

REPORT NUMBER: NCAP-CAL-14-015

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

**General Motors LLC
2015 Chevrolet Silverado
2500 Double Cab**

NHTSA No: M20150103

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



May 29, 2014

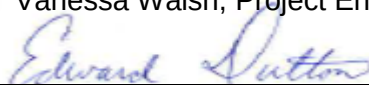
FINAL REPORT

**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-14-015		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 2015 Chevrolet Silverado 2500 Double Cab NHTSA No.: M20150103				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 11, 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 2015 Chevrolet Silverado 2500 Double Cab 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 11, 2014. The impact velocity of the vehicle was 56.54 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 686 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. 273)</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>504.08</td> <td>700</td> <td>434.55</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-39.56</td> <td>52</td> <td>-39.28</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.30</td> <td>1</td> <td>0.50</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>1665.30</td> <td>2,620</td> <td>1202.10</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-665.38</td> <td>2,520</td> <td>-866.33</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-2635.65</td> <td>6,805</td> <td>-1843.52</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-2896.59</td> <td>6,805</td> <td>-1931.68</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD (Serial No. 064)		Passenger ATD (Serial No. 273)		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)		700	504.08	700	434.55	Maximum Chest Compression	mm	63	-39.56	52	-39.28	Nij		1	0.30	1	0.50	Neck Tension	N	4,170	1665.30	2,620	1202.10	Neck Compression	N	4,000	-665.38	2,520	-866.33	Left Femur Force	N	10,008	-2635.65	6,805	-1843.52	Right Femur Force	N	10,008	-2896.59	6,805	-1931.68
Measurement Description	Units	Driver ATD (Serial No. 064)		Passenger ATD (Serial No. 273)																																																					
		Threshold	Result	Threshold	Result																																																				
Head Injury Criteria (HIC ₁₅)		700	504.08	700	434.55																																																				
Maximum Chest Compression	mm	63	-39.56	52	-39.28																																																				
Nij		1	0.30	1	0.50																																																				
Neck Tension	N	4,170	1665.30	2,620	1202.10																																																				
Neck Compression	N	4,000	-665.38	2,520	-866.33																																																				
Left Femur Force	N	10,008	-2635.65	6,805	-1843.52																																																				
Right Femur Force	N	10,008	-2896.59	6,805	-1931.68																																																				
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 2015 Chevrolet Silverado 2500 Double Cab at a velocity of 56.54 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on April 11, 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. 273) were calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

The 100 channels of data were recorded on an on-board data acquisition system. Please refer to Appendix B for the dummy response data traces.

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was a total of 0.0 grams of stoddard solvent leakage after the event and including all phases of the static rollover. The maximum static crush of the test vehicle was 686 mm at the vehicles centerline. During and after the impact event, the driver's and passenger's side doors were closed and operational.

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

The passenger's visible contact points were as follows: The passenger's head contacted the frontal airbag and then the head restraint and 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)	504.08	0.30	1665.30	-665.38	49.59	-39.56	-2635.65	-2896.59
Passenger (5 th)	434.55	0.50	1202.10	-866.33	54.87	-39.28	-1843.52	-1931.68

GENERAL COMMENTS:

1. P1 (Driver) serial number - 064
2. P2 (Passenger) serial number - 273

Data Anomalies:

- Driver Right Foot (Aft) Az – Questionable after 62 ms

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: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20150103	Traction Control System (TCS)	Yes
Model Year	2015	Power Steering	Yes
Make	Chevrolet	Power Window Auto-Reverse	No
Model	2500 Double Cab	Driver Frontal Airbag	Yes
Body Style	Truck	Driver Curtain Airbag	Yes
VIN	1GC2KUEG7FZ106918	Driver Head/Torso Airbag	No
Body Color	Silver	Driver Torso Airbag	No
Odometer Reading (km /mi)	315.4 km / 196 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	6.0	Driver Pelvis Airbag	No
Type / No. Cylinders	V8	Driver Knee Airbag	No
Engine Placement	Inline	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6-Speed	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	All Wheel Drive	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	No	Front Pass. Knee Airbag	No
Running Boards	Yes	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 LLC	GVWR (kg)	4309
Date of Manufacture	02/14	GAWR Front (kg)	2540
		GAWR Rear (kg)	2812

VEHICLE SEATING AND WEIGHT CAPACITY DATA

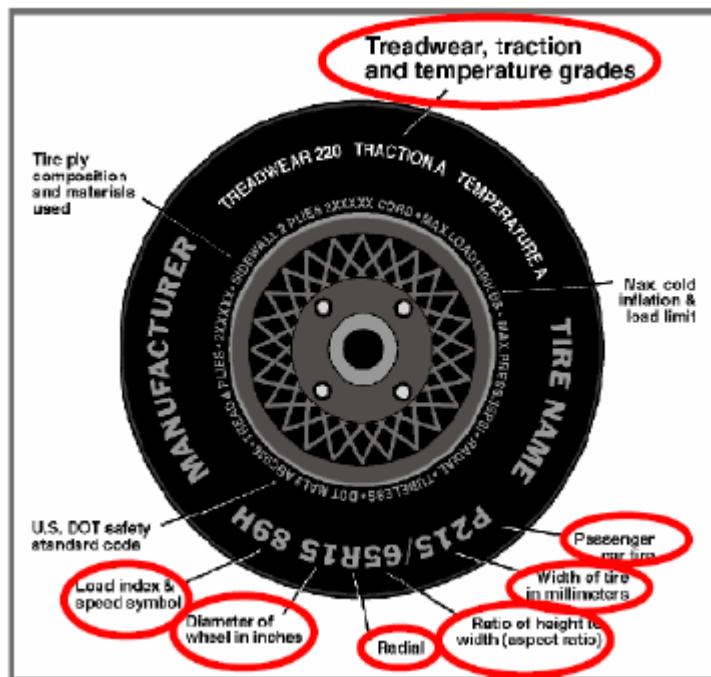
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Bench	-	
Number of Occupants	3	3	-	6
Capacity Wt. (VCW) (kg)				1300
Cargo Wt. (RCLW) (kg)				136

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

Test Vehicle:	2015 Chevrolet Silverado 2500 Double Cab
Test Program:	NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
Test Date: 4/11/2014

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



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	550	550
Cold Pressure (kPa)	480	550
Recommended Tire Size	LT245/75R17	LT245/75R17
Tire Size on Vehicle	LT245/75R17	LT245/75R17
Tire Manufacturer	Firestone	Firestone
Tire Model	Transforce HT	Transforce HT
Treadwear	N/A	N/A
Traction	N/A	N/A
Temperature Grades	N/A	N/A
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	E 121/118R	E 121/118R
Tire Material	Rubber	Rubber
DOT Safety Code Left	8X43TH24813	8X43TH24813
DOT Safety Code Right	8X43TH24813	8X43TH24713

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

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	885	635		931	710	
Right	kg	855	632		908	728	
Ratio	%	57.8%	42.2%		56.1%	43.9%	
Totals	kg	1740	1267	3007	1839	1438	3277

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	3007	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.7	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	136	(C)
Calculated Vehicle Target Weight (TVTW)	kg	3283.7	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	1020	1019	1089	1098	1696
As Tested	mm	1002	1015	1081	1082	1767
Post-Test	mm	986	1062	1057	1122	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	4026
Total Vehicle Length at Left Side	mm	6278
Total Vehicle Length at Centerline	mm	6374
Total Vehicle Length at Right Side	mm	6278
Weight of Ballast in Cargo Area	kg	102.1
Weight of Vehicle Components Removed	kg	2
Amount of Stoddard Solvent in Fuel Tank	L	125.7

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Jack

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

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	6374
2	Total Width	1997
3*	Bumper Top Height	726
4*	Bumper Bottom Height	509
5*	Longitudinal Member Top Height	646
6	Distance Between Longitudinal Members	911
7	Longitudinal Member Width	86
8*	Engine Top Height	1159
9*	Engine Bottom Height	362
10	Engine and Gearbox Width	521
11	Front Bumper-Engine Distance	854
12*	Front Shock Absorber Fixing Height	759
13*	Bonnet Leading Edge Height	1240
14	Front Shock Absorber Fixing Width	983
15	Front Bumper – Front Axle Distance	994
16	Front Axle – A Pillar Distance	510
17	A-Pillar – B-Pillar Distance	1210
18	B-Pillar – Rear Axle Distance	2305
19	B-Pillar – C-Pillar Distance	823
20*	Roof Sill Bottom Height	1773
21*	Roof Sill Top Height	1871
22*	Floor Sill Bottom Height	610
23*	Floor Sill Top Height	620

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

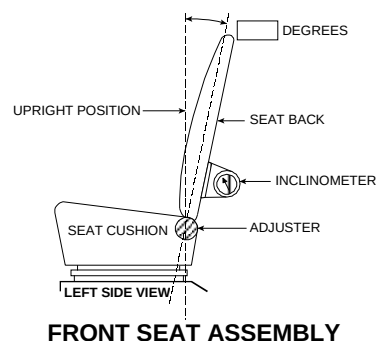
DATA SHEET NO. 2 SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
Test Date: 4/11/2014

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	3.0
Passenger Seat Back Angle	1.9

SEAT FORE / AFT POSITIONS

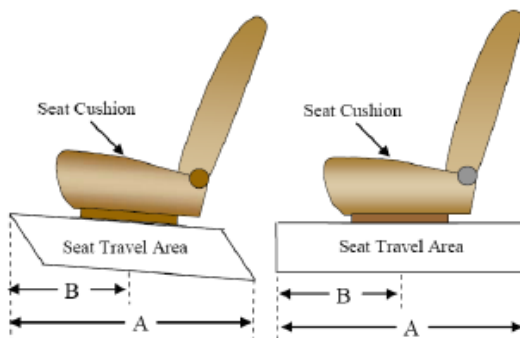
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	0-52	26
Passenger Seat	0-42	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: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

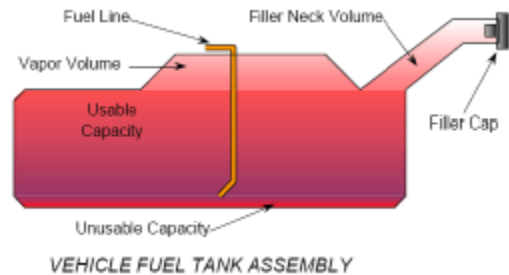
NHTSA No.: M20150103
 Test Date: 4/11/2014

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	135.3
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	124.5 – 127.2
Actual Amount of Solvent Used	125.7
1/3 of Usable Capacity	45.1

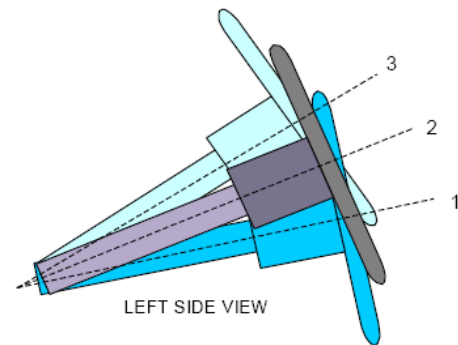
FUEL PUMP

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



STEERING COLUMN ADJUSTMENT

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



STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	10.1	
Geometric center position No. 2	21.3	
Uppermost position No. 3	32.5	
Telescoping Steering Wheel Travel		N/A
Test Position	20.1	N/A

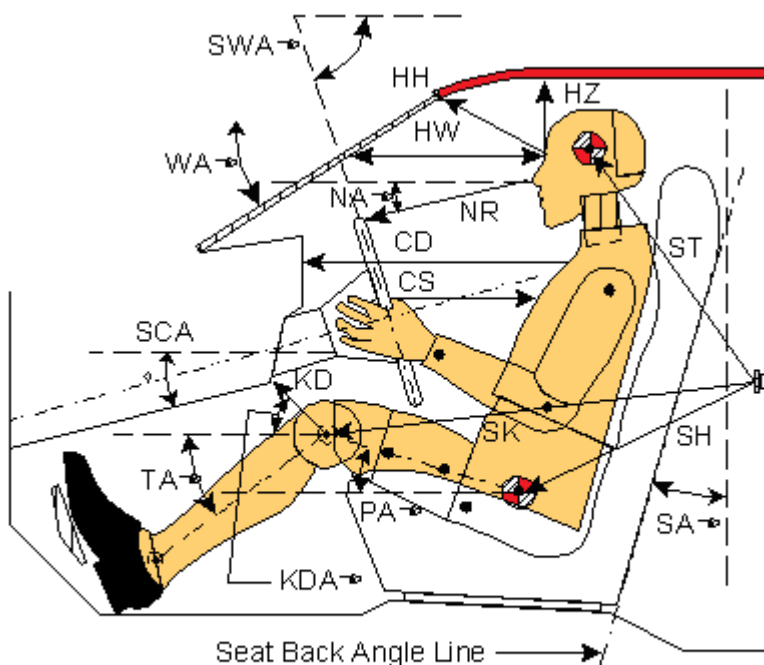
DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab

Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103

Test Date: 4/11/2014



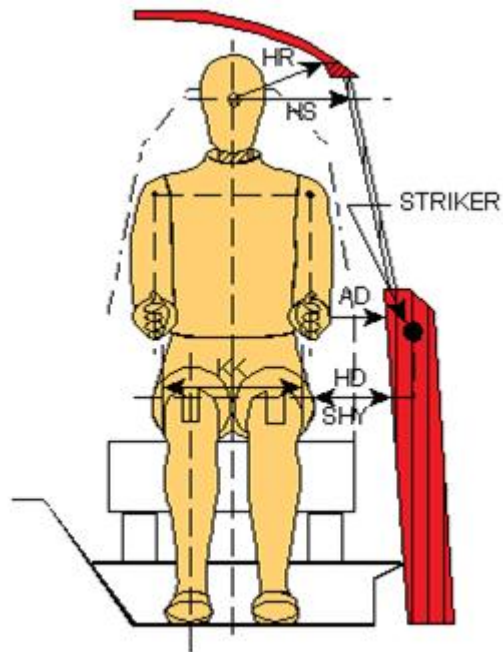
Left Side View

Code	Measurement Description	Driver (SN: 064)		Passenger (SN: 273)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		-31.8		
SWA°	Steering Wheel Angle		20.4		
SCA°	Steering Column Angle		69.6		
SA°	Seat Back Angle (on headrest post)		3.7		1.5
HZ	Head to Roof (Z)	265	90	328	90
HH	Head to Header	483	19.2	445	34.5
HW	Head to Windshield	746	0	749	0
NR	Nose to Rim	418	-8.5	486	17.6
CD	Chest to Dash	556		446	
CS	Chest to Steering Hub	340	-6.9		
RA	Rim to Abdomen	225	0		
KDL	Left Knee to Dash	183	28.8	153	31.6
KDR	Right Knee to Dash	176	23.8	151	31.2
PA°	Pelvic Angle		22.3		20.6
TA°	Tibia Angle		-37.2		-48.4
SK	Striker to Knee	586	3.2	652	1.7
ST	Striker to Head	648	-78.9	575	-70.2
SH	Striker to H-Point	213	-18.3	327	-6.5

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014



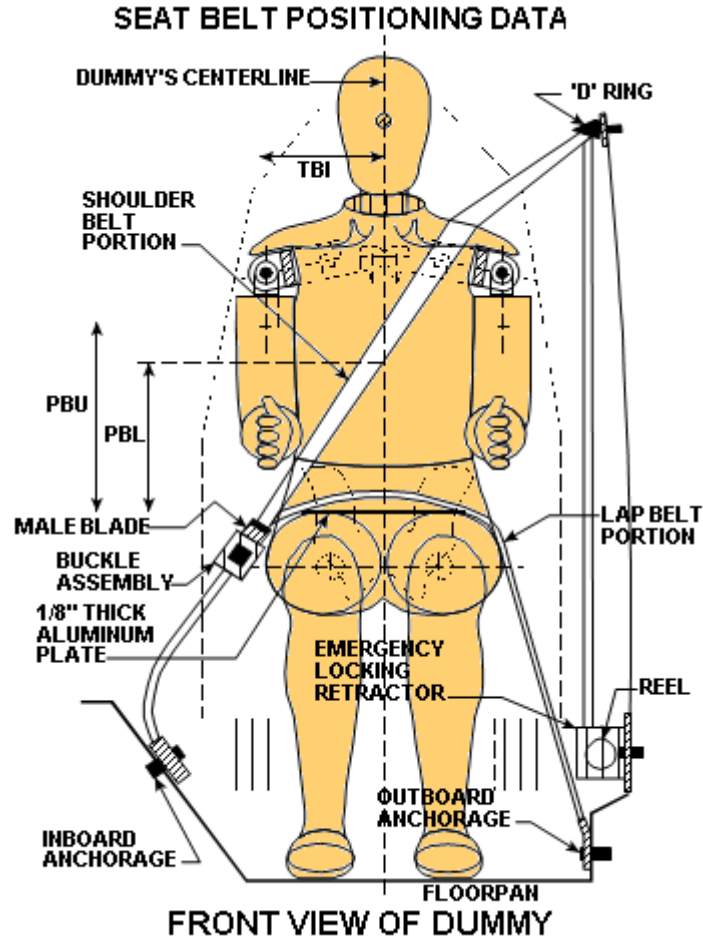
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	141	85
HD	H-Point to Door	148	175
HR	Head to Side Header	243	303
HS	Head to Side Window	350	375
KK	Knee to Knee	345	168
SHY	Striker to H-Point (Y Direction)	265	275
AA	Ankle to Ankle	358	170

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	380	350
PBL — Top surface of reference to belt lower edge	mm	300	280

BELT LENGTH DATA

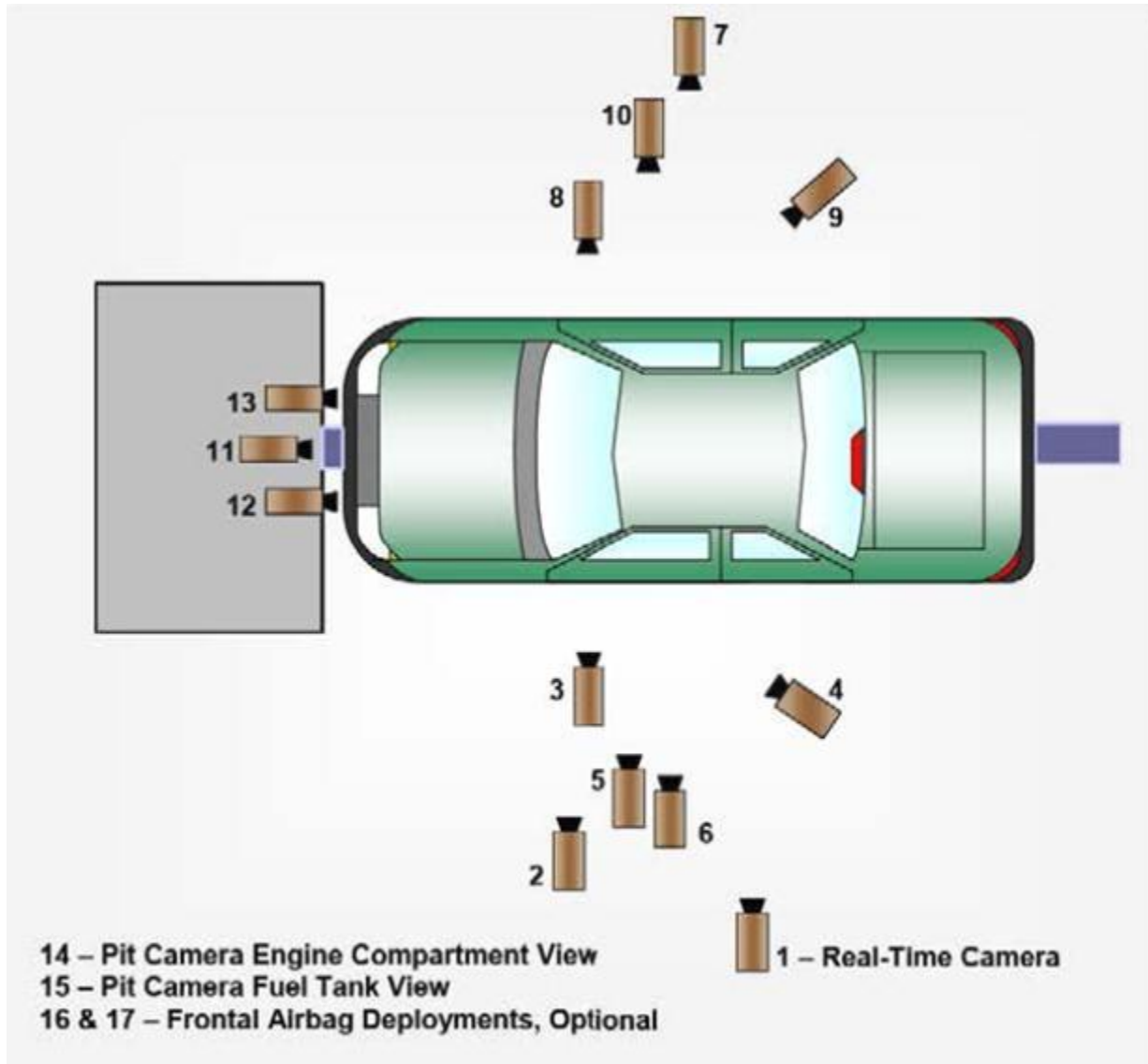
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	870	920
Lap Belt Length as measured on ATD	mm	590	540
Remainder of belt on reel	mm	890	890
Total belt length for continuous webbing systems	mm	2350	2350

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

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
Test Date: 4/11/2014

CAMERA POSITIONS FOR FRONTAL IMPACTS



Top View

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

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

CAMERA LOCATIONS

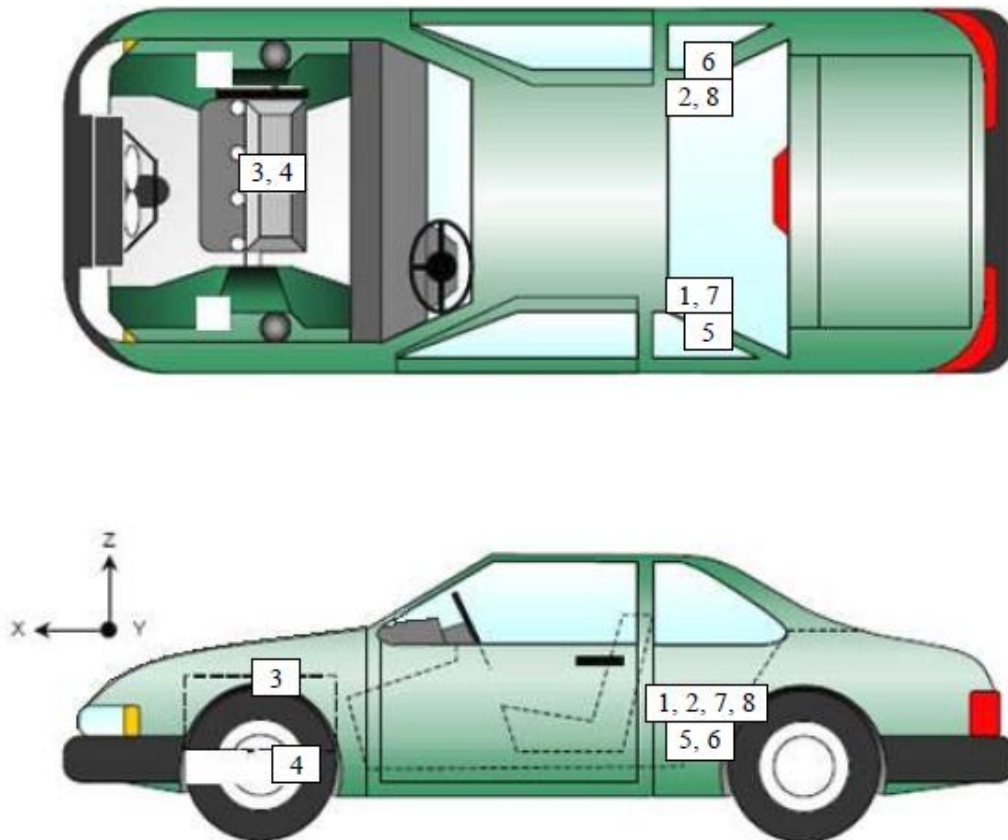
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-	-	-		60
2	Driver Close-Up	1870	-8250	1572	50	1000
3	Left Front Half	1276	-10027	1581	50	1000
4	Left Angle	3636	-3154	2279	24	1000
5	Steering Column - Top	2511	-8005	1976	24-70	1000
6	Steering Column - Bottom	2511	-8005	1385	24-70	1000
7	Right Overall	2359	9791	1177	24	1000
8	Passenger Close-Up	2066	8845	1571	50	1000
9	Right Front Half	1515	8805	1440	28	1000
10	Right Angle	3540	3133	2199	24	1000
11	Windshield	-168	0	3451	20	1000
12	Driver Windshield	405	-571	2026	12.5	1000
13	Passenger Windshield	470	571	2026	12.5	1000
14	Pit Front	1062	0	-1425	12.5	1000
15	Pit Rear	3088	0	-1402	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: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	3014	-685	-238
2	Right Rear Accelerometer – X Direction	3007	700	-254
3	Engine Top X	5325	71	-641
4	Engine Bottom X	5256	4	116
5	Left Rear Accelerometer – Z Direction	3007	685	-255
6	Right Rear Accelerometer – Z Direction	3014	668	-238
7	Left Rear Accelerometer – X Direction Redundant	3014	-685	-238
8	Right Rear Accelerometer – X Direction Redundant	3007	700	-254

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

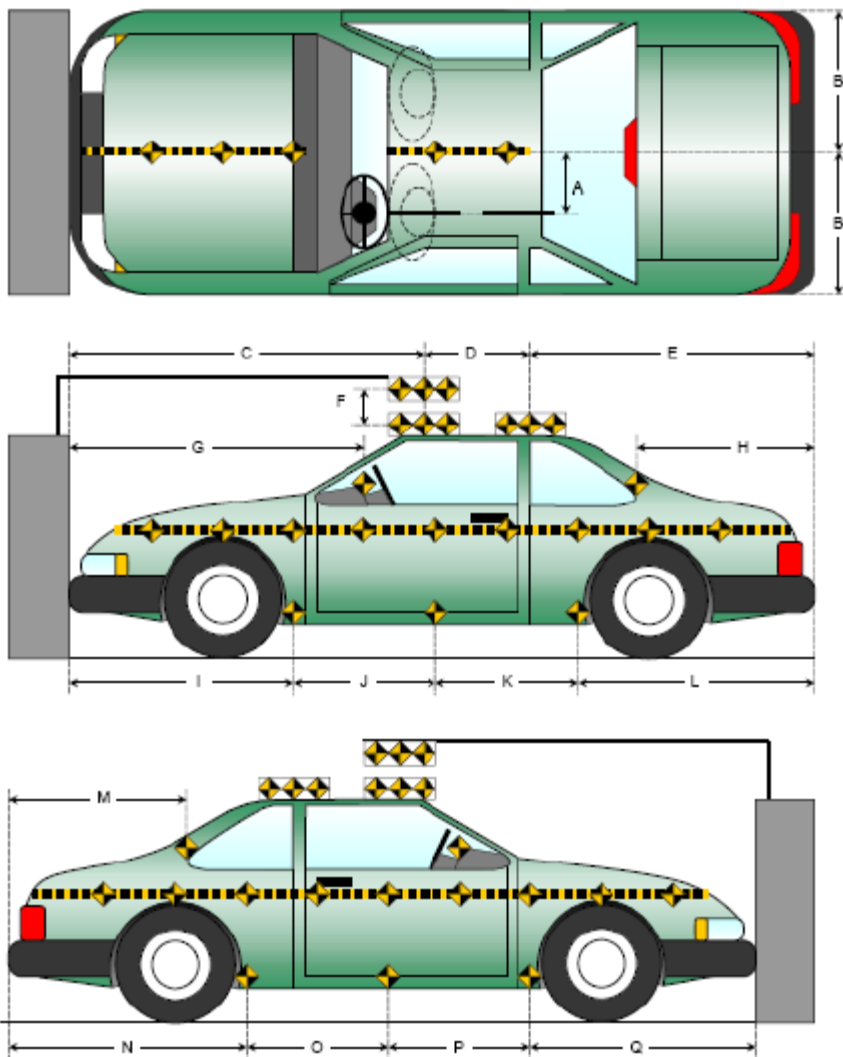
DATA SHEET NO. 8 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

Item	Value
A	447
B	999
C	2520
D	1221
E	2633
F	154
G	1899
H	2841
I	1541
J	1463
K	1464
L	1905
M	2839
N	1901
O	1468
P	1462
Q	1543

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
Test Date: 4/11/2014

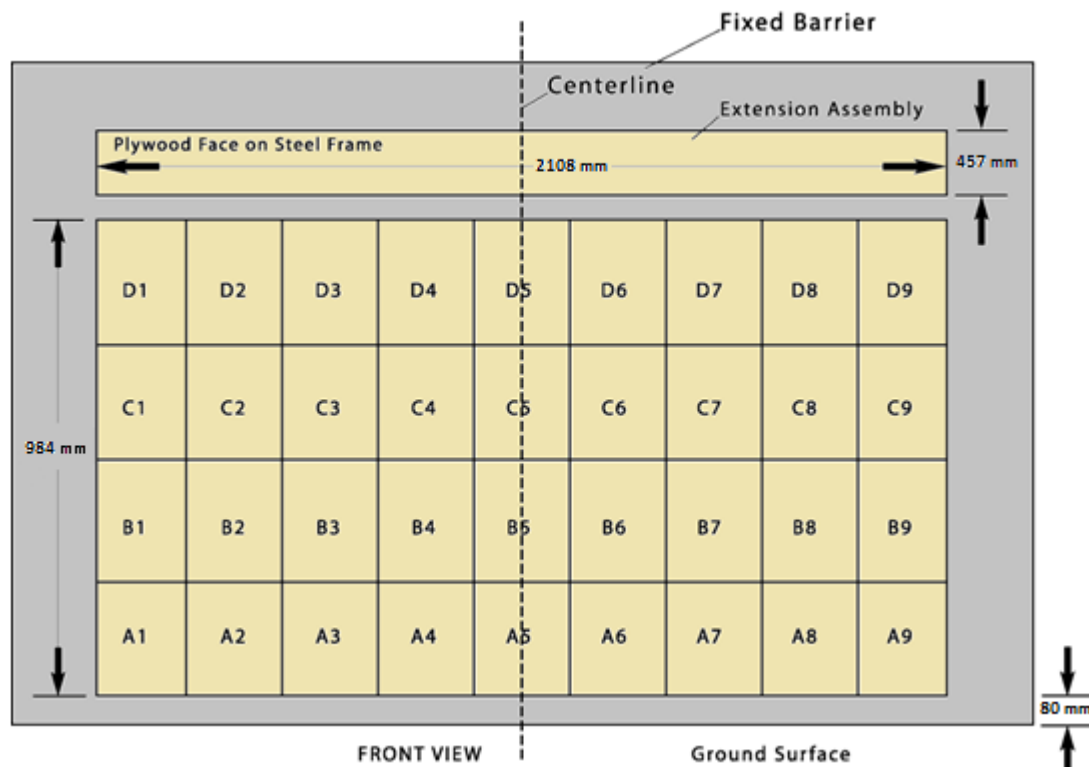


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension*

***Note: The load cell barrier was not used for this test**

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
Test Date: 4/11/2014

INSTRUMENTATION

Instrumentation	Number of Channels Collected
Driver Dummy Accelerometers	46
Passenger Dummy Accelerometers	46
Vehicle Structure Accelerometers	8
Load Cell Barrier	0
Total	100

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: 2015 Chevrolet Silverado 2500 Double Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
Test Date: 4/11/2014

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	P572E 50 th Male / 064	P5720 5 th Female / 273
Head Contact	Front Airbag, Headrest	Front Airbag & Headrest & Seat Back
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

Description	Driver	Passenger
Locked / Unlocked Doors	Unlocked	Unlocked
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	Remained in good condition
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	379
Center	mm	401
Right Side	mm	366
Average	mm	382

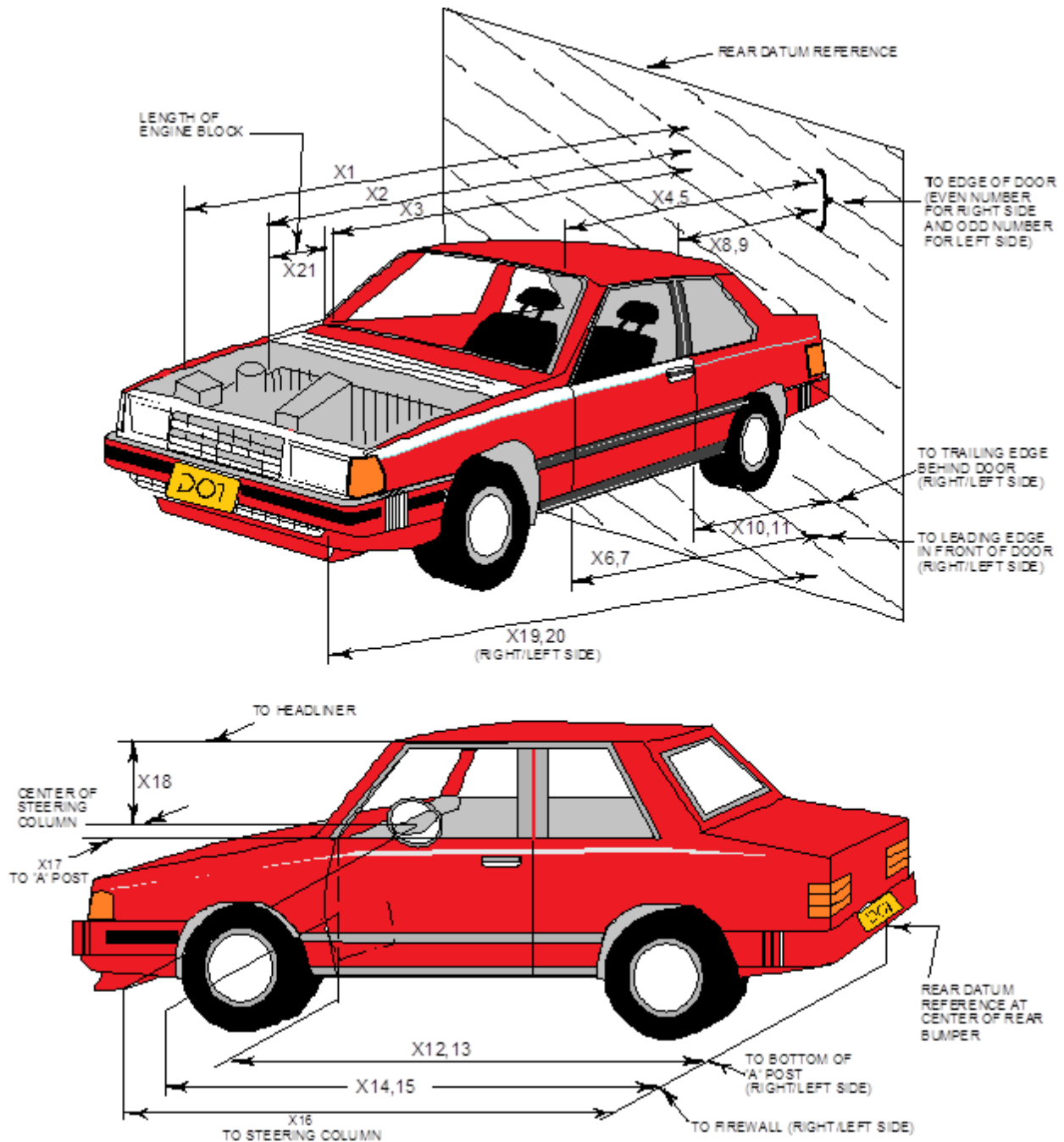
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014



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

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	6374	5688	-686
2	Rear Surface of Vehicle (RSOV) to Front of Engine	5520	5399	-121
3	RSOV to Firewall	4922	4894	-28
4	RSOV to Upper Leading Edge of Right Door	4801	4769	-32
5	RSOV to Upper Leading Edge of Left Door	4802	4778	-24
6	RSOV to Lower Leading Edge of Right Door	4740	4724	-16
7	RSOV to Lower Leading Edge of Left Door	4741	4735	-6
8	RSOV to Upper Trailing Edge of Right Door	3666	3633	-33
9	RSOV to Upper Trailing Edge of Left Door	3666	3643	-23
10	RSOV to Lower Trailing Edge of Right Door	3633	3618	-15
11	RSOV to Lower Trailing Edge of Left Door	3634	3625	-8
12	RSOV to Bottom of "A" Post of Right Side	4902	4871	-30
13	RSOV to Bottom of "A" Post of Left Side	4901	4880	-22
14	RSOV to Firewall, Right Side	5116	5072	-44
15	RSOV to Firewall, Left Side	5119	5089	-30
16	RSOV to Steering Column	4302	4300	-2
17	Center of Steering Column to "A" Post	150	283	133
18	Center of Steering Column to Headliner	428	458	31
19	RSOV to Right Side of Front Bumper	6327	5705	-621
20	RSOV to Left Side of Front Bumper	6327	5727	-600
21	Length of Engine Block	394	394	0
RD	RSOV to Right Side of Dash Panel	4454	4427	-27
CD	RSOV to Center of Dash Panel	4474	4449	-25
LD	RSOV to Left Side of Dash Panel	4452	4433	-20

*UR= Unrecoverable data point
 All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

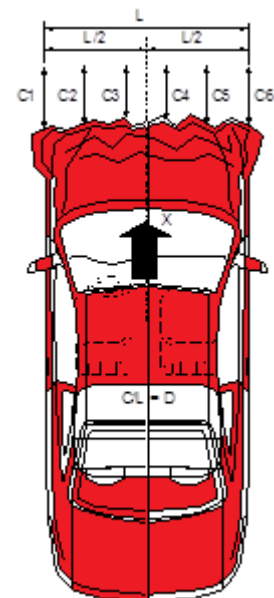
VEHICLE INFORMATION

VIN: 1GC2KUEG7FZ106918
 Vehicle Size Category: Passenger

Wheelbase (mm): 4,026
 Test Weight (kg): 3,277

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): 56.54
 Velocity Change (km/h): 56.54
 Time of Separation (ms): 109



CRUSH PROFILE

Collision Deformation Classification: 12FDEW3
 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 911
 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	6332	5725	607
C2	Crush Zone 2 at Left Side	mm	6353	5713	640
C3	Crush Zone 3 at Left Side	mm	6368	5701	667
C4	Crush Zone 4 at Right Side	mm	6368	5696	672
C5	Crush Zone 5 at Right Side	mm	6353	5698	655
C6	Crush Zone 6 at Right Side	mm	6331	5703	628
L	C1 to C6	mm	911	905	5

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

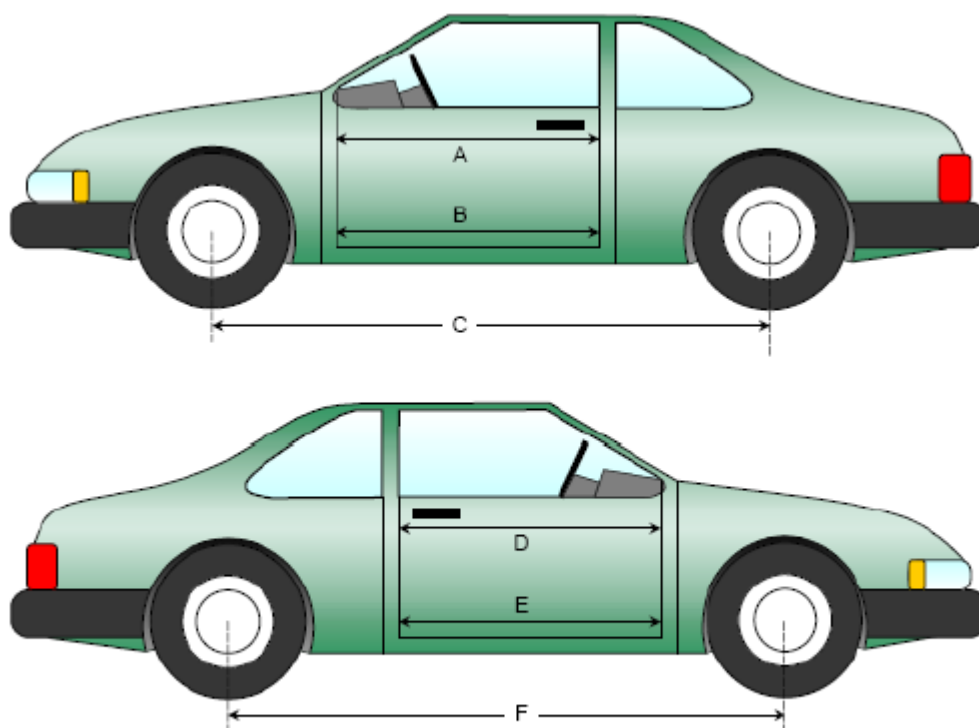
NHTSA No.: M20150103
 Test Date: 4/11/2014

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1037	1036	-1
B	Left Side Lower	mm	953	952	-1
D	Right Side Upper	mm	1036	1036	0
E	Right Side Lower	mm	951	950	-1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	4026	4021	-5
F	Right Side Wheelbase	mm	4026	4017	-9



Left & Right Side Views

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

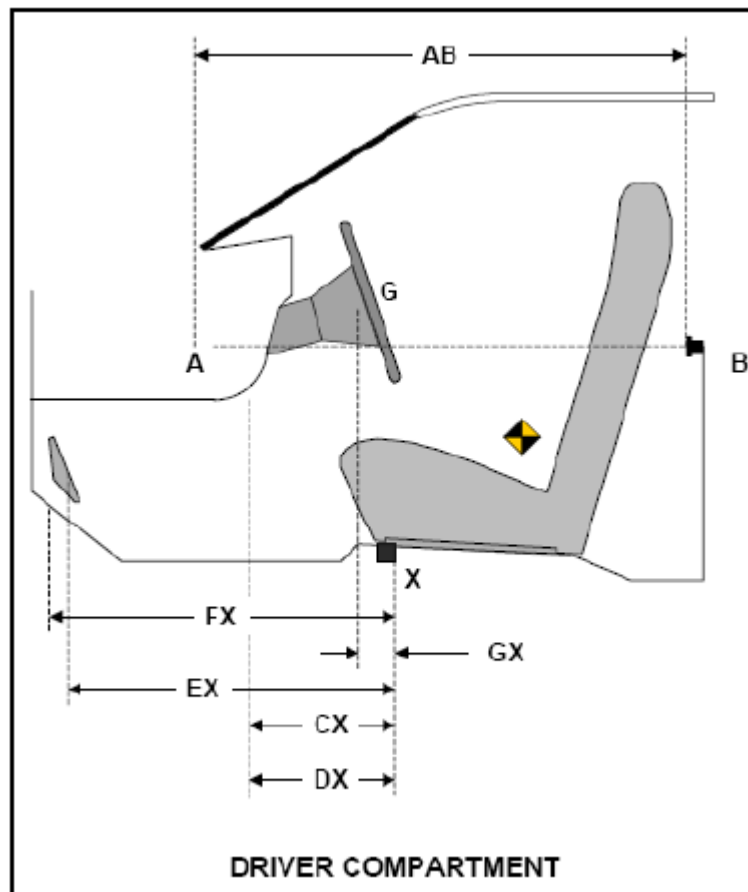
Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	735	735	0
CX	Left Knee Bolster to X	mm	334	322	-12
DX	Right Knee Bolster to X	mm	335	308	-27
EX	Brake Pedal to X	mm	546	520	-26
FX	Foot Rest to X	mm	744	725	-19
GX	Center of Steering Column Wheel Hub to X	mm	106	116	10

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014

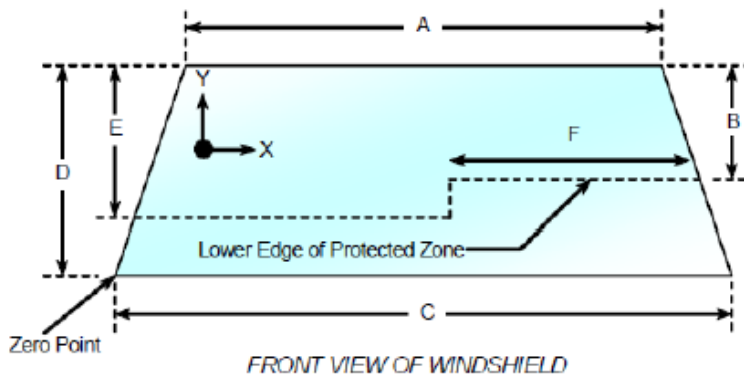
Windshield Mounting Details: A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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	2300	2300	100%
Right Side	2300	2300	100%
Total	4600	4600	100%



Item	Units	Value
A	mm	1370
B	mm	425
C	mm	1650
D	mm	790
E	mm	430
F	mm	330

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: 2015 Chevrolet Silverado 2500 Double Cab
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
Test Date: 4/11/2014

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21 ° C

Test Time: 12:30 PM

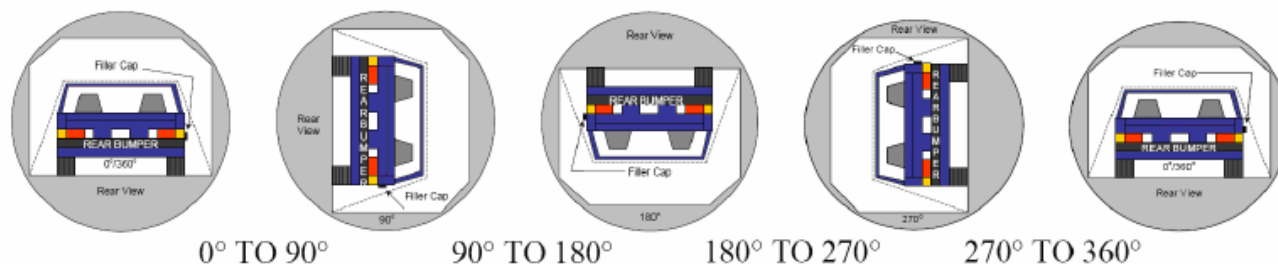
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014



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°	76	300	376
90° to 180°	66	300	366
180° to 270°	66	300	366
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	

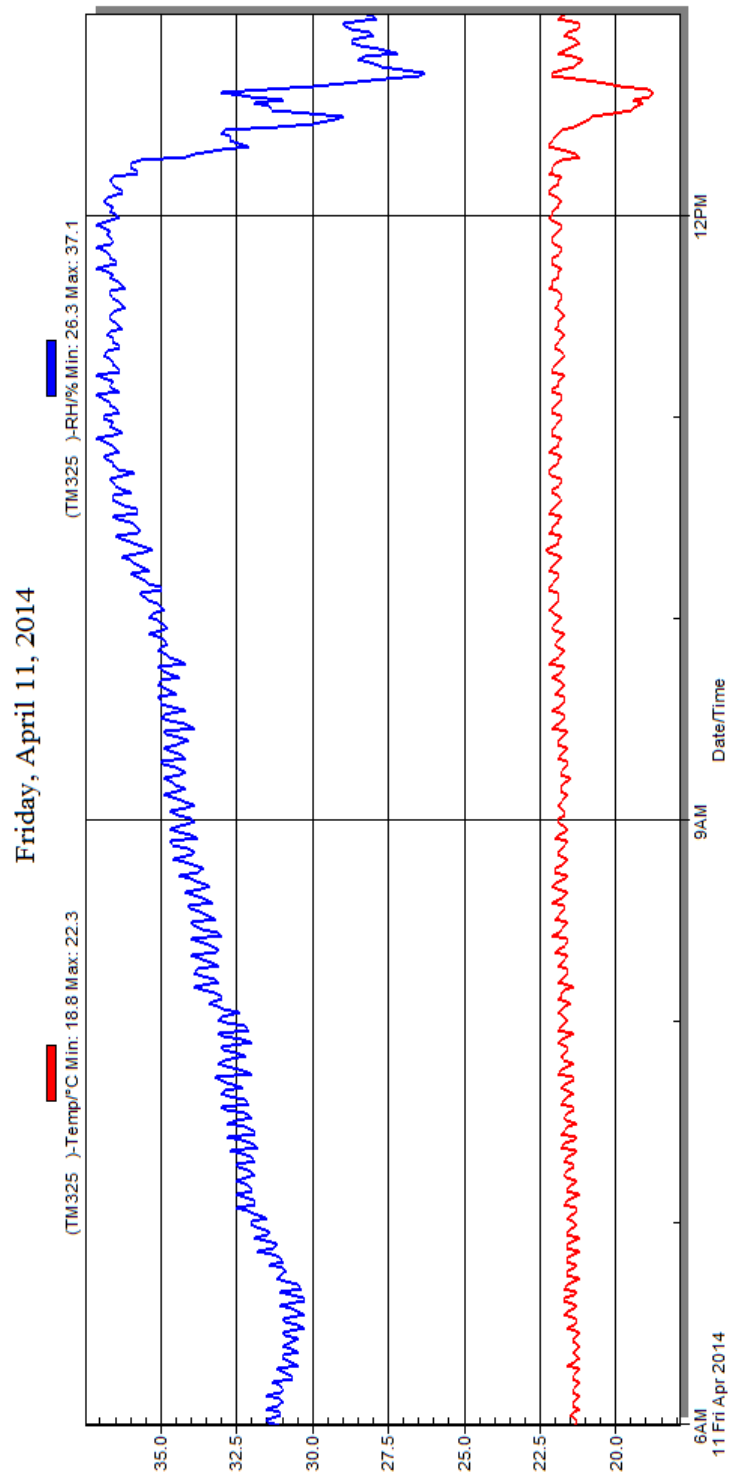
SOLVENT SPILLAGE LOCATION TABLE

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: 2015 Chevrolet Silverado 2500 Double Cab
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20150103
 Test Date: 4/11/2014



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	2015 Chevrolet Silverado 2500 Double Cab 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	2015 Chevrolet Silverado 2500 Double Cab 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.*

Photo Not Applicable

Figure A-1: Load Cell Location

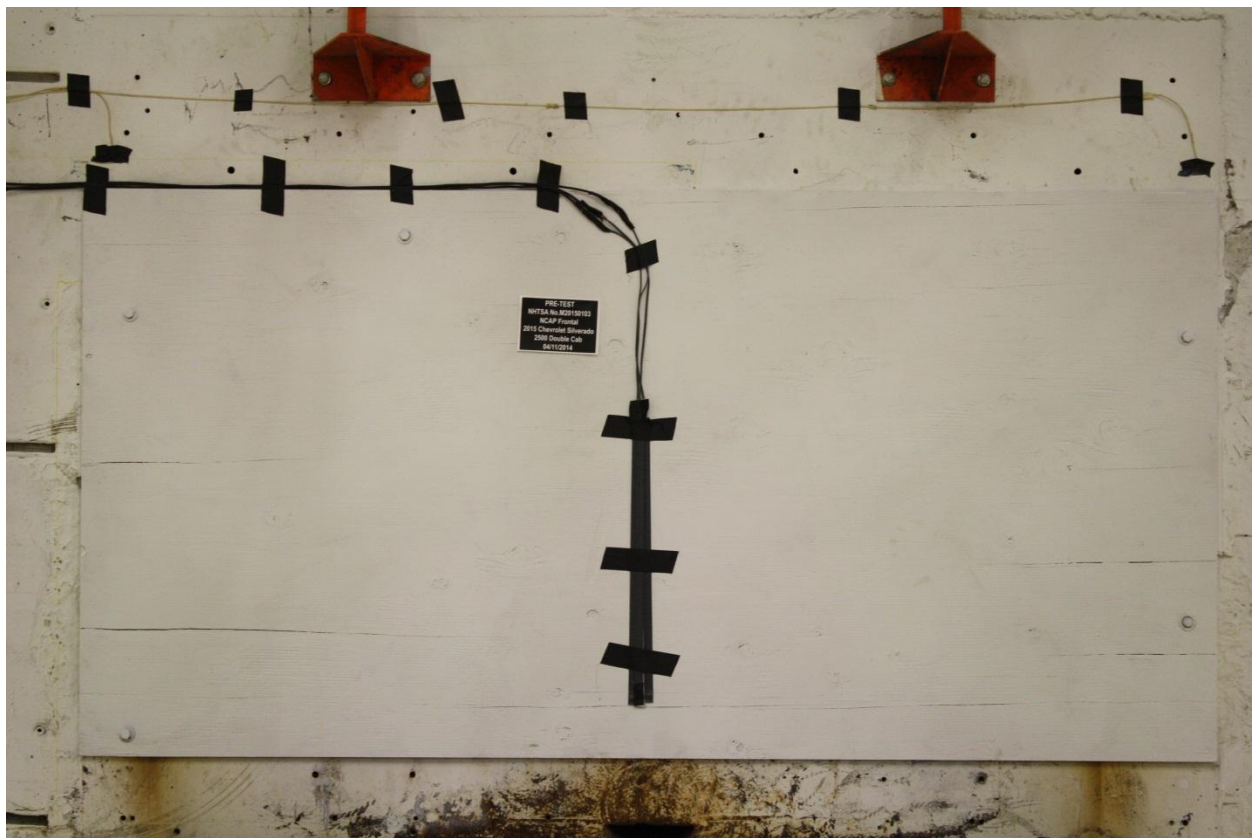


Figure A-2: Load Cell Wall



Figure A-3: Manufacturer's Label



Figure A-4: Tire Placard



Figure A-5: 2015 Chevrolet Silverado 2500 Double Cab Frontal As Delivered



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



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



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



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



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



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



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



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



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



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



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



Figure A-17: Pre-Test Windshield View

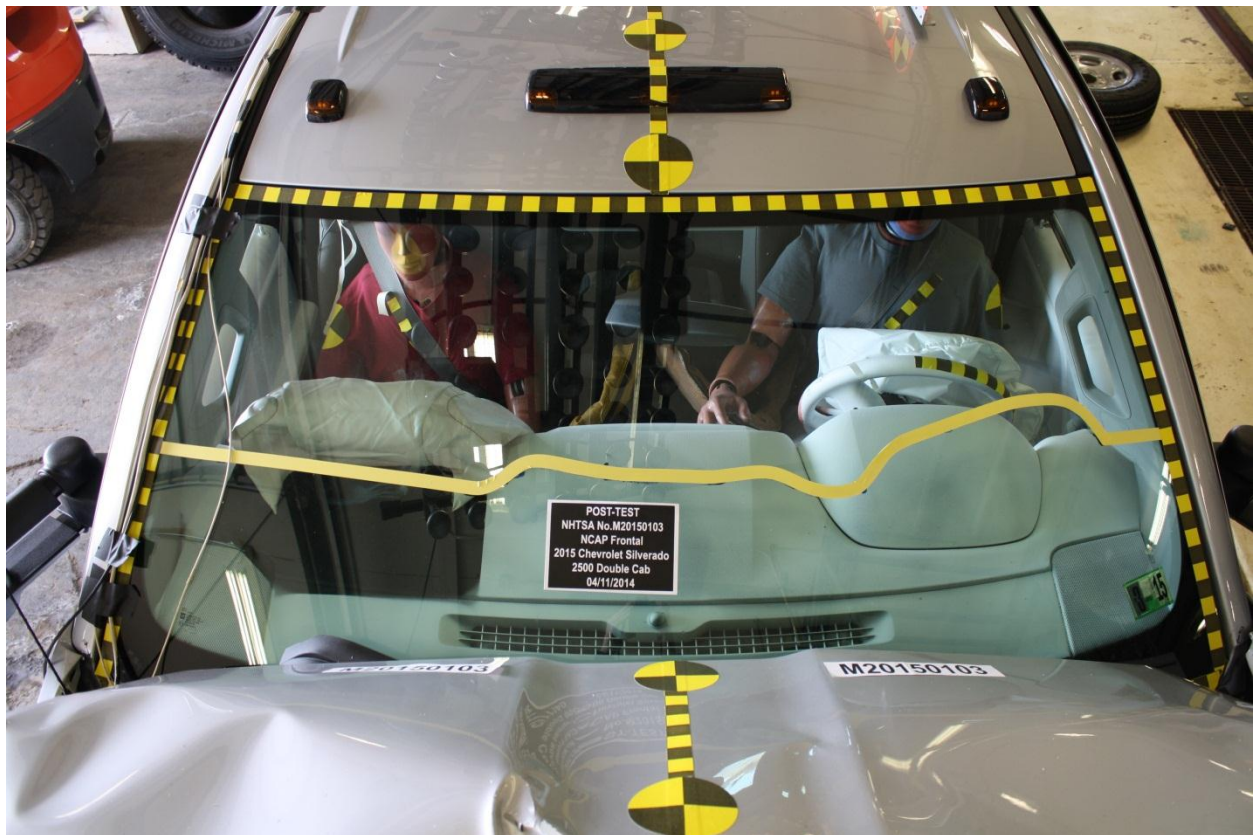


Figure A-18: Post-Test Windshield View



Figure A-19: Pre-Test Engine Compartment View

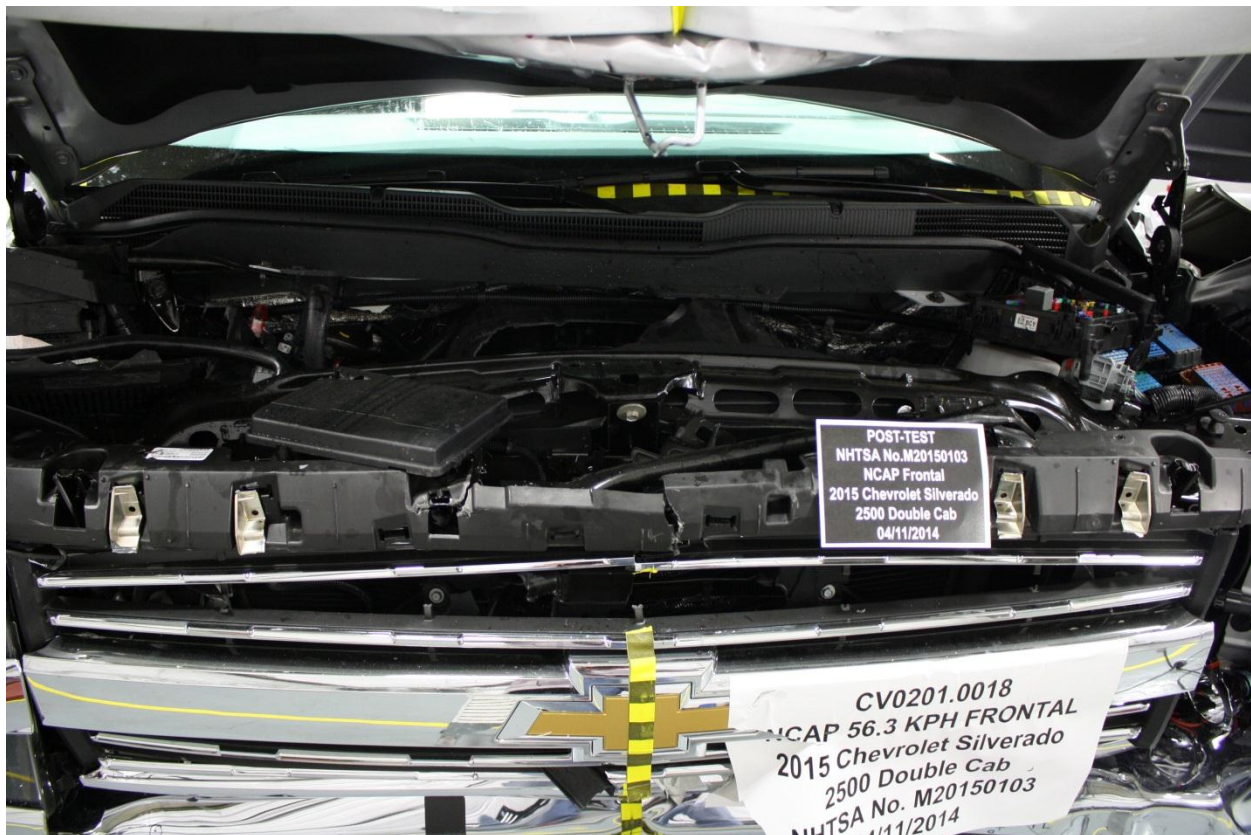


Figure A-20: Post-Test Engine Compartment View



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



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

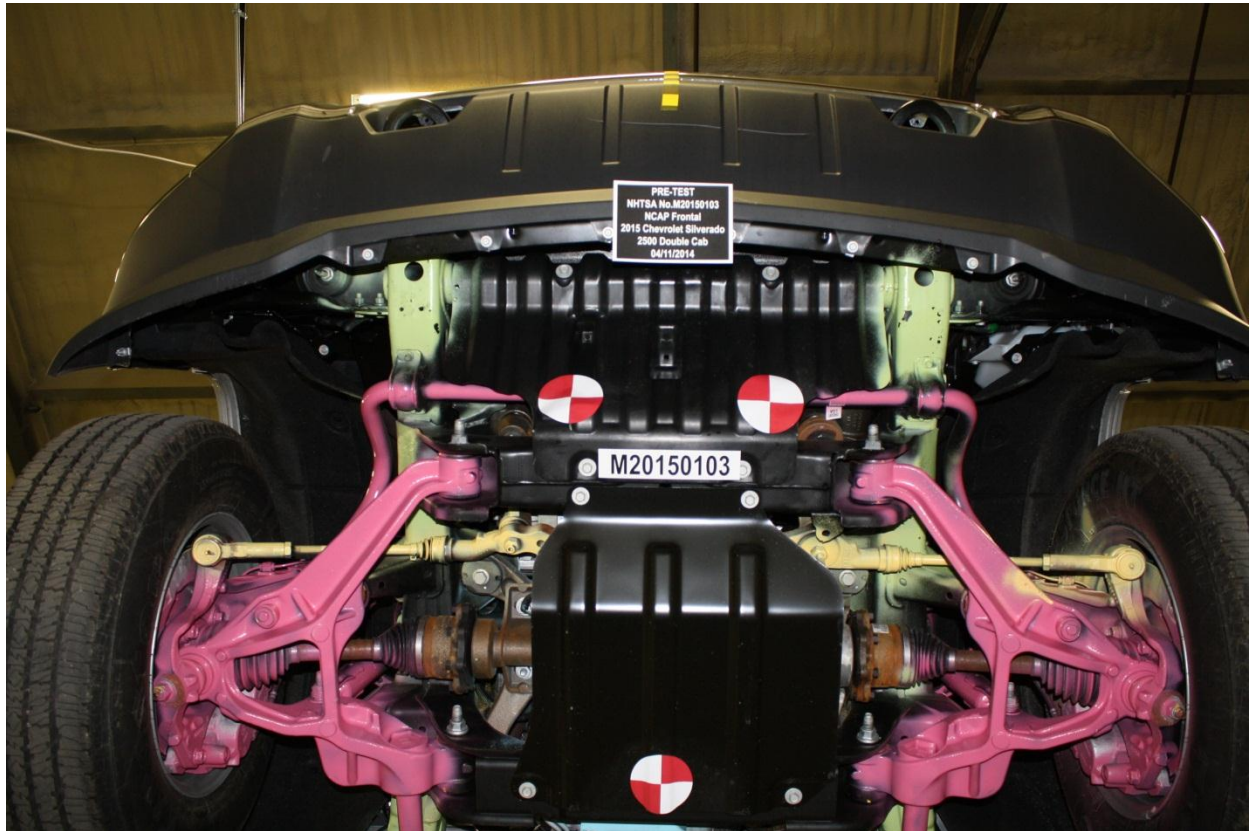


Figure A-23: Pre-Test Front Underbody View

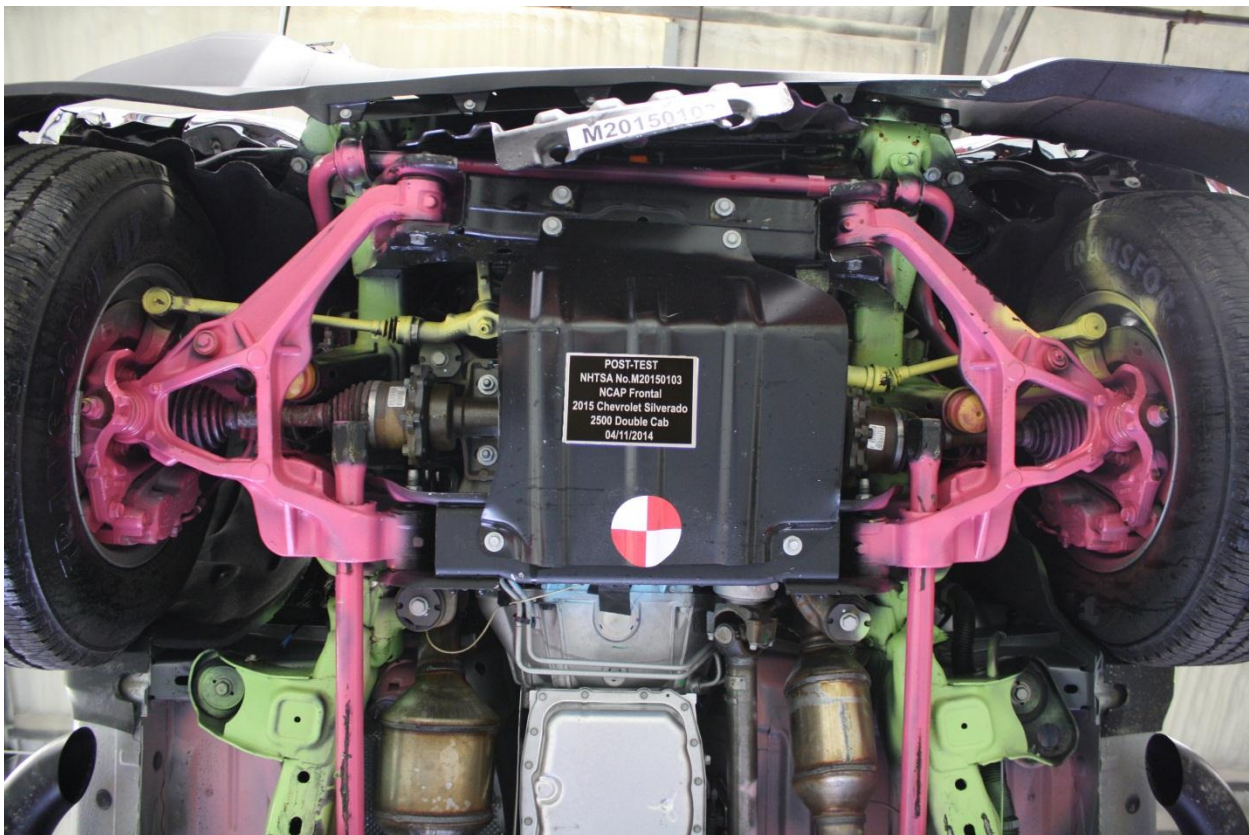


Figure A-24: Post-Test Front Underbody View

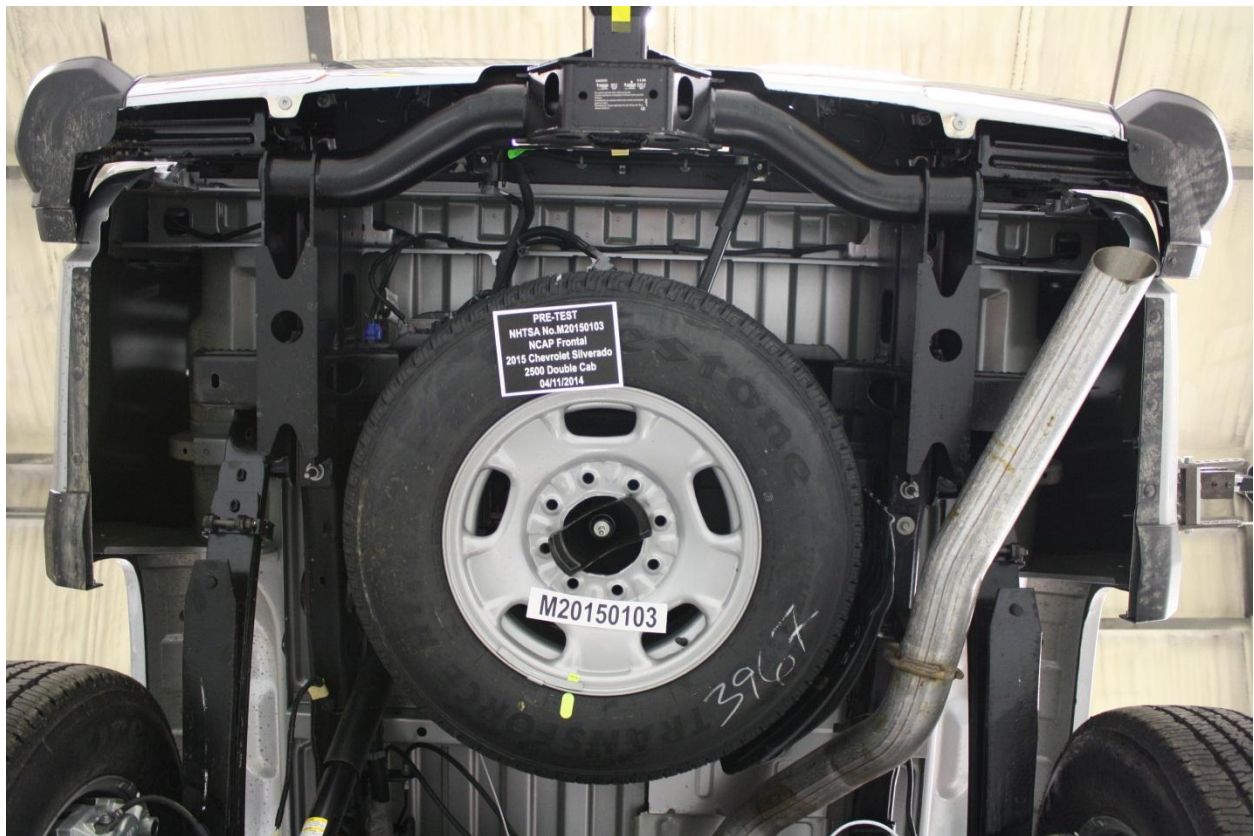


Figure A-25: Pre-Test Rear Underbody View

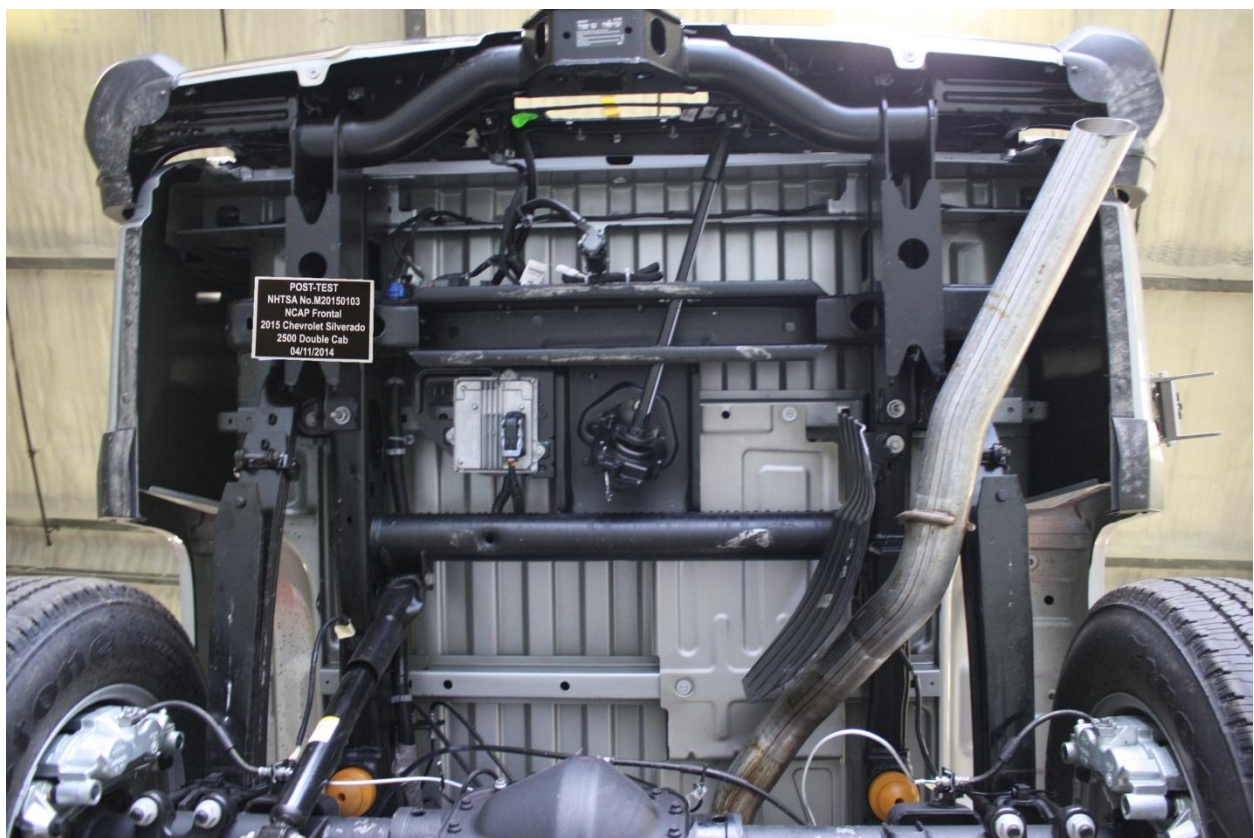


Figure A-26: Post-Test Rear Underbody View



Figure A-27: Pre-Test Dummy Cable Routing

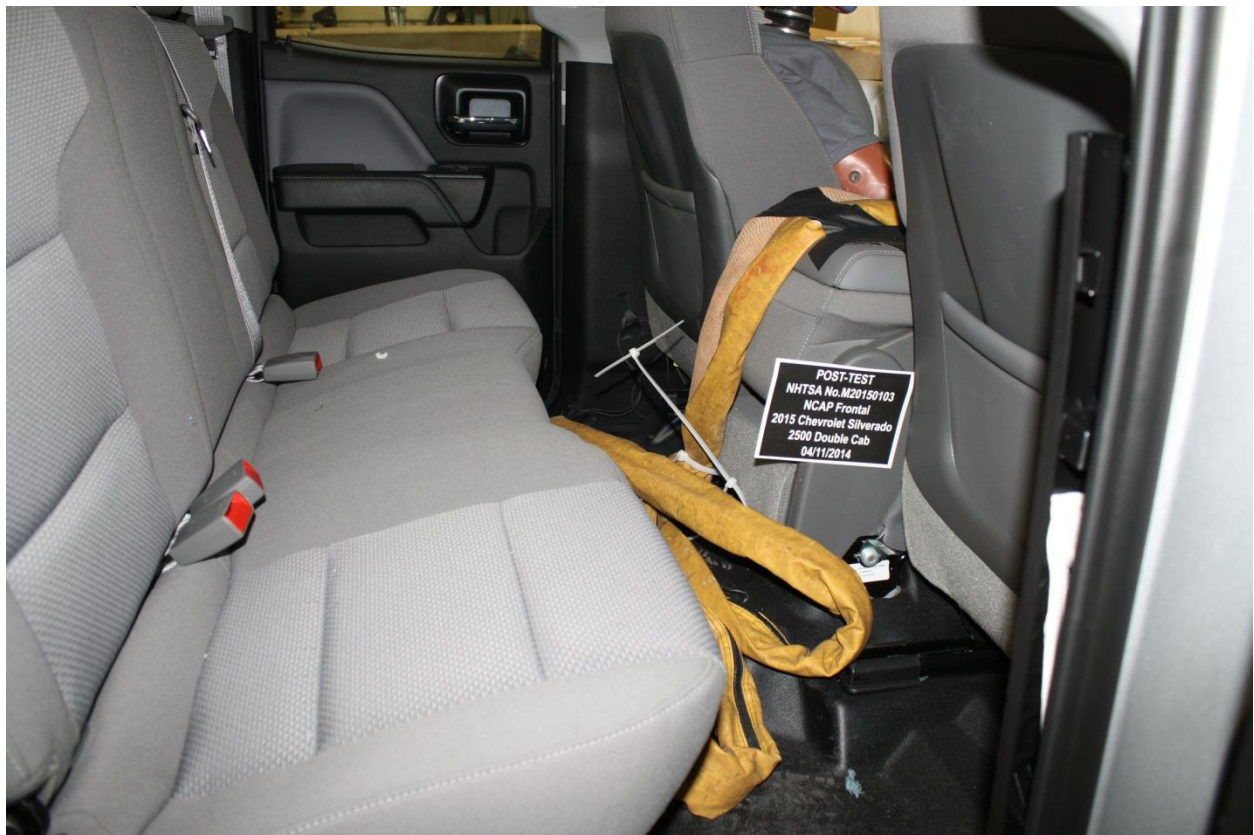


Figure A-28: Post-Test Dummy Cable Routing



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



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



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



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



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



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

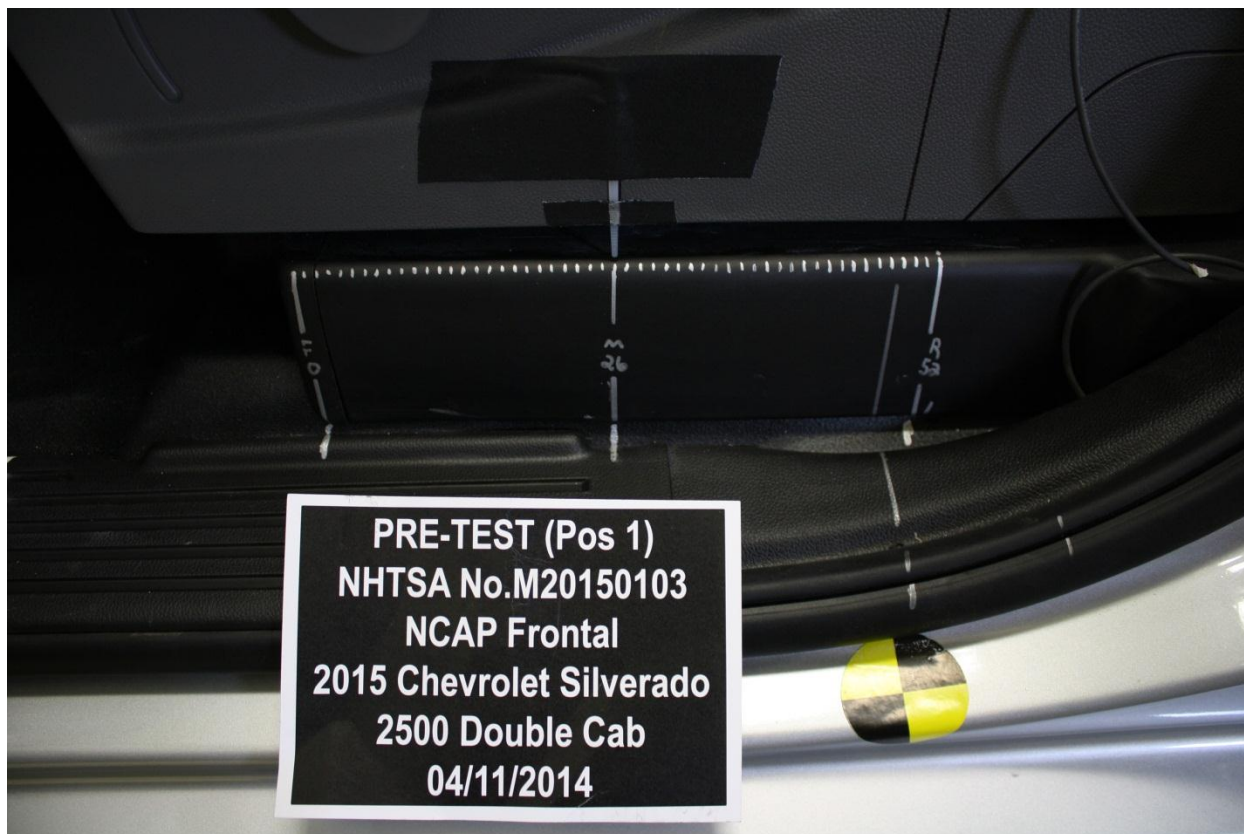


Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings

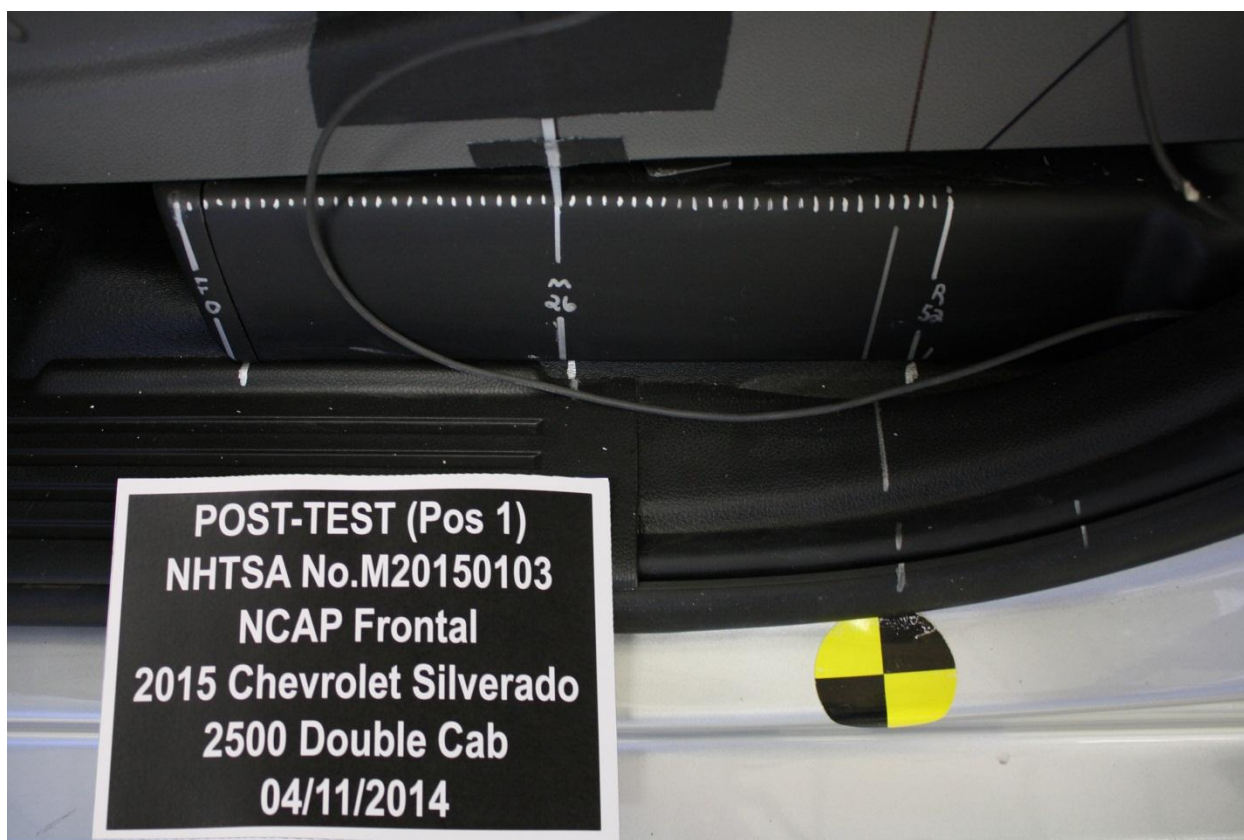


Figure A-36: Post-Test Driver's Seat Fore-Aft Markings



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



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



Figure A-39: Pre-Test Driver Dummy Feet



Figure A-40: Post-Test Driver Dummy Feet



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

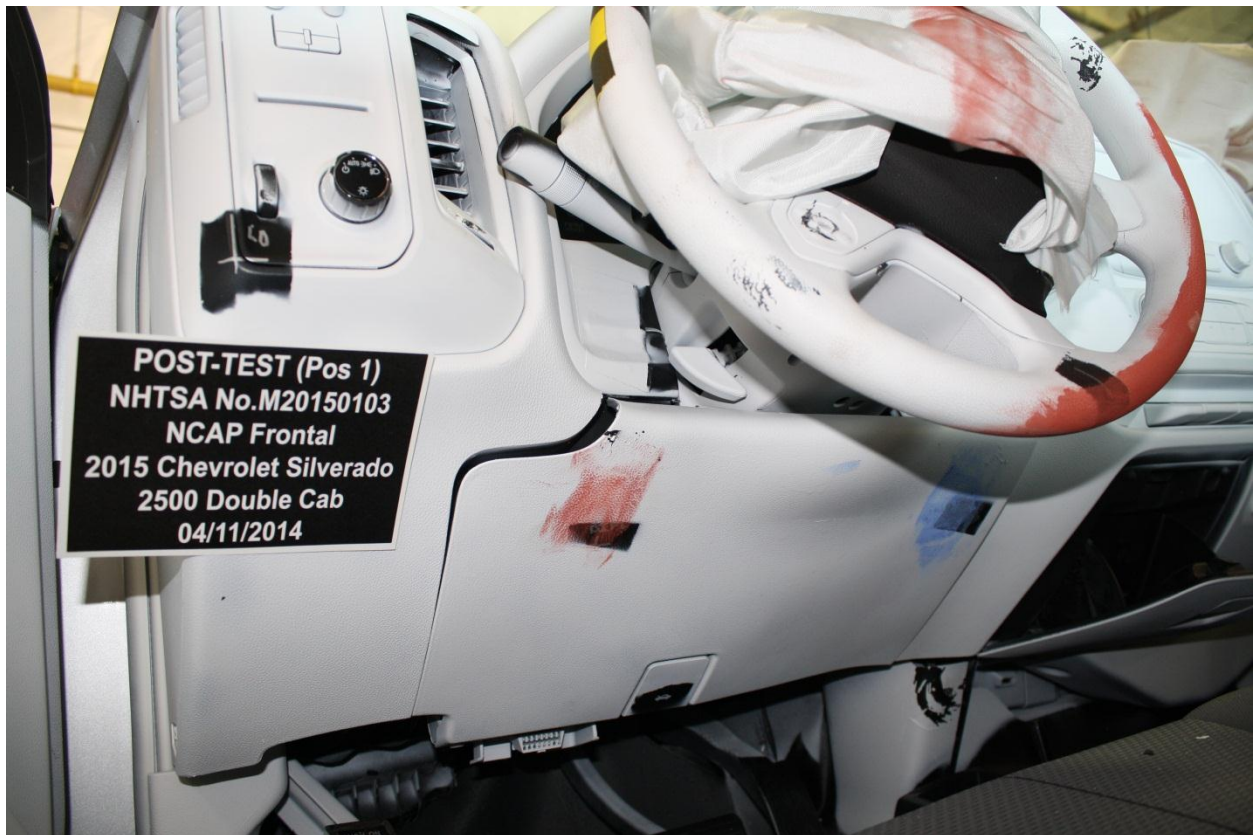


Figure A-42: Post-Test Driver's Side Knee Bolster

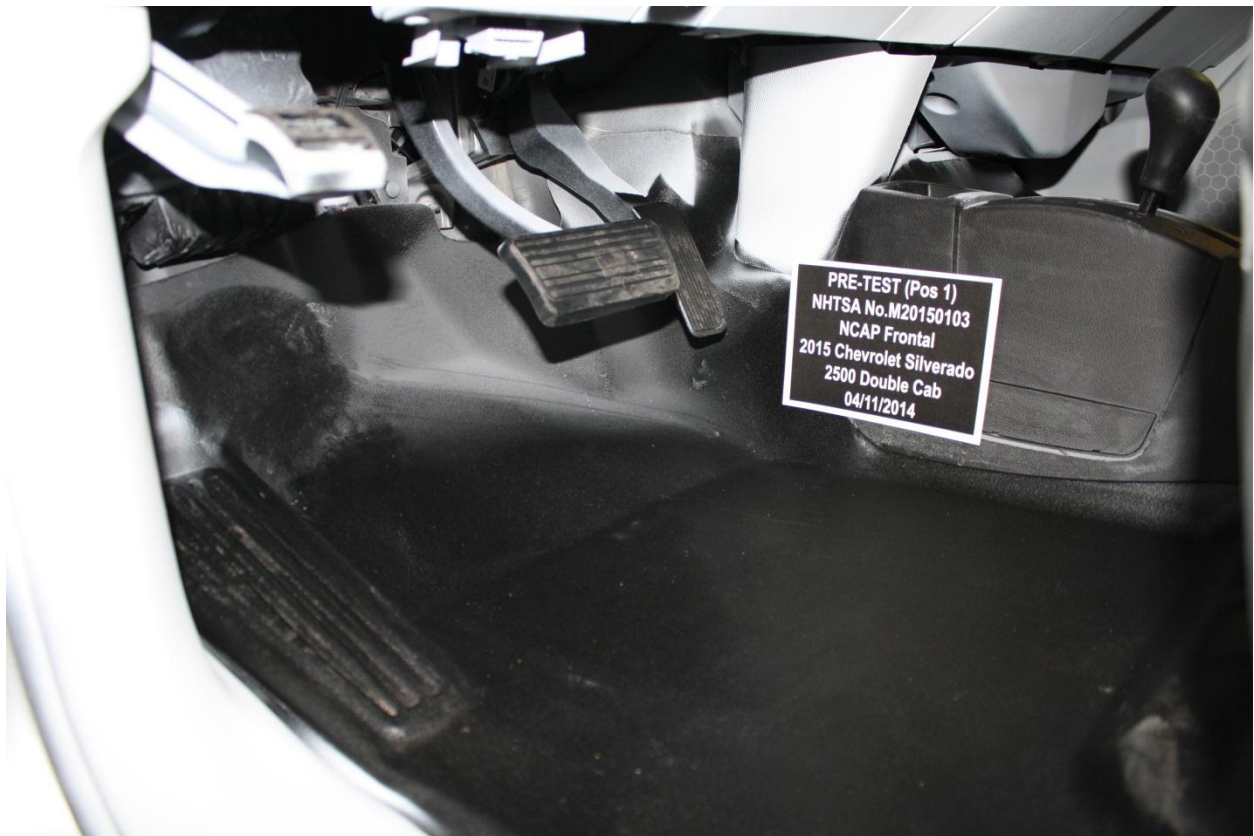


Figure A-43: Pre-Test Driver's Side Floorpan



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



Figure A-45: Post-Test Driver Dummy Face



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



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



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

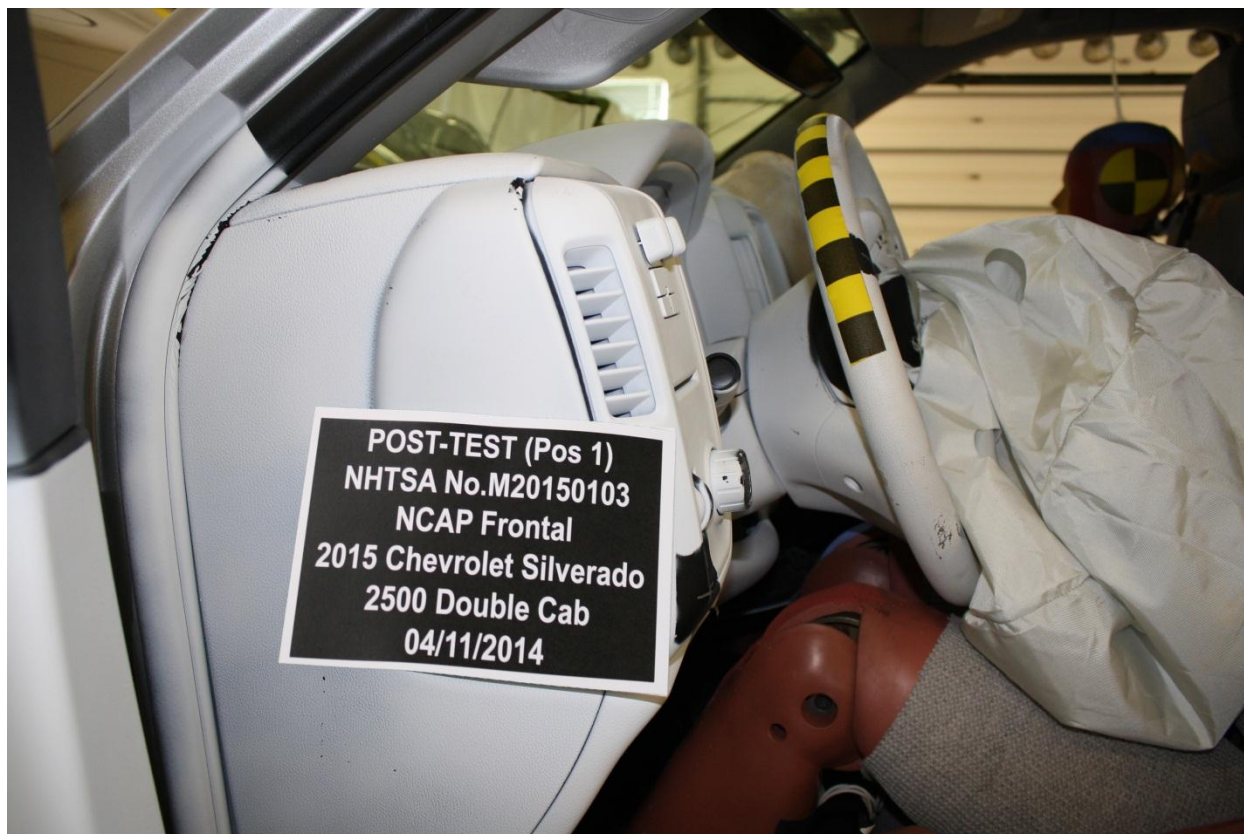


Figure A-49: Post-Test View of the Steering Wheel



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



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



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



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



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



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



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

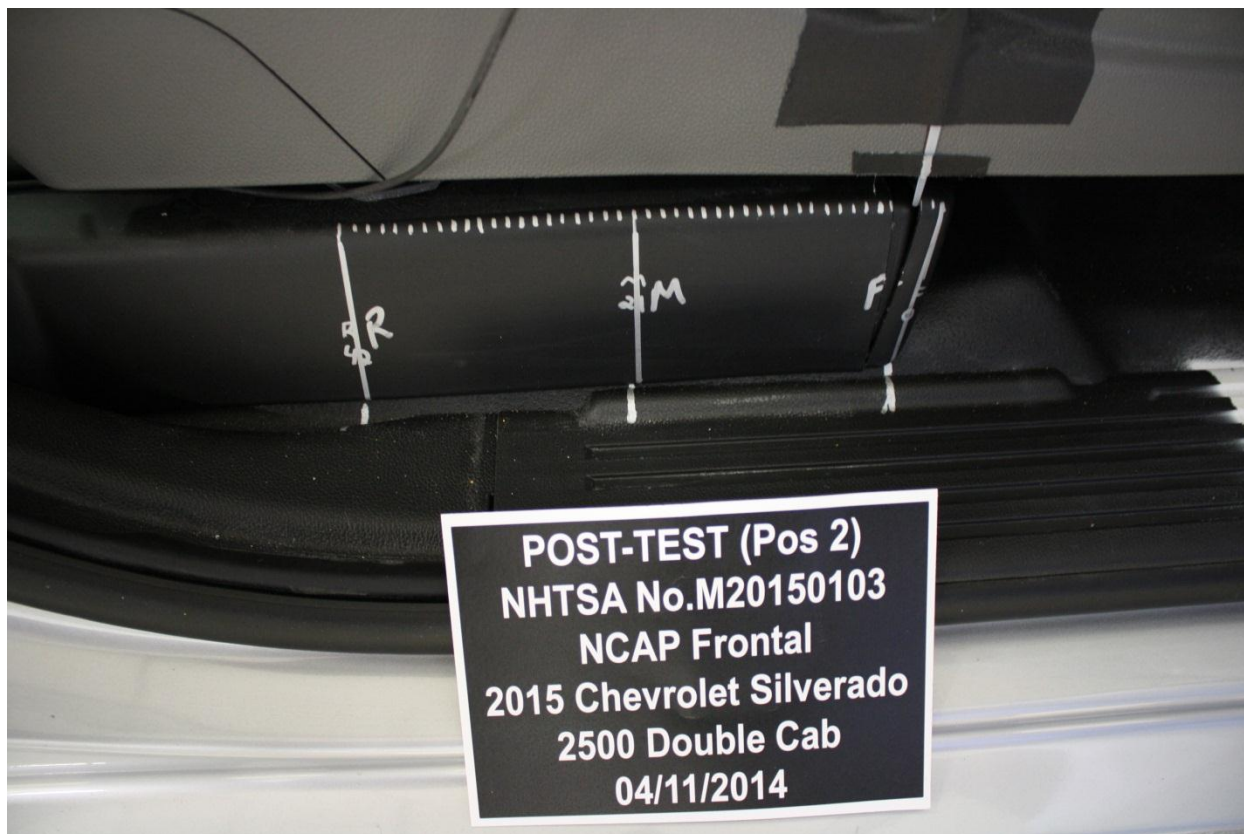


Figure A-57: Post-Test Passenger's Seat Fore-Aft Markings



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



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

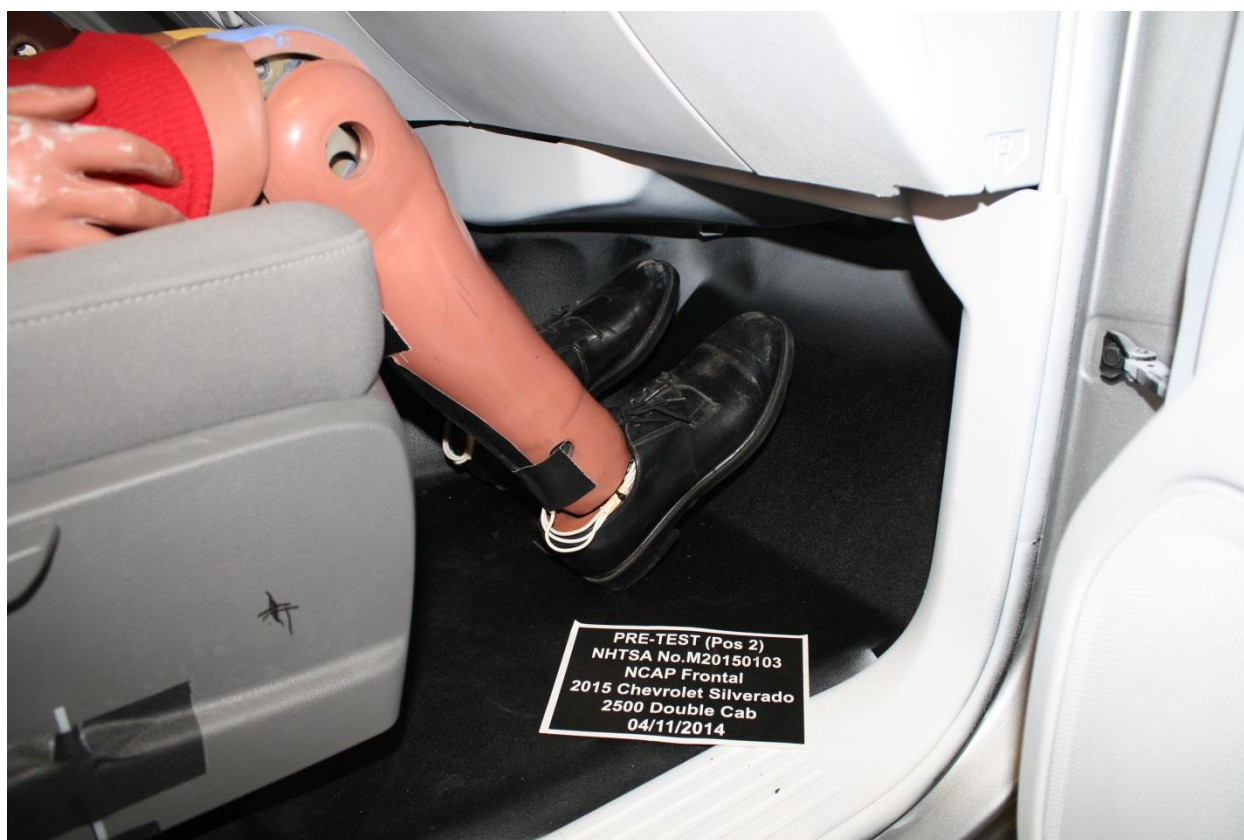


Figure A-60: Pre-Test Passenger Dummy Feet



Figure A-61: Post-Test Passenger Dummy Feet



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



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



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



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



Figure A-66: Post-Test Passenger Dummy Face

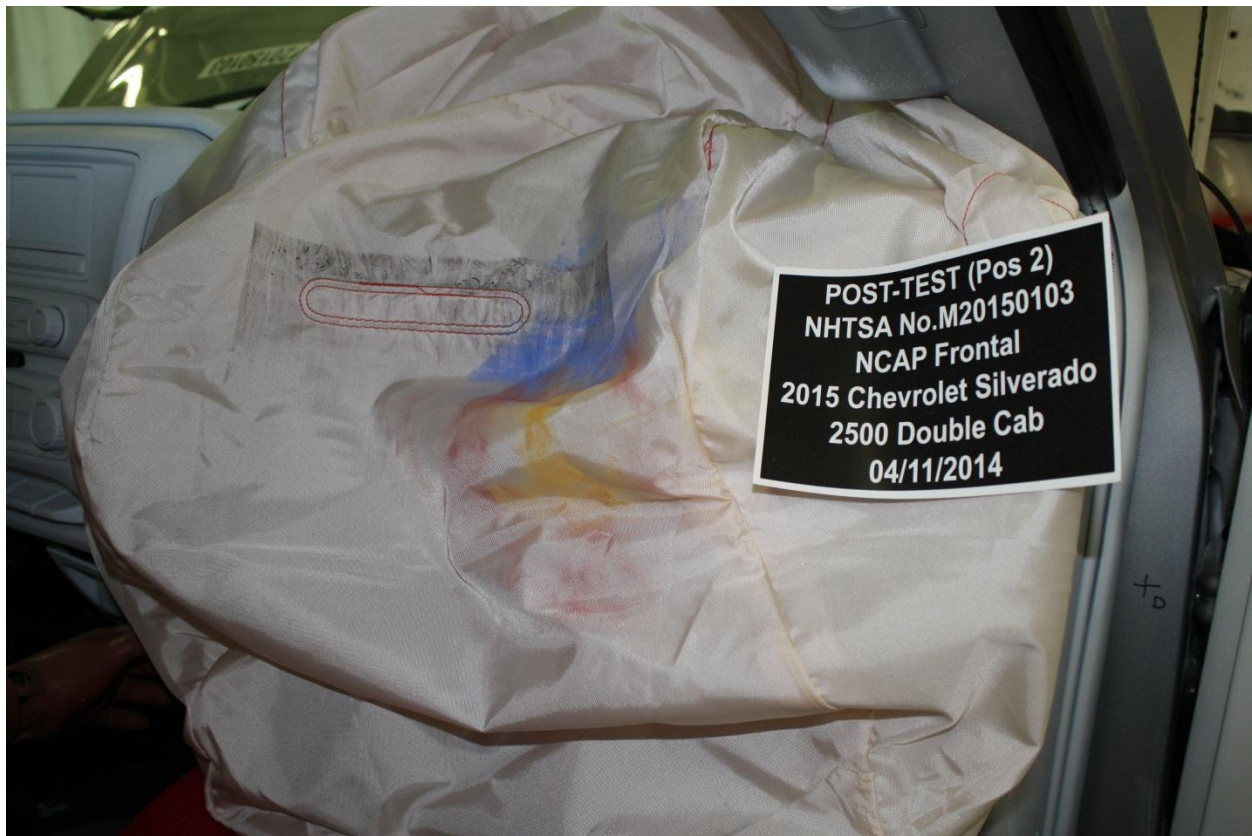


Figure A-67: Post-Test Passenger Dummy Contact With Airbag

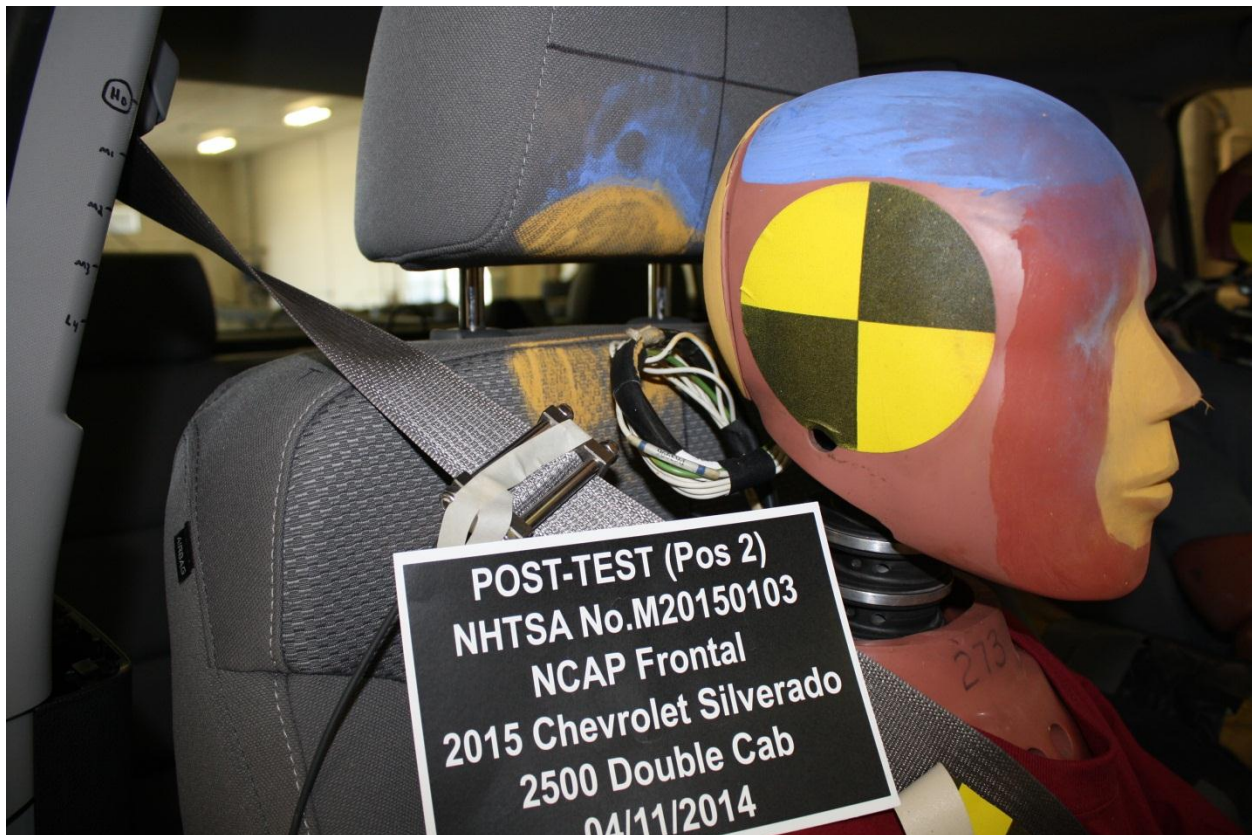


Figure A-68: Post-Test Passenger Dummy Contact With Headrest

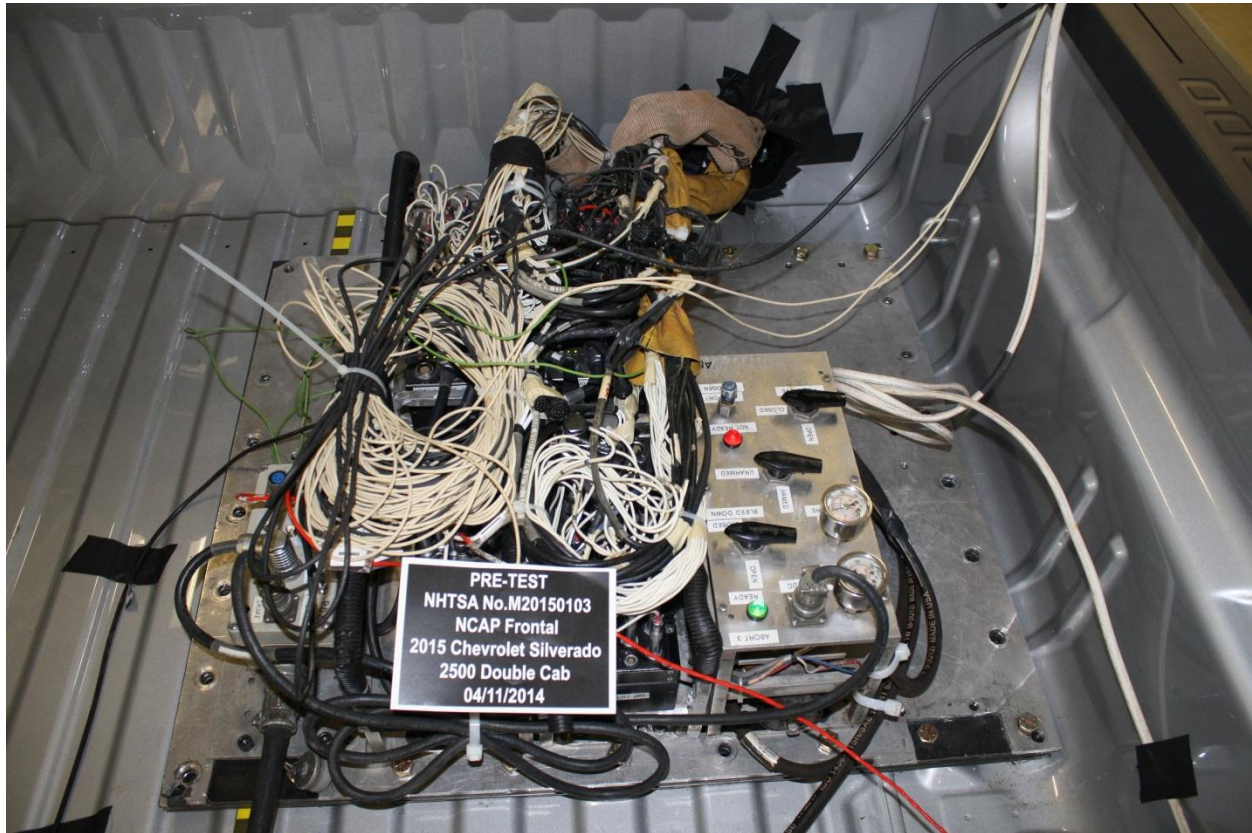


Figure A-69: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

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



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



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



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



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



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



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



Figure A-77: 2015 Chevrolet Silverado 2500 Double Cab Frontal Impact Event

CHEVROLET

**2015 SILVERADO 2500 4WD
WT DBL CAB**

EXTERIOR: SILVER ICE METALLIC
INTERIOR: JET BLACK / DARK ASH

VORTEC 6.0L V8 SFI GAS ENGINE
6-SPEED AUTOMATIC TRANSMISSION

Visit us at www.chevy.com

STANDARD EQUIPMENT		SAFETY & SECURITY		BED RAIL PROTECTORS		OPTIONS & PRICING		TOTAL VEHICLE PRICE*	
ITEMS FEATURED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN. • SCHEDULED MAINTENANCE 2YR/24,000 MILES OIL & FILTER 4 WHEEL TIRE ROTATION SEE WWW.CHEVY.COM OR DEALER FOR DETAILS • 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS • 24-HOUR ROADSIDE ASSISTANCE		• AIRBAGS: DRIVER & RT. FRONT PASS - FRONT/SIDE-IMPACT, OUTBOARD FRT & REAR SEAT-SIDE HEAD CURTAIN • STABILITRAK-STABILITY CONTROL WITH TRAILER SWAY CONTROL AND HILL START ASSIST • ANTILOCK BRAKES, 4 WHEEL DISC • TIRE PRESSURE MONITOR SYSTEM (EXCL. SPARE) EXTERIOR • LOCKING TAILGATE • HEADLAMP, PROJECTOR • WHEELS, 17" STEEL • TIRES, ALL SEASON • SPARE TIRE LOCK • RECOVERY HOOKS, FRONT • FRONT BUMPER, CHROME • REAR BUMPER, CHROME • CORNERSTEP, REAR BUMPER • FULLY BOXED STEEL FRAME		• SEATS, FRONT 40/20/40 BENCH • REAR SEAT, FOLDING BENCH • POWER WINDOWS, DRIVER EXPRESS • POWER DOOR LOCKS • FLOOR COVERING, RUBBERIZED-VINYL • AIR CONDITIONING • CRUISE CONTROL • DRIVER INFORMATION CENTER • STEERING COLUMN, TILT • AUDIO SYSTEM, W/ 4.2" DIAGONAL COLOR SCREEN • USB PORTS		TRAILERING EQUIPMENT PKG: • TRAILERING HITCH • AUTO LOCKING REAR DIFFERENTIAL • TRAILER BRAKE CONTROLLER • 4" BLACK TUBULAR ASSIST STEPS (DEALER INSTALLED) SNOW PLOW PREP PACKAGE: • ALTERNATOR, 220 AMP • PROVISIONS: ROOF MOUNTED LAMP • UNDERBODY SHIELDS CAMPER STYLE EXTERIOR MIRRORS, MANUAL (REPLACES STD/OPT MIRRORS) ROOF MARKER LAMPS CAMPER/5TH WHEEL TRAILER WIRING PROVISIONS GVW RATING - 9,500 LBS TOTAL OPTIONS \$2,145.00 TOTAL VEHICLE & OPTIONS \$38,785.00		DESTINATION CHARGE 1,095.00 TOTAL VEHICLE PRICE* \$39,880.00	

EPA DOT Fuel Economy and Environment

NOT APPLICABLE TO THIS VEHICLE

fuelconomy.gov
Calculate personalized estimates and compare vehicles

GOVERNMENT 5-STAR SAFETY RATINGS

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

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

DEALER NO INVOICE SALES CODE E
SALES MODEL CODE C02990
TRAILER NO 10271
FINAL ASSEMBLY
RENNING, IN U.S.A.
VIN 1G2K2KUG7FZ106918
DEALER TO WHOM DELIVERED
RENN KIRBY CHEVROLET BUICK
55 EXPEDITION TRAIL
GETTYSBURG, PA 17325-7506

4J

1FA2103967

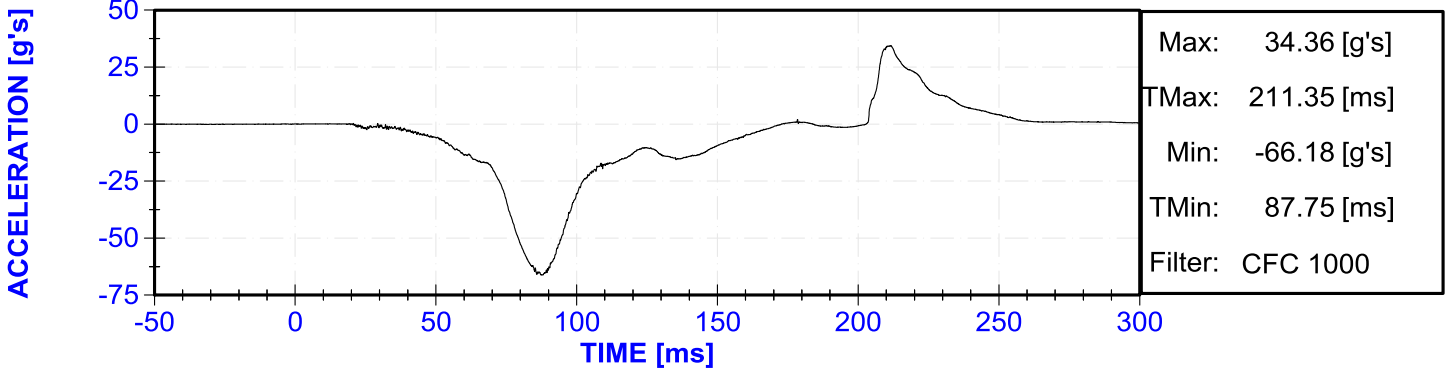
Figure A-78: Monroney Label Photograph

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

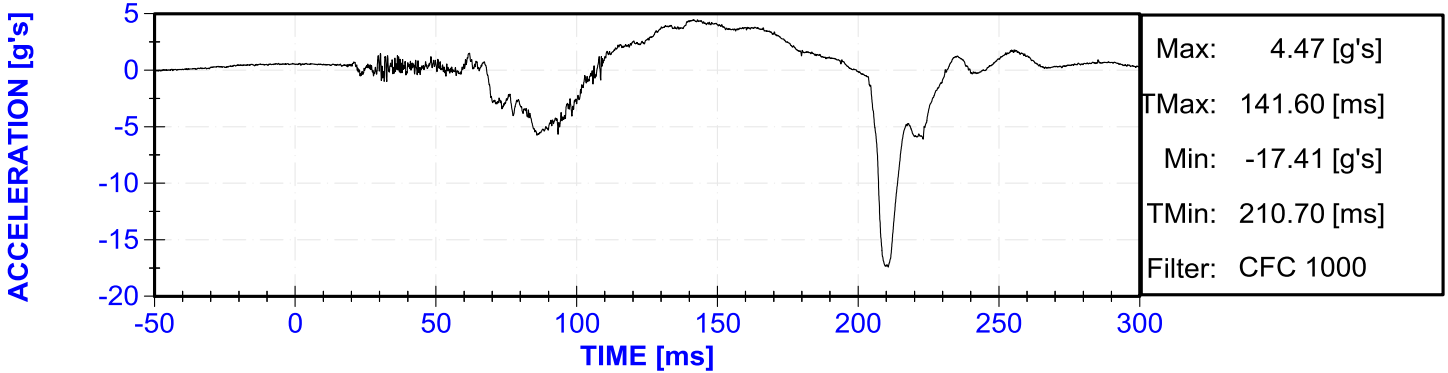
Table of Data Plots

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

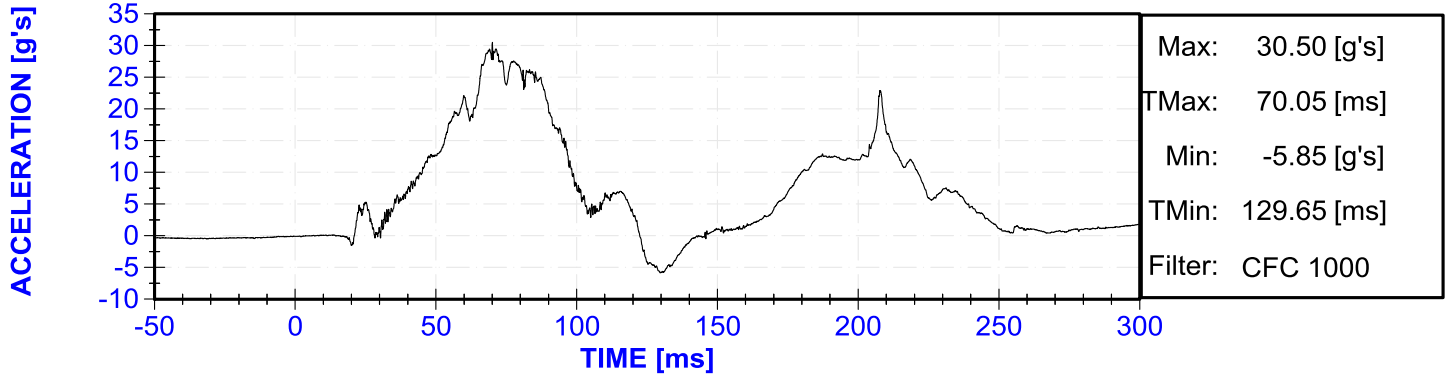
Driver Head X Acceleration vs. Time Primary



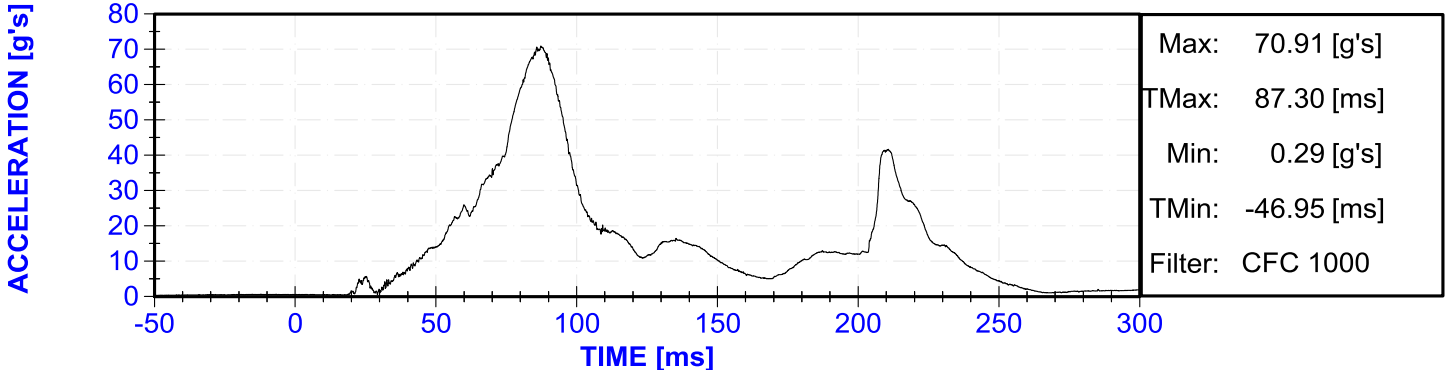
Driver Head Y Acceleration vs. Time Primary



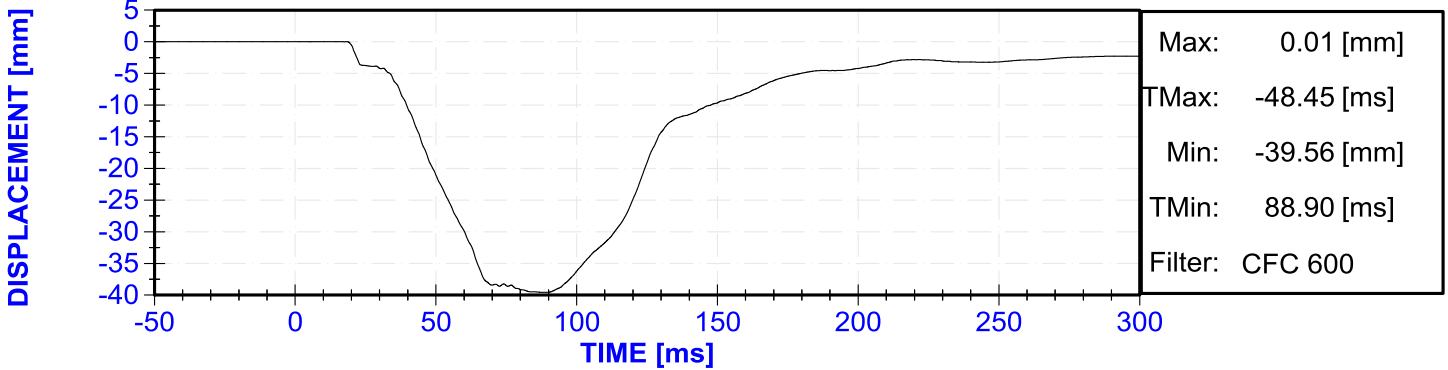
Driver Head Z Acceleration vs. Time Primary



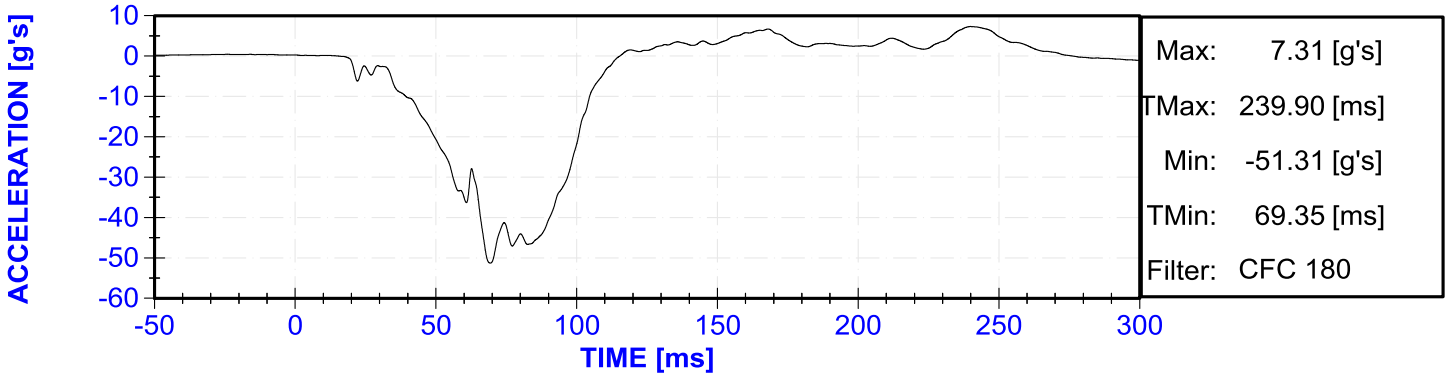
Driver Head Resultant Acceleration vs. Time Primary



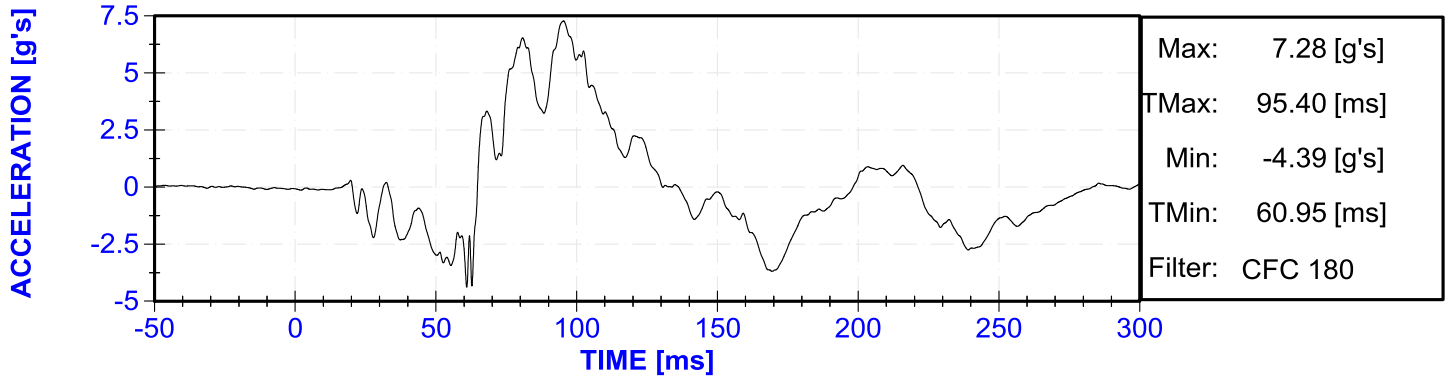
Driver Chest X Deflection vs. Time



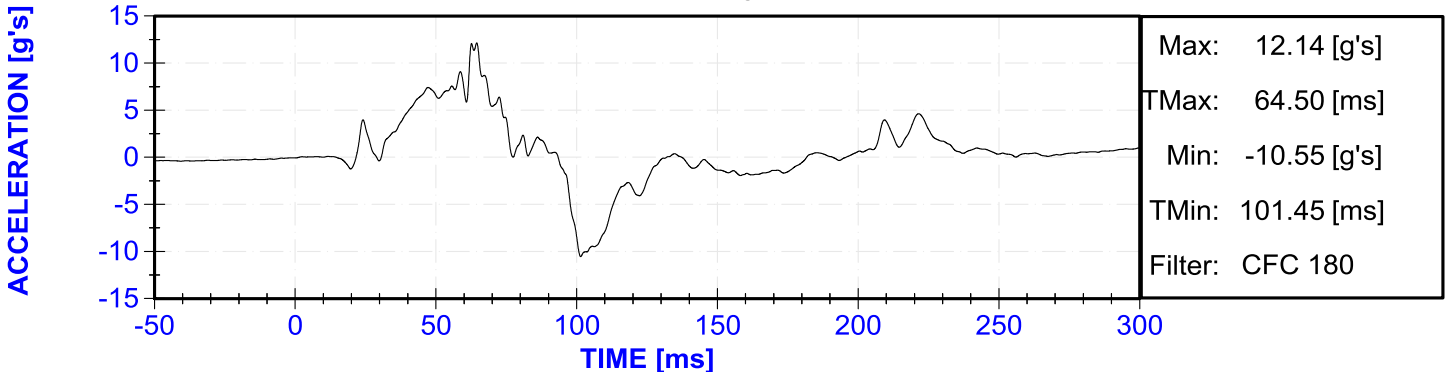
Driver Chest X Acceleration vs. Time Primary



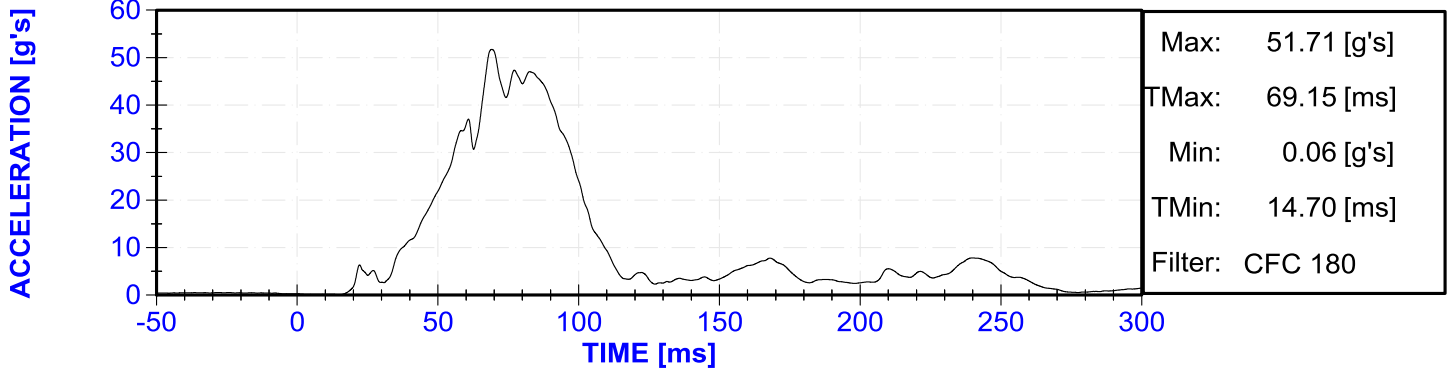
Driver Chest Y Acceleration vs. Time Primary



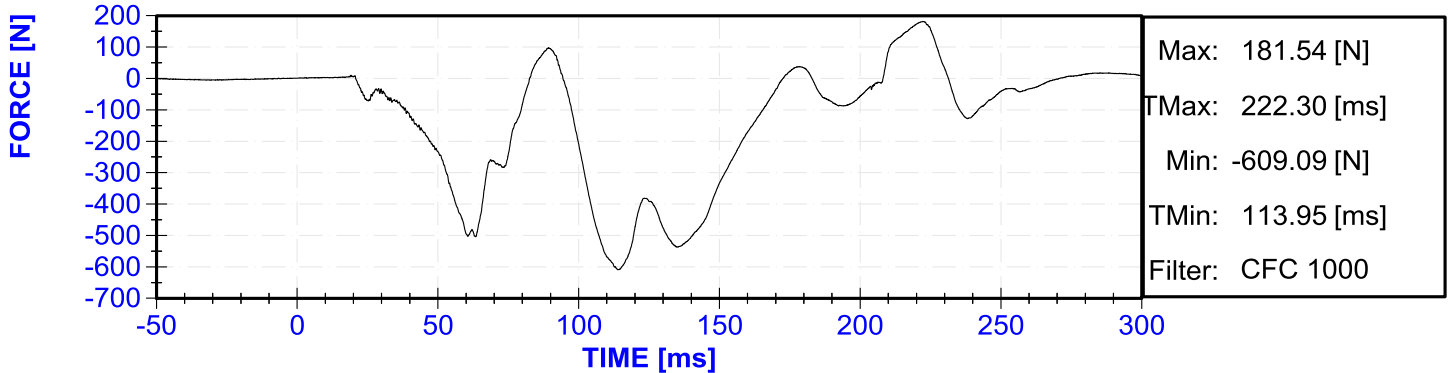
Driver Chest Z Acceleration vs. Time Primary



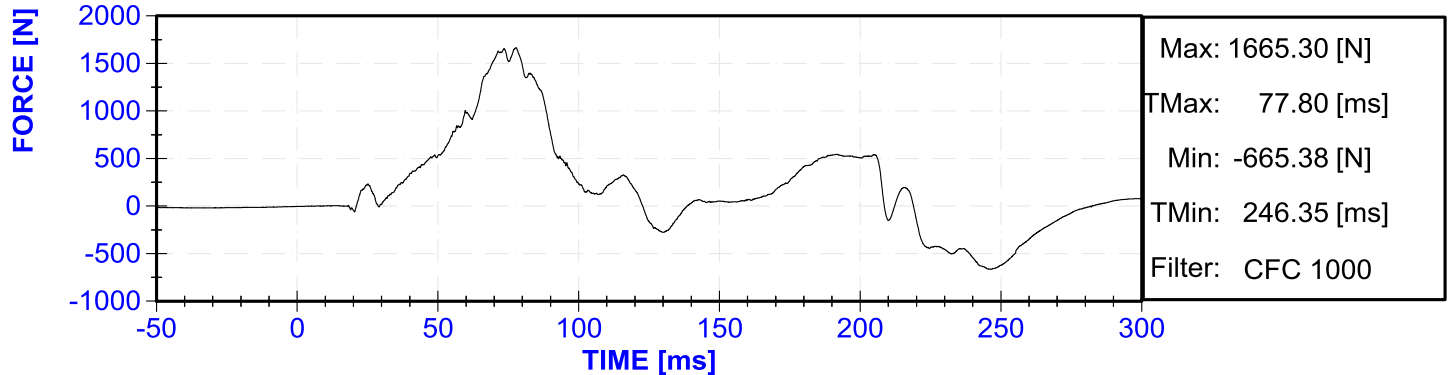
Driver Chest Resultant Acceleration vs. Time Primary



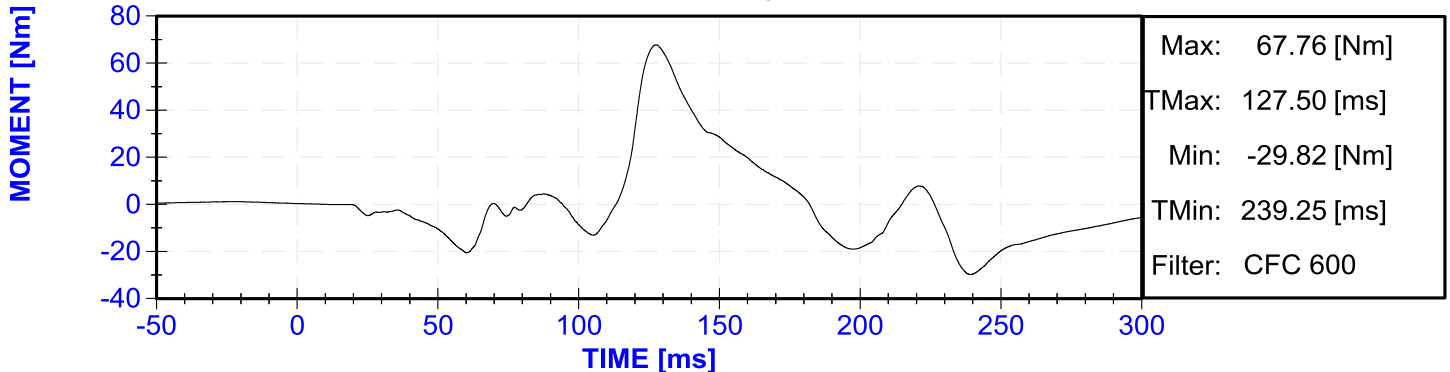
Driver Upper Neck Force X vs. Time Primary

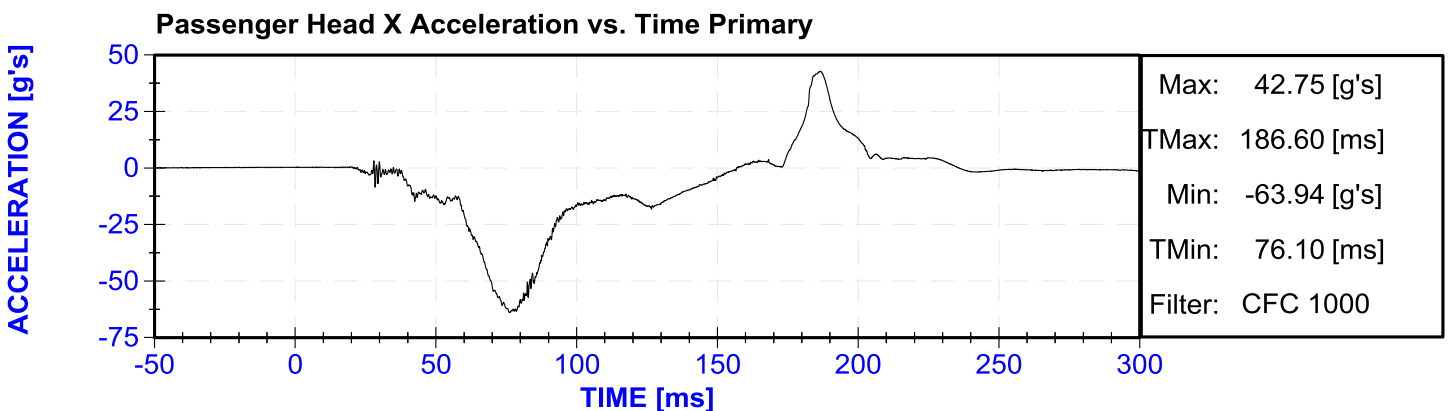
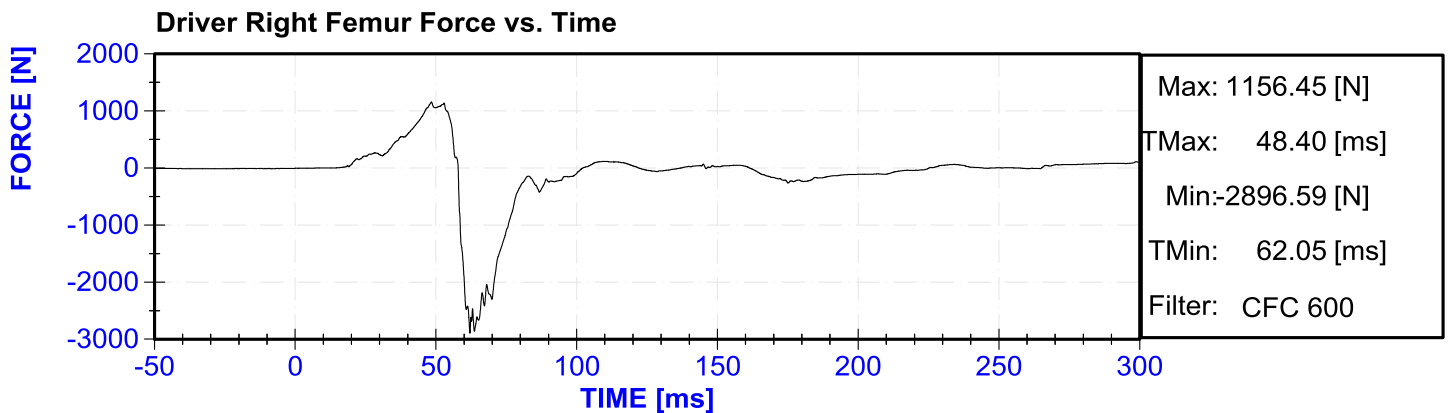
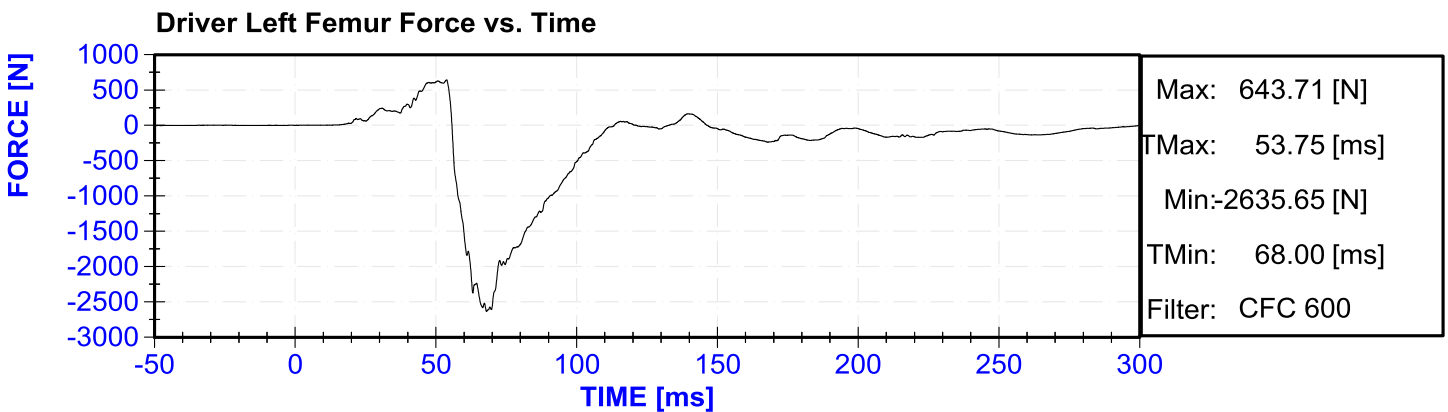
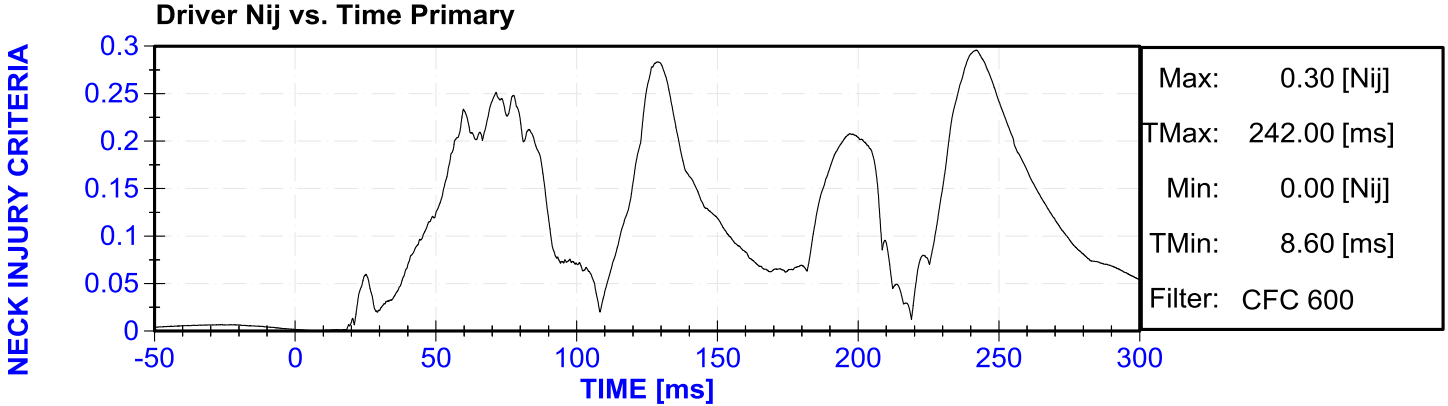


Driver Upper Neck Force Z vs. Time Primary

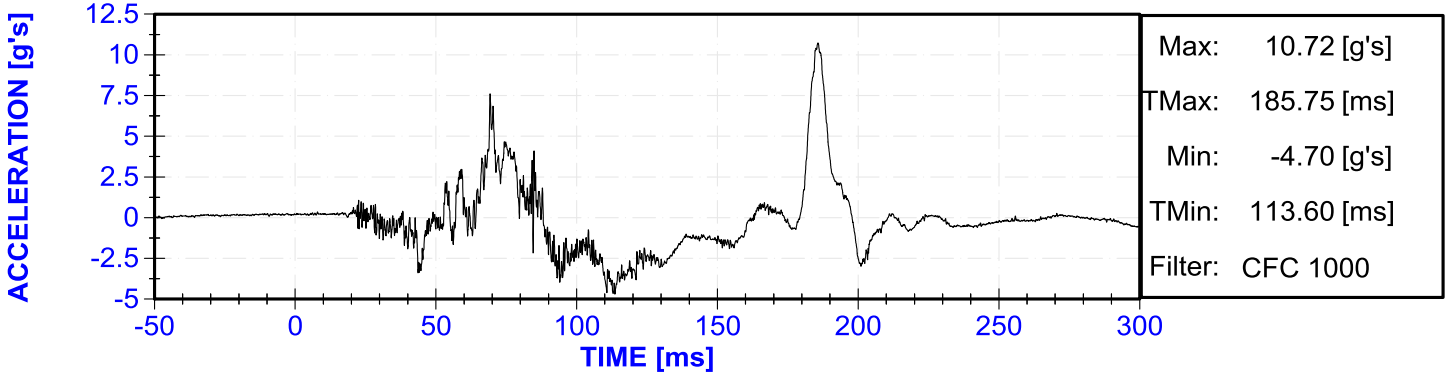


Driver Upper Neck Moment Y vs. Time Primary

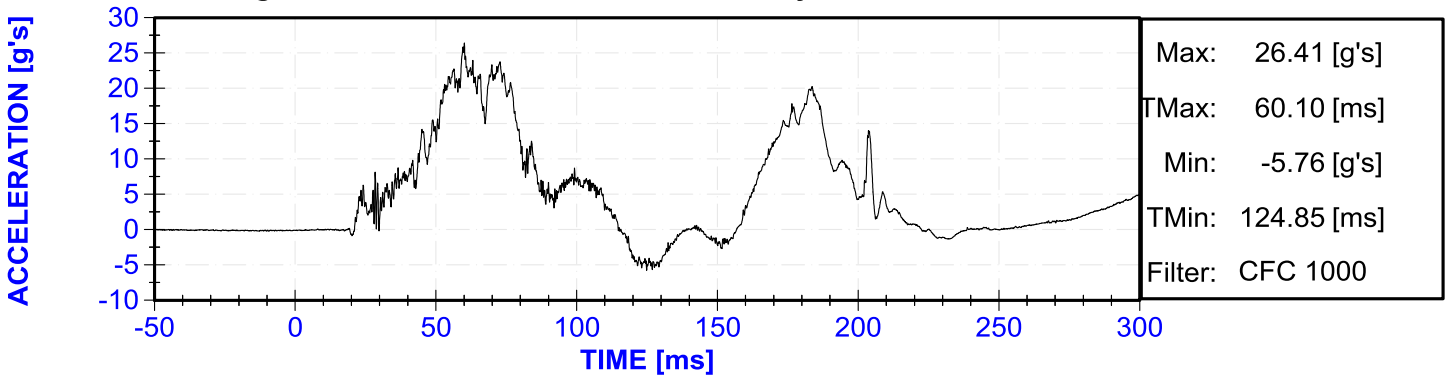




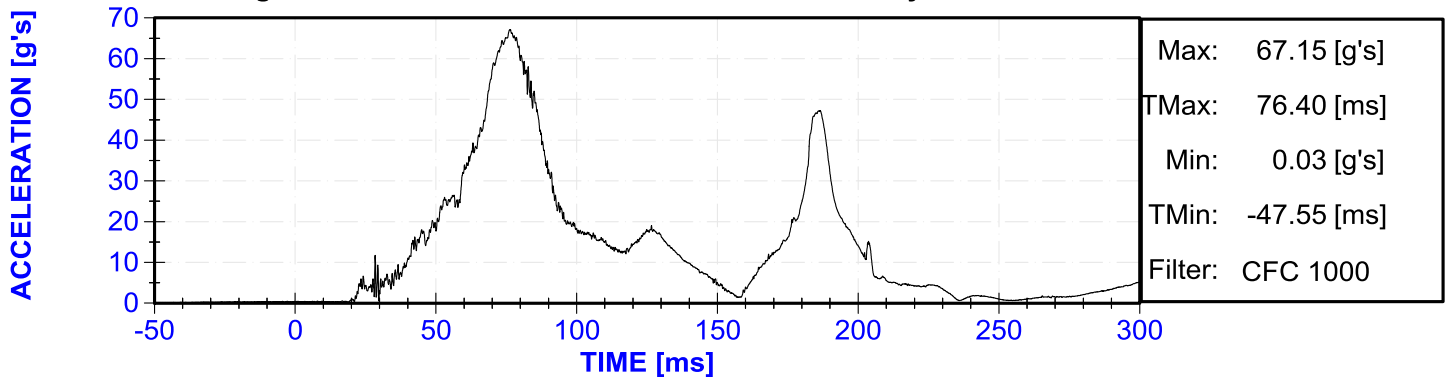
Passenger Head Y Acceleration vs. Time Primary



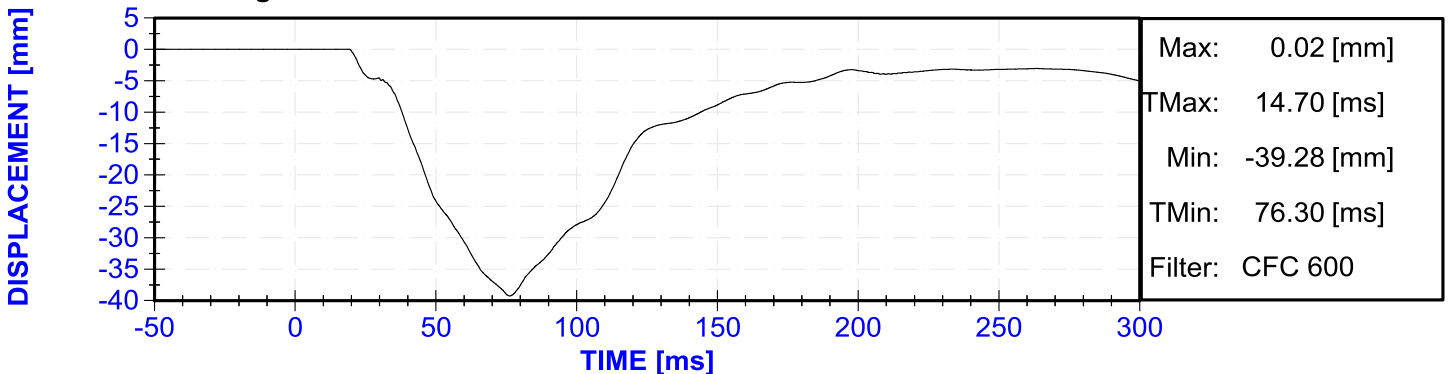
Passenger Head Z Acceleration vs. Time Primary



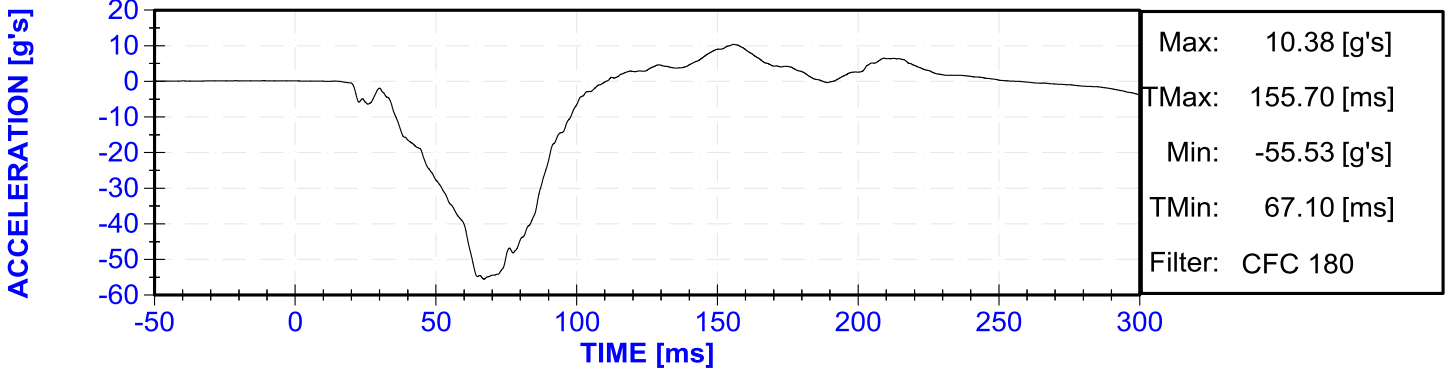
Passenger Head Resultant Acceleration vs. Time Primary



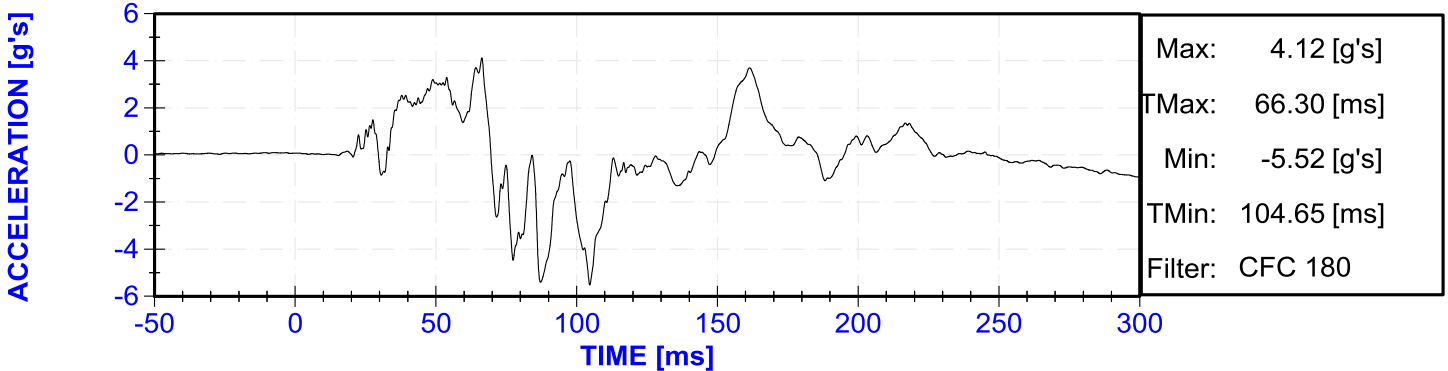
Passenger Chest X Deflection vs. Time



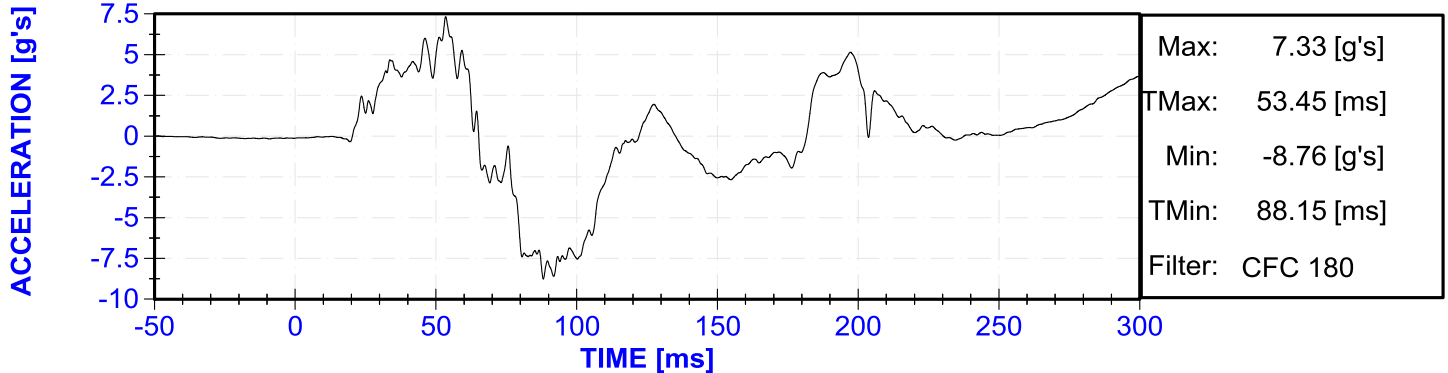
Passenger Chest X Acceleration vs. Time Primary



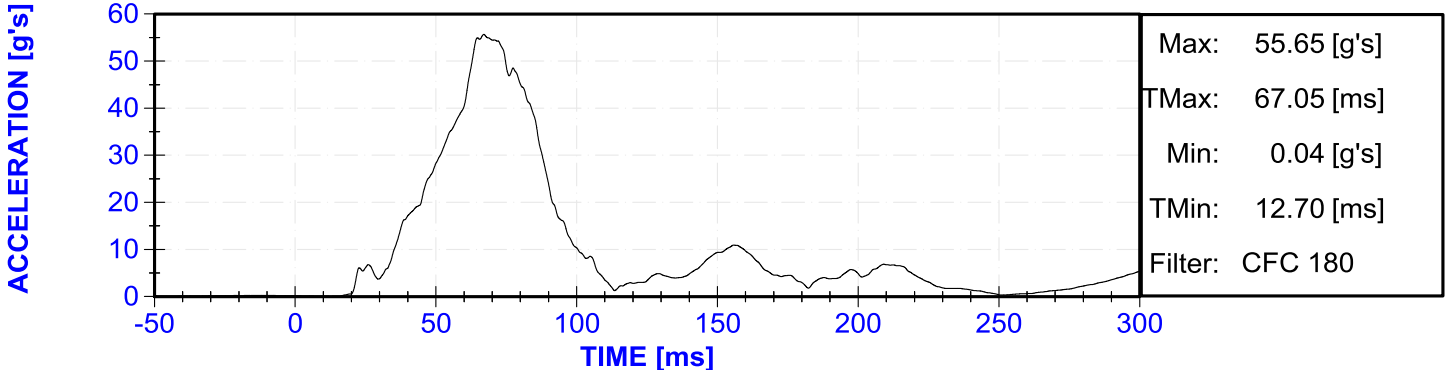
Passenger Chest Y Acceleration vs. Time Primary



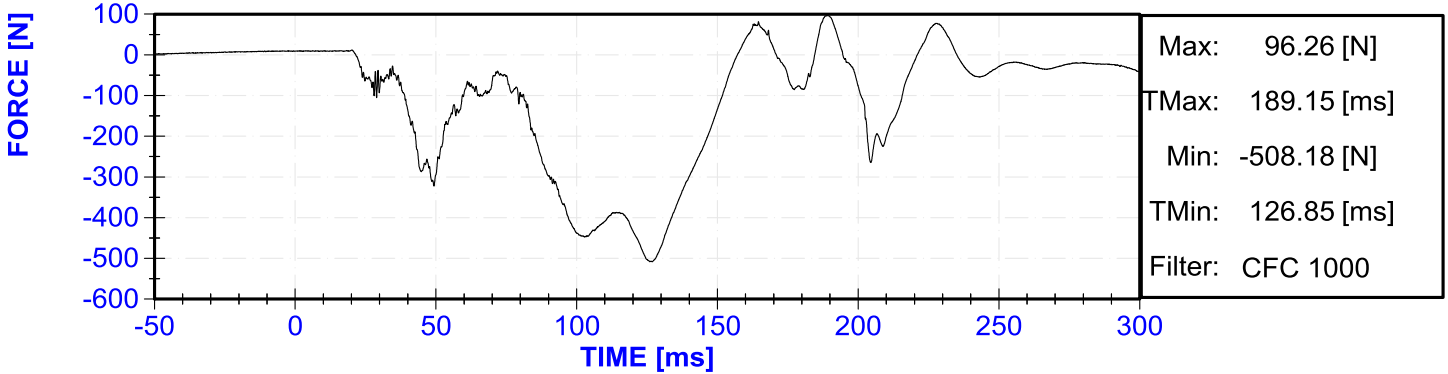
Passenger Chest Z Acceleration vs. Time Primary



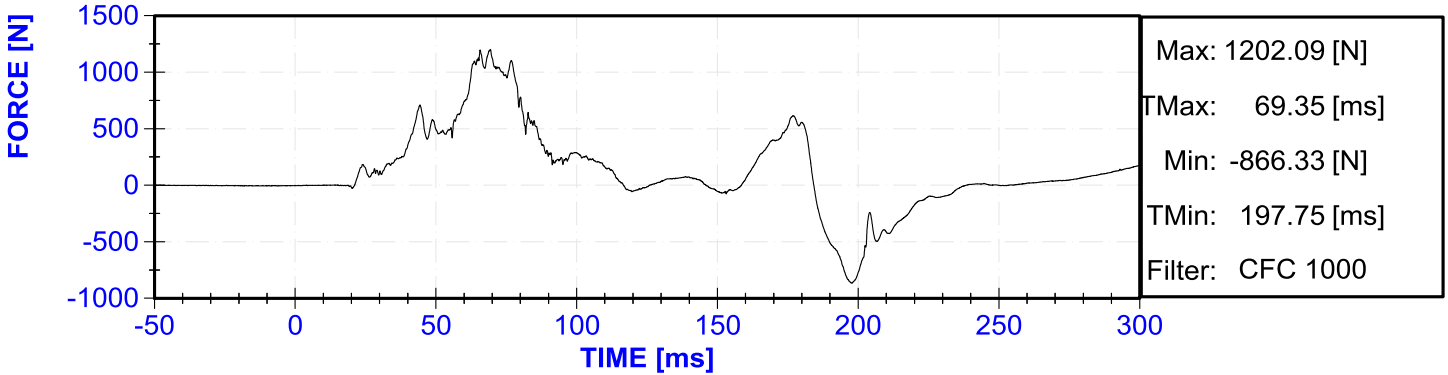
Passenger Chest Resultant Acceleration vs. Time Primary



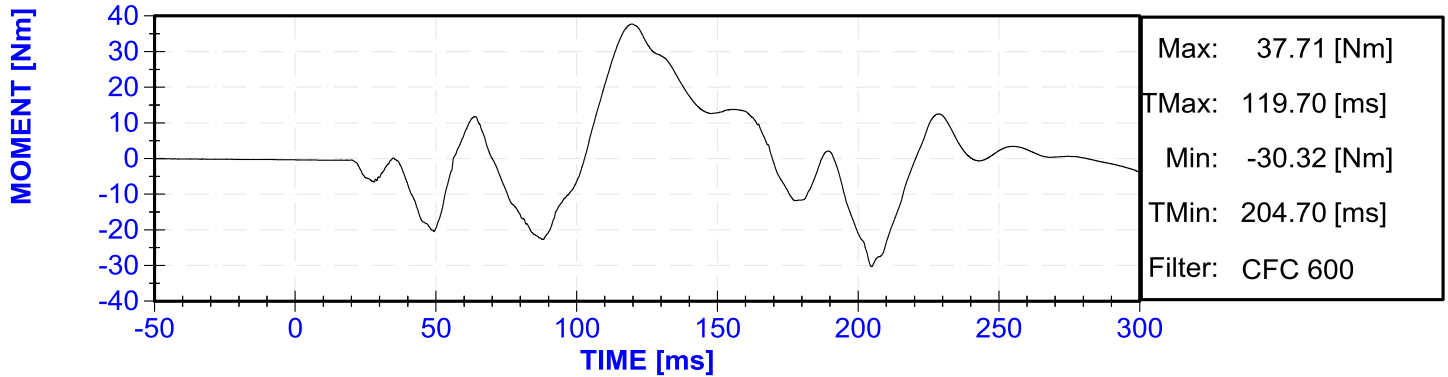
Passenger Upper Neck Force X vs. Time Primary



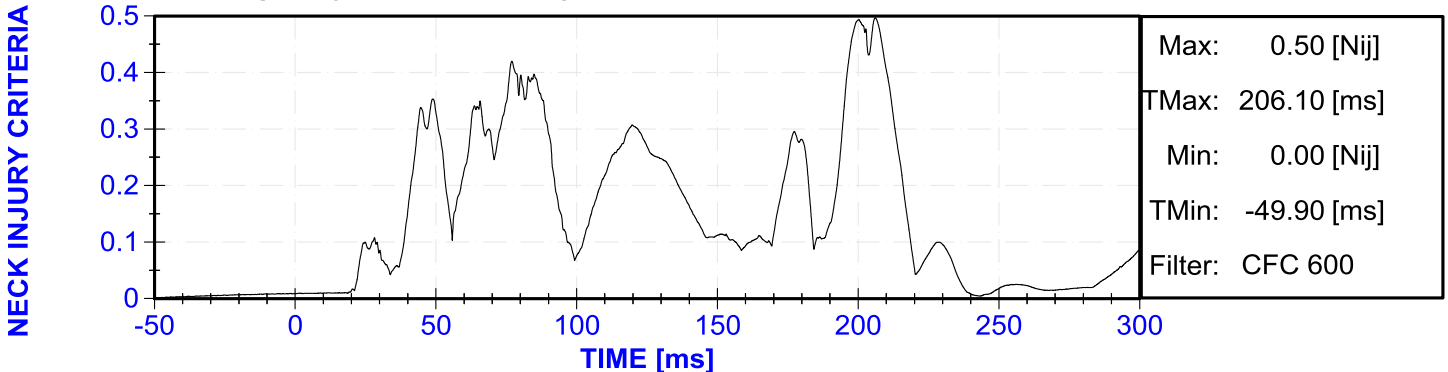
Passenger Upper Neck Force Z vs. Time Primary



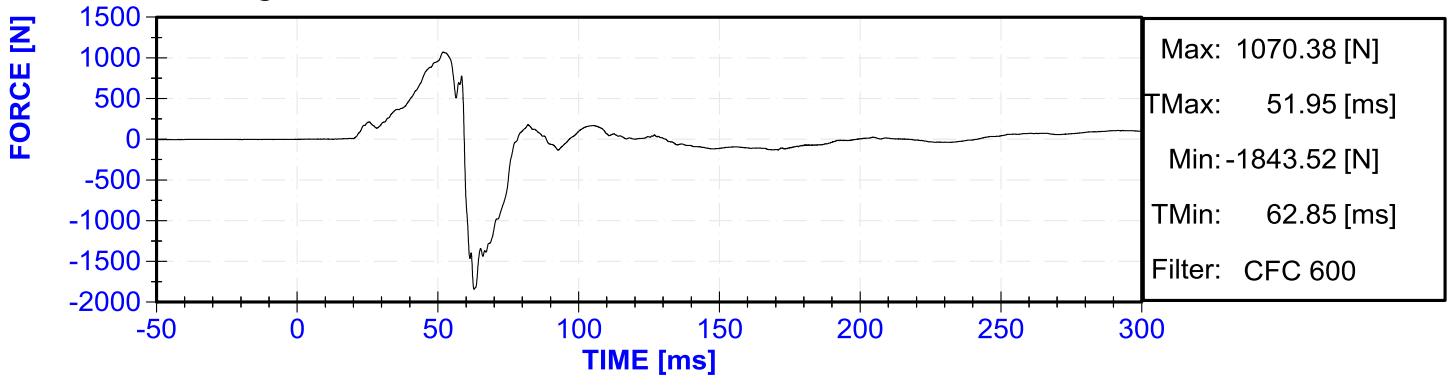
Passenger Upper Neck Moment Y vs. Time Primary



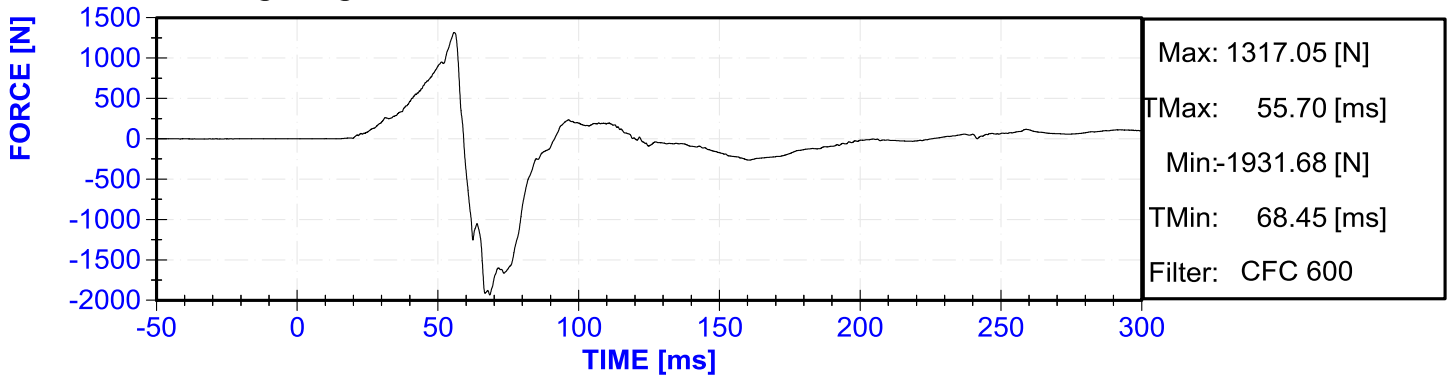
Passenger Nij vs. Time Primary



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



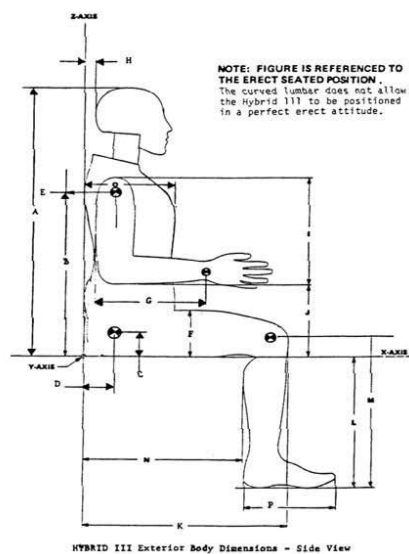
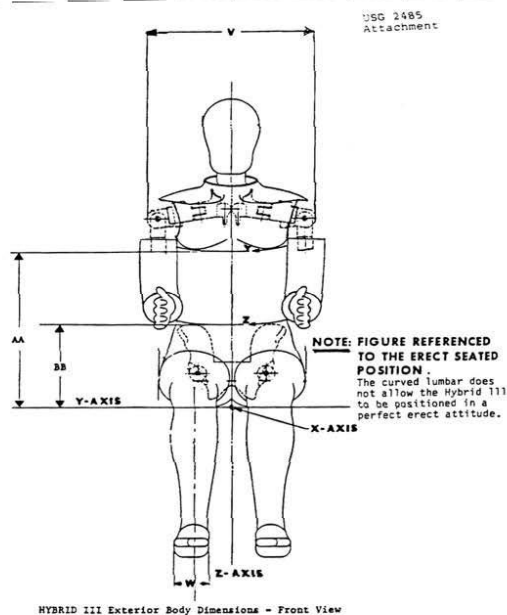
50th Male External Measurements

S/N 064

Symbol	Description	Specification	Results	Pass
		in	In	
A	Sitting Height	34.6 – 35.0	34.6	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	13.0	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

03/06/2014





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:	3/7/2014
		Test Time:	2:49:29 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	7997

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	22.00 deg C	P
Humidity	10	--	70	19.80 %RH	P
Resultant Acceleration	225	--	275	259.6 G's	P
Oscillation	0	--	10	2.3 %	P
Lateral Acceleration	-15	--	15	-8.3 G's	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



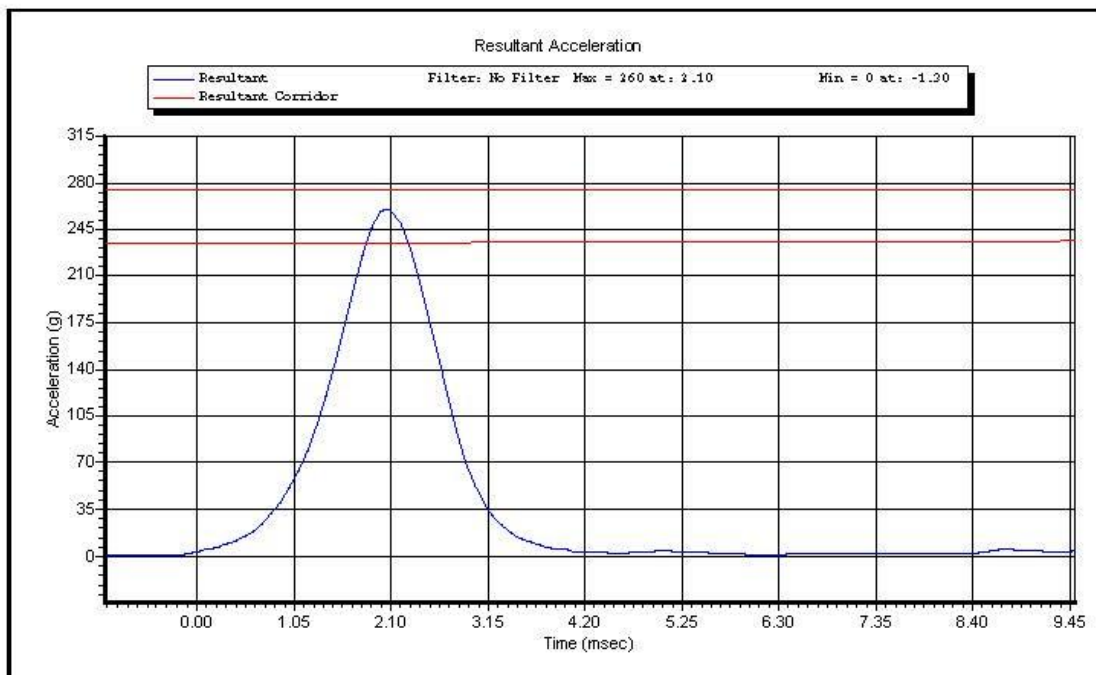
VERIFICATION REPORT

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



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

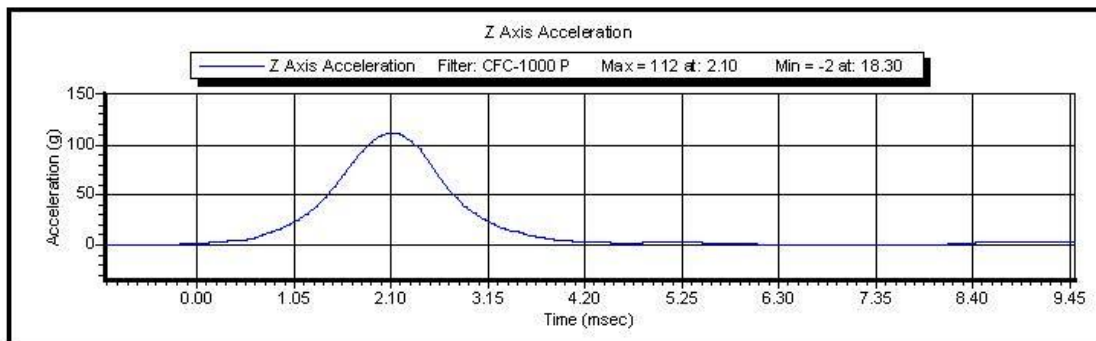
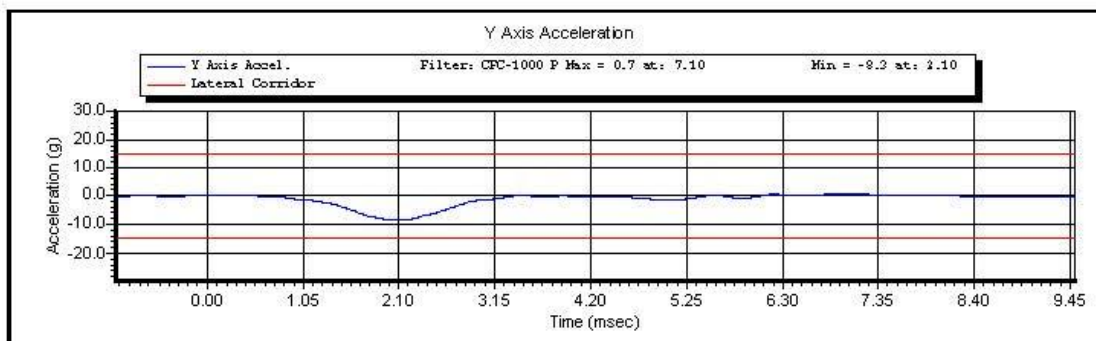
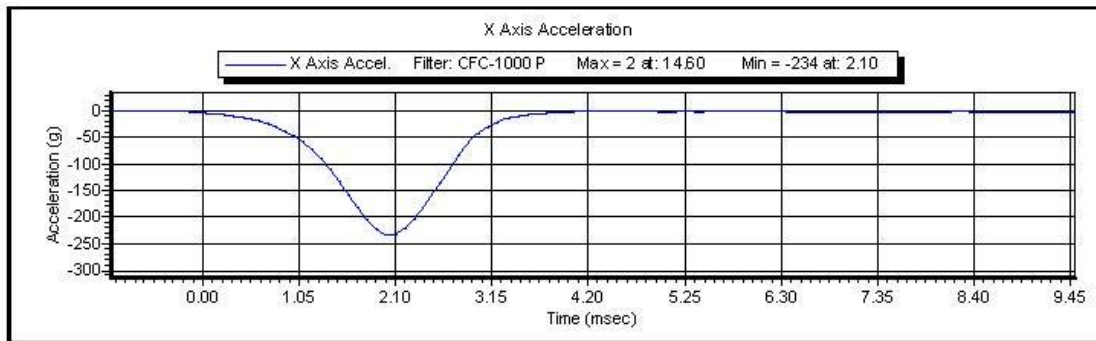


Test ID: **Head Drop**

Test Time: **2:49:29 PM**

Test Date: **3/7/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **2:49:29 PM**

Test Date: **3/7/2014**

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:	3/7/2014
		Test Time:	10:57:21 AM

Component Part Number	Component Serial Number
Neck - 78051-336	021692

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	21.90 deg C	P
Humidity		10	-- 70	16.90 %RH	P
Velocity		5.94	-- 6.19	6.038 m/s	P
Pendulum Deceleration at	10 ms	17.2	-- 21.2	18.90 G's	P
Pendulum Deceleration at	20 ms	14.0	-- 19.0	16.20 G's	P
Pendulum Deceleration at	30 ms	11.0	-- 16.0	12.12 G's	P
Max Pendulum Deceleration after	30 ms	0.0	-- 22.0	13.26 G's	P
Deceleration Time to	5 G's	38	-- 46	43.3 ms	P
D Plane Rotation		81	-- 106	98.8 degrees	P
Time at Max Rotation		72	-- 82	78.0 ms	P
Rotation Decay to Zero		147	-- 174	157.6 ms	P
Moment About Occipital Condyle		-80.0	-- -52.9	-66.68 Nm	P
Time at Maximum Moment		65	-- 79	73.9 ms	P
Moment Decay to Zero		120	-- 148	145.1 ms	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



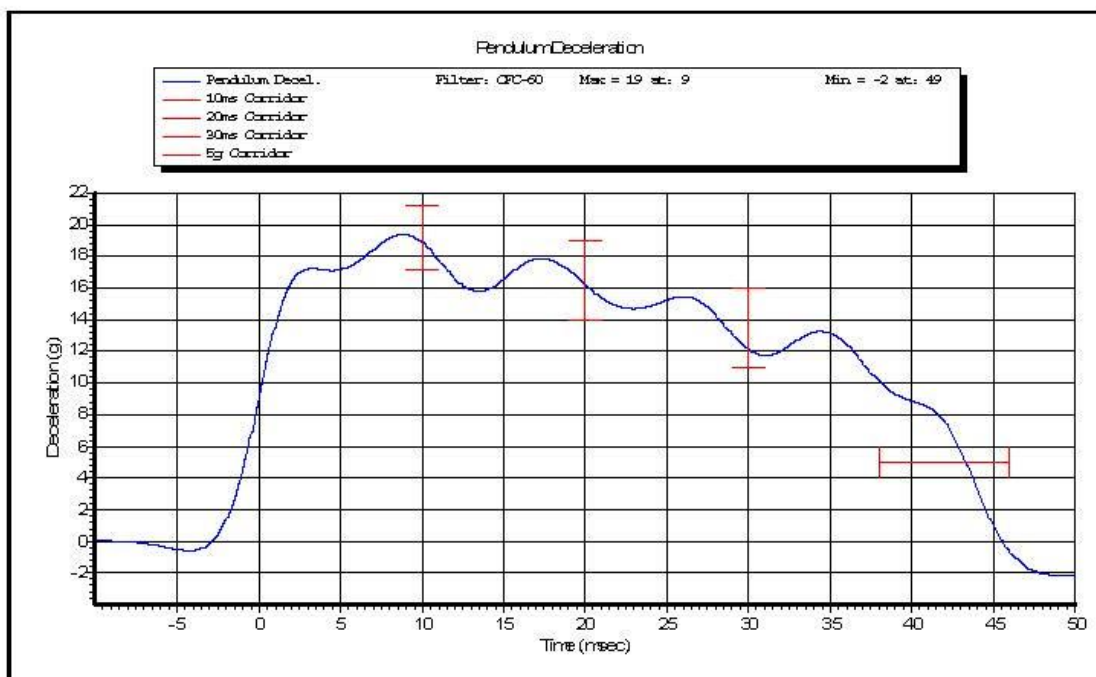
VERIFICATION REPORT

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	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

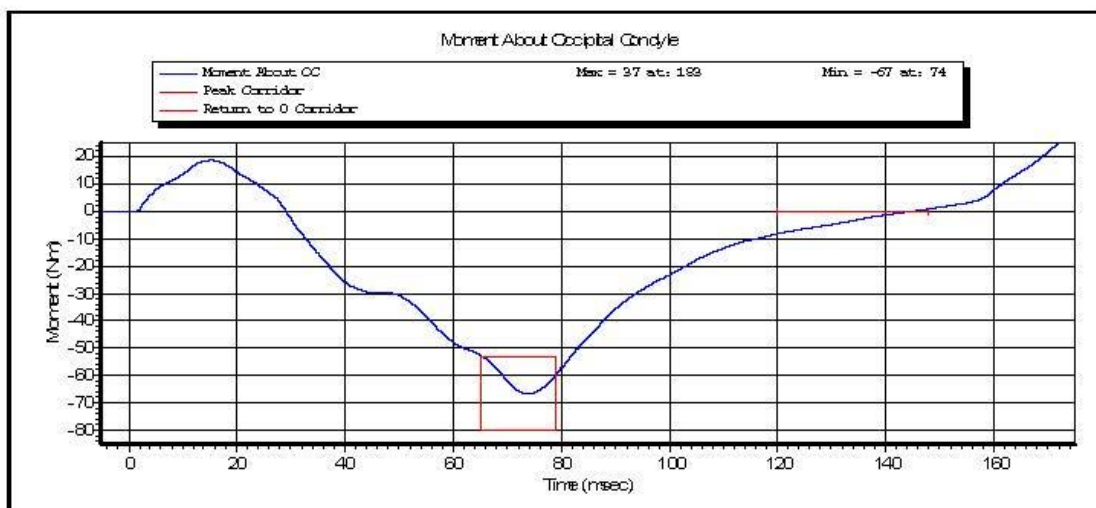
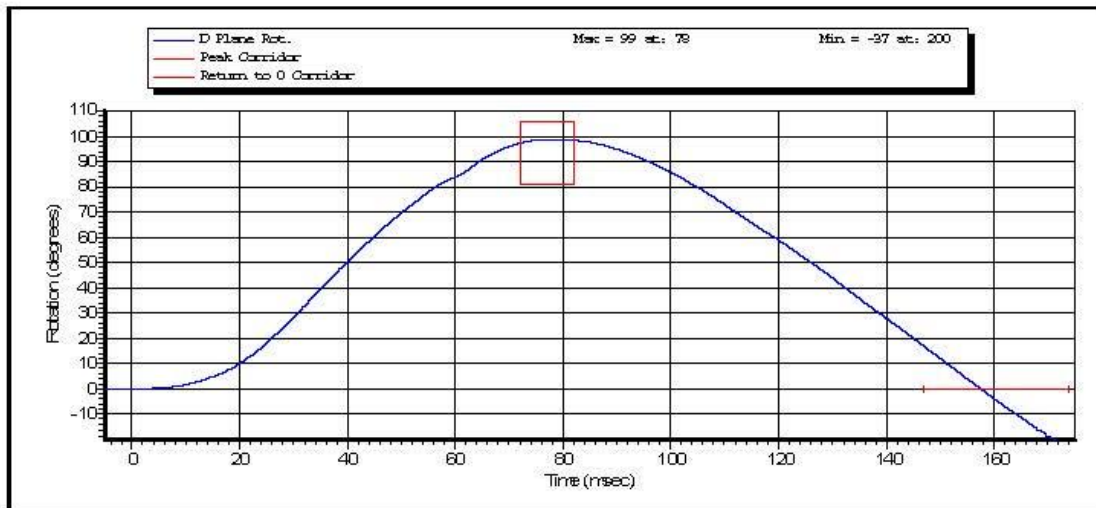


Name of Test:	Neck Extension
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	064



ID of Test: **Neck Extension** Time of Test: **10:57:21 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Date of Test: **3/7/2014**

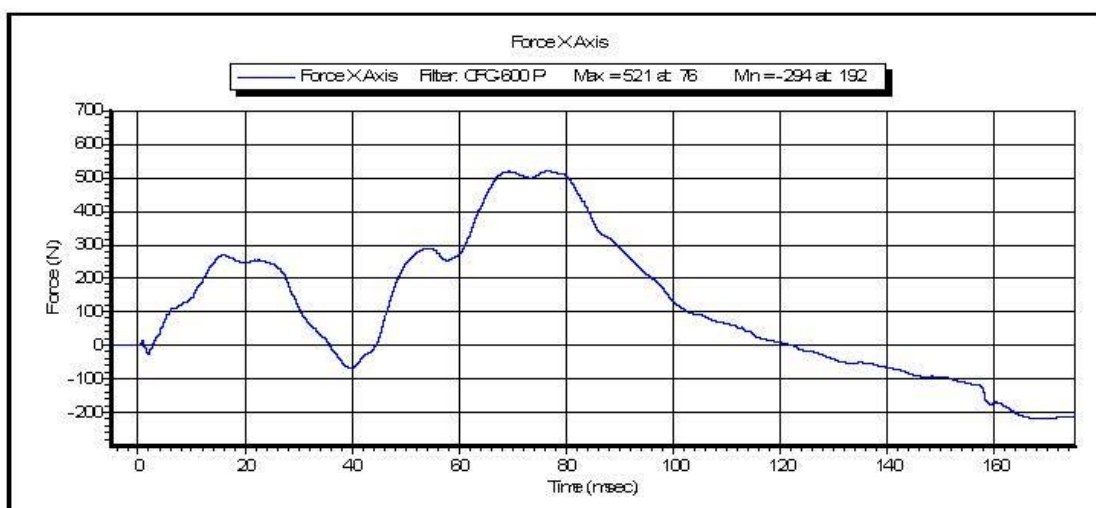
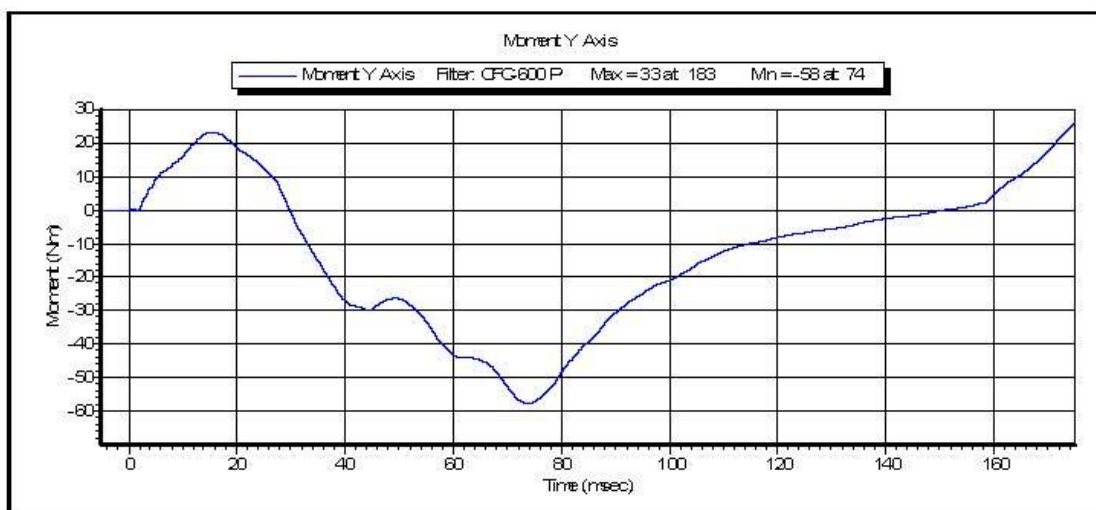


ID of Test: **Neck Extension**

Time of Test: **10:57:21 AM**

Date of Test: **3/7/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Extension**

Time of Test: **10:57:21 AM**

Date of Test: **3/7/2014**

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:	3/7/2014
		Test Time:	9:11:48 AM

Component Part Number	Component Serial Number
Neck - 78051-336	021692

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	21.90 deg C	P
Humidity		10	-- 70	16.00 %RH	P
Velocity		6.89	-- 7.13	6.985 m/s	P
Pendulum Deceleration at	10 ms	22.5	-- 27.5	23.53 G's	P
Pendulum Deceleration at	20 ms	17.6	-- 22.6	20.62 G's	P
Pendulum Deceleration at	30 ms	12.5	-- 18.5	14.49 G's	P
Maximum Pendulum Deceleration After	30 ms	0	-- 29	14.5 G's	P
Deceleration Time to	5 ms	34	-- 42	40.4 ms	P
D Plane Rotation		-78	-- -64	-72.7 degrees	P
Time at Maximum Rotation		57	-- 64	60.0 ms	P
Rotation Decay to Zero		113	-- 128	113.4 ms	P
Moment About Occipital Condyle		88.1	-- 108.4	101.08 Nm	P
Time at Maximum Moment		47	-- 58	53.6 ms	P
Moment Decay to Zero		97.0	-- 107.0	98.9 ms	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



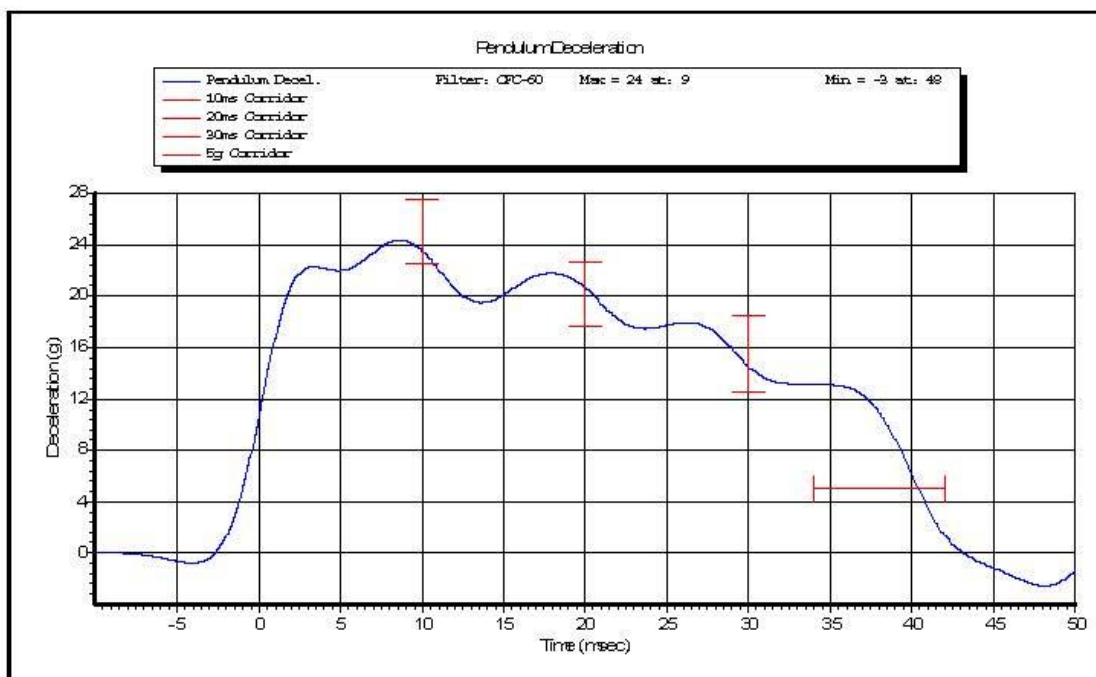
VERIFICATION REPORT

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	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

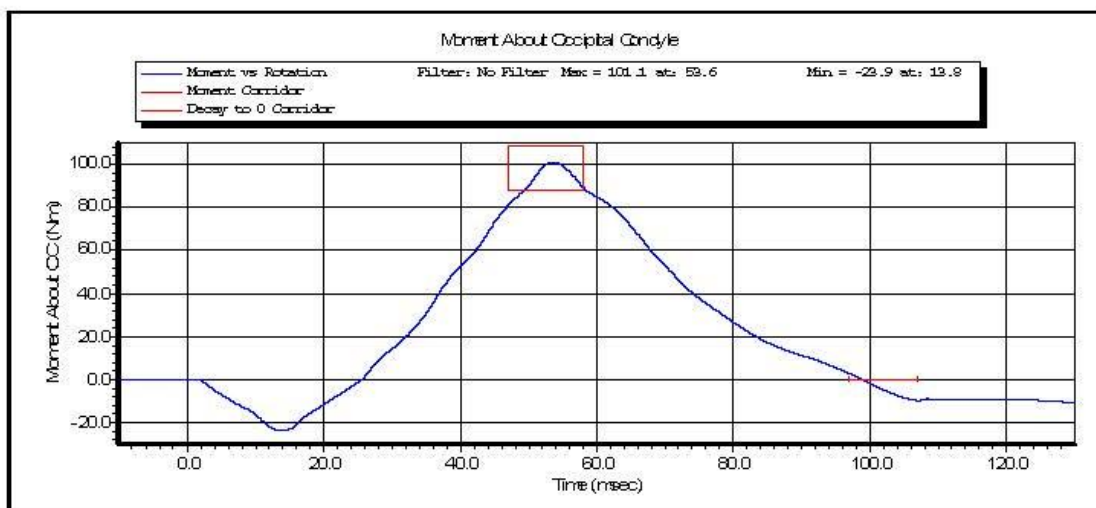
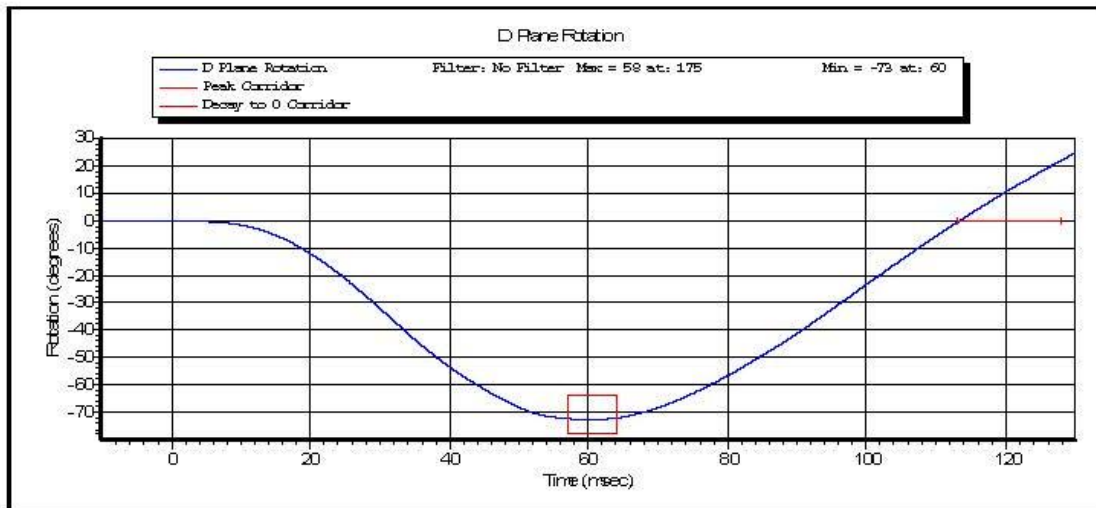


ID of Test: **Neck Flexion**

Time of Test: **9:11:48 AM**

Date of Test: **3/7/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

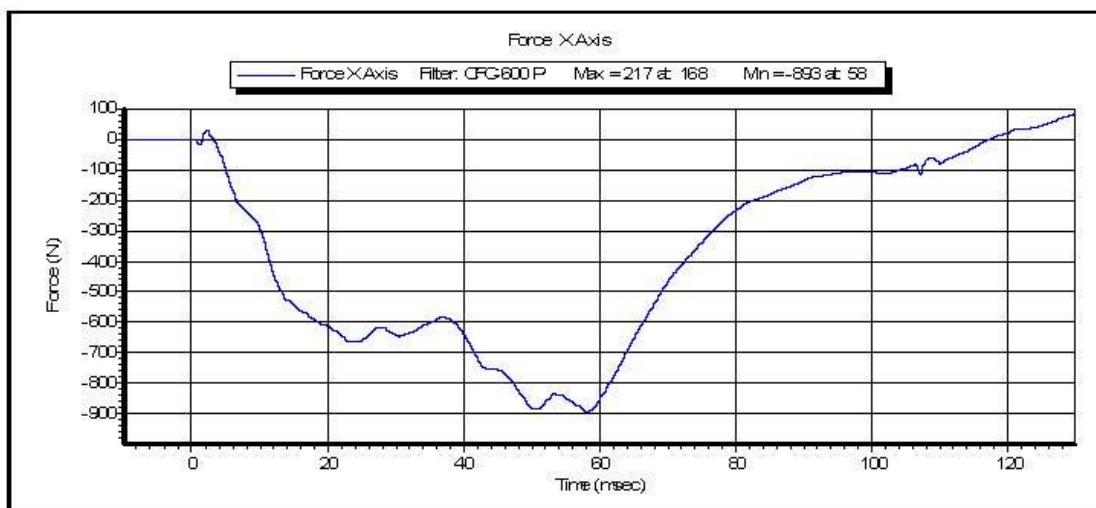
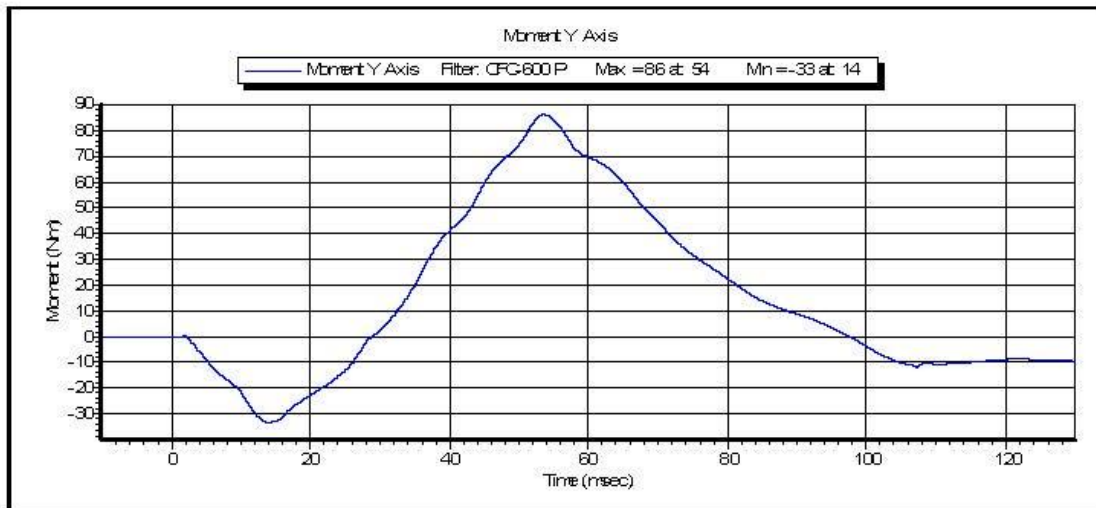


ID of Test: **Neck Flexion**

Time of Test: **9:11:48 AM**

Date of Test: **3/7/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Flexion**

Time of Test: **9:11:48 AM**

Date of Test: **3/7/2014**

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:	3/10/2014
		Test Time:	10:40:24 AM

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

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.40 deg C	P
Humidity	10	--	70	25.50 %RH	P
Velocity	6.59	--	6.83	6.663 m/s	P
Chest Deflection	-72.6	--	-63.5	-71.18 mm	P
Resistive Force	-5.894	--	-5.160	-5.5068 kN	P
Hysteresis	69	--	85	69.8 %	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



VERIFICATION REPORT

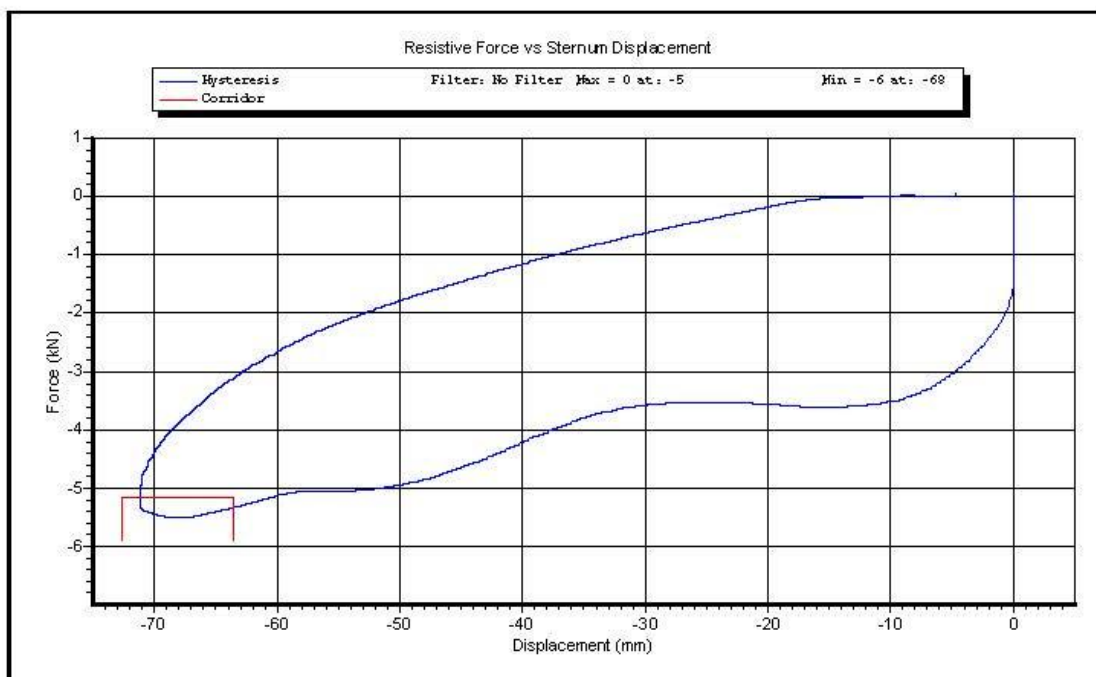
REFERENCE EQUIPMENT

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

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

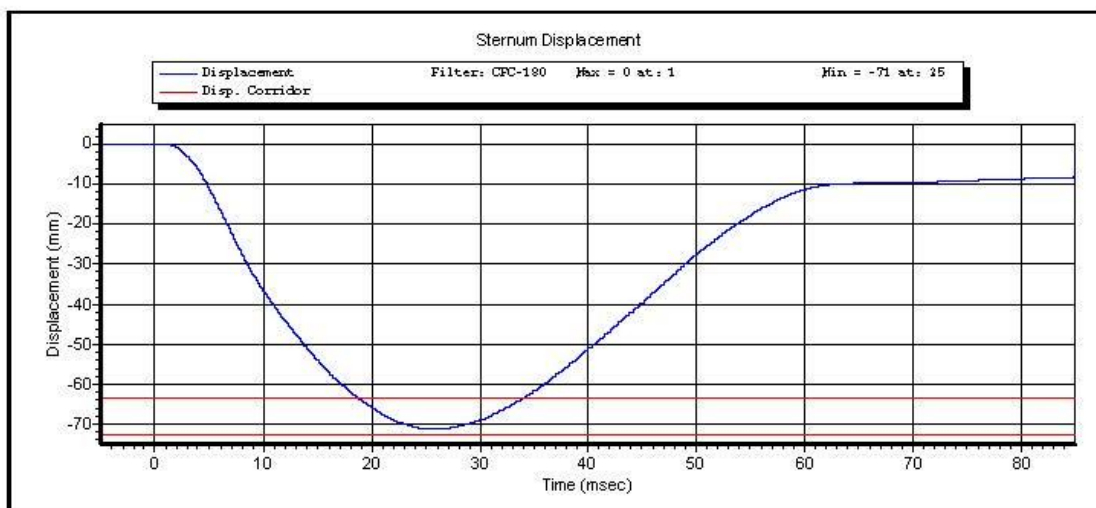
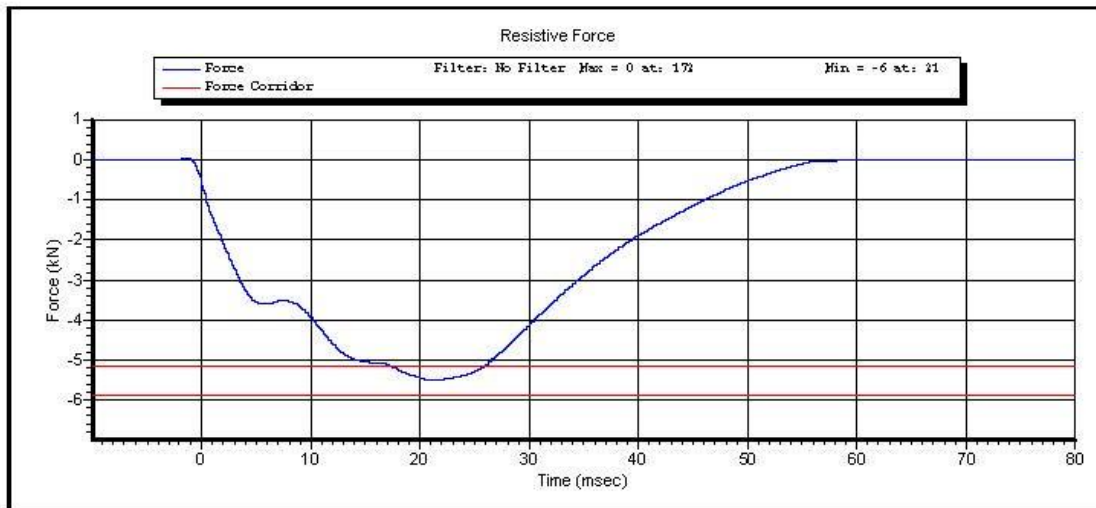


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Thorax Impact** Test Time: **10:40:24 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **3/10/2014**

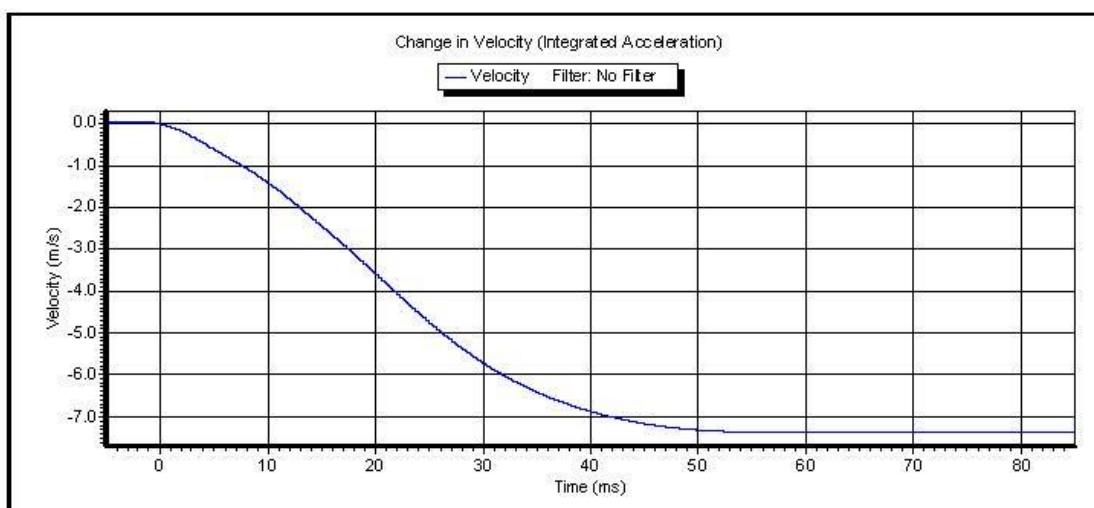
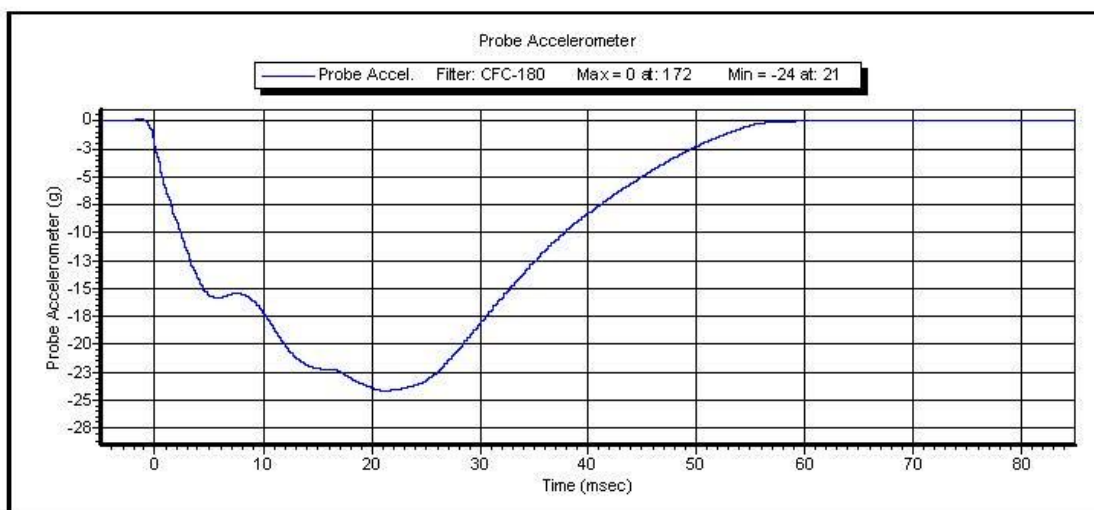


Test ID: **Thorax Impact**

Test Time: **10:40:24 AM**

Test Date: **3/10/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **10:40:24 AM**

Test Date: **3/10/2014**

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:	3/6/2014
		Test Time:	2:25:32 PM

Component Part Number	Component Serial Number
Pelvis Assembly 78051-60	1445

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.60 deg C P
Humidity	10 -- 70	15.00 %RH P
Average Velocity	5 -- 10	5.9 deg/s P
Angle at 203 Nm	40 -- 50	43.6 degrees P
Moment at 30 degrees	0.0 -- 94.9	66.58 Nm P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



VERIFICATION REPORT

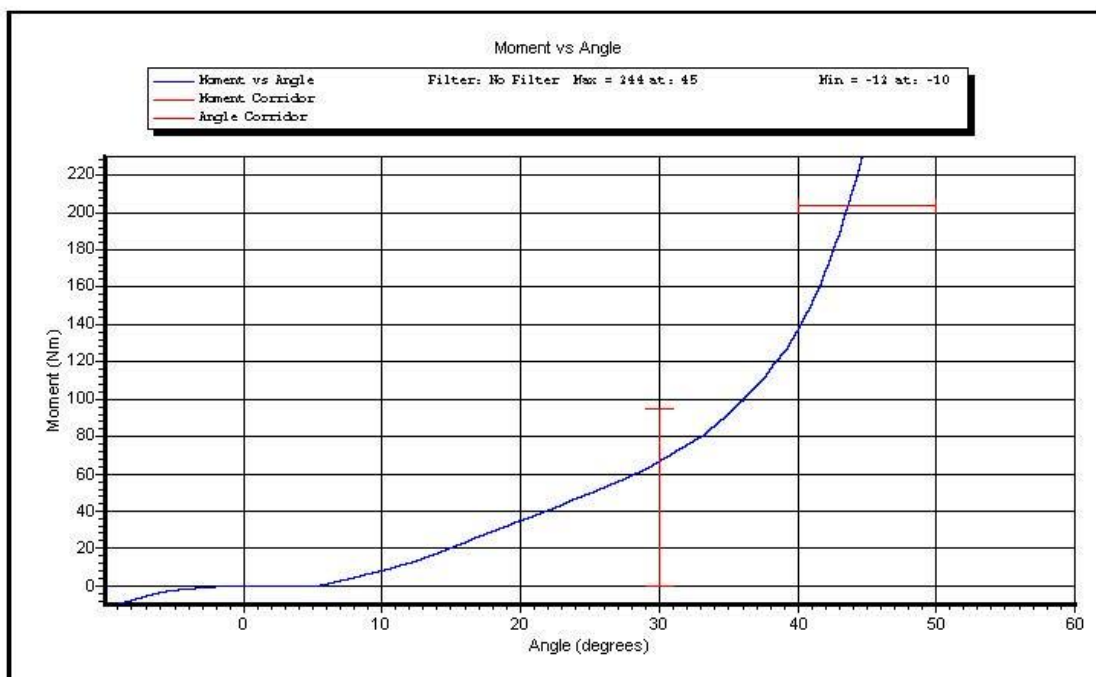
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/19/2013
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 Left** Test Time: **2:25:32 PM**

Test Date: **3/6/2014**

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:	3/6/2014
		Test Time:	2:13:13 PM

Component Part Number	Component Serial Number
Pelvis Assembly 78051-60	1445

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.60 deg C	P
Humidity	10	--	70	15.20 %RH	P
Average Velocity	5	--	10	6.1 deg/s	P
Angle at 203 Nm	40	--	50	42.4 degrees	P
Moment at 30 degrees	0.0	--	94.9	78.34 Nm	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



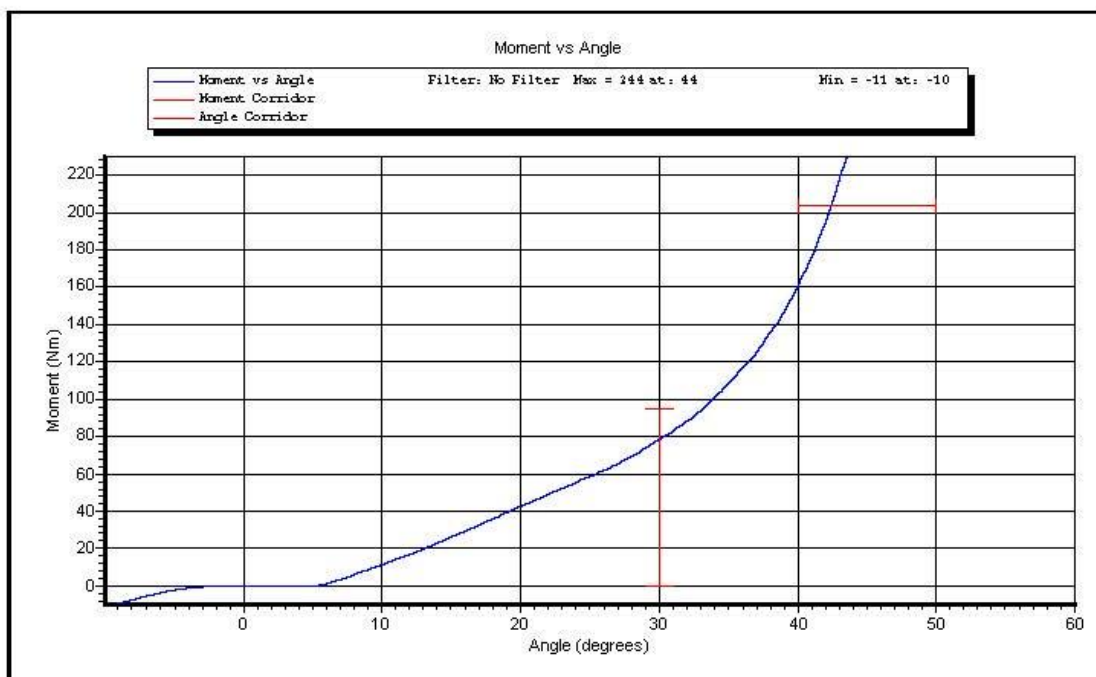
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/19/2013
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: **2:13:13 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **3/6/2014**



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:	3/7/2014
		Test Time:	9:27:51 AM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	2882

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.90 deg C	P
Humidity	10	--	70	16.00 %RH	P
Velocity	2.07	--	2.13	2.104 m/s	P
Resistive Force	-5.780	--	-4.720	-5.268 kN	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

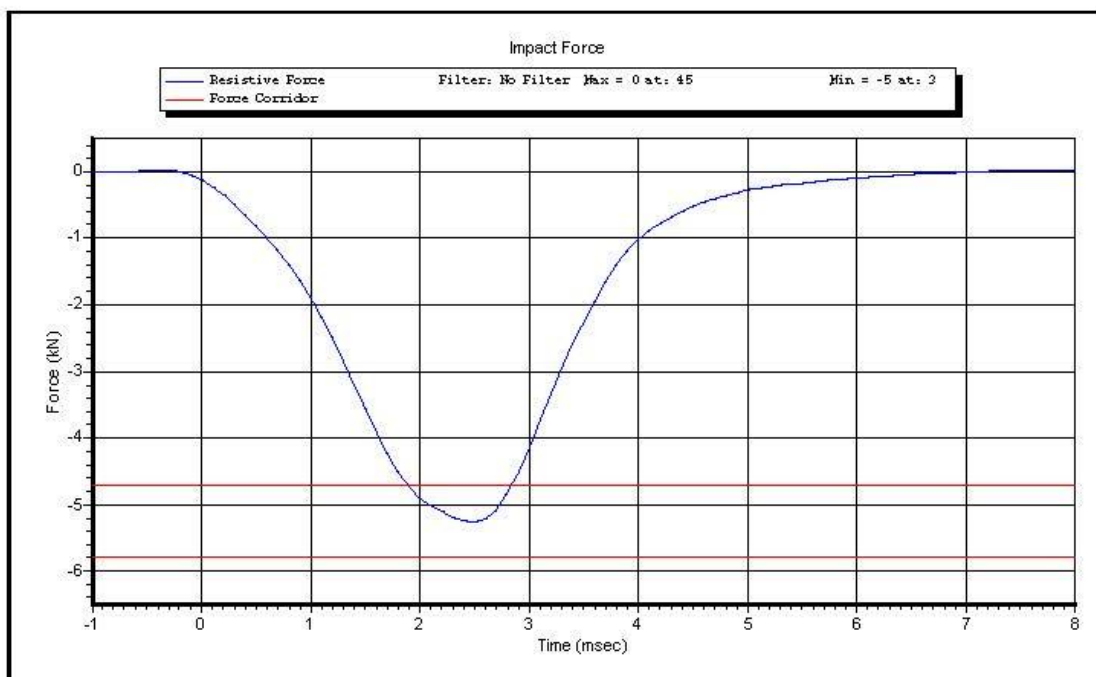
REFERENCE EQUIPMENT

<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

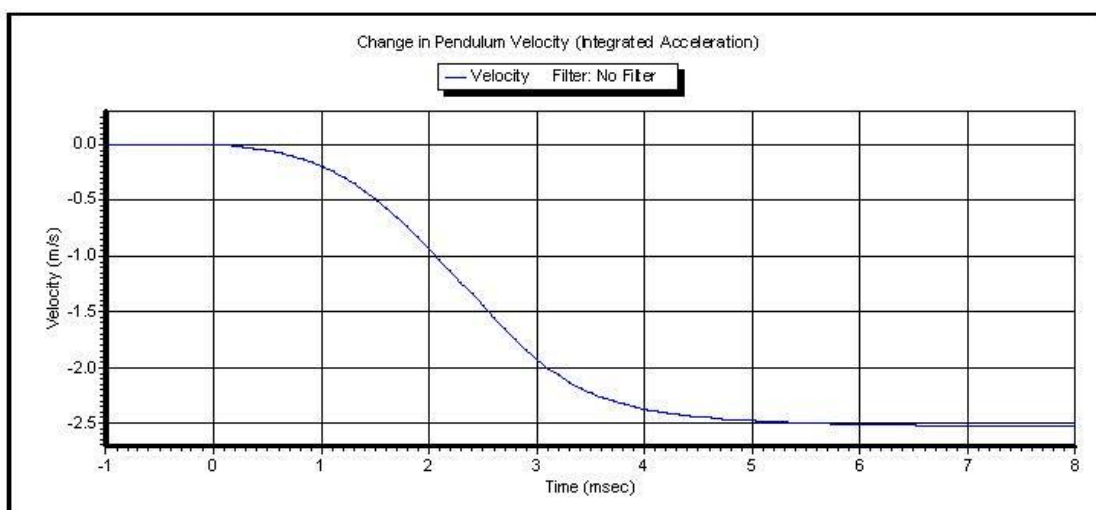
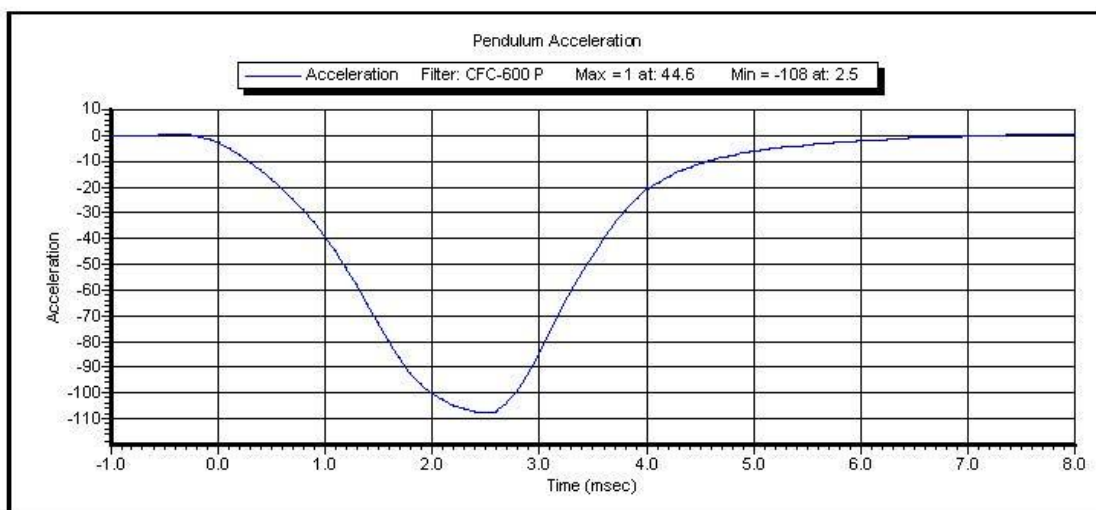


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Knee Impact Left** Test Time: **9:27:51 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **3/7/2014**



Test ID: **Knee Impact Left** Test Time: **9:27:51 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **3/7/2014**



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:		Test Date:	3/7/2014
		Test Time:	11:57:29 AM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	2531

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.20 deg C P
Humidity	10 -- 70	17.90 %RH P
Velocity	2.07 -- 2.13	2.083 m/s P
Resistive Force	-5.780 -- -4.720	-5.211 kN P

All test parameters are within specifications

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



VERIFICATION REPORT

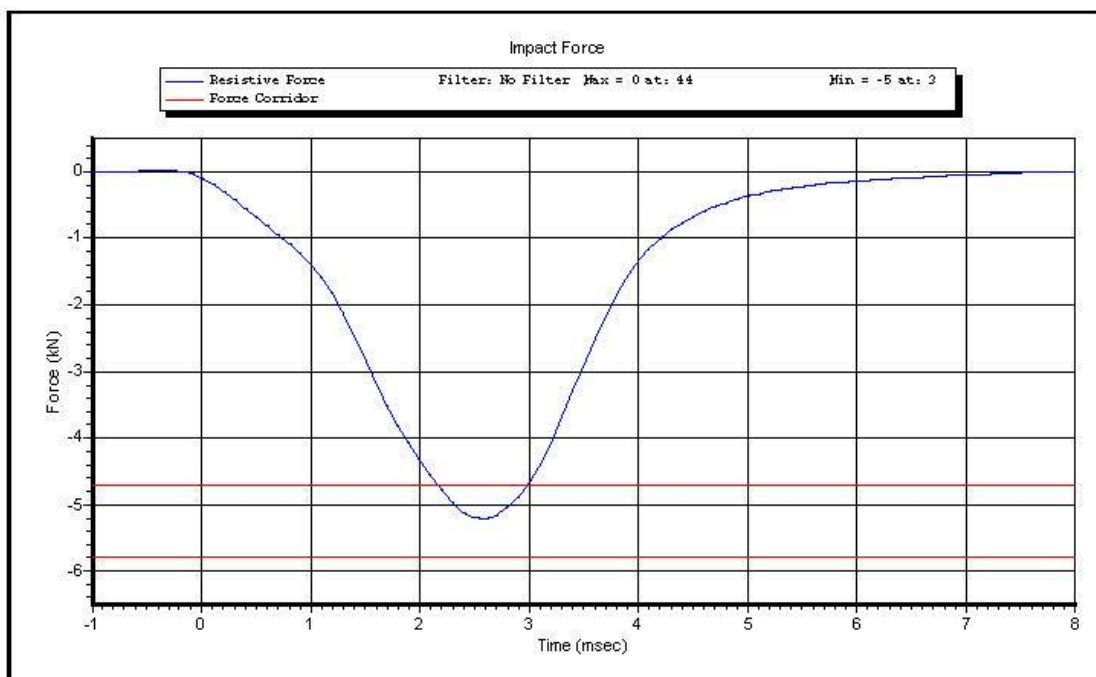
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD 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

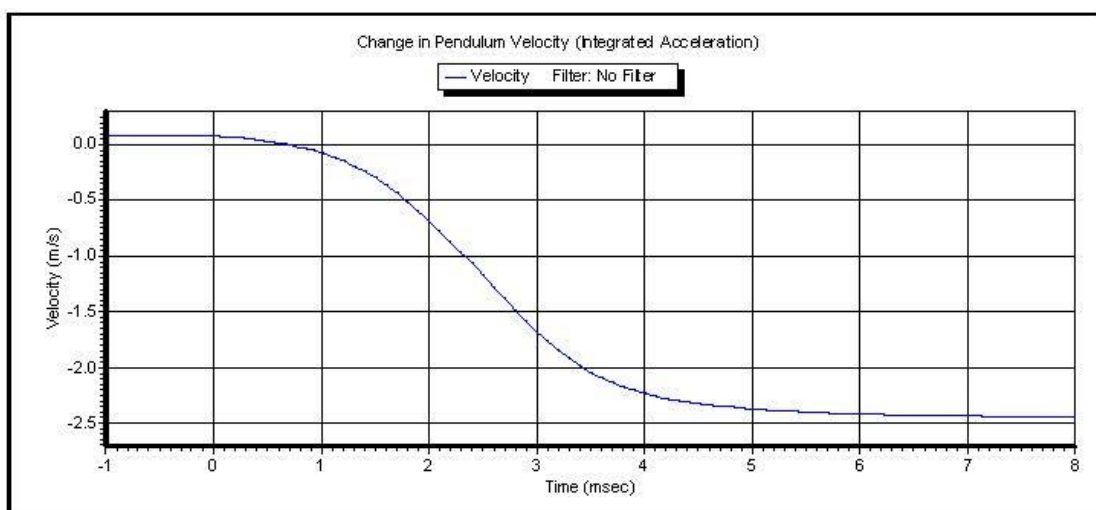
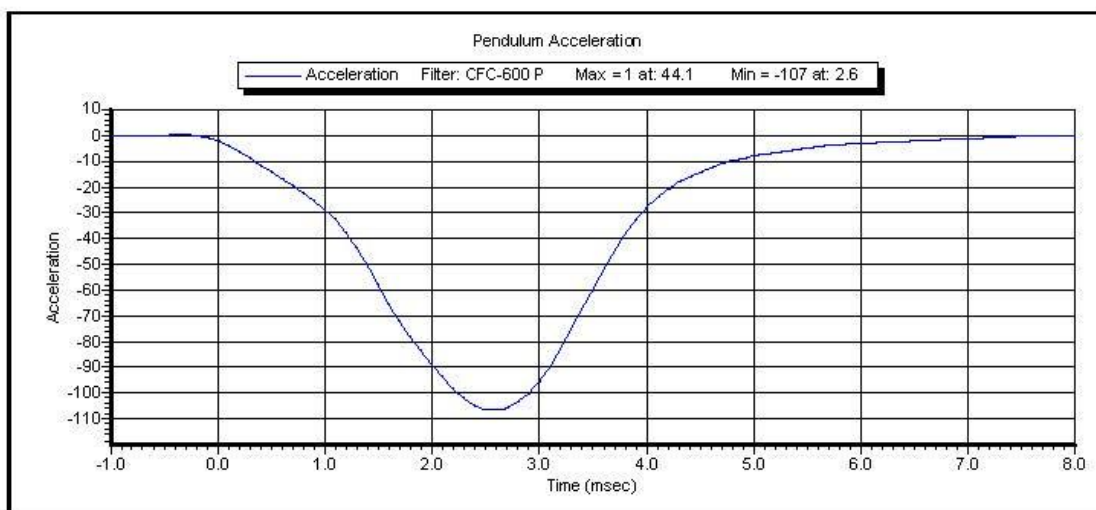


Test ID:

Test Time: 11:57:29 AM

Test Date: 3/7/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID:

Test Time: 11:57:29 AM

Test Date: 3/7/2014

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: 273



External Measurements

5th Female SN 273

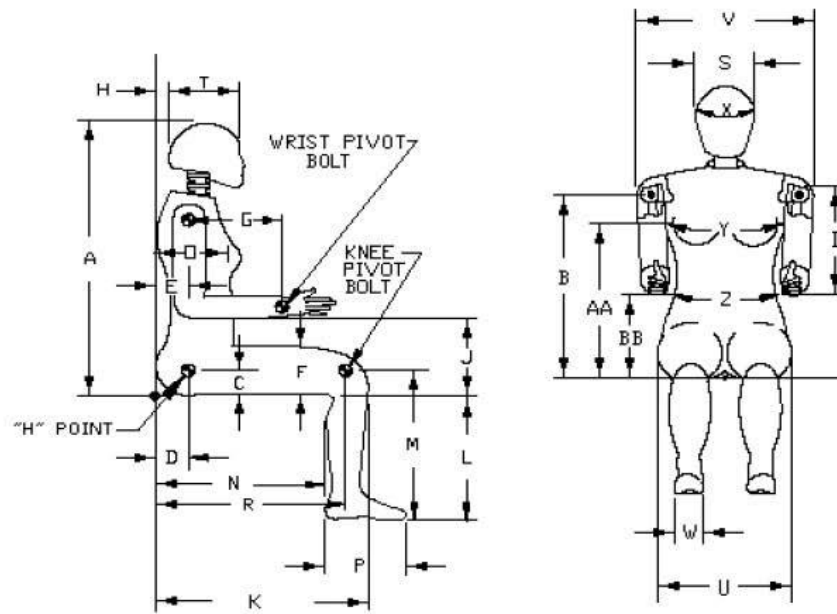
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	780	Yes
B	Shoulder Pivot Height	431.8 – 457.2	450	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	72	Yes
F	Thigh Clearance	119.4 – 134.6	124	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	245	Yes
H	Head Back to Backline	43.2 – 48.2	44	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	293	Yes
J	Elbow Rest Height	182.8 – 203.2	200	Yes
K	Buttock to Knee Length	520.7 – 546.1	531	Yes
L	Popliteal Height	355.6 – 376	373	Yes
M	Knee Pivot Height	393.7 – 419.1	395	Yes
N	Buttock Popliteal Length	414 – 439.4	434	Yes
O	Chest Depth without Jacket	175.3 – 190.5	181	Yes
P	Foot Length (right)	218.5 – 233.7	221	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	179	Yes
U	Hip Breadth	299.7 – 314.9	311	Yes
V	Shoulder Breadth	350.5 – 365.7	358	Yes
W	Foot Breadth	78.8 – 94	81	Yes
X	Head Circumference	528.3 – 548.7	540	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	852	Yes
Z	Waist Circumference	759.5 – 789.9	777	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	355	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	168	Yes

Technician: M. Geesey

Date: 02/13/2014

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:	273		
Test ID:	Head Drop	Test Date:	2/14/2014
		Test Time:	12:25:16 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	780

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.30 deg C P
Humidity	10 -- 70	20.90 %RH P
Resultant Acceleration	250 -- 300	288.1 G's P
Oscillation	0 -- 10	1.5 % P
Lateral Acceleration	-15 -- 15	-3.2 G's P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

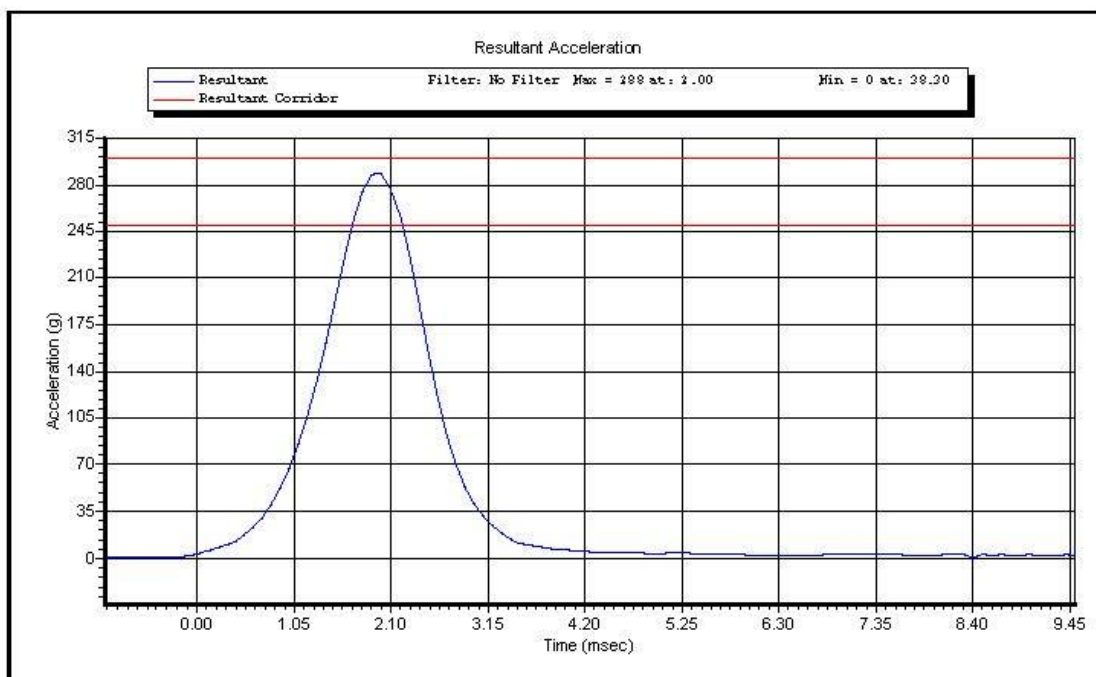
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58833	1/24/2014
Endevco	7264-2000	P58905	1/24/2014
Endevco	7264-2000	P52114	1/24/2014

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:	273

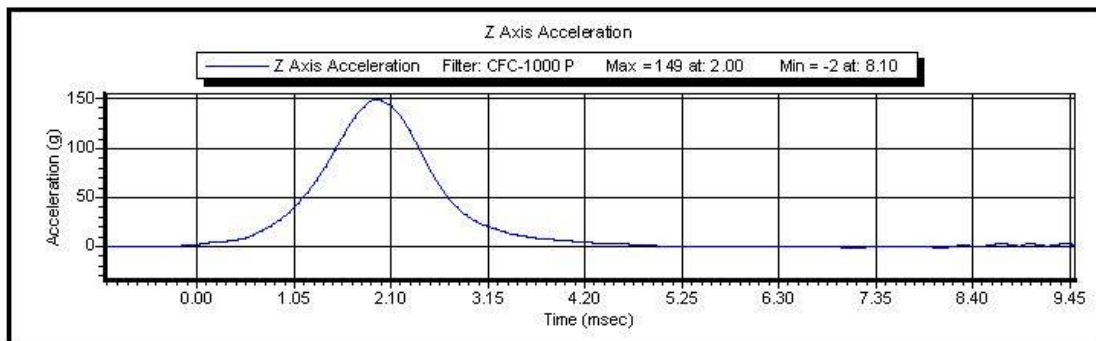
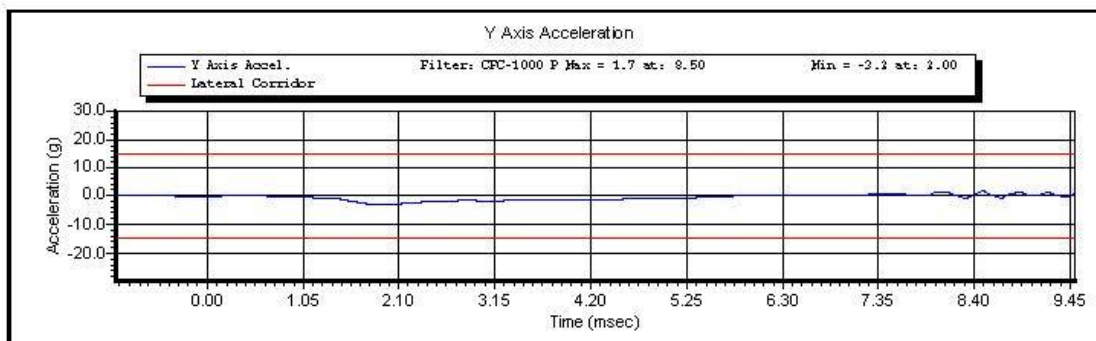
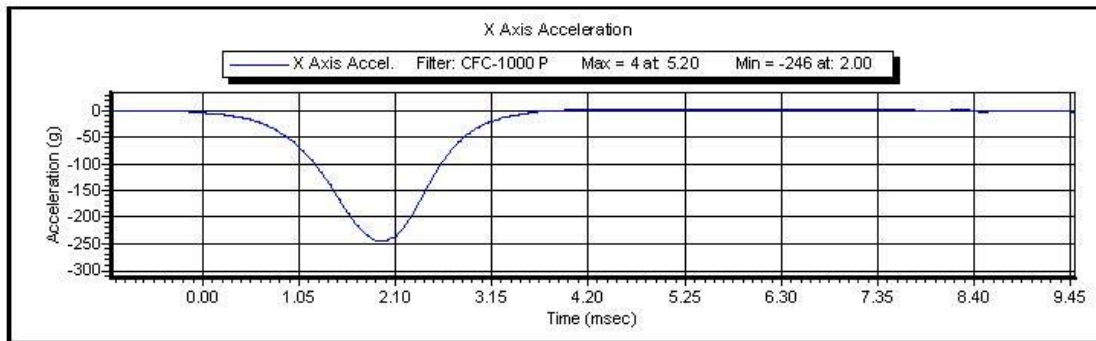


Test ID: **Head Drop**

Test Time: **12:25:16 PM**

Test Date: **2/14/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **12:25:16 PM**

Test Date: **2/14/2014**

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:	273		
Test ID:	Neck Extension	Test Date:	2/14/2014
		Test Time:	7:50:14 AM

Component Part Number	Component Serial Number
Neck - 880105-255	660

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.00 deg C P
Humidity	10 -- 70	20.30 %RH P
Velocity	5.95 -- 6.19	6.045 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.68 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.33 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	4.81 m/s P
D Plane Rotation	99 -- 114	103.9 degrees P
Moment During Rotation Interval	-65 -- -53	-53.3 Nm P
Moment Decay to -10.0 Nm	94 -- 114	102.7 ms P

All test parameters are within specifications

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



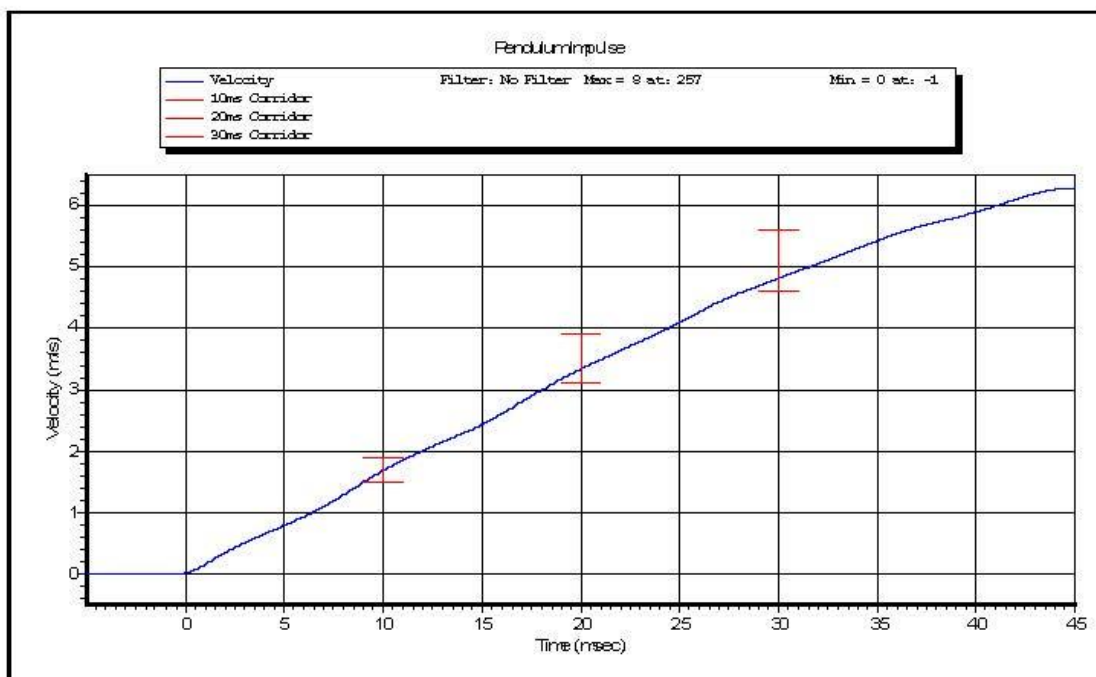
VERIFICATION REPORT

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
DentonATD	78051-342	PENDULUM POT	1/31/2014
DentonATD	78051-342	CONDYLE POT	1/31/2014
Denton	1716A	LC-1629 My	4/30/2013
Denton	1716A	LC-1629 Fx	4/30/2013



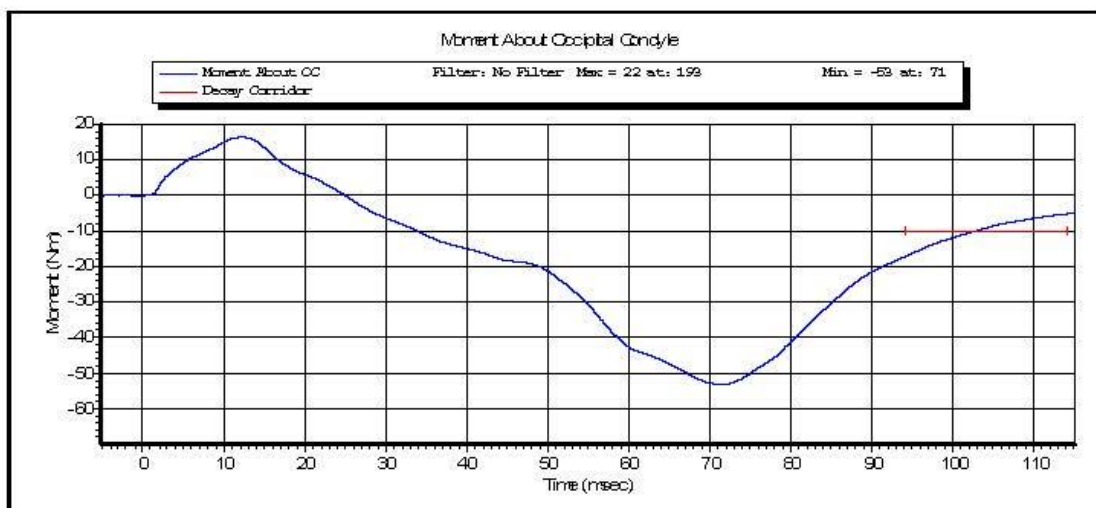
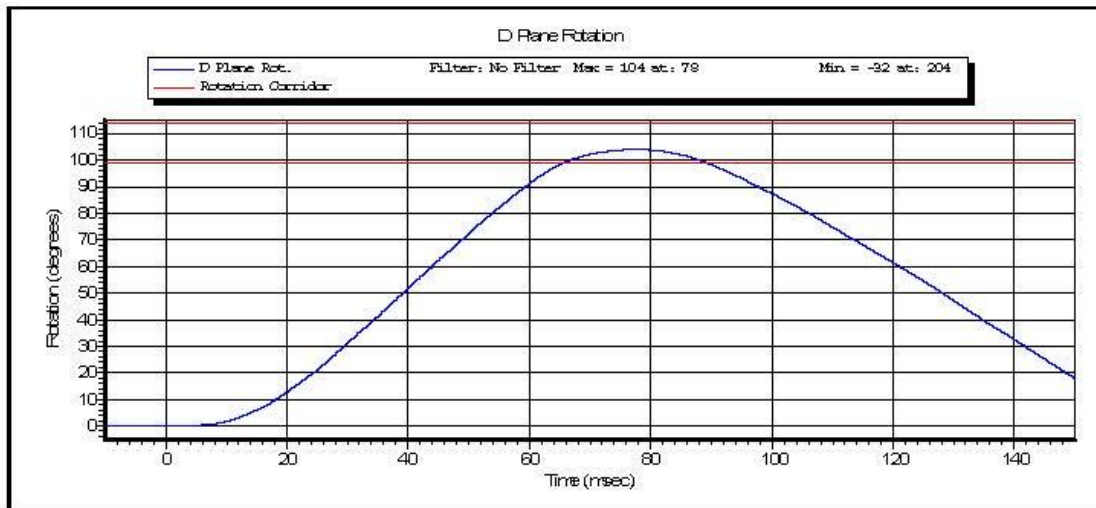
Test Name:	Neck Extension
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: Neck Extension Test Time: 7:50:14 AM

Test Date: 2/14/2014

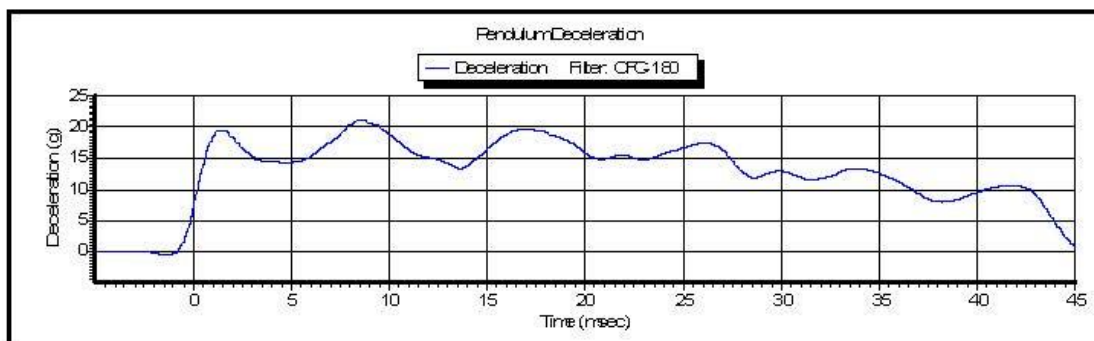
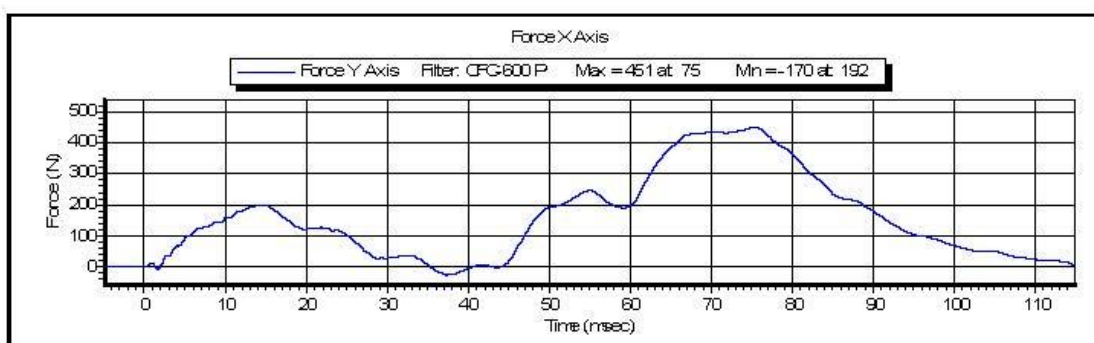
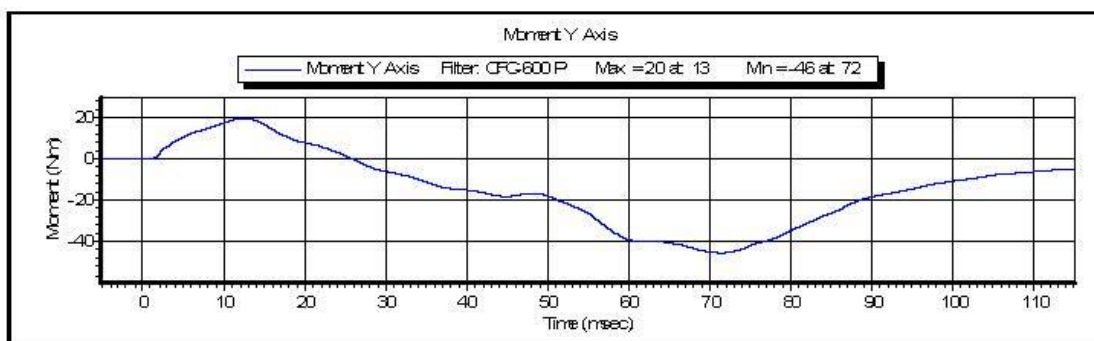
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: Neck Extension Test Time: 7:50:14 AM

Test Date: 2/14/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **7:50:14 AM**

Test Date: **2/14/2014**

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:	273		
Test ID:	Neck Flexion	Test Date:	2/14/2014
		Test Time:	11:08:49 AM

Component Part Number	Component Serial Number
Neck - 880105-255	660

Test Parameters	Test Specifications	Test Results
Temperature	21 -- 22	21.30 deg C P
Humidity	10 -- 70	20.60 %RH P
Velocity	6.89 -- 7.13	6.986 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.35 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.5 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	6.35 m/s P
D Plane Rotation	-91 -- -77	-77.4 degrees P
Moment During Rotation Interval	69 -- 83	69.1 Nm P
Moment Decay to 10.0 Nm	80 -- 100	85.4 ms P

All test parameters are within specifications

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



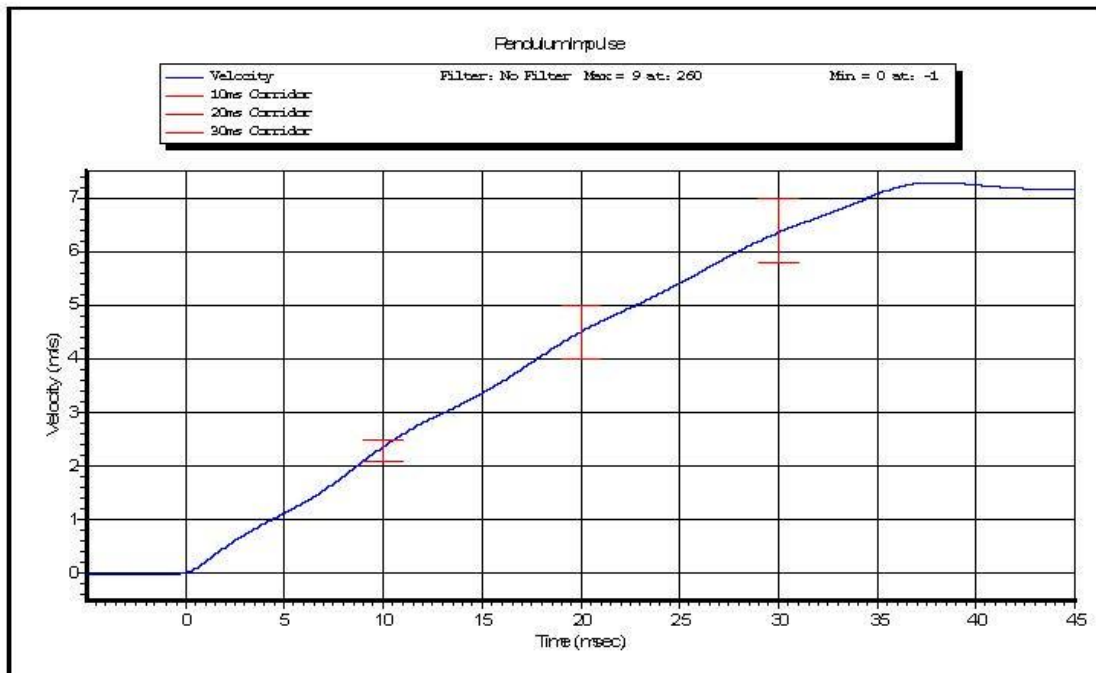
VERIFICATION REPORT

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	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/31/2014
DentonATD	78051-342	CONDYLE POT	1/31/2014
Denton	1716A	LC-1629 My	4/30/2013
Denton	1716A	LC-1629 Fx	4/30/2013



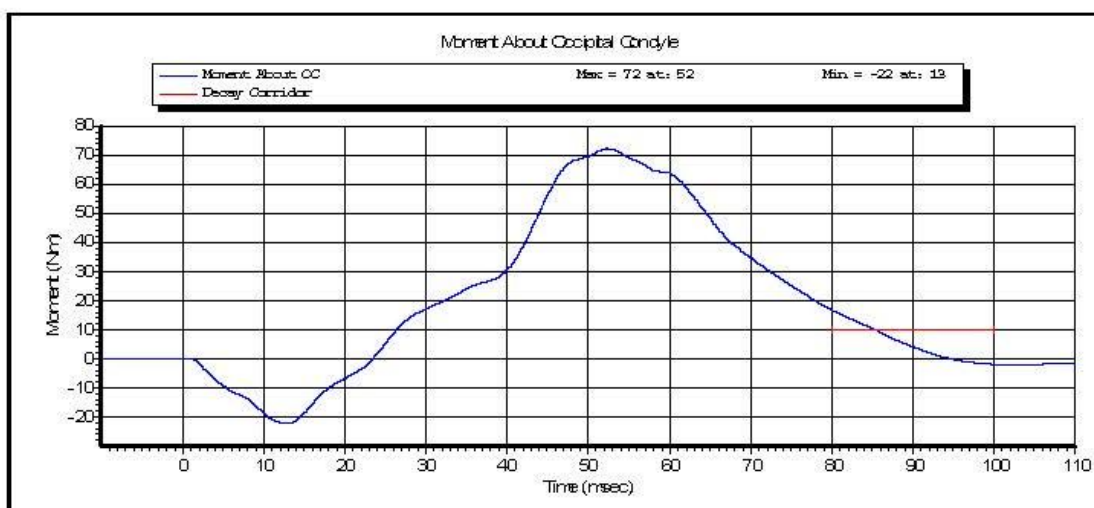
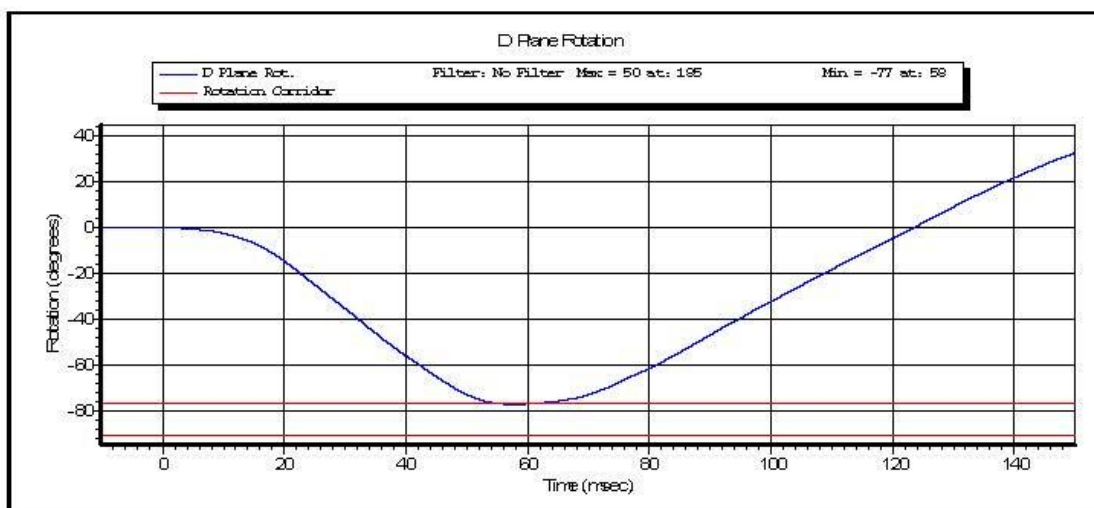
Test Name:	Neck Flexion
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: Neck Flexion Test Time: 11:08:49 AM

Test Date: 2/14/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

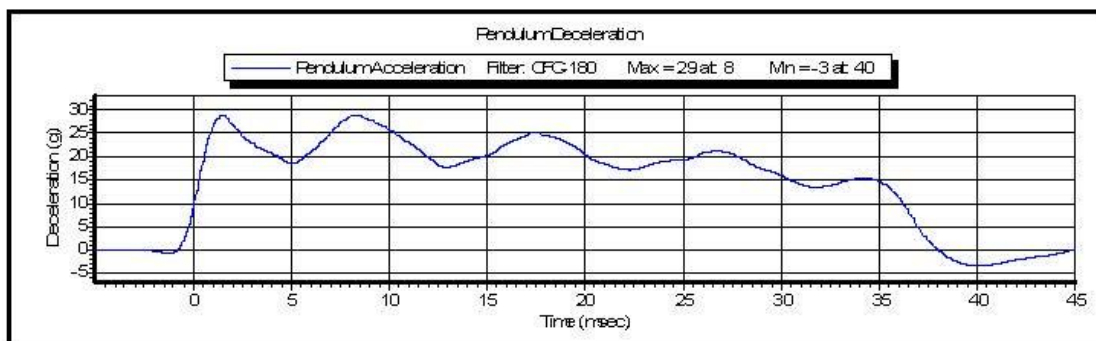
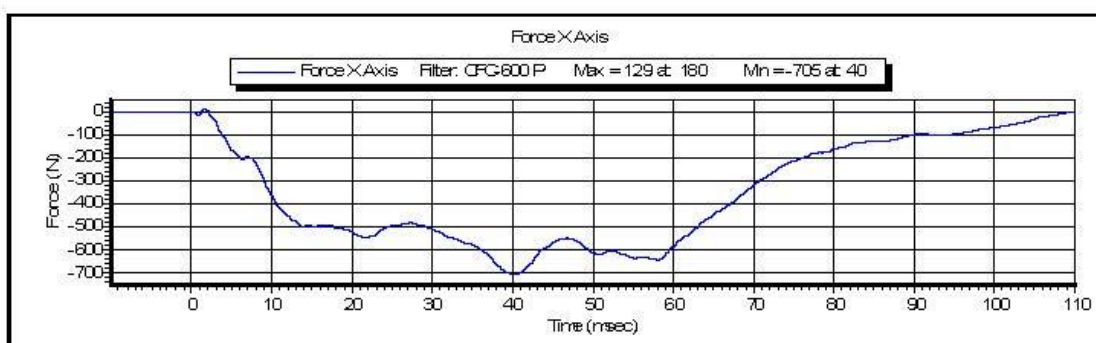
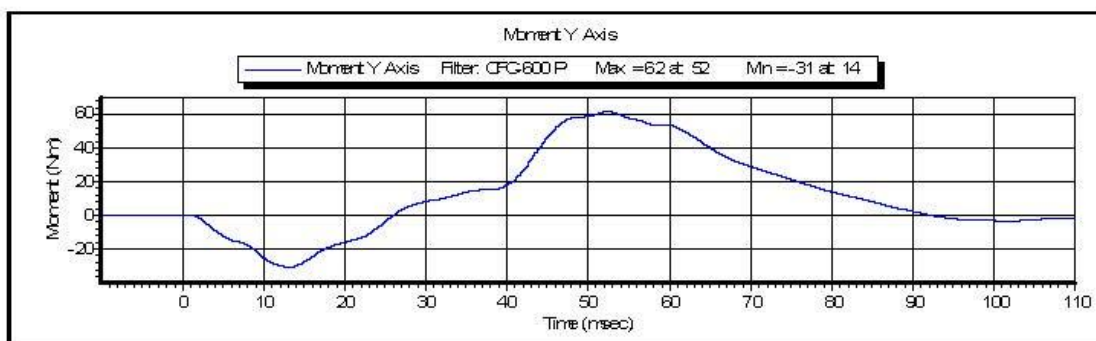


Test ID: Neck Flexion

Test Time: 11:08:49 AM

Test Date: 2/14/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Flexion**

Test Time: **11:08:49 AM**

Test Date: **2/14/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Torso Flexion

Part 5720 HIII 5% Female

ATD Serial No: 273

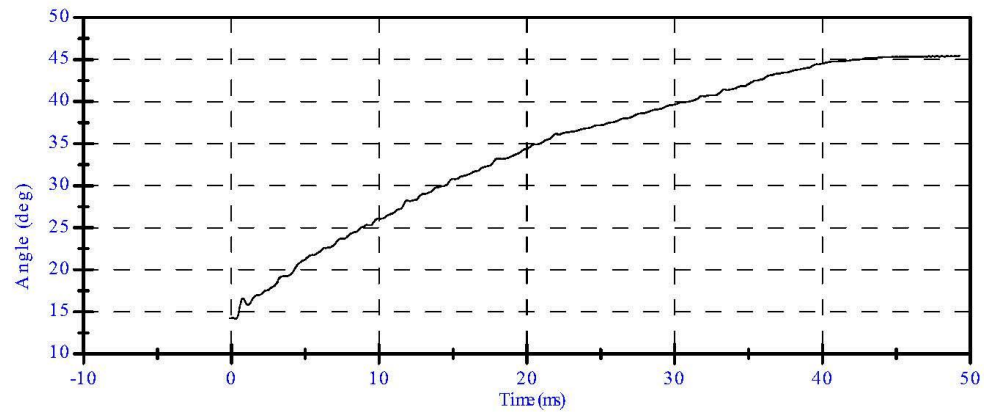
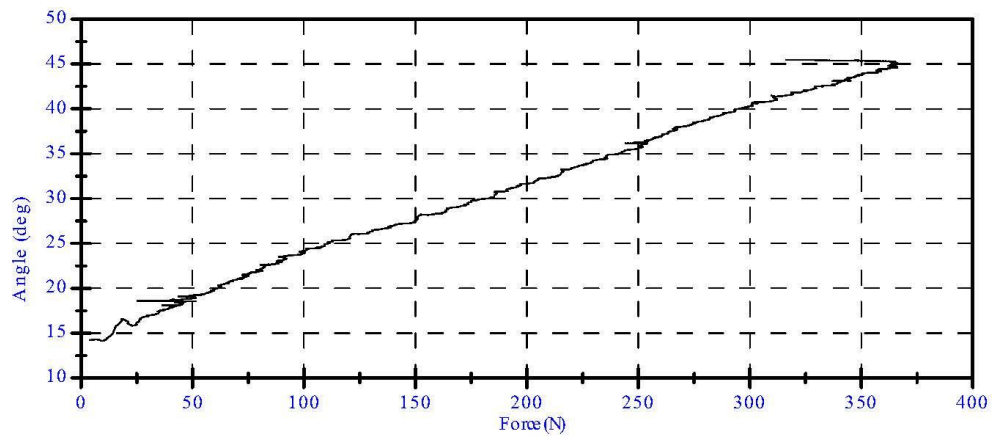
Laboratory Supervisor: E Dutton

Date: 2/14/2014

Laboratory Technician: M. Goehle

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.6 C	22.1 C	Passed
Lab Humidity:	10-70 %	24.3 %	Passed
Initial Angle:	0.00-20.00 Deg	14.13 Deg	Passed
Force at 45 Deg	320.00-390.00 N	366.28 N	Passed
Return Angle	8 Deg Max from Initial	20.6 deg	Passed

TORSO FLEXION TEST





VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	273		
Test ID:	Thorax Impact	Test Date:	2/13/2014
		Test Time:	5:38:55 PM

Component Part Number	Component Serial Number
Chest Jacket - 880105-355-E	DH0069

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.60 deg C	P
Humidity	10	--	70	13.30 %RH	P
Velocity	6.59	--	6.83	6.781 m/s	P
Sternum Displacement	-58	--	-50	-51.4 mm	P
Force During Displacement Interval	-4400	--	-3900	-4298.4 N	P
Force During -18mm to -50mm Displacem	-4600	--	0	-4313.2 N	P
Hysteresis	69	--	85	73.0 %	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



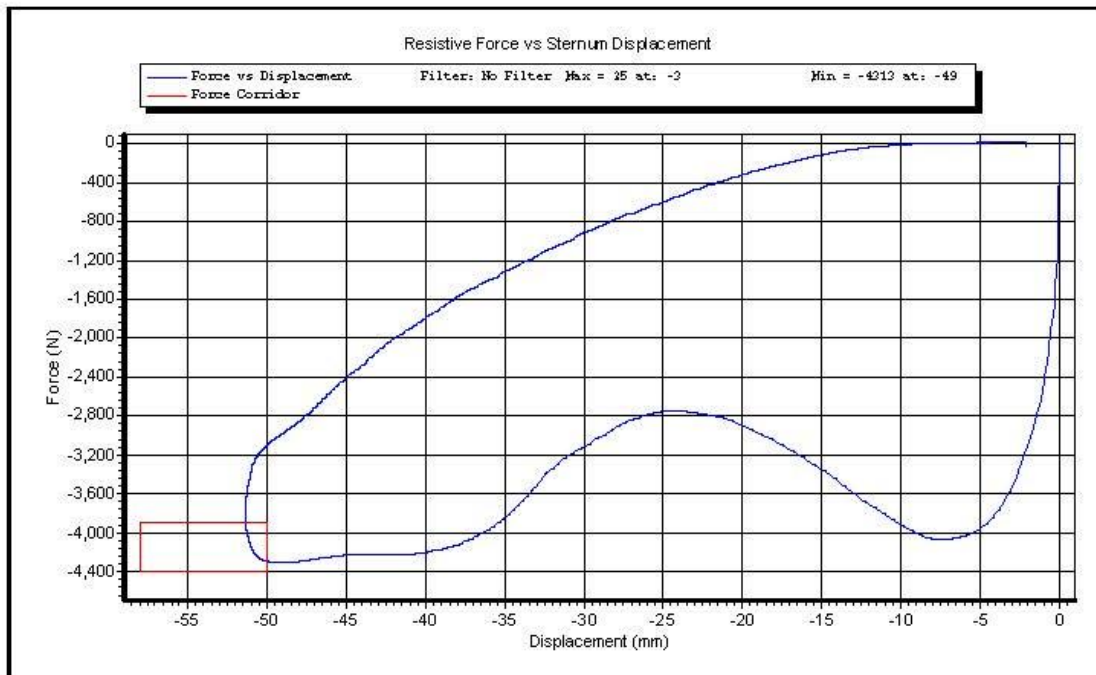
VERIFICATION REPORT

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-273	6/17/2013



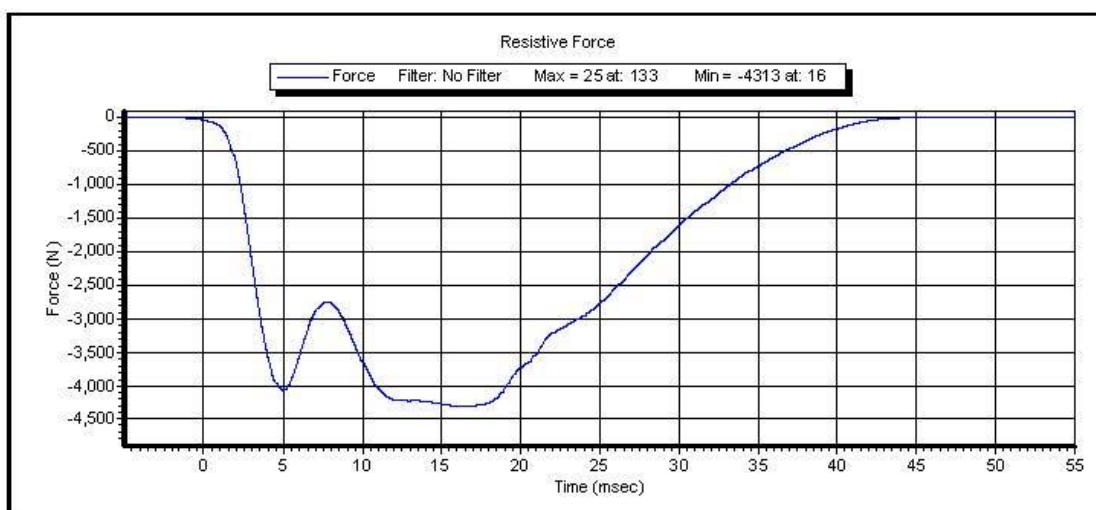
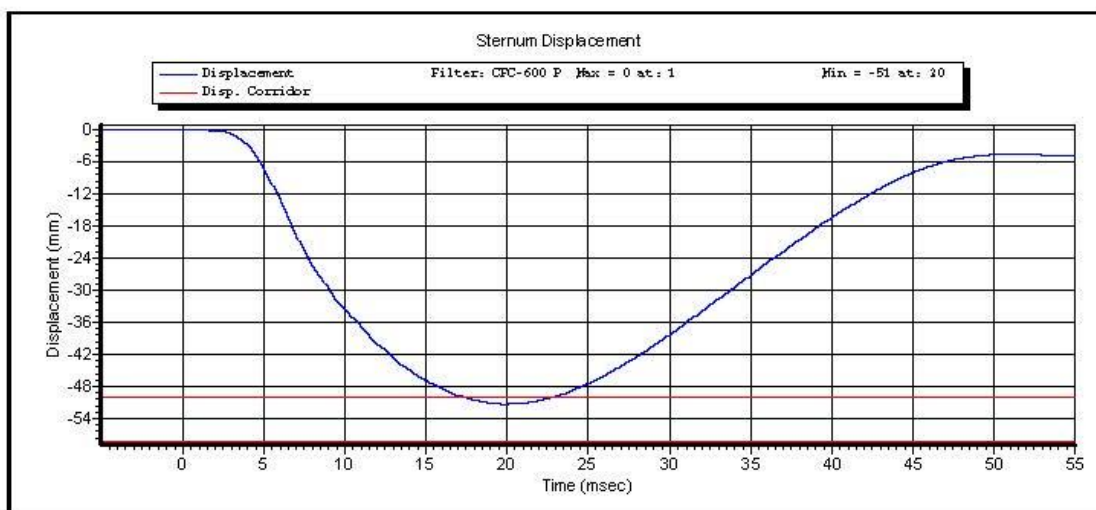
Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: Thorax Impact Test Time: 5:38:55 PM

Test Date: 2/13/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

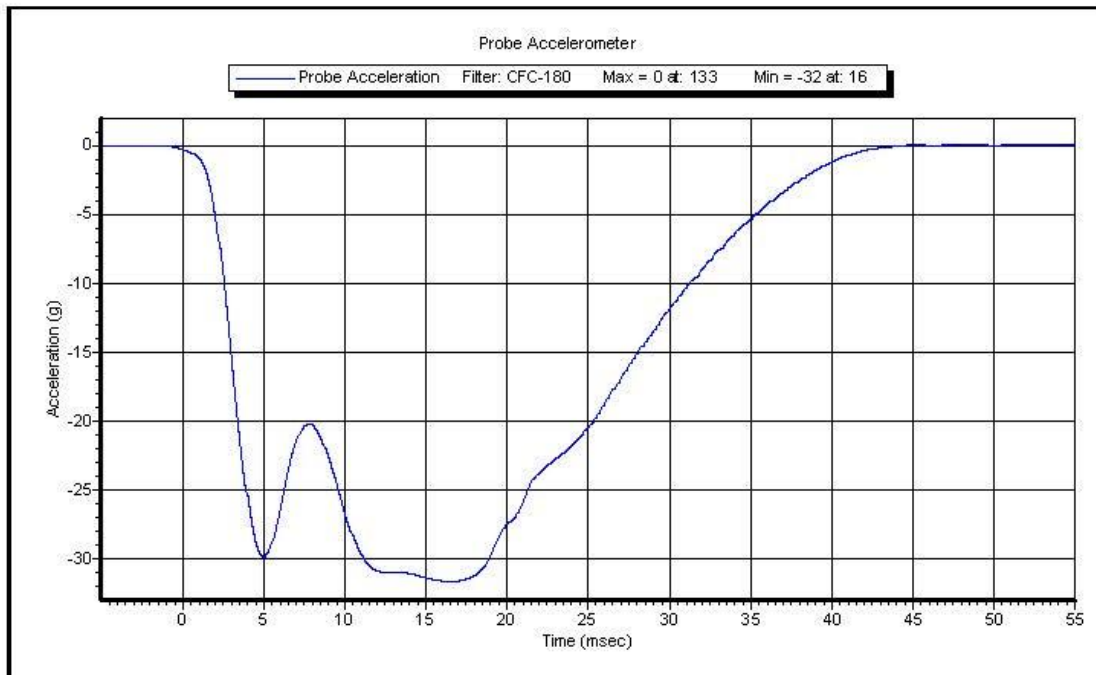


Test ID: Thorax Impact

Test Time: 5:38:55 PM

Test Date: 2/13/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **5:38:55 PM**

Test Date: **2/13/2014**

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:	273		
Test ID:	Knee Impact Left	Test Date:	2/13/2014
		Test Time:	6:34:03 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1726

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.90 deg C P
Humidity	10 -- 70	13.90 %RH P
Velocity	2.07 -- 2.13	2.106 m/s P
Resistive Force	-4060 -- -3450	-3671.9 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

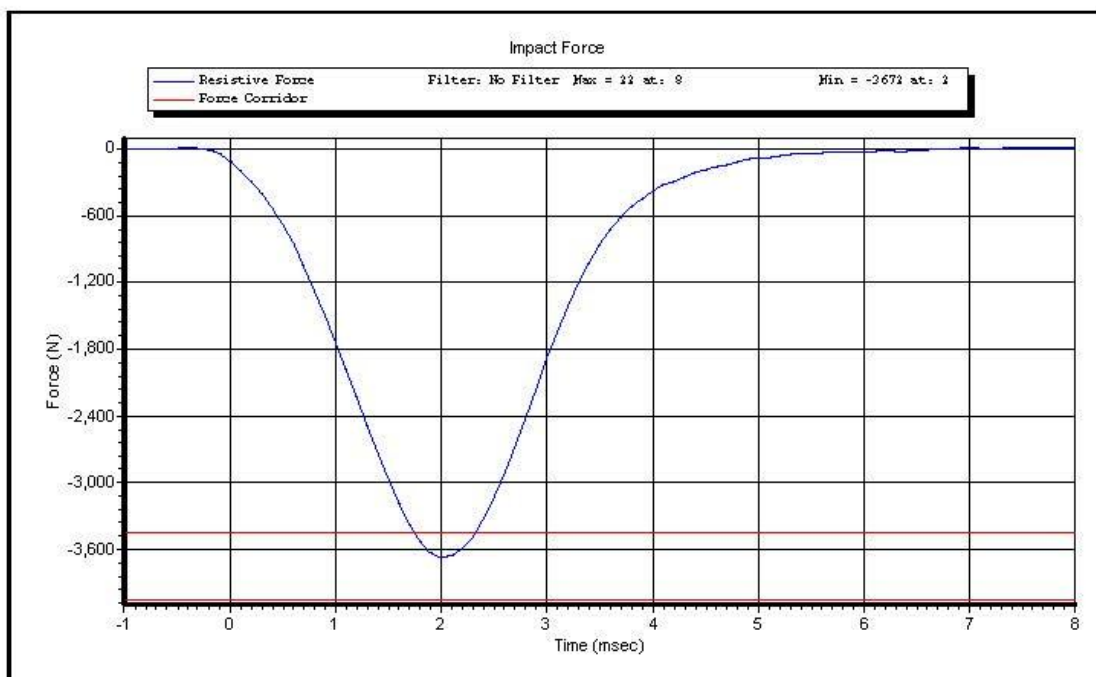
REFERENCE EQUIPMENT

<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

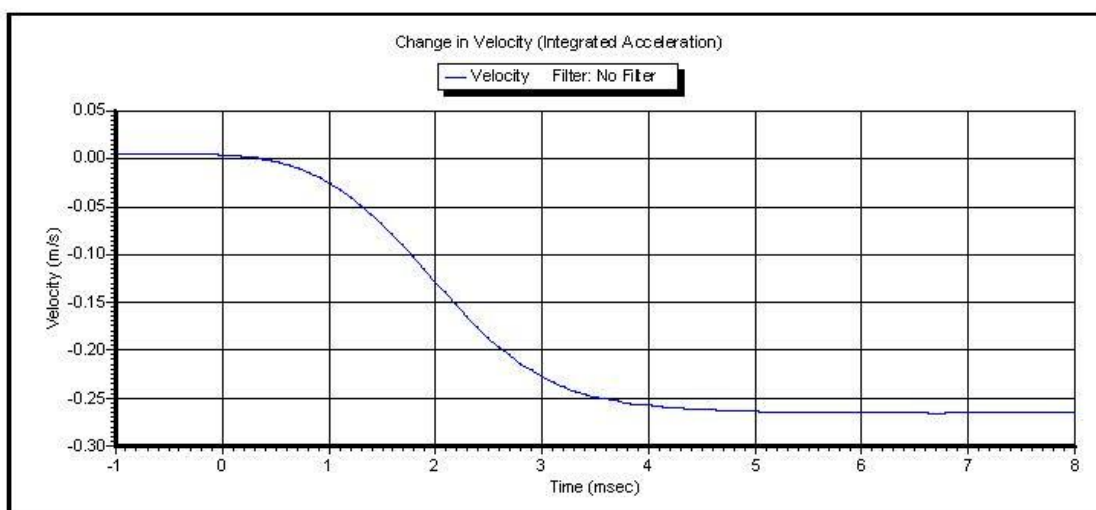
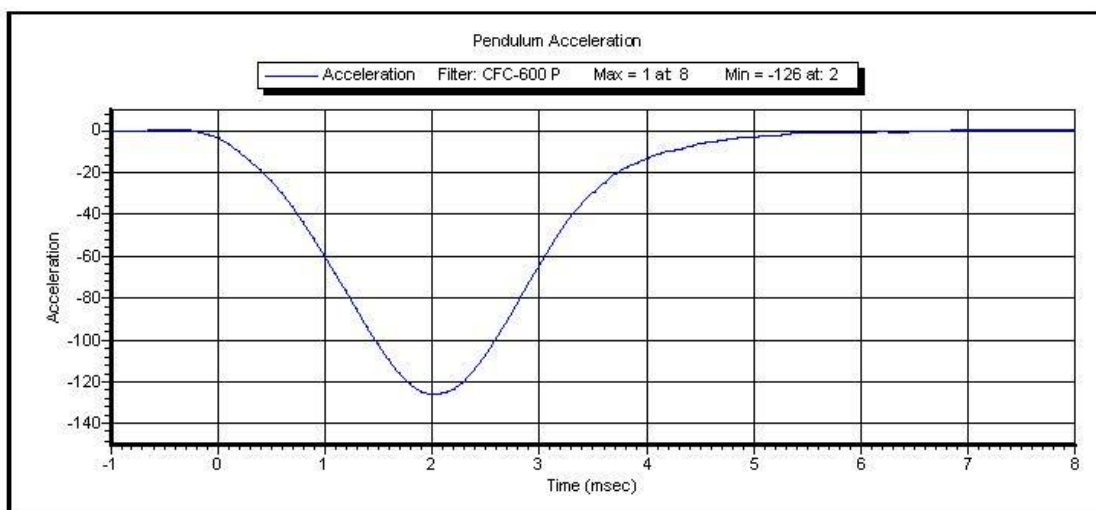


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: **Knee Impact Left** Test Time: **6:34:03 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **2/13/2014**



Test ID: **Knee Impact Left** Test Time: **6:34:03 PM**

Test Date: **2/13/2014**

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:	273		
Test ID:	Knee Impact Right	Test Date:	2/13/2014
		Test Time:	6:40:13 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1051

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	20.90 deg C	P
Humidity	10	--	70	13.90 %RH	P
Velocity	2.07	--	2.13	2.112 m/s	P
Resistive Force	-4060	--	-3450	-3829.0 N	P

All test parameters are within specifications

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



VERIFICATION REPORT

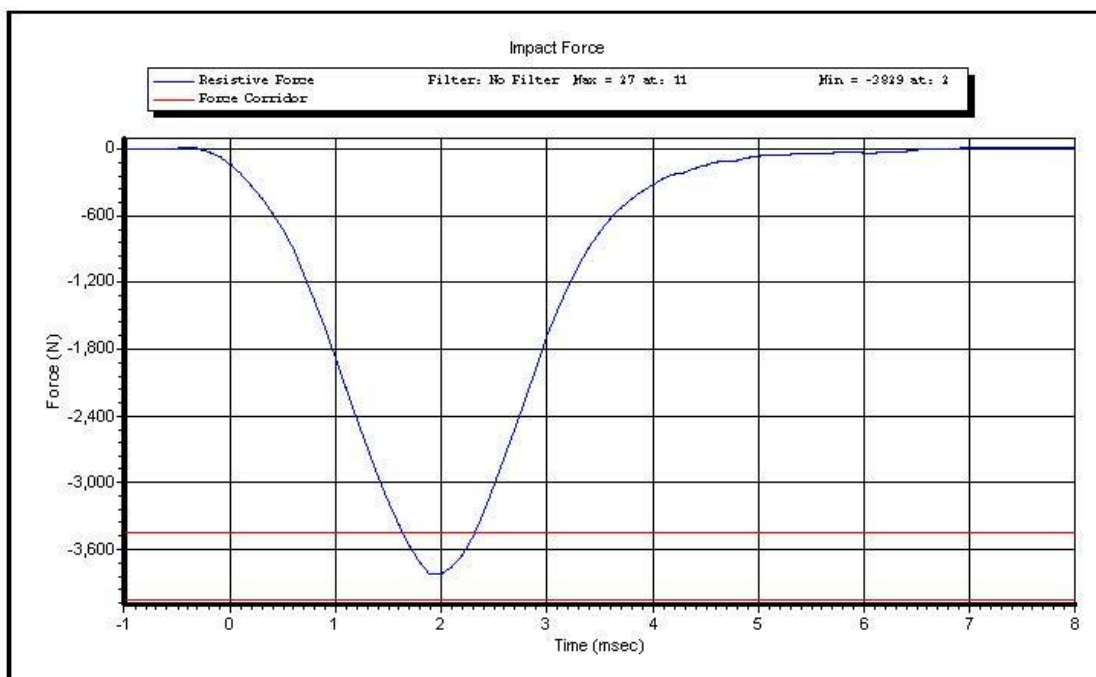
REFERENCE EQUIPMENT

<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



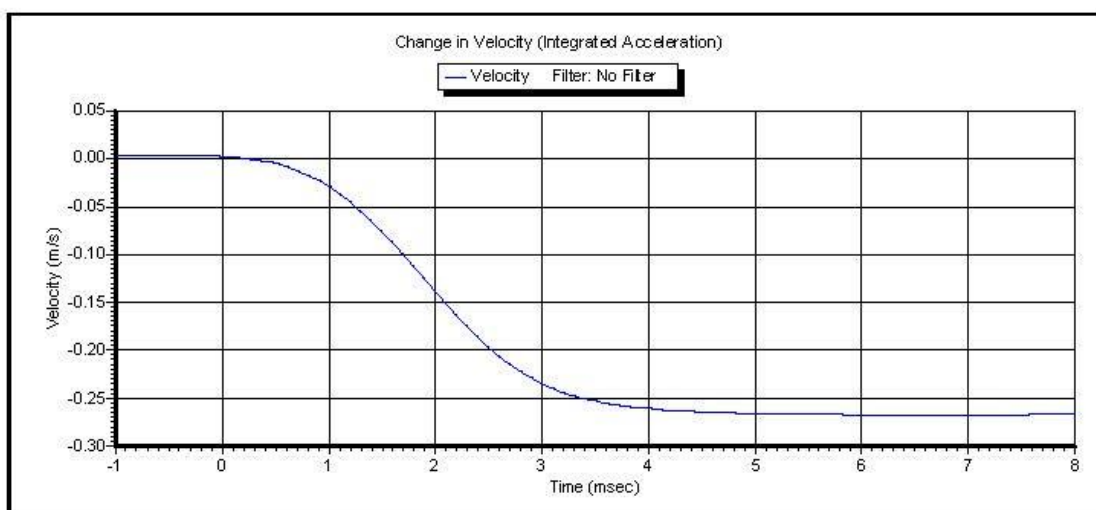
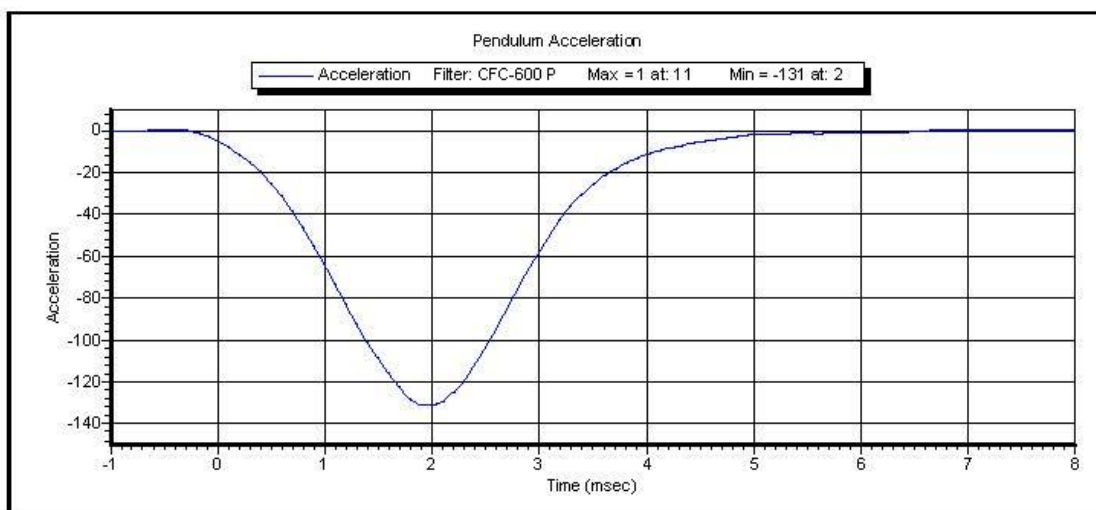
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: **Knee Impact Right** Test Time: **6:40:13 PM**

Test Date: **2/13/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Knee Impact Right** Test Time: **6:40:13 PM**

Test Date: **2/13/2014**

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



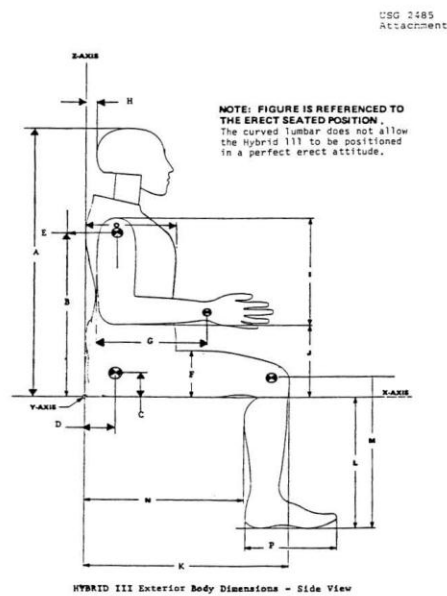
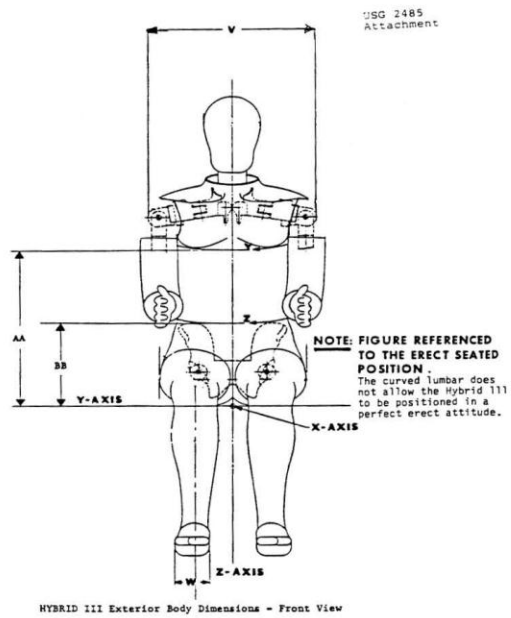
50th Male External Measurements

S/N 064

Symbol	Description	Specification	Results	Pass
		in	In	
A	Sitting Height	34.6 – 35.0	34.8	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

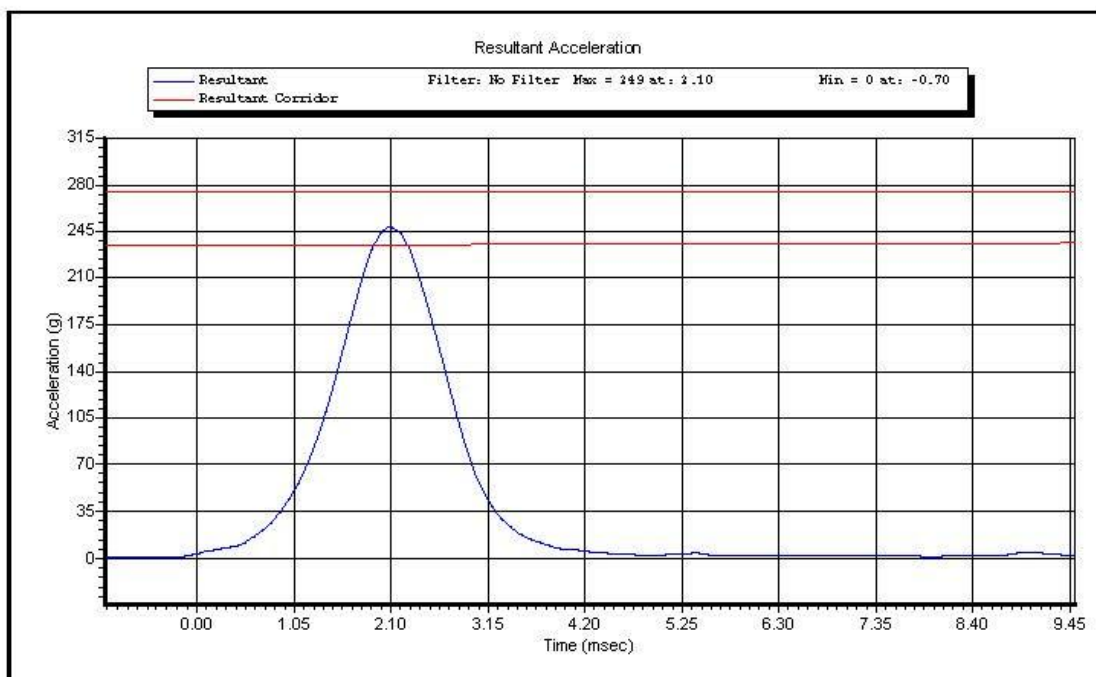
REFERENCE EQUIPMENT

<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

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

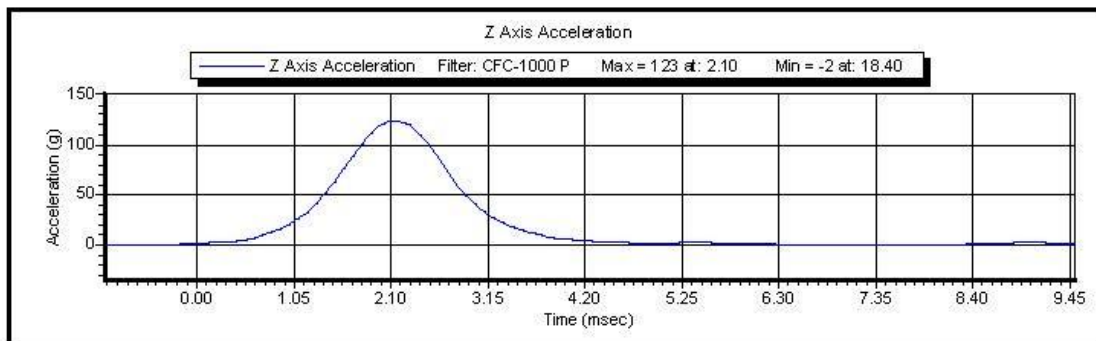
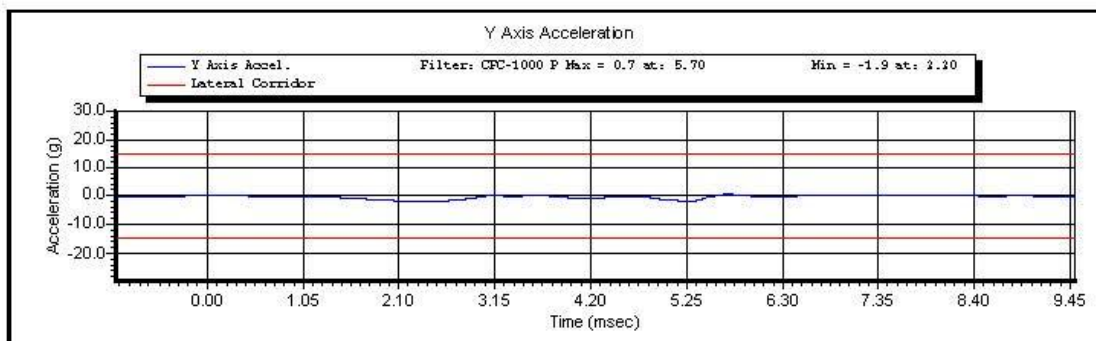
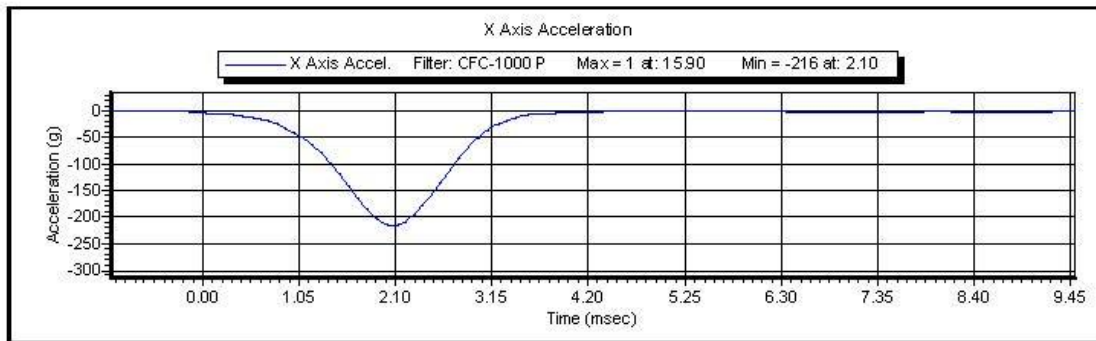


Test ID: **Head Drop**

Test Time: **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**



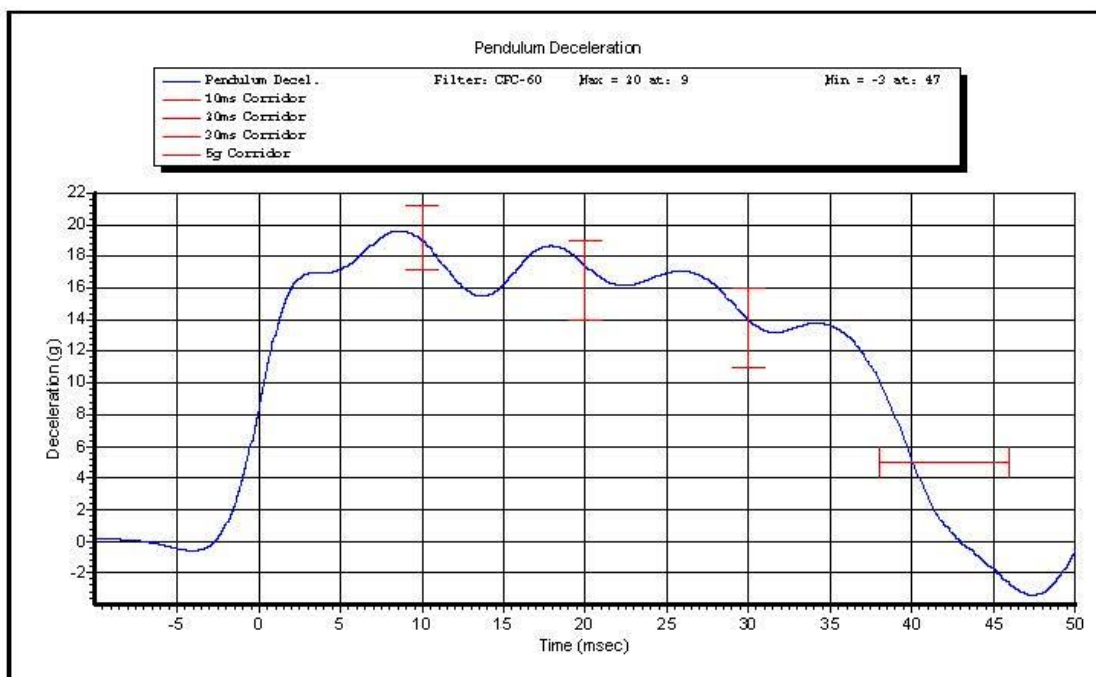
VERIFICATION REPORT

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



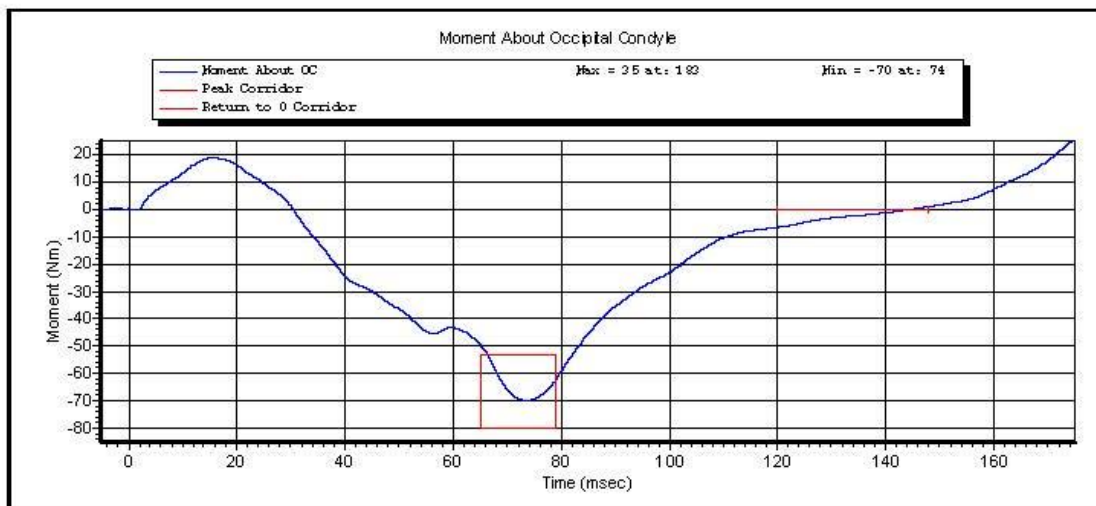
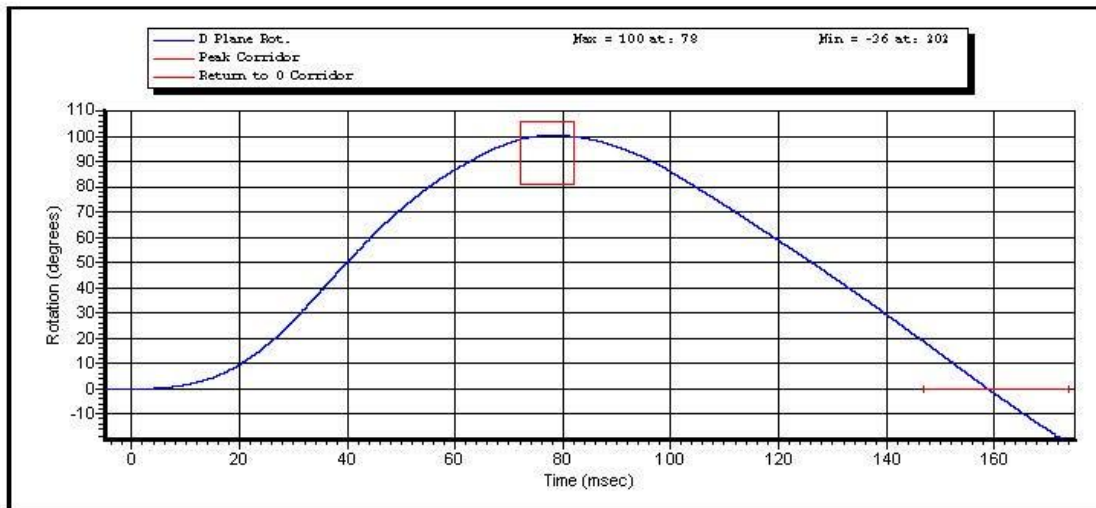
Name of Test:	Neck Extension
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	064



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

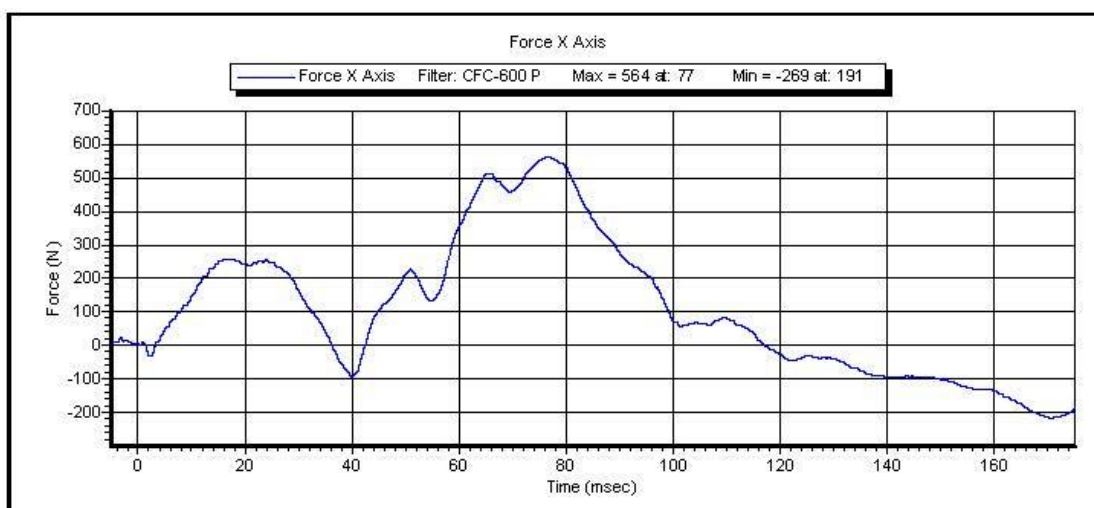
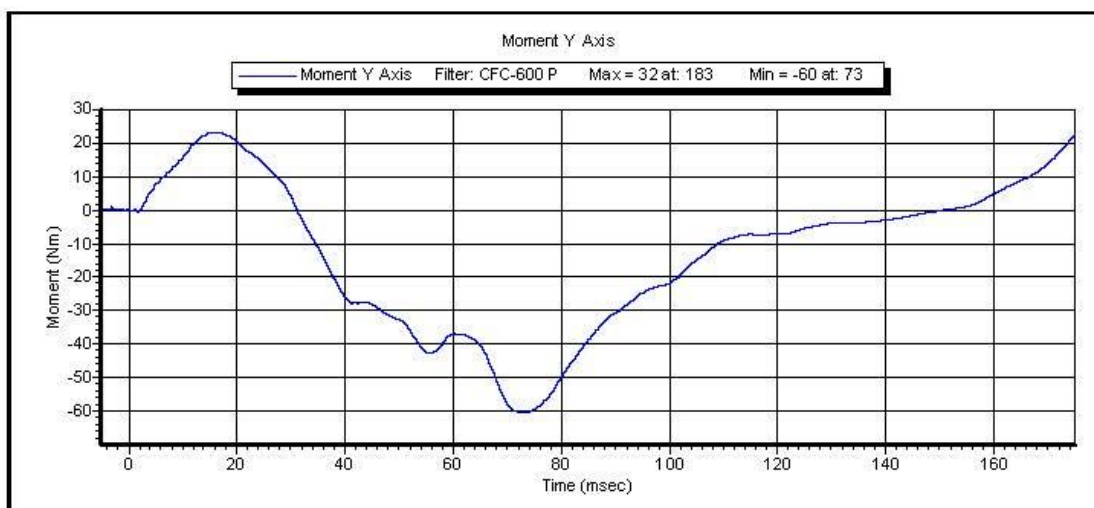


ID of Test: **Neck Extension**

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**



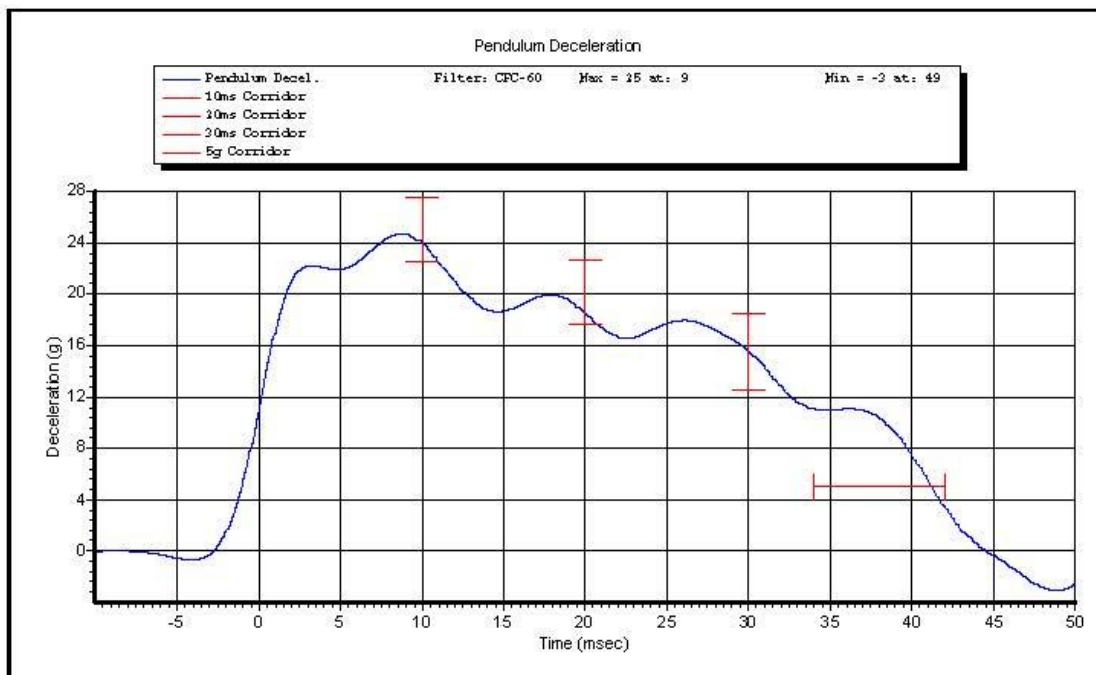
VERIFICATION REPORT

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

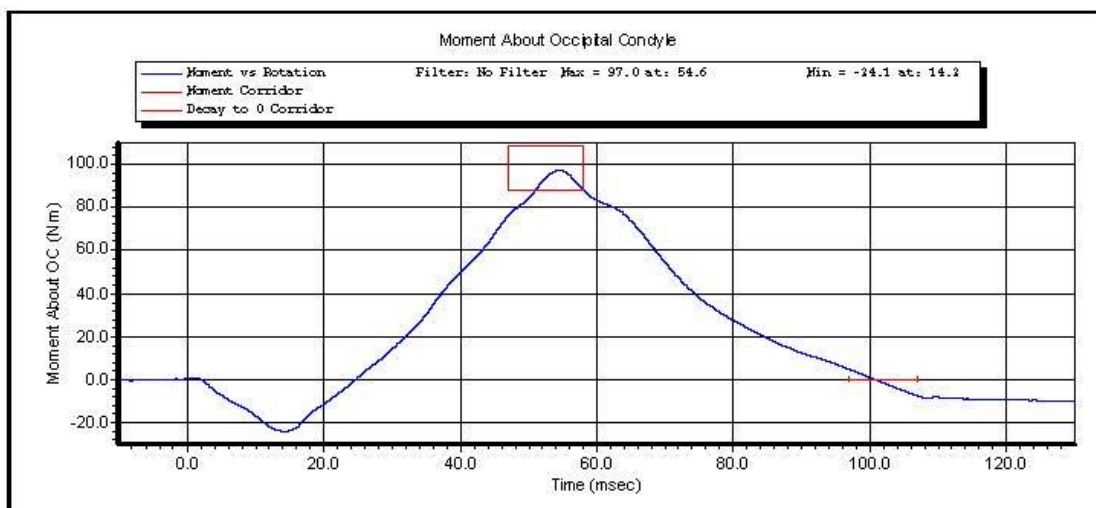
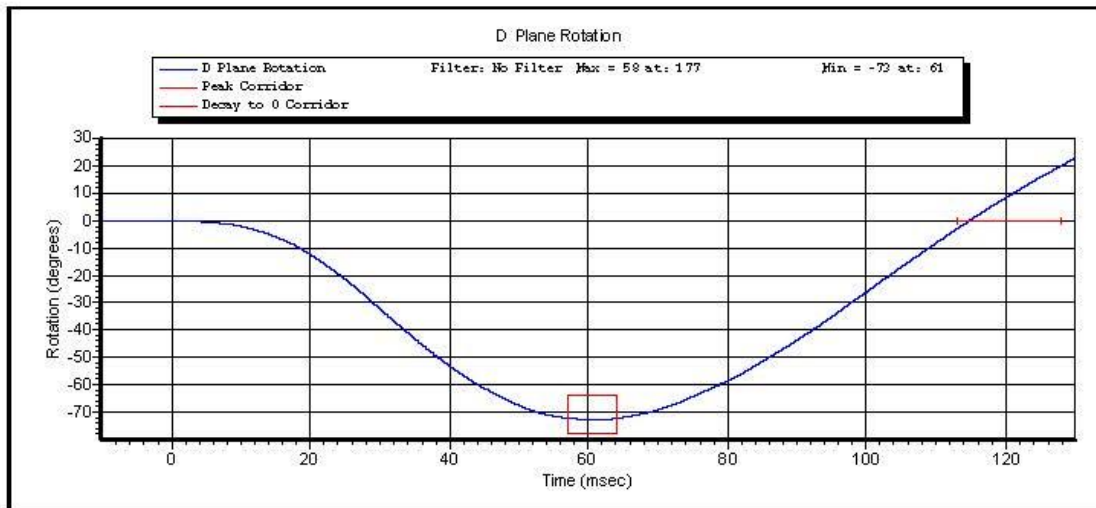


ID of Test: **Neck Flexion**

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

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

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

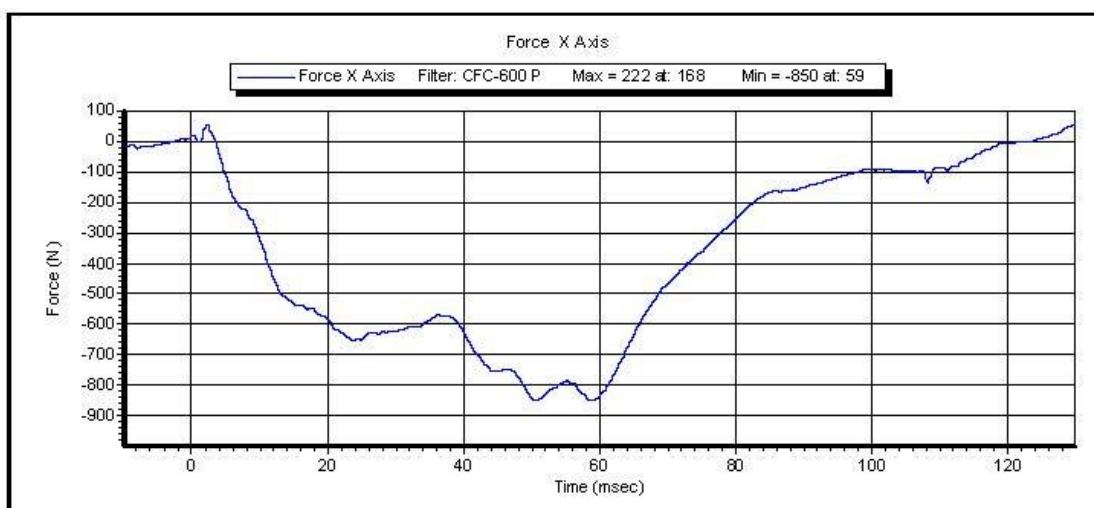
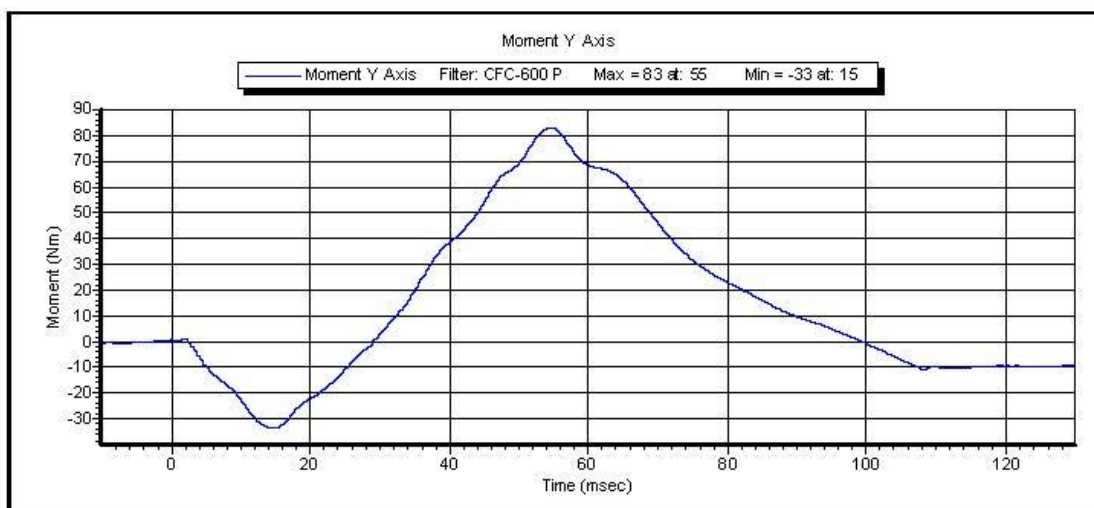


ID of Test: **Neck Flexion**

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

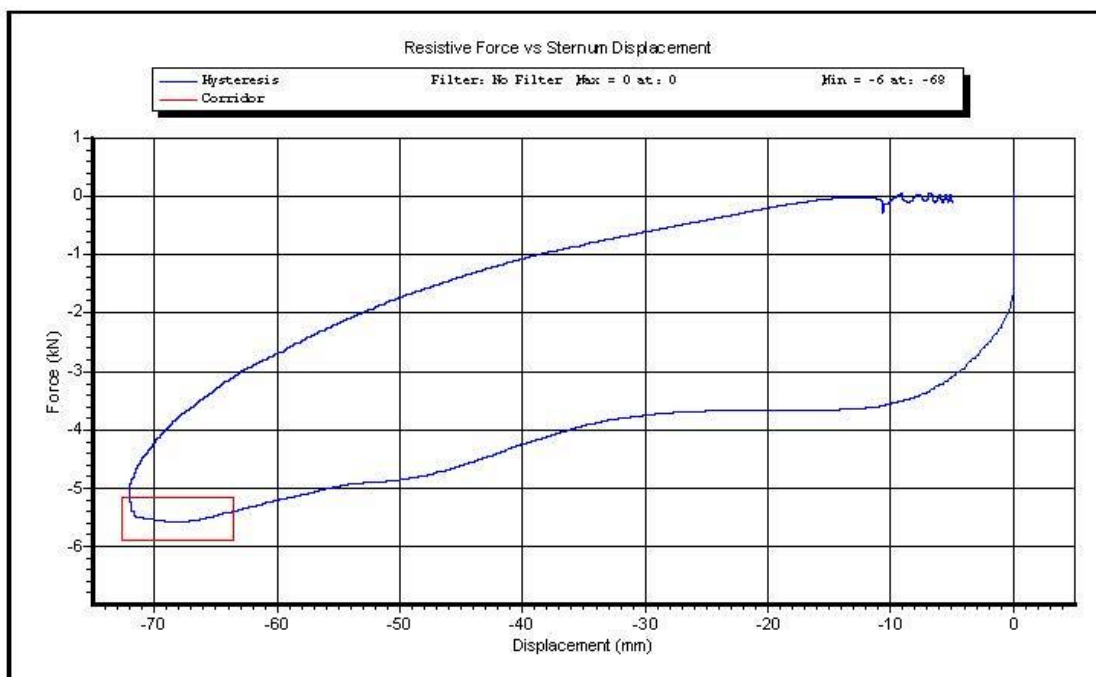
REFERENCE EQUIPMENT

<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

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

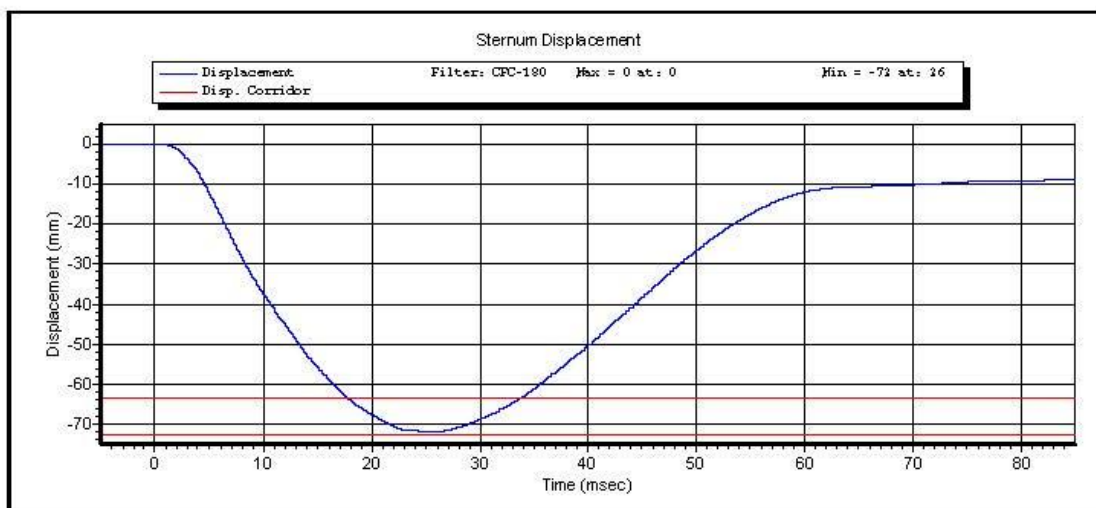
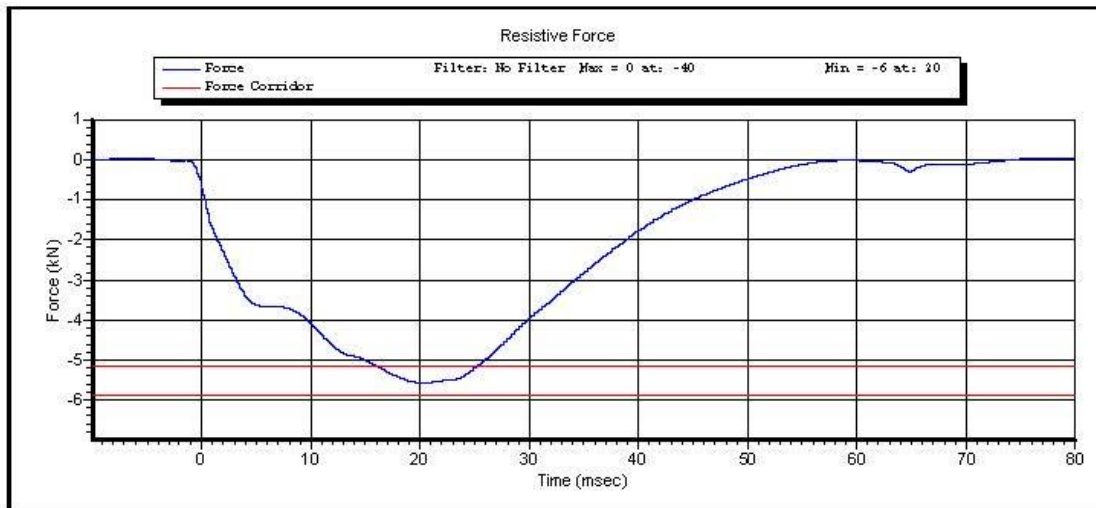


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



Test ID: **Thorax Impact** Test Time: **7:52:34 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

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

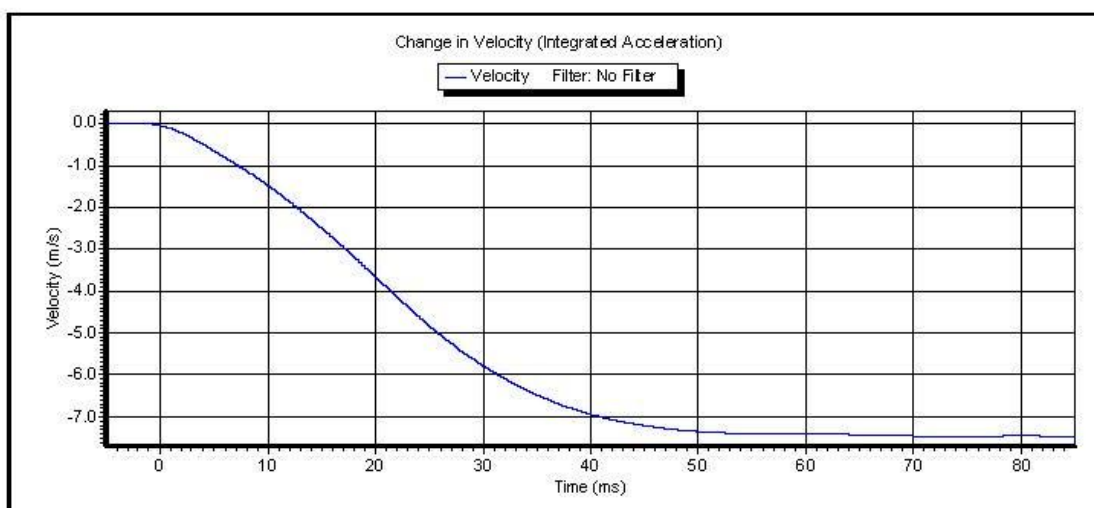
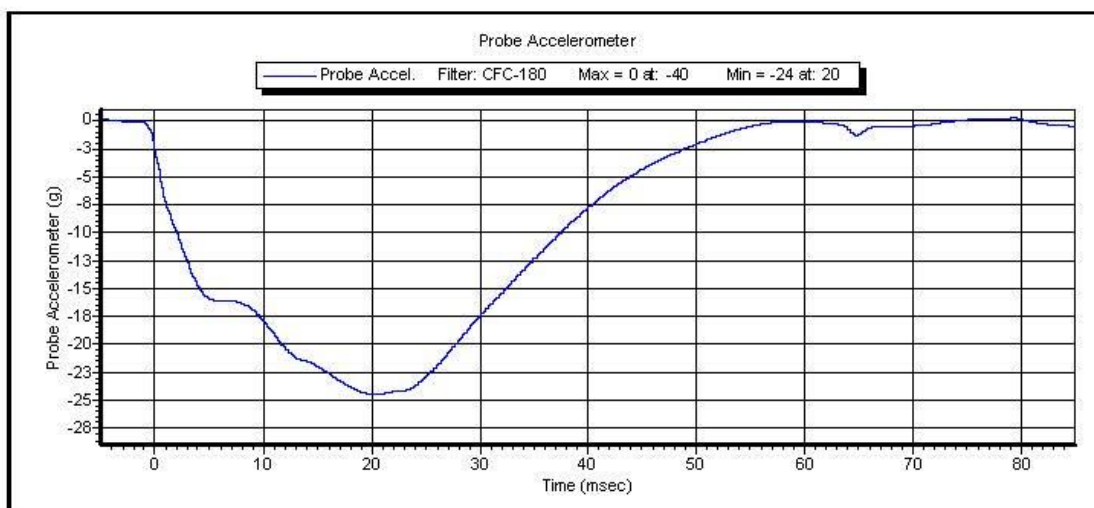


Test ID: **Thorax Impact**

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

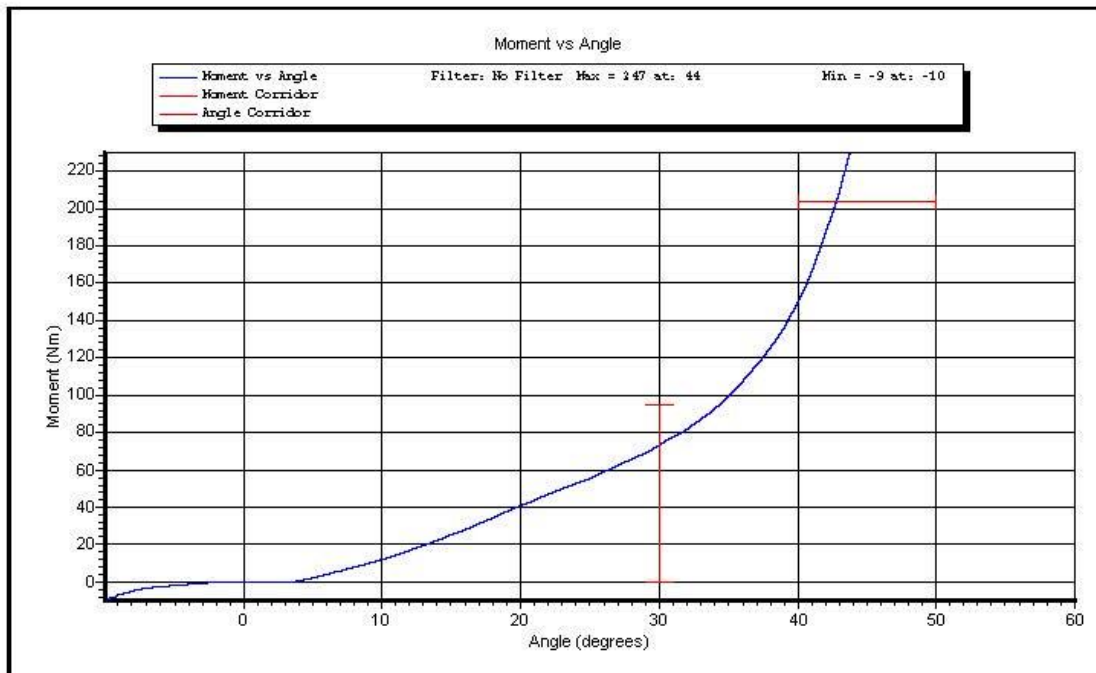
REFERENCE EQUIPMENT

<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

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 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

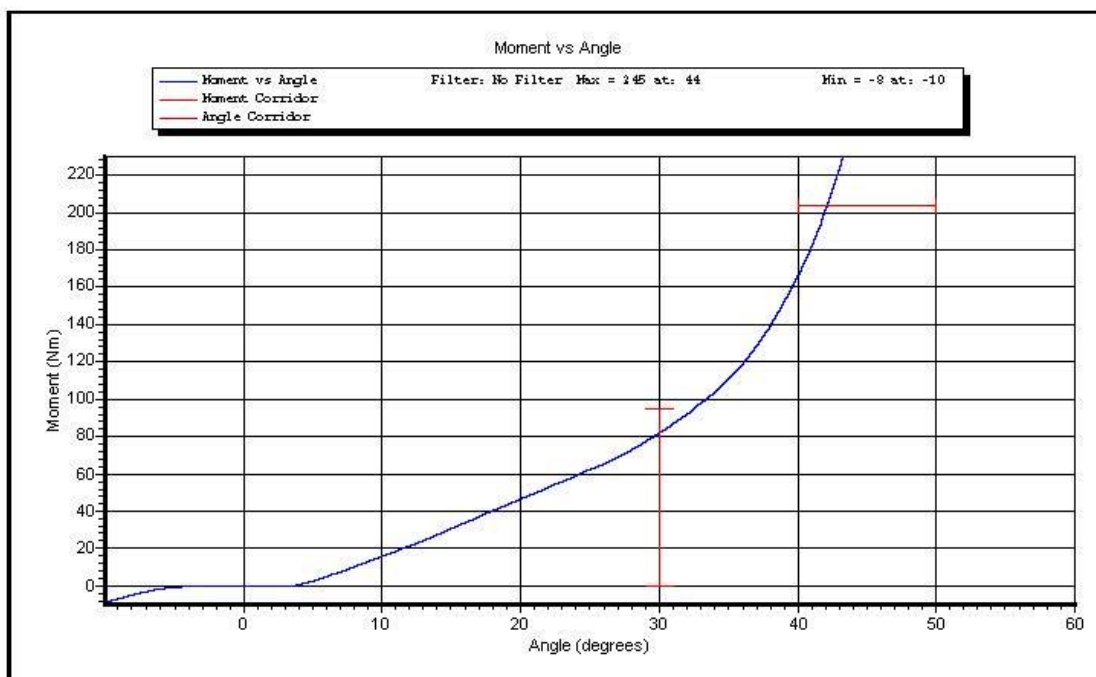
REFERENCE EQUIPMENT

<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

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: **5:11:05 PM**

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 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

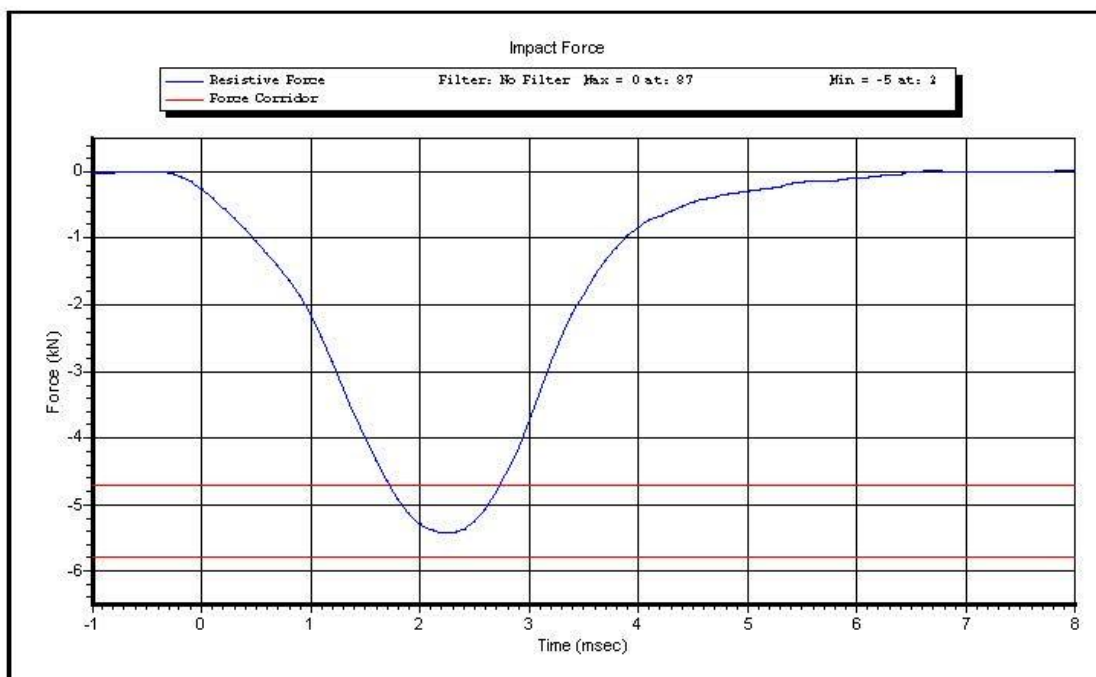
REFERENCE EQUIPMENT

<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



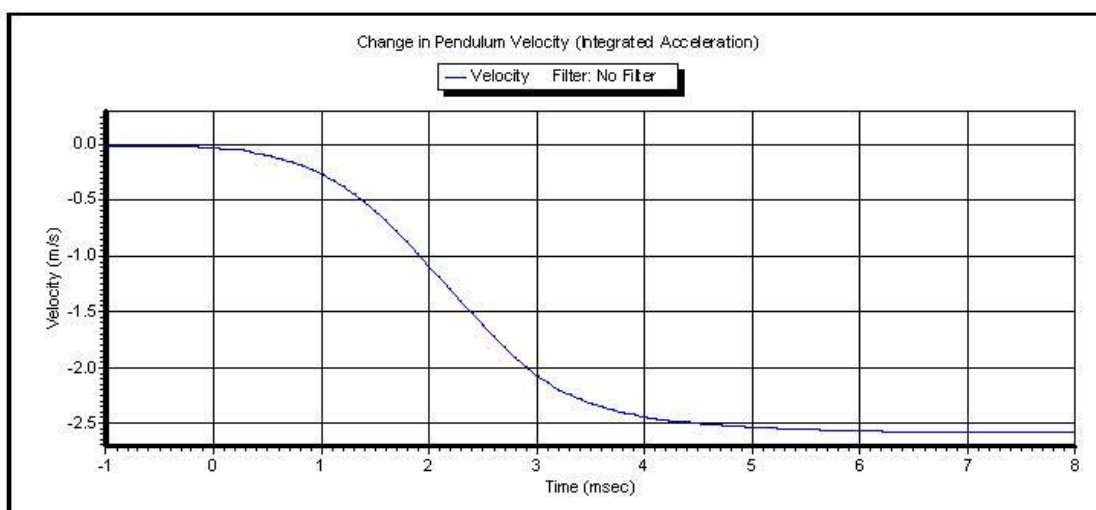
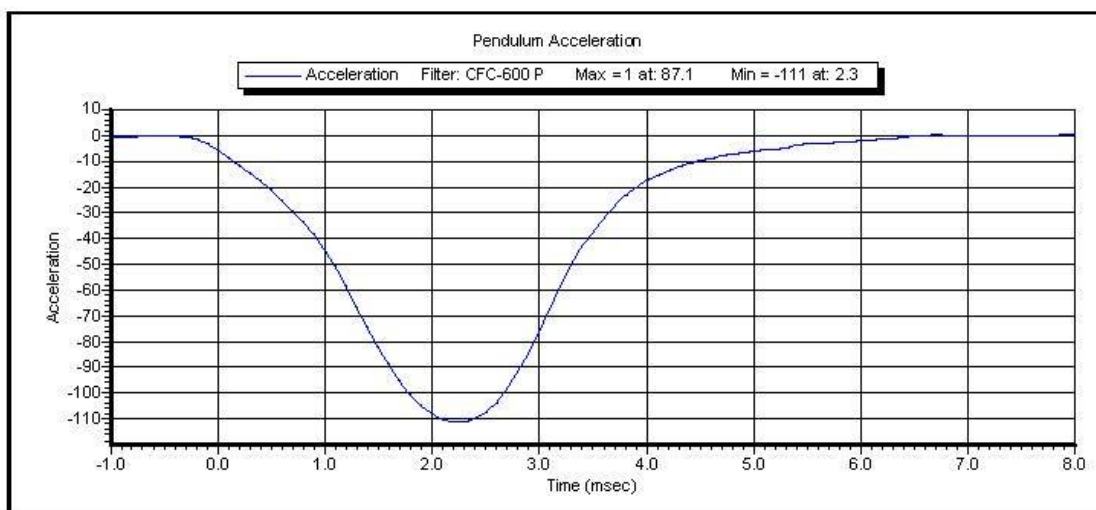
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



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

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

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



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**



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

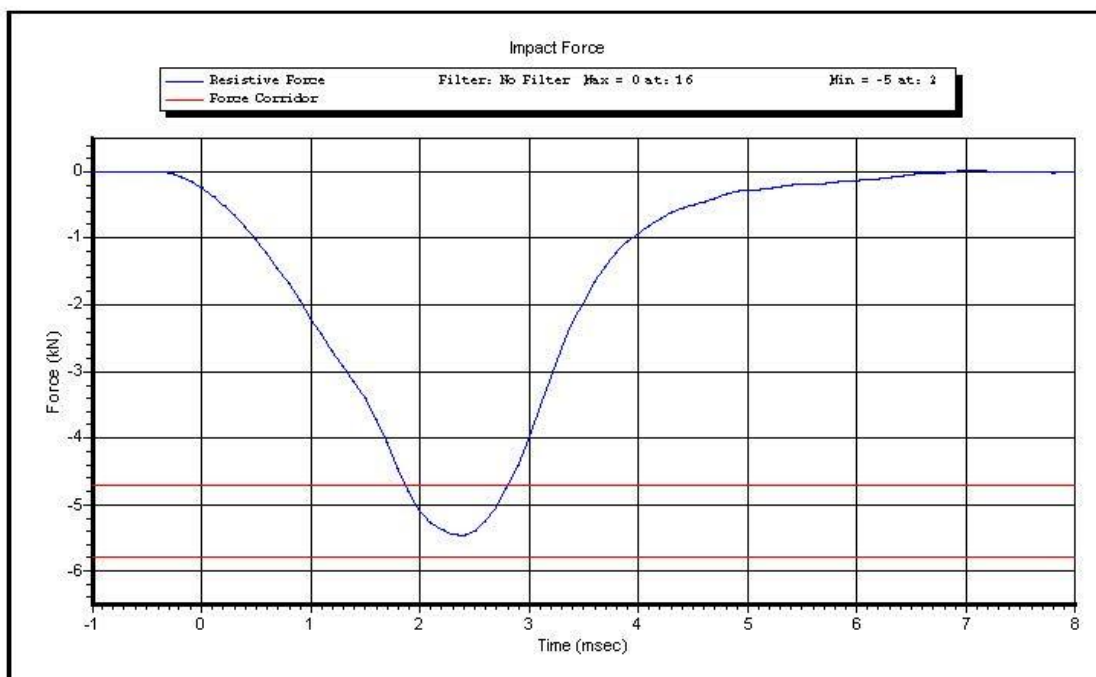
REFERENCE EQUIPMENT

<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



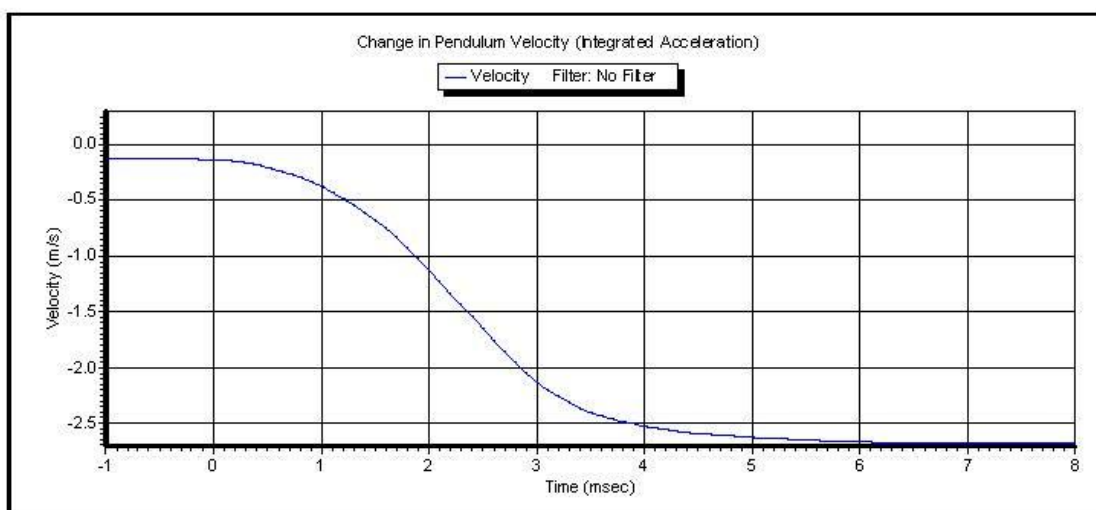
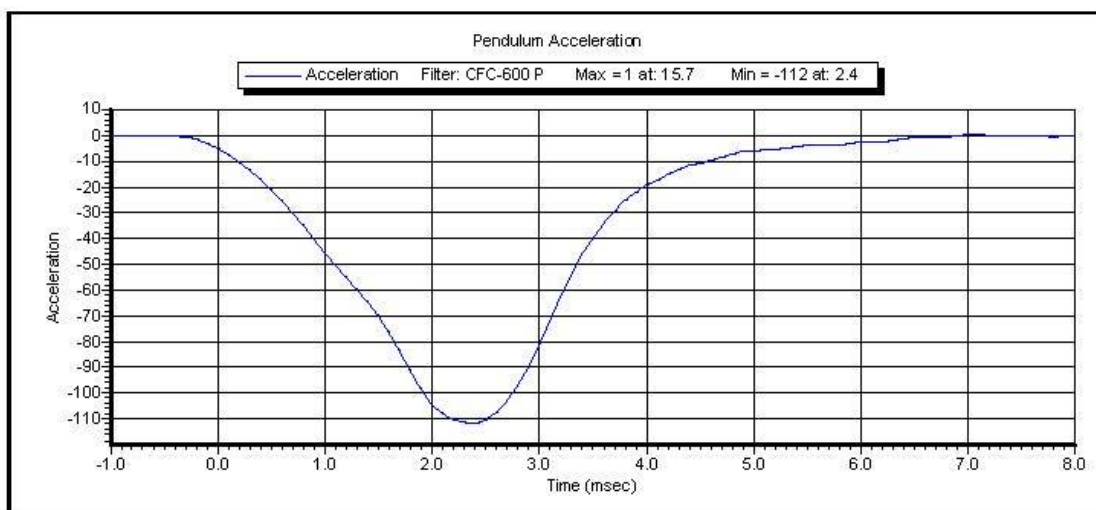
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	064



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

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 273



External Measurements

5th Female SN 273

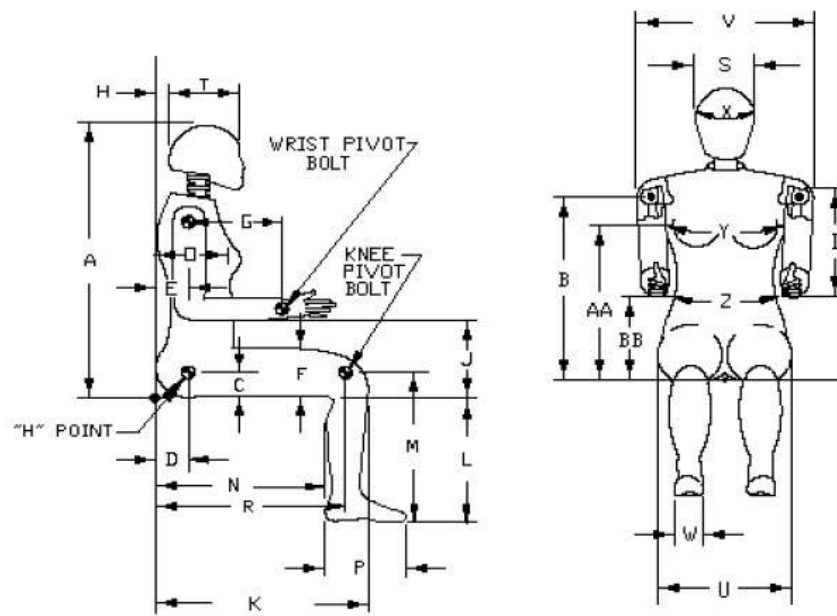
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	780	Yes
B	Shoulder Pivot Height	431.8 – 457.2	453	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	71	Yes
F	Thigh Clearance	119.4 – 134.6	123	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	245	Yes
H	Head Back to Backline	43.2 – 48.2	44	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	294	Yes
J	Elbow Rest Height	182.8 – 203.2	200	Yes
K	Buttock to Knee Length	520.7 – 546.1	530	Yes
L	Popliteal Height	355.6 – 376	373	Yes
M	Knee Pivot Height	393.7 – 419.1	395	Yes
N	Buttock Popliteal Length	414 – 439.4	434	Yes
O	Chest Depth without Jacket	175.3 – 190.5	183	Yes
P	Foot Length (right)	218.5 – 233.7	221	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	179	Yes
U	Hip Breadth	299.7 – 314.9	311	Yes
V	Shoulder Breadth	350.5 – 365.7	359	Yes
W	Foot Breadth	78.8 – 94	81	Yes
X	Head Circumference	528.3 – 548.7	540	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	853	Yes
Z	Waist Circumference	759.5 – 789.9	776	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	355	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	168	Yes

Technician: M. Geesey

Date: 04/15/2014

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:	273		
Test ID:	Head Drop	Test Date:	4/14/2014
		Test Time:	4:51:28 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	780

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.50 deg C P
Humidity	10 -- 70	50.70 %RH P
Resultant Acceleration	250 -- 300	278.0 G's P
Oscillation	0 -- 10	1.4 % P
Lateral Acceleration	-15 -- 15	-5.3 G's P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

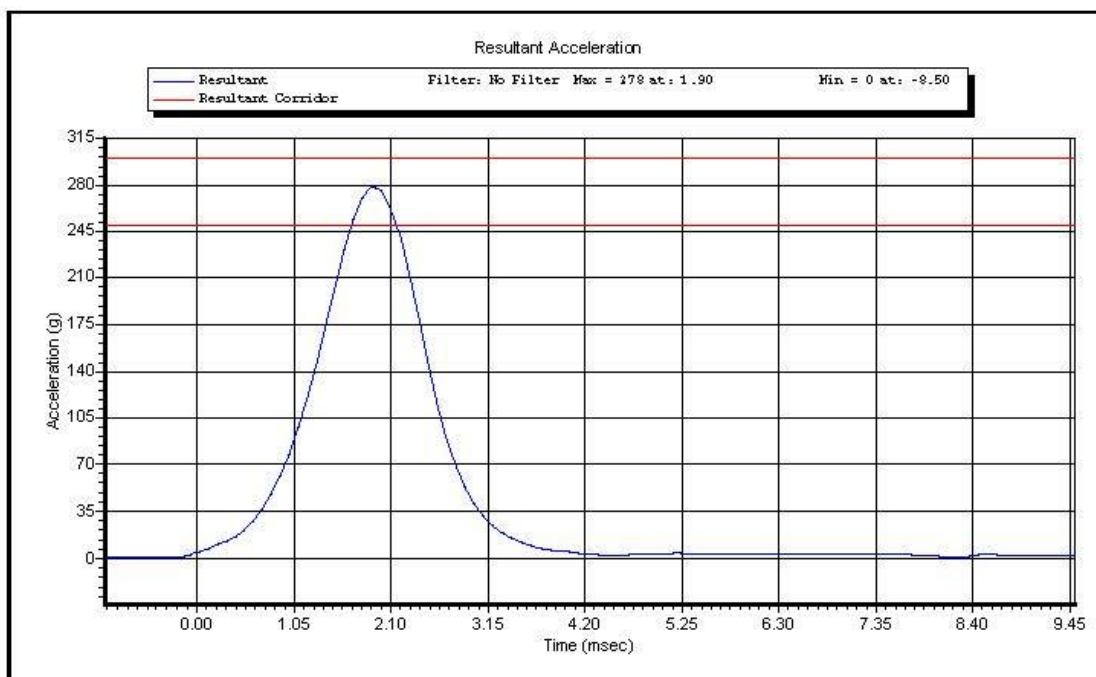
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58833	1/24/2014
Endevco	7264-2000	P58905	1/24/2014
Endevco	7264-2000	P52114	1/24/2014

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:	273

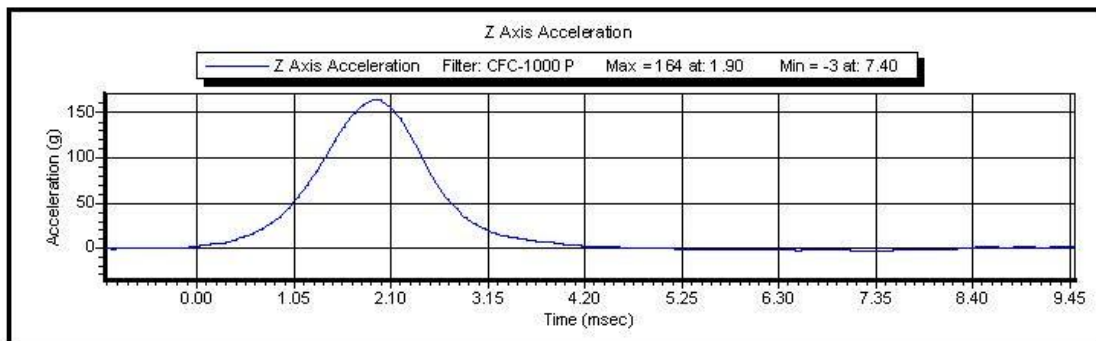
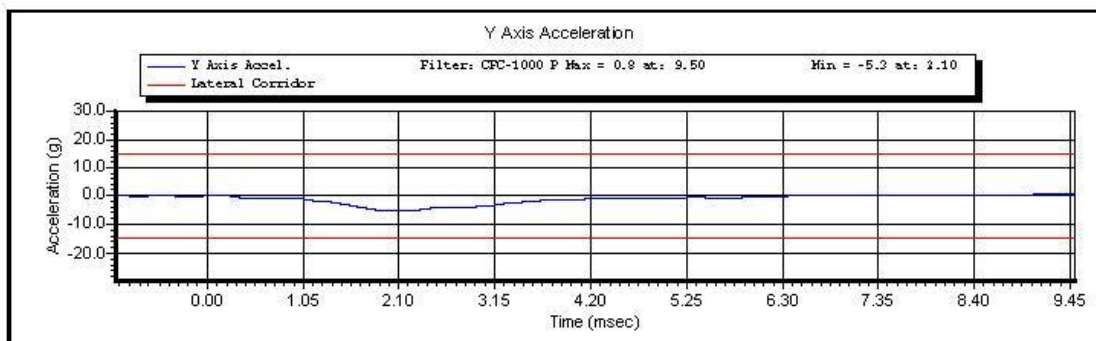
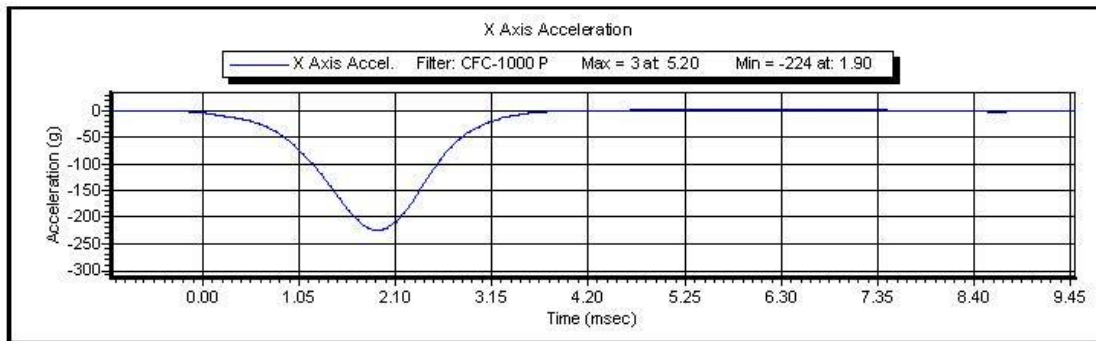


Test ID: **Head Drop**

Test Time: **4:51:28 PM**

Test Date: **4/14/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **4:51:28 PM**

Test Date: **4/14/2014**

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:	273		
Test ID:	Neck Extension	Test Date:	4/14/2014
		Test Time:	6:12:31 PM

Component Part Number	Component Serial Number
Neck - 880105-255	660

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.30 deg C P
Humidity	10 -- 70	52.70 %RH P
Velocity	5.95 -- 6.19	6.040 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.71 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.35 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	4.83 m/s P
D Plane Rotation	99 -- 114	103.5 degrees P
Moment During Rotation Interval	-65 -- -53	-57.6 Nm P
Moment Decay to -10.0 Nm	94 -- 114	101.0 ms P

All test parameters are within specifications

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



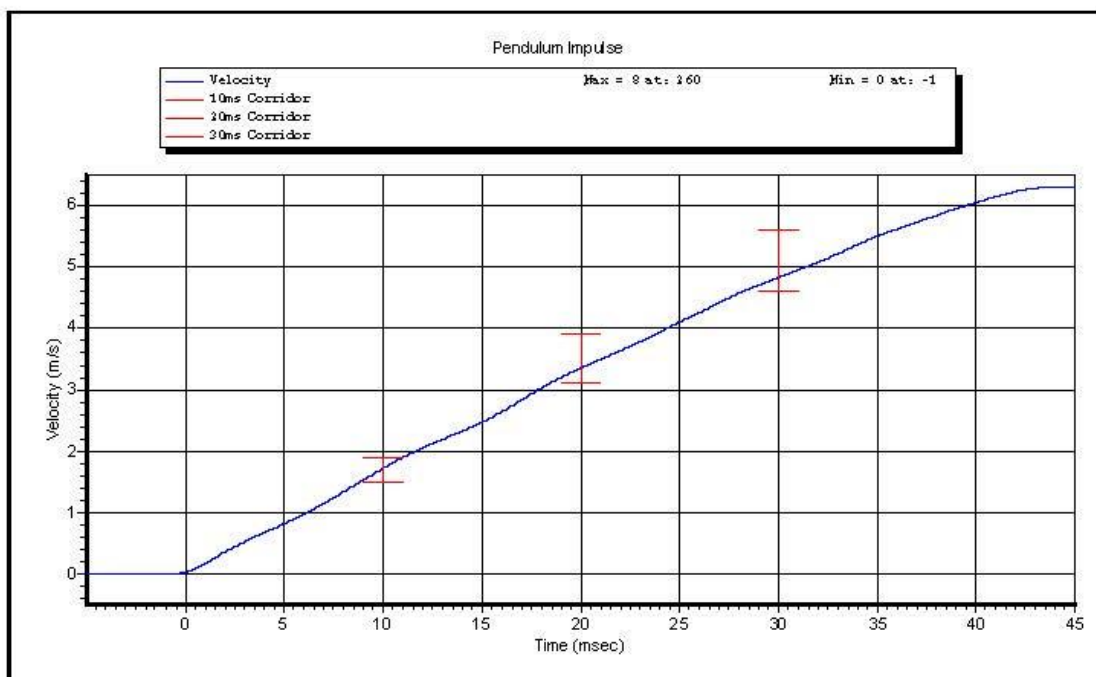
VERIFICATION REPORT

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-1629 My	4/30/2013
Denton	1716A	LC-1629 Fx	4/30/2013



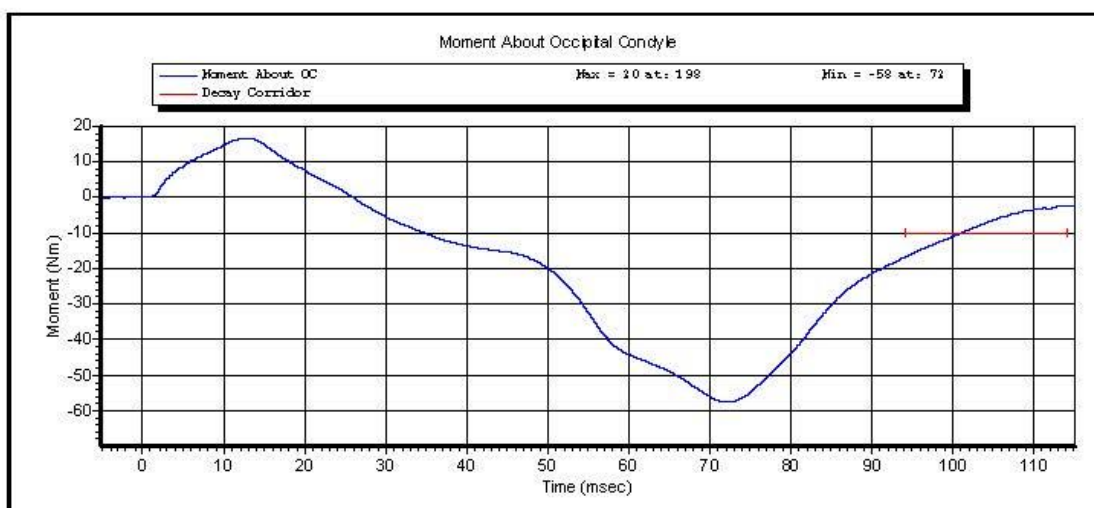
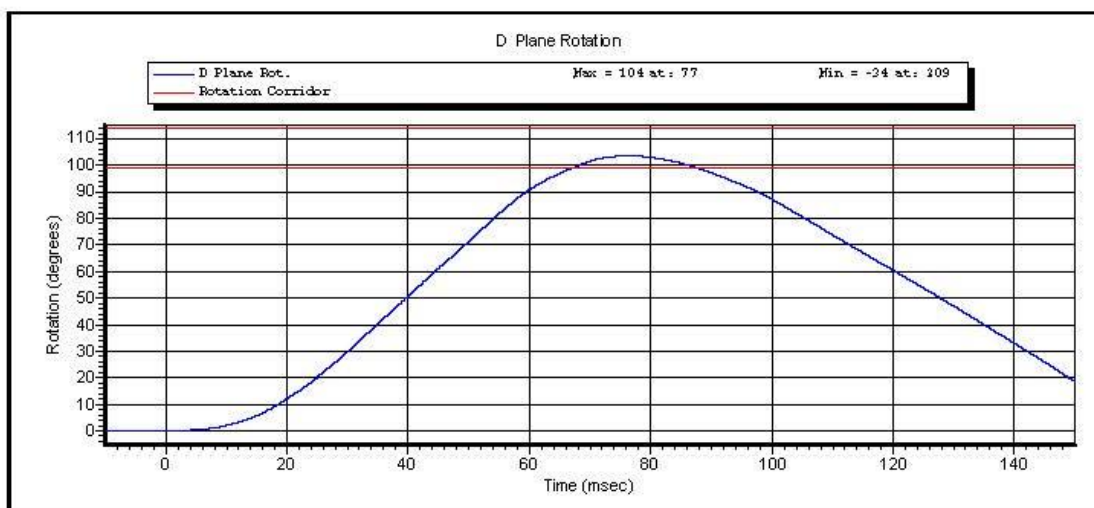
Test Name:	Neck Extension
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: Neck Extension Test Time: 6:12:31 PM

Test Date: 4/14/2014

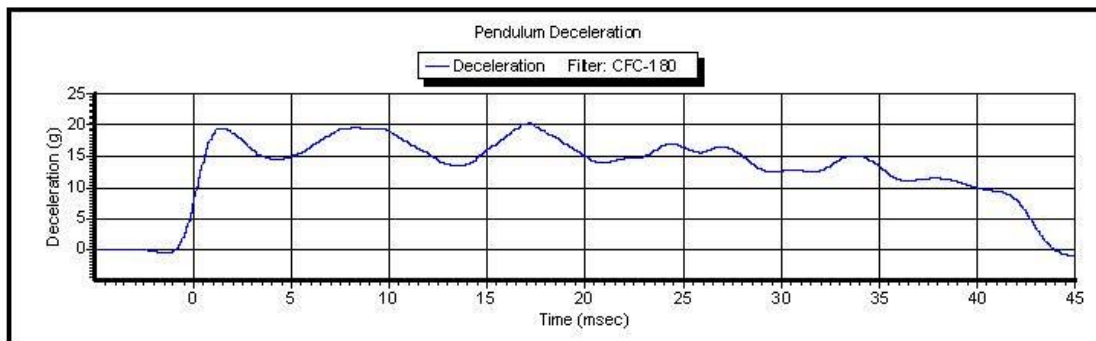
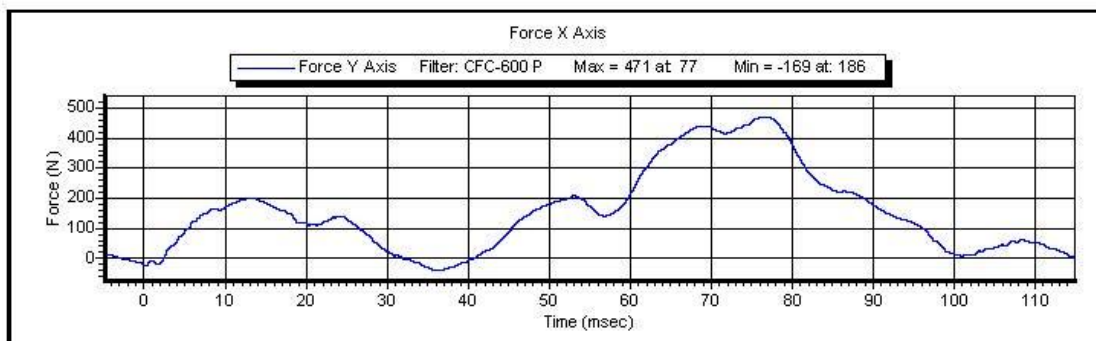
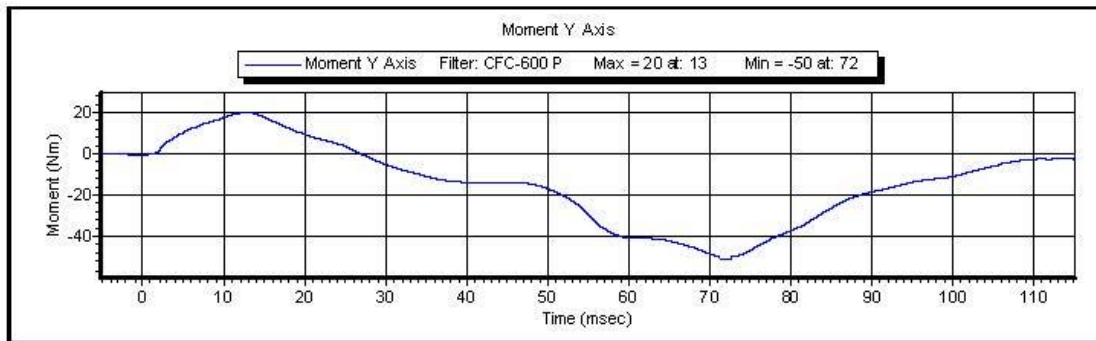
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **6:12:31 PM**

Test Date: **4/14/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **6:12:31 PM**

Test Date: **4/14/2014**

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:	273		
Test ID:	Neck Flexion	Test Date:	4/14/2014
		Test Time:	5:53:42 PM

Component Part Number	Component Serial Number
Neck - 880105-255	660

Test Parameters	Test Specifications	Test Results
Temperature	21 -- 22	21.20 deg C P
Humidity	10 -- 70	53.20 %RH P
Velocity	6.89 -- 7.13	6.983 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.36 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.5 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	6.29 m/s P
D Plane Rotation	-91 -- -77	-77.6 degrees P
Moment During Rotation Interval	69 -- 83	70.8 Nm P
Moment Decay to 10.0 Nm	80 -- 100	84.5 ms P

All test parameters are within specifications

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



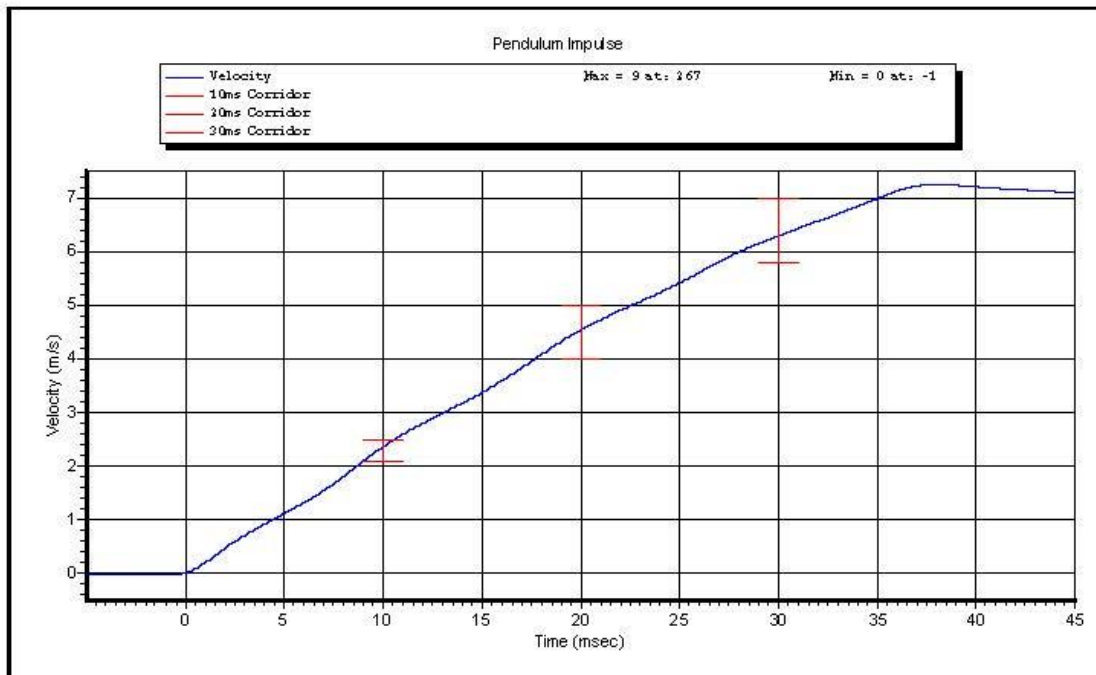
VERIFICATION REPORT

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-1629 My	4/30/2013
Denton	1716A	LC-1629 Fx	4/30/2013



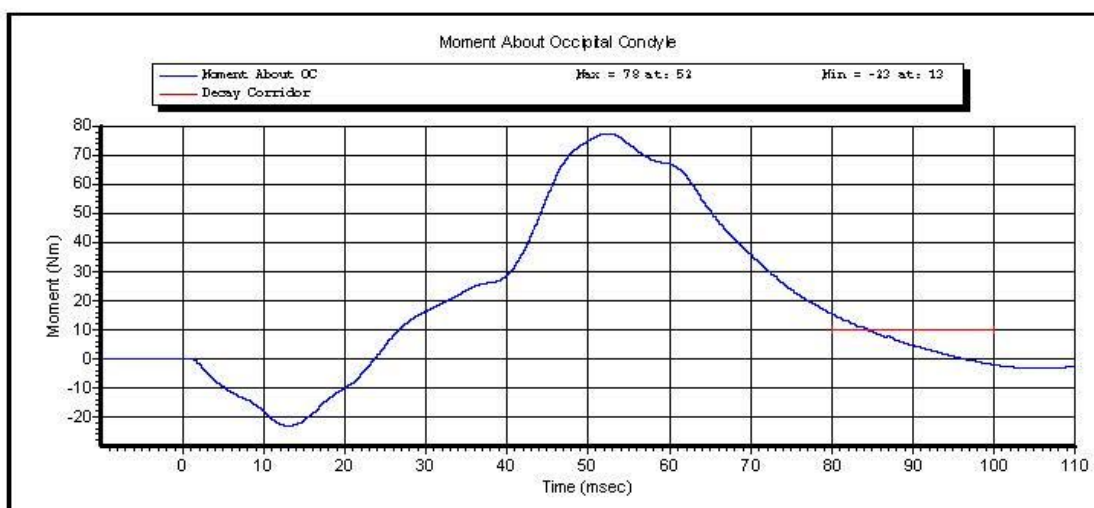
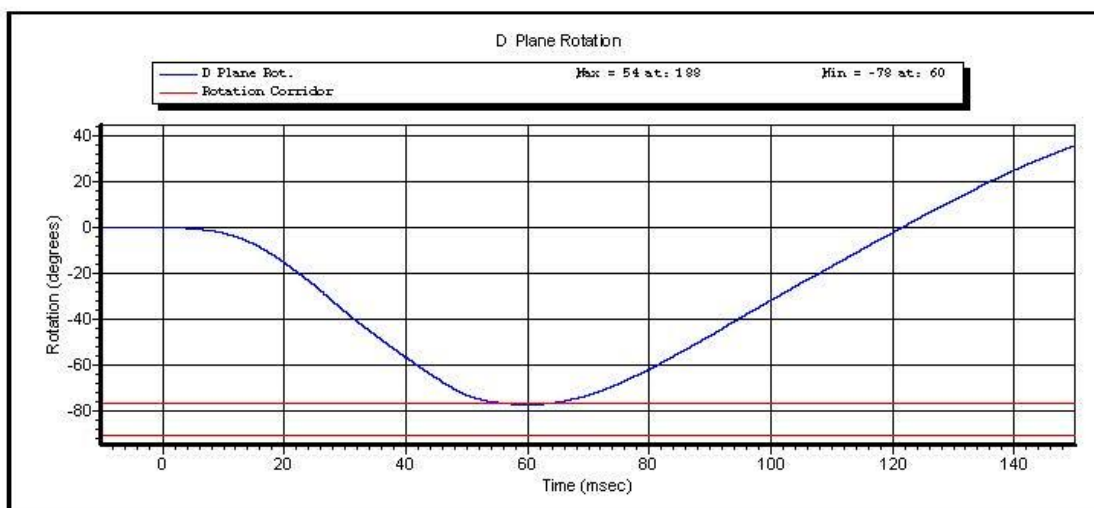
Test Name:	Neck Flexion
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: Neck Flexion Test Time: 5:53:42 PM

Test Date: 4/14/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

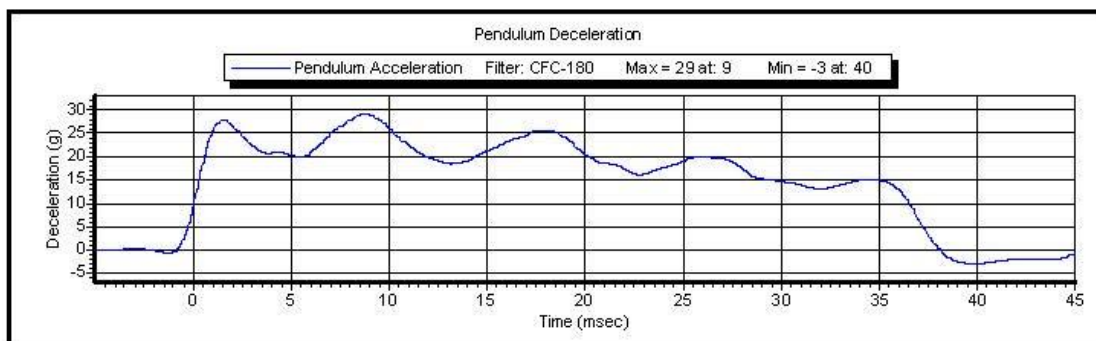
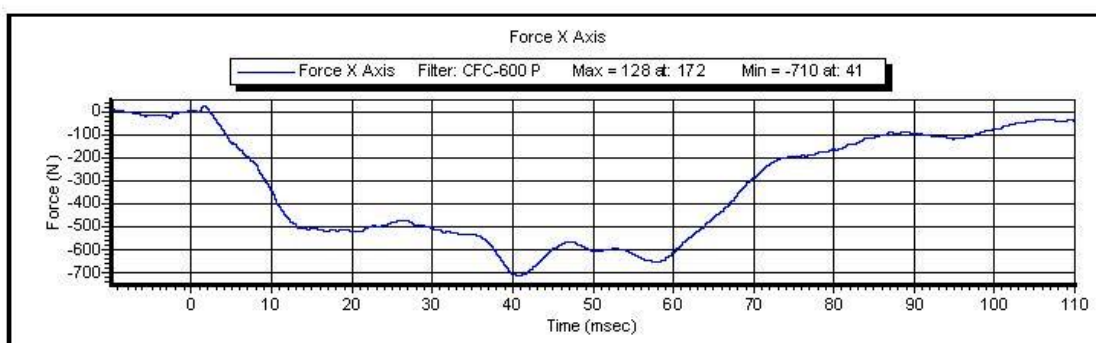
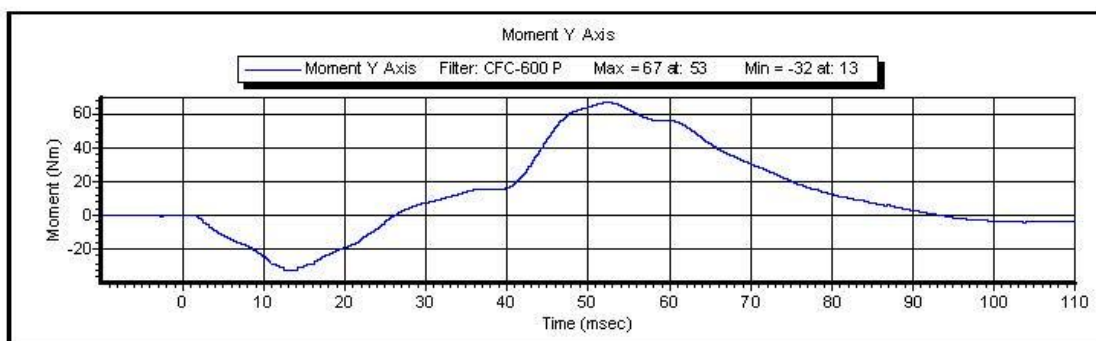


Test ID: **Neck Flexion**

Test Time: **5:53:42 PM**

Test Date: **4/14/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Flexion**

Test Time: **5:53:42 PM**

Test Date: **4/14/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Torso Flexion
Part 572O HIII 5% Female

ATD Serial No: 273

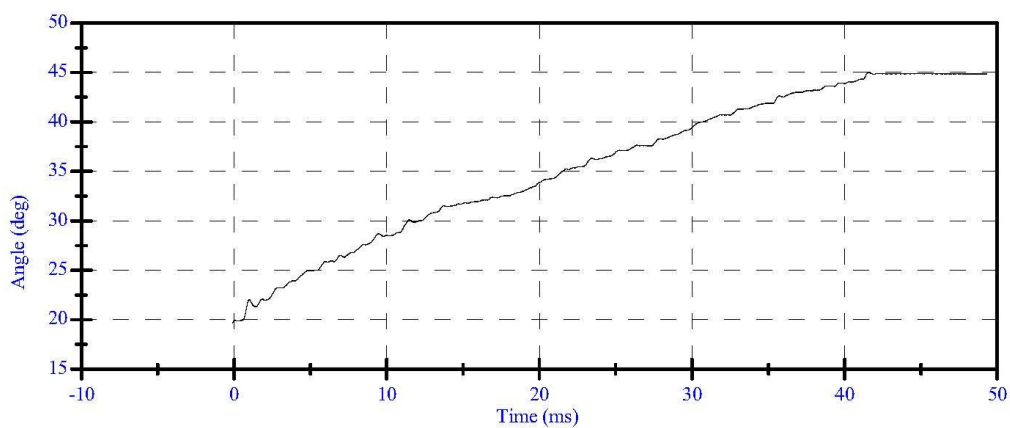
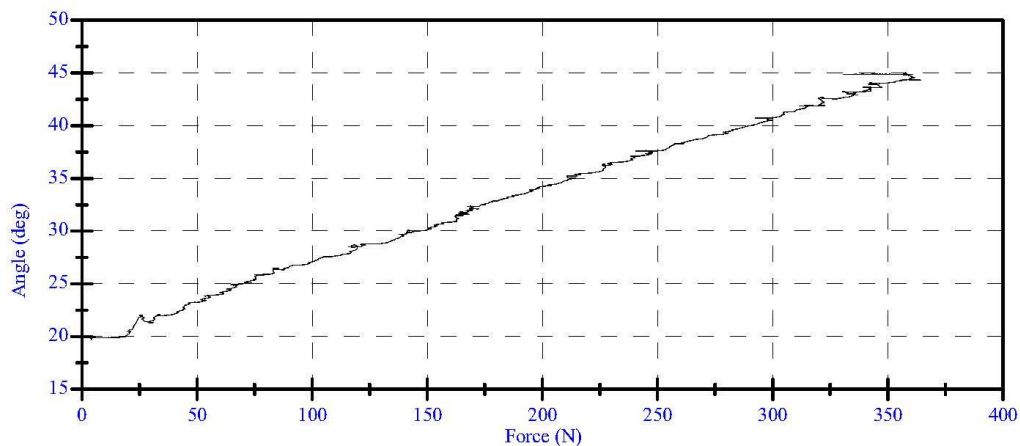
Laboratory Supervisor: E. Dutton

Date: 04/15/2014

Laboratory Technician: M. Geesey

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.6 C	22.2 C	Passed
Lab Humidity:	10-70 %	25.7%	Passed
Initial Angle:	0.00-20.00 Deg	17.3 Deg	Passed
Force at 45 Deg	320.00-390.00 N	364.24 N	Passed
Return Angle	8 Deg Max from Initial	21.5 deg	Passed

TORSO FLEXION TEST





VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	273		
Test ID:	Thorax Impact	Test Date:	4/15/2014
		Test Time:	10:33:11 AM

Component Part Number	Component Serial Number
Chest Jacket - 880105-355-E	DH0069

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.80 deg C	P
Humidity	10	--	70	31.70 %RH	P
Velocity	6.59	--	6.83	6.786 m/s	P
Sternum Displacement	-58	--	-50	-52.3 mm	P
Force During Displacement Interval	-4400	--	-3900	-4315.2 N	P
Force During -18mm to -50mm Displacem	-4600	--	0	-4323.2 N	P
Hysteresis	69	--	85	72.0 %	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



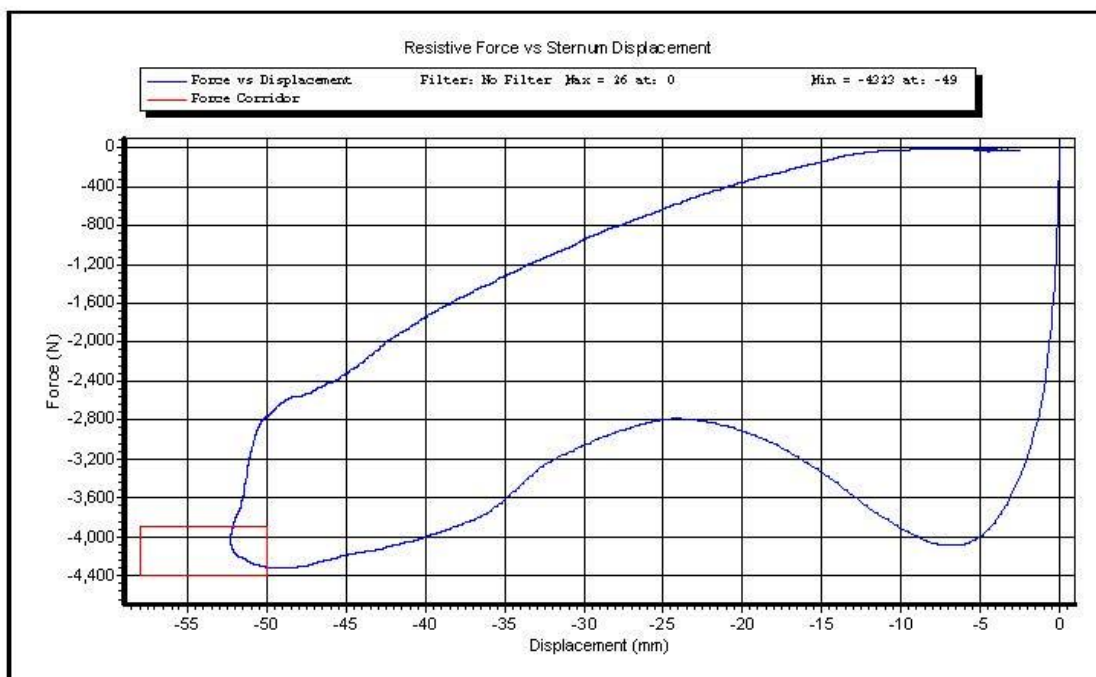
VERIFICATION REPORT

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-273	6/17/2013



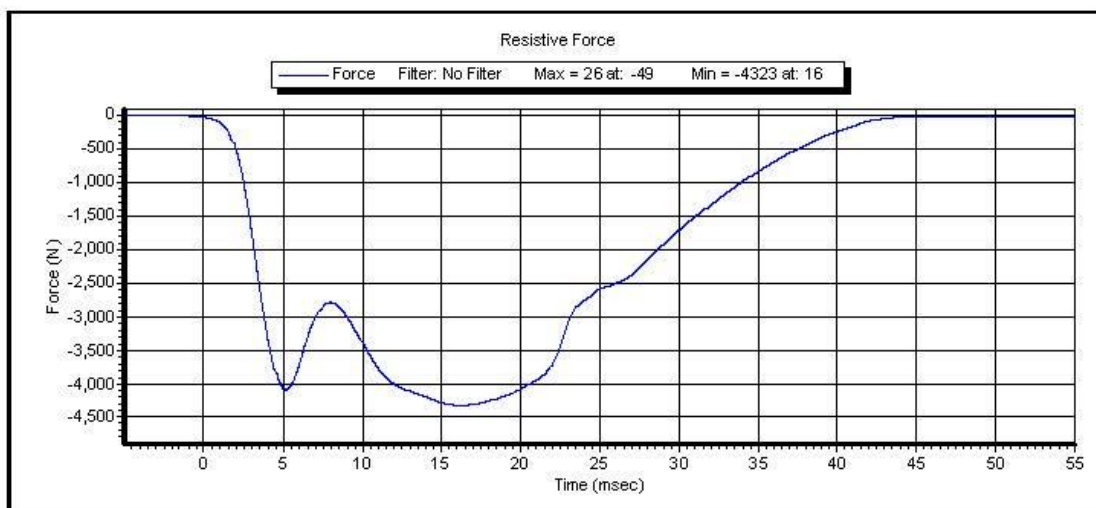
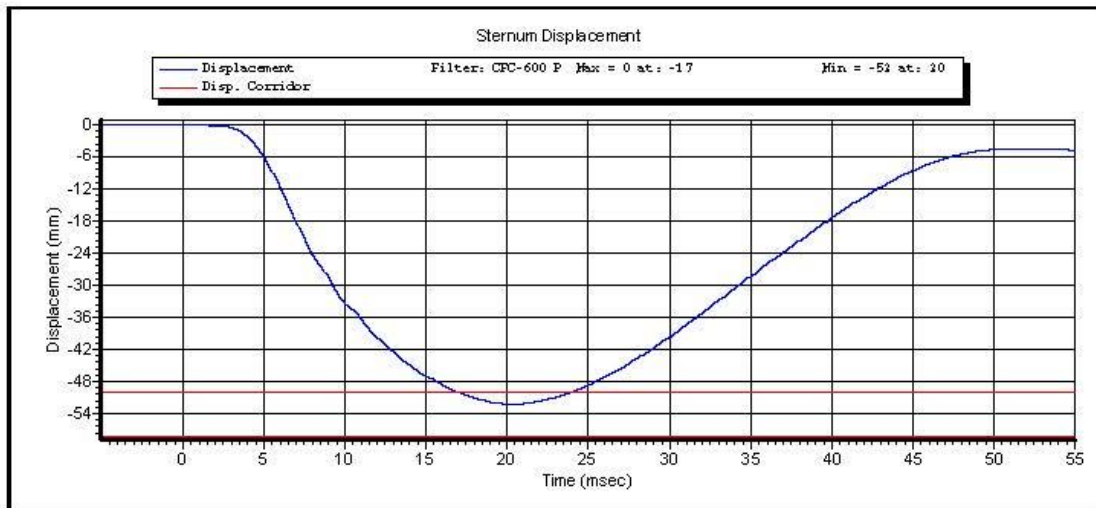
Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: Thorax Impact Test Time: 10:33:11 AM

Test Date: 4/15/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

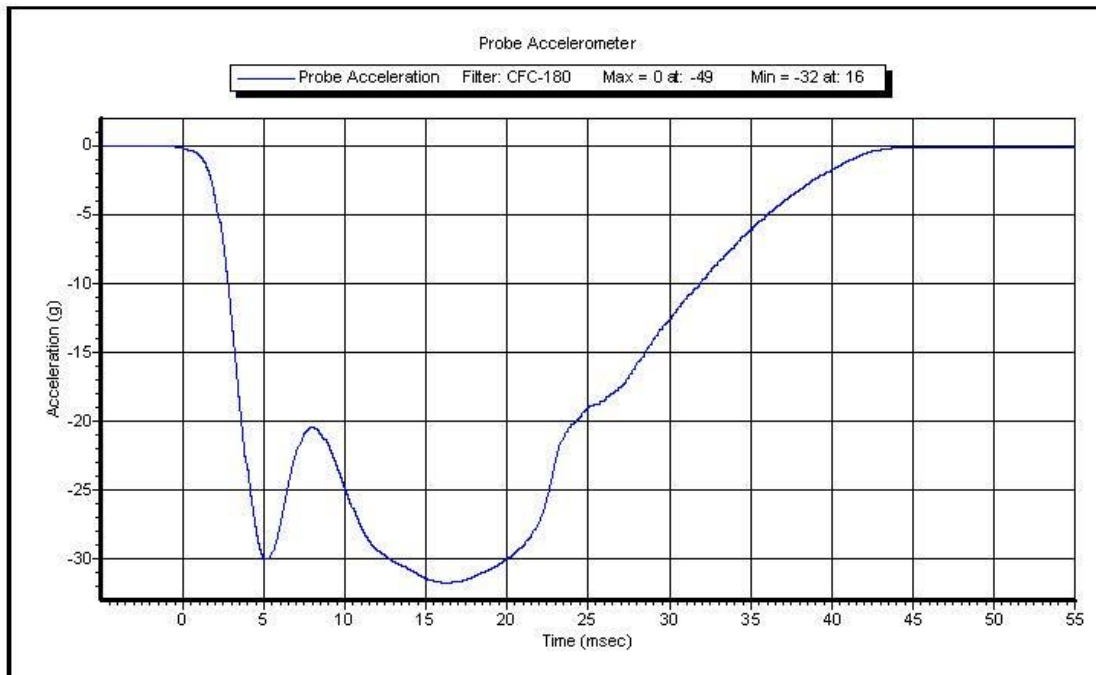


Test ID: **Thorax Impact**

Test Time: **10:33:11 AM**

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

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **10:33:11 AM**

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

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:	273		
Test ID:	Knee Impact Left	Test Date:	4/15/2014
		Test Time:	1:12:16 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	20.70 deg C	P
Humidity	10	--	70	29.40 %RH	P
Velocity	2.07	--	2.13	2.096 m/s	P
Resistive Force	-4060	--	-3450	-3991.0 N	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

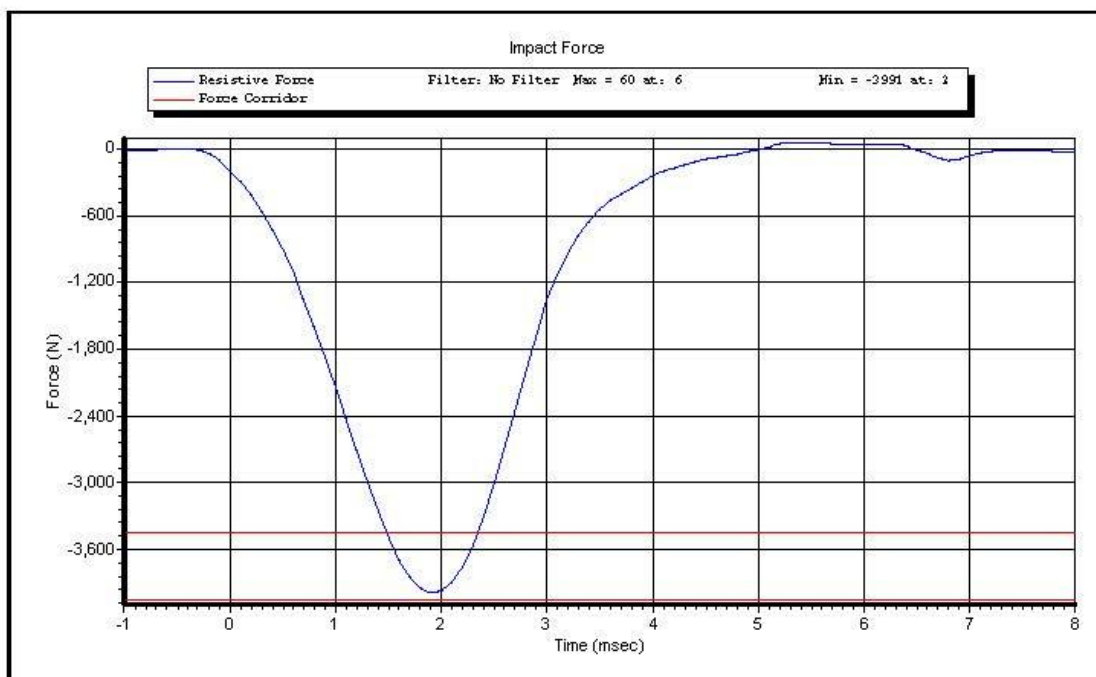
REFERENCE EQUIPMENT

<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

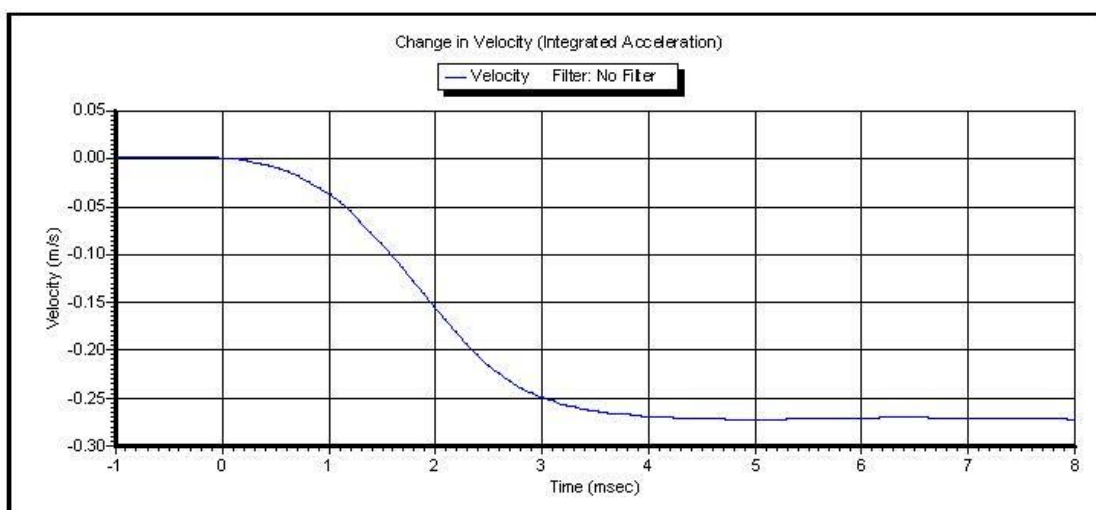
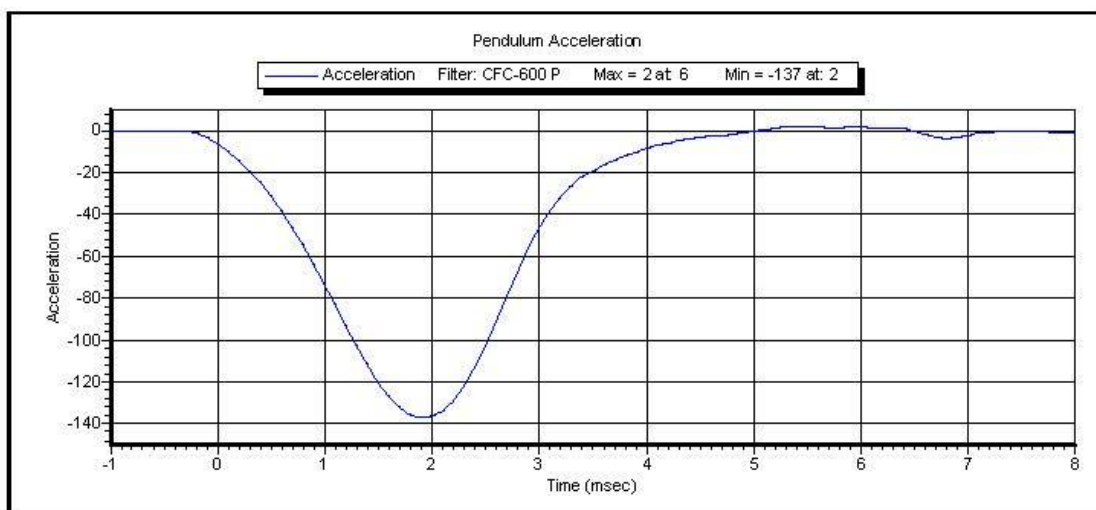


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: **Knee Impact Left** Test Time: **1:12:16 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

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



Test ID: **Knee Impact Left** Test Time: **1:12:16 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

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



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	273		
Test ID:	Knee Impact Right	Test Date:	4/15/2014
		Test Time:	1:07:09 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.70 deg C P
Humidity	10 -- 70	29.40 %RH P
Velocity	2.07 -- 2.13	2.098 m/s P
Resistive Force	-4060 -- -3450	-3854.7 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



VERIFICATION REPORT

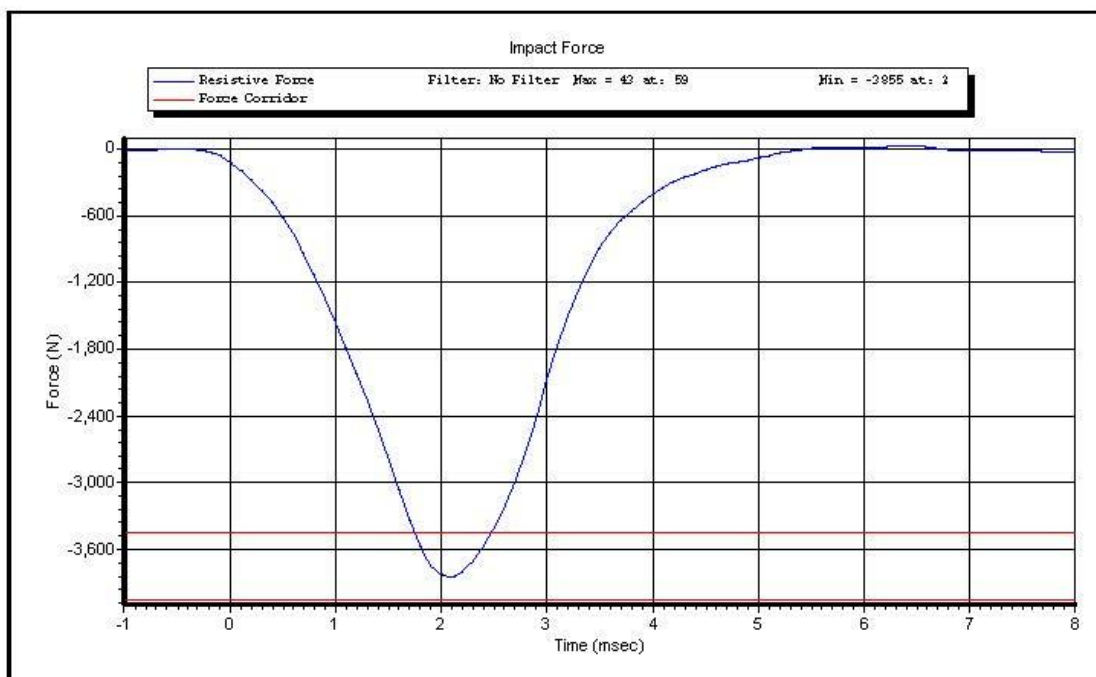
REFERENCE EQUIPMENT

<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



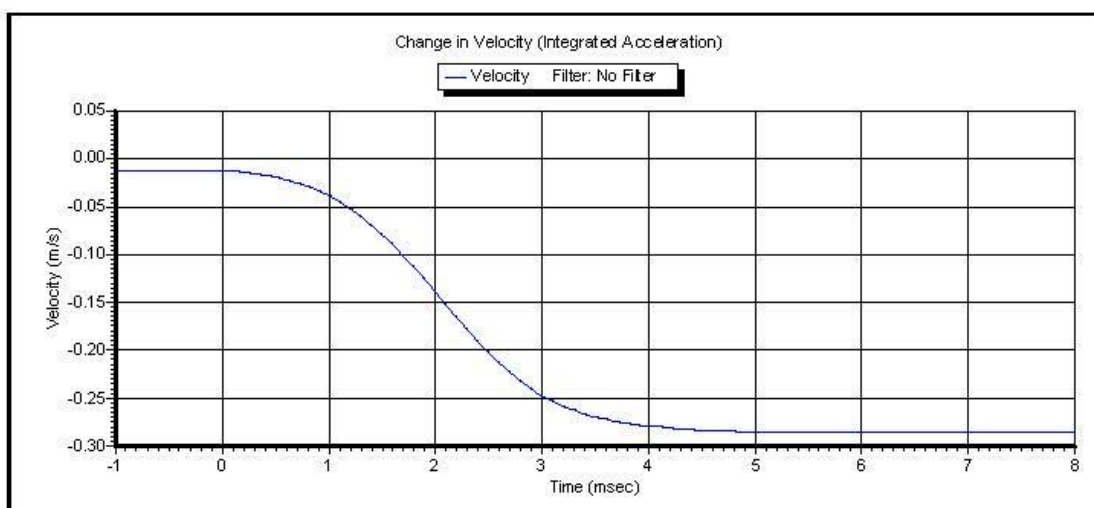
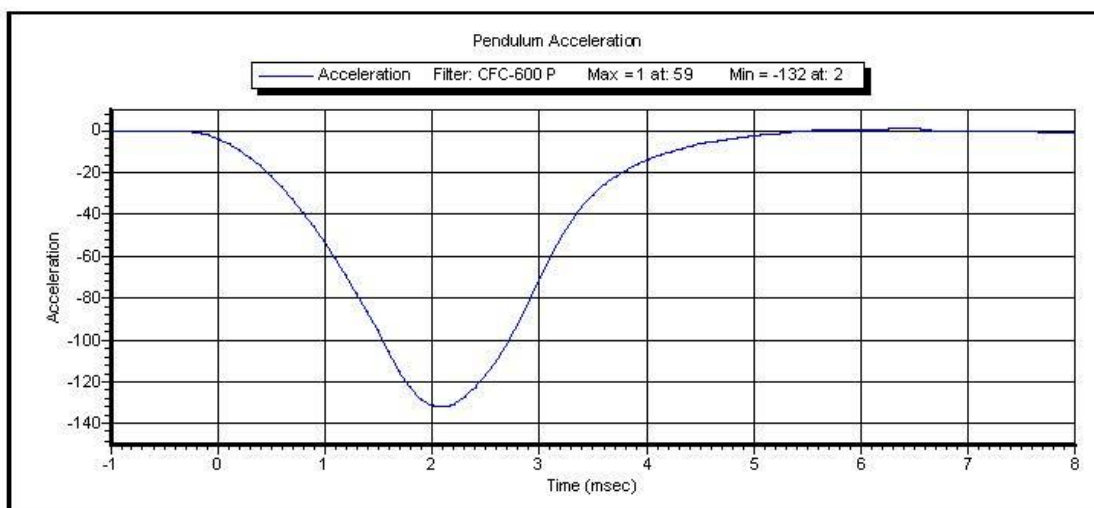
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	273



Test ID: **Knee Impact Right** Test Time: **1:07:09 PM**

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

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Knee Impact Right** Test Time: **1:07:09 PM**

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

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0