

REPORT NUMBER: NCAP-CAL-15-002

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

**Honda of America MFG., INC
2015 Honda CR-V
SUV**

NHTSA No: M20155315

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



June 22, 2015

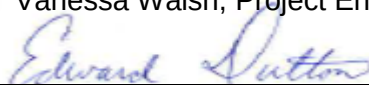
FINAL REPORT

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

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

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Prepared by:	<u></u> Vanessa Walsh, Project Engineer	Date: <u>June 22, 2015</u>
Approved by:	<u></u> Edward J. Dutton, Test Engineer Director Transportation Test Operations	Date: <u>June 22, 2015</u>

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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16. Abstract A 56.30 km/h (35 mph), NCAP Frontal Impact Test was conducted on a 2015 Honda CR-V 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 10, 2014. 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 421 mm at C6 to right of the vehicles centerline. The test vehicle's occupant performance data is as follows: <table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th rowspan="2">Units</th> <th colspan="2">Driver ATD (Serial No. 1046)</th> <th colspan="2">Passenger ATD (Serial No. 139)</th> </tr> <tr> <th>Threshold</th> <th>Result</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td></td> <td>700</td> <td>135.274</td> <td>700</td> <td>295.807</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-23.766</td> <td>52</td> <td>-17.288</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.302</td> <td>1</td> <td>0.396</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>779.816</td> <td>2,620</td> <td>754.584</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-359.429</td> <td>2,520</td> <td>-291.964</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-83.161</td> <td>6,805</td> <td>-2039.506</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-1775.469</td> <td>6,805</td> <td>-495.905</td> </tr> </tbody> </table>						Measurement Description	Units	Driver ATD (Serial No. 1046)		Passenger ATD (Serial No. 139)		Threshold	Result	Threshold	Result	Head Injury Criteria (HIC ₁₅)		700	135.274	700	295.807	Maximum Chest Compression	mm	63	-23.766	52	-17.288	Nij		1	0.302	1	0.396	Neck Tension	N	4,170	779.816	2,620	754.584	Neck Compression	N	4,000	-359.429	2,520	-291.964	Left Femur Force	N	10,008	-83.161	6,805	-2039.506	Right Femur Force	N	10,008	-1775.469	6,805	-495.905
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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 ridged fixed barrier was impacted by a 2015 Honda CR-V 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 10, 2014. Pre- and post-test photographs of the vehicle and dummies to document the test can be found in Appendix A. One real-time camera and 14 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

One Part 572E, 50th percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5th percentile female ATD was placed in the right-front passenger seating position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure. Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right / left femur load cells, and lower leg instrumentation. The driver (position 1) ATD (Serial No. 1046) and the right-front passenger (position 2) ATD (Serial No. 139) 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 421 mm at C6 to the right of the vehicles centerline. During and after the impact event, the driver's and passenger's side doors were closed and operational.

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

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

The occupant data is summarized below.

ATD Position	HIC ₁₅	Nij	Neck Tension (N)	Neck Comp. (N)	3ms Chest Clip (Gs)	Chest Disp. (mm)	Left Femur (N)	Right Femur (N)
Driver (50 th)	135.274	0.302	779.816	-359.429	43.229	-23.766	-83.161	-1775.469
Passenger (5 th)	295.807	0.396	754.584	-291.964	47.587	-17.288	-2039.506	-495.905

GENERAL COMMENTS:

1. P1 (Driver) serial number - 1046
2. P2 (Passenger) serial number - 139

Data Anomalies:

- Engine Bottom X Acceleration has Questionable Data after 42ms

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

This section contains information reporting for the following Data Sheets:

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

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

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Seat Belt Positioning Data

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

Data Sheet No. 7 – Vehicle Accelerometer Locations

Data Sheet No. 8 – Photographic Reference Target Locations

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

Data Sheet No. 10 – Test Vehicle Summary of Results

Data Sheet No. 11 – Post-Test Observations

Data Sheet No. 12 – Vehicle Profile Measurements

Data Sheet No. 13 – Accident Investigation Division Data

Data Sheet No. 14 – Vehicle Intrusion Measurements

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

Data Sheet No. 16 – FMVSS 301 Static Rollover Results

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

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20155315	Traction Control System (TCS)	Yes
Model Year	2015	Power Steering	Yes
Make	Honda	Power Window Auto-Reverse	No
Model	CR-V	Driver Frontal Airbag	Yes
Body Style	SUV	Driver Curtain Airbag	Yes
VIN	5J6RM4H39FL005300	Driver Head/Torso Airbag	No
Body Color	Charcoal Gray	Driver Torso Airbag	No
Odometer Reading (km /mi)	9.7 km / 6 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.4	Driver Pelvis Airbag	No
Type / No. Cylinders	I4	Driver Knee Airbag	No
Engine Placement	Transverse	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	CVT	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	Honda of America MFG., INC.	GVWR (kg)	2050
Date of Manufacture	10/14	GAWR Front (kg)	1055
		GAWR Rear (kg)	1015

VEHICLE SEATING AND WEIGHT CAPACITY DATA

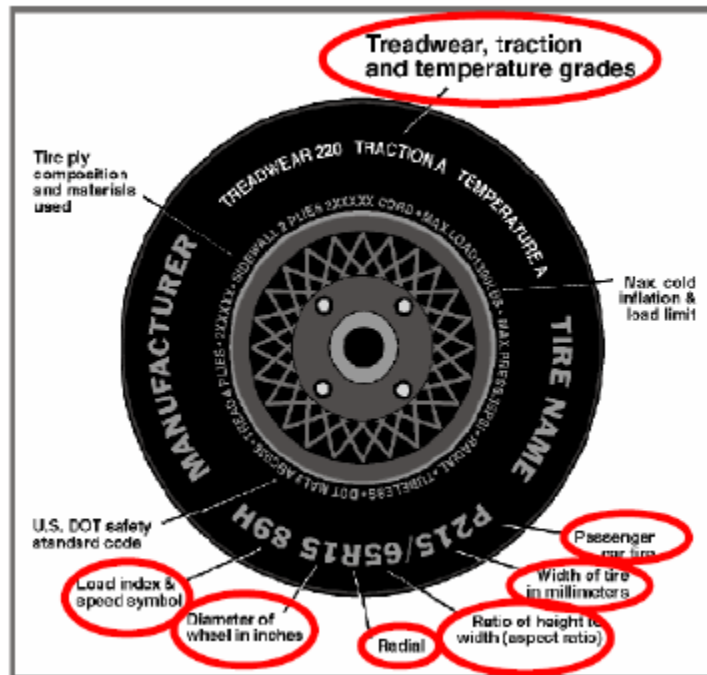
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	-	
Number of Occupants	2	3	-	5
Capacity Wt. (VCW) (kg)				385
Cargo Wt. (RCLW) (kg)				44.8

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

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



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P215/70R16	P215/70R16
Tire Size on Vehicle	P215/70R16	P215/70R16
Tire Manufacturer	Continental	Continental
Tire Model	Cross Contact LX	Cross Contact LX
Treadwear	680	680
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Polyamide	1 Polyester, 2 Steel, 1 Polyamide
Load Index / Speed Symbol	100S	100S
Tire Material	Rubber	Rubber
DOT Safety Code Left	AF093WM3014	AF093WM3014
DOT Safety Code Right	AF093WM3014	AF093WM3014

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	483	325		506	395	
Right	kg	447	332		489	373	
Ratio	%	59%	41%		56%	44%	
Totals	kg	930	657	1587	995	768	1763

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1587	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	140	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	44.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1771.8	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	804	804	884	796	1287
As Tested	mm	796	802	768	778	1142
Post-Test	mm	793	808	767	779	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2622
Total Vehicle Length at Left Side	mm	4434
Total Vehicle Length at Centerline	mm	4556
Total Vehicle Length at Right Side	mm	4435
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	33
Amount of Stoddard Solvent in Fuel Tank	L	53.95

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk carpeting, spare tire, jack, tail light, and hatch plastic.

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	4556
2	Total Width	1820
3*	Bumper Top Height	600
4*	Bumper Bottom Height	468
5*	Longitudinal Member Top Height	576
6	Distance Between Longitudinal Members	1113
7	Longitudinal Member Width	89
8*	Engine Top Height	861
9*	Engine Bottom Height	191
10	Engine and Gearbox Width	568
11	Front Bumper-Engine Distance	651
12*	Front Shock Absorber Fixing Height	962
13*	Bonnet Leading Edge Height	875
14	Front Shock Absorber Fixing Width	1152
15	Front Bumper – Front Axle Distance	915
16	Front Axle – A Pillar Distance	371
17	A-Pillar – B-Pillar Distance	1225
18	B-Pillar – Rear Axle Distance	1028
19	B-Pillar – C-Pillar Distance	964
20*	Roof Sill Bottom Height	1516
21*	Roof Sill Top Height	1563
22*	Floor Sill Bottom Height	381
23*	Floor Sill Top Height	447

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

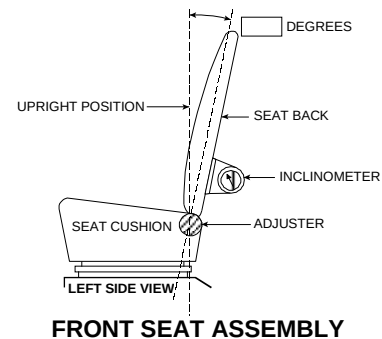
DATA SHEET NO. 2 SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014

NOMINAL DESIGN RIDING POSITION

The driver's seat back was set to the manufacturer's designated angle. The passenger's seat back was positioned in a similar manner as the driver's seat back. Seat back angles are measured at the headrest post bezel using a digital inclinometer.



Seating Position	Degrees
Driver Seat Back Angle	10.2
Passenger Seat Back Angle	9.6

SEAT FORE / AFT POSITIONS

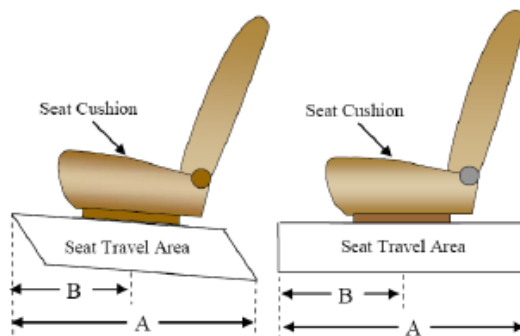
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	25 (0-24)	10
Passenger Seat	25 (0-24)	0

SEAT BELT UPPER ANCHORAGE

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

Seating Position	Total # of Positions	Placed in Position #
Driver Seat	4	0
Passenger Seat	4	0



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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

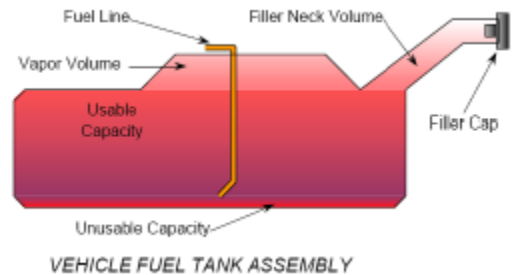
NHTSA No.: M20155315
 Test Date: 12/10/2014

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	58
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	53.4 – 54.5
Actual Amount of Solvent Used	53.95
1/3 of Usable Capacity	19.33

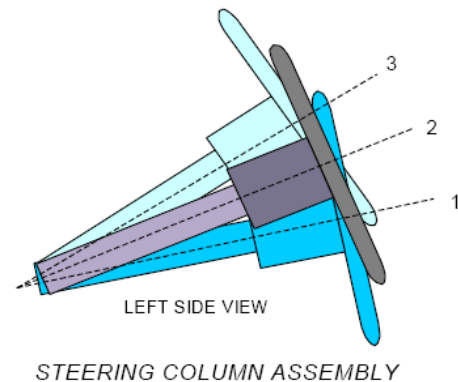
FUEL PUMP

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.



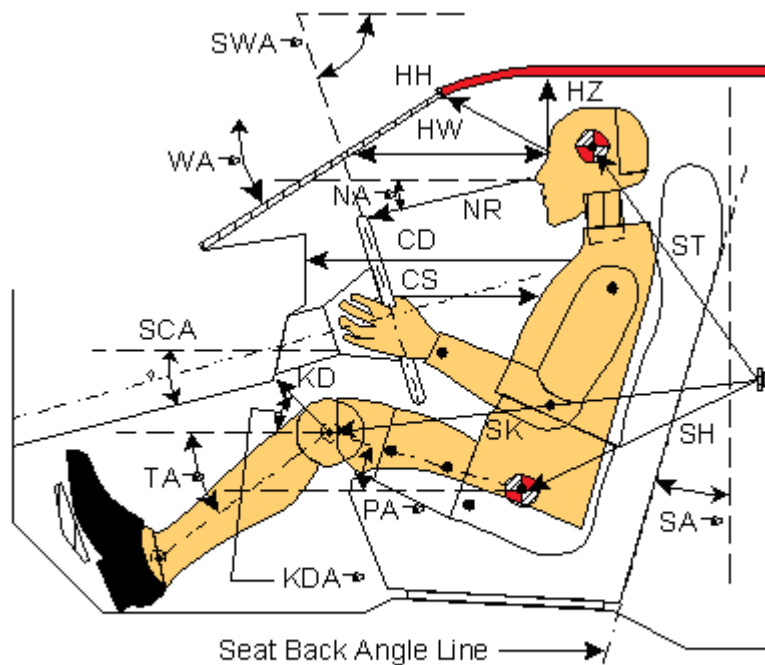
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	25.4	
Geometric center position No. 2	27.7	
Uppermost position No. 3	30.0	
Telescoping Steering Wheel Travel		40
Test Position	27.7	20

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014



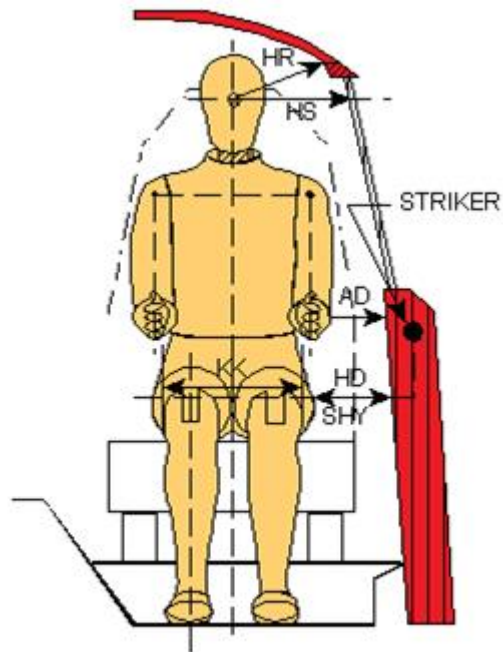
Left Side View

Code	Measurement Description	Driver (SN: 1046)		Passenger (SN: 139)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		-29.2		
SWA°	Steering Wheel Angle		27.4		
SCA°	Steering Column Angle		62.6		
SA°	Seat Back Angle (on headrest post)		10.2		8.9
HZ	Head to Roof (Z)	251	90	245	90
HH	Head to Header	409	24.1	342	38.7
HW	Head to Windshield	721	0	645	0
NR	Nose to Rim	408	-8.9	490	-32.4
CD	Chest to Dash	592		436	
CS	Chest to Steering Hub	317	-1.8		
RA	Rim to Abdomen	184	0		
KDL	Left Knee to Dash	149	28.7	92	34.8
KDR	Right Knee to Dash	111	31.6	98	33.8
PA°	Pelvic Angle		23.8		20.8
TA°	Tibia Angle		-34.0		-43.4
SK	Striker to Knee	632	-12.1	732	-12.0
ST	Striker to Head	441	-74.8	466	-5.4
SH	Striker to H-Point	368	-45.3	432	-27.2

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014



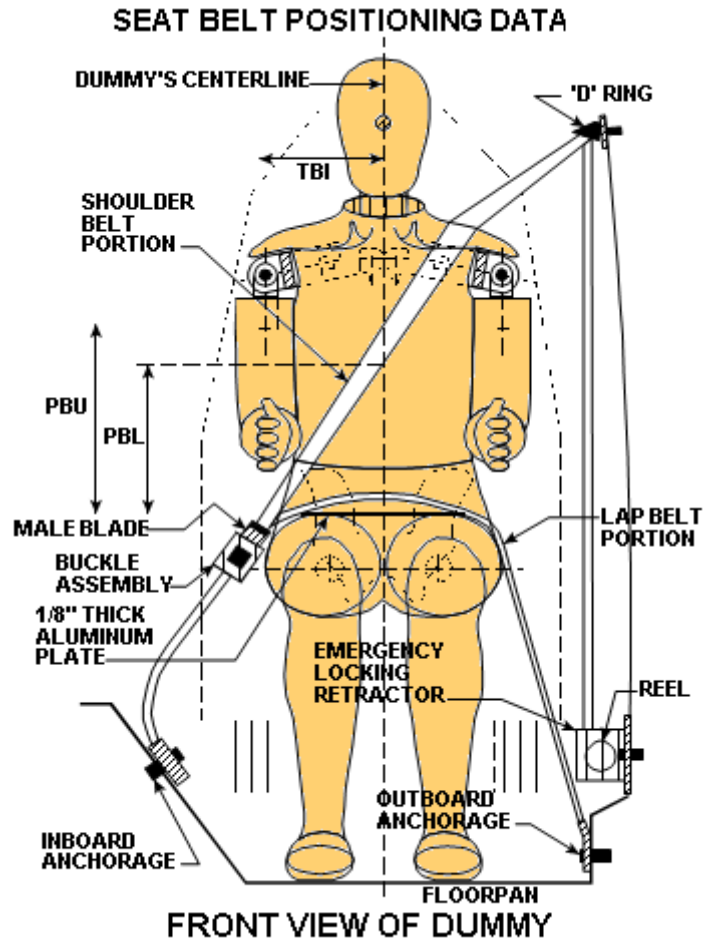
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	126	68
HD	H-Point to Door	150	163
HR	Head to Side Header	234	263
HS	Head to Side Window	350	368
KK	Knee to Knee	353	162
SHY	Striker to H-Point (Y Direction)	235	240
AA	Ankle to Ankle	371	161

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	360	325
PBL — Top surface of reference to belt lower edge	mm	290	230

BELT LENGTH DATA

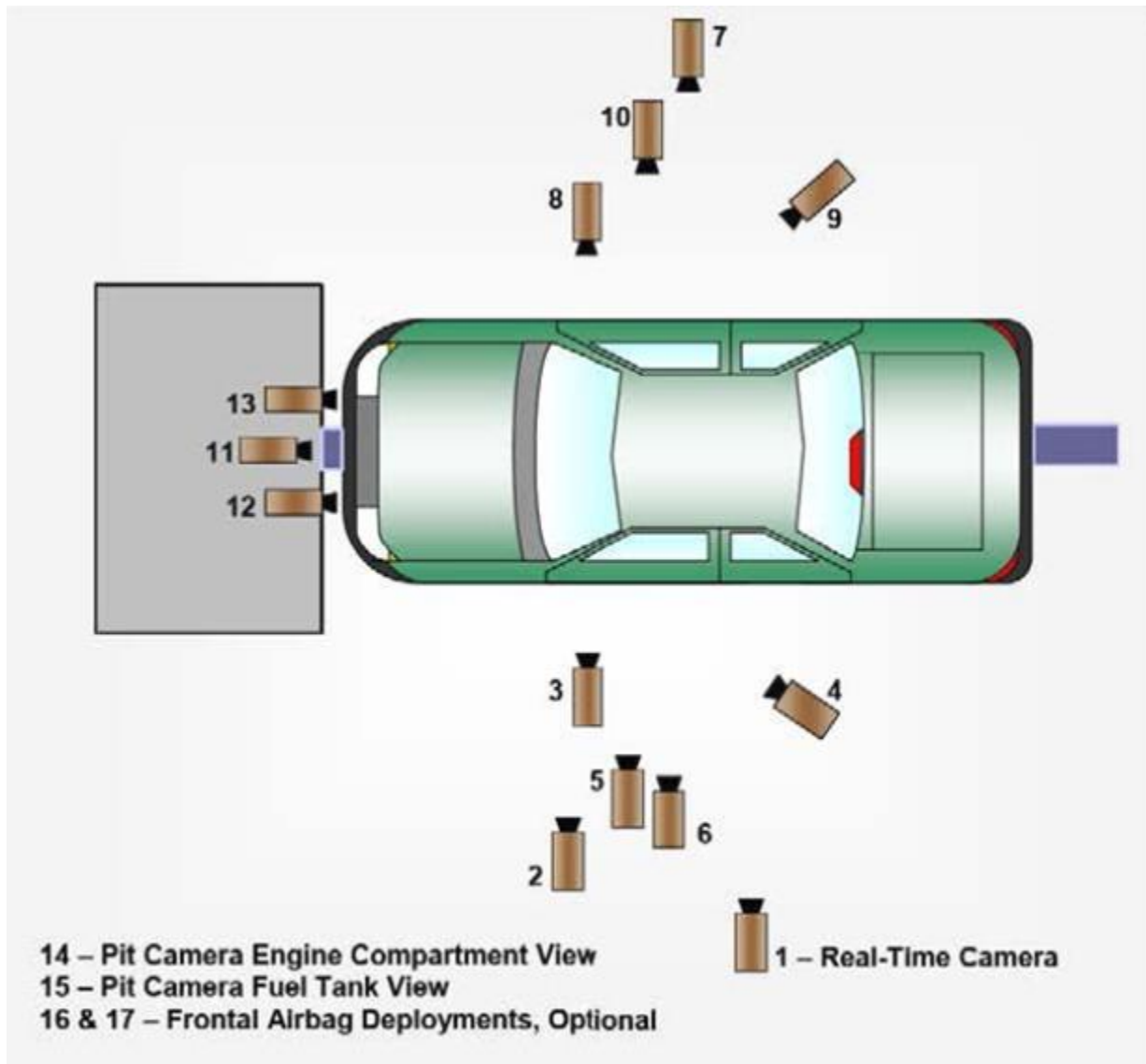
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	870	940
Lap Belt Length as measured on ATD	mm	755	455
Remainder of belt on reel	mm	775	855
Total belt length for continuous webbing systems	mm	2400	2250

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

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014

CAMERA POSITIONS FOR FRONTAL IMPACTS



Top View

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

CAMERA LOCATIONS

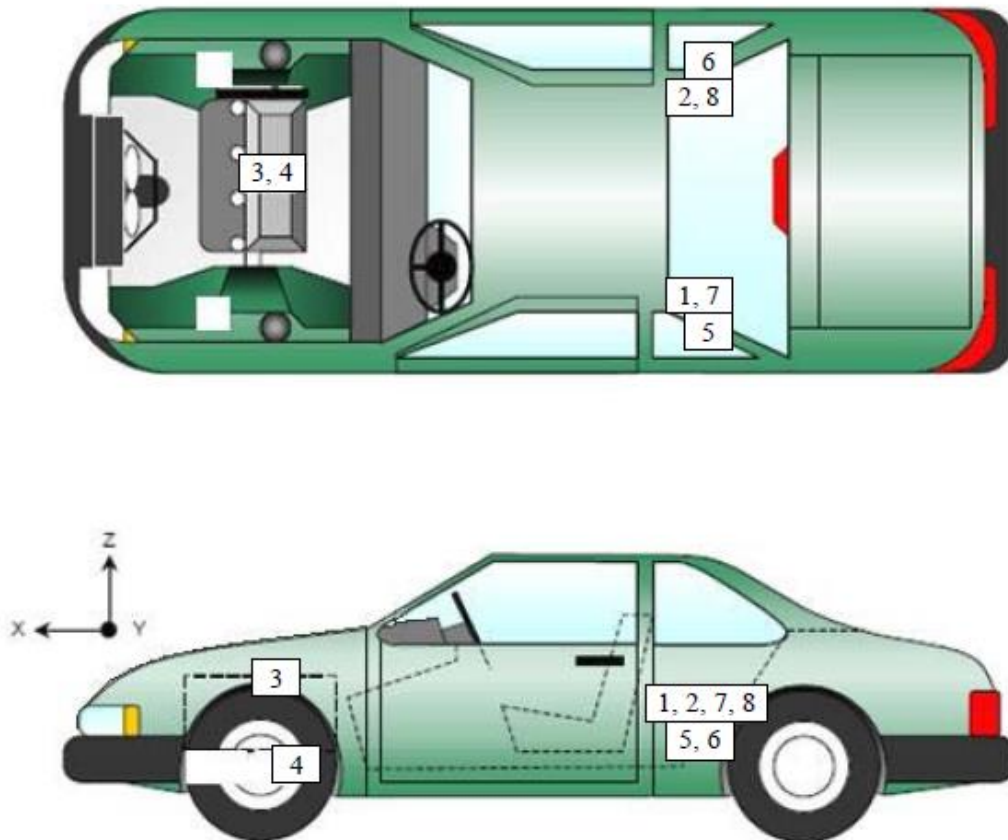
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-	-	-		60
2	Driver Close-Up	1315	-8266	-1559	50	1000
3	Left Front Half	494	-9816	-1581	50	1000
4	Left Angle	2681	-2877	-2213	28	1000
5	Steering Column - Top					
6	Steering Column - Bottom					
7	Right Overall	2078	8852	-1186	24	1000
8	Passenger Close-Up	1654	7762	-1170	50	1000
9	Right Front Half	983	5976	-1173	28	1000
10	Right Angle	2825	3335	-2363	24	1000
11	Windshield	954	0	-3505	28	1000
12	Driver Windshield	395	-600	-2051	25	1000
13	Passenger Windshield	395	600	-2051	25	1000
14	Pit Front	618	0	2484	28	1000
15	Pit Rear	1843	0	1935	28	1000
16	Onboard Driver Airbag (Optional)				12.5	1000
17	Onboard Passenger Airbag (Optional)				12.5	1000

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

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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1787	-463	18
2	Right Rear Accelerometer – X Direction	1787	469	19
3	Engine Top X	3812	274	-361
4	Engine Bottom X	3909	164	311
5	Left Rear Accelerometer – Z Direction	1787	-463	18
6	Right Rear Accelerometer – Z Direction	1787	469	19
7	Left Rear Accelerometer – X Direction Redundant	1787	-463	18
8	Right Rear Accelerometer – X Direction Redundant	1787	469	19

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

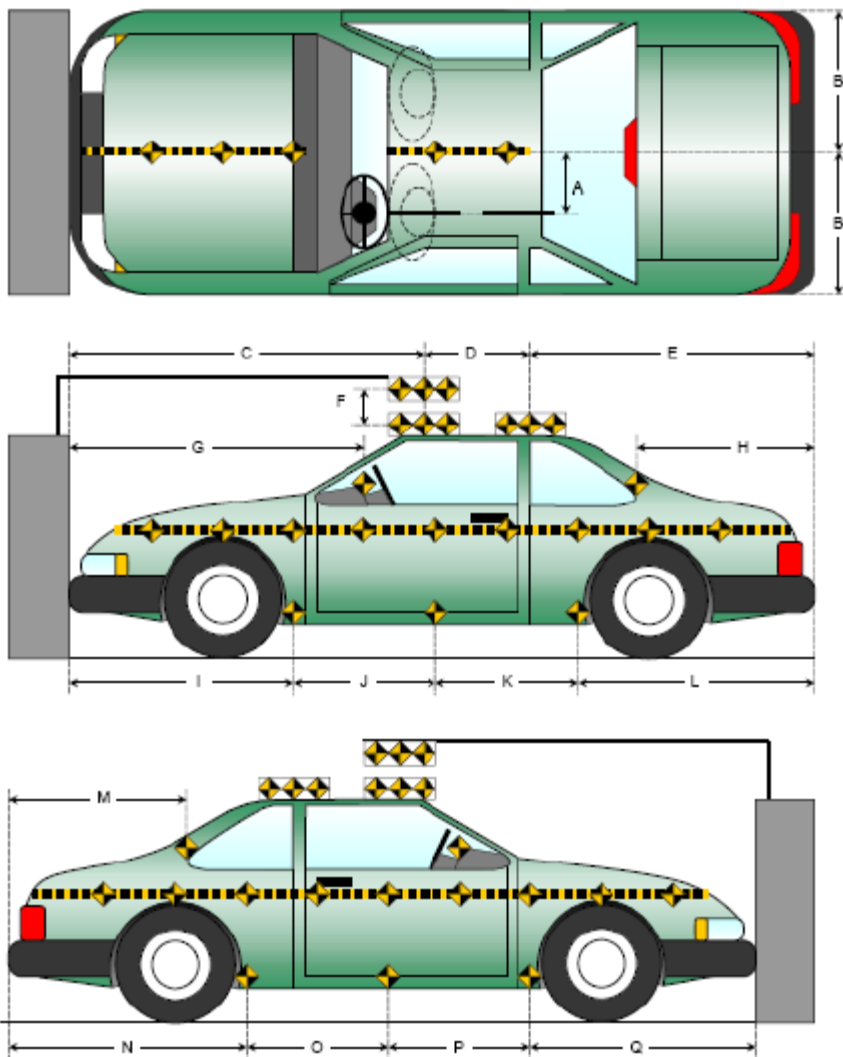
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

Item	Value
A	382
B	910
C	1909
D	552
E	2095
F	122
G	1716
H	1081
I	1402
J	834
K	835
L	1485
M	1079
N	1482
O	835
P	839
Q	1400

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014

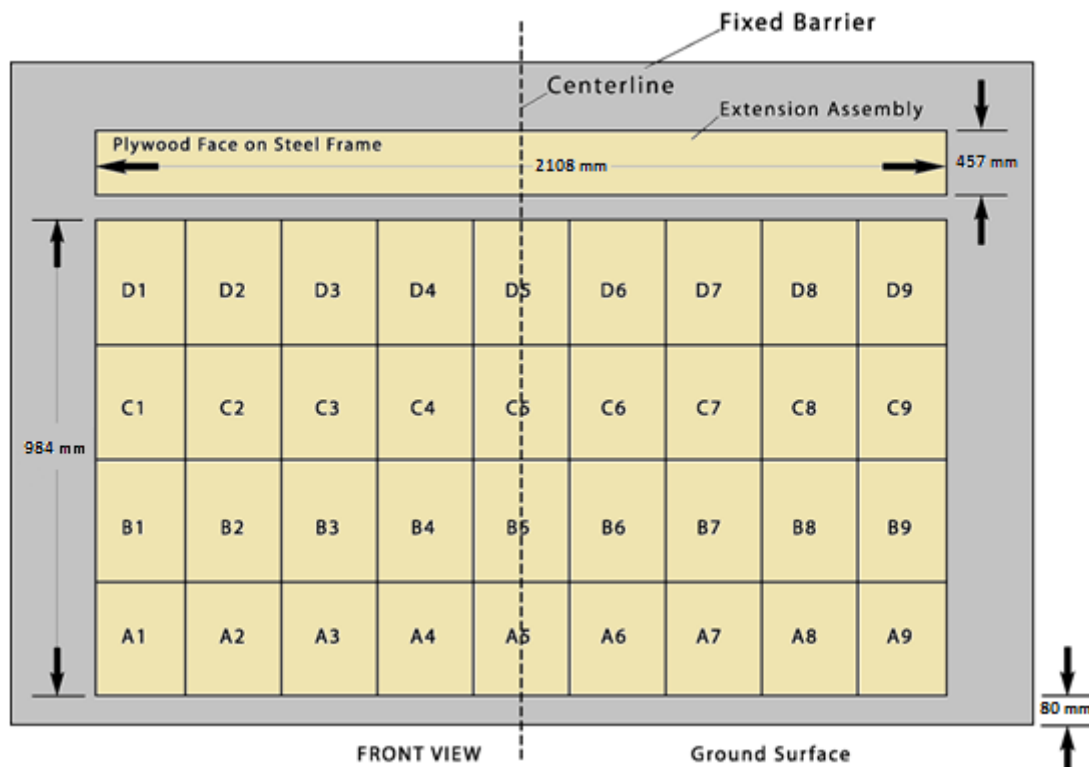


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension*

***Note: The Plywood Height Extension was not used for this test**

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

INSTRUMENTATION

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

CAMERA COVERAGE

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

DATA SHEET NO. 11
POST-TEST OBSERVATIONS

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	P572E 50 th Male / 1046	P5720 5 th Female / 139
Head Contact	Front Airbag & Headrest	Front Airbag & Headrest
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST-TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	673
Center	mm	533
Right Side	mm	527
Average	mm	577.6

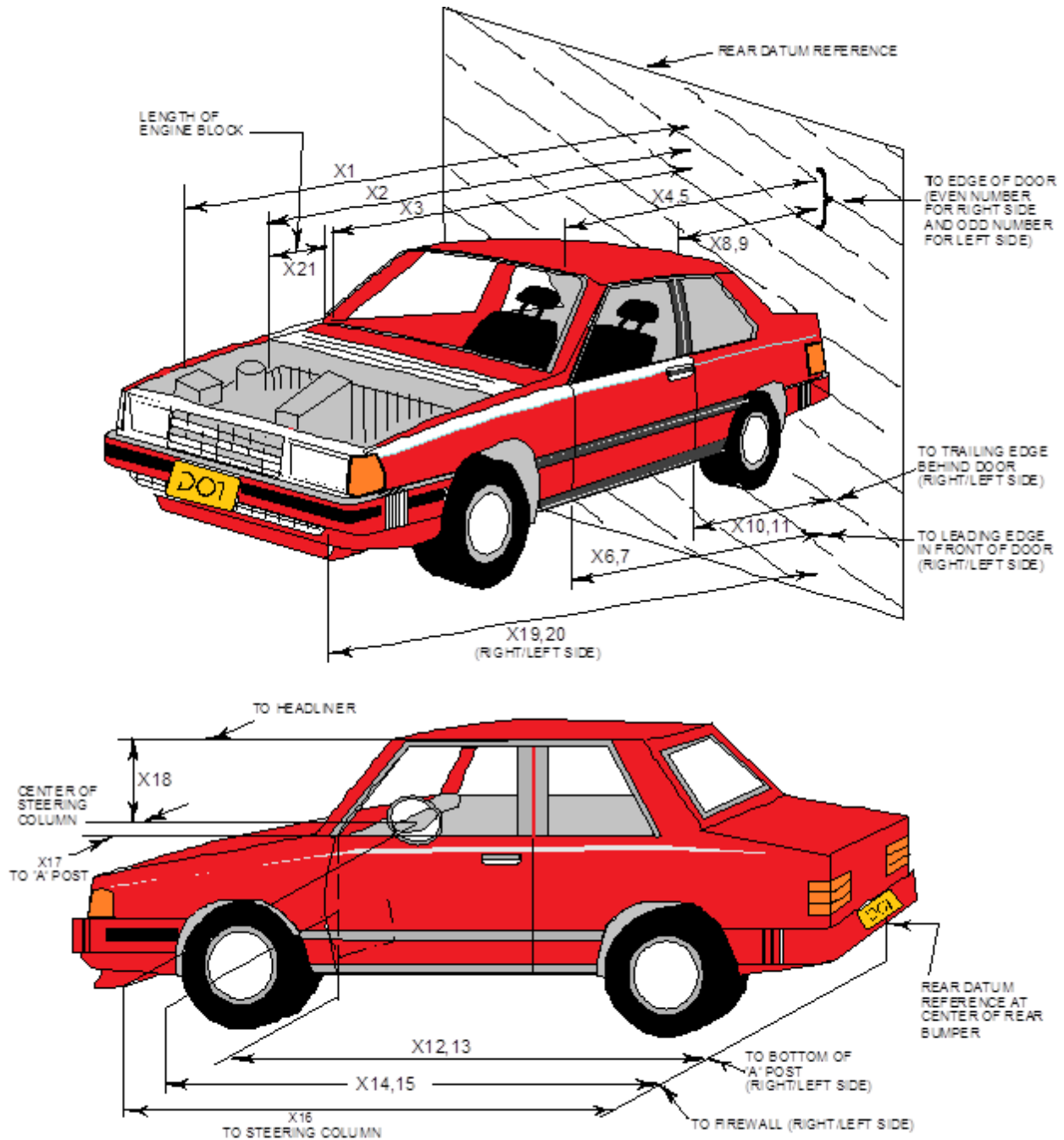
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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

DATA SHEET NO. 12
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014



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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4556	4176	-380
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3905	3590	-315
3	RSOV to Firewall	3427	3364	-63
4	RSOV to Upper Leading Edge of Right Door	3142	3138	-4
5	RSOV to Upper Leading Edge of Left Door	3144	3144	0
6	RSOV to Lower Leading Edge of Right Door	3095	3091	-4
7	RSOV to Lower Leading Edge of Left Door	3093	3094	1
8	RSOV to Upper Trailing Edge of Right Door	2049	2046	-4
9	RSOV to Upper Trailing Edge of Left Door	2051	2053	1
10	RSOV to Lower Trailing Edge of Right Door	2066	2062	-3
11	RSOV to Lower Trailing Edge of Left Door	2064	2065	1
12	RSOV to Bottom of "A" Post of Right Side	3364	3349	-15
13	RSOV to Bottom of "A" Post of Left Side	3363	3363	-1
14	RSOV to Firewall, Right Side	3707	3698	-9
15	RSOV to Firewall, Left Side	3705	3694	-11
16	RSOV to Steering Column	2696	2681	-14
17	Center of Steering Column to "A" Post	294	285	-9
18	Center of Steering Column to Headliner	421	486	65
19	RSOV to Right Side of Front Bumper	4484	4183	-301
20	RSOV to Left Side of Front Bumper	4481	4146	-336
21	Length of Engine Block	256	256	0
RD	RSOV to Right Side of Dash Panel	2879	2881	2
CD	RSOV to Center of Dash Panel	2851	2854	2
LD	RSOV to Left Side of Dash Panel	2884	2884	1

*UR= Unrecoverable data point
 All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014

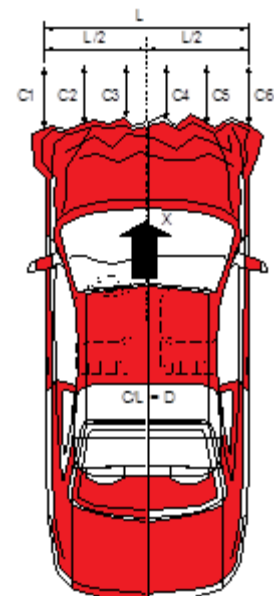
VEHICLE INFORMATION

VIN: 5J6RM4H39FL005300
Vehicle Size Category: Passenger

Wheelbase (mm): 2,622
Test Weight (kg): 1,763

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): 124



CRUSH PROFILE

Collision Deformation Classification: 12FDEW02
Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1219
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4325	4073	252
C2	Crush Zone 2 at Left Side	mm	4501	4147	354
C3	Crush Zone 3 at Left Side	mm	4552	4171	381
C4	Crush Zone 4 at Right Side	mm	4552	4192	360
C5	Crush Zone 5 at Right Side	mm	4502	4166	336
C6	Crush Zone 6 at Right Side	mm	4485	4064	421
L	C1 to C6	mm	1219	1535	-316

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

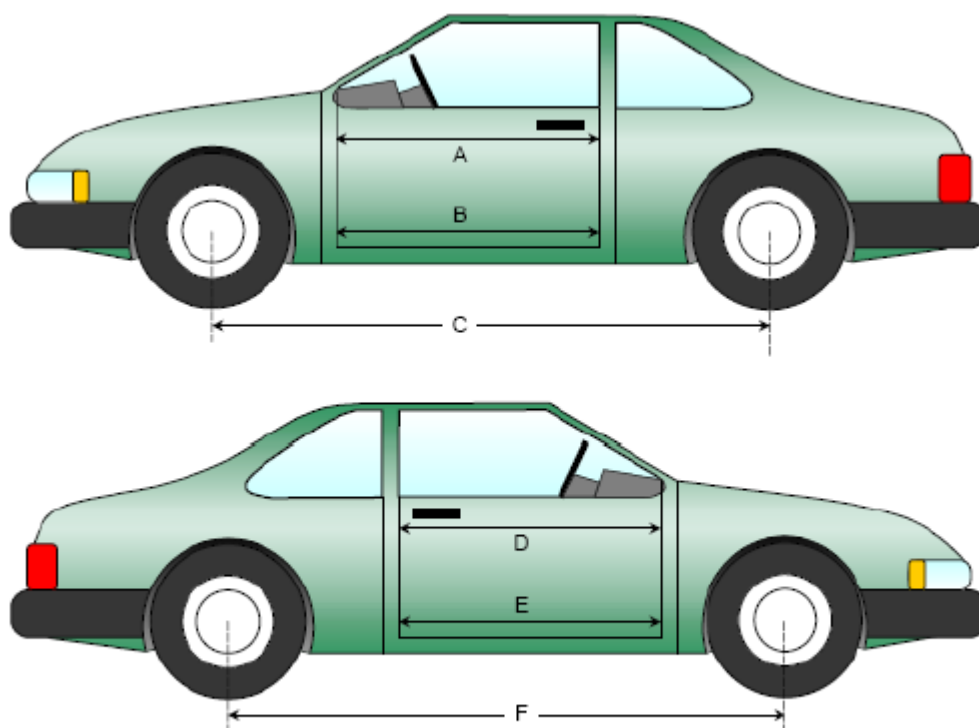
NHTSA No.: M20155315
Test Date: 12/10/2014

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1007	1005	-2
B	Left Side Lower	mm	844	850	6
D	Right Side Upper	mm	1006	1004	-2
E	Right Side Lower	mm	851	850	-1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2622	2541	-81
F	Right Side Wheelbase	mm	2622	2504	-118



Left & Right Side Views

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

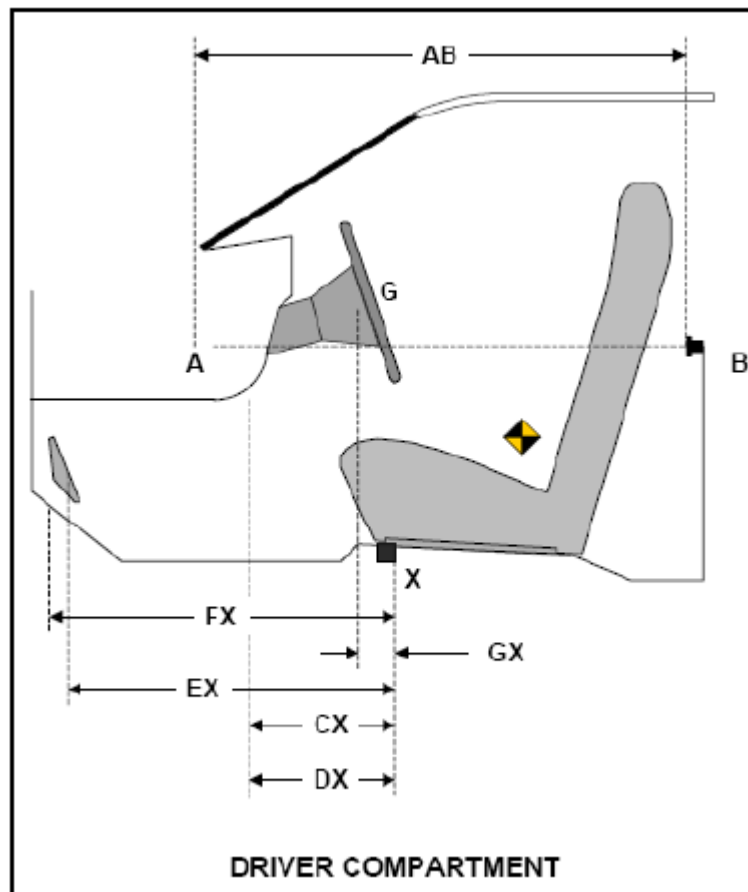
Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	848	850	2
CX	Left Knee Bolster to X	mm	343	346	3
DX	Right Knee Bolster to X	mm	324	330	6
EX	Brake Pedal to X	mm	603	594	-9
FX	Foot Rest to X	mm	628	606	-21
GX	Center of Steering Column Wheel Hub to X	mm	144	131	-13

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014

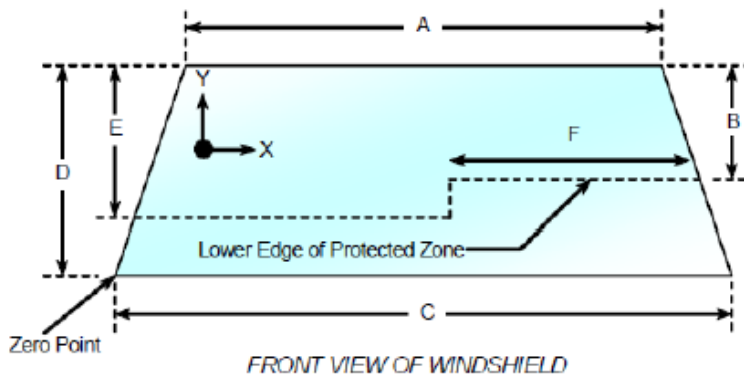
Windshield Mounting Details: A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

The standard requires that the post-test retention measurement be a minimum of 75% of the pre-test total periphery measurement for vehicles not equipped with occupant passive restraints and 50% for each side of the windshield for vehicles which are equipped with occupant passive restraints.

Temperature of windshield molding during test: 21° C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2213	2213	100%
Right Side	2213	2213	100%
Total	4426	4426	100%



Item	Units	Value
A	mm	1227
B	mm	509
C	mm	1555
D	mm	822
E	mm	567
F	mm	509

AREAS OF PROTECTED ZONE FAILURES

A. *Provide coordinates of the area that the protected zone was penetrated more than .25 inches by a vehicle component other than one that is normally in contact with the windshield.*

- No Penetration

X	Y

B. *Provide coordinates of the area beneath the protected zone that the inner surface of the windshield was penetrated by a vehicle component.*

- No Penetration

X	Y

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

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21 ° C

Test Time: 12:05 PM

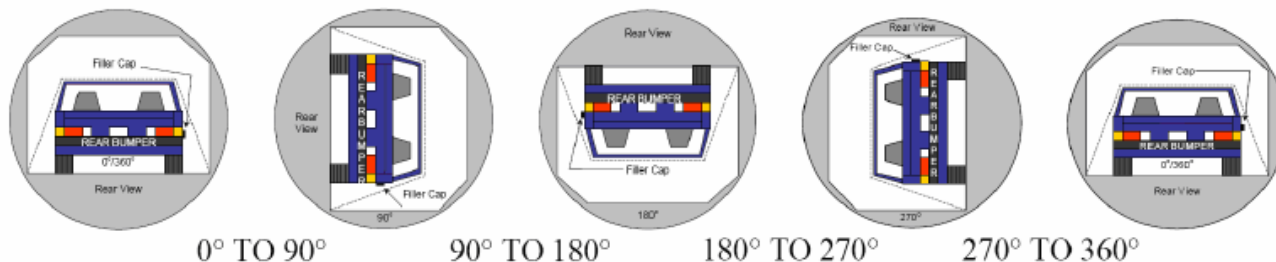
STODDARD SOLVENT SPILLAGE MEASUREMENTS

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

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2015 Honda CR-V SUV
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
 Test Date: 12/10/2014



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

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	68	300	368
90° to 180°	70	300	370
180° to 270°	63	300	363
270° to 360°	68	300	368

FMVSS 301 SPILLAGE TABLE

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

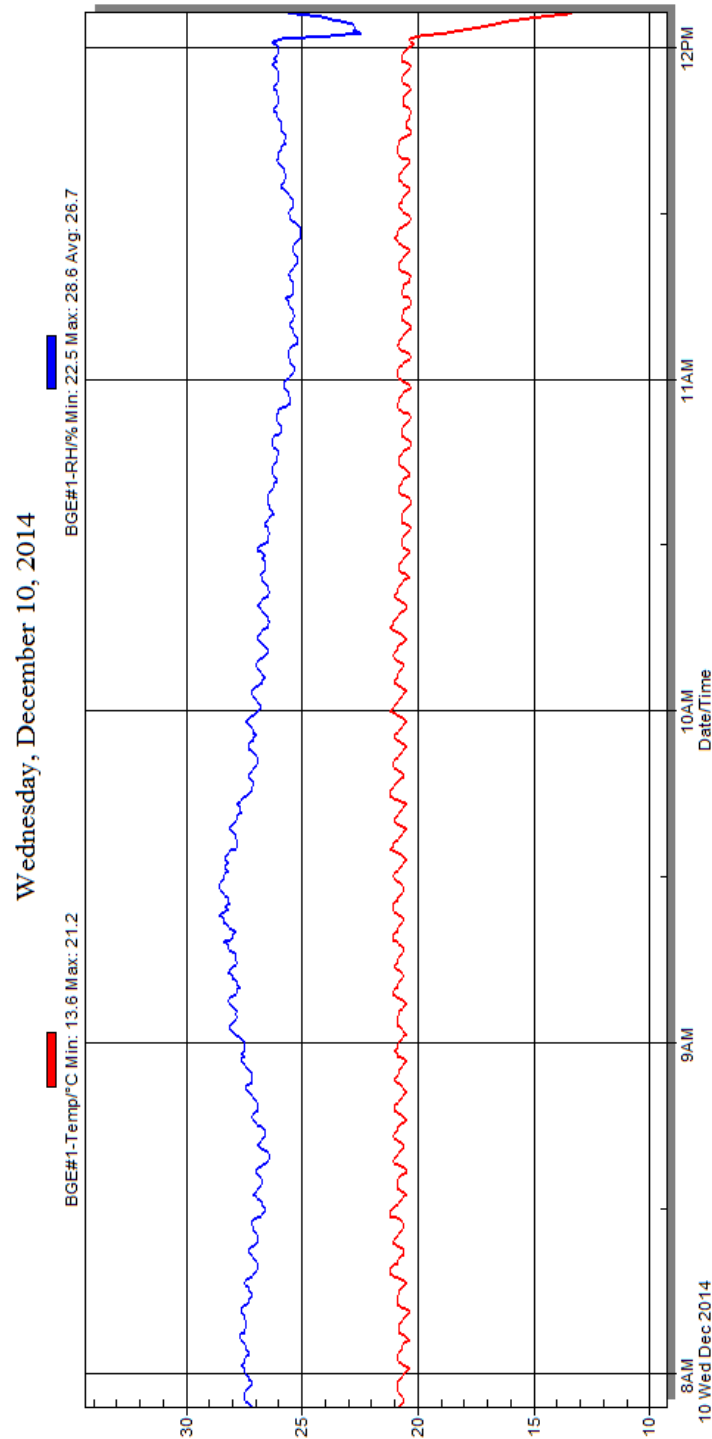
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2015 Honda CR-V SUV
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155315
Test Date: 12/10/2014



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

APPENDIX A
PHOTOGRAPHS

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39	Pre-Test Driver Dummy Feet	A-24
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46	Post-Test Driver Dummy Contact With Airbag	A-27
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76	Vehicle at 360° on Static Rollover Device	A-42
77	2015 Honda CR-V Frontal Impact Event	A-43
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¹**NOTE:** *The underbody views should include the following vehicle components: fuel pump, fuel lines, sender unit, fuel tank filler pipe and any other visible system components.*



Figure A-1: Load Cell Location

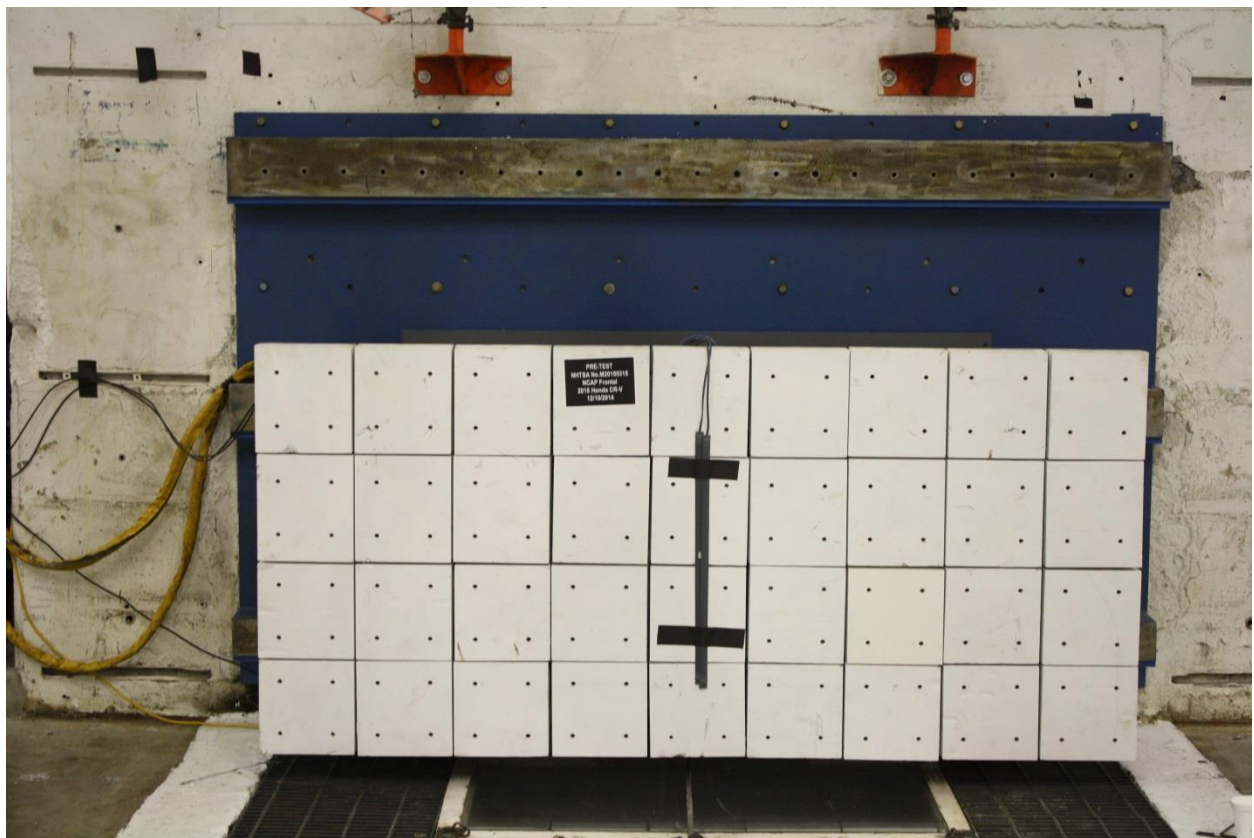


Figure A-2: Load Cell Wall



Figure A-3: Manufacturer's Label



Figure A-4: Tire Placard



Figure A-5: 2015 Honda CR-V Frontal As Delivered



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



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



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



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



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



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



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



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



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



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



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



Figure A-17: Pre-Test Windshield View

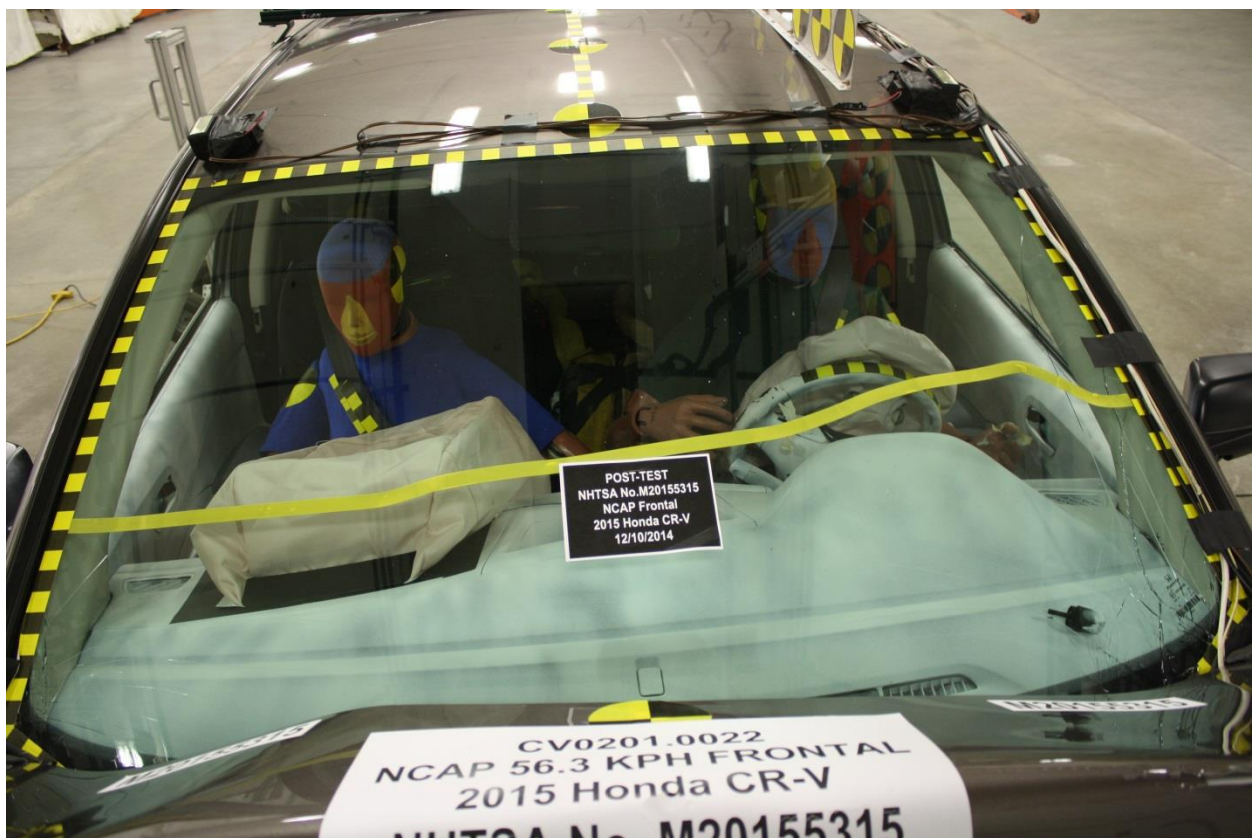


Figure A-18: Post-Test Windshield View

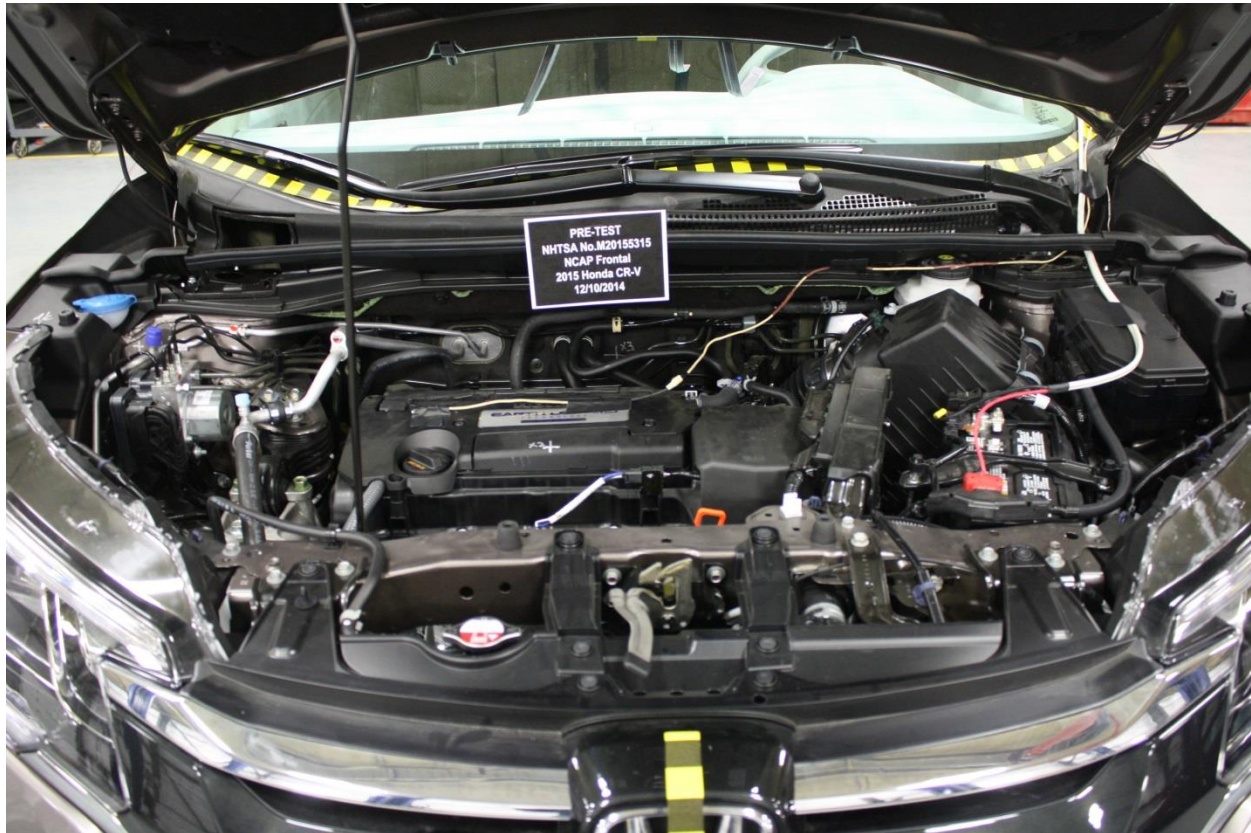


Figure A-19: Pre-Test Engine Compartment View



Figure A-20: Post-Test Engine Compartment View



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



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

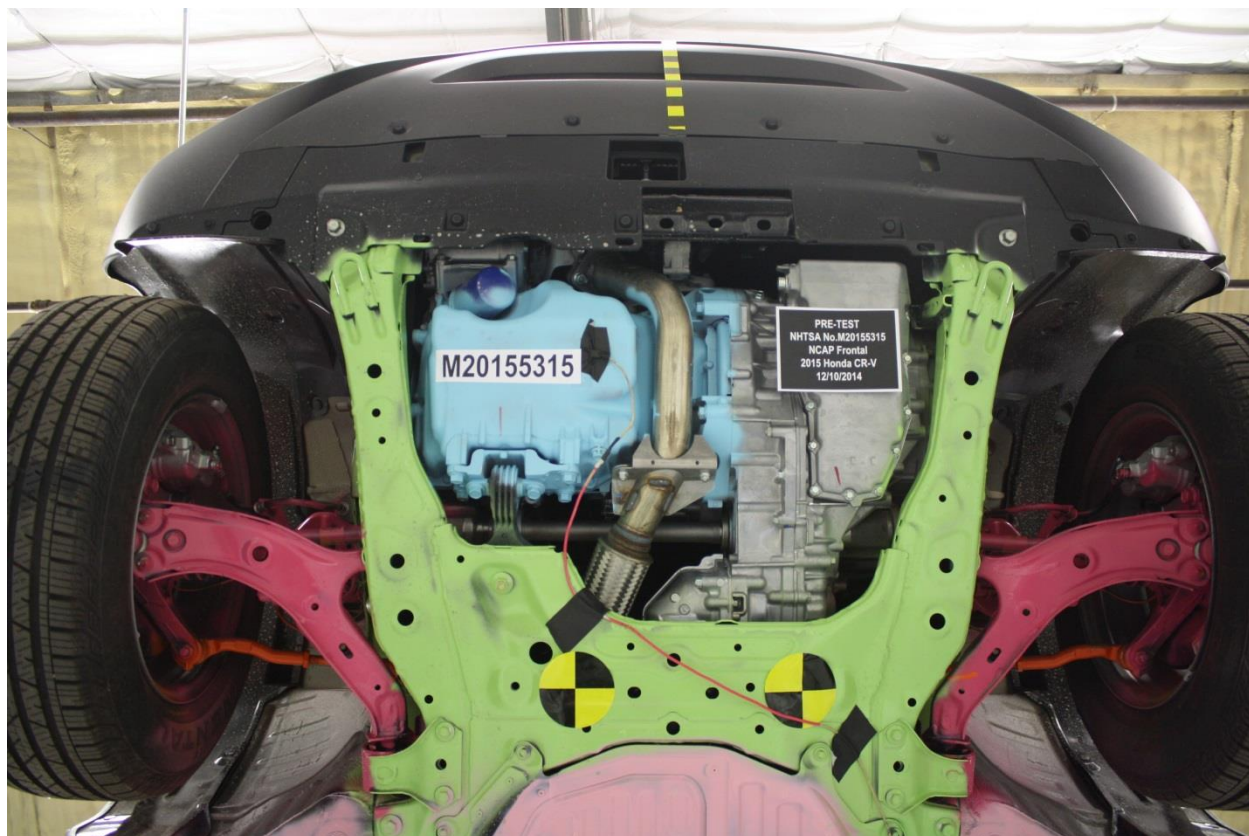


Figure A-23: Pre-Test Front Underbody View



Figure A-24: Post-Test Front Underbody View

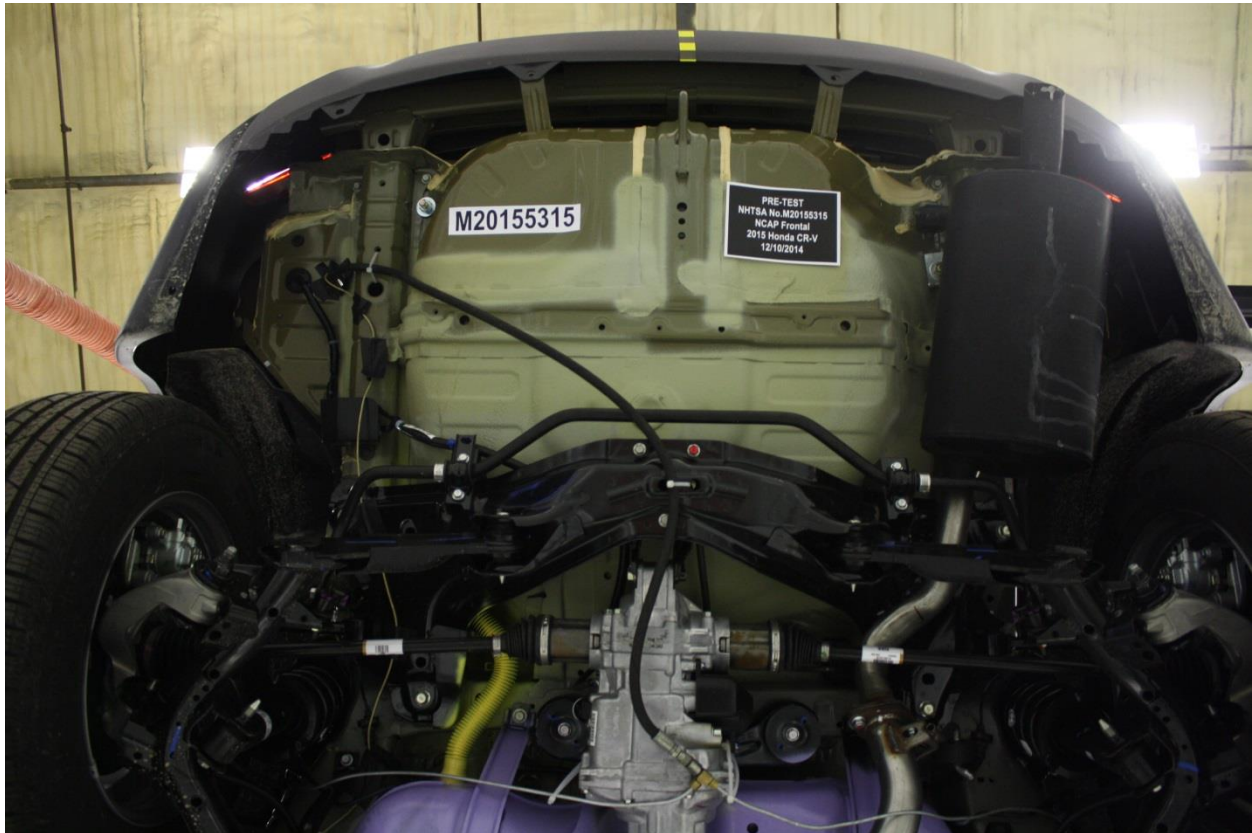


Figure A-25: Pre-Test Rear Underbody View



Figure A-26: Post-Test Rear Underbody View



Figure A-27: Pre-Test Dummy Cable Routing

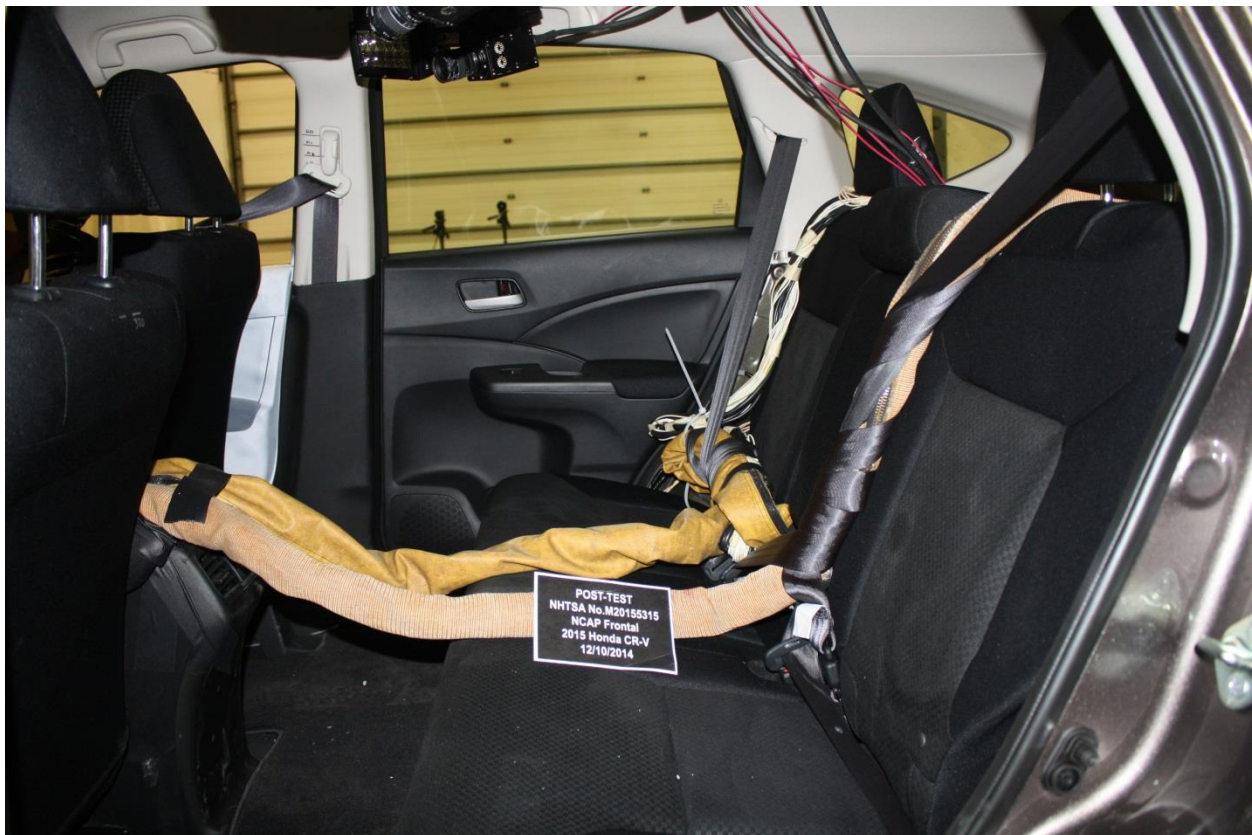


Figure A-28: Post-Test Dummy Cable Routing



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



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



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



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



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



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

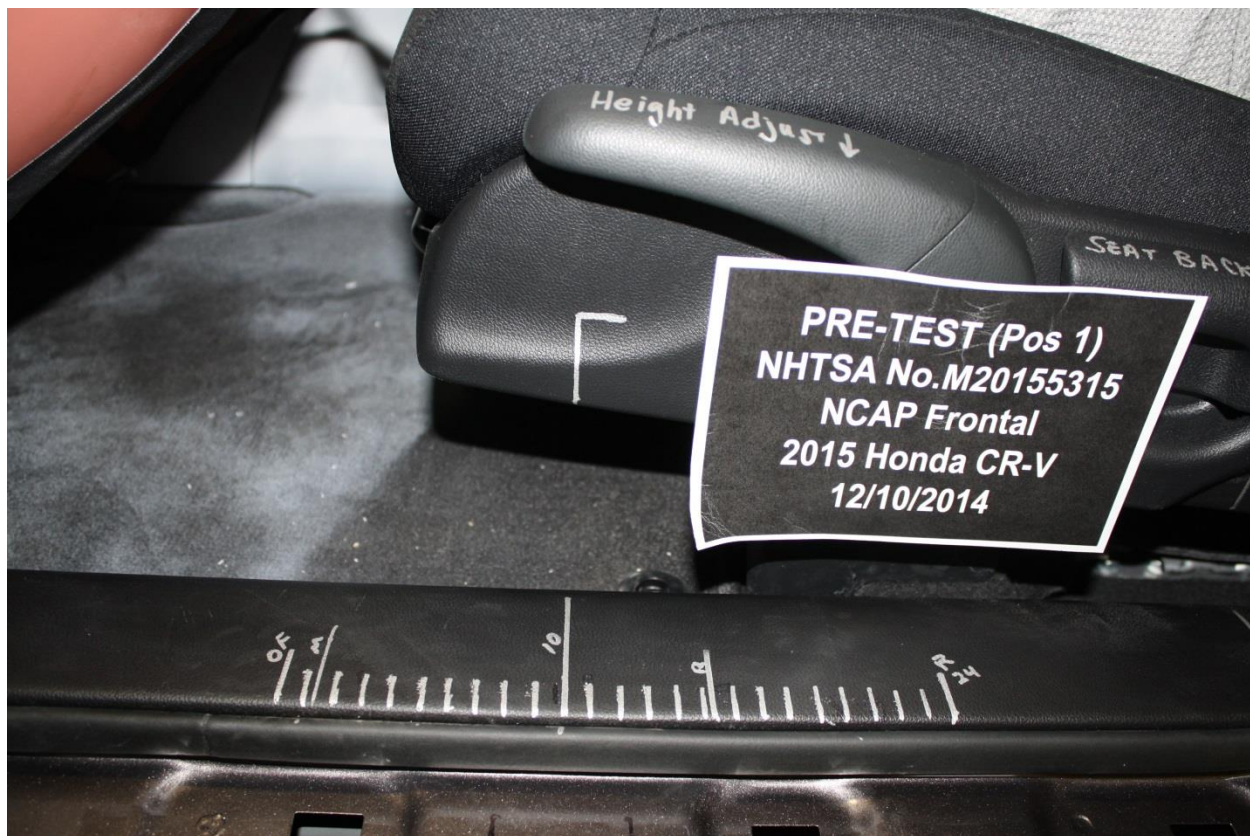


Figure A-35: Pre-Test Driver's Seat Fore-Aft Markings



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



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



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



Figure A-39: Pre-Test Driver Dummy Feet



Figure A-40: Post-Test Driver Dummy Feet



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



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



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



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



Figure A-45: Post-Test Driver Dummy Face



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



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



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



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



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

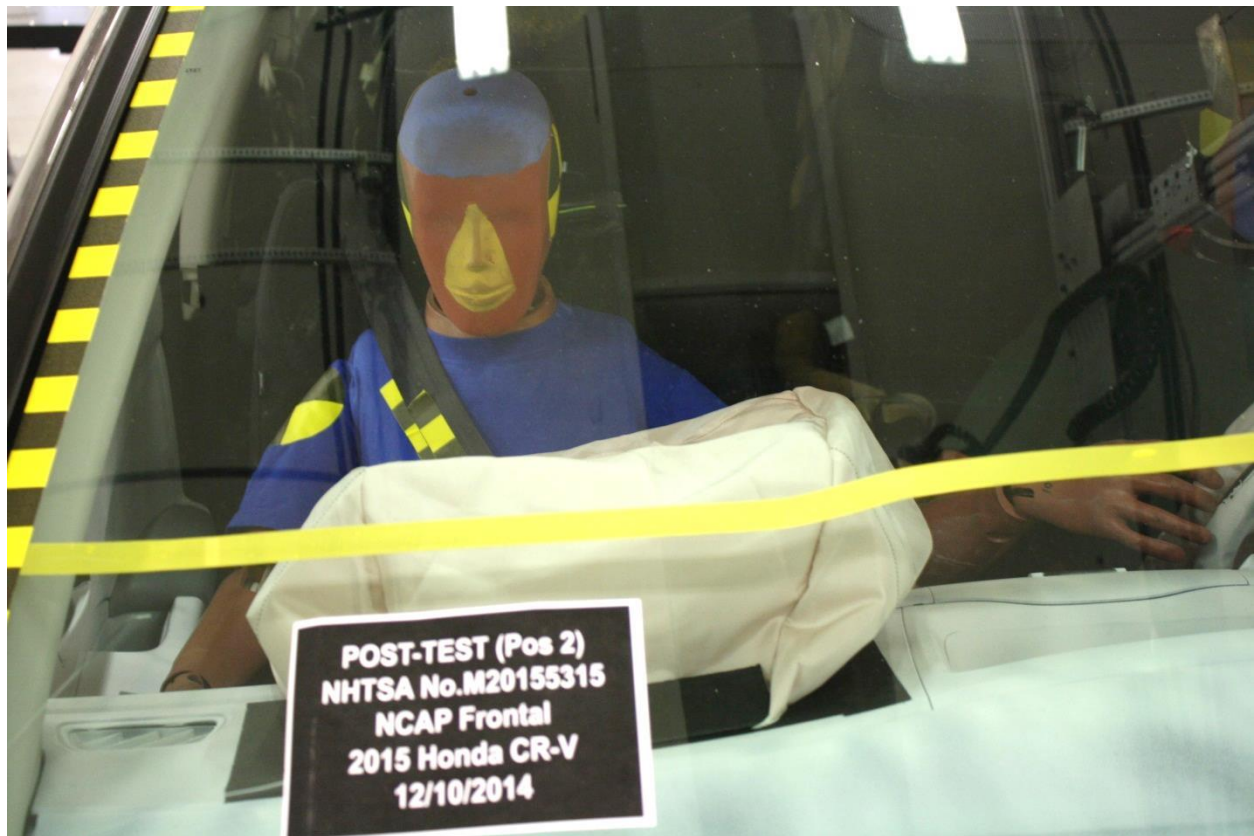


Figure A-51: Post-Test Passenger Dummy Front View



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



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



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



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



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



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

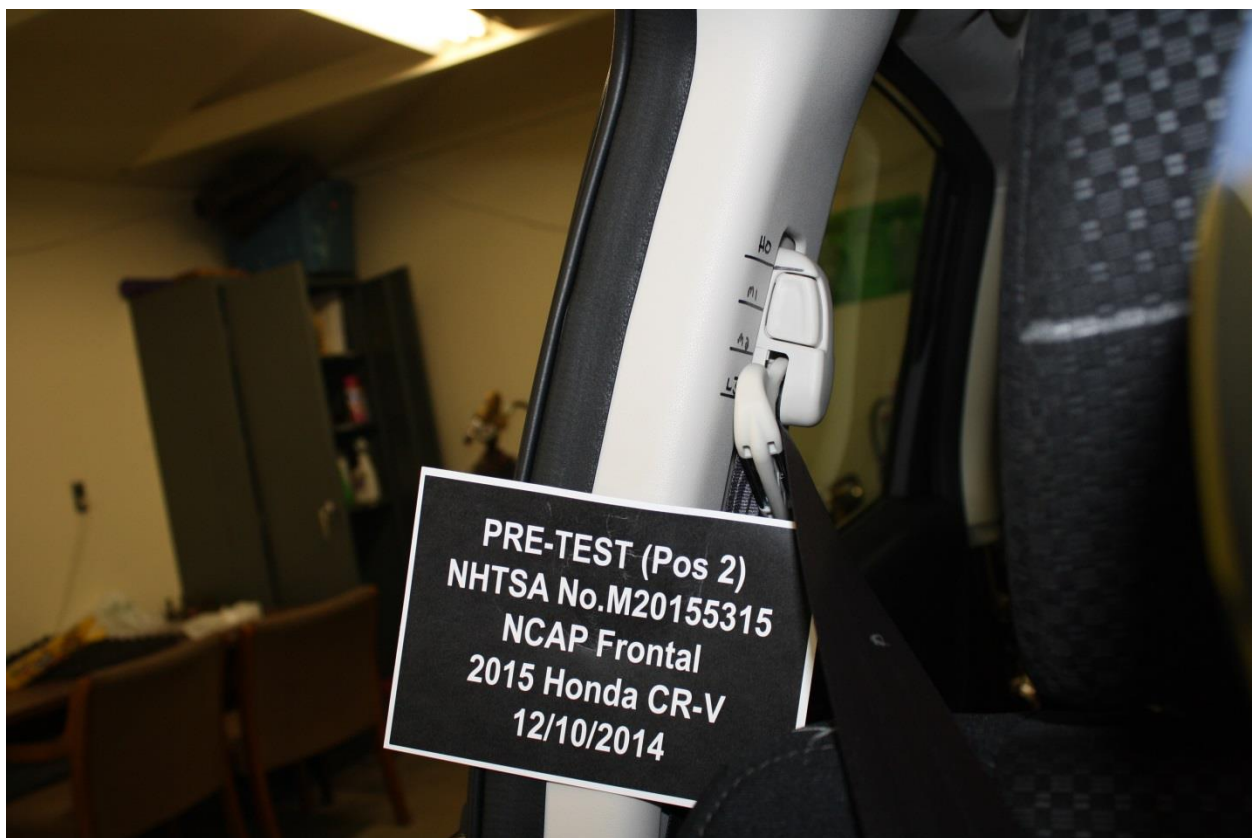


Figure A-58: Pre-Test View of Belt Anchorage for Passenger Dummy



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



Figure A-60: Pre-Test Passenger Dummy Feet



Figure A-61: Post-Test Passenger Dummy Feet



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

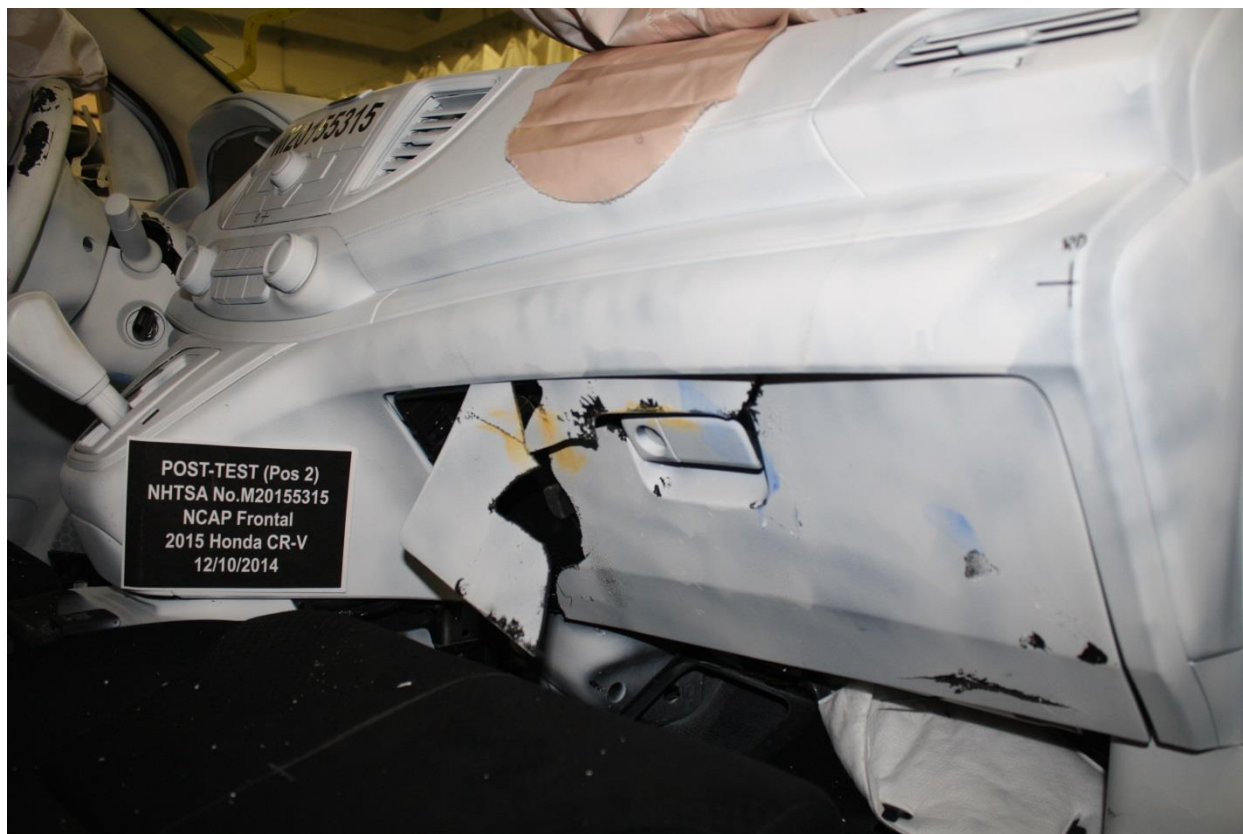


Figure A-63: Post-Test Passenger's Side Knee Bolster



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



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



Figure A-66: Post-Test Passenger Dummy Face



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



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

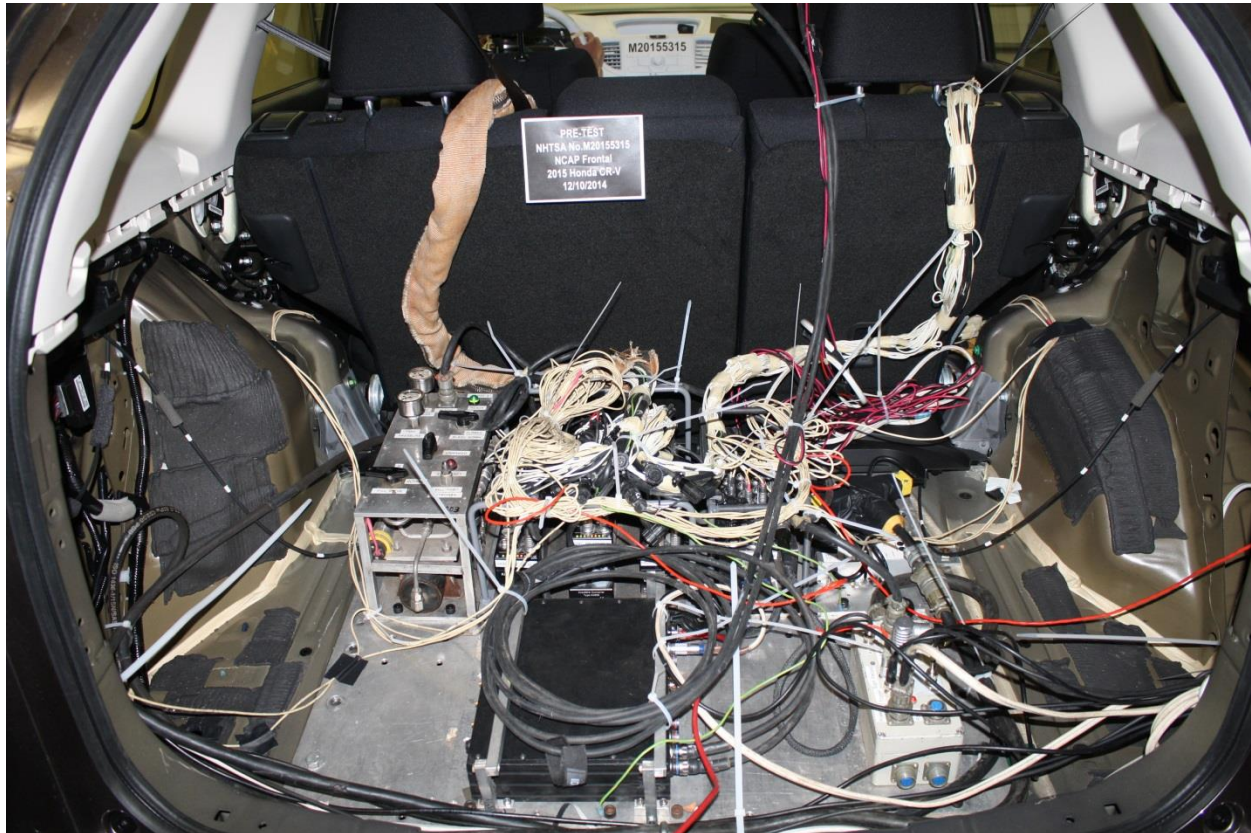


Figure A-69: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

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



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



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



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



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



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

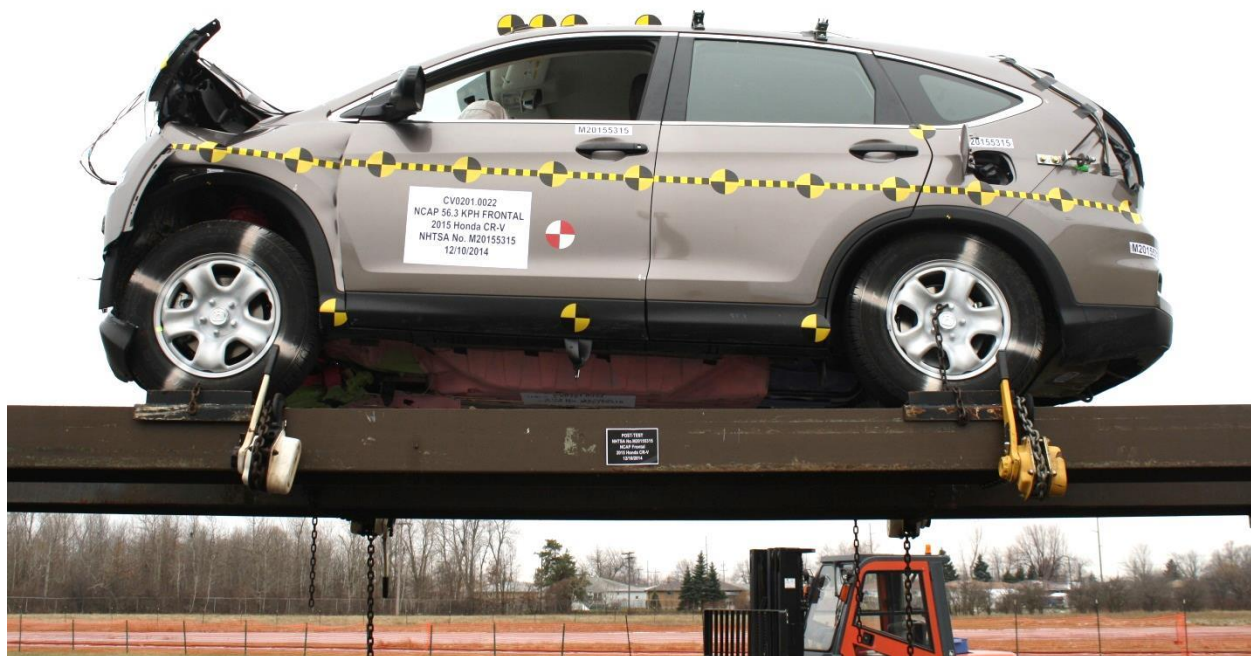


Figure A-76: Vehicle at 360° on Static Rollover Device



Figure A-77: 2015 Honda CR-V Frontal Impact Event

2015 CR-V 5DR AWD LX
EXT: URBAN TITANIUM M. ENGINE NUMBER: K24W9-1013200
INT: BLACK

STANDARD EQUIPMENT AT NO EXTRA COST

- TECHNICAL FEATURES***
 - 185hp 2.4-Liter DOHC 16-Valve i-VTEC 4-Cyl. Earth Dreams Direct-Injection Engine
 - Continuously Variable Transmission (CVT)
 - Real Time AWD with Intelligent Control System
 - 4-Wheel Disc Brakes
 - Front MacPherson Strut Suspension
 - Rear Multi-Link Suspension
 - Drive-by-Wire Throttle System
 - Electric Power-Assisted Rack-and-Pinion Steering
 - Front and Rear Stabilizer Bars
- SAFETY FEATURES***
 - Driver's and Front Passenger's Dual-Stage Airbags (SRS)
 - Driver's and Front Passenger's Side Airbags
 - Side Curtain Airbags with Rollover Sensor
 - Vehicle Stability Assist (VSA)
 - Anti-Lock Braking System (ABS)
 - Electronic Brake Distribution (EBD)
 - Brake Assist
 - Tire Pressure Monitoring System
 - ACE Body Structure
 - LATCH System for Child Seats

INTERIOR FEATURES*

- AM/FM/CD Audio System with 4 Speakers
- Intelligent Multi-Information Display (i-MID) w/ Rearview Camera
- Steering Wheel-Mounted Controls
- Bluetooth Audio
- Bluetooth HandsFreeLink
- Pandora Internet Radio Interface
- USB Audio Interface
- SMS Text Messaging Functionality
- Air Conditioning with Air Filtration System
- Rear Console Vents
- 60/40 Split Fold-Down Rear Seatback
- Power Windows and Door Locks
- Driver's Auto Up/Down Window
- Exterior Temperature Display
- 12-Volt Power Outlets
- Cruise Control
- Floor Mats
- Front Center Console
- Sunglasses Holder with Conversation Mirror

Manufacturer's Suggested Retail Price **\$24,570.00**

Full Tank of Fuel No Charge

Destination and Handling 830.00

TOTAL VEHICLE PRICE
(Includes Pre-Delivery Service) **\$25,400.00**

License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.

ROSEN HONDA
7000 GRAND AVENUE
GURNEE, IL 60031

PORT OF ENTRY: EAST LIBERTY
DELIVERY POINT: SCHAUMBURG

SHIP#: 606-022
TRANS.METHOD: TRUCK

VIN: SJ6RM4H39FL005300

ORIG. DLR: 207853
REF. NO: 40817
HN CODE: HN-2824
EMISSION: 50 STATE
CONTROL NO: 104382
DEALER: 207853

EPA DOT Fuel Economy and Environment

Fuel Economy

28 MPG
combined city/hwy

26 city 33 highway

3.6 gallons per 100 miles

You save \$1,500 in fuel costs over 5 years compared to the average new vehicle.

Annual fuel cost \$1,900

Fuel Economy & Greenhouse Gas Rating (tailpipe only) **Smog Rating** (tailpipe only)

1 7 10 Best

This vehicle emits 313 grams CO₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel and other emissions burn more at fuel economy.gov.

fuel economy.gov
Calculate personalized estimates and compare vehicles

PARTS CONTENT INFORMATION

FOR VEHICLES IN THIS CARLINE
U.S./Canadian Parts Content: **70 %**

Major Sources of Foreign Parts Content:
JAPAN 15 %

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

GOVERNMENT 5-STAR SAFETY RATING

Overall Vehicle Score **Not Rated**

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

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

Based on the risk of injury in a side impact.

Rollover **★★★★**

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 or 1-888-327-4236

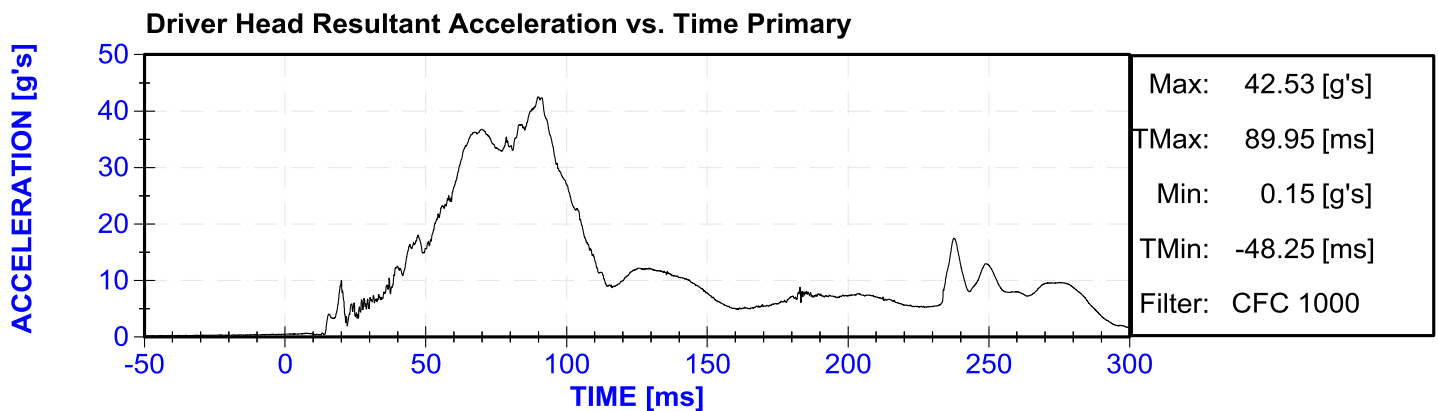
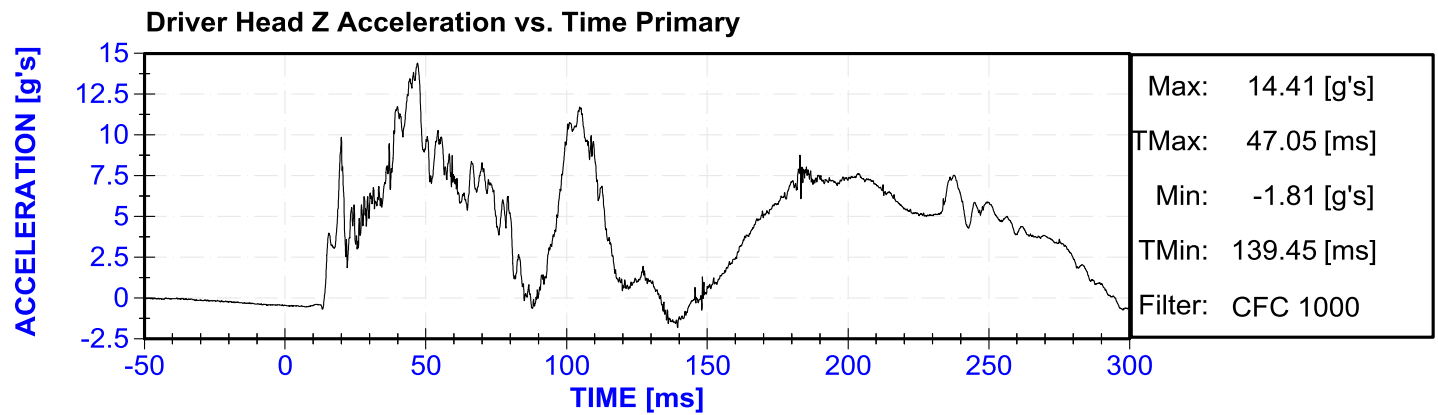
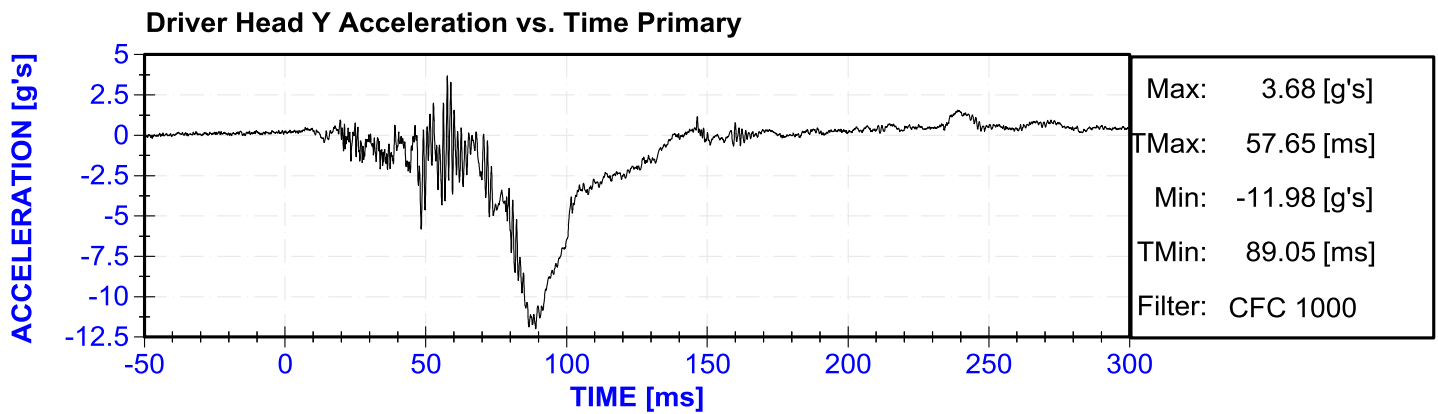
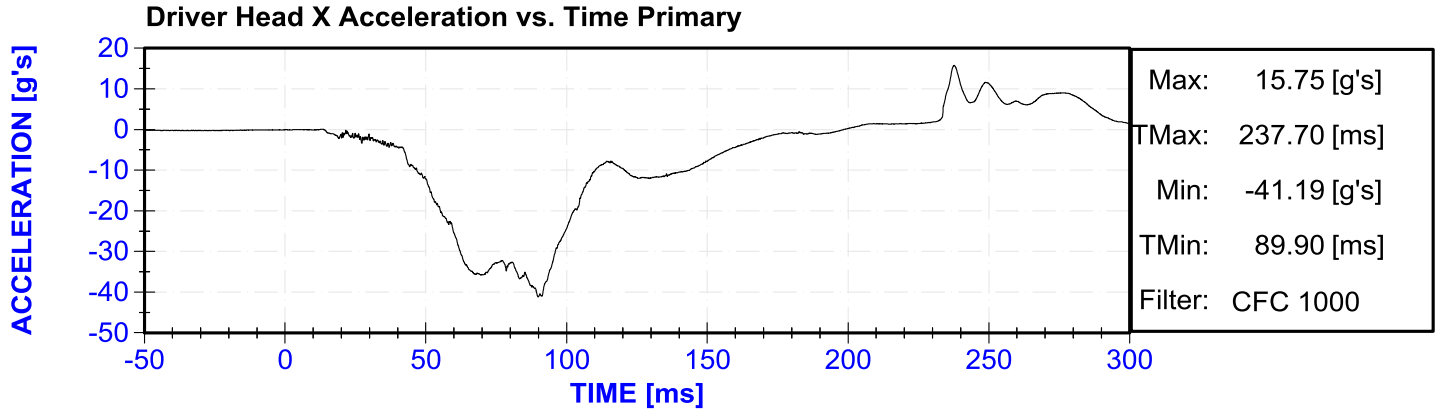
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5 miles
10/14

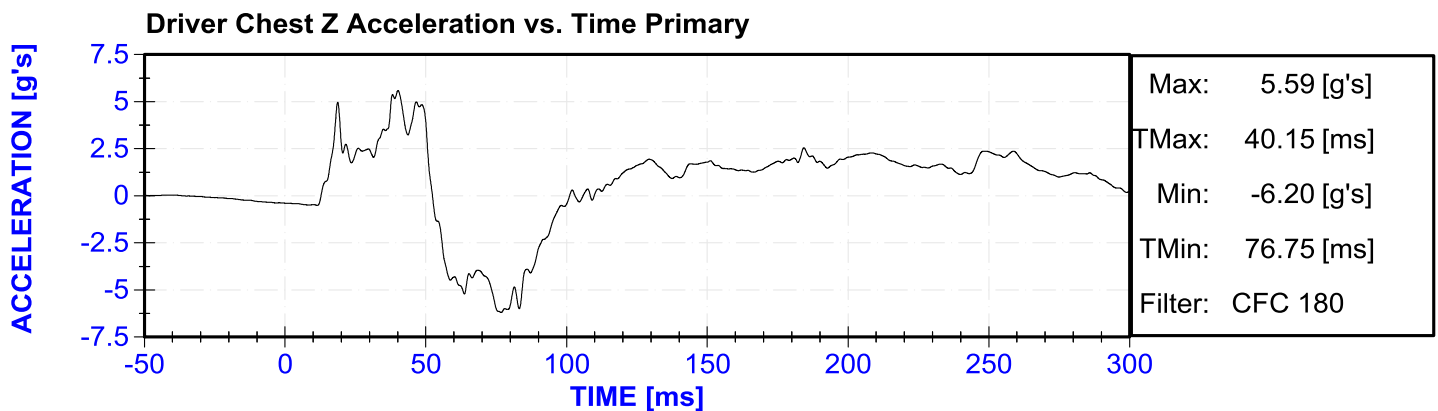
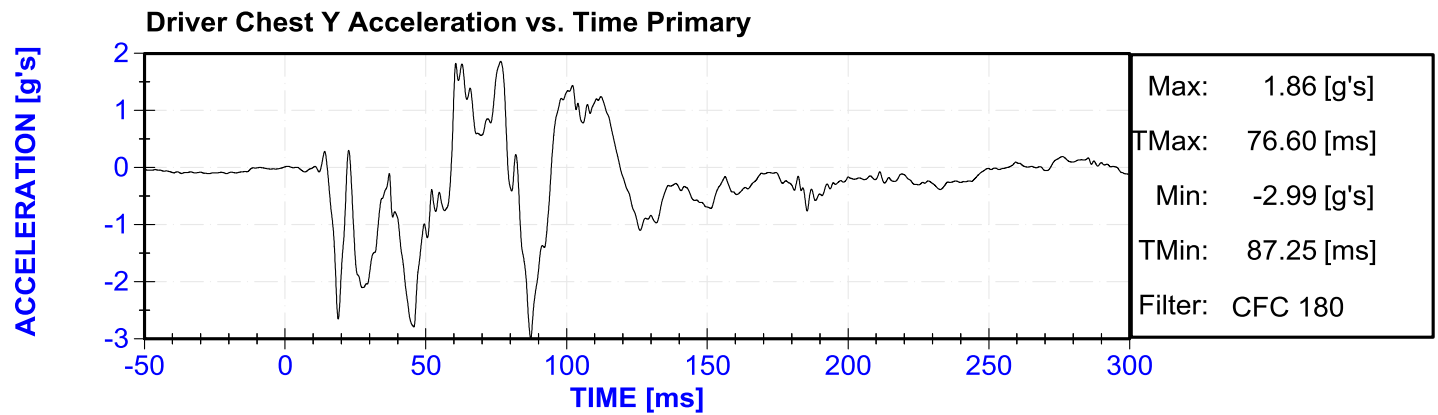
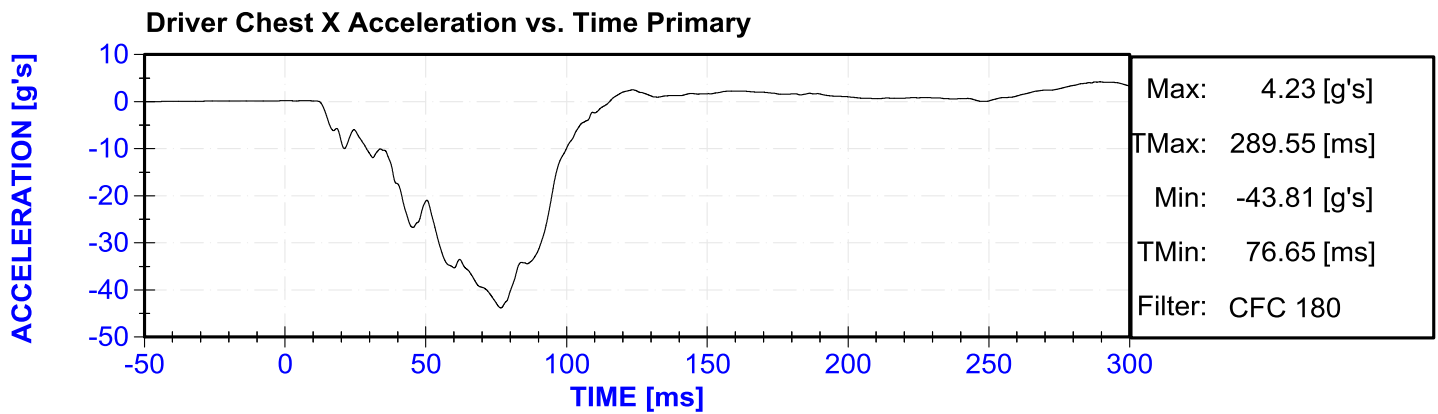
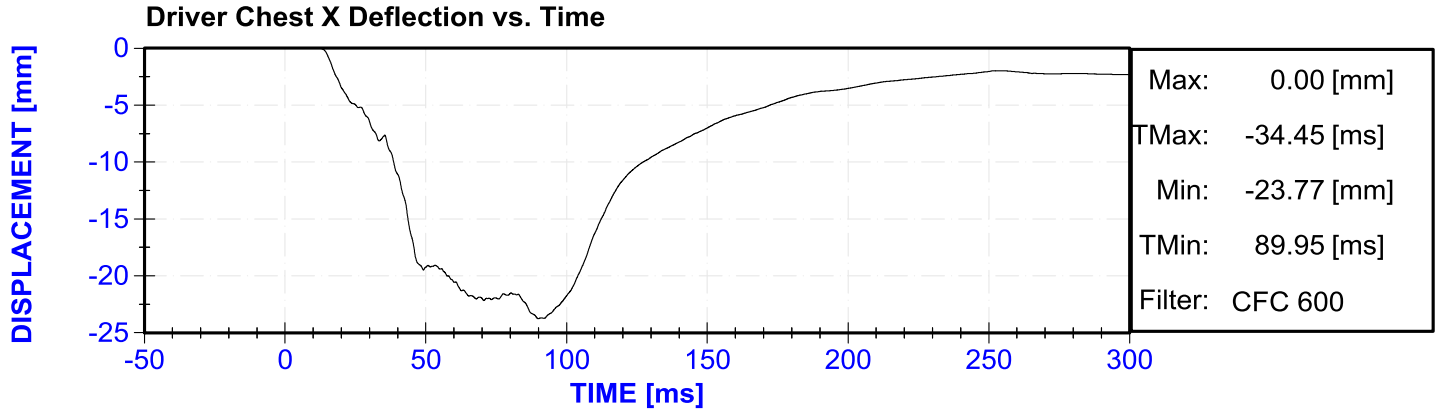
Figure A-78: Monroney Label Photograph

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

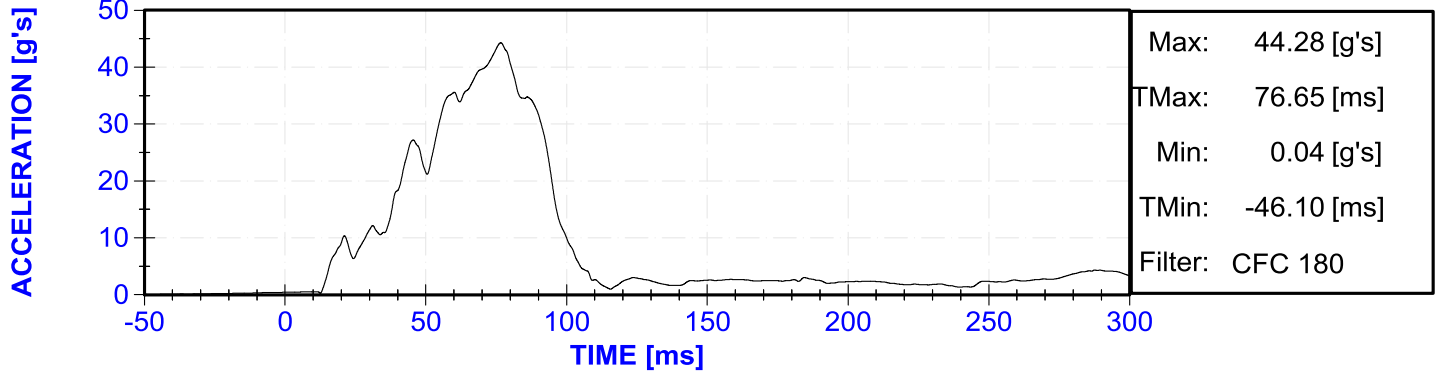
Table of Data Plots

No.	Description	Page
Plot 1	Driver Head X Acceleration vs. Time Primary	B-3
Plot 2	Driver Head Y Acceleration vs. Time Primary	B-3
Plot 3	Driver Head Z Acceleration vs. Time Primary	B-3
Plot 4	Driver Head Resultant Acceleration vs. Time Primary	B-3
Plot 5	Driver Chest X Deflection vs. Time	B-4
Plot 6	Driver Chest X Acceleration vs. Time Primary	B-4
Plot 7	Driver Chest Y Acceleration vs. Time Primary	B-4
Plot 8	Driver Chest Z Acceleration vs. Time Primary	B-4
Plot 9	Driver Chest Resultant Acceleration vs. Time Primary	B-5
Plot 10	Driver Upper Neck Force X vs. Time Primary	B-5
Plot 11	Driver Upper Neck Force Z vs. Time Primary	B-5
Plot 12	Driver Upper Neck Moment Y vs. Time Primary	B-5
Plot 13	Driver Nij vs. Time Primary	B-6
Plot 14	Driver Left Femur Force vs. Time	B-6
Plot 15	Driver Right Femur Force vs. Time	B-6
Plot 16	Passenger Head X Acceleration vs. Time Primary	B-6
Plot 17	Passenger Head Y Acceleration vs. Time Primary	B-7
Plot 18	Passenger Head Z Acceleration vs. Time Primary	B-7
Plot 19	Passenger Head Resultant Acceleration vs. Time Primary	B-7
Plot 20	Passenger Chest X Deflection vs. Time	B-7
Plot 21	Passenger Chest X Acceleration vs. Time Primary	B-8
Plot 22	Passenger Chest Y Acceleration vs. Time Primary	B-8
Plot 23	Passenger Chest Z Acceleration vs. Time Primary	B-8
Plot 24	Passenger Chest Resultant Acceleration vs. Time Primary	B-8
Plot 25	Passenger Upper Neck Force X vs. Time Primary	B-9
Plot 26	Passenger Upper Neck Force Z vs. Time Primary	B-9
Plot 27	Passenger Upper Neck Moment Y vs. Time Primary	B-9
Plot 28	Passenger Nij vs. Time Primary	B-9
Plot 29	Passenger Left Femur Force vs. Time	B-10
Plot 30	Passenger Right Femur Force vs. Time	B-10

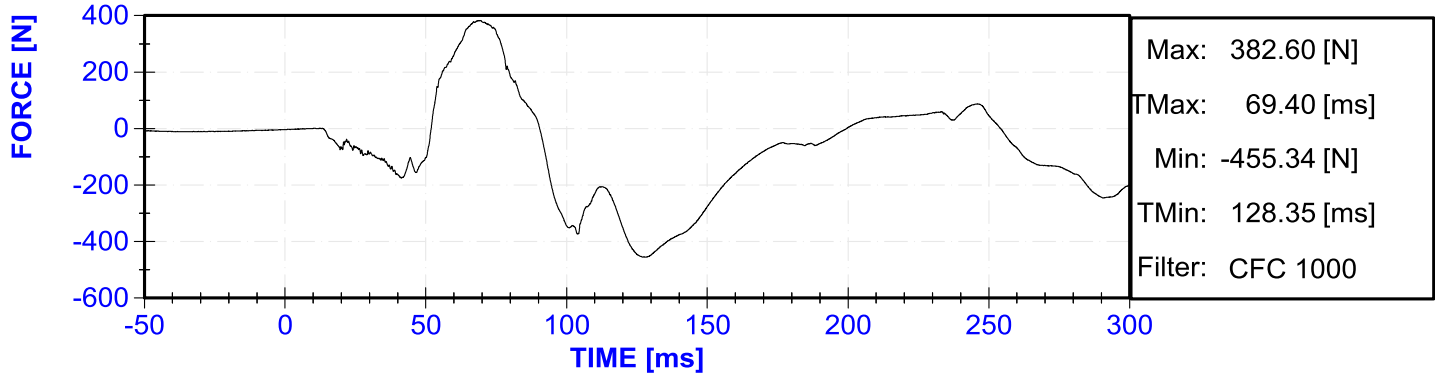




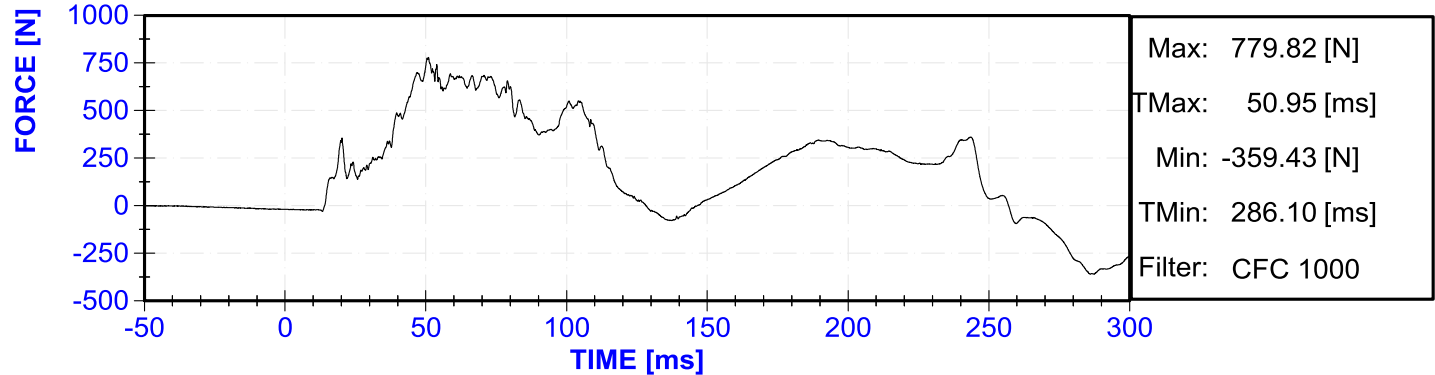
Driver Chest Resultant Acceleration vs. Time Primary



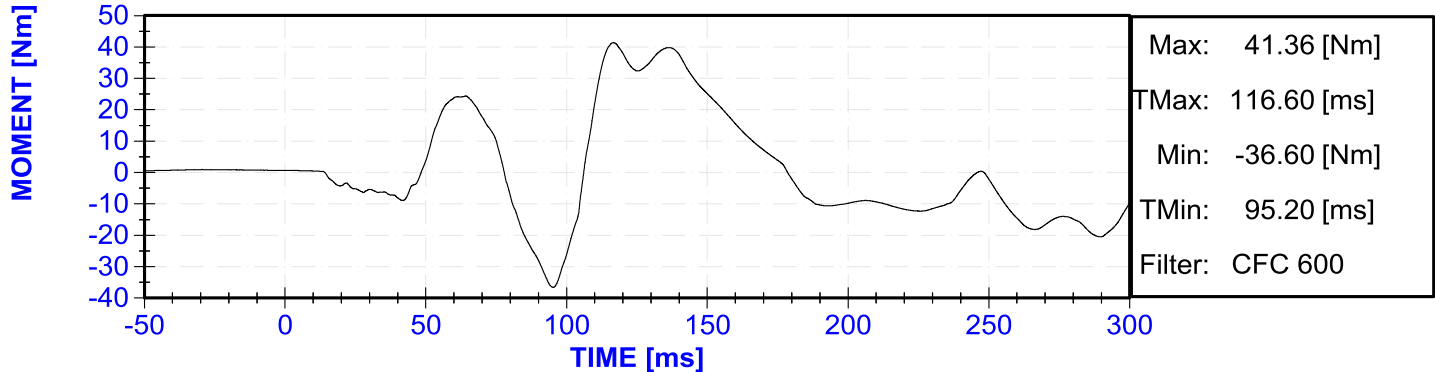
Driver Upper Neck Force X vs. Time Primary

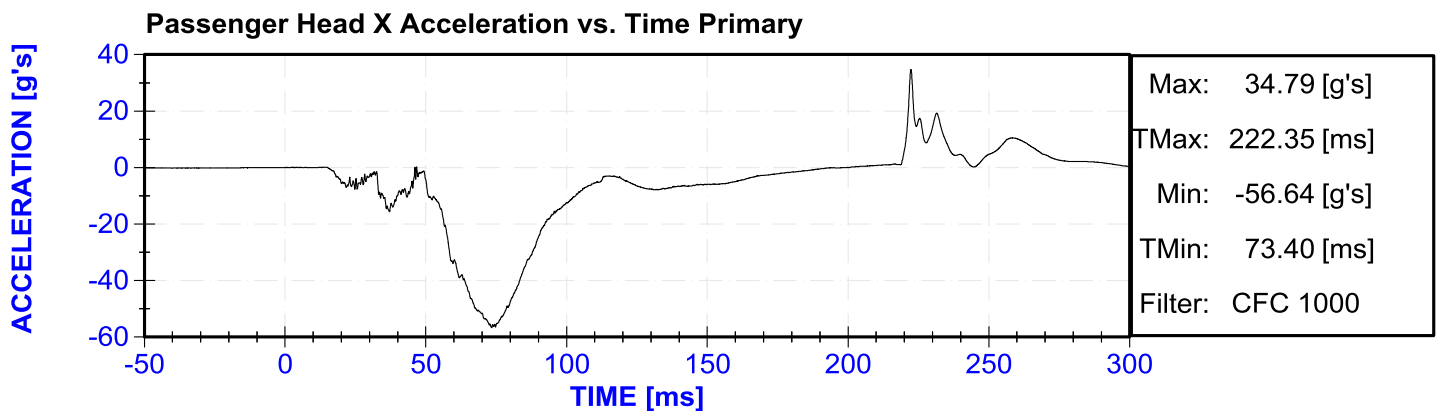
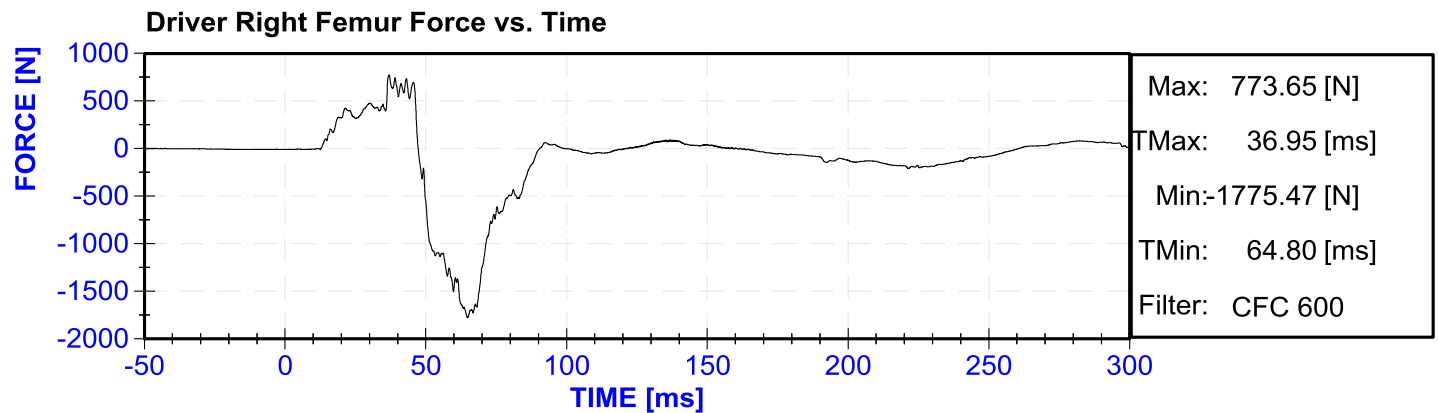
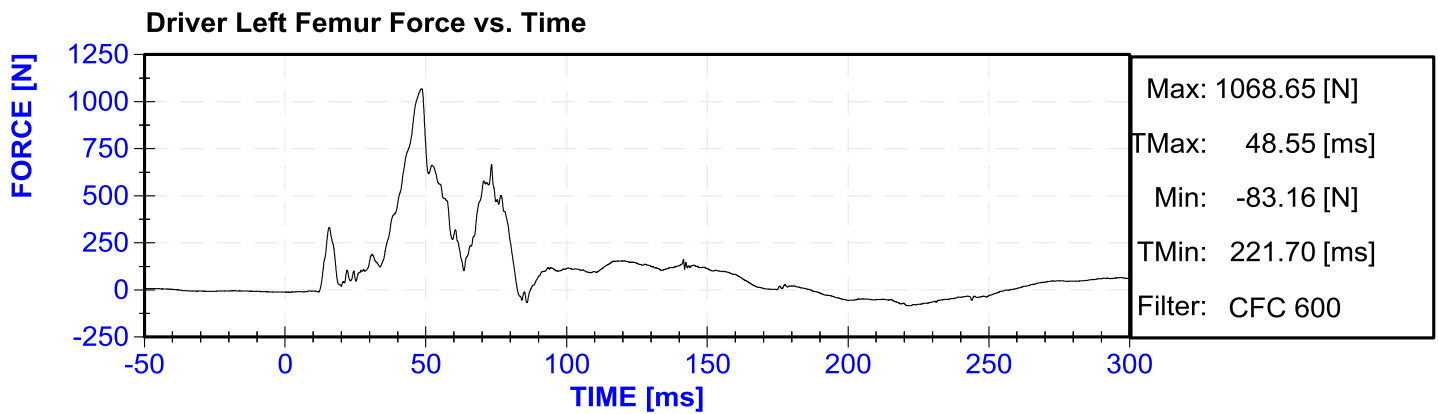
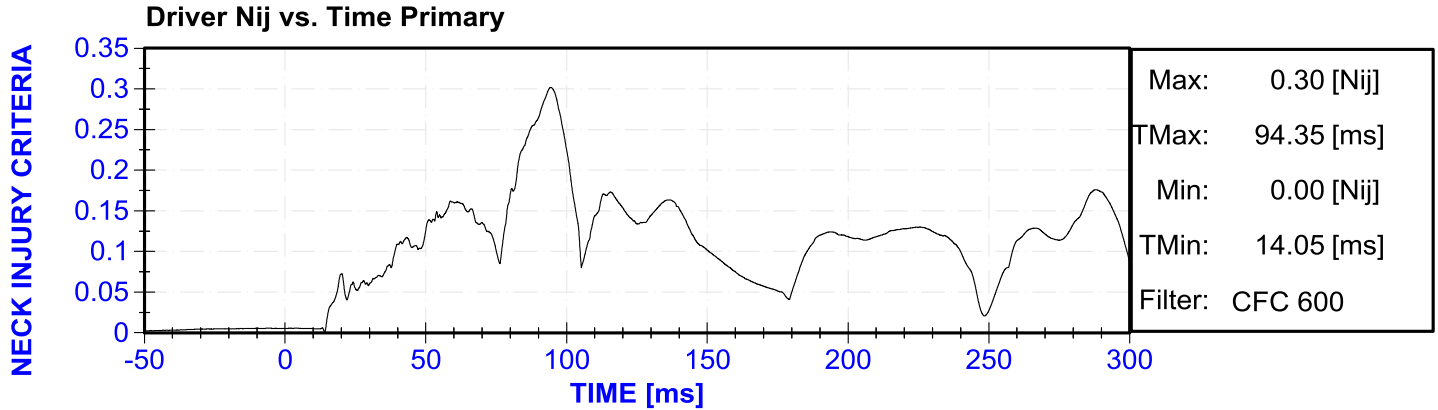


Driver Upper Neck Force Z vs. Time Primary

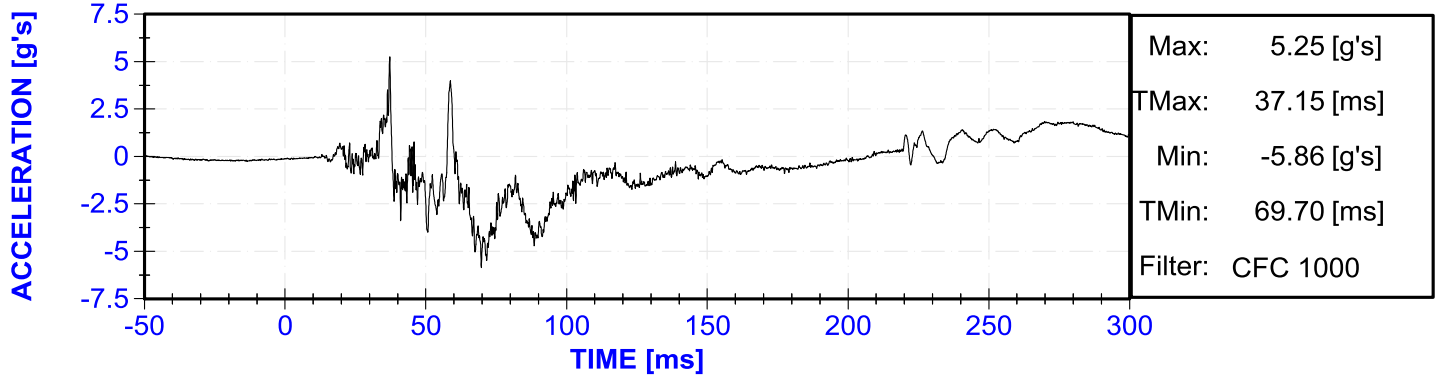


Driver Upper Neck Moment Y vs. Time Primary

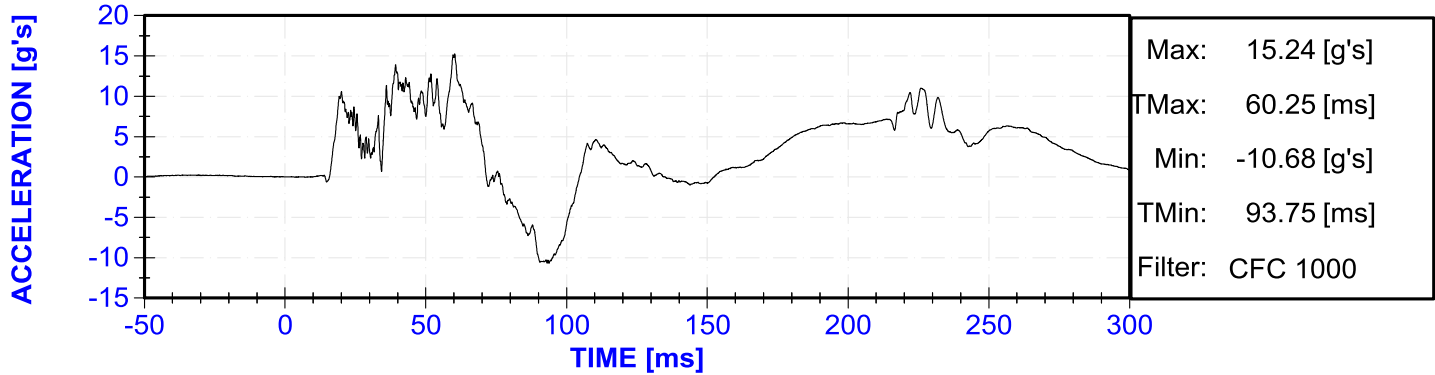




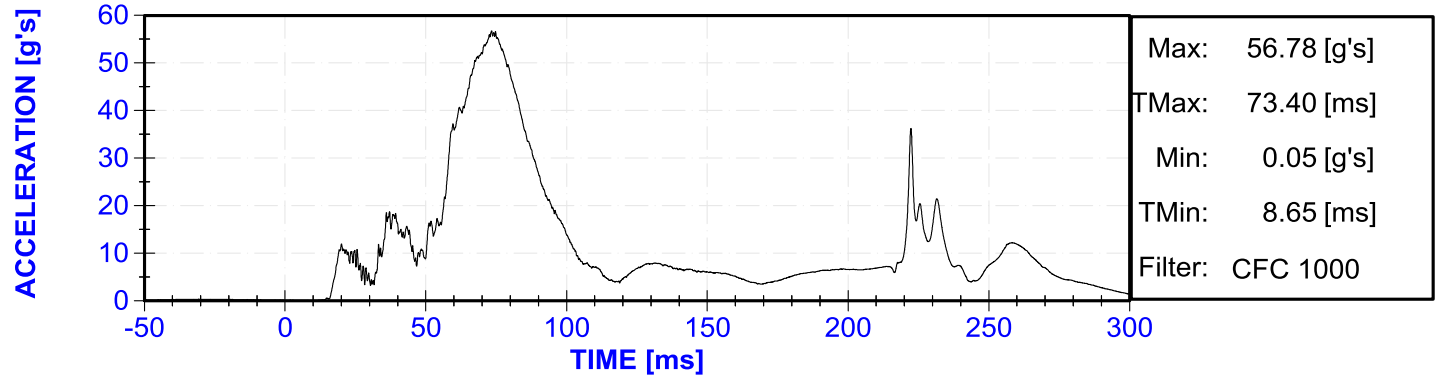
Passenger Head Y Acceleration vs. Time Primary



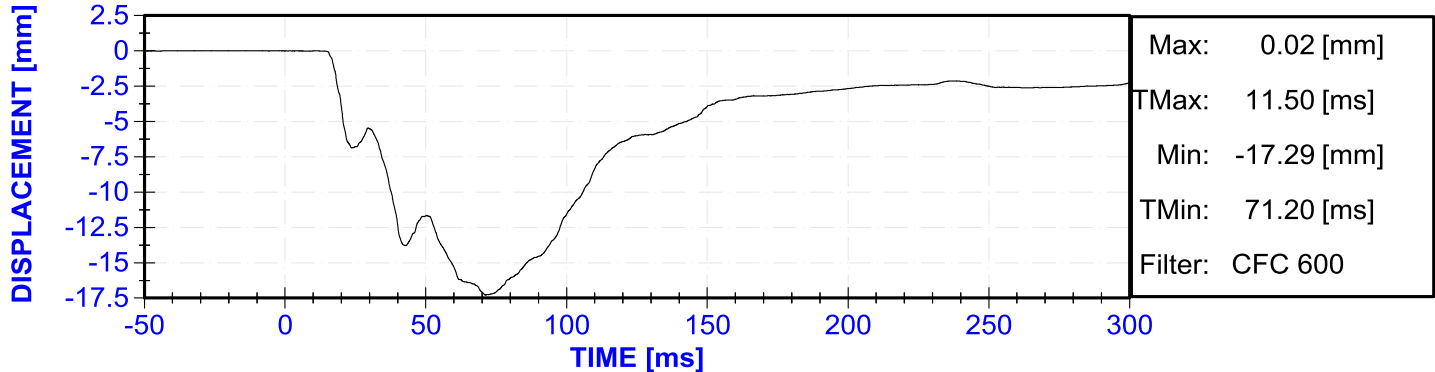
Passenger Head Z Acceleration vs. Time Primary

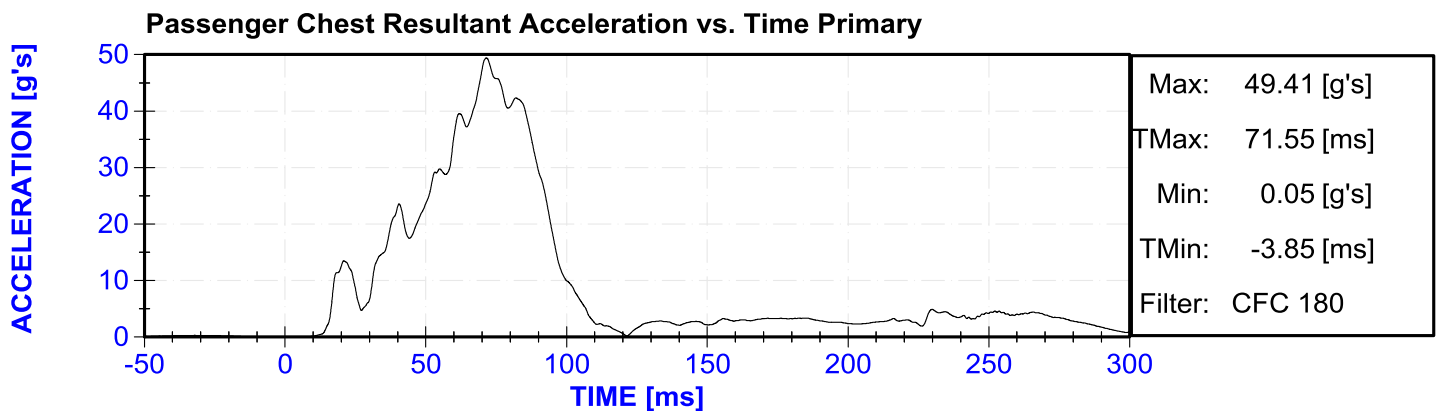
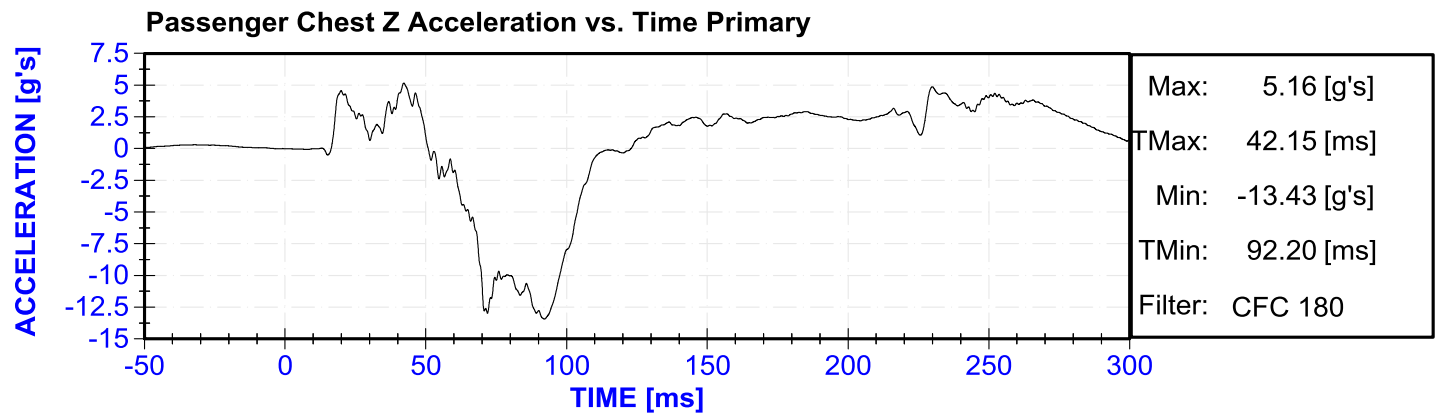
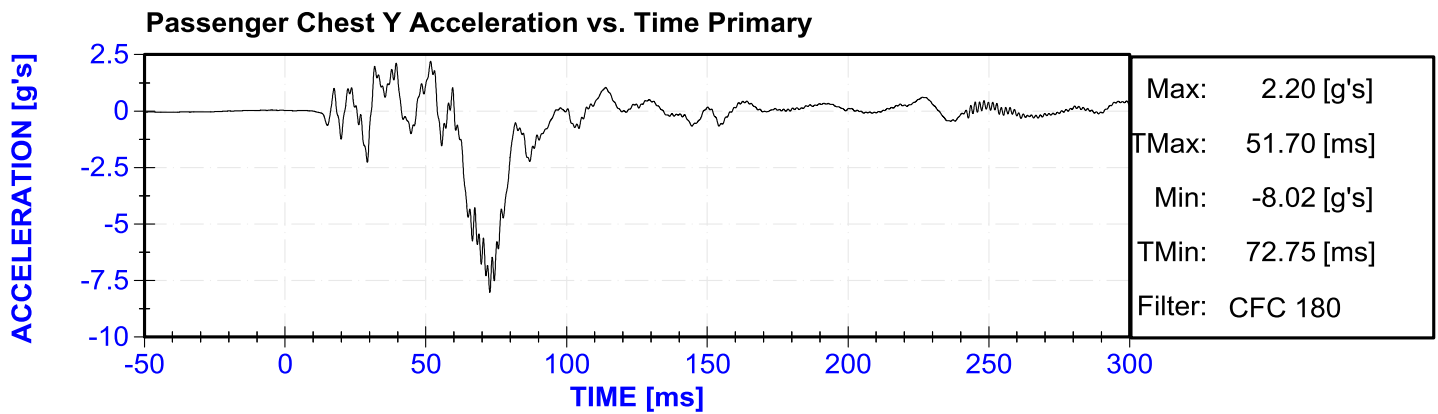
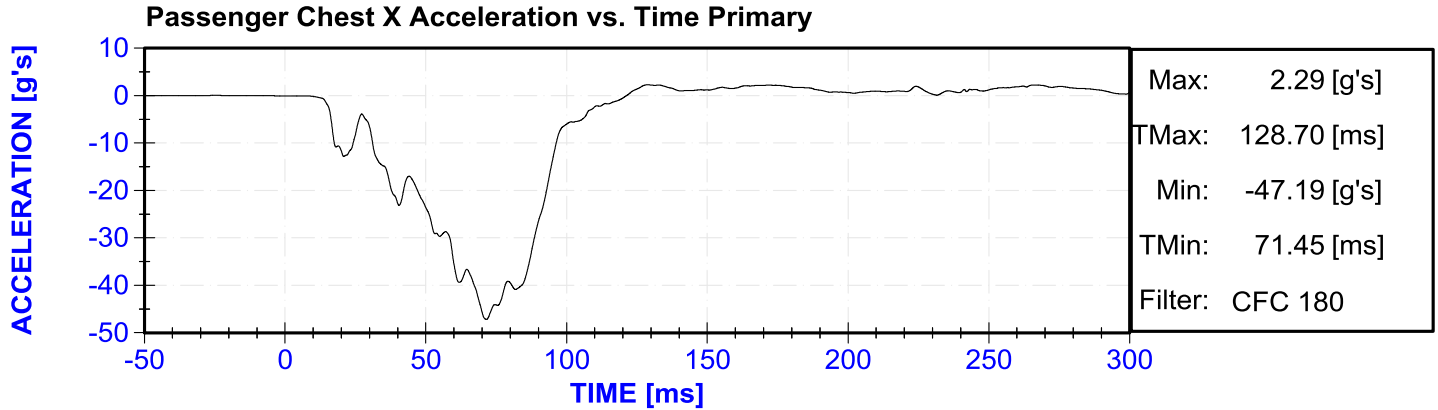


Passenger Head Resultant Acceleration vs. Time Primary

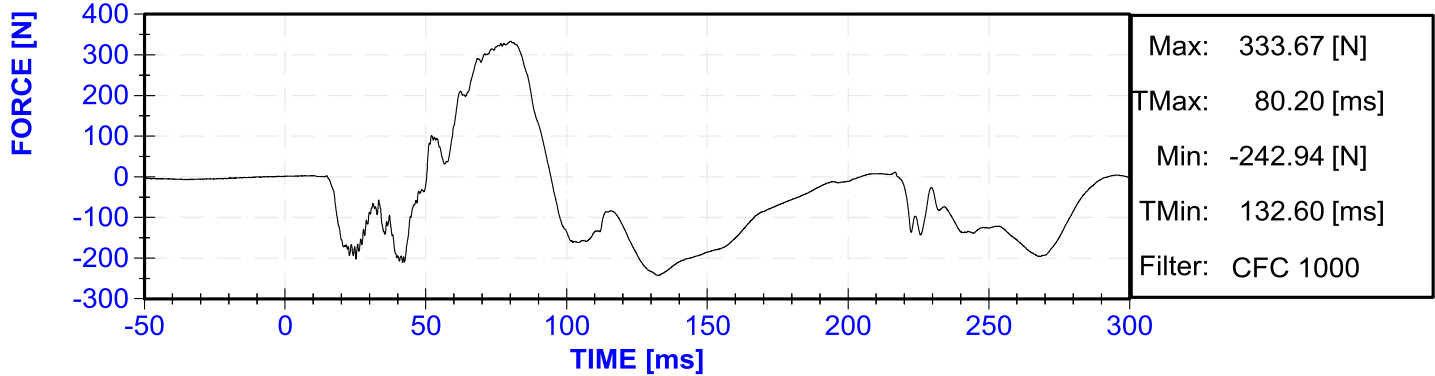


Passenger Chest X Deflection vs. Time

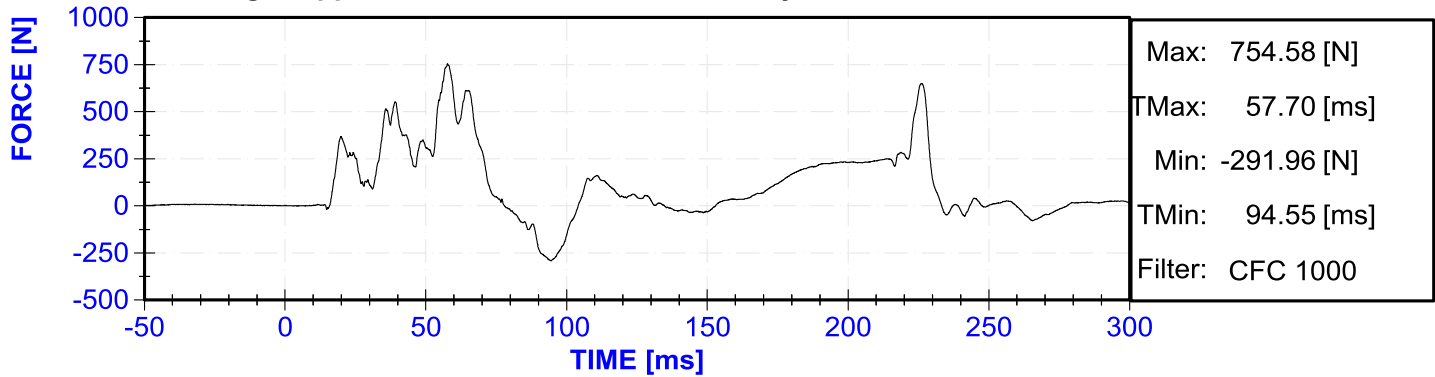




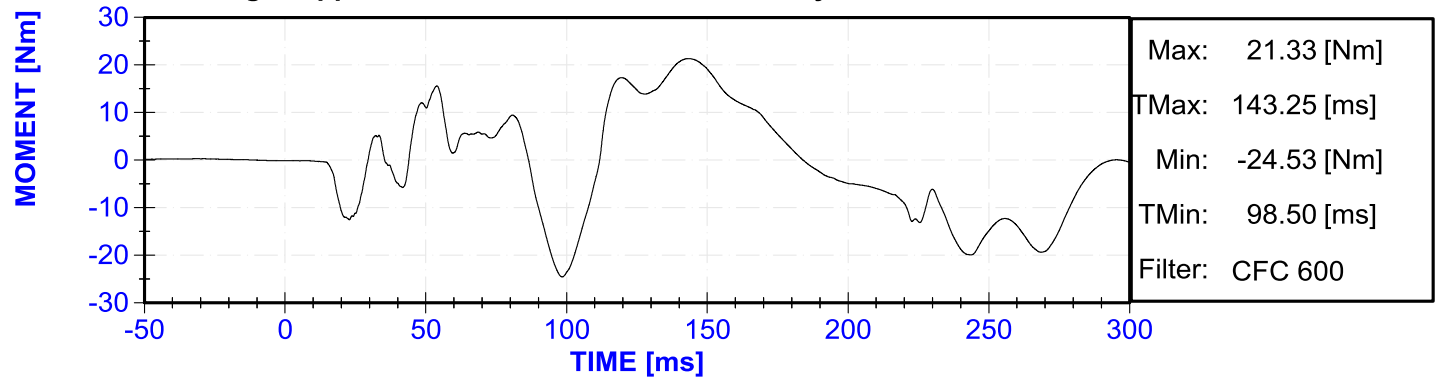
Passenger Upper Neck Force X vs. Time Primary



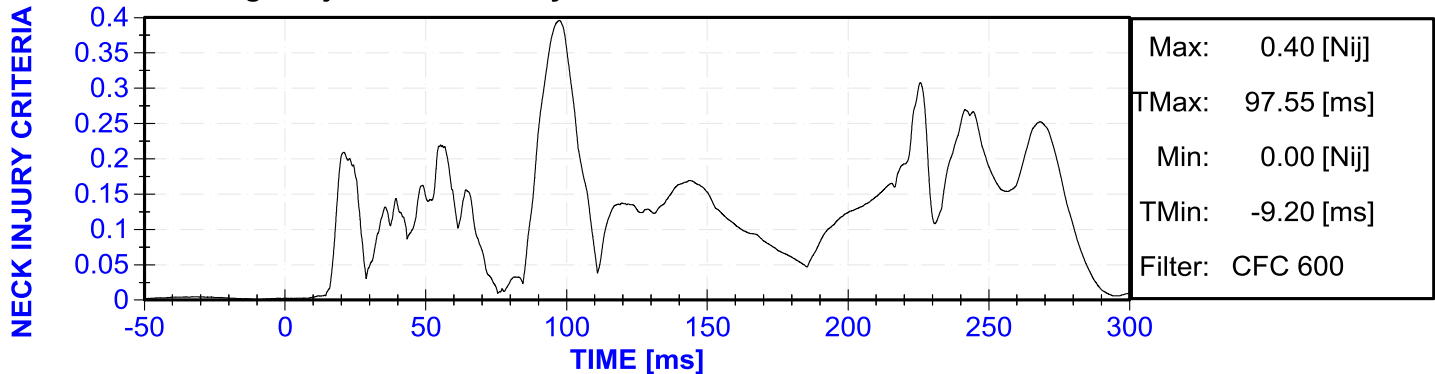
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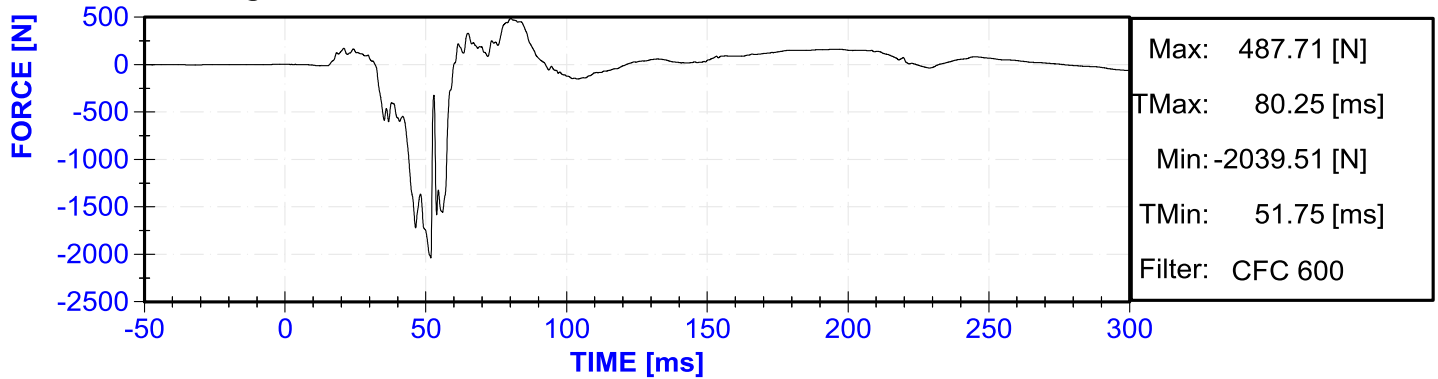
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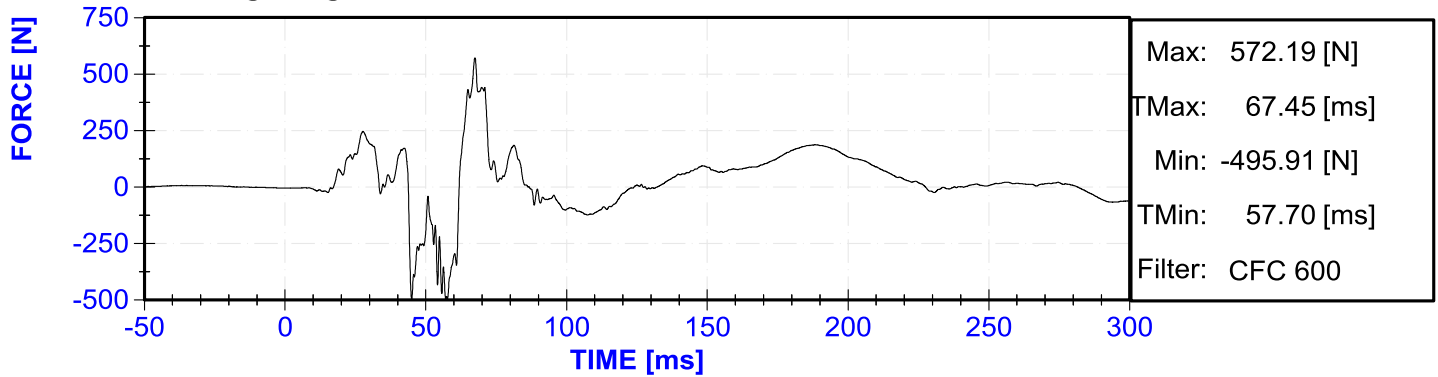
Passenger Nij vs. Time Primary



Passenger Left Femur Force vs. Time



Passenger Right Femur Force vs. Time



APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 1046



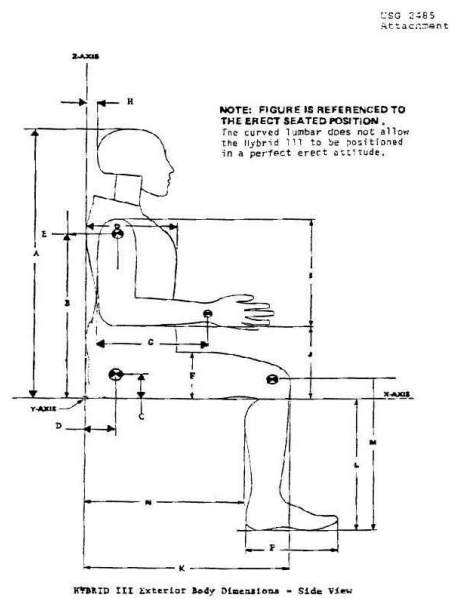
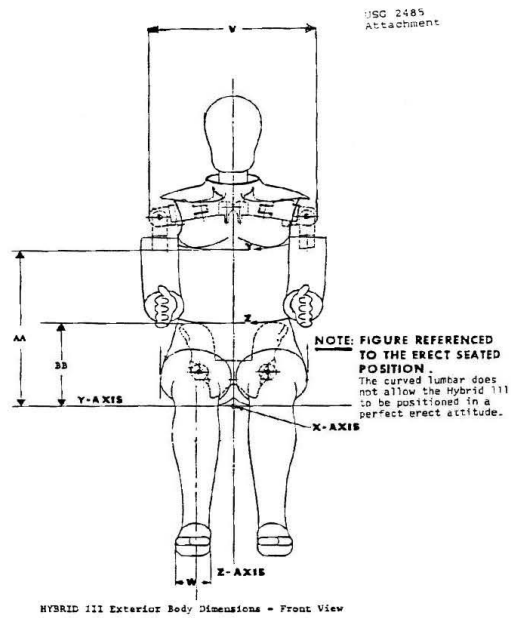
50th Male External Measurements

S/N 1046

Symbol	Description	Specification	Results	Pass
		in	In	
A	Sitting Height	34.6 – 35.0	34.9	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.0	Yes
C	H-Point Height	3.3 – 3.5	3.4	Yes
D	H-Point from Backline	5.3 – 5.5	5.4	Yes
E	Shoulder Pivot from Backline	3.3 – 3.7	3.5	Yes
F	Thigh Clearance	5.5 – 6.1	6.0	Yes
G	Back of Elbow to Wrist Pivot	11.4 – 12.0	11.6	Yes
H	Head Back to Backline	1.6 – 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 – 13.6	13.0	Yes
J	Elbow Rest Height	7.5 – 8.3	7.8	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.2	Yes
L	Popliteal Height	16.9 – 17.9	17.3	Yes
M	Knee Pivot Height	19.1 – 19.7	19.4	Yes
N	Buttock Popliteal Length	17.8 – 18.8	18.2	Yes
O	Chest Depth without Jacket	8.4 – 9.0	8.6	Yes
P	Foot Length (right)	9.9 – 10.5	10.3	Yes
V	Shoulder Breadth	16.3 – 17.2	16.7	Yes
W	Foot Breadth	3.6 – 4.2	3.7	Yes
Y	Chest Circumference with Jacket	38.2 – 39.4	38.9	Yes
Z	Waist Circumference	32.9 – 34.1	33.9	Yes
AA	Reference Location (Chest Circumference)	16.9 – 17.1	17.0	Yes
BB	Reference Location (Waist Circumference)	8.9 – 9.1	9.0	Yes

Technician: R. Weil

12/05/2014





VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Head Drop	Test Date:	12/8/2014
		Test Time:	12:06:41 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.20 deg C	P
Humidity	10	--	70	14.80 %RH	P
Resultant Acceleration	225	--	275	258.0 G's	P
Oscillation	0	--	10	3.2 %	P
Lateral Acceleration	-15	--	15	3.3 G's	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



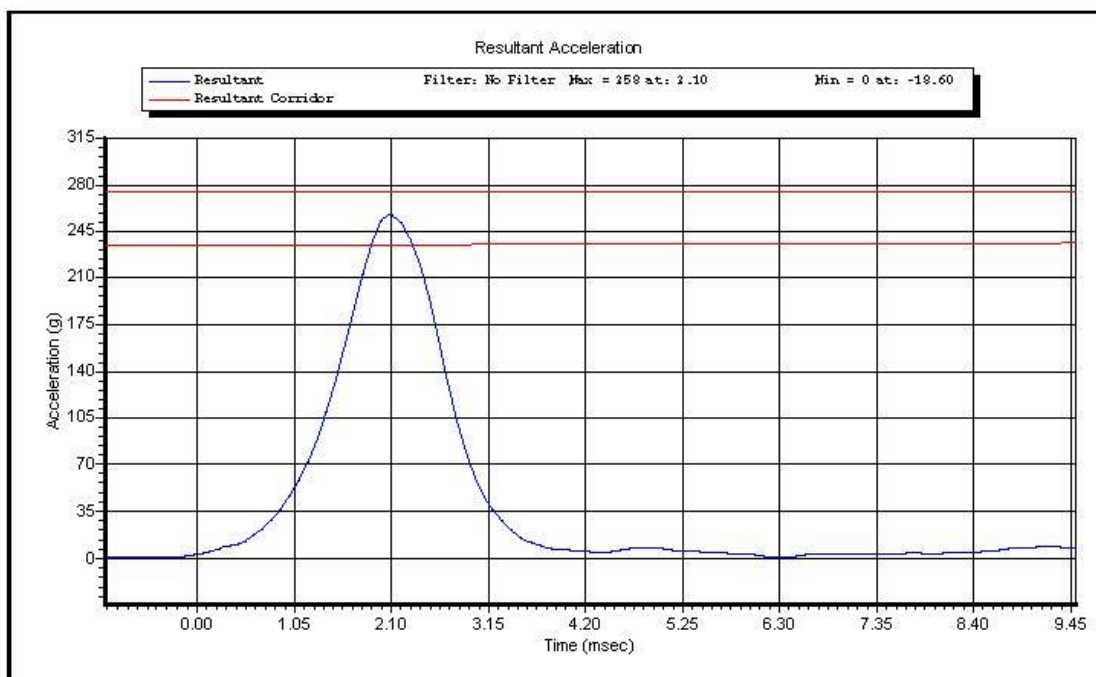
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58871	6/27/2014
Endevco	7264-2000	P12359	6/27/2014
Endevco	7264-2000	P52133	6/27/2014



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046

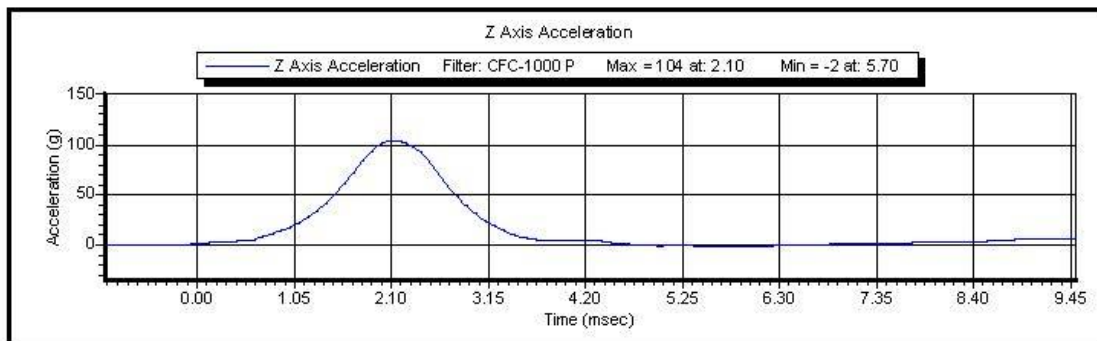
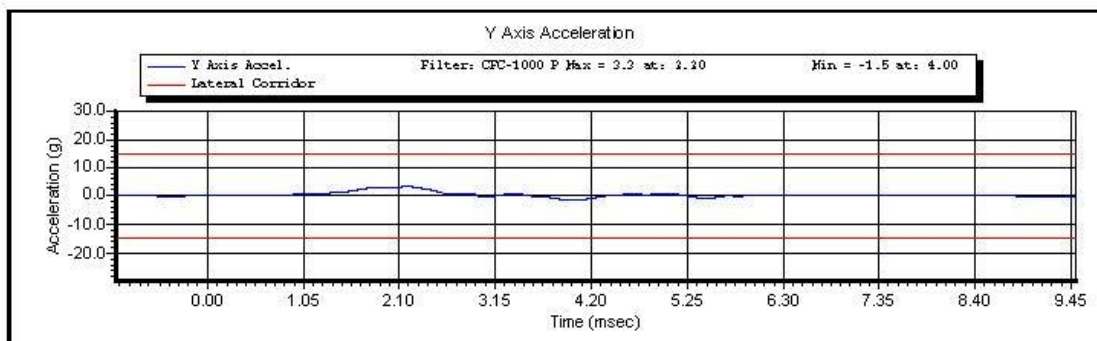
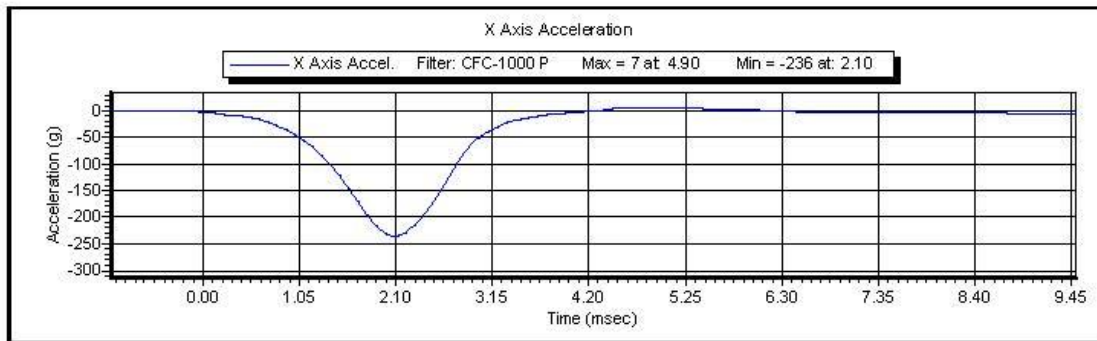


Test ID: **Head Drop**

Test Time: **12:06:41 PM**

Test Date: **12/8/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **12:06:41 PM**

Test Date: **12/8/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Neck Extension	Test Date:	12/5/2014
		Test Time:	3:34:13 PM

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	21.70 deg C	P
Humidity		10	-- 70	22.10 %RH	P
Velocity		5.94	-- 6.19	6.020 m/s	P
Pendulum Deceleration at	10 ms	17.2	-- 21.2	18.89 G's	P
Pendulum Deceleration at	20 ms	14.0	-- 19.0	17.88 G's	P
Pendulum Deceleration at	30 ms	11.0	-- 16.0	13.90 G's	P
Max Pendulum Deceleration after	30 ms	0.0	-- 22.0	13.90 G's	P
Deceleration Time to	5 G's	38	-- 46	40.2 ms	P
D Plane Rotation		81	-- 106	90.4 degrees	P
Time at Max Rotation		72	-- 82	75.8 ms	P
Rotation Decay to Zero		147	-- 174	154.5 ms	P
Moment About Occipital Condyle		-80.0	-- -52.9	-69.51 Nm	P
Time at Maximum Moment		65	-- 79	70.3 ms	P
Moment Decay to Zero		120	-- 148	137.2 ms	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



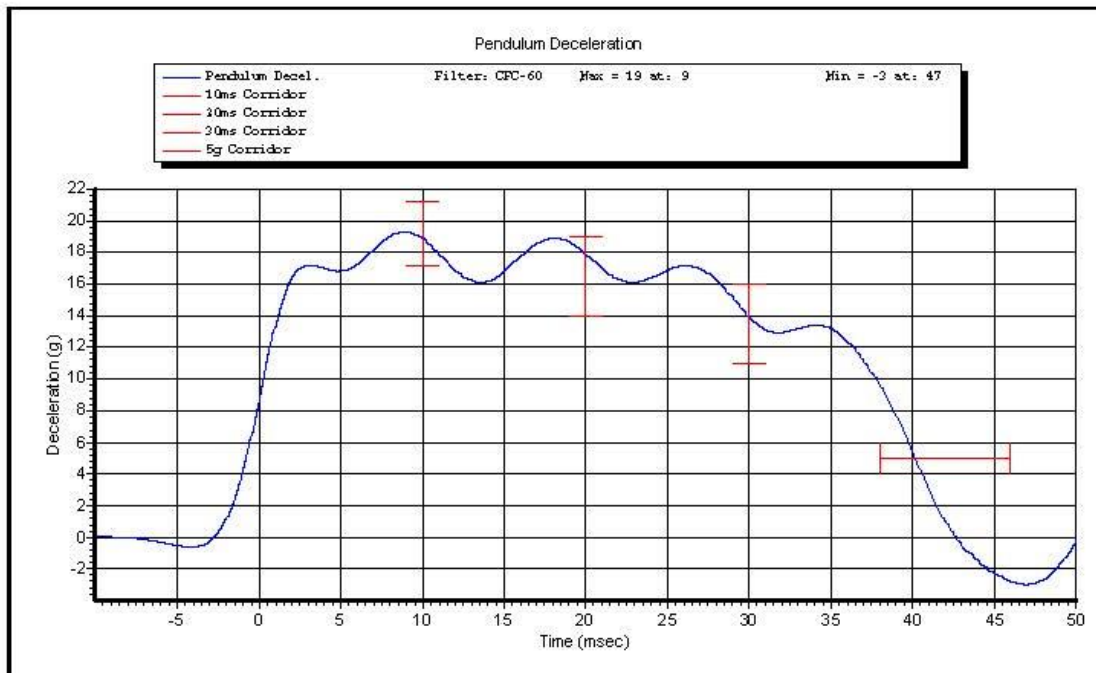
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	8/7/2014
Denton	1716A	LC-2186 Fx	8/7/2014



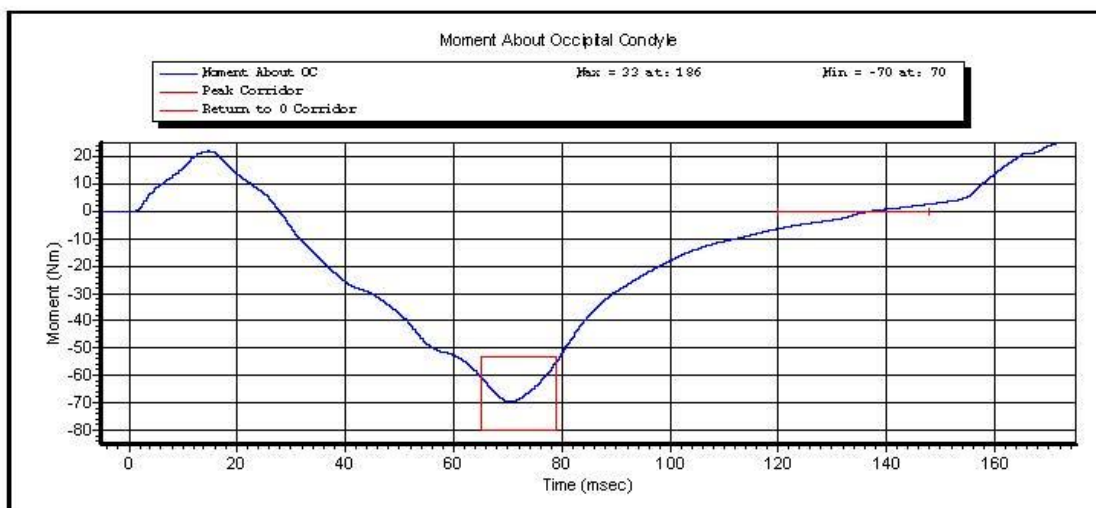
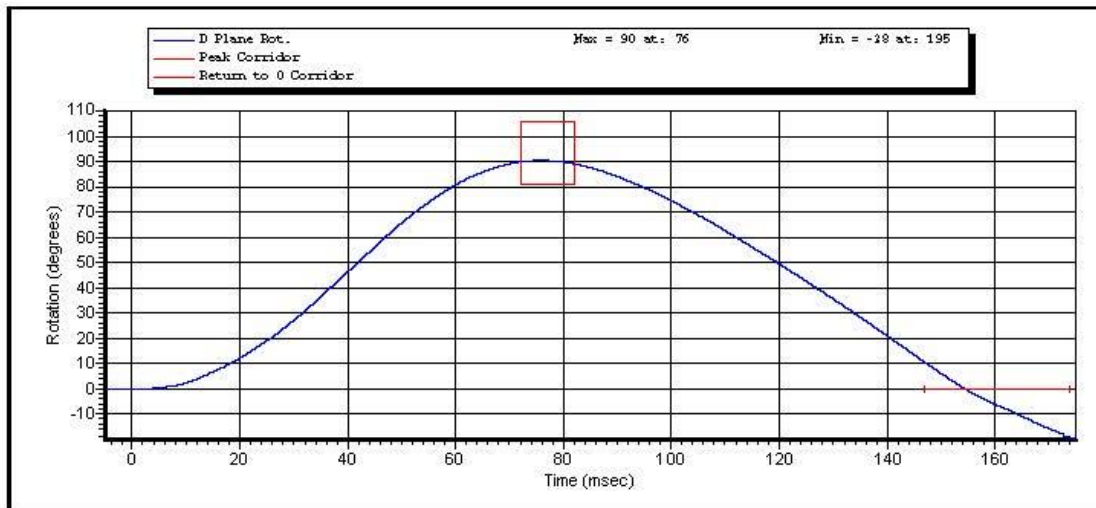
Name of Test:	Neck Extension
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



ID of Test: **Neck Extension** Time of Test: **3:34:13 PM**

Date of Test: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

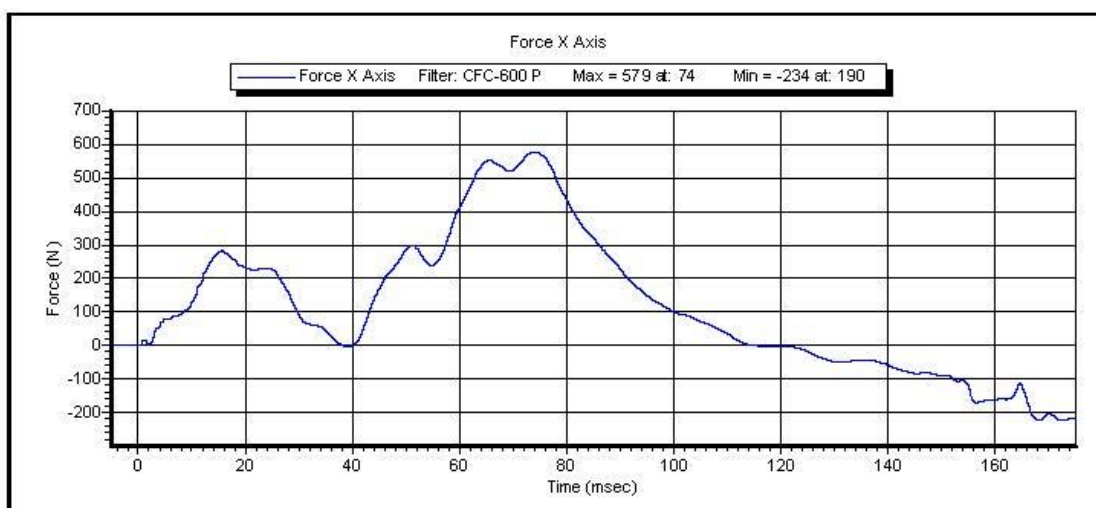
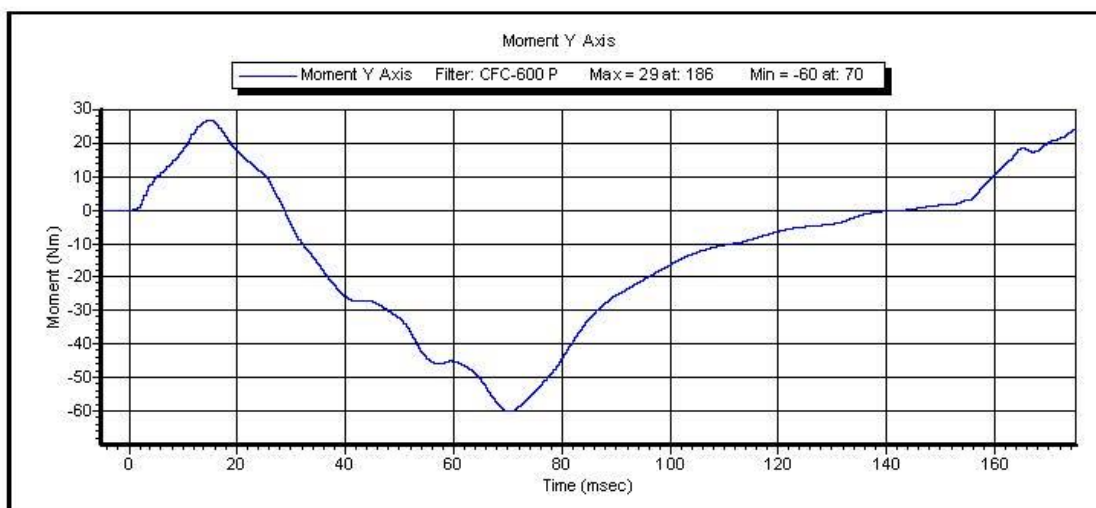


ID of Test: **Neck Extension**

Time of Test: **3:34:13 PM**

Date of Test: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Extension**

Time of Test: **3:34:13 PM**

Date of Test: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Neck Flexion	Test Date:	12/5/2014
		Test Time:	2:51:15 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.70 deg C P
Humidity	10 -- 70	22.00 %RH P
Velocity	6.89 -- 7.13	6.935 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	23.20 G's P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	21.06 G's P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	17.58 G's P
Maximum Pendulum Deceleration After 30 ms	0 -- 29	17.6 G's P
Deceleration Time to 5 G's	34 -- 42	37.0 ms P
D Plane Rotation	-78 -- -64	-64.9 degrees P
Time at Maximum Rotation	57 -- 64	59.7 ms P
Rotation Decay to Zero	113 -- 128	115.7 ms P
Moment About Occipital Condyle	88.1 -- 108.4	96.57 Nm P
Time at Maximum Moment	47 -- 58	48.8 ms P
Moment Decay to Zero	97.0 -- 107.0	98.6 ms P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



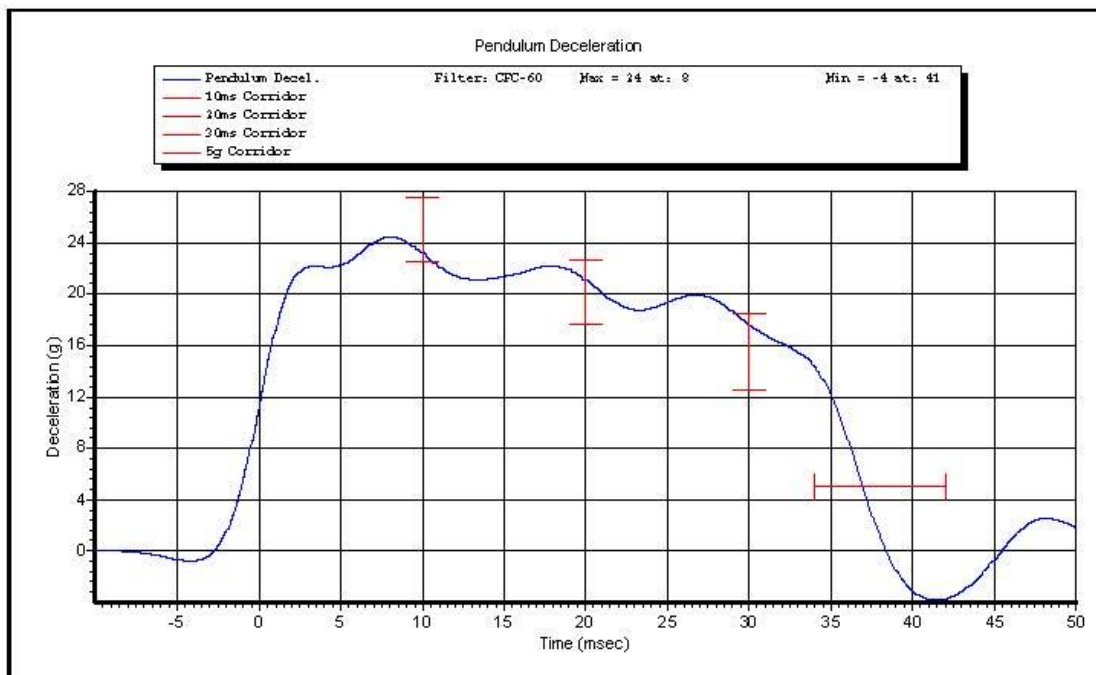
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	8/7/2014
Denton	1716A	LC-2186 Fx	8/7/2014



Name of Test:	Neck Flexion
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	1046

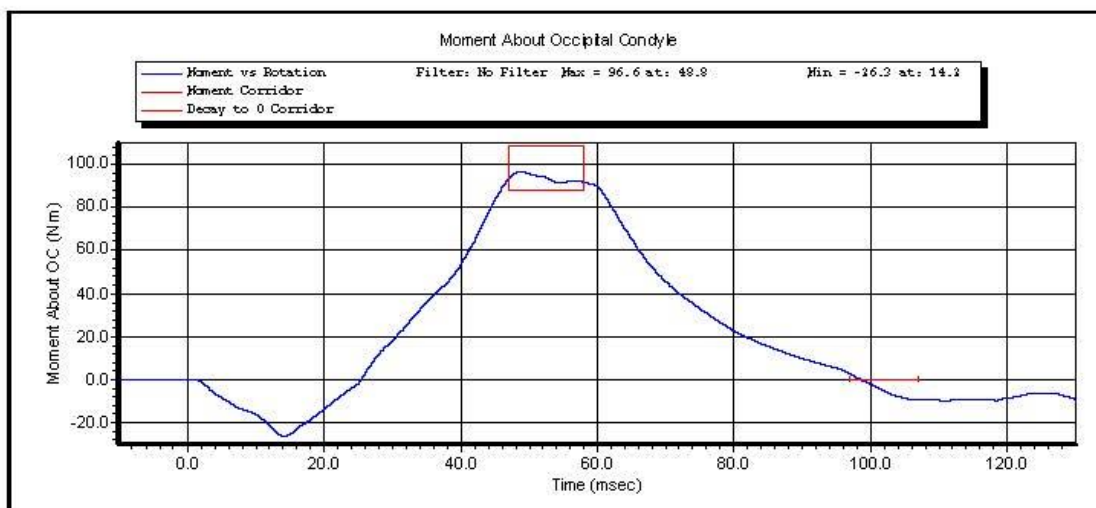
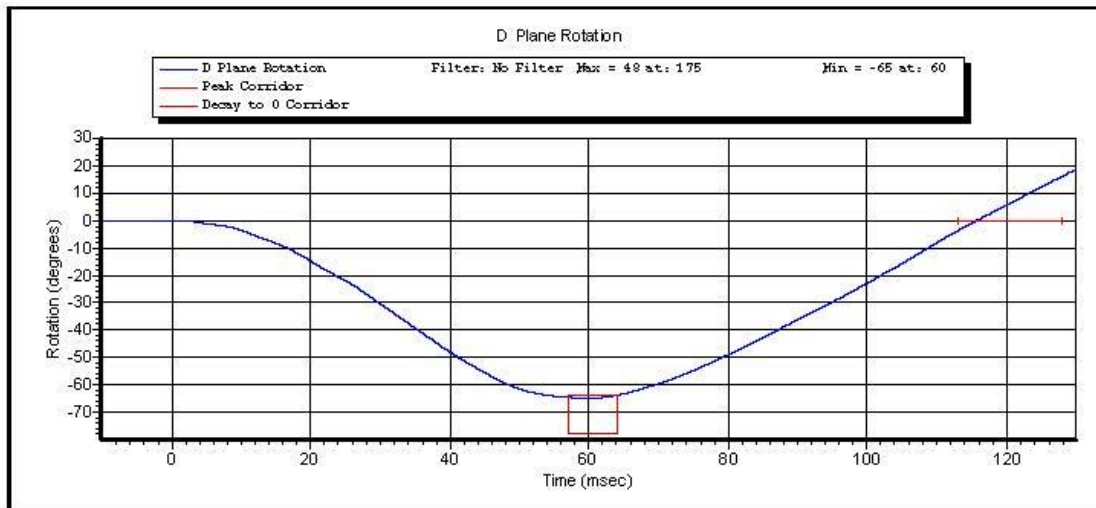


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Time of Test: **2:51:15 PM**

Date of Test: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

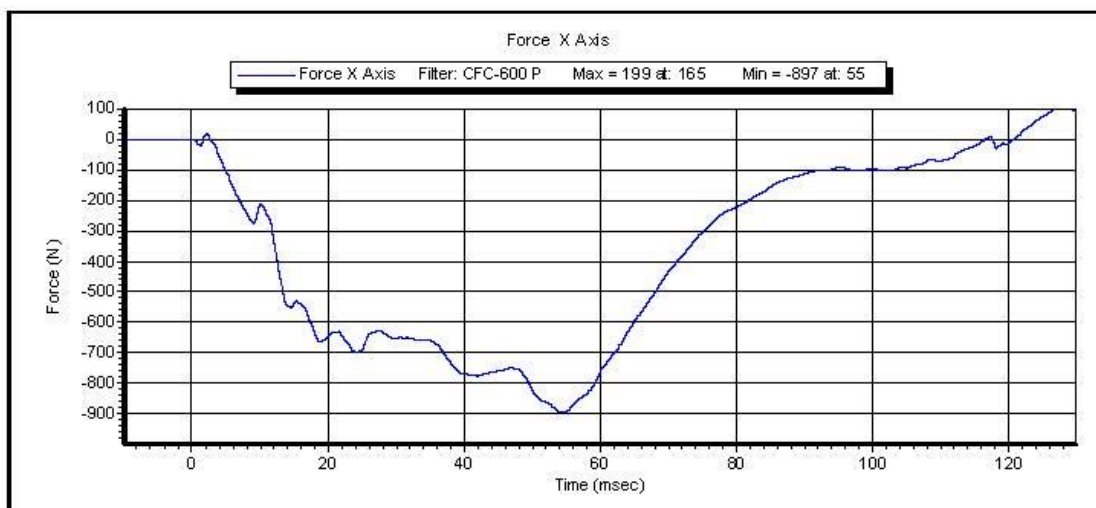
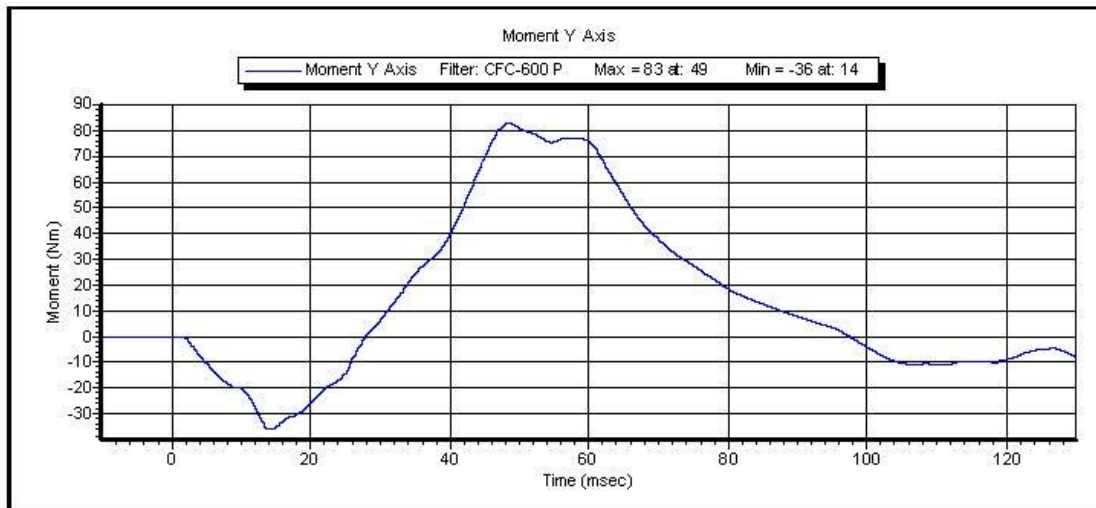


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Time of Test: **2:51:15 PM**

Date of Test: **12/5/2014**

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ID of Test: **Neck Flexion**

Time of Test: **2:51:15 PM**

Date of Test: **12/5/2014**

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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Thorax Impact	Test Date:	12/8/2014
		Test Time:	5:55:30 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.70 deg C	P
Humidity	10	--	70	16.40 %RH	P
Velocity	6.59	--	6.83	6.742 m/s	P
Chest Deflection	-72.6	--	-63.5	-66.79 mm	P
Resistive Force	-5.894	--	-5.160	-5.5918 kN	P
Hysteresis	69	--	85	72.3 %	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



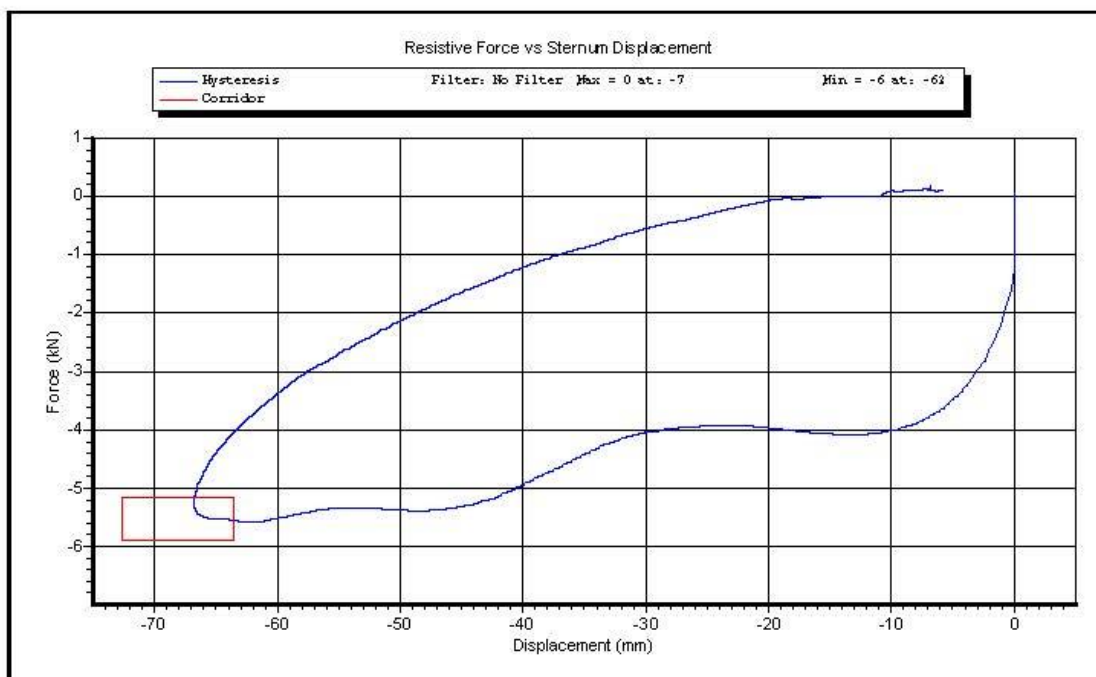
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	14 CBI-2897	DS-1046	7/31/2014

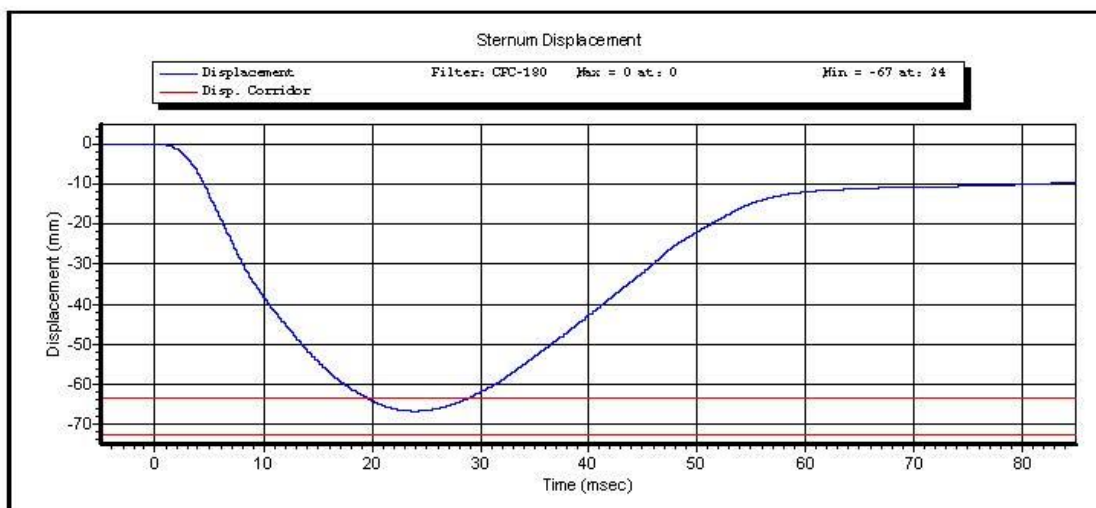
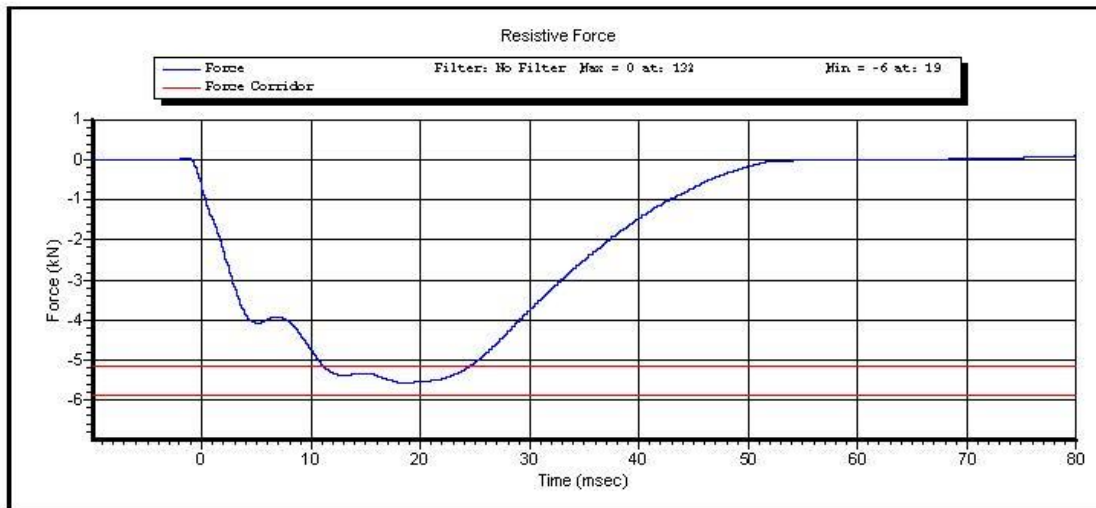


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Thorax Impact** Test Time: **5:55:30 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/8/2014**

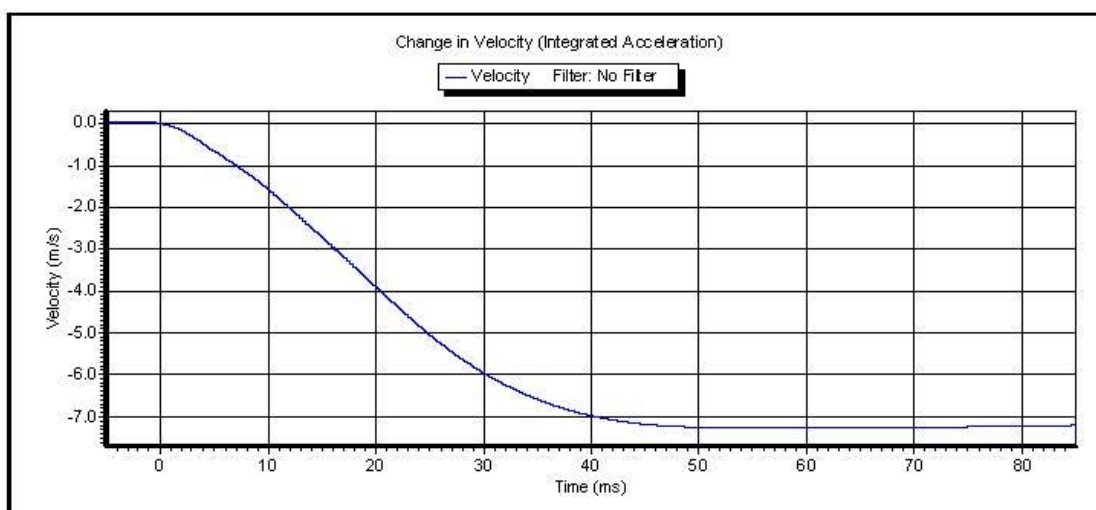
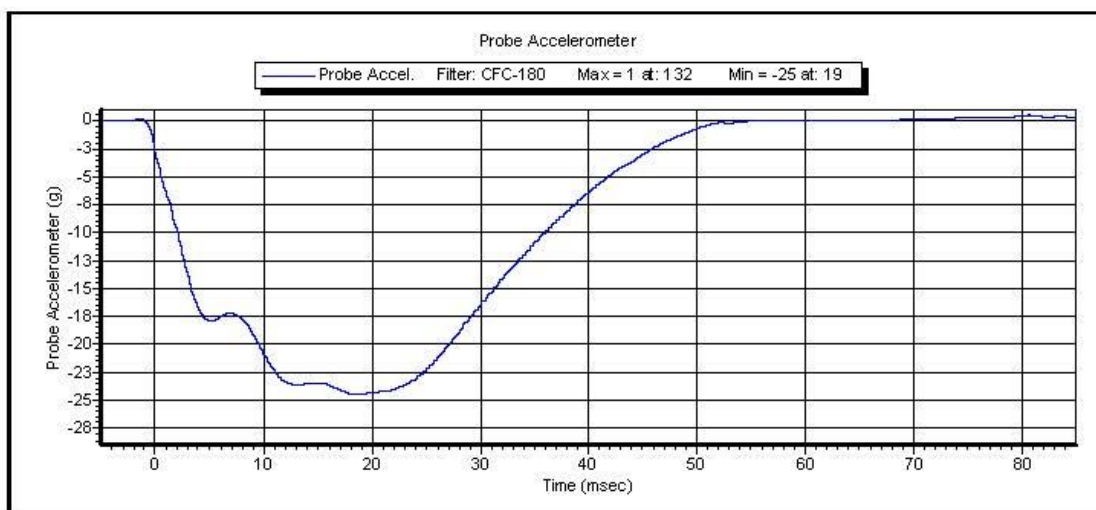


Test ID: **Thorax Impact**

Test Time: **5:55:30 PM**

Test Date: **12/8/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **5:55:30 PM**

Test Date: **12/8/2014**

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VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Hip ROM - Left	Test Date:	12/5/2014
		Test Time:	8:33:28 AM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.40 deg C	P
Humidity	10	--	70	18.70 %RH	P
Average Velocity	5	--	10	6.1 deg/s	P
Angle at 203 Nm	40	--	50	41.3 degrees	P
Moment at 30 degrees	0.0	--	94.9	91.03 Nm	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



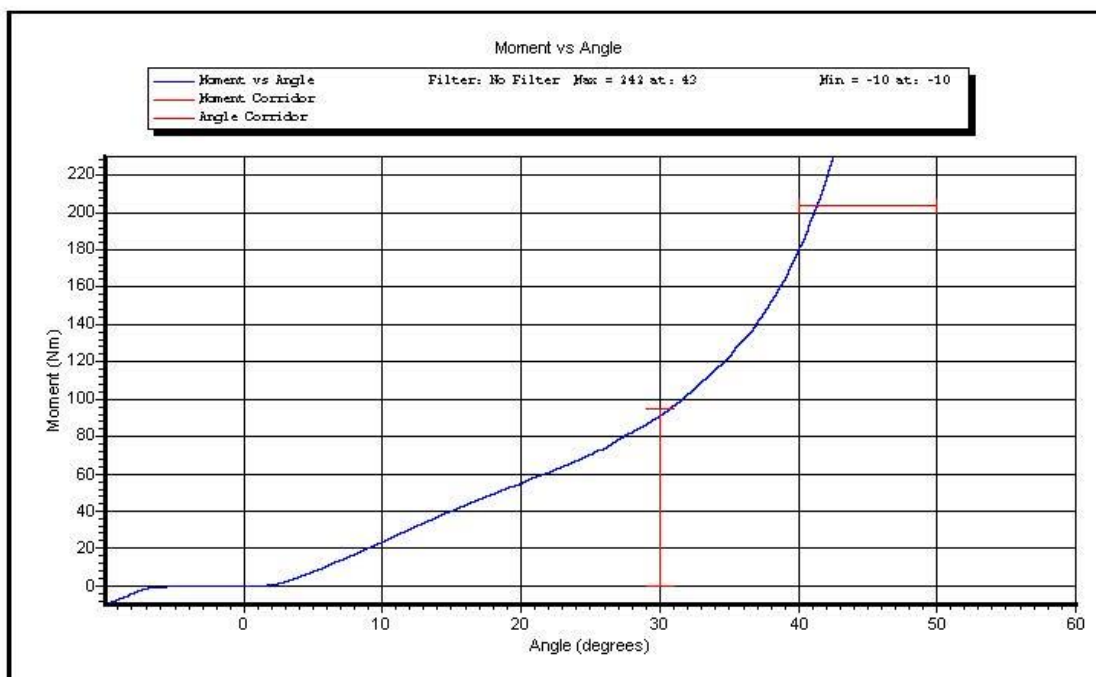
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: Hip ROM - Left

Test Time: 8:33:28 AM

Test Date: 12/5/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Hip ROM Right	Test Date:	12/5/2014
		Test Time:	9:18:29 AM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	20.40 deg C	P
Humidity	10	--	70	21.40 %RH	P
Average Velocity	5	--	10	6.2 deg/s	P
Angle at 203 Nm	40	--	50	40.2 degrees	P
Moment at 30 degrees	0.0	--	94.9	86.80 Nm	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



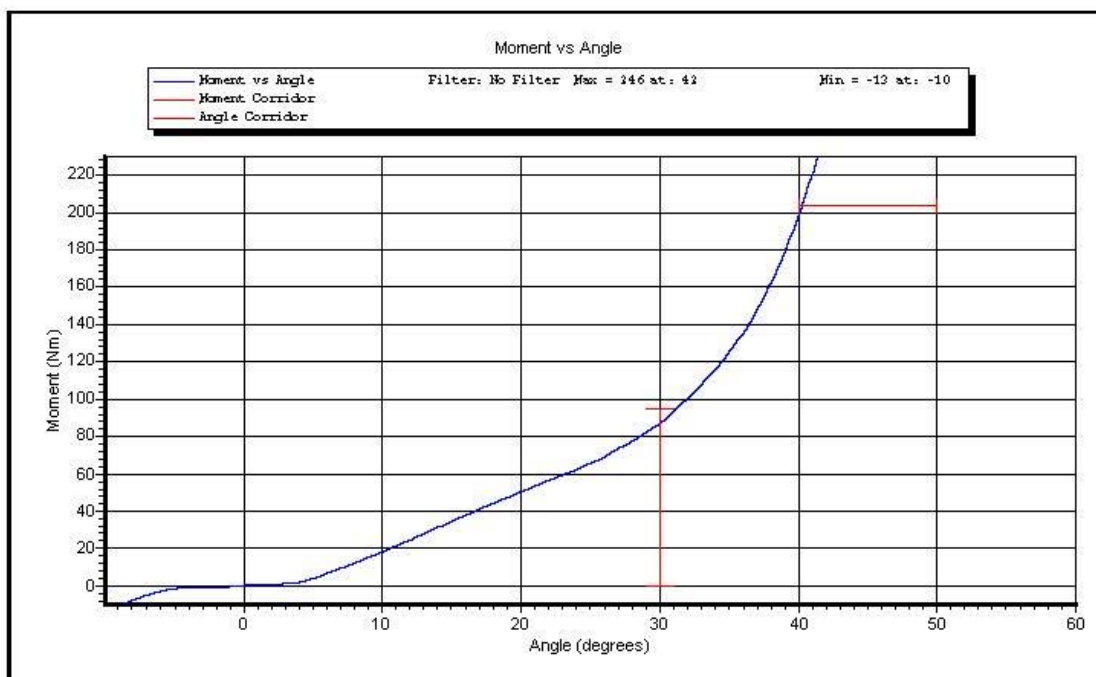
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Hip ROM Right** Test Time: **9:18:29 AM**

Test Date: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Knee Impact Left	Test Date:	12/5/2014
		Test Time:	9:45:01 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.00 deg C P
Humidity	10 -- 70	22.00 %RH P
Velocity	2.07 -- 2.13	2.106 m/s P
Resistive Force	-5.780 -- -4.720	-5.161 kN P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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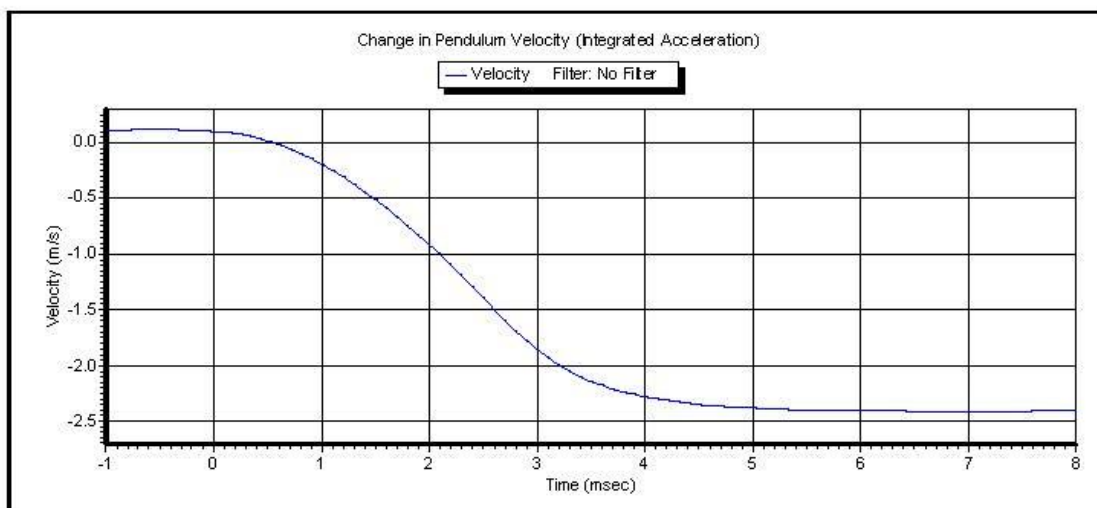
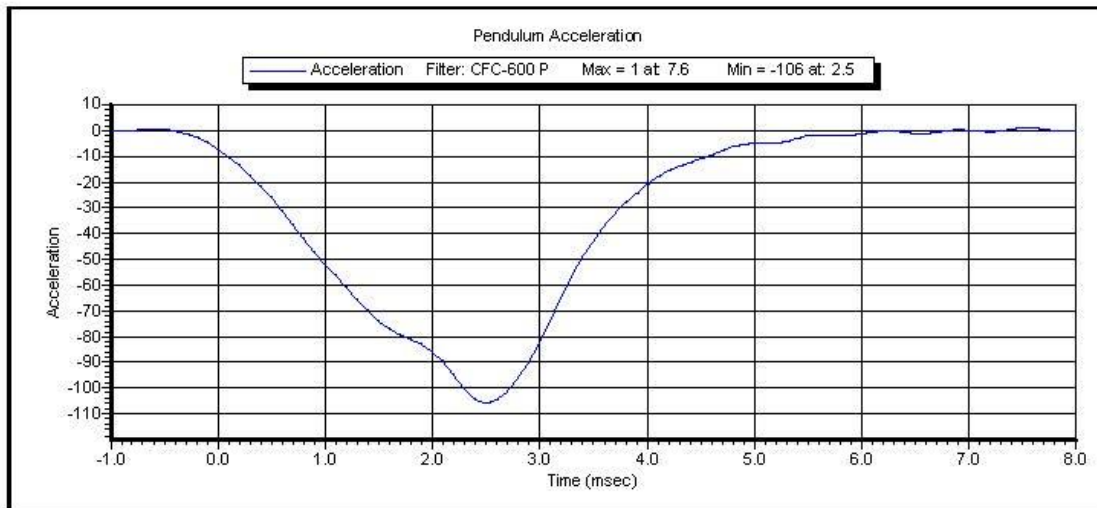


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact Left** Test Time: **9:45:01 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**



Test ID: **Knee Impact Left** Test Time: **9:45:01 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Knee Impact Right	Test Date:	12/5/2014
		Test Time:	9:51:15 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.00 deg C P
Humidity	10 -- 70	21.70 %RH P
Velocity	2.07 -- 2.13	2.106 m/s P
Resistive Force	-5.780 -- -4.720	-5.441 kN P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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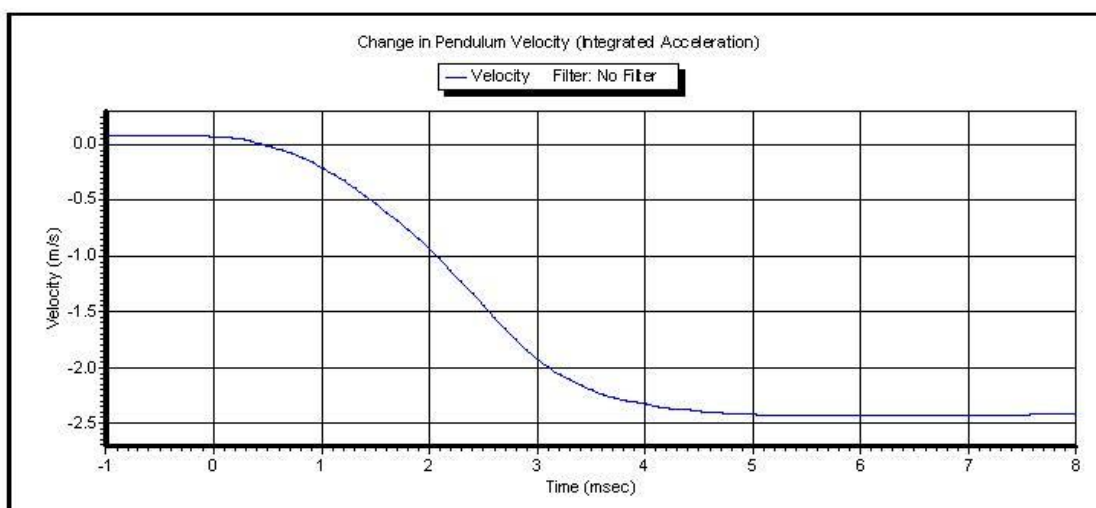
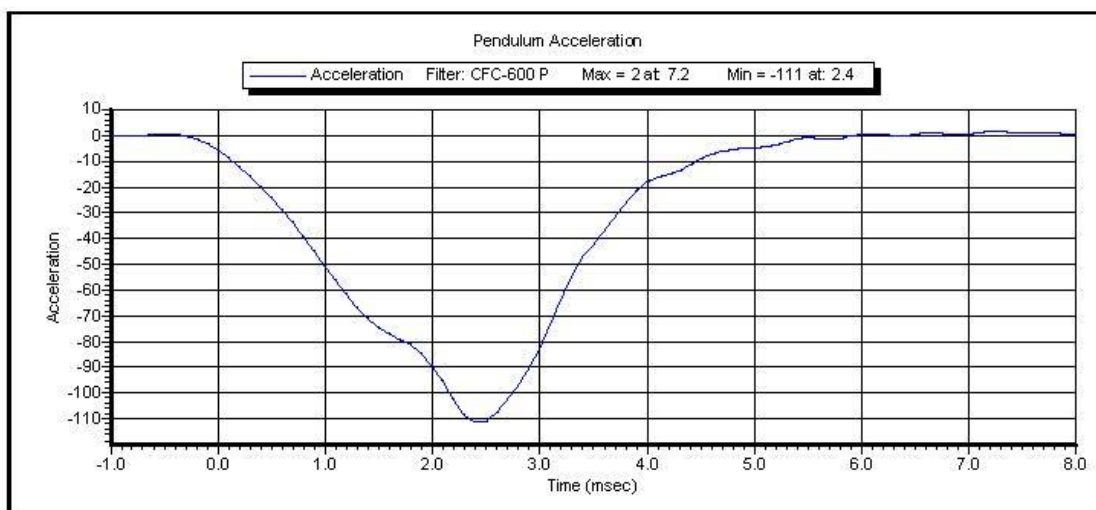


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact Right** Test Time: **9:51:15 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**



Test ID: **Knee Impact Right** Test Time: **9:51:15 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 139



External Measurements

5th Female SN 139

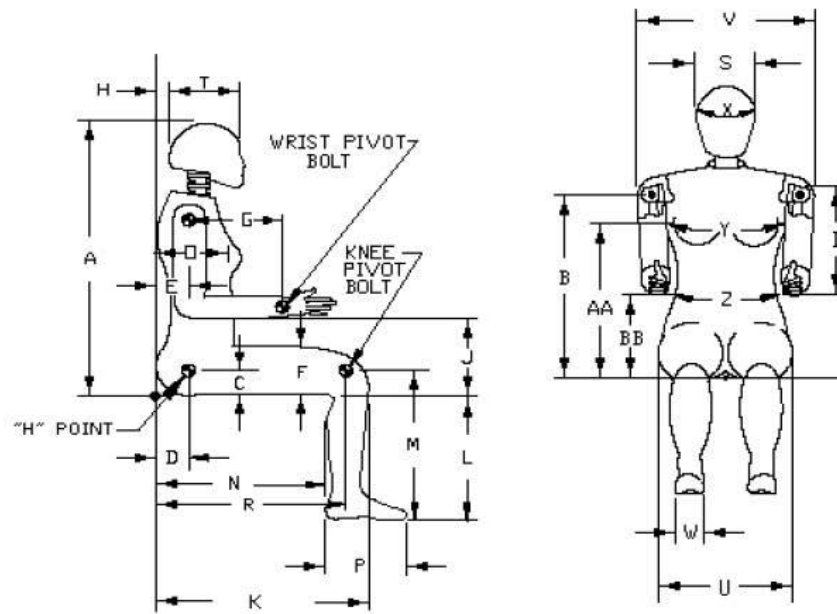
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	789	Yes
B	Shoulder Pivot Height	431.8 – 457.2	446	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	75	Yes
F	Thigh Clearance	119.4 – 134.6	123	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	248	Yes
H	Head Back to Backline	43.2 – 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	290	Yes
J	Elbow Rest Height	182.8 – 203.2	187	Yes
K	Buttock to Knee Length	520.7 – 546.1	542	Yes
L	Popliteal Height	355.6 – 376	362	Yes
M	Knee Pivot Height	393.7 – 419.1	399	Yes
N	Buttock Popliteal Length	414 – 439.4	423	Yes
O	Chest Depth without Jacket	175.3 – 190.5	185	Yes
P	Foot Length (right)	218.5 – 233.7	220	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	471	Yes
S	Head Breadth	137.1 – 147.3	142	Yes
T	Head Depth	177.8 – 188	181	Yes
U	Hip Breadth	299.7 – 314.9	301	Yes
V	Shoulder Breadth	350.5 – 365.7	361	Yes
W	Foot Breadth	78.8 – 94	83	Yes
X	Head Circumference	528.3 – 548.7	535	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	853	Yes
Z	Waist Circumference	759.5 – 789.9	774	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	356	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	170	Yes

Technician: M. Geesey

Date: 12/05/2014

Hybrid III 5th Female External Measurements

Reference Diagram





VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Head Drop	Test Date:	12/5/2014
		Test Time:	11:58:37 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.70 deg C P
Humidity	10 -- 70	20.80 %RH P
Resultant Acceleration	250 -- 300	256.4 G's P
Oscillation	0 -- 10	1.3 % P
Lateral Acceleration	-15 -- 15	.14.5 G's P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



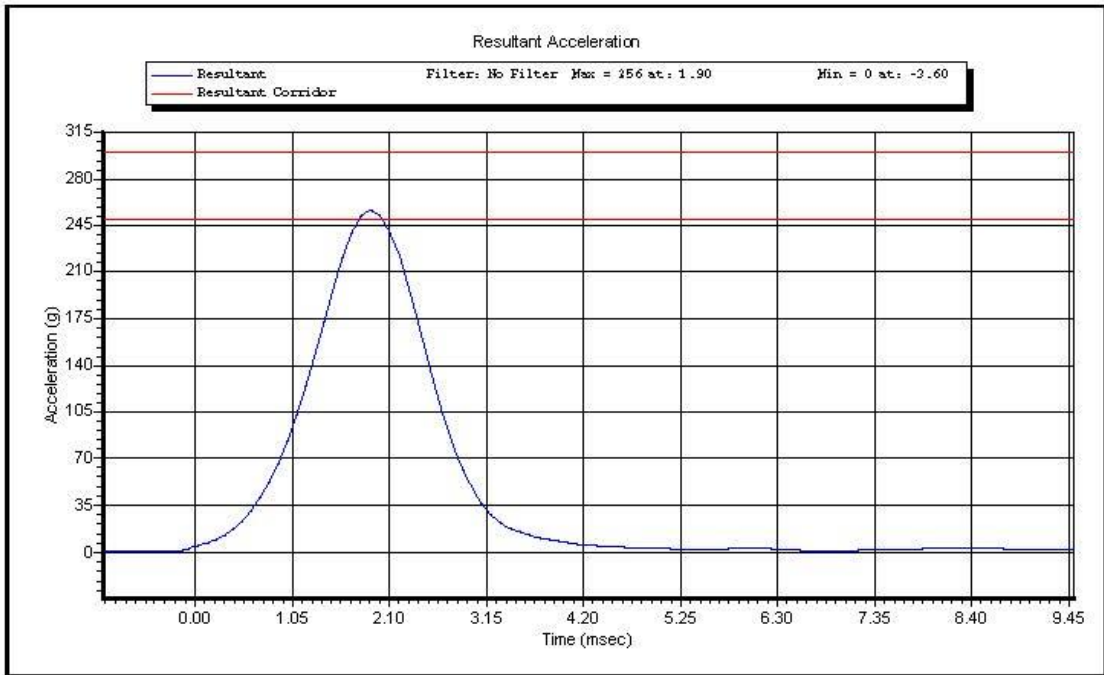
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P52054	8/26/2014
Endevco	7264-2000	P52007	8/26/2014
Endevco	7264-2000	P51298	8/26/2014



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139

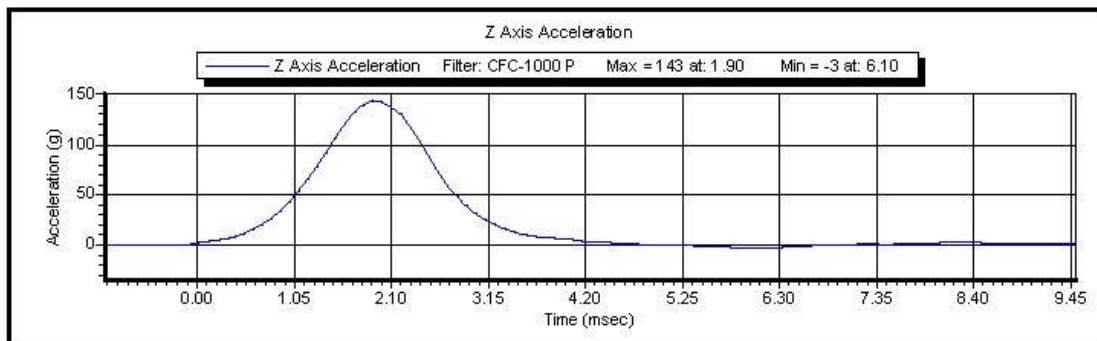
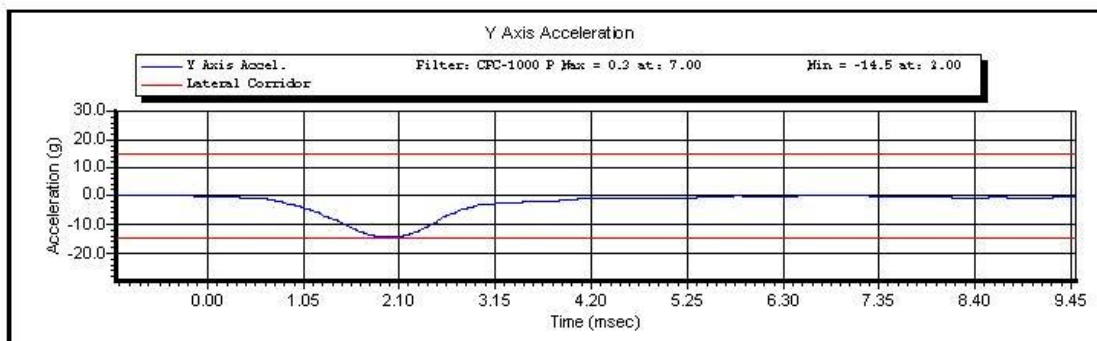
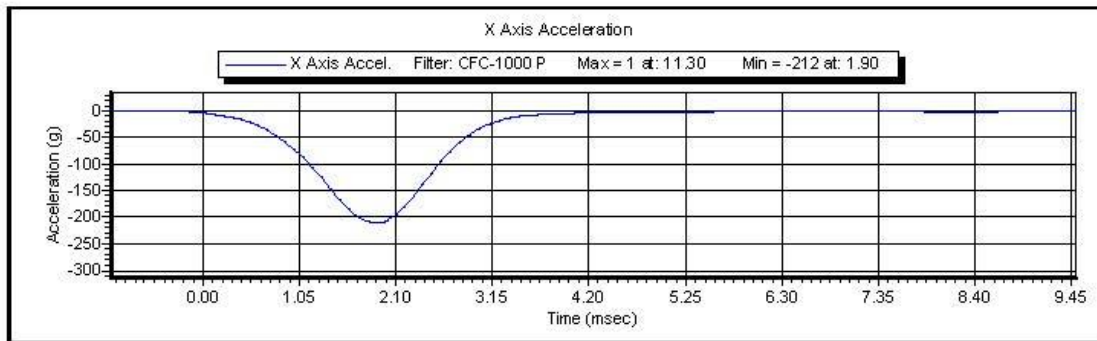


Test ID: **Head Drop**

Test Time: **11:58:37 AM**

Test Date: **12/5/2014**

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Test ID: **Head Drop**

Test Time: **11:58:37 AM**

Test Date: **12/5/2014**

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VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Neck Extension	Test Date:	12/5/2014
		Test Time:	10:15:41 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.40 deg C P
Humidity	10 -- 70	20.30 %RH P
Velocity	5.95 -- 6.19	5.996 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.76 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.58 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	5.39 m/s P
D Plane Rotation	99 -- 114	111.2 degrees P
Moment During Rotation Interval	-65 -- -53	-59.5 Nm P
Moment Decay to -10.0 Nm	94 -- 114	102.4 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



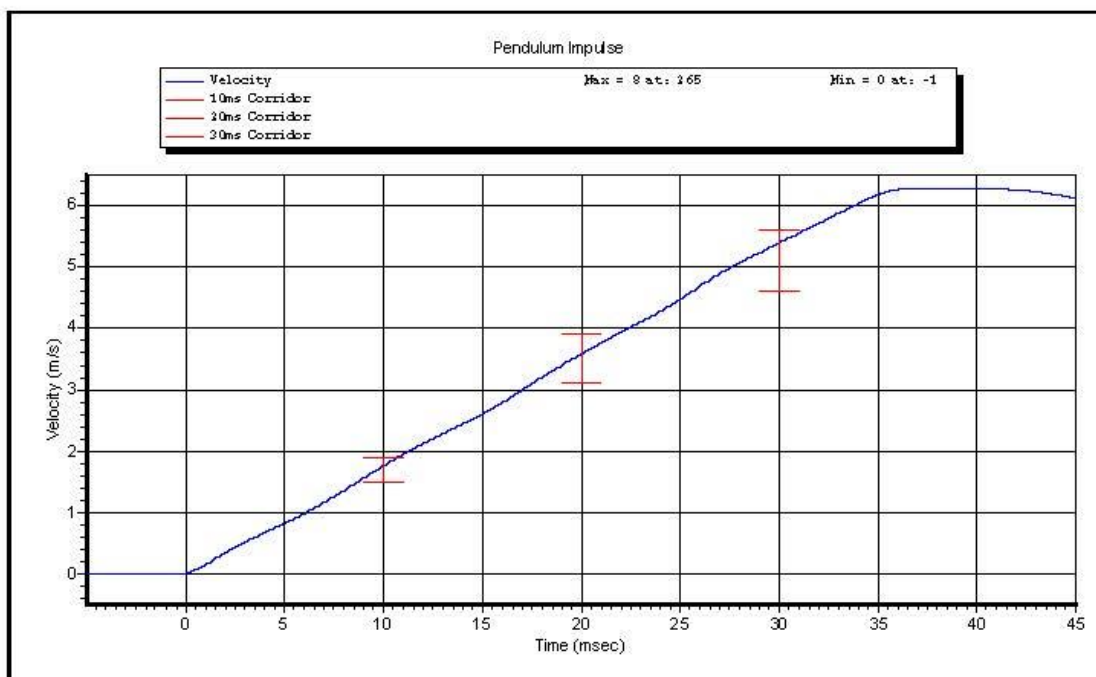
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2018My	5/1/2014
Denton	1716A	LC-2018Fx	5/1/2014



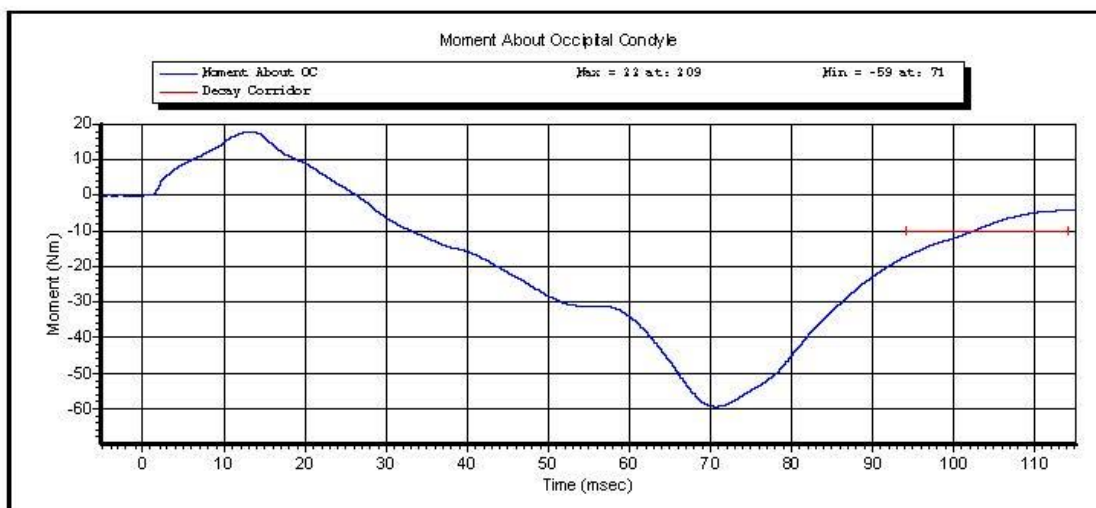
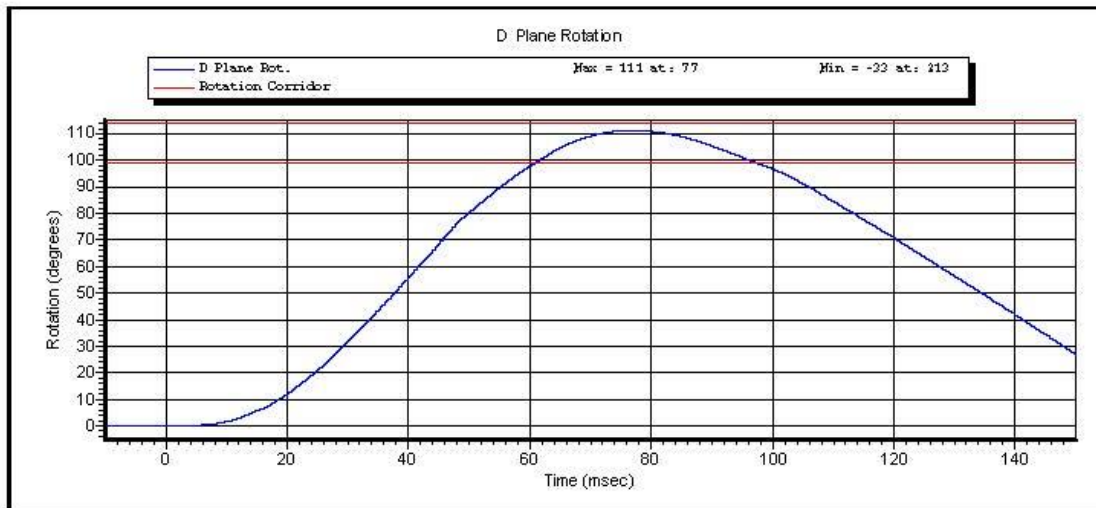
Test Name:	Neck Extension
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Neck Extension Test Time: 10:15:41 AM

Test Date: 12/5/2014

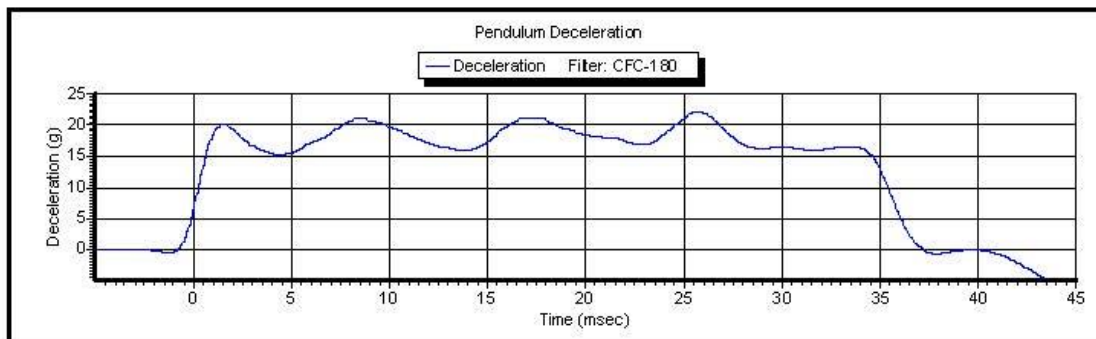
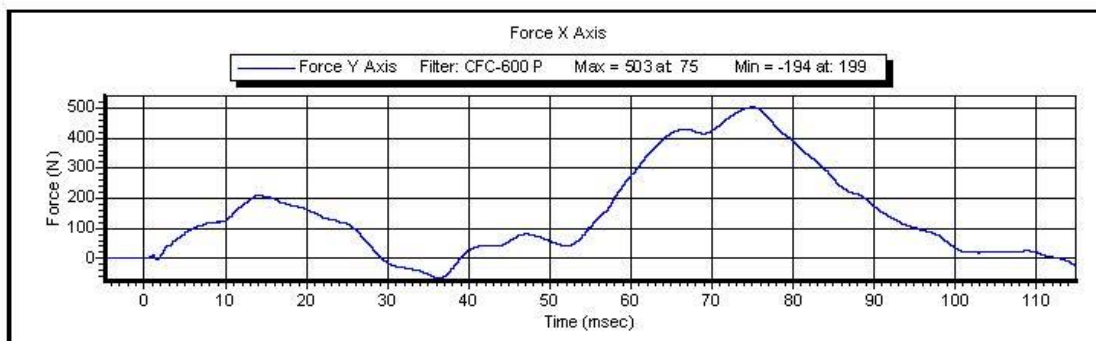
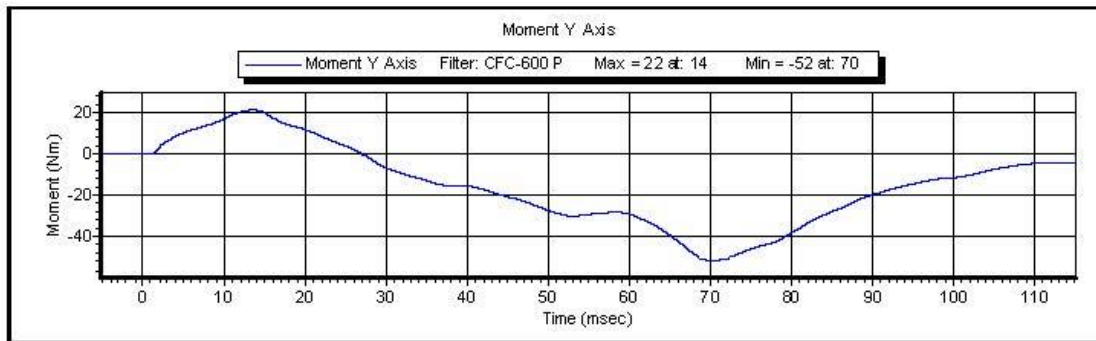
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: Neck Extension Test Time: 10:15:41 AM

Test Date: 12/5/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **10:15:41 AM**

Test Date: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Neck Flexion	Test Date:	12/5/2014
		Test Time:	9:41:25 AM

Test Parameters	Test Specifications	Test Results
Temperature	21 -- 22	21.50 deg C P
Humidity	10 -- 70	19.70 %RH P
Velocity	6.89 -- 7.13	6.972 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.23 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.6 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	6.83 m/s P
D Plane Rotation	-91 -- -77	-82.9 degrees P
Moment During Rotation Interval	69 -- 83	72.8 Nm P
Moment Decay to 10.0 Nm	80 -- 100	86.8 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



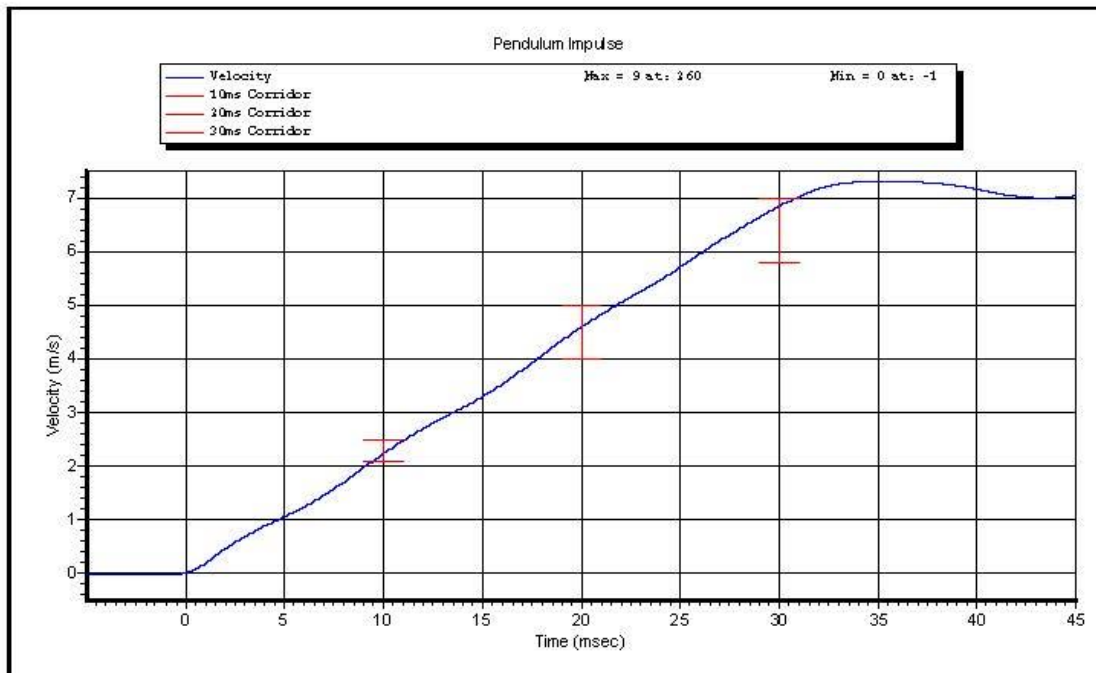
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2018My	5/1/2014
Denton	1716A	LC-2018Fx	5/1/2014

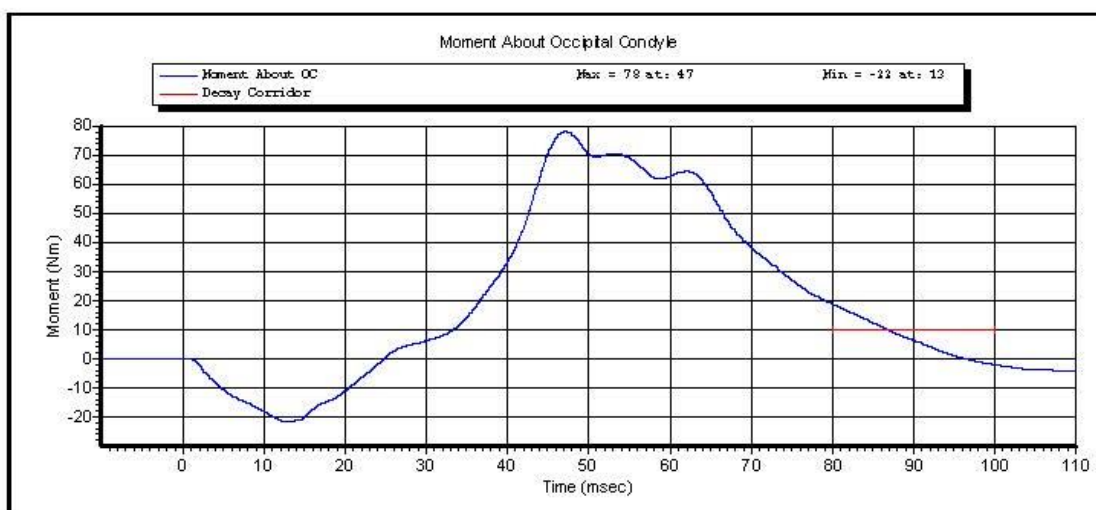
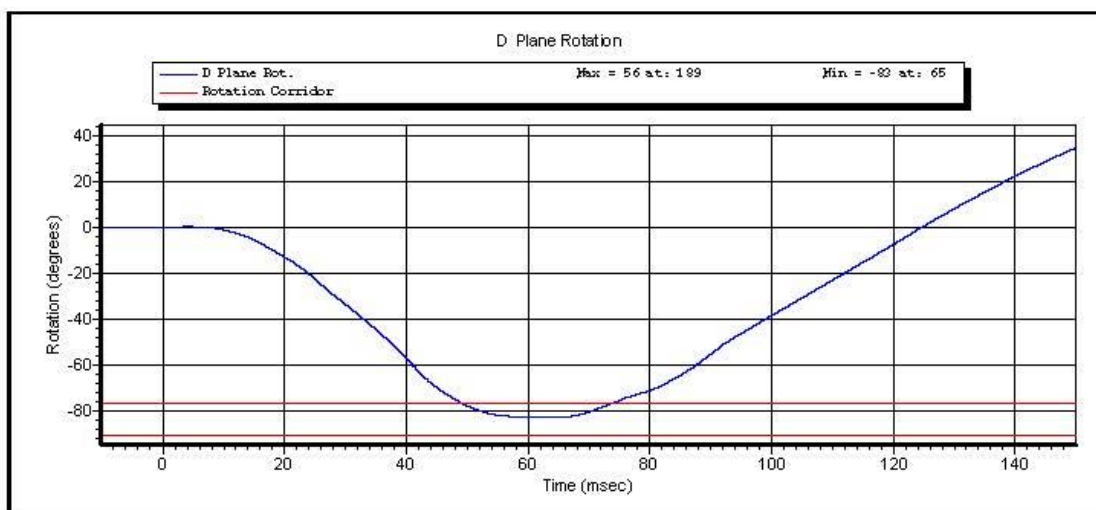


Test Name:	Neck Flexion
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Neck Flexion** Test Time: **9:41:25 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**

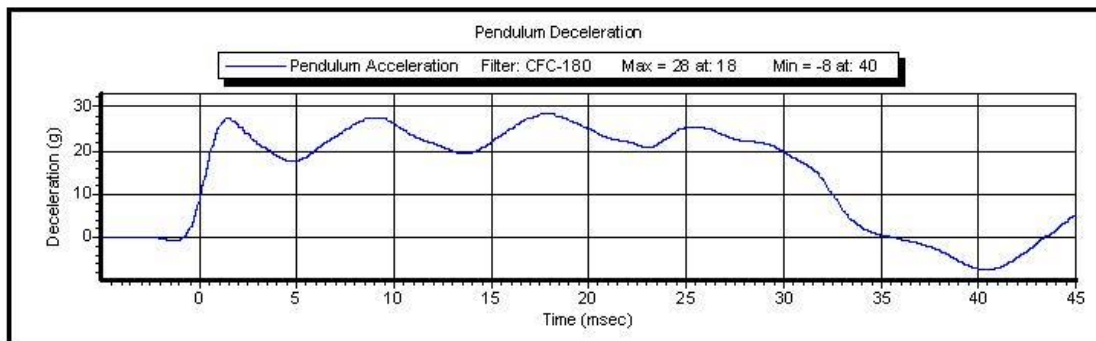
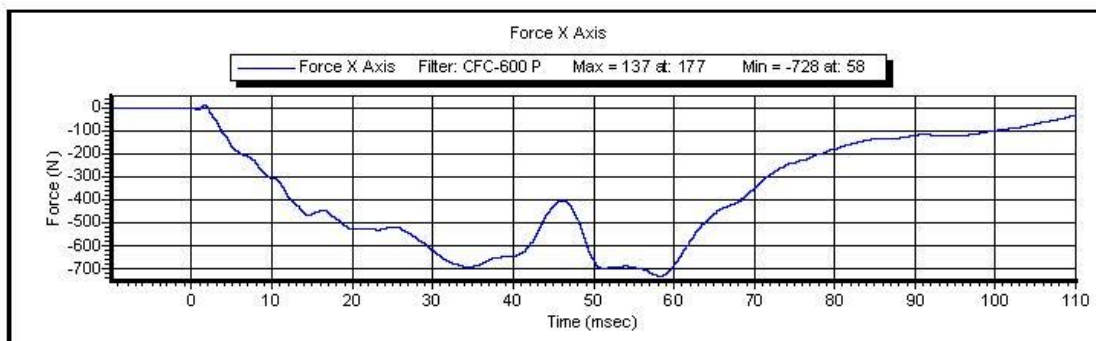
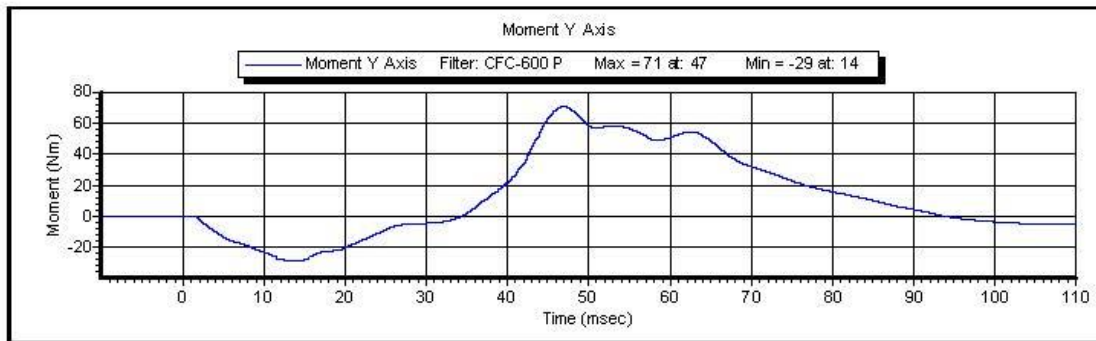


Test ID: **Neck Flexion**

Test Time: **9:41:25 AM**

Test Date: **12/5/2014**

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Test ID: **Neck Flexion**

Test Time: **9:41:25 AM**

Test Date: **12/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Thorax Impact	Test Date:	12/4/2014
		Test Time:	6:05:25 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.70 deg C	P
Humidity	10	--	70	19.10 %RH	P
Velocity	6.59	--	6.83	6.785 m/s	P
Sternum Displacement	-58	--	-50	-50.2 mm	P
Force During Displacement Interval	-4400	--	-3900	-4224.7 N	P
Force During -18mm to -50mm Displacem	-4600	--	0	-4571.8 N	P
Hysteresis	69	--	85	74.7 %	P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **M. Goehle**



VERIFICATION REPORT

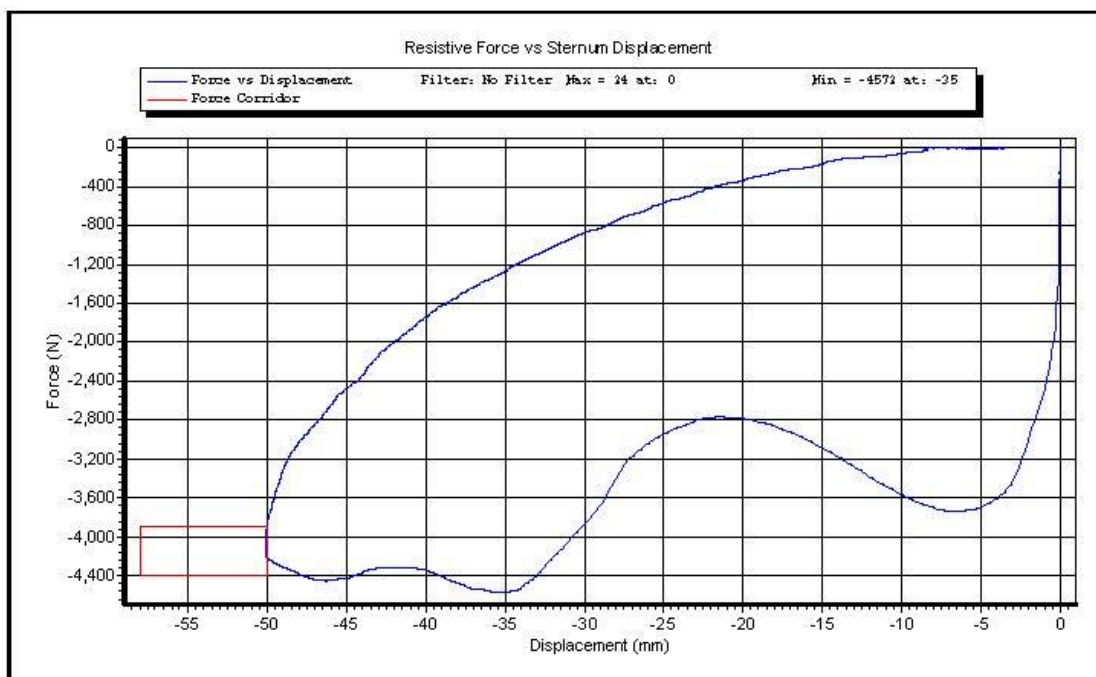
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<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	14 CB1-3615	DS-139	7/31/2014

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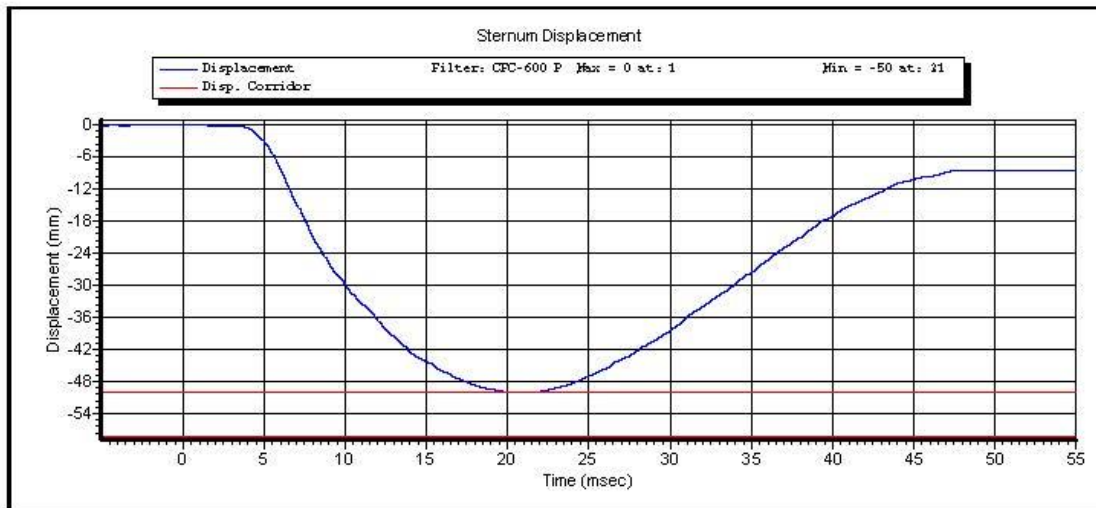


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Thorax Impact Test Time: 6:05:25 PM
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: 12/4/2014

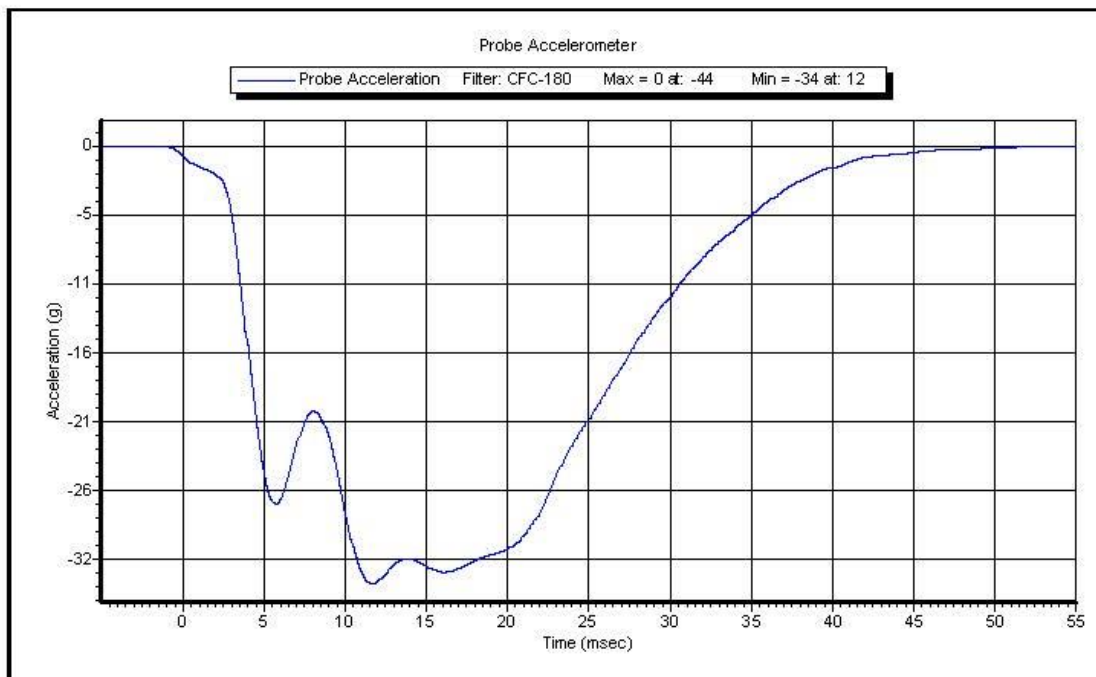


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Test Time: **6:05:25 PM**

Test Date: **12/4/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **6:05:25 PM**

Test Date: **12/4/2014**

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Torso Flexion

Part 572O HIII 5% Female

ATD Serial No: 139

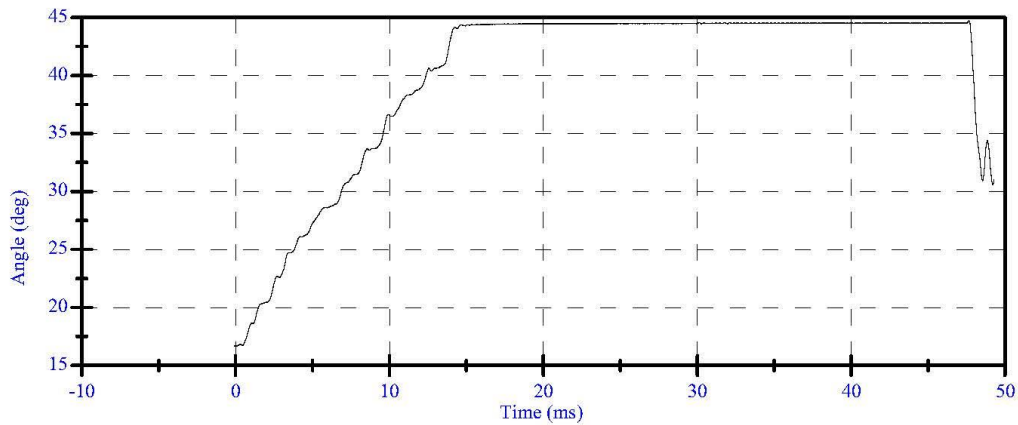
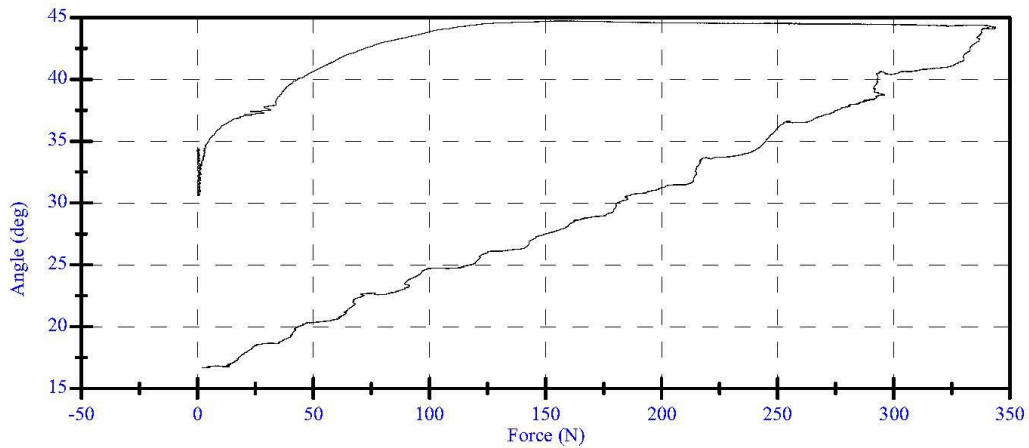
Laboratory Supervisor: M. Goehle

Date: 12/05/2014

Laboratory Technician: M. Geesey

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	21.6 Deg C	Passed
Lab Humidity:	10-70 %	23.0%	Passed
Initial Angle:	0.00-20.00 Deg	12.3 Deg	Passed
Force at 45 Deg	320.00-390.00 N	344.04 N	Passed
Return Angle	8 Deg Max from Initial	18.9 Deg	Passed

TORSO FLEXION TEST





VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Knee Impact Left	Test Date:	12/5/2014
		Test Time:	8:29:00 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.60 deg C P
Humidity	10 -- 70	20.00 %RH P
Velocity	2.07 -- 2.13	2.113 m/s P
Resistive Force	-4060 -- -3450	-3817.6 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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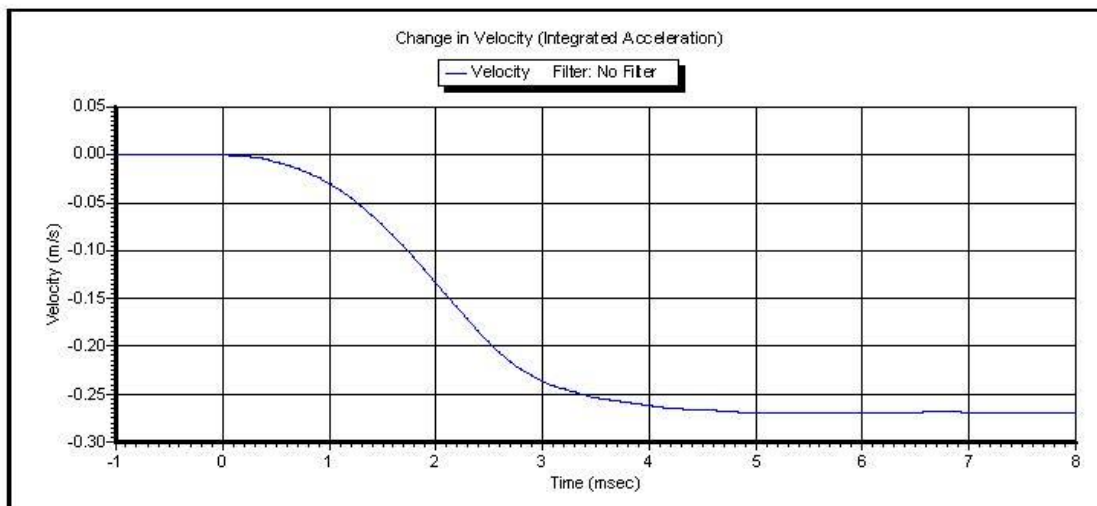
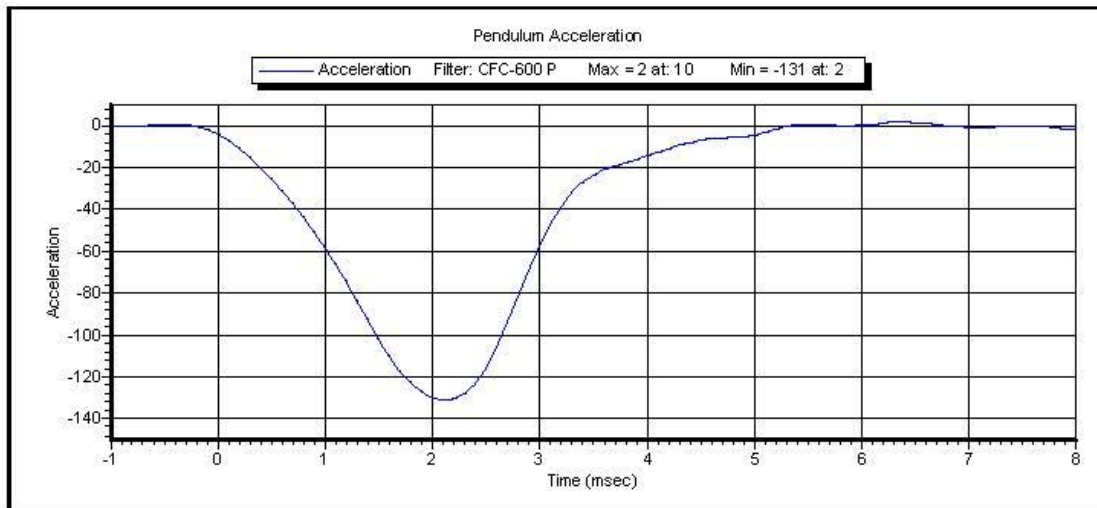


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Left** Test Time: **8:29:00 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**



Test ID: **Knee Impact Left** Test Time: **8:29:00 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Knee Impact Right	Test Date:	12/5/2014
		Test Time:	8:34:33 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.60 deg C P
Humidity	10 -- 70	20.20 %RH P
Velocity	2.07 -- 2.13	2.109 m/s P
Resistive Force	-4060 -- -3450	-3928.7 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

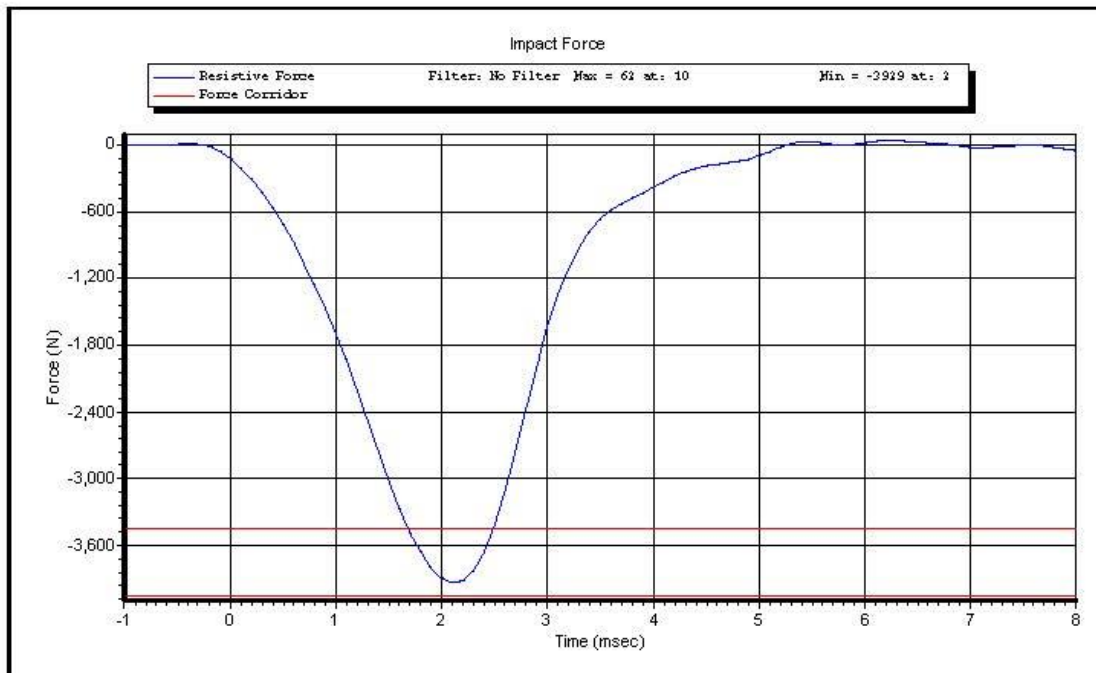
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<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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

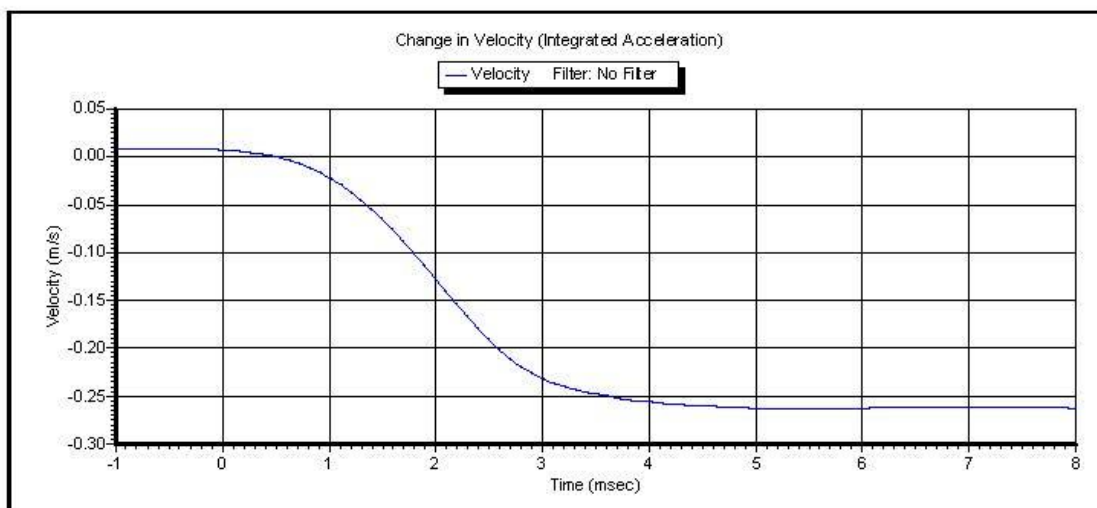
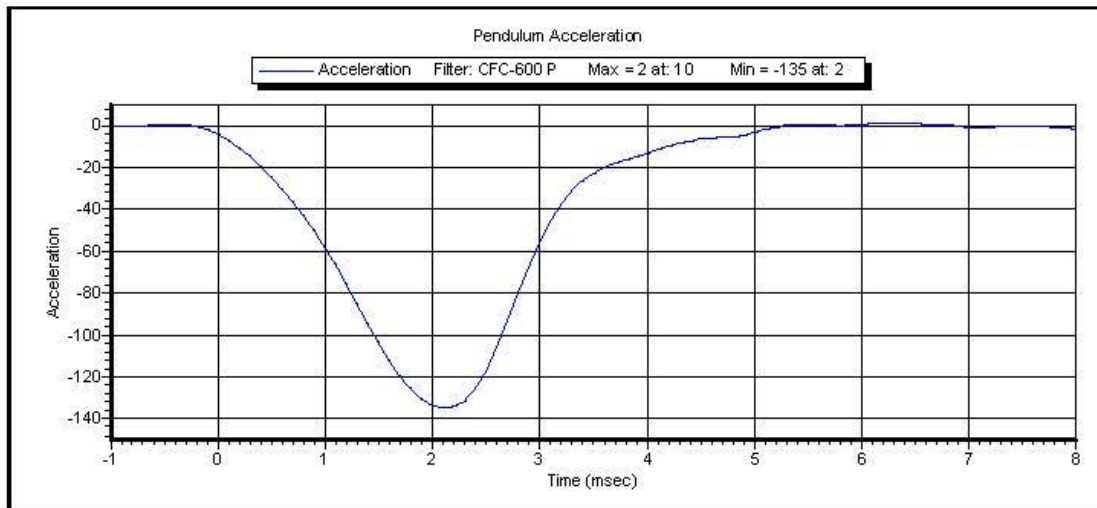


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Right** Test Time: **8:34:33 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**



Test ID: **Knee Impact Right** Test Time: **8:34:33 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/5/2014**

CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 1046

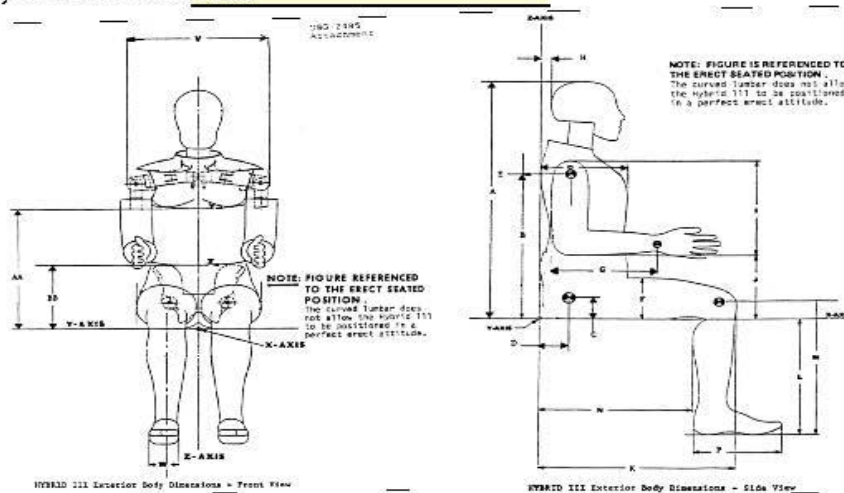


External Measurements - Hybrid 3 - 50th Male

Technician: R. Weil

Date: 12/11/2014

Dummy Serial Number: 1046



Dim. No.	Description	Specification (in)		Result (in)	Pass/Fail
A	Sitting Height	34.6	35.0	34.9	Pass
B	Shoulder Pivot Height	19.9	20.5	20.0	Pass
C	H-Point Height	3.3	3.5	3.4	Pass
D	H-Point from Backline	5.3	5.5	5.4	Pass
E	Shoulder Pivot from Backline	3.3	3.7	3.5	Pass
F	Thigh Clearance	5.5	6.1	6.0	Pass
G	Back of Elbow to Wrist Pivot	11.4	12.0	11.6	Pass
H	Head Back to Backline	1.6	1.8	1.7	Pass
I	Shoulder to Elbow Length	13.0	13.6	13.0	Pass
J	Elbow Rest Height	7.5	8.3	7.8	Pass
K	Buttock to Knee Length	22.8	23.8	23.2	Pass
L	Popliteal Height	16.9	17.9	17.3	Pass
M	Knee Pivot Height	19.1	19.7	19.4	Pass
N	Buttock Popliteal Length	17.8	18.8	18.2	Pass
O	Chest Depth without Jacket	8.4	9.0	8.6	Pass
P	Foot Length (right)	9.9	10.5	10.3	Pass
V	Shoulder Breadth	16.3	17.2	16.7	Pass
W	Foot Breadth	3.6	4.2	3.7	Pass
Y	Chest Circumference with Jacket	38.2	39.4	38.9	Pass
Z	Waist Circumference	32.9	34.1	33.8	Pass
AA	Reference Location (Chest Circumference)	16.9	17.1	17.0	Pass
BB	Reference Location (Waist Circumference)	8.9	9.1	9.0	Pass



VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Head Drop	Test Date:	12/10/2014
		Test Time:	4:23:45 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.80 deg C	P
Humidity	10	--	70	21.40 %RH	P
Resultant Acceleration	225	--	275	257.8 G's	P
Oscillation	0	--	10	2.7 %	P
Lateral Acceleration	-15	--	15	4.7 G's	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



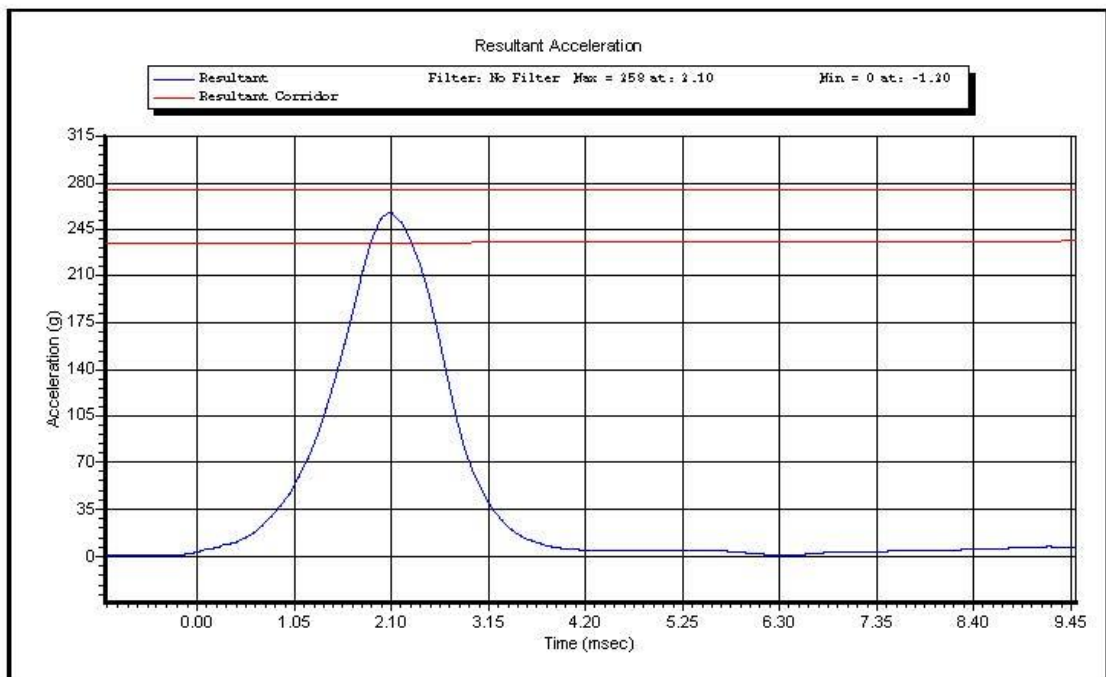
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58871	6/27/2014
Endevco	7264-2000	P12359	6/27/2014
Endevco	7264-2000	P52133	6/27/2014



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046

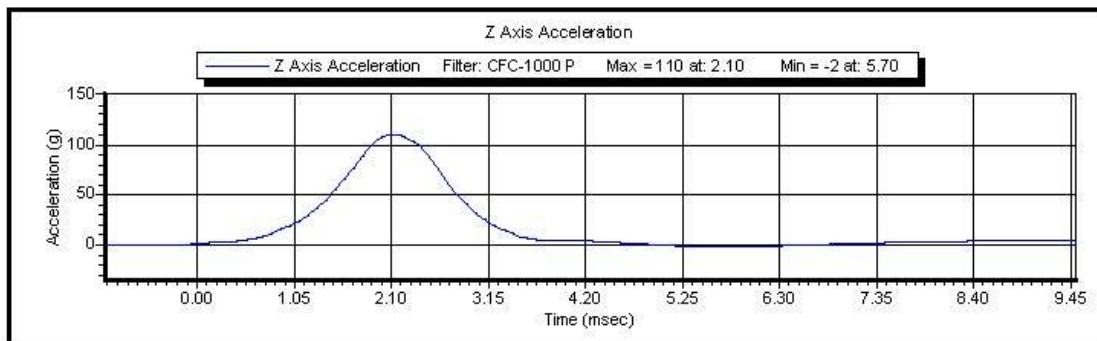
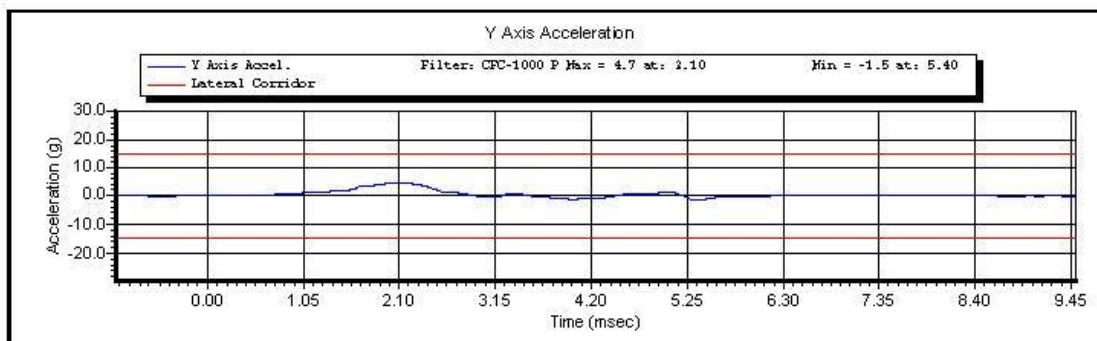
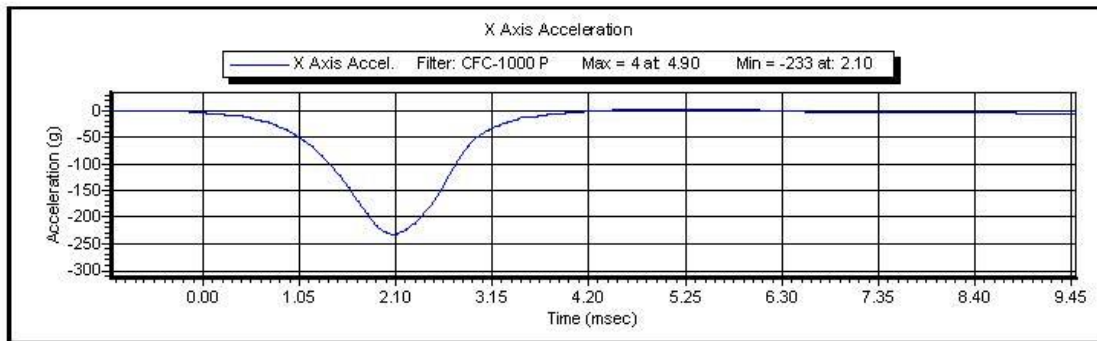


Test ID: **Head Drop**

Test Time: **4:23:45 PM**

Test Date: **12/10/2014**

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Test ID: **Head Drop**

Test Time: **4:23:45 PM**

Test Date: **12/10/2014**

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VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Neck Extension	Test Date:	12/11/2014
		Test Time:	10:51:44 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.00 deg C P
Humidity	10 -- 70	20.30 %RH P
Velocity	5.94 -- 6.19	6.023 m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	19.45 G's P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	17.63 G's P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	15.03 G's P
Max Pendulum Deceleration after 30 ms	0.0 -- 22.0	15.18 G's P
Deceleration Time to 5 G's	38 -- 46	38.2 ms P
D Plane Rotation	81 -- 106	96.7 degrees P
Time at Max Rotation	72 -- 82	75.9 ms P
Rotation Decay to Zero	147 -- 174	155.4 ms P
Moment About Occipital Condyle	-80.0 -- -52.9	-67.46 Nm P
Time at Maximum Moment	65 -- 79	71.6 ms P
Moment Decay to Zero	120 -- 148	140.0 ms P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



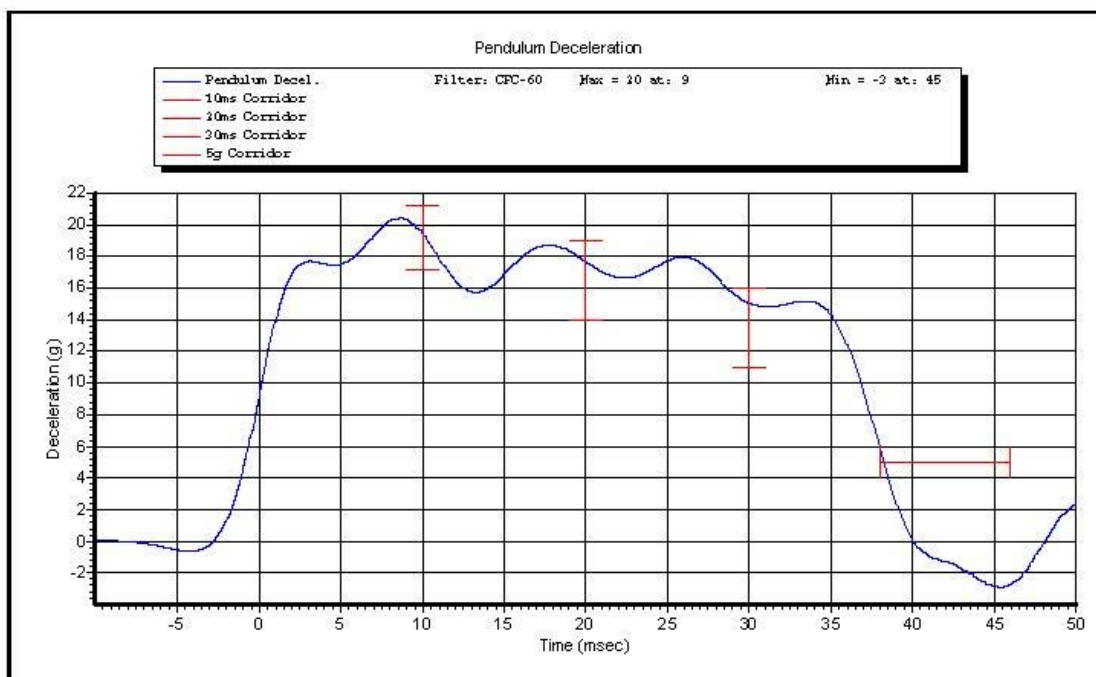
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	8/7/2014
Denton	1716A	LC-2186 Fx	8/7/2014



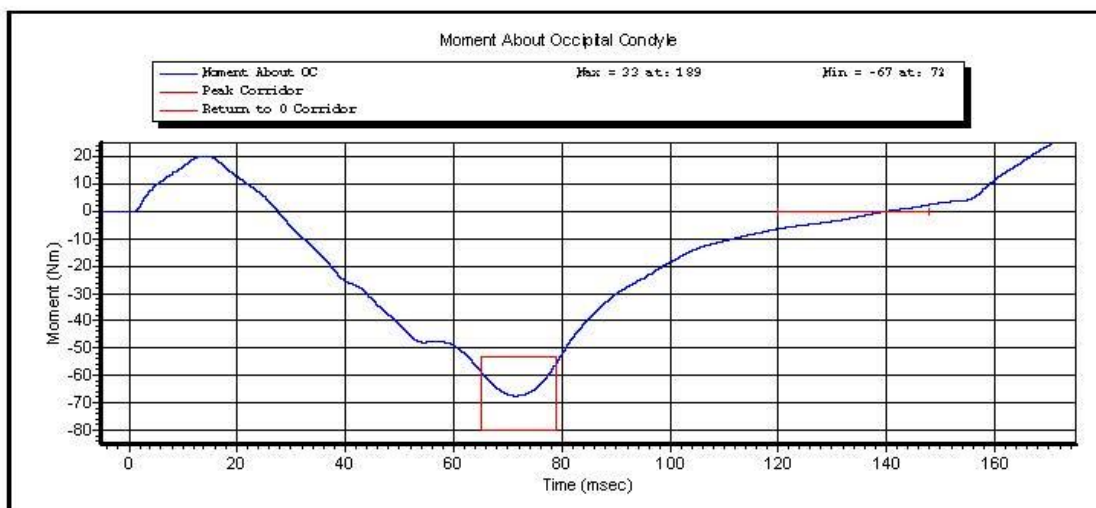
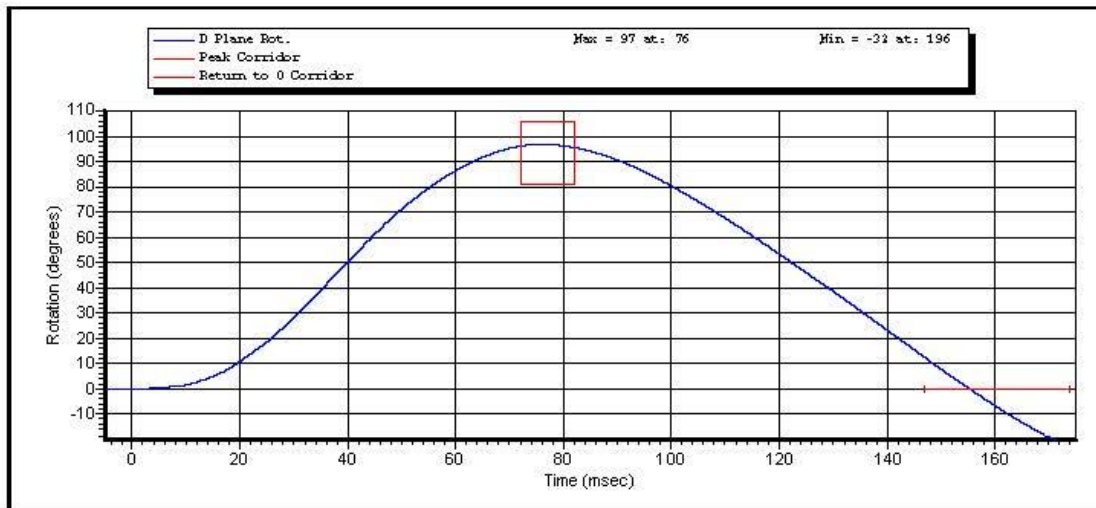
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Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



ID of Test: **Neck Extension** Time of Test: **10:51:44 AM**

Date of Test: **12/11/2014**

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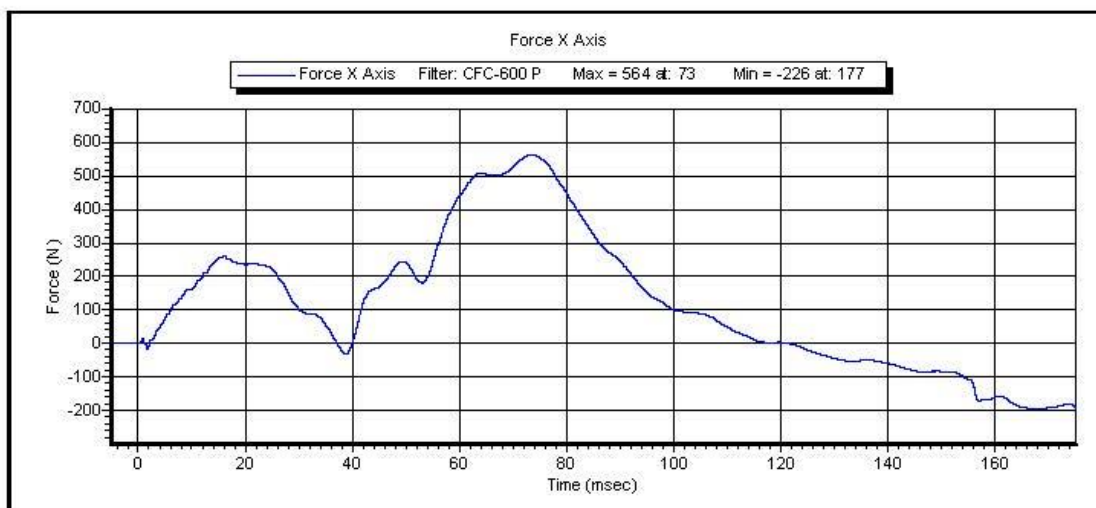
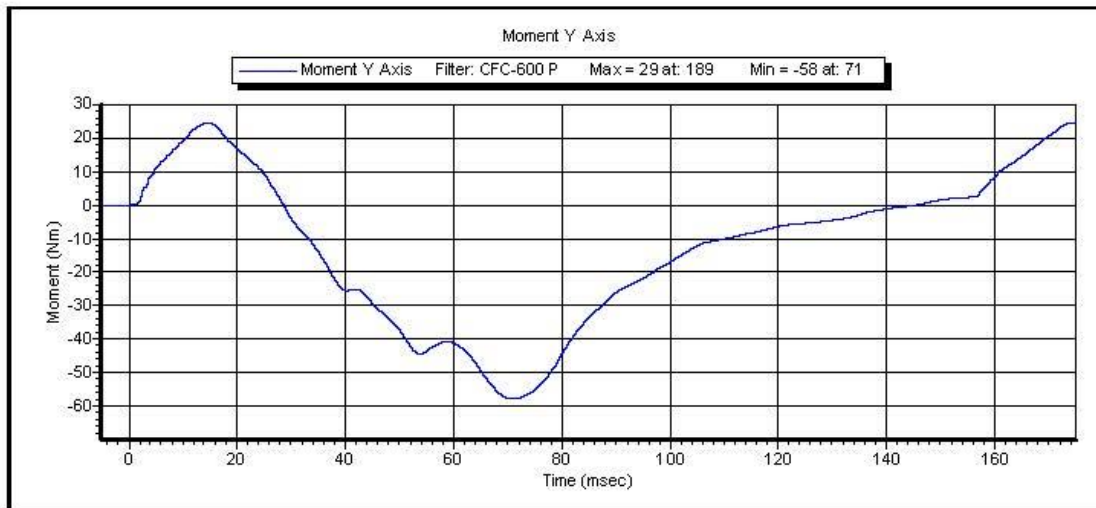


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Time of Test: **10:51:44 AM**

Date of Test: **12/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Extension**

Time of Test: **10:51:44 AM**

Date of Test: **12/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Neck Flexion	Test Date:	12/11/2014
		Test Time:	10:15:13 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.10 deg C P
Humidity	10 -- 70	20.80 %RH P
Velocity	6.89 -- 7.13	6.939 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	22.77 G's P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	21.57 G's P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	17.36 G's P
Maximum Pendulum Deceleration After 30 ms	0 -- 29	17.4 G's P
Deceleration Time to 5 G's	34 -- 42	37.7 ms P
D Plane Rotation	-78 -- -64	-70.3 degrees P
Time at Maximum Rotation	57 -- 64	60.0 ms P
Rotation Decay to Zero	113 -- 128	113.9 ms P
Moment About Occipital Condyle	88.1 -- 108.4	95.37 Nm P
Time at Maximum Moment	47 -- 58	49.9 ms P
Moment Decay to Zero	97.0 -- 107.0	98.8 ms P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



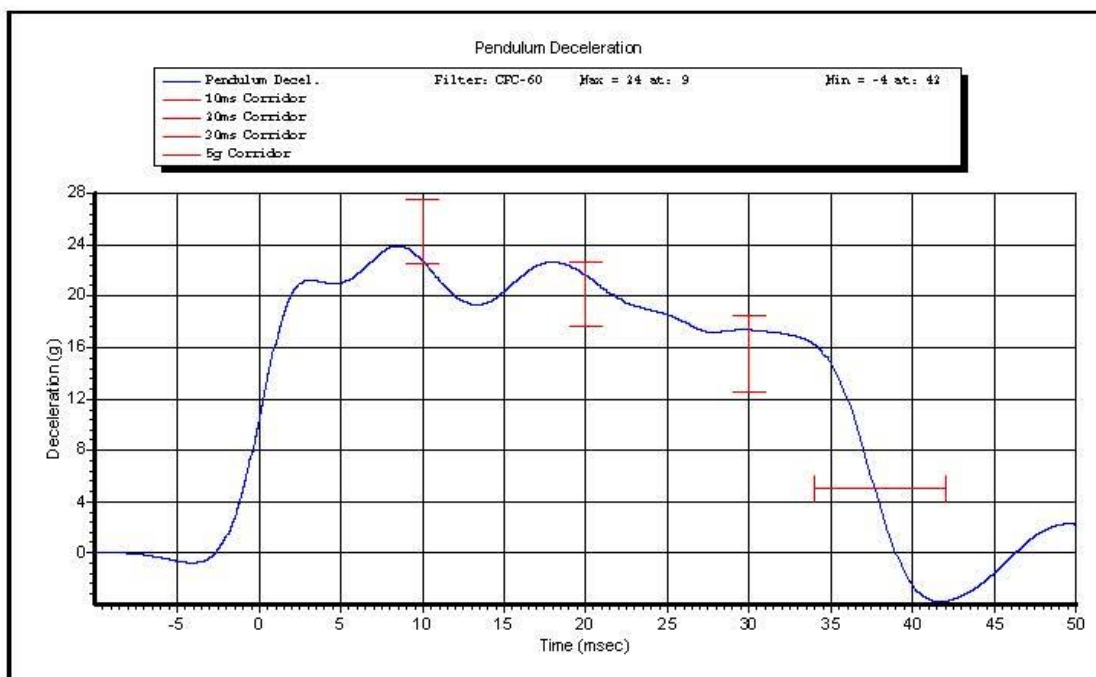
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2186 My	8/7/2014
Denton	1716A	LC-2186 Fx	8/7/2014



Name of Test:	Neck Flexion
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	1046

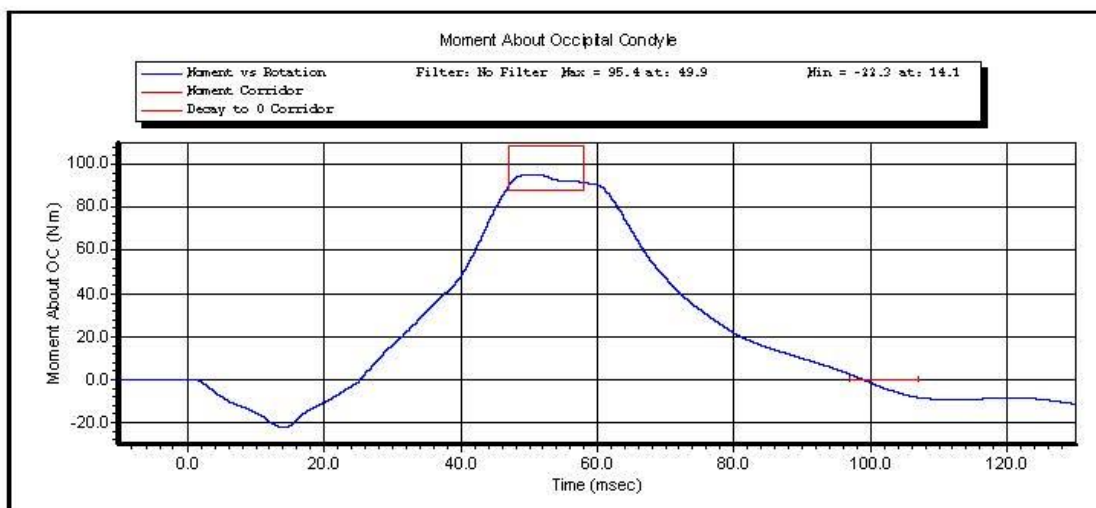
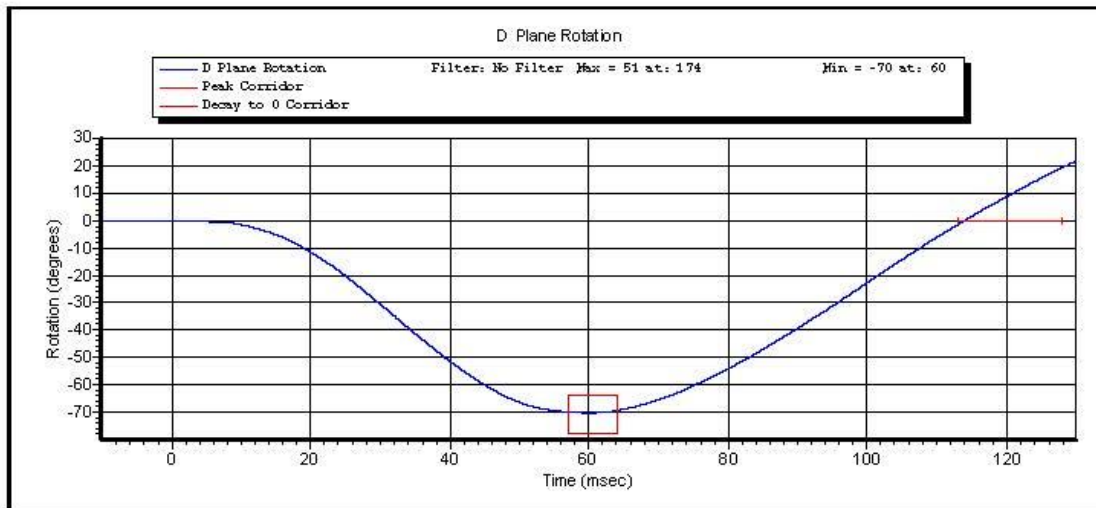


ID of Test: **Neck Flexion**

Time of Test: **10:15:13 AM**

Date of Test: **12/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

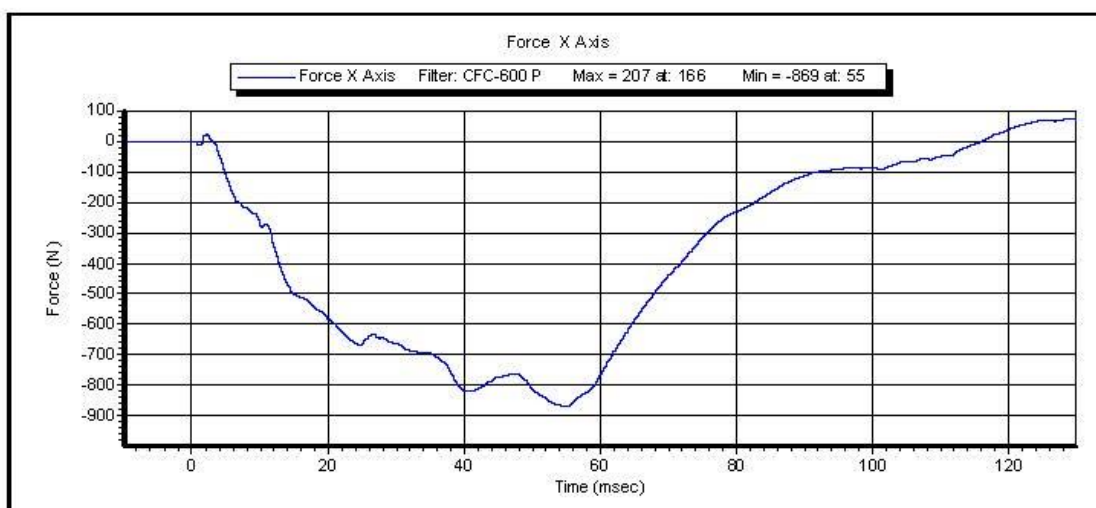
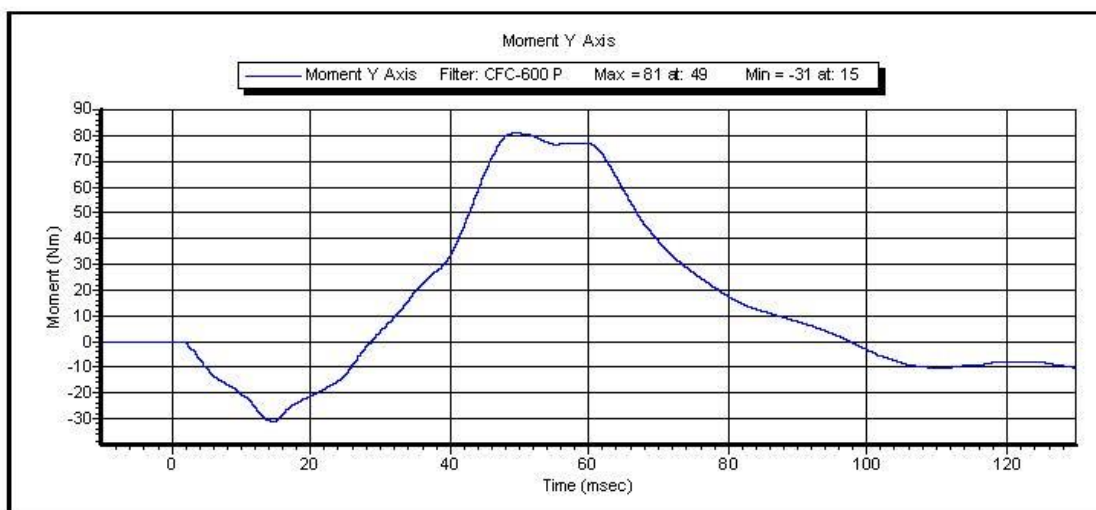


ID of Test: **Neck Flexion**

Time of Test: **10:15:13 AM**

Date of Test: **12/11/2014**

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ID of Test: **Neck Flexion**

Time of Test: **10:15:13 AM**

Date of Test: **12/11/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Thorax Impact	Test Date:	12/12/2014
		Test Time:	11:07:23 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.90 deg C	P
Humidity	10	--	70	23.00 %RH	P
Velocity	6.59	--	6.83	6.752 m/s	P
Chest Deflection	-72.6	--	-63.5	-67.39 mm	P
Resistive Force	-5.894	--	-5.160	-5.5225 kN	P
Hysteresis	69	--	85	72.0 %	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

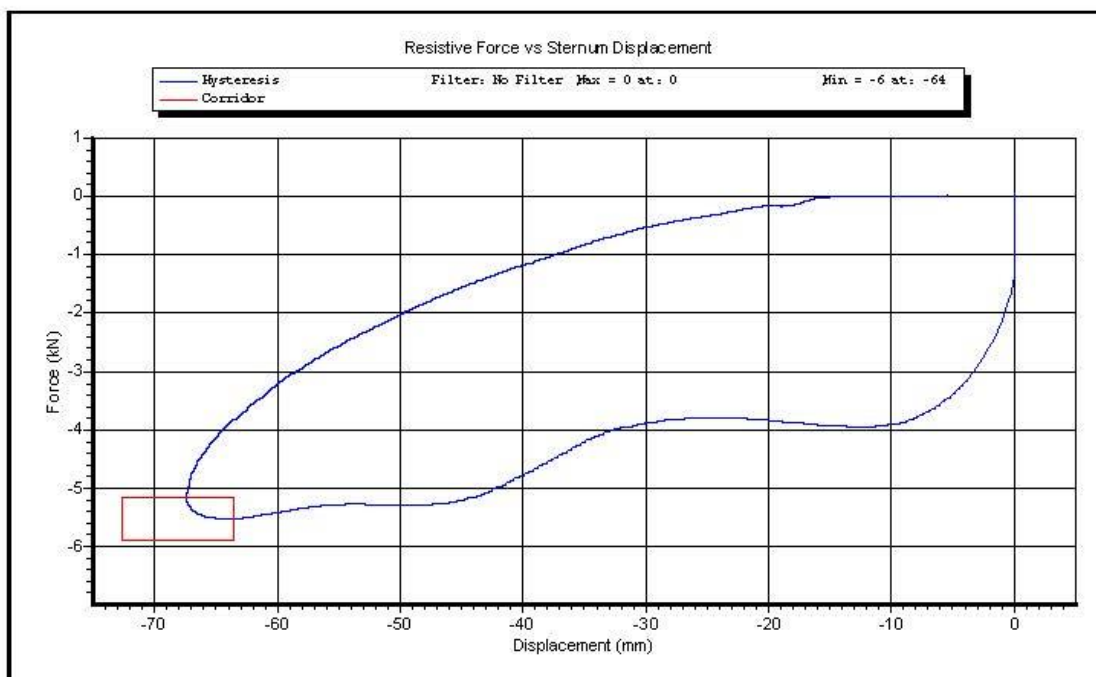
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<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	14 CBI-2897	DS-1046	7/31/2014

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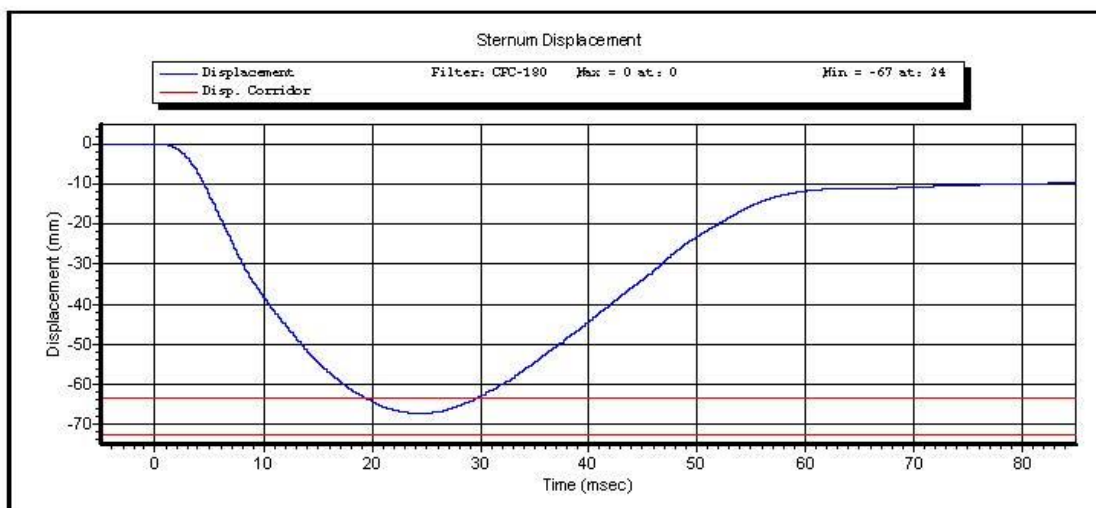
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Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: Thorax Impact Test Time: 11:07:23 AM

Test Date: 12/12/2014

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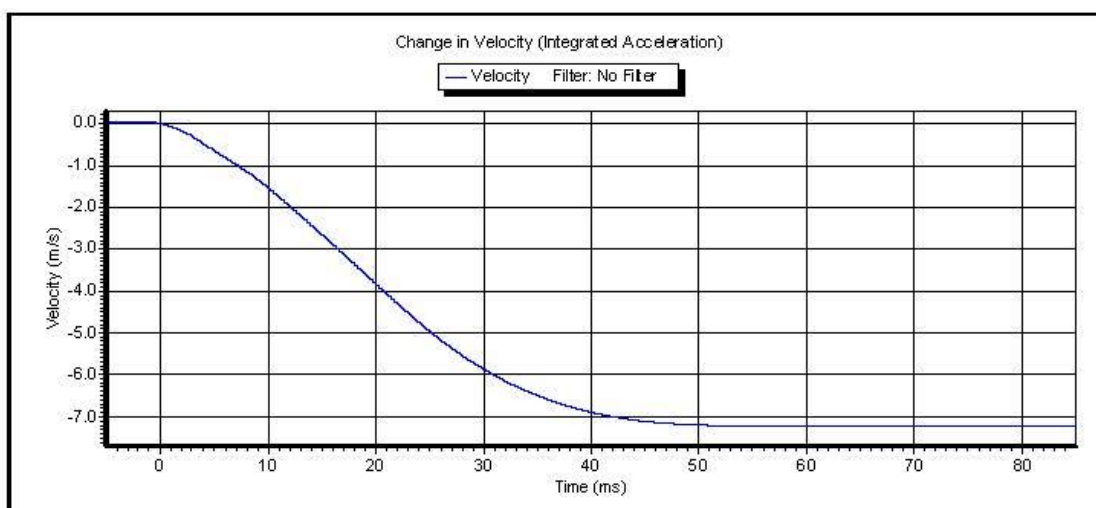
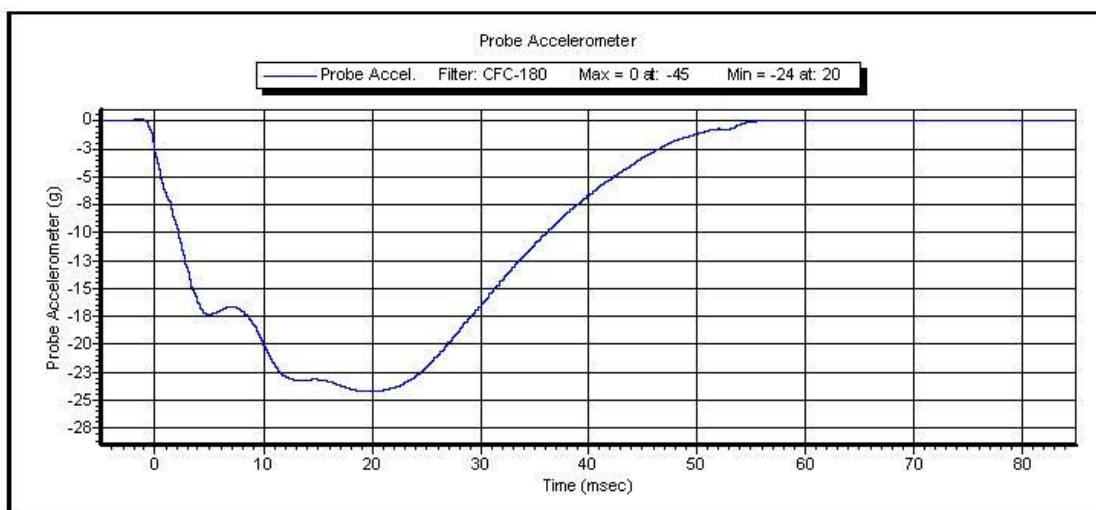


Test ID: **Thorax Impact**

Test Time: **11:07:23 AM**

Test Date: **12/12/2014**

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Test ID: **Thorax Impact**

Test Time: **11:07:23 AM**

Test Date: **12/12/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Hip ROM Left	Test Date:	12/10/2014
		Test Time:	2:55:52 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.70 deg C	P
Humidity	10	--	70	21.10 %RH	P
Average Velocity	5	--	10	6.3 deg/s	P
Angle at 203 Nm	40	--	50	41.5 degrees	P
Moment at 30 degrees	0.0	--	94.9	89.46 Nm	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



VERIFICATION REPORT

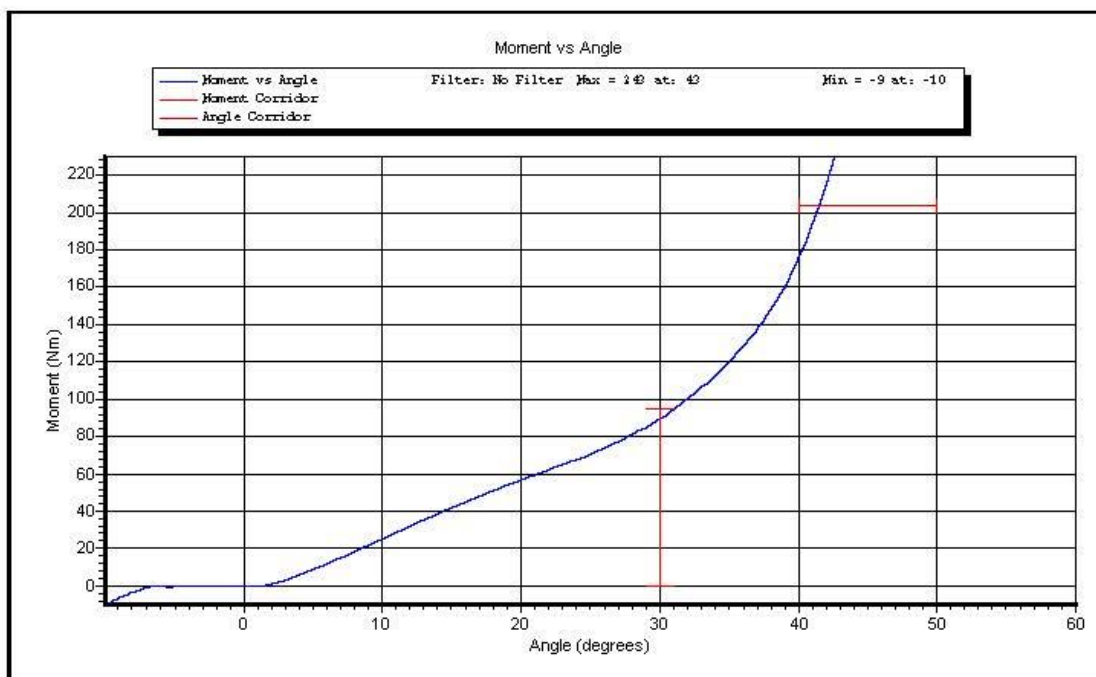
REFERENCE EQUIPMENT

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

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Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Hip ROM Left** Test Time: **2:55:52 PM**

Test Date: **12/10/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Hip ROM	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Hip ROM Right	Test Date:	12/10/2014
		Test Time:	3:16:50 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.70 deg C	P
Humidity	10	--	70	21.00 %RH	P
Average Velocity	5	--	10	6.1 deg/s	P
Angle at 203 Nm	40	--	50	40.3 degrees	P
Moment at 30 degrees	0.0	--	94.9	92.54 Nm	P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **M. Goehle**



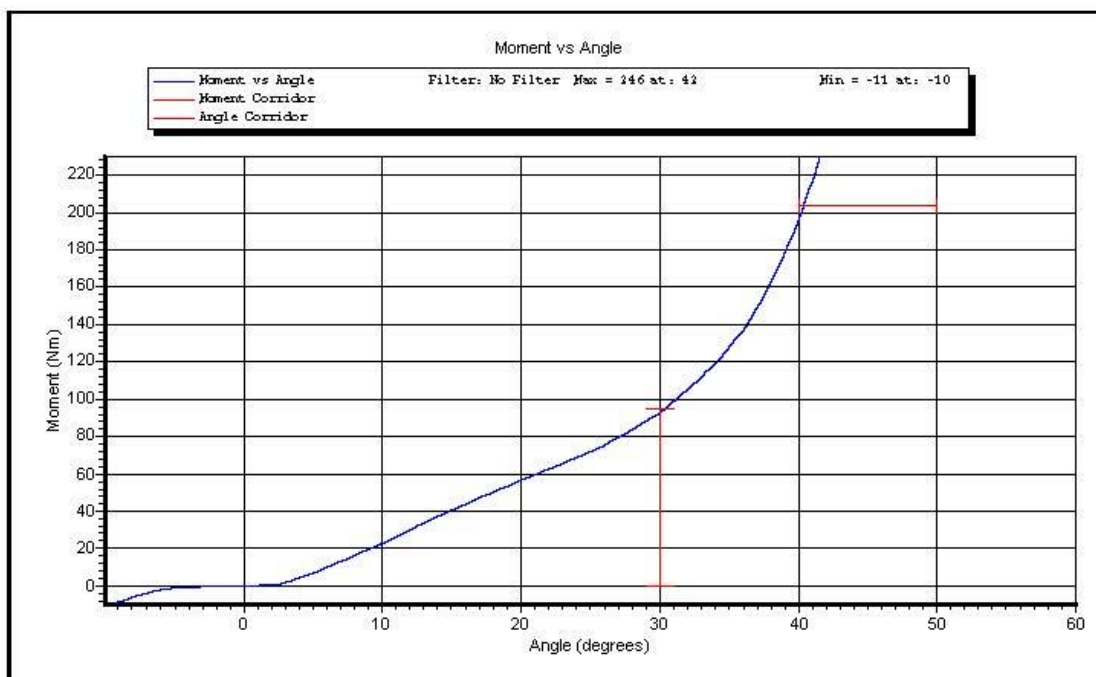
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



Test Name:	Hip ROM
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Hip ROM Right** Test Time: **3:16:50 PM**

Test Date: **12/10/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Knee Impact Left	Test Date:	12/12/2014
		Test Time:	3:22:03 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.60 deg C P
Humidity	10 -- 70	24.30 %RH P
Velocity	2.07 -- 2.13	2.091 m/s P
Resistive Force	-5.780 -- -4.720	-5.371 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

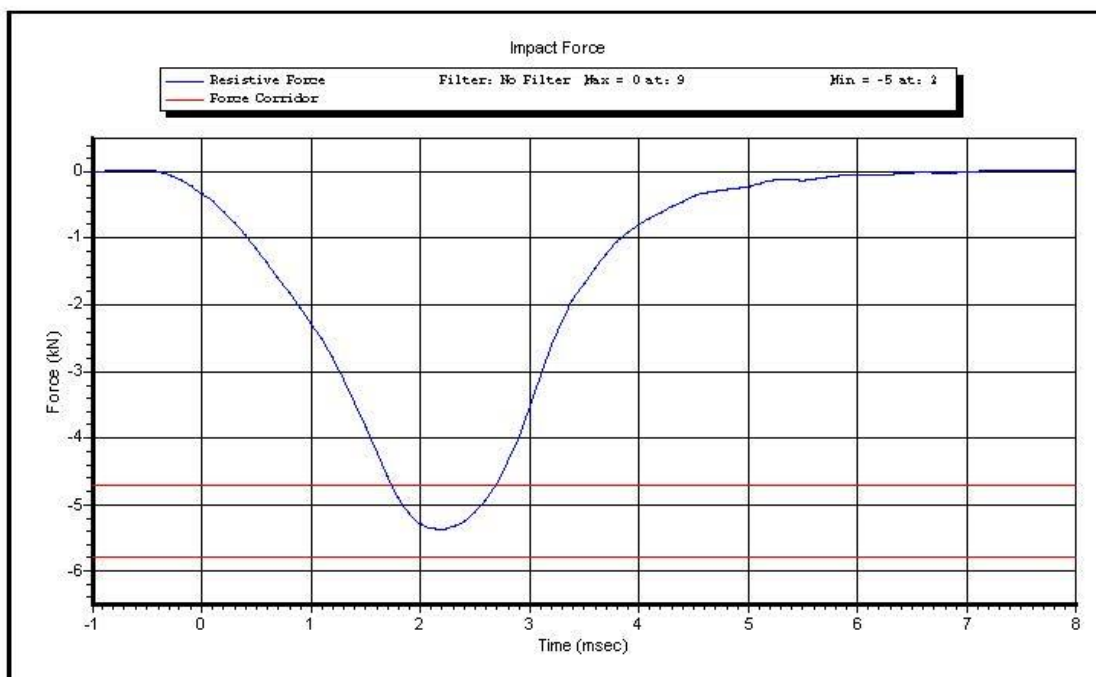
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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

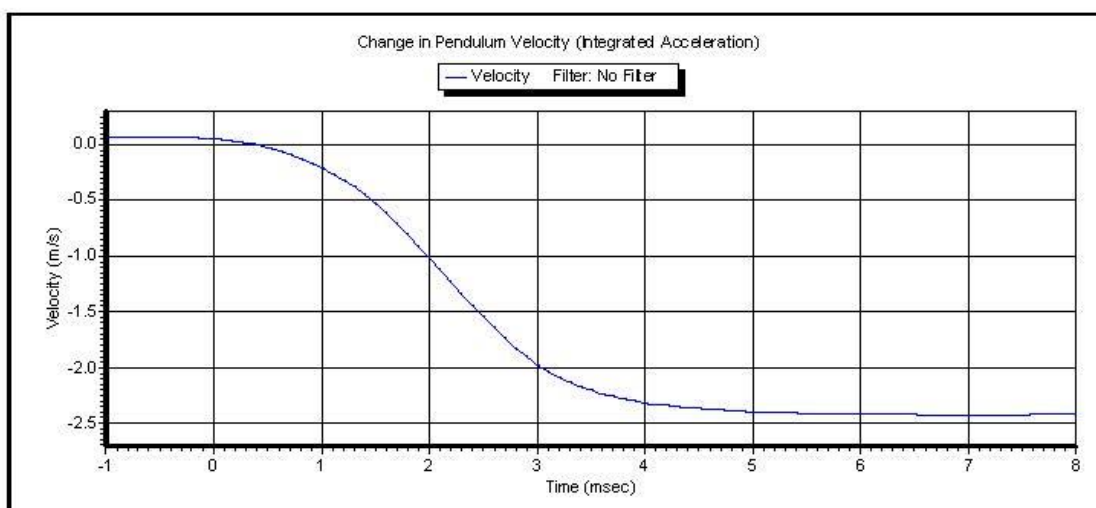
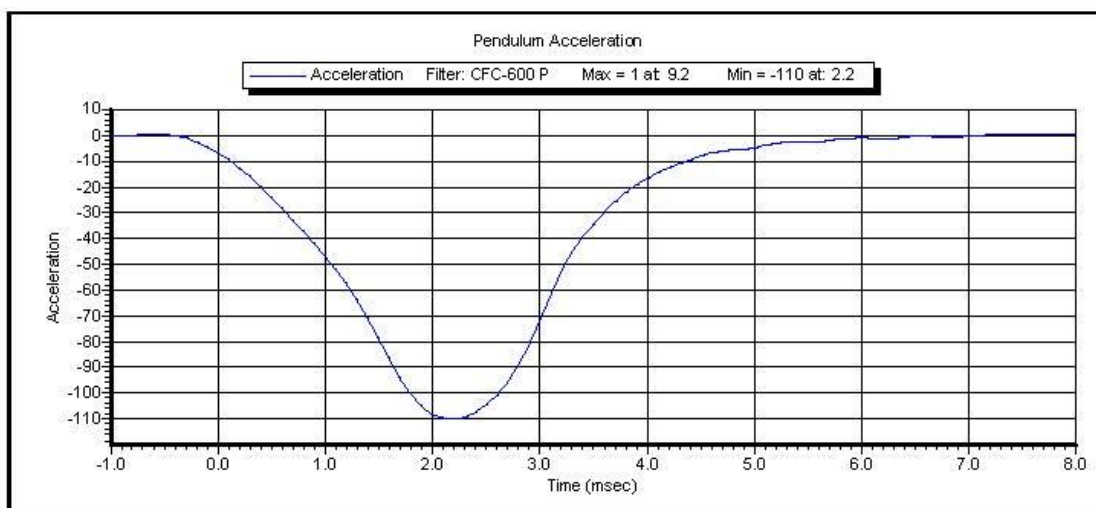


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact Left** Test Time: **3:22:03 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/12/2014**



Test ID: **Knee Impact Left** Test Time: **3:22:03 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/12/2014**



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	1046		
Test ID:	Knee Impact Right	Test Date:	12/12/2014
		Test Time:	2:39:23 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.60 deg C P
Humidity	10 -- 70	23.90 %RH P
Velocity	2.07 -- 2.13	2.097 m/s P
Resistive Force	-5.780 -- -4.720	-5.612 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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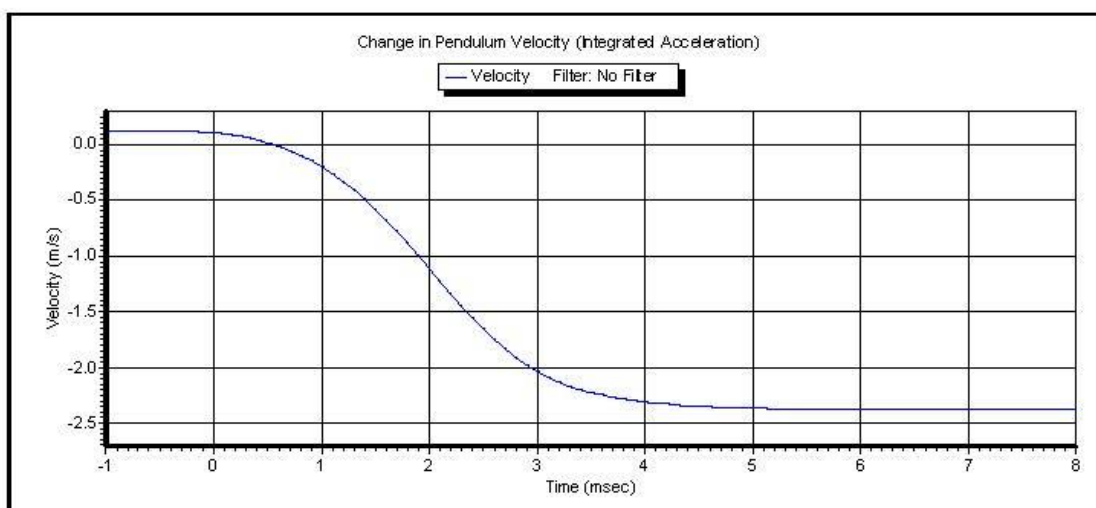
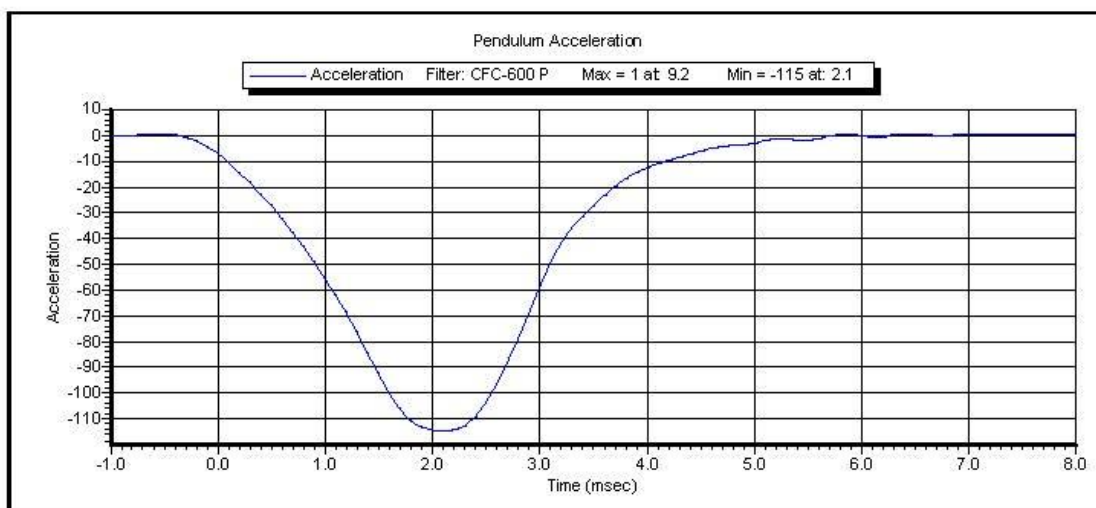
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Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact Right** Test Time: **2:39:23 PM**

Test Date: **12/12/2014**

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Test ID: **Knee Impact Right** Test Time: **2:39:23 PM**

Test Date: **12/12/2014**

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CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 139

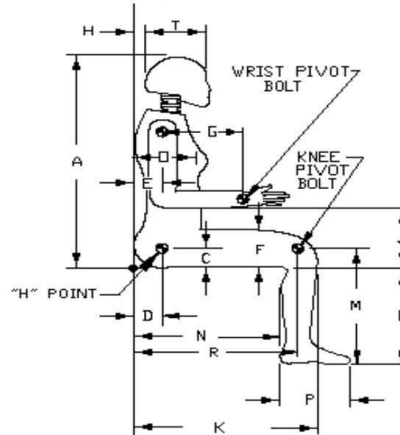
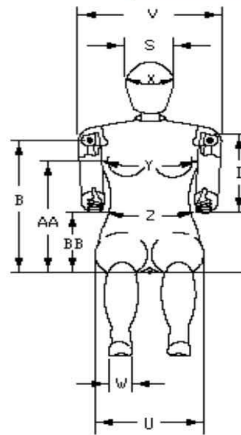


External Measurements - Hybrid 3 - 5th Female

Technician: M. Geesey

Date: 12/11/2014

Dummy Serial Number: 139



Symbol	Description	Specification (mm)		Result (mm)	Pass/Fail
A	Sitting Height	775	800	788	Pass
B	Shoulder Pivot Height	432	457	447	Pass
C	H-Point Height	81	86	84	Pass
D	H-Point from Backline	145	150	146	Pass
E	Shoulder Pivot from Backline	69	84	76	Pass
F	Thigh Clearance	119	135	124	Pass
G	Back of Elbow to Wrist Pivot	244	259	248	Pass
H	Head Back to Backline	43	48	44	Pass
I	Shoulder to Elbow Length	277	297	293	Pass
J	Elbow Rest Height	183	203	186	Pass
K	Buttock to Knee Length	521	546	542	Pass
L	Popliteal Height	356	376	361	Pass
M	Knee Pivot Height	394	419	398	Pass
N	Buttock Popliteal Length	414	439	422	Pass
O	Chest Depth without Jacket	175	191	183	Pass
P	Foot Length (right)	219	234	220	Pass
R	Buttock To Knee Pivot Length	457	483	471	Pass
S	Head Breadth	137	147	140	Pass
T	Head Depth	178	188	181	Pass
U	Hip Breadth	300	315	302	Pass
V	Shoulder Breadth	351	366	362	Pass
W	Foot Breadth	79	94	82	Pass
X	Head Circumference	528	549	536	Pass
Y	Chest Circumference with Jacket	851	881	851	Pass
Z	Waist Circumference	760	791	771	Pass
AA	Reference Location (Chest Circumference)	333	358	357	Pass
BB	Reference Location (Waist Circumference)	160	170	170	Pass



VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Head Drop	Test Date:	12/12/2014
		Test Time:	5:31:51 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.40 deg C P
Humidity	10 -- 70	23.70 %RH P
Resultant Acceleration	250 -- 300	264.5 G's P
Oscillation	0 -- 10	0.0 % P
Lateral Acceleration	-15 -- 15	-6.2 G's P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



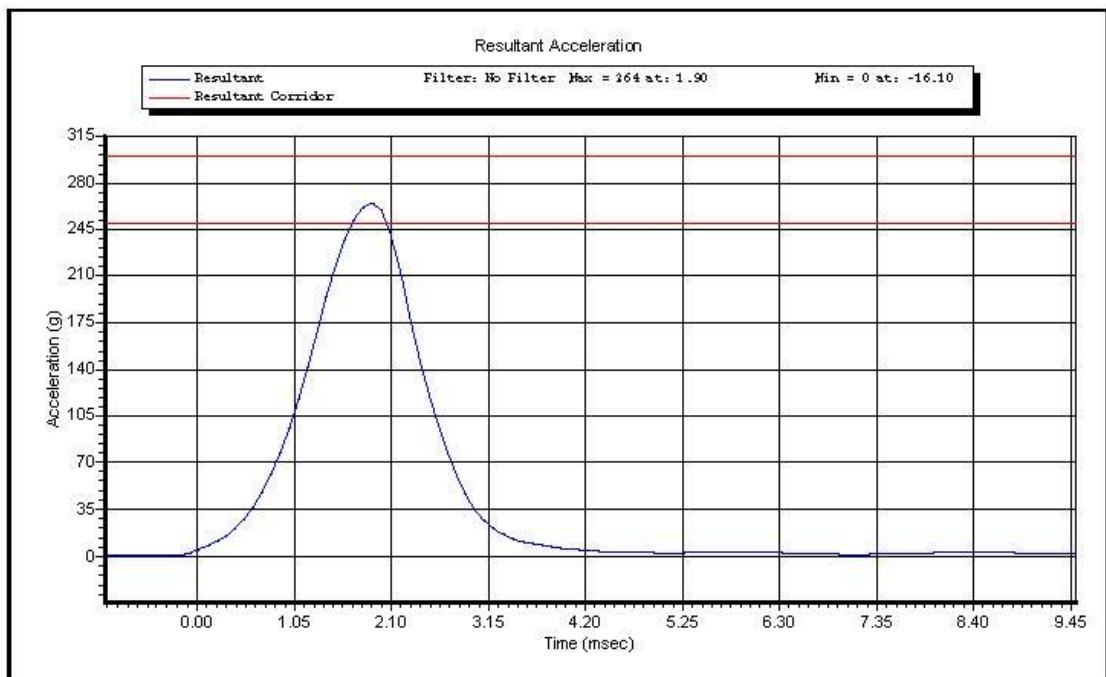
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P52054	8/26/2014
Endevco	7264-2000	P52007	8/26/2014
Endevco	7264-2000	P51298	8/26/2014



Test Name:	Head Drop
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139

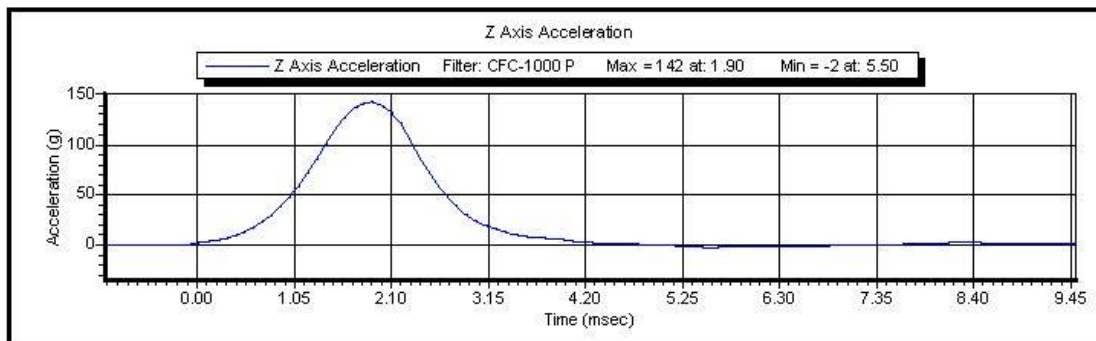
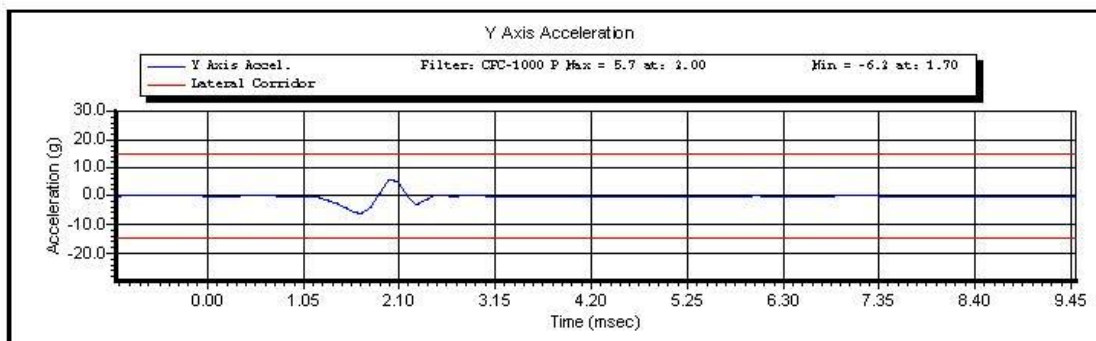
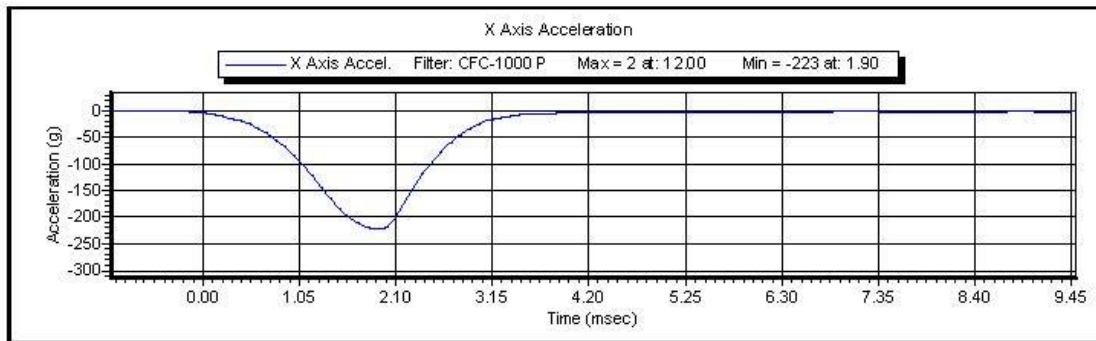


Test ID: **Head Drop**

Test Time: **5:31:51 PM**

Test Date: **12/12/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Head Drop**

Test Time: **5:31:51 PM**

Test Date: **12/12/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Neck Extension	Test Date:	12/11/2014
		Test Time:	3:36:44 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.70 deg C P
Humidity	10 -- 70	20.60 %RH P
Velocity	5.95 -- 6.19	5.997 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.76 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.55 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	5.38 m/s P
D Plane Rotation	99 -- 114	109.9 degrees P
Moment During Rotation Interval	-65 -- -53	-60.1 Nm P
Moment Decay to -10.0 Nm	94 -- 114	104.4 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



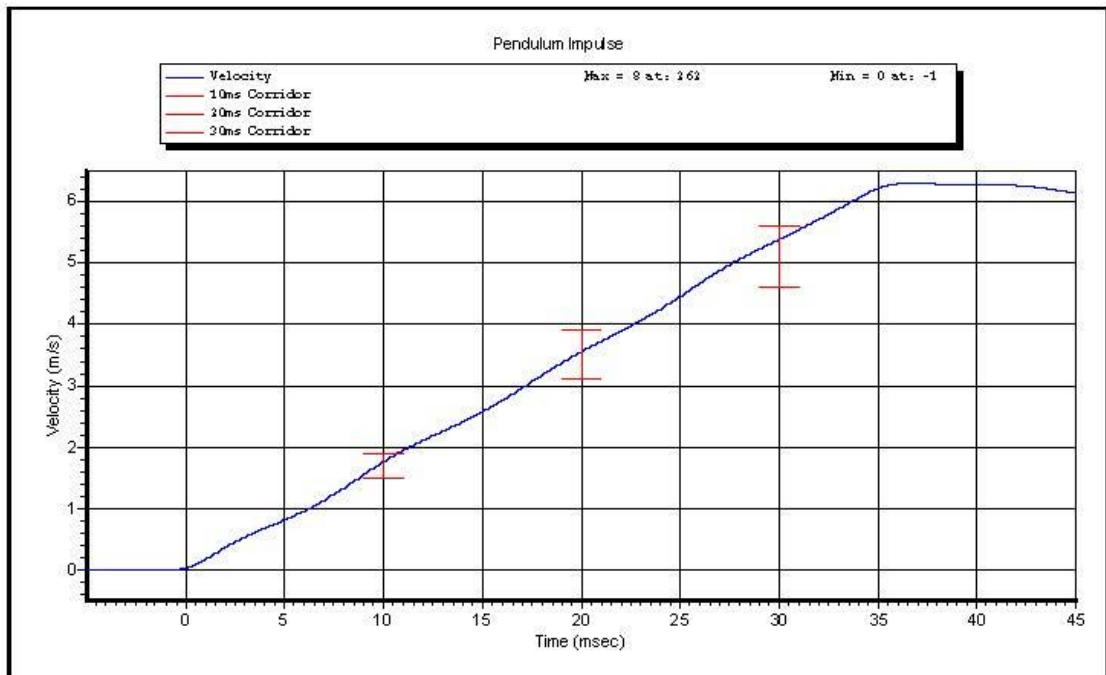
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2018My	5/1/2014
Denton	1716A	LC-2018Fx	5/1/2014



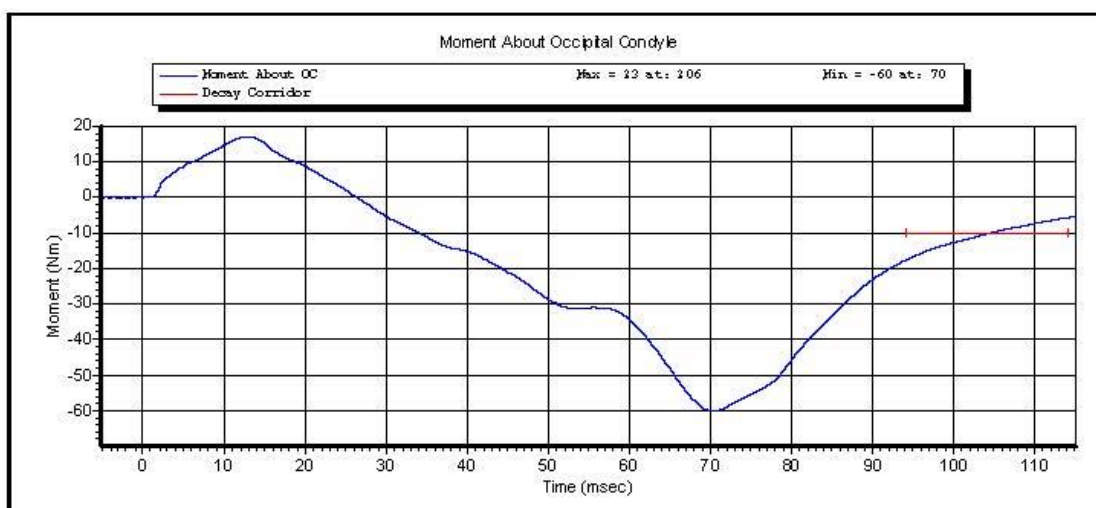
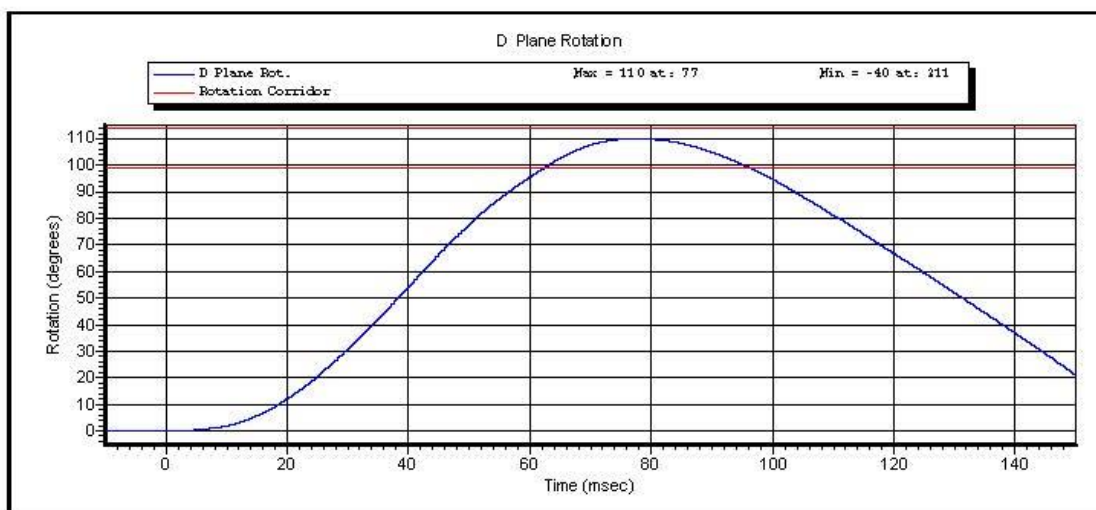
Test Name:	Neck Extension
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Neck Extension Test Time: 3:36:44 PM

Test Date: 12/11/2014

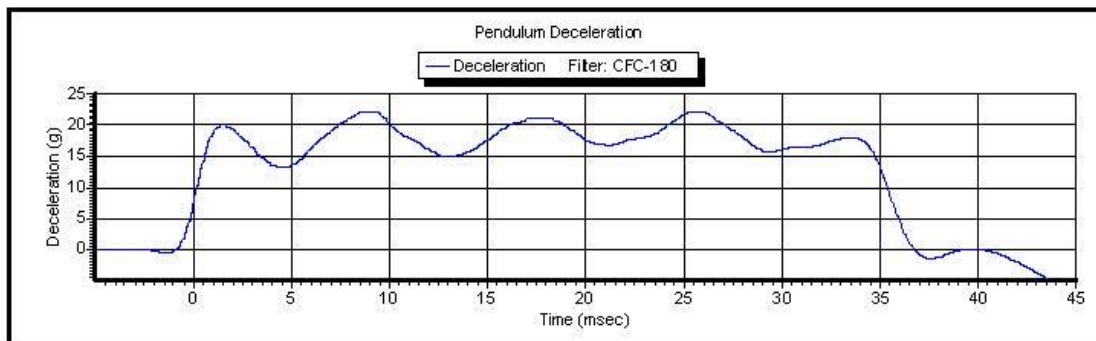
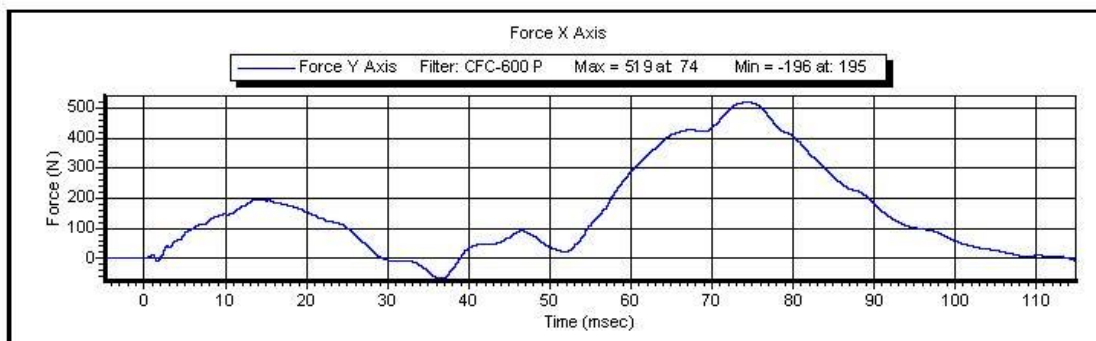
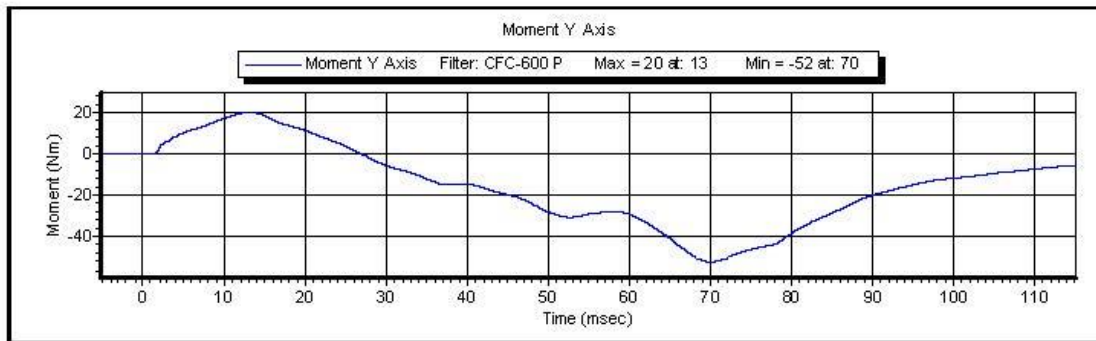
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **3:36:44 PM**

Test Date: **12/11/2014**

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Test ID: **Neck Extension** Test Time: **3:36:44 PM**

Test Date: **12/11/2014**

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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Neck Flexion	Test Date:	12/11/2014
		Test Time:	3:04:41 PM

Test Parameters	Test Specifications	Test Results
Temperature	21 -- 22	21.70 deg C P
Humidity	10 -- 70	20.40 %RH P
Velocity	6.89 -- 7.13	6.974 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.29 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.6 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	6.83 m/s P
D Plane Rotation	-91 -- -77	-80.2 degrees P
Moment During Rotation Interval	69 -- 83	69.8 Nm P
Moment Decay to 10.0 Nm	80 -- 100	86.7 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



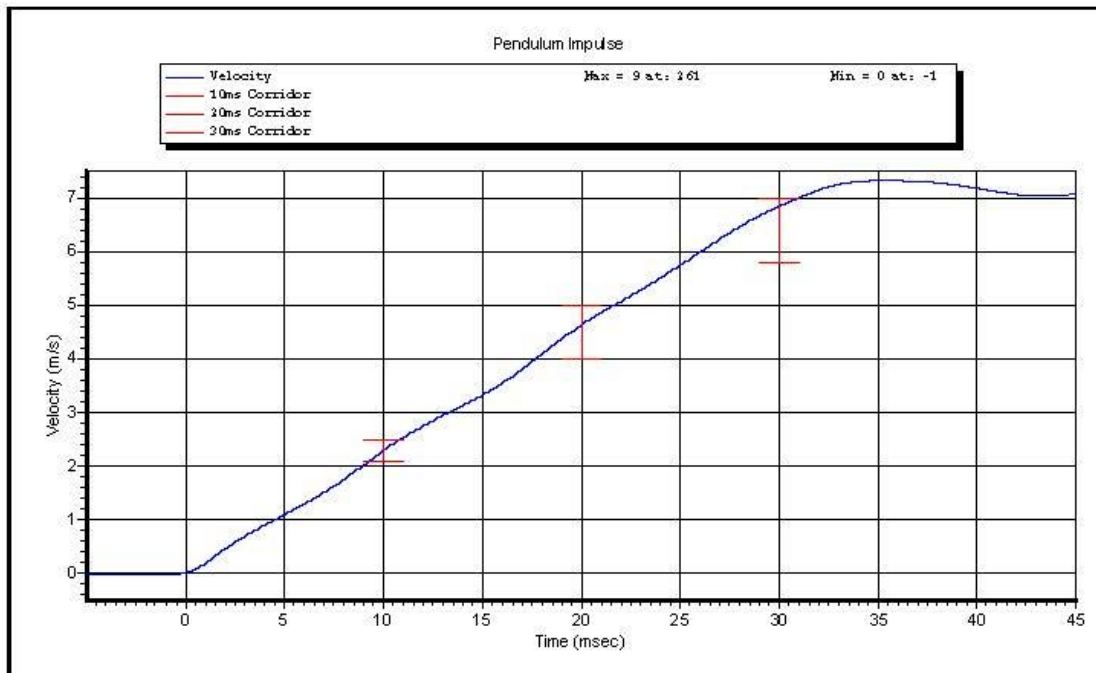
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	11/6/2014
ETI	SP22G	Pendulum Pot	9/16/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-2018My	5/1/2014
Denton	1716A	LC-2018Fx	5/1/2014



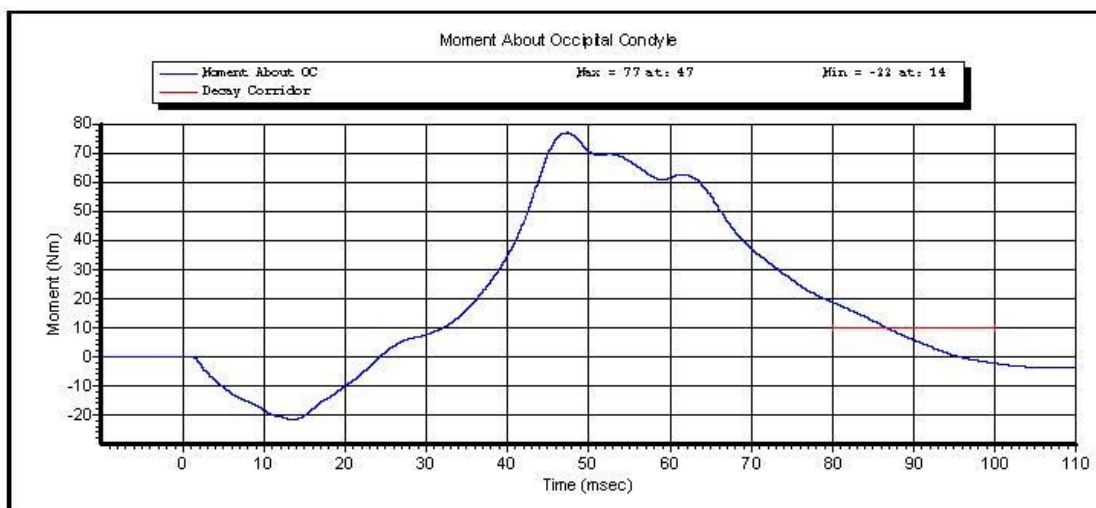
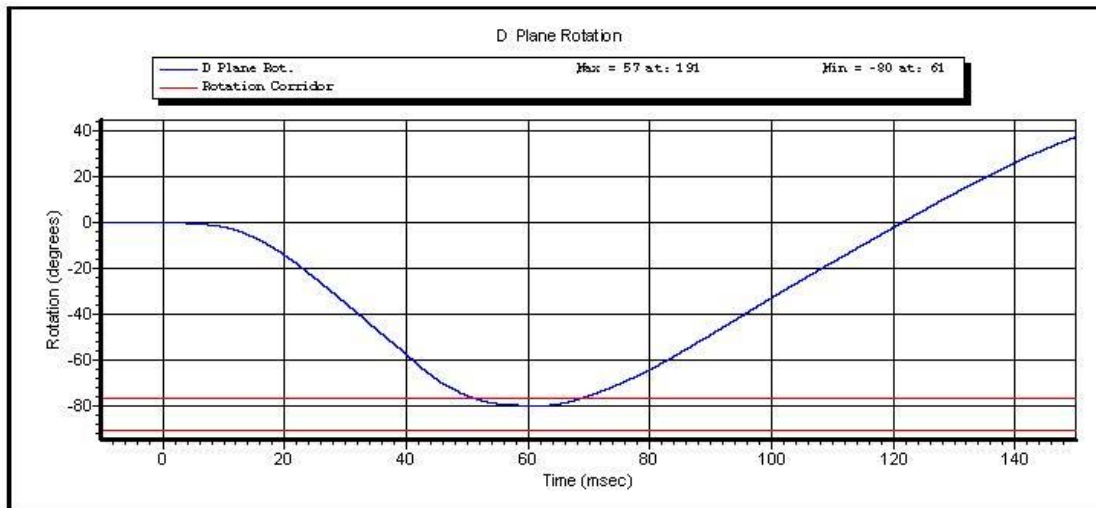
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Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Neck Flexion Test Time: 3:04:41 PM

Test Date: 12/11/2014

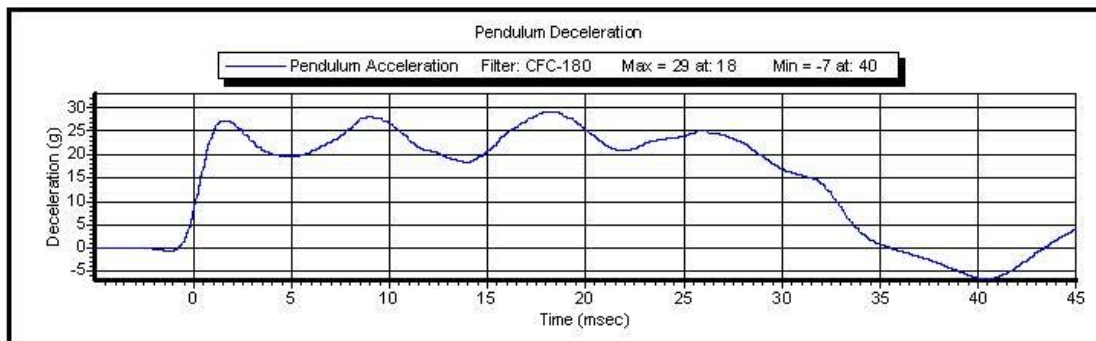
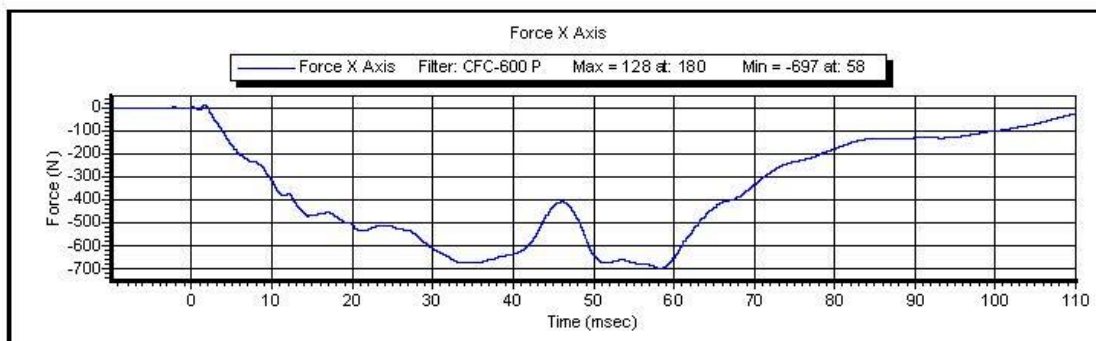
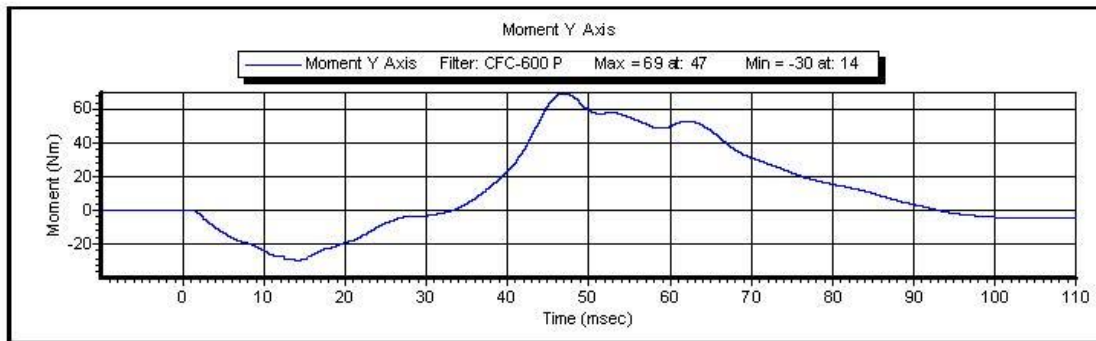
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Test ID: Neck Flexion Test Time: 3:04:41 PM

Test Date: 12/11/2014

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Test ID: **Neck Flexion** Test Time: **3:04:41 PM**

Test Date: **12/11/2014**

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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Thorax Impact	Test Date:	12/12/2014
		Test Time:	10:01:55 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.00 deg C P
Humidity	10 -- 70	22.20 %RH P
Velocity	6.59 -- 6.83	6.765 m/s P
Sternum Displacement	-58 -- -50	-56.4 mm P
Force During Displacement Interval	-4400 -- -3900	-4187.2 N P
Force During -18mm to -50mm Displacem	-4600 -- 0	-4007.8 N P
Hysteresis	69 -- 85	71.1 % P

All test parameters are within specifications

Technician: **M. Geesey**
Supervisor: **M. Goehle**



VERIFICATION REPORT

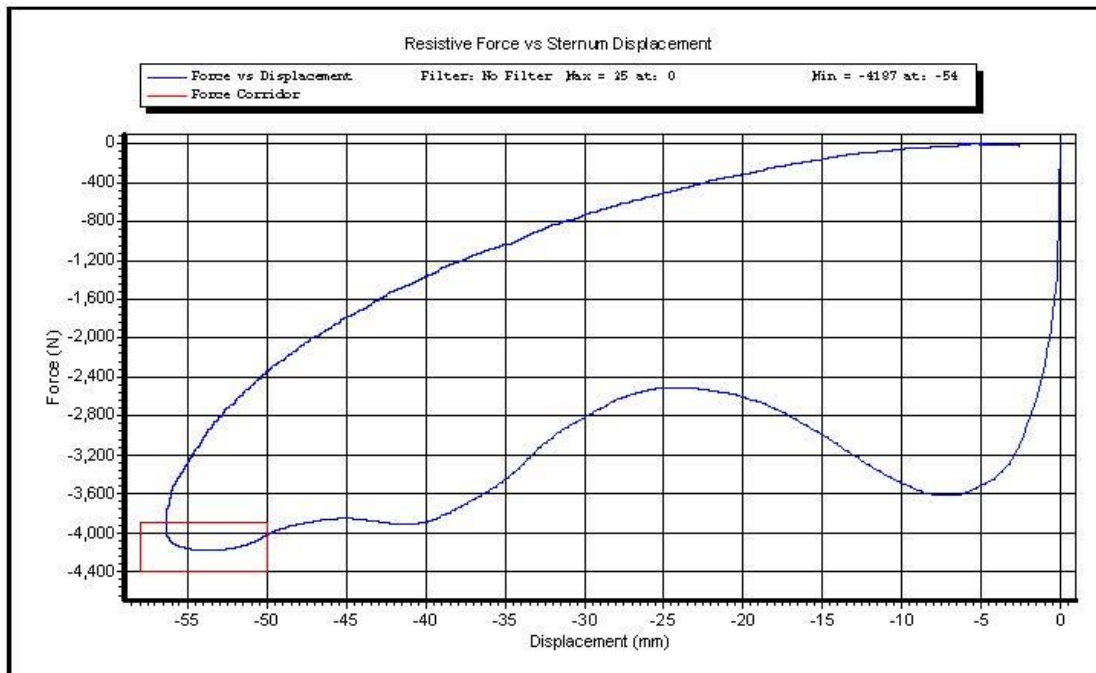
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	14 CB1-3615	DS-139	7/31/2014

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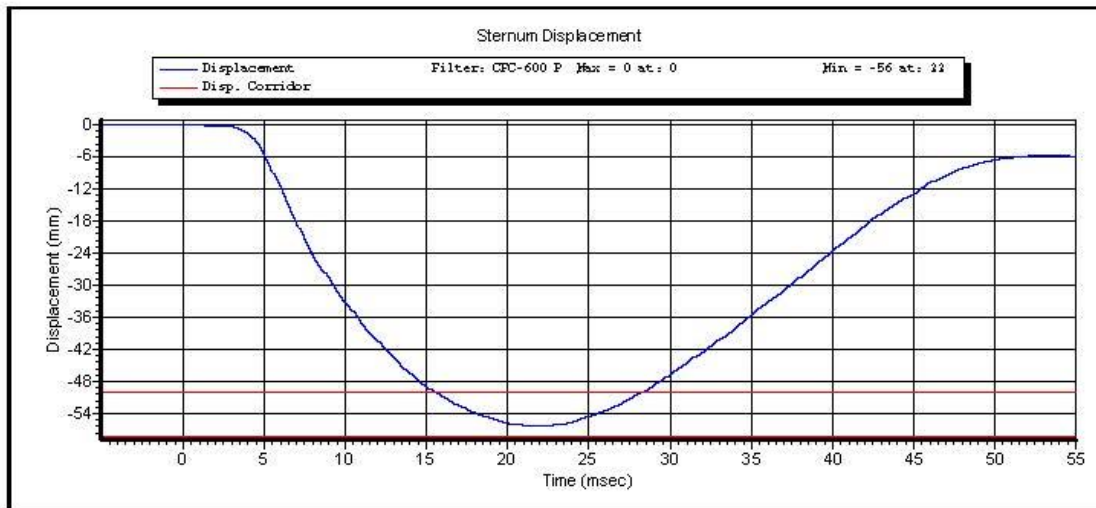
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Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Thorax Impact Test Time: 10:01:55 AM

Test Date: 12/12/2014

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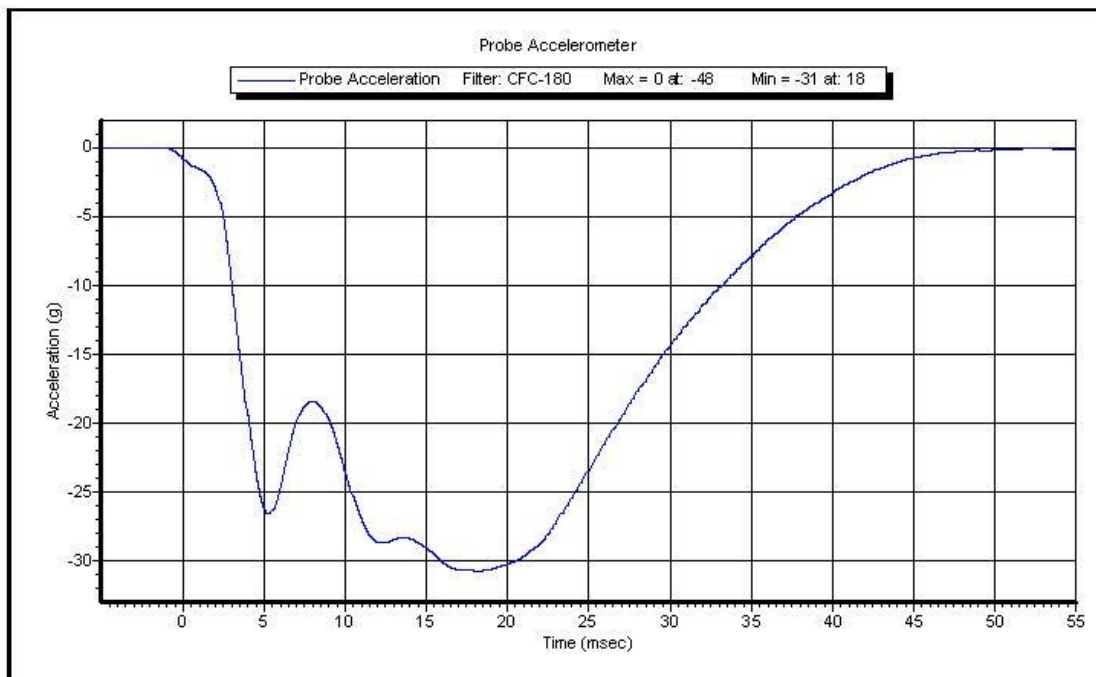


Test ID: **Thorax Impact**

Test Time: **10:01:55 AM**

Test Date: **12/12/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **10:01:55 AM**

Test Date: **12/12/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Torso Flexion

Part 572O HIII 5% Female

ATD Serial No: 139

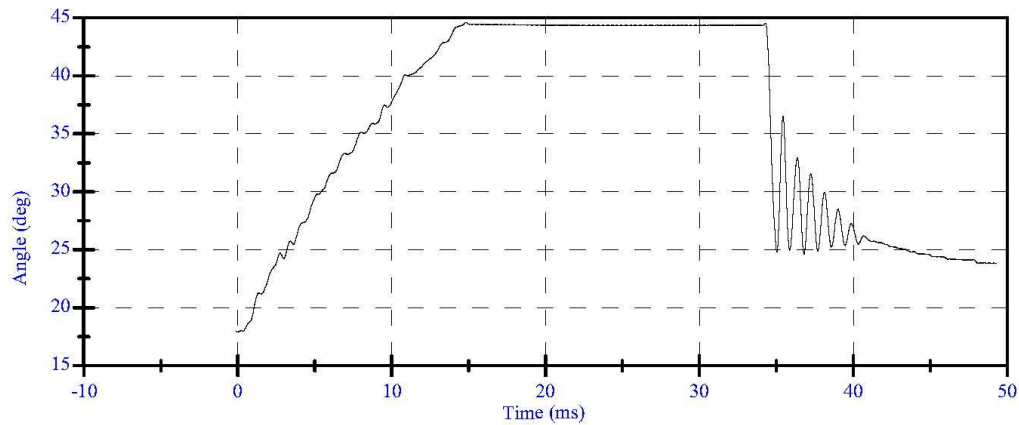
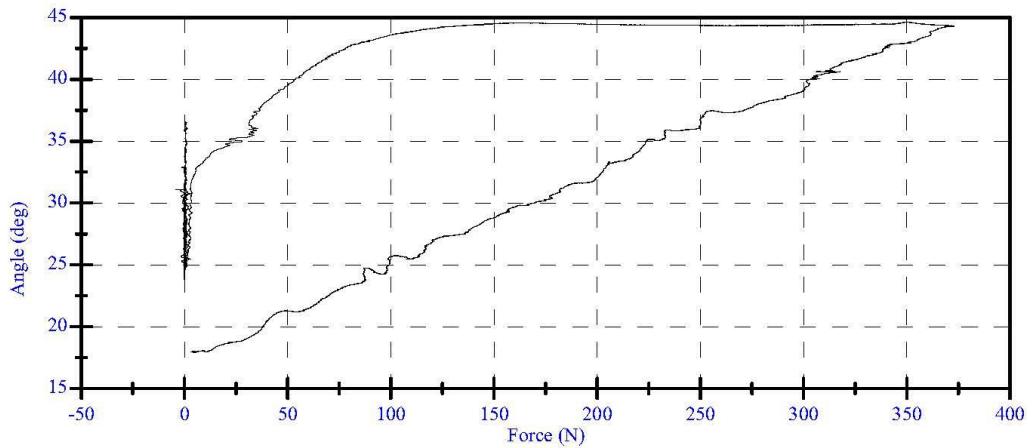
Laboratory Supervisor: M. Goehle

Date: 12/15/2014

Laboratory Technician: M. Geesey

TEST PARAMETER	SPECIFICATION	TEST RESULTS	STATUS
Lab Temperature:	18.9-25.6 C	22.1 Deg C	Passed
Lab Humidity:	10-70 %	27.9 %	Passed
Initial Angle:	0.00-20.00 Deg	16.9 Deg	Passed
Force at 45 Deg	320.00-390.00 N	373.138N	Passed
Return Angle	8 Deg Max from Initial	19.5 Deg	Passed

TORSO FLEXION TEST





VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Knee Impact Left	Test Date:	12/12/2014
		Test Time:	4:32:46 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.60 deg C P
Humidity	10 -- 70	24.70 %RH P
Velocity	2.07 -- 2.13	2.117 m/s P
Resistive Force	-4060 -- -3450	-3786.0 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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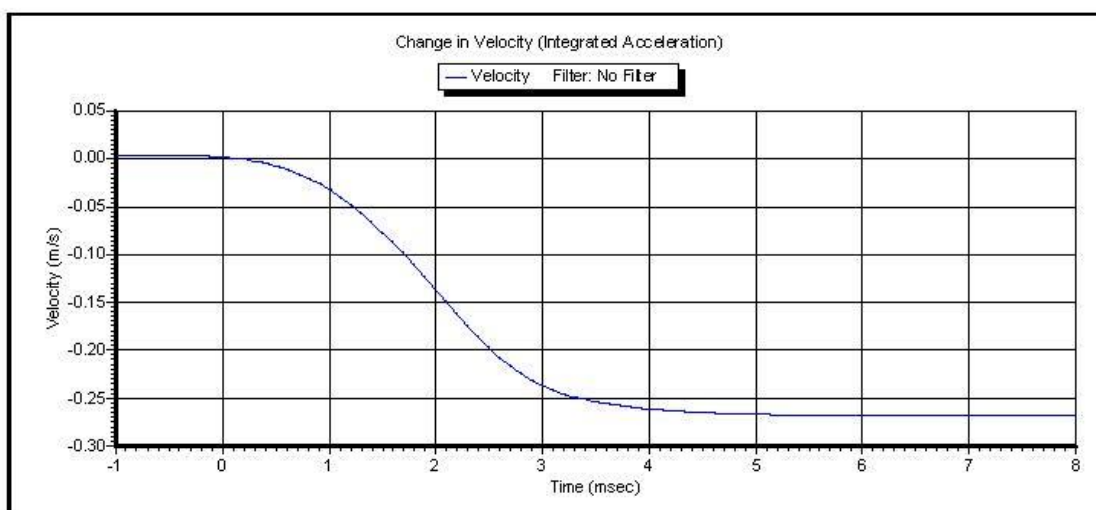
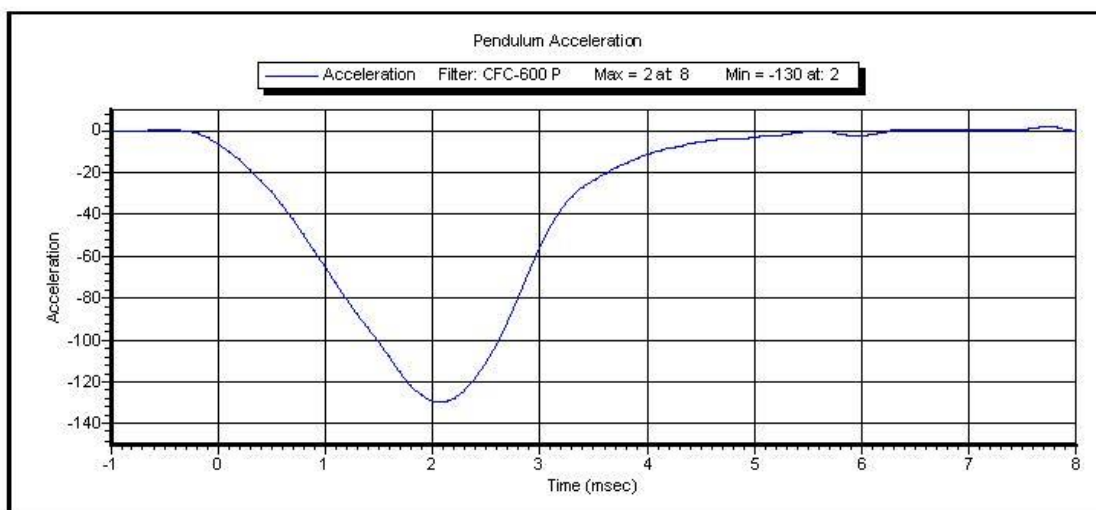


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Left** Test Time: **4:32:46 PM**
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Test Date: **12/12/2014**



Test ID: **Knee Impact Left** Test Time: **4:32:46 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/12/2014**



VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	139		
Test ID:	Knee Impact Right	Test Date:	12/12/2014
		Test Time:	4:25:43 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.60 deg C P
Humidity	10 -- 70	24.70 %RH P
Velocity	2.07 -- 2.13	2.122 m/s P
Resistive Force	-4060 -- -3450	-3939.9 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD Endevco	Velocity Trap 7231CT	1 C14953	1/11/2014 7/30/2014

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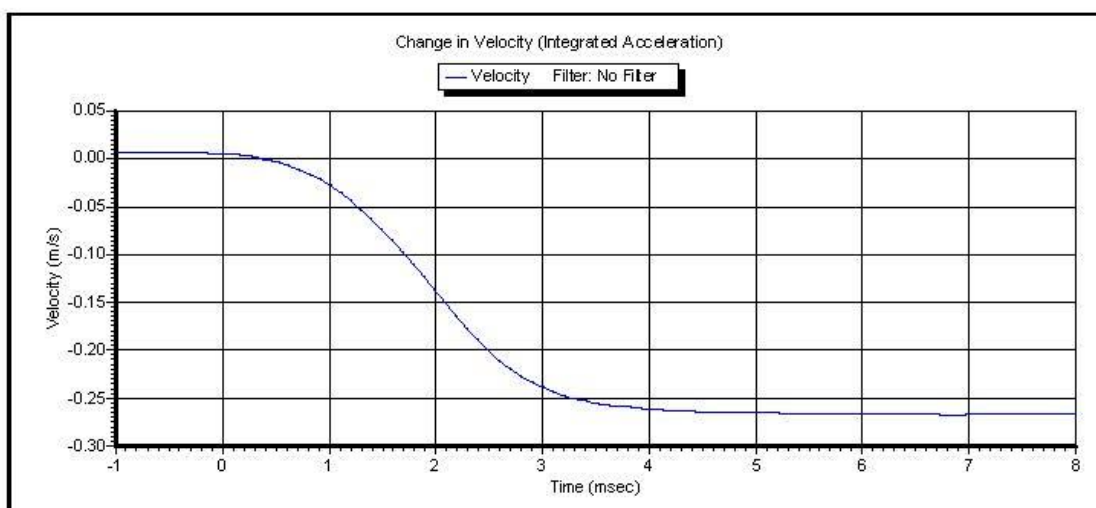
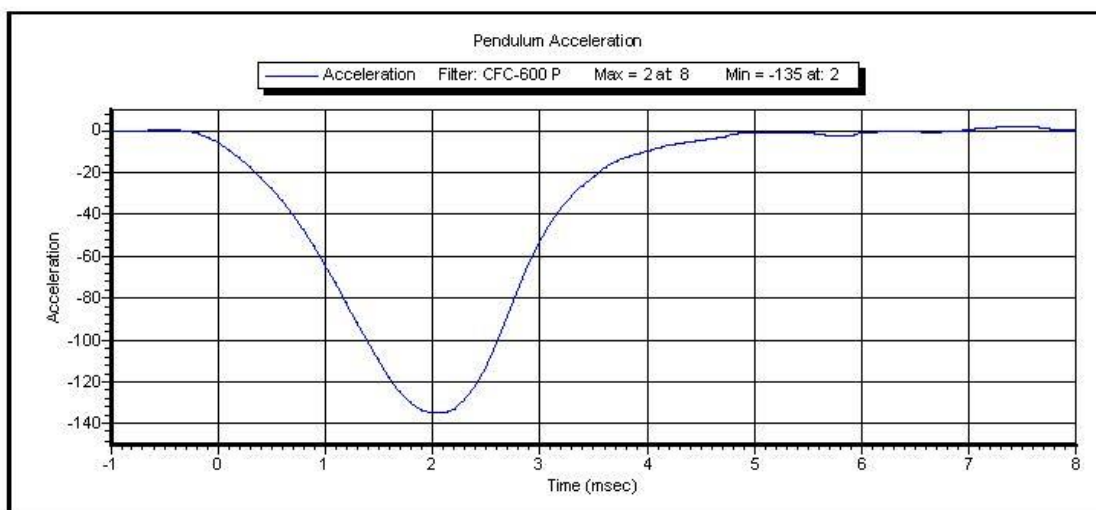


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Right** Test Time: **4:25:43 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **12/12/2014**



Test ID: **Knee Impact Right** Test Time: **4:25:43 PM**

Test Date: **12/12/2014**

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