

REPORT NUMBER: NCAP-CAL-11-030

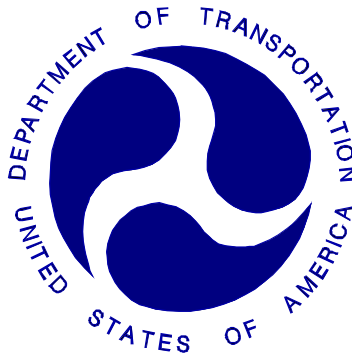
**NEW CAR ASSESSMENT PROGRAM (NCAP)
FRONTAL BARRIER IMPACT TEST**

**Chrysler Group LLC
2011 Dodge Caliber
Five Door Hatchback**

NHTSA NUMBER: MB0308

CALSPAN TEST NUMBER: tr2511

**CALSPAN CORPORATION
TRANSPORTATION SCIENCES CENTER
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BUFFALO, NEW YORK 14225**



February 22, 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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Date: _____

FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

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16. Abstract A 56.3 km/h NCAP Frontal Impact Test was conducted on a 2011 Dodge Caliber Five Door Hatchback in accordance with the specifications of the Office of Crashworthiness Standards Frontal NCAP Laboratory Test Procedure. This test was conducted to obtain data indicant of FMVSS 208, 212, 219 (partial), 301, and foot well intrusion performance. The test was conducted at the Calspan Corporation's crash test facility in Buffalo, New York on 12/9/2010. The impact velocity of the vehicle was 56.36 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 559 mm of Vehicle. The test vehicle's performance is as follows: <table border="1"> <thead> <tr> <th></th><th colspan="3">Driver ATD</th><th colspan="3">Pass. ATD</th></tr> <tr> <th>Measurement Description</th><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>275.16</td><td>N/A</td><td>700</td><td>308.66</td></tr> <tr> <td>Maximum Chest Compression</td><td>mm</td><td>63</td><td>-28.52</td><td>mm</td><td>52</td><td>-11.81</td></tr> <tr> <td>Nij</td><td>n/a</td><td>1</td><td>0.34</td><td>n/a</td><td>1</td><td>0.54</td></tr> <tr> <td>Neck Tension</td><td>Newtons</td><td>4170</td><td>1,425.25</td><td>Newtons</td><td>2620</td><td>967.20</td></tr> <tr> <td>Neck Compression</td><td>Newtons</td><td>4000</td><td>-109.72</td><td>Newtons</td><td>2520</td><td>-529.92</td></tr> <tr> <td>Left Femur Force</td><td>Newtons</td><td>10008</td><td>-2014.94</td><td>Newtons</td><td>6805</td><td>-1858.86</td></tr> <tr> <td>Right Femur Force</td><td>Newtons</td><td>10008</td><td>-2175.99</td><td>Newtons</td><td>6805</td><td>-2817.36</td></tr> </tbody> </table>								Driver ATD			Pass. ATD			Measurement Description	Units	Threshold	Result	Units	Threshold	Result	Head Injury Criteria (HIC ₁₅)	N/A	700	275.16	N/A	700	308.66	Maximum Chest Compression	mm	63	-28.52	mm	52	-11.81	Nij	n/a	1	0.34	n/a	1	0.54	Neck Tension	Newtons	4170	1,425.25	Newtons	2620	967.20	Neck Compression	Newtons	4000	-109.72	Newtons	2520	-529.92	Left Femur Force	Newtons	10008	-2014.94	Newtons	6805	-1858.86	Right Femur Force	Newtons	10008	-2175.99	Newtons	6805	-2817.36
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Form DOT F1700.7 (8-69)

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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 Dodge Caliber Five Door Hatchback at a velocity of 56.36 kph. The test was performed at Calspan on 12/9/2010. 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 (ATDs), 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 drivers 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. 273) 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 559 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 knee airbag. 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 glove box 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)	275.16	63.85	78.85	-28.52	0.34	1,425.25	-109.72	-2014.94	-2175.99
Passenger (5 th)	308.66	62.20	77.20	-11.81	0.54	967.20	-529.92	-1858.86	-2817.36

SECTION 2
DATA SHEETS

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

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

TEST VEHICLE INFORMATION

NHTSA No.	MB0308
Make	Dodge
Model	Caliber
Body Style	Five Door Hatchback
VIN	1B3CB3HA7BD106206
Color	Light gray/silver
Delivery Date	11/23/2010
Odometer Reading (mi)	19
Odometer Reading (km)	30.6
Dealer	West Herr Dodge
Transmission	4-Speed Automatic w/OD
Final Drive	Front Wheel Drive
Type/No. Cyl	Inline 4
Engine Disp. (L)	2.0
Engine Placement	Longitudinal
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	No
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	No

TEST VEHICLE OPTIONS

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

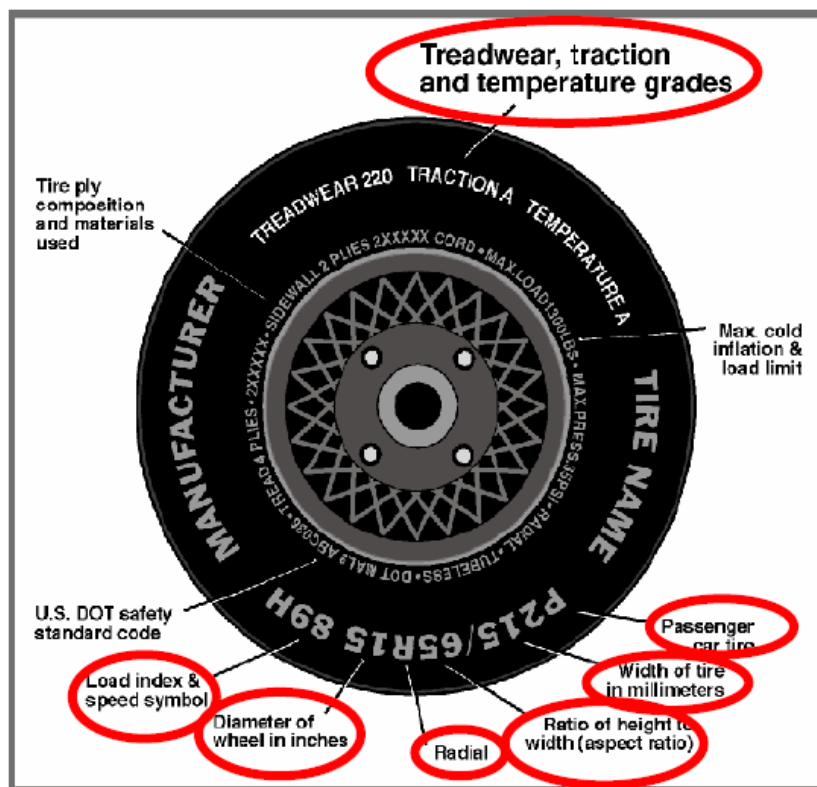
Manufactured By	Chrysler Group LLC	GVWR (kg)	2,012
Date of Manufacture	10/10	GAWR Front (kg)	1,080
		GAWR Rear (kg)	998

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)				392
Cargo Wt. (RCLW) (kg)				51.8

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

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Cold Pressure (kPa)	240	240
Recommended Tire Size	P215/60R17	P215/60R17
Tire Size on Vehicle	P215/60R17	P215/60R17
Tire Manufacturer	Firestone	Firestone
Tire Model	Affinity	Affinity
Treadwear	500	500
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	1 Polyester	1 Polyester
Tire Plies Body	1 Polyester, 2 Steel	1 Polyester, 2 Steel
Load Index/Speed Symbol	95 T	95 T
Tire Material	Rubber	Rubber
DOT Safety Code Right	8XNVAFB3510	8XNVAFB3510
DOT Safety Code Left	8XNVAFB3510	8XNVAFB3510

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

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

TEST VEHICLE WEIGHTS

	Units	As Delivered (UVW) (Axle)			As Tested (ATW) (Axle)		
		Front	Rear	Total	Front	Rear	Total
Left	kg	419	295		451	361	
Right	kg	418	275		436	342	
Ratio	%	59	41		56	44	
Totals	kg	837	570	1,407	887	703	1,590

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value
Total Delivered Weight (UVW)	kg	1,407
Weight of 1 P572E ATD & 1 P572O ATD	kg	140.6
Rated Cargo/Luggage Weight (RCLW)	kg	51.8
Calculated Vehicle Target Weight (TVTW)	kg	1,599

TEST VEHICLE ATTITUDES AND CG

	Units	LF	RF	LR	RR	CG (aft of front axle)
As Delivered	mm	755	758	759	777	1069
As Tested	mm	751	760	732	744	1167
Post Test	mm	772	785	754	756	

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	2,639
Total Vehicle Length at Left Side	mm	3,932
Total Vehicle Length at Centerline	mm	4,414
Total Vehicle Length at Right Side	mm	3,931
Weight of Ballast in Cargo Area	kg	31
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	47.3

LIST OF COMPONENTS REMOVED TO MEET TEST WEIGHT:

None

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

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

TARGET VEHICLE STRUCTURAL MEASUREMENT

	Elements	Pre-Test (mm)
1	Total Length	4414
2	Total Width	1752
3	Bumper Top Height	551
4	Bumper Bottom Height	236
5	Longitudinal Member Top Height	598
6	Distance Between Longitudinal Members	998
7	Longitudinal Member Width	42
8	Engine Top Height	851
9	Engine Bottom Height	207
10	Engine and Gearbox Width	500
11	Front Bumper-Engine Distance	465
12	Front Shock Absorber Fixing Height	907
13	Bonnet Leading Edge Height	868
14	Front Shock Absorber Fixing Width	1113
15	Front Bumper – Front Axle Distance	872
16	Front Axle – A Pillar Distance	523
17	A- Pillar – B-Pillar Distance	1066
18	B-Pillar – Rear Axle Distance	1050
19	B-Pillar – C-Pillar Distance	898
20	Roof Sill Bottom Height	1389
21	Roof Sill Top Height	1447
22	Floor Sill Bottom Height	314
23	Floor Sill Top Height	427

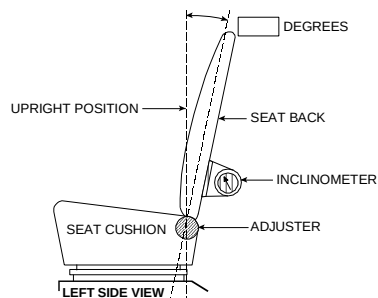
DATA SHEET NO. 2
SEAT ADJUSTMENT, FUEL SYSTEM, AND STEERING WHEEL

Test Vehicle: 2011 Dodge Caliber NHTSA No: MB0308
 Test Program: Frontal NCAP Test Date: 12/9/2010

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



FRONT SEAT ASSEMBLY

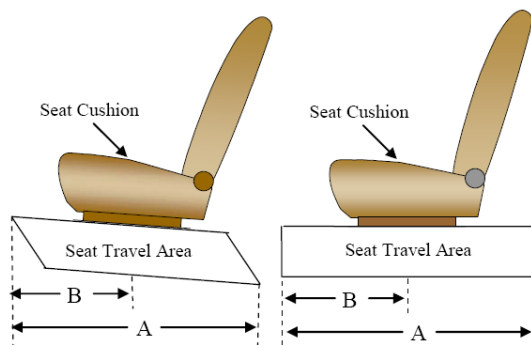
	Deg
Driver Seat Back Angle	12.5
Passenger Seat Back Angle	11.6

SEAT FORE/AFT POSITIONS

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

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

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	288 mm	144 mm
Passenger Seat	34 detents	0 detent



SEAT BELT UPPER ANCHORAGES

The driver and passenger's upper seat belt anchorages were positioned at the uppermost of four 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

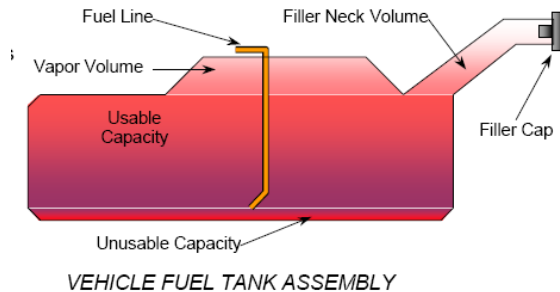
Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

FUEL TANK CAPACITY

	Liters
Usable Capacity of "Standard Tank"	51.1
Usable Capacity of "Optional Tank"	NA
92%-94% of Usable Capacity	47.0 - 48.0
Actual Amount of Solvent Used	47.3
1/3 of Usable Capacity	17.0

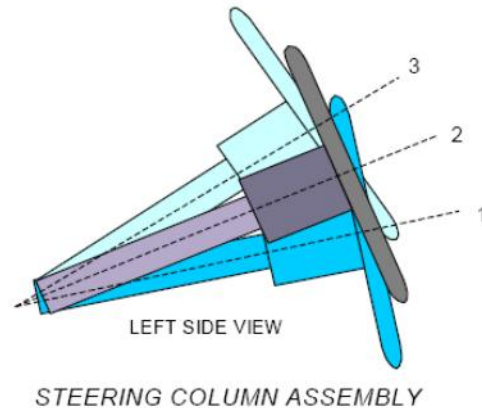
FUEL PUMP

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)

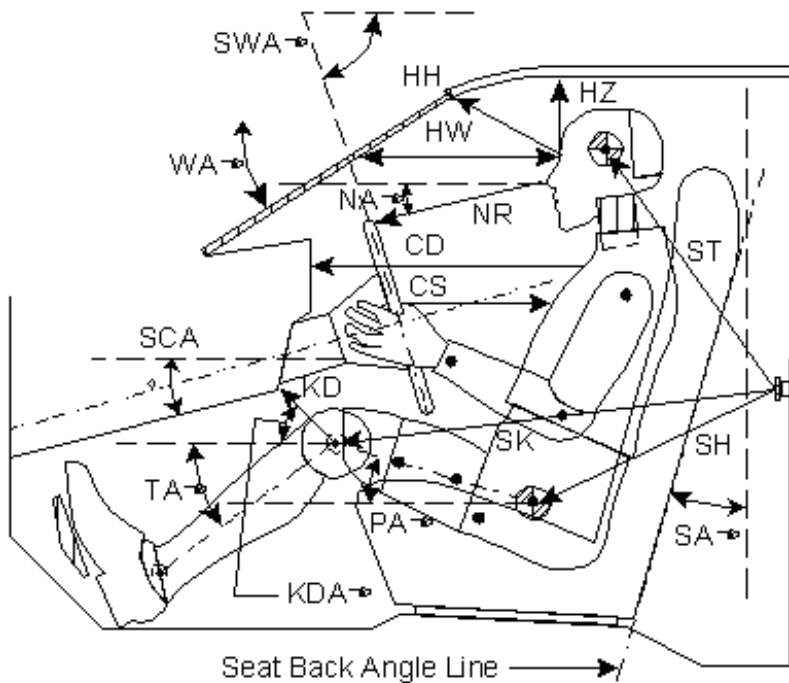


STEERING COLUMN POSITIONS

	Degrees	Fore/Aft Position (mm)
Lowermost position No. 1	65.4	
Geometric center position No. 2	68.4	
Uppermost position No. 3	71.4	
Telescoping Steering Wheel Travel		NA
Test Position	68.4	NA

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

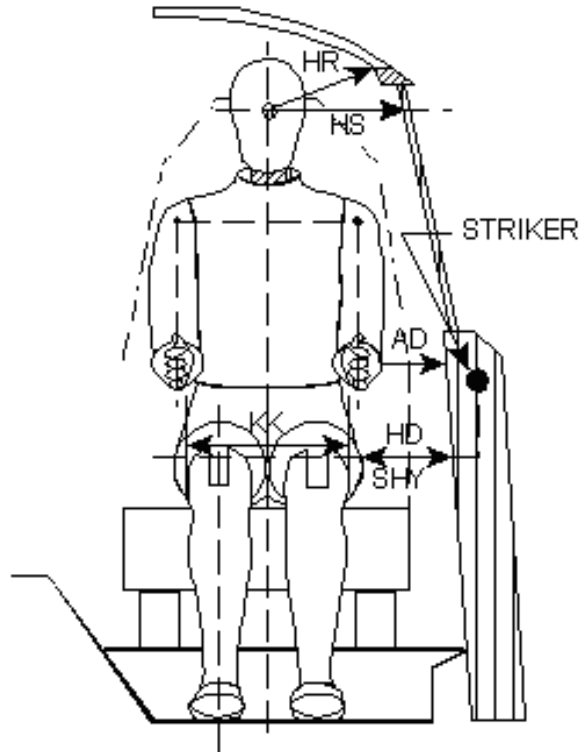
Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010



Code	Measurement Description	Driver		Passenger	
		Length (mm)	Angle(°)	Length (mm)	Angle (°)
WA°	Windshield Angle		30.3		
SWA°	Steering Wheel Angle		68.8		
SCA°	Steering Column Angle		29.2		
SA°	Seat Back Angle (on headrest post)		12.5		11.6
HZ	Head to Roof (Z)	234	90	265	90
HH	Head to Header	458	28	390	30.5
HW	Head to Windshield	765	0	754	0
NR	Nose to Rim	352	-10	400	-29.5
CD	Chest to Dash	560		372	
CS	Chest to Steering Hub	284	0		
RA	Rim to Abdomen	284	0		
KDL	Left Knee to Dash	142	19	105	24.5
KDR	Right Knee to Dash	146	20	110	22
PA°	Pelvic Angle		22.8		20.4
TA°	Tibia Angle		50.9		56.0
SK	Striker to Knee	620	-2.5	725	-19.7
ST	Striker to Head	562	52	553	45
SH	Striker to H-Point	379	-35	446	36.5

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

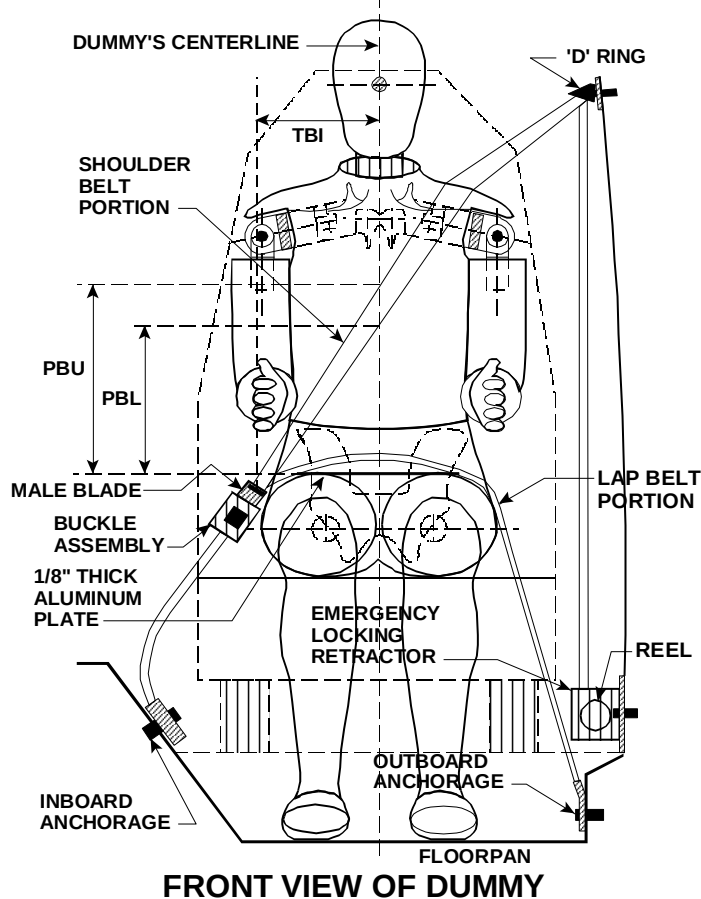


Code	Description	Driver	Passenger
AD	Arm to Door	67	86
HD	H-Point to Door	149	166
HR	Head to Side Header	223	258
HS	Head to Side Window	375	388
KK	Knee to Knee	315	170
SHY	Striker to H-Point (Y Direction)	225	255
AA	Ankle to Ankle	318	180

DATA SHEET NO. 5
SEAT BELT POSITIONING DATA

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

SEAT BELT POSITIONING DATA



SEAT BELT POSITIONING MEASUREMENTS

Measurement Description	Units	Driver	Passenger
PBU — Top surface of aluminum plate to belt upper edge	mm	400	364
PBL — Top surface of aluminum plate to belt lower edge	mm	337	292

BELT LENGTH DATA

Measurement Description	Units	Driver	Passenger
Shoulder belt length as measured on ATD	mm	810	855
Lap Belt Length as measured on ATD	mm	570	550
Remainder of belt on reel	mm	200	200
Total belt length for continuous webbing systems	mm	1580	1605

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

The diagram illustrates the layout of the test facility, divided into two main views: TOP VIEW and LEFT SIDE VIEW.

TOP VIEW: This view shows the overall layout of the test area. A central horizontal track is labeled "TEST VEH." with an arrow pointing left. To the left of the track is a "CONCRETE BARRIER" (13) and a "CONCRETE PAD" (7). To the right is a "MONORAIL" (17) and a "TOW ROAD" (16). A "COVERED PHOTO PIT" is located above the track. Various numbered components are shown: 1 (REAL TIME CAMERA), 2, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, and 18. A "CONCRETE BARRIER" is also labeled on the left side of the top view.

LEFT SIDE VIEW: This view shows the side profile of the test vehicle (a car) positioned on the "MONORAIL". The "COVERED PHOTO PIT" is located below the vehicle. Numbered components 14 and 15 are shown at the bottom of the view.

CAMERA FRAME RATES:

- #1 = 24 fps
- All Others = 1,000 fps

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

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

CAMERA LOCATIONS

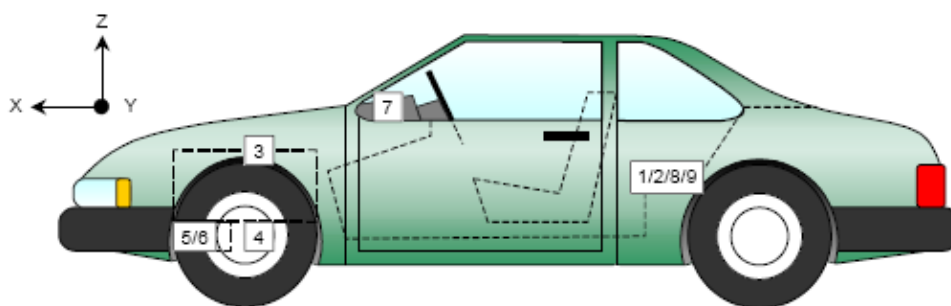
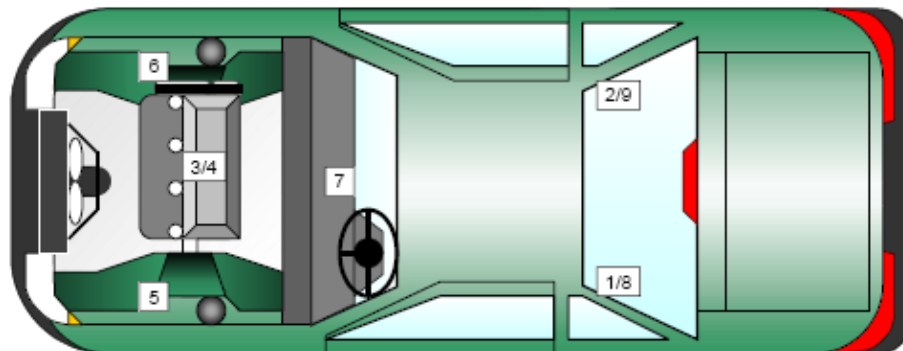
No.	Camera View	Location (mm)			Lens (mm)	Speed (fps)
		X	Y	Z		
1	Real-Time Camera				-	24
2	Driver Left Side View	1240	7060	-980	50	1000
3	Left Side View	850	8865	-1035	50	1000
4	Overall Right Side	2030	7080	-950	28	1000
5	Steering Column (Bottom)	1620	7745	-1205	28 - 70	1000
6	Steering Column (Top)	1620	7745	-1820	24 - 70	1000
7	Driver and Interior View	3110	3090	-2270	24	1000
8	Right Side View	960	7136	-955	50	1000
9	Right Passenger View	1770	7376	-1145	50	1000
10	Pass. And Interior View	3120	3210	-2280	50	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		-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 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Left Rear X-Member X	1666	-610	396
2	Right Rear X-Member X	1665	613	402
3	Engine Top X	3733	118	850
4	Engine Bottom X	3953	285	214
5	Left Brake Caliper X	3499	-731	451
6	Right Brake Caliper X	3499	731	451
7	Instrument Panel X	-	-	-
8	Left Rear X-Member Z	1666	-610	396
9	Right Rear X-Member Z	1665	613	402

Reference Points:

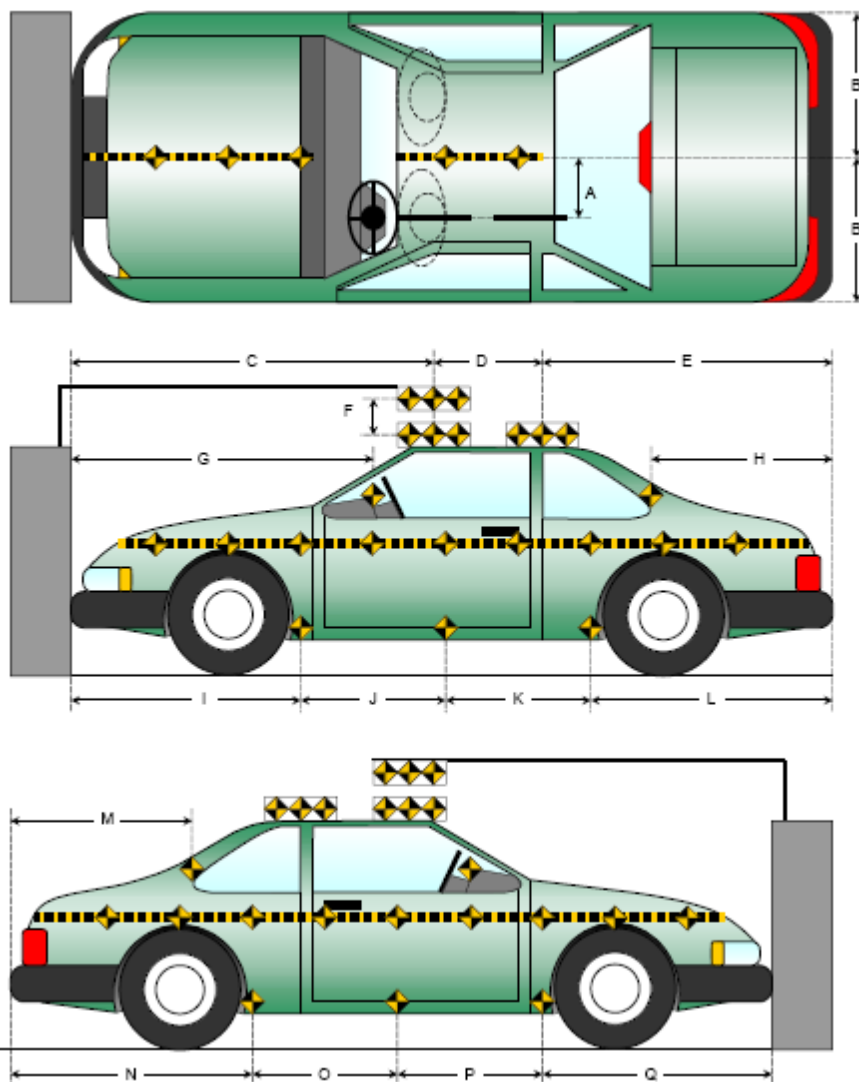
- X – Rear Surface of Vehicle (+ forward)
- Y – Vehicle Centerline (+ to right)
- Z – Ground Plane (+ down)

DATA SHEET NO. 8
PHOTOGRAPHIC REFERENCE TARGET LOCATIONS

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

Item	Value
A	375
B	876
C	1941
D	1218
E	1255
F	-
G	1707
H	1020
I	1385
J	811
K	861
L	1357
M	1013
N	1353
O	861
P	807
Q	1393

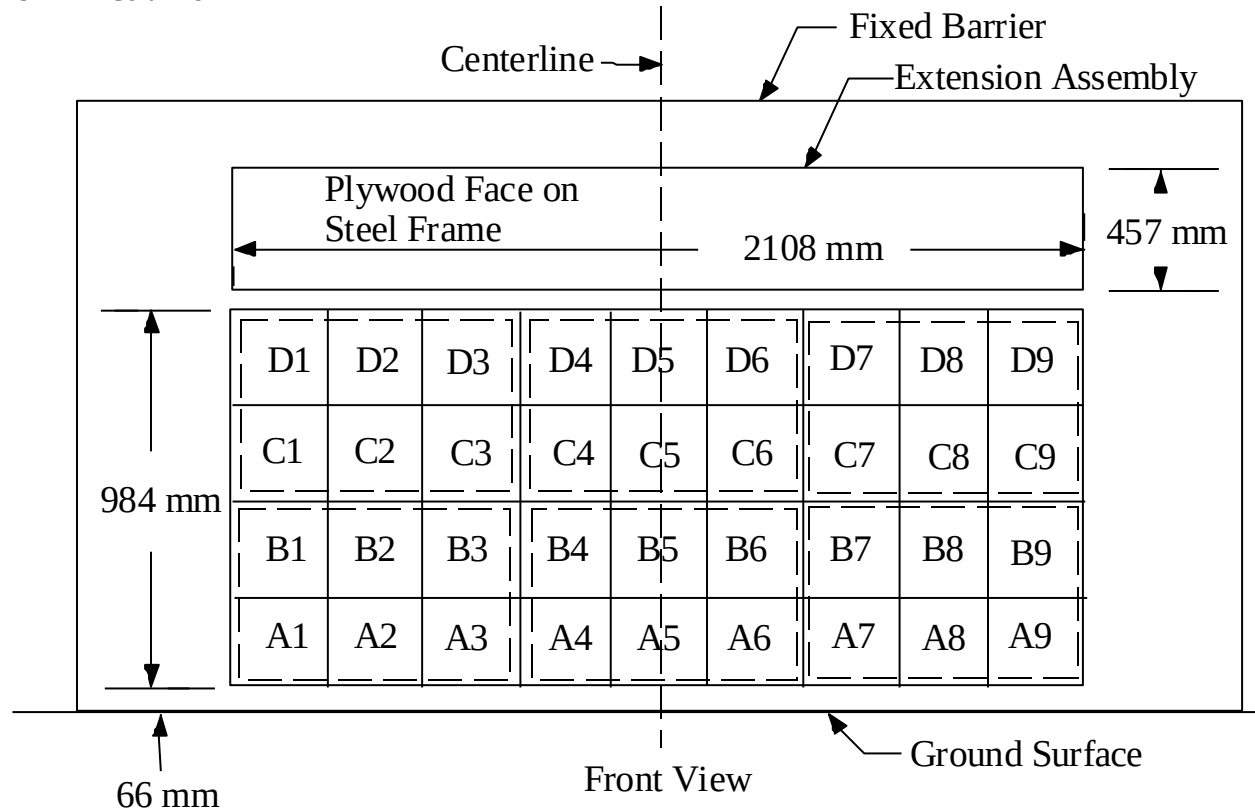
All units in millimeters



DATA SHEET NO. 9
LOAD CELL LOCATIONS ON FIXED BARRIER

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

36 Load Cells
 4 Rows
 9 Columns



DATA SHEET NO. 10
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

INSTRUMENTATION

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

*Passenger shoulder belt load cell was not installed

CAMERA COVERAGE

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

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

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Driver	Passenger
Dummy Type/Serial No.	061	273
Head Contact	Airbag	Airbag
Upper Torso Contact	Airbag	Airbag
Lower Torso Contact	Airbag	Airbag
Left Knee Contact	Knee Airbag	Lower Glove Box Panel
Right Knee Contact	Knee Airbag	Lower Glove Box 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)	6	2
Seat Back Failure	None	None
Glazing Damage	None	

POST TEST STRUCTURAL OBSERVATIONS

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

VEHICLE REBOUND FROM BARRIER

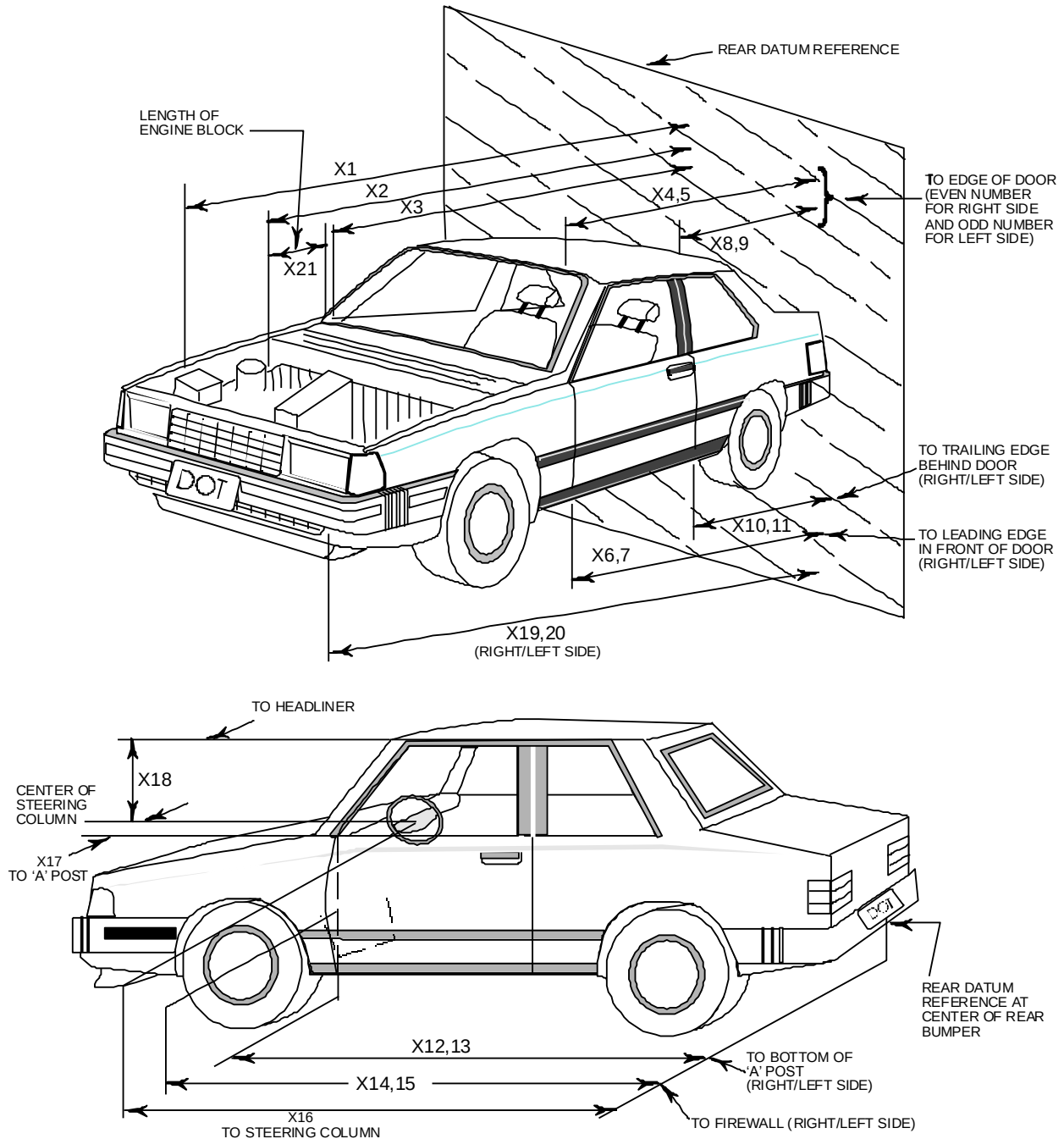
Measured Parameter	Units	Value
Left Side	mm	1310
Center	mm	1307
Right Side	mm	1308
Average	mm	1308

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
Knee Airbag	Yes	Yes	No	NA
Seat Belt Pretensioner	Yes	Yes	Yes	Yes
Seat Belt Load Limiter	No	NA	No	NA
Other	-	-	-	-

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

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010



DATA SHEET NO. 12 (CONTINUED)
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

No.	Measurement Description	Pre-Test	Post-Test	Difference
1	Total Length of Vehicle at Centerline	4414	3855	559
2	Rear Surface of Vehicle (RSOV) to Front of Engine	3949	3675	274
3	RSOV to Firewall	3482	3407	76
4	RSOV to Upper Leading Edge of Right Door	3005	3006	-1
5	RSOV to Upper Leading Edge of Left Door	3010	3003	7
6	RSOV to Lower Leading Edge of Right Door	2973	2973	0
7	RSOV to Lower Leading Edge of Left Door	2980	2973	7
8	RSOV to Upper Trailing Edge of Right Door	1963	1967	-5
9	RSOV to Upper Trailing Edge of Left Door	1968	1962	6
10	RSOV to Lower Trailing Edge of Right Door	1991	1995	-4
11	RSOV to Lower Trailing Edge of Left Door	1995	1993	2
12	RSOV to Bottom of "A" Post of Right Side	3139	3138	0
13	RSOV to Bottom of "A" Post of Left Side	3144	3145	-1
14	RSOV to Firewall, Right Side	3444	3373	71
15	RSOV to Firewall, Left Side	3434	3375	59
16	RSOV to Steering Column	2534	2583	-50
17	Center of Steering Column to "A" Post	263	263	-1
18	Center of Steering Column to Headliner	424	413	11
19	RSOV to Right Side of Front Bumper	3931	3788	143
20	RSOV to Left Side of Front Bumper	3932	3771	161
21	Length of Engine Block	356	303	54
RD	RSOV to Right Side of Dash Panel	2698	2701	-3
CD	RSOV to Center of Dash Panel	2756	2756	0
LD	RSOV to Left Side of Dash Panel	2695	2695	0

All Dimensions in mm

DATA SHEET NO. 13
ACCIDENT INVESTIGATION DIVISION DATA

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

VEHICLE INFORMATION

VIN	1B3CB3HA7BD106206	Wheelbase (mm)	2,639
Vehicle Size Category	Five Door Hatchback	Test Weight (kg)	1,590

ACCELEROMETER DATA

Accelerometer Locations: As Described in Data Sheet No. 7

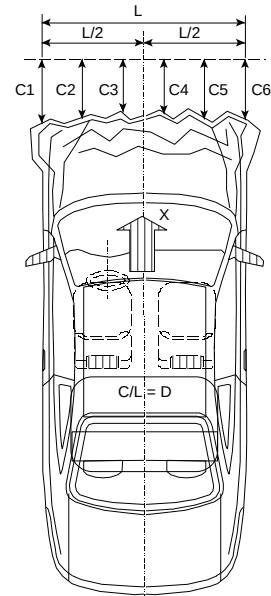
Cal. Procedure/Interval: Calspan Procedure / 6 month

Integration Algorithm: Trapezoidal Linearity: >99%

Impact Velocity (km/h): 56.36

Velocity Change (km/h): 65.82

Time of Separation (msec): 174



CRUSH PROFILE

Collision Deformation Classification: 12FDEW2

Midpoint of Damage: Vehicle Centerline

Damage Region Length (mm): 1413

Impact Mode: Frontal

No.	Measurement Description	Units	Pre-Test	Post-Test	Difference
C1	Crush zone 1 at left side	mm	4230	3792	-438
C2	Crush zone 2 at left side	mm	4375	3859	-516
C3	Crush zone 3 at left side	mm	4411	3866	-545
C4	Crush zone 4 at right side	mm	4411	3870	-541
C5	Crush zone 5 at right side	mm	4374	3869	-505
C6	Crush zone 6 at right side	mm	4231	3808	-423
L	C1 to C6	mm	1413	1430	-17

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

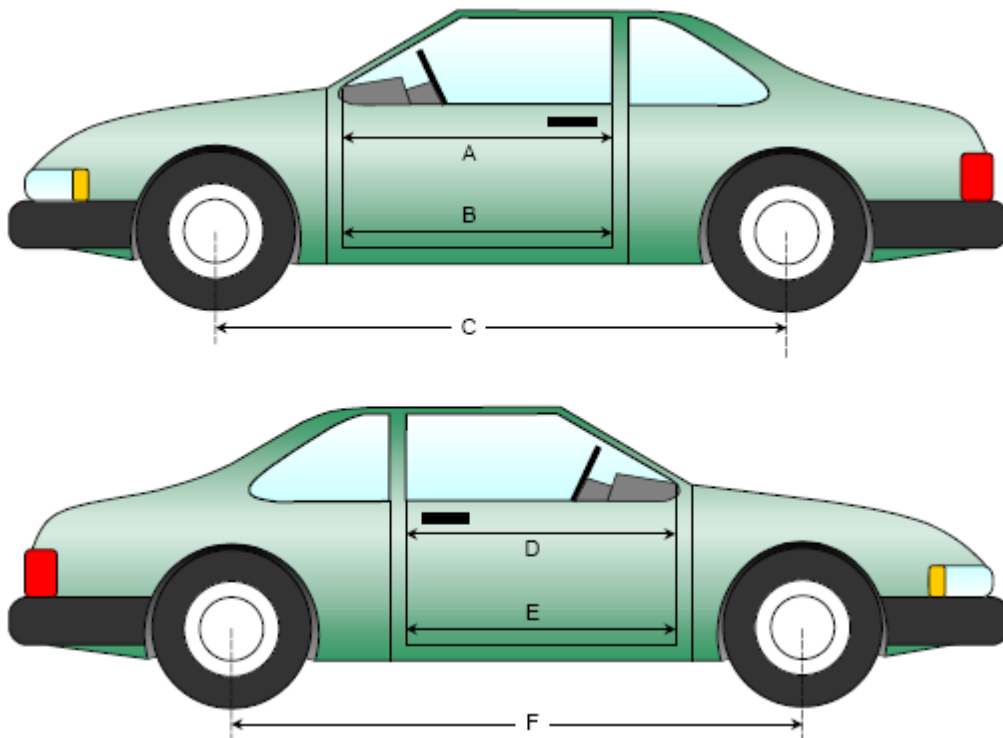
Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

DOOR OPENING WIDTH

Item	Description	Units	Pre-Test	Post-Test	Difference
A	Left Side Upper	mm	936	936	0
B	Left Side Lower	mm	896	896	0
D	Right Side Upper	mm	938	937	1
E	Right Side Lower	mm	897	896	0

WHEELBASE MEASUREMENTS

Item	Description	Units	Pre-Test	Post-Test	Difference
C	Left Side Wheelbase	mm	2639	2549	90
F	Right Side Wheelbase	mm	2636	2570	66



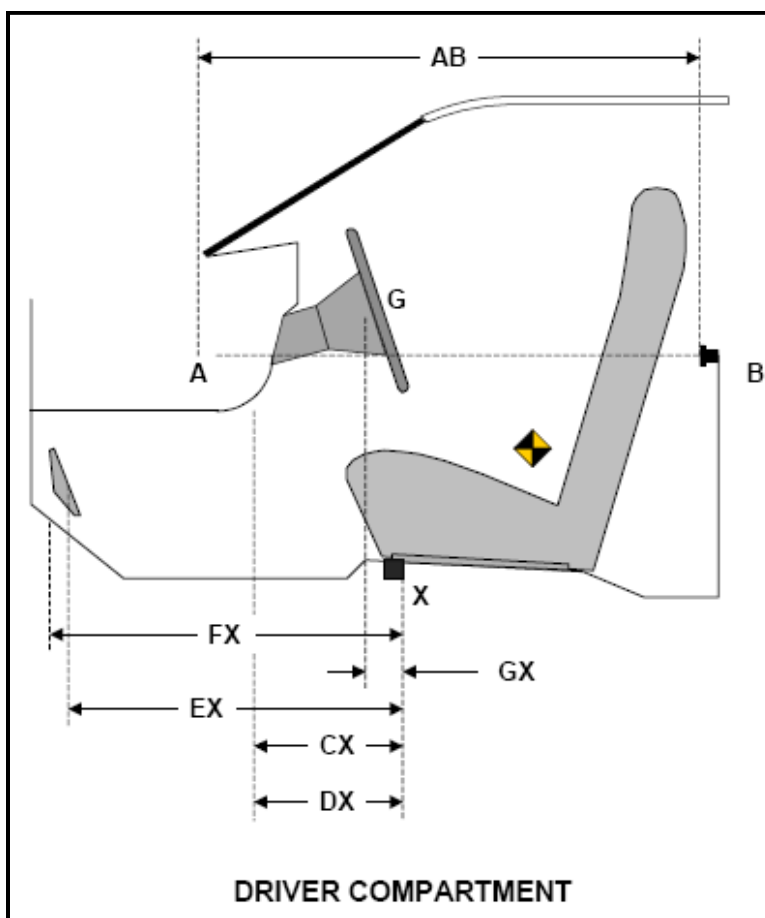
DATA SHEET NO.14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle: 2011 Dodge Caliber NHTSA No: MB0308
 Test Program: Frontal NCAP Test Date: 12/9/2010

DRIVER COMPARTMENT INTRUSION

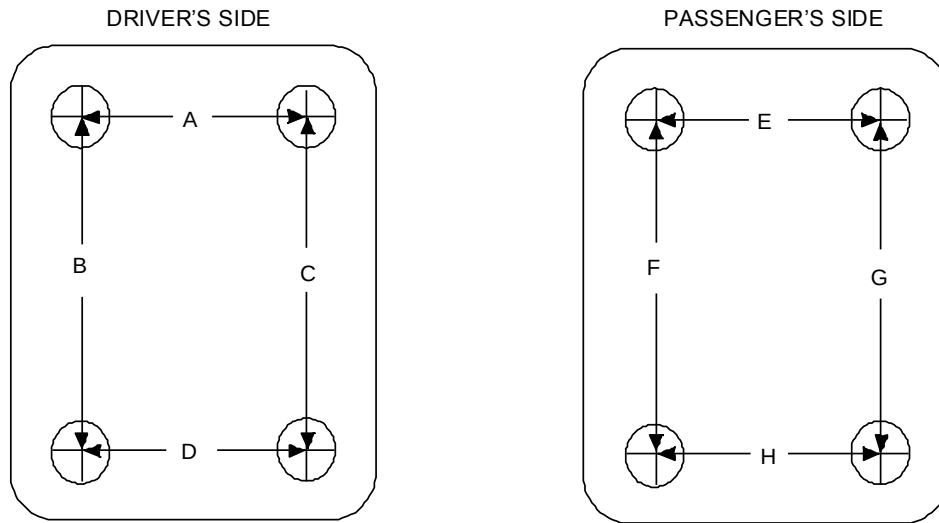
Item	Description	Units	Pre-Test	Post-Test	Difference
AB	Door Opening (Inside Window Jam)	mm	843	837	-6
CX	Left Knee Bolster to X	mm	272	287	16
DX	Right Knee Bolster to X	mm	265	291	26
EX	Brake Pedal to X	mm	545	540	-5
FX	Foot Rest to X	mm	580	544	-37
GX	Center of Steering Column Wheel Hub to X	mm	39	92	53

X = Front of Seat Track (Stationary)



DATA SHEET NO.14 (CONTINUED)
VEHICLE INTRUSION MEASUREMENTS

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010



TOP VIEW THROUGH FLOOR PAN

UNDERBODY FLOORBOARD DEFORMATION

Measurement	Pre-Test	Post-Test	Difference
A	421	420	-1
B	290	292	2
C	295	290	-5
D	429	424	-5
E	348	344	-4
F	323	322	-1
G	306	307	1
H	386	383	-3

All units in millimeters

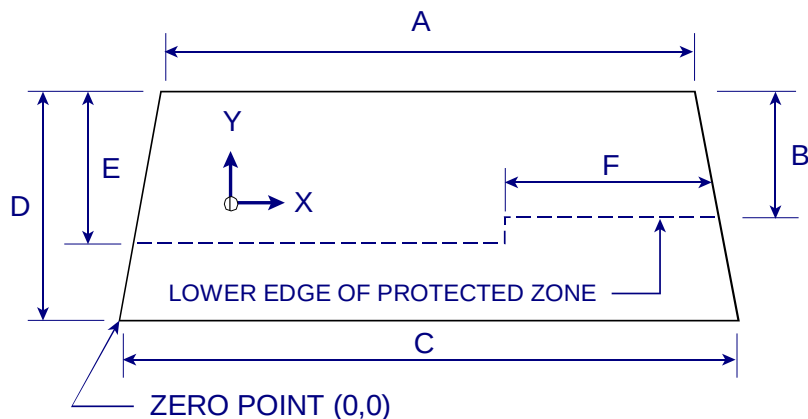
DATA SHEET NO. 15
SUMMARY OF FMVSS 212, 219 (PARTIAL), AND 301 DATA

Test Vehicle:	2011 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010

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	2030	2030	100%
Right Side	2030	2030	100%
Total	4060	4060	100%



Item	Units	Value
A	mm	1215
B	mm	420
C	mm	1405
D	mm	720
E	mm	420
F	mm	400

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 Dodge Caliber</u>	NHTSA No:	<u>MB0308</u>
Test Program:	<u>Frontal NCAP</u>	Test Date	<u>12/9/2010</u>

FMVSS 301 FUEL SYSTEM INTEGRITY POST IMPACT DATA

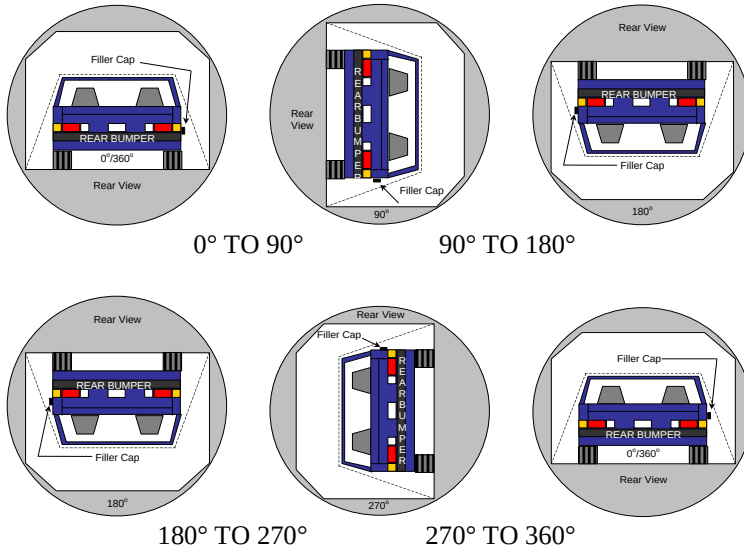
Temperature at Time of Impact: -10° C Test Time: 15:05

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 Dodge Caliber	NHTSA No:	MB0308
Test Program:	Frontal NCAP	Test Date	12/9/2010



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°	1:05	5:00	6:05
180° to 270°	1:01	5:00	6:01
270° to 360°	1:10	5:00	6:10

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:	<u>2011 Dodge Caliber</u>	NHTSA No:	<u>MB0308</u>
Test Program:	<u>Frontal NCAP</u>	Test Date	<u>12/9/2010</u>

Photo Not Available

APPENDIX A
PHOTOGRAPHS

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6	Left Rear $\frac{3}{4}$ View, as Received	A-7
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39	Pre-test Driver's Side Knee Bolster	A-24
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43	Post-test Driver Dummy Contact With Airbag	A-26
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44	Pre-test View of the Steering Column Shear Capsule	A-27
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57	Post-test Passenger's Side Knee Bolster	A-33
58	Pre-test Passenger's Side Floorpan	A-34
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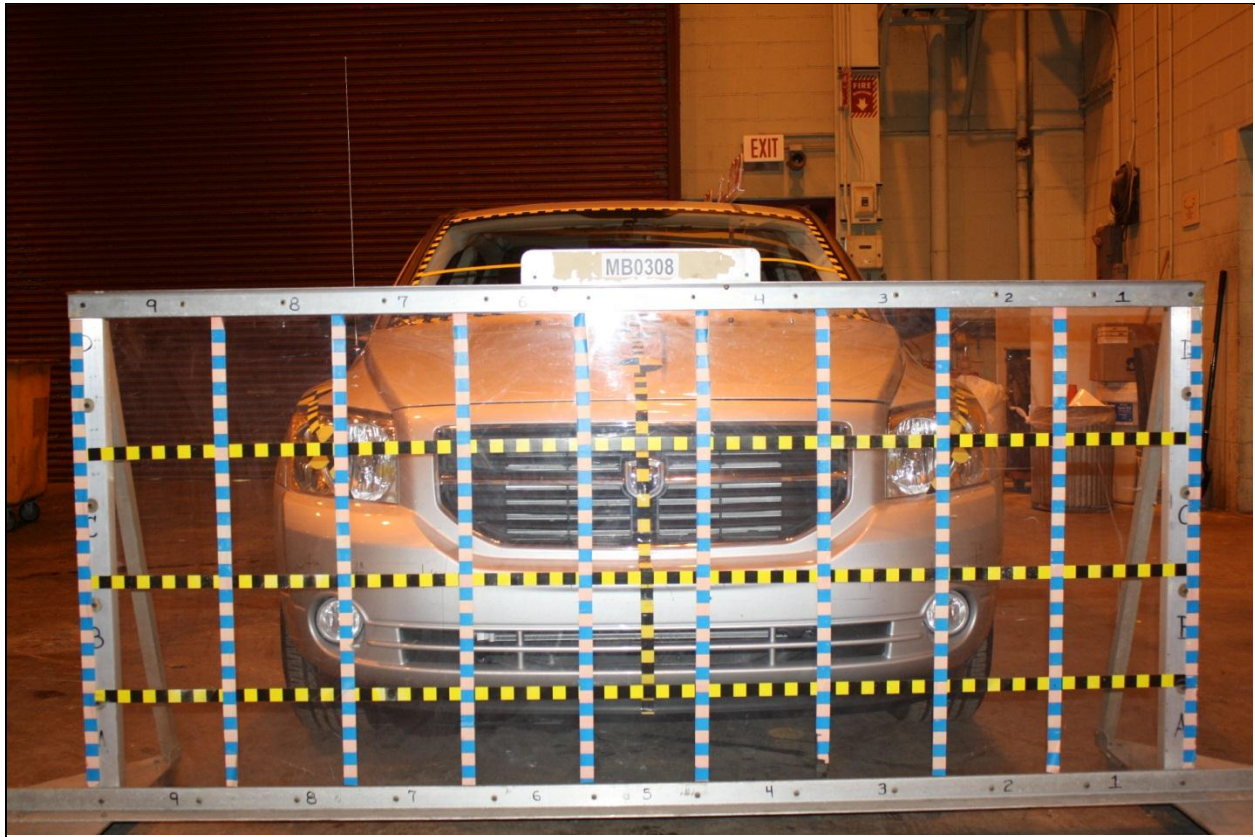


Figure A-1: Load Cell Location



Figure A-2: Load Cell Wall



Figure A-3: Manufacturer Label

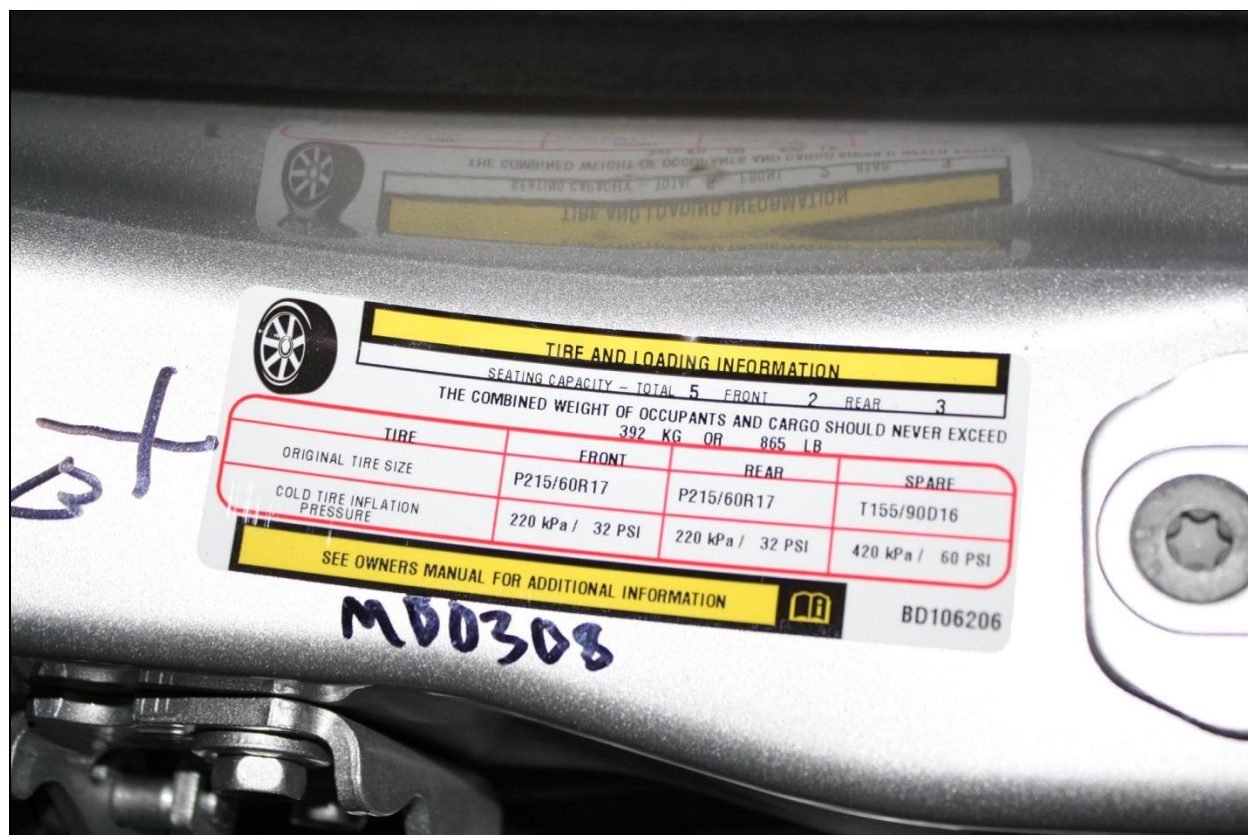


Figure A-4: Tire Placard



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



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



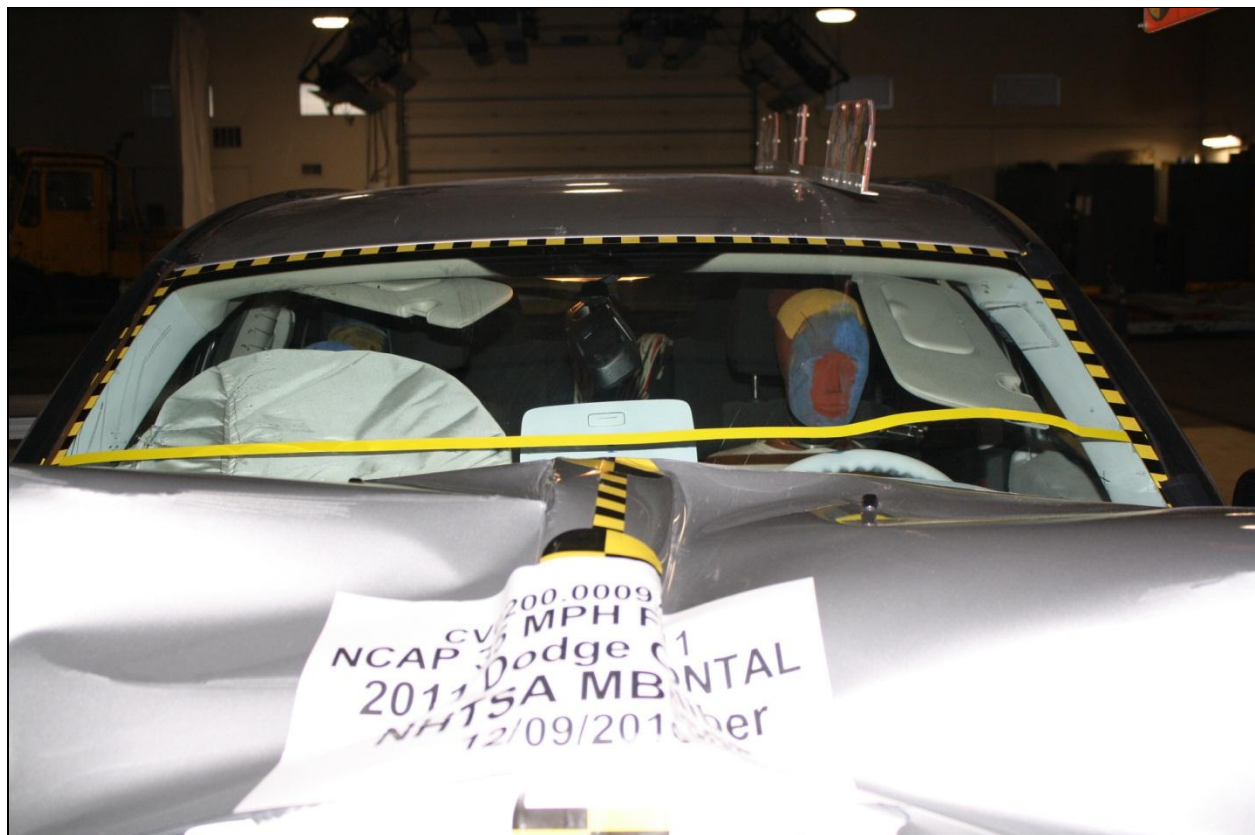
Figure A-14: Post-Test Right $\frac{3}{4}$ View



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



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



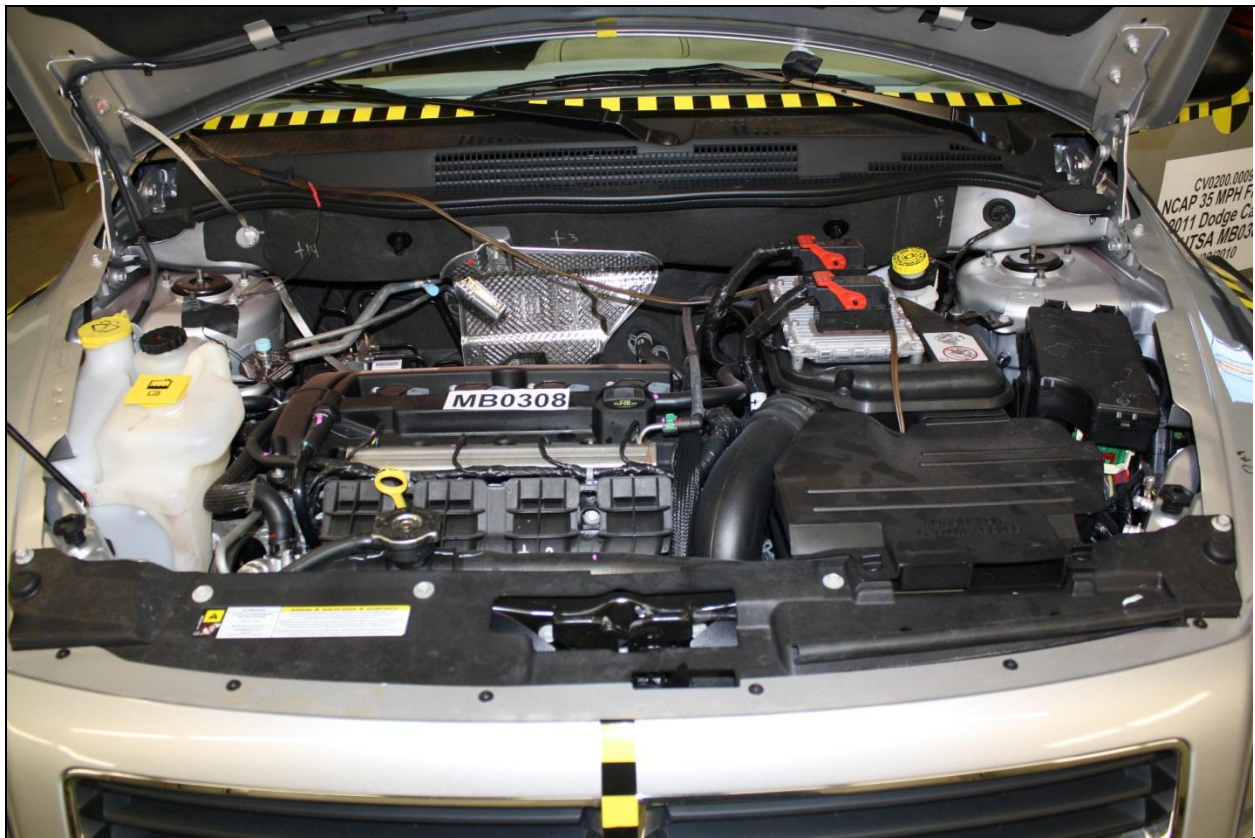


Figure A-19: Pre-Test Engine Compartment View



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

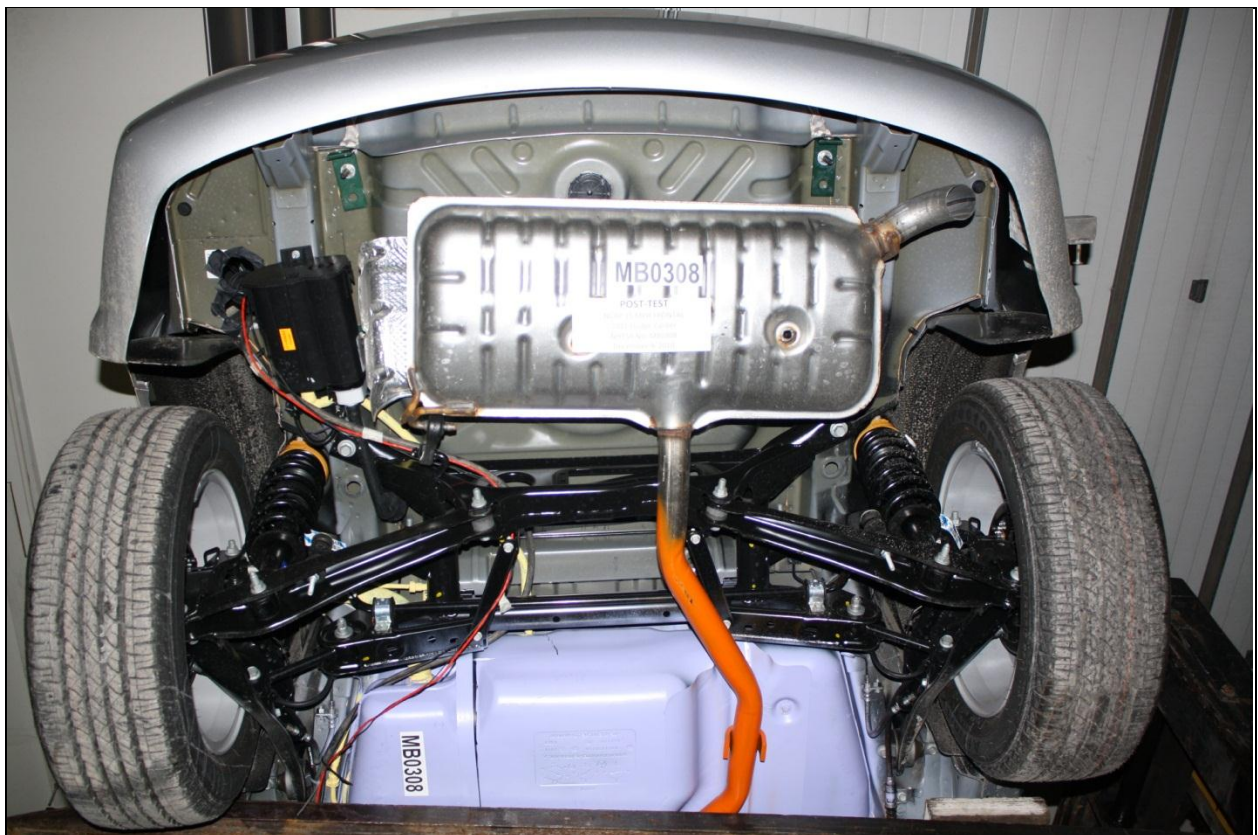


Figure A-26: Post-Test Rear Underbody View



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

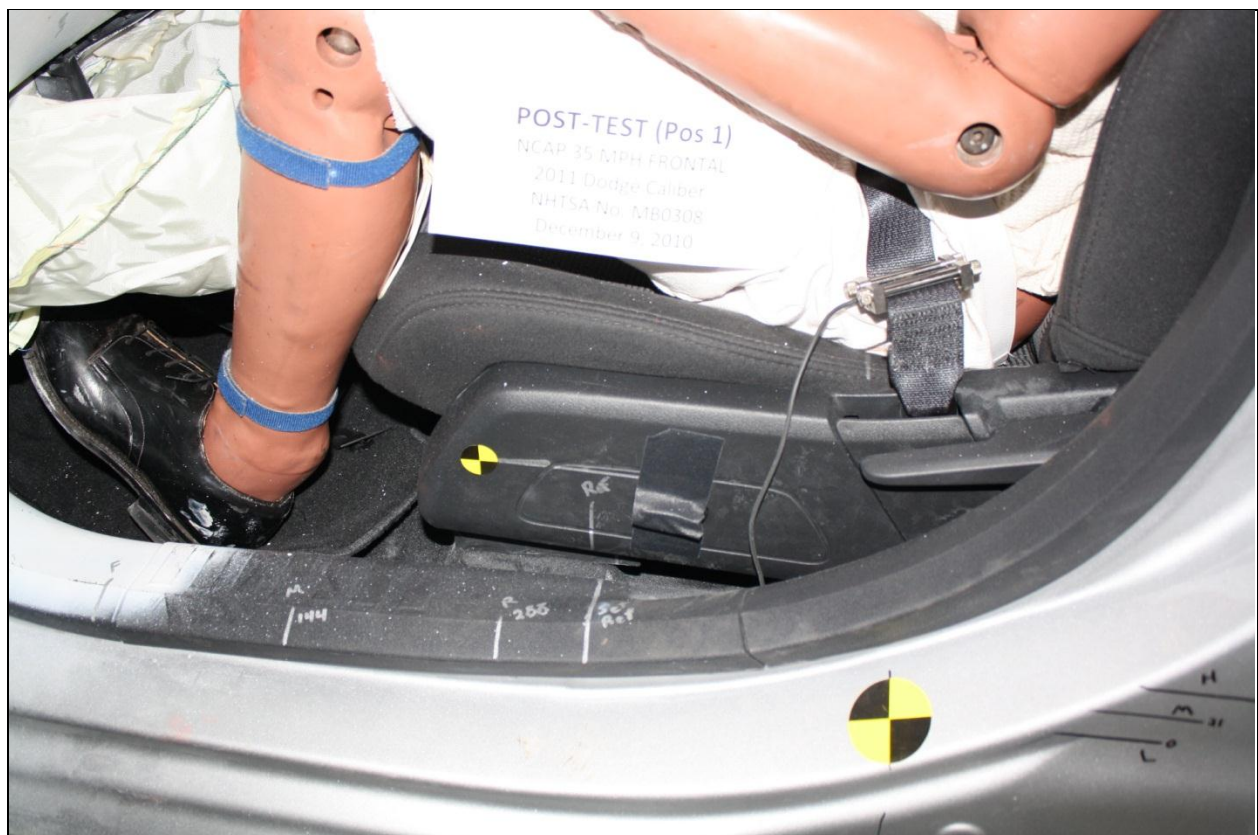


Figure A-36: Post-Test Driver's Seat Fore-Aft Markings



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

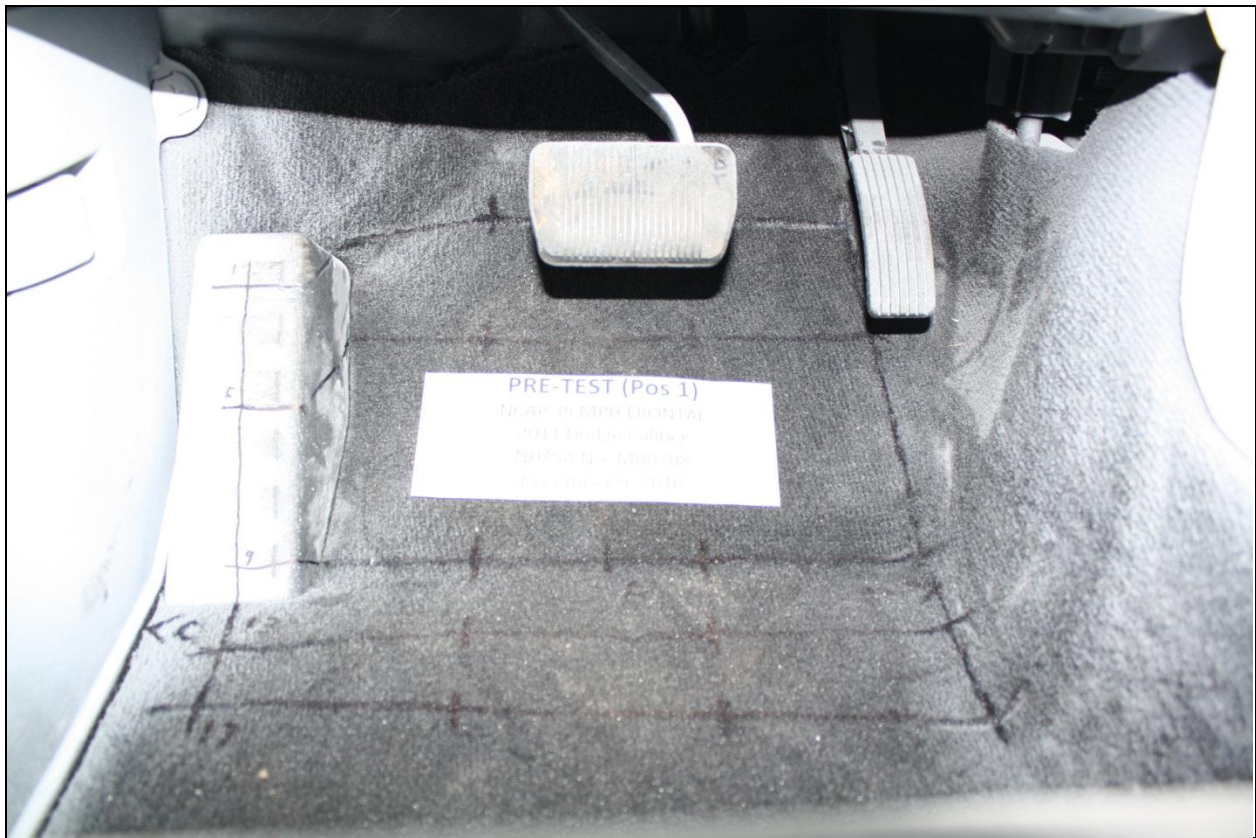


Figure A-41: Pre-Test Driver's Side Floorpan



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



Figure A-43: Post-Test Driver 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

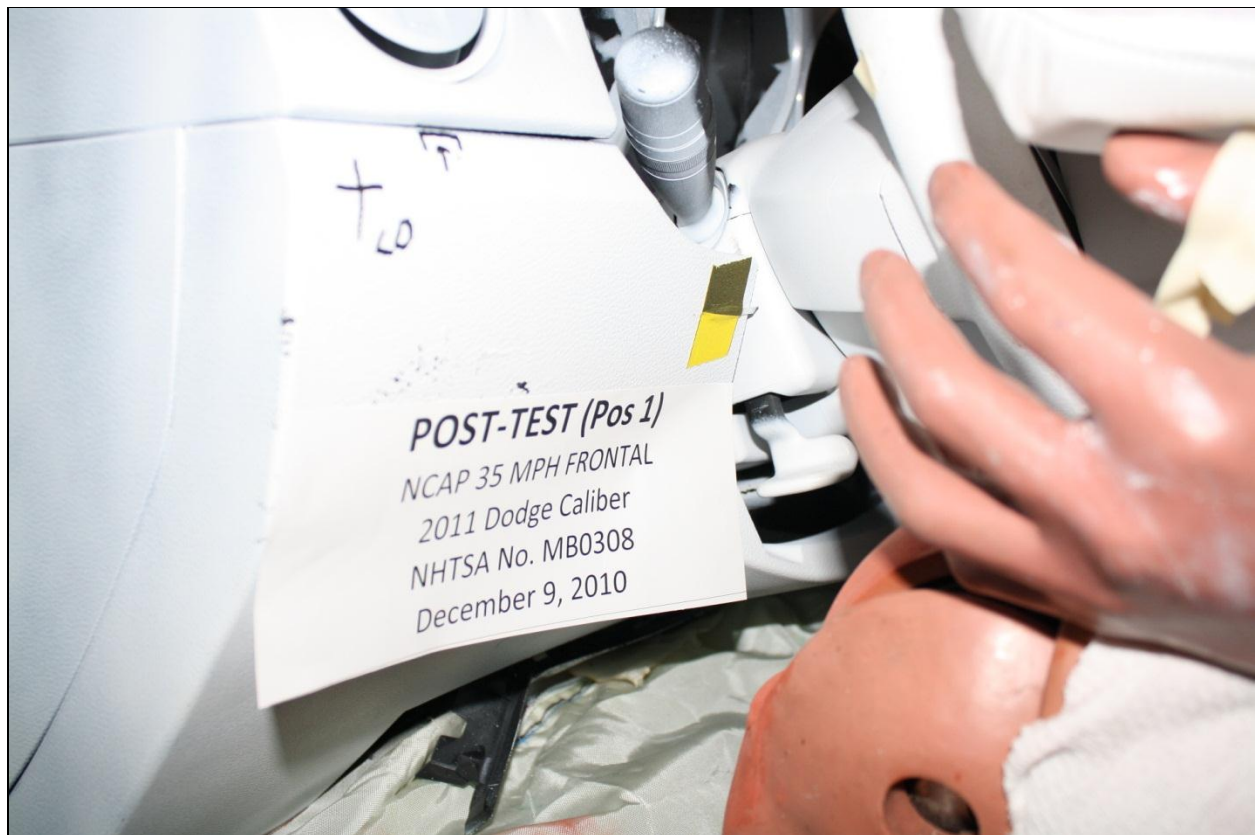


Figure A-45: Post-Test View of the Steering Column Shear Capsule



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



Figure A-52: Pre-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

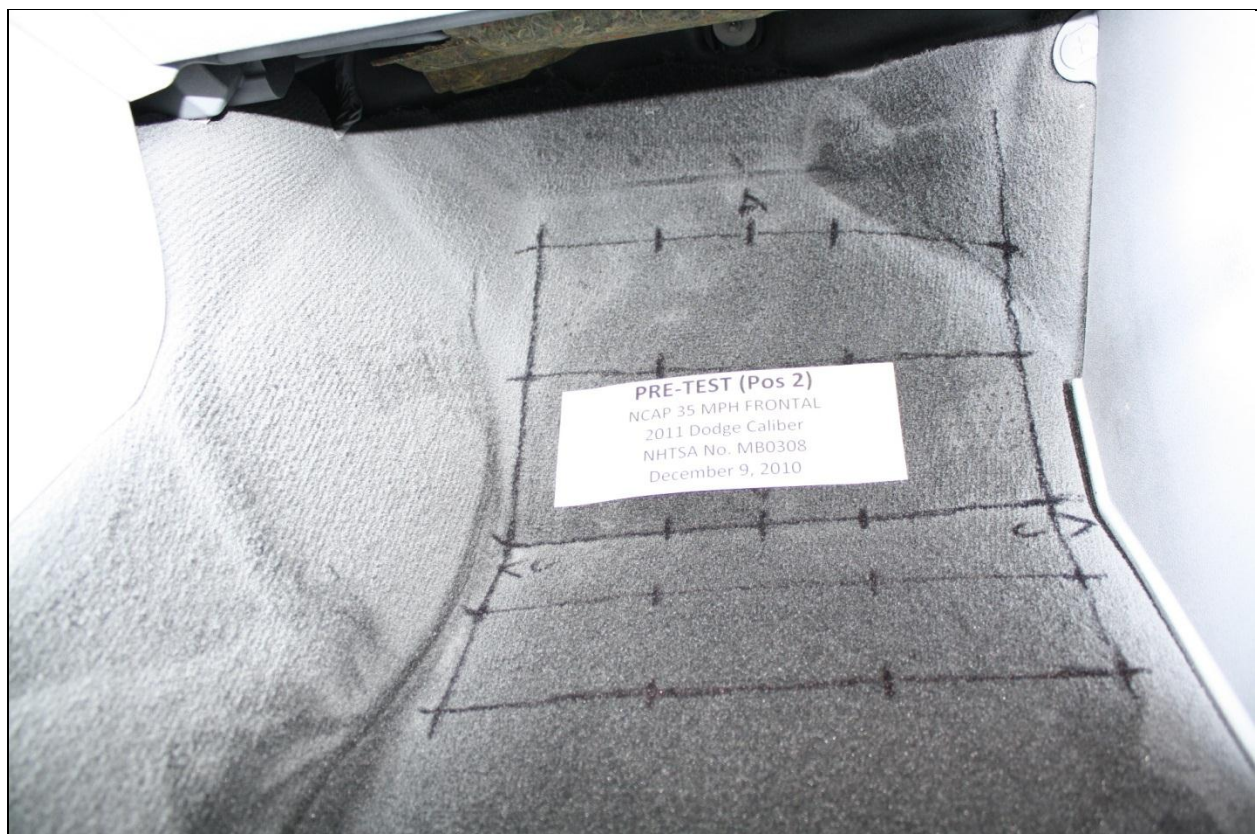


Figure A-58: Pre-Test Passenger's Side Floorpan



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

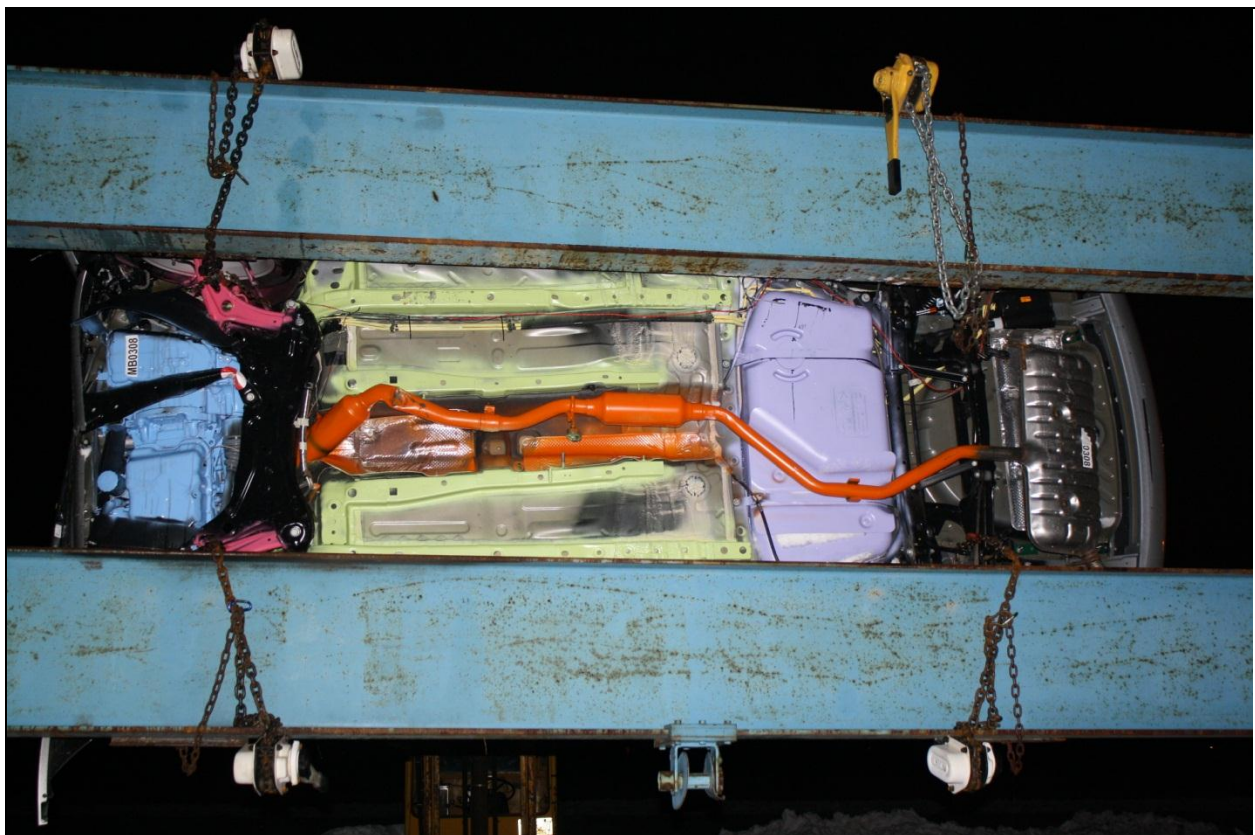


Figure A-67: Vehicle at 270° on Static Rollover Device



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



Figure A-69: Impact Photograph

APPENDIX B
DUMMY RESPONSE DATA TRACES

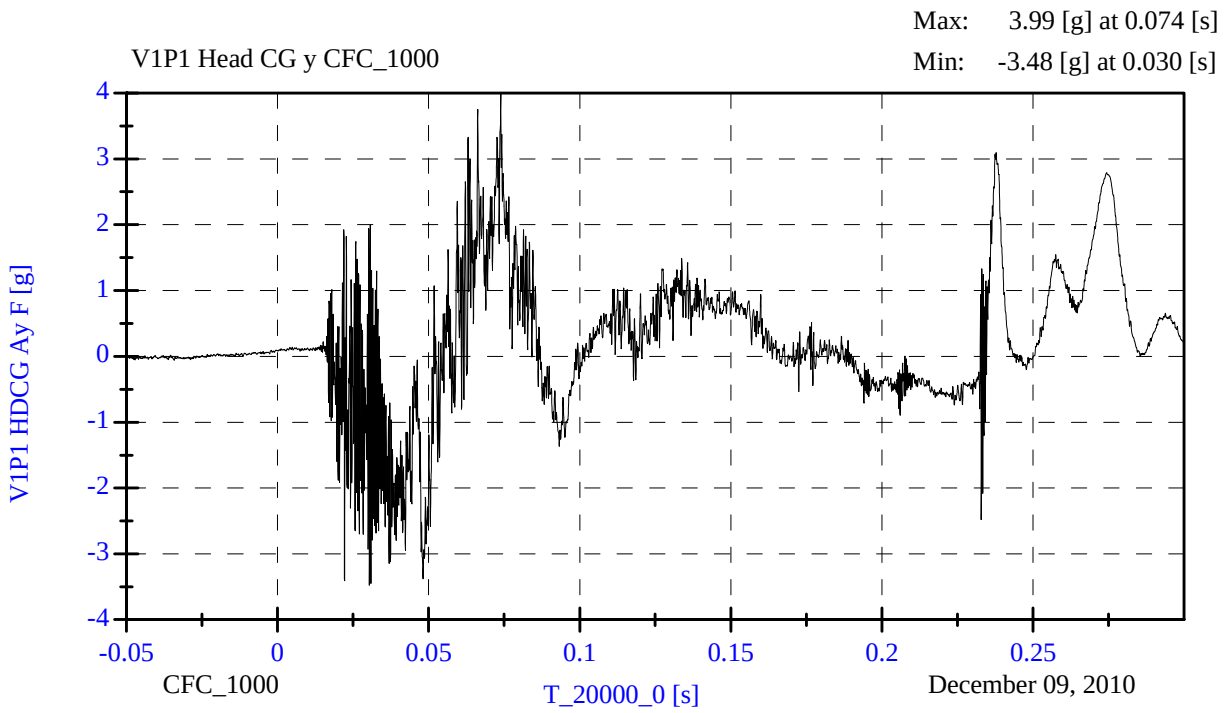
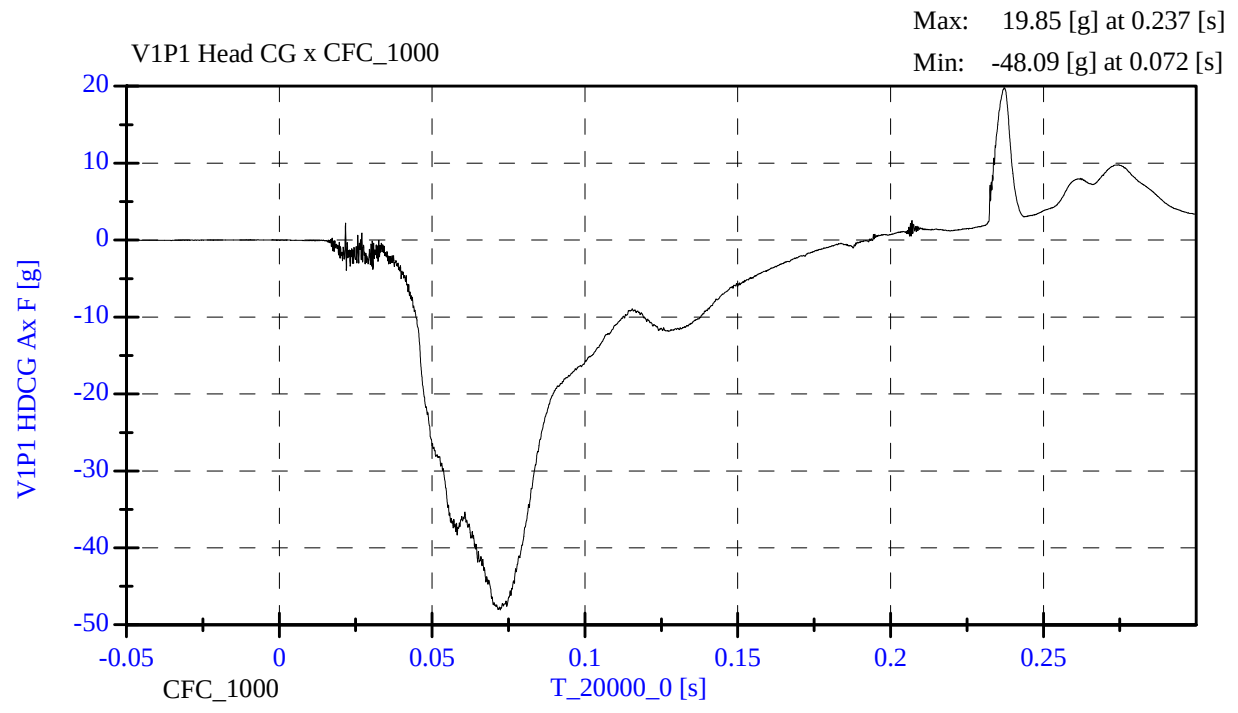
Fig. No.	List of Data Plots Provided In The Test Report	Page No.
1	Driver Head X Acceleration vs. Time Primary	B-5
2	Driver Head Y Acceleration vs. Time Primary	B-5
3	Driver Head Z Acceleration vs. Time Primary	B-6
4	Driver Head Resultant Acceleration vs. Time Primary	B-6
5	Driver Chest X Deflection 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

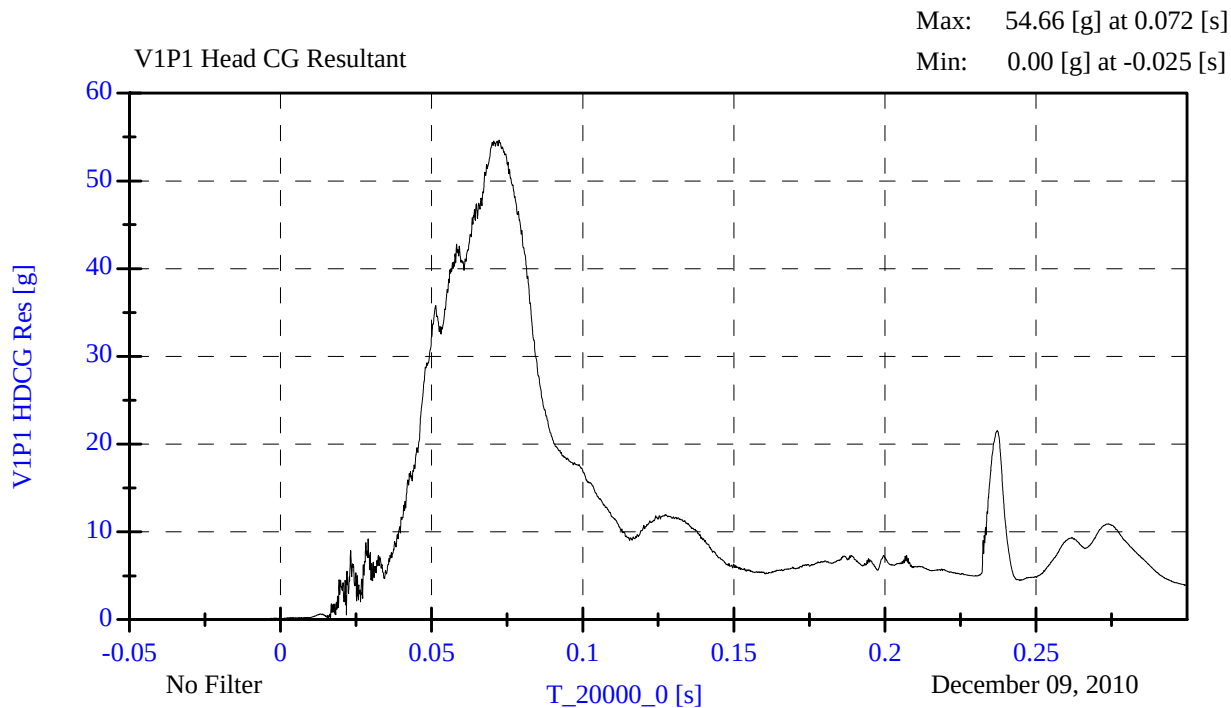
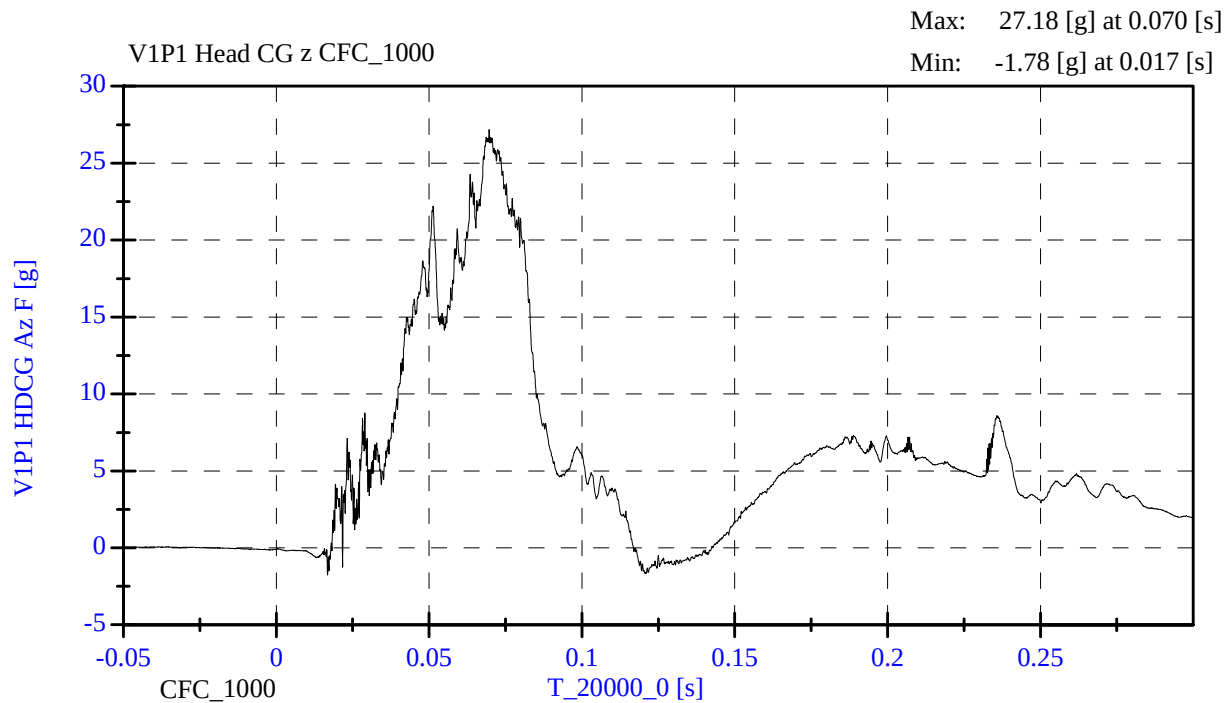
30	Passenger Right Femur Force vs. Time	B-19
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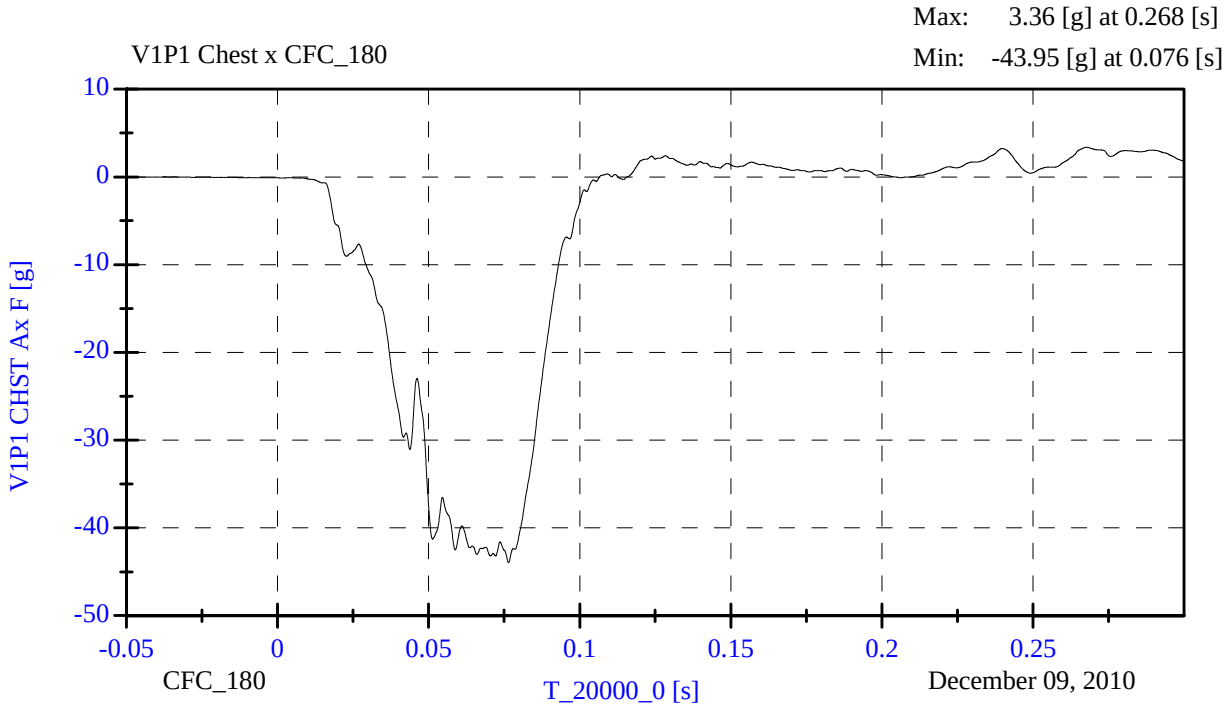
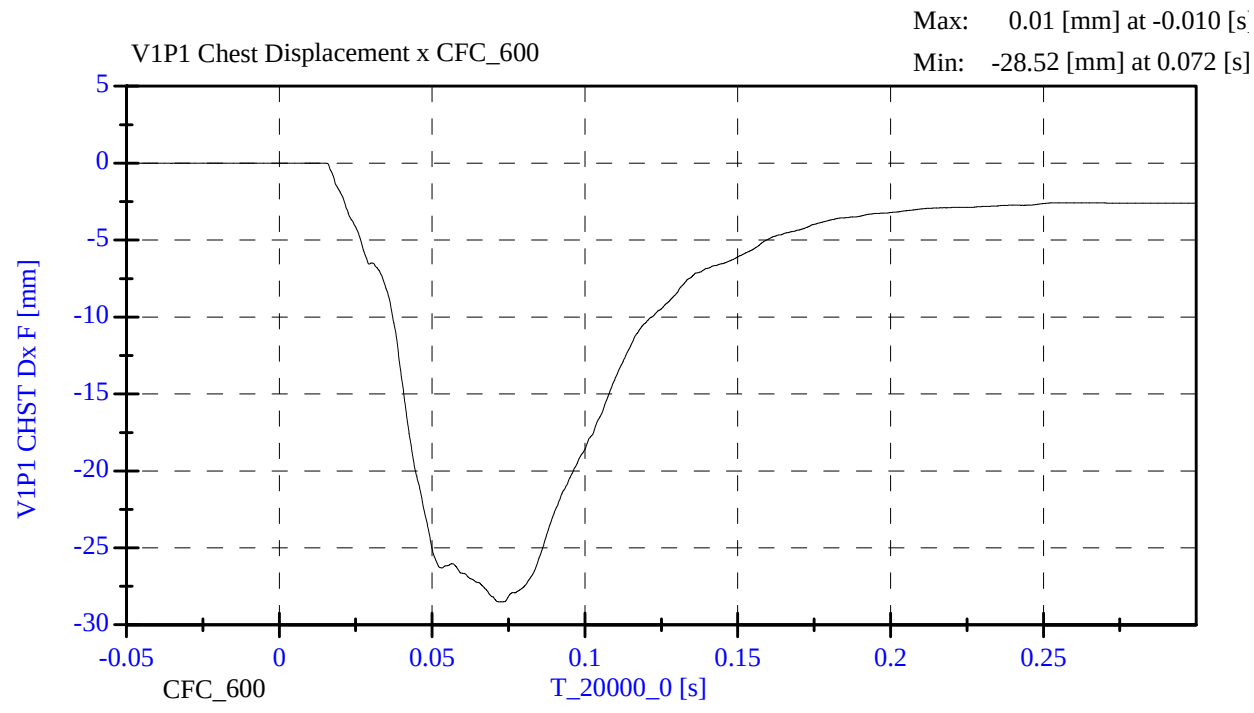
The following additional dummy and vehicle response data can be found in the R&D section of the NHTSA website at www.nhtsa.dot.gov

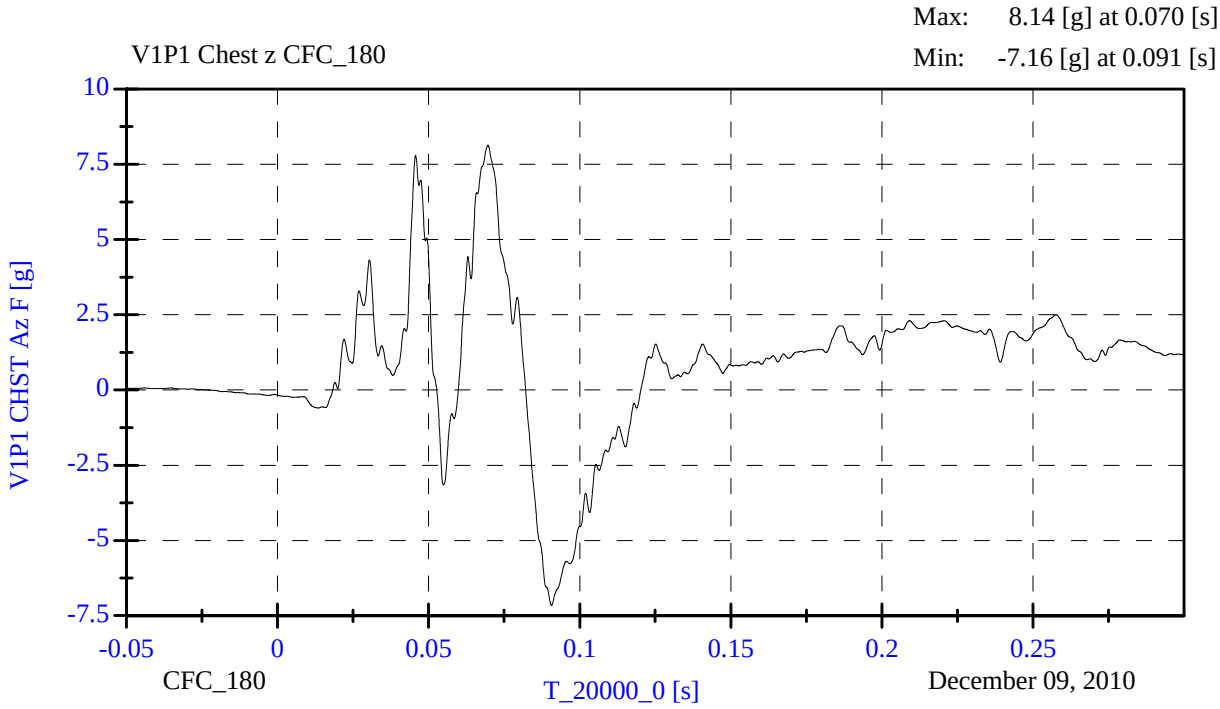
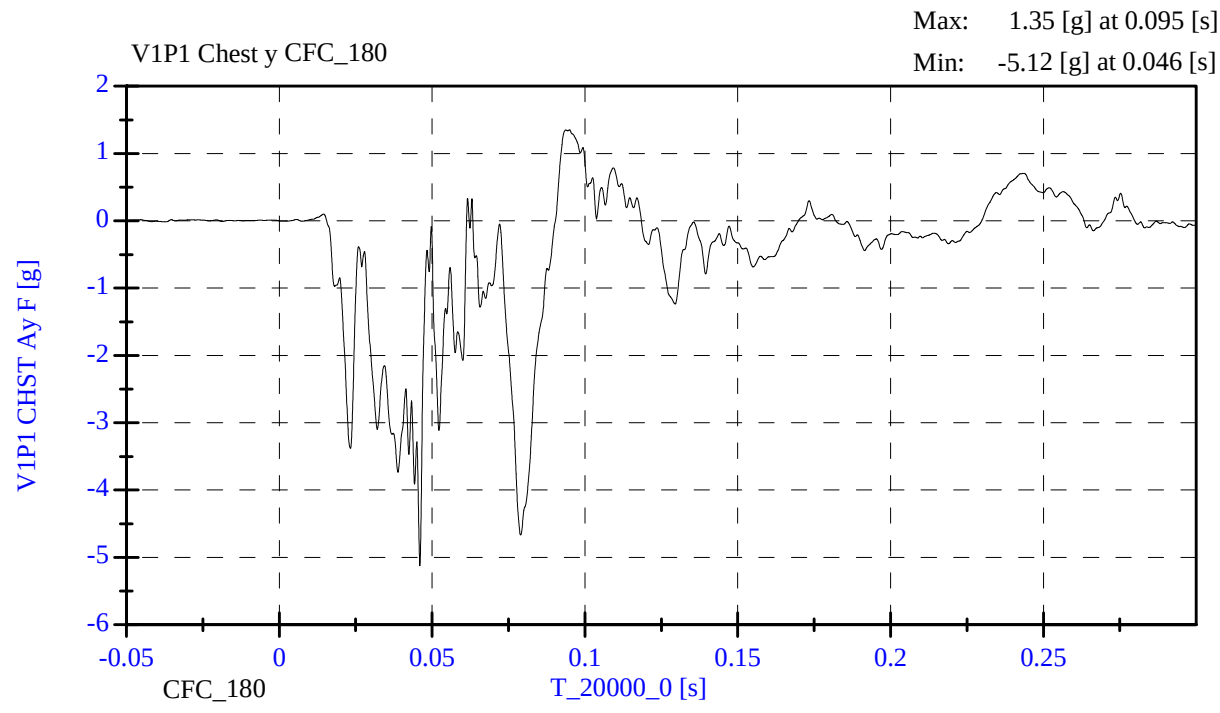
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 Driver Head Y Acceleration Redundant
 Driver Head Z Acceleration Redundant
 Driver Upper Neck Force Y
 Driver Upper Neck Moment X
 Driver Upper Neck Moment Z
 Driver Chest X Acceleration Redundant
 Driver Chest Y Acceleration Redundant
 Driver Chest 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

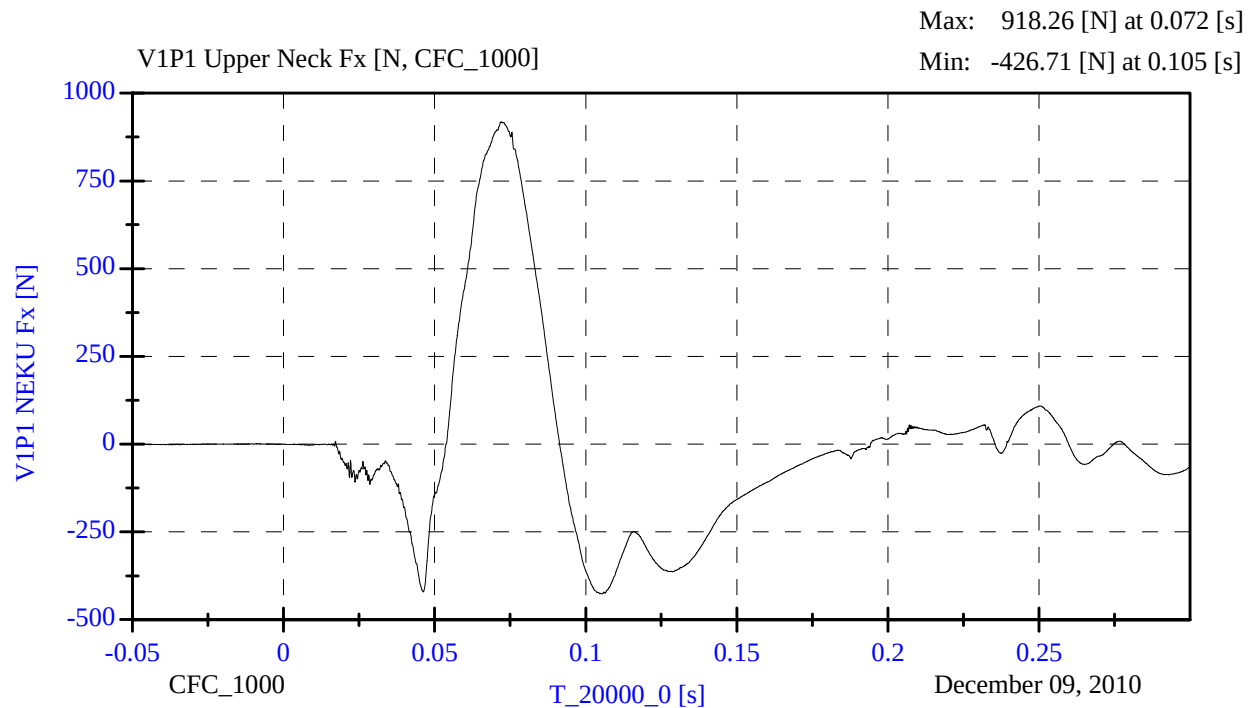
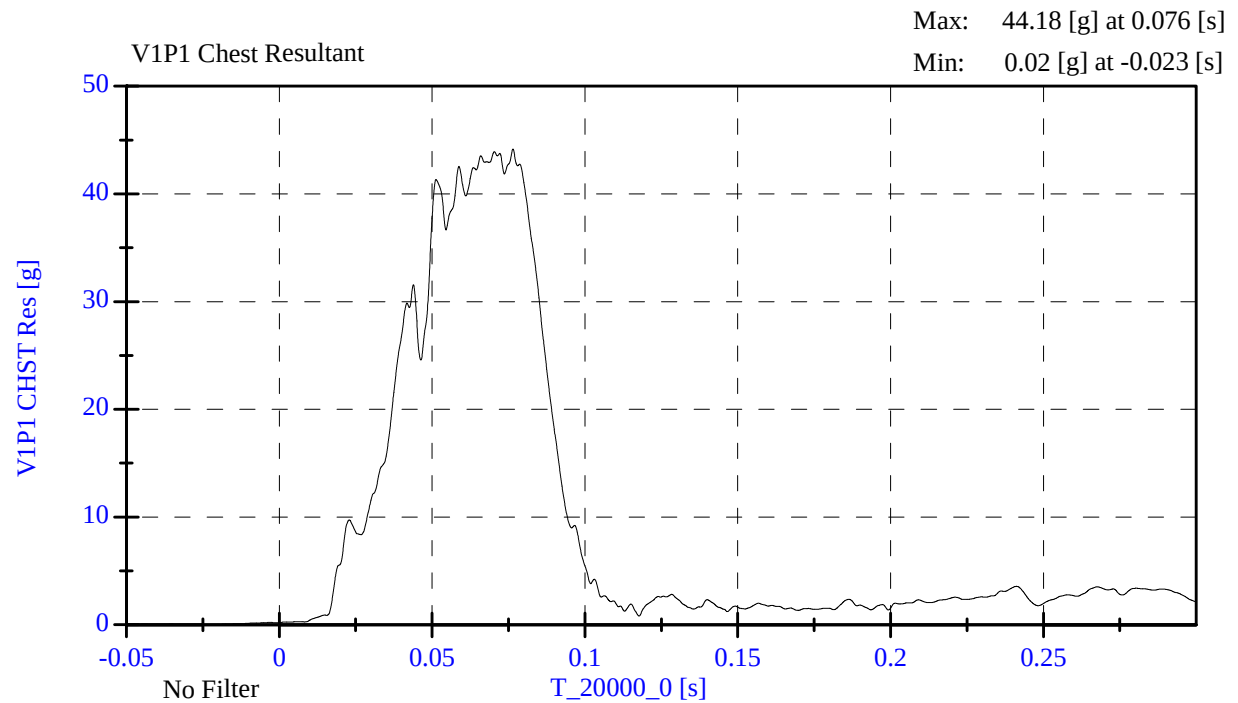


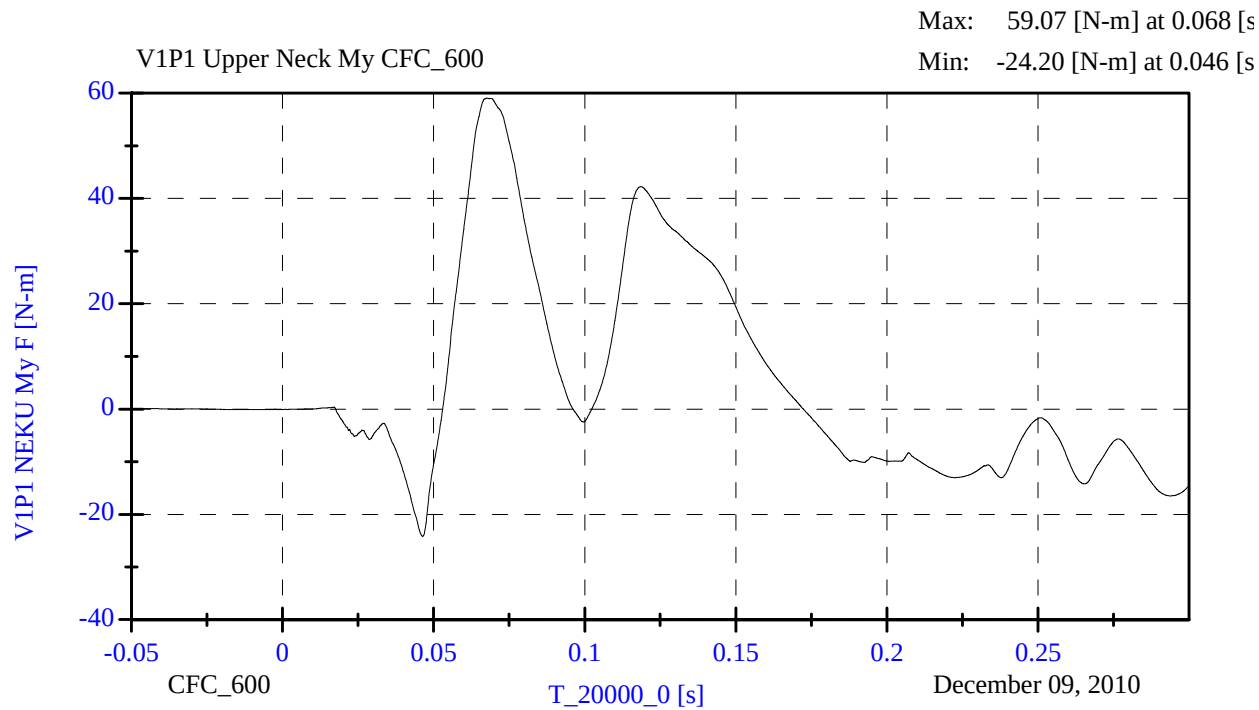
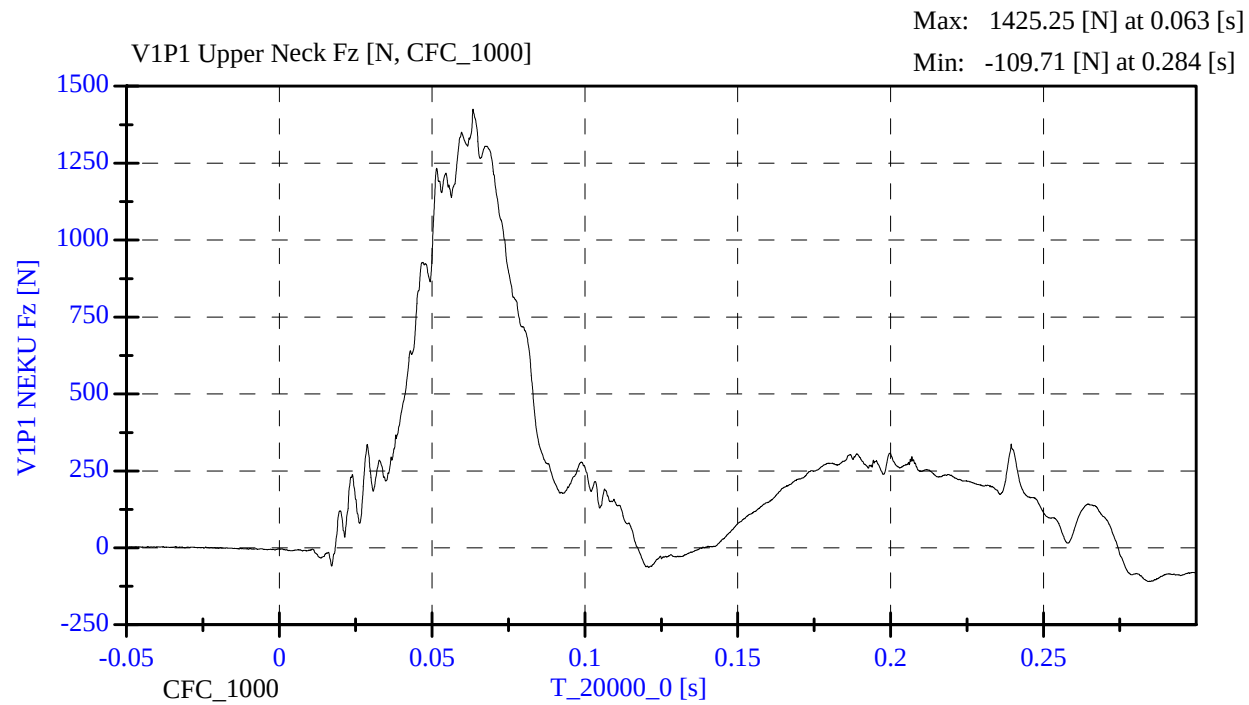


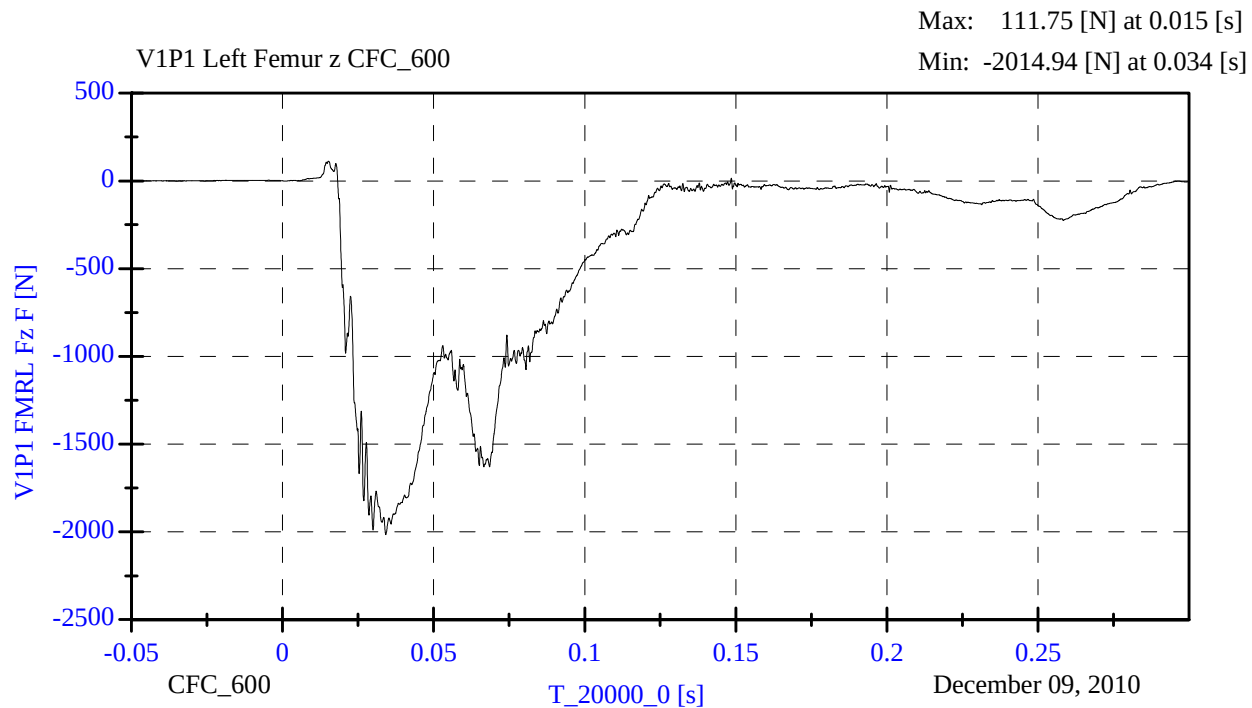
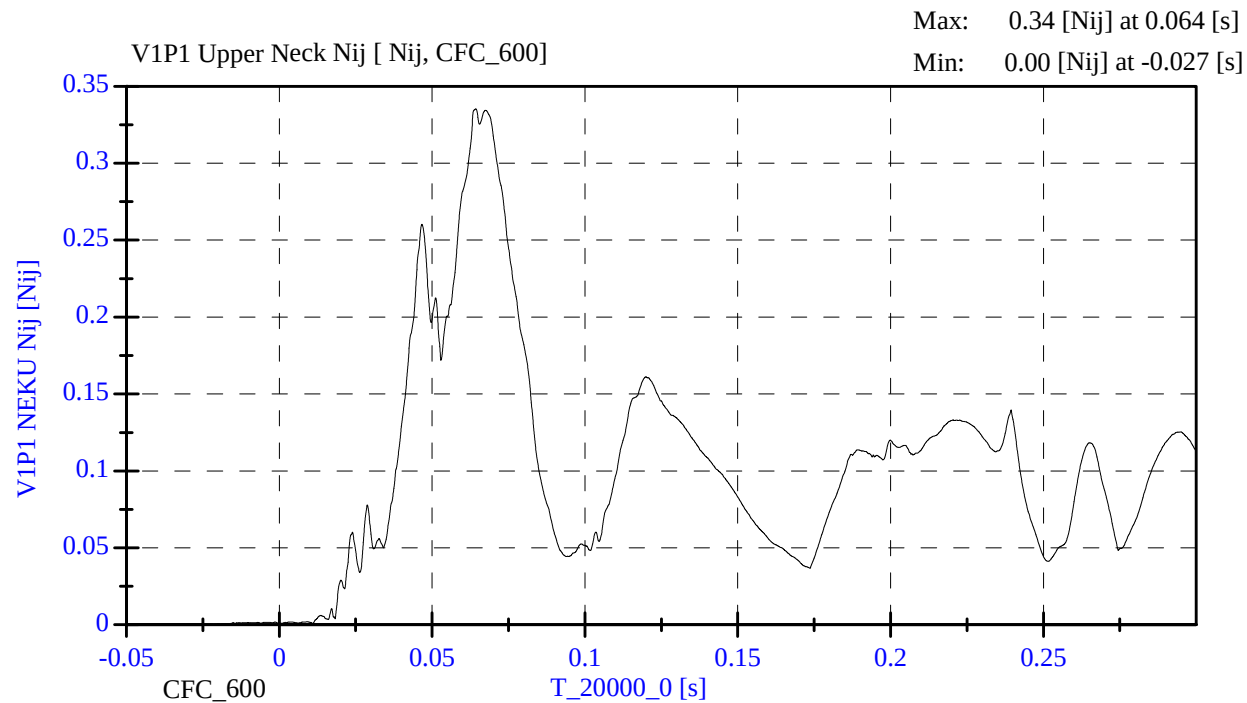


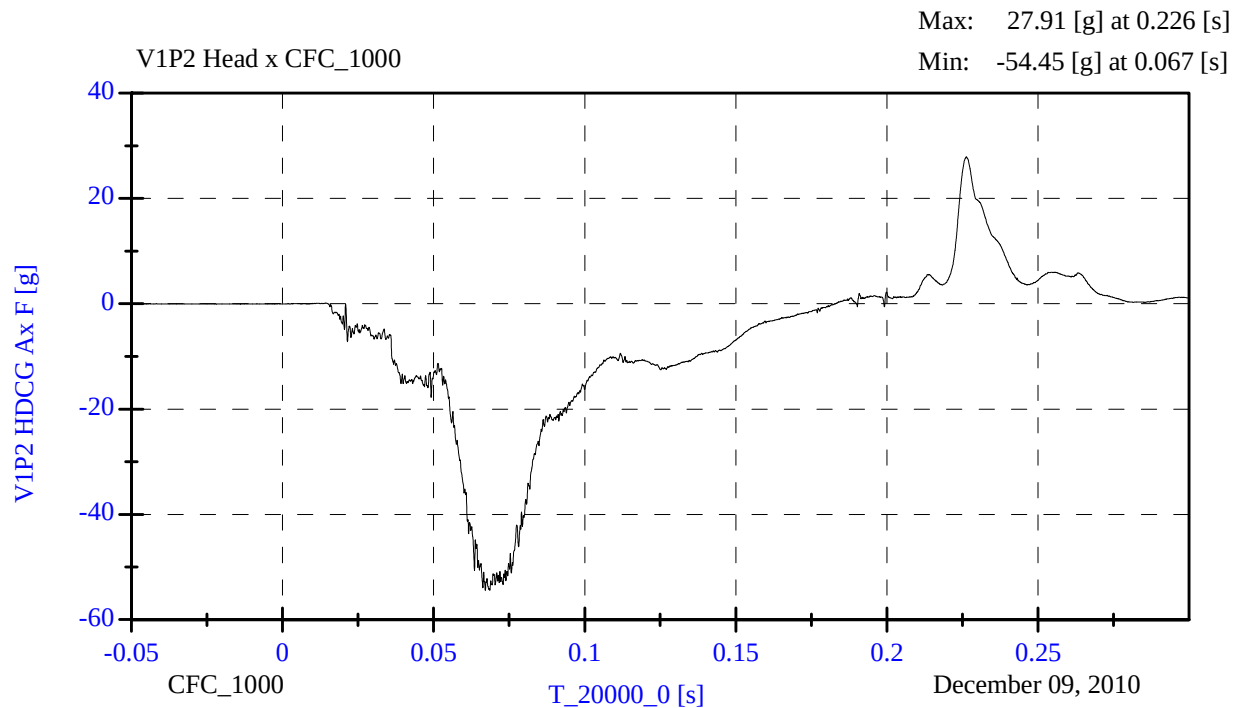
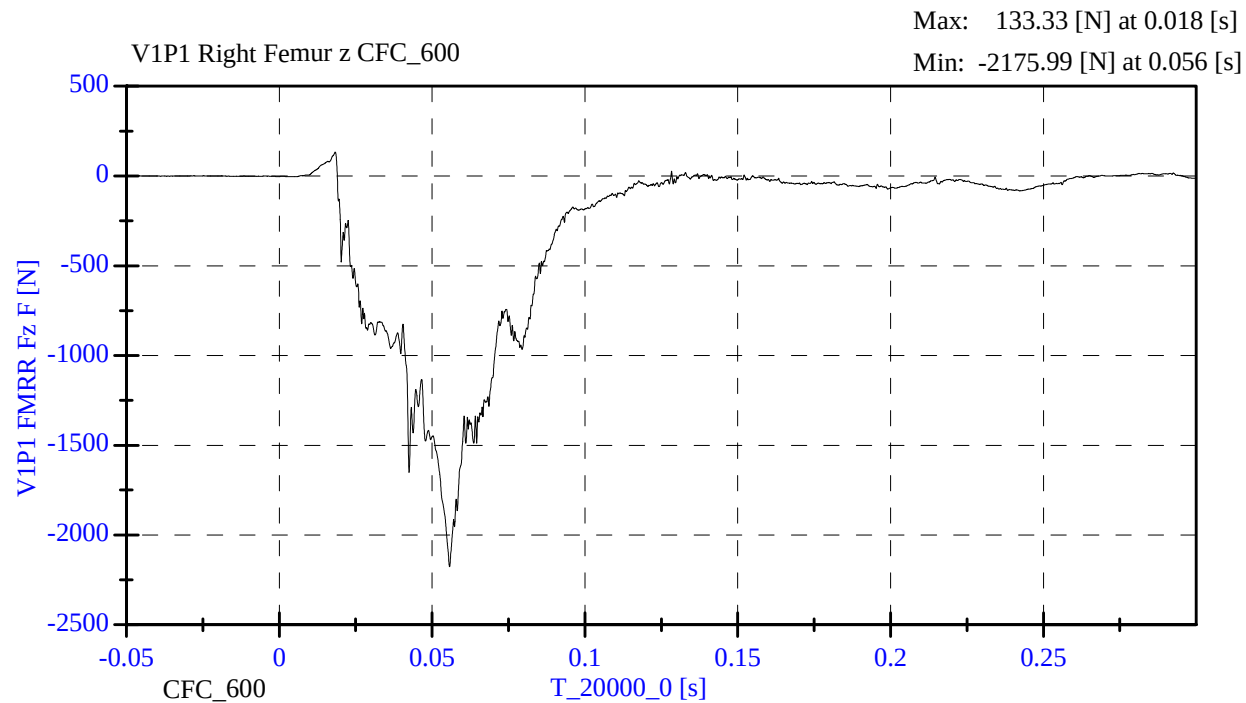


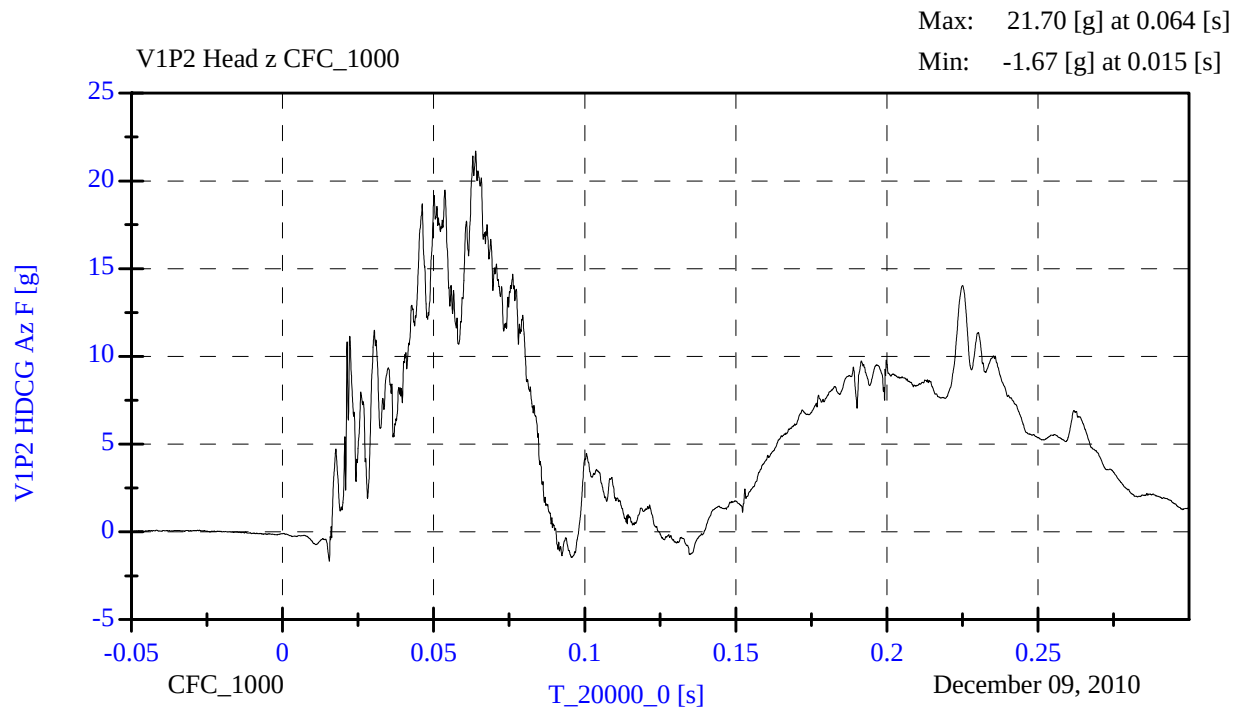
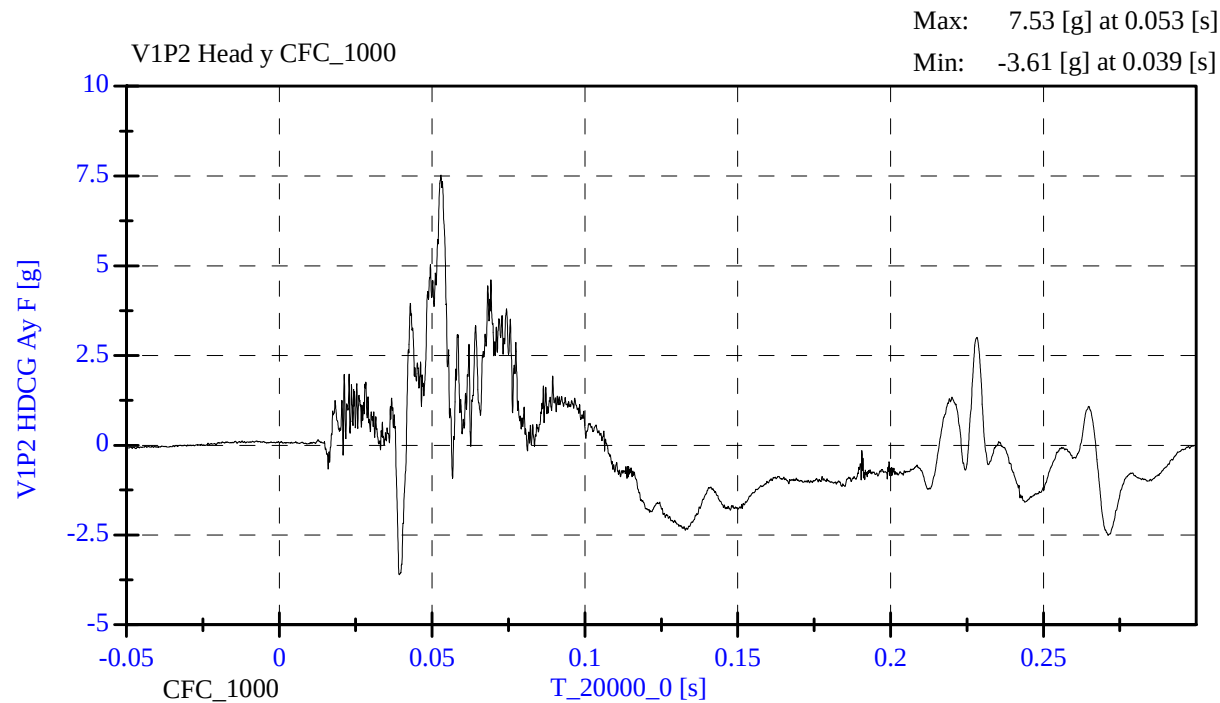
December 09, 2010

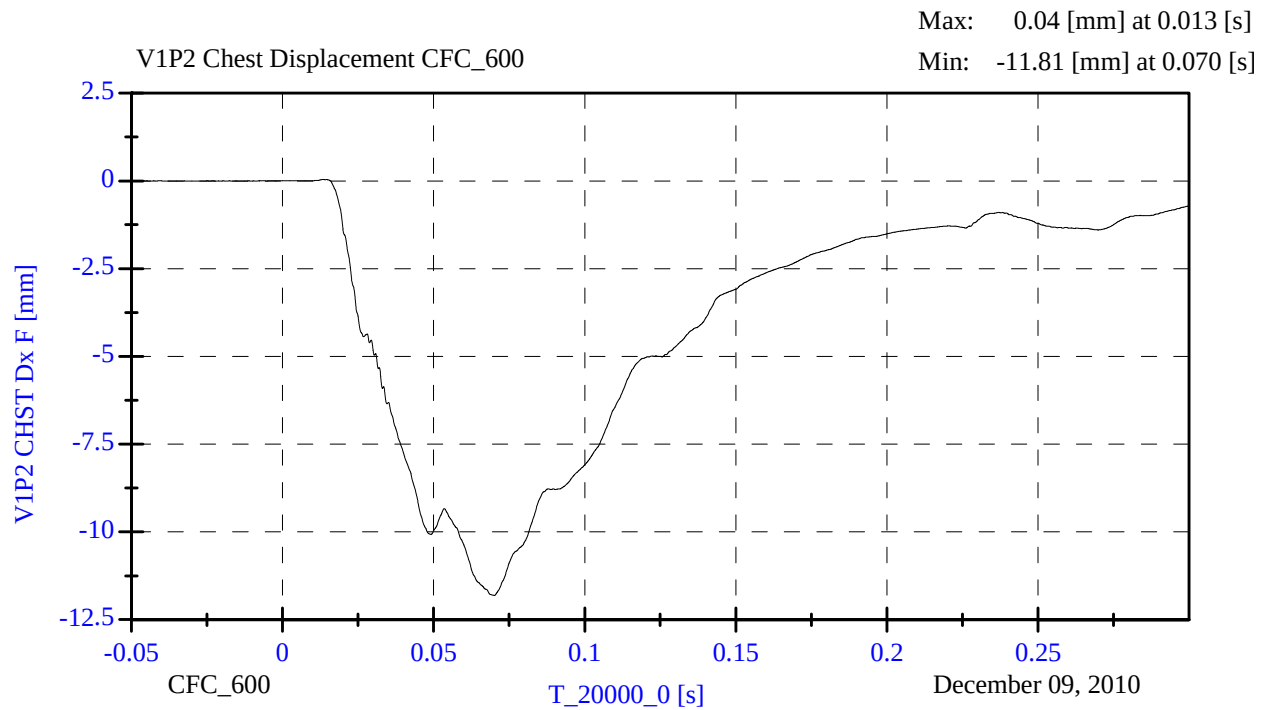
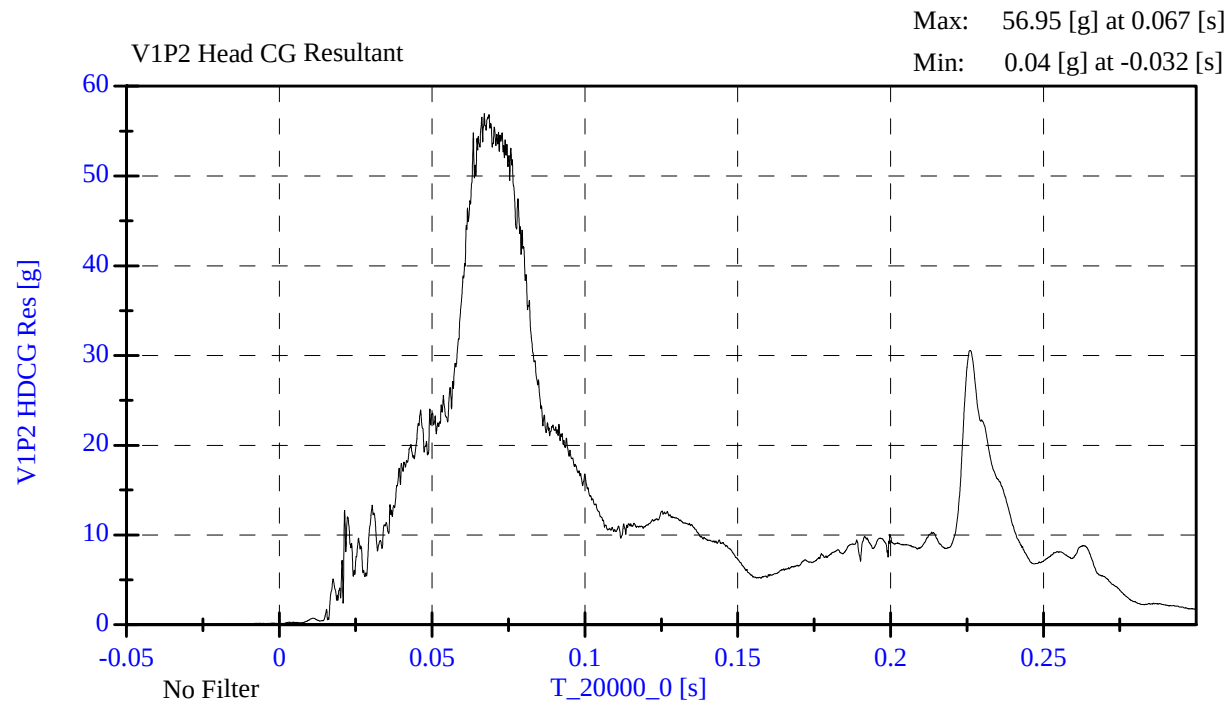


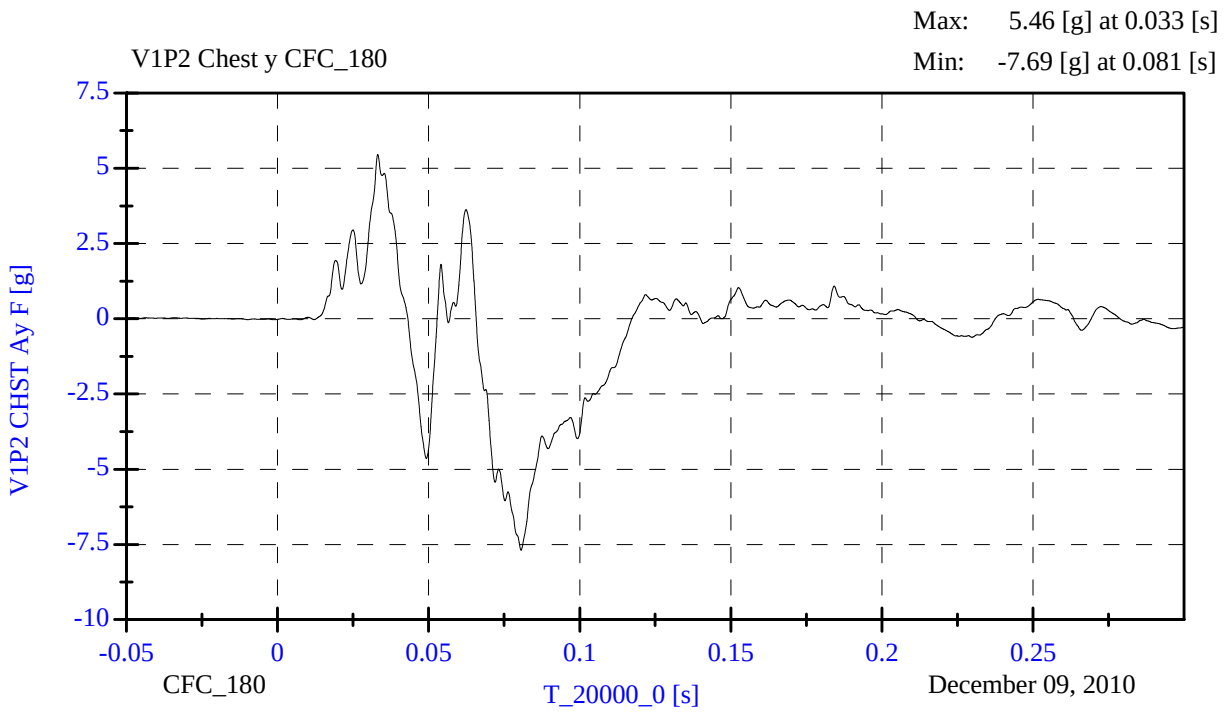
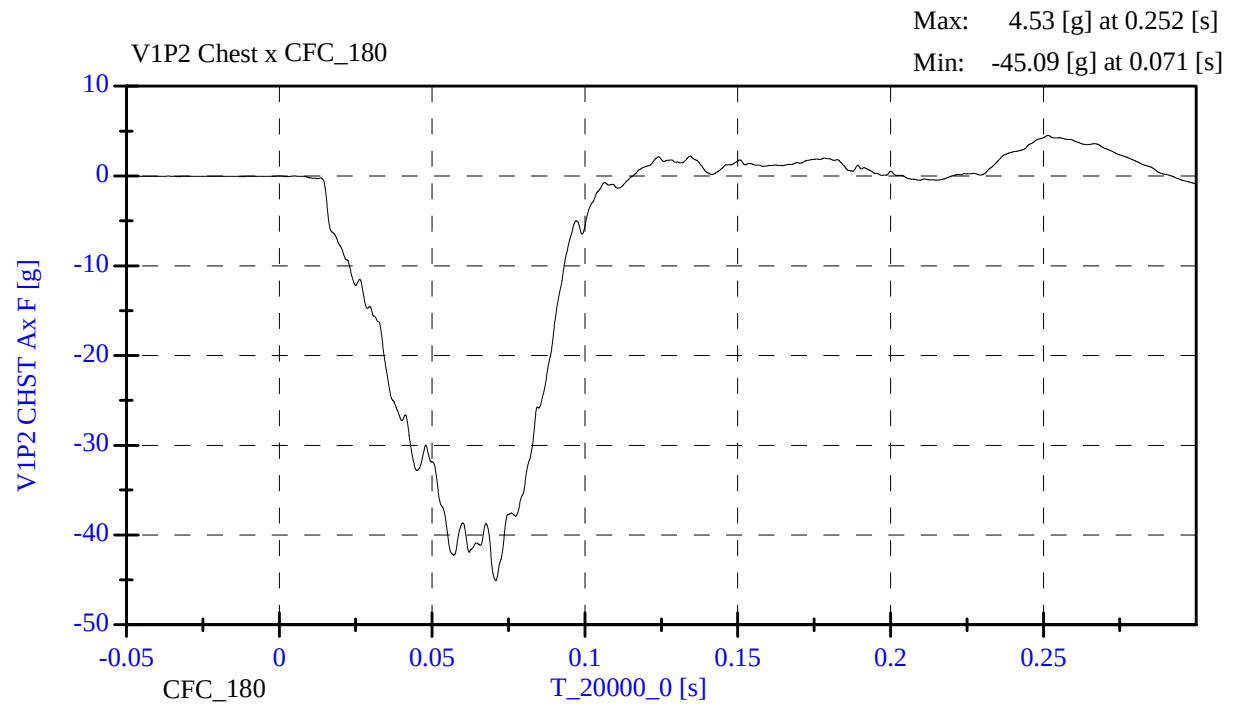


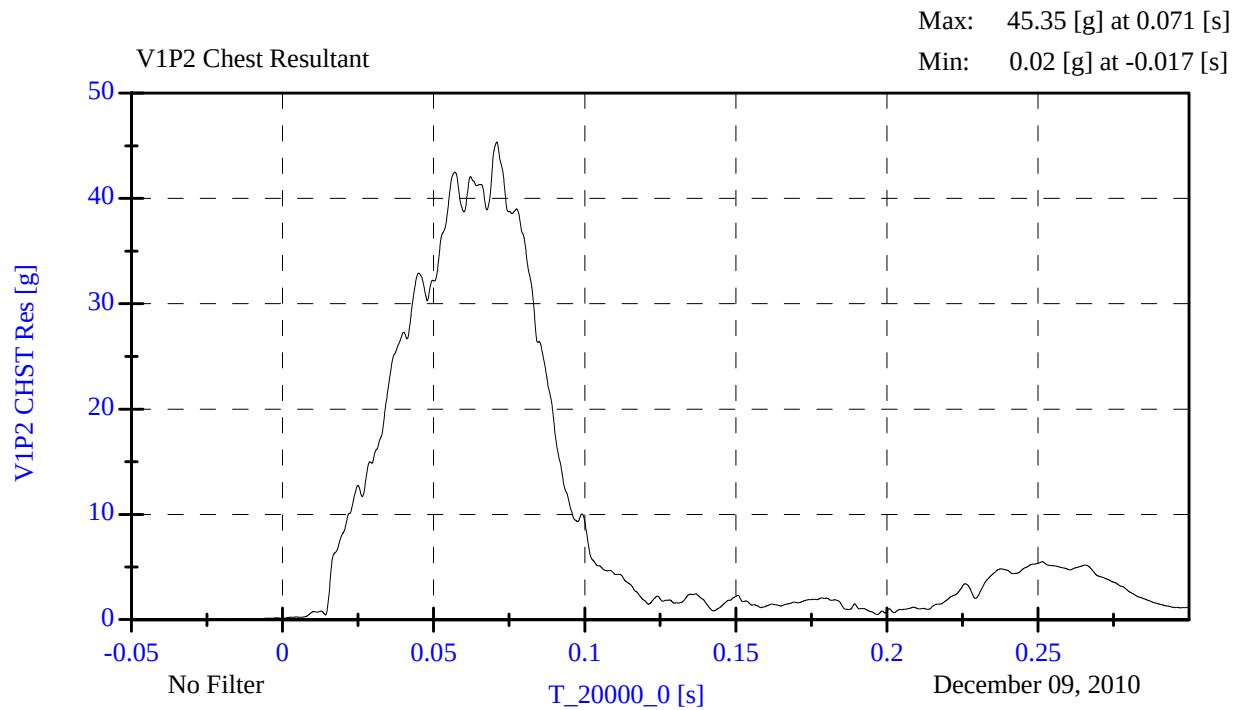
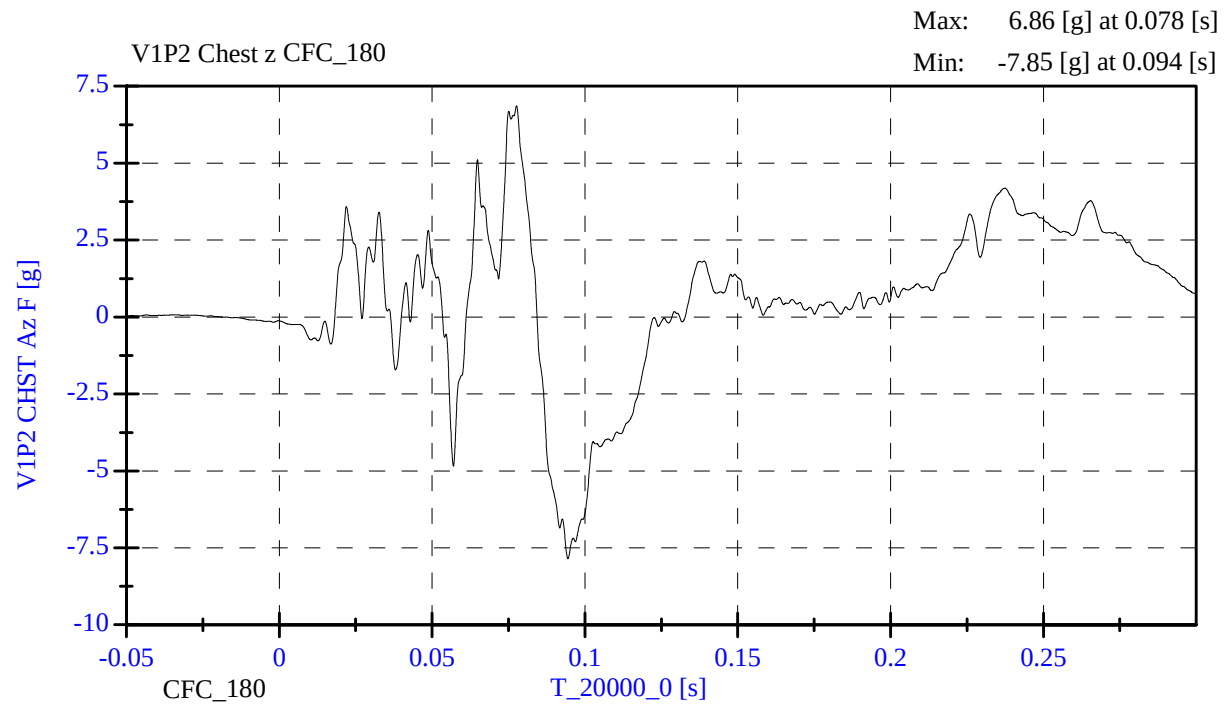


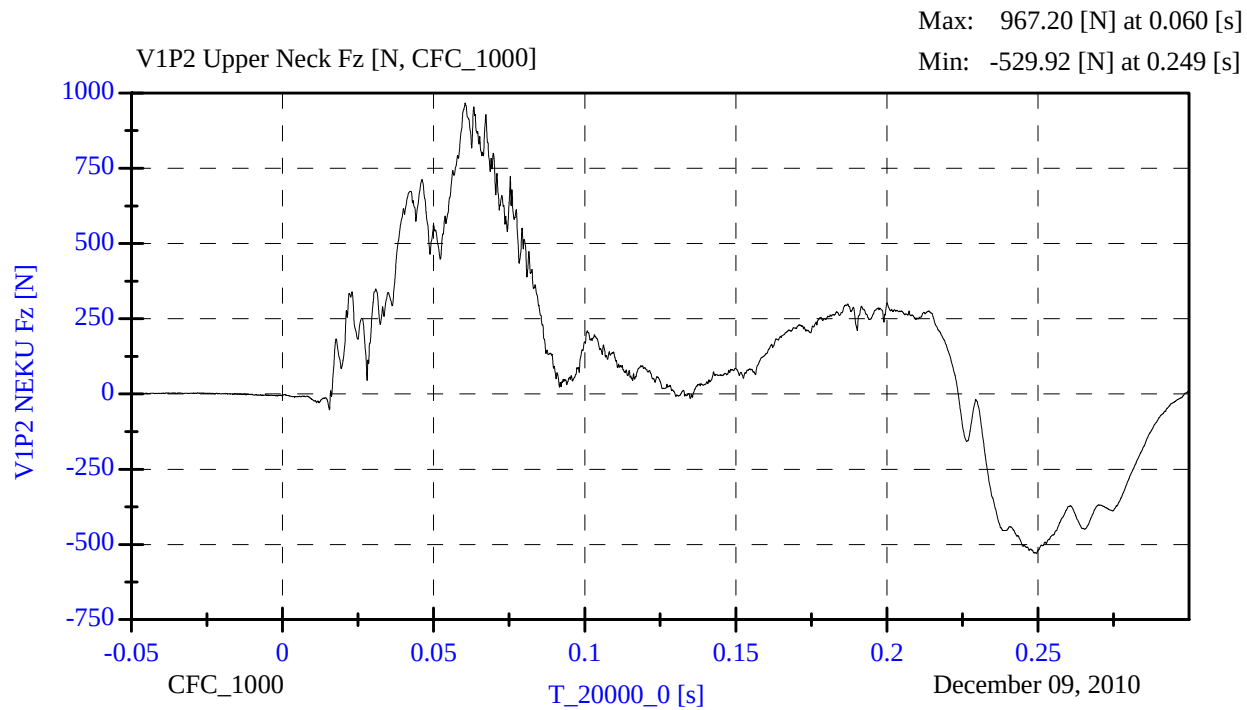
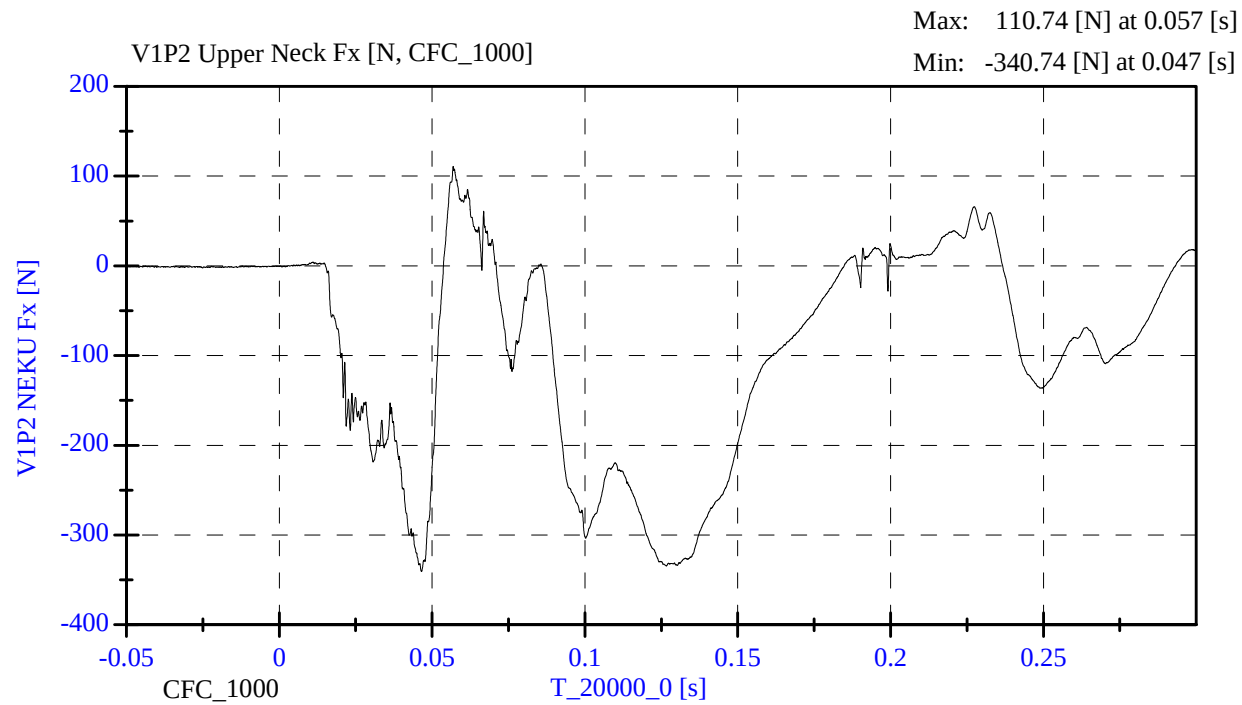


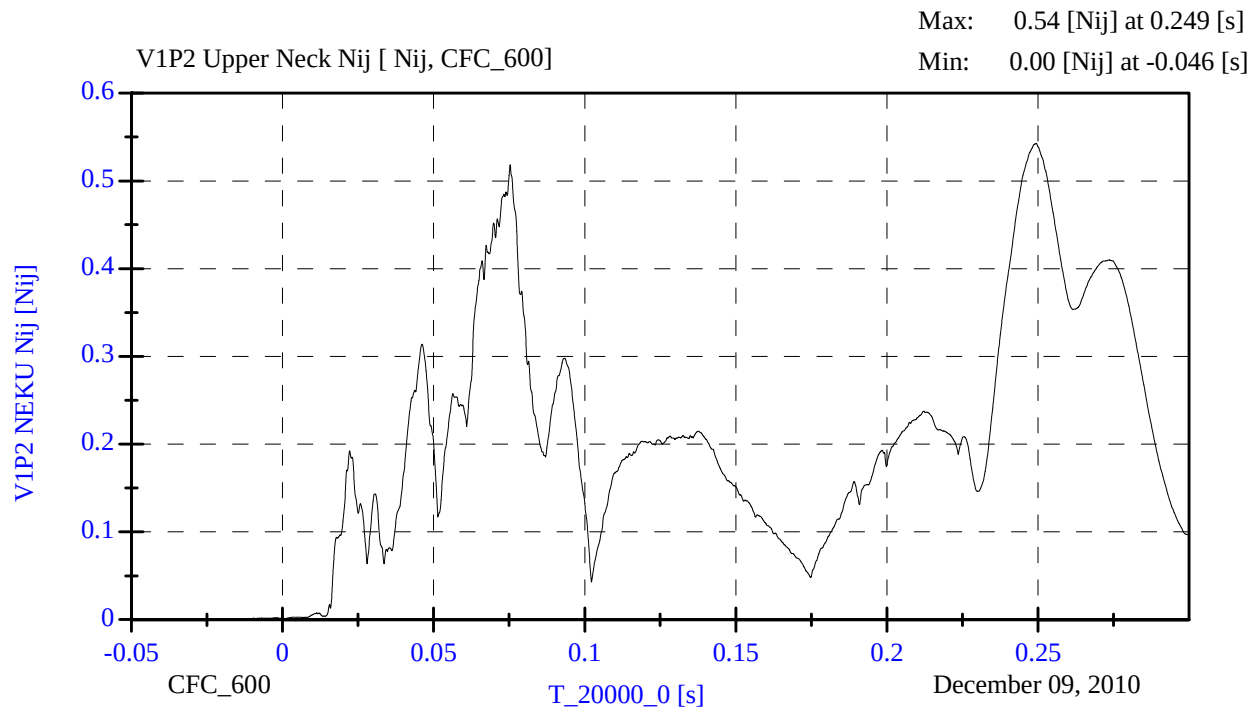
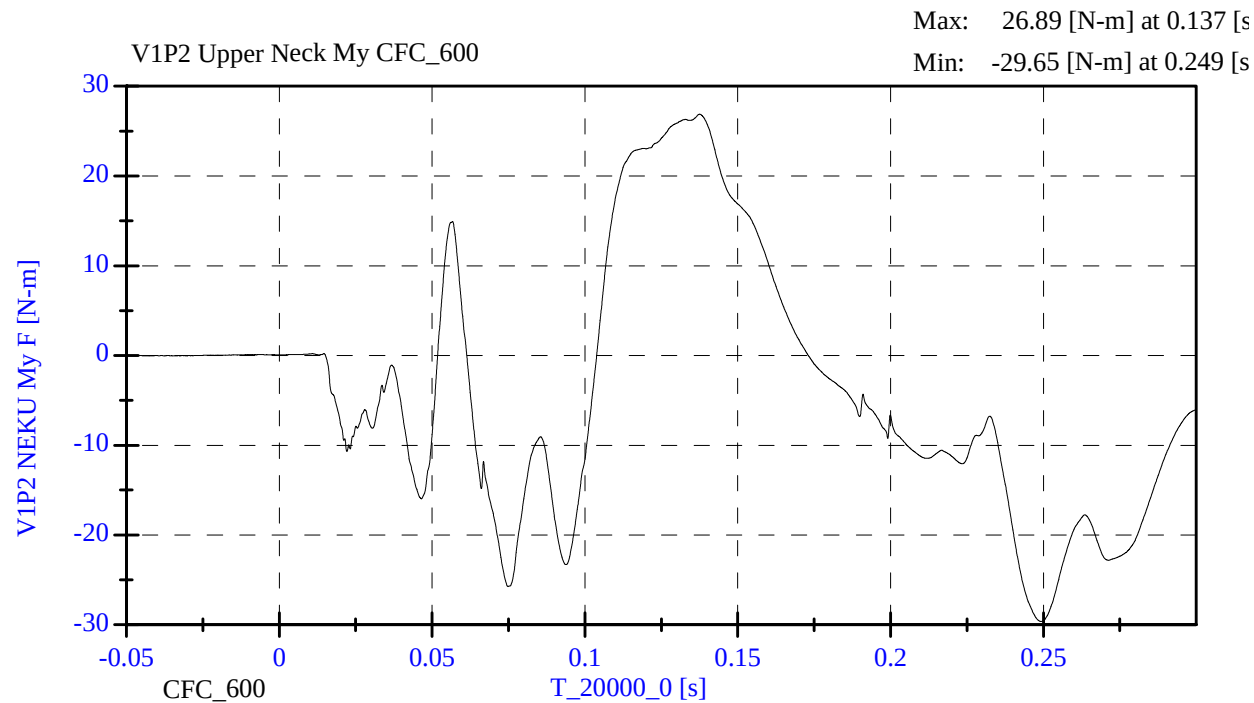


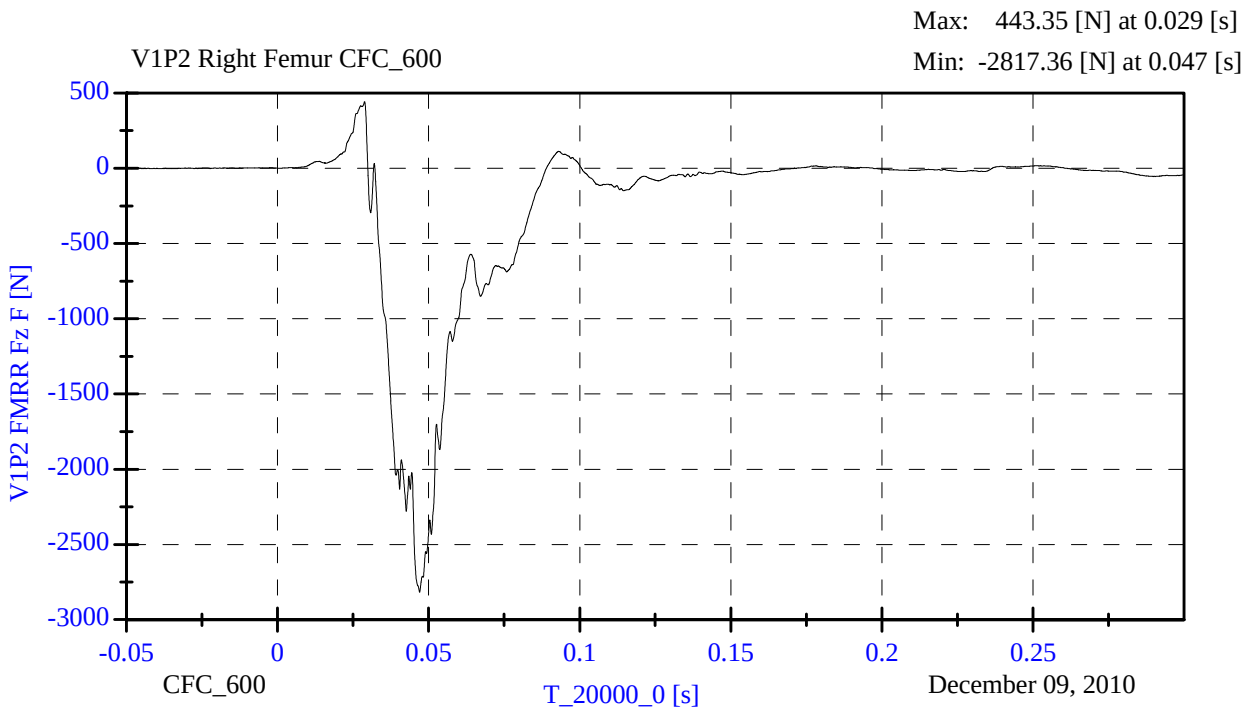
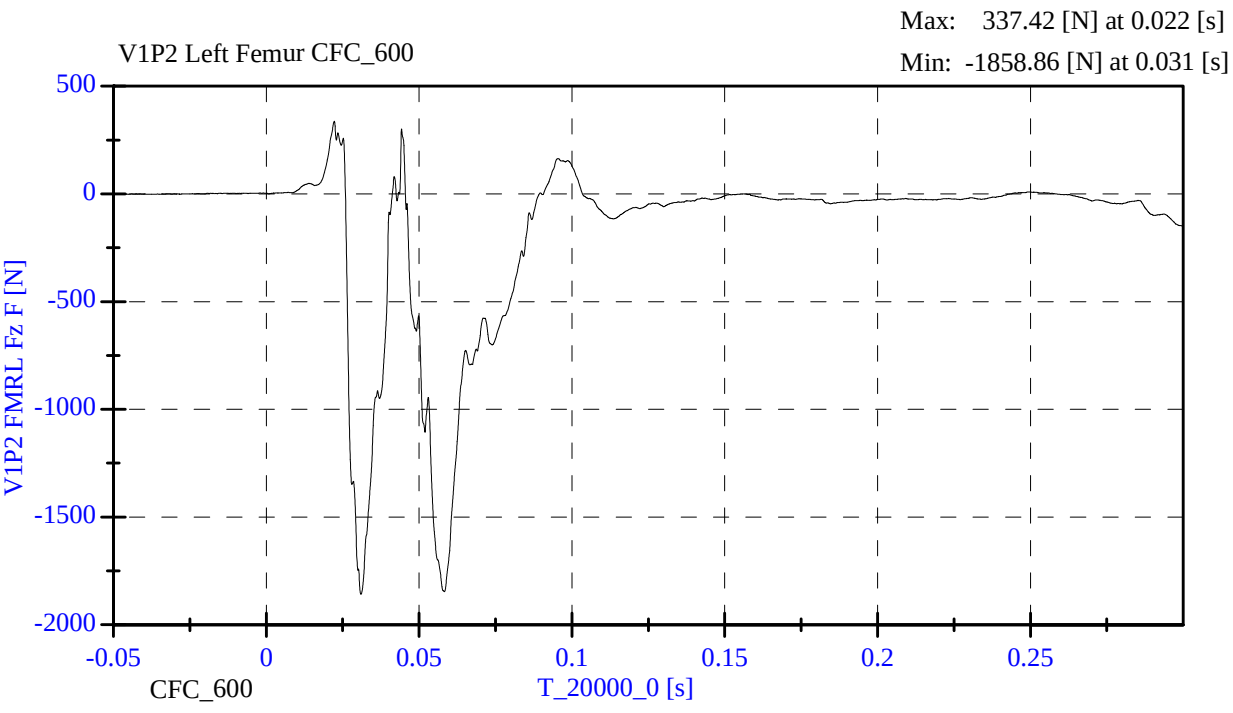












APPENDIX C

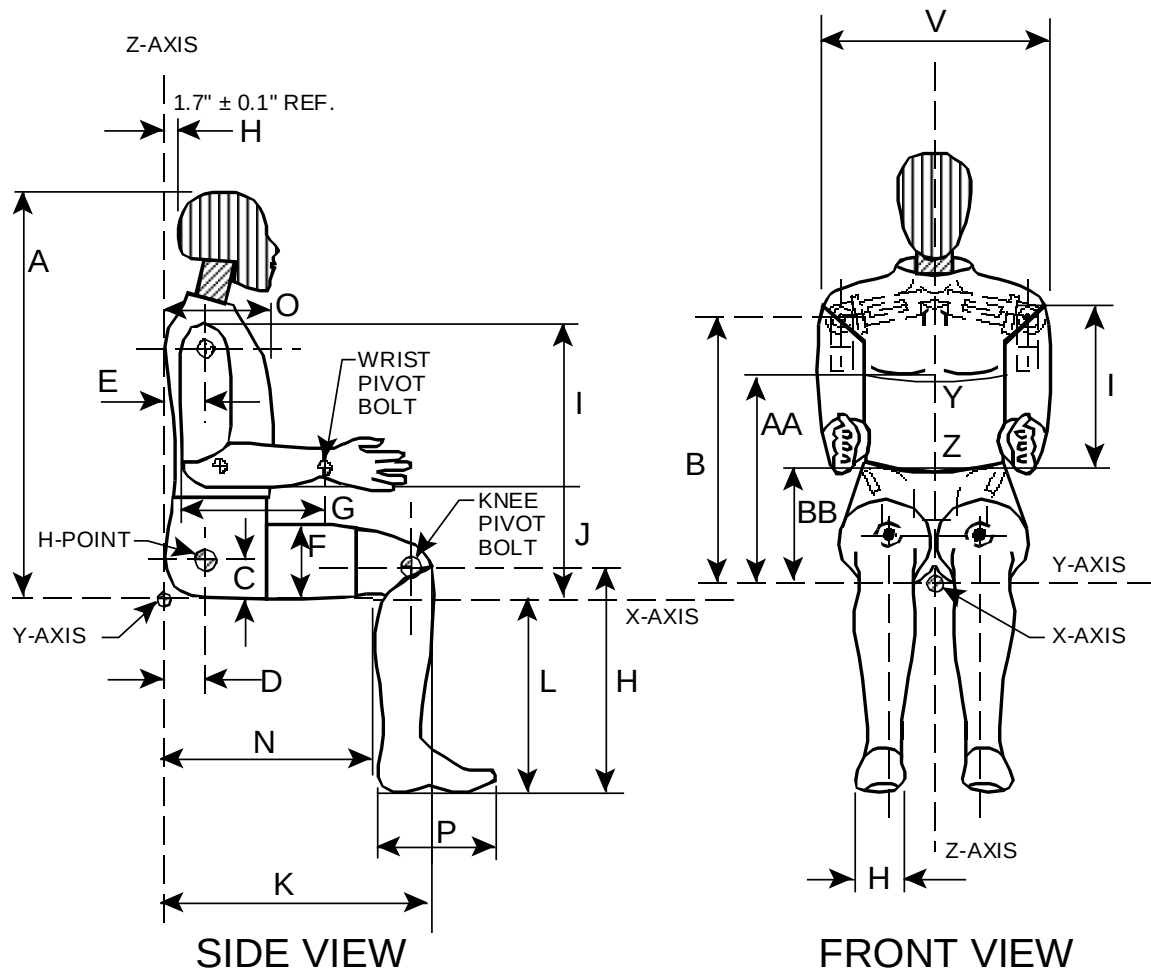
PART 572 E/O DUMMY CONFIGURATION AND PERFORMANCE VERIFICATION DATA SHEETS

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	12/08/2010
#2/Right Front Passenger	273	11/01/2010

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: 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**

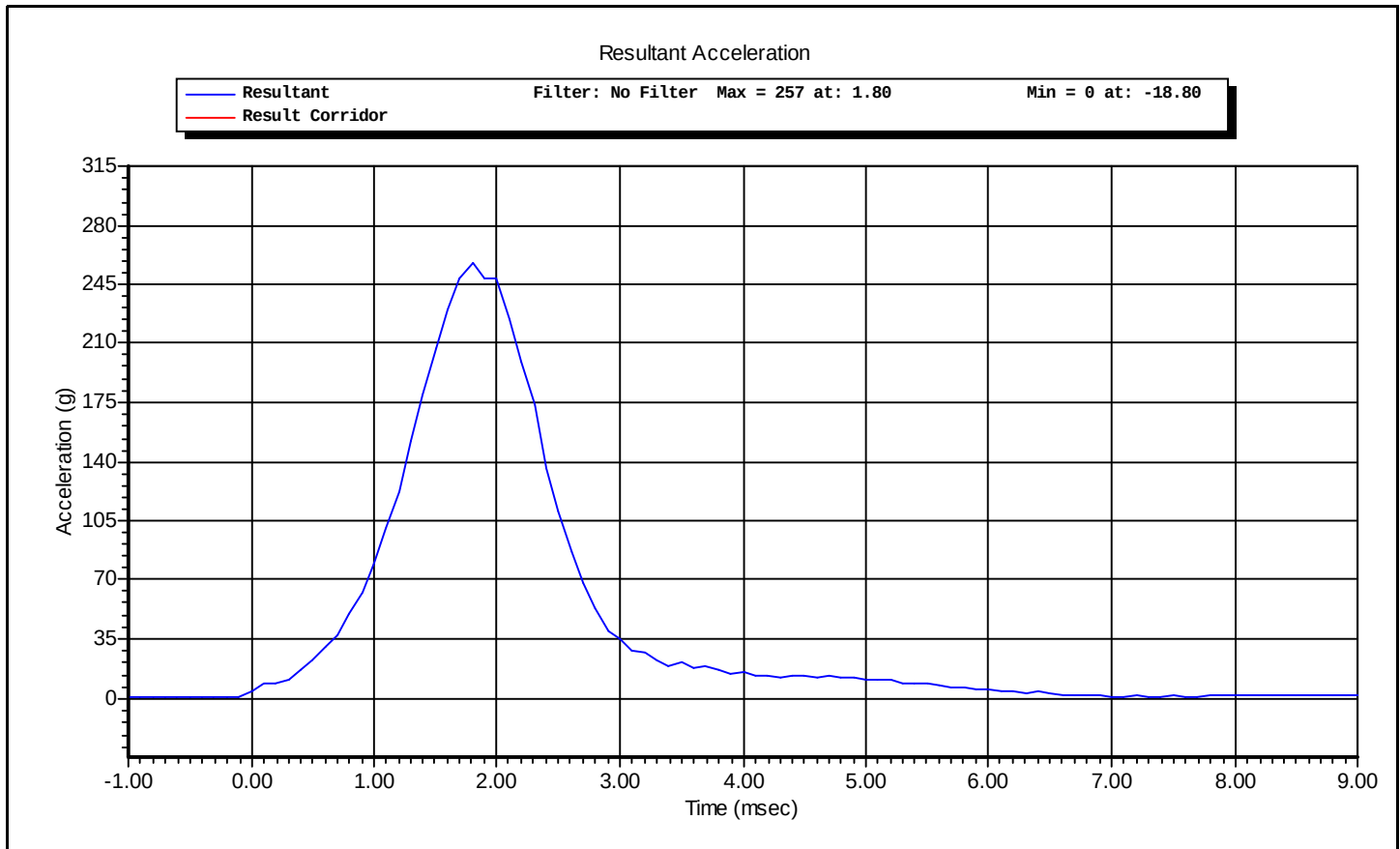


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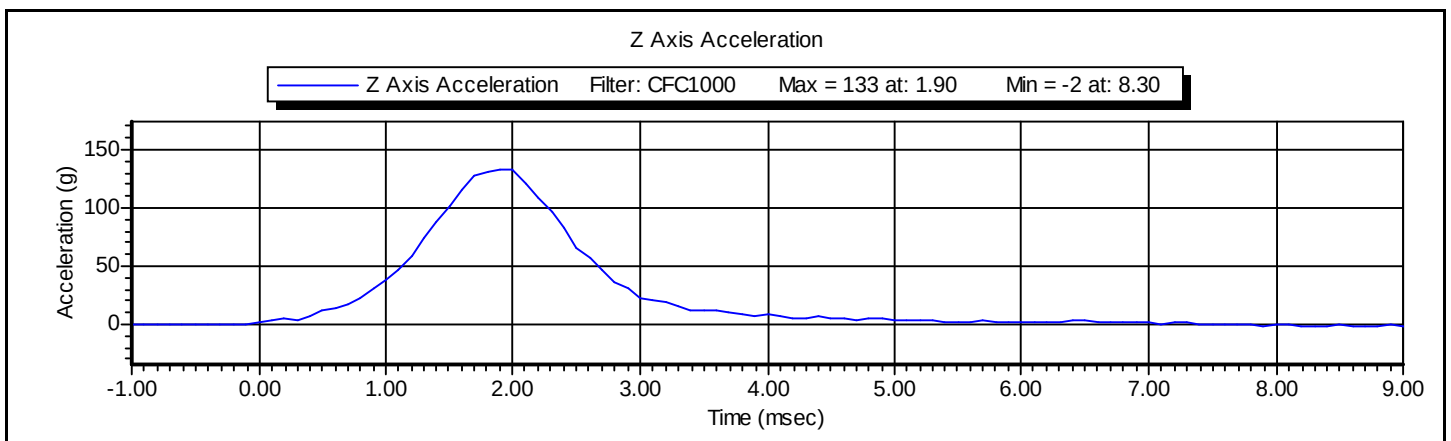
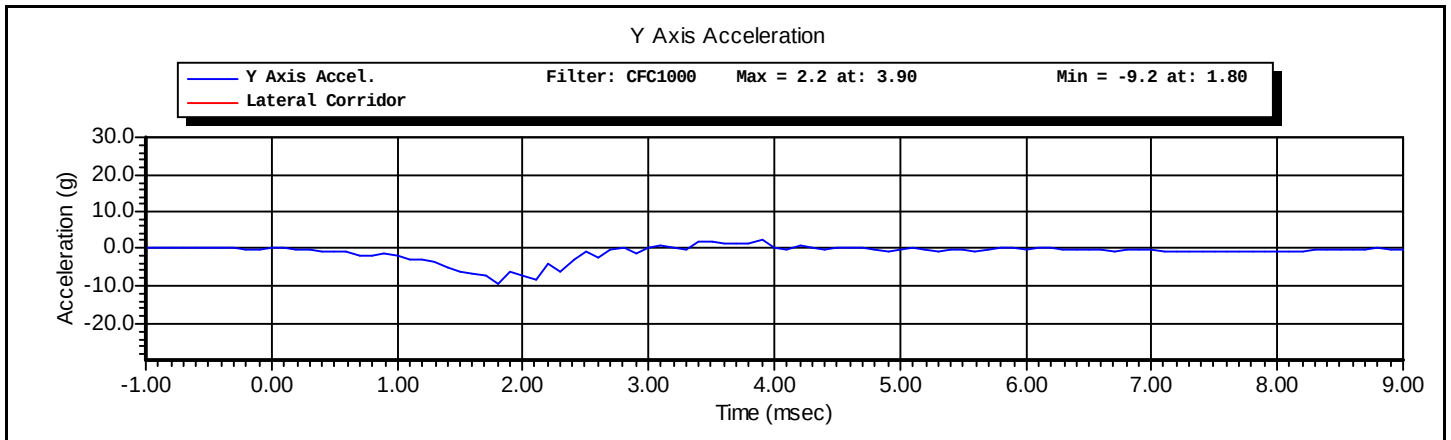
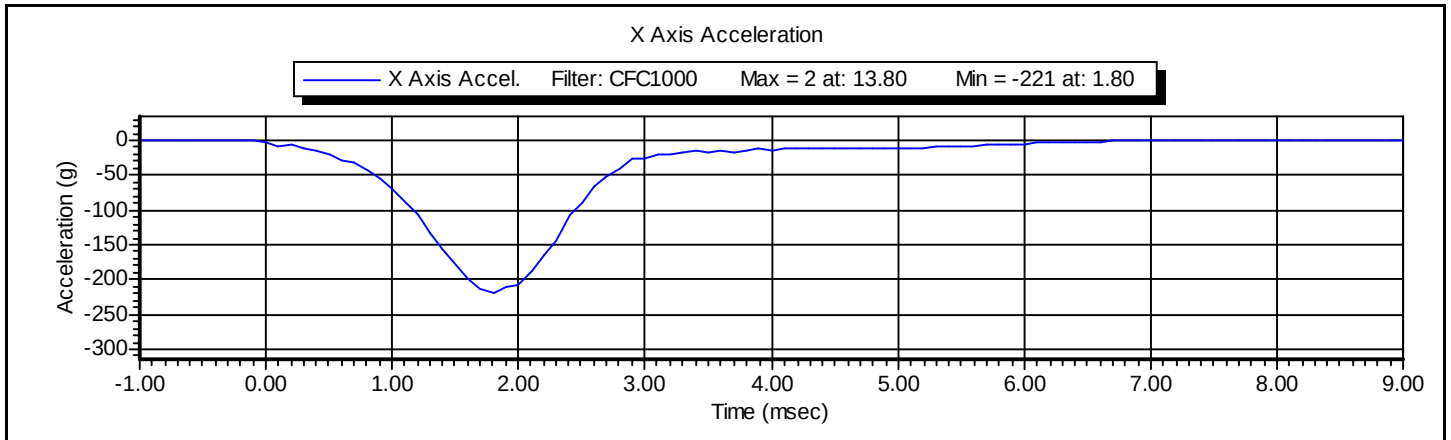
Test Name:	Head Drop	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Head Drop	Test Date:	12/7/2010
Test Number:	1	Test Time:	9:37:50 AM



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**

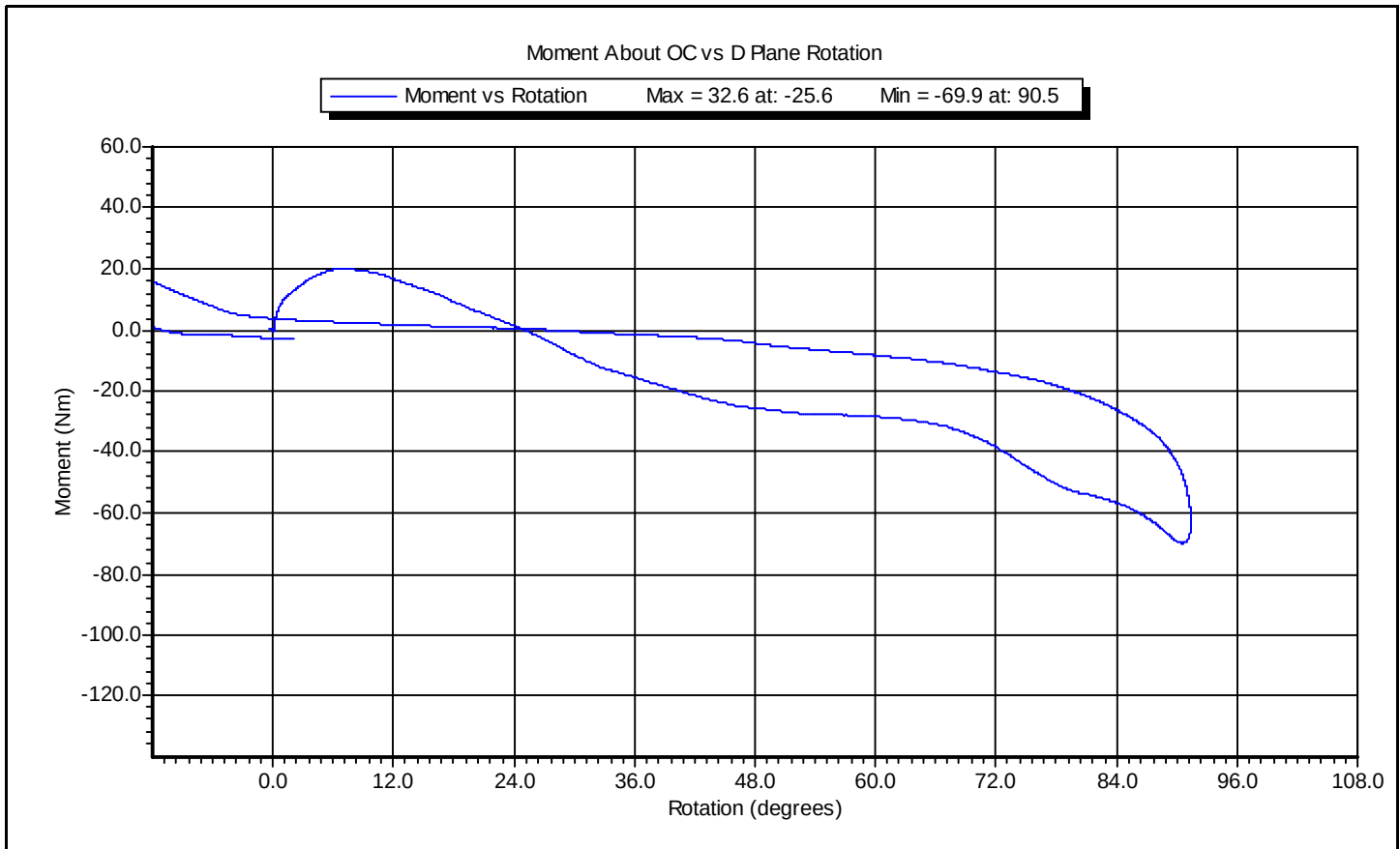


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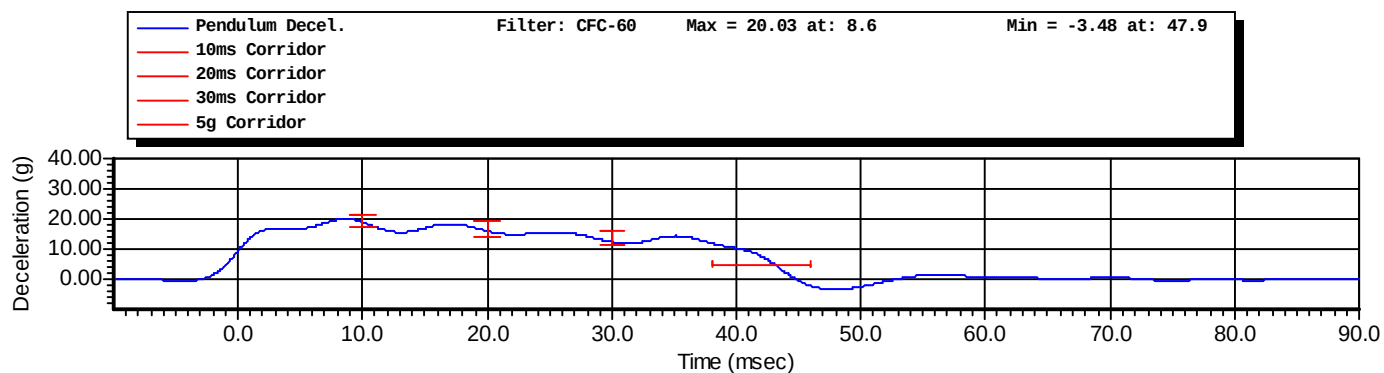
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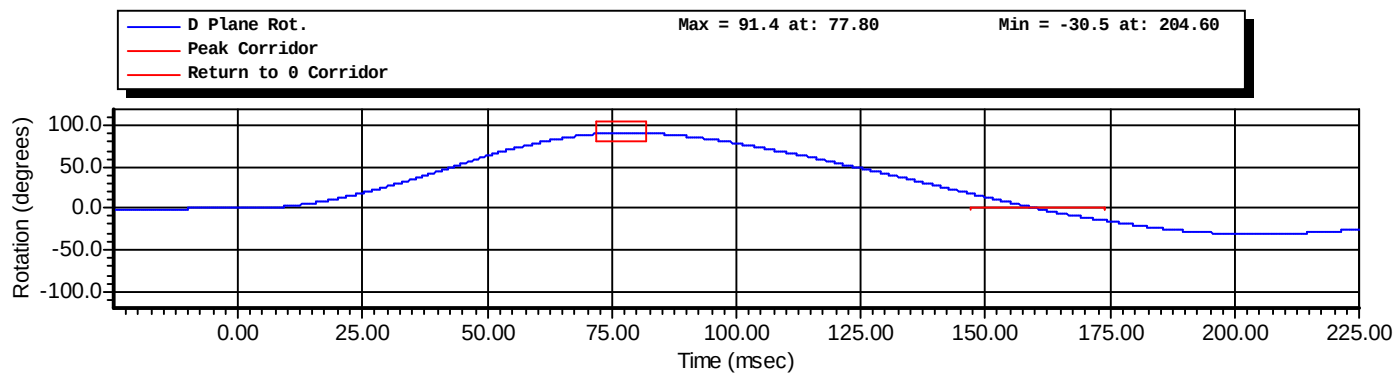
Name of Test:	Neck Extension	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Extension	Date:	12/7/2010
Number of Test:	1	Time of Test:	1:44:10 PM



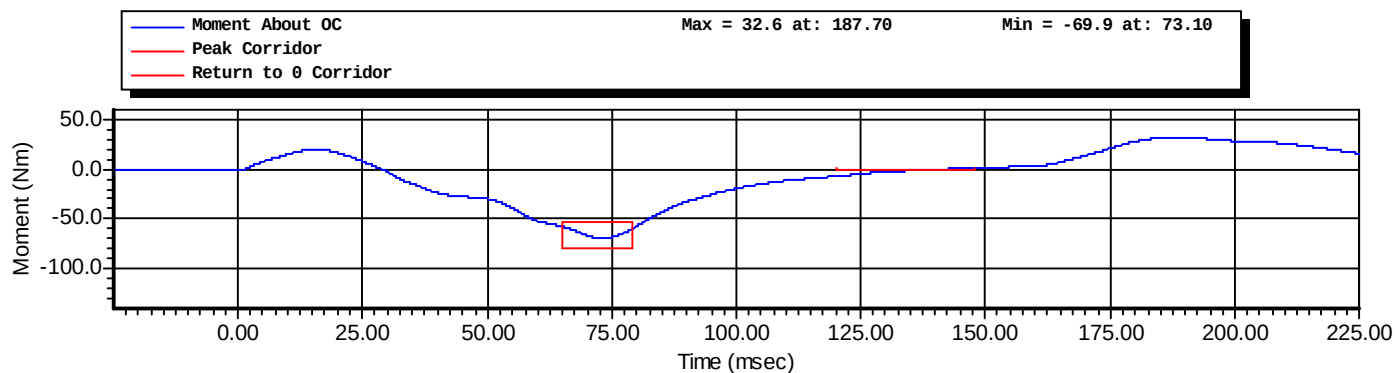
Pendulum Deceleration



D Plane Rotation



Moment About Occipital Condyle





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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

<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: **1:13:30 PM**

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

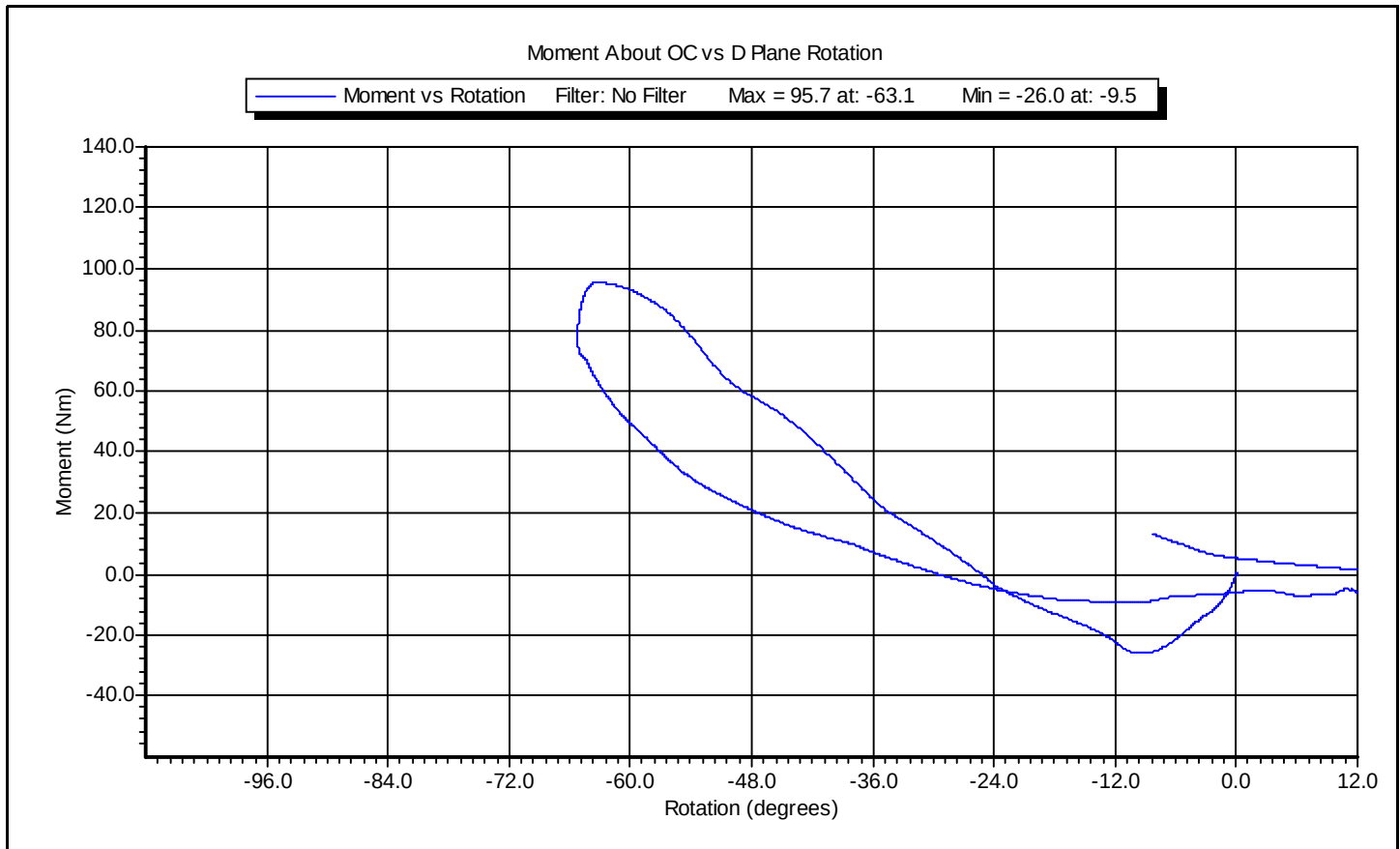


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Name of Test:	Neck Flexion	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Flexion	Date:	12/7/2010
Number of Test:	4	Time of Test:	1:13:30 PM

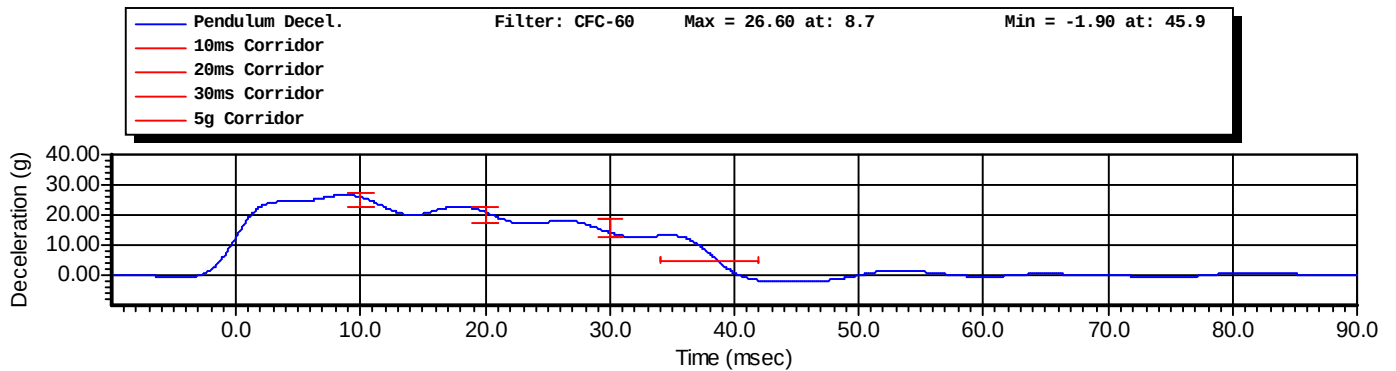


ID of Test: Neck Flexion

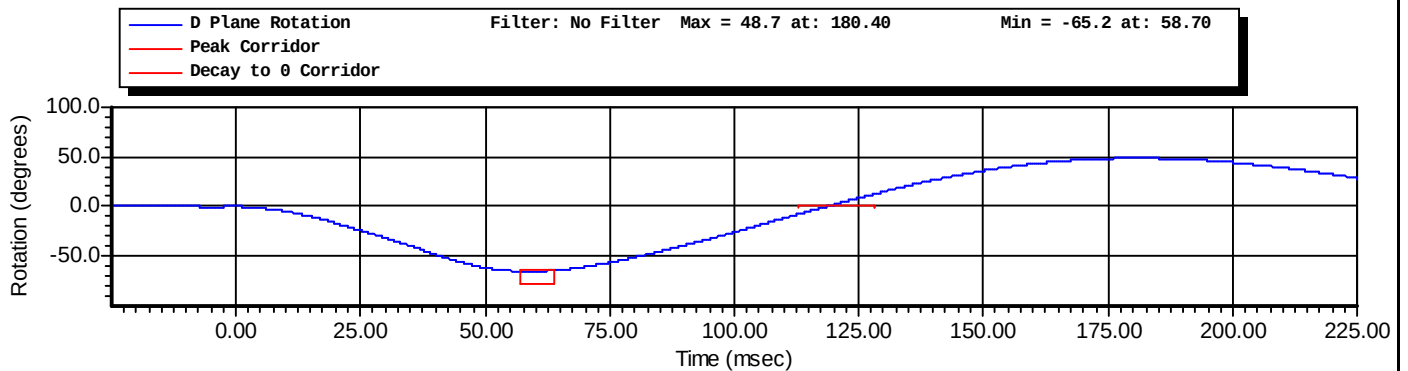
Time of Test: 1:13:30 PM

Date of Test: 12/7/2010

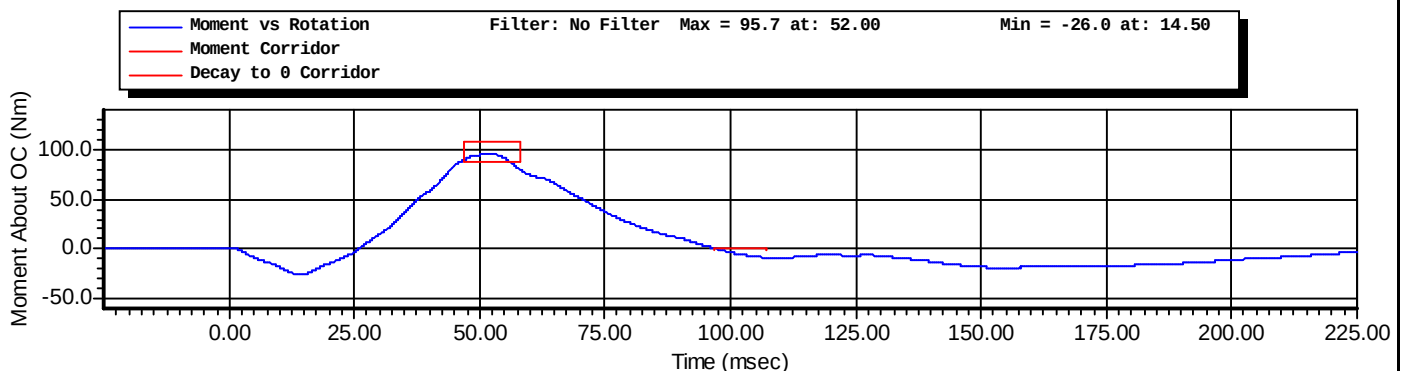
Pendulum Deceleration



D Plane Rotation



Moment About Occipital Condyle





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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

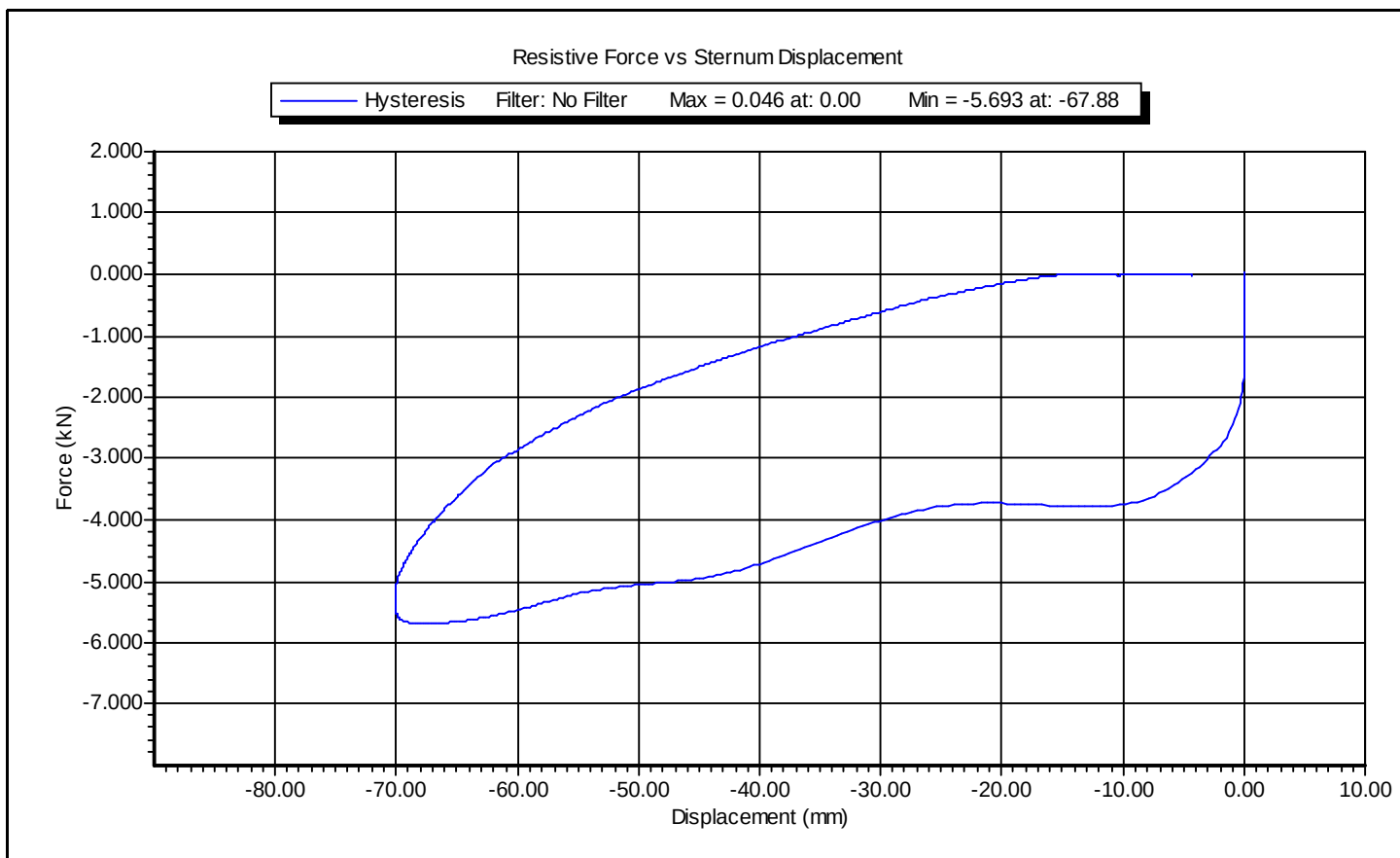
<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
DentonATD	78051-342	DS-061	6/1/2010

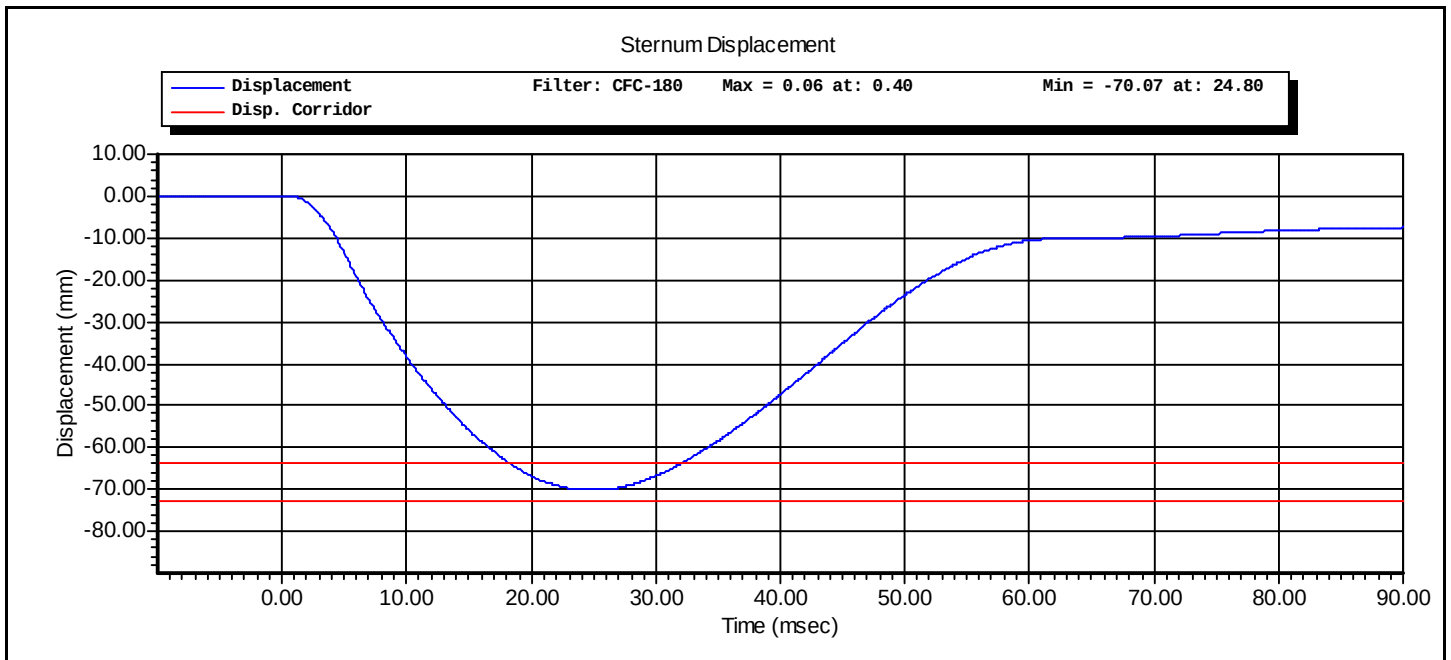
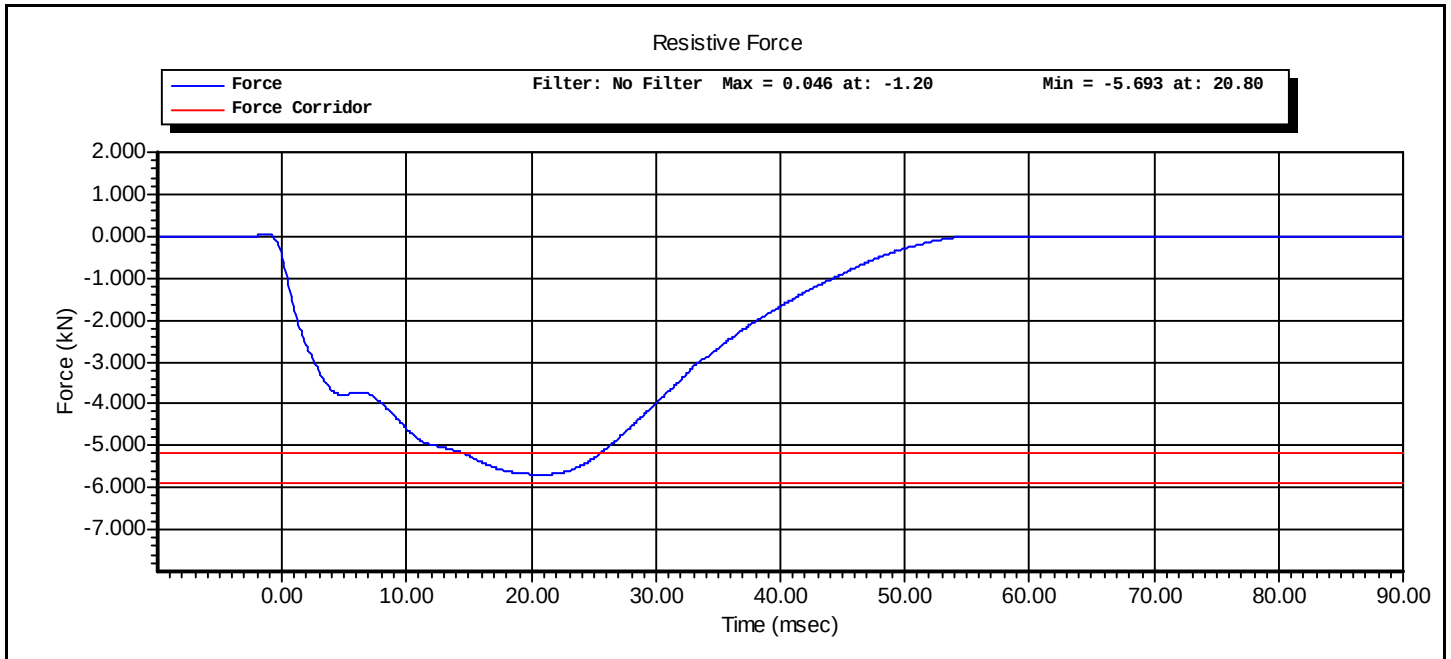
Test ID: **Thorax**

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

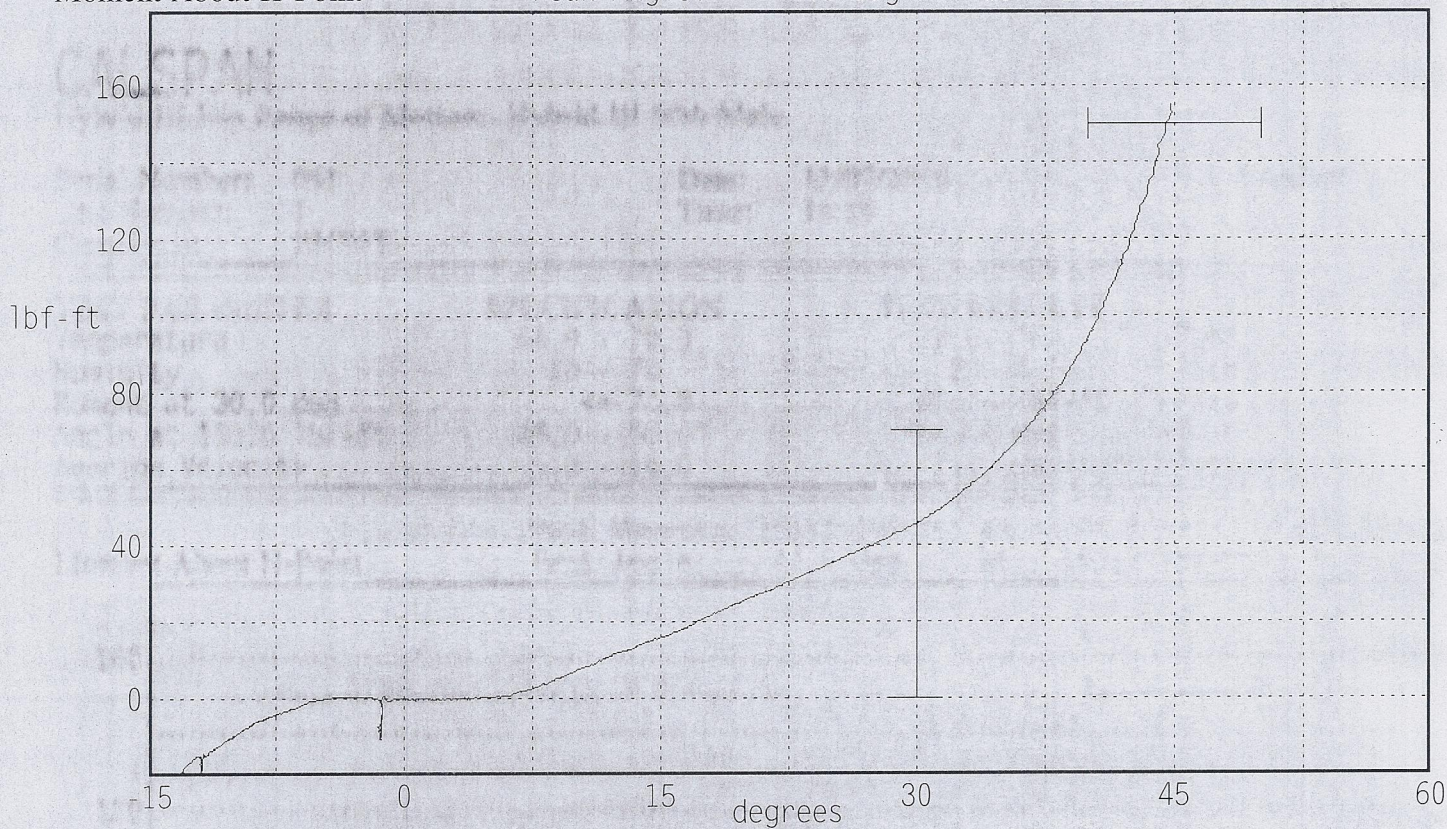
Date: 12/07/2010
Time: 16:59

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

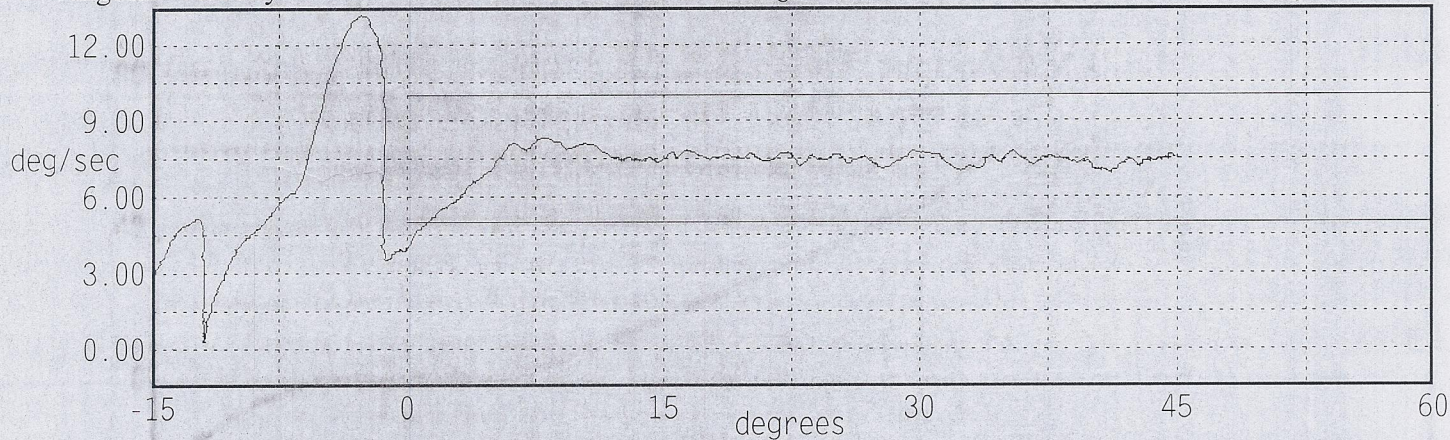
Moment About H-Point



Angular Velocity

Max: 8.3 deg/sec

Min: 4.0 deg/sec



CALSPAN

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

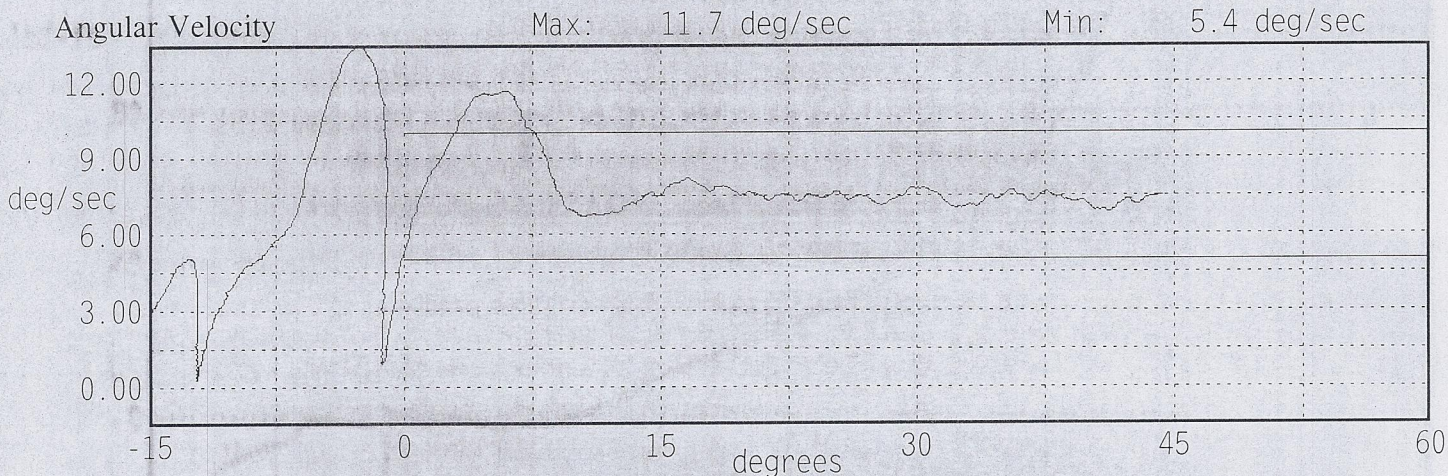
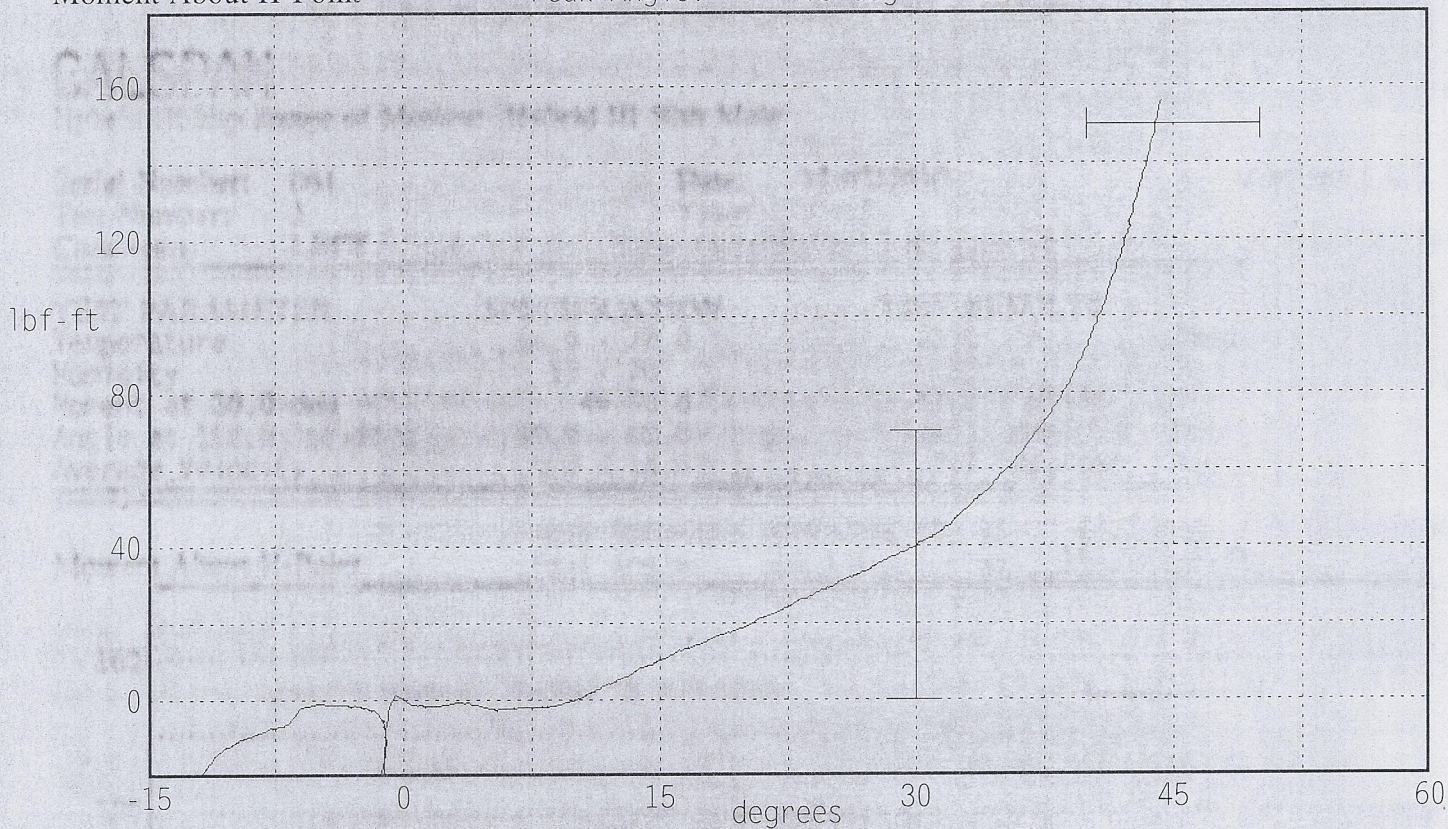
Serial Number: 061
Test Number: 2
Comments: LEFT

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**

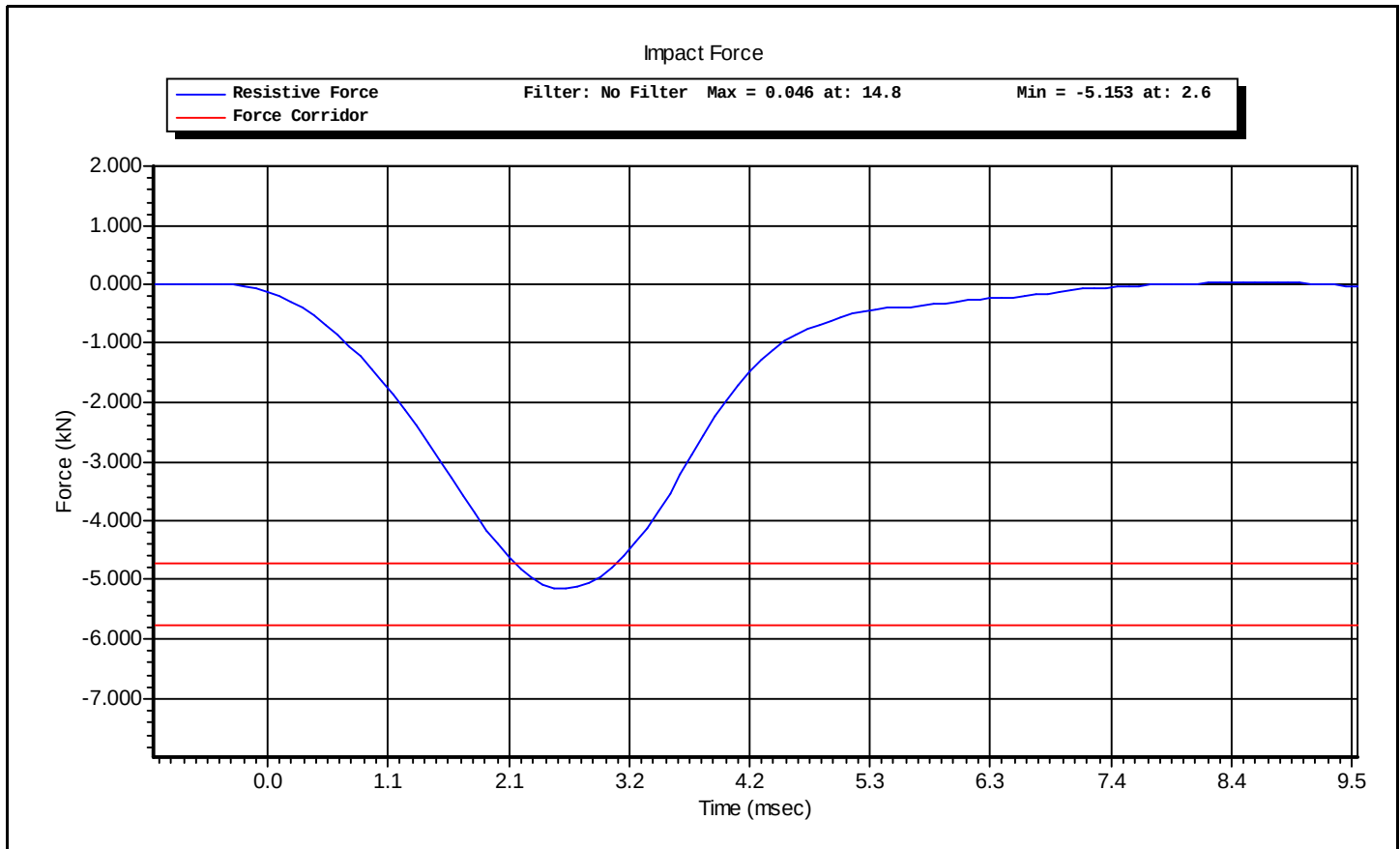


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left knee	Test Date:	12/8/2010
Test Number:	1	Test Time:	8:45:38 AM



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**

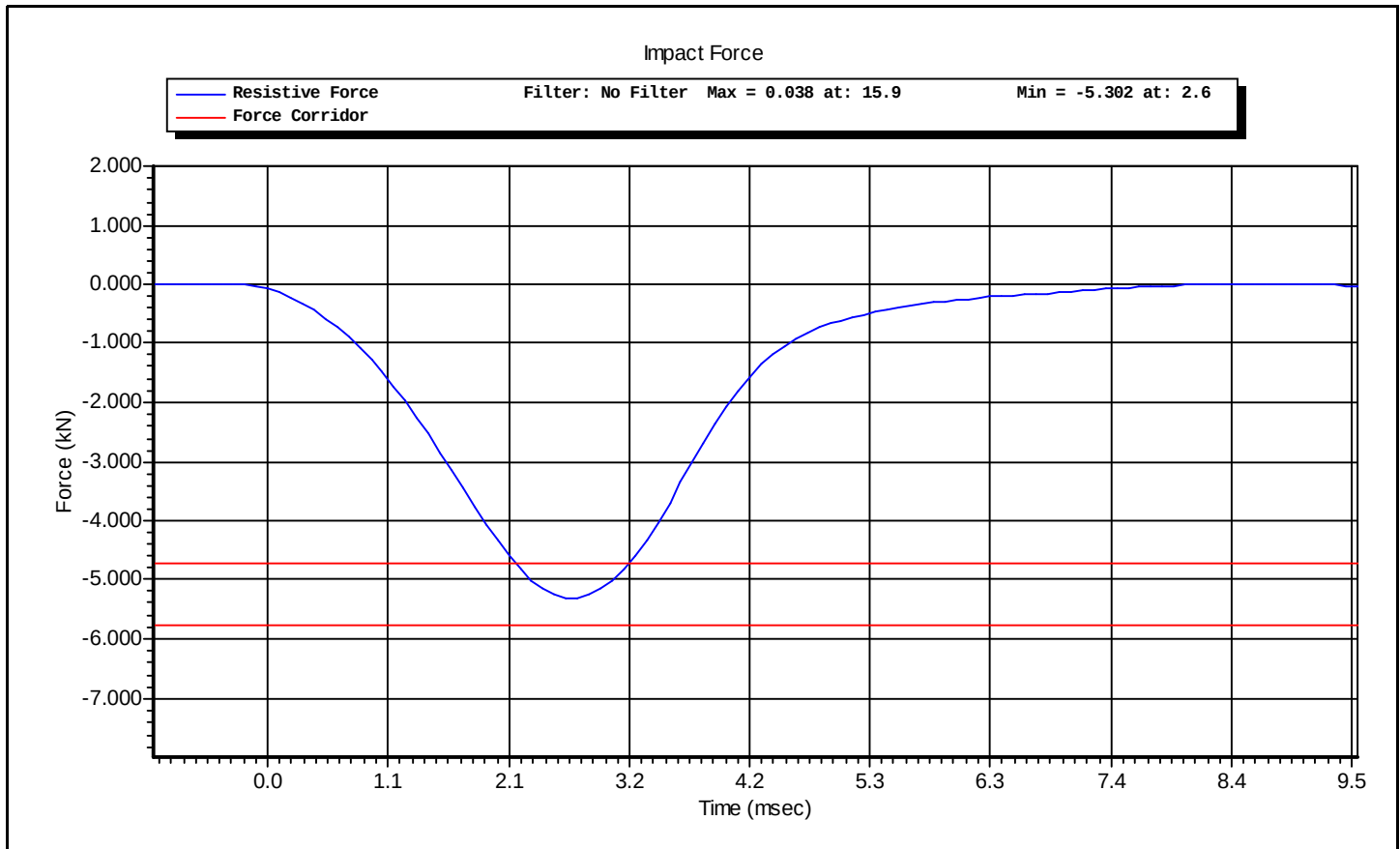


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	12/7/2010
Test Number:	1	Test Time:	3:58:36 PM



Test ID: **Right Knee**

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

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

CALIBRATION TEST RESULTS

PRE-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 273

External Measurements

5th Female SN 273

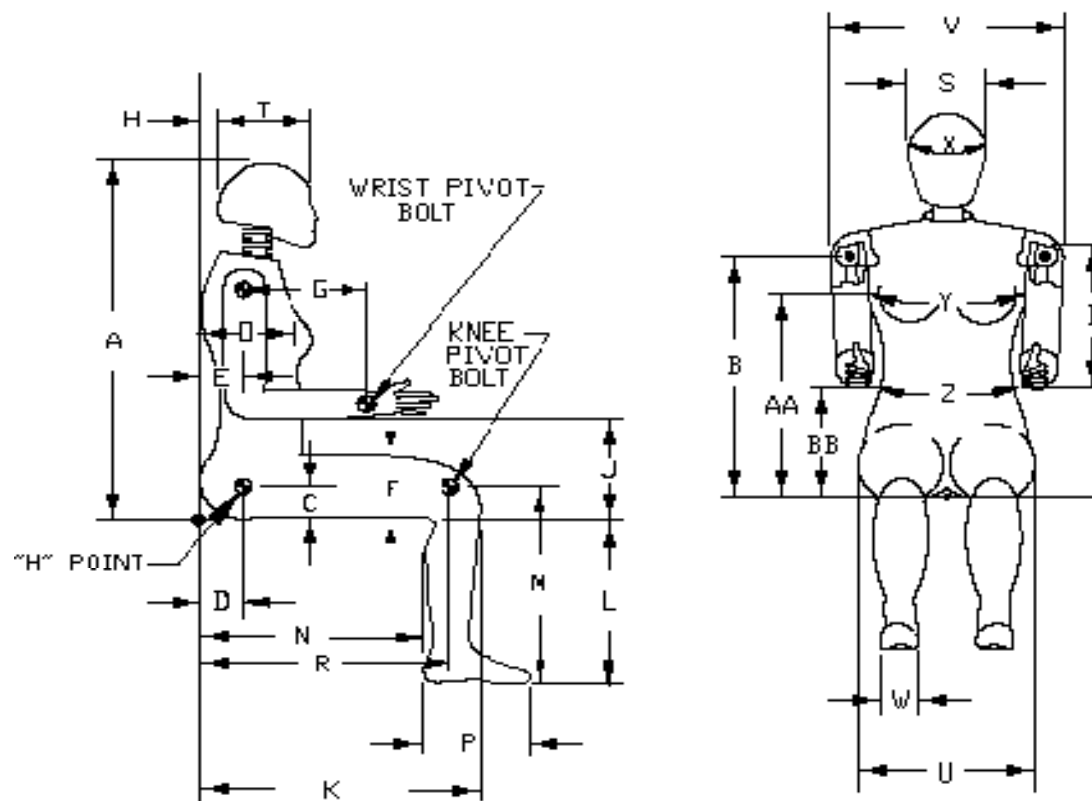
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	784	Yes
B	Shoulder Pivot Height	431.8 – 457.2	450	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6-83.8	76	Yes
F	Thigh Clearance	119.4 – 134.6	130	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	250	Yes
H	Head Back to Backline	43.2 – 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	282	Yes
J	Elbow Rest Height	182.8 – 203.2	195	Yes
K	Buttock to Knee Length	520.7 – 546.1	529	Yes
L	Popliteal Height	355.6 - 376	361	Yes
M	Knee Pivot Height	393.7 – 419.1	399	Yes
N	Buttock Popliteal Length	414 – 439.4	421	Yes
O	Chest Depth without Jacket	175.3 – 190.5	185	Yes
P	Foot Length (right)	218.5 – 233.7	221	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	465	Yes
S	Head Breadth	137.1 – 147.3	144	Yes
T	Head Depth	177.8 - 188	180	Yes
U	Hip Breadth	299.7 – 314.9	311	Yes
V	Shoulder Breadth	350.5 – 365.7	358	Yes
W	Foot Breadth	78.8 - 94	85	Yes
X	Head Circumference	528.3 – 548.7	540	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	859	Yes
Z	Waist Circumference	759.5 – 789.9	775	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	345	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	165	Yes

Technician: SZ

Date: 11/1/2010

Hybrid III 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:	273		
Test ID:	Head Drop	Test Date:	10/29/2010
Test Number:	1	Test Time:	12:58:21 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	780

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10 -- 70	30 %RH P
Resultant Acceleration	250 -- 300	284 g P
Oscillation	0.0 -- 10.0	5.3 % P
Lateral Acceleration	-15.00 -- 15.00	14.35 g P

All test parameters are within specifications

Technician: **S. Zito** Signature: _____

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

Test ID: **Head Drop**

Test Time: **12:58:21 PM**

Test Date: **10/29/2010**



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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	P66943	10/25/2010
Endevco	7264-2000	P66931	10/25/2010
Endevco	7264-2000	P66926	10/25/2011

Test ID: **Head Drop**

Test Time: **12:58:21 PM**

Test Date: **10/29/2010**

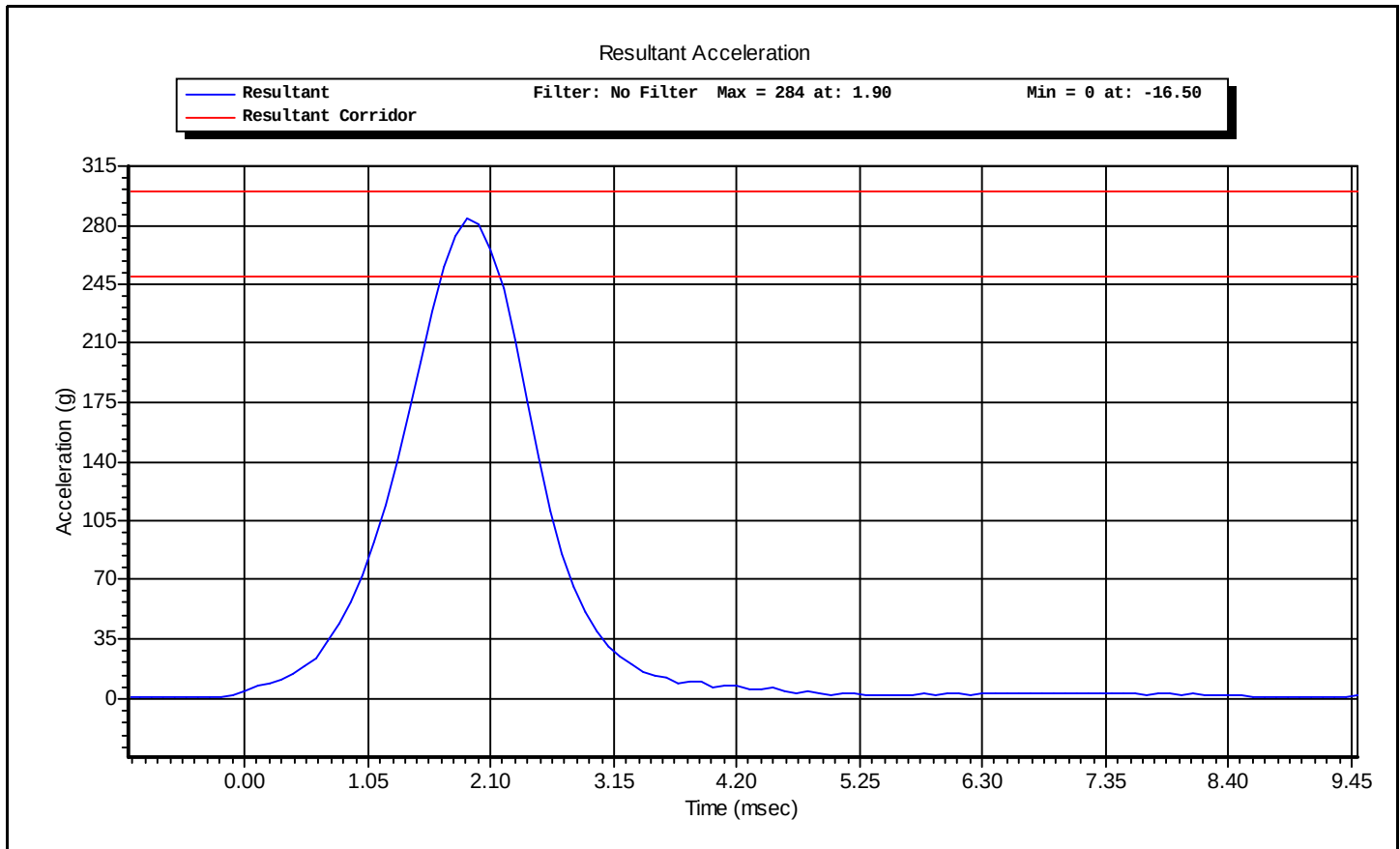


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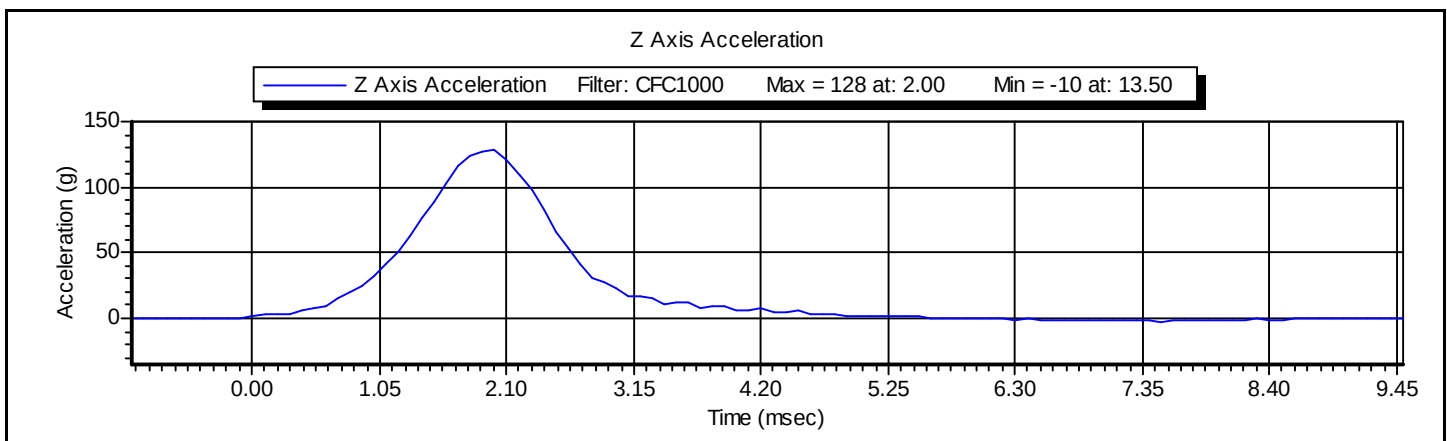
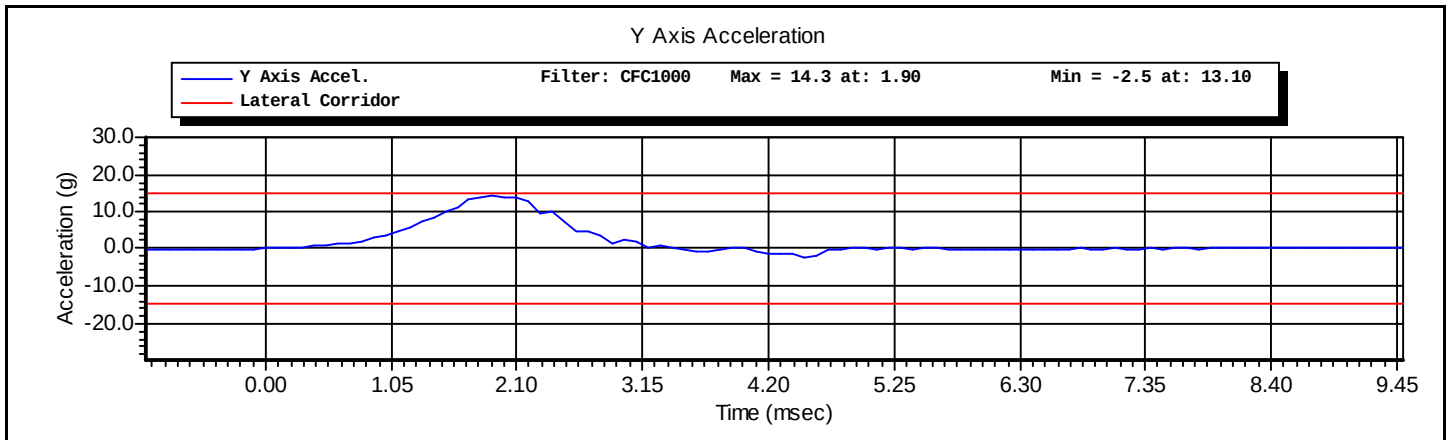
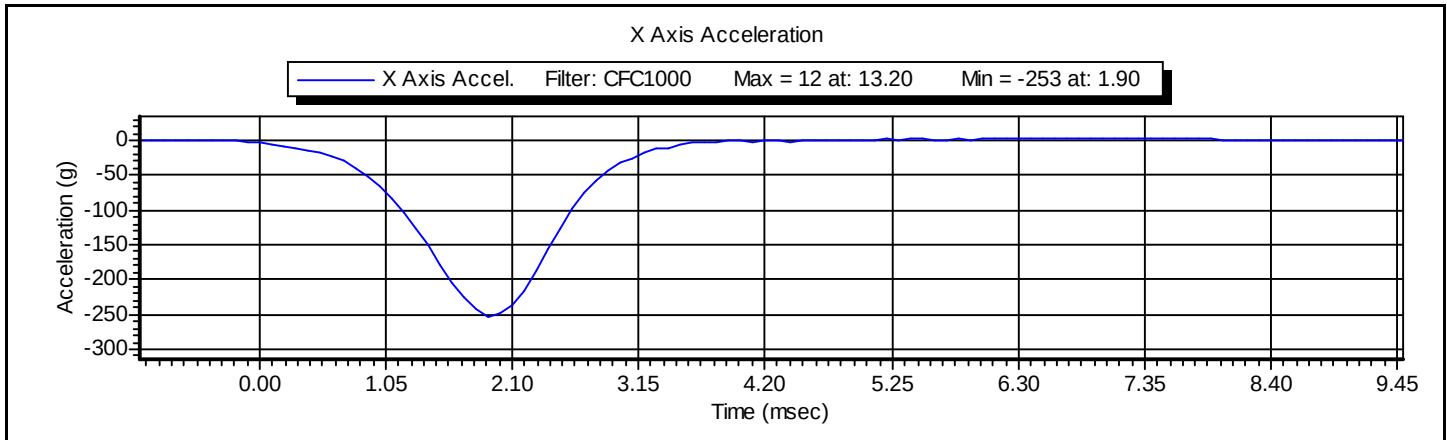
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Head Drop	Test Date:	10/29/2010
Test Number:	1	Test Time:	12:58:21 PM



Test ID: **Head Drop**

Test Time: **12:58:21 PM**

Test Date: **10/29/2010**





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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:	273		
Test ID:	Neck Extension	Test Date:	10/29/2010
Test Number:	2	Test Time:	11:41:29 AM

Component Part Number	Component Serial Number
Neck - 880105-255	713

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	31 %RH P
Velocity	5.95 -- 6.19	6.13 m/s P
Pendulum Impulse at 10 ms	1.50 -- 1.90	1.63 m/s P
Pendulum Impulse at 20 ms	3.10 -- 3.90	3.22 m/s P
Pendulum Impulse at 30 ms	4.60 -- 5.60	4.70 m/s P
D Plane Rotation	99.0 -- 114.0	103.6 degrees P
Moment During Rotation Interval	-65.0 -- -53.0	-53.1 Nm P
Moment Decay to -10.0 Nm	94.0 -- 114.0	105.9 ms P

All test parameters are within specifications

Technician: **S. Zito** Signature: _____

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

Test ID: **Neck Extension**

Test Time: **11:41:29 AM**

Test Date: **10/29/2010**



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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	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
FTSS	1716A	LC-296 My	2/1/2010
FTSS	1716A	LC-296 Fx	2/1/2010
FTSS	1716A	LC-296 Fy	2/1/2010
FTSS	1716A	LC-296 Fz	2/1/2010

Test ID: **Neck Extension**

Test Time: **11:41:29 AM**

Test Date: **10/29/2010**

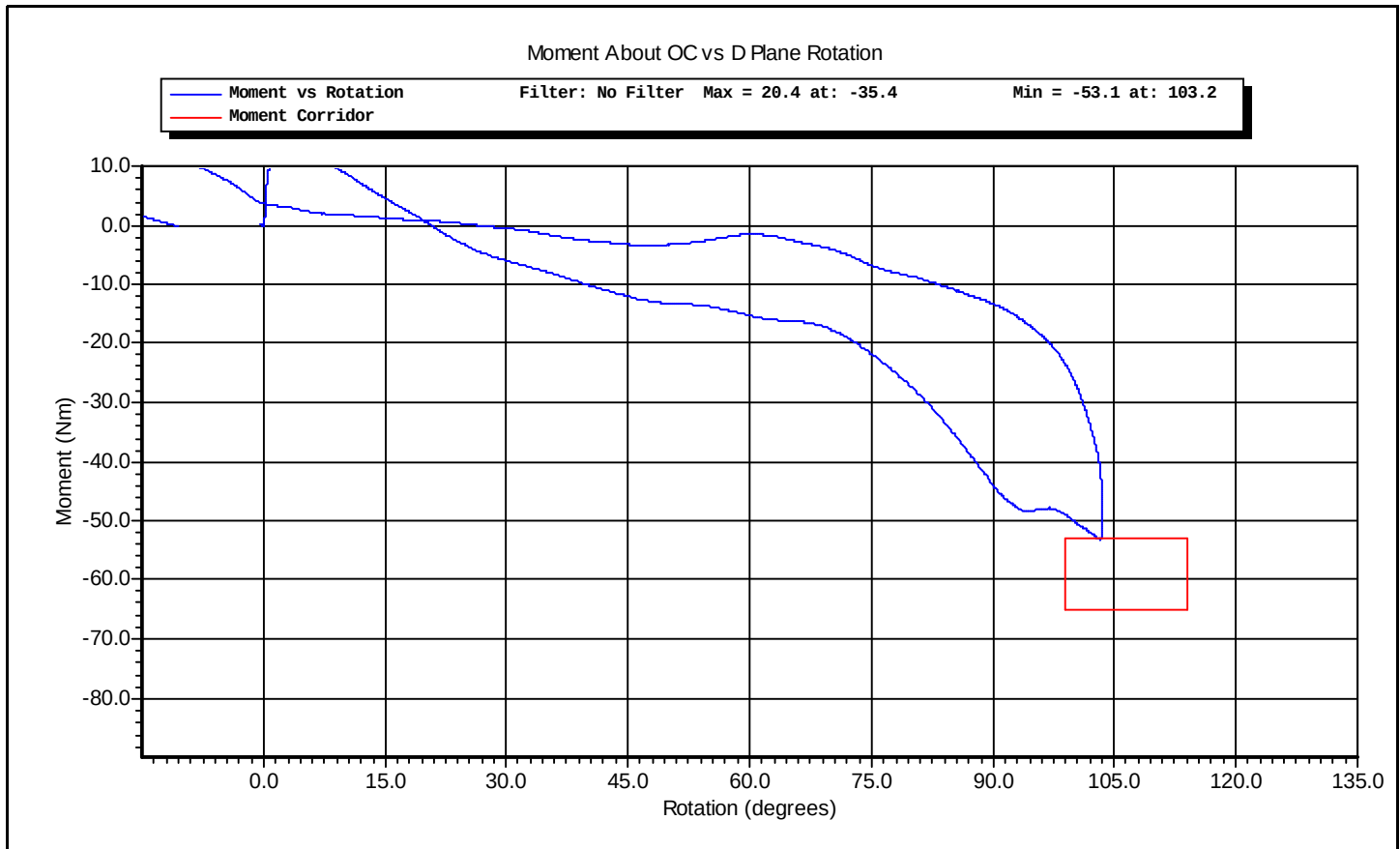


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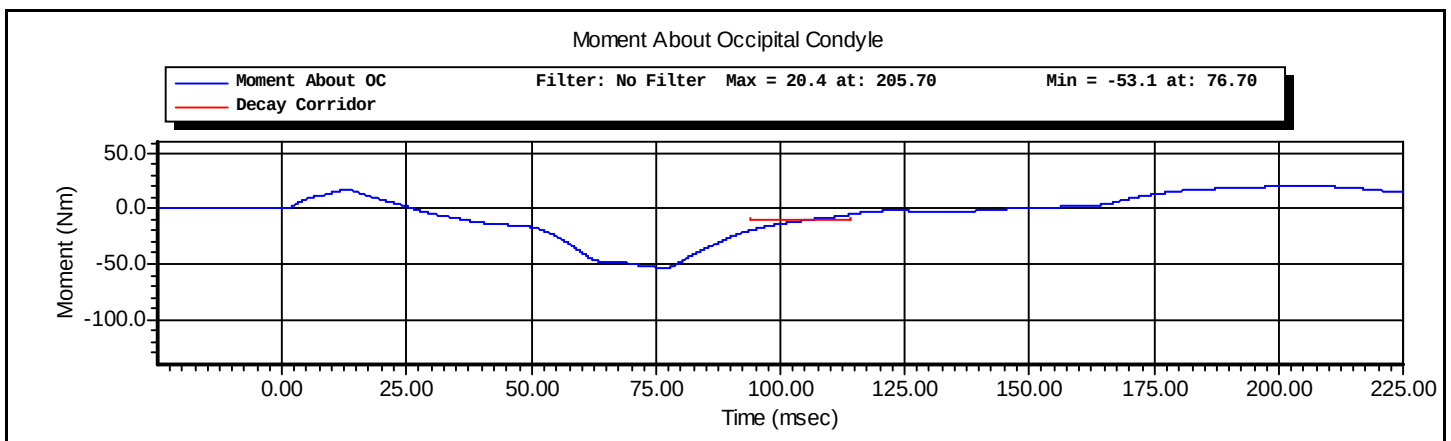
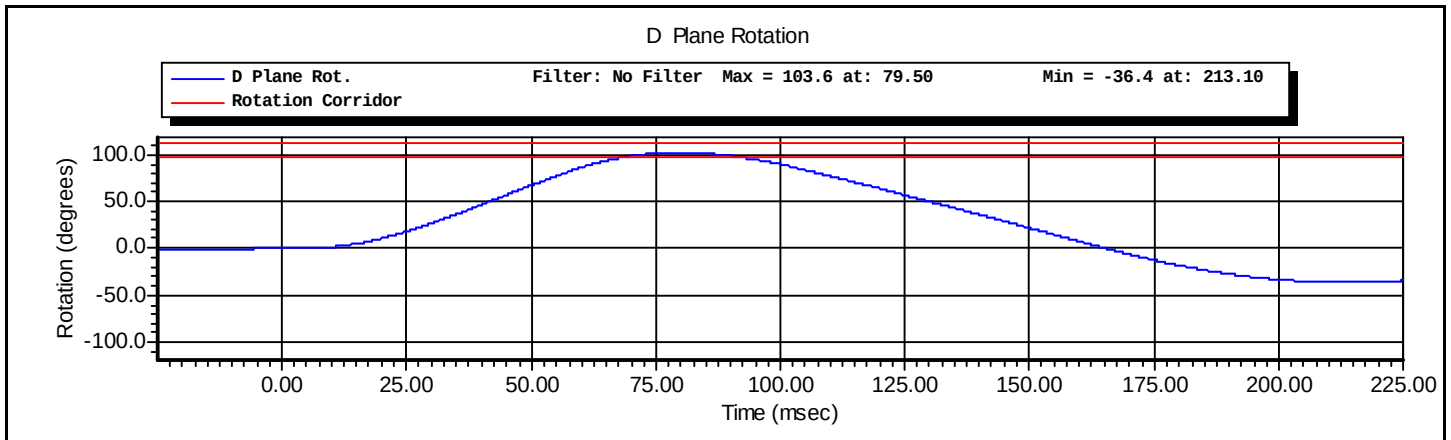
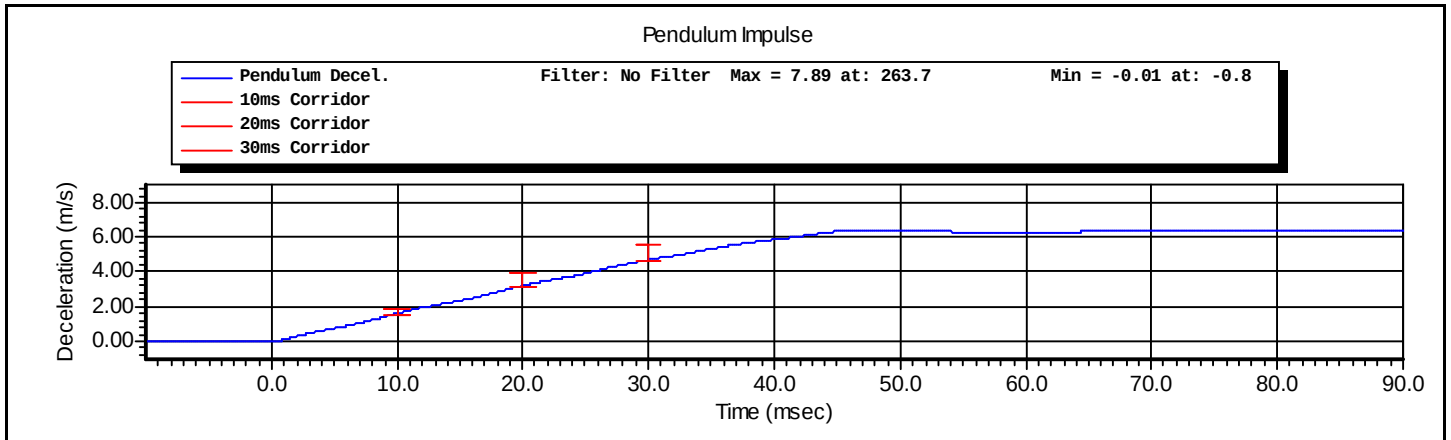
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Extension	Test Date:	10/29/2010
Test Number:	2	Test Time:	11:41:29 AM



Test ID: Neck Extension Test Time: 11:41:29 AM

Test Date: 10/29/2010





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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:	273		
Test ID:	Neck Flexion	Test Date:	10/29/2010
Test Number:	1	Test Time:	10:07:57 AM

Component Part Number	Component Serial Number
Neck - 880105-255	713
Front Nodding Block - 78051-351	
Rear Nodding Block - 78051-351	
Head Skin - 880105-109	
Skull - 880105-1002	

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	32 %RH P
Velocity	6.89 -- 7.13	7.10 m/s P
Pendulum Impulse at 10 ms	2.10 -- 2.50	2.19 m/s P
Pendulum Impulse at 20 ms	4.00 -- 5.00	4.51 m/s P
Pendulum Impulse at 30 ms	5.80 -- 7.00	6.45 m/s P
D Plane Rotation	-91.0 -- -77.0	-78.9 degrees P
Moment During Rotation Interval	69.0 -- 83.0	71.4 Nm P
Moment Decay to 10.0 Nm	80.0 -- 100.0	88.0 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **10:07:57 AM**

Test Date: **10/29/2010**



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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	5/10/2010
DentonATD	78051-342	PENDULUM POT	8/14/2010
DentonATD	78051-342	CONDYLE POT	8/14/2010
FTSS	1716A	LC-296 My	2/1/2010
FTSS	1716A	LC-296 Fx	2/1/2010
FTSS	1716A	LC-296 Fy	2/1/2010
FTSS	1716A	LC-296 Fz	2/1/2010

Test ID: **Neck Flexion**

Test Time: **10:07:57 AM**

Test Date: **10/29/2010**

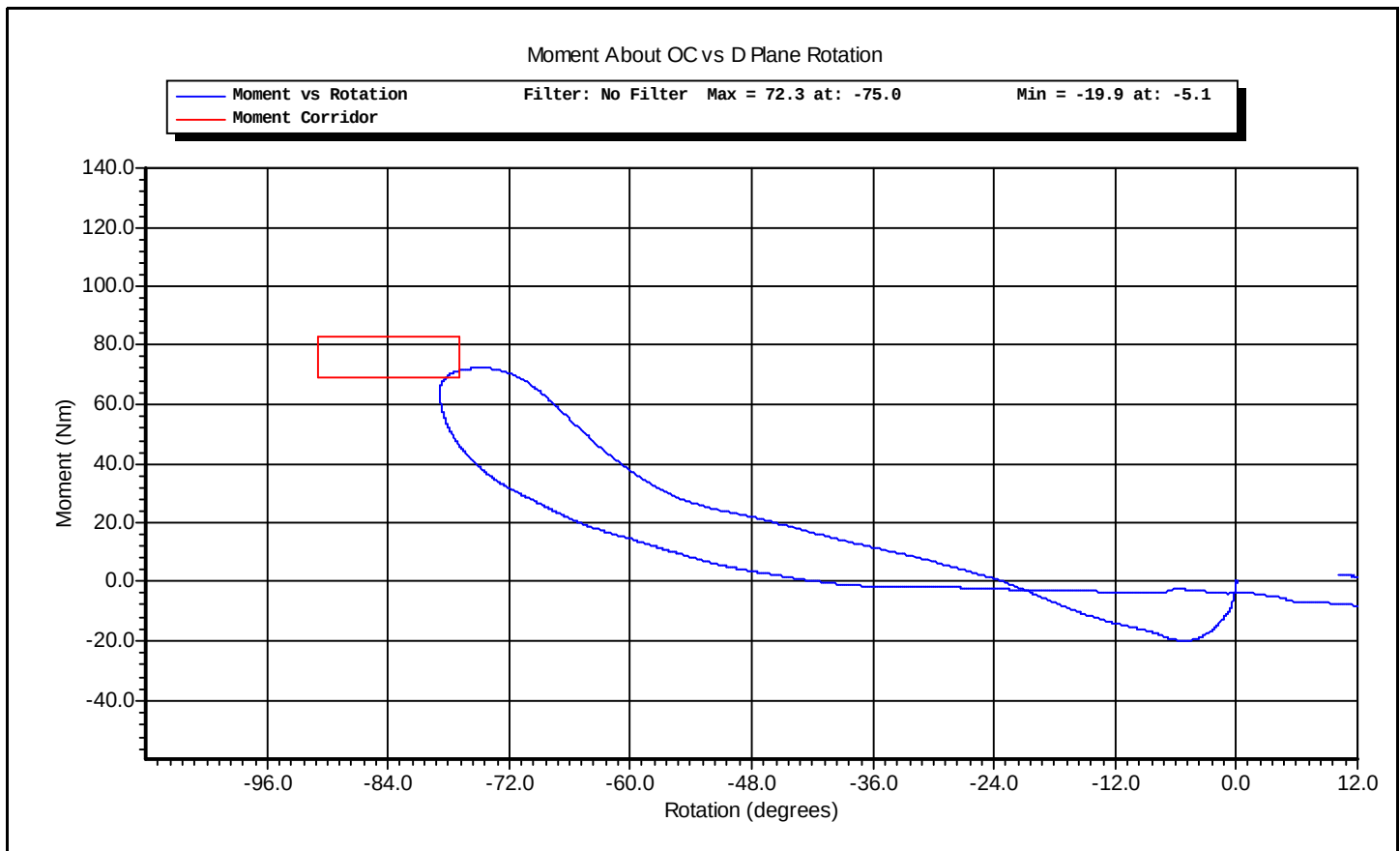


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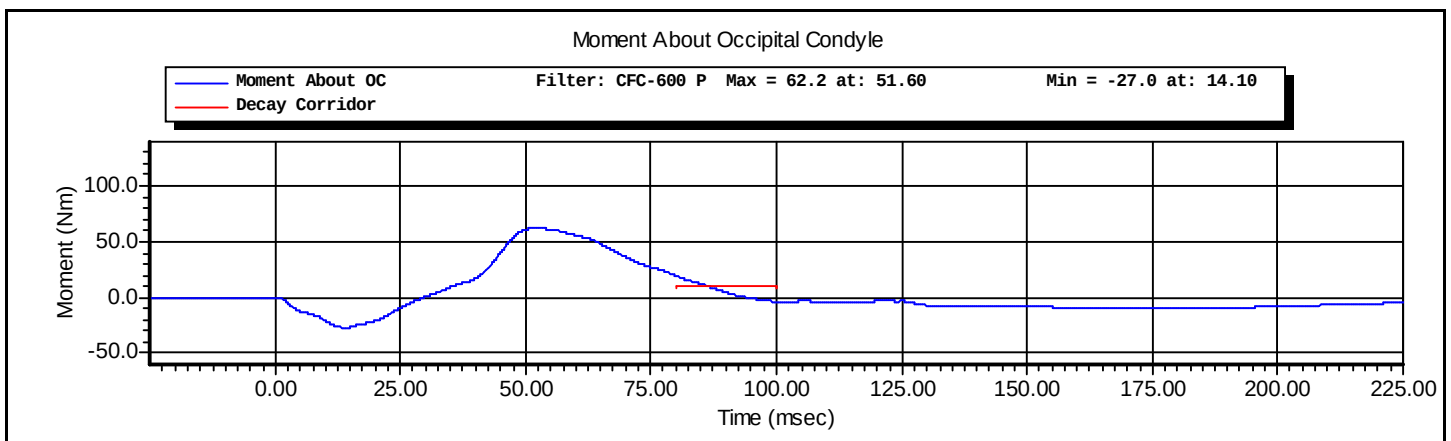
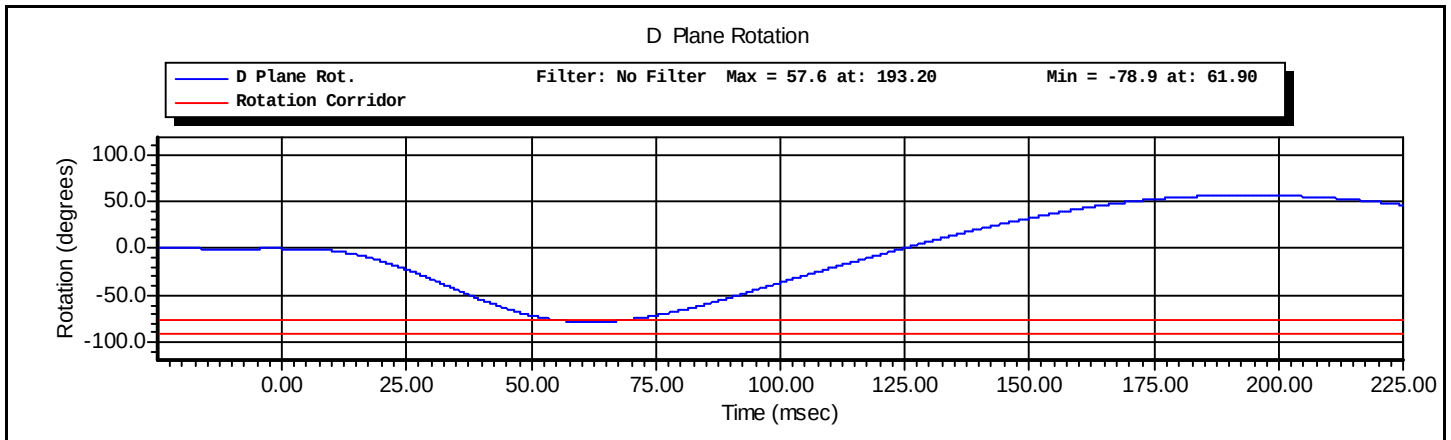
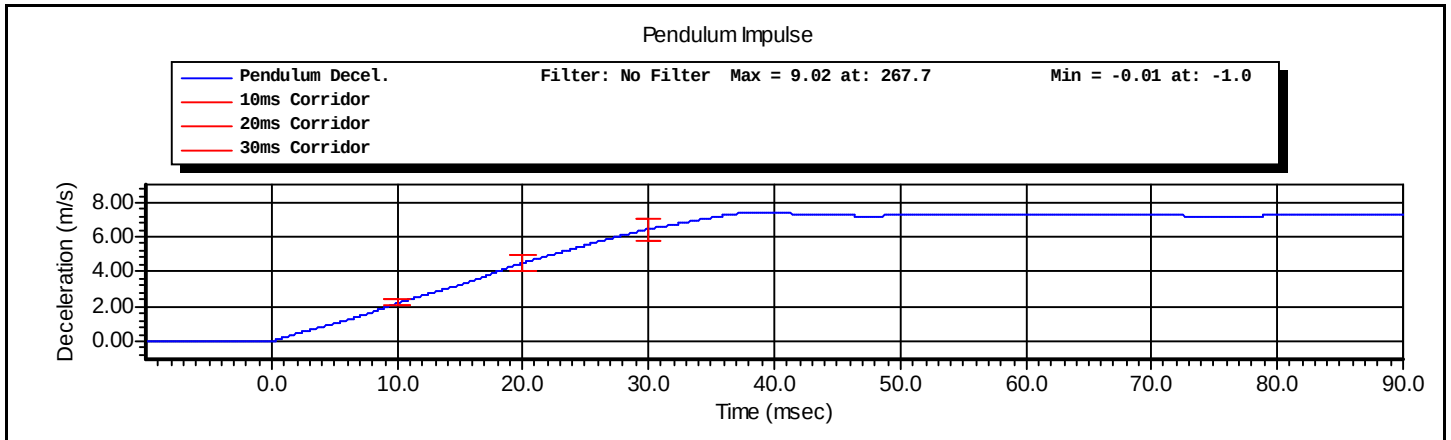
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Flexion	Test Date:	10/29/2010
Test Number:	1	Test Time:	10:07:57 AM



Test ID: Neck Flexion

Test Time: 10:07:57 AM

Test Date: 10/29/2010





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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:	273		
Test ID:	Thorax Impact	Test Date:	10/27/2010
Test Number:	1	Test Time:	2:12:12 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10.0	--	70.0	41.0 %RH	P
Velocity	6.59	--	6.83	6.69 m/s	P
Sternum Displacement	-58.0	--	-50.0	-51.1 mm	P
Force During Displacement Interval	-4400	--	-3900	-4353 N	P
Force -18.0 to -50.0 Displacement	-4600	--	0	-4266 N	P
Hysteresis	69	--	85	71 %	P

All test parameters are within specifications

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

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

Test ID: **Thorax Impact**

Test Time: **2:12:12 PM**

Test Date: **10/27/2010**



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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-273	4/13/2010

Test ID: **Thorax Impact**

Test Time: **2:12:12 PM**

Test Date: **10/27/2010**



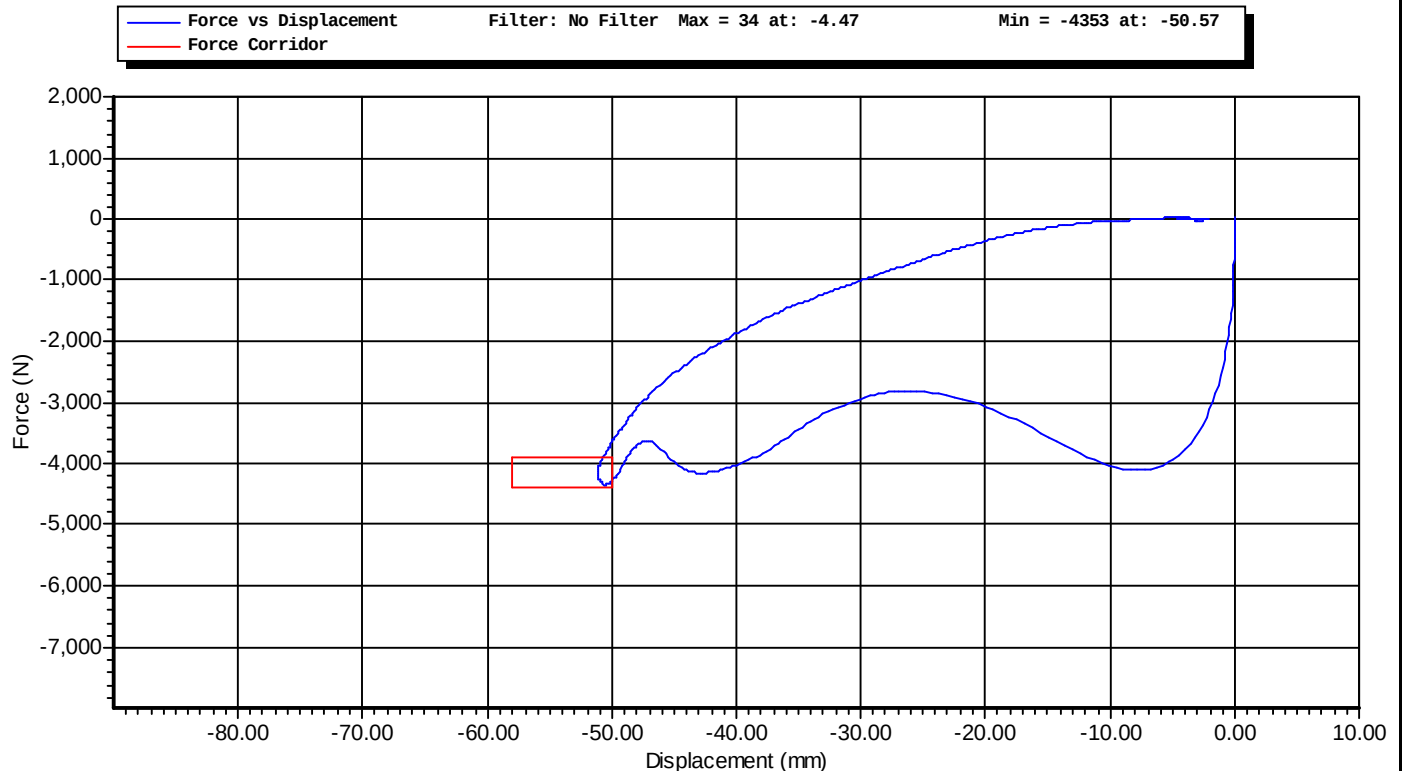
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Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Thorax Impact	Test Date:	10/27/2010
Test Number:	1	Test Time:	2:12:12 PM

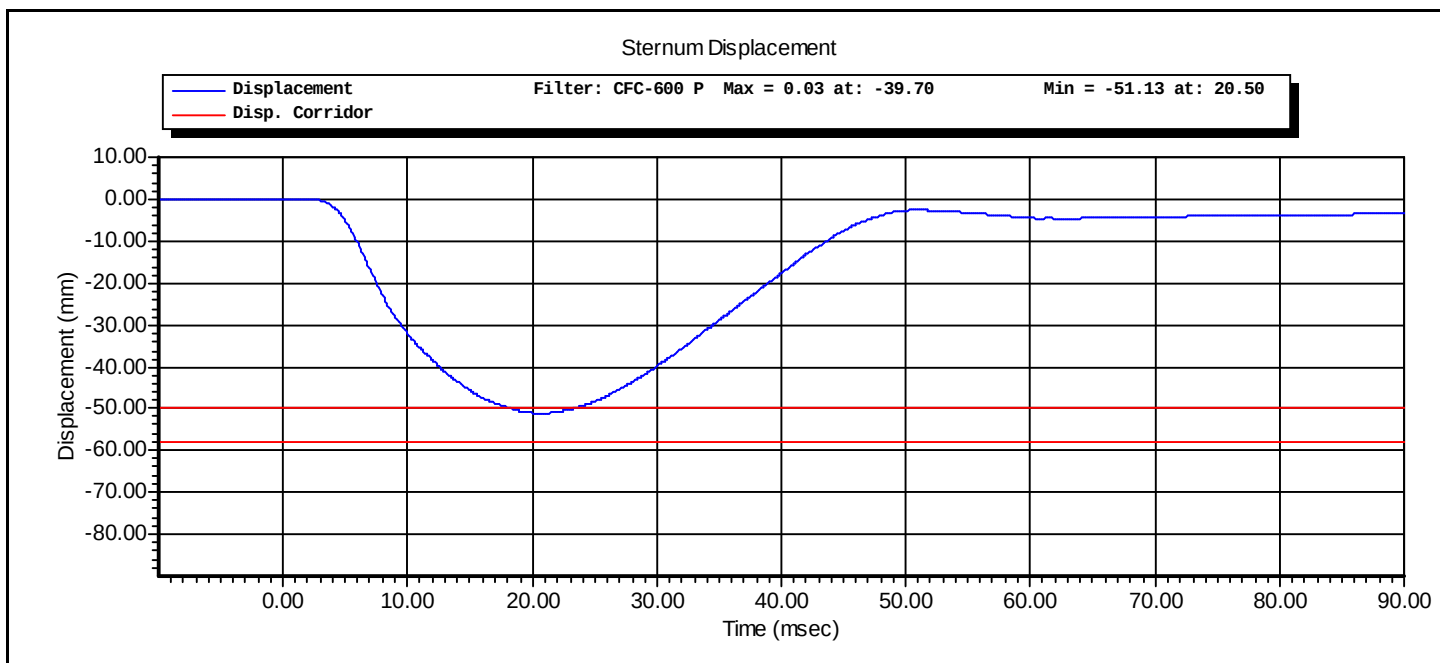
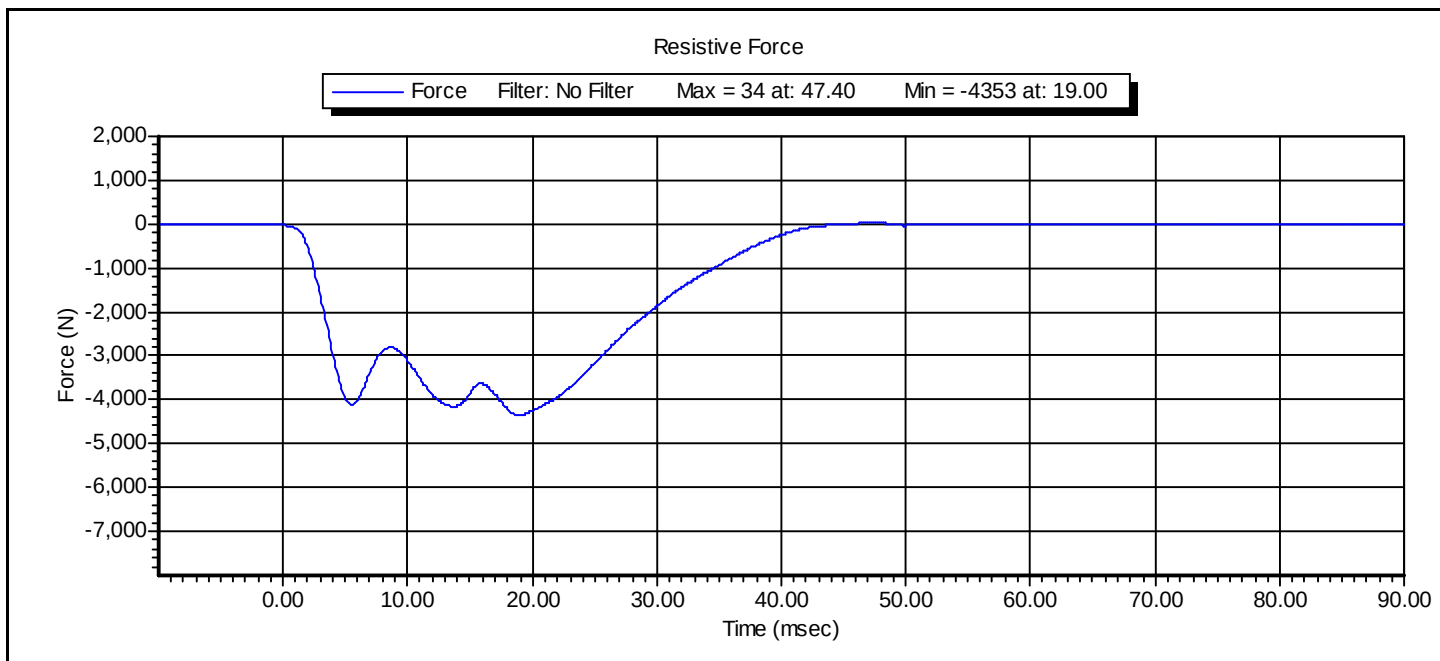
Resistive Force vs Sternum Displacement



Test ID: Thorax Impact

Test Time: 2:12:12 PM

Test Date: 10/27/2010



Torso Flexion Test

Technician: AR

Calibration Date: 10/29/2010

ATD Serial Number: 5th Female 273

Test Results			
Test Condition	Parameters	Results	Status
Temperature	18.9-25.6° C	22.2° C	P
Lab Humidity: 38%	10-70%	29%	P
Max Force @ 45 deg	320 – 390N	362N	P
Torso Rotation Rate	0.5 °/s ≤ rate ≤ 1.5 °/s	1.0 °/s	P
Initial reference angle	≤20 deg	14 °	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:	273		
Test ID:	Left Knee	Test Date:	10/29/2010
Test Number:	1	Test Time:	2:12:42 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1726

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	30.0 %RH P
Velocity	2.07 -- 2.13	2.09 m/s P
Resistive Force	-4060 -- -3450	-3552 N P

All test parameters are within specifications

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

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

Test ID: **Left Knee**

Test Time: **2:12:42 PM**

Test Date: **10/29/2010**



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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**

Test Time: **2:12:42 PM**

Test Date: **10/29/2010**

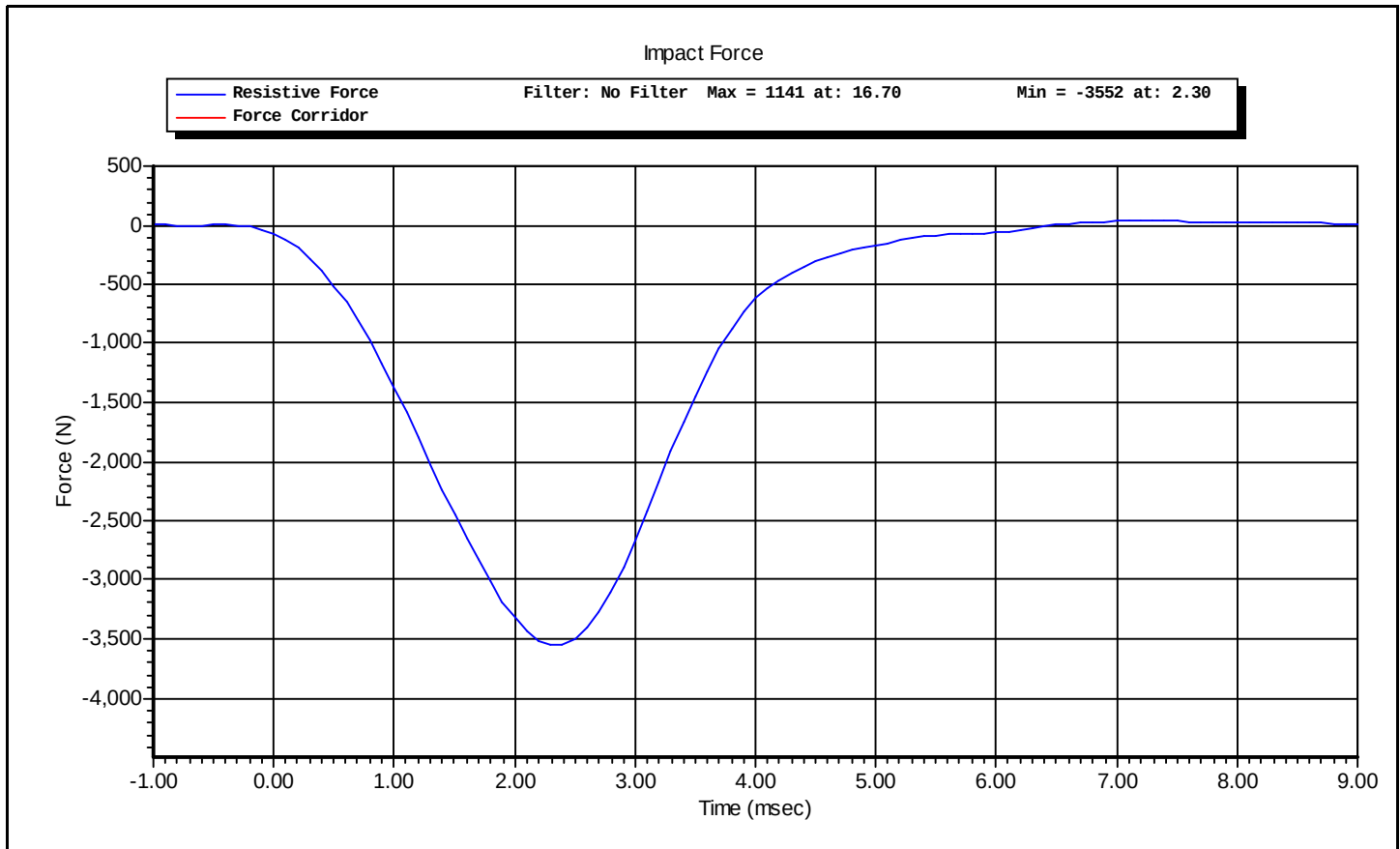


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Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Left	Test Date:	10/29/2010
Test Number:	1	Test Time:	2:12:42 PM



Test ID: **Left**

Test Time: **2:12:42 PM**

Test Date: **10/29/2010**



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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:	273		
Test ID:	Right Knee	Test Date:	10/29/2010
Test Number:	1	Test Time:	2:00:39 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1051

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	30.0 %RH P
Velocity	2.07 -- 2.13	2.12 m/s P
Resistive Force	-4060 -- -3450	-3727 N P

All test parameters are within specifications

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

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

Test ID: **Right Knee**

Test Time: **2:00:39 PM**

Test Date: **10/29/2010**



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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: **2:00:39 PM**

Test Date: **10/29/2010**

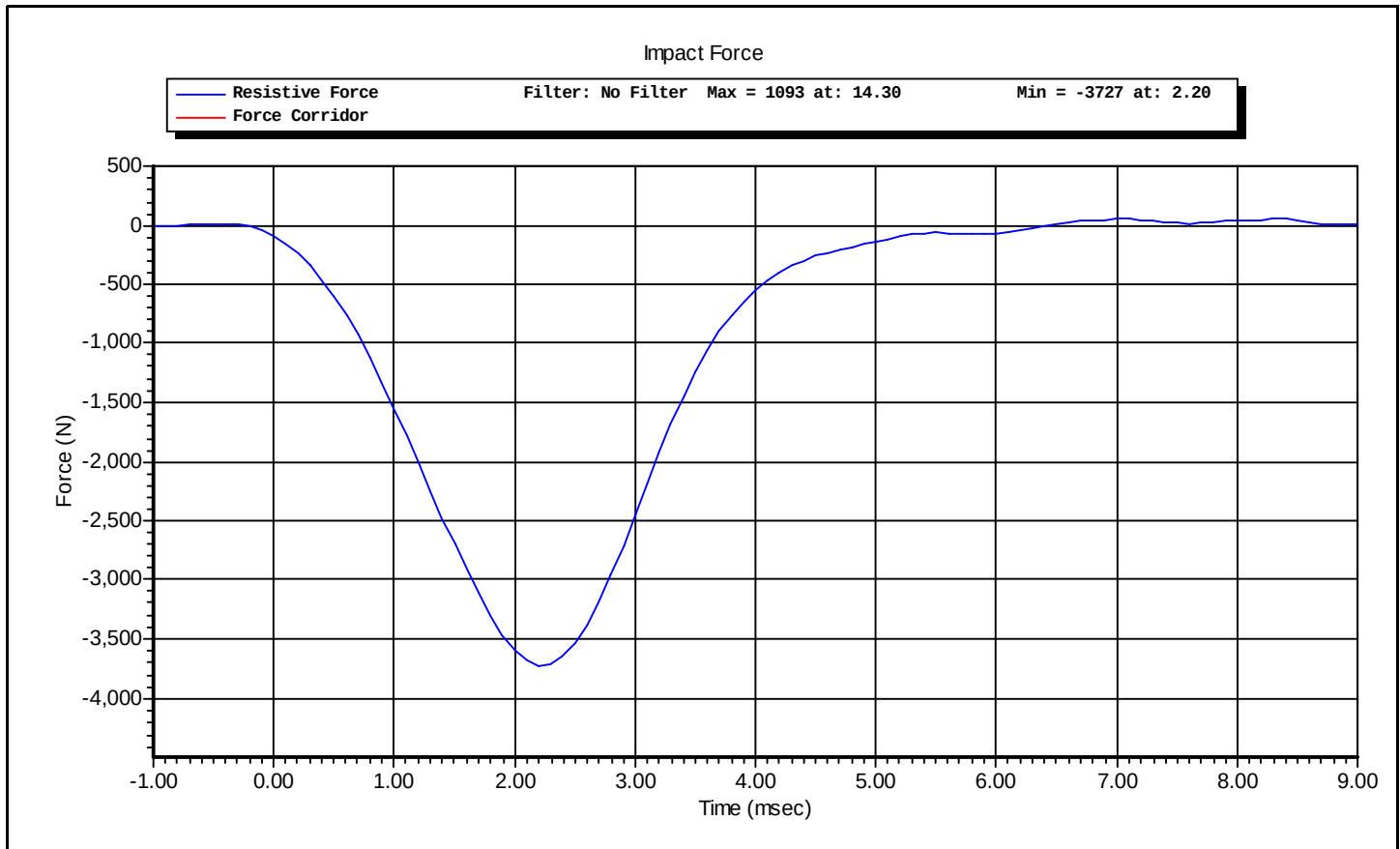


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Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Right Knee	Test Date:	10/29/2010
Test Number:	1	Test Time:	2:00:39 PM



Test ID: Right Knee

Test Time: 2:00:39 PM

Test Date: 10/29/2010

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: AR

Date: 12/21/2010



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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:	12/23/2010
Test Number:	1	Test Time:	5:43:41 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10 -- 70	29 %RH P
Resultant Acceleration	225 -- 275	252 g P
Oscillation	0.0 -- 10.0	1.4 % P
Lateral Acceleration	-15.00 -- 15.00	6.27 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **5:43:41 PM**

Test Date: **12/23/2010**



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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: **5:43:41 PM**

Test Date: **12/23/2010**

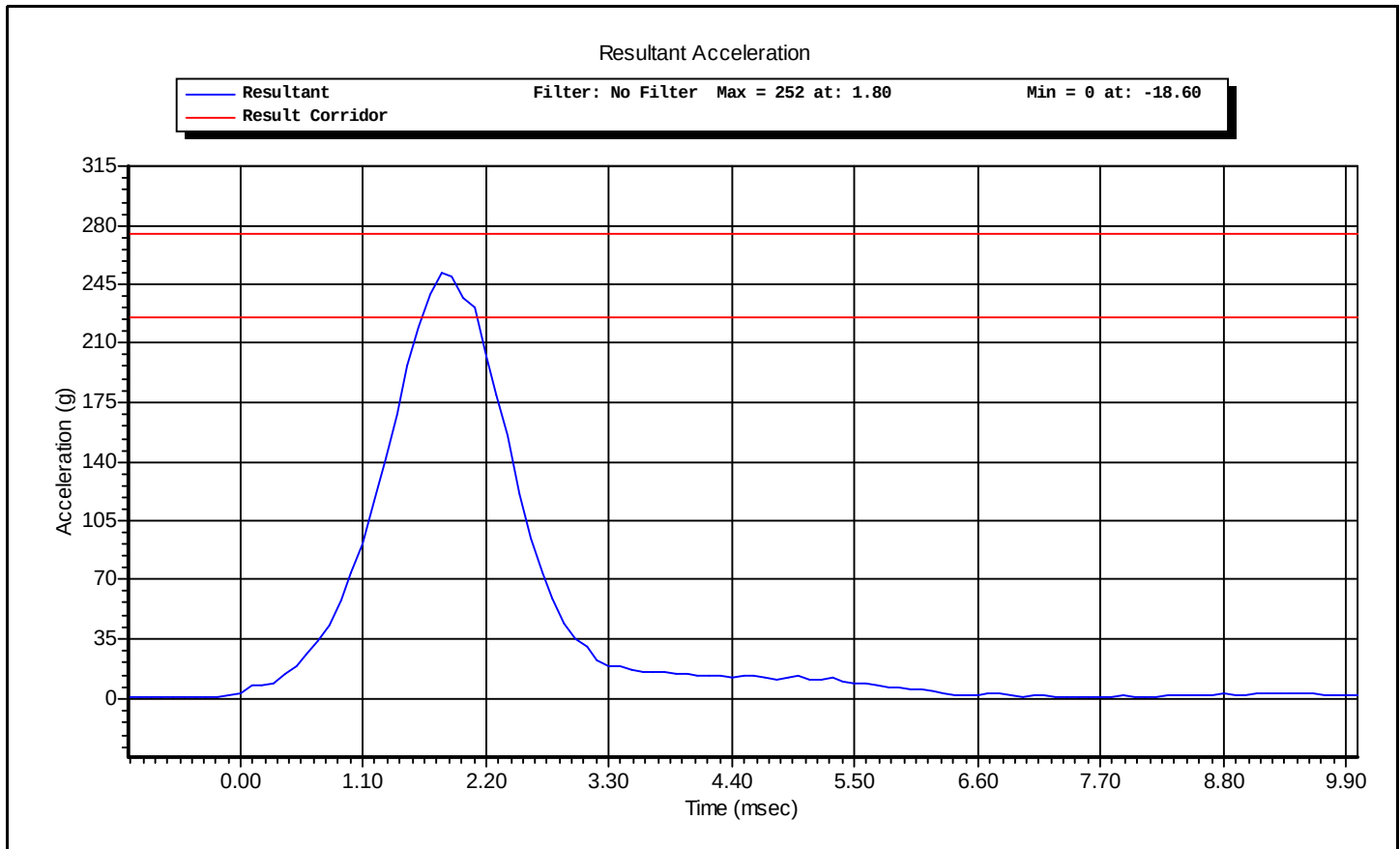


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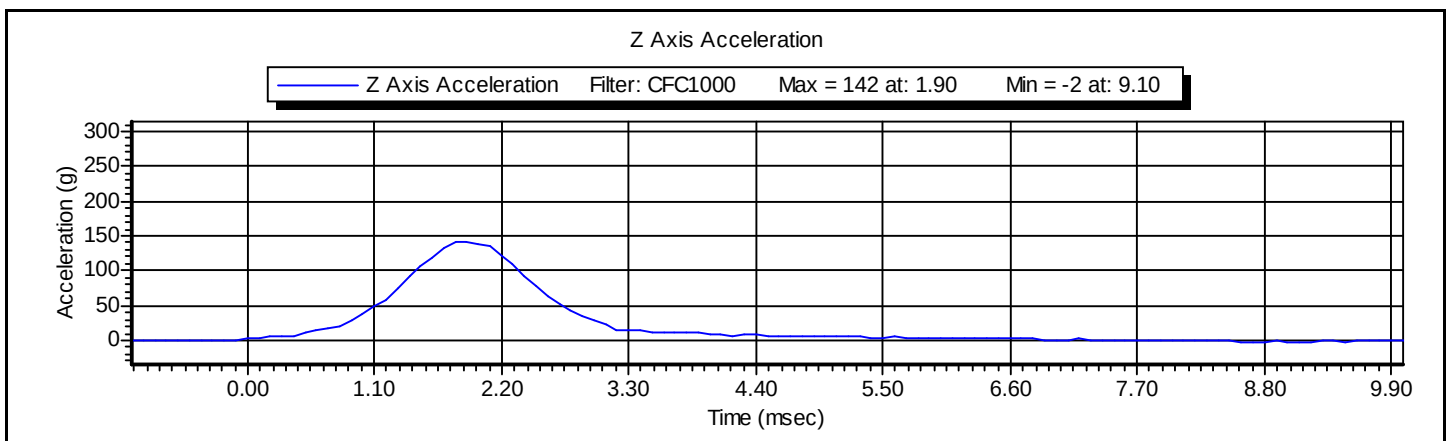
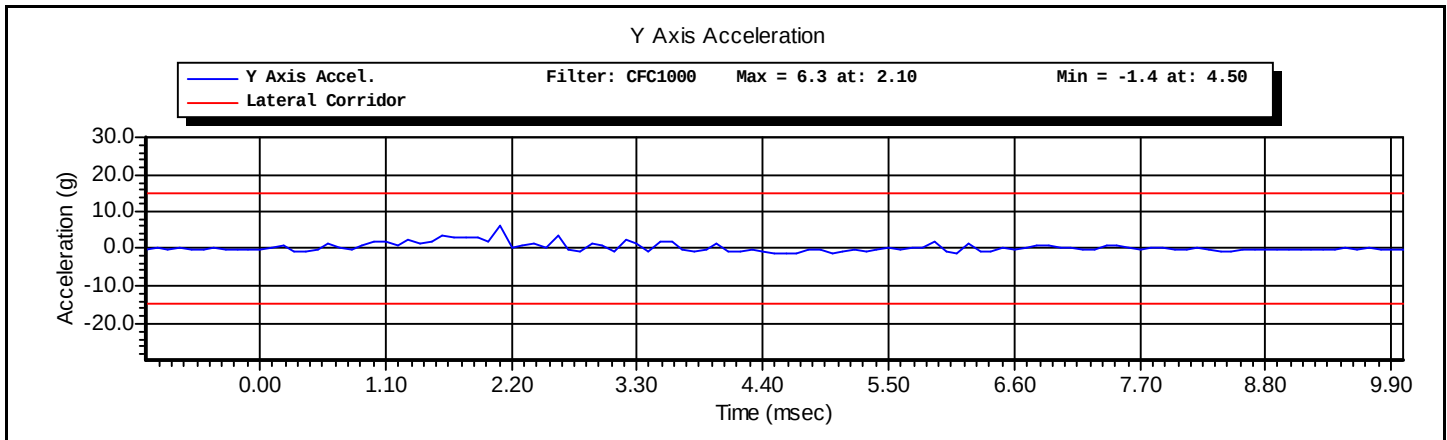
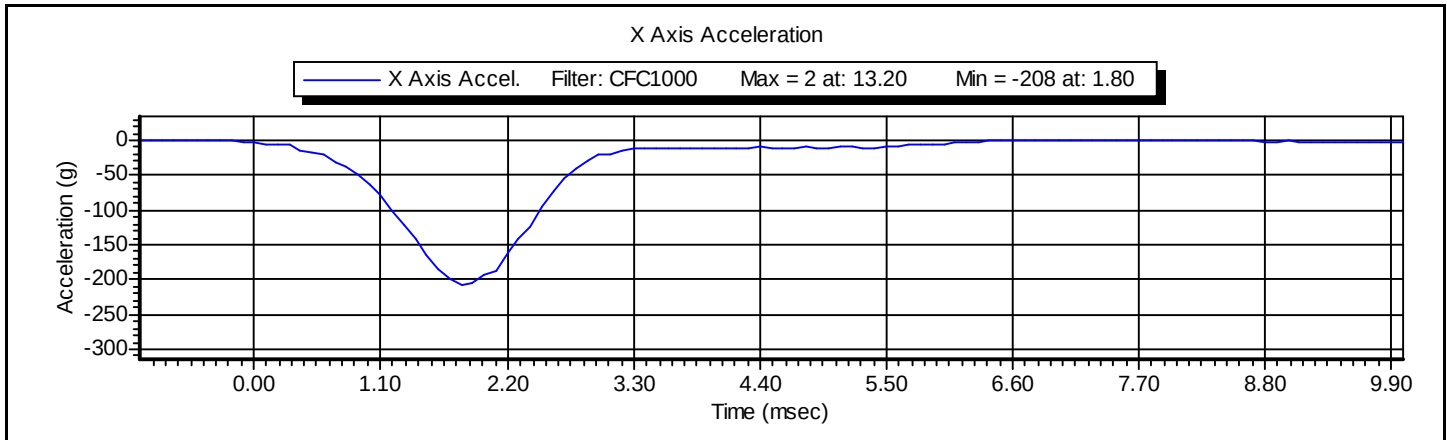
Test Name:	Head Drop	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Head Drop	Test Date:	12/23/2010
Test Number:	1	Test Time:	5:43:41 PM



Test ID: **Head Drop**

Test Time: **5:43:41 PM**

Test Date: **12/23/2010**





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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:	1/4/2011
Test Number:	2	Test Time:	2:48:12 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	22.2 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	24.7 g	P
Pendulum Deceleration at	20 ms	17.6	-- 22.6	21.1 g	P
Pendulum Deceleration at	30 ms	12.5	-- 18.5	15.7 g	P
Max Pendulum Deceleration After	30 ms	0.0	-- 29.0	15.7 g	P
Deceleration time to	5 g	34.0	-- 42.0	38.6 ms	P
D Plane Rotation		-78.0	-- -64.0	-75.7 degrees	P
Time at max rotation		57.0	-- 64.0	60.0 ms	P
Rotation Decay to Zero		113.0	-- 128.0	117.8 ms	P
Moment about OC		88.1	-- 108.4	96.0 Nm	P
Time at Max Moment		47.0	-- 58.0	50.4 ms	P
Moment Decay to Zero		97.0	-- 107.0	99.1 ms	P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **2:48:12 PM**

Test Date: **1/4/2011**



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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-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: **2:48:12 PM**

Test Date: **1/4/2011**

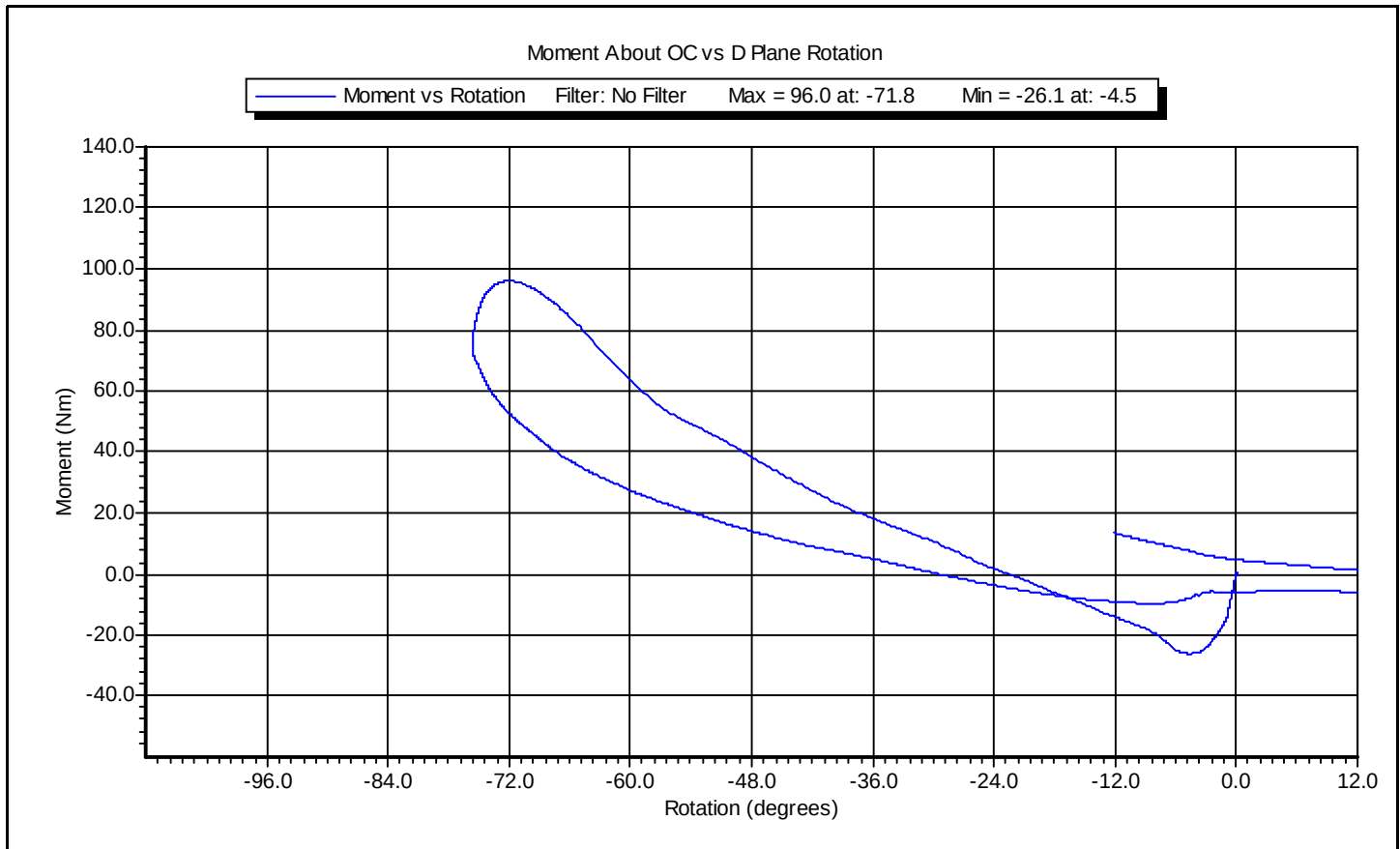


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Name of Test:	Neck Flexion	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Flexion	Date:	1/4/2011
Number of Test:	2	Time of Test:	2:48:12 PM

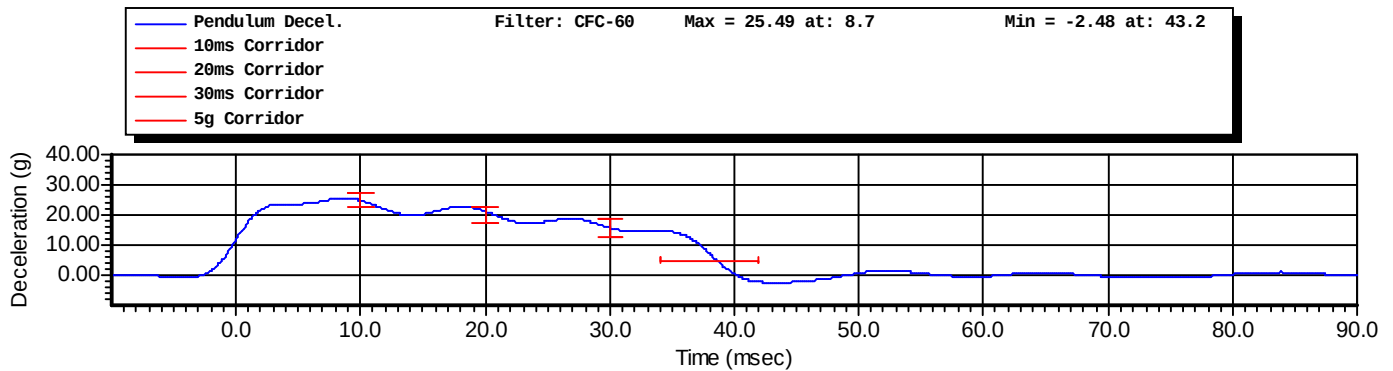


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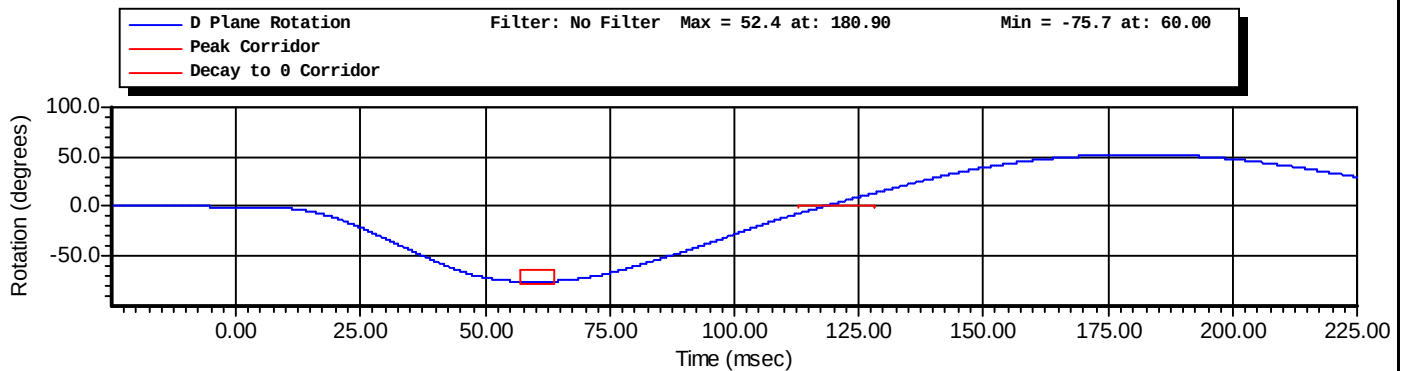
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Date of Test: 1/4/2011

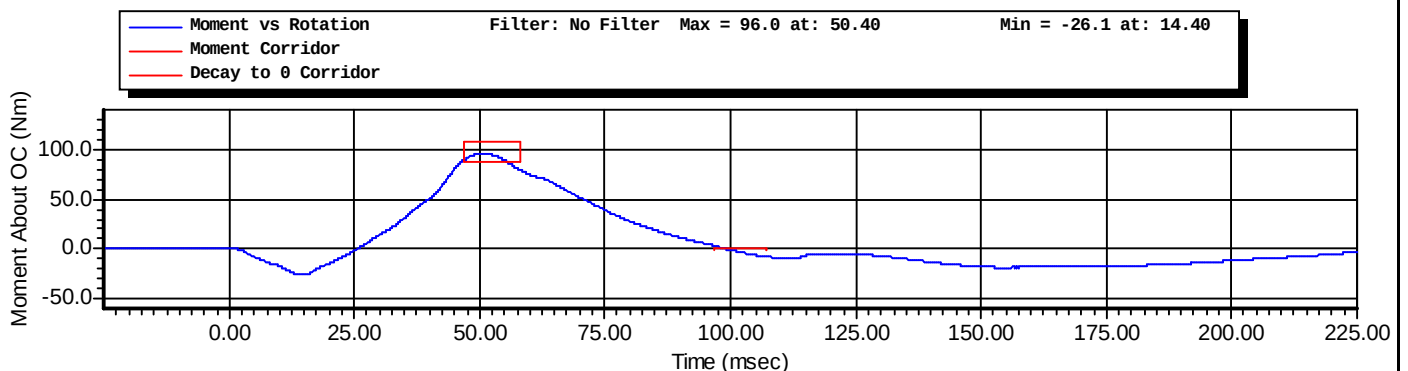
Pendulum Deceleration



D Plane Rotation



Moment About Occipital Condyle





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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:	1/4/2011
Test Number:	1	Test Time:	3:30:53 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	22.1 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	20.6 g	P
Pendulum Deceleration at	20 ms	14.0	-- 19.0	17.3 g	P
Pendulum Deceleration at	30 ms	11.0	-- 16.0	14.6 g	P
Max Pendulum Deceleration after	30 ms	0.0	-- 22.0	15.1 g	P
Decel Time to	5 g	38.0	-- 46.0	39.1 ms	P
D Plane Rotation		81.0	-- 106.0	99.5 degrees	P
Time at Max Rotation		72.0	-- 82.0	76.5 ms	P
Rotation Decay to Zero		147.0	-- 174.0	159.3 ms	P
Moment About Occipital Condyle		-80.0	-- -52.9	-72.2 Nm	P
Time at Max Moment		65.0	-- 79.0	72.6 ms	P
Moment Decay to Zero		120.0	-- 148.0	142.2 ms	P

All test parameters are within specifications

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

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

Test ID: **Neck Extension**

Test Time: **3:30:53 PM**

Test Date: **1/4/2011**



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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-1916 My	11/18/2010
Denton	1716A	LC-1916 Fx	11/18/2010

Test ID: **Neck Extension**

Test Time: **3:30:53 PM**

Test Date: **1/4/2011**

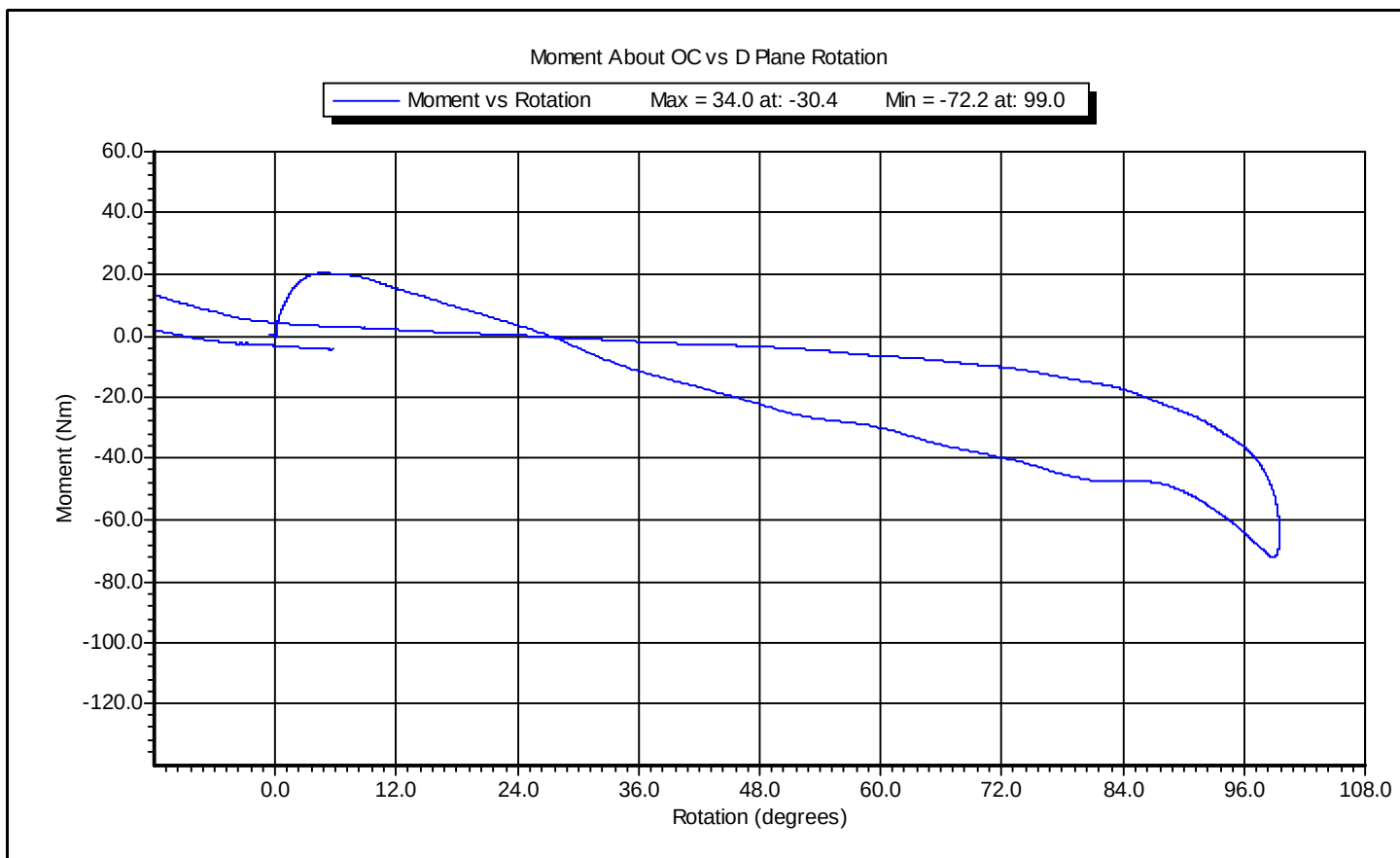


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Name of Test:	Neck Extension	REVISION:	10/1/2001
Name of Sub Test:		Type of Spec:	NHTSA
Type of ATD:	Hybrid III 50'th		
ATD Serial Number:	061		
ID of Test:	Neck Extension	Date:	1/4/2011
Number of Test:	1	Time of Test:	3:30:53 PM

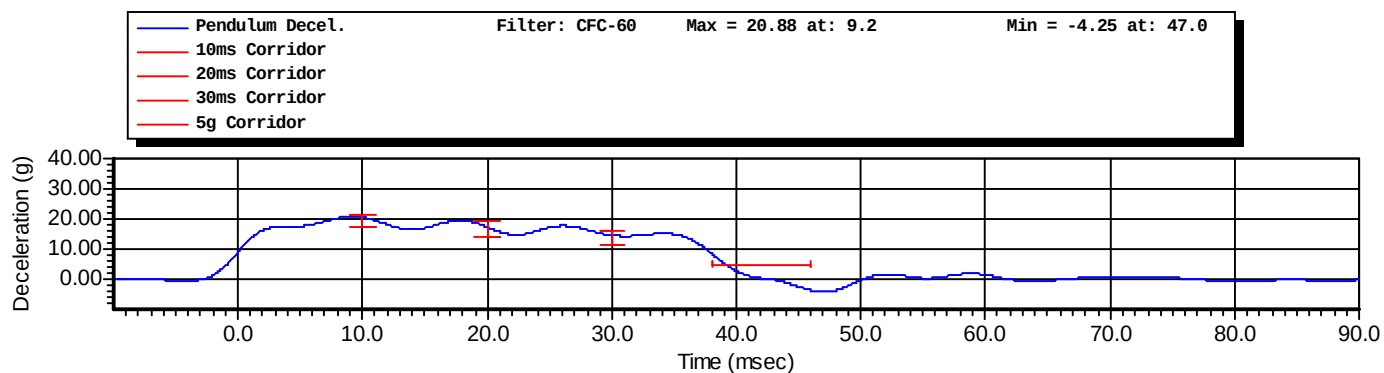


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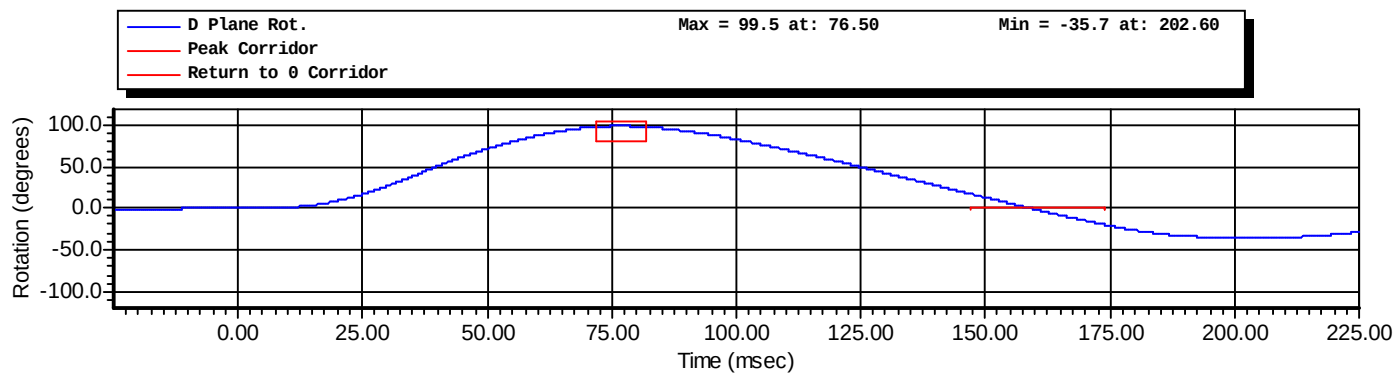
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Date of Test: **1/4/2011**

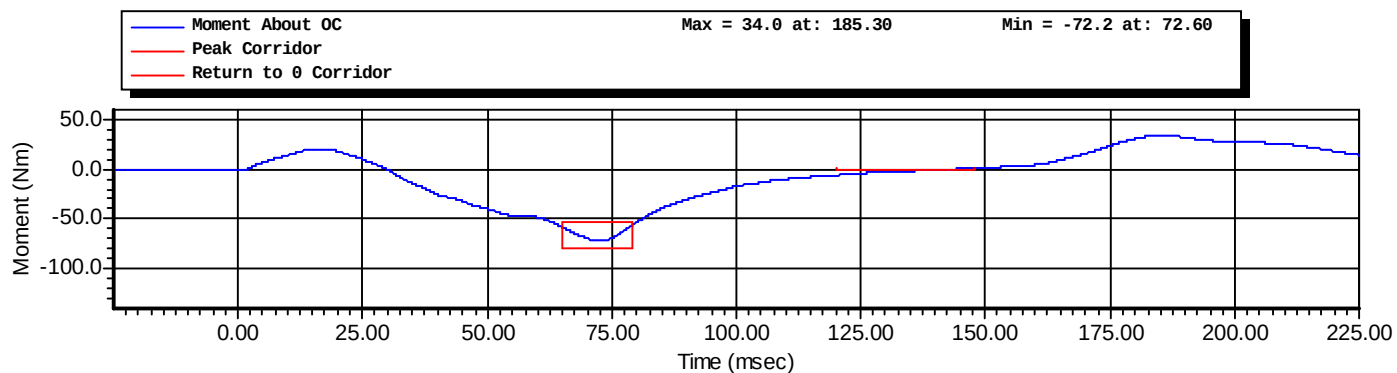
Pendulum Deceleration



D Plane Rotation



Moment About Occipital Condyle





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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:	12/23/2010
Test Number:	1	Test Time:	5:03:00 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	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	6.59 -- 6.83	6.69 m/s P
Resistive Force	-5.894 -- -5.160	-5.445 kN P
Sternum Displacement	-72.6 -- -63.5	-70.1 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: **5:03:00 PM**

Test Date: **12/23/2010**



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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: **5:03:00 PM**

Test Date: **12/23/2010**

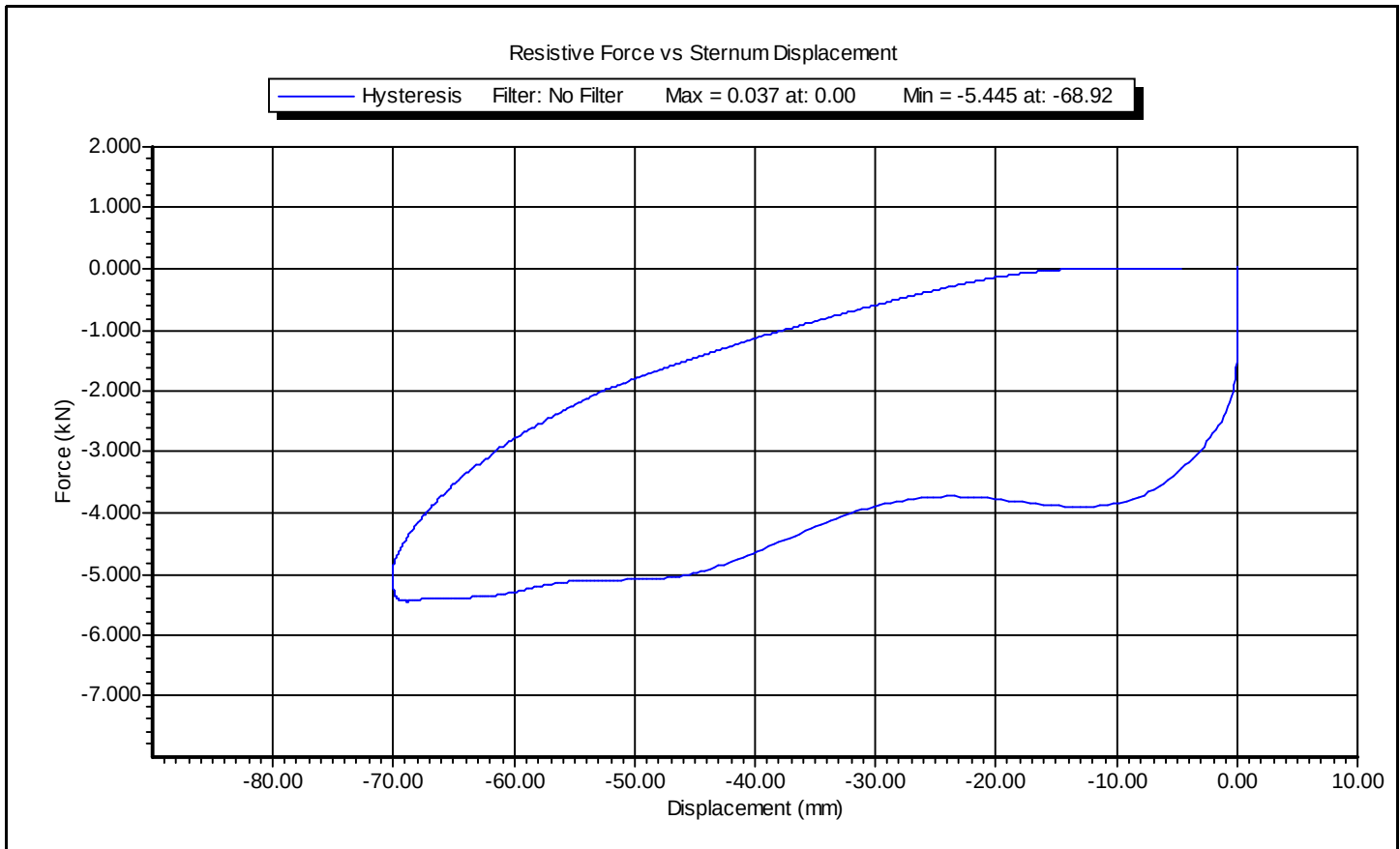


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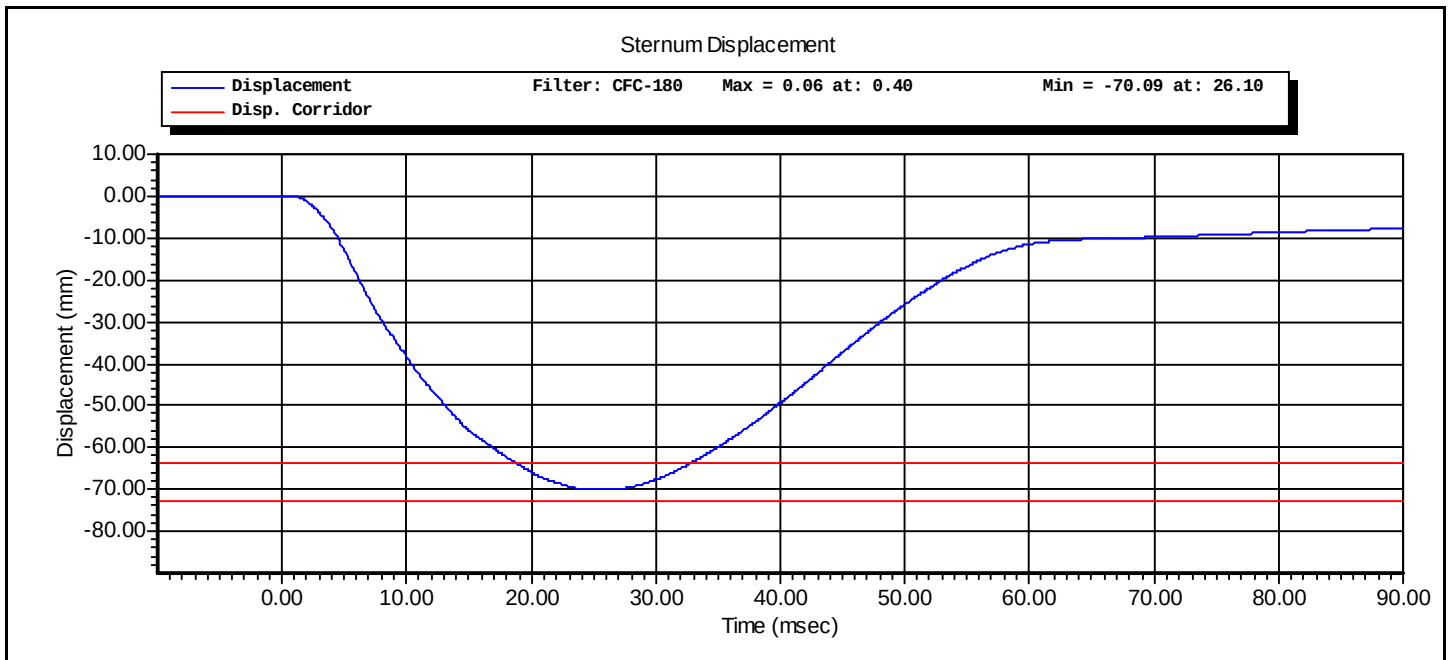
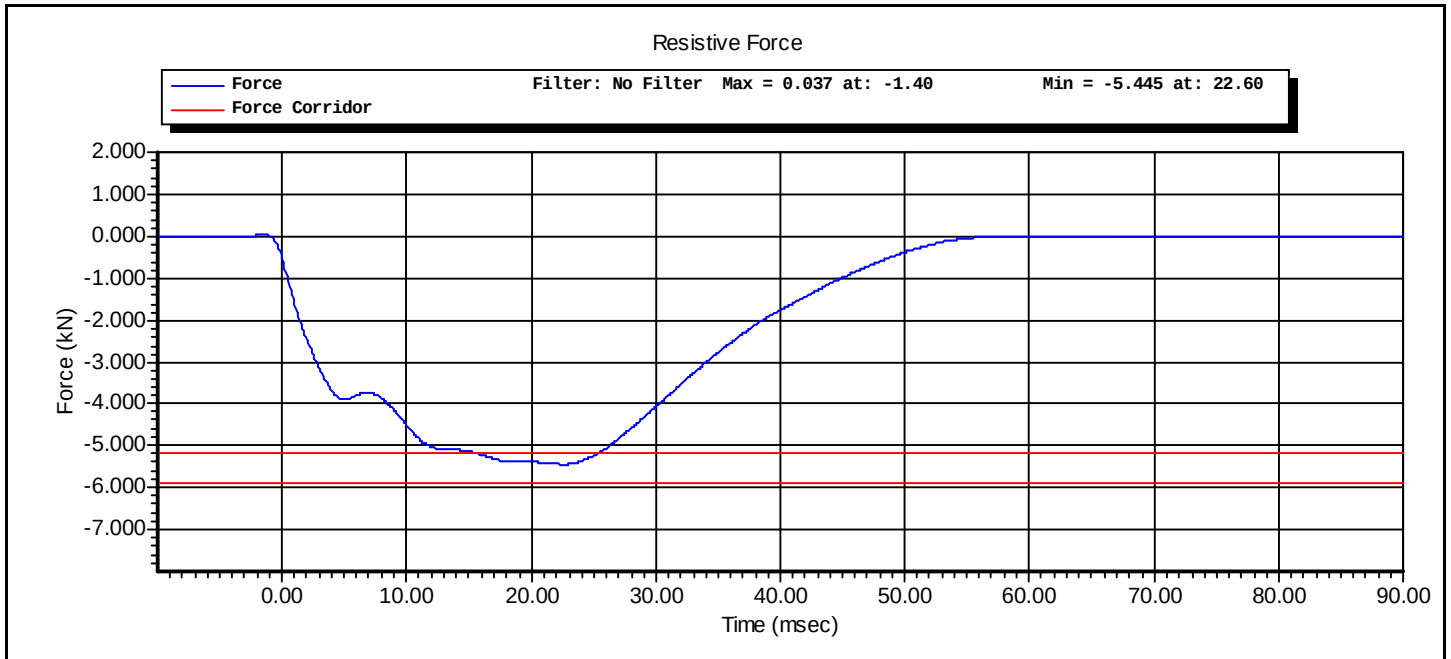
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Thorax	Test Date:	12/23/2010
Test Number:	1	Test Time:	5:03:00 PM



Test ID: **Thorax**

Test Time: **5:03:00 PM**

Test Date: **12/23/2010**



CALSPAN

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

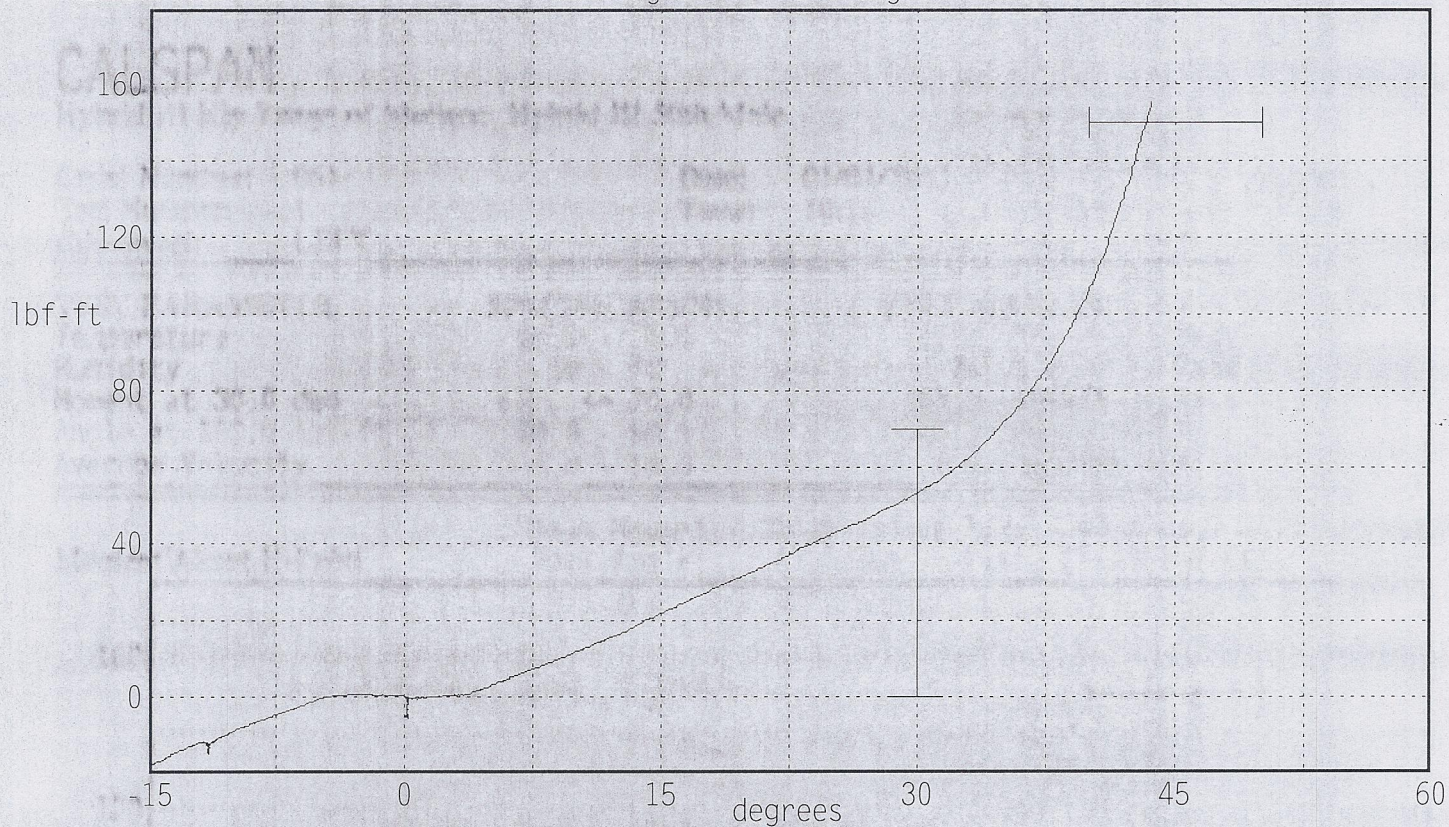
Serial Number: 061
Test Number: 1
Comments: LEFT

Date: 01/04/2011
Time: 10:18

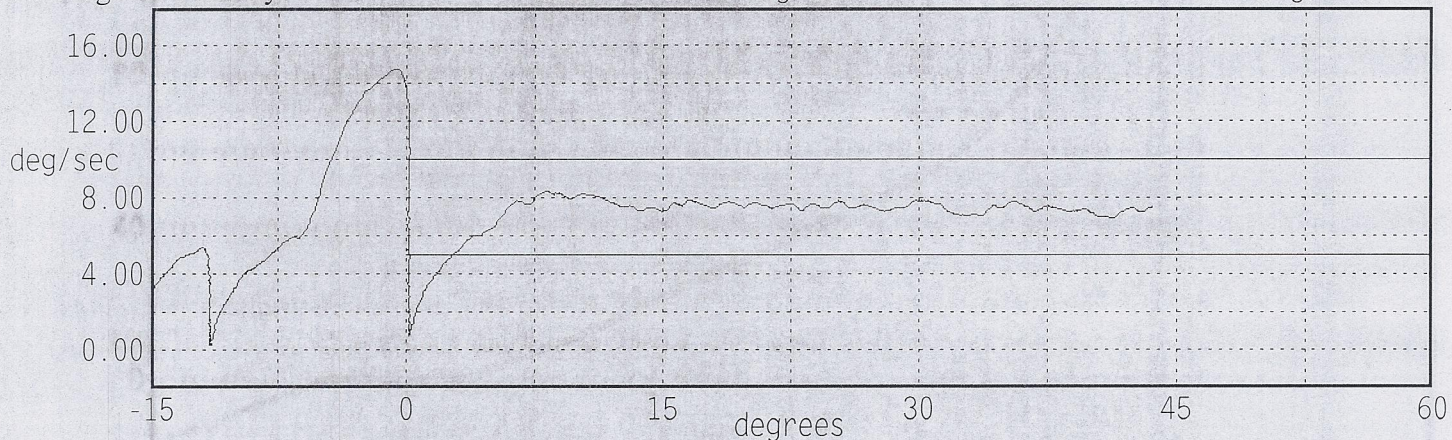
Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66.0 - 78.0	72.0 °F Pass
Humidity	10 - 70	26 % Pass
Moment at 30.0 deg	<= 70.0	53.3 lbf-ft Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	43.3 deg Pass
Average Velocity	5.0 - 10.0	6.8 deg/sec Pass

Moment About H-Point
Peak Moment: 155.3 lbf-ft at 43.6 deg
Peak Angle: 43.6 deg at 155.3 lbf-ft



Angular Velocity Max: 13.8 deg/sec Min: 0.8 deg/sec



CALSPAN

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

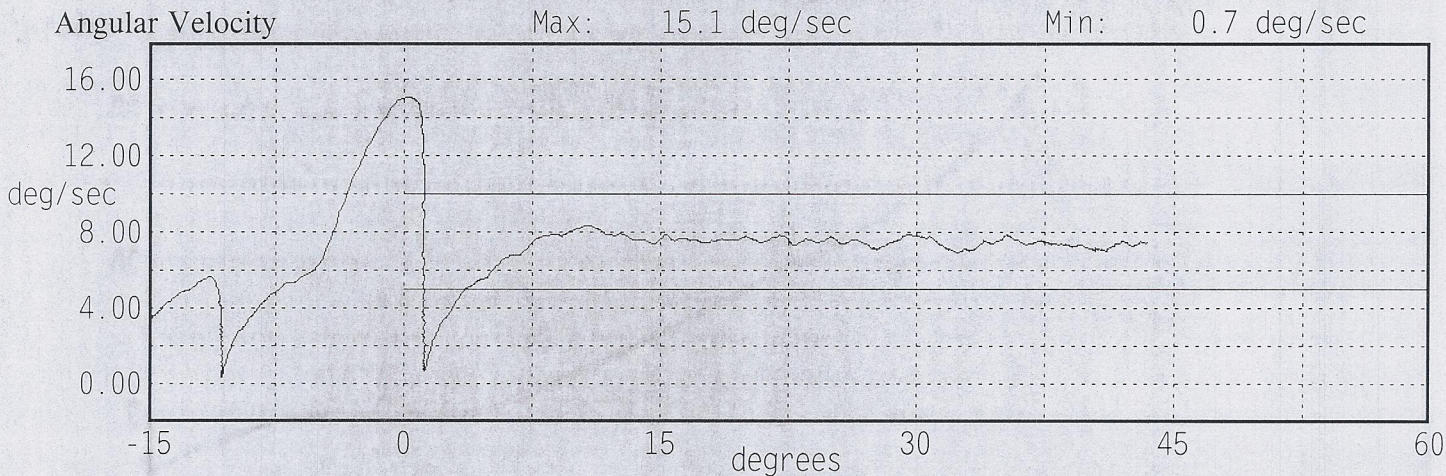
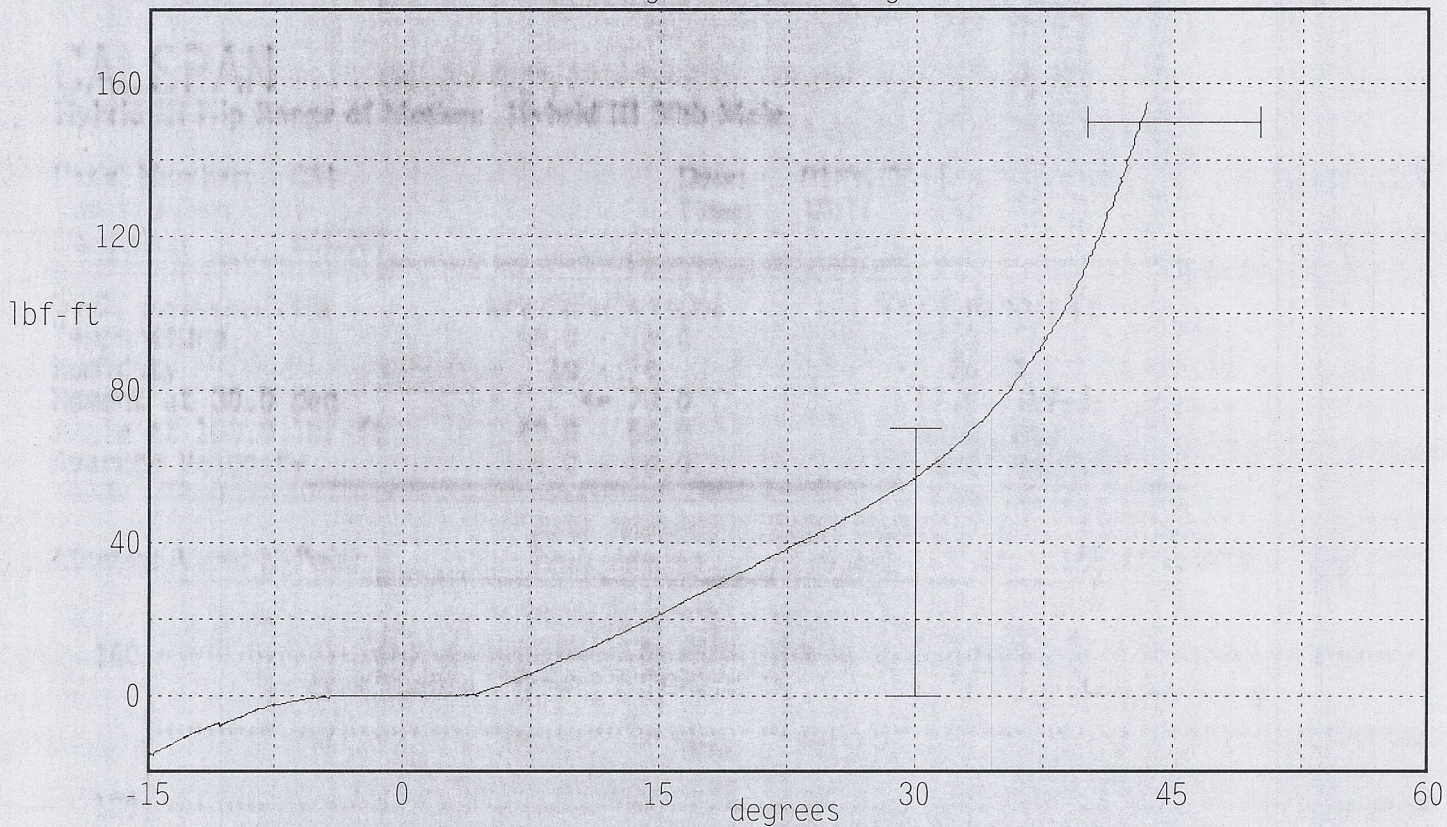
Serial Number: 061
Test Number: 1
Comments: RIGHT

Date: 01/04/2011
Time: 10:11

Version: 1.6.3

TEST PARAMETER	SPECIFICATION	TEST RESULTS
Temperature	66.0 - 78.0	72.0 °F Pass
Humidity	10 - 70	26 % Pass
Moment at 30.0 deg	<= 70.0	57.0 lbf-ft Pass
Angle at 150.0 lbf-ft	40.0 - 50.0	43.0 deg Pass
Average Velocity	5.0 - 10.0	6.8 deg/sec Pass

Moment About H-Point
Peak Moment: 155.0 lbf-ft at 43.4 deg
Peak Angle: 43.4 deg at 155.0 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:	1/4/2011
Test Number:	1	Test Time:	10:22:01 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	26.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-5.78 -- -4.72	-5.06 kN P

All test parameters are within specifications

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

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

Test ID: **Left Knee**

Test Time: **10:22:01 AM**

Test Date: **1/4/2011**



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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
CEC	4-202	AC-A44	8/26/2010

Test ID: **Left Knee**

Test Time: **10:22:01 AM**

Test Date: **1/4/2011**

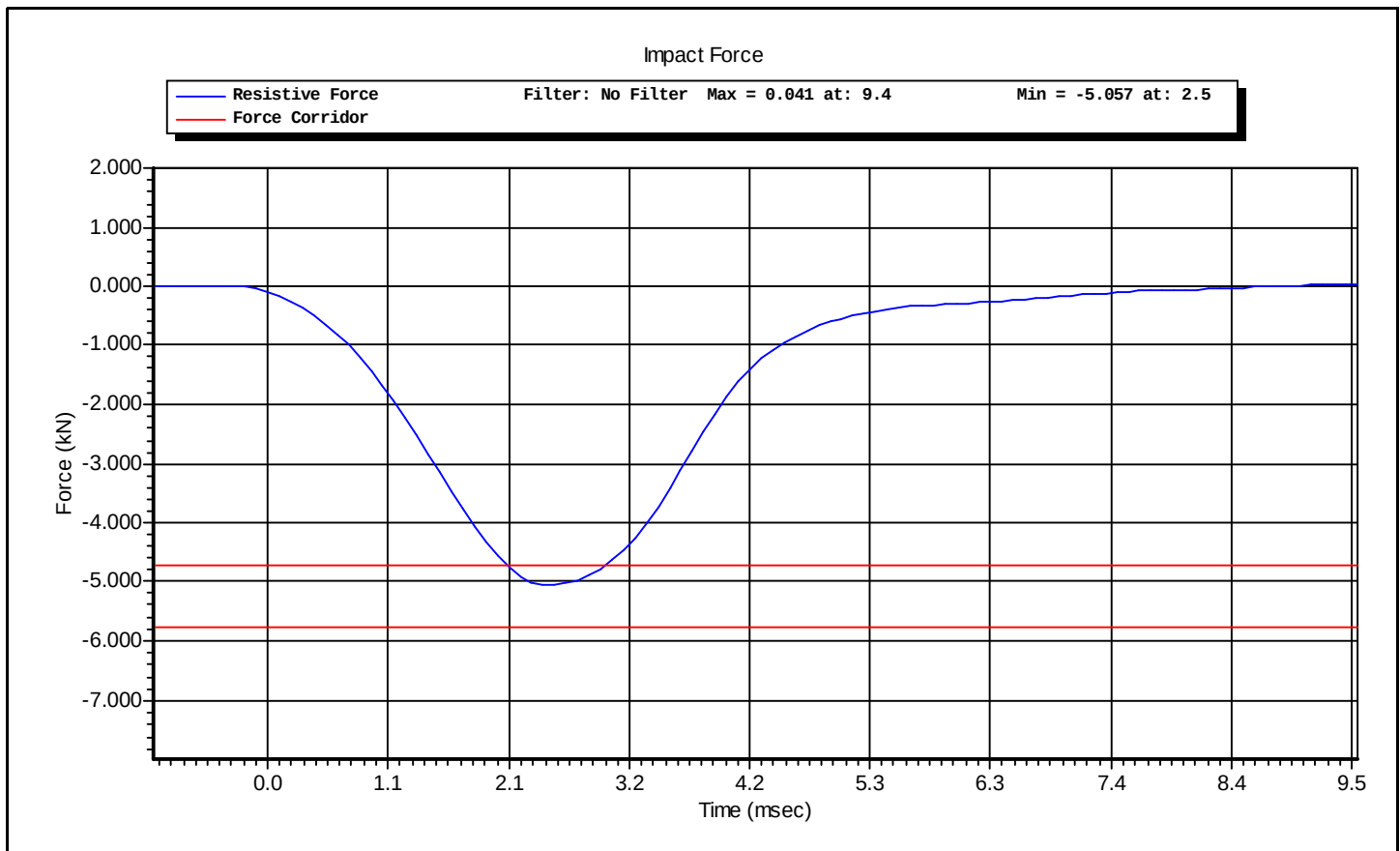


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Left Knee	Test Date:	1/4/2011
Test Number:	1	Test Time:	10:22:01 AM



Test ID: **Left Knee**

Test Time: **10:22:01 AM**

Test Date: **1/4/2011**



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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:	1/4/2011
Test Number:	1	Test Time:	9:44:39 AM

Component Part Number	Component Serial Number
Knee Skin - 780516	3266

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	26.0 %RH P
Velocity	2.07 -- 2.13	2.11 m/s P
Resistive Force	-5.78 -- -4.72	-5.21 kN P

All test parameters are within specifications

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

Test ID: **Right Knee**

Test Time: **9:44:39 AM**

Test Date: **1/4/2011**



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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
CEC	4-202	AC-A44	8/26/2010

Test ID: **Right Knee**

Test Time: **9:44:39 AM**

Test Date: **1/4/2011**

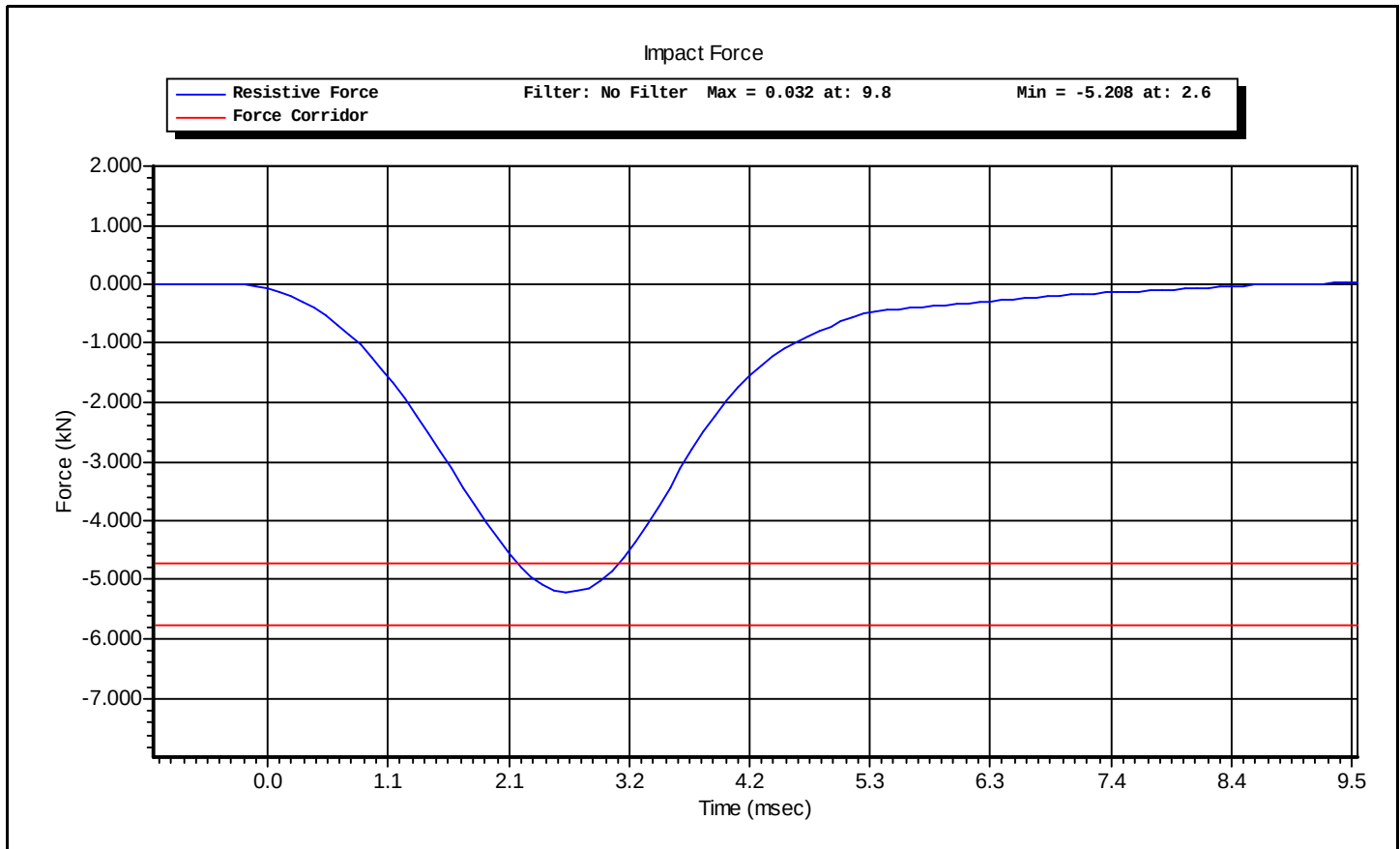


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Test Name:	Knee Impact	Revision:	10/1/2001
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 50'th		
ATD Serial Number:	061		
Test ID:	Right Knee	Test Date:	1/4/2011
Test Number:	1	Test Time:	9:44:39 AM



Test ID: **Right Knee**

Test Time: **9:44:39 AM**

Test Date: **1/4/2011**

CALIBRATION TEST RESULTS

POST-TEST

RIGHT-FRONT PASSENGER DUMMY

S/N: 273

External Measurements

5th Female SN 273

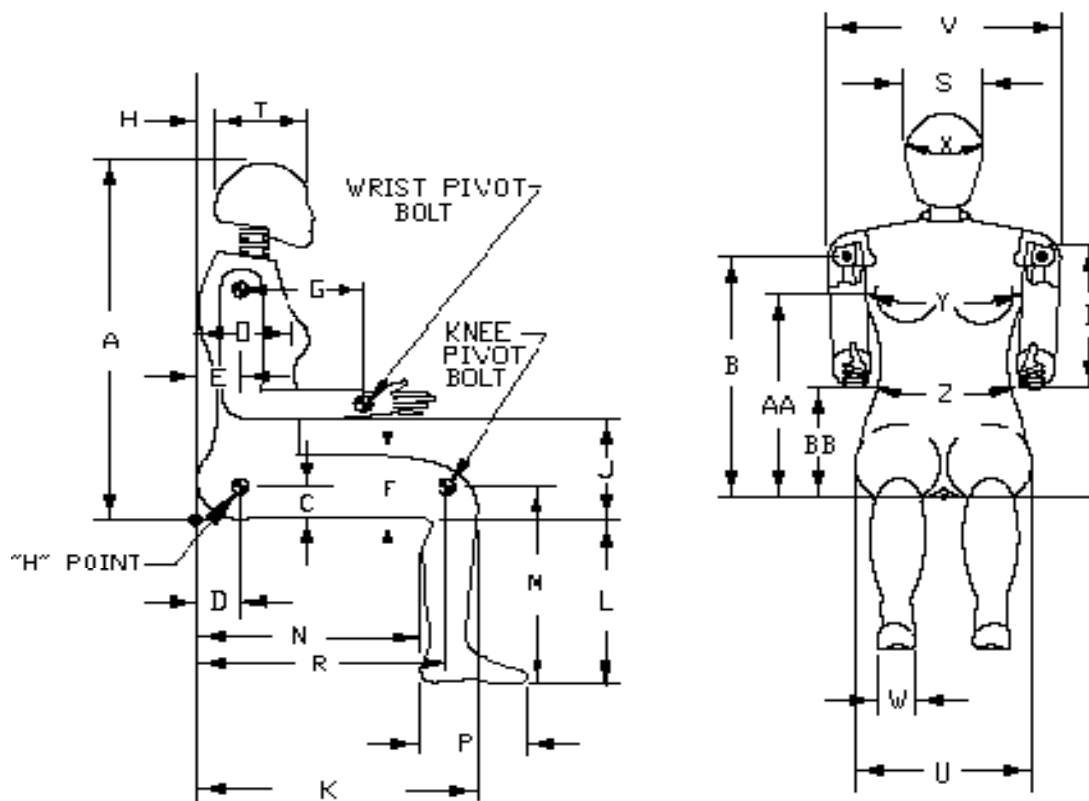
Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	774.7 – 800.1	785	Yes
B	Shoulder Pivot Height	431.8 – 457.2	450	Yes
C	H-Point Height	81.3 – 86.3	85	Yes
D	H-Point from Backline	144.8 – 149.8	148	Yes
E	Shoulder Pivot from Backline	68.6-83.8	76	Yes
F	Thigh Clearance	119.4 – 134.6	130	Yes
G	Back of Elbow to Wrist Pivot	243.9 – 259.1	250	Yes
H	Head Back to Backline	43.2 – 48.2	45	Yes
I	Shoulder to Elbow Length	276.8 – 297.2	282	Yes
J	Elbow Rest Height	182.8 – 203.2	195	Yes
K	Buttock to Knee Length	520.7 – 546.1	529	Yes
L	Popliteal Height	355.6 - 376	361	Yes
M	Knee Pivot Height	393.7 – 419.1	399	Yes
N	Buttock Popliteal Length	414 – 439.4	422	Yes
O	Chest Depth without Jacket	175.3 – 190.5	185	Yes
P	Foot Length (right)	218.5 – 233.7	221	Yes
R	Buttock To Knee Pivot Length	457.2 – 482.6	465	Yes
S	Head Breadth	137.1 – 147.3	144	Yes
T	Head Depth	177.8 - 188	180	Yes
U	Hip Breadth	299.7 – 314.9	311	Yes
V	Shoulder Breadth	350.5 – 365.7	358	Yes
W	Foot Breadth	78.8 - 94	85	Yes
X	Head Circumference	528.3 – 548.7	540	Yes
Y	Chest Circumference with Jacket	850.9 – 881.3	864	Yes
Z	Waist Circumference	759.5 – 789.9	775	Yes
AA	Reference Location (Chest Circumference)	332.7 – 358.1	345	Yes
BB	Reference Location (Waist Circumference)	160.1 – 170.2	165	Yes

Technician: AR

Date: 1/10/2011

Hybrid III 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:	273		
Test ID:	Head Drop	Test Date:	1/10/2011
Test Number:	1	Test Time:	2:55:24 PM

Component Part Number	Component Serial Number
Head Skin - 78051-228	780

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	285 g P
Oscillation	0.0 -- 10.0	2.6 % P
Lateral Acceleration	-15.00 -- 15.00	4.23 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **2:55:24 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: **2:55:24 PM**

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

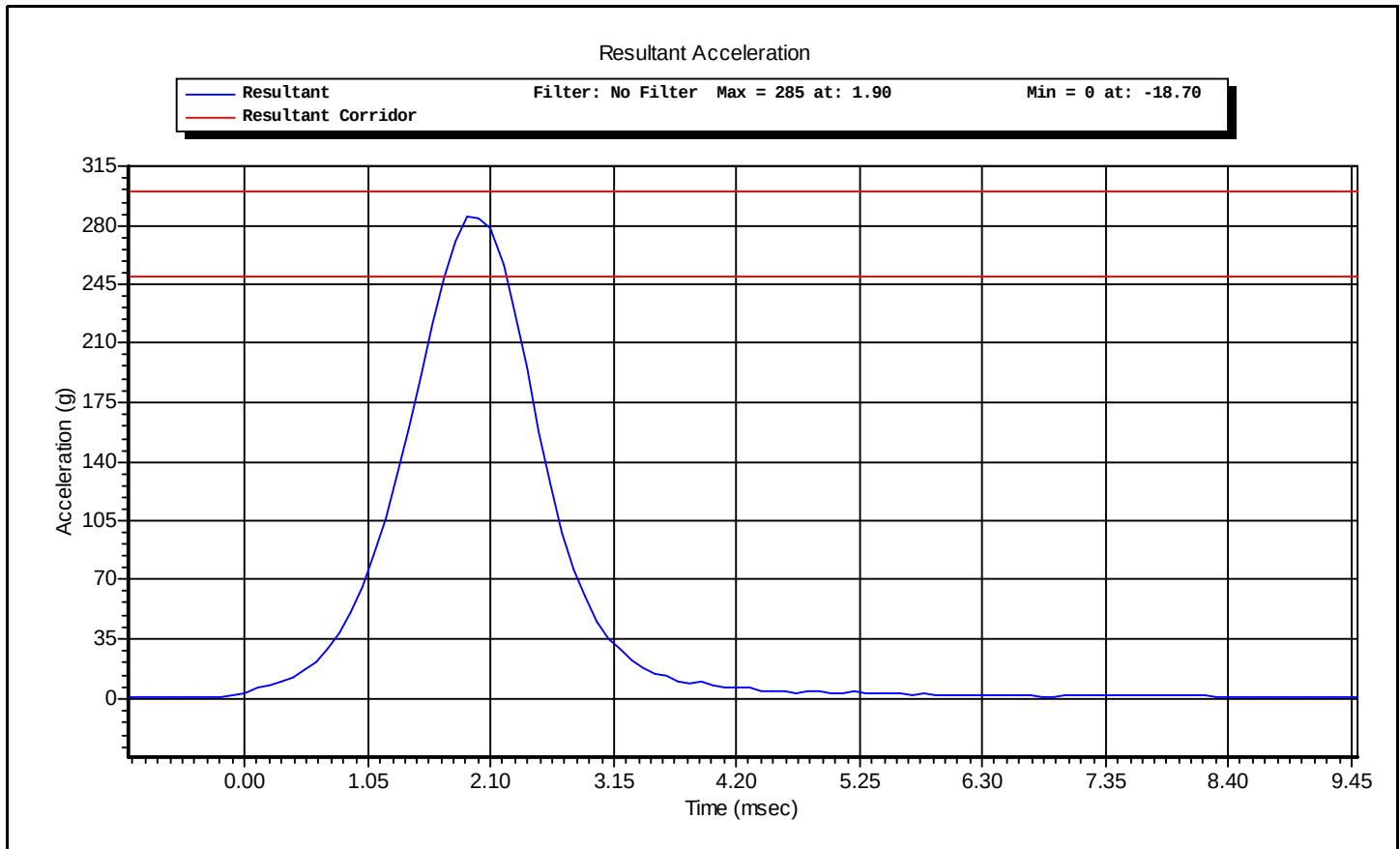


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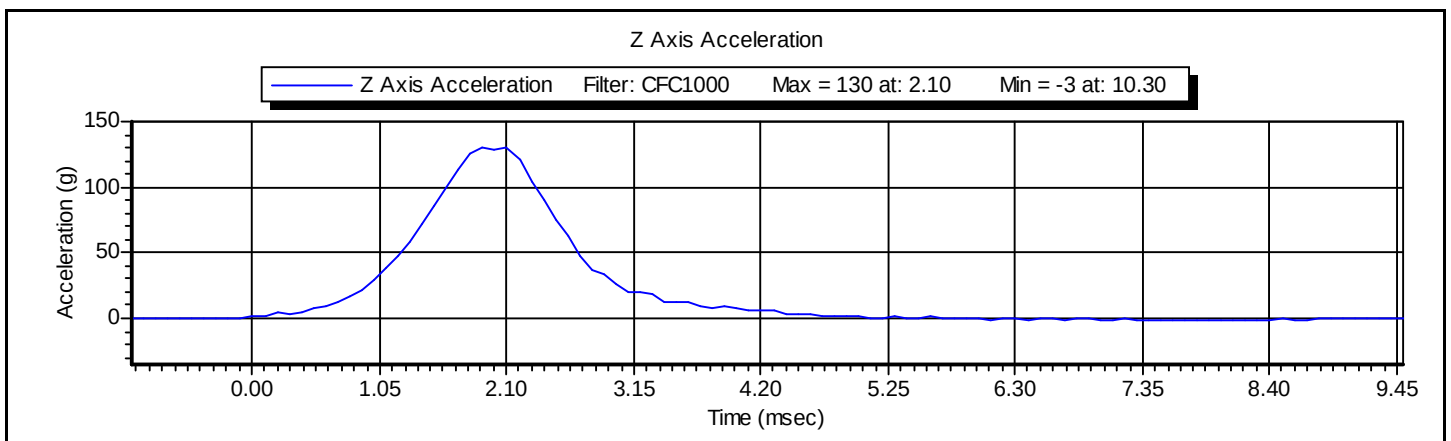
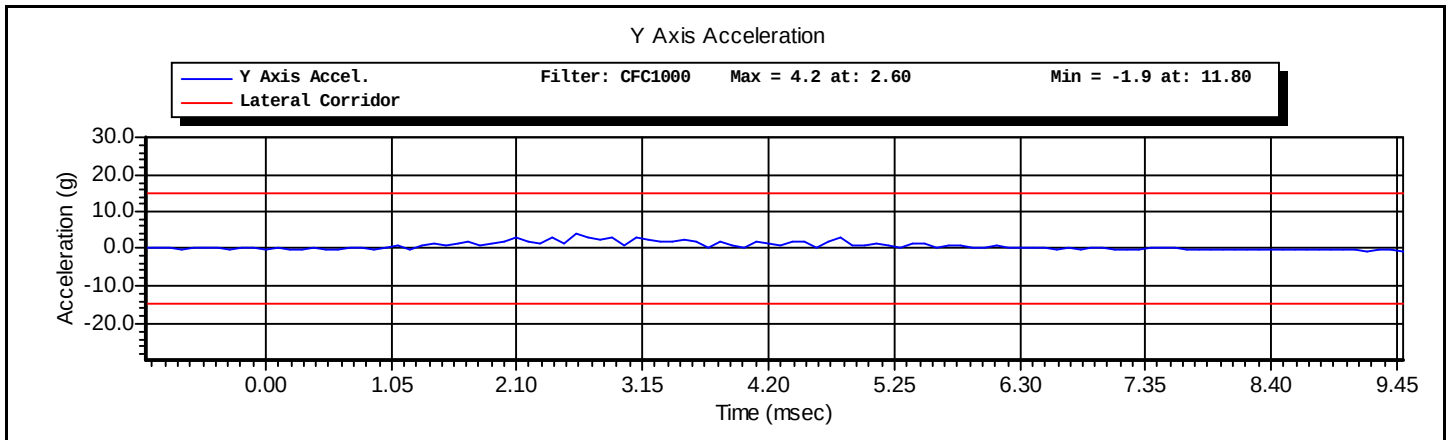
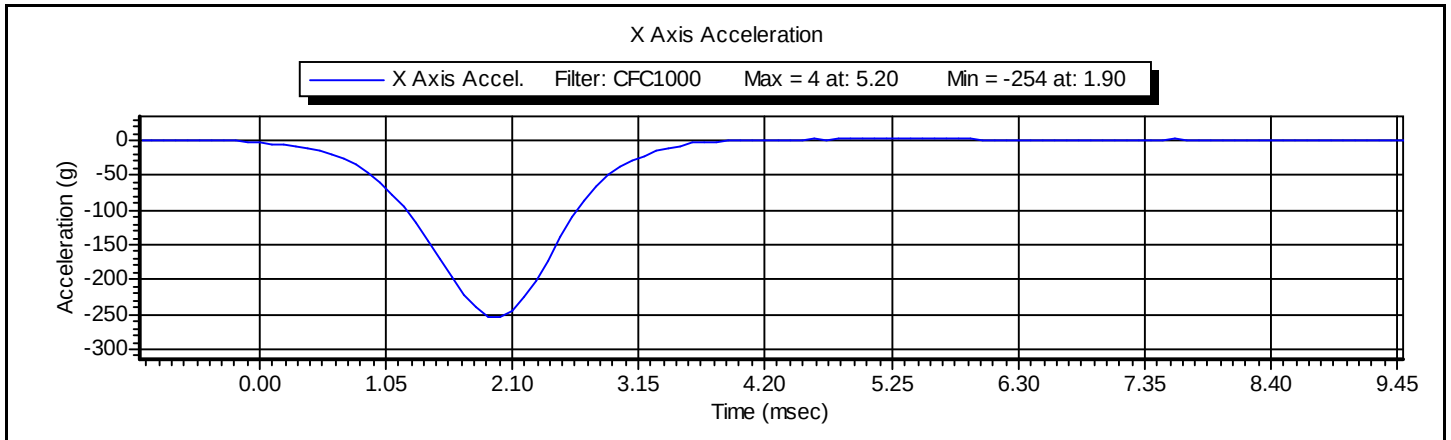
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Head Drop	Test Date:	1/10/2011
Test Number:	1	Test Time:	2:55:24 PM



Test ID: **Head Drop**

Test Time: **2:55:24 PM**

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





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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:	273		
Test ID:	Neck Extension	Test Date:	2/28/2011
Test Number:	2	Test Time:	10:10:42 AM

Component Part Number	Component Serial Number
Neck - 880105-255	2151

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	33 %RH P
Velocity	5.95 -- 6.19	6.08 m/s P
Pendulum Impulse at 10 ms	1.50 -- 1.90	1.83 m/s P
Pendulum Impulse at 20 ms	3.10 -- 3.90	3.54 m/s P
Pendulum Impulse at 30 ms	4.60 -- 5.60	5.28 m/s P
D Plane Rotation	99.0 -- 114.0	101.2 degrees P
Moment During Rotation Interval	-65.0 -- -53.0	-57.6 Nm P
Moment Decay to -10.0 Nm	94.0 -- 114.0	98.8 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Extension**

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

Test Date: **2/28/2011**



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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
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	IF-205	LC-265 My	7/28/2010
Denton	IF-205	LC-265 Fx	7/28/2010

Test ID: **Neck Extension**

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

Test Date: **2/28/2011**

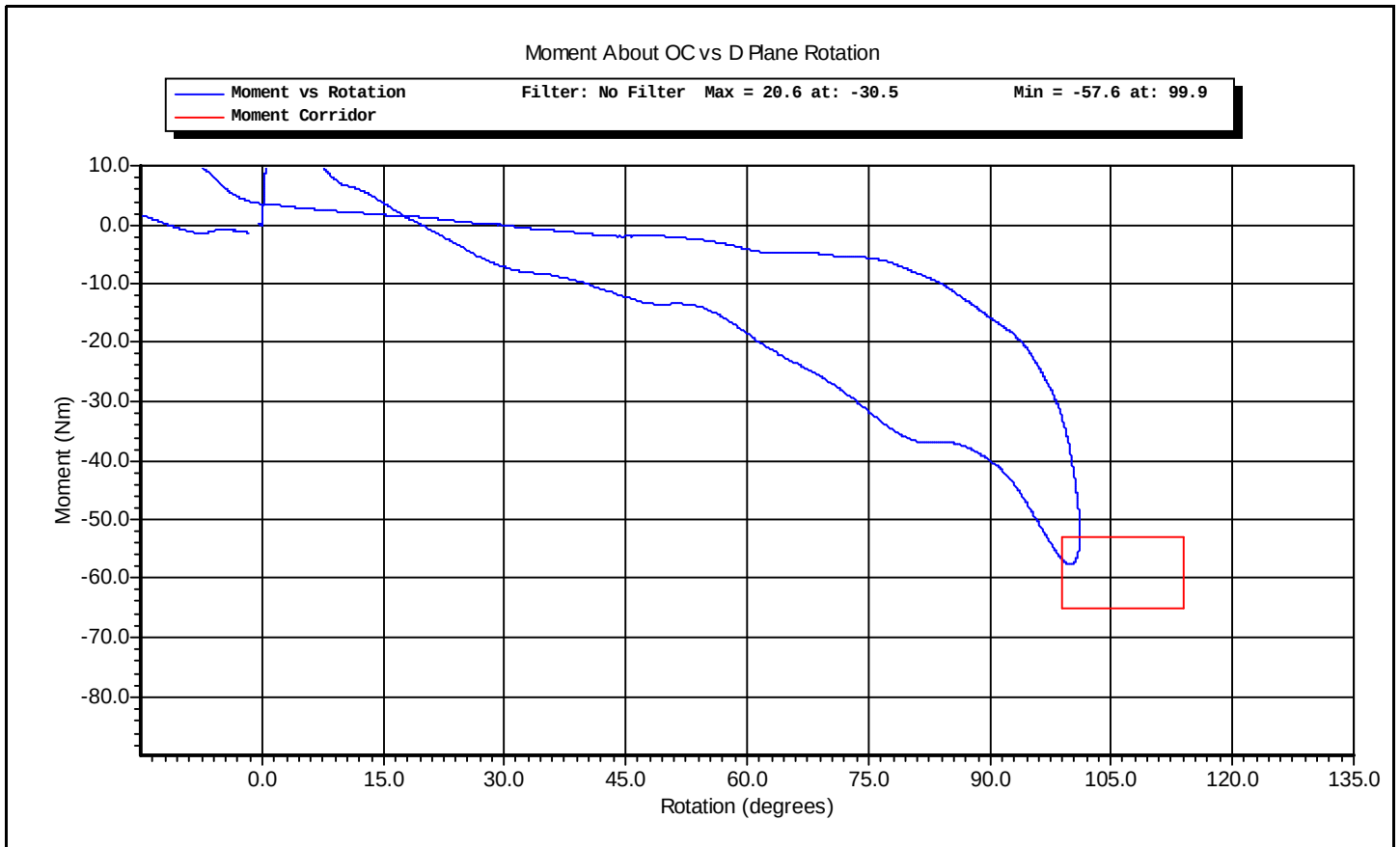


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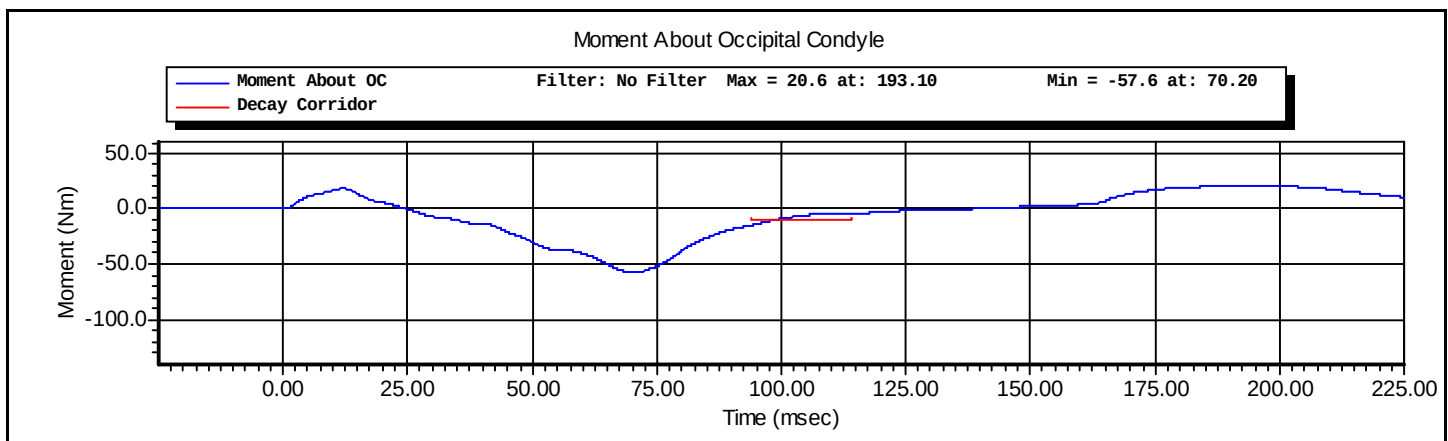
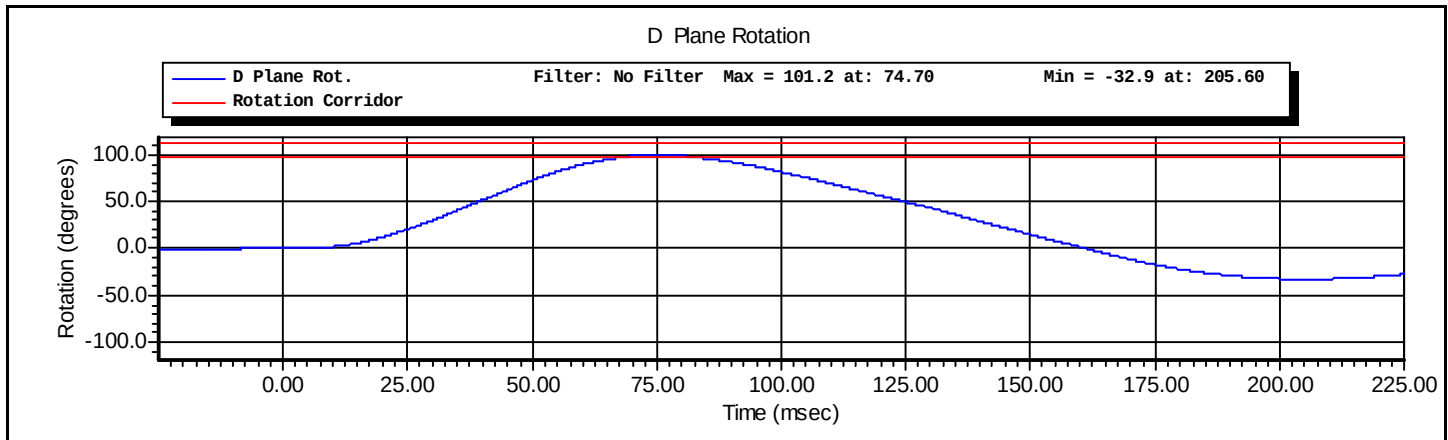
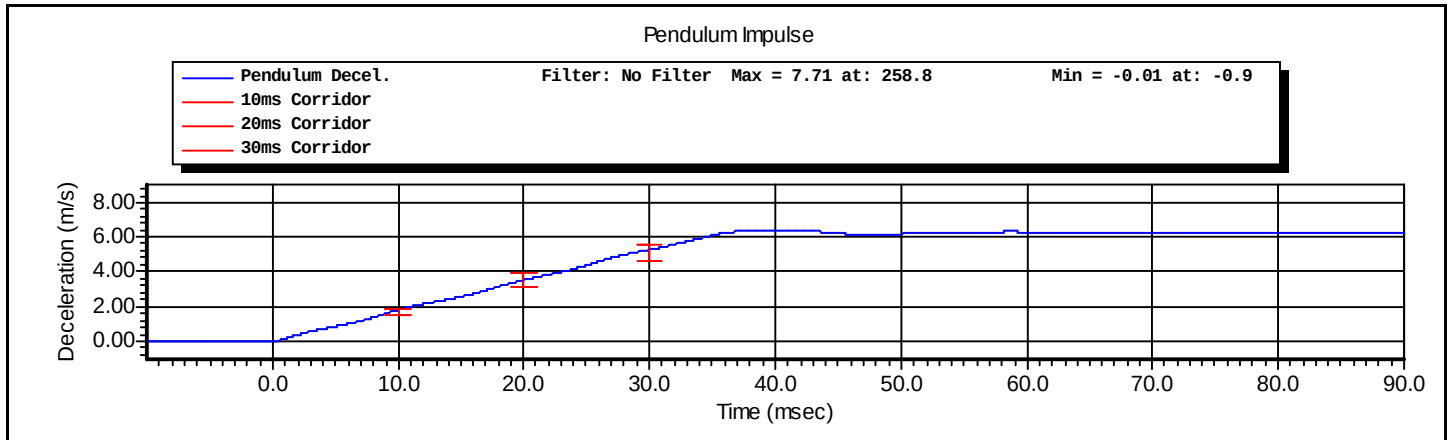
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Extension	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Extension	Test Date:	2/28/2011
Test Number:	2	Test Time:	10:10:42 AM



Test ID: Neck Extension Test Time: 10:10:42 AM

Test Date: 2/28/2011





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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:	273		
Test ID:	Neck Flexion	Test Date:	2/22/2011
Test Number:	2	Test Time:	4:18:27 PM

Component Part Number	Component Serial Number
Neck - 880105-255	2151

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.1 deg C P
Humidity	10 -- 70	16 %RH P
Velocity	6.89 -- 7.13	7.10 m/s P
Pendulum Impulse at 10 ms	2.10 -- 2.50	2.35 m/s P
Pendulum Impulse at 20 ms	4.00 -- 5.00	4.75 m/s P
Pendulum Impulse at 30 ms	5.80 -- 7.00	6.60 m/s P
D Plane Rotation	-91.0 -- -77.0	-77.8 degrees P
Moment During Rotation Interval	69.0 -- 83.0	70.3 Nm P
Moment Decay to 10.0 Nm	80.0 -- 100.0	85.2 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **4:18:27 PM**

Test Date: **2/22/2011**



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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
Endevco	7231CT	C16510	10/21/2010
DentonATD	78051-342	PENDULUM POT	2/7/2011
DentonATD	78051-342	CONDYLE POT	2/7/2011
Denton	IF-205	LC-265 My	7/28/2010
Denton	IF-205	LC-265 Fx	7/28/2010

Test ID: **Neck Flexion**

Test Time: **4:18:27 PM**

Test Date: **2/22/2011**

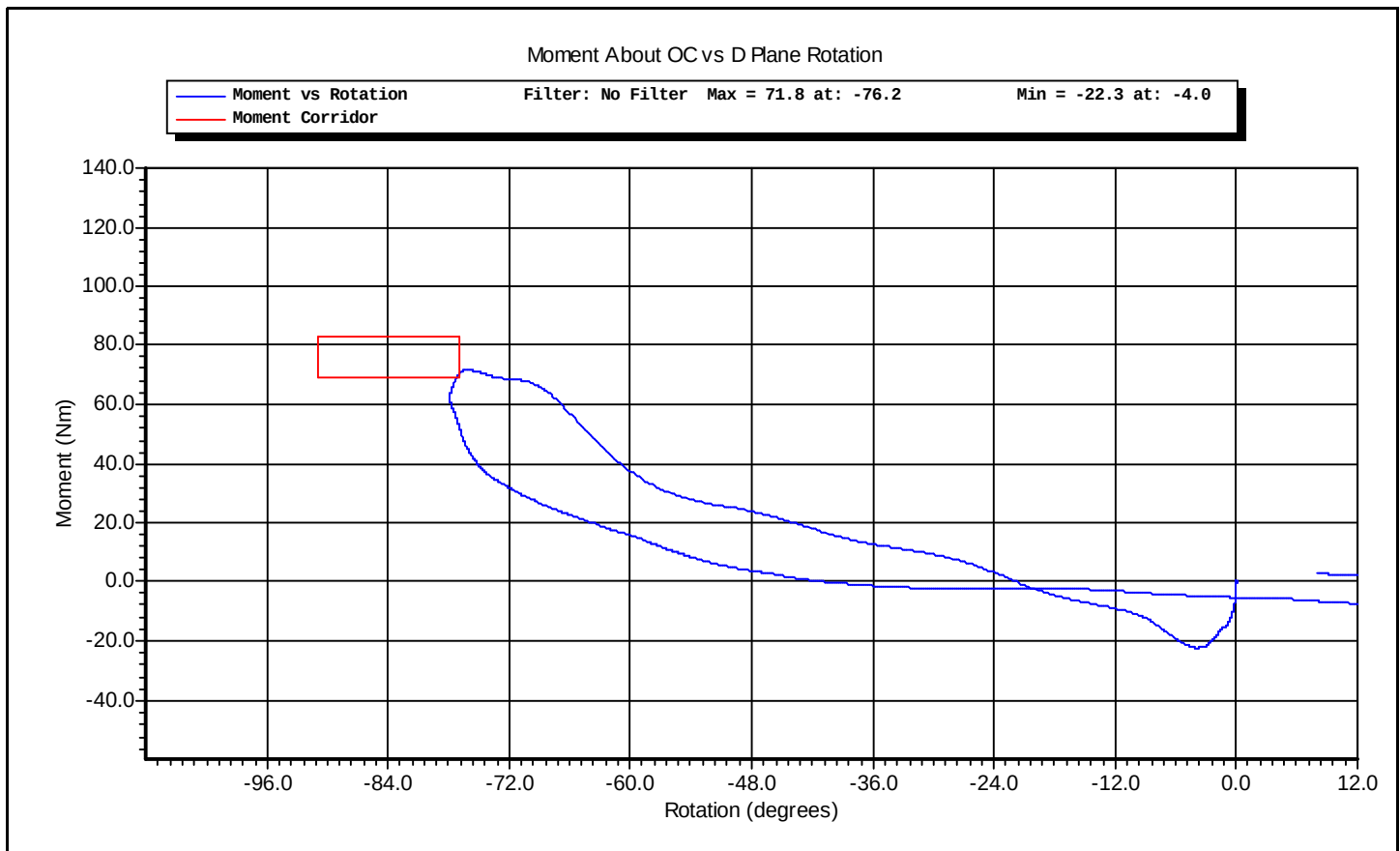


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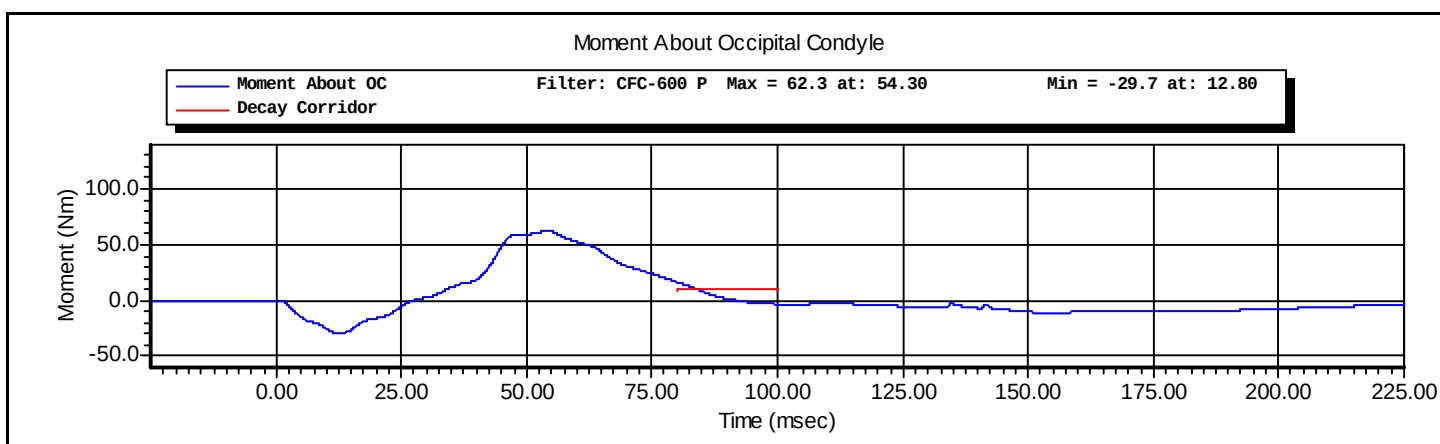
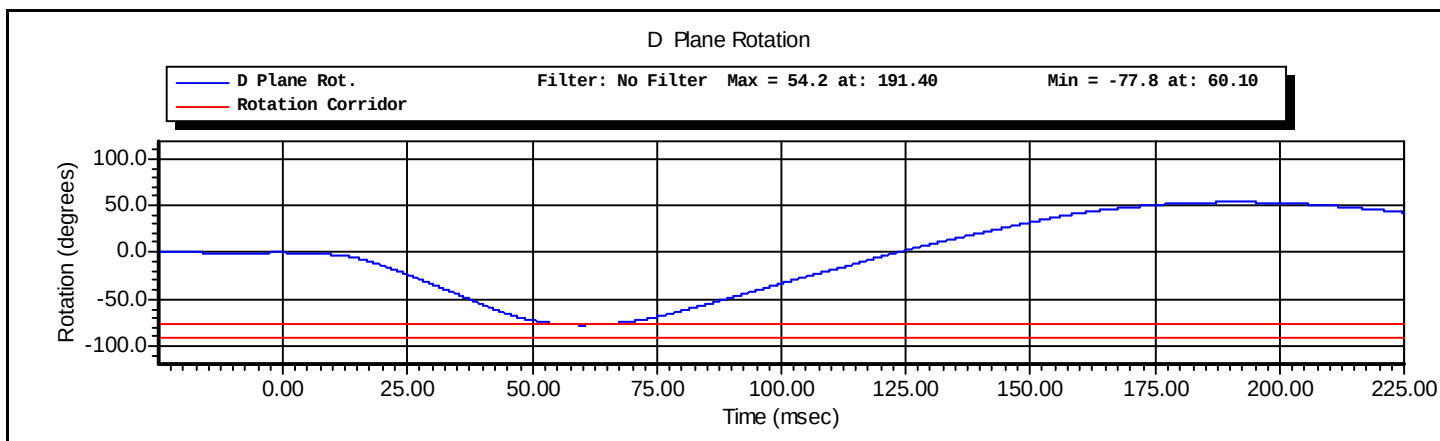
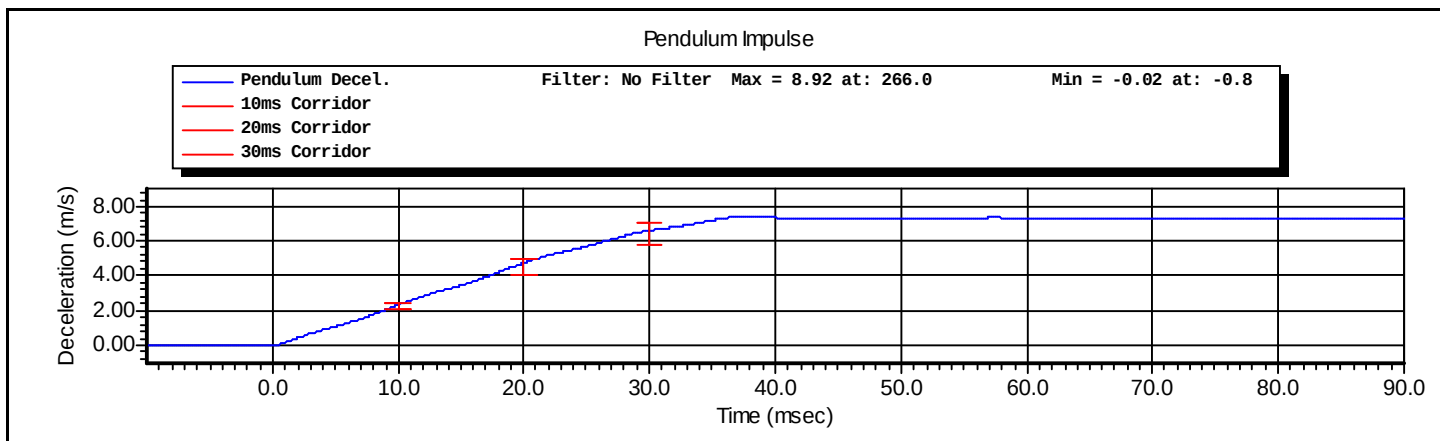
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Neck Flexion	Test Date:	2/22/2011
Test Number:	2	Test Time:	4:18:27 PM



Test ID: Neck Flexion

Test Time: 4:18:27 PM

Test Date: 2/22/2011





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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:	273		
Test ID:	Thorax	Test Date:	12/23/2010
Test Number:	1	Test Time:	3:52:30 PM

Component Part Number	Component Serial Number
Chest Jacket - 880105-355-E	686

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	29.0 %RH P
Velocity	6.59 -- 6.83	6.66 m/s P
Sternum Displacement	-58.0 -- -50.0	-51.6 mm P
Force During Displacement Interval	-4400 -- -3900	-4356 N P
Force -18.0 to -50.0 Displacement	-4600 -- 0	-4333 N P
Hysteresis	69 -- 85	70 % P

All test parameters are within specifications

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

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

Test ID: **Thorax**

Test Time: **3:52:30 PM**

Test Date: **12/23/2010**



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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-273	4/13/2010

Test ID: **Thorax**

Test Time: **3:52:30 PM**

Test Date: **12/23/2010**



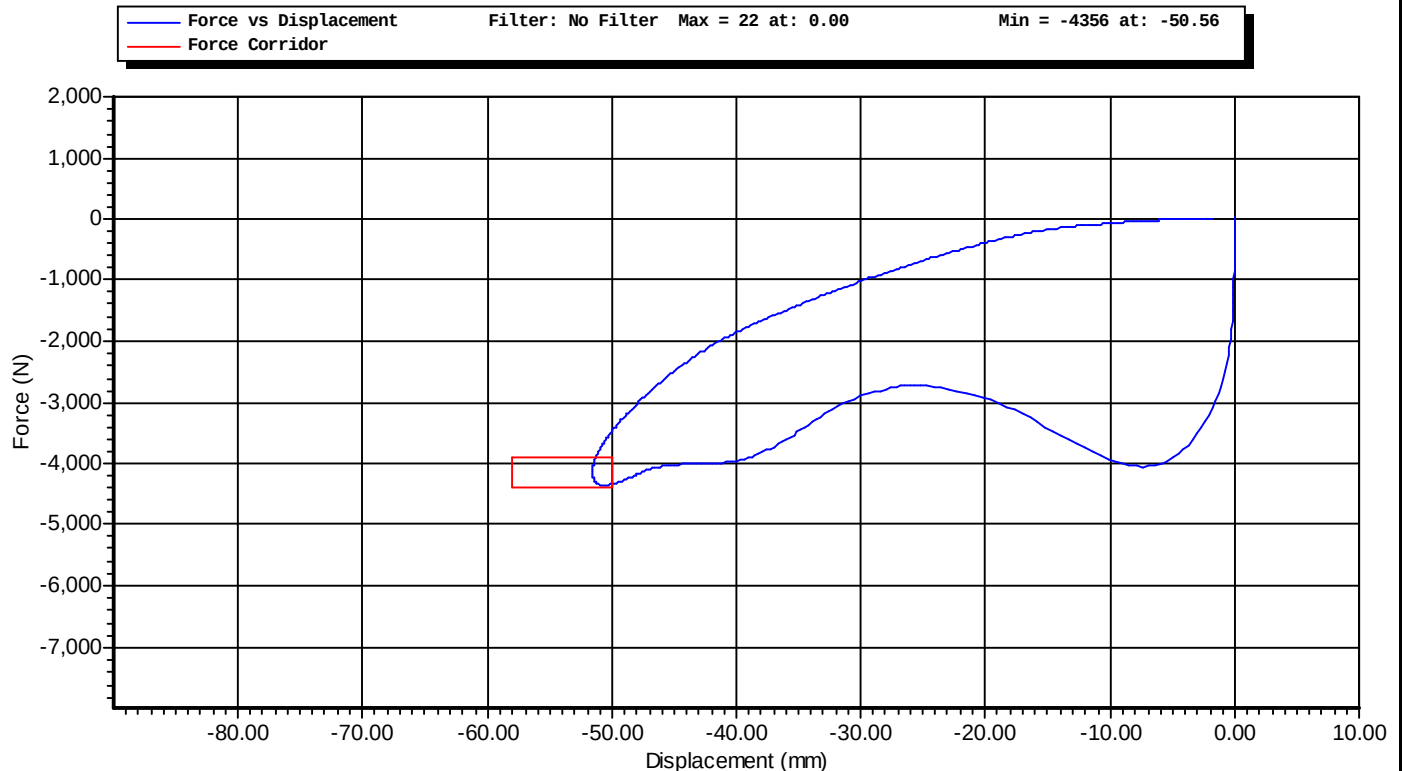
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Test Name:	Thorax Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Thorax	Test Date:	12/23/2010
Test Number:	1	Test Time:	3:52:30 PM

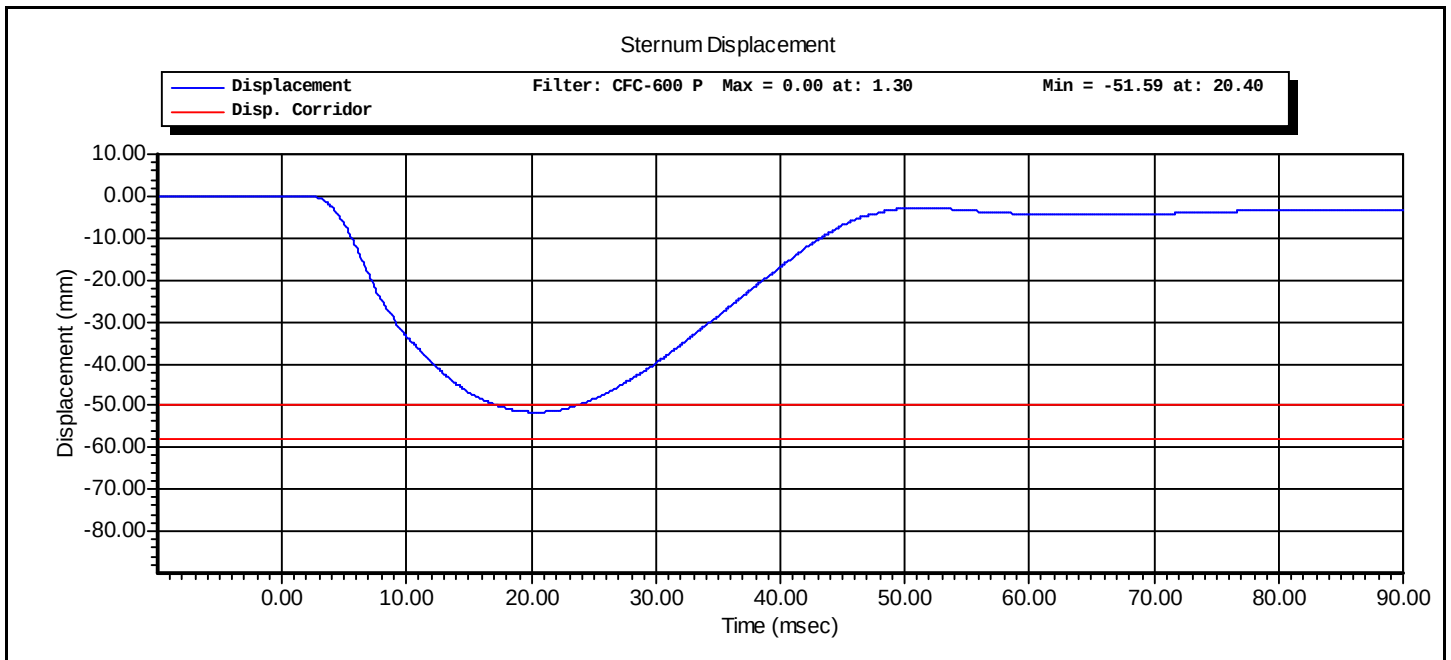
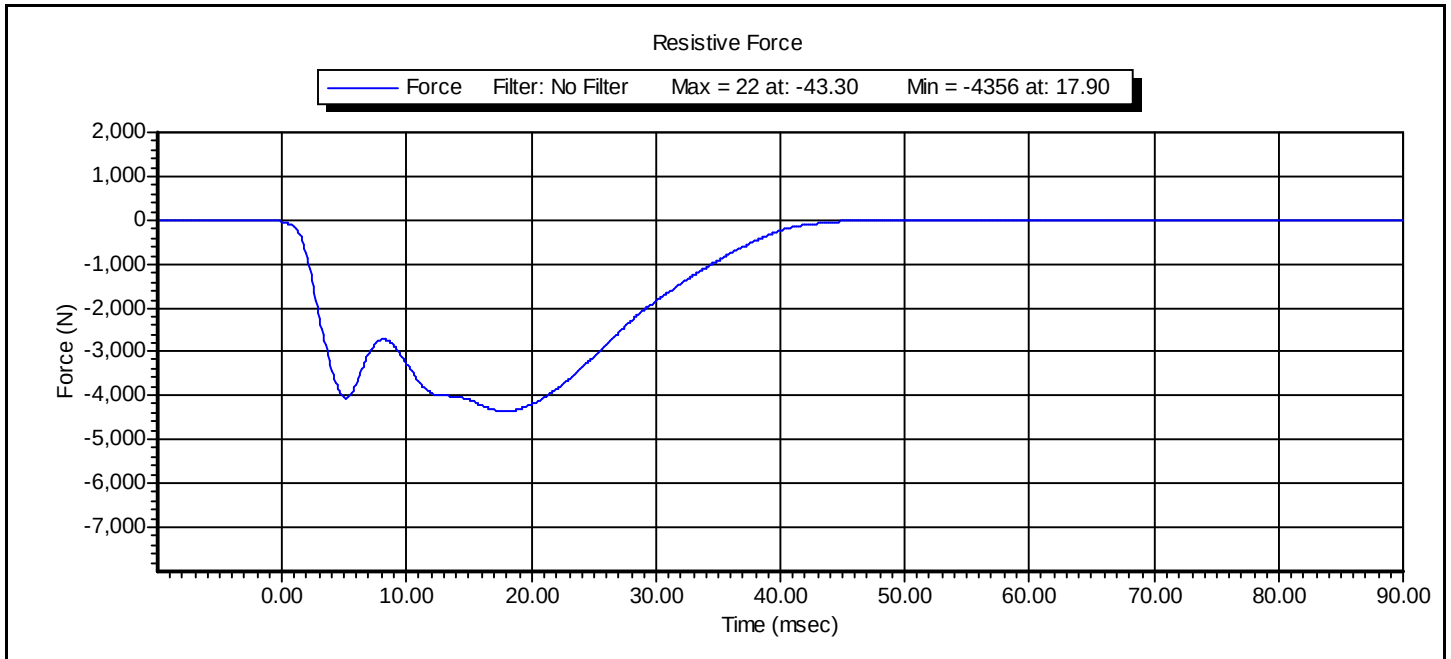
Resistive Force vs Sternum Displacement



Test ID: Thorax

Test Time: 3:52:30 PM

Test Date: 12/23/2010



Torso Flexion Test

Technician: AR

Calibration Date: 1/10/2011

ATD Serial Number: 5th Female 273

Test Results			
Test Condition	Parameters	Results	Status
Temperature	18.9-25.6° C	21.7° C	P
Lab Humidity: 38%	10-70%	25%	P
Max Force @ 45 deg	320 – 390N	362N	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	19°	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:	273		
Test ID:	Left Knee	Test Date:	1/20/2011
Test Number:	1	Test Time:	8:20:33 AM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1726

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.0 deg C P
Humidity	10.0 -- 70.0	18.0 %RH P
Velocity	2.07 -- 2.13	2.11 m/s P
Resistive Force	-4060 -- -3450	-3722 N P

All test parameters are within specifications

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

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

Test ID: **Left Knee**

Test Time: **8:20:33 AM**

Test Date: **1/20/2011**



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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: **8:20:33 AM**

Test Date: **1/20/2011**

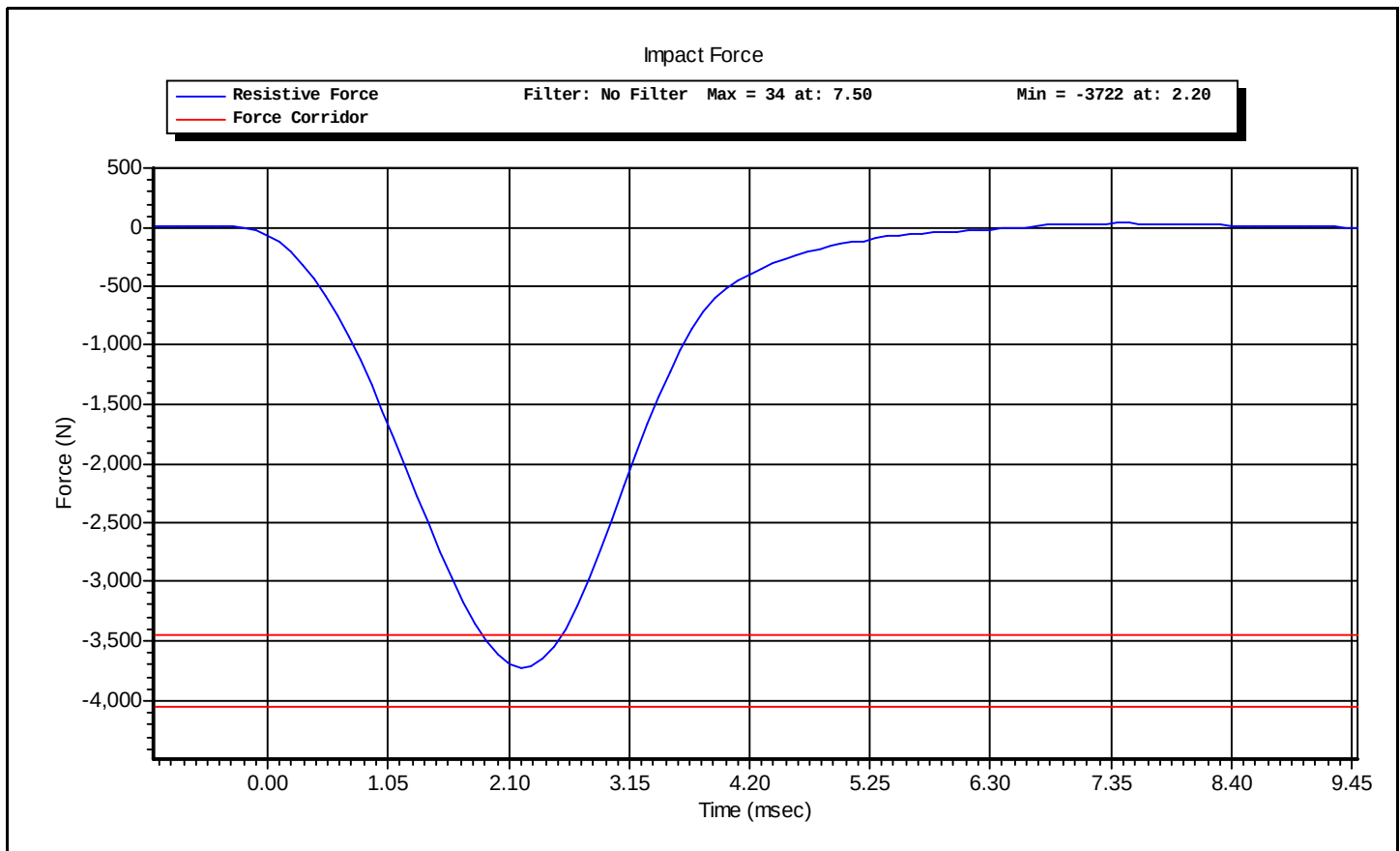


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Test Name:	Knee Impact	Revision:	7/15/2002
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	Hybrid III 5'th		
ATD Serial Number:	273		
Test ID:	Left Knee	Test Date:	1/20/2011
Test Number:	1	Test Time:	8:20:33 AM



Test ID: **Left Knee**

Test Time: **8:20:33 AM**

Test Date: **1/20/2011**



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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:	273		
Test ID:	Right Knee	Test Date:	1/19/2011
Test Number:	1	Test Time:	4:17:32 PM

Component Part Number	Component Serial Number
Knee Skin - 880105-508	1051

Test Parameters	Test Specifications	Test Results
Temperature	18.9 -- 25.6	22.2 deg C P
Humidity	10.0 -- 70.0	23.0 %RH P
Velocity	2.07 -- 2.13	2.10 m/s P
Resistive Force	-4060 -- -3450	-3777 N P

All test parameters are within specifications

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

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

Test ID: **Right Knee**

Test Time: **4:17:32 PM**

Test Date: **1/19/2011**



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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: **4:17:32 PM**

Test Date: **1/19/2011**

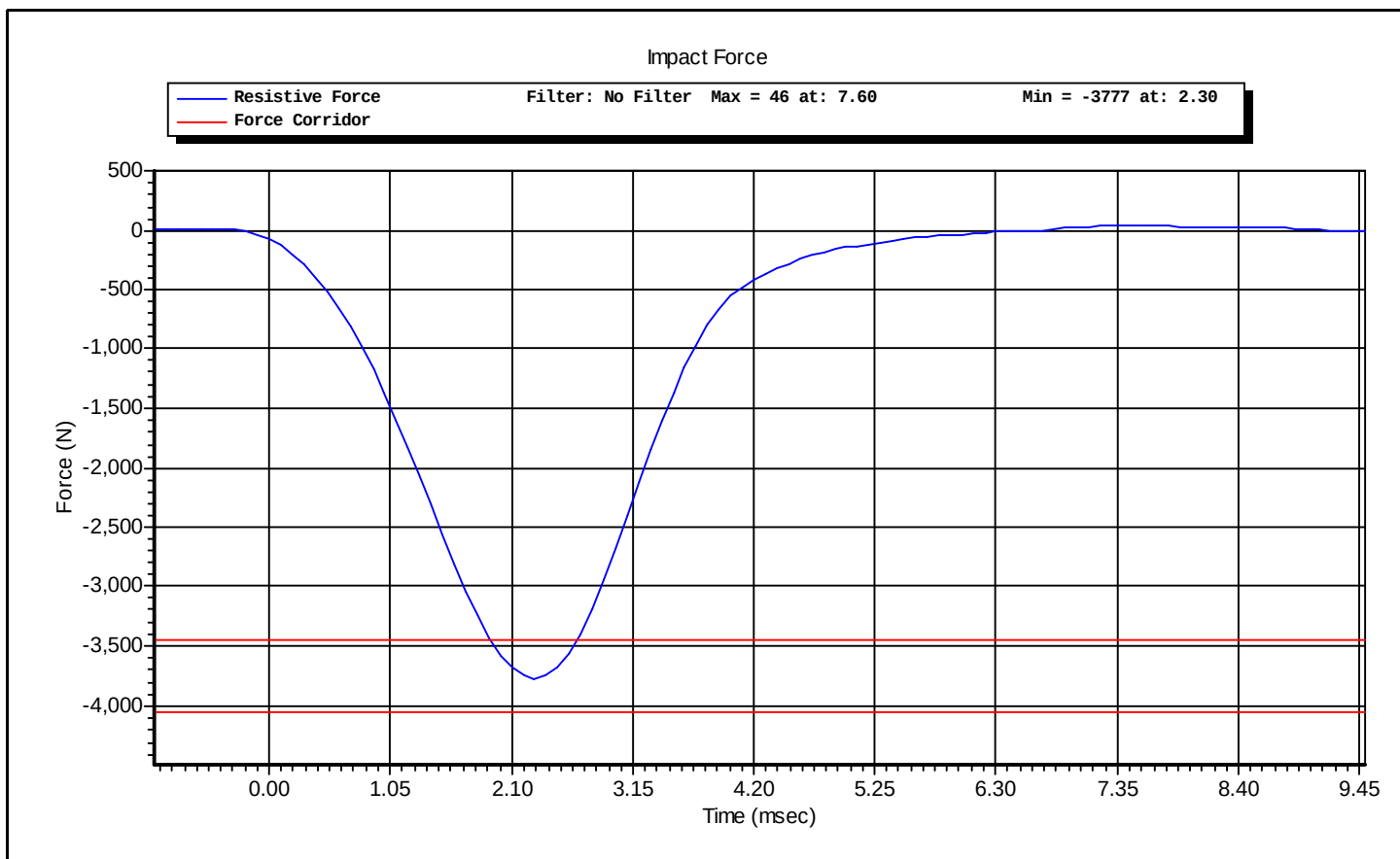


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Test Date: **1/19/2011**

