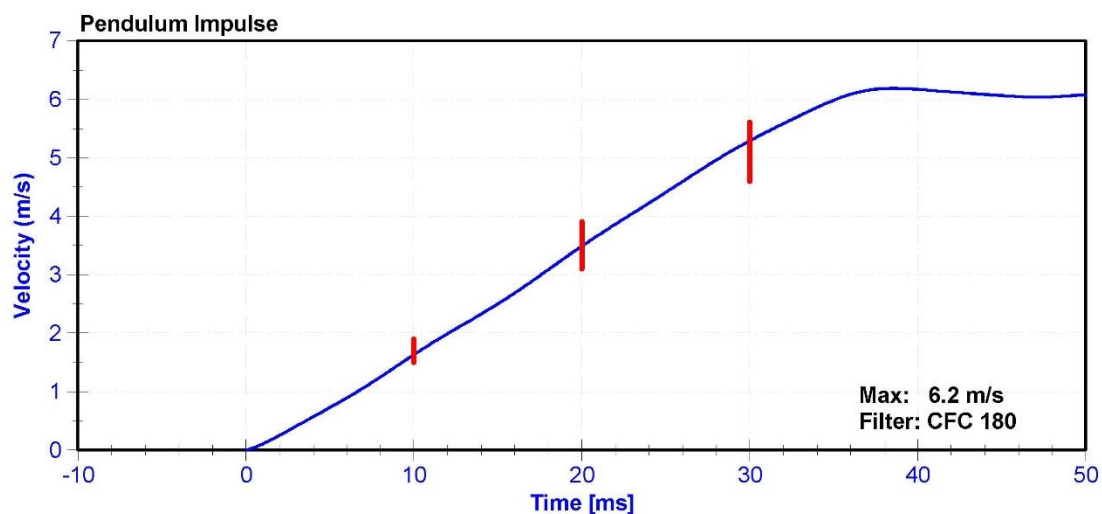
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

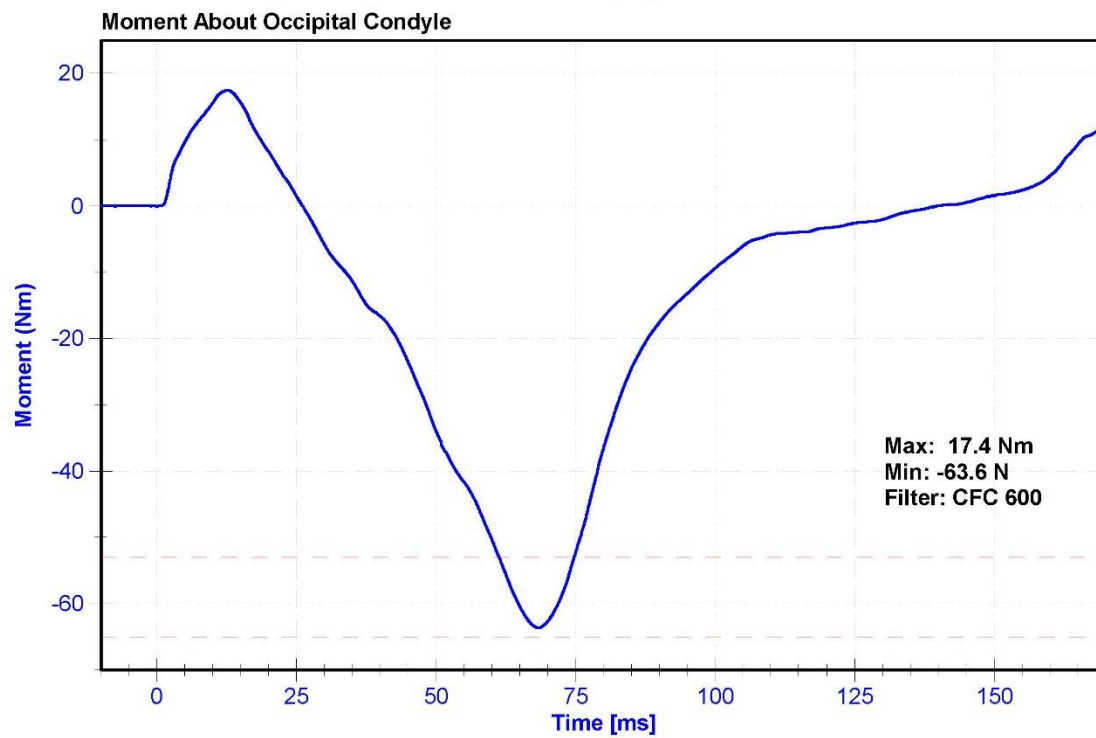
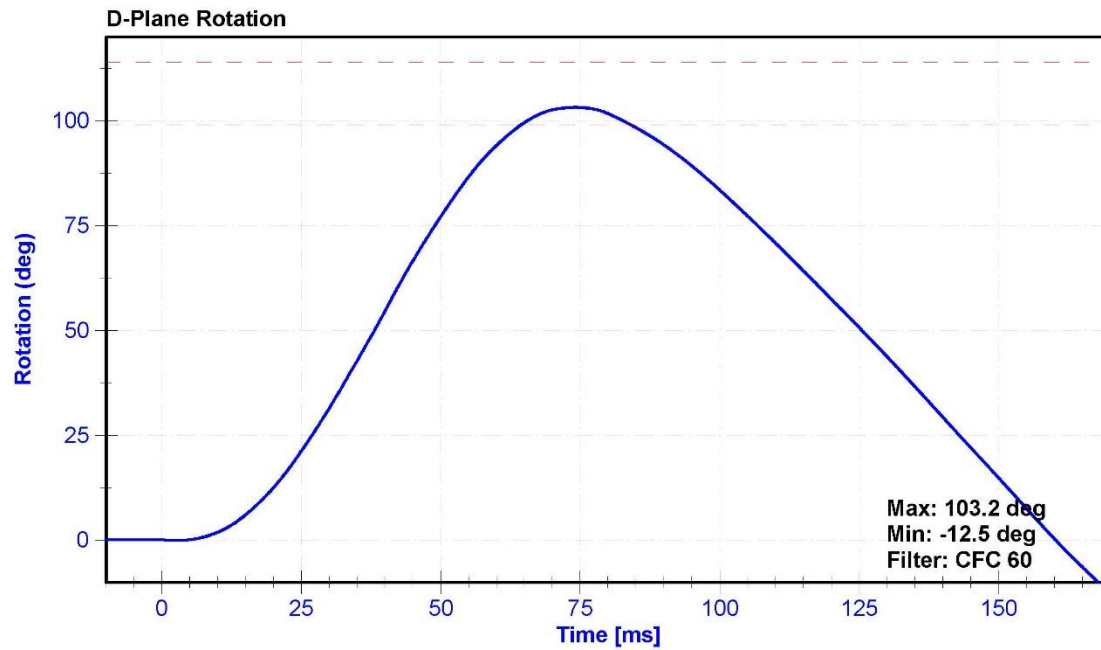
Results

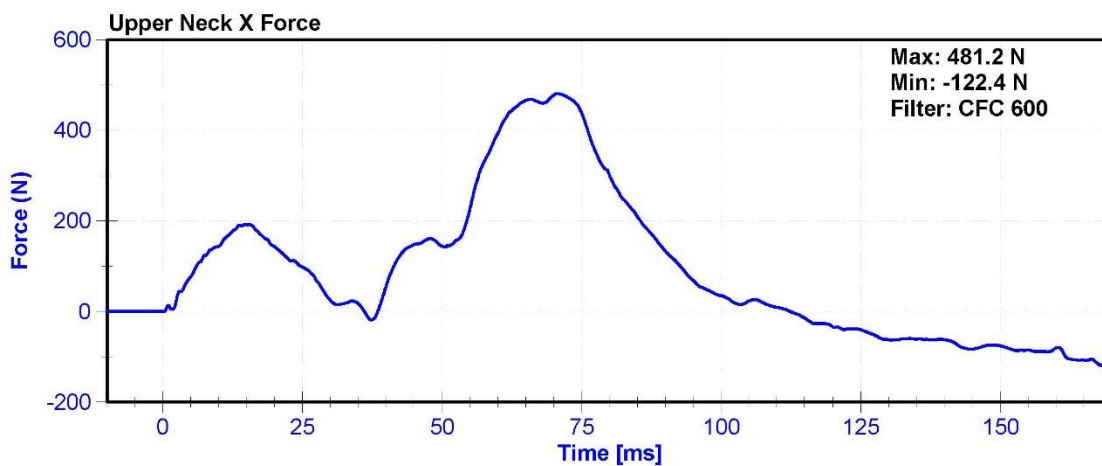
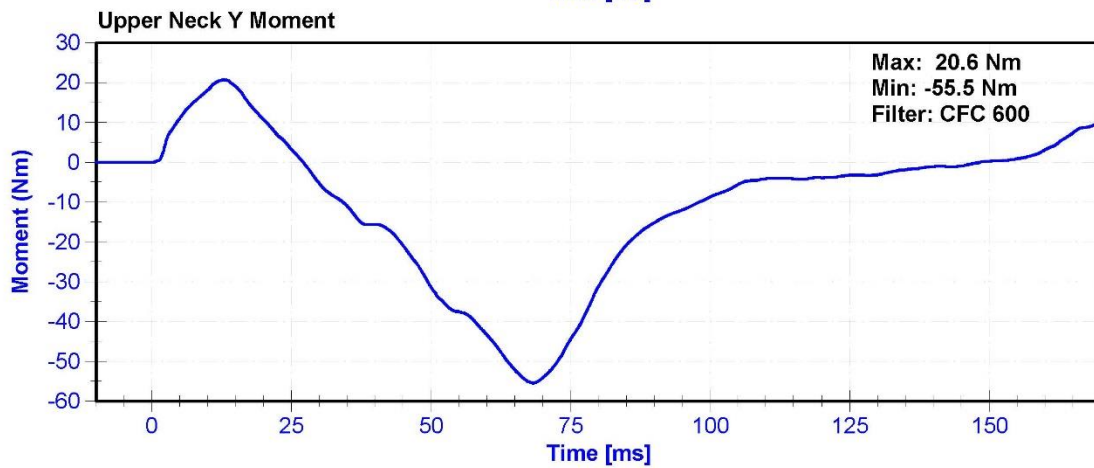
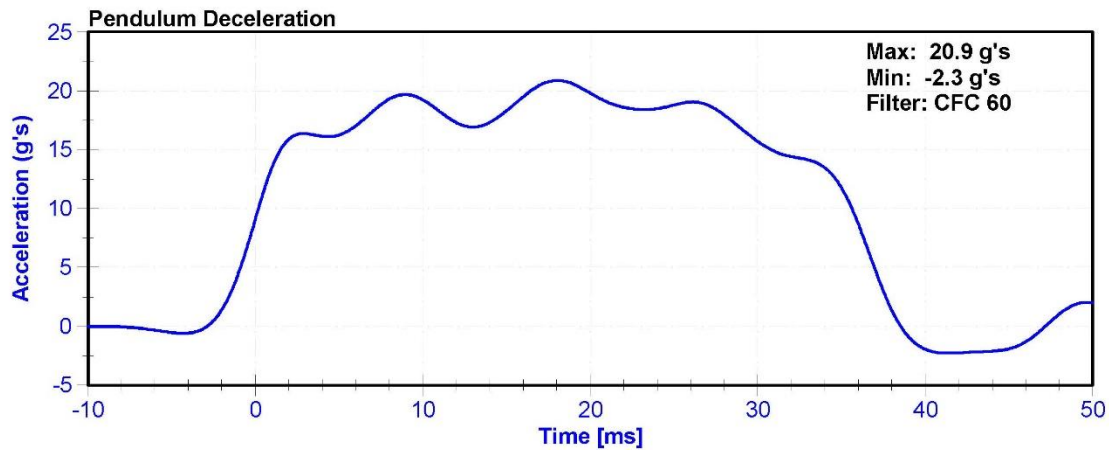
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	36.3	Pass
Velocity	5.95	6.19	m/s	6.025	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.63	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.49	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.29	Pass
D Plane Rotation	99	114	deg	103.2	Pass
Moment During Rotation Interval	-65	-53	Nm	-63.6	Pass
Moment Decay to -10Nm	94	114	ms	99.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716A	LC-2206Fx	5/13/2015	5/12/2016







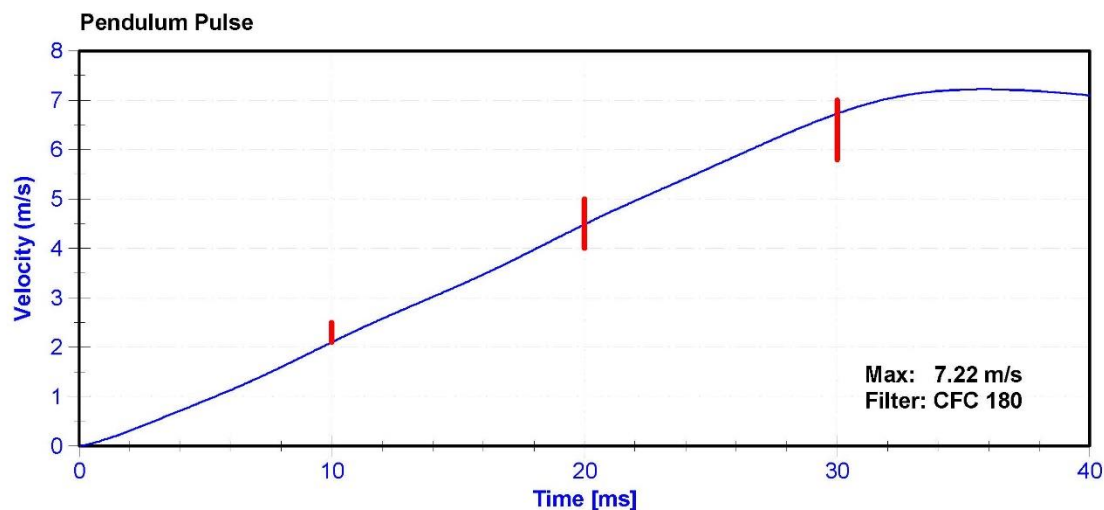
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

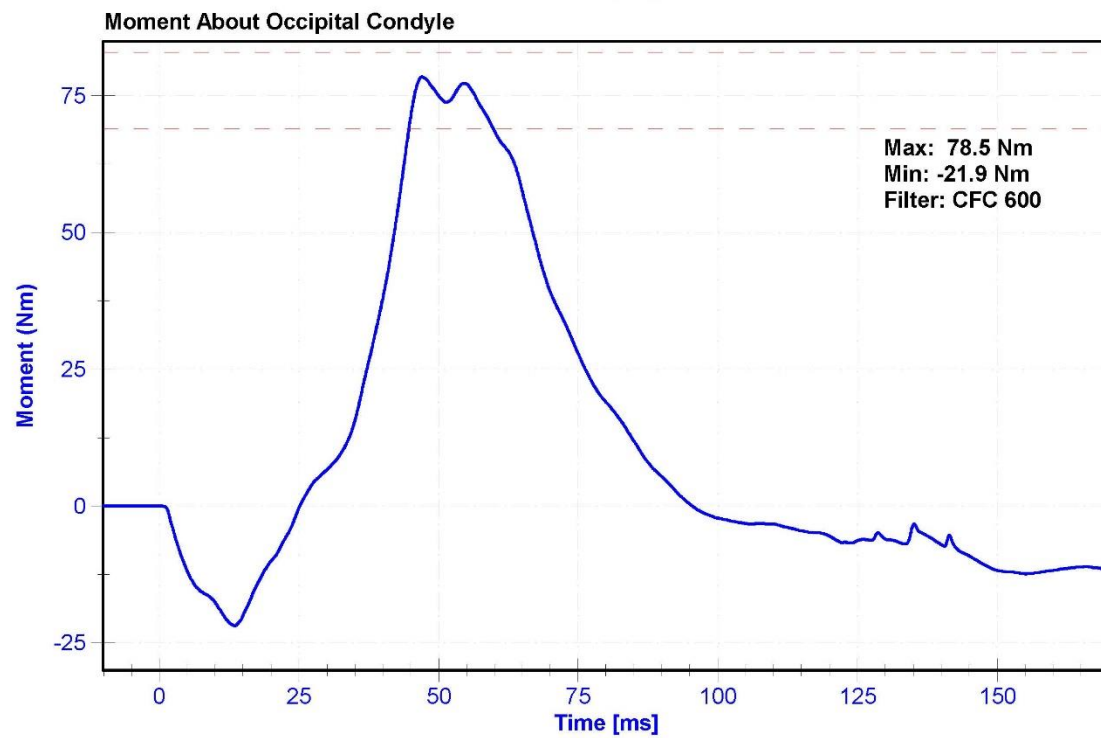
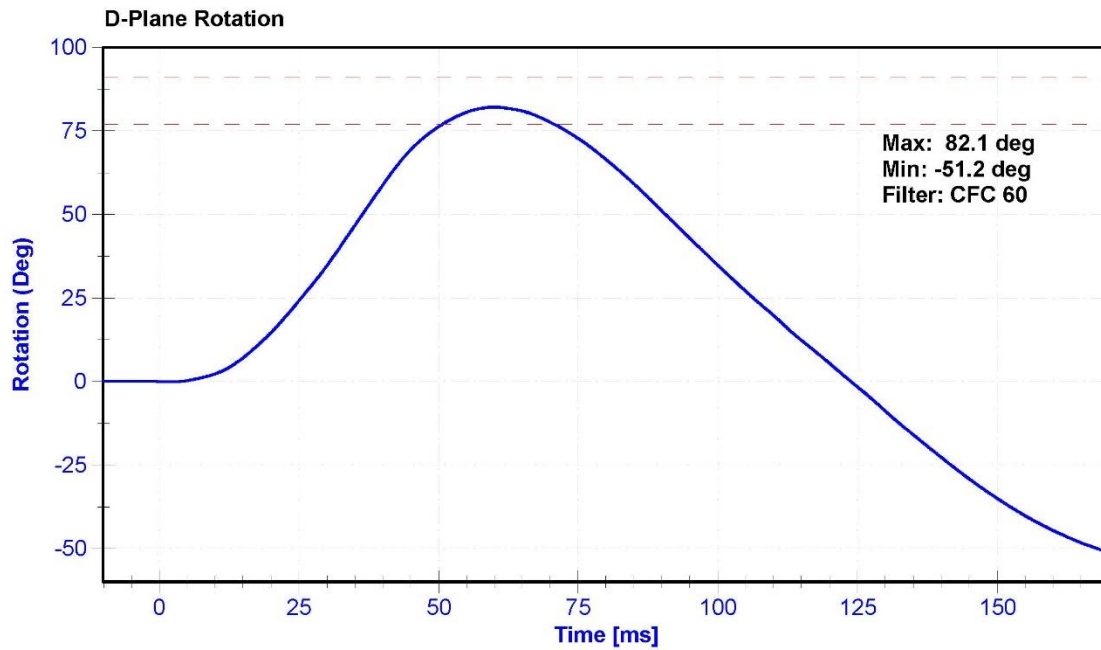
Results

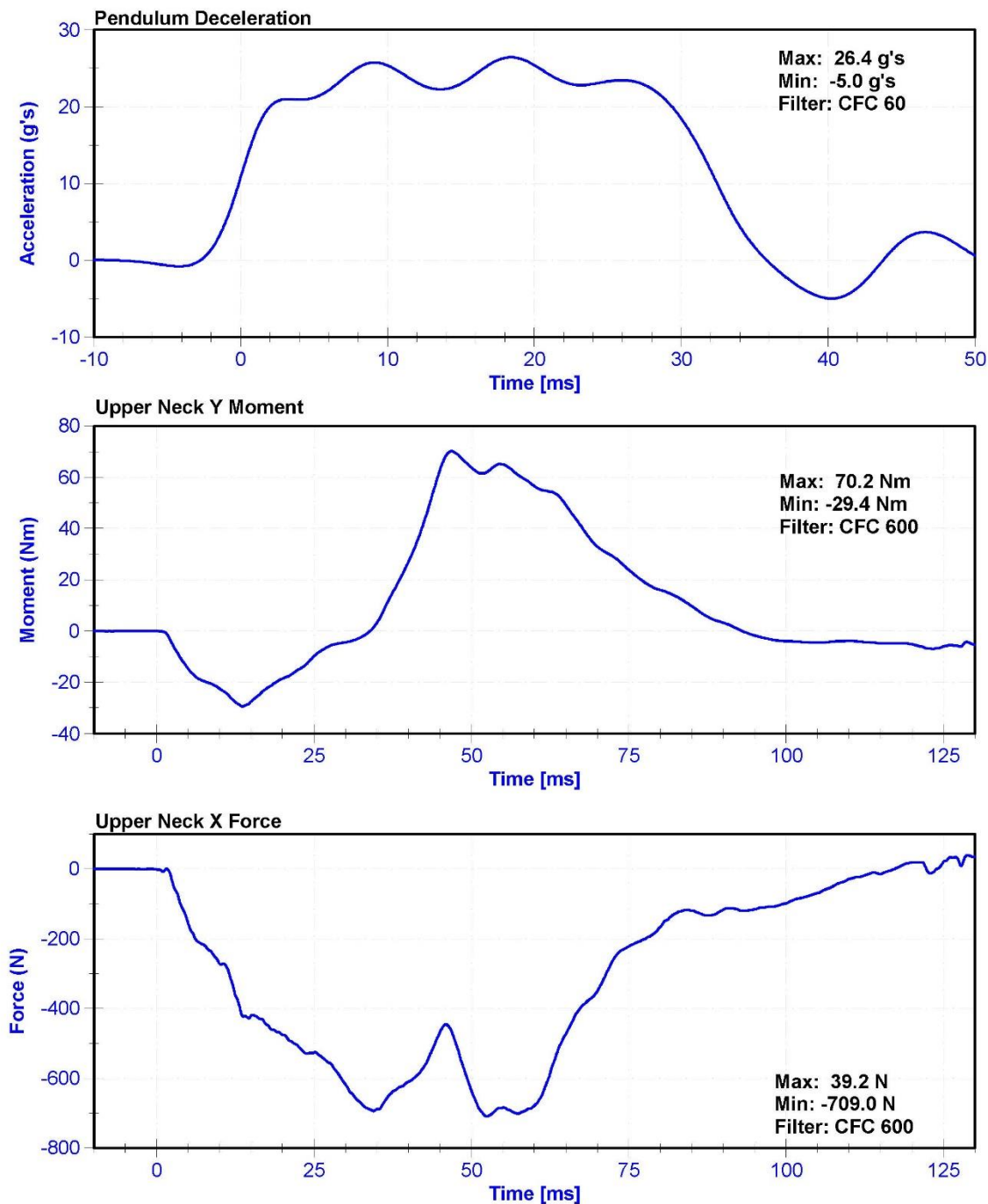
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.3	Pass
Humidity	10	70	%	36.3	Pass
Velocity	6.89	7.13	m/s	6.979	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.10	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.49	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.73	Pass
Max D Plane Rotation	77	91	deg	82.1	Pass
Max Moment During Rotation Interval	69	83	Nm	78.5	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 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716A	LC-2206Fx	5/13/2015	5/12/2016







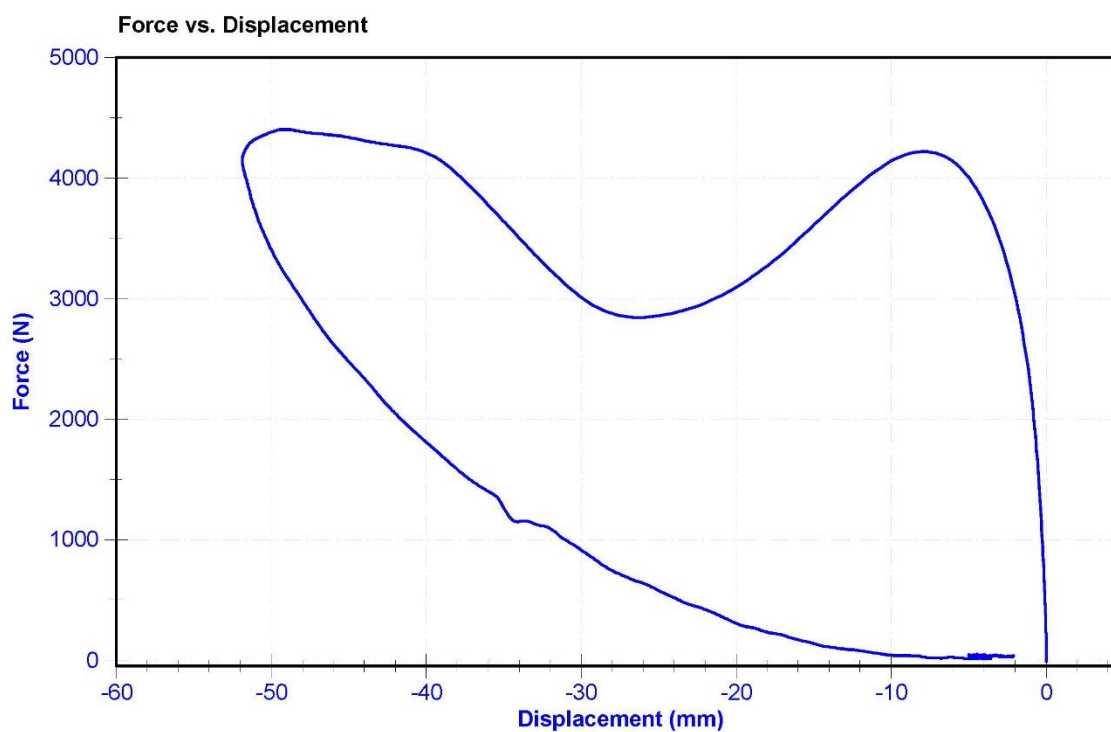
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

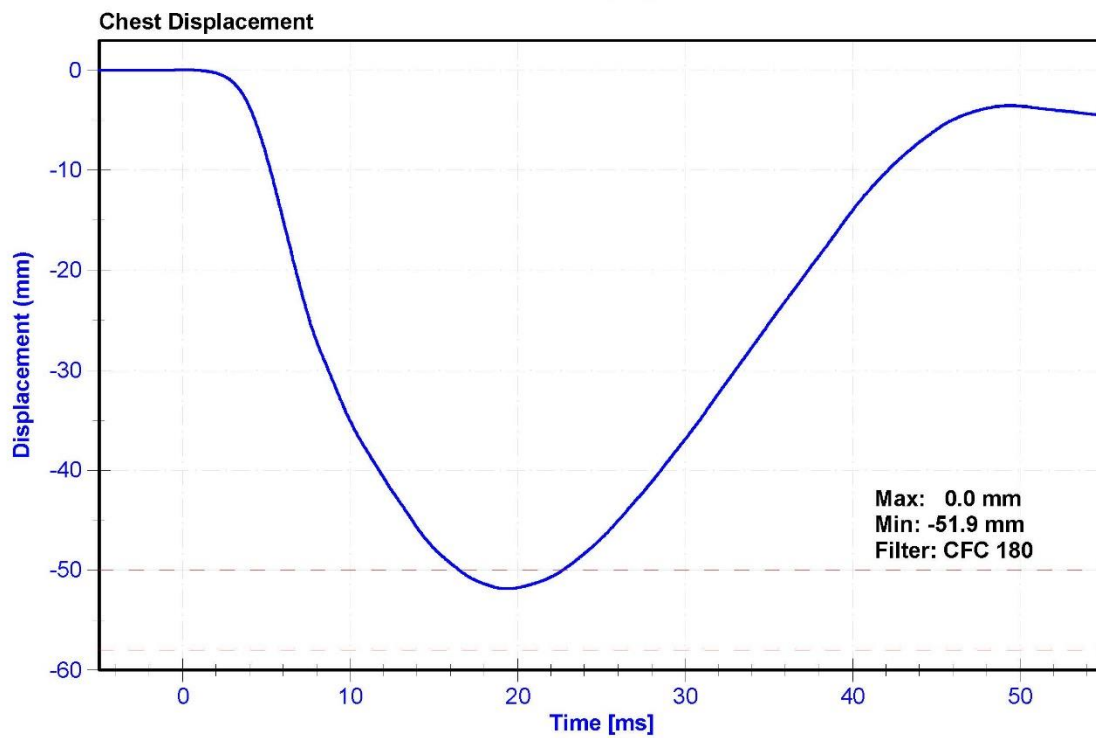
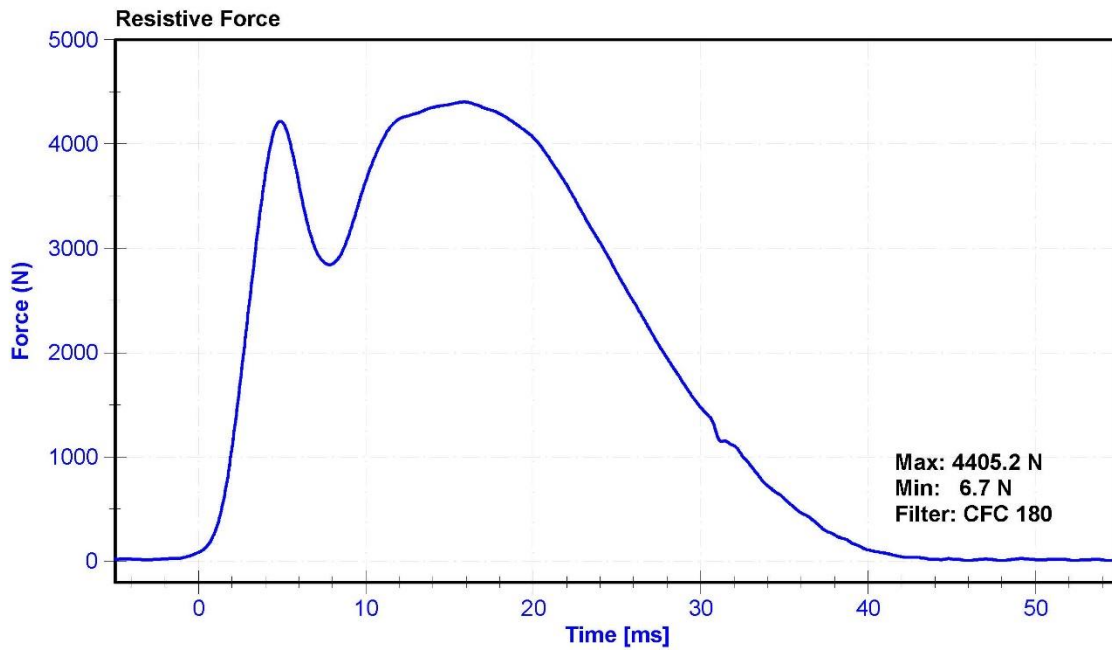
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	39.6	Pass
Velocity	6.59	6.83	m/s	6.626	Pass
Chest Deflection	-58	-50	mm	-51.9	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4382.4	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4405.2	Pass
Hysteresis	69	85	%	72.0	Pass

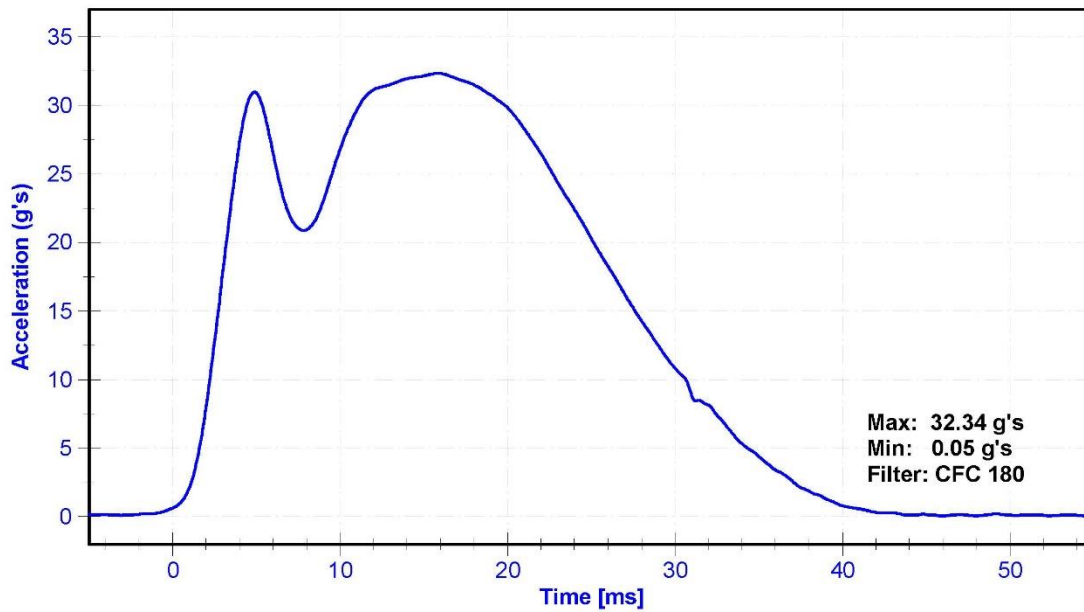
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Chest Potentiometer	SERVO 14CB1-2897	DS-288	9/18/2015	9/17/2016

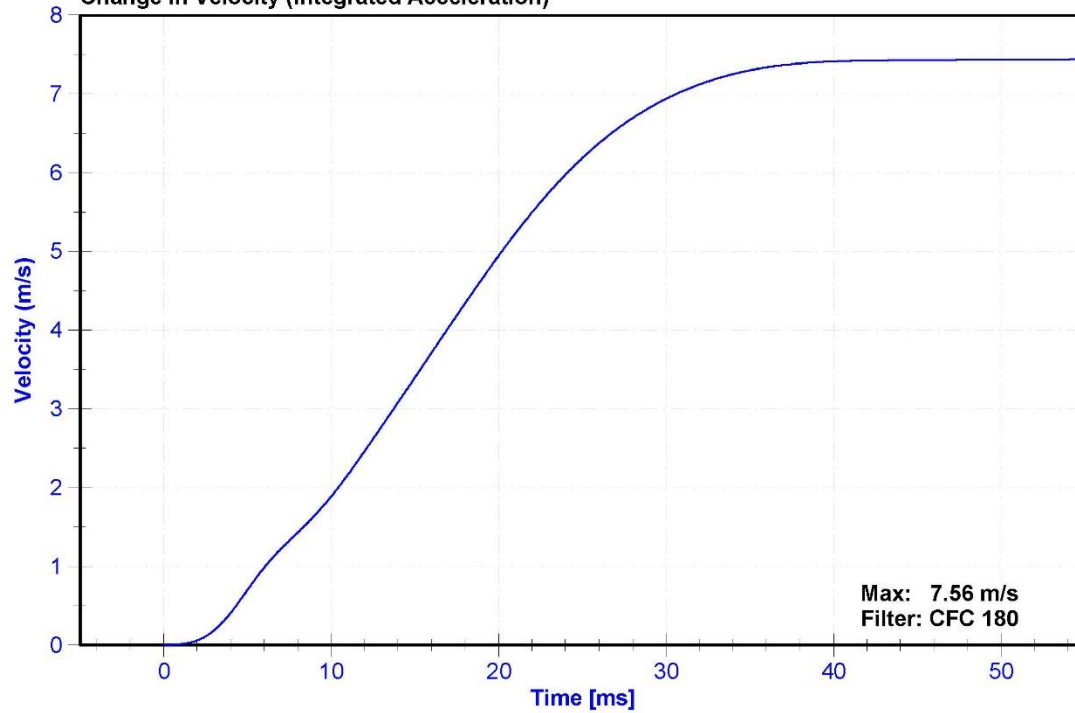




Probe Acceleration



Change in Velocity (Integrated Acceleration)



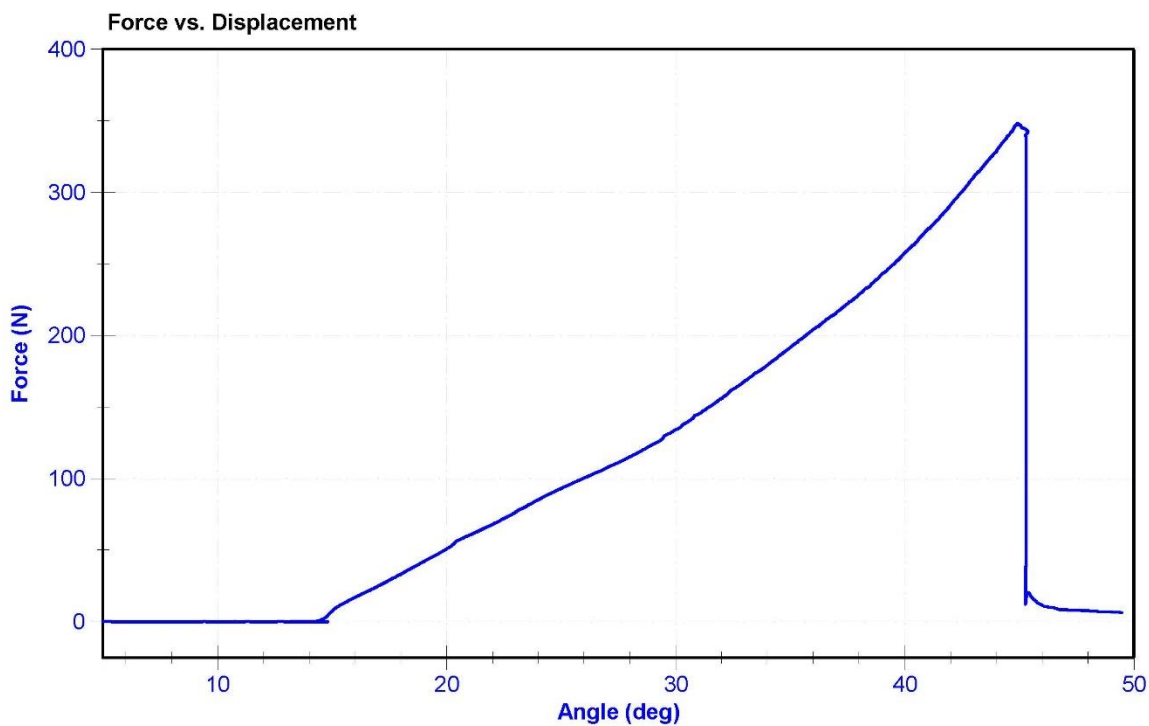
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.4	Pass
Humidity	10	70	%	35	Pass
Initial Angle	0	20	deg	14.0	Pass
Force at 45 Degrees	320	390	N	348.2	Pass
Return Angle Relative to Initial	0	8	deg	6.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker N4C-1	DS-13051548	8/14/2015	8/13/2016
Load Cell	Interface SML-200	LC-493319	8/13/2015	8/12/2016



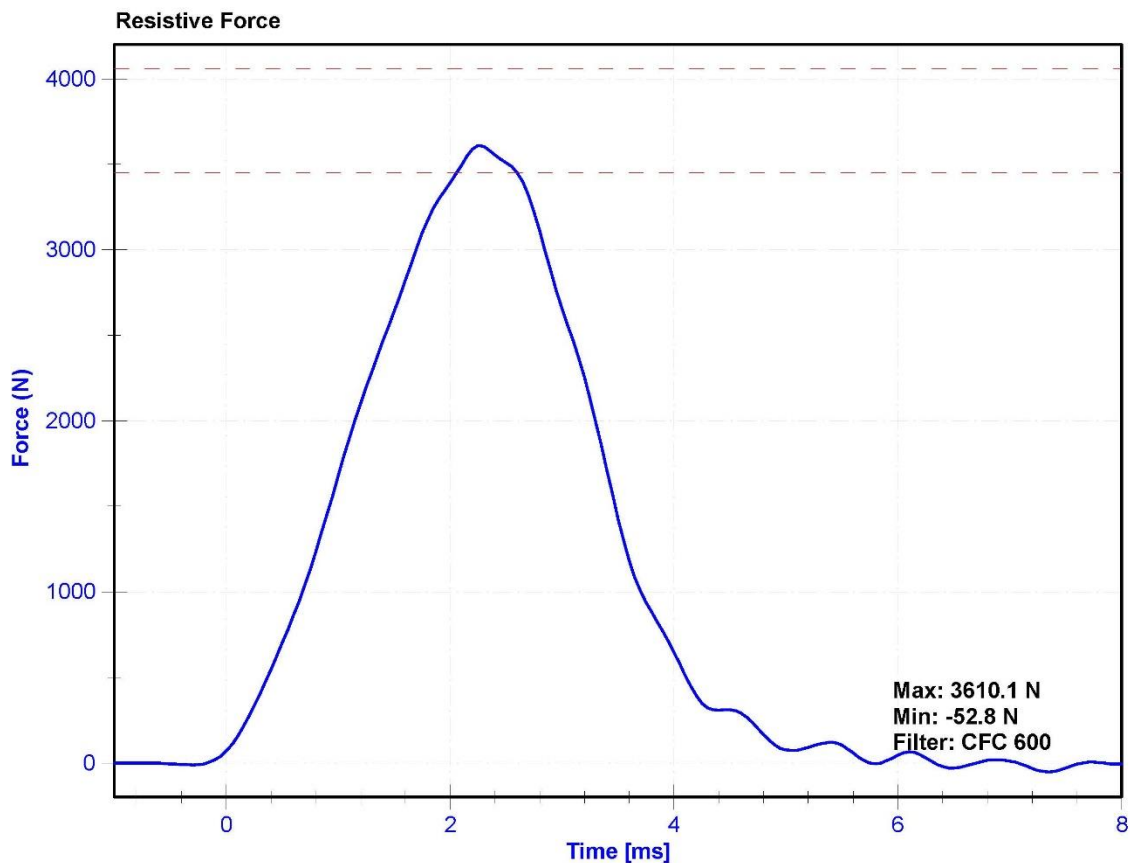
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

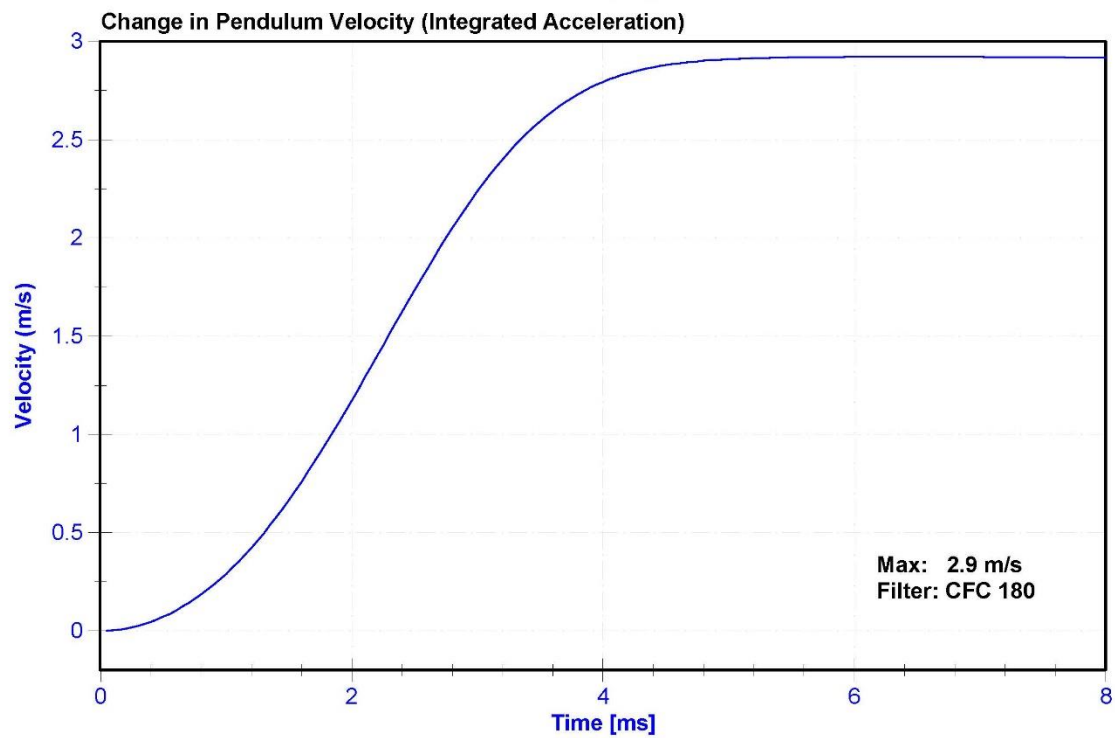
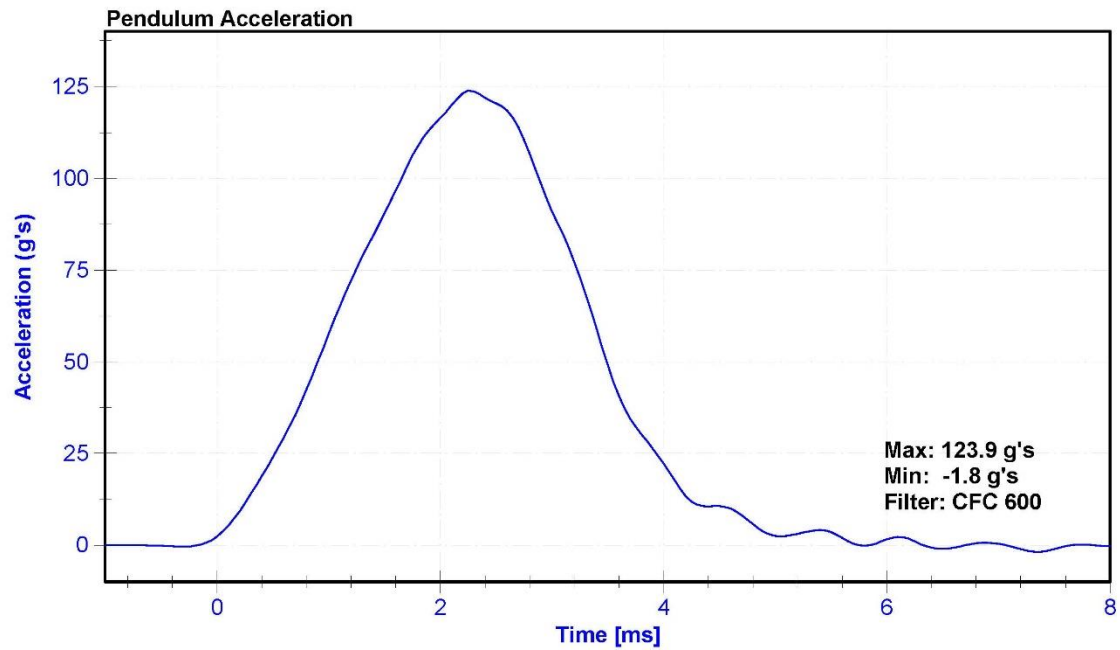
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.8	Pass
Humidity	10	70	%	36.3	Pass
Velocity	2.07	2.13	m/s	2.120	Pass
Resistive Force	3,450	4,060	N	3610.1	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





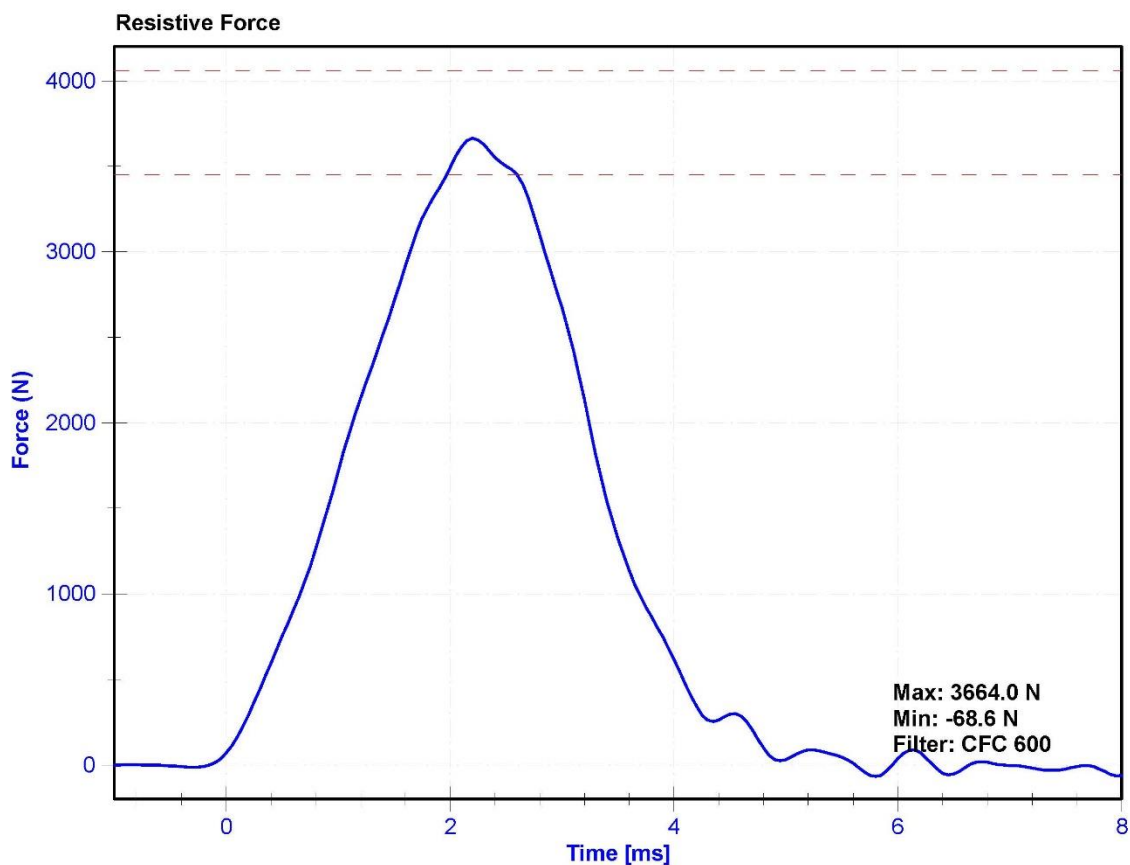
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

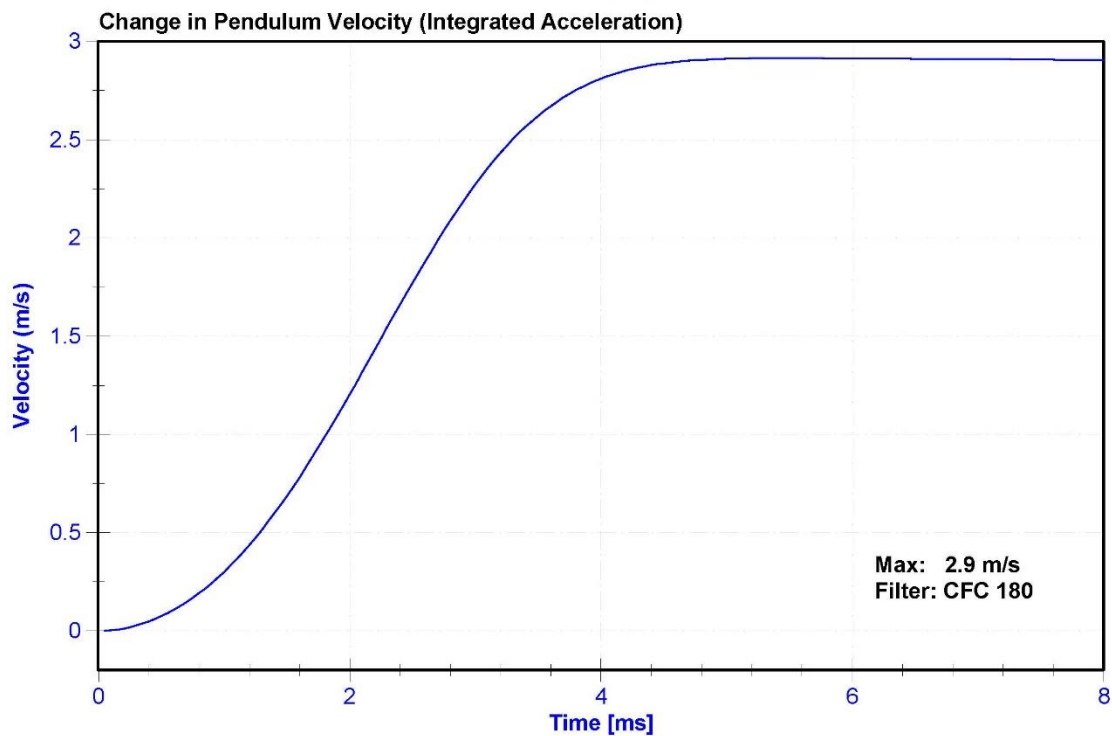
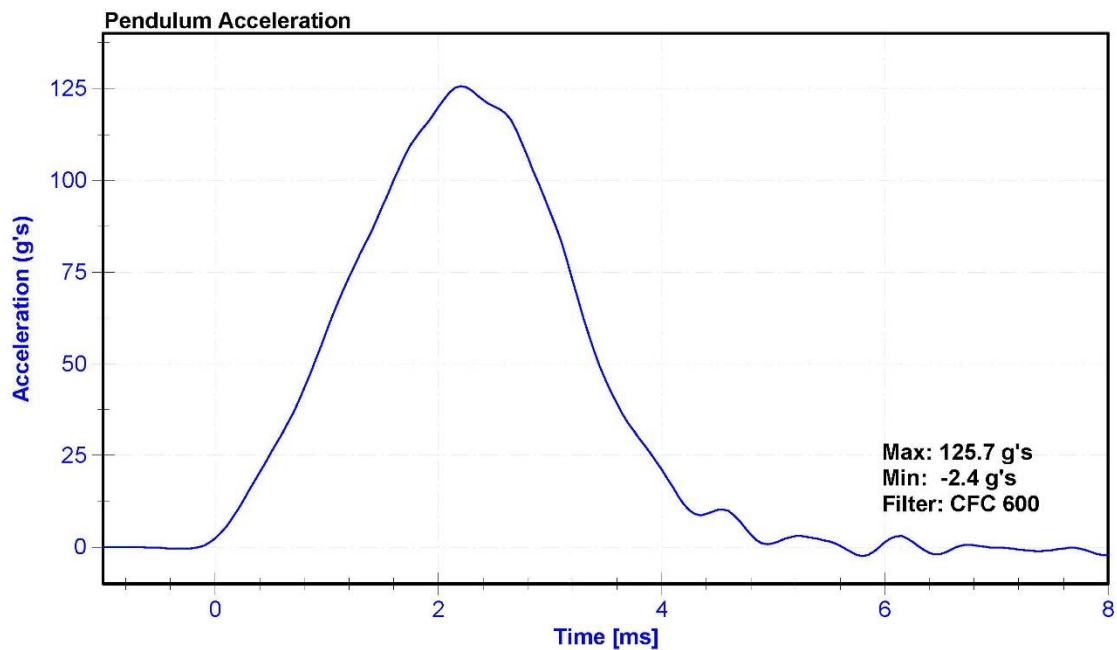
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	20.8	Pass
Humidity	10	70	%	36.3	Pass
Velocity	2.07	2.13	m/s	2.117	Pass
Resistive Force	3,450	4,060	N	3664.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 1046

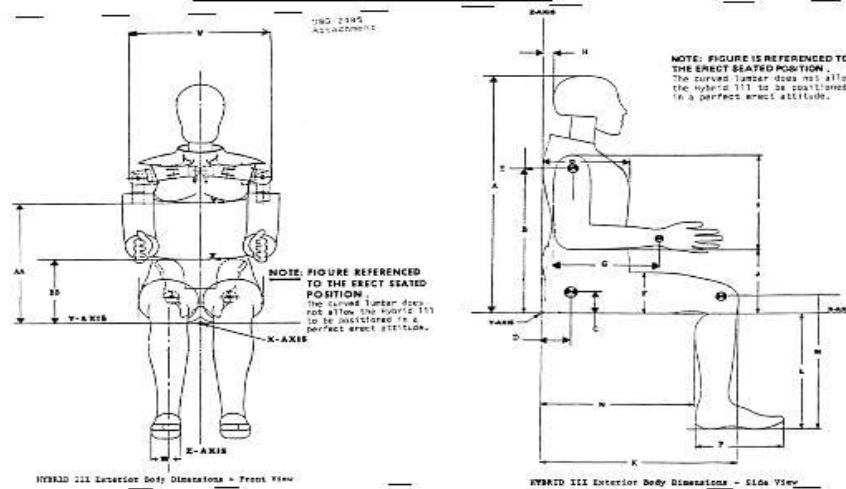


External Measurements - Hybrid 3 - 50th Male

Technician: M. Hartung

Date: 12/18/2015

Dummy Serial Number: 1046



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	20.1	Pass
C	H-Point Height	3.3	3.5	3.4	Pass
D	H-Point from Backline	5.3	5.5	5.5	Pass
E	Shoulder Pivot from Backline	3.3	3.7	3.6	Pass
F	Thigh Clearance	5.5	6.1	5.9	Pass
G	Back of Elbow to Wrist Pivot	11.4	12.0	11.8	Pass
H	Head Back to Backline	1.6	1.8	1.6	Pass
I	Shoulder to Elbow Length	13.0	13.6	13.4	Pass
J	Elbow Rest Height	7.5	8.3	8.0	Pass
K	Buttock to Knee Length	22.8	23.8	23.2	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	10.0	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	38.8	Pass
Z	Waist Circumference	32.9	34.1	33.7	Pass
AA	Reference Location (Chest Circumference)	16.9	17.1	17.0	Pass
BB	Reference Location (Waist Circumference)	8.9	9.1	9.1	Pass

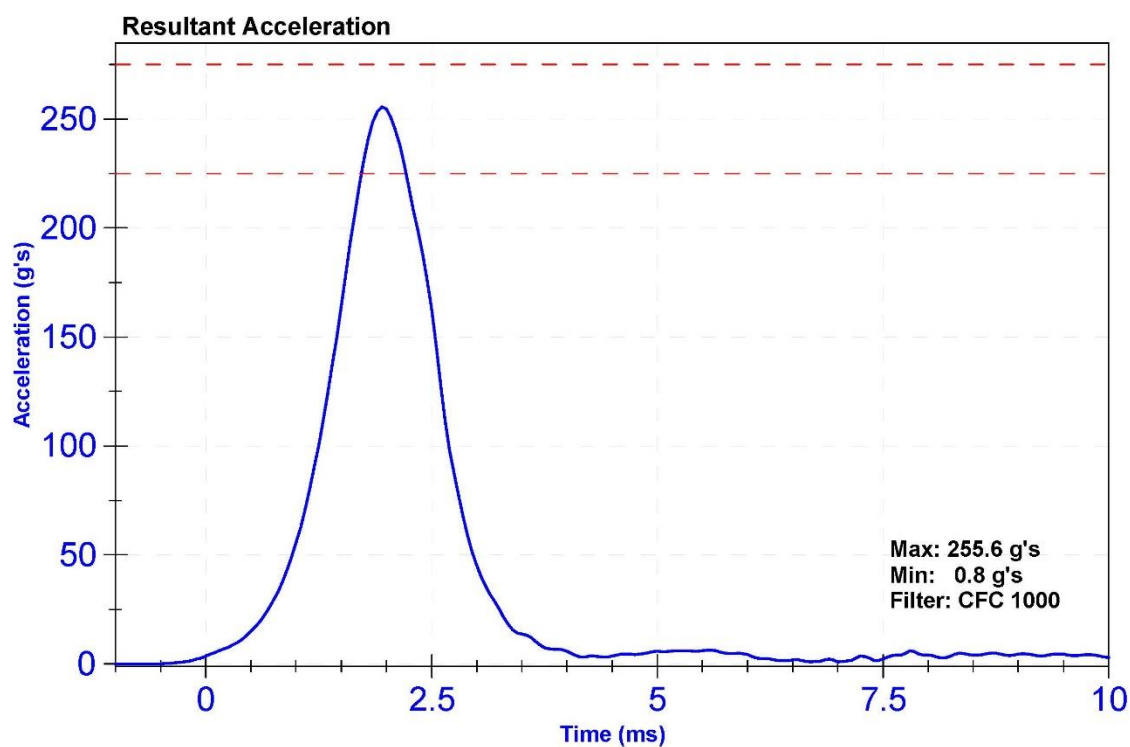
ATD Manufacturer		Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

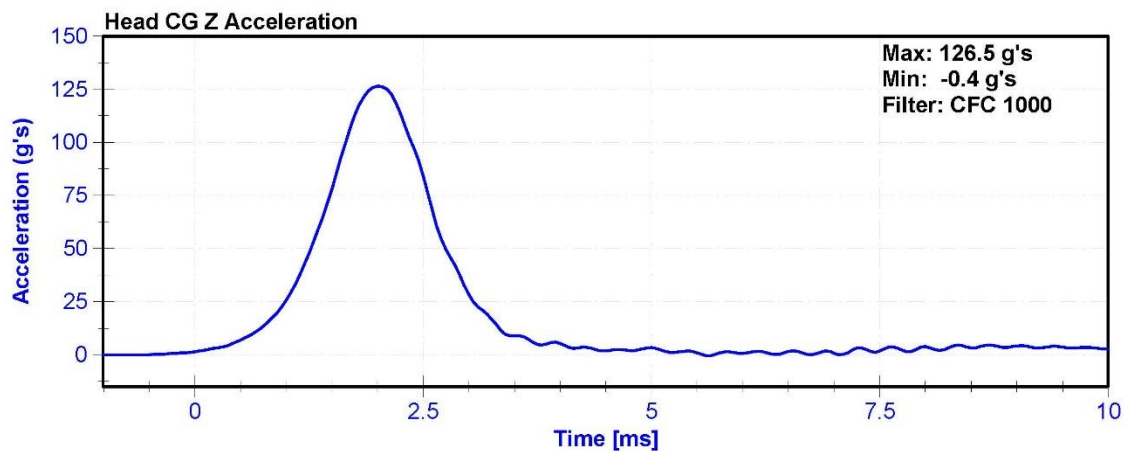
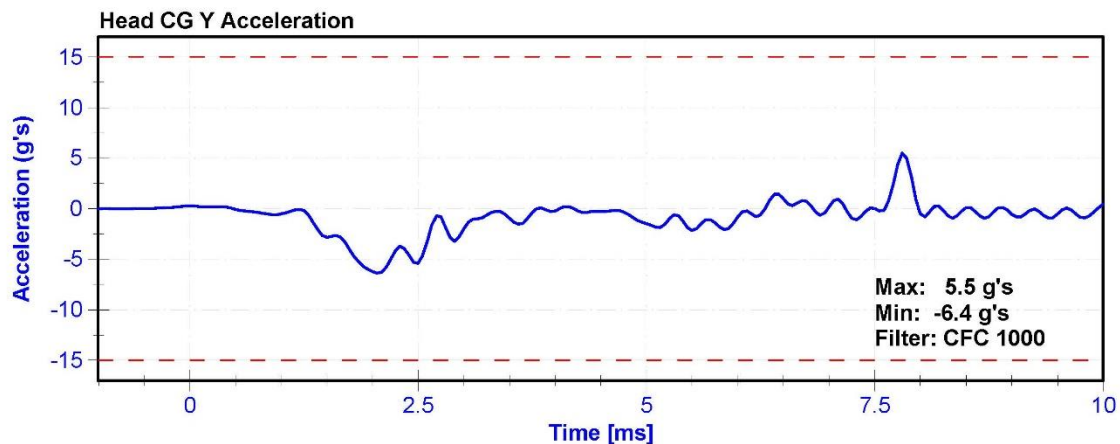
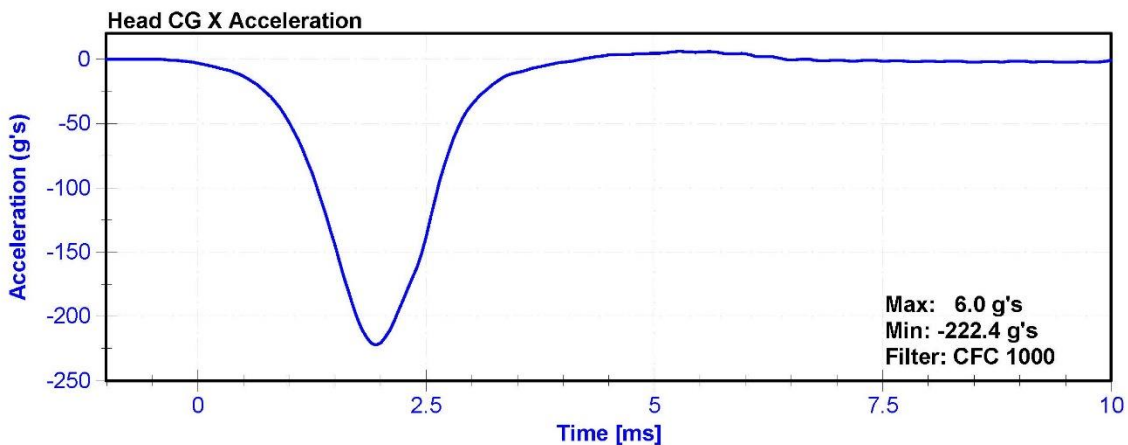
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	22.3	Pass
Humidity	10	70	%	22.7	Pass
Resultant Acceleration	225	275	g's	255.6	Pass
Oscillation	0	10	%	2.4	Pass
Lateral Acceleration	-15	15	g's	-6.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264CT	AC-P58871	12/3/2015	6/2/2016
Y Accelerometer	ENDEVCO 7264	AC-P12359	12/3/2015	6/2/2016
Z Accelerometer	ENDEVCO 7264CT	AC-P52133	12/3/2015	6/2/2016





ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

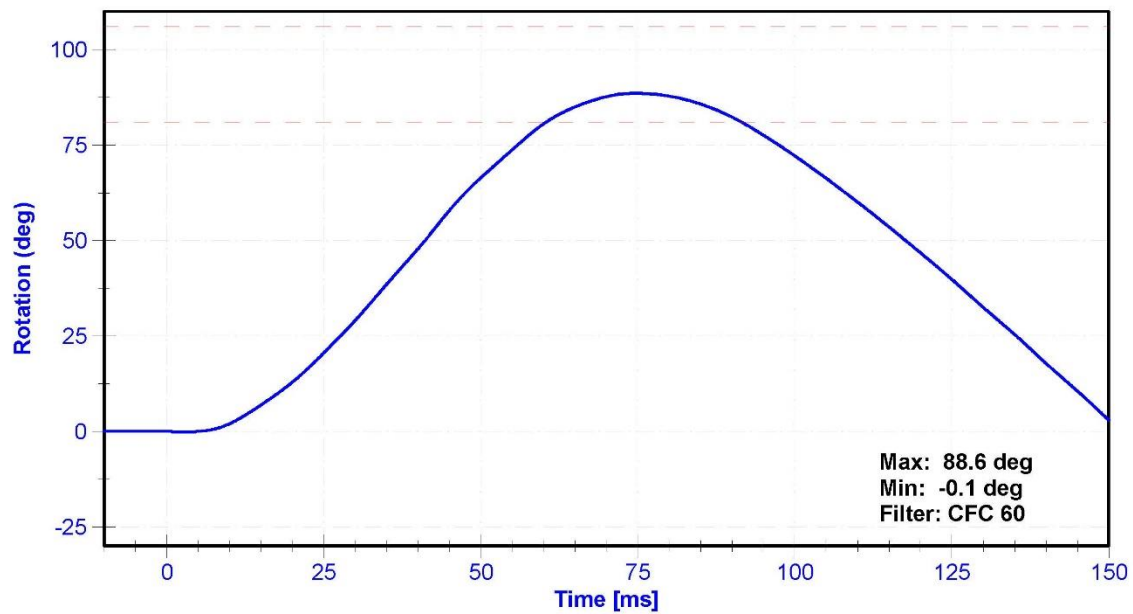
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.7	Pass
Humidity	10	70	%	21.9	Pass
Velocity	5.94	6.19	m/s	6.025	Pass
Pendulum Deceleration at 10ms	17.2	21.2	g's	19.75	Pass
Pendulum Deceleration at 20ms	14	19	g's	18.8	Pass
Pendulum Deceleration at 30ms	11	16	g's	15.0	Pass
Max. Pendulum Deceleration After 30ms	0	22	g's	20.1	Pass
Pendulum Deceleration Time to 5 g's	38	46	ms	38.3	Pass
Maximum D Plane Rotation	81	106	deg	88.6	Pass
Time to Maximum Rotation	72	82	ms	74.7	Pass
Rotation Decay to Zero	147	174	ms	152.1	Pass
Minimum Moment About OC	-80	-52.9	Nm	-69.16	Pass
Time to Minimum Moment	65	79	ms	69.3	Pass
Moment Decay to Zero	120	148	ms	135.6	Pass

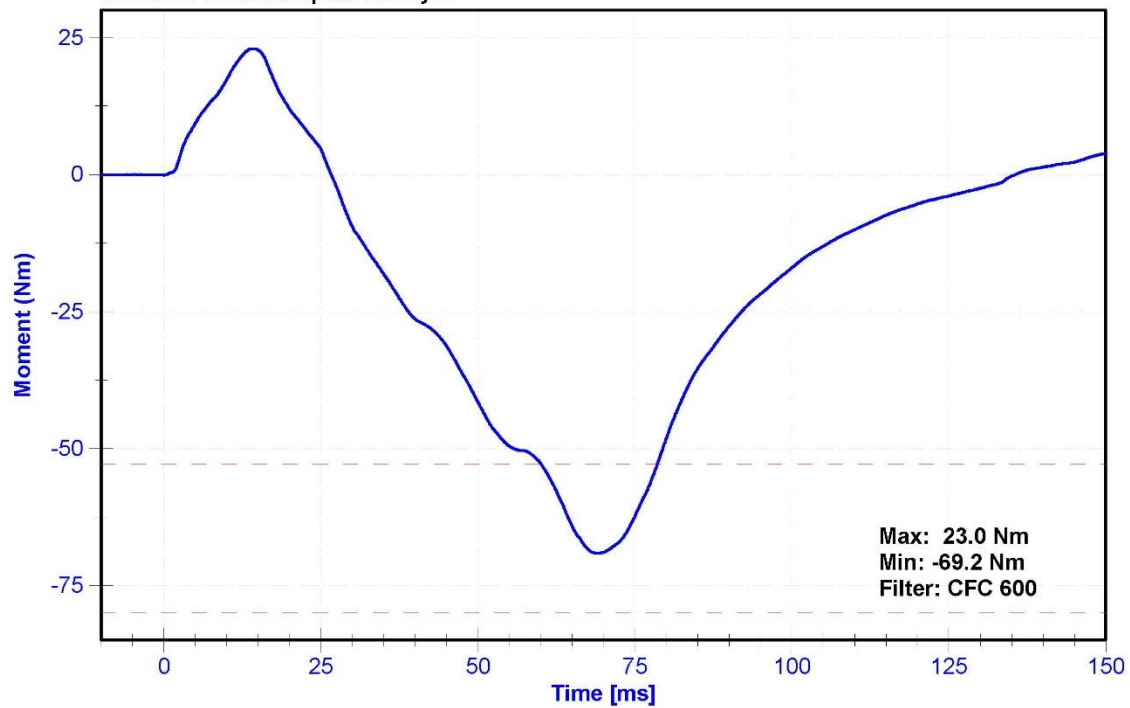
Transducer Calibrations

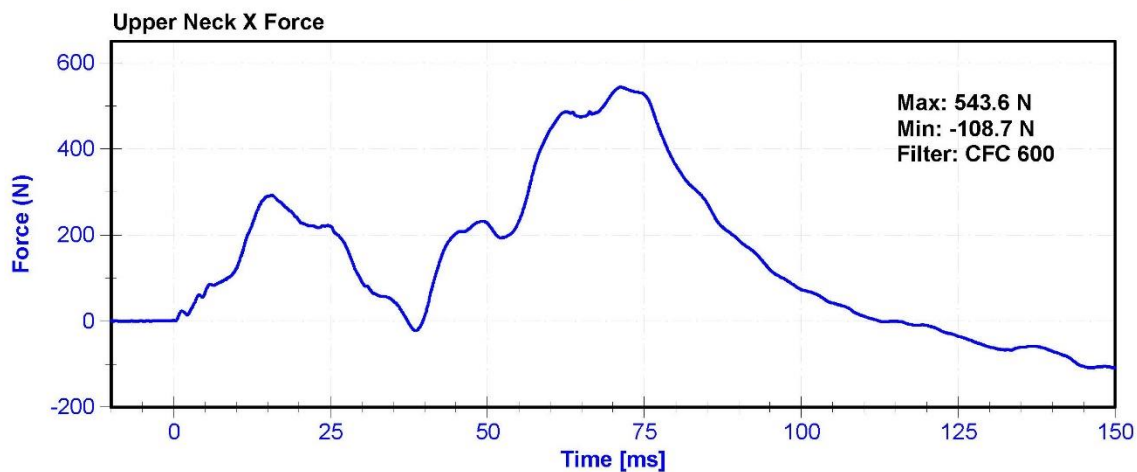
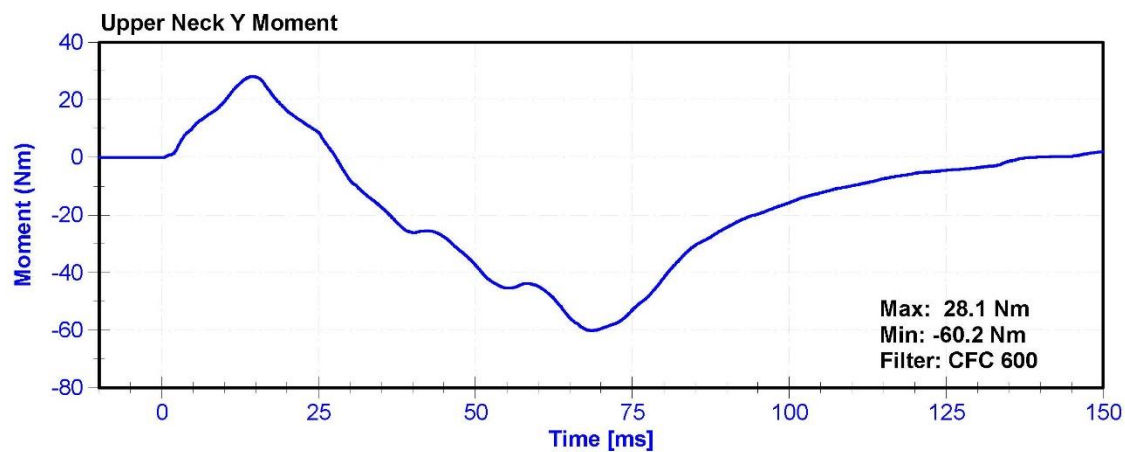
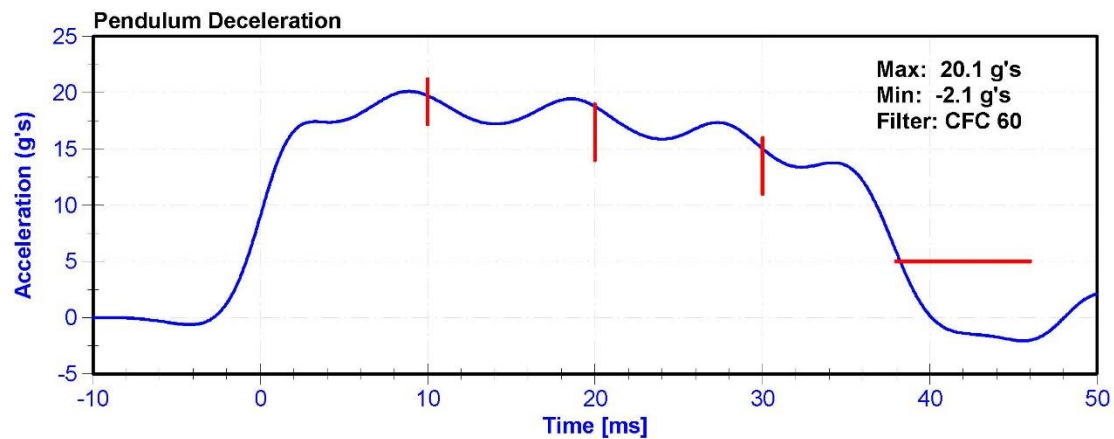
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716A	LC-2186Fx	5/18/2015	5/17/2016

D-Plane Rotation



Moment About Occipital Condyle





ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	4458	Laboratory Supervisor	M.Goehle

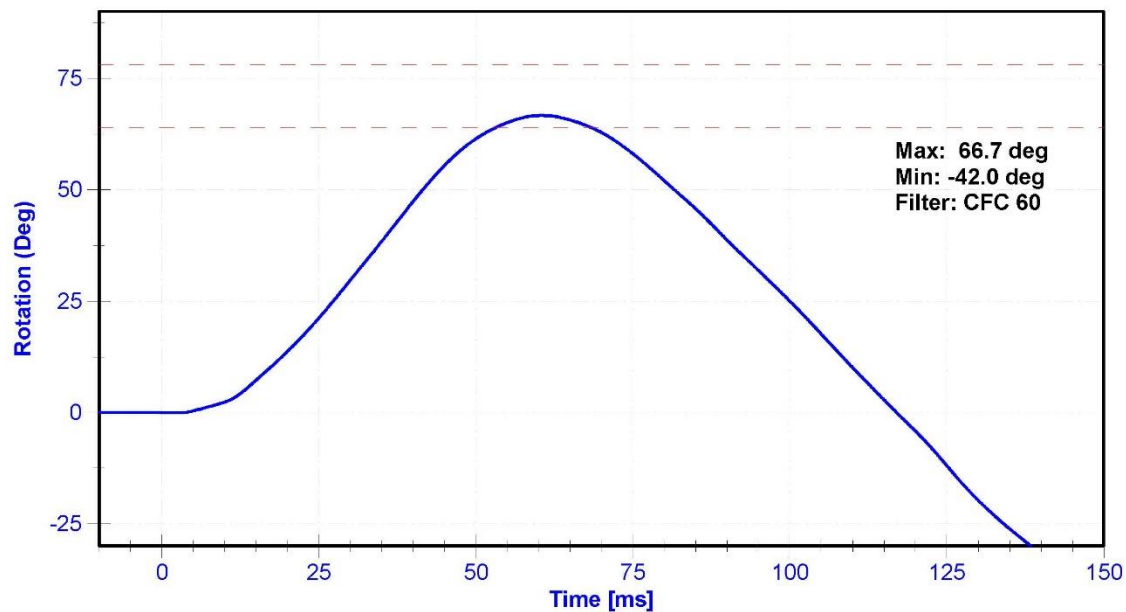
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.8	Pass
Humidity	10	70	%	20.6	Pass
Velocity	6.89	7.13	m/s	7.037	Pass
Pendulum Deceleration at 10ms	22.5	27.5	g's	23.12	Pass
Pendulum Deceleration at 20ms	17.6	22.6	g's	20.75	Pass
Pendulum Deceleration at 30ms	12.5	18.5	g's	16.80	Pass
Max. Pendulum Deceleration After 30ms	0	29	g's	24.0	Pass
Pendulum Deceleration Time to 5 g's	34	42	ms	38.7	Pass
Maximum D Plane Rotation	64	78	deg	66.7	Pass
Time to Maximum Rotation	57	64	ms	60.5	Pass
Rotation Decay to Zero	113	127	ms	117.0	Pass
Moment About Occipital Condyle	88.1	108.4	Nm	96.41	Pass
Time to Maximum Moment	47	58	ms	50.9	Pass
Moment Decay to Zero	97	107	ms	100.9	Pass

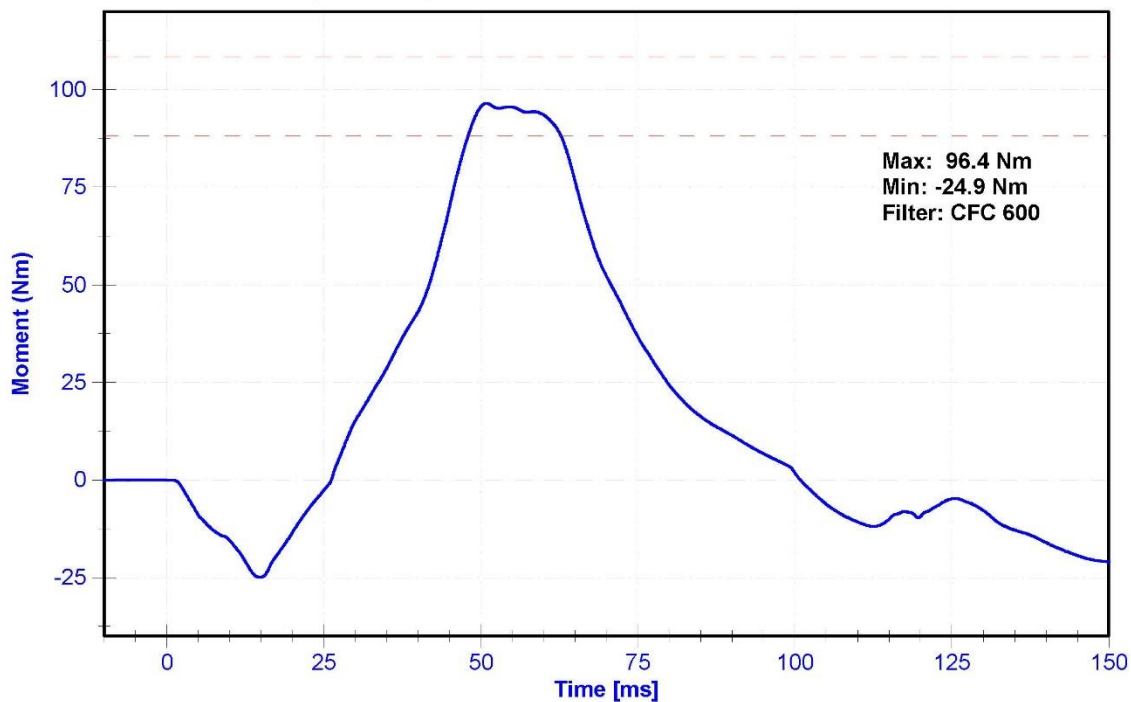
Transducer Calibrations

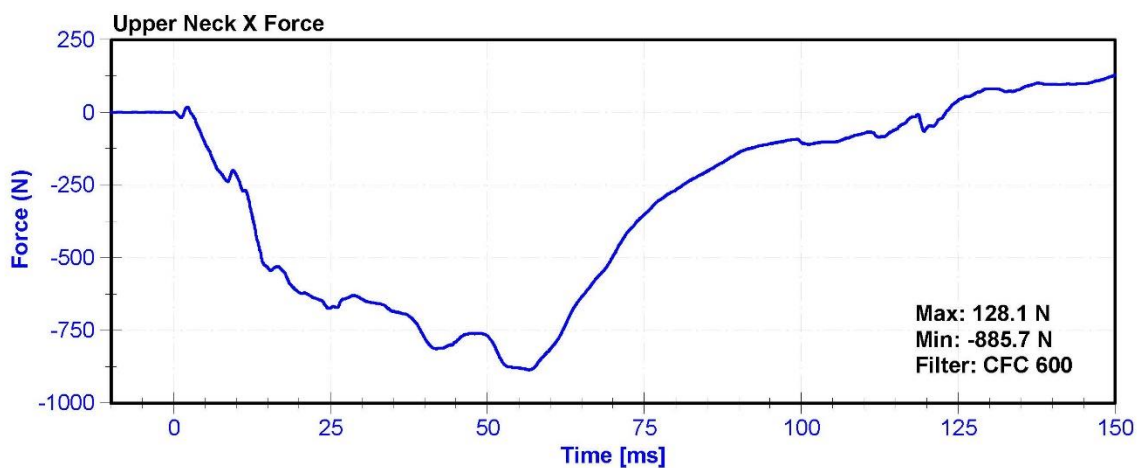
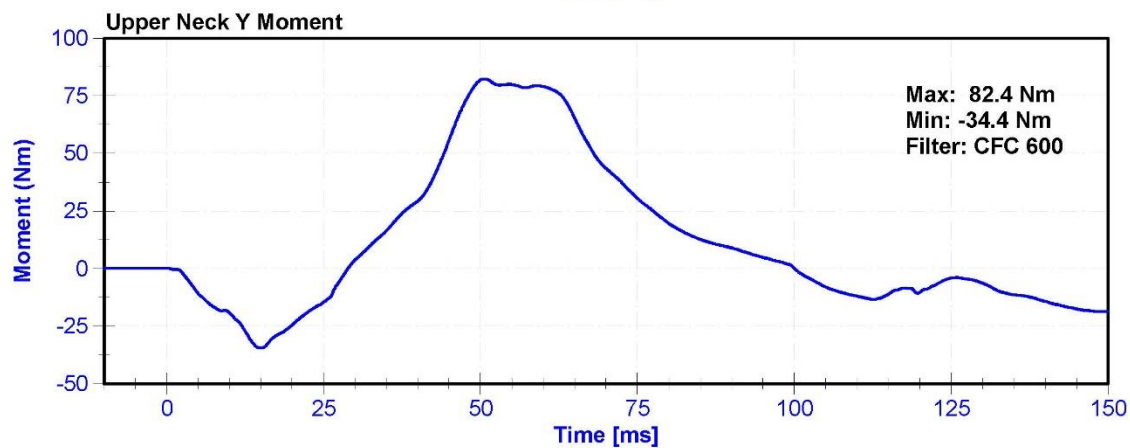
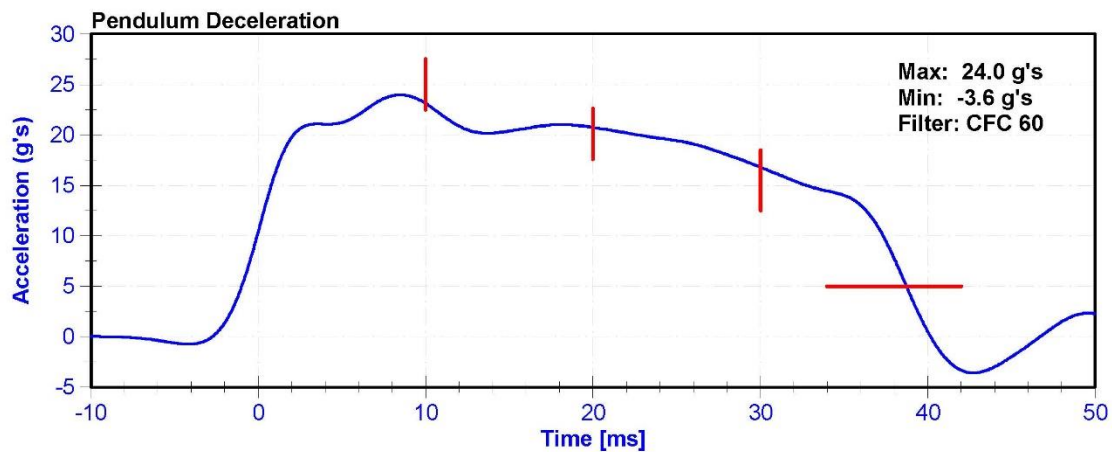
Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716A	LC-2186Fx	5/18/2015	5/17/2016

D-Plane Rotation



Moment About Occipital Condyle





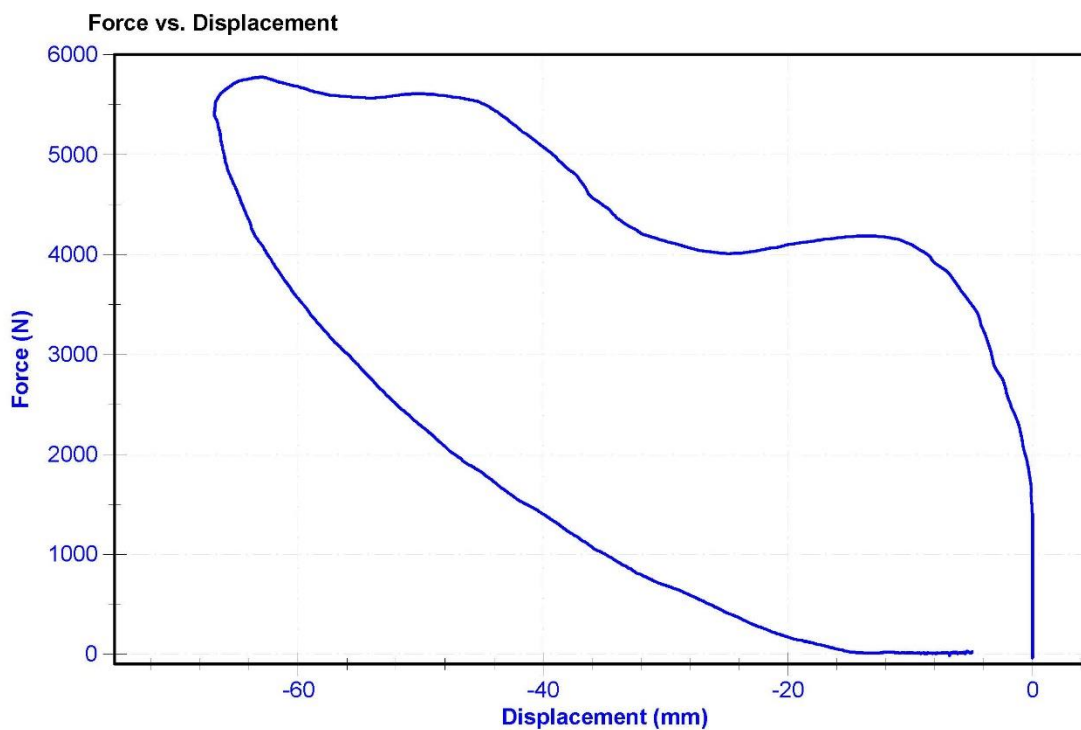
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

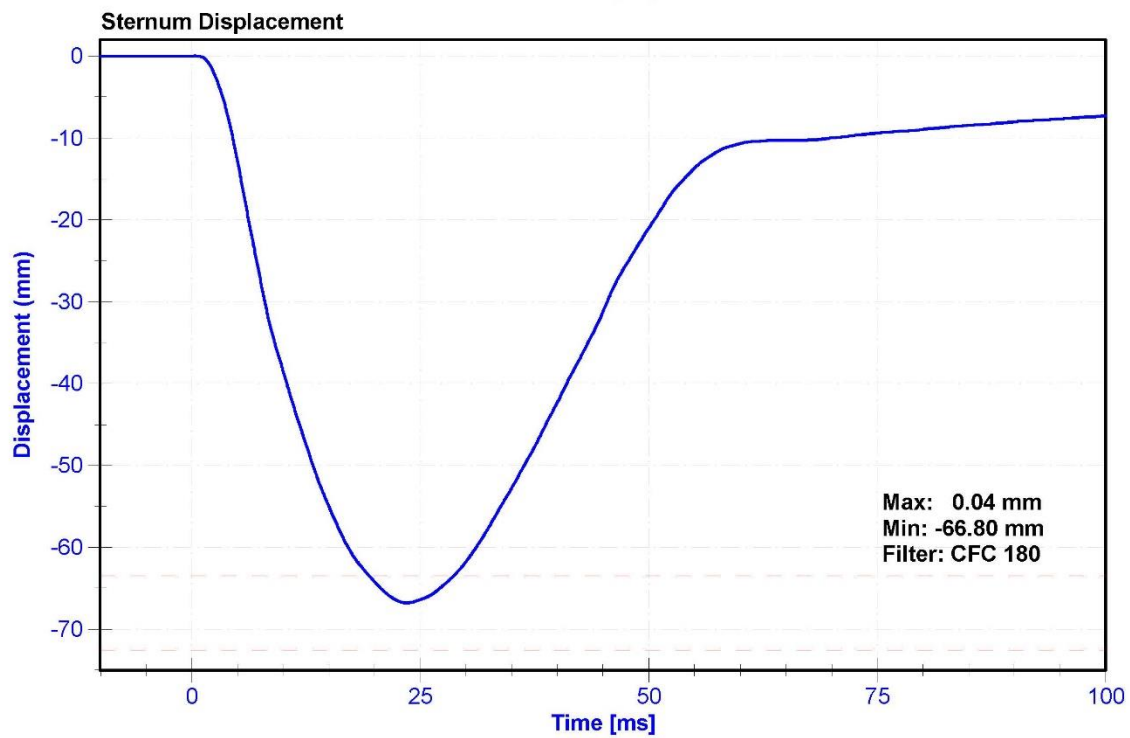
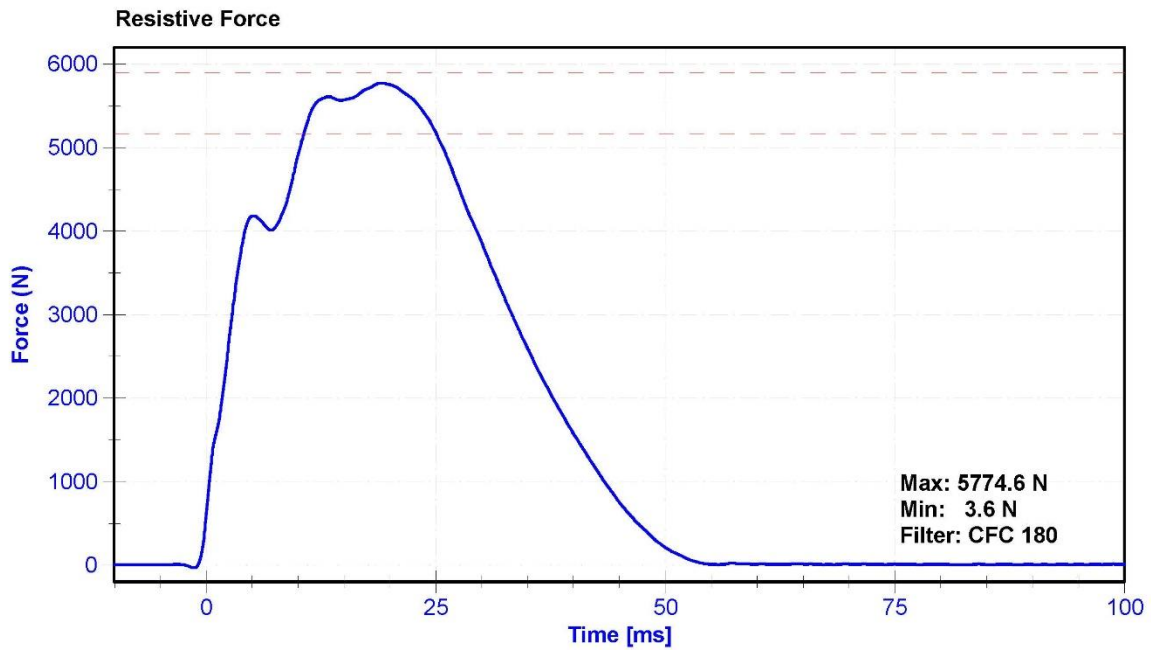
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	21.1	Pass
Humidity	10	70	%	26.1	Pass
Velocity	6.59	6.83	m/s	6.773	Pass
Chest Displacement	-72.6	-63.5	mm	-66.80	Pass
Resistive Force	5160	5894	N	5774.6	Pass
Hysteresis	65	85	%	70.6	Pass

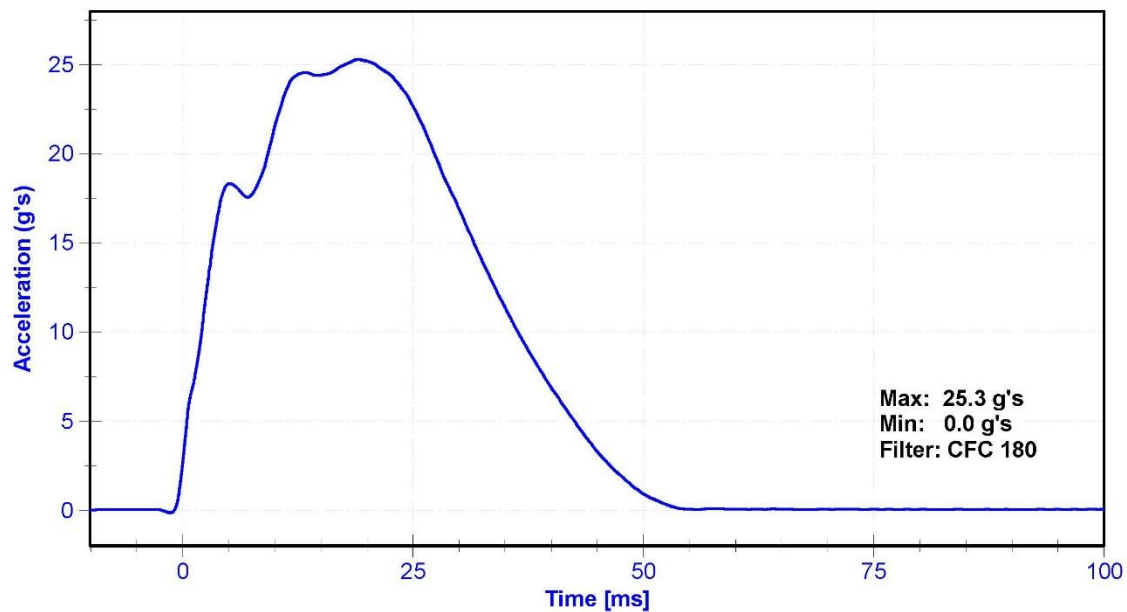
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016
Chest Potentiometer	Servo 14CB1-2897	DS-1046	6/2/2015	6/1/2016

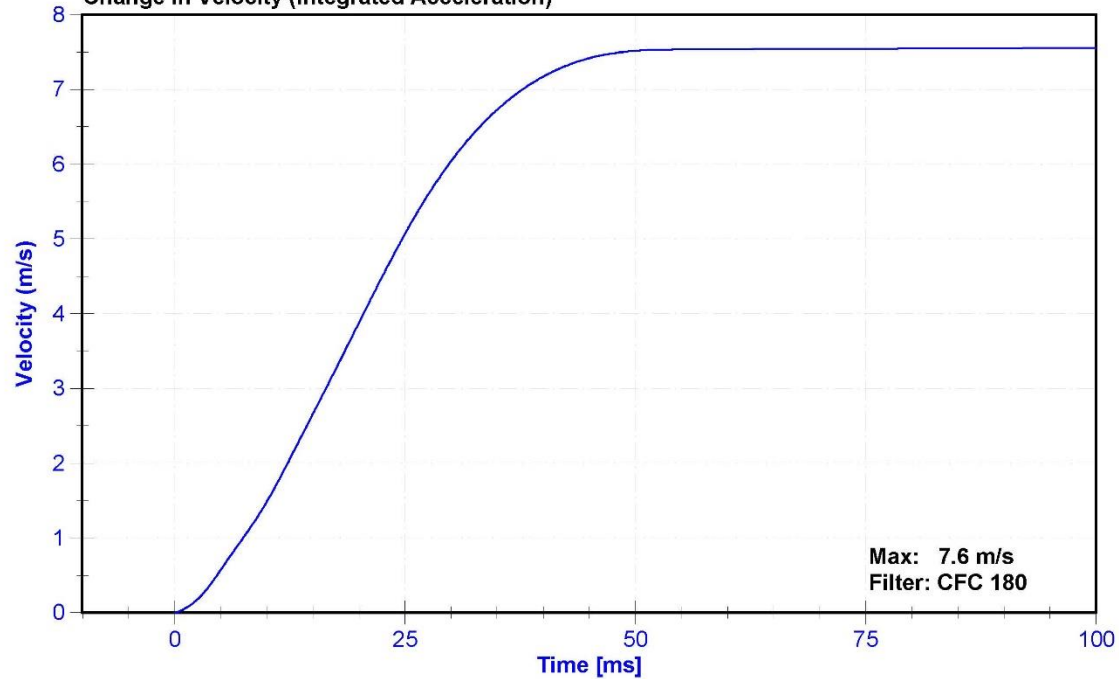




Probe Acceleration



Change in Velocity (Integrated Acceleration)



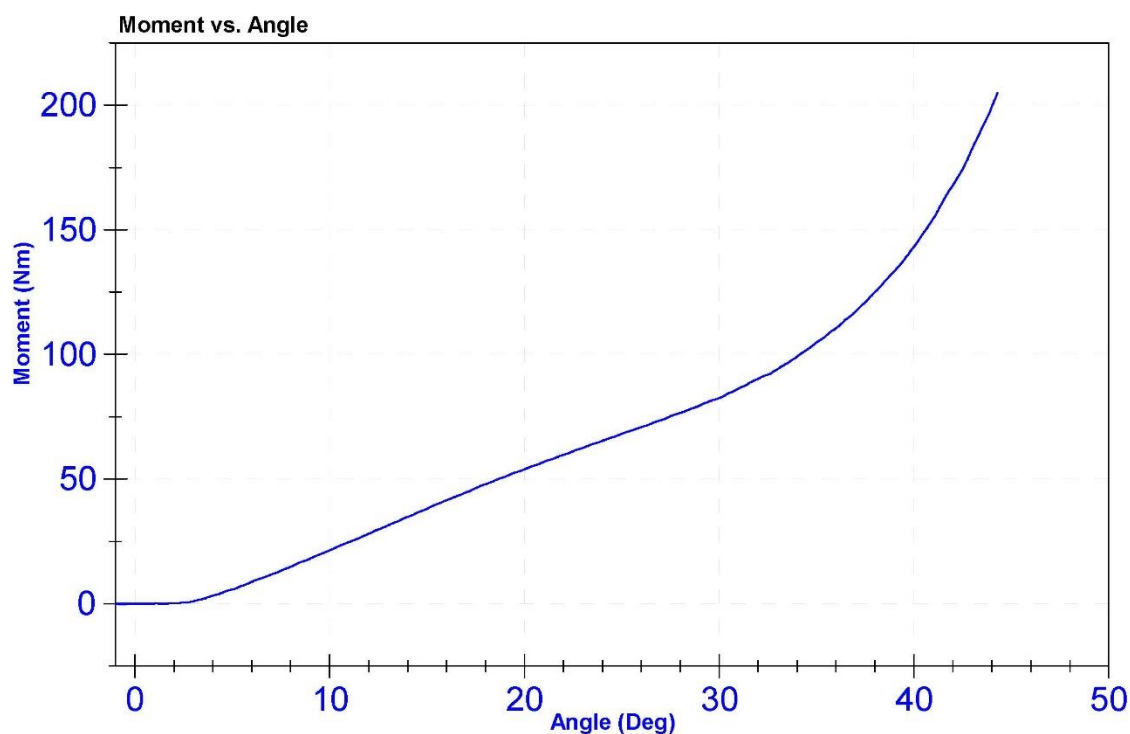
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.2	Pass
Humidity	10	70	%	46.2	Pass
Average Velocity	5	10	deg/s	7.5	Pass
Angle at 203Nm	40	50	deg	44.2	Pass
Moment at 30 degrees	0	94.9	Nm	82.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Servo 14CB1-3615	DS-0008	3/13/2015	3/12/2016
Load Cell	Key Trans 2301-02	LC-115 My	3/30/2015	3/29/2016



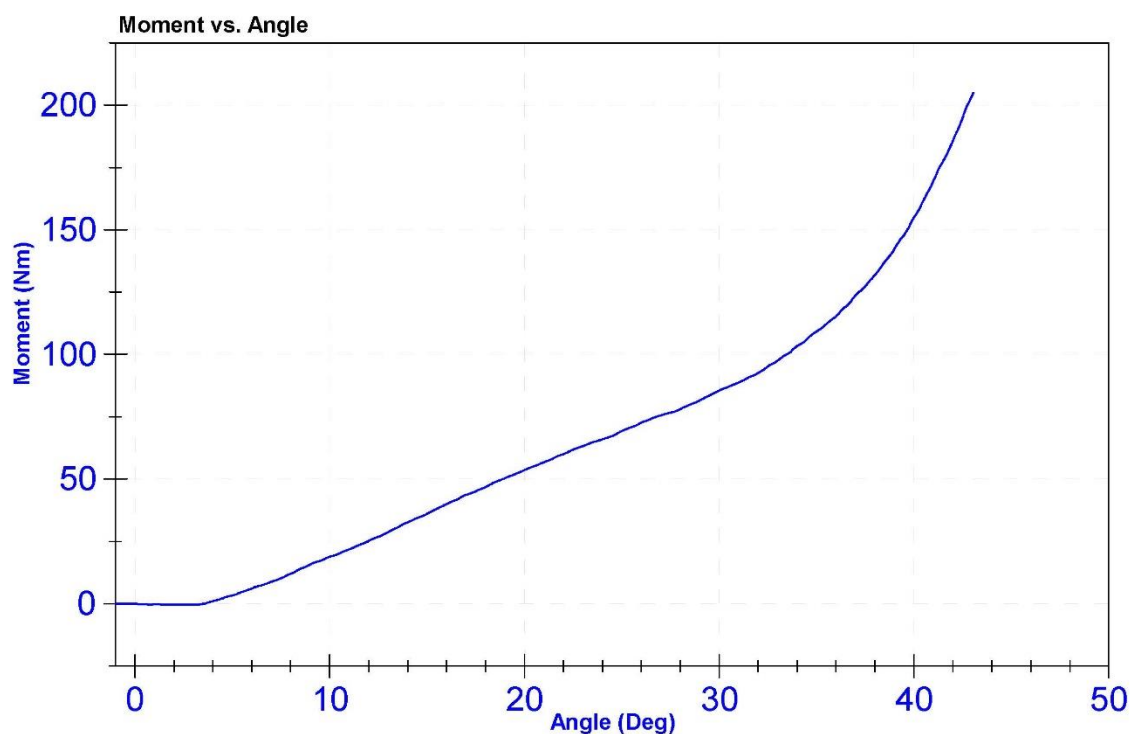
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M.Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.2	Pass
Humidity	10	70	%	46.2	Pass
Average Velocity	5	10	deg/s	7.3	Pass
Angle at 203Nm	40	50	deg	42.9	Pass
Moment at 30 degrees	0	94.9	Nm	85.5	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Servo 14CB1-3615	DS-0008	3/13/2015	3/12/2016
Load Cell	Key Trans 2301-02	LC-115 My	3/30/2015	3/29/2016



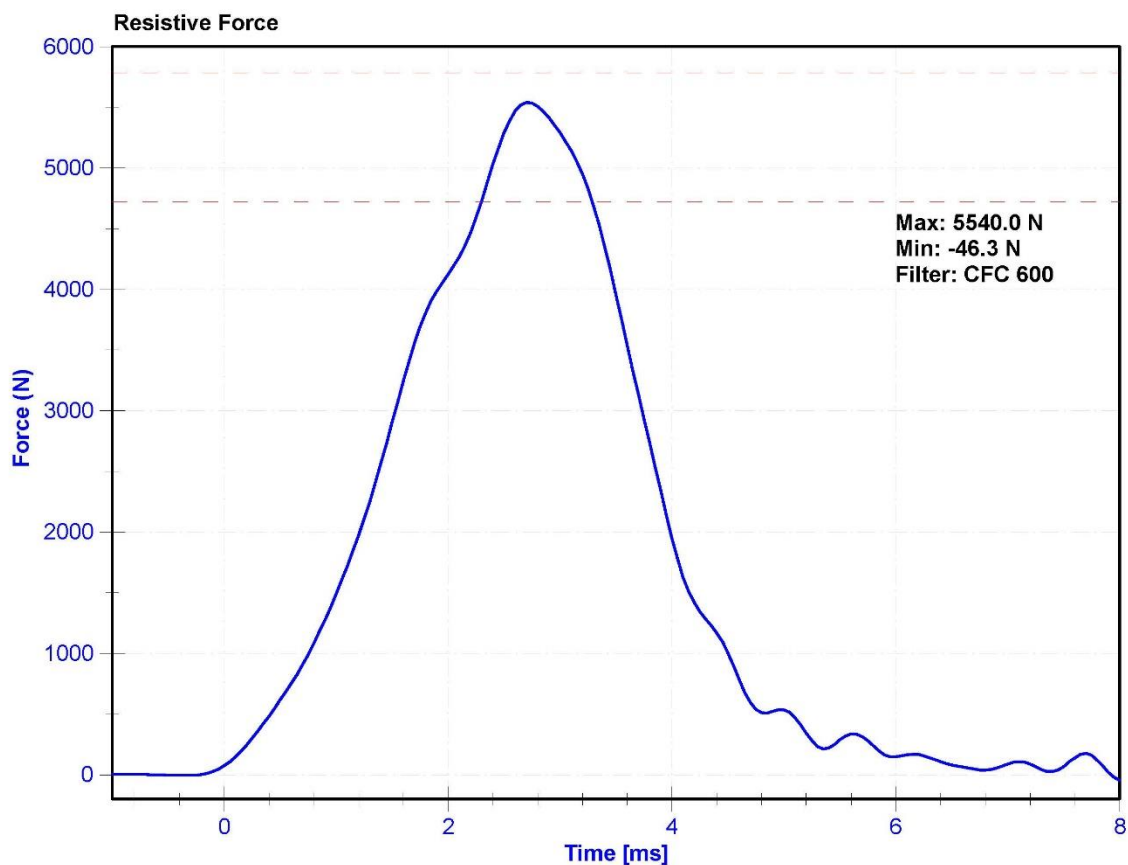
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M. Goehle

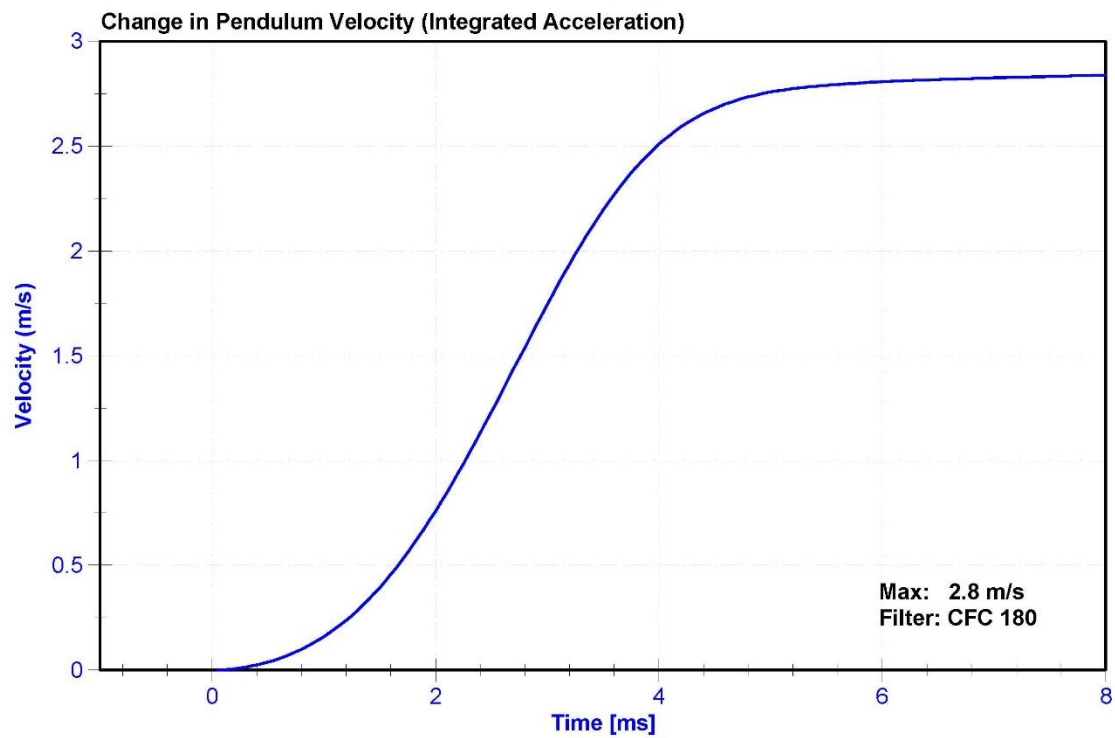
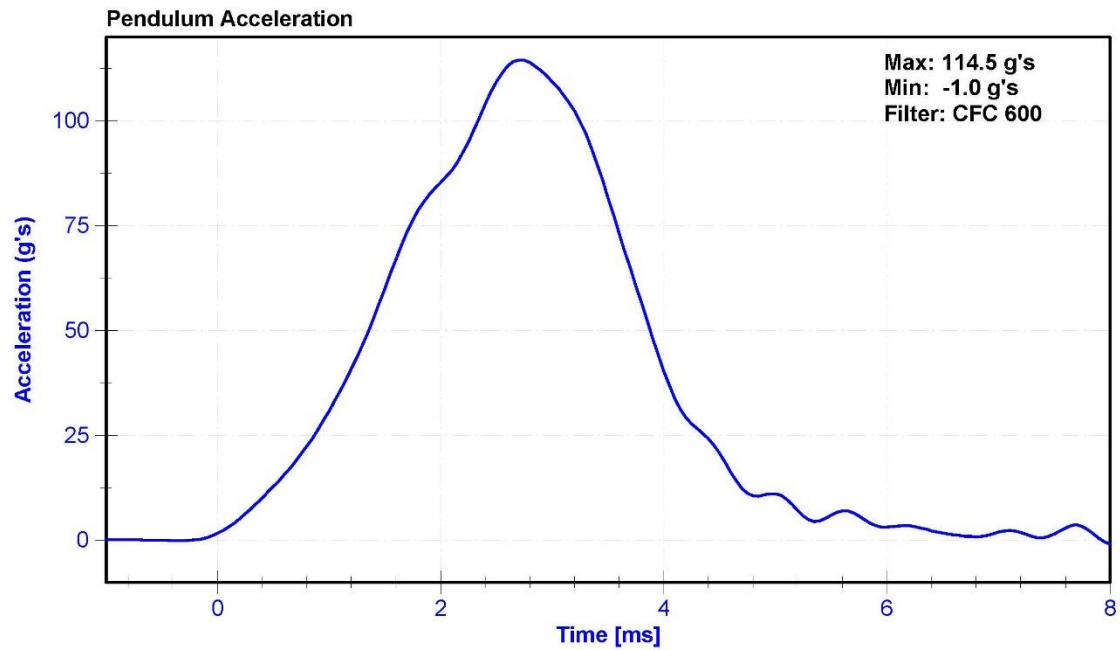
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	31.3	Pass
Velocity	2.07	2.13	m/s	2.082	Pass
Maximum Resistive Force	4720	5780	N	5540.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





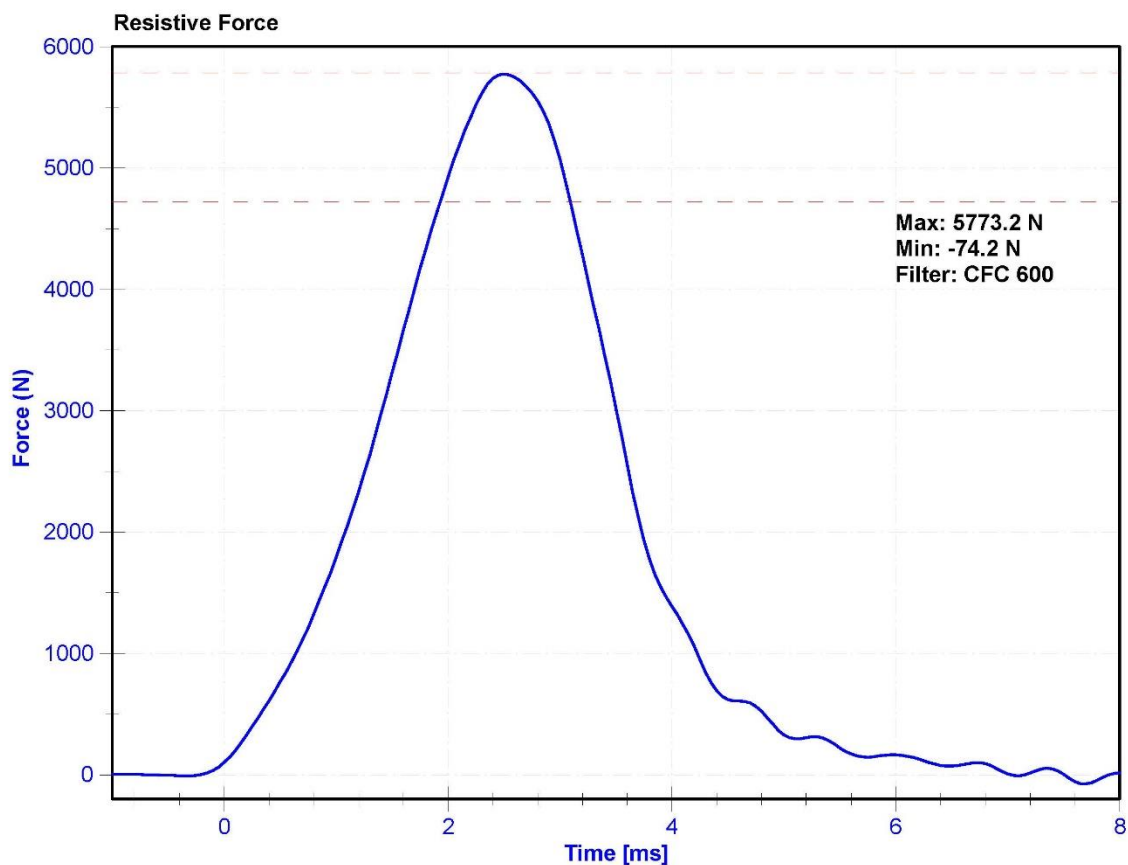
ATD Manufacturer	FTSS	Test Technician	M.Hartung
ATD Serial Number	1046	Laboratory Supervisor	M. Goehle

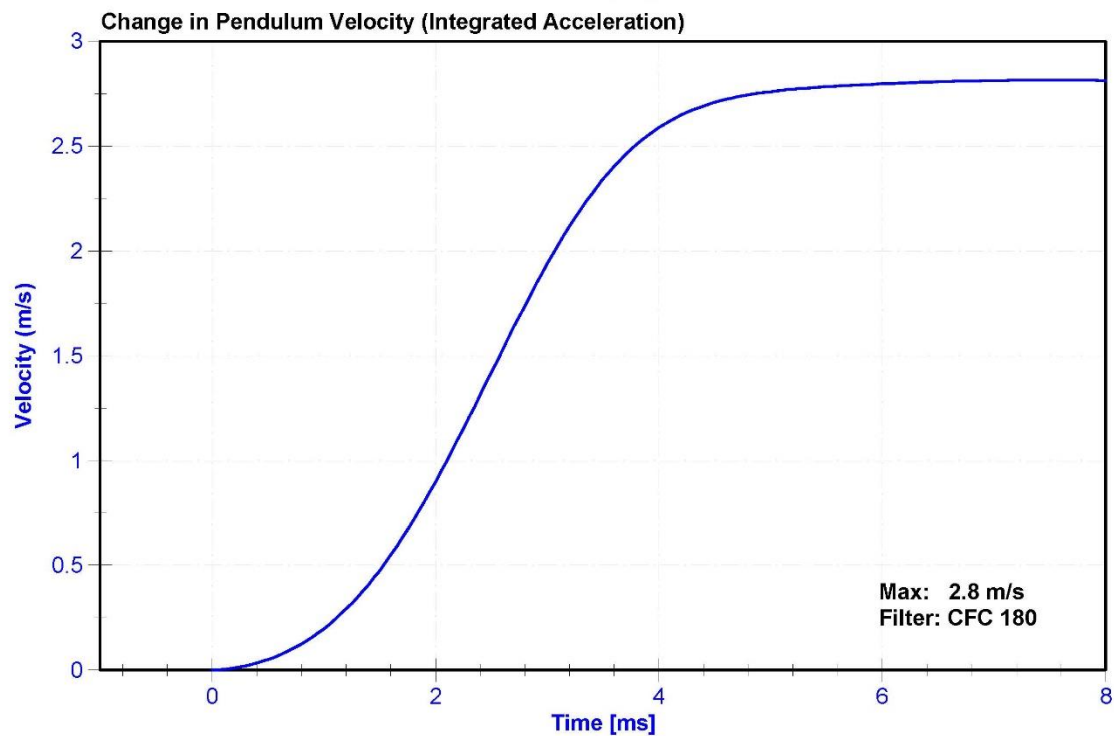
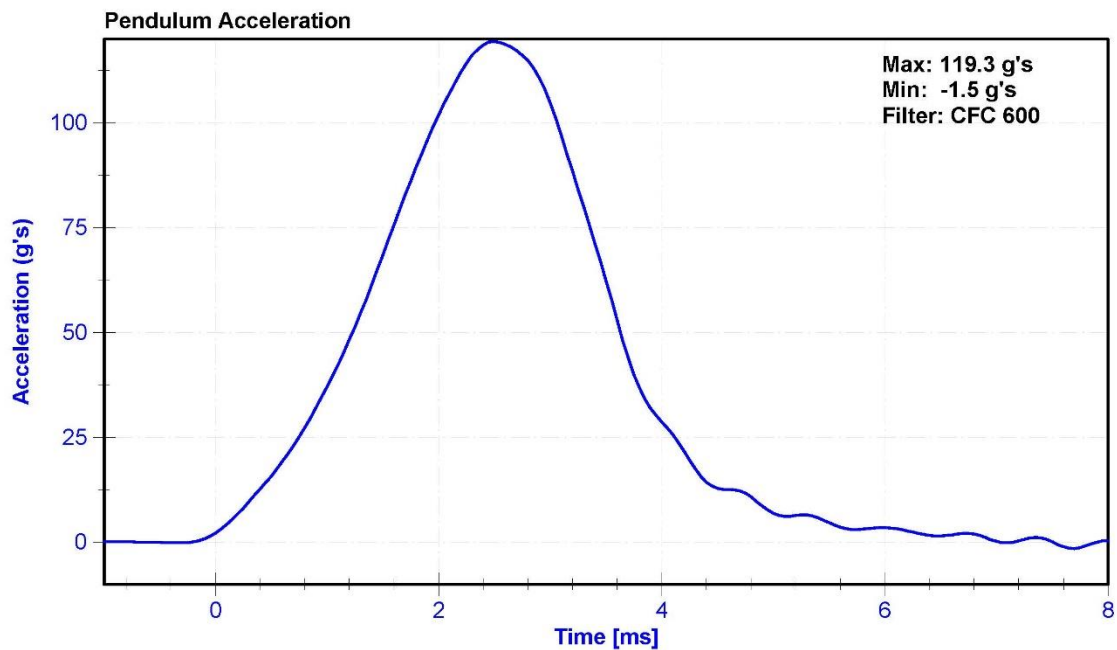
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21	Pass
Humidity	10	70	%	32.3	Pass
Velocity	2.07	2.13	m/s	2.071	Pass
Maximum Resistive Force	4720	5780	N	5773.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C14972	8/13/2015	2/11/2016





CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 288

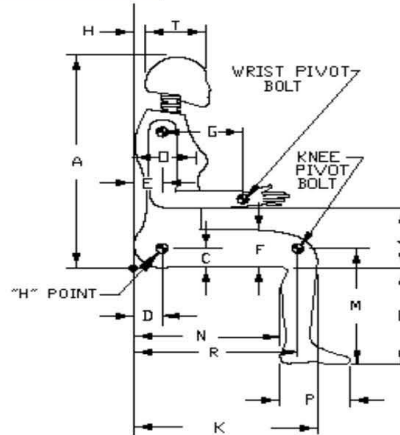
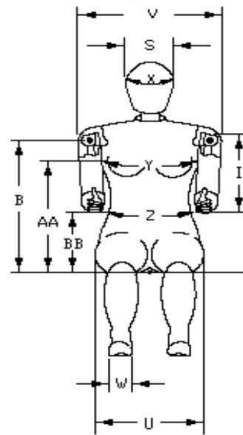


External Measurements - Hybrid 3 - 5th Female

Technician: M.Hartung

Date: 12/18/2015

Dummy Serial Number: 288



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	781	Pass
B	Shoulder Pivot Height	432	457	441	Pass
C	H-Point Height	81	86	83	Pass
D	H-Point from Backline	145	150	148	Pass
E	Shoulder Pivot from Backline	69	84	75	Pass
F	Thigh Clearance	119	135	125	Pass
G	Back of Elbow to Wrist Pivot	244	259	247	Pass
H	Head Back to Backline	43	48	45	Pass
I	Shoulder to Elbow Length	277	297	281	Pass
J	Elbow Rest Height	183	203	189	Pass
K	Buttock to Knee Length	521	546	539	Pass
L	Popliteal Height	356	376	367	Pass
M	Knee Pivot Height	394	419	397	Pass
N	Buttock Popliteal Length	414	439	433	Pass
O	Chest Depth without Jacket	175	191	180	Pass
P	Foot Length (right)	219	234	225	Pass
R	Buttock To Knee Pivot Length	457	483	462	Pass
S	Head Breadth	137	147	143	Pass
T	Head Depth	178	188	182	Pass
U	Hip Breadth	300	315	306	Pass
V	Shoulder Breadth	351	366	361	Pass
W	Foot Breadth	79	94	82	Pass
X	Head Circumference	528	549	538	Pass
Y	Chest Circumference with Jacket	851	881	856	Pass
Z	Waist Circumference	460	790	780	Pass
AA	Reference Location (Chest Circumference)	333	358	344	Pass
BB	Reference Location (Waist Circumference)	160	170	165	Pass

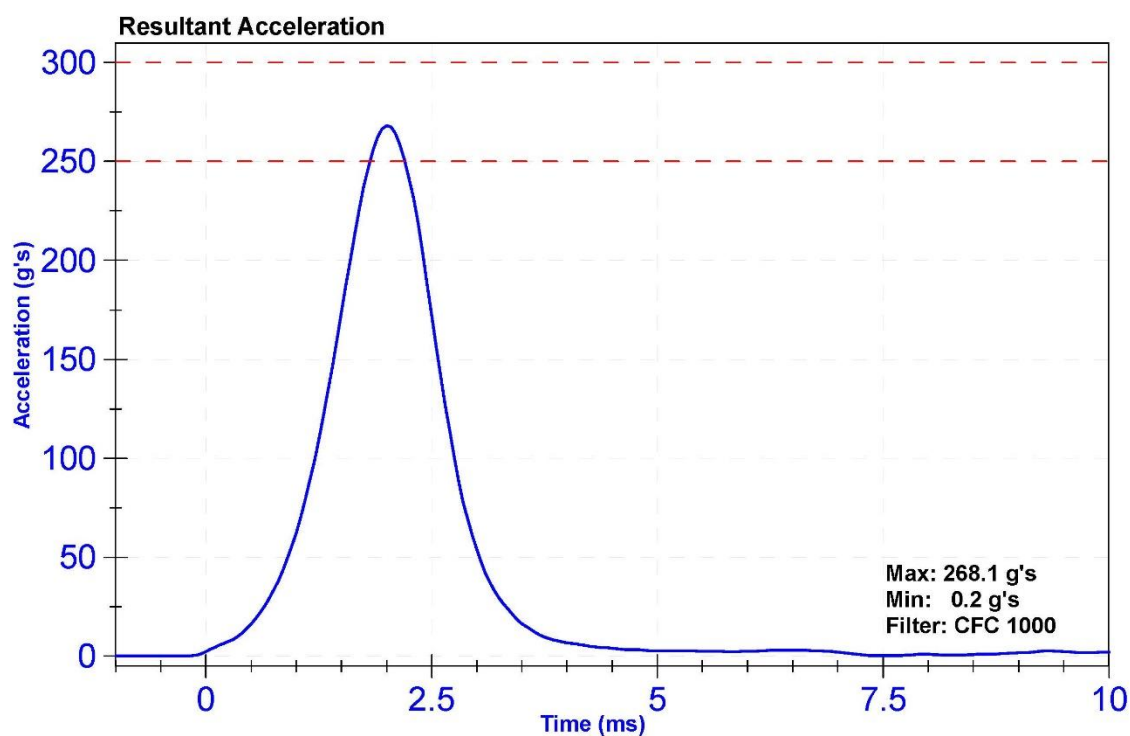
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

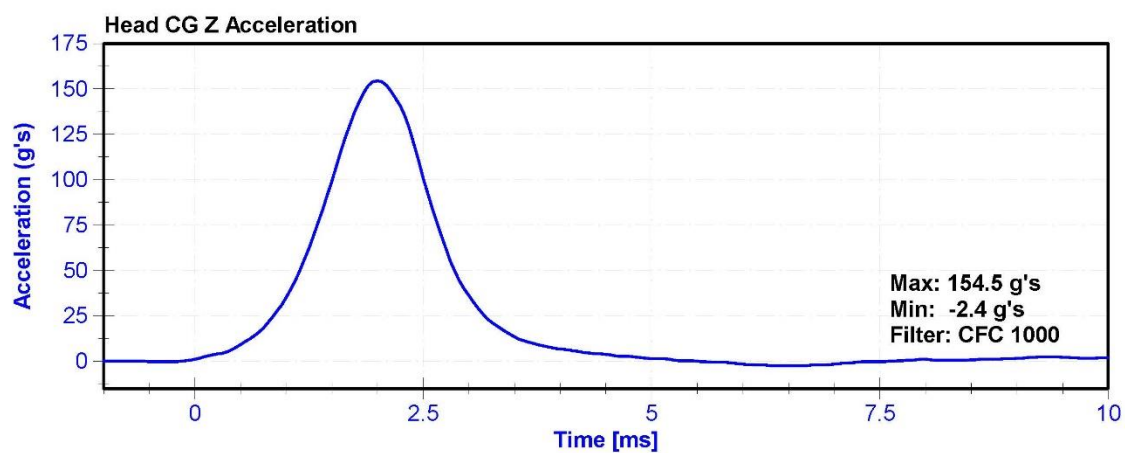
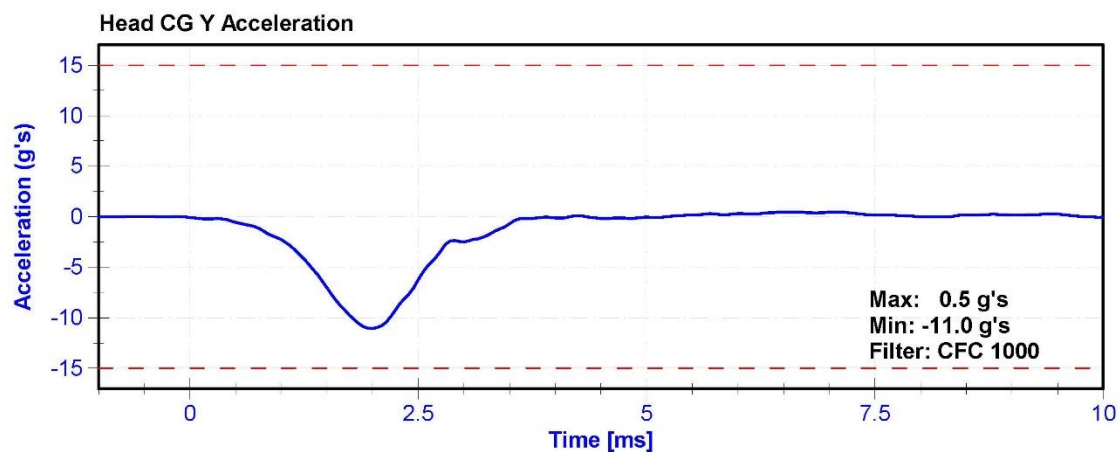
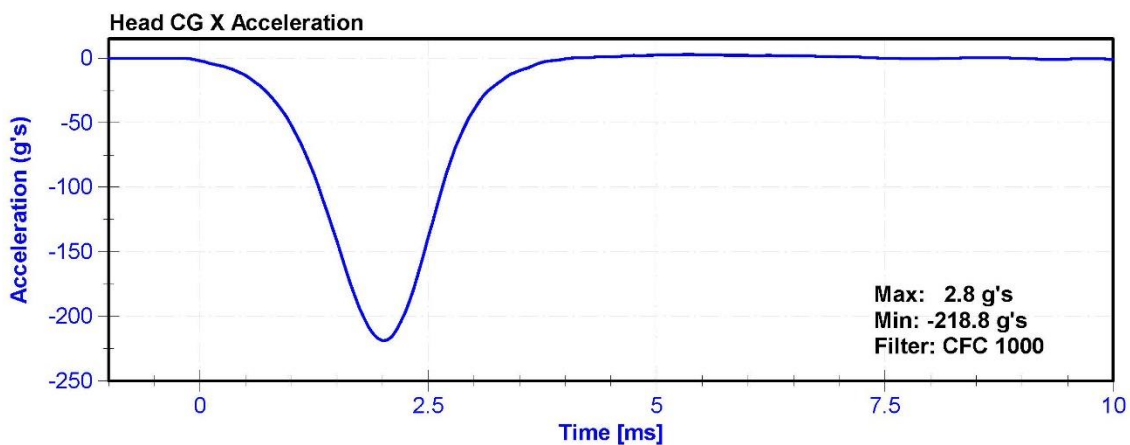
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.2	Pass
Humidity	10	70	%	44	Pass
Resultant Acceleration	250	300	g's	268.1	Pass
Oscillation	0	10	%	1.2	Pass
Lateral Acceleration	-15	15	g's	-11.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
X Accelerometer	ENDEVCO 7264	AC-P80337	12/9/2015	6/8/2016
Y Accelerometer	ENDEVCO 7264CT	AC-P80265	12/9/2015	6/8/2016
Z Accelerometer	ENDEVCO 7264CT	AC-P83418	12/9/2015	6/8/2016





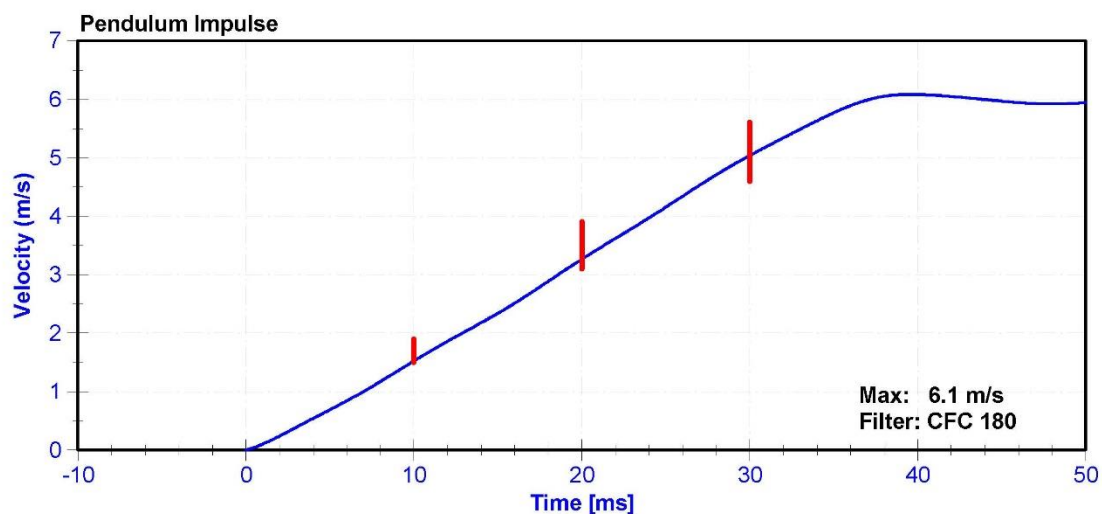
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

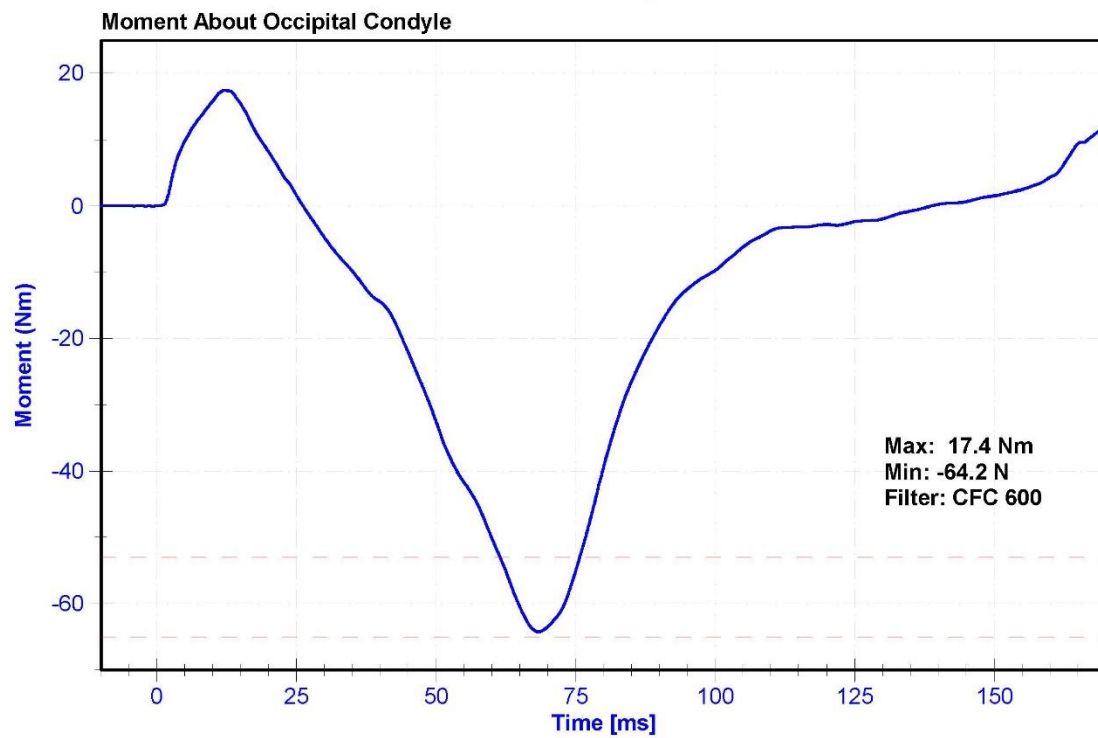
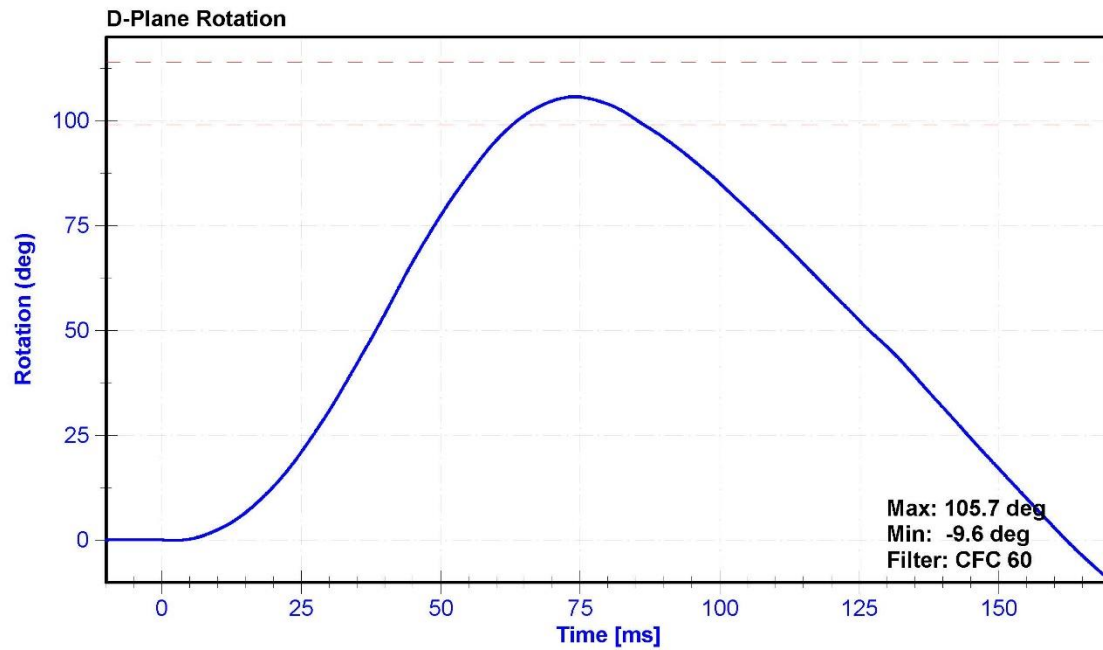
Results

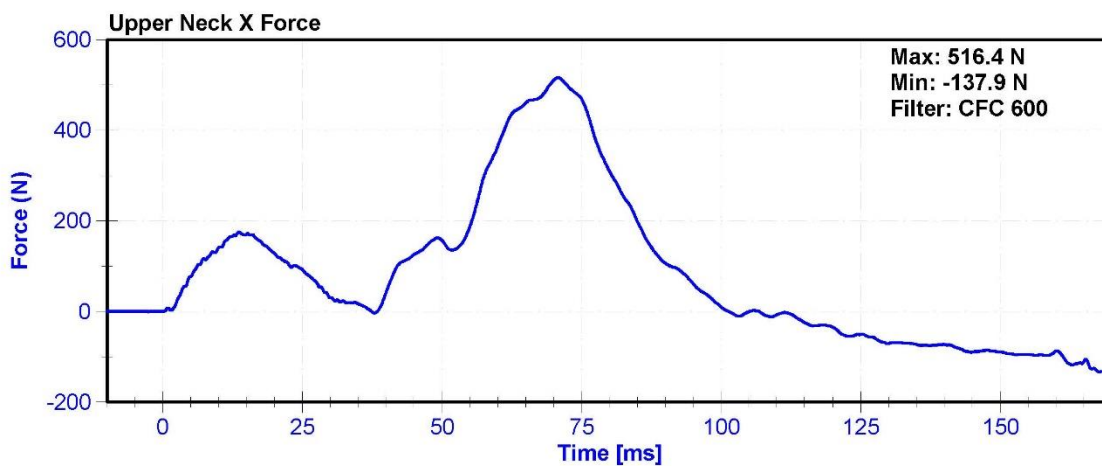
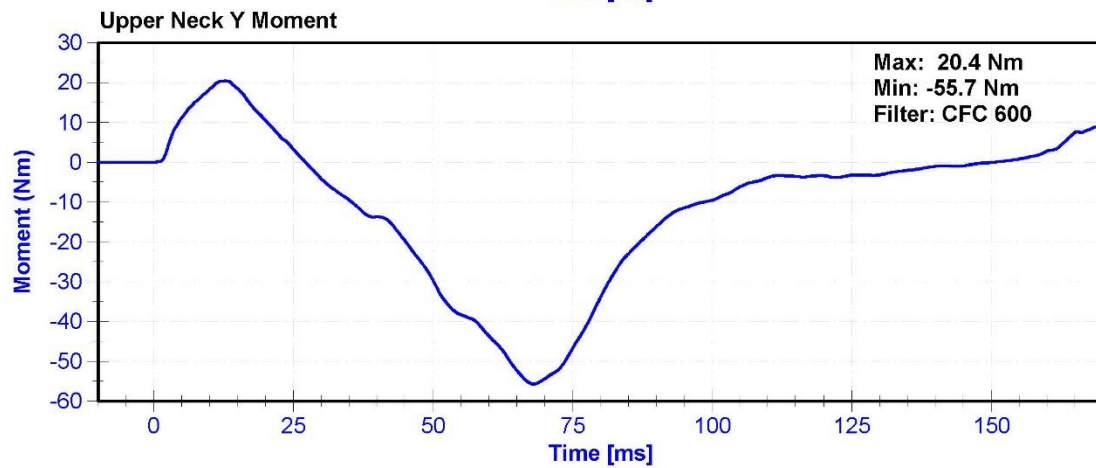
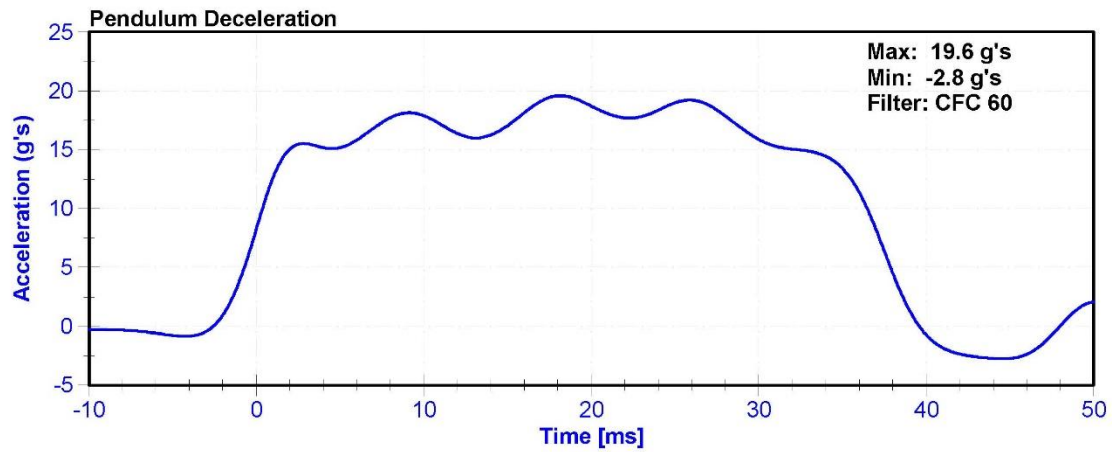
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.0	Pass
Humidity	10	70	%	15.8	Pass
Velocity	5.95	6.19	m/s	6.025	Pass
Pendulum Impulse at 10ms	1.5	1.9	m/s	1.53	Pass
Pendulum Impulse at 20ms	3.1	3.9	m/s	3.27	Pass
Pendulum Impulse at 30ms	4.6	5.6	m/s	5.04	Pass
D Plane Rotation	99	114	deg	105.7	Pass
Moment During Rotation Interval	-65	-53	Nm	-64.2	Pass
Moment Decay to -10Nm	94	114	ms	99.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716A	LC-2206Fx	5/13/2015	5/12/2016







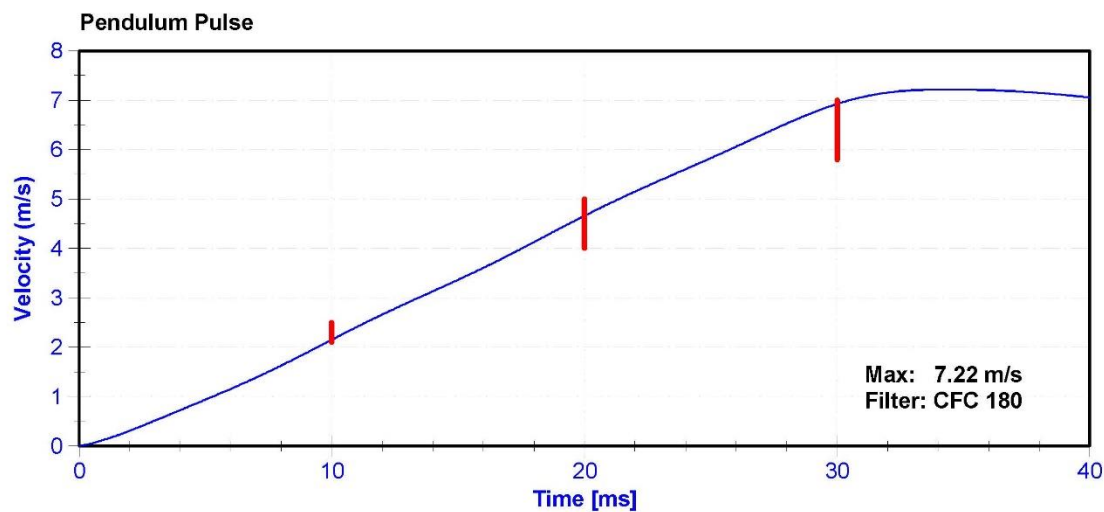
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

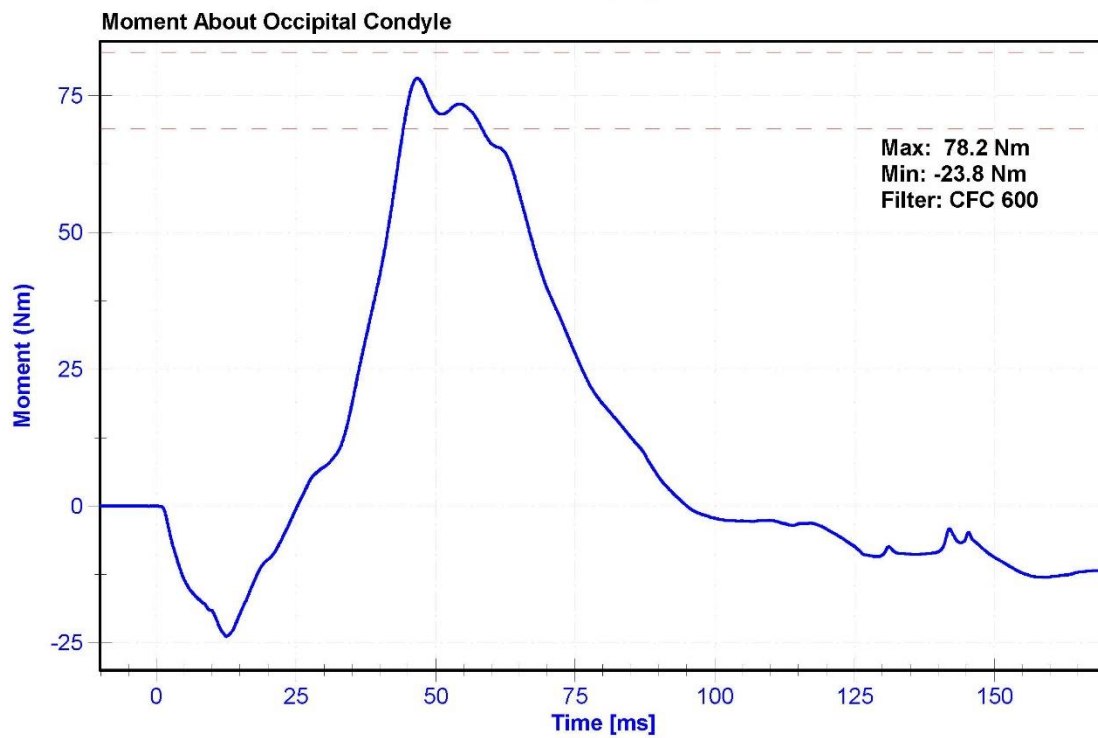
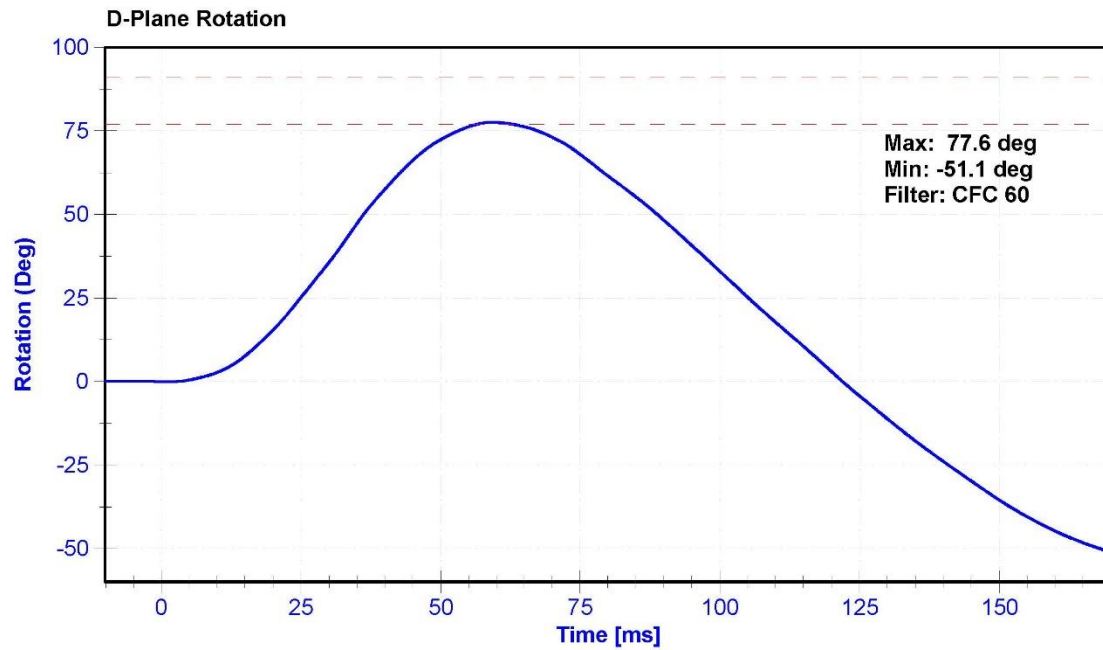
Results

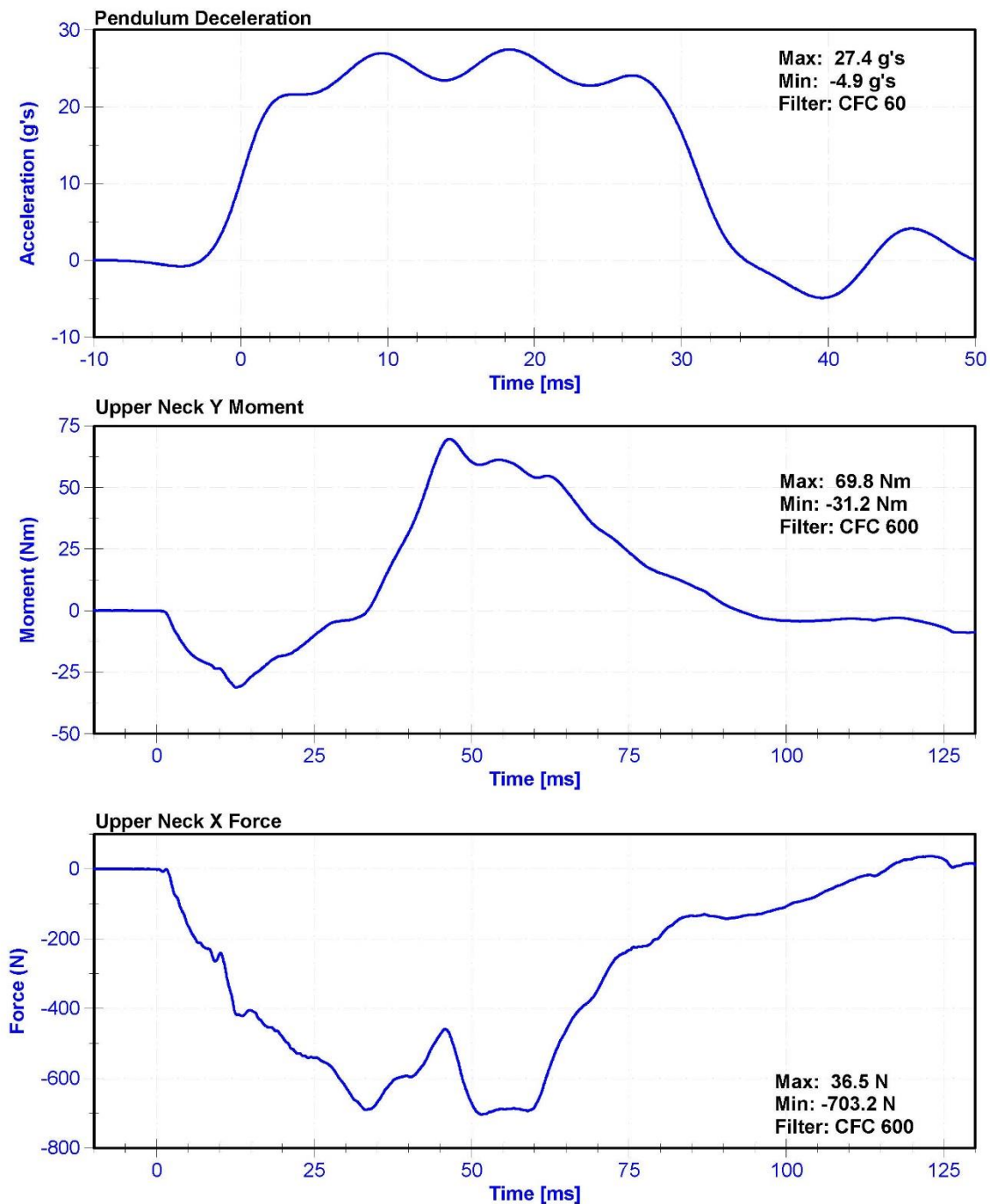
Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	22.2	Pass
Humidity	10	70	%	15.7	Pass
Velocity	6.89	7.13	m/s	6.979	Pass
Pendulum Impulse at 10ms	2.1	2.5	m/s	2.15	Pass
Pendulum Impulse at 20ms	4.0	5.0	m/s	4.66	Pass
Pendulum Impulse at 30ms	5.8	7.0	m/s	6.92	Pass
Max D Plane Rotation	77	91	deg	77.6	Pass
Max Moment During Rotation Interval	69	83	Nm	78.2	Pass
Moment Decay to 10.0 Nm	80	100	ms	87.2	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-AH5F3	5/7/2015	5/6/2016
Pendulum Potentiometer	ETI SP22G	DS-PendPot	9/28/2015	9/27/2016
Condyle Potentiometer	ETI SP22G	DS-CondPot	9/28/2015	9/27/2016
Upper Neck Load Cell	DENTON 1716A	LC-2206Fx	5/13/2015	5/12/2016







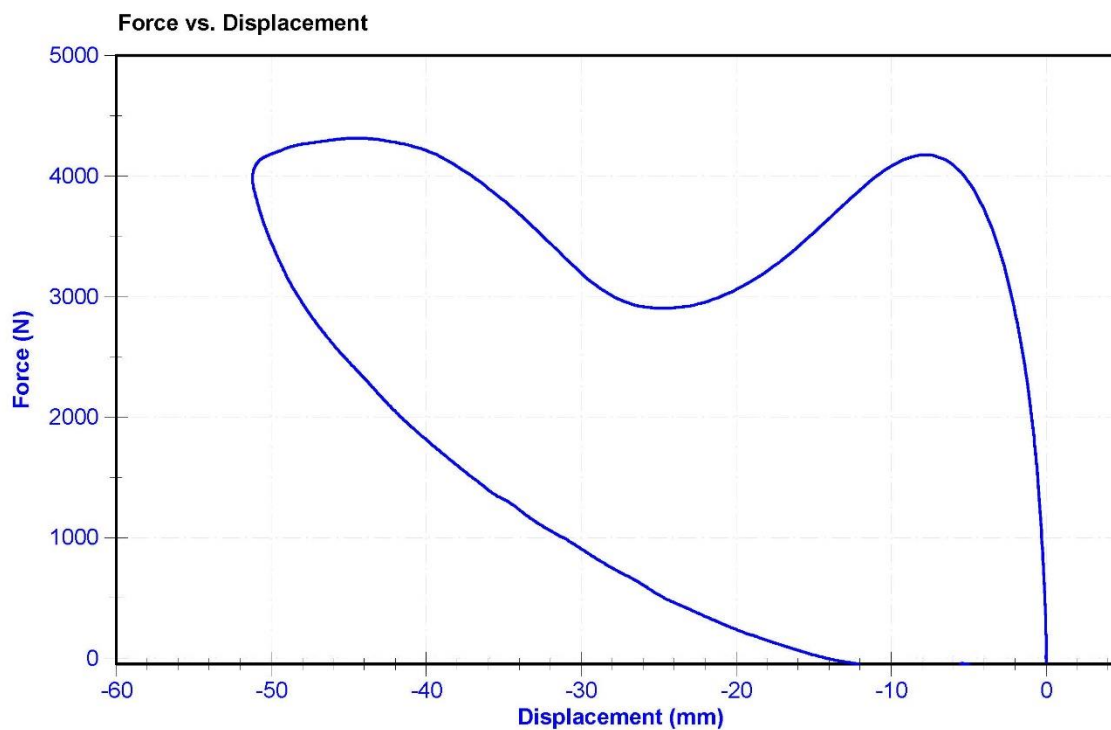
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

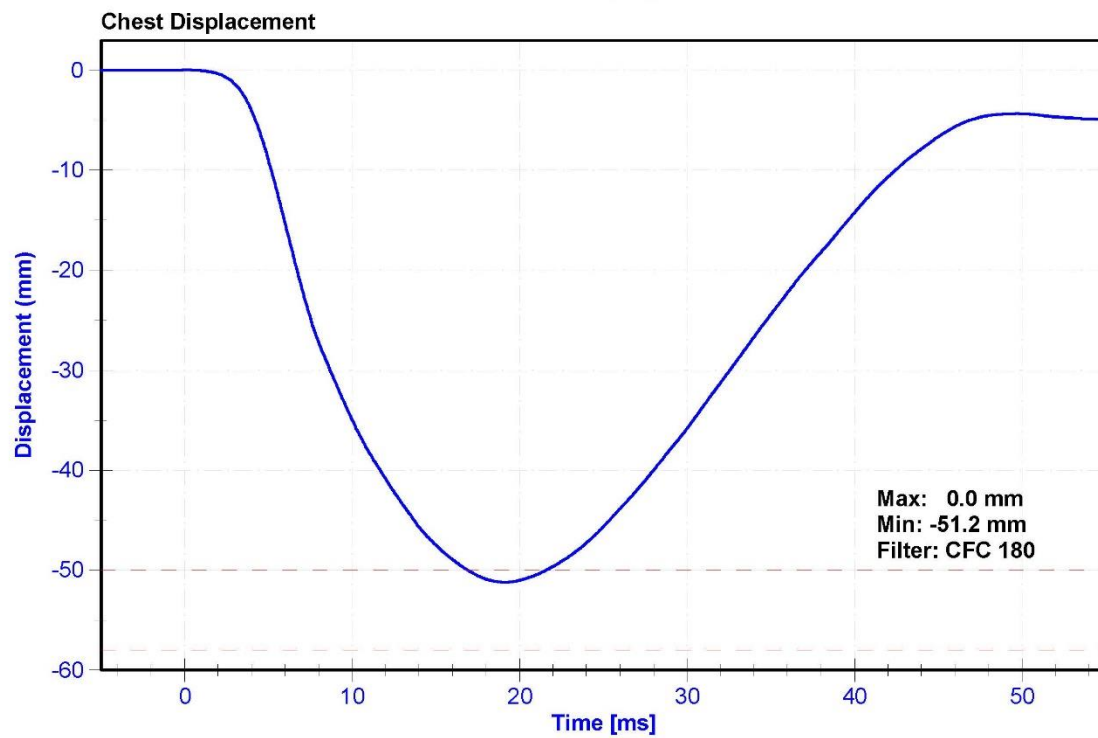
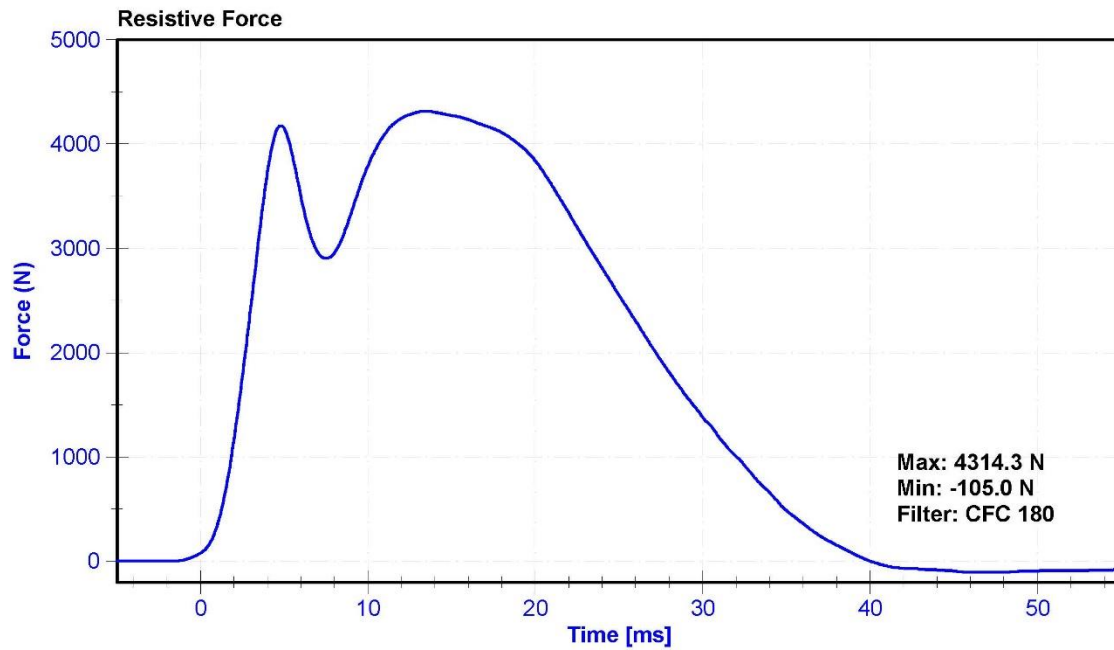
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	20.6	22.2	°C	20.9	Pass
Humidity	10	70	%	14.3	Pass
Velocity	6.59	6.83	m/s	6.670	Pass
Chest Deflection	-58	-50	mm	-51.2	Pass
Maximum Resistive Force (50 to 58mm)	3900	4400	N	4185.8	Pass
Maximum Resistive Force (18 to 50mm)	0	4600	N	4314.3	Pass
Hysteresis	69	85	%	73.7	Pass

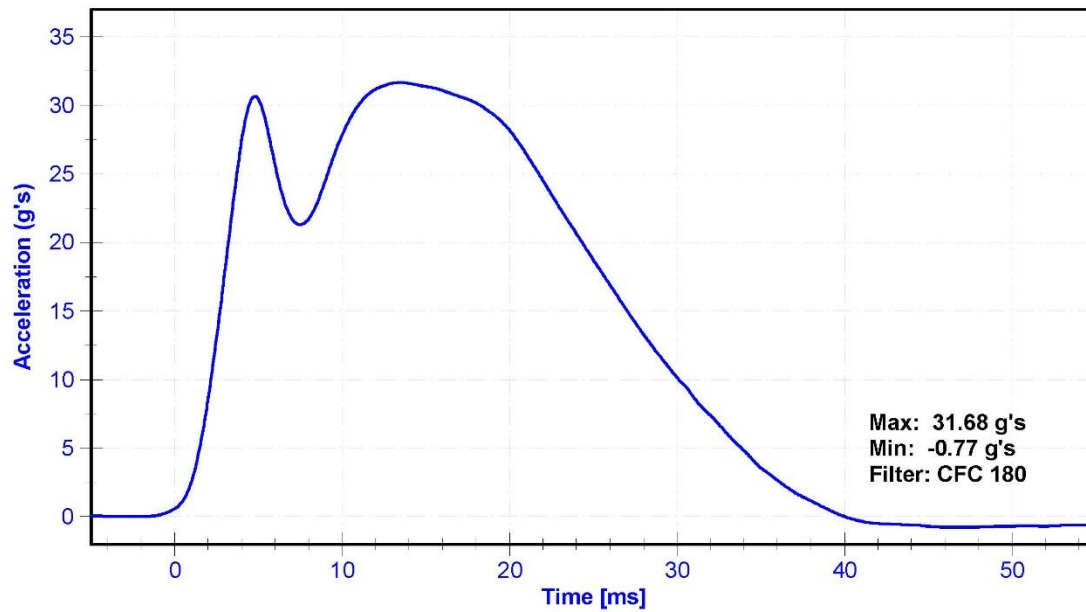
Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016
Chest Potentiometer	SERVO 14CB1-2897	DS-288	9/18/2015	9/17/2016

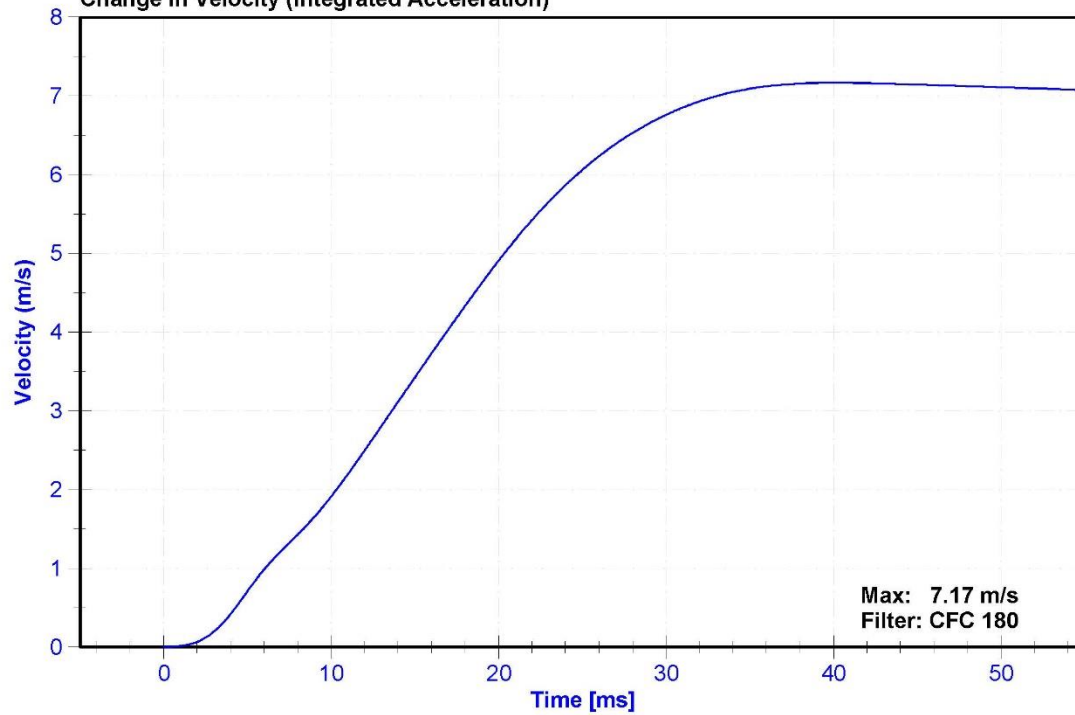




Probe Acceleration



Change in Velocity (Integrated Acceleration)



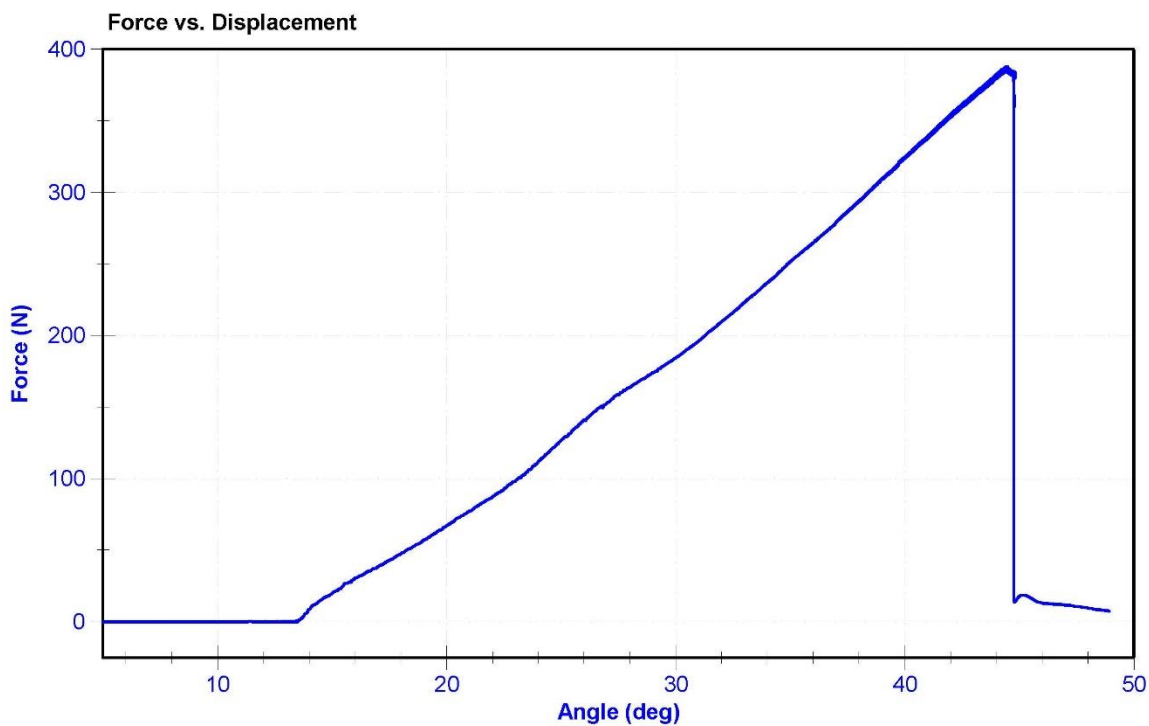
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.6	25.6	°C	21.9	Pass
Humidity	10	70	%	14.7	Pass
Initial Angle	0	20	deg	12.8	Pass
Force at 45 Degrees	320	390	N	387.8	Pass
Return Angle Relative to Initial	0	8	deg	7.0	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Potentiometer	Rieker N4C-1	DS-13051548	8/14/2015	8/13/2016
Load Cell	Interface SML-200	LC-493319	8/13/2015	8/12/2016



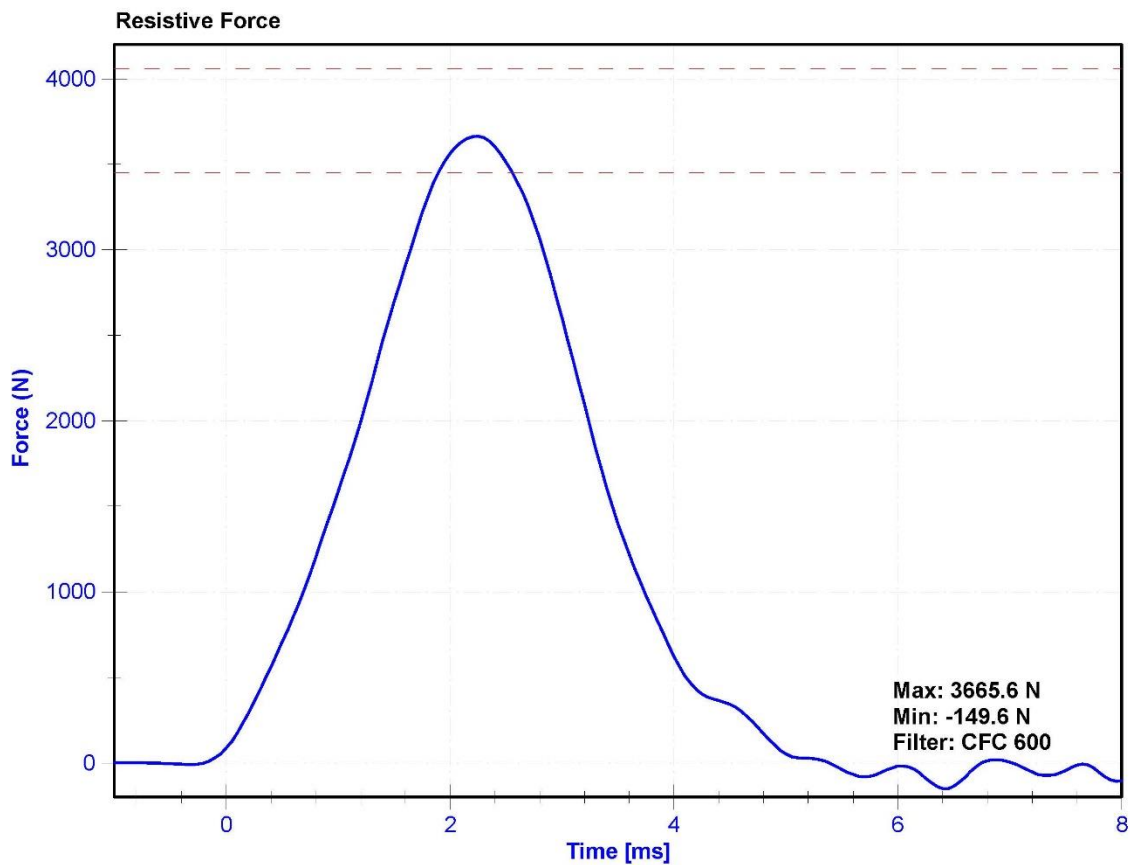
ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

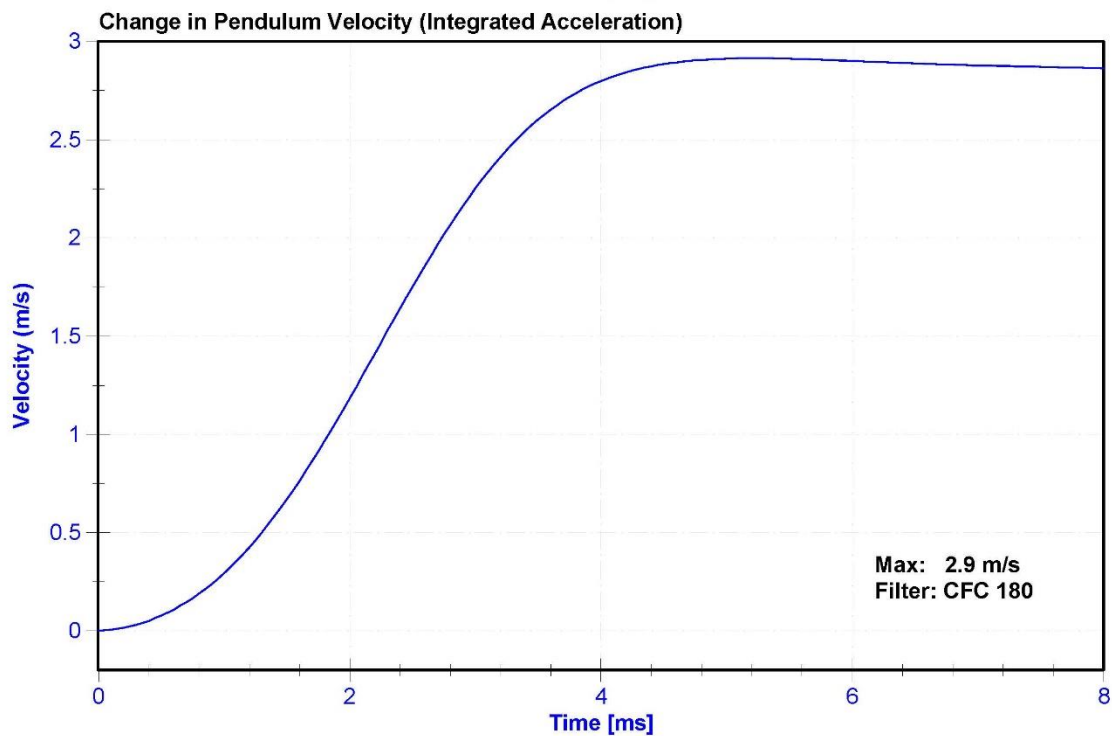
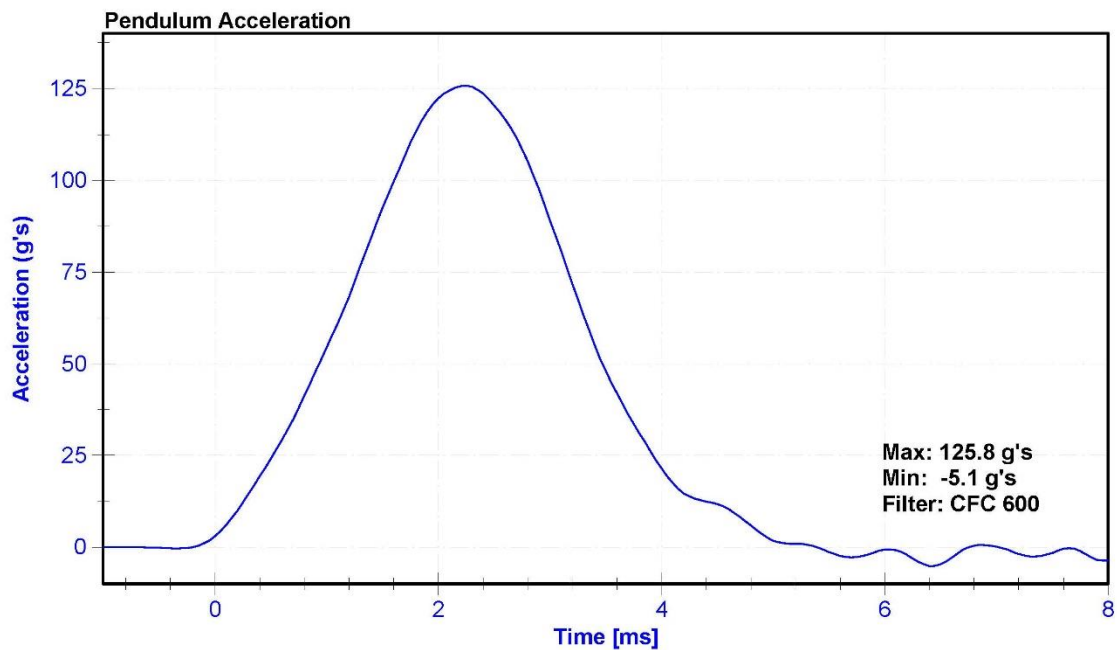
Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.5	Pass
Humidity	10	70	%	14.9	Pass
Velocity	2.07	2.13	m/s	2.088	Pass
Resistive Force	3450	4060	N	3665.6	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016





ATD Manufacturer	FTSS	Test Technician	M. Geesey
ATD Serial Number	288	Laboratory Supervisor	M. Goehle

Results

Test Parameter	Minimum Specification	Maximum Specification	Unit	Result	Pass/Fail
Temperature	18.9	25.6	°C	21.2	Pass
Humidity	10	70	%	14.7	Pass
Velocity	2.07	2.13	m/s	2.109	Pass
Resistive Force	3450	4060	N	3808.4	Pass

Transducer Calibrations

Channel	Manufacturer	Serial Number	Calibration Date	Calibration Due Date
Pendulum Accelerometer	ENDEVCO 7231CT	AC-C15018	7/15/2015	7/14/2016

