

REPORT NUMBER: NCAP-CAL-11-029

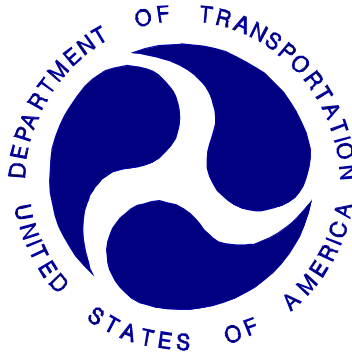
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**Ford Motor Company
2011 Ford Edge
Utility Vehicle**

NHTSA NUMBER: MB0202

CALSPAN TEST NUMBER: TR2509

**CALSPAN CORPORATION
TRANSPORTATION SCIENCES CENTER
P.O. BOX 400
BUFFALO, NEW YORK 14225**



March 30, 2011

FINAL REPORT

PREPARED FOR:

**U. S. DEPARTMENT OF TRANSPORTATION
National Highway Traffic Safety Administration
Rulemaking
Office of Crashworthiness Standards
1200 New Jersey Ave SE, Room W43-410
Washington, DC 20590**

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Transportation Sciences Center

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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15. Supplementary Notes																																																																				
16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2011 Ford Edge Utility Vehicle 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 the Calspan Corporation's crash test facility in Buffalo, New York on 11/30/2010. The impact velocity of the vehicle was 56.92 km/h, and the ambient temperature at the barrier face at the time of impact was 22°C. The target vehicle post-test maximum crush was 465 mm of Vehicle. The test vehicle's performance is as follows:																																																																				
<table border="1"> <thead> <tr> <th rowspan="2">Measurement Description</th> <th colspan="3">Driver ATD</th> <th colspan="3">Pass. ATD</th> </tr> <tr> <th>Units</th> <th>Threshold</th> <th>Result</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₁₅)</td> <td>N/A</td> <td>700</td> <td>321.83</td> <td>N/A</td> <td>700</td> <td>325.79</td> </tr> <tr> <td>Maximum Chest Compression</td> <td>mm</td> <td>63</td> <td>-31.25</td> <td>mm</td> <td>52</td> <td>-20.01</td> </tr> <tr> <td>Nij</td> <td>n/a</td> <td>1</td> <td>0.36</td> <td>n/a</td> <td>1</td> <td>0.64</td> </tr> <tr> <td>Neck Tension</td> <td>Newtons</td> <td>4170</td> <td>1,951.29</td> <td>Newtons</td> <td>2620</td> <td>1,486.48</td> </tr> <tr> <td>Neck Compression</td> <td>Newtons</td> <td>4000</td> <td>-325.38</td> <td>Newtons</td> <td>2520</td> <td>-394.10</td> </tr> <tr> <td>Left Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-4548.56</td> <td>Newtons</td> <td>6805</td> <td>-3025.02</td> </tr> <tr> <td>Right Femur Force</td> <td>Newtons</td> <td>10008</td> <td>-2792.57</td> <td>Newtons</td> <td>6805</td> <td>-3056.95</td> </tr> </tbody> </table>							Measurement Description	Driver ATD			Pass. ATD			Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	321.83	N/A	700	325.79	Maximum Chest Compression	mm	63	-31.25	mm	52	-20.01	Nij	n/a	1	0.36	n/a	1	0.64	Neck Tension	Newtons	4170	1,951.29	Newtons	2620	1,486.48	Neck Compression	Newtons	4000	-325.38	Newtons	2520	-394.10	Left Femur Force	Newtons	10008	-4548.56	Newtons	6805	-3025.02	Right Femur Force	Newtons	10008	-2792.57	Newtons	6805	-3056.95
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SECTION 1

PURPOSE AND SUMMARY OF TEST

1.1 PURPOSE

This 56.3 kph 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. DTNH22-06-D-00024. The purpose of this test was to obtain vehicle crashworthiness and occupant restraint system performance data for consumer information purposes.

The 56.3 kph frontal barrier impact test was conducted in accordance with the Office of Crashworthiness Standard Frontal NCAP Laboratory Test procedure.

1.2 TEST PROCEDURE

A load cell barrier consisting of 36 load cells was impacted by a 2011 Ford Edge Utility Vehicle at a velocity of 56.92 kph. The test was performed at Calspan on 11/30/2010. Pre- and post-test photographs of the vehicle and dummies 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 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 according to dummy placement instructions specified in the Frontal NCAP Laboratory Test Procedure.

Both ATDs were fully instrumented with head, chest and pelvis triaxial accelerometers, chest displacement potentiometers, upper neck transducers, right/left femur load cells, and lower leg instrumentation. Seat belt load cells were also on the driver's and passenger's lap and shoulder belts to measure dummy torso and pelvic section loading. The driver (position 1) ATD (Serial No. 061) and the right-front passenger (position 2) ATD (Serial No. 143) were calibrated previous to this test. Certification details, along with instrumentation calibration data, are found in Appendix C.

The 129 channels of data were recorded on an on-board data acquisition system. Appendix B contains 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 no Stoddard solvent leakage after the event or during any phase of the static rollover.

The maximum static crush of the vehicle was 465 mm and both the driver and passenger side doors remained closed during the impact event and were operable after the impact.

The driver's visible contact points were as follows: Face and Upper Torso with Frontal airbag with the back of head with the head restraint; both knees contacted the lower dash panel. The passenger's visible contact points were as follows: Face and Upper Torso with Frontal airbag with the back of head with the head restraint; both knees contacted the lower glovebox door.

The occupant data is summarized below.

ATD Position	HIC ₁₅	T ¹	T ²	Chest Disp. (mm)	Nij	Neck Tension (N)	Neck Comp (N)	Left Femur (N)	Right Femur (N)
Driver (50th)	321.83	62.60	77.60	-31.25	0.36	1,951.29	-325.38	-4548.56	-2792.57
Passenger (5 th)	325.79	60.15	75.15	-20.01	0.64	1,486.48	-394.10	-3025.02	-3056.95

**SECTION 2
DATA SHEETS**

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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

TEST VEHICLE INFORMATION

NHTSA No.	MB0202
Make	Ford
Model	Edge
Body Style	Utility Vehicle
VIN	2FMDK4JC0BBA30107
Color	Dark green
Delivery Date	11/5/2010
Odometer Reading (mi)	142
Odometer Reading (km)	228.5
Dealer	West Herr
Transmission	6-Speed Automatic
Final Drive	All Wheel Drive
Type/No. Cyl	V6
Engine Disp. (L)	3.5
Engine Placement	Longitudinal
Roof Rack	Yes
Sunroof/T-Top	No
Tinted Glass	Yes
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

TEST VEHICLE OPTIONS

Anti-Lock Brakes	Yes
All-Wheel Drive	Yes
Power Steering	Yes
Driver Front Airbag	Yes
Driver Curtain Airbag	Yes
Driver Head/Torso Airbag	No
Driver Torso Airbag	Yes
Driver Torso/Pelvis Airbag	No
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Pass. Front Airbag	Yes
Pass. Curtain Airbag	Yes
Pass. Head/Torso Airbag	No
Pass. Torso Airbag	Yes
Pass. Torso/Pelvis Airbag	No
Pass. Pelvis Airbag	No
Pass. Knee Airbag	No
Pretensioners	Yes
Load Limiters	Yes
Automatic Door Locks	Yes
Tilt Steering	Yes
Other	--

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

DATA FROM CERTIFICATION LABEL

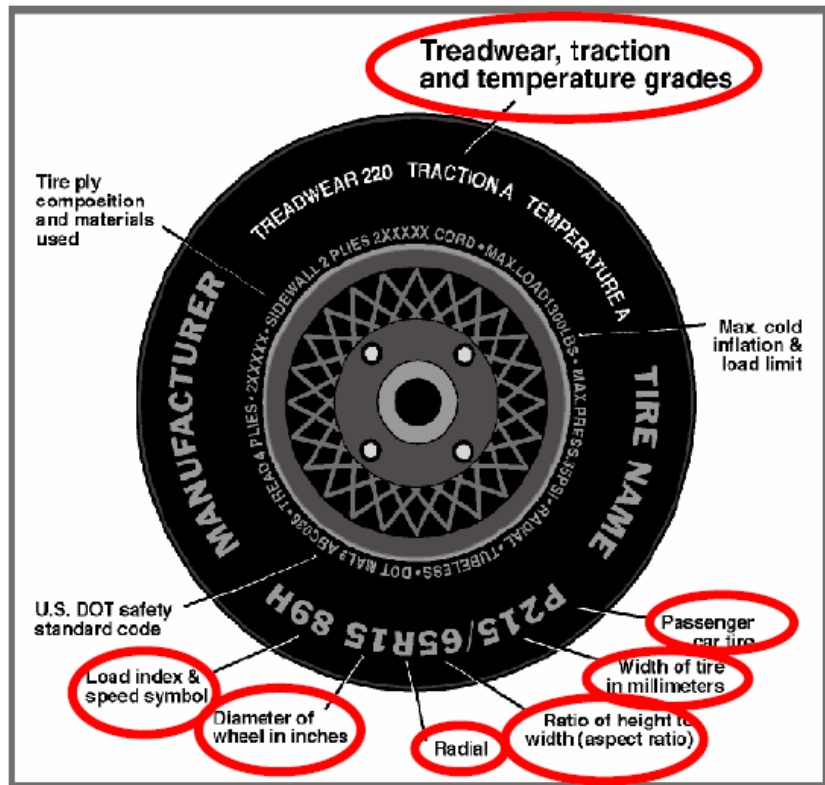
Manufactured By	Ford Motor Company	GVWR (kg)	2,531
Date of Manufacture	10/10	GAWR Front (kg)	1,329
		GAWR Rear (kg)	1,207

VEHICLE SEATING AND WEIGHT CAPACITY

Measured Parameter	Front	Rear	Third	Total
Type of Seats	Bucket	Split Bench	NA	
Number of Occupants	2	3		5
Capacity Wt. (VCW) (kg)				412
Cargo Wt. (RCLW) (kg)				71.8

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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P245/60R18	P245/60R18
Tire Size on Vehicle	P245/60R18	P245/60R18
Tire Manufacturer	Michelin	Michelin
Tire Model	Latitude Tour HP	Latitude Tour HP
Treadwear	440	440
Traction	A	A
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 2 Polyester, 1 Nylon	2 Steel, 2 Polyester, 1 Nylon
Load Index/Speed Symbol	104H	104H
Tire Material	Rubber	Rubber
DOT Safety Code Right	AP4ADAMX3510	AP4ADAMX3510
DOT Safety Code Left	AP4ADAMX3510	AP4ADAMX3510

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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	584.5	396.5		602.5	487.0	
Right	kg	555.5	406.0		587.0	469.5	
Ratio	%	59	41		55	45	
Totals	kg	1,140.0	802.5	1,942.5	1,189.5	956.5	2,146.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1,942.5
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	71.8
Calculated Vehicle Target Weight (TVTW)	kg	2,155

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	859	858	862	857	1166
As Tested	mm	852	852	838	841	1259
Post Test	mm	873	868	843	834	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2823
Total Vehicle Length at Left Side	mm	4,227
Total Vehicle Length at Centerline	mm	4,687
Total Vehicle Length at Right Side	mm	4,227
Weight of Ballast in Cargo Area	kg	62.0
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	67.0

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT: None

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

Test Vehicle:	2011 Ford Edge	NHTSA No:	MB0202
Test Program:	Frontal NCAP	Test Date	11/30/2010

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4687
2	Total Width	1900
3	Bumper Top Height	666
4	Bumper Bottom Height	213
5	Longitudinal Member Top Height	667
6	Distance Between Longitudinal Members	1037
7	Longitudinal Member Width	27
8	Engine Top Height	964
9	Engine Bottom Height	280
10	Engine and Gearbox Width	682
11	Front Bumper-Engine Distance	416
12	Front Shock Absorber Fixing Height	1027
13	Bonnet Leading Edge Height	951
14	Front Shock Absorber Fixing Width	1249
15	Front Bumper – Front Axle Distance	918
16	Front Axle – A Pillar Distance	485
17	A- Pillar – B-Pillar Distance	1158
18	B-Pillar – Rear Axle Distance	1179
19	B-Pillar – C-Pillar Distance	1009
20	Roof Sill Bottom Height	1537
21	Roof Sill Top Height	1601
22	Floor Sill Bottom Height	394
23	Floor Sill Top Height	476

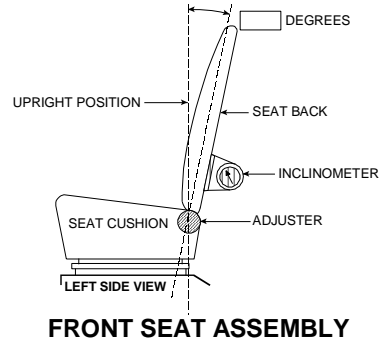
DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

NORMAL DESIGN RIDING POSITION

Driver seat: The driver seat back was positioned according to the Nominal Design Riding position listed in FORM 1

Passenger Seat: The passenger seat back as positioned to allow for a zero head angle of the passenger SID-II's dummy



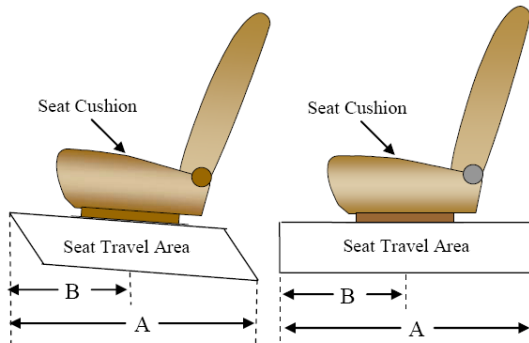
	Deg
Driver Seat Back Angle	7.6
Passenger Seat Back Angle	5.7

SEAT FORE/AFT POSITIONS

The driver's seat was positioned at the mid-point of fore/aft travel.

The passenger's seat was positioned at the most forward position of fore/aft travel.

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	316	158
Passenger Seat	242	0



SEAT BELT UPPER ANCHORAGES

The driver's upper belt anchorage was placed in the uppermost of 4 possible positions

The right front passenger's upper belt anchorage was placed in the uppermost of 4 possible positions

	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

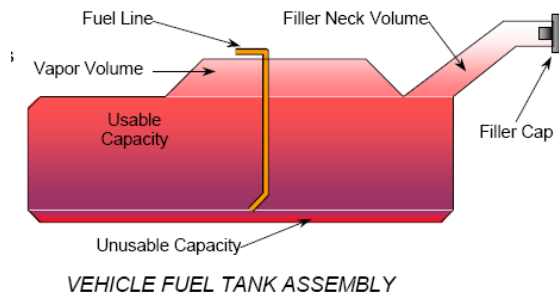
Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	72.7
Usable Capacity of "Optional Tank"	NA
92%-94% of Usable Capacity	66.9 - 68.3
Actual Amount of Solvent Used	67.0
1/3 of Usable Capacity	24.2

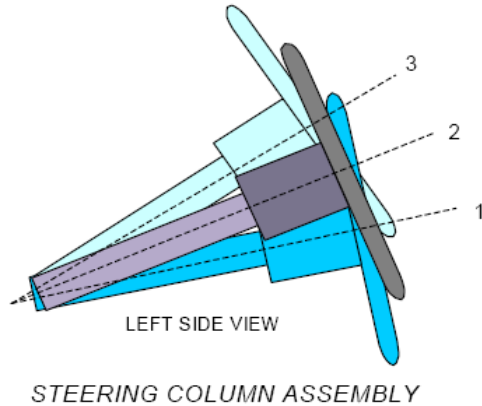
FUEL PUMP

Fuel evacuated according to the specifications provided by the manufacturer in Form 1



STEERING COLUMN ADJUSTMENT

The steering wheel was adjusted to the midpoint of Tilt angle range and the midpoint of the telescoping Travel (if applicable)

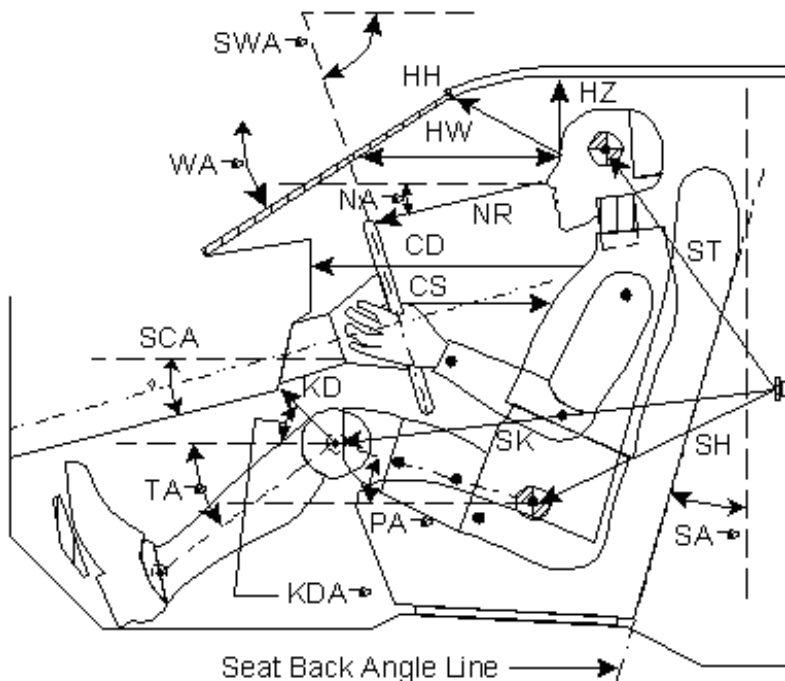


STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	58.2	
Geometric center position No. 2	61.1	
Uppermost position No. 3	64.0	
Telescoping Steering Wheel Travel		40
Test Position	61.1	20

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

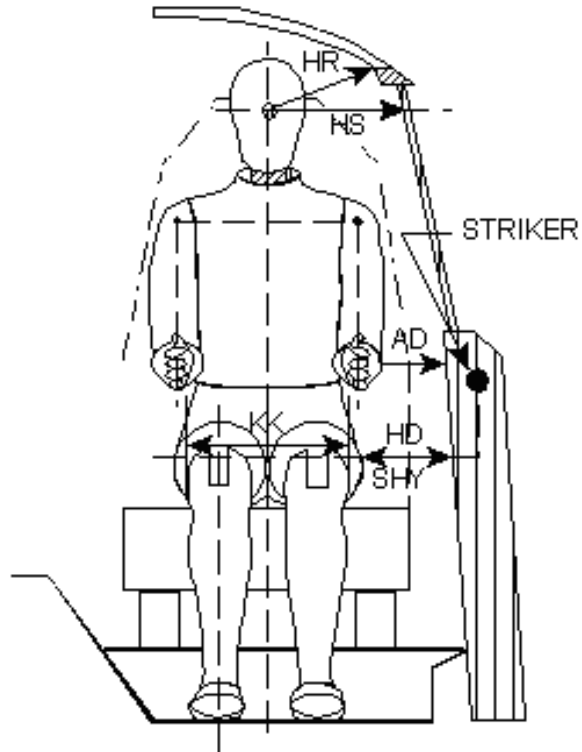
Test Vehicle:	2011 Ford Edge	NHTSA No:	MB0202
Test Program:	Frontal NCAP	Test Date	11/30/2010



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		25.0		
SWA°	Steering Wheel Angle		61.1		
SCA°	Steering Column Angle		32.5		
SA°	Seat Back Angle (on headrest post)		7.6		5.7
HZ	Head to Roof (Z)	233	90	265	90
HH	Head to Header	356	31	332	47
HW	Head to Windshield	715	0	782	0
NR	Nose to Rim	377	-11	491	-21
CD	Chest to Dash	528		398	
CS	Chest to Steering Hub	280	0		
RA	Rim to Abdomen	161	0		
KDL	Left Knee to Dash	116	14.4	80	22.5
KDR	Right Knee to Dash	95	18.2	80	19.8
PA°	Pelvic Angle		24.3		22.3
TA°	Tibia Angle		16.3		55.1
SK	Striker to Knee	725	-6.0	802	-5.8
ST	Striker to Head	631	58	608	59
SH	Striker to H-Point	446	-21	542	-11

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Ford Edge	NHTSA No:	MB0202
Test Program:	Frontal NCAP	Test Date	11/30/2010

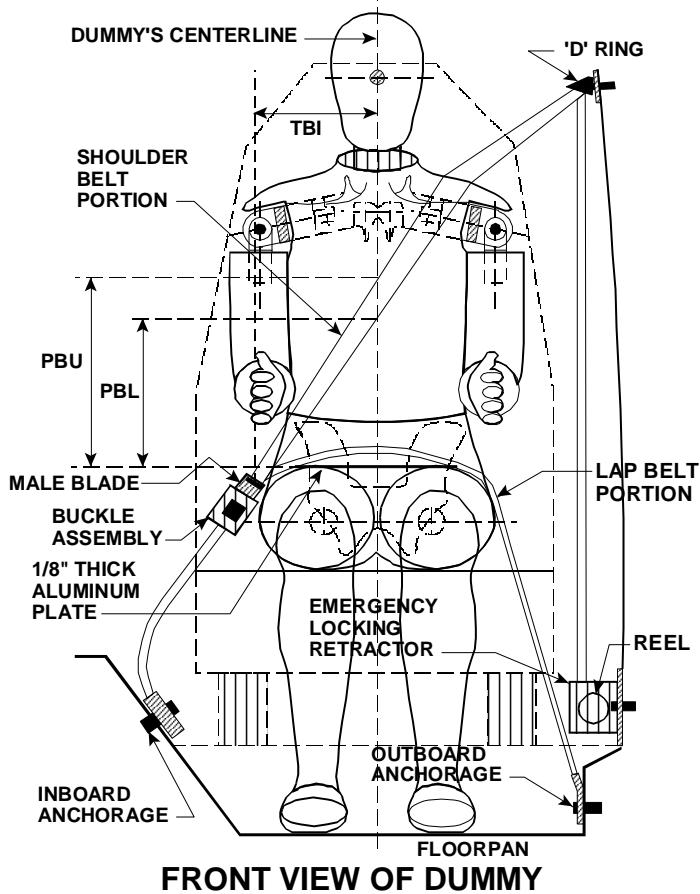


Code	Description	Driver	Passenger
AD	Arm to Door	116	82
HD	H-Point to Door	145	180
HR	Head to Side Header	243	288
HS	Head to Side Window	374	415
KK	Knee to Knee	325	170
SHY	Striker to H-Point (Y Direction)	275	305
AA	Ankle to Ankle	398	185

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

Test Vehicle:	2011 Ford Edge	NHTSA No:	MB0202
Test Program:	Frontal NCAP	Test Date	11/30/2010

SEAT BELT POSITIONING DATA



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of aluminum plate to belt upper edge	mm	368	341
PBL — Top surface of aluminum plate to belt lower edge	mm	305	258

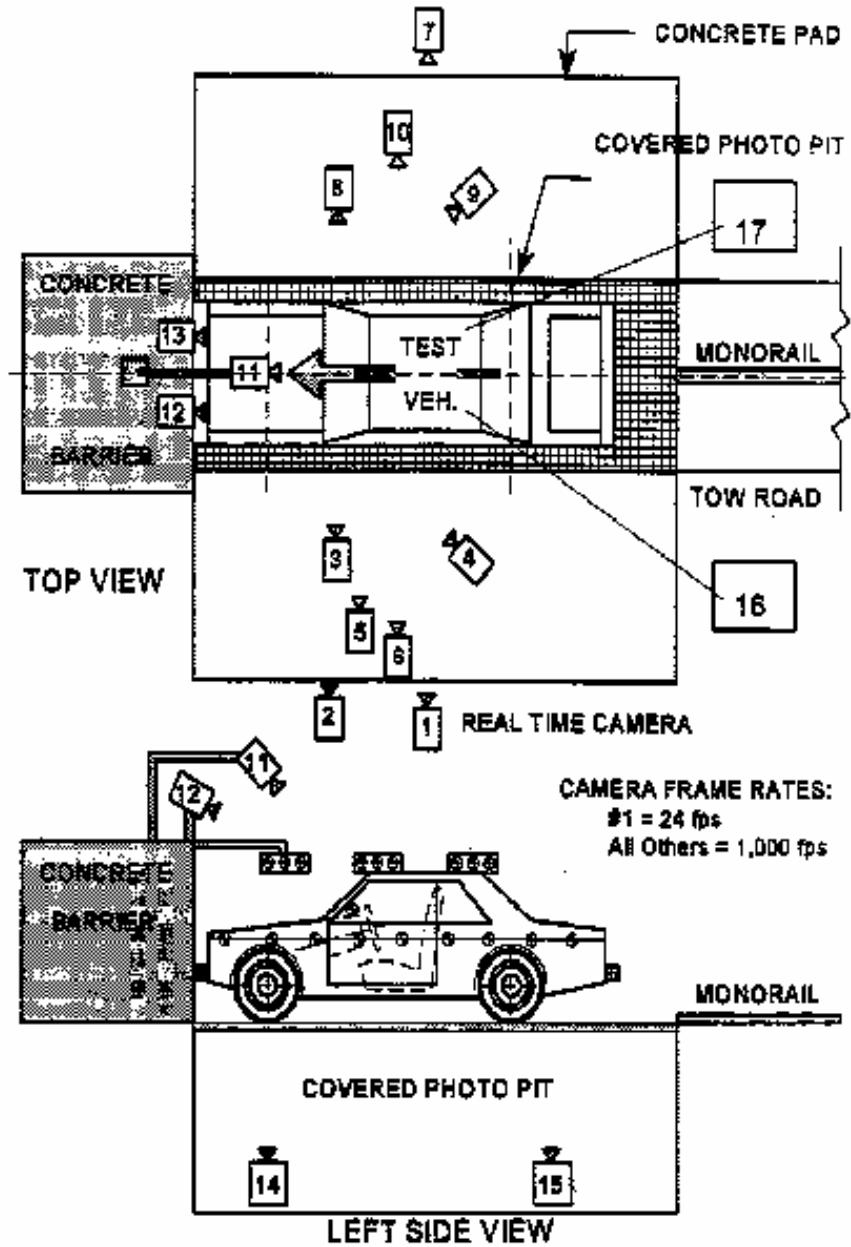
BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	885	965
Lap Belt Length as measured on ATD	mm	595	575
Remainder of belt on reel	mm	200	200
Total belt length for continuous webbing systems	mm	1680	1740

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

Test Vehicle:	2011 Ford Edge	NHTSA No:	MB0202
Test Program:	Frontal NCAP	Test Date	11/30/2010

CAMERA POSITIONS FOR FRONTAL IMPACTS



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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

CAMERA LOCATIONS

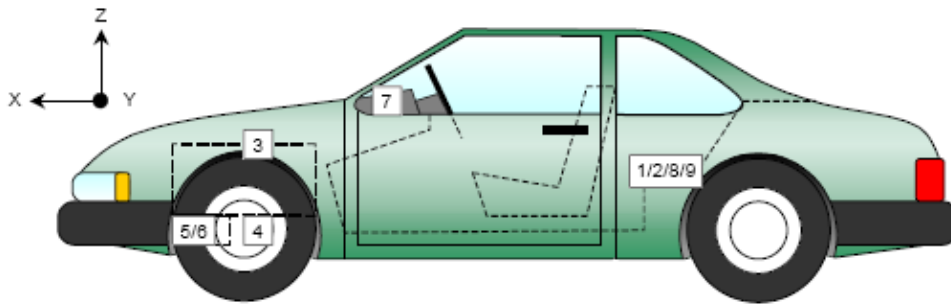
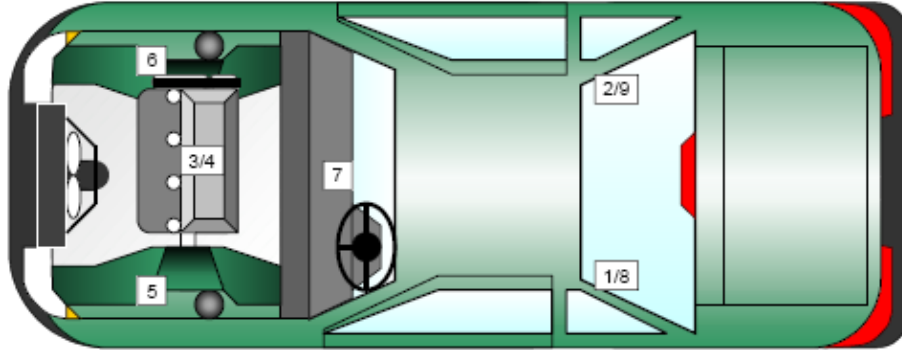
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Camera				-	24
2	Driver Left Side View	1390	7026	-1090	50	1000
3	Left Side View	930	9264	-985	50	500
4	Overall Right Side	1970	17186	-970	50	1000
5	Steering Column (Bottom)	1705	7660	-1220	24 - 70	1000
6	Steering Column (Top)	1705	7660	-1825	28 - 70	1000
7	Driver and Interior View	3040	2970	-2270	24	1000
8	Right Side View	1200	9730	-950	50	1000
9	Right Passenger View	1710	7516	-1130	50	1000
10	Pass. And Interior View	3110	3090	-2140	24	1000
11	Passenger Front View	620	-92	-1987	25	500
12	Driver Front View	620	-92	-1987	25	500
13	Windshield View	0	-530	-3374	25	500
14	Pit View of Engine	0	615	3048	12.5	1000
15	Pit View of Fuel Tank	0	1805	3048	12.5	1000
16	Onboard Driver Side (Optional)	N/A	N/A	N/A	N/A	N/A
17	Onboard Passenger Side (Optional)	N/A	N/A	N/A	N/A	N/A

* COORDINATES:

- +X = forward of impact plane
- +Y = right of monorail center
- +Z = into ground

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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member X	1964	-659	469
2	Right Rear X-Member X	1903	650	474
3	Engine Top X	4018	154	980
4	Engine Bottom X	4366	242	283
5	Left Brake Caliper X	3862	-814	508
6	Right Brake Caliper X	3918	856	465
7	Instrument Panel X	-	-	-
8	Left Rear X-Member Z	1964	-659	469
9	Right Rear X-Member Z	1903	650	474

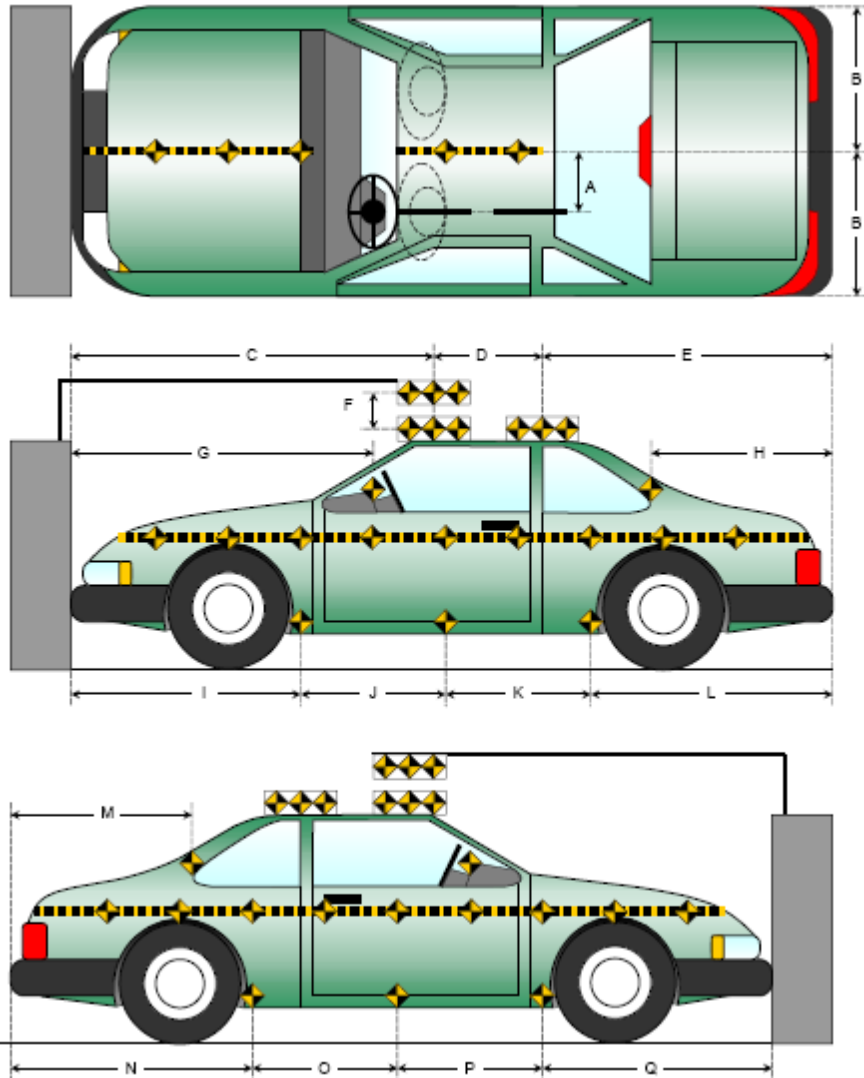
Reference Points: X – Rear Surface of Vehicle (+ forward)
 Y – Vehicle Centerline (+ to right)
 Z – Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date 11/30/2010

Item	Value
A	404
B	950
C	2095
D	1223
E	1369
F	-
G	1747
H	1081
I	1429
J	906
K	907
L	1445
M	1073
N	1439
O	906
P	910
Q	1432

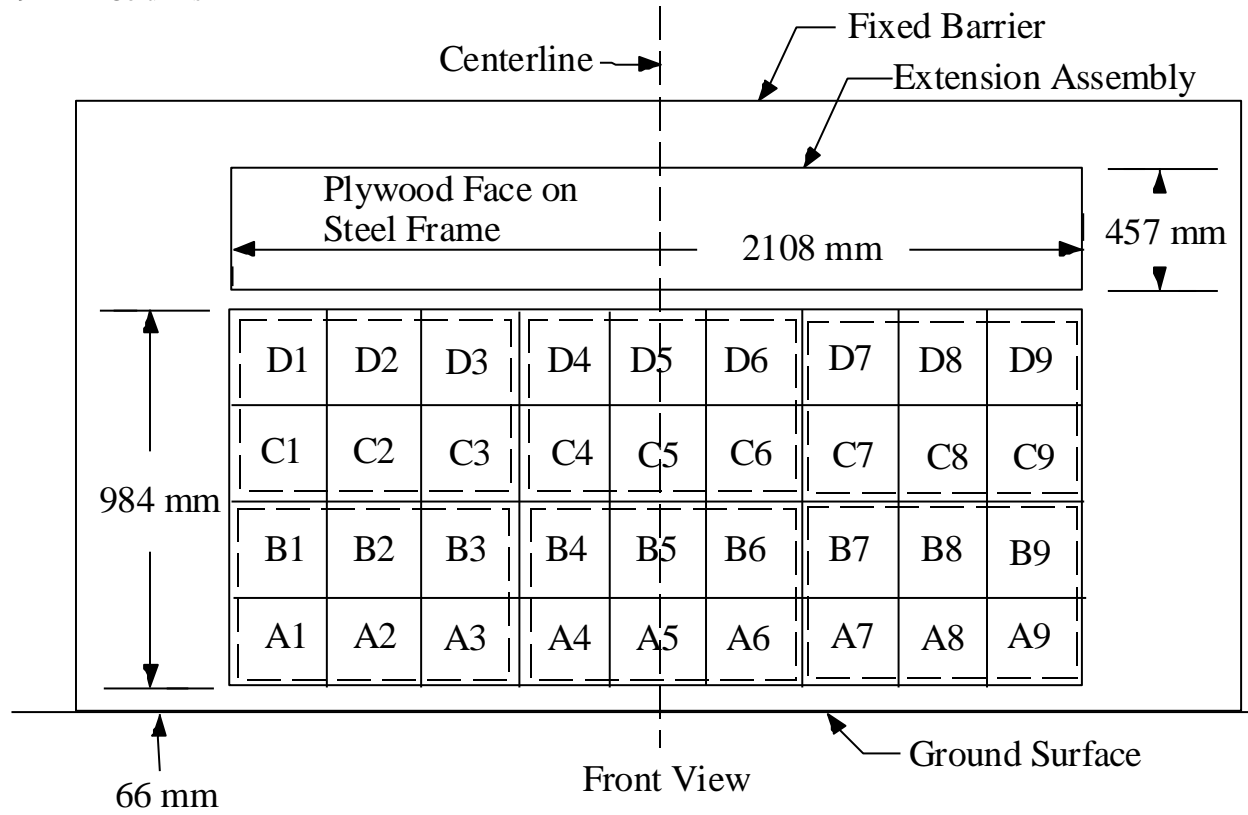
All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

36 Load Cells
 4 Rows
 9 Columns



DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
Test Program: Frontal NCAP Test Date: 11/30/2010

INSTRUMENTATION

Driver Dummy Channels	42
Passenger Dummy Channels	42
Belt load cells	4
Vehicle Structure Accelerometers	8
Barrier load cells	36
Total	132

CAMERA COVERAGE

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

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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	061	143
Head Contact	Airbag and head restraint	Airbag and head restraint
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	Airbag	Airbag
Left Knee Contact	Lower Dash Panel	Glovebox Door Panel
Right Knee Contact	Lower Dash Panel	Glovebox Door Panel

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)	1.4	2.2
Seat Back Failure	None	None
Glazing Damage	None	

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Windshield Damage	Cracked near A pillars, lower edge, and center.
Window Damage	None
Other Notable Effects	None

VEHICLE REBOUND FROM BARRIER

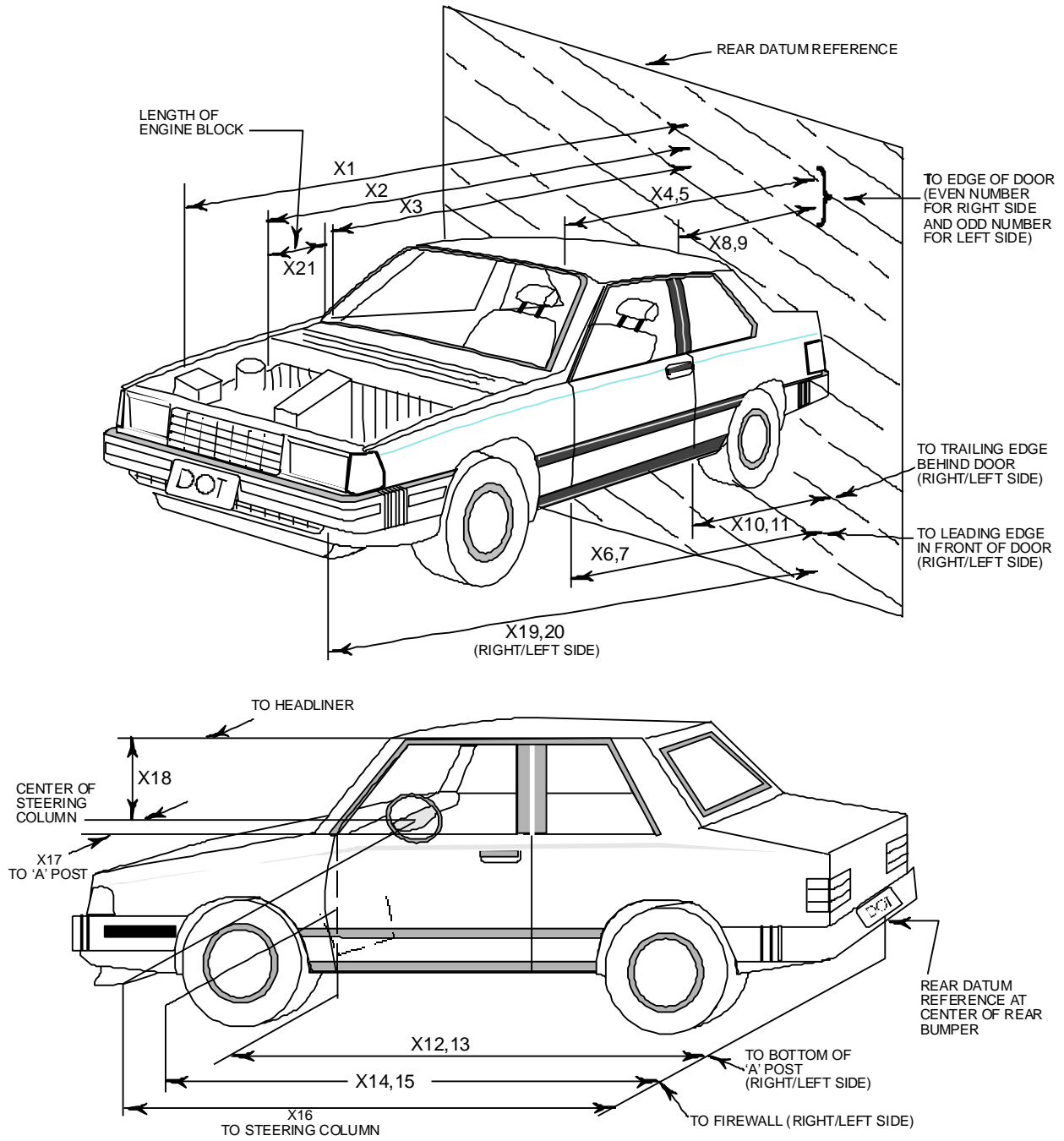
Measured Parameter	Units	Value
Left Side	mm	850
Center	mm	770
Right Side	mm	840
Average	mm	820

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

Restraint Type	Driver (Occupant 1)		Passenger (Occupant 2)	
	Installed	Operated	Installed	Operated
Front Airbag	Yes	Yes	Yes	Yes
Side Curtain Airbag	Yes	No	Yes	No
Side Torso Airbag	Yes	No	Yes	No
Knee Airbag	No	NA	No	NA
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:	2011 Ford Edge	NHTSA No:	MB0202
Test Program:	Frontal NCAP	Test Date	11/30/2010



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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4687	4221	-465
2	Rear Surface of Vehicle (RSOV) to Front of Engine	4271	3985	-286
3	RSOV to Firewall	3762	3594	-168
4	RSOV to Upper Leading Edge of Right Door	3279	3274	-5
5	RSOV to Upper Leading Edge of Left Door	3280	3280	0
6	RSOV to Lower Leading Edge of Right Door	3228	3226	-2
7	RSOV to Lower Leading Edge of Left Door	3232	3236	3
8	RSOV to Upper Trailing Edge of Right Door	2133	2131	-2
9	RSOV to Upper Trailing Edge of Left Door	2135	2135	0
10	RSOV to Lower Trailing Edge of Right Door	2164	2160	-3
11	RSOV to Lower Trailing Edge of Left Door	2166	2168	2
12	RSOV to Bottom of "A" Post of Right Side	3394	3394	0
13	RSOV to Bottom of "A" Post of Left Side	3400	3400	-1
14	RSOV to Firewall, Right Side	3764	-	-
15	RSOV to Firewall, Left Side	3765	3622	-143
16	RSOV to Steering Column	2768	2846	78
17	Center of Steering Column to "A" Post	308	315	7
18	Center of Steering Column to Headliner	437	437	0
19	RSOV to Right Side of Front Bumper	4227	4122	-105
20	RSOV to Left Side of Front Bumper	4227	3988	-239
21	Length of Engine Block	463	287	-176
RD	RSOV to Right Side of Dash Panel	2997	2999	2
CD	RSOV to Center of Dash Panel	3032	3038	6
LD	RSOV to Left Side of Dash Panel	2999	2999	0

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

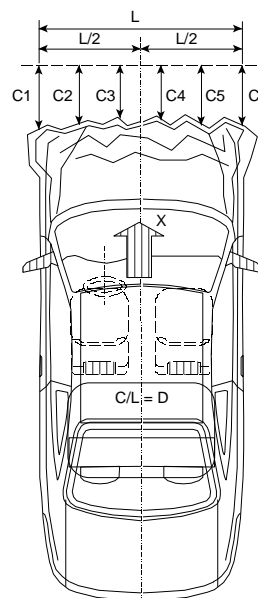
Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

VEHICLE INFORMATION

VIN 2FMDK4JC0BBA30107 Wheelbase (mm) 2,823
 Vehicle Size Category Utility Vehicle Test Weight (kg) 2,146

ACCELEROMETER DATA

Accelerometer Locations: As Described in Data Sheet No. 7
 Cal. Procedure/Interval: Calspan Procedure / 6 month
 Integration Algorithm: Trapezoidal Linearity: >99%
 Impact Velocity (km/h): 56.92
 Velocity Change (km/h): 63.48
 Time of Separation (msec): 228 ms



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2
 Midpoint of Damage: Vehicle Centerline
 Damage Region Length (mm): 1,393
 Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4478	4163	-315
C2	Crush zone 2 at left side	mm	4621	4174	-447
C3	Crush zone 3 at left side	mm	4679	4212	-468
C4	Crush zone 4 at right side	mm	4680	4213	-467
C5	Crush zone 5 at right side	mm	4627	4178	-450
C6	Crush zone 6 at right side	mm	4486	4164	-322
L	C1 to C6	mm	1394	1481	88

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

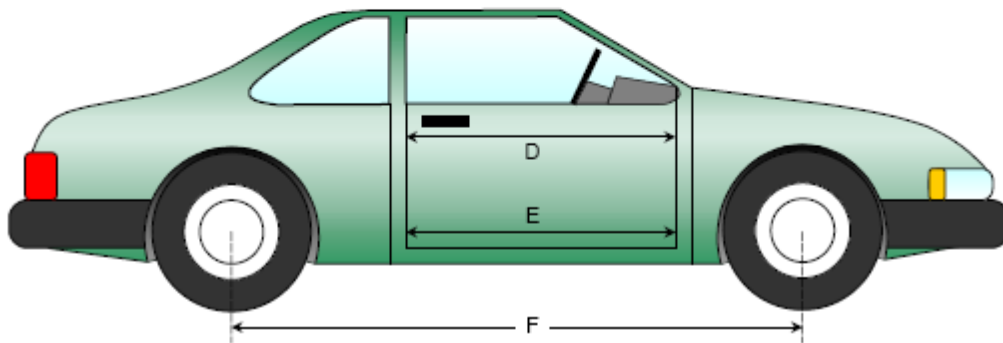
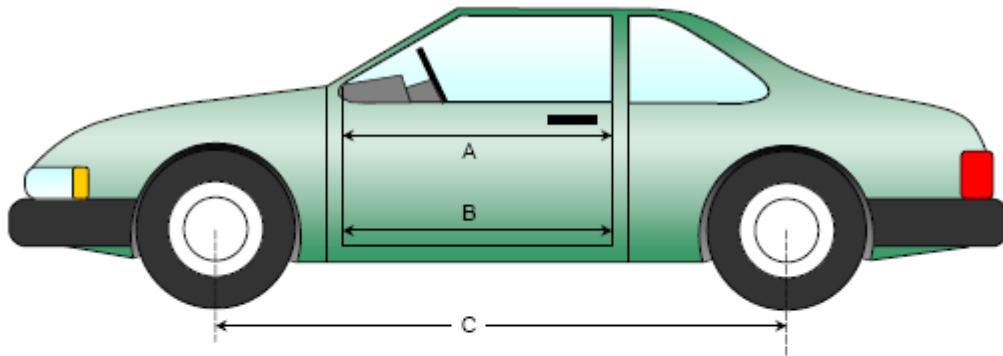
Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	1033	1032	-1
B	Left Side Lower	mm	928	928	0
D	Right Side Upper	mm	1032	1033	1
E	Right Side Lower	mm	941	941	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2822	2802	-20
F	Right Side Wheelbase	mm	2823	2800	-23



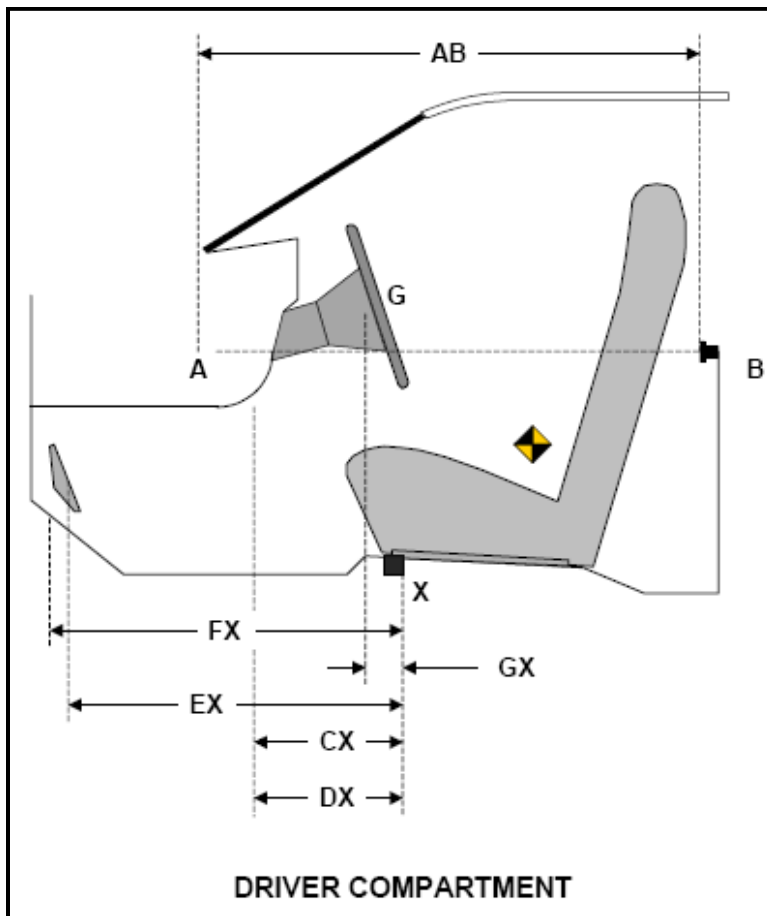
DATA SHEET NO.14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

DRIVER COMPARTMENT INTRUSION

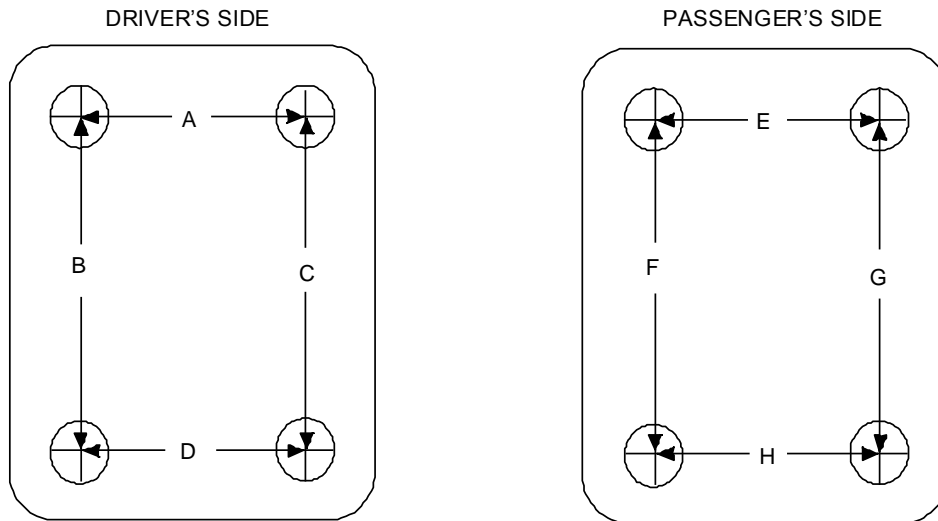
Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	872	870	-2
CX	Left Knee Bolster to X	mm	298	321	23
DX	Right Knee Bolster to X	mm	282	326	44
EX	Brake Pedal to X	mm	522	509	-14
FX	Foot Rest to X	mm	526	574	48
GX	Center of Steering Column Wheel Hub to X	mm	38	116	78

X = Front of Seat Track (Stationary)



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

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010



TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	503	506	3
B	404	402	-3
C	364	363	-1
D	505	504	-1
E	450	447	-3
F	438	439	1
G	395	379	-16
H	502	485	-17

All units in millimeters

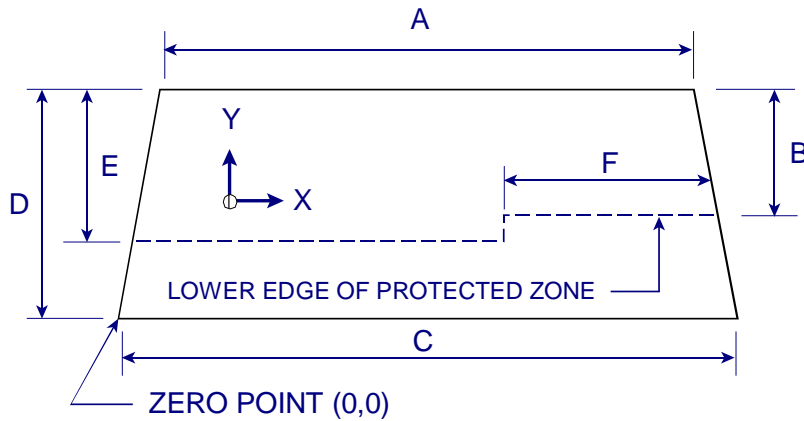
DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010

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: 21.3°C

WINDSHIELD PERIPHERY MEASUREMENTS

Measurement	Pre-Test (mm)	Post-Test (mm)	% Retention
Left Side	2268	2268	100%
Right Side	2268	2268	100%
Total	4535	4535	100%



Item	Units	Value
A	mm	1283
B	mm	560
C	mm	1582
D	mm	835
E	mm	560
F	mm	662

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.

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.

X	Y
-	-
-	-
-	-
-	-

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

Test Vehicle:	<u>2011 Ford Edge</u>	NHTSA No:	<u>MB0202</u>
Test Program:	<u>Frontal NCAP</u>	Test Date	<u>11/30/2010</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

Temperature at Time of Impact: 13.3° C

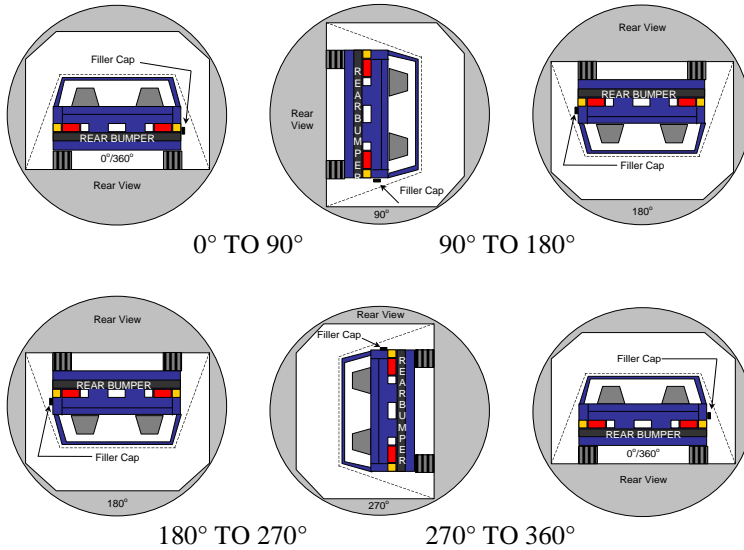
Test Time: 13:30

Stoddard Solvent Spillage Measurements

A.	From impact until vehicle motion ceases: (Maximum allowable = 1 oz.)	<u>0</u>	oz
B.	For the 5-minute period after motion ceases: (Maximum allowable = 5 oz.)	<u>0</u>	oz
C.	For the following 25 minutes: (Maximum allowable = 1 oz./minute)	<u>0</u>	oz
D.	Spillage	<u>None</u>	oz

DATA SHEET NO. 16
FMVSS 301 STATIC ROLLOVER RESULTS

Test Vehicle: 2011 Ford Edge NHTSA No: MB0202
 Test Program: Frontal NCAP Test Date: 11/30/2010



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).
2. Details of Stoddard Solvent spillage: None

SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0° to 90°	1:08	5:00	6:08
90° to 180°	1:06	5:00	6:06
180° to 270°	1:03	5:00	6:03
270° to 360°	1:11	5:00	6:11

FMVSS 301 SPILLAGE TABLE

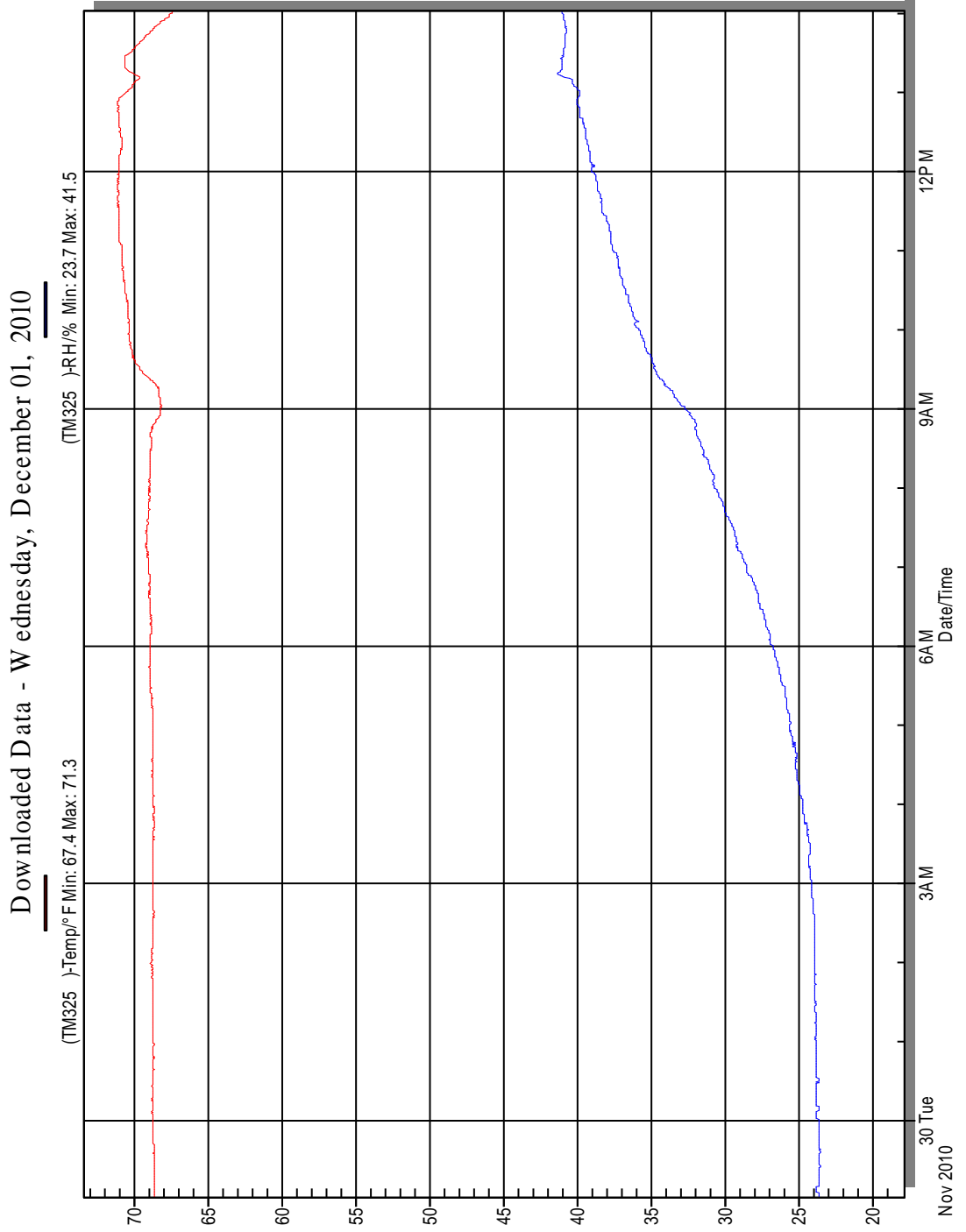
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0° to 90°	0	0	NA	NA
90° to 180°	0	0	NA	NA
180° to 270°	0	0	NA	NA
270° to 360°	0	0	NA	NA

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

Test Vehicle:	2011 Ford Edge	NHTSA No:	MB0202
Test Program:	Frontal NCAP	Test Date	11/30/2010



**APPENDIX A
PHOTOGRAPHS**

TABLE OF PHOTOGRAPHS		
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2	Load Cell Wall	A-5
3	Manufacturer's Label	A-6
4	Tire Placard	A-6
5	Right Front $\frac{3}{4}$ View, as Received	A-7
6	Left Rear $\frac{3}{4}$ View, as Received	A-7
7	Pre-test Front View of Test Vehicle	A-8
8	Post-test Front View of Test Vehicle	A-8
9	Pre-test Left View of Test Vehicle	A-9
10	Post-test Left View of Test Vehicle	A-9
11	Pre-test Right View of Test Vehicle	A-10
12	Post-test Right View of Test Vehicle	A-10
13	Pre-test Right Front $\frac{3}{4}$ View	A-11
14	Post-test Right Front $\frac{3}{4}$ View	A-11
15	Pre-test Left Rear $\frac{3}{4}$ View	A-12
16	Post-test Left Rear $\frac{3}{4}$ View	A-12
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19	Pre-test Engine Compartment View	A-14
20	Post-test Engine Compartment View	A-14
21	Pre-test Fuel Filler Cap View	A-15
22	Post-test Fuel Filler Cap View	A-15
23	Pre-test Front Underbody View	A-16
24	Post-test Front Underbody View	A-16
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27	Pre-test Dummy Cable Routing	A-18
28	Post-test Dummy Cable Routing	A-18
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31	Pre-test Driver Dummy Window View	A-20
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33	Pre-test Driver Dummy and Vehicle Interior View	A-21
34	Post-test Driver Dummy and Vehicle Interior View	A-21
35	Pre-test Driver's Seat Fore-Aft Markings	A-22
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37	Pre-test Driver Dummy Feet	A-23
38	Post-test Driver Dummy Feet	A-23
39	Pre-test Driver's Side Knee Bolster	A-24
40	Post-test Driver's Side Knee Bolster	A-24
41	Pre-test Driver's Side Floorpan	A-25
42	Post-test Driver's Side Floorpan	A-25
43	Post-test Driver Dummy Contact With Airbag	A-26
43a	Post-Test Driver Dummy Contact With Head Restraint	A-26
44	Pre-test View of the Steering Column Shear Capsule	A-27
45	Post-test View of the Steering Column Shear Capsule	A-27
46	Pre-test Passenger Dummy Front View	A-28
47	Post-test Passenger Dummy Front View	A-28
48	Pre-test Passenger Dummy Window View	A-29
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50	Pre-test Passenger Dummy and Vehicle Interior View	A-30
51	Post-test Passenger Dummy and Vehicle Interior View	A-30
52	Pre-test Passenger's Seat Fore-Aft Markings	A-31
53	Post-test Passenger's Seat Fore-Aft Markings	A-31
54	Pre-test Passenger Dummy Feet	A-32
55	Post-test Passenger Dummy Feet	A-32
56	Pre-test Passenger's Side Knee Bolster	A-33
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58	Pre-test Passenger's Side Floorpan	A-34
59	Post-test Passenger's Side Floorpan	A-34
60	Post-test Passenger Dummy Contact With Airbag	A-35
60a	Post-test Passenger Dummy Contact with Head Restraint	A-35
61	Photograph of ballast installed in vehicle	A-36

62	Post-test Stoddard solvent spillage location view, if required	A-36
63	Post-test Speed Trap Read-out	A-37
64	Vehicle at 0° on Static Rollover Device	A-37
65	Vehicle at 90° on Static Rollover Device	A-38
66	Vehicle at 180° on Static Rollover Device	A-38
67	Vehicle at 270° on Static Rollover Device	A-39
68	Vehicle at 360° on Static Rollover Device	A-39
69	Impact Photograph (video still)	A-40
70	Monronev Label Photograph	A-40

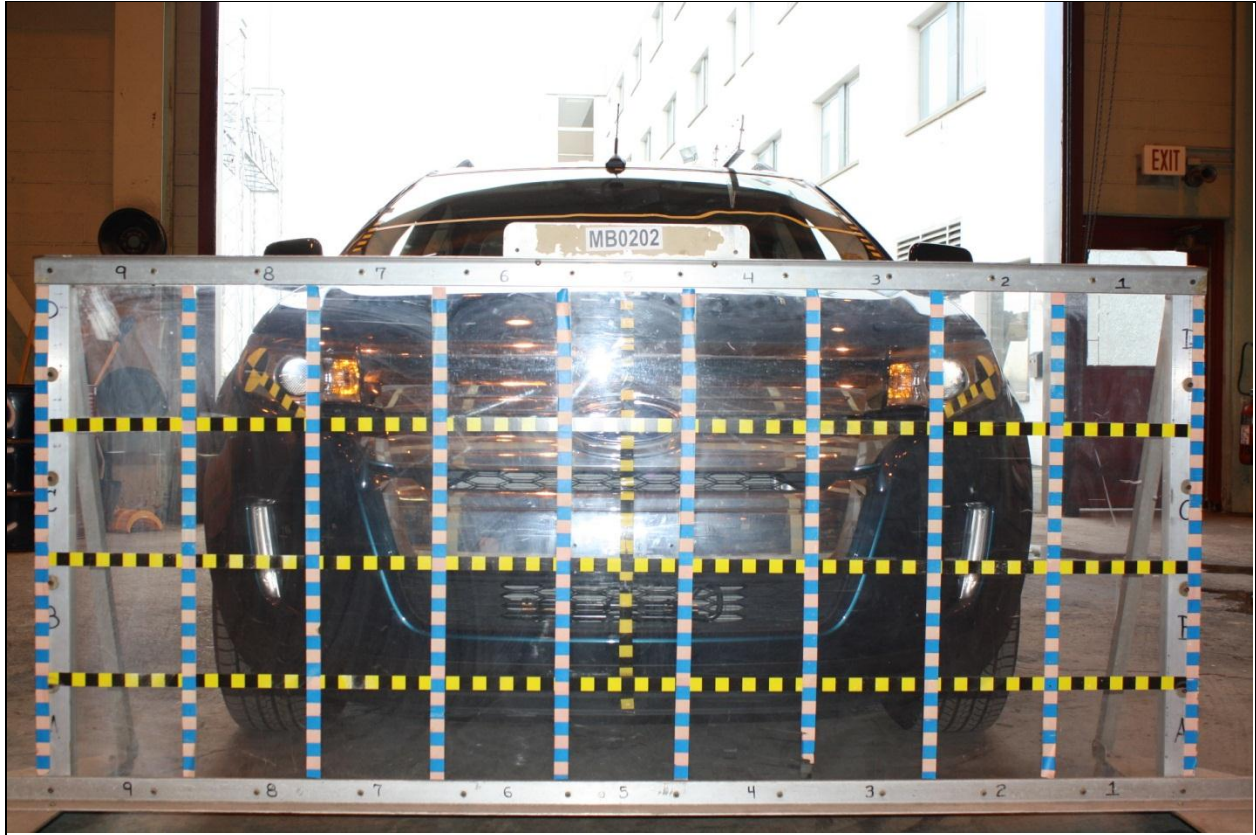


Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall



Figure A-3: Manufacturer Label



Figure A-4: Tire Placard



Figure A-5: Right Front 3/4 View, as Received



Figure A-6: Left Rear $\frac{3}{4}$ 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 Vehicle



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



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

Photo Not Available

Figure A-13: Pre-Test Right $\frac{3}{4}$ View



Figure A-14: Post-Test Right $\frac{3}{4}$ View



Figure A-15: Pre-Test Left Rear $\frac{3}{4}$ View



Figure A-16: Post-Test Left Rear $\frac{3}{4}$ View



Figure A-17: Pre-Test Windshield View

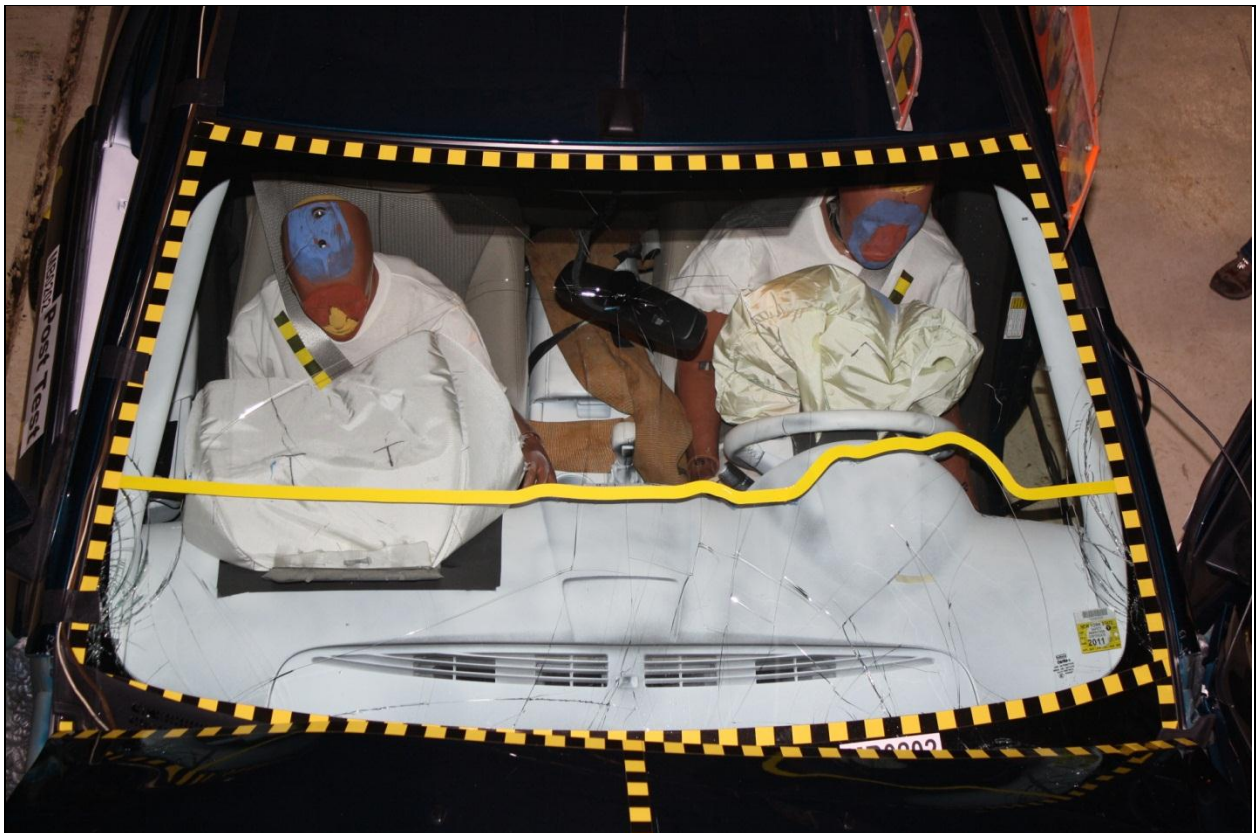


Figure A-18: Post-Test Windshield View



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

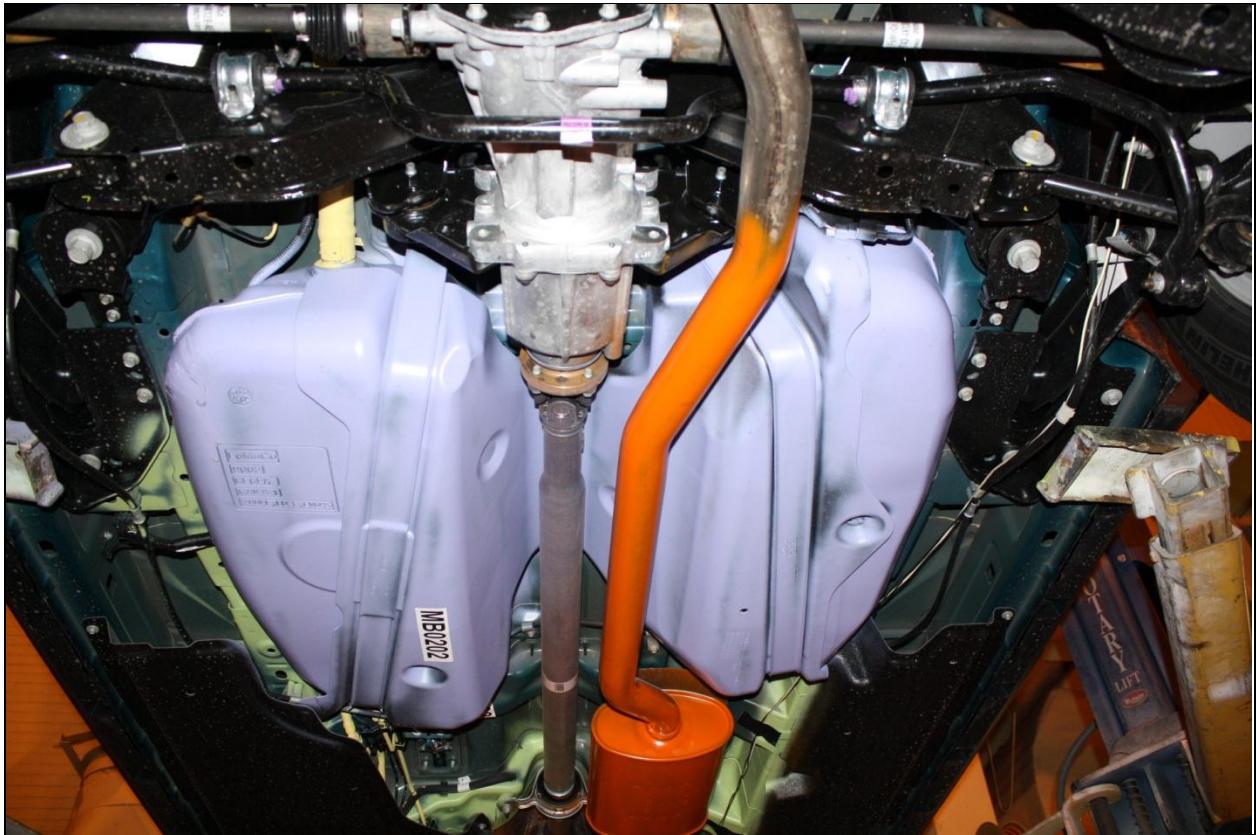


Figure A-25: Pre-Test Rear Underbody View

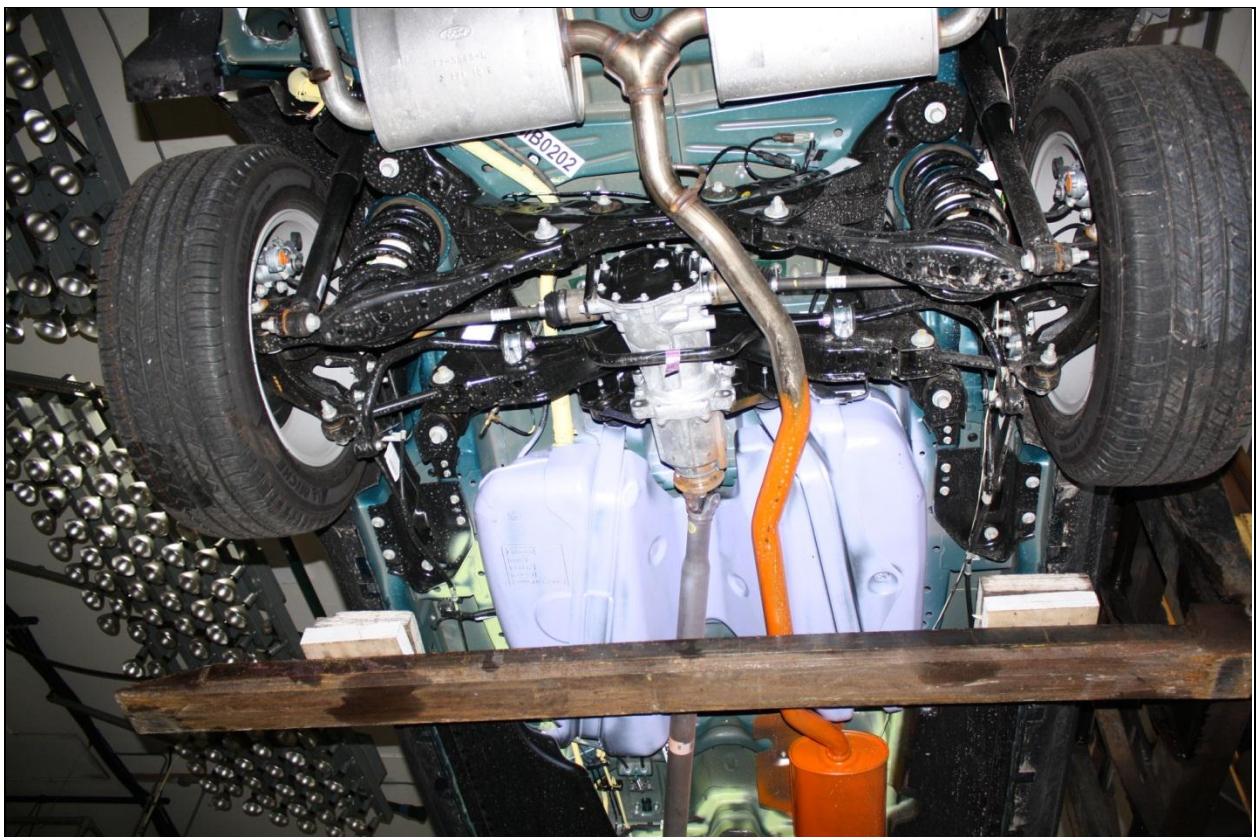


Figure A-26: Post-Test Rear Underbody View



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 Driver Dummy Feet



Figure A-38: Post-Test Driver Dummy Feet



Figure A-39: Pre-Test Driver's Side Knee Bolster

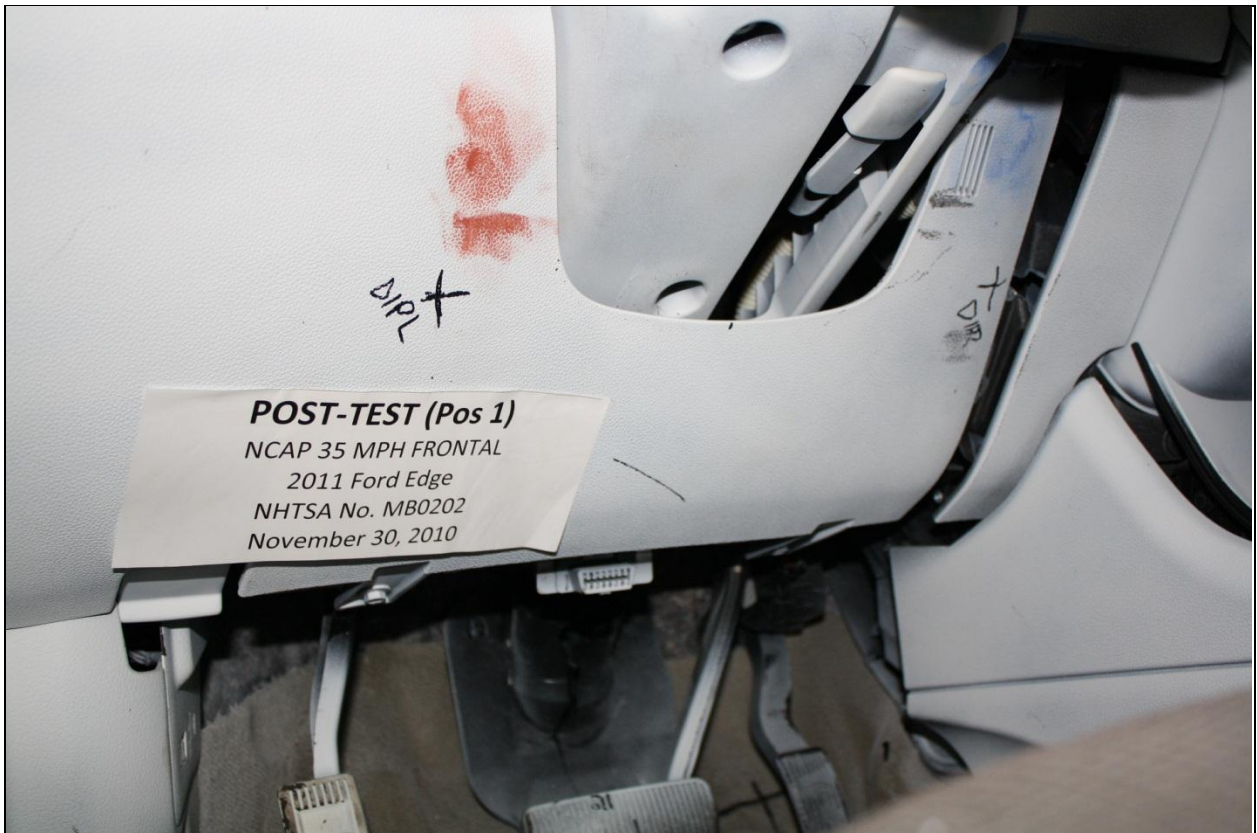


Figure A-40: Post-Test Driver's Side Knee Bolster

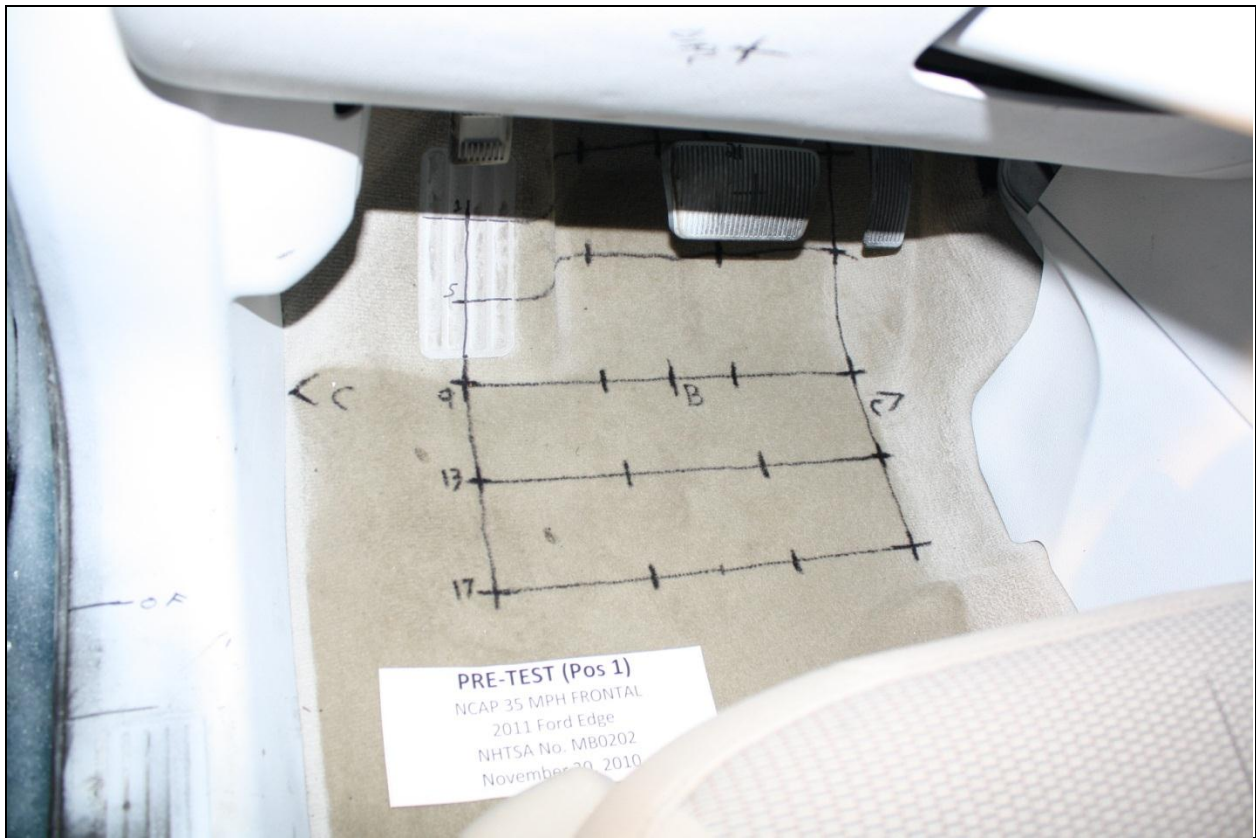


Figure A-41: Pre-Test Driver's Side Floorpan

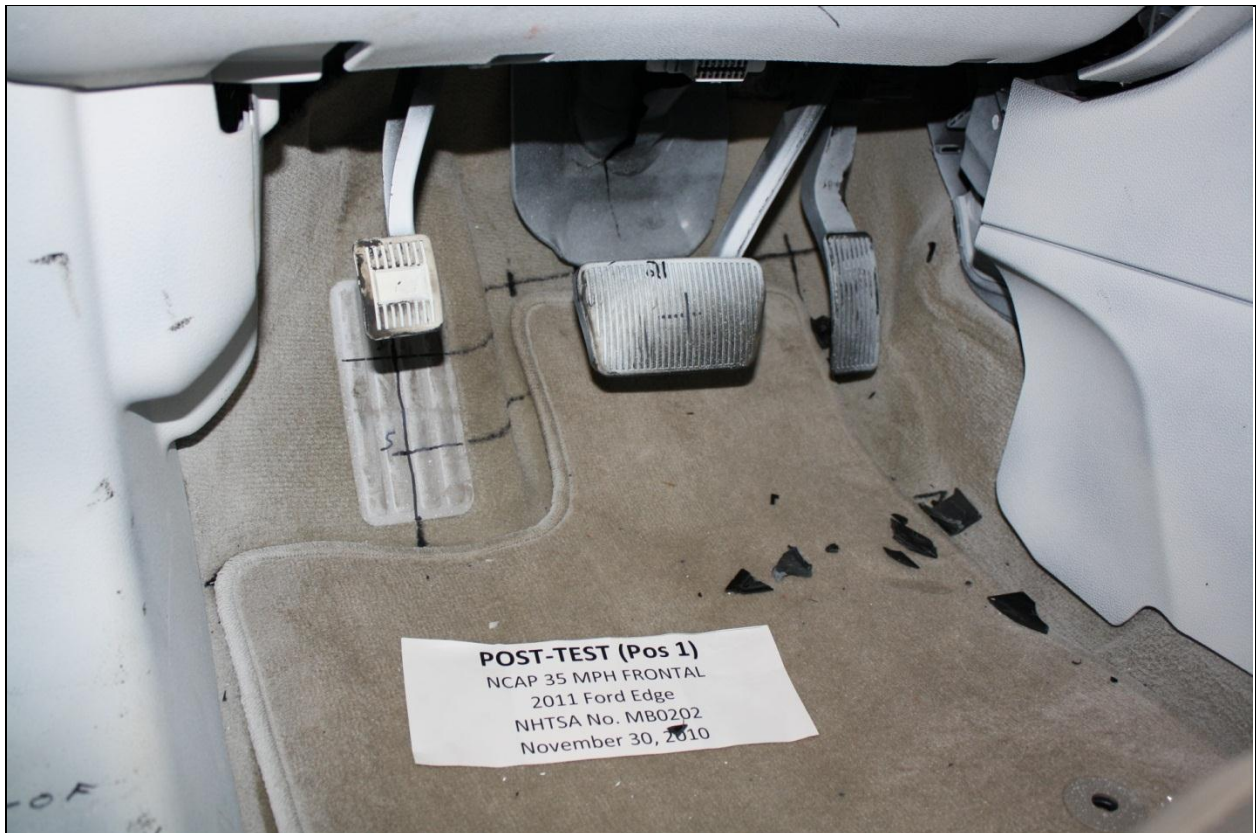


Figure A-42: Post-Test Driver's Side Floorpan

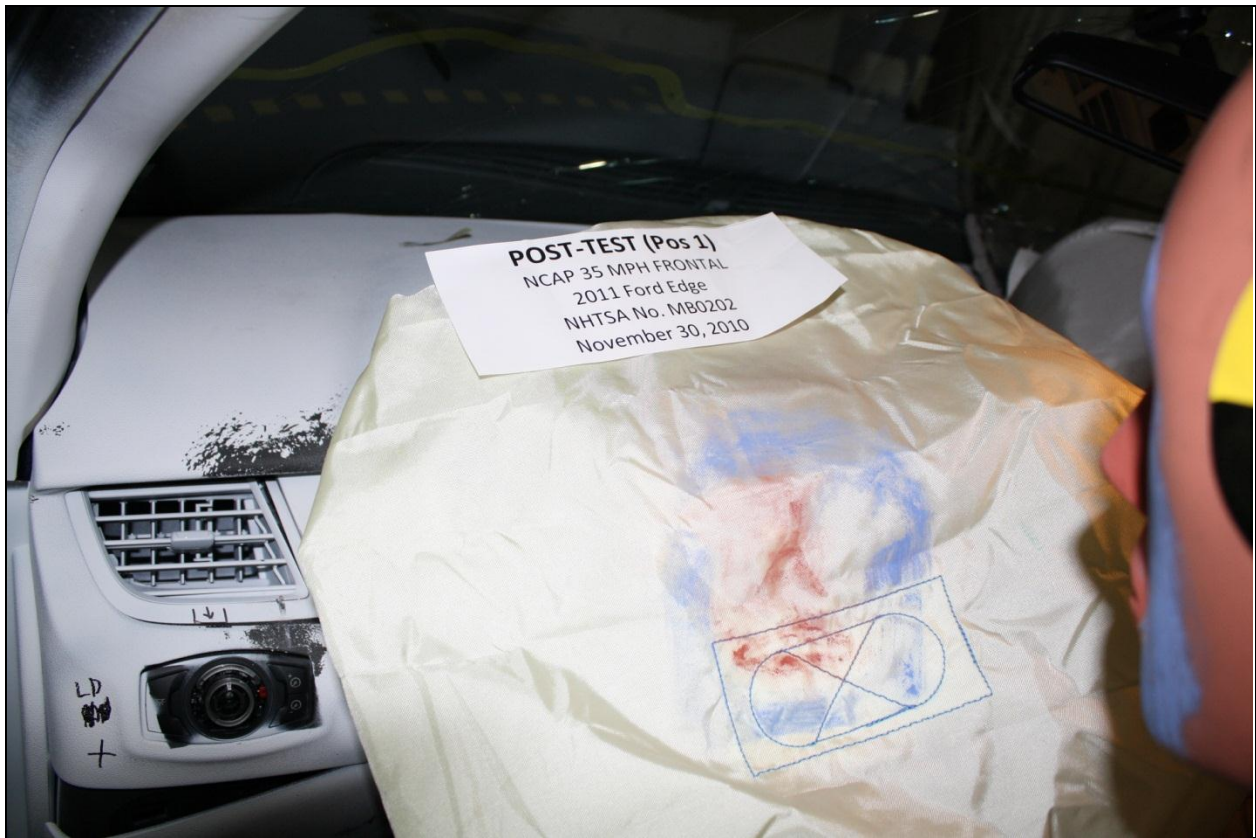


Figure A-43: Post-Test Diver Dummy Contact with Airbag



Figure A-43a: Post-Test Driver Dummy Contact with Head Restraint

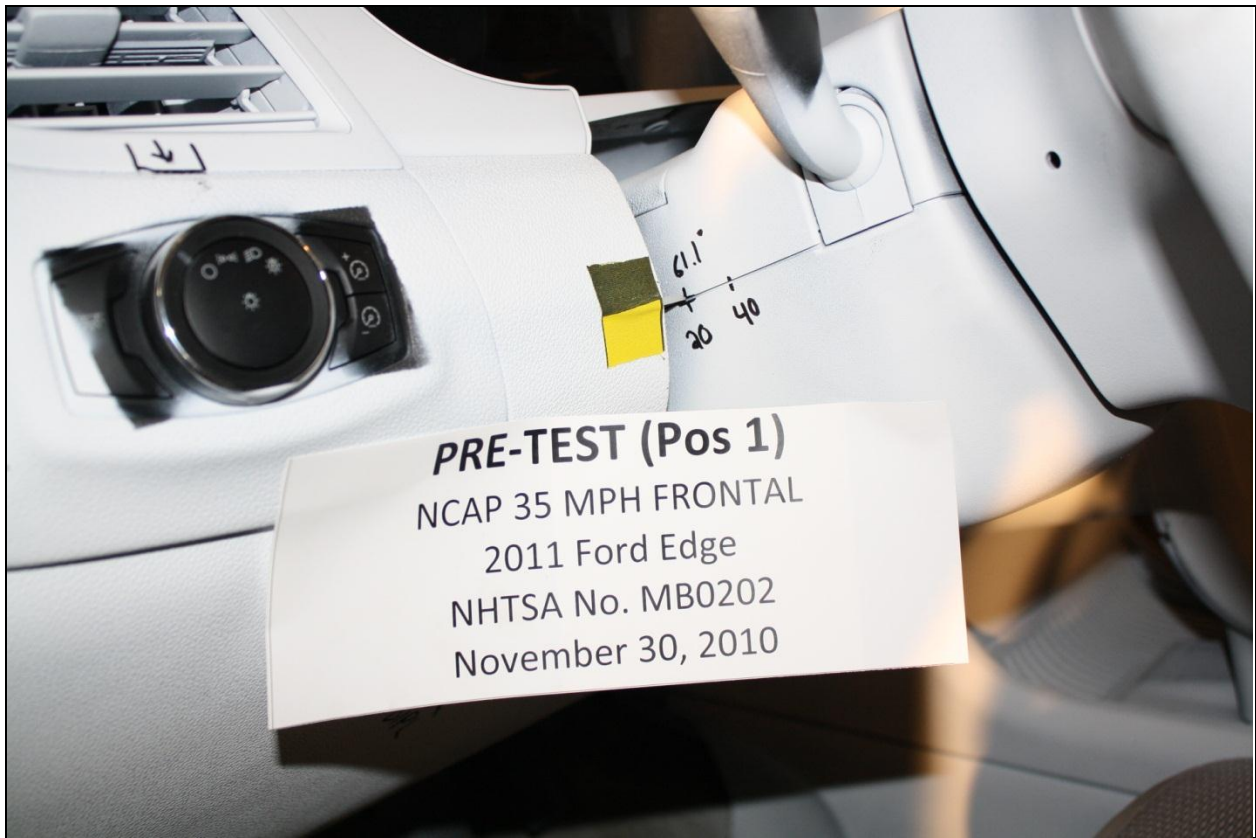


Figure A-44: Pre-Test View of the Steering Column Shear Capsule



Figure A-45: Post-Test View of the Steering Column Shear Capsule



Figure A-46: Pre-Test Passenger Dummy Front View

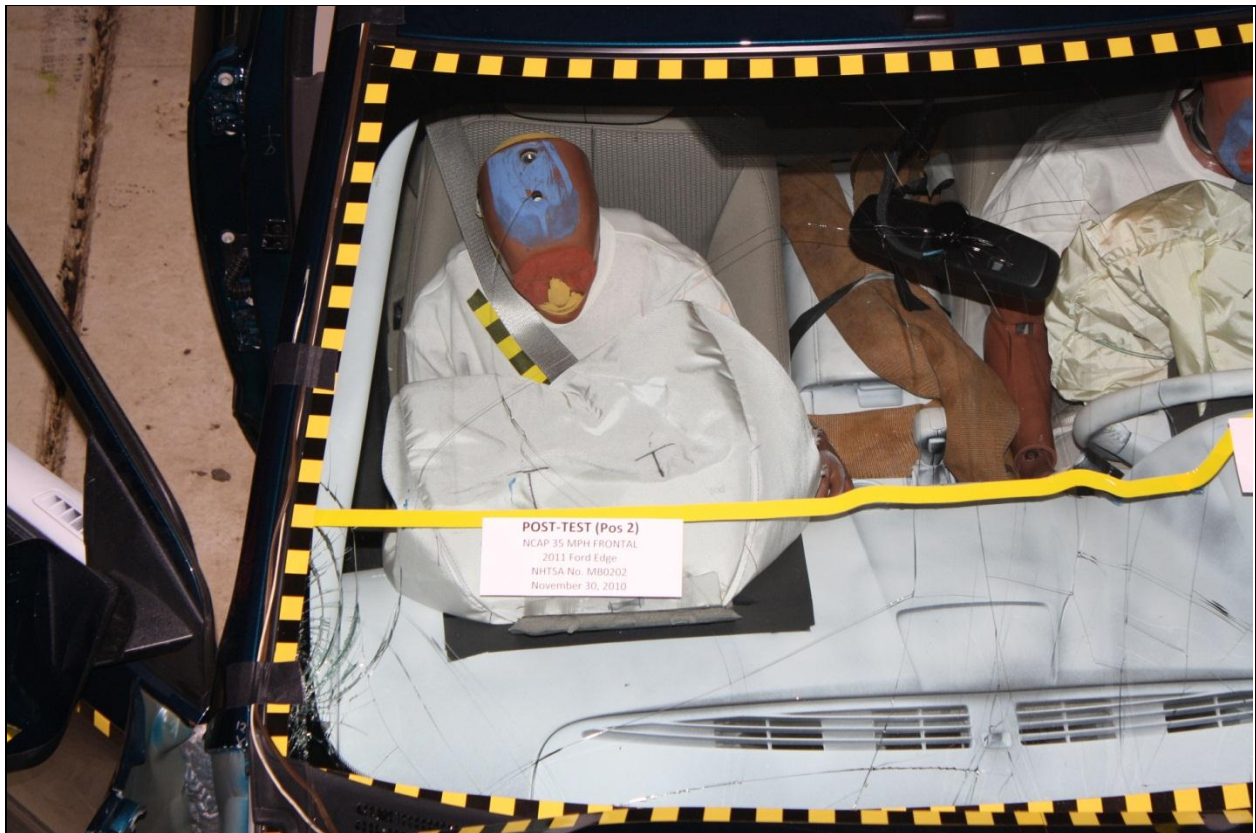


Figure A-47: Post-Test Passenger Dummy Front View



Figure A-48: Pre-Test Passenger Dummy Window View



Figure A-49: Post-Test Passenger Dummy Window View



Figure A-50: Pre-Test Passenger Dummy and Vehicle Interior View



Figure A-51: Post-Test Passenger Dummy and Vehicle Interior View

Photo Not Available

Figure A-52: Pre-Test Passenger's Seat Fore-Aft Markings

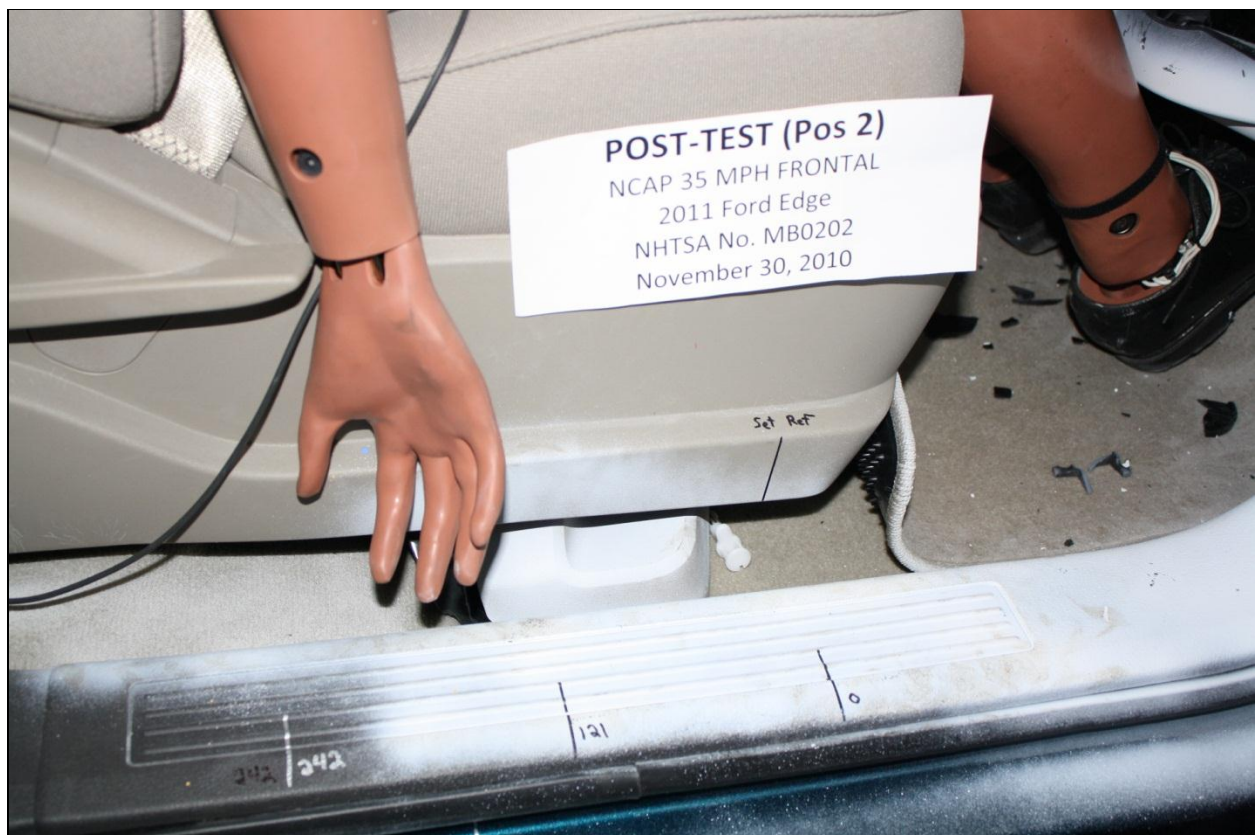


Figure A-53: Post-Test Passenger's Seat Fore-Aft Markings



Figure A-54: Pre-Test Passenger Dummy Feet



Figure A-55: Post-Test Passenger Dummy Feet

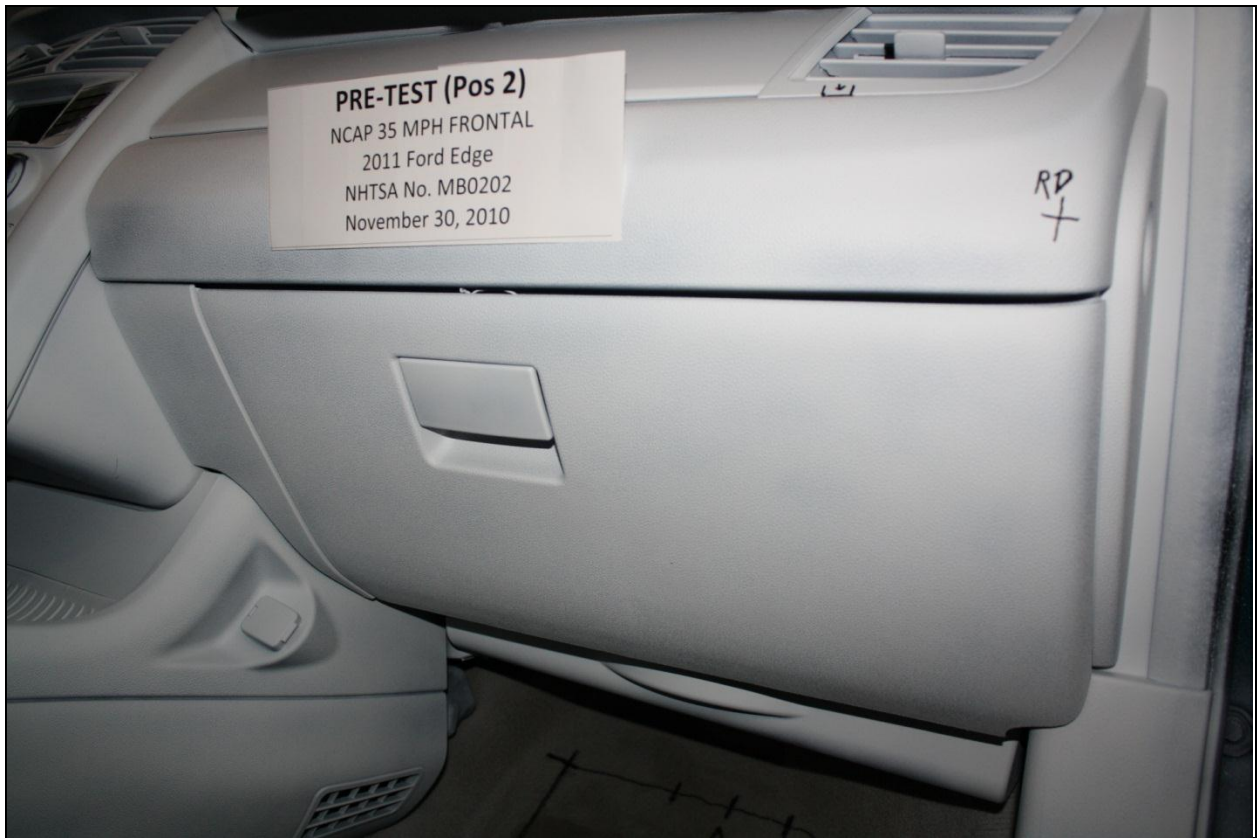


Figure A-56: Pre-Test Passenger's Side Knee Bolster



Figure A-57: Post-Test Passenger's Side Knee Bolster

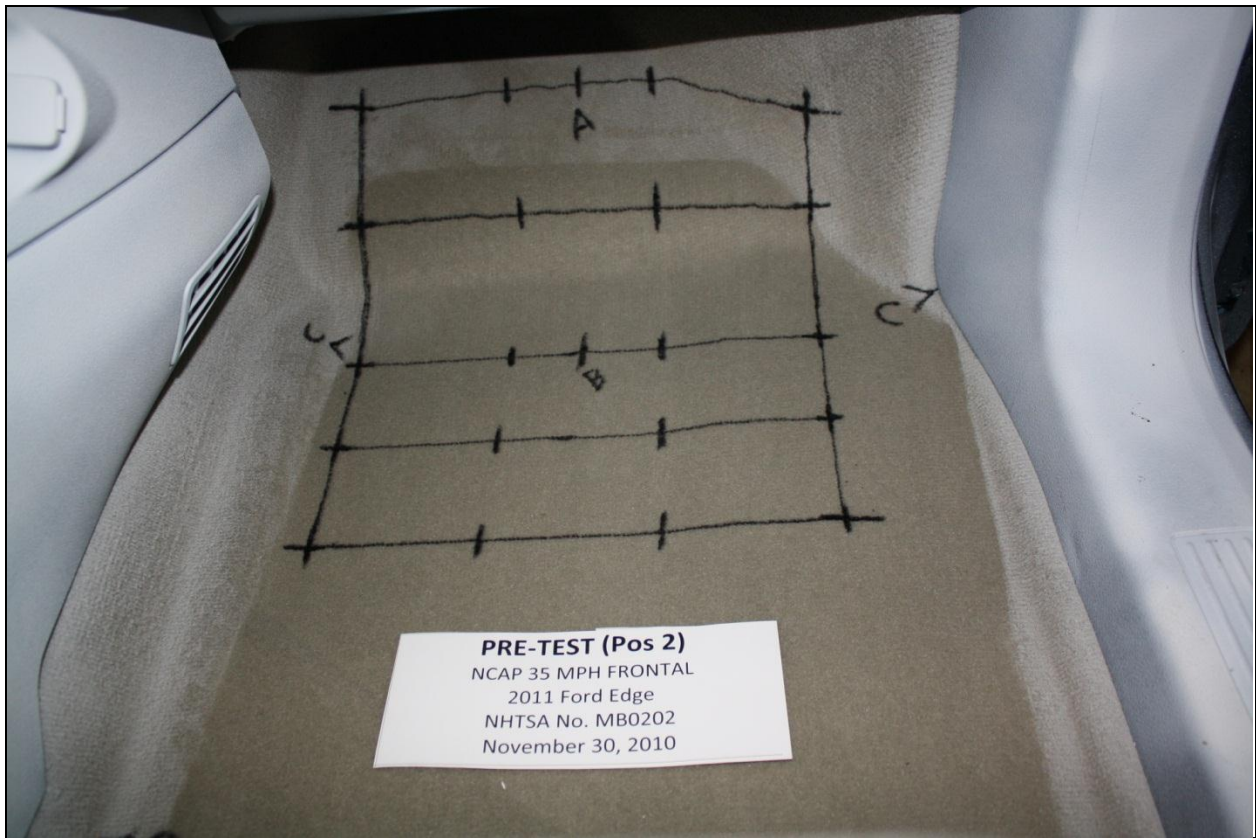


Figure A-58: Pre-Test Passenger's Side Floorpan



Figure A-59: Post-Test Passenger's Floorpan



Figure A-60: Post-Test Passenger Dummy Contact with Airbag

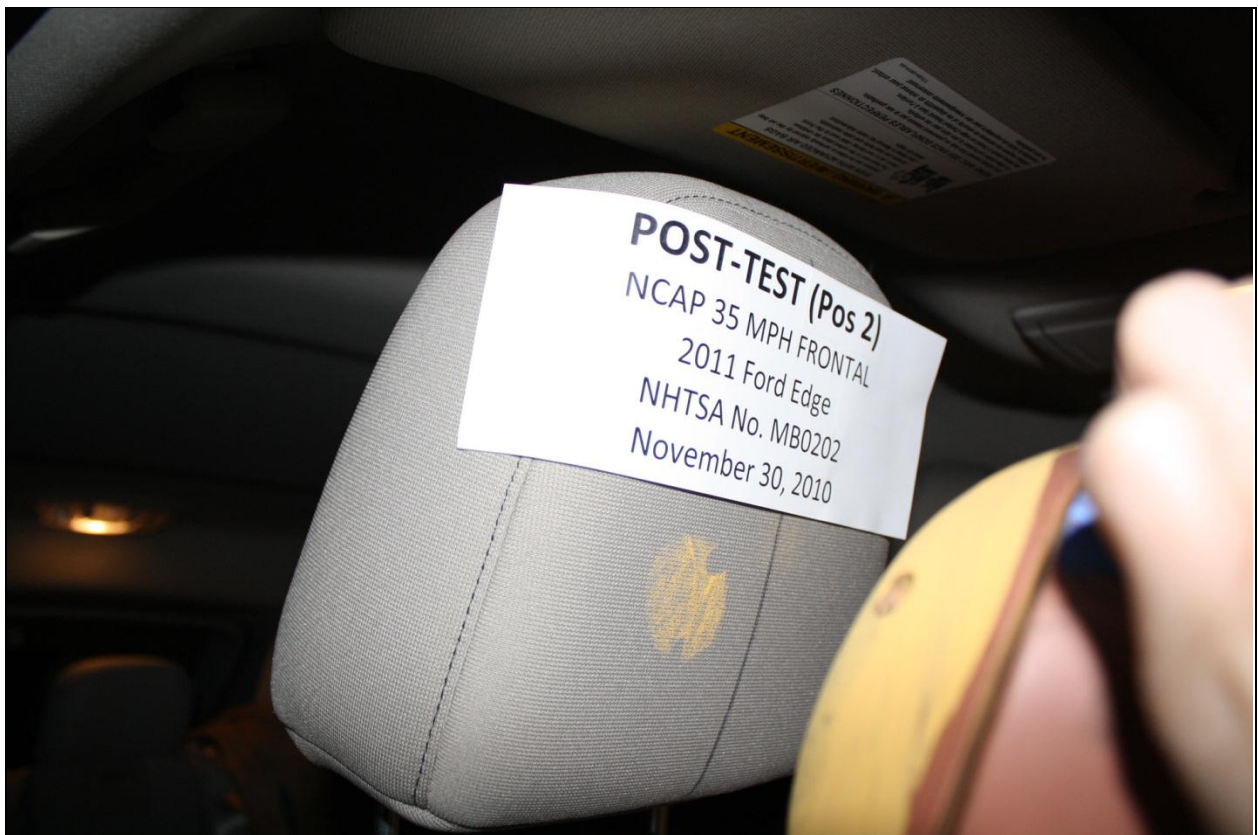


Figure A-60a: Post-Test Passenger Dummy Contact with Head Restraint

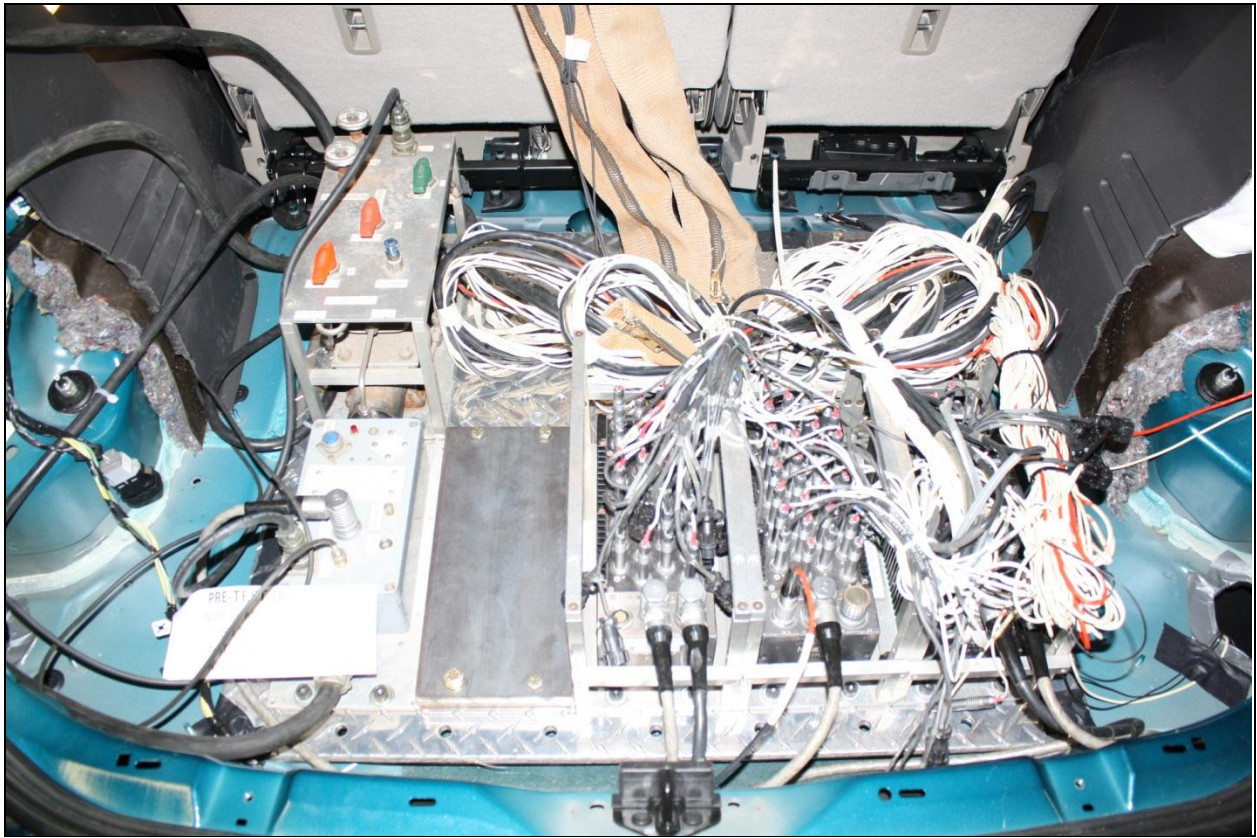


Figure A-61: Photograph of Ballast Installed Vehicle

Photo Not Applicable

Figure A-62: Post-Test Stoddard Solvent Spillage Location View

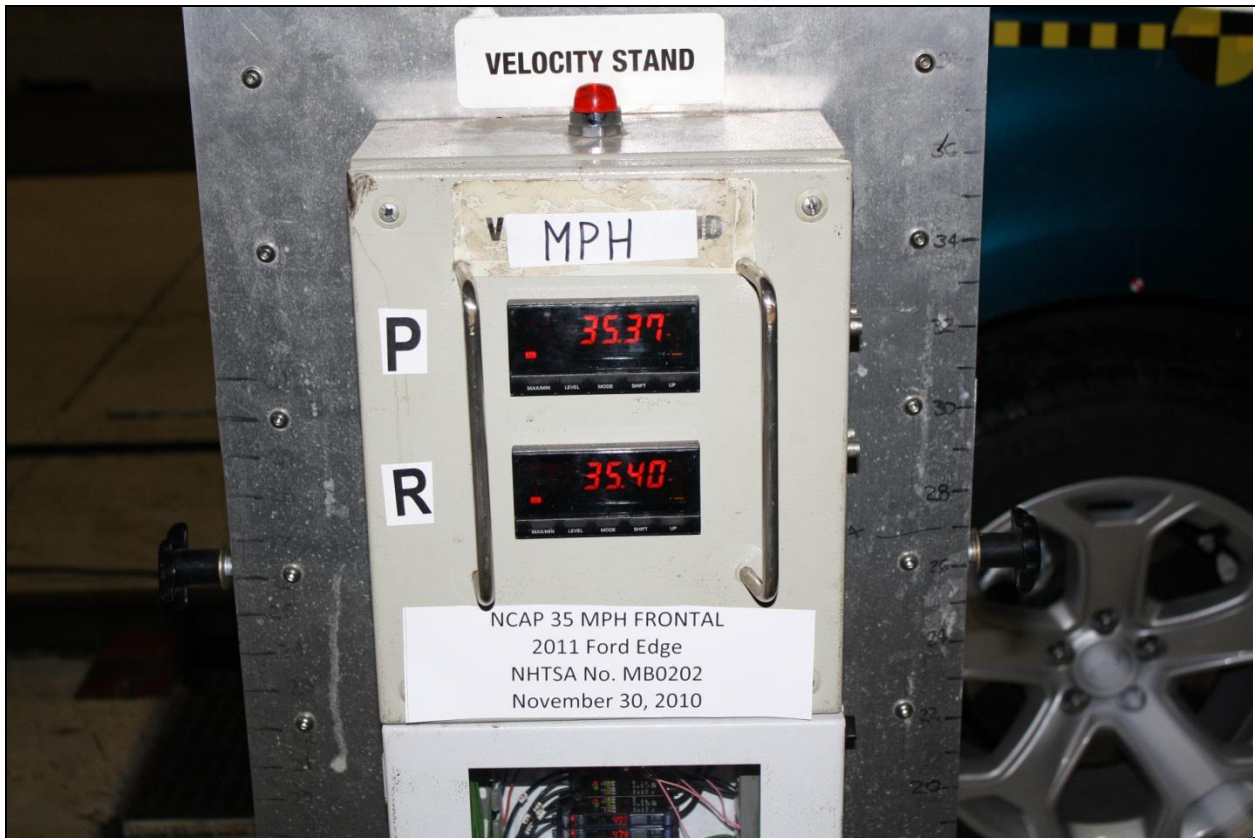


Figure A-63: Post-Test Speed Trap Read Out



Figure A-64: Vehicle at 0° on Static Rollover Device



Figure A-65: Vehicle at 90° on Static Rollover Device



Figure A-66: Vehicle at 180° on Static Rollover Device



Figure A-67: Vehicle at 270° on Static Rollover Device



Figure A-68: Vehicle at 360° on Static Rollover Device



Figure A-69: Impact Photograph

Ford		VEHICLE DESCRIPTION		2011 FORD EDGE-SEL AWD		EXTERIOR		BB A30107						
www.fordvehicles.com		EDGE		5-PASSENGER 3.5L TI-VCT V6 ENGINE 6-SPD AUTOMATIC TRANS		MEDITERRANEAN BLUE METALLIC INTERIOR MED LT STONE CLOTH								
STANDARD EQUIPMENT INCLUDED AT NO EXTRA CHARGE					PRICE INFORMATION									
EXTERIOR <ul style="list-style-type: none"> 18" PAINTED ALUMINUM W/LS AUTO PROTECT BEAM HEADLAMPS SUPPLEMENTAL PARK LAMPS KEYLESS ENTRY KEYPAD DUAL POWER HEATED MIRRORS W/SECURITY APPROACH LAMPS REAR SPOILER ROOF RAILS INTERIOR <ul style="list-style-type: none"> PREMIUM CLOTH BUCKET FRONT SEAT 6-WAY POWER DRIVER'S SEAT W/CASTFOLD REMOTE RELEASE AM/FM SINGLE CD/MP3/SCHEM DUAL ZONE ELEC TEMP CTRL W/REAR STEERING W/LS/SPEED/AUD & 3-WAY SWITCH CLUSTER CONTR TILT/TELE STEERING COLUMN 					FUNCTIONAL <ul style="list-style-type: none"> 6-SPEED SELECTSHIFT TRANS 10.0 GALLON FUEL TANK INDEP. FR & RR SUSPENSION REVERSE SENSING SYSTEM AUTO DIM REARVIEW MIRROR POWER POINTS (4) KEYLESS SAFETY/SECURITY <ul style="list-style-type: none"> 4-WHEEL DISC BRAKES W/ABS ADVANCETRAC W/ESC PERSONAL SAFETY SYSTEM SLIDE AID SAFETY CANOPY CHILD SEAT TETHER ANCHOR SLIDE IMPACT DOOR BEARING TIRE PRESSURE MONITOR SYS WARRANTY <ul style="list-style-type: none"> 3-YR/50,000 BUMPER-TO-BUMPER 5-YR/60,000 POWERTRAIN 3-YR/50,000 ROADSIDE ASSIST 					STANDARD VEHICLE PRICE \$32,070.00 INCLUDED ON THIS VEHICLE RAPID SPEC 2.0A OPTIONAL EQUIPMENT FRONT LICENSE PLATE BRACKET NO CHARGE CALIFORNIA/GREEN STATES EMISSIONS NO CHARGE ROOF RAILS-BLACK 195.00 TOTAL OPTIONS 195.00 TOTAL VEHICLE & OPTIONS 32,265.00 DESTINATION & DELIVERY 32,775.00				
EPA Fuel Economy Estimates CITY MPG: 18 (Expected range for most drivers: 14 to 22 MPG) HIGHWAY MPG: 25 (Expected range for most drivers: 28 to 36 MPG) Estimated Annual Fuel Cost: \$2,250 (based on 15,000 miles at \$3.00 per gallon) Combined Fuel Economy: 21 (This Vehicle) / 21 (All SUVs) Your actual mileage will vary depending on how you drive and maintain your vehicle.														
TOTAL MSRP \$33,040.00 GOVERNMENT SAFETY RATINGS Frontal Crash: Driver Passenger To Be Rated To Be Rated Side Crash: Front seat Rear seat To Be Rated To Be Rated Rollover: ★★★★★ Star ratings based on the risk of injury in a single vehicle crash. Star ratings range from 1 to 5 stars (★★★★★), with 5 being the highest. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or call 1-888-327-4236														
SOLD TO 44G 117 West Hiller Ford of Ambient, LLC 10 Campbell Blvd Getzville NY 14068		ONE	DEALER NO.	METHOD OF TRANSP.										
		CA60	44G 117	CONVOY										
SHIP TO IF OTHER THAN SOLD TO		TWO	2FMDK4JC0BA30107		ITEM #		44-1523 O/T 2							
SHIP THROUGH		FINAL ASSEMBLY POINT		<small>This label is placed pursuant to the Federal Automobile Information Disclosure Act. Dealer's, retailer's, and fleet name, state and local taxes are not included. Dealer's contact information or accessories are not included unless stated otherwise.</small>										
		OAKVILLE		AJ241 N RB 2X 115 000214 09 24 10										
EXTENDED SERVICE PLAN Ford Extended Service Plan is the only service contract backed by Ford and honored at all Ford and Lincoln Mercury Dealers. Ask your dealer for price and additional details or see our website at www.ford-esp.com .														

Figure A-70: Monroney Label Photograph

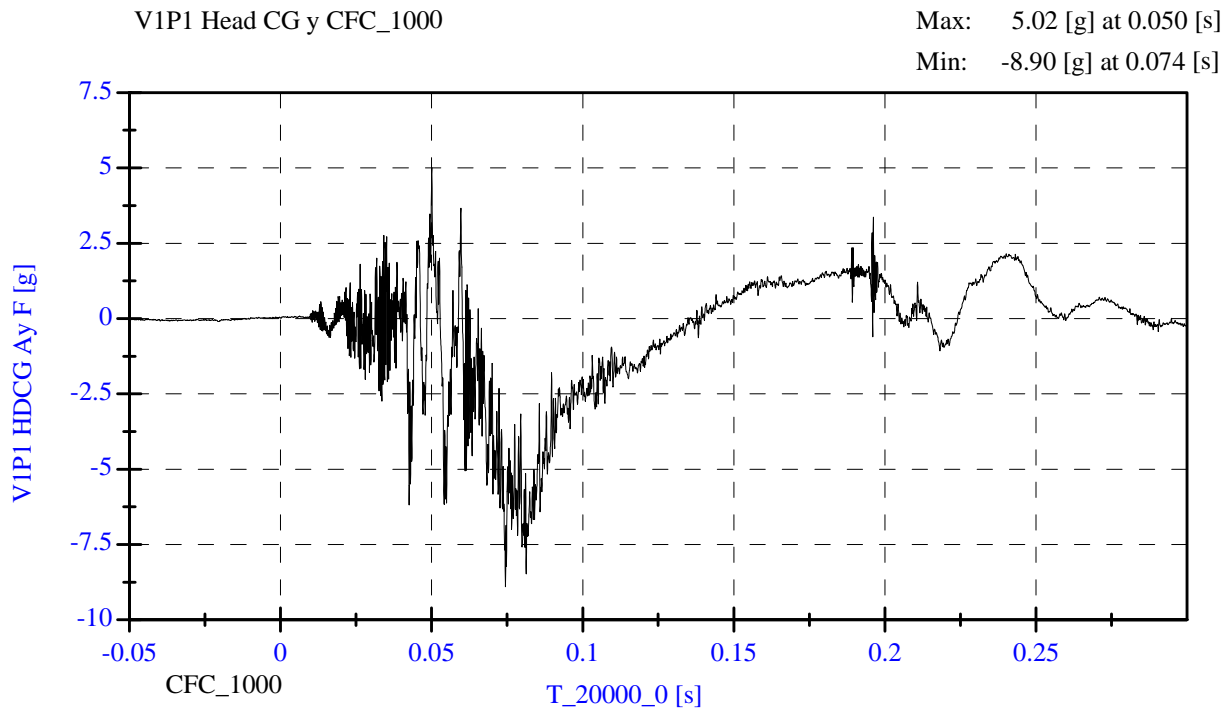
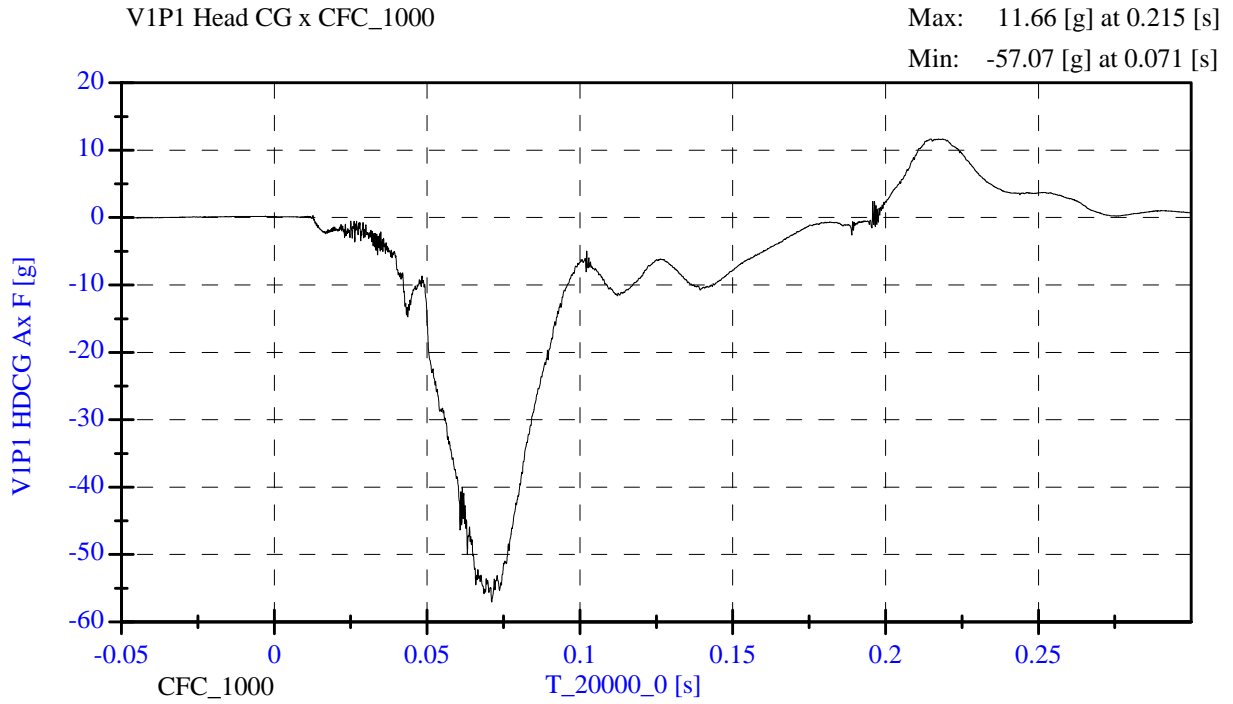
APPENDIX B
DUMMY RESPONSE DATA TRACES

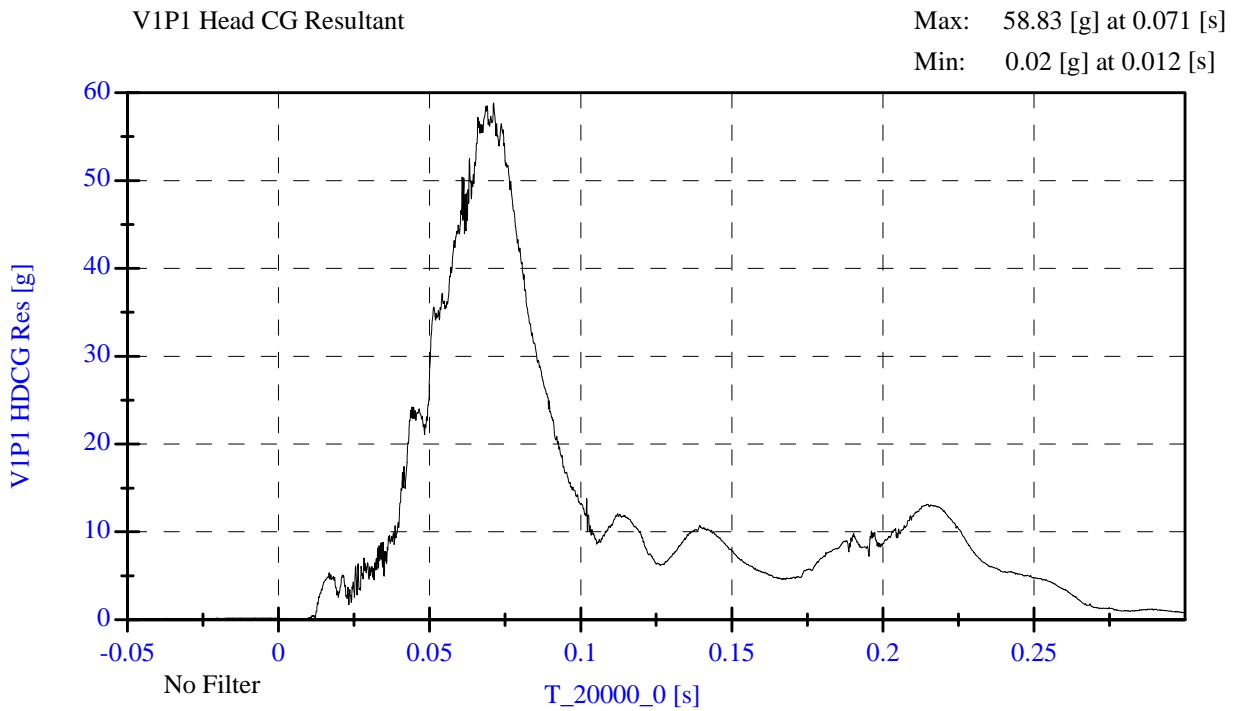
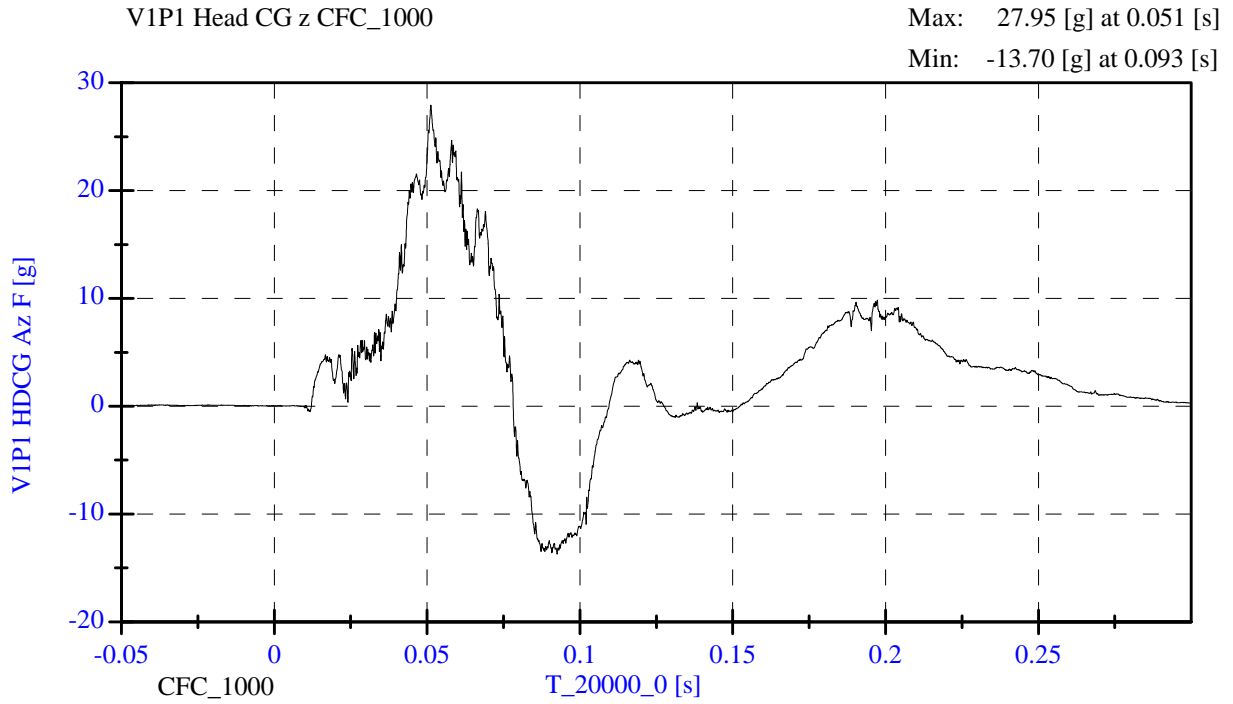
Fig. No.	List of Data Plots Provided In The Test Report	Page No.
1	Driver Head X Acceleration vs. Time Primary	B-5
2	Driver Head Y Acceleration vs. Time Primary	B-5
3	Driver Head Z Acceleration vs. Time Primary	B-6
4	Driver Head Resultant Acceleration vs. Time Primary	B-6
5	Driver Chest X Deflection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

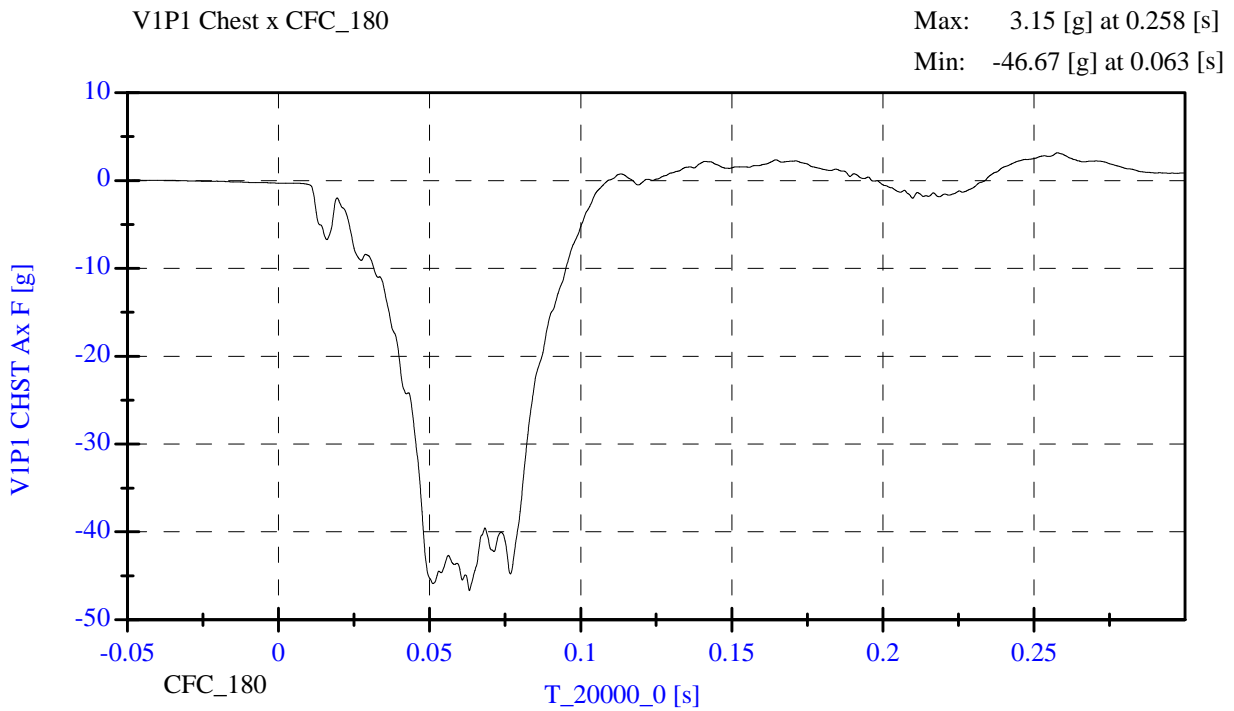
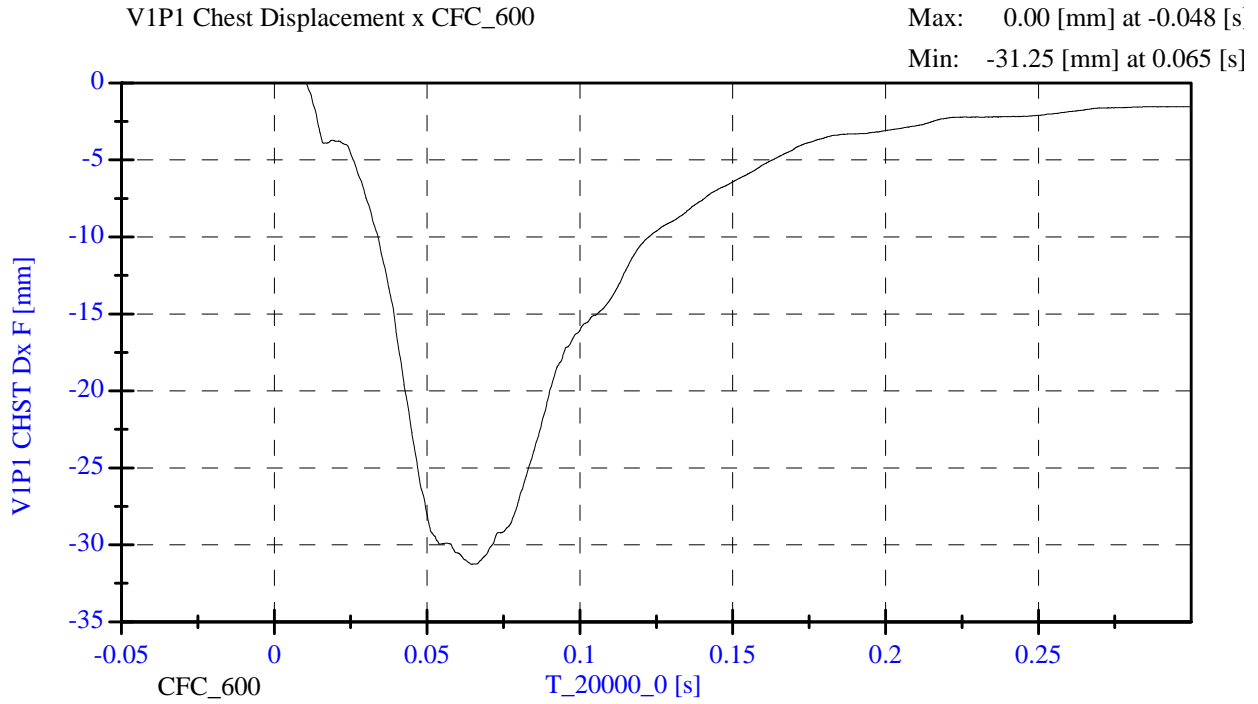
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

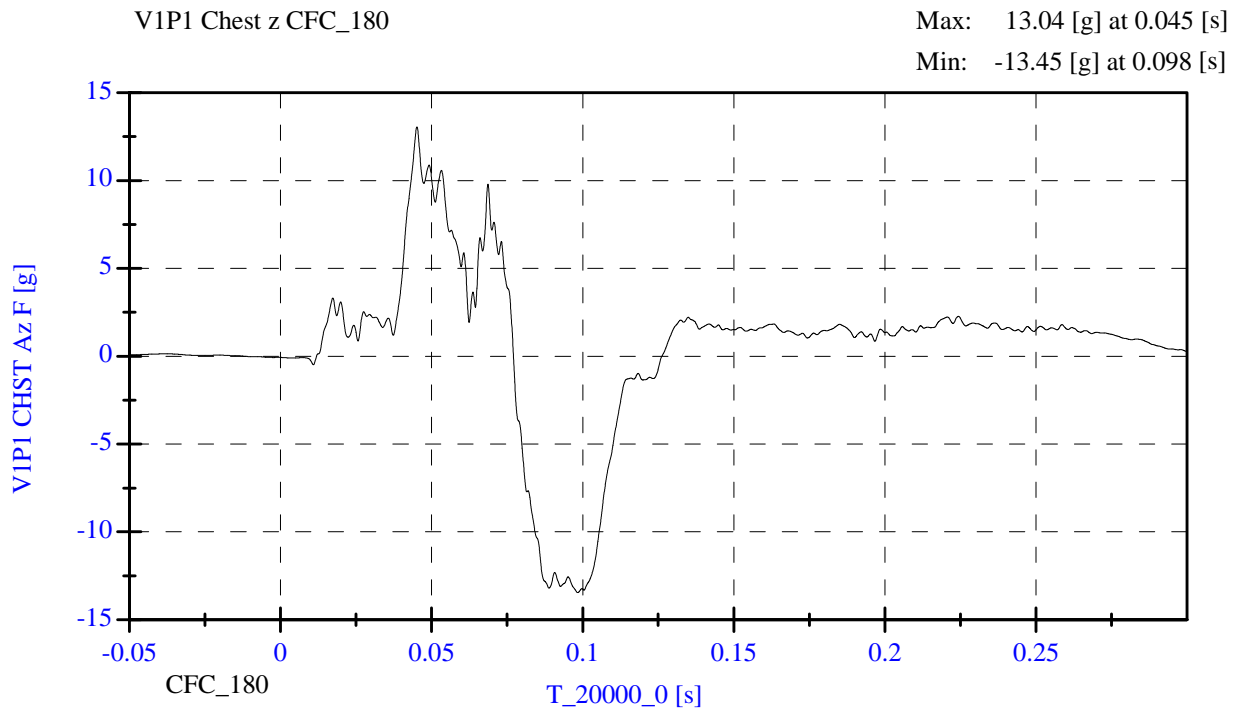
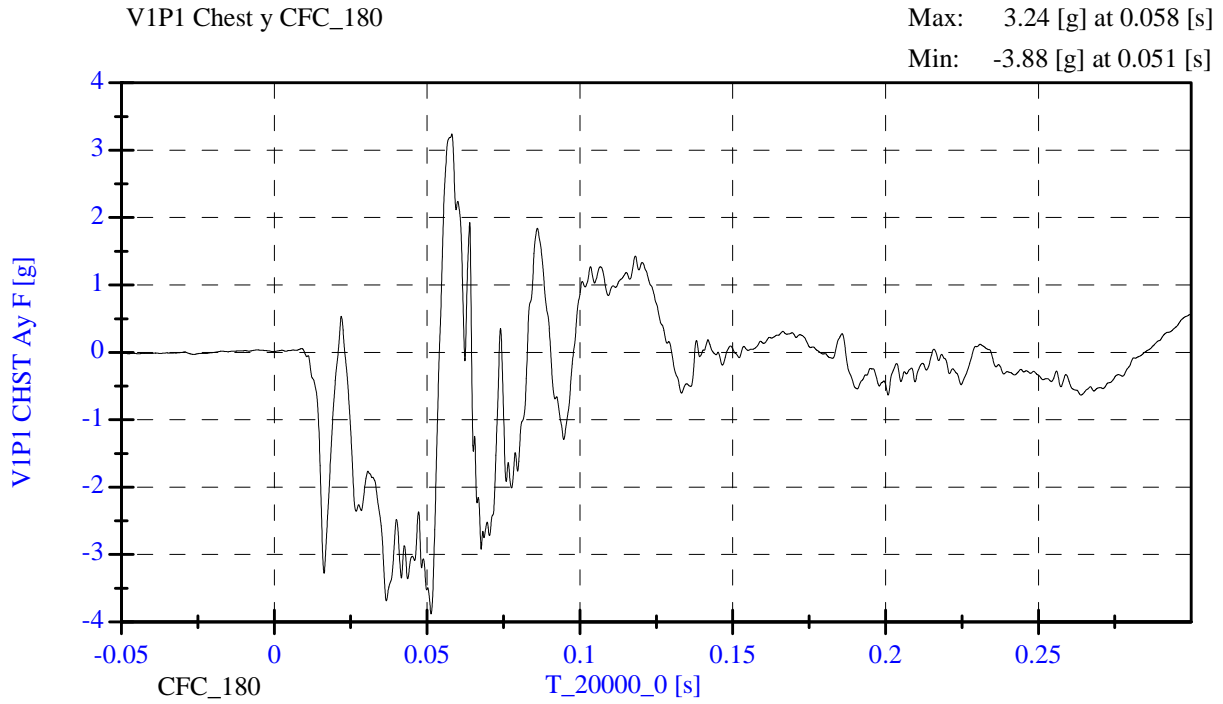
Driver Head X Acceleration Redundant
 Driver Head Y Acceleration Redundant
 Driver Head Z Acceleration Redundant
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Acceleration Redundant
 Driver Chest Y Acceleration Redundant
 Driver Chest Z Acceleration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

Passenger Right Upper Tibia Force Z
Passenger Right Lower Tibia Moment X
Passenger Right Lower Tibia Moment Y
Passenger Right Lower Tibia Force Z
Passenger Left Foot Fore Z
Passenger Left Foot Aft X
Passenger Left Foot Aft Z
Passenger Right Foot Fore Z
Passenger Right Foot Aft X
Passenger Right Foot Aft Z
Left Rear Seat Crossmember X
Left Rear Seat Crossmember Z
Right Rear Seat Crossmember X
Right Rear Seat Crossmember Z
Vehicle Engine Top X
Vehicle Engine Bottom X
Vehicle Left Brake Caliper X
Vehicle Right Brake Caliper X
Load Cell Barrier A1-A9
Load Cell Barrier B1-A9
Load Cell Barrier C1-A9
Load Cell Barrier D1-A9





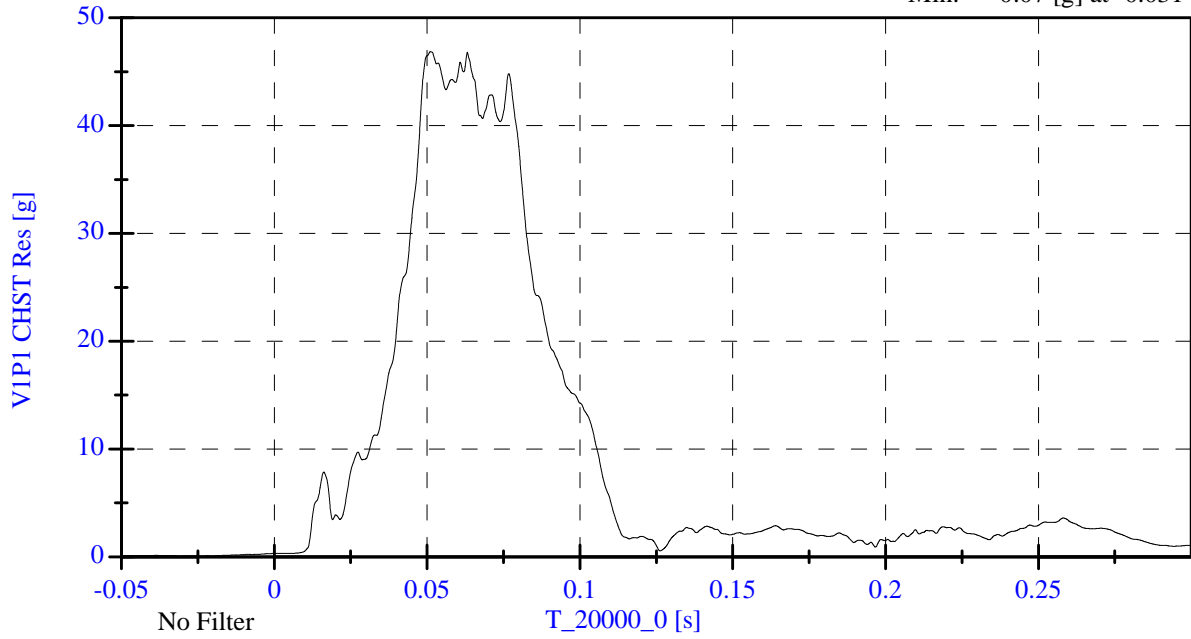




VIP1 Chest Resultant

Max: 46.87 [g] at 0.051 [s]

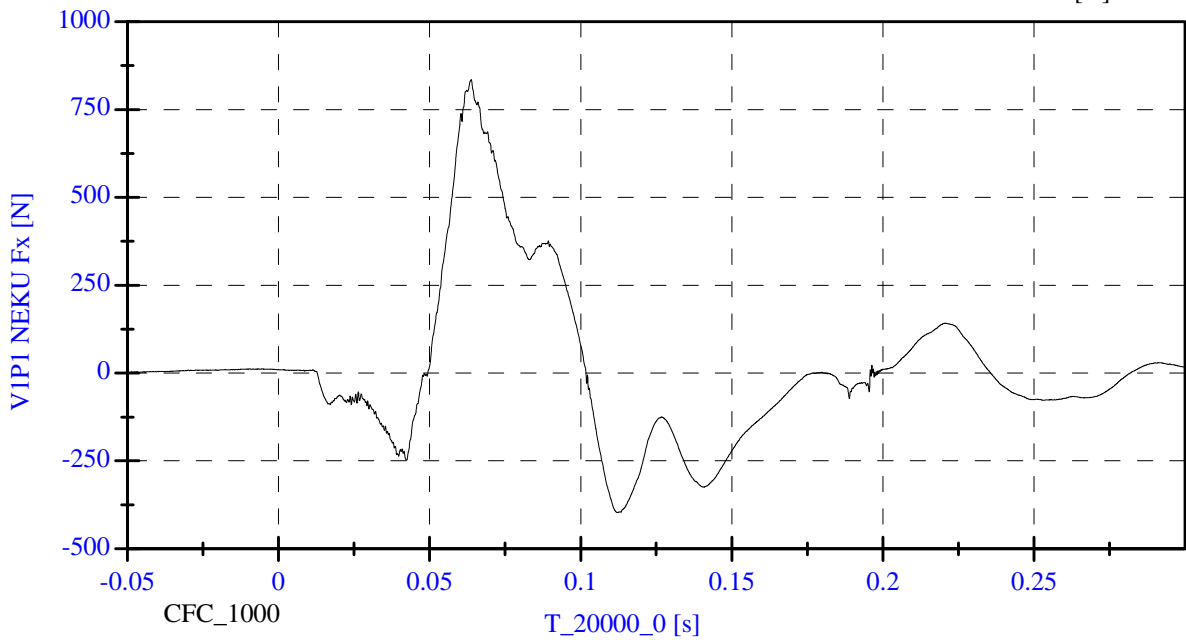
Min: 0.07 [g] at -0.031 [s]

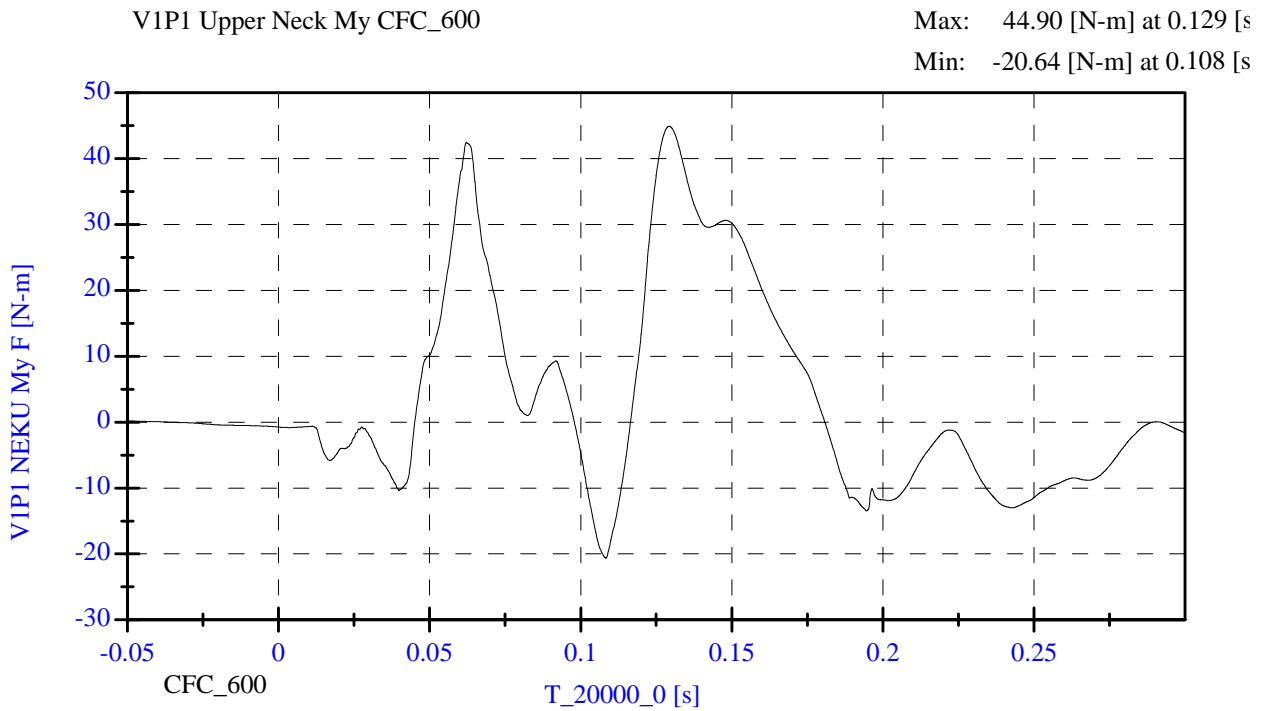
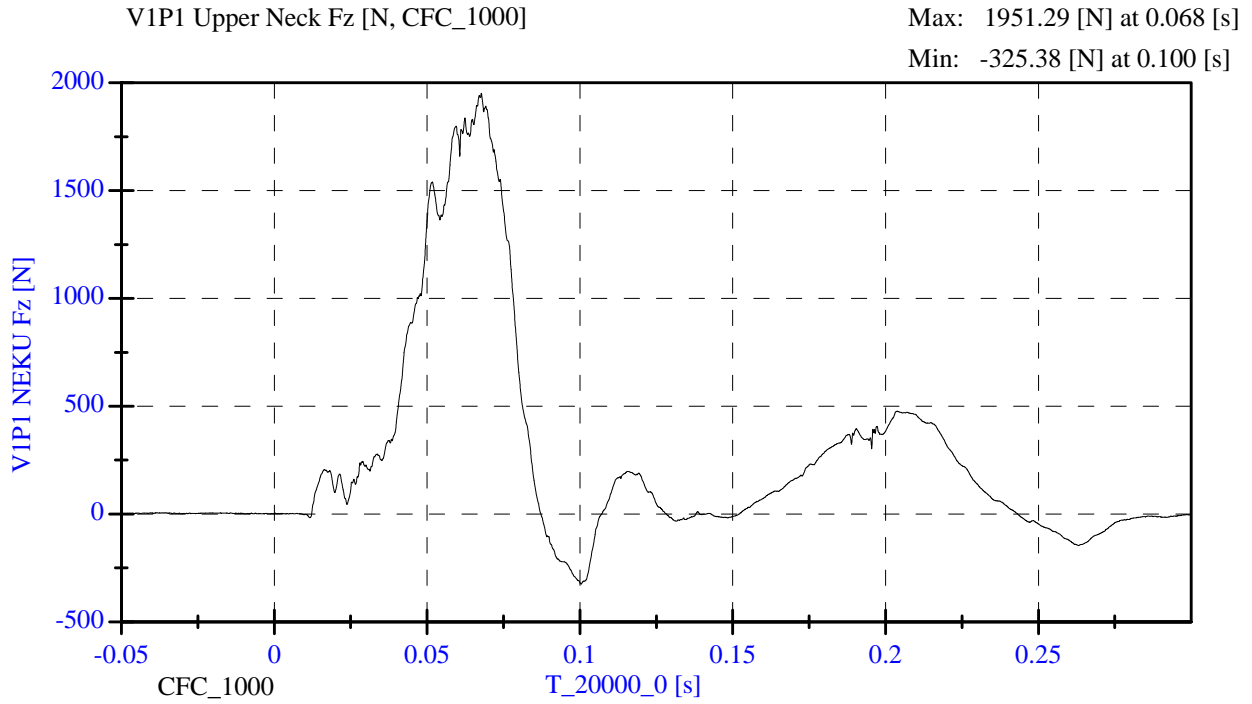


VIP1 Upper Neck Fx [N, CFC_1000]

Max: 835.26 [N] at 0.064 [s]

Min: -397.24 [N] at 0.112 [s]

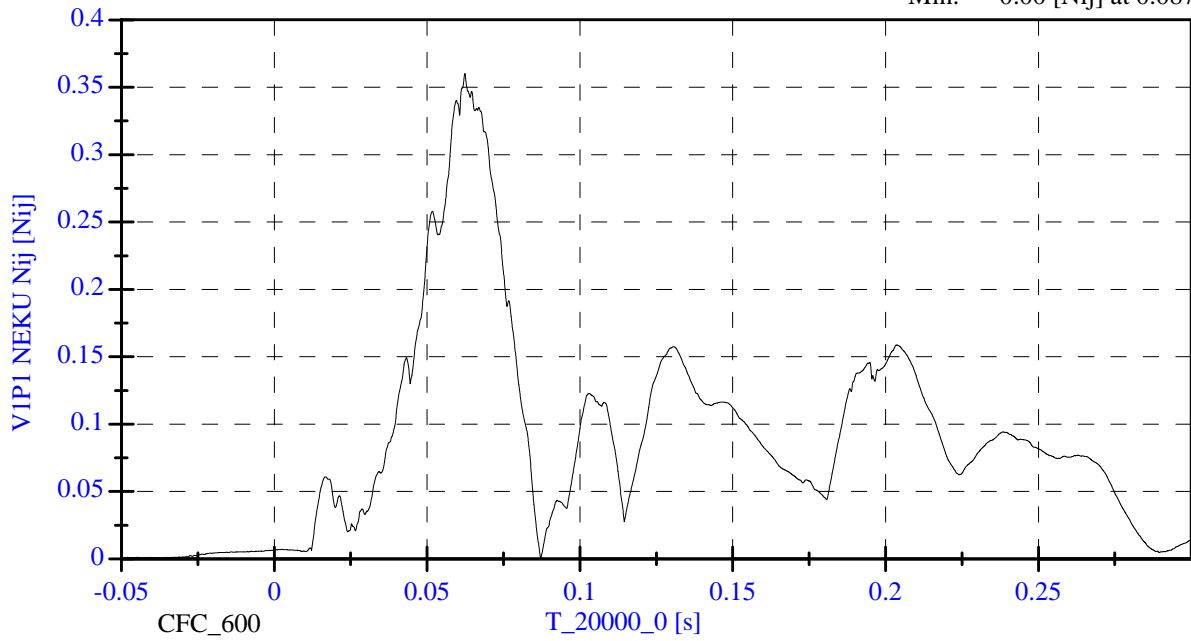




VIP1 Upper Neck Nij [Nij, CFC_600]

Max: 0.36 [Nij] at 0.062 [s]

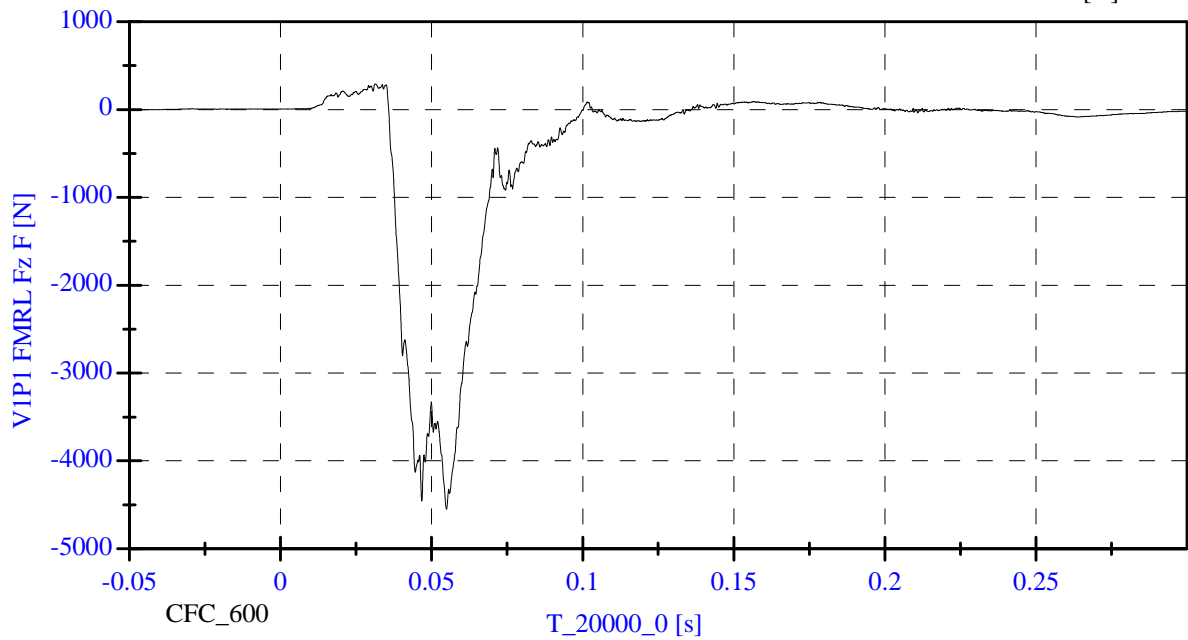
Min: 0.00 [Nij] at 0.087 [s]

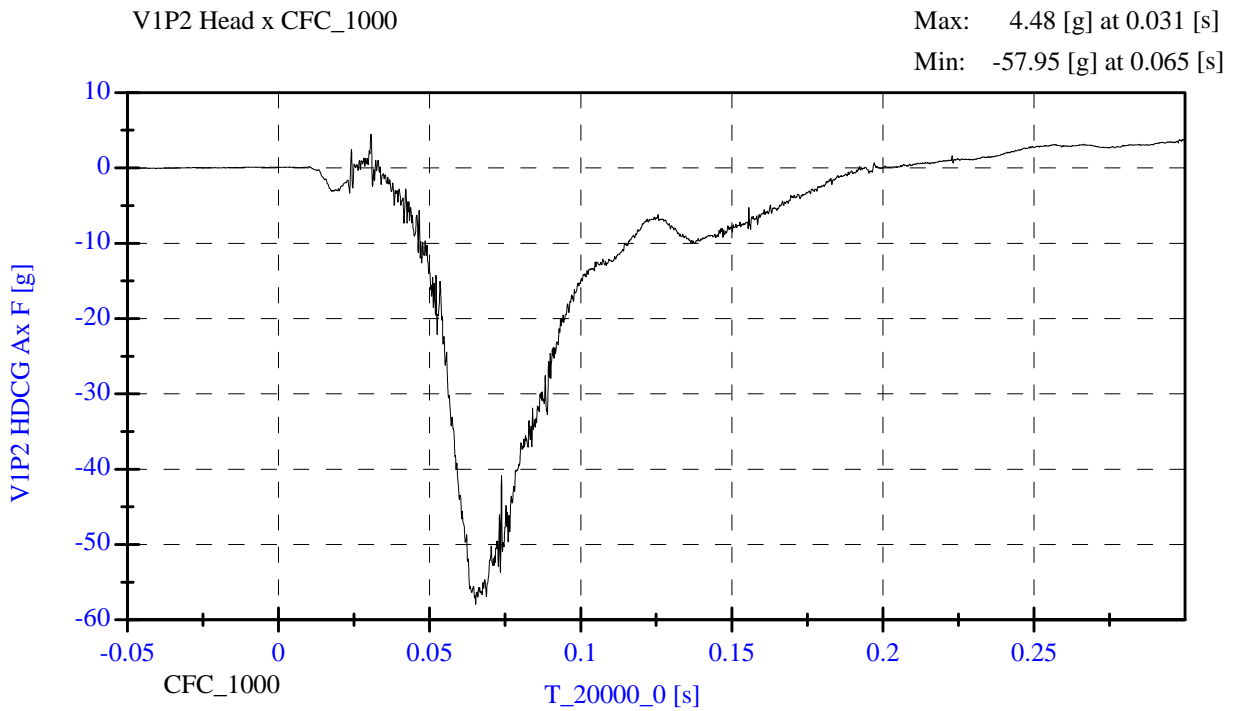
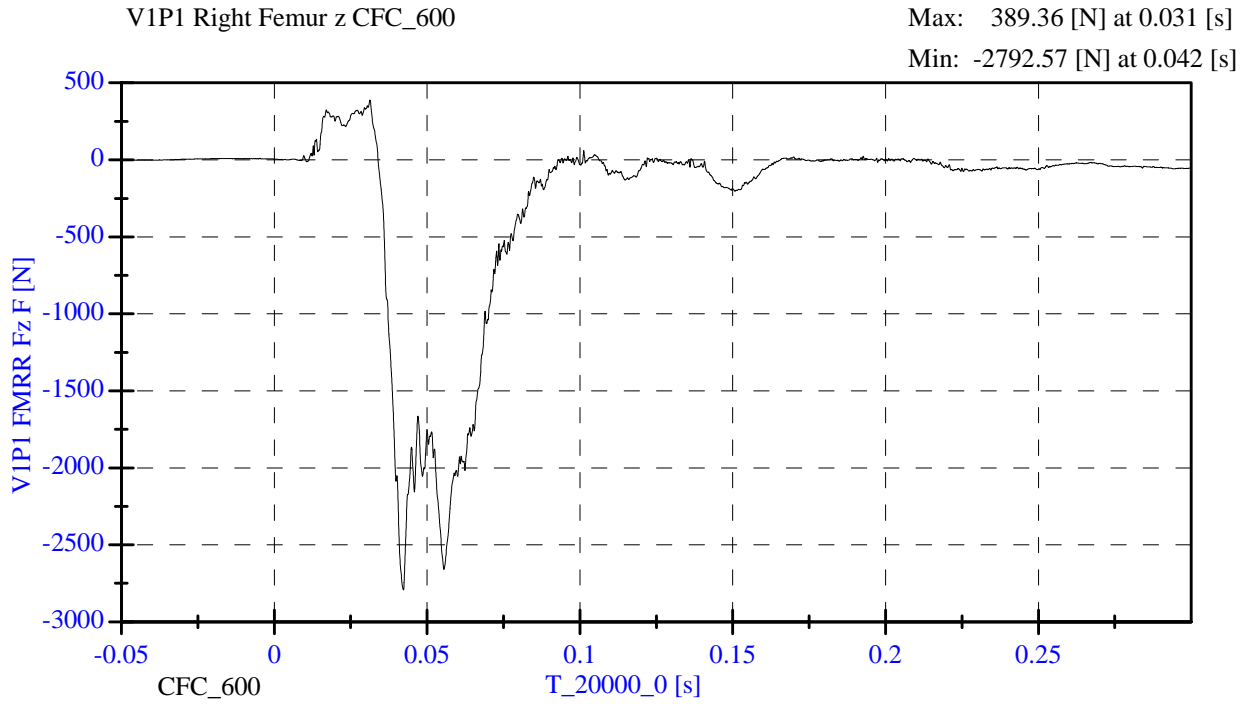


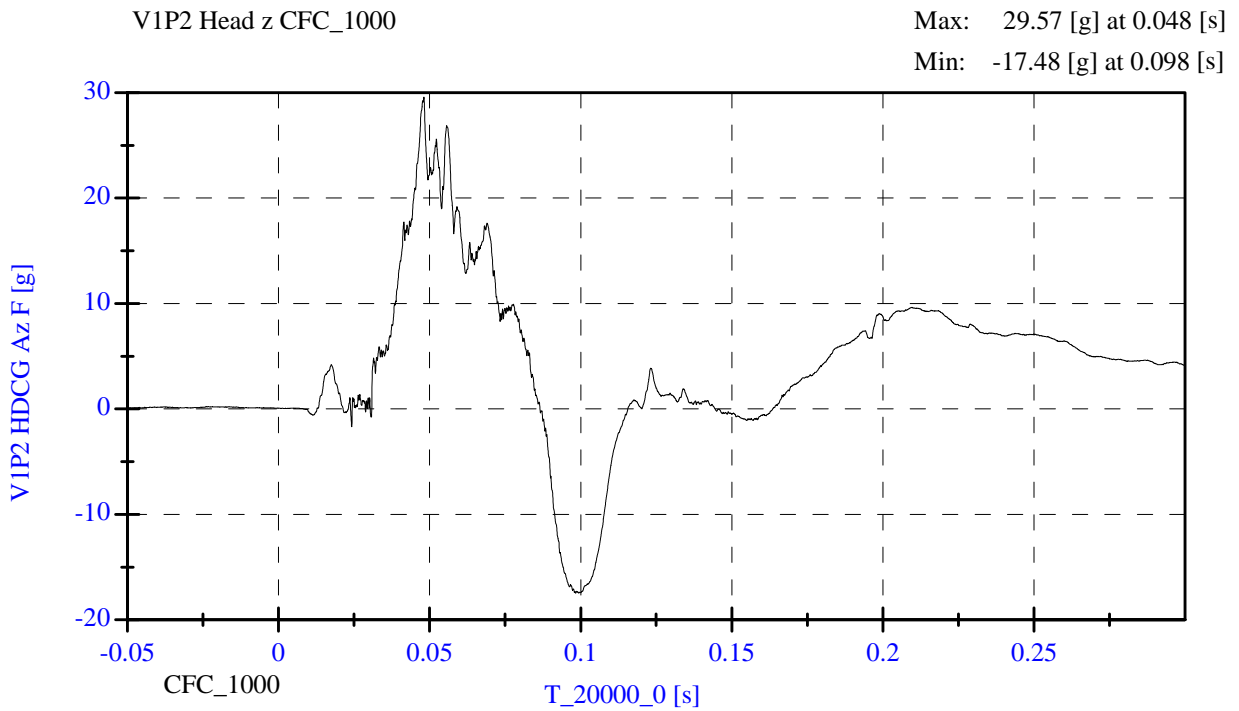
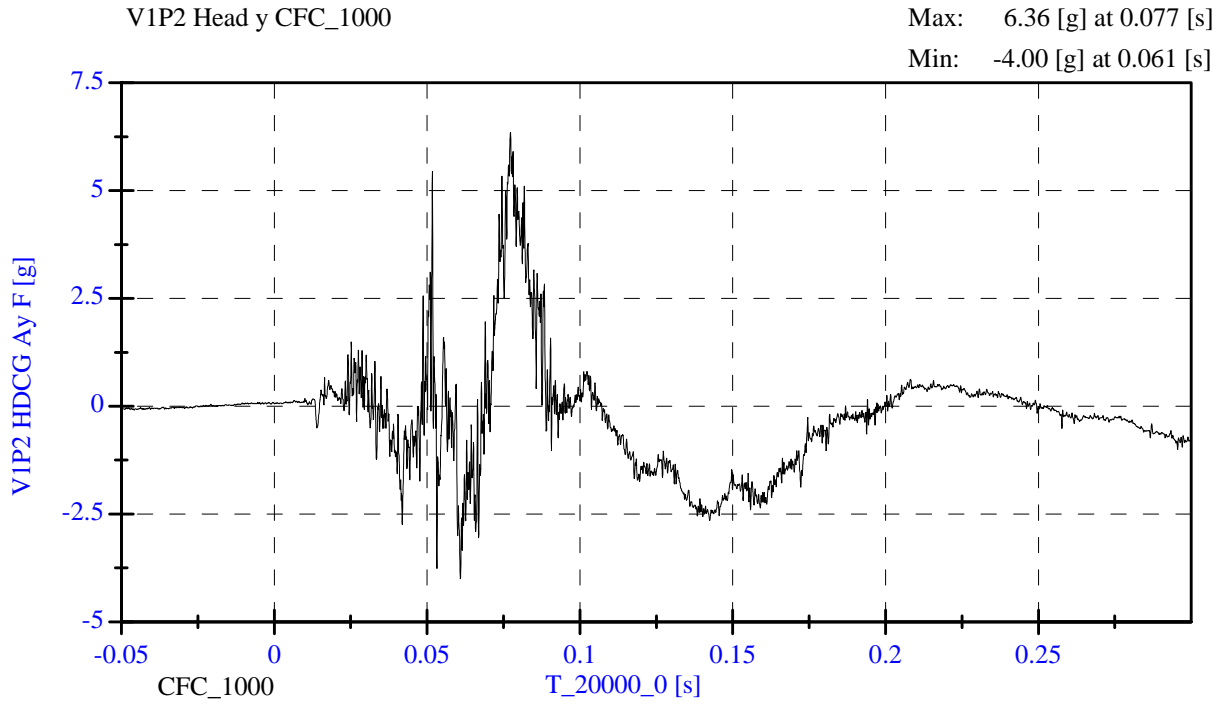
VIP1 Left Femur z CFC_600

Max: 291.24 [N] at 0.031 [s]

Min: -4548.56 [N] at 0.055 [s]



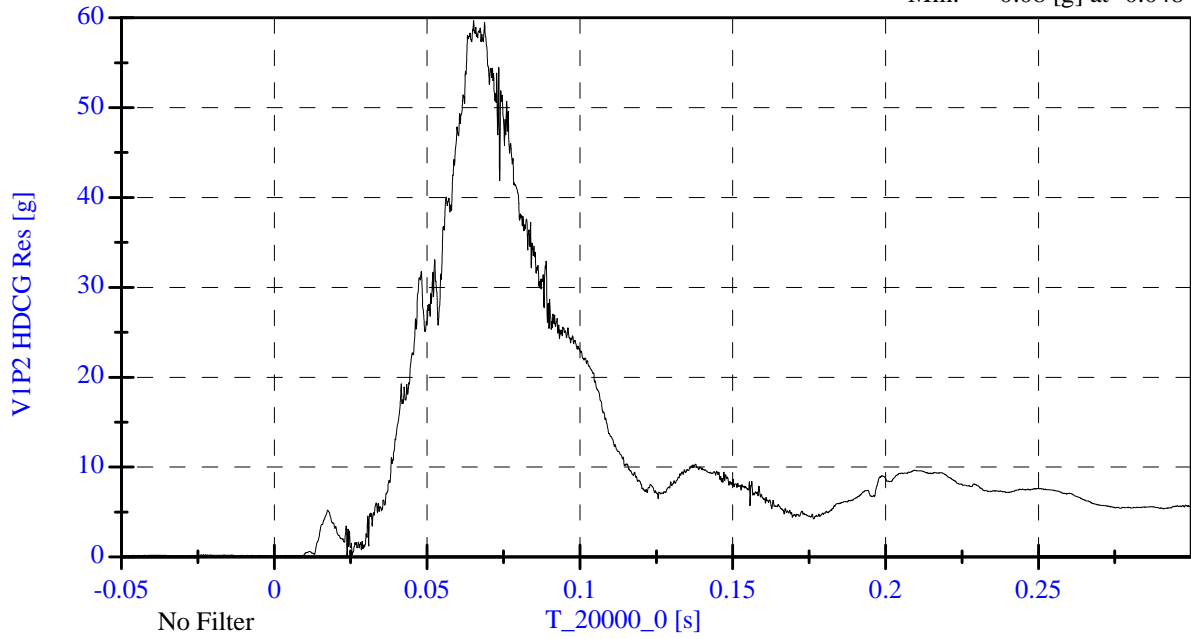




V1P2 Head CG Resultant

Max: 59.70 [g] at 0.065 [s]

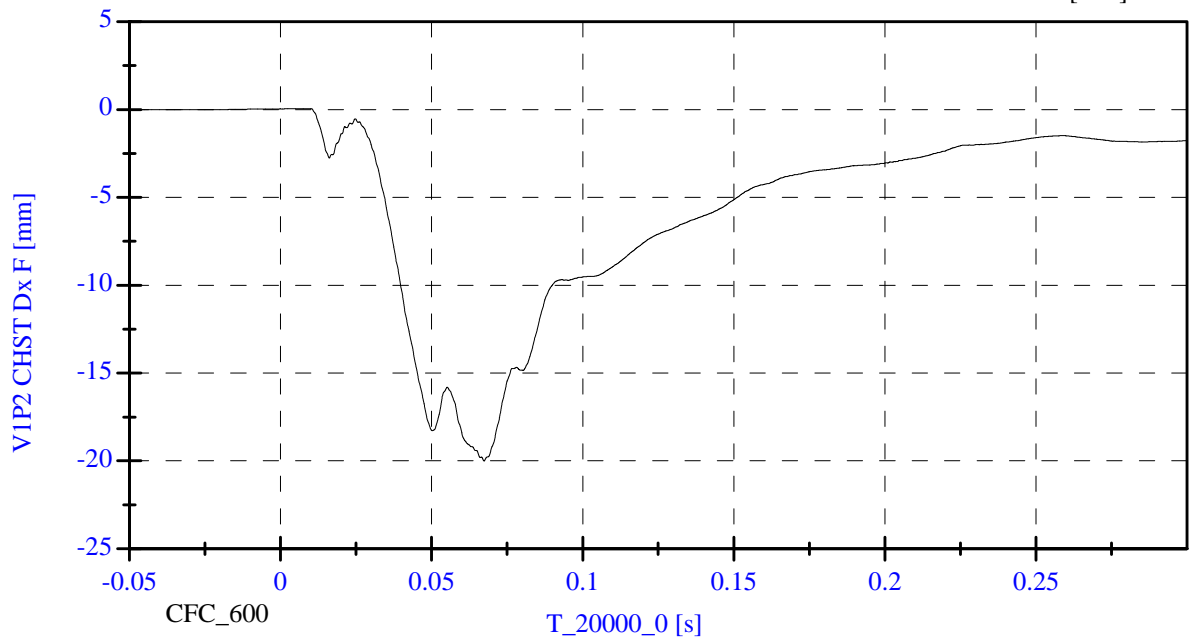
Min: 0.08 [g] at -0.048 [s]

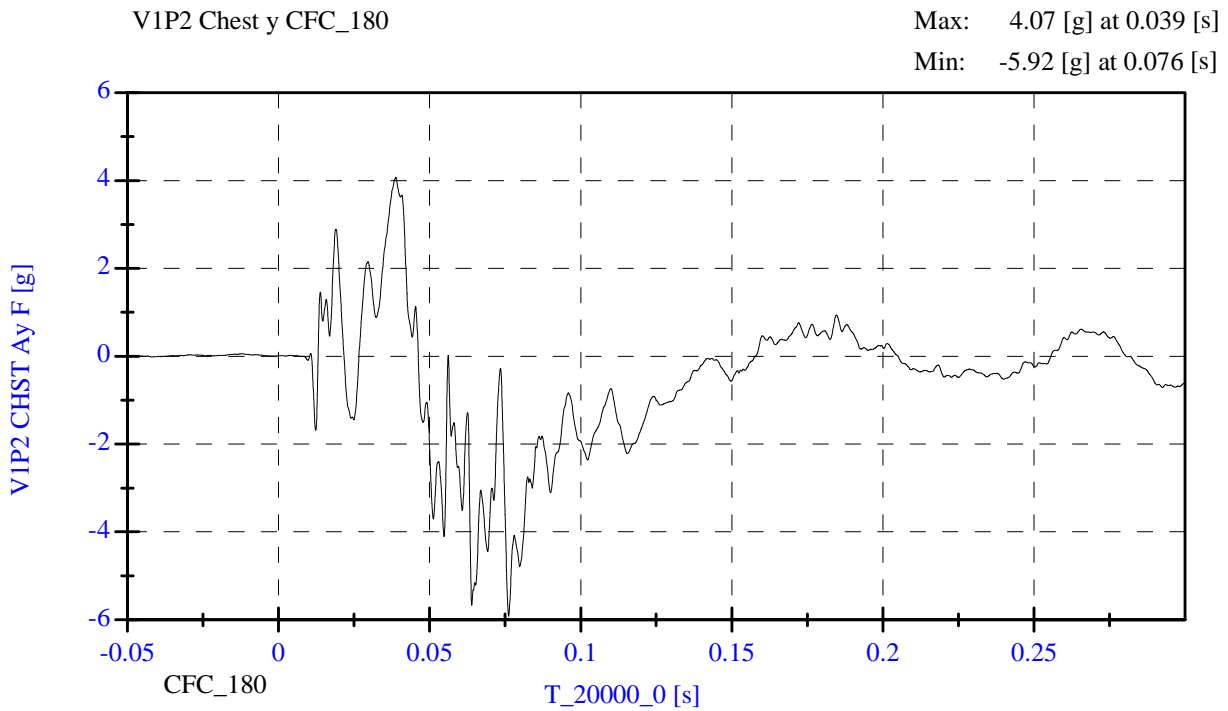
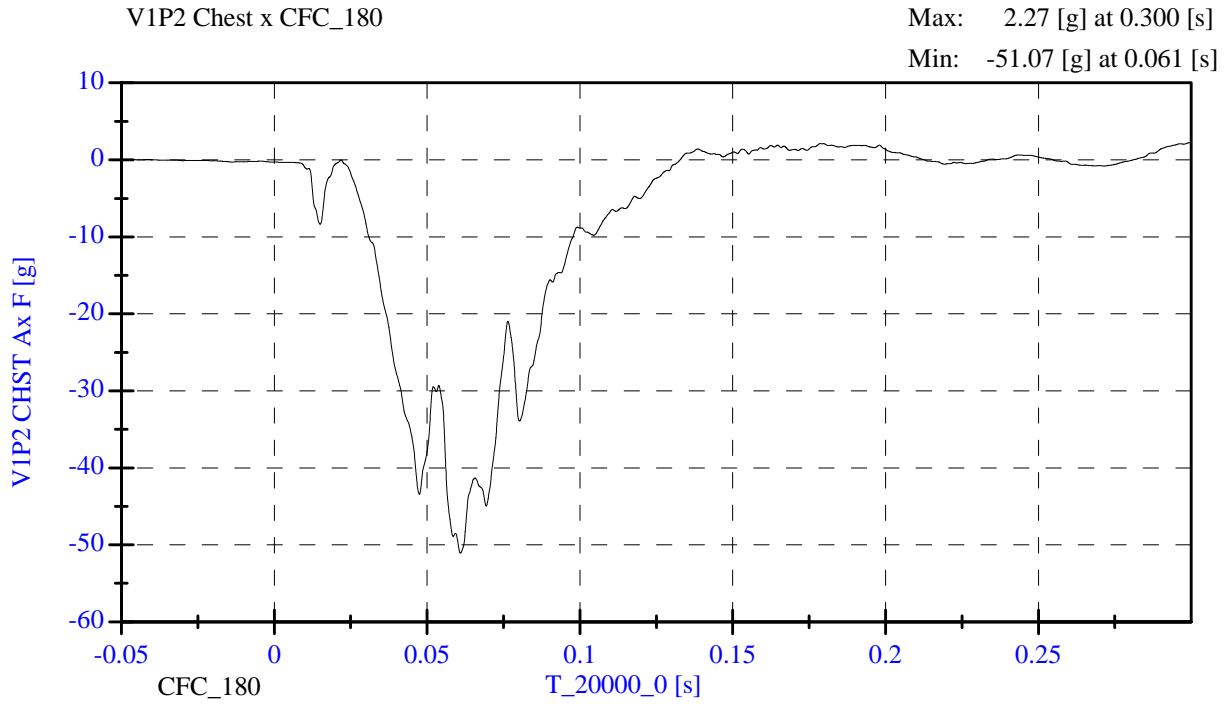


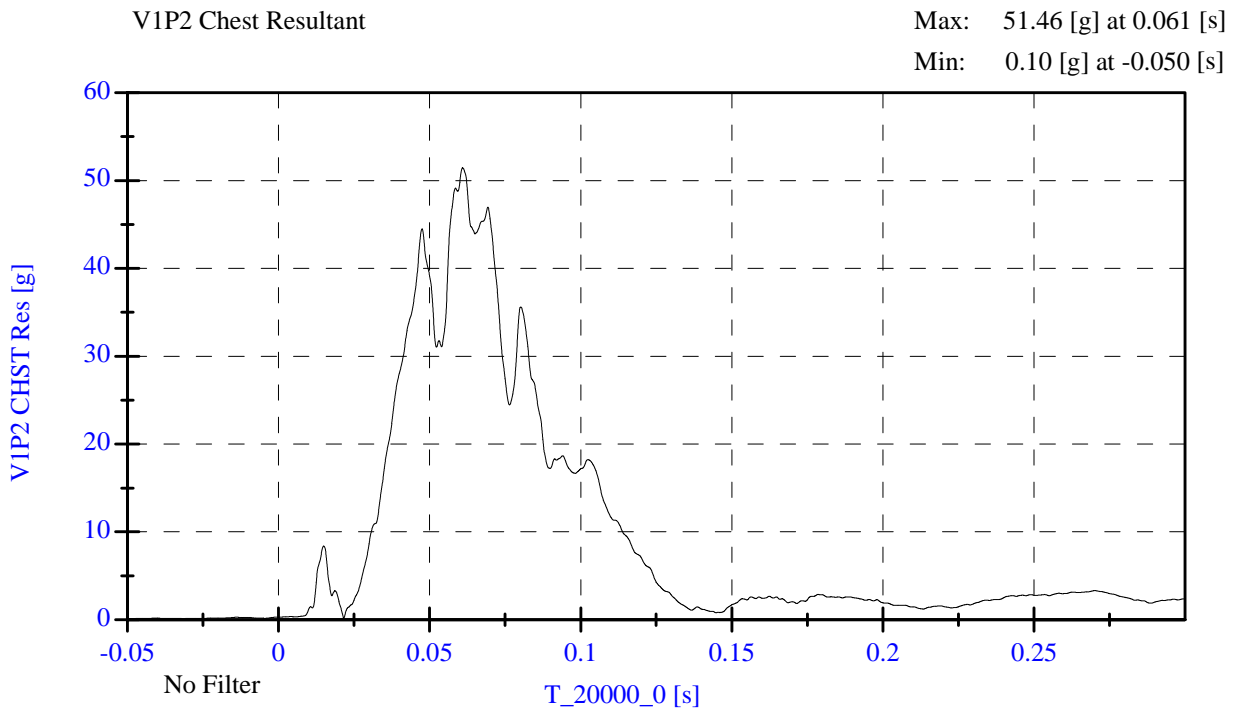
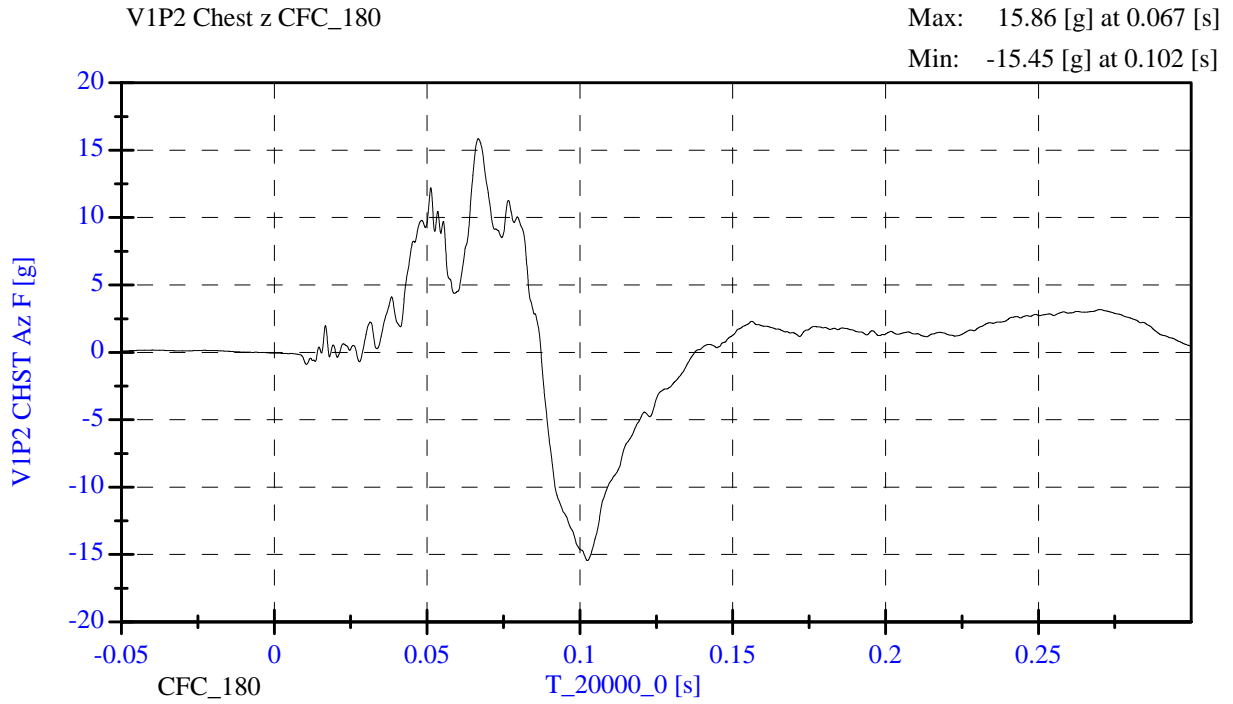
V1P2 Chest Displacement CFC_600

Max: 0.06 [mm] at 0.010 [s]

Min: -20.01 [mm] at 0.067 [s]



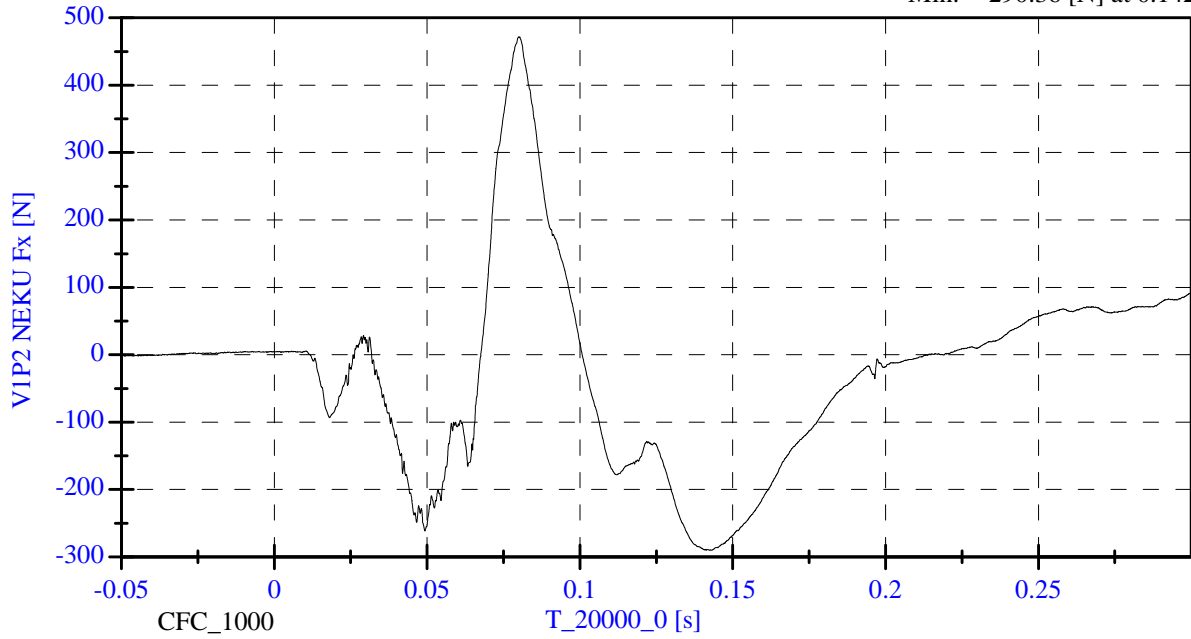




VIP2 Upper Neck Fx [N, CFC_1000]

Max: 471.87 [N] at 0.080 [s]

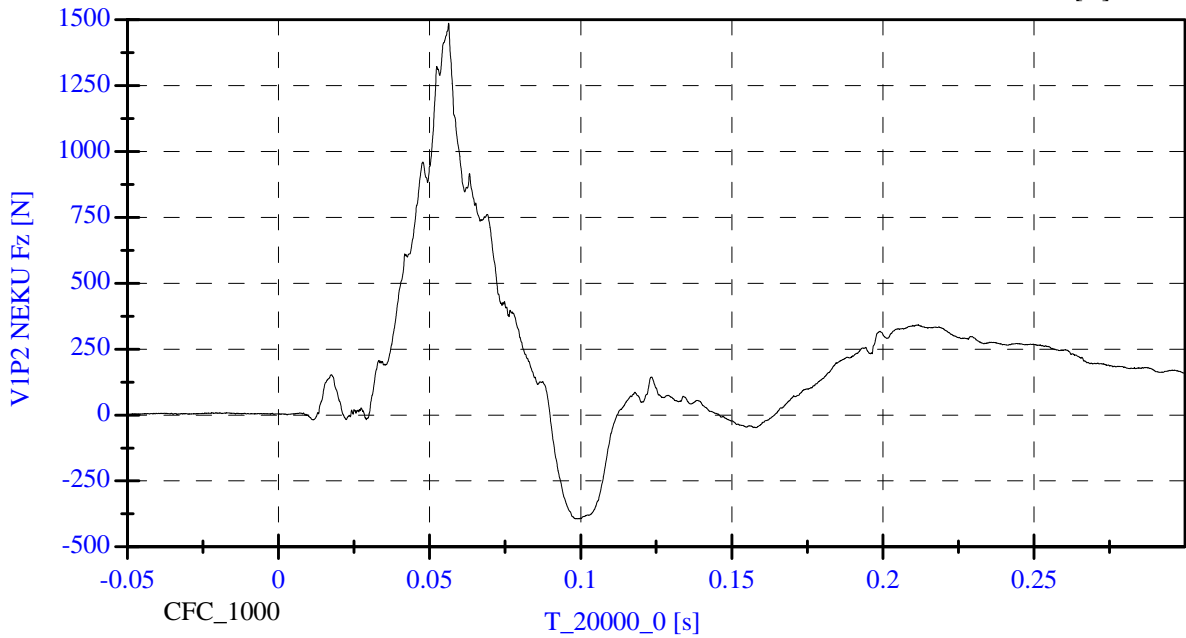
Min: -290.36 [N] at 0.142 [s]



VIP2 Upper Neck Fz [N, CFC_1000]

Max: 1486.48 [N] at 0.056 [s]

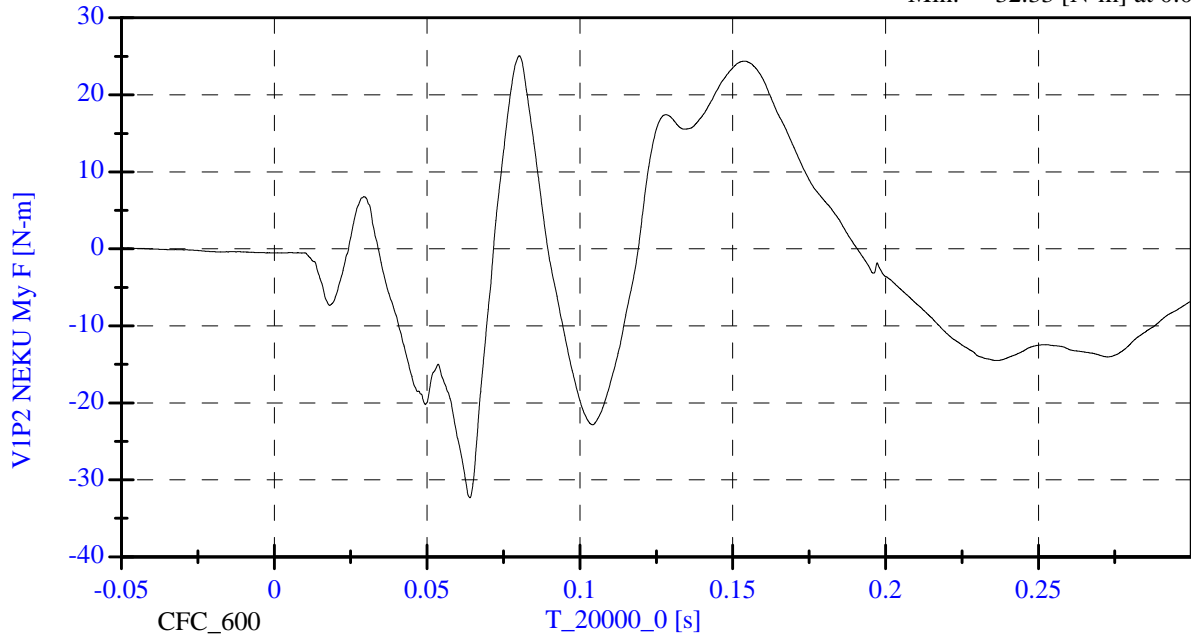
Min: -394.10 [N] at 0.099 [s]



V1P2 Upper Neck My CFC_600

Max: 25.09 [N-m] at 0.080 [s]

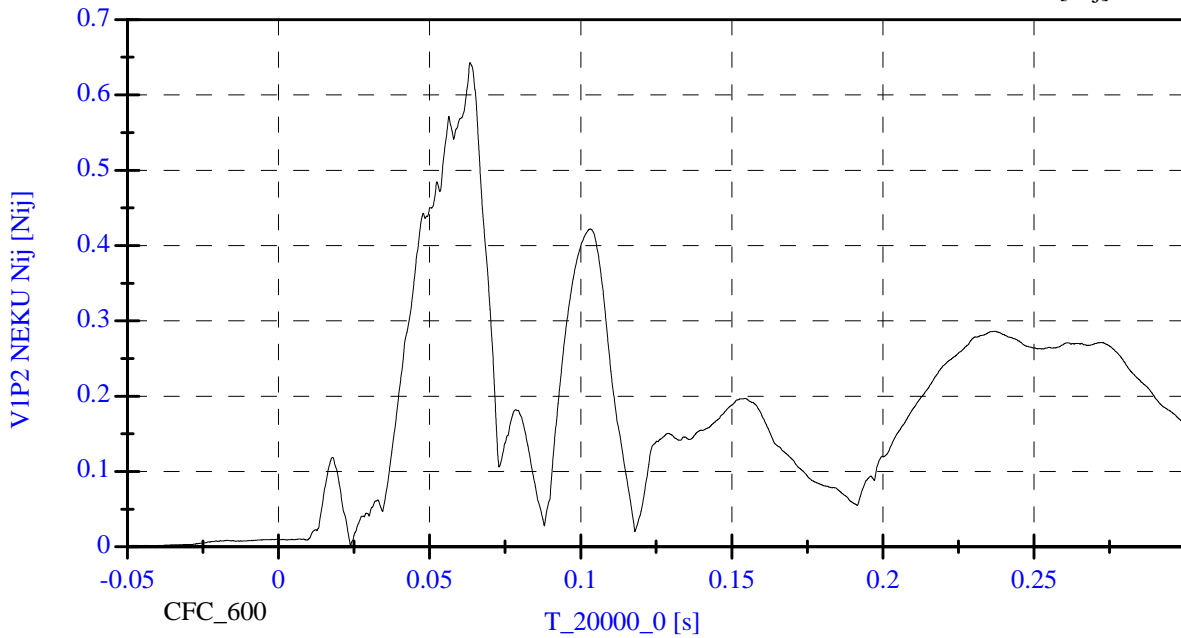
Min: -32.33 [N-m] at 0.064 [s]

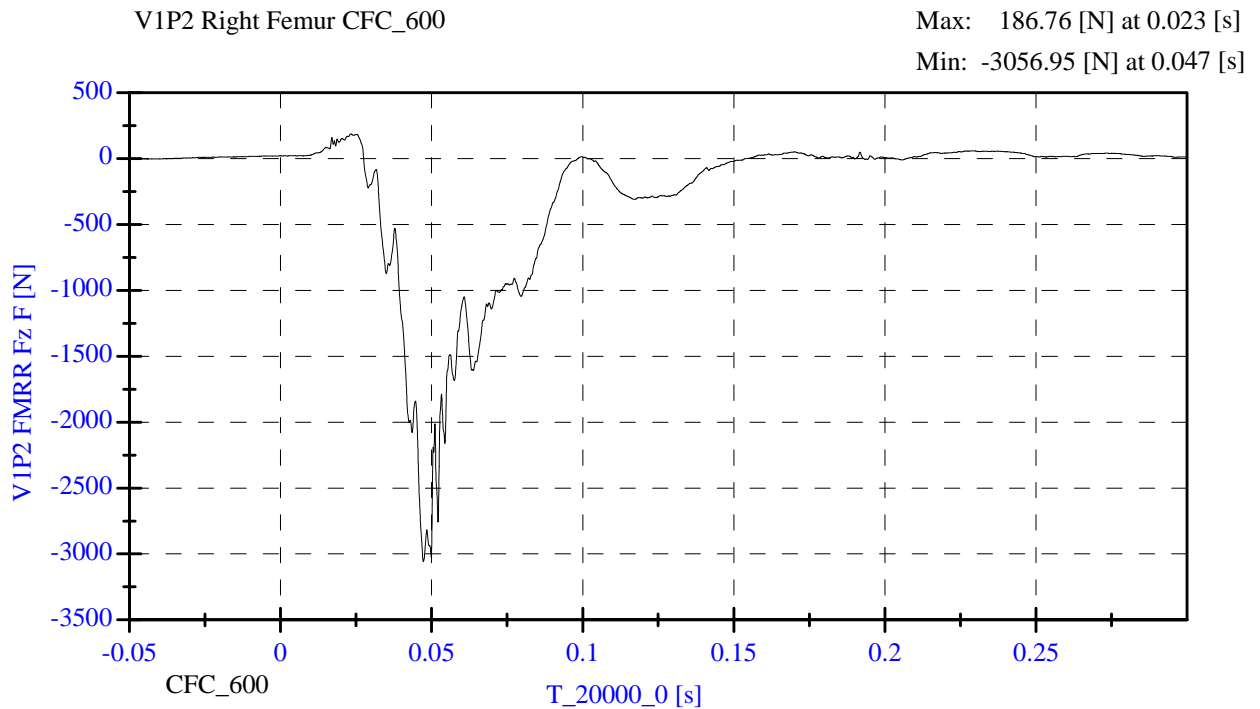
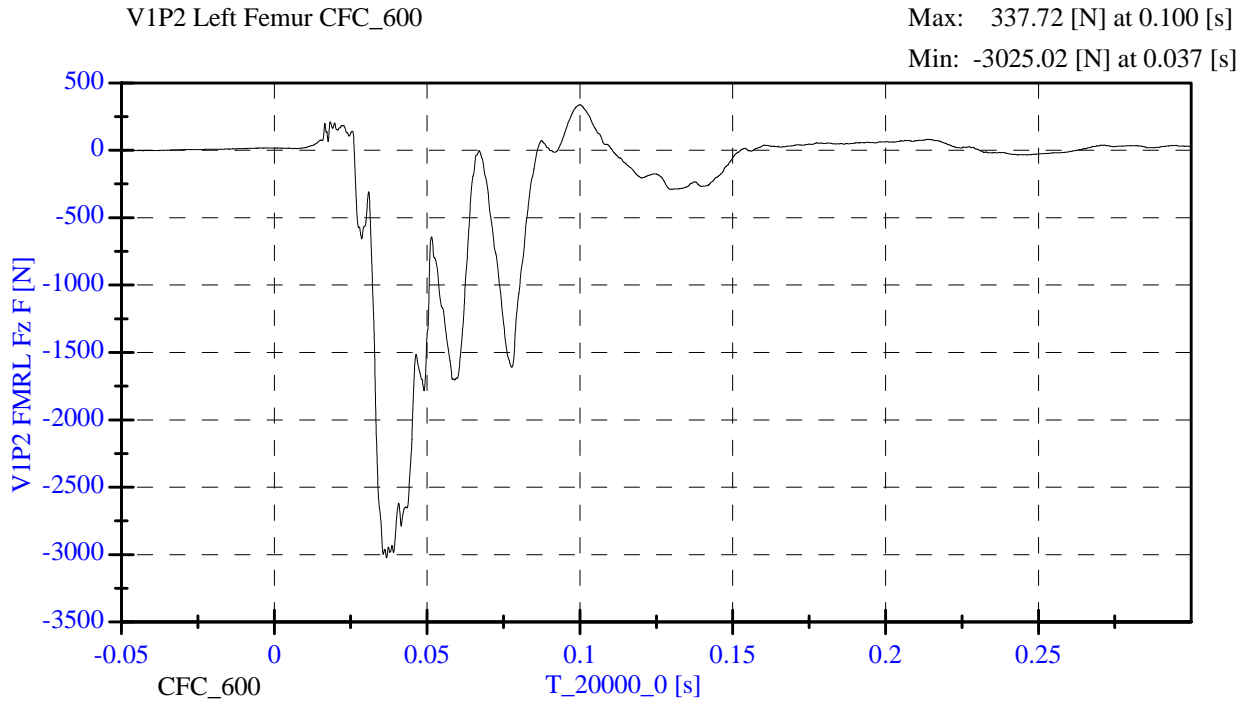


V1P2 Upper Neck Nij [Nij, CFC_600]

Max: 0.64 [Nij] at 0.063 [s]

Min: 0.00 [Nij] at 0.024 [s]





APPENDIX C

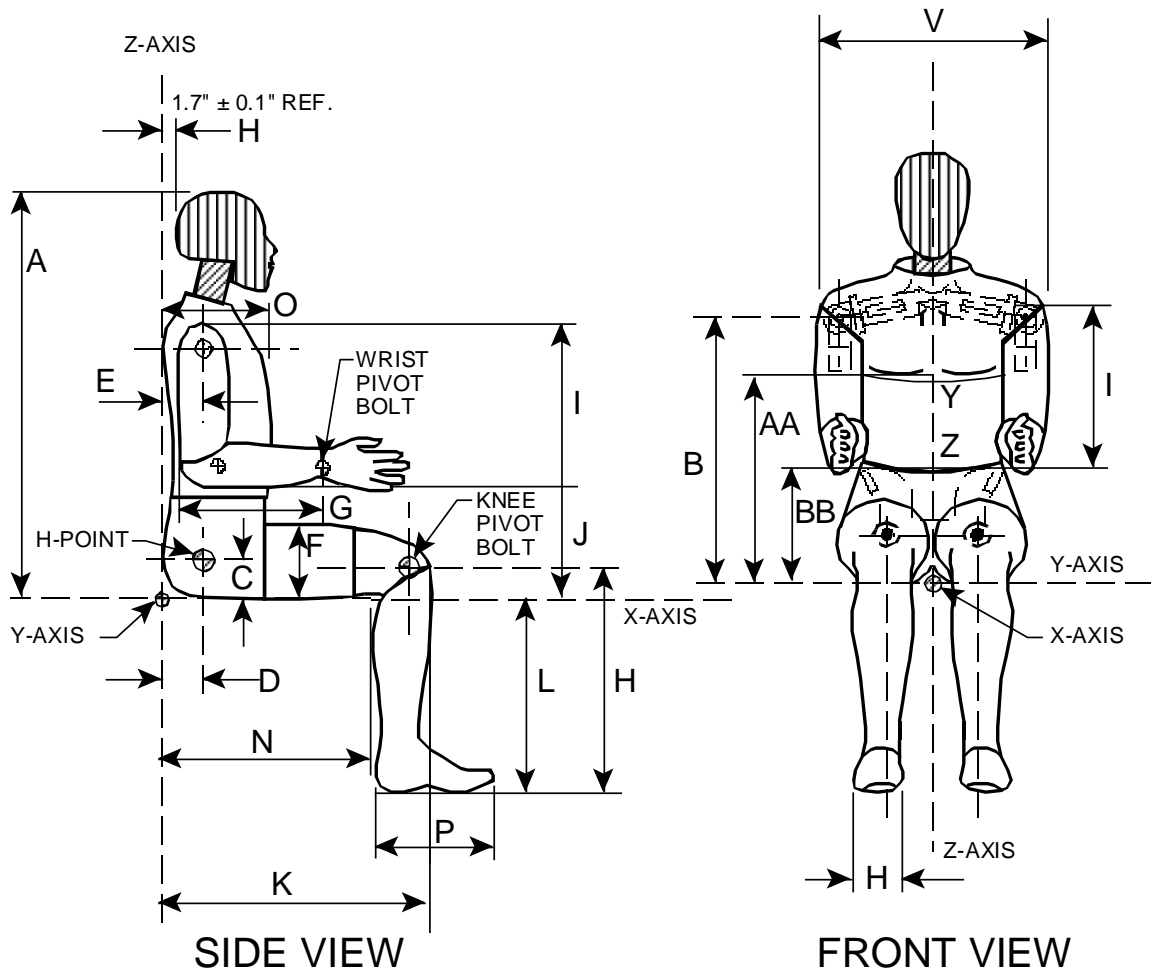
**PART 572 E/O DUMMY CONFIGURATION
AND PERFORMANCE VERIFICATION DATA SHEETS**

The tests were conducted at the Dummy Certification Test Facility of Calspan. A summary of the test results, and Part 572 specifications are included in this Appendix.

Dummy serial numbers and certification dates are:

<u>Position No./Location</u>	<u>Serial No.</u>	<u>Completion Date</u>
#1/Driver	061	11/18/2010
#2/Right Front Passenger	143	11/23/2010

EXTERNAL DIMENSIONS SPECIFICATIONS



NOTE: Figure is referenced to the erect seated position. The curved lumbar does not allow the Hybrid III to be positioned in a perfect erect attitude. (REF: S572.31(A)(6))

CALIBRATION TEST RESULTS

PRE-TEST

DRIVER DUMMY

S/N: 061

50th Male External Measurements

SN 061

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 - 35	34.7	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.2	Yes
C	H-Point Height	3.3 - 3.5	3.5	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	6.1	Yes
G	Back of Elbow to Wrist Pivot	11.4 - 12.0	11.6	Yes
H	Head Back to Backline	1.6 - 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 - 13.6	13.3	Yes
J	Elbow Rest Height	7.5 - 8.3	8.1	Yes
K	Buttock to Knee Length	22.8 - 23.8	23.6	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	18.7	Yes
O	Chest Depth without Jacket	8.4 - 9.0	8.5	Yes
P	Foot Length (right)	9.9 - 10.5	10.0	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	38.5	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: SZ

Date: 11/18/2010



www.calspan.com

Calspan - Transportation Research Group

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

VERIFICATION REPORT

Test Name:	Head Drop	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
Test ID:	Head Drop	Test Date:	11/18/2010
Test Number:	1	Test Time:	4:26:02 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	243

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.7 deg C P
Humidity	10 -- 70	35 %RH P
Resultant Acceleration	225 -- 275	238 g P
Oscillation	0.0 -- 10.0	1.1 % P
Lateral Acceleration	-15.00 -- 15.00	4.25 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **4:26:02 PM**

Test Date: **11/18/2010**



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Calspan - Transportation Research Group

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

VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66931	10/25/2010
Endevco	7264-2000	P66926	10/25/2010
Endevco	7264-2000	P66943	10/25/2010

Test ID: **Head Drop**

Test Time: **4:26:02 PM**

Test Date: **11/18/2010**

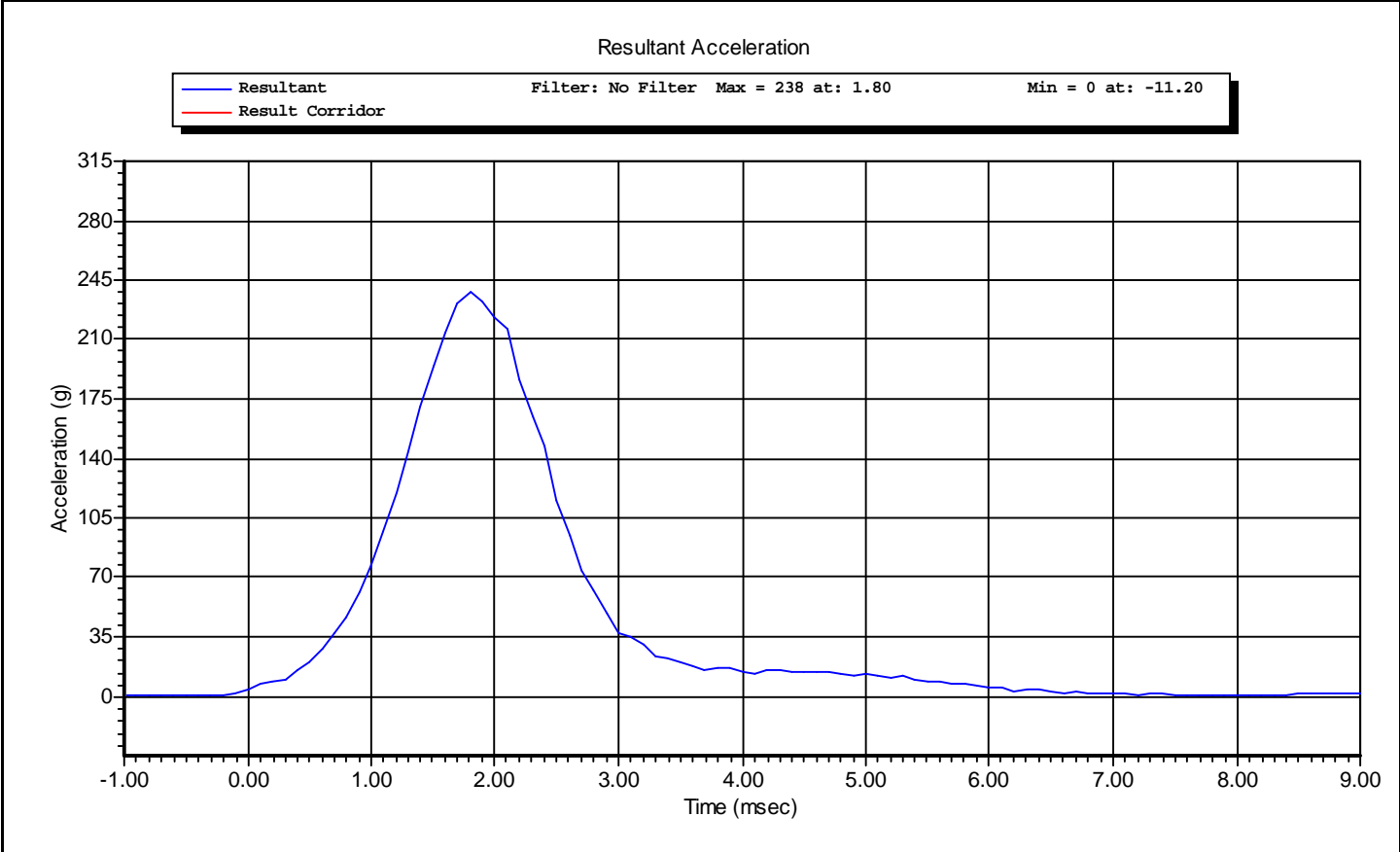


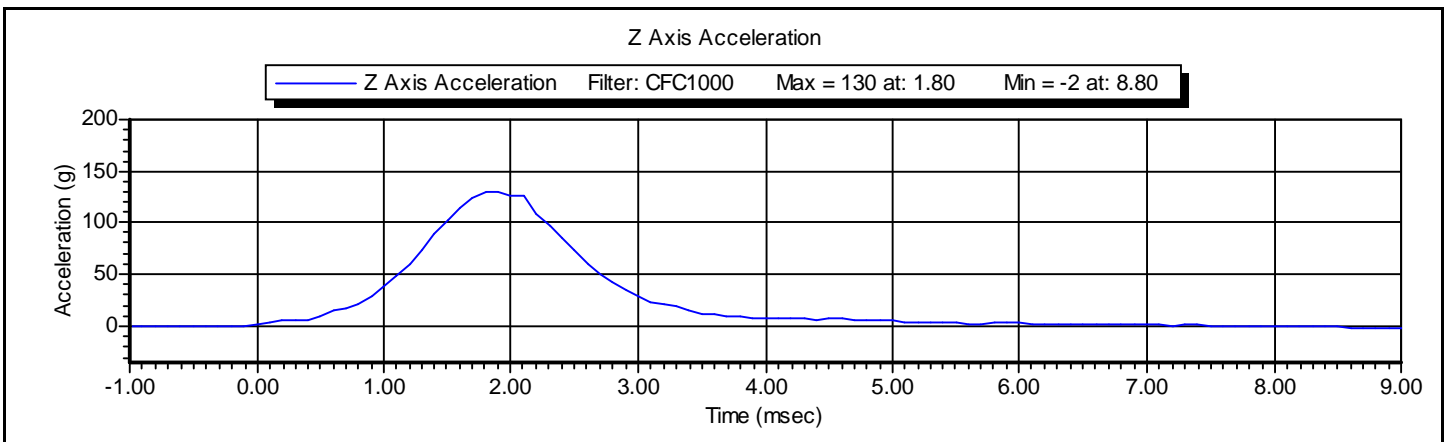
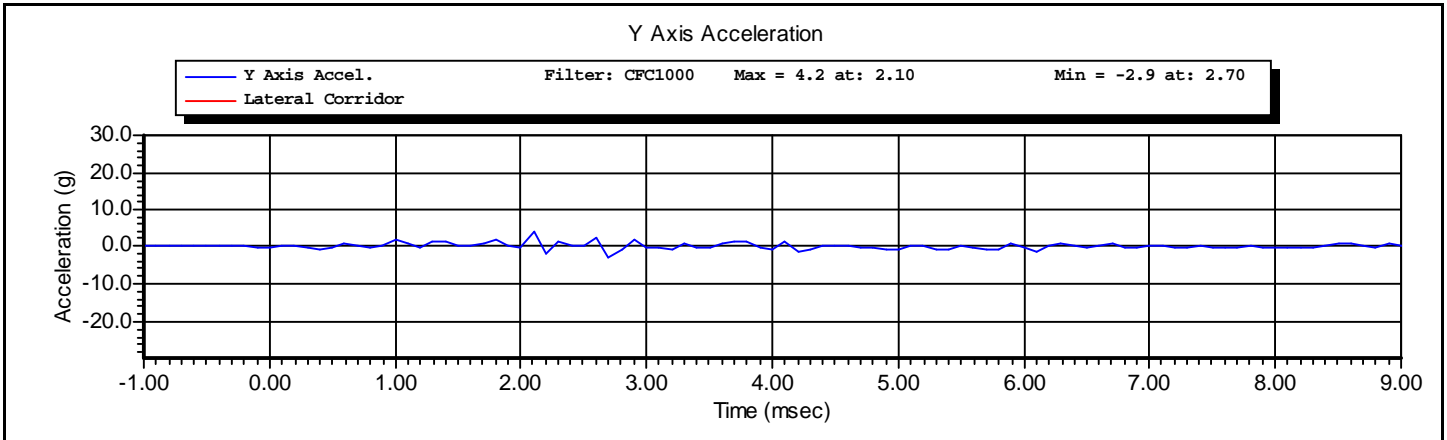
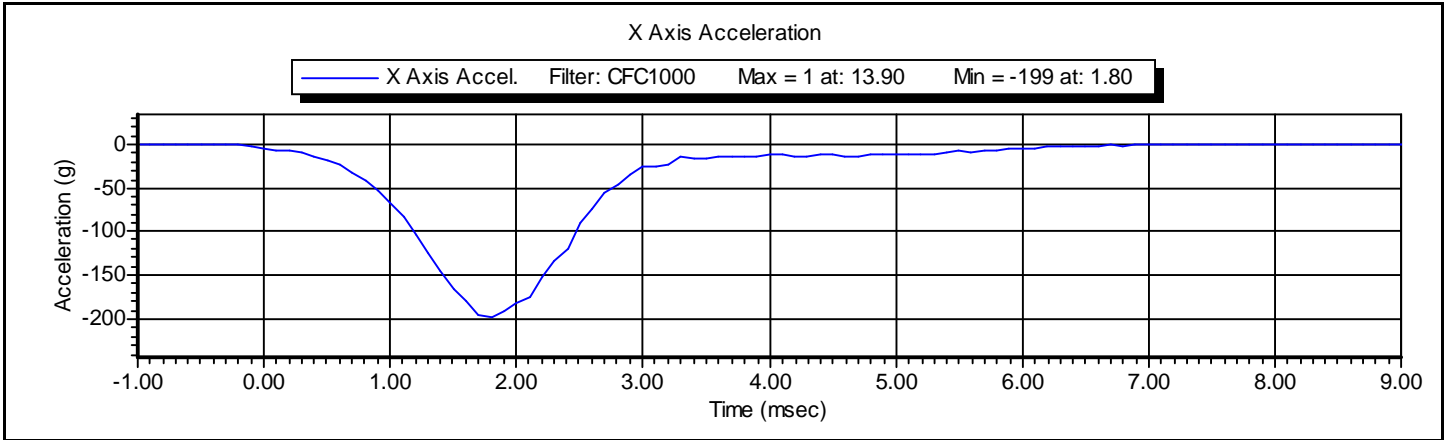
www.calspan.com

Calspan - Transportation Research Group

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

Test Name:	Head Drop	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Head Drop	Test Date:	11/18/2010
Test Number:	1	Test Time:	4:26:02 PM







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VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
Test ID:	Neck Extension	Test Date:	11/19/2010
Test Number:	1	Test Time:	2:09:41 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4194
Front Nodding Block - 78051-351	1797
Rear Nodding Block - 78051-351	1799
Head Skin - 78051-220	243

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	27 %RH P
Velocity	5.94 -- 6.19	6.12 m/s P
Pendulum Deceleration at 10 ms	17.2 -- 21.2	21.2 g P
Pendulum Deceleration at 20 ms	14.0 -- 19.0	17.3 g P
Pendulum Deceleration at 30 ms	11.0 -- 16.0	13.8 g P
Max Pendulum Deceleration after 30 ms	0.0 -- 22.0	14.1 g P
Decel Time to 5 g	38.0 -- 46.0	38.0 ms P
D Plane Rotation	81.0 -- 106.0	98.3 degrees P
Time at Max Rotation	72.0 -- 82.0	75.3 ms P
Rotation Decay to Zero	147.0 -- 174.0	157.0 ms P
Moment About Occipital Condyle	-80.0 -- -52.9	-69.4 Nm P
Time at Max Moment	65.0 -- 79.0	70.4 ms P
Moment Decay to Zero	120.0 -- 148.0	136.9 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension**

Test Time: **2:09:41 PM**

Test Date: **11/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

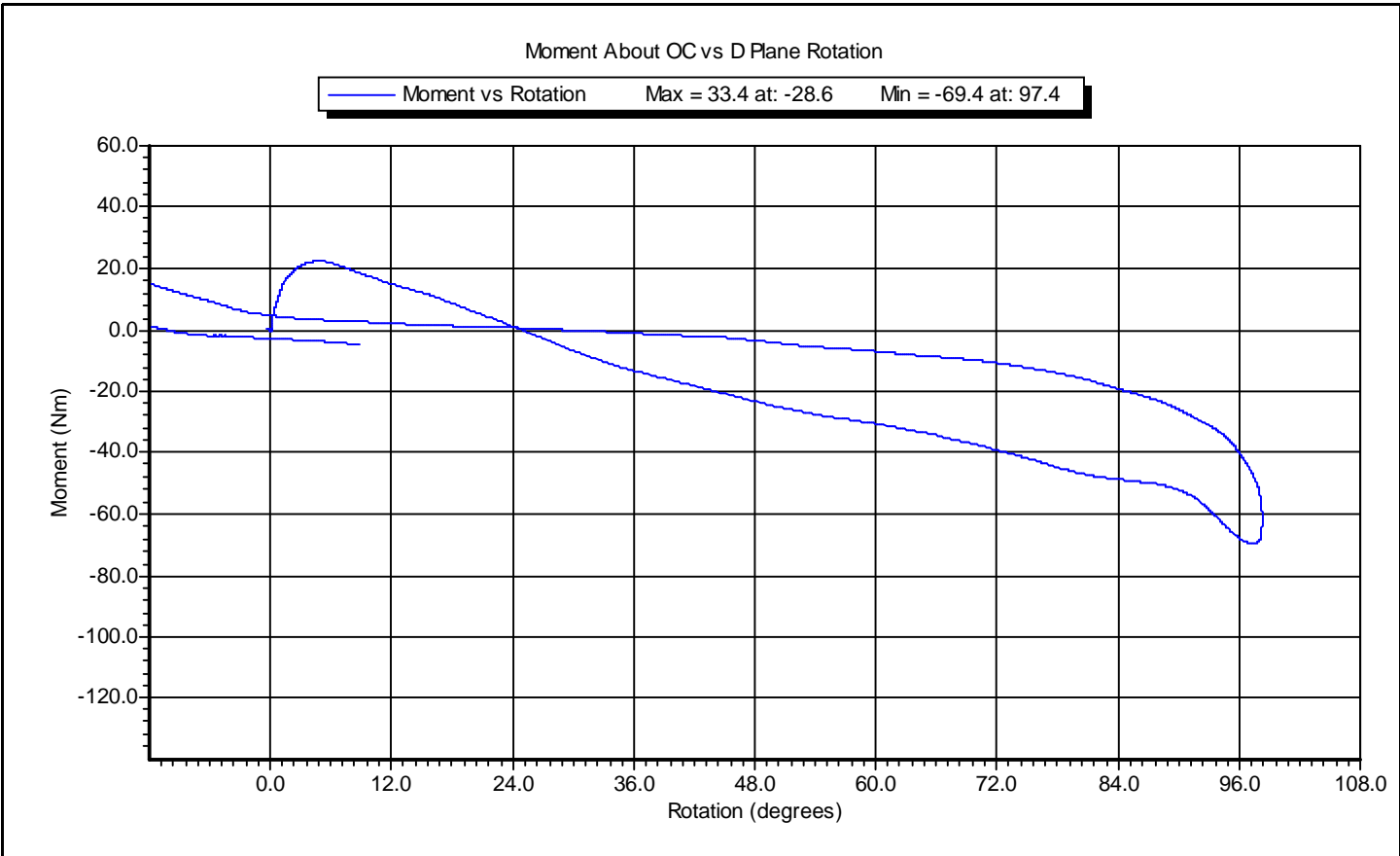
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	11/18/2010
Denton	1716A	LC-1916 Fx	11/18/2010

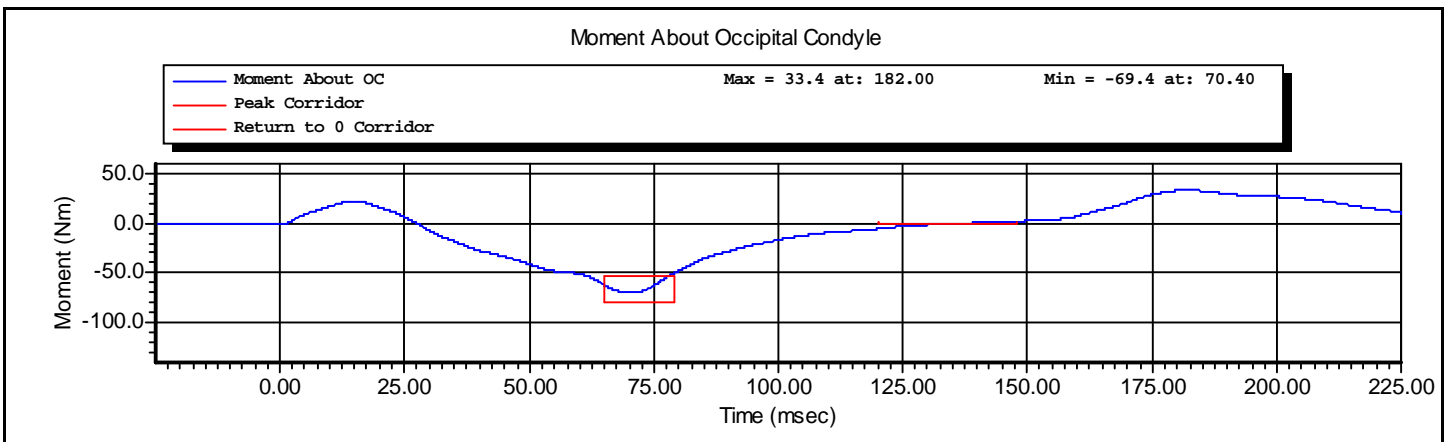
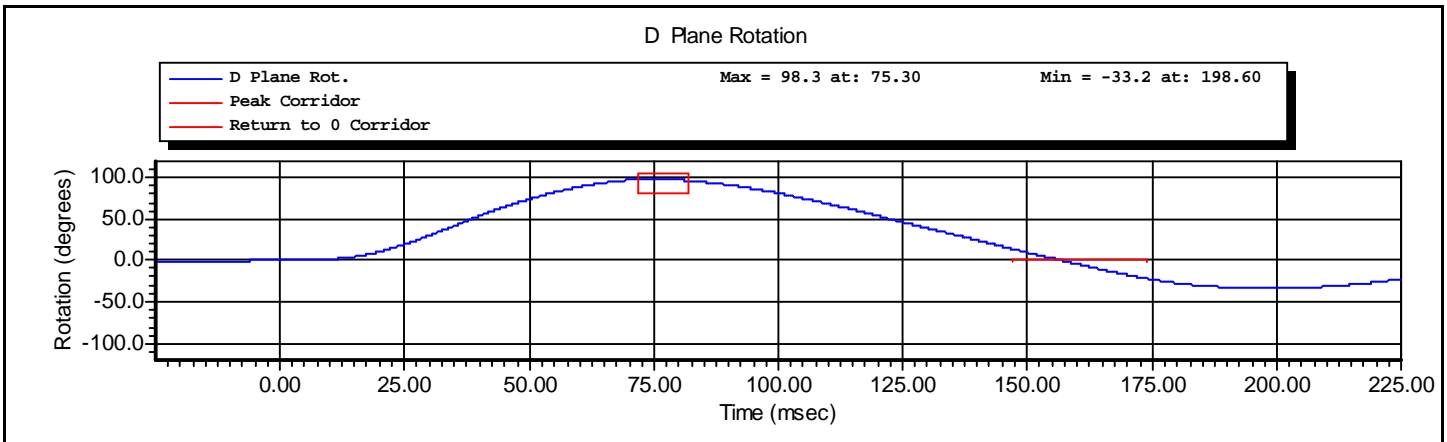
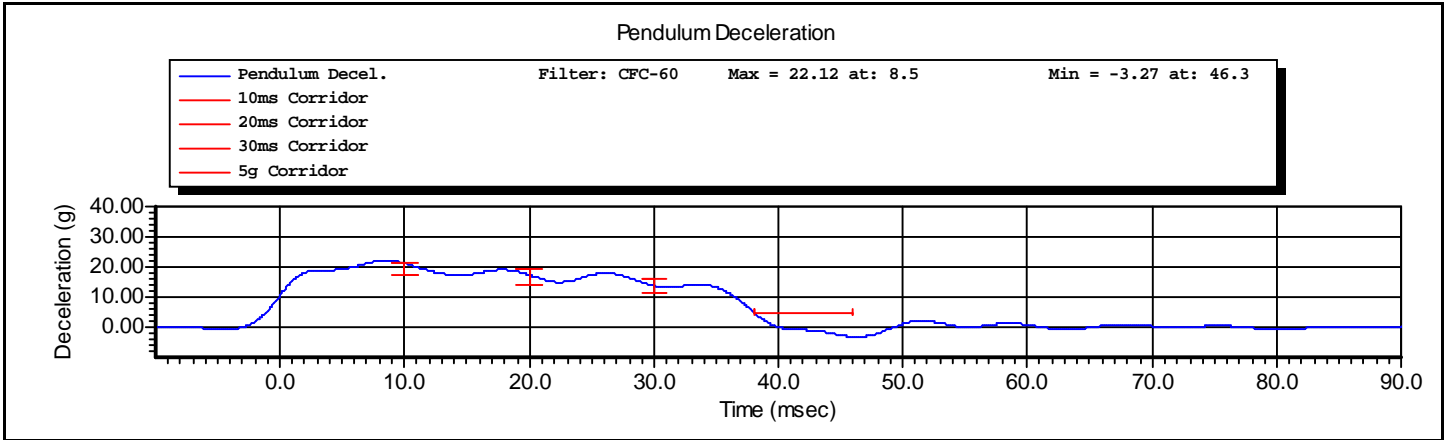
Test ID: **Neck Extension**

Test Time: **2:09:41 PM**

Test Date: **11/19/2010**

Name of Test:	Neck Extension	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Extension	Date:	11/19/2010
Number of Test:	1	Time of Test:	2:09:41 PM







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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
Test ID:	Neck Flexion	Test Date:	11/19/2010
Test Number:	2	Test Time:	8:43:58 AM

Component Part Number	Component Serial Number
Neck - 78051-336	4194
Front Nodding Block - 78051-351	1797
Rear Nodding Block - 78051-351	1799
Head Skin - 78051-220	243

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	27 %RH P
Velocity	6.89 -- 7.13	7.10 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	25.3 g P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	18.4 g P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	13.3 g P
Max Pendulum Deceleration After 30 ms	0.0 -- 29.0	13.7 g P
Deceleration time to 5 g	34.0 -- 42.0	41.5 ms P
D Plane Rotation	-78.0 -- -64.0	-72.5 degrees P
Time at max rotation	57.0 -- 64.0	58.3 ms P
Rotation Decay to Zero	113.0 -- 128.0	118.1 ms P
Moment about OC	88.1 -- 108.4	94.7 Nm P
Time at Max Moment	47.0 -- 58.0	54.8 ms P
Moment Decay to Zero	97.0 -- 107.0	98.4 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **8:43:58 AM**

Test Date: **11/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	11/18/2010
Denton	1716A	LC-1916 Fx	11/18/2010
Endevco	7231CT	P35758	10/5/2010

Test ID: **Neck Flexion**

Test Time: **8:43:58 AM**

Test Date: **11/19/2010**

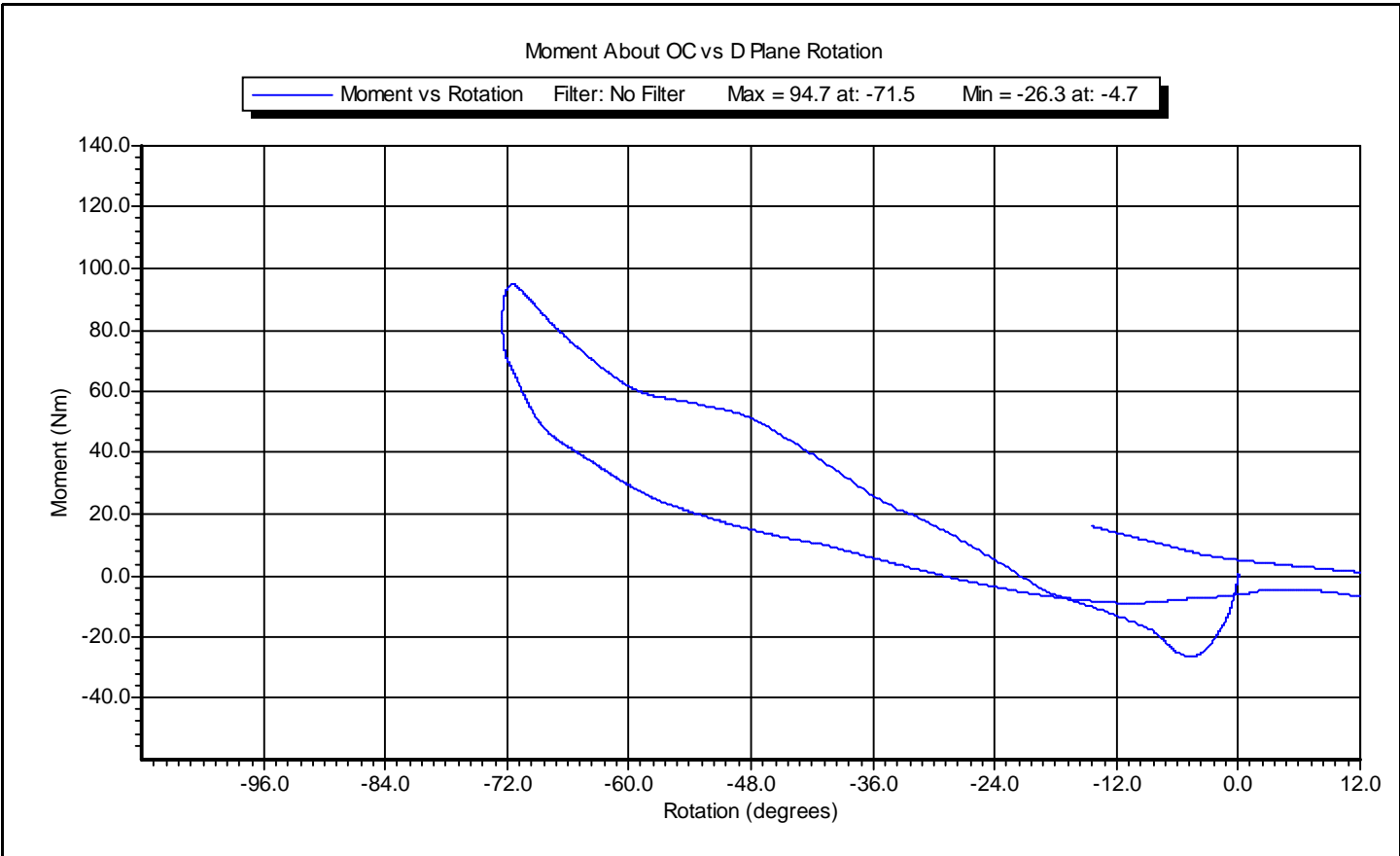


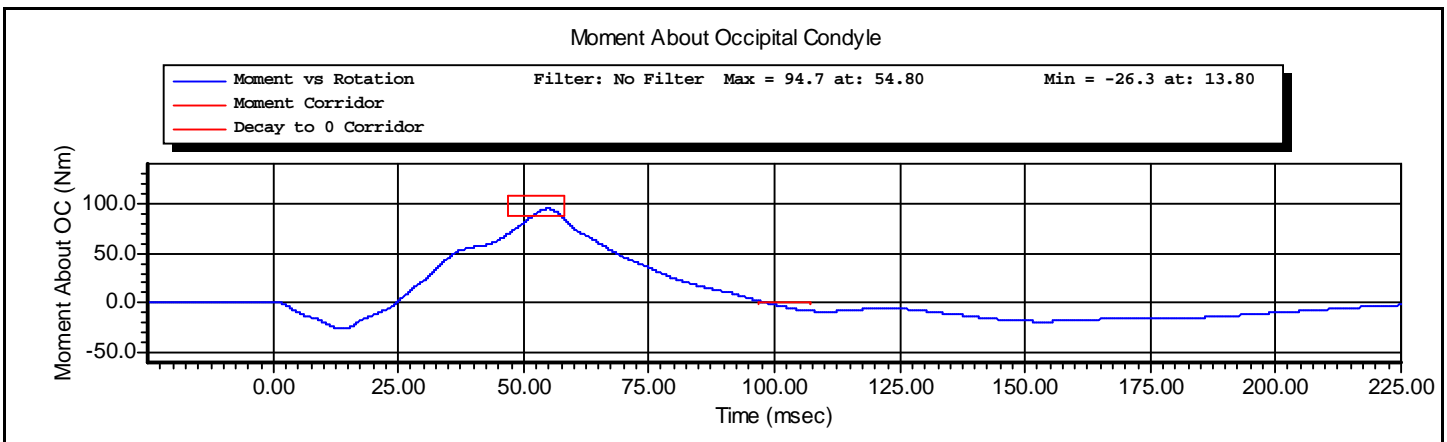
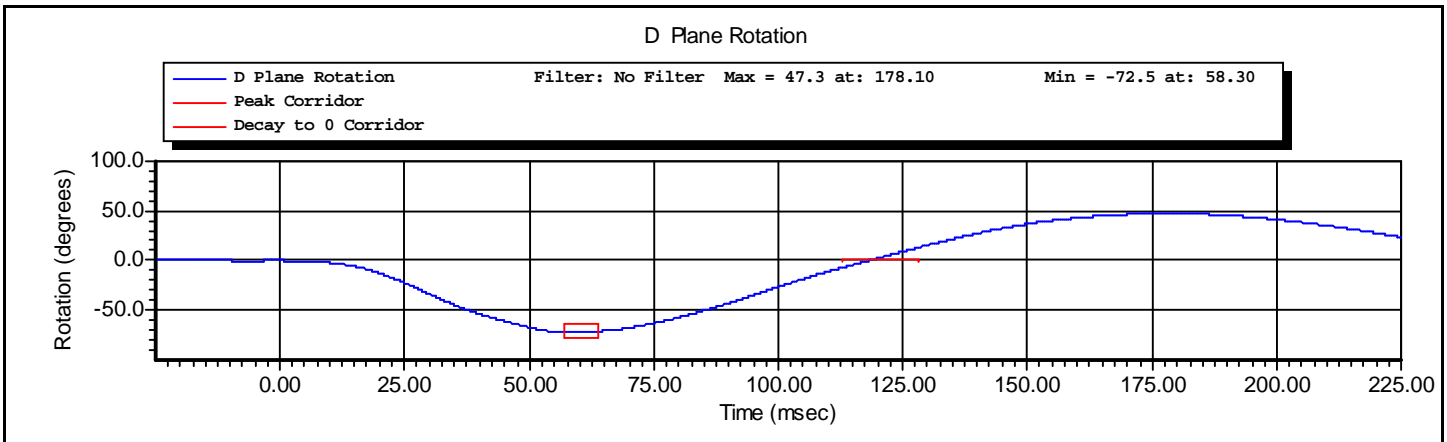
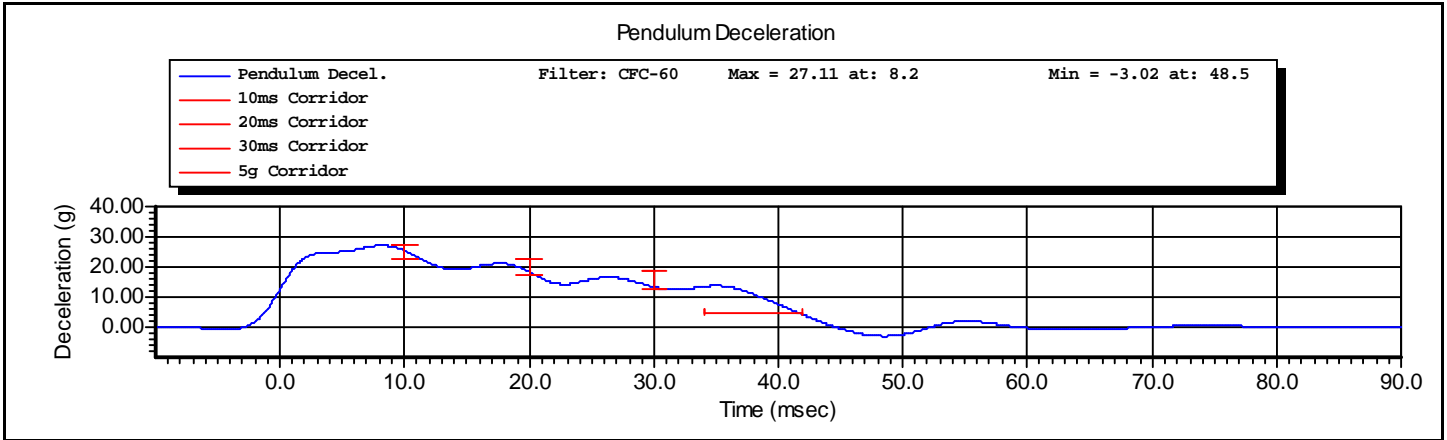
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Name of Test:	Neck Flexion	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Flexion	Date:	11/19/2010
Number of Test:	2	Time of Test:	8:43:58 AM







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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
Test ID:	Thorax	Test Date:	11/23/2010
Test Number:	1	Test Time:	9:55:55 AM

Component Part Number	Component Serial Number
Ribs 78051-RS	4273
Chest Jacket - 78051-169	2437
Lumbar Spine - 78051-66	555

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	54.0 %RH P
Velocity	6.59 -- 6.83	6.71 m/s P
Resistive Force	-5.894 -- -5.160	-5.736 kN P
Sternum Displacement	-72.6 -- -63.5	-70.3 mm P
Hysteresis	69 -- 85	72 % P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax**

Test Time: **9:55:55 AM**

Test Date: **11/23/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

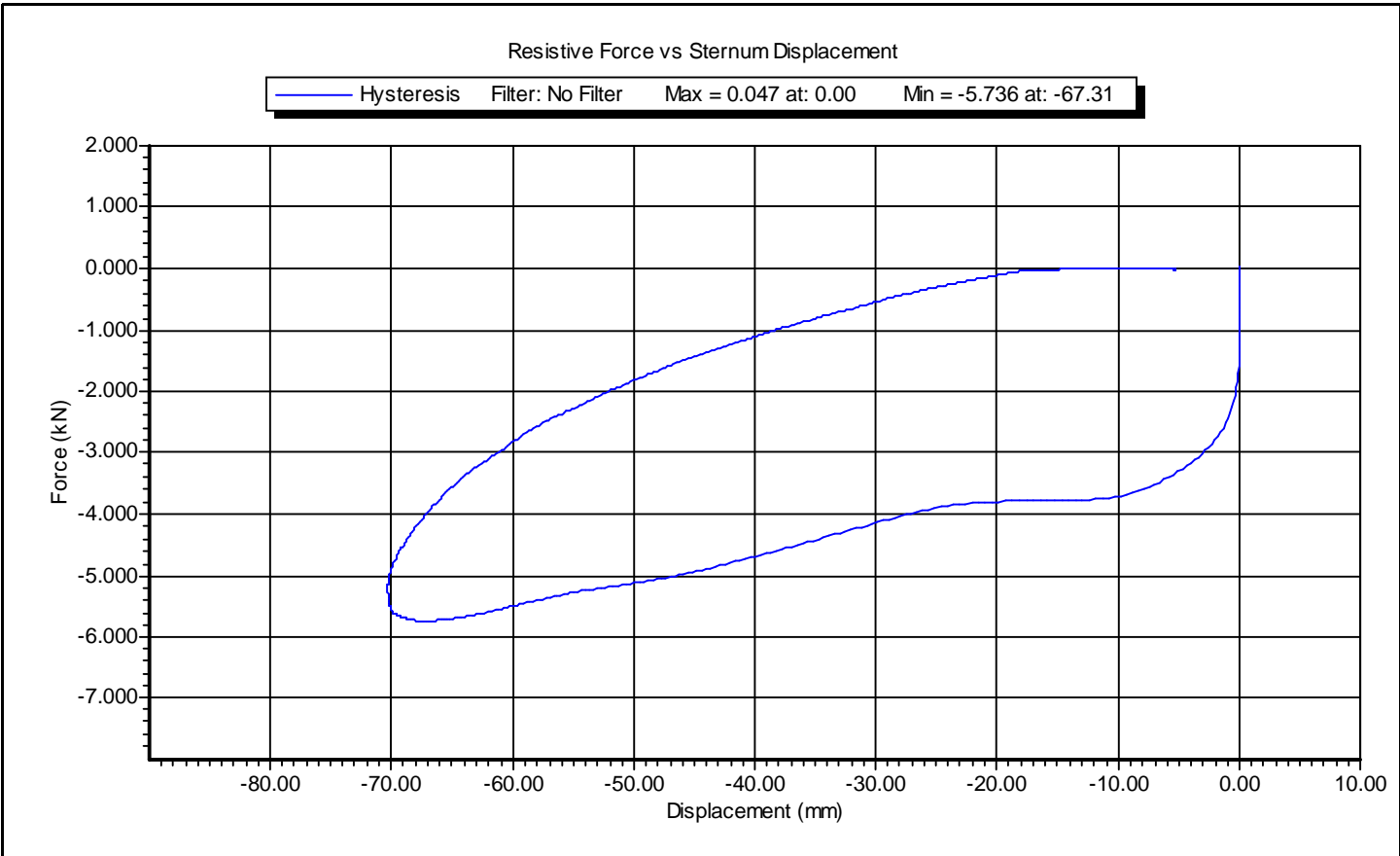
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DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-061	6/1/2010

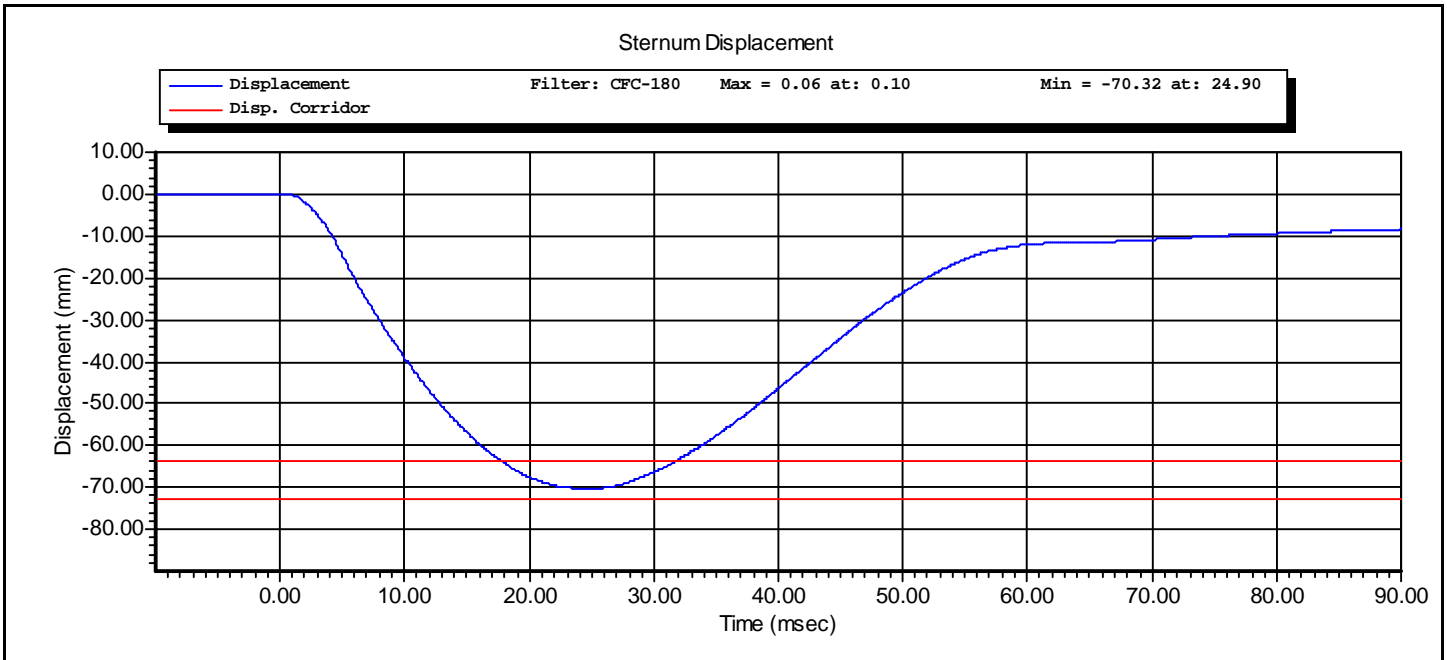
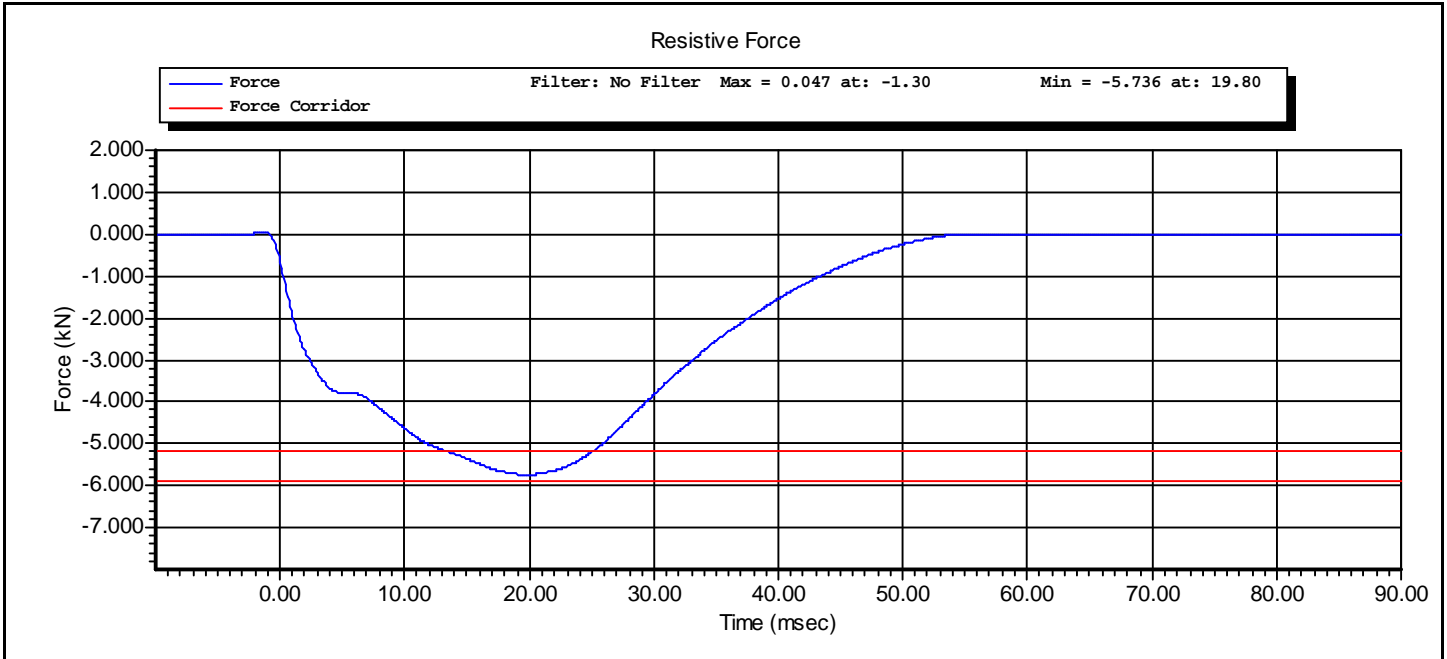
Test ID: **Thorax**

Test Time: **9:55:55 AM**

Test Date: **11/23/2010**

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Thorax	Test Date:	11/23/2010
Test Number:	1	Test Time:	9:55:55 AM





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Hybrid III Hip Range of Motion: Hybrid III 50th Male

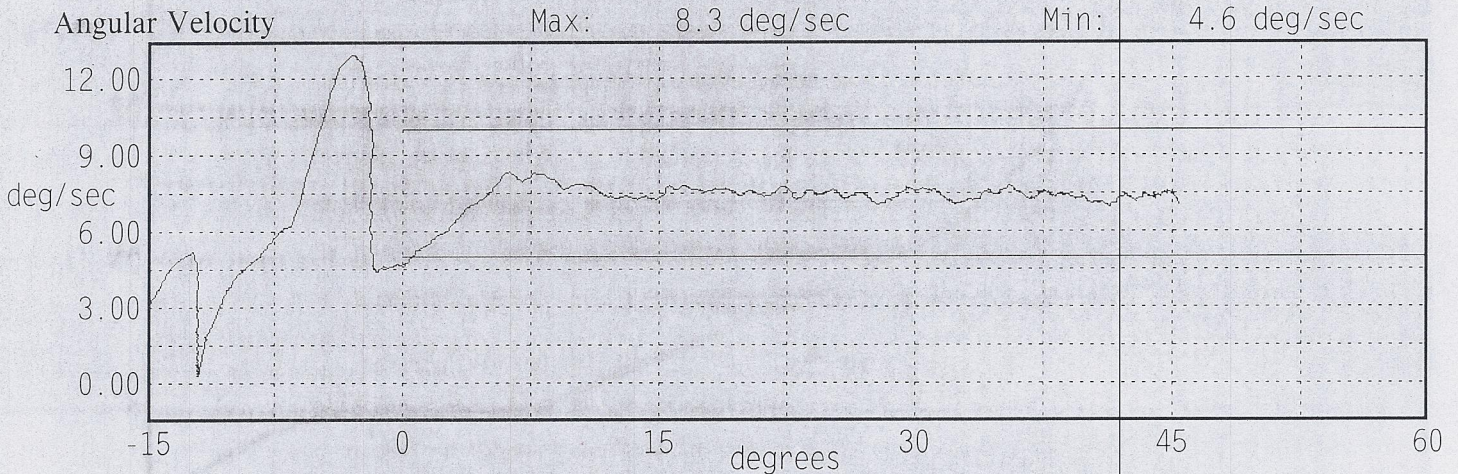
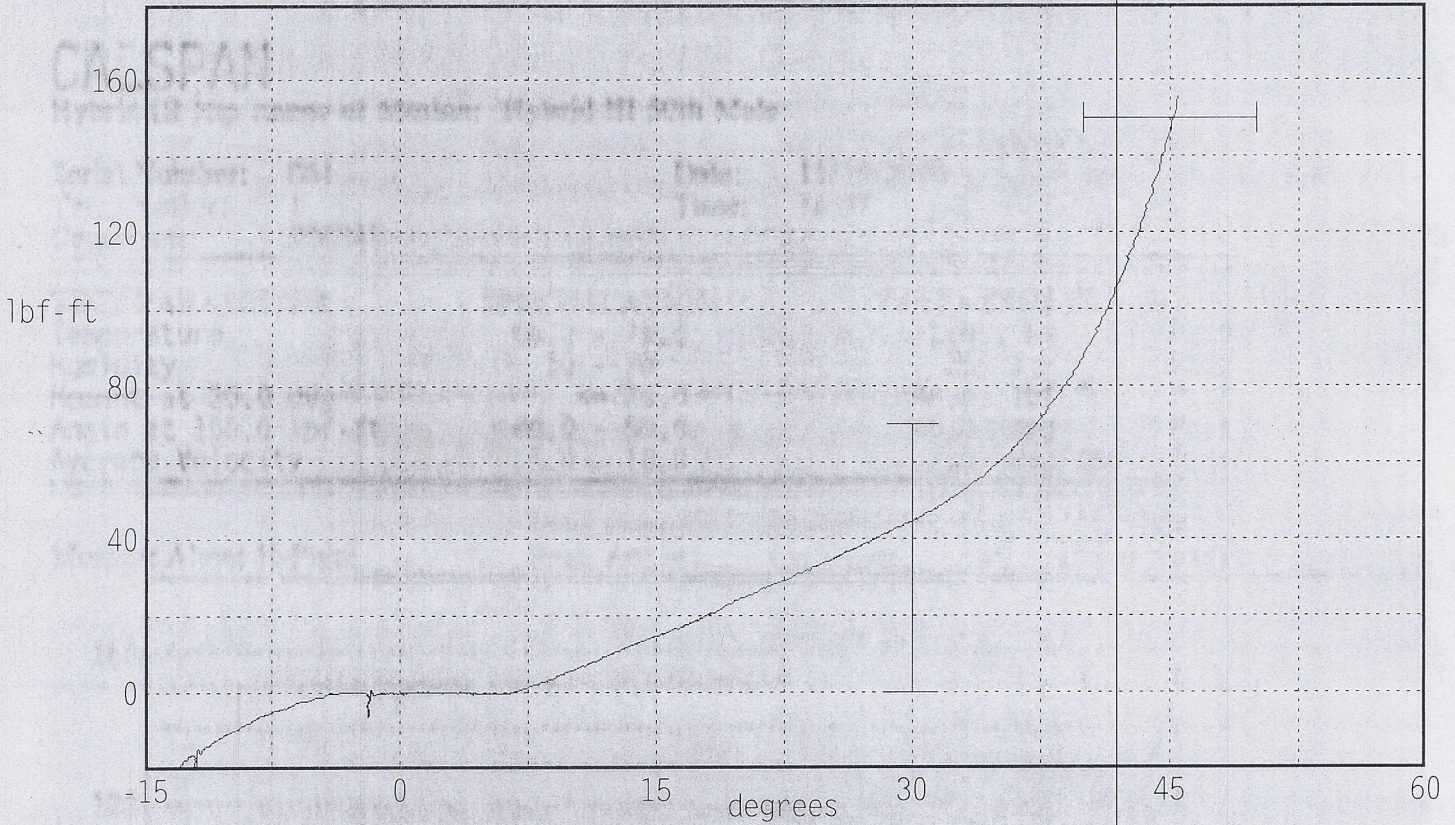
Serial Number: 061
Test Number: 1
Comments: RIGHT

Date: 11/19/2010
Time: 16:07

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	66.0 - 78.0	71.0 °F	Pass
Humidity	10 - 70	25 %	Pass
Moment at 30.0 deg	<= 70.0	44.6 lbf-ft	Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	45.3 deg	Pass
Average Velocity	5.0 - 10.0	7.3 deg/sec	Pass

Moment About H-Point
Peak Moment: 155.5 lbf-ft at 45.5 deg
Peak Angle: 45.5 deg at 155.5 lbf-ft



CALSPAN

Hybrid III Hip Range of Motion: Hybrid III 50th Male

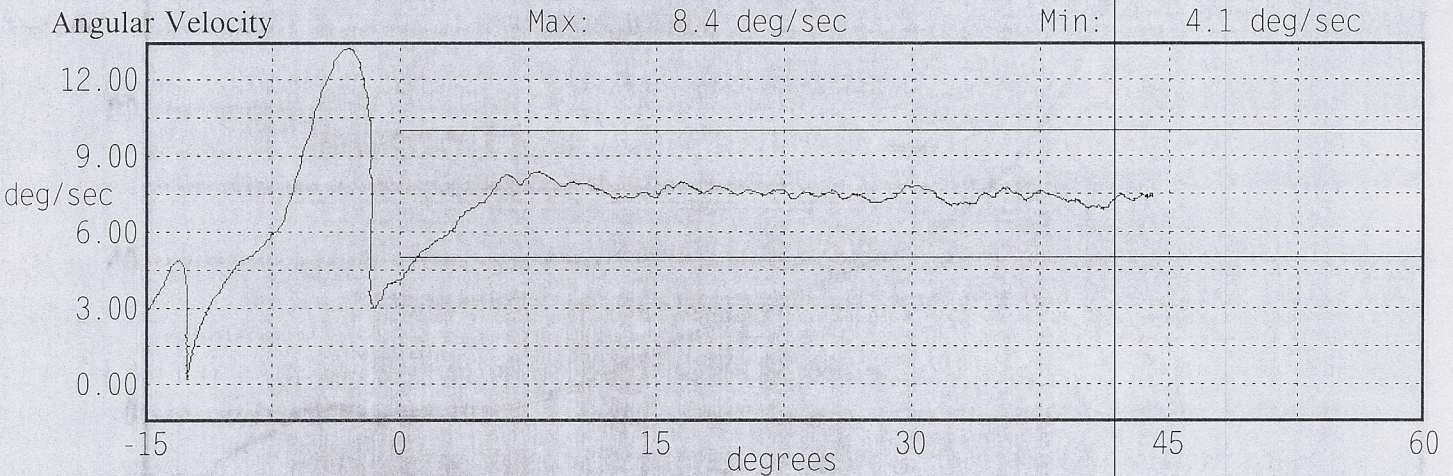
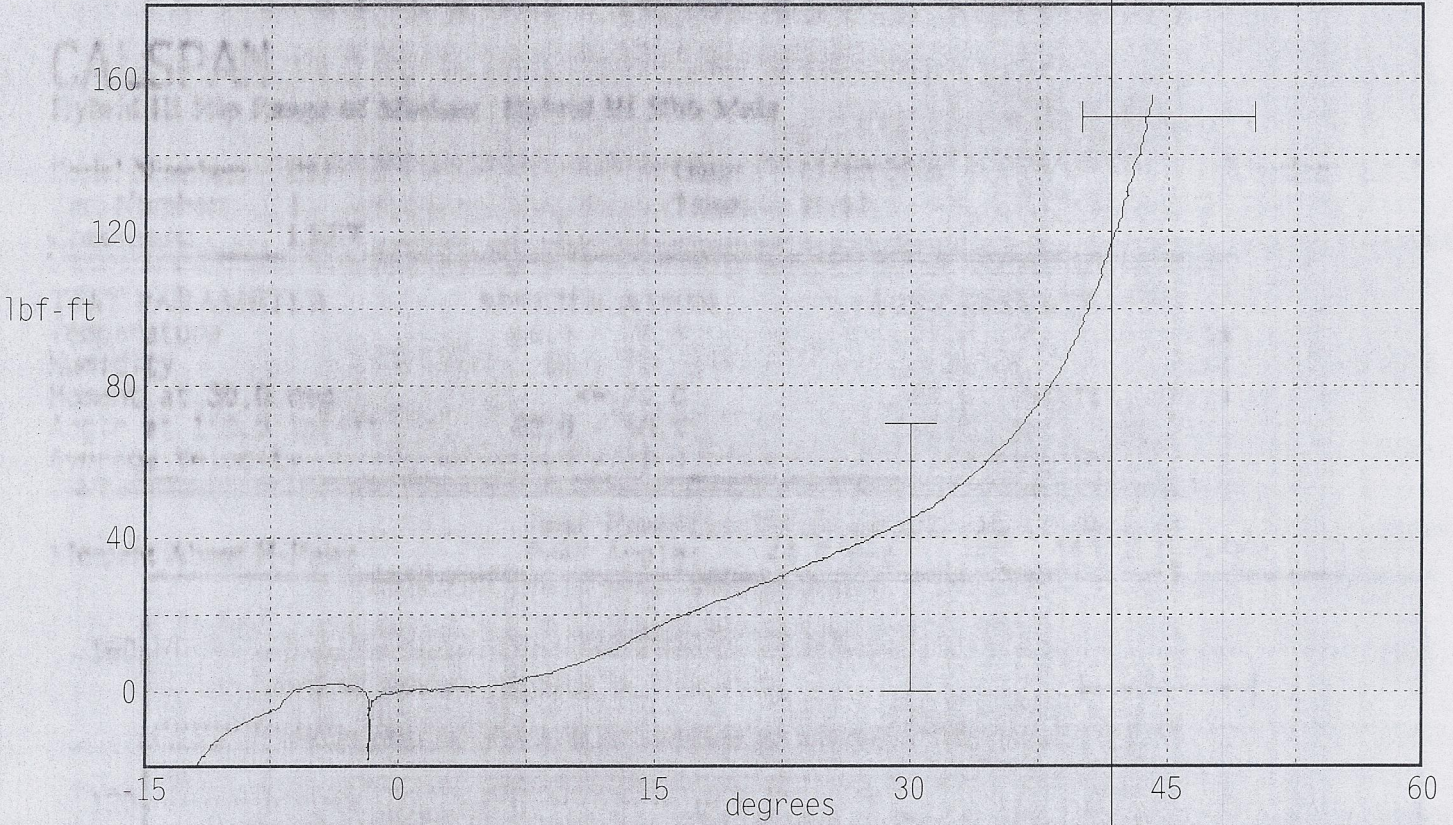
Serial Number: 061
Test Number: 1
Comments: LEFT

Date: 11/19/2010
Time: 16:13

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS	
Temperature	66.0 - 78.0	71.0 °F	Pass
Humidity	10 - 70	25 %	Pass
Moment at 30.0 deg	<= 70.0	44.9 lbf-ft	Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	43.8 deg	Pass
Average Velocity	5.0 - 10.0	7.3 deg/sec	Pass

Moment About H-Point
Peak Moment: 155.5 lbf-ft at 44.0 deg
Peak Angle: 44.0 deg at 153.4 lbf-ft





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
Test ID:	Left Knee	Test Date:	11/19/2010
Test Number:	1	Test Time:	4:35:59 PM

Component Part Number	Component Serial Number
Knee Skin - 78051	077

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.0 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-5.78 -- -4.72	-5.37 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Knee**

Test Time: **4:35:59 PM**

Test Date: **11/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left Knee**

Test Time: **4:35:59 PM**

Test Date: **11/19/2010**

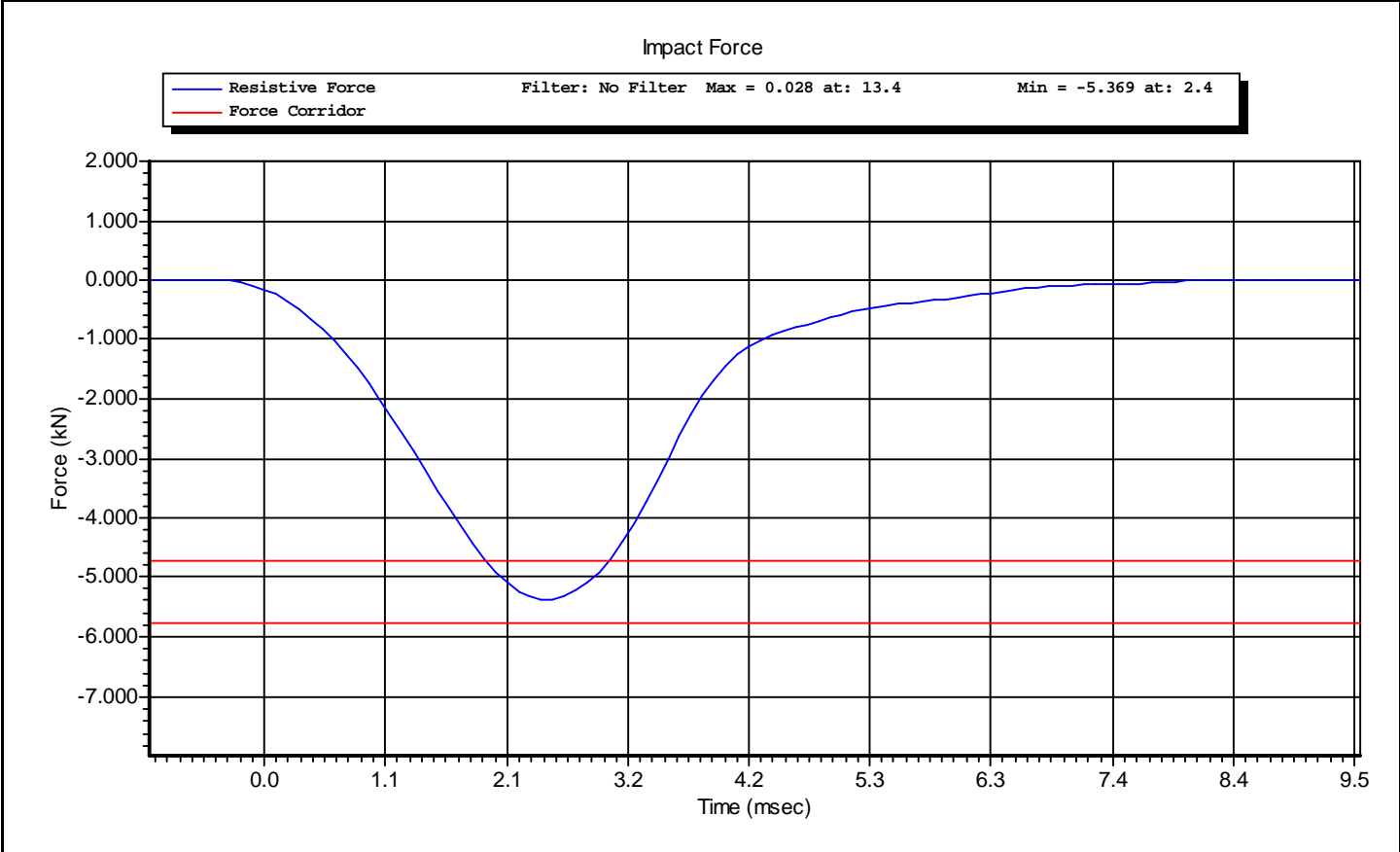


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left Knee	Test Date:	11/19/2010
Test Number:	1	Test Time:	4:35:59 PM





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
Test ID:	Right Knee	Test Date:	11/19/2010
Test Number:	1	Test Time:	4:44:34 PM

Component Part Number	Component Serial Number
Knee Skin - 78056	3266

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.0 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	2.07 -- 2.13	2.09 m/s P
Resistive Force	-5.78 -- -4.72	-5.27 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee** Test Time: **4:44:34 PM** Test Date: **11/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **4:44:34 PM**

Test Date: **11/19/2010**

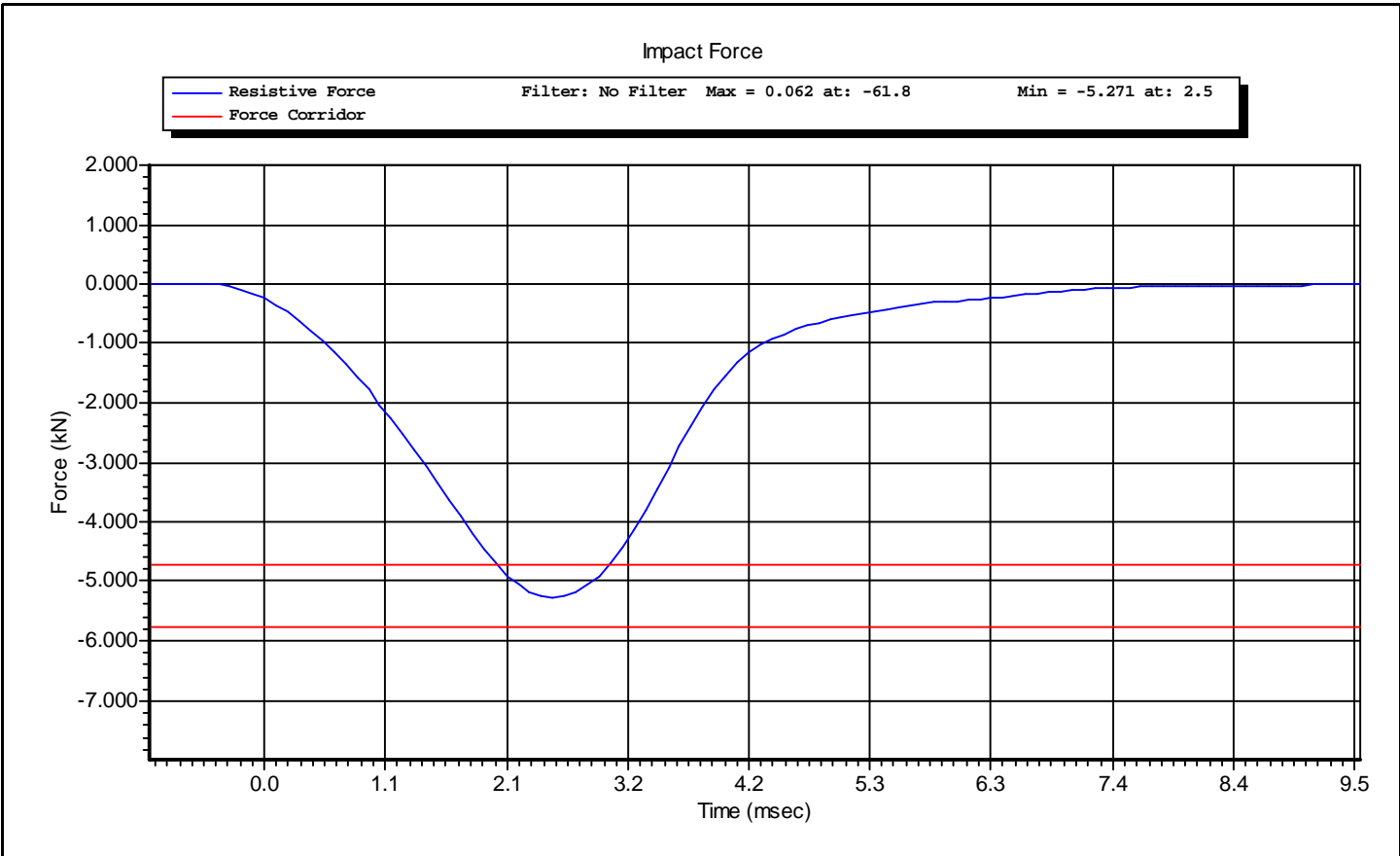


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	11/19/2010
Test Number:	1	Test Time:	4:44:34 PM



CALIBRATION TEST RESULTS

PRE-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 143



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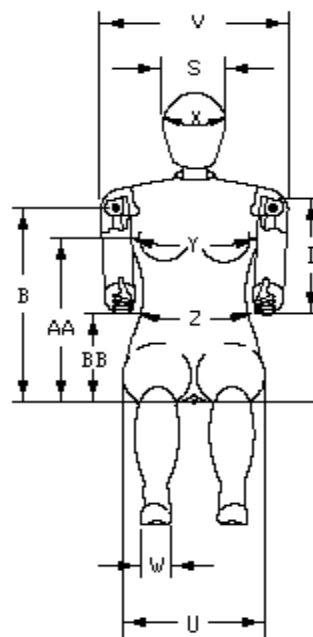
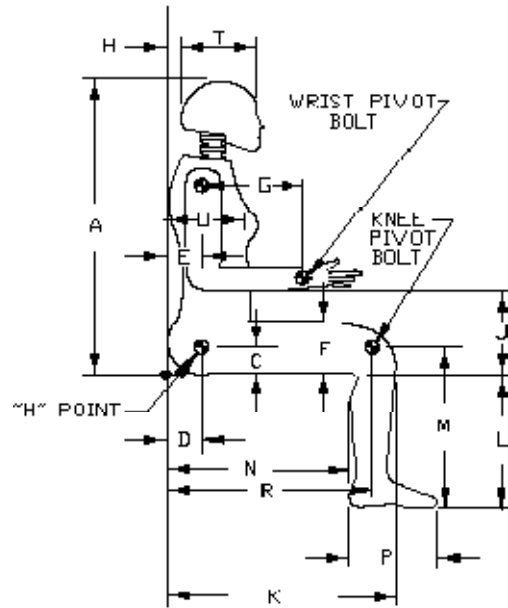
External Measurements - 5th Female

SN 143

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	786	Yes
B	Shoulder Pivot Height	431.8 – 457.2	449	Yes
C	H-Point Height	81.3 – 86.3	86	Yes
D	H-Point from Backline	144.8 – 149.8	146	Yes
E	Shoulder Pivot from Backline	68.6.83.8	75	Yes
F	Thigh Clearance	119.4 – 134.6	127	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	250	Yes
H	Head Back to Backline	43.2 – 48.2	47	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	277	Yes
J	Elbow Rest Height	182.8 – 203.2	195	Yes
K	Buttock to Knee Length	520.7 – 546.1	530	Yes
L	Popliteal Height	355.6 - 376	360	Yes
M	Knee Pivot Height	393.7 – 419.1	401	Yes
N	Buttock Popliteal Length	414 – 439.4	435	Yes
O	Chest Depth without Jacket	175.3 – 190.5	184	Yes
P	Foot Length (right)	218.5 – 233.7	219	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	480	Yes
S	Head Breadth	137.1 – 147.3	143	Yes
T	Head Depth	177.8 - 188	184	Yes
U	Hip Breadth	299.7 – 314.9	305	Yes
V	Shoulder Breadth	350.5 – 365.7	362	Yes
W	Foot Breadth	78.8 - 94	86	Yes
X	Head Circumference	528.3 – 548.7	537	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	879	Yes
Z	Waist Circumference	759.5 – 789.9	785	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	338	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	165	Yes

Hybrid 3 5th Female External Measurements

Reference Diagram





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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Head Drop	Test Date:	11/22/2010
Test Number:	1	Test Time:	11:36:23 AM

Component Part Number	Component Serial Number
Head Skin - 78051-228	05733

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.3 deg C P
Humidity	10 -- 70	49 %RH P
Resultant Acceleration	250 -- 300	256 g P
Oscillation	0.0 -- 10.0	1.5 % P
Lateral Acceleration	-15.00 -- 15.00	3.08 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **11:36:23 AM**

Test Date: **11/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66931	10/25/2010
Endevco	7264-2000	P66926	10/25/2010
Endevco	7264-2000	P66943	10/25/2010

Test ID: **Head Drop**

Test Time: **11:36:23 AM**

Test Date: **11/22/2010**

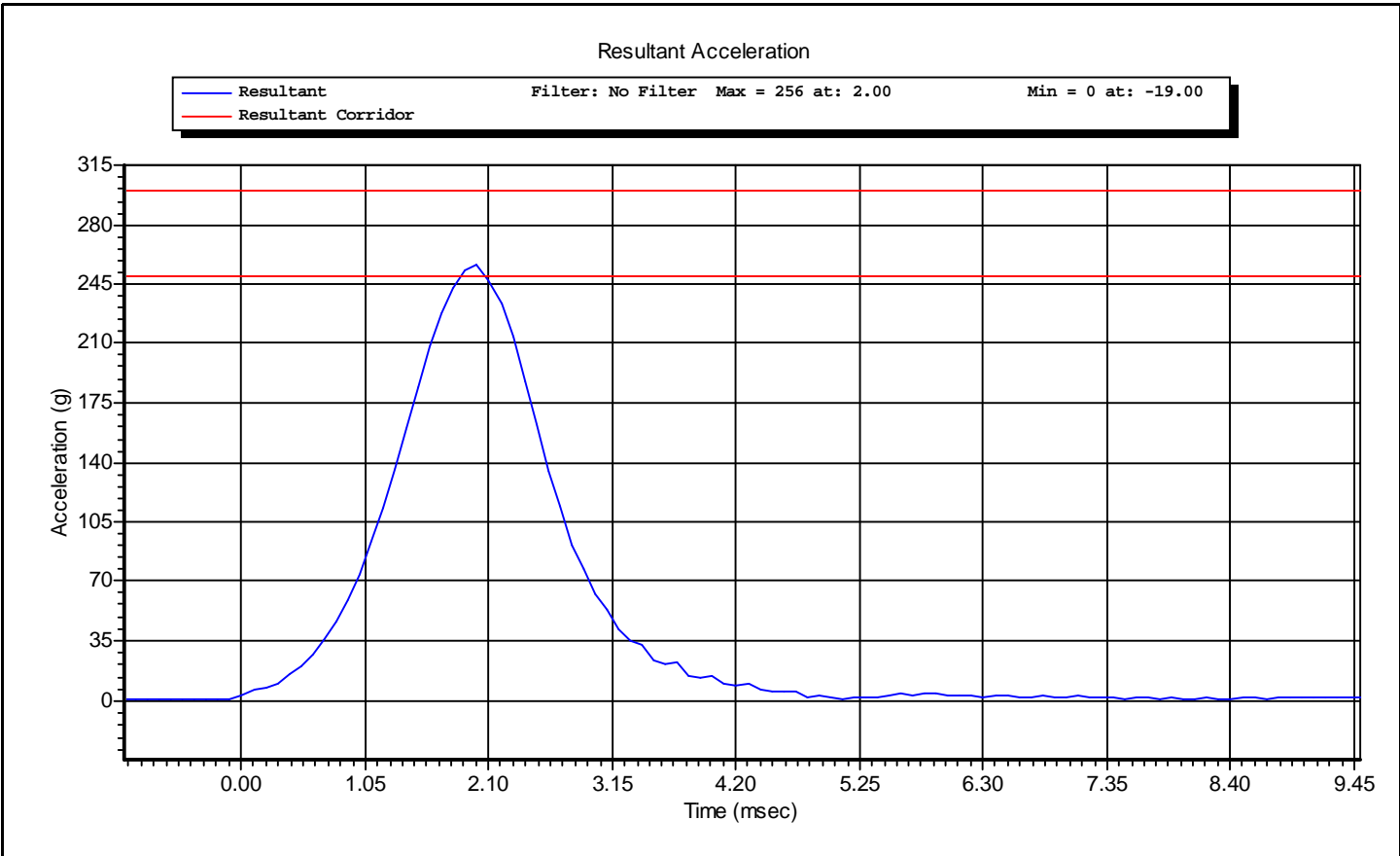


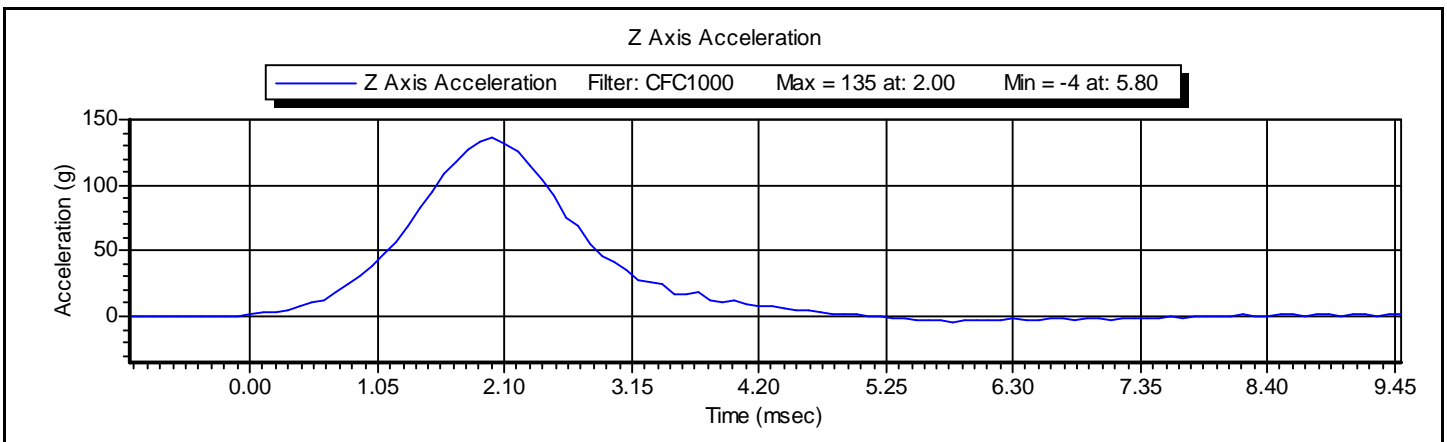
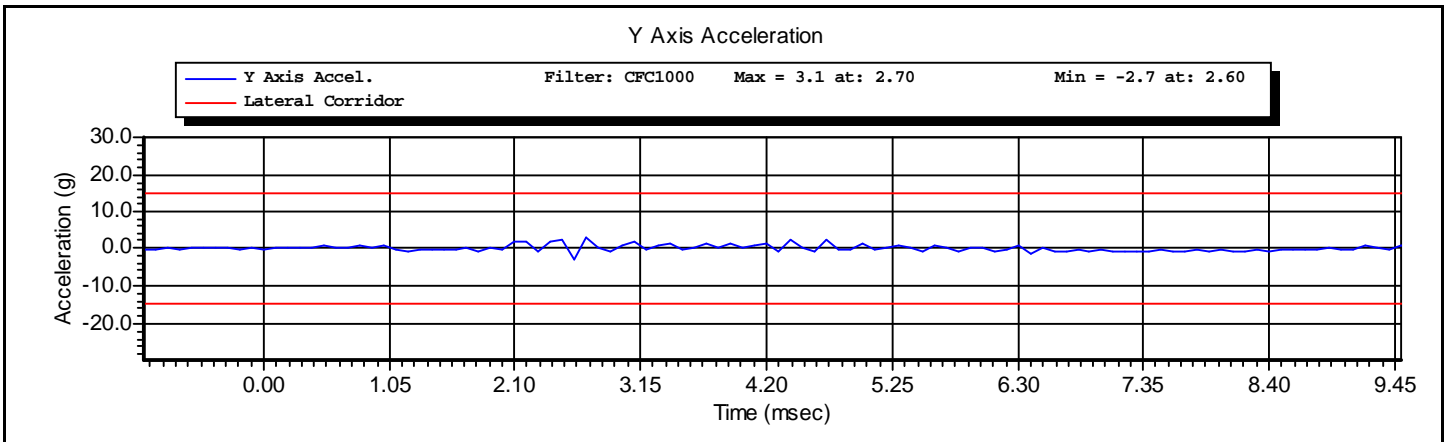
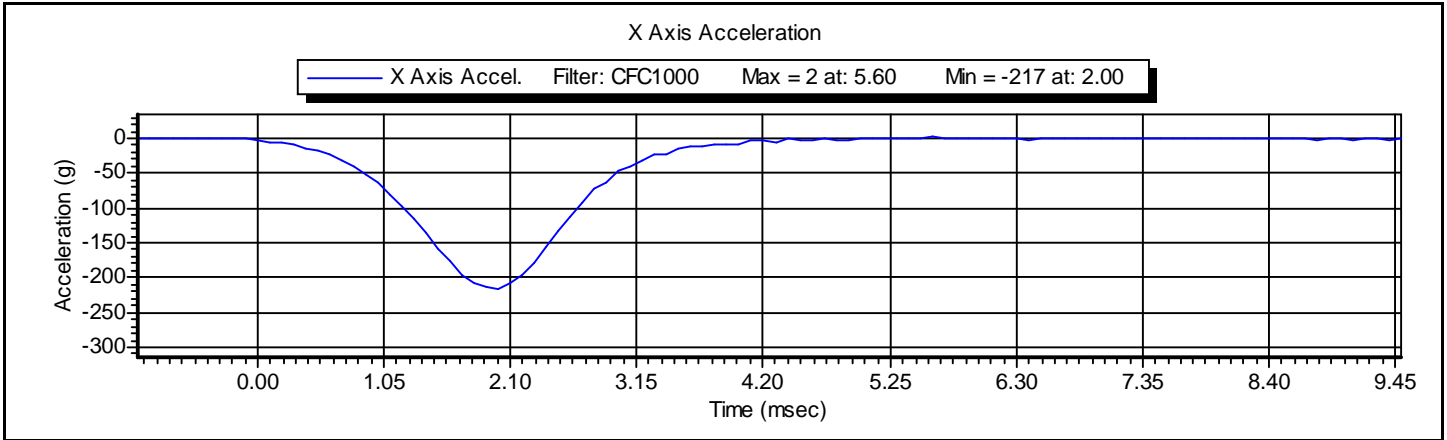
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Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Head Drop	Test Date:	11/22/2010
Test Number:	1	Test Time:	11:36:23 AM







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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Flexion	Test Date:	11/22/2010
Test Number:	1	Test Time:	1:38:45 PM

Component Part Number	Component Serial Number
Neck - 880105-255	05-0512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	51 %RH P
Velocity	6.89 -- 7.13	7.09 m/s P
Pendulum Impulse at 10 ms	2.10 -- 2.50	2.33 m/s P
Pendulum Impulse at 20 ms	4.00 -- 5.00	4.67 m/s P
Pendulum Impulse at 30 ms	5.80 -- 7.00	6.58 m/s P
D Plane Rotation	-91.0 -- -77.0	-78.7 degrees P
Moment During Rotation Interval	69.0 -- 83.0	74.9 Nm P
Moment Decay to 10.0 Nm	80.0 -- 100.0	86.9 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **1:38:45 PM**

Test Date: **11/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-443 My	5/25/2010
Denton	1716A	LC-443 Fx	5/25/2010
FTSS	1716A	LC-296 Fy	2/1/2010
FTSS	1716A	LC-296 Fz	2/1/2010

Test ID: **Neck Flexion**

Test Time: **1:38:45 PM**

Test Date: **11/22/2010**

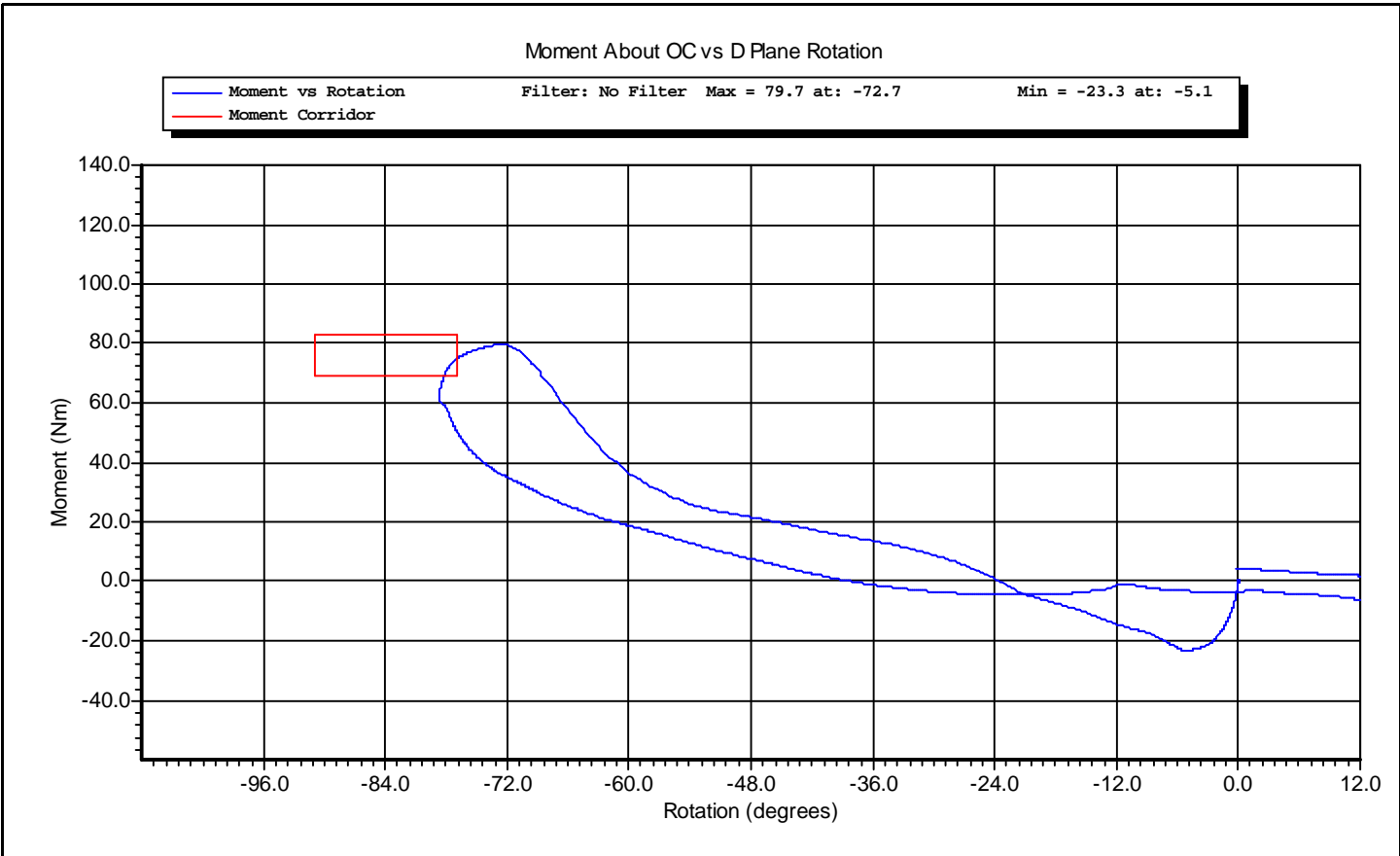


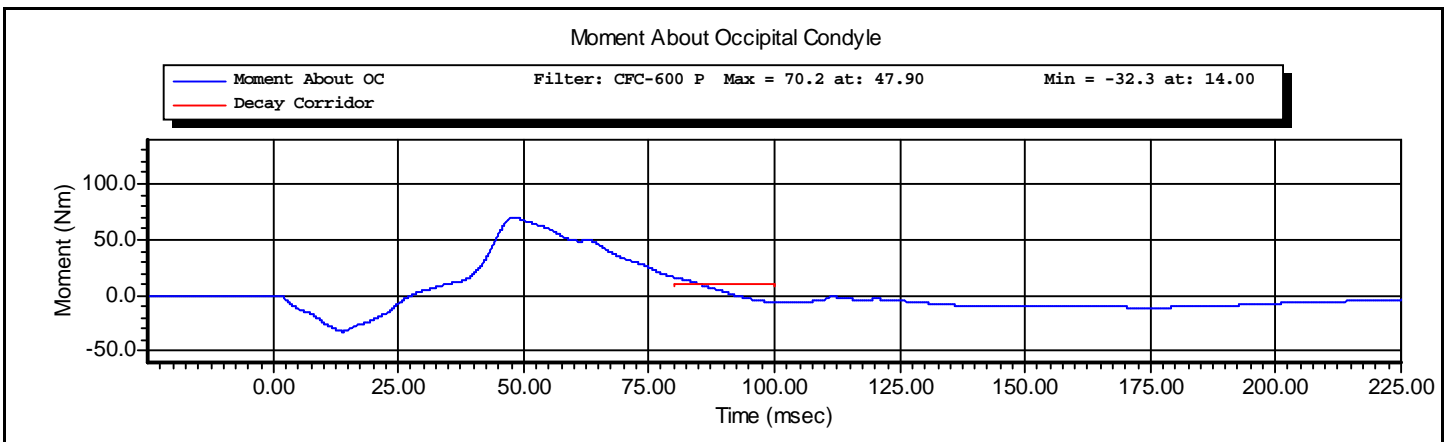
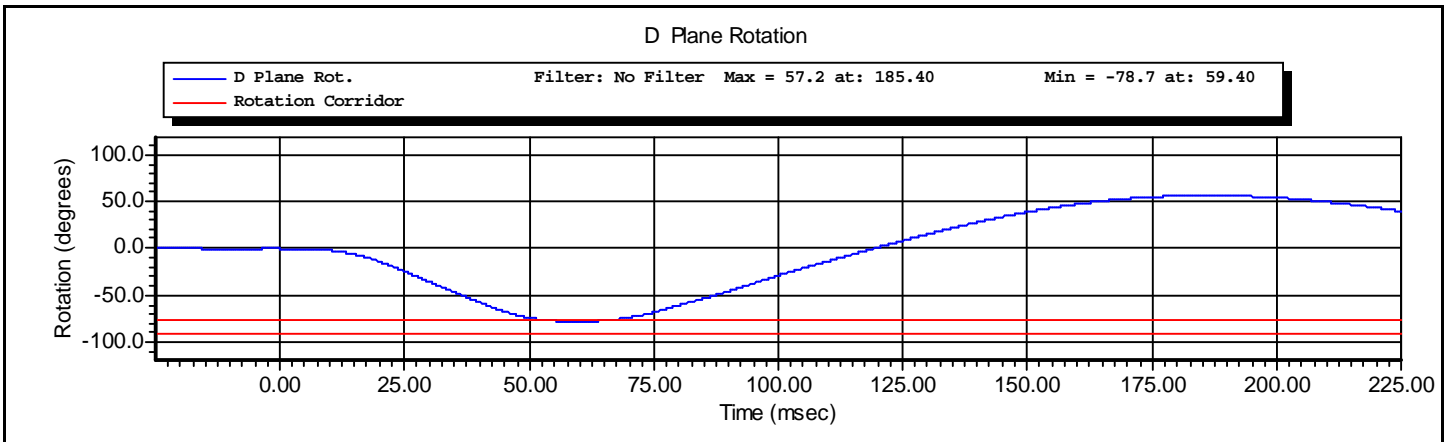
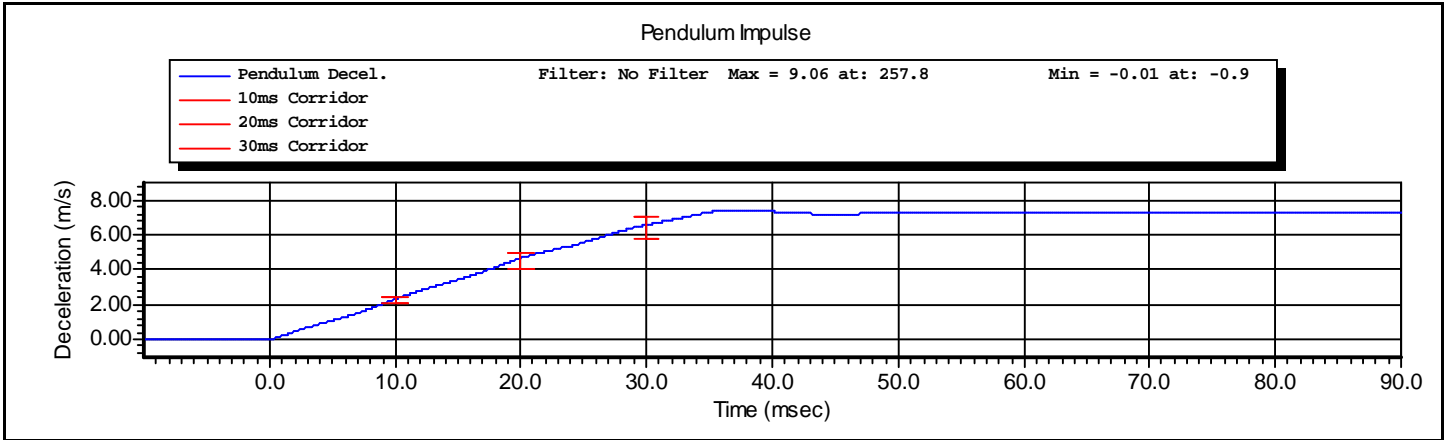
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Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Flexion	Test Date:	11/22/2010
Test Number:	1	Test Time:	1:38:45 PM







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VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Extension	Test Date:	11/22/2010
Test Number:	2	Test Time:	2:44:09 PM

Component Part Number	Component Serial Number
Neck - 880105-255	05-0512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	51 %RH P
Velocity	5.95 -- 6.19	6.07 m/s P
Pendulum Impulse at 10 ms	1.50 -- 1.90	1.86 m/s P
Pendulum Impulse at 20 ms	3.10 -- 3.90	3.73 m/s P
Pendulum Impulse at 30 ms	4.60 -- 5.60	5.38 m/s P
D Plane Rotation	99.0 -- 114.0	107.0 degrees P
Moment During Rotation Interval	-65.0 -- -53.0	-58.0 Nm P
Moment Decay to -10.0 Nm	94.0 -- 114.0	104.1 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension** Test Time: **2:44:09 PM** Test Date: **11/22/2010**



VERIFICATION REPORT

REFERENCE EQUIPMENT

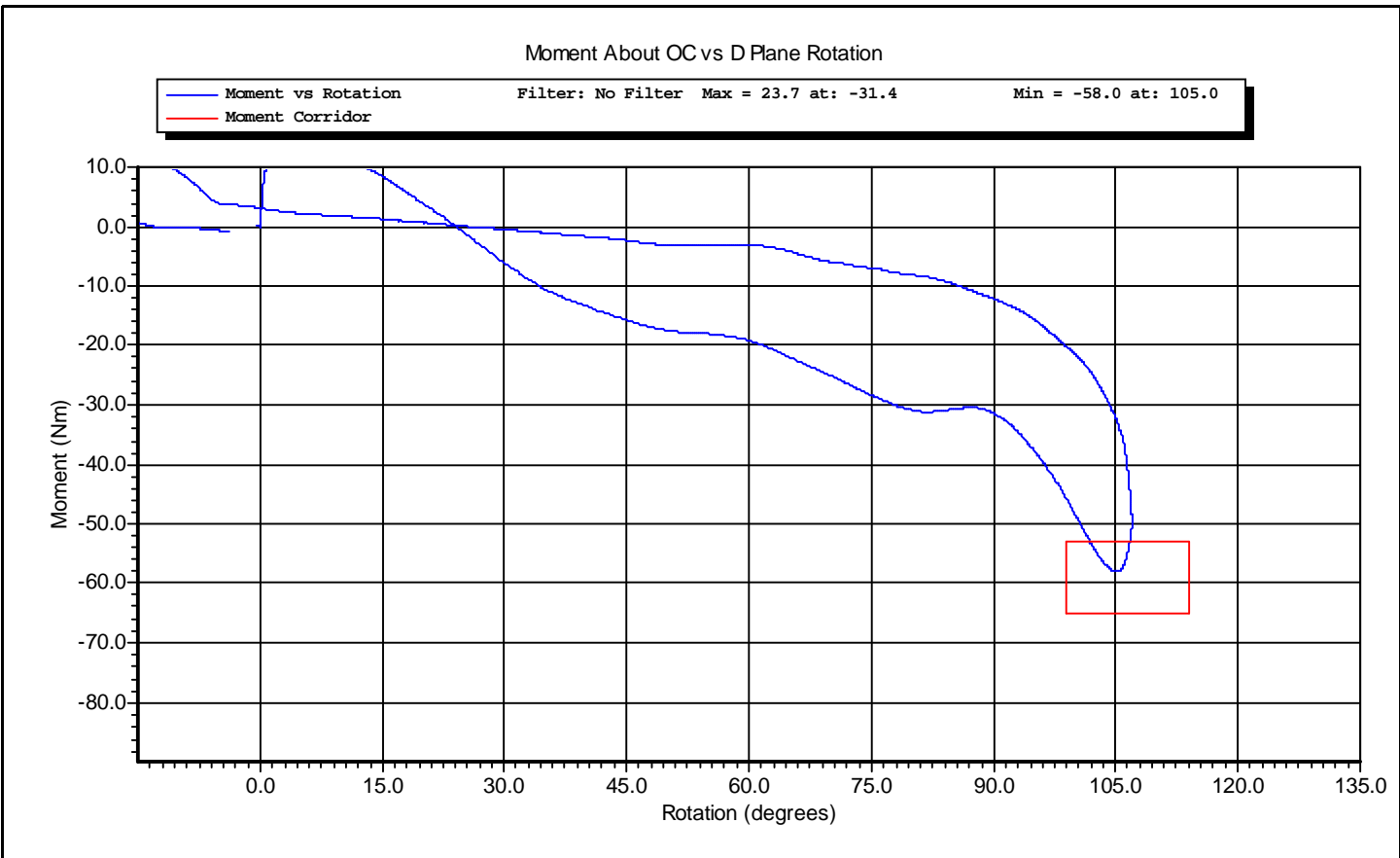
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-443 My	5/25/2010
Denton	1716A	LC-443 Fx	5/25/2010
FTSS	1716A	LC-296 Fy	2/1/2010
FTSS	1716A	LC-296 Fz	2/1/2010

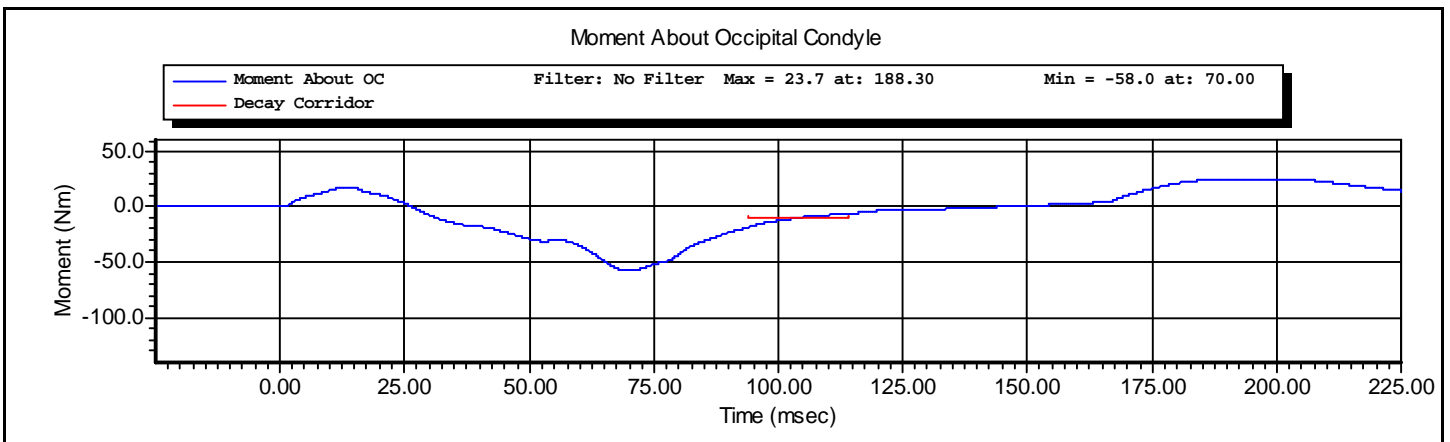
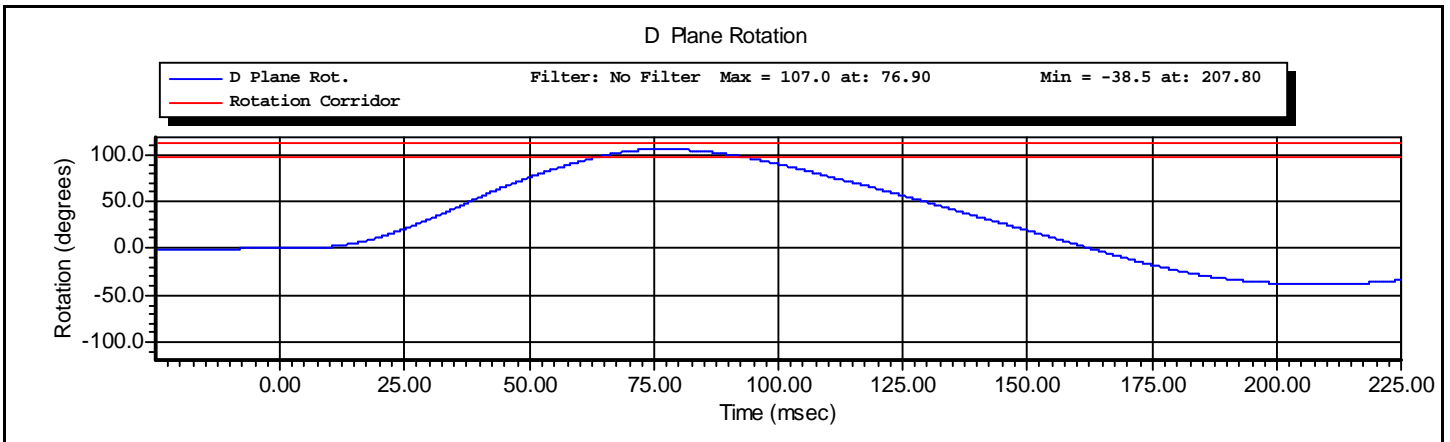
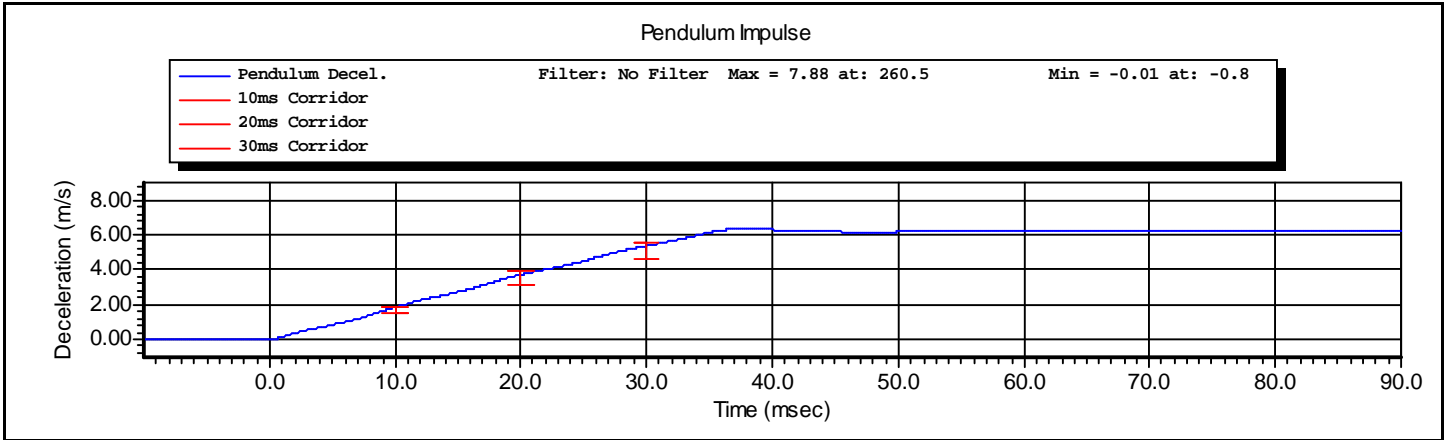
Test ID: **Neck Extension**

Test Time: **2:44:09 PM**

Test Date: **11/22/2010**

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Extension	Test Date:	11/22/2010
Test Number:	2	Test Time:	2:44:09 PM







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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-143G	6/2/2010

Test ID: **Thorax Impact**

Test Time: **3:14:11 PM**

Test Date: **11/22/2010**

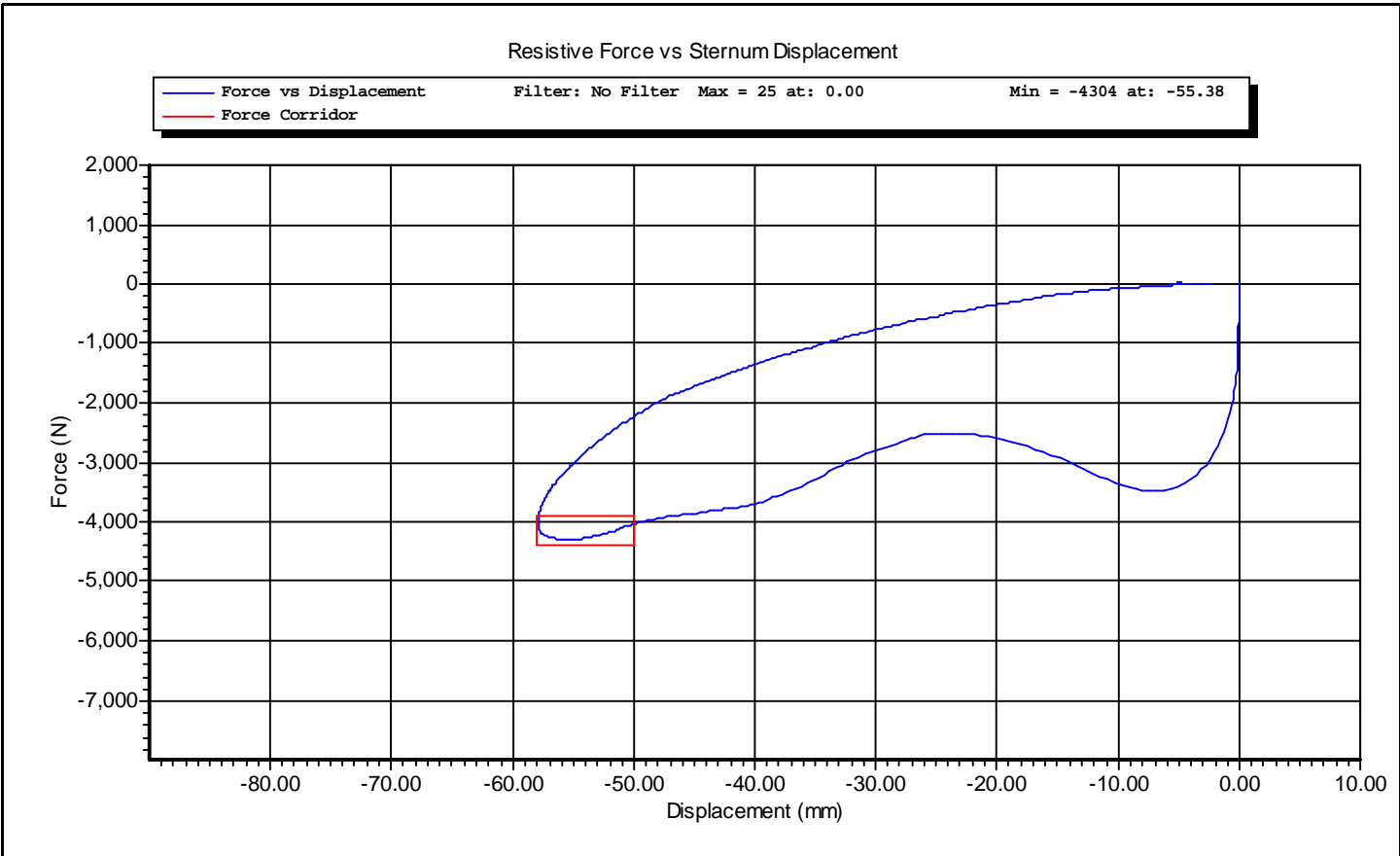


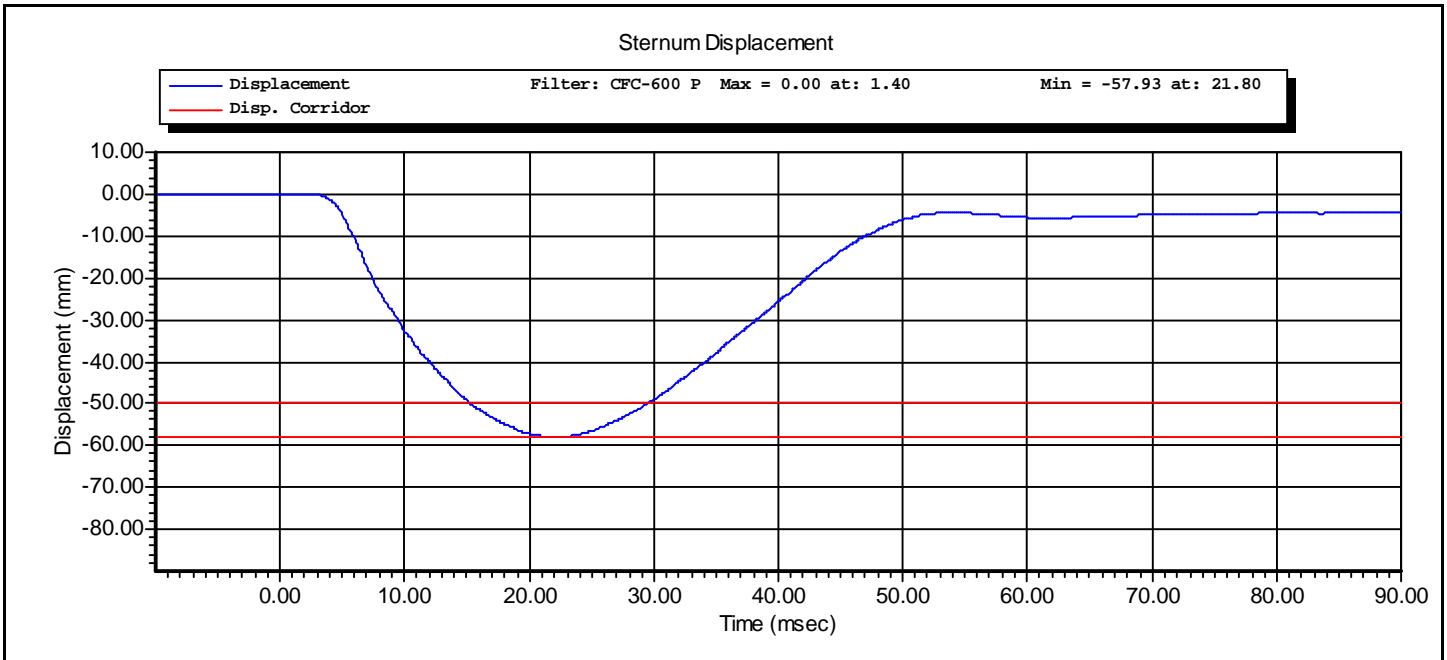
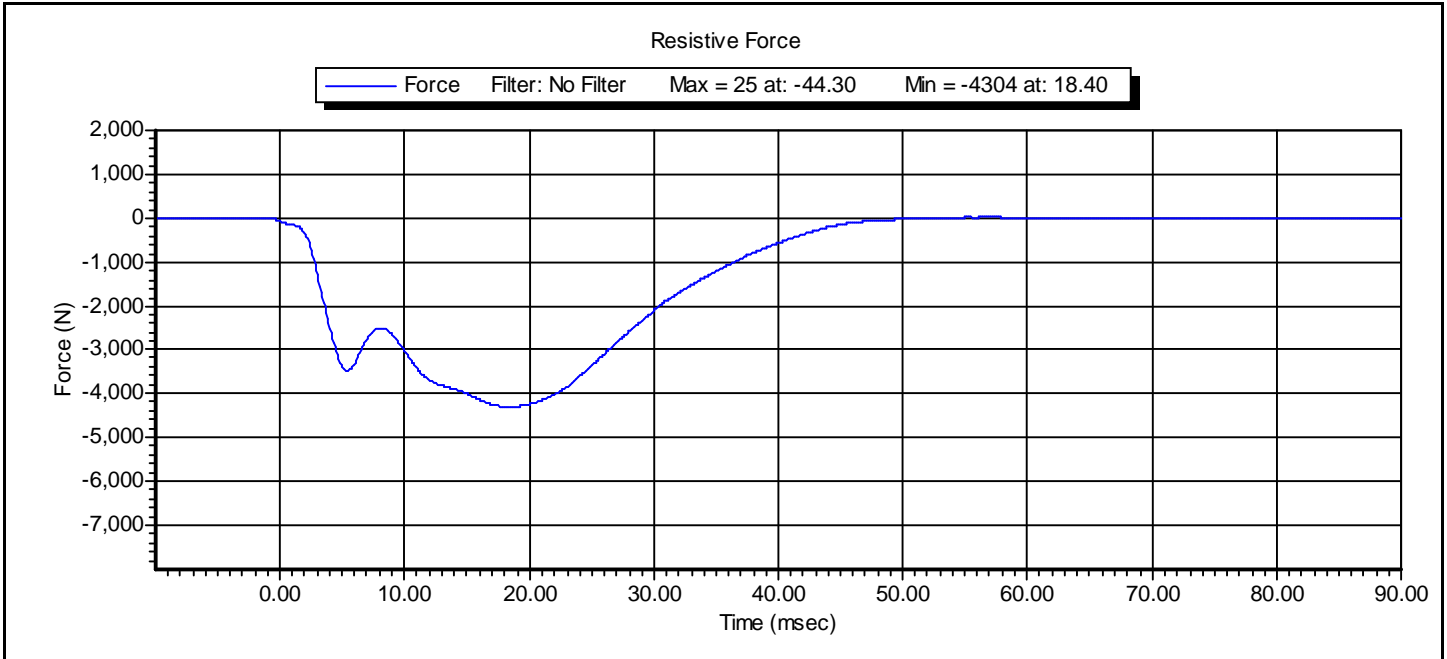
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Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Thorax Impact	Test Date:	11/22/2010
Test Number:	1	Test Time:	3:14:11 PM





Torso Flexion Test

Technician: AR

Calibration Date: 11/23/2010

ATD Serial Number: 5th Female 143

Test Results			
Test Condition	Parameters	Results	Status
Temperature	18.9-25.6° C	21.7° C	P
Lab Humidity: 38%	10-70%	53%	P
Max Force @ 45 deg	320 – 390N	368N	P
Torso Rotation Rate	0.5 °/s ≤ rate ≤ 1.5 °/s	1.0 °/s	P
Initial reference angle	≤20 deg	12°	P
Final ref plan angle	Initial ref plane ± 8 deg	18°	P

P = Pass

F = Fail



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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Left Knee	Test Date:	11/22/2010
Test Number:	1	Test Time:	4:15:27 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	5955

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	52.0 %RH P
Velocity	2.07 -- 2.13	2.11 m/s P
Resistive Force	-4060 -- -3450	-3515 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Knee**

Test Time: **4:15:27 PM**

Test Date: **11/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left Knee**

Test Time: **4:15:27 PM**

Test Date: **11/22/2010**

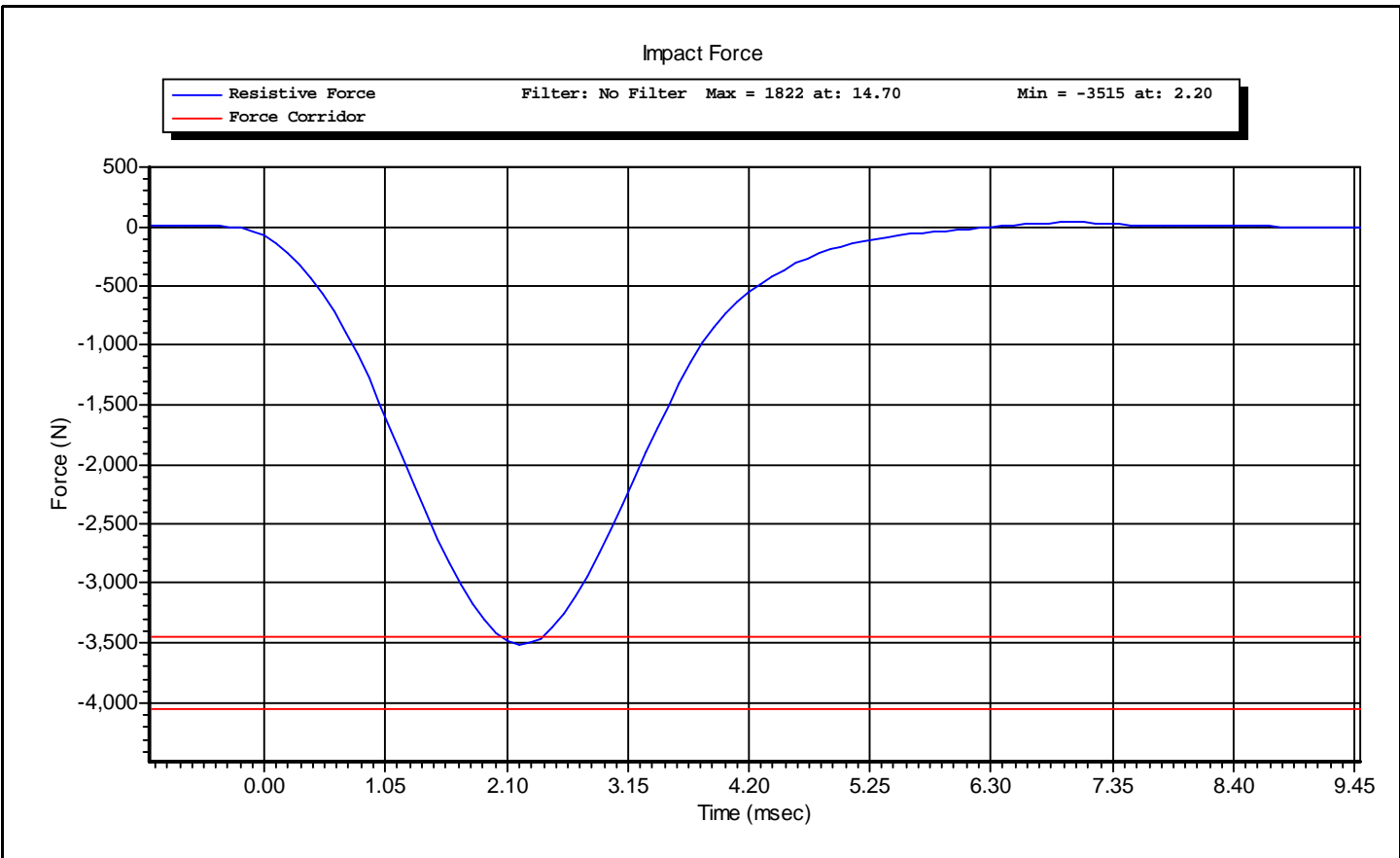


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Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Left Knee	Test Date:	11/22/2010
Test Number:	1	Test Time:	4:15:27 PM





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Right Knee	Test Date:	11/22/2010
Test Number:	1	Test Time:	4:34:32 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	06052

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	51.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-4060 -- -3450	-3545 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee**

Test Time: **4:34:32 PM**

Test Date: **11/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **4:34:32 PM**

Test Date: **11/22/2010**

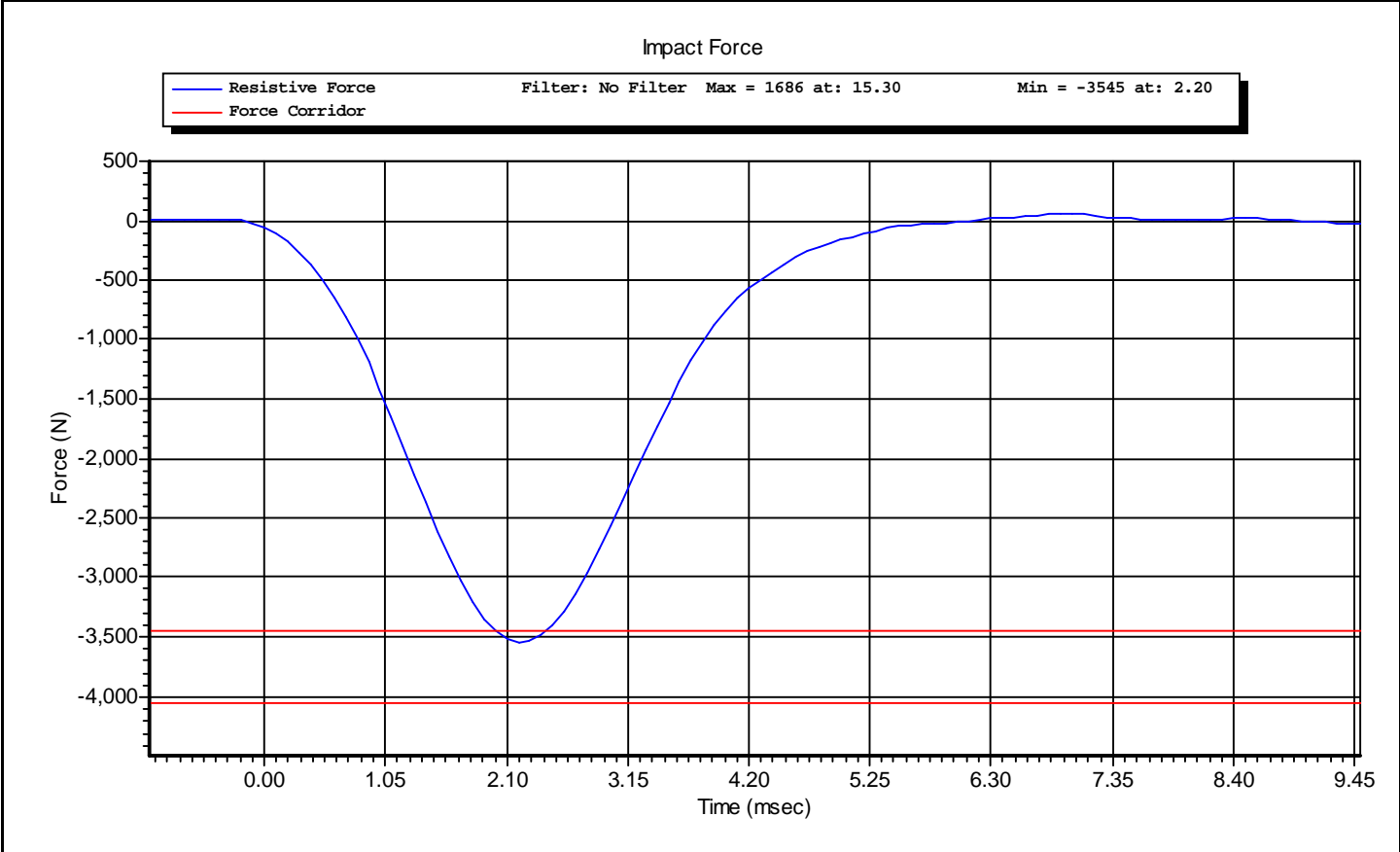


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Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Right Knee	Test Date:	11/22/2010
Test Number:	1	Test Time:	4:34:32 PM



CALIBRATION TEST RESULTS

POST-TEST

DRIVER DUMMY

S/N: 061

50th Male External Measurements

SN 061

Symbol	Description	Specification	Results	Pass
		in	in	
A	Sitting Height	34.6 - 35	34.7	Yes
B	Shoulder Pivot Height	19.9 - 20.5	20.2	Yes
C	H-Point Height	3.3 - 3.5	3.5	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	6.1	Yes
G	Back of Elbow to Wrist Pivot	11.4 - 12.0	11.6	Yes
H	Head Back to Backline	1.6 - 1.8	1.7	Yes
I	Shoulder to Elbow Length	13.0 - 13.6	13.3	Yes
J	Elbow Rest Height	7.5 - 8.3	8.1	Yes
K	Buttock to Knee Length	22.8 - 23.8	23.6	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	18.7	Yes
O	Chest Depth without Jacket	8.4 - 9.0	8.5	Yes
P	Foot Length (right)	9.9 - 10.5	10.0	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	38.5	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: SZ

Date: 12/8/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Head Drop	Test Date:	12/7/2010
Test Number:	1	Test Time:	9:37:50 AM

Component Part Number	Component Serial Number
Head Skin - 78051-228	243

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.1 deg C P
Humidity	10 -- 70	27 %RH P
Resultant Acceleration	225 -- 275	257 g P
Oscillation	0.0 -- 10.0	1.4 % P
Lateral Acceleration	-15.00 -- 15.00	-9.21 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **9:37:50 AM**

Test Date: **12/7/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66931	10/25/2010
Endevco	7264-2000	P66926	10/25/2010
Endevco	7264-2000	P66943	10/25/2010

Test ID: **Head Drop**

Test Time: **9:37:50 AM**

Test Date: **12/7/2010**

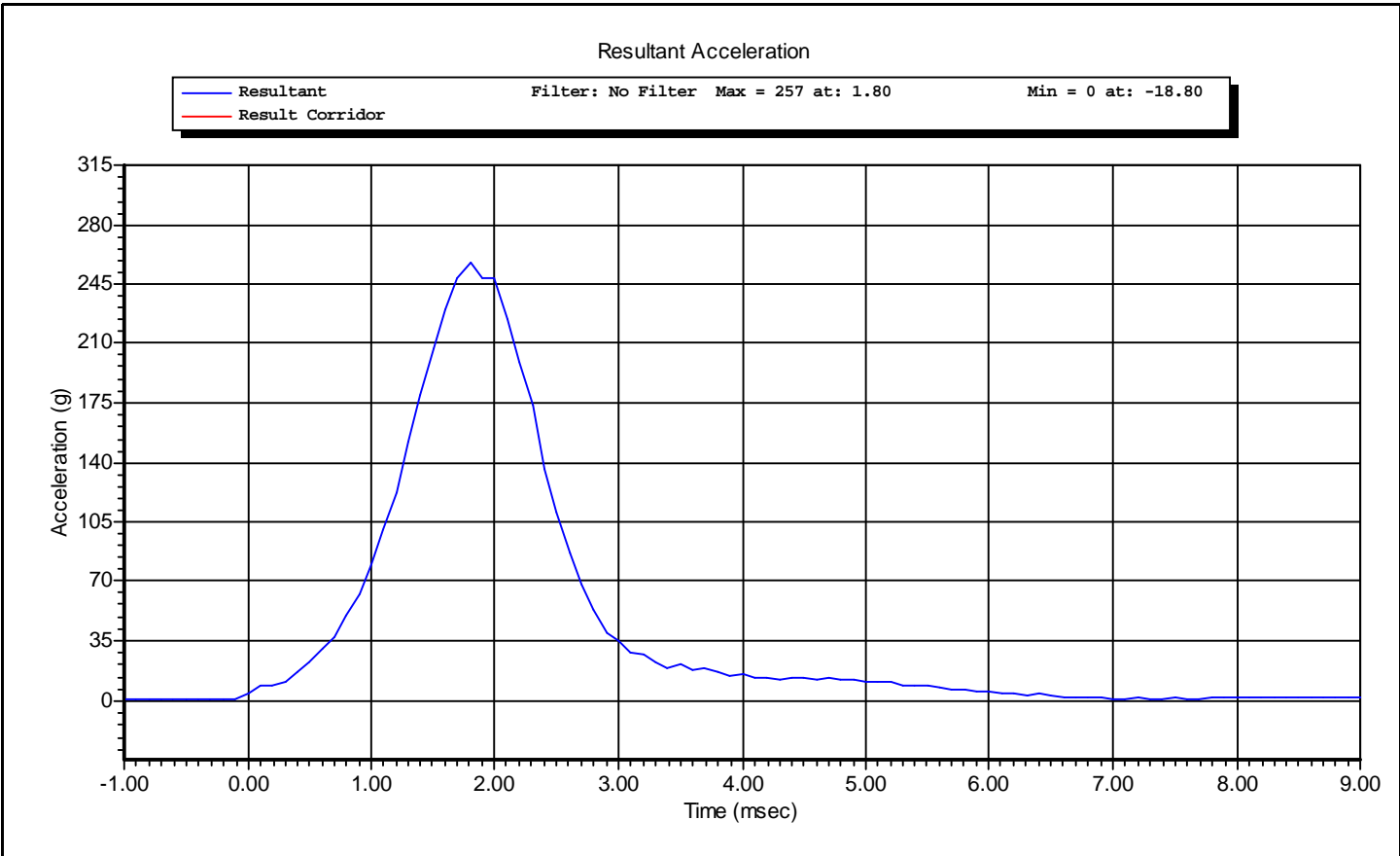


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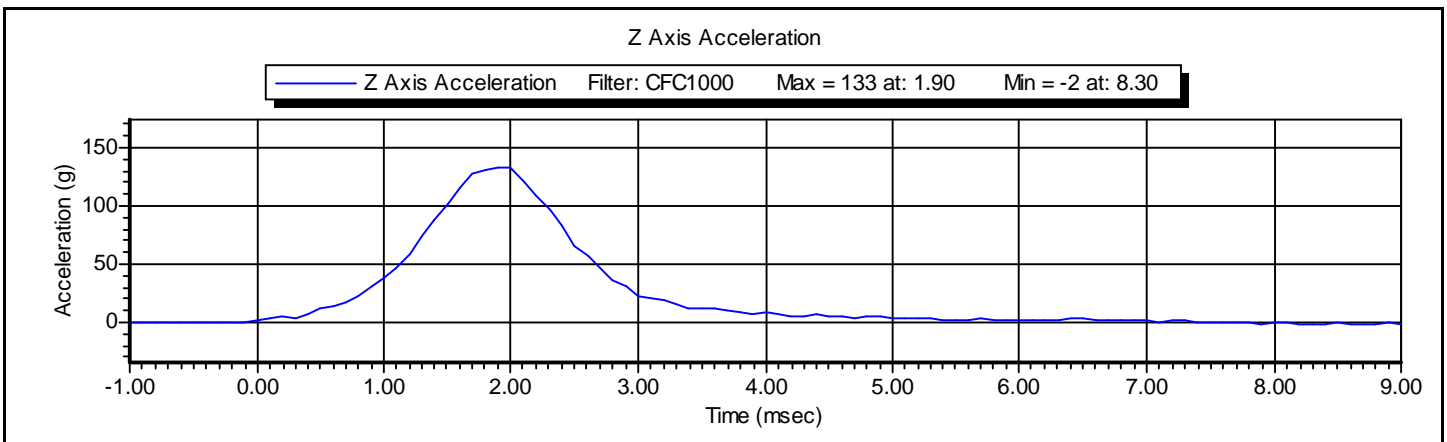
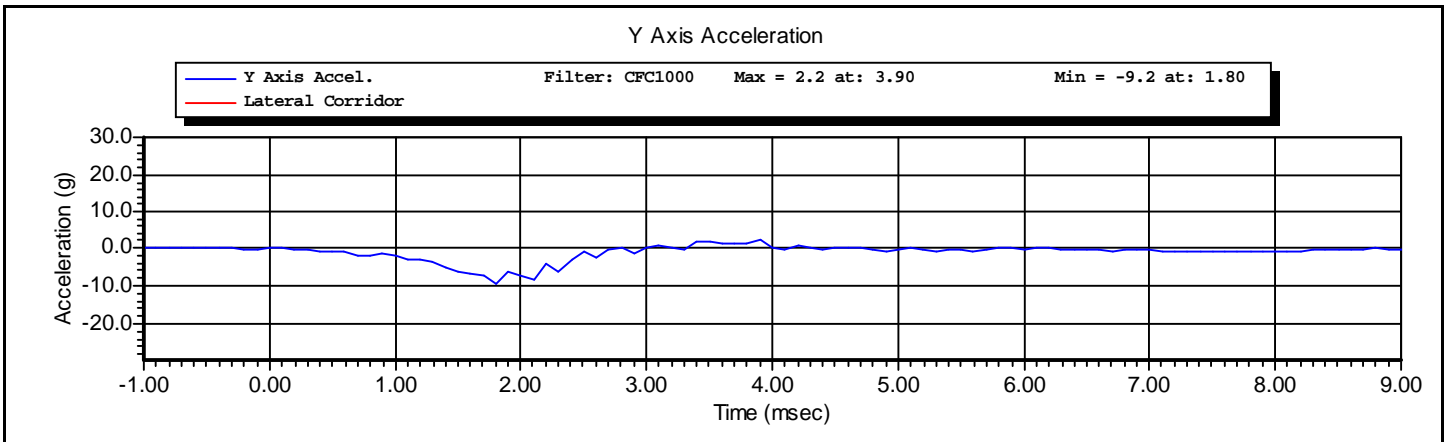
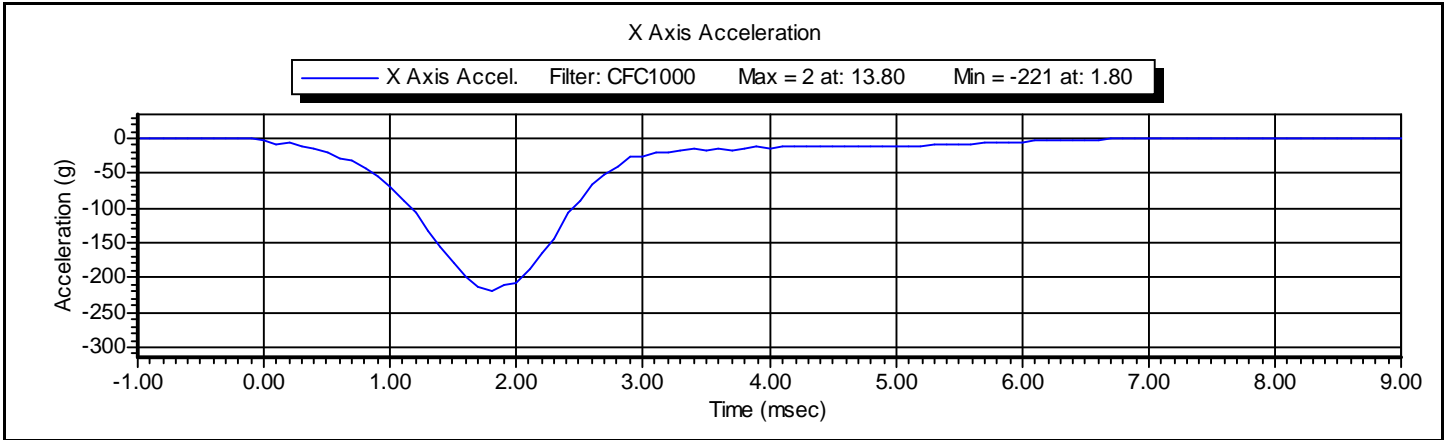
Test Name:	Head Drop	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Head Drop	Test Date:	12/7/2010
Test Number:	1	Test Time:	9:37:50 AM



Test ID: **Head Drop**

Test Time: **9:37:50 AM**

Test Date: **12/7/2010**





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VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Neck Extension	Test Date:	12/7/2010
Test Number:	1	Test Time:	1:44:10 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4194
Front Nodding Block - 78051-351	1797
Rear Nodding Block - 78051-351	1799
Head Skin - 78051-220	243

Test Parameters		Test Specifications		Test Results	
Temperature		20.6	-- 22.2	21.7 deg C	P
Humidity		10	-- 70	24 %RH	P
Velocity		5.94	-- 6.19	6.12 m/s	P
Pendulum Deceleration at	10 ms	17.2	-- 21.2	18.9 g	P
Pendulum Deceleration at	20 ms	14.0	-- 19.0	16.0 g	P
Pendulum Deceleration at	30 ms	11.0	-- 16.0	12.4 g	P
Max Pendulum Deceleration after	30 ms	0.0	-- 22.0	14.3 g	P
Decel Time to	5 g	38.0	-- 46.0	43.0 ms	P
D Plane Rotation		81.0	-- 106.0	91.4 degrees	P
Time at Max Rotation		72.0	-- 82.0	77.8 ms	P
Rotation Decay to Zero		147.0	-- 174.0	160.4 ms	P
Moment About Occipital Condyle		-80.0	-- -52.9	-69.9 Nm	P
Time at Max Moment		65.0	-- 79.0	73.1 ms	P
Moment Decay to Zero		120.0	-- 148.0	140.7 ms	P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension**

Test Time: **1:44:10 PM**

Test Date: **12/7/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

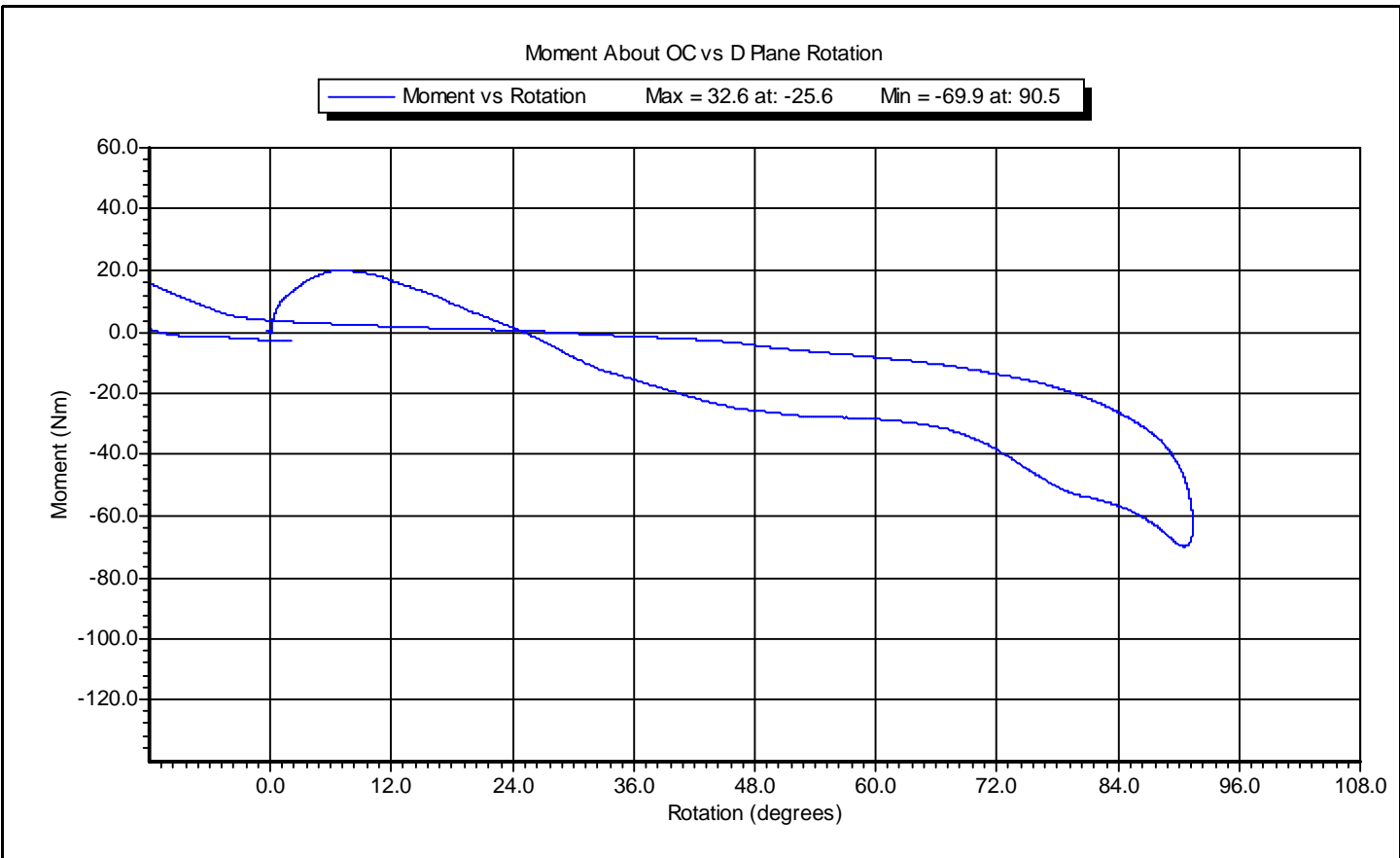
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	11/18/2010
Denton	1716A	LC-1916 Fx	11/18/2010

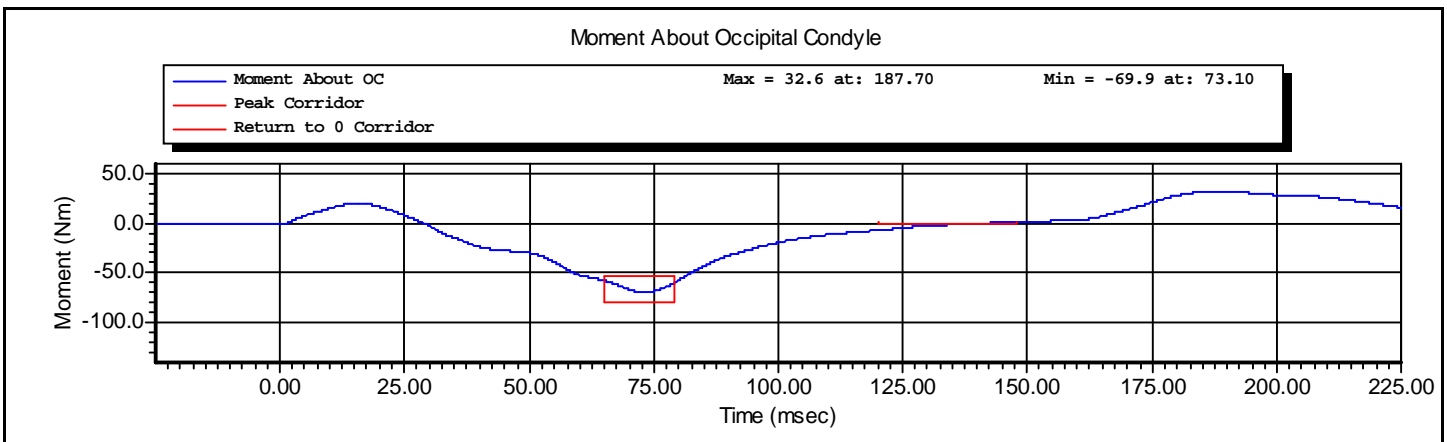
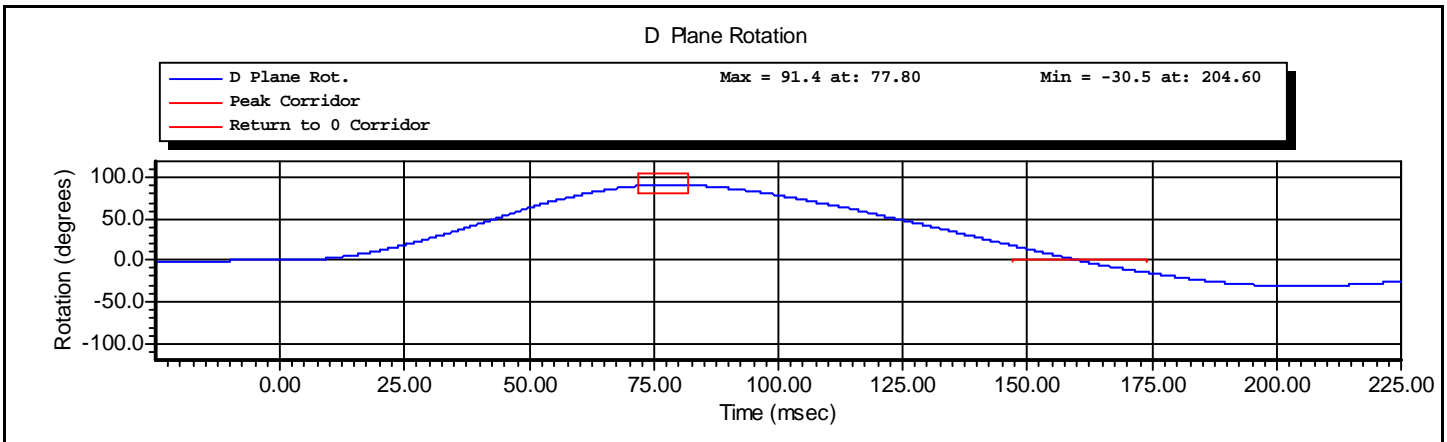
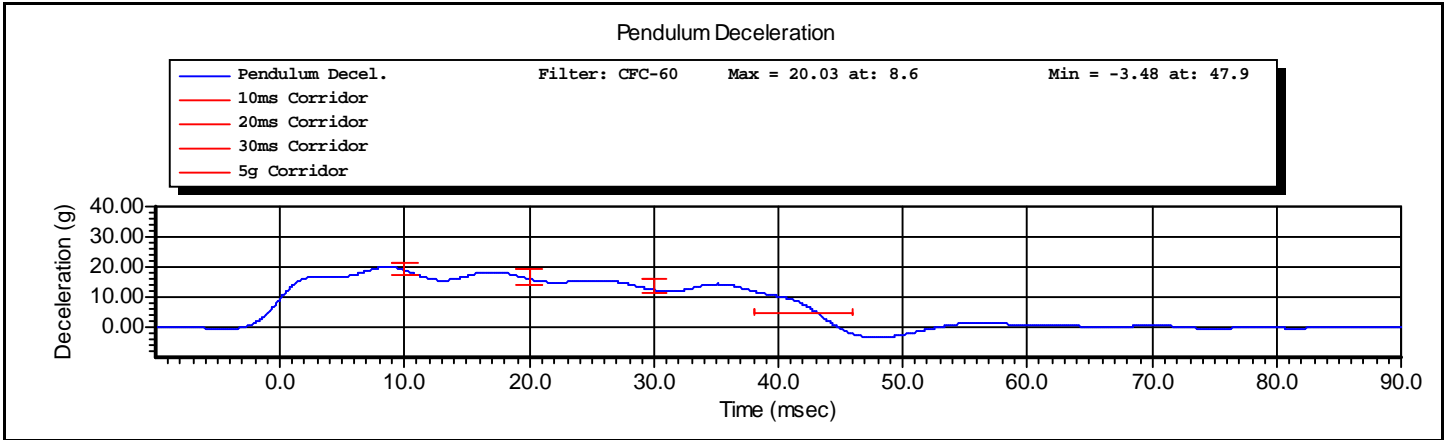
Test ID: **Neck Extension**

Test Time: **1:44:10 PM**

Test Date: **12/7/2010**

Name of Test:	Neck Extension	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Extension	Date:	12/7/2010
Number of Test:	1	Time of Test:	1:44:10 PM







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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Neck Flexion	Test Date:	12/7/2010
Test Number:	4	Test Time:	1:13:30 PM

Component Part Number	Component Serial Number
Neck - 78051-336	4194
Front Nodding Block - 78051-351	1797
Rear Nodding Block - 78051-351	1799
Head Skin - 78051-220	243

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	24 %RH P
Velocity	6.89 -- 7.13	7.09 m/s P
Pendulum Deceleration at 10 ms	22.5 -- 27.5	25.9 g P
Pendulum Deceleration at 20 ms	17.6 -- 22.6	20.9 g P
Pendulum Deceleration at 30 ms	12.5 -- 18.5	14.1 g P
Max Pendulum Deceleration After 30 ms	0.0 -- 29.0	14.1 g P
Deceleration time to 5 g	34.0 -- 42.0	38.6 ms P
D Plane Rotation	-78.0 -- -64.0	-65.2 degrees P
Time at max rotation	57.0 -- 64.0	58.7 ms P
Rotation Decay to Zero	113.0 -- 128.0	118.4 ms P
Moment about OC	88.1 -- 108.4	95.7 Nm P
Time at Max Moment	47.0 -- 58.0	52.0 ms P
Moment Decay to Zero	97.0 -- 107.0	97.2 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **1:13:30 PM**

Test Date: **12/7/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

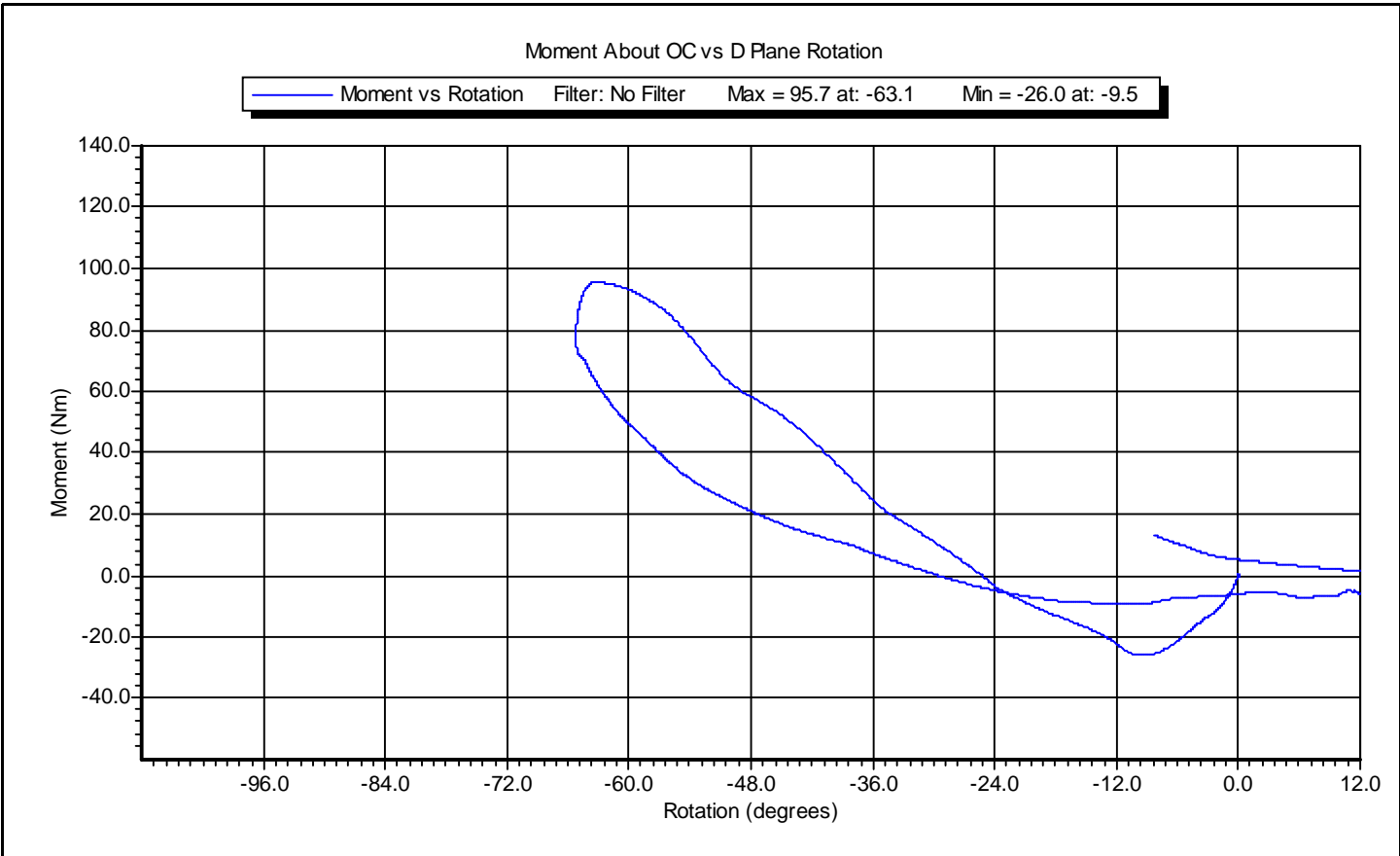
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DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-1916 My	11/18/2010
Denton	1716A	LC-1916 Fx	11/18/2010
Endevco	7231CT	P35758	10/5/2010

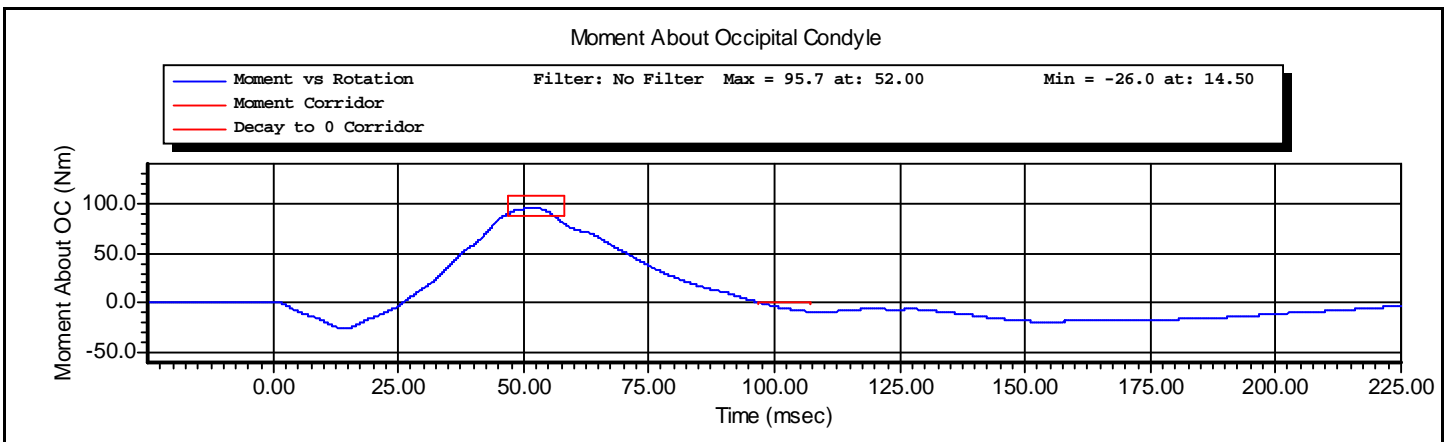
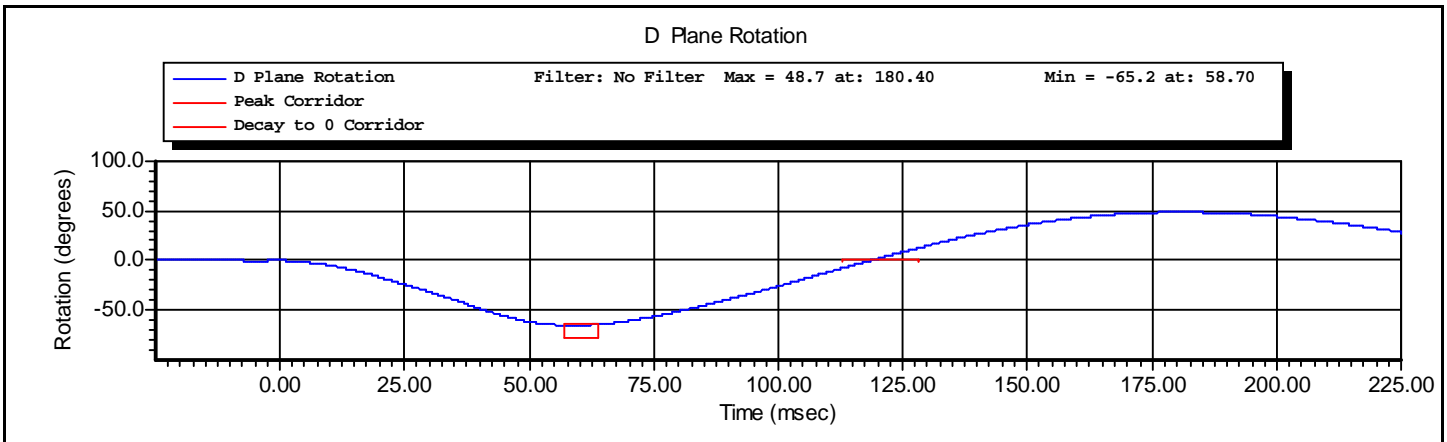
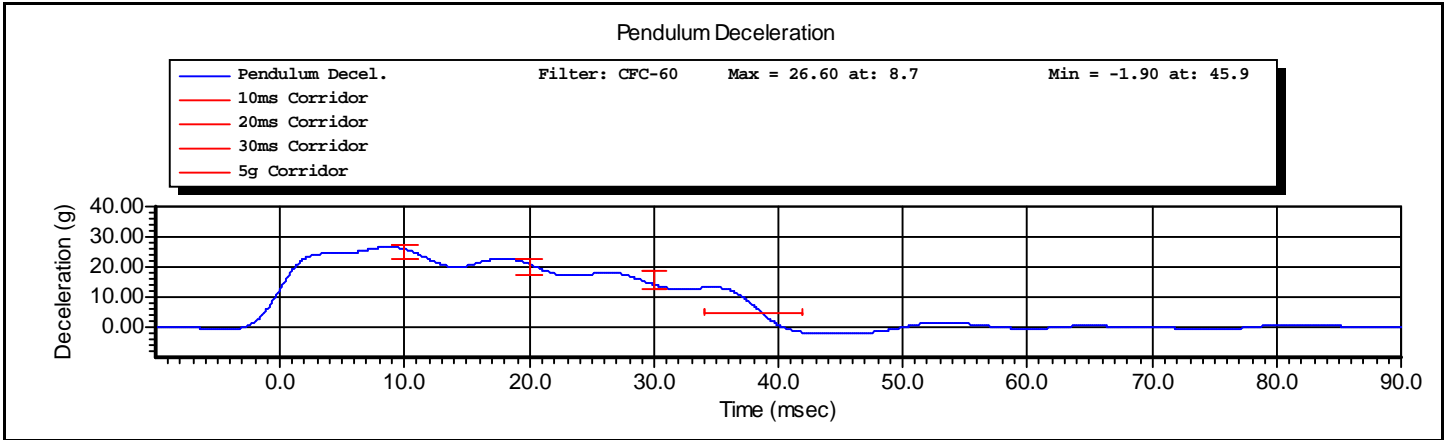
Test ID: **Neck Flexion**

Test Time: **1:13:30 PM**

Test Date: **12/7/2010**

Name of Test:	Neck Flexion	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Flexion	Date:	12/7/2010
Number of Test:	4	Time of Test:	1:13:30 PM







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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Thorax	Test Date:	12/8/2010
Test Number:	2	Test Time:	3:41:32 PM

Component Part Number	Component Serial Number
Ribs 78051-RS	4273
Chest Jacket - 78051-169	2437
Lumbar Spine - 78051-66	555

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.0 deg C P
Humidity	10.0 -- 70.0	25.0 %RH P
Velocity	6.59 -- 6.83	6.67 m/s P
Resistive Force	-5.894 -- -5.160	-5.693 kN P
Sternum Displacement	-72.6 -- -63.5	-70.1 mm P
Hysteresis	69 -- 85	71 % P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax**

Test Time: **3:41:32 PM**

Test Date: **12/8/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

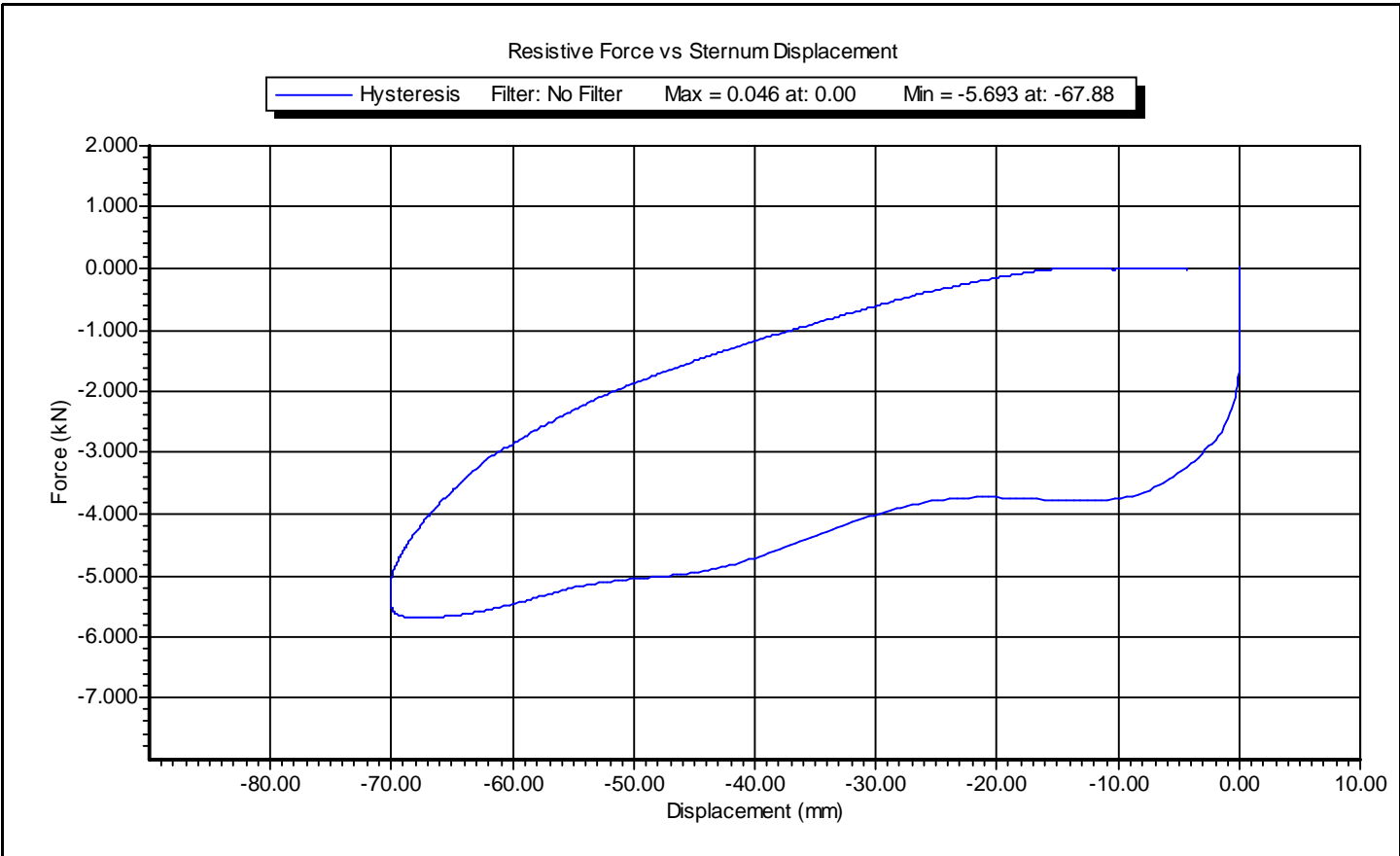
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-061	6/1/2010

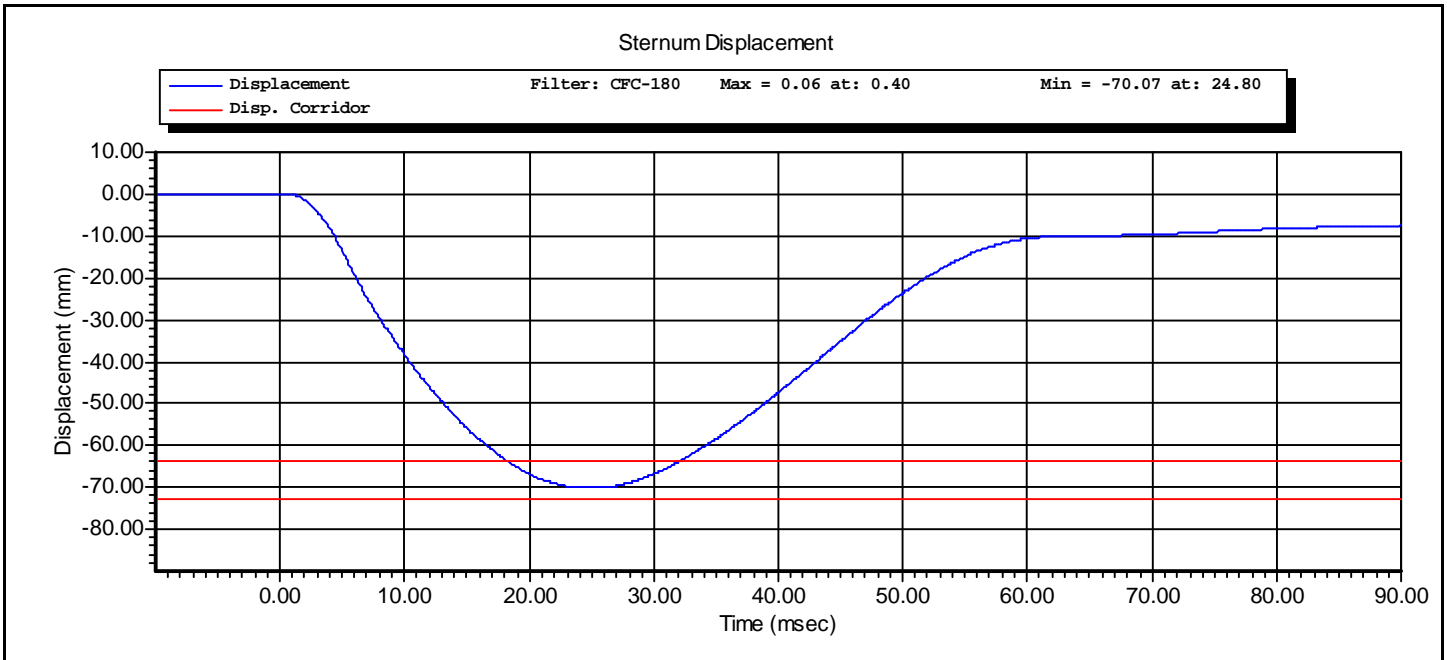
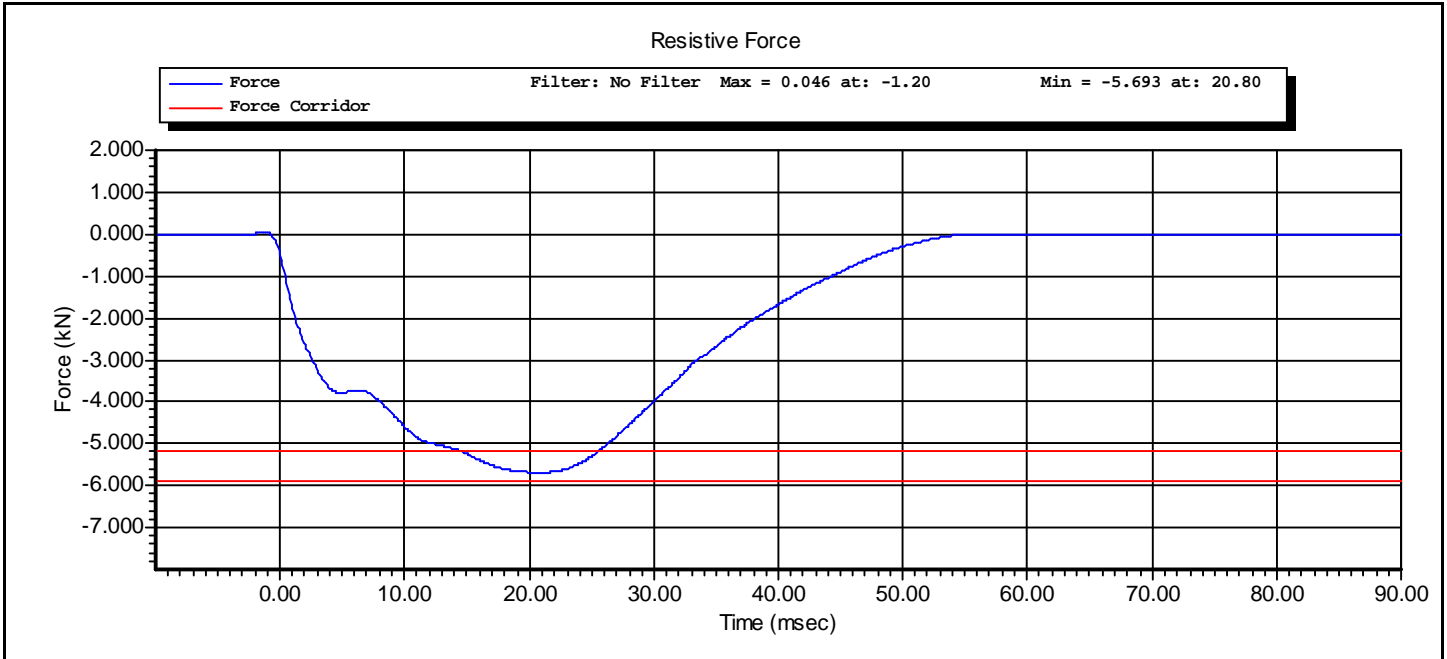
Test ID: **Thorax**

Test Time: **3:41:32 PM**

Test Date: **12/8/2010**

Test Name:	Thorax Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Thorax	Test Date:	12/8/2010
Test Number:	2	Test Time:	3:41:32 PM





CALSPAN

Hybrid III Hip Range of Motion: Hybrid III 50th Male

Serial Number: 061
Test Number: 1
Comments: RIGHT

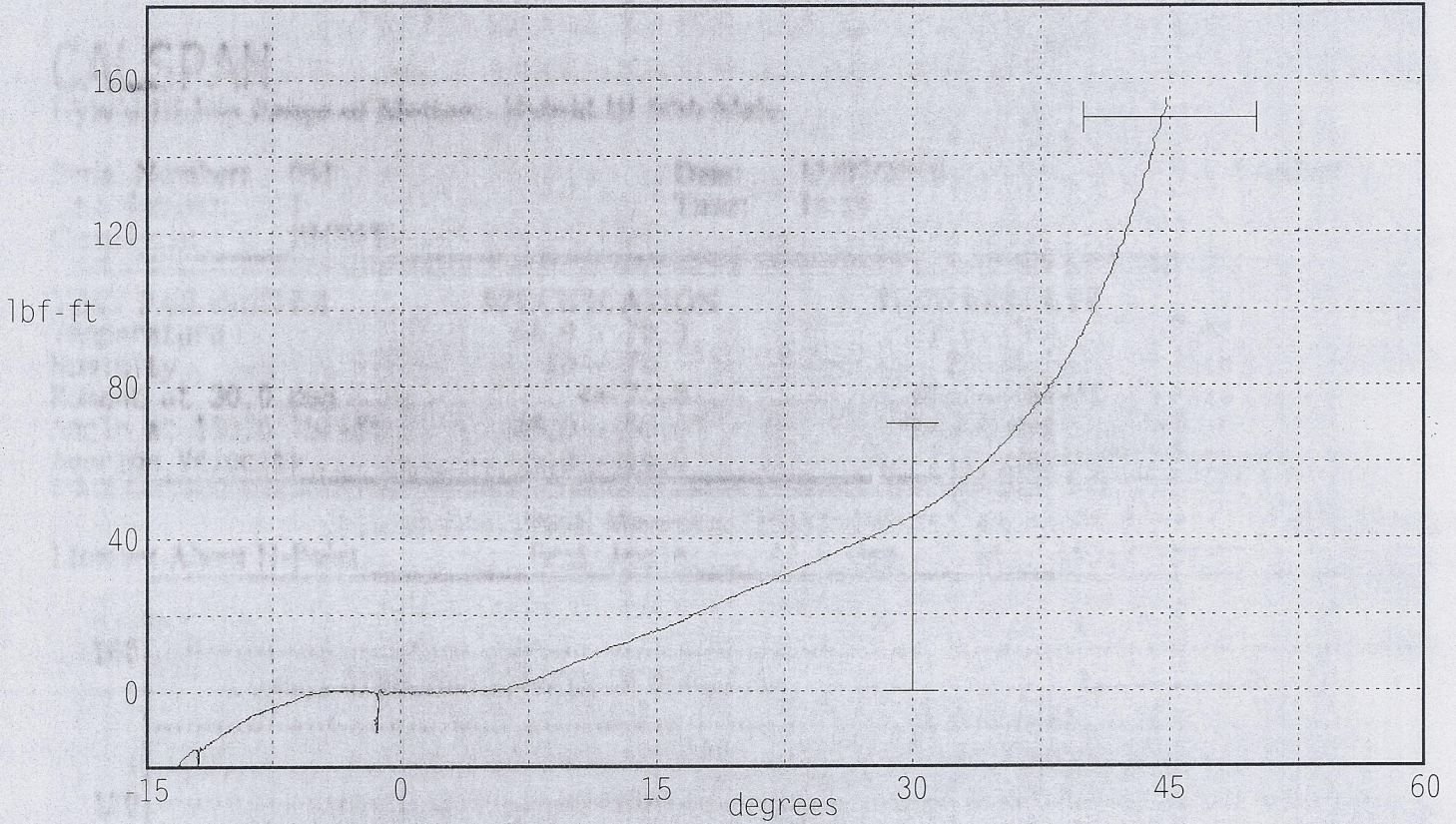
Date: 12/07/2010
Time: 16:59

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66.0 - 78.0	72.0 °F Pass
Humidity	10 - 70	22 % Pass
Moment at 30.0 deg	<= 70.0	45.7 lbf-ft Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	44.6 deg Pass
Average Velocity	5.0 - 10.0	7.3 deg/sec Pass

Peak Moment: 155.2 lbf-ft at 44.8 deg
Peak Angle: 44.8 deg at 153.2 lbf-ft

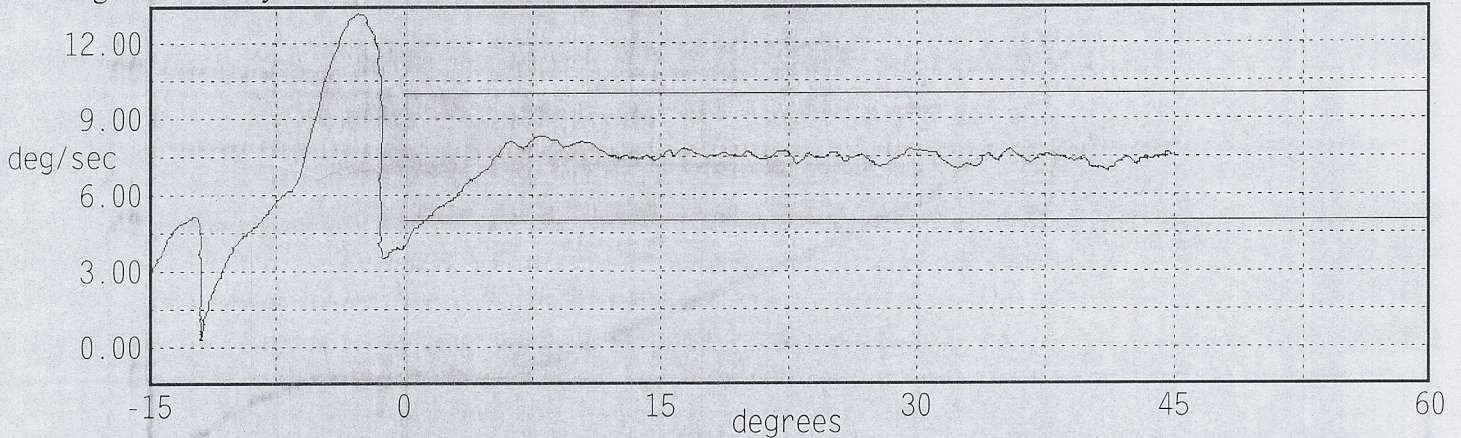
Moment About H-Point



Angular Velocity

Max: 8.3 deg/sec

Min: 4.0 deg/sec



CALSPAN

Hybrid III Hip Range of Motion: Hybrid III 50th Male

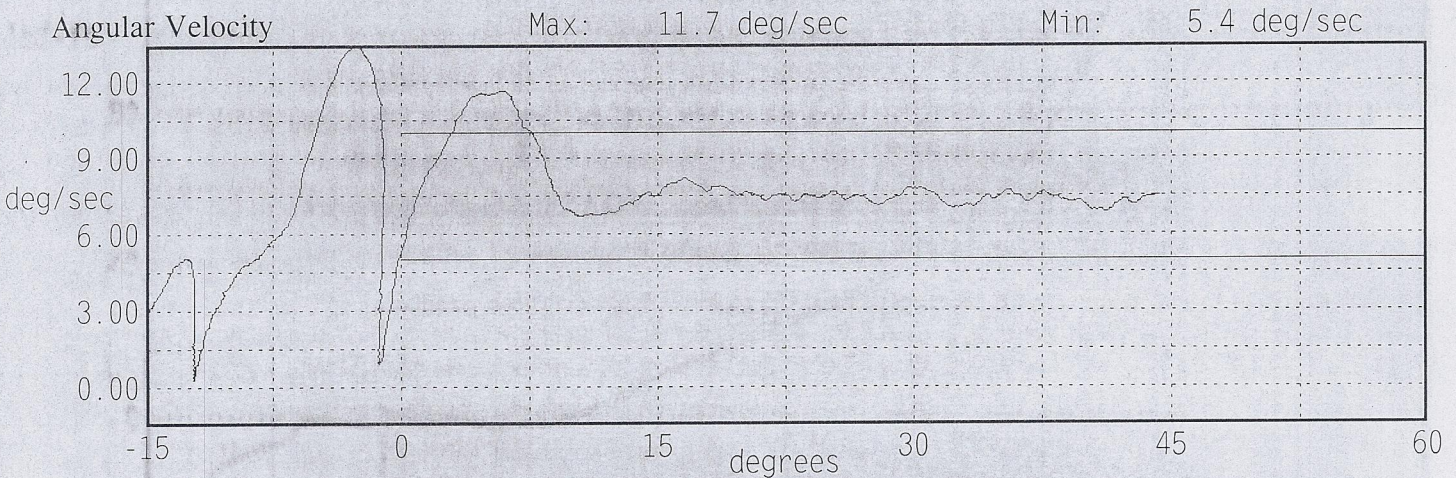
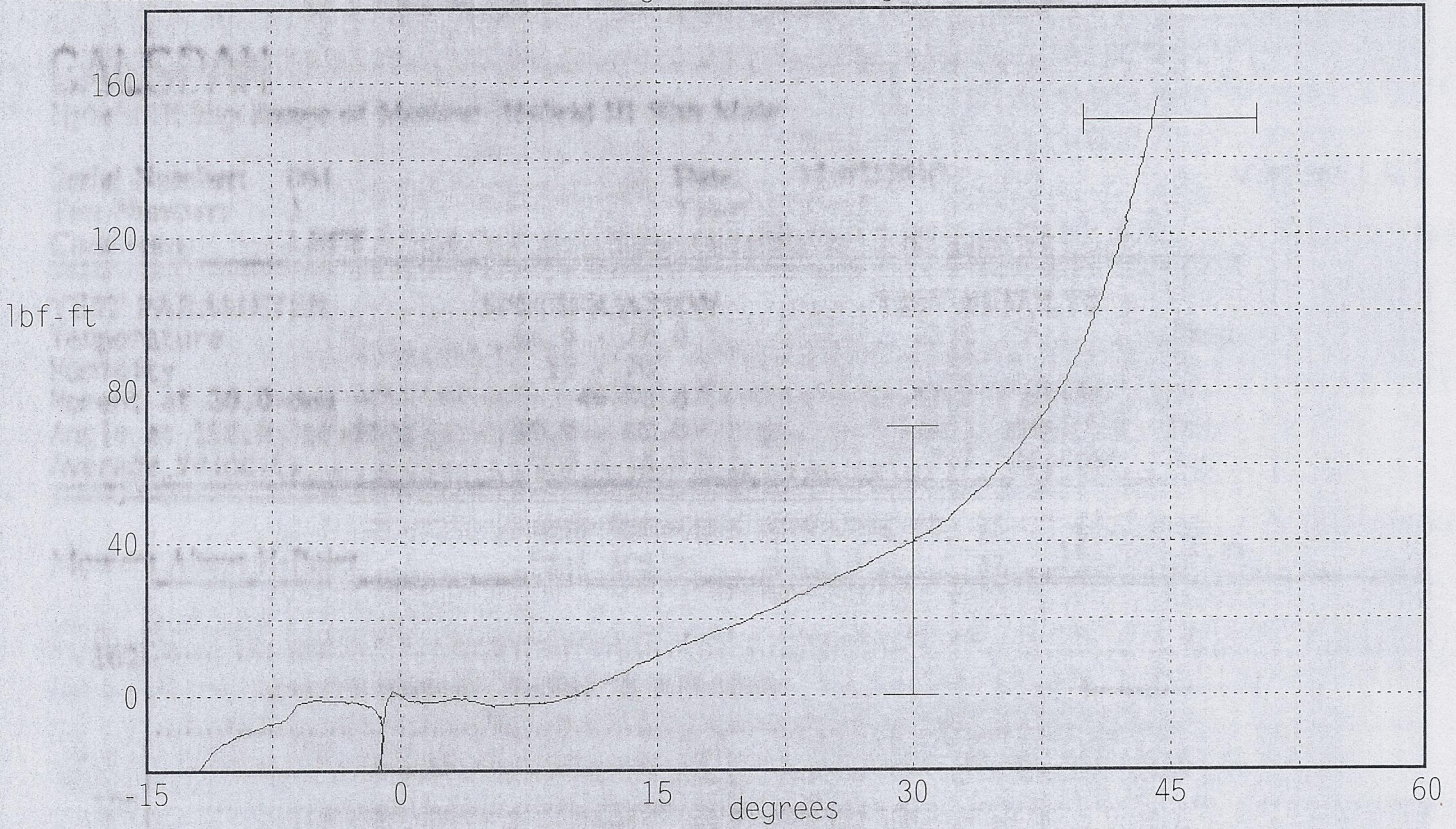
Serial Number: 061
Test Number: 2
Comments: LEFT

Date: 12/07/2010
Time: 17:22

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66.0 - 78.0	72.0 °F Pass
Humidity	10 - 70	22 % Pass
Moment at 30.0 deg	<= 70.0	40.2 lbf-ft Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	44.1 deg Pass
Average Velocity	5.0 - 10.0	7.7 deg/sec Pass

Moment About H-Point
Peak Moment: 155.9 lbf-ft at 44.3 deg
Peak Angle: 44.3 deg at 155.9 lbf-ft





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left knee	Test Date:	12/8/2010
Test Number:	1	Test Time:	8:45:38 AM

Component Part Number	Component Serial Number
Knee Skin - 78051	077

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	21.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-5.78 -- -4.72	-5.15 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left knee**

Test Time: **8:45:38 AM**

Test Date: **12/8/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left knee**

Test Time: **8:45:38 AM**

Test Date: **12/8/2010**

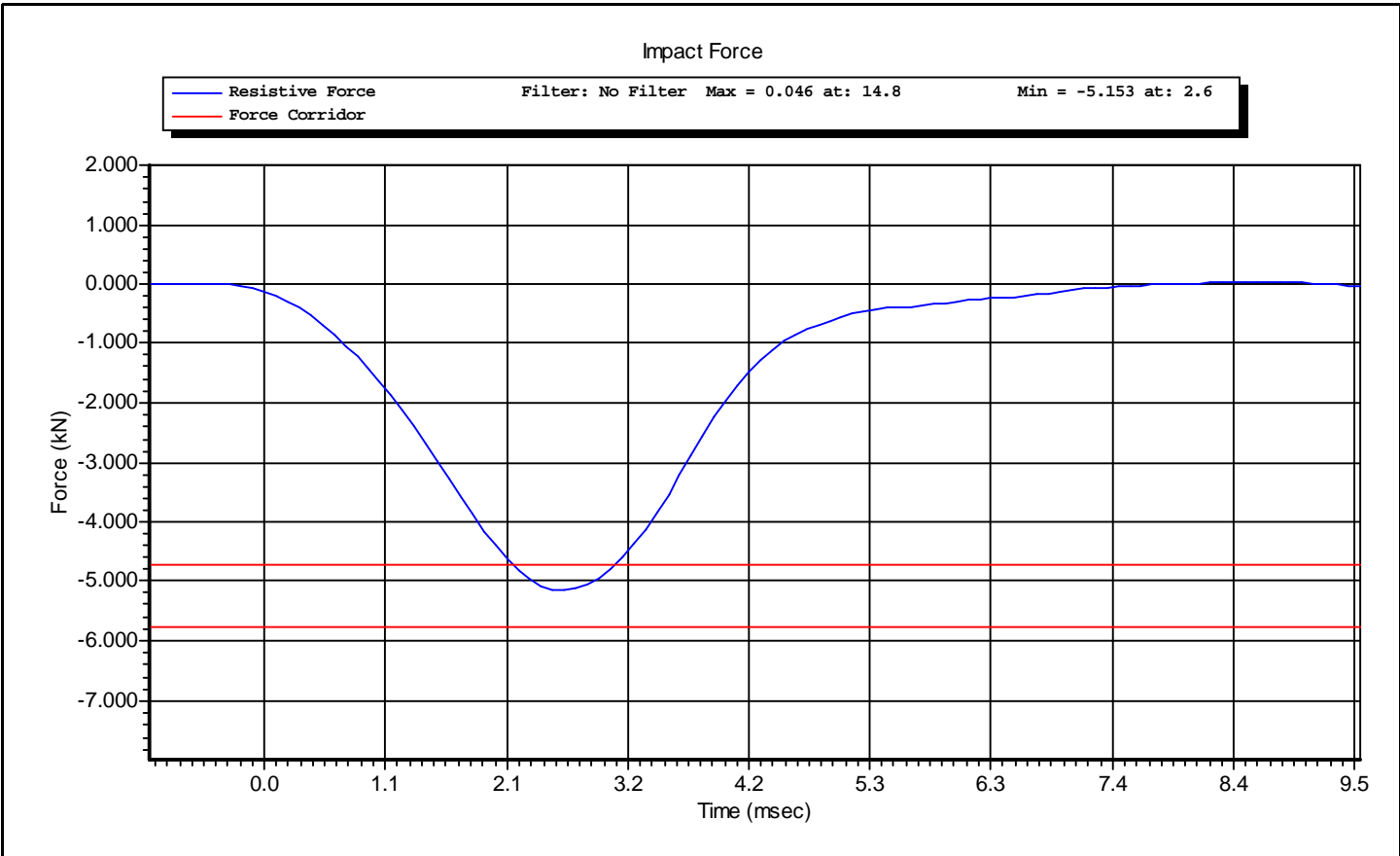


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left knee	Test Date:	12/8/2010
Test Number:	1	Test Time:	8:45:38 AM



Test ID: **Left knee**

Test Time: **8:45:38 AM**

Test Date: **12/8/2010**



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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	12/7/2010
Test Number:	1	Test Time:	3:58:36 PM

Component Part Number	Component Serial Number
Knee Skin - 780516	3266

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.0 deg C P
Humidity	10.0 -- 70.0	23.0 %RH P
Velocity	2.07 -- 2.13	2.12 m/s P
Resistive Force	-5.78 -- -4.72	-5.30 kN P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee**

Test Time: **3:58:36 PM**

Test Date: **12/7/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **3:58:36 PM**

Test Date: **12/7/2010**

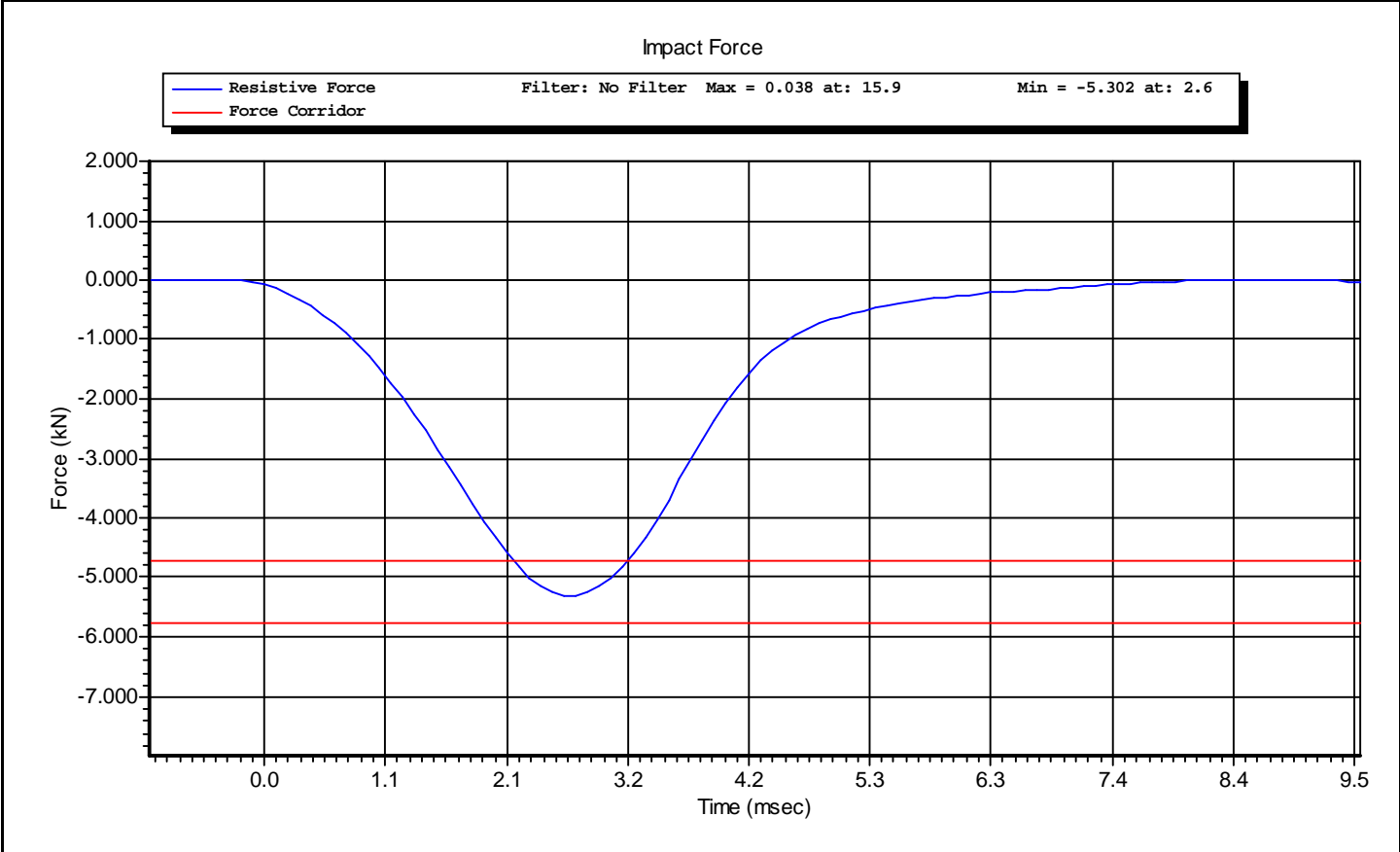


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	12/7/2010
Test Number:	1	Test Time:	3:58:36 PM



CALIBRATION TEST RESULTS

POST-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 143



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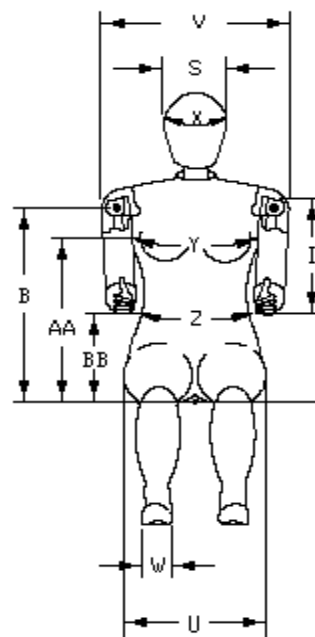
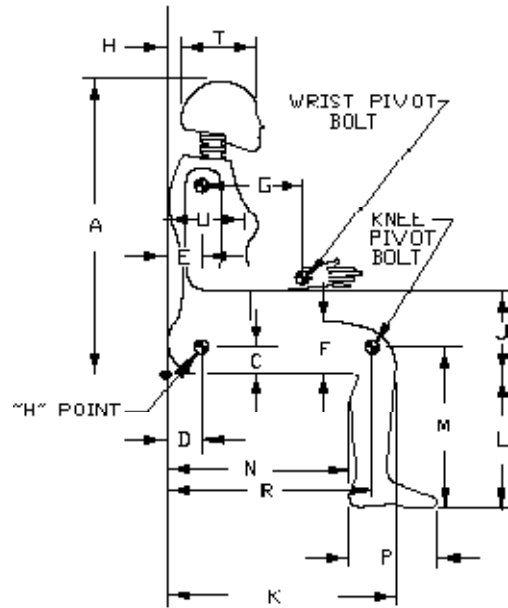
External Measurements - 5th Female

SN 143

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	786	Yes
B	Shoulder Pivot Height	431.8 – 457.2	449	Yes
C	H-Point Height	81.3 – 86.3	84	Yes
D	H-Point from Backline	144.8 – 149.8	147	Yes
E	Shoulder Pivot from Backline	68.6 - 83.8	76	Yes
F	Thigh Clearance	119.4 – 134.6	129	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	250	Yes
H	Head Back to Backline	43.2 – 48.2	47	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	288	Yes
J	Elbow Rest Height	182.8 – 203.2	195	Yes
K	Buttock to Knee Length	520.7 – 546.1	543	Yes
L	Popliteal Height	355.6 - 376	360	Yes
M	Knee Pivot Height	393.7 – 419.1	399	Yes
N	Buttock Popliteal Length	414 – 439.4	431	Yes
O	Chest Depth without Jacket	175.3 – 190.5	183	Yes
P	Foot Length (right)	218.5 – 233.7	219	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	475	Yes
S	Head Breadth	137.1 – 147.3	143	Yes
T	Head Depth	177.8 - 188	184	Yes
U	Hip Breadth	299.7 – 314.9	305	Yes
V	Shoulder Breadth	350.5 – 365.7	362	Yes
W	Foot Breadth	78.8 - 94	86	Yes
X	Head Circumference	528.3 – 548.7	544	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	870	Yes
Z	Waist Circumference	759.5 – 789.9	775	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	338	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	165	Yes

Hybrid 3 5th Female External Measurements

Reference Diagram





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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Head Drop	Test Date:	1/10/2011
Test Number:	1	Test Time:	3:38:04 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	05733

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	21.7 deg C P
Humidity	10 -- 70	26 %RH P
Resultant Acceleration	250 -- 300	264 g P
Oscillation	0.0 -- 10.0	1.2 % P
Lateral Acceleration	-15.00 -- 15.00	1.85 g P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Head Drop**

Test Time: **3:38:04 PM**

Test Date: **1/10/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66931	10/25/2010
Endevco	7264-2000	P66926	10/25/2010
Endevco	7264-2000	P66943	10/25/2010

Test ID: **Head Drop**

Test Time: **3:38:04 PM**

Test Date: **1/10/2011**

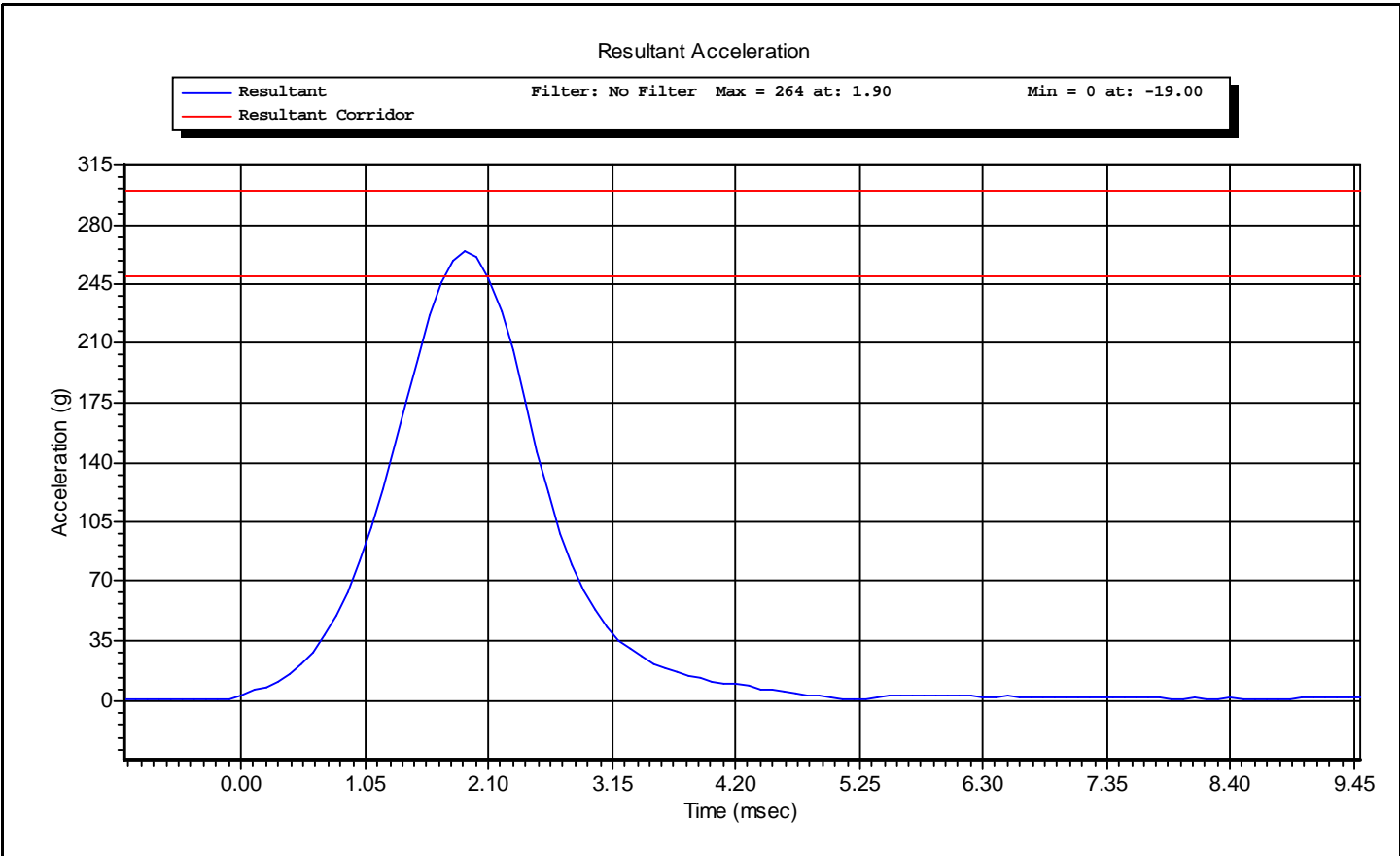


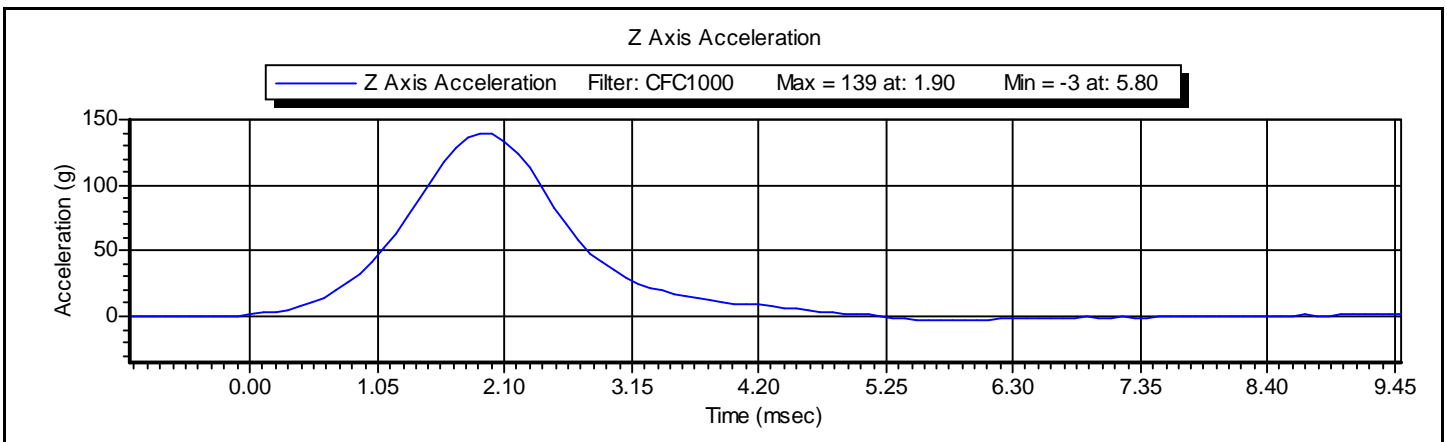
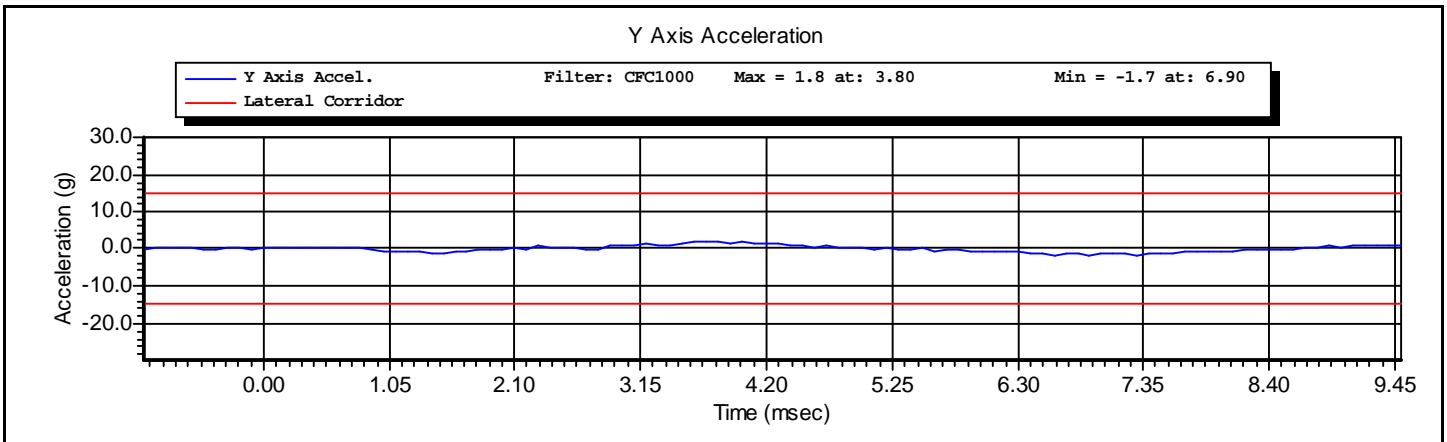
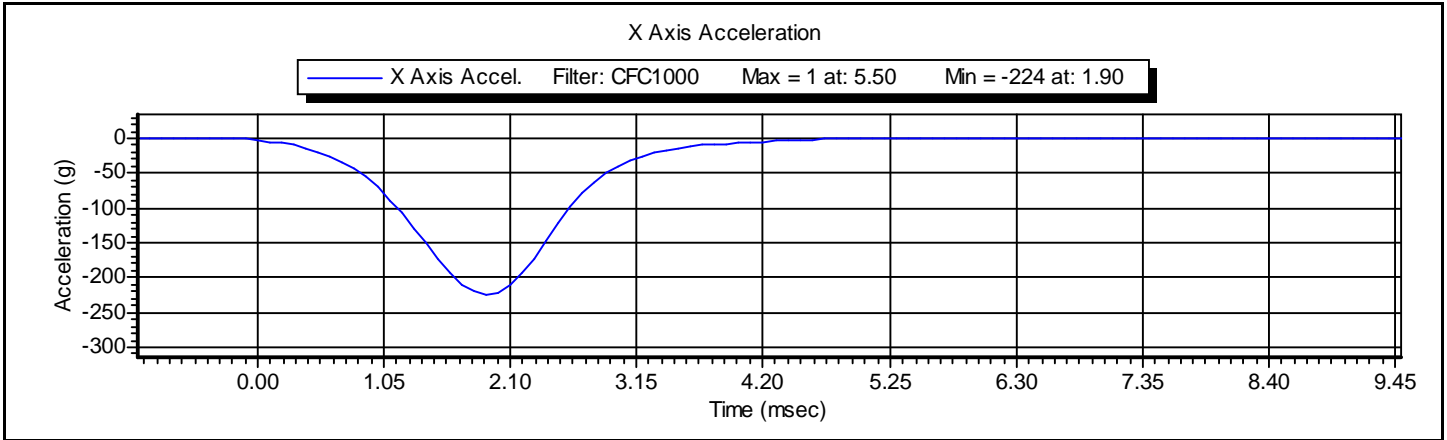
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Test Name:	Head Drop	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Head Drop	Test Date:	1/10/2011
Test Number:	1	Test Time:	3:38:04 PM







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VERIFICATION REPORT

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Extension	Test Date:	1/11/2011
Test Number:	2	Test Time:	10:35:05 AM

Component Part Number	Component Serial Number
Neck - 880105-255	05-0512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	5.95 -- 6.19	6.08 m/s P
Pendulum Impulse at 10 ms	1.50 -- 1.90	1.82 m/s P
Pendulum Impulse at 20 ms	3.10 -- 3.90	3.56 m/s P
Pendulum Impulse at 30 ms	4.60 -- 5.60	5.24 m/s P
D Plane Rotation	99.0 -- 114.0	107.5 degrees P
Moment During Rotation Interval	-65.0 -- -53.0	-58.3 Nm P
Moment Decay to -10.0 Nm	94.0 -- 114.0	105.5 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Extension**

Test Time: **10:35:05 AM**

Test Date: **1/11/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

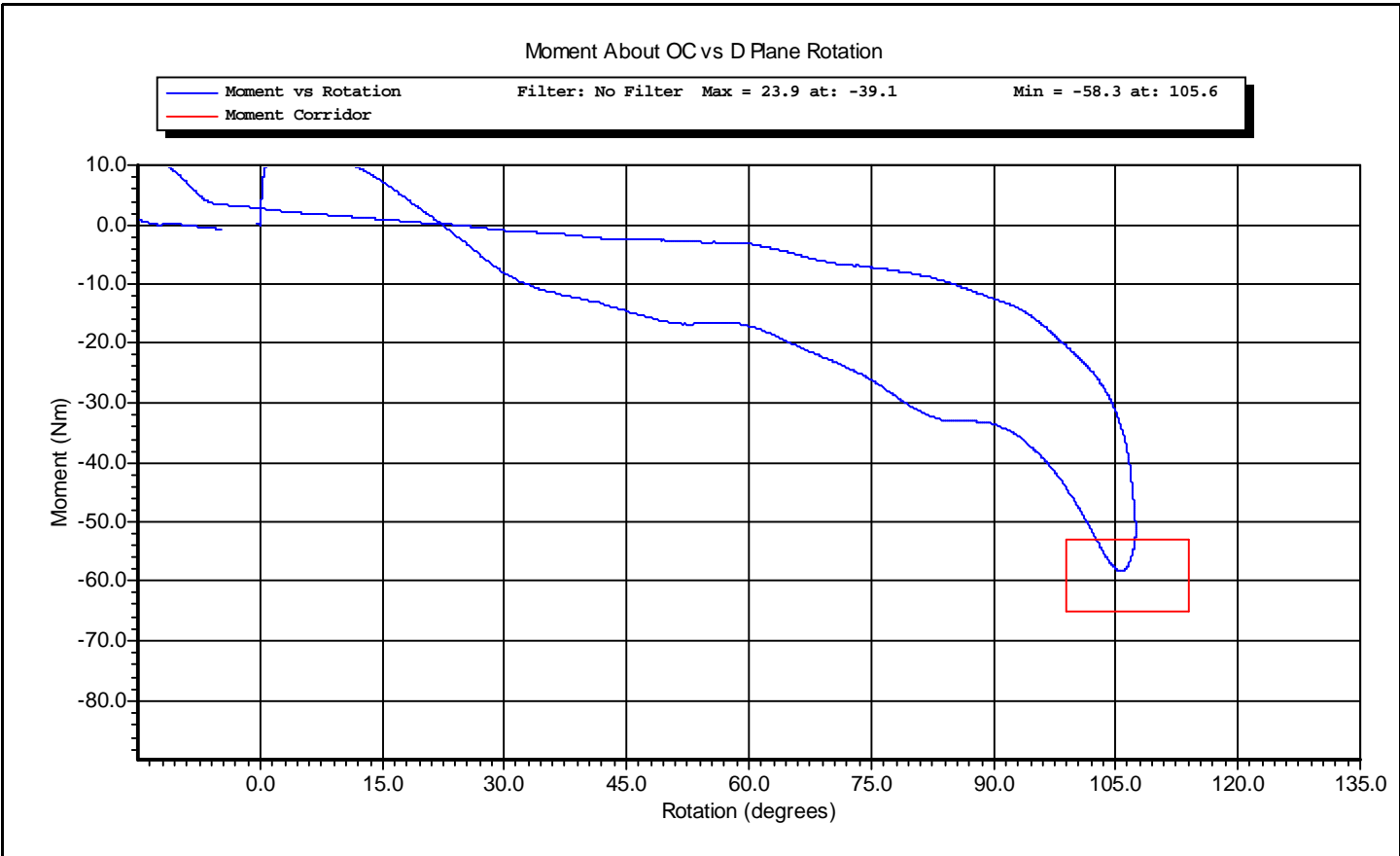
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-443 My	5/25/2010
Denton	1716A	LC-443 Fx	5/25/2010

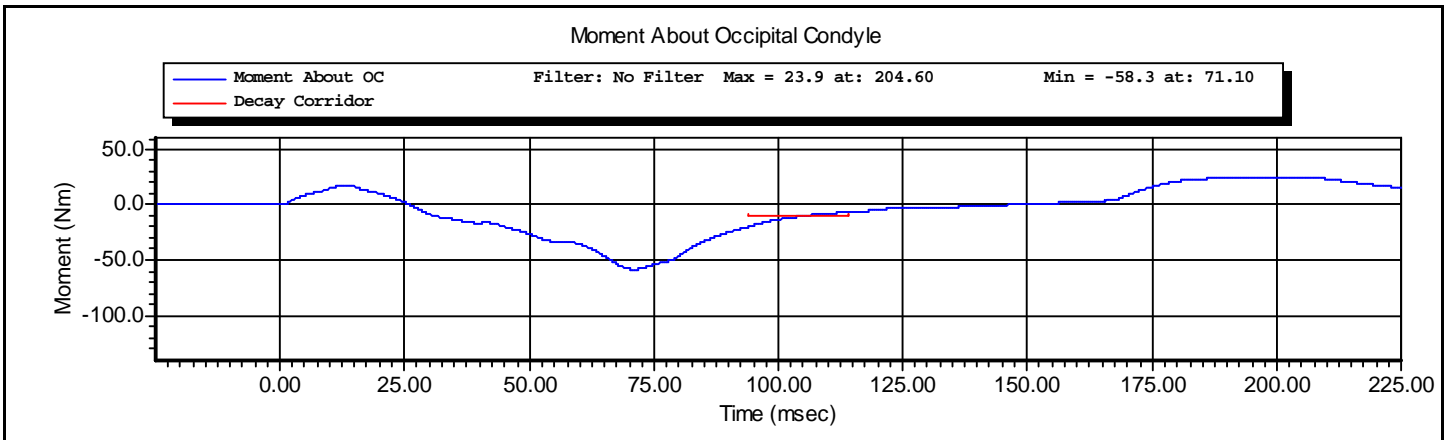
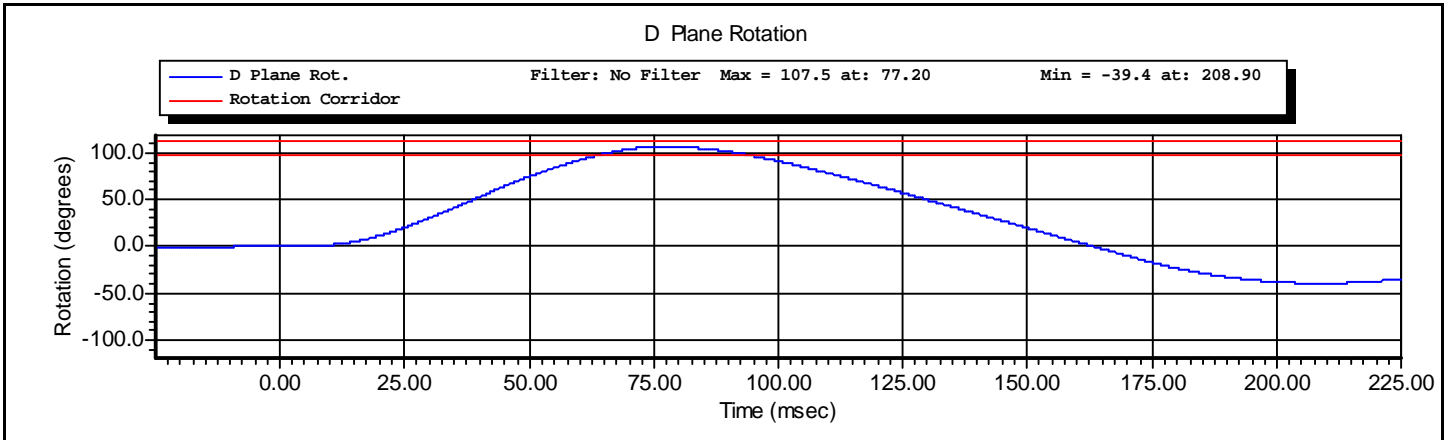
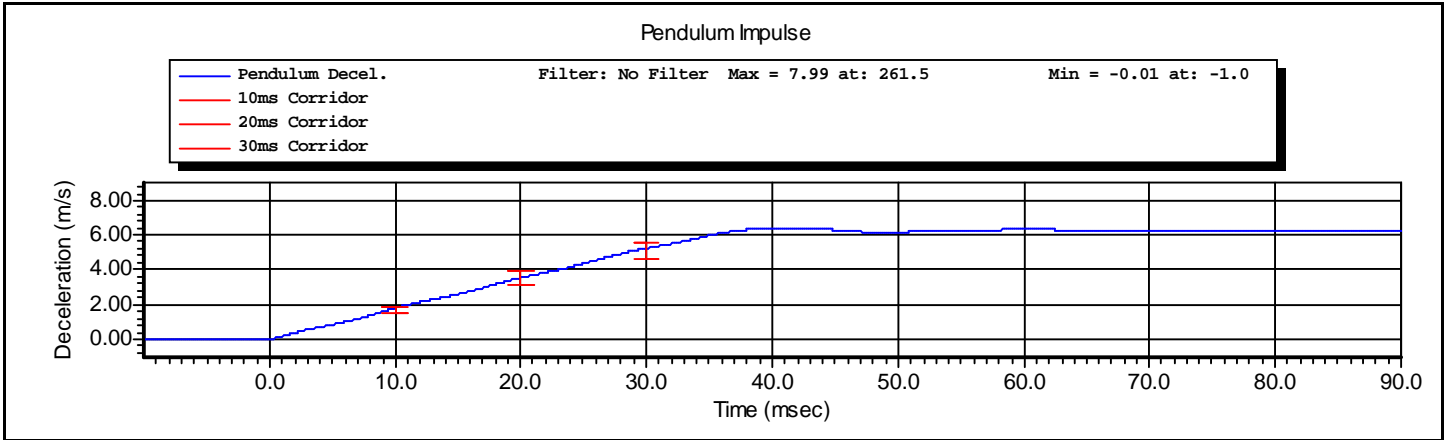
Test ID: **Neck Extension**

Test Time: **10:35:05 AM**

Test Date: **1/11/2011**

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Extension	Test Date:	1/11/2011
Test Number:	2	Test Time:	10:35:05 AM







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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Flexion	Test Date:	1/11/2011
Test Number:	3	Test Time:	11:04:18 AM

Component Part Number	Component Serial Number
Neck - 880105-255	05-0512

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	25 %RH P
Velocity	6.89 -- 7.13	7.09 m/s P
Pendulum Impulse at 10 ms	2.10 -- 2.50	2.16 m/s P
Pendulum Impulse at 20 ms	4.00 -- 5.00	4.31 m/s P
Pendulum Impulse at 30 ms	5.80 -- 7.00	6.24 m/s P
D Plane Rotation	-91.0 -- -77.0	-81.9 degrees P
Moment During Rotation Interval	69.0 -- 83.0	82.5 Nm P
Moment Decay to 10.0 Nm	80.0 -- 100.0	89.2 ms P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **11:04:18 AM**

Test Date: **1/11/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
Denton	1716A	LC-443 My	5/25/2010
Denton	1716A	LC-443 Fx	5/25/2010

Test ID: **Neck Flexion**

Test Time: **11:04:18 AM**

Test Date: **1/11/2011**

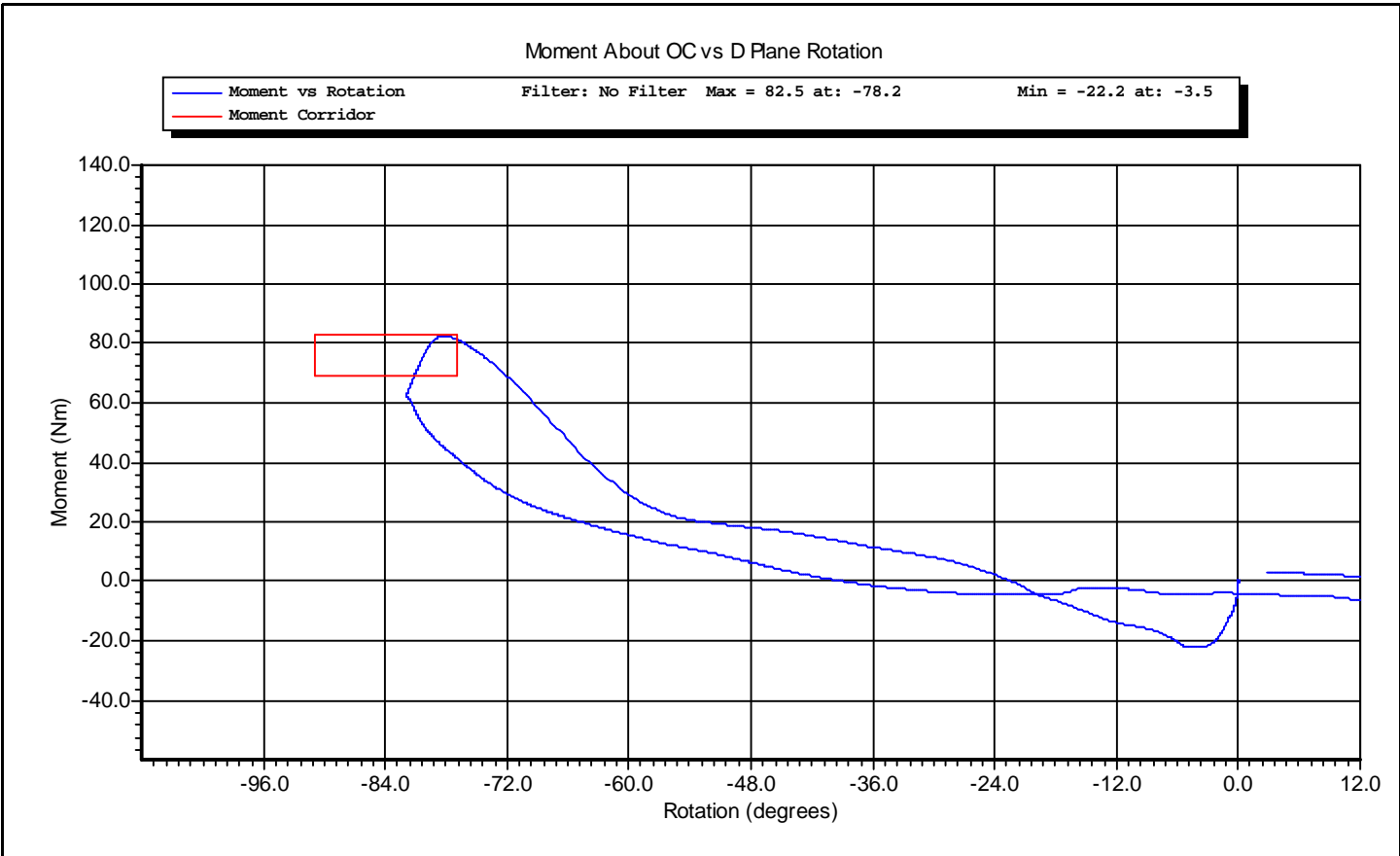


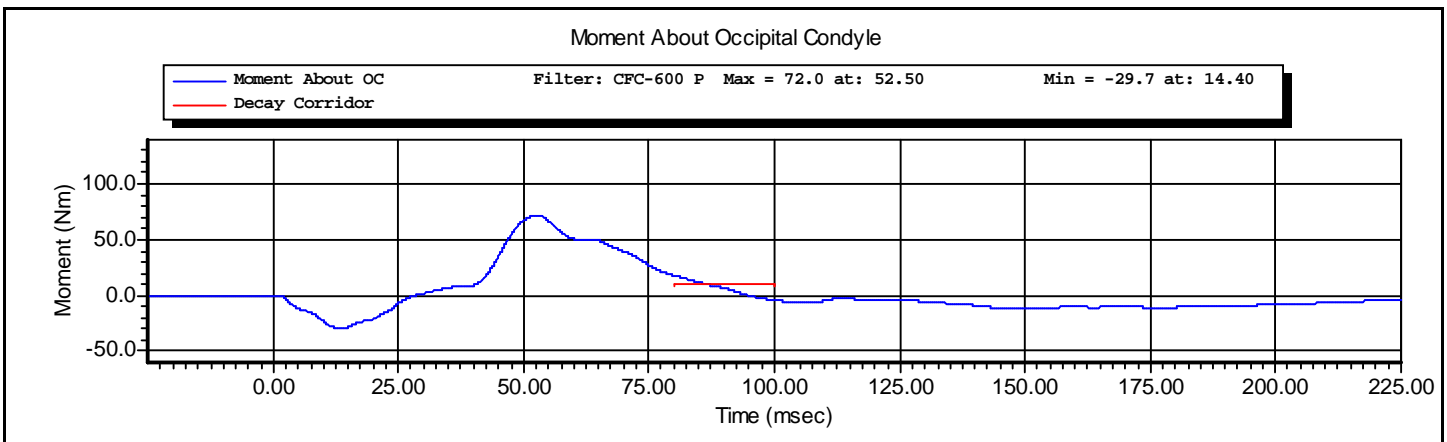
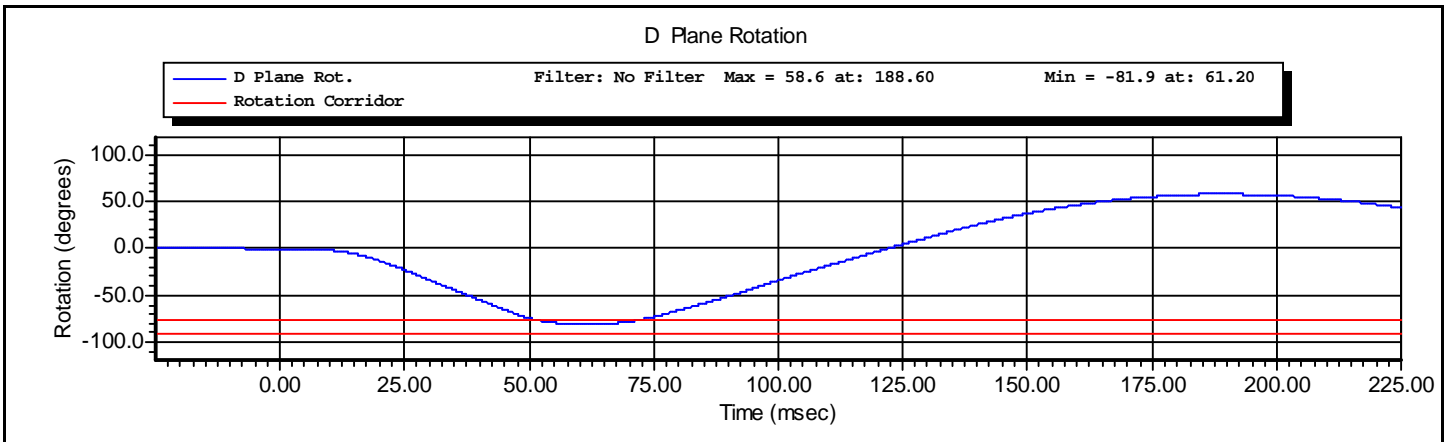
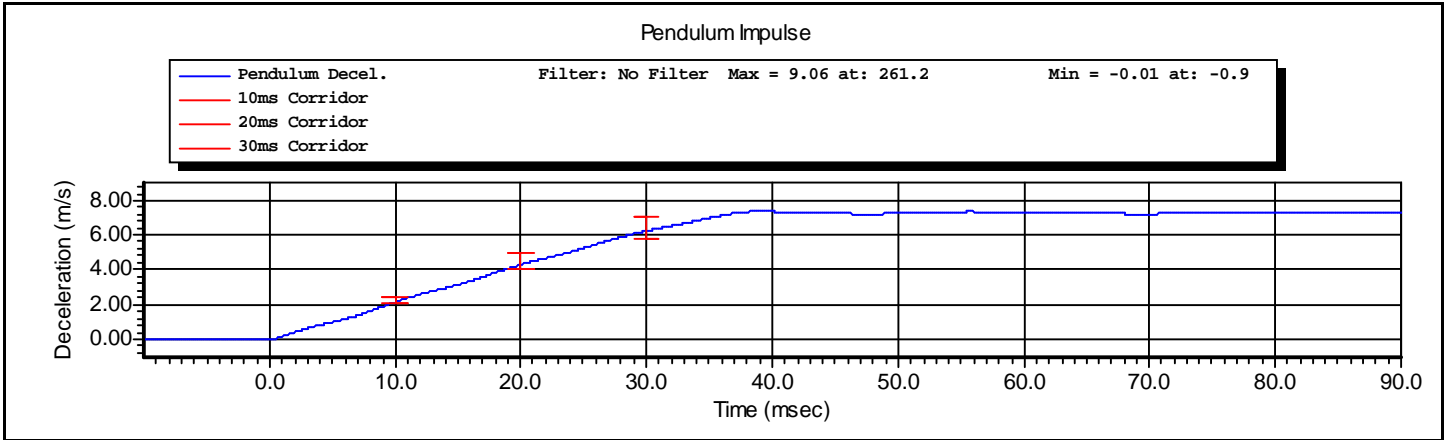
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Test Name:	Neck Flexion	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Neck Flexion	Test Date:	1/11/2011
Test Number:	3	Test Time:	11:04:18 AM







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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Thorax Impact	Test Date:	1/11/2011
Test Number:	2	Test Time:	5:40:57 PM

Component Part Number	Component Serial Number
Ribs 880105-RS	05032021A
Chest Jacket - 880105-355-E	05855
Lumbar Spine - 880105-1095	050330

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	6.59 -- 6.83	6.71 m/s P
Sternum Displacement	-58.0 -- -50.0	-53.7 mm P
Force During Displacement Interval	-4400 -- -3900	-4371 N P
Force -18.0 to -50.0 Displacement	-4600 -- 0	-4366 N P
Hysteresis	69 -- 85	72 % P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Thorax Impact**

Test Time: **5:40:57 PM**

Test Date: **1/11/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-143G	6/2/2010

Test ID: **Thorax Impact**

Test Time: **5:40:57 PM**

Test Date: **1/11/2011**

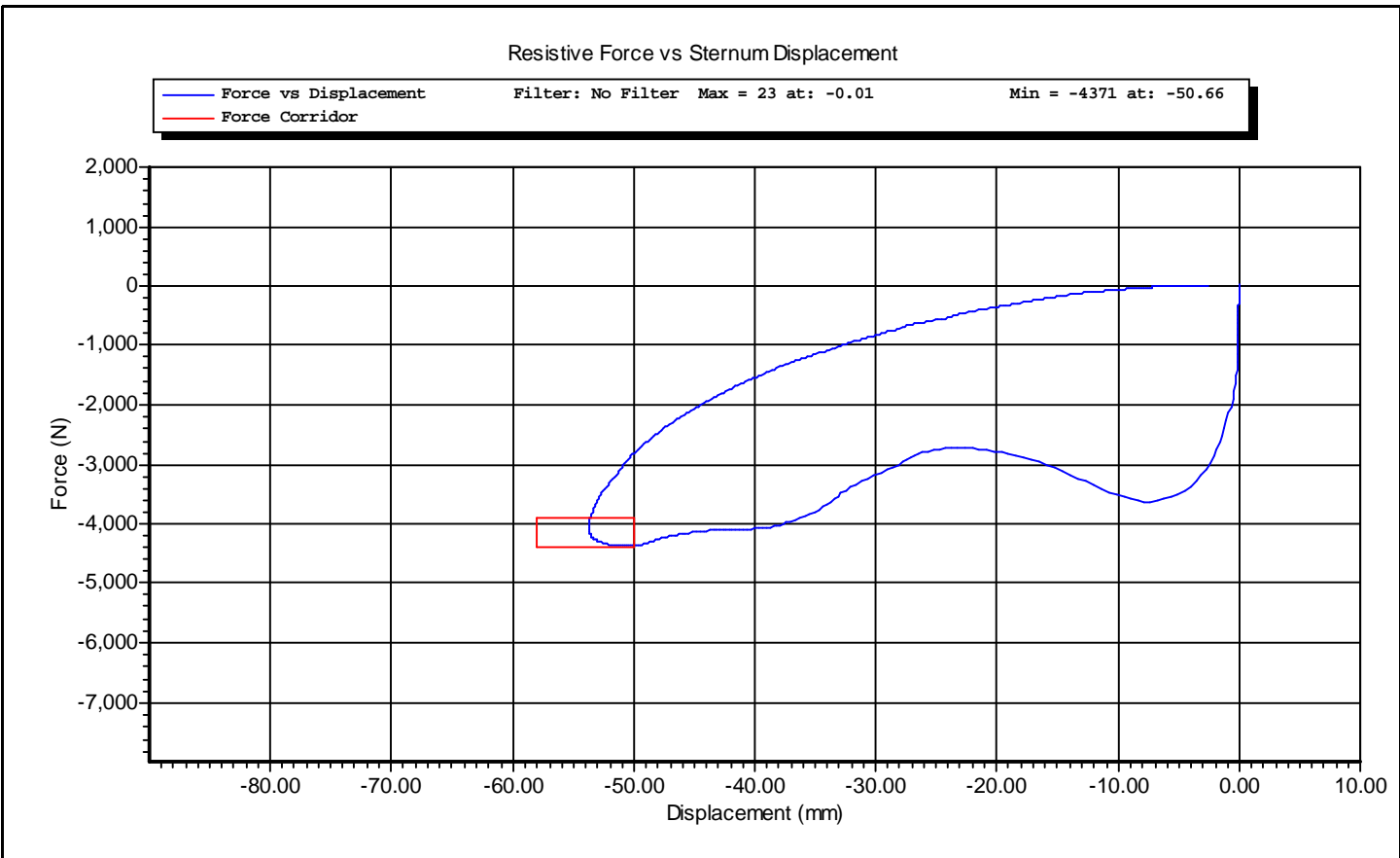


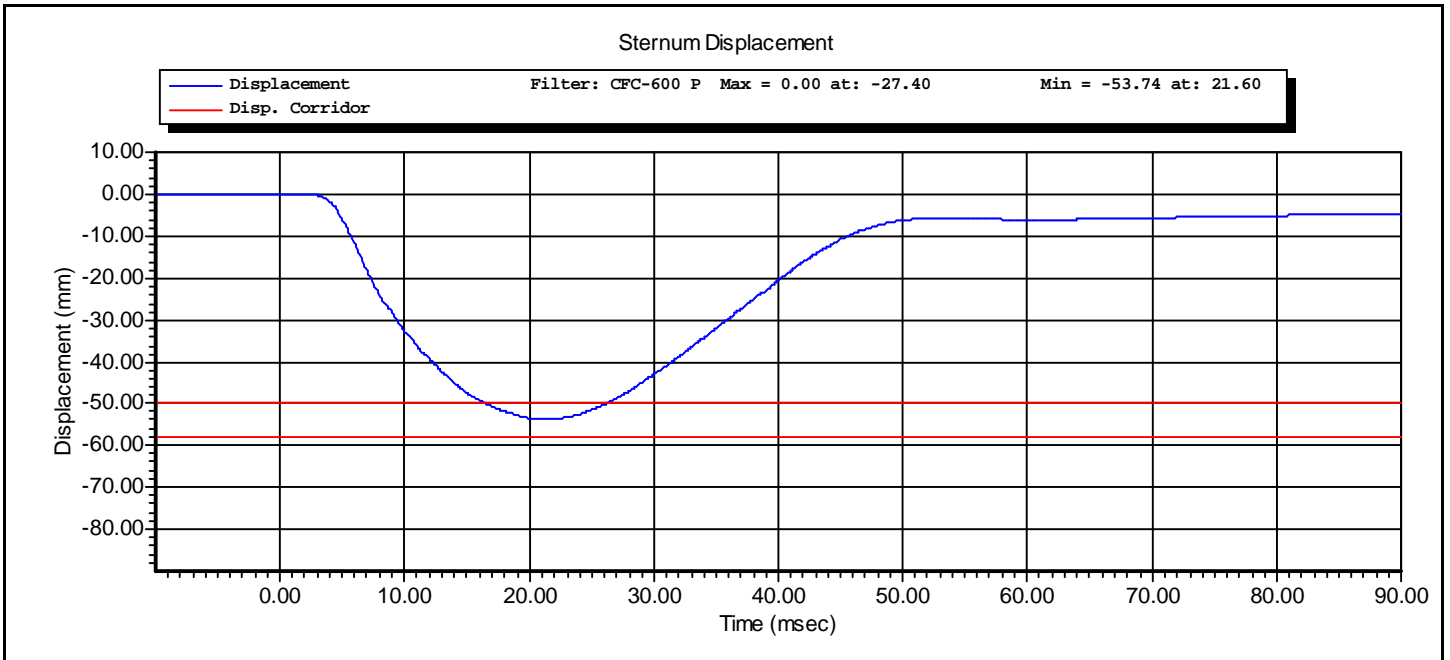
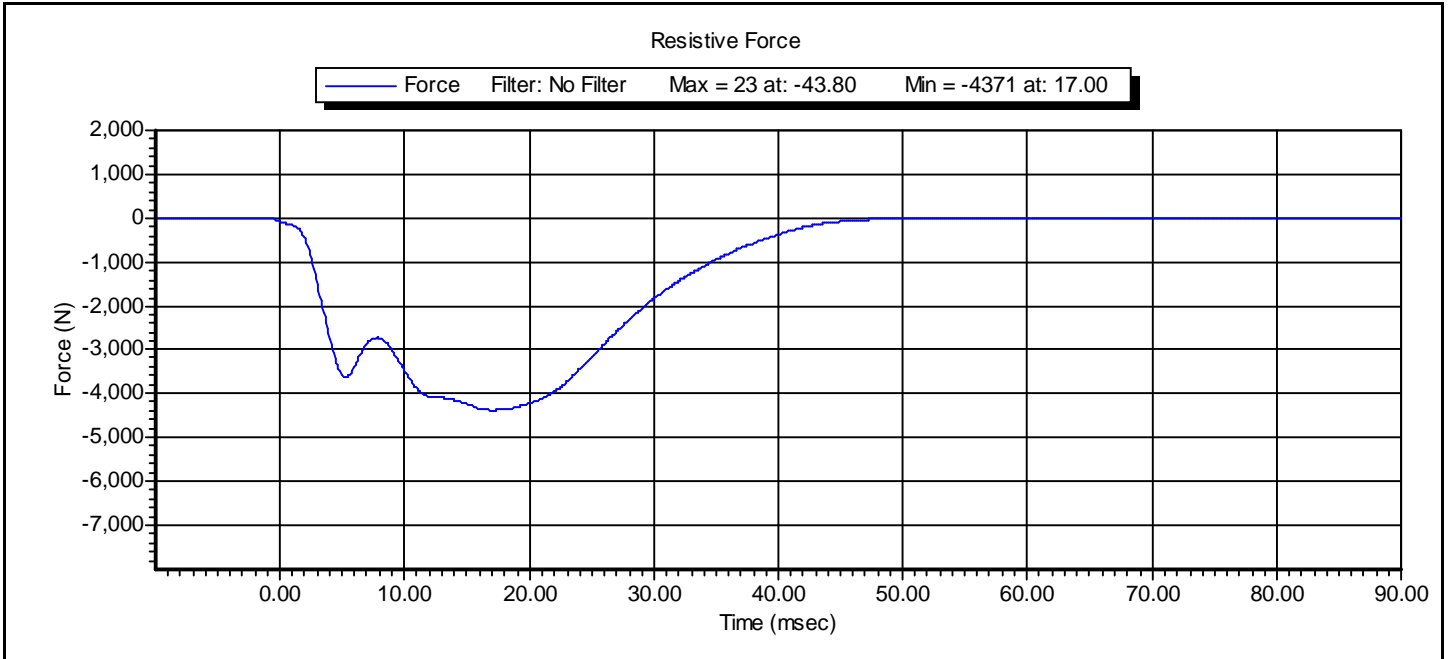
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Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Thorax Impact	Test Date:	1/11/2011
Test Number:	2	Test Time:	5:40:57 PM







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Torso Flexion Test

Technician: AR

Calibration Date: 1/11/2011

ATD Serial Number: 5th Female 143

Test Results			
Test Condition	Parameters	Results	Status
Temperature	18.9-25.6° C	21.7° C	P
Lab Humidity: 38%	10-70%	28%	P
Max Force @ 45 deg	320 – 390N	365N	P
Torso Rotation Rate	0.5 °/s ≤ rate ≤ 1.5 °/s	1.0 °/s	P
Initial reference angle	≤20 deg	13°	P
Final ref plan angle	Initial ref plane ± 8 deg	20°	P

P = Pass

F = Fail



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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Left Knee	Test Date:	1/12/2011
Test Number:	1	Test Time:	11:03:29 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	2.07 -- 2.13	2.11 m/s P
Resistive Force	-4060 -- -3450	-3606 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Left Knee**

Test Time: **11:03:29 AM**

Test Date: **1/12/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
CEC	4-202	AC-A44	8/26/2010

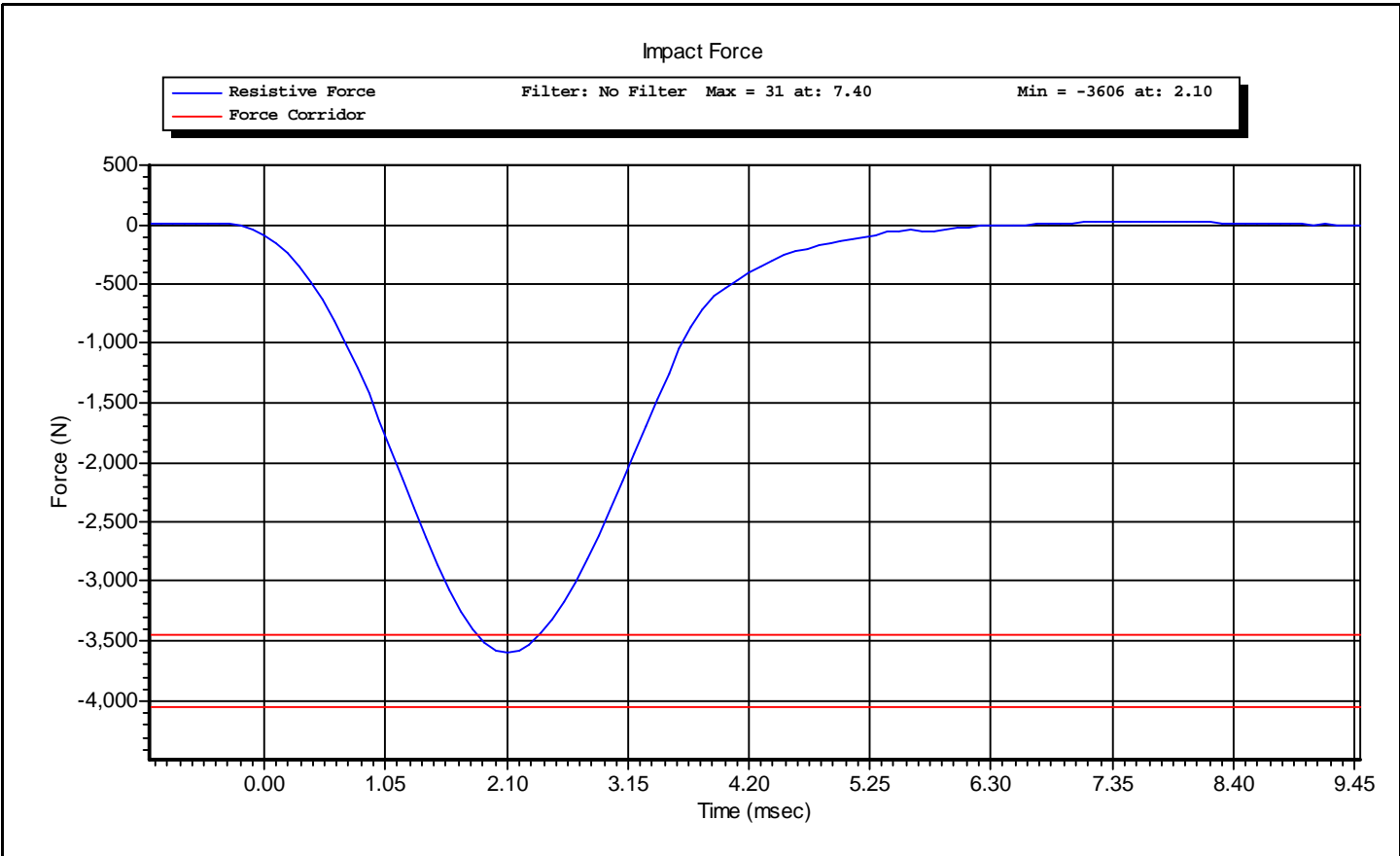
Test ID: **Left Knee**

Test Time: **11:03:29 AM**

Test Date: **1/12/2011**



Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Left Knee	Test Date:	1/12/2011
Test Number:	1	Test Time:	11:03:29 AM





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VERIFICATION REPORT

Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Right Knee	Test Date:	1/12/2011
Test Number:	1	Test Time:	10:50:18 AM

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	24.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-4060 -- -3450	-3523 N P

All test parameters are within specifications

Technician: **A. Rudniski** Signature: _____

Supervisor: **D. Travale** Signature: _____

Test ID: **Right Knee**

Test Time: **10:50:18 AM**

Test Date: **1/12/2011**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2011
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **10:50:18 AM**

Test Date: **1/12/2011**



Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	143		
Test ID:	Right Knee	Test Date:	1/12/2011
Test Number:	1	Test Time:	10:50:18 AM

