

REPORT NUMBER: NCAP-CAL-14-016

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

**General Motors LLC
2014 Chevrolet Captiva Sport
SUV**

NHTSA No: M20140106

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



May 29, 2014

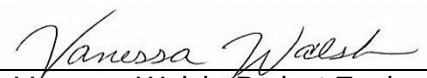
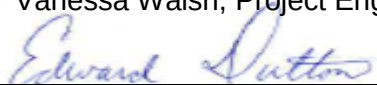
FINAL REPORT

**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**

This final test report was prepared for the U.S. Department of Transportation, National Highway Traffic Administration, in response to Contract Number DTNH22-12-D-00260.

This publication is distributed by the U.S. Department of Transportation, National Highway Traffic Safety Administration, in the interest of information exchange. The opinions, findings and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Department of Transportation or the National Highway Traffic Safety Administration. The United States Government assumes no liability for its contents or use thereof.

If trade or manufacturers' names or products are mentioned it is only because they are considered essential to the object of the publication and should not be construed as an endorsement. The United States Government does not endorse products or manufacturers.

Prepared by:	 _____ Vanessa Walsh, Project Engineer	Date:	_____ May 29, 2014
Approved by:	 _____ Edward J. Dutton, Test Engineer Director Transportation Test Operations	Date:	_____ May 29, 2014

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: _____

TECHNICAL REPORT DOCUMENTATION PAGE

1. Report No. NCAP-CAL-14-016		2. Government Accession No.		3. Recipient's Catalog No.																																																					
4. Title and Subtitle Final Report of New Car Assessment Program Frontal Impact Testing of a 2014 Chevrolet Captiva Sport SUV NHTSA No.: M20140106				5. Report Date May 29, 2014																																																					
				6. Performing Organization Code CAL																																																					
7. Author(s) Vanessa Walsh, Project Engineer Edward Dutton, Senior Test Engineer				8. Performing Organization Report No. CAL-DOT-2014-008																																																					
9. Performing Organization Name and Address Calspan Corporation Transportation Test Operations P.O. Box 400 Buffalo, New York 14225				10. Work Unit No.																																																					
				11. Contract or Grant No. DTNH22-12-D-00260																																																					
12. Sponsoring Agency Name and Address U.S. Department of Transportation National Highway Traffic Safety Administration Office of Crashworthiness Standards (NVS-111) 1200 New Jersey Ave., SE, Room W43-410 Washington, D.C. 20590				13. Type of Report and Period Covered: Final Test Report April 25, 2014 - May 29, 2014																																																					
				14. Sponsoring Agency Code NVS-111																																																					
15. Supplementary Notes																																																									
16. Abstract A 56.30 km/h (35 mph), NCAP Frontal Impact Test was conducted on a 2014 Chevrolet Captiva Sport SUV 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 April 25, 2014. The impact velocity of the vehicle was 56.46 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 564 mm at the vehicles 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. 064)</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>323.18</td> <td>700</td> <td>241.49</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-29.99</td> <td>52</td> <td>-22.71</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.27</td> <td>1</td> <td>0.46</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>1560.24</td> <td>2,620</td> <td>775.39</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-314.87</td> <td>2,520</td> <td>-843.26</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-4767.64</td> <td>6,805</td> <td>-3172.39</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-5380.17</td> <td>6,805</td> <td>-1929.96</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD (Serial No. 064)		Passenger ATD (Serial No. 288)		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)		700	323.18	700	241.49	Maximum Chest Compression	mm	63	-29.99	52	-22.71	Nij		1	0.27	1	0.46	Neck Tension	N	4,170	1560.24	2,620	775.39	Neck Compression	N	4,000	-314.87	2,520	-843.26	Left Femur Force	N	10,008	-4767.64	6,805	-3172.39	Right Femur Force	N	10,008	-5380.17	6,805	-1929.96
Measurement Description	Units	Driver ATD (Serial No. 064)		Passenger ATD (Serial No. 288)																																																					
		Threshold	Result	Threshold	Result																																																				
Head Injury Criteria (HIC ₁₅)		700	323.18	700	241.49																																																				
Maximum Chest Compression	mm	63	-29.99	52	-22.71																																																				
Nij		1	0.27	1	0.46																																																				
Neck Tension	N	4,170	1560.24	2,620	775.39																																																				
Neck Compression	N	4,000	-314.87	2,520	-843.26																																																				
Left Femur Force	N	10,008	-4767.64	6,805	-3172.39																																																				
Right Femur Force	N	10,008	-5380.17	6,805	-1929.96																																																				
17. Key Words 35 mph Frontal Barrier Impact Test New Car Assessment Program (NCAP)				18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Administration Technical Information Services Division, NPO-411 1200 New Jersey Ave, SE Washington, DC 20590 e-mail: tis@nhtsa.dot.gov FAX: 202-493-2833																																																					
19. Security Class. (of this report) UNCLASSIFIED		20. Security Class. (of this page) UNCLASSIFIED		21. No. of Pages 220																																																					
22. Price																																																									

TABLE OF CONTENTS

<u>Section</u>		<u>Page</u>
1	Purpose and Summary of the Test	1-1
2	Occupant and Vehicle Information / Data Sheets	2-1
<u>Data Sheet</u>		<u>Page</u>
1	General Test and Vehicle Parameter Data	2-2
2	Seat Adjustment, Fuel System, and Steering Wheel Data	2-6
3	Dummy Longitudinal Clearance Dimensions	2-8
4	Dummy Lateral Clearance Dimensions	2-9
5	Seat Belt Positioning Data	2-10
6	High-Speed Camera Locations and Data	2-11
7	Vehicle Accelerometer Locations	2-13
8	Photographic Reference Target Locations	2-14
9	Load Cell Locations on Fixed Barrier	2-15
10	Test Vehicle Summary of Results	2-16
11	Post-Test Observations	2-17
12	Vehicle Profile Measurements	2-18
13	Accident Investigation Division Data	2-20
14	Vehicle Intrusion Measurements	2-21
15	Summary of FMVSS 212, 219 (Partial), and 301 Data	2-23
16	FMVSS 301 Static Rollover Results	2-25
17	Dummy/Vehicle Temperature Stabilization Chart	2-26
<u>Appendix</u>		<u>Page</u>
A	Photographs	A-1
B	Dummy Response Data Traces	B-1
C	Dummy Calibration and Performance Verification Data	C-1

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 August 2013.

SUMMARY

A ridged fixed barrier was impacted by a 2014 Chevrolet Captiva Sport SUV at a velocity of 56.46 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on April 25, 2014. 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. Seat belt load cells were also on the driver's and passenger's shoulder and lap belts to measure the dummy's torso and pelvic section loading. The driver (position 1) ATD (Serial No. 064) 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 85.4 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 564 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. Left leg contacted the steering column and the top of the right leg contacted the steering wheel rim.

The passenger's visible contact points were as follows: The passenger's head contacted the frontal airbag and then the head restraint and seat back. 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)	323.18	0.27	1560.24	-314.87	40.72	-29.99	-4767.64	-5380.17
Passenger (5 th)	241.49	0.46	775.39	-843.26	44.67	-22.71	-3172.39	-1929.96

GENERAL COMMENTS:

1. P1 (Driver) serial number - 064
2. P2 (Passenger) serial number - 288

Data Anomalies:

- Engine Bottom X Acceleration, Questionable data after 71 ms
- Driver Shoulder Belt Load Cell, Questionable data

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: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20140106	Traction Control System (TCS)	Yes
Model Year	2014	Power Steering	Yes
Make	Chevrolet	Power Window Auto-Reverse	No
Model	Captiva Sport	Driver Frontal Airbag	Yes
Body Style	SUV	Driver Curtain Airbag	Yes
VIN	3GNAL1EKXES637416	Driver Head/Torso Airbag	No
Body Color	Silver	Driver Torso Airbag	Yes
Odometer Reading (km /mi)	12.9 km / 8 mi	Driver Torso/Pelvis Airbag	No
Engine Displacement (L)	2.4	Driver Pelvis Airbag	No
Type / No. Cylinders	I4	Driver Knee Airbag	No
Engine Placement	Transverse	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	Yes
Final Drive	Front Wheel Drive	Front Pass. Torso/Pelvis Airbag	No
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	No	Front Pass. Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	No	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	-

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors De Mexico, S.DE R.L. DE C.V.	GVWR (kg)	2189
Date of Manufacture	03/14	GAWR Front (kg)	1130
		GAWR Rear (kg)	1280

VEHICLE SEATING AND WEIGHT CAPACITY DATA

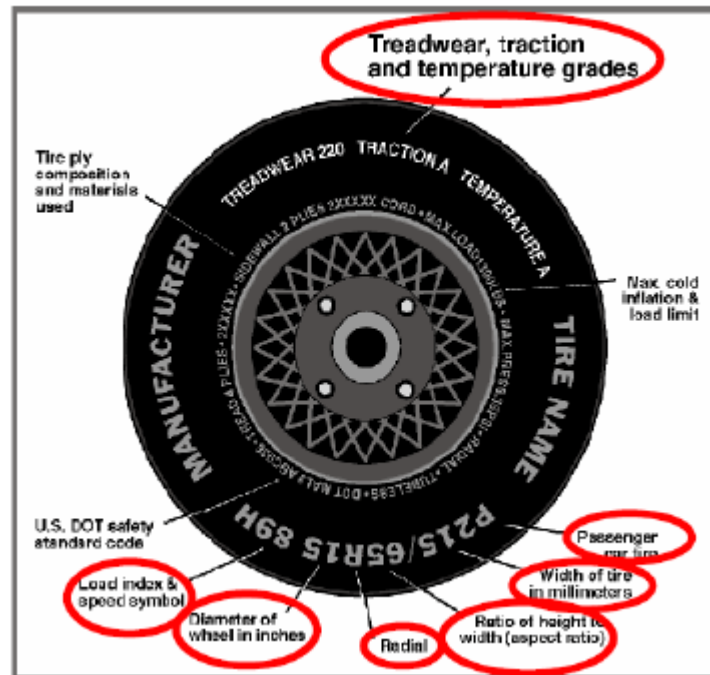
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	-	
Number of Occupants	2	3	-	5
Capacity Wt. (VCW) (kg)				440
Cargo Wt. (RCLW) (kg)				99.8

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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

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



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P235/60R17	P235/60R17
Tire Size on Vehicle	P235/60R17	P235/60R17
Tire Manufacturer	Firestone	Firestone
Tire Model	Destination LE	Destination LE
Treadwear	480	480
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 2 Steel, 1 Nylon	2 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	100H	100H
Tire Material	Rubber	Rubber
DOT Safety Code Left	8XOUD183613	8XOUD183513
DOT Safety Code Right	8XOUD185213	8XOUD183613

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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	527	341		545	446	
Right	kg	462	380		495	456	
Ratio	%	58%	42%		54%	46%	
Totals	kg	989	721	1710	1040	902	1942

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1710	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.7	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	99.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1950.5	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	786	795	830	832	1141
As Tested	mm	782	787	802	806	1257
Post-Test	mm	808	803	795	798	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2707
Total Vehicle Length at Left Side	mm	4420
Total Vehicle Length at Centerline	mm	4582
Total Vehicle Length at Right Side	mm	4421
Weight of Ballast in Cargo Area	kg	82.1
Weight of Vehicle Components Removed	kg	39
Amount of Stoddard Solvent in Fuel Tank	L	67.57

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk carpeting, spare tire, jack, tail lights, and trim pieces.

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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	4582
2	Total Width	1786
3*	Bumper Top Height	707
4*	Bumper Bottom Height	592
5*	Longitudinal Member Top Height	567
6	Distance Between Longitudinal Members	1054
7	Longitudinal Member Width	85
8*	Engine Top Height	827
9*	Engine Bottom Height	235
10	Engine and Gearbox Width	561
11	Front Bumper-Engine Distance	613
12*	Front Shock Absorber Fixing Height	982
13*	Bonnet Leading Edge Height	936
14	Front Shock Absorber Fixing Width	1165
15	Front Bumper – Front Axle Distance	933
16	Front Axle – A Pillar Distance	387
17	A-Pillar – B-Pillar Distance	1226
18	B-Pillar – Rear Axle Distance	1088
19	B-Pillar – C-Pillar Distance	925
20*	Roof Sill Bottom Height	1533
21*	Roof Sill Top Height	1659
22*	Floor Sill Bottom Height	411
23*	Floor Sill Top Height	452

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

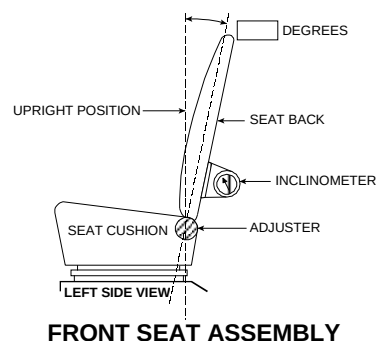
DATA SHEET NO. 2 SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
Test Date: 4/25/2014

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	8.2
Passenger Seat Back Angle	2.8

SEAT FORE / AFT POSITIONS

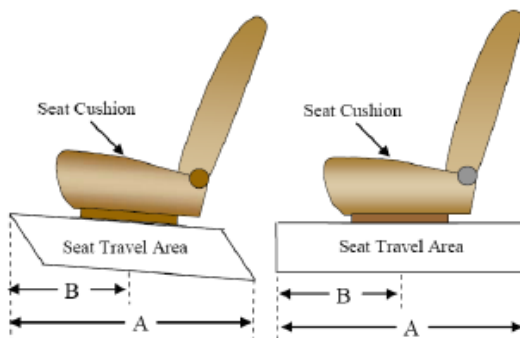
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	25	10
Passenger Seat	25	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	5	0
Passenger Seat	5	0



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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

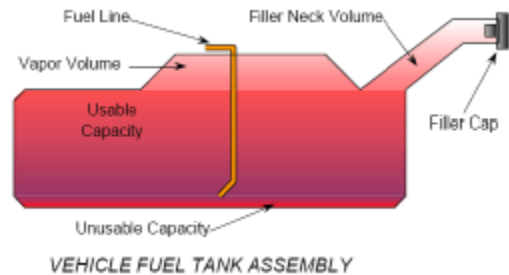
NHTSA No.: M20140106
 Test Date: 4/25/2014

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	72.68
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	66.87 – 68.32
Actual Amount of Solvent Used	67.57
1/3 of Usable Capacity	23.96

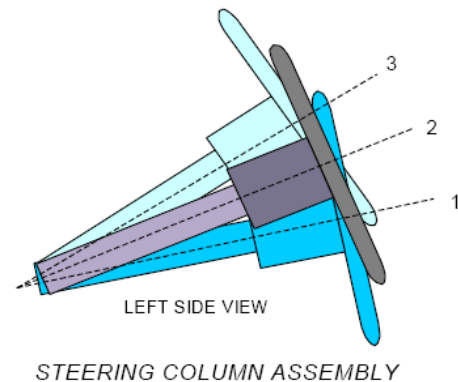
FUEL PUMP

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



STEERING COLUMN ADJUSTMENT

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



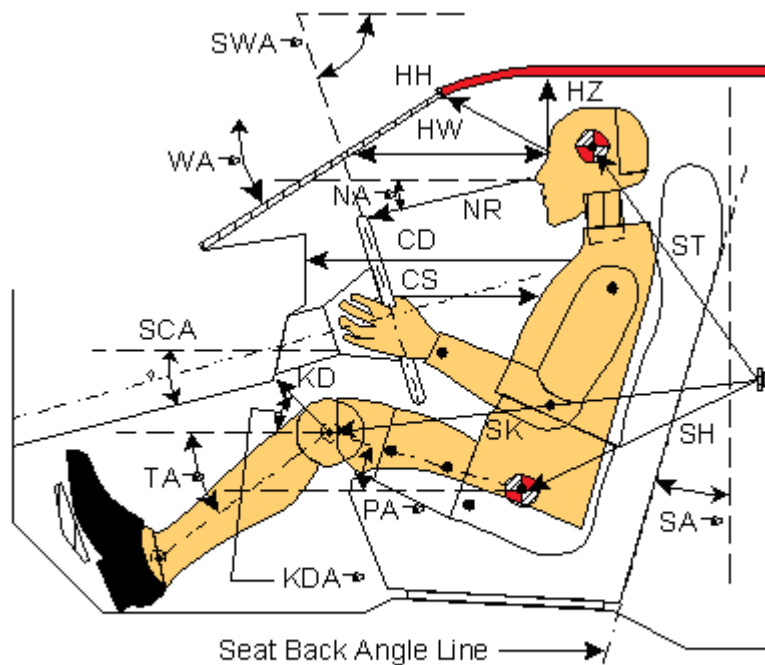
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	22.5	
Geometric center position No. 2	24.6	
Uppermost position No. 3	26.8	
Telescoping Steering Wheel Travel		40
Test Position	25.0	20

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014



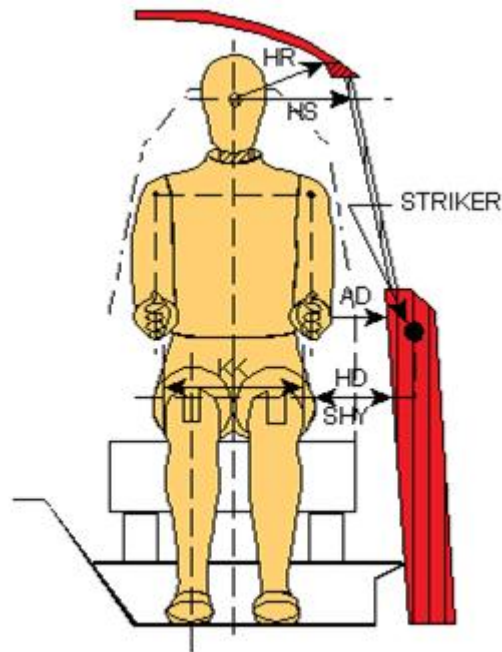
Left Side View

Code	Measurement Description	Driver (SN: 064)		Passenger (SN: 288)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		-29.3		
SWA°	Steering Wheel Angle		25.0		
SCA°	Steering Column Angle		65		
SA°	Seat Back Angle (on headrest post)		6.4		2.8
HZ	Head to Roof (Z)	240	90	230	90
HH	Head to Header	370	30.1	310	54.9
HW	Head to Windshield	690	0	625	0
NR	Nose to Rim	405	-9.1	457	30.2
CD	Chest to Dash	517		394	
CS	Chest to Steering Hub	305	0		
RA	Rim to Abdomen	172	0		
KDL	Left Knee to Dash	151	23.6	88	32.9
KDR	Right Knee to Dash	128	34.7	91	33.1
PA°	Pelvic Angle		22.8		20.1
TA°	Tibia Angle		40.9		47.1
SK	Striker to Knee	605	-2.0	693	-4.3
ST	Striker to Head	545	-81	536	64.3
SH	Striker to H-Point	257	-32.9	382	-12.8

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014



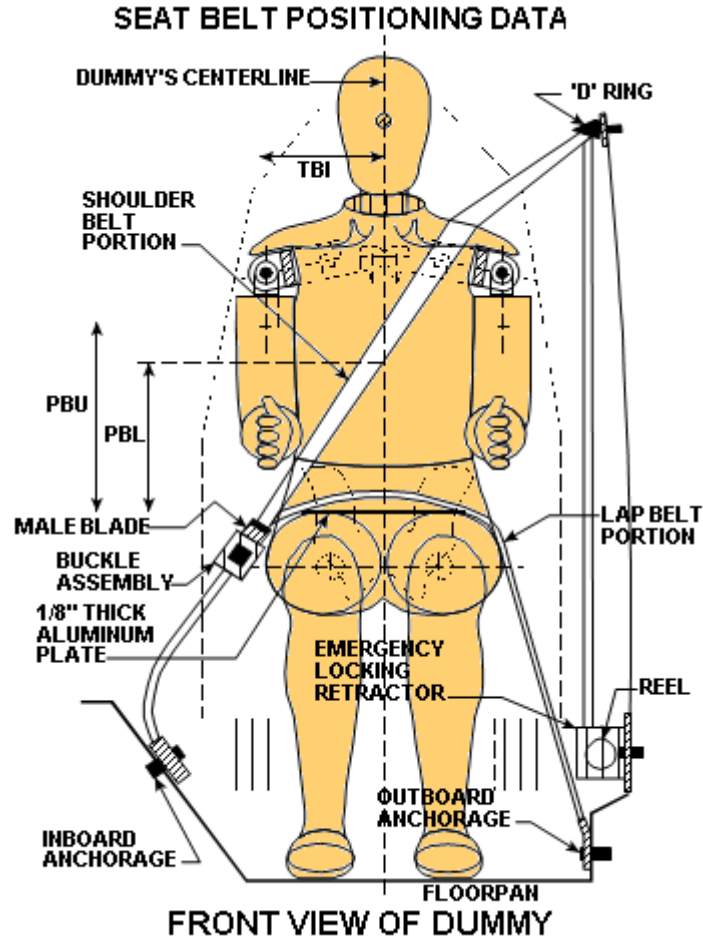
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	113	65
HD	H-Point to Door	139	188
HR	Head to Side Header	229	262
HS	Head to Side Window	345	370
KK	Knee to Knee	350	165
SHY	Striker to H-Point (Y Direction)	230	255
AA	Ankle to Ankle	359	164

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
Test Date: 4/25/2014



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	355	330
PBL — Top surface of reference to belt lower edge	mm	275	260

BELT LENGTH DATA

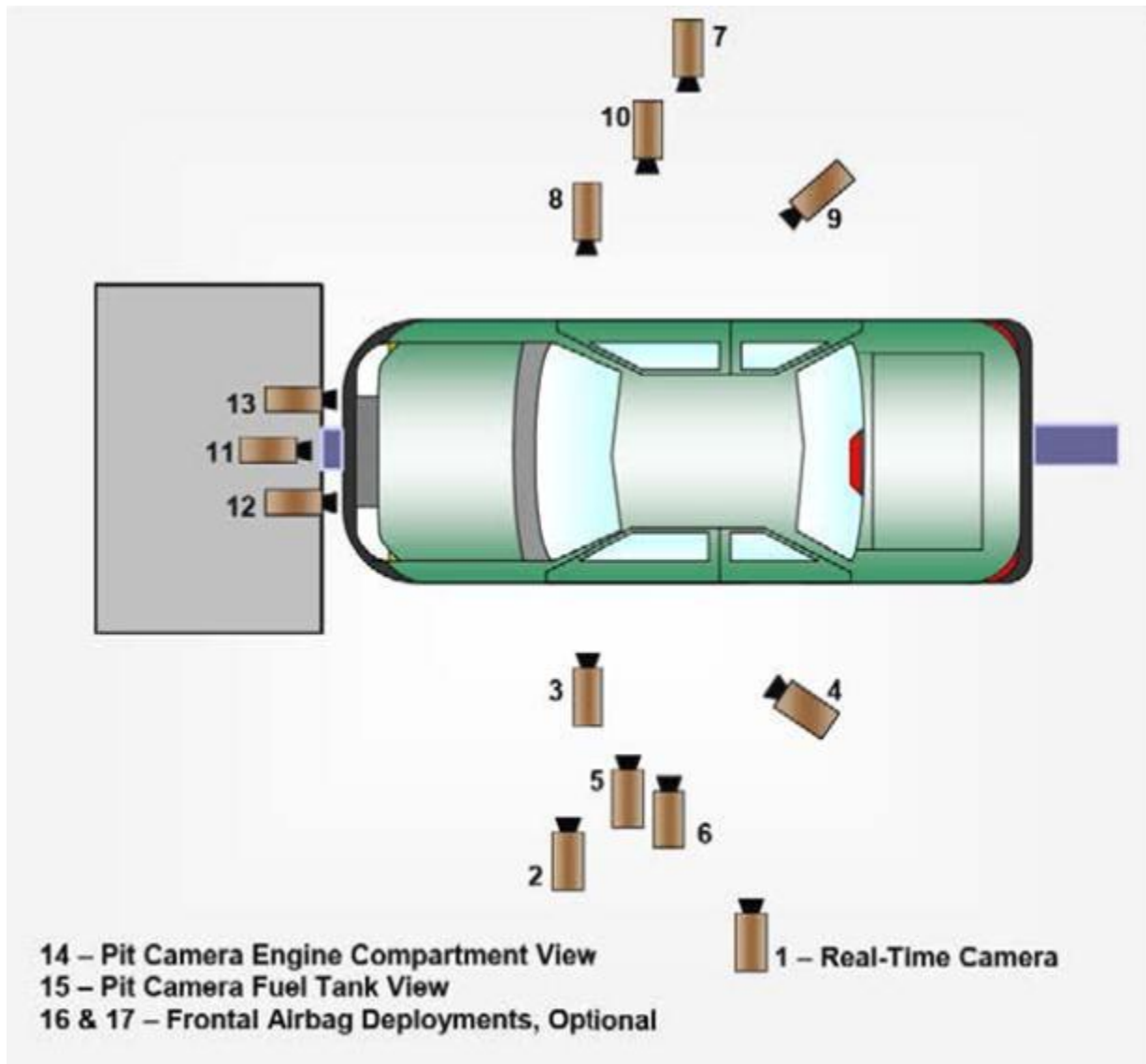
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	865	945
Lap Belt Length as measured on ATD	mm	790	850
Remainder of belt on reel	mm	845	705
Total belt length for continuous webbing systems	mm	2500	2500

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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
Test Date: 4/25/2014

CAMERA POSITIONS FOR FRONTAL IMPACTS



Top View

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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

CAMERA LOCATIONS

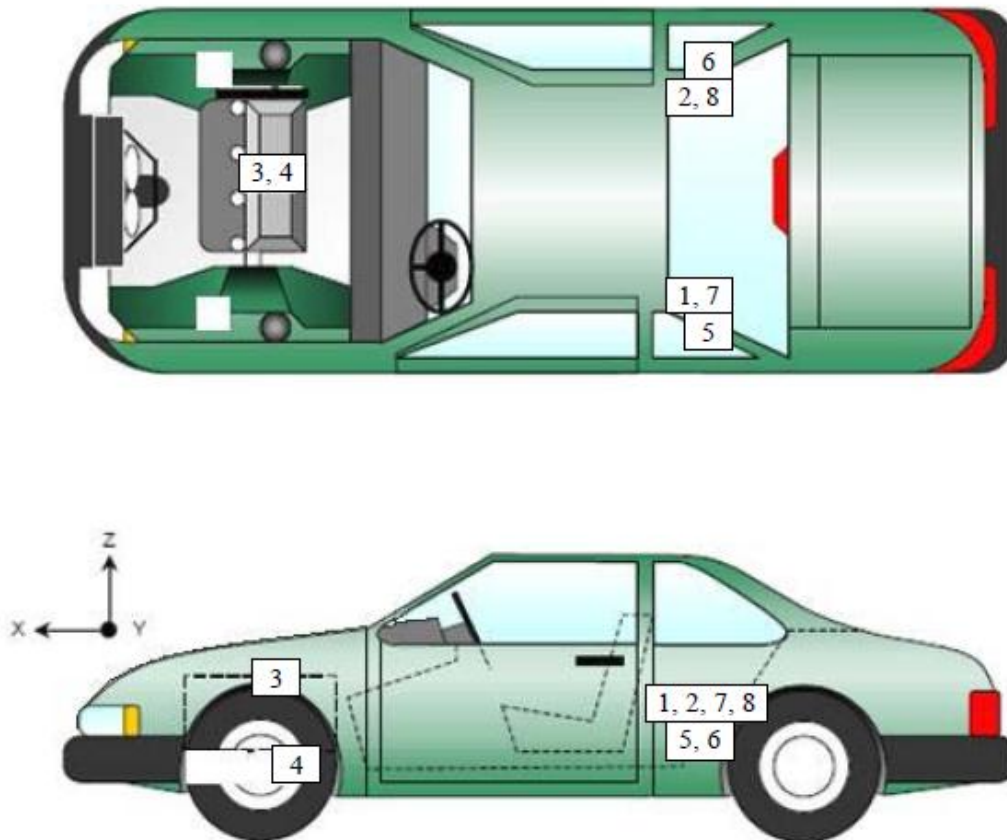
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	2586	-8020	1491		60
2	Driver Close-Up	1590	-8126	1493	50	1000
3	Left Front Half	802	-9787	1603	50	1000
4	Left Angle	3115	-3188	2143	28	1000
5	Steering Column - Top	2066	-8013	1974	24-70	1000
6	Steering Column - Bottom	2066	-8013	1383	24-70	1000
7	Right Overall	1854	8758	1154	28	1000
8	Passenger Close-Up	1467	8462	1349	50	1000
9	Right Front Half	1031	9865	1187	50	1000
10	Right Angle	2933	3359	2313	28	1000
11	Windshield	-620	0	3172	24	1000
12	Driver Windshield	-50	-550	2013	25	1000
13	Passenger Windshield	-50	550	2013	25	1000
14	Pit Front	821	0	-2062	12.5	1000
15	Pit Rear	2655	0	-2033	12.5	1000
16	Onboard Driver Airbag (Optional)					
17	Onboard Passenger Airbag (Optional)					

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

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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1749	-610	87
2	Right Rear Accelerometer – X Direction	1751	604	95
3	Engine Top X	3804	16	-294
4	Engine Bottom X	3782	131	304
5	Left Rear Accelerometer – Z Direction	1751	-582	92
6	Right Rear Accelerometer – Z Direction	1749	589	83
7	Left Rear Accelerometer – X Direction Redundant	1749	-610	87
8	Right Rear Accelerometer – X Direction Redundant	1751	604	95

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

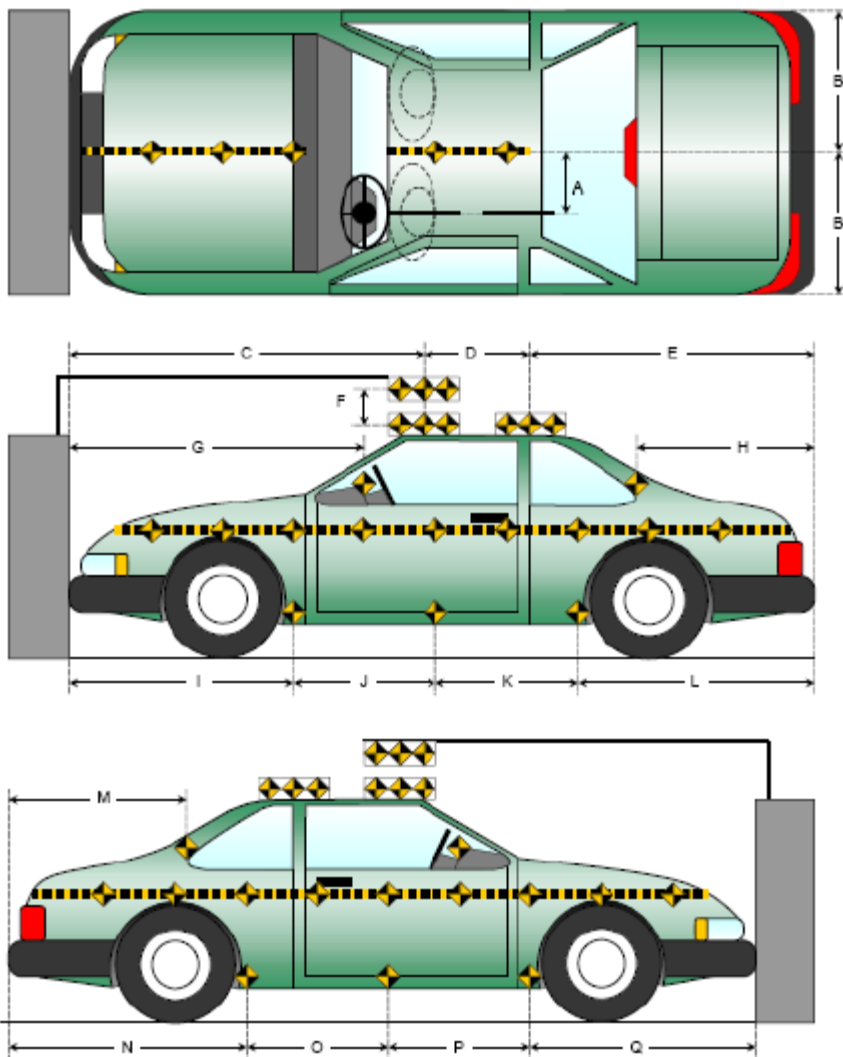
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

Item	Value
A	352
B	893
C	2311
D	1221
E	1049
F	122
G	1737
H	1049
I	1407
J	867
K	877
L	1432
M	1046
N	1424
O	925
P	821
Q	1412

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

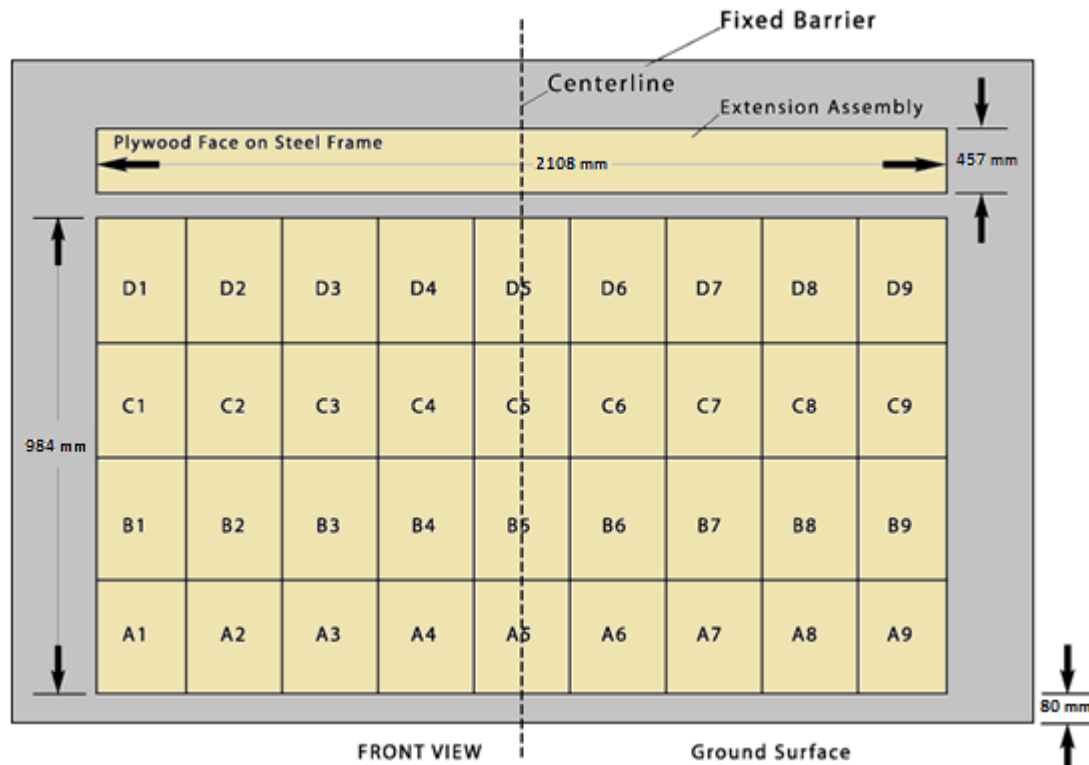


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension*

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
Test Date: 4/25/2014

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	0
High-Speed Offboard	14
Real-Time Panning	1
Total	15

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
Test Date: 4/25/2014

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	P572E 50 th Male / 064	P5720 5 th Female / 288
Head Contact	Front Airbag, Headrest	Front Airbag & Headrest
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster & Steering Column	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	No
Glazing Damage	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Cracks throughout
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	906
Center	mm	888
Right Side	mm	878
Average	mm	891

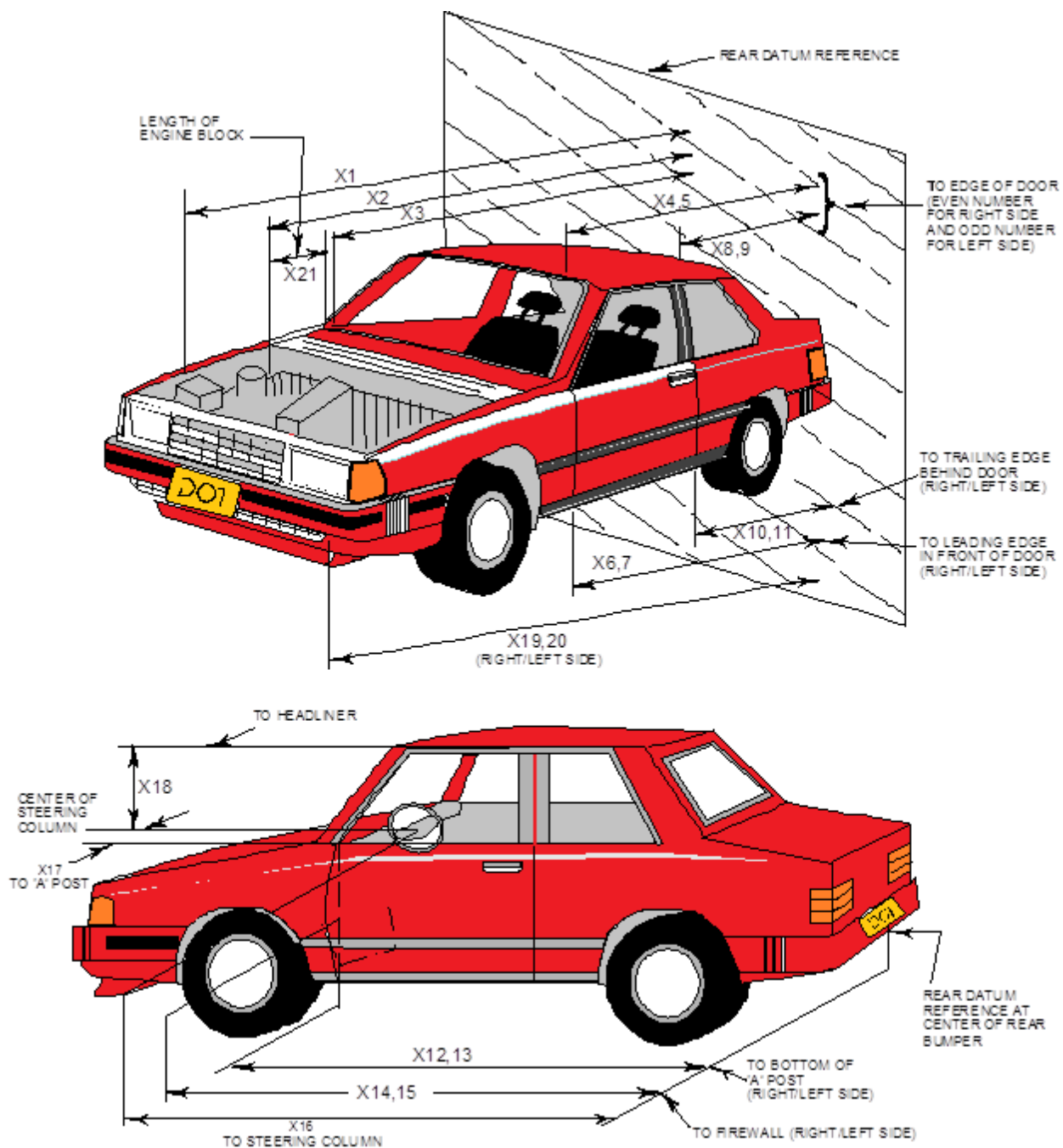
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver		Passenger	
	Installed	Deployed	Installed	Deployed
Front Airbag	Yes	Yes	Yes	Yes
Side Airbag 1 - Curtain	Yes	No	Yes	No
Side Airbag 2 - Torso 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: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014



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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4582	4018	-564
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3969	3702	-267
3	RSOV to Firewall	3572	3487	-86
4	RSOV to Upper Leading Edge of Right Door	3104	3107	3
5	RSOV to Upper Leading Edge of Left Door	3107	3108	1
6	RSOV to Lower Leading Edge of Right Door	3086	3085	-1
7	RSOV to Lower Leading Edge of Left Door	3090	3088	-2
8	RSOV to Upper Trailing Edge of Right Door	2044	2047	3
9	RSOV to Upper Trailing Edge of Left Door	2046	2045	0
10	RSOV to Lower Trailing Edge of Right Door	2056	2053	-4
11	RSOV to Lower Trailing Edge of Left Door	2058	2055	-3
12	RSOV to Bottom of "A" Post of Right Side	3196	3183	-13
13	RSOV to Bottom of "A" Post of Left Side	3197	3165	-32
14	RSOV to Firewall, Right Side	3526	3515	-11
15	RSOV to Firewall, Left Side	3529	3495	-35
16	RSOV to Steering Column	2678	2733	55
17	Center of Steering Column to "A" Post	295	305	10
18	Center of Steering Column to Headliner	448	469	22
19	RSOV to Right Side of Front Bumper	4503	4021	-482
20	RSOV to Left Side of Front Bumper	4502	4026	-476
21	Length of Engine Block	342	342	0
RD	RSOV to Right Side of Dash Panel	2865	2862	-2
CD	RSOV to Center of Dash Panel	2804	2803	-1
LD	RSOV to Left Side of Dash Panel	2869	2846	-23

*UR= Unrecoverable data point
 All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
Test Date: 4/25/2014

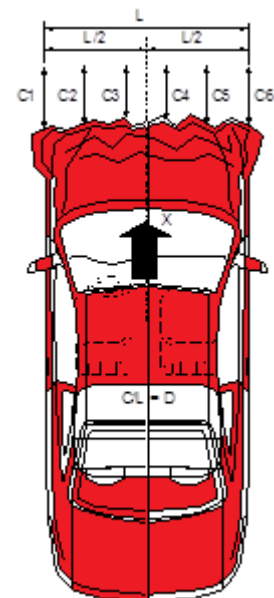
VEHICLE INFORMATION

VIN: 3GNAL1EKXES637416
Vehicle Size Category: Passenger

Wheelbase (mm): 2707
Test Weight (kg): 1,942

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): 56.46
Velocity Change (km/h): 56.46
Time of Separation (ms): 141



CRUSH PROFILE

Collision Deformation Classification: 12FDEW3
Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1053
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4445	3996	449
C2	Crush Zone 2 at Left Side	mm	4530	4035	495
C3	Crush Zone 3 at Left Side	mm	4565	4052	513
C4	Crush Zone 4 at Right Side	mm	4565	4052	513
C5	Crush Zone 5 at Right Side	mm	4531	4036	495
C6	Crush Zone 6 at Right Side	mm	4447	3997	450
L	C1 to C6	mm	1053	1081	-28

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

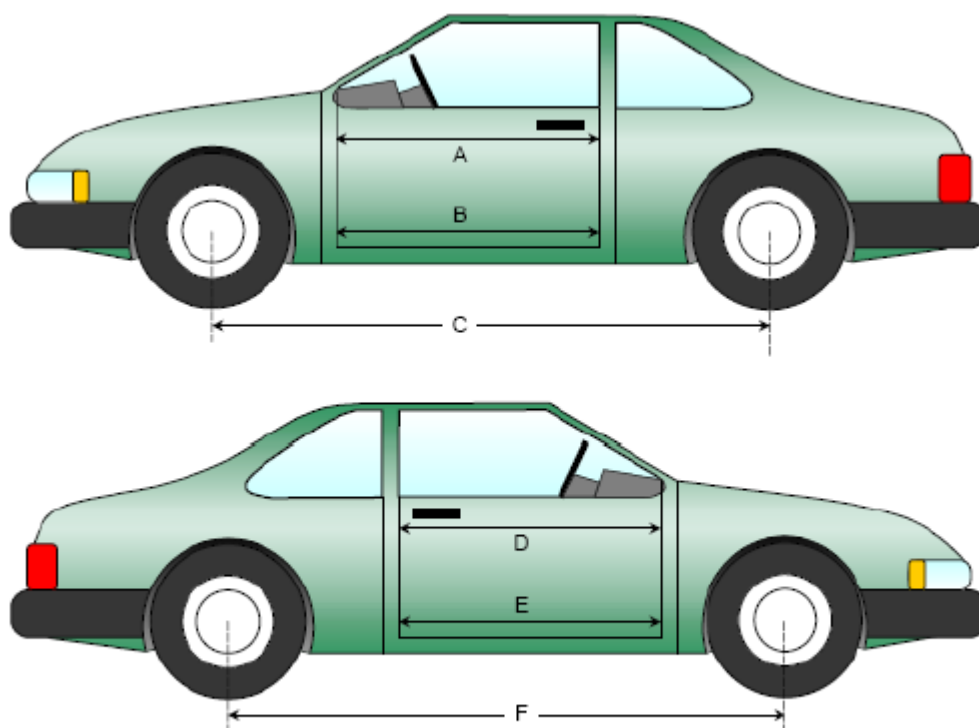
NHTSA No.: M20140106
 Test Date: 4/25/2014

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	931	923	-8
B	Left Side Lower	mm	884	883	-1
D	Right Side Upper	mm	926	923	-3
E	Right Side Lower	mm	891	891	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2707	2674	-33
F	Right Side Wheelbase	mm	2707	2673	-34



Left & Right Side Views

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

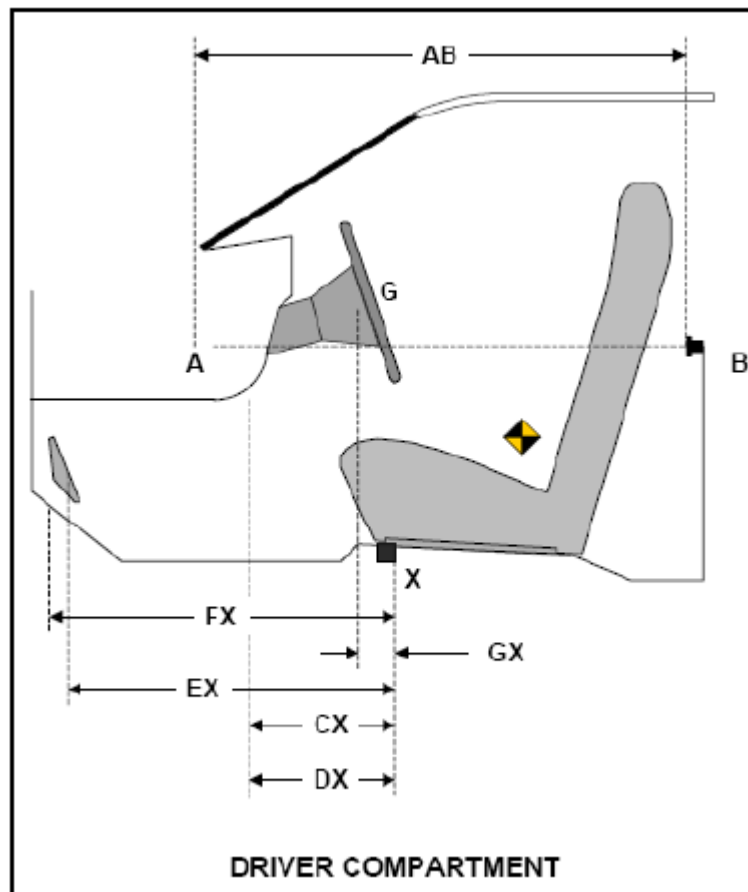
Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	835	834	-1
CX	Left Knee Bolster to X	mm	320	323	3
DX	Right Knee Bolster to X	mm	302	318	16
EX	Brake Pedal to X	mm	540	548	8
FX	Foot Rest to X	mm	640	616	-24
GX	Center of Steering Column Wheel Hub to X	mm	92	146	54

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014

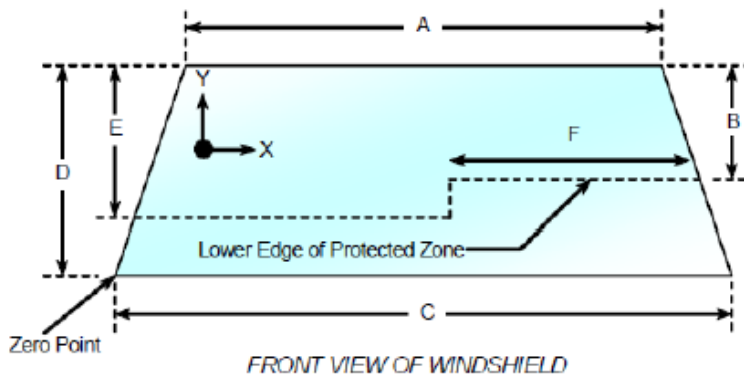
Windshield Mounting Details: A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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	2135	1705	79.9%
Right Side	2135	1940	90.9%
Total	4270	3645	85.4%



Item	Units	Value
A	mm	1170
B	mm	560
C	mm	1350
D	mm	875
E	mm	555
F	mm	480

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: 2014 Chevrolet Captiva Sport SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
Test Date: 4/25/2014

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21 ° C

Test Time: 1:00 PM

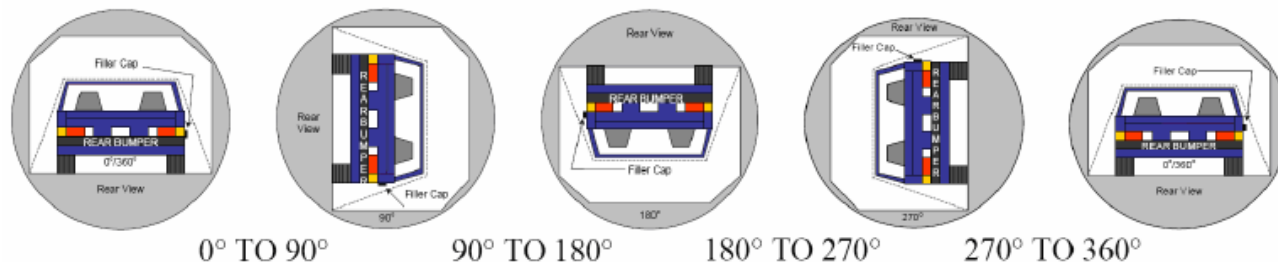
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014



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°	71	300	371
90° to 180°	61	300	361
180° to 270°	62	300	362
270° to 360°	67	300	367

FMVSS 301 SPILLAGE TABLE

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

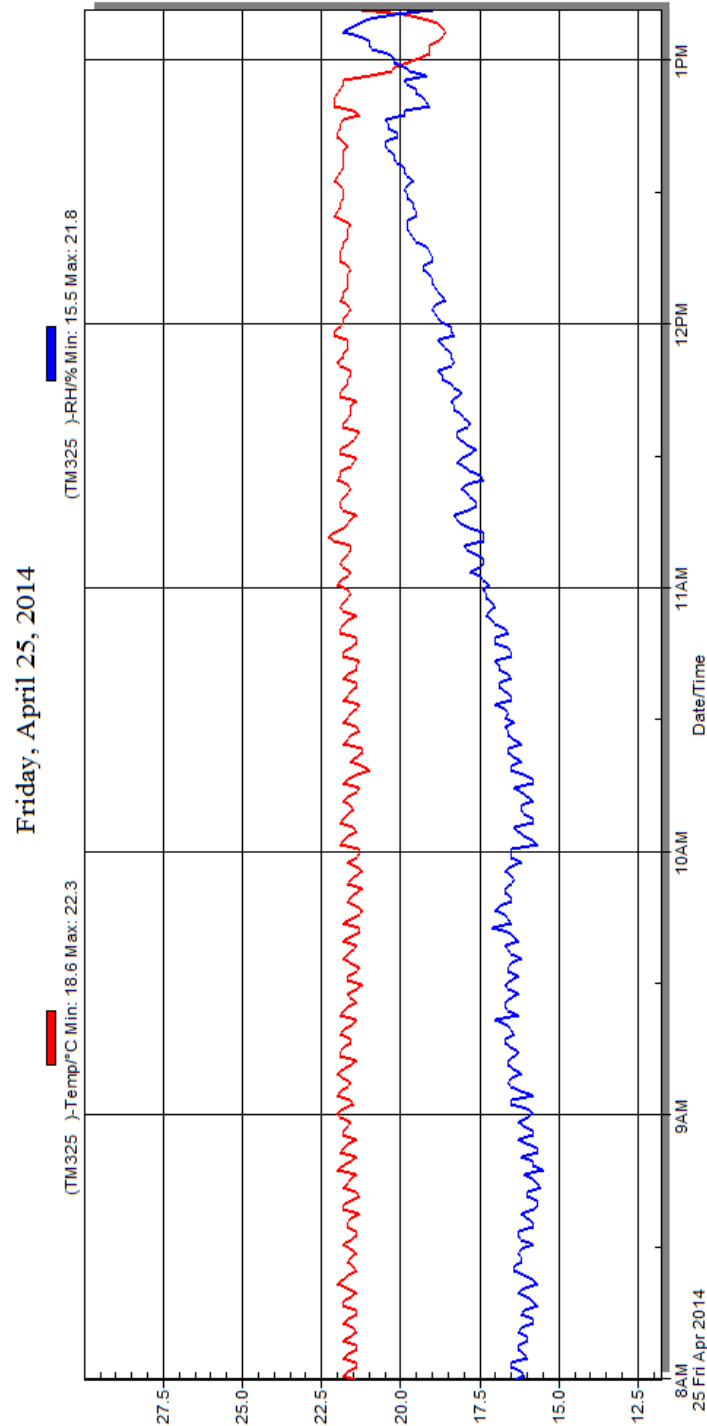
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2014 Chevrolet Captiva Sport SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140106
 Test Date: 4/25/2014



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

APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

Fig.	Description	Page
1	Load Cell Location	A-5
2	Load Cell Wall	A-5
3	Manufacturer's Label	A-6
4	Tire Placard	A-6
5	2014 Chevrolet Captiva Sport Frontal As Delivered	A-7
6	Left Rear 3-4 View, as Received	A-7
7	Pre-Test Front View of Test Vehicle	A-8
8	Post-Test Front View of Test Vehicle	A-8
9	Pre-Test Left View of Test Vehicle	A-9
10	Post-Test Left View of Test Vehicle	A-9
11	Pre-Test Right View of Test Vehicle	A-10
12	Post-Test Right View of Test Vehicle	A-10
13	Pre-Test Right Front 3-4 View	A-11
14	Post-Test Right Front 3-4 View	A-11
15	Pre-Test Left Rear 3-4 View	A-12
16	Post-Test Left Rear 3-4 View	A-12
17	Pre-Test Windshield View	A-13
18	Post-Test Windshield View	A-13
19	Pre-Test Engine Compartment View	A-14
20	Post-Test Engine Compartment View	A-14
21	Pre-Test Fuel Filler Cap View	A-15
22	Post-Test Fuel Filler Cap View	A-15
23	Pre-Test Front Underbody View ¹	A-16
24	Post-Test Front Underbody View ¹	A-16
25	Pre-Test Rear Underbody View ¹	A-17
26	Post-Test Rear Underbody View ¹	A-17
27	Pre-Test Dummy Cable Routing	A-18
28	Post-Test Dummy Cable Routing	A-18
29	Pre-Test Driver Dummy Front View	A-19
30	Post-Test Driver Dummy Front View	A-19
31	Pre-Test Driver Dummy Window View	A-20
32	Post-Test Driver Dummy Window View	A-20
33	Pre-Test Driver Dummy and Vehicle Interior View	A-21
34	Post-Test Driver Dummy and Vehicle Interior View	A-21

Fig.	Description	Page
35	Pre-Test Driver's Seat Fore-Aft Markings	A-22
36	Post-Test Driver's Seat Fore-Aft Markings	A-22
37	Pre-Test View of Belt Anchorage for Driver Dummy	A-23
38	Post-Test View of Belt Anchorage for Driver Dummy	A-23
39	Pre-Test Driver Dummy Feet	A-24
40	Post-Test Driver Dummy Feet	A-24
41	Pre-Test Driver's Side Knee Bolster	A-25
42	Post-Test Driver's Side Knee Bolster	A-25
43	Pre-Test Driver's Side Floorpan	A-26
44	Post-Test Driver's Side Floorpan	A-26
45	Post-Test Driver Dummy Face	A-27
46	Post-Test Driver Dummy Contact With Airbag	A-27
47	Post-Test Driver Dummy Contact With Headrest	A-28
48	Pre-Test View of the Steering Wheel	A-28
49	Post-Test View of the Steering Wheel	A-29
50	Pre-Test Passenger Dummy Front View	A-29
51	Post-Test Passenger Dummy Front View	A-30
52	Pre-Test Passenger Dummy Window View	A-30
53	Post-Test Passenger Dummy Window View	A-31
54	Pre-Test Passenger Dummy and Vehicle Interior View	A-31
55	Post-Test Passenger Dummy and Vehicle Interior View	A-32
56	Pre-Test Passenger's Seat Fore-Aft Markings	A-32
57	Post-Test Passenger's Seat Fore-Aft Markings	A-33
58	Pre-Test View of Belt Anchorage for Passenger Dummy	A-33
59	Post-Test View of Belt Anchorage for Passenger Dummy	A-34
60	Pre-Test Passenger Dummy Feet	A-34
61	Post-Test Passenger Dummy Feet	A-35
62	Pre-Test Passenger's Side Knee Bolster	A-35
63	Post-Test Passenger's Side Knee Bolster	A-36
64	Pre-Test Passenger's Side Floorpan	A-36
65	Post-Test Passenger's Side Floorpan	A-37
66	Post-Test Passenger Dummy Face	A-37
67	Post-Test Passenger Dummy Contact With Airbag	A-38
68	Post-Test Passenger Dummy Contact With Headrest	A-38

Fig.	Description	Page
69	Photograph of Ballast Installed in Vehicle	A-39
70	Post-Test Stoddard Solvent Spillage Location View, if Required	A-39
71	Post-Test Speed Trap Read-Out	A-40
72	Vehicle at 0° on Static Rollover Device	A-40
73	Vehicle at 90° on Static Rollover Device	A-41
74	Vehicle at 180° on Static Rollover Device	A-41
75	Vehicle at 270° on Static Rollover Device	A-42
76	Vehicle at 360° on Static Rollover Device	A-42
77	2014 Chevrolet Captiva Sport Frontal Impact Event	A-43
78	Monroney Label Photograph	A-43

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.*

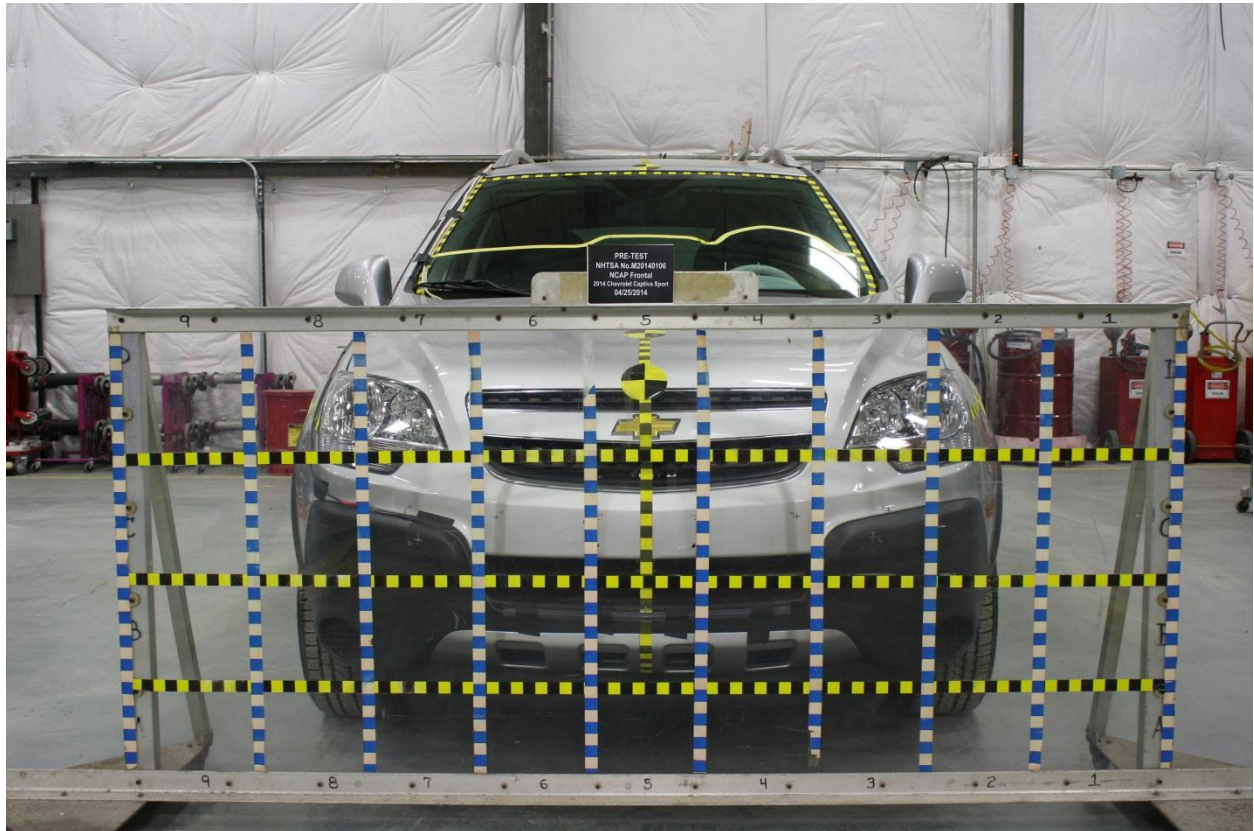


Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall



Figure A-3: Manufacturer's Label



Figure A-4: Tire Placard



Figure A-5: 2014 Chevrolet Captiva Sport 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

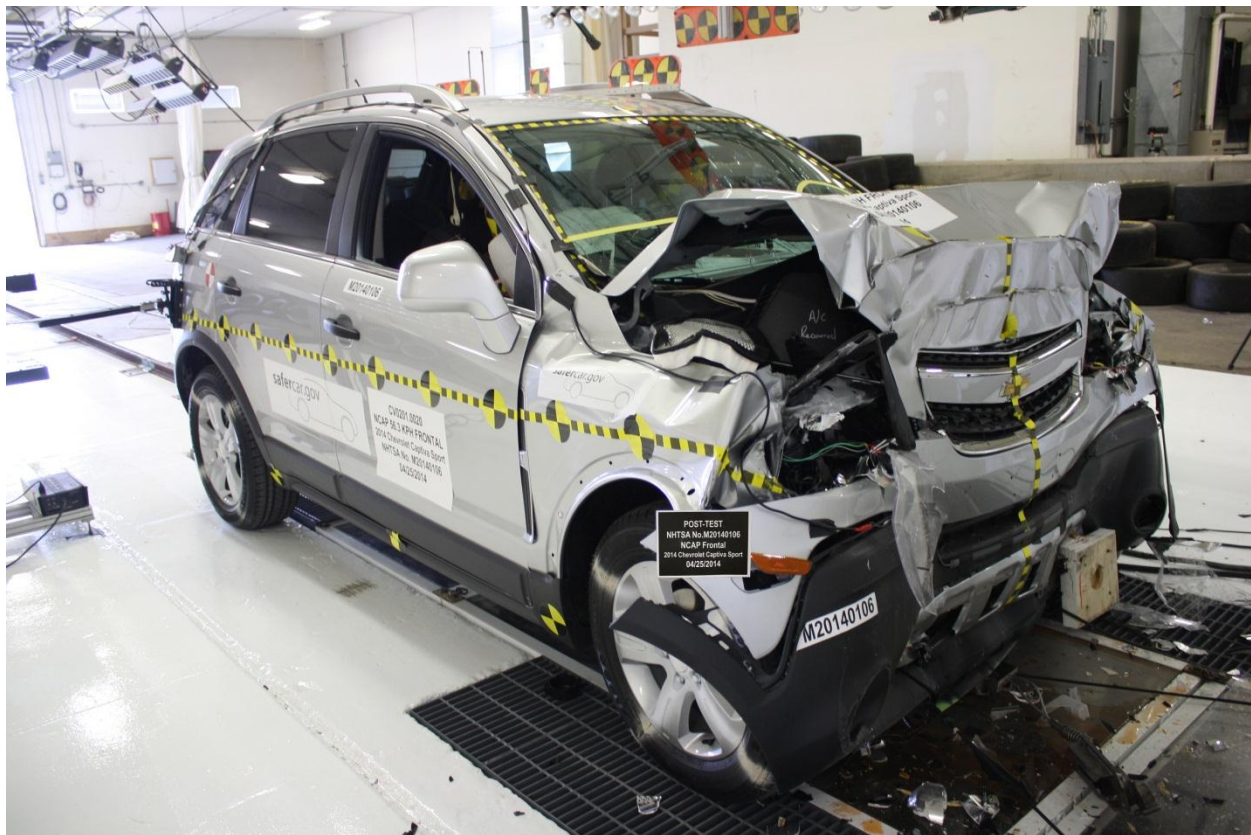


Figure A-14: Post-Test Right Front 3-4 View



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

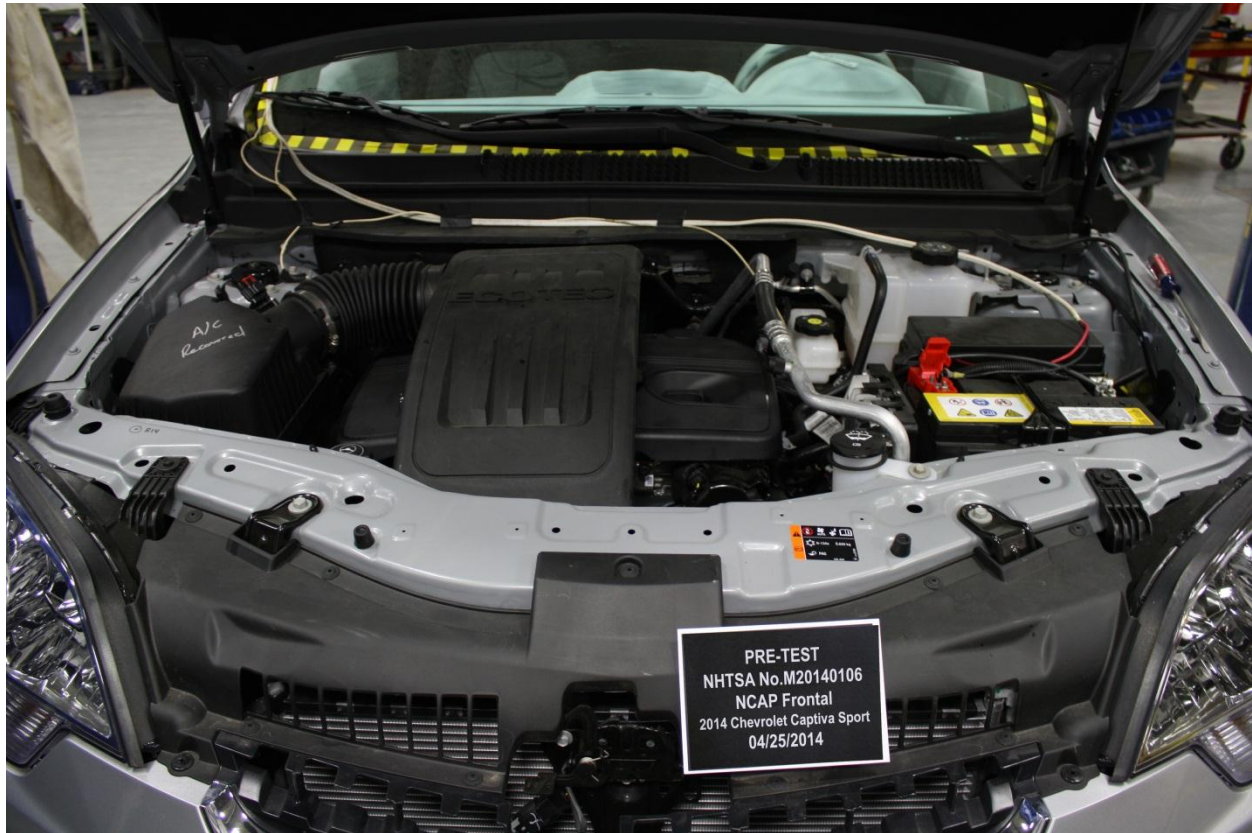


Figure A-19: Pre-Test Engine Compartment View

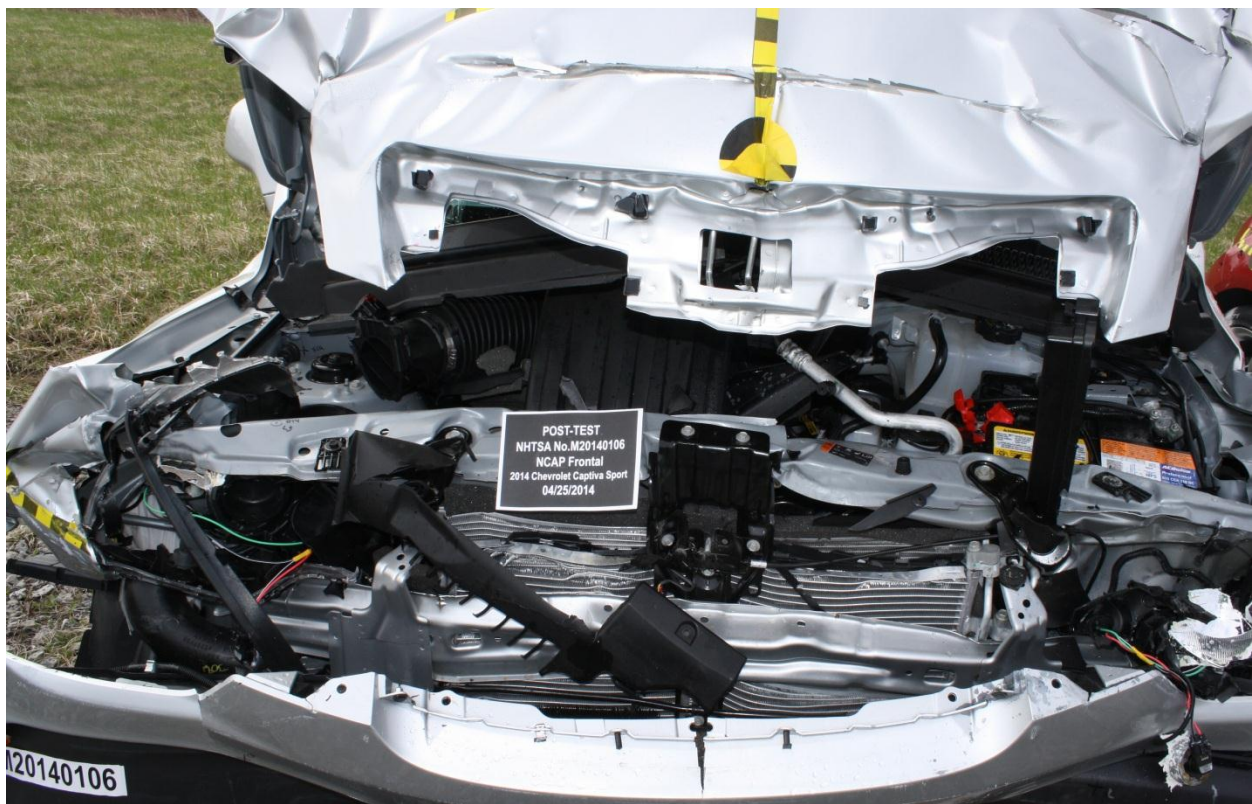


Figure A-20: Post-Test Engine Compartment View



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



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

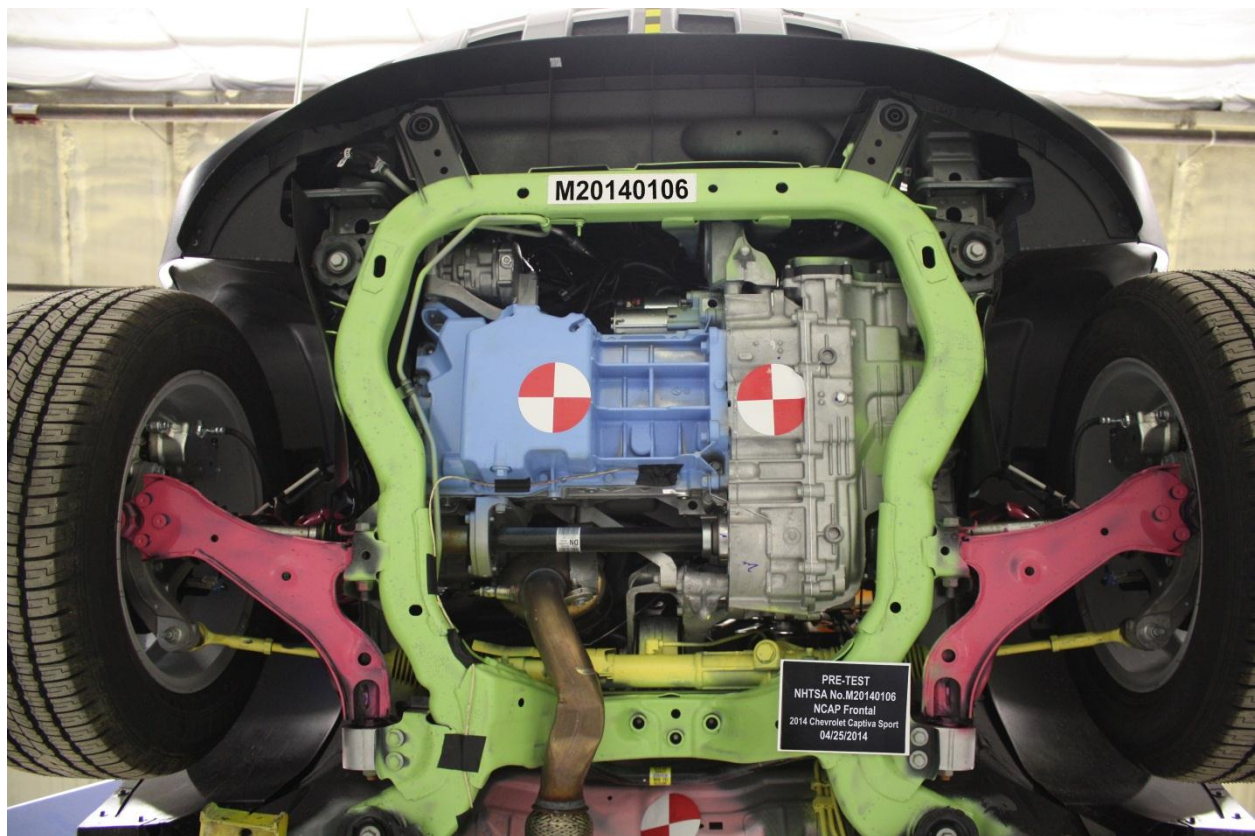


Figure A-23: Pre-Test Front Underbody View



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

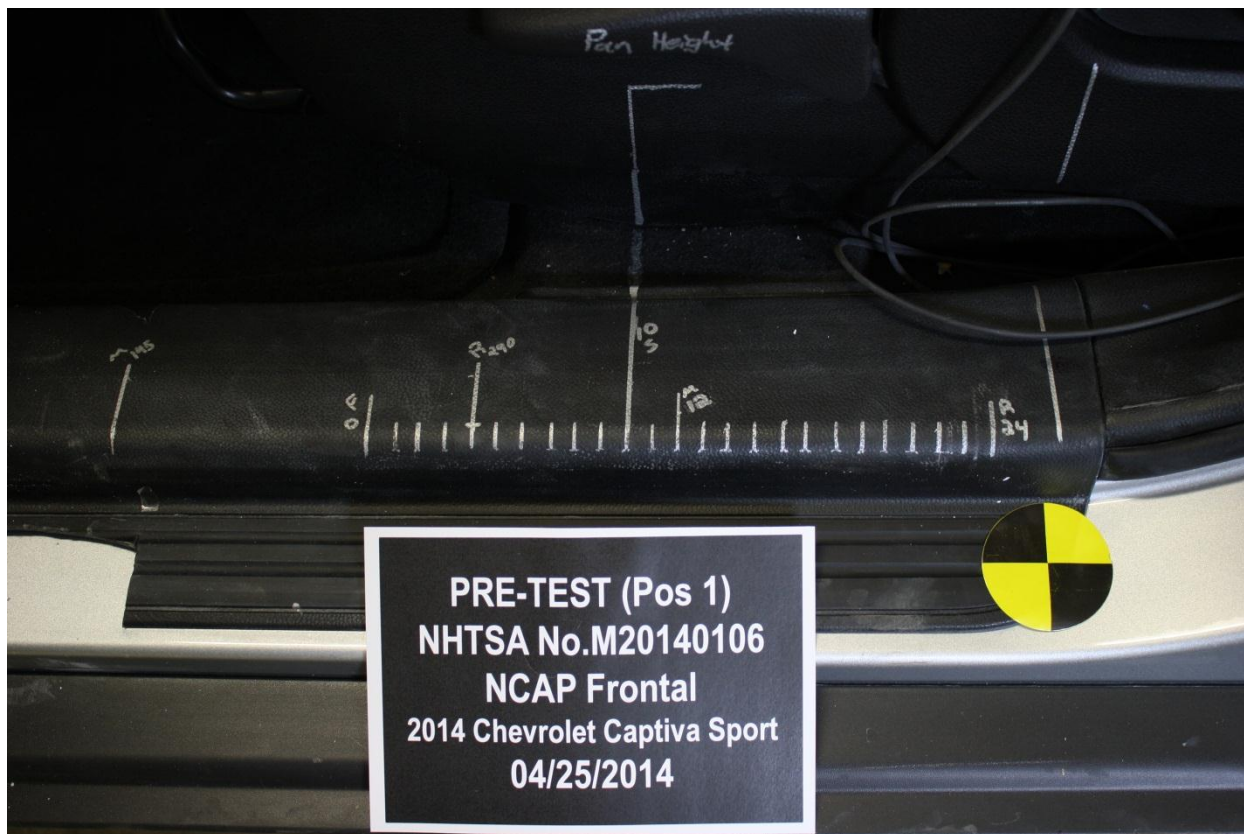


Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings



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

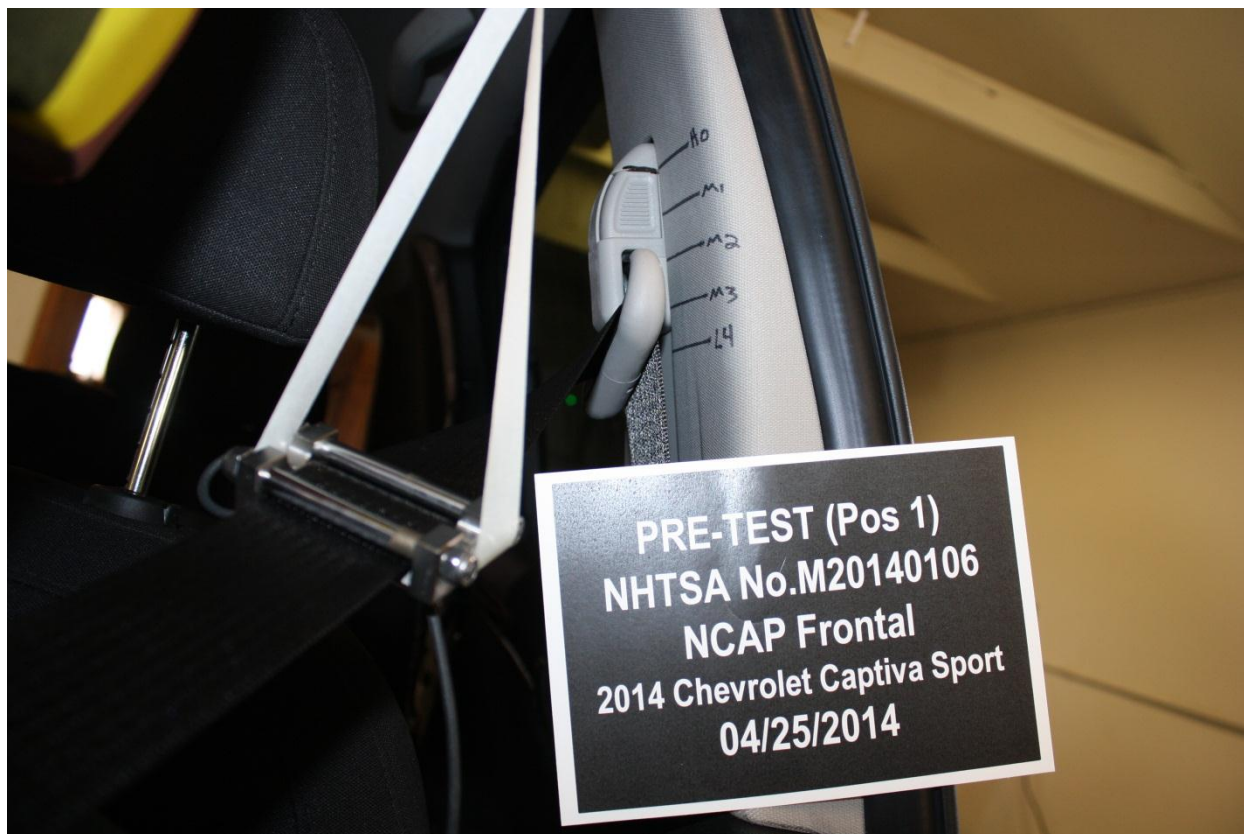


Figure A-37: Pre-Test View of Belt Anchorage for Driver Dummy



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

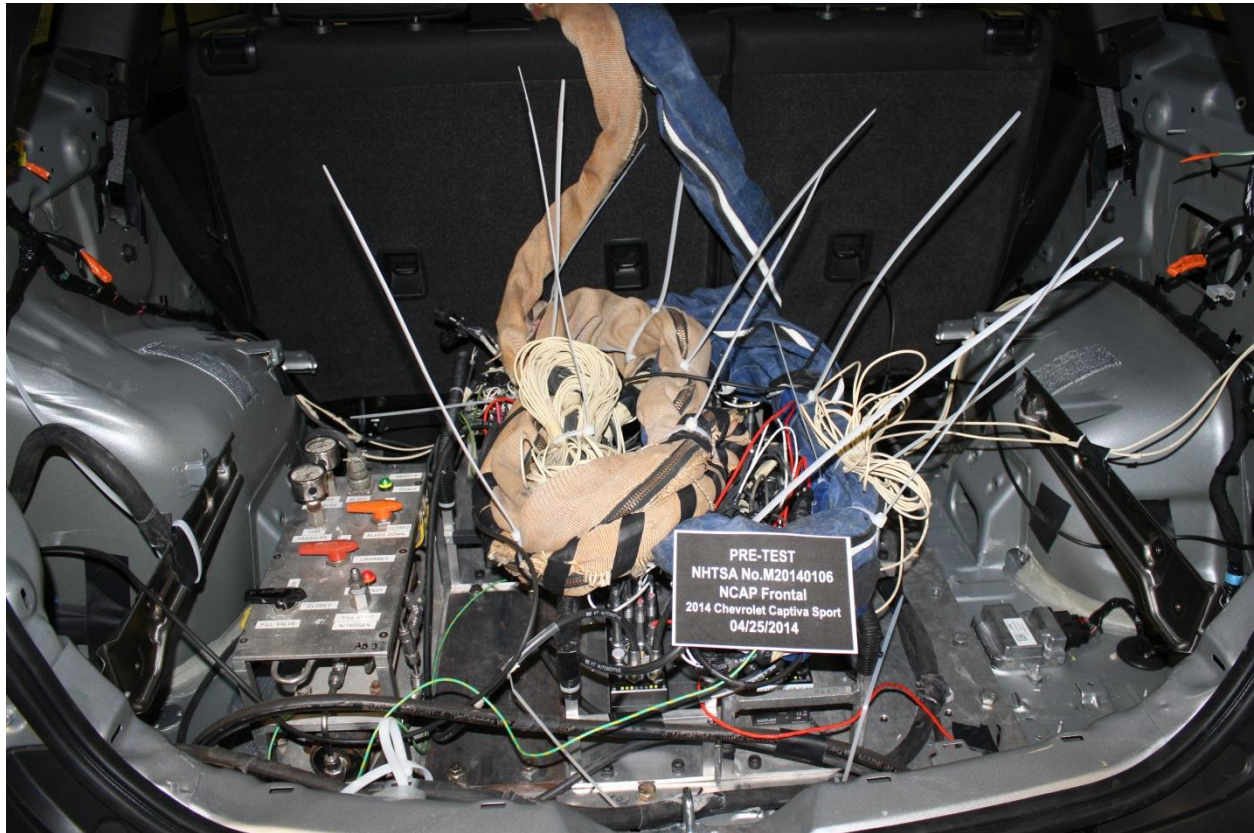


Figure A-69: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

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



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

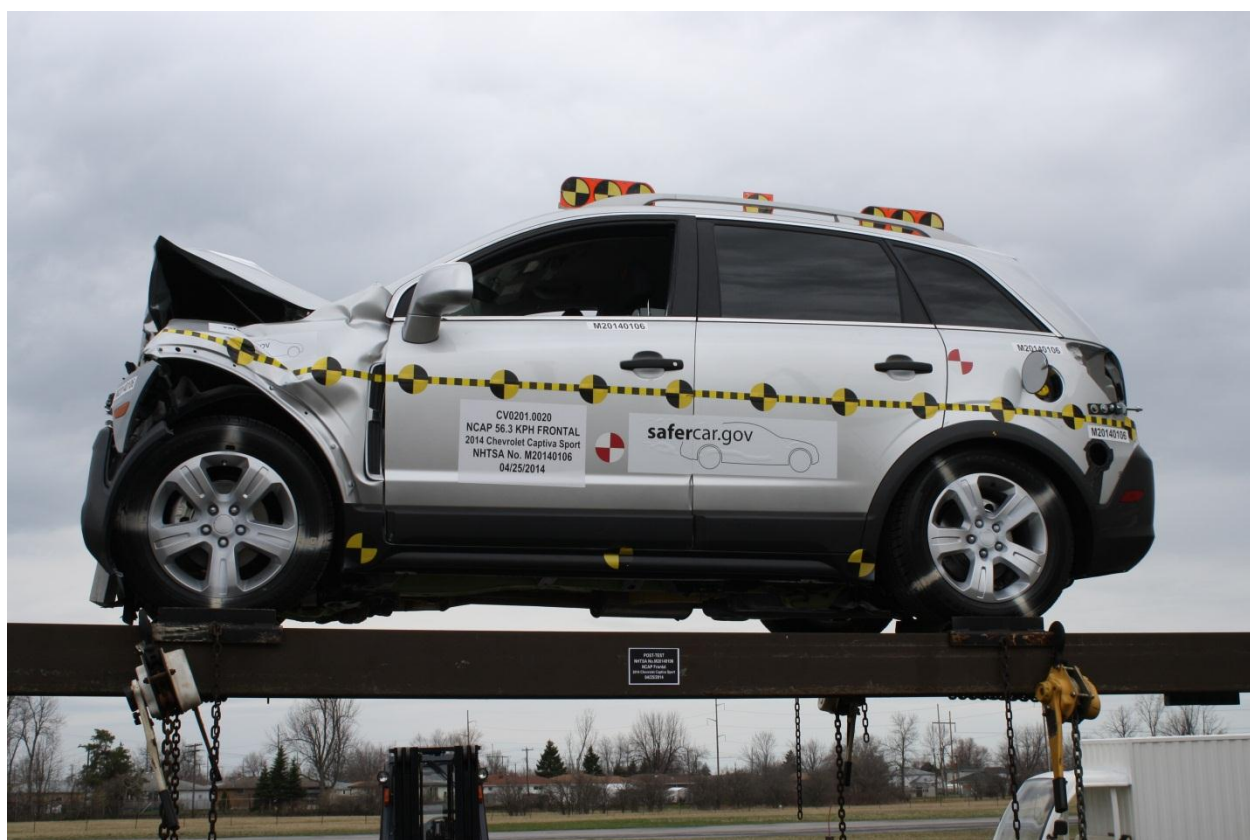


Figure A-72: Vehicle at 0° on Static Rollover Device



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



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

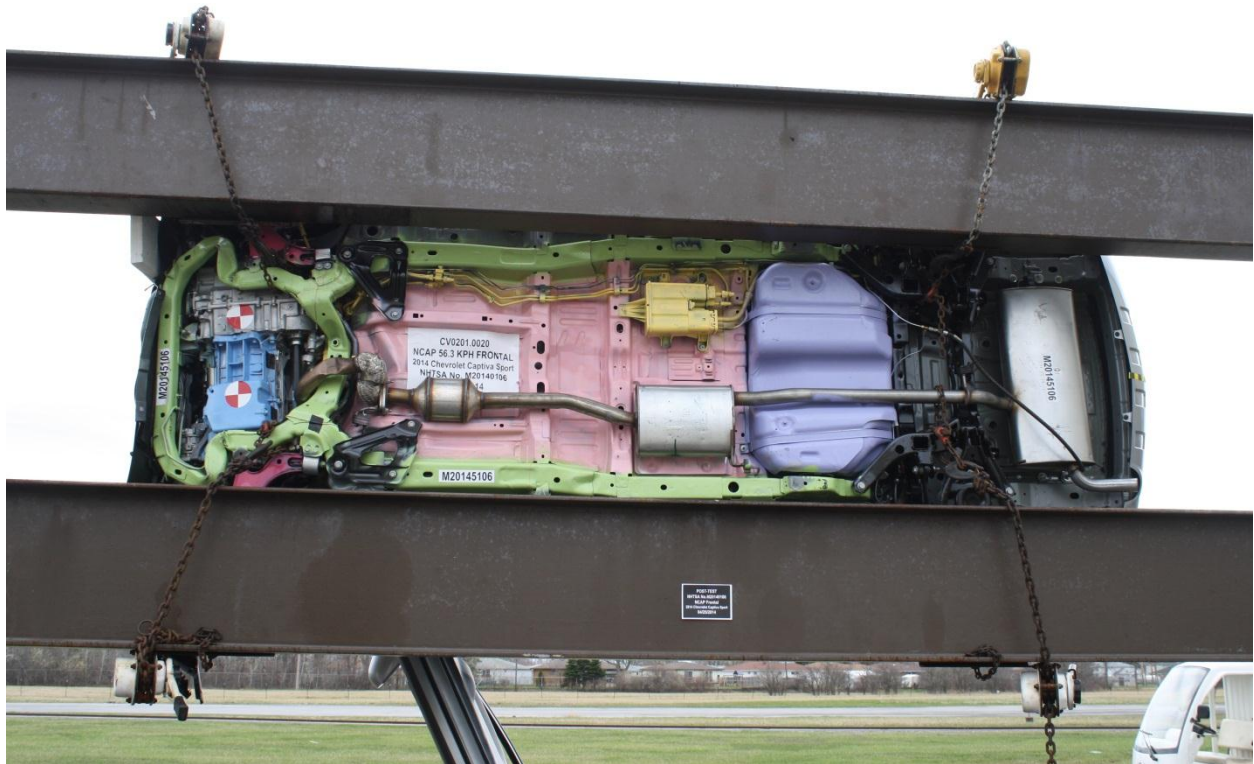


Figure A-75: Vehicle at 270° on Static Rollover Device



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



Figure A-77: 2014 Chevrolet Captiva Sport SUV Frontal Impact Event

2014 CAPTIVA SPORT FWD 1LS

EXTERIOR: SILVER ICE METALLIC
INTERIOR: BLACK

ENGINE: 2.4L DOHC 4 CYL W/ VVT
6 SPD AUTOMATIC TRANSMISSION

STANDARD EQUIPMENT

ITEMS LISTED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN.

- 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY. SEE DEALER FOR DETAILS.
- SCHEDULED MAINTENANCE 2YR/24,000 MILES OIL & FILTER 4 WHEEL FIRE ROTATION. SEE WWW.CHEVY.COM OR DEALER FOR DETAILS.

MECHANICAL

- TRANSMISSION, 6 SPD AUTOMATIC
- ENGINE, 2.4L DOHC 4 CYL WITH VVT
- OIL LIFE MONITOR SYSTEM
- COMPACT SPARE TIRE

SAFETY & SECURITY

- REMOTE KEYLESS ENTRY
- AIRBAGS, DRIVER & FRONT PASS. FRONT / SIDE IMPACT

AIRBAGS - SIDE HEAD CURTAIN

- THEFT DETERRENT SYSTEM
- DAYTIME RUNNING LAMPS
- STABILITRAK - STABILITY CONTROL SYSTEM W/ TRACTION CONTROL
- ANTI-LOCK BRAKE SYSTEM
- 6 MTH ONSTAR(R) DIRECTIONS AND CONNECTIONS W/AUTOMATIC CRASH RESPONSE, TURN-BY-TURN NAV & 5-YEARS REMOTE LINK APP KEY FOR SERVICES (ASK DEALER ABOUT GEOGRAPHIC COVERAGE).
- TIRE PRESSURE MONITOR SYSTEM (EXCL. SPARE TIRE)

EXTERIOR

- MIRROR, MANUAL INSIDE RR VIEW
- POWER OUTSIDE MIRROR
- EXHAUST, STAINLESS STEEL
- LUGGAGE RACK SIDE RAILS, ROOF MOUNTED
- REAR WIPER WITH WASHER

GLASS, TINTED

- WHEELS, 17" PAINTED ALUMINUM
- DOOR HANDLES, DARK GRAPHITE

INTERIOR

- SEAT, FRONT BUCKET
- FLOOR MATS, FRONT
- FLOOR MATS, REAR
- SEATS, FOLD FLAT FRONT PASS
- CONSOLE, FRONT FLOOR W/ ARMREST
- SEAT ADJUSTER, DRIVER MANUAL LUMBAR
- POWER WINDOWS, DRIVER EXPRESS DOWN
- BLUETOOTH FOR PHONE
- AM/FM STEREO CD PLAYER WITH AUX INPUT JACK
- AUDIO SYSTEM, 6 SPEAKER PREMIUM SOUND
- AIR CONDITIONING
- CRUISE CONTROL
- STEERING WHEEL CONTROLS

Visit us at www.chevy.com

MANUFACTURER'S SUGGESTED RETAIL PRICE	
STANDARD VEHICLE PRICE	\$24,360.00
OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN).	
GWR RATING - 4,825 LBS	INC.
TOTAL OPTIONS	\$0.00
TOTAL VEHICLE & OPTIONS	\$24,360.00
DESTINATION CHARGE	\$75.00
TOTAL VEHICLE PRICE*	\$25,235.00

EPA Fuel Economy and Environment

Fuel Economy

23 MPG combined city/hwy

20 MPG city

28 MPG highway

4.3 gallons per 100 miles

You save \$0 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$2,300

Fuel Economy & Greenhouse Gas Rating (tailpipe only)

6 (Best)

Smog Rating (tailpipe only)

6 (Best)

GOVERNMENT 5-STAR SAFETY RATINGS

Overall Vehicle Score Not Rated

Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.

Frontal Crash	Driver Passenger	Not Rated
Side Crash	Front seat	Not Rated
	Rear seat	Not Rated
Rollover	★★★★	

Star ratings range from 1 to 5 stars (★★★★★) with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 70%

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

FOR THIS VEHICLE: FINAL ASSEMBLY POINT: RAMOS ARIZPE, CZ MEXICO COUNTRY OF ORIGIN: ENGINE: UNITED STATES TRANSMISSION: MEXICO

ORDER NO. RDZ0000000 SALES CODE R SALES REGION CODE 12000 DEALER NO. 11461 TRUCK ASSEMBLY: RAMOS ARIZPE, CZ MEXICO VIN 3GNAL1KXSE637416 (SOLD TO RENT) DELIVERED BY CHEVROLET, INC. 39 N RTE 12 FOX LAKE, IL 60020-1222

UL 20C1947916

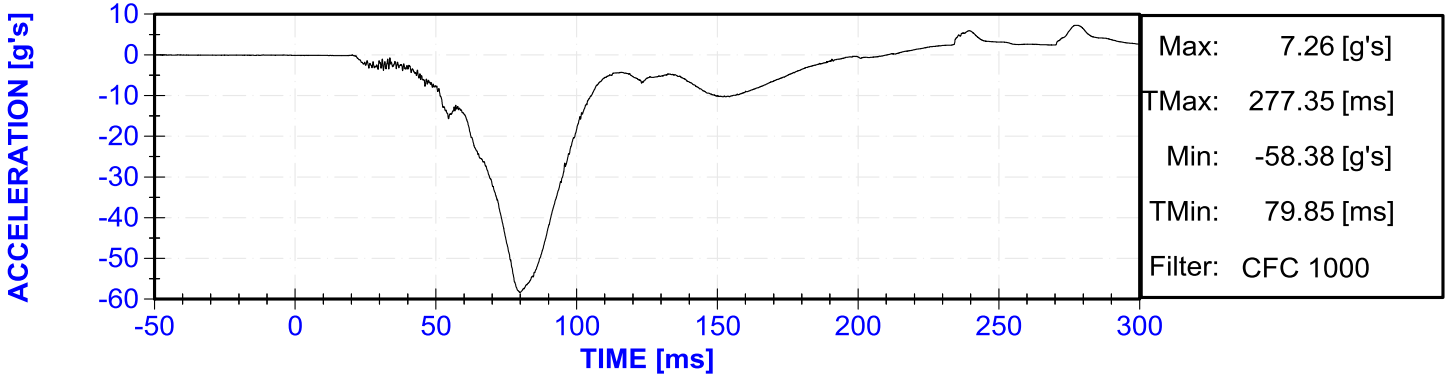
Figure A-78: Monroney Label Photograph

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

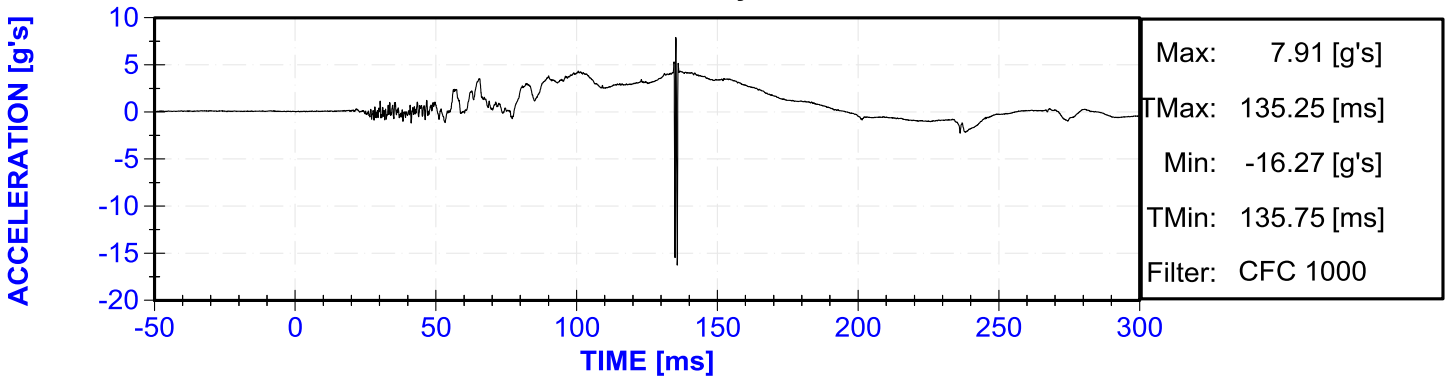
Table of Data Plots

No.	Description	Page
Plot 1	Driver Head X Acceleration vs. Time Primary	B-3
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

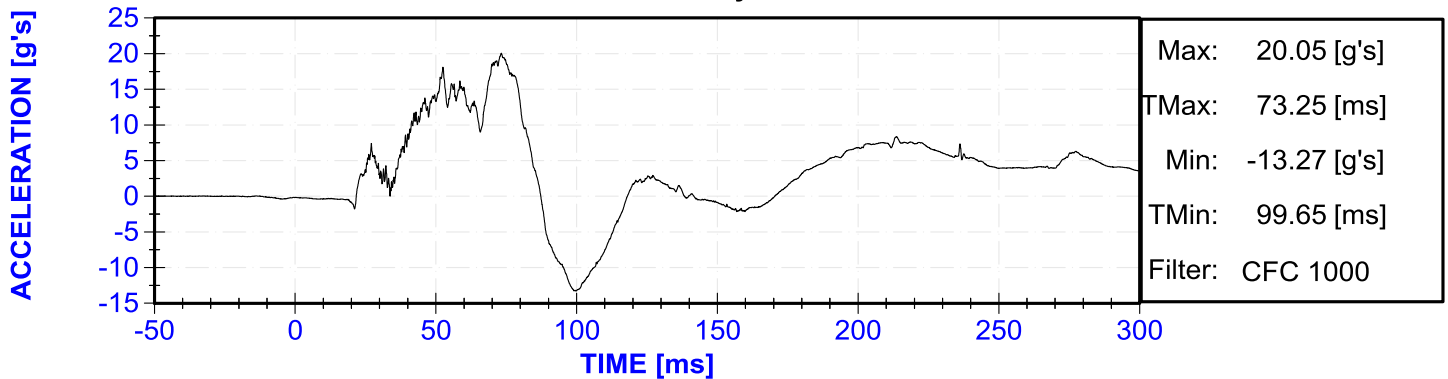
Driver Head X Acceleration vs. Time Primary



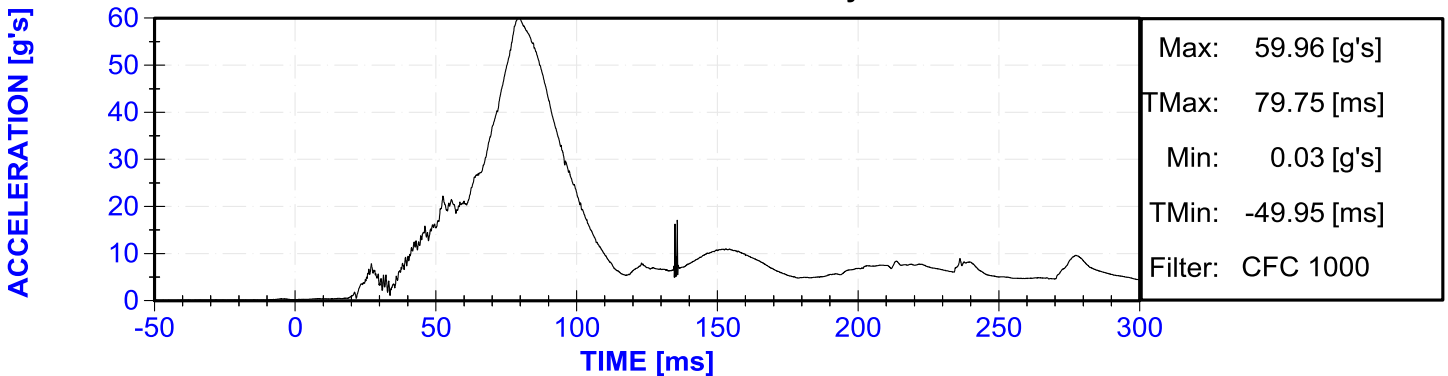
Driver Head Y Acceleration vs. Time Primary



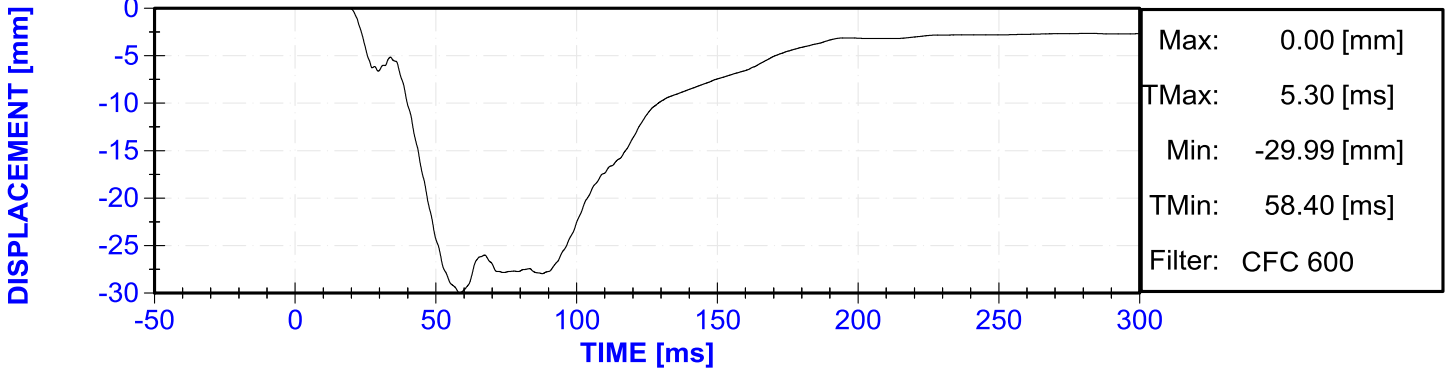
Driver Head Z Acceleration vs. Time Primary



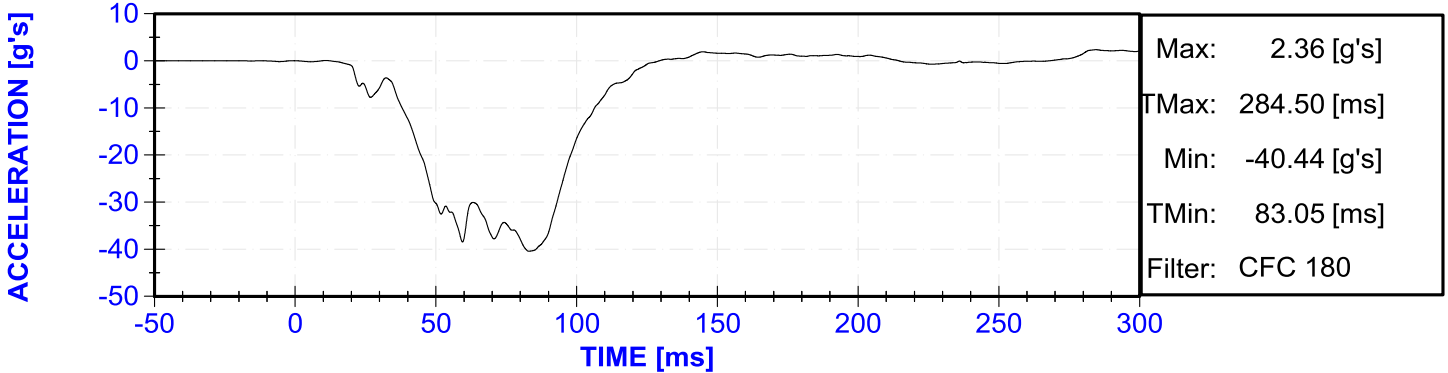
Driver Head Resultant Acceleration vs. Time Primary



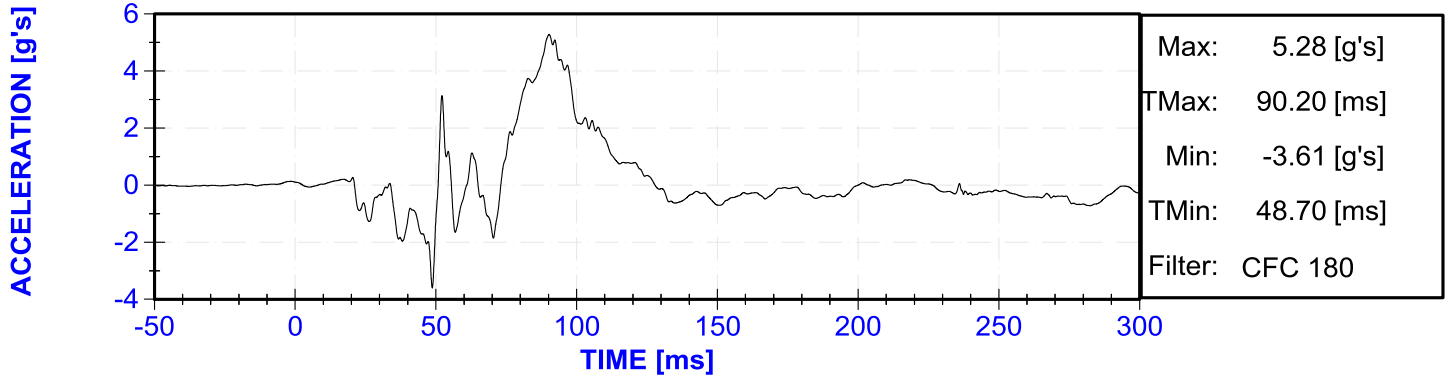
Driver Chest X Deflection vs. Time



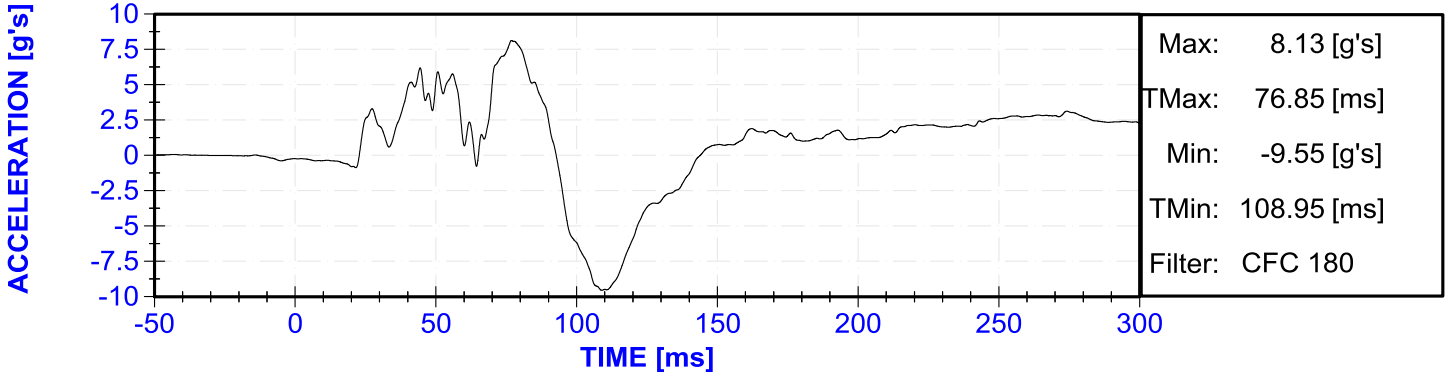
Driver Chest X Acceleration vs. Time Primary



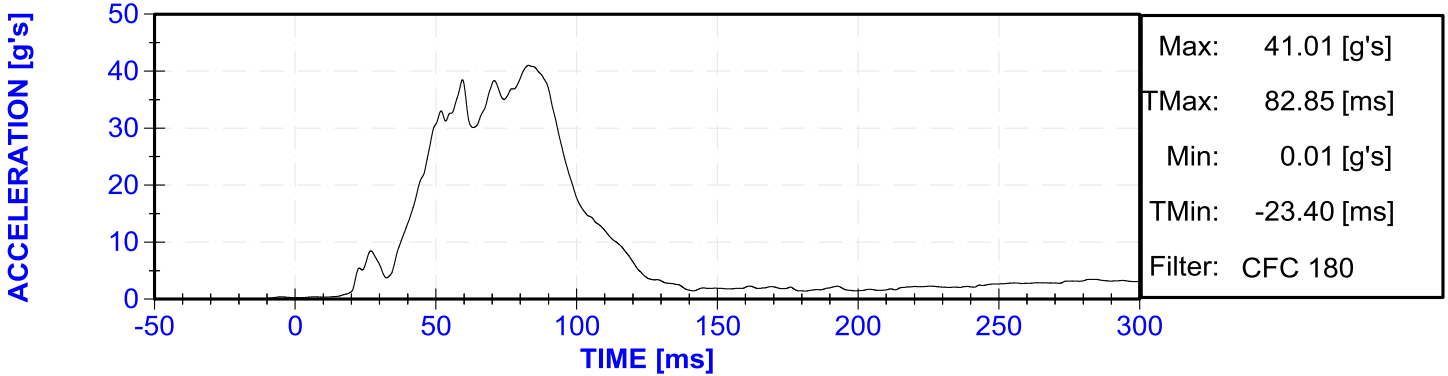
Driver Chest Y Acceleration vs. Time Primary



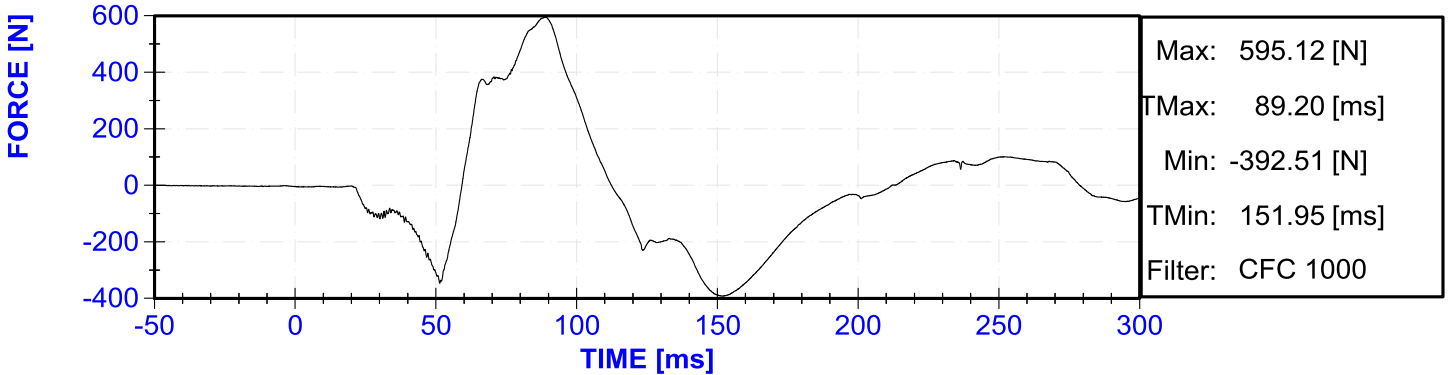
Driver Chest Z Acceleration vs. Time Primary



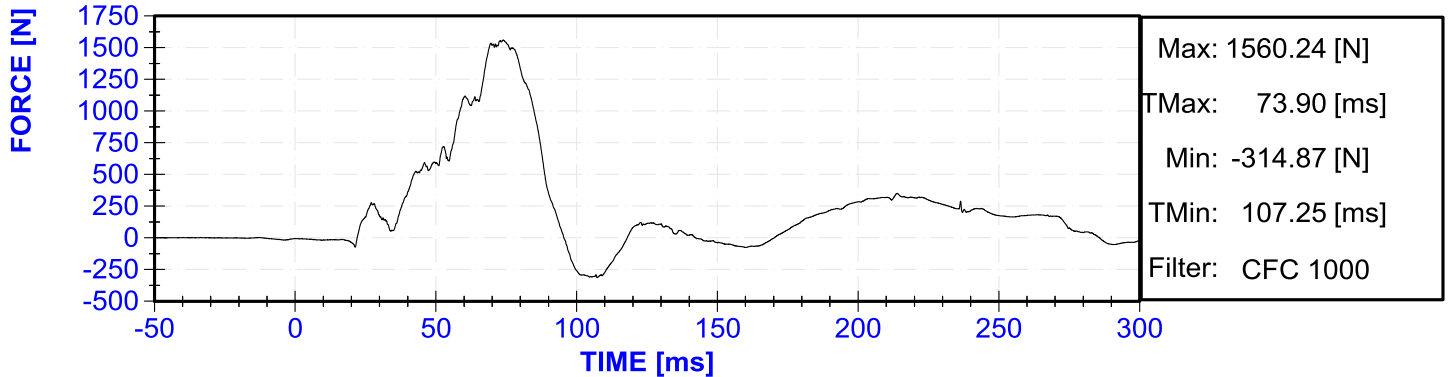
Driver Chest Resultant Acceleration vs. Time Primary



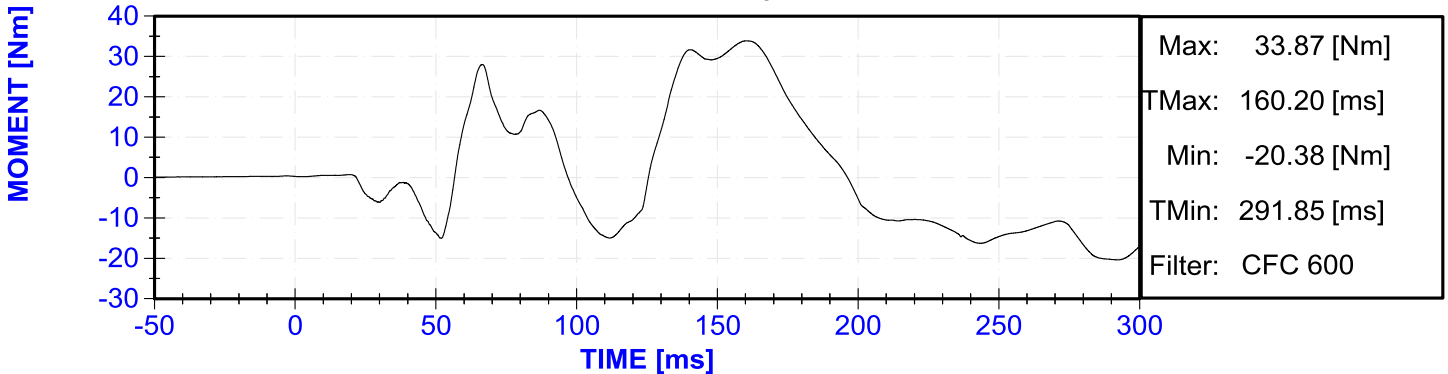
Driver Upper Neck Force X vs. Time Primary

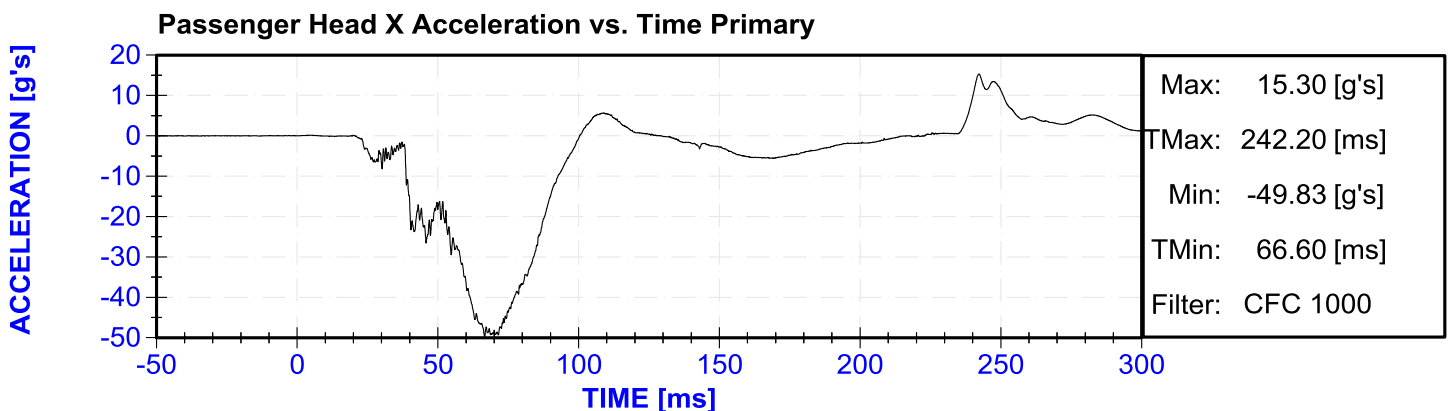
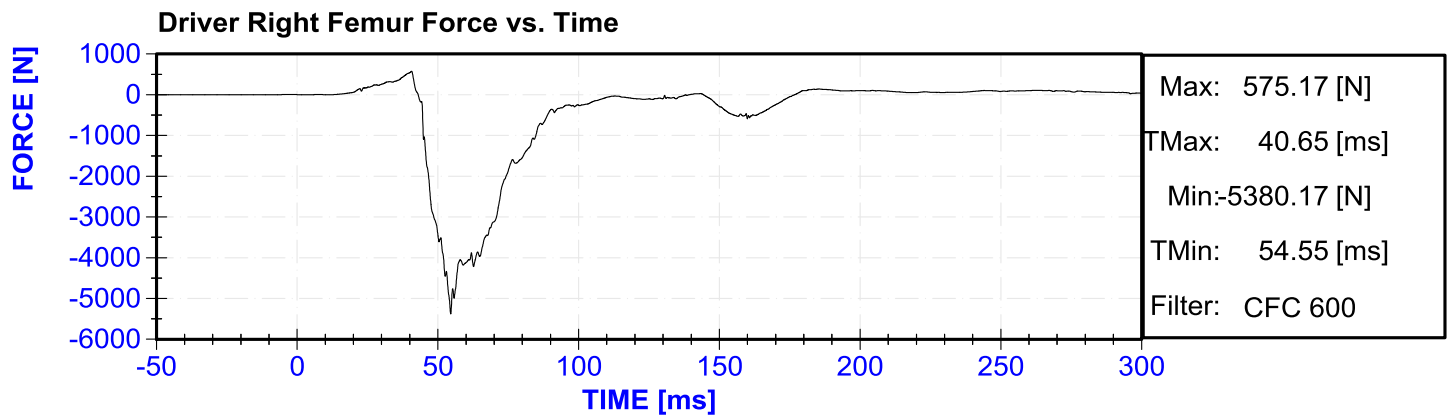
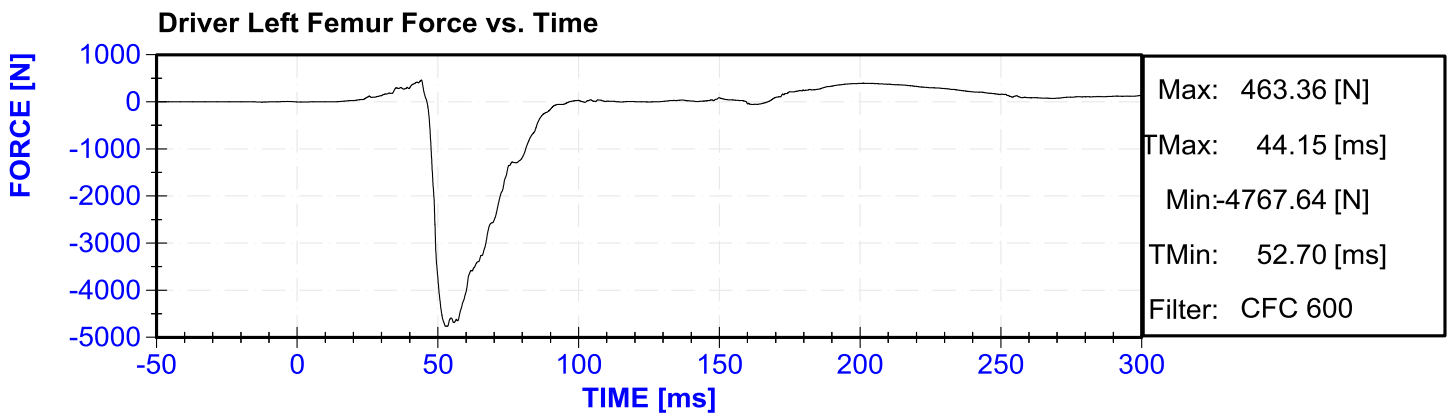
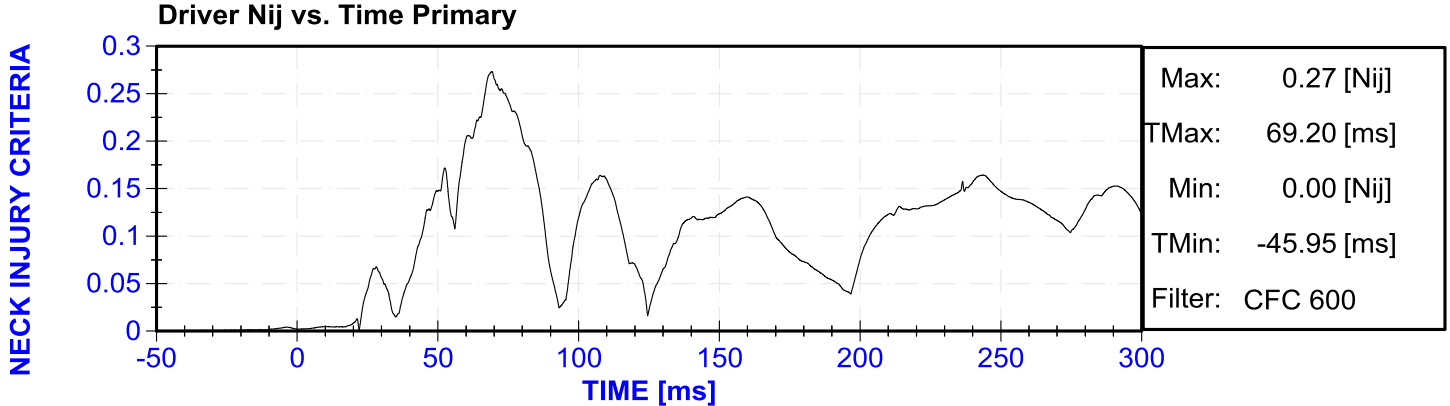


Driver Upper Neck Force Z vs. Time Primary

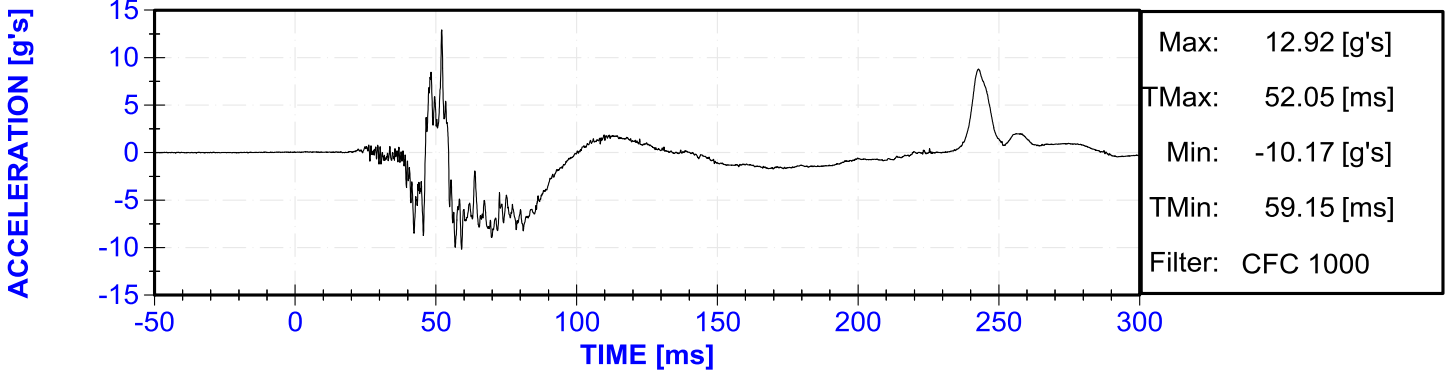


Driver Upper Neck Moment Y vs. Time Primary

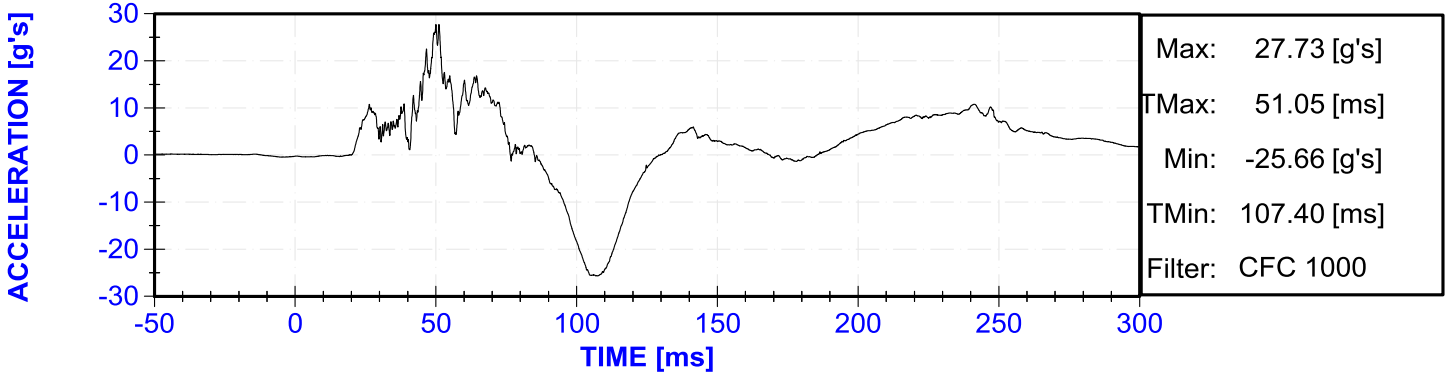




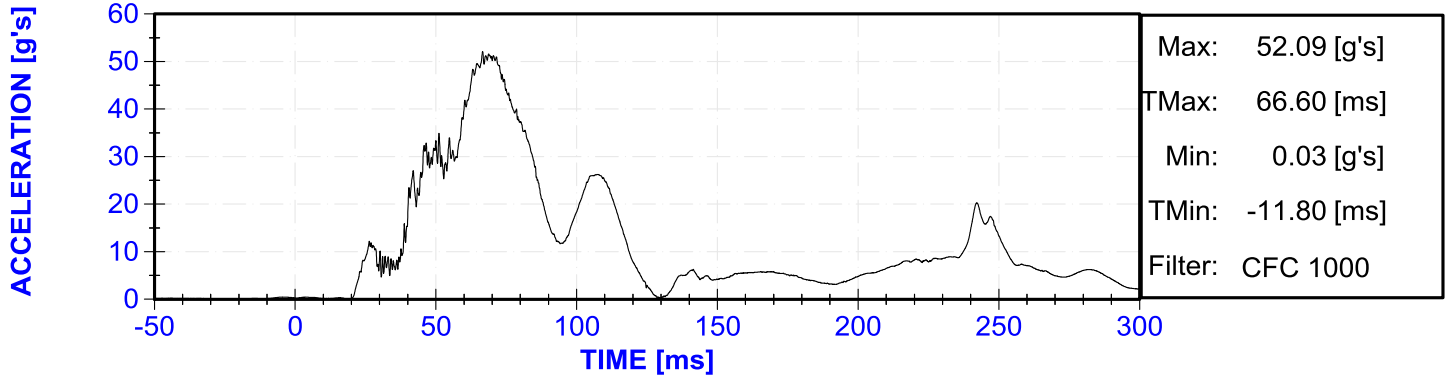
Passenger Head Y Acceleration vs. Time Primary



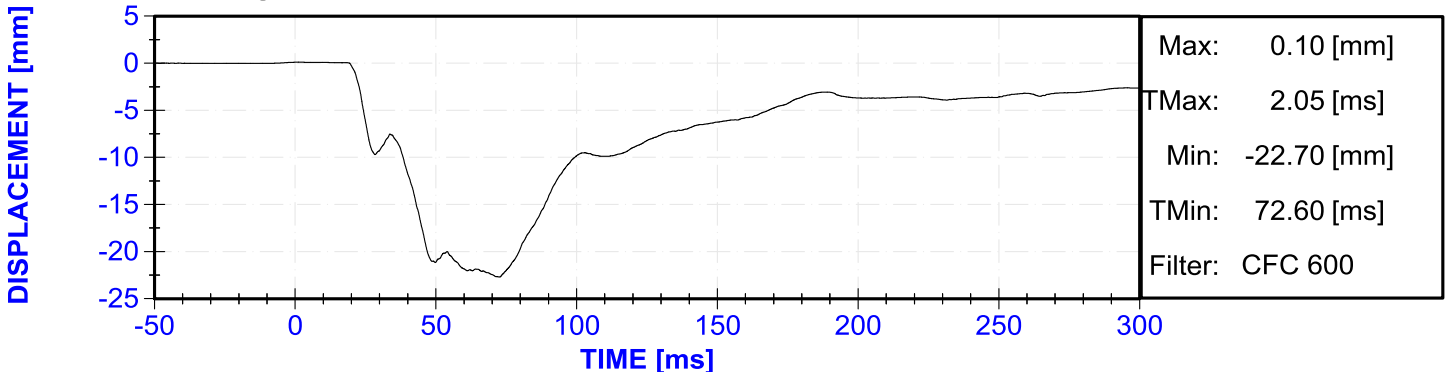
Passenger Head Z Acceleration vs. Time Primary



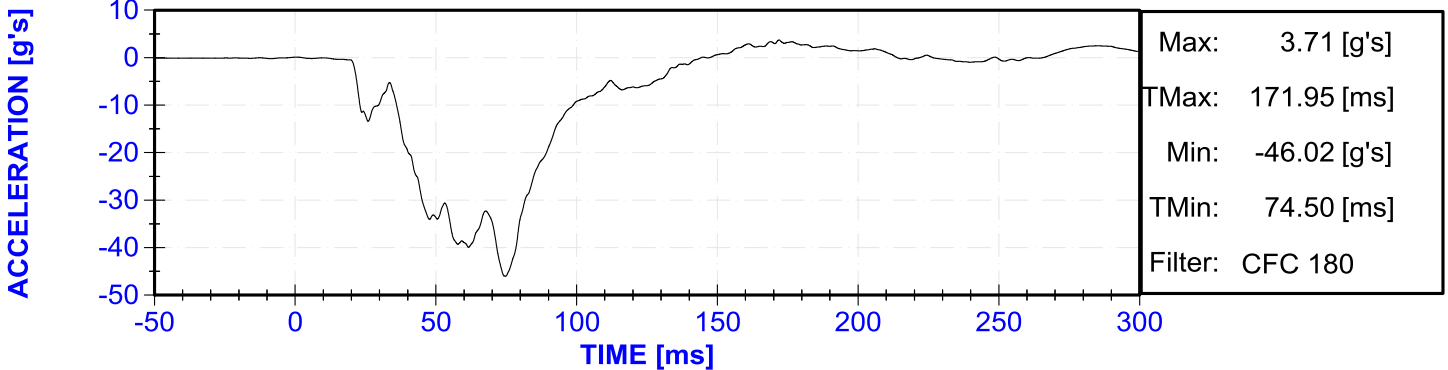
Passenger Head Resultant Acceleration vs. Time Primary



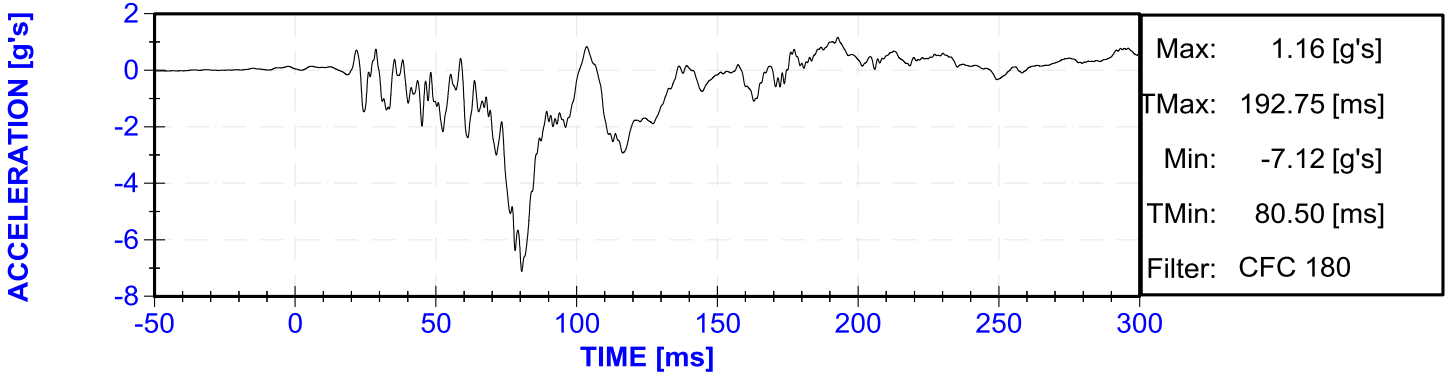
Passenger Chest X Deflection vs. Time



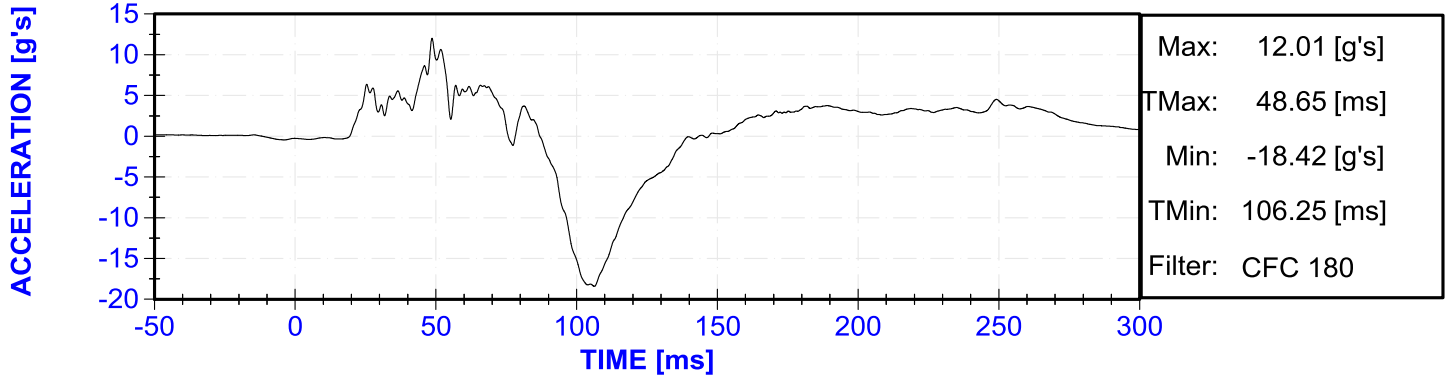
Passenger Chest X Acceleration vs. Time Primary



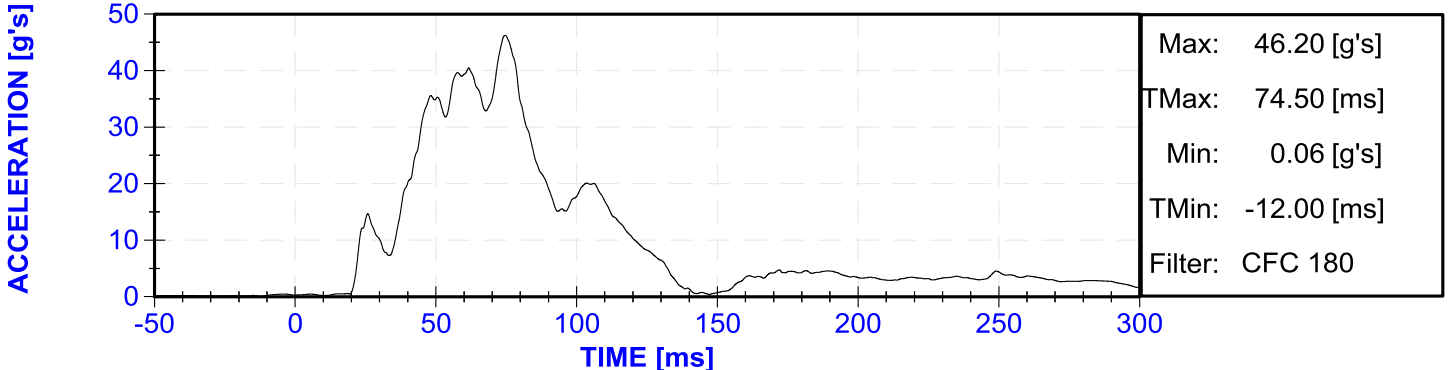
Passenger Chest Y Acceleration vs. Time Primary



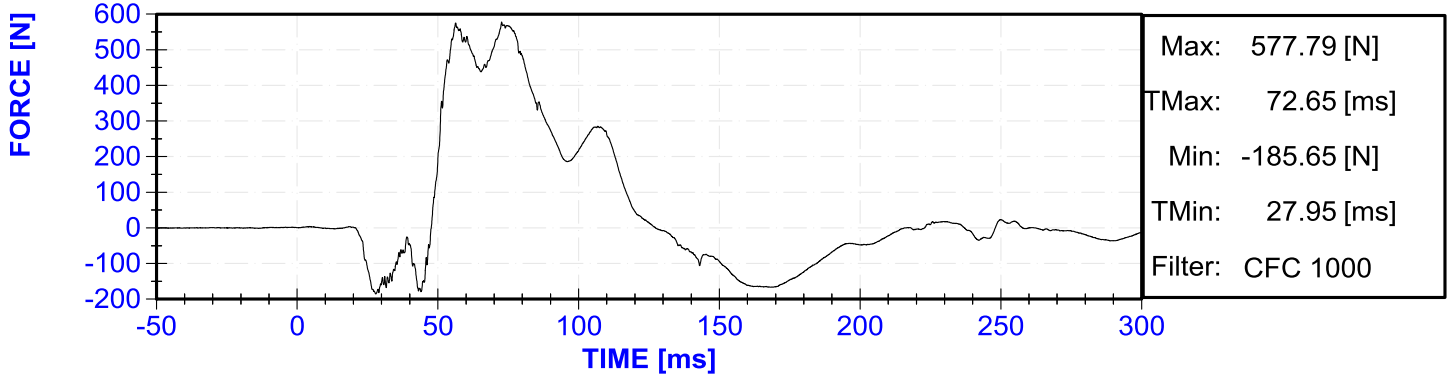
Passenger Chest Z Acceleration vs. Time Primary



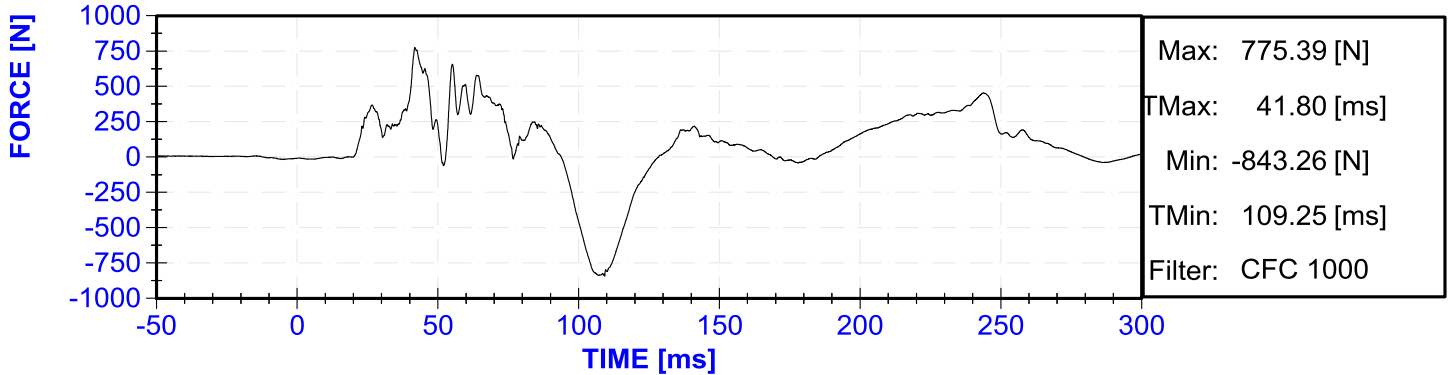
Passenger Chest Resultant Acceleration vs. Time Primary



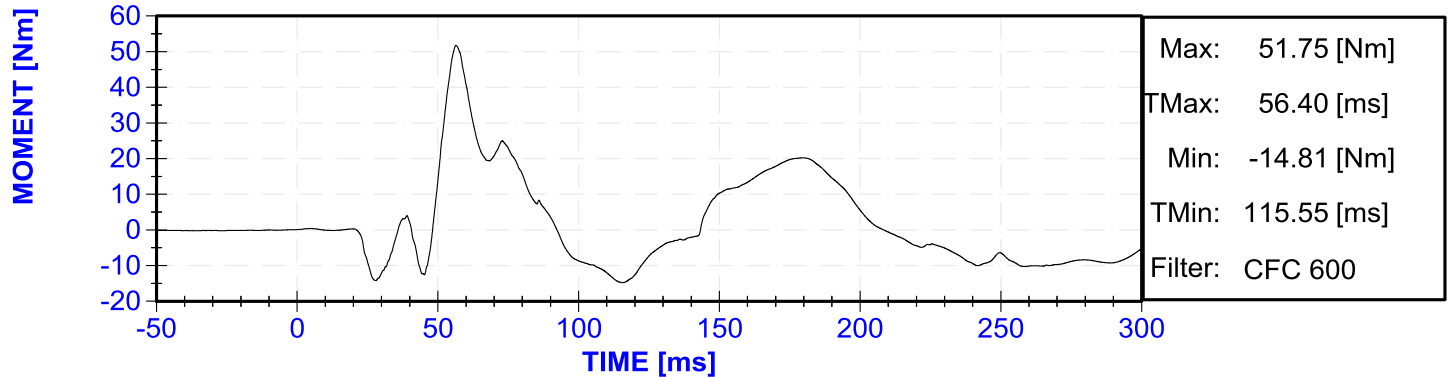
Passenger Upper Neck Force X vs. Time Primary



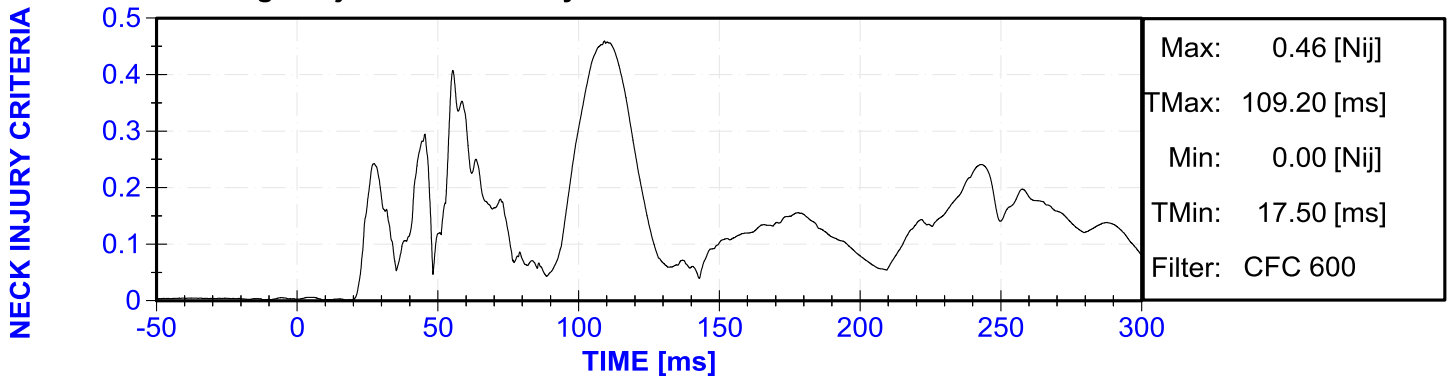
Passenger Upper Neck Force Z vs. Time Primary



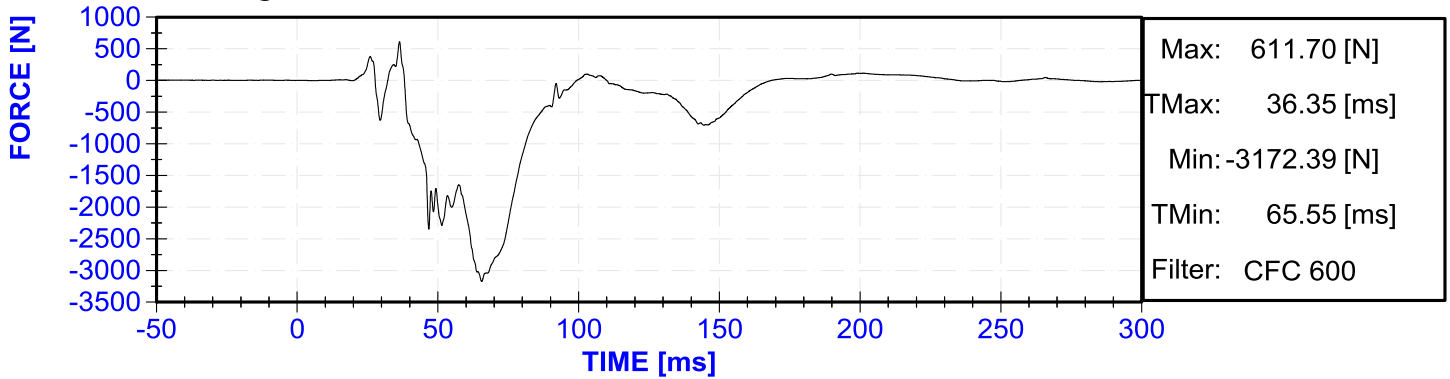
Passenger Upper Neck Moment Y vs. Time Primary



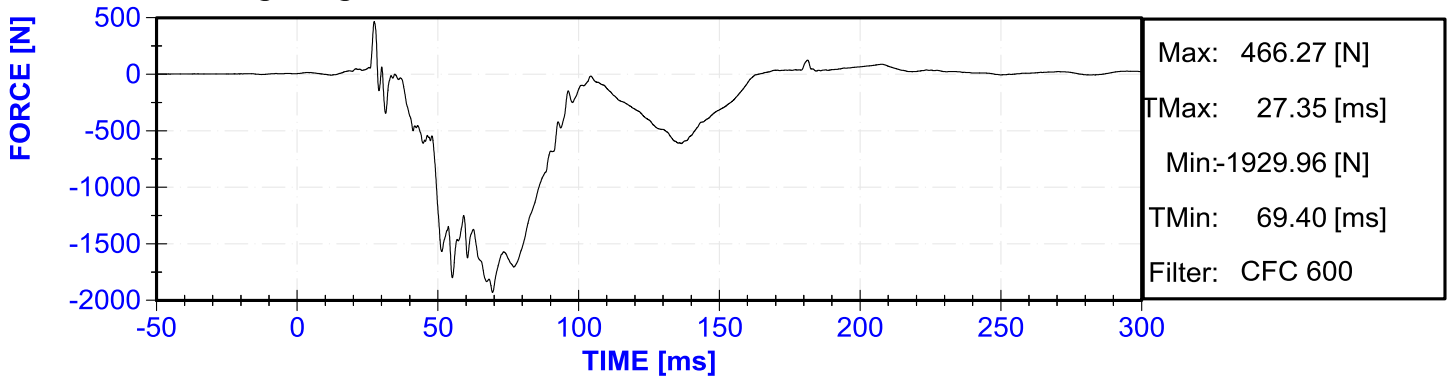
Passenger Nij vs. Time Primary



Passenger Left Femur Force vs. Time



Passenger Right Femur Force vs. Time



APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 064



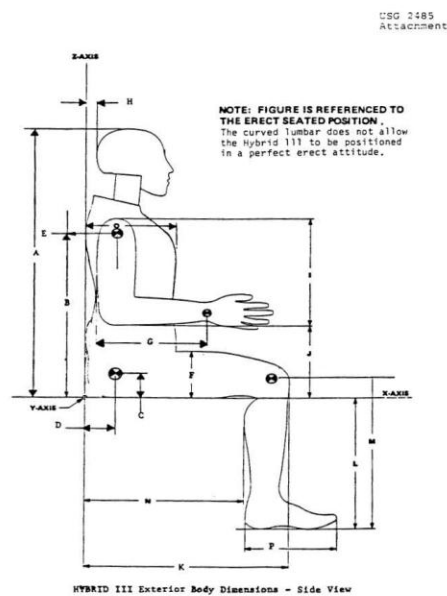
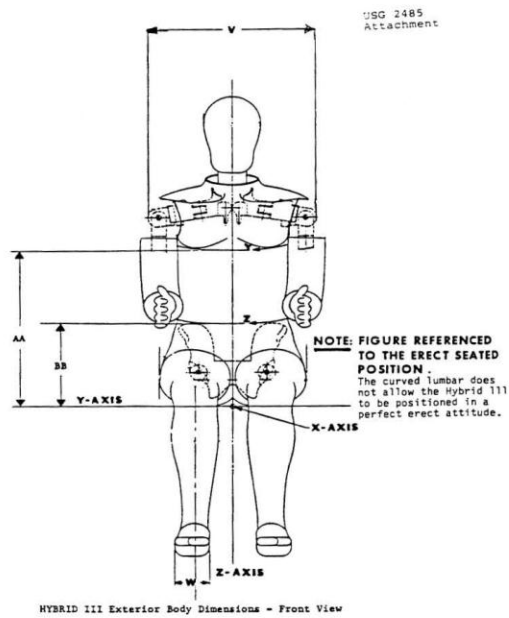
50th Male External Measurements

S/N 064

Symbol	Description	Specification	Results	Pass
		in	In	
A	Sitting Height	34.6 – 35.0	34.8	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.0	Yes
C	H-Point Height	3.3 – 3.5	3.3	Yes
D	H-Point from Backline	5.3 – 5.5	5.4	Yes
E	Shoulder Pivot from Backline	3.3 – 3.7	3.5	Yes
F	Thigh Clearance	5.5 – 6.1	6.0	Yes
G	Back of Elbow to Wrist Pivot	11.4 – 12.0	11.6	Yes
H	Head Back to Backline	1.6 – 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 – 13.6	13.1	Yes
J	Elbow Rest Height	7.5 – 8.3	8.1	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.1	Yes
L	Popliteal Height	16.9 – 17.9	17.2	Yes
M	Knee Pivot Height	19.1 – 19.7	19.3	Yes
N	Buttock Popliteal Length	17.8 – 18.8	18.6	Yes
O	Chest Depth without Jacket	8.4 – 9.0	8.5	Yes
P	Foot Length (right)	9.9 – 10.5	10.2	Yes
V	Shoulder Breadth	16.3 – 17.2	16.8	Yes
W	Foot Breadth	3.6 – 4.2	3.9	Yes
Y	Chest Circumference with Jacket	38.2 – 39.4	39.0	Yes
Z	Waist Circumference	32.9 – 34.1	33.7	Yes
AA	Reference Location (Chest Circumference)	16.9 – 17.1	17.0	Yes
BB	Reference Location (Waist Circumference)	8.9 – 9.1	9.0	Yes

Technician: M. Geesey

04/15/2014





VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Head Drop	Test Date:	4/15/2014
		Test Time:	4:08:28 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.00 deg C P
Humidity	10 -- 70	24.80 %RH P
Resultant Acceleration	225 -- 275	248.5 G's P
Oscillation	0 -- 10	1.9 % P
Lateral Acceleration	-15 -- 15	1.9 G's P

All test parameters are within specifications

Technician: M. Geesey

Supervisor: E. Dutton



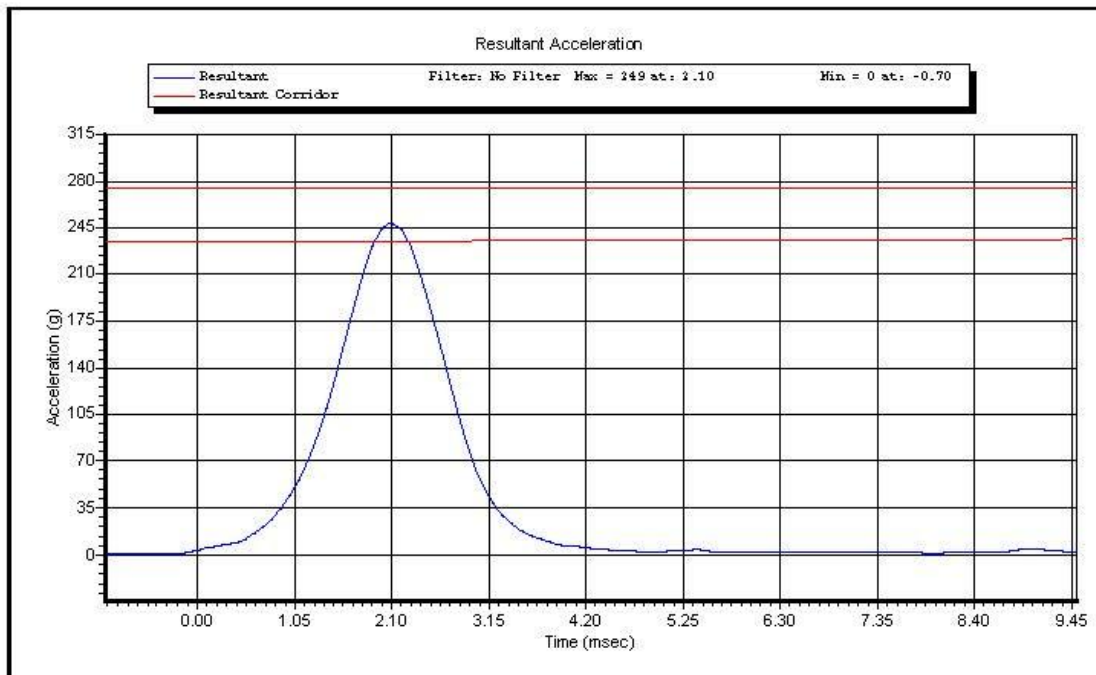
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58904	12/5/2013
Endevco	7264-2000	P58911	12/5/2013
Endevco	7264-2000	P58776	12/5/2013



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064

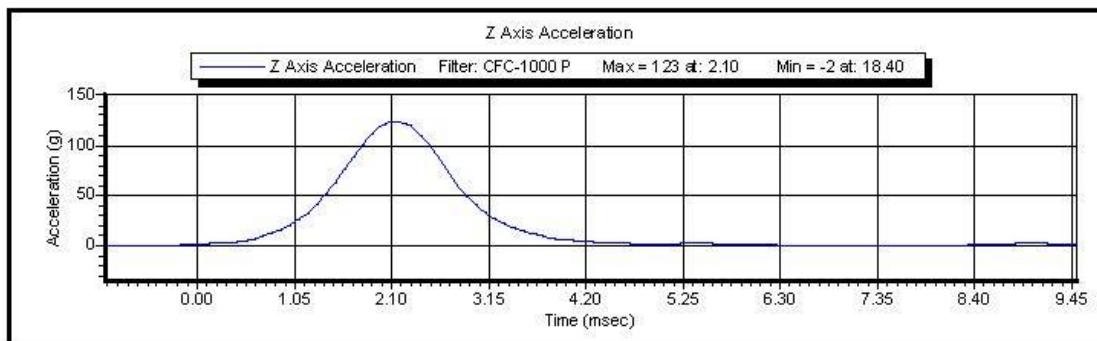
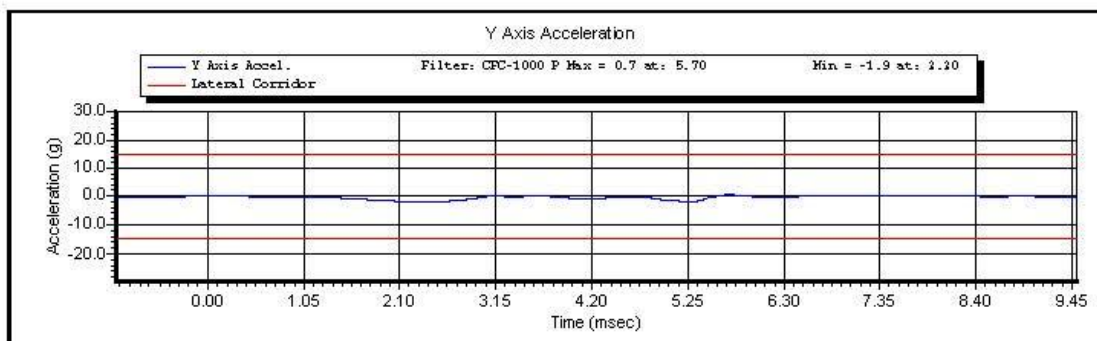
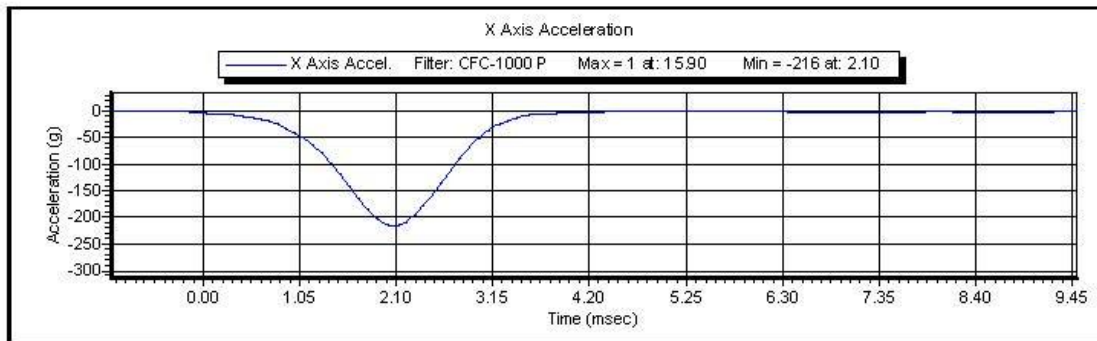


Test ID: **Head Drop**

Test Time: **4:08:28 PM**

Test Date: **4/15/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **4:08:28 PM**

Test Date: **4/15/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Neck Extension	Test Date:	4/16/2014
		Test Time:	5:05:36 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.30 deg C P
Humidity	10 -- 70	18.00 %RH P
Velocity	5.94 -- 6.19	6.020 m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	19.02 G's P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	17.39 G's P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	13.96 G's P
Max Pendulum Deceleration after 30 ms	0.0 -- 22.0	13.96 G's P
Deceleration Time to 5 G's	38 -- 46	40.1 ms P
D Plane Rotation	81 -- 106	100.3 degrees P
Time at Max Rotation	72 -- 82	78.1 ms P
Rotation Decay to Zero	147 -- 174	159.0 ms P
Moment About Occipital Condyle	-80.0 -- -52.9	-69.78 Nm P
Time at Maximum Moment	65 -- 79	73.6 ms P
Moment Decay to Zero	120 -- 148	144.5 ms P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **E. Dutton**



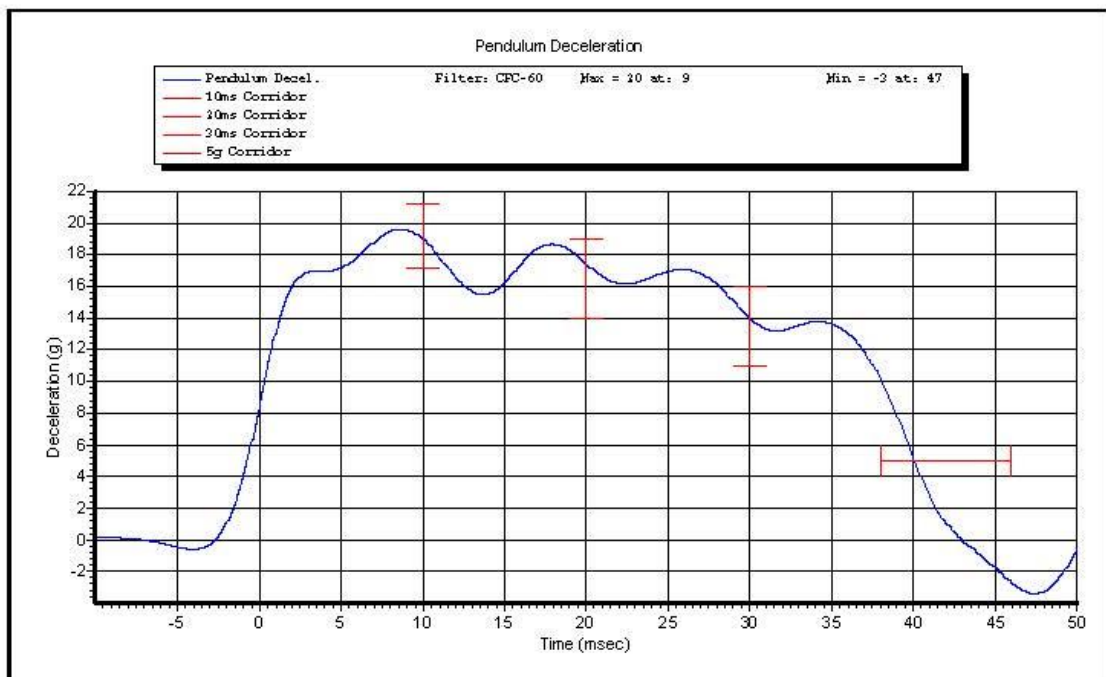
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	5/23/2013
Denton	1716A	LC-2186 Fx	5/23/2013



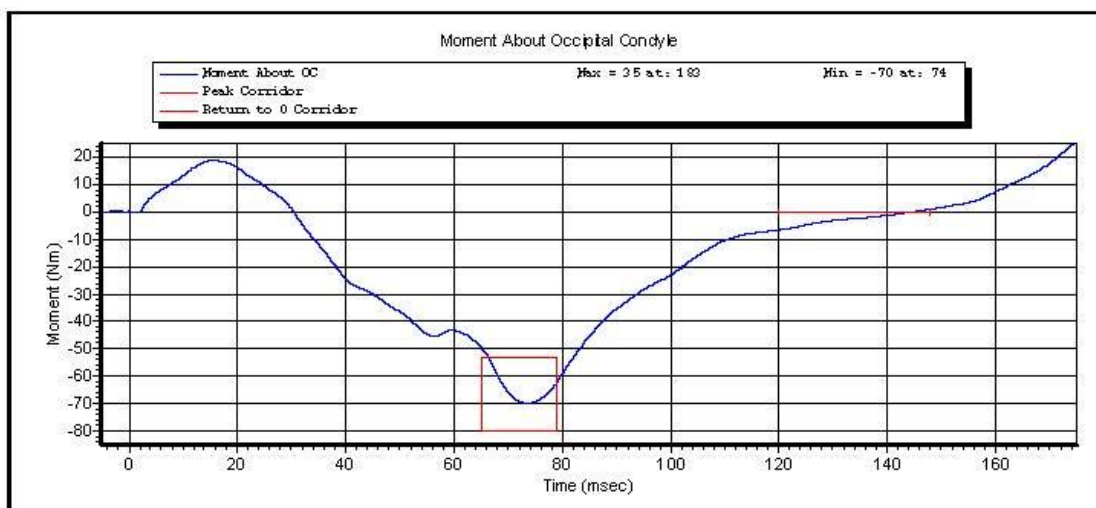
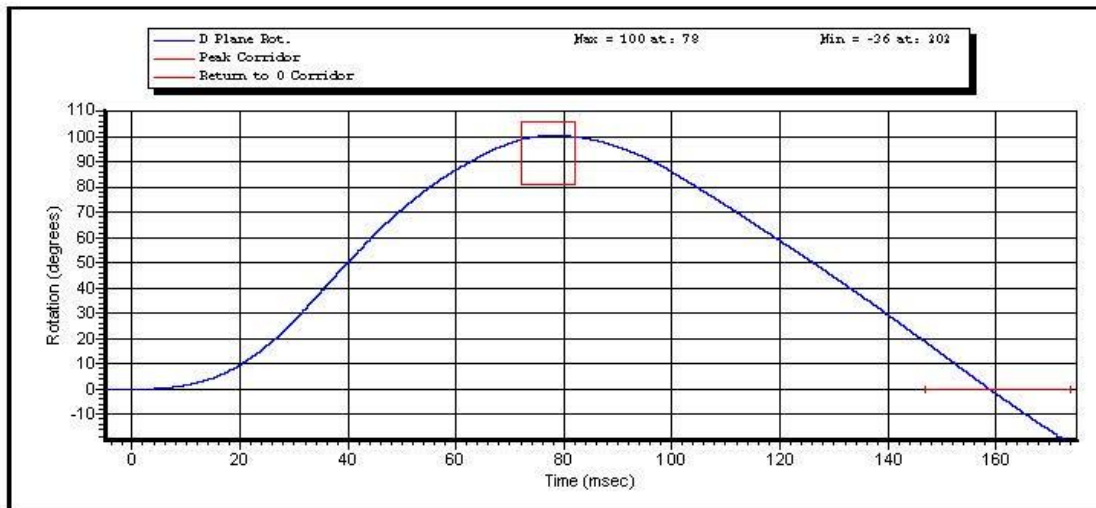
Name of Test:	Neck Extension
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	064



ID of Test: **Neck Extension** Time of Test: **5:05:36 PM**

Date of Test: **4/16/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

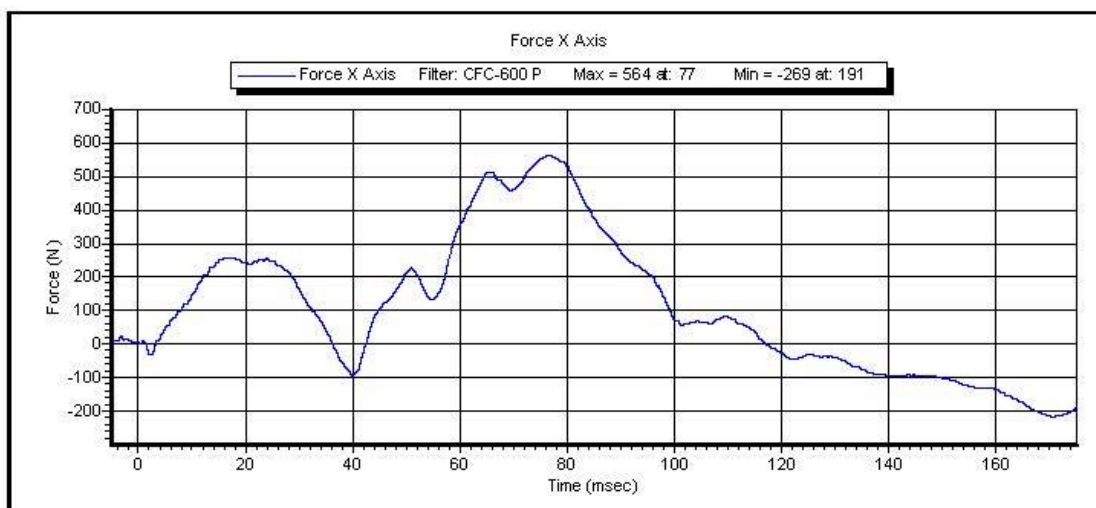
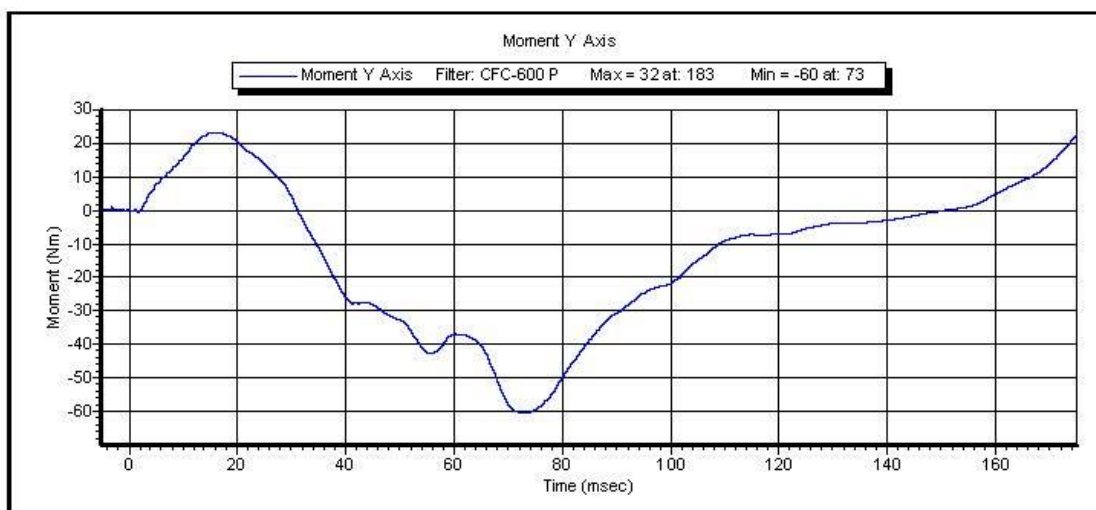


ID of Test: **Neck Extension**

Time of Test: **5:05:36 PM**

Date of Test: **4/16/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Extension** Time of Test: **5:05:36 PM**

Date of Test: **4/16/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Neck Flexion	Test Date:	4/16/2014
		Test Time:	1:35:54 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.00 deg C P
Humidity	10 -- 70	17.90 %RH P
Velocity	6.89 -- 7.13	6.994 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	23.94 G's P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	18.48 G's P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	15.55 G's P
Maximum Pendulum Deceleration After 30 ms	0 -- 29	15.5 G's P
Deceleration Time to 5 ms	34 -- 42	41.2 ms P
D Plane Rotation	-78 -- -64	-72.8 degrees P
Time at Maximum Rotation	57 -- 64	60.8 ms P
Rotation Decay to Zero	113 -- 128	114.8 ms P
Moment About Occipital Condyle	88.1 -- 108.4	97.04 Nm P
Time at Maximum Moment	47 -- 58	54.6 ms P
Moment Decay to Zero	97.0 -- 107.0	100.6 ms P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **E. Dutton**



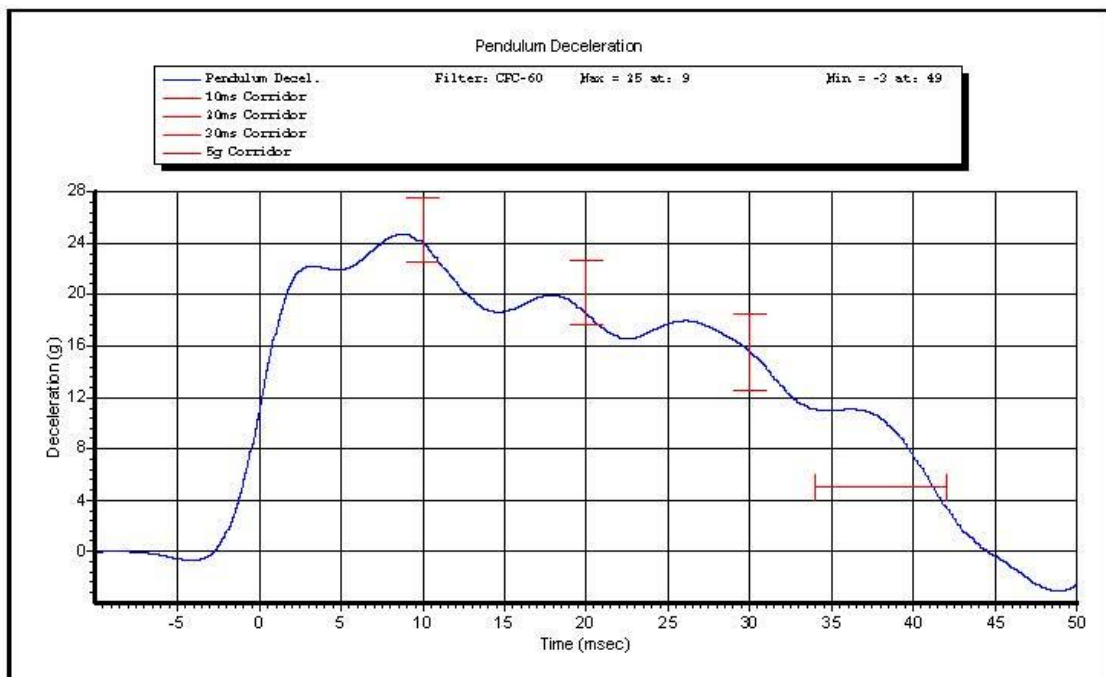
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	5/23/2013
Denton	1716A	LC-2186 Fx	5/23/2013



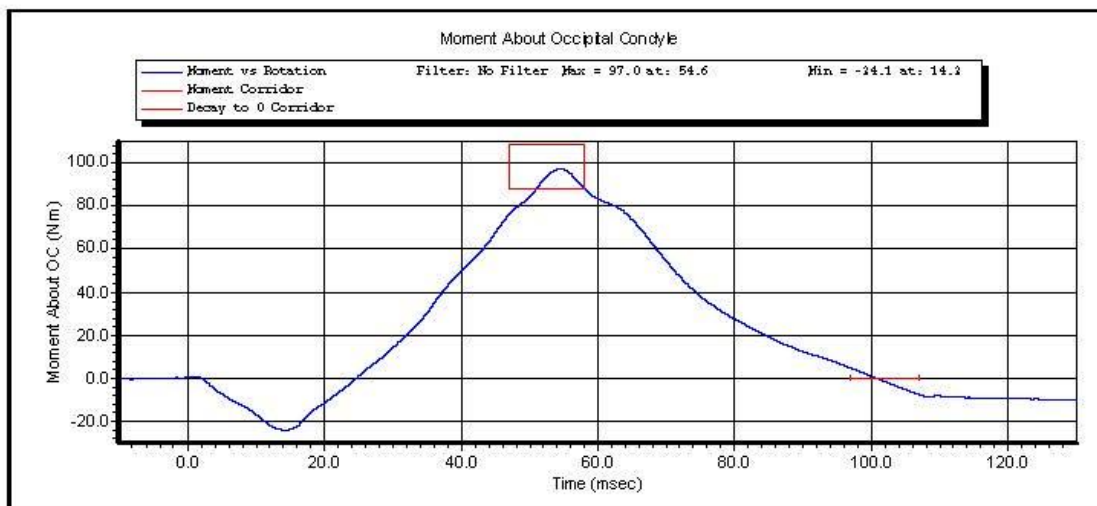
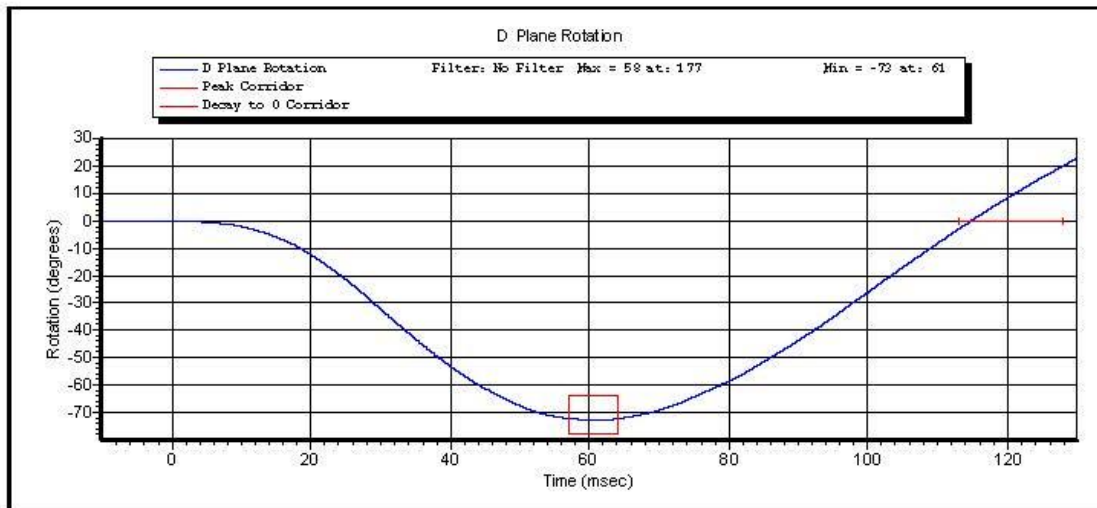
Name of Test:	Neck Flexion
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	064



ID of Test: **Neck Flexion** Time of Test: **1:35:54 PM**

Date of Test: **4/16/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

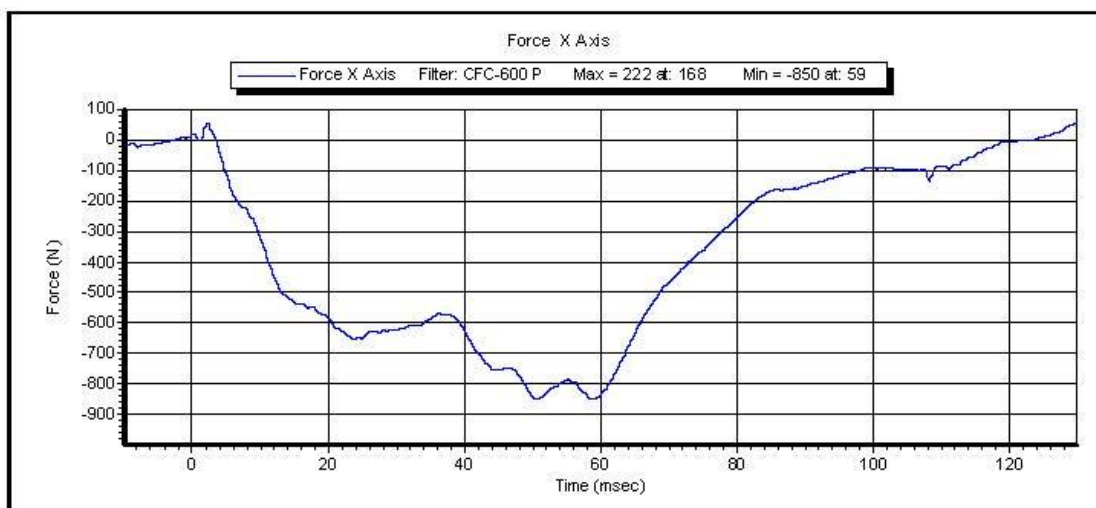
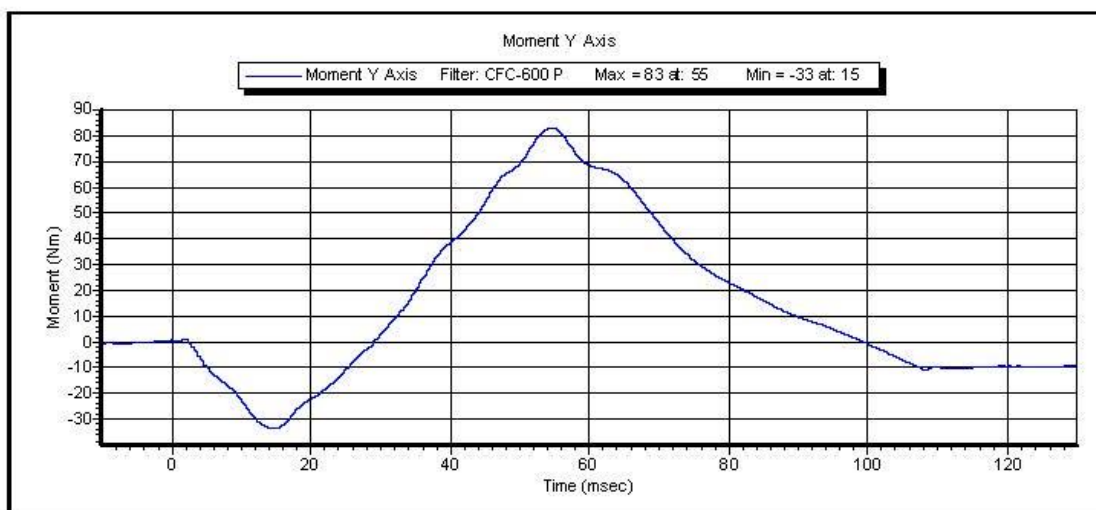


ID of Test: **Neck Flexion**

Time of Test: **1:35:54 PM**

Date of Test: **4/16/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Flexion**

Time of Test: **1:35:54 PM**

Date of Test: **4/16/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Thorax Impact	Test Date:	4/15/2014
		Test Time:	7:52:34 AM

Component Part Number	Component Serial Number
Chest Jacket - 78051-169	DL7598

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.60 deg C	P
Humidity	10	--	70	34.20 %RH	P
Velocity	6.59	--	6.83	6.663 m/s	P
Chest Deflection	-72.6	--	-63.5	-71.92 mm	P
Resistive Force	-5.894	--	-5.160	-5.5803 kN	P
Hysteresis	69	--	85	70.0 %	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



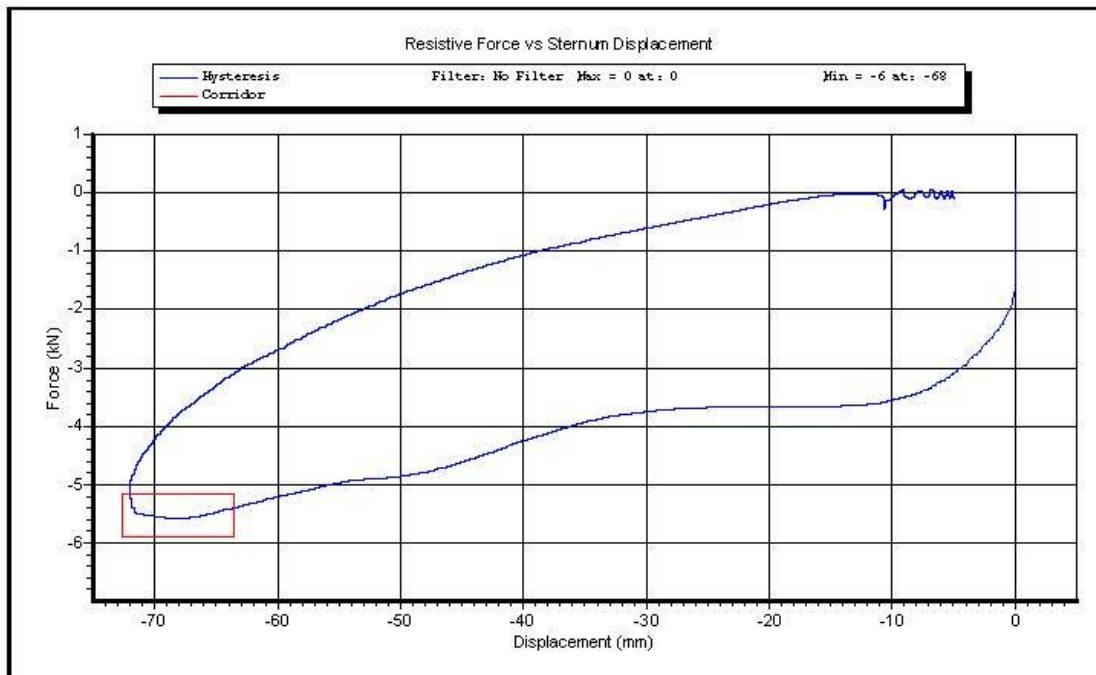
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
DentonATD	78051-342	DS-064	6/18/2013



Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064

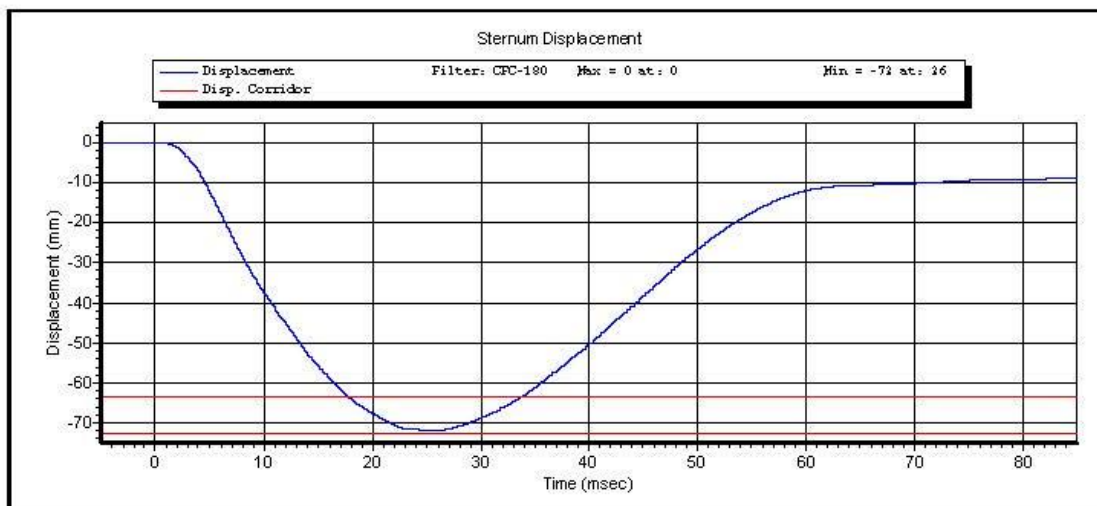


Test ID: Thorax Impact

Test Time: 7:52:34 AM

Test Date: 4/15/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

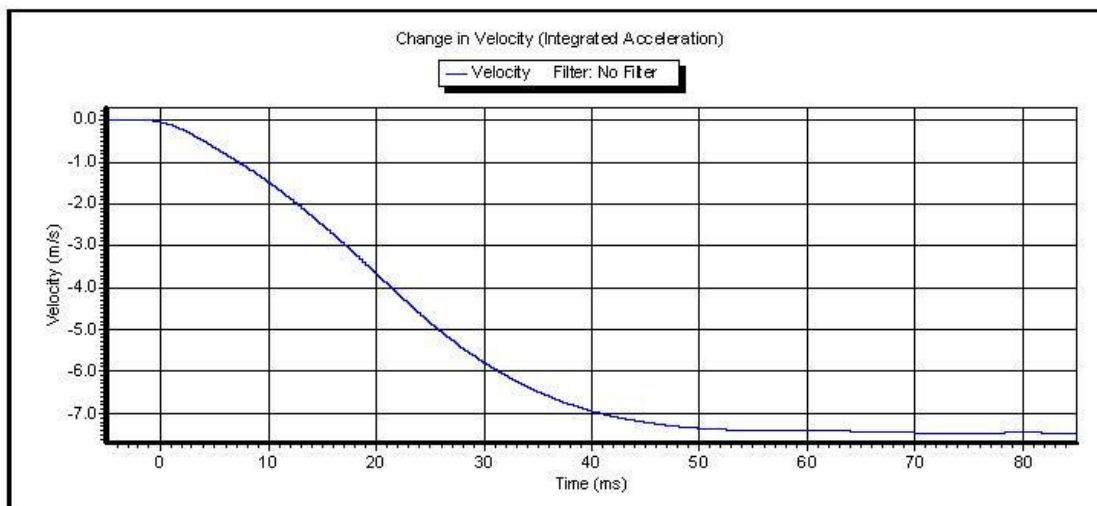
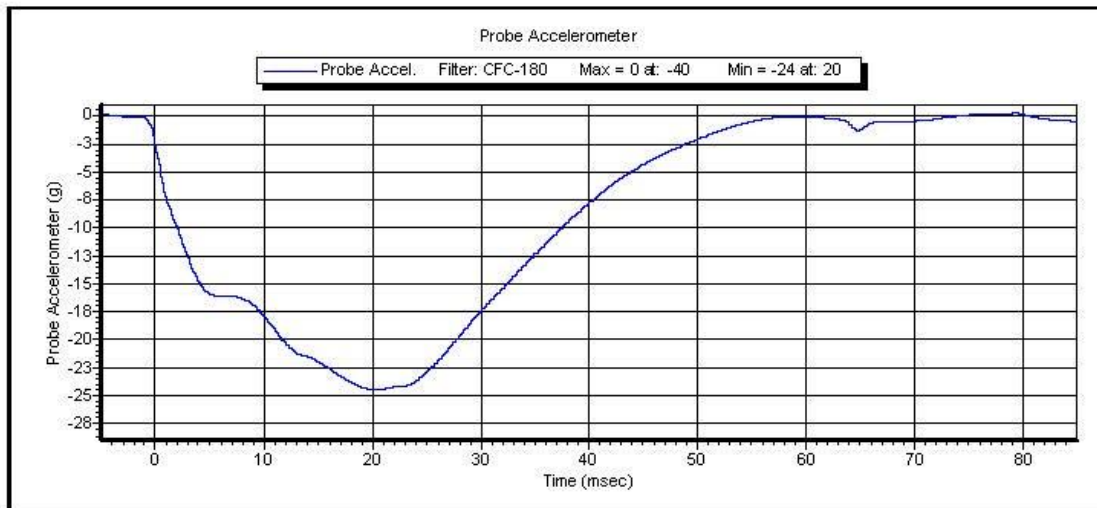


Test ID: **Thorax Impact**

Test Time: **7:52:34 AM**

Test Date: **4/15/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **7:52:34 AM**

Test Date: **4/15/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Hip ROM Left	Test Date:	4/15/2014
		Test Time:	5:40:15 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	20.90 deg C	P
Humidity	10	--	70	24.70 %RH	P
Average Velocity	5	--	10	7.0 deg/s	P
Angle at 203 Nm	40	--	50	42.8 degrees	P
Moment at 30 degrees	0.0	--	94.9	73.32 Nm	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



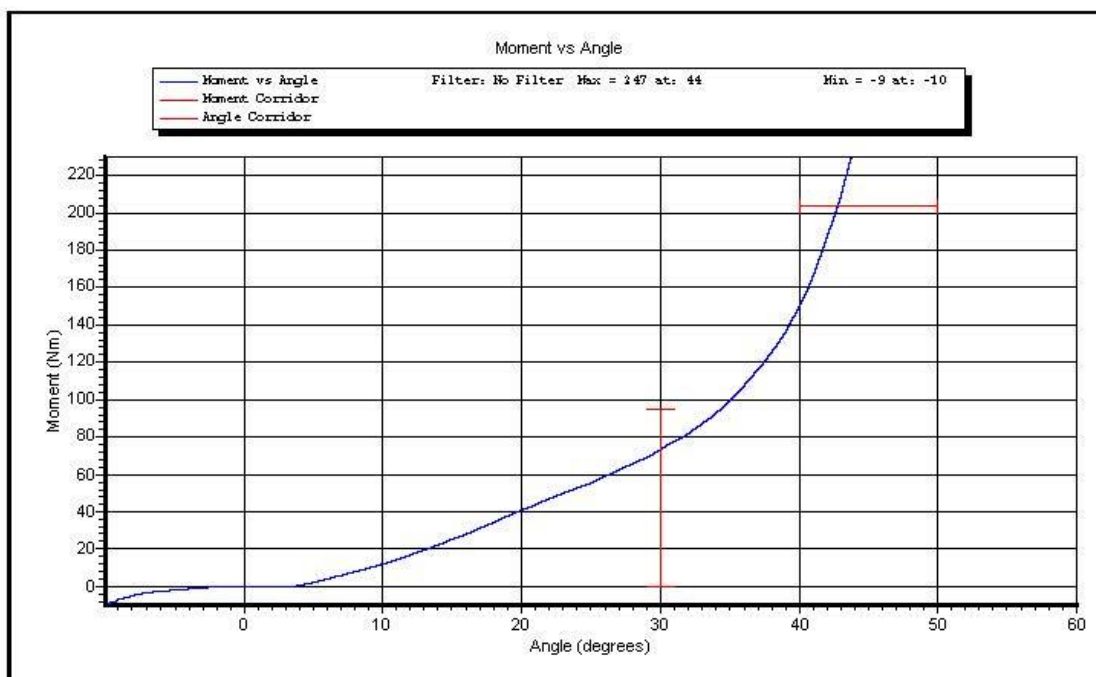
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/25/2014
DentonATD	14 CB1-3615	0008	2/20/2014
DentonATD	A0 Output	1	1/11/2014



Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Hip ROM Left** Test Time: **5:40:15 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/15/2014**



VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Hip ROM Right	Test Date:	4/15/2014
		Test Time:	5:11:05 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.30 deg C P
Humidity	10 -- 70	24.90 %RH P
Average Velocity	5 -- 10	6.7 deg/s P
Angle at 203 Nm	40 -- 50	42.1 degrees P
Moment at 30 degrees	0.0 -- 94.9	81.94 Nm P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



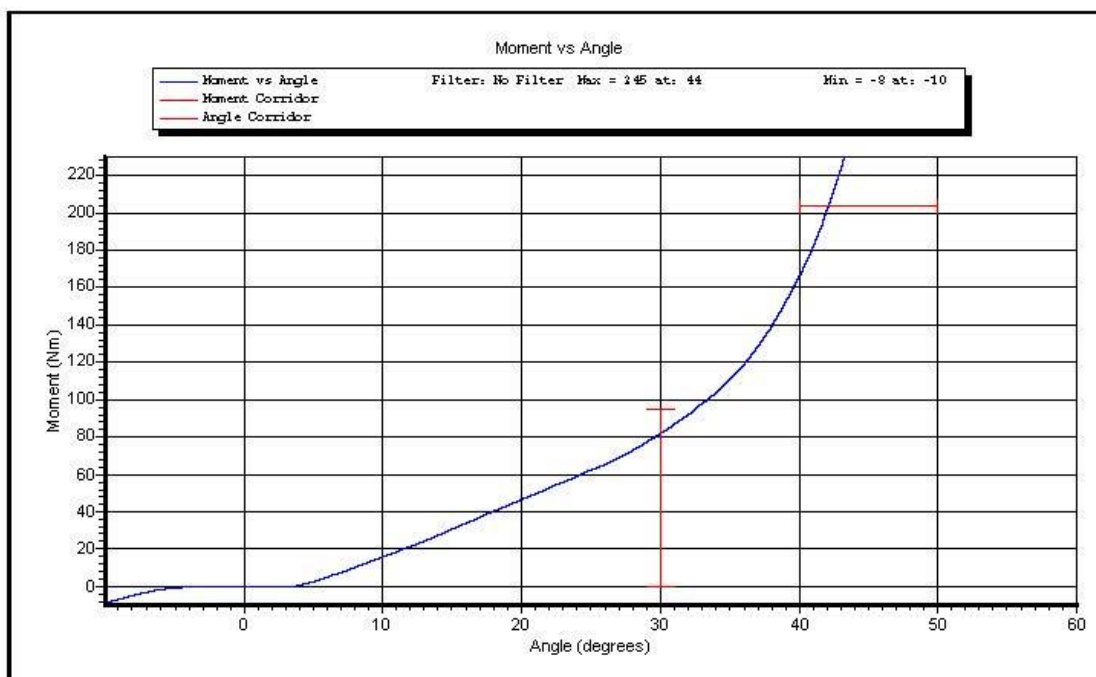
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/25/2014
DentonATD	14 CB1-3615	0008	2/20/2014
DentonATD	A0 Output	1	1/11/2014



Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Hip ROM Right** Test Time: **5:11:05 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/15/2014**



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Knee Impact Left	Test Date:	4/15/2014
		Test Time:	11:26:09 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.70 deg C P
Humidity	10 -- 70	29.90 %RH P
Velocity	2.07 -- 2.13	2.103 m/s P
Resistive Force	-5.780 -- -4.720	-5.424 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

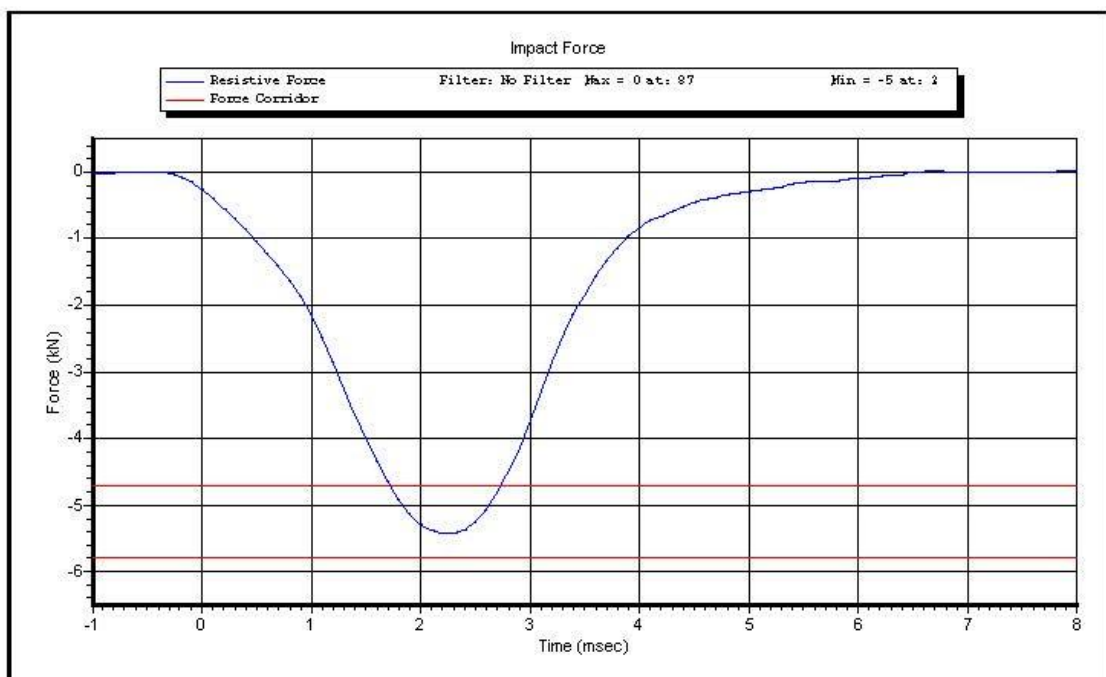
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0

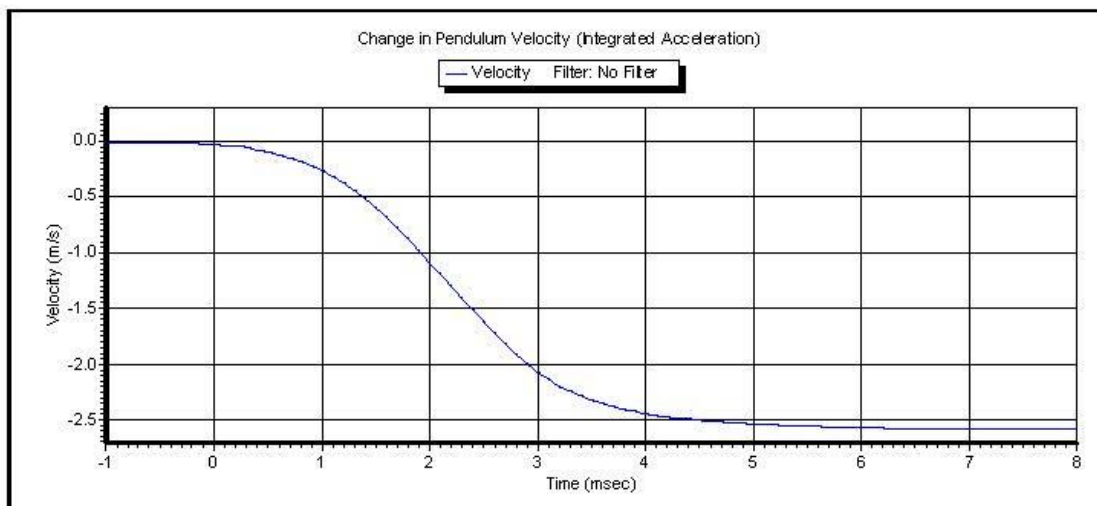
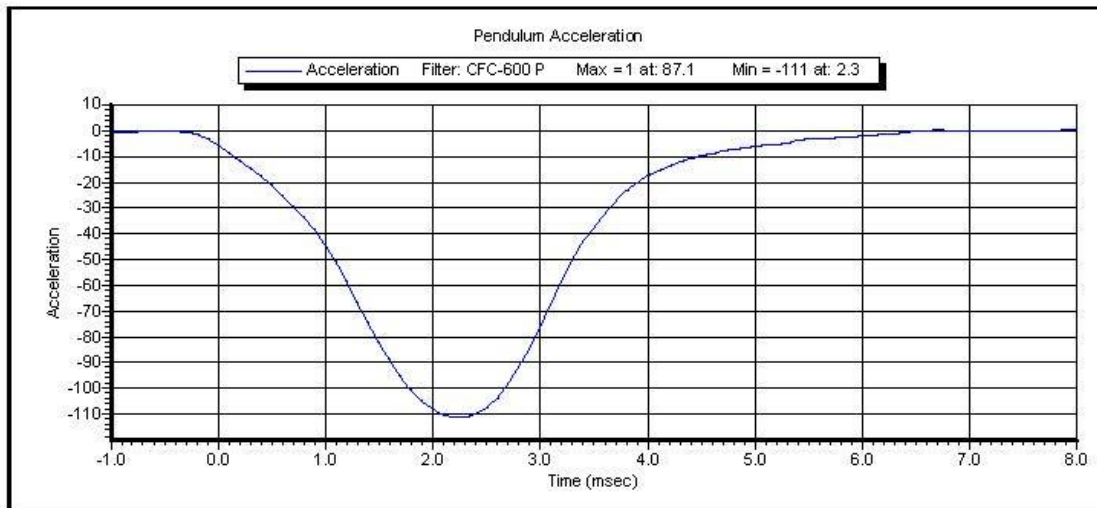


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Knee Impact Left** Test Time: **11:26:09 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/15/2014**



Test ID: **Knee Impact Left** Test Time: **11:26:09 AM**

Test Date: **4/15/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Knee Impact Right	Test Date:	4/15/2014
		Test Time:	11:48:30 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.40 deg C P
Humidity	10 -- 70	29.70 %RH P
Velocity	2.07 -- 2.13	2.088 m/s P
Resistive Force	-5.780 -- -4.720	-5.463 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

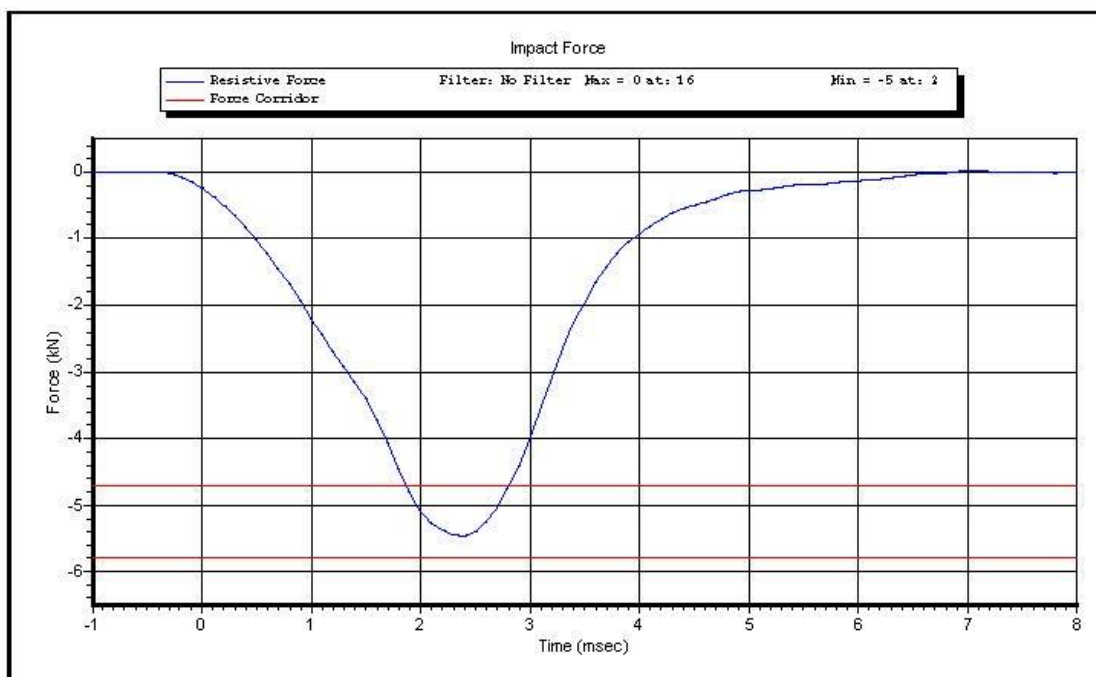
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0



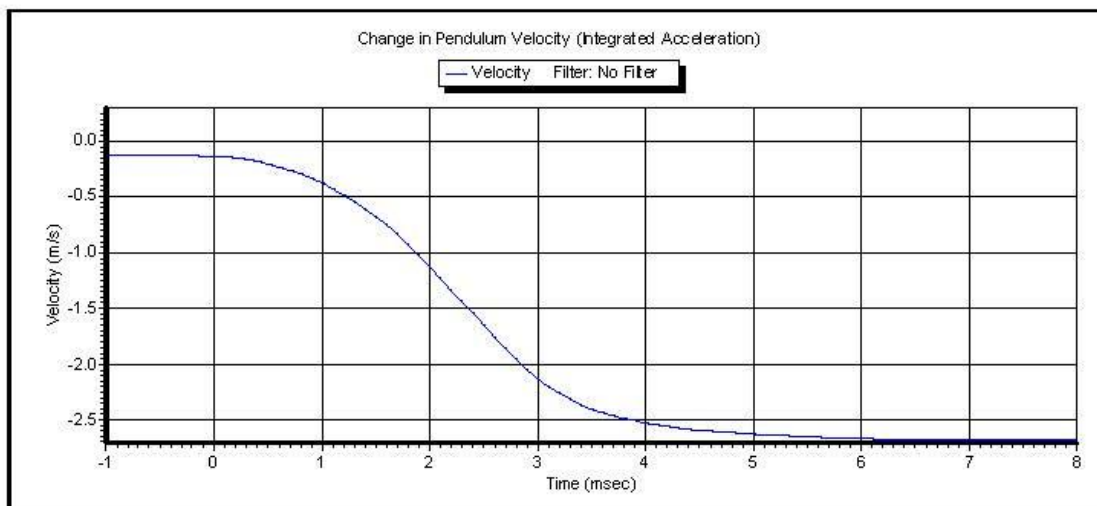
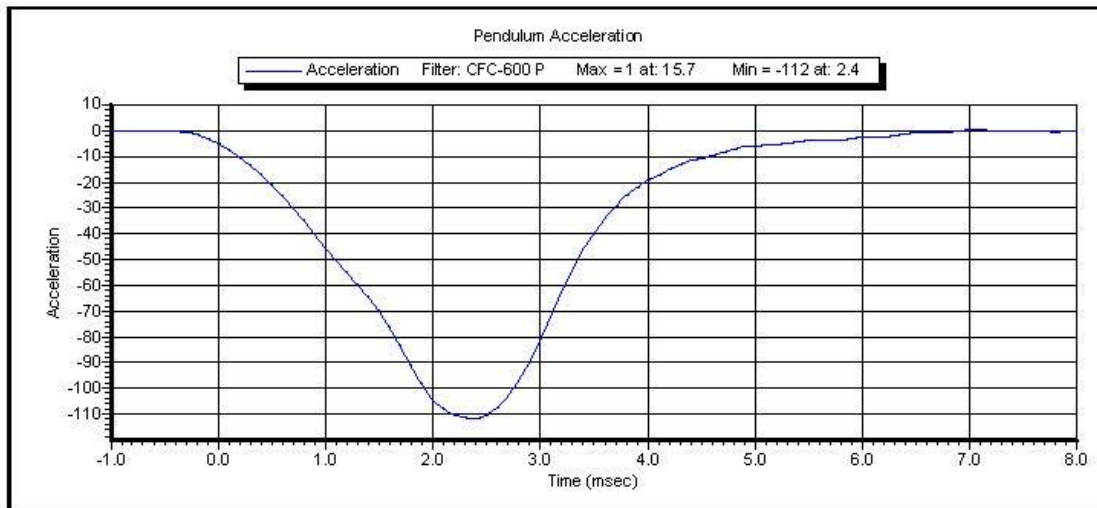
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Knee Impact Right** Test Time: **11:48:30 AM**

Test Date: **4/15/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Knee Impact Right** Test Time: **11:48:30 AM**

Test Date: **4/15/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 288



External Measurements

5th Female SN 288

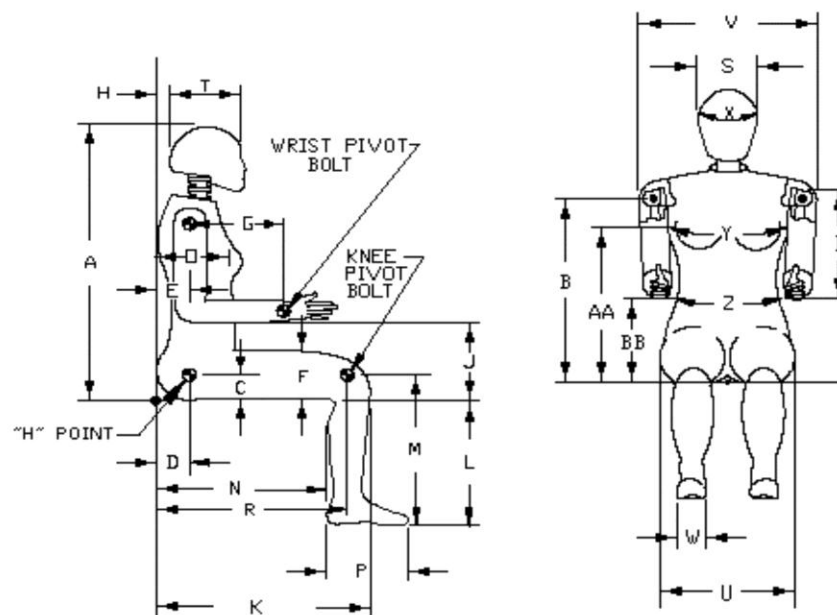
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	780	Yes
B	Shoulder Pivot Height	431.8 – 457.2	439	Yes
C	H-Point Height	81.3 – 86.3	83	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	75	Yes
F	Thigh Clearance	119.4 – 134.6	124	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	247	Yes
H	Head Back to Backline	43.2 – 48.2	44	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	281	Yes
J	Elbow Rest Height	182.8 – 203.2	189	Yes
K	Buttock to Knee Length	520.7 – 546.1	541	Yes
L	Popliteal Height	355.6 – 376	368	Yes
M	Knee Pivot Height	393.7 – 419.1	398	Yes
N	Buttock Popliteal Length	414 – 439.4	430	Yes
O	Chest Depth without Jacket	175.3 – 190.5	179	Yes
P	Foot Length (right)	218.5 – 233.7	223	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	461	Yes
S	Head Breadth	137.1 – 147.3	142	Yes
T	Head Depth	177.8 – 188	181	Yes
U	Hip Breadth	299.7 – 314.9	302	Yes
V	Shoulder Breadth	350.5 – 365.7	358	Yes
W	Foot Breadth	78.8 – 94	82	Yes
X	Head Circumference	528.3 – 548.7	540	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	856	Yes
Z	Waist Circumference	759.5 – 789.9	781	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	343	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	164	Yes

Technician: M. Geesey

Date: 04/10/2014

Hybrid III 5th Female External Measurements

Reference Diagram





VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Head Drop	Test Date:	4/11/2014
		Test Time:	12:15:24 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	912

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.50 deg C	P
Humidity	10	--	70	36.30 %RH	P
Resultant Acceleration	250	--	300	274.4 G's	P
Oscillation	0	--	10	1.3 %	P
Lateral Acceleration	-15	--	15	-9.6 G's	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

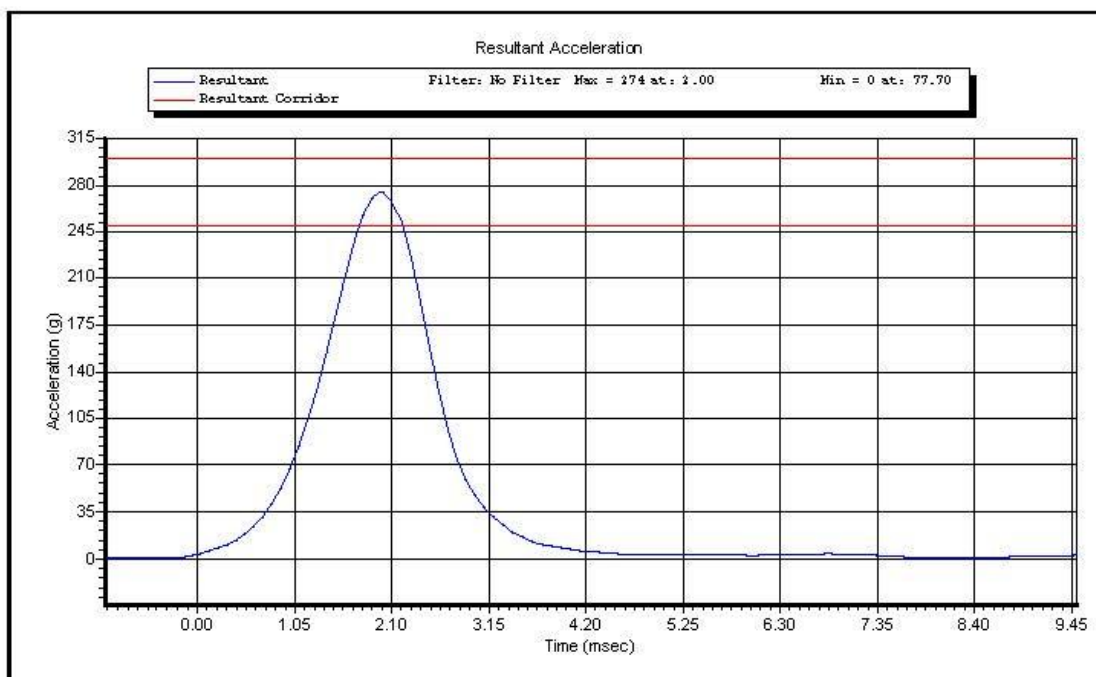
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51682	11/21/2013
Endevco	7264-2000	P51685	11/21/2013
Endevco	7264-2000	P51699	11/21/2013

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288

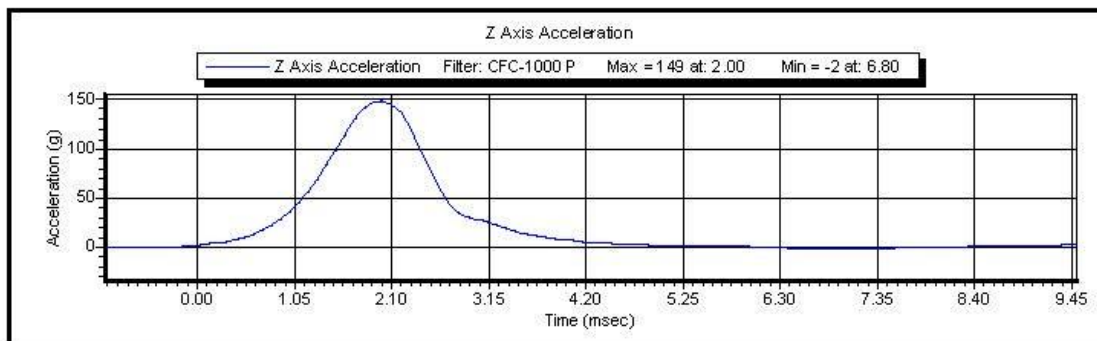
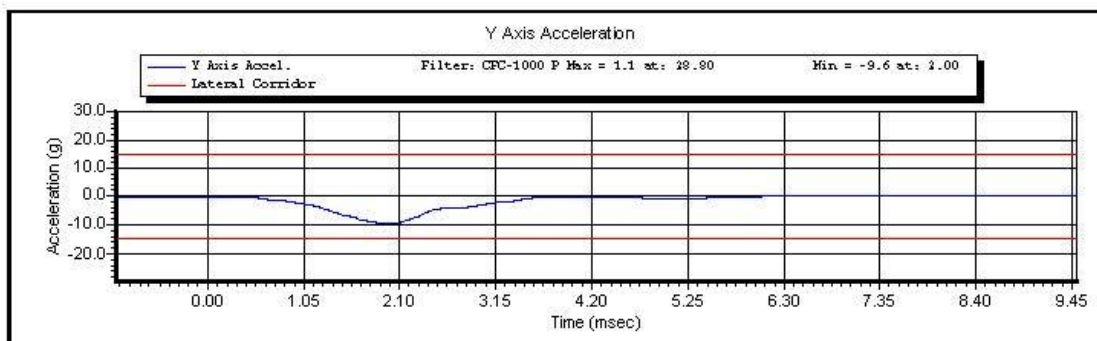
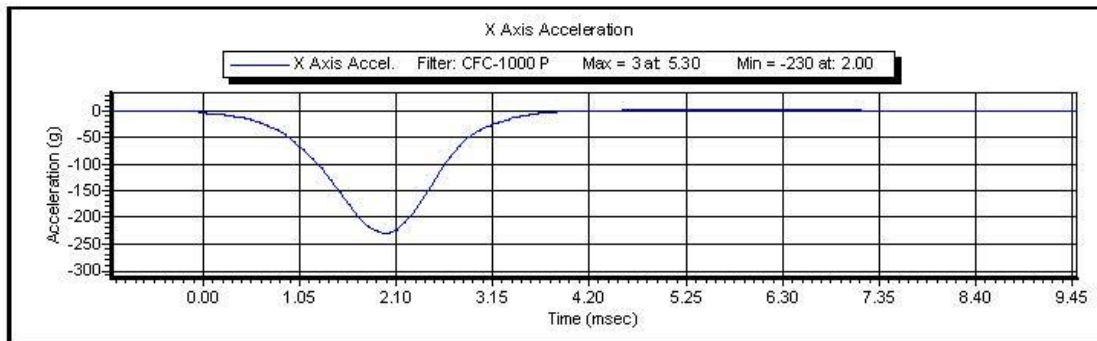


Test ID: **Head Drop**

Test Time: **12:15:24 PM**

Test Date: **4/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **12:15:24 PM**

Test Date: **4/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Neck Extension	Test Date:	4/11/2014
		Test Time:	11:10:12 AM

Component Part Number	Component Serial Number
Neck - 880105-255	7121

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.40 deg C P
Humidity	10 -- 70	36.70 %RH P
Velocity	5.95 -- 6.19	6.018 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.79 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.45 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	5.01 m/s P
D Plane Rotation	99 -- 114	105.7 degrees P
Moment During Rotation Interval	-65 -- -53	-62.9 Nm P
Moment Decay to -10.0 Nm	94 -- 114	100.0 ms P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **E. Dutton**



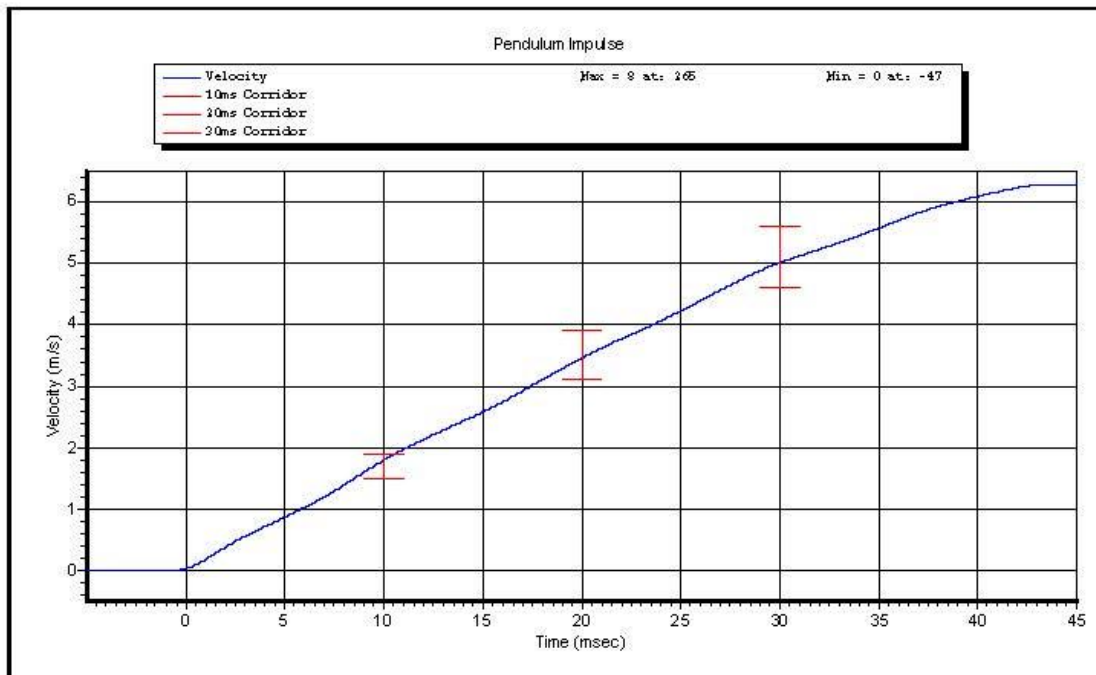
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013



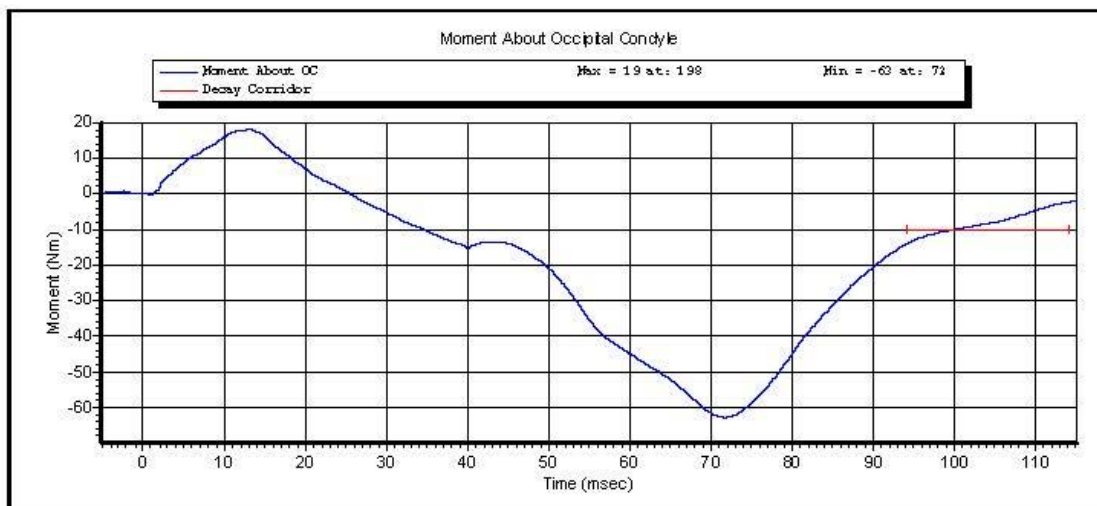
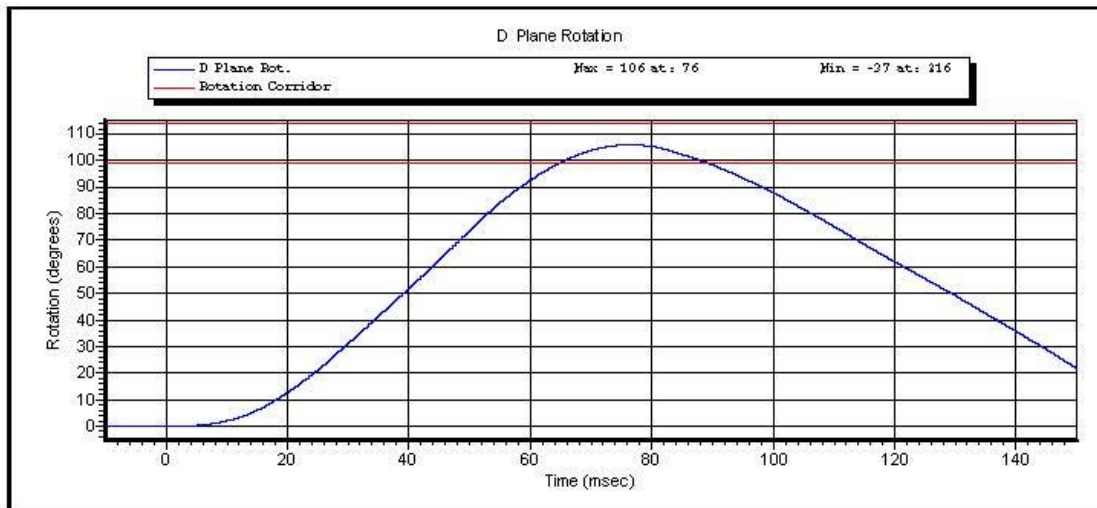
Test Name:	Neck Extension
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: Neck Extension Test Time: 11:10:12 AM

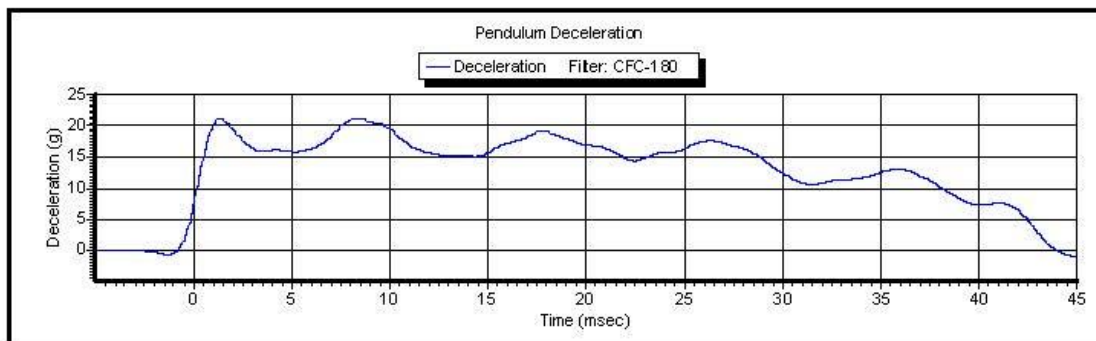
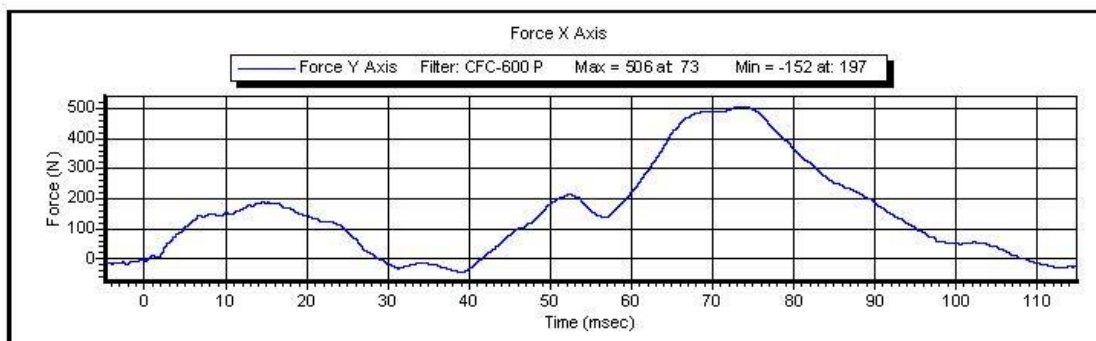
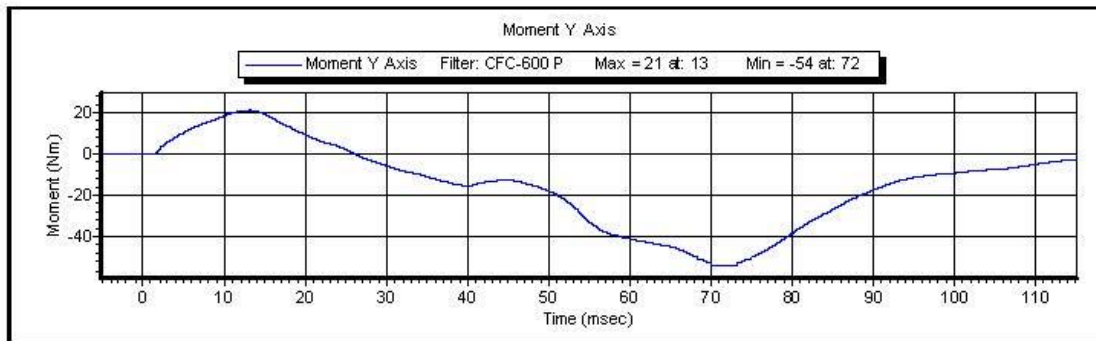
Test Date: 4/11/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **11:10:12 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/11/2014**



Test ID: **Neck Extens ion** Test Time: **11:10:12 AM**

Test Date: **4/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Neck Flexion	Test Date:	4/11/2014
		Test Time:	10:44:15 AM

Test Parameters	Test Specifications	Test Results
Temperature	21 -- 22	21.30 deg C P
Humidity	10 -- 70	36.70 %RH P
Velocity	6.89 -- 7.13	6.978 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.11 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.1 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	5.89 m/s P
D Plane Rotation	-91 -- -77	-81.1 degrees P
Moment During Rotation Interval	69 -- 83	79.4 Nm P
Moment Decay to 10.0 Nm	80 -- 100	90.8 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



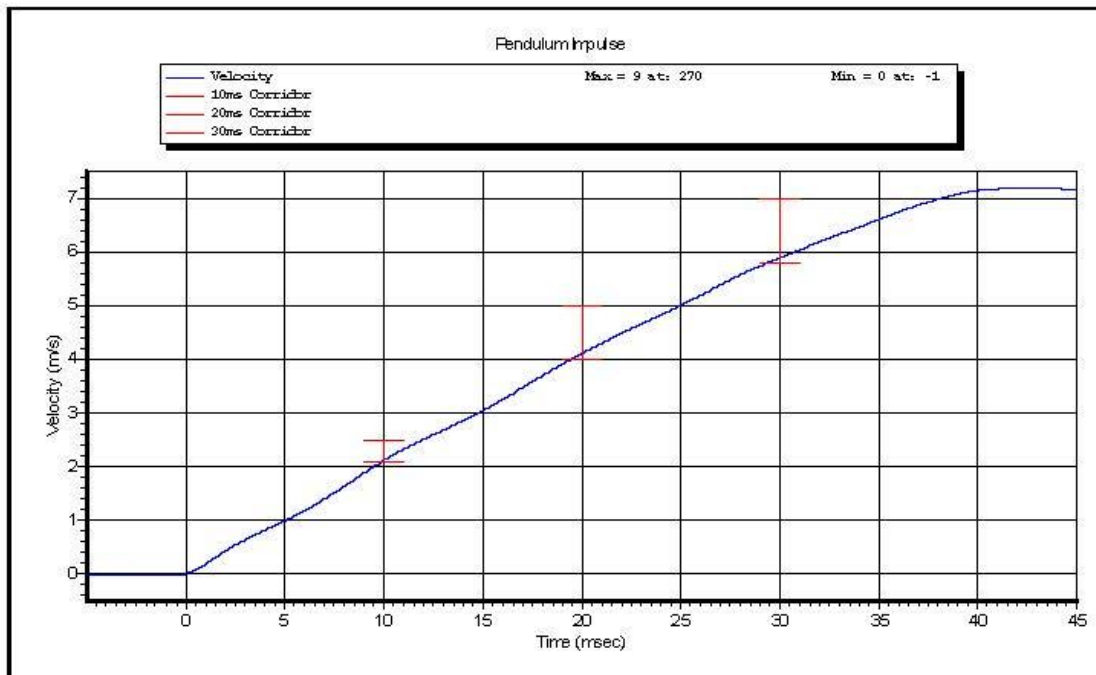
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013



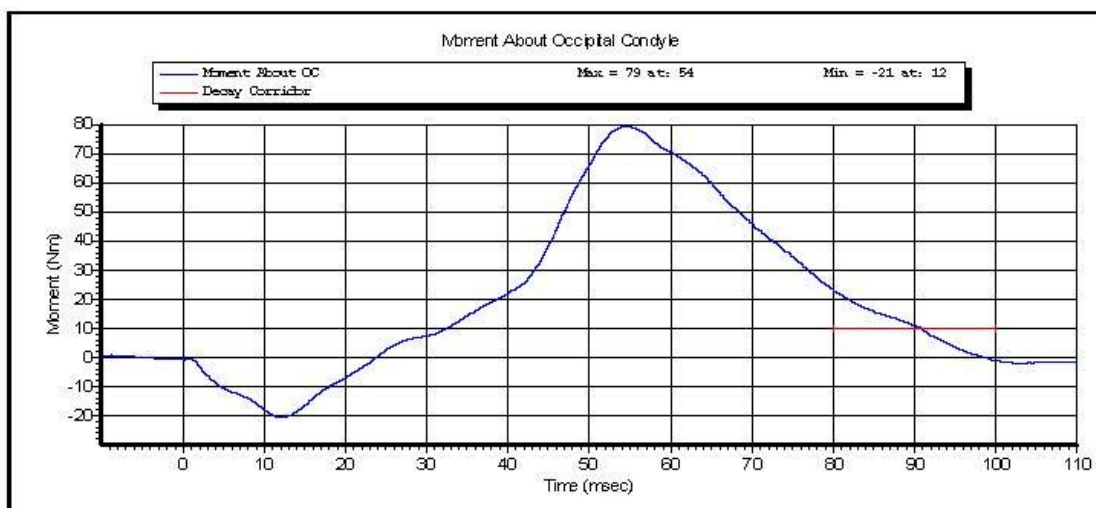
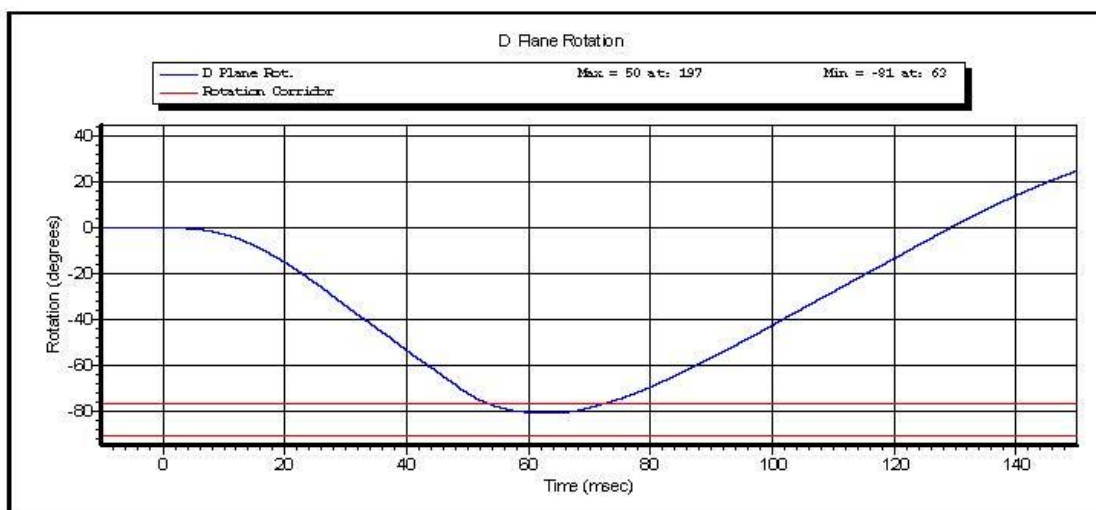
Test Name:	Neck Flexion
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: Neck Flexion Test Time: 10:44:15 AM

Test Date: 4/11/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

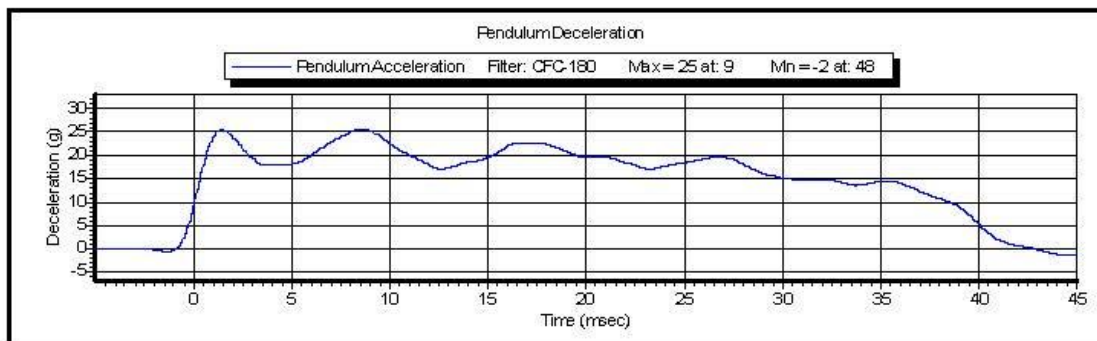
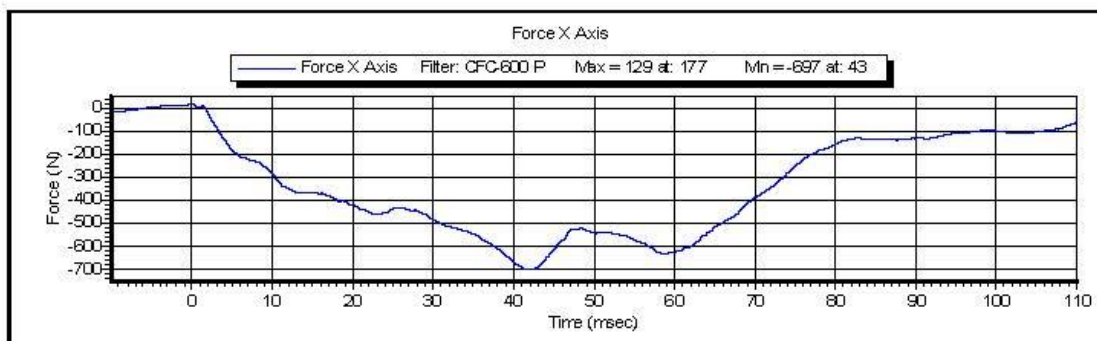
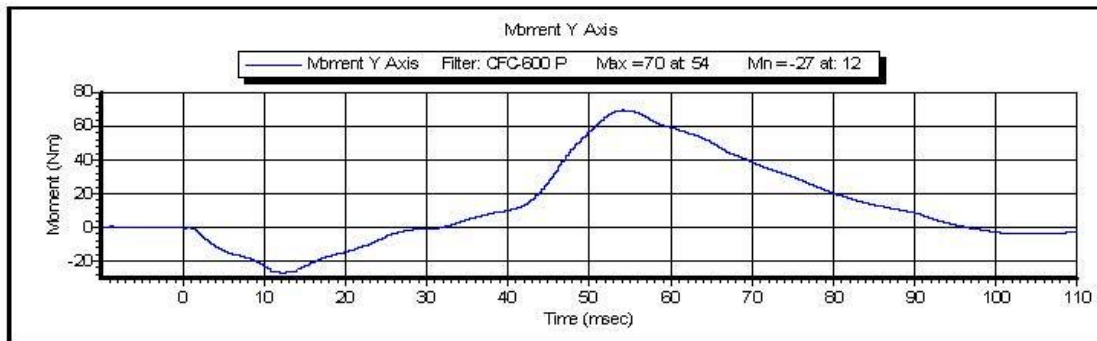


Test ID: **Neck Flexion**

Test Time: **10:44:15 AM**

Test Date: **4/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Flexion**

Test Time: **10:44:15 AM**

Test Date: **4/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Thorax Impact	Test Date:	4/11/2014
		Test Time:	9:34:55 AM

Component Part Number	Component Serial Number
Chest Jacket - 880105-355-E	DG8843

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.10 deg C	P
Humidity	10	--	70	35.10 %RH	P
Velocity	6.59	--	6.83	6.803 m/s	P
Sternum Displacement	-58	--	-50	-53.2 mm	P
Force During Displacement Interval	-4400	--	-3900	-4295.1 N	P
Force During -18mm to -50mm Displacem	-4600	--	0	-4276.9 N	P
Hysteresis	69	--	85	72.1 %	P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **E. Dutton**



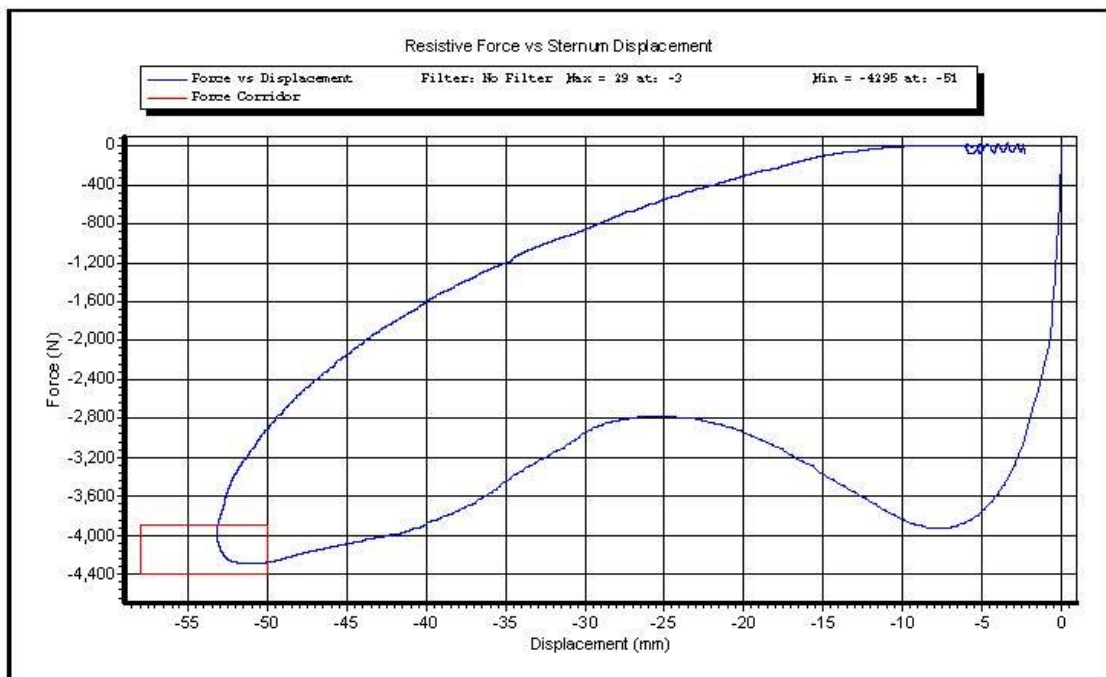
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
SERVO	14 CB1-2897	DS-288	11/21/2013



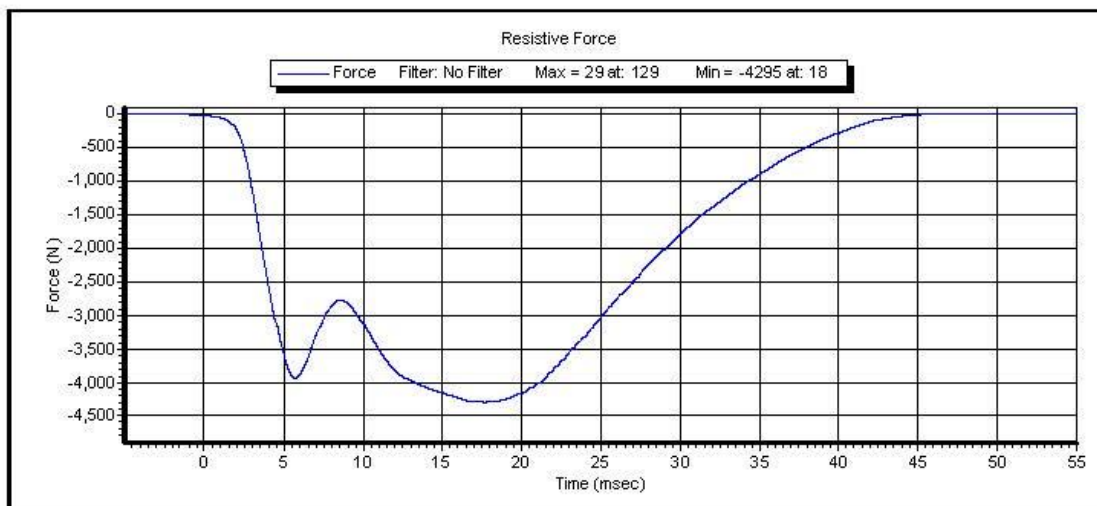
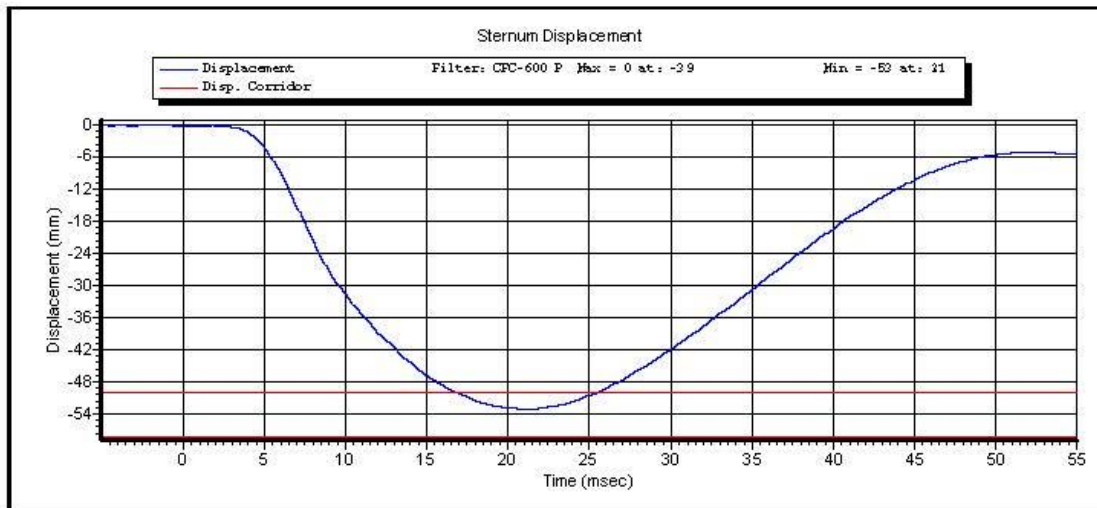
Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: Thorax Impact Test Time: 9:34:55 AM

Test Date: 4/11/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

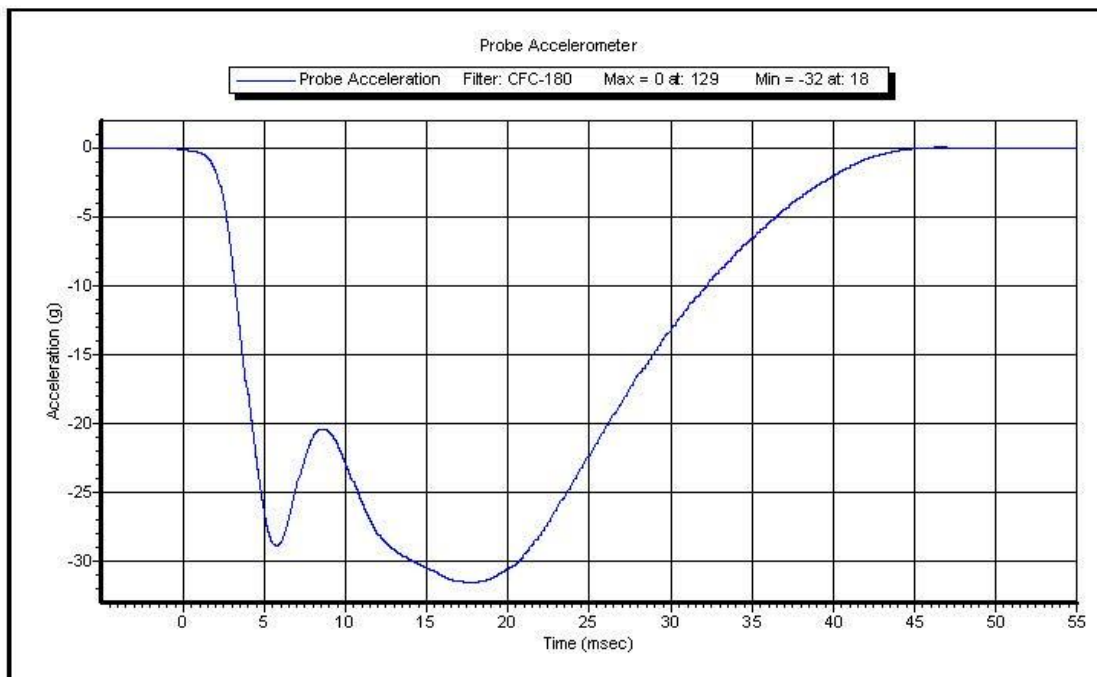


Test ID: **Thorax Impact**

Test Time: **9:34:55 AM**

Test Date: **4/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **9:34:55 AM**

Test Date: **4/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Torso Flexion

Part 572O HIII 5% Female

ATD Serial No: 288

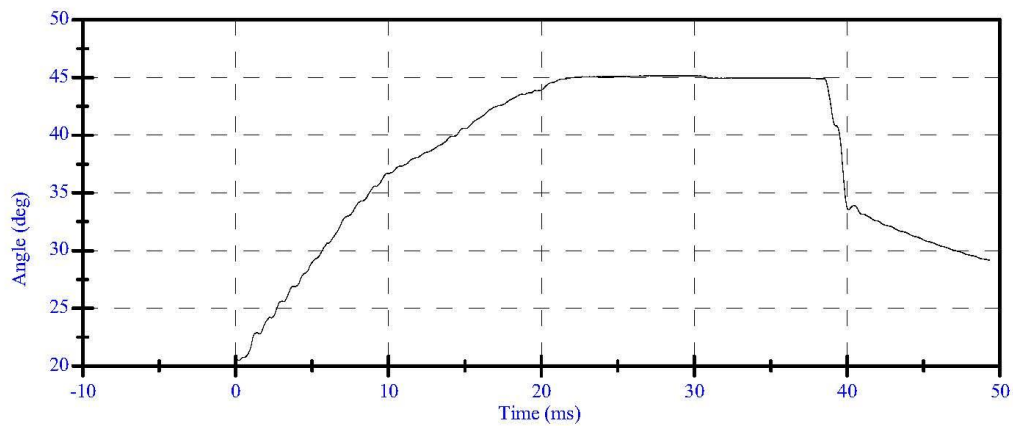
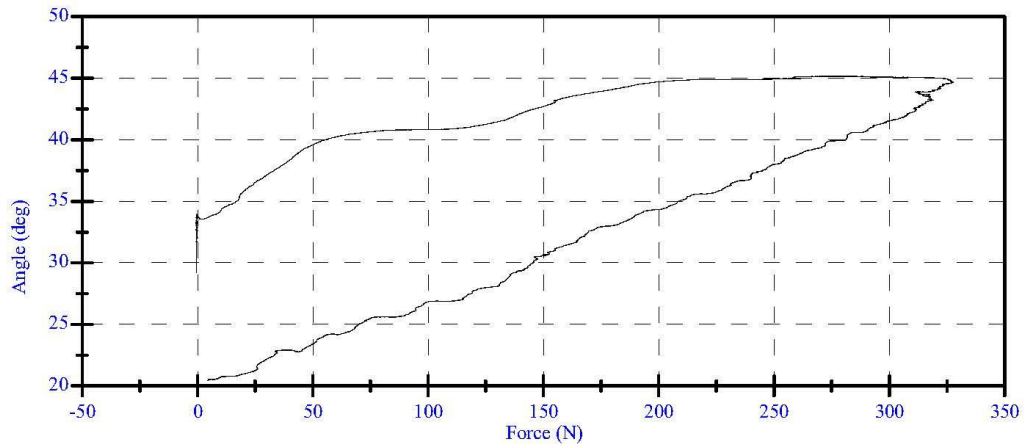
Laboratory Supervisor: E. Dutton

Date: 04/15/2014

Laboratory Technician: M. Goehle

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	20.9 C	Passed
Lab Humidity:	10-70 %	31.3 %	Passed
Initial Angle:	0.00-20.00 degrees	19.4 deg	Passed
Force at 45 Deg	320.00-390.00 N	327.74 N	Passed
Return Angle	8 Deg Max from Initial	26.0 deg	Passed

TORSO FLEXION TEST





VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Knee Impact Left	Test Date:	4/10/2014
		Test Time:	3:06:27 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1729

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.20 deg C P
Humidity	10 -- 70	25.60 %RH P
Velocity	2.07 -- 2.13	2.113 m/s P
Resistive Force	-4060 -- -3450	-3879.5 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



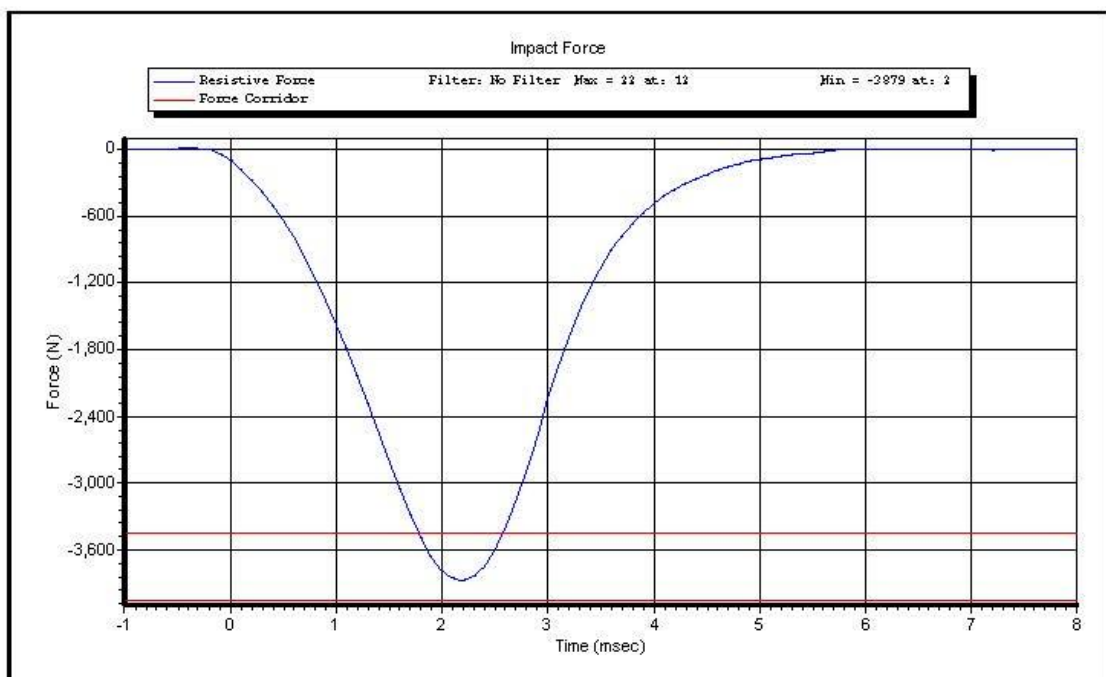
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

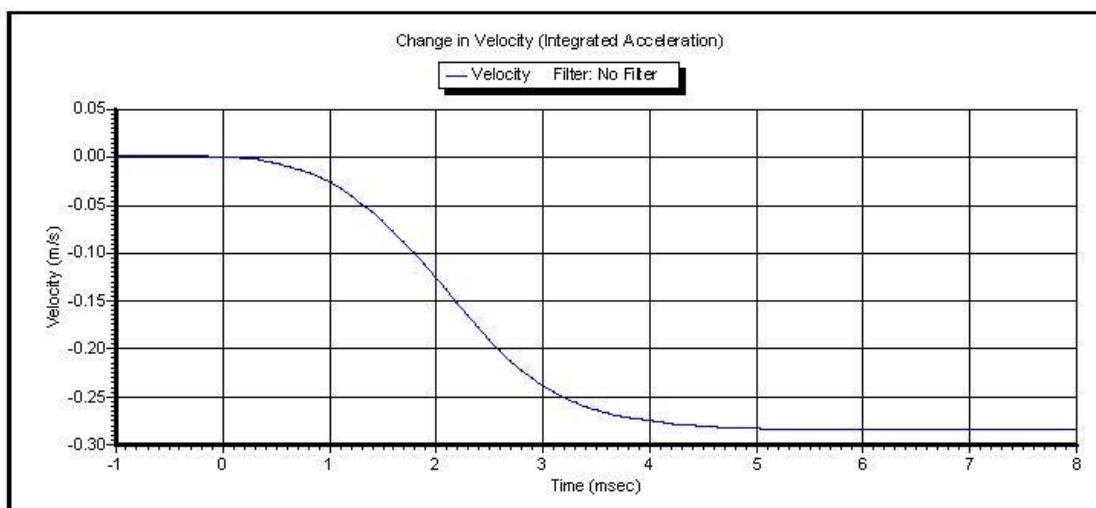
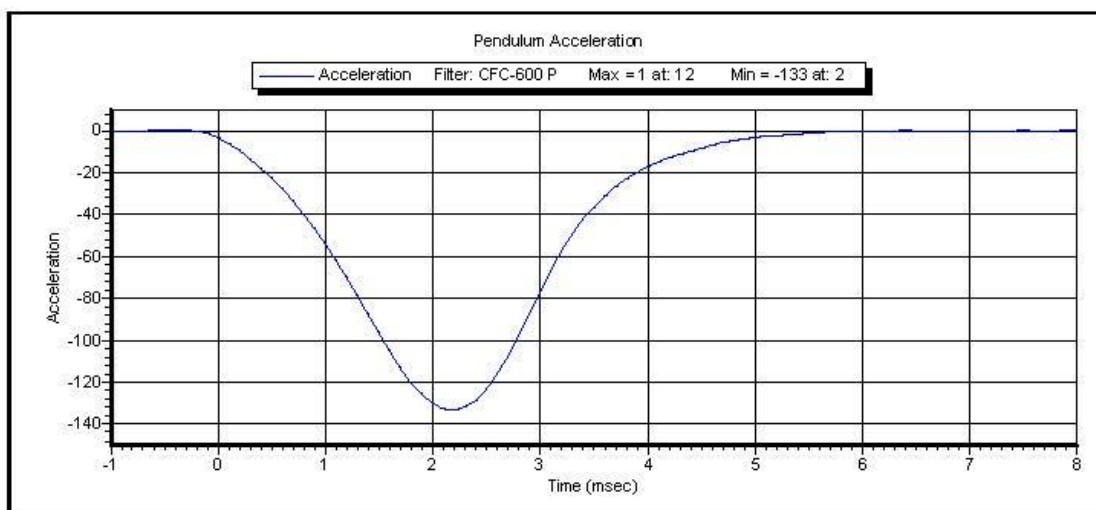


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: **Knee Impact Left** Test Time: **3:06:27 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/10/2014**



Test ID: **Knee Impact Left** Test Time: **3:06:27 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/10/2014**



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Knee Impact Right	Test Date:	4/10/2014
		Test Time:	3:16:20 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1728

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	22.20 deg C	P
Humidity	10	--	70	25.30 %RH	P
Velocity	2.07	--	2.13	2.115 m/s	P
Resistive Force	-4060	--	-3450	-3623.7 N	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



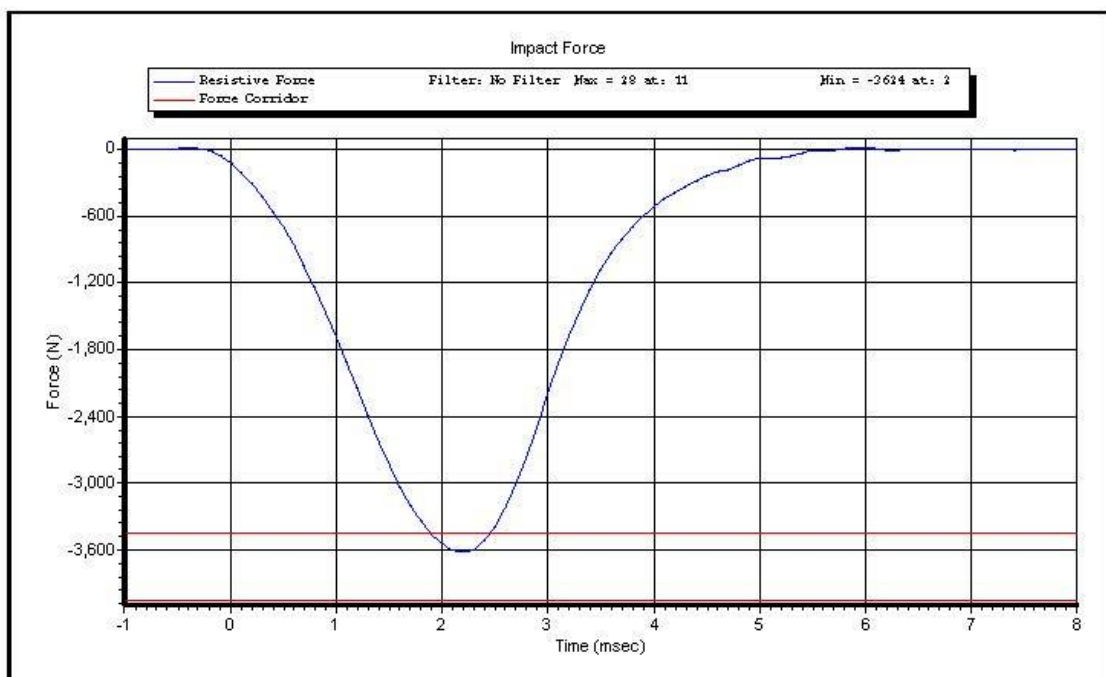
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

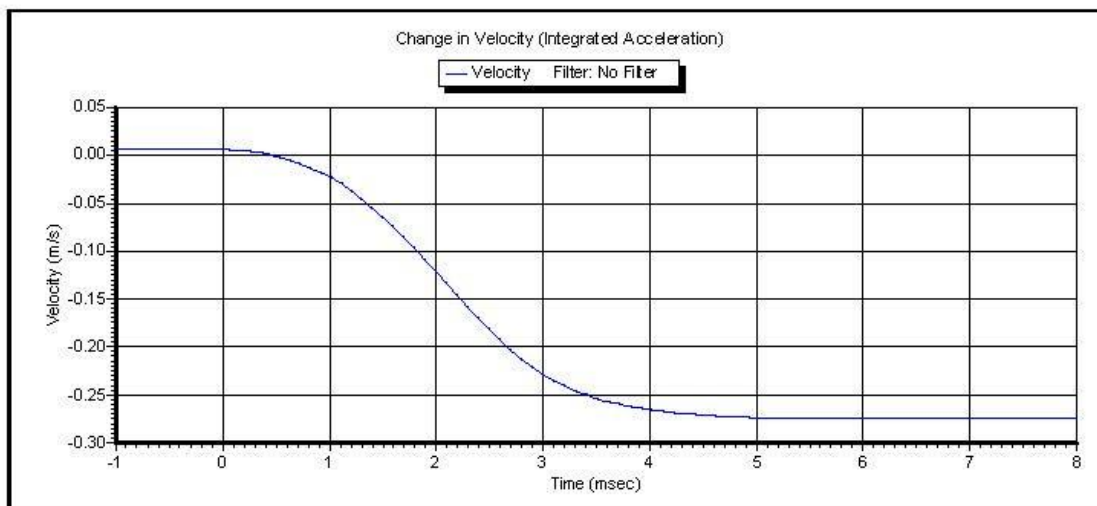
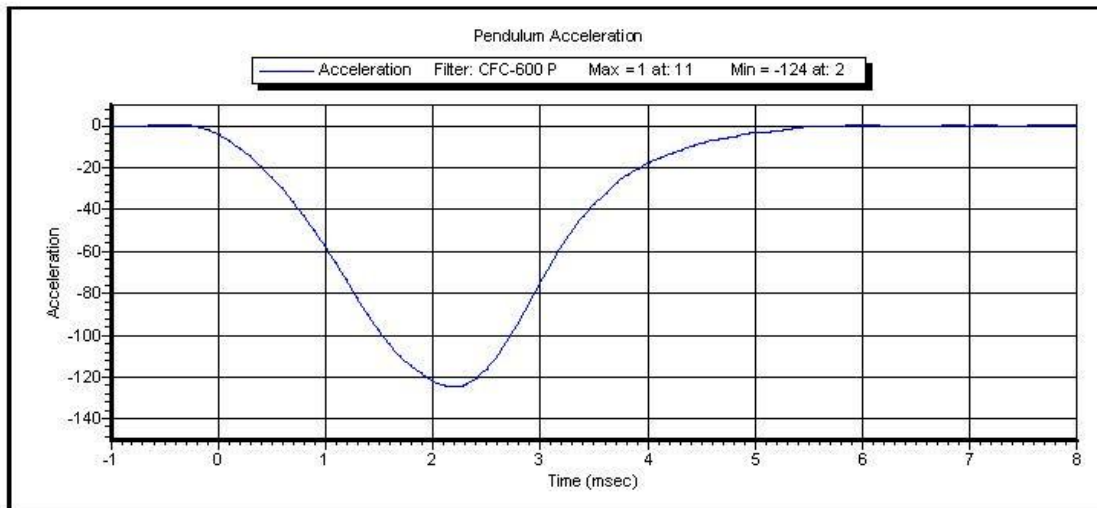


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: **Knee Impact Right** Test Time: **3:16:20 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/10/2014**



Test ID: **Knee Impact Right** Test Time: **3:16:20 PM**

Test Date: **4/10/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 064



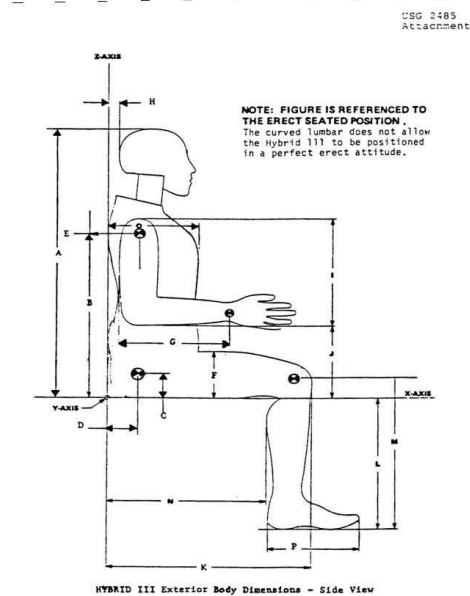
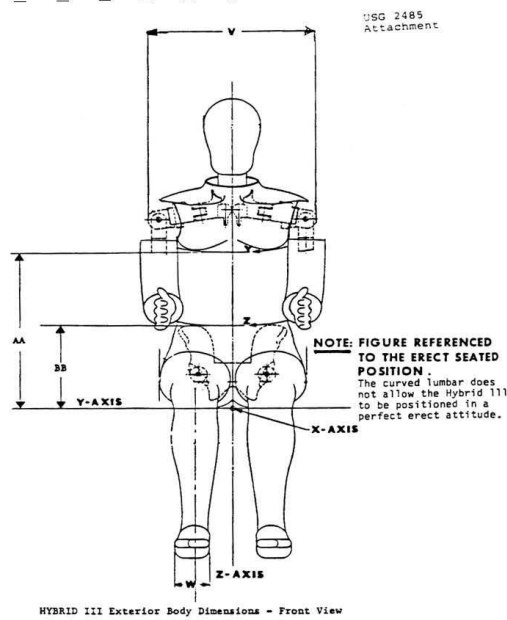
50th Male External Measurements

S/N 064

Symbol	Description	Specification	Results	Pass
		in	In	
A	Sitting Height	34.6 – 35.0	34.7	Yes
B	Shoulder Pivot Height	19.9 – 20.5	20.0	Yes
C	H-Point Height	3.3 – 3.5	3.4	Yes
D	H-Point from Backline	5.3 – 5.5	5.4	Yes
E	Shoulder Pivot from Backline	3.3 – 3.7	3.5	Yes
F	Thigh Clearance	5.5 – 6.1	5.9	Yes
G	Back of Elbow to Wrist Pivot	11.4 – 12.0	11.6	Yes
H	Head Back to Backline	1.6 – 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 – 13.6	13.1	Yes
J	Elbow Rest Height	7.5 – 8.3	8.1	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.1	Yes
L	Popliteal Height	16.9 – 17.9	17.1	Yes
M	Knee Pivot Height	19.1 – 19.7	19.3	Yes
N	Buttock Popliteal Length	17.8 – 18.8	18.5	Yes
O	Chest Depth without Jacket	8.4 – 9.0	8.6	Yes
P	Foot Length (right)	9.9 – 10.5	10.1	Yes
V	Shoulder Breadth	16.3 – 17.2	16.8	Yes
W	Foot Breadth	3.6 – 4.2	3.9	Yes
Y	Chest Circumference with Jacket	38.2 – 39.4	38.9	Yes
Z	Waist Circumference	32.9 – 34.1	33.9	Yes
AA	Reference Location (Chest Circumference)	16.9 – 17.1	17.0	Yes
BB	Reference Location (Waist Circumference)	8.9 – 9.1	9.0	Yes

Technician: R. Weil

04/30/2014





VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Head Drop	Test Date:	4/30/2014
		Test Time:	1:18:34 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.20 deg C P
Humidity	10 -- 70	41.70 %RH P
Resultant Acceleration	225 -- 275	262.0 G's P
Oscillation	0 -- 10	2.0 % P
Lateral Acceleration	-15 -- 15	0.8 G's P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



VERIFICATION REPORT

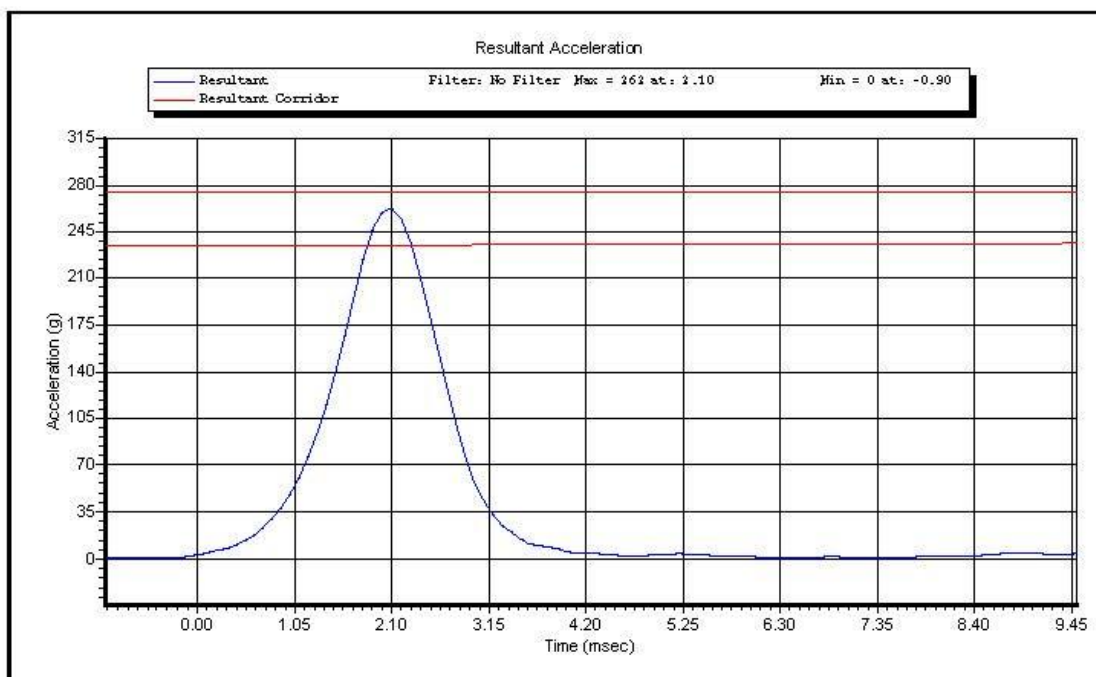
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58904	12/5/2013
Endevco	7264-2000	P58911	12/5/2013
Endevco	7264-2000	P58776	12/5/2013

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064

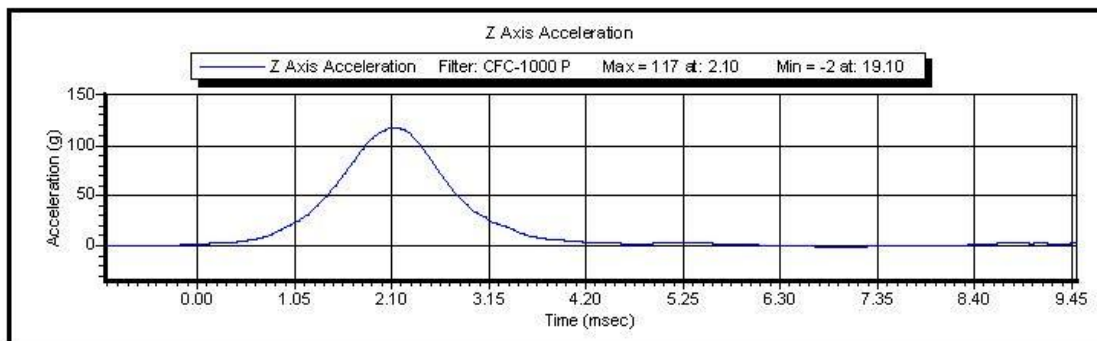
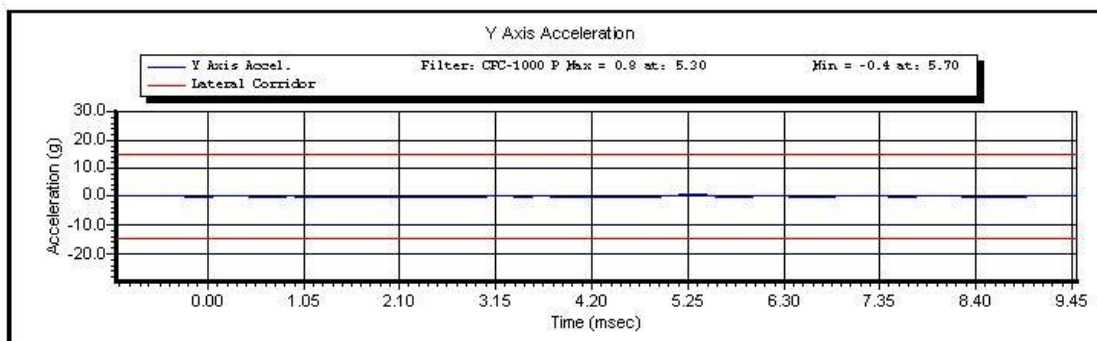
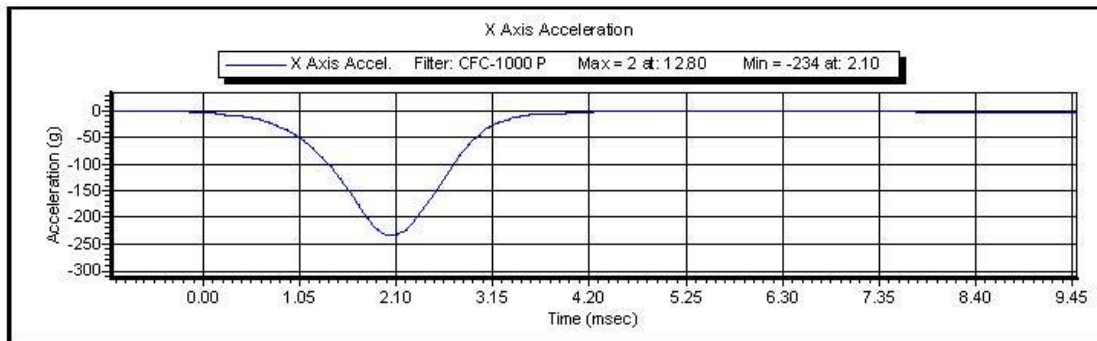


Test ID: **Head Drop**

Test Time: **1:18:34 PM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **1:18:34 PM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Neck Extension	Test Date:	4/30/2014
		Test Time:	4:21:28 PM

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	21.60 deg C	P
Humidity		10	-- 70	43.10 %RH	P
Velocity		5.94	-- 6.19	6.017 m/s	P
Pendulum Deceleration at	10 ms	17.2	-- 21.2	18.85 G's	P
Pendulum Deceleration at	20 ms	14.0	-- 19.0	15.50 G's	P
Pendulum Deceleration at	30 ms	11.0	-- 16.0	12.64 G's	P
Max Pendulum Deceleration after	30 ms	0.0	-- 22.0	13.18 G's	P
Deceleration Time to	5 G's	38	-- 46	43.1 ms	P
D Plane Rotation		81	-- 106	94.4 degrees	P
Time at Max Rotation		72	-- 82	79.0 ms	P
Rotation Decay to Zero		147	-- 174	160.5 ms	P
Moment About Occipital Condyle		-80.0	-- -52.9	-65.93 Nm	P
Time at Maximum Moment		65	-- 79	74.8 ms	P
Moment Decay to Zero		120	-- 148	147.6 ms	P

All test parameters are within specifications

Technician: **R. Weil**
Supervisor: **E. Dutton**



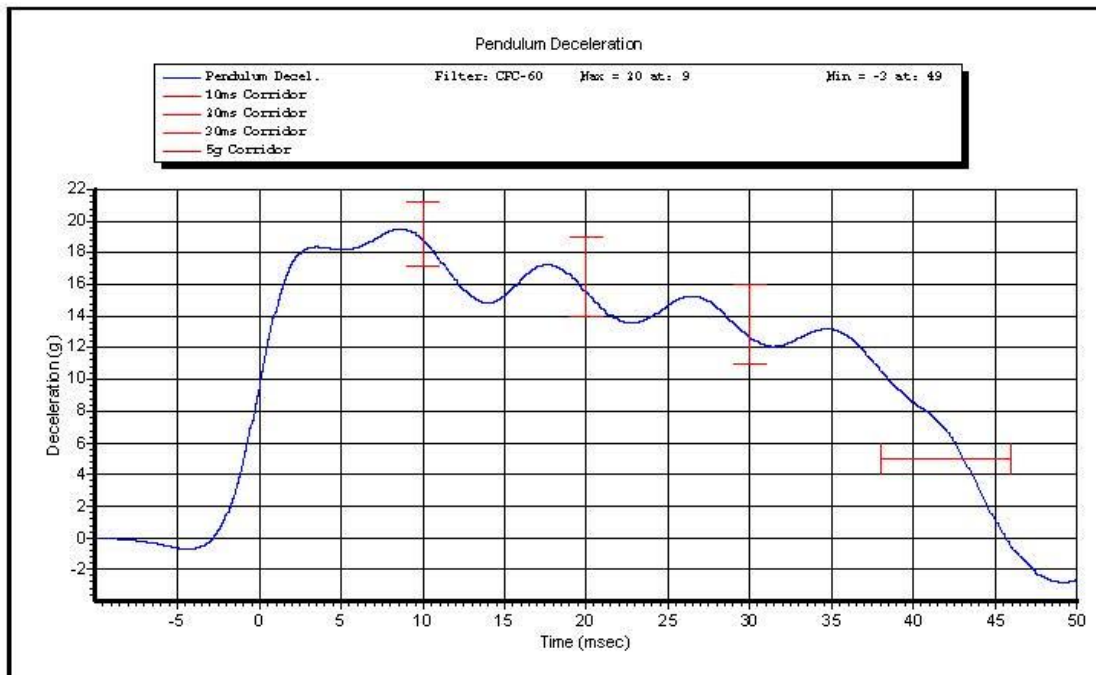
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	4/30/2014
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	5/23/2013
Denton	1716A	LC-2186 Fx	5/23/2013



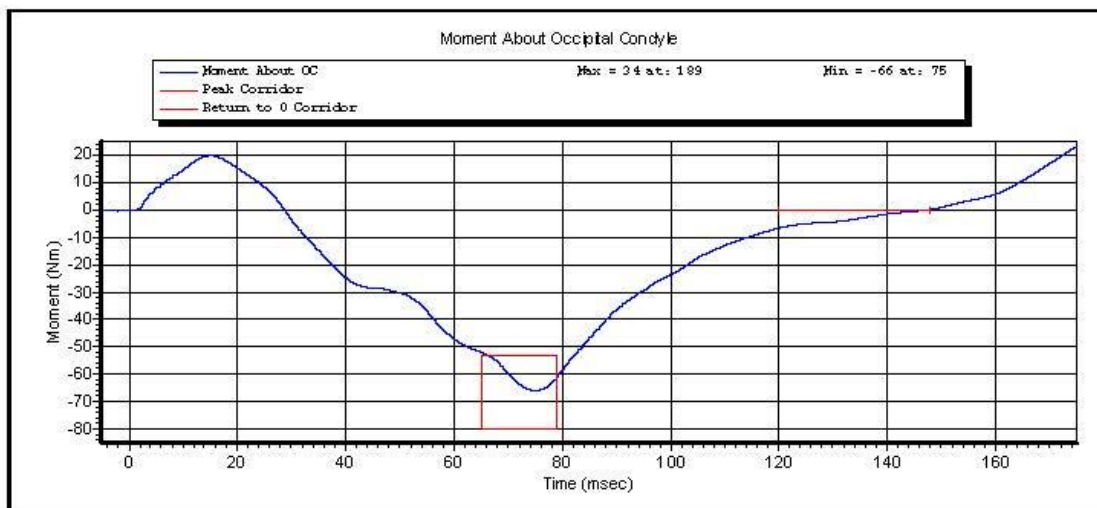
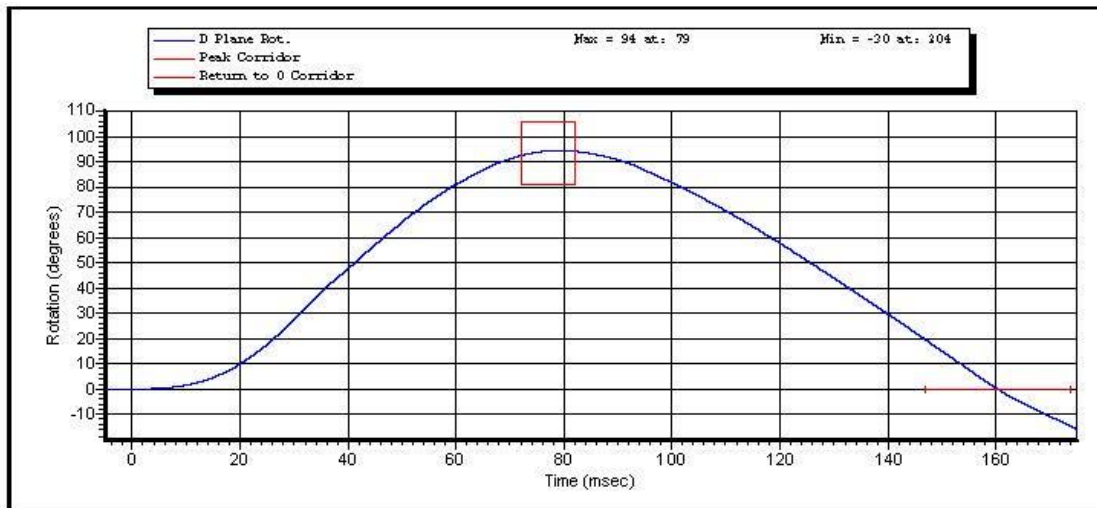
Name of Test:	Neck Extension
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	064



ID of Test: **Neck Extension** Time of Test: **4:21:28 PM**

Date of Test: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

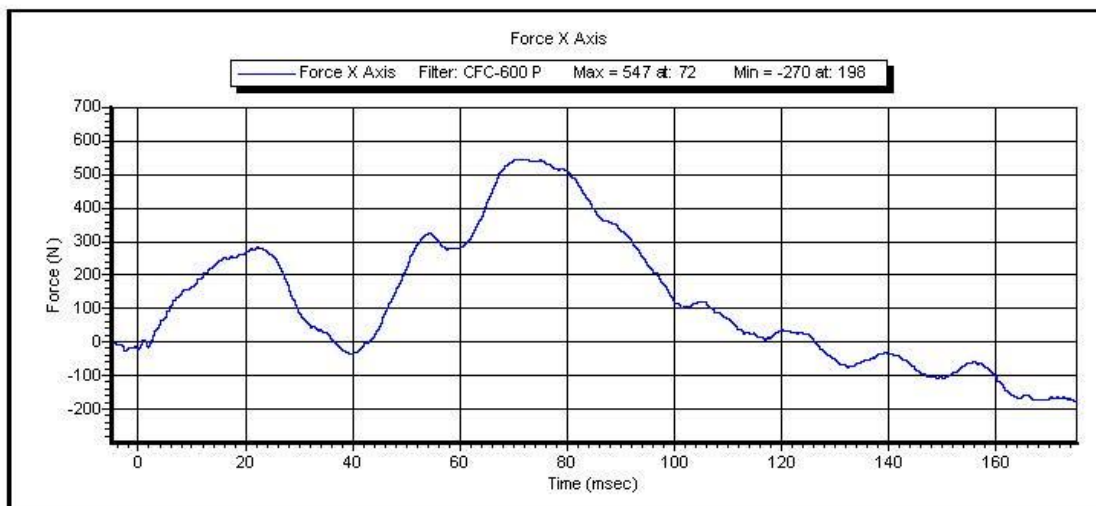
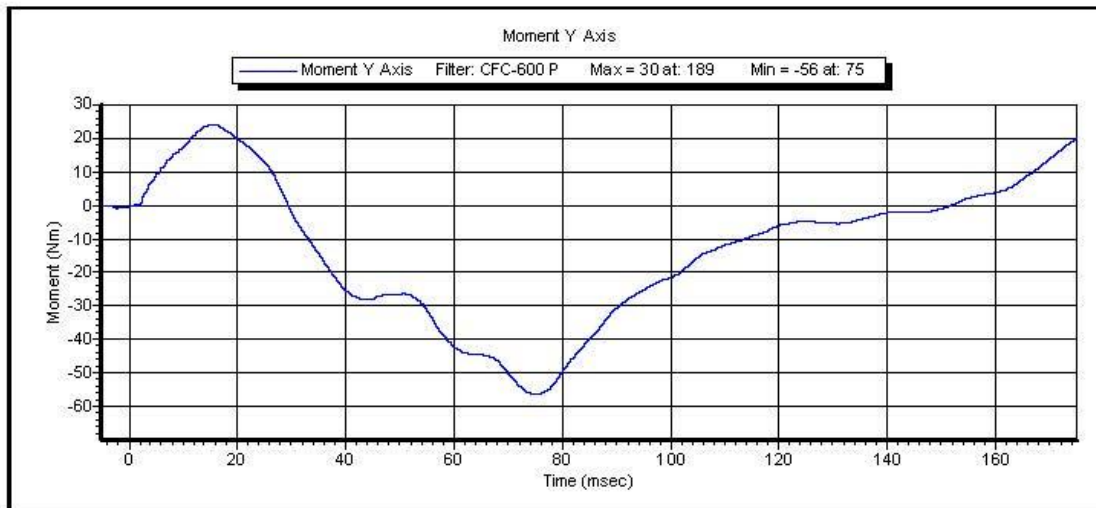


ID of Test: **Neck Extension**

Time of Test: **4:21:28 PM**

Date of Test: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Extension** Time of Test: **4:21:28 PM**

Date of Test: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Neck Flexion	Test Date:	4/30/2014
		Test Time:	3:05:48 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.30 deg C P
Humidity	10 -- 70	42.50 %RH P
Velocity	6.89 -- 7.13	6.960 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	26.00 G's P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	20.94 G's P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	15.80 G's P
Maximum Pendulum Deceleration After 30 ms	0 -- 29	15.8 G's P
Deceleration Time to 5 ms	34 -- 42	36.2 ms P
D Plane Rotation	-78 -- -64	-66.9 degrees P
Time at Maximum Rotation	57 -- 64	59.1 ms P
Rotation Decay to Zero	113 -- 128	113.9 ms P
Moment About Occipital Condyle	88.1 -- 108.4	101.67 Nm P
Time at Maximum Moment	47 -- 58	47.3 ms P
Moment Decay to Zero	97.0 -- 107.0	97.4 ms P

All test parameters are within specifications

Technician: R. Weil

Supervisor: E. Dutton



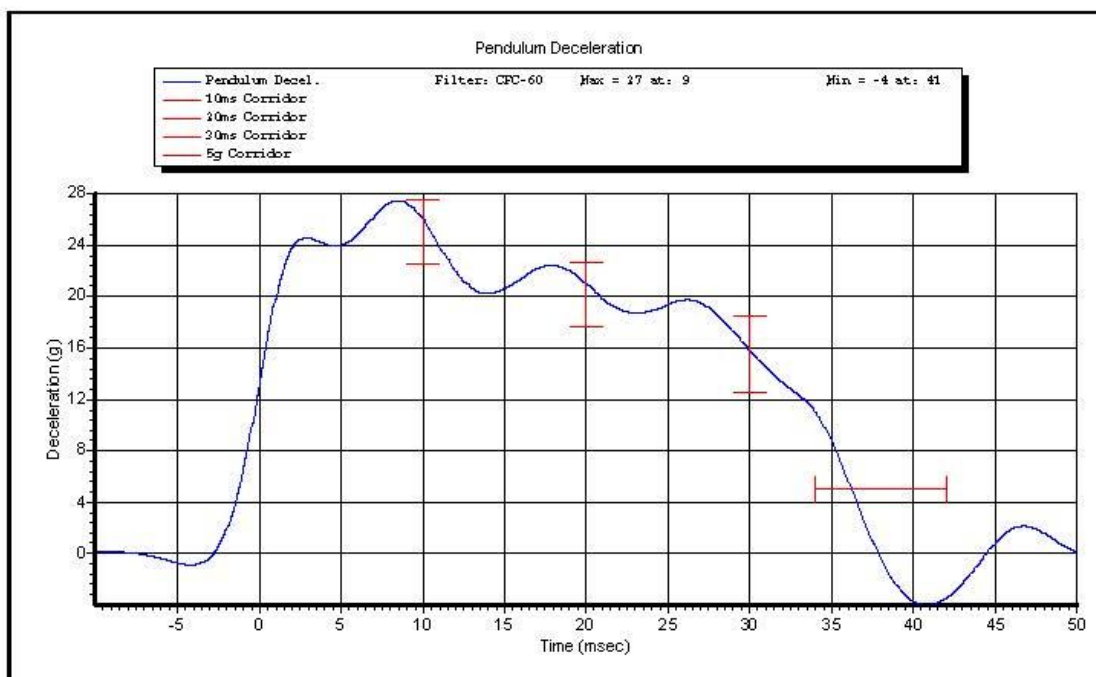
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	4/30/2014
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	5/23/2013
Denton	1716A	LC-2186 Fx	5/23/2013



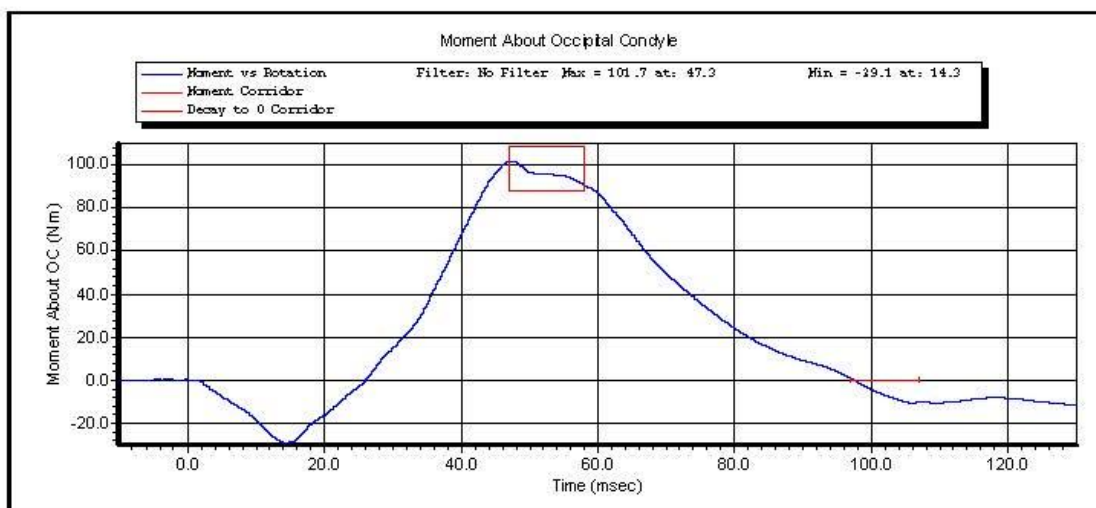
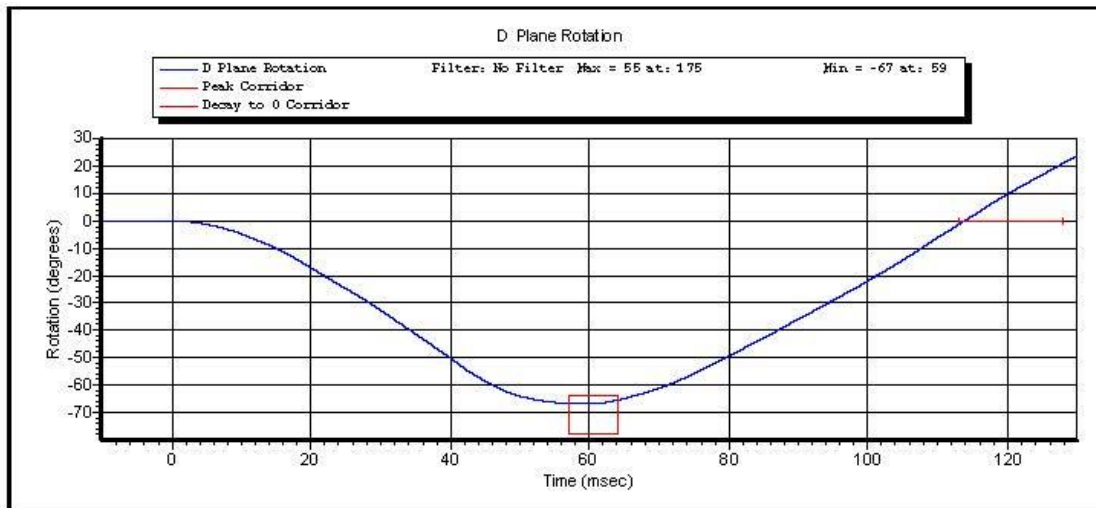
Name of Test:	Neck Flexion
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	064



ID of Test: **Neck Flexion** Time of Test: **3:05:48 PM**

Date of Test: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

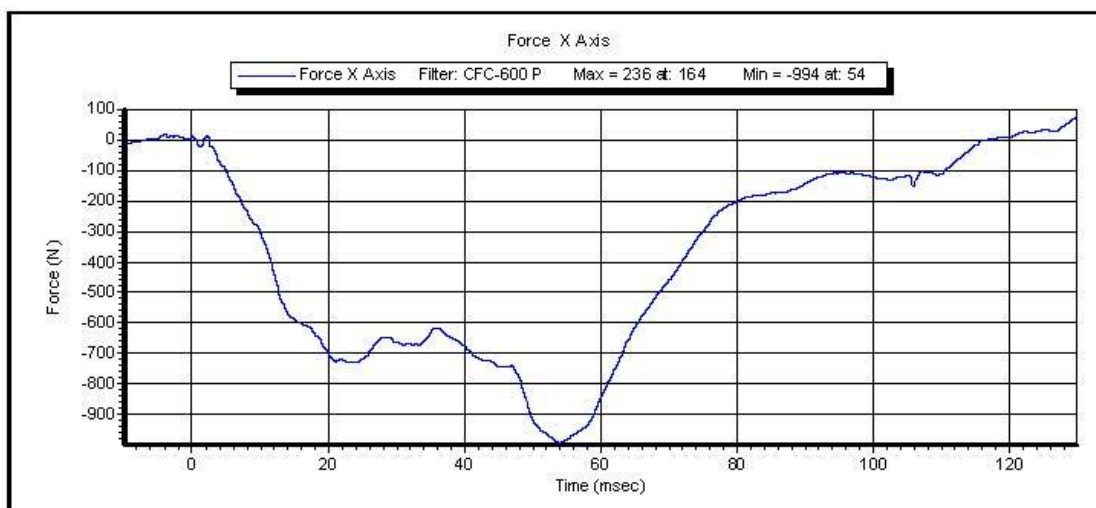
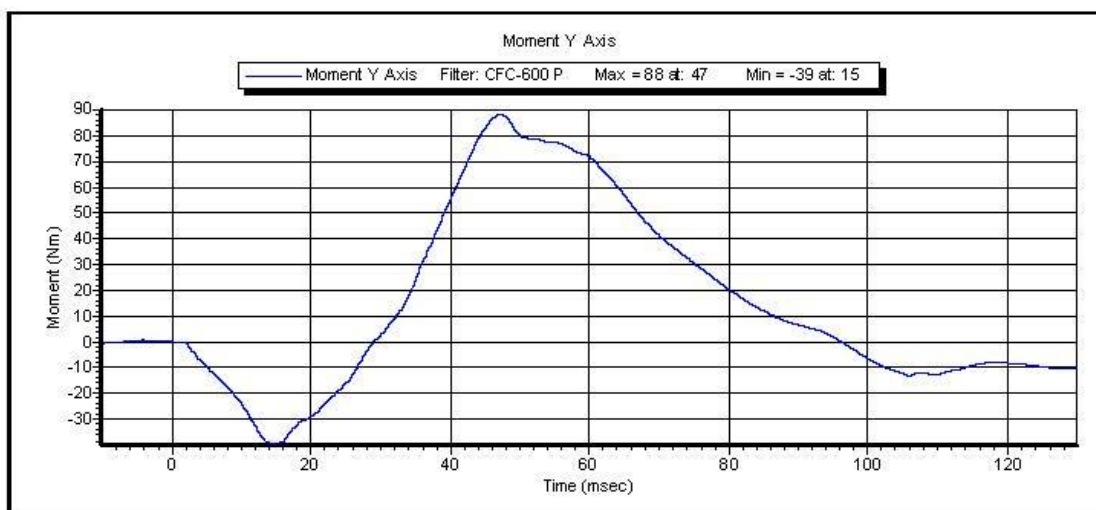


ID of Test: **Neck Flexion**

Time of Test: **3:05:48 PM**

Date of Test: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Flexion**

Time of Test: **3:05:48 PM**

Date of Test: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Thorax Impact	Test Date:	5/1/2014
		Test Time:	9:12:34 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.60 deg C	P
Humidity	10	--	70	45.10 %RH	P
Velocity	6.59	--	6.83	6.629 m/s	P
Chest Deflection	-72.6	--	-63.5	-73.11 mm	F
Resistive Force	-5.894	--	-5.160	-5.3692 kN	P
Hysteresis	69	--	85	68.6 %	F

All test parameters are NOT within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



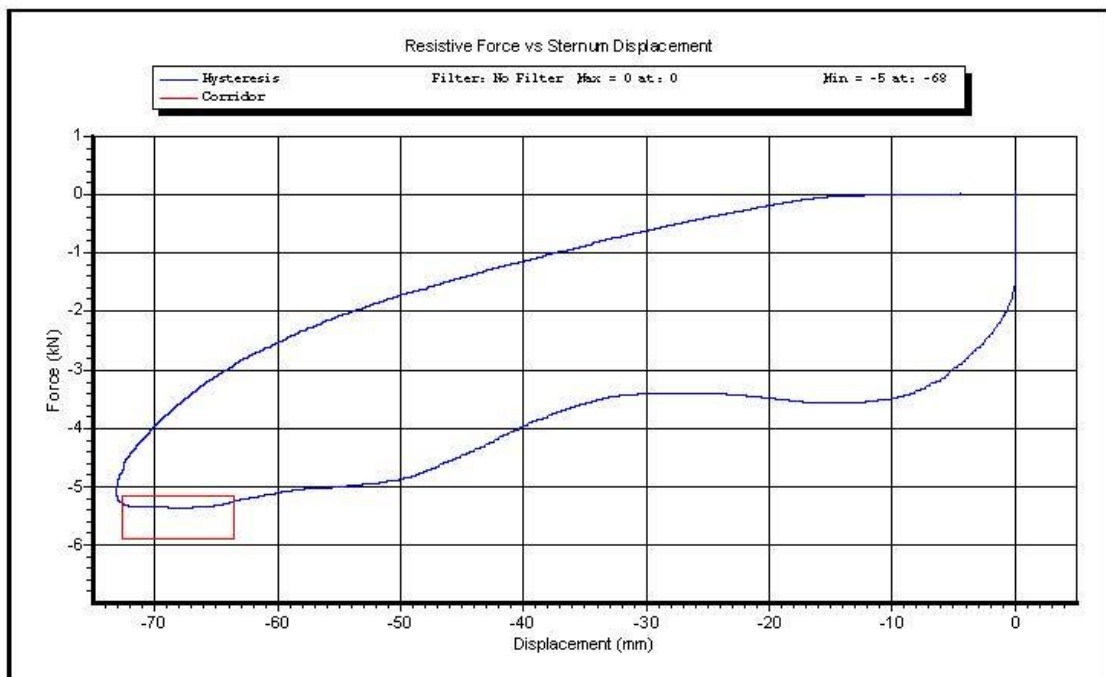
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
DentonATD	78051-342	DS-064	6/18/2013

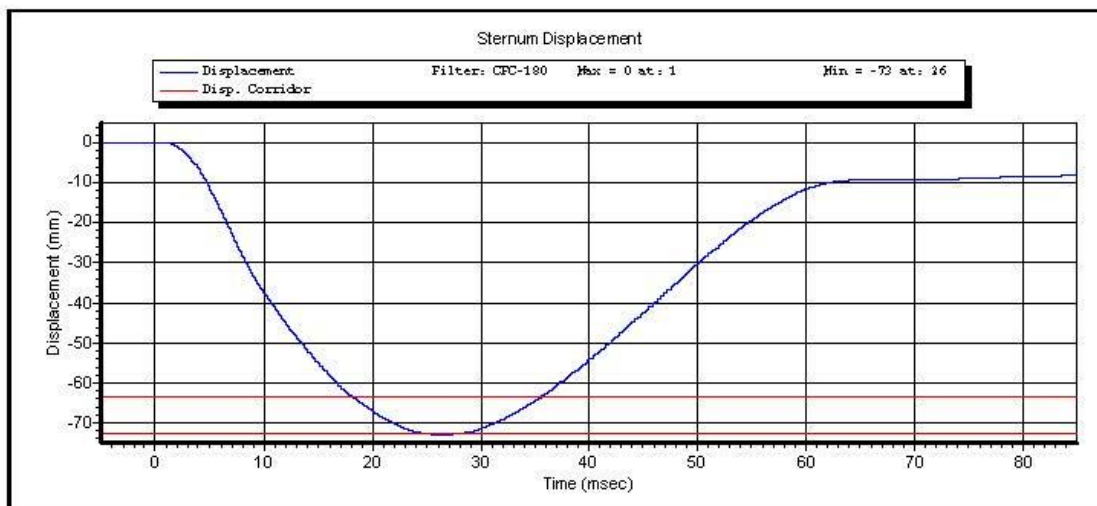
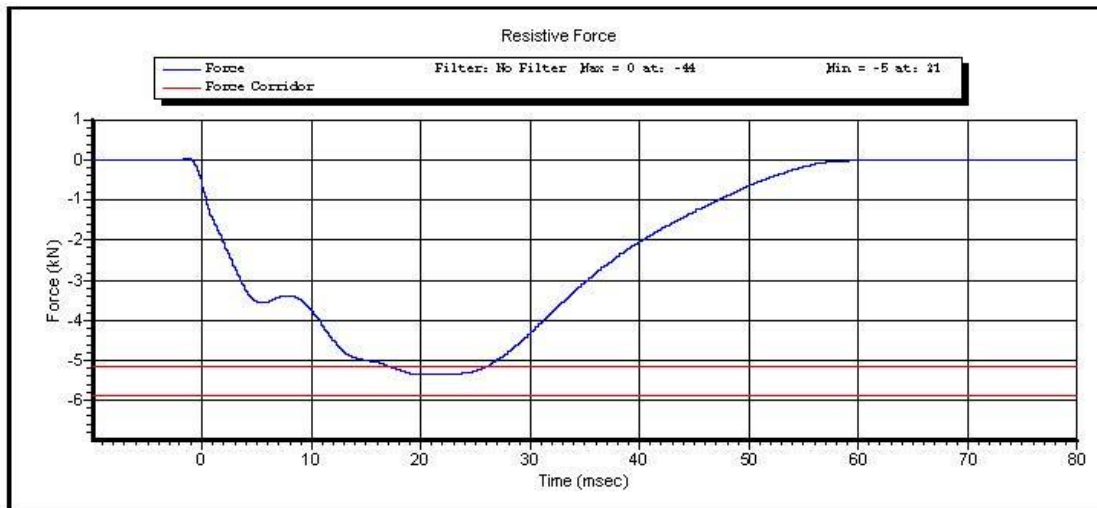


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: Thorax Impact Test Time: 9:12:34 AM
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: 5/1/2014

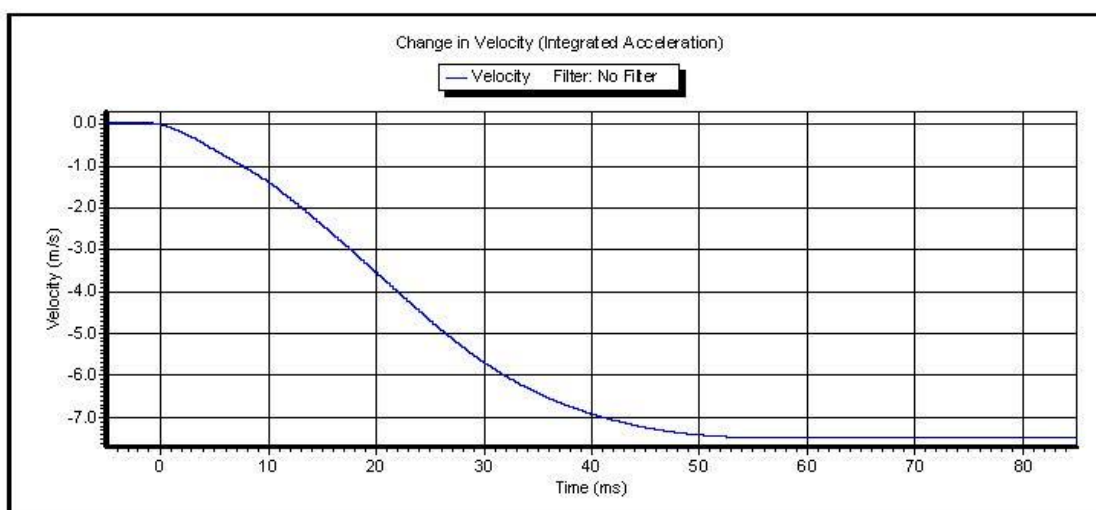
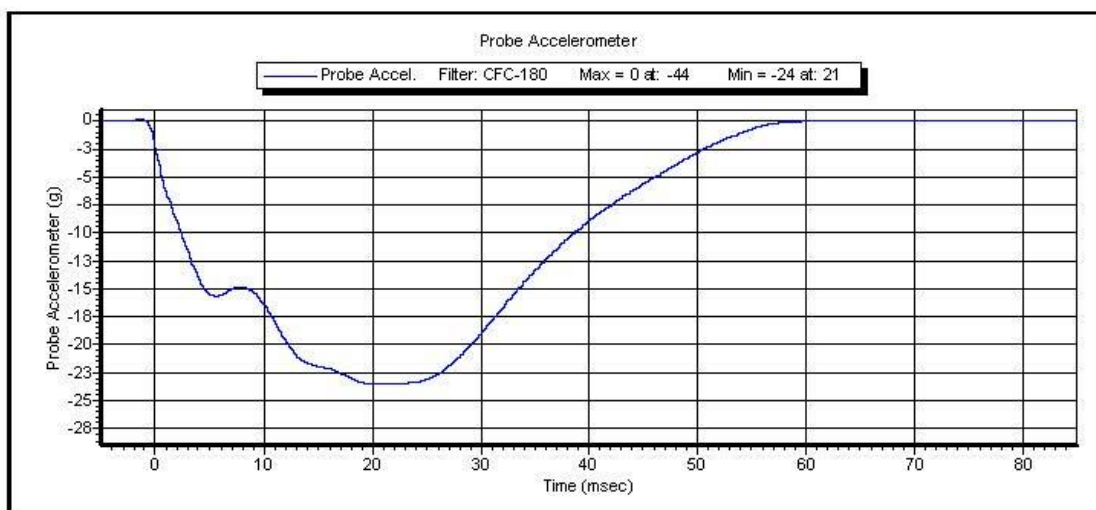


Test ID: **Thorax Impact**

Test Time: **9:12:34 AM**

Test Date: **5/1/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact** Test Time: **9:12:34 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **5/1/2014**



VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Hip ROM Left	Test Date:	4/30/2014
		Test Time:	9:30:50 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.90 deg C P
Humidity	10 -- 70	40.60 %RH P
Average Velocity	5 -- 10	5.4 deg/s P
Angle at 203 Nm	40 -- 50	43.5 degrees P
Moment at 30 degrees	0.0 -- 94.9	64.31 Nm P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



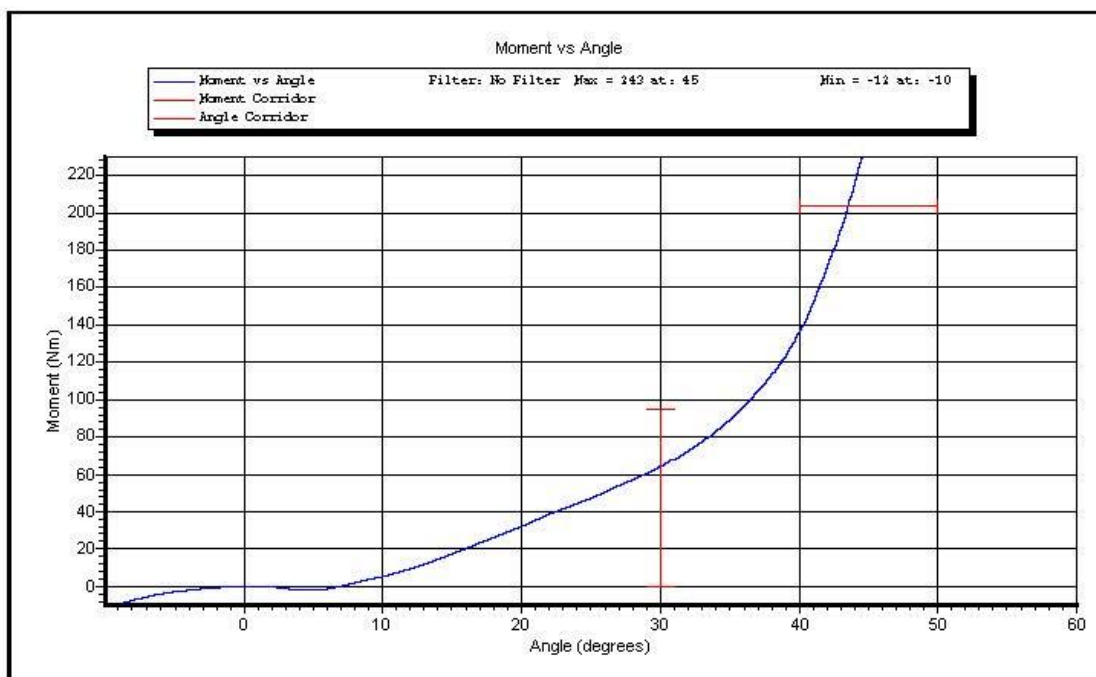
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/25/2014
DentonATD	14 CB1-3615	0008	2/20/2014
DentonATD	A0 Output	1	1/11/2014



Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: Hip ROM Left

Test Time: 9:30:50 AM

Test Date: 4/30/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Hip ROM Right	Test Date:	4/30/2014
		Test Time:	9:21:04 AM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	20.90 deg C	P
Humidity	10	--	70	40.60 %RH	P
Average Velocity	5	--	10	5.8 deg/s	P
Angle at 203 Nm	40	--	50	42.1 degrees	P
Moment at 30 degrees	0.0	--	94.9	79.17 Nm	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



VERIFICATION REPORT

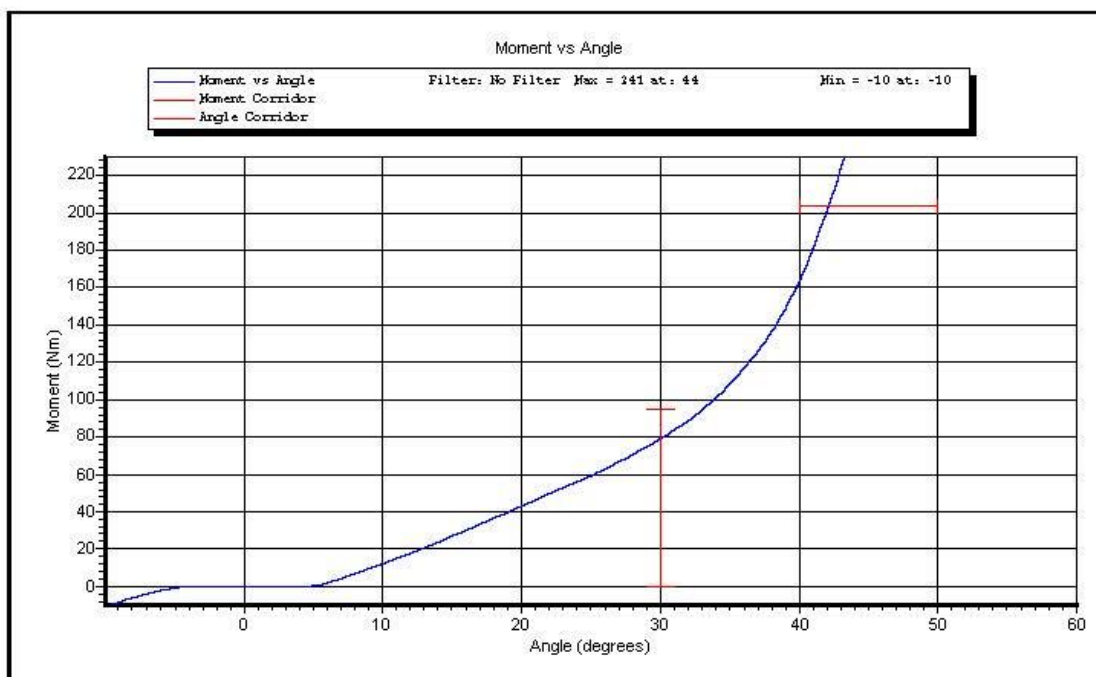
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/25/2014
DentonATD	14 CB1-3615	0008	2/20/2014
DentonATD	A0 Output	1	1/11/2014

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0



Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: Hip ROM Right

Test Time: 9:21:04 AM

Test Date: 4/30/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Knee Impact Left	Test Date:	4/30/2014
		Test Time:	8:42:04 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.80 deg C P
Humidity	10 -- 70	39.60 %RH P
Velocity	2.07 -- 2.13	2.096 m/s P
Resistive Force	-5.780 -- -4.720	-5.596 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



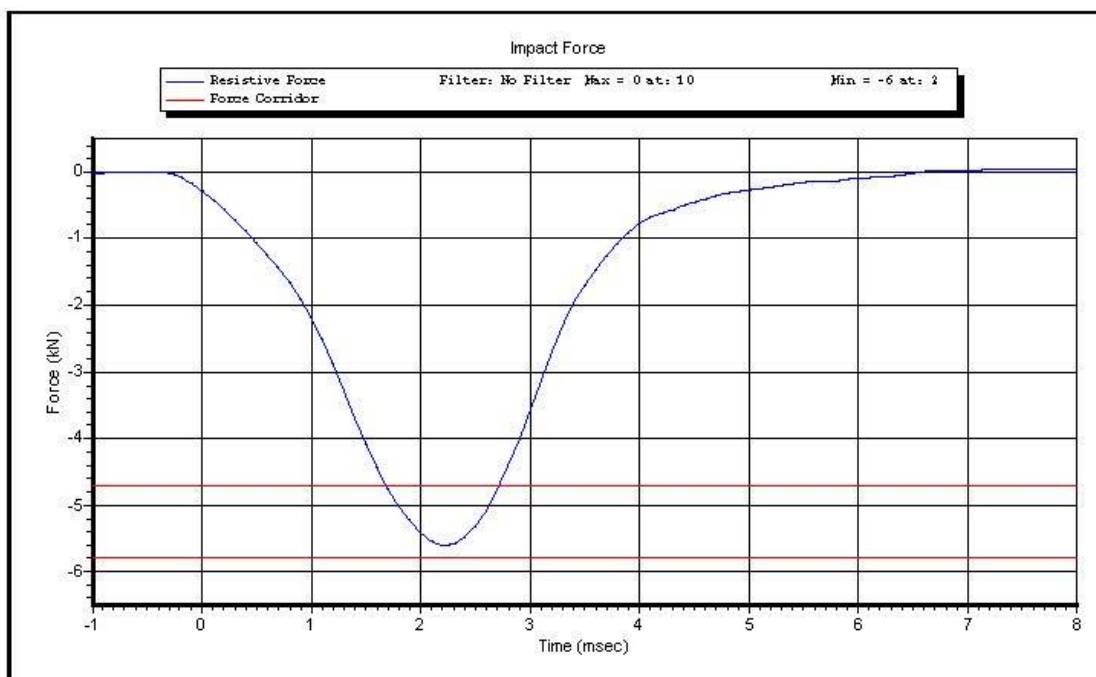
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

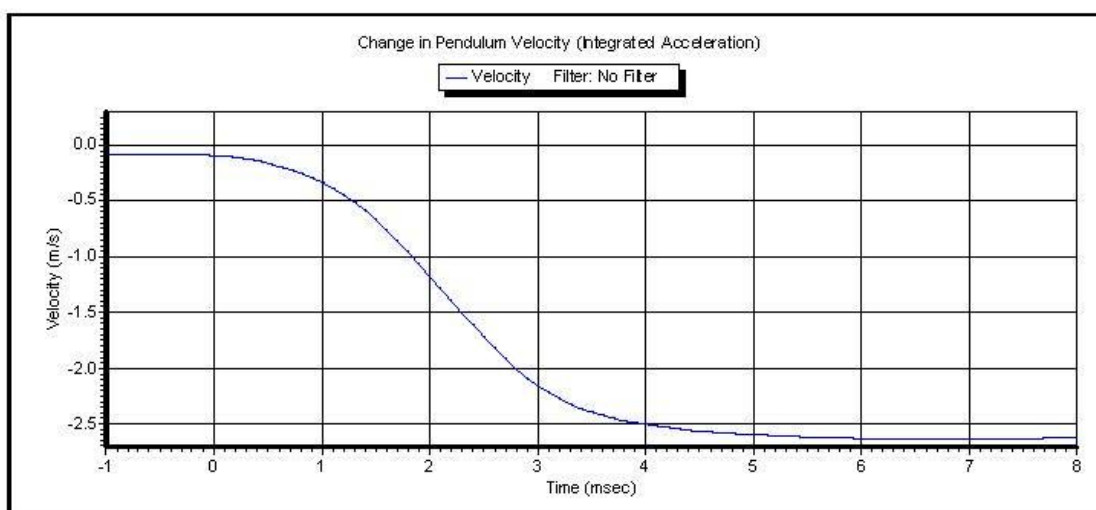
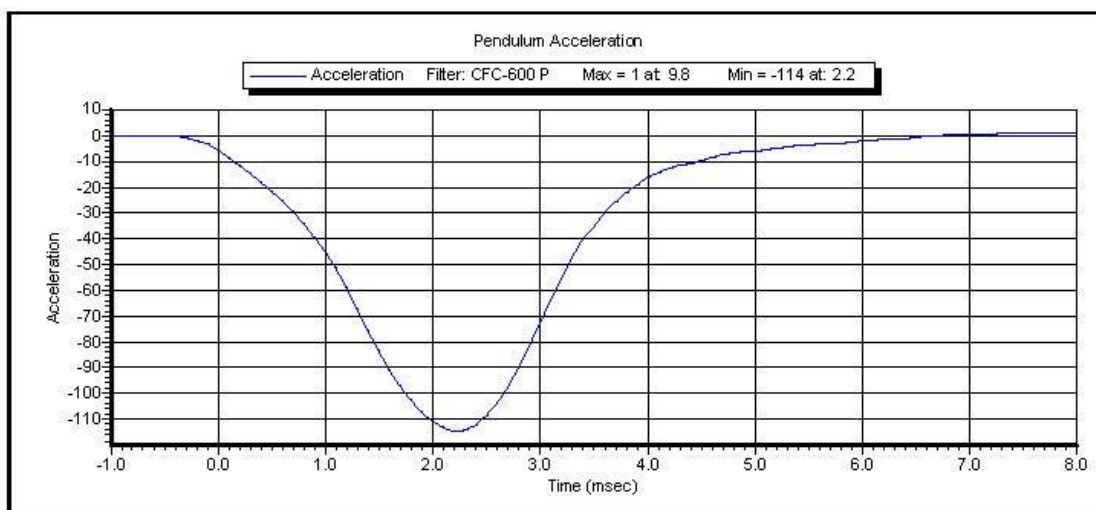


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Knee Impact Left** Test Time: **8:42:04 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/30/2014**



Test ID: **Knee Impact Left** Test Time: **8:42:04 AM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	064		
Test ID:	Knee Impact Right	Test Date:	4/30/2014
		Test Time:	8:52:04 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.80 deg C P
Humidity	10 -- 70	39.60 %RH P
Velocity	2.07 -- 2.13	2.096 m/s P
Resistive Force	-5.780 -- -4.720	-5.676 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

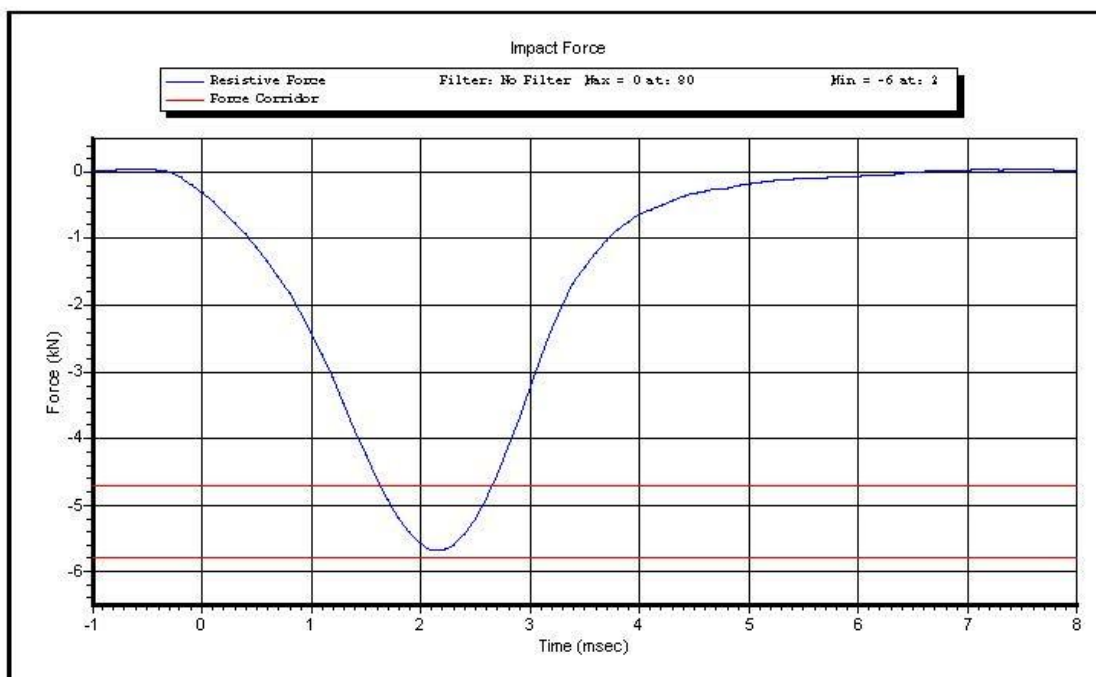
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0



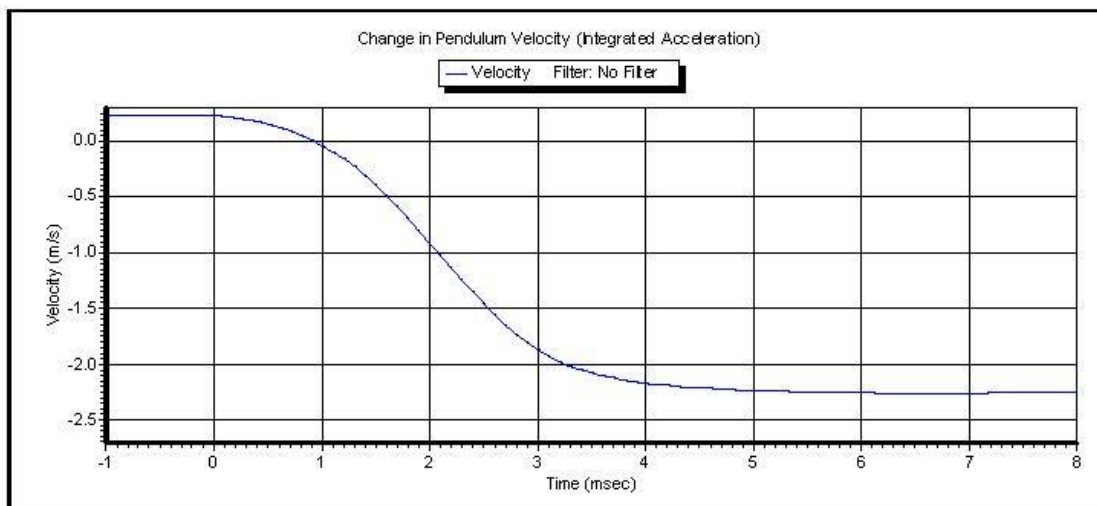
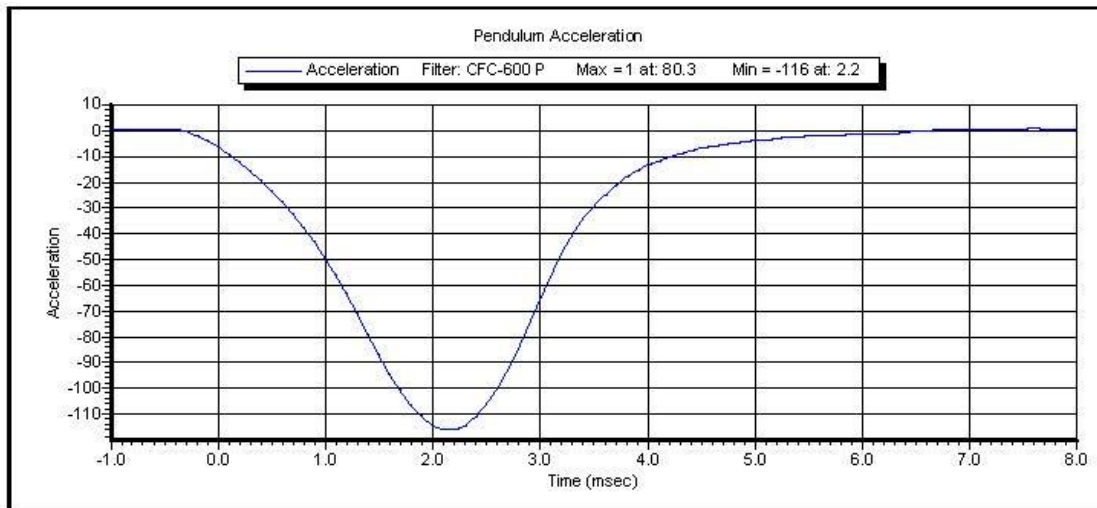
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Knee Impact Right** Test Time: **8:52:04 AM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Knee Impact Right** Test Time: **8:52:04 AM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 288



External Measurements

5th Female SN 288

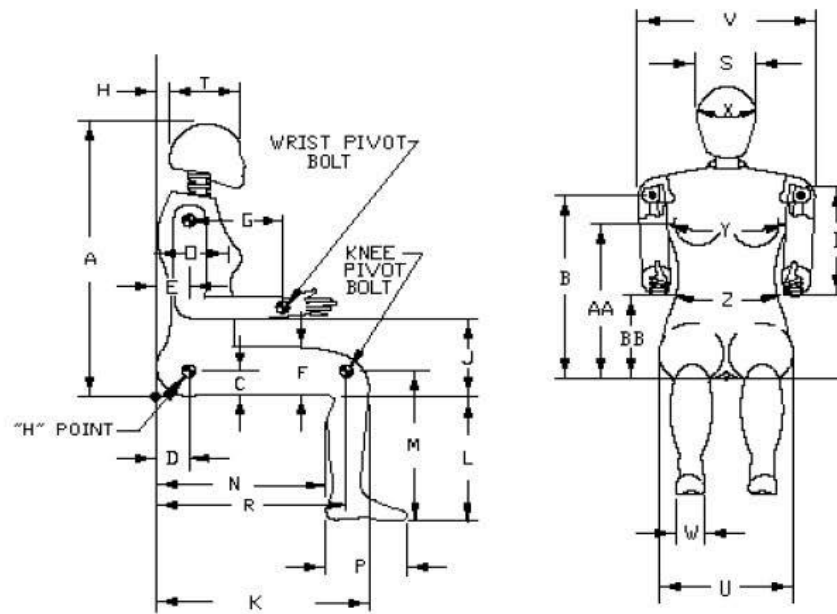
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	780	Yes
B	Shoulder Pivot Height	431.8 – 457.2	439	Yes
C	H-Point Height	81.3 – 86.3	83	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	75	Yes
F	Thigh Clearance	119.4 – 134.6	124	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	247	Yes
H	Head Back to Backline	43.2 – 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	281	Yes
J	Elbow Rest Height	182.8 – 203.2	189	Yes
K	Buttock to Knee Length	520.7 – 546.1	540	Yes
L	Popliteal Height	355.6 – 376	368	Yes
M	Knee Pivot Height	393.7 – 419.1	399	Yes
N	Buttock Popliteal Length	414 – 439.4	430	Yes
O	Chest Depth without Jacket	175.3 – 190.5	179	Yes
P	Foot Length (right)	218.5 – 233.7	223	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	461	Yes
S	Head Breadth	137.1 – 147.3	142	Yes
T	Head Depth	177.8 – 188	181	Yes
U	Hip Breadth	299.7 – 314.9	303	Yes
V	Shoulder Breadth	350.5 – 365.7	359	Yes
W	Foot Breadth	78.8 – 94	82	Yes
X	Head Circumference	528.3 – 548.7	540	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	856	Yes
Z	Waist Circumference	759.5 – 789.9	781	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	343	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	164	Yes

Technician: M. Geesey

Date: 04/30/2014

Hybrid III 5th Female External Measurements

Reference Diagram





VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Head Drop	Test Date:	4/30/2014
		Test Time:	2:09:21 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.20 deg C P
Humidity	10 -- 70	42.20 %RH P
Resultant Acceleration	250 -- 300	270.0 G's P
Oscillation	0 -- 10	0.0 % P
Lateral Acceleration	-15 -- 15	2.5 G's P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



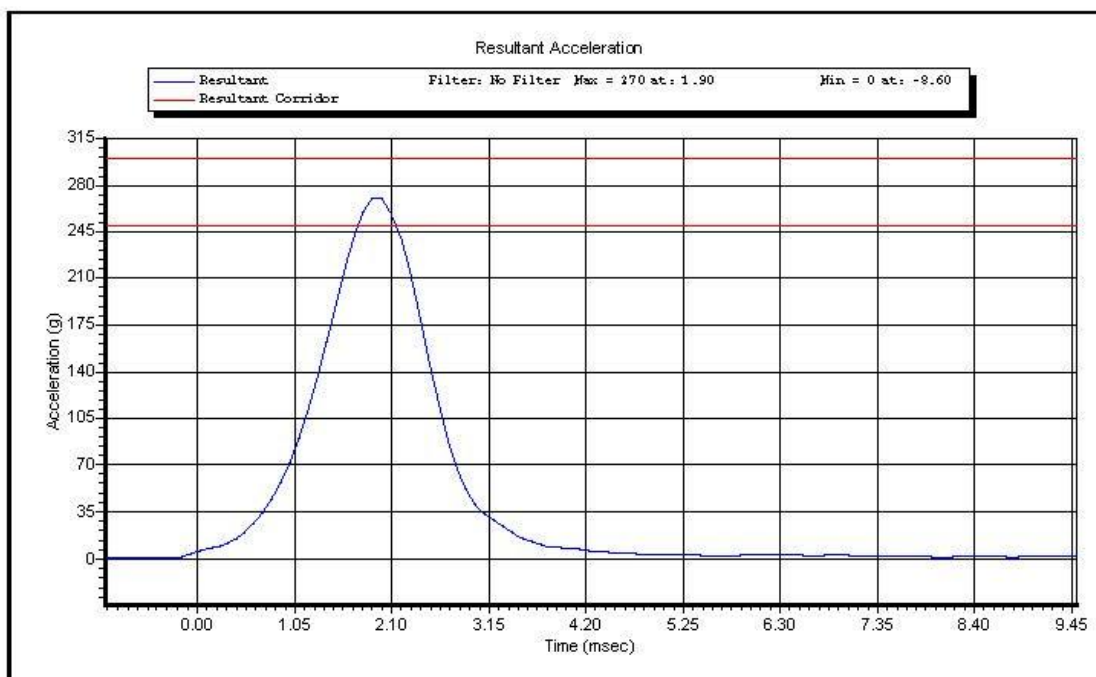
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51682	11/21/2013
Endevco	7264-2000	P51685	11/21/2013
Endevco	7264-2000	P51699	11/21/2013



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288

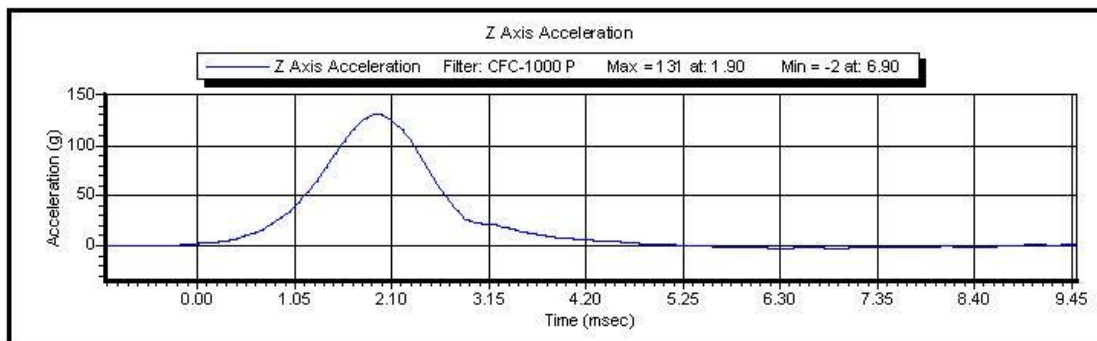
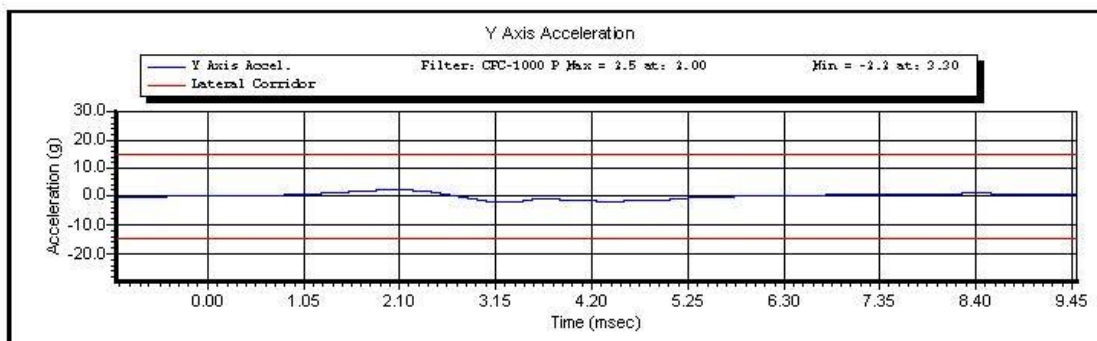
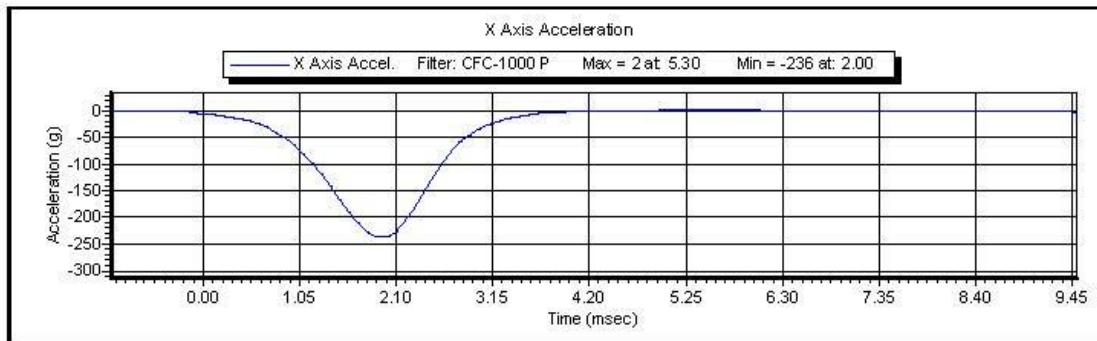


Test ID: **Head Drop**

Test Time: **2:09:21 PM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **2:09:21 PM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Neck Extension	Test Date:	4/30/2014
		Test Time:	12:31:59 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.20 deg C P
Humidity	10 -- 70	41.40 %RH P
Velocity	5.95 -- 6.19	6.008 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.79 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.58 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	5.19 m/s P
D Plane Rotation	99 -- 114	103.6 degrees P
Moment During Rotation Interval	-65 -- -53	-63.9 Nm P
Moment Decay to -10.0 Nm	94 -- 114	98.4 ms P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **E. Dutton**



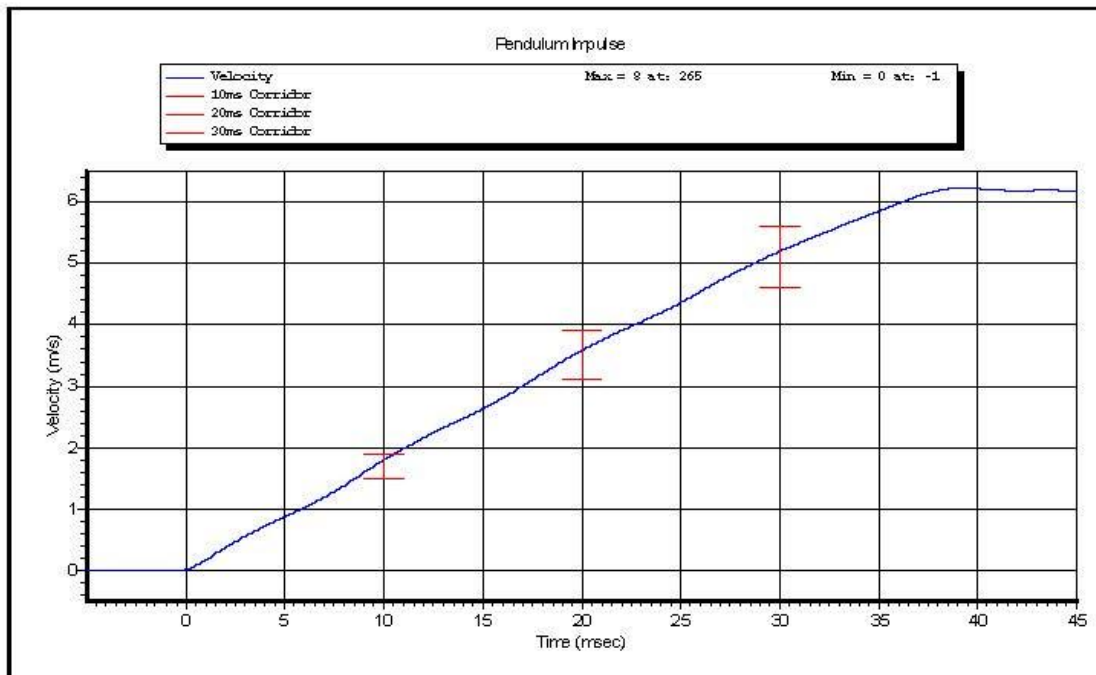
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	4/30/2014
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013



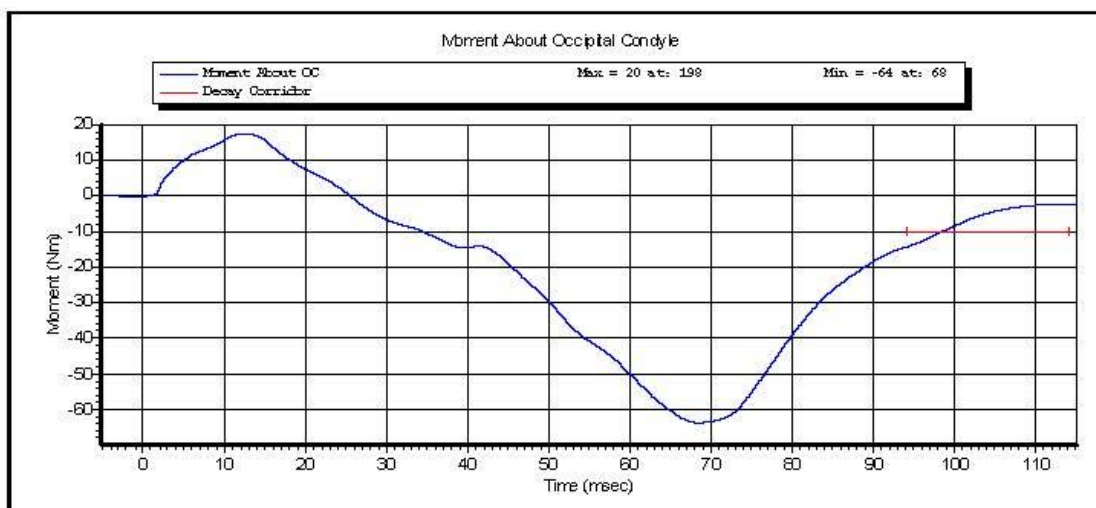
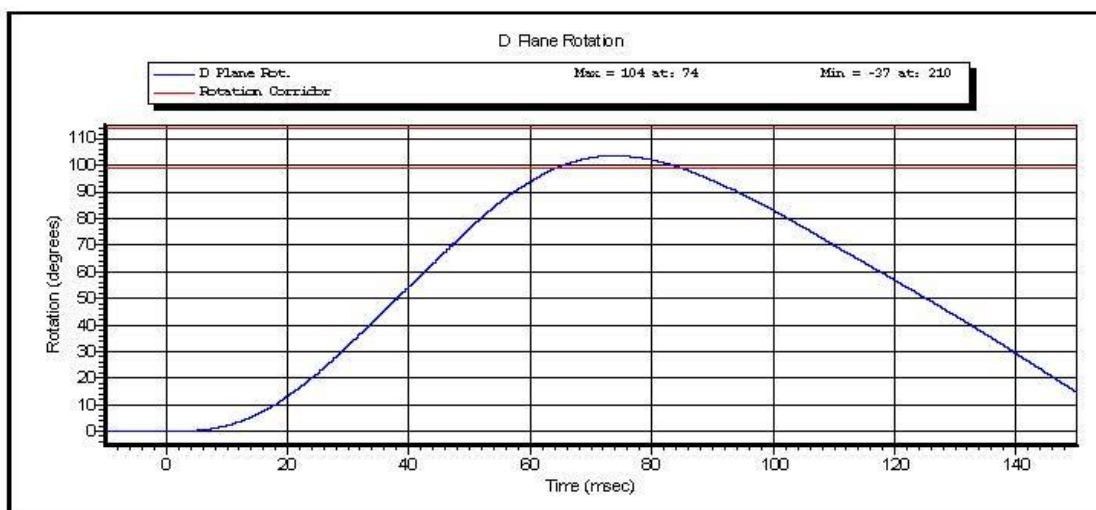
Test Name:	Neck Extension
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: **Neck Extension** Test Time: **12:31:59 PM**

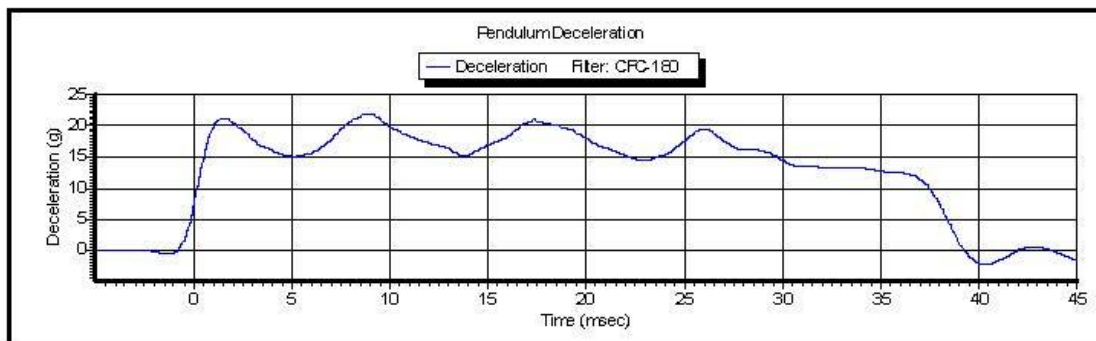
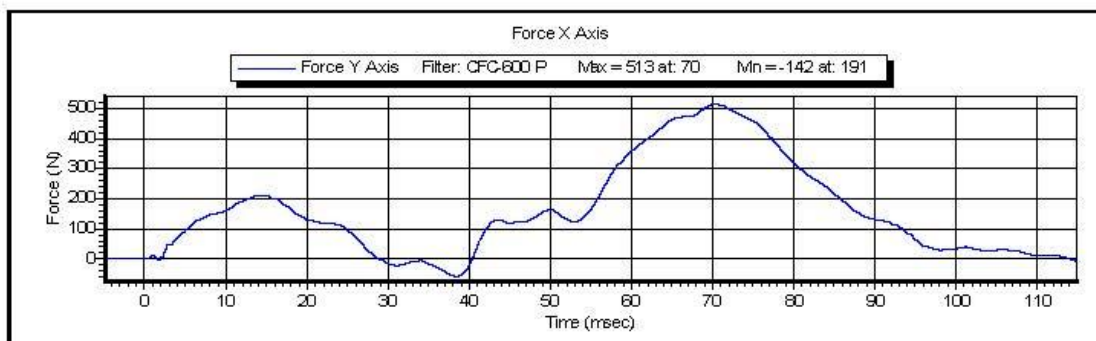
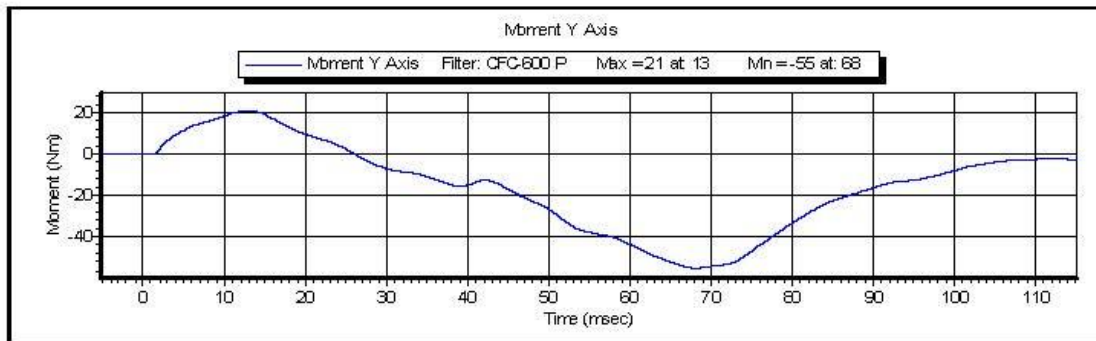
Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **12:31:59 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/30/2014**



Test ID: **Neck Extension** Test Time: **12:31:59 PM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Neck Flexion	Test Date:	4/30/2014
		Test Time:	12:01:36 PM

Test Parameters	Test Specifications	Test Results
Temperature	21 -- 22	21.30 deg C P
Humidity	10 -- 70	41.40 %RH P
Velocity	6.89 -- 7.13	6.976 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.16 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.3 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	6.09 m/s P
D Plane Rotation	-91 -- -77	-81.8 degrees P
Moment During Rotation Interval	69 -- 83	76.7 Nm P
Moment Decay to 10.0 Nm	80 -- 100	90.0 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



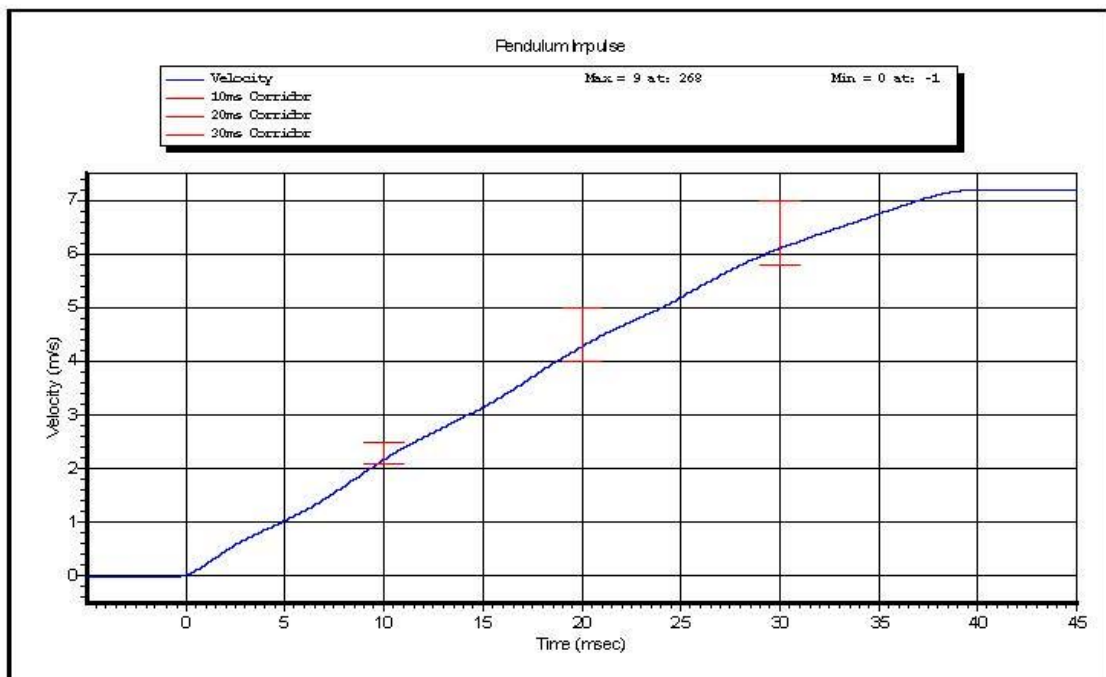
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	4/30/2014
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013



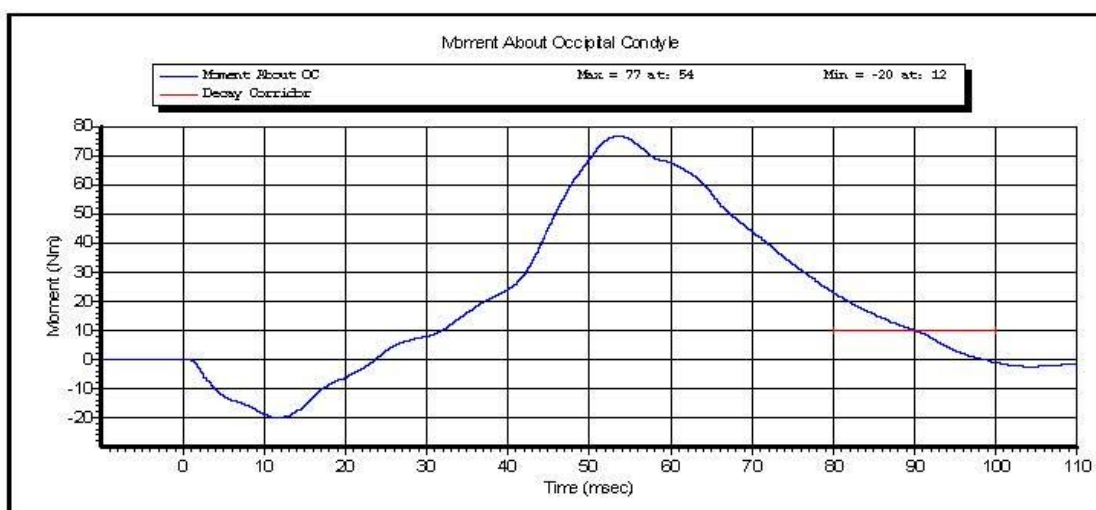
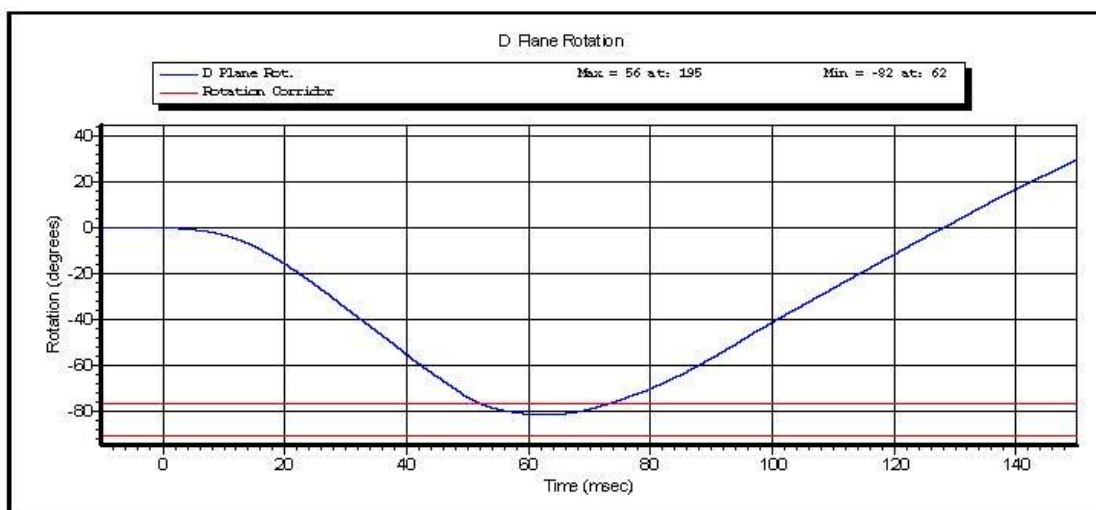
Test Name:	Neck Flexion
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: Neck Flexion Test Time: 12:01:36 PM

Test Date: 4/30/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

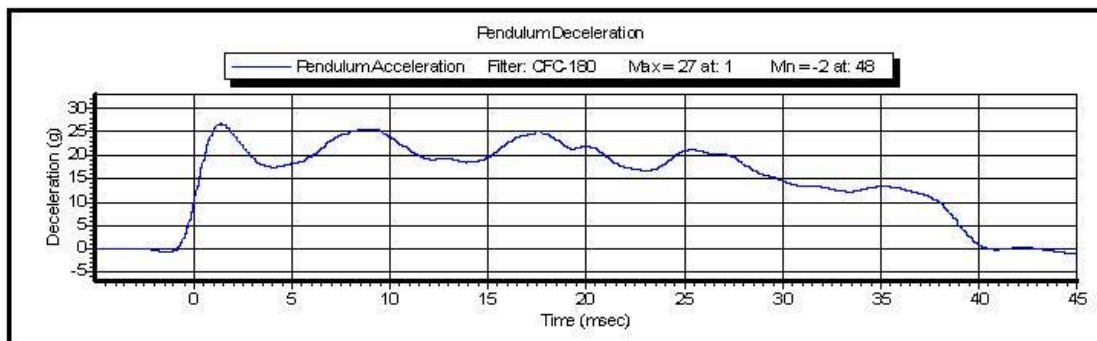
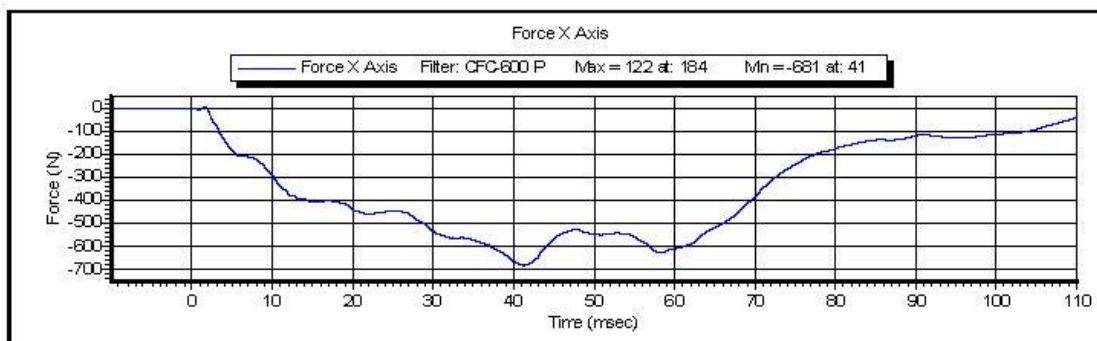
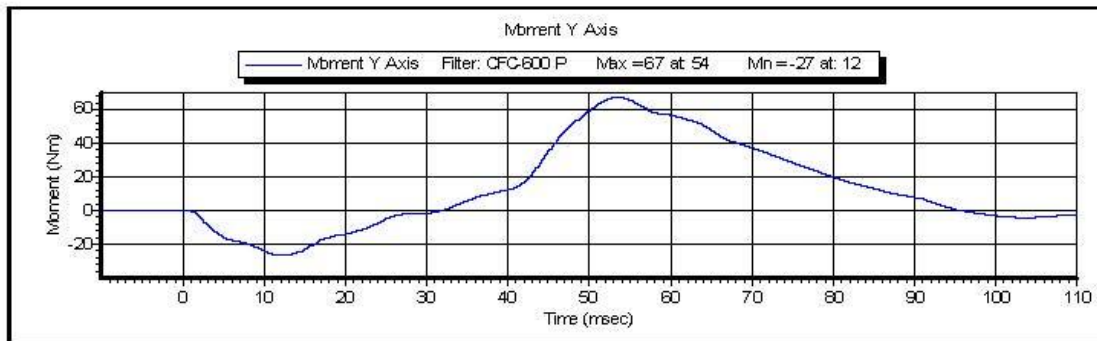


Test ID: **Neck Flexion**

Test Time: **12:01:36 PM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Flexion**

Test Time: **12:01:36 PM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Thorax Impact	Test Date:	4/30/2014
		Test Time:	10:40:59 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.90 deg C	P
Humidity	10	--	70	41.30 %RH	P
Velocity	6.59	--	6.83	6.807 m/s	P
Sternum Displacement	-58	--	-50	-52.3 mm	P
Force During Displacement Interval	-4400	--	-3900	-4205.8 N	P
Force During -18mm to -50mm Displacem	-4600	--	0	-4251.9 N	P
Hysteresis	69	--	85	73.7 %	P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **E. Dutton**



VERIFICATION REPORT

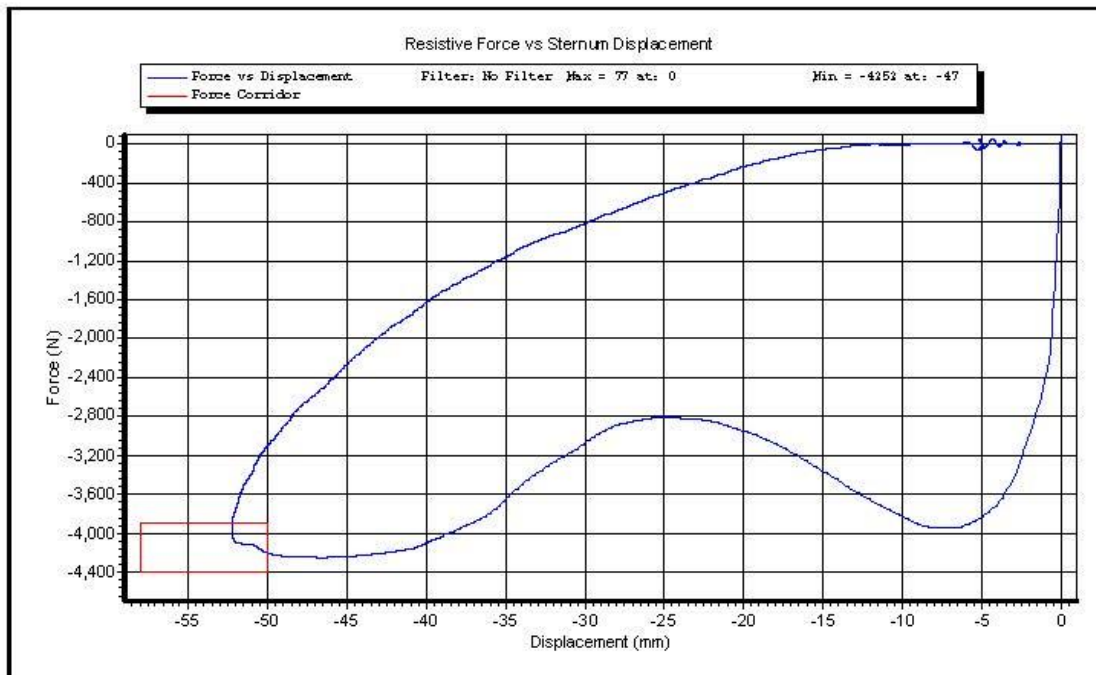
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
SERVO	14 CB1-2897	DS-288	11/21/2013

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0



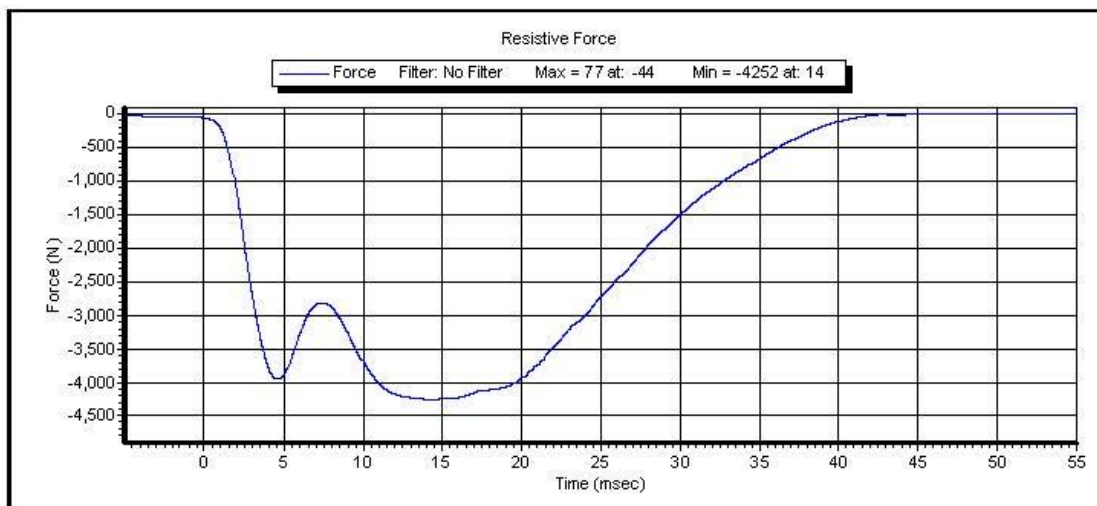
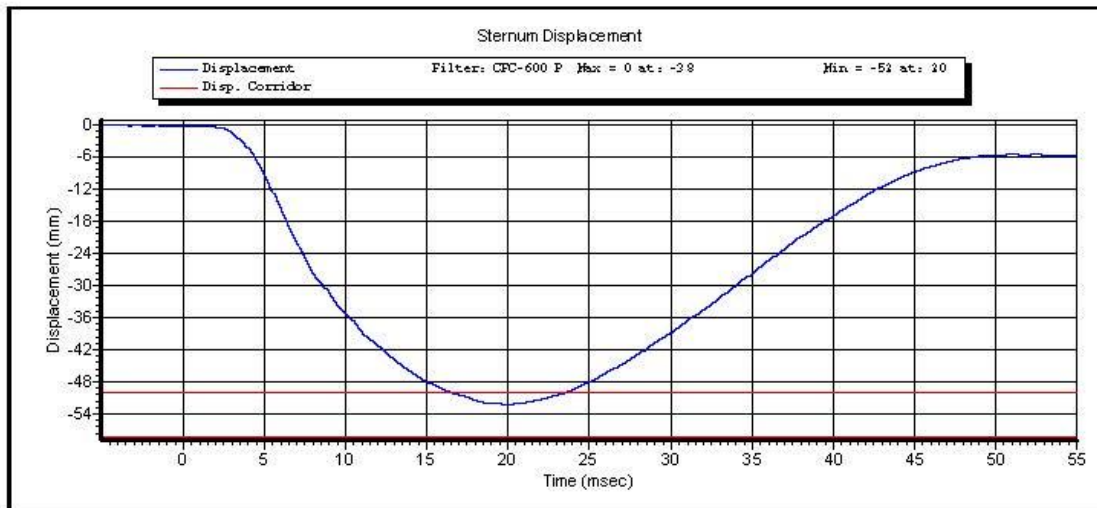
Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: **Thorax Impact** Test Time: **10:40:59 AM**

Test Date: **4/30/2014**

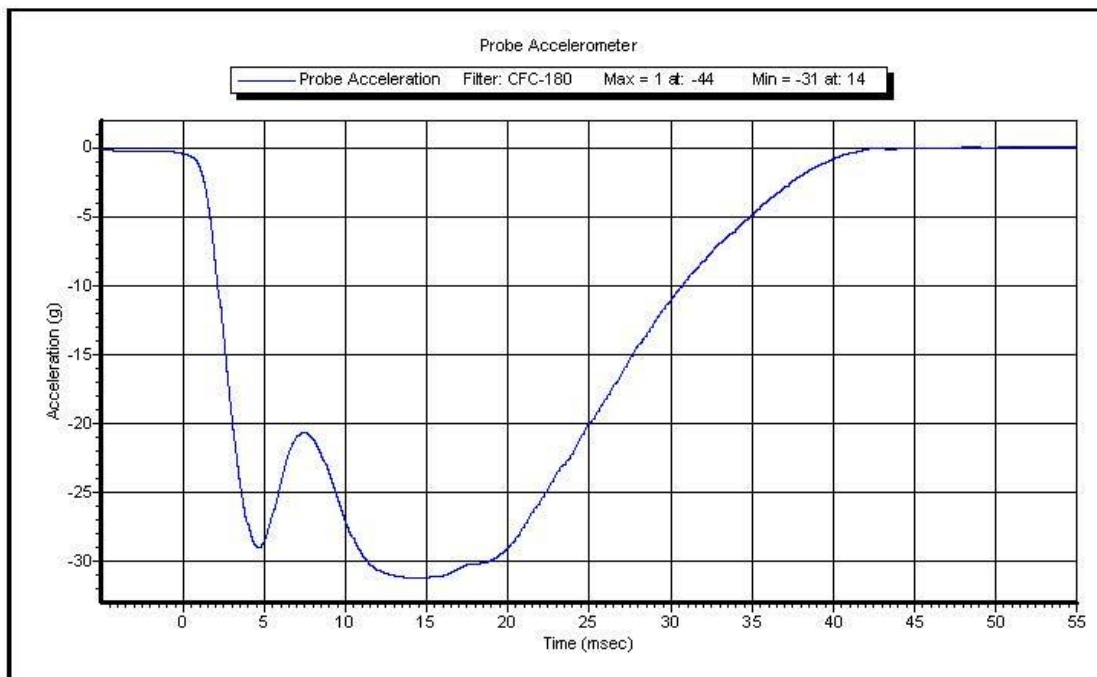
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact** Test Time: **10:40:59 AM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **10:40:59 AM**

Test Date: **4/30/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Torso Flexion

Part 572O HIII 5% Female

ATD Serial No: 288

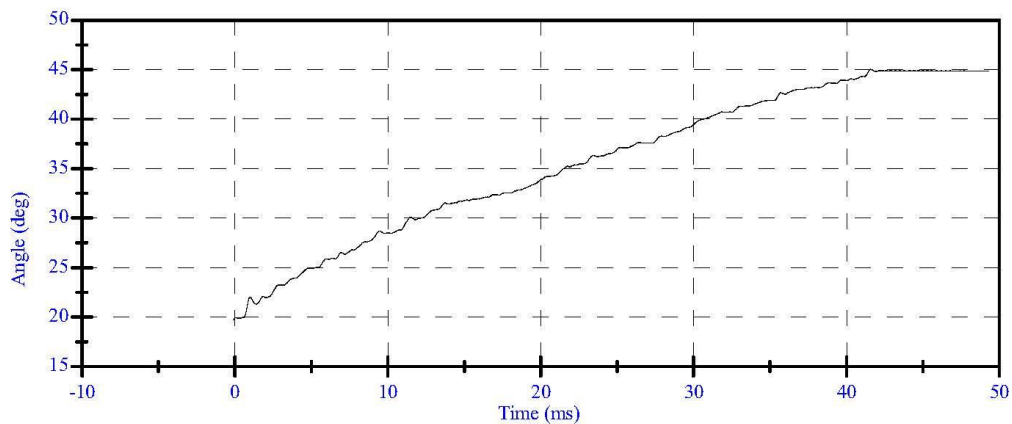
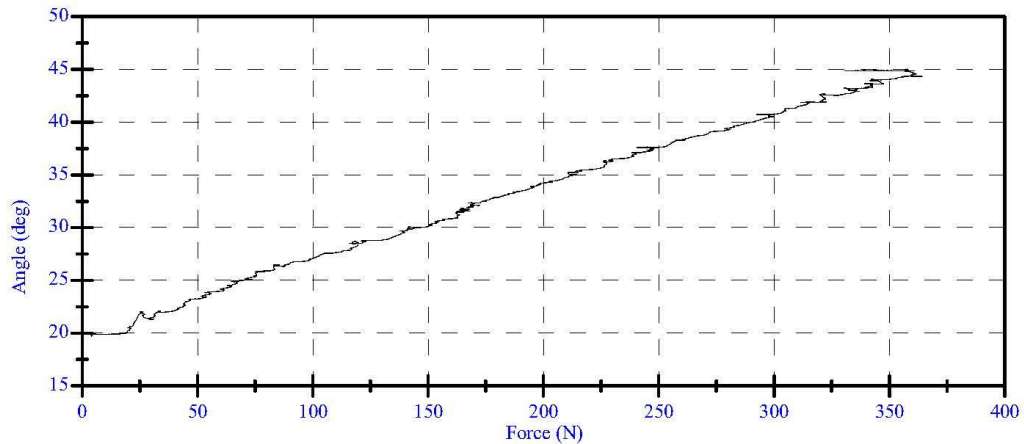
Laboratory Supervisor: E. Dutton

Date: 04/30/2014

Laboratory Technician: M. Geesey

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.4 C	Passed
Lab Humidity:	10-70 %	43.1%	Passed
Initial Angle:	0.00-20.00 Deg	18.3 Deg	Passed
Force at 45 Deg	320.00-390.00 N	364.24 N	Passed
Return Angle	8 Deg Max from Initial	25.7 deg	Passed

TORSO FLEXION TEST





VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Knee Impact Left	Test Date:	4/29/2014
		Test Time:	3:16:02 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.70 deg C P
Humidity	10 -- 70	40.90 %RH P
Velocity	2.07 -- 2.13	2.118 m/s P
Resistive Force	-4060 -- -3450	-3648.5 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



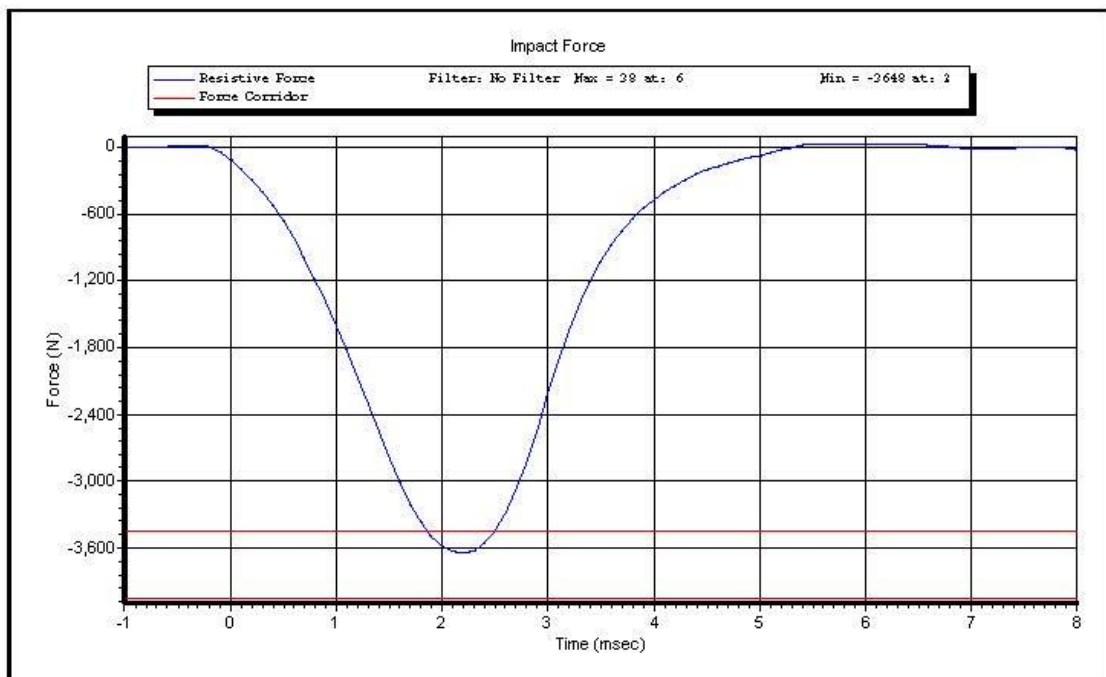
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

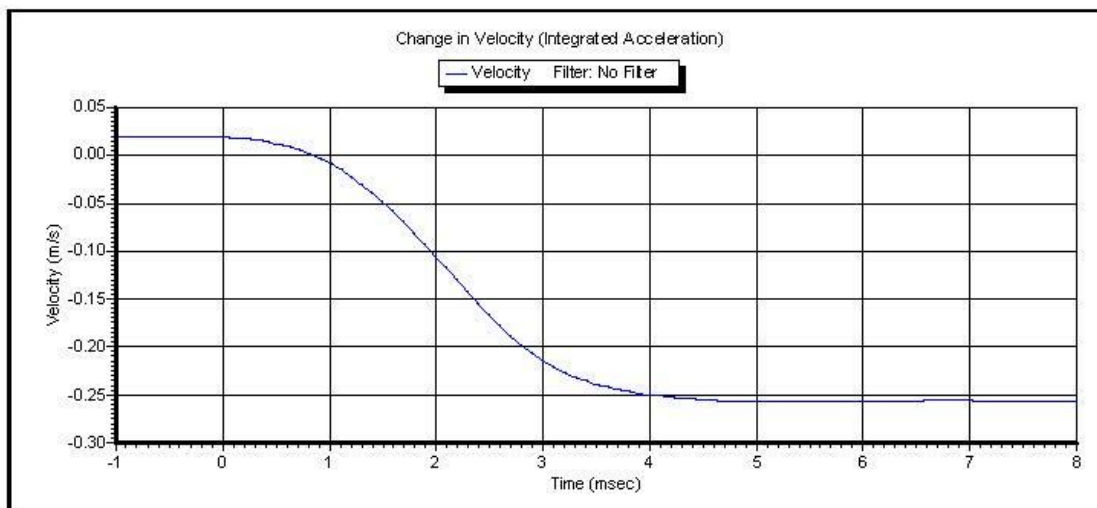
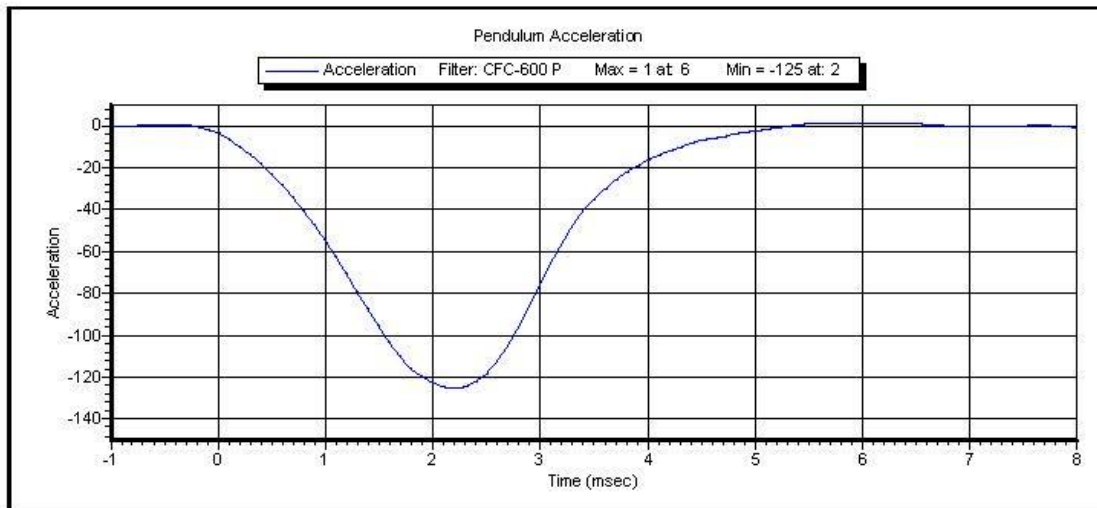


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: **Knee Impact Left** Test Time: **3:16:02 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/29/2014**



Test ID: **Knee Impact Left** Test Time: **3:16:02 PM**

Test Date: **4/29/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	288		
Test ID:	Knee Impact Right	Test Date:	4/29/2014
		Test Time:	3:20:48 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.70 deg C P
Humidity	10 -- 70	40.90 %RH P
Velocity	2.07 -- 2.13	2.115 m/s P
Resistive Force	-4060 -- -3450	-3578.7 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

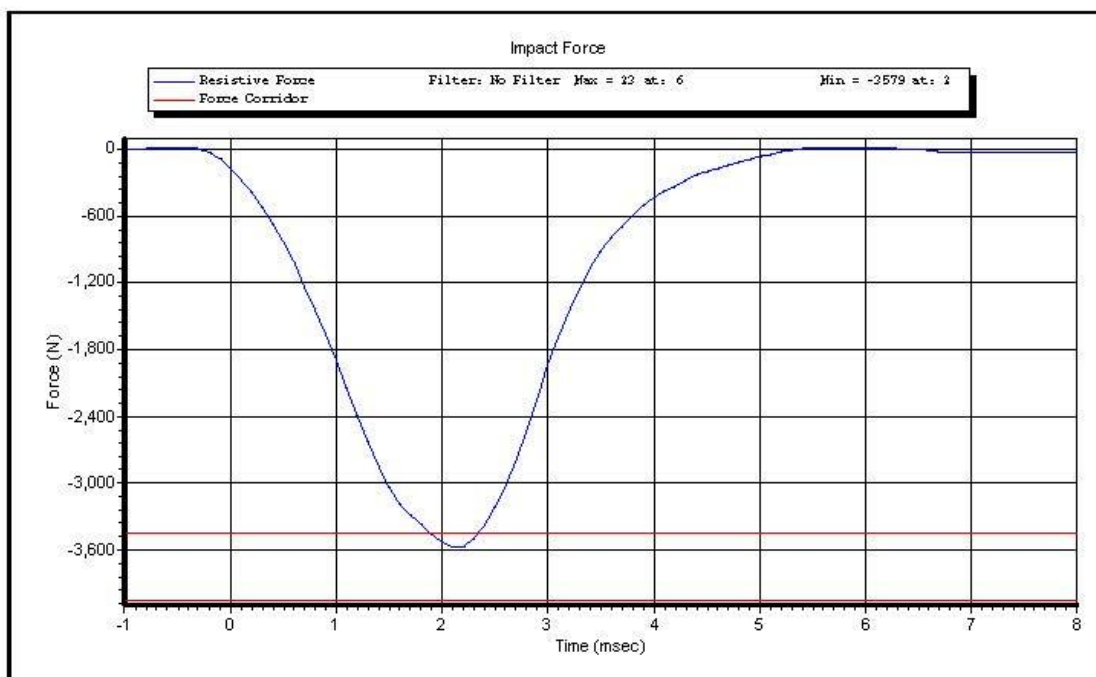
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 12/4/2013

Copyright 2006 Denton ATD, Inc. LabPac II Version: 1.8.5.0

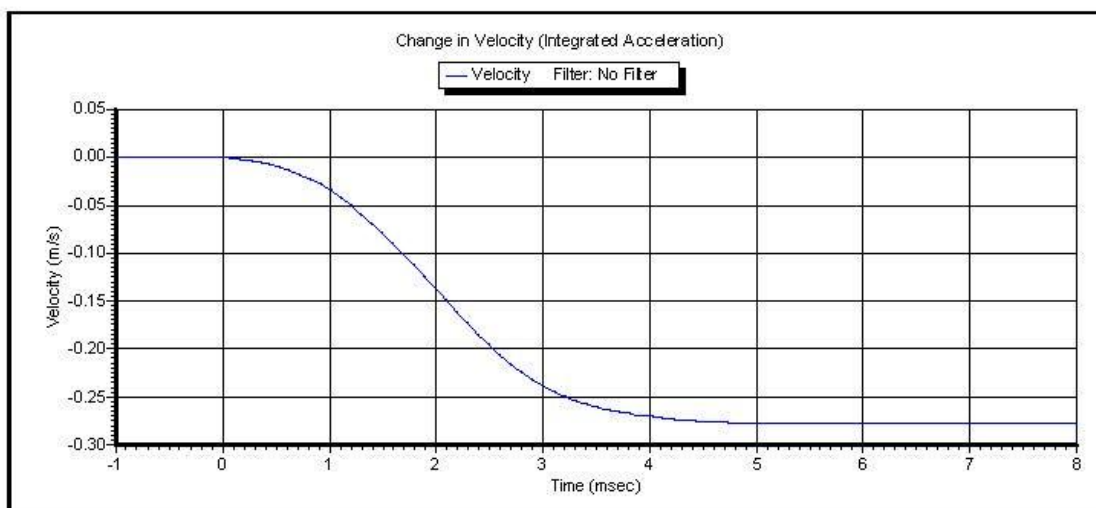
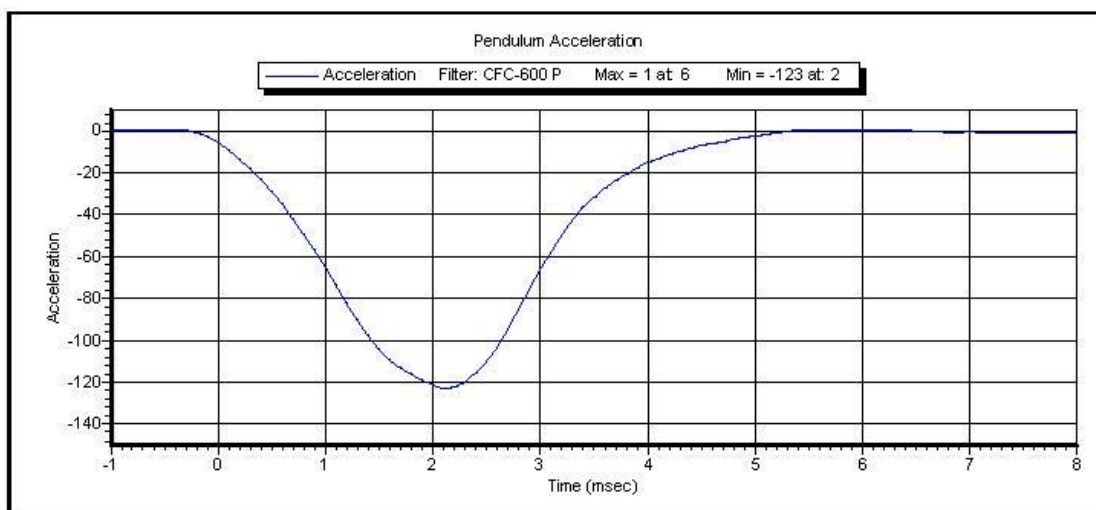


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	288



Test ID: **Knee Impact Right** Test Time: **3:20:48 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **4/29/2014**



Test ID: **Knee Impact Right** Test Time: **3:20:48 PM**

Test Date: **4/29/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0