

REPORT NUMBER: NCAP-CAL-15-001

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

**Honda De Mexico S.A. De C.V
2015 Honda Fit
Five Door Hatchback**

NHTSA No: M20155318

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



February 20, 2015

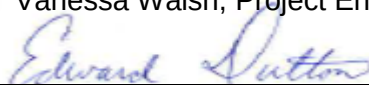
FINAL REPORT

**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:	 _____ Vanessa Walsh, Project Engineer	Date:	<u>February 20, 2015</u>
Approved by:	 _____ Edward J. Dutton, Test Engineer Director Transportation Test Operations	Date:	<u>February 20, 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 Fit five door hatchback 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 4, 2014. The impact velocity of the vehicle was 56.55 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 187 mm at C2 to the left 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>251.383</td> <td>700</td> <td>266.562</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-23.771</td> <td>52</td> <td>-14.521</td> </tr> <tr> <td>Nij</td> <td></td> <td>1</td> <td>0.278</td> <td>1</td> <td>0.299</td> </tr> <tr> <td>Neck Tension</td> <td>N</td> <td>4,170</td> <td>738.645</td> <td>2,620</td> <td>850.998</td> </tr> <tr> <td>Neck Compression</td> <td>N</td> <td>4,000</td> <td>-80.414</td> <td>2,520</td> <td>-213.727</td> </tr> <tr> <td>Left Femur Force</td> <td>N</td> <td>10,008</td> <td>-231.750</td> <td>6,805</td> <td>-1449.042</td> </tr> <tr> <td>Right Femur Force</td> <td>N</td> <td>10,008</td> <td>-241.963</td> <td>6,805</td> <td>-1667.983</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	251.383	700	266.562	Maximum Chest Compression	mm	63	-23.771	52	-14.521	Nij		1	0.278	1	0.299	Neck Tension	N	4,170	738.645	2,620	850.998	Neck Compression	N	4,000	-80.414	2,520	-213.727	Left Femur Force	N	10,008	-231.750	6,805	-1449.042	Right Femur Force	N	10,008	-241.963	6,805	-1667.983
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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 Fit five door hatchback at a velocity of 56.55 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on December 4, 2014. Pre- and post-test photographs of the vehicle and dummies to document the test can be found in Appendix A. One real-time camera and 14 high-speed cameras were used to document the frontal barrier impact event. Camera locations and other pertinent camera information can be found in Data Sheet 6 of this report.

One Part 572E, 50th percentile male anthropomorphic test device (ATD), was placed in the driver seating position and one Part 572O 5th percentile female ATD was placed in the right-front passenger seating position according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure. Both ATDs were fully instrumented with head, chest and pelvis tri-axial accelerometers, chest displacement potentiometers, upper neck transducers, right / left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's shoulder and lap belts to measure the dummy's torso and pelvic section loading. The driver (position 1) ATD (Serial No. 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 187 mm at C2 to the left 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. 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)	251.383	0.278	738.645	-80.414	43.926	-23.771	-231.750	-241.963
Passenger (5 th)	266.562	0.299	850.998	-213.727	47.304	-14.521	-1449.042	-1667.983

GENERAL COMMENTS:

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

Data Anomalies:

- None

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 Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20155318	Traction Control System (TCS)	Yes
Model Year	2015	Power Steering	Yes
Make	Honda	Power Window Auto-Reverse	No
Model	Fit	Driver Frontal Airbag	Yes
Body Style	Five Door Hatchback	Driver Curtain Airbag	Yes
VIN	3HGGK5G50FM735298	Driver Head/Torso Airbag	No
Body Color	Red	Driver Torso Airbag	No
Odometer Reading (km /mi)	46.7 km / 29 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	1.5	Driver Pelvis Airbag	No
Type / No. Cylinders	I4	Driver Knee Airbag	No
Engine Placement	Transverse	Front Pass. Frontal Airbag	Yes
Transmission Type	Manual	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6-Speed	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	No
Final Drive	Front 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 De Mexico S.A. De C.V.	GVWR (kg)	1525
Date of Manufacture	10/14	GAWR Front (kg)	803
		GAWR Rear (kg)	722

VEHICLE SEATING AND WEIGHT CAPACITY DATA

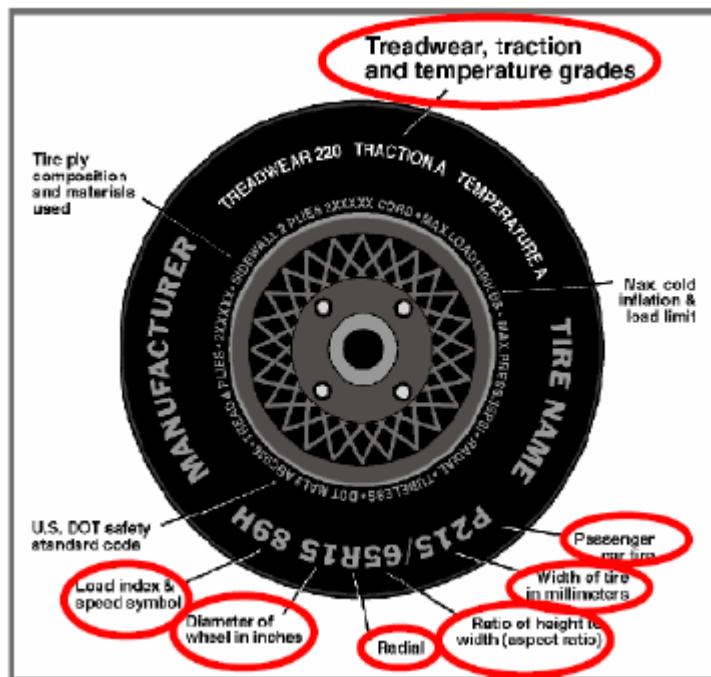
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Split Bench	Bench	-	
Number of Occupants	2	3	-	5
Capacity Wt. (VCW) (kg)				385
Cargo Wt. (RCLW) (kg)				44.8

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

Test Vehicle:	2015 Honda Fit five door hatchback
Test Program:	NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
Test Date: 12/4/2014

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)	230	230
Recommended Tire Size	P185/60R15	P185/60R15
Tire Size on Vehicle	P185/60R15	P185/60R15
Tire Manufacturer	Firestone	Firestone
Tire Model	FR740	FR740
Treadwear	400	400
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 1 Nylon	1 Polyester, 2 Steel, 1 Nylon
Load Index / Speed Symbol	84T	84T
Tire Material	Rubber	Rubber
DOT Safety Code Left	ELCACJJ1714	ELCACJJ1714
DOT Safety Code Right	ELCACJJ1714	ELCACJJ1714

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

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	366	215		383	294	
Right	kg	347	224		390	262	
Ratio	%	62%	38%		58%	42%	
Totals	kg	713	439	1152	773	556	1329

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1152	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	44.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1337.4	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	649	647	663	664	965
As Tested	mm	639	633	634	628	1059
Post-Test	mm	634	673	638	632	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2531
Total Vehicle Length at Left Side	mm	3996
Total Vehicle Length at Centerline	mm	4069
Total Vehicle Length at Right Side	mm	4000
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	20
Amount of Stoddard Solvent in Fuel Tank	L	37.2

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Trunk carpeting, tail light, spare tire and jack.

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

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	4069
2	Total Width	1696
3*	Bumper Top Height	536
4*	Bumper Bottom Height	422
5*	Longitudinal Member Top Height	521
6	Distance Between Longitudinal Members	1027
7	Longitudinal Member Width	60
8*	Engine Top Height	871
9*	Engine Bottom Height	198
10	Engine and Gearbox Width	730
11	Front Bumper-Engine Distance	426
12*	Front Shock Absorber Fixing Height	878
13*	Bonnet Leading Edge Height	749
14	Front Shock Absorber Fixing Width	1116
15	Front Bumper – Front Axle Distance	809
16	Front Axle – A Pillar Distance	175
17	A-Pillar – B-Pillar Distance	1340
18	B-Pillar – Rear Axle Distance	1018
19	B-Pillar – C-Pillar Distance	899
20*	Roof Sill Bottom Height	1412
21*	Roof Sill Top Height	1441
22*	Floor Sill Bottom Height	331
23*	Floor Sill Top Height	358

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

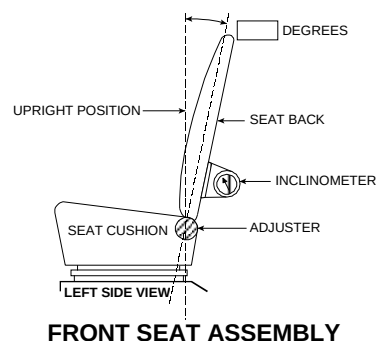
DATA SHEET NO. 2 SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2015 Honda Fit five door hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
Test Date: 12/4/2014

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	0.9
Passenger Seat Back Angle	-1.0

SEAT FORE / AFT POSITIONS

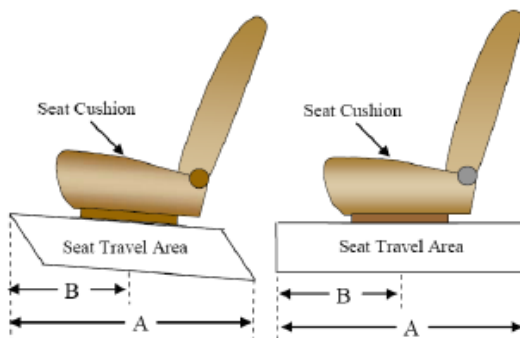
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	35 (0-34)	15
Passenger Seat	35 (0-34)	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 Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

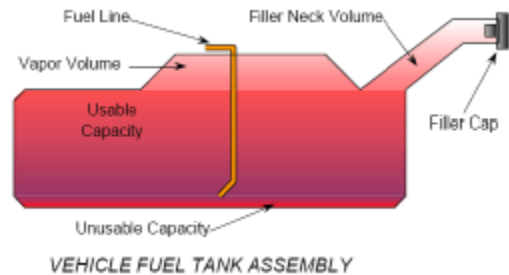
NHTSA No.: M20155318
 Test Date: 12/4/2014

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	40
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	36.8 – 37.6
Actual Amount of Solvent Used	37.2
1/3 of Usable Capacity	13.3

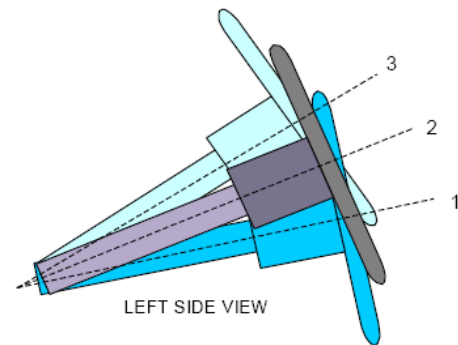
FUEL PUMP

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.



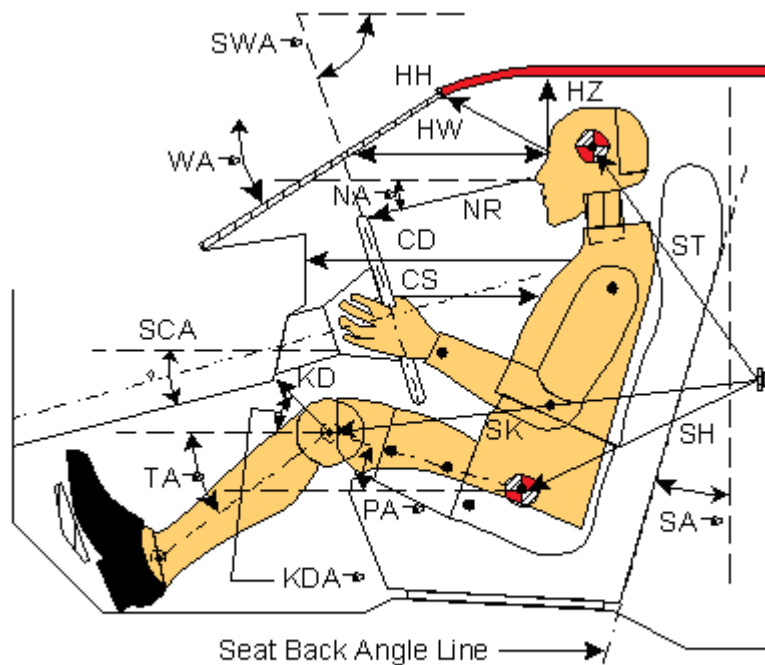
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	24.9	
Geometric center position No. 2	27.4	
Uppermost position No. 3	29.9	
Telescoping Steering Wheel Travel		40
Test Position	27.4	20

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014



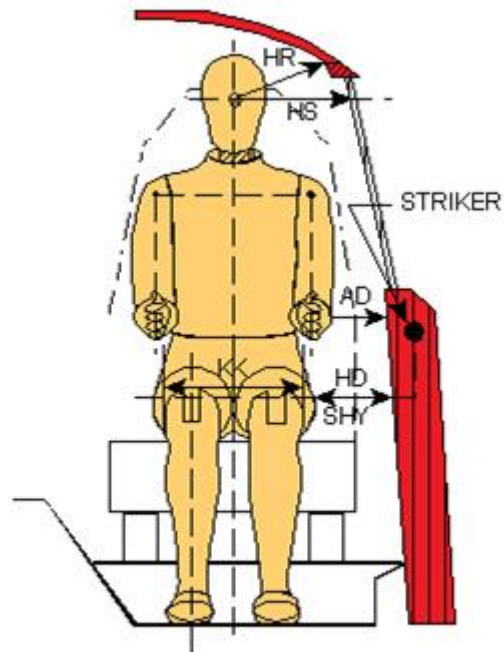
Left Side View

Code	Measurement Description	Driver (SN: 1046)		Passenger (SN: 139)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		26.3		
SWA°	Steering Wheel Angle		27.5		
SCA°	Steering Column Angle		62.5		
SA°	Seat Back Angle (on headrest post)		0.7		-1.0
HZ	Head to Roof (Z)	227	90	251	90
HH	Head to Header	356	30.7	297	51.8
HW	Head to Windshield	732	0	707	0
NR	Nose to Rim	399	8.9	427	-30.9
CD	Chest to Dash	541		366	
CS	Chest to Steering Hub	302	-1.9		
RA	Rim to Abdomen	173	0		
KDL	Left Knee to Dash	128	11.8	74	34.6
KDR	Right Knee to Dash	126	36.3	79	37.6
PA°	Pelvic Angle		23.7		20.6
TA°	Tibia Angle		-39.8		45.2
SK	Striker to Knee	603	0.2	698	-2.2
ST	Striker to Head	545	-77.6	559	60.1
SH	Striker to H-Point	272	-33.6	387	-15.1

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014



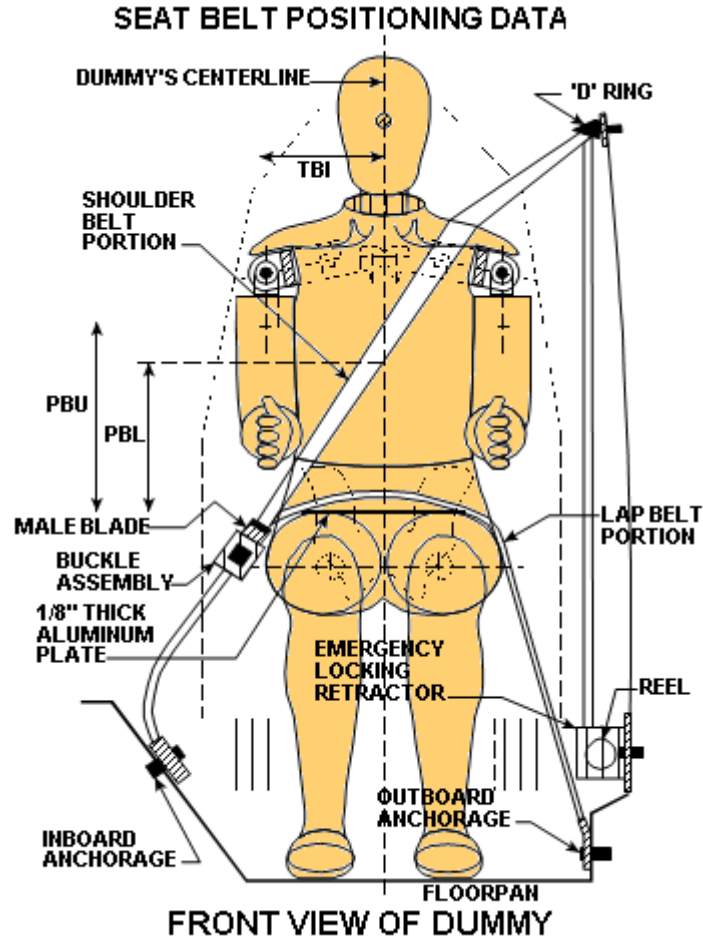
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	122	86
HD	H-Point to Door	147	173
HR	Head to Side Header	225	255
HS	Head to Side Window	343	358
KK	Knee to Knee	334	165
SHY	Striker to H-Point (Y Direction)	235	260
AA	Ankle to Ankle	368	168

DATA SHEET NO. 5 SEAT BELT POSITIONING DATA

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	355	300
PBL — Top surface of reference to belt lower edge	mm	290	230

BELT LENGTH DATA

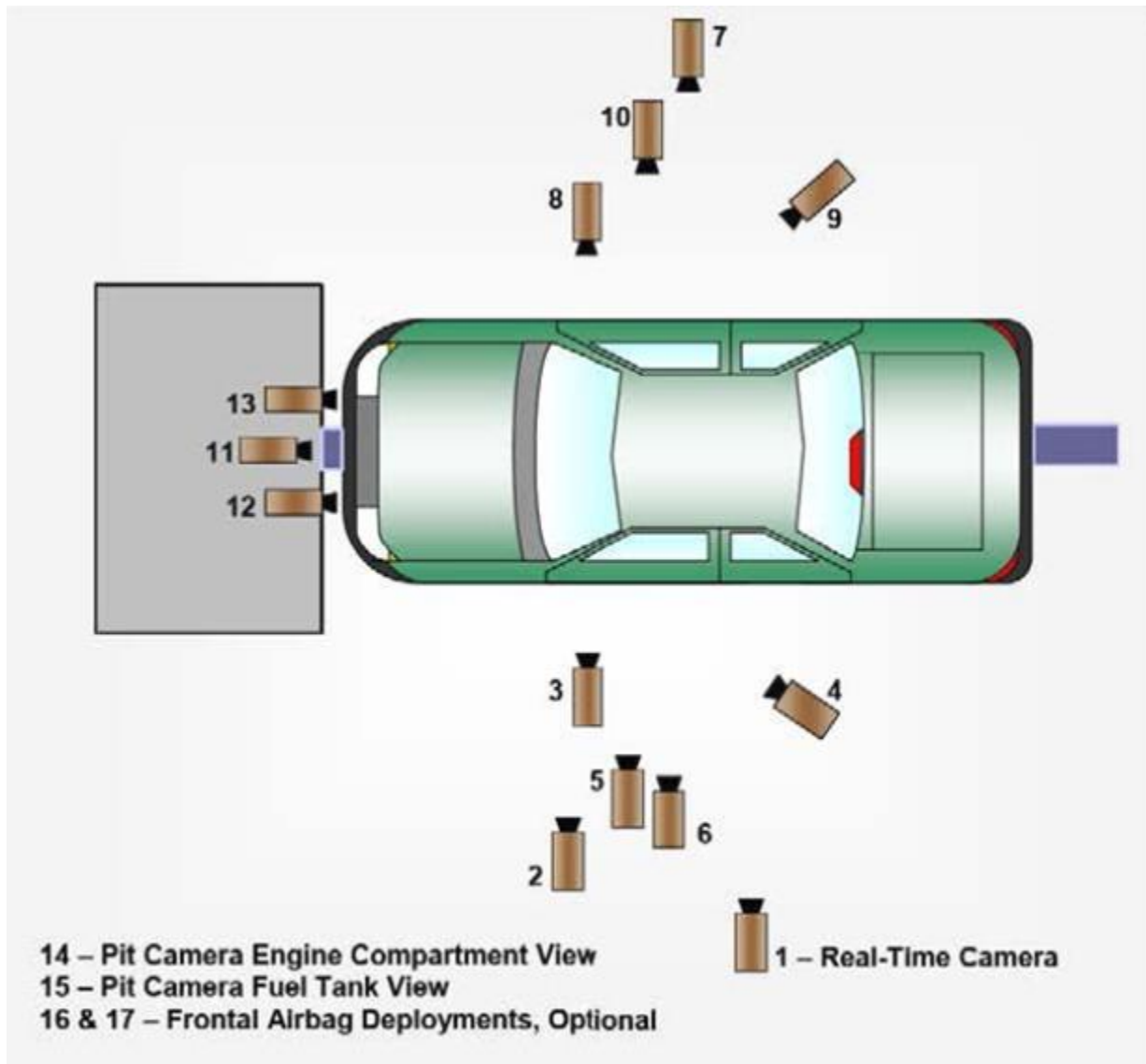
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	855	930
Lap Belt Length as measured on ATD	mm	660	455
Remainder of belt on reel	mm	835	965
Total belt length for continuous webbing systems	mm	2350	2350

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

Test Vehicle: 2015 Honda Fit five door hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
Test Date: 12/4/2014

CAMERA POSITIONS FOR FRONTAL IMPACTS



Top View

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

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

CAMERA LOCATIONS

No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-	-	-		60
2	Driver Close-Up	1483	-8084	1481	50	1000
3	Left Front Half	926	-9121	1526	50	1000
4	Left Angle	2793	-3108	2348	28	1000
5	Steering Column – Top*					
6	Steering Column – Bottom*					
7	Right Overall	1655	8121	1160	24	1000
8	Passenger Close-Up	1306	7855	1157	50	1000
9	Right Front Half	812	5745	1198	28	1000
10	Right Angle	2887	3069	2312	28	1000
11	Windshield	954	0	3506	20	1000
12	Driver Windshield	395	-600	2051	25	1000
13	Passenger Windshield	395	600	2051	25	1000
14	Pit Front	406	0	2282	24	1000
15	Pit Rear	1813	0	2206	24	1000
16	Onboard Driver Airbag				12.5	1000
17	Onboard Passenger Airbag				12.5	1000

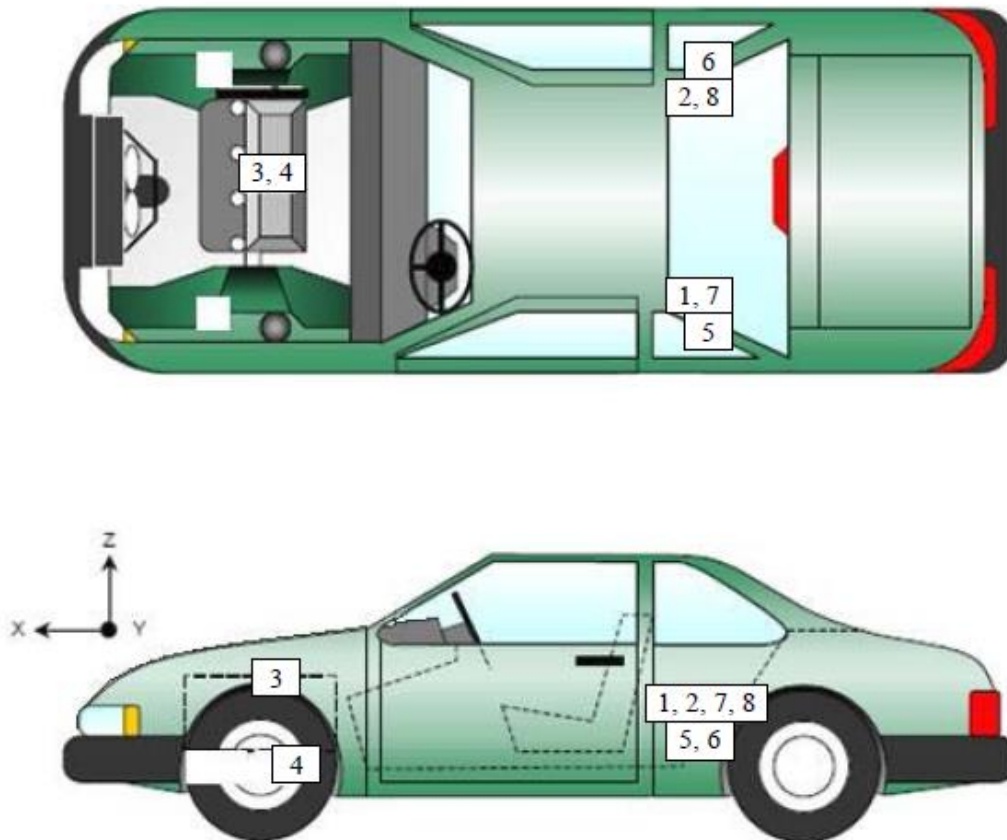
*Omitted Cameras 5 & 6 to capture camera views 16 & 17

* 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 Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	1210	-412	247
2	Right Rear Accelerometer – X Direction	1211	394	239
3	Engine Top X	3314	59	-265
4	Engine Bottom X	3746	146	309
5	Left Rear Accelerometer – Z Direction	1210	-412	247
6	Right Rear Accelerometer – Z Direction	1211	394	239
7	Left Rear Accelerometer – X Direction Redundant	1210	-412	247
8	Right Rear Accelerometer – X Direction Redundant	1211	394	239

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

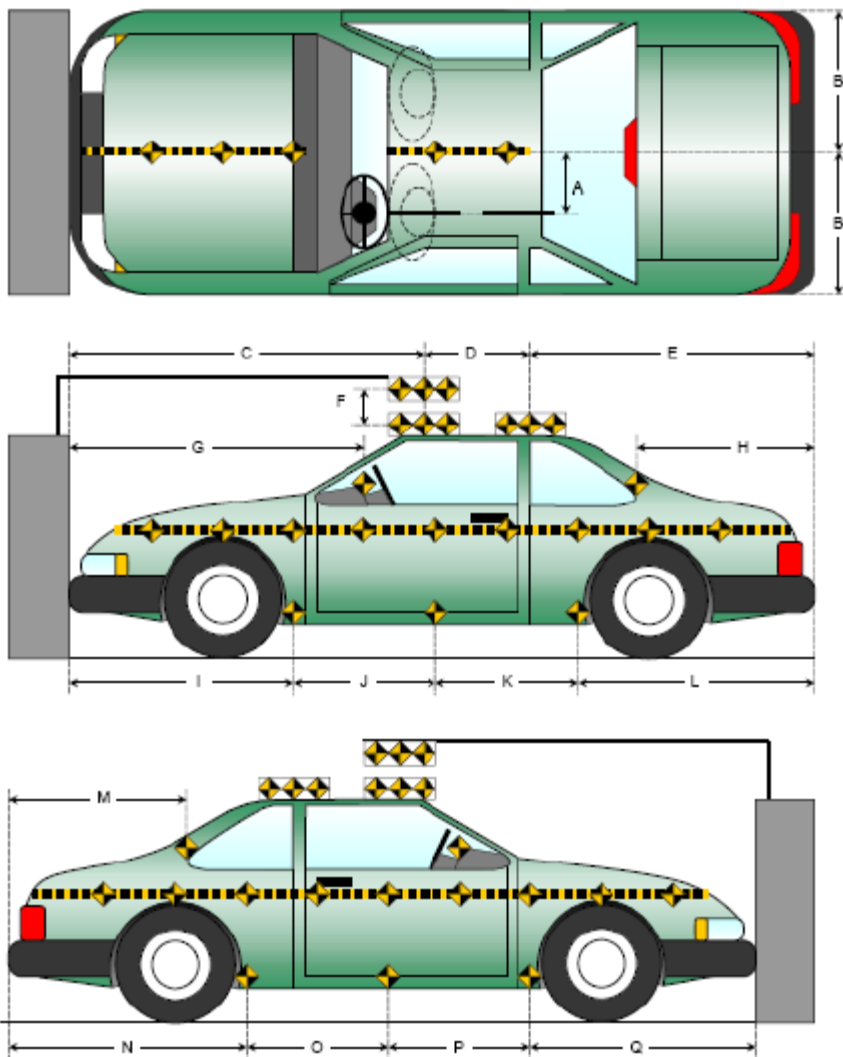
DATA SHEET NO. 8 **PHOTOGRAPHIC REFERENCE TARGET LOCATIONS**

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

Item	Value
A	341
B	848
C	1908
D	425
E	1735
F	149
G	1526
H	847
I	1235
J	850
K	845
L	1139
M	855
N	1141
O	848
P	848
Q	1232

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

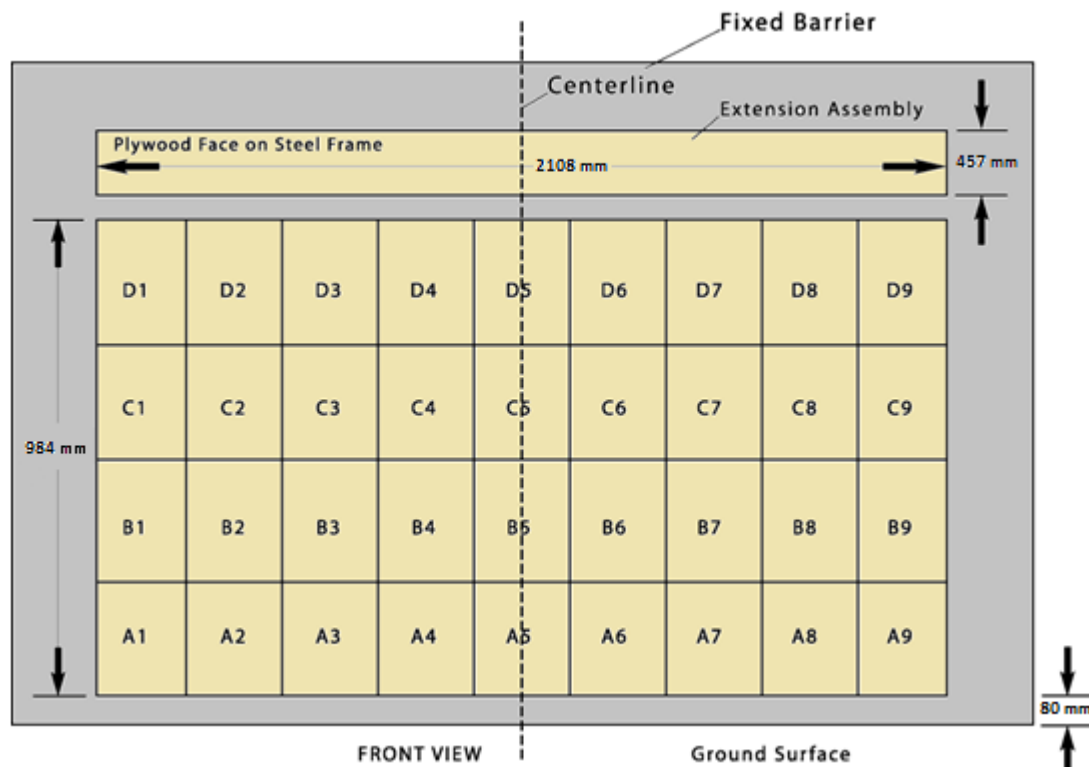


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension*

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

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

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 Fit five door hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
Test Date: 12/4/2014

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	Frontal Airbag & Headrest	Frontal Airbag & Headrest
Upper Torso Contact	Frontal Airbag	Frontal 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)	7	0
Seat Back Failure	No	No
Glazing Damage	None	None

POST-TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	One small crack along driver's side
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	848
Center	mm	818
Right Side	mm	822
Average	mm	829

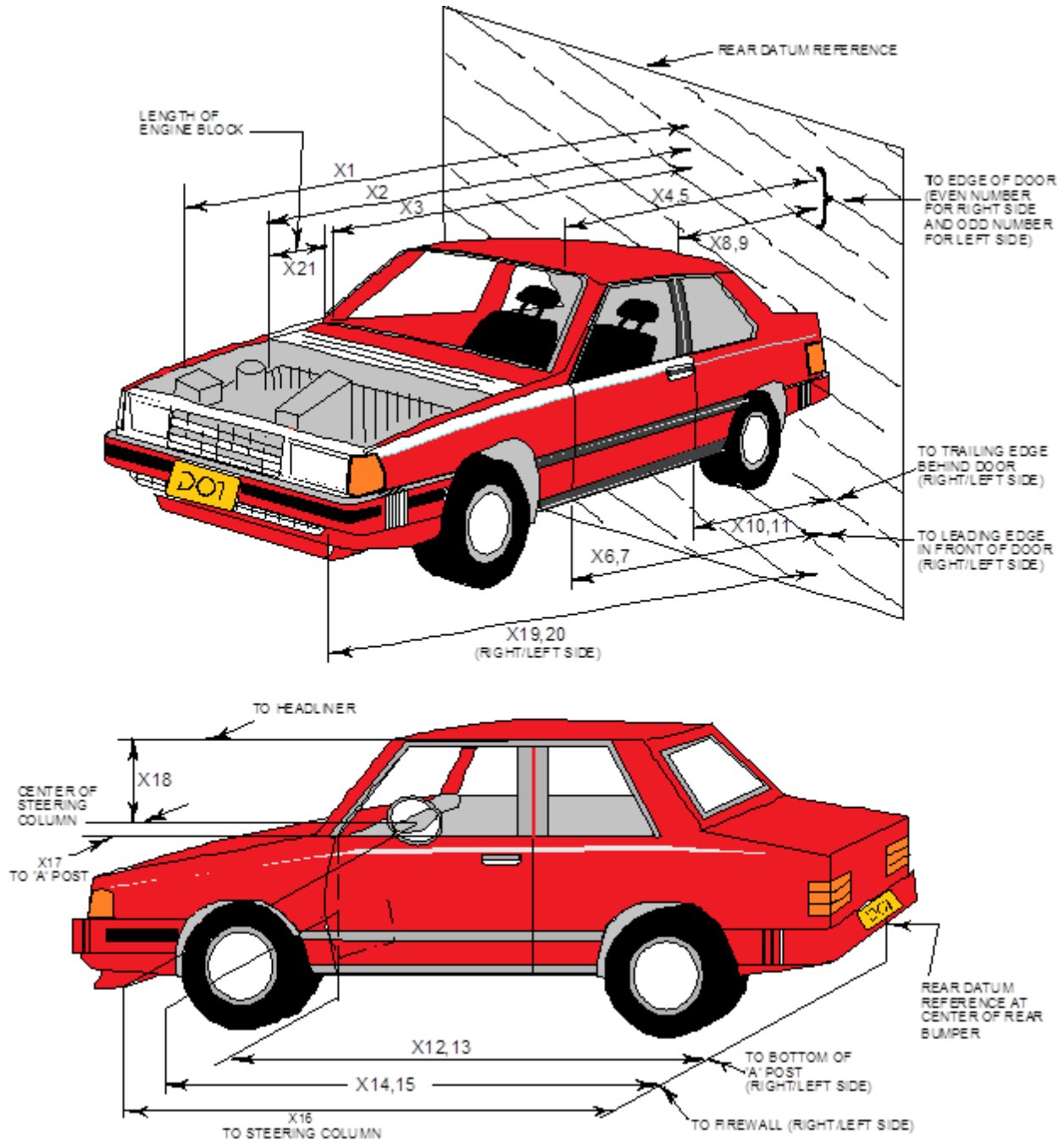
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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 Fit five door hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
Test Date: 12/4/2014



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

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4069	3899	-170
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3643	3381	-262
3	RSOV to Firewall	3059	3058	0
4	RSOV to Upper Leading Edge of Right Door	2797	2793	-4
5	RSOV to Upper Leading Edge of Left Door	2797	2796	-1
6	RSOV to Lower Leading Edge of Right Door	2794	2791	-3
7	RSOV to Lower Leading Edge of Left Door	2796	2793	-3
8	RSOV to Upper Trailing Edge of Right Door	1751	1750	-1
9	RSOV to Upper Trailing Edge of Left Door	1750	1750	0
10	RSOV to Lower Trailing Edge of Right Door	1766	1764	-2
11	RSOV to Lower Trailing Edge of Left Door	1766	1766	0
12	RSOV to Bottom of "A" Post of Right Side	3185	3151	-33
13	RSOV to Bottom of "A" Post of Left Side	3184	3168	-16
14	RSOV to Firewall, Right Side	3196	3186	-10
15	RSOV to Firewall, Left Side	3185	3180	-5
16	RSOV to Steering Column	2382	2406	24
17	Center of Steering Column to "A" Post	288	287	-2
18	Center of Steering Column to Headliner	443	425	-18
19	RSOV to Right Side of Front Bumper	4030	3836	-194
20	RSOV to Left Side of Front Bumper	4029	3850	-179
21	Length of Engine Block	338	338	0
RD	RSOV to Right Side of Dash Panel	2534	2538	4
CD	RSOV to Center of Dash Panel	2567	2575	8
LD	RSOV to Left Side of Dash Panel	2559	2561	3

*UR= Unrecoverable data point
 All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2015 Honda Fit five door hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
Test Date: 12/4/2014

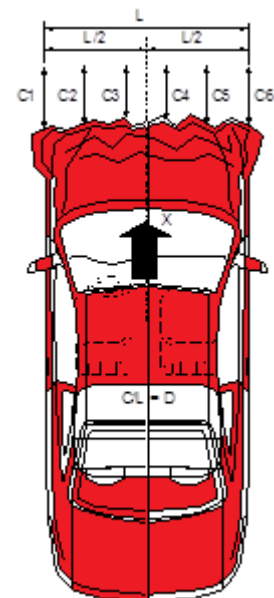
VEHICLE INFORMATION

VIN: 3HGGK5G50FM735298
Vehicle Size Category: Passenger

Wheelbase (mm): 2531
Test Weight (kg): 1,329

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): 56.55
Velocity Change (km/h): 56.55
Time of Separation (ms): 117



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1028
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4022	3850	172
C2	Crush Zone 2 at Left Side	mm	4056	3869	187
C3	Crush Zone 3 at Left Side	mm	4068	3892	176
C4	Crush Zone 4 at Right Side	mm	4069	3896	173
C5	Crush Zone 5 at Right Side	mm	4057	3885	172
C6	Crush Zone 6 at Right Side	mm	4023	3853	170
L	C1 to C6	mm	1028	1023	5

DATA SHEET NO. 14
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2015 Honda Fit five door hatchback
Test Program: NCAP Frontal Barrier Impact Test

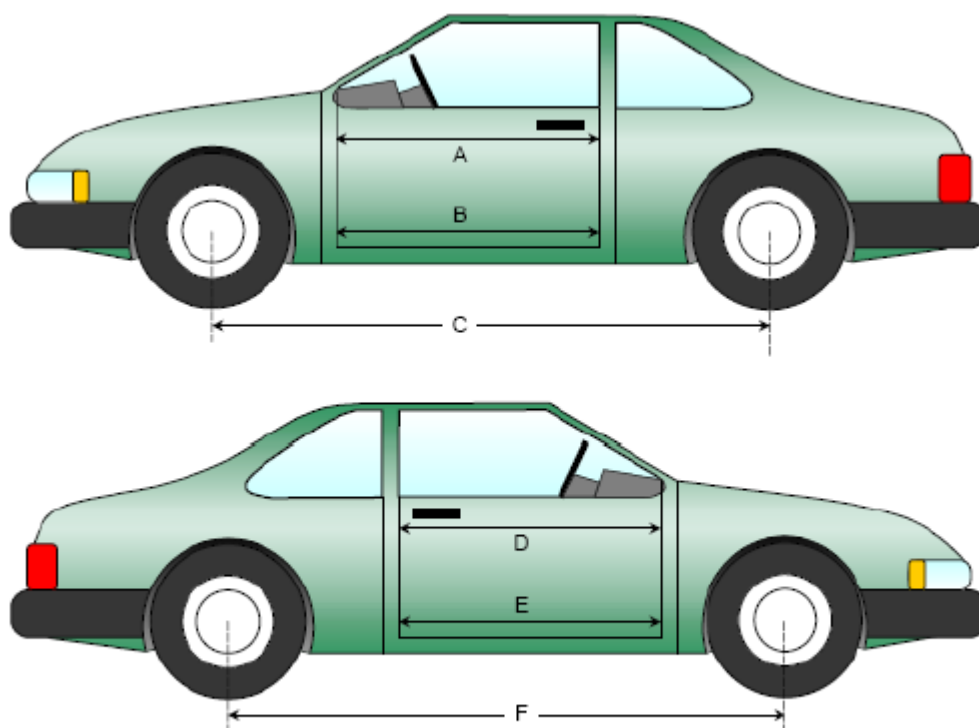
NHTSA No.: M20155318
Test Date: 12/4/2014

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	895	896	1
B	Left Side Lower	mm	863	863	0
D	Right Side Upper	mm	884	884	0
E	Right Side Lower	mm	866	867	1

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2531	2414	-117
F	Right Side Wheelbase	mm	2531	2408	-123



Left & Right Side Views

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

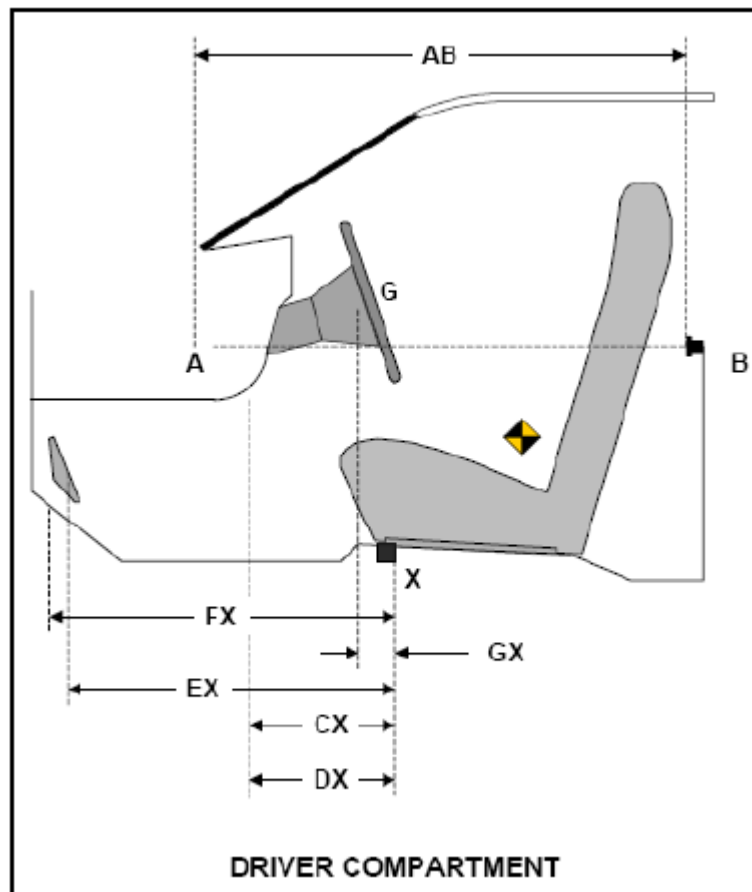
Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	776	775	-1
CX	Left Knee Bolster to X	mm	222	219	-3
DX	Right Knee Bolster to X	mm	228	228	0
EX	Brake Pedal to X	mm	482	473	-9
FX	Foot Rest to X	mm	529	498	-31
GX	Center of Steering Column Wheel Hub to X	mm	10	32	22

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2015 Honda Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014

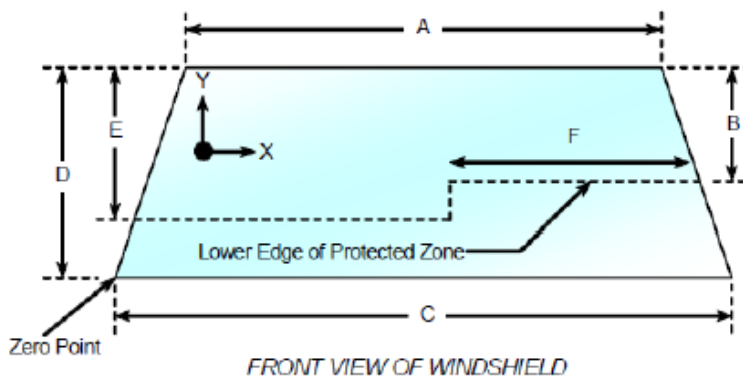
Windshield Mounting Details: A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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	2152	2152	100%
Right Side	2152	2152	100%
Total	4304	4304	100%



Item	Units	Value
A	mm	1074
B	mm	515
C	mm	1340
D	mm	945
E	mm	607
F	mm	755

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 Fit five door hatchback
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
Test Date: 12/4/2014

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21 ° C

Test Time: 1:05 PM

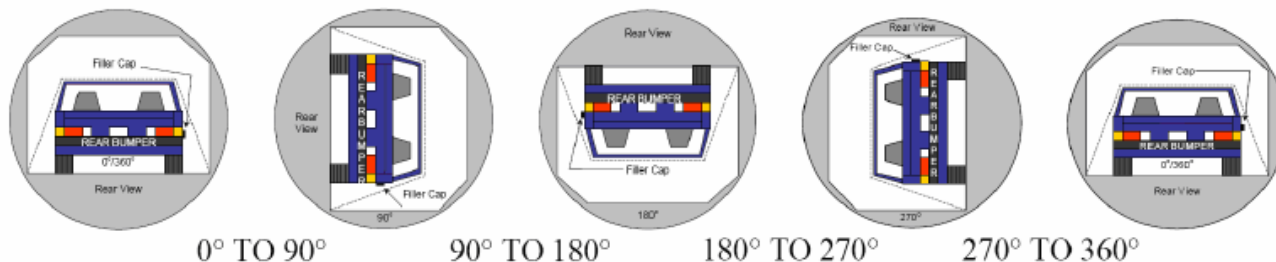
STODDARD SOLVENT SPILLAGE MEASUREMENTS

- 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 Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014



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°	74	300	374
90° to 180°	62	300	362
180° to 270°	61	300	361
270° to 360°	70	300	370

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	

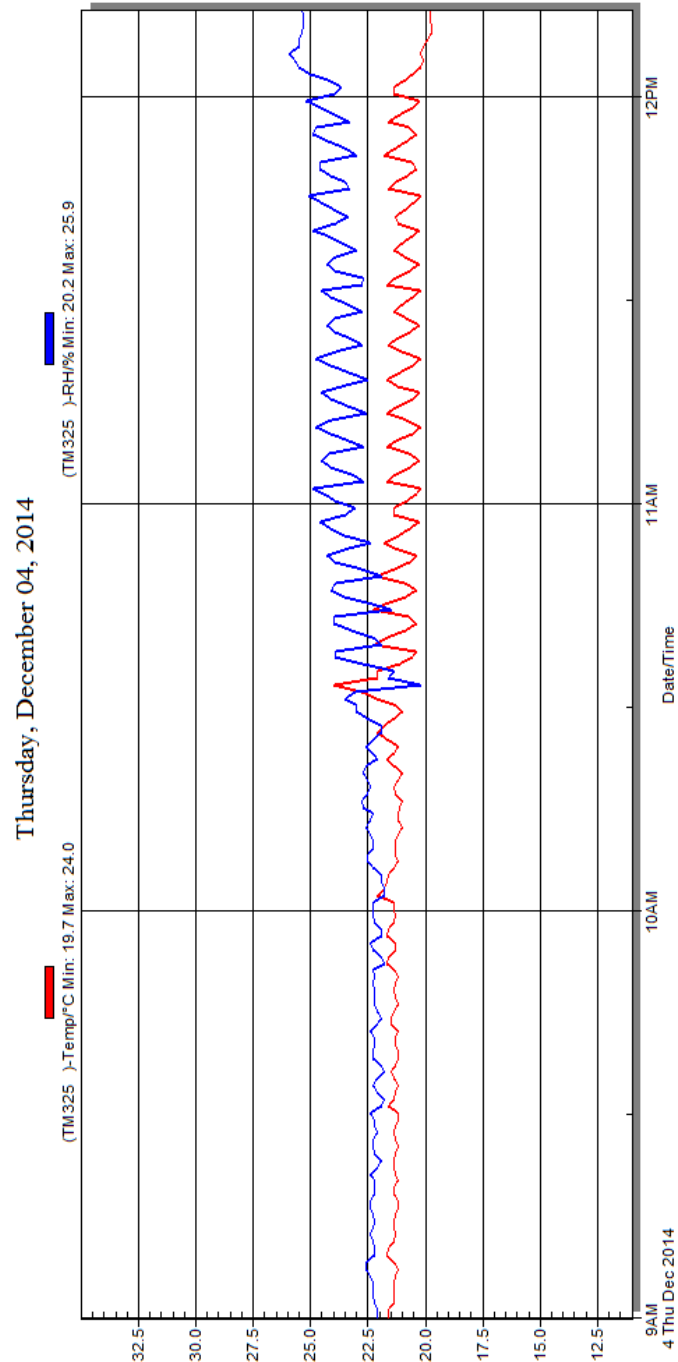
SOLVENT SPILLAGE LOCATION TABLE

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 Fit five door hatchback
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20155318
 Test Date: 12/4/2014



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

APPENDIX A
PHOTOGRAPHS

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60	Pre-Test Passenger Dummy Feet	A-34
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Fig.	Description	Page
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74	Vehicle at 180° on Static Rollover Device	A-41
75	Vehicle at 270° on Static Rollover Device	A-42
76	Vehicle at 360° on Static Rollover Device	A-42
77	2015 Honda Fit 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.*

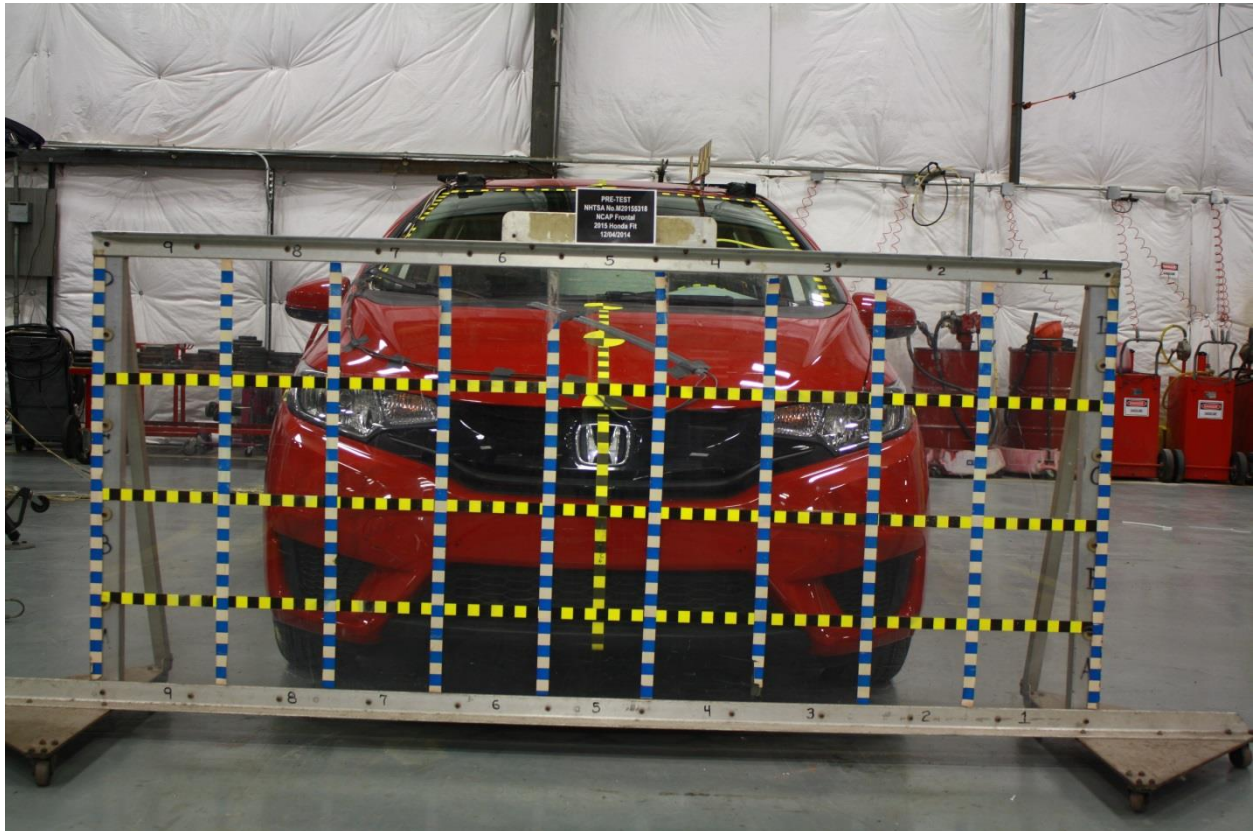


Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall

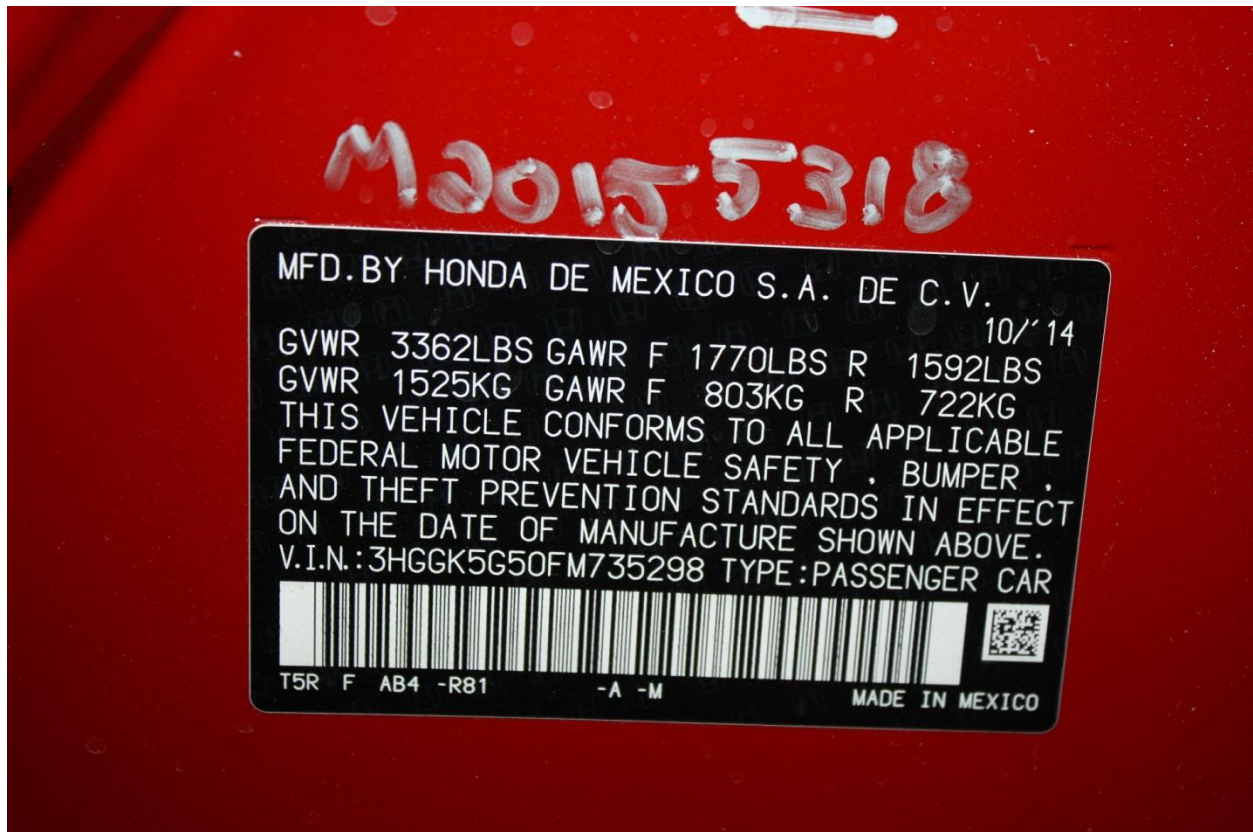


Figure A-3: Manufacturer's Label



Figure A-4: Tire Placard



Figure A-5: 2015 Honda Fit Frontal As Delivered



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



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

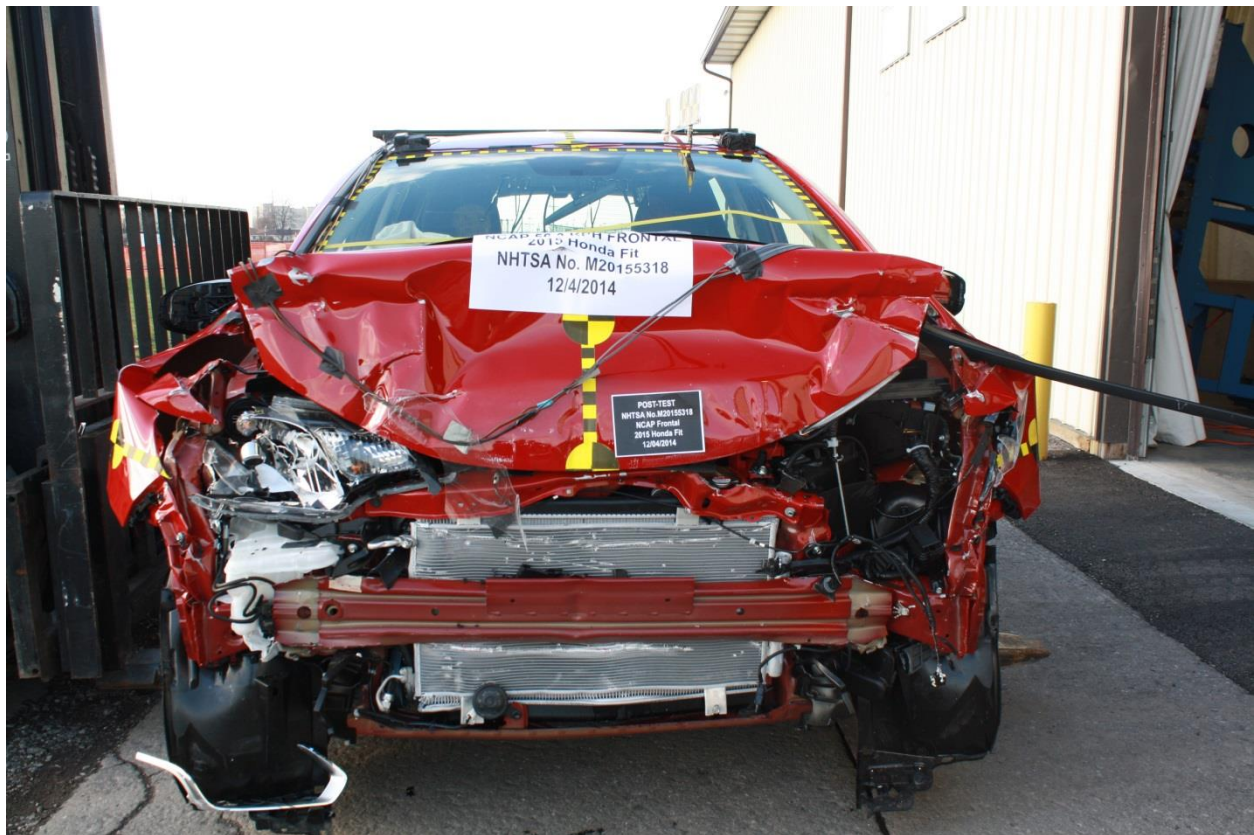


Figure A-8: Post-Test Front View of Test Vehicle



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

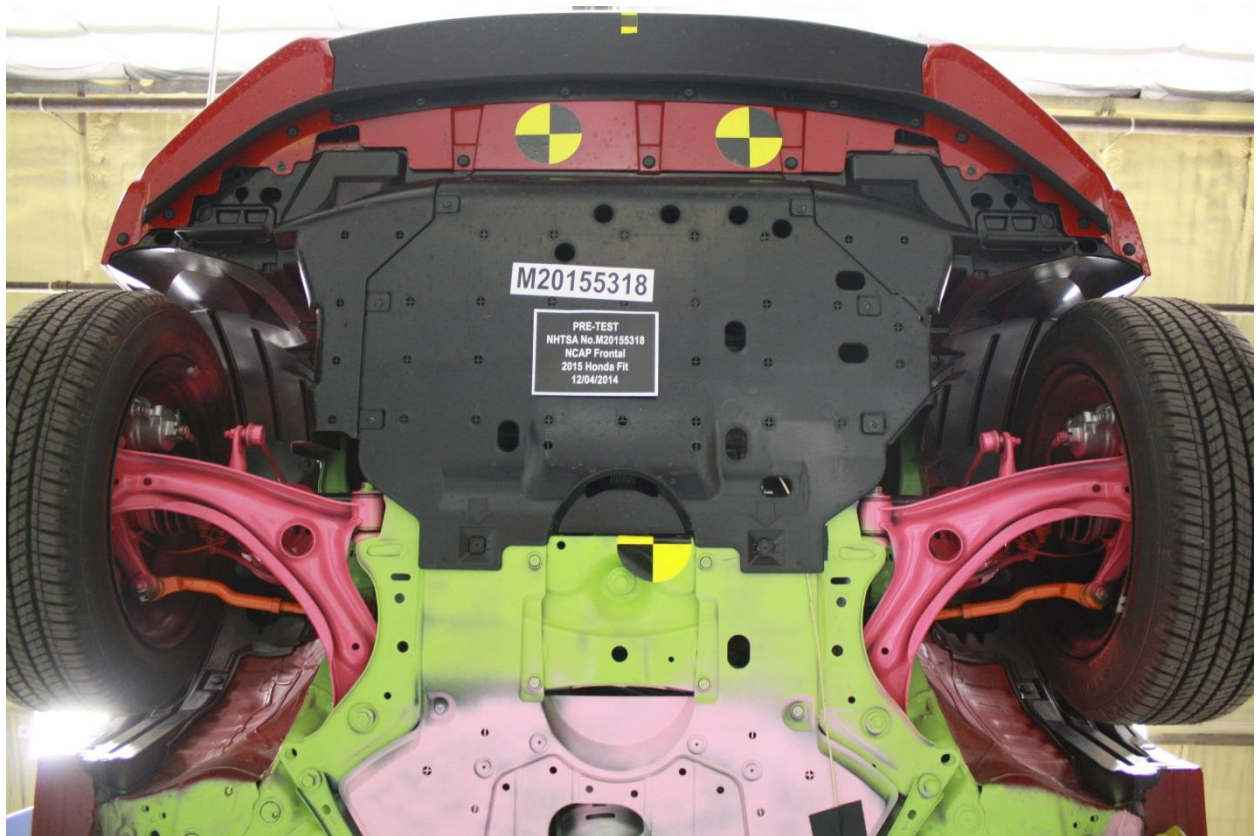


Figure A-23: Pre-Test Front Underbody View

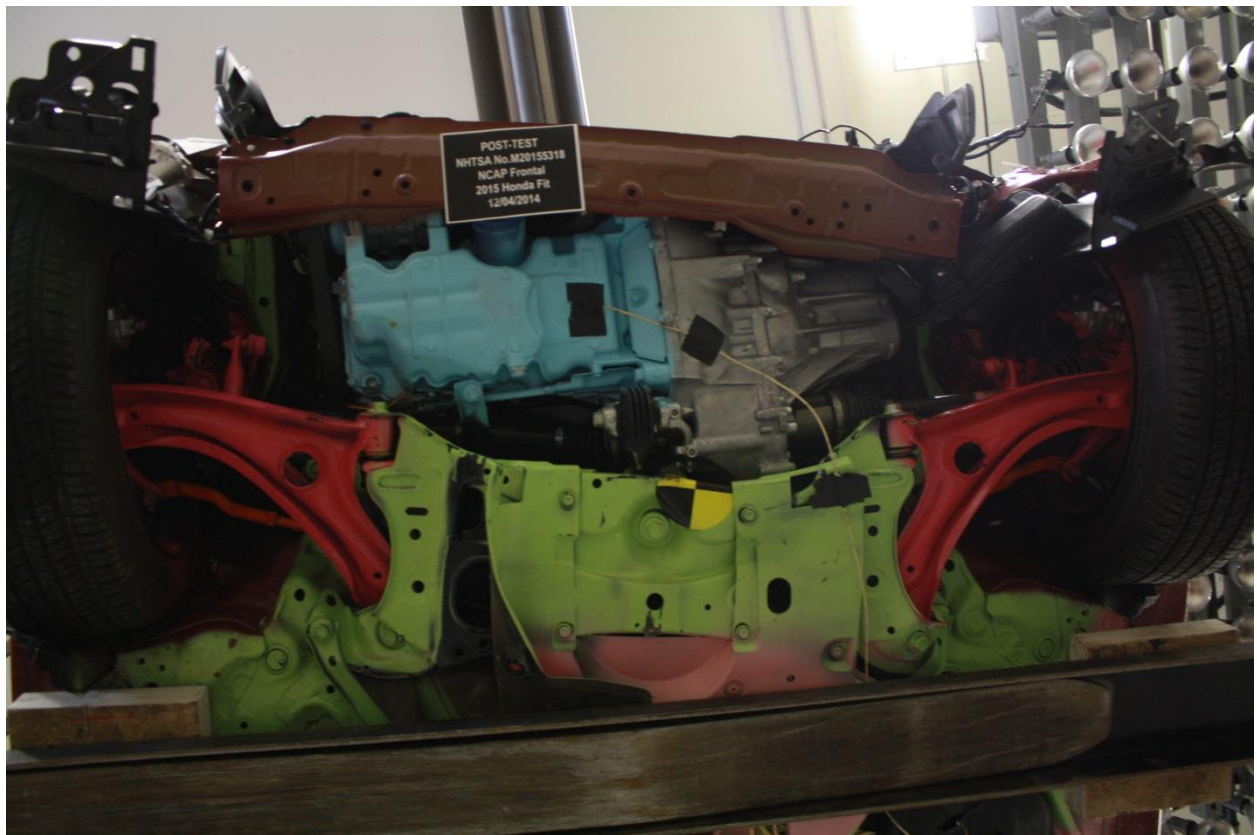


Figure A-24: Post-Test Front Underbody View



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

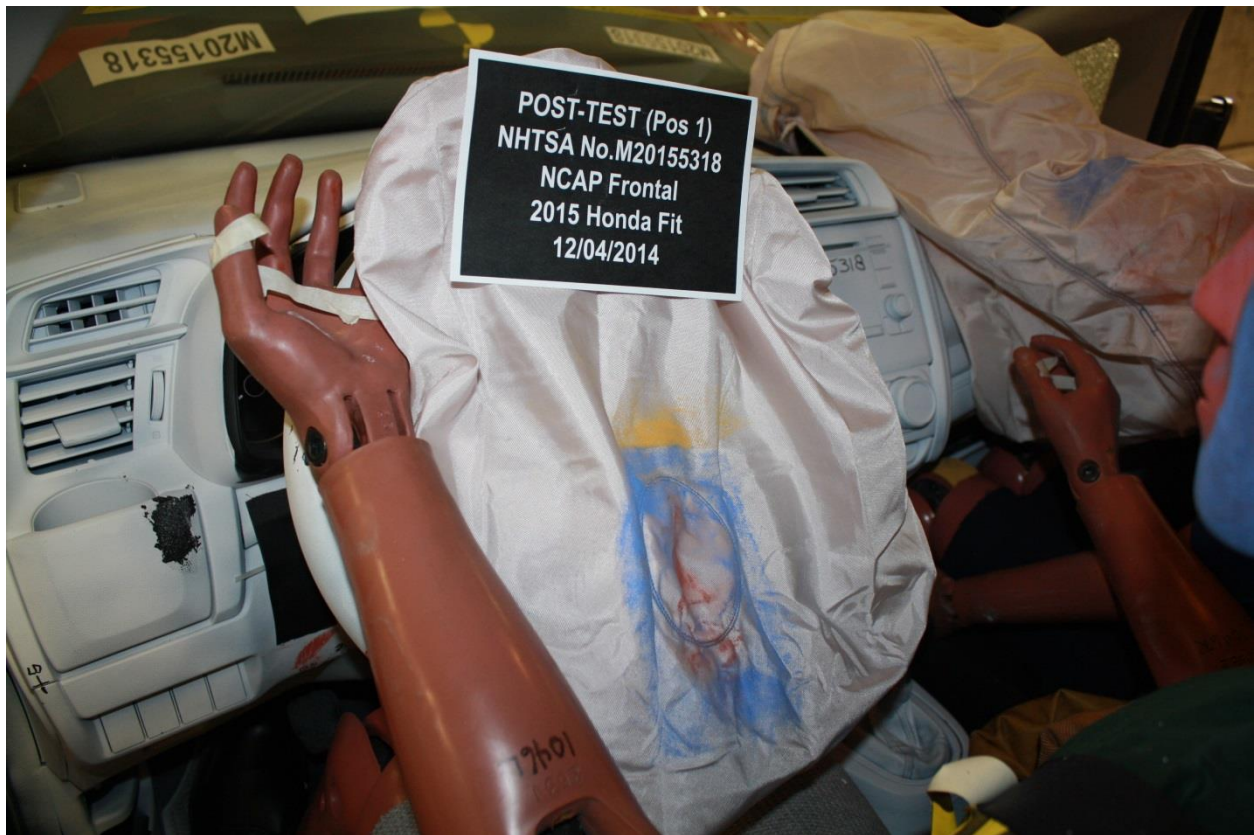


Figure A-46: Post-Test Driver Dummy Contact With Airbag



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

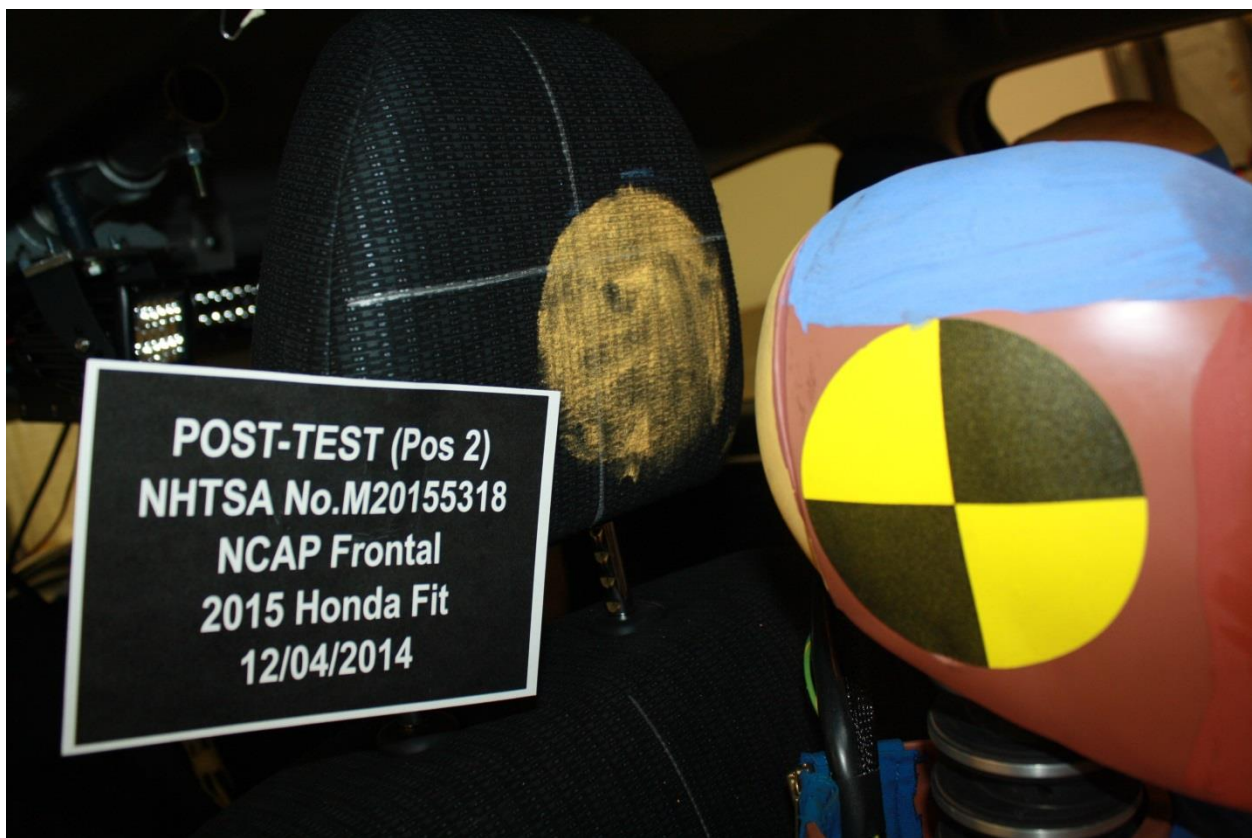


Figure A-68: Post-Test Passenger Dummy Contact With Headrest

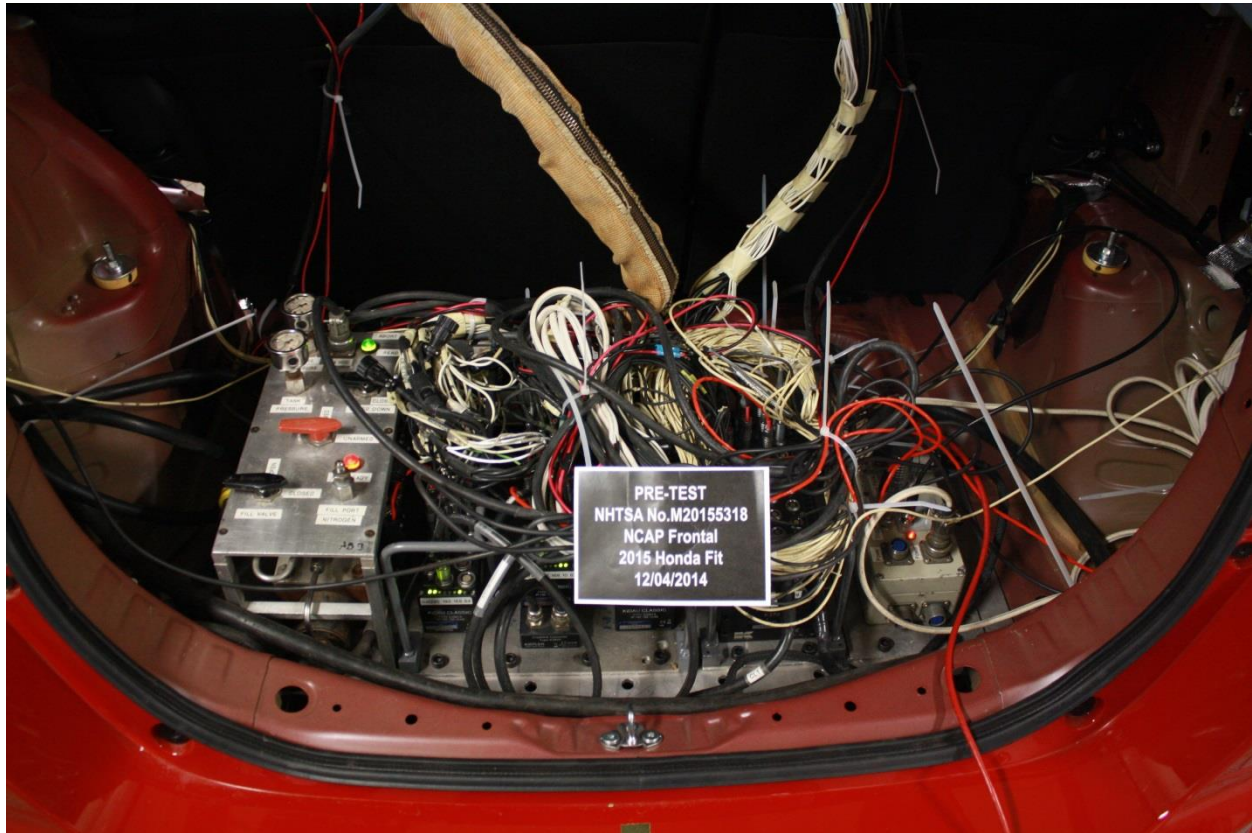


Figure A-69: Photograph of Ballast Installed in Vehicle

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 Fit Frontal Impact Event

HONDA		2015 FIT 5DR LX EXT: MILANO RED INT: BLACK ENGINE NUMBER: L15B1-1047701		EPA DOT Fuel Economy and Environment Gasoline Vehicle					
STANDARD EQUIPMENT AT NO EXTRA COST 130hp 1.5-Liter DOHC 16-Valve i-VTEC 4-Cylinder Direct Injection Engine w/ Earth Dreams Technology 6-Speed Manual Transmission - Drive-by-Wire Throttle System - Electric Power-Assisted Rack-and-Pinion Steering - Front MacPherson Strut Suspension - Rear Torsion Beam Suspension - Immobilizer Theft-Deterrent System		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 - Anti-Lock Braking System (ABS) - Brake Assist - Electronic Brake Distribution (EBD) - Vehicle Stability Assist (VSA) - Tire Pressure Monitoring System - ACE Body Structure - Daytime Running Lights (DRL) - LATCH System for Child Seats		INTERIOR FEATURES* - AM/FM/CD/MP3 Audio System with 4 Speakers 5-Inch Color LCD Screen with Rearview Camera - Bluetooth Audio - Bluetooth HandsFreeLink - USB Audio Interface - Steering Wheel-Mounted Controls - MP3/Auxiliary Input Jack - Air Conditioning with Air Filtration System - Center Storage Console w/ Armrest - Driver's Seat Height Adjustment 60/40 Fold-Flat Rear Magic Seat - Power Windows and Programmable Auto Door Locks - Driver's Auto Up/Down Window - Tilt & Telescopic Steering Column - Cargo Area Light - Visor Vanity Mirrors - Cruise Control 12-Volt Power Outlets		EXTERIOR FEATURES* 15" x 6.0" Steel Wheels with Full Wheel Covers - P185/60 R15 All-Season Tires - Intermittent Windshield Wipers - Rear Window Defogger - Rear Wiper with Washer - Auto-On/Off Headlights - Expanded View Driver's Mirror - Body-Colored Power Door Mirrors - LED Brake Lights - Rear Roofline Spoiler - Remote Entry with Security System		Manufacturer's Suggested Retail Price \$15,525.00 Full Tank of Fuel No Charge	
Destination and Handling 790.00		TOTAL VEHICLE PRICE (Includes Pre-Delivery Service) \$16,315.00		Fuel Economy 32 MPG combined city/hwy 3.1 gallons per 100 miles					
License and title fees, state and local taxes and dealer options and accessories are not included in the manufacturer's suggested retail price.		ANNUAL FUEL COST \$1,650		You save \$2,750 in fuel costs over 5 years compared to the average new vehicle.					
10/14 29 miles H43258		PORT OF ENTRY: EL PASO DELIVERY POINT: SCHAUMBURG ROW/SPACE: 411-005 TRANS.METHOD: N50 ELWOOD VIN: 3HGGKSG50FM735298		Fuel Economy & Greenhouse Gas Rating This vehicle emits 277 grams CO ₂ per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also create emissions. Learn more at fuelconomy.gov					
ORIG. DLR: 206855 REF. NO.: 40844 HN CODE: HN-0810 EMISSION: 50 STATE CONTROL NO.: 548611 DEALER: 206855		PARTS CONTENT INFORMATION FOR VEHICLES IN THIS CARLINE U.S./Canadian Parts Content: 5 % Major Sources of Foreign Parts Content: MEXICO 70 % 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 be compared to other vehicles of similar size and weight.					
VIN: 3HGGKSG50FM735298		FOR THIS VEHICLE Final Assembly Point: CELAYA, CELAYA MEXICO Country of Origin: Engine: MEXICO Transmission: PHILIPPINES		Frontal Crash Driver Not Rated Passenger Not Rated Based on the risk of injury in a frontal impact. Should ONLY be compared to other vehicles of similar size and weight.					
VIN: 3HGGKSG50FM735298		Side Crash Front seat Not Rated Rear seat Not Rated Based on the risk of injury in a side impact.		Rollover Not Rated Based on the risk of rollover in a single vehicle crash.					
VIN: 3HGGKSG50FM735298		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		This vehicle is equipped with a front bumper of a type that has been tested at an impact speed of 5 miles per hour, and a rear bumper of a type that has been tested at an impact speed of 5 miles per hour, resulting in no damage to the vehicle's body and safety systems and minimal damage to the bumper and attachment hardware. "Minimal damage to the bumper" means minor cosmetic damage that can be repaired with the use of common repair materials and without replacing any parts. The stronger the bumper, the less likely the vehicle will require repair after a low-speed collision. This vehicle exceeds the current federal bumper standard of 2.5 miles per hour.					

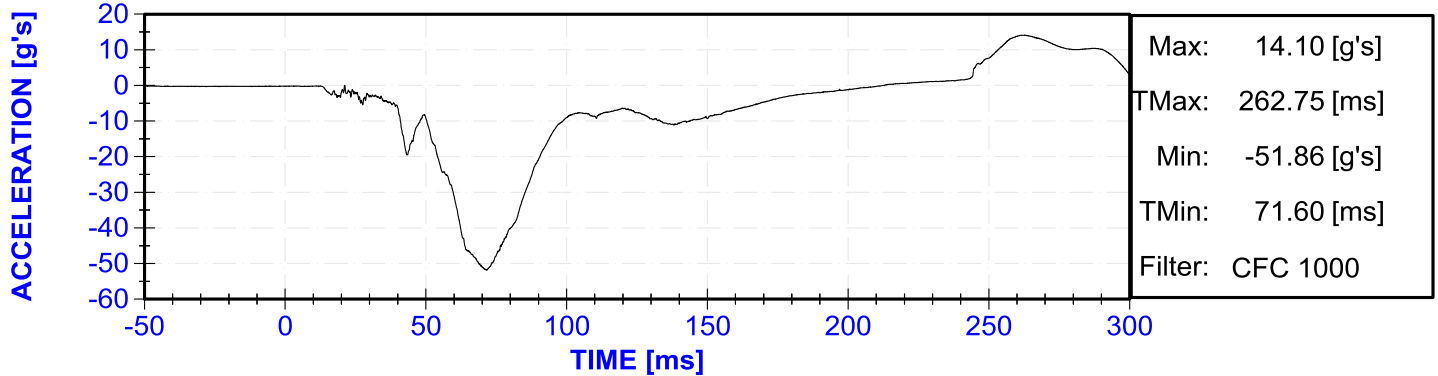
Figure A-78: Monroney Label Photograph

APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

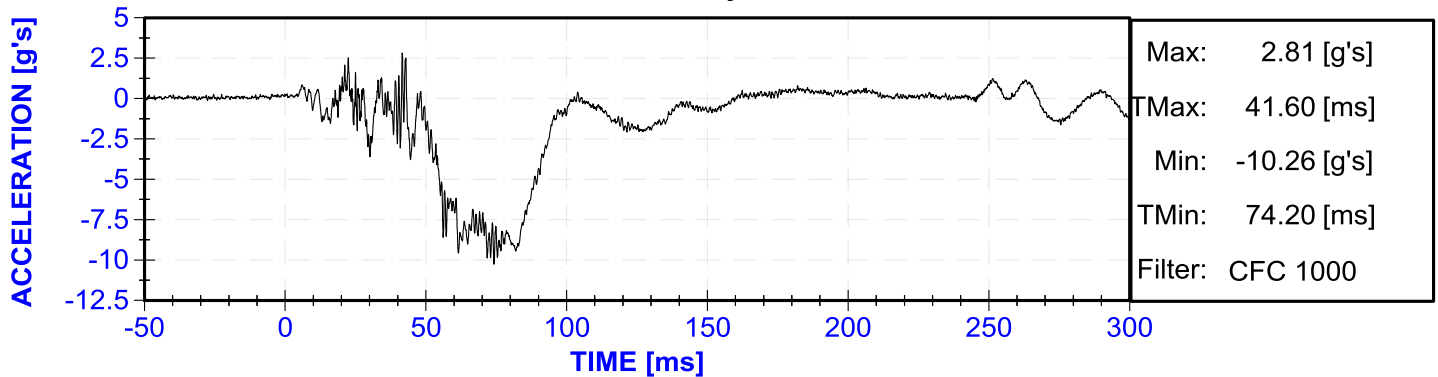
Table of Data Plots

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
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Plot 25	Passenger Upper Neck Force X vs. Time Primary	B-9
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Plot 27	Passenger Upper Neck Moment Y vs. Time Primary	B-9
Plot 28	Passenger Nij vs. Time Primary	B-9
Plot 29	Passenger Left Femur Force vs. Time	B-10
Plot 30	Passenger Right Femur Force vs. Time	B-10

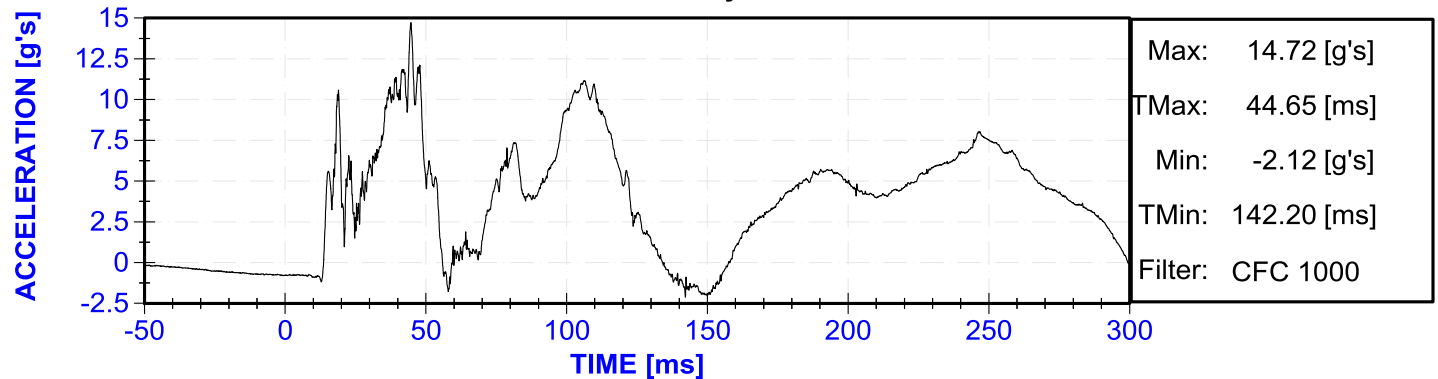
Driver Head X Acceleration vs. Time Primary



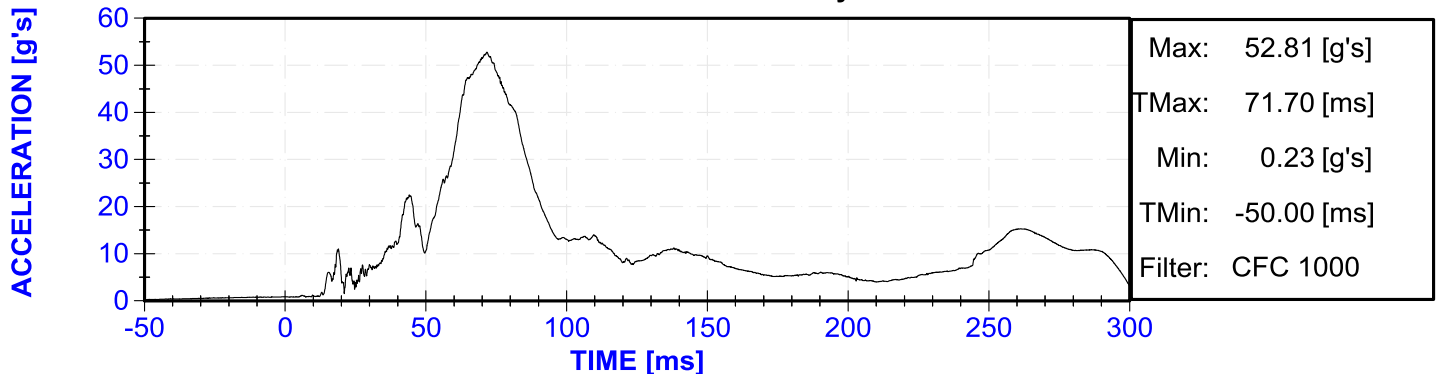
Driver Head Y Acceleration vs. Time Primary

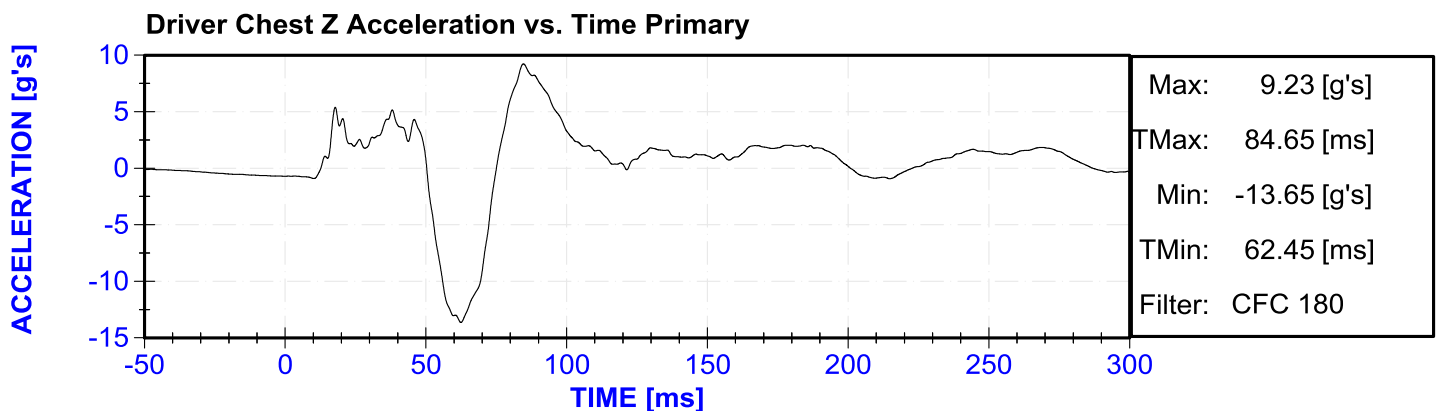
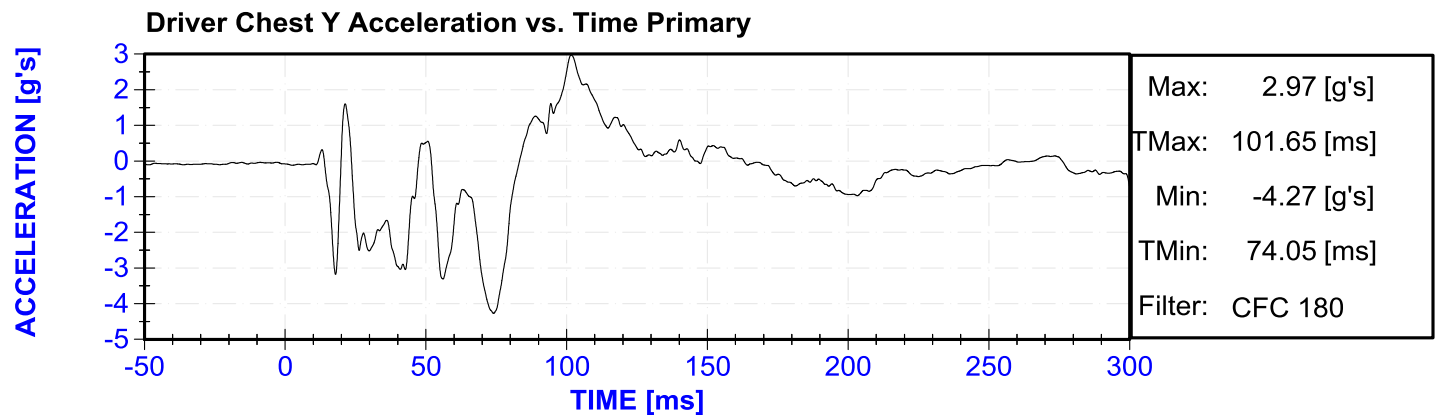
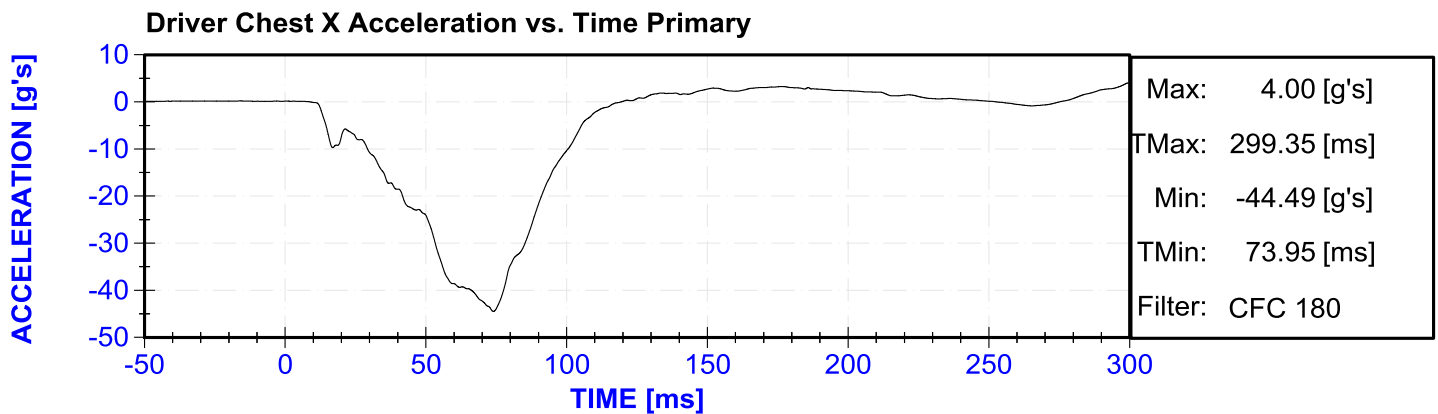
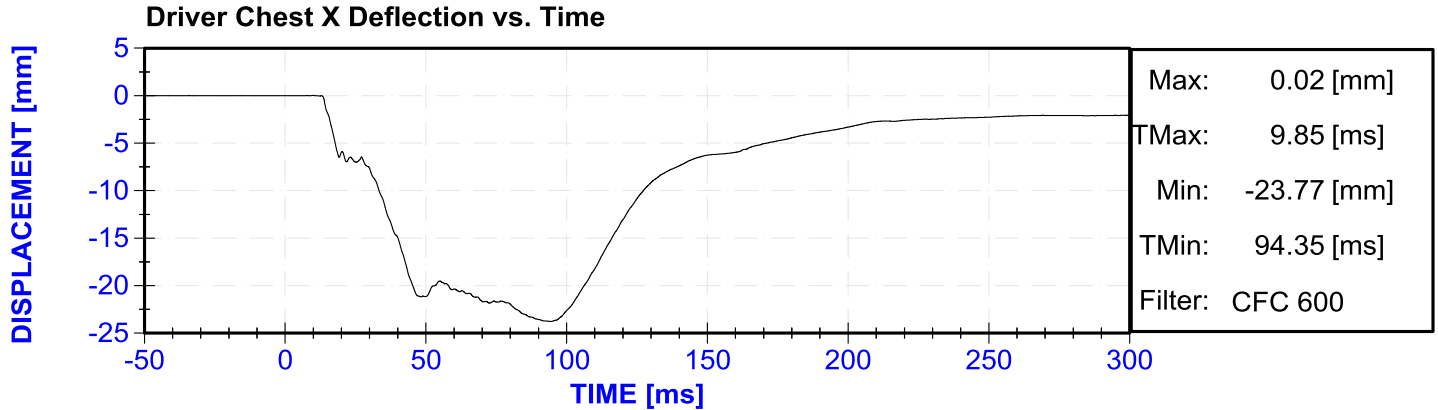


Driver Head Z Acceleration vs. Time Primary

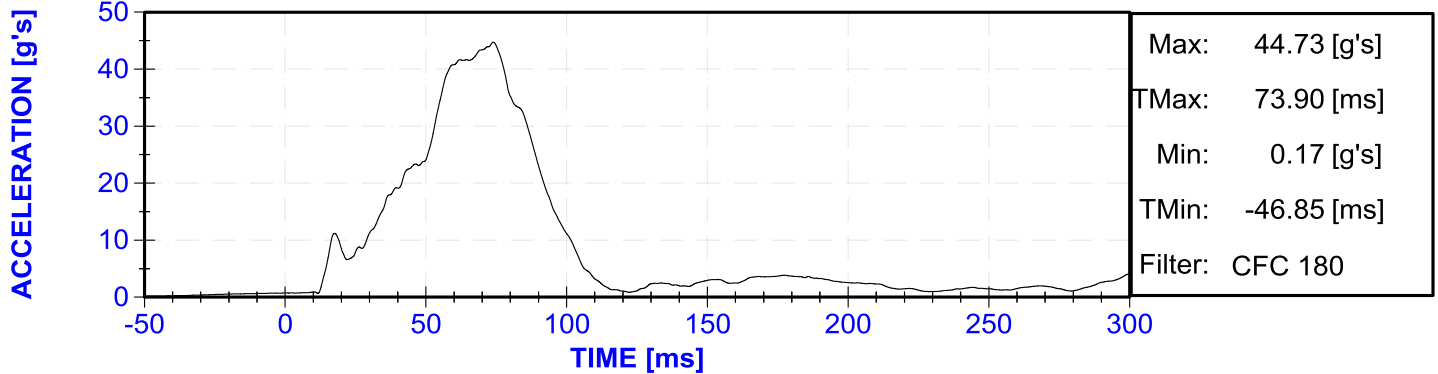


Driver Head Resultant Acceleration vs. Time Primary

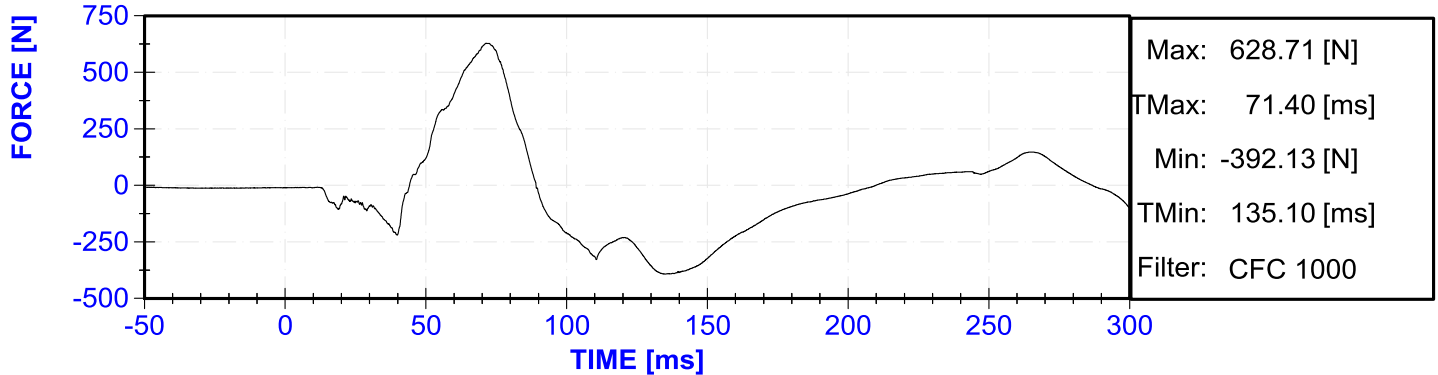




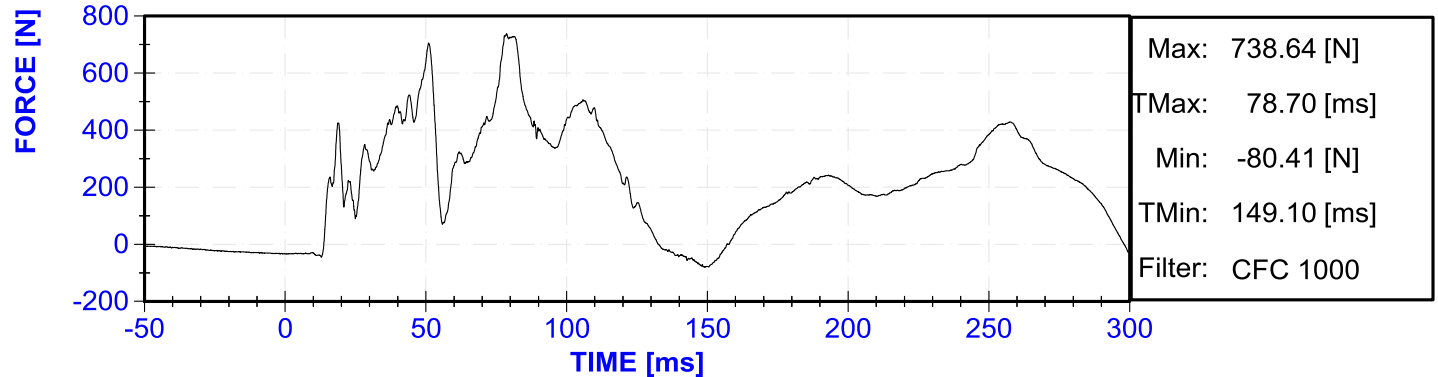
Driver Chest Resultant Acceleration vs. Time Primary



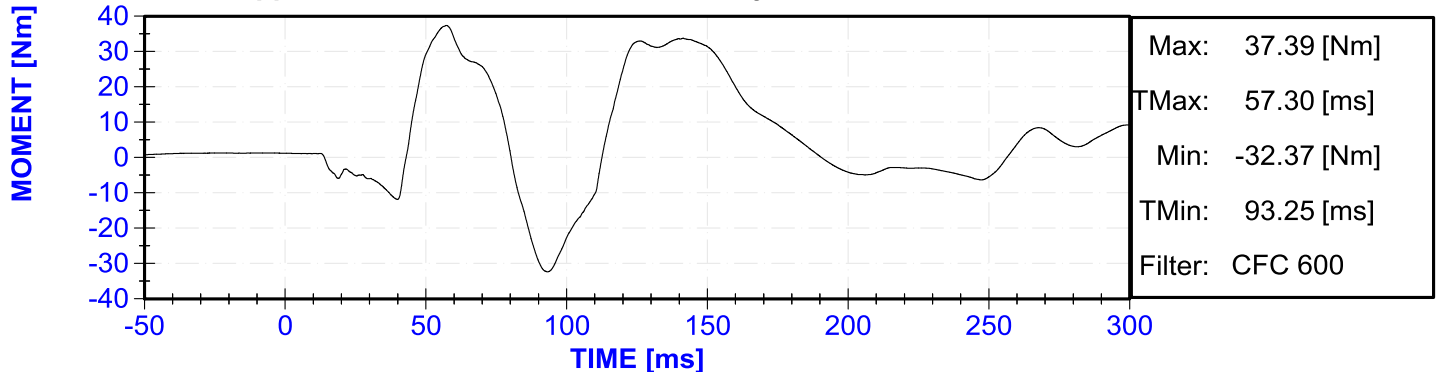
Driver Upper Neck Force X vs. Time Primary

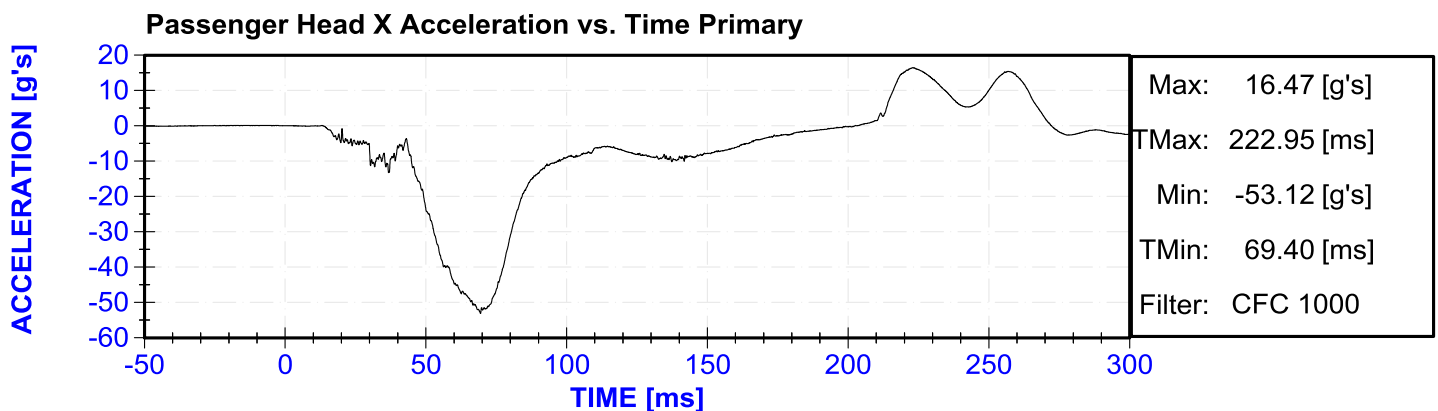
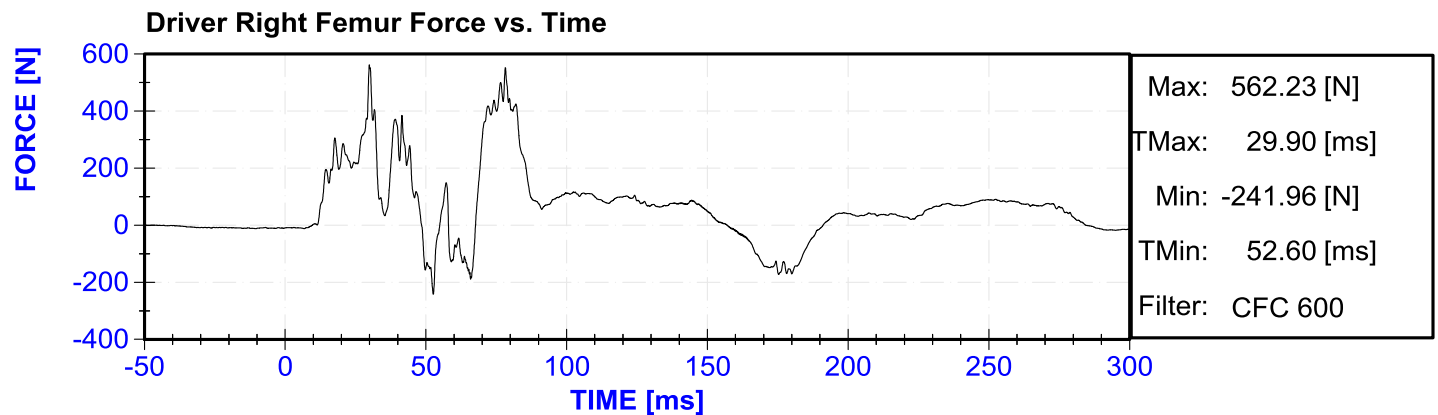
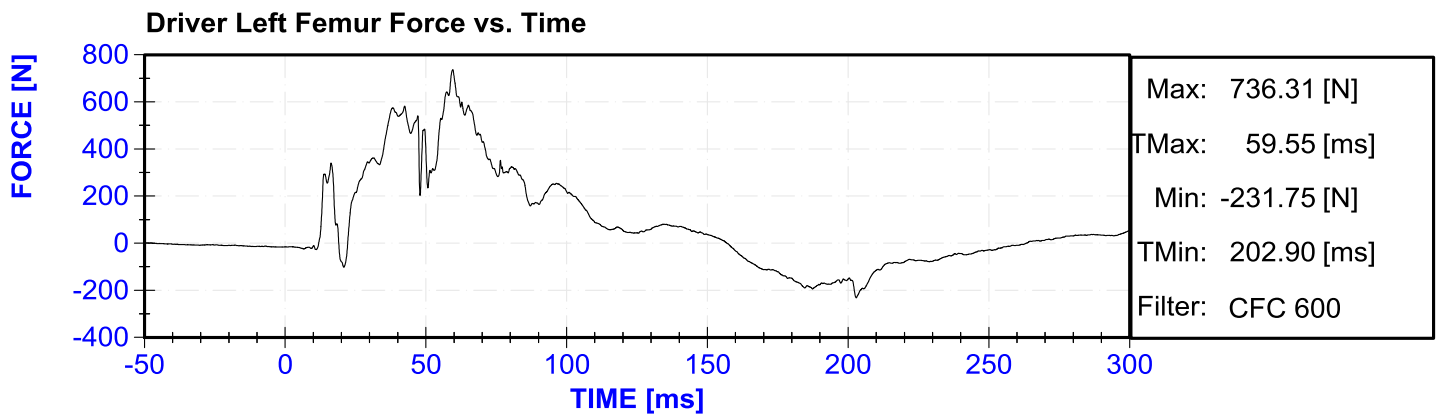
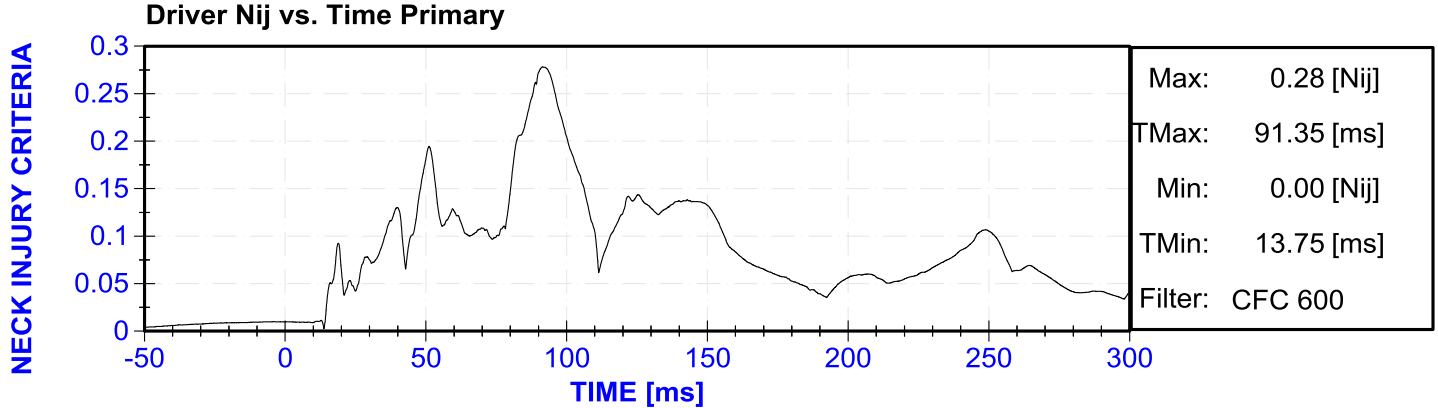


Driver Upper Neck Force Z vs. Time Primary

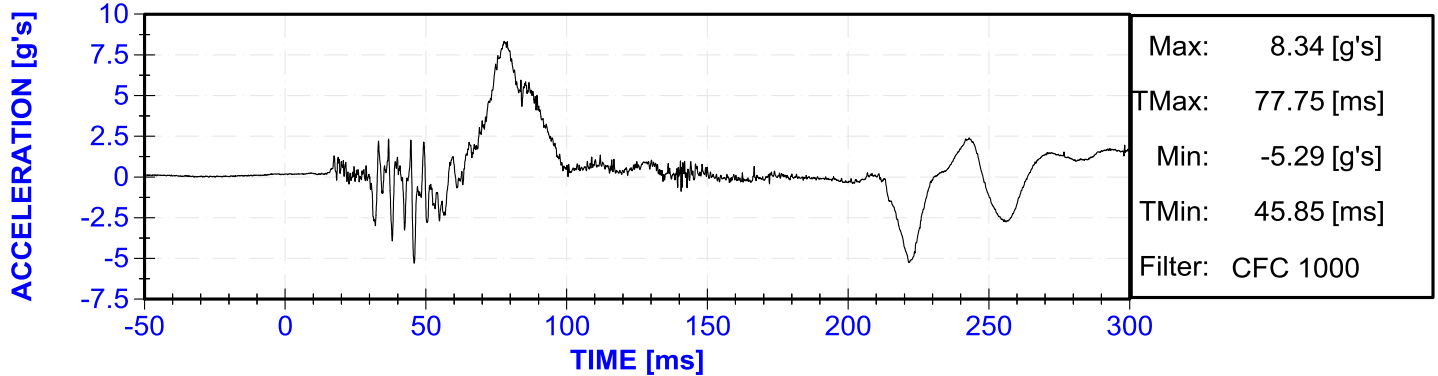


Driver Upper Neck Moment Y vs. Time Primary

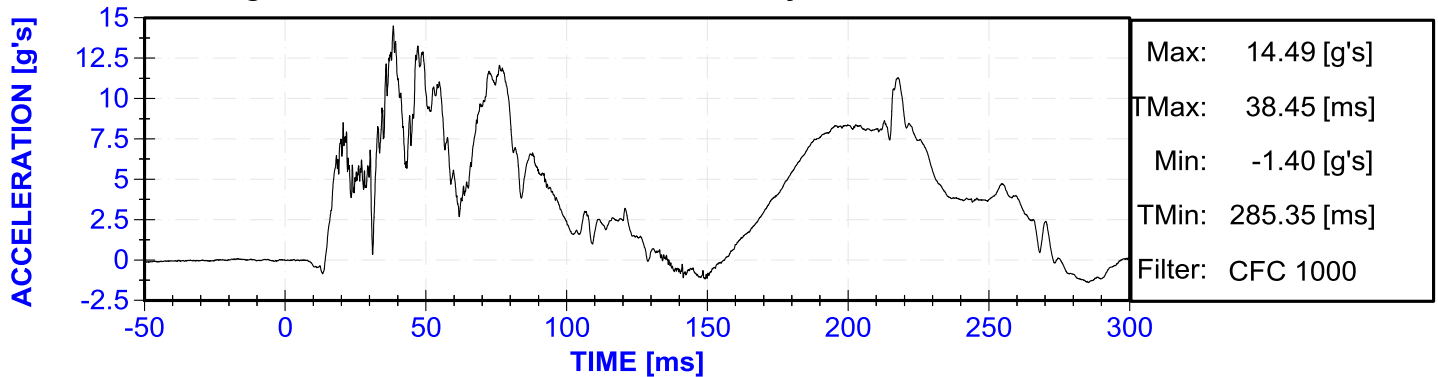




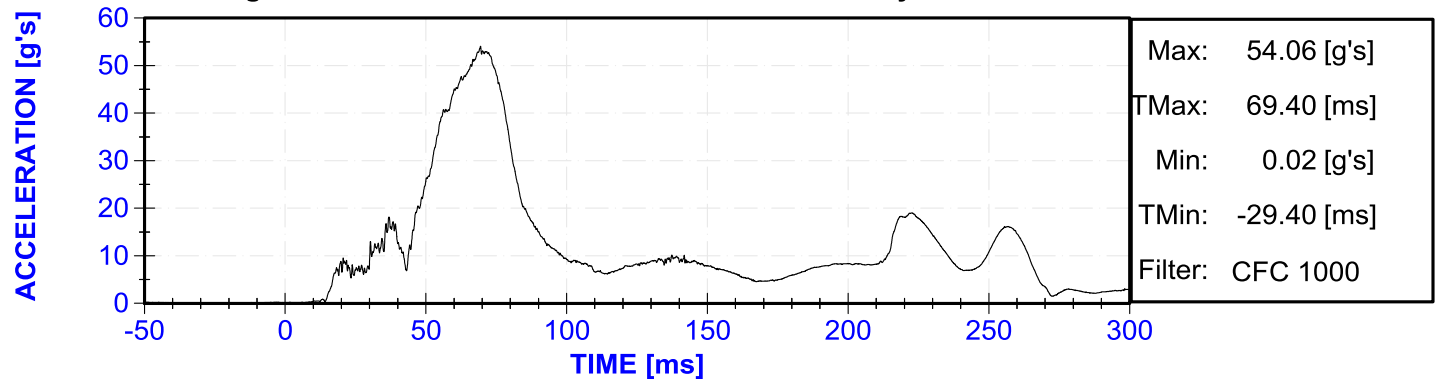
Passenger Head Y Acceleration vs. Time Primary



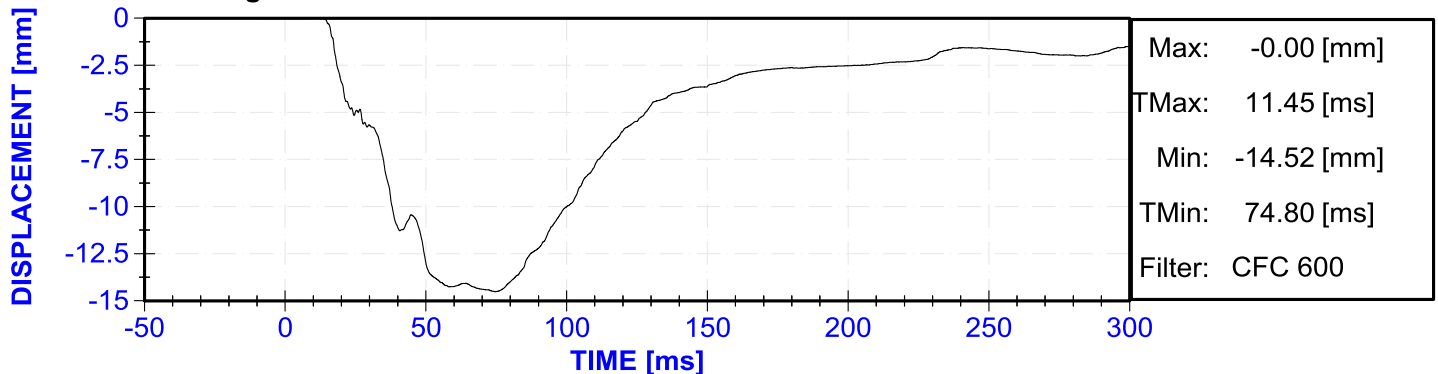
Passenger Head Z Acceleration vs. Time Primary



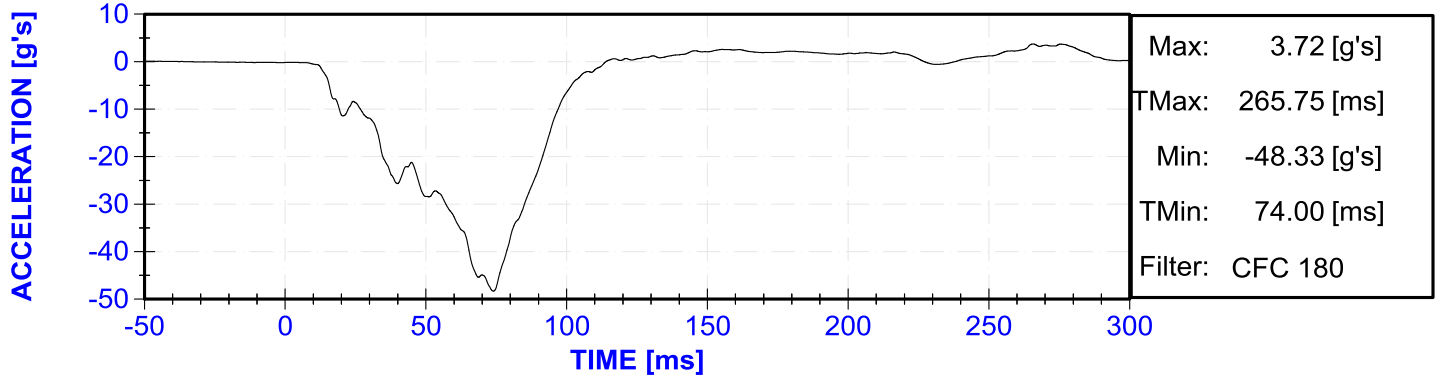
Passenger Head Resultant Acceleration vs. Time Primary



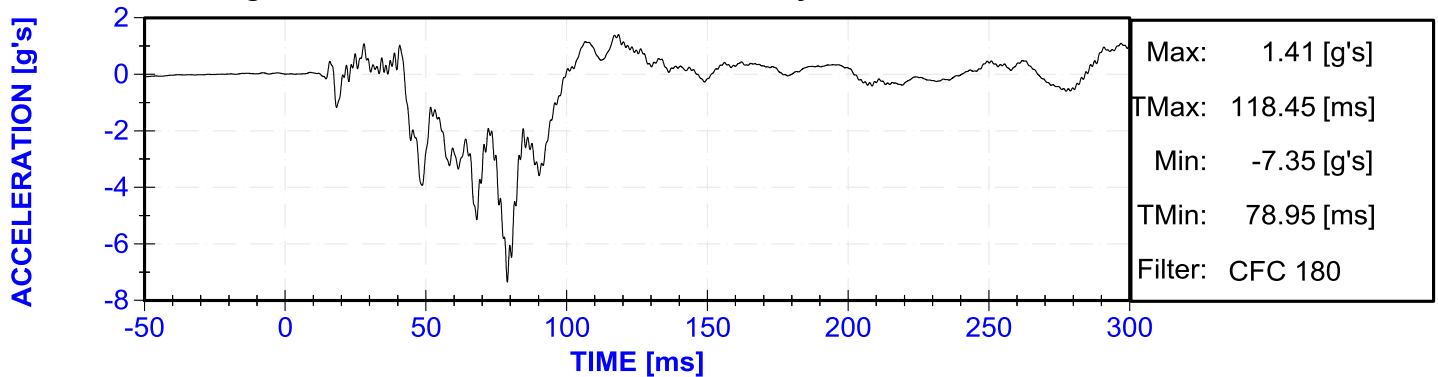
Passenger Chest X Deflection vs. Time



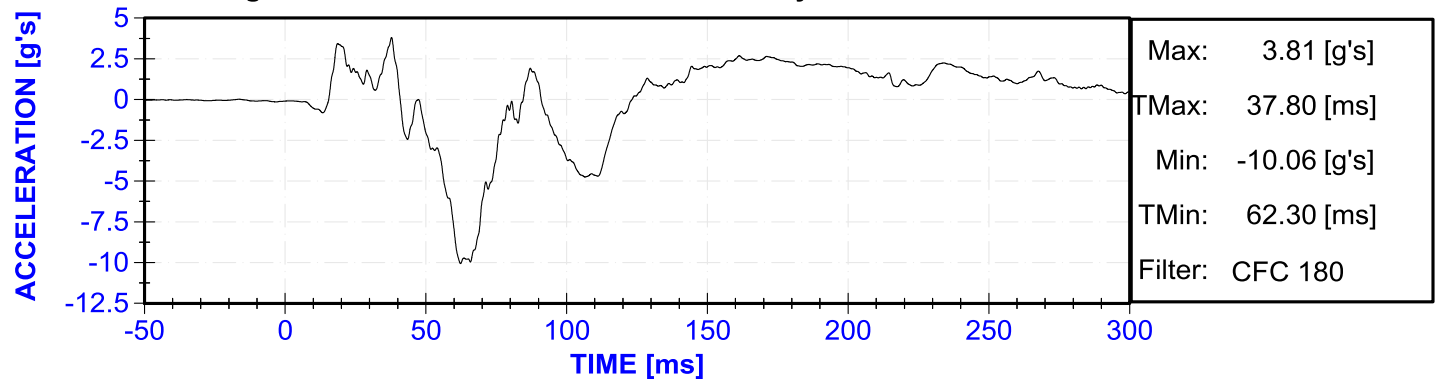
Passenger Chest X Acceleration vs. Time Primary



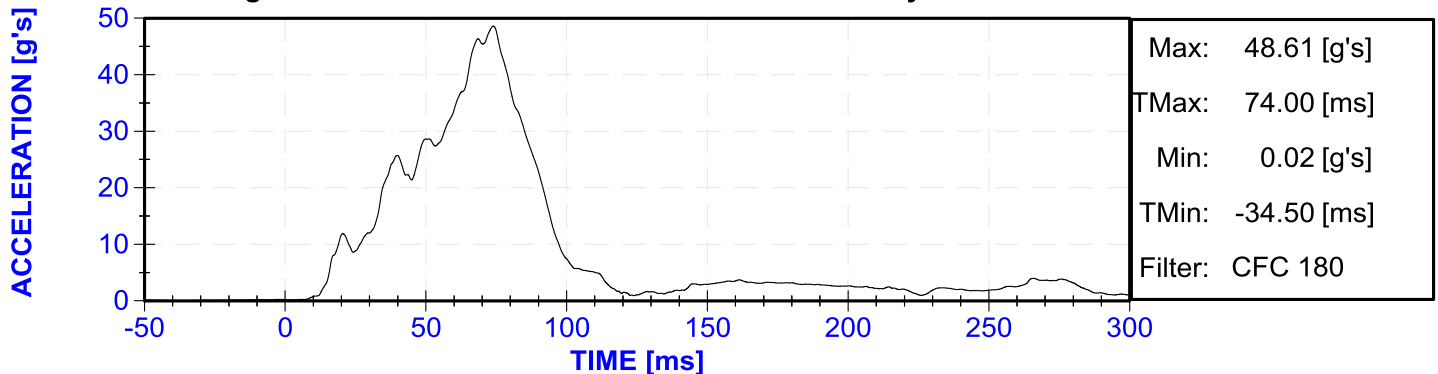
Passenger Chest Y Acceleration vs. Time Primary



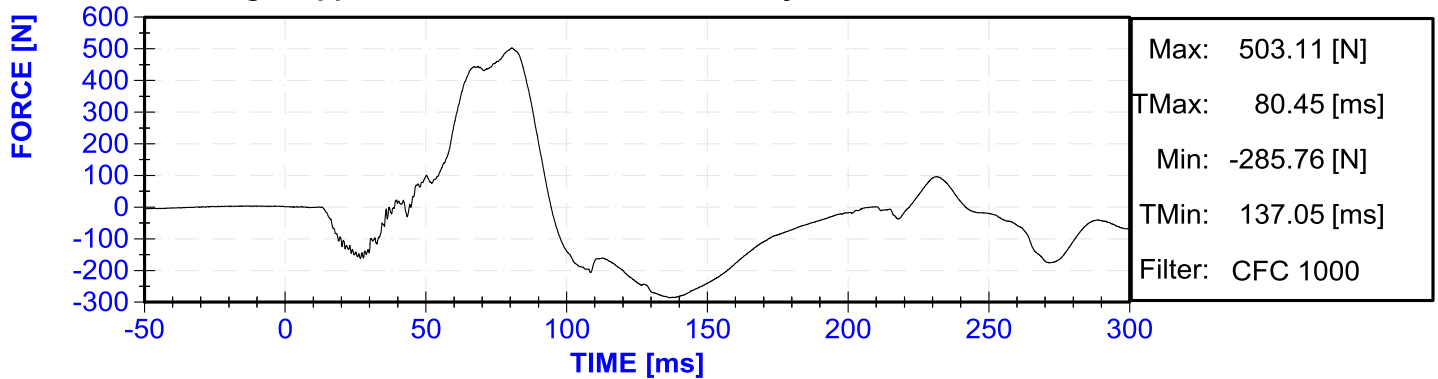
Passenger Chest Z Acceleration vs. Time Primary



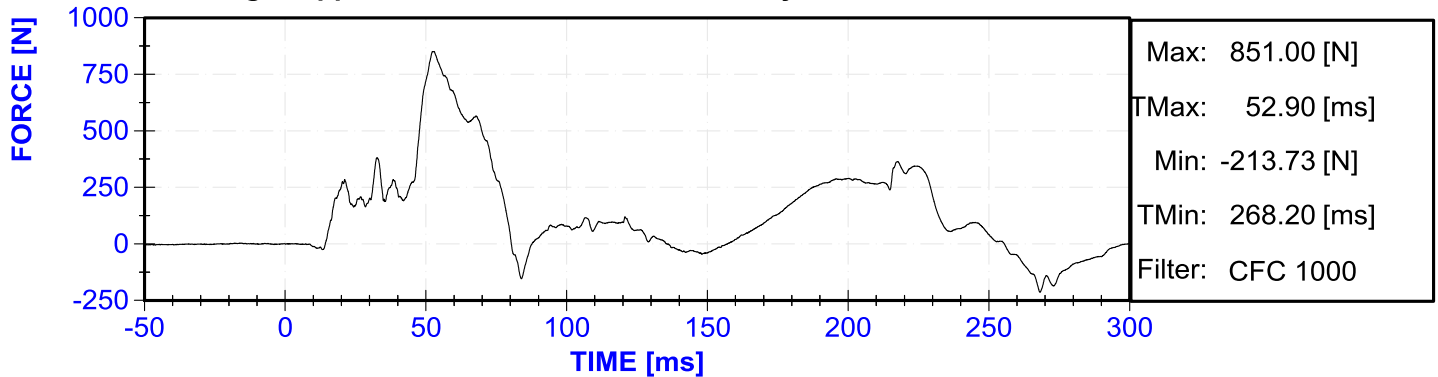
Passenger Chest Resultant Acceleration vs. Time Primary



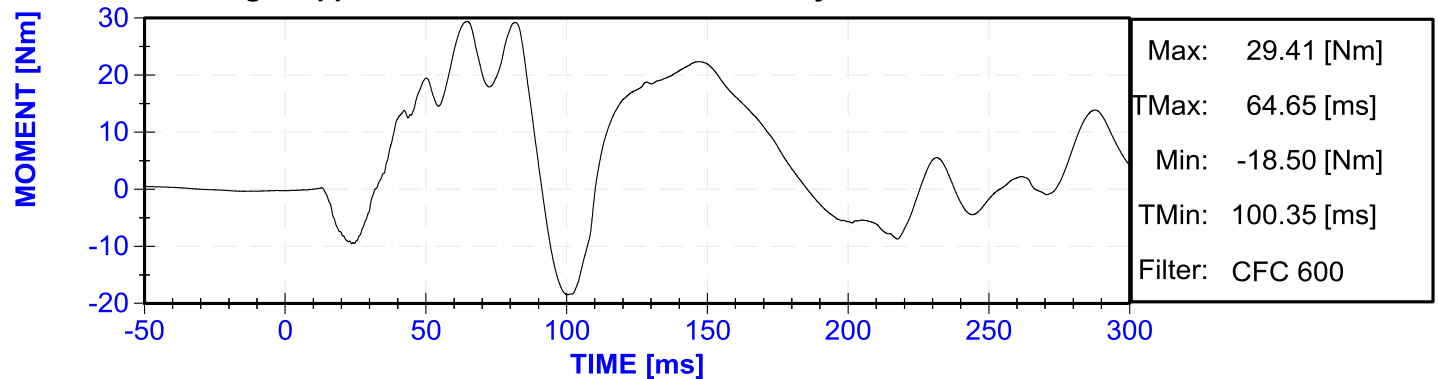
Passenger Upper Neck Force X vs. Time Primary



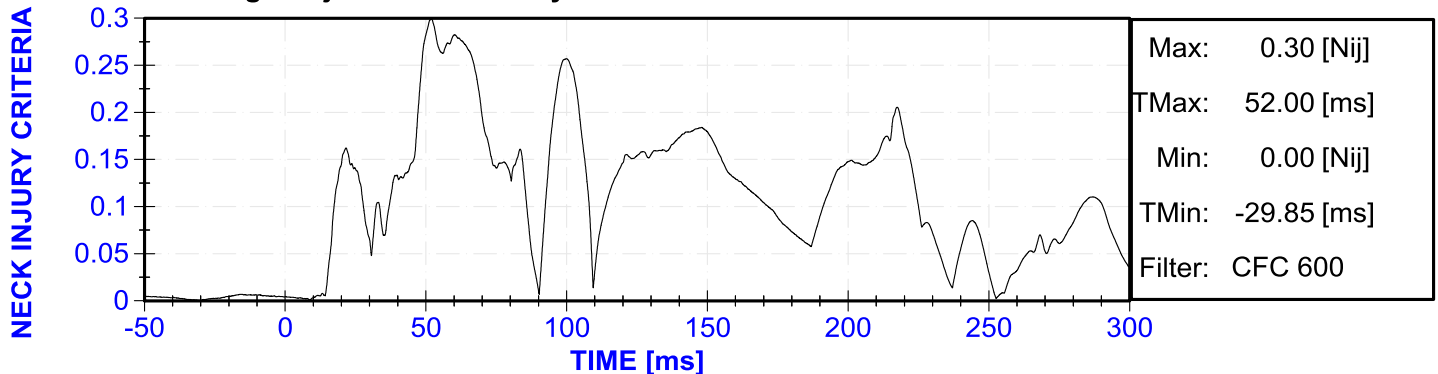
Passenger Upper Neck Force Z vs. Time Primary



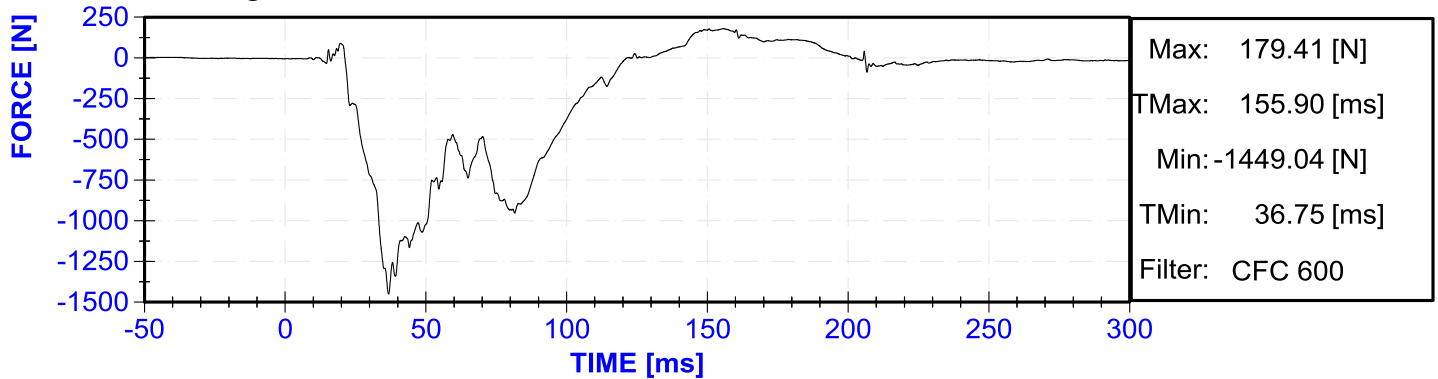
Passenger Upper Neck Moment Y vs. Time Primary



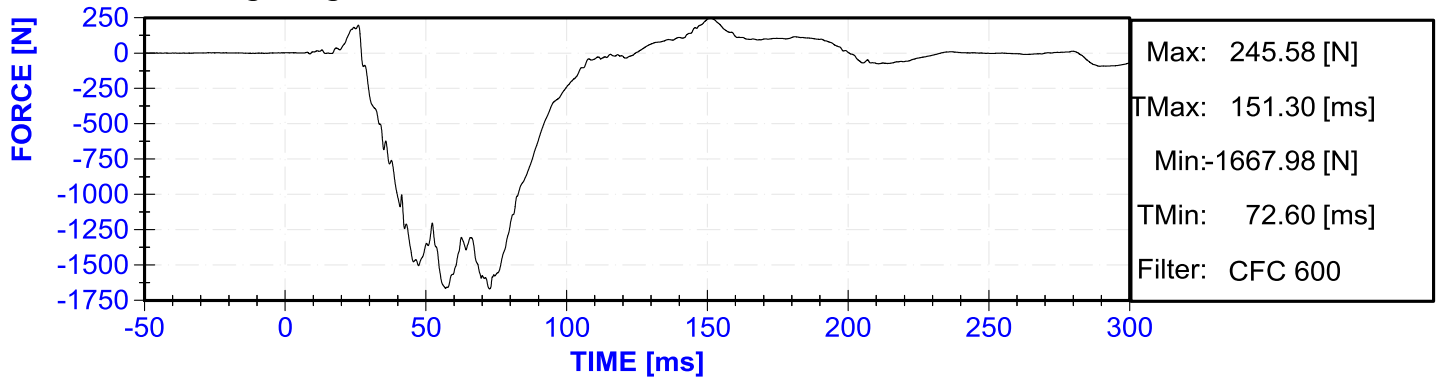
Passenger Nij vs. Time Primary



Passenger Left Femur Force vs. Time



Passenger Right Femur Force vs. Time



APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 1046



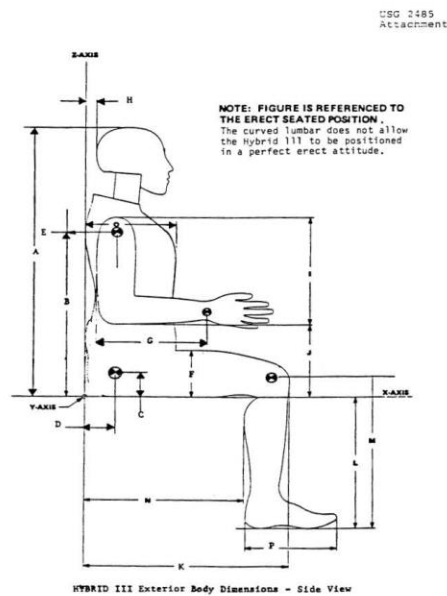
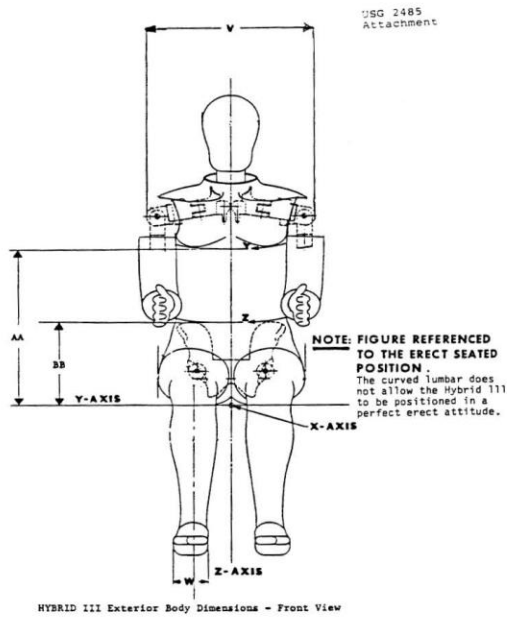
50th Male External Measurements

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	11.5	Yes
H	Head Back to Backline	1.6 – 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 – 13.6	13.1	Yes
J	Elbow Rest Height	7.5 – 8.3	7.8	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.4	Yes
L	Popliteal Height	16.9 – 17.9	17.2	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	33.8	Yes
AA	Reference Location (Chest Circumference)	16.9 – 17.1	17.0	Yes
BB	Reference Location (Waist Circumference)	8.9 – 9.1	9.0	Yes

Technician: M. Geesey

11/13/2014





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:	11/6/2014
		Test Time:	12:41:03 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.50 deg C	P
Humidity	10	--	70	35.20 %RH	P
Resultant Acceleration	225	--	275	260.5 G's	P
Oscillation	0	--	10	2.6 %	P
Lateral Acceleration	-15	--	15	1.9 G's	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



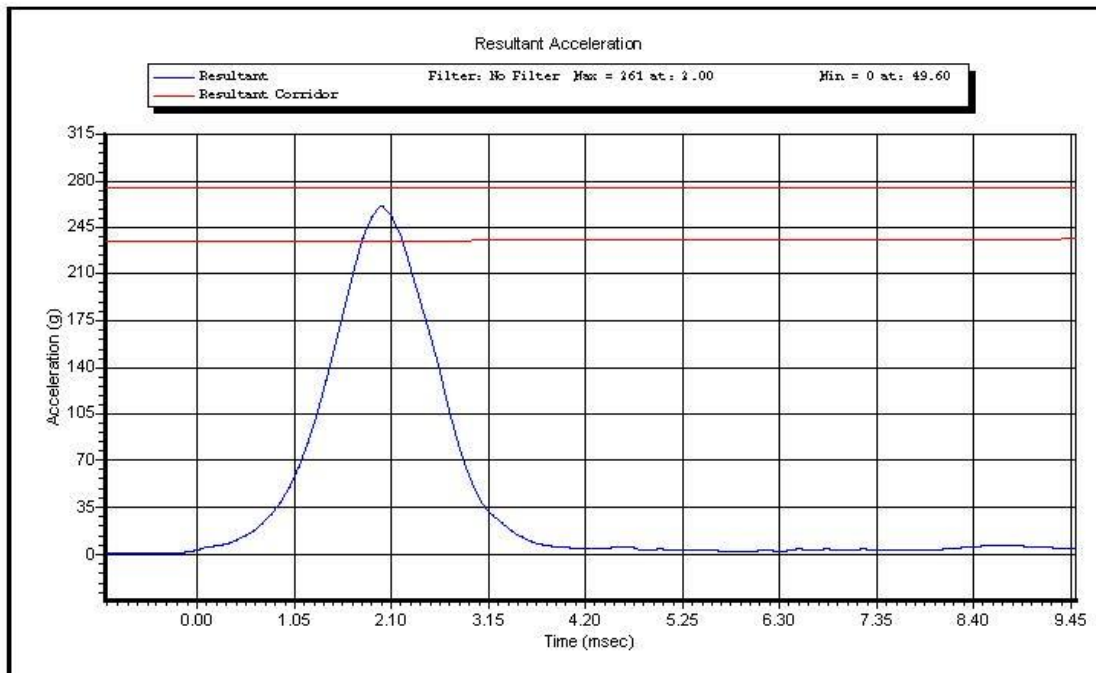
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	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

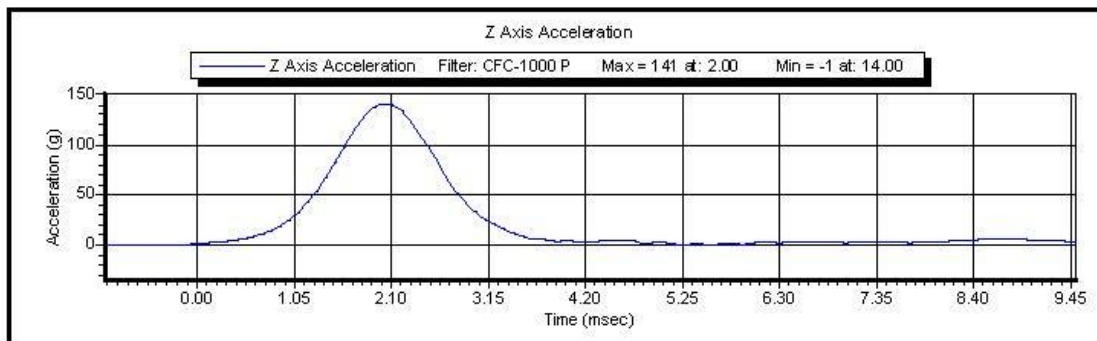
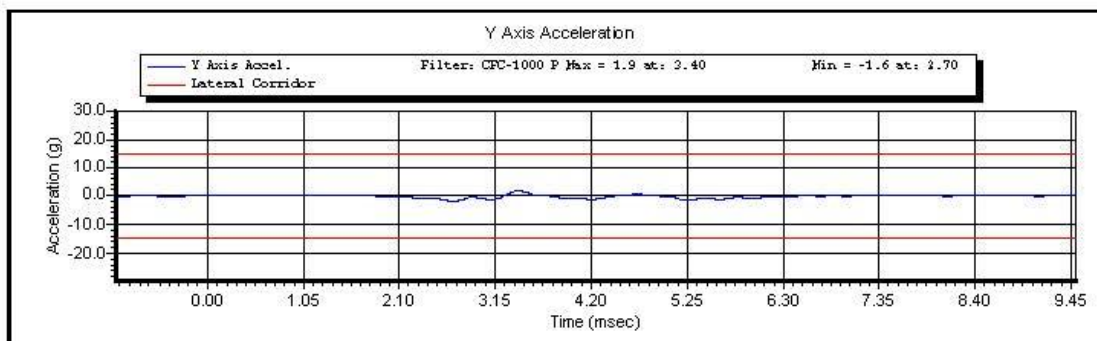
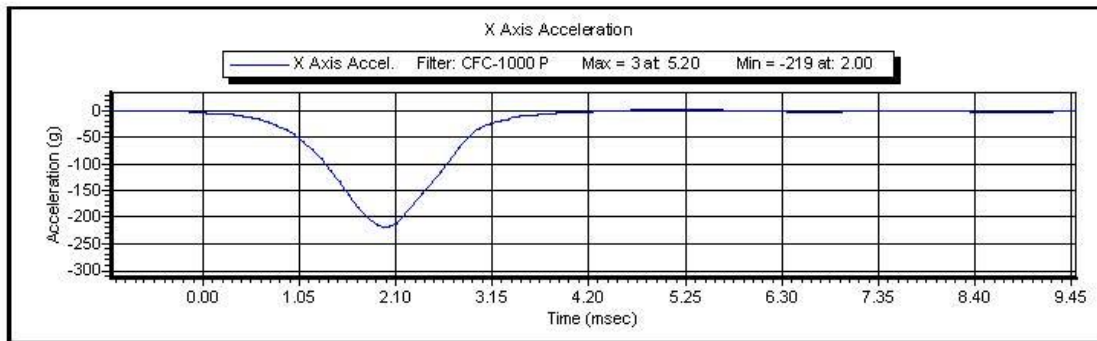


Test ID: **Head Drop**

Test Time: **12:41:03 PM**

Test Date: **11/6/2014**

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Test ID: **Head Drop**

Test Time: **12:41:03 PM**

Test Date: **11/6/2014**

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:	11/12/2014
		Test Time:	11:47:31 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.70 deg C P
Humidity	10 -- 70	26.60 %RH P
Velocity	5.94 -- 6.19	6.024 m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	21.07 G's P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	17.42 G's P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	12.04 G's P
Max Pendulum Deceleration after 30 ms	0.0 -- 22.0	12.74 G's P
Deceleration Time to 5 G's	38 -- 46	38.0 ms P
D Plane Rotation	81 -- 106	94.8 degrees P
Time at Max Rotation	72 -- 82	72.8 ms P
Rotation Decay to Zero	147 -- 174	153.2 ms P
Moment About Occipital Condyle	-80.0 -- -52.9	-74.80 Nm P
Time at Maximum Moment	65 -- 79	68.5 ms P
Moment Decay to Zero	120 -- 148	134.7 ms P

All test parameters are within specifications

Technician: **M. Goehle**

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



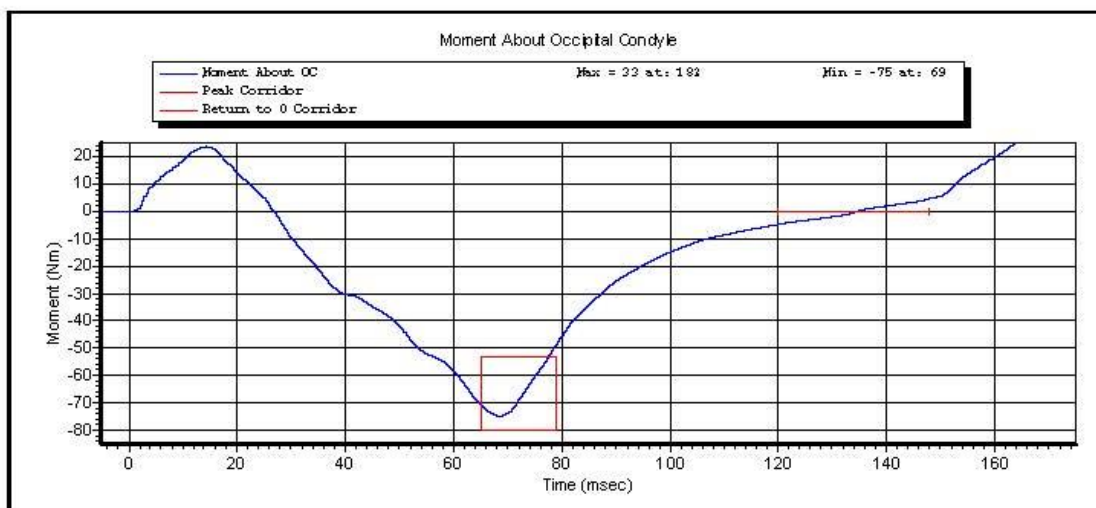
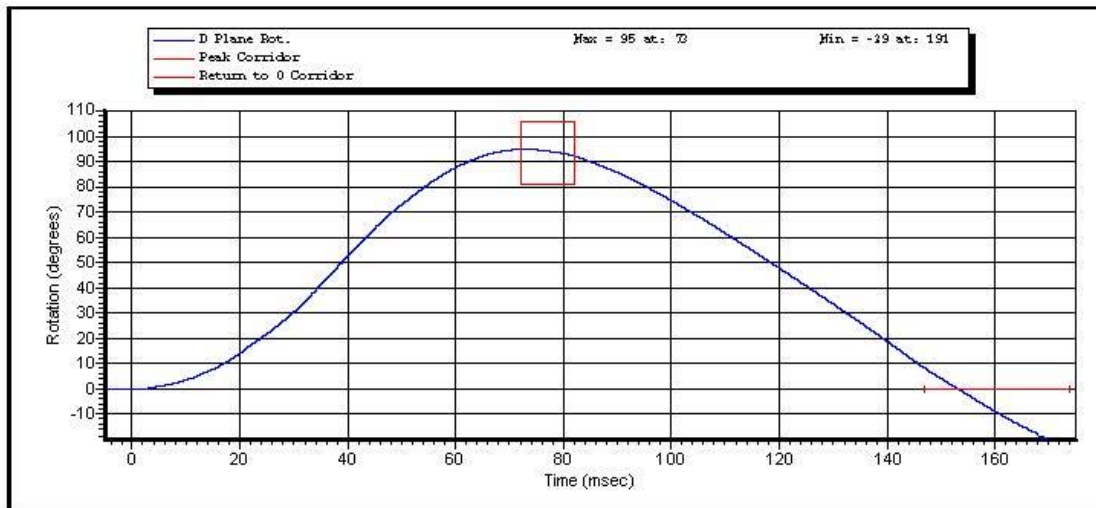
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Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



ID of Test: **Neck Extension** Time of Test: **11:47:31 AM**

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

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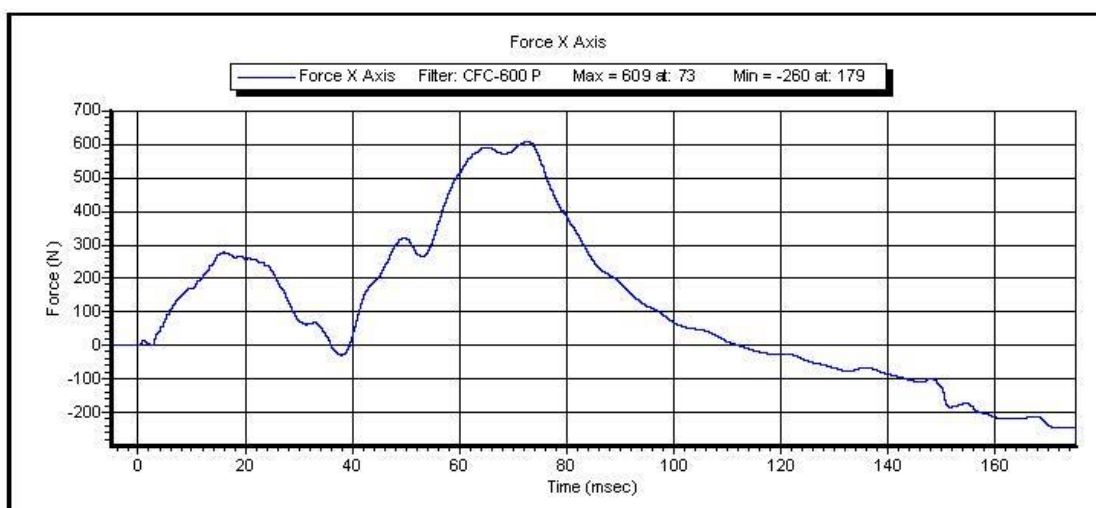
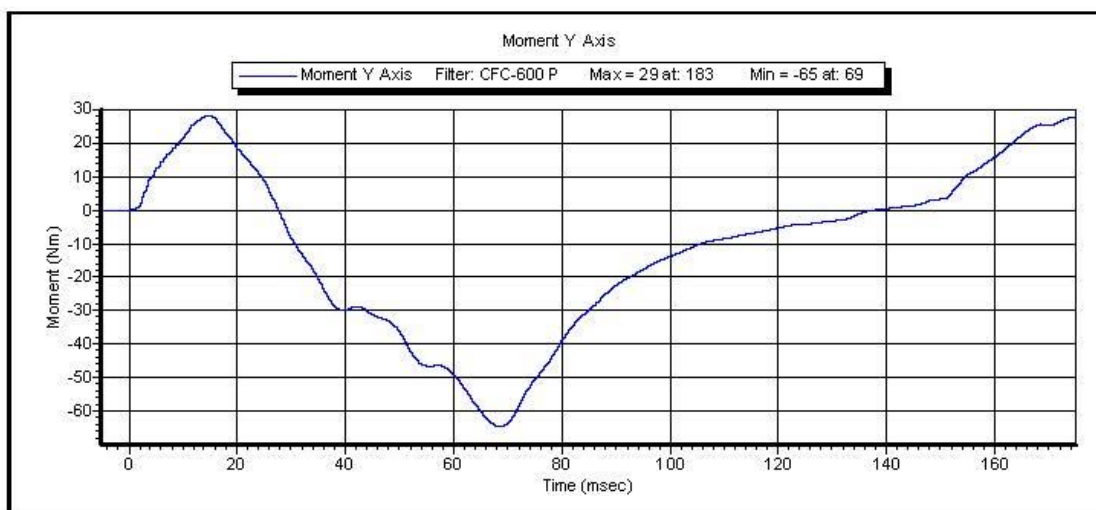


ID of Test: **Neck Extension**

Time of Test: **11:47:31 AM**

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

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ID of Test: **Neck Extension** Time of Test: **11:47:31 AM**

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

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:	11/12/2014
		Test Time:	9:41:39 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.60 deg C P
Humidity	10 -- 70	28.50 %RH P
Velocity	6.89 -- 7.13	6.934 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	24.03 G's P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	21.30 G's P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	15.33 G's P
Maximum Pendulum Deceleration After 30 ms	0 -- 29	15.3 G's P
Deceleration Time to 5 G's	34 -- 42	37.9 ms P
D Plane Rotation	-78 -- -64	-64.8 degrees P
Time at Maximum Rotation	57 -- 64	58.7 ms P
Rotation Decay to Zero	113 -- 128	116.3 ms P
Moment About Occipital Condyle	88.1 -- 108.4	94.87 Nm P
Time at Maximum Moment	47 -- 58	51.2 ms P
Moment Decay to Zero	97.0 -- 107.0	98.7 ms P

All test parameters are within specifications

Technician: **M. Goehle**

Supervisor: **M. Goehle**



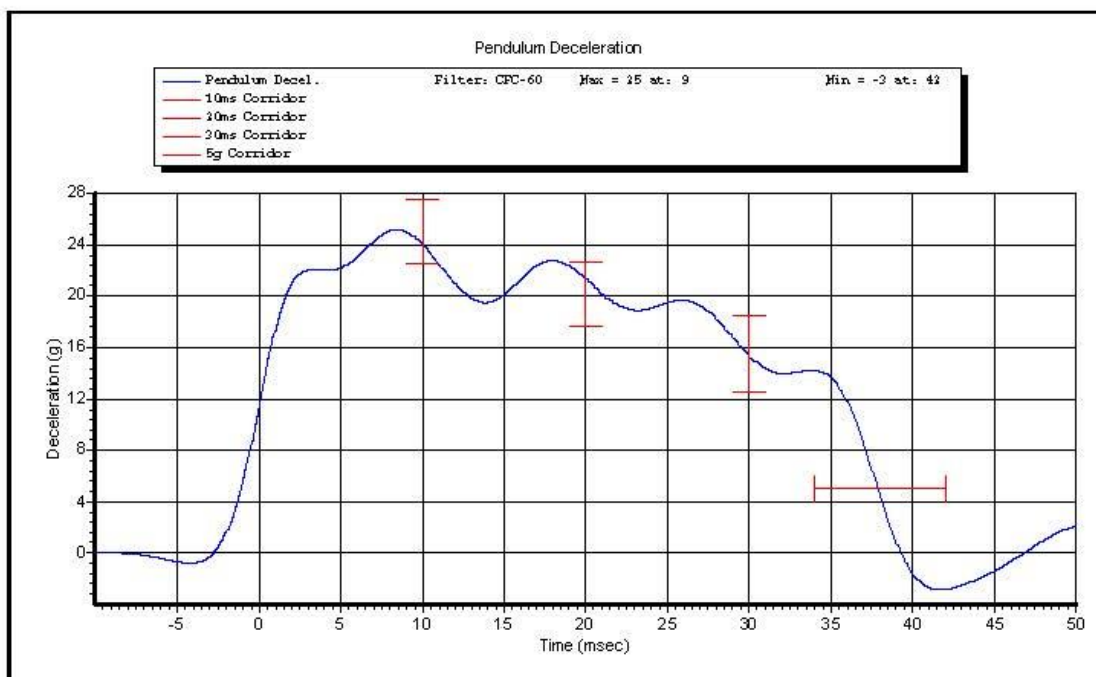
VERIFICATION REPORT

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

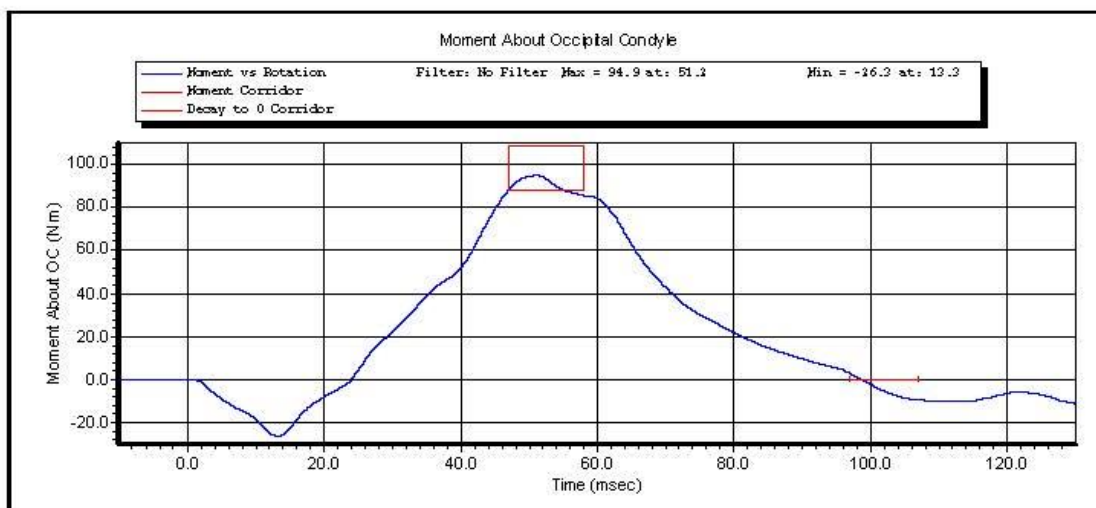
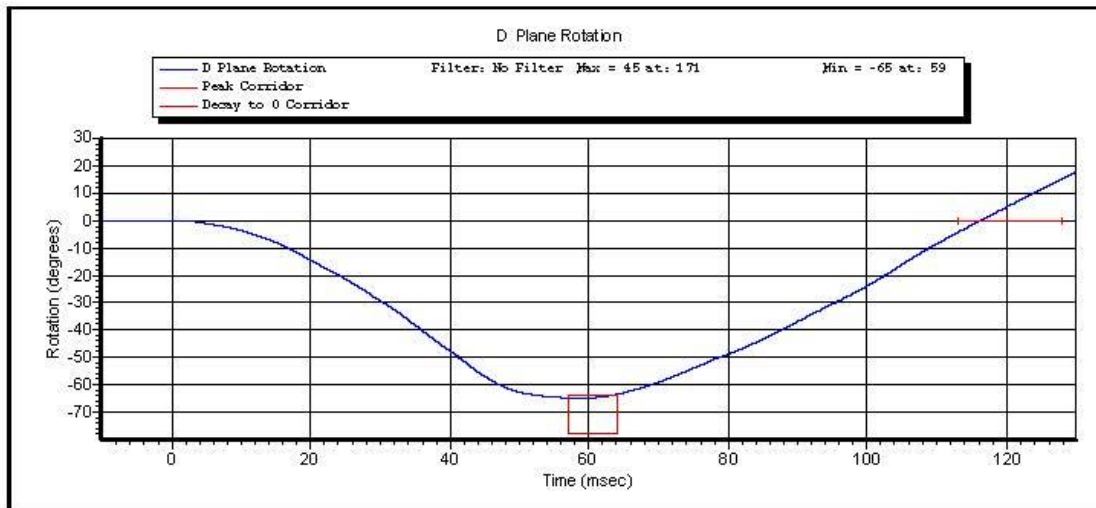


ID of Test: **Neck Flexion**

Time of Test: **9:41:39 AM**

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

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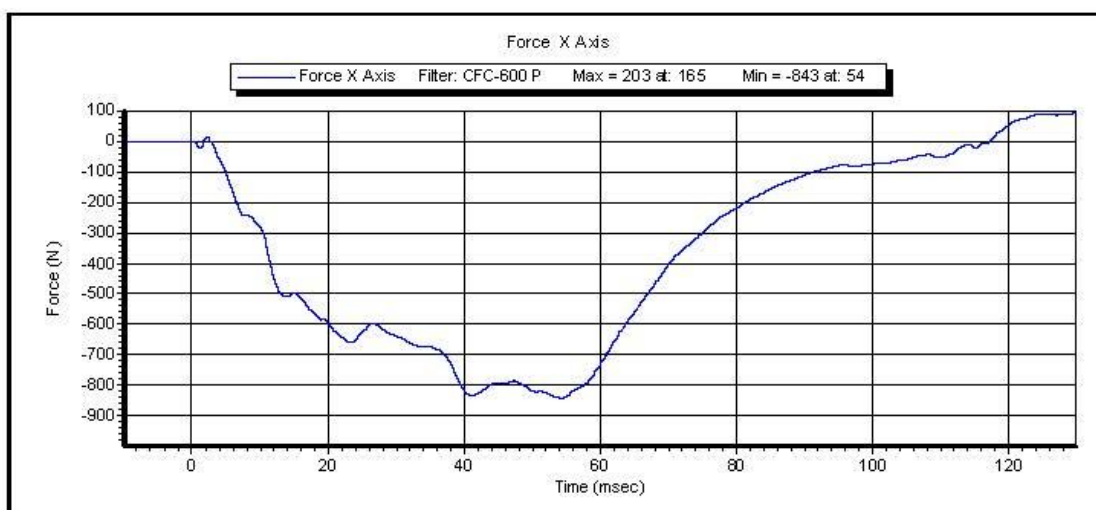
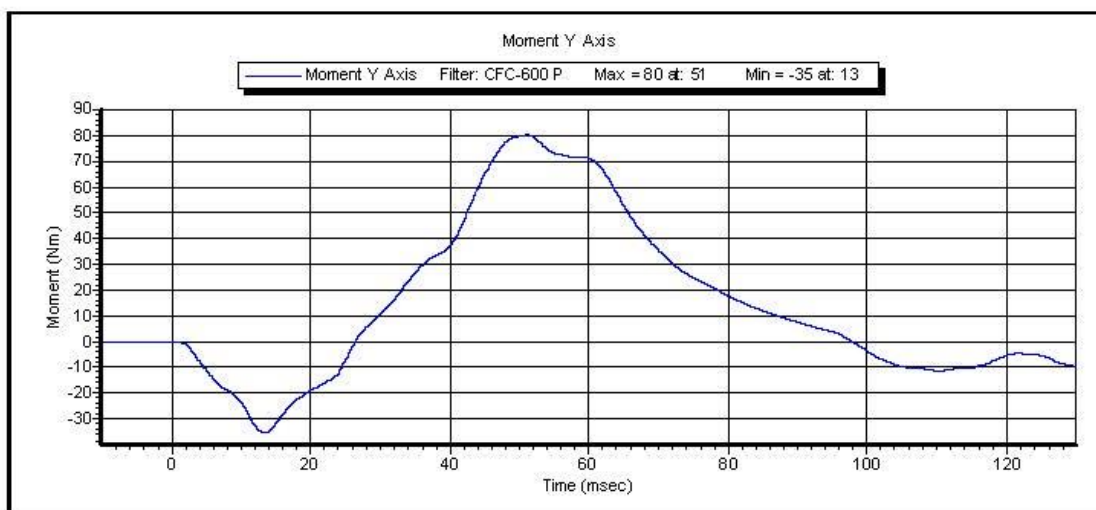


ID of Test: **Neck Flexion**

Time of Test: **9:41:39 AM**

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

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



ID of Test: **Neck Flexion**

Time of Test: **9:41:39 AM**

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

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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:	11/5/2014
		Test Time:	8:45:08 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.70 deg C	P
Humidity	10	--	70	34.90 %RH	P
Velocity	6.59	--	6.83	6.735 m/s	P
Chest Deflection	-72.6	--	-63.5	-66.43 mm	P
Resistive Force	-5.894	--	-5.160	-5.4657 kN	P
Hysteresis	69	--	85	72.5 %	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



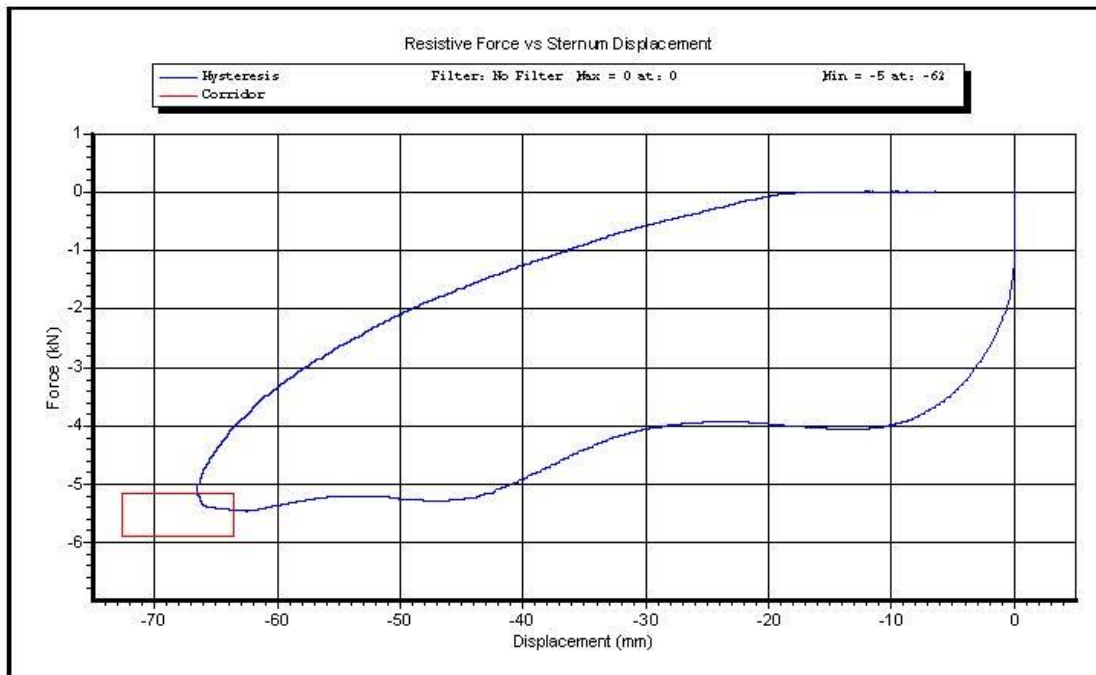
VERIFICATION REPORT

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 CBI-2897	DS-1046	7/31/2014

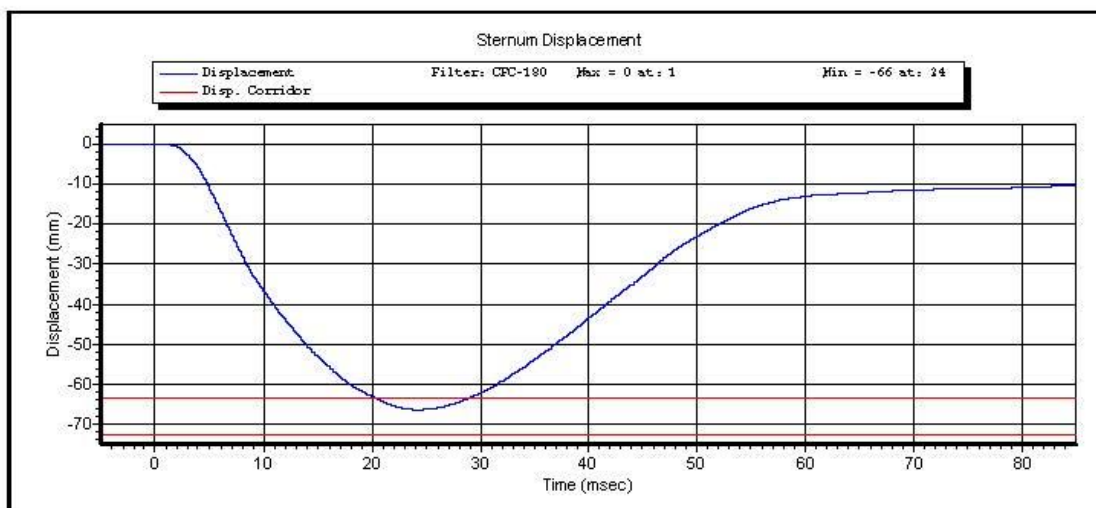


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Thorax Impact** Test Time: **8:45:08 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **11/5/2014**

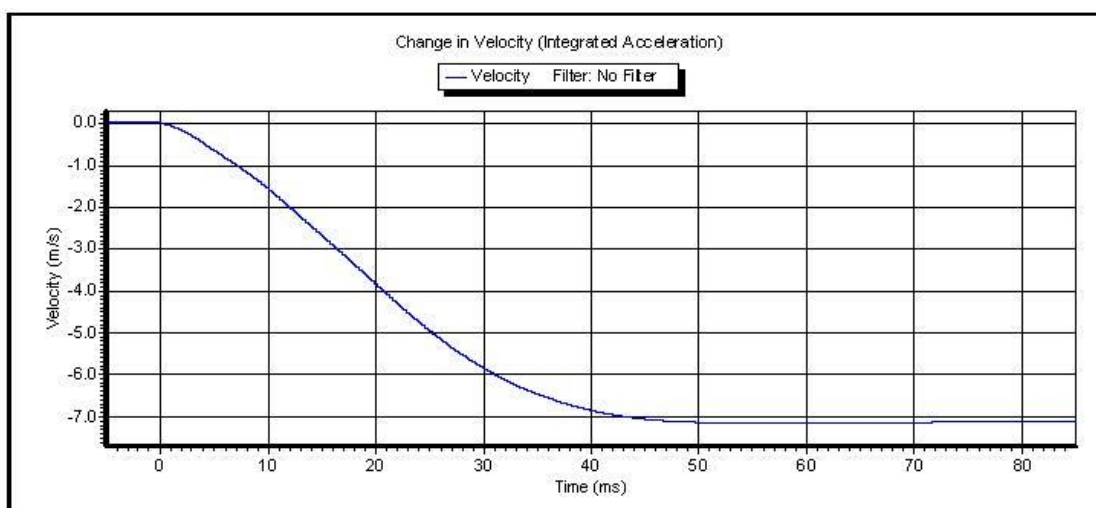
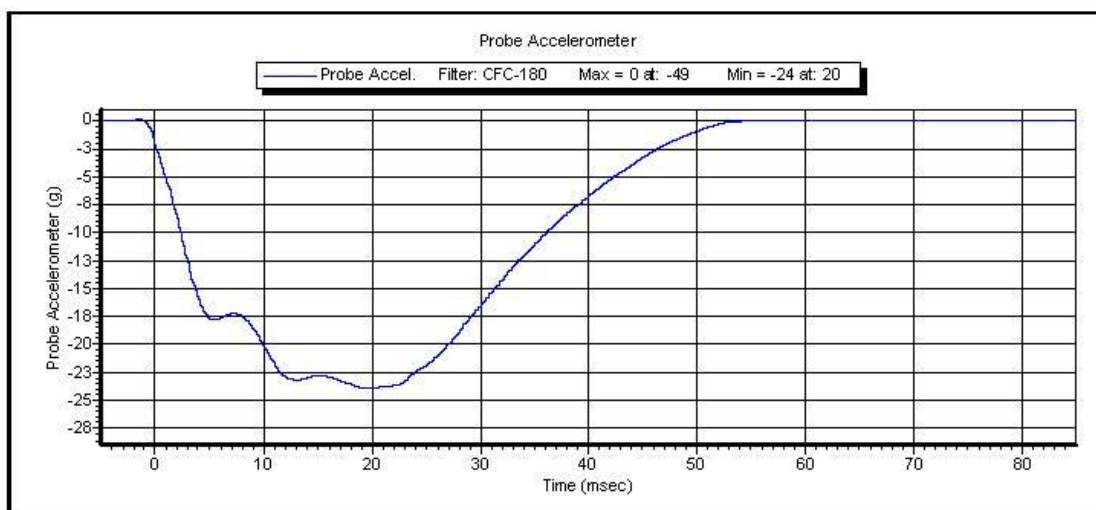


Test ID: **Thorax Impact**

Test Time: **8:45:08 AM**

Test Date: **11/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Thorax Impact**

Test Time: **8:45:08 AM**

Test Date: **11/5/2014**

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 Left	Test Date:	11/5/2014
		Test Time:	12:23:55 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.70 deg C	P
Humidity	10	--	70	36.10 %RH	P
Average Velocity	5	--	10	7.1 deg/s	P
Angle at 203 Nm	40	--	50	40.9 degrees	P
Moment at 30 degrees	0.0	--	94.9	91.67 Nm	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

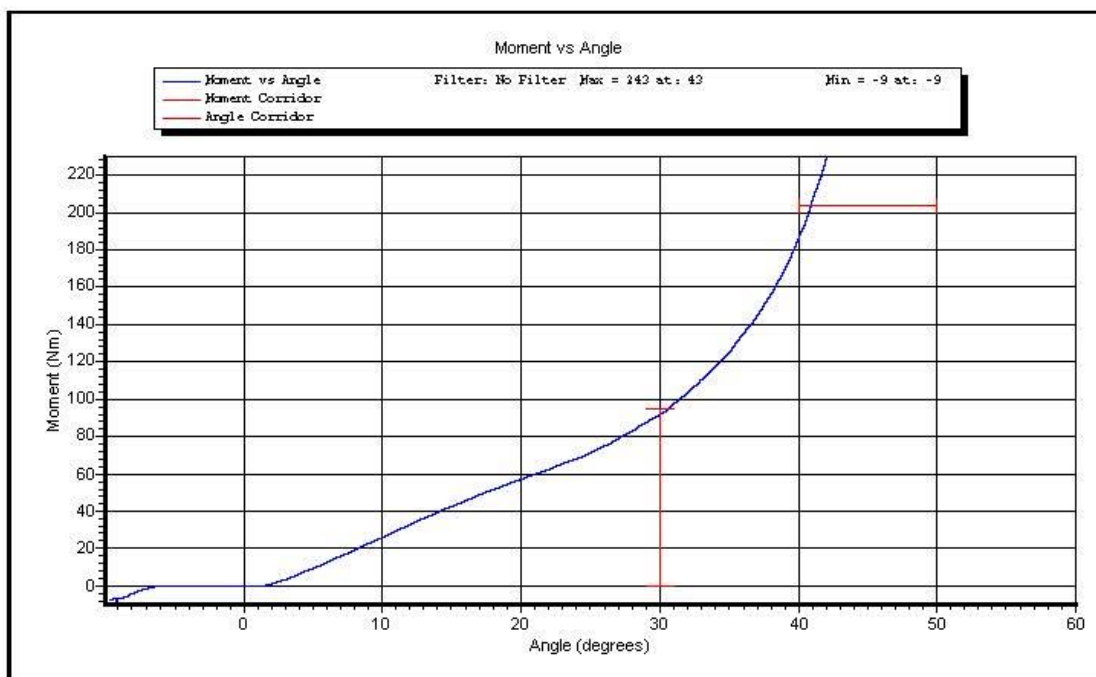
REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
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: 12:23:55 PM

Test Date: 11/5/2014

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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 Right	Test Date:	11/6/2014
		Test Time:	9:56:49 AM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	21.50 deg C	P
Humidity	10	--	70	32.00 %RH	P
Average Velocity	5	--	10	6.4 deg/s	P
Angle at 203 Nm	40	--	50	40.3 degrees	P
Moment at 30 degrees	0.0	--	94.9	80.68 Nm	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



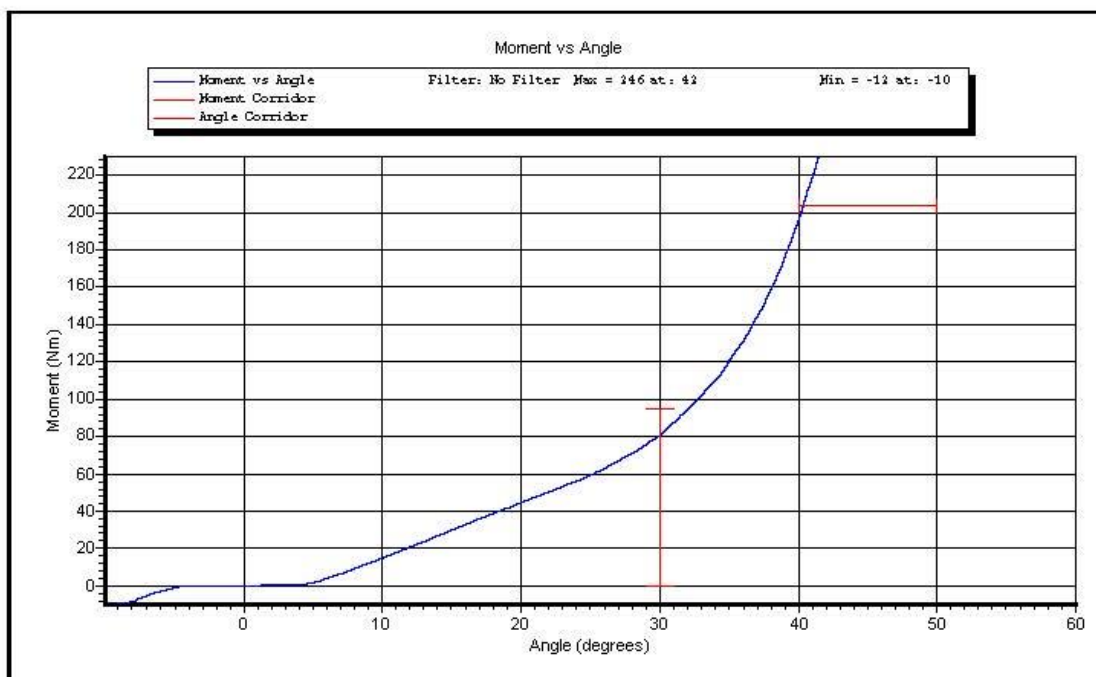
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
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: **9:56:49 AM**

Test Date: **11/6/2014**

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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:	11/5/2014
		Test Time:	9:27:07 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.70 deg C P
Humidity	10 -- 70	35.80 %RH P
Velocity	2.07 -- 2.13	2.103 m/s P
Resistive Force	-5.780 -- -4.720	-5.657 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

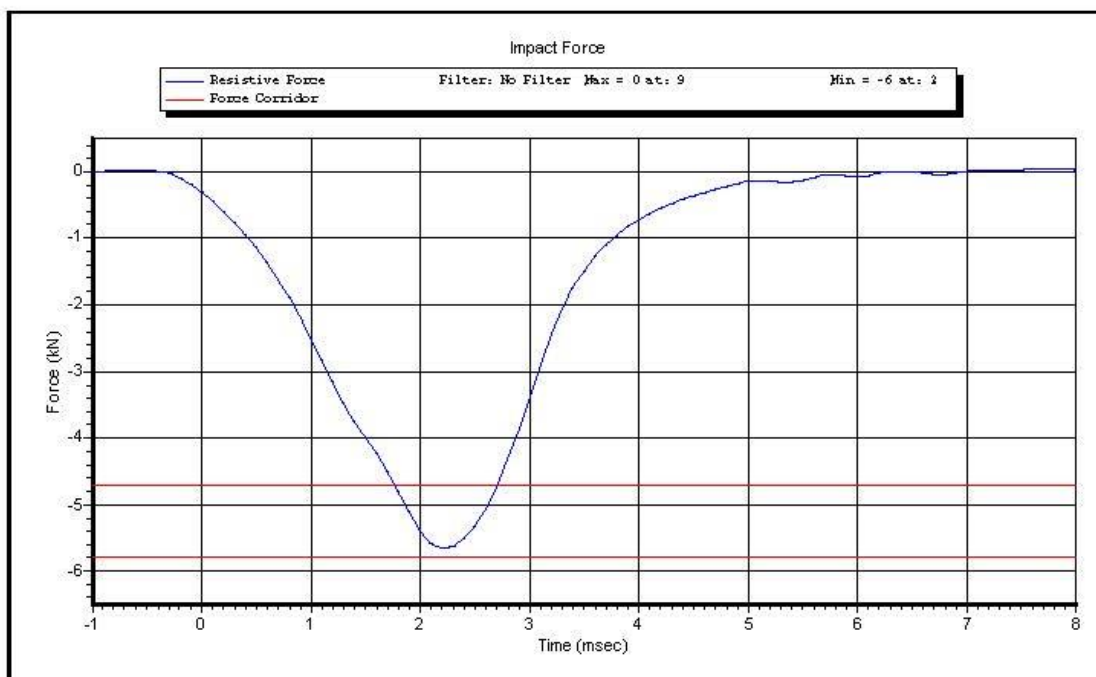
REFERENCE EQUIPMENT

<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

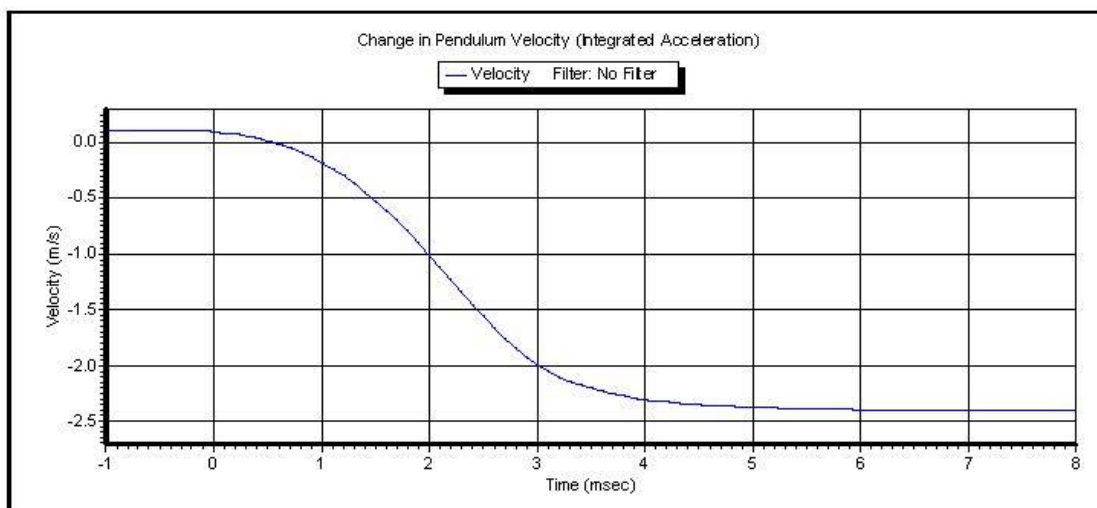
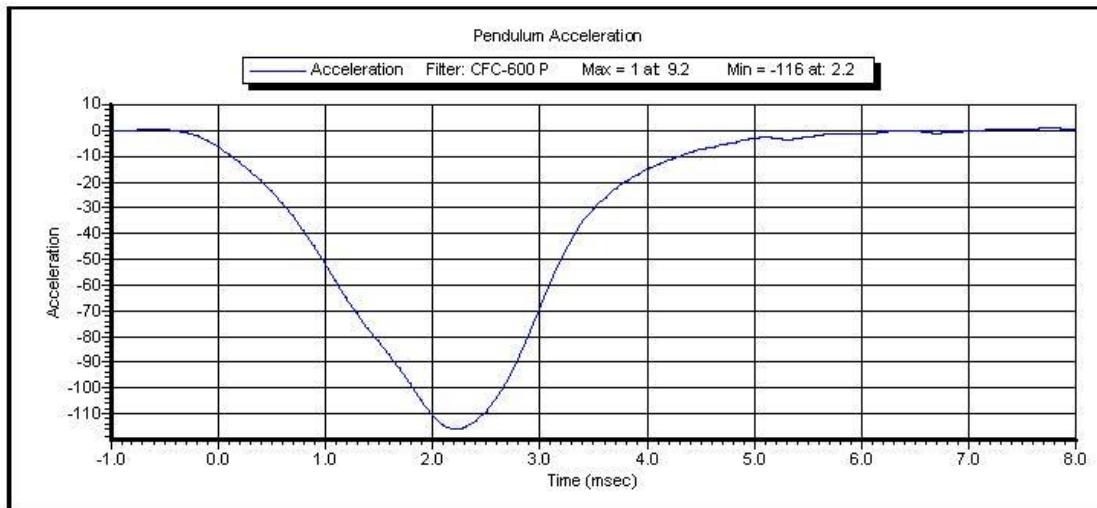


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact Left** Test Time: **9:27:07 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **11/5/2014**



Test ID: **Knee Impact Left** Test Time: **9:27:07 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **11/5/2014**



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:	11/5/2014
		Test Time:	9:30:52 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.80 deg C P
Humidity	10 -- 70	35.90 %RH P
Velocity	2.07 -- 2.13	2.101 m/s P
Resistive Force	-5.780 -- -4.720	-5.502 kN P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

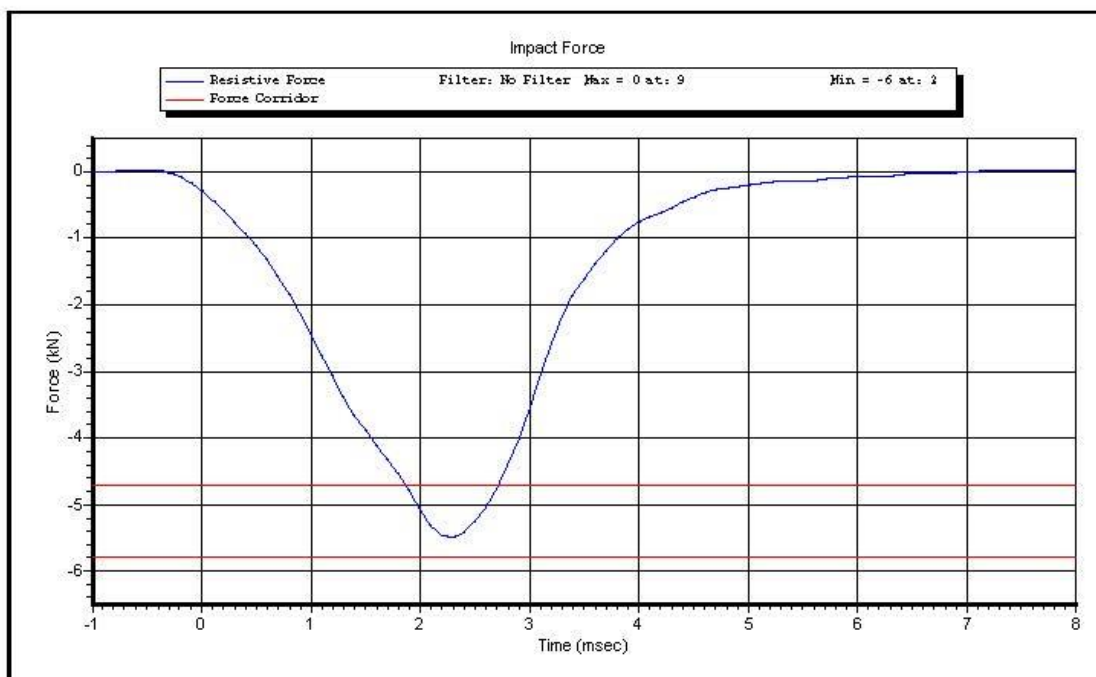
REFERENCE EQUIPMENT

<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

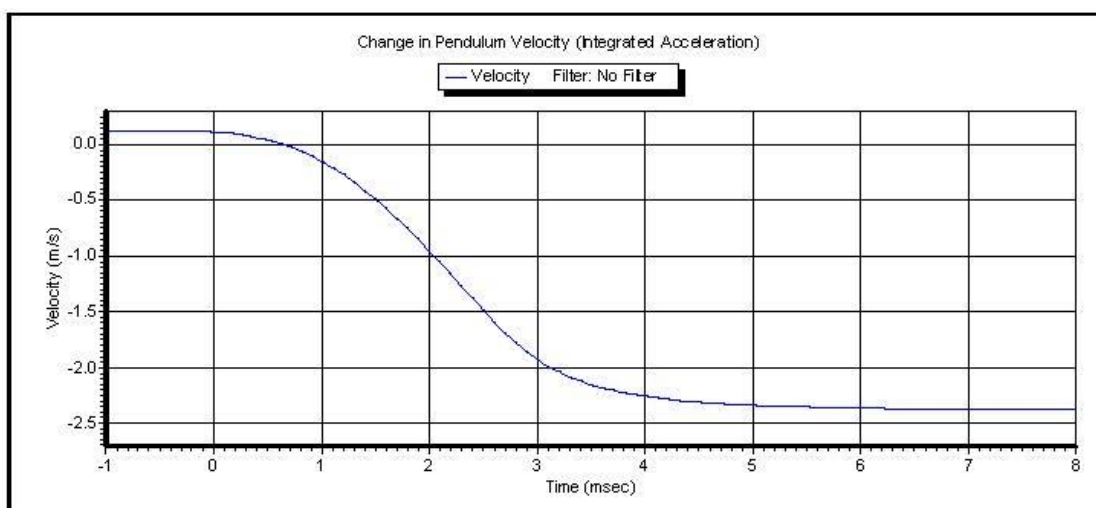
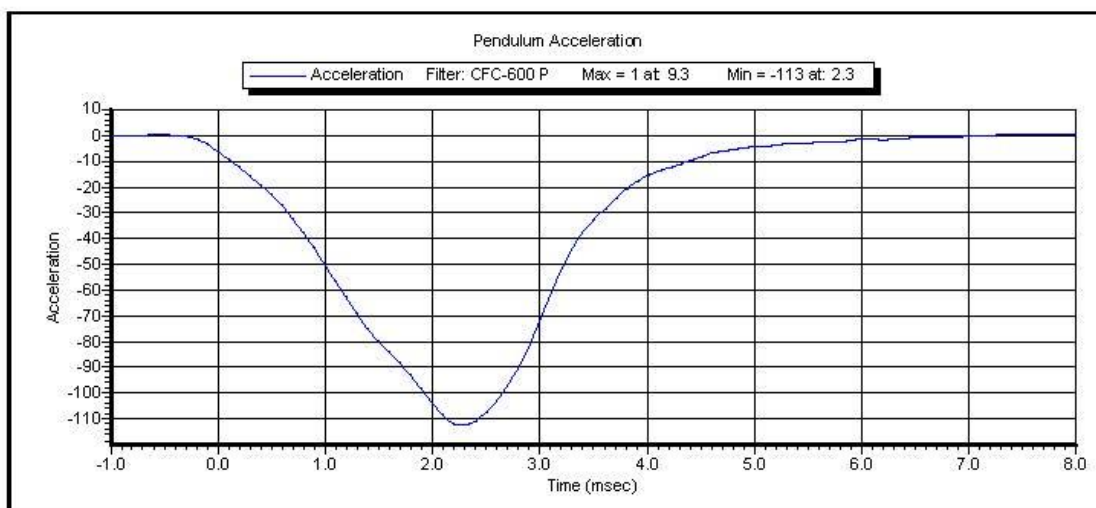


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact Right** Test Time: **9:30:52 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **11/5/2014**



Test ID: **Knee Impact Right** Test Time: **9:30:52 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **11/5/2014**

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 139



External Measurements

5th Female SN 139

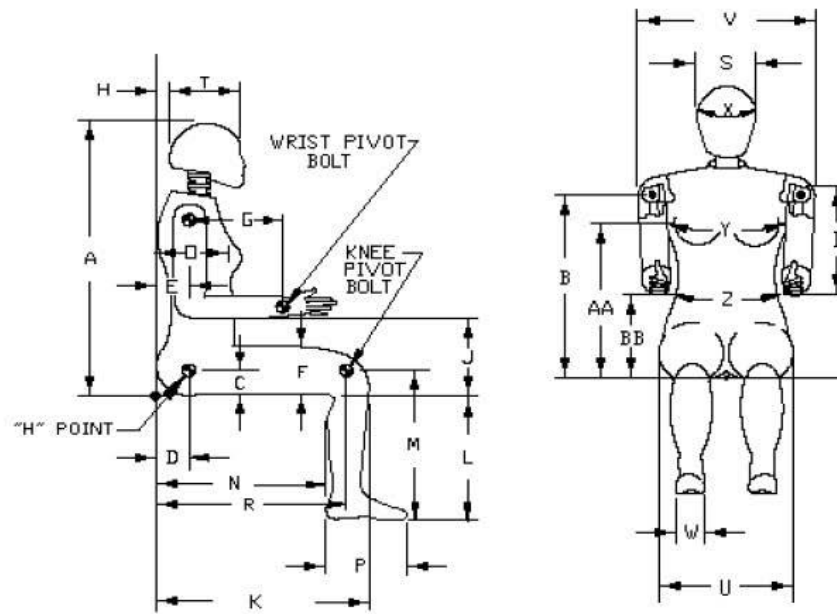
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	790	Yes
B	Shoulder Pivot Height	431.8 – 457.2	446	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	74	Yes
F	Thigh Clearance	119.4 – 134.6	123	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	247	Yes
H	Head Back to Backline	43.2 – 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	290	Yes
J	Elbow Rest Height	182.8 – 203.2	187	Yes
K	Buttock to Knee Length	520.7 – 546.1	541	Yes
L	Popliteal Height	355.6 – 376	362	Yes
M	Knee Pivot Height	393.7 – 419.1	398	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	141	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	82	Yes
X	Head Circumference	528.3 – 548.7	535	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	852	Yes
Z	Waist Circumference	759.5 – 789.9	773	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: 11/17/2014

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:	11/17/2014
		Test Time:	4:17:13 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.60 deg C P
Humidity	10 -- 70	27.90 %RH P
Resultant Acceleration	250 -- 300	253.9 G's P
Oscillation	0 -- 10	1.3 % P
Lateral Acceleration	-15 -- 15	14.2 G's P

All test parameters are within specifications

Technician: M. Geesey

Supervisor: M. Goehle



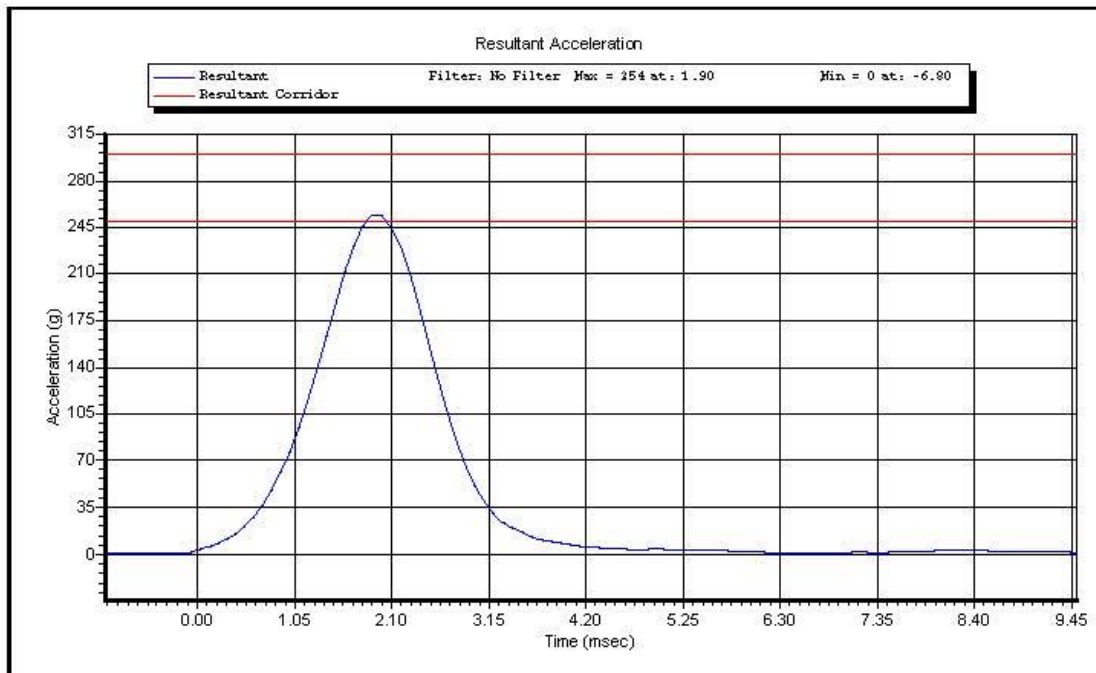
VERIFICATION REPORT

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

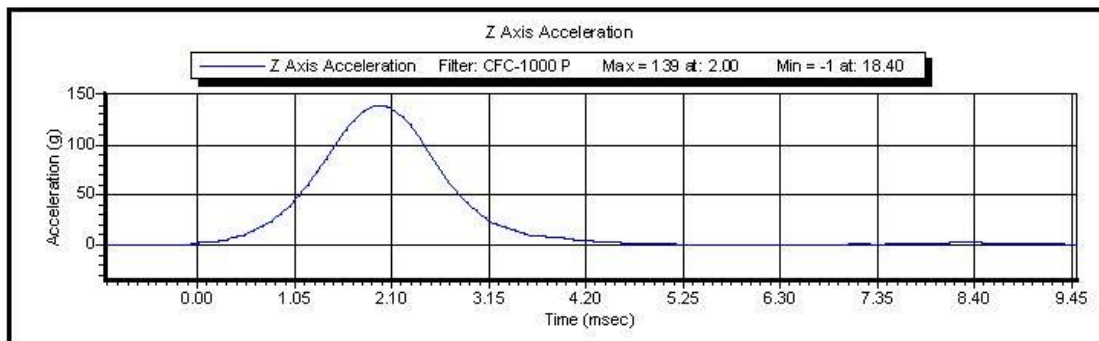
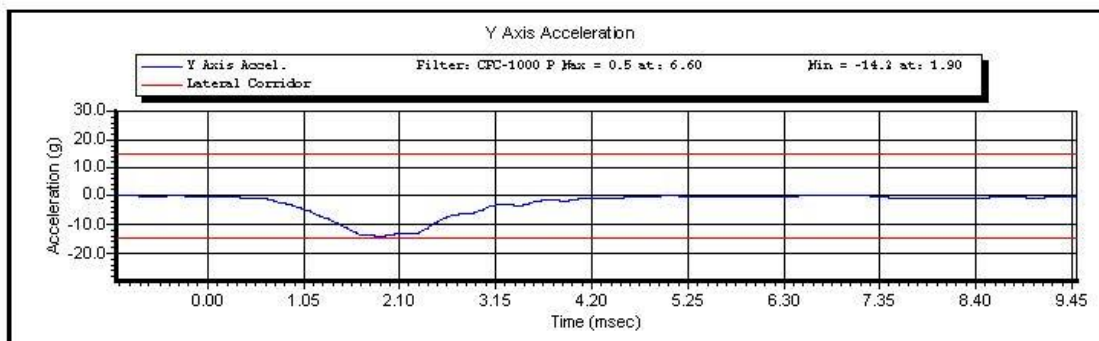
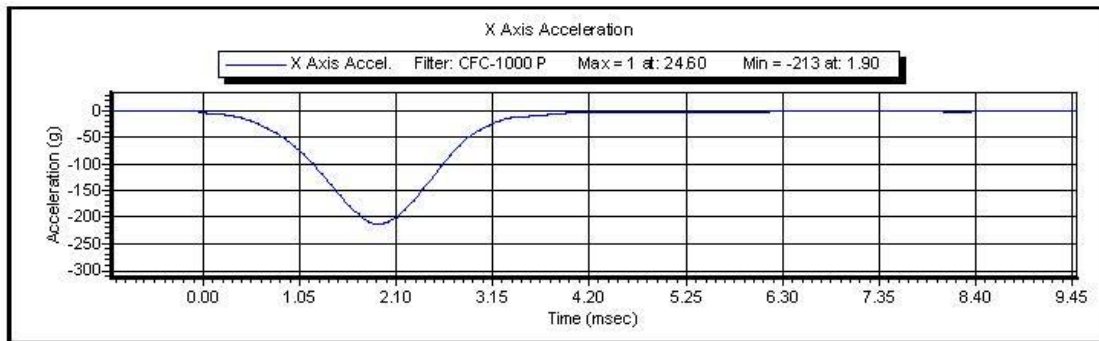


Test ID: **Head Drop**

Test Time: **4:17:13 PM**

Test Date: **11/17/2014**

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Test ID: **Head Drop**

Test Time: **4:17:13 PM**

Test Date: **11/17/2014**

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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:	11/17/2014
		Test Time:	1:11:03 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.70 deg C P
Humidity	10 -- 70	23.70 %RH P
Velocity	5.95 -- 6.19	6.002 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.82 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.62 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	5.28 m/s P
D Plane Rotation	99 -- 114	108.3 degrees P
Moment During Rotation Interval	-65 -- -53	-56.6 Nm P
Moment Decay to -10.0 Nm	94 -- 114	102.1 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



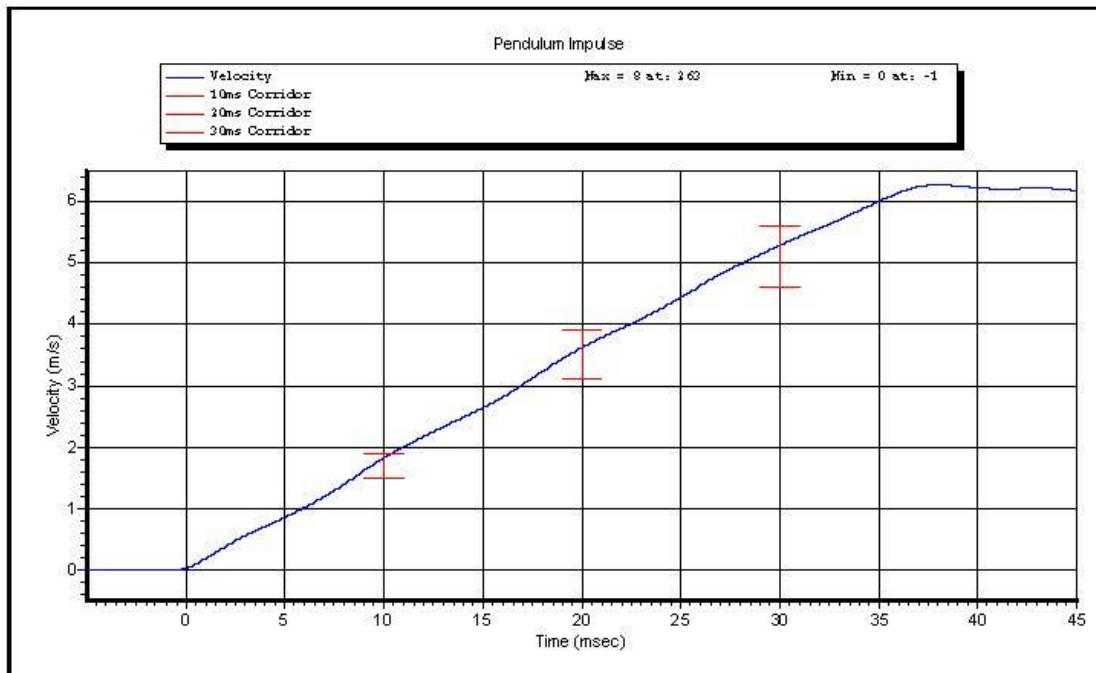
VERIFICATION REPORT

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



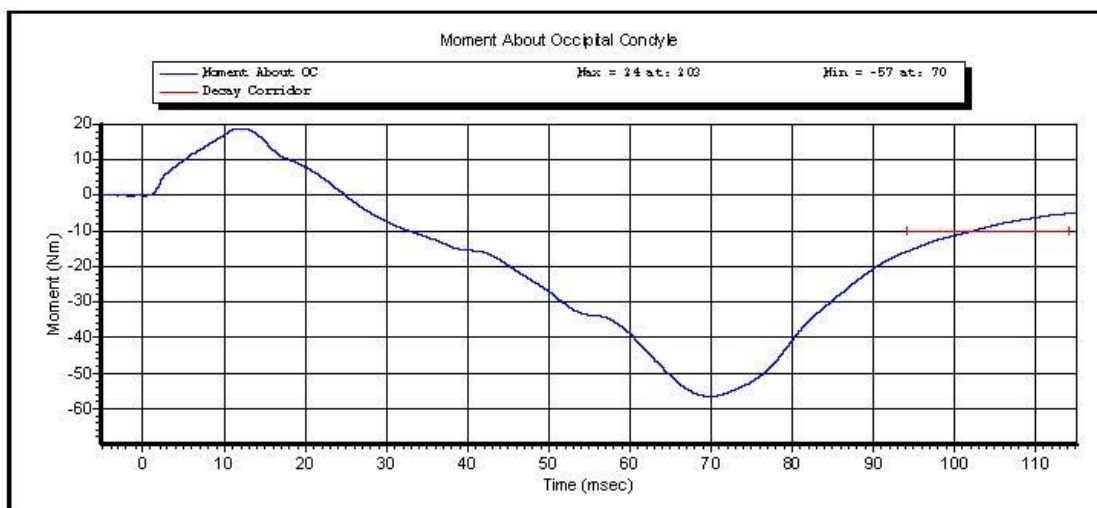
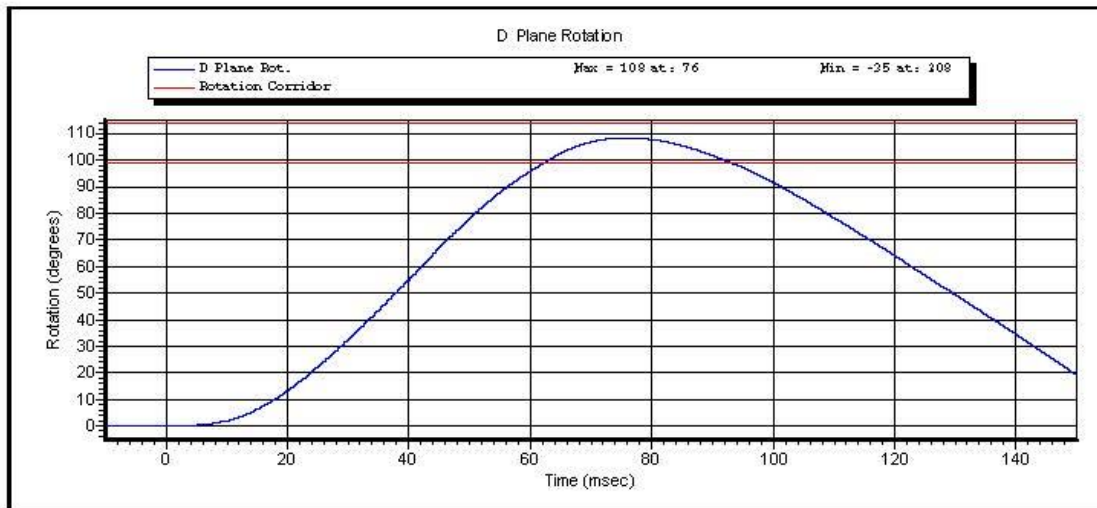
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Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Neck Extension Test Time: 1:11:03 PM

Test Date: 11/17/2014

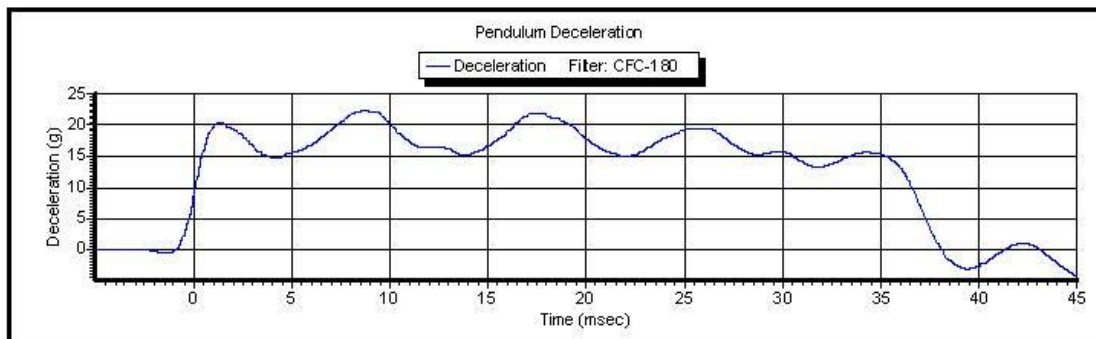
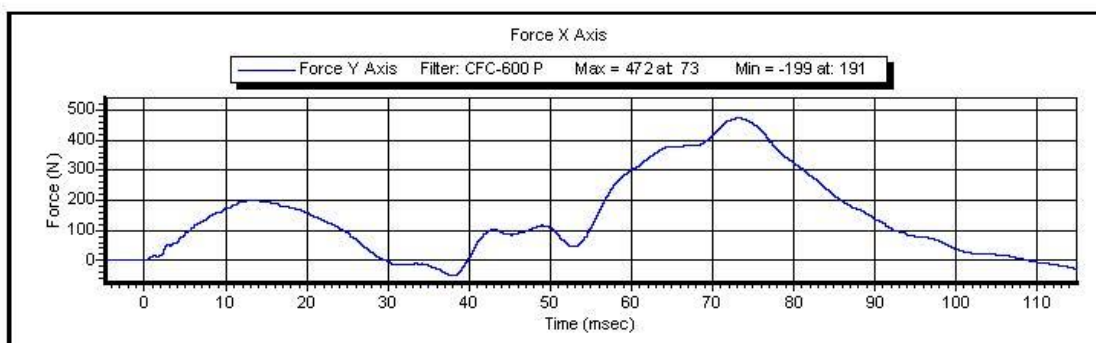
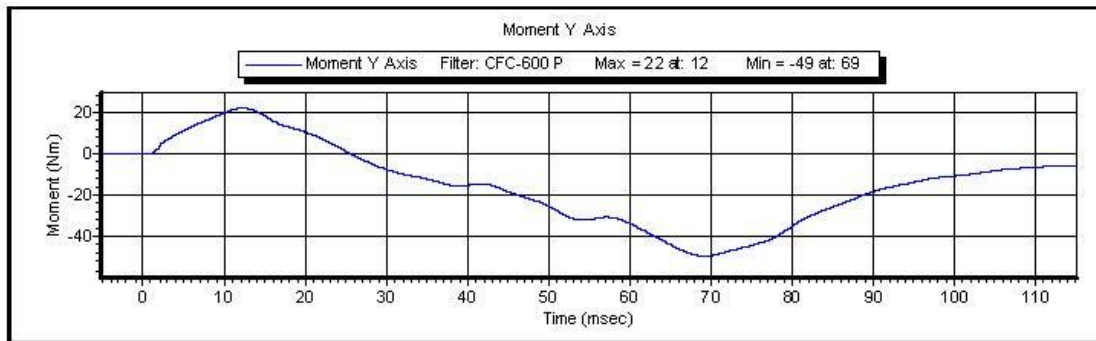
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **1:11:03 PM**

Test Date: **11/17/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



Test ID: **Neck Extension** Test Time: **1:11:03 PM**

Test Date: **11/17/2014**

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:	11/17/2014
		Test Time:	3:08:56 PM

Test Parameters	Test Specifications	Test Results
Temperature	21 -- 22	21.50 deg C P
Humidity	10 -- 70	27.70 %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	6.74 m/s P
D Plane Rotation	-91 -- -77	-84.7 degrees P
Moment During Rotation Interval	69 -- 83	78.2 Nm P
Moment Decay to 10.0 Nm	80 -- 100	87.3 ms P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



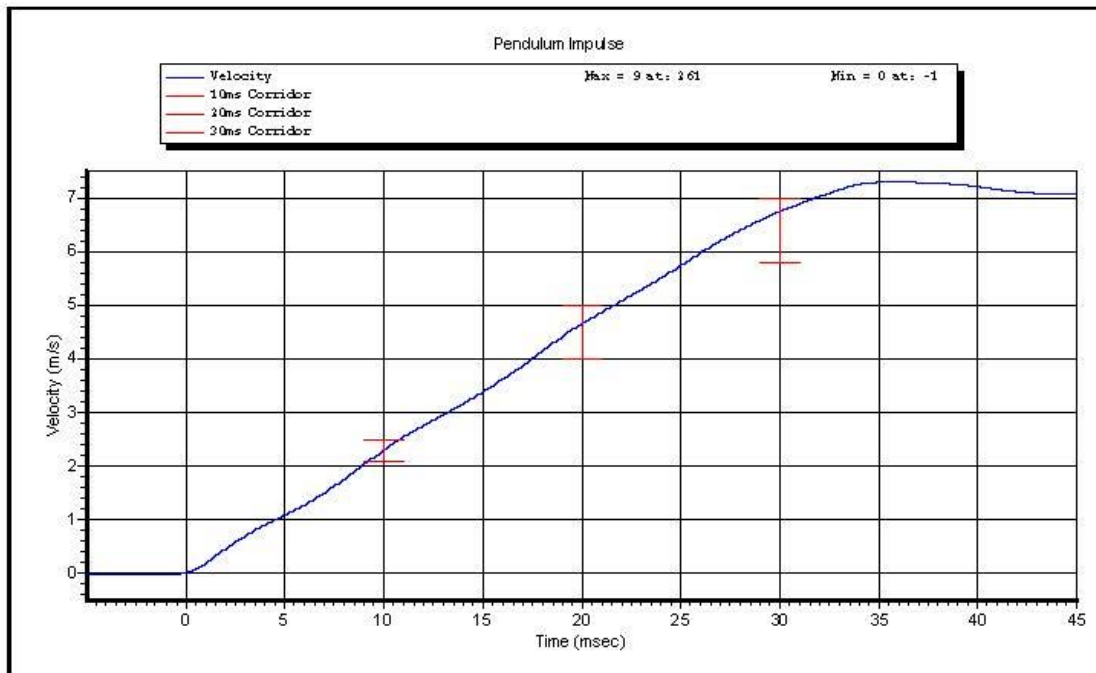
VERIFICATION REPORT

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



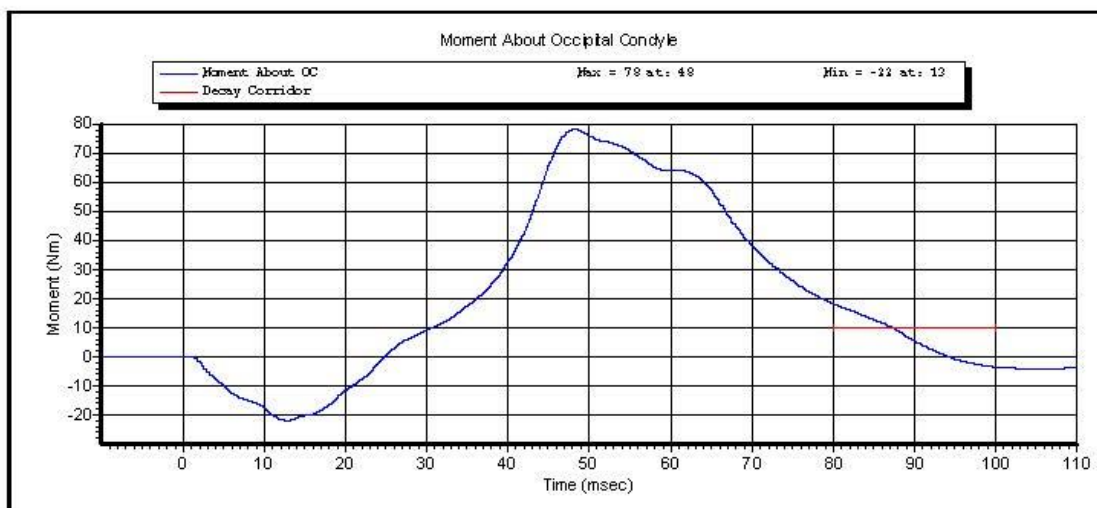
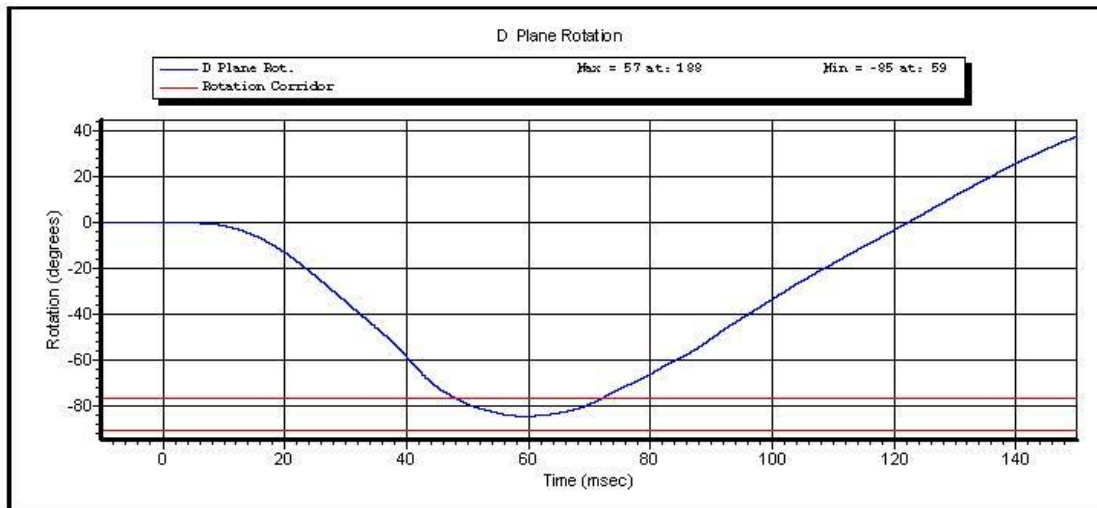
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Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Neck Flexion Test Time: 3:08:56 PM

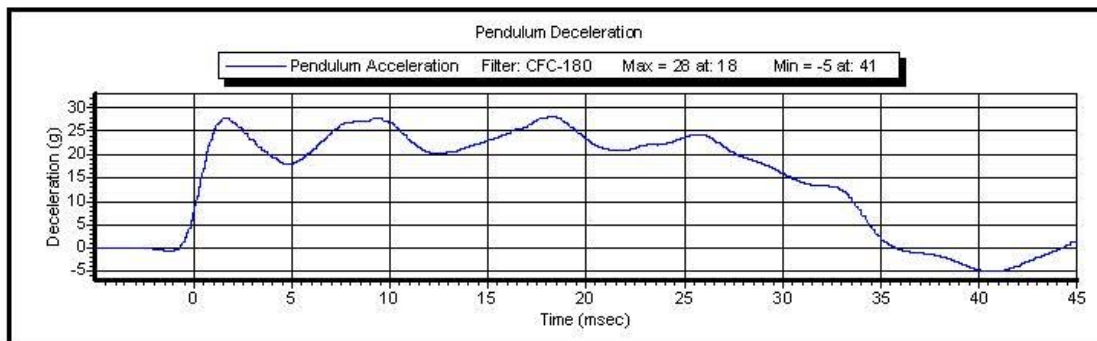
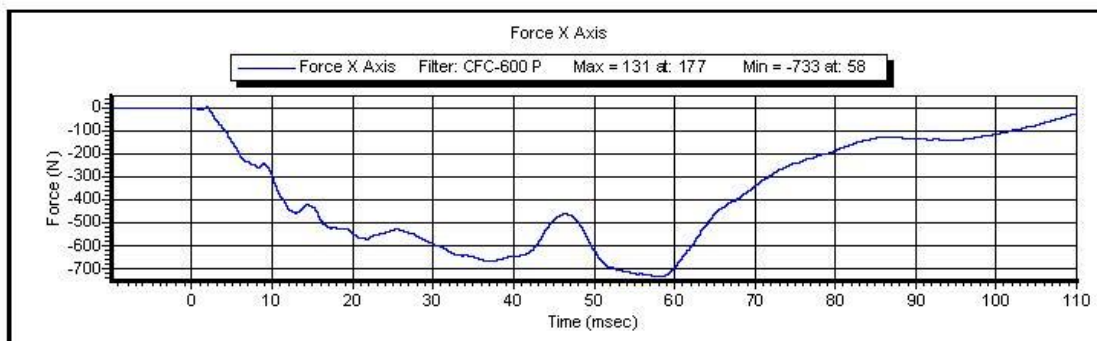
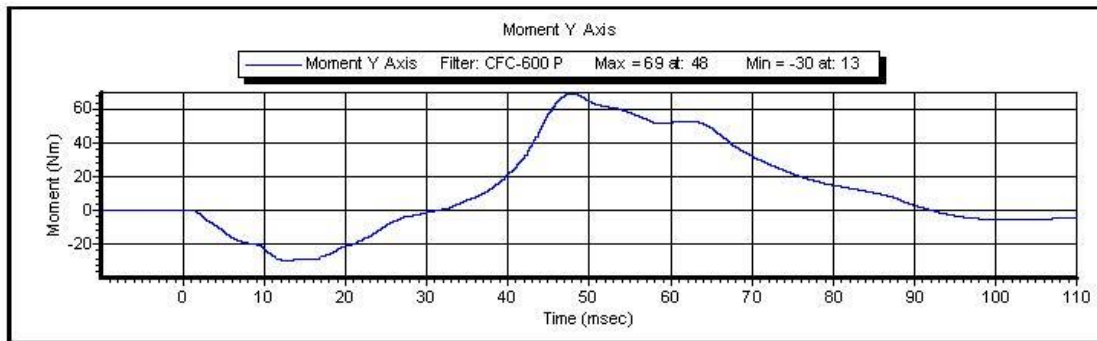
Test Date: 11/17/2014

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Test ID: **Neck Flexion** Test Time: **3:08:56 PM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Test Date: **11/17/2014**



Test ID: **Neck Flexion** Test Time: **3:08:56 PM**

Test Date: **11/17/2014**

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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:	11/17/2014
		Test Time:	10:53:38 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.60 deg C	P
Humidity	10	--	70	28.60 %RH	P
Velocity	6.59	--	6.83	6.776 m/s	P
Sternum Displacement	-58	--	-50	-56.7 mm	P
Force During Displacement Interval	-4400	--	-3900	-4194.8 N	P
Force During -18mm to -50mm Displacem	-4600	--	0	-4000.2 N	P
Hysteresis	69	--	85	71.1 %	P

All test parameters are within specifications

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



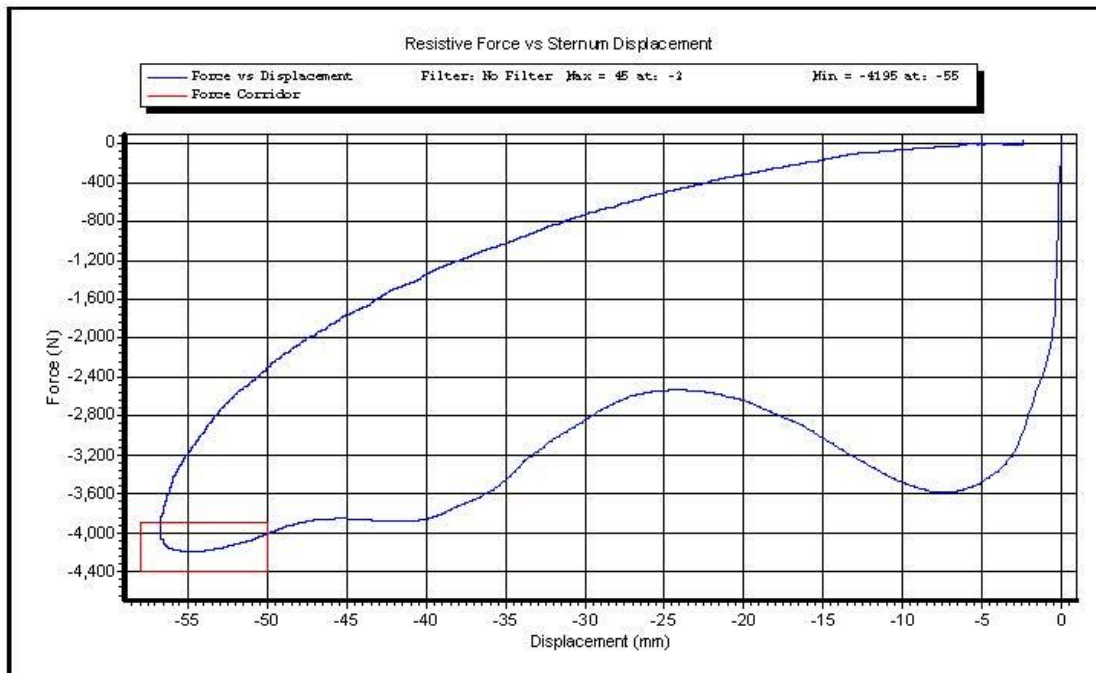
VERIFICATION REPORT

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



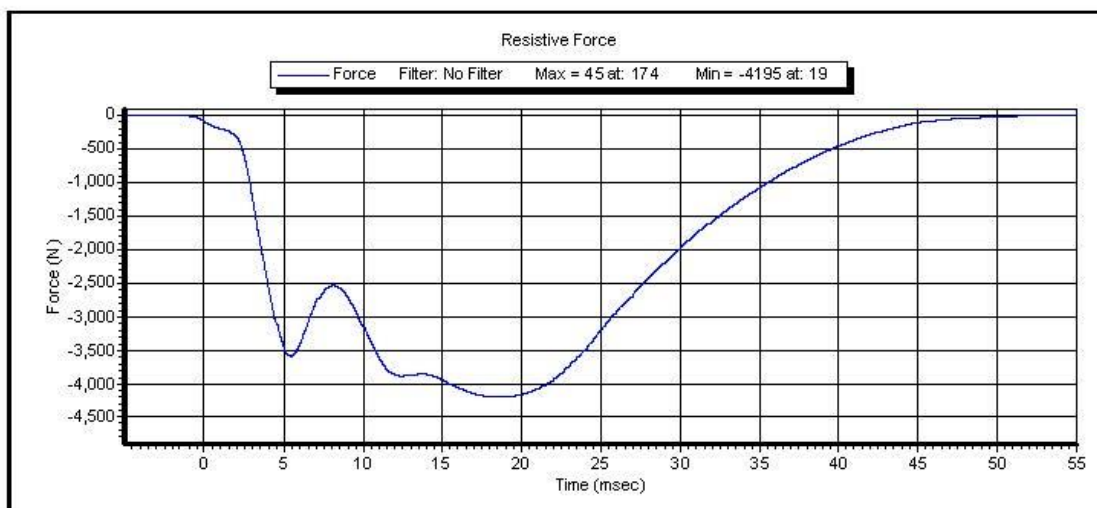
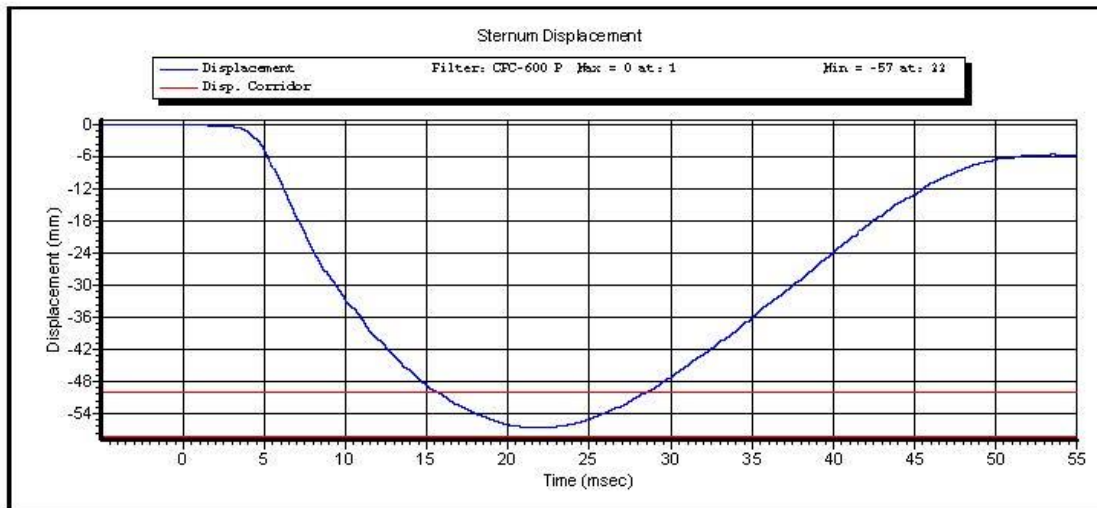
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Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: Thorax Impact Test Time: 10:53:38 AM

Test Date: 11/17/2014

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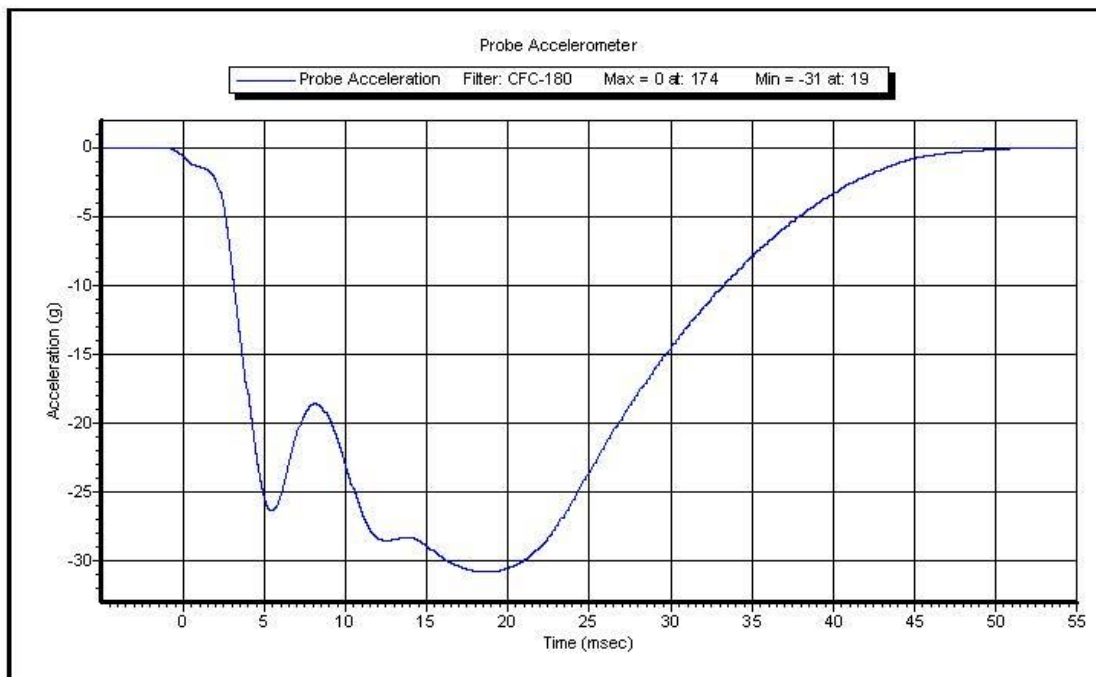


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Test Time: **10:53:38 AM**

Test Date: **11/17/2014**

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Test ID: **Thorax Impact**

Test Time: **10:53:38 AM**

Test Date: **11/17/2014**

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Torso Flexion

Part 572O HIII 5% Female

ATD Serial No: 139

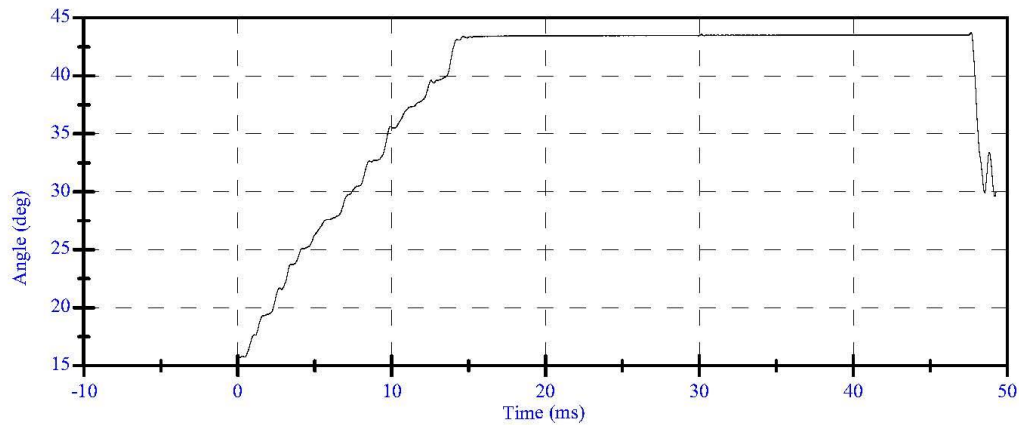
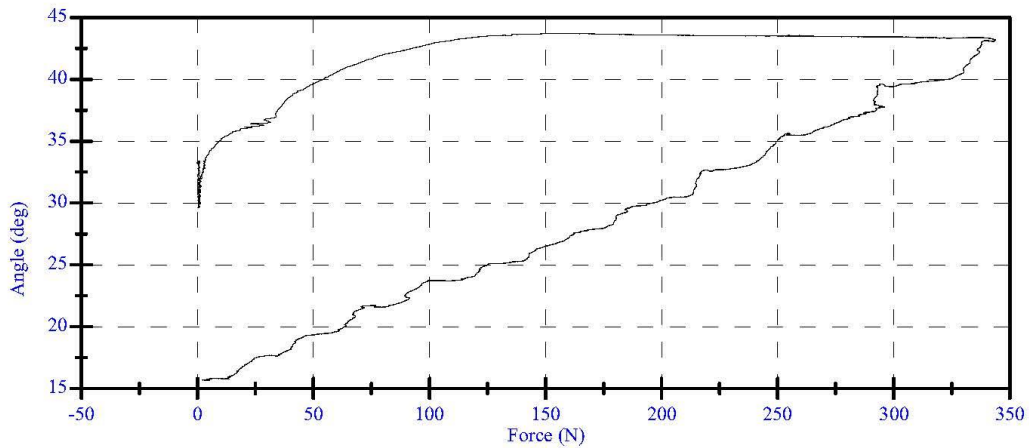
Laboratory Supervisor: M. Goehle

Date: 11/19/2014

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 %	15.3 %	Passed
Initial Angle:	0.00-20.00 Deg	14.9 Deg	Passed
Force at 45 Deg	320.00-390.00 N	344.04 N	Passed
Return Angle	8 Deg Max from Initial	22.3 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:	11/17/2014
		Test Time:	12:08:46 PM

Test Parameters	Test Specifications			Test Results	
Temperature	18.9	--	25.6	20.60 deg C	P
Humidity	10	--	70	28.90 %RH	P
Velocity	2.07	--	2.13	2.113 m/s	P
Resistive Force	-4060	--	-3450	-3830.4 N	P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

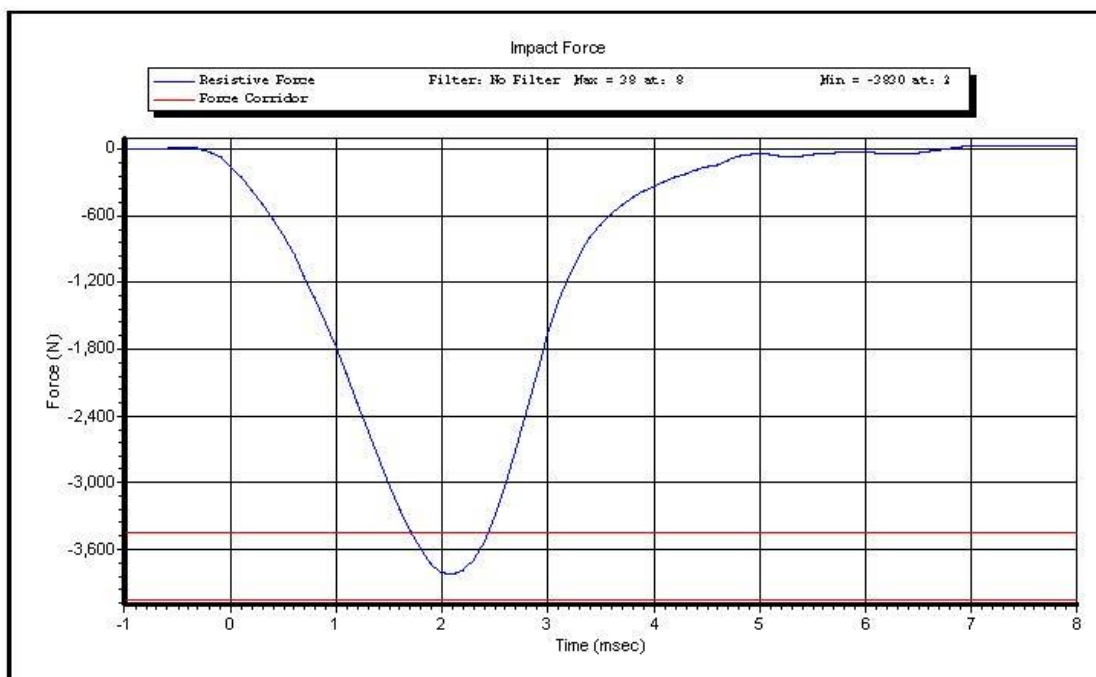
REFERENCE EQUIPMENT

<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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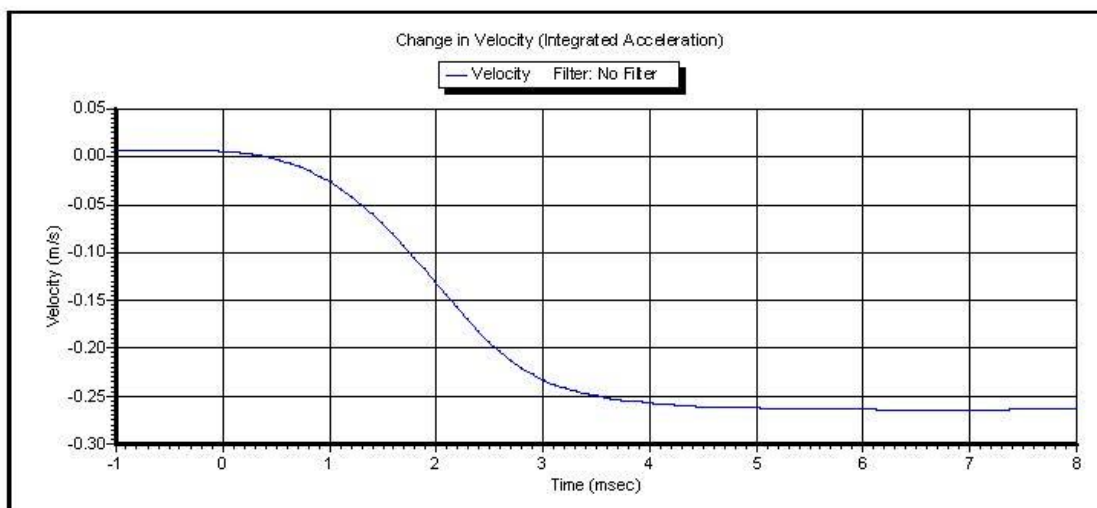
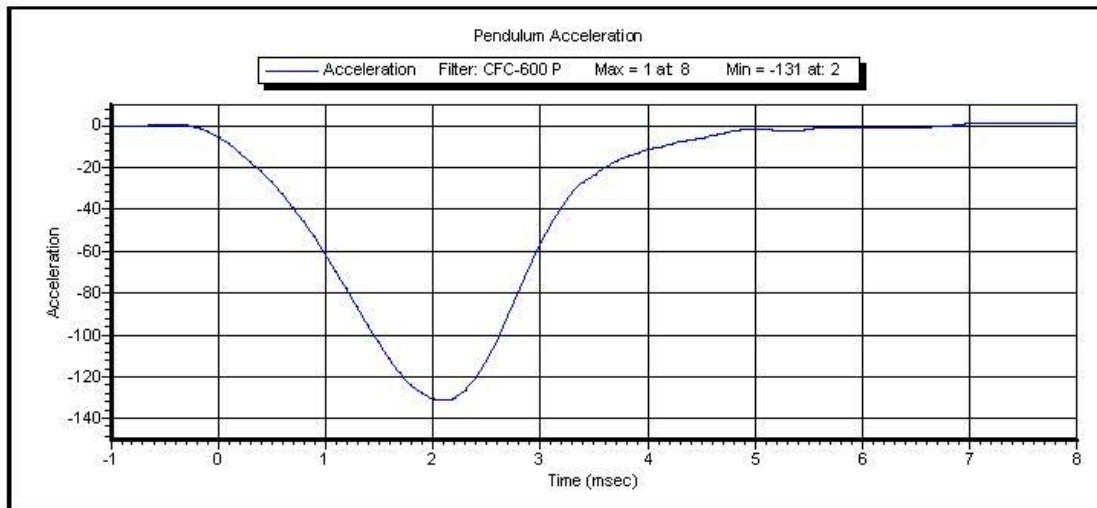


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Left** Test Time: **12:08:46 PM**
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Test Date: **11/17/2014**



Test ID: **Knee Impact Left** Test Time: **12:08:46 PM**

Test Date: **11/17/2014**

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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:	11/17/2014
		Test Time:	12:15:02 PM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	20.60 deg C P
Humidity	10 -- 70	28.90 %RH P
Velocity	2.07 -- 2.13	2.101 m/s P
Resistive Force	-4060 -- -3450	-3996.6 N P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **M. Goehle**



VERIFICATION REPORT

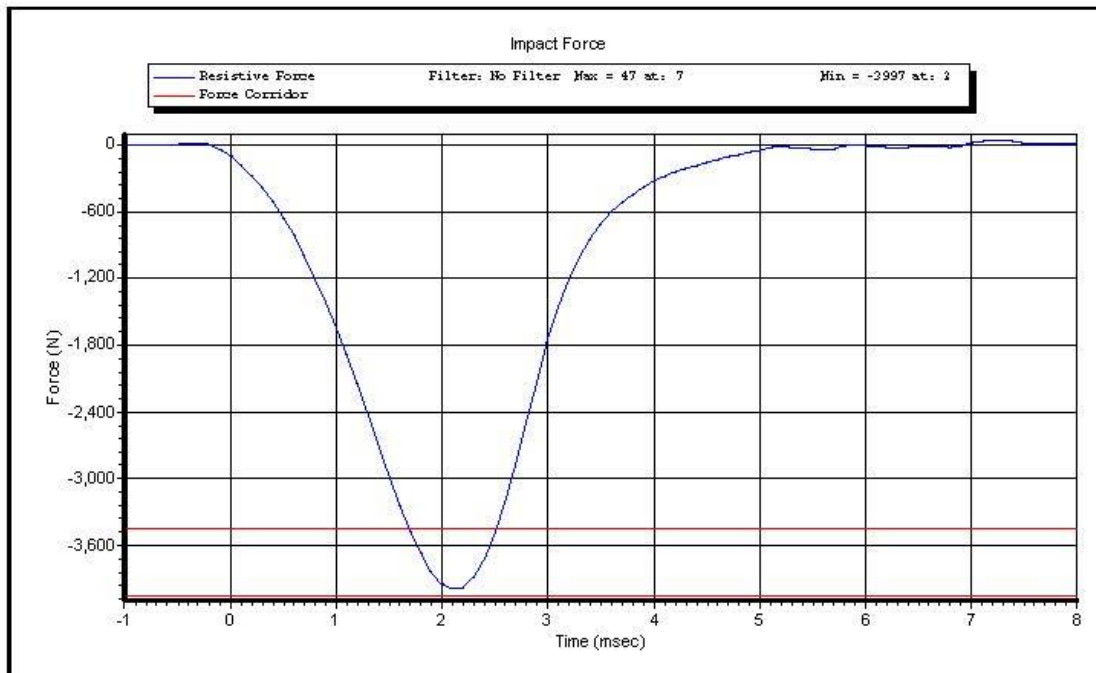
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<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
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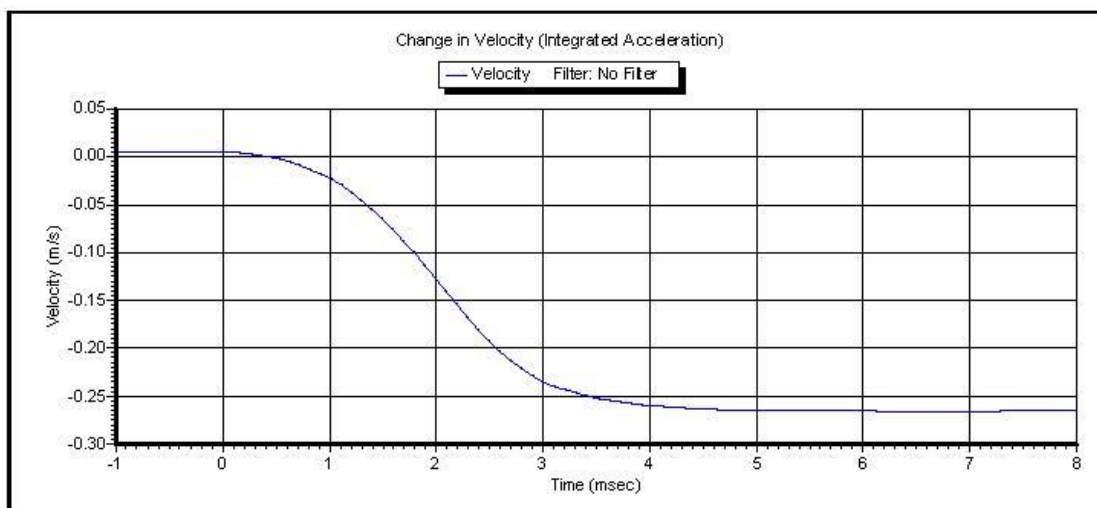
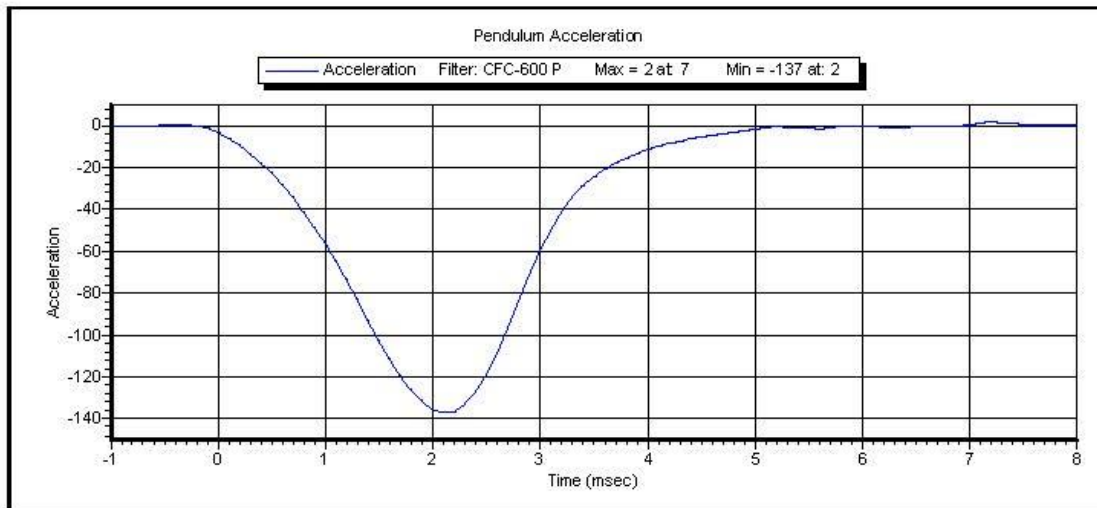


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Right** Test Time: **12:15:02 PM**
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Test Date: **11/17/2014**



Test ID: **Knee Impact Right** Test Time: **12:15:02 PM**

Test Date: **11/17/2014**

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CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 1046



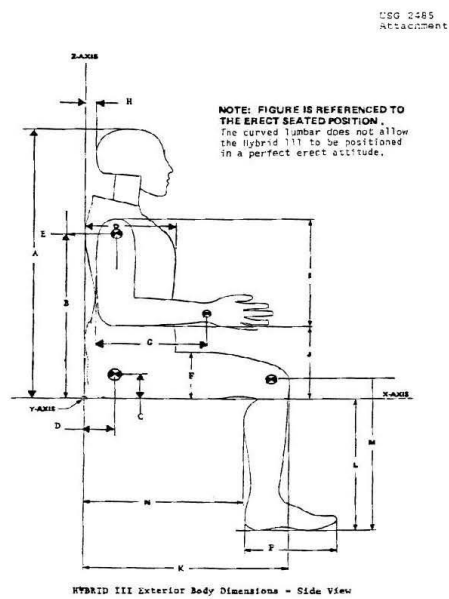
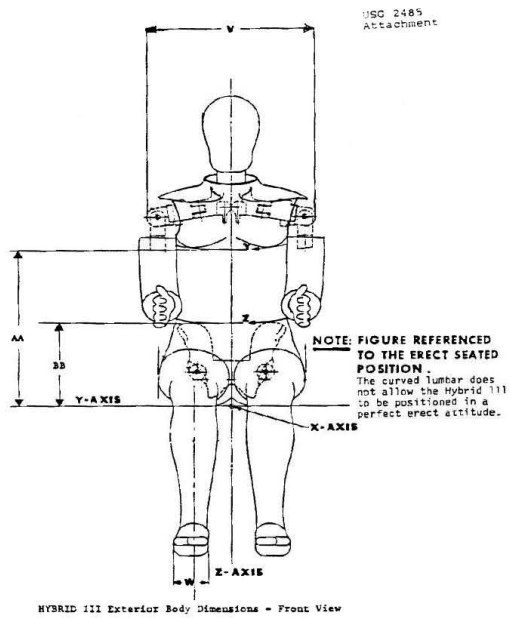
50th Male External Measurements

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**



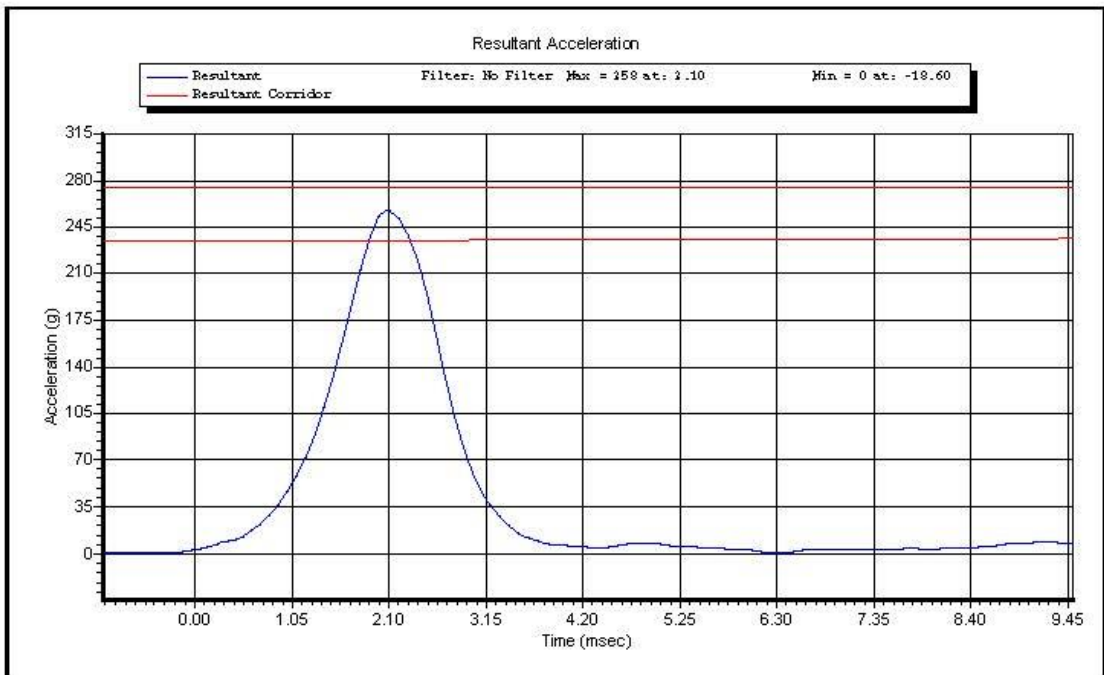
VERIFICATION REPORT

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

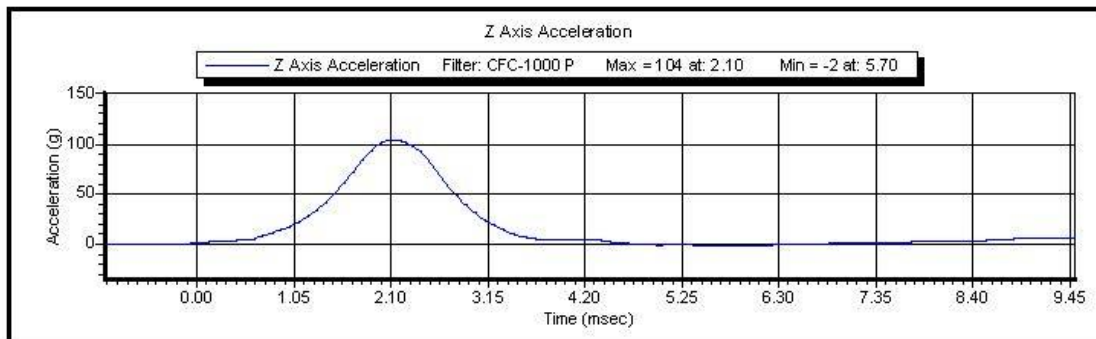
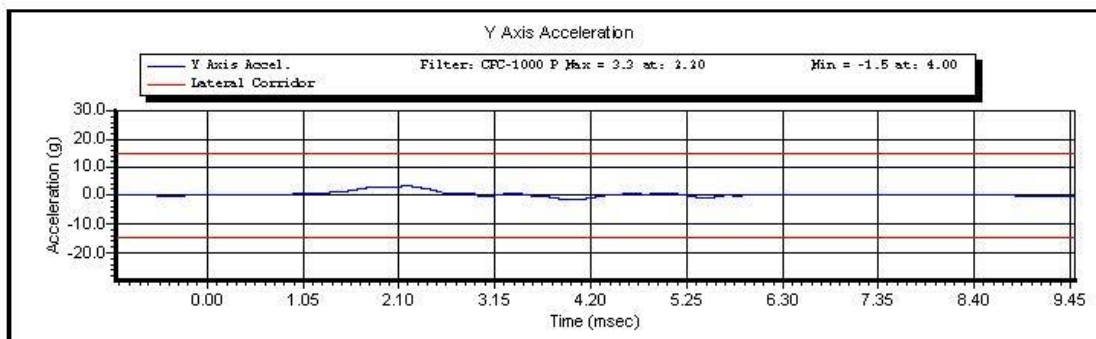
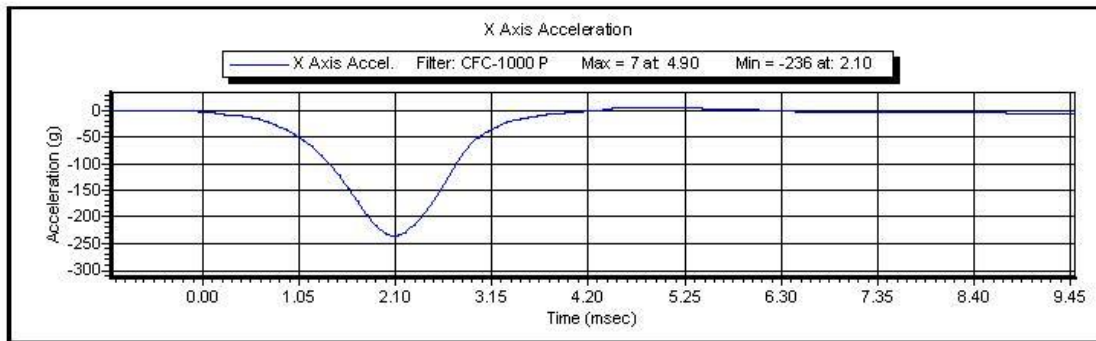


Test ID: **Head Drop**

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

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

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Test ID: **Head Drop**

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

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

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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:	12/5/2014
		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**



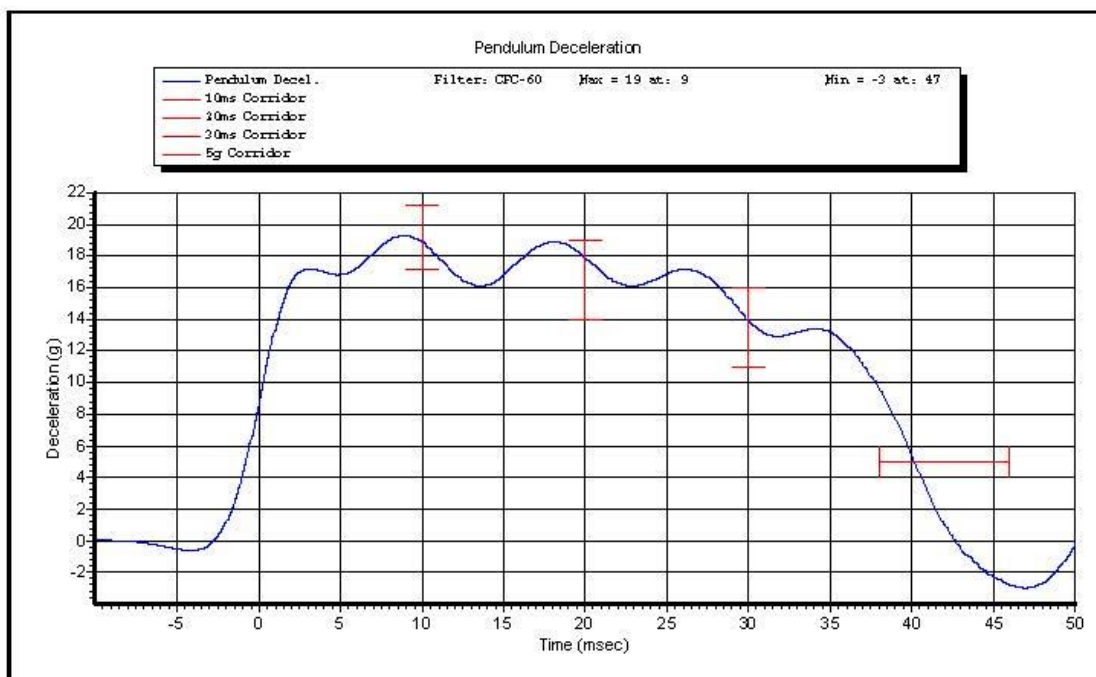
VERIFICATION REPORT

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	17 16A	LC-2186 My	8/7/2014
Denton	17 16A	LC-2186 Fx	8/7/2014

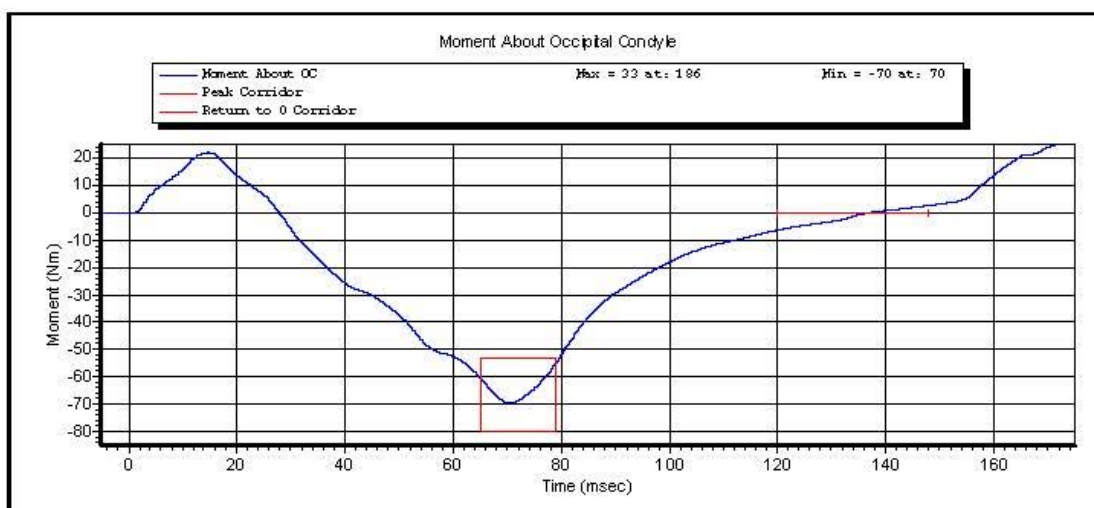
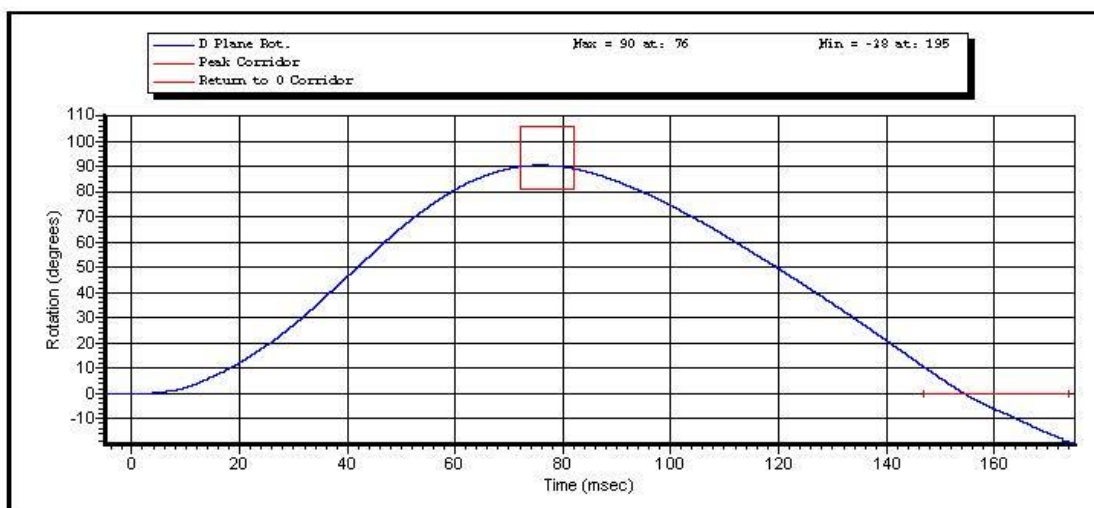


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Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



ID of Test: **Neck Extension** Time of Test: **3:34:13 PM**
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Date of Test: **12/5/2014**

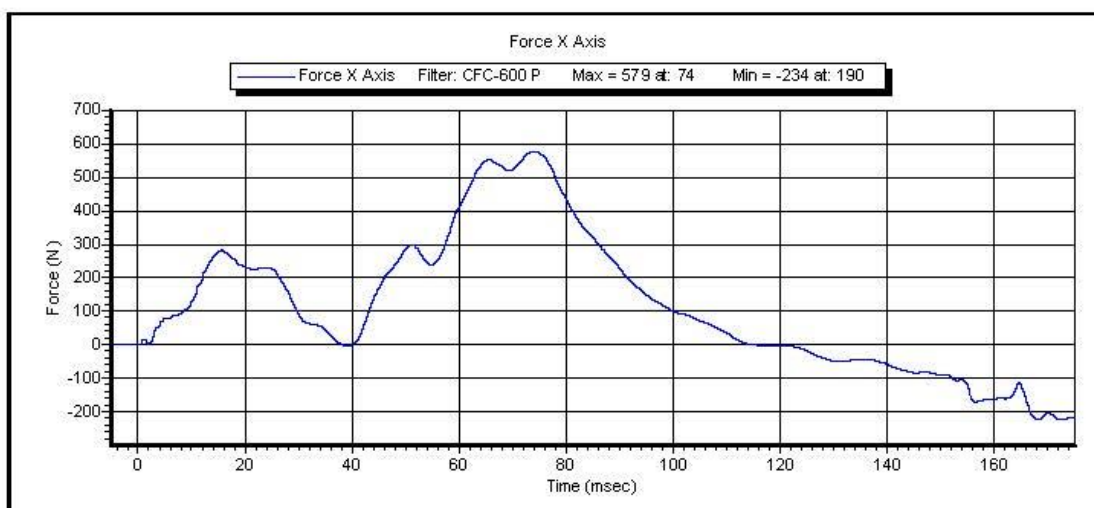
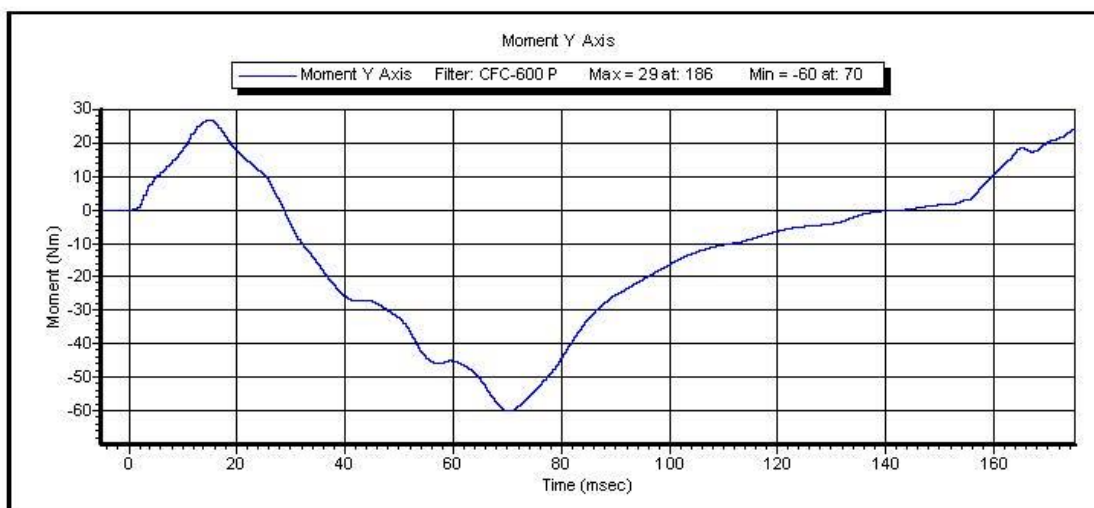


ID of Test: **Neck Extension**

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

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

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

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

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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**



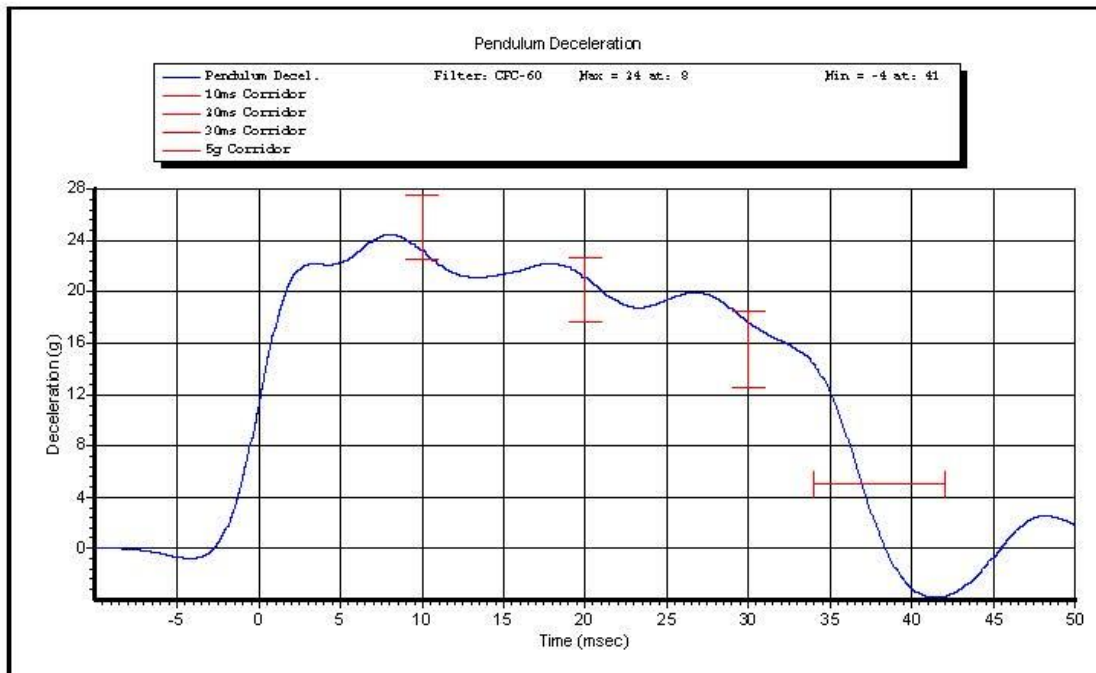
VERIFICATION REPORT

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

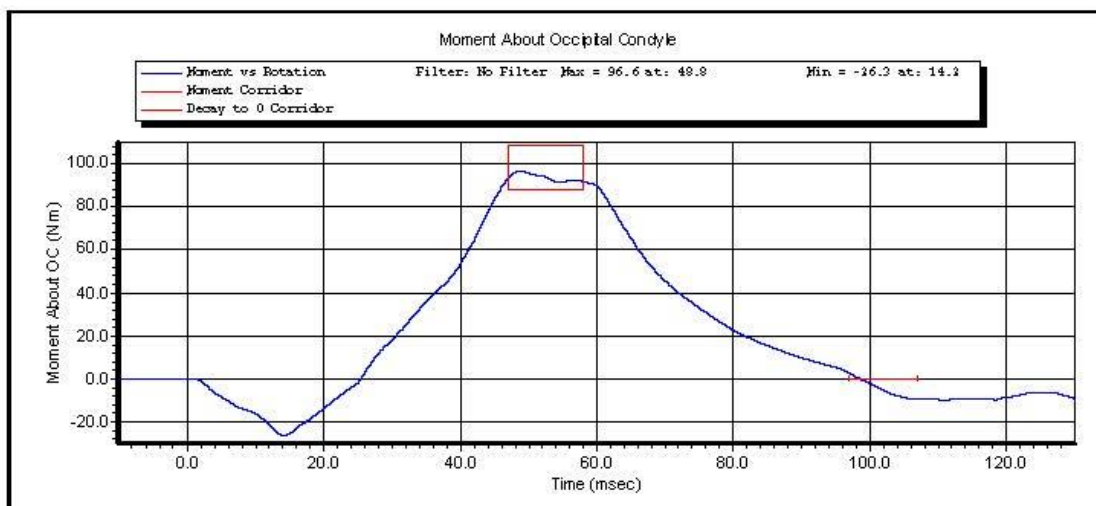
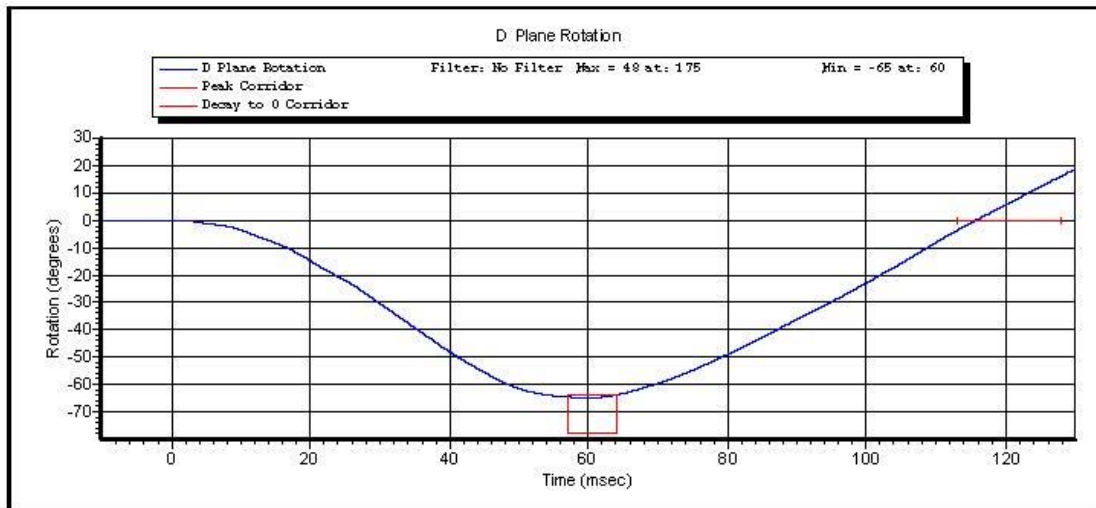


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Time of Test: **2:51:15 PM**

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

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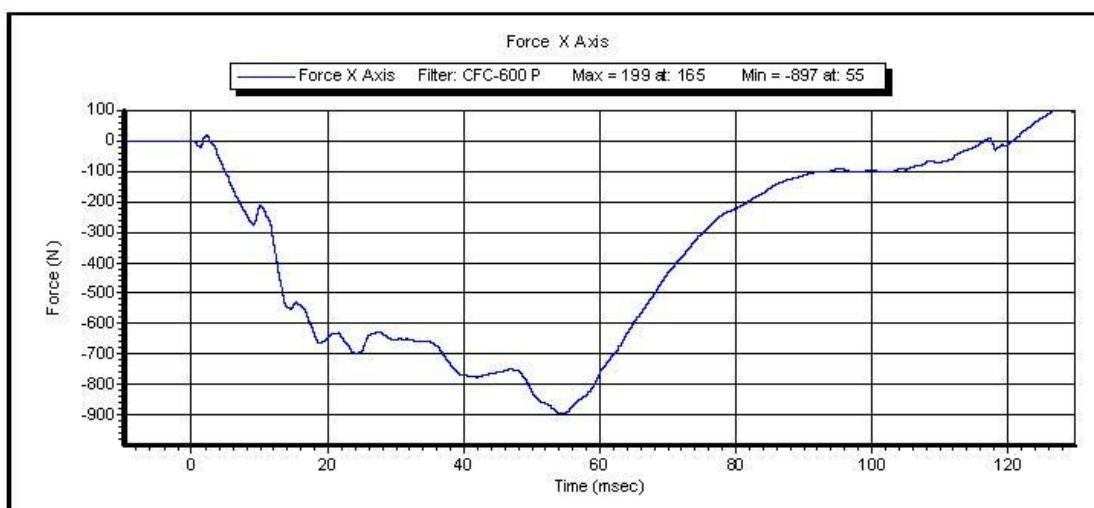
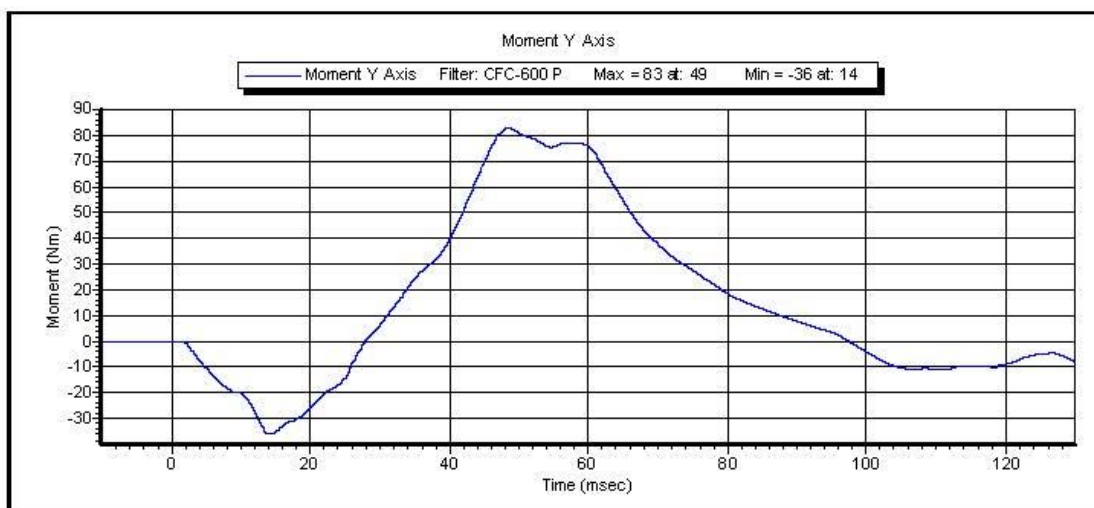


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Time of Test: **2:51:15 PM**

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

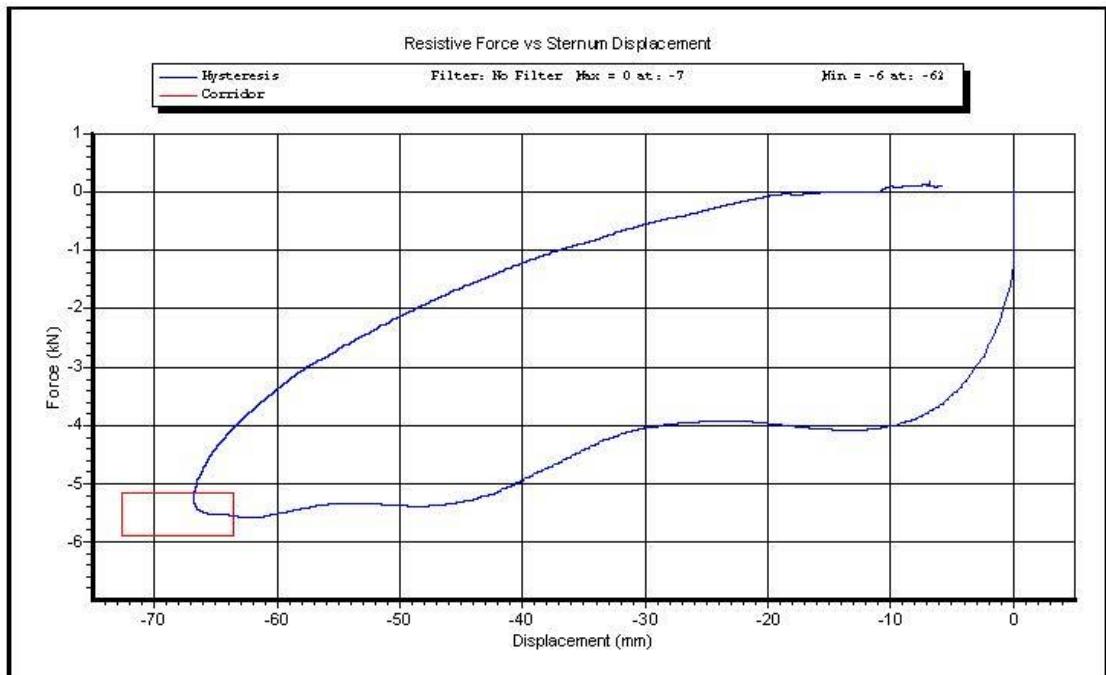
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<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	7/30/2014
Servo	14 CBI-2897	DS-1046	7/31/2014

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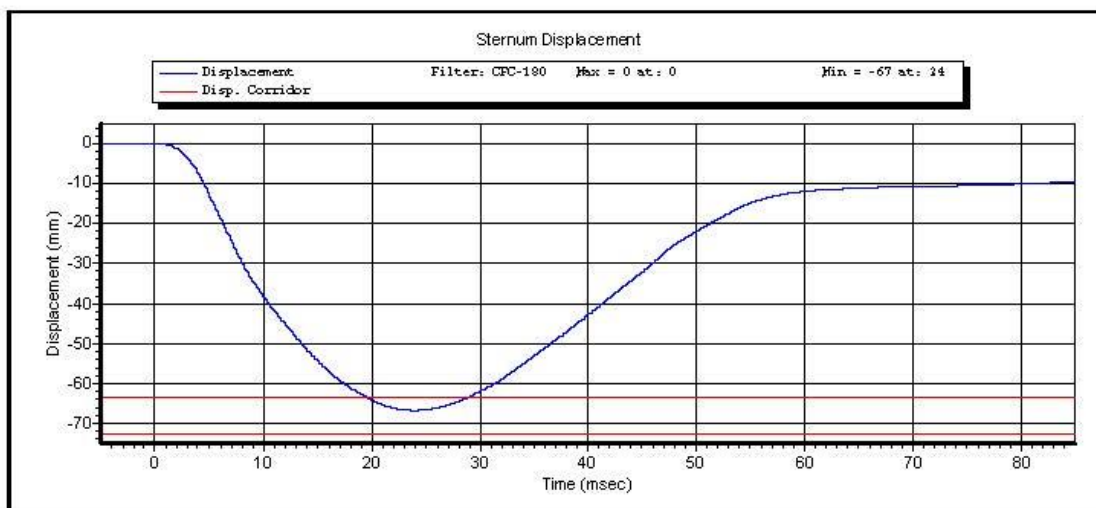
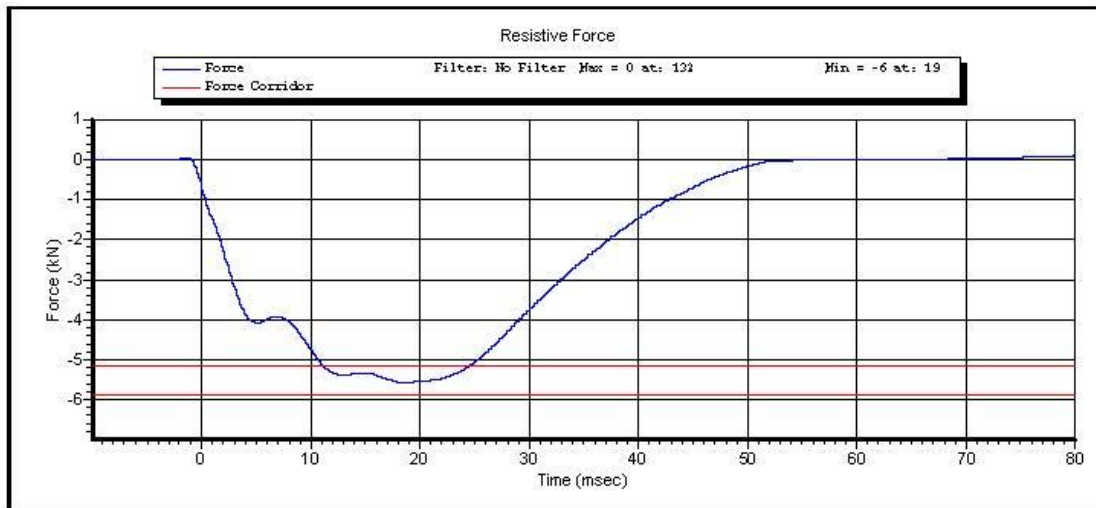


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Thorax Impact** Test Time: **5:55:30 PM**
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Test Date: **12/8/2014**

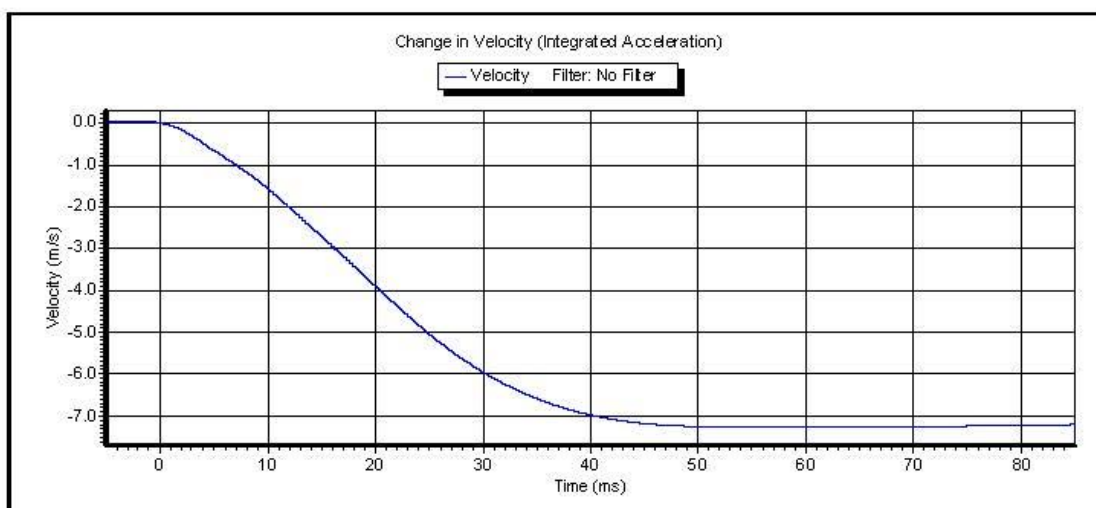
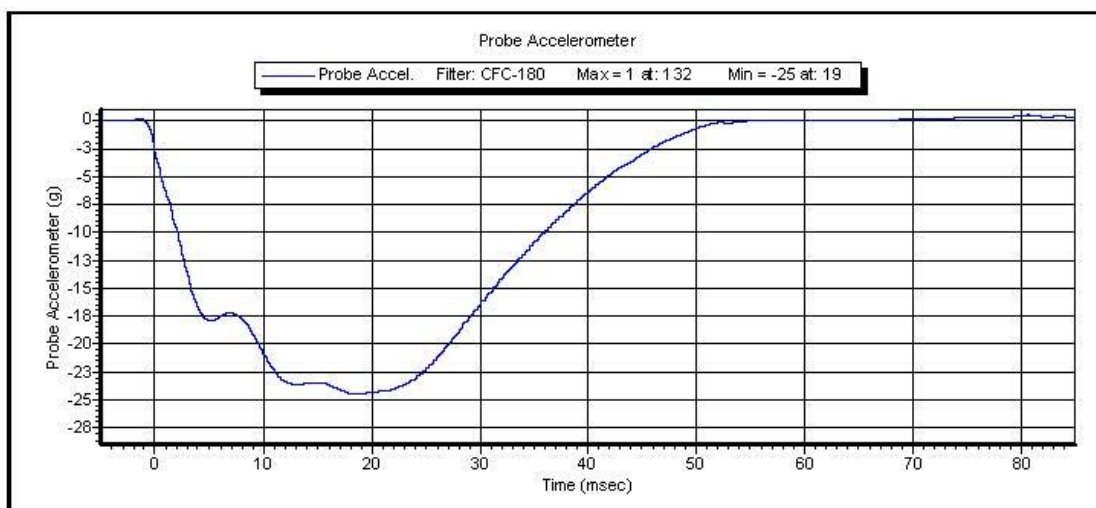


Test ID: **Thorax Impact**

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**

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:	12/5/2014
		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

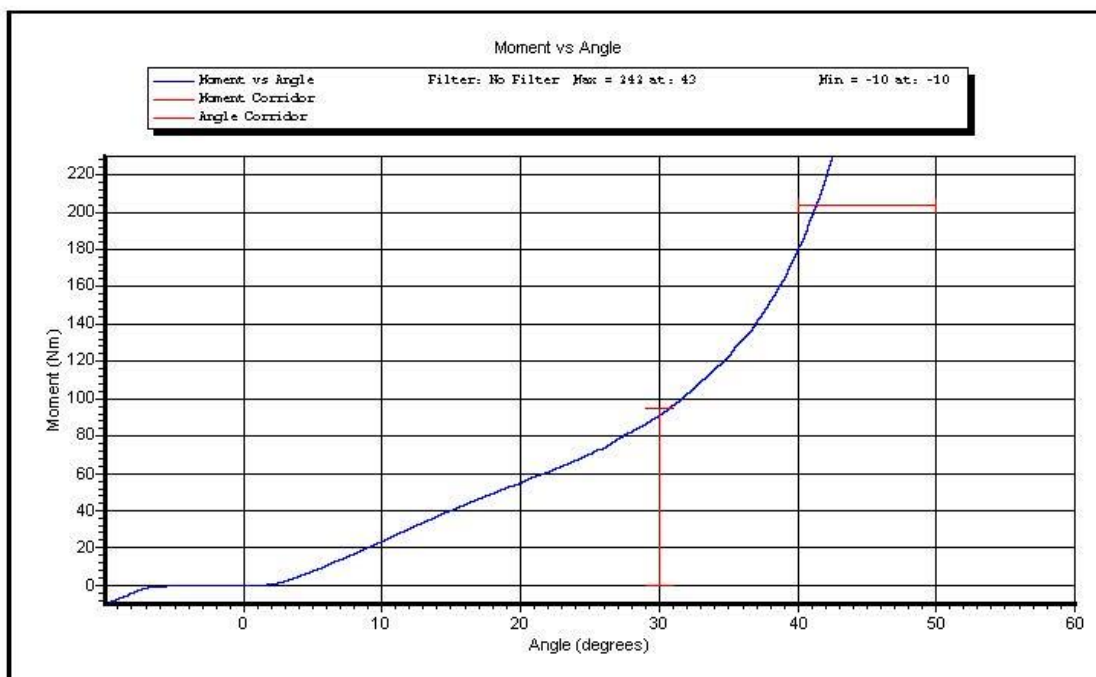
REFERENCE EQUIPMENT

<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

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



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



Test ID: **Hip ROM - Left** Test Time: **8:33:28 AM**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

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



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**



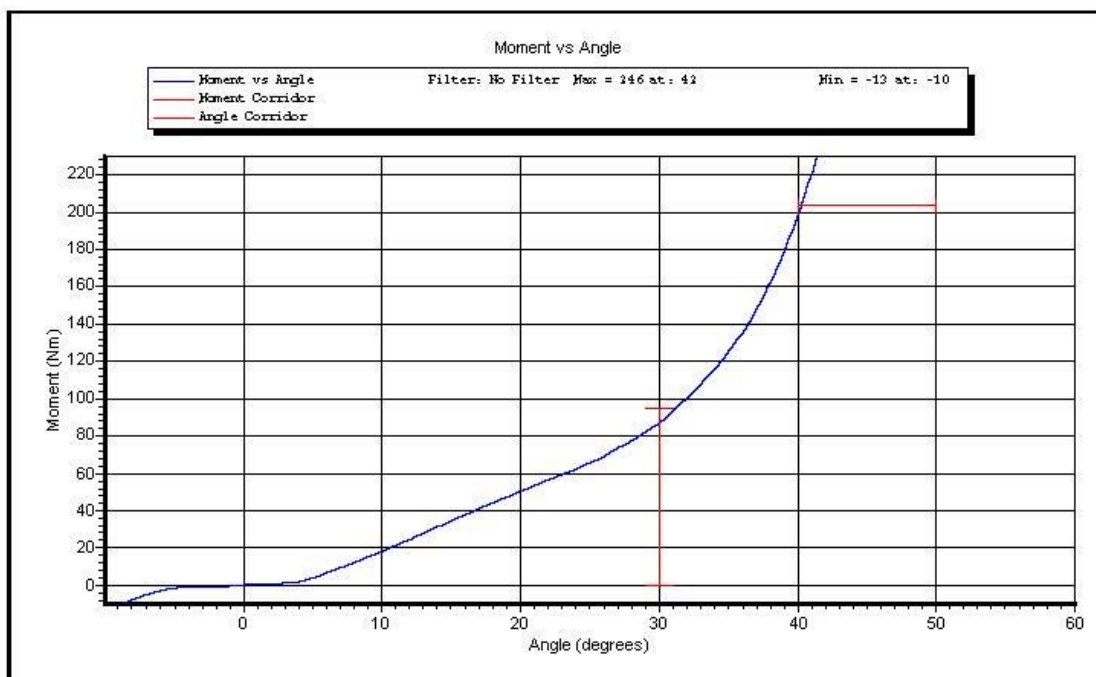
VERIFICATION REPORT

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

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

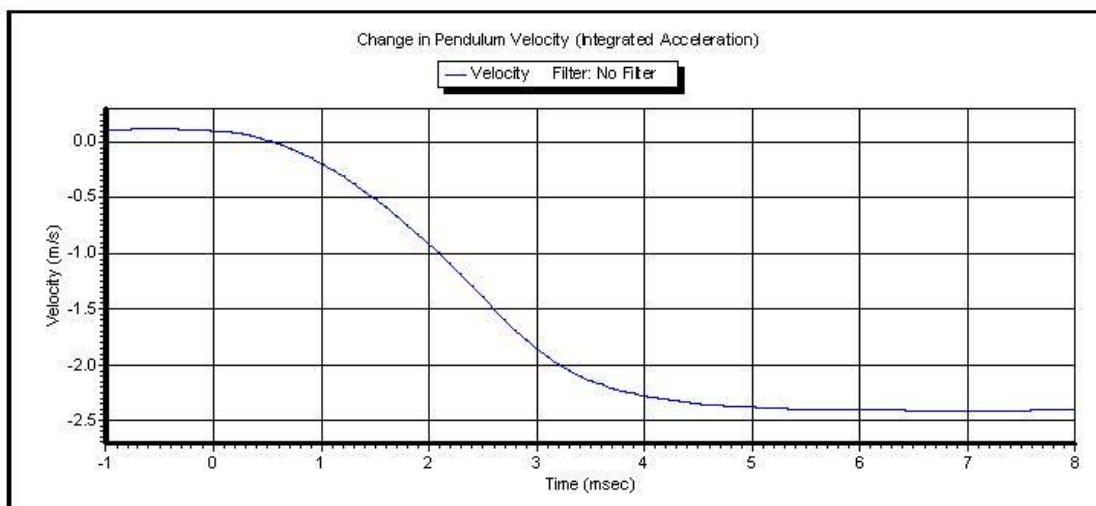
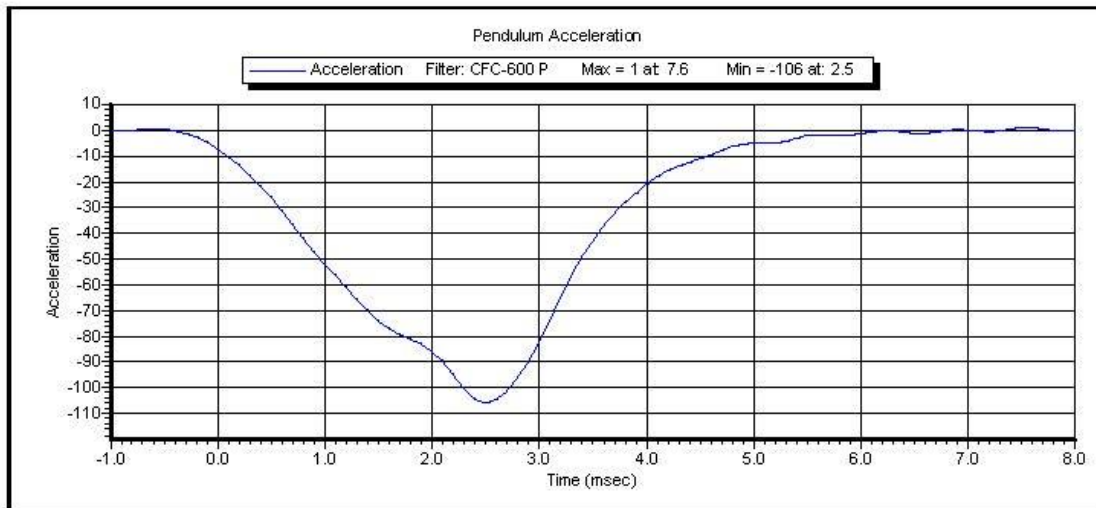


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact Left** Test Time: **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

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

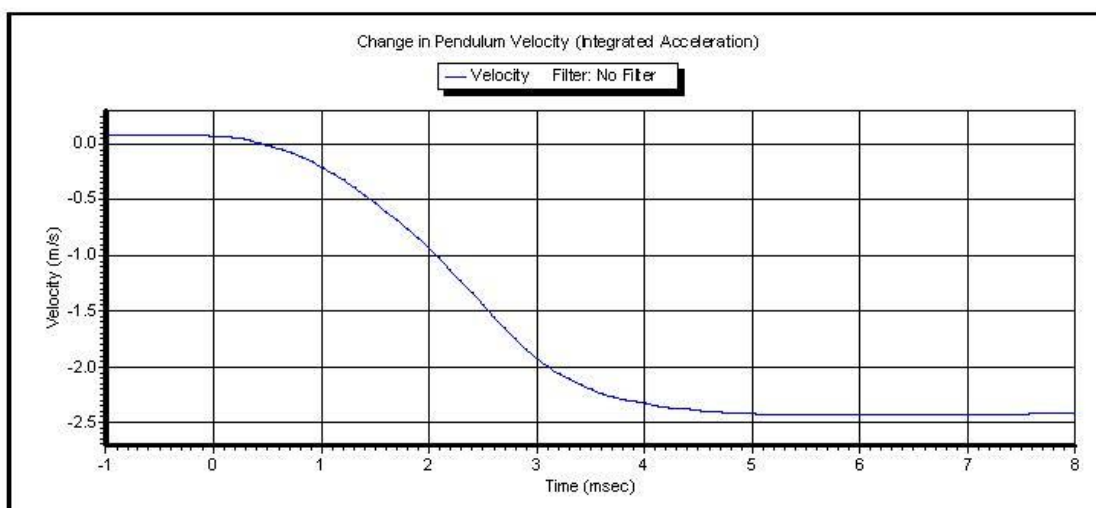
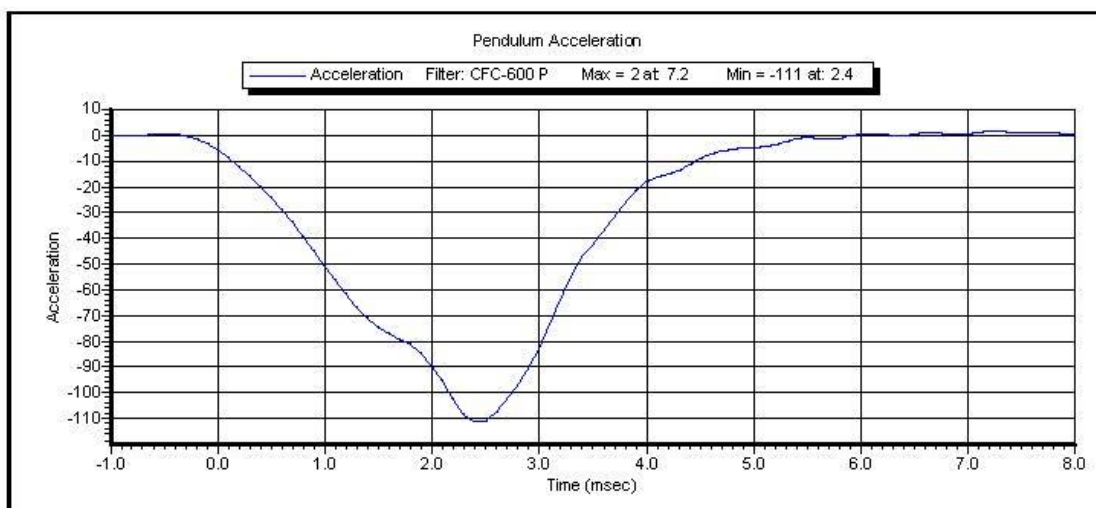


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	1046



Test ID: **Knee Impact 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

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 139



External Measurements

5th Female SN 139

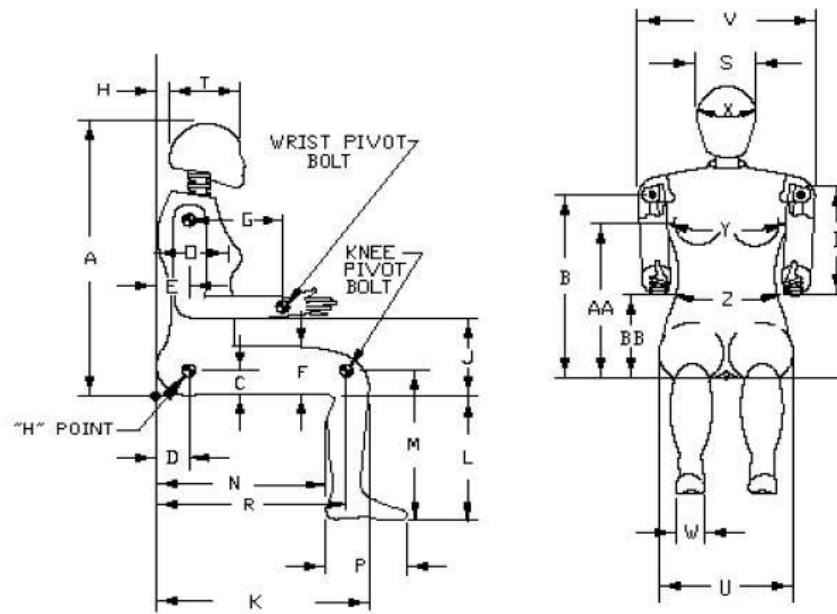
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	789	Yes
B	Shoulder Pivot Height	431.8 – 457.2	446	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	75	Yes
F	Thigh Clearance	119.4 – 134.6	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**



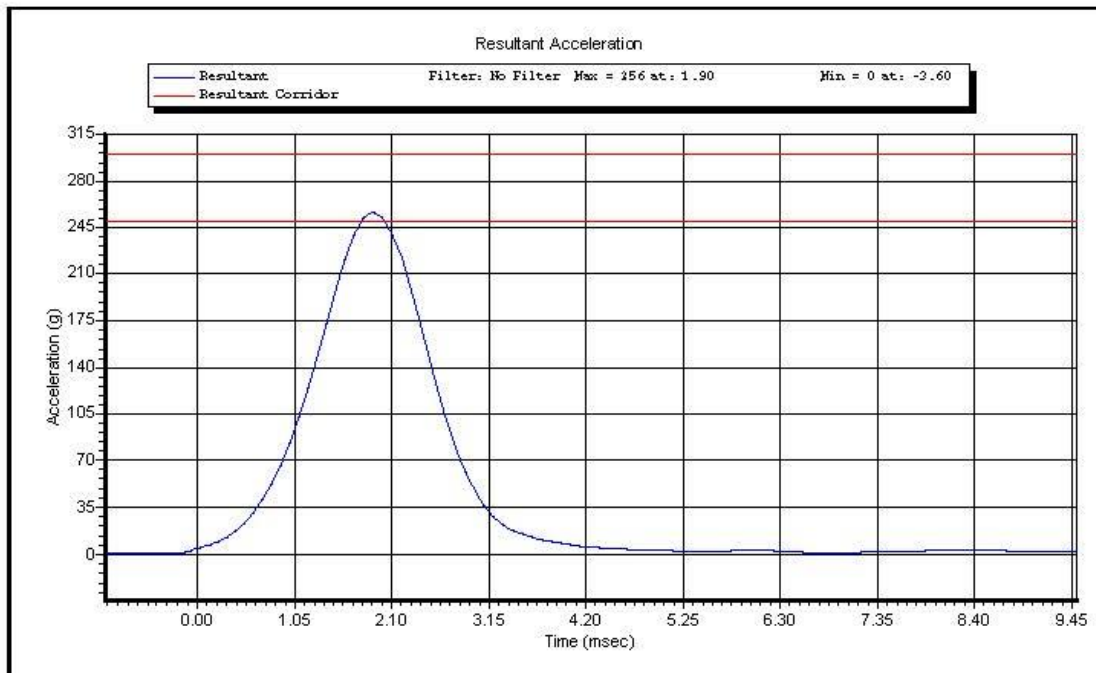
VERIFICATION REPORT

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

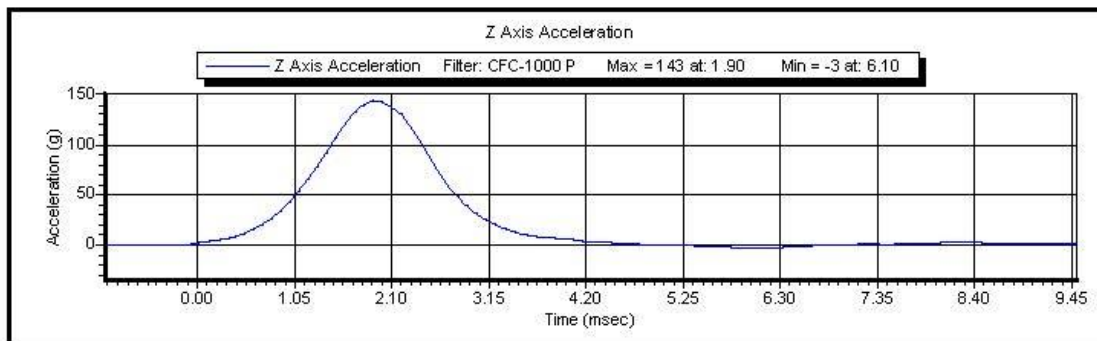
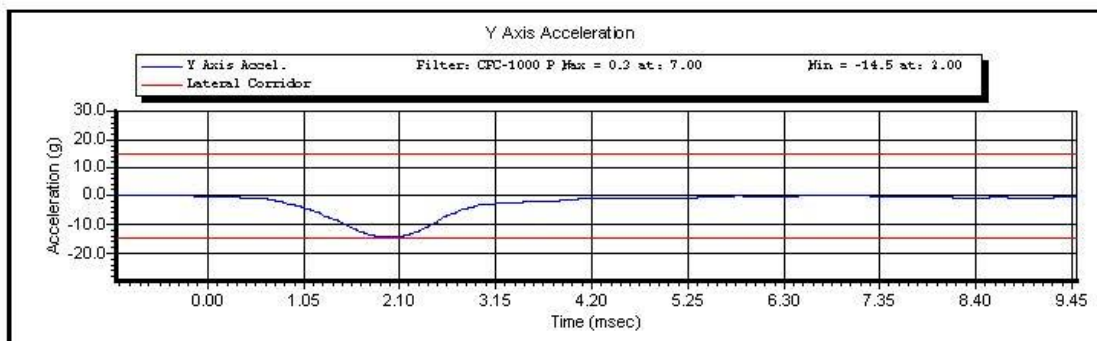
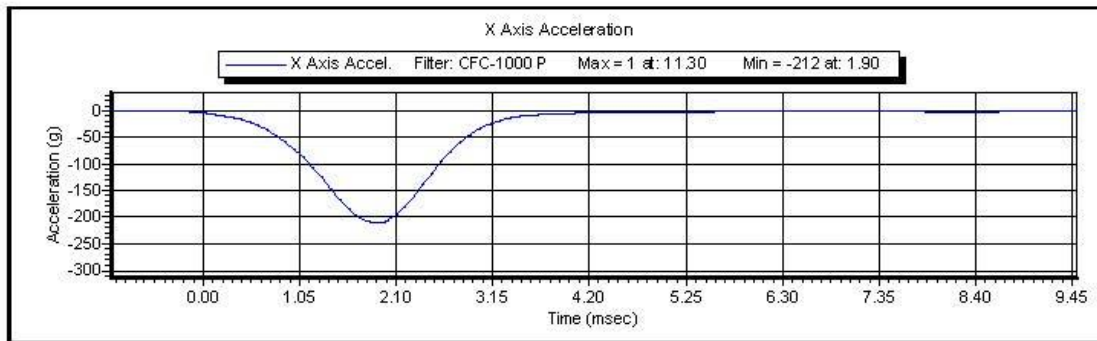


Test ID: **Head Drop**

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**

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:	12/5/2014
		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**



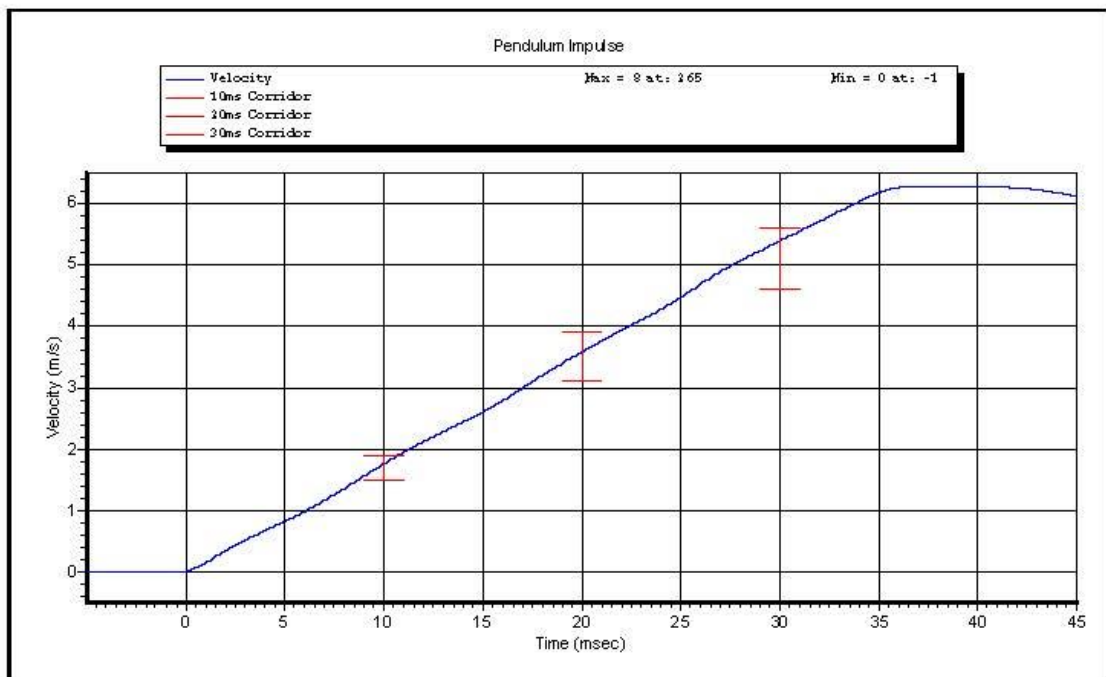
VERIFICATION REPORT

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



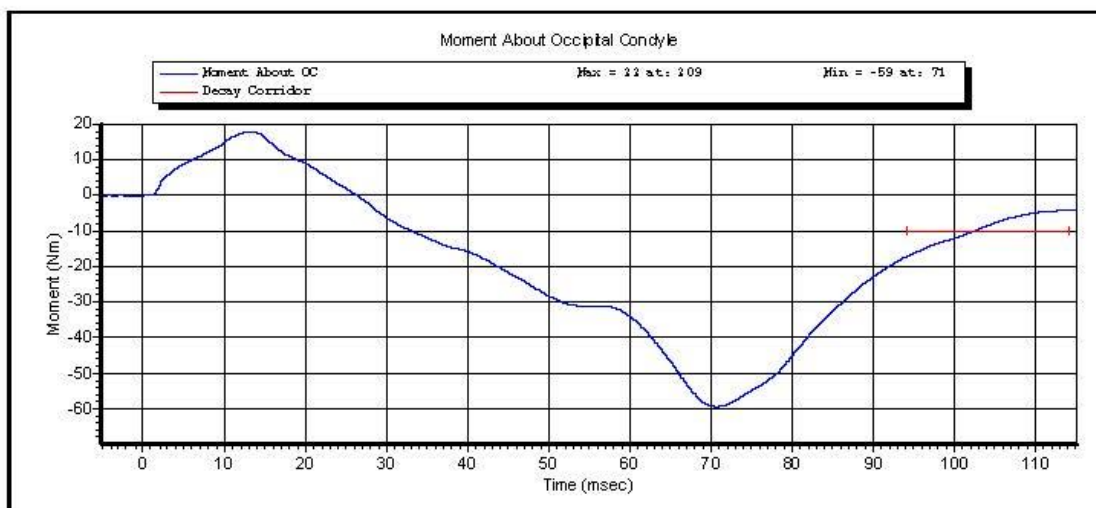
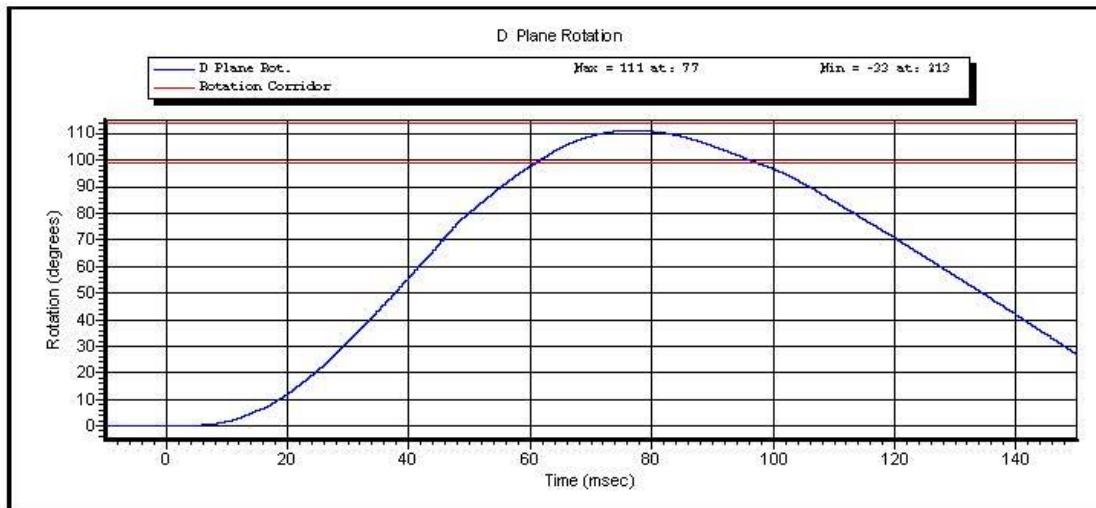
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Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



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

Test Date: 12/5/2014

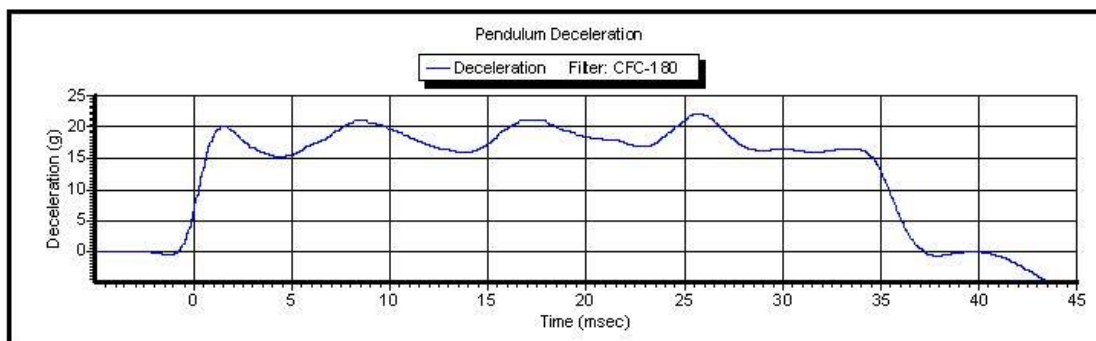
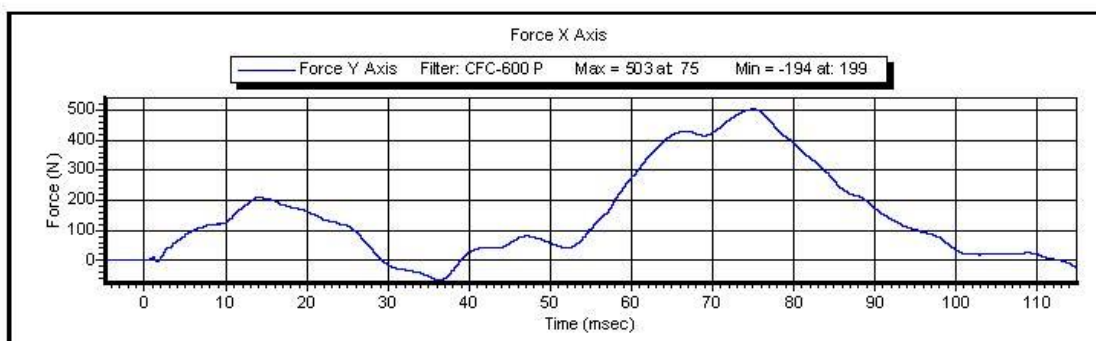
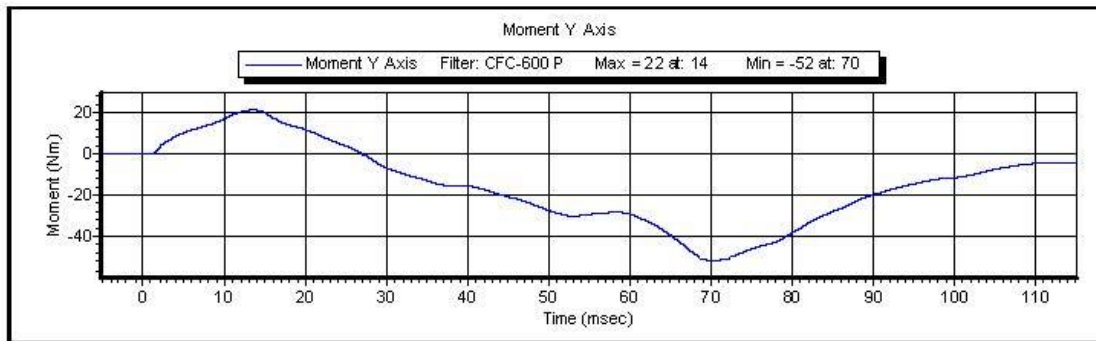
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



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**

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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:	12/5/2014
		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**



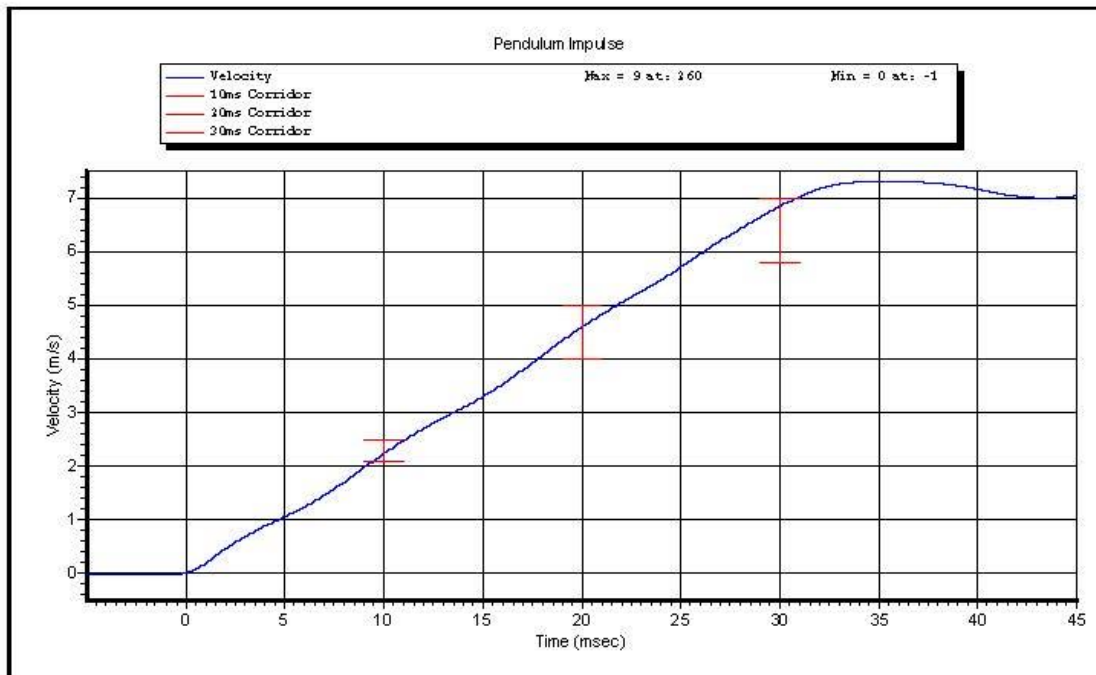
VERIFICATION REPORT

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	17 16A	LC-2018My	5/1/2014
Denton	17 16A	LC-2018Fx	5/1/2014



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

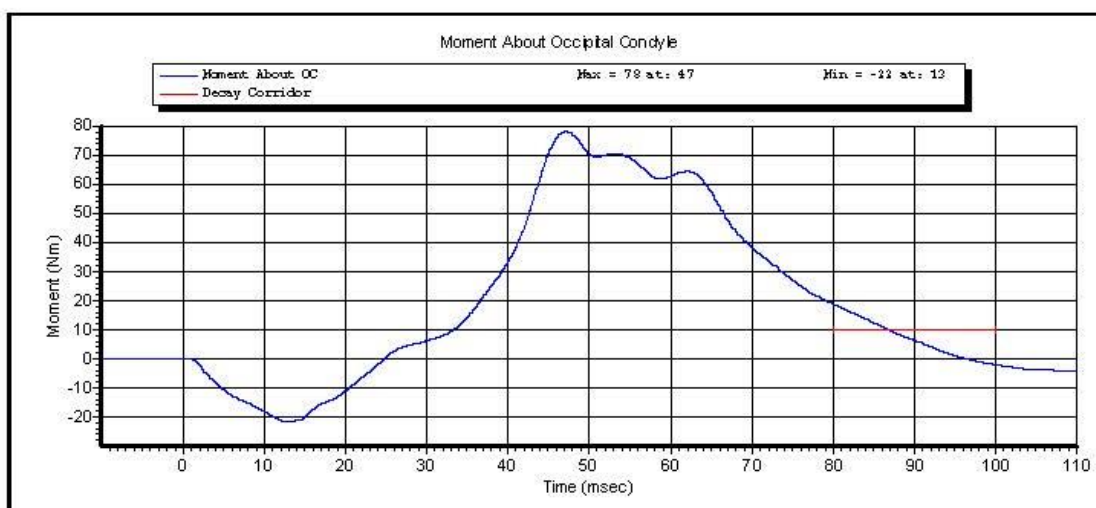
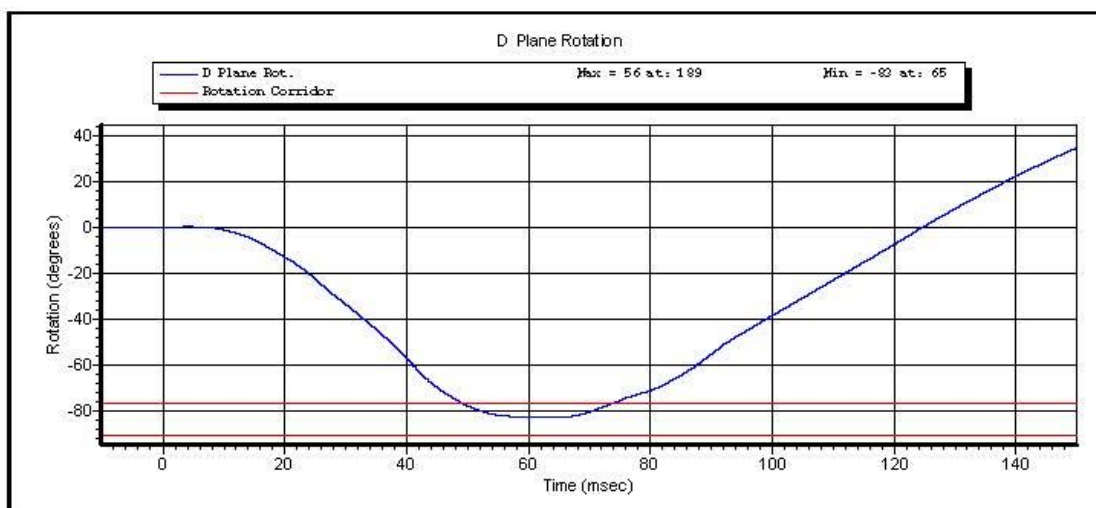


Test ID: Neck Flexion

Test Time: 9:41:25 AM

Test Date: 12/5/2014

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

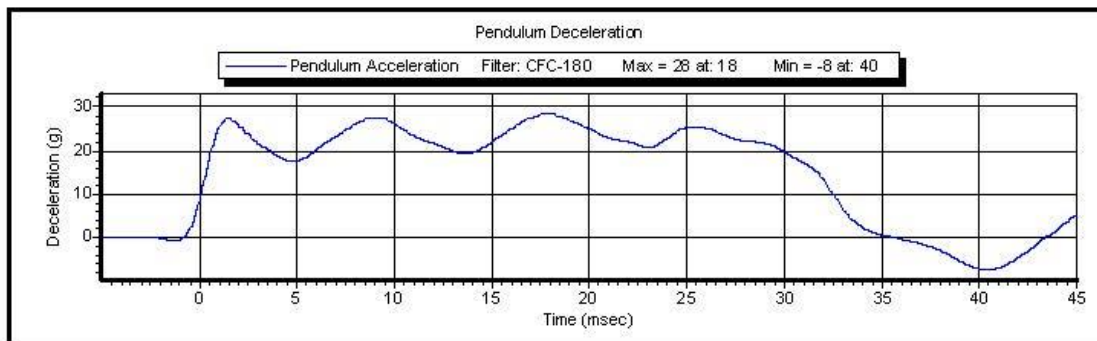
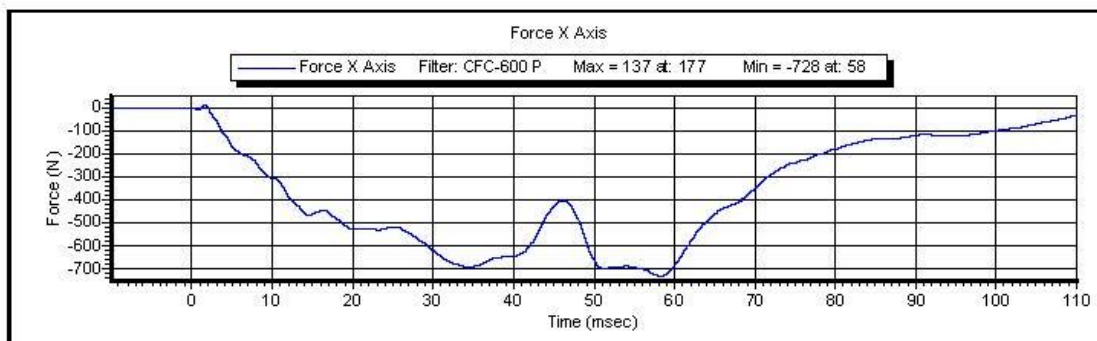
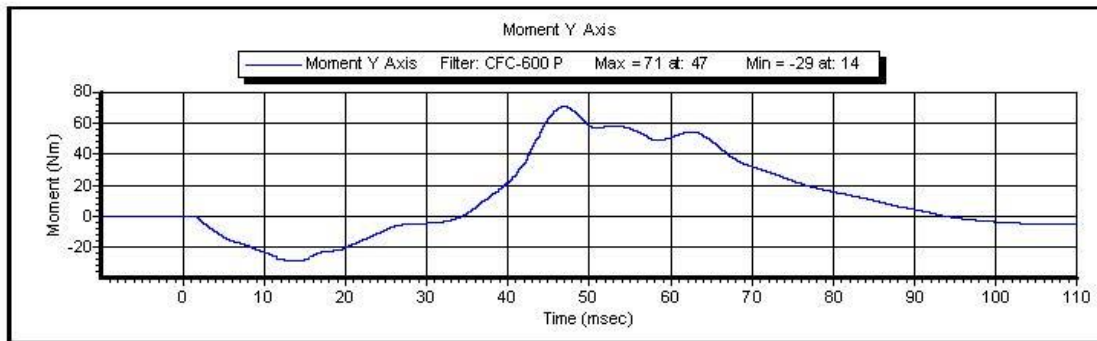


Test ID: **Neck Flexion**

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**



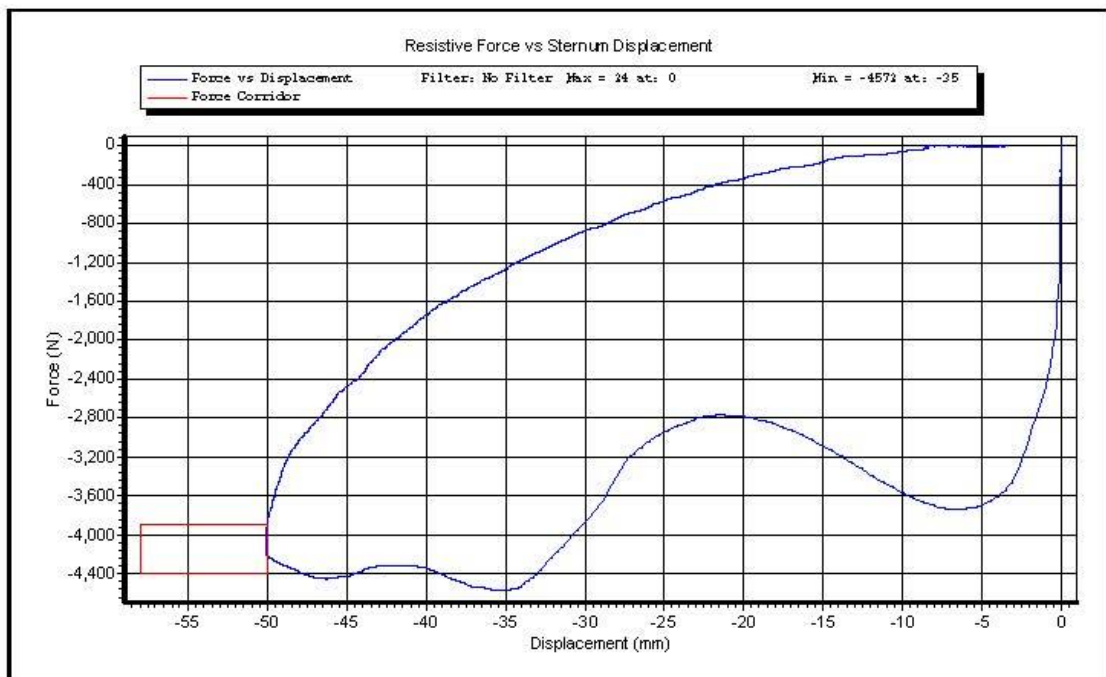
VERIFICATION REPORT

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

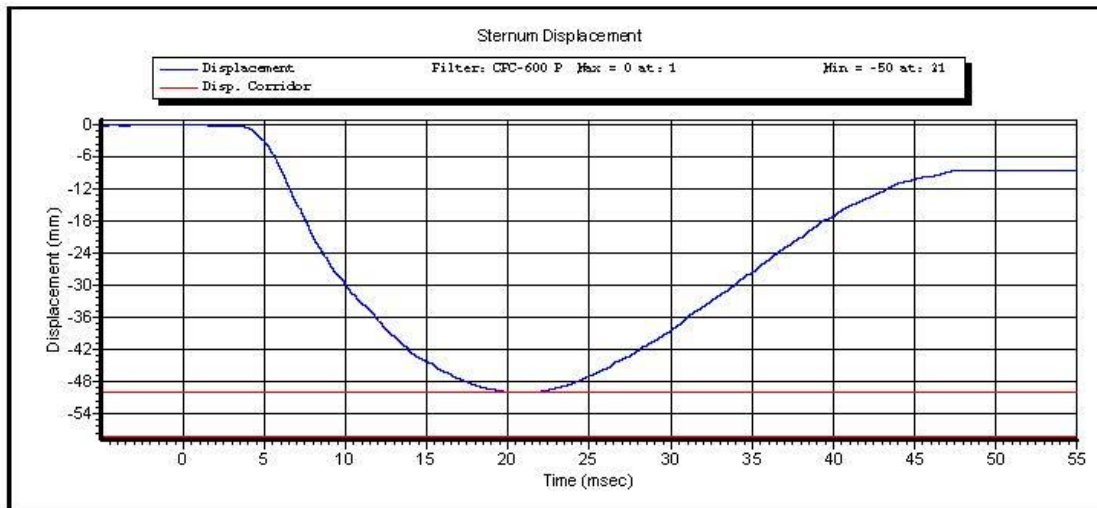


Test Name:	Thorax Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



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

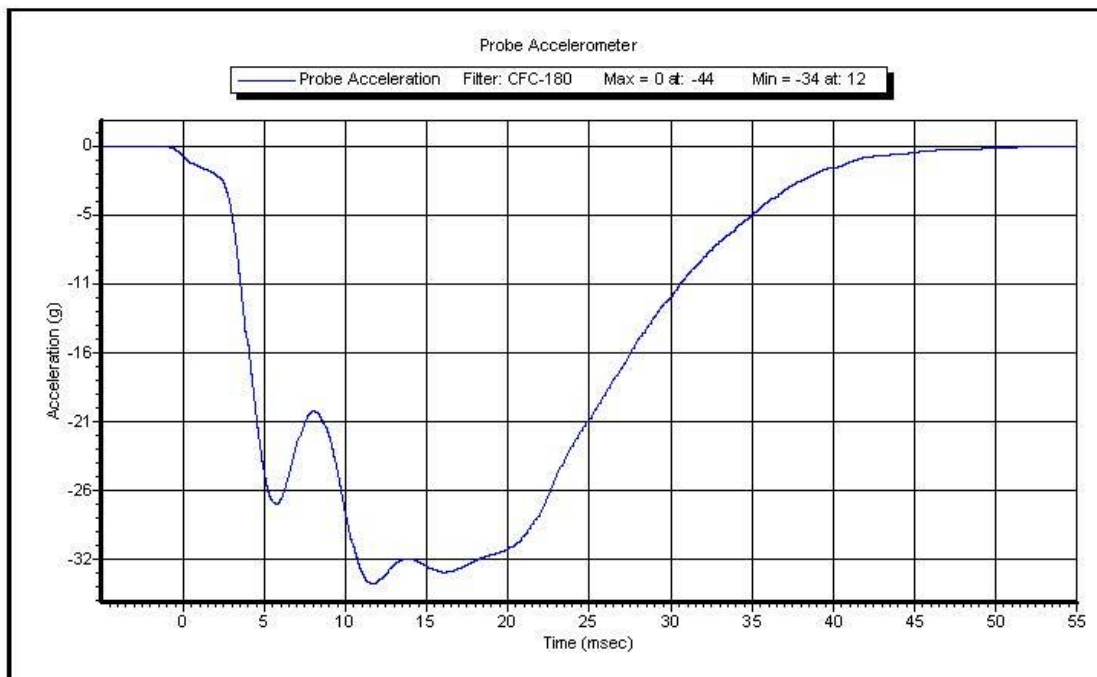


Test ID: **Thorax Impact**

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**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

Torso Flexion

Part 572O HIII 5% Female

ATD Serial No: 139

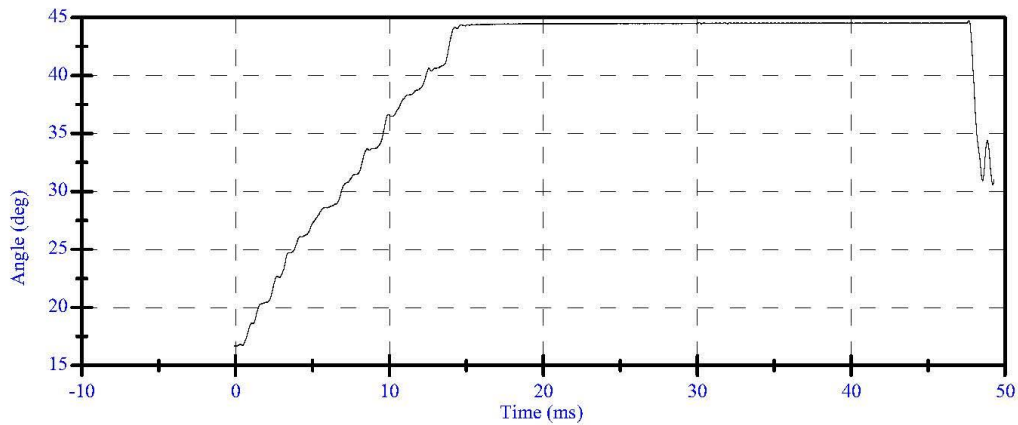
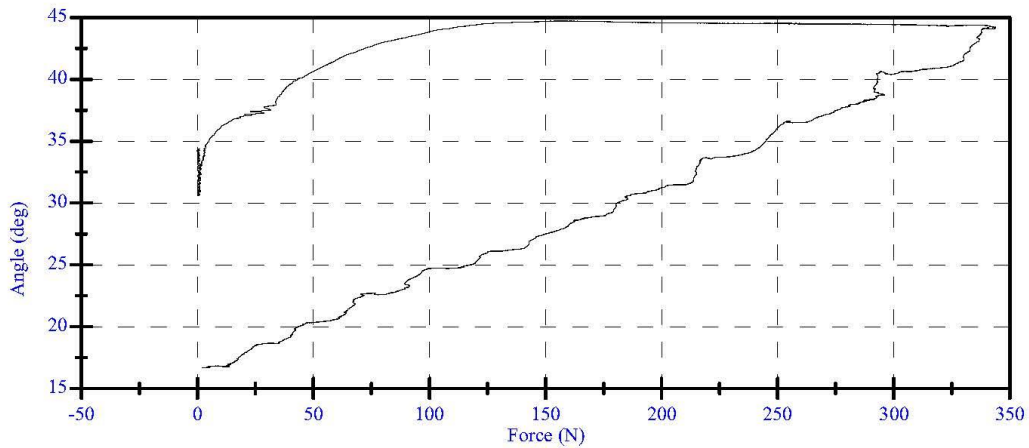
Laboratory Supervisor: M. Goehle

Date: 12/05/2014

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

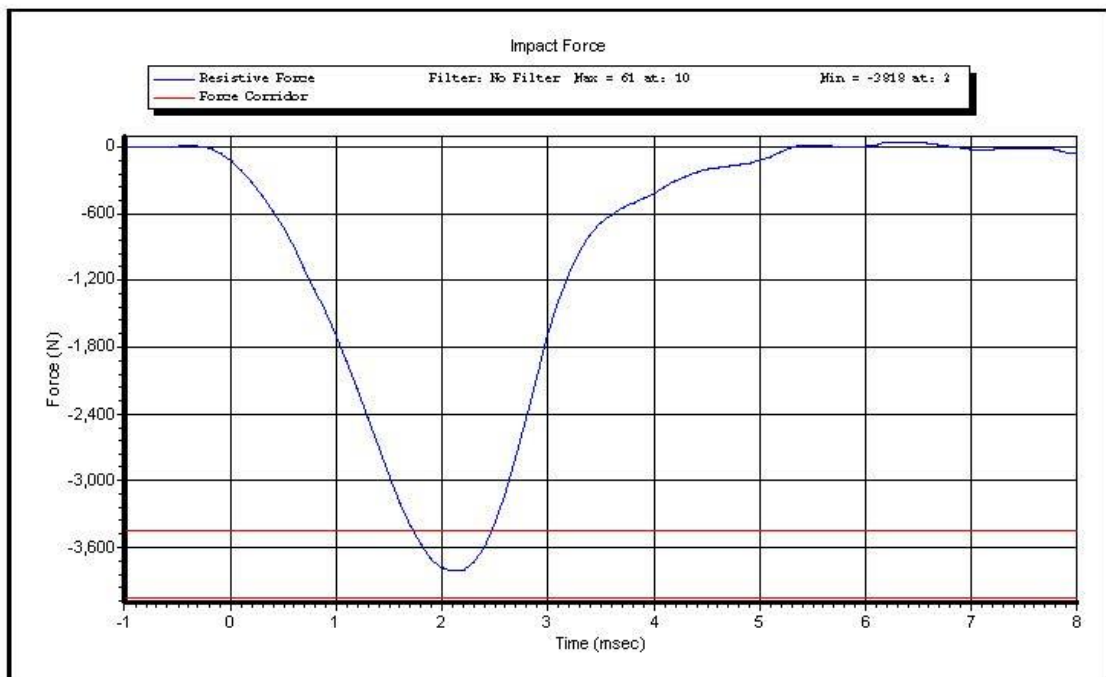
REFERENCE EQUIPMENT

<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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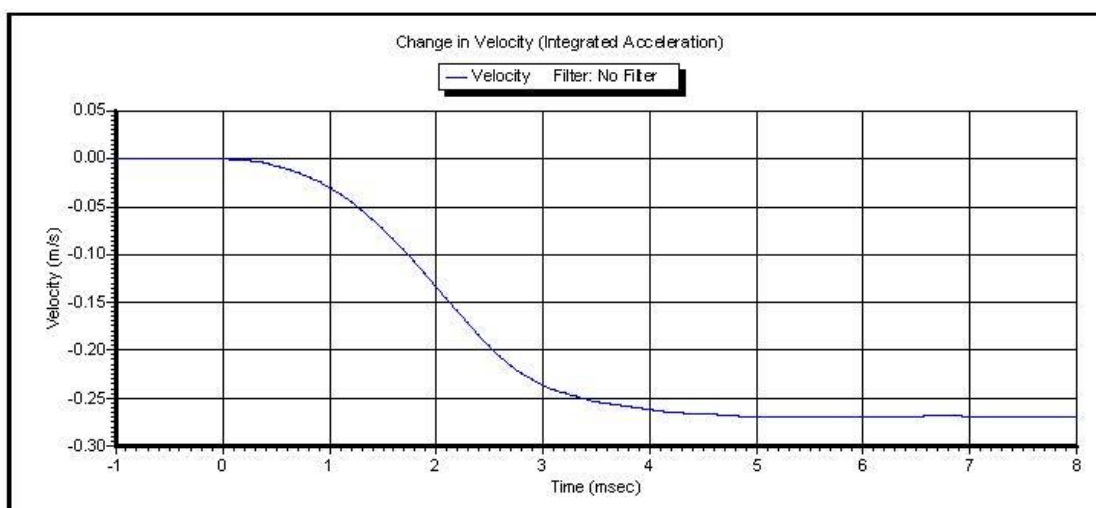
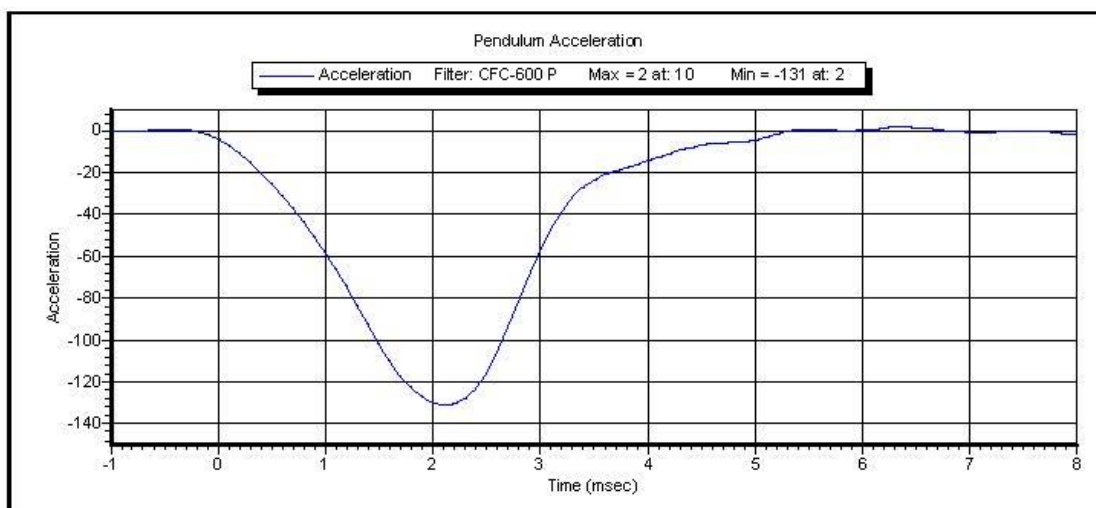


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Left** Test Time: **8:29:00 AM**
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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

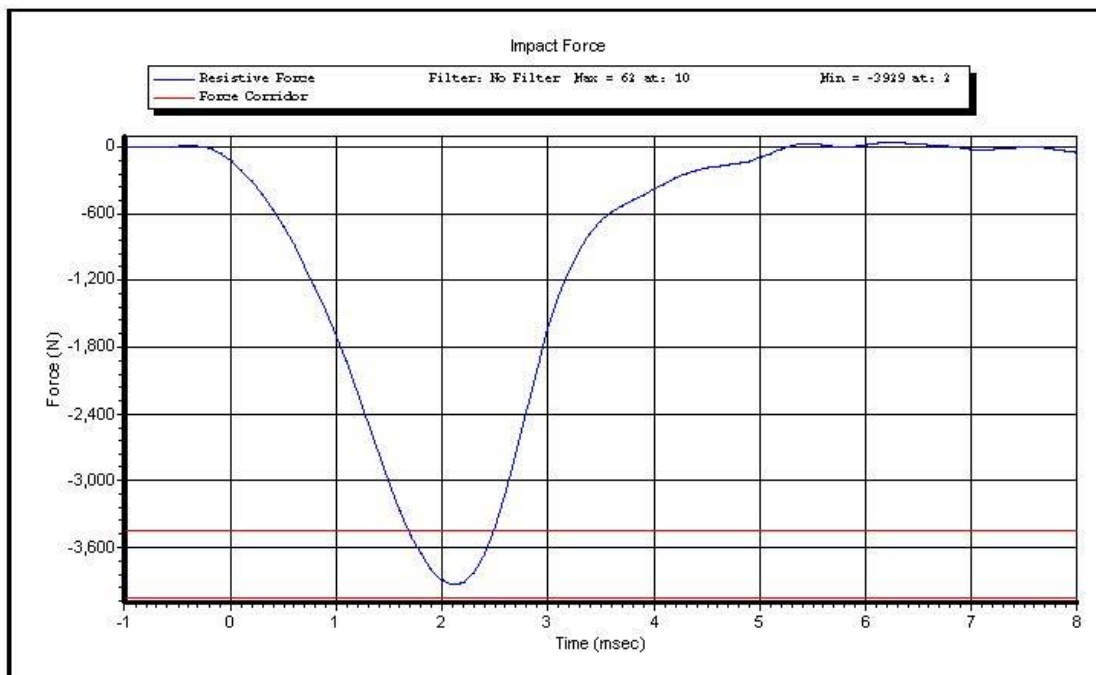
REFERENCE EQUIPMENT

<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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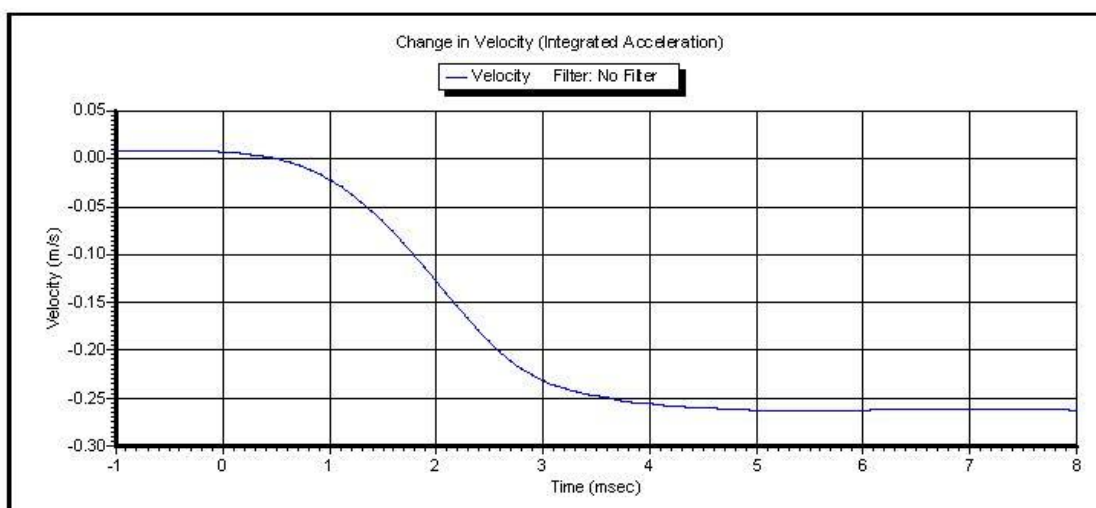
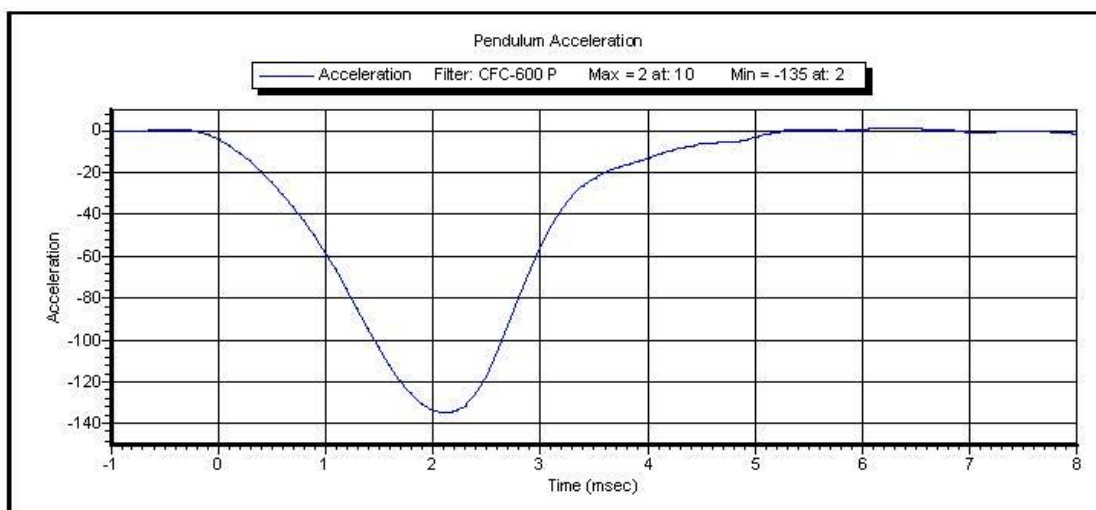


Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	139



Test ID: **Knee Impact Right** Test Time: **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**

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

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