

REPORT NUMBER: NCAP-CAL-14-010

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

**Ford Motor Co.
2014 Ford Transit Connect XLT
Wagon**

NHTSA No: M20140202

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



April 4, 2014

FINAL REPORT

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

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FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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16. Abstract A 56.30 km/h (35 mph), NCAP Frontal Impact Test was conducted on a 2014 Ford Transit Connect wagon 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 March 4, 2014. The impact velocity of the vehicle was 56.48 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 487 mm at C5 to the right of centerline of the vehicle. The test vehicle's occupant performance data is as follows:																																																									
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SECTION 1

PURPOSE AND SUMMARY OF TEST

PURPOSE

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

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

SUMMARY

A load cell barrier consisting of 36 load cells was impacted by a 2014 Ford Transit Connect wagon at a velocity of 56.48 km/h. The test was performed at Calspan Corporation's Transportation Test Operations facility in Buffalo, New York on March 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. The driver (position 1) ATD (Serial No. 142) and the right-front passenger (position 2) ATD (Serial No. 143) 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 487 mm at C5 to the right of the vehicle centerline. During and after the impact event, the driver's and passenger's side door were closed and operational.

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

The passenger's visible contact points were as follows: The passenger's head contacted the frontal airbag and then the head restraint and seatback. 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)	315.0	0.31	965.2	-14.5	39.6	-23.3	-270.3	-1471.6
Passenger (5 th)	216.6	0.40	921.8	-59.3	44.2	-8.5	-2229.9	-1948.5

GENERAL COMMENTS:

1. P1 (Driver) serial number - 142
2. P2 (Passenger) serial number - 143

Data Anomalies:

- Passenger Head CG Redundant X Acceleration, Questionable data from 57 to 122 ms
- Engine Top X Acceleration, Questionable magnitude throughout
- Engine Bottom X Acceleration, Questionable data after 37 ms

SECTION 2

OCCUPANT AND VEHICLE INFORMATION / DATA SHEETS

This section contains information reporting for the following Data Sheets:

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

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

Data Sheet No. 3 – Dummy Longitudinal Clearance Dimensions

Data Sheet No. 4 – Dummy Lateral Clearance Dimensions

Data Sheet No. 5 – Seat Belt Positioning Data

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

Data Sheet No. 7 – Vehicle Accelerometer Locations

Data Sheet No. 8 – Photographic Reference Target Locations

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

Data Sheet No. 10 – Test Vehicle Summary of Results

Data Sheet No. 11 – Post-Test Observations

Data Sheet No. 12 – Vehicle Profile Measurements

Data Sheet No. 13 – Accident Investigation Division Data

Data Sheet No. 14 – Vehicle Intrusion Measurements

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

Data Sheet No. 16 – FMVSS 301 Static Rollover Results

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

**DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA**

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	M20140202	Traction Control System (TCS)	Yes
Model Year	2014	Power Steering	Yes
Make	Ford	Power Window Auto-Reverse	No
Model	Transit Connect XLT	Driver Frontal Airbag	Yes
Body Style	Truck	Driver Curtain Airbag	Yes
VIN	NM0GE9F71E1140792	Driver Head/Torso Airbag	No
Body Color	Gold/Tan/Copper	Driver Torso Airbag	No
Odometer Reading (km /mi)	43.5 km / 27 mi	Driver Torso/Pelvis Airbag	Yes
Engine Displacement (L)	2.5	Driver Pelvis Airbag	No
Type / No. Cylinders	I4	Driver Knee Airbag	No
Engine Placement	Transverse	Front Pass. Frontal Airbag	Yes
Transmission Type	Automatic	Front Pass. Curtain Airbag	Yes
Transmission Speeds	6-Speed	Front Pass. Head/Torso Airbag	No
Overdrive	Yes	Front Pass. Torso Airbag	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	Ford Motor Co.	GVWR (kg)	2395
Date of Manufacture	11/13	GAWR Front (kg)	1232
		GAWR Rear (kg)	1232

VEHICLE SEATING AND WEIGHT CAPACITY DATA

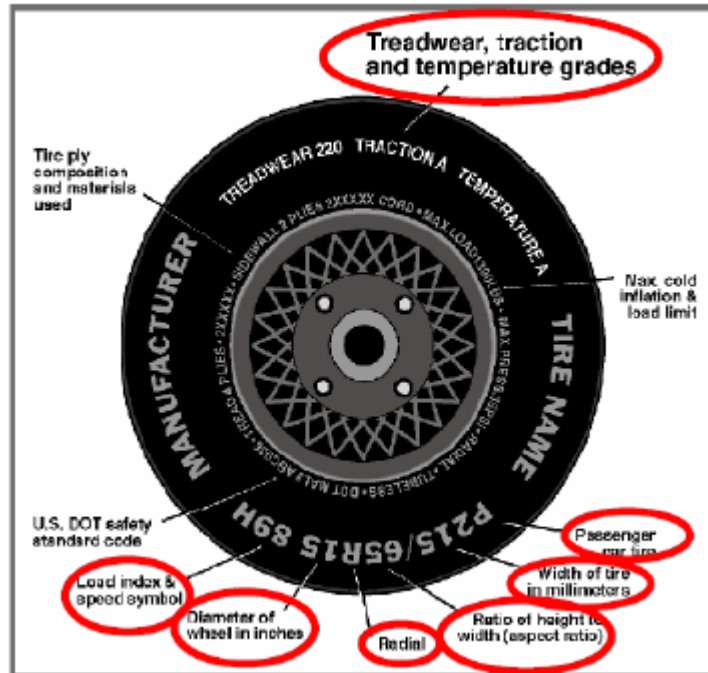
Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Bench	Bench	
Number of Occupants	2	3	2	7
Capacity Wt. (VCW) (kg)				559
Cargo Wt. (RCLW) (kg)				82.7

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

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



VEHICLE TIRE INFORMATION

Measured Parameter	Front	Rear
Maximum Tire Pressure (kPa)	350	350
Cold Pressure (kPa)	280	300
Recommended Tire Size	P215/55R16	P215/55R16
Tire Size on Vehicle	P215/55R16	P215/55R16
Tire Manufacturer	Continental	Continental
Tire Model	ContiProContact	ContiProContact
Treadwear	400	400
Traction	AA	AA
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	1 Polyester, 2 Steel, 2 Nylon	1 Polyester, 2 Steel, 2 Nylon
Load Index / Speed Symbol	97H	97H
Tire Material	Rubber	Rubber
DOT Safety Code Left	6GB3WBEC4513	6GB3WBEC4513
DOT Safety Code Right	6GB3WBEC4513	6GB3WBEC4513

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

TEST VEHICLE WEIGHTS

	Units	As Delivered Weights (UVW)			As Tested Weights (ATW)		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	509	383		559	456	
Right	kg	496	407		510	487	
Ratio	%	56%	44%		53%	47%	
Totals	kg	1005	790	1795	1069	943	2012

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	1795	(A)
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.7	(B)
Rated Cargo / Luggage Weight (RCLW)	kg	82.7	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2018.4	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

Condition	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	707	709	746	751	1349
As Tested	mm	704	707	723	723	1436
Post-Test	mm	764	768	732	730	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3064
Total Vehicle Length at Left Side	mm	4787
Total Vehicle Length at Centerline	mm	4834
Total Vehicle Length at Right Side	mm	4795
Weight of Ballast in Cargo Area	kg	103
Weight of Vehicle Components Removed	kg	55
Amount of Stoddard Solvent in Fuel Tank	L	55.8

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

Third row seats, jack, and rear tail light.

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

TARGET VEHICLE STRUCTURAL MEASUREMENT

No.	Description	Pre-Test
1	Total Length	4834
2	Total Width	1789
3*	Bumper Top Height	576
4*	Bumper Bottom Height	457
5*	Longitudinal Member Top Height	597
6	Distance Between Longitudinal Members	1073
7	Longitudinal Member Width	79
8*	Engine Top Height	829
9*	Engine Bottom Height	186
10	Engine and Gearbox Width	540
11	Front Bumper-Engine Distance	445
12*	Front Shock Absorber Fixing Height	876
13*	Bonnet Leading Edge Height	922
14	Front Shock Absorber Fixing Width	1084
15	Front Bumper – Front Axle Distance	885
16	Front Axle – A Pillar Distance	314
17	A-Pillar – B-Pillar Distance	1247
18	B-Pillar – Rear Axle Distance	1498
19	B-Pillar – C-Pillar Distance	1155
20*	Roof Sill Bottom Height	1499
21*	Roof Sill Top Height	1648
22*	Floor Sill Bottom Height	354
23*	Floor Sill Top Height	395

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

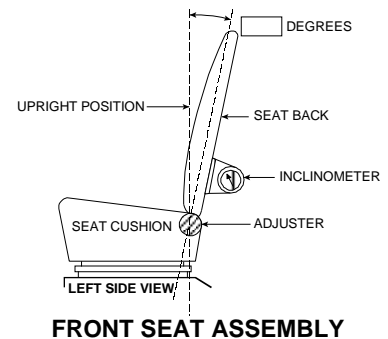
DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL DATA

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

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	11.6
Passenger Seat Back Angle	6.7

SEAT FORE / AFT POSITIONS

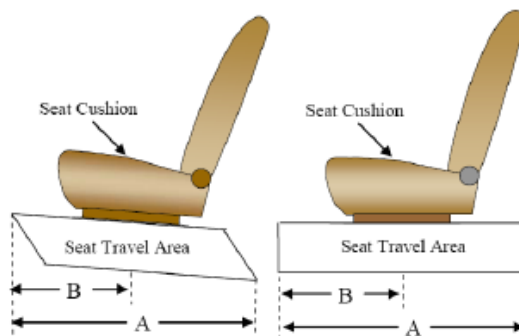
The driver's seat was positioned at the mid-point of fore/aft travel at its lowest position. The passenger's seat was positioned at the most forward position of fore/aft travel. Zero is defined as the forward most position.

Seating Position	Total Fore / Aft Travel	Placed in Position #
Driver Seat	23	8
Passenger Seat	23	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: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

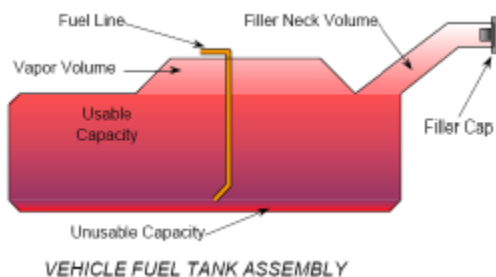
NHTSA No.: M20140202
 Test Date: 3/4/2014

FUEL TANK CAPACITY

Description	Liters
Usable Capacity of "Standard Tank"	60.0
Usable Capacity of "Optional Tank"	N/A
92%-94% of Usable Capacity	55.2 – 56.4
Actual Amount of Solvent Used	55.8
1/3 of Usable Capacity	20.0

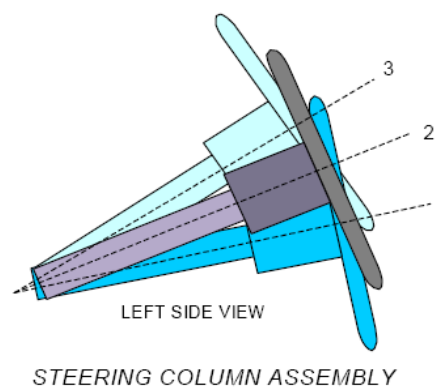
FUEL PUMP

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.



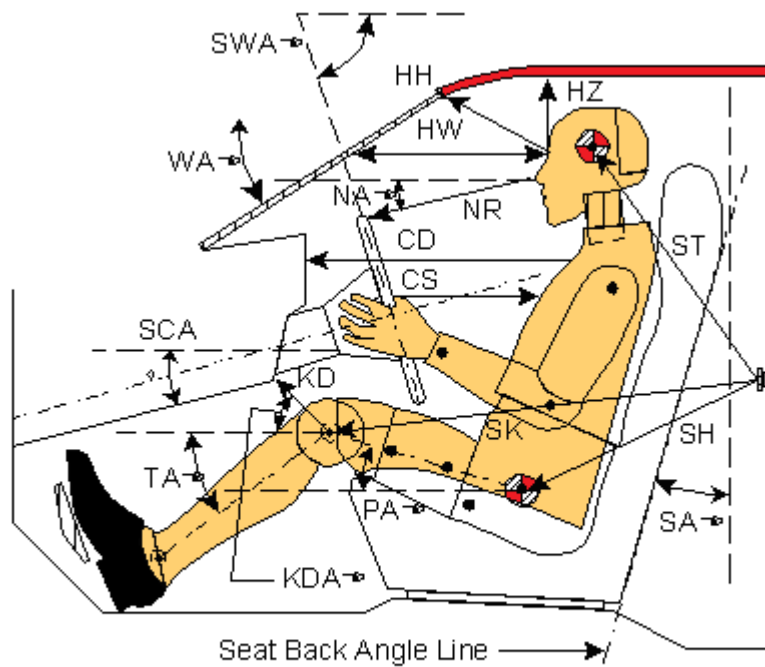
STEERING COLUMN POSITIONS

Description	Degrees	Fore / Aft Position (mm)
Lowermost position No. 1	23.2	
Geometric center position No. 2	26.1	
Uppermost position No. 3	28.9	
Telescoping Steering Wheel Travel		50
Test Position	26.0	25

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014



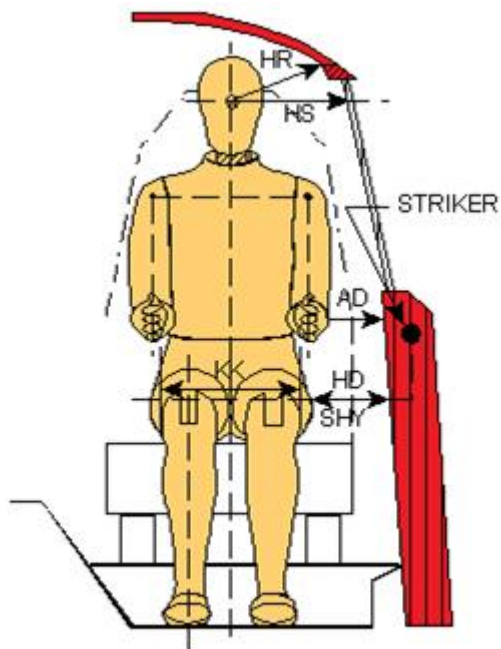
Left Side View

Code	Measurement Description	Driver (SN: 142)		Passenger (SN: 143)	
		Length (mm)	Angle (°)	Length (mm)	Angle (°)
WA°	Windshield Angle		-35.0		
SWA°	Steering Wheel Angle		26.0		
SCA°	Steering Column Angle		64.0		
SA°	Seat Back Angle (on headrest post)		11.5		6.7
HZ	Head to Roof (Z)	443	90	314	90
HH	Head to Header	608	26.2	515	37.4
HW	Head to Windshield	1013	0	884	0
NR	Nose to Rim	428	-8.6	447	-33.4
CD	Chest to Dash	543		390	
CS	Chest to Steering Hub	338	-3.1		
RA	Rim to Abdomen	208	0		
KDL	Left Knee to Dash	150	22.8	80	41.4
KDR	Right Knee to Dash	166	33.0	97	35.3
PA°	Pelvic Angle		22.5		20.3
TA°	Tibia Angle		-42.2		51.0
SK	Striker to Knee	594	2.6	633	-1.3
ST	Striker to Head	582	-84.9	589	-64.6
SH	Striker to H-Point	244	-30.8	358	-9.8

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014



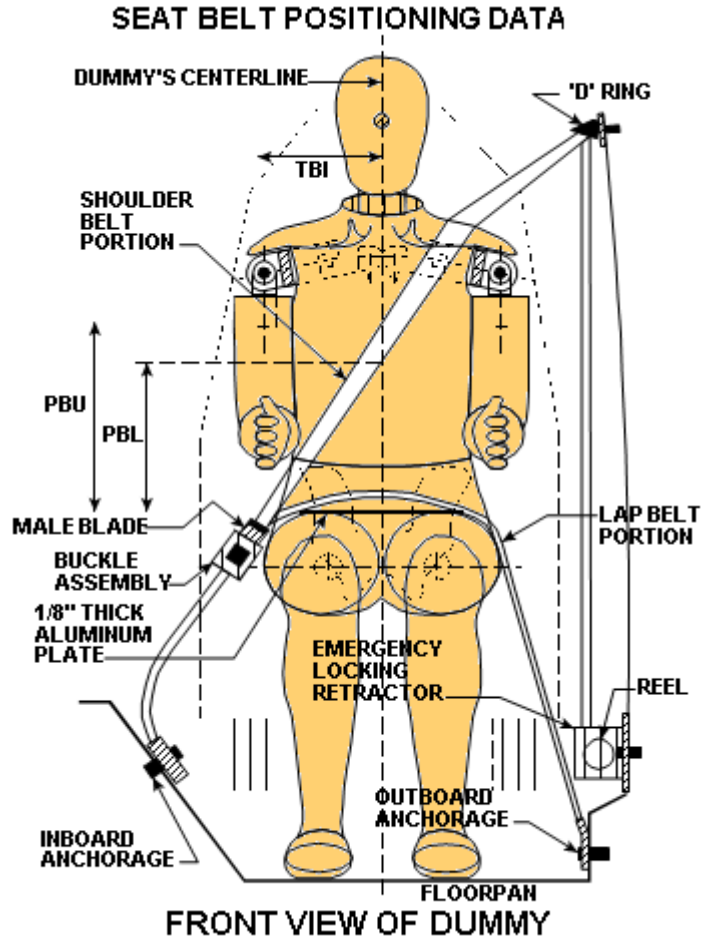
Front View

Code	Description	Driver (mm)	Passenger (mm)
AD	Arm to Door	149	104
HD	H-Point to Door	153	180
HR	Head to Side Header	363	394
HS	Head to Side Window	415	420
KK	Knee to Knee	336	163
SHY	Striker to H-Point (Y Direction)	260	270
AA	Ankle to Ankle	348	165

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of reference to belt upper edge	mm	370	350
PBL — Top surface of reference to belt lower edge	mm	295	265

BELT LENGTH DATA

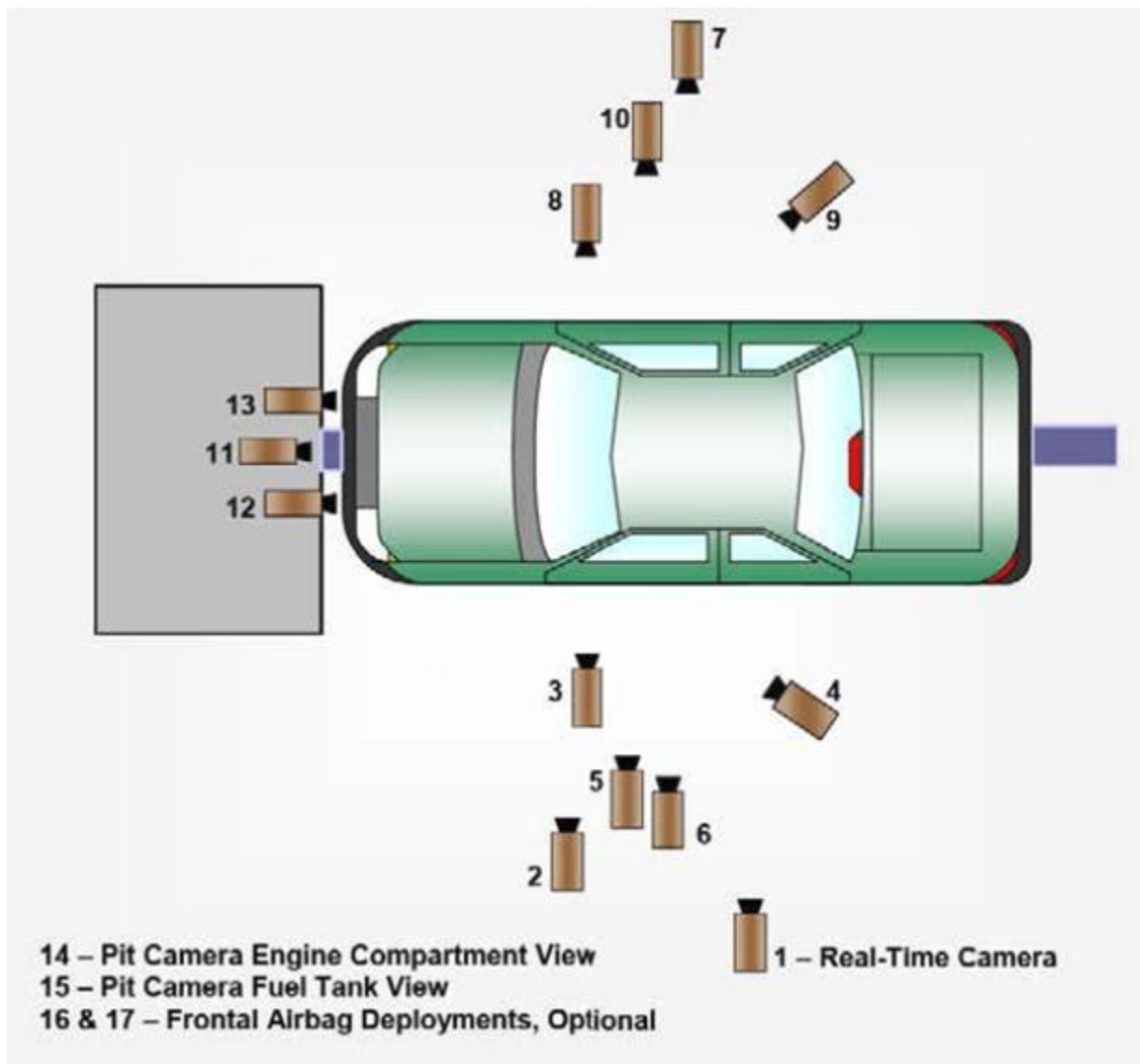
Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	890	970
Lap Belt Length as measured on ATD	mm	740	830
Remainder of belt on reel	mm	1170	850
Total belt length for continuous webbing systems	mm	2800	2650

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

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014

CAMERA POSITIONS FOR FRONTAL IMPACTS



Top View

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

CAMERA LOCATIONS

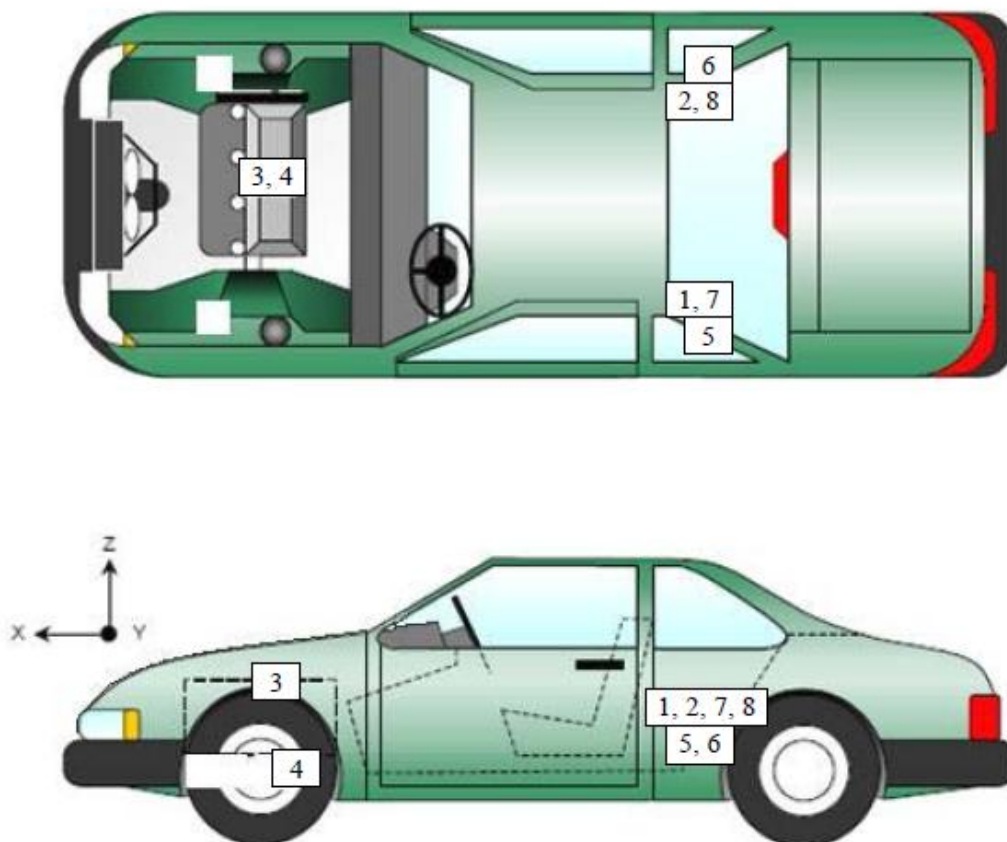
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Left Overall	-	-	-		60
2	Driver Close-Up	1497	-8319	1515	50	1000
3	Left Front Half	936	-9953	1550	50	1000
4	Left Angle	2924	-3151	2217	24	1000
5	Steering Column - Top	1729	-8215	1976	24-70	1000
6	Steering Column - Bottom	1729	-8215	1370	24-70	1000
7	Right Overall	2110	9547	1188	28	1000
8	Passenger Close-Up	1229	8392	1378	50	1000
9	Right Front Half	568	10081	1125	50	1000
10	Right Angle	3228	3215	2275	28	1000
11	Windshield	-557	0	3494	20	1000
12	Driver Windshield	-191	-638	2026	25	1000
13	Passenger Windshield	-191	621	2026	25	1000
14	Pit Front	749	0	1428	12.5	1000
15	Pit Rear	2547	0	1412	12.5	1000
16	Onboard Driver Airbag (Optional)					
17	Onboard Passenger Airbag (Optional)					

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

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear Accelerometer – X Direction	2083	-692	-39
2	Right Rear Accelerometer – X Direction	2063	709	-44
3	Engine Top X	4155	75	-438
4	Engine Bottom X	4059	138	186
5	Left Rear Accelerometer – Z Direction	2078	-708	-43
6	Right Rear Accelerometer – Z Direction	2072	692	-40
7	Left Rear Accelerometer – X Direction Redundant	2083	-692	-39
8	Right Rear Accelerometer – X Direction Redundant	2063	709	-44

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

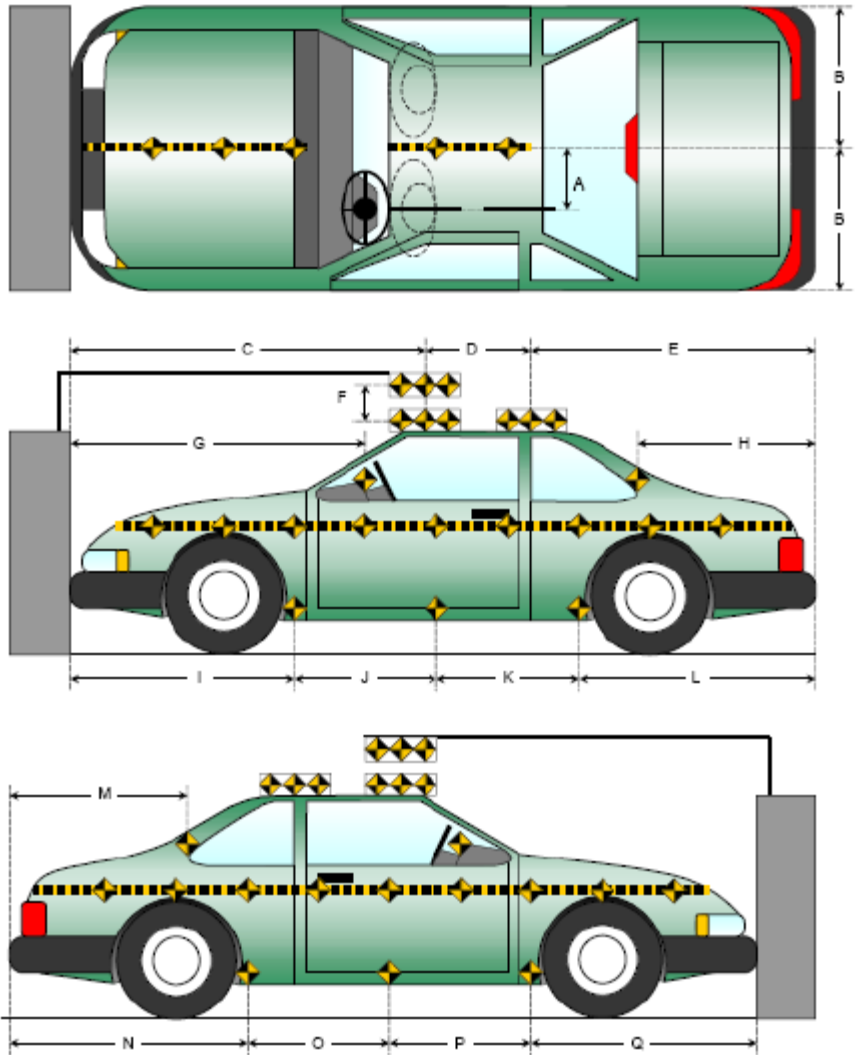
DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

Item	Value
A	371
B	894
C	2140
D	1221
E	1473
F	140
G	1668
H	1225
I	1353
J	1085
K	1081
L	1315
M	1229
N	1321
O	1076
P	1092
Q	1345

All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

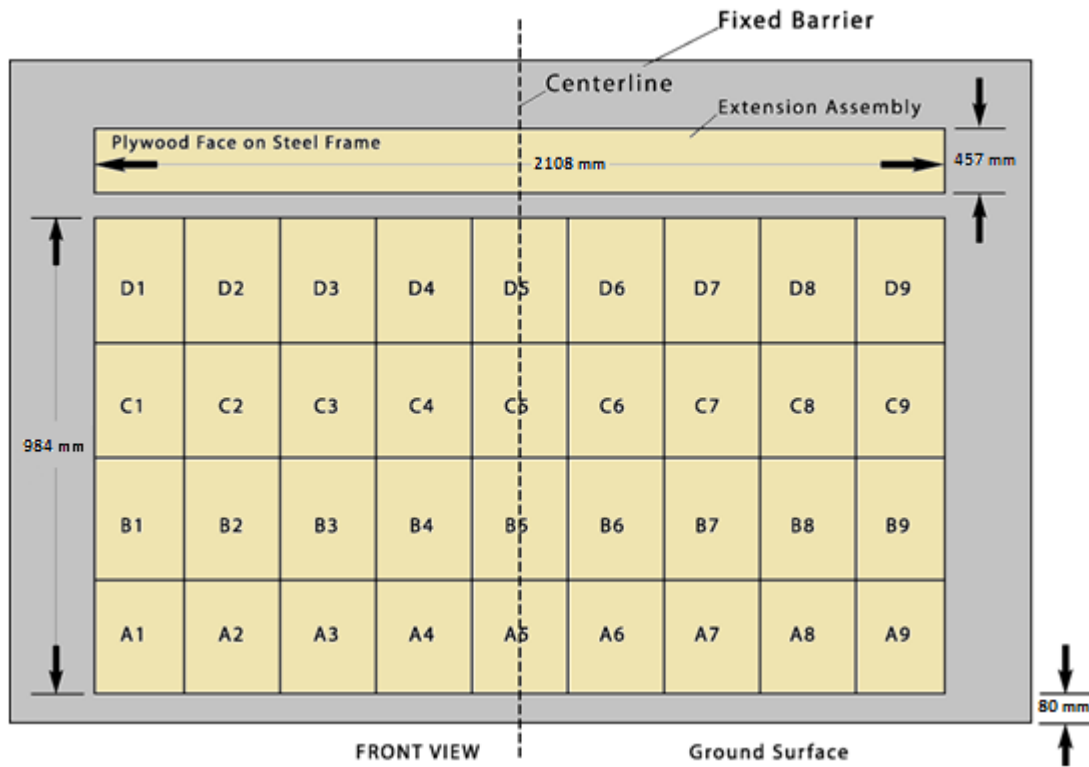


Figure 1 - Load Cell Locations on a 36-Load Cell Barrier with Plywood Height Extension

DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014

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

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

TEST DUMMY INFORMATION AND CONTACT LOCATIONS

Description	Driver	Passenger
Dummy Type / Serial No.	P572E 50 th Male / 142	P5720 5 th Female / 143
Head Contact	Front Airbag & Headrest	Front Airbag, Headrest & Seatback
Upper Torso Contact	Front Airbag	Front Airbag
Lower Torso Contact	None	None
Left Knee Contact	Knee Bolster	Glove Box
Right Knee Contact	Knee Bolster	Glove Box

DOOR OPENING AND SEAT TRACK INFORMATION

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

POST-TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

Measured Parameter	Units	Value
Left Side	mm	778
Center	mm	743
Right Side	mm	810
Average	mm	777

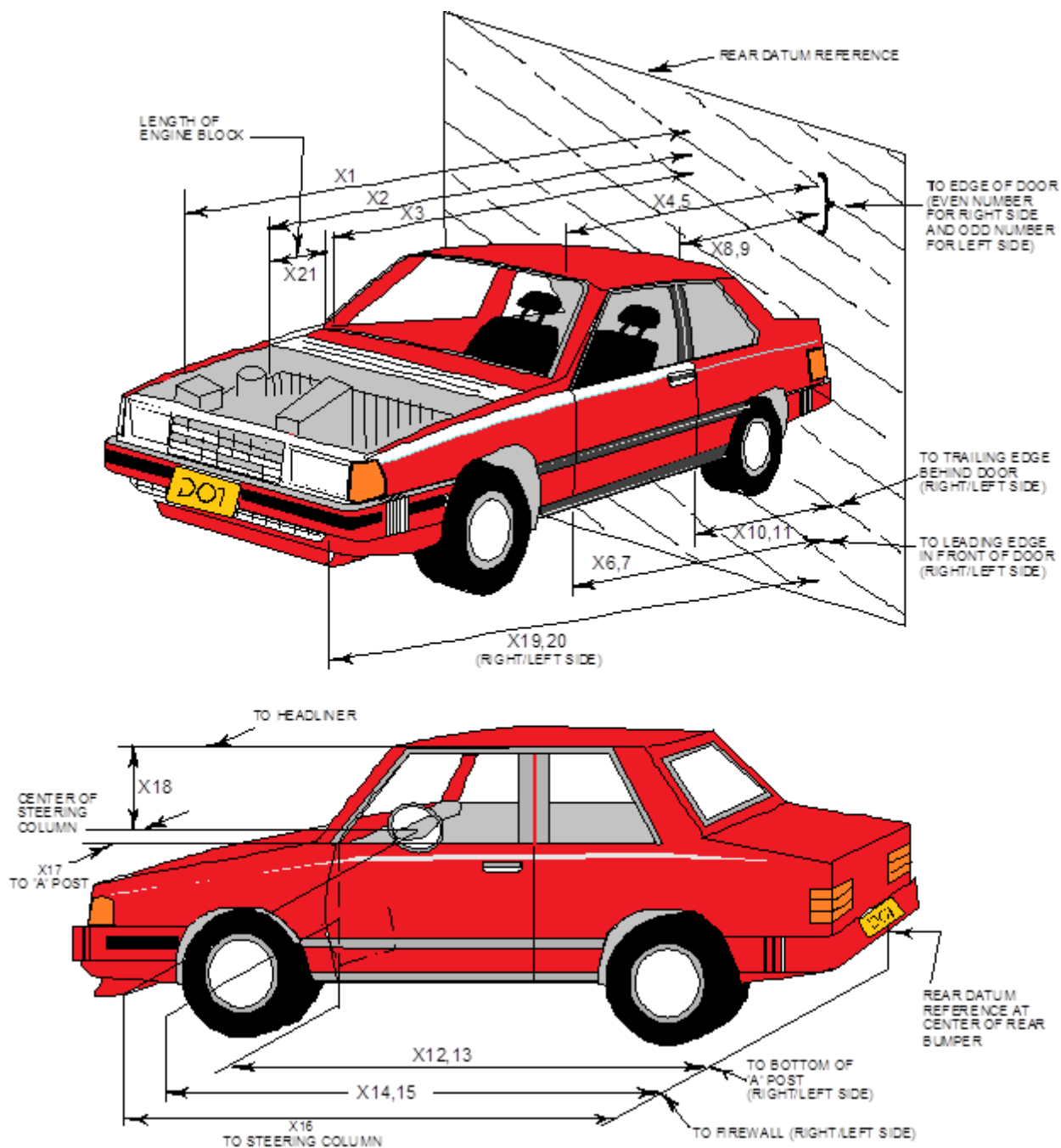
SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

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: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014



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

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4834	4418	-416
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4389	4078	-311
3	RSOV to Firewall	4046	4036	-10
4	RSOV to Upper Leading Edge of Right Door	3522	3515	-6
5	RSOV to Upper Leading Edge of Left Door	3514	3514	0
6	RSOV to Lower Leading Edge of Right Door	3470	3466	-4
7	RSOV to Lower Leading Edge of Left Door	3462	3461	-1
8	RSOV to Upper Trailing Edge of Right Door	2400	2393	-7
9	RSOV to Upper Trailing Edge of Left Door	2391	2392	1
10	RSOV to Lower Trailing Edge of Right Door	2404	2402	-3
11	RSOV to Lower Trailing Edge of Left Door	2397	2399	2
12	RSOV to Bottom of "A" Post of Right Side	3816	3786	-30
13	RSOV to Bottom of "A" Post of Left Side	3808	3776	-32
14	RSOV to Firewall, Right Side	4028	3953	-74
15	RSOV to Firewall, Left Side	4024	3995	-29
16	RSOV to Steering Column	3025	3094	69
17	Center of Steering Column to "A" Post	322	322	0
18	Center of Steering Column to Headliner	527	510	-17
19	RSOV to Right Side of Front Bumper	4808	4318	-491
20	RSOV to Left Side of Front Bumper	4805	4361	-444
21	Length of Engine Block	373	373	0
RD	RSOV to Right Side of Dash Panel	3182	3182	0
CD	RSOV to Center of Dash Panel	3141	3139	-2
LD	RSOV to Left Side of Dash Panel	3187	3184	-3

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014

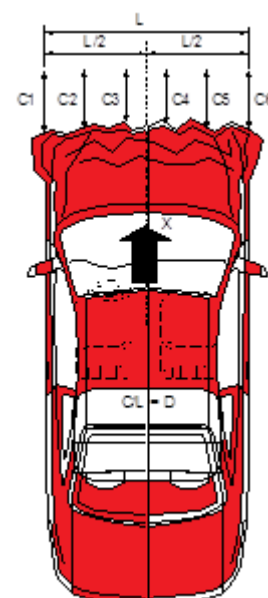
VEHICLE INFORMATION

VIN: NM0GE9F71E1140792
Vehicle Size Category: Passenger

Wheelbase (mm): 3064
Test Weight (kg): 2,012

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): 56.48
Velocity Change (km/h): 56.48
Time of Separation (ms): 121



CRUSH PROFILE

Collision Deformation Classification: 12FDEW3
Midpoint of Damage: Vehicle Centerline
Damage Region Length (mm): 1072
Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush Zone 1 at Left Side	mm	4768	4338	430
C2	Crush Zone 2 at Left Side	mm	4812	4358	454
C3	Crush Zone 3 at Left Side	mm	4813	4346	467
C4	Crush Zone 4 at Right Side	mm	4815	4337	478
C5	Crush Zone 5 at Right Side	mm	4816	4329	487
C6	Crush Zone 6 at Right Side	mm	4775	4312	463
L	C1 to C6	mm	1072	1085	-12

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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

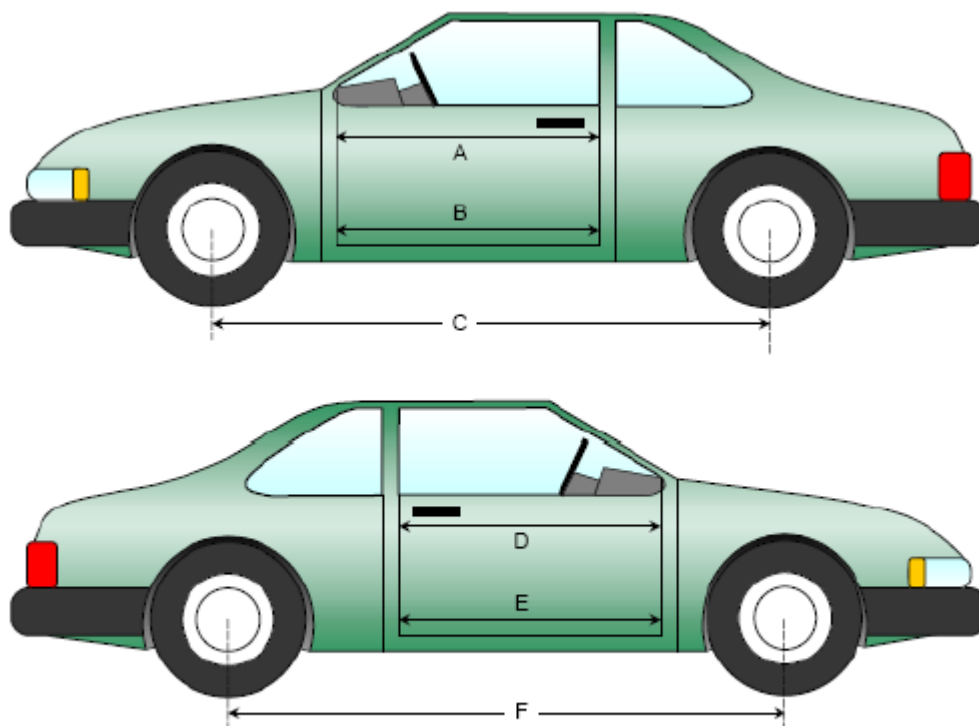
NHTSA No.: M20140202
 Test Date: 3/4/2014

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	959	957	-2
B	Left Side Lower	mm	855	853	-2
D	Right Side Upper	mm	957	953	-4
E	Right Side Lower	mm	856	853	-3

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	3064	2959	-105
F	Right Side Wheelbase	mm	3064	2974	-90



Left & Right Side Views

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

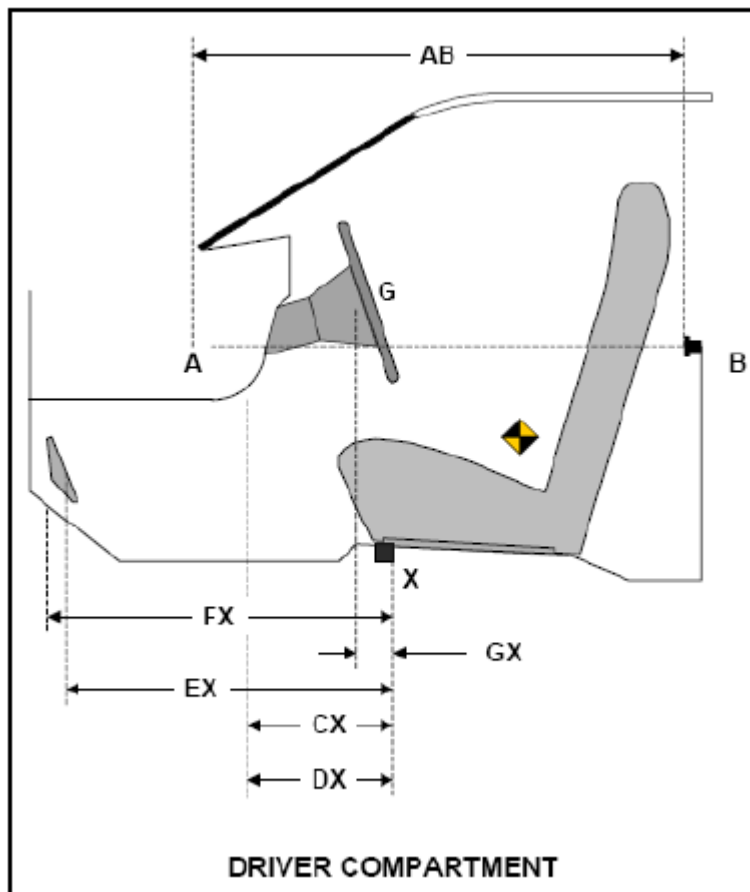
Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

DRIVER COMPARTMENT INTRUSION

Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	914	913	-1
CX	Left Knee Bolster to X	mm	337	336	-1
DX	Right Knee Bolster to X	mm	323	317	-6
EX	Brake Pedal to X	mm	495	511	16
FX	Foot Rest to X	mm	572	544	-28
GX	Center of Steering Column Wheel Hub to X	mm	72	146	74

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014

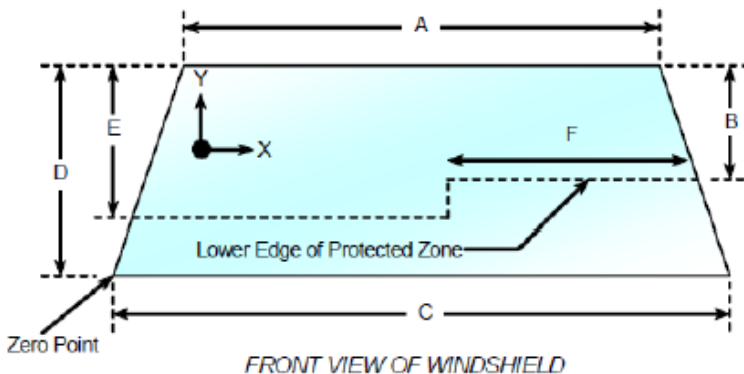
Windshield Mounting Details: A 0.8 mm trim surrounds the top and side of windshield while a plastic shroud is on the bottom.

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	2330	2330	100%
Right Side	2330	2330	100%
Total	4660	4660	100%



Item	Units	Value
A	mm	1370
B	mm	670
C	mm	1540
D	mm	875
E	mm	705
F	mm	390

AREAS OF PROTECTED ZONE FAILURES

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

X	Y

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

X	Y

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

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 21 ° C

Test Time: 12:15 PM

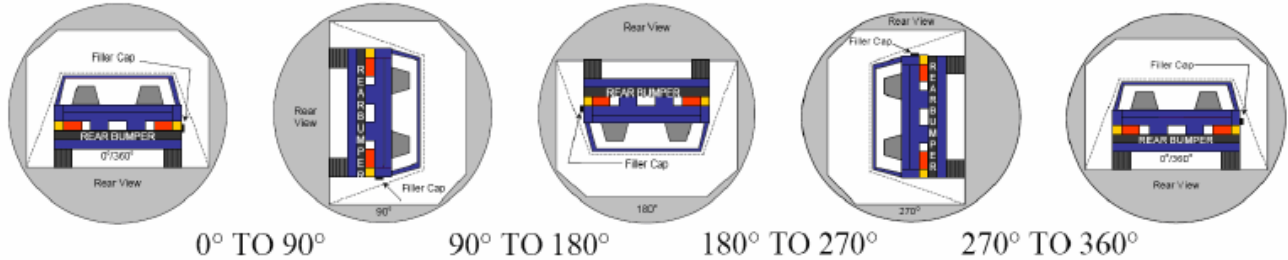
STODDARD SOLVENT SPILLAGE MEASUREMENTS

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

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2014 Ford Transit Connect wagon
Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
Test Date: 3/4/2014



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°	72	300	372
90° to 180°	68	300	368
180° to 270°	64	300	364
270° to 360°	66	300	366

FMVSS 301 SPILLAGE TABLE

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

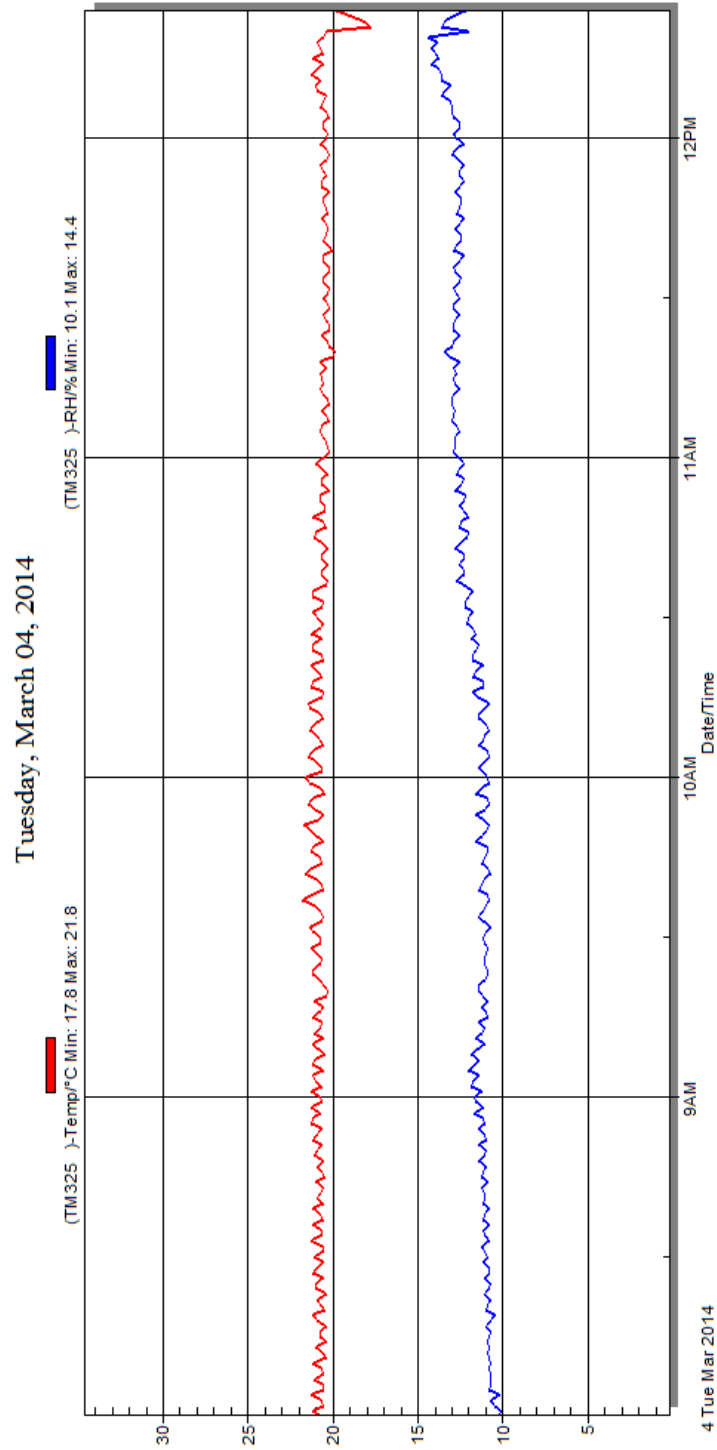
SOLVENT SPILLAGE LOCATION TABLE

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

DATA SHEET NO. 17
DUMMY / VEHICLE TEMPERATURE STABILIZATION CHART

Test Vehicle: 2014 Ford Transit Connect wagon
 Test Program: NCAP Frontal Barrier Impact Test

NHTSA No.: M20140202
 Test Date: 3/4/2014



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

APPENDIX A
PHOTOGRAPHS

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Fig.	Description	Page
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41	Pre-Test Driver's Side Knee Bolster	A-25
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44	Post-Test Driver's Side Floorpan	A-26
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46	Post-Test Driver Dummy Contact With Airbag	A-27
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48	Pre-Test View of the Steering Wheel	A-28
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62	Pre-Test Passenger's Side Knee Bolster	A-35
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Fig.	Description	Page
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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.*

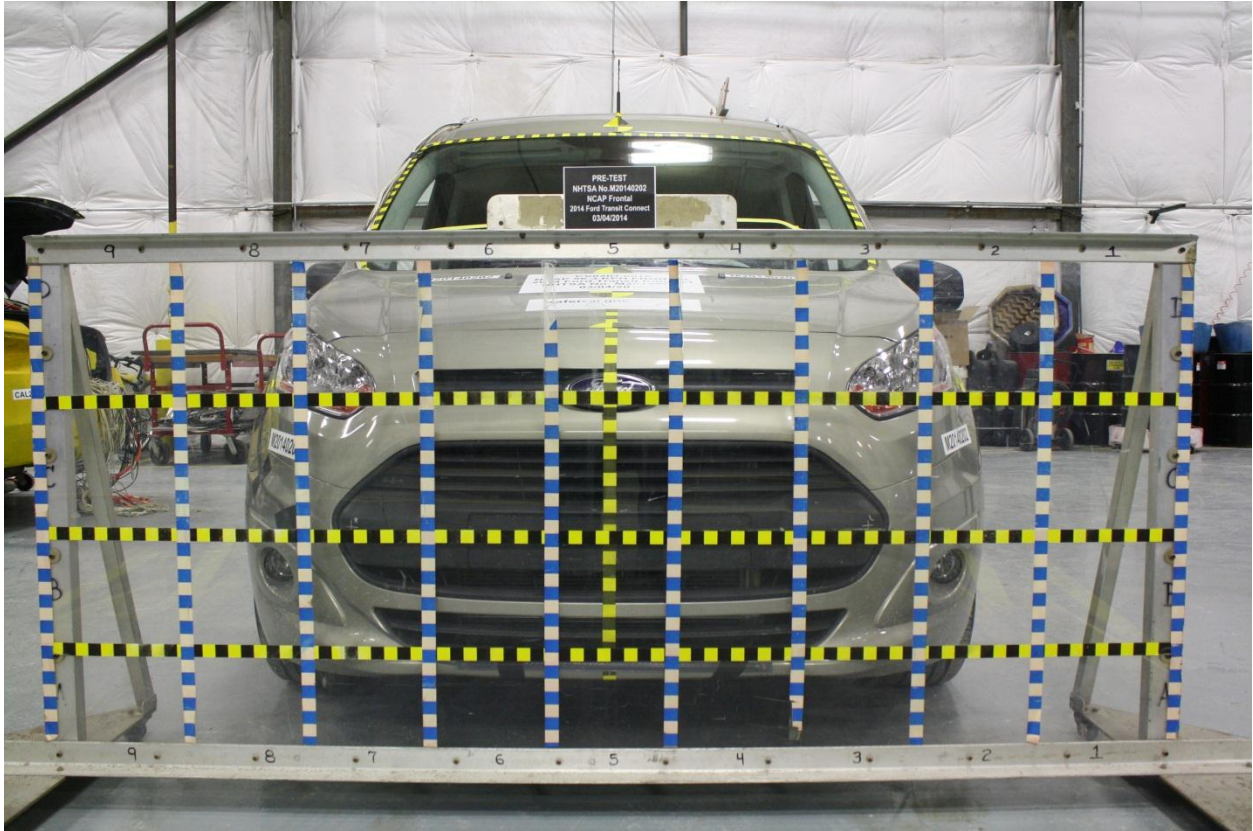


Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall

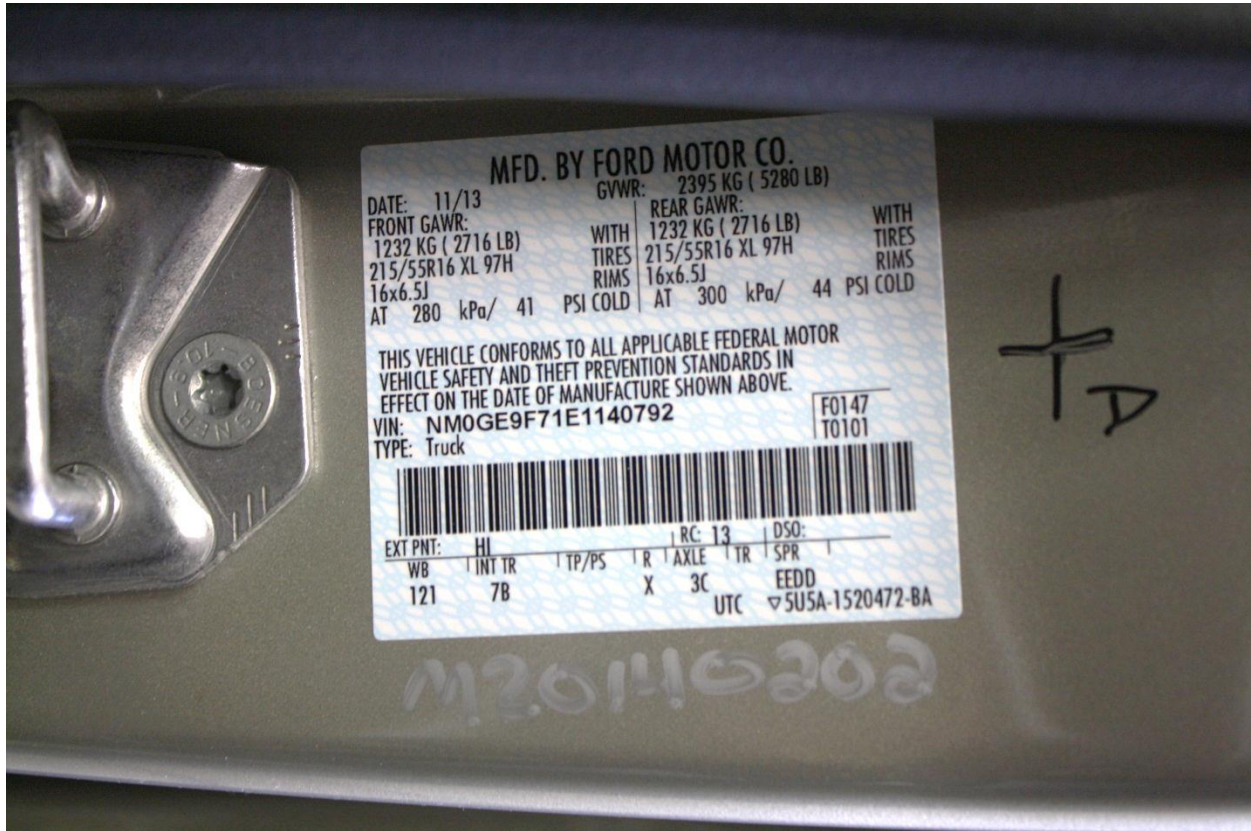


Figure A-3: Manufacturer's Label



Figure A-4: Tire Placard



Figure A-5: 2014 Ford Transit Connect Frontal As Delivered



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



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



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



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



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



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



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



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



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



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



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



Figure A-17: Pre-Test Windshield View

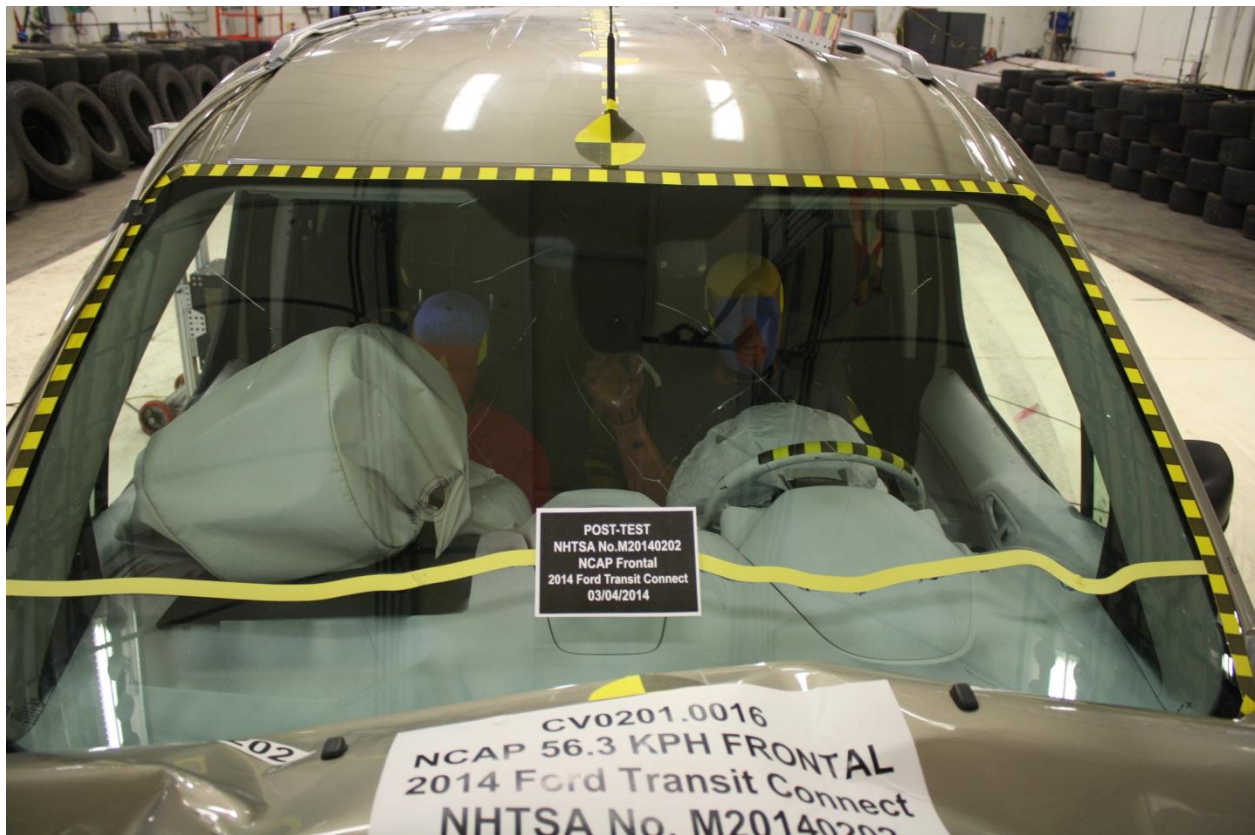


Figure A-18: Post-Test Windshield View



Figure A-19: Pre-Test Engine Compartment View



Figure A-20: Post-Test Engine Compartment View



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



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

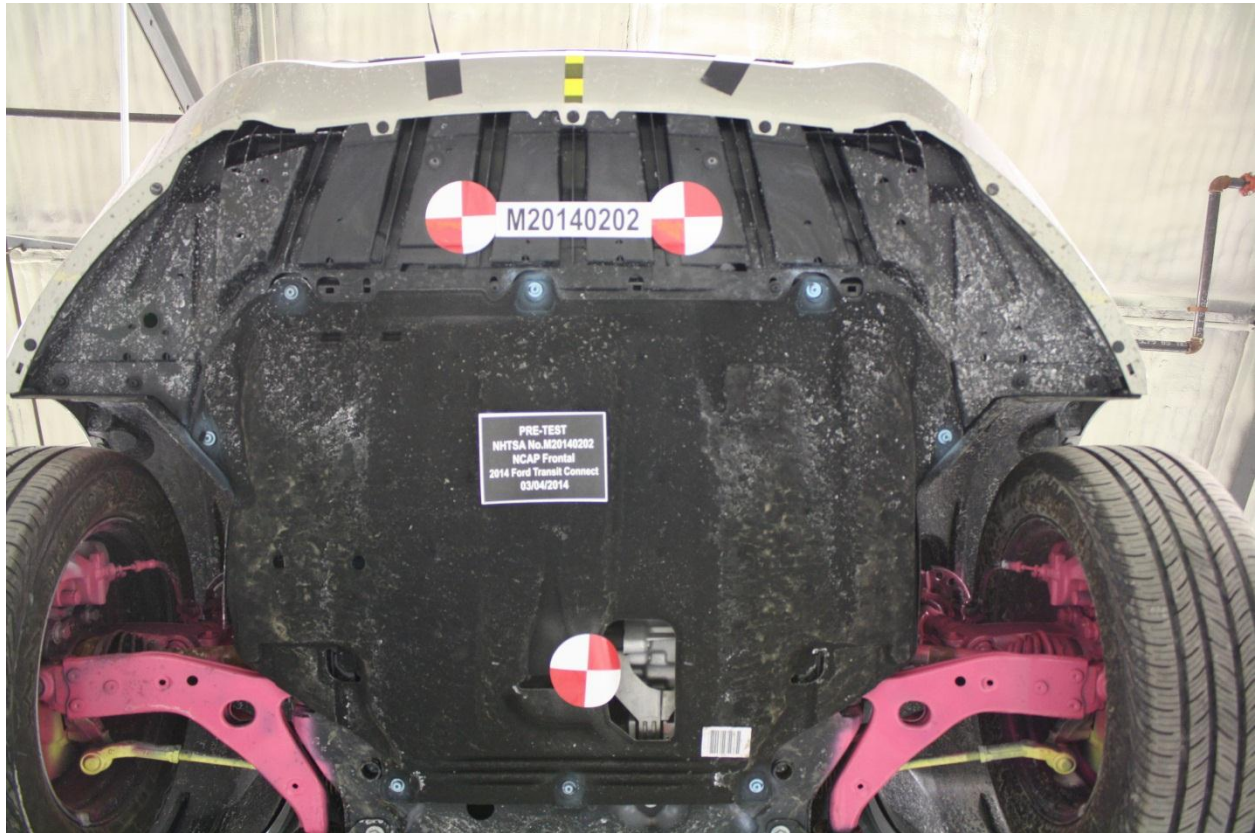


Figure A-23: Pre-Test Front Underbody View

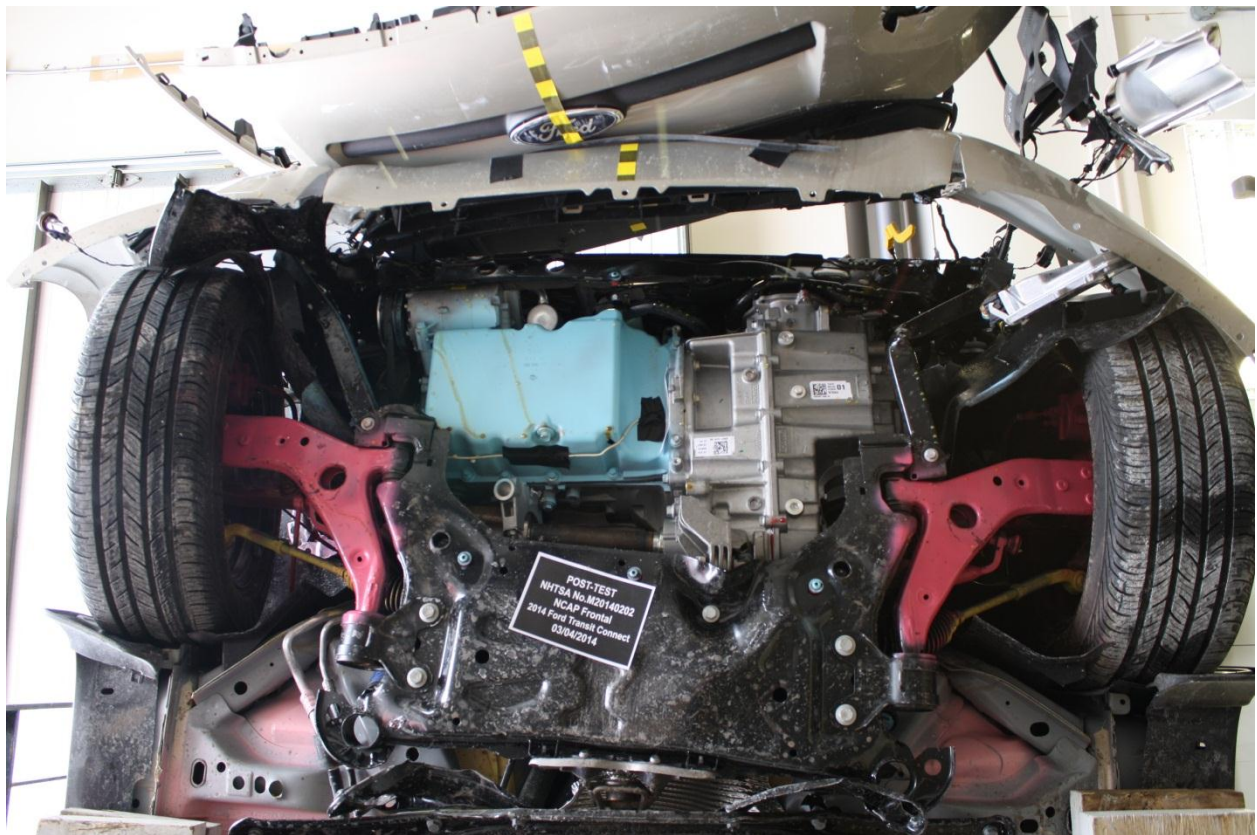


Figure A-24: Post-Test Front Underbody View



Figure A-25: Pre-Test Rear Underbody View

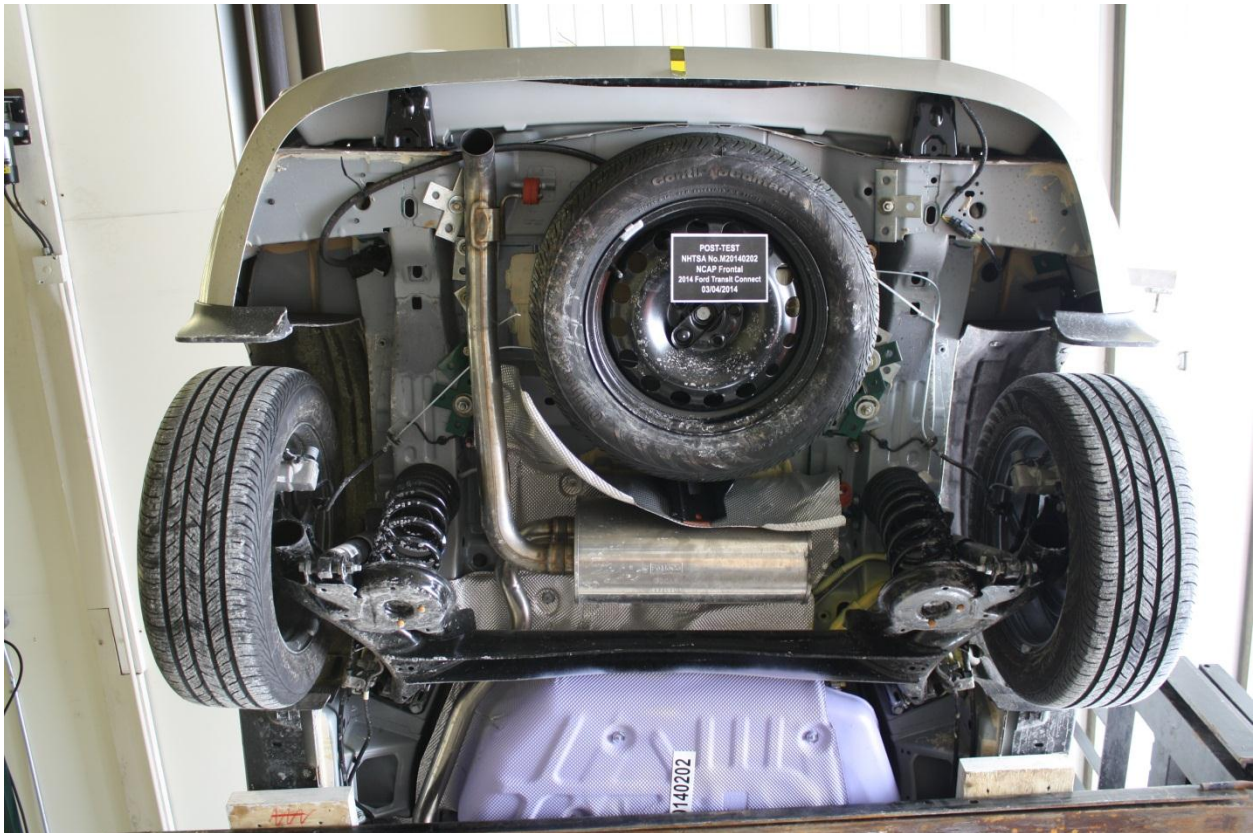


Figure A-26: Post-Test Rear Underbody View



Figure A-27: Pre-Test Dummy Cable Routing

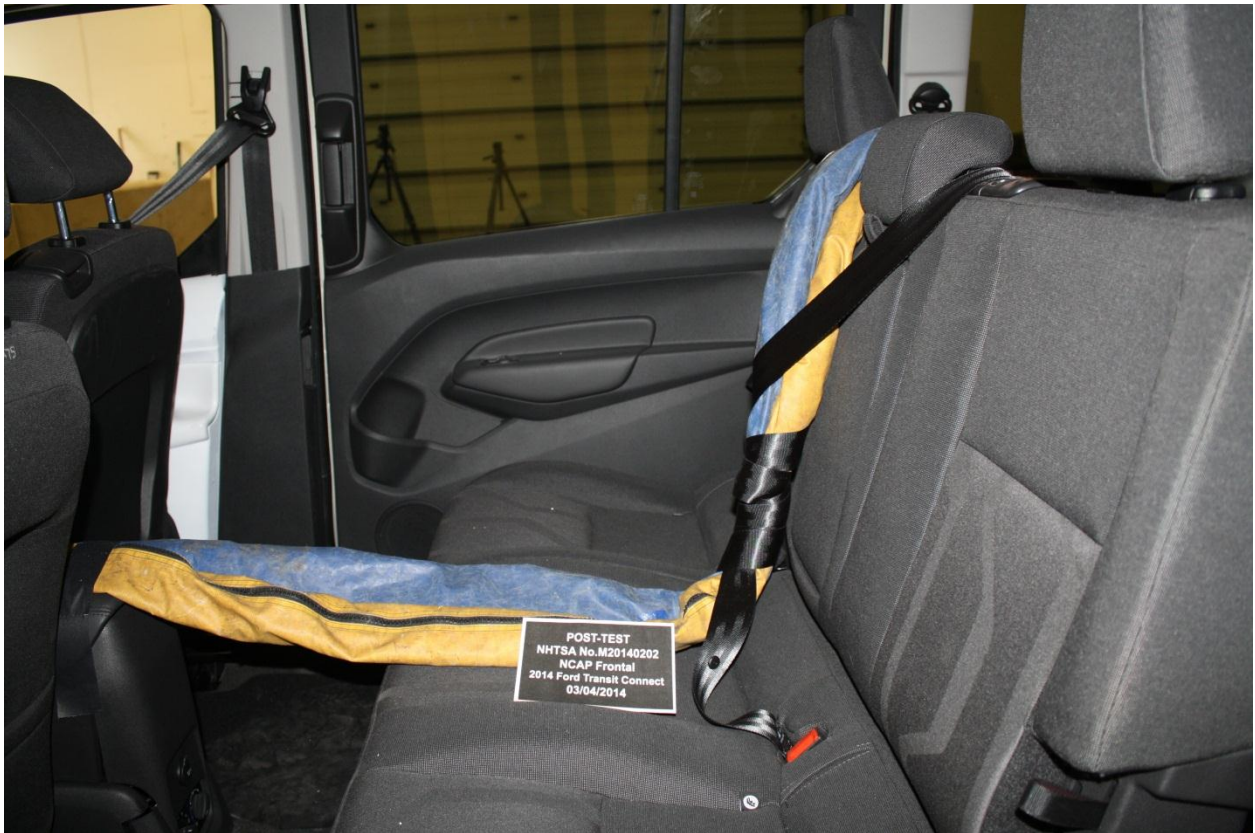


Figure A-28: Post-Test Dummy Cable Routing



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

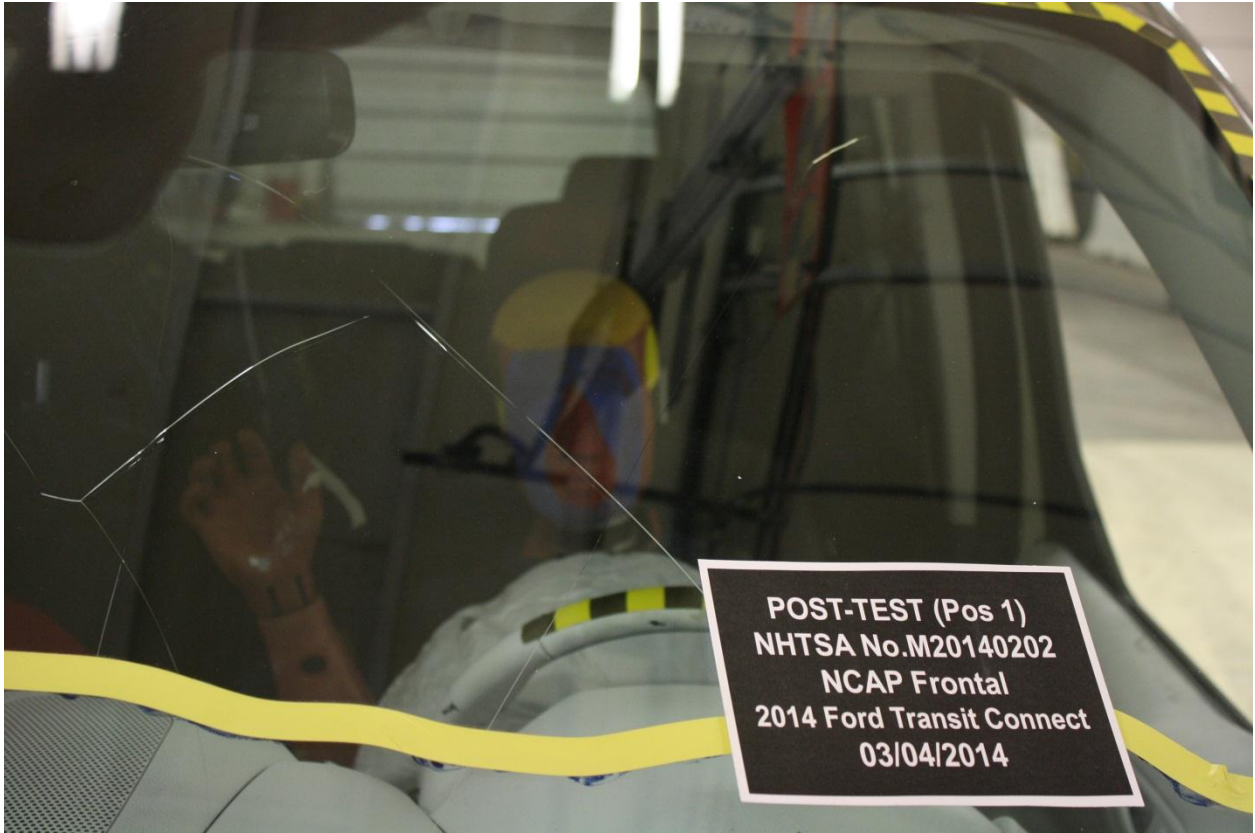


Figure A-30: Post-Test Driver Dummy Front View



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



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



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



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



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



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



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



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

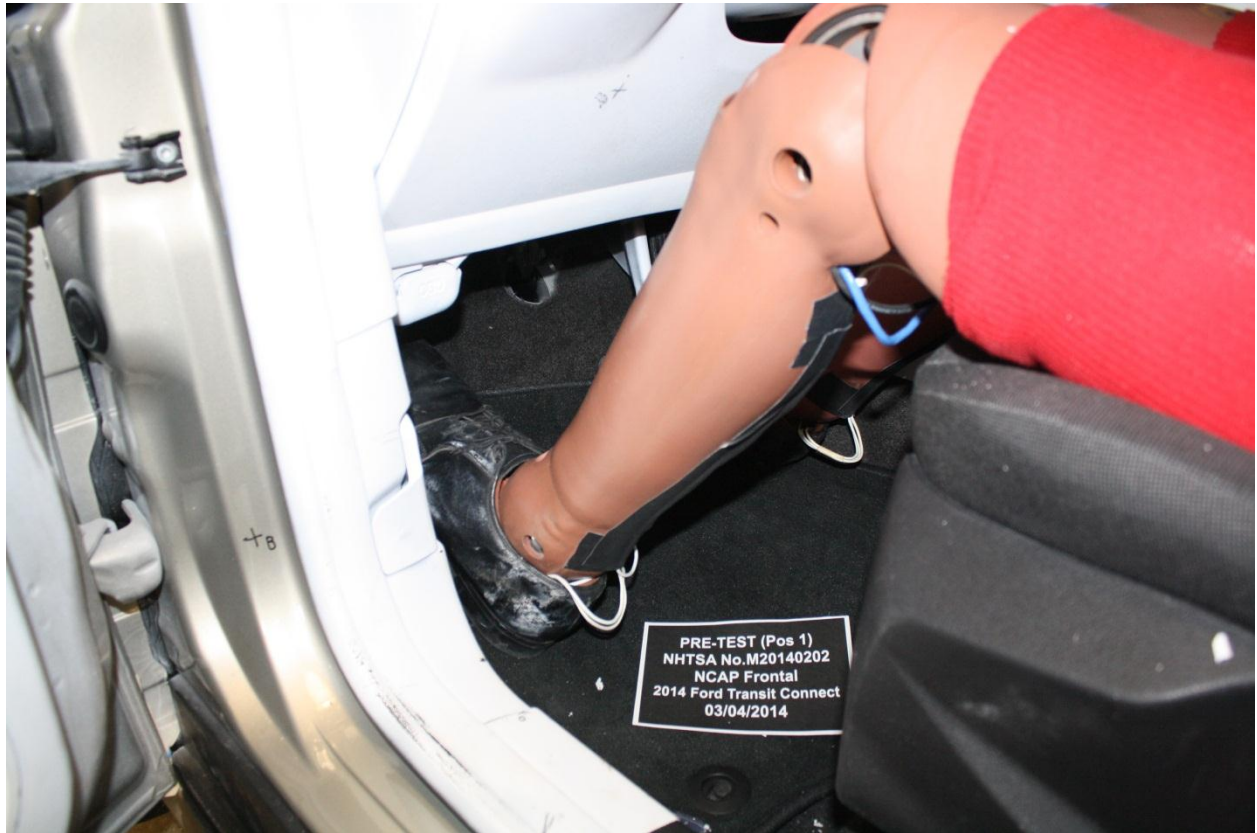


Figure A-39: Pre-Test Driver Dummy Feet



Figure A-40: Post-Test Driver Dummy Feet

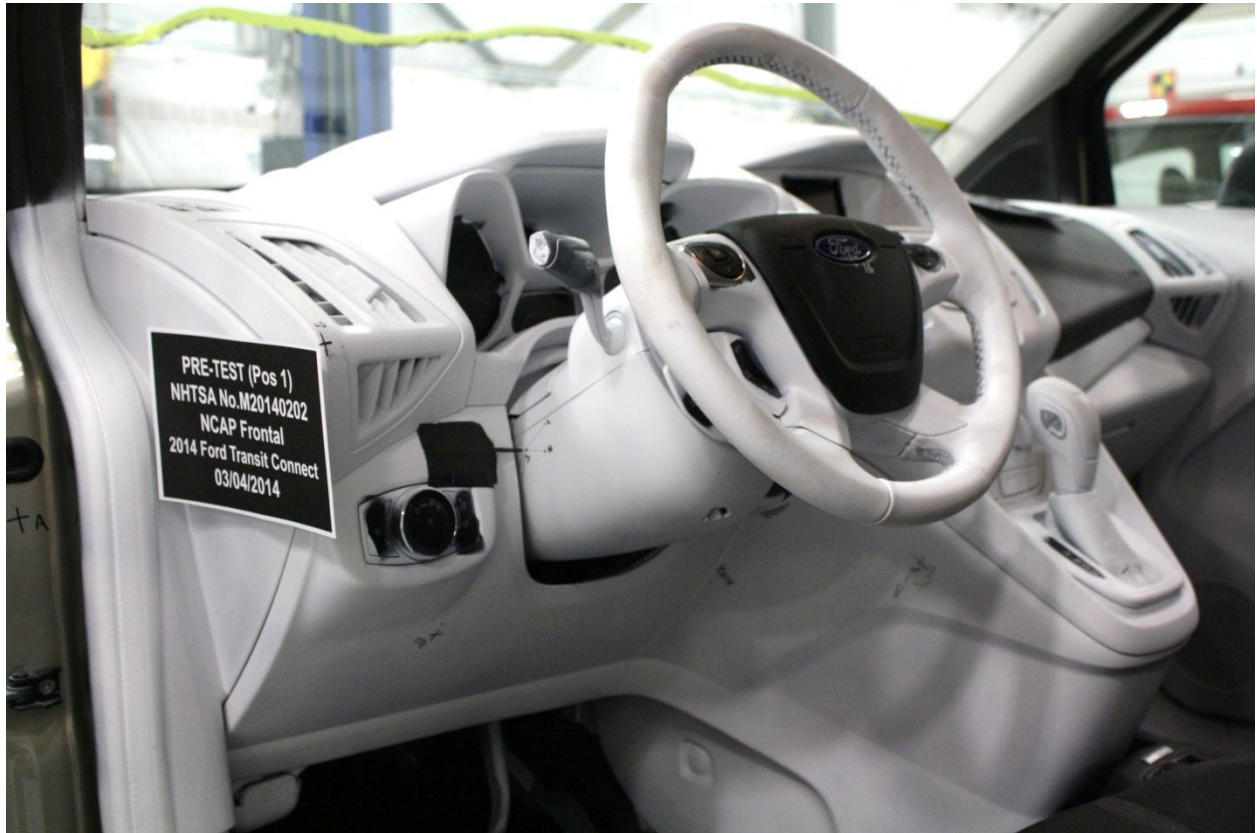


Figure A-41: Pre-Test Driver's Side Knee Bolster



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



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



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

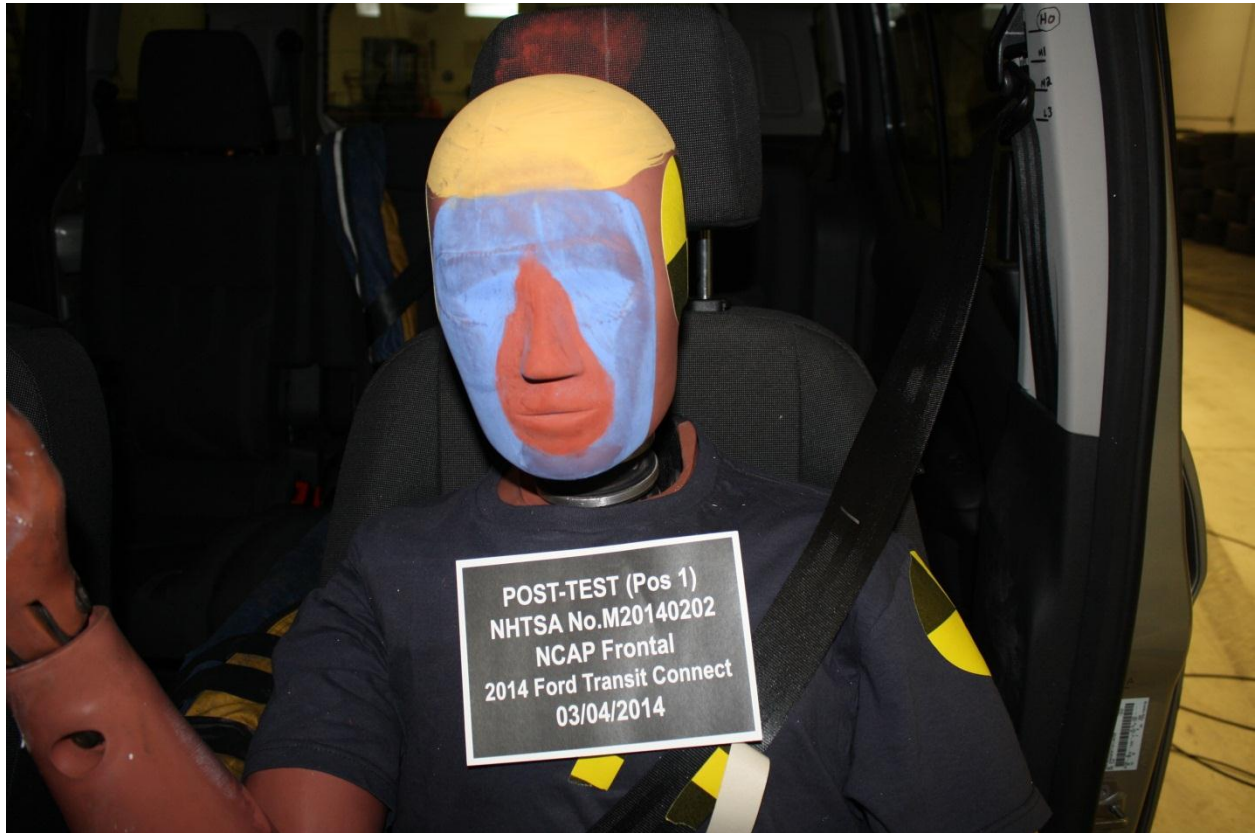


Figure A-45: Post-Test Driver Dummy Face

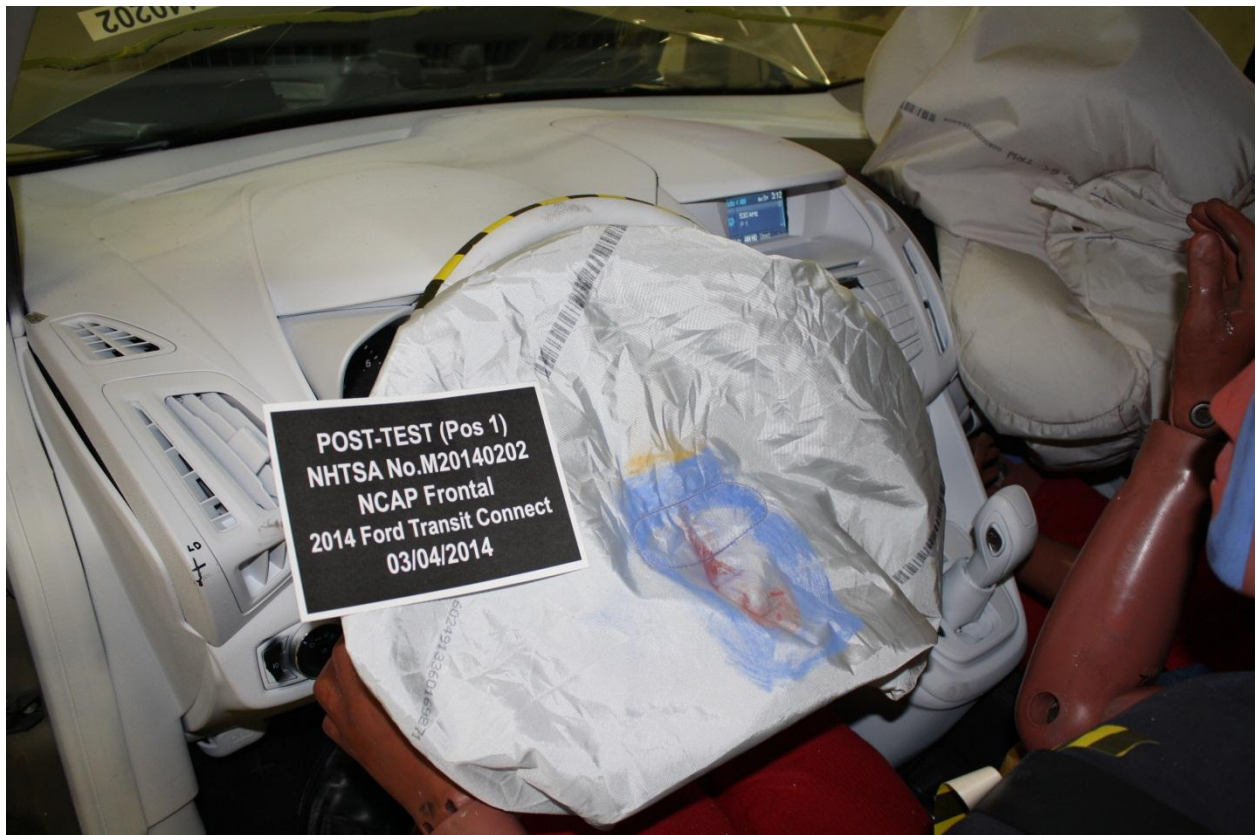


Figure A-46: Post-Test Driver Dummy Contact With Airbag



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



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

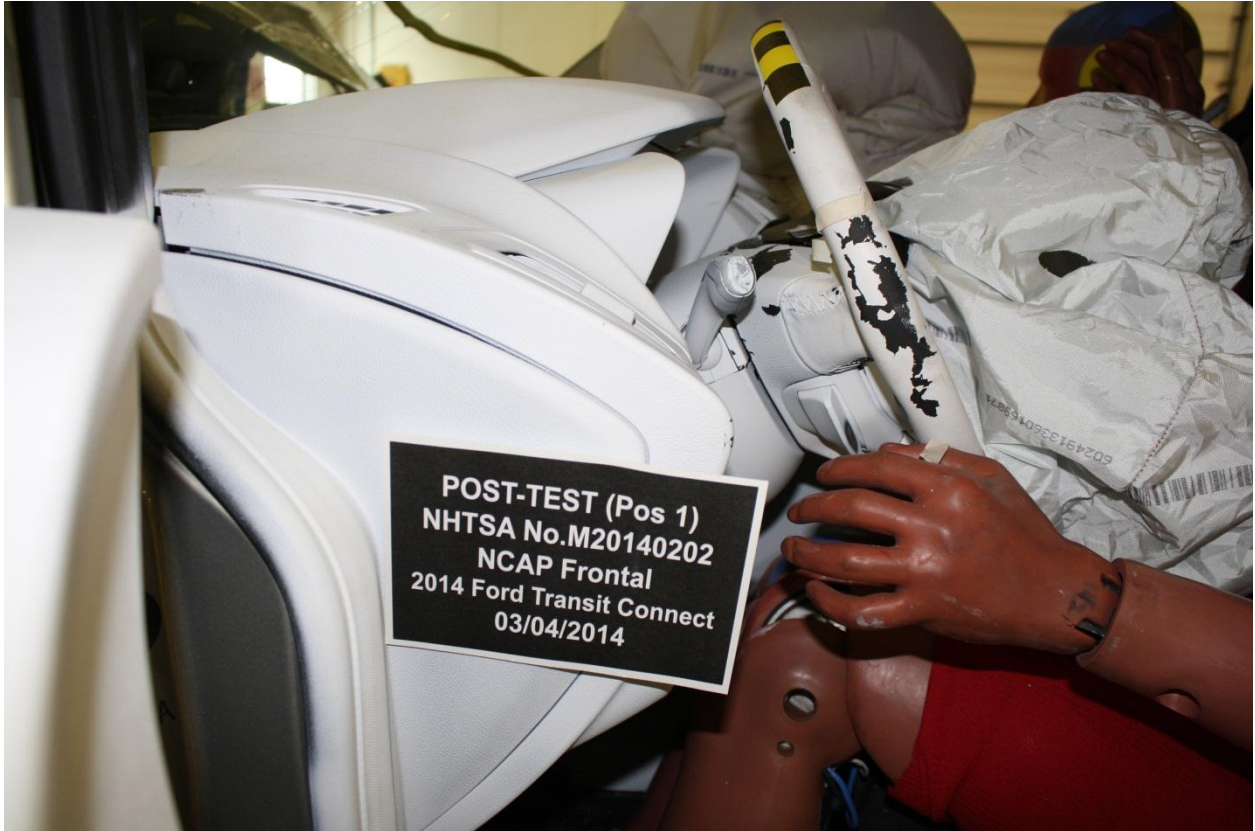


Figure A-49: Post-Test View of the Steering Wheel

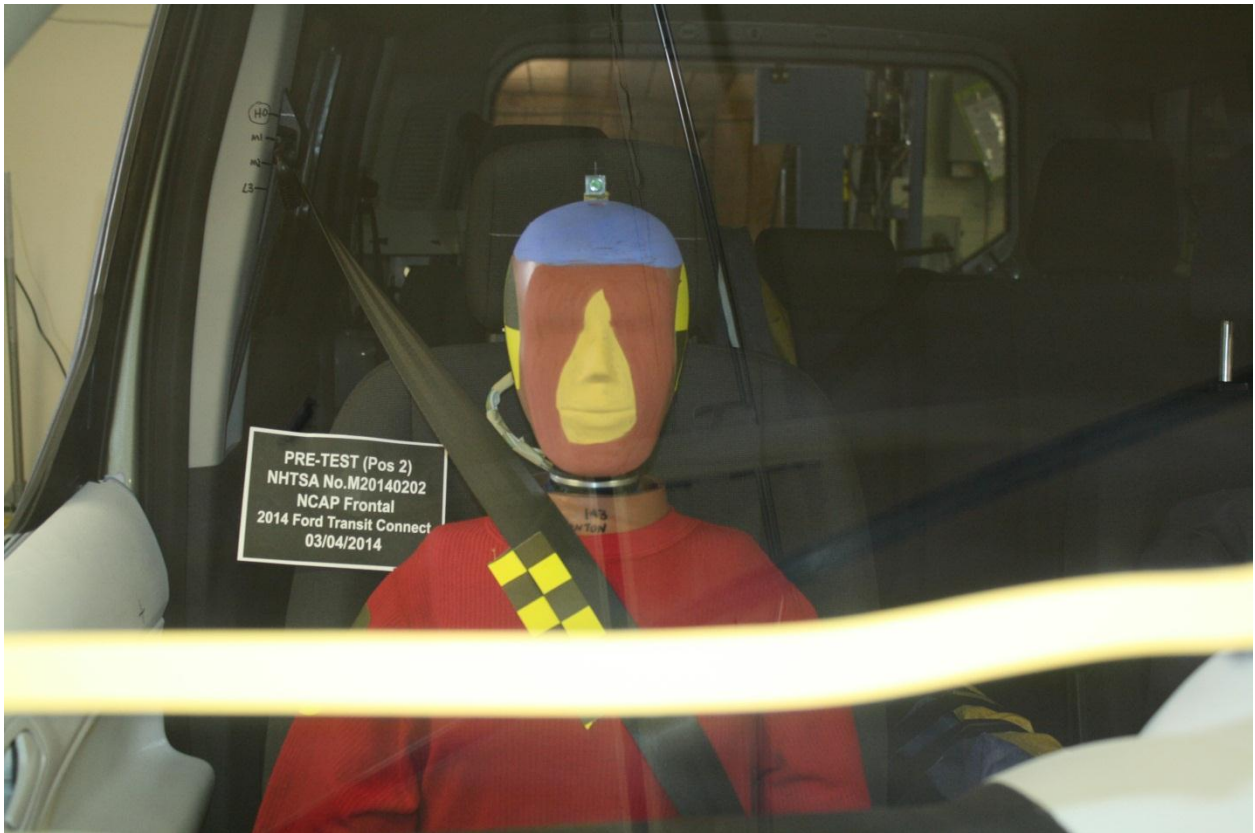


Figure A-50: Pre-Test Passenger Dummy Front View

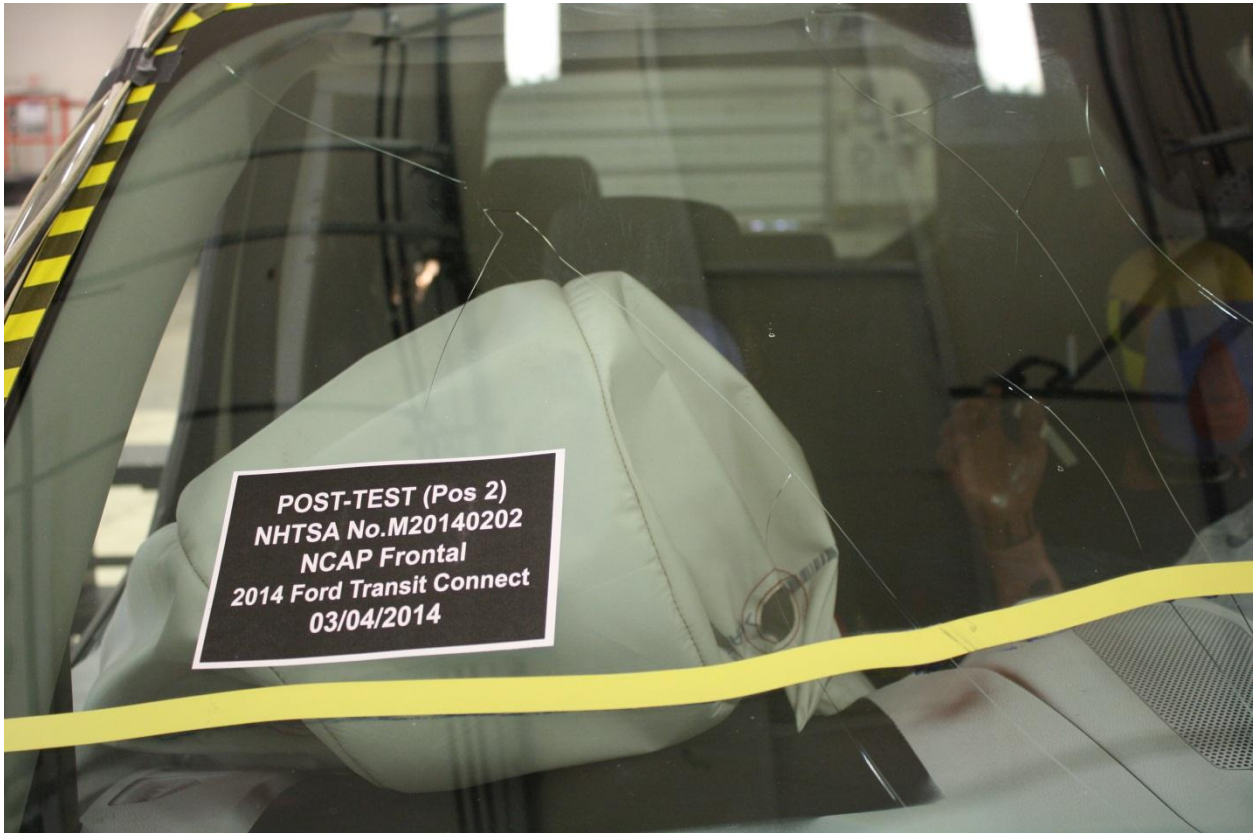


Figure A-51: Post-Test Passenger Dummy Front View



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



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



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



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

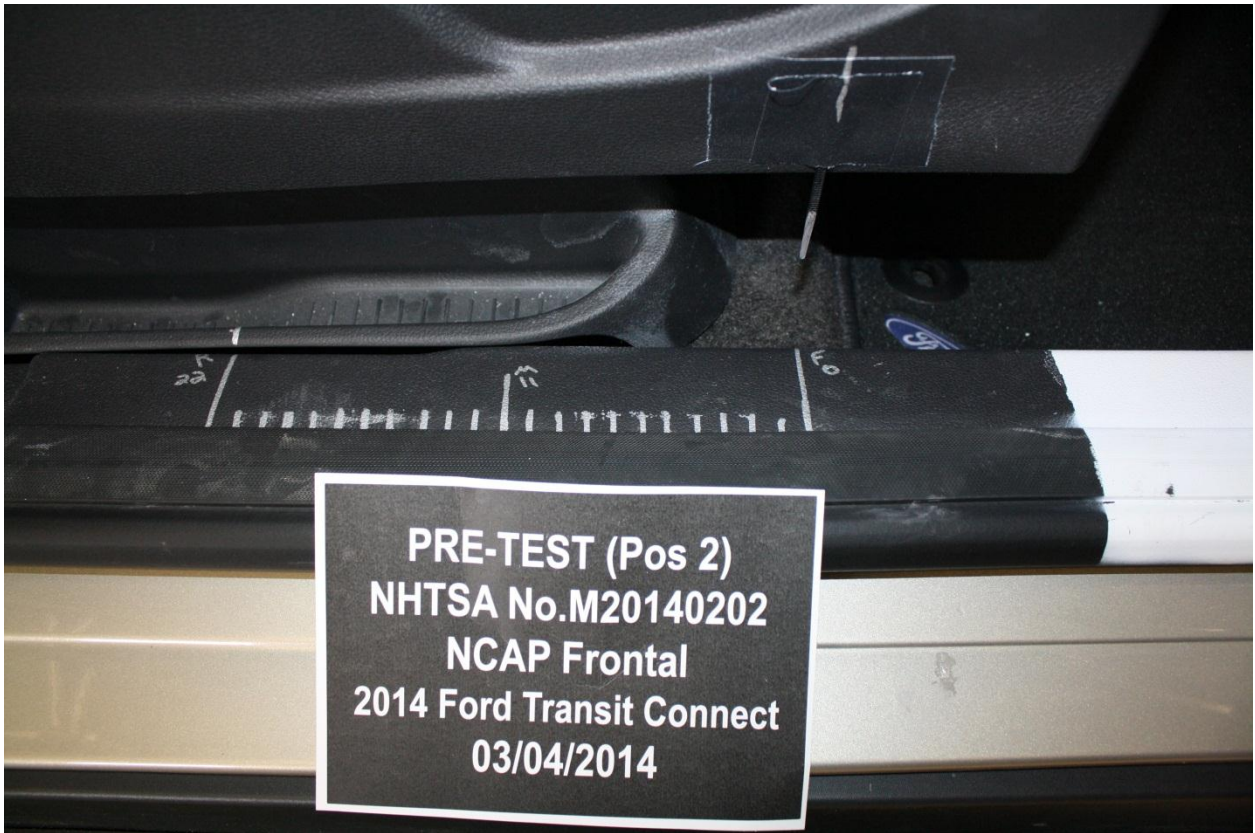


Figure A-56: Pre-Test Passenger's Seat Fore-Aft Markings



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



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

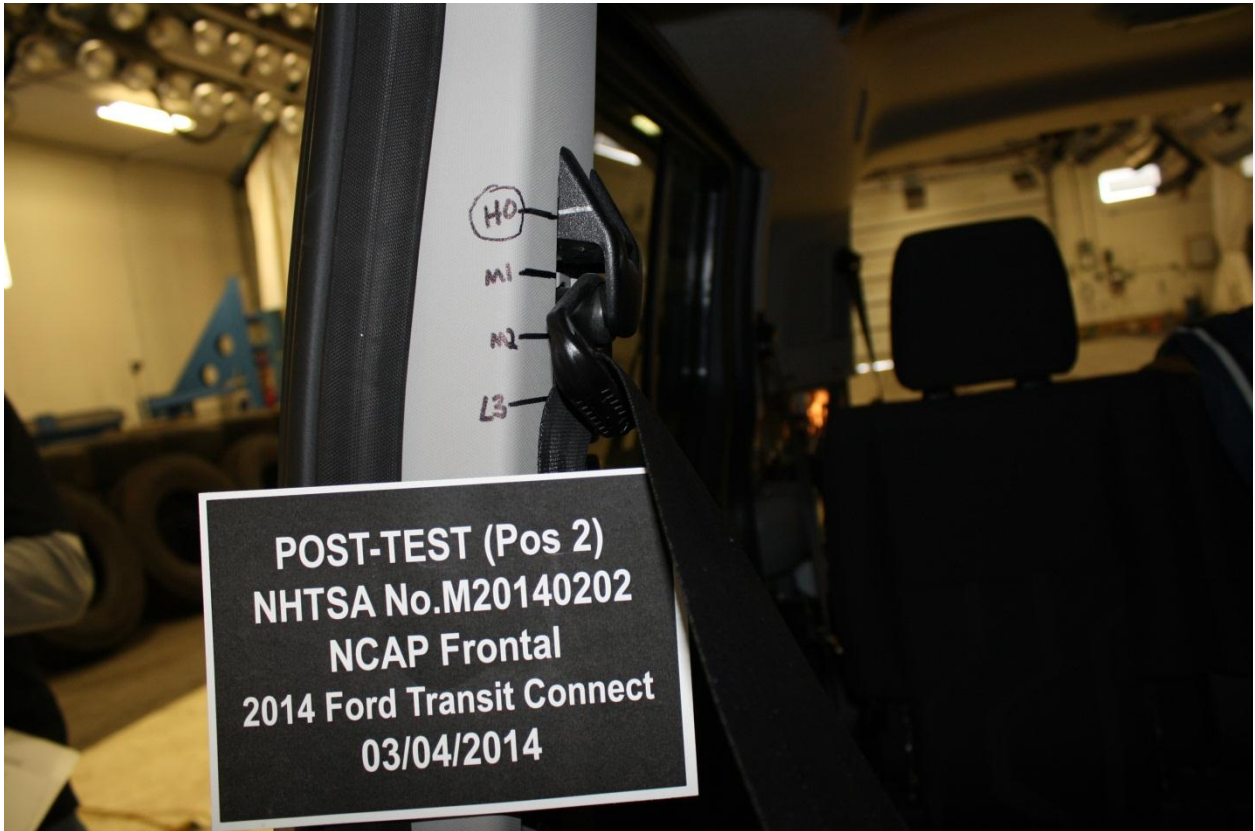


Figure A-59: Post-Test View of Belt Anchorage for Passenger Dummy



Figure A-60: Pre-Test Passenger Dummy Feet



Figure A-61: Post-Test Passenger Dummy Feet



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



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



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



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



Figure A-66: Post-Test Passenger Dummy Face

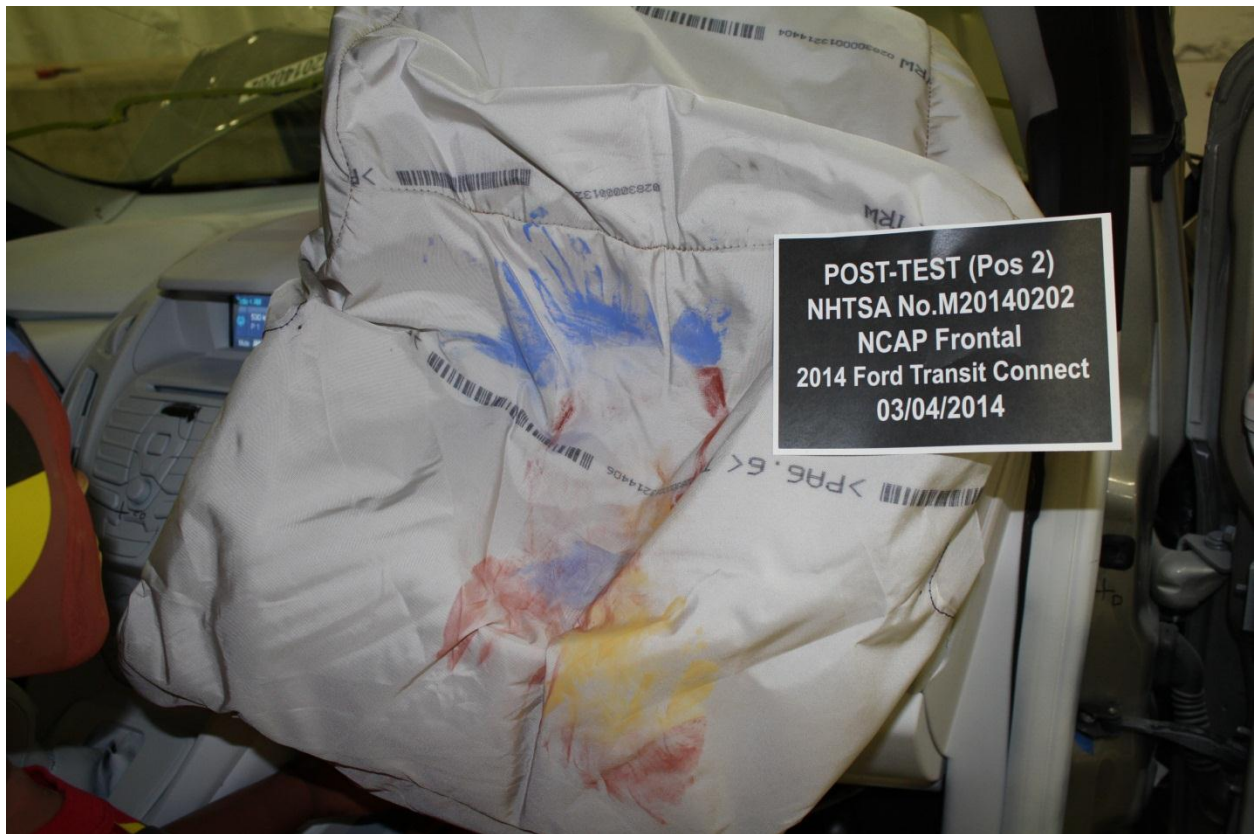


Figure A-67: Post-Test Passenger Dummy Contact With Airbag



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

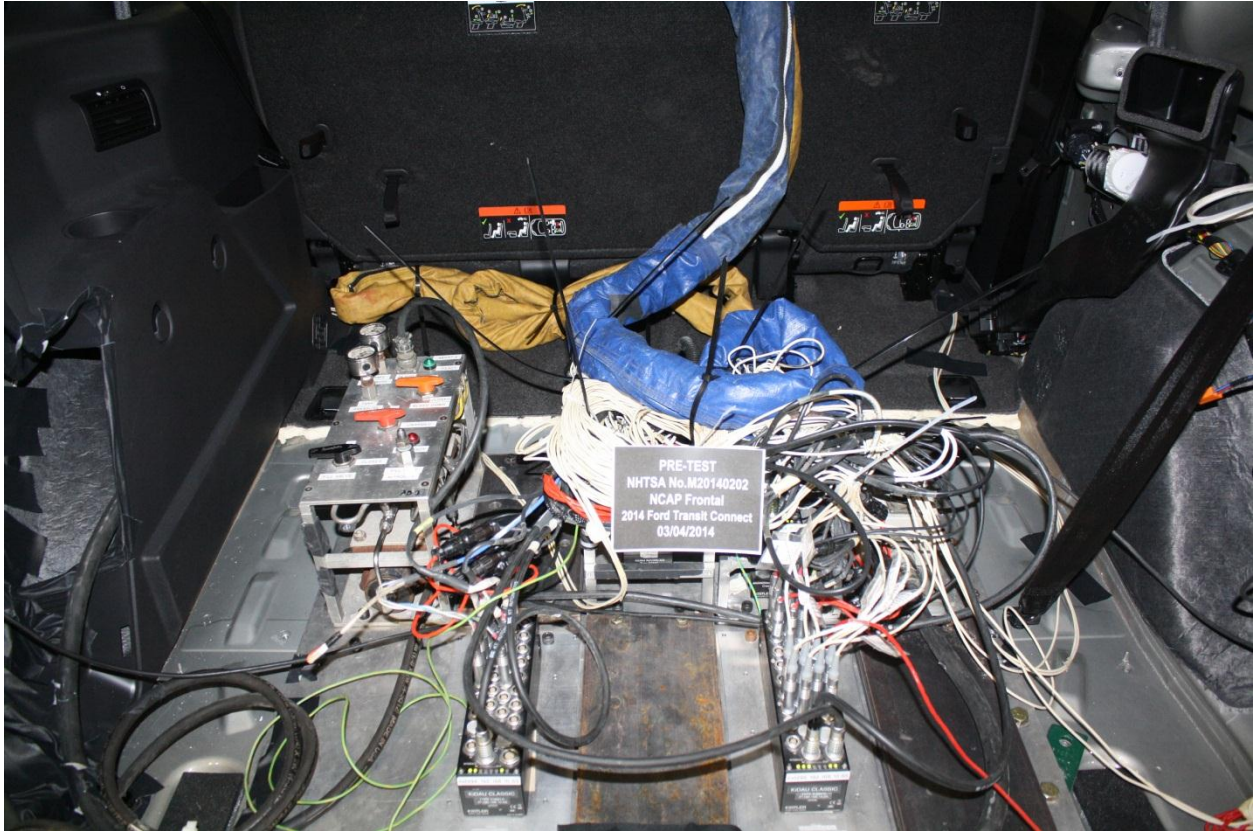


Figure A-69: Photograph of Ballast Installed in Vehicle

Photo Not Applicable

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



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



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



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



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



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



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



Figure A-77: 2014 Ford Transit Connect Frontal Impact Event

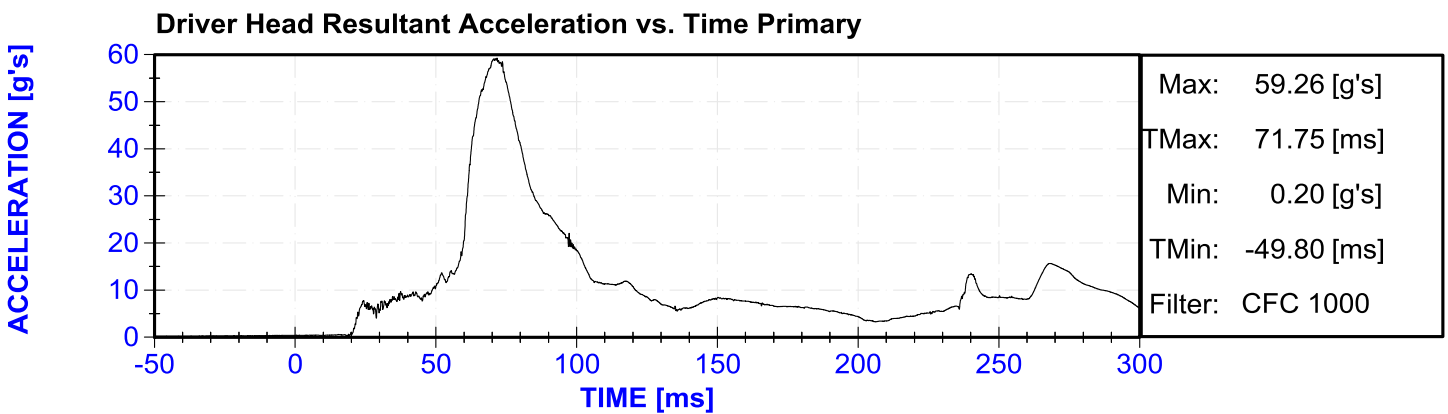
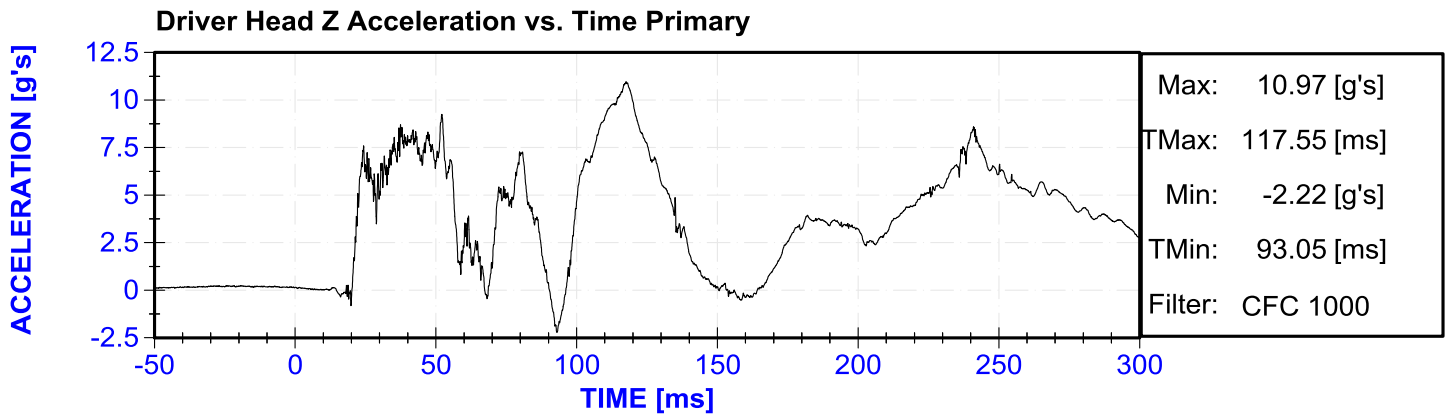
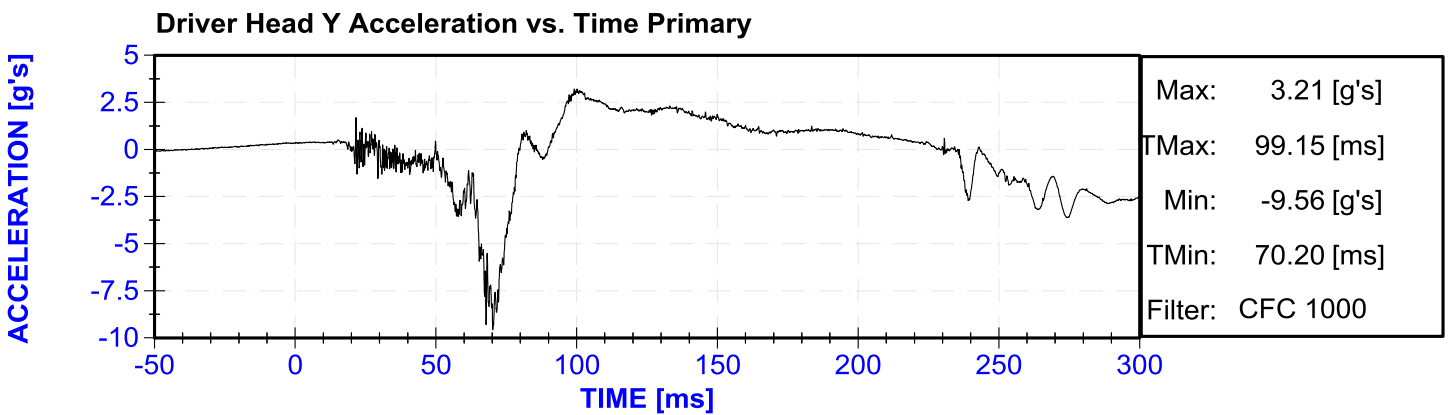
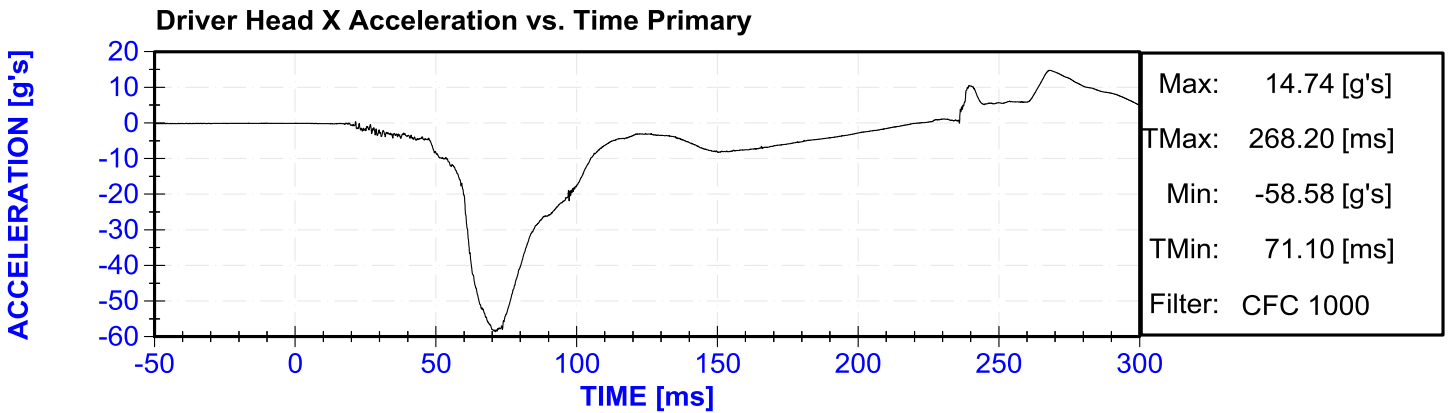
<p>TRANSIT CONNECT E1 140792</p> <p>2014 XLT WAGON LWB XLT 7-PASSENGER 2.3L I4 OHV ENGINE 5 SPD AUTO TRANSAXLE W/ O/D</p> <p>EXTERIOR: TECTONIC SILVER METALLIC INTERIOR: CHARCOAL BLACK CLOTH SEATS</p>		<p>EPA DOT Fuel Economy and Environment Gasoline Vehicle</p> <p>Fuel Economy 23 MPG <small>combined city/hwy</small> 20 city 28 highway 4.3 gallons per 100 miles</p> <p>You Save \$0 in fuel costs over 5 years compared to the average new vehicle.</p> <p>Annual fuel cost \$2,300</p> <p>Fuel Economy & Greenhouse Gas Rating (tailpipe only) Smog Rating (tailpipe only)</p> <p>1 6 10 1 5 10 <small>Best</small> <small>Best</small></p> <p>fueleconomy.gov Calculate personalized estimates and compare vehicles.</p>																									
<p>STANDARD EQUIPMENT INCLUDED AT NO. EXTRA CHARGE</p> <p>EXTERIOR</p> <ul style="list-style-type: none"> 18" STEEL WHEELS WITH COVERS BODY SIDE MOLDINGS - BODY COLOR BUMPERS - BODY COLOR DOOR HANDLES - BODY COLOR DOORS - DUAL SLIDING SIDE LIFTGATE W/ FXD GLASS REAR FOG LAMPS WITH BODY COLOR BEZEL HALOGEN HEADLAMPS INTEGRATED SPOTTER MIRRORS POWER HEATED, MANUAL FOLD EXTERIOR MIRRORS PRIVACY GLASS <p>INTERIOR</p> <ul style="list-style-type: none"> 2ND AND 3RD ROW SEATS AIR COND. MANUAL FRONT AM/FM SINGLE CD/MP3 PLAYER CARGO HOOKS DUAL VANITY MIRRORS FLOOR CONSOLE W/ CUPHOLDERS FLOOR COVERING - CARPETED FOLD FLAT FRONT PASS SEAT FRONT FLOOR MATS HEADLINER - FULL CLOTH MANUAL BUCKET SEATS - 6-WAY DRIV AND 4-WAY PASS OVERHEAD STORAGE SHELF STEERING - TILT/TELESCOPIC <p>FUNCTIONAL</p> <ul style="list-style-type: none"> 6-SPEED SELECTSHIFT TRANS ALTERNATOR 150 AMP BRAKES, 4-WHEEL DISC/ABS FRONT WHEEL DRIVE FUEL TANK - 15.8 GAL FULL-SIZE SPARE TIRE HILL START ASSIST POWER STEERING W/EPAS POWER WINDOWS & LOCKS POWERPOINTS (2) REAR VIEW CAMERA REMOTE KEYLESS ENTRY <p>SAFETY/SECURITY WITH HSC</p> <ul style="list-style-type: none"> ADVANCETRAC WITH HSC AIRBAGS - DUAL STAGE FRONT AIRBAGS - FRONT SEAT MOUNTED SIDE IMPACT AIRBAGS - SIDE AIR CURTAINS EMERGENCY BRAKE ASSIST MYKEY SECURELOCK PASS ANTI THEFT TIRE PRESSURE MONITOR SYS <p>WARRANTY</p> <ul style="list-style-type: none"> 3YR/36,000 BUMPER / BUMPER 5YR/60,000 POWERTRAIN 5YR/60,000 ROADSIDE ASSIST 		<p>INCLUDED ON THIS VEHICLE (MSRP)</p> <p>ORDER CODE 210A</p> <p>OPTIONAL EQUIPMENT</p> <table border="1"> <tr><td>RR CARPET FLOOR MATS (2 PIECE)</td><td>25.00</td></tr> <tr><td>50 STATE EMISSIONS</td><td>NO CHARGE</td></tr> <tr><td>PWR ADJUST/FOLDHEATED MIRRORS</td><td>180.00</td></tr> <tr><td>SINGLE CD W/SIRIUS/SYNCRAM CAM</td><td>520.00</td></tr> <tr><td>CARGO NET KIT VERTICAL</td><td>50.00</td></tr> <tr><td>ROOF RACK INCLUDING CROSSBARS</td><td>195.00</td></tr> <tr><td>PERIMETER ANTI THEFT ALARM SYS</td><td>165.00</td></tr> <tr><td>REMOTE START</td><td>345.00</td></tr> <tr><td>REVERSE SENSING SYSTEM</td><td>295.00</td></tr> <tr><td>AUTO HEADLAMPS</td><td>125.00</td></tr> <tr><td>DAYTIME RUNNING LAMPS</td><td>45.00</td></tr> <tr><td>FRONT AND REAR SPLASH GUARDS</td><td>140.00</td></tr> </table>		RR CARPET FLOOR MATS (2 PIECE)	25.00	50 STATE EMISSIONS	NO CHARGE	PWR ADJUST/FOLDHEATED MIRRORS	180.00	SINGLE CD W/SIRIUS/SYNCRAM CAM	520.00	CARGO NET KIT VERTICAL	50.00	ROOF RACK INCLUDING CROSSBARS	195.00	PERIMETER ANTI THEFT ALARM SYS	165.00	REMOTE START	345.00	REVERSE SENSING SYSTEM	295.00	AUTO HEADLAMPS	125.00	DAYTIME RUNNING LAMPS	45.00	FRONT AND REAR SPLASH GUARDS	140.00
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AUTO HEADLAMPS	125.00																										
DAYTIME RUNNING LAMPS	45.00																										
FRONT AND REAR SPLASH GUARDS	140.00																										
<p>PRICE INFORMATION (MSRP)</p> <p>BASE PRICE \$26,525.00 TOTAL OPTIONS 2,115.00 TOTAL VEHICLE & OPTIONS 28,640.00 DESTINATION & DELIVERY 995.00</p>		<p>GOVERNMENT 5-STAR SAFETY RATINGS</p> <p>Overall Vehicle Score To Be Rated Based on the combined ratings of frontal, side and rollover. Should ONLY be compared to other vehicles of similar size and weight.</p> <p>Frontal Crash Driver To Be Rated Passenger To Be Rated</p> <p>Side Crash Front seat To Be Rated Rear seat To Be Rated</p> <p>Rollover To Be Rated</p> <p>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</p>																									
<p>SOLD TO: Specchio Ford, Inc. 602 North Franklin Watkins Glen NY 14891</p> <p>SHIP TO: (IF OTHER THAN SOLD TO)</p> <p>SHIP THROUGH</p>		<p>13V 490</p> <p>RAMP ONE: RA43</p> <p>RAMP TWO: VALENCIA</p> <p>DEALER NO.: 13V 490</p> <p>FINAL ASSEMBLY PLANT: VALENCIA</p> <p>METHOD OF TRANSP.: RAIL</p> <p>ITEM #: 13-1414 O/T 2</p> <p>DM193 N RB22X 420 000897 12 19 13</p> <p>TOTAL MSRP \$29,635.00</p> <p>This label is affixed pursuant to the Federal Automobile Information Disclosure Act. Gasoline, License, and Title Fees, State and Local taxes are not included. Dealer installed options or accessories are not included unless listed above.</p>																									
<p>Scan this code to experience this vehicle or text NME1140792 to 46028 or Visit ford.com/windowsticker</p> <p>Standard messaging & data plan rates may apply.</p>		<p>Ford ESP is the only extended service plan honored at every Ford dealership in the U.S. and Canada. See your dealer for additional details or visit www.FordOwner.com for more information.</p> <p>Extended Service Plan</p> <p>Choose the vehicle you want. Whether you decide to lease or finance, you'll find the choices that are right for you. See your Ford Dealer for details or visit www.Ford.com.</p> <p>FORD CREDIT</p>																									

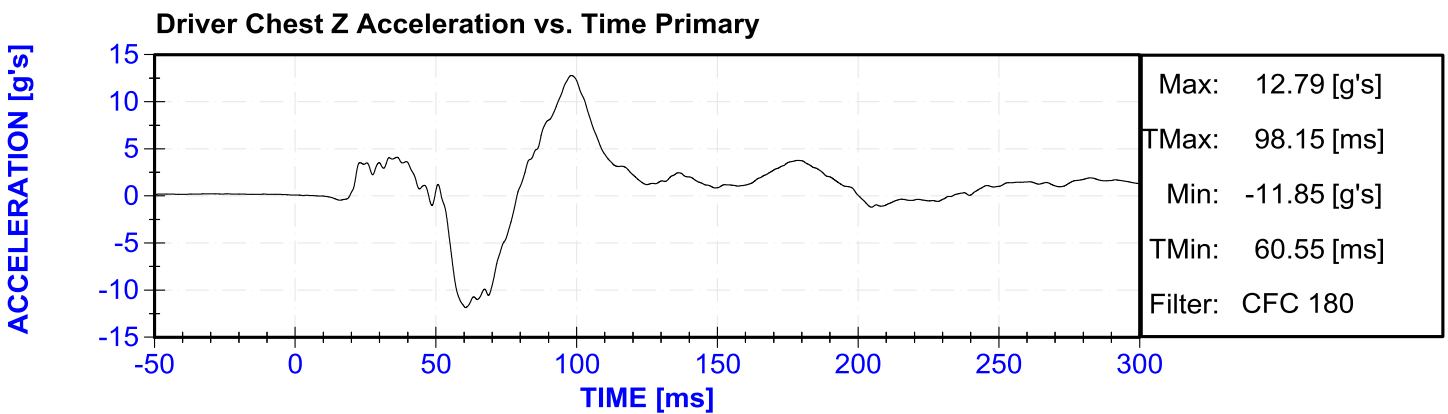
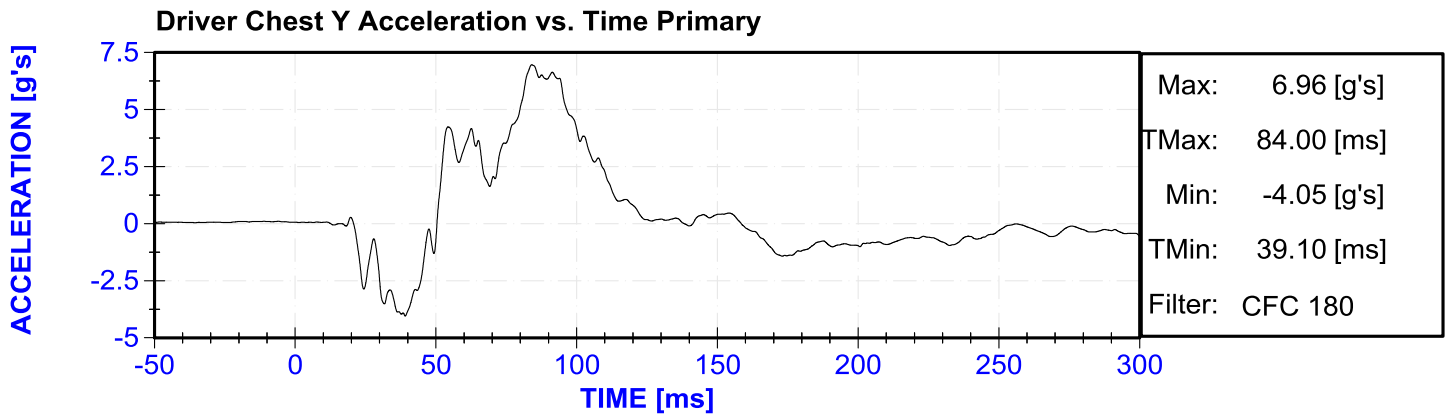
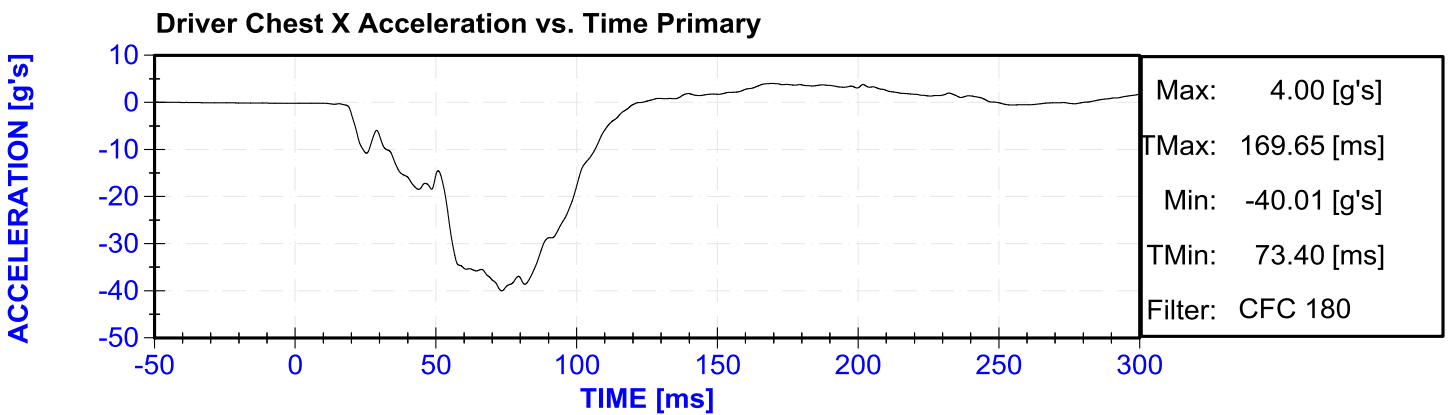
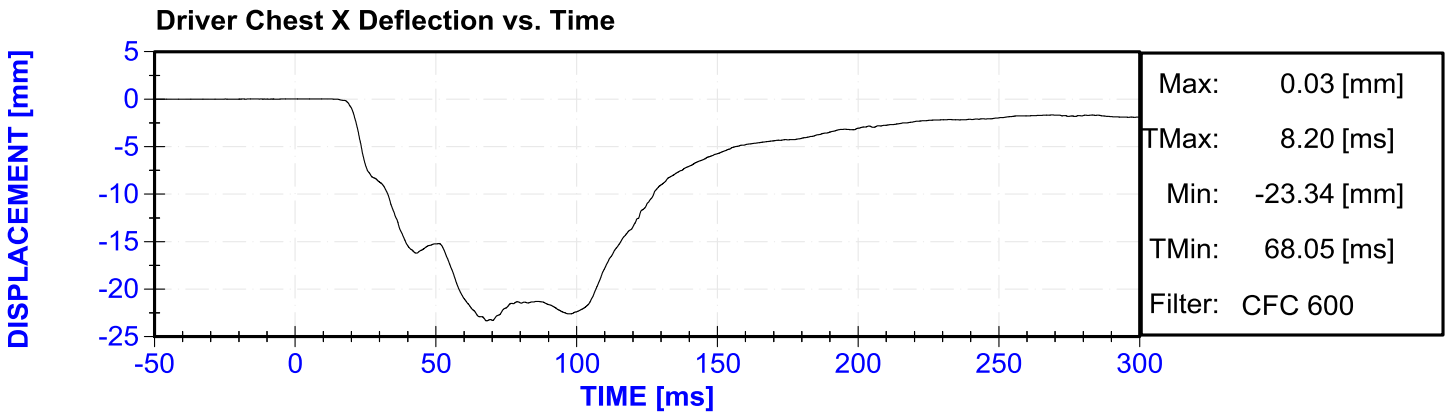
Figure A-78: Monroney Label Photograph

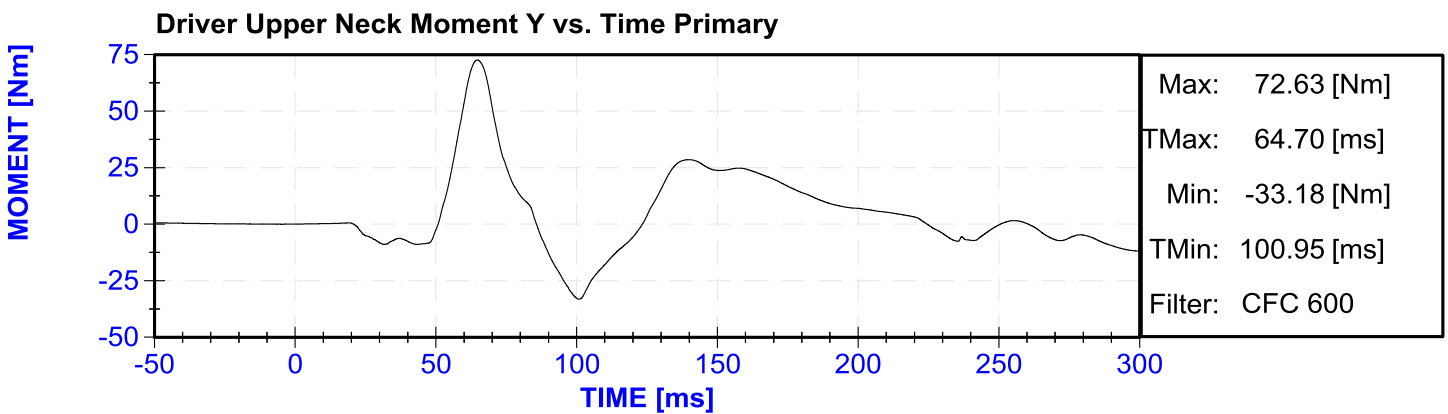
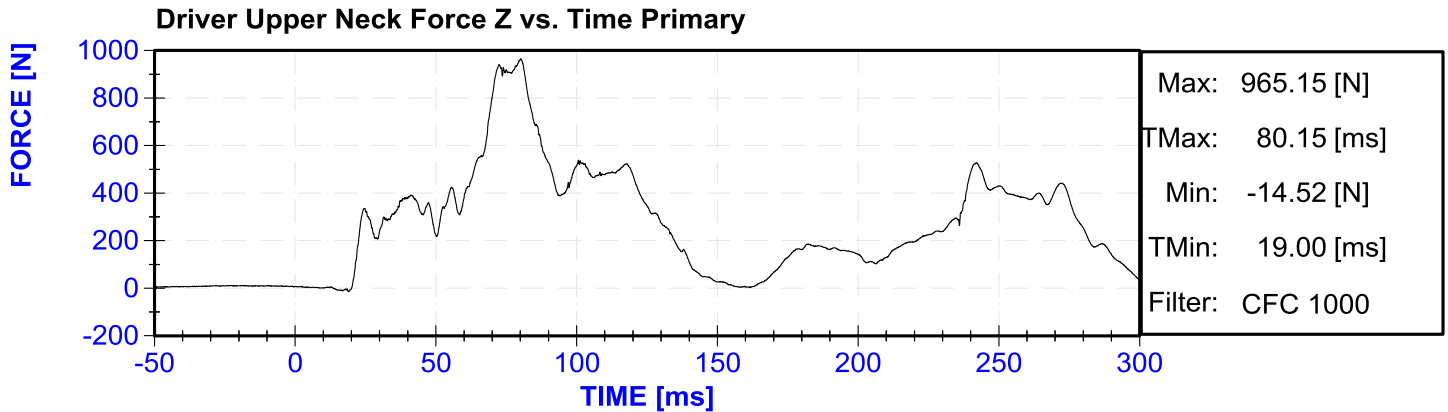
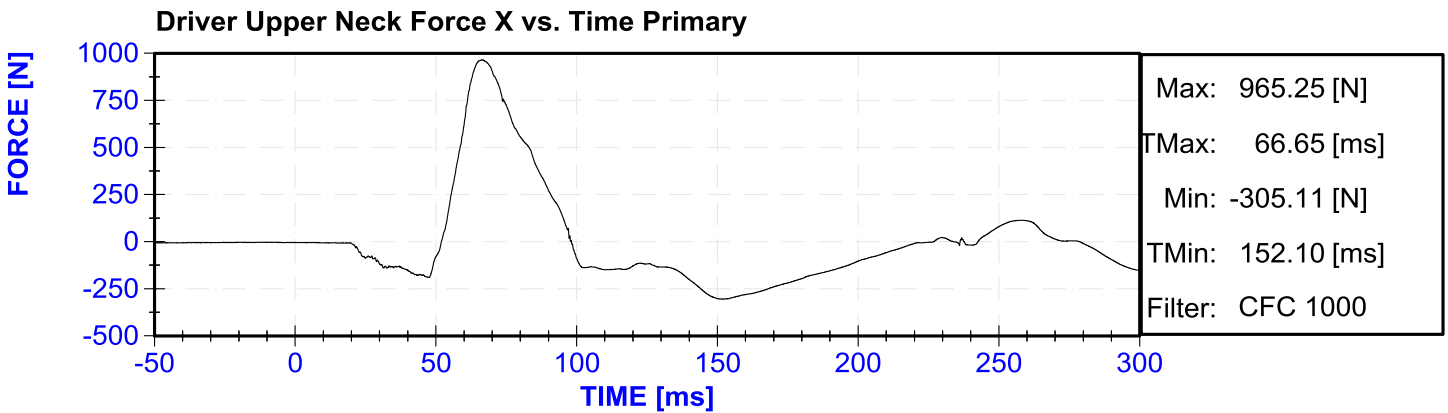
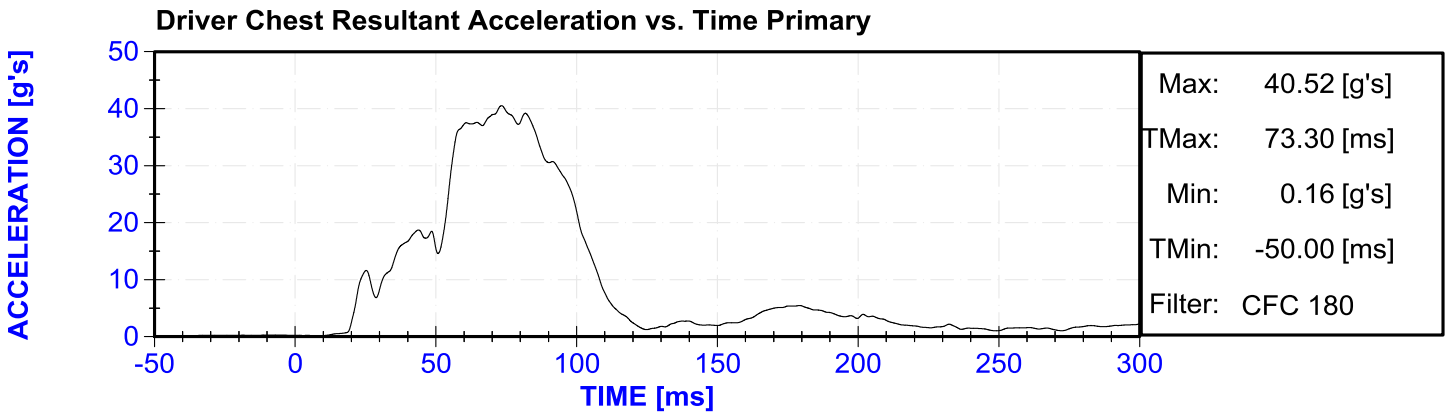
APPENDIX B
VEHICLE & DUMMY RESPONSE DATA TRACES

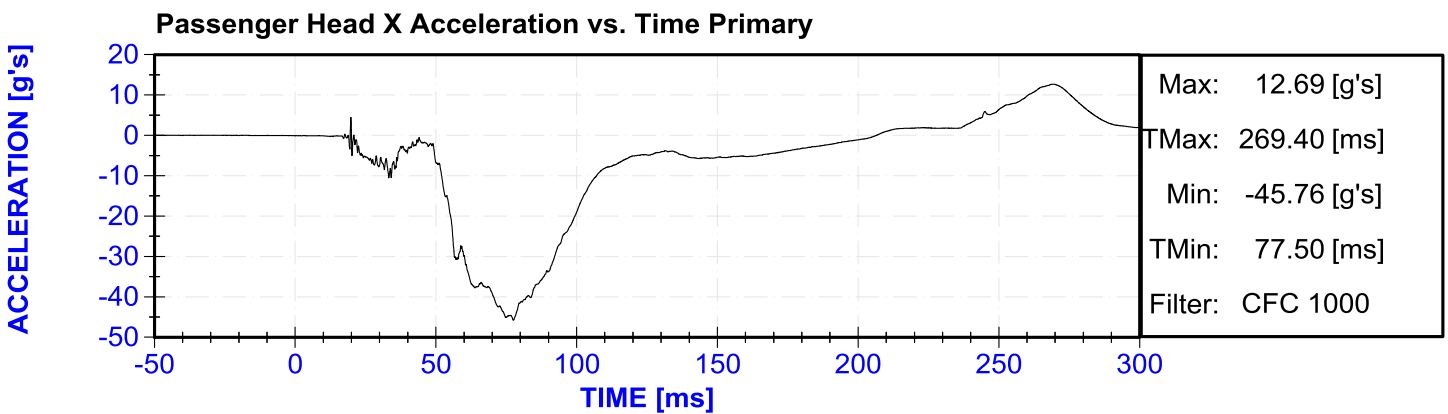
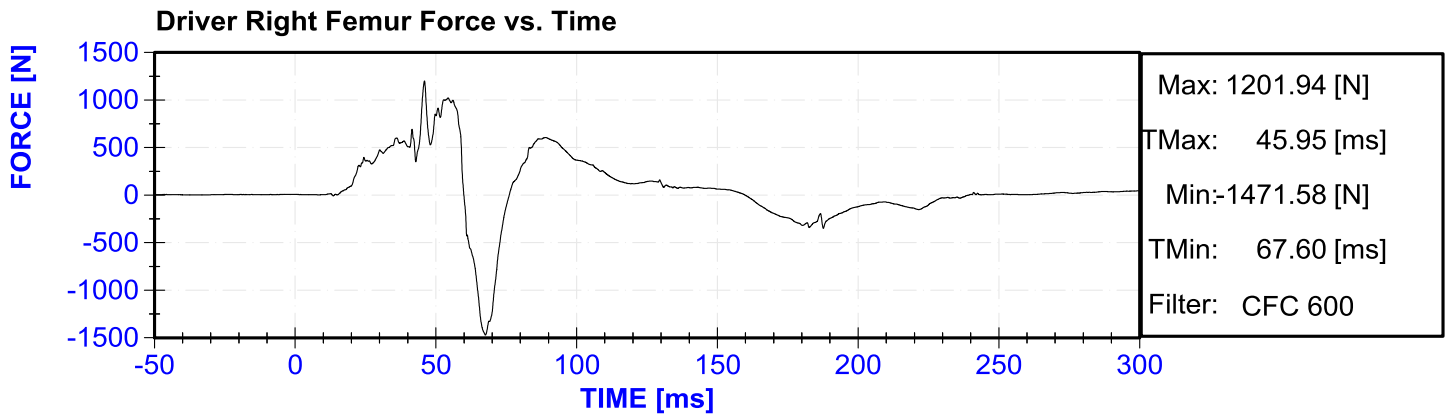
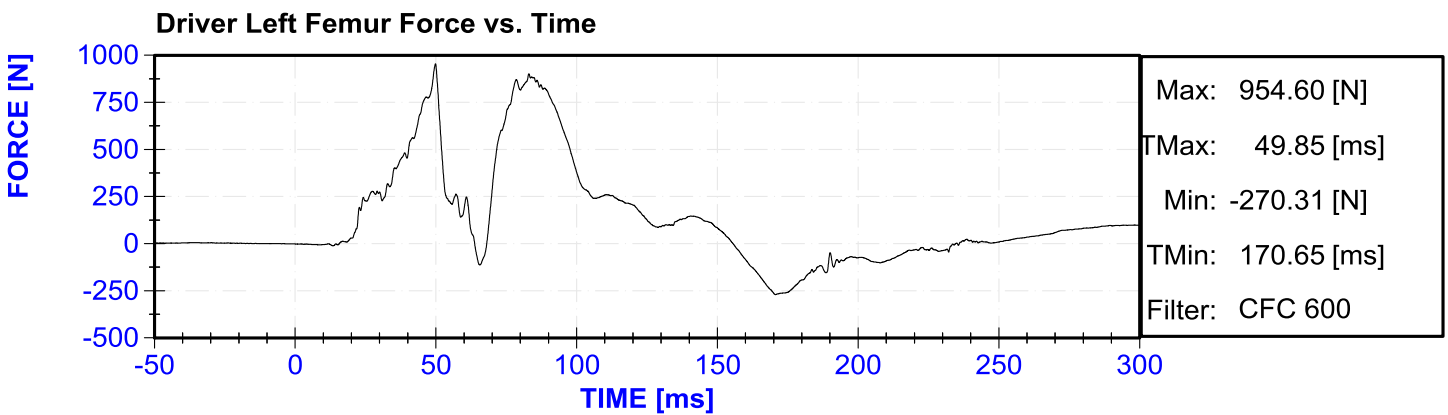
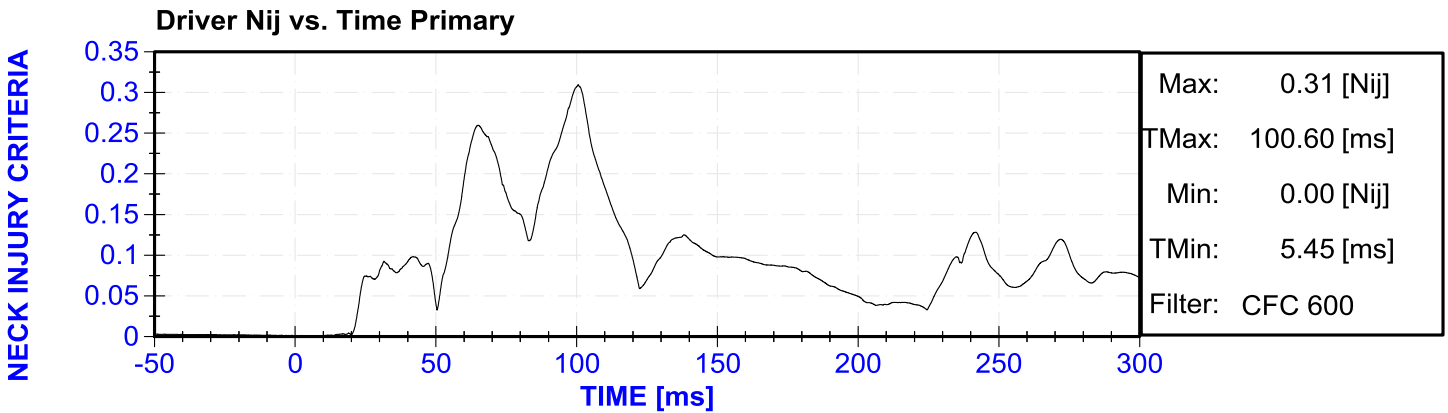
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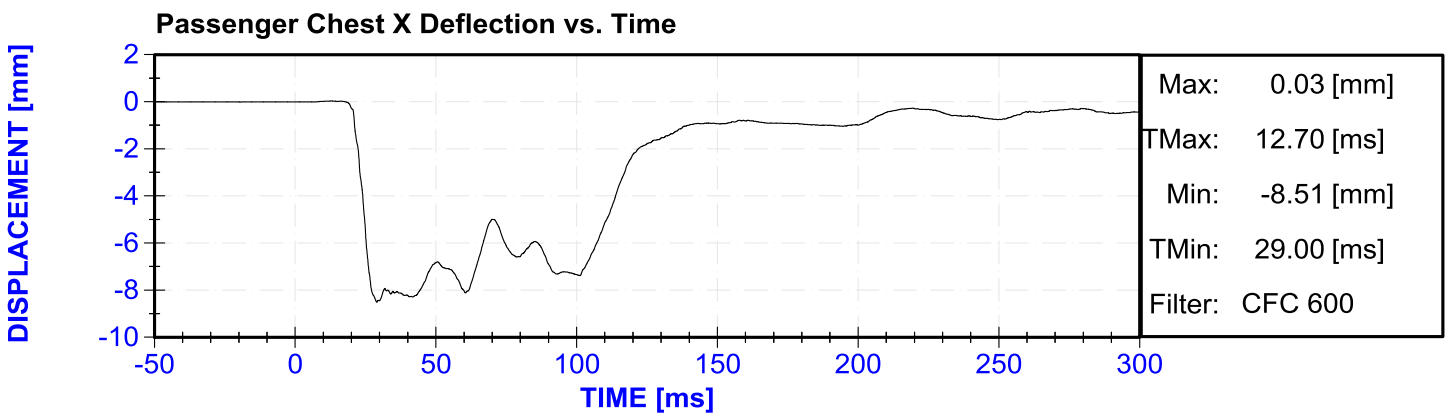
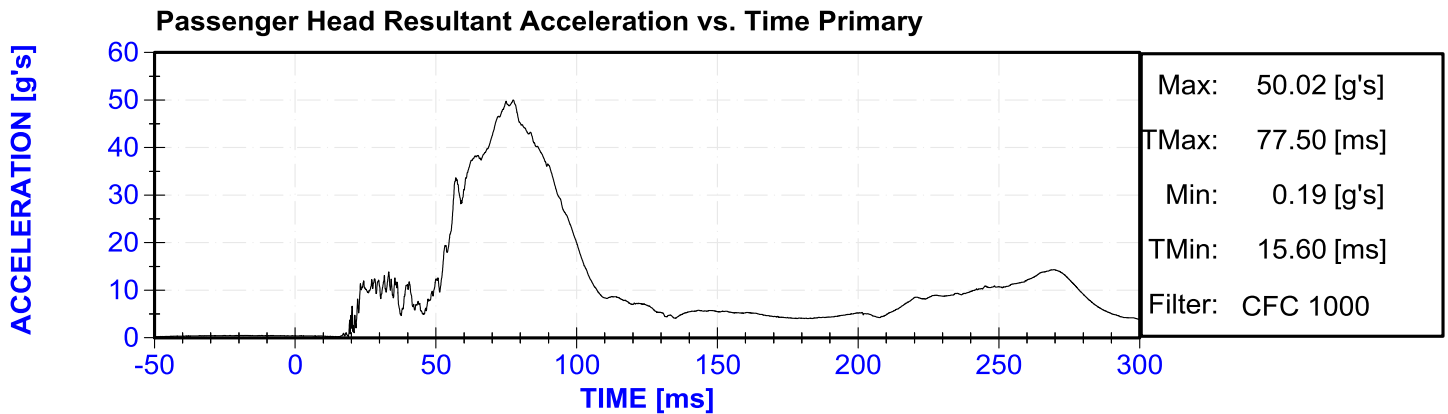
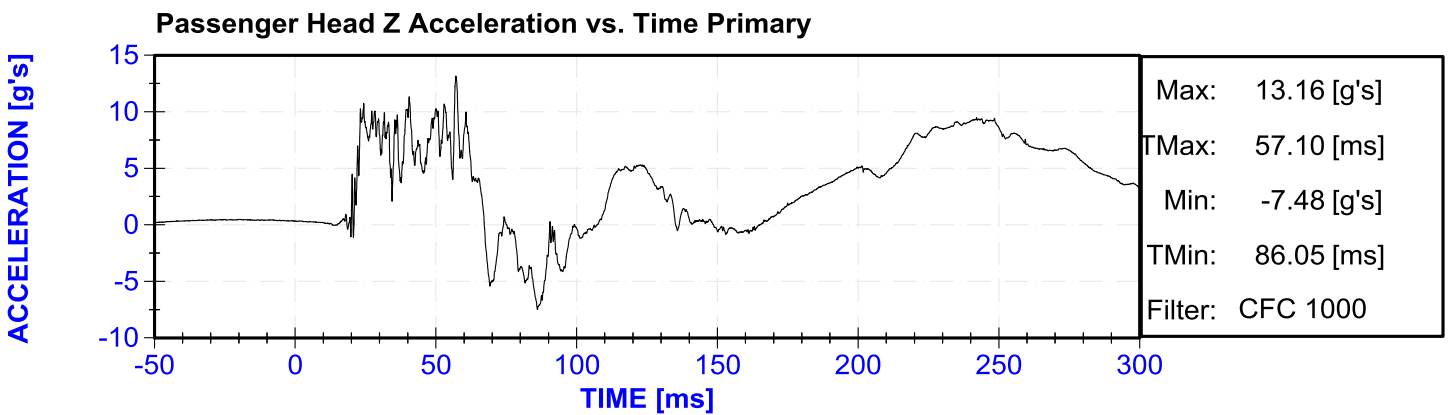
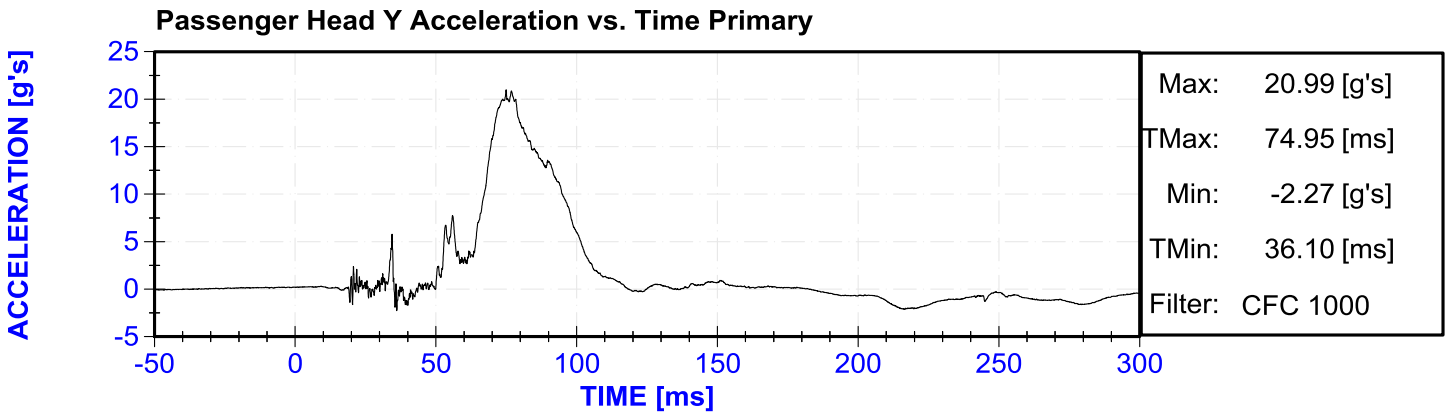
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Plot 3	Driver Head Z Acceleration vs. Time Primary	B-3
Plot 4	Driver Head Resultant Acceleration vs. Time Primary	B-3
Plot 5	Driver Chest X Deflection vs. Time	B-4
Plot 6	Driver Chest X Acceleration vs. Time Primary	B-4
Plot 7	Driver Chest Y Acceleration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

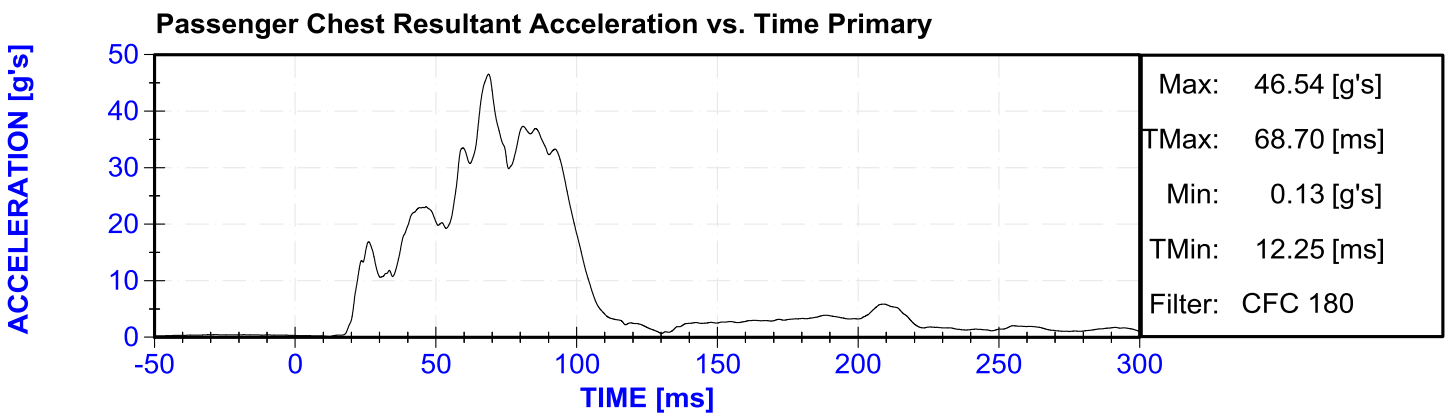
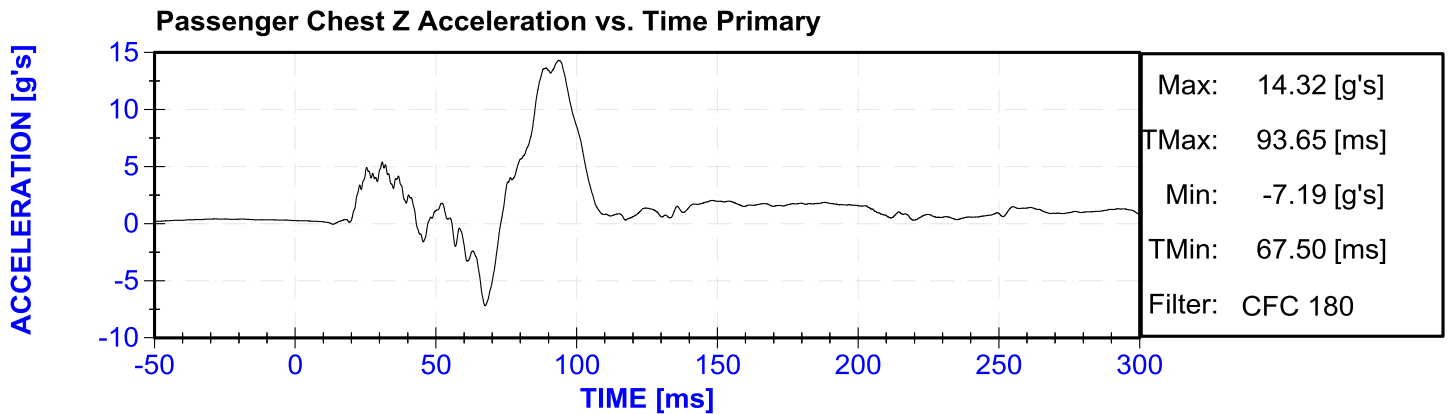
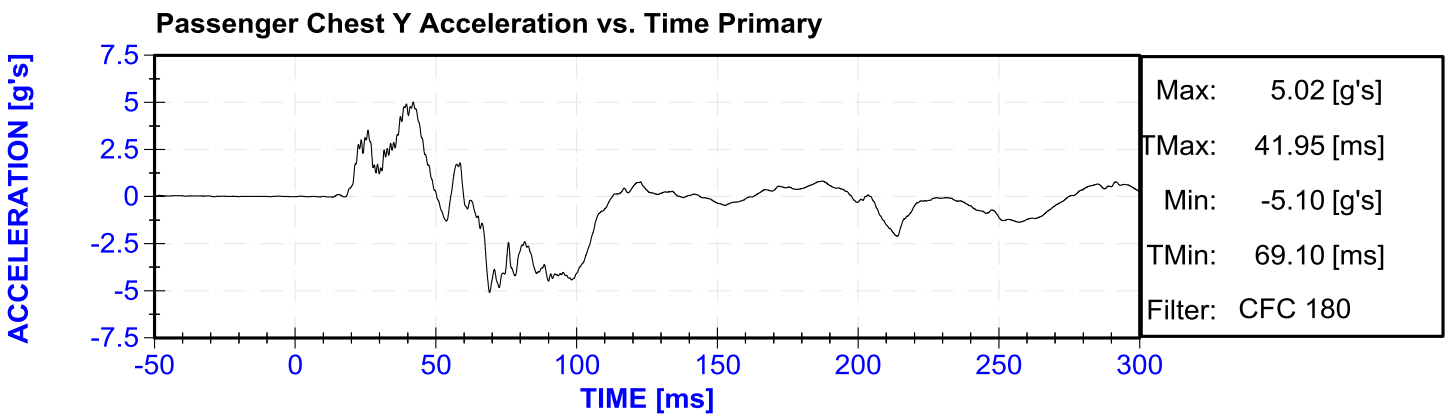
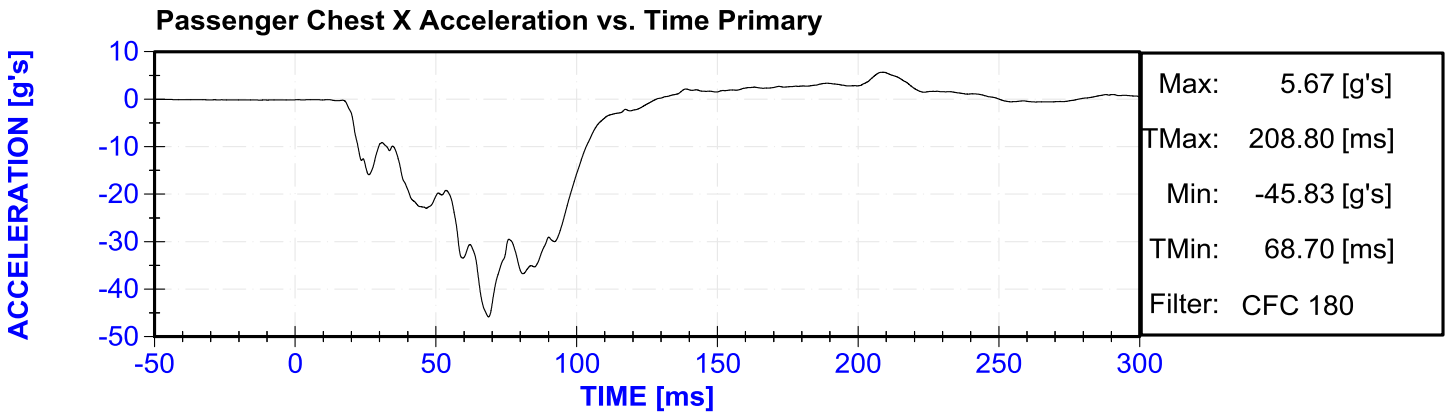


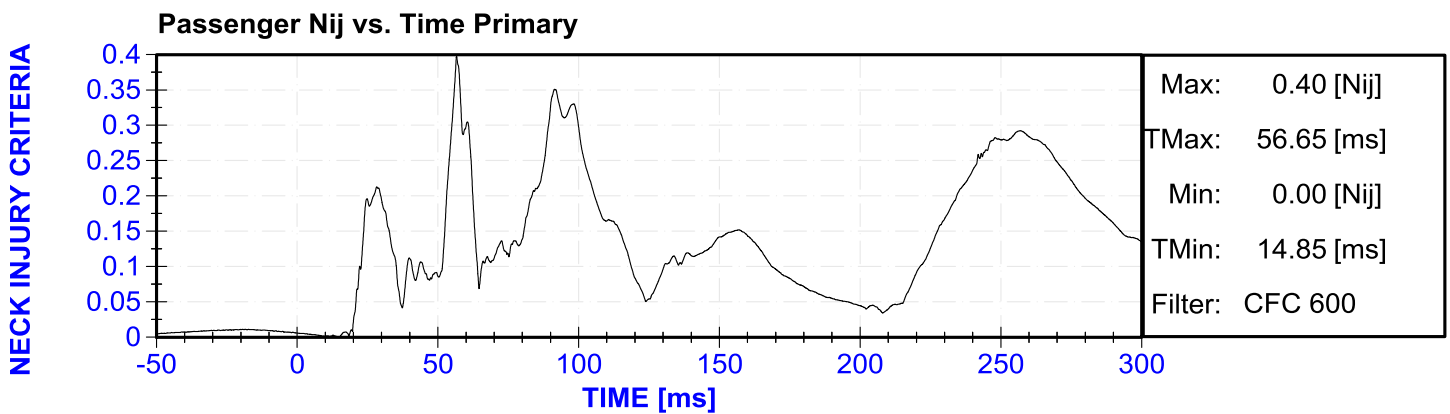
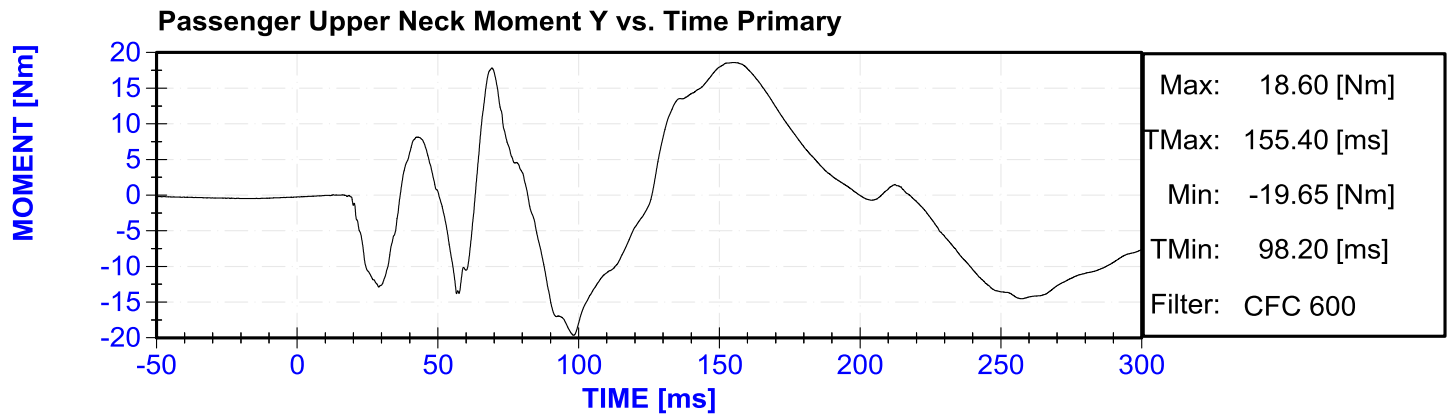
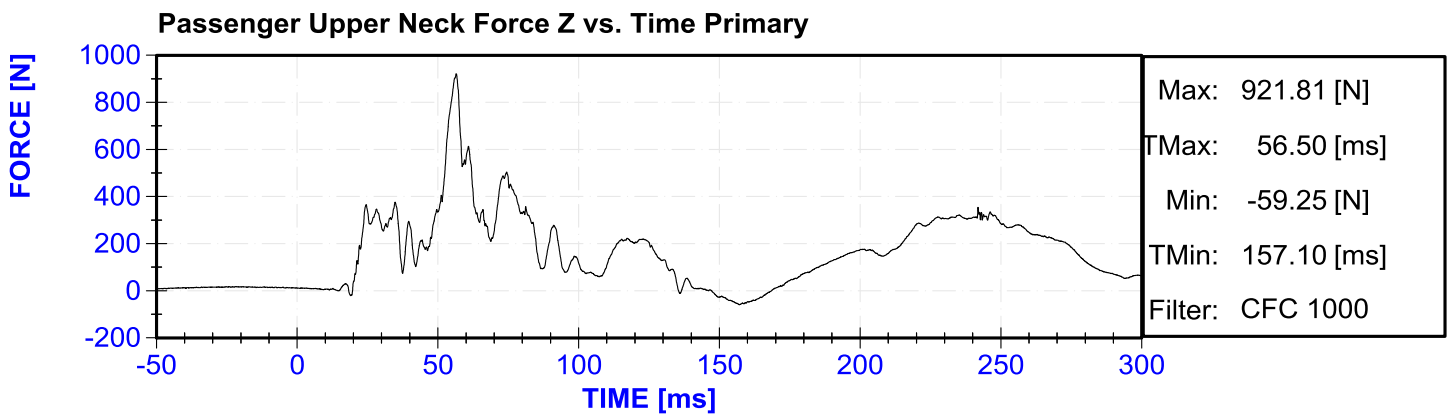
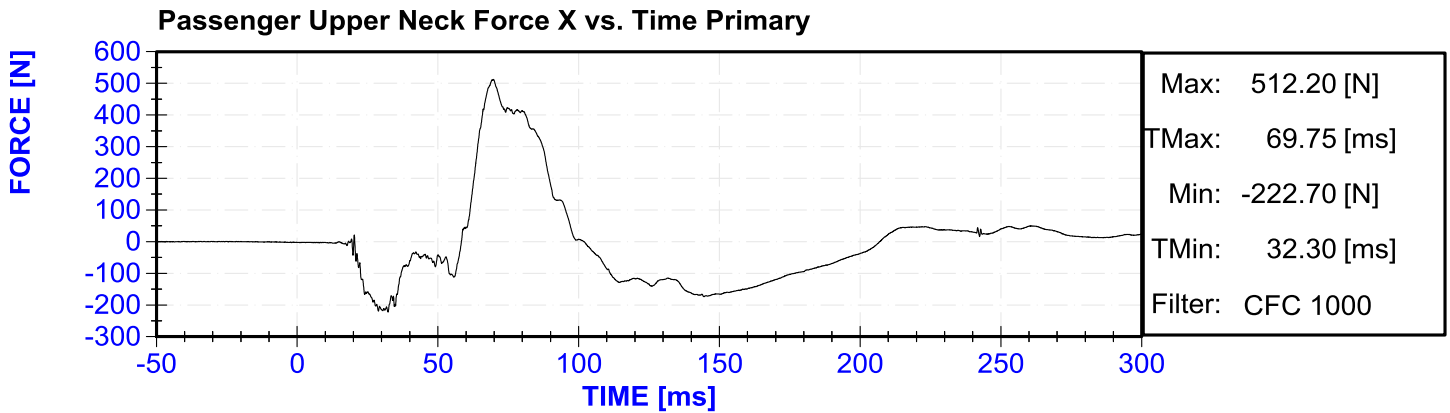


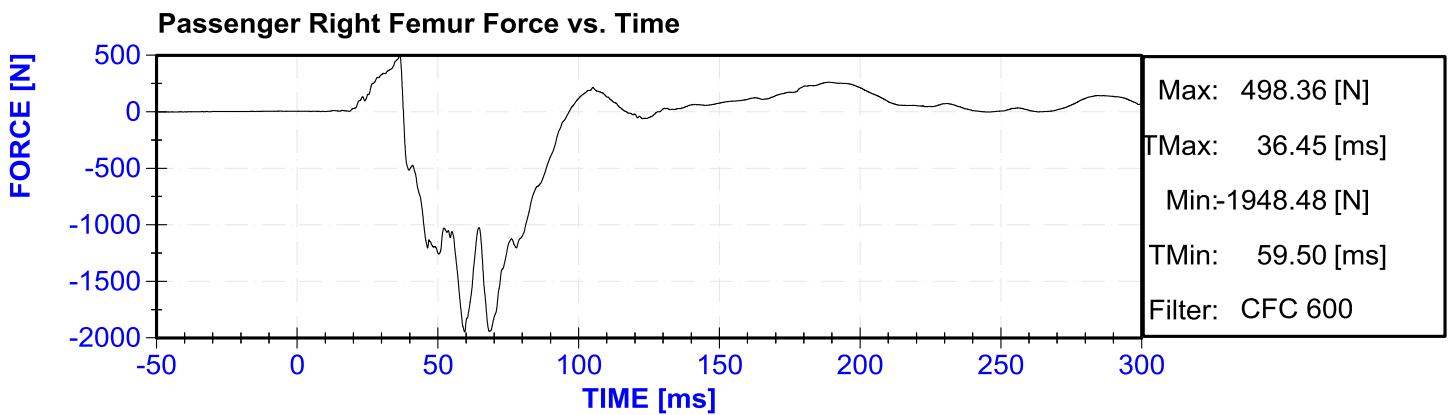
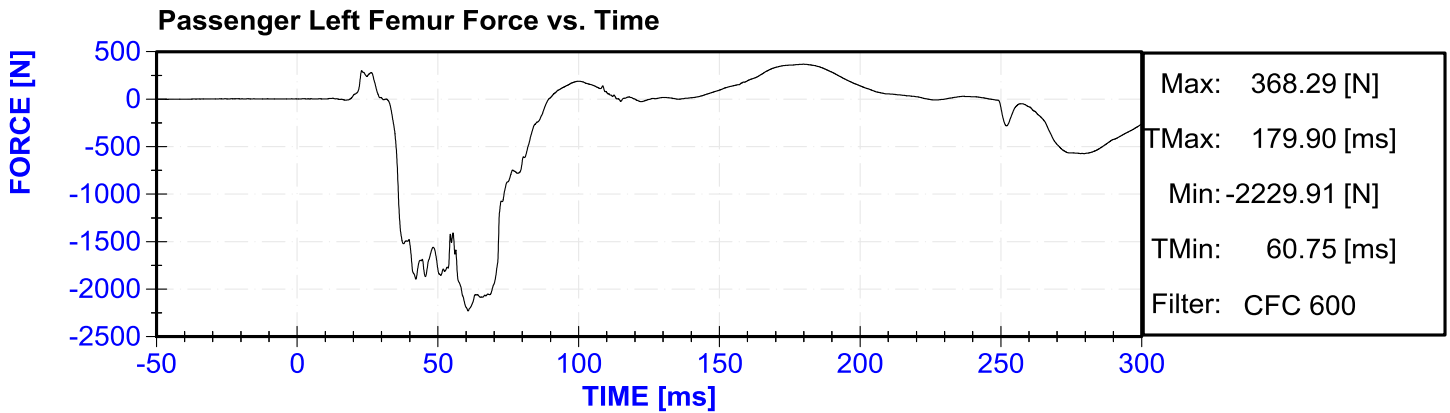












APPENDIX C

DUMMY CALIBRATION AND PERFORMANCE VERIFICATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 142



50th Male External Measurements

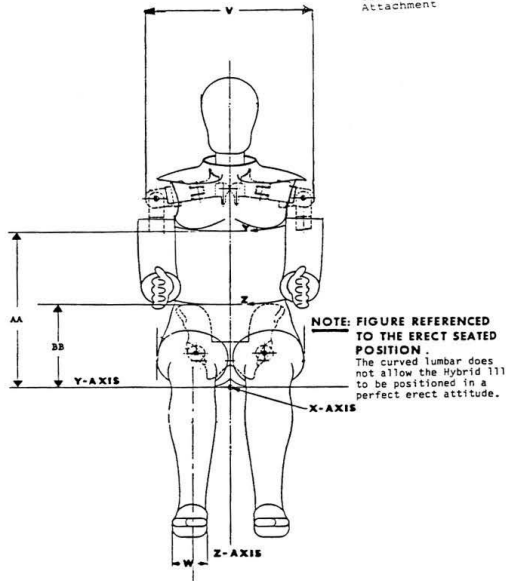
S/N 142

Symbol	Description	Specification	Results	Pass
		in	In	
A	Sitting Height	34.6 – 35.0	34.8	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.1	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	3.6	Yes
F	Thigh Clearance	5.5 – 6.1	5.8	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	13.4	Yes
J	Elbow Rest Height	7.5 – 8.3	7.9	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.0	Yes
L	Popliteal Height	16.9 – 17.9	17.1	Yes
M	Knee Pivot Height	19.1 – 19.7	19.4	Yes
N	Buttock Popliteal Length	17.8 – 18.8	18.3	Yes
O	Chest Depth without Jacket	8.4 – 9.0	8.6	Yes
P	Foot Length (right)	9.9 – 10.5	10.1	Yes
V	Shoulder Breadth	16.3 – 17.2	16.8	Yes
W	Foot Breadth	3.6 – 4.2	3.9	Yes
Y	Chest Circumference with Jacket	38.2 – 39.4	38.9	Yes
Z	Waist Circumference	32.9 – 34.1	33.4	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

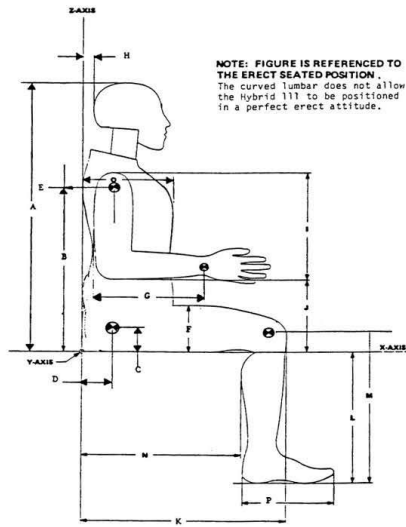
Date: 02-18-14

USG 2485
Attachment



HYBRID III Exterior Body Dimensions - Front View

USG 2485
Attachment



HYBRID III Exterior Body Dimensions - Side View



VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	142		
Test ID:	Head Droip	Test Date:	2/18/2014
		Test Time:	10:42:22 AM

Component Part Number	Component Serial Number
Head Skin - 78051-228	S329

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.50 deg C P
Humidity	10 -- 70	22.50 %RH P
Resultant Acceleration	225 -- 275	272.5 G's P
Oscillation	0 -- 10	3.4 % P
Lateral Acceleration	-15 -- 15	-3.5 G's P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



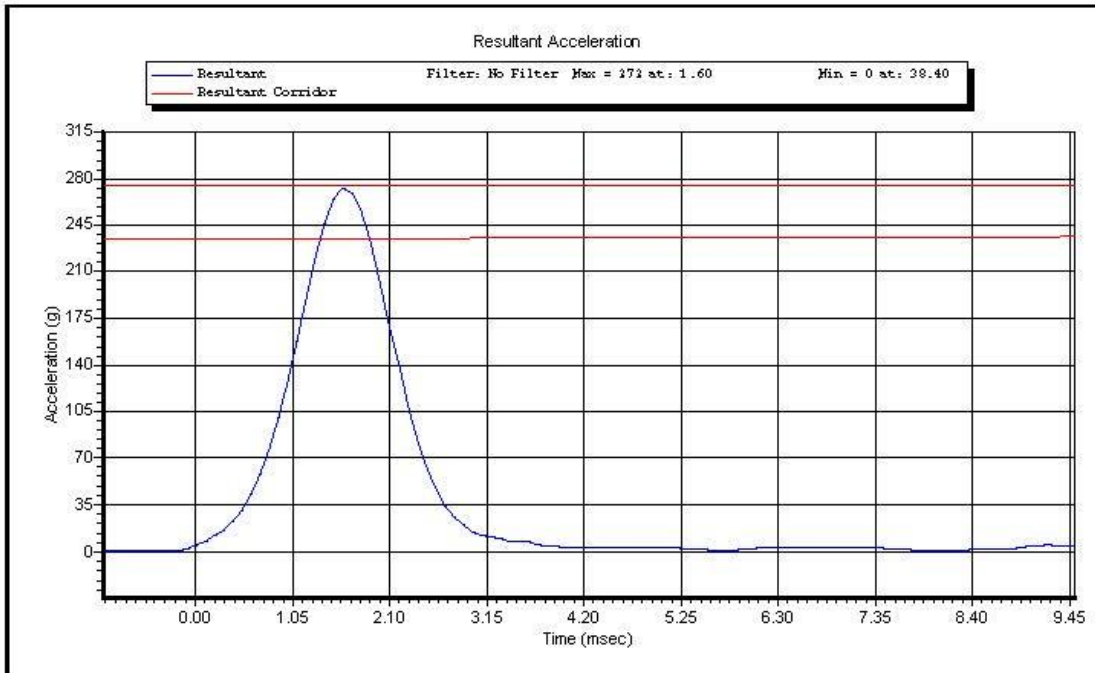
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58998	2/10/2014
Endevco	7264-2000	P58912	2/10/2014
Endevco	7264-2000	P58997	2/10/2014



Test Name: **Head Drop**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**

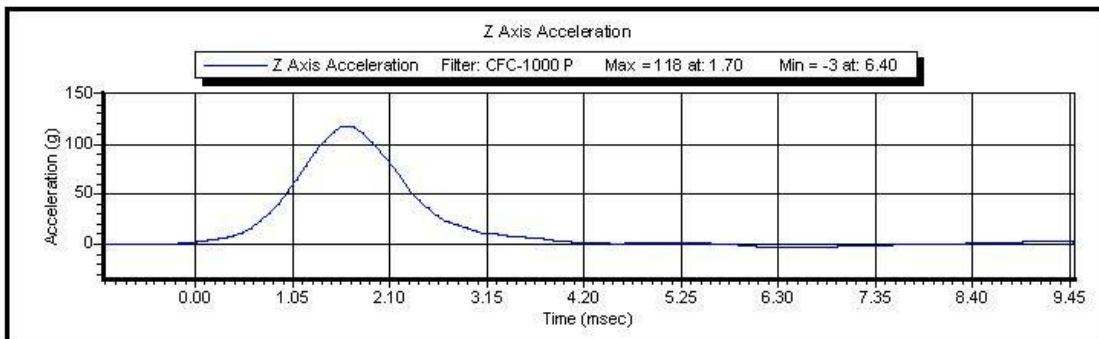
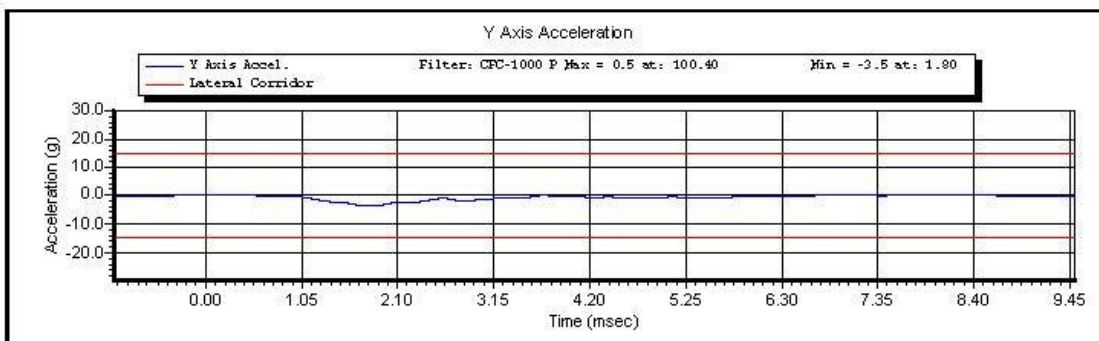
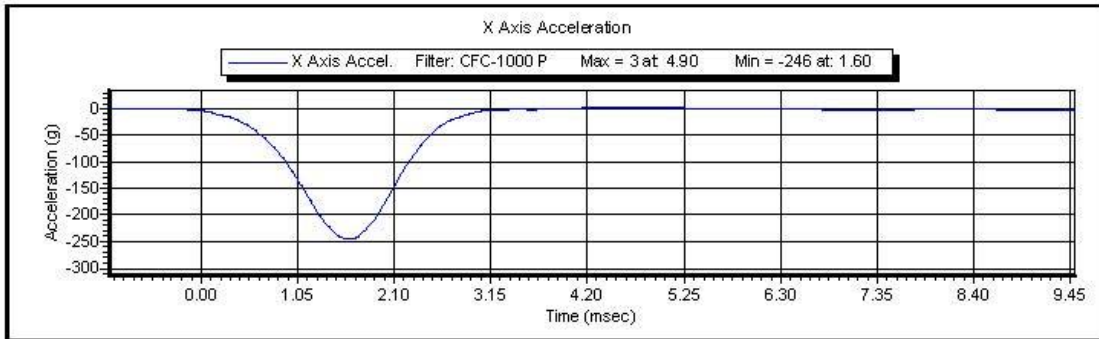


Test ID: **Head Droip**

Test Time: **10:42:22 AM**

Test Date: **2/18/2014**

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Test ID: **Head Droip**

Test Time: **10:42:22 AM**

Test Date: **2/18/2014**

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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:	142		
Test ID:	Neck Extension	Test Date:	2/18/2014
		Test Time:	1:18:06 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4196

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.20 deg C P
Humidity	10 -- 70	21.30 %RH P
Velocity	5.94 -- 6.19	6.025 m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	18.85 G's P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	15.03 G's P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	12.69 G's P
Max Pendulum Deceleration after 30 ms	0.0 -- 22.0	12.84 G's P
Deceleration Time to 5 G's	38 -- 46	43.5 ms P
D Plane Rotation	81 -- 106	94.5 degrees P
Time at Max Rotation	72 -- 82	77.1 ms P
Rotation Decay to Zero	147 -- 174	161.3 ms P
Moment About Occipital Condyle	-80.0 -- -52.9	-66.78 Nm P
Time at Maximum Moment	65 -- 79	72.6 ms P
Moment Decay to Zero	120 -- 148	142.4 ms P

All test parameters are within specifications

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



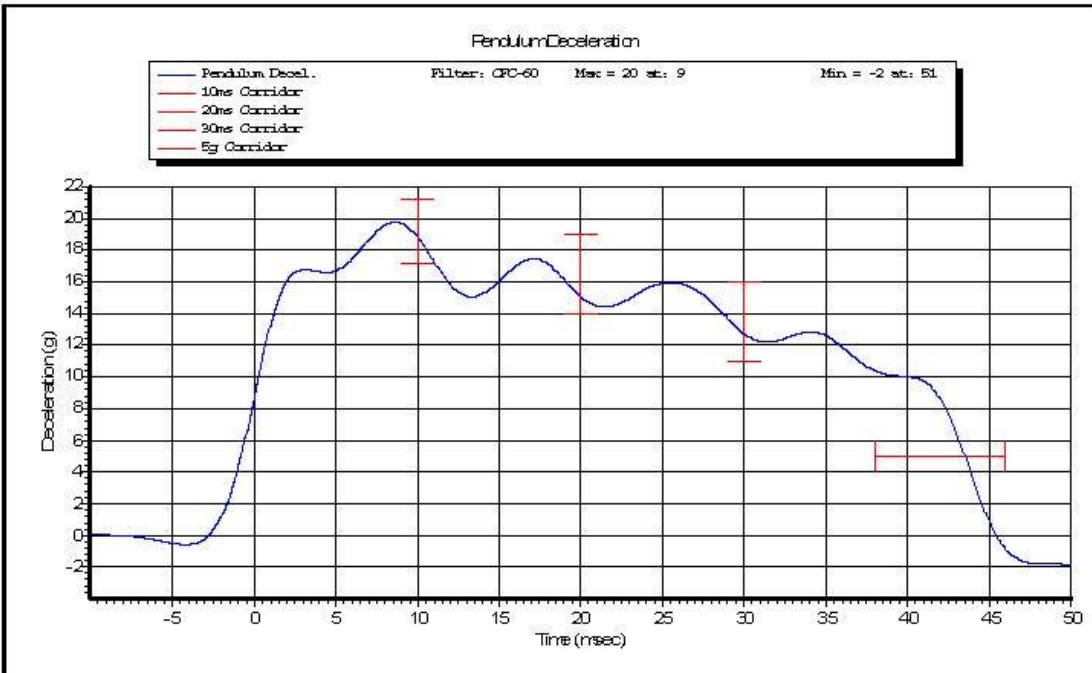
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/31/2014
DentonATD	78051-342	CONDYLE POT	1/31/2014
First Technology	IF-205	LC-161 My	4/30/2013
First Technology	IF-205	LC-161 Fx	4/30/2013



Name of Test:	Neck Extension
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	142

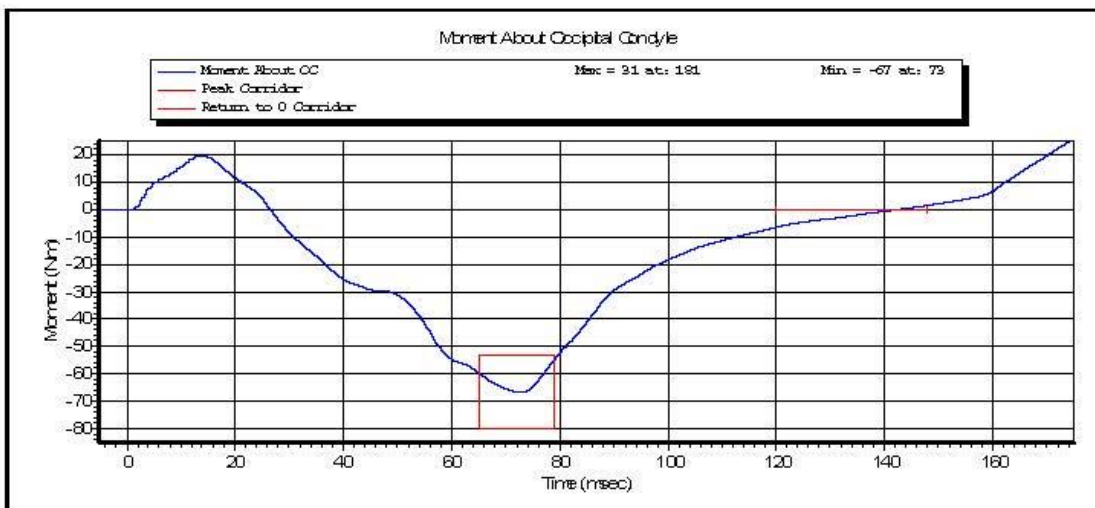
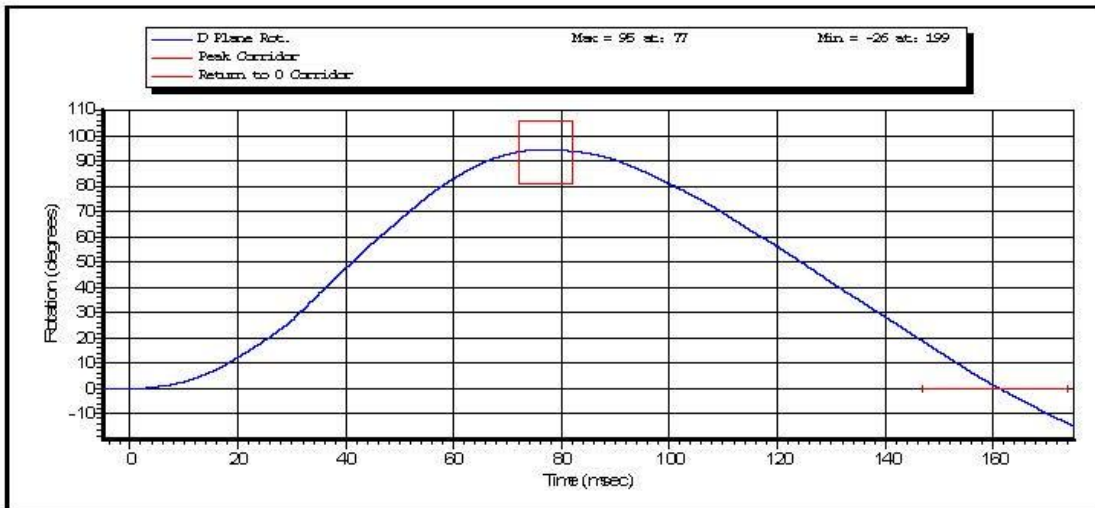


ID of Test: **Neck Extension**

Time of Test: **1:18:06 PM**

Date of Test: **2/18/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

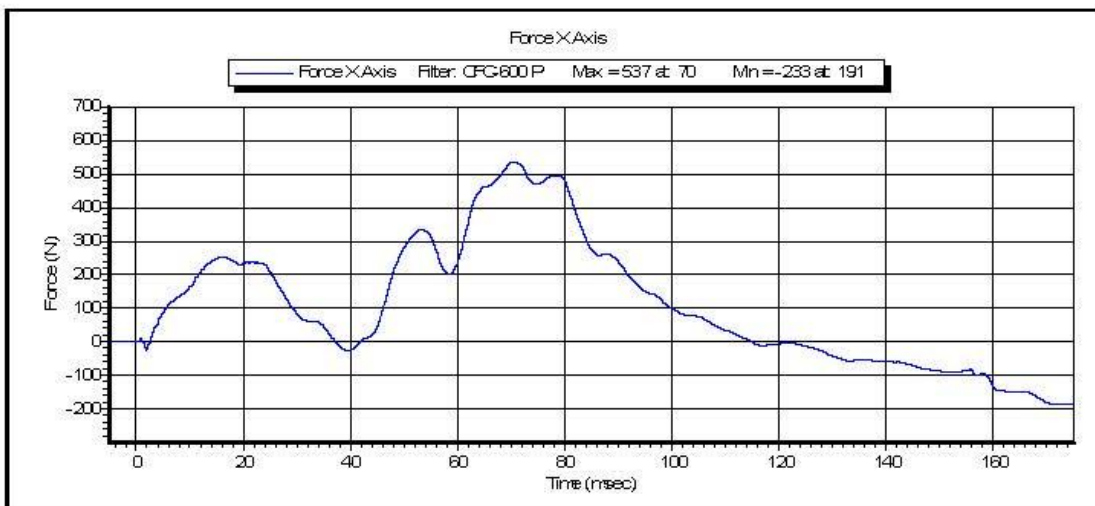
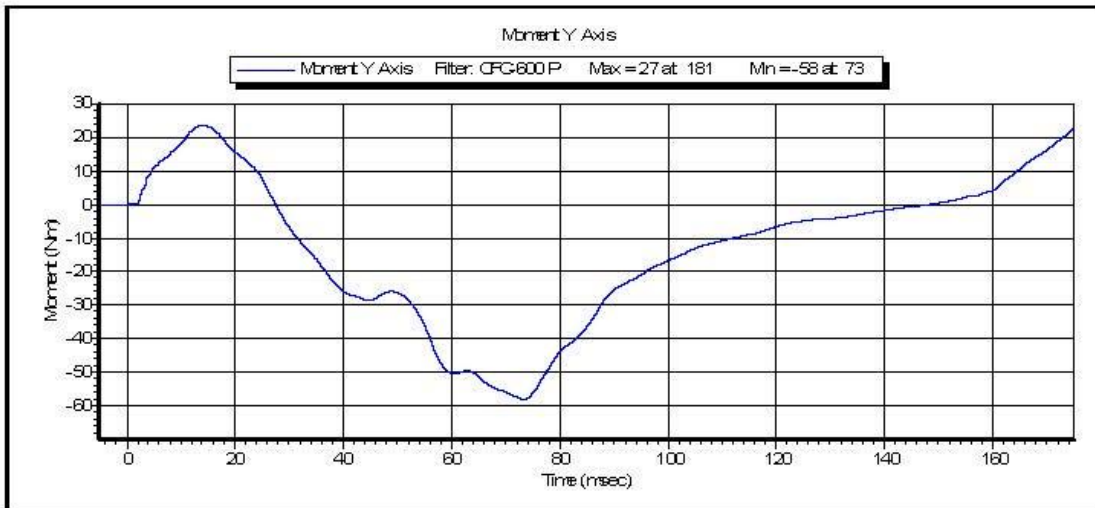


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Time of Test: **1:18:06 PM**

Date of Test: **2/18/2014**

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ID of Test: **Neck Extension**

Time of Test: **1:18:06 PM**

Date of Test: **2/18/2014**

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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:	142		
Test ID:	Neck Flexion	Test Date:	2/18/2014
		Test Time:	12:45:23 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4196

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.50 deg C P
Humidity	10 -- 70	21.30 %RH P
Velocity	6.89 -- 7.13	6.981 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	24.69 G's P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	20.01 G's P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	13.96 G's P
Maximum Pendulum Deceleration After 30 ms	0 -- 29	15.0 G's P
Deceleration Time to 5 ms	34 -- 42	39.0 ms P
D Plane Rotation	-78 -- -64	-68.7 degrees P
Time at Maximum Rotation	57 -- 64	58.1 ms P
Rotation Decay to Zero	113 -- 128	113.3 ms P
Moment About Occipital Condyle	88.1 -- 108.4	98.47 Nm P
Time at Maximum Moment	47 -- 58	52.4 ms P
Moment Decay to Zero	97.0 -- 107.0	98.5 ms P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



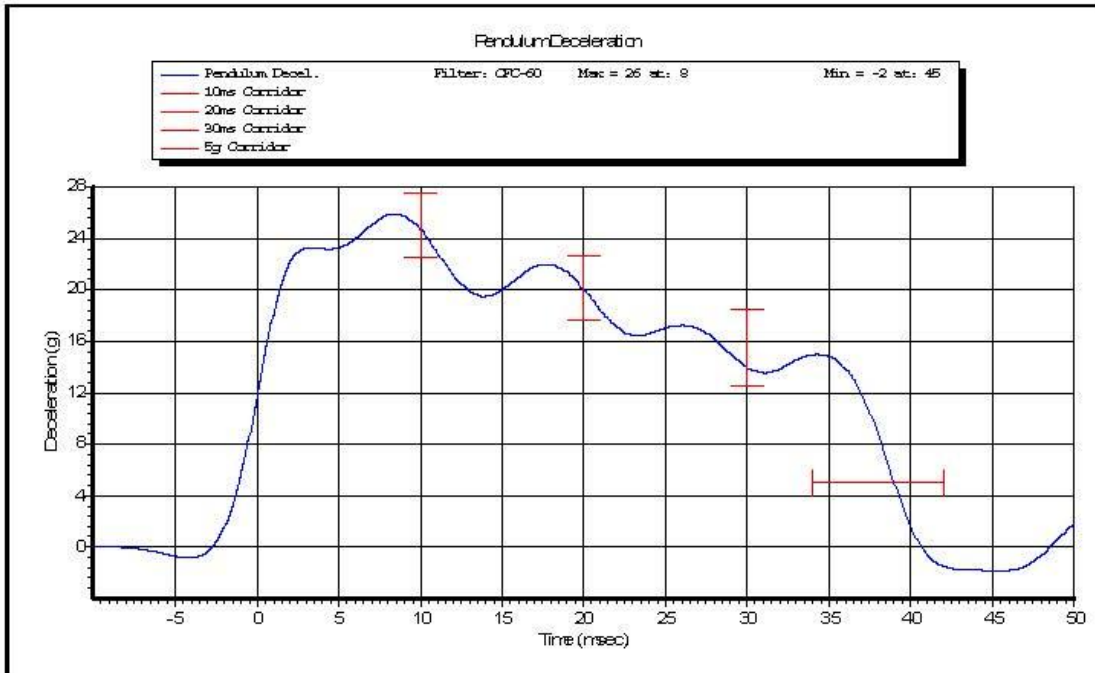
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/31/2014
DentonATD	78051-342	CONDYLE POT	1/31/2014
First Technology	IF-205	LC-161 My	4/30/2013
First Technology	IF-205	LC-161 Fx	4/30/2013



Name of Test:	Neck Flexion
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	142

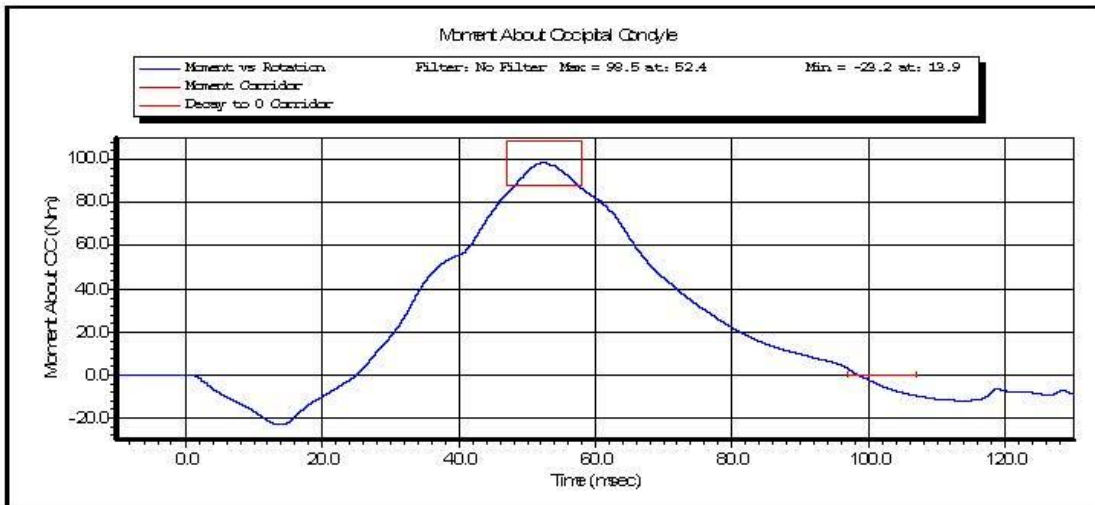
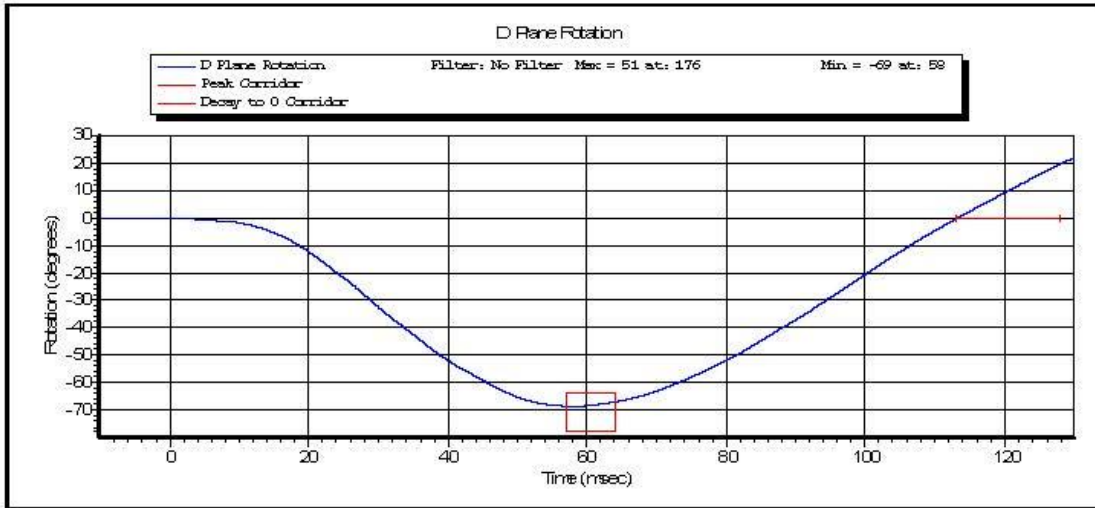


ID of Test: **Neck Flexion**

Time of Test: **12:45:23 PM**

Date of Test: **2/18/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

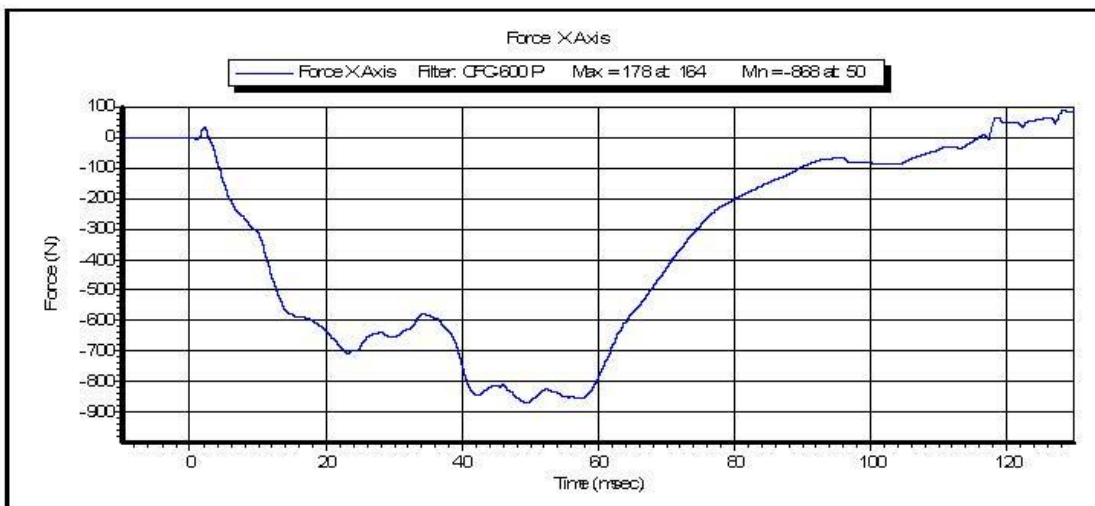
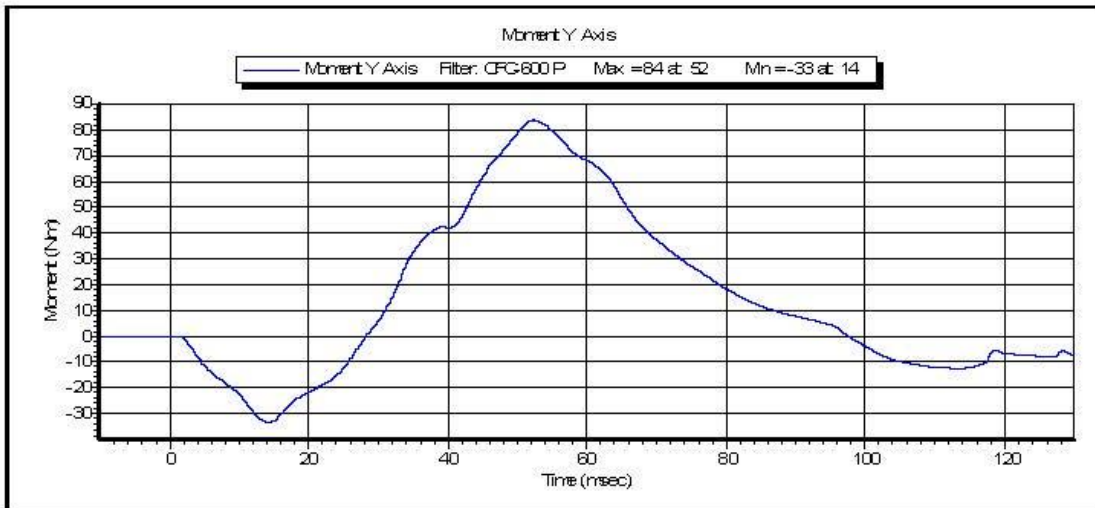


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Time of Test: **12:45:23 PM**

Date of Test: **2/18/2014**

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ID of Test: **Neck Flexion**

Time of Test: **12:45:23 PM**

Date of Test: **2/18/2014**

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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:	142		
Test ID:	Thorax Impact	Test Date:	2/18/2014
		Test Time:	4:36:04 PM

Component Part Number	Component Serial Number
Chest Jacket - 78051-169	100

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	20.90 deg C P
Humidity	10 -- 70	22.90 %RH P
Velocity	6.59 -- 6.83	6.663 m/s P
Chest Deflection	-72.6 -- -63.5	-68.17 mm P
Resistive Force	-5.894 -- -5.160	-5.8141 kN P
Hysteresis	69 -- 85	72.6 % P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



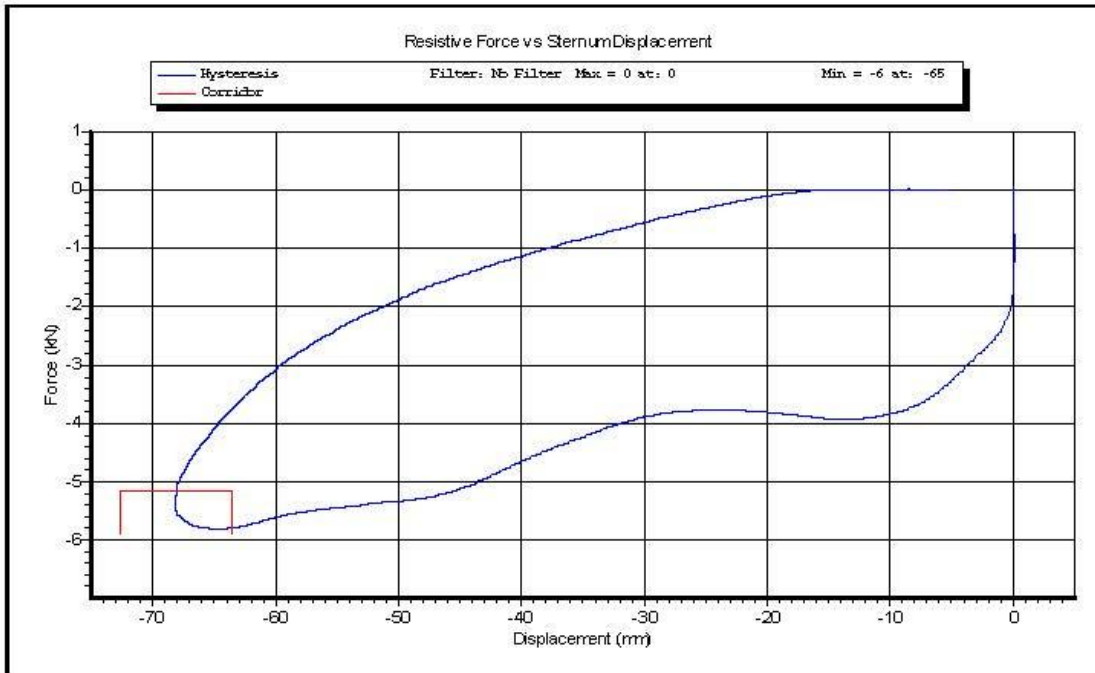
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
SERVO	78051-342	DS-142	11/18/2013



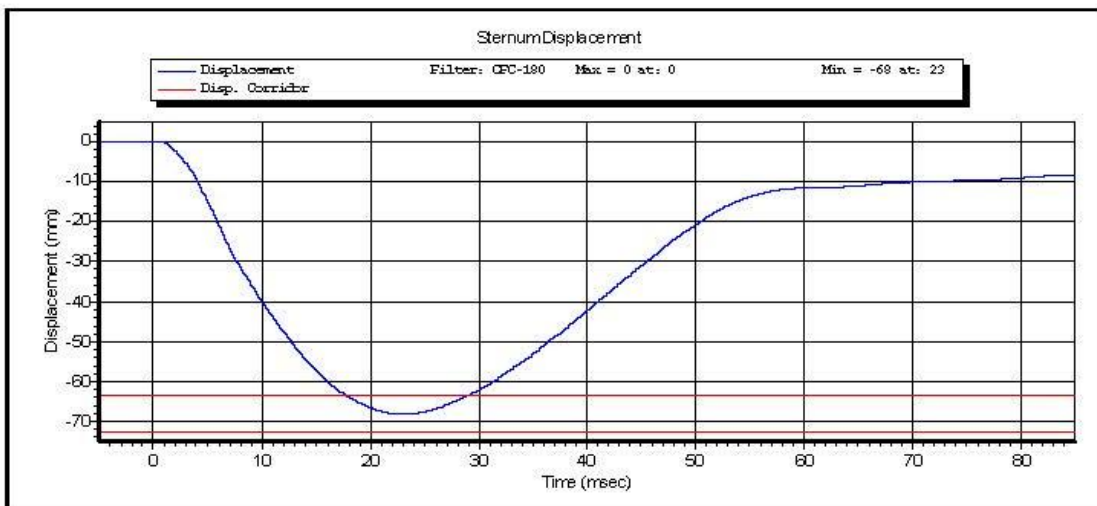
Test Name: **Thorax Impact**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Thorax Impact** Test Time: **4:36:04 PM**

Test Date: **2/18/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

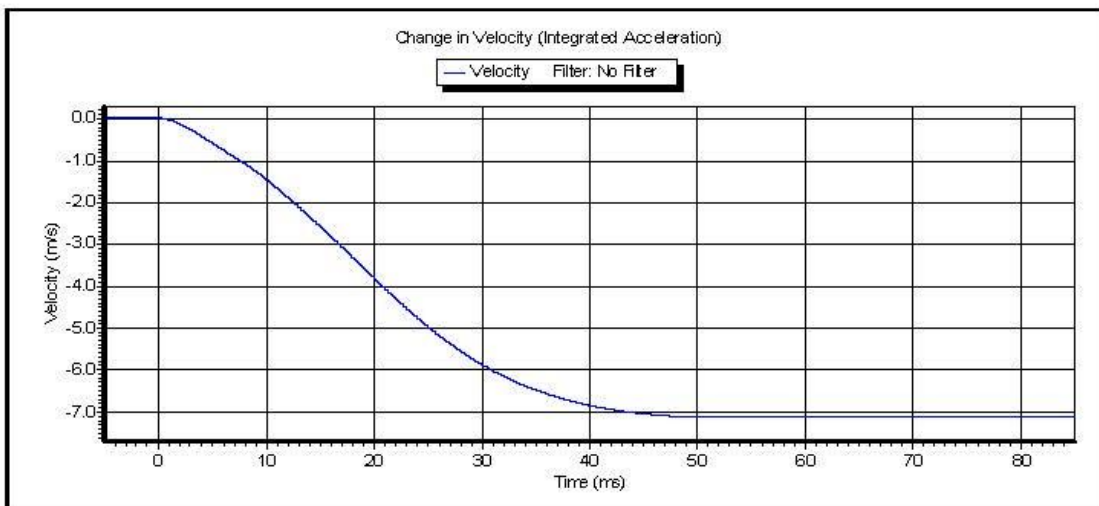
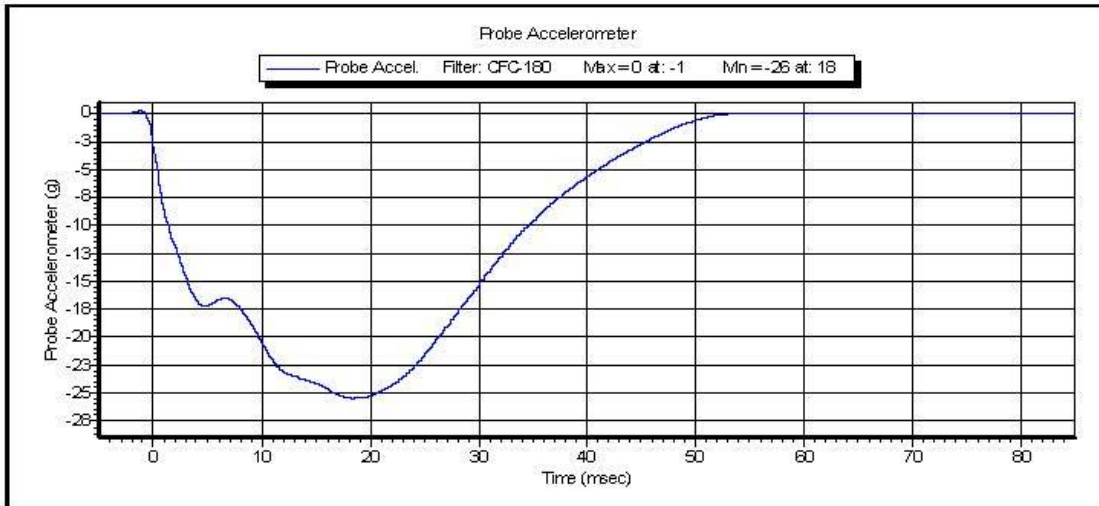


Test ID: Thorax Impact

Test Time: 4:36:04 PM

Test Date: 2/18/2014

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Test ID: **Thorax Impact**

Test Time: **4:36:04 PM**

Test Date: **2/18/2014**

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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:	142		
Test ID:	Hip ROM Left	Test Date:	2/18/2014
		Test Time:	8:25:48 AM

Component Part Number	Component Serial Number
Pelvis Assembly 78051-60	

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.60 deg C P
Humidity	10 -- 70	22.60 %RH P
Average Velocity	5 -- 10	6.1 deg/s P
Angle at 203 Nm	40 -- 50	44.3 degrees P
Moment at 30 degrees	0.0 -- 94.9	83.18 Nm P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



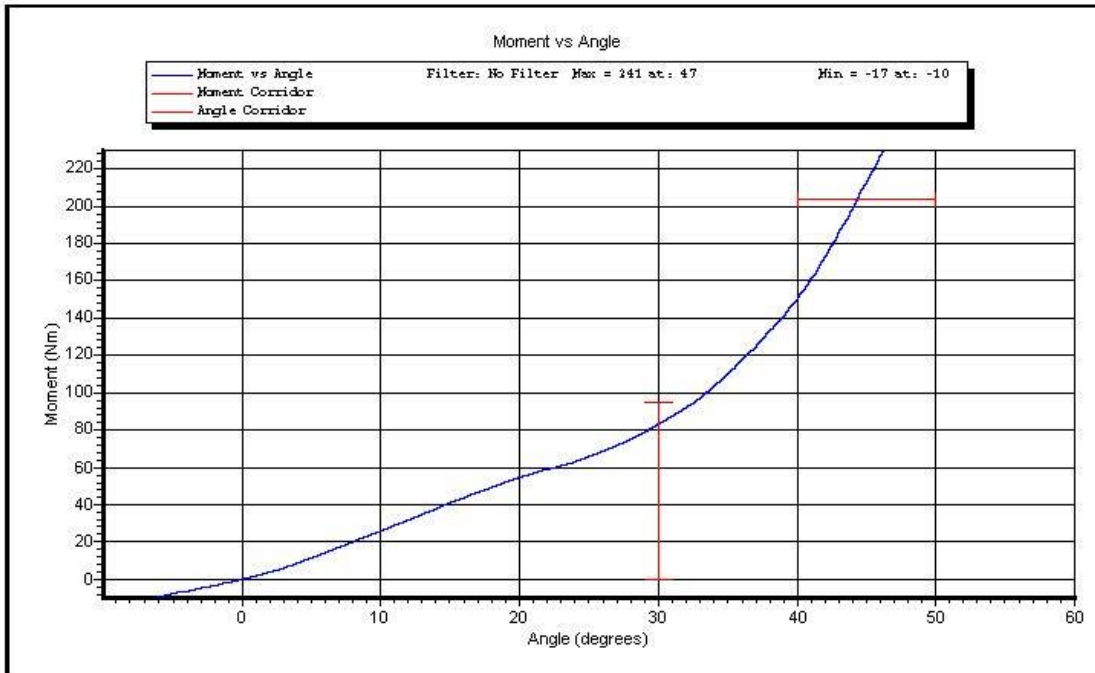
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/19/2013
DentonATD	14 CB1-3615	0008	2/21/2013
DentonATD	A0 Output	1	1/11/2014



Test Name: **Hip ROM**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Hip ROM Left**

Test Time: **8:25:48 AM**

Test Date: **2/18/2014**

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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:	142		
Test ID:	Hip ROM Right	Test Date:	2/18/2014
		Test Time:	9:03:00 AM

Component Part Number	Component Serial Number
Pelvis Assembly 78051-60	

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.80 deg C P
Humidity	10 -- 70	21.80 %RH P
Average Velocity	5 -- 10	5.9 deg/s P
Angle at 203 Nm	40 -- 50	42.0 degrees P
Moment at 30 degrees	0.0 -- 94.9	92.31 Nm P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



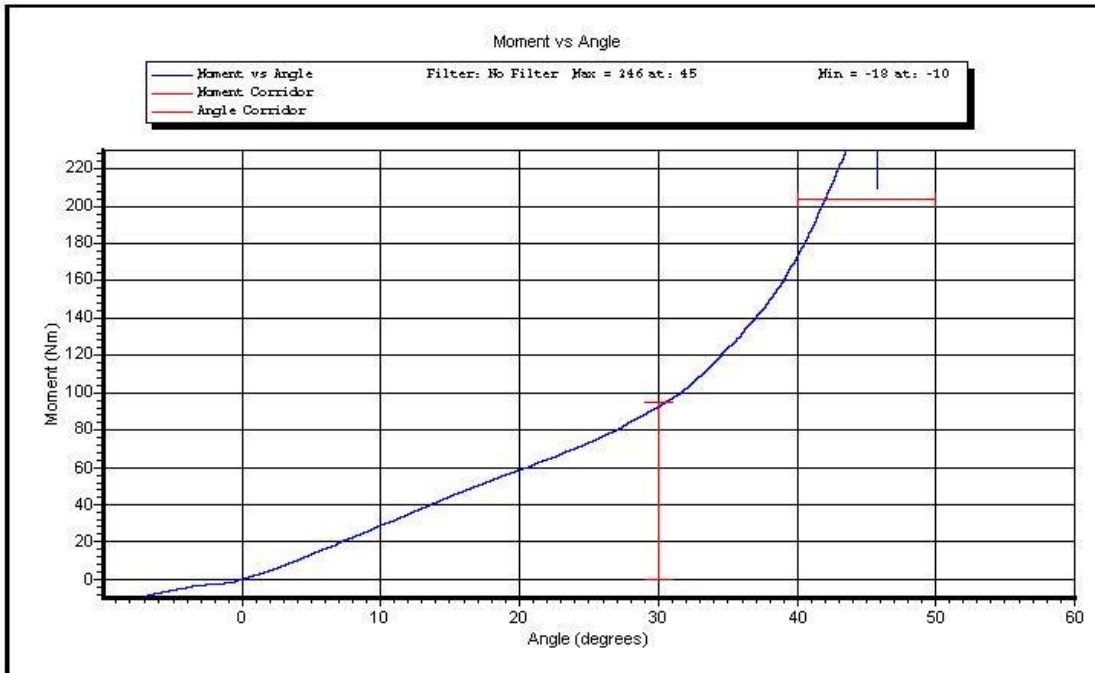
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/19/2013
DentonATD	14 CB1-3615	0008	2/21/2013
DentonATD	A0 Output	1	1/11/2014



Test Name: **Hip ROM**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Hip ROM Right**

Test Time: **9:03:00 AM**

Test Date: **2/18/2014**

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:	142		
Test ID:	Knee Impact Left	Test Date:	2/17/2014
		Test Time:	7:23:48 AM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	078

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.20 deg C P
Humidity	10 -- 70	12.10 %RH P
Velocity	2.07 -- 2.13	2.118 m/s P
Resistive Force	-5.780 -- -4.720	-4.887 kN P

All test parameters are within specifications

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



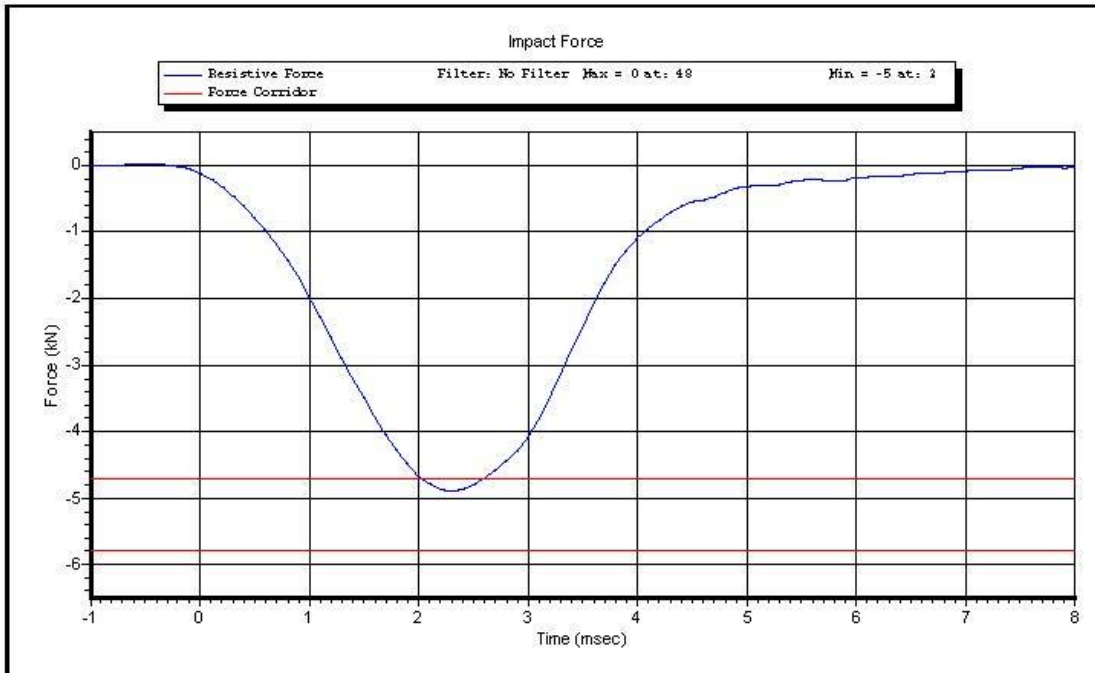
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



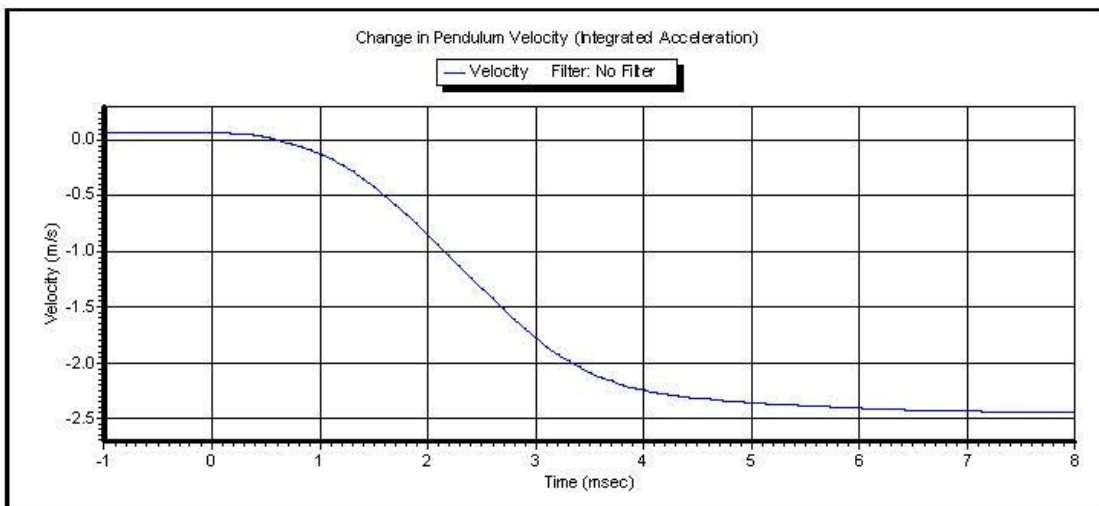
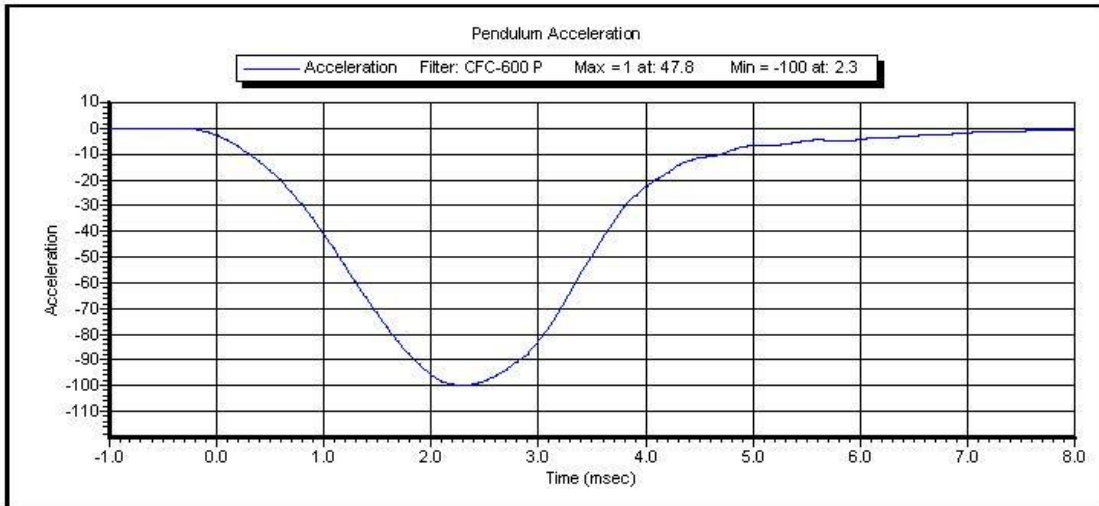
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 50th Male
ATD Serial Number:	142



Test ID: **Knee Impact LEft** Test Time: **7:23:48 AM**

Test Date: **2/17/2014**

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Test ID: **Knee Impact LEft** Test Time: **7:23:48 AM**

Test Date: **2/17/2014**

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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:	142		
Test ID:	Knee Impact Right	Test Date:	2/17/2014
		Test Time:	7:32:08 AM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	3307

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.20 deg C P
Humidity	10 -- 70	12.10 %RH P
Velocity	2.07 -- 2.13	2.118 m/s P
Resistive Force	-5.780 -- -4.720	-5.563 kN P

All test parameters are within specifications

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



VERIFICATION REPORT

REFERENCE EQUIPMENT

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



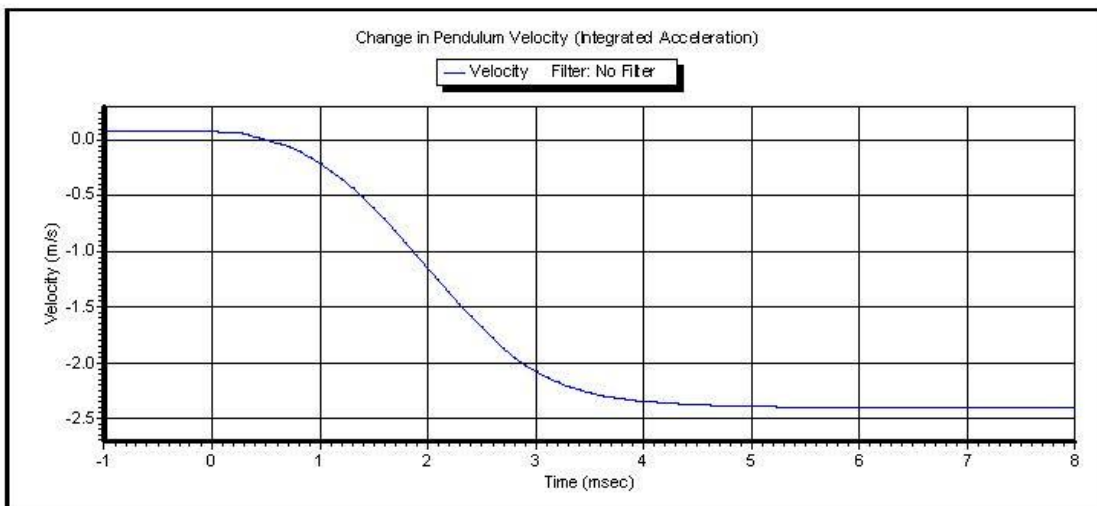
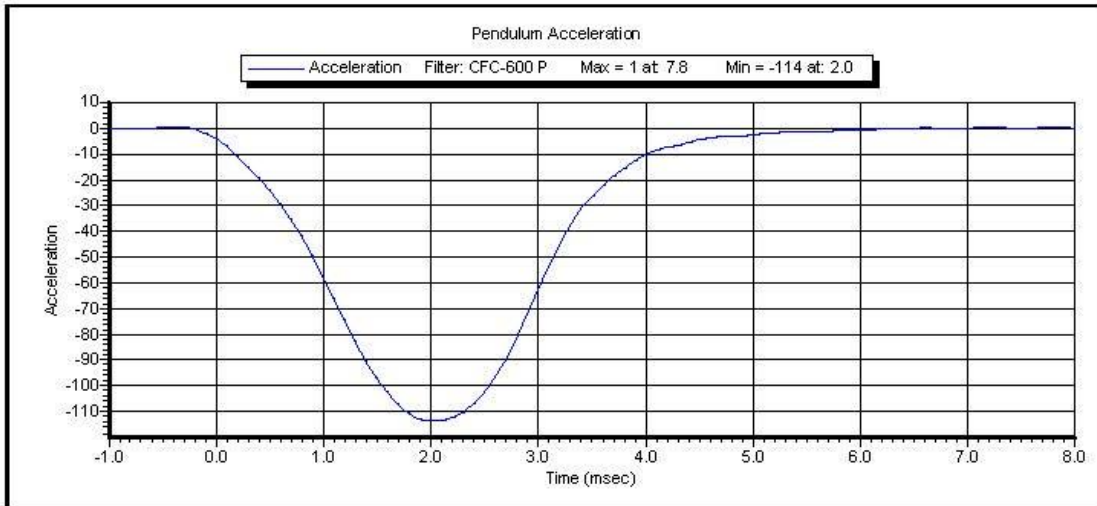
Test Name: **Knee Impact**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Knee Impact Right** Test Time: **7:32:08 AM**

Test Date: **2/17/2014**

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Test ID: **Knee Impact Right** Test Time: **7:32:08 AM**

Test Date: **2/17/2014**

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CALIBRATION TEST RESULTS

PRE-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 143



External Measurements

5th Female SN 143

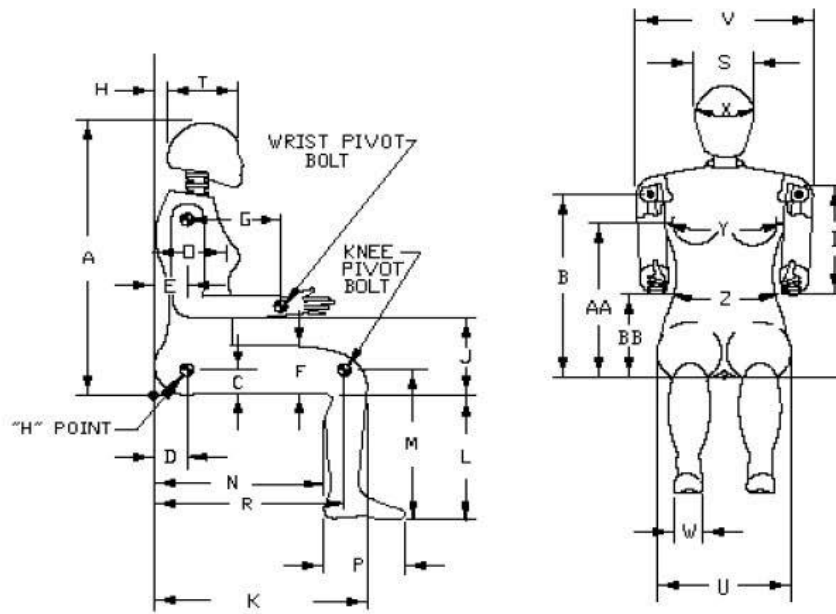
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	790	Yes
B	Shoulder Pivot Height	431.8 – 457.2	446	Yes
C	H-Point Height	81.3 – 86.3	84	Yes
D	H-Point from Backline	144.8 – 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	77	Yes
F	Thigh Clearance	119.4 – 134.6	124	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	246	Yes
H	Head Back to Backline	43.2 – 48.2	44	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	280	Yes
J	Elbow Rest Height	182.8 – 203.2	186	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	422	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	220	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	473	Yes
S	Head Breadth	137.1 – 147.3	142	Yes
T	Head Depth	177.8 – 188	183	Yes
U	Hip Breadth	299.7 – 314.9	302	Yes
V	Shoulder Breadth	350.5 – 365.7	362	Yes
W	Foot Breadth	78.8 – 94	81	Yes
X	Head Circumference	528.3 – 548.7	537	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	852	Yes
Z	Waist Circumference	759.5 – 789.9	768	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	357	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	170	Yes

Technician: M. Geesey

Date: 02/19/2014

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:	143		
Test ID:	Head Drop	Test Date:	2/20/2014
		Test Time:	11:28:10 AM

Component Part Number	Component Serial Number
Head Skin - 78051-228	05733
Cap Skin - 78051-229	06108

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.40 deg C P
Humidity	10 -- 70	27.10 %RH P
Resultant Acceleration	250 -- 300	269.8 G's P
Oscillation	0 -- 10	0.0 % P
Lateral Acceleration	-15 -- 15	-9.3 G's P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



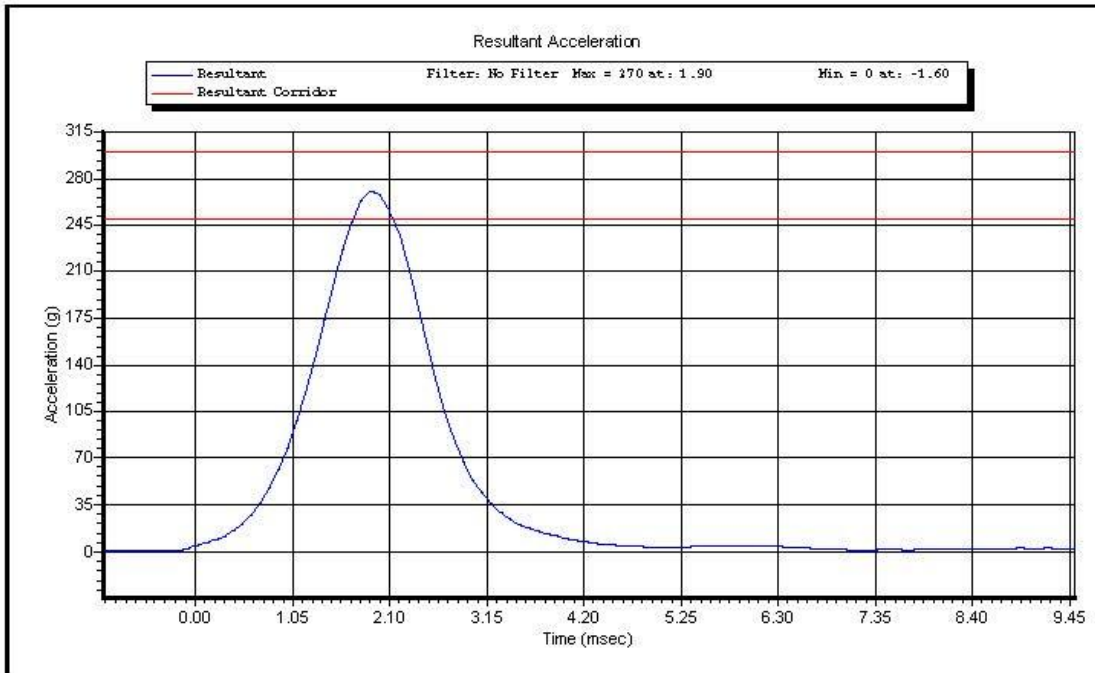
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P15321	2/5/2014
Endevco	7264-2000	P16755	2/5/2014
Endevco	7264-2000	P58868	2/5/2014



Test Name: **Head Drop**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**

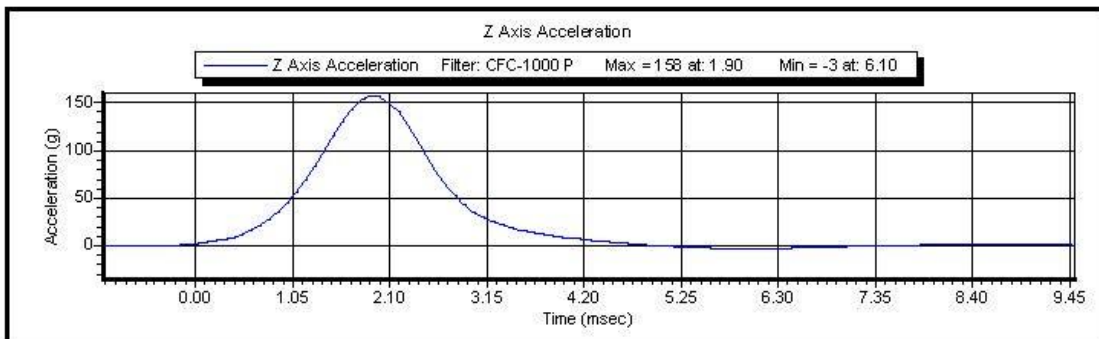
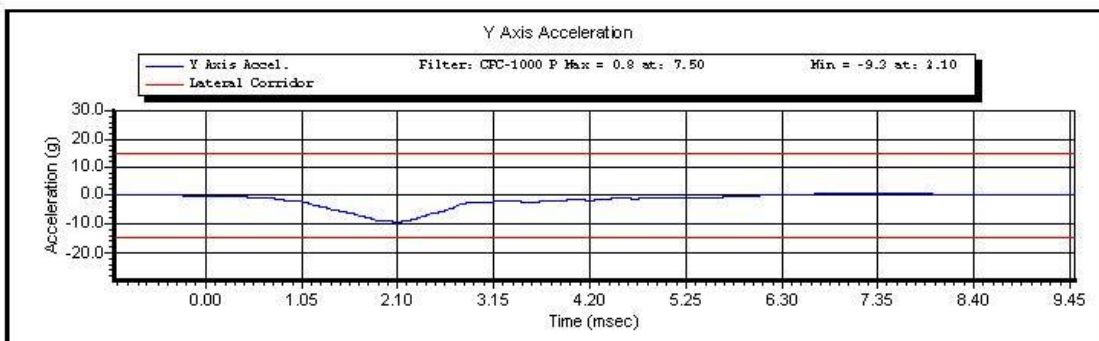
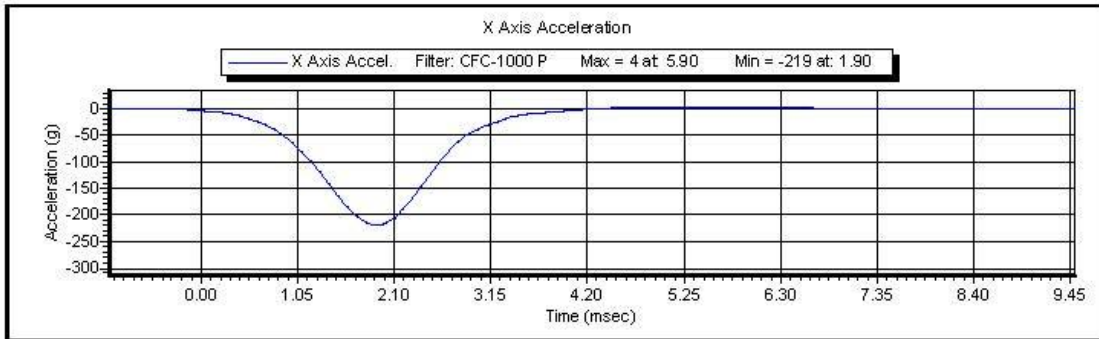


Test ID: **Head Drop**

Test Time: **11:28:10 AM**

Test Date: **2/20/2014**

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Test ID: **Head Drop**

Test Time: **11:28:10 AM**

Test Date: **2/20/2014**

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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:	143		
Test ID:	Neck Extension	Test Date:	2/20/2014
		Test Time:	9:38:03 AM

Component Part Number	Component Serial Number
Neck - 880105-255	050512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.50 deg C P
Humidity	10 -- 70	26.60 %RH P
Velocity	5.95 -- 6.19	6.041 m/s P
Pendulum Impulse at 10 ms	1.5 -- 1.9	1.84 m/s P
Pendulum Impulse at 20 ms	3.1 -- 3.9	3.57 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	5.13 m/s P
D Plane Rotation	99 -- 114	103.0 degrees P
Moment During Rotation Interval	-65 -- -53	-55.7 Nm P
Moment Decay to -10.0 Nm	94 -- 114	102.5 ms P

All test parameters are within specifications

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



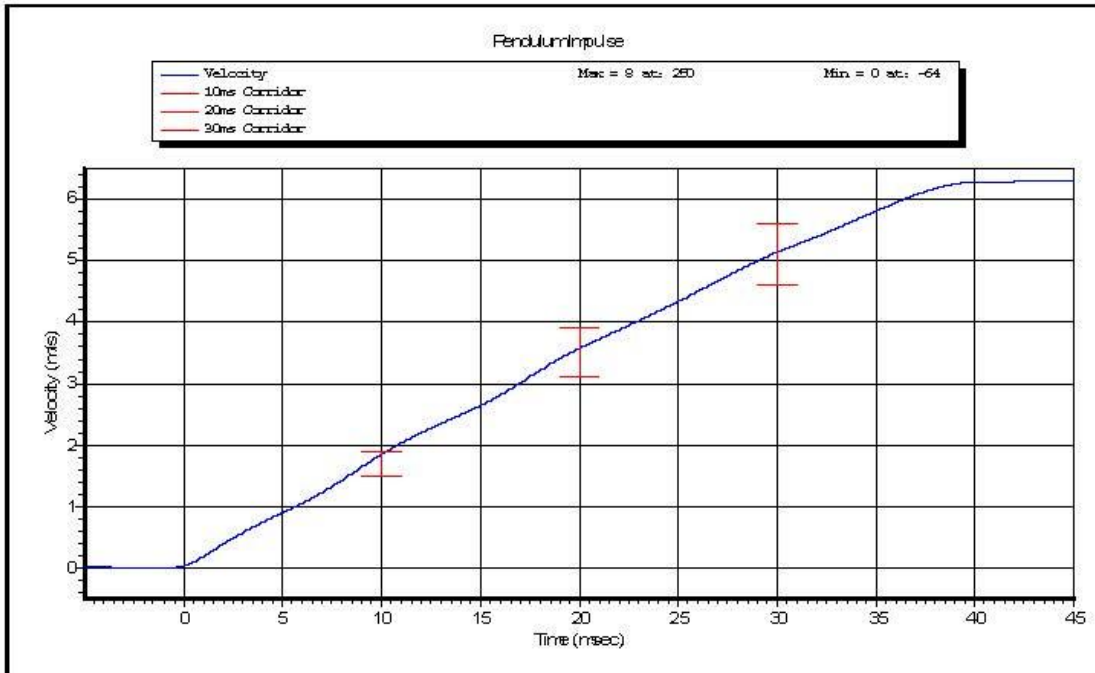
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/31/2014
DentonATD	78051-342	CONDYLE POT	1/31/2014
Denton	1716A	LC-283My	5/29/2013
Denton	1716A	LC-283 Fx	5/29/2013



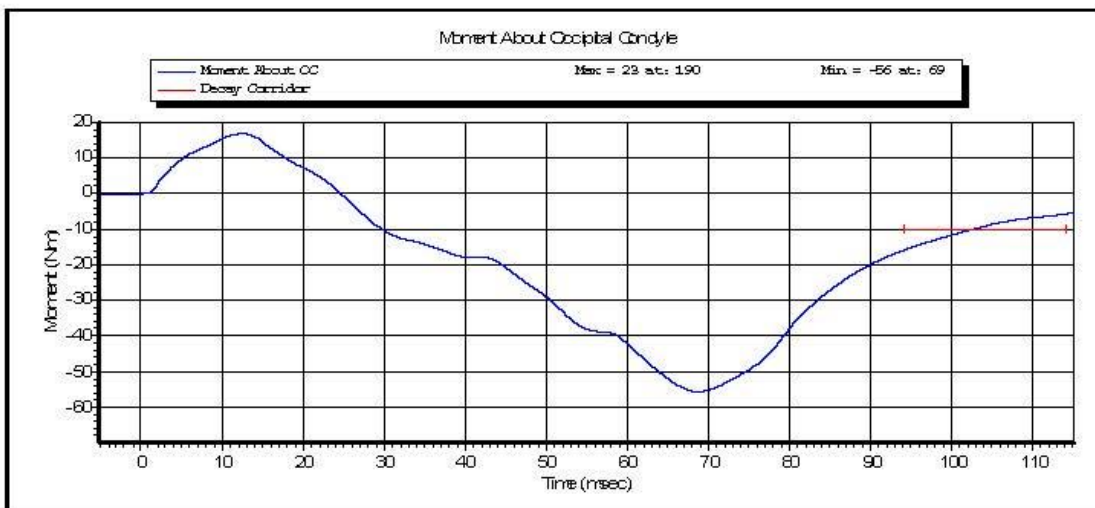
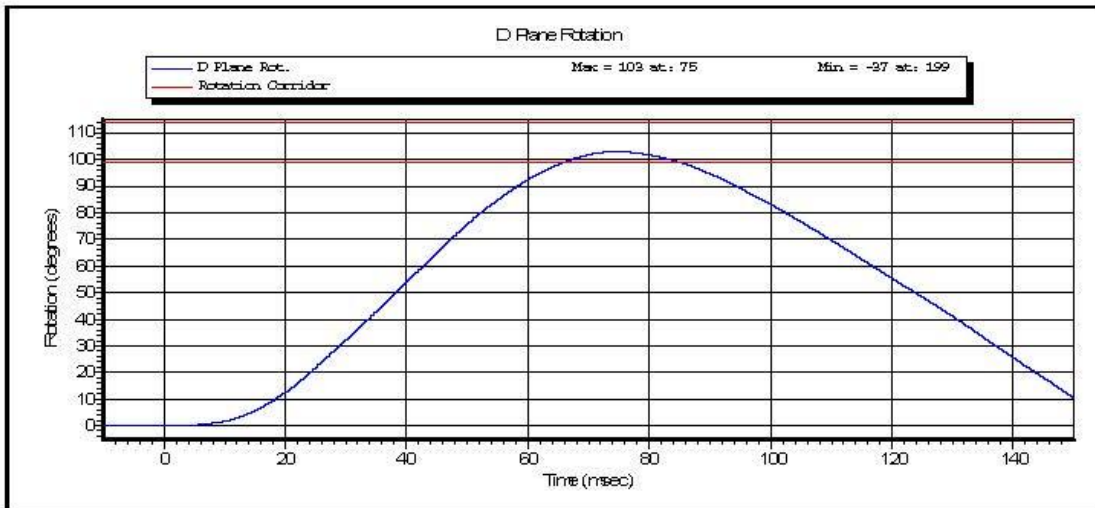
Test Name: **Neck Extension**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**



Test ID: **Neck Extension** Test Time: **9:38:03 AM**

Test Date: **2/20/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

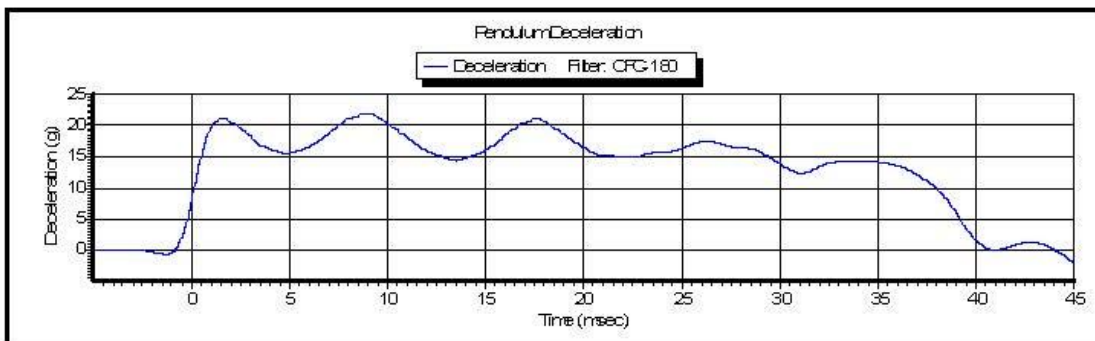
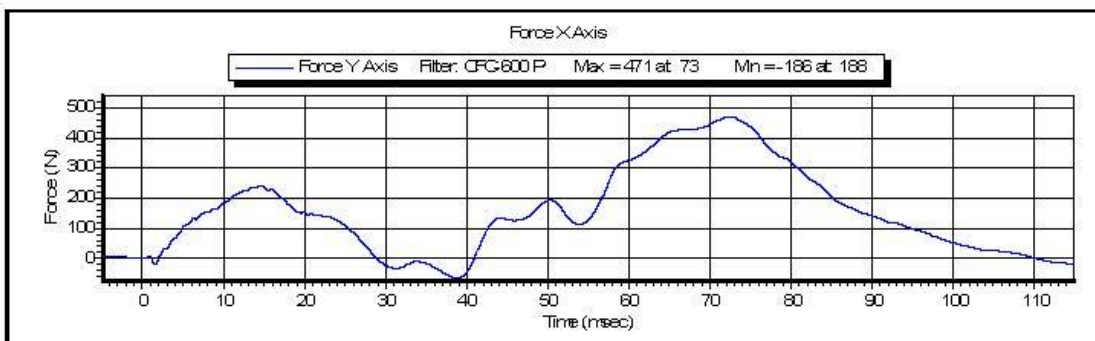
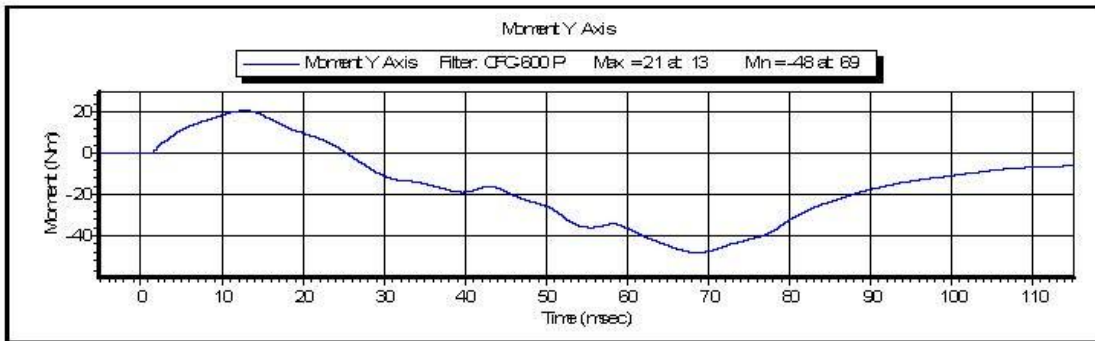


Test ID: **Neck Extension**

Test Time: **9:38:03 AM**

Test Date: **2/20/2014**

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Test ID: **Neck Extension**

Test Time: **9:38:03 AM**

Test Date: **2/20/2014**

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:	143		
Test ID:	Neck Flexion	Test Date:	2/20/2014
		Test Time:	9:12:23 AM

Component Part Number	Component Serial Number
Neck - 880105-255	050512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.50 deg C P
Humidity	10.0 -- 70.0	26.20 %RH P
Velocity	6.89 -- 7.13	7.042 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.36 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.7 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	6.73 m/s P
D Plane Rotation	-91 -- -77	-77.6 degrees P
Moment During Rotation Interval	69 -- 83	74.9 Nm P
Moment Decay to 10.0 Nm	80 -- 100	84.7 ms P

All test parameters are within specifications

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



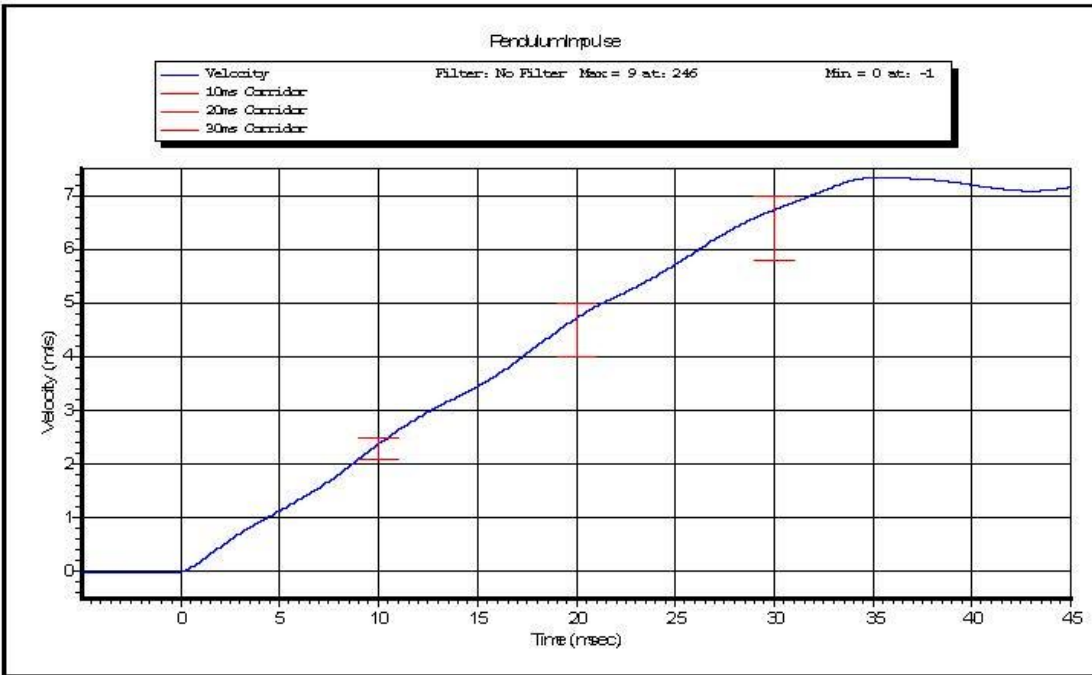
VERIFICATION REPORT

REFERENCE EQUIPMENT

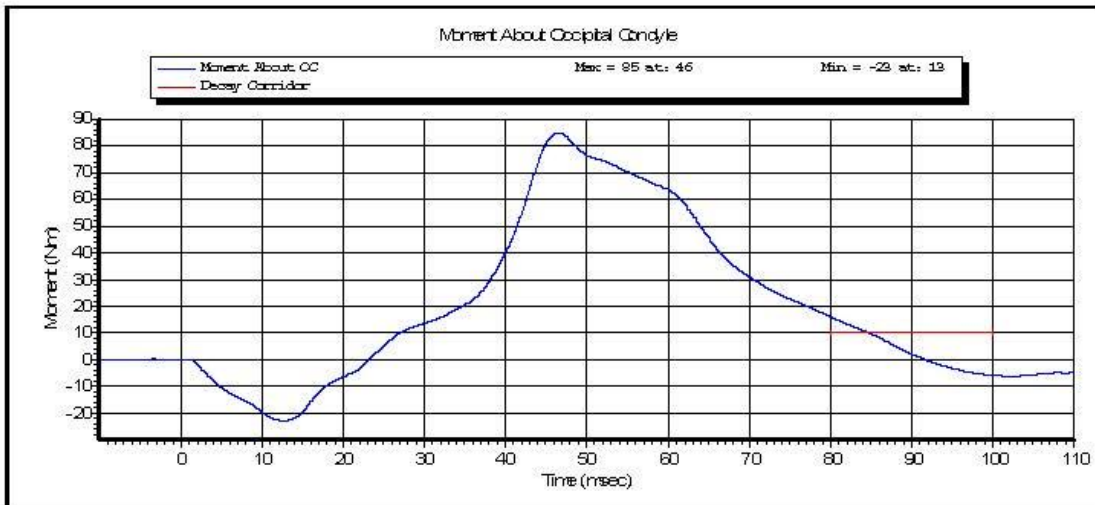
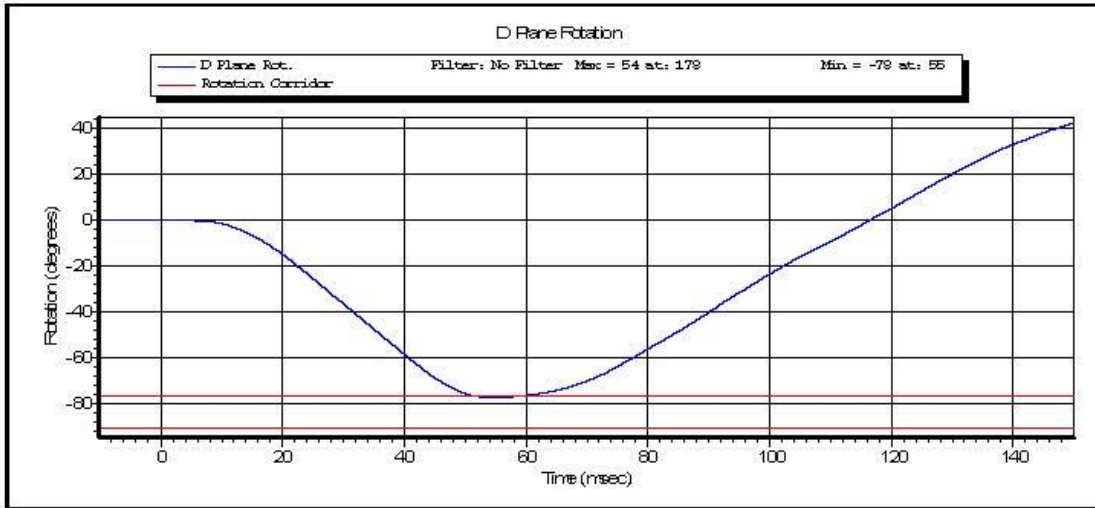
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DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
DentonATD	78051-342	PENDULUM POT	1/31/2014
DentonATD	78051-342	CONDYLE POT	1/31/2014
Denton	1716A	LC-283My	5/29/2013
Denton	1716A	LC-283 Fx	5/29/2013



Test Name: **Neck Flexion**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**



Test ID: **Neck Flexion** Test Time: **9:12:23 AM** Test Date: **2/20/2014**
Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0

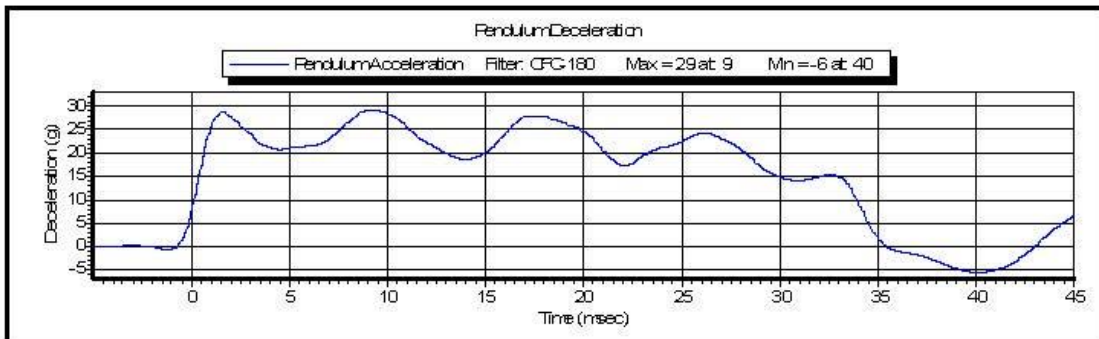
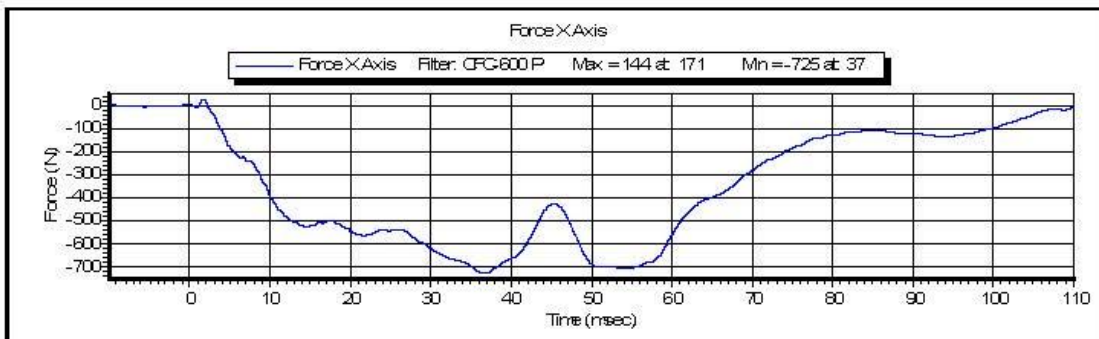
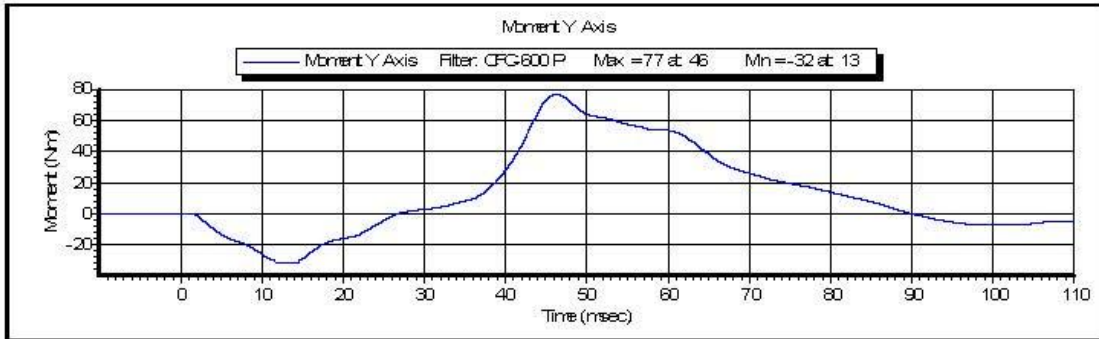


Test ID: Neck Flexion

Test Time: 9:12:23 AM

Test Date: 2/20/2014

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Test ID: **Neck Flexion**

Test Time: **9:12:23 AM**

Test Date: **2/20/2014**

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Torso Flexion

Part 5720 HIII 5% Female

ATD Serial No: 143

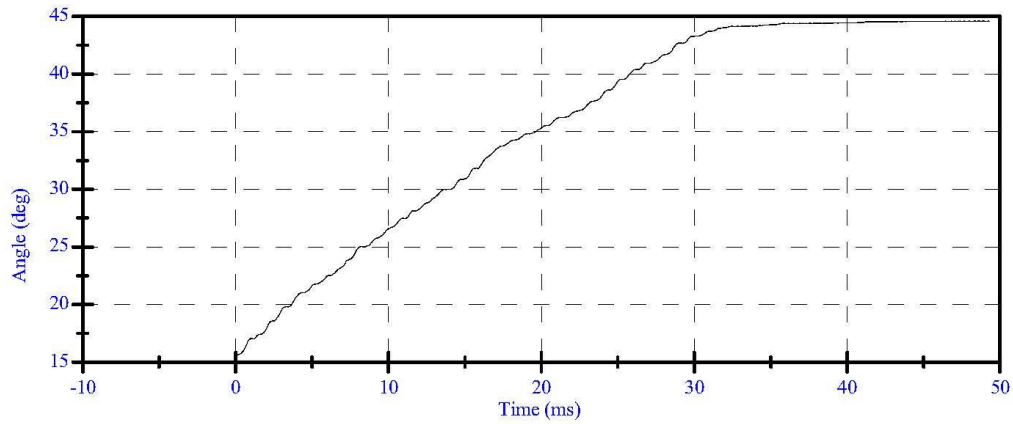
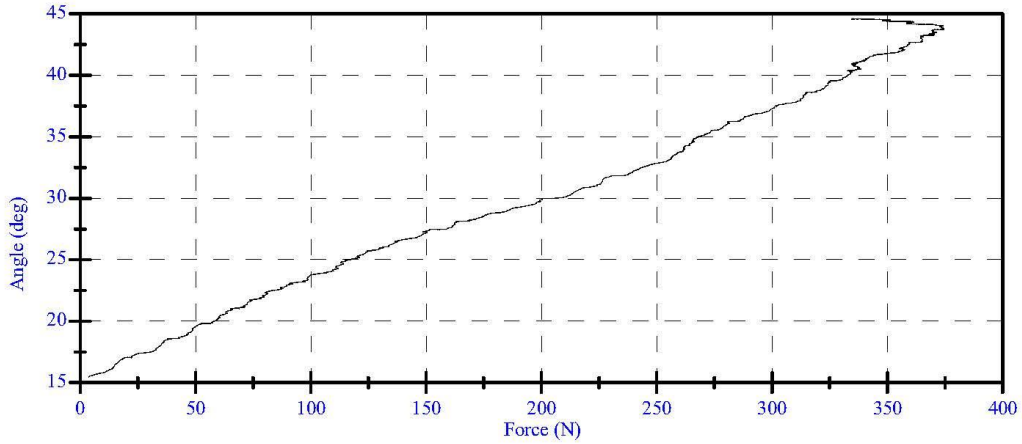
Laboratory Supervisor: E. Dutton

Date: 02/21/2014

Laboratory Technician: M. Goehle

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.6 C	21.4 C	Passed
Lab Humidity:	10-70 %	34.4 %	Passed
Initial Angle:	0.00-20.00 Deg	15.5 Deg	Passed
Force at 45 Deg	320.00-390.00 N	374.66 N	Passed
Return Angle	8 Deg Max from Initial	21.1 deg	Passed

TORSO FLEXION TEST





VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 5th Female		
ATD Serial Number:	143		
Test ID:	Thorax Impact	Test Date:	2/19/2014
		Test Time:	10:46:34 AM

Component Part Number	Component Serial Number
Chest Jacket - 880105-355-E	05855

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.30 deg C P
Humidity	10 -- 70	19.20 %RH P
Velocity	6.59 -- 6.83	6.799 m/s P
Sternum Displacement	-58 -- -50	-56.7 mm P
Force During Displacement Interval	-4400 -- -3900	-4261.3 N P
Force During -18mm to -50mm Displacem	-4600 -- 0	-4163.6 N P
Hysteresis	69 -- 85	69.5 % P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



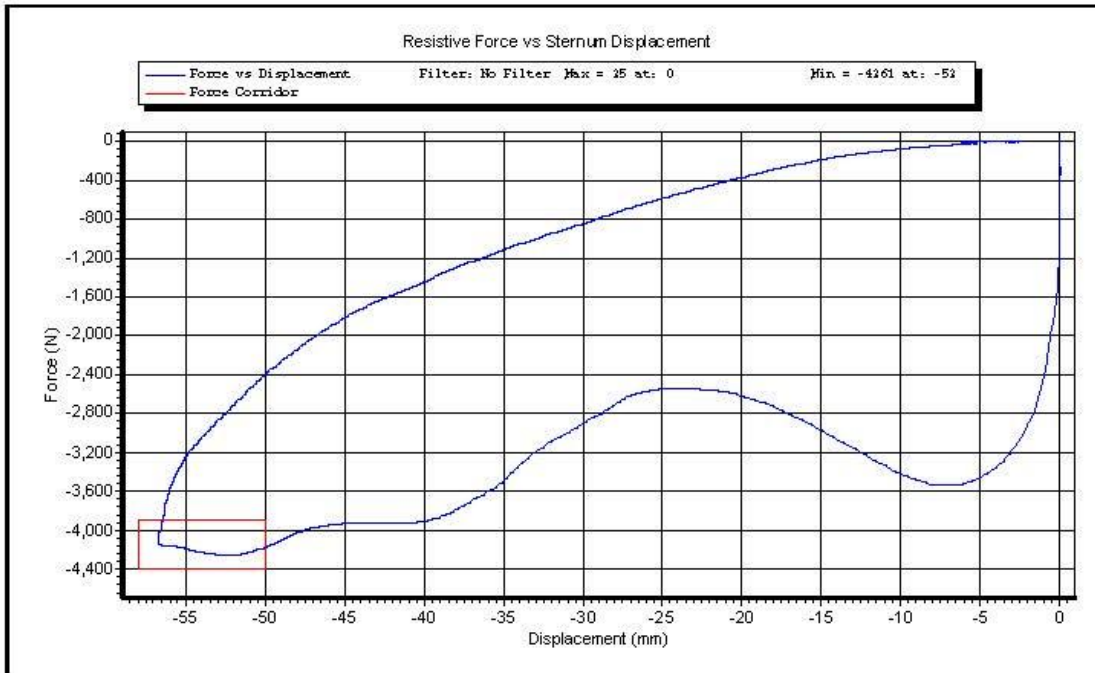
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
DentonATD	H3CD	DS-143	1/30/2014



Test Name: **Thorax Impact**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**

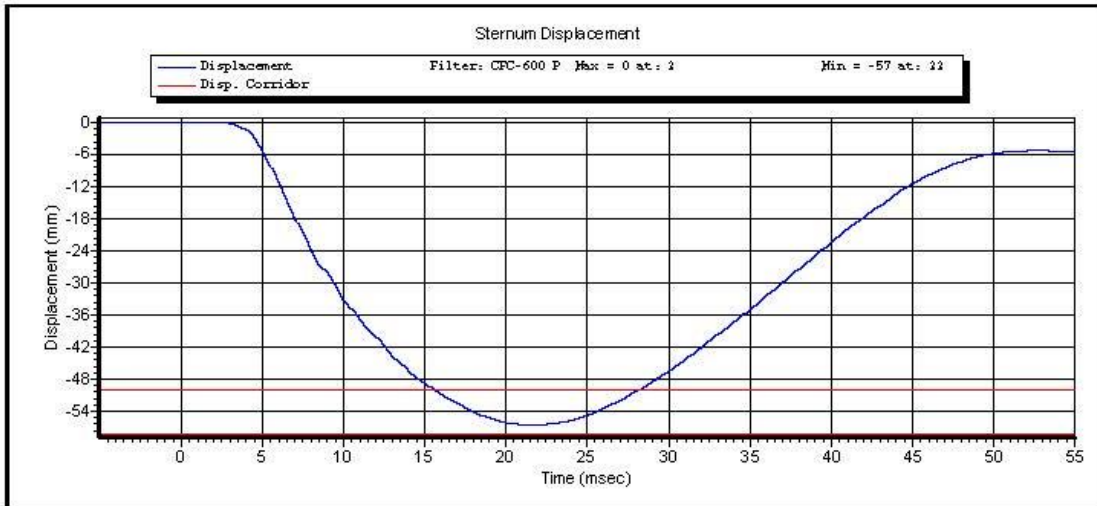


Test ID: **Thorax Impact**

Test Time: **10:46:34 AM**

Test Date: **2/19/2014**

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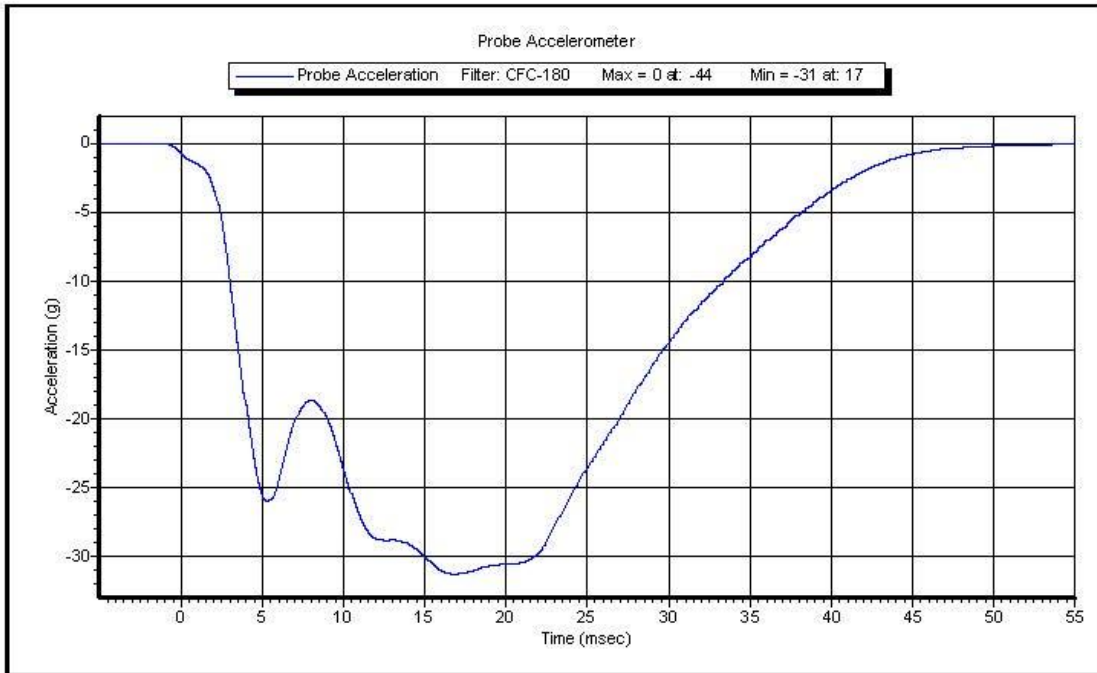


Test ID: **Thorax Impact**

Test Time: **10:46:34 AM**

Test Date: **2/19/2014**

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Test ID: **Thorax Impact**

Test Time: **10:46:34 AM**

Test Date: **2/19/2014**

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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:	143		
Test ID:	Knee Impact Left	Test Date:	2/19/2014
		Test Time:	12:15:56 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1687

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.50 deg C P
Humidity	10 -- 70	20.10 %RH P
Velocity	2.07 -- 2.13	2.115 m/s P
Resistive Force	-4060 -- -3450	-3779.3 N P

All test parameters are within specifications

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



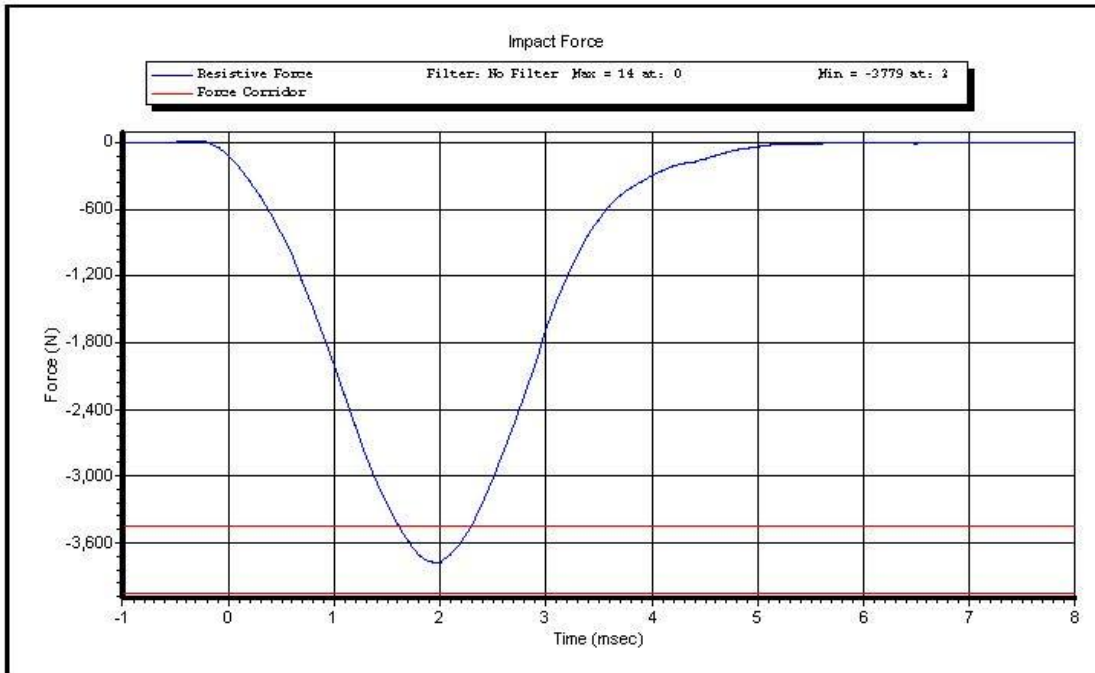
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



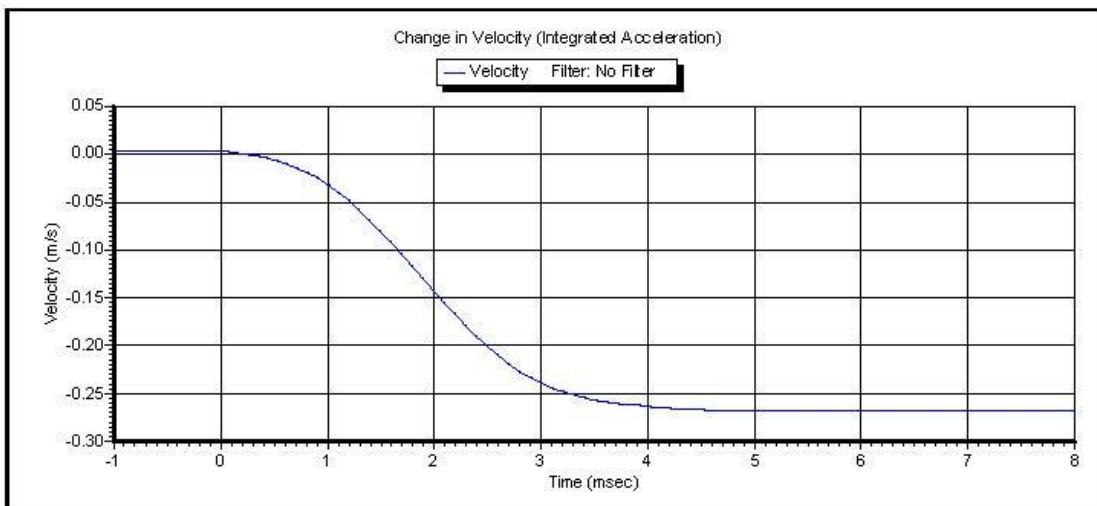
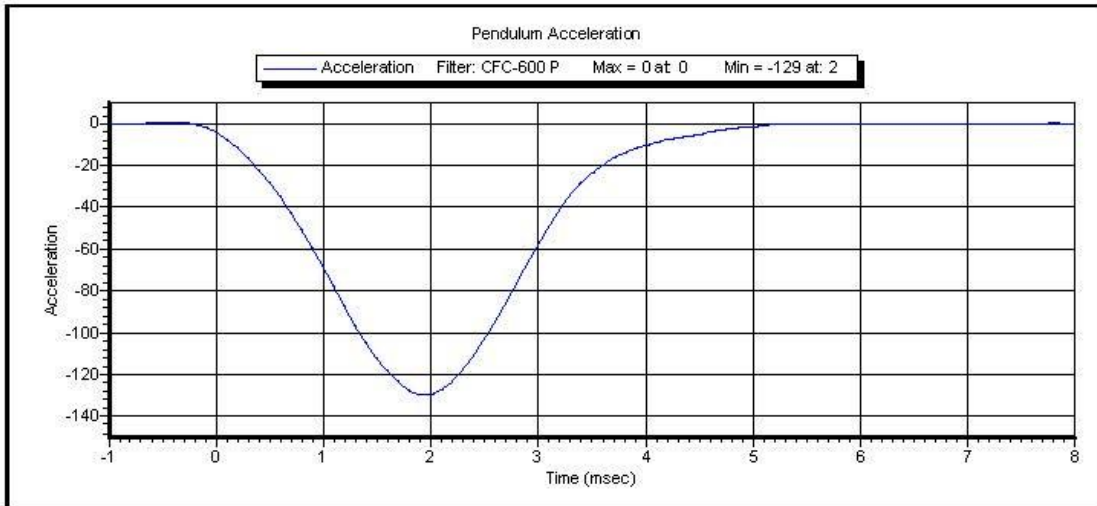
Test Name: **Knee Impact**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**



Test ID: **Knee Impact Left** Test Time: **12:15:56 PM**

Test Date: **2/19/2014**

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Test ID: **Knee Impact Left** Test Time: **12:15:56 PM**

Test Date: **2/19/2014**

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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:	143		
Test ID:	Knee Impact Right	Test Date:	2/19/2014
		Test Time:	11:39:19 AM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1028

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.40 deg C P
Humidity	10 -- 70	19.80 %RH P
Velocity	2.07 -- 2.13	2.092 m/s P
Resistive Force	-4060 -- -3450	-3798.9 N P

All test parameters are within specifications

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



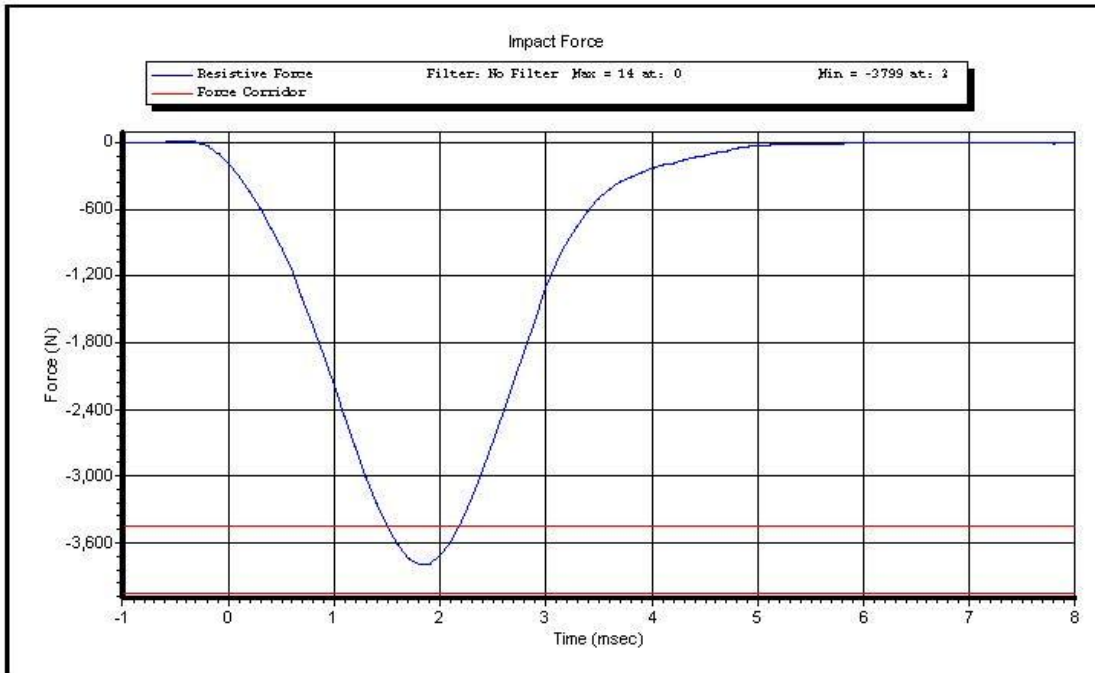
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



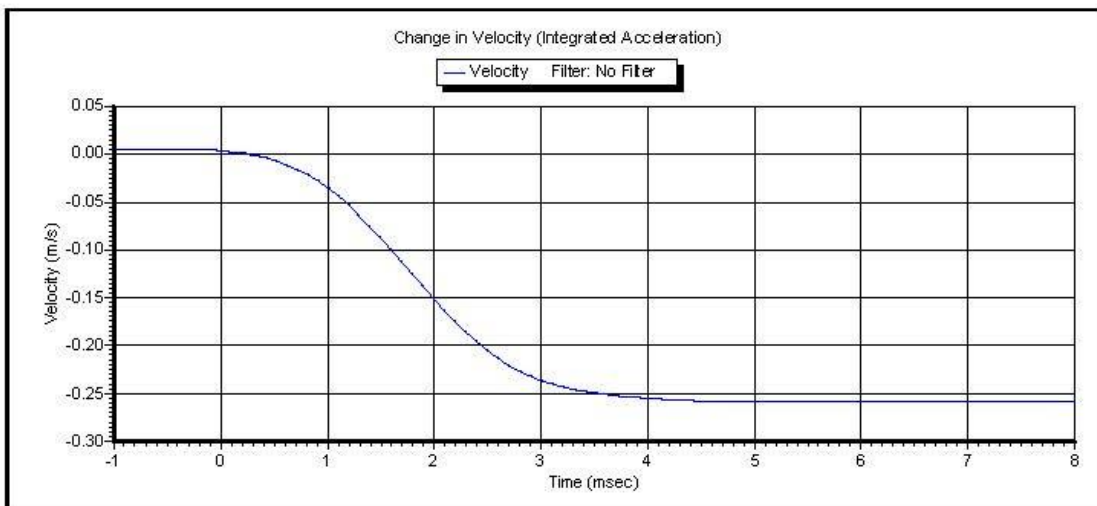
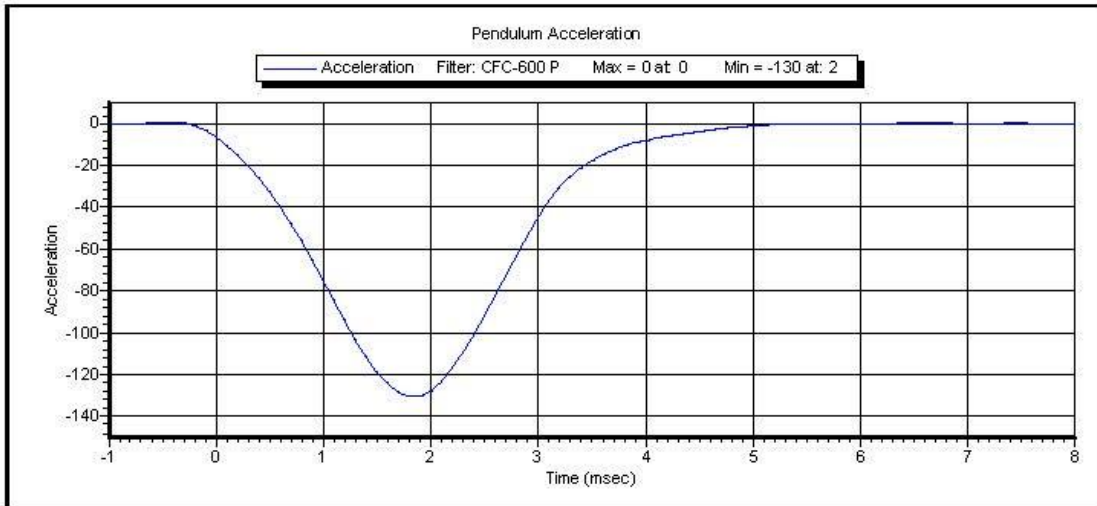
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	143



Test ID: **Knee Impact Right** Test Time: **11:39:19 AM**

Test Date: **2/19/2014**

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Test ID: **Knee Impact Right** Test Time: **11:39:19 AM**

Test Date: **2/19/2014**

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CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 50TH PERCENTILE MALE - DRIVER ATD

SERIAL NO: 142



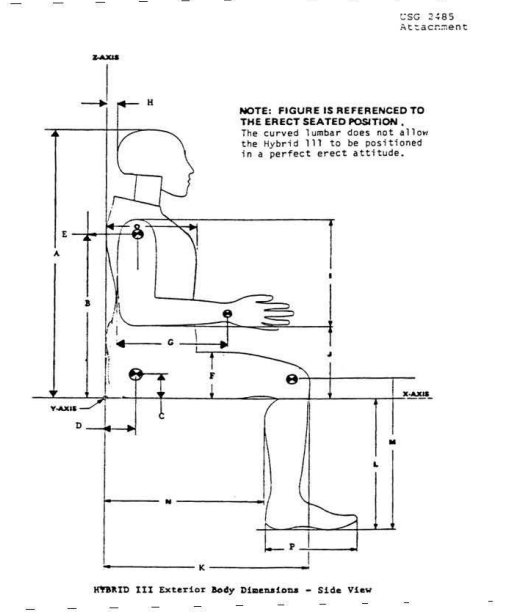
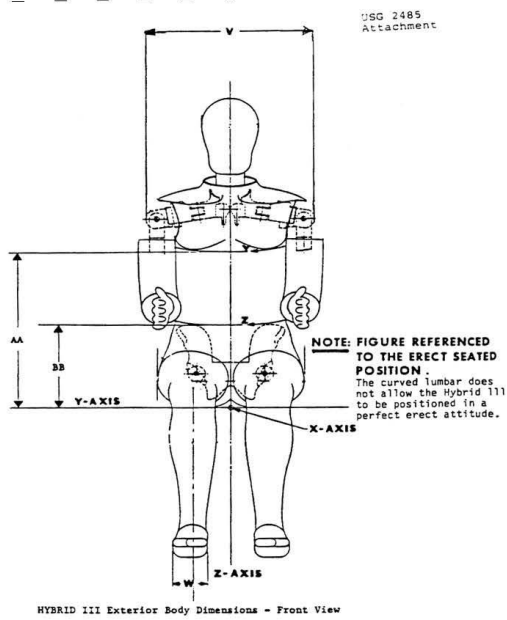
50th Male External Measurements

S/N 142

Symbol	Description	Specification	Results	Pass
		in	In	
A	Sitting Height	34.6 – 35.0	34.7	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.0	Yes
C	H-Point Height	3.3 – 3.5	3.4	Yes
D	H-Point from Backline	5.3 – 5.5	5.4	Yes
E	Shoulder Pivot from Backline	3.3 – 3.7	3.6	Yes
F	Thigh Clearance	5.5 – 6.1	5.8	Yes
G	Back of Elbow to Wrist Pivot	11.4 – 12.0	11.4	Yes
H	Head Back to Backline	1.6 – 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 – 13.6	13.5	Yes
J	Elbow Rest Height	7.5 – 8.3	7.9	Yes
K	Buttock to Knee Length	22.8 – 23.8	23.0	Yes
L	Popliteal Height	16.9 – 17.9	17.1	Yes
M	Knee Pivot Height	19.1 – 19.7	19.3	Yes
N	Buttock Popliteal Length	17.8 – 18.8	18.4	Yes
O	Chest Depth without Jacket	8.4 – 9.0	8.6	Yes
P	Foot Length (right)	9.9 – 10.5	10.1	Yes
V	Shoulder Breadth	16.3 – 17.2	16.7	Yes
W	Foot Breadth	3.6 – 4.2	3.8	Yes
Y	Chest Circumference with Jacket	38.2 – 39.4	38.8	Yes
Z	Waist Circumference	32.9 – 34.1	33.6	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

Date: 03-05-2014





VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	142		
Test ID:	Head Drop	Test Date:	3/5/2014
		Test Time:	10:10:46 AM

Component Part Number	Component Serial Number
Head Skin - 78051-228	S329

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.10 deg C P
Humidity	10 -- 70	17.40 %RH P
Resultant Acceleration	225 -- 275	267.1 G's P
Oscillation	0 -- 10	2.1 % P
Lateral Acceleration	-15 -- 15	4.0 G's P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



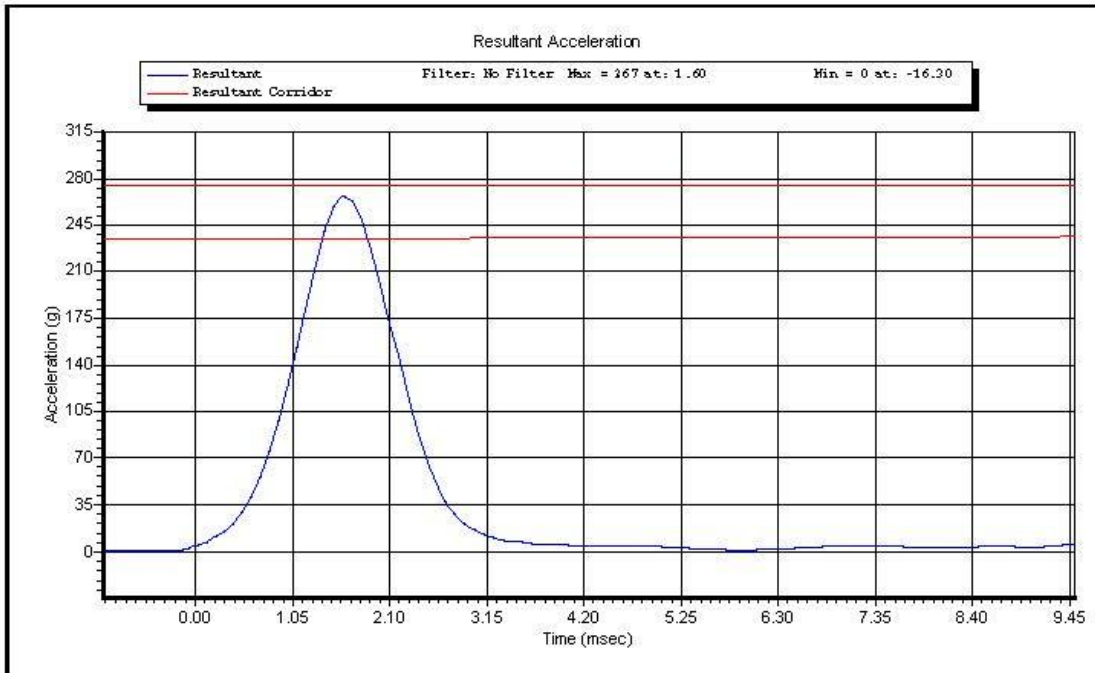
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P58998	2/10/2014
Endevco	7264-2000	P58912	2/10/2014
Endevco	7264-2000	P58997	2/10/2014



Test Name: **Head Drop**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**

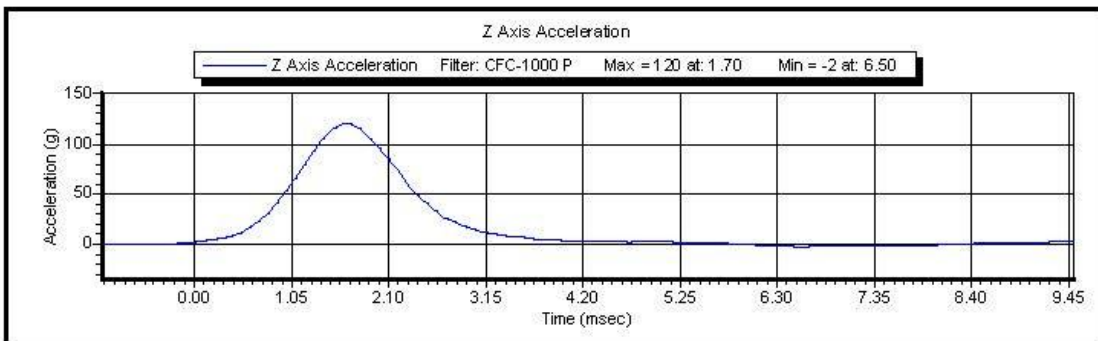
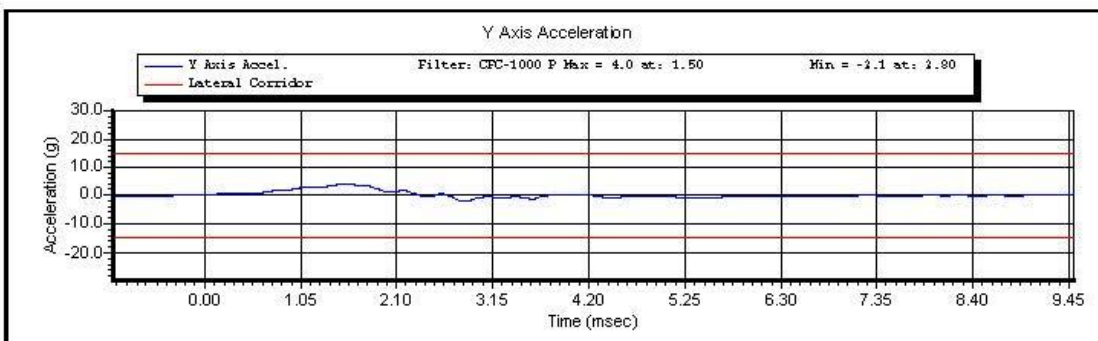
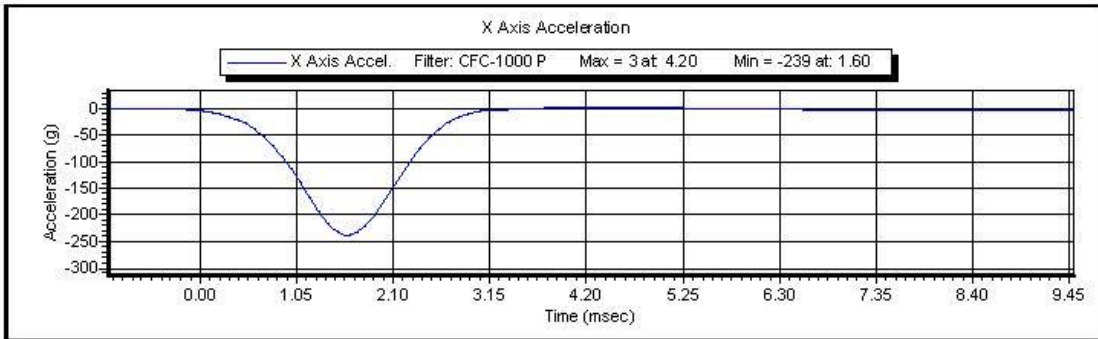


Test ID: **Head Drop**

Test Time: **10:10:46 AM**

Test Date: **3/5/2014**

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Test ID: **Head Drop**

Test Time: **10:10:46 AM**

Test Date: **3/5/2014**

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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:	142		
Test ID:	Neck Extension	Test Date:	3/5/2014
		Test Time:	11:39:03 AM

Component Part Number	Component Serial Number
Neck - 78051-336	4196

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.40 deg C P
Humidity	10 -- 70	17.30 %RH P
Velocity	5.94 -- 6.19	6.032 m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	19.08 G's P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	16.00 G's P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	11.70 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	44.5 ms P
D Plane Rotation	81 -- 106	96.1 degrees P
Time at Max Rotation	72 -- 82	77.6 ms P
Rotation Decay to Zero	147 -- 174	159.3 ms P
Moment About Occipital Condyle	-80.0 -- -52.9	-67.34 Nm P
Time at Maximum Moment	65 -- 79	71.2 ms P
Moment Decay to Zero	120 -- 148	142.8 ms P

All test parameters are within specifications

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



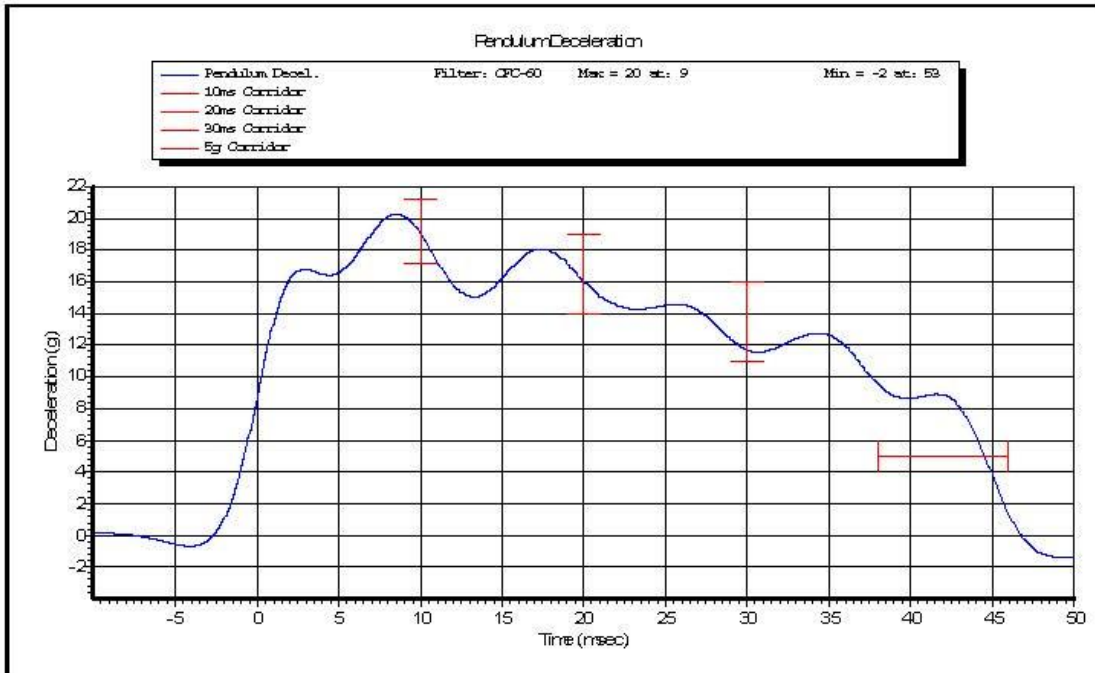
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
First Technology	IF-205	LC-161 My	4/30/2013
First Technology	IF-205	LC-161 Fx	4/30/2013



Name of Test:	Neck Extension
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	142

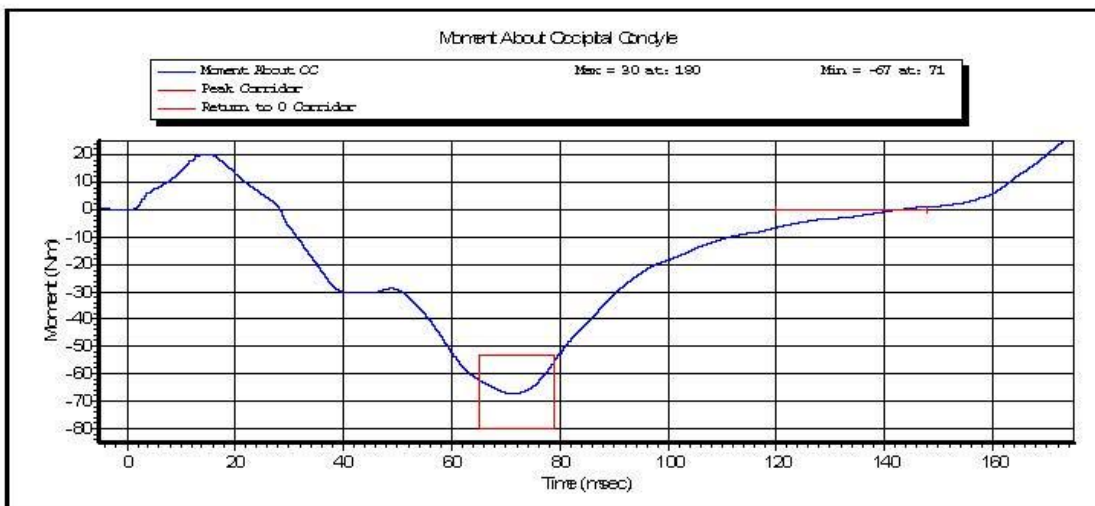
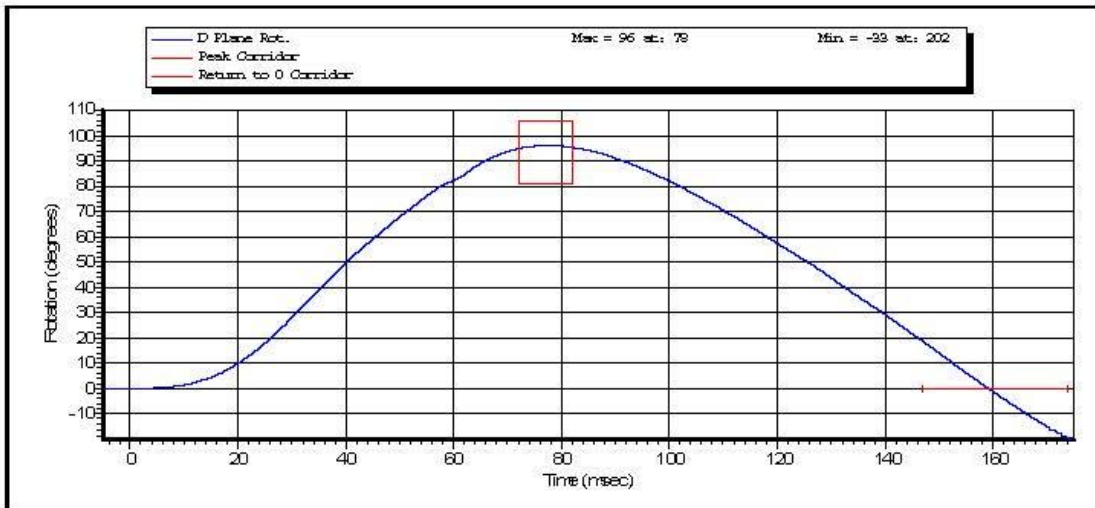


ID of Test: **Neck Extension**

Time of Test: **11:39:03 AM**

Date of Test: **3/5/2014**

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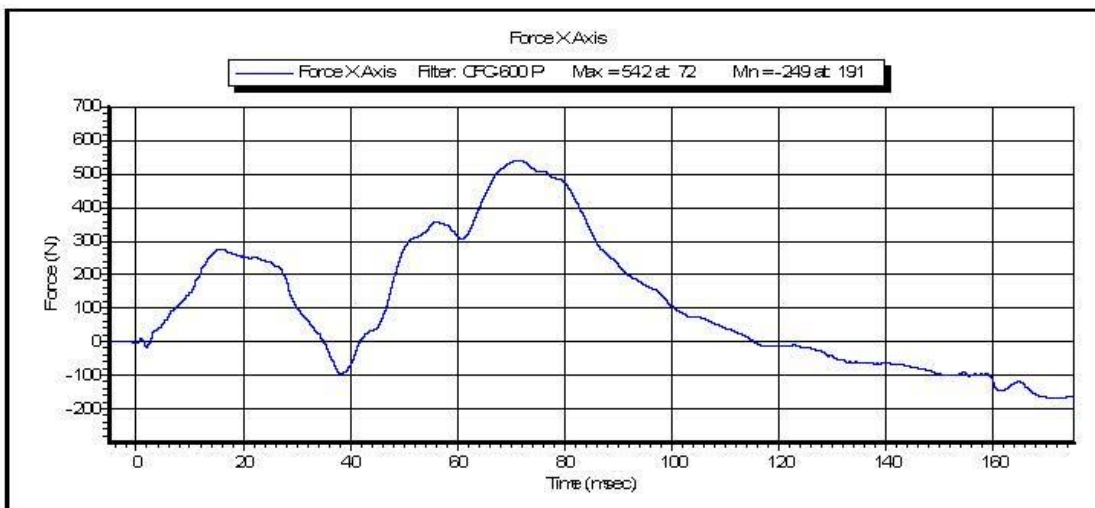
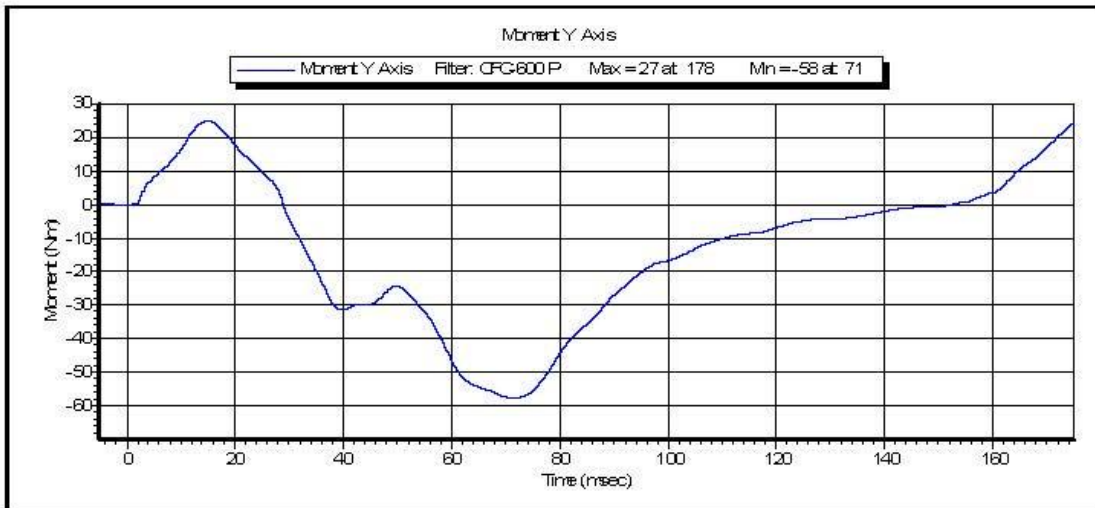


ID of Test: **Neck Extension**

Time of Test: **11:39:03 AM**

Date of Test: **3/5/2014**

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ID of Test: **Neck Extension**

Time of Test: **11:39:03 AM**

Date of Test: **3/5/2014**

Copyright 2003 Denton ATD, Inc. LabPaqII Version: 1.8.5.0



VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	10/1/2001
Sub Test Name:			
ATD Type:	Hybrid 3 - 50th Male		
ATD Serial Number:	142		
Test ID:	Neck Flexion	Test Date:	3/5/2014
		Test Time:	11:07:37 AM

Component Part Number	Component Serial Number
Neck - 78051-336	4196

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.40 deg C P
Humidity	10 -- 70	17.50 %RH P
Velocity	6.89 -- 7.13	6.985 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	24.20 G's P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	20.60 G's P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	14.27 G's P
Maximum Pendulum Deceleration After 30 ms	0 -- 29	14.4 G's P
Deceleration Time to 5 ms	34 -- 42	39.3 ms P
D Plane Rotation	-78 -- -64	-70.1 degrees P
Time at Maximum Rotation	57 -- 64	58.8 ms P
Rotation Decay to Zero	113 -- 128	113.7 ms P
Moment About Occipital Condyle	88.1 -- 108.4	97.81 Nm P
Time at Maximum Moment	47 -- 58	51.7 ms P
Moment Decay to Zero	97.0 -- 107.0	99.8 ms P

All test parameters are within specifications

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



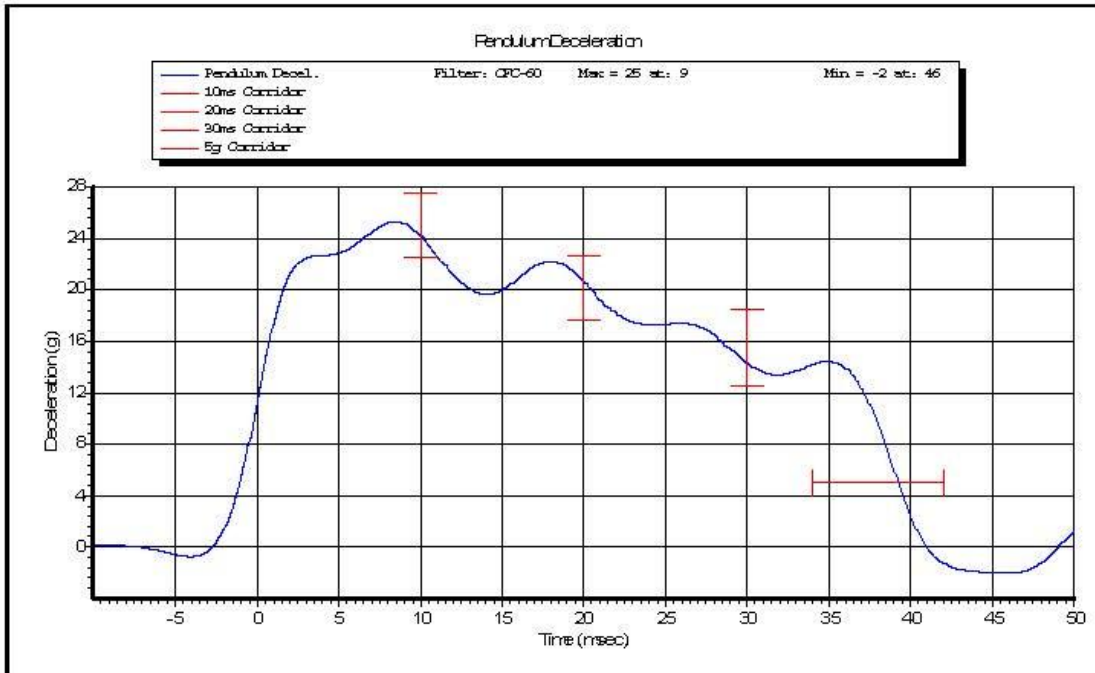
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
First Technology	IF-205	LC-161 My	4/30/2013
First Technology	IF-205	LC-161 Fx	4/30/2013



Name of Test:	Neck Flexion
Name of Sub Test:	
Type of ATD:	Hybrid 3 - 50th Male
ATD Serial Number:	142

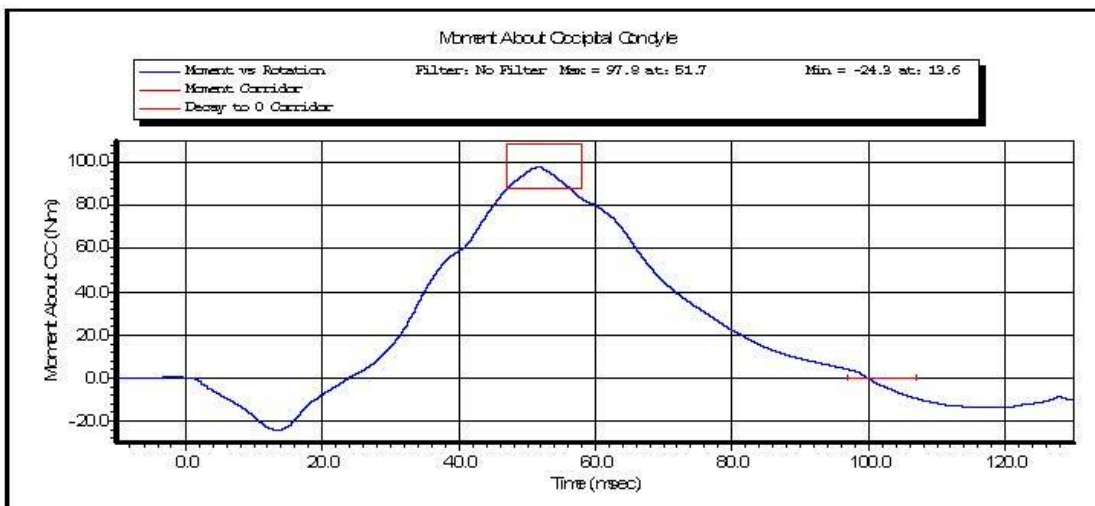
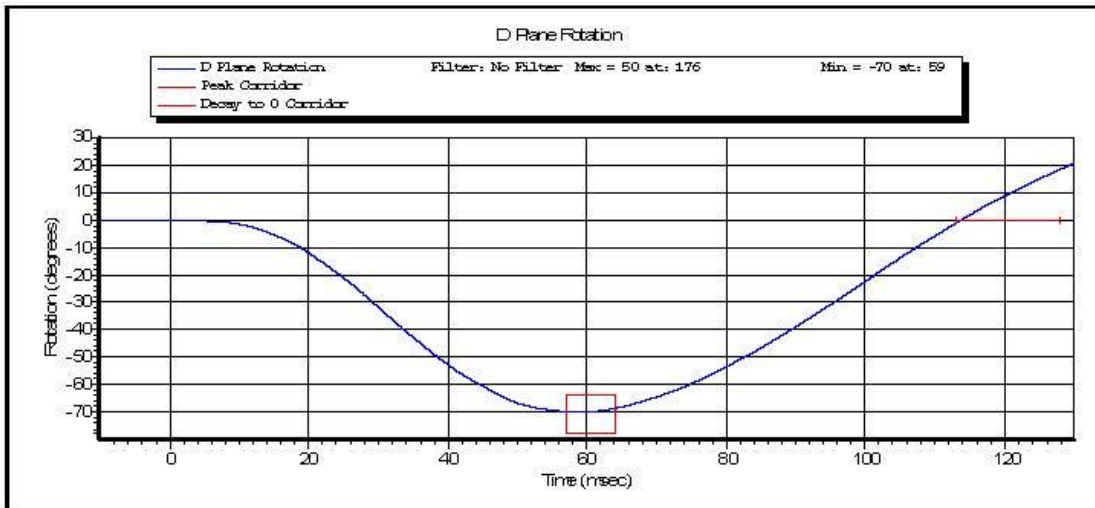


ID of Test: **Neck Flexion**

Time of Test: **11:07:37 AM**

Date of Test: **3/5/2014**

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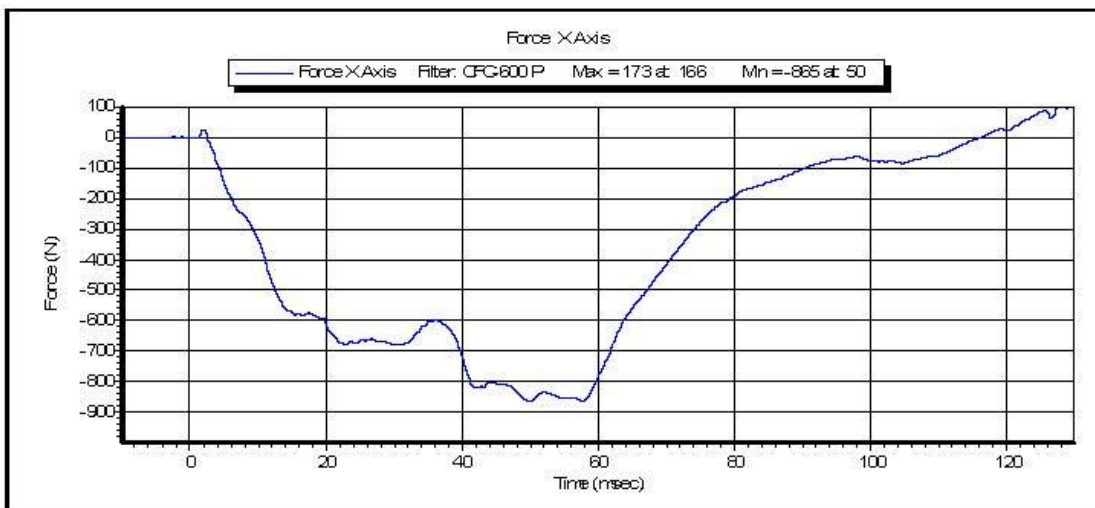
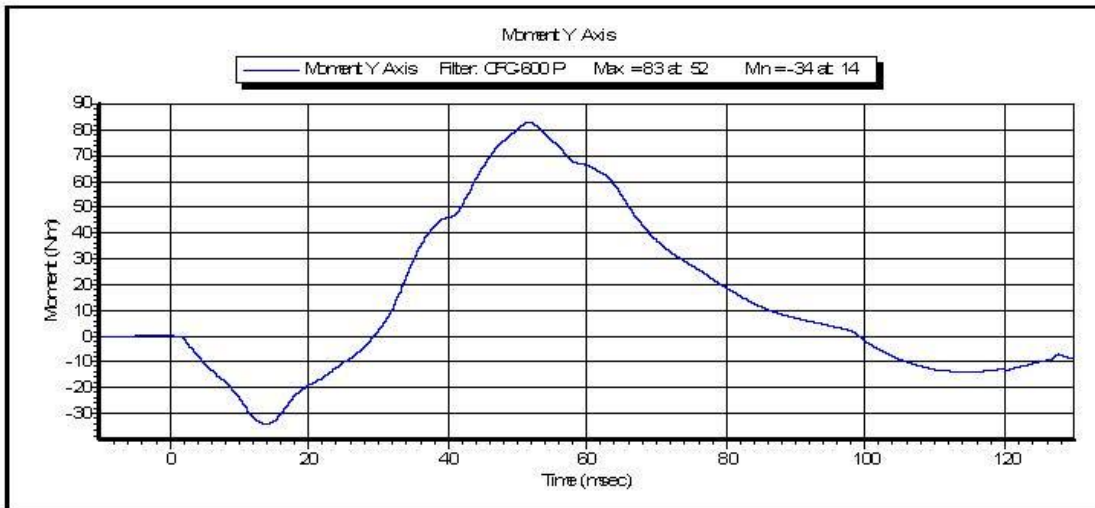


ID of Test: **Neck Flexion**

Time of Test: **11:07:37 AM**

Date of Test: **3/5/2014**

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ID of Test: **Neck Flexion**

Time of Test: **11:07:37 AM**

Date of Test: **3/5/2014**

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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:	142		
Test ID:	Thorax Impact	Test Date:	3/5/2014
		Test Time:	2:05:51 PM

Component Part Number	Component Serial Number
Chest Jacket - 78051-169	100

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.50 deg C P
Humidity	10 -- 70	17.40 %RH P
Velocity	6.59 -- 6.83	6.661 m/s P
Chest Deflection	-72.6 -- -63.5	-66.14 mm P
Resistive Force	-5.894 -- -5.160	-5.7646 kN P
Hysteresis	69 -- 85	74.0 % P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



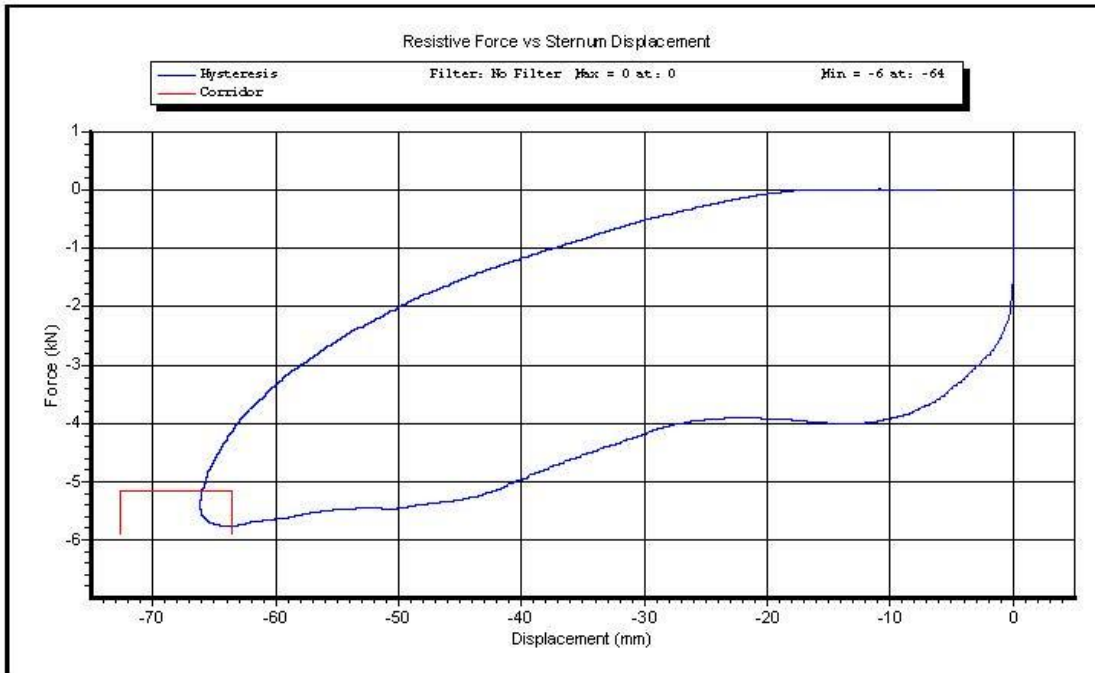
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
SERVO	78051-342	DS-142	11/18/2013



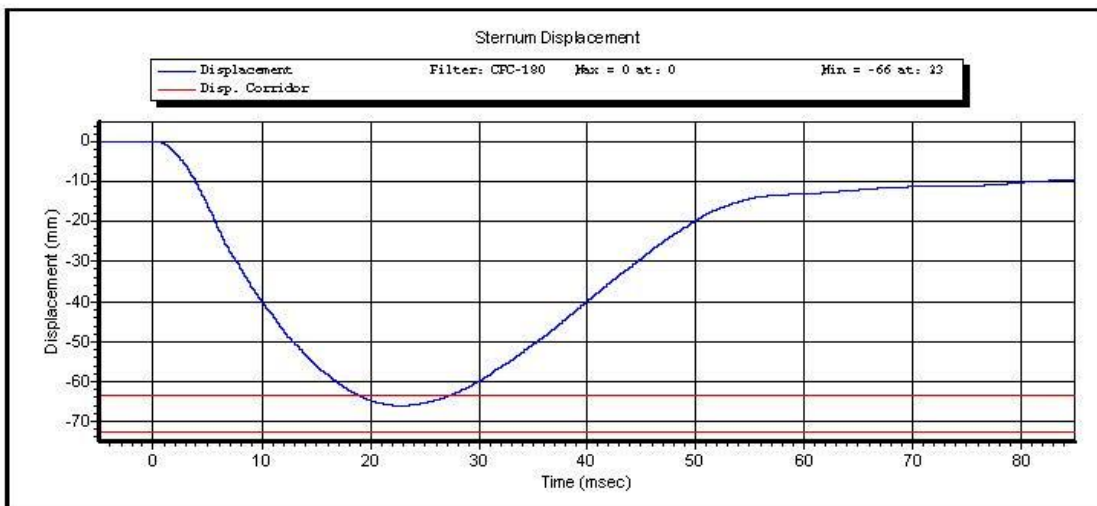
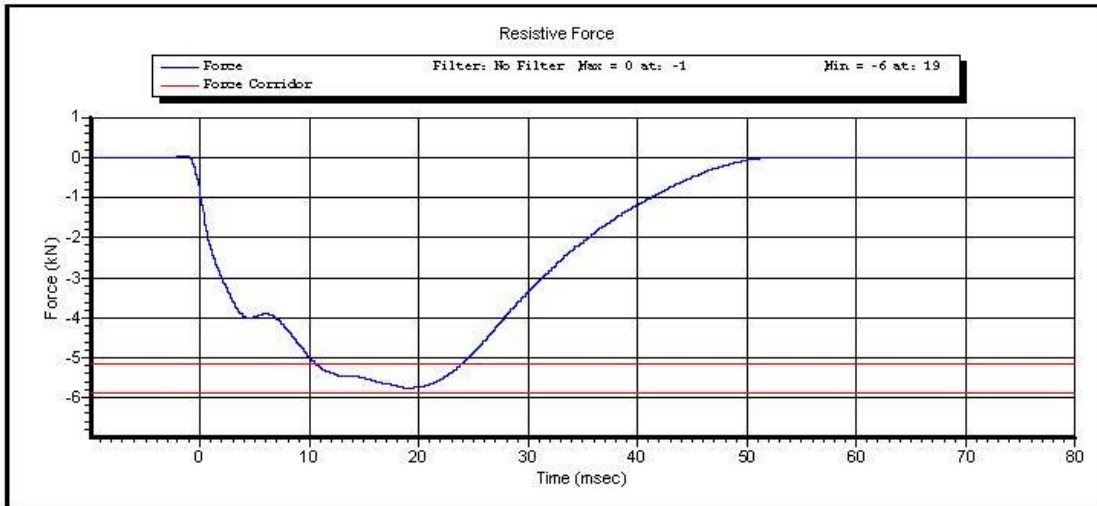
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Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Thorax Impact** Test Time: **2:05:51 PM**

Test Date: **3/5/2014**

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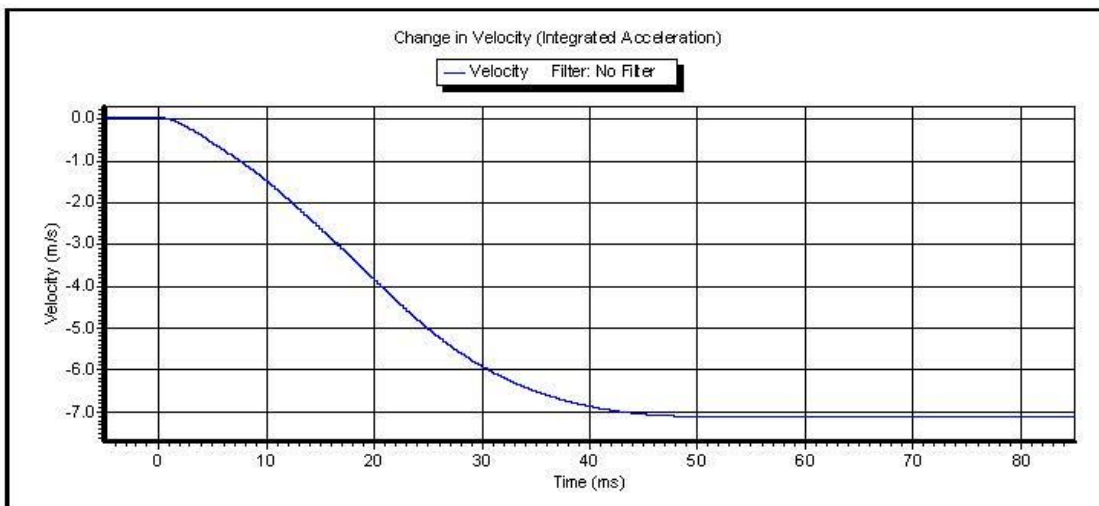
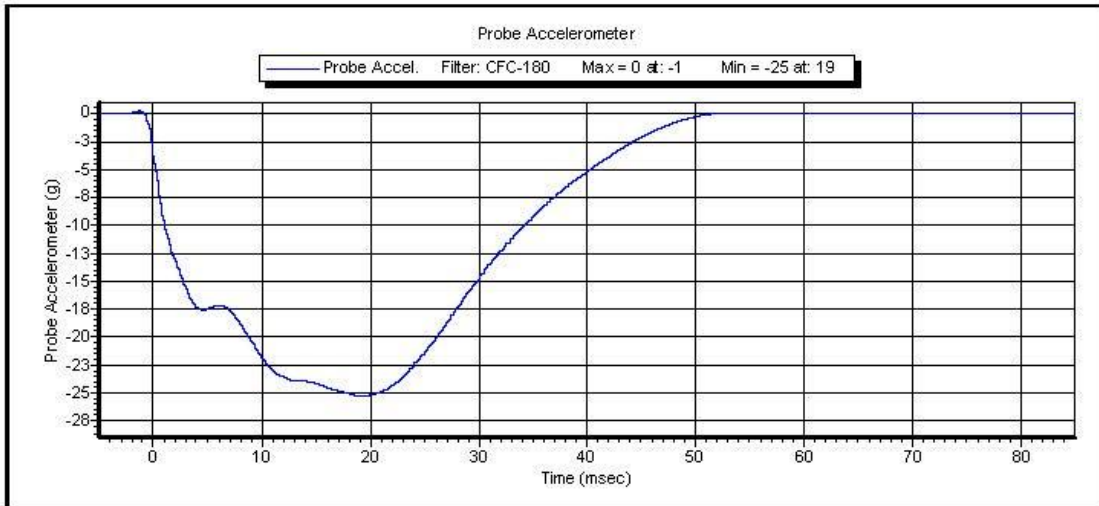


Test ID: Thorax Impact

Test Time: 2:05:51 PM

Test Date: 3/5/2014

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Test ID: **Thorax Impact**

Test Time: **2:05:51 PM**

Test Date: **3/5/2014**

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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:	142		
Test ID:	Hip ROM Left	Test Date:	3/5/2014
		Test Time:	8:59:46 AM

Component Part Number	Component Serial Number
Pelvis Assembly 78051-60	

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.40 deg C P
Humidity	10 -- 70	17.30 %RH P
Average Velocity	5 -- 10	6.1 deg/s P
Angle at 203 Nm	40 -- 50	44.2 degrees P
Moment at 30 degrees	0.0 -- 94.9	83.26 Nm P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



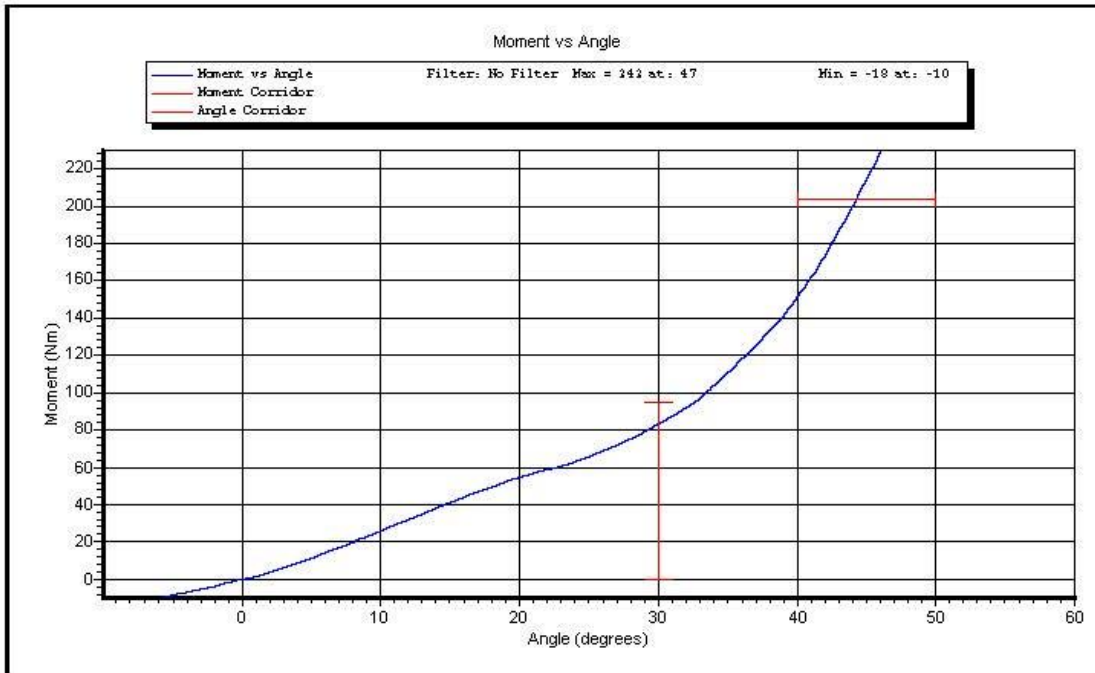
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/19/2013
DentonATD	14 CB1-3615	0008	2/20/2014
DentonATD	A0 Output	1	1/11/2014



Test Name: **Hip ROM**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Hip ROM Left**

Test Time: **8:59:46 AM**

Test Date: **3/5/2014**

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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:	142		
Test ID:	Hip ROM Right	Test Date:	3/5/2014
		Test Time:	8:45:16 AM

Component Part Number	Component Serial Number
Pelvis Assembly 78051-60	

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.20 deg C P
Humidity	10 -- 70	17.40 %RH P
Average Velocity	5 -- 10	6.1 deg/s P
Angle at 203 Nm	40 -- 50	43.0 degrees P
Moment at 30 degrees	0.0 -- 94.9	89.36 Nm P

All test parameters are within specifications

Technician: **R. Weil**

Supervisor: **E. Dutton**



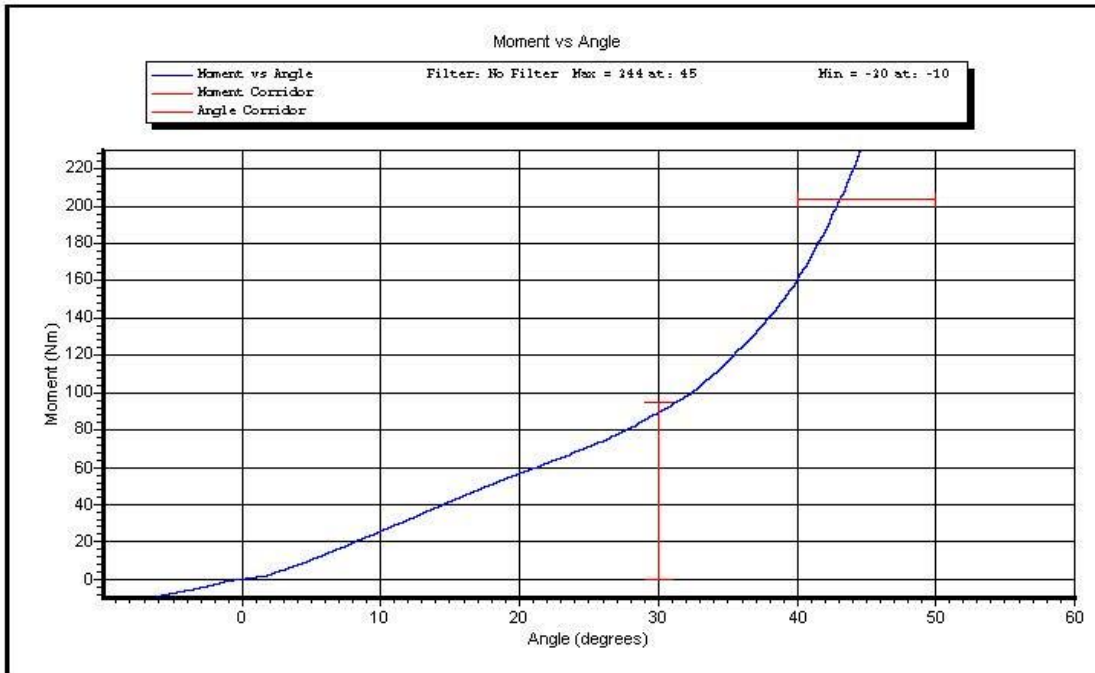
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Key Trans/PCB	2301-02	115	3/19/2013
DentonATD	14 CB1-3615	0008	2/20/2014
DentonATD	A0 Output	1	1/11/2014



Test Name: **Hip ROM**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Hip ROM Right**

Test Time: **8:45:16 AM**

Test Date: **3/5/2014**

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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:	142		
Test ID:	Knee Impact Left	Test Date:	3/5/2014
		Test Time:	3:08:20 PM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	078

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.30 deg C P
Humidity	10 -- 70	17.30 %RH P
Velocity	2.07 -- 2.13	2.126 m/s P
Resistive Force	-5.780 -- -4.720	-5.395 kN P

All test parameters are within specifications

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



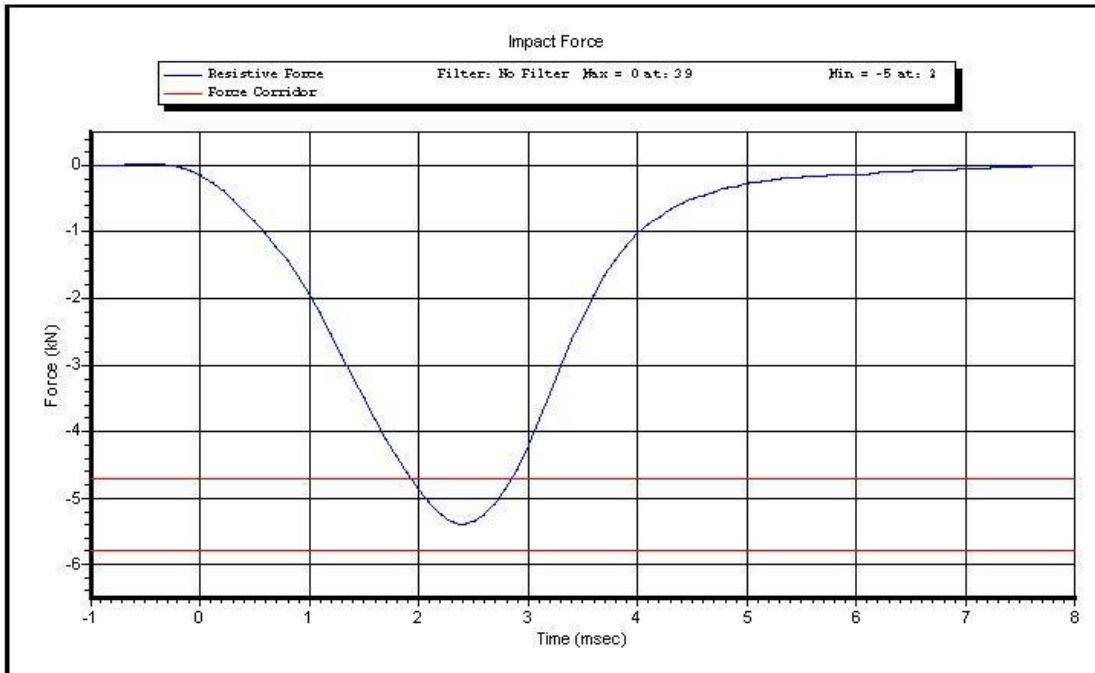
VERIFICATION REPORT

REFERENCE EQUIPMENT

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



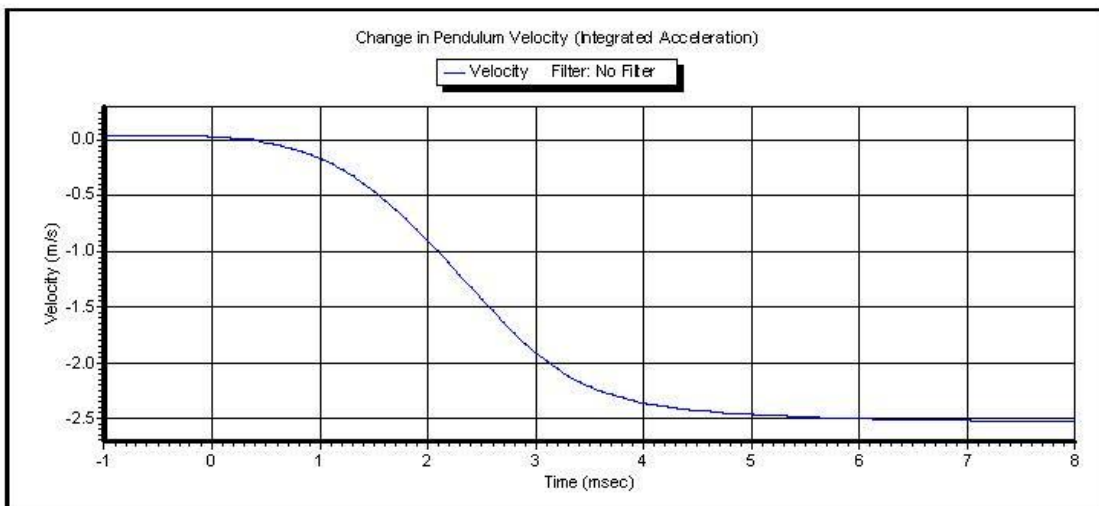
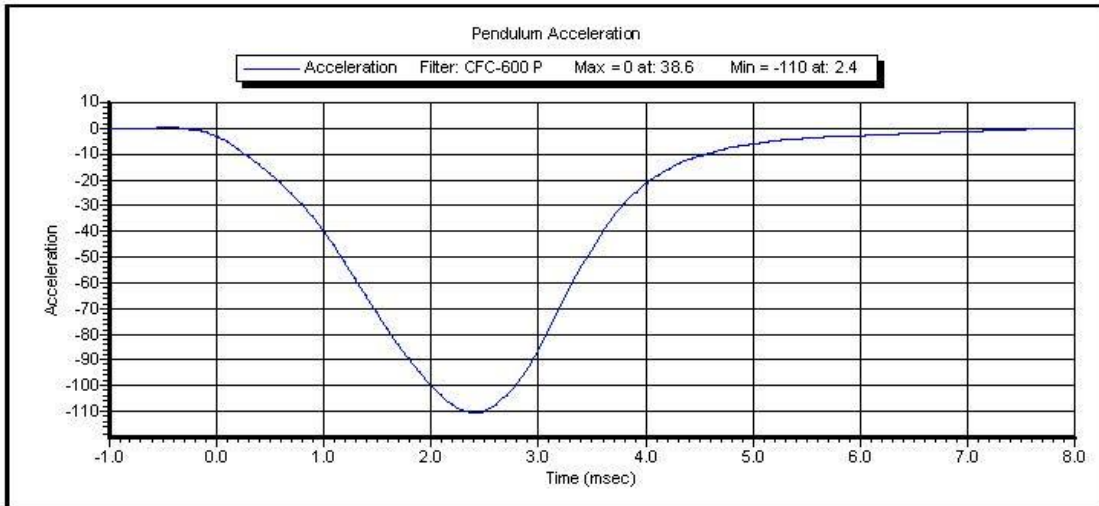
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Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Knee Impact Left** Test Time: **3:08:20 PM**

Test Date: **3/5/2014**

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Test ID: **Knee Impact Left** Test Time: **3:08:20 PM**

Test Date: **3/5/2014**

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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:	142		
Test ID:	Knee Impact Right	Test Date:	3/5/2014
		Test Time:	3:14:26 PM

Component Part Number	Component Serial Number
Knee Skin - 78051(L) or 6(R)	3307

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.30 deg C P
Humidity	10 -- 70	17.50 %RH P
Velocity	2.07 -- 2.13	2.126 m/s P
Resistive Force	-5.780 -- -4.720	-4.987 kN P

All test parameters are within specifications

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



VERIFICATION REPORT

REFERENCE EQUIPMENT

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



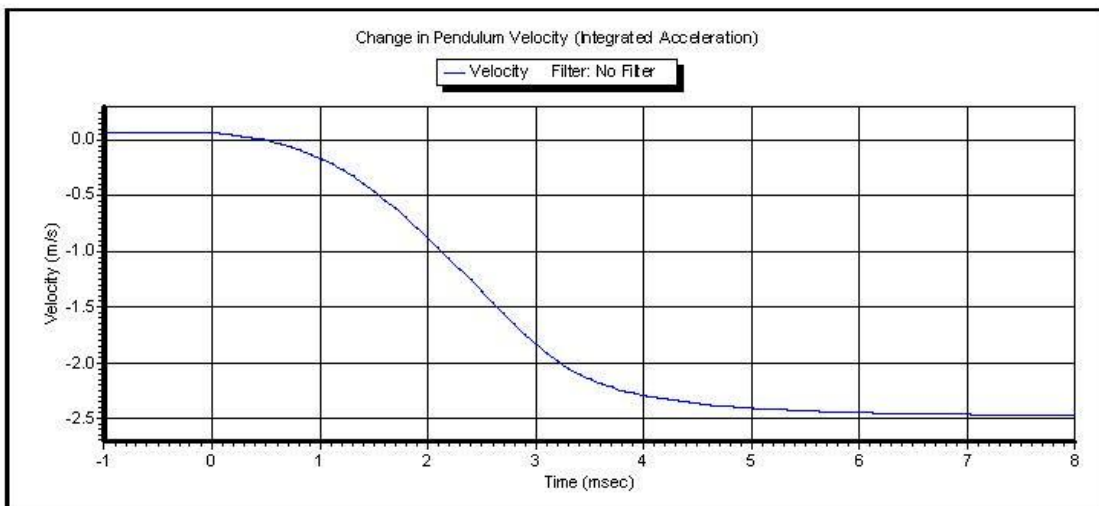
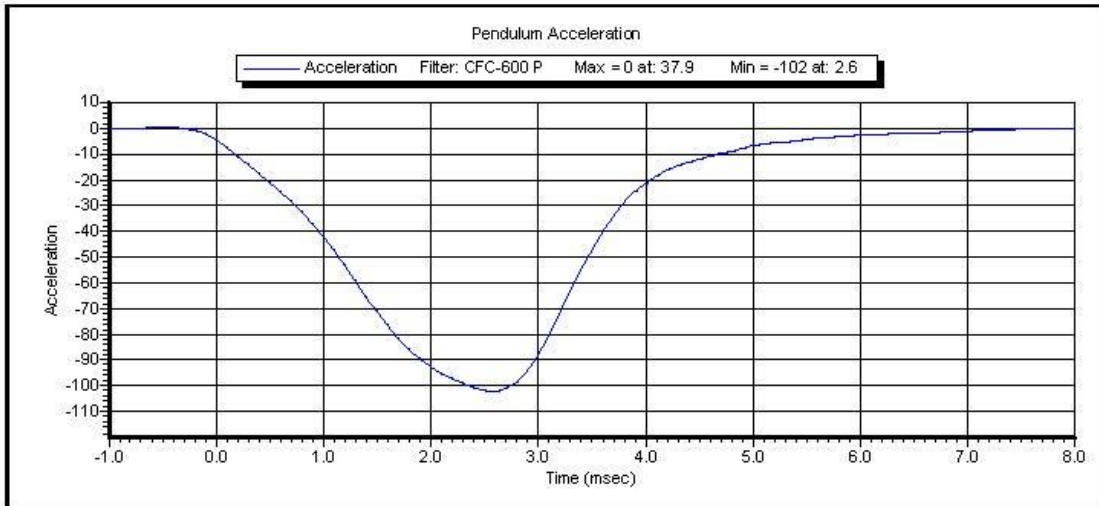
Test Name: **Knee Impact**
Sub Test Name:
ATD Type: **Hybrid 3 - 50th Male**
ATD Serial Number: **142**



Test ID: **Knee Impact Right** Test Time: **3:14:26 PM**

Test Date: **3/5/2014**

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Test ID: **Knee Impact Right** Test Time: **3:14:26 PM**

Test Date: **3/5/2014**

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CALIBRATION TEST RESULTS

POST-TEST

HYBRID III 5TH PERCENTILE FEMALE - PASSENGER ATD

SERIAL NO: 143



External Measurements

5th Female SN 143

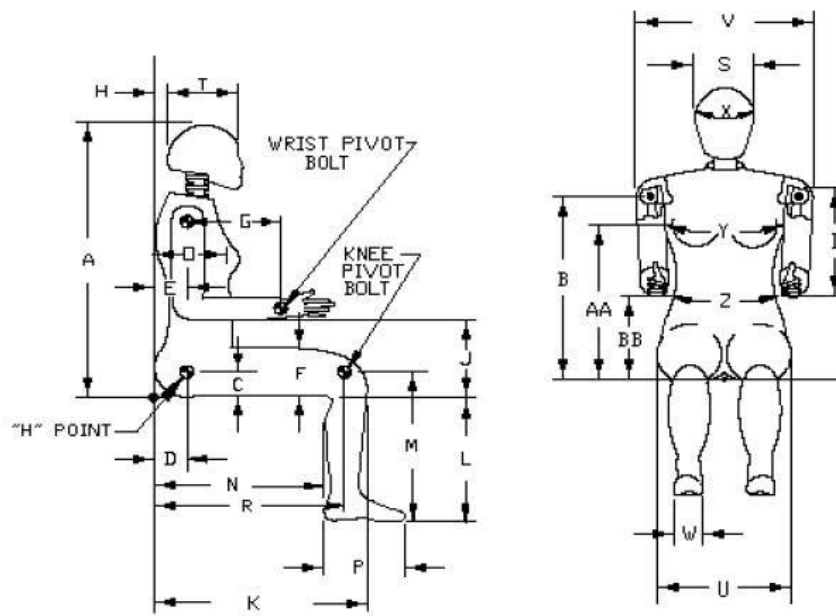
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	790	Yes
B	Shoulder Pivot Height	431.8 – 457.2	446	Yes
C	H-Point Height	81.3 – 86.3	84	Yes
D	H-Point from Backline	144.8 – 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6 – 83.8	77	Yes
F	Thigh Clearance	119.4 – 134.6	125	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	246	Yes
H	Head Back to Backline	43.2 – 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	280	Yes
J	Elbow Rest Height	182.8 – 203.2	186	Yes
K	Buttock to Knee Length	520.7 – 546.1	541	Yes
L	Popliteal Height	355.6 – 376	363	Yes
M	Knee Pivot Height	393.7 – 419.1	398	Yes
N	Buttock Popliteal Length	414 – 439.4	422	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	220	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	473	Yes
S	Head Breadth	137.1 – 147.3	142	Yes
T	Head Depth	177.8 – 188	183	Yes
U	Hip Breadth	299.7 – 314.9	302	Yes
V	Shoulder Breadth	350.5 – 365.7	361	Yes
W	Foot Breadth	78.8 – 94	81	Yes
X	Head Circumference	528.3 – 548.7	537	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	853	Yes
Z	Waist Circumference	759.5 – 789.9	768	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	357	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	170	Yes

Technician: M. Geesey

Date: 03/06/2014

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:	143		
Test ID:	Head Drop	Test Date:	3/6/2014
		Test Time:	4:17:50 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	05733
Cap Skin - 78051-229	06108

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.20 deg C P
Humidity	10 -- 70	14.90 %RH P
Resultant Acceleration	250 -- 300	268.0 G's P
Oscillation	0 -- 10	0.0 % P
Lateral Acceleration	-15 -- 15	-12.5 G's P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



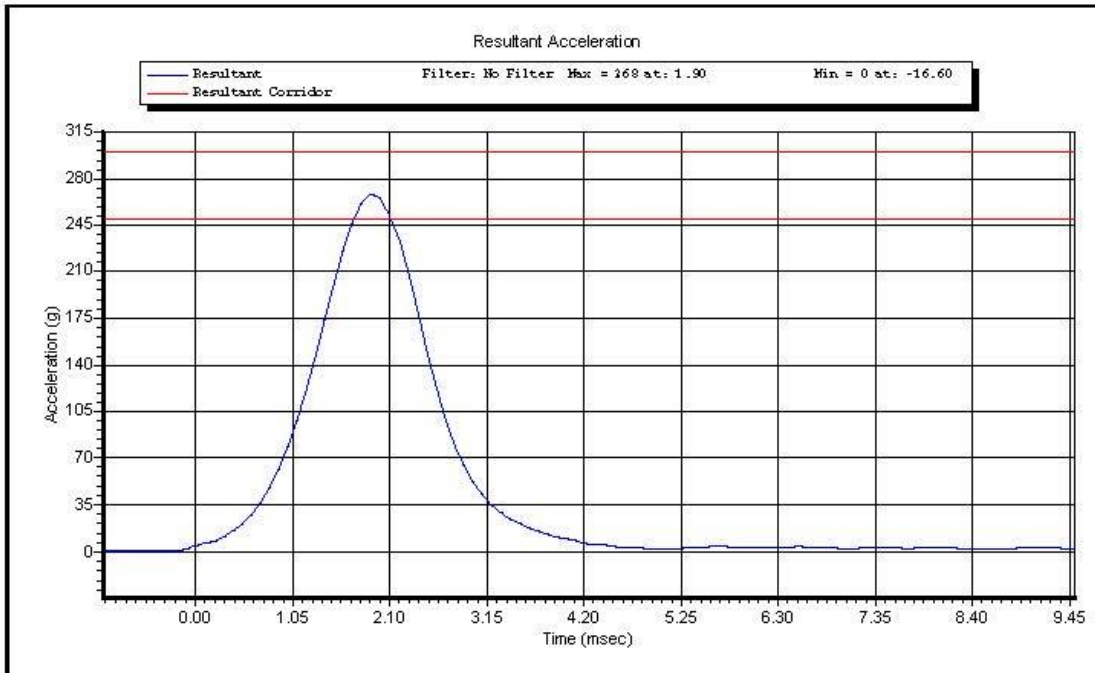
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P51303	3/3/2014
Endevco	7264-2000	P16755	2/5/2014
Endevco	7264-2000	P58868	2/5/2014



Test Name: **Head Drop**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**

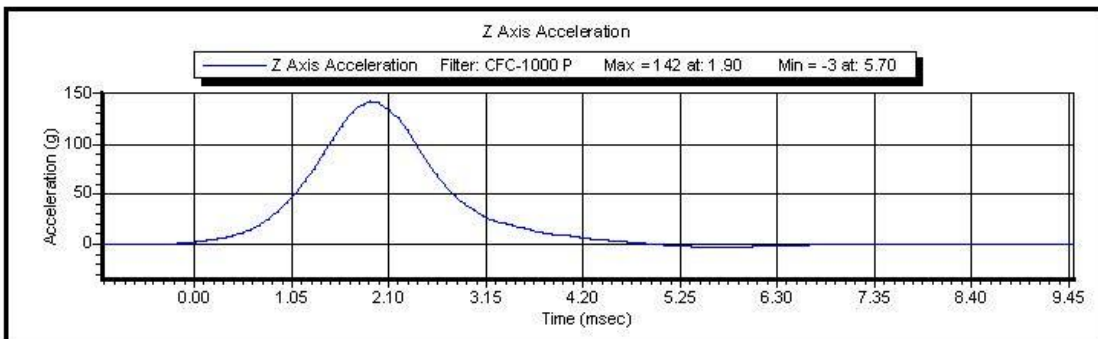
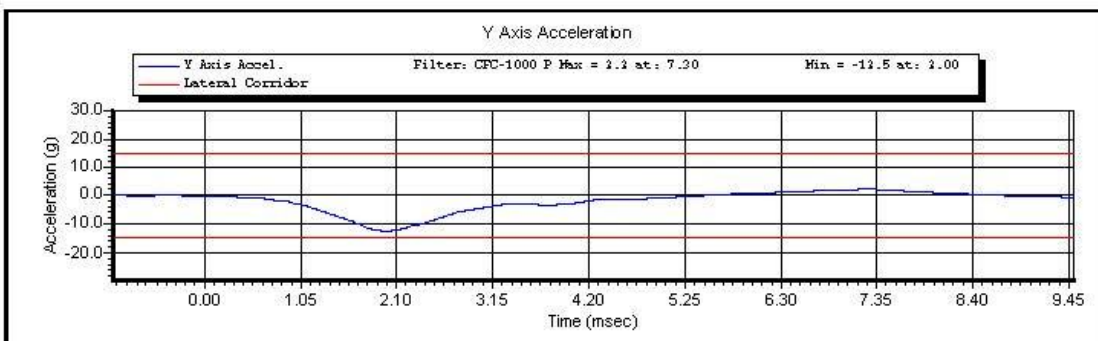
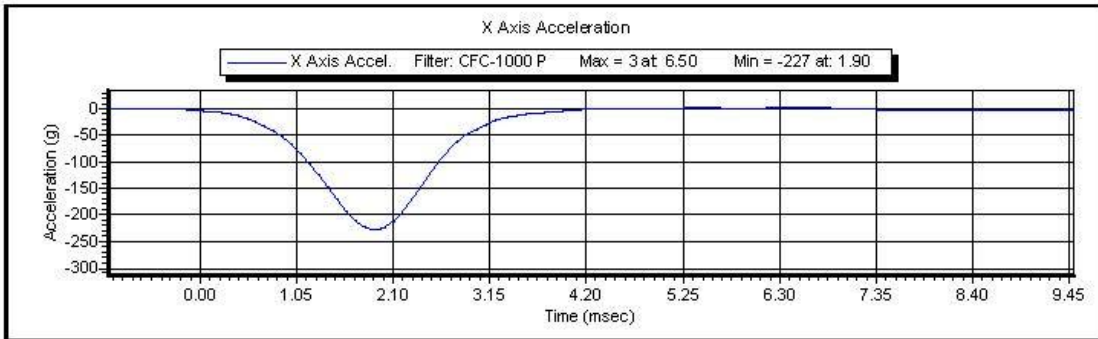


Test ID: **Head Drop**

Test Time: **4:17:50 PM**

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

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Test ID: **Head Drop**

Test Time: **4:17:50 PM**

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

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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:	143		
Test ID:	Neck Extension	Test Date:	3/6/2014
		Test Time:	1:32:20 PM

Component Part Number	Component Serial Number
Neck - 880105-255	050512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.40 deg C P
Humidity	10 -- 70	14.80 %RH P
Velocity	5.95 -- 6.19	6.048 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	3.55 m/s P
Pendulum Impulse at 30 ms	4.6 -- 5.6	5.12 m/s P
D Plane Rotation	99 -- 114	102.7 degrees P
Moment During Rotation Interval	-65 -- -53	-58.3 Nm P
Moment Decay to -10.0 Nm	94 -- 114	101.9 ms P

All test parameters are within specifications

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



VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-283My	5/29/2013
Denton	1716A	LC-283 Fx	5/29/2013



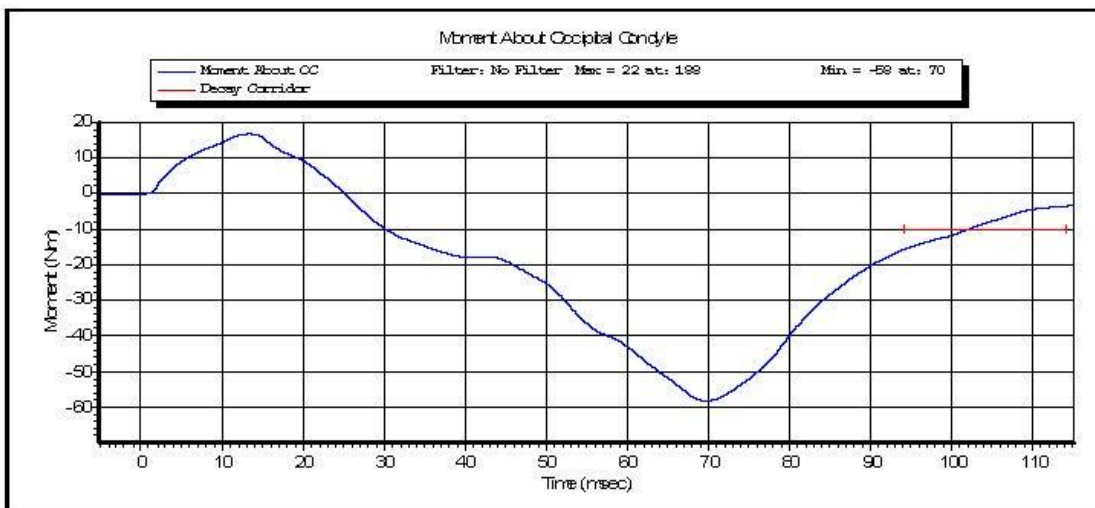
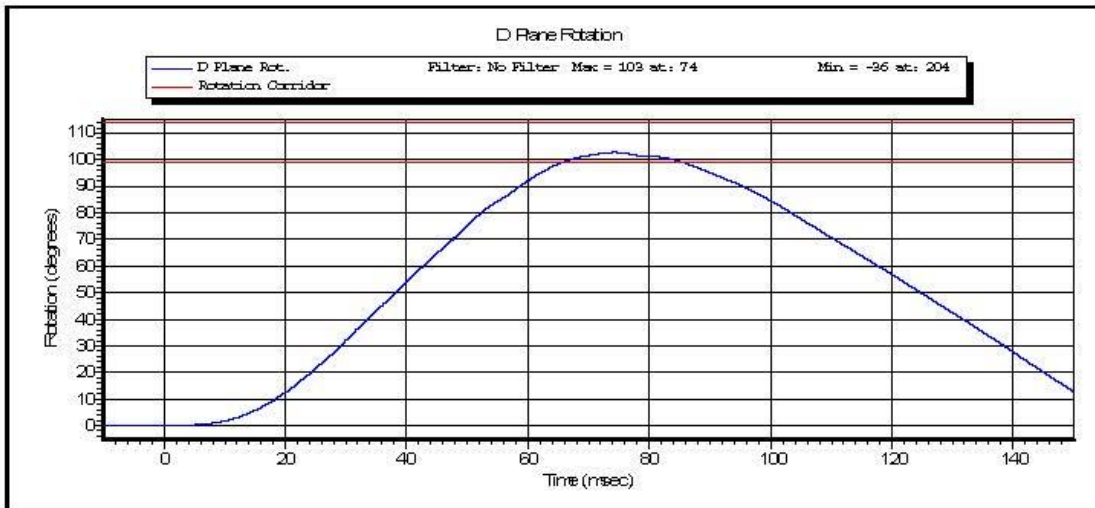
Test Name: **Neck Extension**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**



Test ID: **Neck Extension** Test Time: **1:32:20 PM**

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

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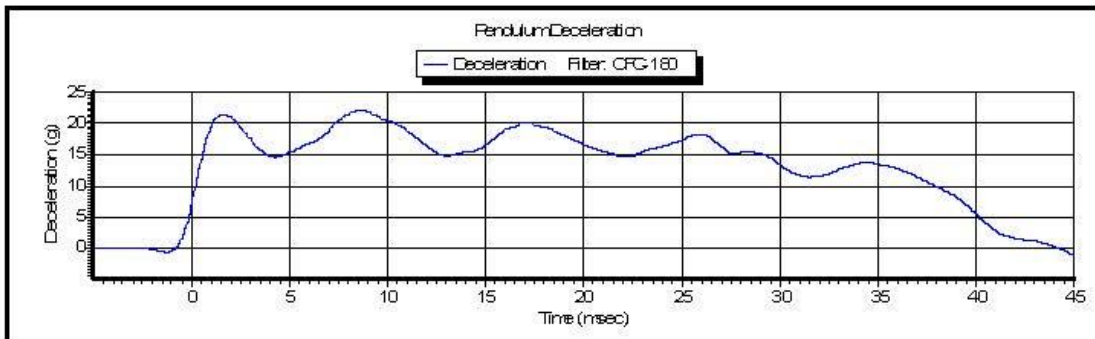
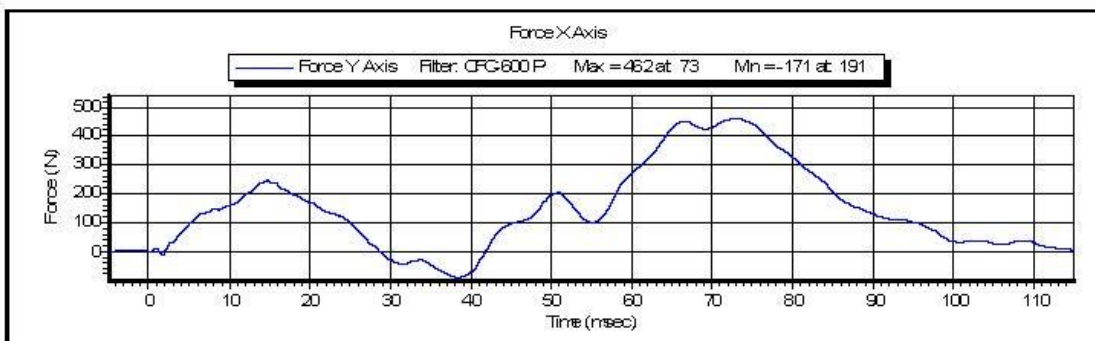
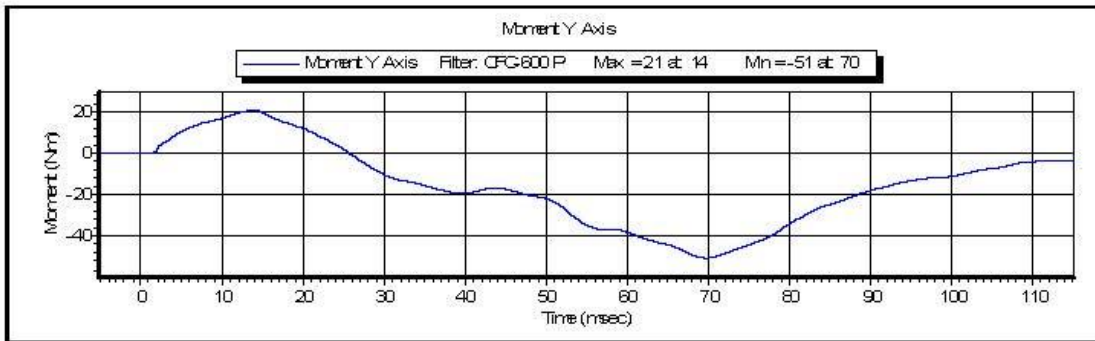


Test ID: Neck Extension

Test Time: 1:32:20 PM

Test Date: 3/6/2014

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Test ID: **Neck Extension** Test Time: **1:32:20 PM**

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

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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:	143		
Test ID:	Neck Flexion	Test Date:	3/6/2014
		Test Time:	12:19:46 PM

Component Part Number	Component Serial Number
Neck - 880105-255	050512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	20.70 deg C P
Humidity	10.0 -- 70.0	14.80 %RH P
Velocity	6.89 -- 7.13	7.045 m/s P
Pendulum Impulse at 10 ms	2.1 -- 2.5	2.42 m/s P
Pendulum Impulse at 20 ms	4 -- 5	4.7 m/s P
Pendulum Impulse at 30 ms	5.8 -- 7.0	6.72 m/s P
D Plane Rotation	-91 -- -77	-78.7 degrees P
Moment During Rotation Interval	69 -- 83	73.8 Nm P
Moment Decay to 10.0 Nm	80 -- 100	84.5 ms P

All test parameters are within specifications

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



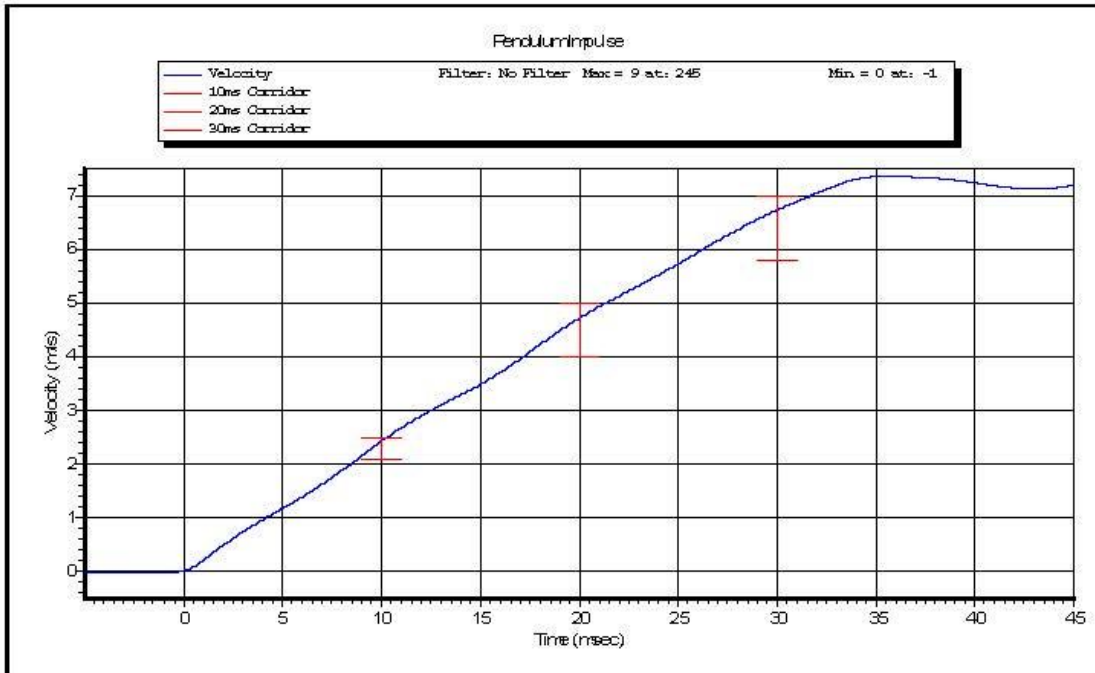
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	AH5F3	10/16/2013
ETI	SP22D	SP22 PENDULUM	2/21/2014
ETI	SP22D	SP22 CONDYLE	2/21/2014
Denton	1716A	LC-283My	5/29/2013
Denton	1716A	LC-283 Fx	5/29/2013



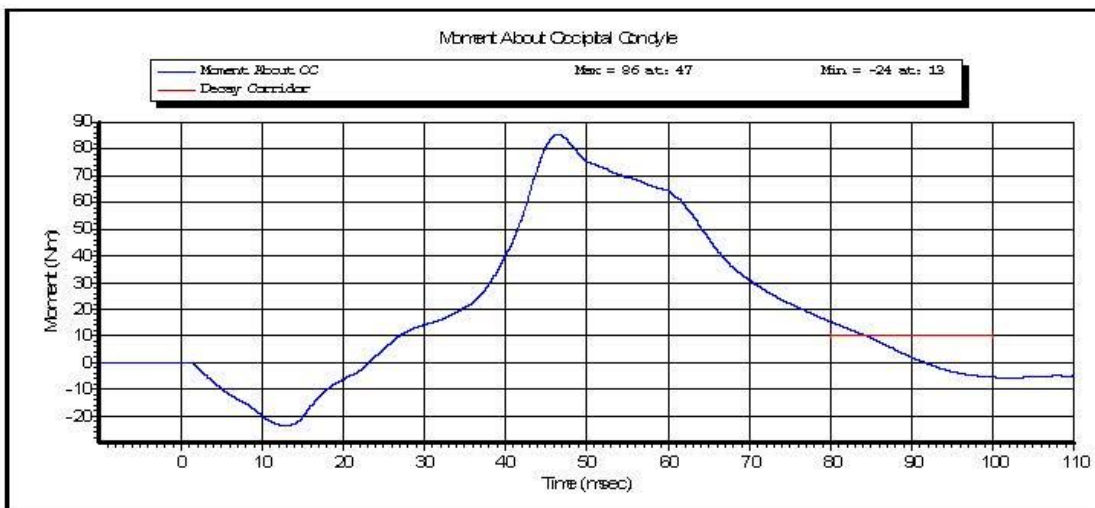
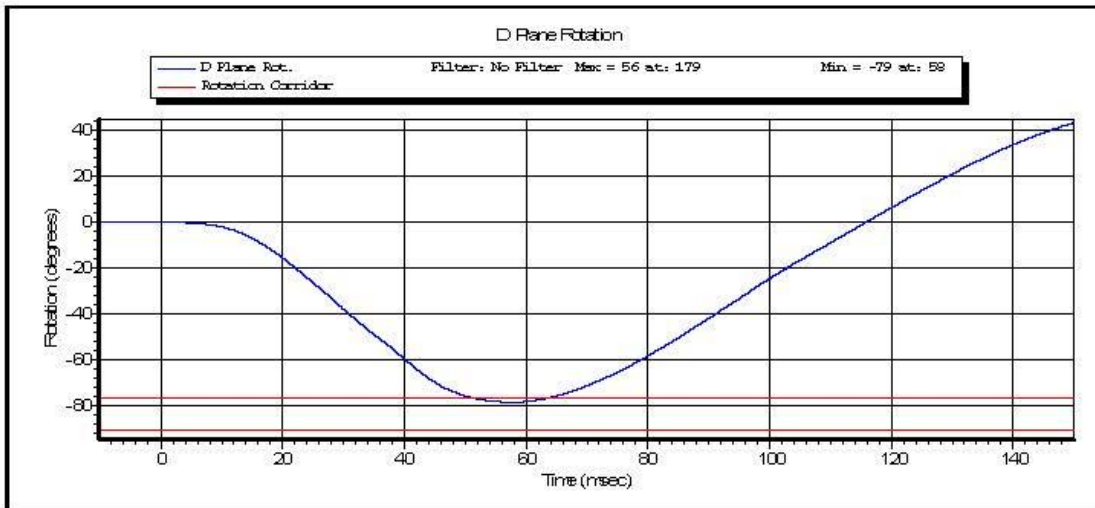
Test Name: **Neck Flexion**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**



Test ID: **Neck Flexion** Test Time: **12:19:46 PM**

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

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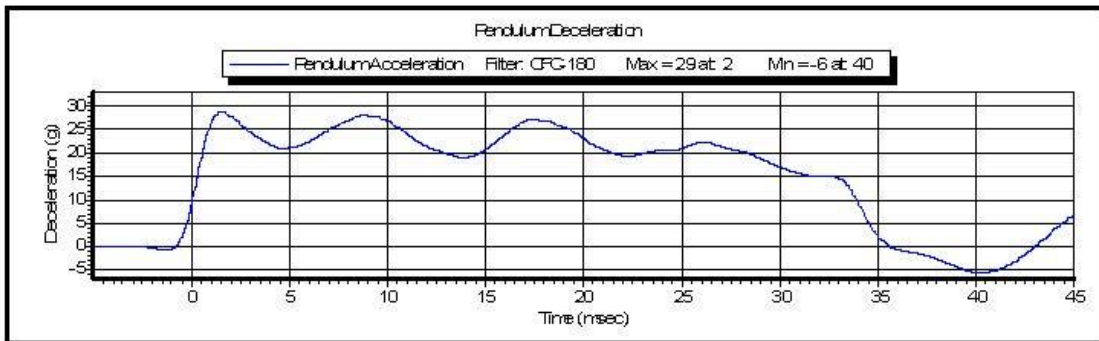
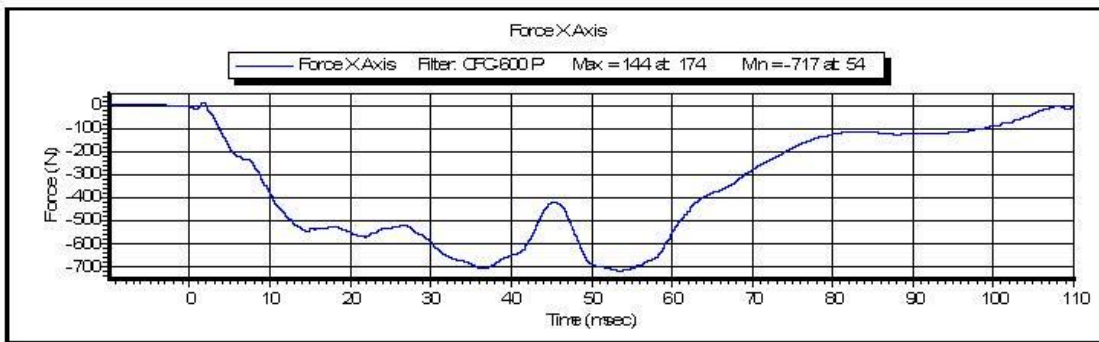
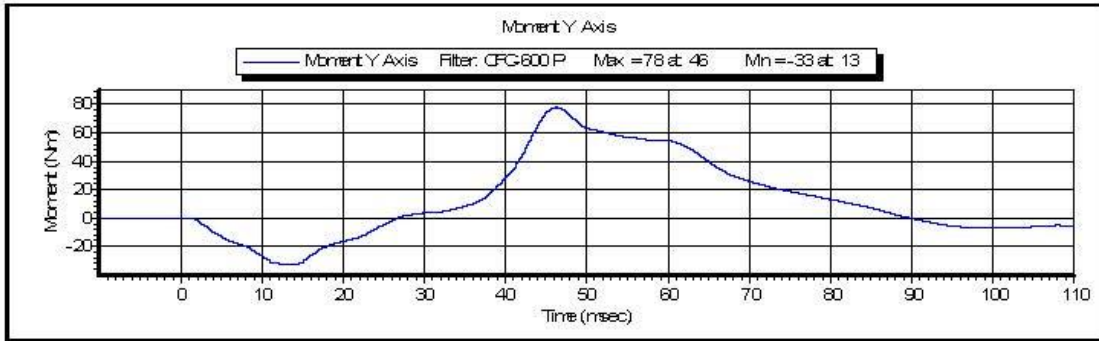


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Test Time: 12:19:46 PM

Test Date: 3/6/2014

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Test ID: **Neck Flexion**

Test Time: **12:19:46 PM**

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

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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:	143		
Test ID:	Thorax Impact	Test Date:	3/6/2014
		Test Time:	9:40:50 AM

Component Part Number	Component Serial Number
Chest Jacket - 880105-355-E	05855

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.30 deg C P
Humidity	10 -- 70	14.30 %RH P
Velocity	6.59 -- 6.83	6.795 m/s P
Sternum Displacement	-58 -- -50	-50.5 mm P
Force During Displacement Interval	-4400 -- -3900	-4307.5 N P
Force During -18mm to -50mm Displacem	-4600 -- 0	-4448.6 N P
Hysteresis	69 -- 85	72.8 % P

All test parameters are within specifications

Technician: **M. Geesey**

Supervisor: **E. Dutton**



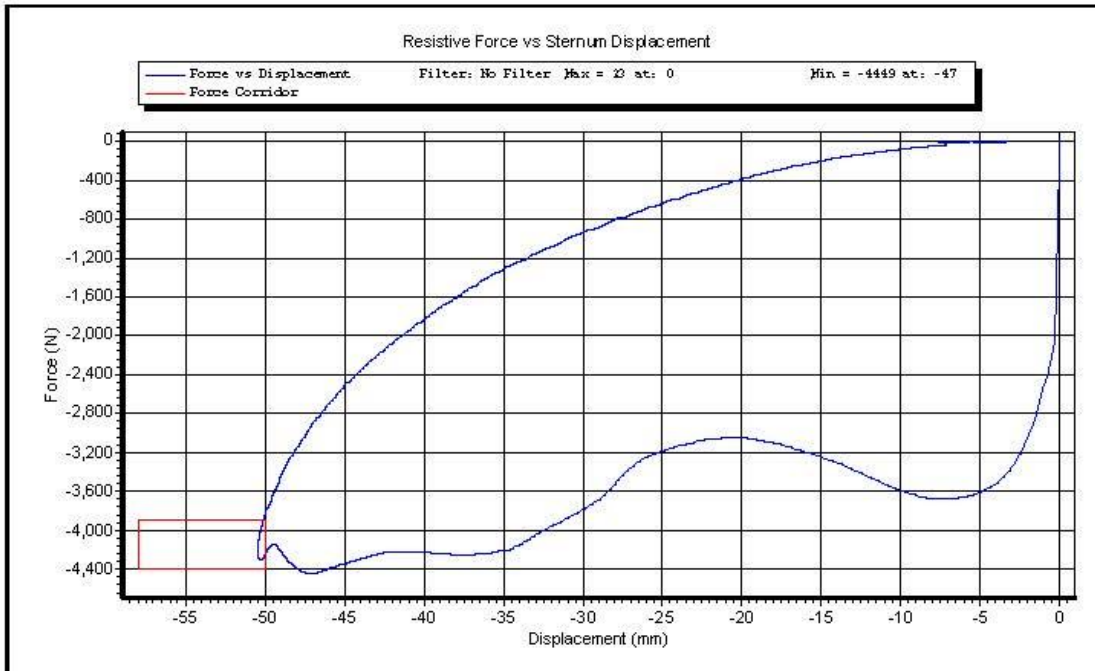
VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2014
Endevco	7231CT	C14953	12/4/2013
DentonATD	H3CD	DS-143	1/30/2014



Test Name: **Thorax Impact**
Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**

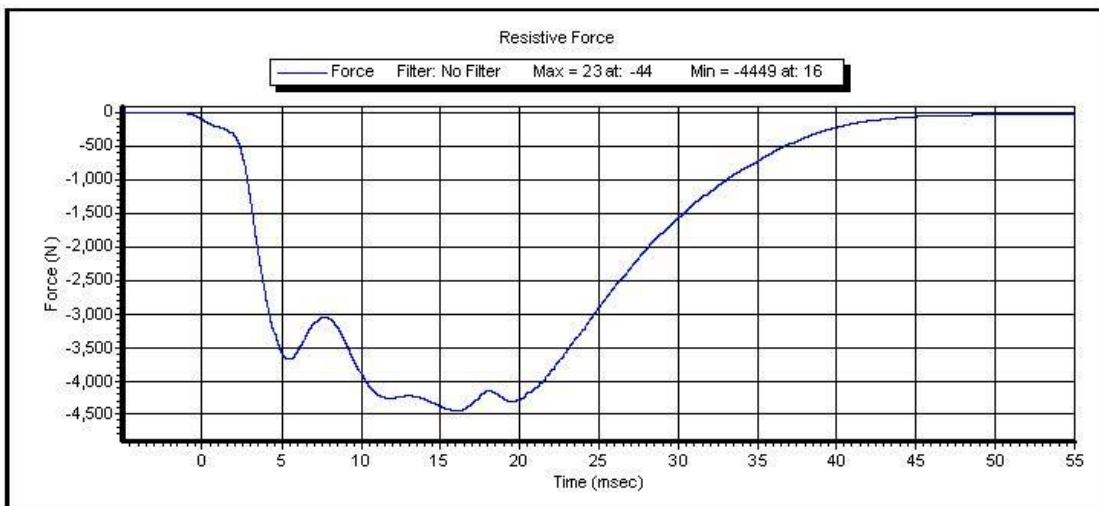
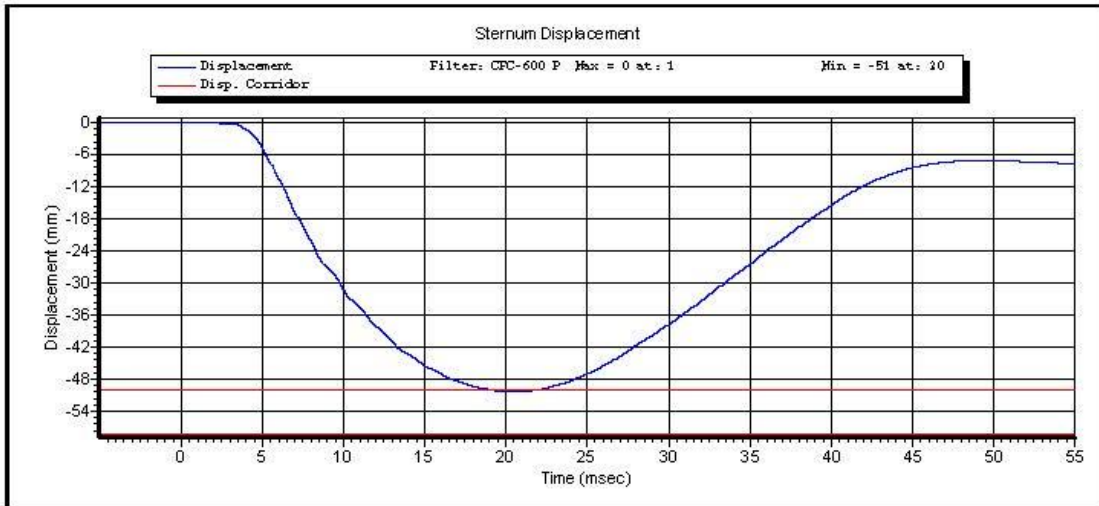


Test ID: **Thorax Impact**

Test Time: **9:40:50 AM**

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

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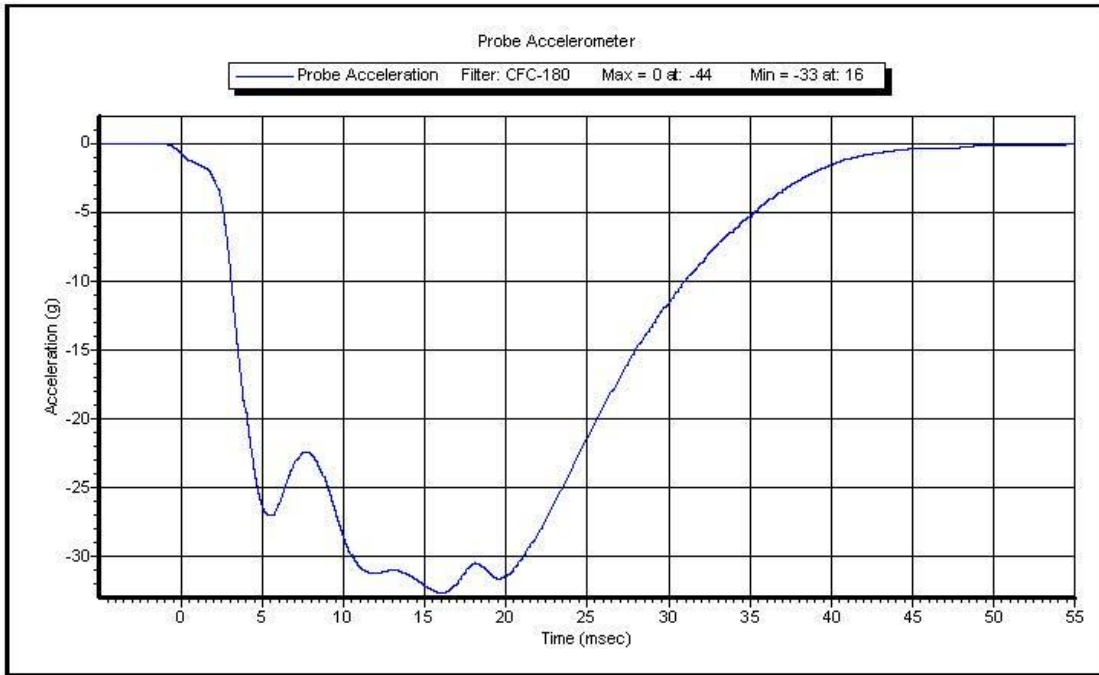


Test ID: **Thorax Impact**

Test Time: **9:40:50 AM**

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

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Test ID: **Thorax Impact**

Test Time: **9:40:50 AM**

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

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Torso Flexion

Part 5720 HIII 5% Female

ATD Serial No: 143

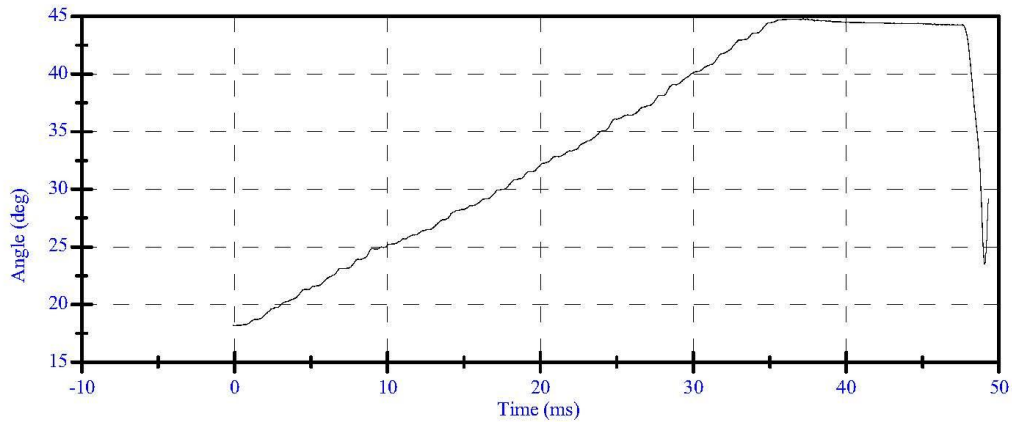
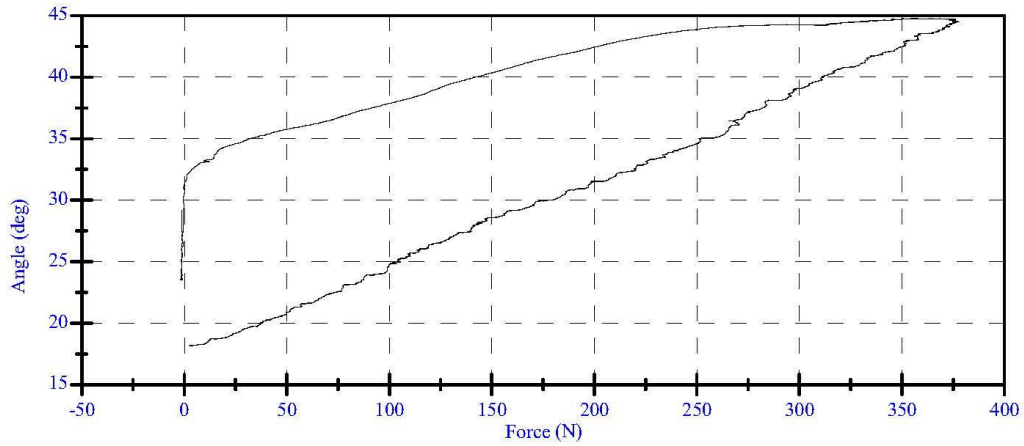
Laboratory Supervisor: E. Dutton

Date: 03/07/2014

Laboratory Technician: M. Goehle

<u>TEST PARAMETER</u>	<u>SPECIFICATION</u>	<u>TEST RESULTS</u>	<u>STATUS</u>
Lab Temperature:	18.9-25.6 C	22.1 C	Passed
Lab Humidity:	10-70 %	20.6 %	Passed
Initial Angle:	0.00-20.00 Deg	15.8 Deg	Passed
Force at 45 Deg	320.00-390.00 N	377.8 N	Passed
Return Angle	8 Deg Max from Initial	20.3 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:	143		
Test ID:	Knee Impact Left	Test Date:	3/6/2014
		Test Time:	8:46:30 AM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1687

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.20 deg C P
Humidity	10 -- 70	13.90 %RH P
Velocity	2.07 -- 2.13	2.100 m/s P
Resistive Force	-4060 -- -3450	-4035.9 N P

All test parameters are within specifications

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



VERIFICATION REPORT

REFERENCE EQUIPMENT

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



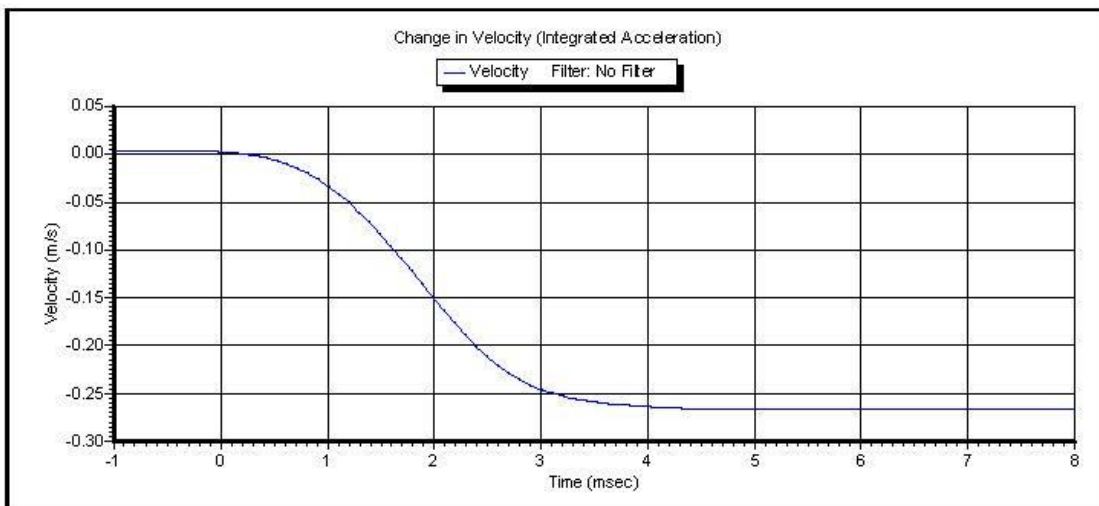
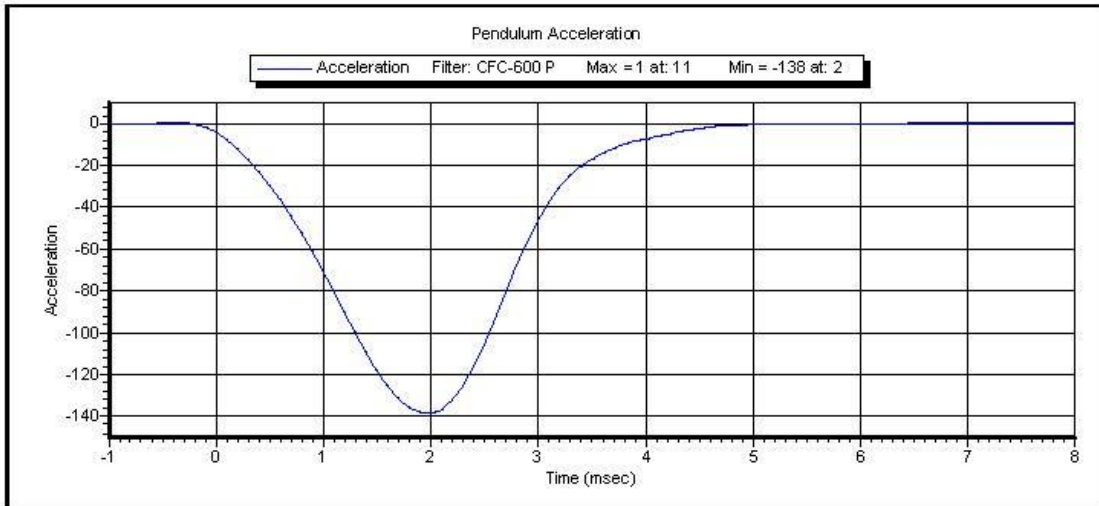
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Sub Test Name:
ATD Type: **Hybrid 3 - 5th Female**
ATD Serial Number: **143**



Test ID: **Knee Impact Left** Test Time: **8:46:30 AM**

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

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Test ID: **Knee Impact Left** Test Time: **8:46:30 AM**

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

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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:	143		
Test ID:	Knee Impact Right	Test Date:	3/6/2014
		Test Time:	8:41:02 AM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1028

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.20 deg C P
Humidity	10 -- 70	13.90 %RH P
Velocity	2.07 -- 2.13	2.107 m/s P
Resistive Force	-4060 -- -3450	-3917.5 N P

All test parameters are within specifications

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



VERIFICATION REPORT

REFERENCE EQUIPMENT

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



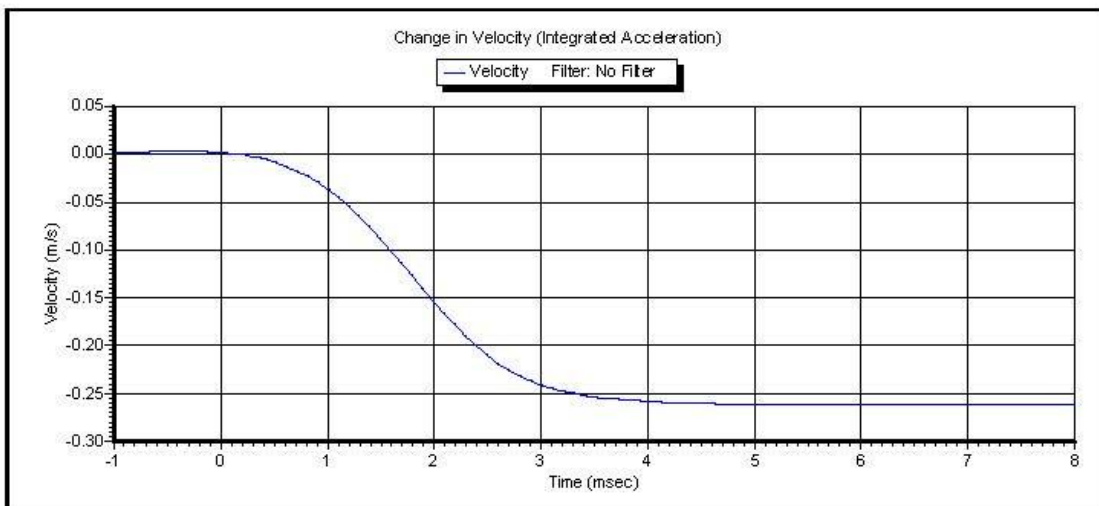
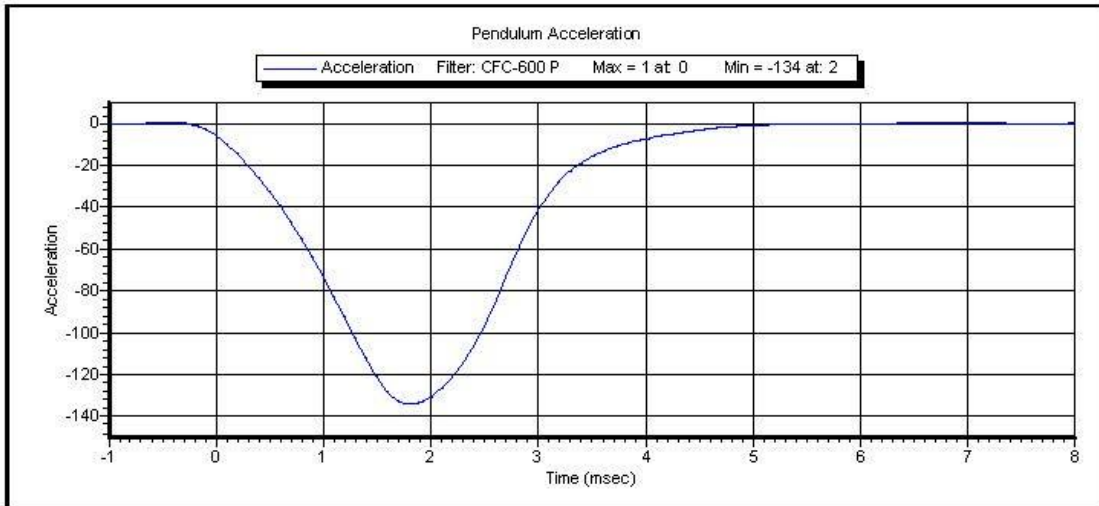
Test Name:	Knee Impact
Sub Test Name:	
ATD Type:	Hybrid 3 - 5th Female
ATD Serial Number:	143



Test ID: **Knee Impact Right** Test Time: **8:41:02 AM**

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

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Test ID: **Knee Impact Right** Test Time: **8:41:02 AM**

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

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