

**REPORT NUMBER: NCAP-CAL-14-003**

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

**Chrysler Group LLC  
2014 Dodge Durango  
4 Door SUV**

**NHTSA No: M20140301**

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



**January 2, 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**

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**FINAL REPORT ACCEPTANCE BY OCWS:**

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

Date: \_\_\_\_\_

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

Date: \_\_\_\_\_

**TECHNICAL REPORT DOCUMENTATION PAGE**

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<b>15. Supplementary Notes</b>																																																									
<b>16. Abstract</b> A 56.30 km/h (35 mph), NCAP Frontal Impact Test was conducted on a 2014 Dodge Durango four door SUV in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 2, 2013.  The impact velocity of the vehicle was 56.43 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 505 mm at the 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 (HIC<sub>15</sub>)</td> <td></td> <td>700</td> <td>143.58</td> <td>700</td> <td>344.32</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-33.39</td> <td>52</td> <td>-16.89</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.34</td> <td>1</td> <td>0.24</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>1114.67</td> <td>2,620</td> <td>376.19</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-114.17</td> <td>2,520</td> <td>-549.29</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-1900.36</td> <td>6,805</td> <td>-1798.94</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-1558.36</td> <td>6,805</td> <td>-998.05</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 <sub>15</sub> )		700	143.58	700	344.32	Maximum Chest Compression	mm	63	-33.39	52	-16.89	Nij		1	0.34	1	0.24	Neck Tension	N	4,170	1114.67	2,620	376.19	Neck Compression	N	4,000	-114.17	2,520	-549.29	Left Femur Force	N	10,008	-1900.36	6,805	-1798.94	Right Femur Force	N	10,008	-1558.36	6,805	-998.05
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## SECTION 1

### PURPOSE AND SUMMARY OF TEST

#### PURPOSE

This 56.3 km/h frontal barrier impact test is part of the Vehicle Barrier Impact Testing Program sponsored by the National Highway Traffic Safety Administration (NHTSA) under Contract No. DTNH22-12-D-00260. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 km/h frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standards Frontal NCAP Laboratory Test procedure, dated August 2013.

#### SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2014 Dodge Durango four door SUV at a velocity of 56.43 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 2, 2013. 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, 50<sup>th</sup> percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5<sup>th</sup> 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 lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 288) were calibrated previous to this test. Certification details, along with instrumentation calibration data, can be found in Appendix C of this report.

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

There was 100 percent windshield retention and no intrusion into the protected zone of the windshield during the event. There was a total of 0.0 grams of stoddard solvent leakage after the event and including all phases of the static rollover. The maximum static crush of the test vehicle was 505 mm at the centerline. During and after the impact event, the driver's and passenger's side door 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 airbag.

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

The occupant data is summarized below.

ATD Position	HIC <sub>15</sub>	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 <sup>th</sup> )	143.58	0.34	1114.67	-114.17	41.42	-33.39	-1900.36	-1558.36
Passenger (5 <sup>th</sup> )	344.32	0.24	376.19	-549.29	46.49	-16.89	-1798.94	-998.05

**GENERAL COMMENTS:**

1. P1 (Driver) serial number - 061
2. P2 (Passenger) serial number - 288

**Data Anomalies:**

- 13TIBILELOHFFOZP – Passenger Left Lower Tibia Z Force - Questionable data after 100 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: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**TEST VEHICLE INFORMATION AND OPTIONS**

NHTSA No.	M20140301	Traction Control System (TCS)	Yes
Model Year	2014	Power Steering	Yes
Make	Dodge	Power Window Auto-Reverse	No
Model	Durango	Driver Frontal Airbag	Yes
Body Style	SUV	Driver Curtain Airbag	Yes
VIN	1C4RDJAG9EC314068	Driver Head/Torso Airbag	No
Body Color	Charcoal gray	Driver Torso Airbag	No
Odometer Reading (km /mi)	157.7 km / 98 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	3.6	Driver Pelvis Airbag	No
Type / No. Cylinders	V6	Driver Knee Airbag	Yes
Engine Placement	Inline	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	8-Speed	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	All-Wheel Drive	Front Pass. Torso/Pelvis Airbag	Yes
Roof Rack	No	Front Pass. Pelvis Airbag	No
Sunroof / T-Top	No	Front Pass. Knee Airbag	No
Running Boards	No	Driver Pretensioner	Yes
Tilt Steering Wheel	Yes	Driver Load Limiter	Yes
Power Seats	No	Front Pass. Pretensioner	Yes
Anti-Lock Brakes (ABS)	Yes	Front Pass. Load Limiter	Yes
Automatic Door Locks (ADLs)	Yes	Other	-

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

Yes

**DATA FROM CERTIFICATION LABEL**

Manufactured By	Chrysler Group LLC	GVWR (kg)	2949
Date of Manufacture	10/13	GAWR Front (kg)	1452
		GAWR Rear (kg)	1770

**VEHICLE SEATING AND WEIGHT CAPACITY DATA**

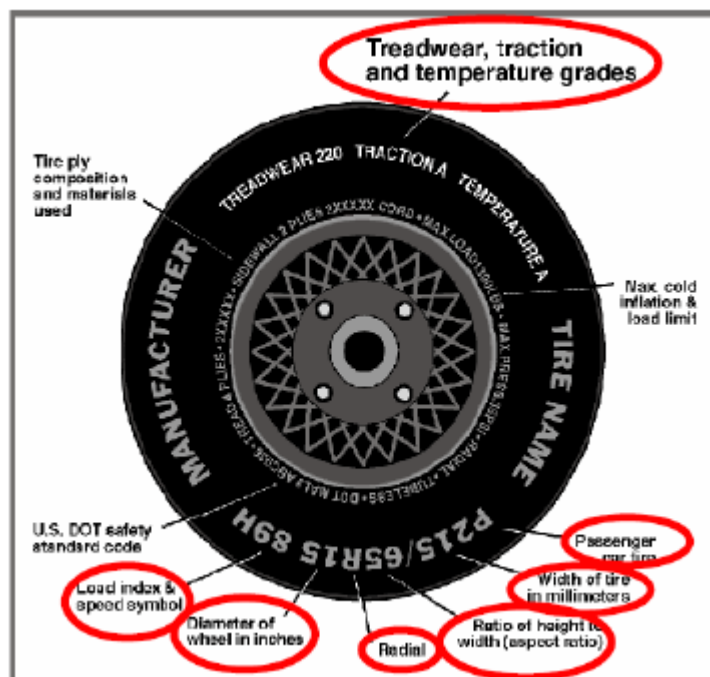
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				544
Cargo Wt. (RCLW) (kg)				67.72

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

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



**VEHICLE TIRE INFORMATION**

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	250	250
Recommended Tire Size	P265/60R18	P265/60R18
Tire Size on Vehicle	P265/60R18	P265/60R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Latitude Tour	Latitude Tour
Treadwear	720	720
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Polyester, 1 Polyamide, 2 Steel	2 Polyester, 1 Polyamide, 2 Steel
Load Index / Speed Symbol	109T	109T
Tire Material	Rubber	Rubber
DOT Safety Code Left	AP5E00DX3713	AP5E00DX3713
DOT Safety Code Right	AP5E00DX3713	AP5E00DX3713

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**TEST VEHICLE WEIGHTS**

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	572	543		632	613	
Right	kg	559	574		545	660	
Ratio	%	50.4%	49.6%		48.1%	51.9%	
Totals	kg	1131	1117	2248	1177	1273	2450

**TARGET TEST WEIGHT CALCULATION**

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2248	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.7	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	67.7	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2456.4	(A+B+C)

**TEST VEHICLE ATTITUDES AND CG**

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	869	869	882	887	1510
As Tested	mm	885	886	866	870	1579
Post-Test	mm	938	955	879	854	

**GENERAL TEST VEHICLE DATA**

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3040
Total Vehicle Length at Left Side	mm	4980
Total Vehicle Length at Centerline	mm	5085
Total Vehicle Length at Right Side	mm	4978
Weight of Ballast in Cargo Area	kg	40
Weight of Vehicle Components Removed	kg	67
Amount of Stoddard Solvent in Fuel Tank	L	87.1

**LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:**

The third row rear seats, tail light, trunk carpeting, spare tire and jack were removed to install the  
Data acquisition boxes.

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**TARGET VEHICLE STRUCTURAL MEASUREMENT**

No.	Description	Pre-Test
1	Total Length	5085
2	Total Width	1914
3*	Bumper Top Height	680
4*	Bumper Bottom Height	539
5*	Longitudinal Member Top Height	599
6	Distance Between Longitudinal Members	944
7	Longitudinal Member Width	79
8*	Engine Top Height	1136
9*	Engine Bottom Height	246
10	Engine and Gearbox Width	619
11	Front Bumper-Engine Distance	671
12*	Front Shock Absorber Fixing Height	1040
13*	Bonnet Leading Edge Height	1016
14	Front Shock Absorber Fixing Width	964
15	Front Bumper – Front Axle Distance	868
16	Front Axle – A Pillar Distance	630
17	A-Pillar – B-Pillar Distance	1130
18	B-Pillar – Rear Axle Distance	1275
19	B-Pillar – C-Pillar Distance	1137
20*	Roof Sill Bottom Height	1612
21*	Roof Sill Top Height	1716
22*	Floor Sill Bottom Height	484
23*	Floor Sill Top Height	526

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

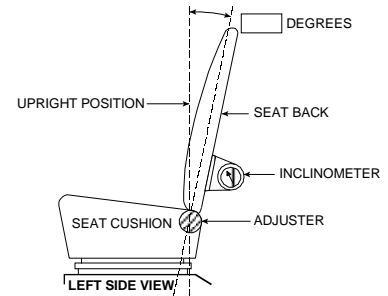
**DATA SHEET NO. 2**  
**SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA**

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**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.



**FRONT SEAT ASSEMBLY**

Seating Position	Degrees
Driver Seat Back Angle	14.0
Passenger Seat Back Angle	7.1

**SEAT FORE / AFT POSITIONS**

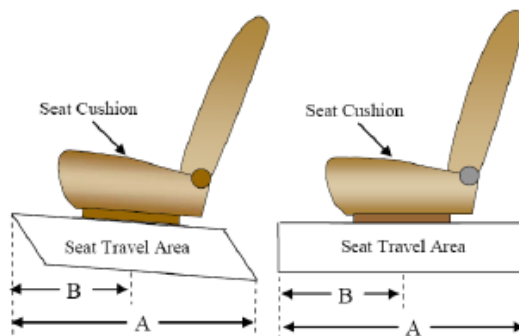
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	42	22
Passenger Seat	240	0

**SEAT BELT UPPER ANCHORAGE**

The driver's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 50<sup>th</sup> percentile adult male ATD. The passenger's seat belt anchorage was positioned according to the manufacturer's designated positioning for a 5<sup>th</sup> percentile adult female ATD. For this test zero is defined as the uppermost position.

Seating Position	Total # of Positions	Placed in Position #
Driver Seat	5	0
Passenger Seat	5	0



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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

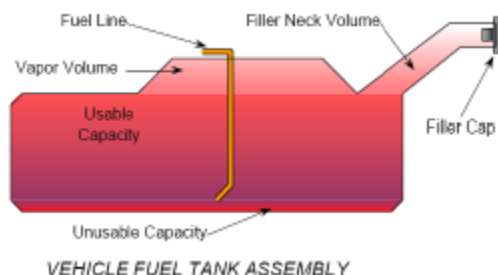
NHTSA No.: M20140301  
 Test Date: 12/2/2013

**FUEL TANK CAPACITY**

Description	Liters
Usable Capacity of "Standard Tank"	93.49
Usable Capacity of "Optional Tank"	93.49
92%-94% of Usable Capacity	86.0 – 87.9
Actual Amount of Solvent Used	87.1
1/3 of Usable Capacity	31.2

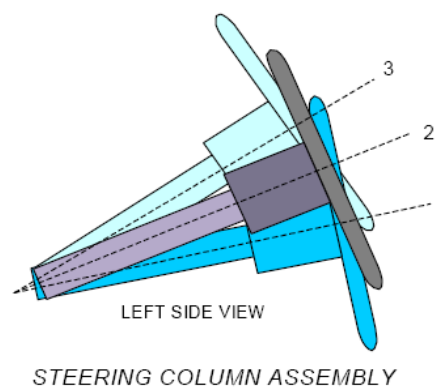
**FUEL PUMP**

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.



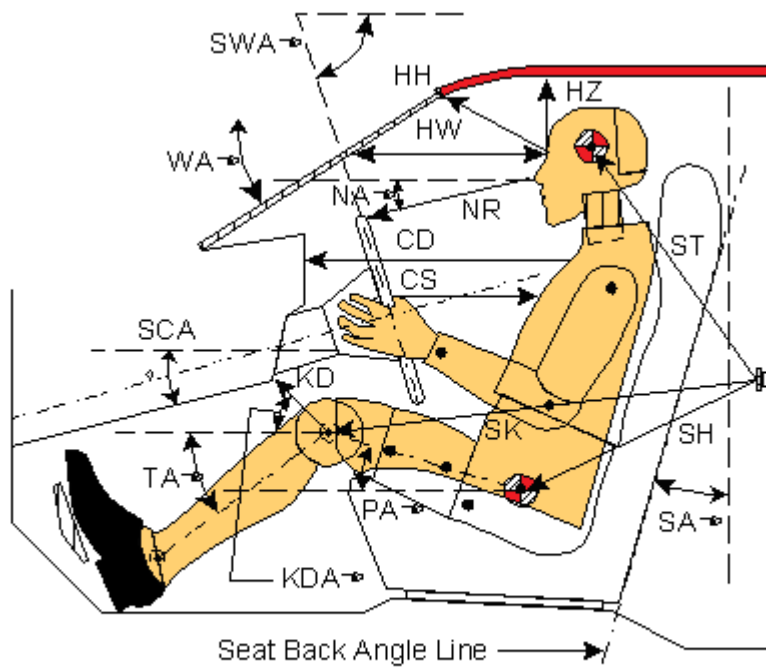
**STEERING COLUMN POSITIONS**

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	19.9	
Geometric center position No. 2	22.15	
Uppermost position No. 3	24.4	
Telescoping Steering Wheel Travel		57
Test Position	22.15	28.5

**DATA SHEET NO. 3**  
**DUMMY LONGITUDINAL CLEARANCE DIMENSIONS**

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013



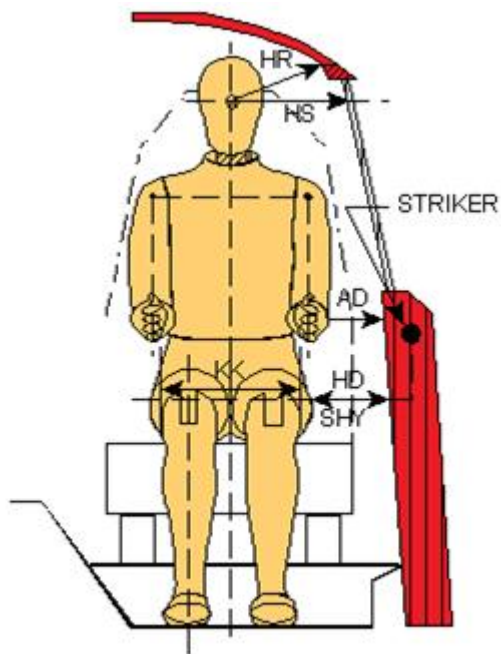
**Left Side View**

Code	Measurement Description	Driver (SN: 061)		Passenger (SN: 288)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		-29.1		
SWA°	Steering Wheel Angle		22.2		
SCA°	Steering Column Angle		67.8		
SA°	Seat Back Angle (on headrest post)		13.7		7.1
HZ	Head to Roof (Z)	212	90	230	90
HH	Head to Header	438	14.5	360	38
HW	Head to Windshield	665	0	655	0
NR	Nose to Rim	431	-10.5	473	-28
CD	Chest to Dash	571		418	
CS	Chest to Steering Hub	334	0		
RA	Rim to Abdomen	230	0		
KDL	Left Knee to Dash	208	27.5	134	32
KDR	Right Knee to Dash	199	23.0	136	32
PA°	Pelvic Angle		23.9		21.4
TA°	Tibia Angle		-36.0		-50.4
SK	Striker to Knee	560	-1.2	653	-2.8
ST	Striker to Head	590	83.7	542	65.2
SH	Striker to H-Point	205	-29.0	326	14.2

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

Test Vehicle: 2014 Dodge Durango four door SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
Test Date: 12/2/2013



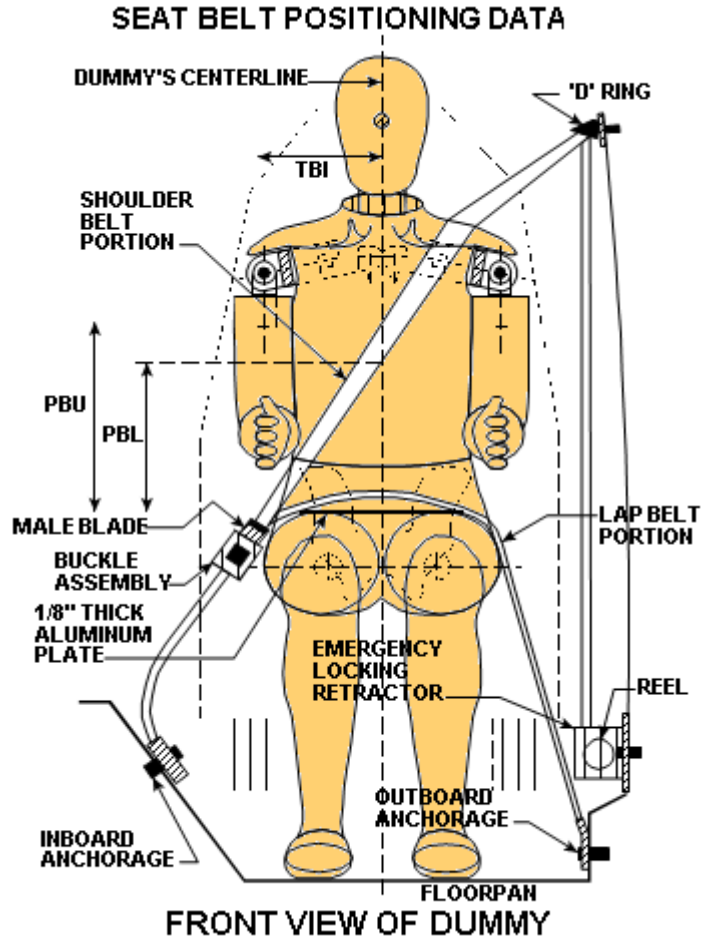
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	137	97
HD	H-Point to Door	152	196
HR	Head to Side Header	211	270
HS	Head to Side Window	360	380
KK	Knee to Knee	295	165
SHY	Striker to H-Point (Y Direction)	240	275
AA	Ankle to Ankle	280	178

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013



**SEAT BELT POSITIONING MEASUREMENTS**

Measurement Description	Units	Driver	Passenger
<b>PBU</b> — Top surface of reference to belt upper edge	mm	390	330
<b>PBL</b> — Top surface of reference to belt lower edge	mm	325	250

**BELT LENGTH DATA**

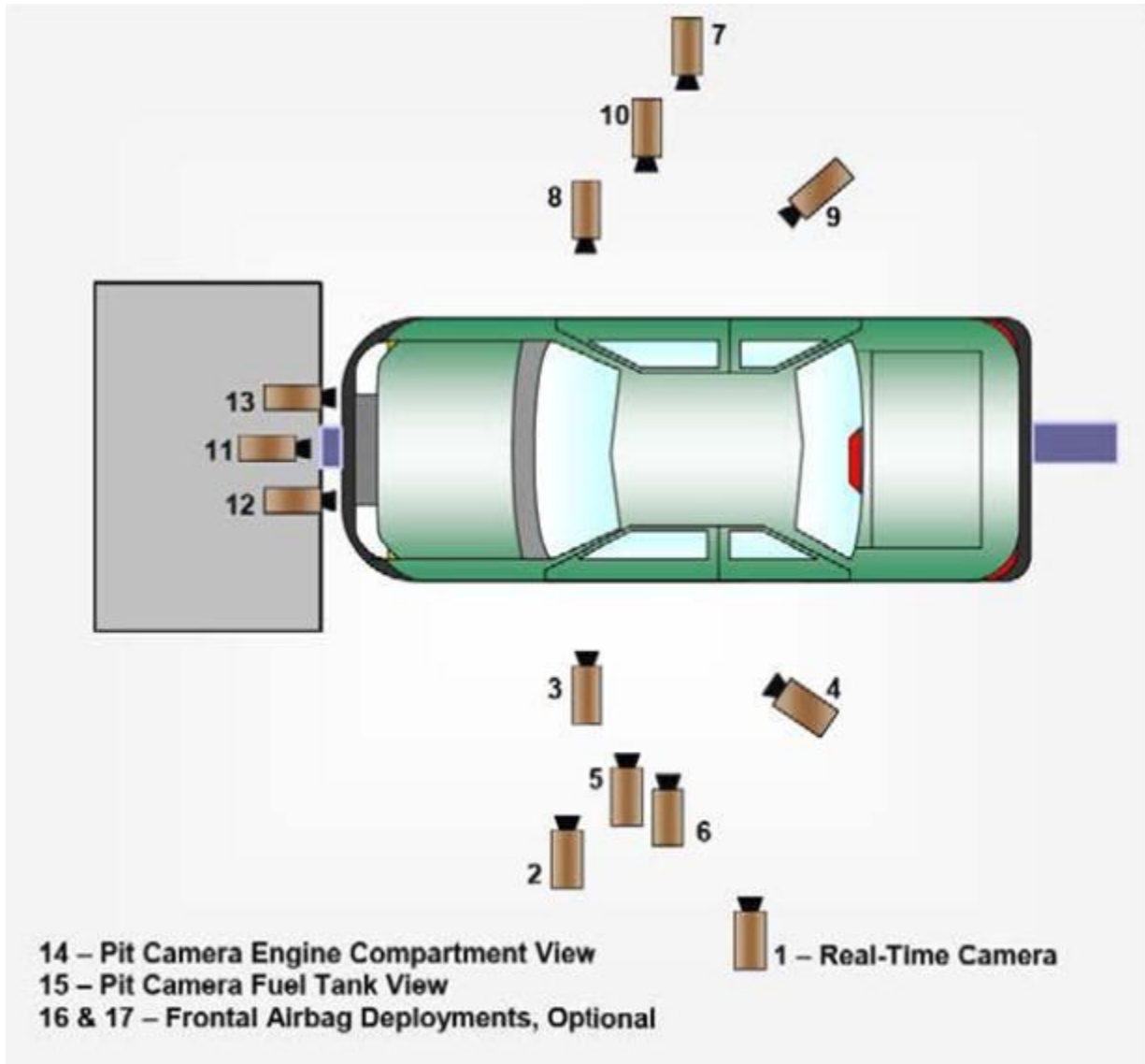
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	850	935
Lap Belt Length as measured on ATD	mm	605	565
Remainder of belt on reel	mm	945	900
Total belt length for continuous webbing systems	mm	2400	2400

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

Test Vehicle: 2014 Dodge Durango four door SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
Test Date: 12/2/2013

**CAMERA POSITIONS FOR FRONTAL IMPACTS**



Top View

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**CAMERA LOCATIONS**

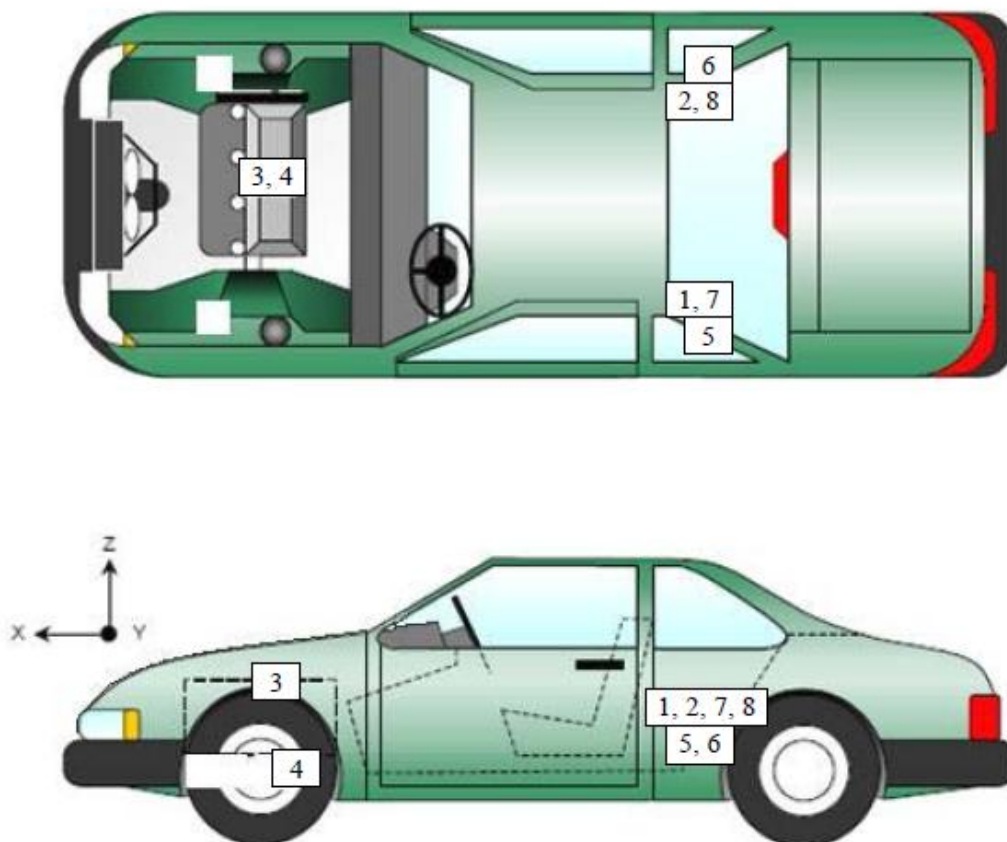
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-	-	-		-
2	Driver Close-Up	1660	-8262	1360	50	1000
3	Left Front Half	1069	-9430	1499	50	1000
4	Left Angle	3066	-3252	2404	24	1000
5	Steering Column - Top	2066	-8202	1837	24-70	1000
6	Steering Column - Bottom	2066	-8202	1269	24-70	1000
7	Right Overall	1821	9648	1126	28	1000
8	Passenger Close-Up	1504	9753	1142	50	1000
9	Right Front Half	831	10089	1095	50	1000
10	Right Angle	3229	3125	2170	28	1000
11	Windshield	-533	0	3476	24	1000
12	Driver Windshield	-191	-638	2026	25	1000
13	Passenger Windshield	-191	621	2026	25	1000
14	Pit Front	976	0	2052	12.5	1000
15	Pit Rear	2310	0	2052	12.5	1000
16	Onboard Driver Airbag (Optional)					
17	Onboard Passenger Airbag (Optional)					

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

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

Test Vehicle: 2014 Dodge Durango four door SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
Test Date: 12/2/2013



**VEHICLE ACCELEROMETER PRE-TEST LOCATIONS**

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2145	-563	3
2	Right Rear Accelerometer – X Direction	2153	562	1
3	Engine Top X	4362	44	-405
4	Engine Bottom X	4252	10	326
5	Left Rear Accelerometer – Z Direction	2145	-563	3
6	Right Rear Accelerometer – Z Direction	2153	562	1
7	Left Rear Accelerometer – X Direction Redundant	2145	-563	3
8	Right Rear Accelerometer – X Direction Redundant	2153	562	1

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

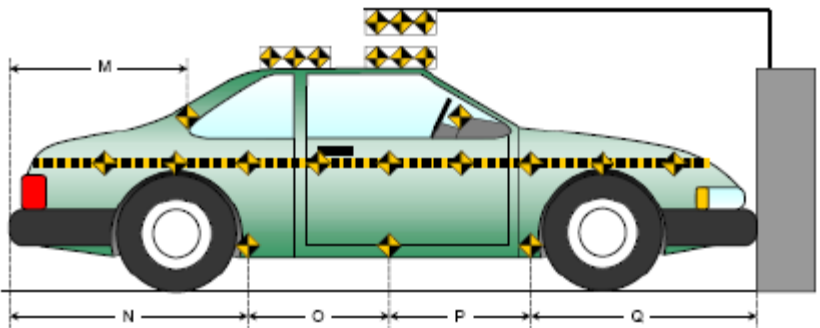
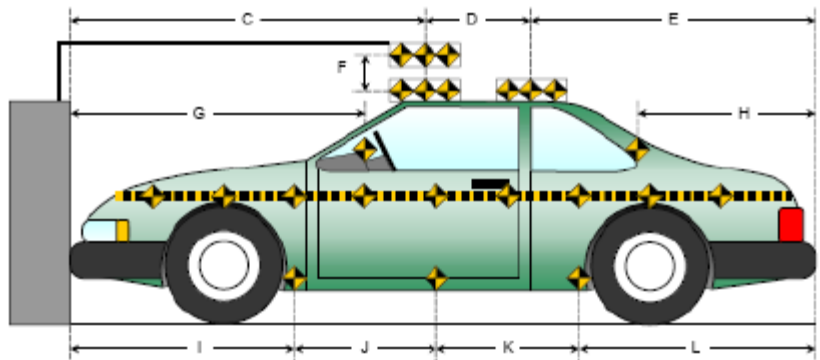
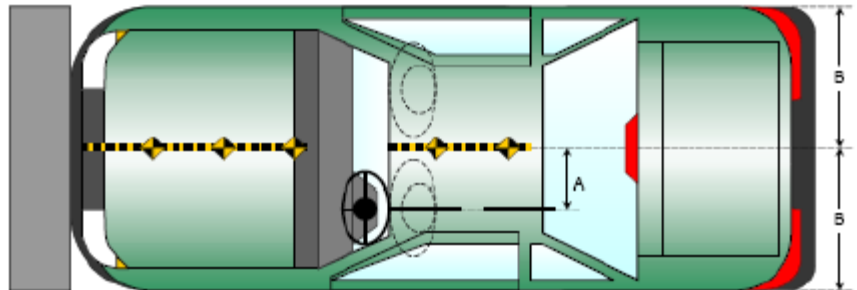
**DATA SHEET NO. 8**  
**PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

Item	Value
A	394
B	957
C	2282
D	1216
E	1587
F	118
G	1895
H	1276
I	1412
J	989
K	988
L	1695
M	1273
N	1696
O	992
P	986
Q	1410

All units in millimeters



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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

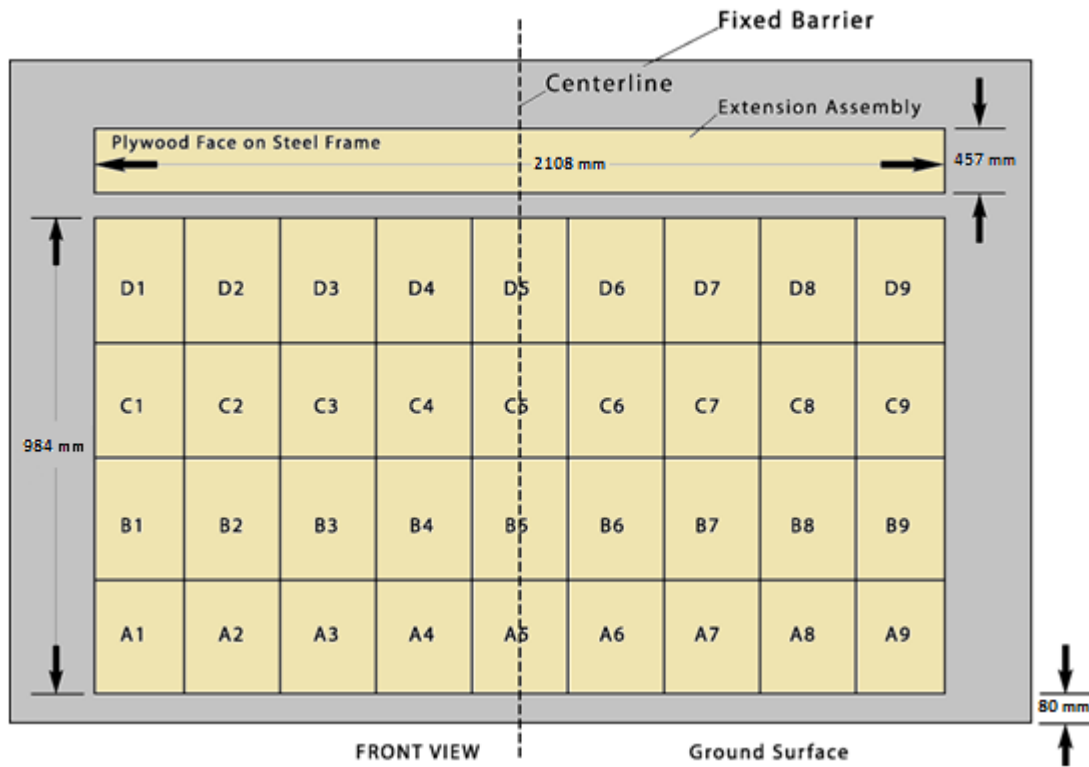


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension

**DATA SHEET NO. 10**  
**TEST VEHICLE SUMMARY OF RESULTS**

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**INSTRUMENTATION**

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

**CAMERA COVERAGE**

Type of Camera	Number Used in this Test
High-Speed Vehicle Onboard	0
High-Speed Offboard	14
Real-Time Panning	1
<b>Total</b>	<b>15</b>

**DATA SHEET NO. 11  
POST-TEST OBSERVATIONS**

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**TEST DUMMY INFORMATION AND CONTACT LOCATIONS**

Description	Driver	Passenger
Dummy Type / Serial No.	P572E 50 <sup>th</sup> Male / 061	P5720 5 <sup>th</sup> Female / 288
Head Contact	Front Airbag & Headrest	Front Airbag & Headrest
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Airbag	Glove Box
Right Knee Contact	Knee Airbag	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	None
Window Damage	None
Other Notable Effects	None

**VEHICLE REBOUND FROM BARRIER**

Measured Parameter	Units	Value
Left Side	mm	368
Center	mm	400
Right Side	mm	427
Average	mm	398

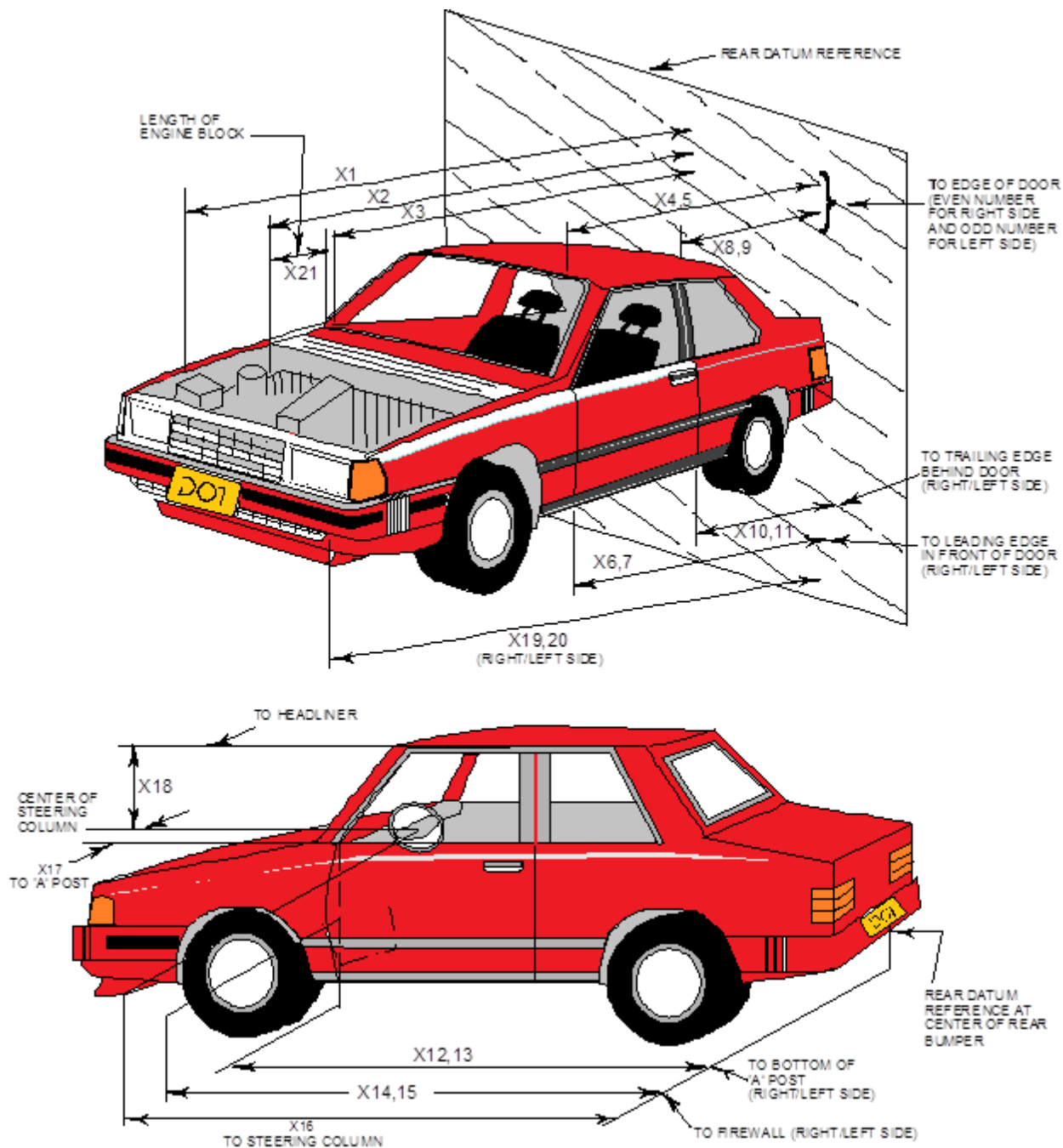
**SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION**

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

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013



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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	5085	4580	-505
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4414	4372	-43
3	RSOV to Firewall	3994	3954	-41
4	RSOV to Upper Leading Edge of Right Door	3585	3572	-12
5	RSOV to Upper Leading Edge of Left Door	3585	3564	-21
6	RSOV to Lower Leading Edge of Right Door	3541	3540	-1
7	RSOV to Lower Leading Edge of Left Door	3539	3539	0
8	RSOV to Upper Trailing Edge of Right Door	2462	2461	-2
9	RSOV to Upper Trailing Edge of Left Door	2462	2461	-1
10	RSOV to Lower Trailing Edge of Right Door	2475	2474	-1
11	RSOV to Lower Trailing Edge of Left Door	2475	2470	-5
12	RSOV to Bottom of "A" Post of Right Side	3575	3575	-1
13	RSOV to Bottom of "A" Post of Left Side	3578	3578	-1
14	RSOV to Firewall, Right Side	4181	4165	-16
15	RSOV to Firewall, Left Side	4180	4167	-13
16	RSOV to Steering Column	3057	3134	77
17	Center of Steering Column to "A" Post	291	298	7
18	Center of Steering Column to Headliner	403	436	32
19	RSOV to Right Side of Front Bumper	5025	4555	-470
20	RSOV to Left Side of Front Bumper	5028	4603	-425
21	Length of Engine Block	388	388	0
RD	RSOV to Right Side of Dash Panel	3273	3272	-1
CD	RSOV to Center of Dash Panel	3267	3266	0
LD	RSOV to Left Side of Dash Panel	3273	3273	-1

All Dimensions in mm

**DATA SHEET NO. 13**  
**ACCIDENT INVESTIGATION DIVISION DATA**

Test Vehicle: 2014 Dodge Durango four door SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
Test Date: 12/2/2013

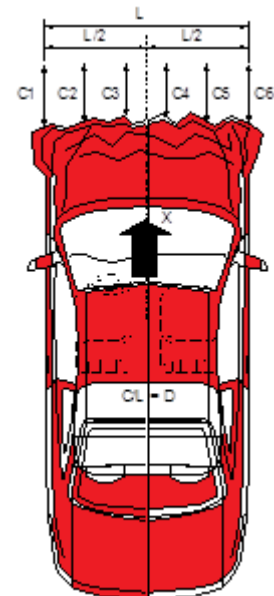
**VEHICLE INFORMATION**

VIN: 1C4RDJAG9EC314068  
Vehicle Size Category: Passenger

Wheelbase (mm): 3,040  
Test Weight (kg): 2,450

**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): 56.43  
Velocity Change (km/h): 56.43  
Time of Separation (ms): 145.6



**CRUSH PROFILE**

Collision Deformation Classification: 12FDEW2  
Midpoint of Damage: Vehicle Centerline  
Damage Region Length (mm): 1564  
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4889	4547	342
C2	Crush Zone 2 at Left Side	mm	5029	4614	415
C3	Crush Zone 3 at Left Side	mm	5076	4631	445
C4	Crush Zone 4 at Right Side	mm	5077	4615	462
C5	Crush Zone 5 at Right Side	mm	5028	4569	459
C6	Crush Zone 6 at Right Side	mm	4887	4540	347
L	C1 to C6	mm	1564	1602	-39

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

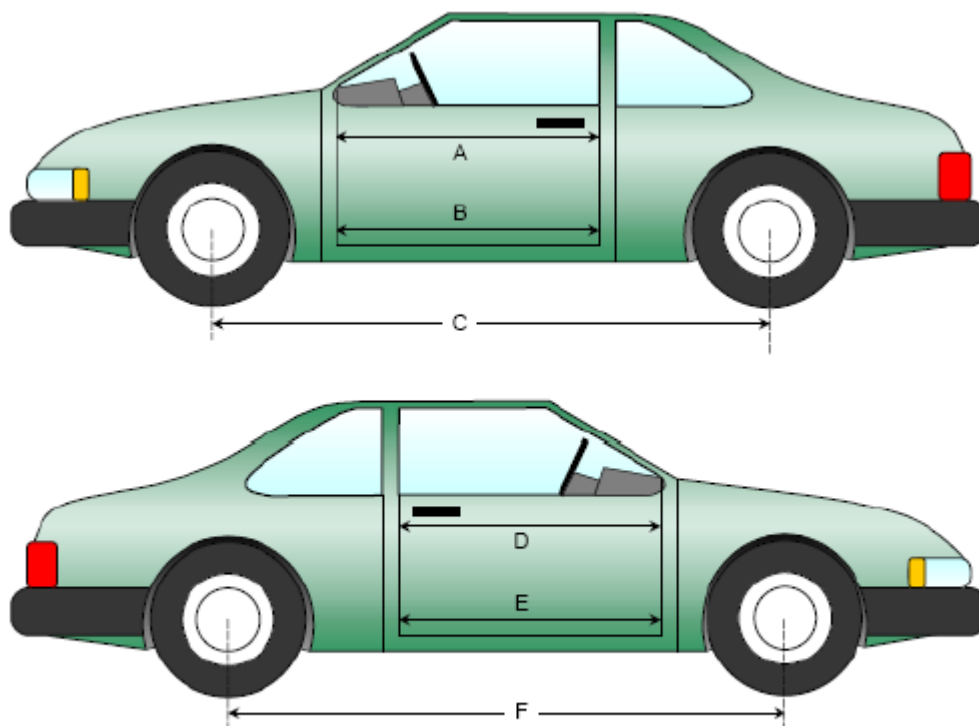
NHTSA No.: M20140301  
 Test Date: 12/2/2013

**DOOR OPENING WIDTH**

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	958	959	0
B	Left Side Lower	mm	861	861	0
D	Right Side Upper	mm	962	963	1
E	Right Side Lower	mm	878	877	-1

**WHEELBASE MEASUREMENTS**

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3040	2899	-141
F	Right Side Wheelbase	mm	3040	2907	-133



**Left & Right Side Views**

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

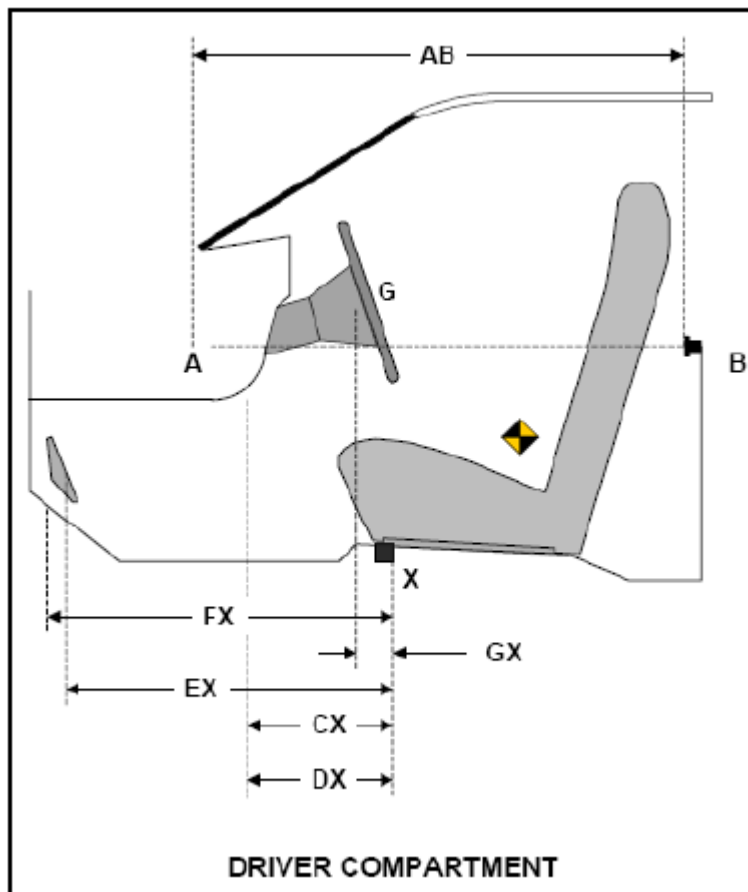
Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

**DRIVER COMPARTMENT INTRUSION**

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	765	765	0
CX	Left Knee Bolster to X	mm	288	291	3
DX	Right Knee Bolster to X	mm	275	273	-1
EX	Brake Pedal to X	mm	501	491	-10
FX	Foot Rest to X	mm	616	621	5
GX	Center of Steering Column Wheel Hub to X	mm	1	80	79

*X = Front of Seat Track (Stationary)*



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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013

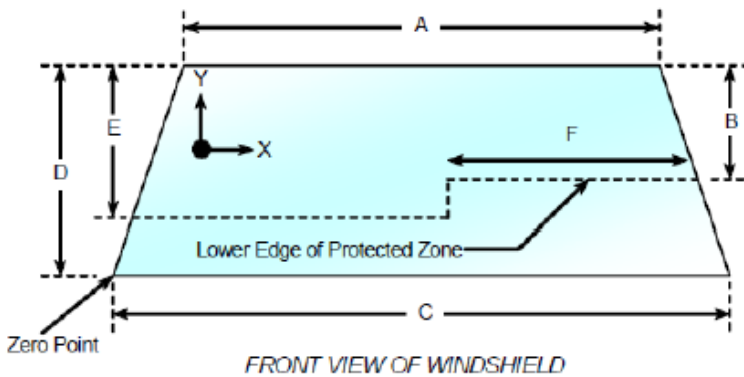
**Windshield Mounting Details:** A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

*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	2263	2263	100%
Right Side	2263	2263	100%
Total	4526	4526	100%



Item	Units	Value
A	mm	1335
B	mm	475
C	mm	1530
D	mm	830
E	mm	580
F	mm	335

**AREAS OF PROTECTED ZONE FAILURES**

- A. Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.
- No Penetration

X	Y

- B. Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.
- No Penetration

X	Y

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

Test Vehicle: 2014 Dodge Durango four door SUV  
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
Test Date: 12/2/2013

**FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA**

Temperature at Time of Impact: 21 ° C

Test Time: 2:40 PM

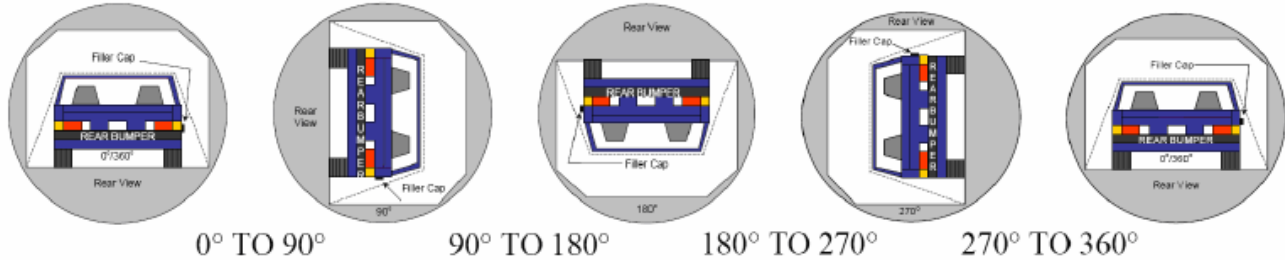
**STODDARD SOLVENT SPILLAGE MEASUREMENTS**

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

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

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013



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°	66	300	366
90° to 180°	65	300	365
180° to 270°	64	300	364
270° to 360°	67	300	367

**FMVSS 301 SPILLAGE TABLE**

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

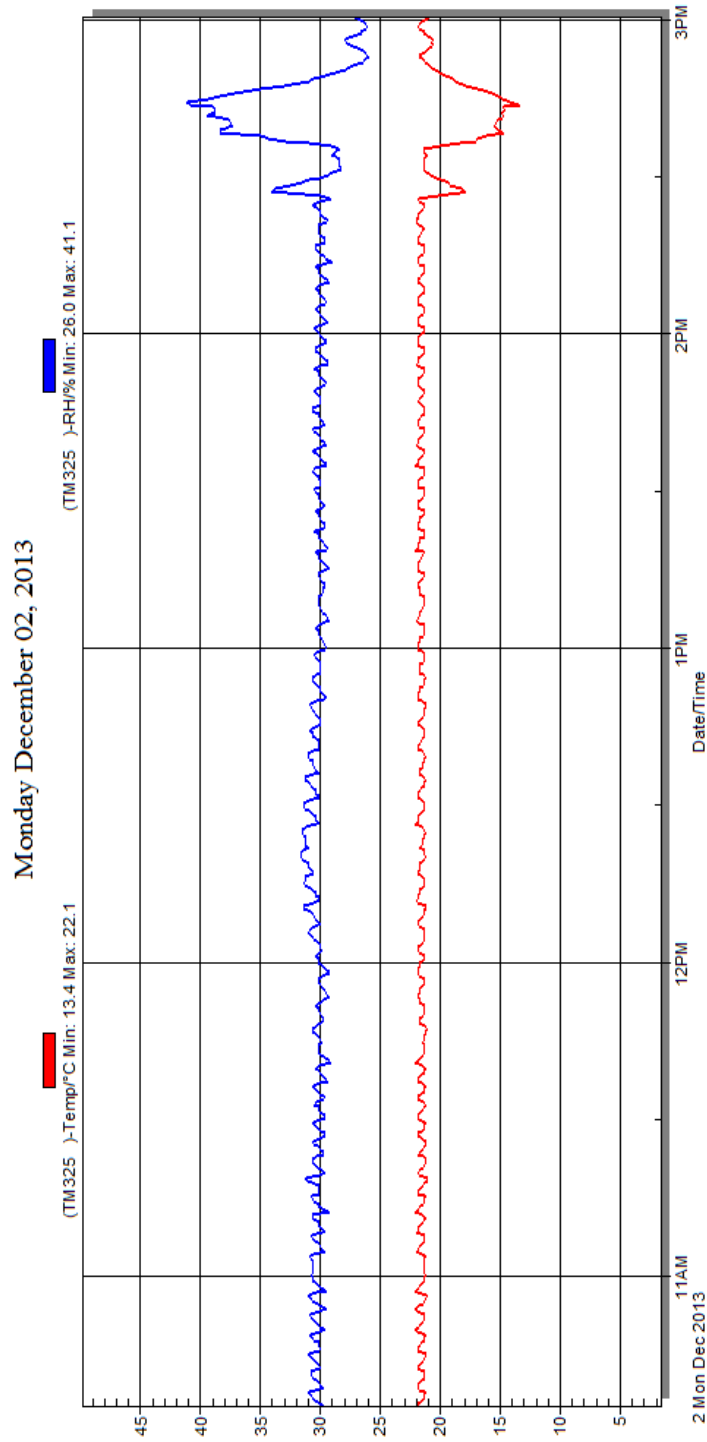
**SOLVENT SPILLAGE LOCATION TABLE**

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

**DATA SHEET NO. 17  
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART**

Test Vehicle: 2014 Dodge Durango four door SUV  
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140301  
 Test Date: 12/2/2013



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

**APPENDIX A**  
**PHOTOGRAPHS**

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

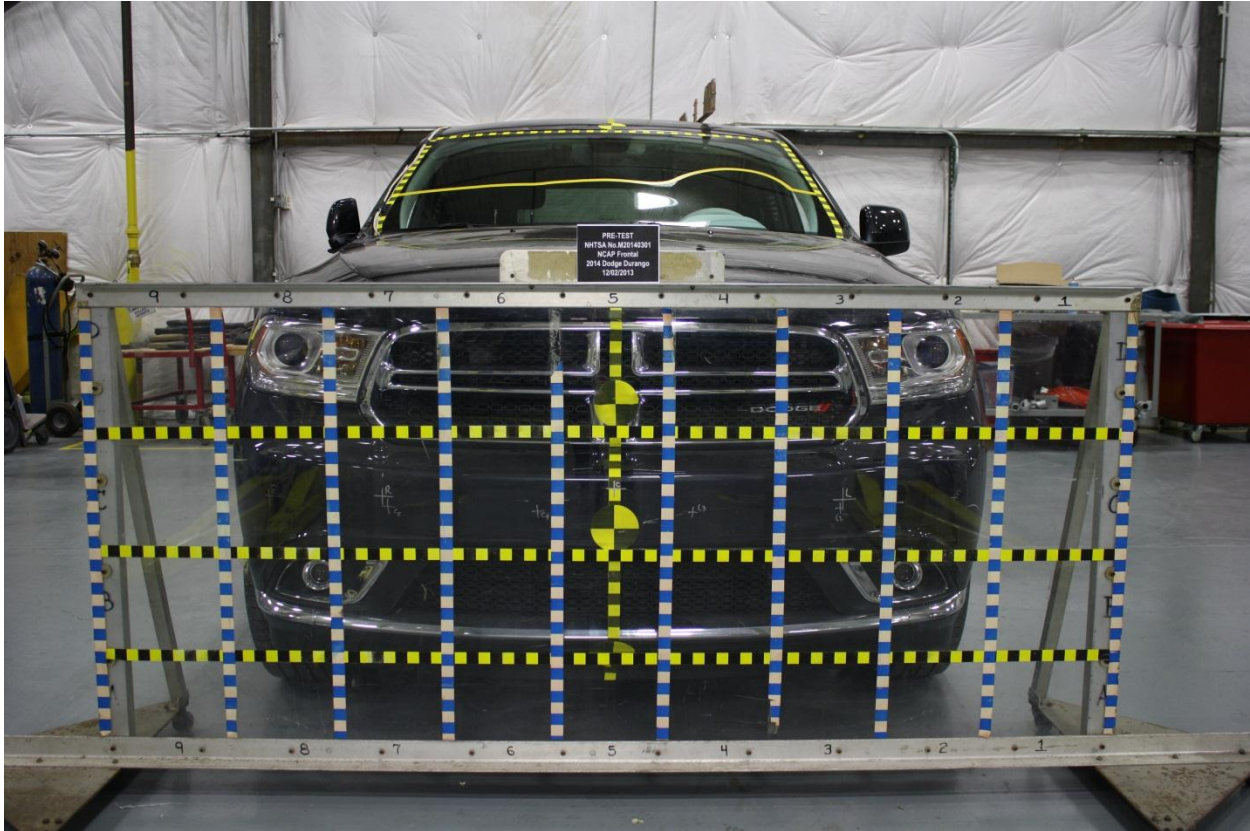


Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall



Figure A-3: Manufacturer's Label



Figure A-4: Tire Placard



**Figure A-5: 2014 Dodge Durango 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

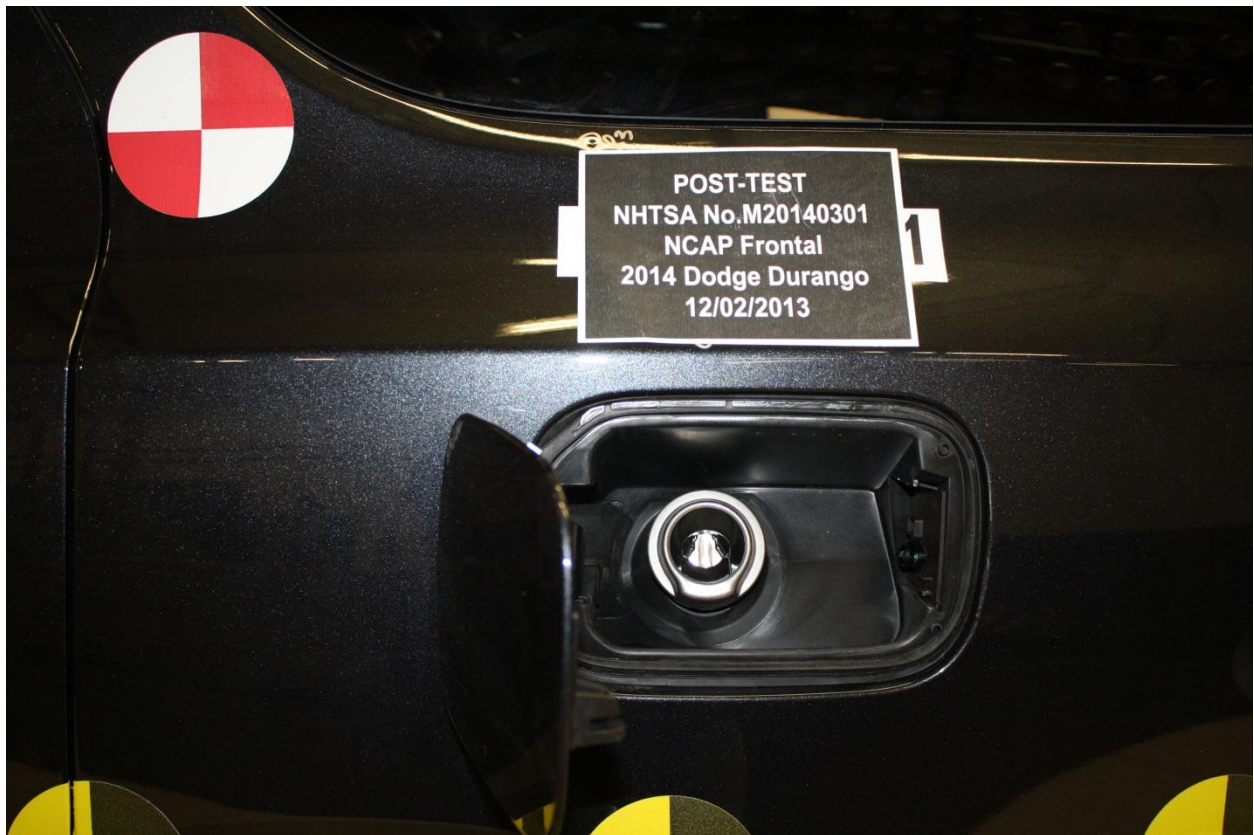


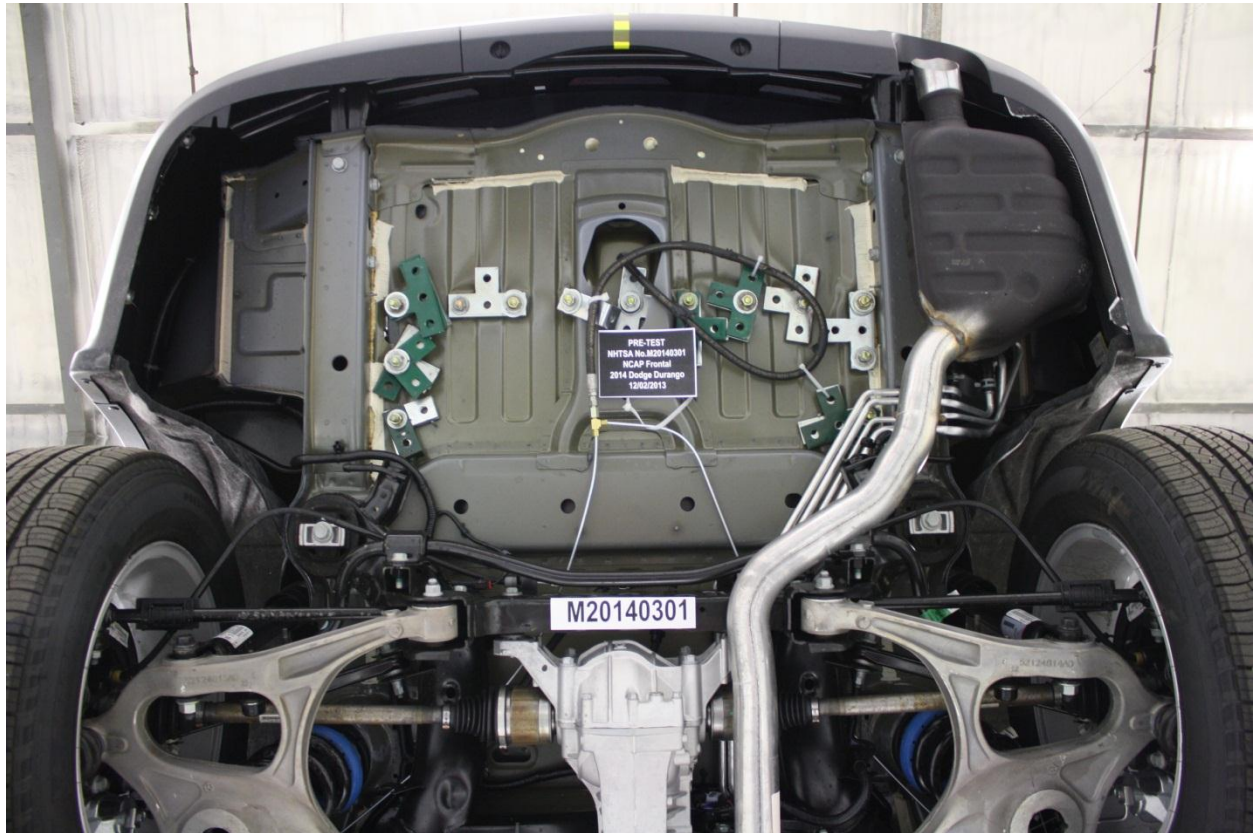
Figure A-22: Post-Test Fuel Filler Cap View



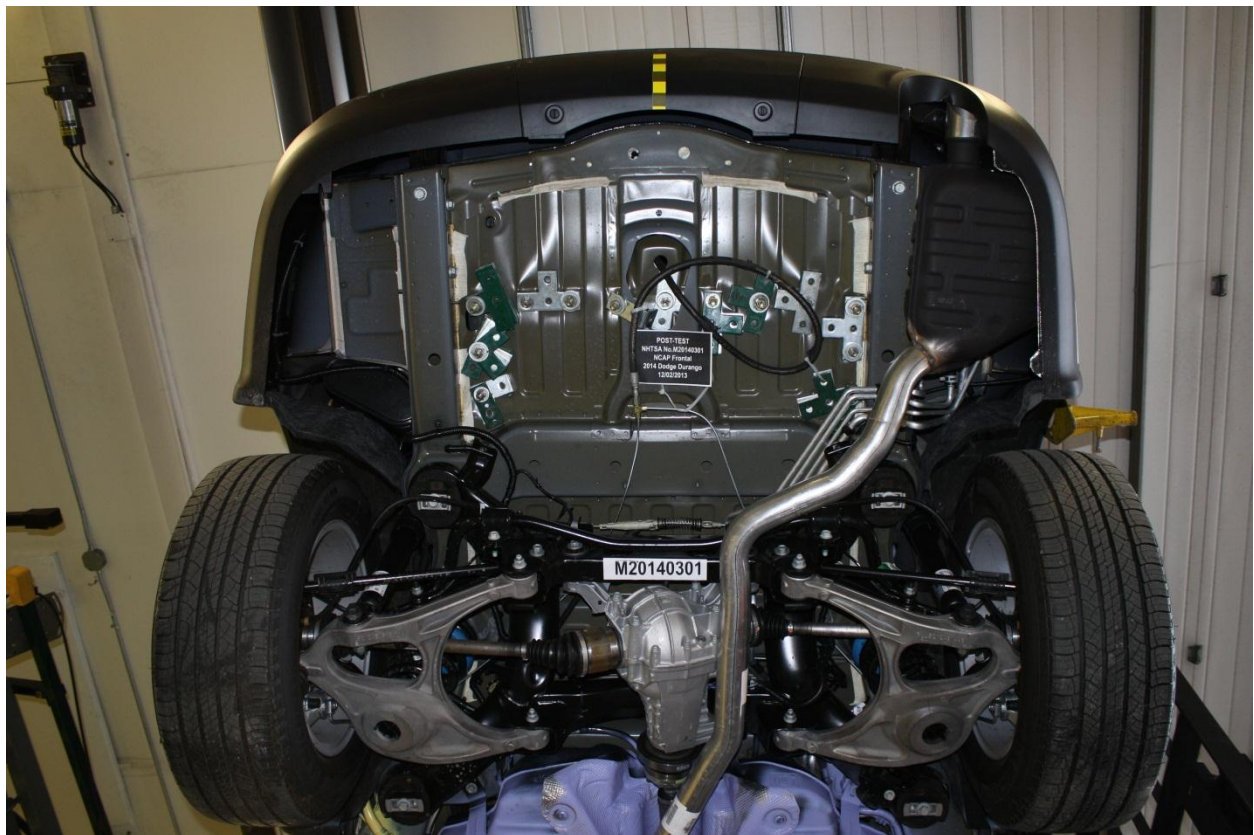
**Figure A-23: Pre-Test Front Underbody View**



**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**



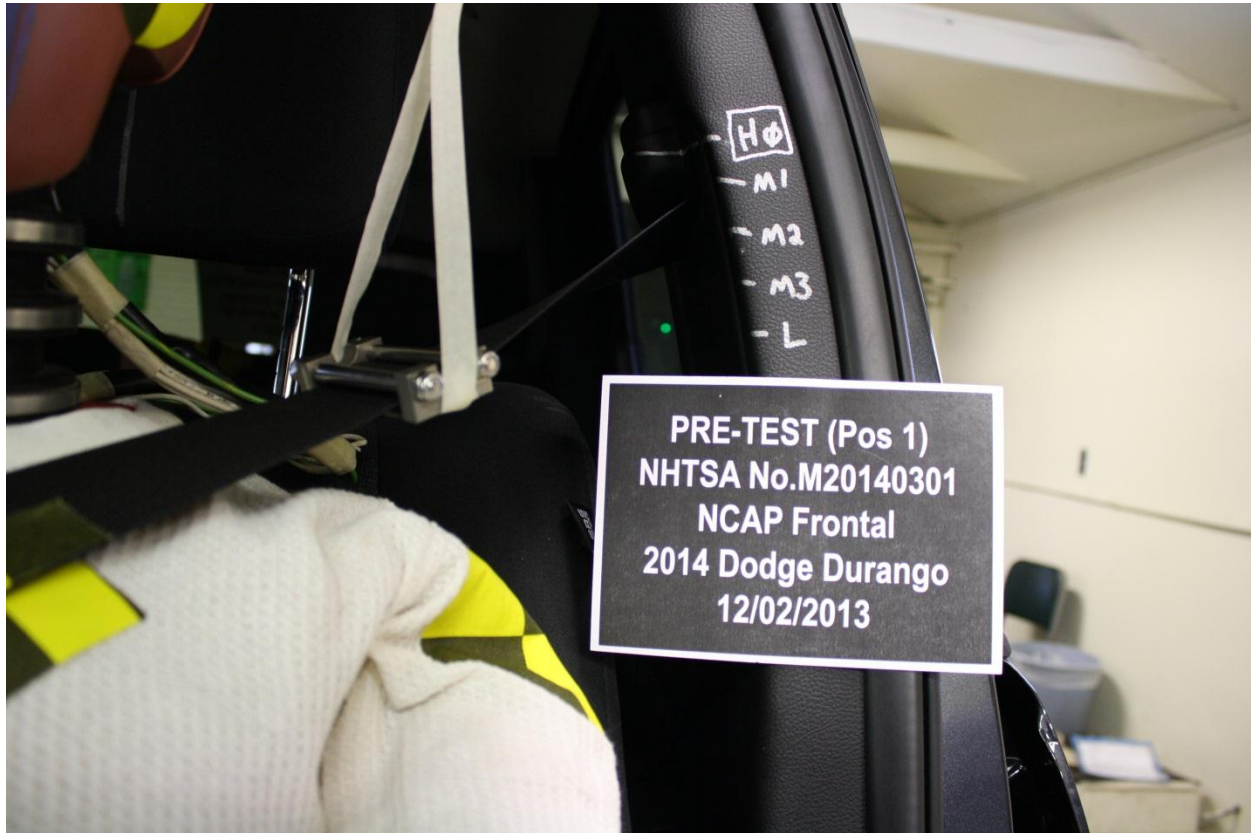
**Figure A-34: Post-Test Driver Dummy and Vehicle Interior View**



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**



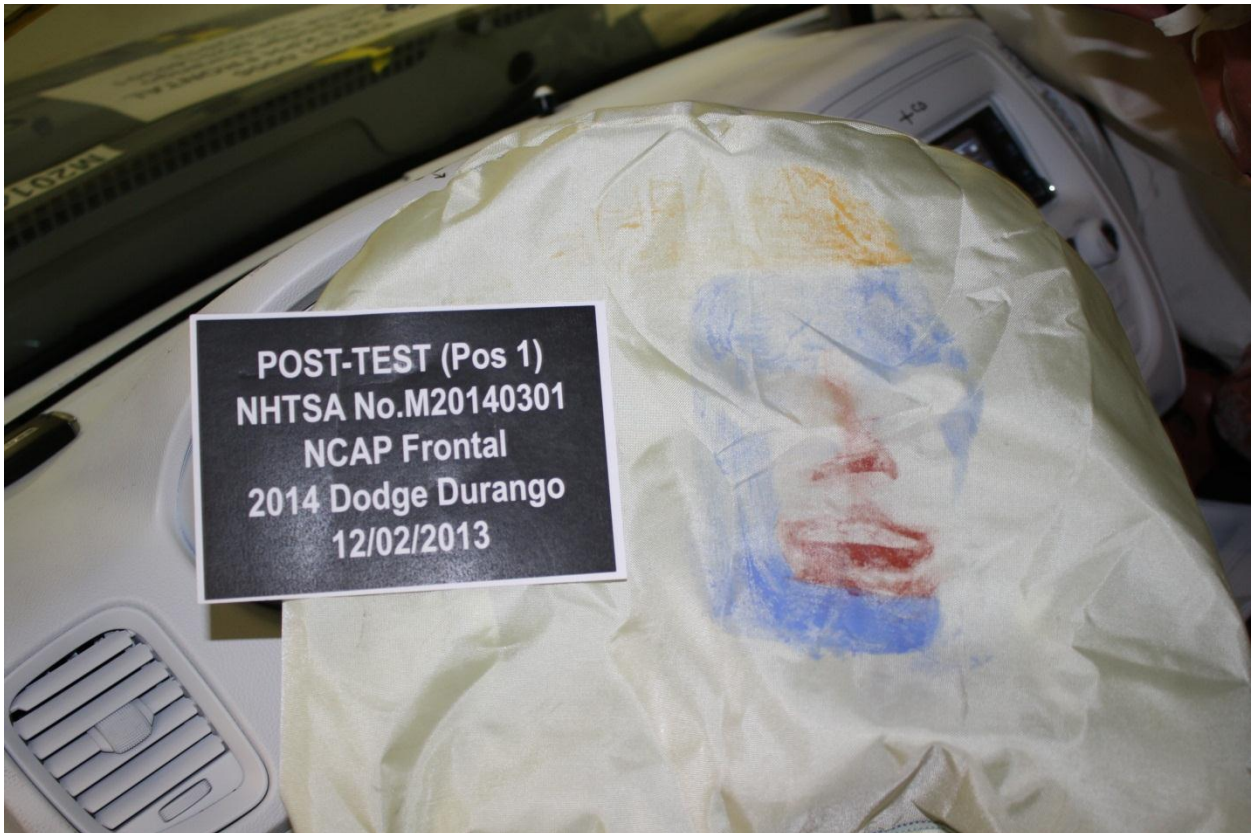
**Figure A-43: Pre-Test Driver's Side Floorpan**



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



**Figure A-45: Post-Test Driver Dummy Face**



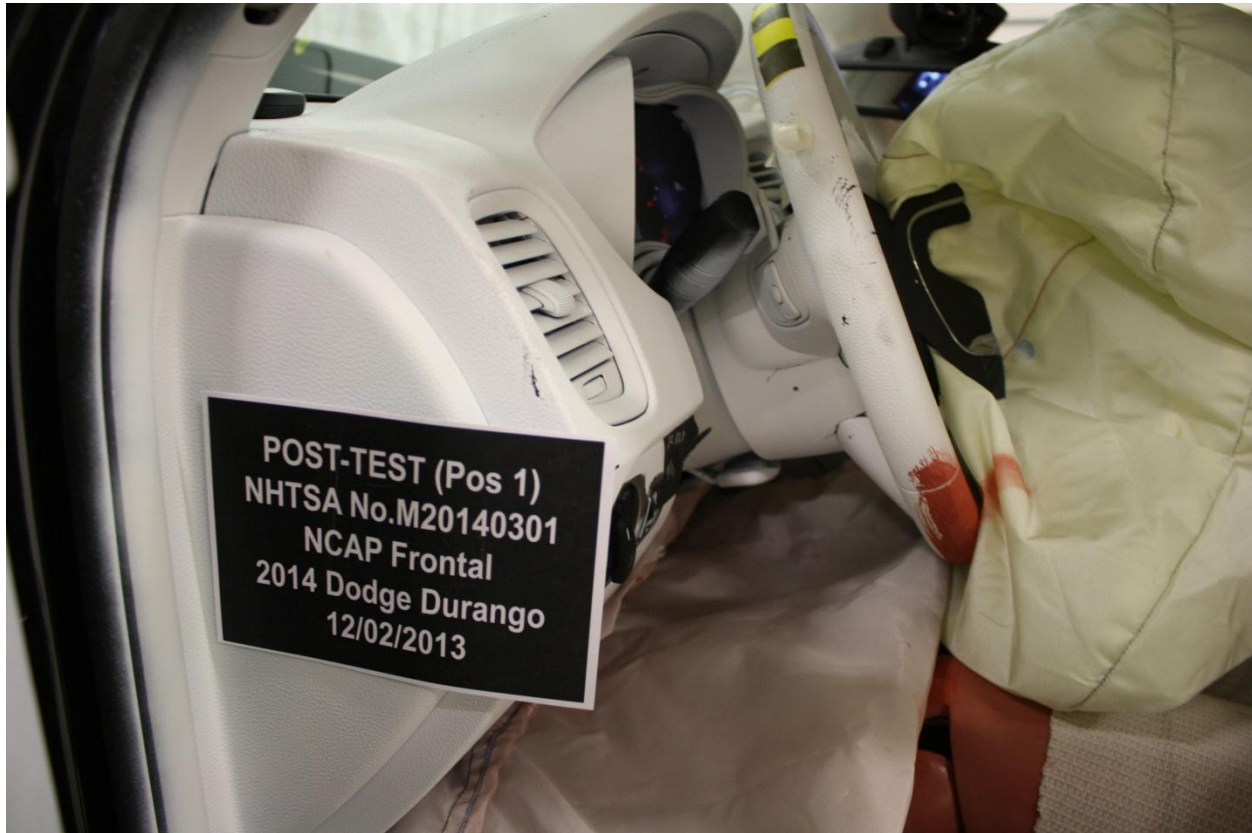
**Figure A-46: Post-Test Driver Dummy Contact With Airbag**



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



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



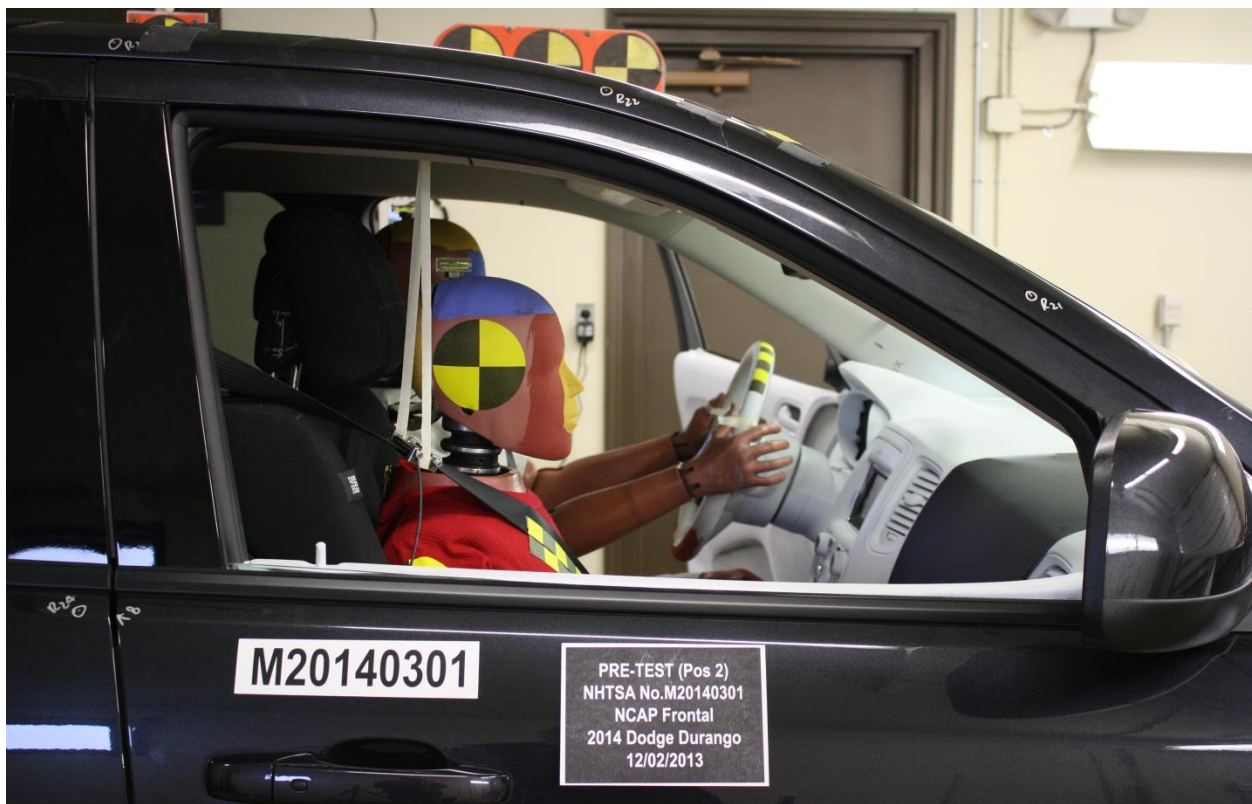
**Figure A-49: Post-Test View of the Steering Wheel**



**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**

**Photo Not Available**

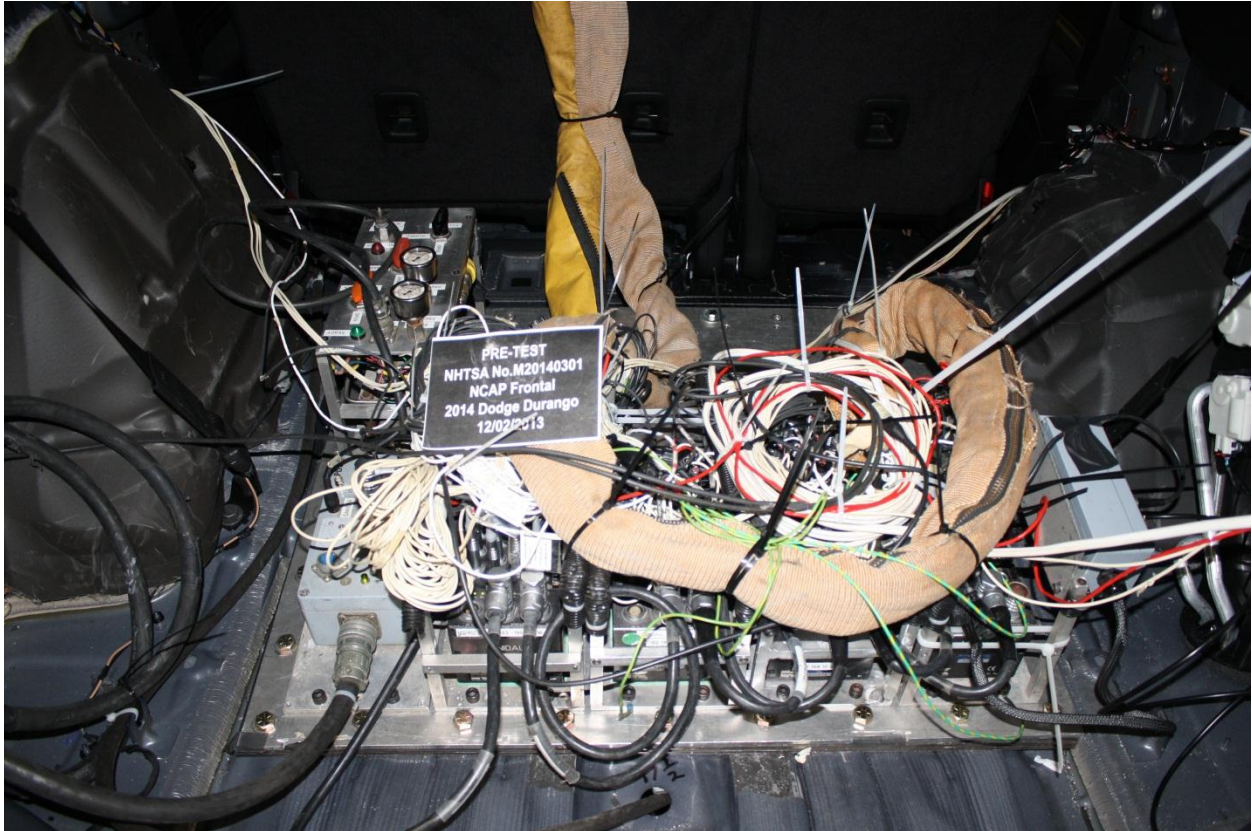
**Figure A-66: Post-Test Passenger Dummy Face**



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



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



**Figure A-69: Photograph of Ballast Installed in Vehicle**

# Photo Not Applicable

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



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



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



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



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



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



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



Figure A-77: 2014 Dodge Durango Frontal Impact Event

**2014 DODGE DURANGO SXT AWD**

THIS VEHICLE IS MANUFACTURED TO MEET SPECIFIC UNITED STATES REQUIREMENTS. THIS VEHICLE IS NOT MANUFACTURED FOR SALE OR REGISTRATION OUTSIDE OF THE UNITED STATES.

**MANUFACTURER'S SUGGESTED RETAIL PRICE OF THIS MODEL INCLUDING DEALER PREPARATION**

Base Price: **\$32,195**

**DODGE DURANGO SXT AWD**  
 Exterior Color: Maximum Steel Metallic Clear Coat Exterior Paint  
 Interior Color: Black Interior Color  
 Interior: Cloth Low-Back Bucket Seats  
 Engine: 3.6-Liter V6 24-Valve VVT Engine  
 Transmission: 8-Speed 845RE Automatic Transmission

**STANDARD EQUIPMENT** (UNLESS REPLACED BY OPTIONAL EQUIPMENT)  
**FUNCTIONAL SAFETY FEATURES**  
 Rotary Shifter  
 Steering Wheel Mounted Shift Control  
 Remote Proximity Keyless Entry  
 Keyless Go™  
 Single Speed Transfer Case  
 Advanced Multistage Front Airbags  
 Supplemental Side-Curtain Airbags in All Rows  
 Supplemental Front Seat-Mounted Side Airbags  
 Driver Inflatable Knee-Bolster Airbag  
 Active Head Restraints  
 Child Seat Anchor System-LATCH Ready  
 Anti-Lock 4-Wheel Disc Brakes  
 Electronic Stability Control  
 Electro-Hydraulic Power Steering  
 Hill Start Assist  
 Trailer Sway Damping  
 Sentry Key® Theft Deterrent System

**INTERIOR FEATURES**  
 Uconnect® 5.0 AM/FM/ST  
 5.0-Inch Touch Screen Display  
 Integrated Voice Command with Bluetooth®  
 Bluetooth® Streaming Audio  
 Media Hub (SD, USB, Aux)  
 Air Conditioning with 3-Zone Automatic Temp Control  
 Power Front Windows w/ 1-Touch Up and Down Feature  
 Front-Passenger Fold-Flat-Forward Seat  
 Second-Row 60 / 40 Fold and Tumble Seat  
 Third-Row Seat  
 Third-Row Remote Headrest Fold Down  
 8 Speakers  
 Steering Wheel Mounted Audio Controls

Assembly Point/Port of Entry: DETROIT, MICHIGAN, U.S.A.  
 VIN: 1C4RDJAG8C314098      4-1009 9348

Electronic Vehicle Information Center  
 Tire Pressure Monitoring Display  
 Tilt / Telescope Steering Column  
 Door Trim Panel with Ambient Lighting  
 Illuminated Cup Holders  
 Front and Rear Interior LED Lamps  
 Interior Removable / Rechargeable Lamp  
 12-Volt Auxiliary Power Outlet  
 Full-Length Floor Console

**EXTERIOR FEATURES**  
 18-inch x 8.0-inch Painted Aluminum Wheels  
 P265/60R18 BSW On/Off-Road Tires  
 Power Heated Exterior Mirrors w/ Manual Fold-Away  
 Automatic Headlamps  
 Projector Fog Lamps  
 LED Tail Lamps with Red Accents  
 Capless Fuel Fill

**OPTIONAL EQUIPMENT**  
 Customer Preferred Package 23A  
 Flex Fuel Vehicle

**DESTINATION CHARGE** \$995

**TOTAL PRICE: \* \$33,190**

**WARRANTY COVERAGE**  
 5-year or 100,000-mile Powertrain Limited Warranty  
 3-year or 36,000-mile Basic Limited Warranty  
 5-year or 100,000-mile Roadside Assistance, certain restrictions apply.  
 Ask Dealer for a copy of the limited warranties or see your owner's manual for details.

**5 YEAR / 100,000 MILE POWERTRAIN WARRANTY**

For more information visit: [www.dodge.com](http://www.dodge.com) or call 1-800-4ADODGE Chrysler Group LLC

**EPA DOT Fuel Economy and Environment** Flexible-Fuel Vehicle Gasoline-Ethanol (E85)

**Fuel Economy**  
**19** MPG combined city/hwy  
 Driving Range: 463 miles  
 Estimated E85: 370 miles

Standard SUV 4WD range from 12 to 28 MPG. The best vehicle rates 121 MPG. Values are based on gasoline and do not reflect performance and ratings based on E85.

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

**Annual fuel cost \$2,750**

**Fuel Economy & Greenhouse Gas Rating** (tailpipe only) Smog Rating (tailpipe only)  
 4 (Scale 1-10) 6 (Scale 1-10)

This vehicle emits 458 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions. Learn more at [fuelconomy.gov](http://fuelconomy.gov)

**Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 23 MPG and cost \$11,500 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at \$3.50 per gallon. This is a dual fueled automobile. MPG is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.**

[fuelconomy.gov](http://fuelconomy.gov)  
 Calculate personalized estimates and compare vehicles

**GOVERNMENT 5-STAR SAFETY RATINGS**

**Overall Vehicle Score** Not Rated  
 Based on the combined ratings of frontal, side, and rollover. Should ONLY be compared to other vehicles of similar size and weight.

<b>Frontal Crash</b>	Driver Passenger	Not Rated
<b>Side Crash</b>	Front seat	★★★★★
	Rear seat	★★★★★
<b>Rollover</b>		★★★

Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.  
 Based on the risk of injury in a side impact.  
 Based on the risk of rollover in a single-vehicle crash.

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

The safety ratings above are based on Federal Government tests of particular vehicles equipped with certain features and options. The performance of this vehicle may differ.

**PARTS CONTENT INFORMATION**  
 FOR VEHICLES IN THIS CLASS: U.S./CANADIAN PARTS CONTENT: 68 %  
**MAJOR SOURCES OF FOREIGN PARTS CONTENT:**  
 MEXICO: 15 %  
 NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS.

**FOR THIS VEHICLE:**  
 FINAL ASSEMBLY POINT: DETROIT, MICHIGAN, U.S.A.  
 COUNTRY OF ORIGIN: ENGINE: MEXICO TRANSMISSION: UNITED STATES

Figure A-78: Monroney Label Photograph

**APPENDIX B**  
**DUMMY RESPONSE DATA TRACES**

## TABLE OF DATA PLOTS

### Driver & Passenger Dummy Instrumentation Plots

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

The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at [www.nhtsa.dot.gov](http://www.nhtsa.dot.gov)

#### **Additional Driver Dummy Instrumentation Data**

Driver Head X Acceleration Redundant  
Driver Head Y Acceleration Redundant  
Driver Head Z Acceleration Redundant  
Driver Upper Neck Force Y  
Driver Upper Neck Moment X  
Driver Upper Neck Moment Z  
Driver Chest X Acceleration Redundant  
Driver Chest Y Acceleration Redundant  
Driver Chest Z Acceleration Redundant  
Driver Pelvis X  
Driver Pelvis Y  
Driver Pelvis Z  
Driver Left Femur Redundant  
Driver Right Femur Redundant  
Driver Left Upper Tibia Moment X  
Driver Left Upper Tibia Moment Y  
Driver Left Upper Tibia Force Z  
Driver Left Lower Tibia Moment X  
Driver Left Lower Tibia Moment Y  
Driver Left Lower Tibia Force Z  
Driver Right Upper Tibia Moment X  
Driver Right Upper Tibia Moment Y  
Driver Right Upper Tibia Force Z  
Driver Right Lower Tibia Moment X  
Driver Right Lower Tibia Moment Y  
Driver Right Lower Tibia Force Z  
Driver Left Foot Fore Z  
Driver Left Foot Aft X  
Driver Left Foot Aft Z  
Driver Right Foot Fore Z  
Driver Right Foot Aft X  
Driver Right Foot Aft Z  
Driver Shoulder Belt Force  
Driver Lap Belt Force

#### **Additional Passenger Dummy Instrumentation Data**

Passenger Head X Acceleration Redundant  
Passenger Head Y Acceleration Redundant  
Passenger Head Z Acceleration Redundant  
Passenger Upper Neck Force X  
Passenger Upper Neck Force Z  
Passenger Upper Neck Moment Y  
Passenger Chest X Acceleration Redundant  
Passenger Chest Y Acceleration Redundant  
Passenger Chest Z Acceleration Redundant  
Passenger Pelvis X

## **Additional Passenger Dummy Instrumentation Data ... (continued)**

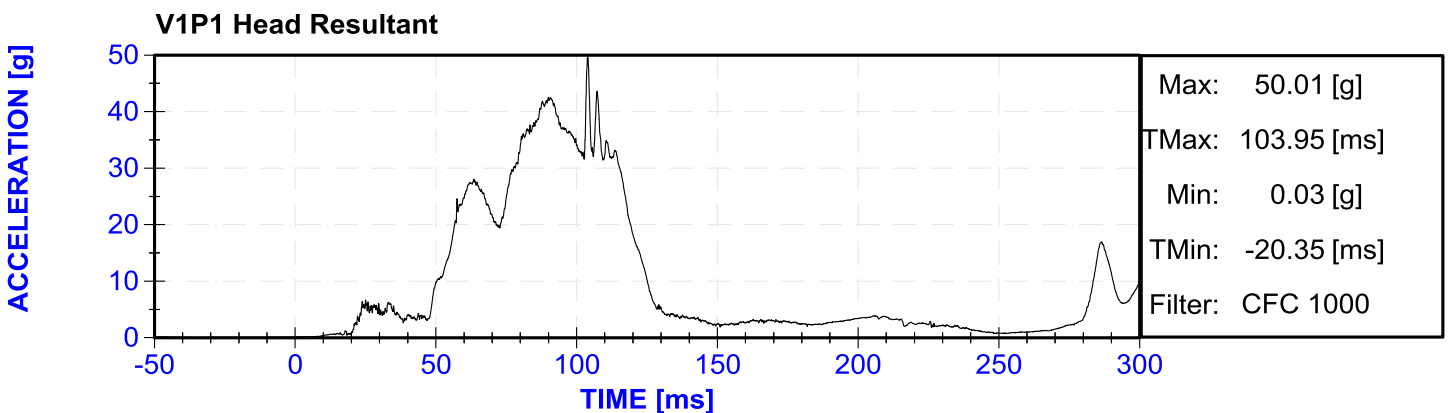
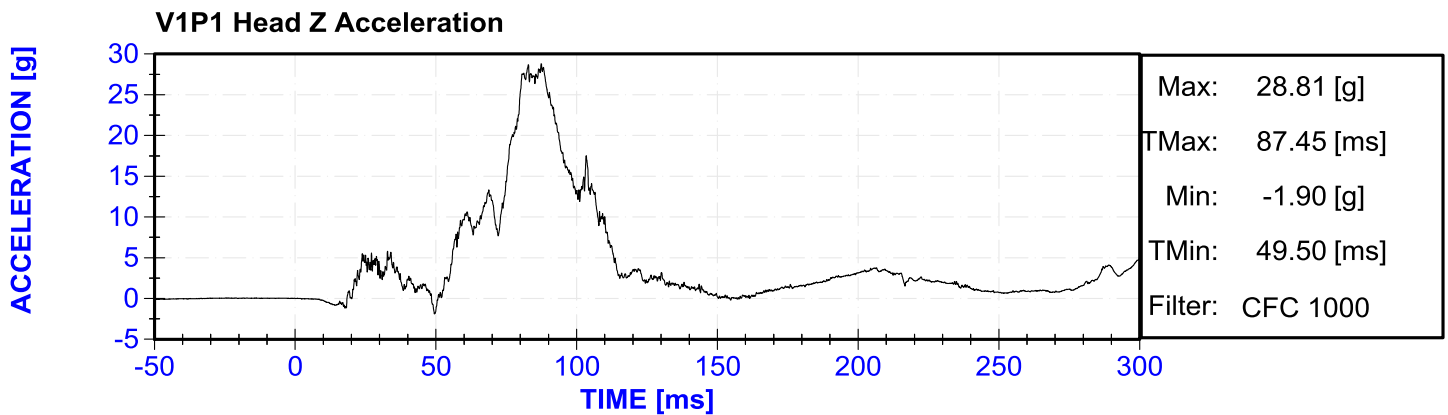
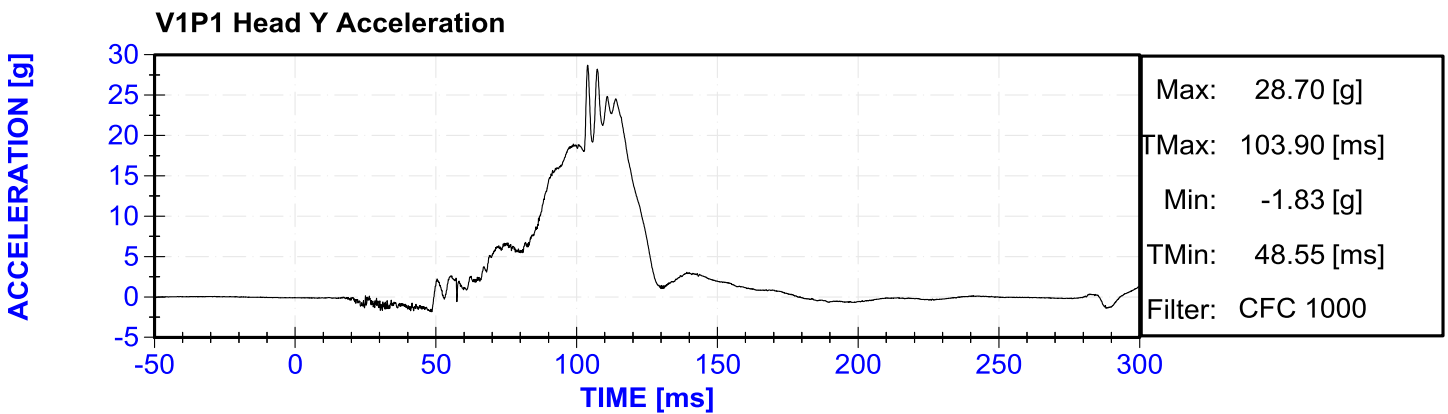
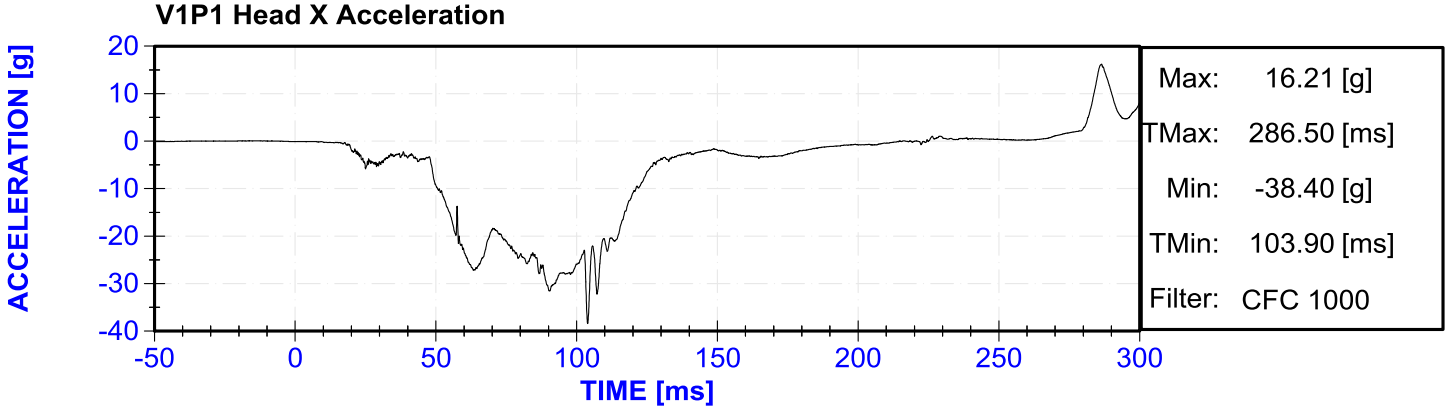
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Passenger Pelvis Z  
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Passenger Right Femur Redundant  
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Passenger Left Upper Tibia Moment Y  
Passenger Left Upper Tibia Force Z  
Passenger Left Lower Tibia Moment X  
Passenger Left Lower Tibia Moment Y  
Passenger Left Lower Tibia Force Z  
Passenger Right Upper Tibia Moment X  
Passenger Right Upper Tibia Moment Y  
Passenger Right Upper Tibia Force Z  
Passenger Right Lower Tibia Moment X  
Passenger Right Lower Tibia Moment Y  
Passenger Right Lower Tibia Force Z  
Passenger Left Foot Fore Z  
Passenger Left Foot Aft X  
Passenger Left Foot Aft Z  
Passenger Right Foot Fore Z  
Passenger Right Foot Aft X  
Passenger Right Foot Aft Z  
Passenger Shoulder Belt Force  
Passenger Lap Belt Force

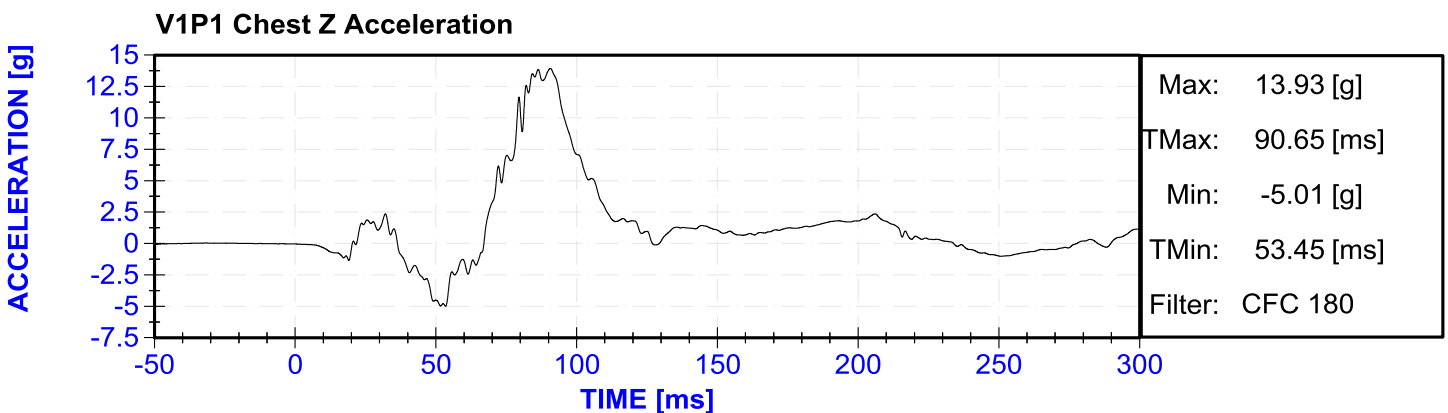
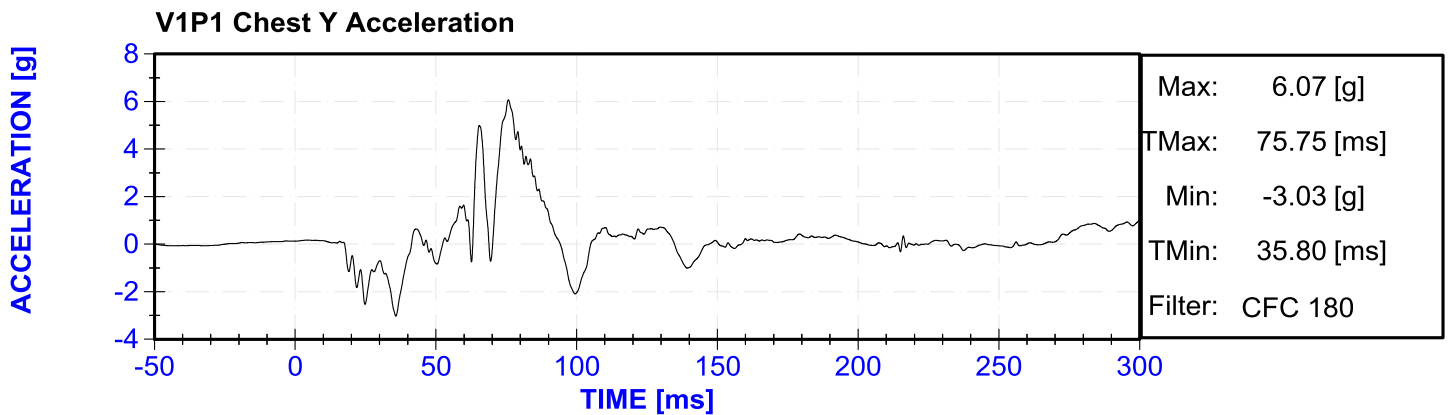
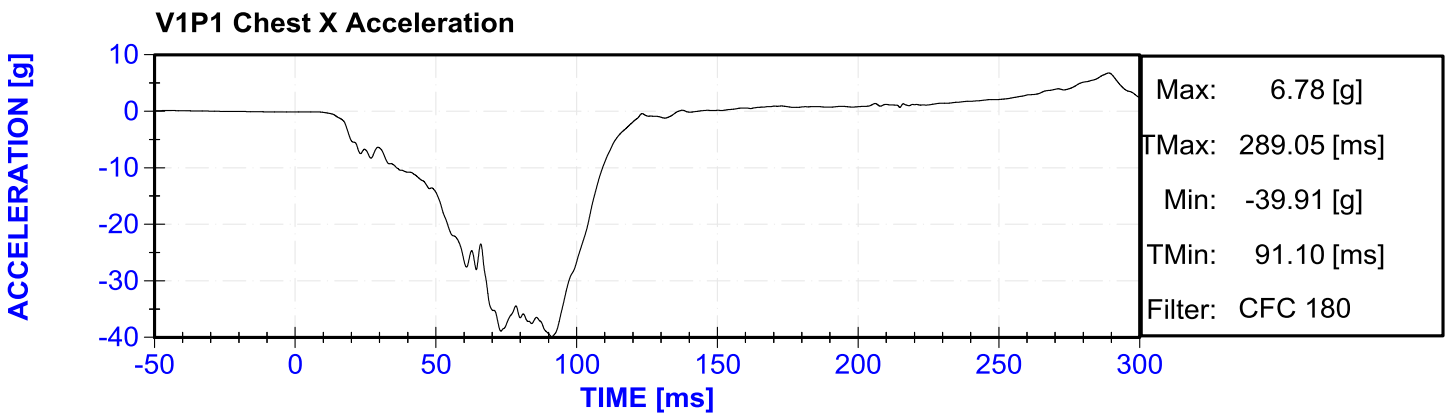
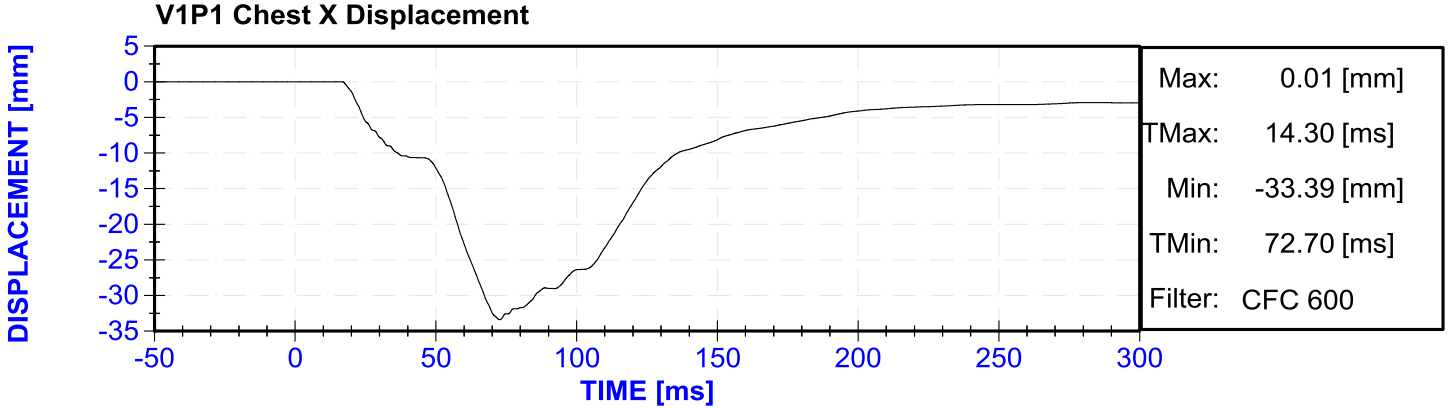
### **Vehicle Instrumentation Data**

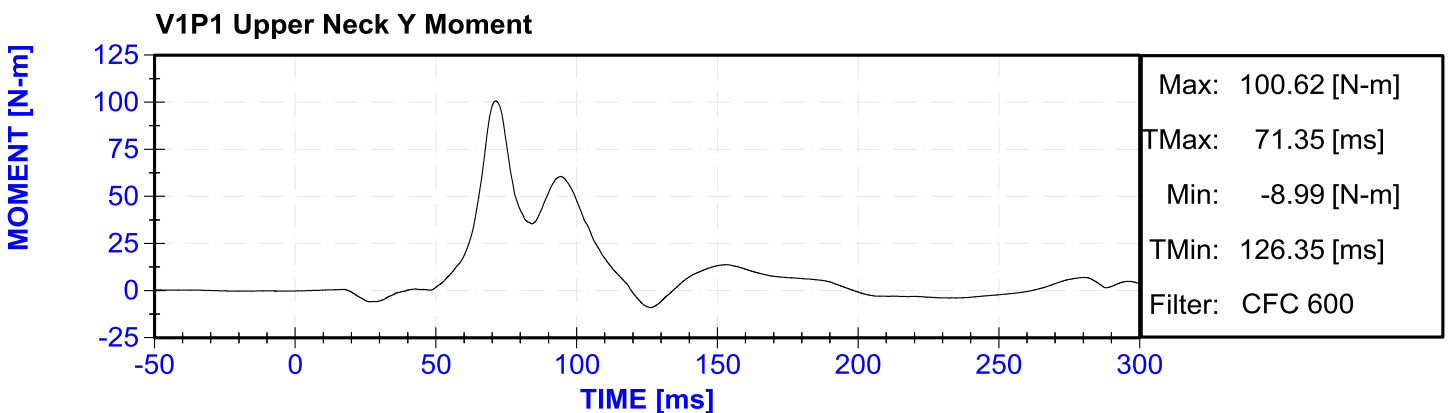
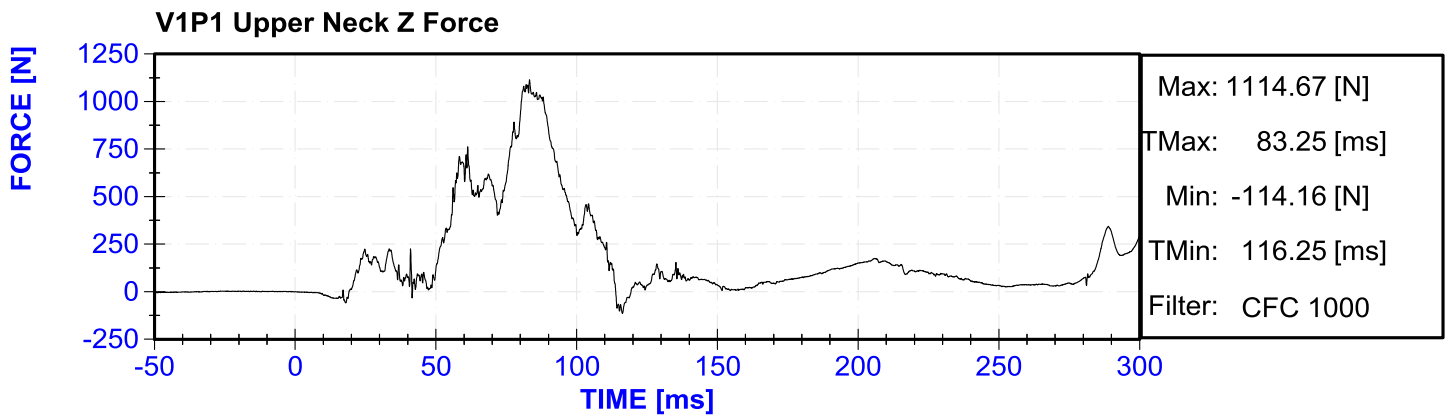
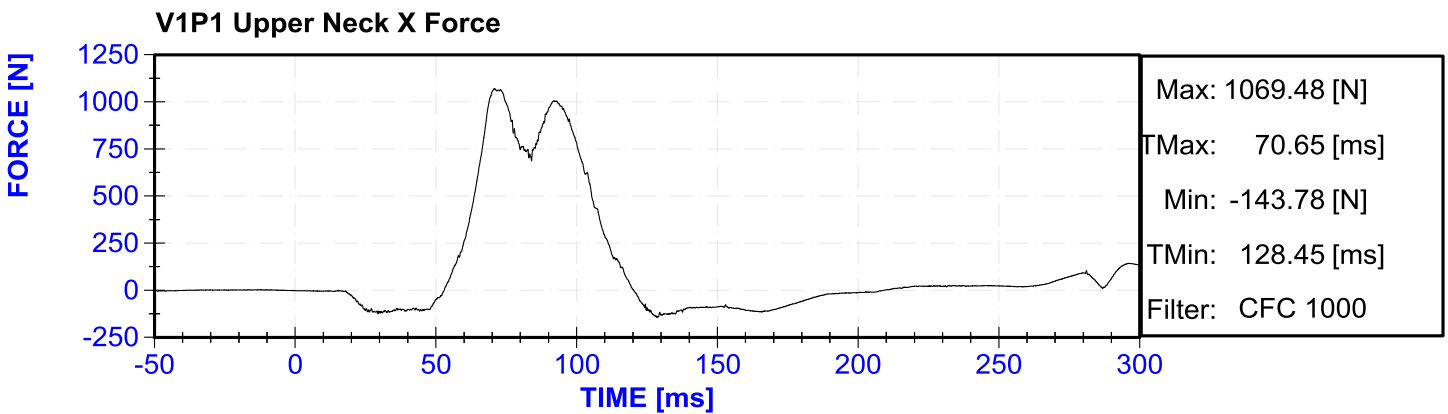
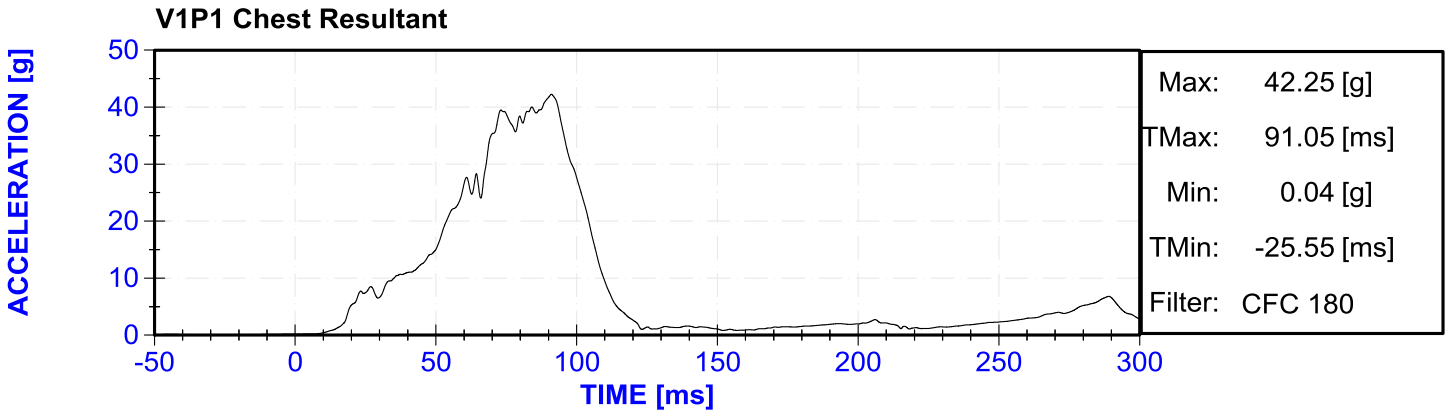
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Left Rear Seat Crossmember Z  
Right Rear Seat Crossmember X  
Right Rear Seat Crossmember Z  
Left Rear Seat Crossmember X Redundant  
Right Rear Seat Crossmember X Redundant  
Vehicle Engine Top X  
Vehicle Engine Bottom X

### **Load Cell Barrier Data**

Load Cell Barrier A1-A9  
Load Cell Barrier B1-A9  
Load Cell Barrier C1-A9  
Load Cell Barrier D1-A9

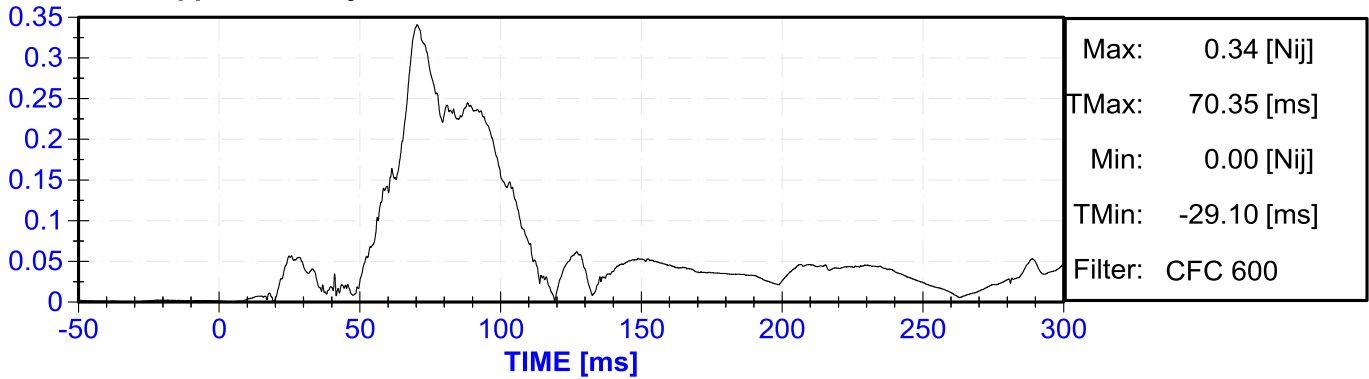






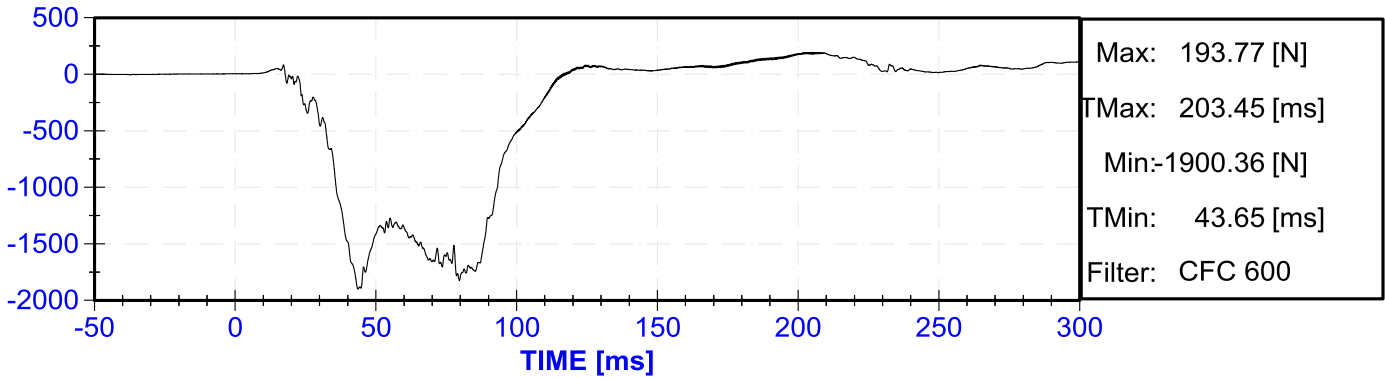
NECK INJURY CRITERIA

V1P1 Upper Neck Nij



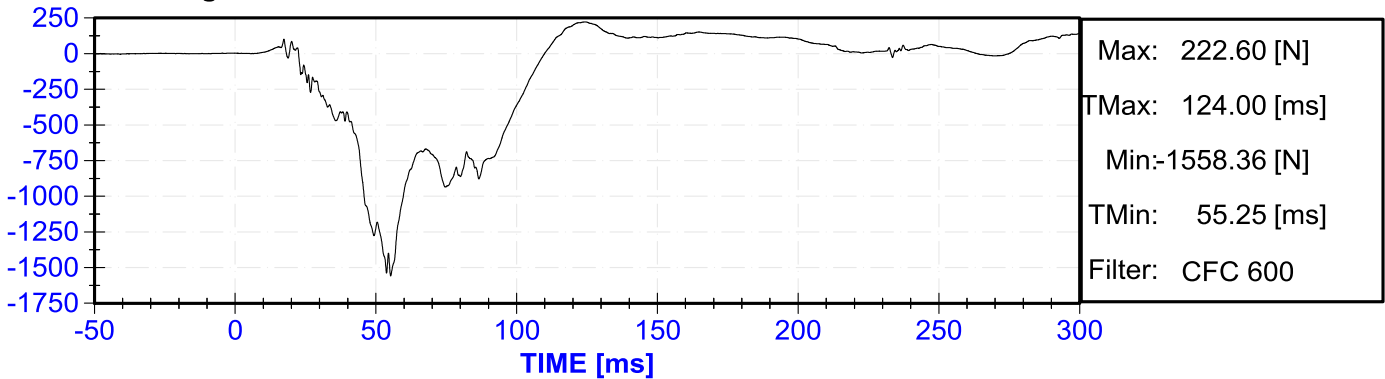
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V1P1 Left Femur Z Force



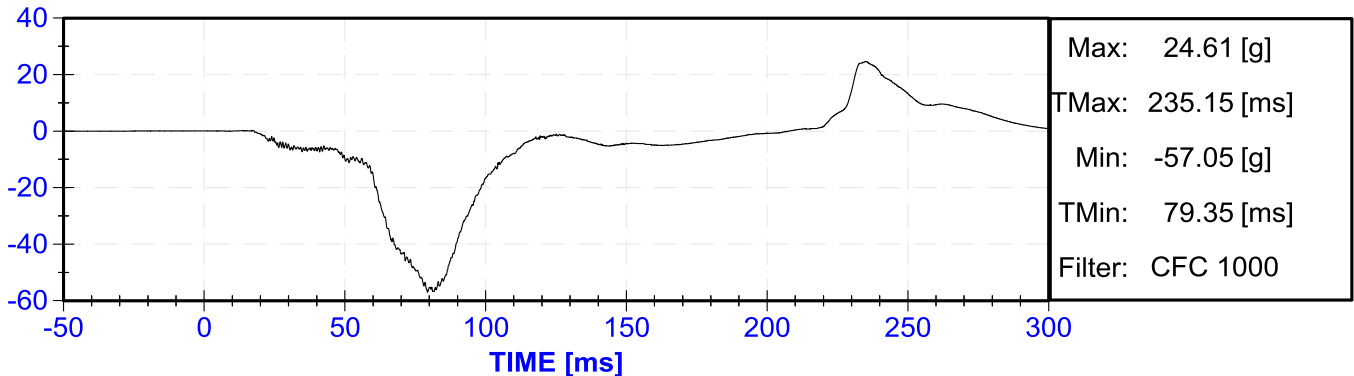
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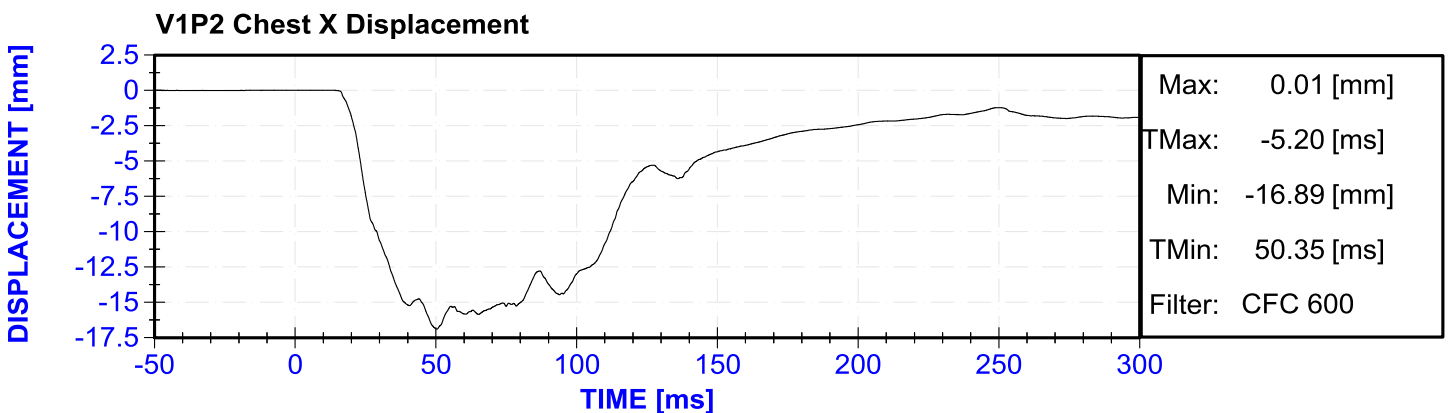
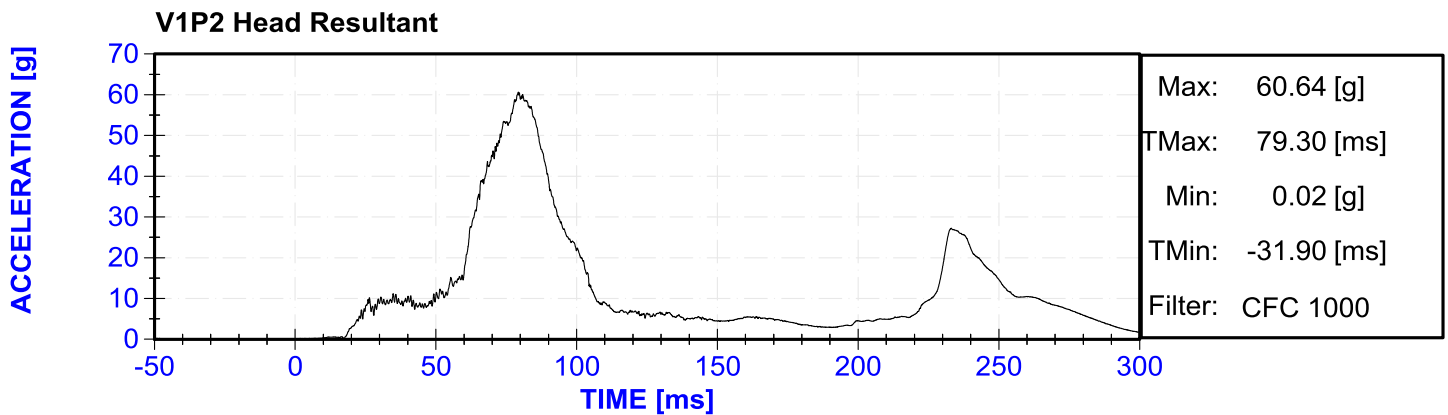
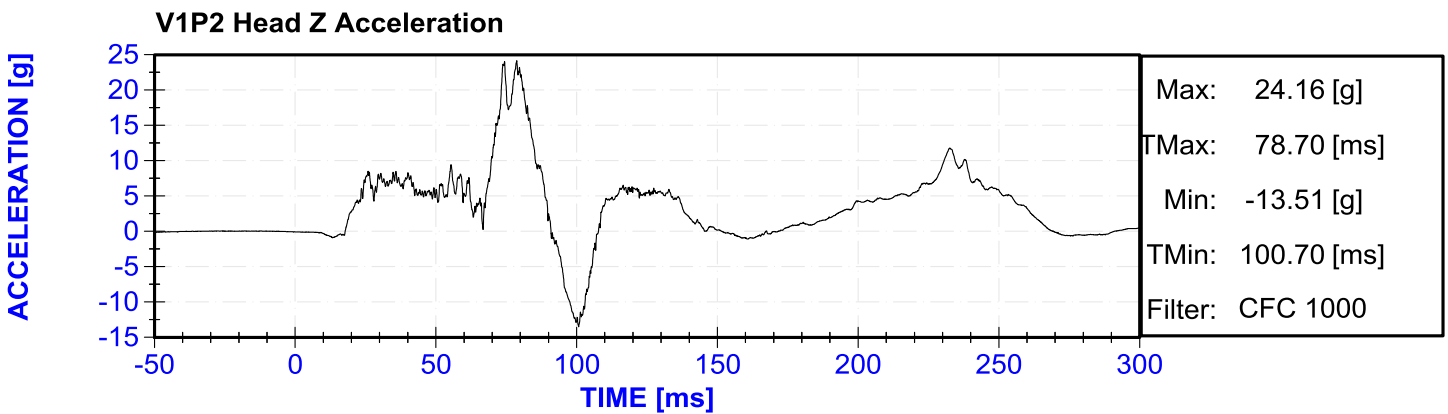
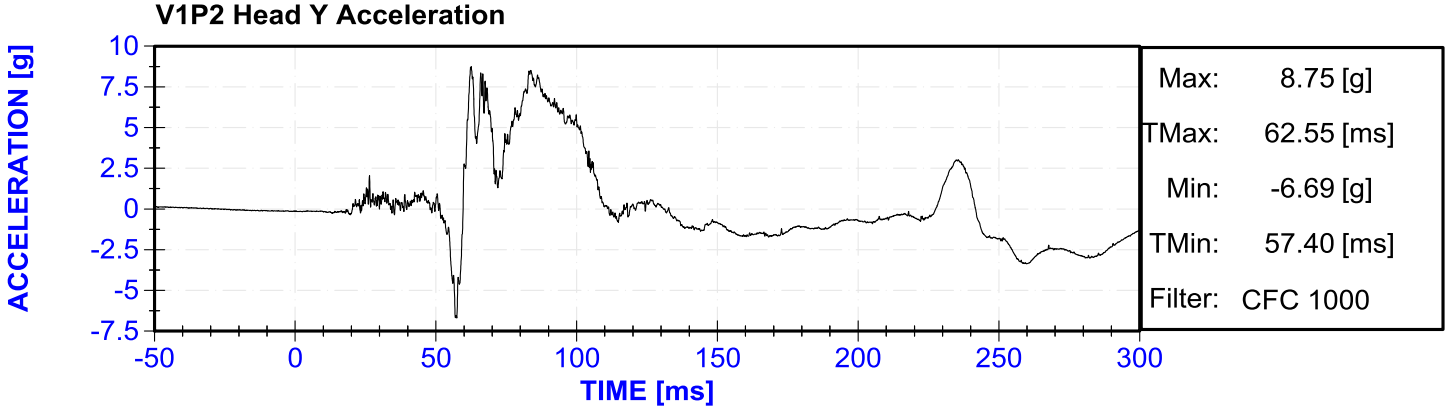
V1P1 Right Femur Z Force

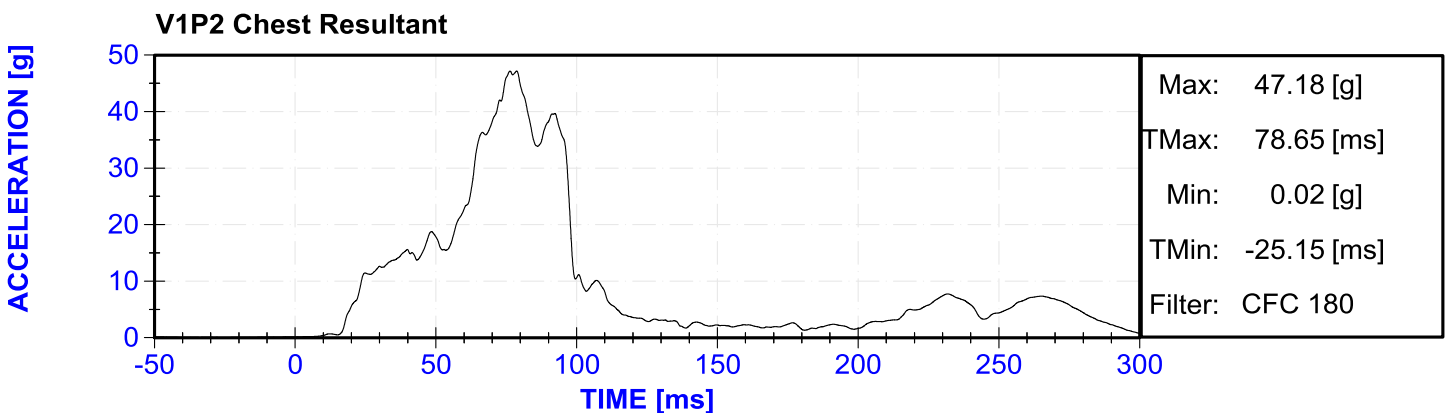
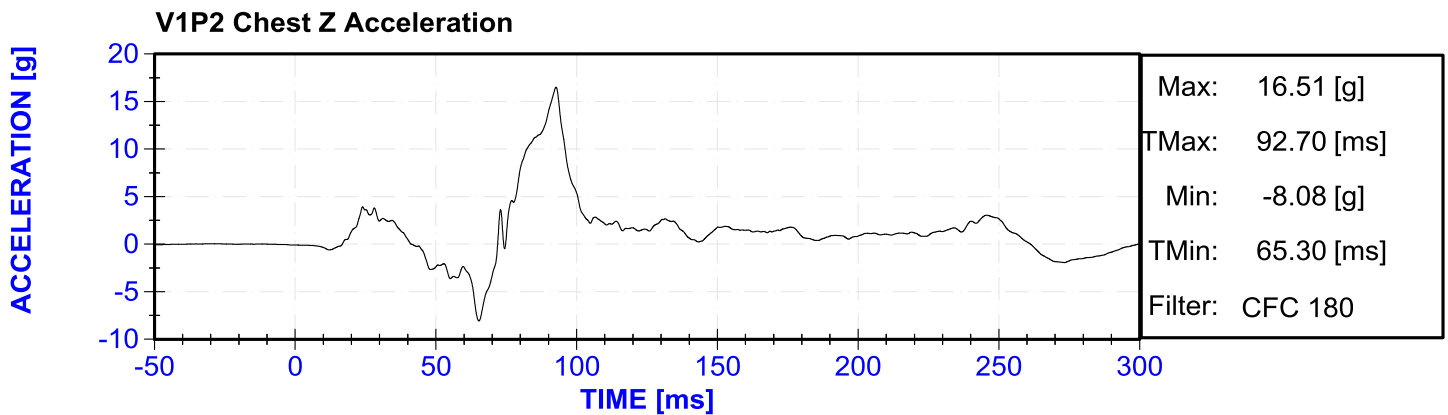
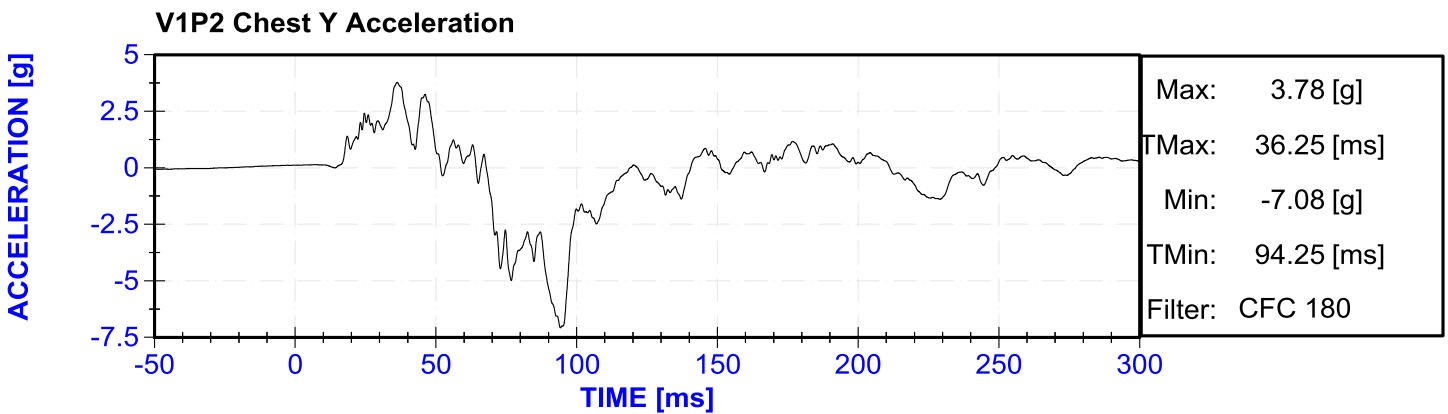
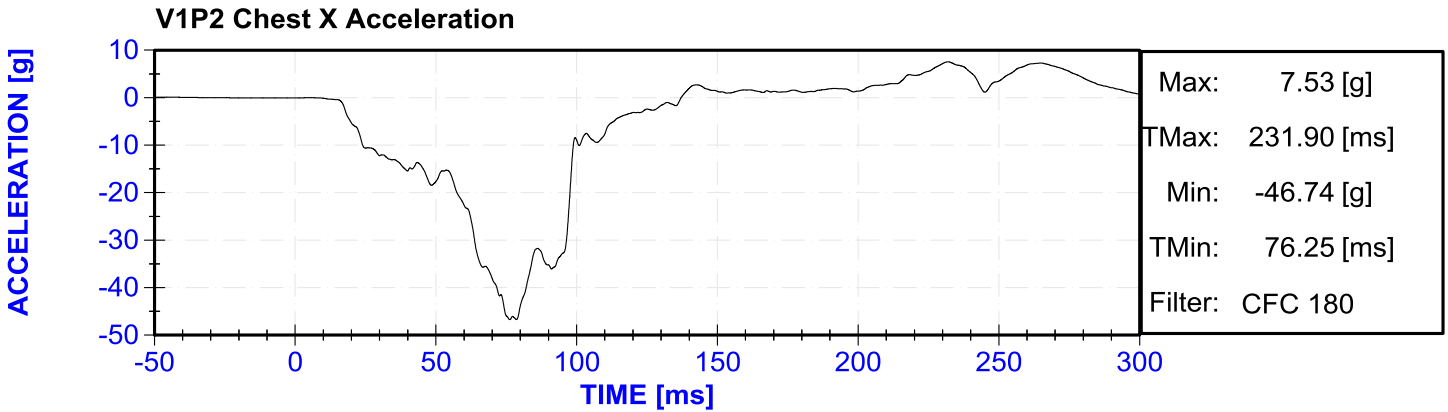


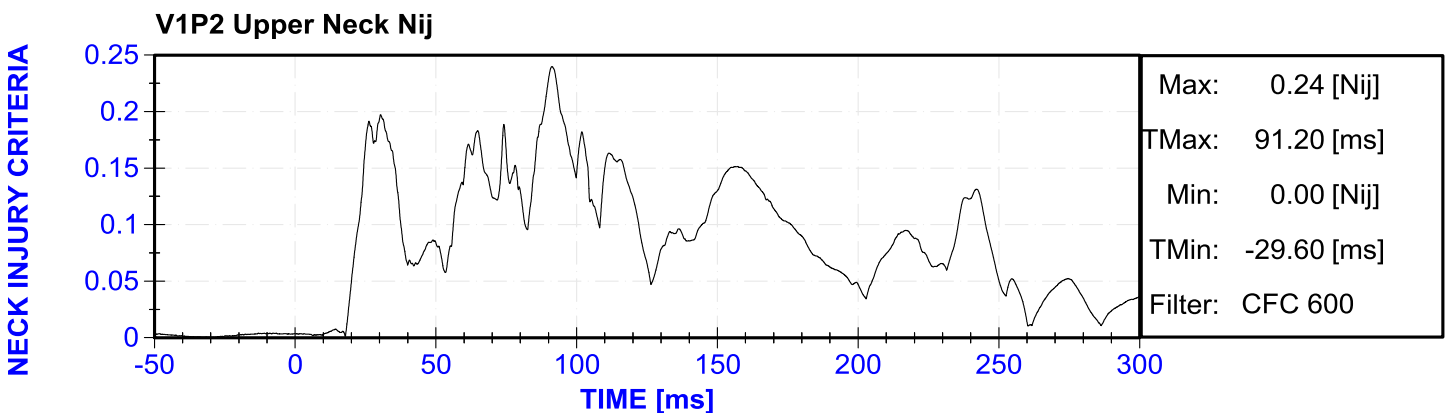
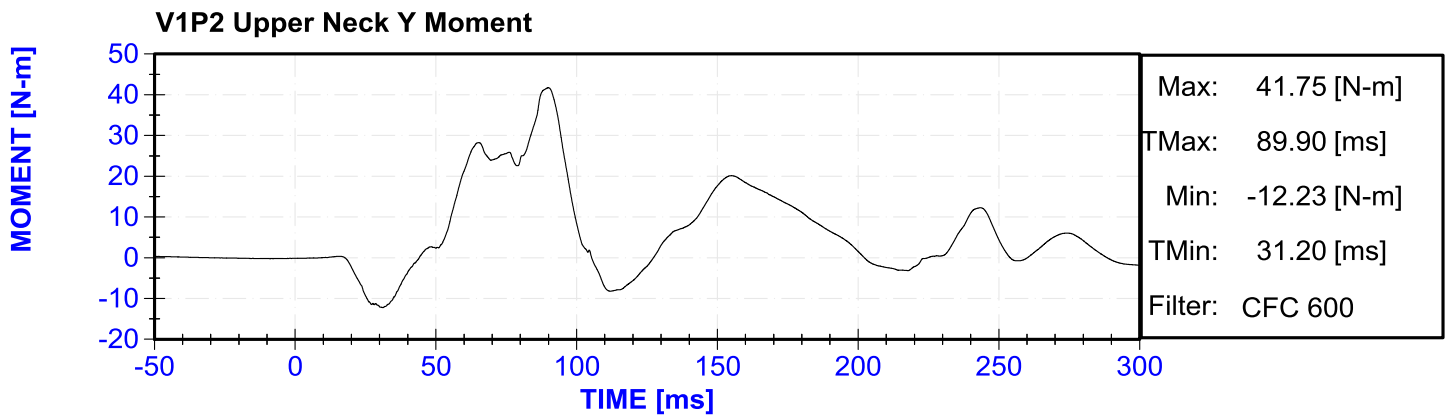
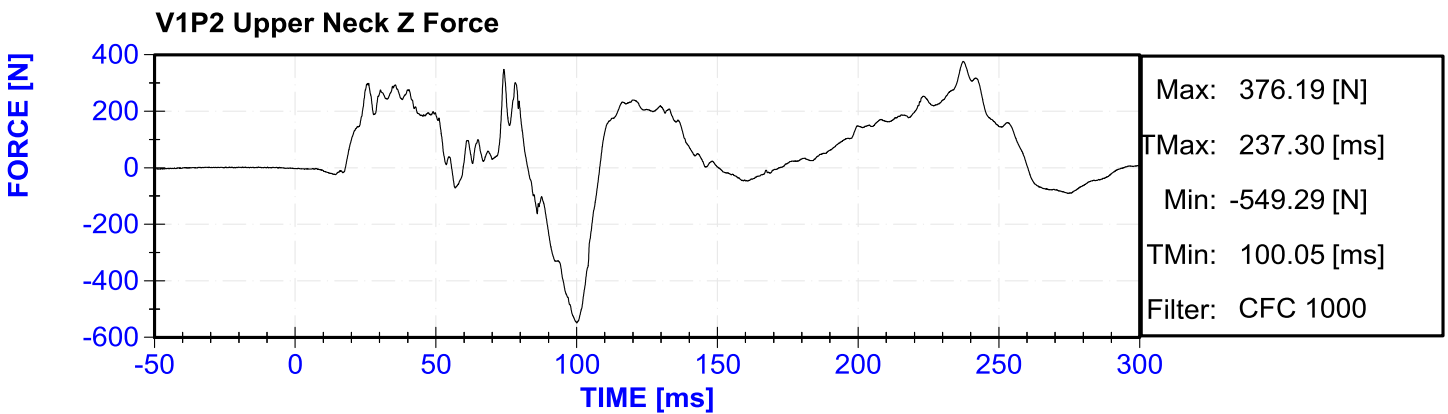
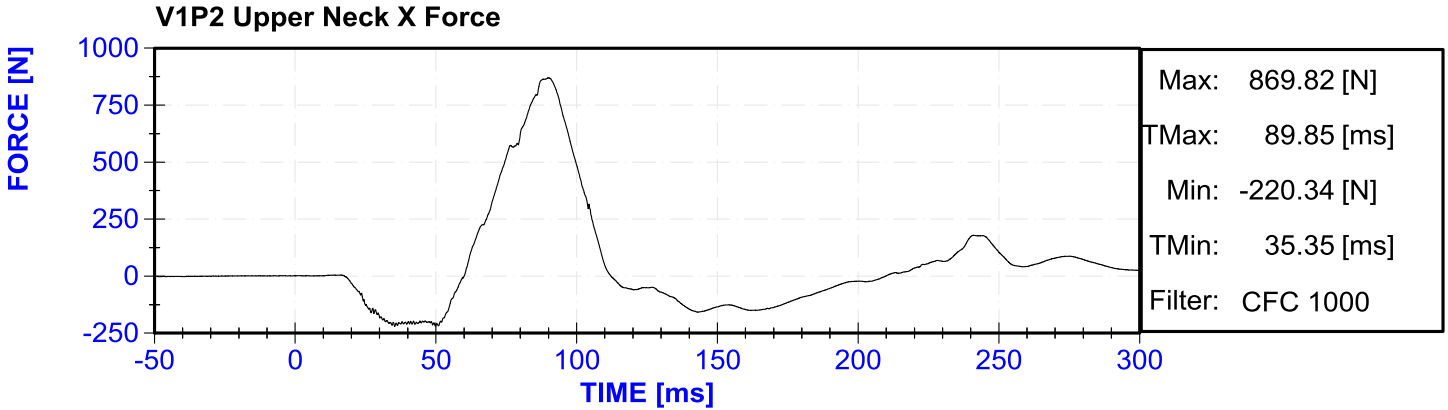
ACCELERATION [g]

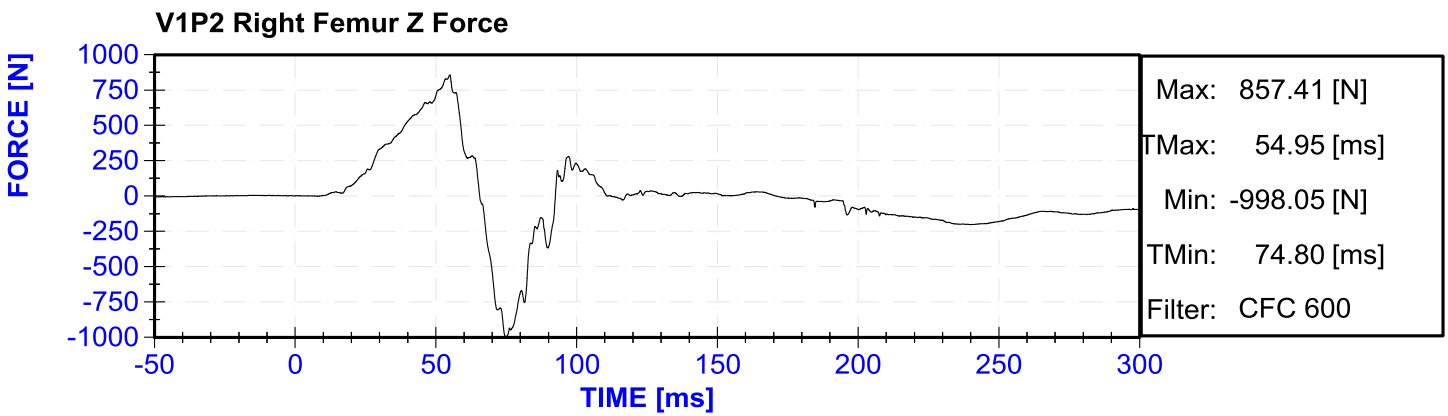
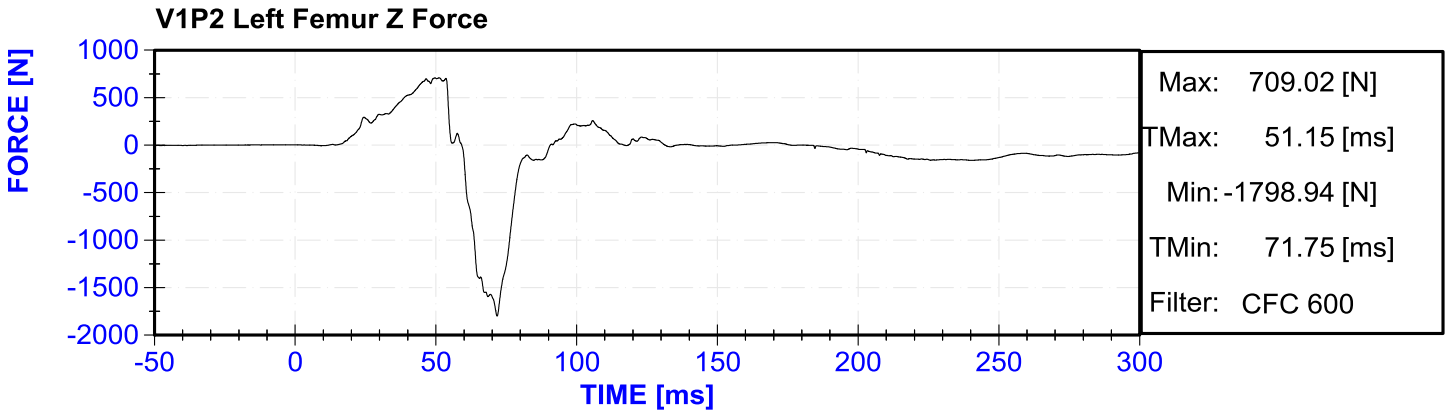
V1P2 Head X Acceleration











## **APPENDIX C**

### **DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA**

**CALIBRATION TEST RESULTS**

**PRE-TEST**

**HYBRID III 50<sup>TH</sup> PERCENTILE MALE - DRIVER ATD**

**SERIAL NO: 061**



## 50<sup>th</sup> Male External Measurements

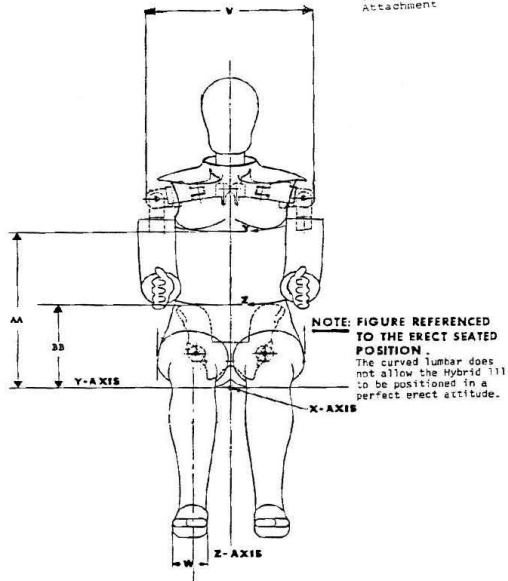
SN 061

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 - 35	34.9	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.1	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	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	13.3	Yes
J	Elbow Rest Height	7.5 - 8.3	8.0	Yes
K	Buttock to Knee Length	22.8 - 23.8	23.6	Yes
L	Popliteal Height	16.9 - 17.9	16.9	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	8.7	Yes
P	Foot Length (right)	9.9 - 10.5	10.2	Yes
V	Shoulder Breadth	16.3 - 17.2	16.7	Yes
W	Foot Breadth	3.6 - 4.2	4.0	Yes
Y	Chest Circumference with Jacket	38.2 - 39.4	38.9	Yes
Z	Waist Circumference	32.9 - 34.1	33.7	Yes
AA	Reference Location (Chest Circumference)	16.9 - 17.1	16.9	Yes
BB	Reference Location (Waist Circumference)	8.9 - 9.1	9.0	Yes

Technician: M. Goehle

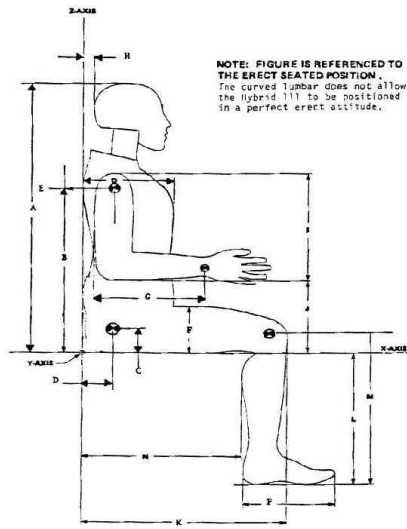
Date: 2/5/2013

USG 2485  
Attachment



HYBRID III Exterior Body Dimensions - Front View

USG 2485  
Attachment



HYBRID III Exterior Body Dimensions - Side View



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**VERIFICATION REPORT**

Test Name:	<b>Head Drop</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:		Test Date:	<b>2/4/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>9:56:57 AM</b>

Component Part Number	Component Serial Number
<b>Head Skin - 78051-228</b>	<b>02-20544</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.7</b> deg C P
Humidity	10 -- 70	<b>16</b> %RH P
Resultant Acceleration	225 -- 275	<b>244</b> g P
Oscillation	0.0 -- 10.0	<b>0.0</b> % P
Lateral Acceleration	-15.00 -- 15.00	<b>-1.77</b> g P

All test parameters are within specifications

Technician:           **A. Rudniski**          

Supervisor:           **E. Dutton**          

Test Time: **9:56:57 AM**

Test Date: **2/4/2013**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58904	1/25/2013
Endevco	7264-2000	P58911	1/26/2013
Endevco	7264-2000	P58757	1/26/2013

Test Time: 9:56:57 AM

Test Date: 2/4/2013

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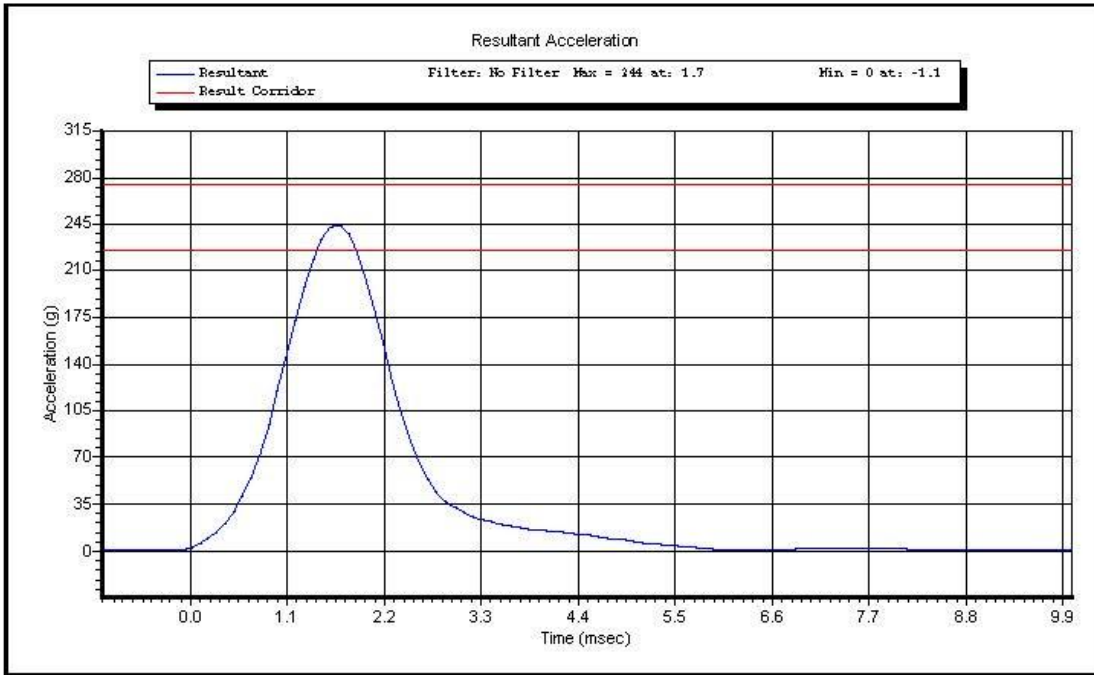


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Test Name:	<b>Head Drop</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:		Test Date:	<b>2/4/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>9:56:57 AM</b>



Test Time: **9:56:57 AM**

Test Date: **2/4/2013**

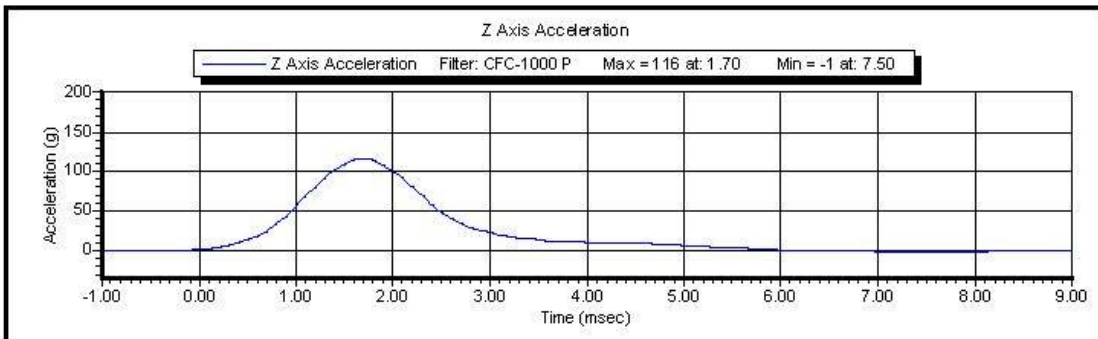
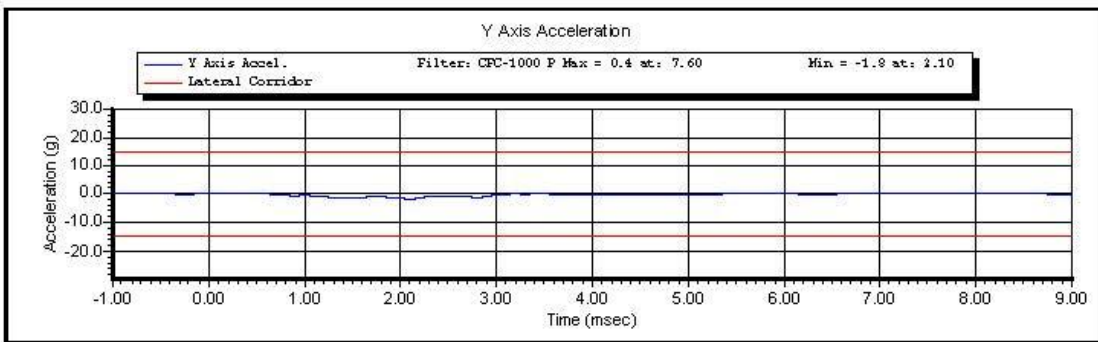
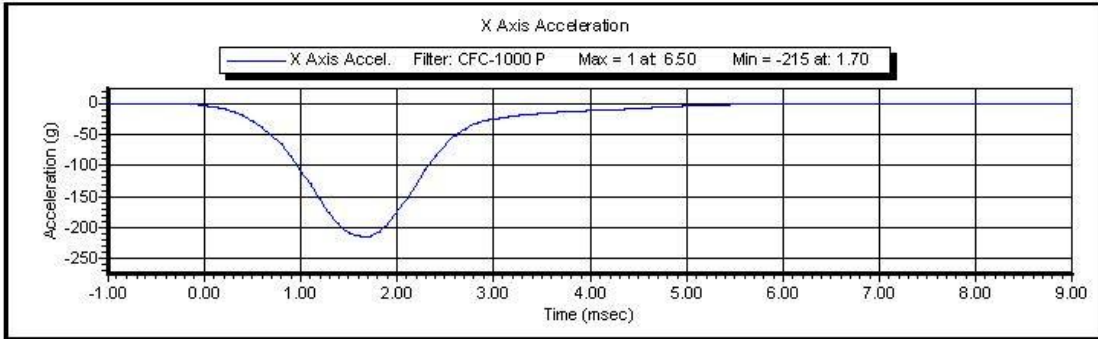
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Test Time: 9:56:57 AM

Test Date: 2/4/2013

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#### VERIFICATION REPORT

Test Name:	<b>Neck Extension</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:		Test Date:	<b>2/4/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>1:44:23 PM</b>

Component Part Number	Component Serial Number
<b>Neck - 78051-336</b>	<b>4194</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.8</b> deg C P
Humidity	10 -- 70	<b>16</b> %RH P
Velocity	5.94 -- 6.19	<b>6.12</b> m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	<b>18.4</b> g P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	<b>17.7</b> g P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	<b>13.4</b> g P
Max Pendulum Deceleration after 30 ms	0.0 -- 22.0	<b>13.8</b> g P
Decel Time to 5 g	38.0 -- 46.0	<b>39.6</b> ms P
D Plane Rotation	81.0 -- 106.0	<b>93.9</b> degrees P
Time at Max Rotation	72.0 -- 82.0	<b>76.3</b> ms P
Rotation Decay to Zero	147.0 -- 174.0	<b>158.0</b> ms P
Moment About Occipital Condyle	-80.0 -- -52.9	<b>-68.7</b> Nm P
Time at Max Moment	65.0 -- 79.0	<b>71.4</b> ms P
Moment Decay to Zero	120.0 -- 148.0	<b>137.9</b> ms P

All test parameters are within specifications

Technician:           **A. Rudniski**          

Supervisor:           **E.dutton**          

Test Time: **1:44:23 PM**

Test Date: **2/4/2013**

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### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C15016	8/15/2012
DentonATD	78051-342	PENDULUM POT	1/25/2013
DentonATD	78051-342	CONDYLE POT	1/25/2013
Denton	IF-205	LC-175 My	5/21/2012
Denton	IF-205	LC-175 Fx	5/21/2012

Test Time: 1:44:23 PM

Test Date: 2/4/2013

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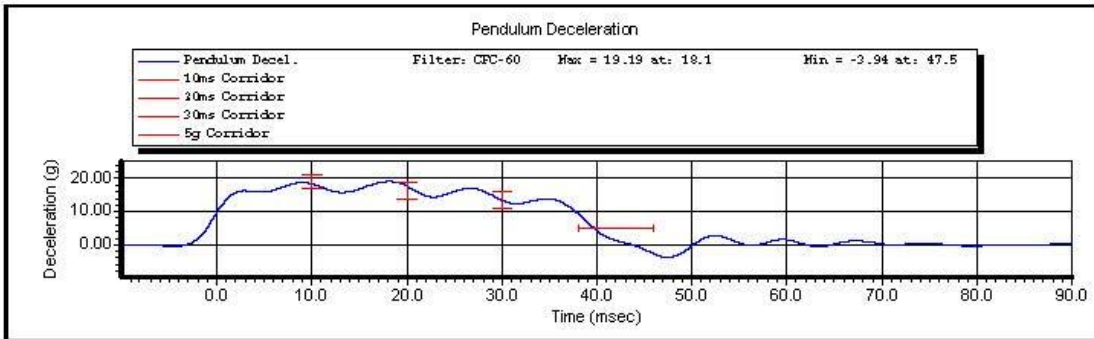
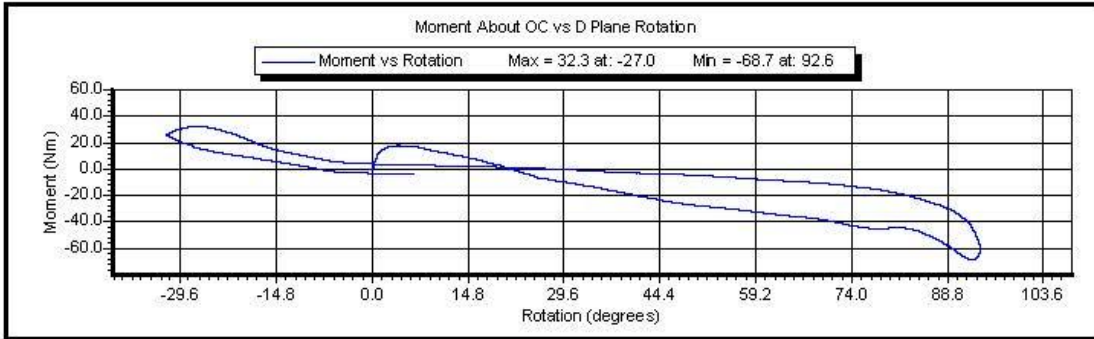


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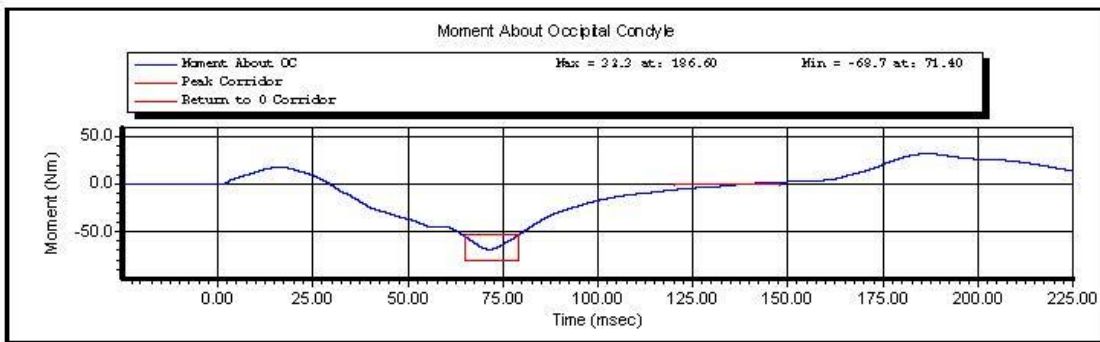
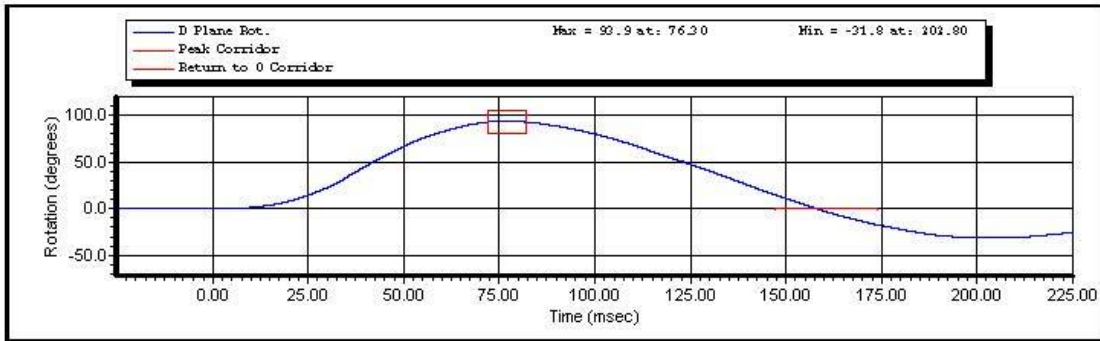
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Name of Sub Test:		Type of Spec:	<b>NHTSA</b>
Type of ATD:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
ID of Test:		Date:	<b>2/4/2013</b>
Number of Test:	<b>1</b>	Time of Test:	<b>1:44:23 PM</b>



Time of Test: **1:44:23 PM**

Date of Test: **2/4/2013**

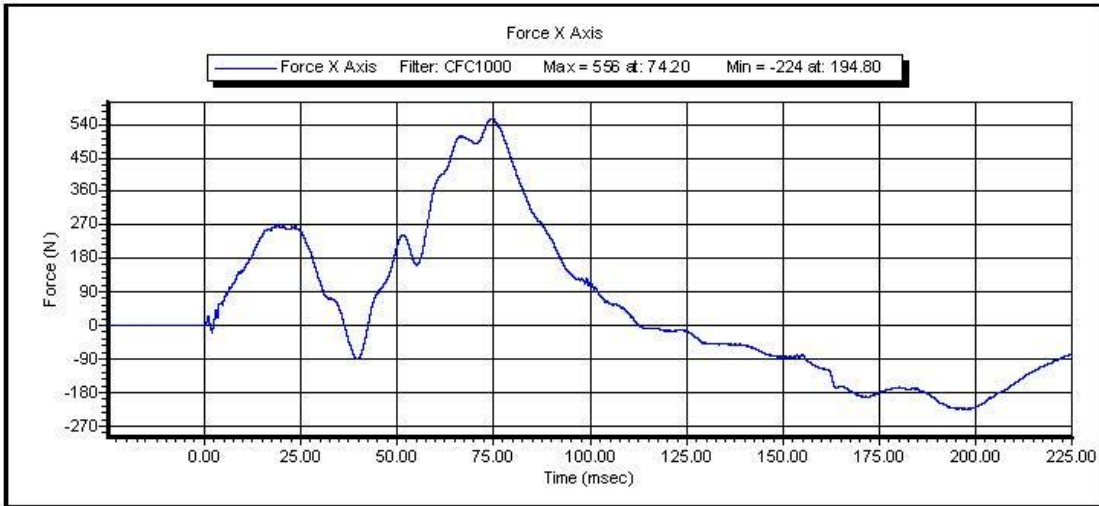
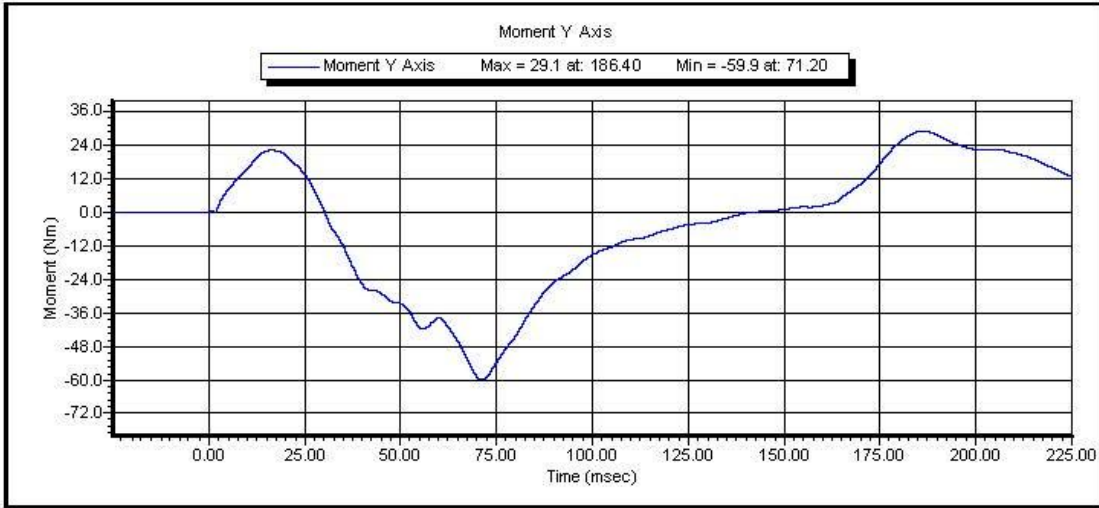
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Time of Test: 1:44:23 PM

Date of Test: 2/4/2013

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Time of Test: 1:44:23 PM

Date of Test: 2/4/2013

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**VERIFICATION REPORT**

Test Name:	<b>Neck Flexion</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:		Test Date:	<b>2/4/2013</b>
Test Number:	<b>2</b>	Test Time:	<b>1:11:15 PM</b>

Component Part Number	Component Serial Number
<b>Neck - 78051-336</b>	<b>4194</b>

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	<b>21.8</b> deg C	P
Humidity		10	-- 70	<b>16</b> %RH	P
Velocity		6.89	-- 7.13	<b>7.10</b> m/s	P
Pendulum Deceleration at	10 ms	22.5	-- 27.5	<b>23.7</b> g	P
Pendulum Deceleration at	20 ms	17.6	-- 22.6	<b>21.6</b> g	P
Pendulum Deceleration at	30 ms	12.5	-- 18.5	<b>17.0</b> g	P
Max Pendulum Deceleration After	30 ms	0.0	-- 29.0	<b>17.0</b> g	P
Deceleration time to	5 g	34.0	-- 42.0	<b>37.3</b> ms	P
D Plane Rotation		-78.0	-- -64.0	<b>-65.8</b> degrees	P
Time at max rotation		57.0	-- 64.0	<b>59.4</b> ms	P
Rotation Decay to Zero		113.0	-- 128.0	<b>120.4</b> ms	P
Moment about OC		88.1	-- 108.4	<b>95.3</b> Nm	P
Time at Max Moment		47.0	-- 58.0	<b>47.9</b> ms	P
Moment Decay to Zero		97.0	-- 107.0	<b>99.9</b> ms	P

All test parameters are within specifications

Technician:           **A. Rudniski**          

Supervisor:           **E. Dutton**          

Test Time: **1:11:15 PM**

Test Date: **2/4/2013**

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#### REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C15016	8/15/2012
DentonATD	78051.342	PENDULUM POT	1/25/2013
DentonATD	78051.342	CONDYLE POT	1/25/2013
Denton	IF-205	LC-175 My	5/21/2012
Denton	IF-205	LC-175 Fx	5/21/2012

Test Time: 1:11:15 PM

Test Date: 2/4/2013

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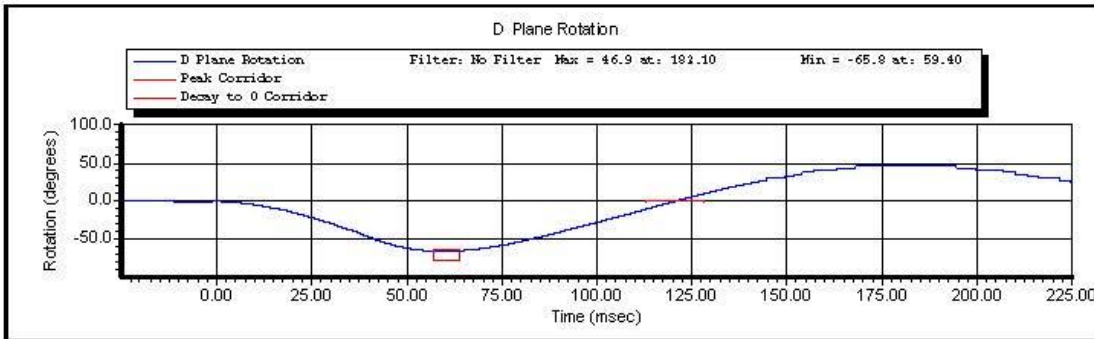
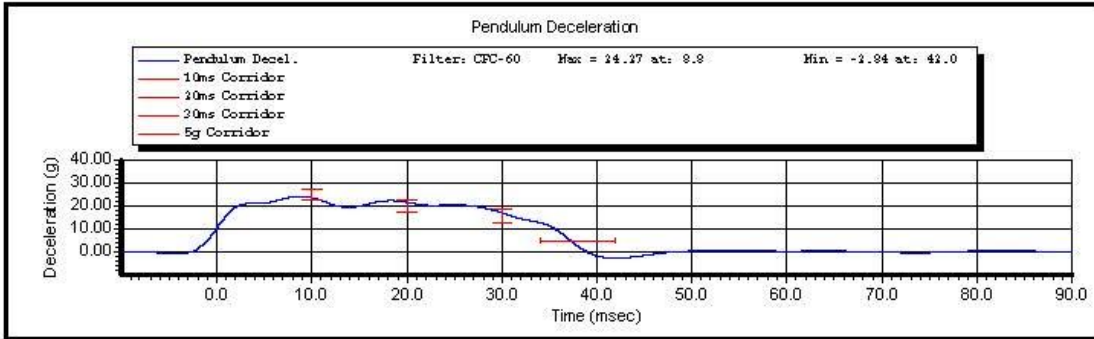


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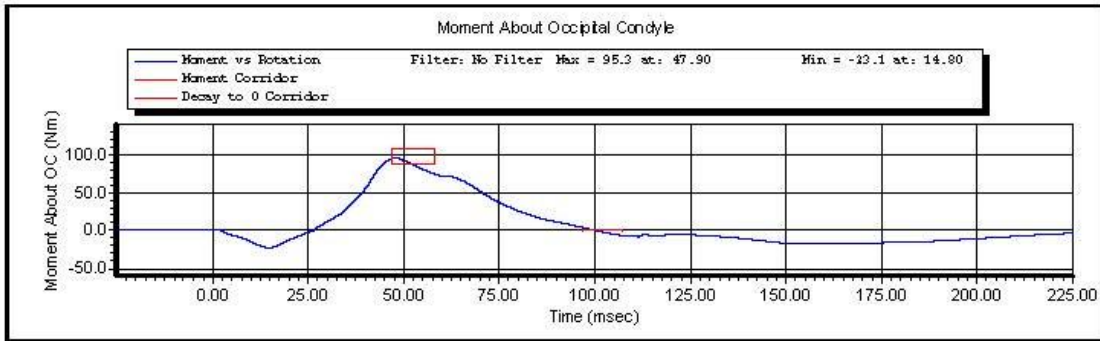
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Name of Sub Test:		Type of Spec:	<b>NHTSA</b>
Type of ATD:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
ID of Test:		Date:	<b>2/4/2013</b>
Number of Test:	<b>2</b>	Time of Test:	<b>1:11:15 PM</b>



Time of Test: **1:11:15 PM**

Date of Test: **2/4/2013**

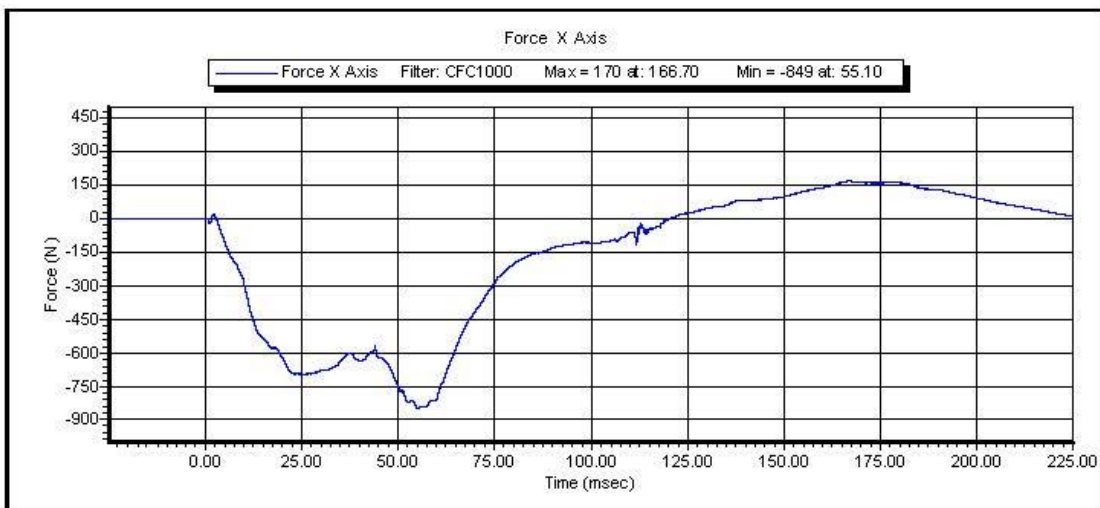
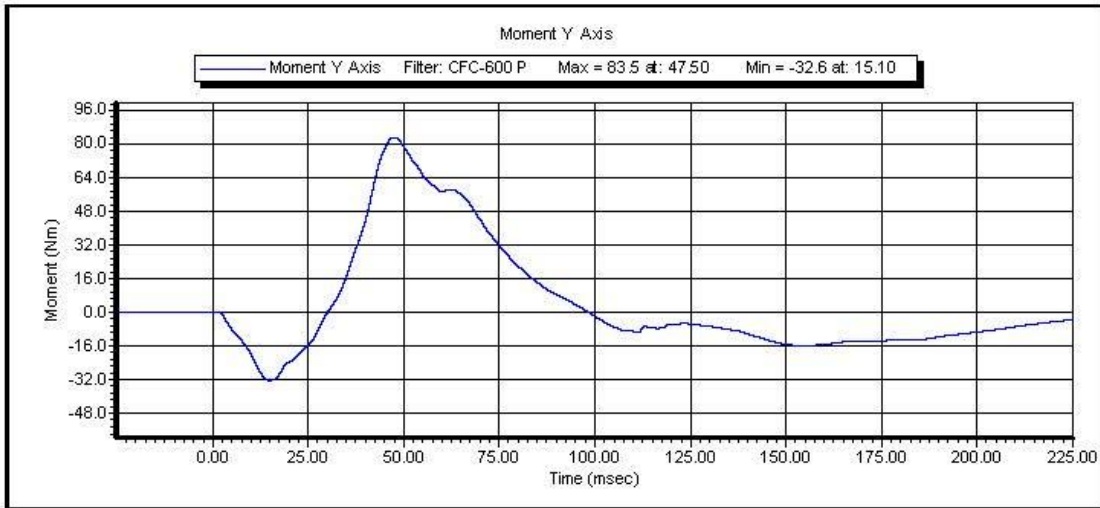
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Time of Test: 1:11:15 PM

Date of Test: 2/4/2013

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Time of Test: 1:11:15 PM

Date of Test: 2/4/2013

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**VERIFICATION REPORT**

Test Name:	<b>Thorax Impact</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:		Test Date:	<b>2/5/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>2:08:19 PM</b>

Component Part Number	Component Serial Number
<b>Ribs 78051-RS</b>	<b>2437</b>
<b>Chest Jacket - 78051-169</b>	<b>555</b>
<b>Lumbar Spine - 78051-66</b>	

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>22.0</b> deg C P
Humidity	10.0 -- 70.0	<b>12.0</b> %RH P
Velocity	6.59 -- 6.83	<b>6.64</b> m/s P
Resistive Force	-5.894 -- -5.160	<b>-5.349</b> kN P
Sternum Displacement	-72.6 -- -63.5	<b>-71.6</b> mm P
Hysteresis	69 -- 85	<b>70</b> % P

All test parameters are within specifications

Technician:           **A. Rudniski**          

Supervisor:           **E. Dutton**          

Test Time: **2:08:19 PM**

Test Date: **2/5/2013**

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REFERENCE EQUIPMENT

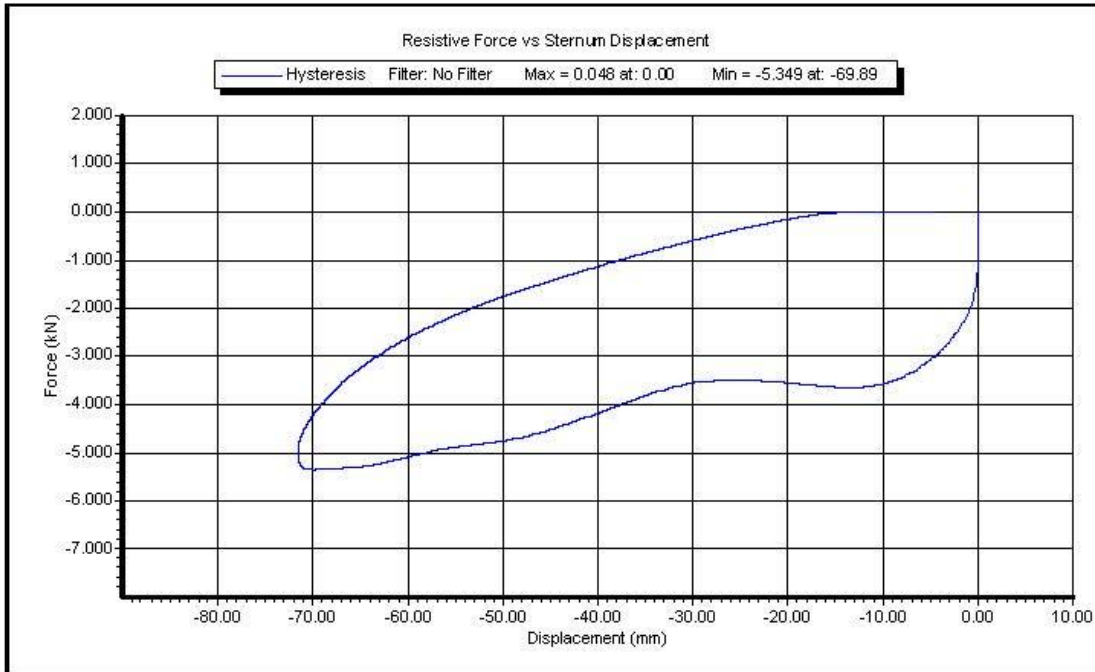
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	11/28/2012
DentonATD	78051-342	DS-061	5/17/2012

Test Time: 2:08:19 PM

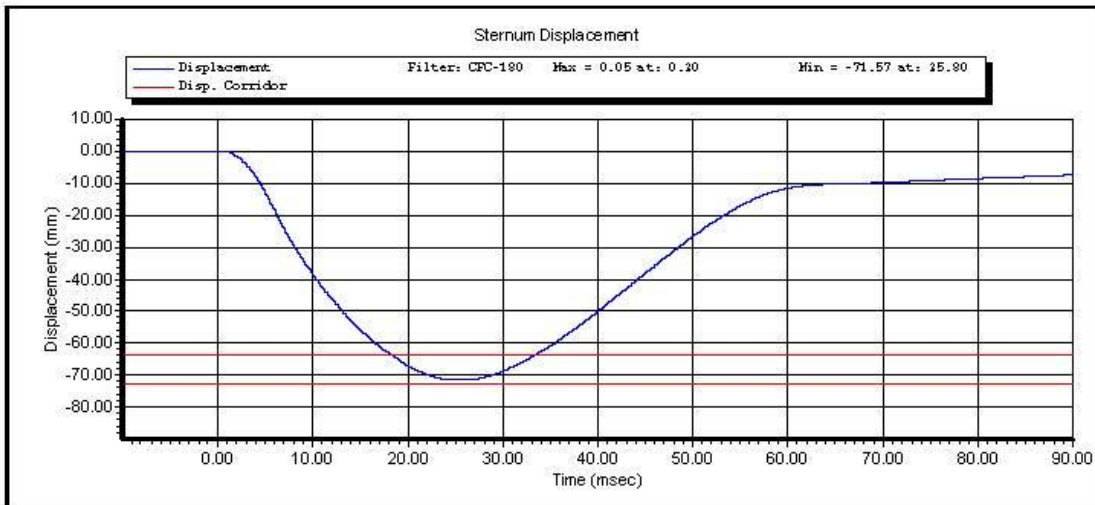
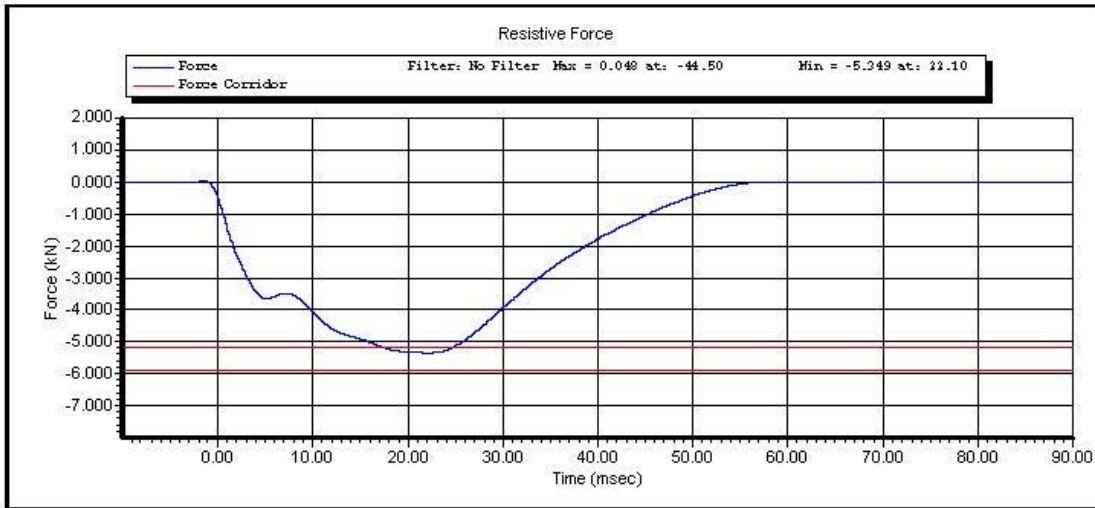
Test Date: 2/5/2013

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Test Name:	<b>Thorax Impact</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:		Test Date:	<b>2/5/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>2:08:19 PM</b>

Test Time: **2:08:19 PM**Test Date: **2/5/2013**

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Test Time: 2:08:19 PM

Test Date: 2/5/2013

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**VERIFICATION REPORT**

Test Name:	<b>Hip ROM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Hip ROM Left</b>	Test Date:	<b>11/25/2013</b>
		Test Time:	<b>10:21:07 AM</b>

Component Part Number	Component Serial Number
<b>Pelvis Assembly 78051-60</b>	<b>DB459</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.5</b> deg C P
Humidity	10 -- 70	<b>18.5</b> %RH P
Average Velocity	5 -- 10	<b>5.6</b> deg/s P
Angle at 203 Nm	40 -- 50	<b>40.04</b> degrees P
Moment at 30 degrees	0.0 -- 94.9	<b>89.23</b> Nm P

All test parameters are within specifications

Technician:           **R.Weil**          

Supervisor:           **E.Dutton**



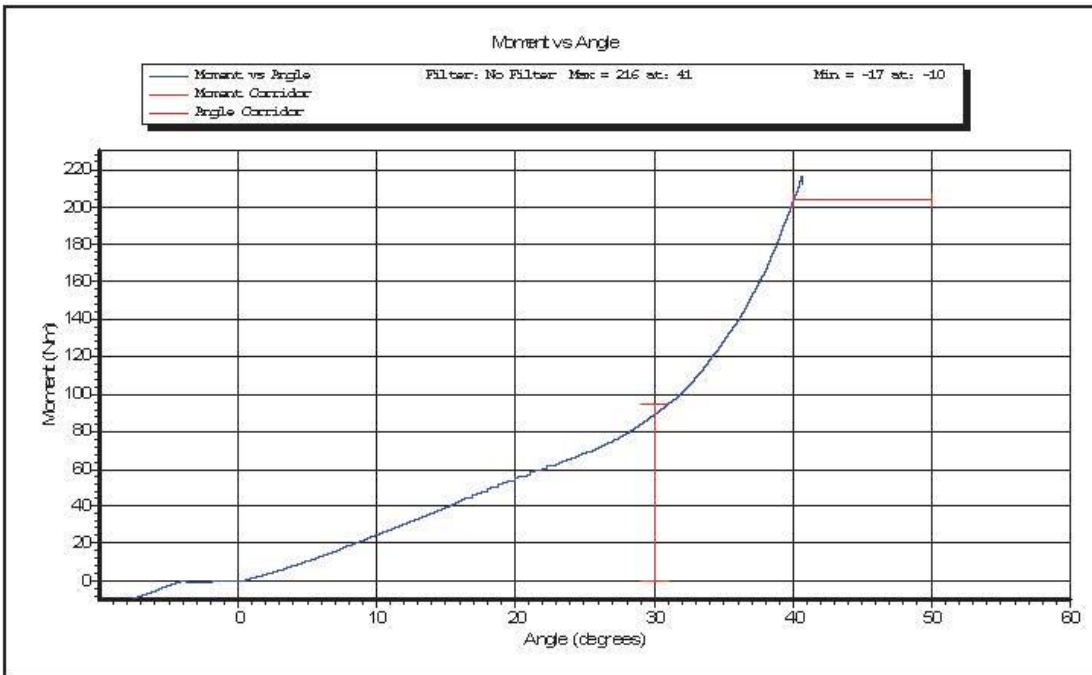
VERIFICATION REPORT

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	14CB1-3615	0008	2/21/2013
DentonATD	Velocity Trap	1	1/11/2013



Test Name: **Hip ROM**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**



Test ID: **Hip ROM Left**

Test Time: **10:21:07 AM**

Test Date: **11/25/2013**

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VERIFICATION REPORT

Test Name:	<b>Hip ROM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Hip ROM Right</b>	Test Date:	<b>11/21/2013</b>
		Test Time:	<b>3:13:30 PM</b>

Component Part Number	Component Serial Number
<b>Pelvis Assembly 78051-60</b>	<b>DB459</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>27.1</b> %RH P
Average Velocity	5 -- 10	<b>7.1</b> deg/s P
Angle at 203 Nm	40 -- 50	<b>41.7</b> degrees P
Moment at 30 degrees	0.0 -- 94.9	<b>89.17</b> 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	14CB1-3615	0008	2/21/2013
DentonATD	Velocity Trap	1	1/11/2013



Test Name: **Hip ROM**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**



Test ID: **Hip ROM Right**    Test Time: **3:13:30 PM**    Test Date: **11/21/2013**

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#### VERIFICATION REPORT

Test Name:	<b>Knee Impact PENDULUM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Left Knee Impact</b>	Test Date:	<b>2/4/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>2:58:27 PM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 78051(L) or 6(R)</b>	<b>3268</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.0</b> deg C P
Humidity	10.0 -- 70.0	<b>13.2</b> %RH P
Velocity	2.07 -- 2.13	<b>2.10</b> m/s P
Resistive Force	-5.78 -- -4.72	<b>-5.28</b> kN P

All test parameters are within specifications

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

Test Time: **2:58:27 PM**

Test Date: **2/4/2013**

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4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

### VERIFICATION REPORT

#### REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	11/28/2012

Test Time: 2:58:27 PM

Test Date: 2/4/2013

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Test Name:	<b>Knee Impact PENDULUM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Left Knee Impact</b>	Test Date:	<b>2/4/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>2:58:27 PM</b>



Test Time: **2:58:27 PM**

Test Date: **2/4/2013**

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**VERIFICATION REPORT**

Test Name:	<b>Knee Impact PENDULUM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Right Knee Impact</b>	Test Date:	<b>2/4/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>3:17:47 PM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 78051(L) or 6(R)</b>	<b>3158</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.0</b> deg C P
Humidity	10.0 -- 70.0	<b>13.2</b> %RH P
Velocity	2.07 -- 2.13	<b>2.10</b> m/s P
Resistive Force	-5.78 -- -4.72	<b>-5.58</b> kN P

All test parameters are within specifications

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

Test Time: **3:17:47 PM**

Test Date: **2/4/2013**

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**VERIFICATION REPORT**

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	11/28/2012

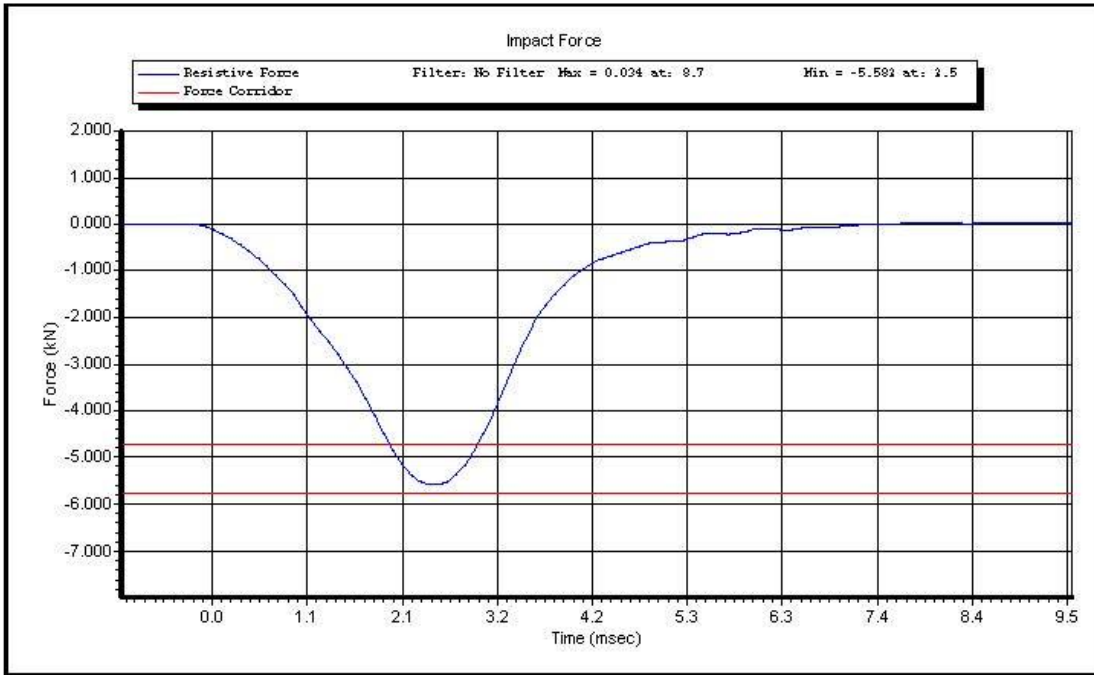
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Test Date: 2/4/2013

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Test Name:	<b>Knee Impact PENDULUM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:		Spec Type:	<b>NHTSA</b>
ATD Type:	<b>Hybrid III 50'th</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Right Knee Impact</b>	Test Date:	<b>2/4/2013</b>
Test Number:	<b>1</b>	Test Time:	<b>3:17:47 PM</b>



Test Time: 3:17:47 PM

Test Date: 2/4/2013

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**CALIBRATION TEST RESULTS**

**PRE-TEST**

**HYBRID III 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

**SERIAL NO: 288**



## External Measurements

5<sup>th</sup> Female SN 288

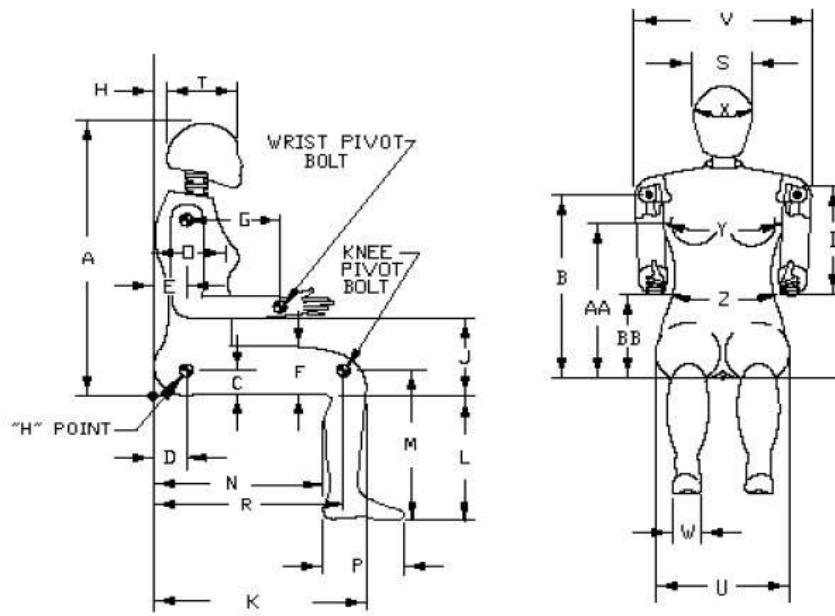
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	786	Yes
B	Shoulder Pivot Height	431.8 – 457.2	452	Yes
C	H-Point Height	81.3 – 86.3	83	Yes
D	H-Point from Backline	144.8 – 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	76	Yes
F	Thigh Clearance	119.4 – 134.6	131	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	248	Yes
H	Head Back to Backline	43.2 – 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	285	Yes
J	Elbow Rest Height	182.8 – 203.2	193	Yes
K	Buttock to Knee Length	520.7 – 546.1	534	Yes
L	Popliteal Height	355.6 – 376	359	Yes
M	Knee Pivot Height	393.7 – 419.1	398	Yes
N	Buttock Popliteal Length	414 – 439.4	420	Yes
O	Chest Depth without Jacket	175.3 – 190.5	185	Yes
P	Foot Length (right)	218.5 – 233.7	219	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	469	Yes
S	Head Breadth	137.1 – 147.3	143	Yes
T	Head Depth	177.8 – 188	183	Yes
U	Hip Breadth	299.7 – 314.9	311	Yes
V	Shoulder Breadth	350.5 – 365.7	356	Yes
W	Foot Breadth	78.8 – 94	81	Yes
X	Head Circumference	528.3 – 548.7	536	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	861	Yes
Z	Waist Circumference	759.5 – 789.9	770	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	346	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	164	Yes

Technician: M. Geesey

Date: 11/22/2013

Hybrid III 5<sup>th</sup> Female External Measurements

Reference Diagram





VERIFICATION REPORT

Test Name:	<b>Head Drop</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Head Drop</b>	Test Date:	<b>11/21/2013</b>
		Test Time:	<b>2:44:26 PM</b>

Component Part Number	Component Serial Number
<b>Head Skin - 78051-228</b>	<b>912</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>26.1</b> %RH P
Resultant Acceleration	250 -- 300	<b>272.2</b> g P
Oscillation	0 -- 10	<b>0.0</b> % P
Lateral Acceleration	-15 -- 15	<b>7.3</b> g P

All test parameters are within specifications

Technician:           **M. Geesey**          

Supervisor:           **E. Dutton**



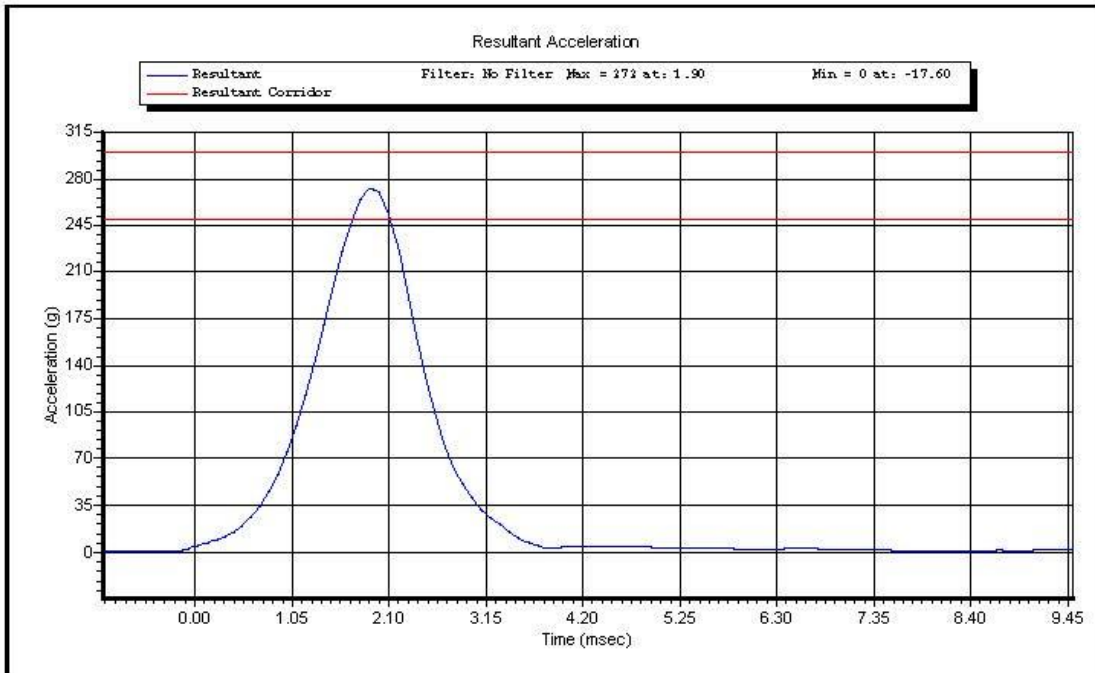
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



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

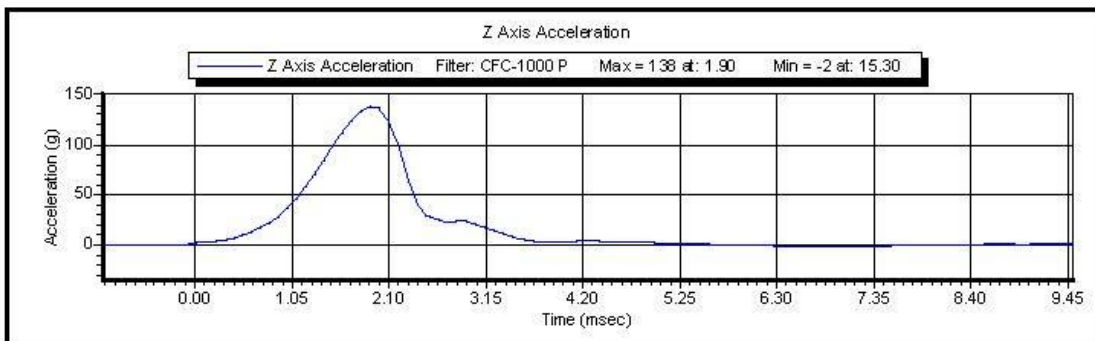
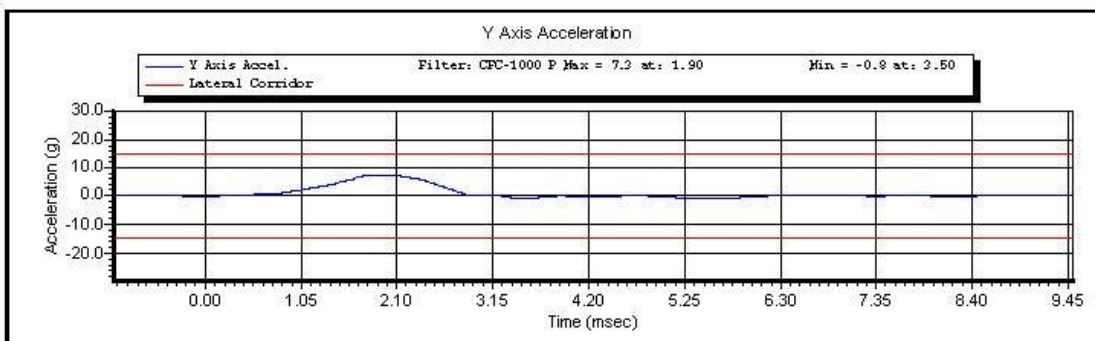
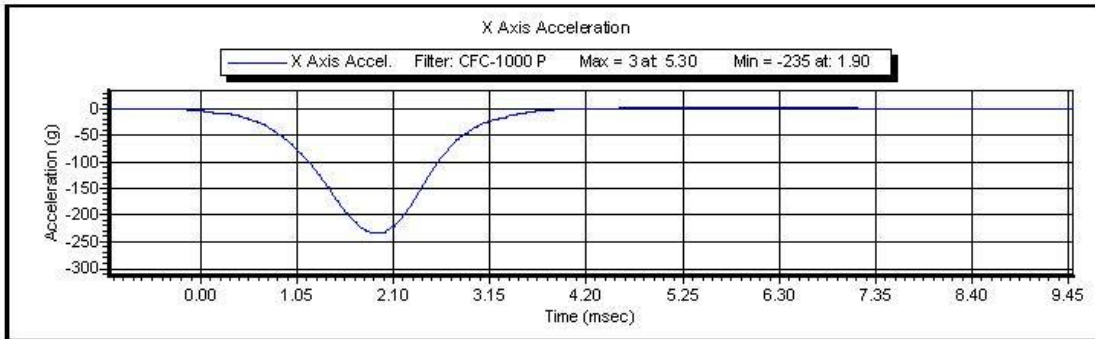


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Test Time: **2:44:26 PM**

Test Date: **11/21/2013**

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Test ID: **Head Drop**

Test Time: **2:44:26 PM**

Test Date: **11/21/2013**

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VERIFICATION REPORT

Test Name:	<b>Neck Extension</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Neck Extension</b>	Test Date:	<b>11/21/2013</b>
		Test Time:	<b>7:02:46 PM</b>

Component Part Number	Component Serial Number
<b>Neck - 880105-255</b>	<b>7121</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.4</b> deg C P
Humidity	10 -- 70	<b>30.3</b> %RH P
Velocity	5.95 -- 6.19	<b>6.135</b> m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	<b>1.79</b> m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	<b>3.59</b> m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	<b>5.20</b> m/s P
D Plane Rotation	99 -- 114	<b>104.2</b> degrees P
Moment During Rotation Interval	-65 -- -53	<b>-60.0</b> Nm P
Moment Decay to -10.0 Nm	94 -- 114	<b>100.9</b> 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	1/11/2013
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/25/2013
DentonATD	78051-342	CONDYLE POT	4/19/2013
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013



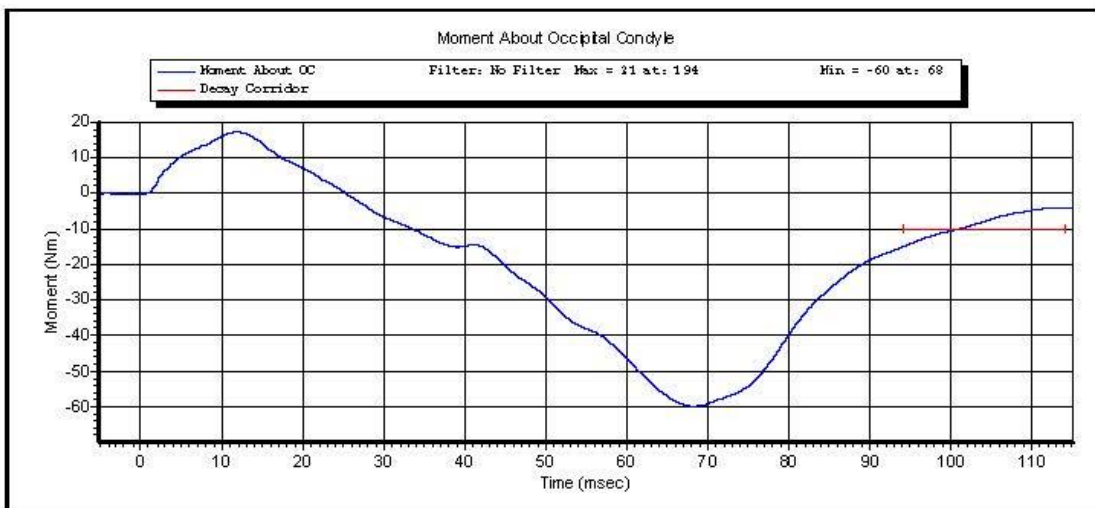
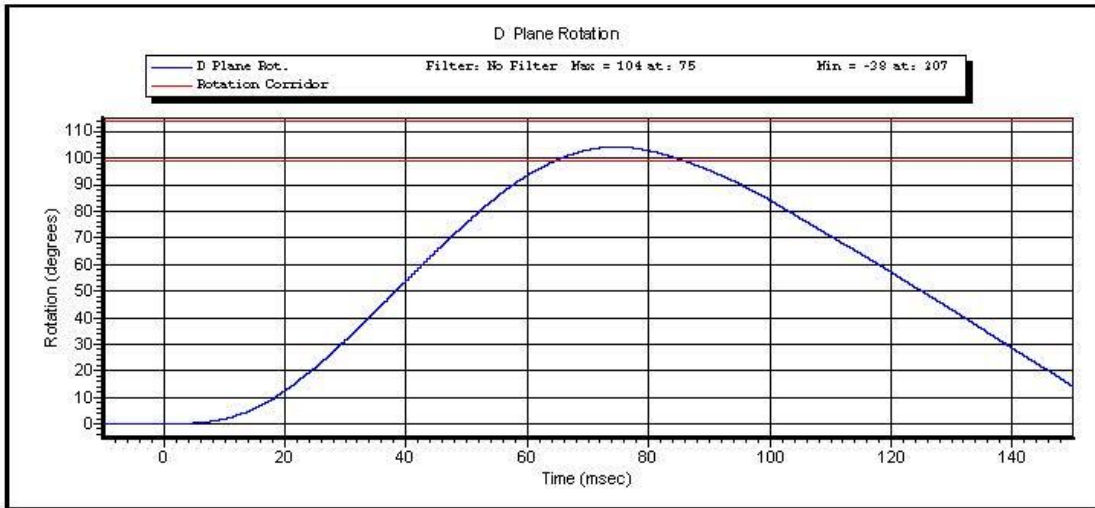
Test Name: **Neck Extension**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 5th Female**  
ATD Serial Number: **288**



Test ID: **Neck Extension** Test Time: **7:02:46 PM**

Test Date: **11/21/2013**

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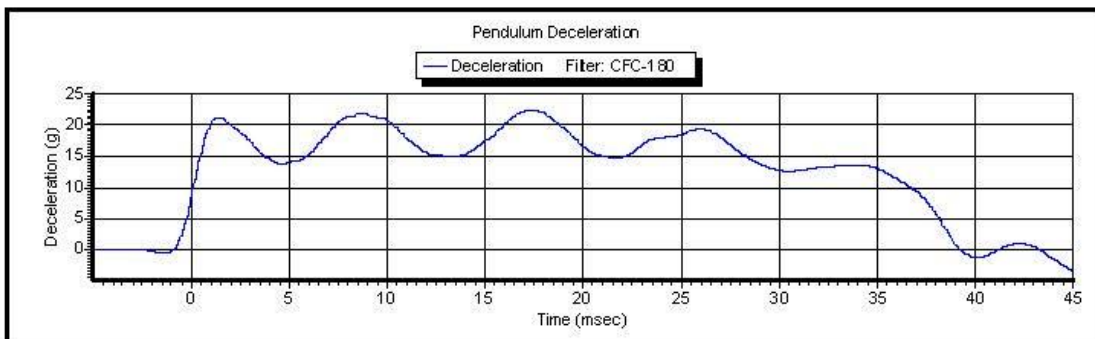
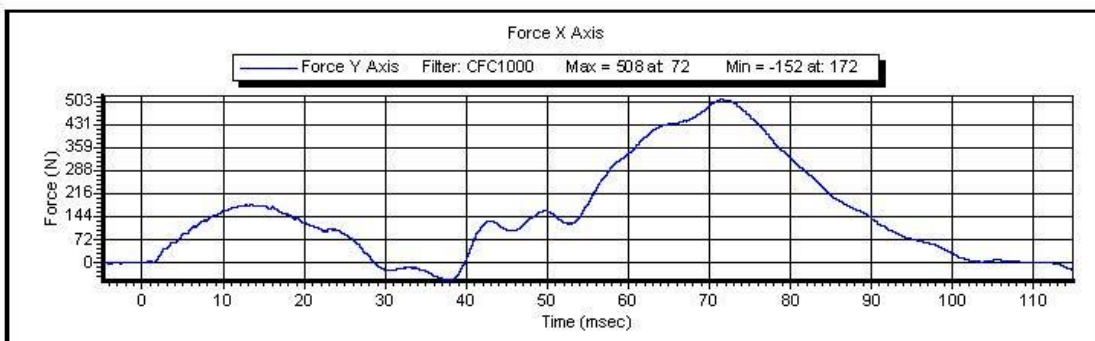
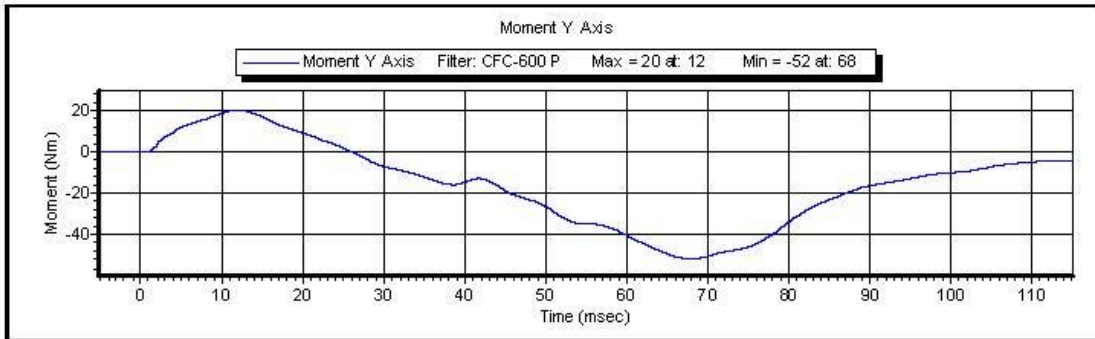


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Test Time: 7:02:46 PM

Test Date: 11/21/2013

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Test ID: **Neck Extension** Test Time: **7:02:46 PM**

Test Date: **11/21/2013**

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### VERIFICATION REPORT

Test Name:	<b>Neck Flexion</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Neck Flexion</b>	Test Date:	<b>11/21/2013</b>
		Test Time:	<b>4:28:24 PM</b>

Component Part Number	Component Serial Number
<b>Neck - 880105-255</b>	<b>7121</b>
<b>Head Skin - 880105-109</b>	<b>912</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.5</b> deg C P
Humidity	10 -- 70	<b>28.6</b> %RH P
Velocity	6.89 -- 7.13	<b>7.098</b> m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	<b>2.31</b> m/s P
Pendulum Impulse at 20 ms	4 -- 5	<b>4.6</b> m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	<b>6.59</b> m/s P
D Plane Rotation	-91 -- -77	<b>-79.5</b> degrees P
Moment During Rotation Interval	69 -- 83	<b>74.9</b> Nm P
Moment Decay to 10.0 Nm	80 -- 100	<b>85.2</b> ms P

All test parameters are within specifications

Technician:           **M. Geesey**          

Supervisor:           **E. Dutton**



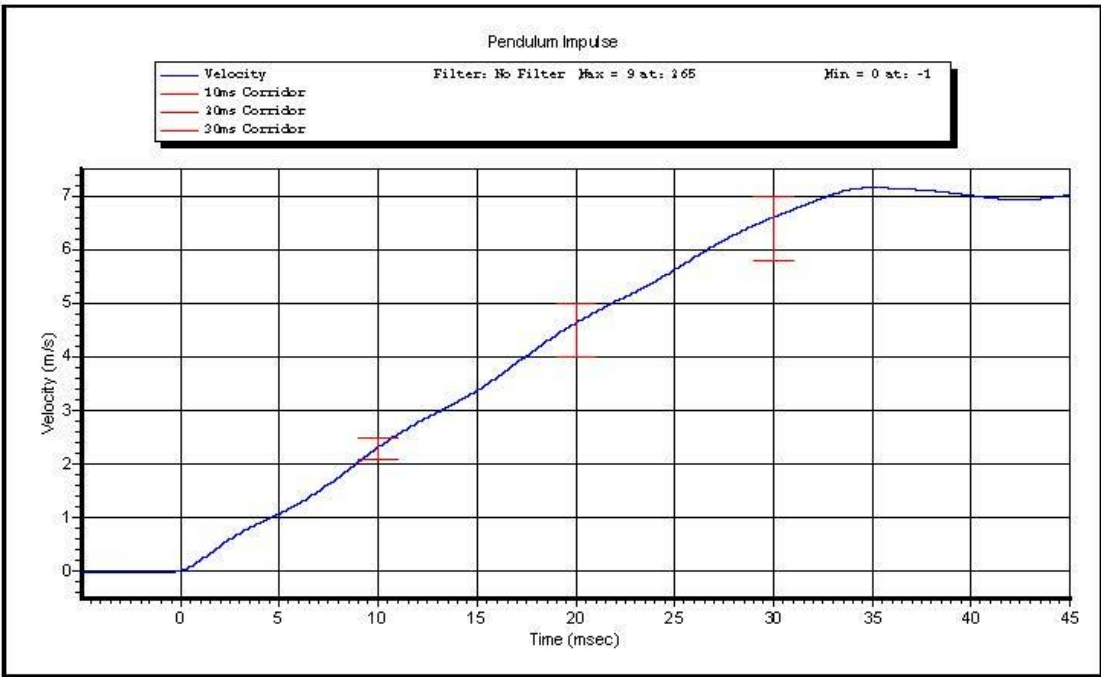
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/25/2013
DentonATD	78051-342	CONDYLE POT	4/19/2013
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013

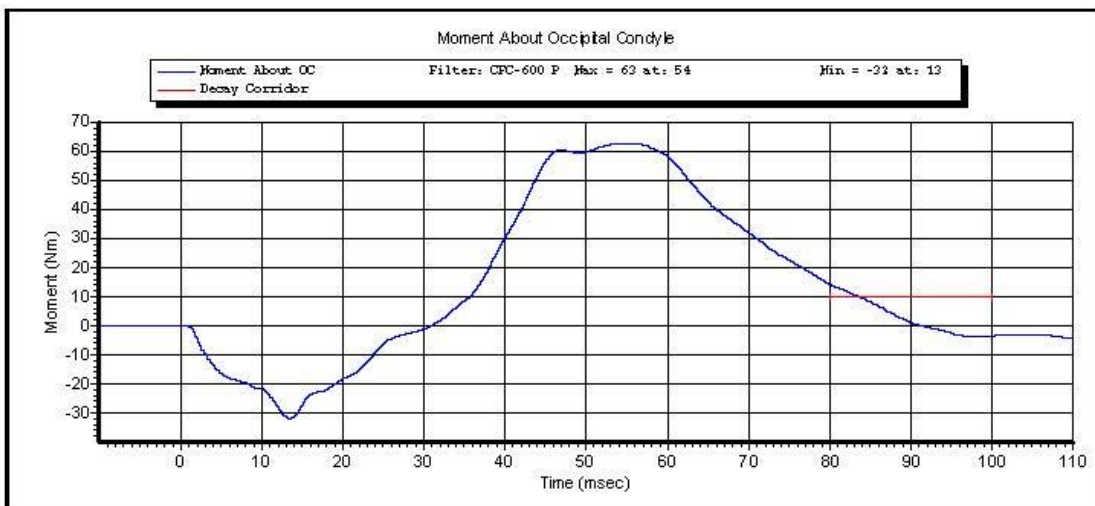
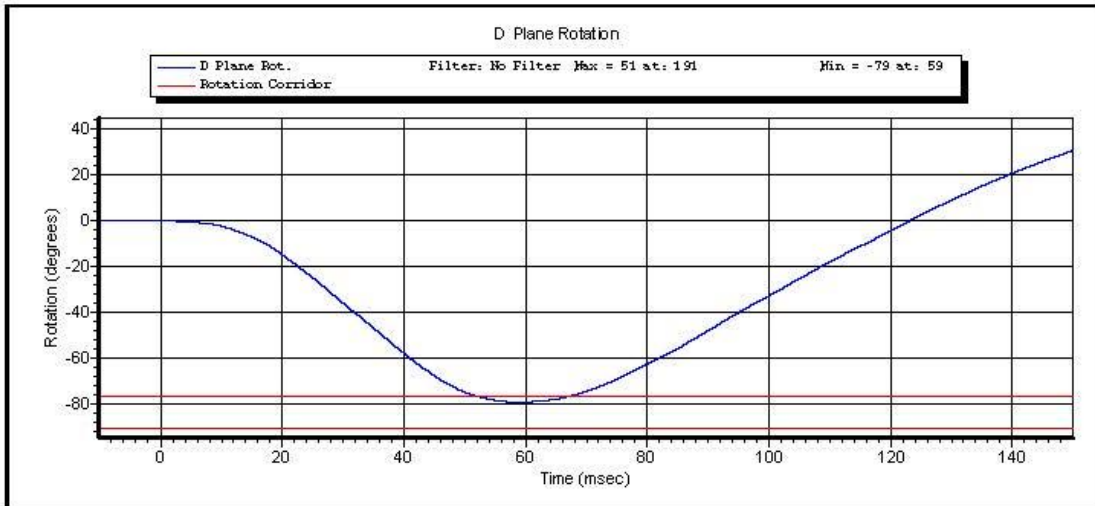


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Sub Test Name:  
ATD Type: **Hybrid 3 - 5th Female**  
ATD Serial Number: **288**



Test ID: **Neck Flexion** Test Time: **4:28:24 PM** Test Date: **11/21/2013**

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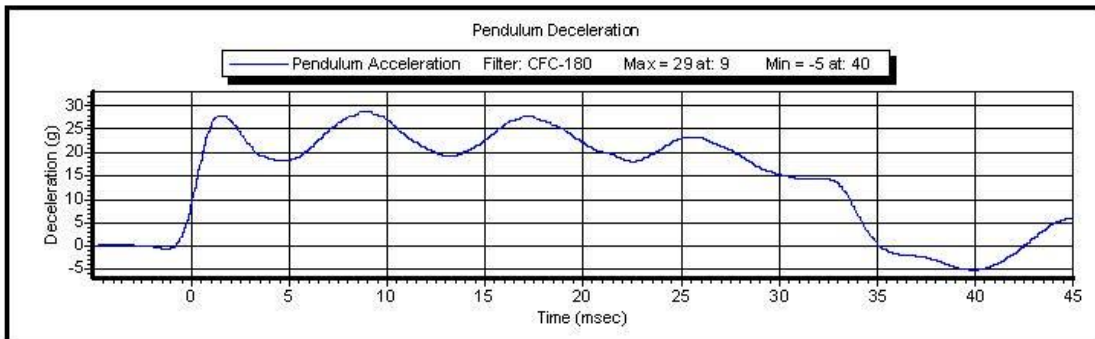
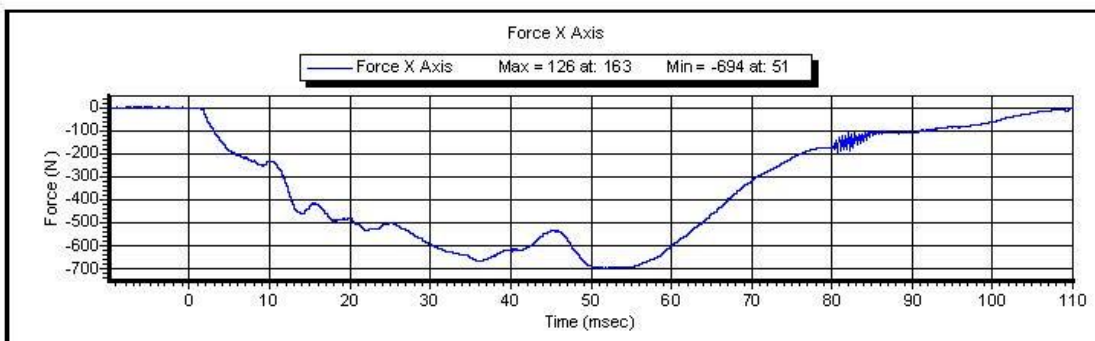
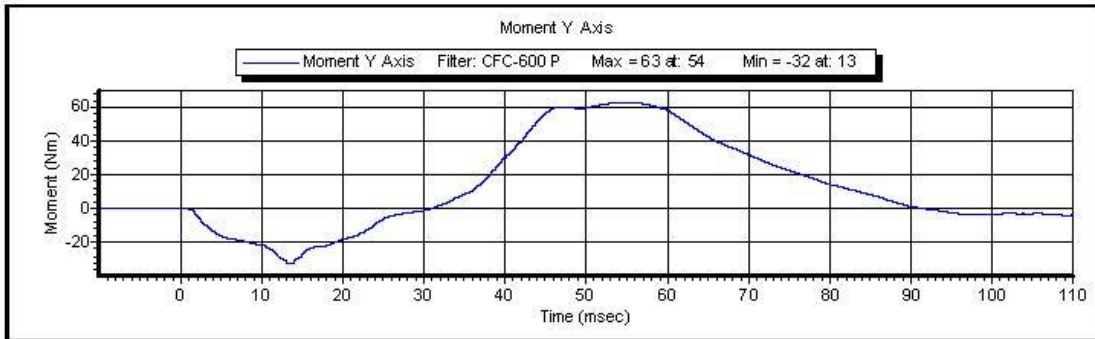


Test ID: Neck Flexion

Test Time: 4:28:24 PM

Test Date: 11/21/2013

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Test ID: **Neck Flexion**

Test Time: **4:28:24 PM**

Test Date: **11/21/2013**

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**Torso Flexion**

**Pre-Test**

**Part 5720 HIII 5% Female**

ATD Serial No: 288

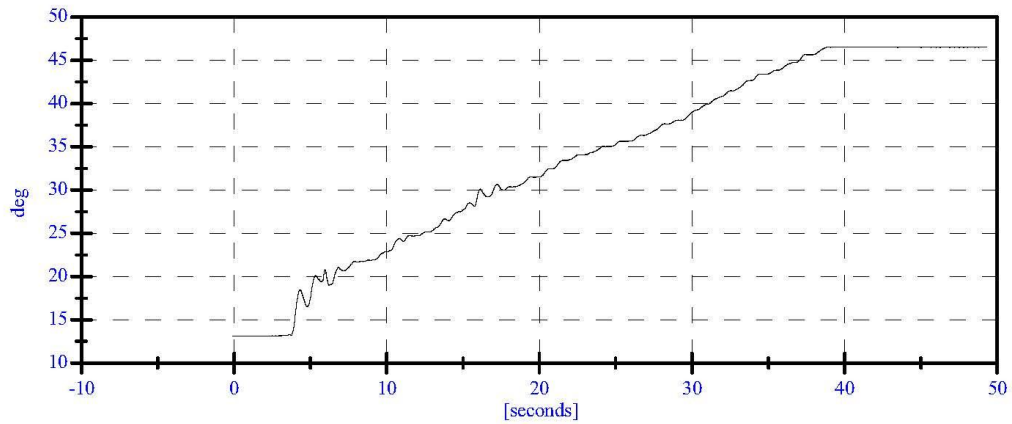
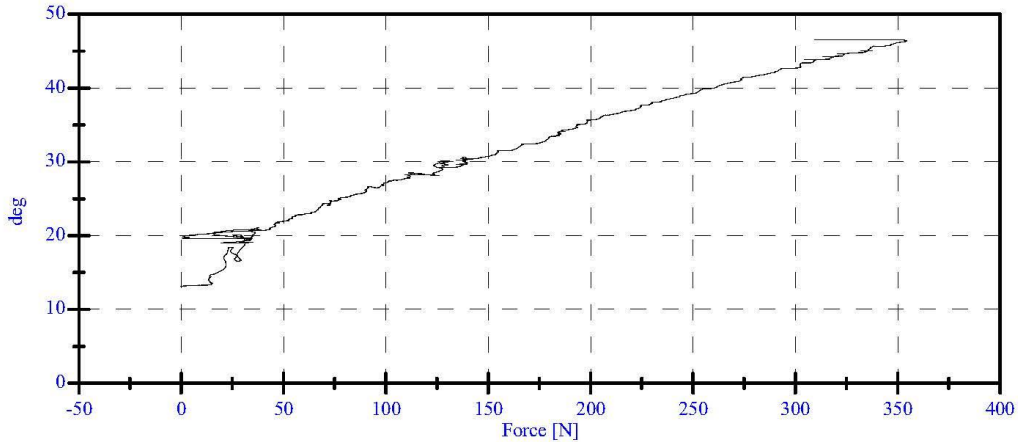
Laboratory Supervisor: E. Dutton

Date: 11/27/2013

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	20.4 C	Passed
Lab Humidity:	10-70 %	24.00 %	Passed
Initial Angle:	0.00-20.00 Deg	13.11 Deg	Passed
Force at 45 Deg	320.00-390.00 N	354.60 N	Passed
Return Angle	8 Deg Max from Initial	19.30 deg	Passed

**LUMBAR SPINE FLEXION TEST**





### VERIFICATION REPORT

Test Name:	<b>Thorax Impact</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Thorax Impact</b>	Test Date:	<b>11/22/2013</b>
		Test Time:	<b>8:26:28 PM</b>

Component Part Number	Component Serial Number
<b>Chest Jacket - 880105-355-E</b>	<b>DG8843</b>
<b>Lumbar Spine - 880105-1095</b>	<b>288</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.0</b> deg C P
Humidity	10 -- 70	<b>36.4</b> %RH P
Velocity	6.59 -- 6.83	<b>6.730</b> m/s P
Sternum Displacement	-58 -- -50	<b>-50.5</b> mm P
Force During Displacement Interval	-4400 -- -3900	<b>-4170.2</b> N P
Force -18.0 to -50.0 Displacement	-4600 -- 0	<b>-4239.6</b> N P
Hysteresis	69 -- 85	<b>74.1</b> % 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	1/11/2013
Endevco	7231CT	C14953	6/3/2013
SERVO	14 CB1-2897	DS-288	11/21/2013



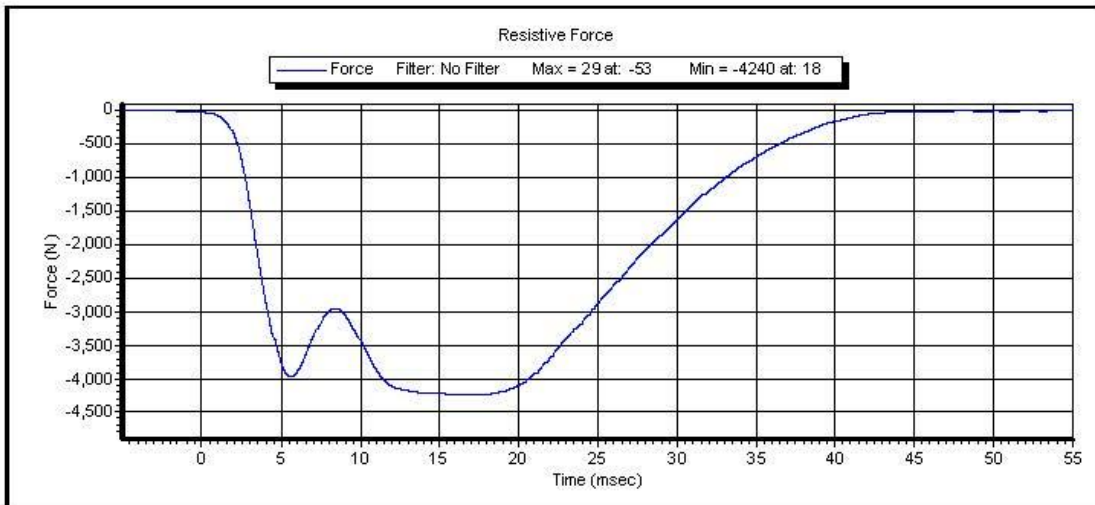
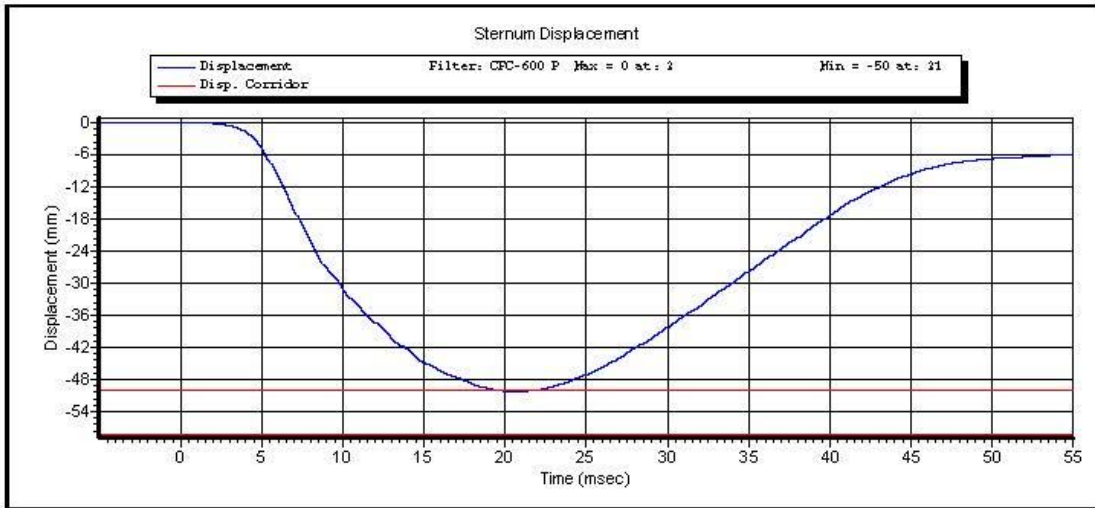
Test Name: **Thorax Impact**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 5th Female**  
ATD Serial Number: **288**



Test ID: **Thorax Impact**      Test Time: **8:26:28 PM**

Test Date: **11/22/2013**

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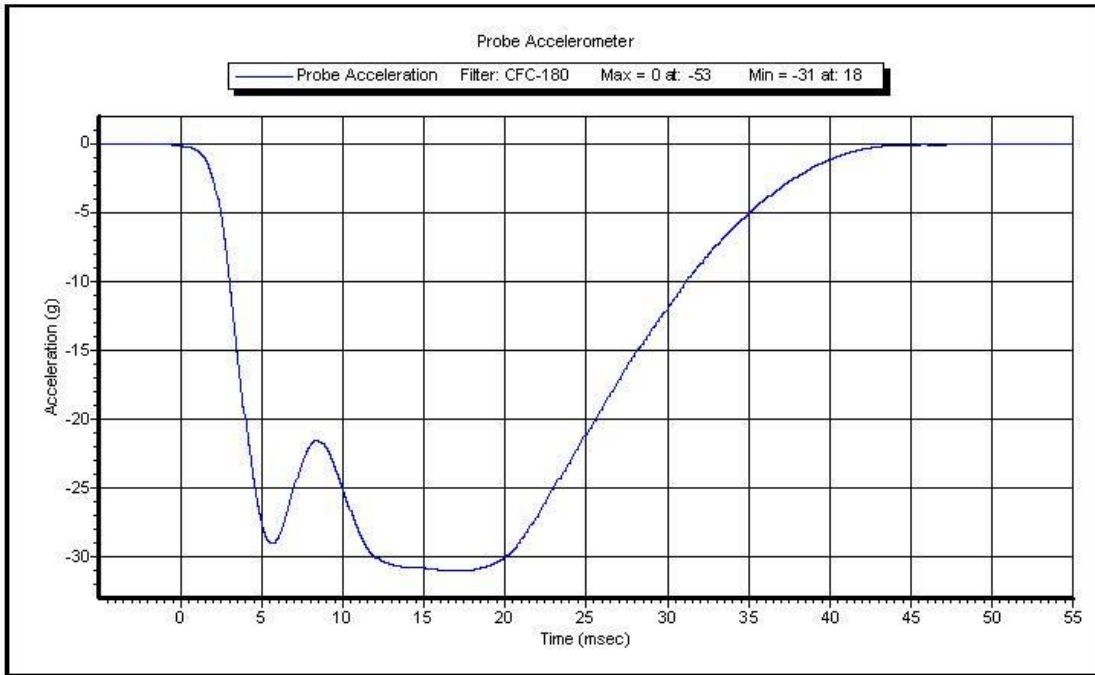


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Test Time: **8:26:28 PM**

Test Date: **11/22/2013**

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Test ID: **Thorax Impact**

Test Time: **8:26:28 PM**

Test Date: **11/22/2013**

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VERIFICATION REPORT

Test Name:	<b>Knee Impact</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Knee Impact Left</b>	Test Date:	<b>11/21/2013</b>
		Test Time:	<b>7:32:40 PM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 880105-508</b>	<b>1729 (Left)</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>26.8</b> %RH P
Velocity	2.07 -- 2.13	<b>2.087</b> m/s P
Resistive Force	-4060 -- -3450	<b>-3465.4</b> 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	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	6/3/2013



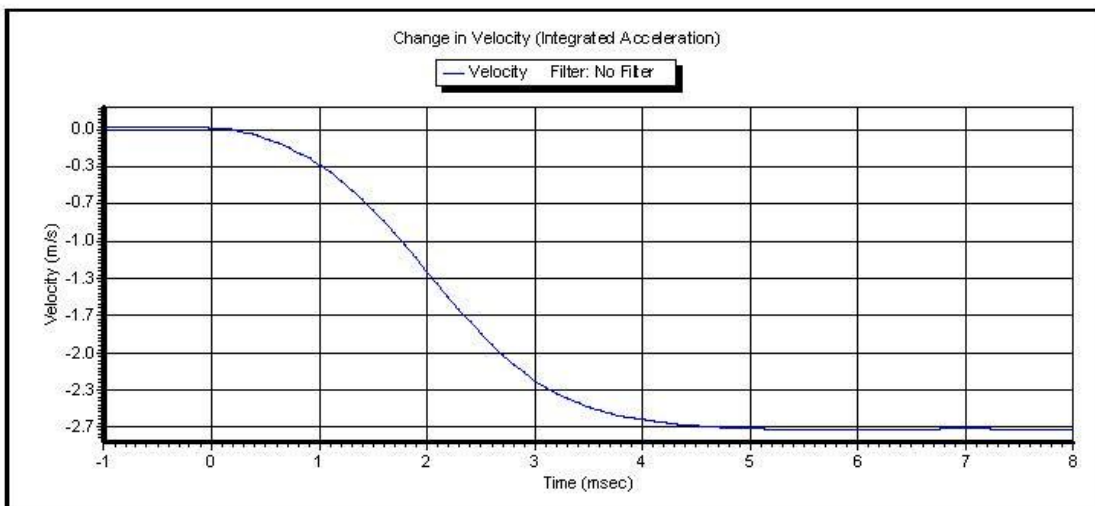
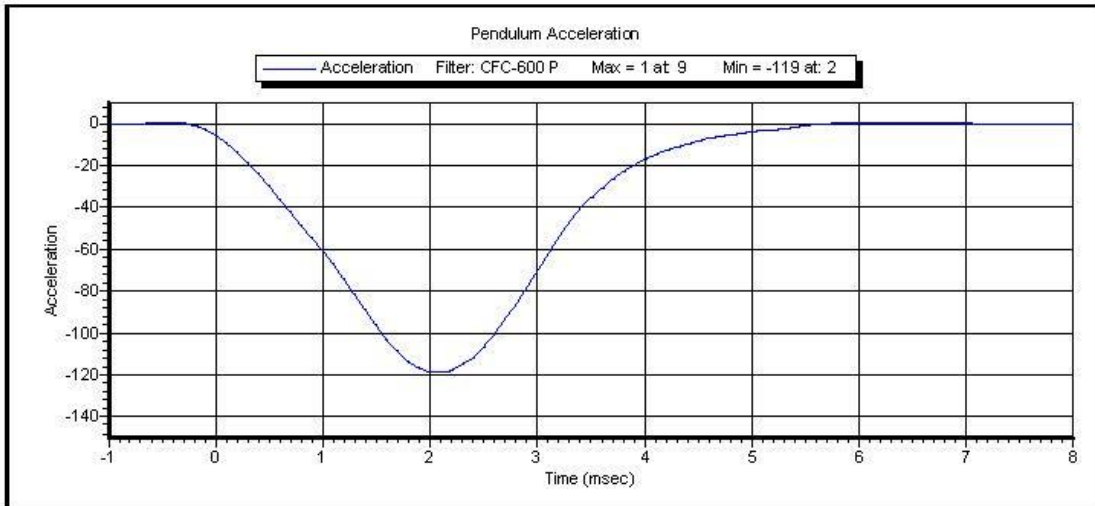
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Sub Test Name:	
ATD Type:	<b>Hybrid 3 - 5th Female</b>
ATD Serial Number:	<b>288</b>



Test ID: **Knee Impact Left** Test Time: **7:32:40 PM**

Test Date: **11/21/2013**

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Test ID: **Knee Impact Left** Test Time: **7:32:40 PM**

Test Date: **11/21/2013**

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VERIFICATION REPORT

Test Name:	<b>Knee Impact</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Knee Impact Right</b>	Test Date:	<b>11/22/2013</b>
		Test Time:	<b>8:49:06 AM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 880105-508</b>	<b>1728 (Right)</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.2</b> deg C P
Humidity	10 -- 70	<b>39.5</b> %RH P
Velocity	2.07 -- 2.13	<b>2.093</b> m/s P
Resistive Force	-4060 -- -3450	<b>-3530.3</b> N P

All test parameters are within specifications

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



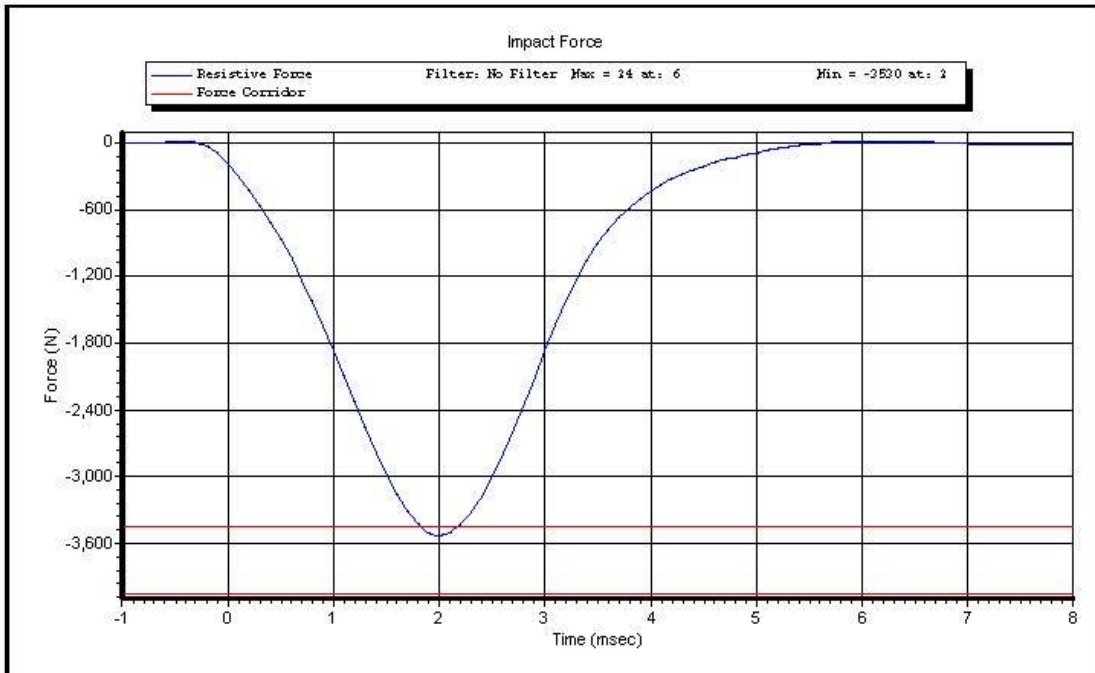
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	6/3/2013



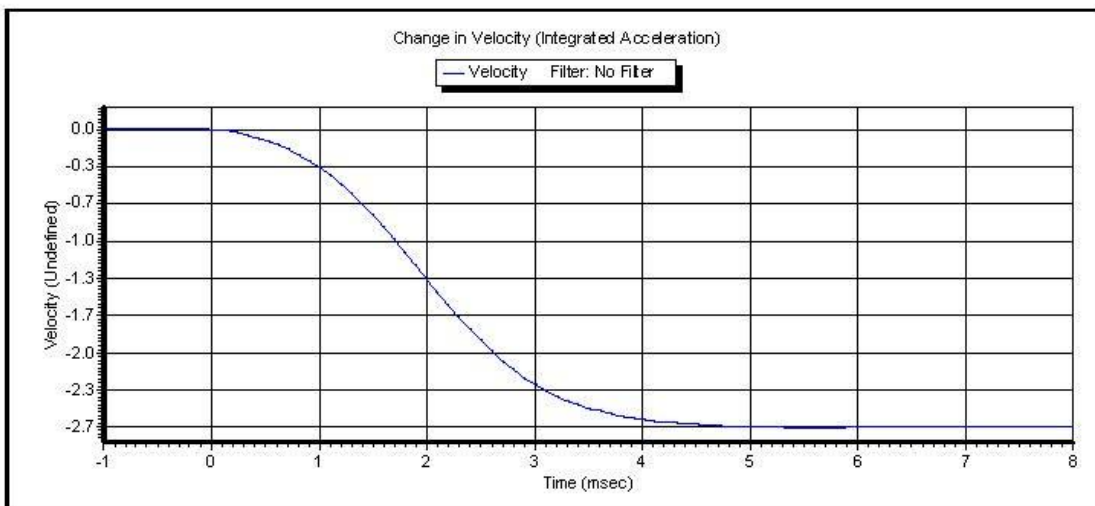
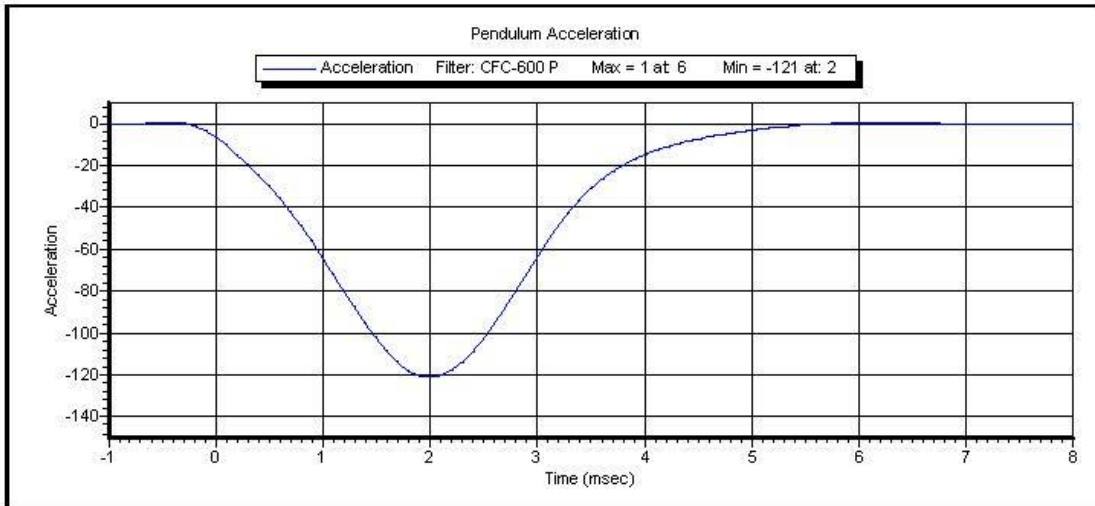
Test Name: **Knee Impact**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 5th Female**  
ATD Serial Number: **288**



Test ID: **Knee Impact Right** Test Time: **8:49:06 AM**

Test Date: **11/22/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Knee Impact Right** Test Time: **8:49:06 AM**

Test Date: **11/22/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

**CALIBRATION TEST RESULTS**

**POST-TEST**

**HYBRID III 50<sup>TH</sup> PERCENTILE MALE - DRIVER ATD**

**SERIAL NO: 061**



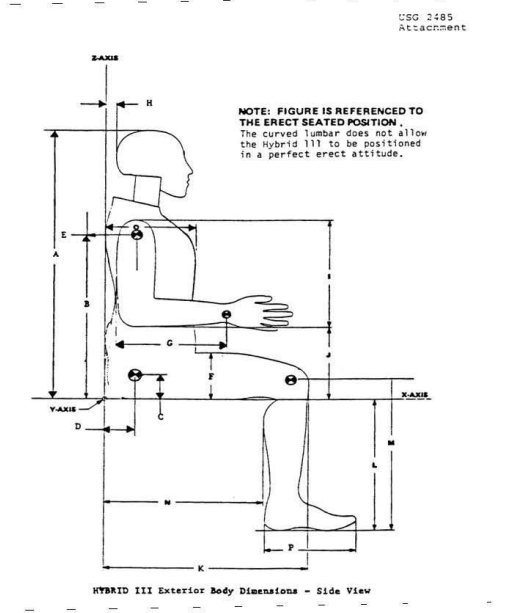
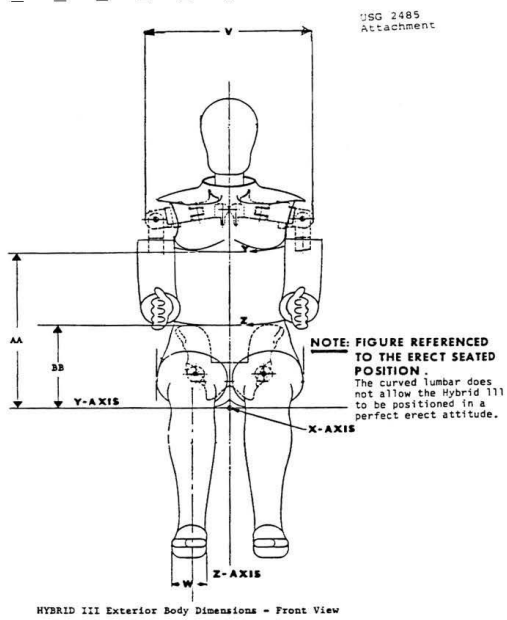
## 50<sup>th</sup> Male External Measurements

S/N 061

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 - 35	34.9	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.1	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	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	13.3	Yes
J	Elbow Rest Height	7.5 - 8.3	8.0	Yes
K	Buttock to Knee Length	22.8 - 23.8	23.6	Yes
L	Popliteal Height	16.9 - 17.9	16.9	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	8.7	Yes
P	Foot Length (right)	9.9 - 10.5	10.2	Yes
V	Shoulder Breadth	16.3 - 17.2	16.7	Yes
W	Foot Breadth	3.6 - 4.2	4.0	Yes
Y	Chest Circumference with Jacket	38.2 - 39.4	38.9	Yes
Z	Waist Circumference	32.9 - 34.1	33.7	Yes
AA	Reference Location (Chest Circumference)	16.9 - 17.1	16.9	Yes
BB	Reference Location (Waist Circumference)	8.9 - 9.1	9.0	Yes

Technician: R.Weil

Date: 12/5/2013





VERIFICATION REPORT

Test Name:	<b>Head Drop</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male -NEW</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Head Drop</b>	Test Date:	<b>12/4/2013</b>
		Test Time:	<b>3:33:25 PM</b>

Component Part Number	Component Serial Number
<b>Head Skin - 78051-228</b>	<b>022544</b>
<b>Cap Skin - 78051-229</b>	<b>20496</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.8</b> deg C P
Humidity	10 -- 70	<b>35.0</b> %RH P
Resultant Acceleration	225 -- 275	<b>266.3</b> g P
Oscillation	0 -- 10	<b>0.0</b> % P
Lateral Acceleration	-15 -- 15	<b>-2.9</b> g P

All test parameters are within specifications

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



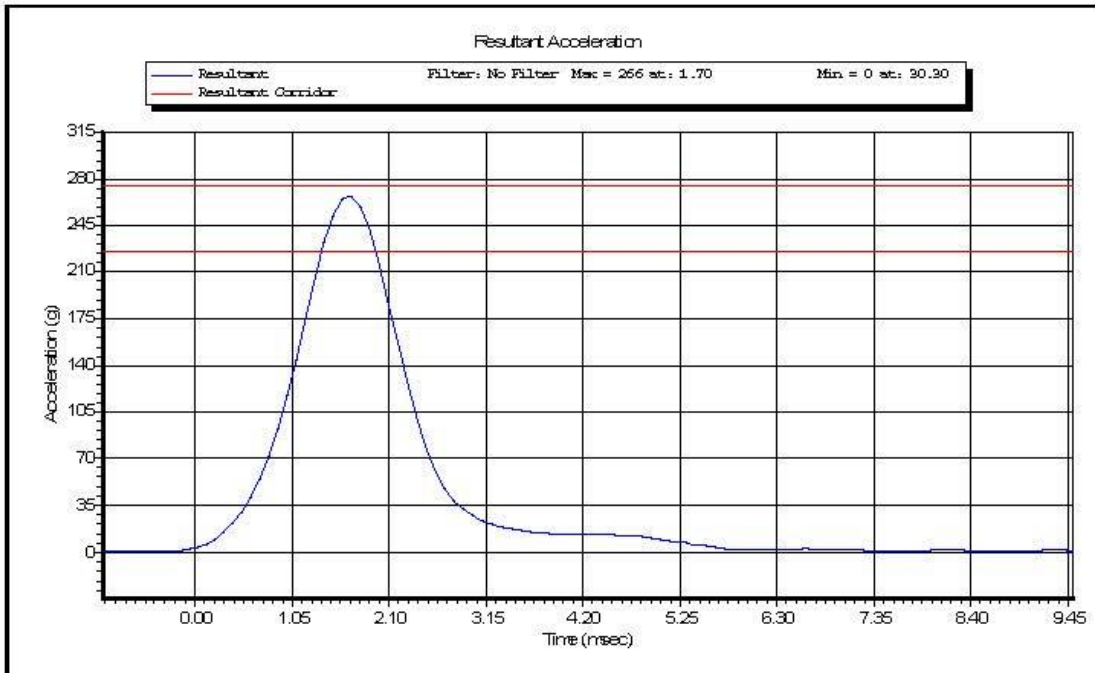
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58871	6/11/2013
Endevco	7264-2000	P12359	6/11/2013
Endevco	7264-2000	P52133	6/11/2013



Test Name: **Head Drop**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male -NEW**  
ATD Serial Number: **061**

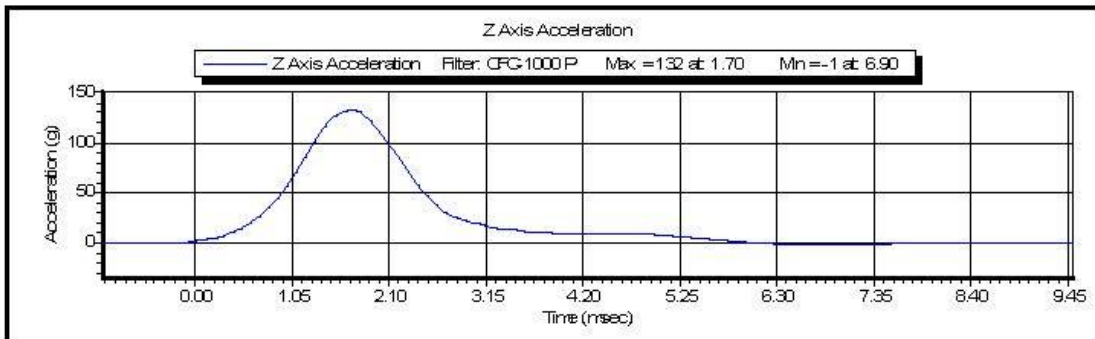
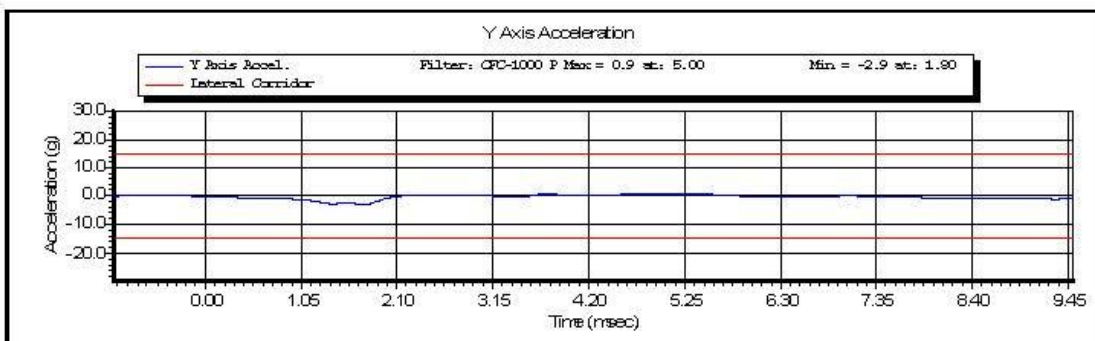
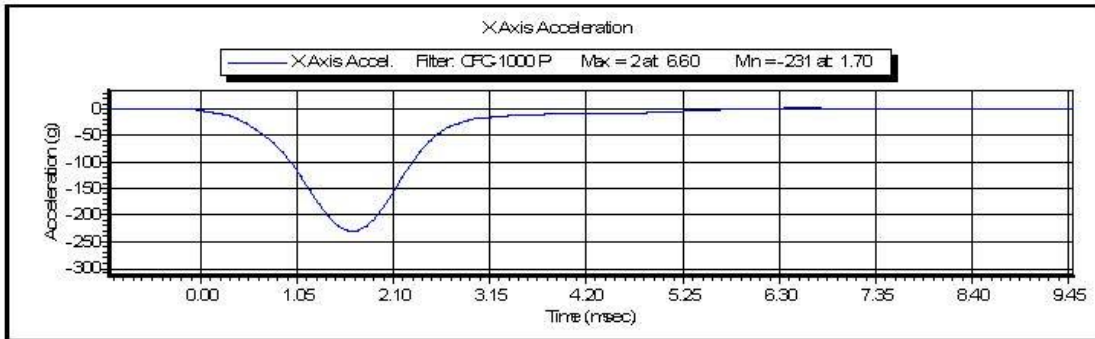


Test ID: **Head Drop**

Test Time: **3:33:25 PM**

Test Date: **12/4/2013**

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Test ID: **Head Drop**

Test Time: **3:33:25 PM**

Test Date: **12/4/2013**

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VERIFICATION REPORT

Test Name:	<b>Neck Extension</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Neck Extension</b>	Test Date:	<b>12/5/2013</b>
		Test Time:	<b>10:17:25 AM</b>

Component Part Number	Component Serial Number
<b>Neck - 78051-336</b>	<b>4194</b>
<b>Head Skin - 78051-220</b>	<b>0220544</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.6</b> deg C P
Humidity	10 -- 70	<b>47.6</b> %RH P
Velocity	5.94 -- 6.19	<b>6.123</b> m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	<b>18.98</b> g P
Pendulum Deceleration at 20 ms	14 -- 19	<b>17.1</b> g P
Pendulum Deceleration at 30 ms	11 -- 16	<b>13.6</b> g P
Max Pendulum Deceleration after 30 ms	0 -- 22	<b>13.6</b> g P
Decel Time to 5 g	38 -- 46	<b>39.8</b> ms P
D Plane Rotation	81 -- 106	<b>95.8</b> degrees P
Time at Max Rotation	72 -- 82	<b>74.9</b> ms P
Rotation Decay to Zero	147 -- 174	<b>155.6</b> ms P
Moment About Occipital Condyle	-80.0 -- -52.9	<b>-70.91</b> Nm P
Time at Max Moment	65 -- 79	<b>70.6</b> ms P
Moment Decay to Zero	120 -- 148	<b>137.4</b> ms P

All test parameters are within specifications

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



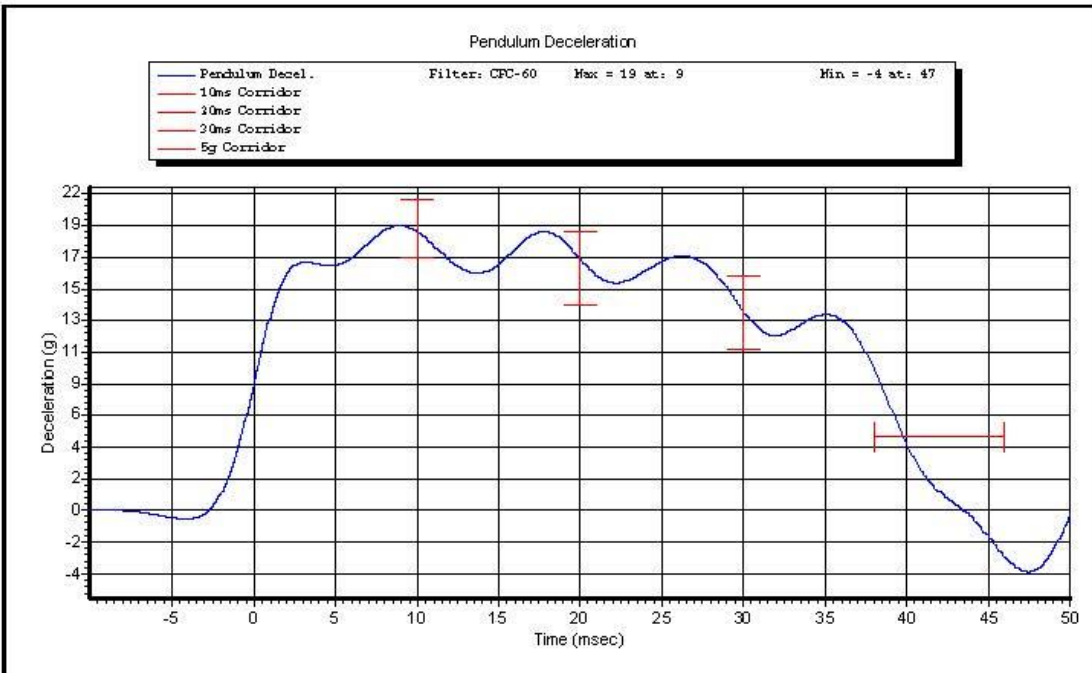
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/25/2013
DentonATD	78051-342	CONDYLE POT	4/19/2013
Denton	1716AFT	LC-2184 My	5/7/2013
Denton	1716AFT	LC-2184 Fx	5/7/2013



Name of Test:	<b>Neck Extension</b>
Name of Sub Test:	
Type of ATD:	<b>Hybrid 3 - 50th Male</b>
ATD Serial Number:	<b>061</b>

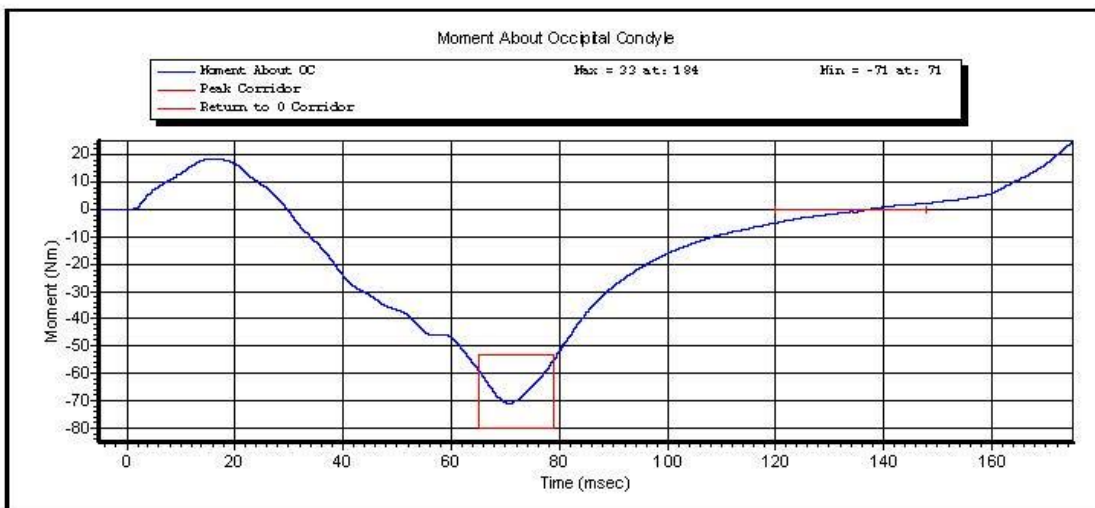
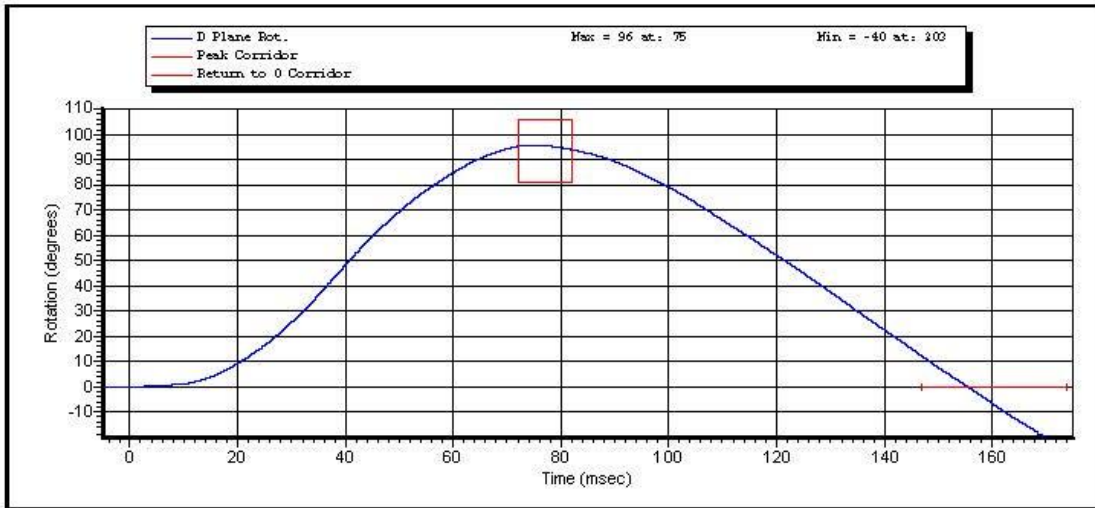


ID of Test: **Neck Extension**

Time of Test: **10:17:25 AM**

Date of Test: **12/5/2013**

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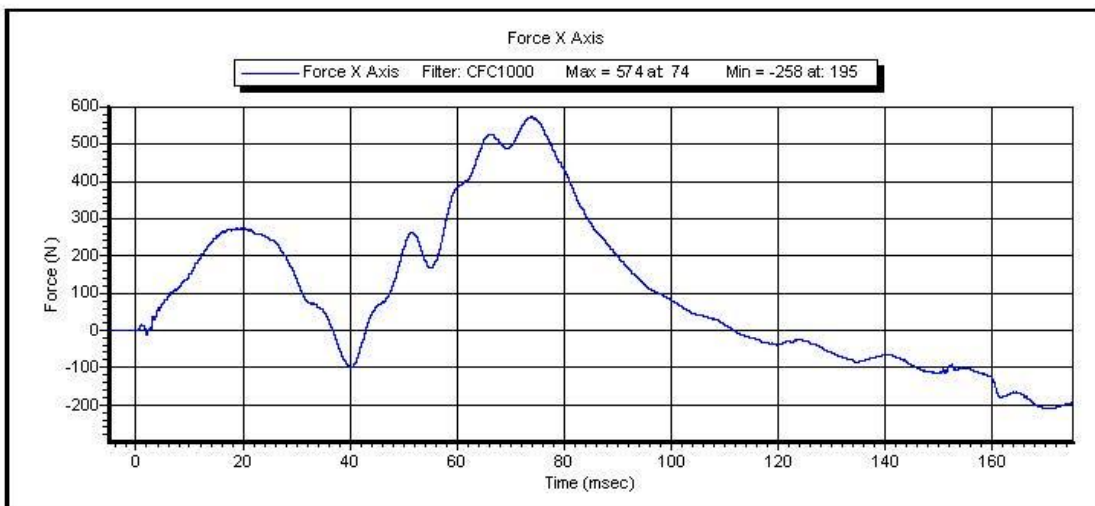
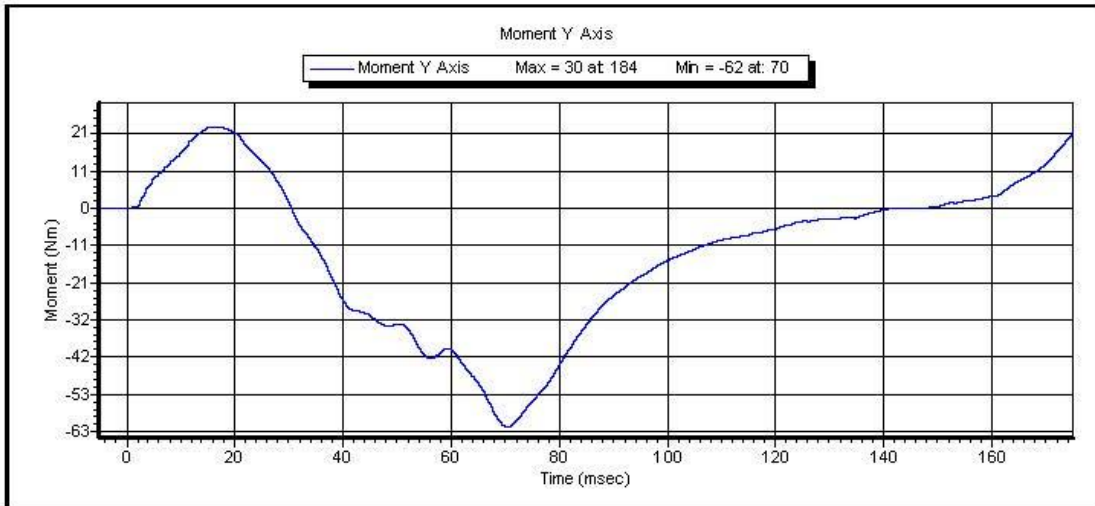


ID of Test: **Neck Extension**

Time of Test: **10:17:25 AM**

Date of Test: **12/5/2013**

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ID of Test: **Neck Extension**

Time of Test: **10:17:25 AM**

Date of Test: **12/5/2013**

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VERIFICATION REPORT

Test Name:	<b>Neck Flexion</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Neck Flexion</b>	Test Date:	<b>12/5/2013</b>
		Test Time:	<b>9:35:53 AM</b>

Component Part Number	Component Serial Number
<b>Neck - 78051-336</b>	<b>4194</b>
<b>Head Skin - 78051-220</b>	<b>0220544</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.5</b> deg C P
Humidity	10 -- 70	<b>47.0</b> %RH P
Velocity	6.89 -- 7.13	<b>7.096</b> m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	<b>23.55</b> g P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	<b>18.15</b> g P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	<b>14.42</b> g P
Max Pendulum Deceleration After 30 ms	0 -- 29	<b>14.4</b> g P
Deceleration time to 5 g	34 -- 42	<b>41.8</b> ms P
D Plane Rotation	-78 -- -64	<b>-72.9</b> degrees P
Time at max rotation	57 -- 64	<b>61.0</b> ms P
Rotation Decay to Zero	113 -- 128	<b>124.5</b> ms P
Moment about OC	88.1 -- 108.4	<b>88.87</b> Nm P
Time at Max Moment	47 -- 58	<b>54.6</b> ms P
Moment Decay to Zero	97 -- 107	<b>101.4</b> 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	1/11/2013
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/25/2013
DentonATD	78051-342	CONDYLE POT	4/19/2013
Denton	1716AFT	LC-2184 My	5/7/2013
Denton	1716AFT	LC-2184 Fx	5/7/2013



Name of Test: **Neck Flexion**  
Name of Sub Test:  
Type of ATD: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**

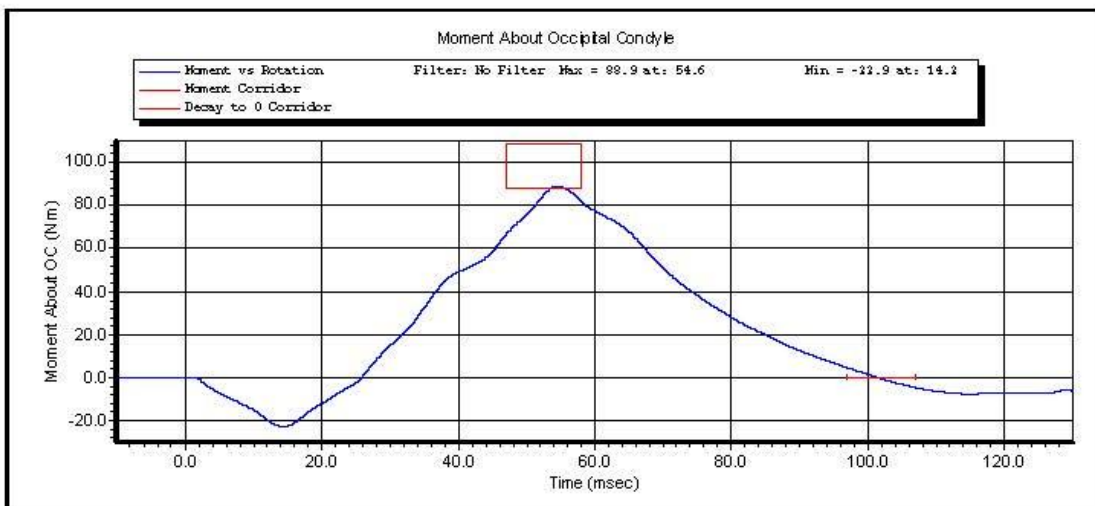
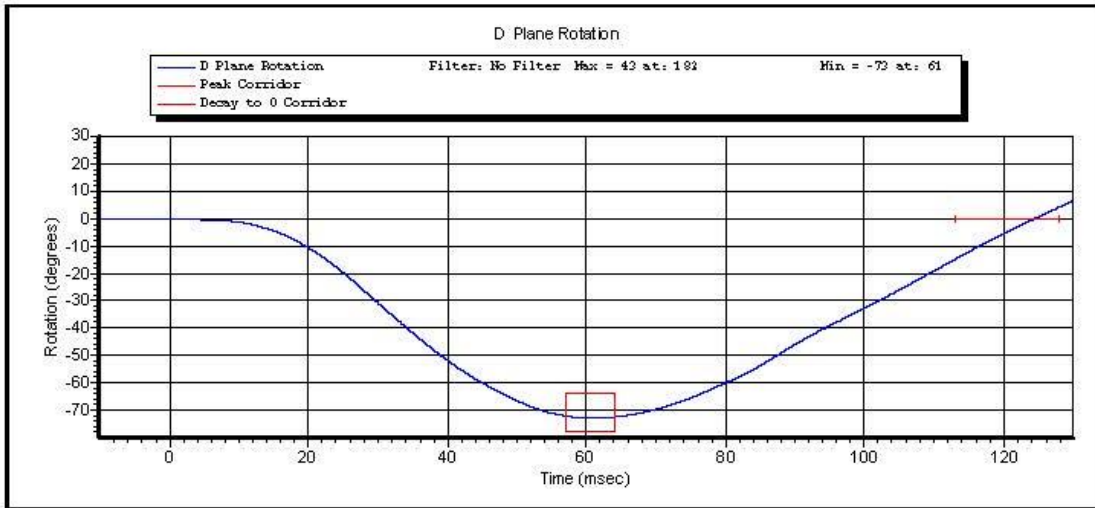


ID of Test: **Neck Flexion**

Time of Test: **9:35:53 AM**

Date of Test: **12/5/2013**

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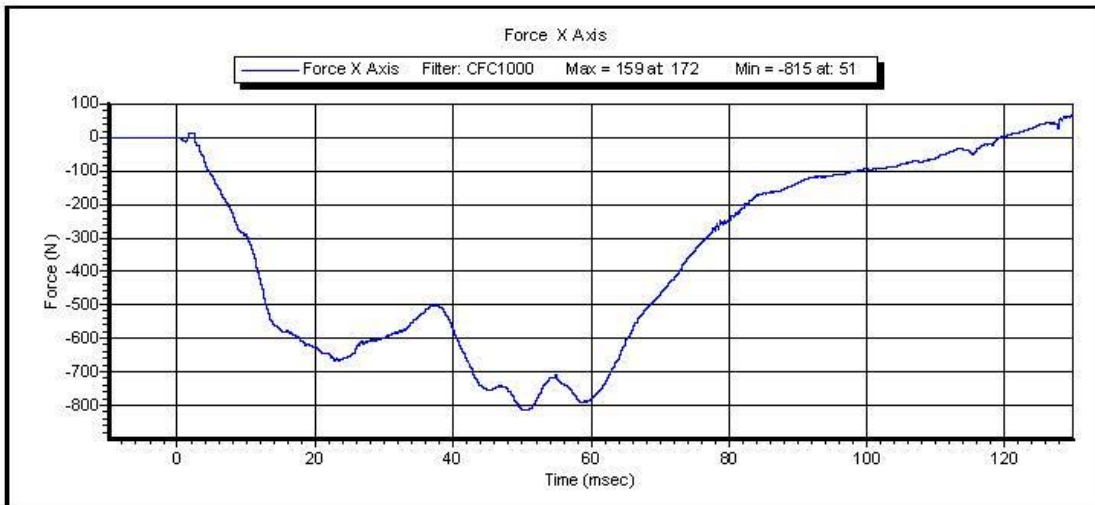
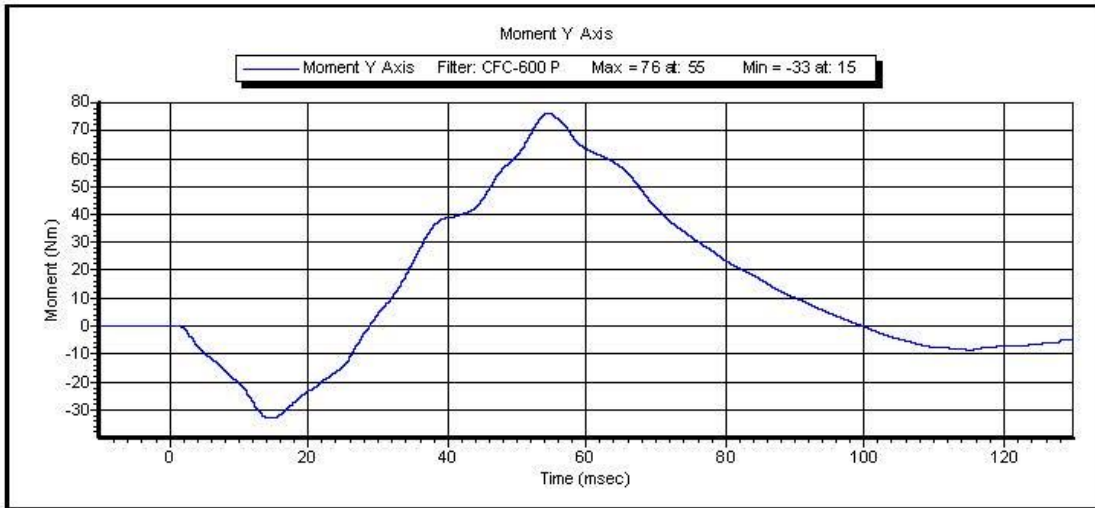


ID of Test: **Neck Flexion**

Time of Test: **9:35:53 AM**

Date of Test: **12/5/2013**

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ID of Test: **Neck Flexion**

Time of Test: **9:35:53 AM**

Date of Test: **12/5/2013**

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VERIFICATION REPORT

Test Name:	<b>Thorax Impact</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Thorax Impact</b>	Test Date:	<b>12/4/2013</b>
		Test Time:	<b>9:19:01 AM</b>

Component Part Number	Component Serial Number
<b>Ribs 78051-RS</b>	<b>2437</b>
<b>Chest Jacket - 78051-169</b>	<b>555</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.3</b> deg C P
Humidity	10 -- 70	<b>31.6</b> %RH P
Velocity	6.59 -- 6.83	<b>6.722</b> m/s P
Resistive Force	-5.894 -- -5.160	<b>-5.4850</b> kN P
Sternum Displacement	-72.6 -- -63.5	<b>-69.64</b> mm P
Hysteresis	69 -- 85	<b>72.2</b> % P

All test parameters are within specifications

Technician:           **M. Geesey**          

Supervisor:           **E. Dutton**



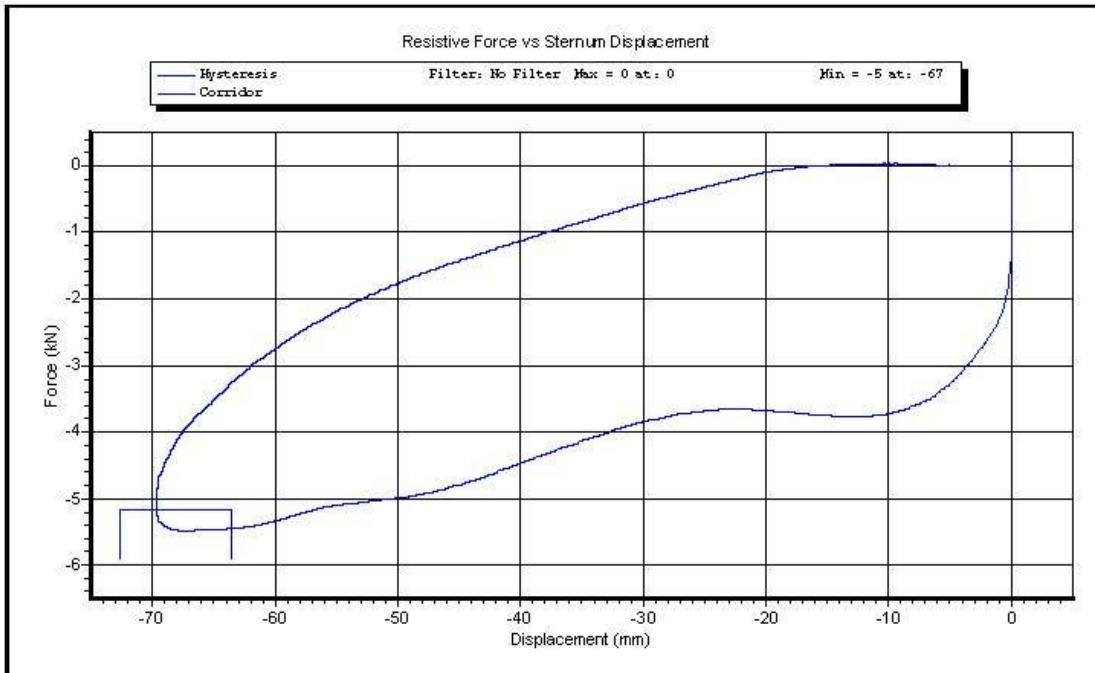
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	12/4/2013
DentonATD	78051-342	DS-061	5/14/2013



Test Name: **Thorax Impact**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**

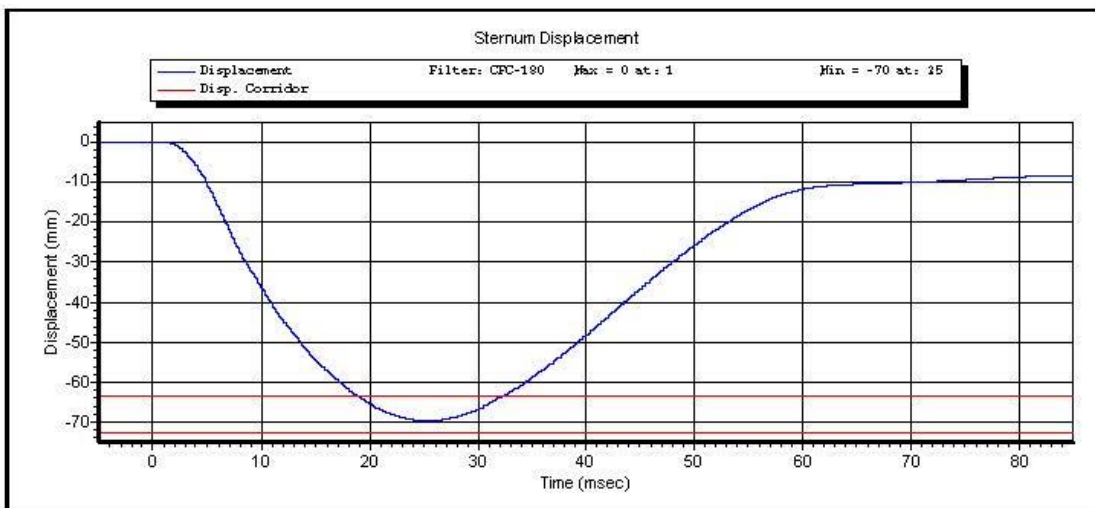
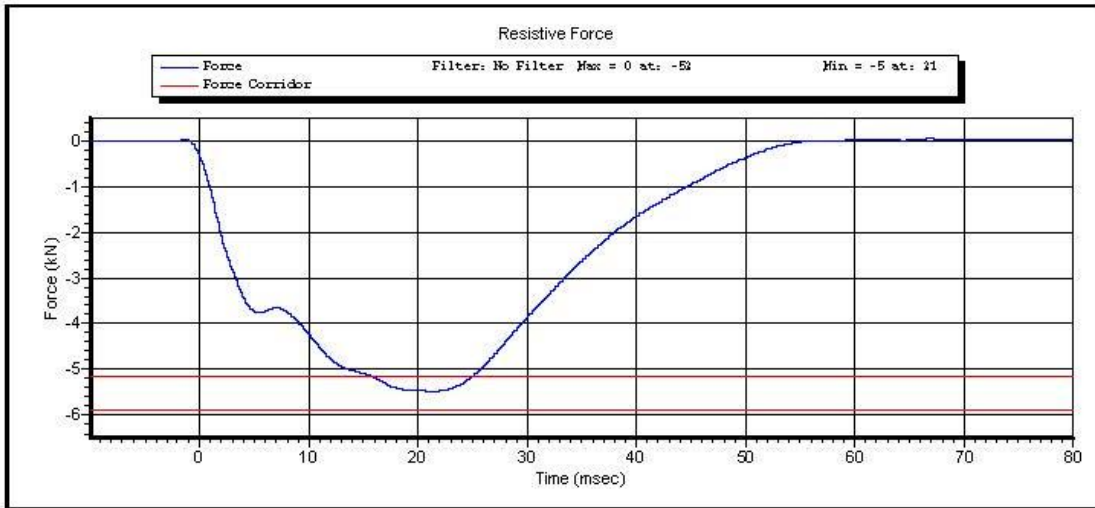


Test ID: **Thorax Impact**

Test Time: **9:19:01 AM**

Test Date: **12/4/2013**

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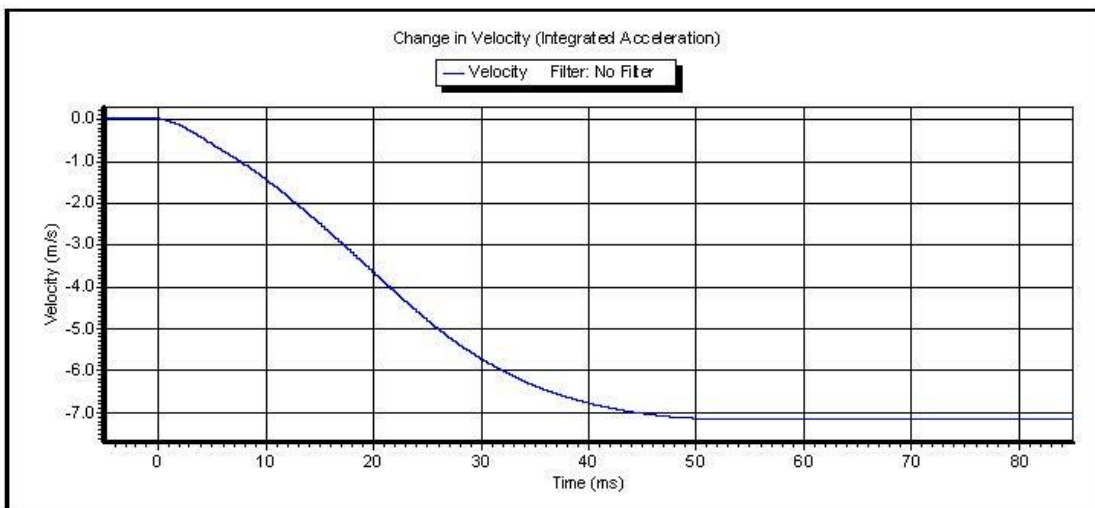
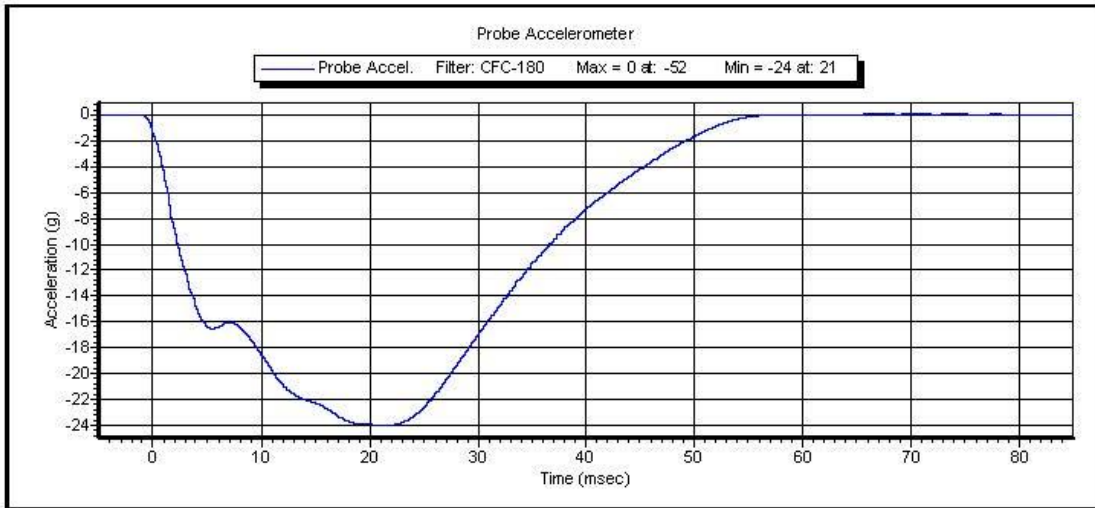


Test ID: **Thorax Impact**

Test Time: **9:19:01 AM**

Test Date: **12/4/2013**

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Test ID: **Thorax Impact**

Test Time: **9:19:01 AM**

Test Date: **12/4/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	<b>Hip ROM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Hip ROM Left</b>	Test Date:	<b>12/5/2013</b>
		Test Time:	<b>10:25:44 AM</b>

Component Part Number	Component Serial Number
<b>Pelvis Assembly 78051-60</b>	<b>DB459</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.7</b> deg C P
Humidity	10 -- 70	<b>47.5</b> %RH P
Average Velocity	5 -- 10	<b>5.02</b> deg/s P
Angle at 203 Nm	40 -- 50	<b>40.6</b> degrees P
Moment at 30 degrees	0.0 -- 94.9	<b>84.02</b> Nm P

All test parameters are within specifications

Technician:           **R. Weil**          

Supervisor:           **E. Dutton**



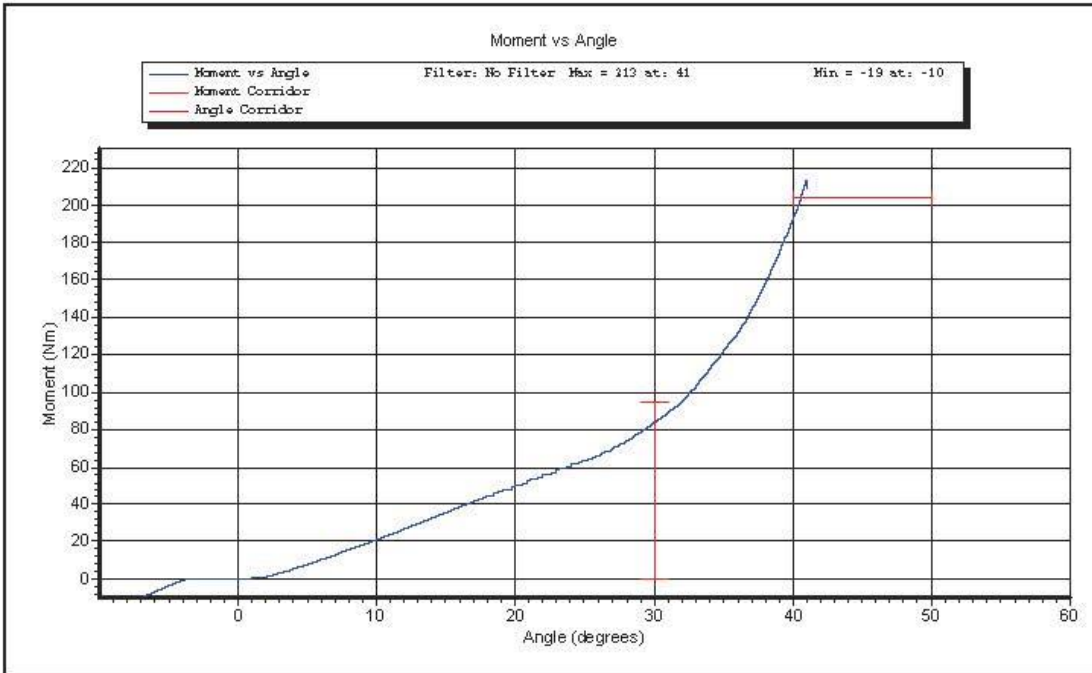
VERIFICATION REPORT

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	14CB1-3615	0008	2/21/2013
DentonATD	Velocity Trap	1	1/11/2013



Test Name: **Hip ROM**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**



Test ID: **Hip ROM Left**

Test Time: **10:25:44 AM**

Test Date: **12/5/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	<b>Hip ROM</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Hip ROM Right</b>	Test Date:	<b>12/5/2013</b>
		Test Time:	<b>10:13:16 AM</b>

Component Part Number	Component Serial Number
<b>Pelvis Assembly 78051-60</b>	<b>DB459</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.6</b> deg C P
Humidity	10 -- 70	<b>47.5</b> %RH P
Average Velocity	5 -- 10	<b>5.5</b> deg/s P
Angle at 203 Nm	40 -- 50	<b>41.9</b> degrees P
Moment at 30 degrees	0.0 -- 94.9	<b>93.01</b> Nm P

All test parameters are within specifications

Technician:           **R. Weil**          

Supervisor:           **E. Dutton**



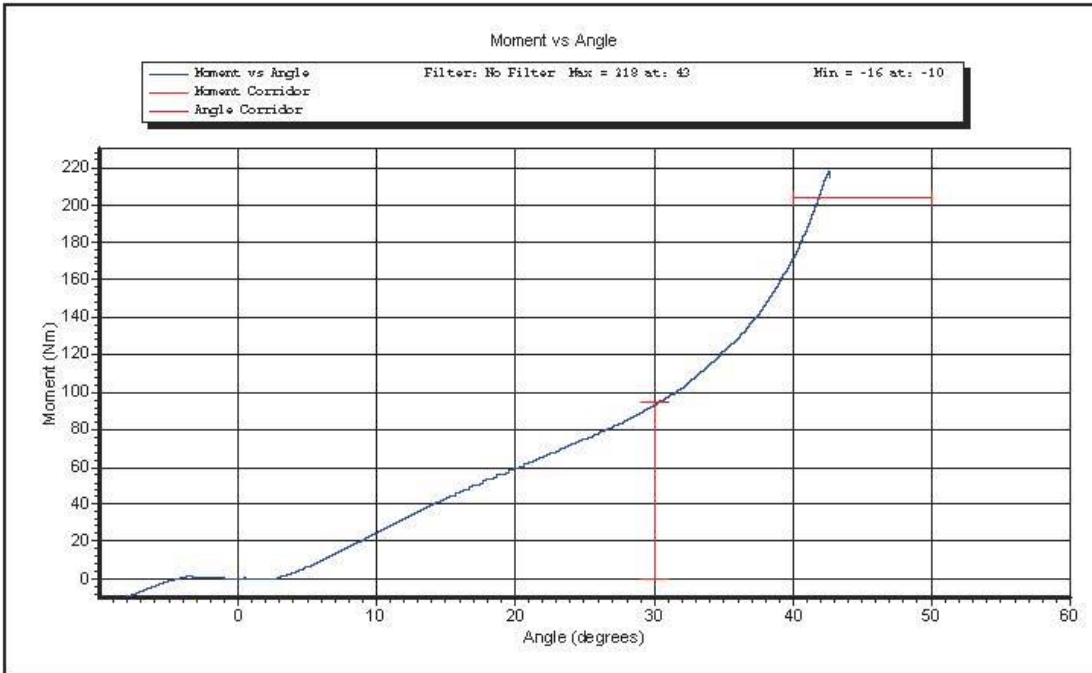
VERIFICATION REPORT

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	14CB1-3615	0008	2/21/2013
DentonATD	Velocity Trap	1	1/11/2013



Test Name: **Hip ROM**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**



Test ID: **Hip ROM Right**

Test Time: **10:13:16 AM**

Test Date: **12/5/2013**

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### VERIFICATION REPORT

Test Name:	<b>Knee Impact</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Knee Impact Left</b>	Test Date:	<b>12/3/2013</b>
		Test Time:	<b>12:16:22 PM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 78051(L) or 6(R)</b>	<b>3268 (L)</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>20.6</b> deg C P
Humidity	10 -- 70	<b>21.6</b> %RH P
Velocity	2.07 -- 2.13	<b>2.117</b> m/s P
Resistive Force	-5.78 -- -4.72	<b>-5.284</b> kN P

All test parameters are within specifications

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



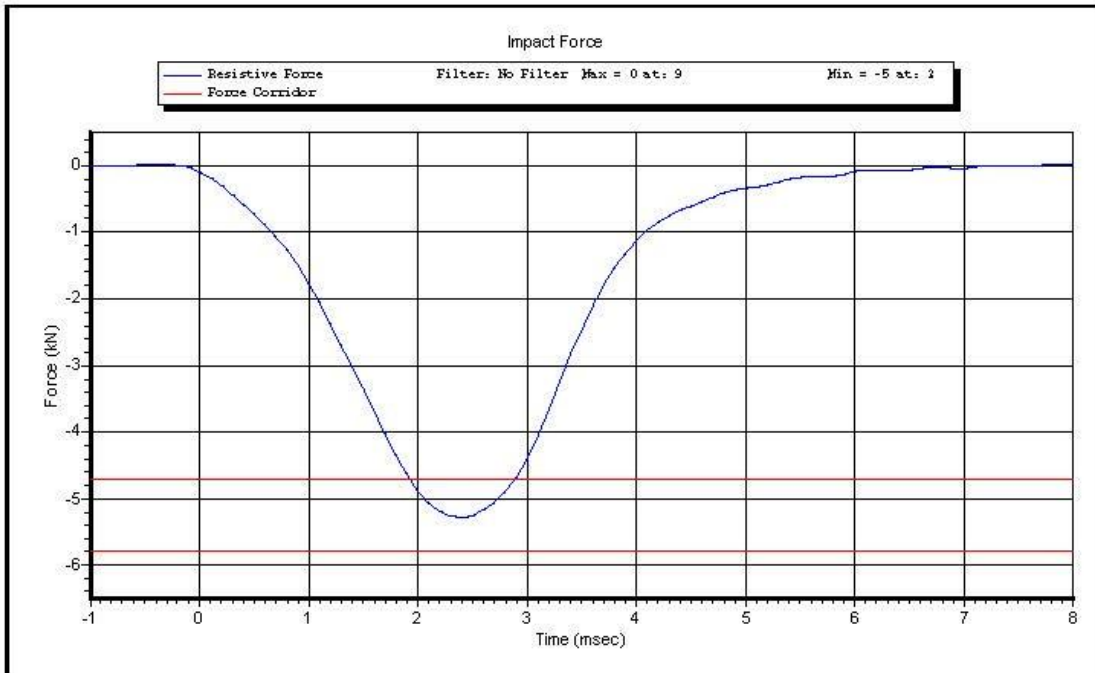
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	6/3/2013



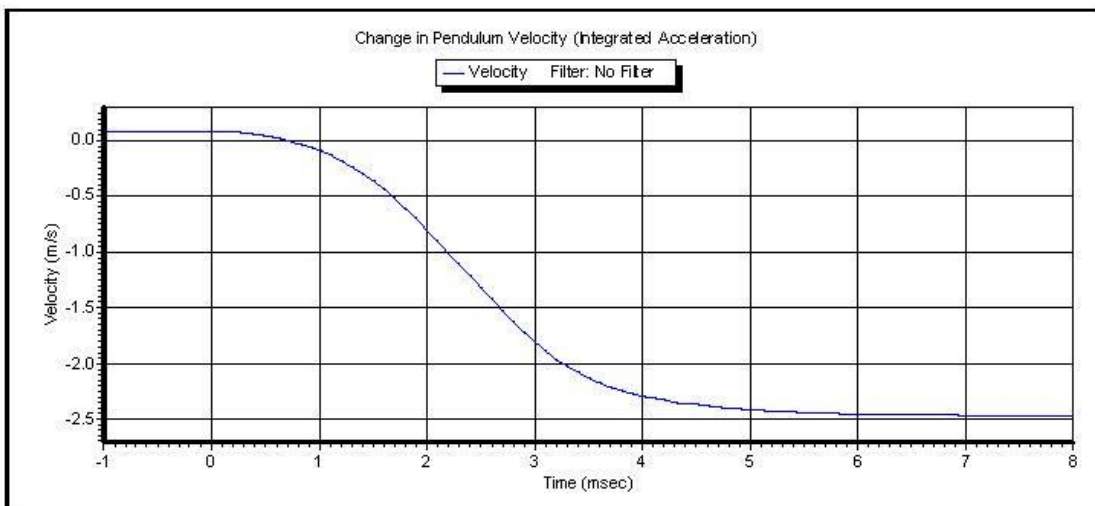
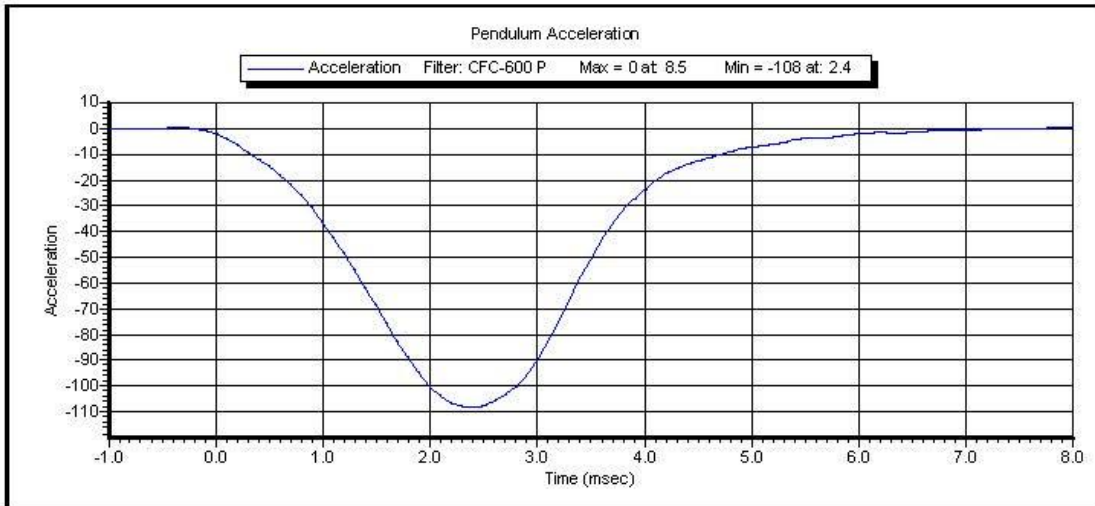
Test Name: **Knee Impact**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**



Test ID: **Knee Impact Left** Test Time: **12:16:22 PM**

Test Date: **12/3/2013**

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Test ID: **Knee Impact Left** Test Time: **12:16:22 PM**

Test Date: **12/3/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	<b>Knee Impact</b>	Revision:	<b>10/1/2001</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 50th Male</b>		
ATD Serial Number:	<b>061</b>		
Test ID:	<b>Knee Impact Right</b>	Test Date:	<b>12/3/2013</b>
		Test Time:	<b>10:07:51 AM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 78051(L) or 6(R)</b>	<b>3158 (R)</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.0</b> deg C P
Humidity	10 -- 70	<b>25.6</b> %RH P
Velocity	2.07 -- 2.13	<b>2.116</b> m/s P
Resistive Force	-5.78 -- -4.72	<b>-4.881</b> kN P

All test parameters are within specifications

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



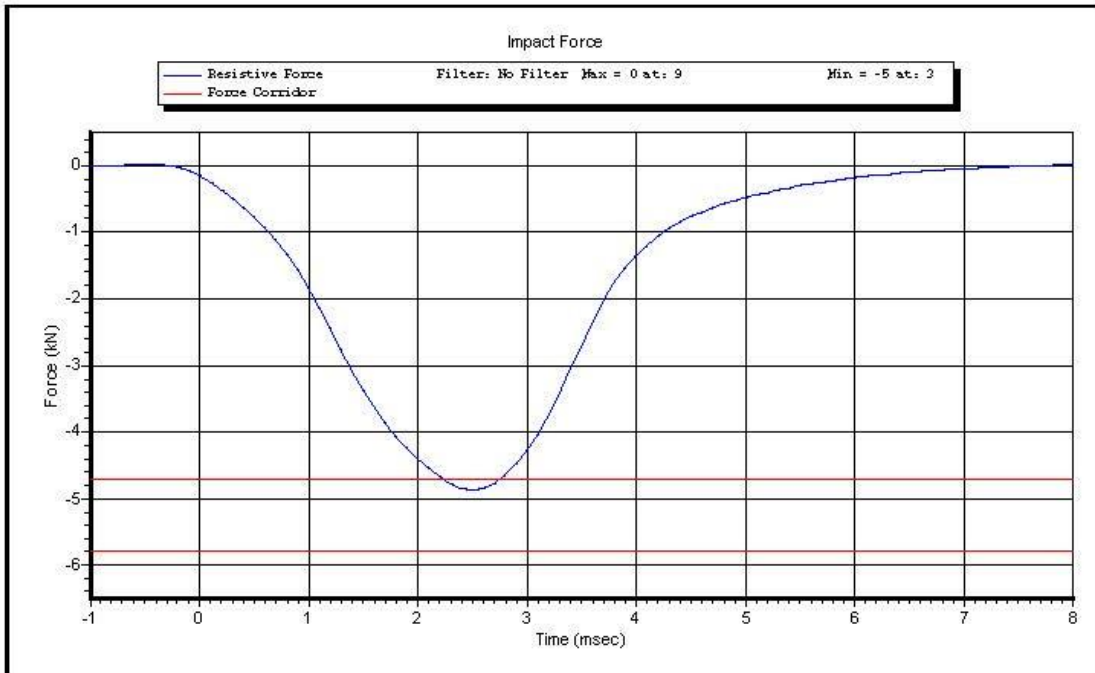
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	6/3/2013



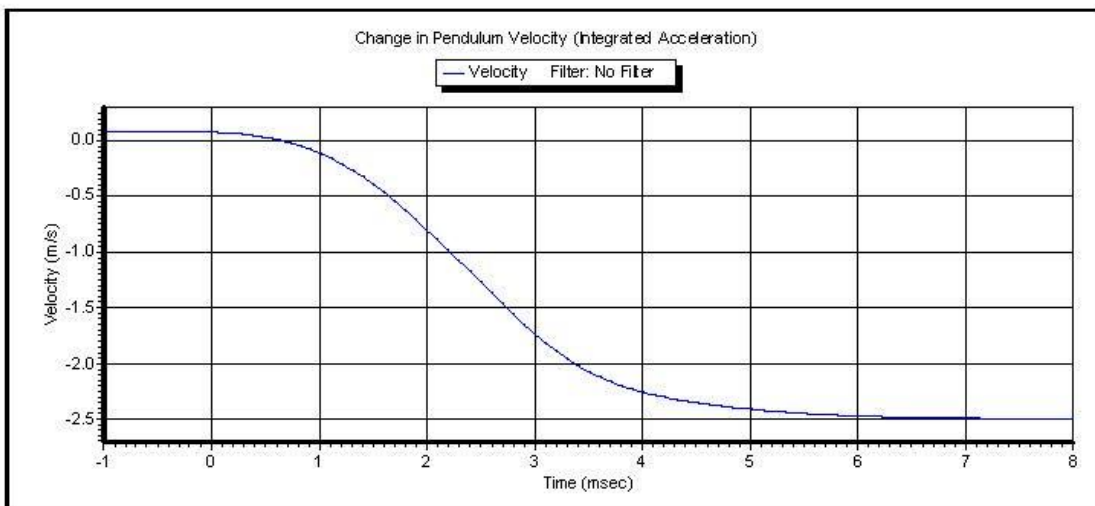
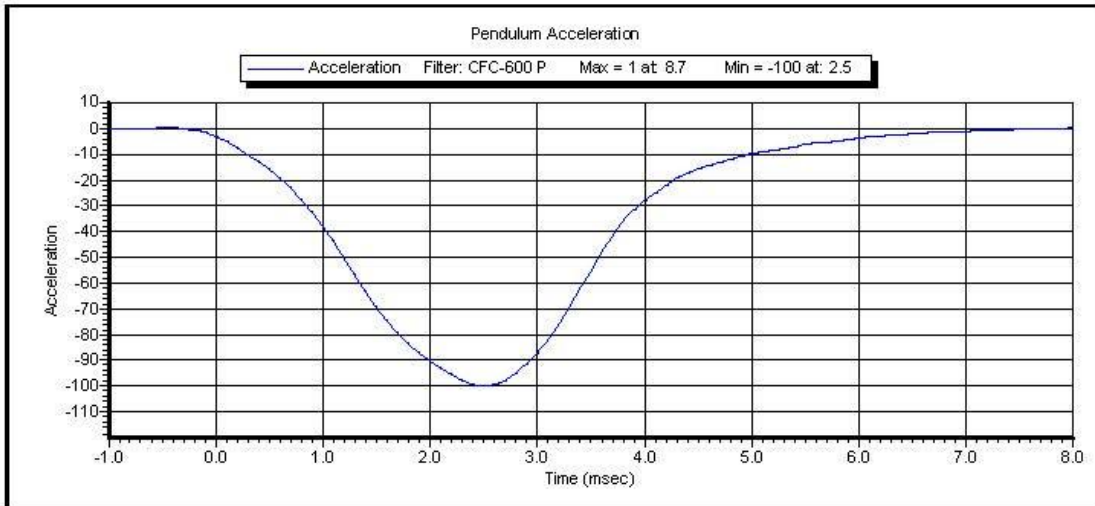
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Sub Test Name:  
ATD Type: **Hybrid 3 - 50th Male**  
ATD Serial Number: **061**



Test ID: **Knee Impact Right** Test Time: **10:07:51 AM**

Test Date: **12/3/2013**

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Test ID: **Knee Impact Right** Test Time: **10:07:51 AM**

Test Date: **12/3/2013**

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**CALIBRATION TEST RESULTS**

**POST-TEST**

**HYBRID III 5<sup>TH</sup> PERCENTILE FEMALE - PASSENGER ATD**

**SERIAL NO: 288**



## External Measurements

5<sup>th</sup> Female SN 288

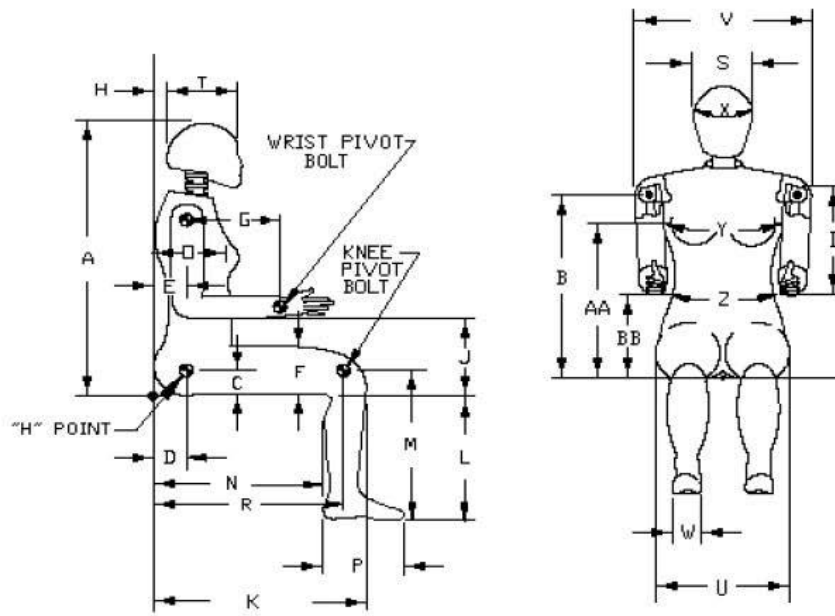
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	786	Yes
B	Shoulder Pivot Height	431.8 – 457.2	453	Yes
C	H-Point Height	81.3 – 86.3	82	Yes
D	H-Point from Backline	144.8 – 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	76	Yes
F	Thigh Clearance	119.4 – 134.6	131	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	248	Yes
H	Head Back to Backline	43.2 – 48.2	46	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	285	Yes
J	Elbow Rest Height	182.8 – 203.2	194	Yes
K	Buttock to Knee Length	520.7 – 546.1	533	Yes
L	Popliteal Height	355.6 – 376	361	Yes
M	Knee Pivot Height	393.7 – 419.1	397	Yes
N	Buttock Popliteal Length	414 – 439.4	421	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	221	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	469	Yes
S	Head Breadth	137.1 – 147.3	143	Yes
T	Head Depth	177.8 – 188	183	Yes
U	Hip Breadth	299.7 – 314.9	308	Yes
V	Shoulder Breadth	350.5 – 365.7	356	Yes
W	Foot Breadth	78.8 – 94	82	Yes
X	Head Circumference	528.3 – 548.7	534	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	863	Yes
Z	Waist Circumference	759.5 – 789.9	770	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	346	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	164	Yes

Technician: M. Geesey

Date: 12/04/2013

Hybrid III 5<sup>th</sup> Female External Measurements

Reference Diagram





VERIFICATION REPORT

Test Name:	<b>Head Drop</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Head Drop</b>	Test Date:	<b>12/4/2013</b>
		Test Time:	<b>9:54:26 AM</b>

Component Part Number	Component Serial Number
<b>Head Skin - 78051-228</b>	<b>912</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>32.4</b> %RH P
Resultant Acceleration	250 -- 300	<b>277.6</b> g P
Oscillation	0 -- 10	<b>0.0</b> % P
Lateral Acceleration	-15 -- 15	<b>-2.0</b> g P

All test parameters are within specifications

Technician:           **M. Goehle**          

Supervisor:           **E. Dutton**



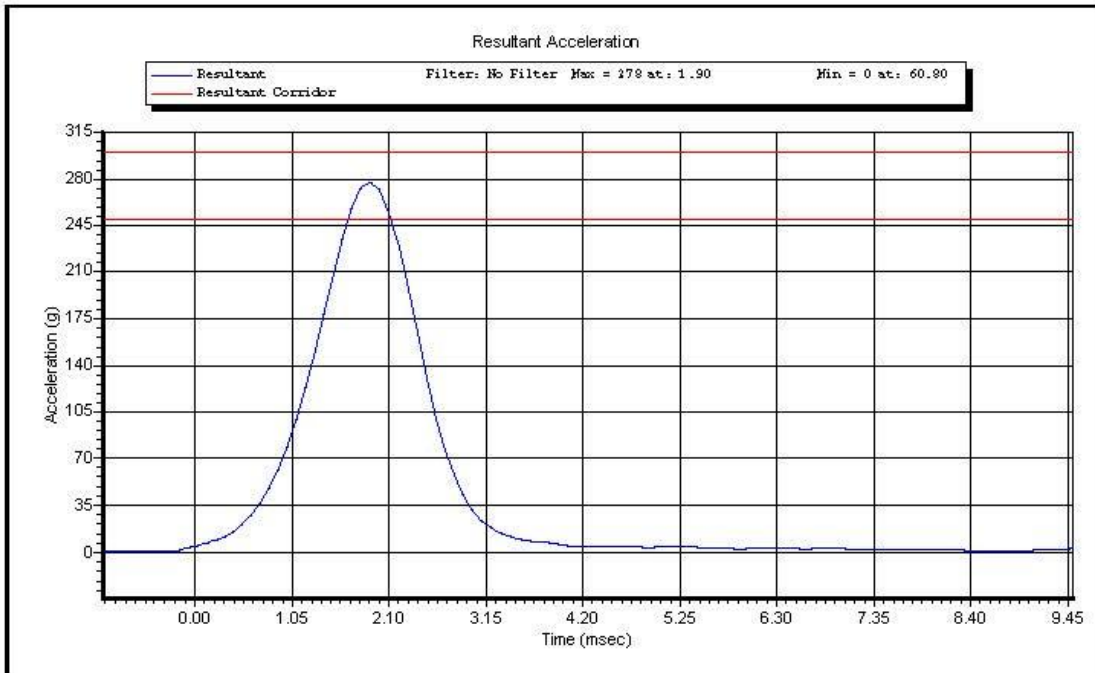
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



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

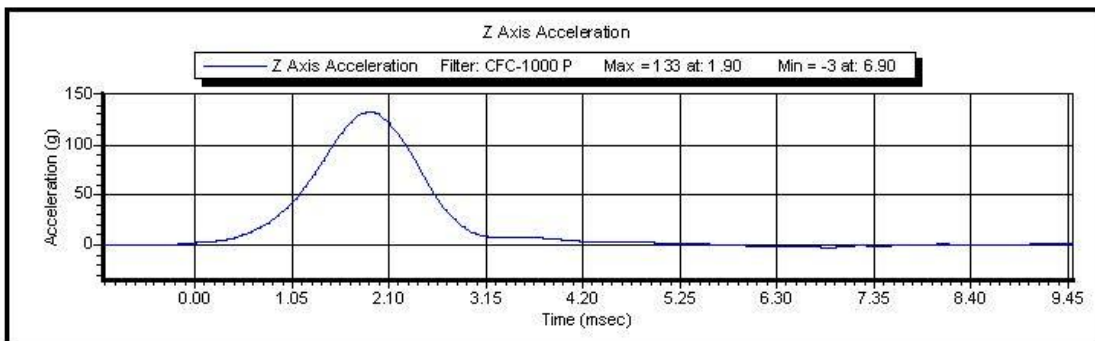
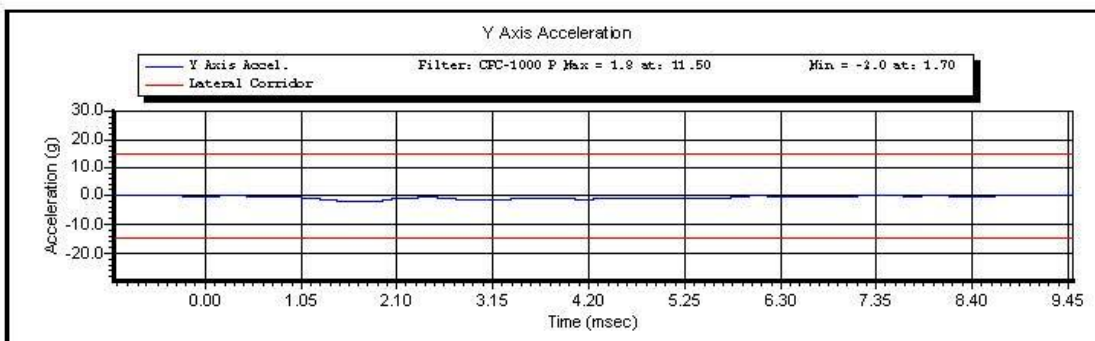
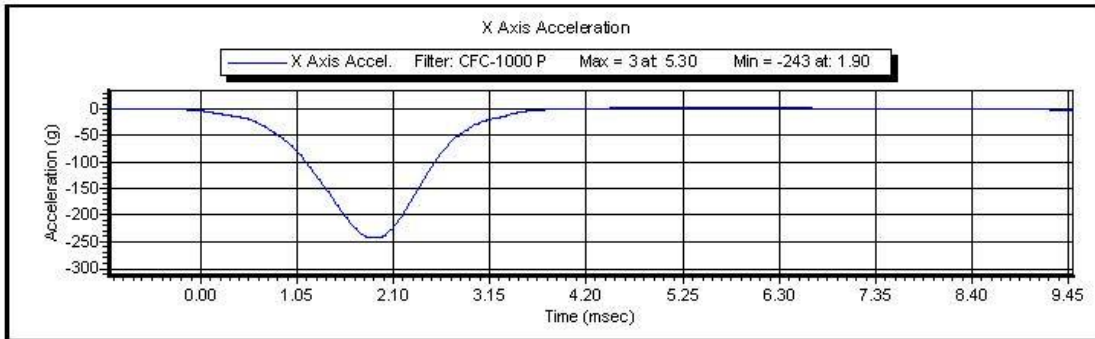


Test ID: **Head Drop**

Test Time: **9:54:26 AM**

Test Date: **12/4/2013**

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Test ID: **Head Drop**

Test Time: **9:54:26 AM**

Test Date: **12/4/2013**

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VERIFICATION REPORT

Test Name:	<b>Neck Extension</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Neck Extension</b>	Test Date:	<b>12/5/2013</b>
		Test Time:	<b>1:20:08 PM</b>

Component Part Number	Component Serial Number
<b>Neck - 880105-255</b>	<b>7121</b>
<b>Head Skin - 880105-109</b>	<b>912</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.8</b> deg C P
Humidity	10 -- 70	<b>46.9</b> %RH P
Velocity	5.95 -- 6.19	<b>6.146</b> m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	<b>1.60</b> m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	<b>3.29</b> m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	<b>4.87</b> m/s P
D Plane Rotation	99 -- 114	<b>105.1</b> degrees P
Moment During Rotation Interval	-65 -- -53	<b>-60.9</b> Nm P
Moment Decay to -10.0 Nm	94 -- 114	<b>103.6</b> ms P

All test parameters are within specifications

Technician:           **M. Geesey**          

Supervisor:           **E. Dutton**



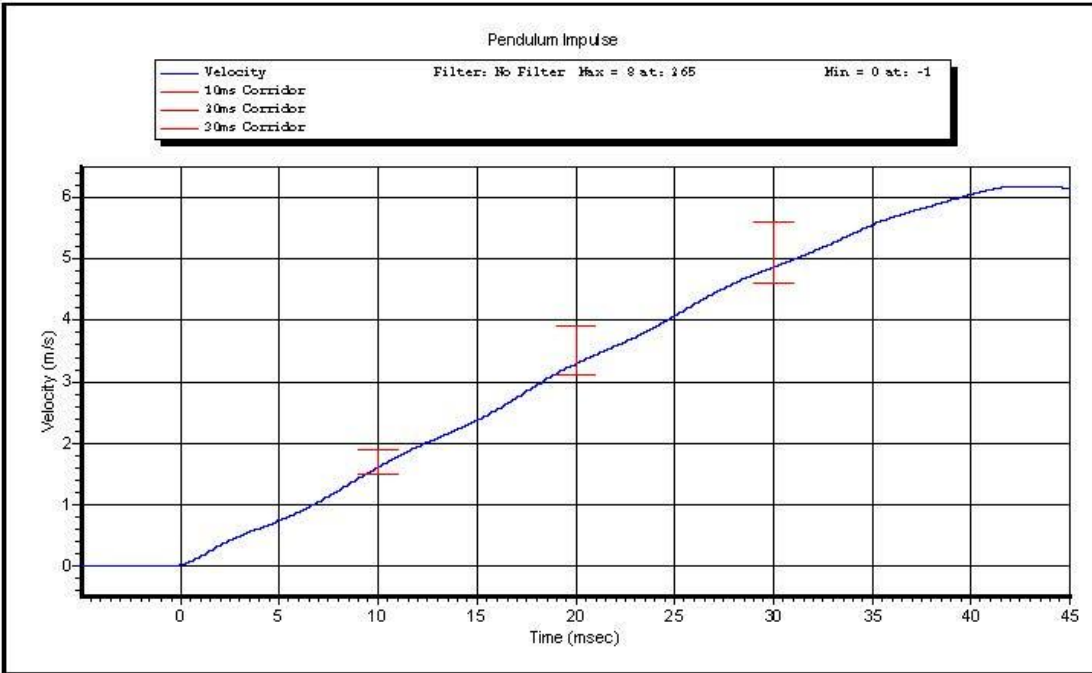
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/25/2013
DentonATD	78051-342	CONDYLE POT	4/19/2013
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013



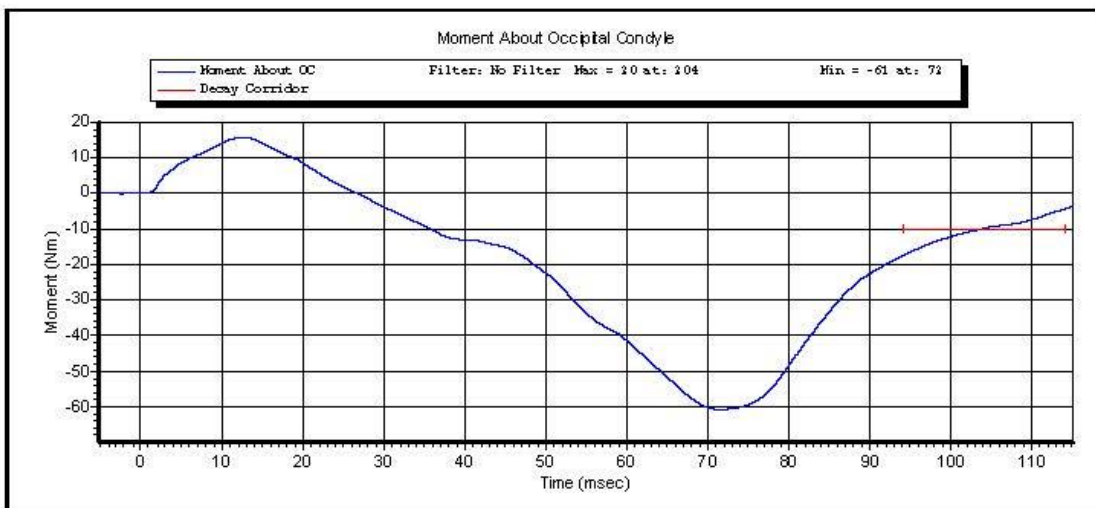
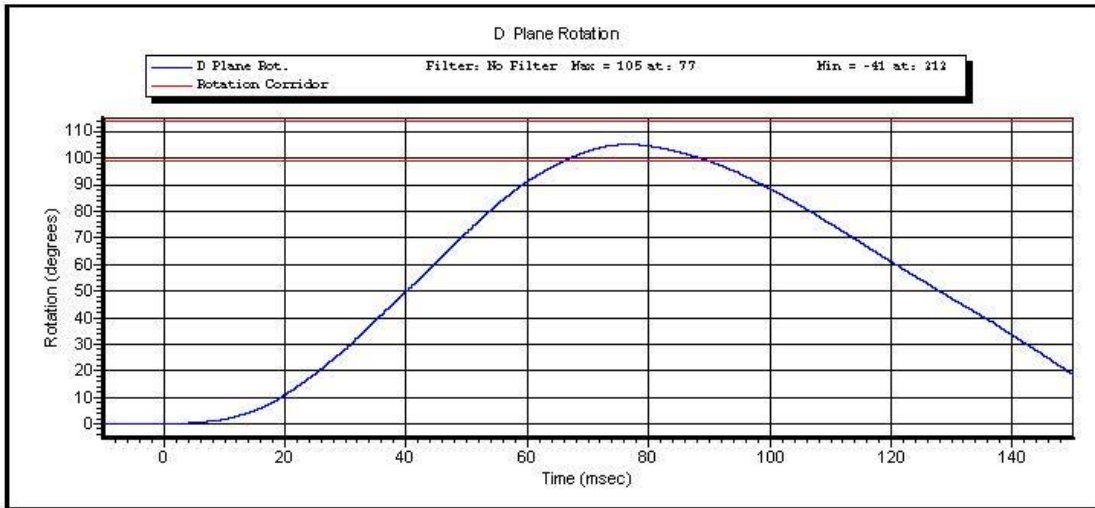
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Sub Test Name:  
ATD Type: **Hybrid 3 - 5th Female**  
ATD Serial Number: **288**



Test ID: **Neck Extension** Test Time: **1:20:08 PM**

Test Date: **12/5/2013**

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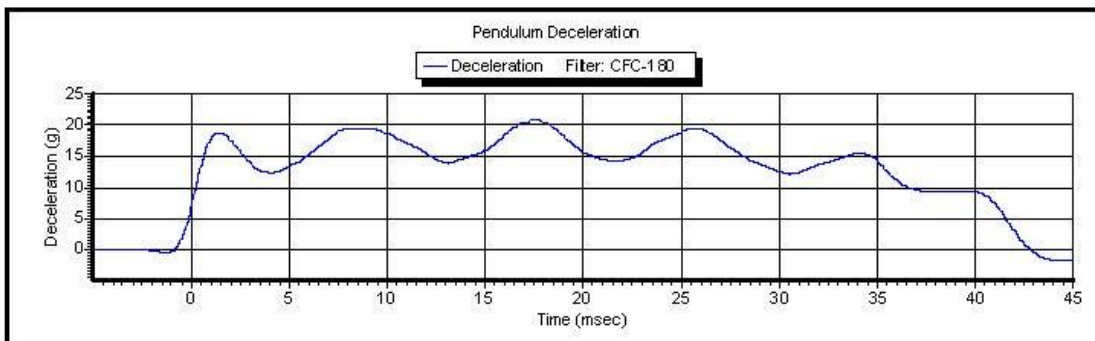
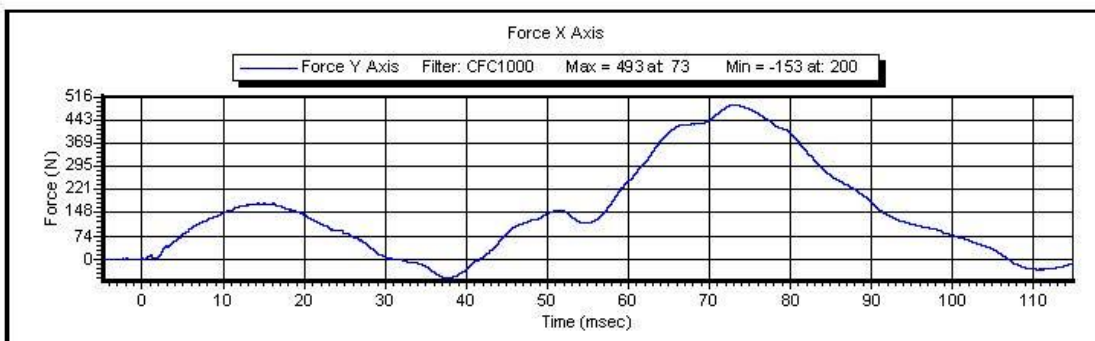
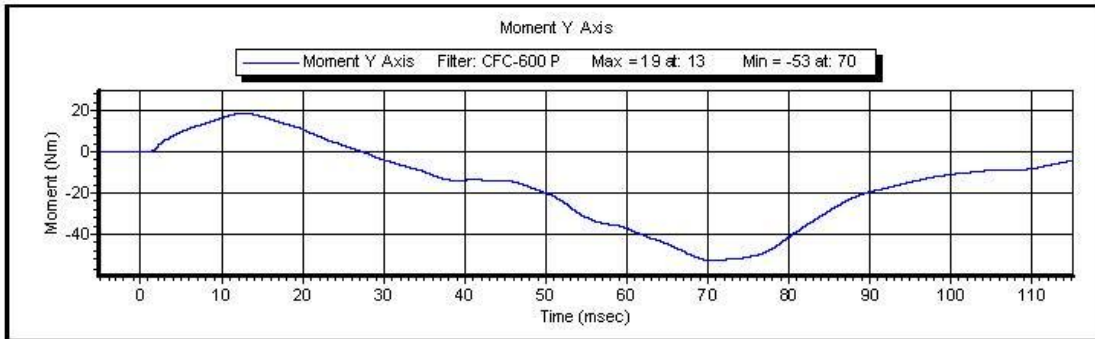


Test ID: Neck Extension

Test Time: 1:20:08 PM

Test Date: 12/5/2013

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Test ID: **Neck Extension**

Test Time: **1:20:08 PM**

Test Date: **12/5/2013**

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VERIFICATION REPORT

Test Name:	<b>Neck Flexion</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Neck Flexion</b>	Test Date:	<b>12/5/2013</b>
		Test Time:	<b>12:59:40 PM</b>

Component Part Number	Component Serial Number
<b>Neck - 880105-255</b>	<b>7121</b>
<b>Head Skin - 880105-109</b>	<b>912</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.8</b> deg C P
Humidity	10 -- 70	<b>46.9</b> %RH P
Velocity	6.89 -- 7.13	<b>7.100</b> m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	<b>2.15</b> m/s P
Pendulum Impulse at 20 ms	4 -- 5	<b>4.4</b> m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	<b>6.28</b> m/s P
D Plane Rotation	-91 -- -77	<b>-80.6</b> degrees P
Moment During Rotation Interval	69 -- 83	<b>73.0</b> Nm P
Moment Decay to 10.0 Nm	80 -- 100	<b>88.5</b> ms P

All test parameters are within specifications

Technician:           **M. Geesey**          

Supervisor:           **E. Dutton**



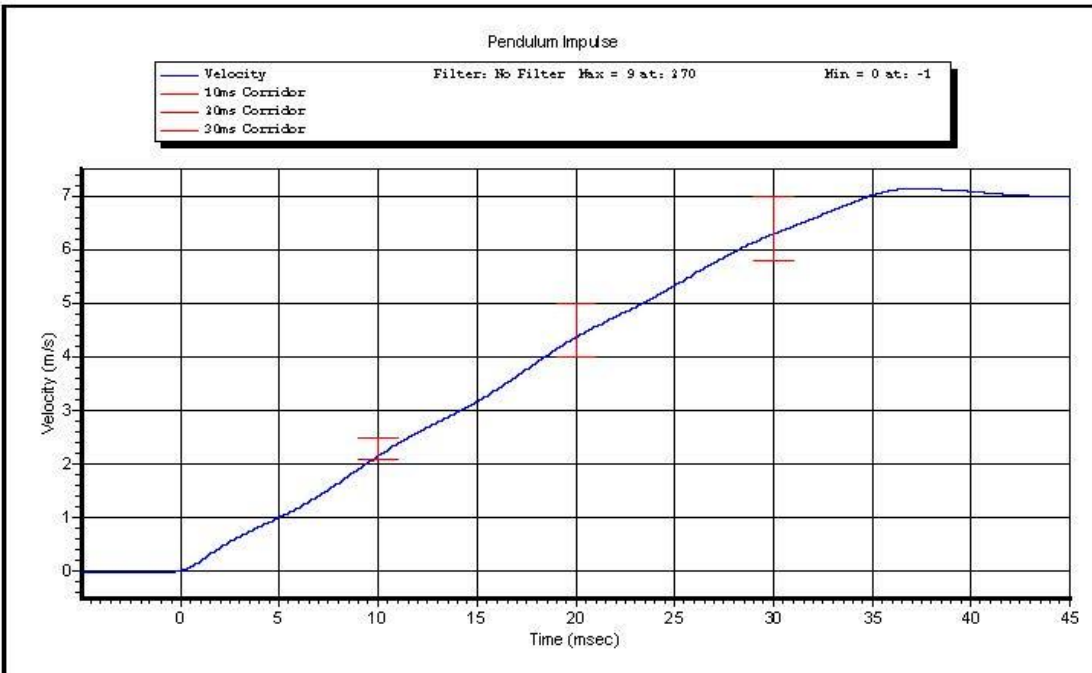
## VERIFICATION REPORT

### REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/25/2013
DentonATD	78051-342	CONDYLE POT	4/19/2013
Denton	1716A	LC-2206My	5/23/2013
Denton	1716A	LC-2206Fx	5/23/2013



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

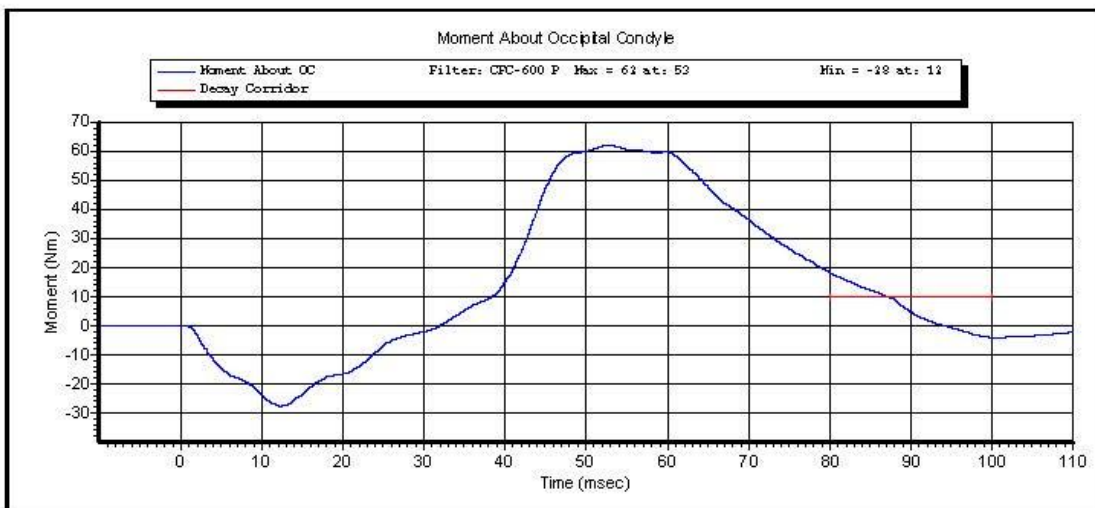
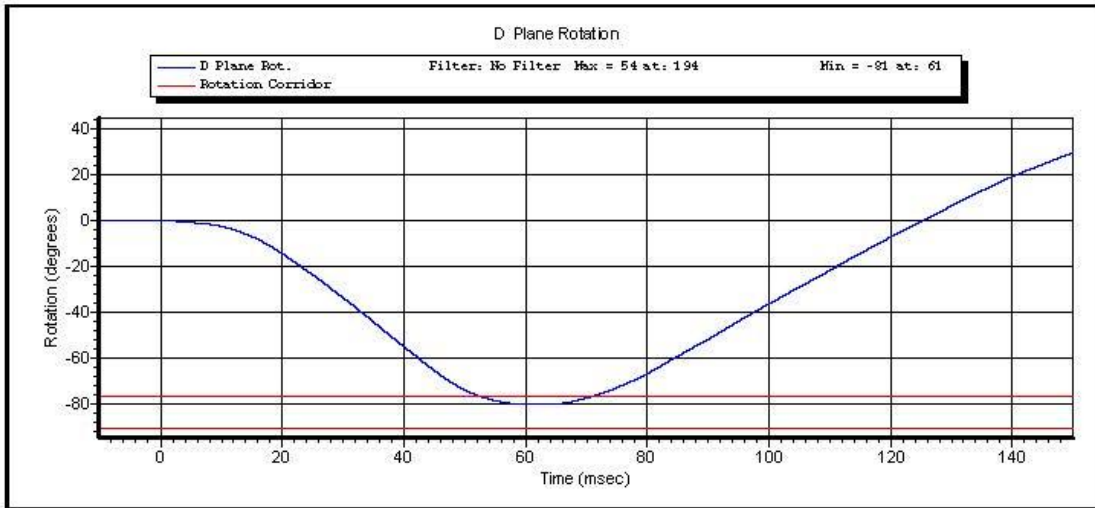


Test ID: **Neck Flexion**

Test Time: **12:59:40 PM**

Test Date: **12/5/2013**

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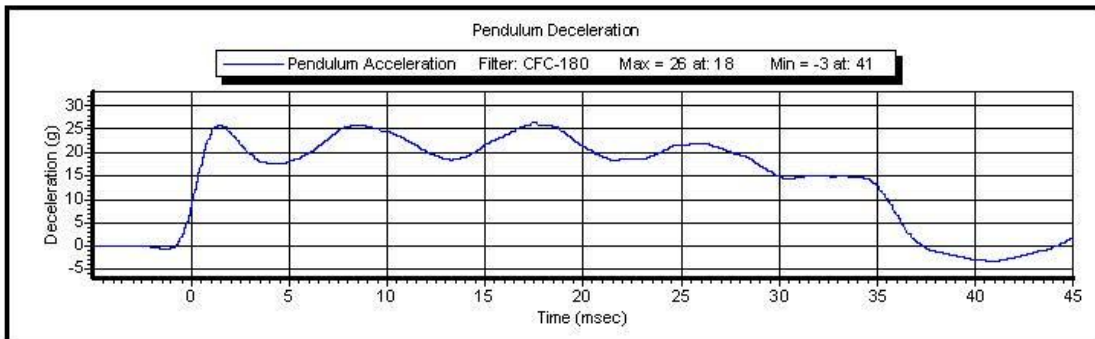
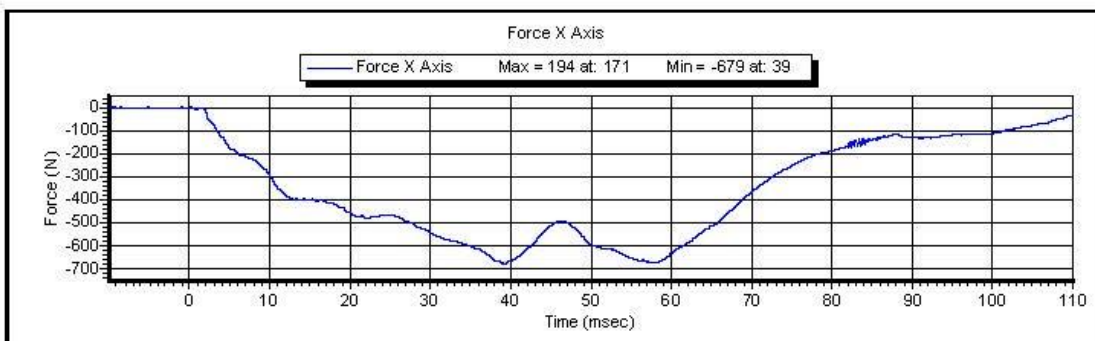
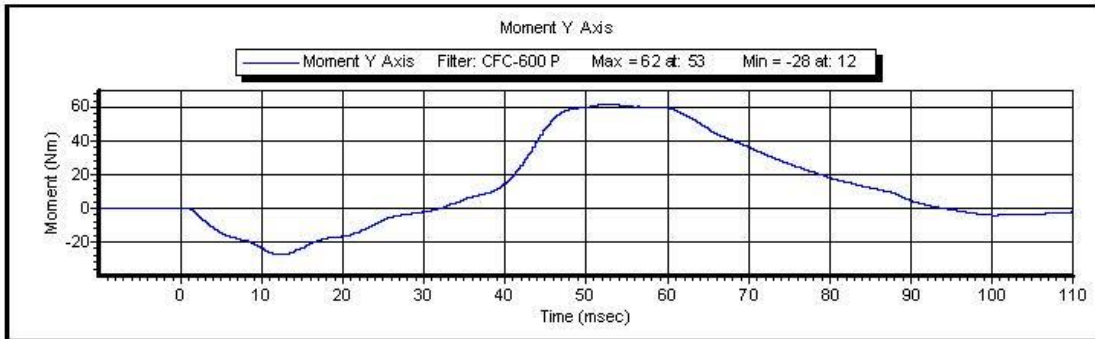


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Test Time: 12:59:40 PM

Test Date: 12/5/2013

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Test ID: **Neck Flexion**

Test Time: **12:59:40 PM**

Test Date: **12/5/2013**

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VERIFICATION REPORT

Test Name:	<b>Thorax Impact</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Thorax Impact</b>	Test Date:	<b>12/4/2013</b>
		Test Time:	<b>12:18:35 PM</b>

Component Part Number	Component Serial Number
<b>Chest Jacket - 880105-355-E</b>	<b>DG 8843</b>
<b>Lumbar Spine - 880105-1095</b>	<b>288</b>

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	<b>21.0</b> deg C P
Humidity	10 -- 70	<b>29.5</b> %RH P
Velocity	6.59 -- 6.83	<b>6.716</b> m/s P
Sternum Displacement	-58 -- -50	<b>-50.8</b> mm P
Force During Displacement Interval	-4400 -- -3900	<b>-4094.5</b> N P
Force -18.0 to -50.0 Displacement	-4600 -- 0	<b>-4103.7</b> N P
Hysteresis	69 -- 85	<b>75.0</b> % P

All test parameters are within specifications

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



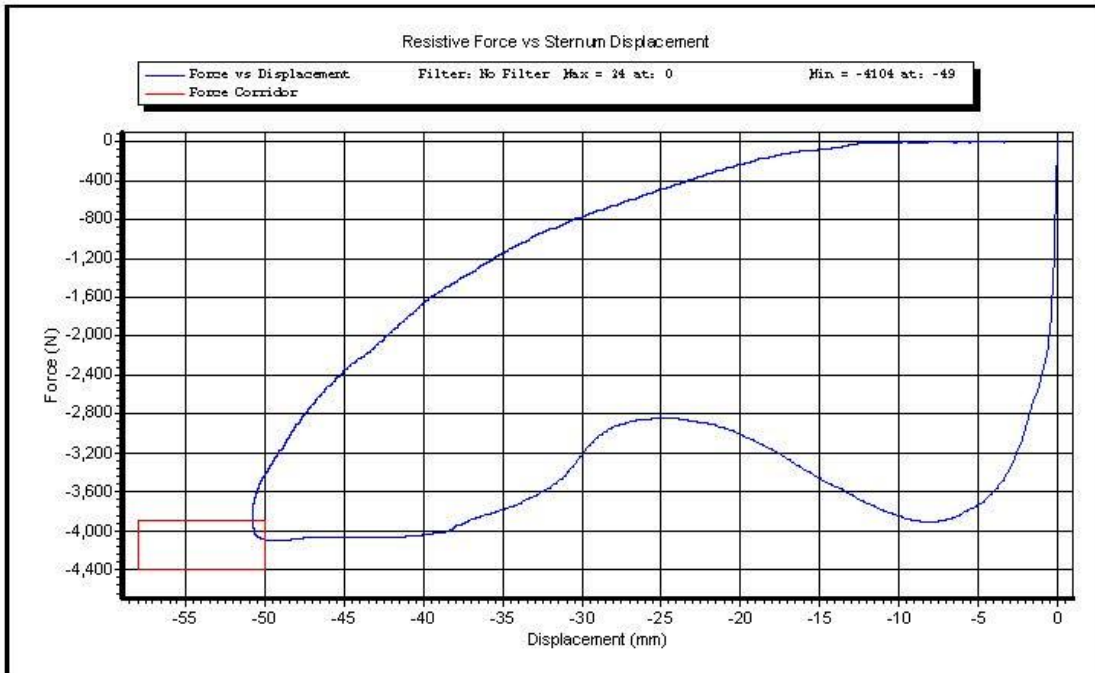
## VERIFICATION REPORT

### REFERENCE EQUIPMENT

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



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

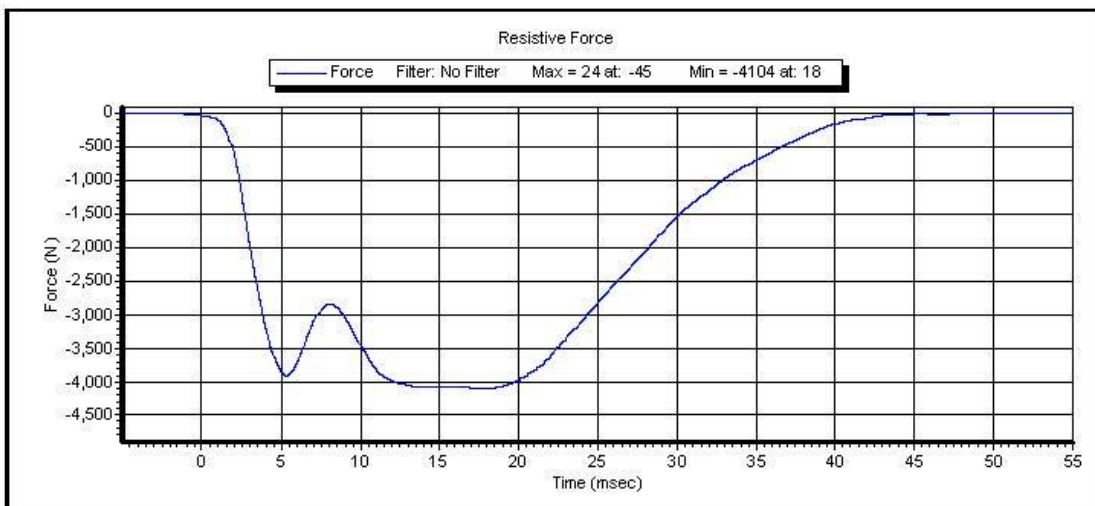
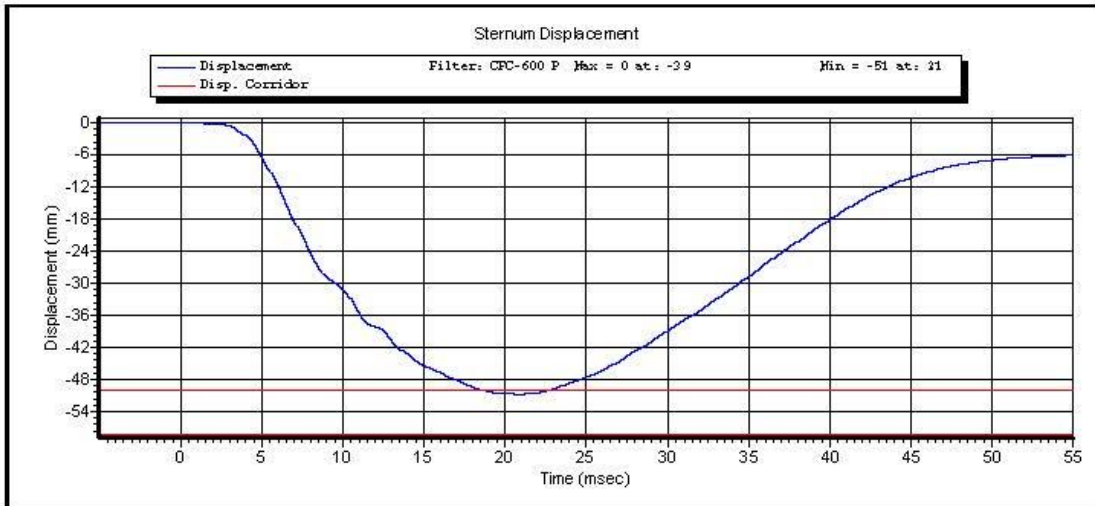


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Test Time: **12:18:35 PM**

Test Date: **12/4/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

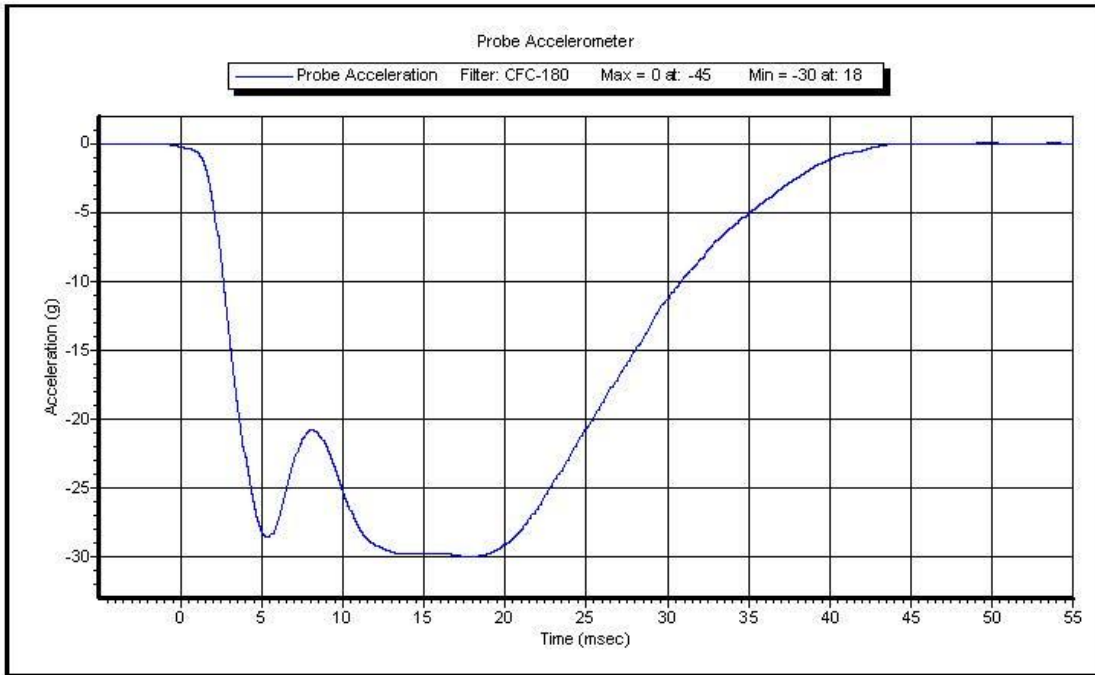


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Test Time: **12:18:35 PM**

Test Date: **12/4/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **12:18:35 PM**

Test Date: **12/4/2013**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

**Torso Flexion**

**Post-Test**

**Part 5720 HIII 5% Female**

ATD Serial No: 288

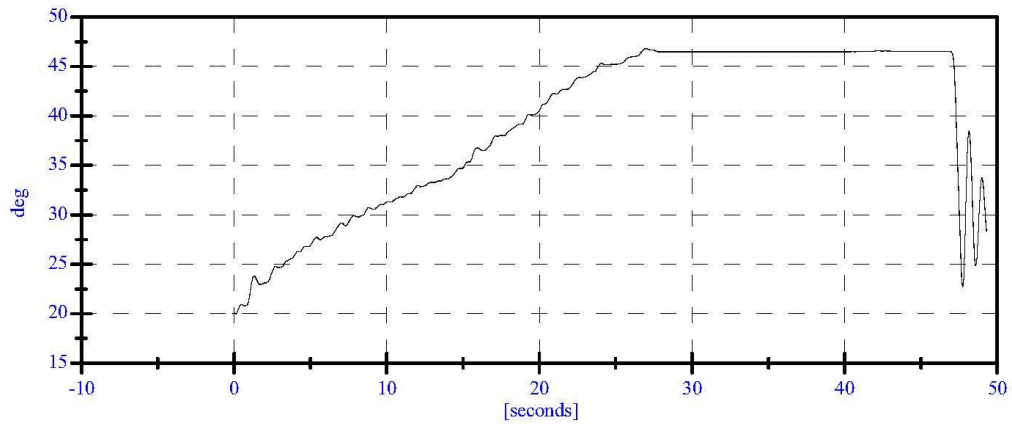
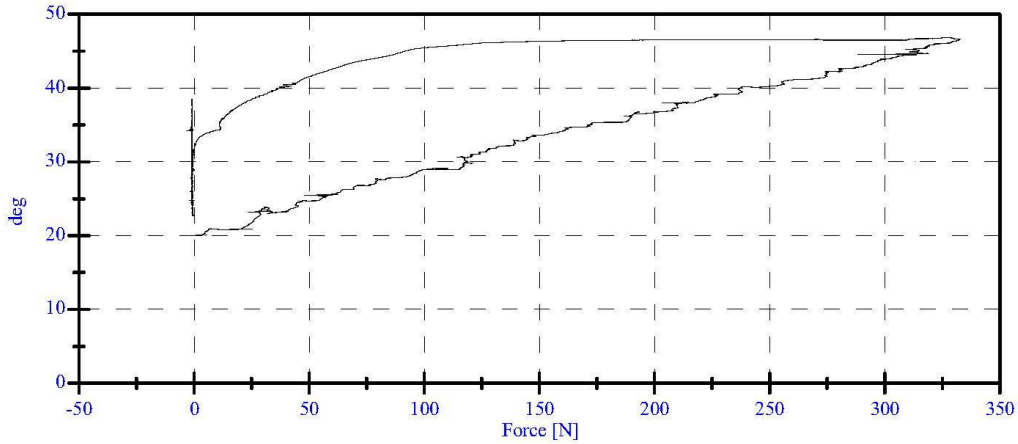
Laboratory Supervisor: E. Dutton

Date: 12/5/2013

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	21.8 C	Passed
Lab Humidity:	10-70 %	48.00 %	Passed
Initial Angle:	0.00-20.00 Deg	20.00 Deg	Passed
Force at 45 Deg	320.00-390.00 N	332.80 N	Passed
Return Angle	8 Deg Max from Initial	25.70 deg	Passed

**LUMBAR SPINE FLEXION TEST**





VERIFICATION REPORT

Test Name:	<b>Knee Impact</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Knee Impact Left</b>	Test Date:	<b>12/3/2013</b>
		Test Time:	<b>2:24:43 PM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 880105-508</b>	<b>1729 (L)</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.1</b> deg C P
Humidity	10 -- 70	<b>21.0</b> %RH P
Velocity	2.07 -- 2.13	<b>2.102</b> m/s P
Resistive Force	-4060 -- -3450	<b>-3590.2</b> N P

All test parameters are within specifications

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



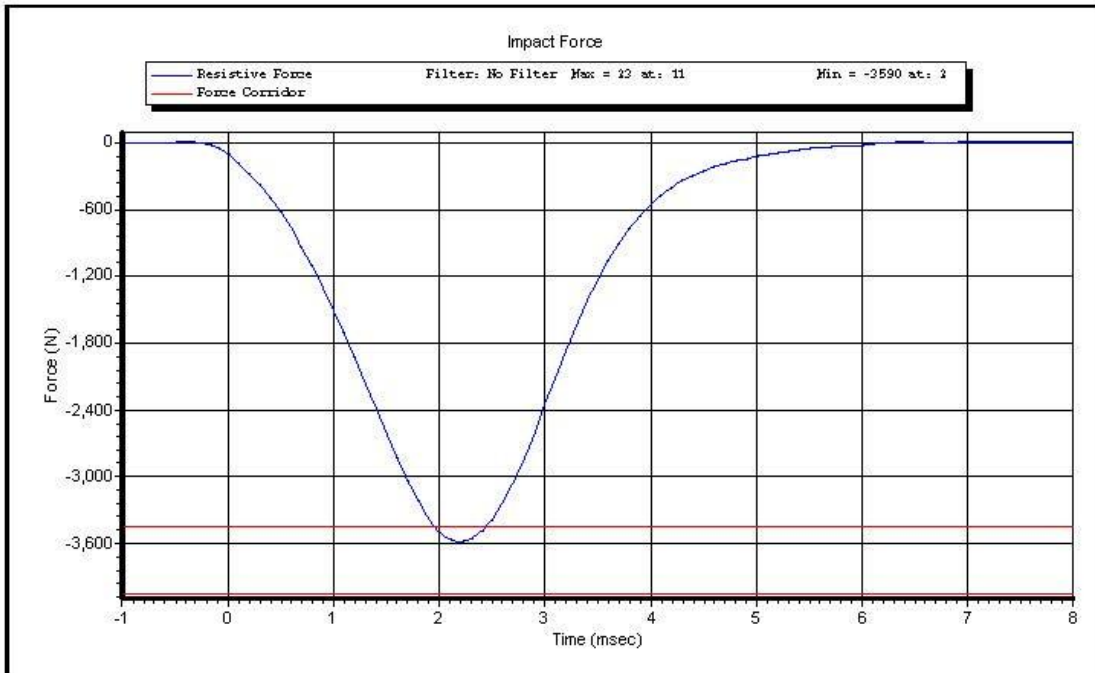
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	6/3/2013



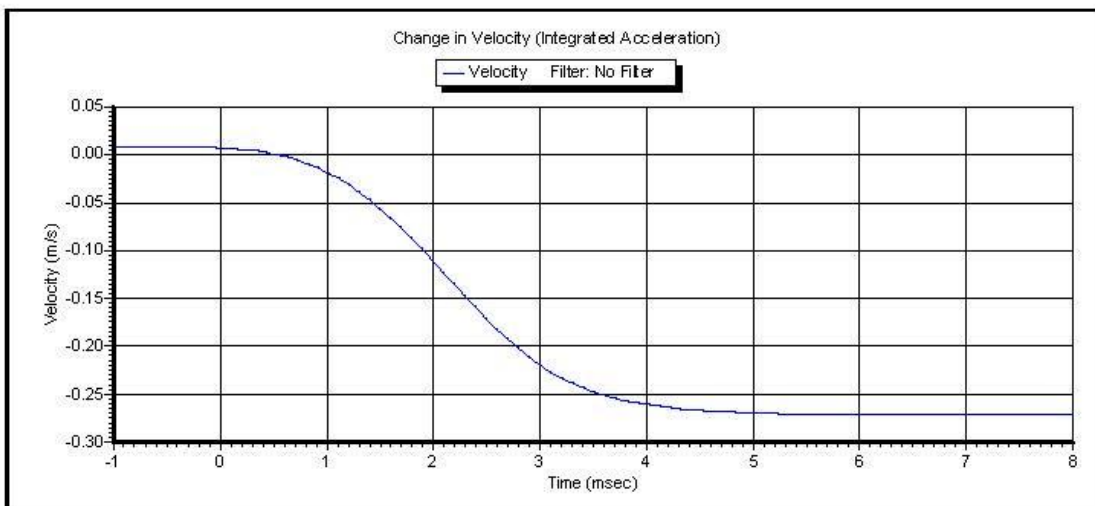
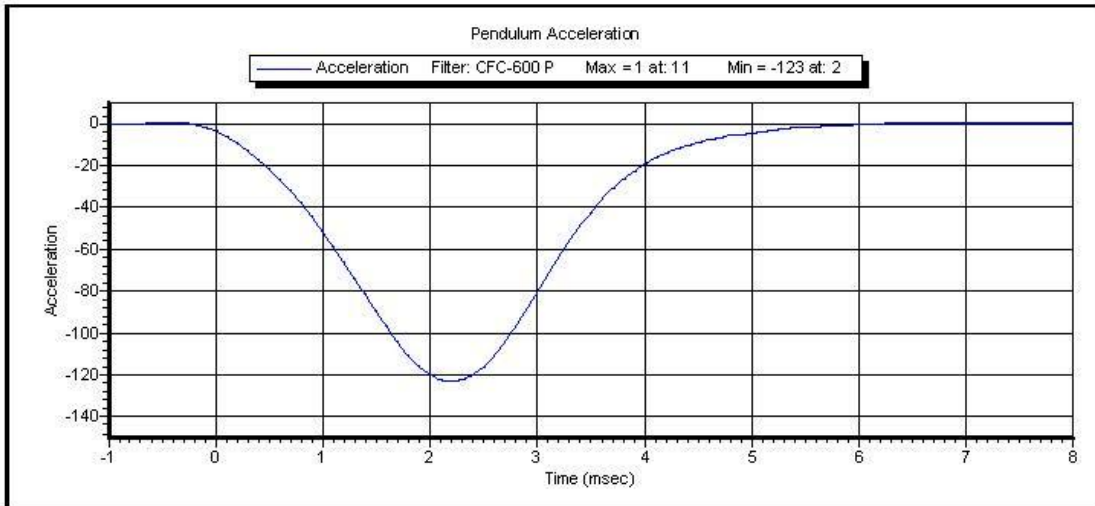
Test Name: **Knee Impact**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 5th Female**  
ATD Serial Number: **288**



Test ID: **Knee Impact Left** Test Time: **2:24:43 PM**

Test Date: **12/3/2013**

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Test ID: **Knee Impact Left** Test Time: **2:24:43 PM**

Test Date: **12/3/2013**

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VERIFICATION REPORT

Test Name:	<b>Knee Impact</b>	Revision:	<b>7/15/2002</b>
Sub Test Name:			
ATD Type:	<b>Hybrid 3 - 5th Female</b>		
ATD Serial Number:	<b>288</b>		
Test ID:	<b>Knee Impact Right</b>	Test Date:	<b>12/3/2013</b>
		Test Time:	<b>2:29:59 PM</b>

Component Part Number	Component Serial Number
<b>Knee Skin - 880105-508</b>	<b>1728 (R)</b>

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	<b>21.2</b> deg C P
Humidity	10 -- 70	<b>20.9</b> %RH P
Velocity	2.07 -- 2.13	<b>2.100</b> m/s P
Resistive Force	-4060 -- -3450	<b>-3577.4</b> N P

All test parameters are within specifications

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



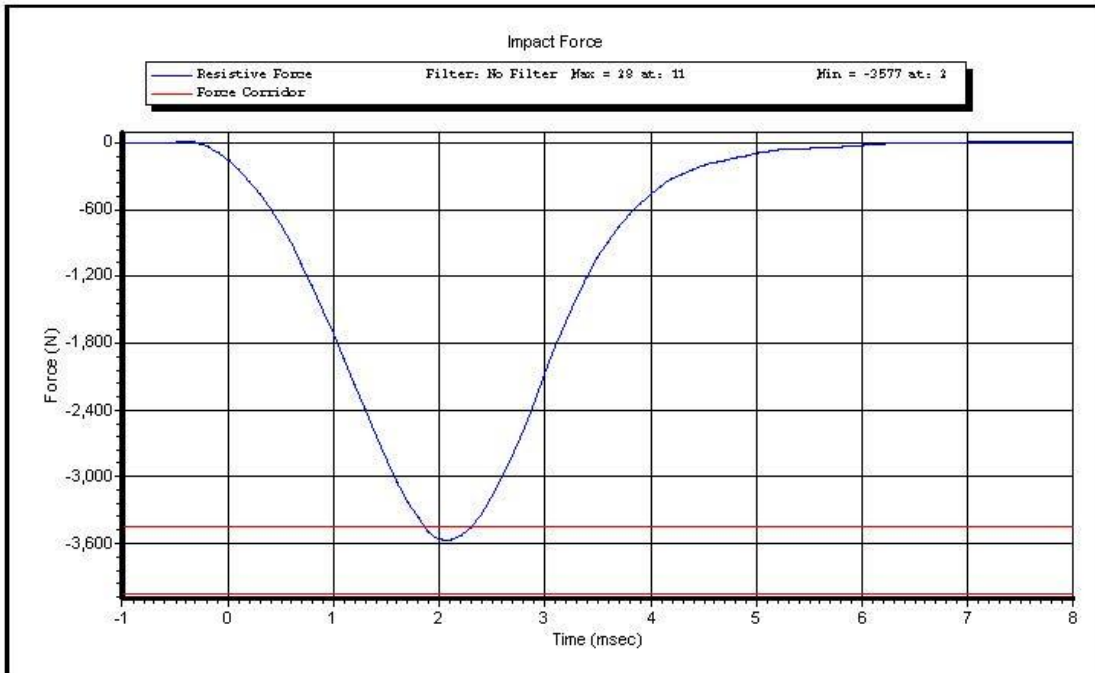
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2013
Endevco	7231CT	C14953	6/3/2013



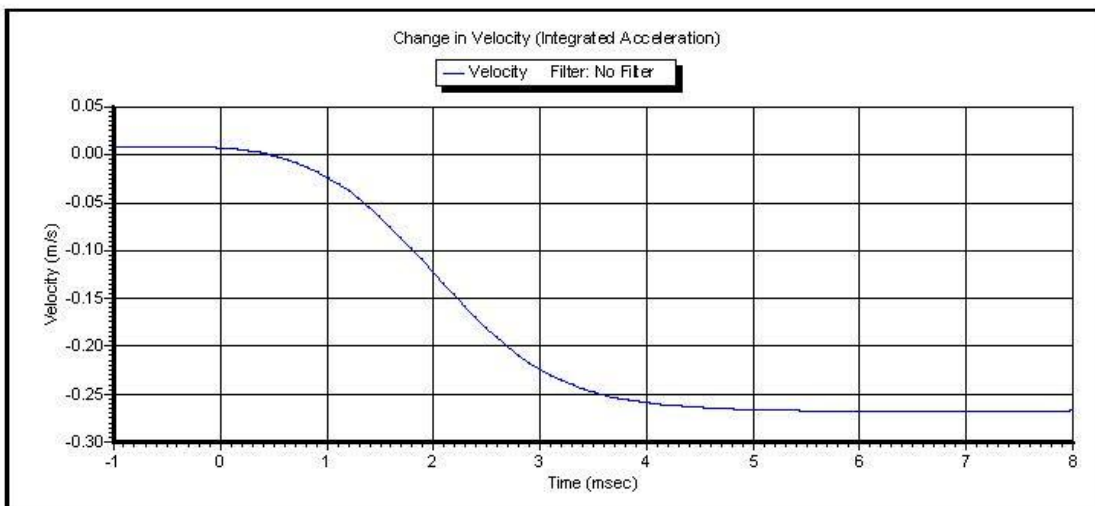
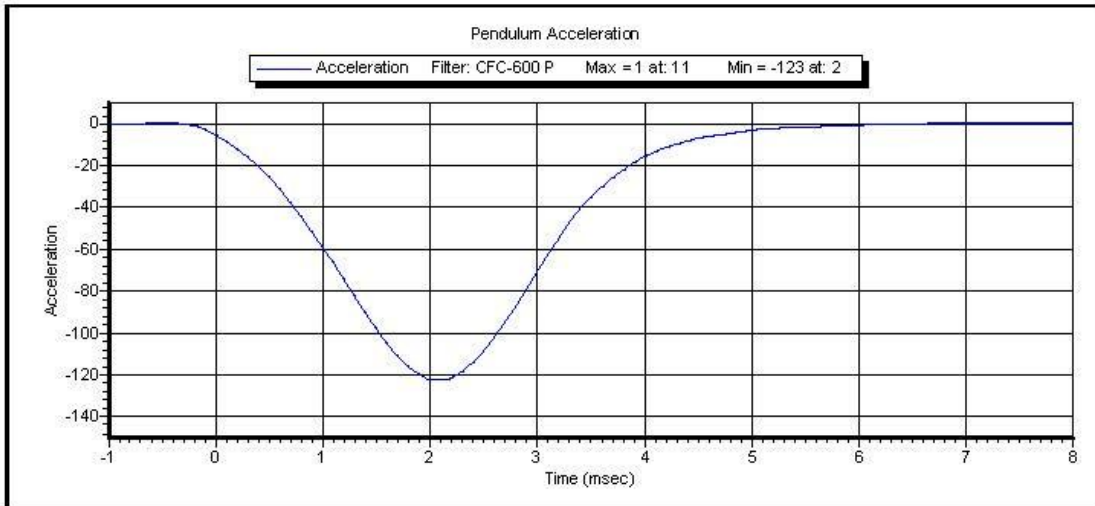
Test Name: **Knee Impact**  
Sub Test Name:  
ATD Type: **Hybrid 3 - 5th Female**  
ATD Serial Number: **288**



Test ID: **Knee Impact Right** Test Time: **2:29:59 PM**

Test Date: **12/3/2013**

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Test ID: **Knee Impact Right** Test Time: **2:29:59 PM**

Test Date: **12/3/2013**

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