

REPORT NUMBER: NCAP-CAL-11-0025

**NEW CAR ASSESSMENT PROGRAM (NCAP)
SIDE IMPACT POLE TEST**

**Toyota Canada
2011 Toyota Rav4
Utility Vehicle**

NHTSA NUMBER: MB5115

**PREPARED BY:
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December 30, 2010

FINAL REPORT

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FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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16. Abstract A 32.2 km/h (20 mph), 75° oblique impact Side NCAP Test was conducted on the subject 2011 Toyota Rav4 Utility Vehicle in accordance with the specifications of the Office of Crashworthiness Standards Side NCAP Pole Laboratory Test Procedure for the generation of consumer information on vehicle side pole crash protection. This test was conducted at the Calspan Corporation Crash Test Facility in Buffalo, New York, on 11/9/2010. The impact velocity was 32.6 km/h, and the ambient temperature at the struck (driver's) side of the vehicle was 22°C. The test vehicle post-test maximum crush was 402 mm at level 3. The test vehicle's occupant performance is as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th style="width: 50%;"></th> <th colspan="3" style="text-align: center;">Driver ATD (SID-IIs)</th> </tr> <tr> <th style="text-align: left;">Measurement Description</th> <th style="text-align: center;">Units</th> <th style="text-align: center;">Threshold</th> <th style="text-align: center;">Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₈)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">618.45</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td style="text-align: center;">Gs</td> <td style="text-align: center;">82</td> <td style="text-align: center;">78.43</td> </tr> <tr> <td>Combined Acetabular and Iliac Pelvic Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">4903.90</td> </tr> </tbody> </table> The two doors on the struck side of the vehicle did not separate from the body at the hinges or latches and the opposite doors did not open during the side impact event.					Driver ATD (SID-IIs)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₈)	N/A	1000	618.45	Resultant Lower Spine Acceleration	Gs	82	78.43	Combined Acetabular and Iliac Pelvic Force	N	5525	4903.90
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SECTION 1

PURPOSE AND TEST PROCEDURE

PURPOSE

This side impact test was conducted as part of the MY 2011 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under Contract No. DTNH22-09-00126. The purpose of this test is to generate comparative side impact performance in a 2011 Toyota Rav4 Utility Vehicle manufactured by Toyota Canada. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Side NCAP Pole Laboratory Test Procedure, dated January 2010.

SECTION 2

SUMMARY OF NCAP SIDE IMPACT TEST

A rigid pole side test was conducted on a 2011 Toyota Rav4 Utility Vehicle. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.6 km/h. The test was conducted by Calspan Corporation Transportation Research Group on 11/9/2010. Pre-test and post test photographs of the test vehicle and side impact dummy (SID-IIs) are included in Appendix A of this report.

One Part 572V (SID-IIs) dummy was placed in the driver designated seating position according to instructions specified in the OCWS Side NCAP Pole Laboratory Test Procedure, dated January 2010. Camera locations and other pertinent camera information are included in this report.

The Part 572V (SID-IIs) Dummy was instrumented accordingly:

Head CG Triaxial Accelerometers
Thorax Upper, Middle, and Lower Rib Displacement Potentiometers
Abdomen Upper and Lower Rib Displacement Potentiometers
Lower Spine Triaxial Accelerometers
Iliac Load Cell
Acetabulum Load Cell

Appendix B contains the dummy response data. Dummy configuration and performance verification data can be found in Appendix C of this report.

The following table summarizes the results of the test:

Dummy	HIC (36ms)	Resultant Lower Spine Acceleration	Pelvic Force (N)
SID-IIs 5th percentile female	618.45	78.43	Iliac Wing = 1943.85
			Acetabular = 3215.25
			Sum = 4903.90

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1	
	Mounted	Deployed
Frontal Airbag	Yes	No
Knee Airbag	No	NA
Side Curtain Airbag	Yes	Yes
Side Torso Airbag	Yes	Yes
Seat Belt Pretensioner	Yes	Yes
Seat Belt Load Limiter	Yes	No

GENERAL COMMENTS:

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

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

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB5115	Anti-Lock Brakes	Yes
Model Year	2011	All-Wheel Drive	No
Make	Toyota	Power Steering	Yes
Model	Rav4	Driver Front Airbag	Yes
Body Style	Utility Vehicle	Driver Curtain Airbag	Yes
VIN	2T3ZF4DV3BW055933	Driver Head/Torso Airbag	No
Body Color	Brown	Driver Torso Airbag	Yes
Delivery Date	10/18/2010	Driver Torso/Pelvis Airbag	No
Odometer Reading (km/mi)	35 / 22	Driver Pelvis Airbag	No
Dealer	Basil Toyota	Driver Knee Airbag	No
Transmission	4 Speed Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Front Wheel Drive	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	v4	Rear Pass. Torso Airbag	No
Engine Displacement (L)	2.5	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Transverse	Rear Pass. Pelvis Airbag	No
Roof Rack	Yes	Pretensioners	Yes
Sunroof/T-Top	No	Load Limiters	Yes
Tinted Glass	Yes	Automatic Door Locks	No
Traction Control	Yes	Bucket Seats	Yes
Power Brakes	Yes	Tilt Steering	Yes
Front Disc	Yes	Other	--
Rear Disc	Yes	Other	

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

NA

DATA FROM CERTIFICATION LABEL

Manufactured By	Toyota Canada	GVWR (kg)	2035
Date of Manufacture	9/10	GAWR Front (kg)	1145
		GAWR Rear (kg)	1100

VEHICLE SEATING AND WEIGHT CAPACITY DATA

	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	NA	5
Vehicle Capacity Weight (VCW) (kg)				375
DSC X 68.04 kg				340.2
Rated Cargo and Luggage Weight (RCLW) (kg)				34.8

(A)

(B)

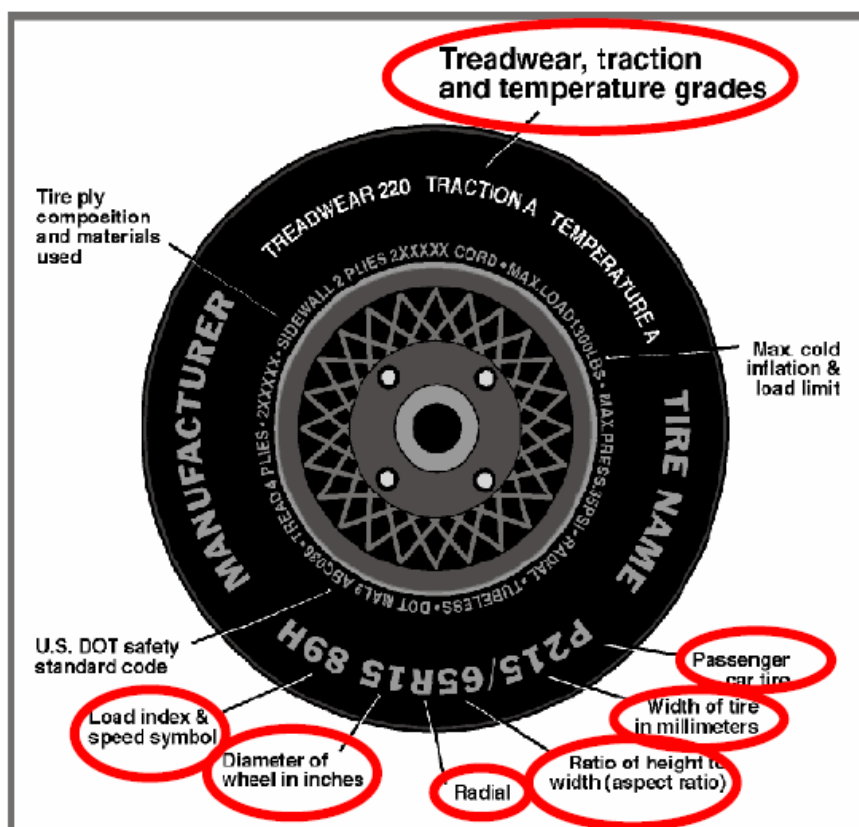
(A-B)

VEHICLE SEAT TYPE

	Type of Seat Pan				Type of Seat Back		
Seating Location	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat	X					X	
Rear or Second Row Seat			X			X	
Third row seat							

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

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010



Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Cold Pressure (kPa)	220	220
Recommended Tire Size	P225/65R17	P225/65R17
Tire Size on Vehicle	P225/65R17	P225/65R17
Tire Model	Dueler	Dueler
Tire Manufacturer	Bridgestone	Bridgestone
Treadwear	300	300
Traction	B	B
Temperature Grades	A	A
Tire Plies Sidewall	2 Polyester	2 Polyester
Tire Plies Body	2 Steel, 1 polyester, 1 nylon	2 Steel, 1 Polyester, 1 Nylon
Load Index/Speed Symbol	101h	101h
Tire Material	Rubber	Rubber
DOT Safety Code Right	EPF5CFK2510	EPF5CFK2510
DOT Safety Code Left	EPF5CFK2510	EPF5CFK2510

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

Test Vehicle: 2011 Toyota Rav4 NHTSA No: MB5115
 Test Program: Side Pole NCAP Test Date: 11/9/2010

TEST VEHICLE AXLE WEIGHTS

	Unit s	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	464	326		484	360		484	365	
Right	kg	430	322		430	346		436	346	
Ratio	%	58	42		56	44		56	44	
Totals	kg	894	648	1542	914	706	1620	920	711	1631

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	1542	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	51.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	34.8	(C)
Calculated Vehicle Target Weight (TVTW)	kg	1628	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded
Driver Door Sill Angle (front-to-rear)*	Deg.	-0.5	-0.5	-0.5
Front Passenger Sill Angle (front-to-rear)*	Deg.	0.2	0.6	0.2
Front Bumper Angle (left-to-right)**	Deg.	0	0.4	0.1
Rear Bumper Angle (left-to-right)**	Deg.	-0.2	-0.2	-0.4
Vehicle CG (Aft of Front Axle)	mm	1117	1158	1159
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	-21	-36	-36

* Front up is positive

** Left up is positive

GENERAL VEHICLE TEST DATA

Measurement Description	Units	Value
Weight of Ballast in Cargo Area	kg	0
Weight of Vehicle Components Removed	kg	0

Vehicle parts removed to make Target Vehicle Test Weight:
 None

TEST VEHICLE IMPACT POINT DATA

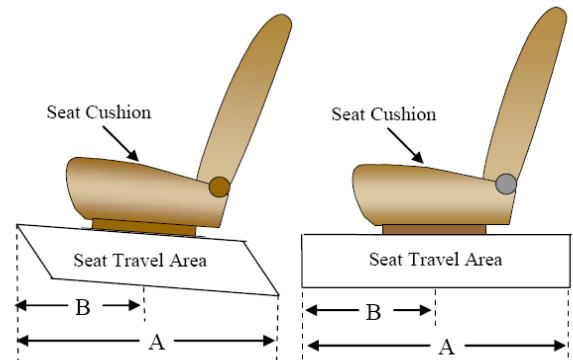
Measured Parameter	Units	Value
Vertical Impact Reference Line (Aft of Front Axle)	mm	1042
Actual Impact Point (Aft of Front Axle)	mm	1026
Impact Point Difference (- forward / + rearward)	mm	-16

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

Test Vehicle: 2011 Toyota Rav4 NHTSA No: MB5115
 Test Program: Side Pole NCAP Test Date: 11/9/2010

SEAT FORE/AFT POSITIONS

Seat moved to the forward most position of Fore/Aft travel

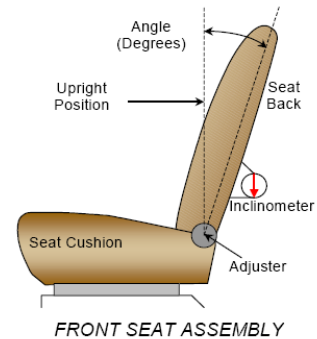


SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel (mm)	Placed in Detent # or Position (mm)
Driver Seat	16	0

SEAT BACK ANGLE POSITION

Seat back adjusted to position which allowed for a 0 degree head angle on the SID-IIs driver dummy



SEAT BACK ANGLE

	Degrees	Detent
Driver Seat Back Angle with Seated Dummy	7	NA

SEAT BELT UPPER ANCHORAGES

The drivers upper belt anchorage was adjusted to the topmost position of 4 possible positions

SEAT BELT UPPER ANCHORAGE POSITIONING

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

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

Test Vehicle: 2011 Toyota Rav4

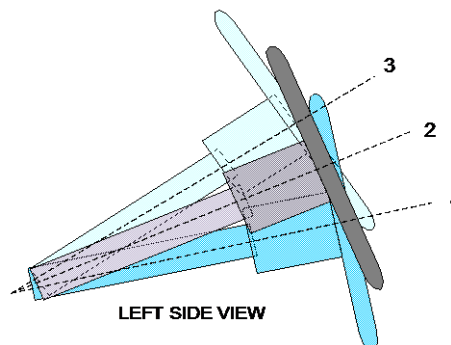
NHTSA No: MB5115

Test Program: Side Pole NCAP

Test Date: 11/9/2010

STEERING COLUMN ADJUSTMENT

Steering column adjusted to mid point of tilt
and mid-point of telescoping travel



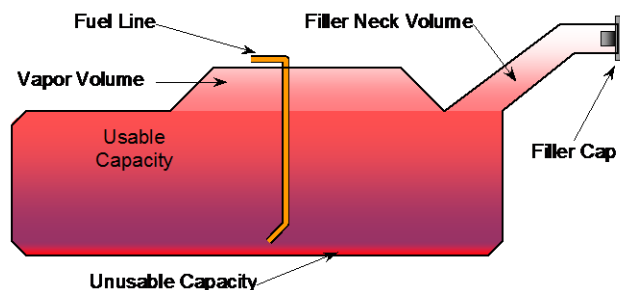
STEERING COLUMN ASSEMBLY

STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	60	
Geometric Center, Position No. 2	62	
Uppermost, Position No. 3	64	
Telescoping Steering Wheel Travel		30
Test Position	62	15

FUEL PUMP

Fuel was evacuated from the vehicle using
manufacturer specifications listed in Form 1



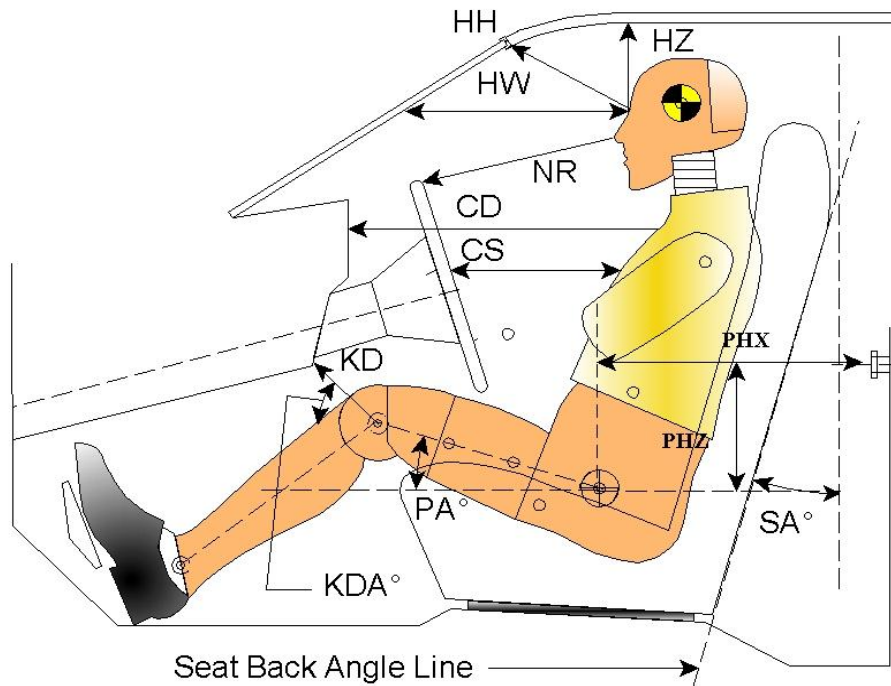
VEHICLE FUEL TANK ASSEMBLY

FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	60.0
Usable Capacity of "Optional Tank"	NA
Usable Capacity of Standard Tank as Specified in Owner's Manual	60.0
Usable Capacity of Optional Tank as Specified in Owner's Manual	NA
92-94% of Usable Capacity	55.2-56.4
Actual Amount of Solvent Used in Test	55.5
1/3 of Usable Capacity	20.0

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010



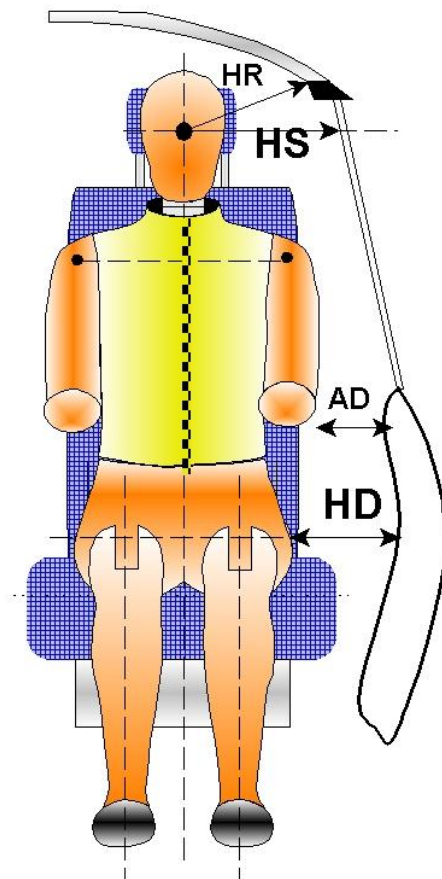
DUMMY ID# _____

Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	268	
HW	Head to Windshield	503	
HZ	Head to Roof	255	
NR	Nose to Rim	251	
CD	Chest to Dash	390	
CS	Chest to Steering Wheel	165	
KDL/KDAL°	Left Knee to Dash	90	25
KDR/KDAR°	Right Knee to Dash	75	20
PA°	Pelvic Angle		17
PHX	H-Point to Striker (X-Axis)	360	
PHZ	H-Point to Striker (Z-Axis)	191	
SA°	Seat Back Angle		7

* Measured from Head-restraint post

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010

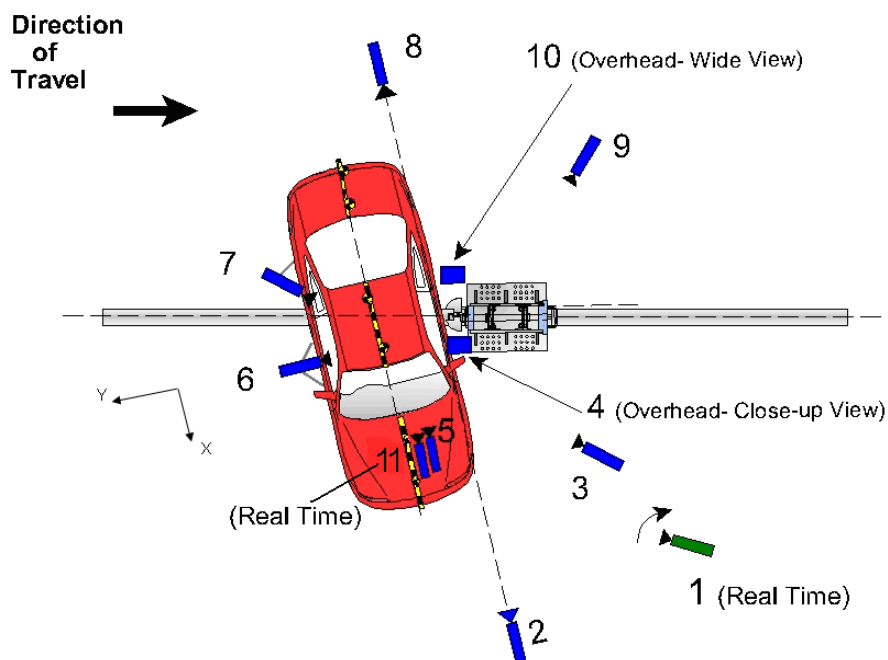


DUMMY ID# _____

Code	Measurement Description	Length (mm)
HR	Head To Side Header	247
HS	Head to Side Window	382
AD	Arm to Door	88
HD	H-Point to Door	221

**DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA**

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010



REFERENCE (from Point of Impact for X and Y; from Ground for Z):
+ X = Forward of vehicle, + Y = Right of vehicle, + Z = Down

Camera No.	View	Coordinates (mm)			Lens (mm)	Film Speed (fps)
		X*	Y*	Z*		
1	Real time (24-30 fps) pan view of impact	-	-	-	-	24
2	Front ground level - impact view	2030	7010	980	28	1000
3	Impact side 45° - forward pole view	-2450	2340	1805	24	1000
4	Overhead Close-up view of impact				24	1000
5	Onboard – dummy front view				25	500
6	Onboard – dummy side view				12.5	500
7	Onboard – dummy rear oblique view				12.5	500
8	Rear ground level – impact view	1670	-6570	945		1000
9	Impact side 45° - rearward pole view	-2970	-3120	1185		1000
10	Overhead wide-view of impact				14	1000
11	Real-time (24-30 fps) – dummy front view	-	-	-	-	24

* All measurements accurate to ± 6 mm.

NOTE: Vehicle was at a 15° angle to the rigid pole.

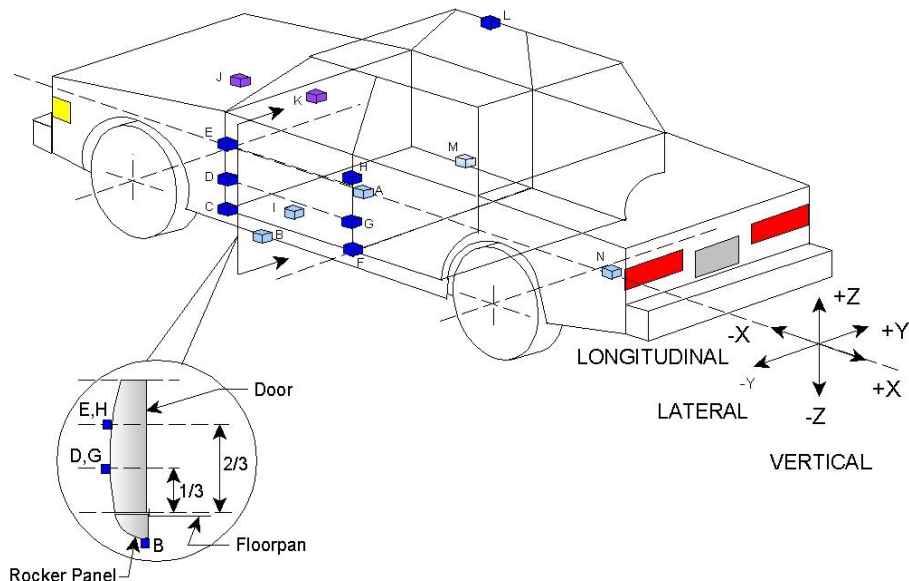
INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Vehicle Structure	18
Pole Load Cells	6
Contact Switches	0
Total No. of Data Channels	40

** Vehicle manufacturer requested that contact switches not be installed on ATD.

**DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA**

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010



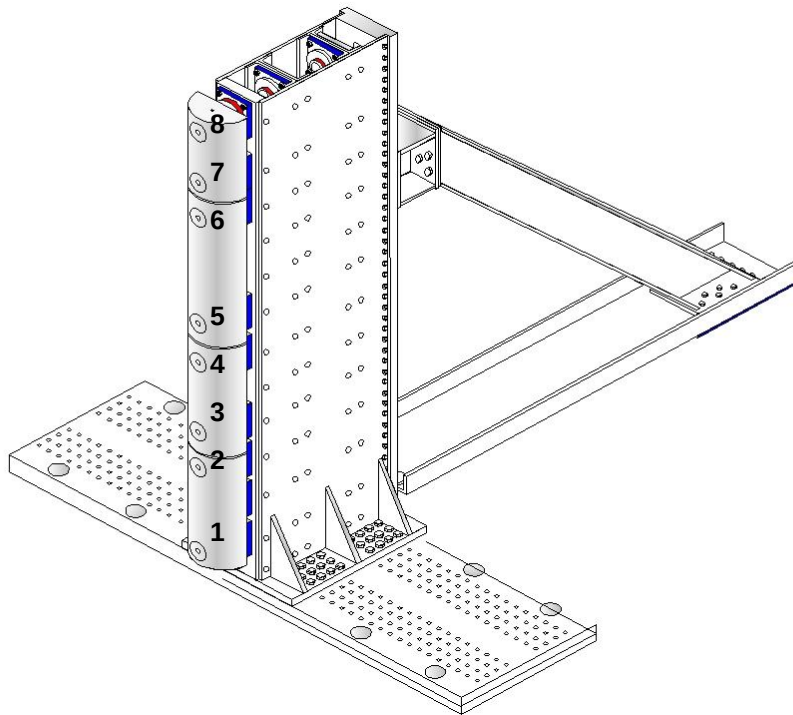
	Accelerometer/Sensor Location			
	ID	Coordinates (mm)		
		X	Y	Z
	Vehicle CG Accel.	2825	-4	705
A	Vehicle CG Sensor	2825	-4	705
B	Left Floor Sill	2825	-679	430
C	A Pillar Sill	3169	-667	445
D	A Pillar Low	3221	-660	617
E	A Pillar Mid	3138	-641	1216
F	B Pillar Sill	2175	-685	468
G	B Pillar Low	2180	-688	657
H	B Pillar Mid	2121	-691	1132
I	Driver Seat	2287	-552	445
J	Engine Top	3820	75	941
K	Firewall	3625	27	979
L	Right Roof	2264	492	1678
M	Right Floor Sill	2864	678	430
N	Rear Floorpan	1106	2	658

X = + Forward
Y = + to Right
Z = + Down

**DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA**

Test Vehicle:	<u>2011 Toyota Rav4</u>	NHTSA No:	<u>MB5115</u>
Test Program:	<u>Side Pole NCAP</u>	Test Date	<u>11/9/2010</u>

FOIL 300K RIGID POLE



Load Cell Locations	
ID	Height From Ground (mm)
1	200
2	590
3	750
4	1075
5	1260
6	1740
7	1920
8	2300

**DATA SHEET NO. 8
POST-TEST OBSERVATIONS**

Test Vehicle: 2011 Toyota Rav4 NHTSA No: MB5115
 Test Program: Side Pole NCAP Test Date: 11/9/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Driver Dummy
Dummy Type/Serial No.	SID-IIs / 300
Head Contact	Frontal Airbag and Curtain Airbag
Upper Torso Contact	Curtain Airbag
Lower Torso Contact	Side Torso Airbag
Left Knee Contact	Door Trim Panel
Right Knee Contact	

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Jammed Shut	Jammed Shut
Right Side Doors	Closed & Operational	Closed & Operational
Hatch and Other Doors	-	Closed & Operational
Seat Movement	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Intact
Sill Separation	None
Windshield Damage	Glazing Damaged
Window Damage	Driver window displaced
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

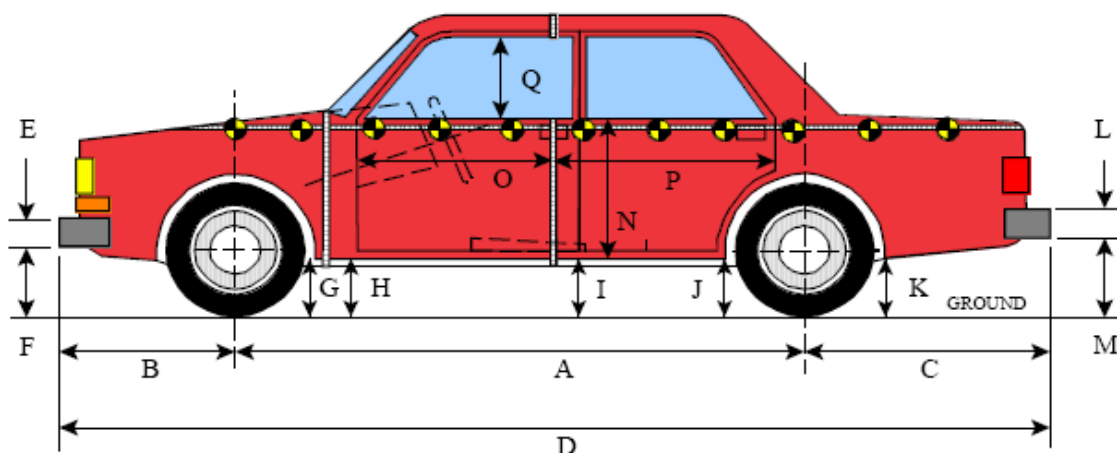
Restraint Type	Left Front (Driver) Occupant Location 1	
	Mounted	Deployed
Frontal Airbag	Yes	Yes
Knee Airbag	No	NA
Side Curtain Airbag	Yes	Yes
Side Torso Airbag	Yes	Yes
Seat Belt Pretensioner	Yes	Yes
Seat Belt Load Limiter	Yes	No

VEHICLE SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset from Vertical Impact Reference Line	mm	+/- 38	-16
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.59
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.72

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010



LEFT SIDE VIEW

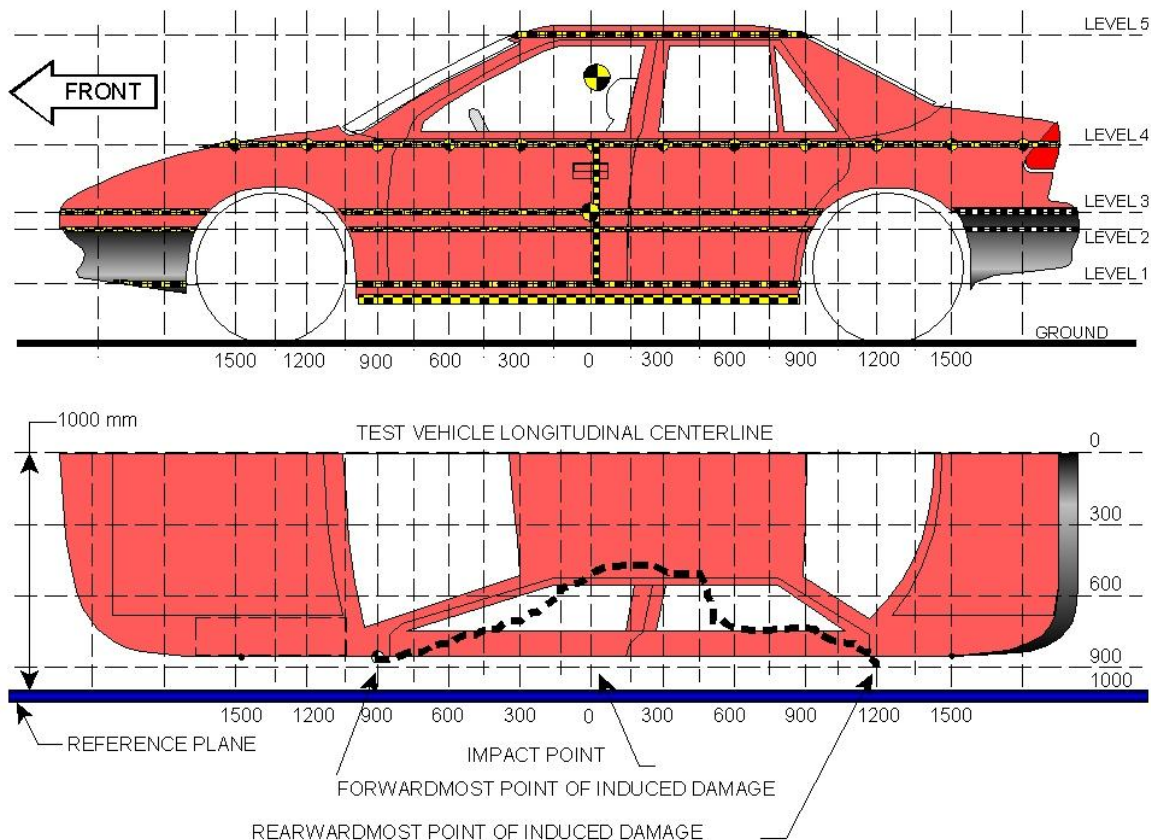
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	2659	2596	-63
B	Front Axle to FSOV	880	918	37
C	Rear Axle to RSOV	1076	1069	-6
D1	Total Vehicle Length at Left Side	4457	4389	-68
D2	Total Vehicle Length at Centerline	4617	4582	-35
D3	Total Vehicle Length at Right Side	4458	4452	-5
E	Front Bumper Thickness	424	424	0
F	Front Bumper Bottom to Ground	308	341	33
G	Sill Height at Front Wheel Well	292	269	-23
H	Sill Height at Front Door Leading Edge	295	276	-19
I	Sill Height at B Pillar	312	309	-3
J1	Sill Height at Rear Wheel Well	310	310	0
J2	Pinch Weld Height at Rear Wheel Well	256	279	23
K	Sill Height Aft of Rear Wheel Well	346	344	-2
L	Rear Bumper Thickness	187	187	0
M	Rear Bumper Bottom to Ground	363	341	-22
N	Sill Height to Window Bottom Sill	769	774	4
O	Front Door Leading Edge to Impact CL	610	602	-8
P	Rear Door Trailing Edge to Impact CL	1367	1339	-27
Q	Front Window Opening	483	468	-15
R	Right Side Length	4458	4452	-5
S	Left Side Length	4457	4389	-68
T	Vehicle Width at B Post	1787	1661	-126

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010



Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	365
2	Occupant H-Point	708
3	Mid-Door	795
4	Window Sill	1037
5	Window Top	1622

NOTE: The above measurements should be taken along the vertical impact reference line. Vehicle measurements forward of the vertical impact reference line are negative.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2011 Toyota Rav4	NHTSA No:	MB5115
Test Program:	Side Pole NCAP	Test Date	11/9/2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-1350	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-1200	--	--	--	695	--	--	--	--	776	--	--	--	--	-81	--
-1050	--	--	--	742	--	--	--	--	810	--	--	--	--	-68	--
-900	--	--	--	781	--	--	--	--	826	--	--	--	--	-45	--
-750	--	908	908	804	--	--	913	913	827	--	--	-5	-5	-23	--
-600	852	892	889	814	--	837	872	872	810	--	15	20	17	4	--
-450	827	883	885	823	--	723	766	774	753	--	104	117	111	70	--
-300	826	882	885	833	--	644	662	673	665	--	182	220	212	168	--
-150	827	883	888	844	--	551	561	570	567	--	276	322	318	277	--
0	826	885	890	852	--	493	491	488	487	--	333	394	402	365	--
150	826	886	892	860	586	566	553	546	545	481	260	333	346	315	105
300	826	887	893	858	600	651	672	668	650	530	175	215	225	208	70
450	827	888	893	871	606	698	760	765	752	555	129	128	128	119	51
600	825	886	892	872	609	734	792	798	783	578	91	94	94	89	31
750	825	885	890	873	609	767	814	819	805	598	58	71	71	68	11
900	822	884	888	873	607	797	835	839	826	600	25	49	49	47	7
1050	821	886	889	872	603	828	860	861	847	597	-7	26	28	25	6
1200	--	903	899	874	597	--	899	894	868	594	--	4	5	6	3
1350	--	--	907	890	591	--	--	898	904	587	--	--	9	-14	4
1500	--	--	--	873	579	--	--	--	867	578	--	--	--	6	1

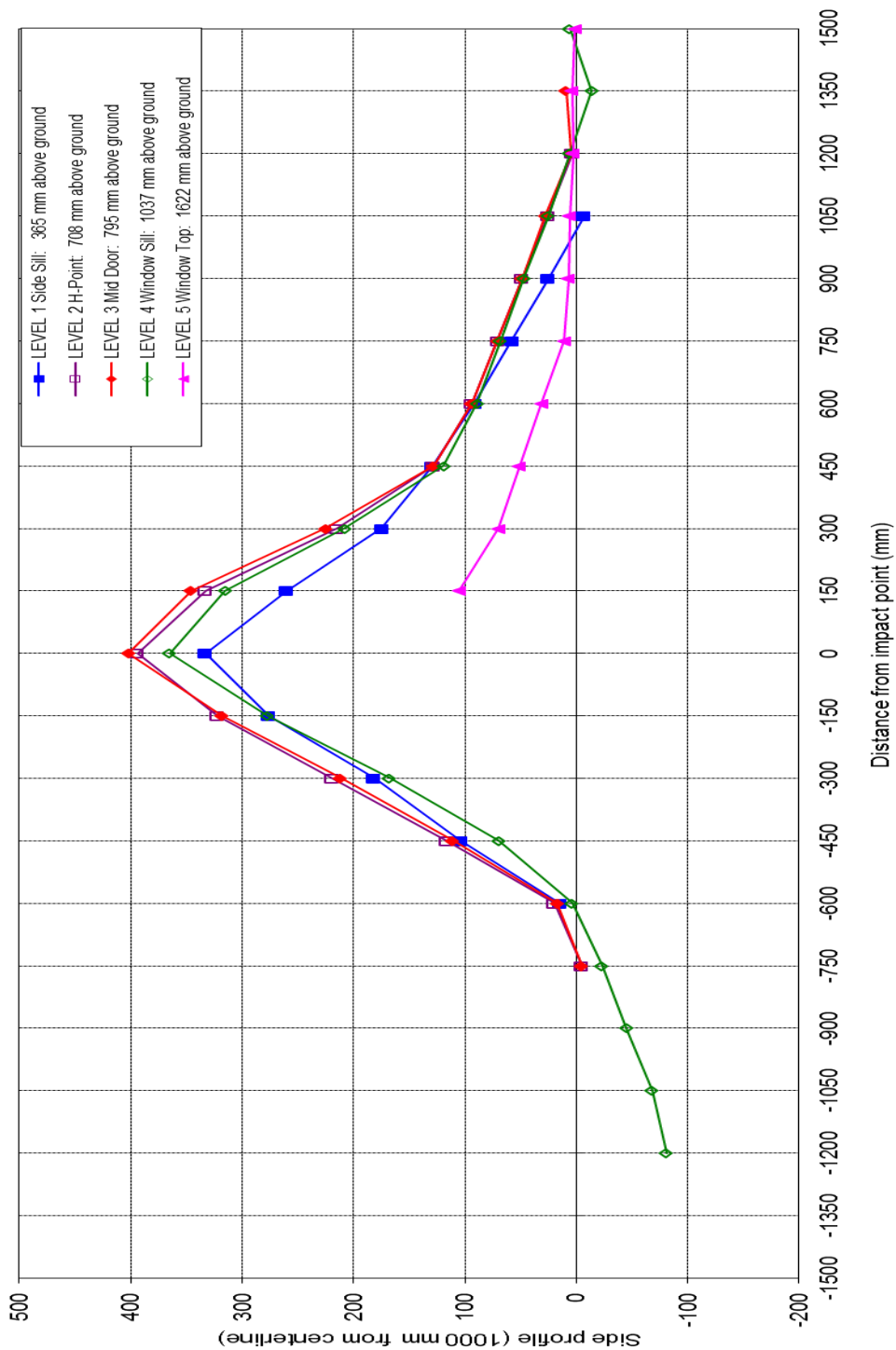
MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	333	394	402	365	105
Distance From Impact (mm)	0	0	0	0	150

NOTE: Pre-test measurements are taken when the vehicle is in the "As Tested" weight condition. Vehicle measurements forward of the vertical impact reference line are negative. The crush profile grid is established prior to test based on an estimated impact point. The final distance to impact is determined after the final dummy positioning and the pole is aligned with the center of gravity of the dummy's head.

DATA SHEET NO. 10 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	<u>2011 Toyota Rav4</u>	NHTSA No:	<u>MB5115</u>
Test Program:	<u>Side Pole NCAP</u>	Test Date	<u>11/9/2010</u>



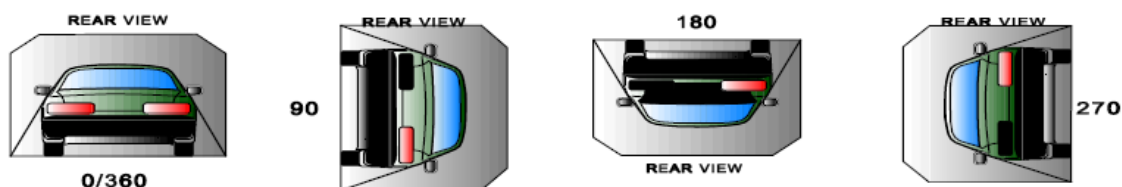
DATA SHEET NO. 11
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Toyota Rav4 NHTSA No: MB5115
 Test Program: Side Pole NCAP Test Date: 11/9/2010

Test Time: 14:15 Temperature: 7.2 ° C

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

FMVSS 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

Test Phase	Rotation Time	Hold Time	Total Time
0 to 90	1:10	5:00	6:10
90 to 180	1:08	5:00	6:08
180 to 270	1:09	5:00	6:09
270 to 360	1:12	5:00	6:12

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

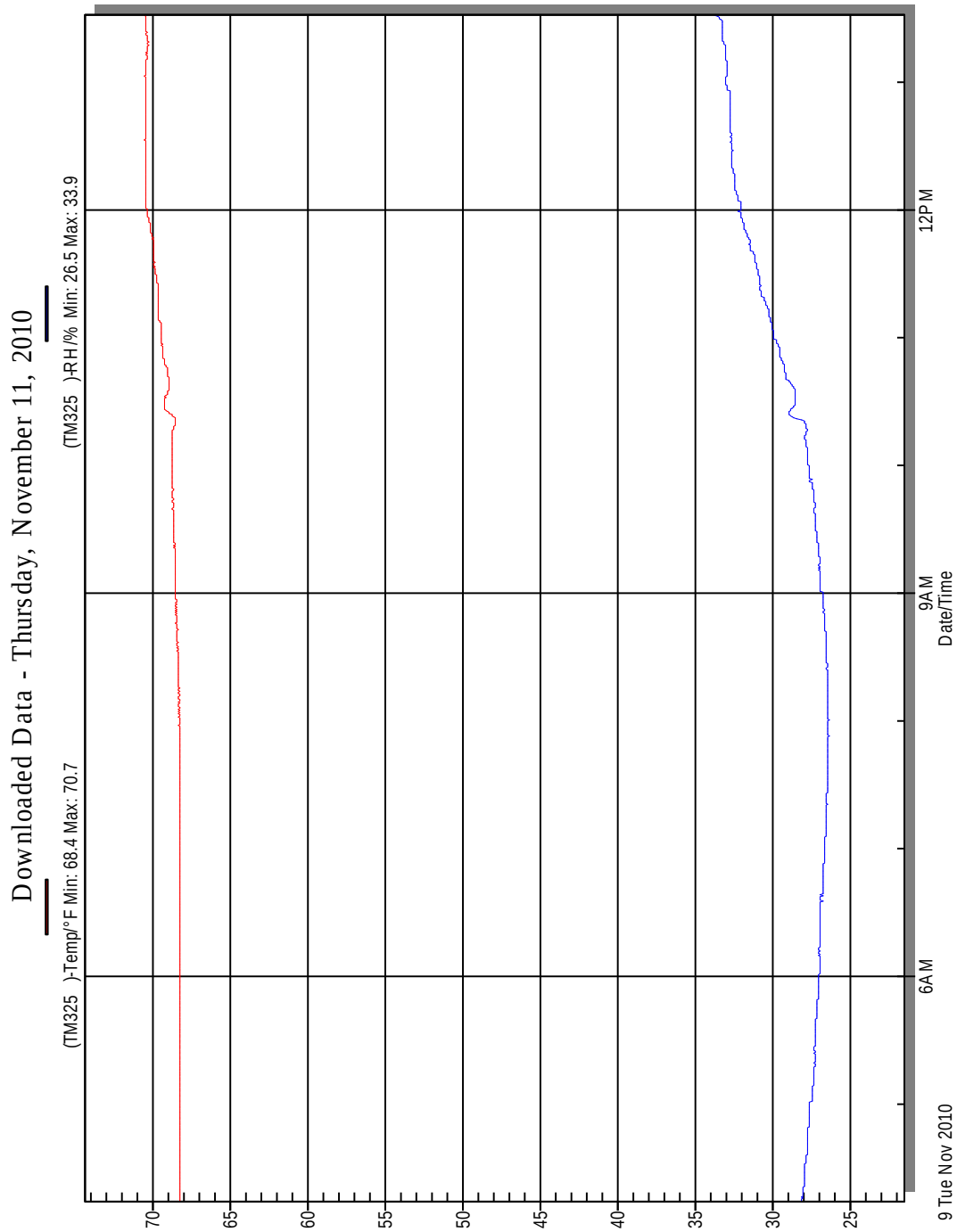
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	NA	NA
90 to 180	0	0	NA	NA
180 to 270	0	0	NA	NA
270 to 360	0	0	NA	NA

ROLLOVER 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. 12
DUMMY/VEHICLE TEMPERATURE STABILIZATION DATA

Test Vehicle:	<u>2011 Toyota Rav4</u>	NHTSA No:	<u>MB5115</u>
Test Program:	<u>Side Pole NCAP</u>	Test Date	<u>11/9/2010</u>



**APPENDIX A
PHOTOGRAPHS**

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2	As Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
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4	Post-Test Frontal View of Test Vehicle	A-6
5	Pre-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-7
6	Post-Test Left Front $\frac{3}{4}$ View of Test Vehicle	A-7
7	Pre-Test Left Side View of Test Vehicle	A-8
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9	Pre-Test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-9
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27	Pre-Test Frontal View of Dummy Head and Shoulders in Relation to Head Restraint	A-18
28	Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning	A-18

29	Pre-Test Overhead View of Dummy Thighs on Seat Pan	A-19
30	Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket	A-19
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32	Pre-Test Placement of Dummy's Feet	A-20
33	Pre-Test View of Belt Anchorage for Dummy to Show Position	A-21
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35	Pre-Test View of Parking Brake	A-22
36	Pre-Test Close-Up Left Side View of Driver Seat Track Showing Test Position	A-22
37	Pre-Test Close-Up Left Side View of Driver Seat Back Showing Test Position	A-23
38	Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position	A-23
39	Pre-Test Dummy and Door Clearance View	A-24
40	Post-Test Dummy and Door Clearance View	A-24
41	Pre-Test Right Side View of Dummy and Front Seat Occupant Compartment	A-25
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43	Pre-Test Inner Door Panel View	A-26
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49	Post-Test Dummy Close-Up Pelvis Contact View	A-29
50	Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View	A-29
51	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-30
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57	Pre-Test Pole Barrier Side View	A-33
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61	FMVSS No. 031/305 Rollover 0°	A-35
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Figure A-1: As Delivered Right Front 3/4 View of Test Vehicle



Figure A-2: As Delivered Left Rear 3/4 View of Test Vehicle



Figure A-3: Pre-Test Frontal View of Test Vehicle



Figure A-4: Post-Test Frontal View of Test Vehicle



Figure A-5: Pre-Test Left $\frac{3}{4}$ Front View of Test Vehicle

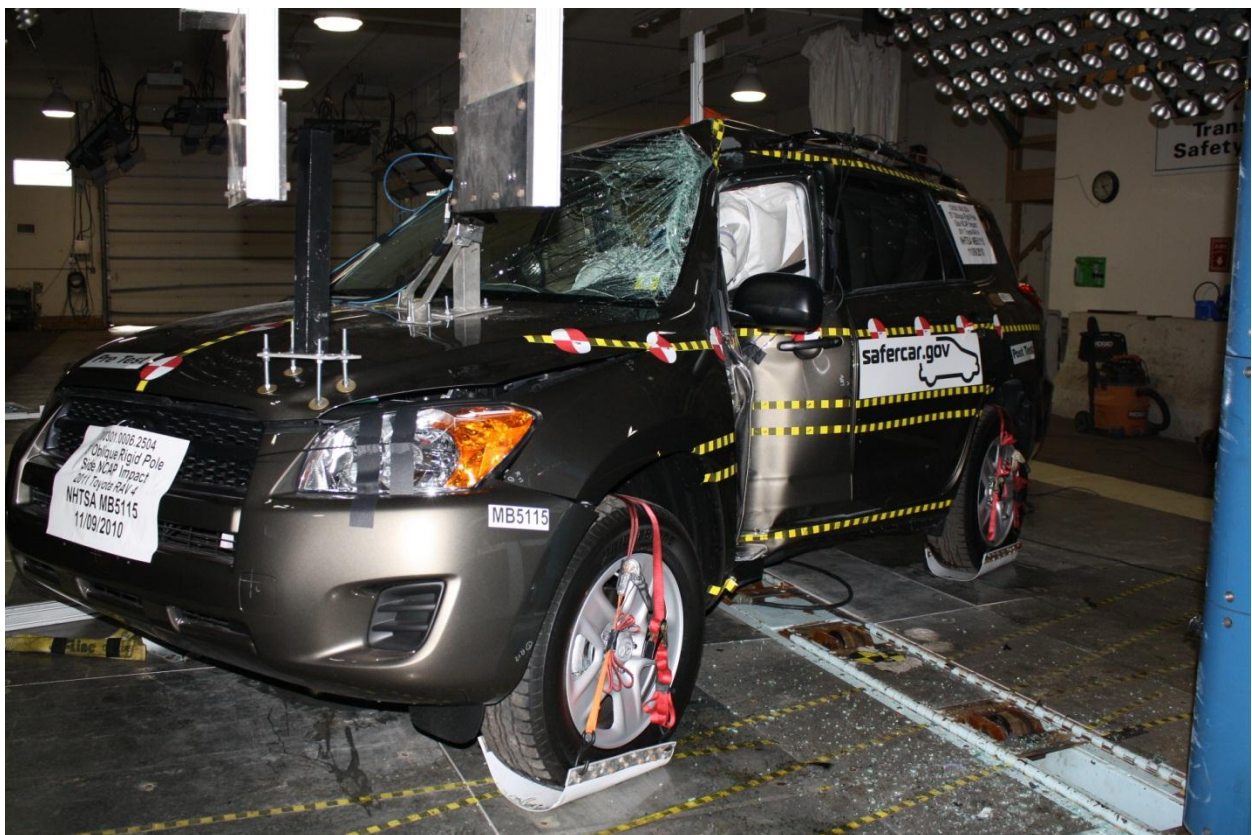


Figure A-6: Post-Test Left $\frac{3}{4}$ Front View Test Vehicle



Figure A-7: Pre-Test Left Side View of Test Vehicle



Figure A-8: Post-Test Left Side View of Test Vehicle



Figure A-9: Pre-Test Left $\frac{3}{4}$ Rear View of Test Vehicle



Figure A-10: Post-Test Left Rear $\frac{3}{4}$ View of Test Vehicle



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



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



Figure A-13: Pre-Test Right Side View of Test Vehicle



Figure A-14: Post-Test Right Side View of Test Vehicle

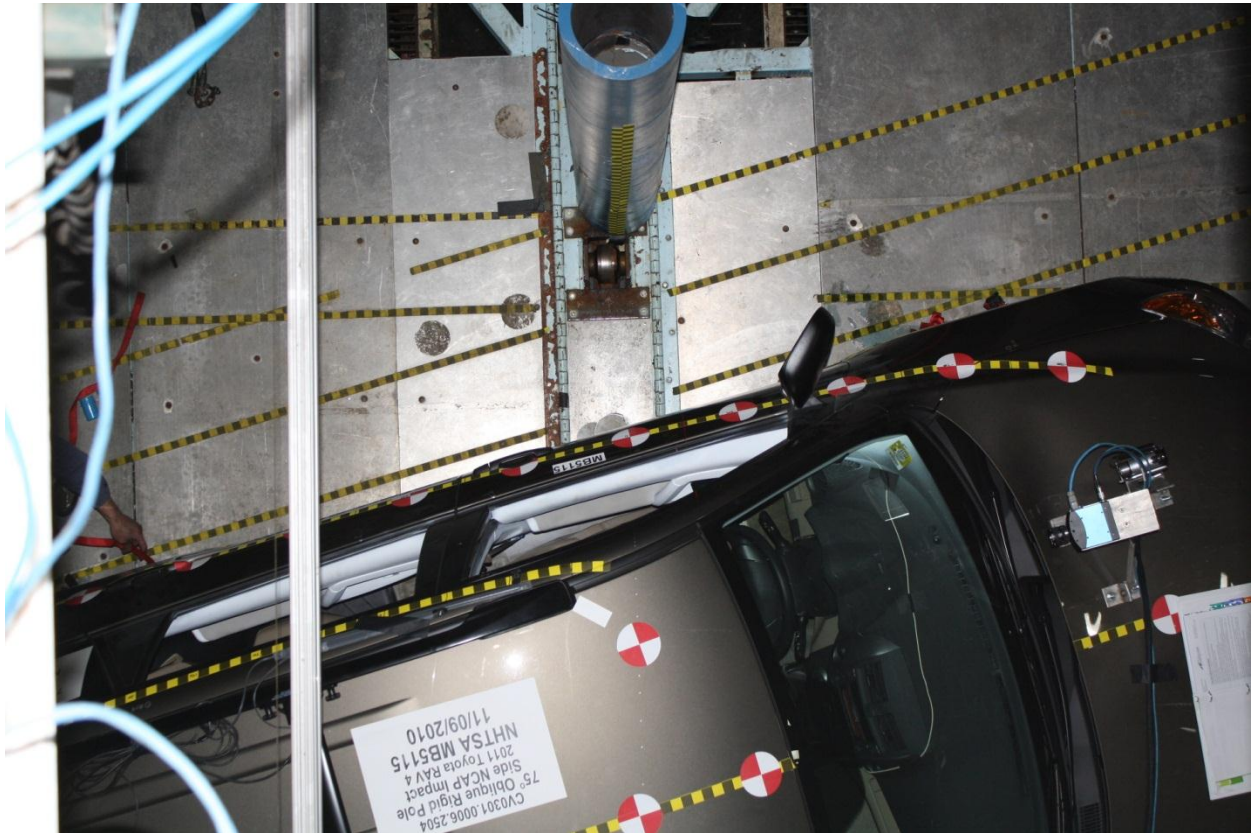


Figure A-15: Pre-Test Overhead View of Test Vehicle and Pole



Figure A-16: Post-Test Overhead View of Test Vehicle and Pole

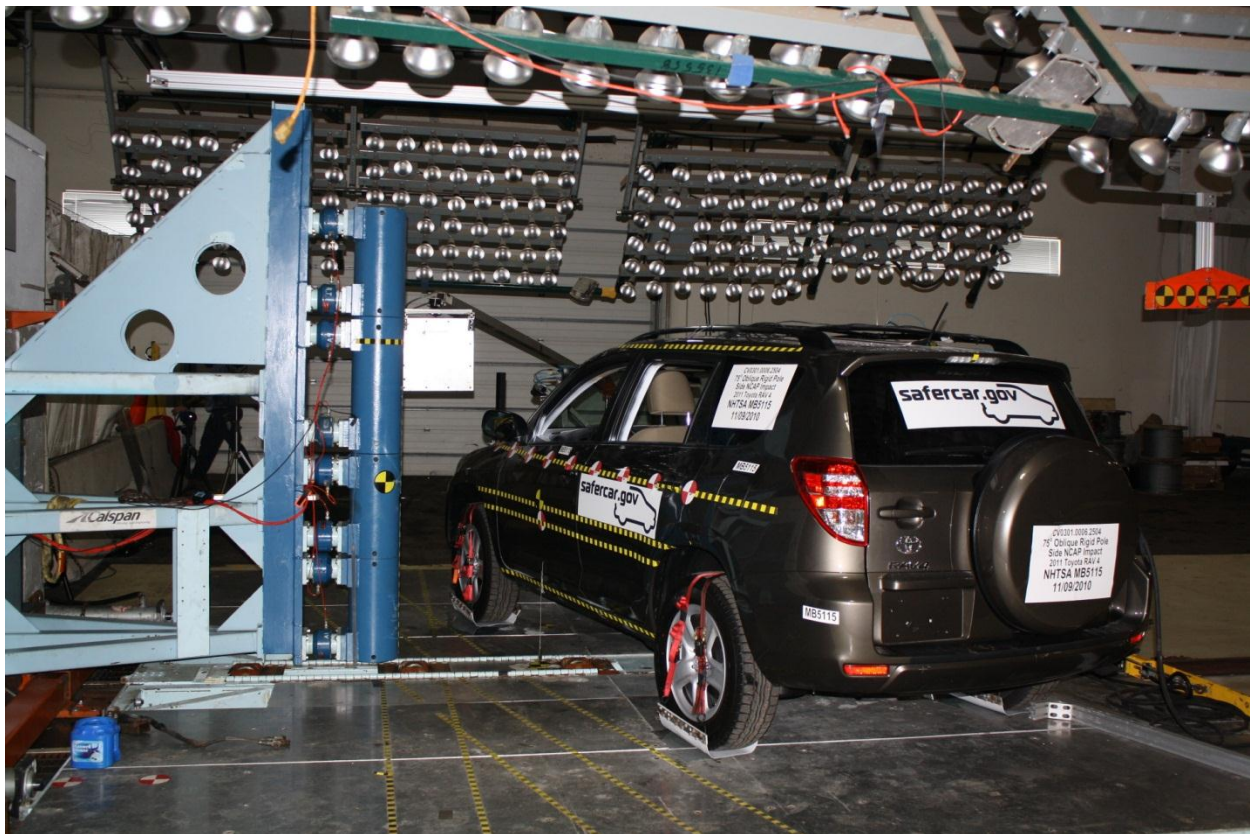


Figure A-17: Pre-Test Left Side View of Pole Positioned Against Side of Vehicle at Ideal Impact Point



Figure A-18: Pre-Test Left Side View of Pole Positioned Against Side of Vehicle at Ideal Impact Point

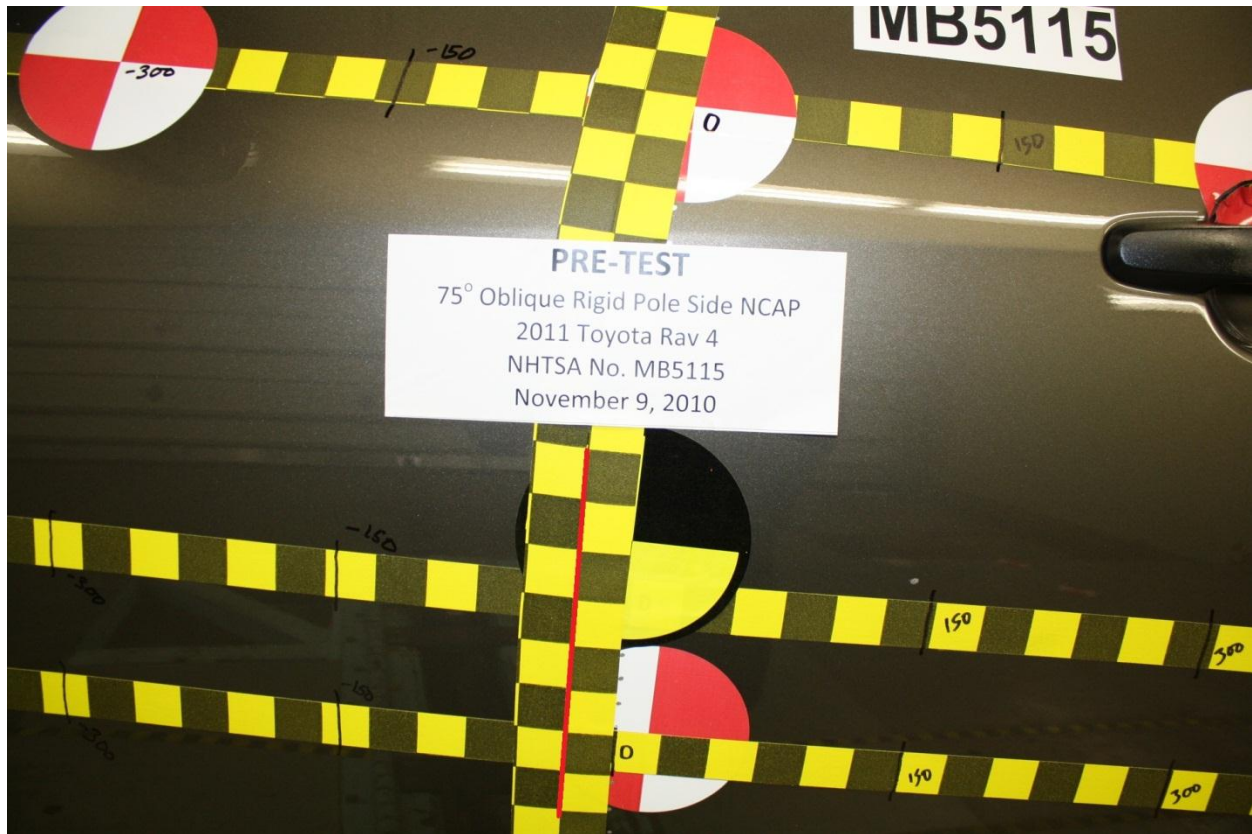


Figure A-19: Pre-Test Close-Up View of Impact Point Target



Figure A-20: Post-Test Close-Up View of Impact Point Target Showing Impact Location



Figure A-21: Pre-Test Front Close-Up View of Dummy



Figure A-22: Post-Test Front Close-Up View of Dummy



Figure A-23. Pre-Test Left Side View of Dummy Showing Belt, Chalking, and Contact Switches



Figure A-24: Pre-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-25: Post-Test Left Side View of Dummy Shoulder and Door Top View



Figure A-26: Pre-Test Frontal View of Seat Back Prior to Dummy Positioning



Figure A-27: Pre-Test Frontal View of Dummy Head and Shoulders in Relation to Head Restraint



Figure A-28: Pre-Test Frontal View of Seat Pan Prior to Dummy Positioning



Figure A-29: Pre-Test Overhead View of Dummy Thighs on Seat Pan



Figure A-30: Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-31: Pre-Test View of Dummy's Head Showing Dummy's Head is Level



Figure A-32: Pre-Test Placement of Dummy's Feet

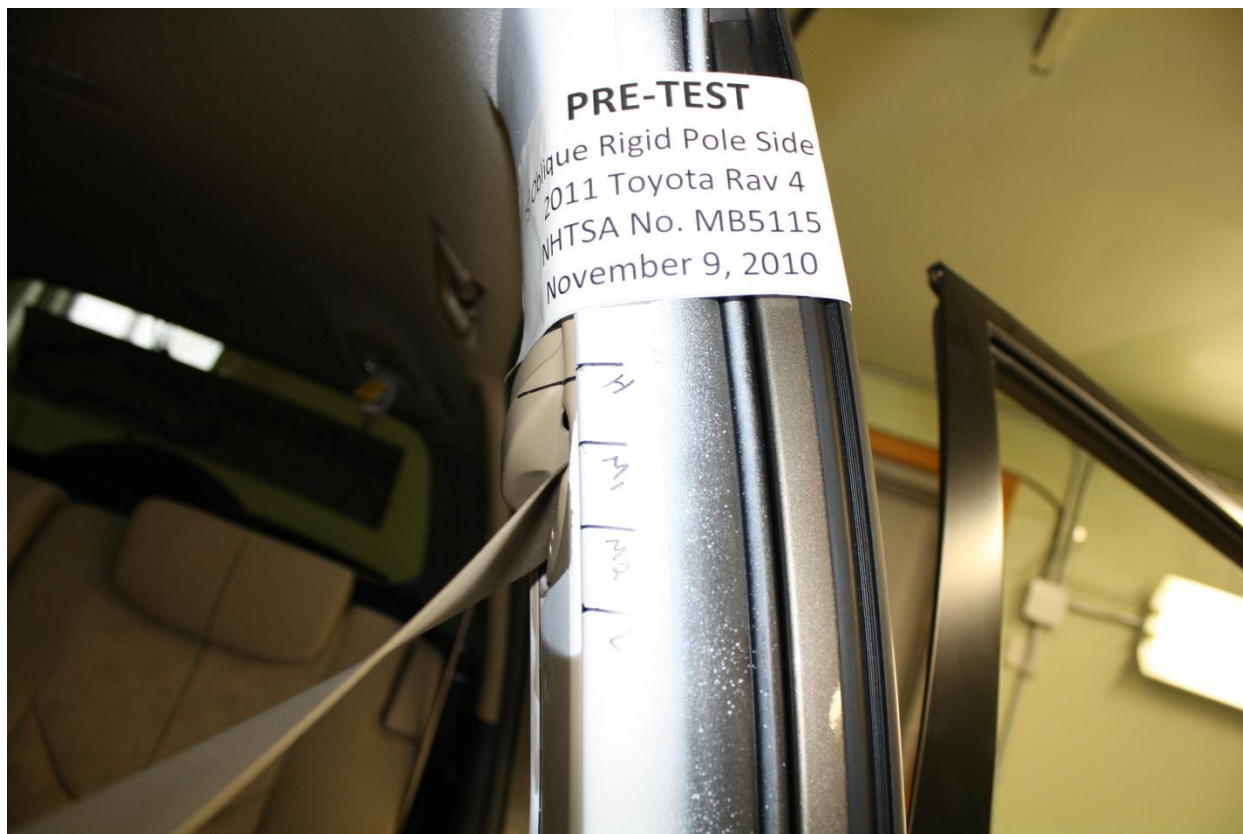


Figure A-33: Pre-Test View of Belt Anchorage for Dummy to Show Position



Figure A-34: Pre-Test Left Side View of Steering Wheel to Show Position



Figure A-35: Pre-Test View of Parking Brake



Figure A-36: Pre-Test Close-Up Left Side View of Driver Seat Track Showing Test Position



Figure A-37: Pre-Test Close-Up Left Side View of Driver Seat Back Showing Test Position



Figure A-38: Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position



Figure A-39: Pre-Test Dummy and Door Clearance View



Figure A-40: Post-Test Dummy and Door Clearance View



Figure A-41: Pre-Test Right Side View of Dummy and Front Seat Occupant Compartment



Figure A-42: Post-Test Right Side View of Dummy and Front Seat Occupant Compartment



Figure A-43: Pre-Test Inner Door Panel View



Figure A-44: Post-Test Inner Door Panel View Showing Dummy Contact Location



Figure A-45: Post-Test Dummy Close-Up Head Contact with Vehicle View



Figure A-46: Post-Test Dummy Close-Up Head Contact with Side Airbag View



Figure A-47: Post-Test Dummy Close-Up Torso Contact with Vehicle Interior View



Figure A-48: Post-Test Dummy Close-Up Torso Contact with Side Airbag View



Figure A-49: Post-Test Dummy Close-Up Pelvis Contact View

Photo Not Applicable

Figure A-50: Post-Test Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-51: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck

Photo Not Available

Figure A-52: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-53: Close-Up View of Vehicle's Certification Label

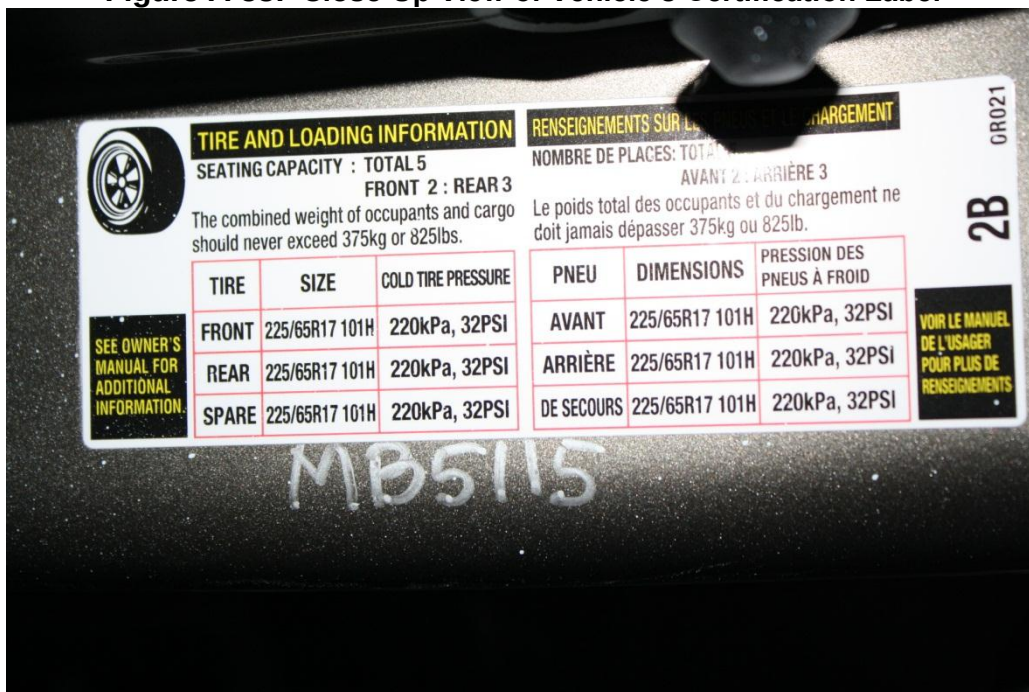


Figure A-54: Close-Up View of Vehicle's Tire Information Placard or Label



Figure A-55: Pre-Test Pole Barrier Front View



Figure A-56: Post-Test Pole Barrier Front View



Figure A-57: Pre-Test Pole Barrier Side View

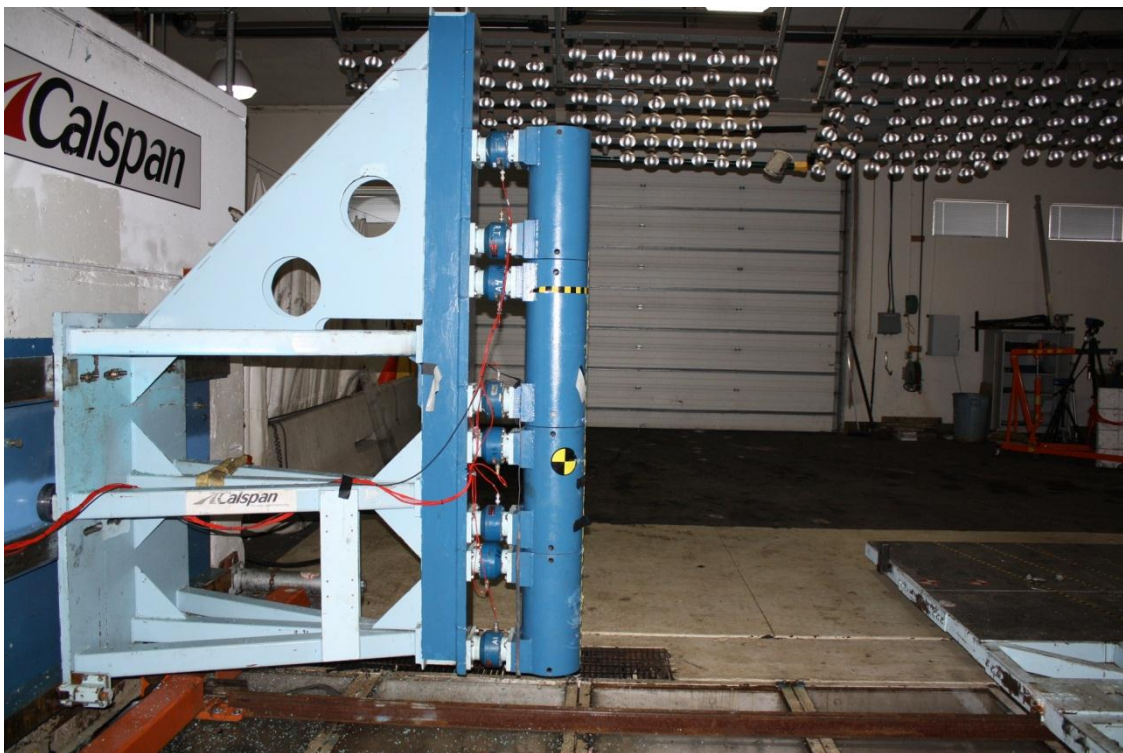


Figure A-58: Post-Test Pole Barrier Side View

Photo Not Applicable

Figure A-59a: Pre-Test Ballast View



Figure A-60: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-61: FMVSS No. 301 Rollover 0°

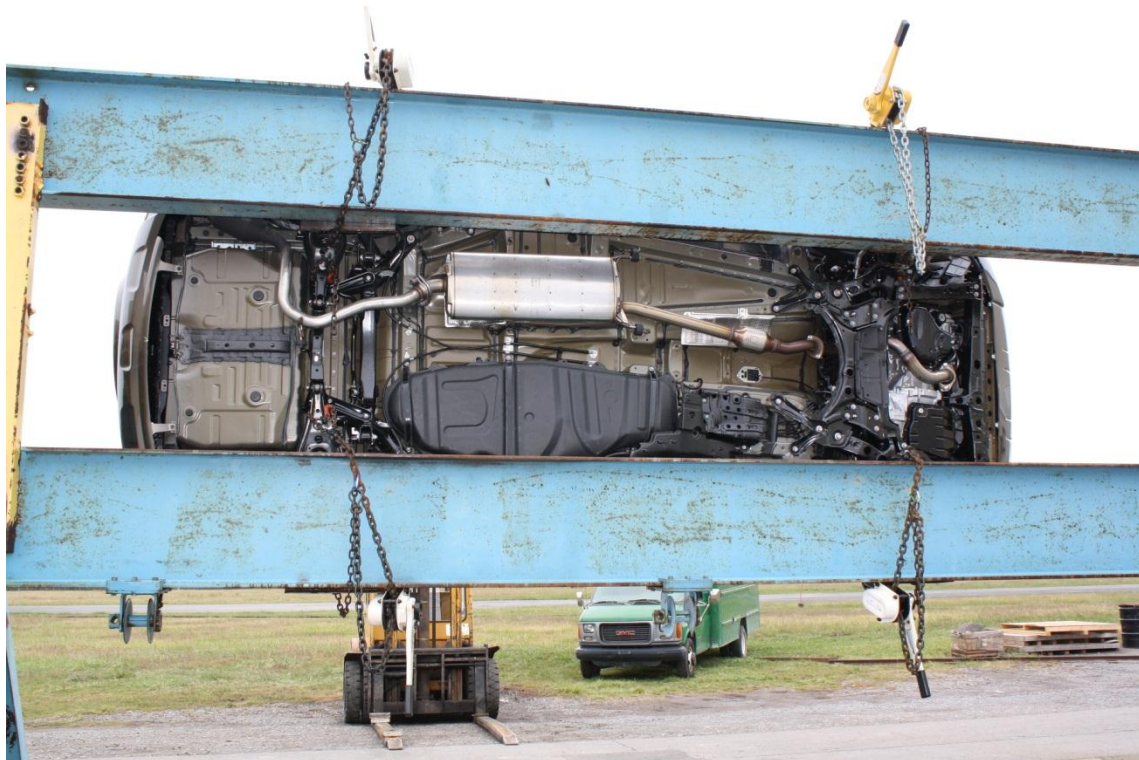


Figure A-62: FMVSS No. 301 Rollover 90°



Figure A-63: FMVSS No. 301 Rollover 180°



Figure A-64: FMVSS No. 301 Rollover 270°



Figure A-65: FMVSS No. 301 Rollover 360°



Figure A-66: Impact Event

APPENDIX B

VEHICLE AND DUMMY RESPONSE DATA PLOTS

TABLE OF DATA PLOTS

No.		Page
	Driver Dummy Instrumentation Plots	
1	Driver Head Acceleration (X) Primary vs. Time	B-5
2	Driver Head Acceleration (Y) Primary vs. Time	B-5
3	Driver Head Acceleration(Z) Primary vs. Time	B-6
4	Driver Head Resultant Primary vs. Time	B-6
5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-7
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-7
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-8
8	Driver Lower Spine Y12 Resultant Acceleration vs. Time	B-8
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-9
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-9
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-10

The following additional data for this test can be obtained from the Research and Development section of the NHTSA website. The website can be found at www.NHTSA.dot.gov.

Additional Driver Dummy Instrumentation Data

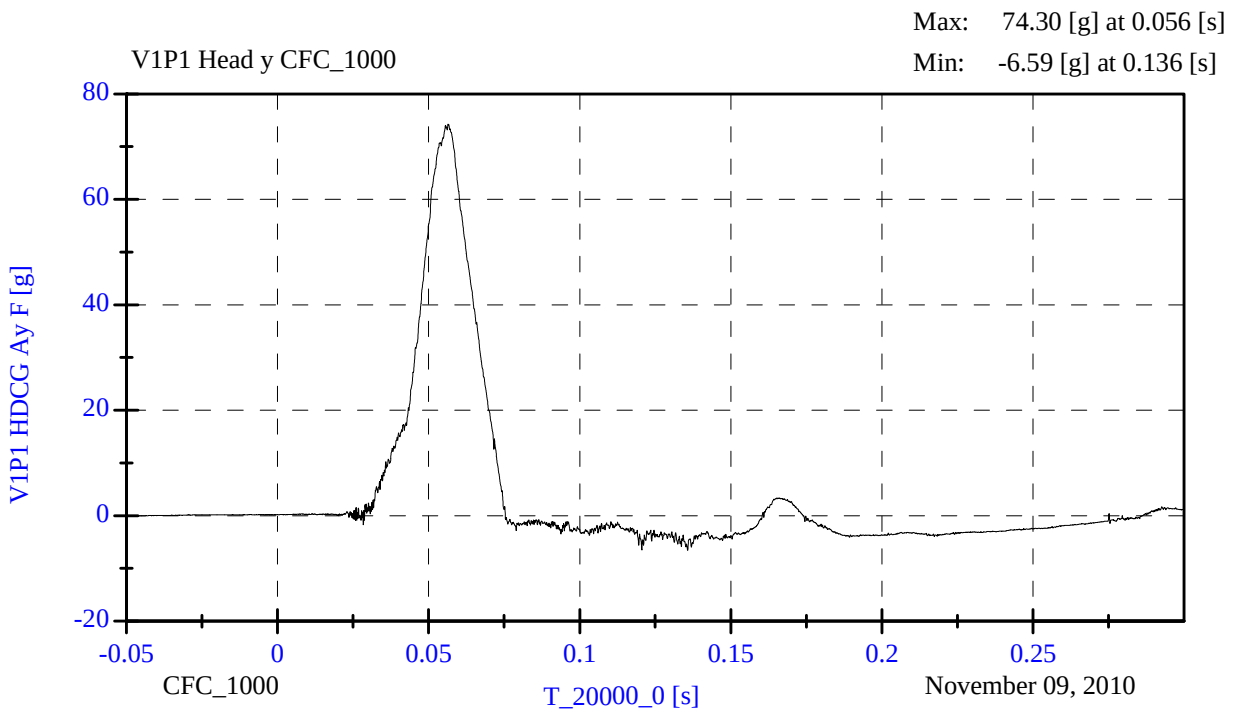
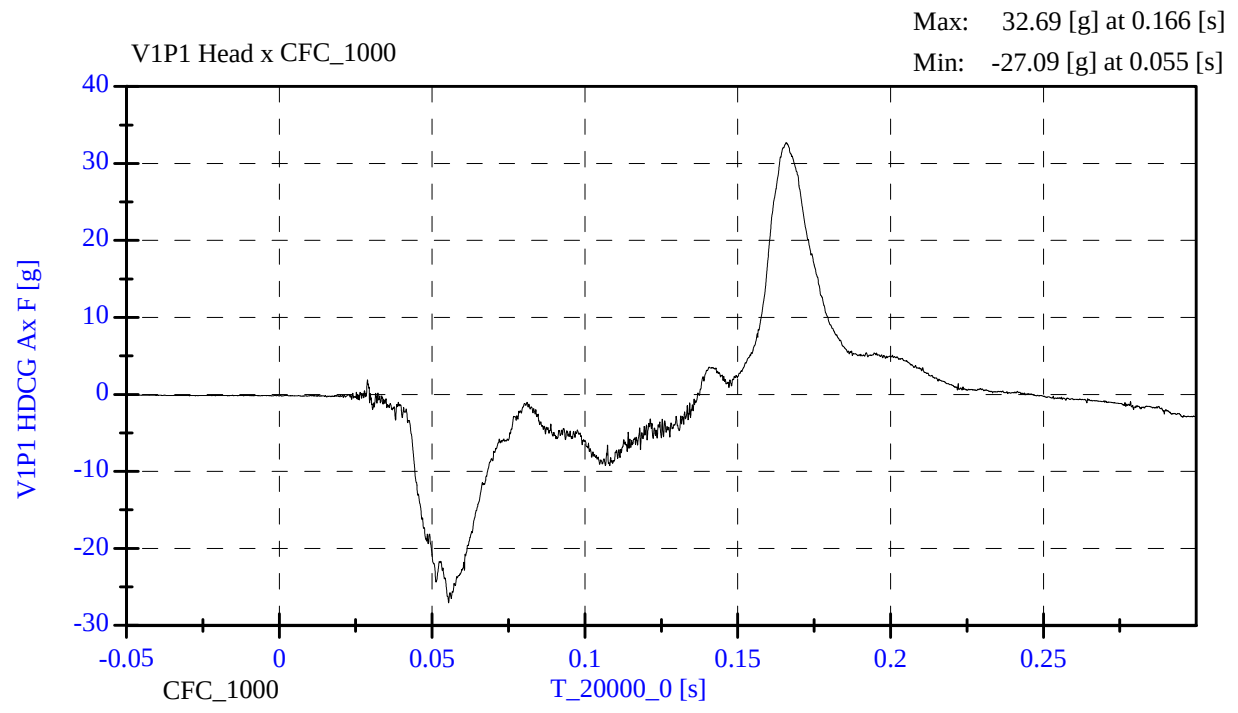
Driver Head Acceleration (X) Redundant
Driver Head Acceleration (Y) Redundant
Driver Head Acceleration (Z) Redundant
Driver Upper Thorax Rib Deflection (Y)
Driver Middle Thorax Rib Deflection (Y)
Driver Lower Thorax Rib Deflection (Y)
Driver Upper Abdomen Rib Deflection (Y)
Driver Lower Abdomen Rib Deflection (Y)
Driver Shoulder Contact Switch
Driver Torso Contact Switch
Driver Pelvis Contact Switch

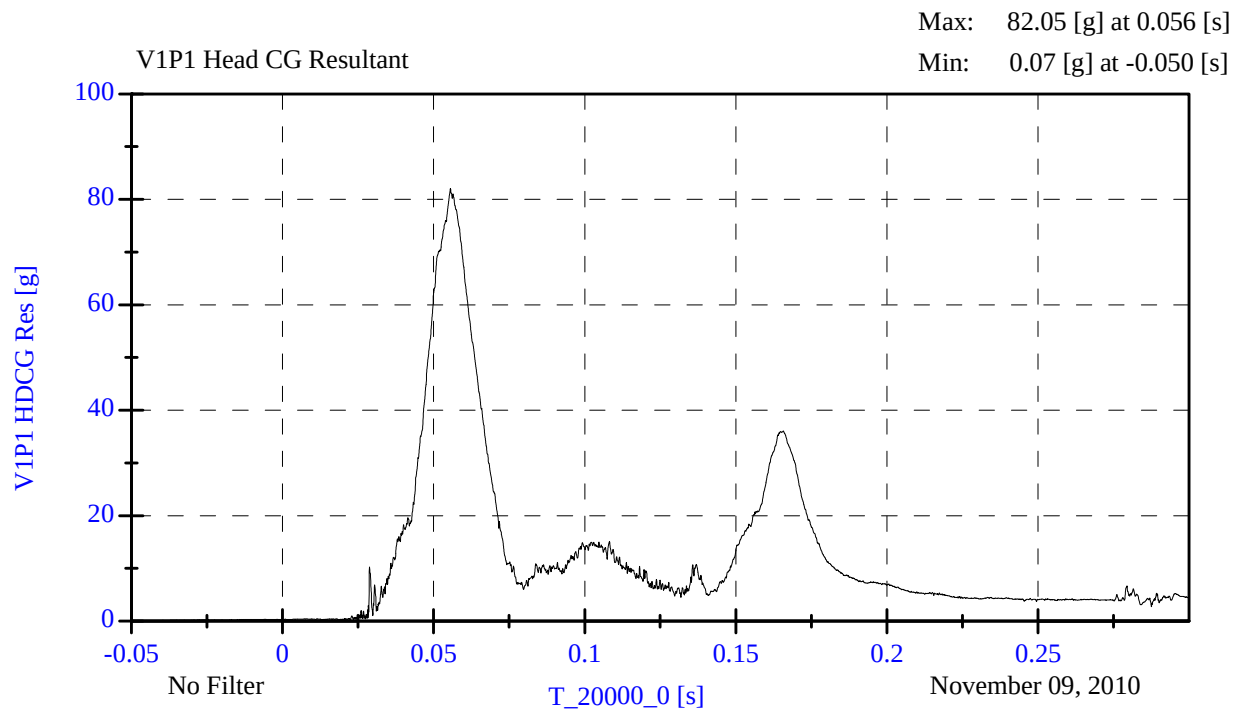
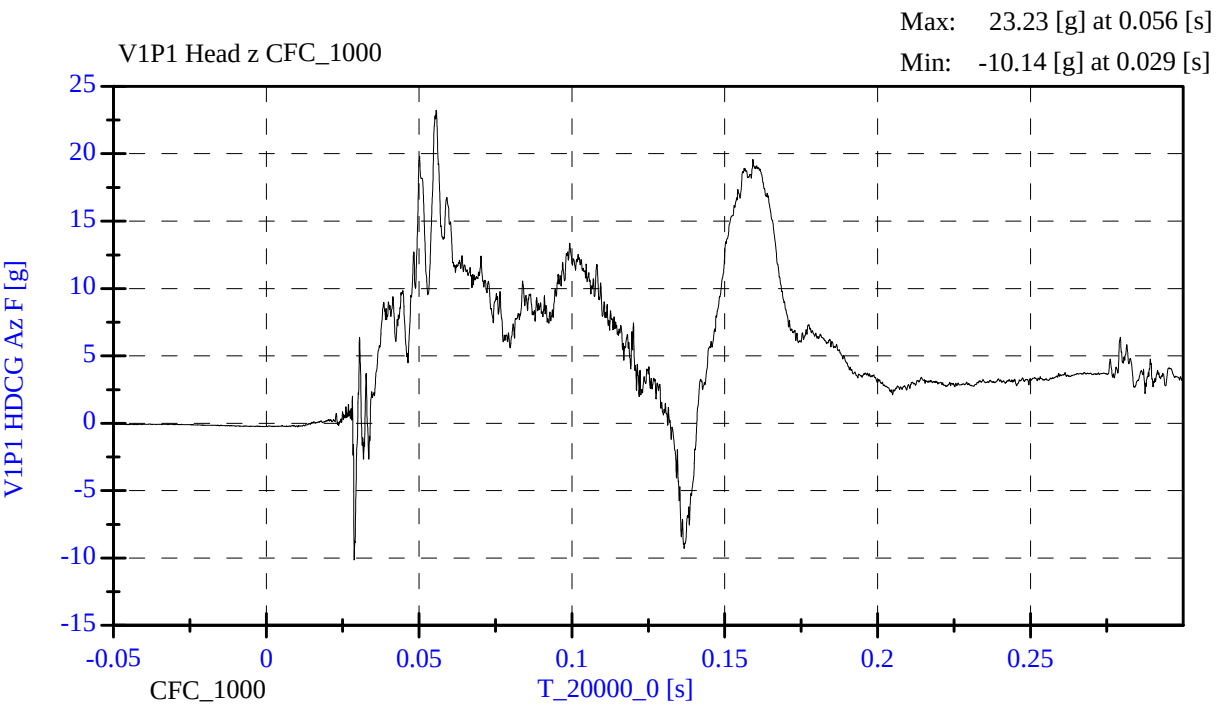
Vehicle Instrumentation Data

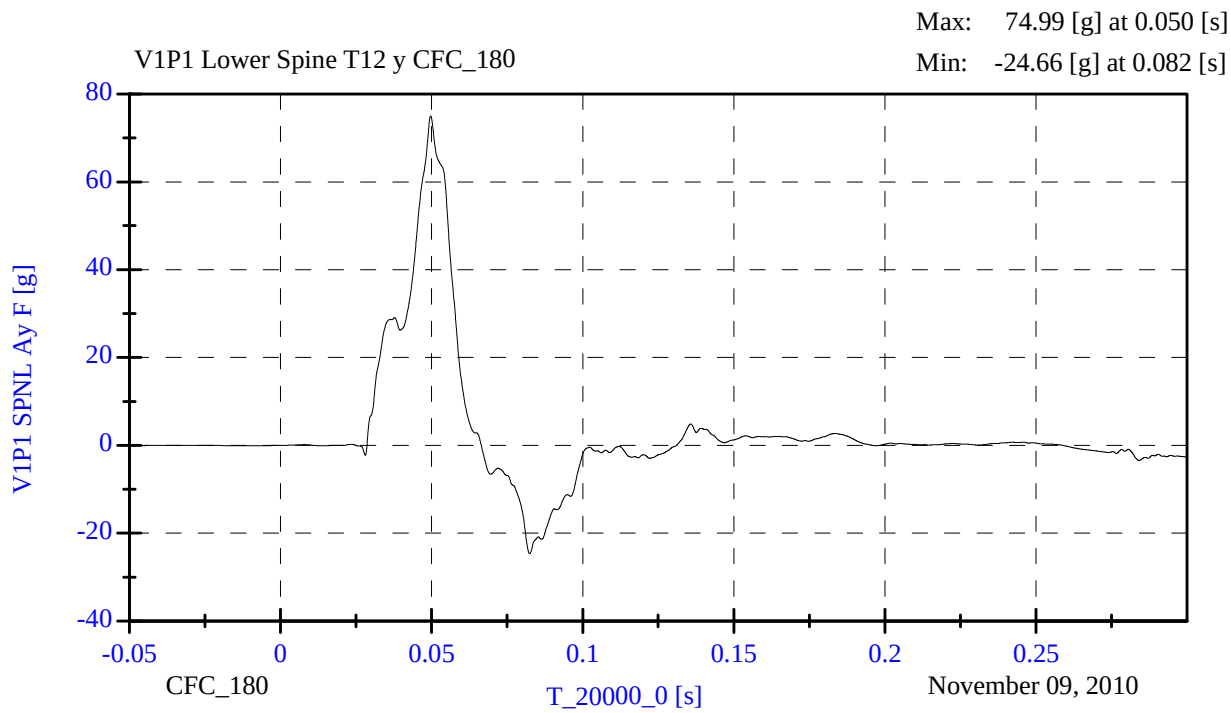
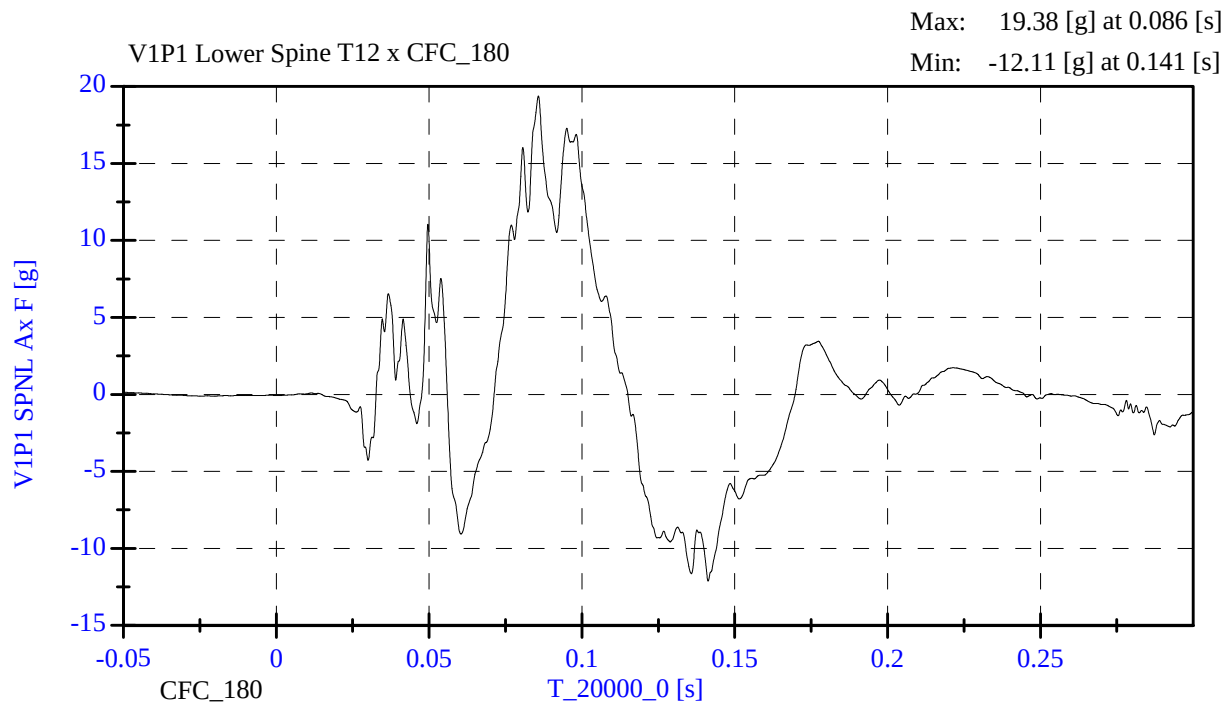
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Vehicle Center of Gravity Angular Rate About X (Roll)
Vehicle Center of Gravity Angular Rate About Y (Pitch)
Vehicle Center of Gravity Angular Rate About Z (Yaw)
Left Floor Sill Acceleration (Y)
Left A-Pillar Sill Acceleration (Y)
Left Lower A-Pillar Acceleration (Y)
Left Mid A-Pillar Acceleration (Y)
Left B-Pillar Sill Acceleration (Y)
Left Lower B-Pillar Acceleration (Y)
Left Mid B-Pillar Acceleration (Y)
Driver Seat Track at Dummy H-Point Acceleration (Y)
Engine Top Acceleration (X)
Engine Top Acceleration (Y)
Firewall Center Acceleration (Y)
Right Roof at Vertical Impact Reference Line Acceleration (Y)
Right Sill at Vertical Impact Reference Line Acceleration (Y)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (X)
Rear Floorpan Behind Rear Axle at Centerline Acceleration (Y)
Driver Side Airbag Timing
Driver Side Curtain Airbag Timing

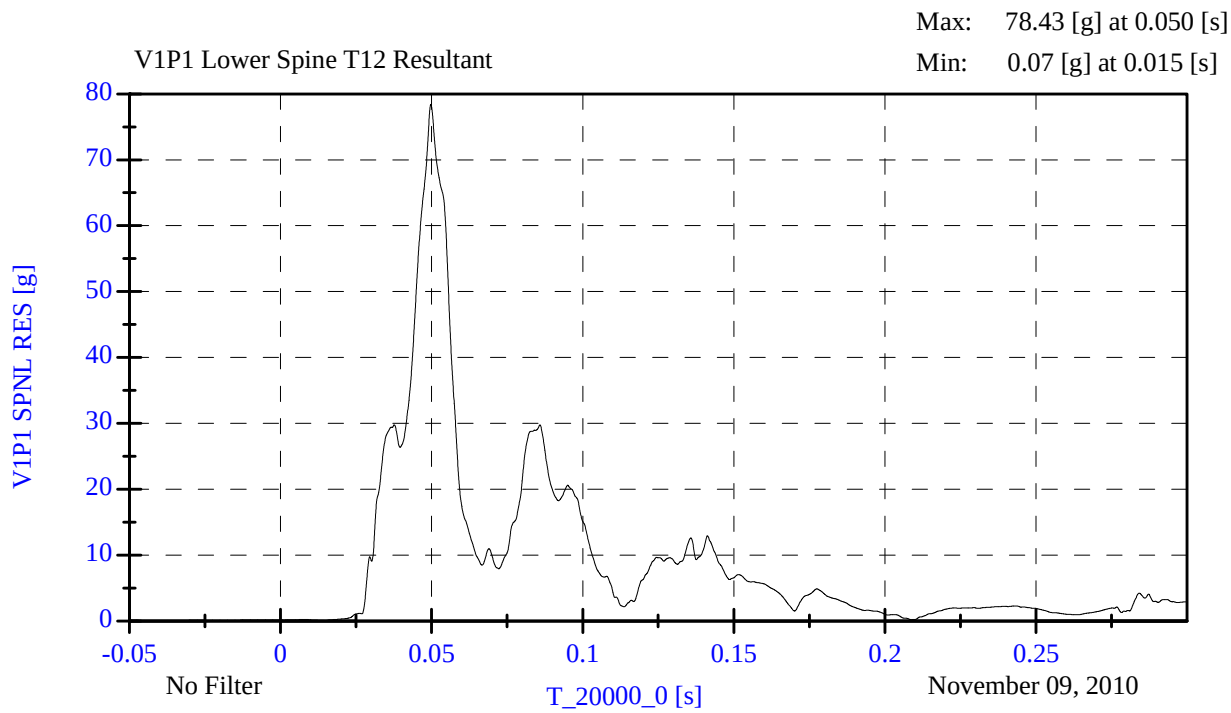
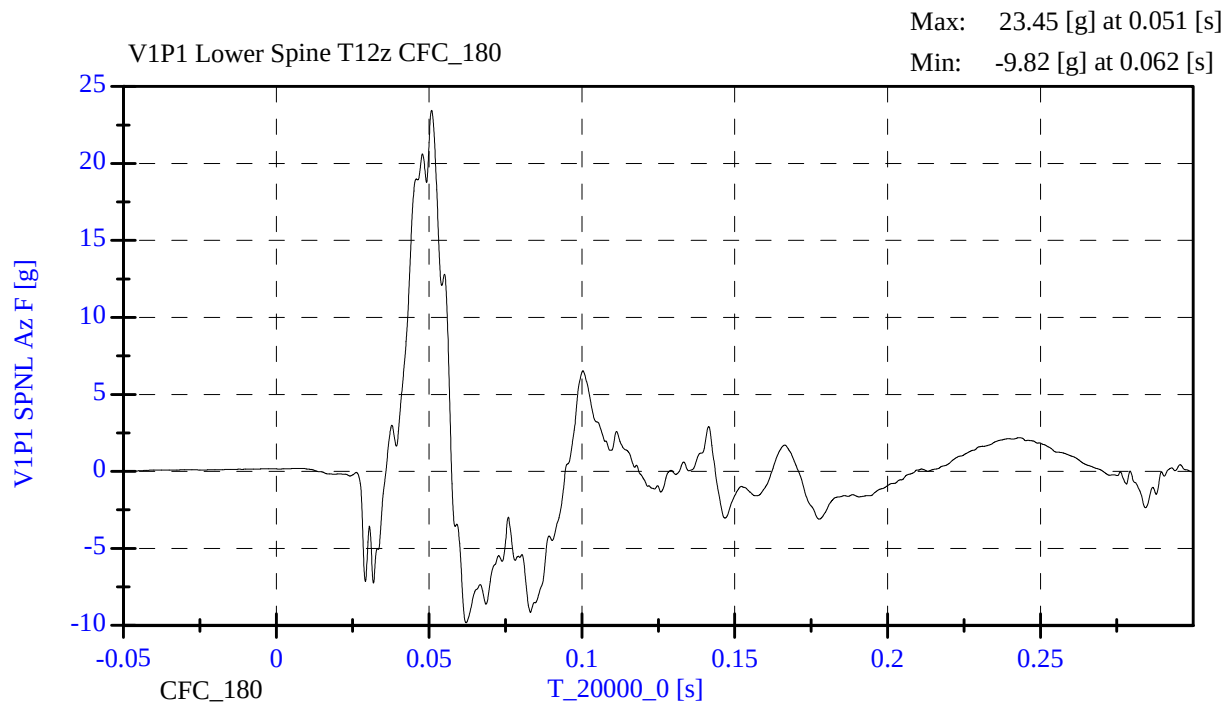
Pole Instrumentation Data

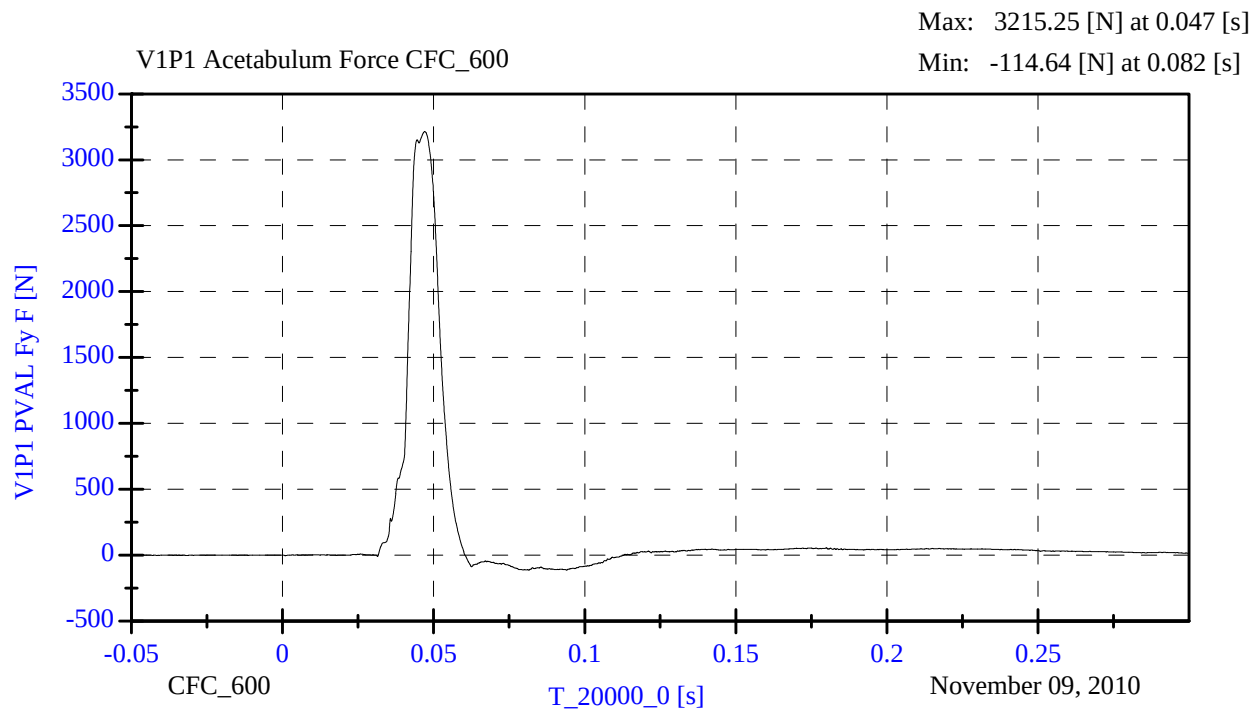
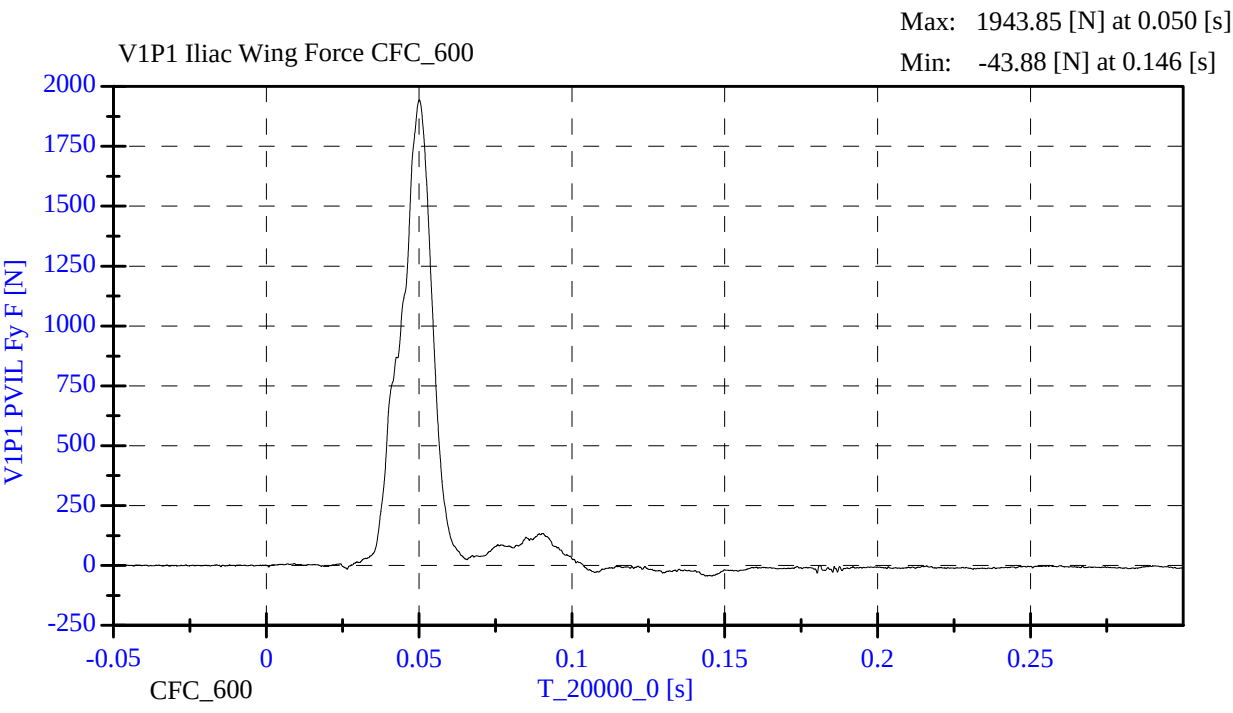
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

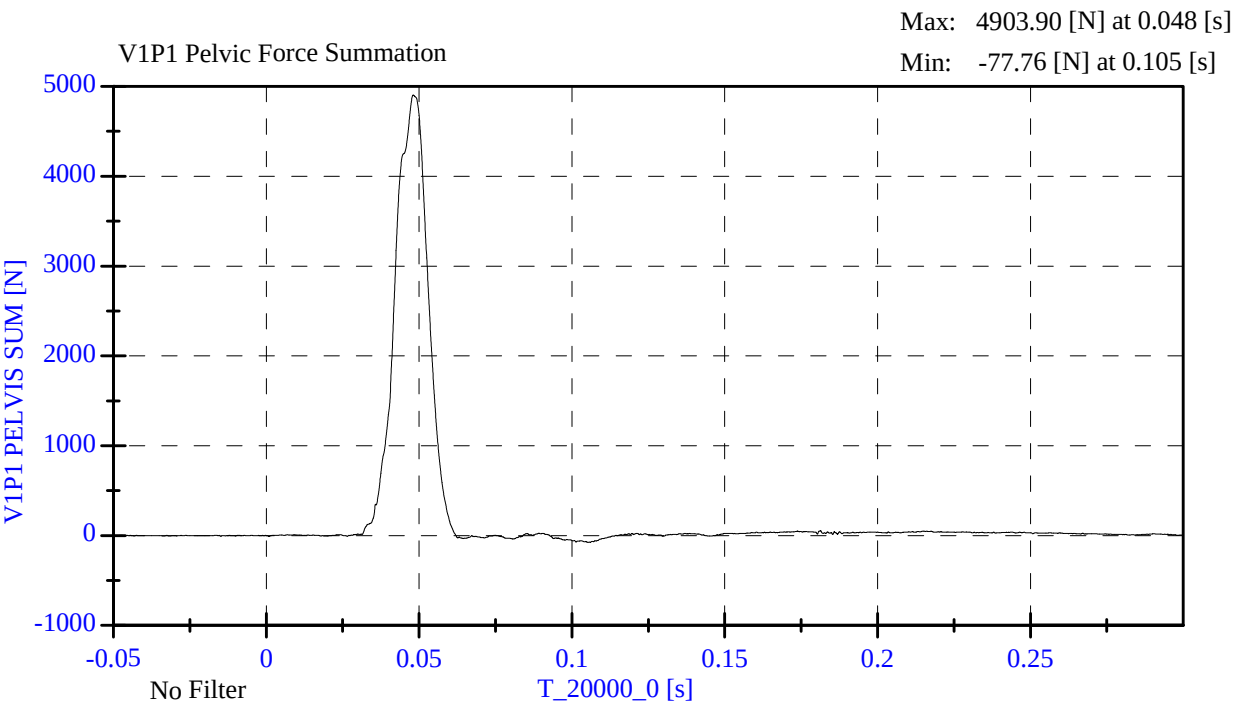












November 09, 2010

APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

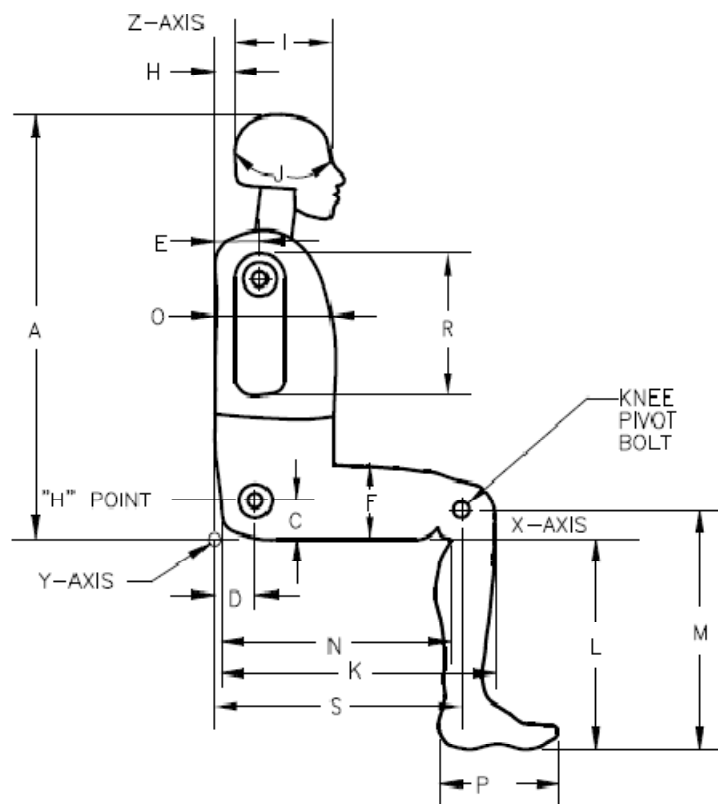
NHTSA ATD S/N 300

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	785	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	87	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	42	Yes
I	Head Depth	178.0 - 188.0	181	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	523	Yes
L	Popliteal Height	343.0 - 369.0	365	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	395	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	315	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to Seat back	478.0 - 493.0	475	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	773	Yes

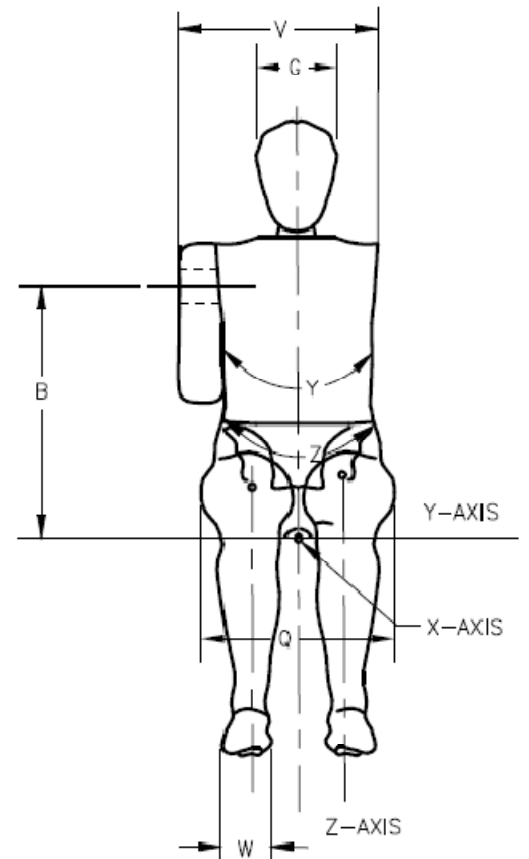
Technician: SZ

Date: 11/5/2010

SID-IIIsD External Dimension Reference Diagram



SIDE VIEW



FRONT VIEW



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	11/4/2010
Test Number:	2	Test Time:	1:08:42 PM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1355

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	36 %RH P
Resultant Acceleration	115.0 -- 137.0	136.4 g P
Oscillation	0.0 -- 15.0	3.1 % P
Fore-Aft Acceleration	-15.0 -- 15.0	5.1 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **1:08:42 PM**

Test Date: **11/4/2010**



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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	P17462	11/2/2010
Endevco	7264-2000	P16658	11/2/2010
Endevco	7264-2000	P16596	11/2/2010

Test ID: **Head Drop**

Test Time: **1:08:42 PM**

Test Date: **11/4/2010**

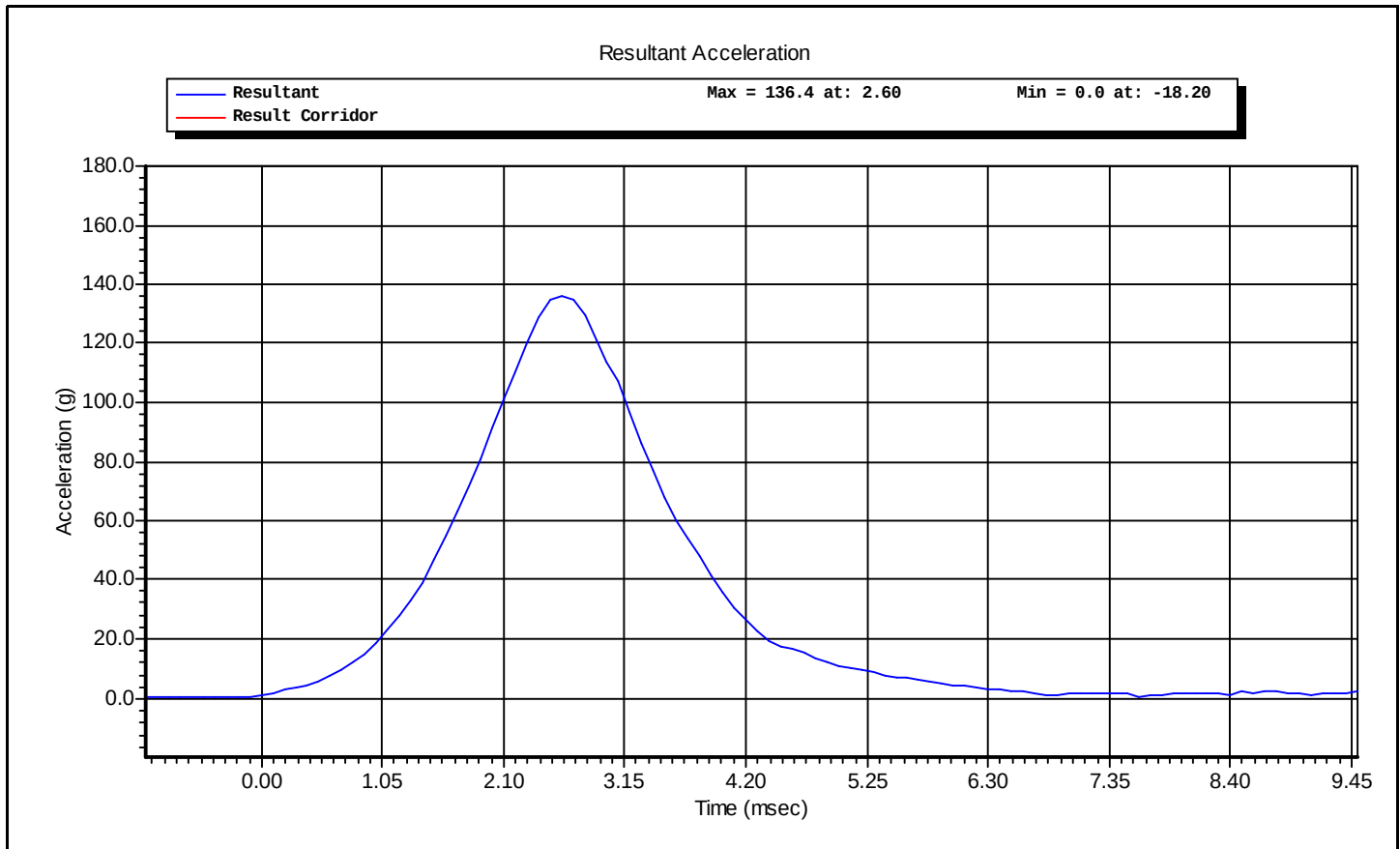


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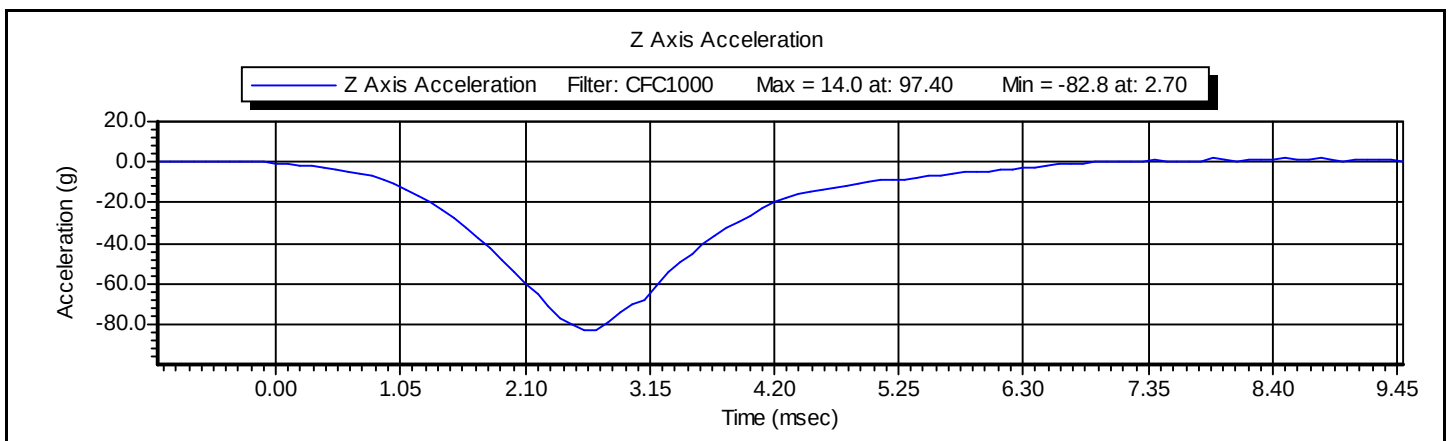
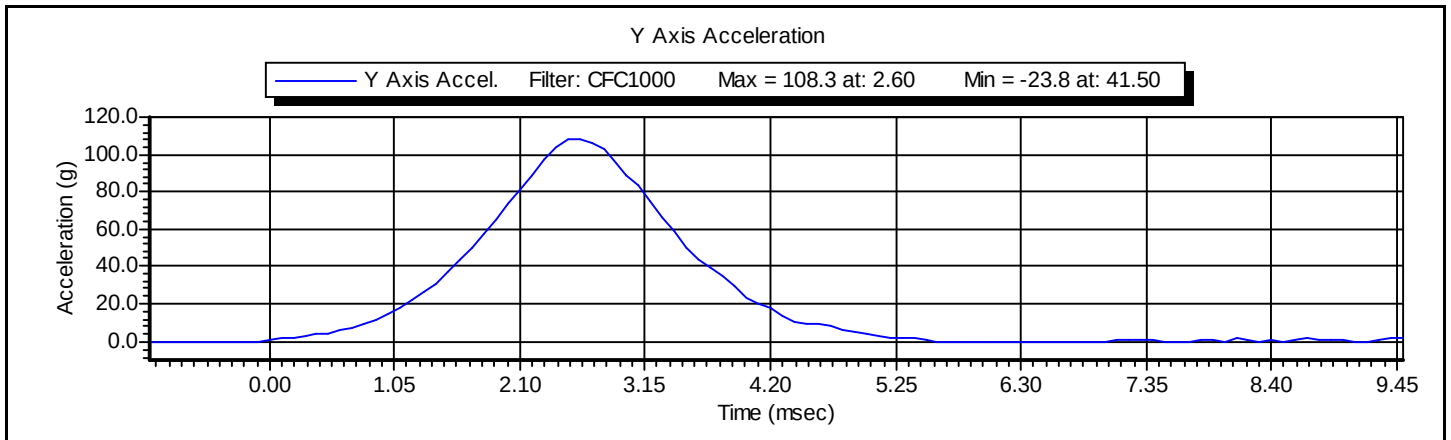
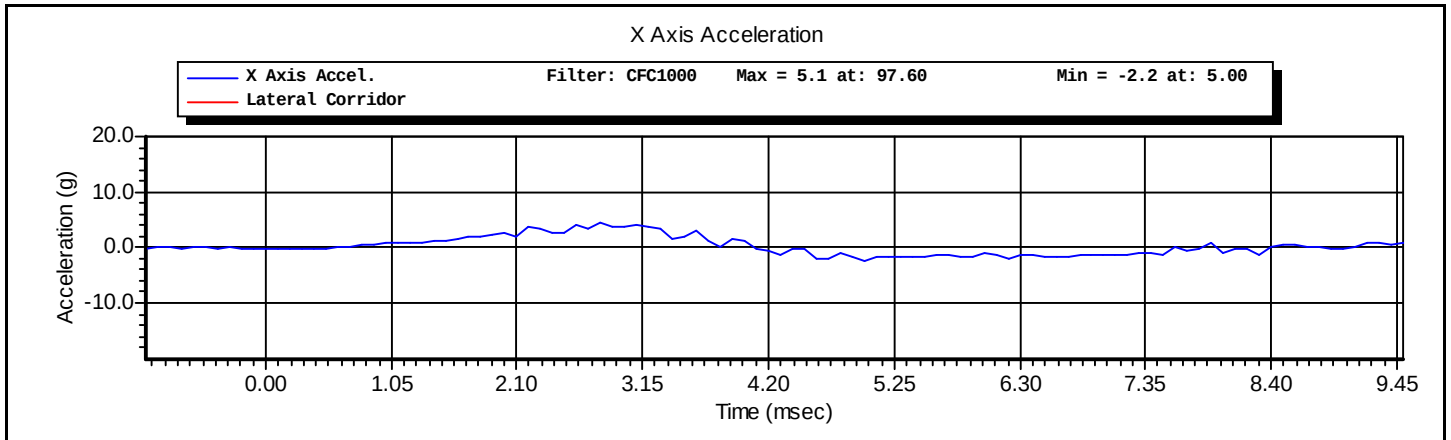
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	11/4/2010
Test Number:	2	Test Time:	1:08:42 PM



Test ID: **Head Drop**

Test Time: **1:08:42 PM**

Test Date: **11/4/2010**





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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	11/4/2010
Test Number:	1	Test Time:	12:12:32 PM

Component Part Number	Component Serial Number
Neck - 180-2000	787

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.0 deg C P
Humidity	10 -- 70	36 %RH P
Velocity	5.51 -- 5.63	5.56 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.43 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.53 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.80 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.73 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.84 m/s P
Max D Plane Rotation	71.0 -- 81.0	72.4 degrees P
Time at Max Rotation	50.0 -- 70.0	61.2 ms P
Moment about OC	-44.0 -- -36.0	-41.4 Nm P
Moment Decay to Zero	102.0 -- 126.0	113.6 ms P

All test parameters are within specifications

Technician: **S. Zito III** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Neck Flexion**

Test Time: **12:12:32 PM**

Test Date: **11/4/2010**



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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
Denton	1716A	LC-576 Fy	2/15/2010
Denton	1716A	LC-576 Mx	2/15/2010
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Neck Flexion**

Test Time: **12:12:32 PM**

Test Date: **11/4/2010**



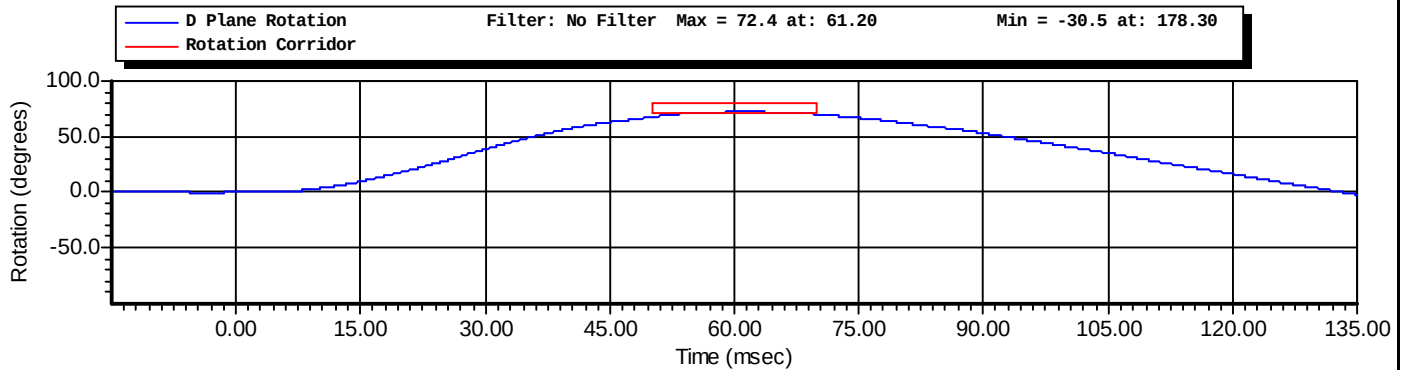
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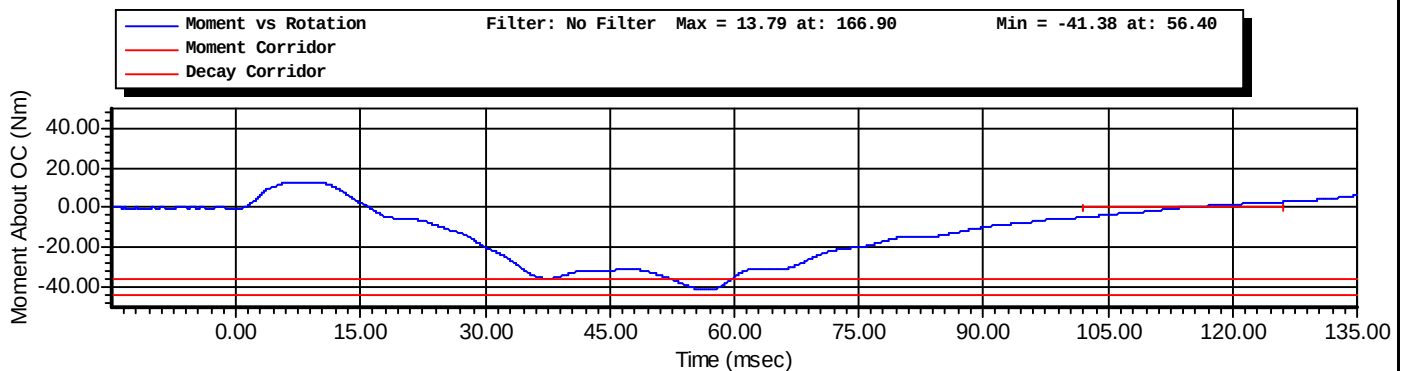
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	11/4/2010
Test Number:	1	Test Time:	12:12:32 PM

D Plane Rotation



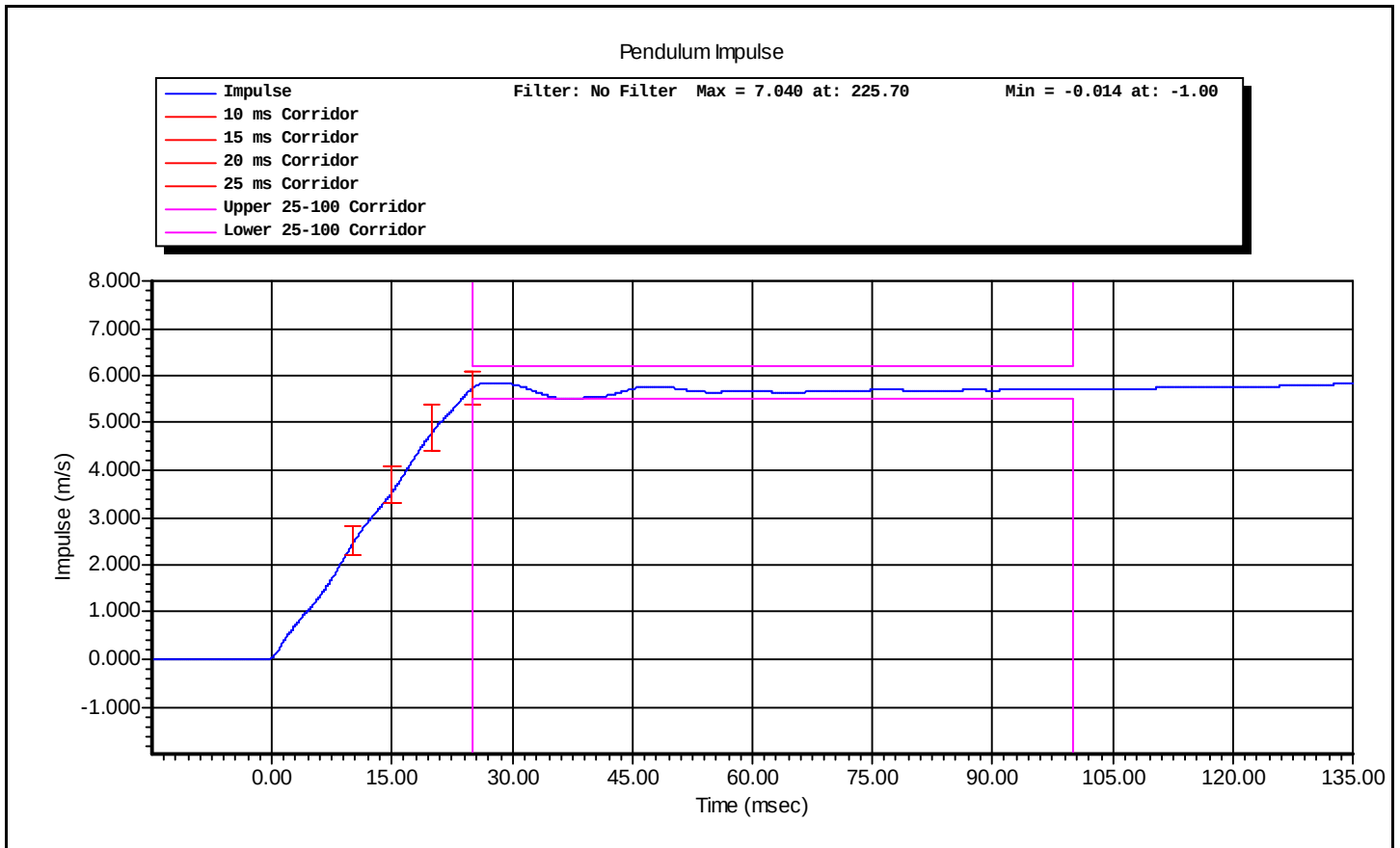
Moment About Occipital Condyle



Test ID: Neck Flexion

Test Time: 12:12:32 PM

Test Date: 11/4/2010





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder Impact	Test Date:	11/5/2010
Test Number:	2	Test Time:	10:34:14 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	20.80 deg C P
Humidity	10.0 -- 70.0	36.0 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Probe Acceleration	13.0 -- 18.0	17.0 g P
Shoulder Deflection	28.0 -- 37.0	31.1 mm P
T1 Acceleration	17.0 -- 22.0	20.7 g P

All test parameters are within specifications

Technician: **S. Zito III** Signature: _____
Supervisor: **D. Travale** Signature: _____

Test ID: **Shoulder Impact**

Test Time: **10:34:14 AM**

Test Date: **11/5/2010**



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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
Servo	180-3885	DS-1063	4/7/2010
Endevco	7264-2000	P51927	10/8/2010

Test ID: **Shoulder Impact**

Test Time: **10:34:14 AM**

Test Date: **11/5/2010**

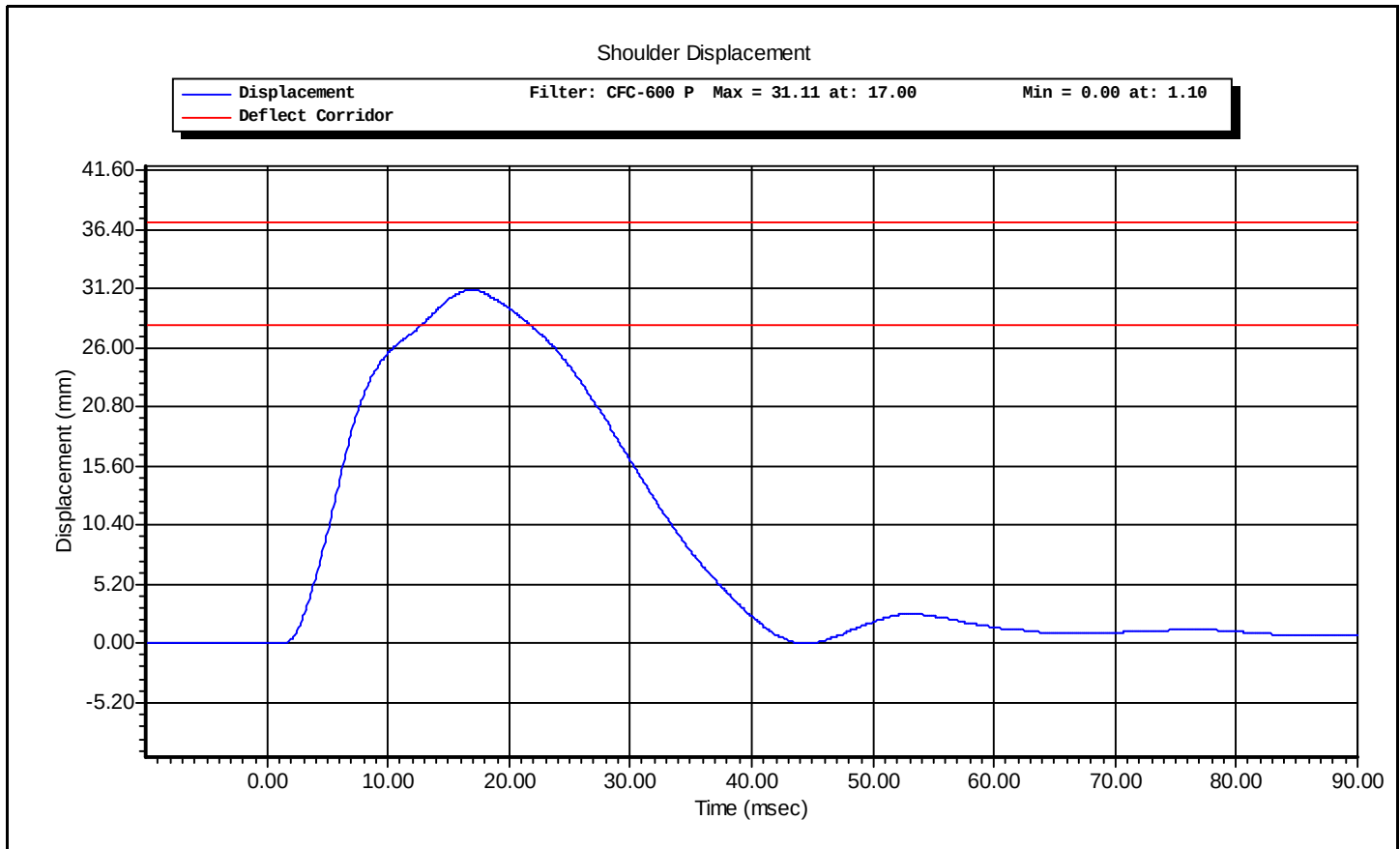


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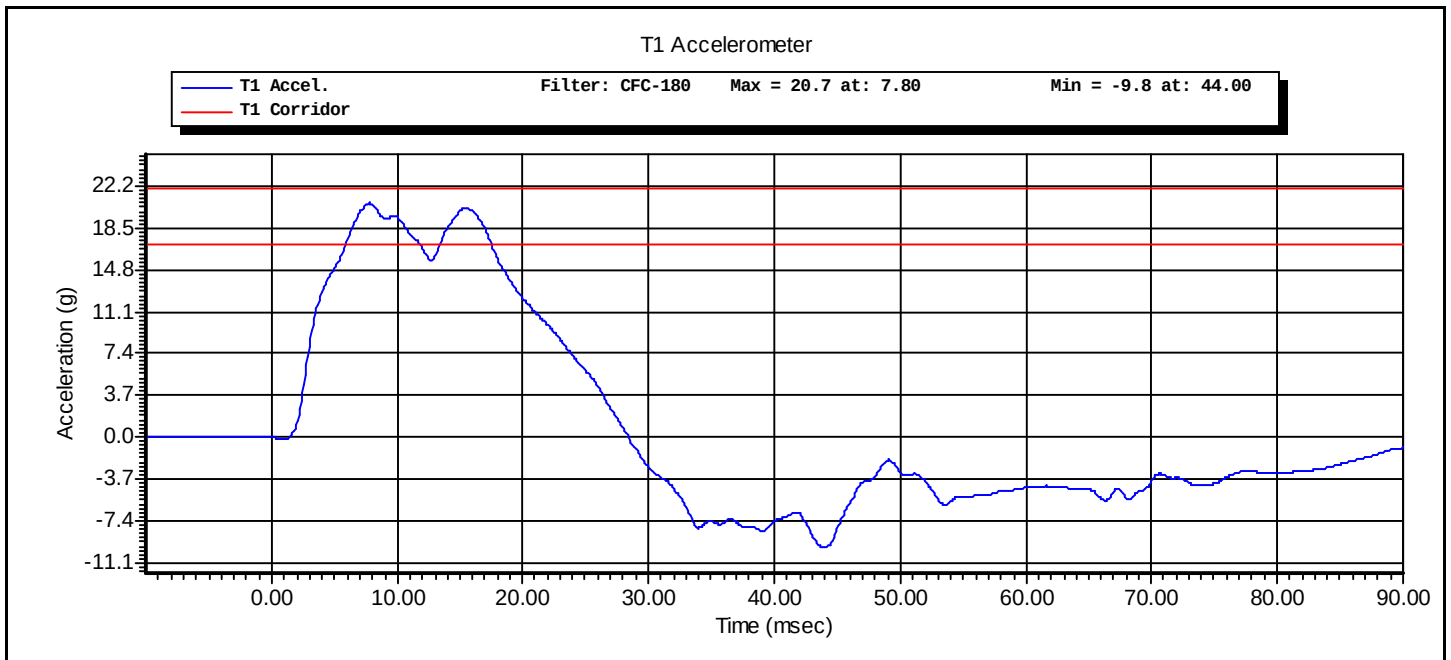
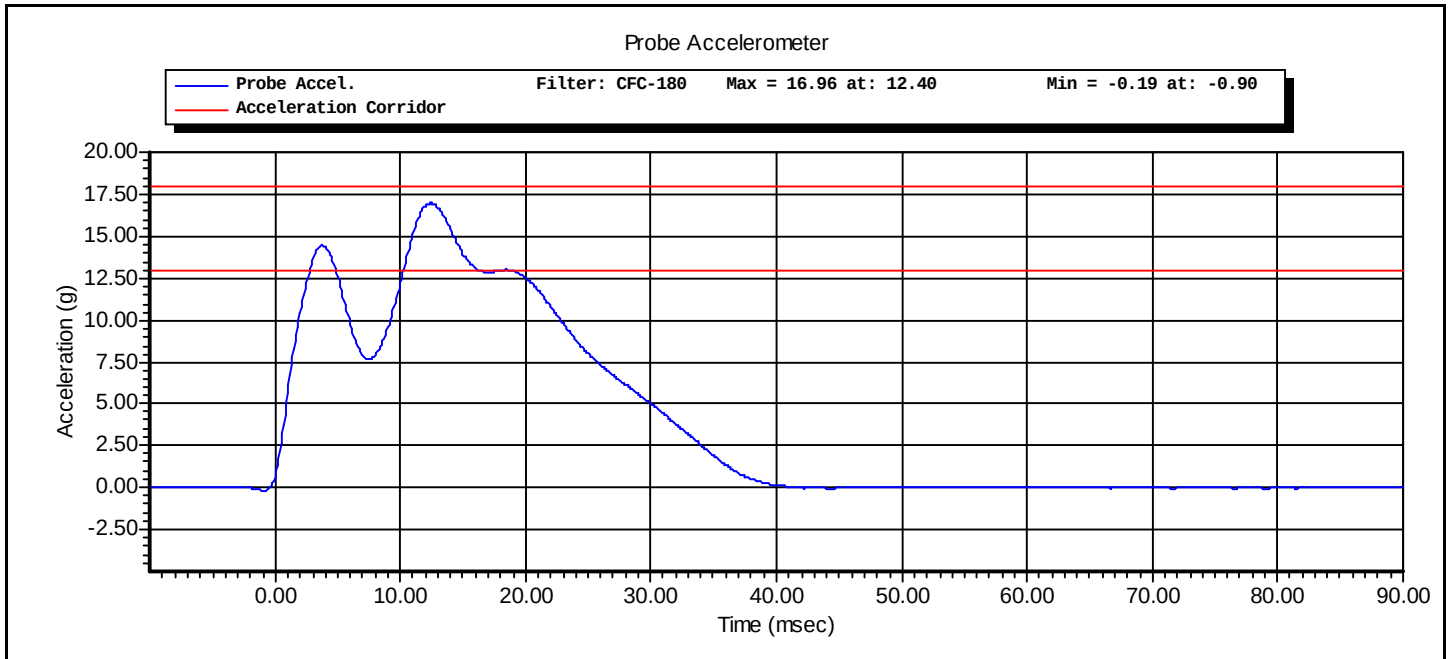
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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder Impact	Test Date:	11/5/2010
Test Number:	2	Test Time:	10:34:14 AM



Test ID: **Shoulder Impact** Test Time: **10:34:14 AM**

Test Date: **11/5/2010**





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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	11/4/2010
Test Number:	1	Test Time:	3:14:37 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.4 deg C	P
Humidity	10	--	70	36 %RH	P
Velocity	4.20	--	4.40	4.35 m/s	P
Probe Acceleration	14.0	--	18.0	16.4 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	35.3 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.5 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	41.9 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	15.3 g	P
Lower Spine Acceleration T12	7.0	--	11.0	10.2 g	P

All test parameters are within specifications

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

Test ID: **Thorax Without Arm** Test Time: **3:14:37 PM**

Test Date: **11/4/2010**



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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
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P51927	10/8/2010
Endevco	7264-2000	P64147	9/20/2010

Test ID: **Thorax Without Arm** Test Time: **3:14:37 PM**

Test Date: **11/4/2010**

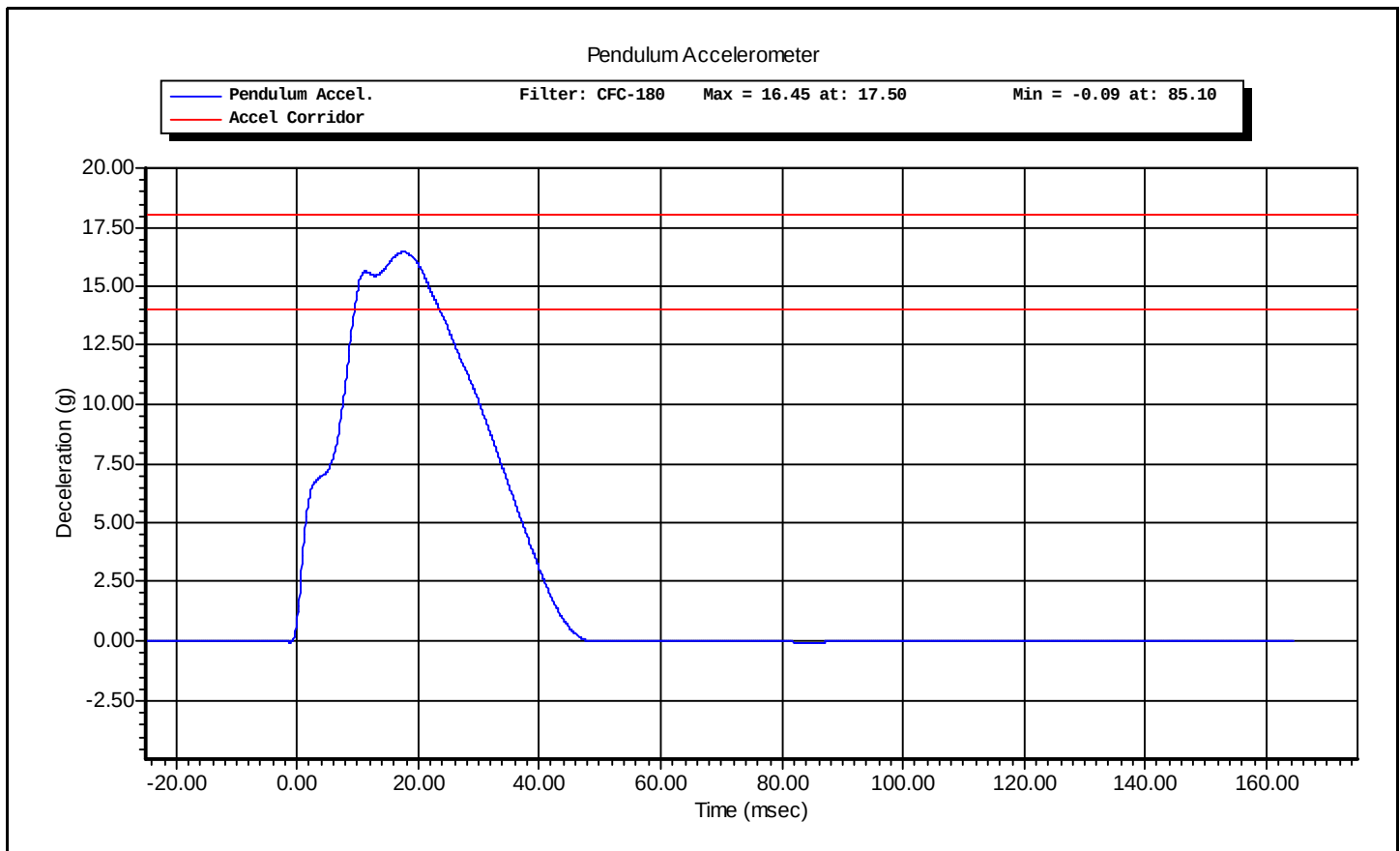


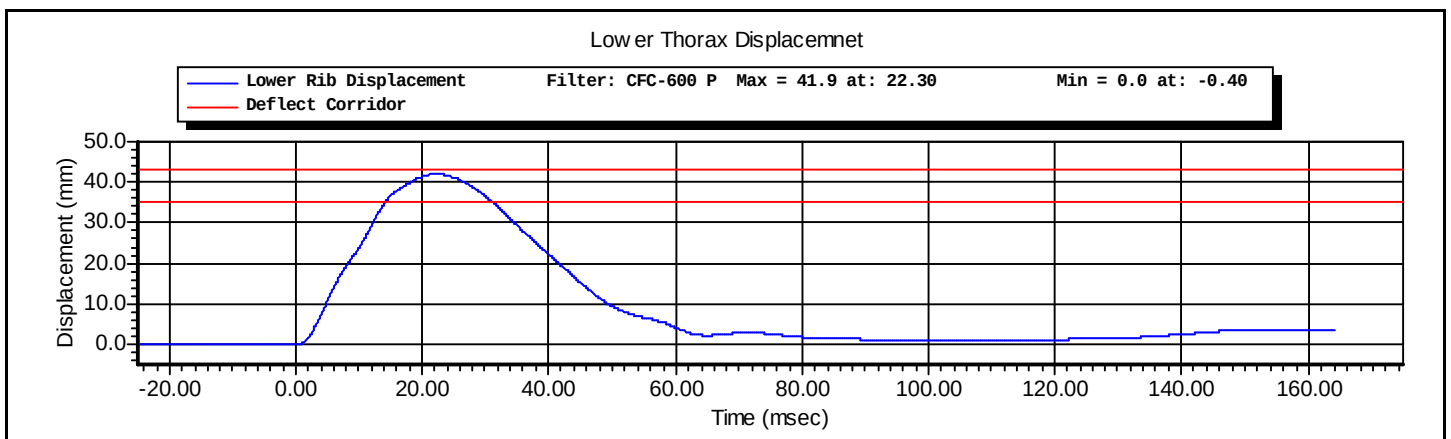
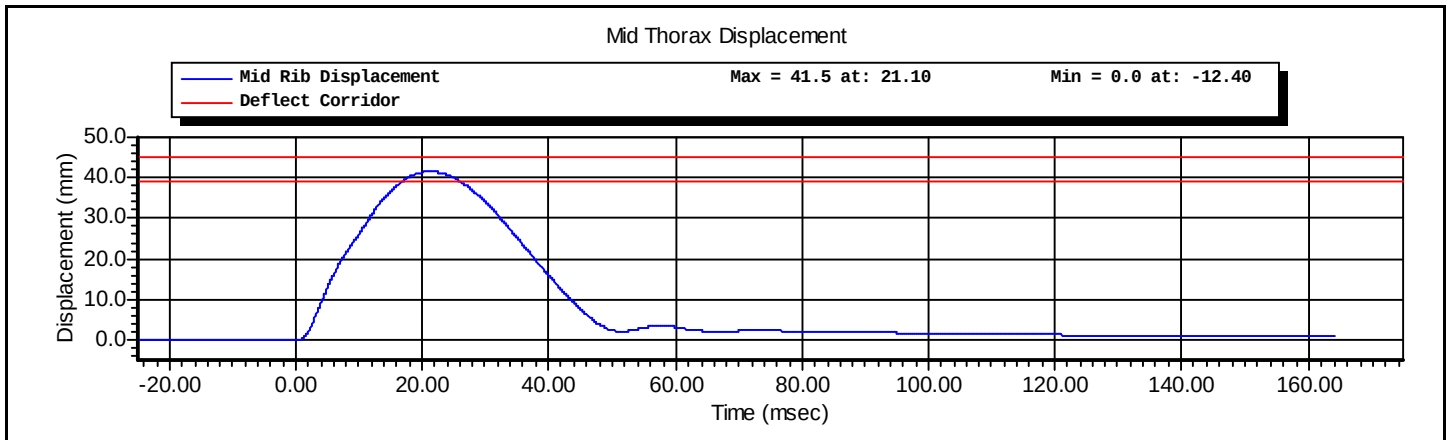
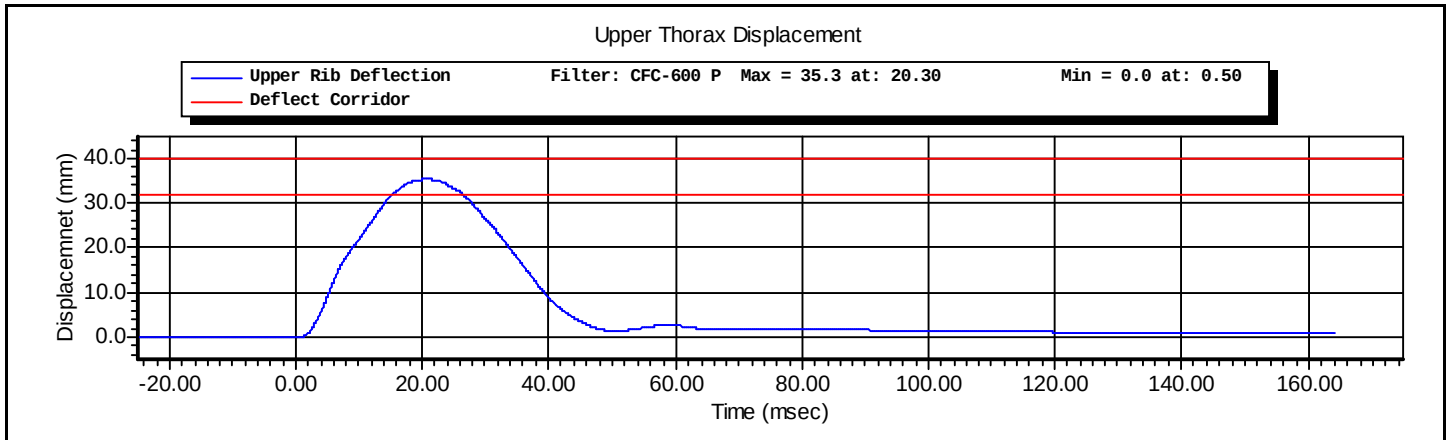
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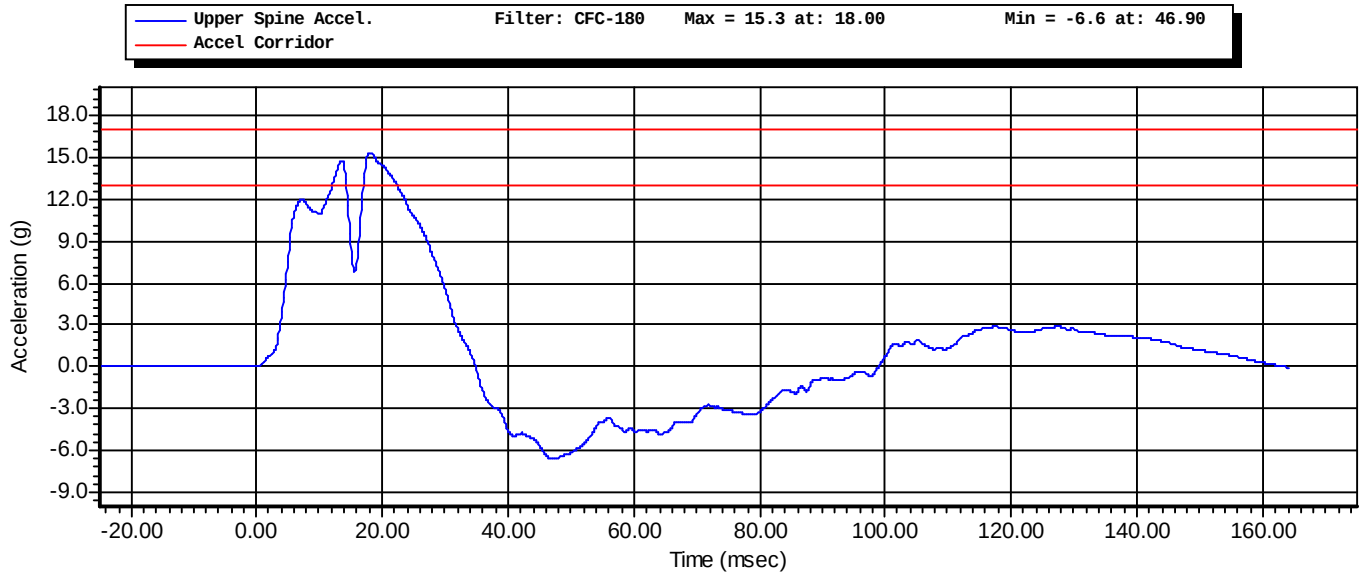
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	11/4/2010
Test Number:	1	Test Time:	3:14:37 PM

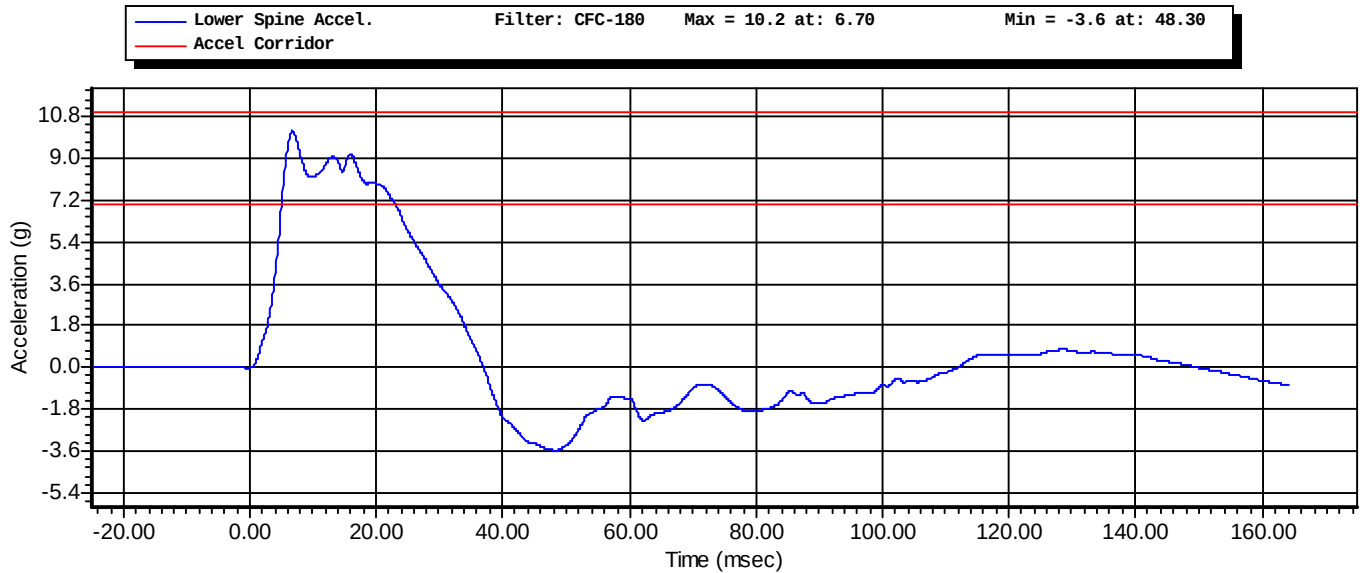




Upper Spine Acceleration



Lower Spine Acceleration





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	11/4/2010
Test Number:	1	Test Time:	3:54:20 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.4 deg C	P
Humidity	10	--	70	35 %RH	P
Velocity	6.60	--	6.80	6.70 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	35.1 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	26.6 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	31.5 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	36.7 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	39.5 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	36.8 g	P
Shoulder Deflection	31.0	--	40.0	36.7 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm** Test Time: **3:54:20 PM**

Test Date: **11/4/2010**



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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
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P51927	10/8/2010
Endevco	7264-2000	P64147	9/20/2010
Servo	180-3885	DS-1063	4/7/2010

Test ID: **Thorax With Arm** Test Time: **3:54:20 PM**

Test Date: **11/4/2010**

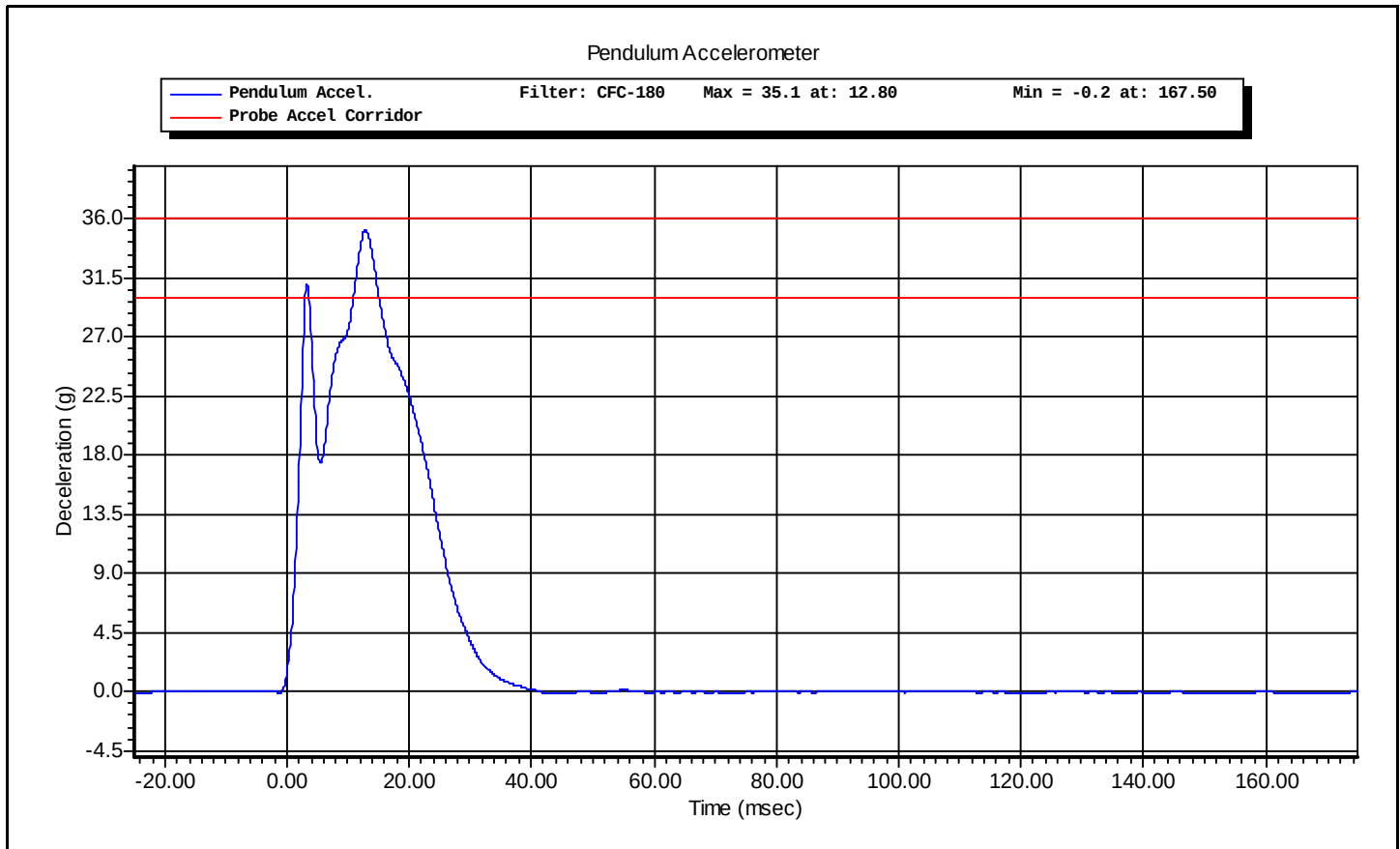


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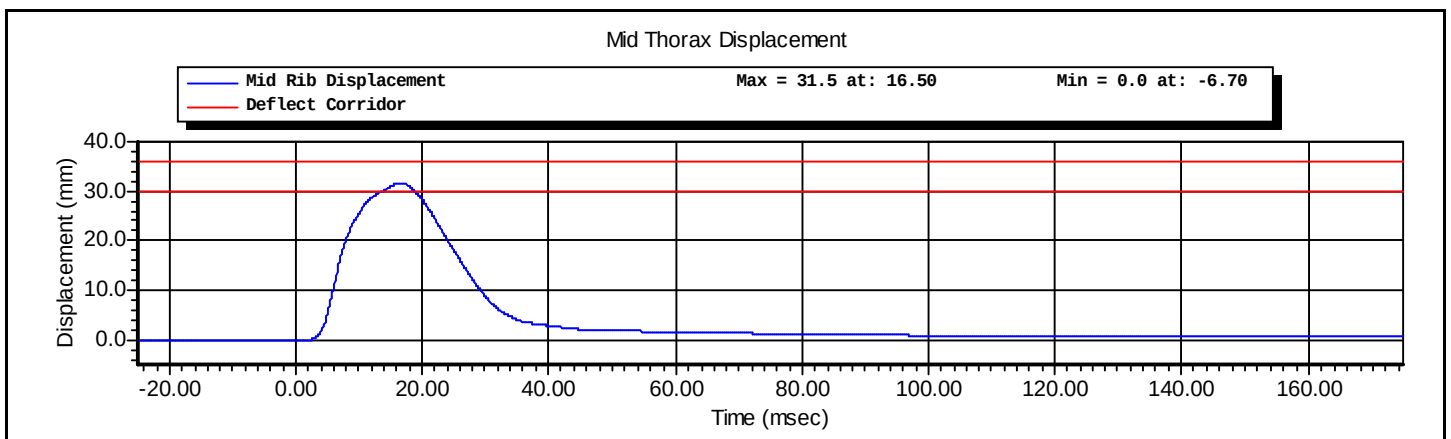
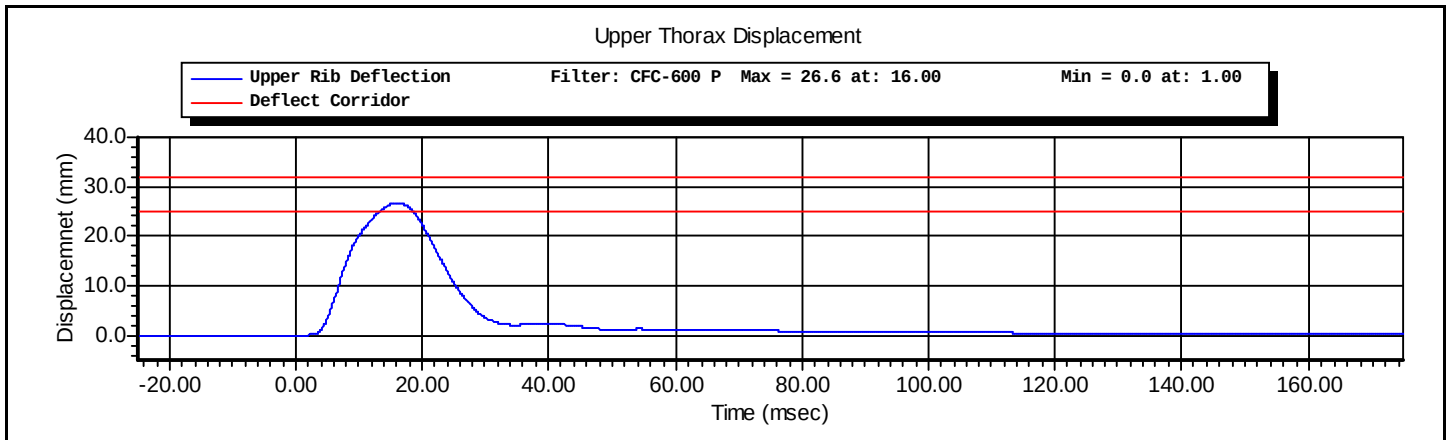
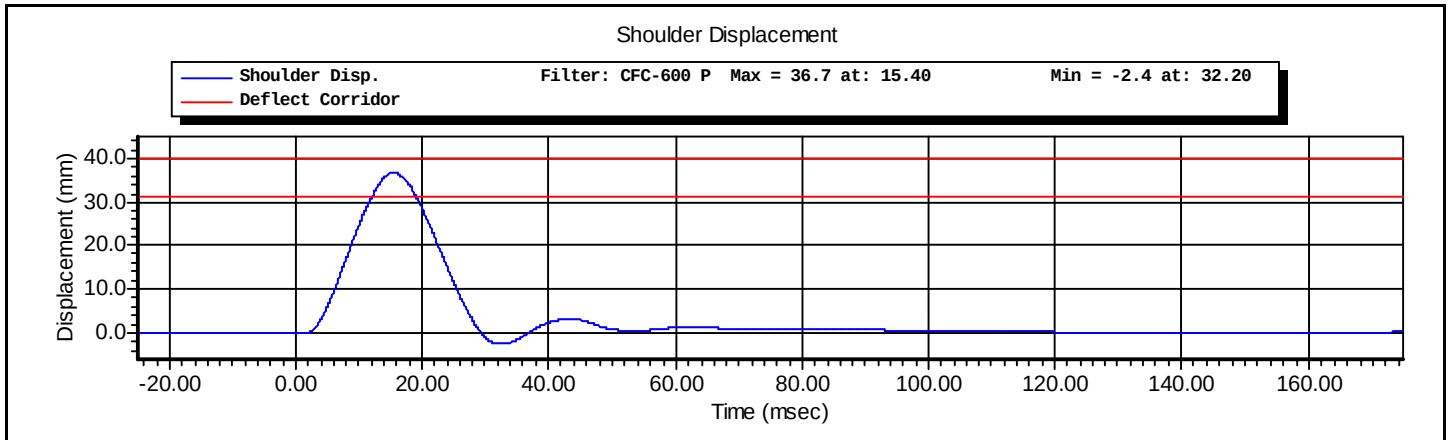
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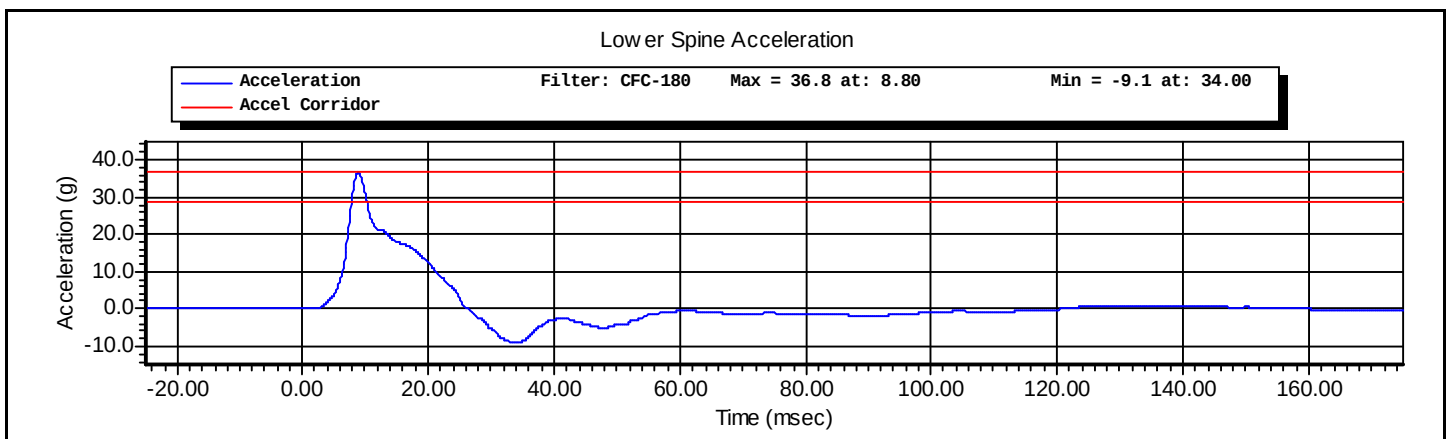
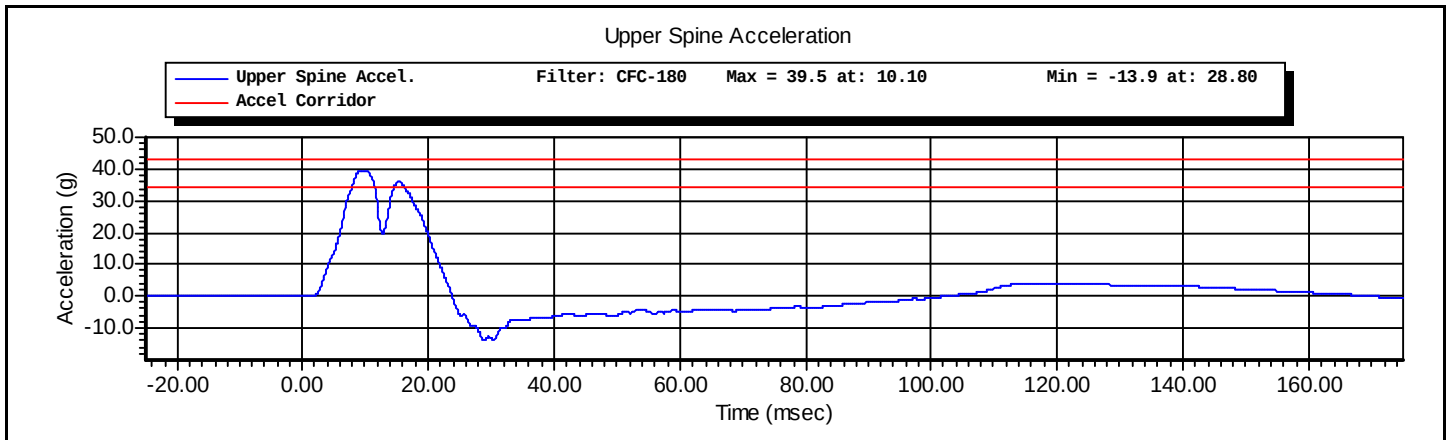
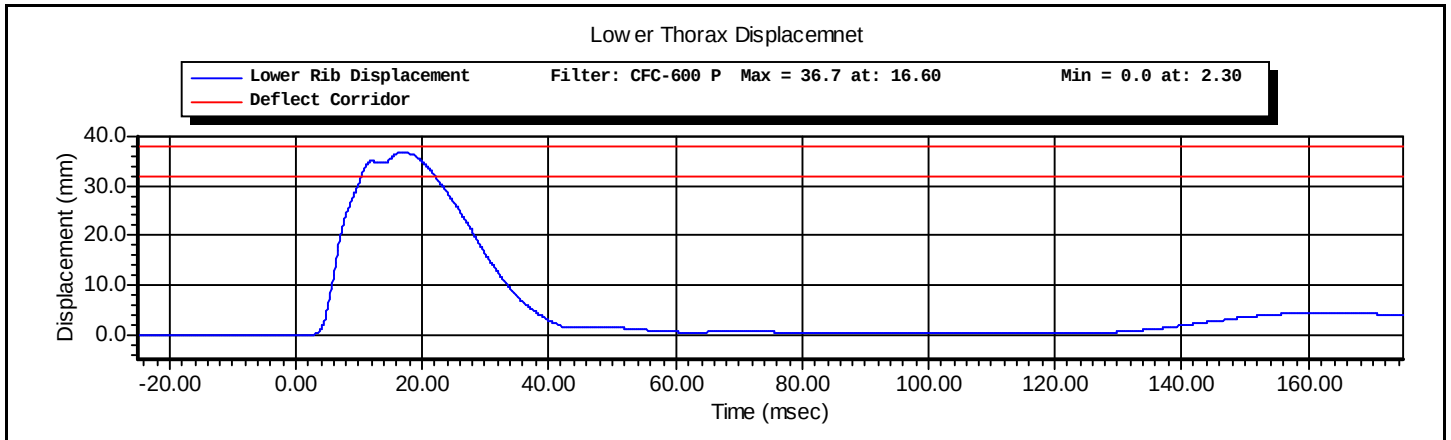
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	11/4/2010
Test Number:	1	Test Time:	3:54:20 PM



Test ID: Thorax With Arm Test Time: 3:54:20 PM

Test Date: 11/4/2010







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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	11/4/2010
Test Number:	1	Test Time:	2:53:45 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.4 deg C P
Humidity	10 -- 70	35 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	12.0 -- 16.0	15.9 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	38.8 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	34.8 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.3 g P

All test parameters are within specifications

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

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

Test ID: **Abdomen**

Test Time: **2:53:45 PM**

Test Date: **11/4/2010**



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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
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1232	4/7/2010
Endevco	7264-2000	P64147	9/20/2010

Test ID: **Abdomen**

Test Time: **2:53:45 PM**

Test Date: **11/4/2010**



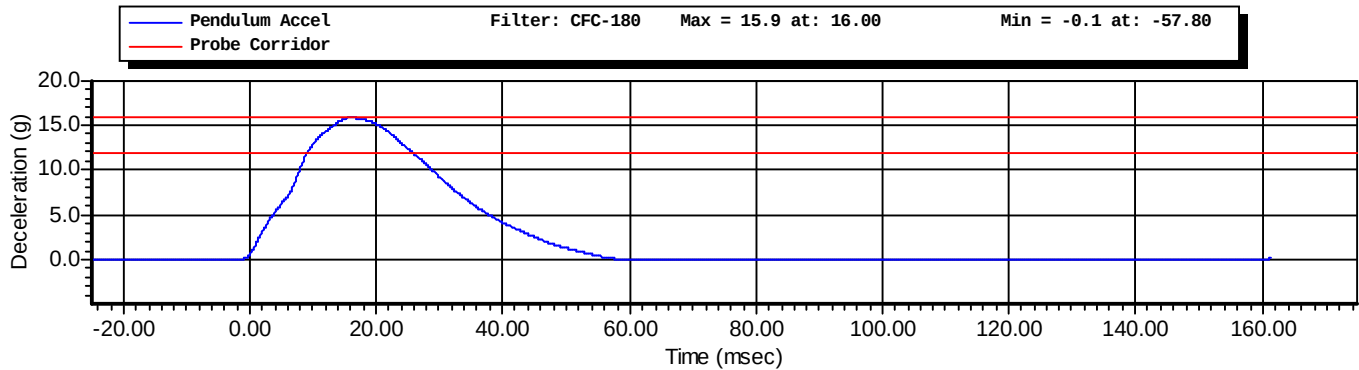
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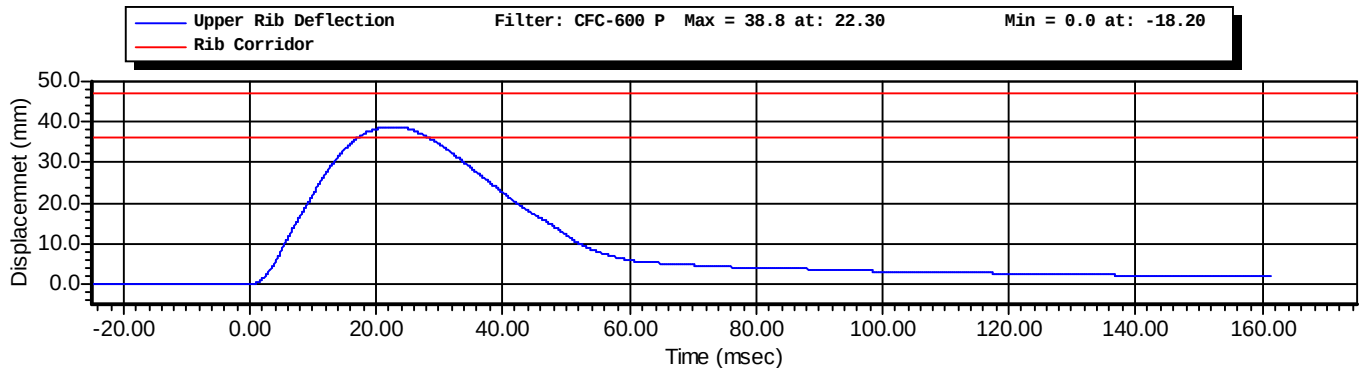
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	11/4/2010
Test Number:	1	Test Time:	2:53:45 PM

Pendulum Accelerometer



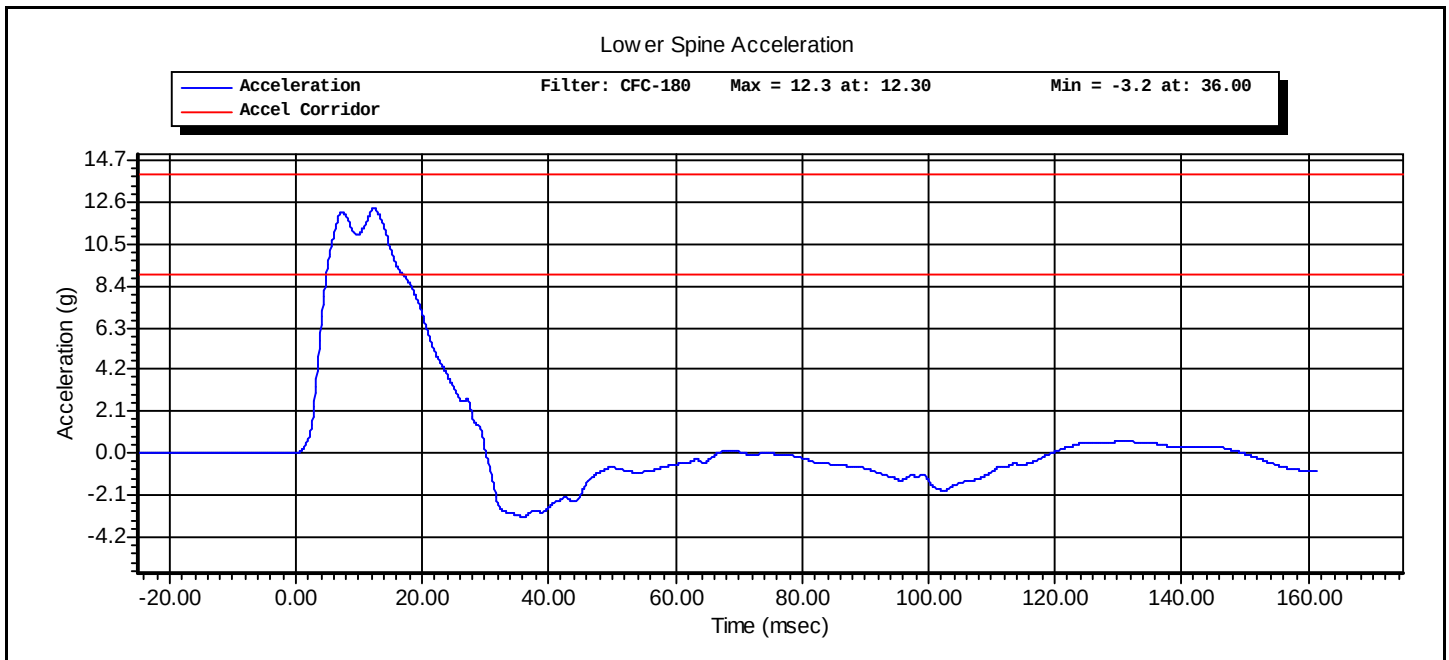
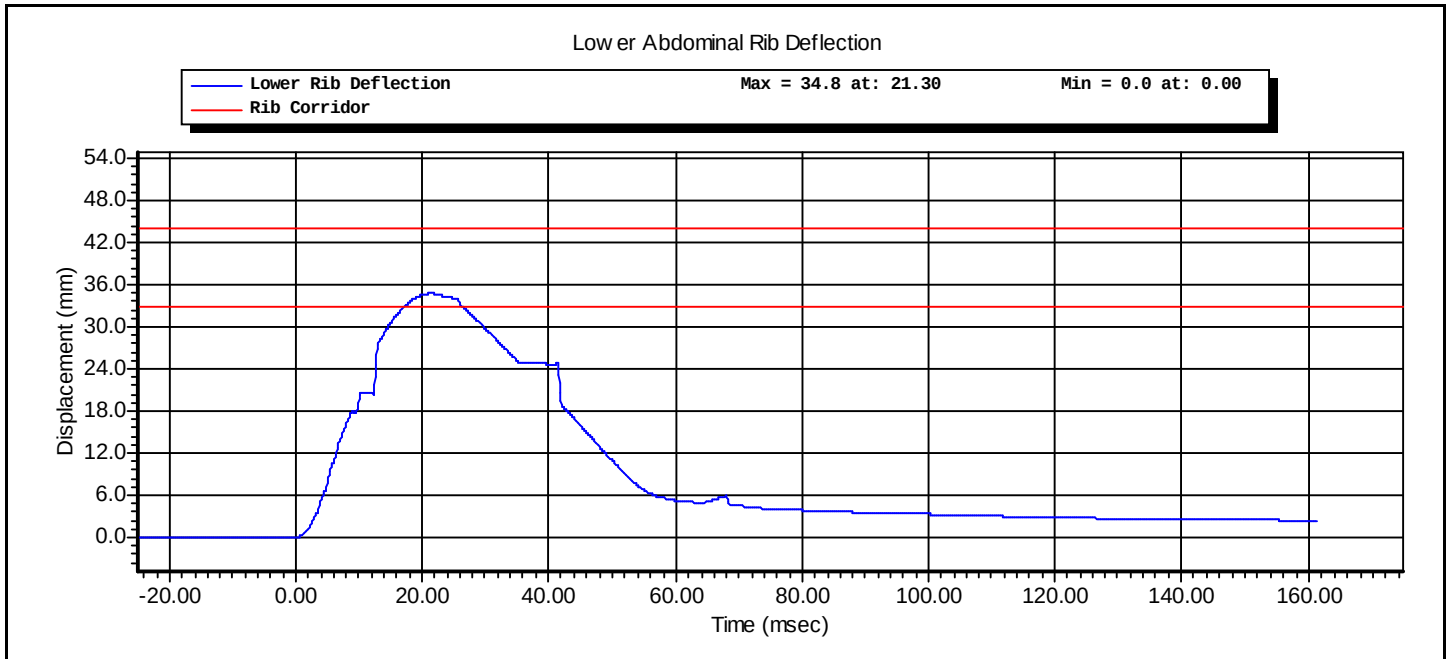
Upper Abdominal Rib Deflection



Test ID: **Abdomen**

Test Time: **2:53:45 PM**

Test Date: **11/4/2010**





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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Iliac Pelvis	Test Date:	11/5/2010
Test Number:	1	Test Time:	10:55:27 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	20.9 deg C P
Humidity	10 -- 70	35 %RH P
Velocity	4.20 -- 4.40	4.30 m/s P
Peak Probe Acceleration	36.0 -- 45.0	43.0 g P
Peak Pelvis Acceleration	28.0 -- 39.0	37.7 g P
Peak Iliac Force	4.10 -- 5.10	4.78 kN P

All test parameters are within specifications

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

Test ID: **Iliac Pelvis**

Test Time: **10:55:27 AM**

Test Date: **11/5/2010**



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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
Endevco	7264-2000	P51671	10/12/2010
DentonATD	3228J	LC-279 Fy	4/12/2010

Test ID: **Iliac Pelvis**

Test Time: **10:55:27 AM**

Test Date: **11/5/2010**

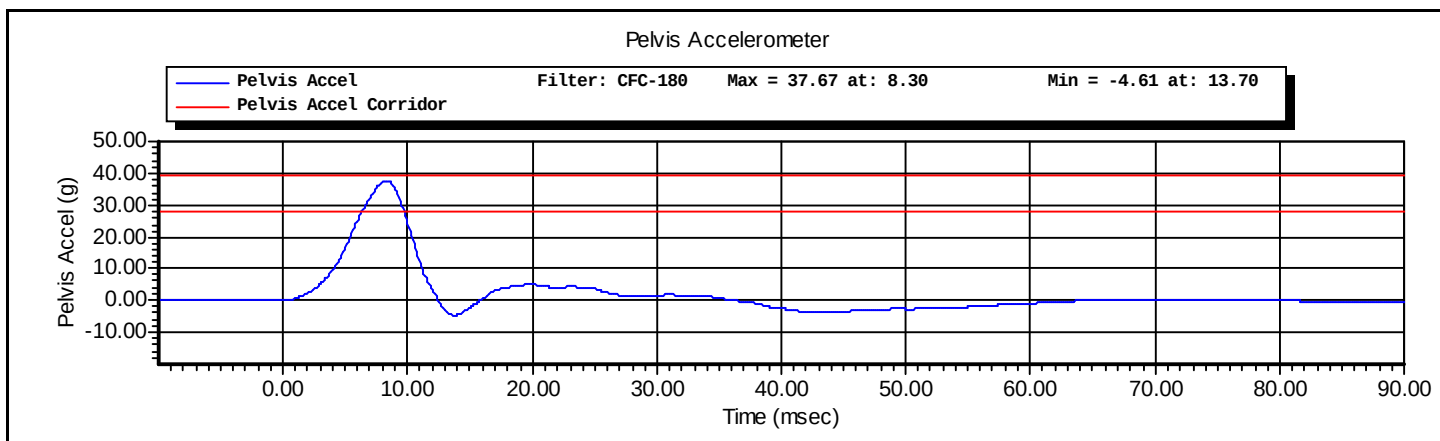
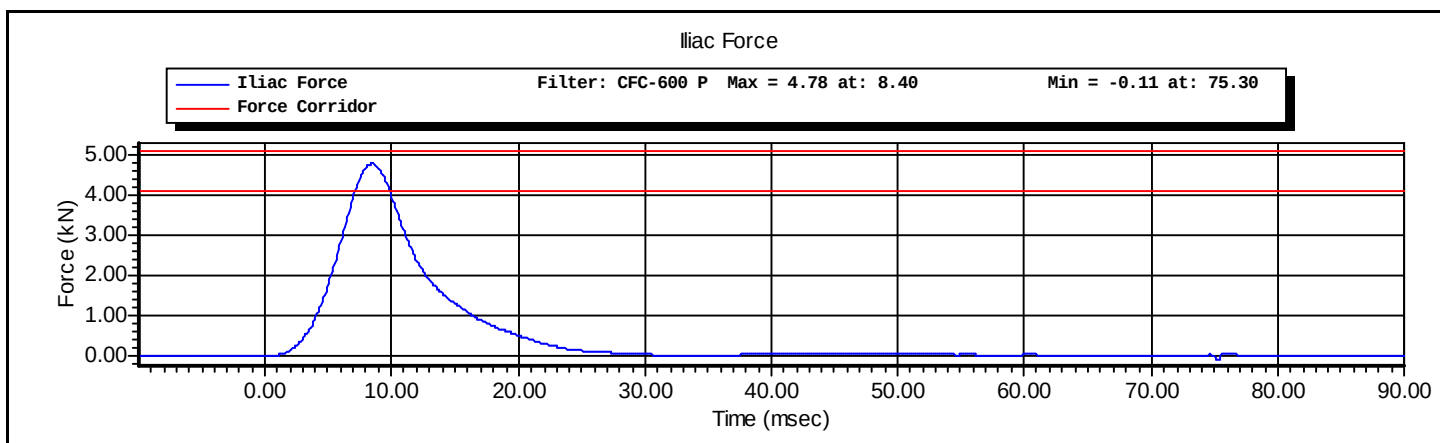


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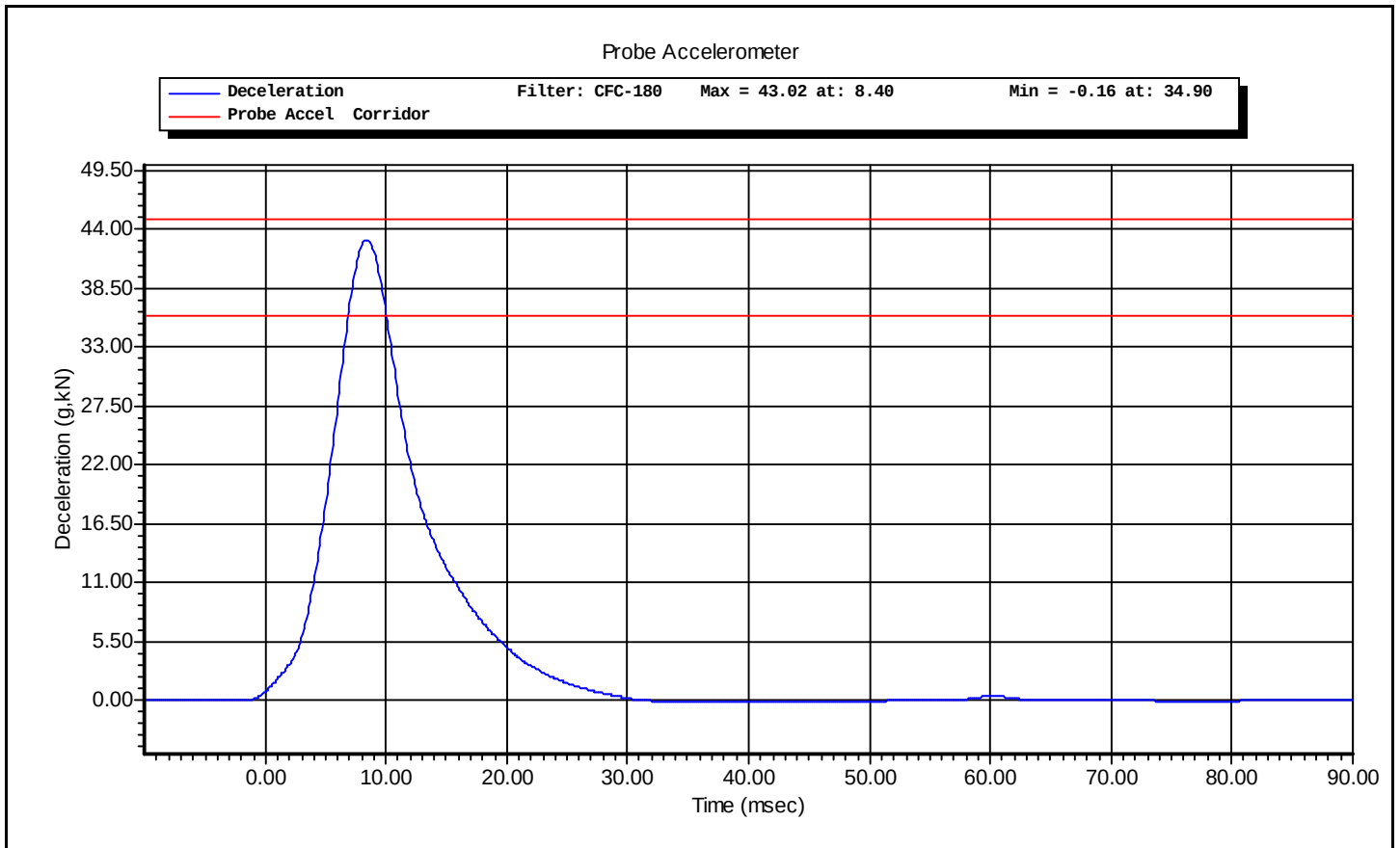
Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Iliac Pelvis	Test Date:	11/5/2010
Test Number:	1	Test Time:	10:55:27 AM



Test ID: **Iliac Pelvis**

Test Time: **10:55:27 AM**

Test Date: **11/5/2010**





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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	11/4/2010
Test Number:	1	Test Time:	2:17:09 PM

Comments:

Pelvis Plug Used for Certification:
FTSS S/N 12783
Force @ 3mm = 1494N

Pelvis Plug Used for Full Scale Test:
FTSS S/N 12742
Force @ 3mm = 1499N

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.1 deg C	P
Humidity	10	--	70	36 %RH	P
Velocity	6.60	--	6.80	6.62 m/s	P
Peak Probe Acceleration	38.0	--	47.0	45.3 g	P
Peak Pelvis Acceleration	34.0	--	42.0	40.1 g	P
Peak Acetabulum Force	3.60	--	4.30	3.98 kN	P

All test parameters are within specifications

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

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

Test ID: **Pelvis Acetabulum** Test Time: **2:17:09 PM**

Test Date: **11/4/2010**



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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
Endevco	7264-2000	P51671	10/12/2010
DentonATD	3249J	LC-275a	4/12/2010

Test ID: **Pelvis Acetabulum** Test Time: **2:17:09 PM**

Test Date: **11/4/2010**



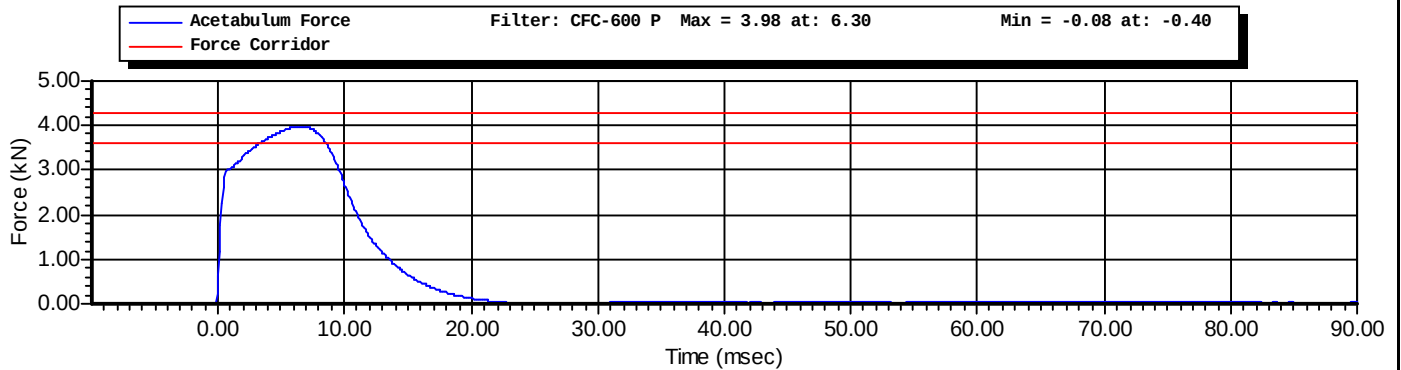
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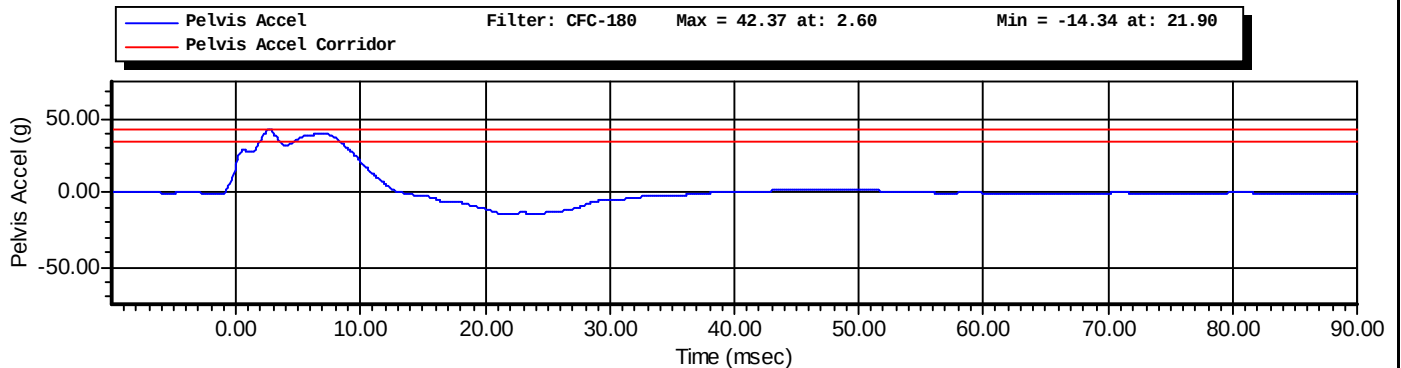
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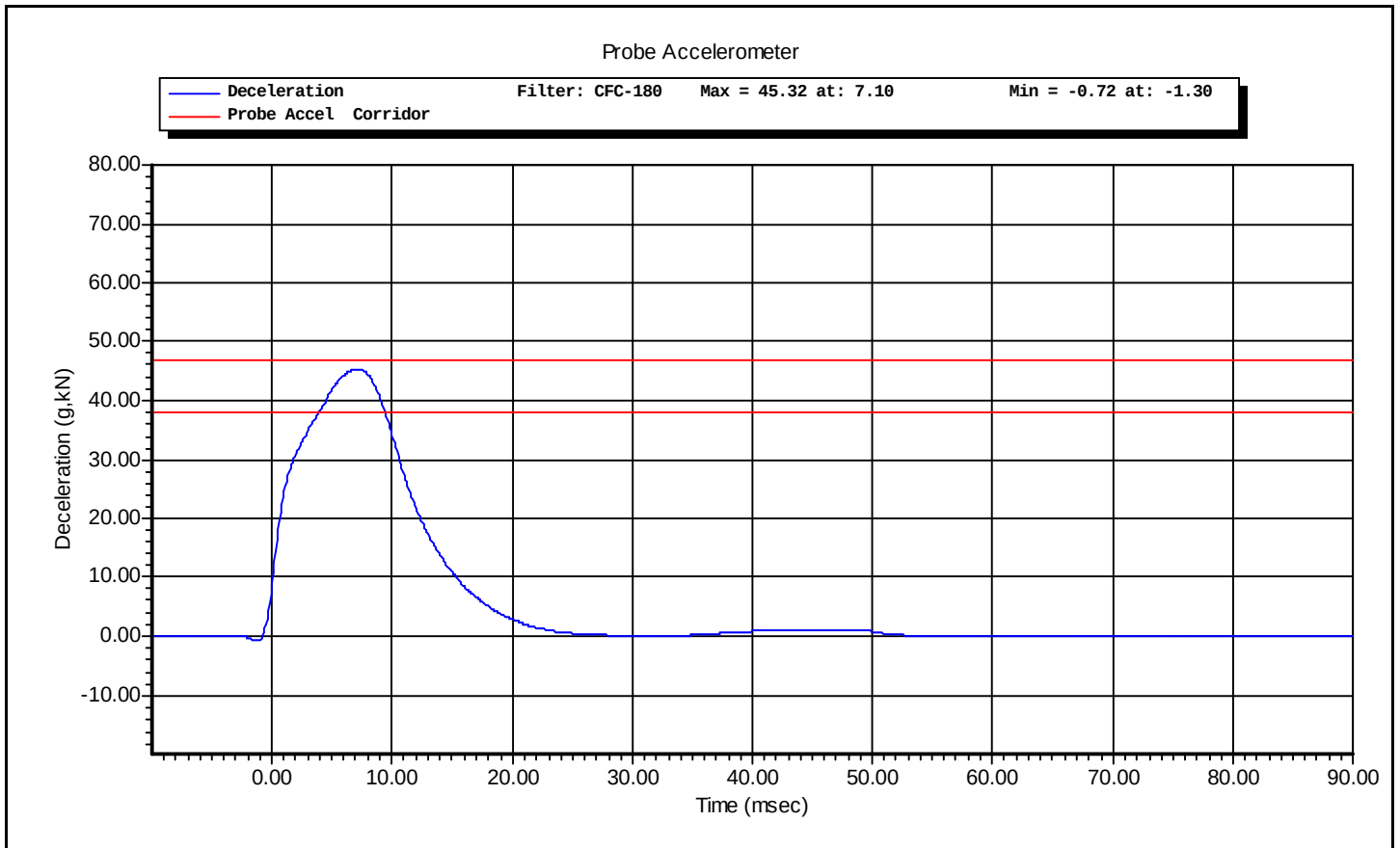
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Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Pelvis Acetabulum	Test Date:	11/4/2010
Test Number:	1	Test Time:	2:17:09 PM

Acetabulum Force

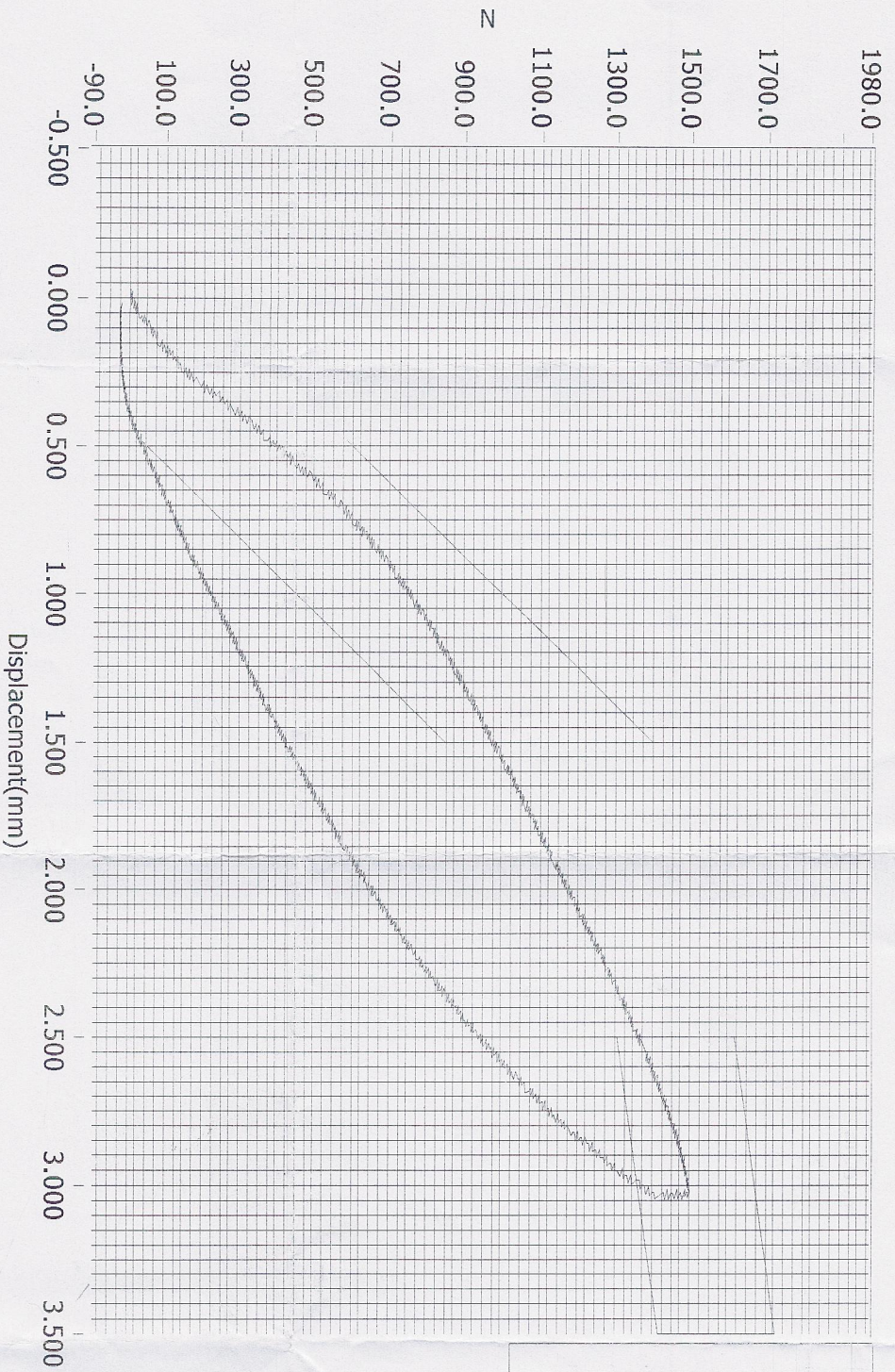


Pelvis Accelerometer





Resultant Data - SIDIIs Plug Compression



Loading Curve
 Boundary Limit Upper
 Boundary Limit Lower
 Peak Load Upper
 Peak Load Lower
 Peak Defl Upper
 Peak Defl Lower

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

12783

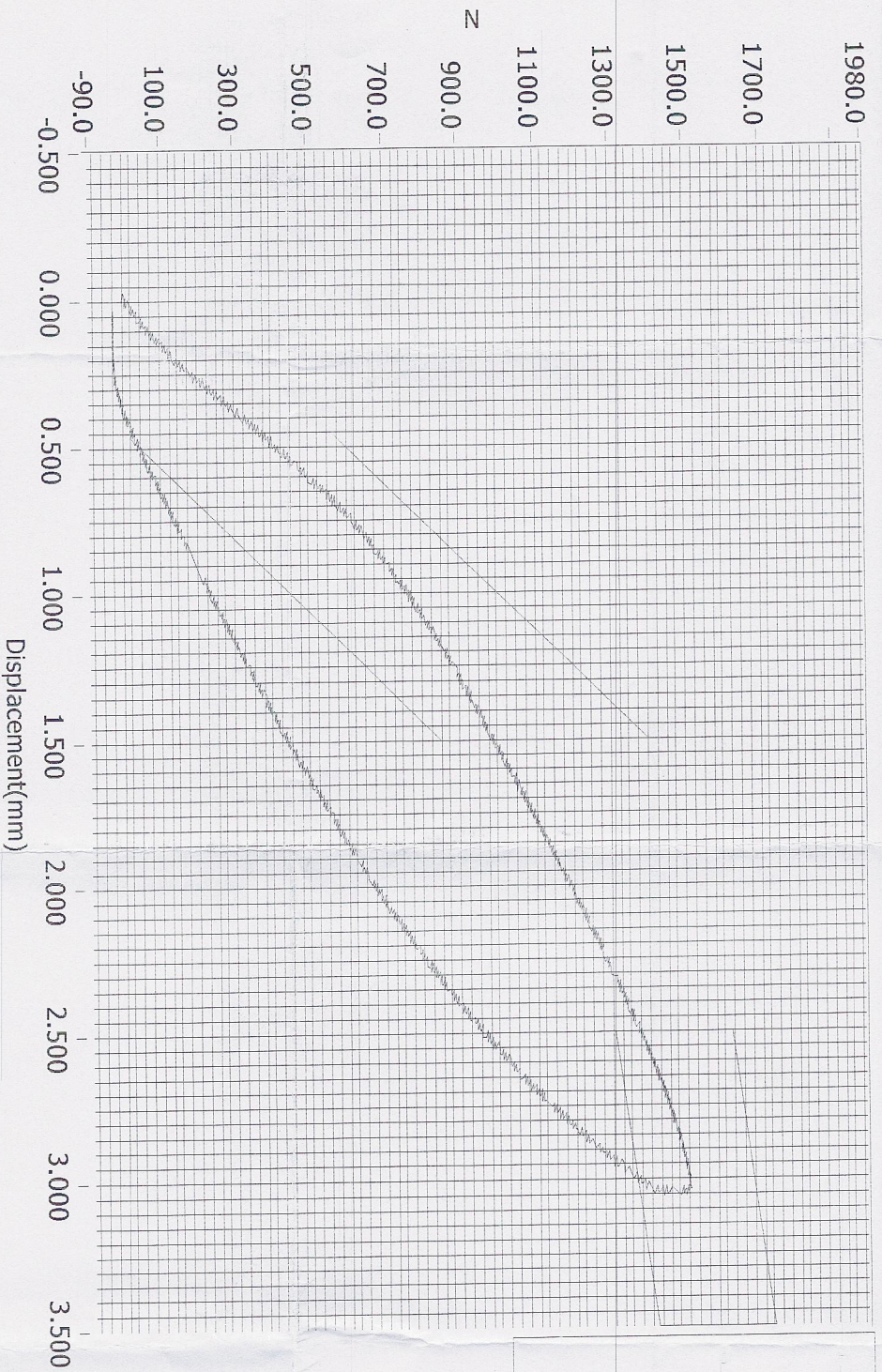
SIDIIs

Current Date : 7/16/2007

Current Time : 15:32:18

C

Resultant Data - SIDIIs Plug Compression



Loading Curve	<
Boundary Limit Upper	<
Boundary Limit Lower	<
Peak Load Upper	<
Peak Load Lower	<
Peak Defl Upper	<
Peak Defl Lower	<

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

SIDIIs

Current Date : 7/16/2007

Current Time : 13:38:26

FS

CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 300

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

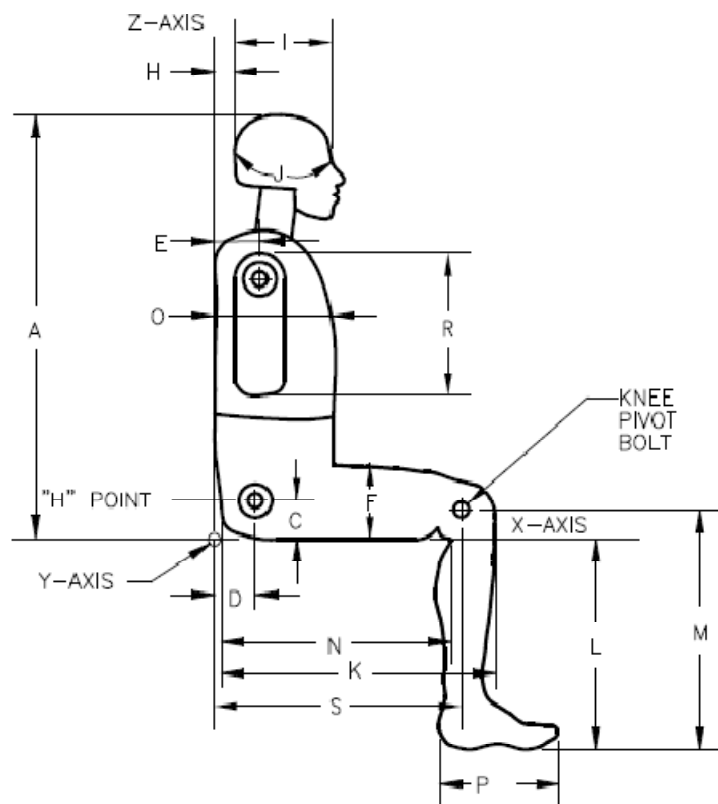
NHTSA ATD S/N 300

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	785	Yes
B	Shoulder Pivot Height	437.0 - 453.0	450	Yes
C	H-Point Height	79.0 - 89.0	87	Yes
D	H-Point from Seat Back	141.0 - 151.0	145	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	98	Yes
F	Thigh Clearance	119.0 - 135.0	125	Yes
G	Head Breadth	140.0 - 148.0	143	Yes
H	Head Back from Backline	40.0 - 46.0	42	Yes
I	Head Depth	178.0 - 188.0	181	Yes
J	Head Circumference	541.0 - 551.0	545	Yes
K	Buttock to Knee Length	514.0 - 540.0	523	Yes
L	Popliteal Height	343.0 - 369.0	365	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	395	Yes
N	Buttock Popliteal Length	416.0 - 442.0	430	Yes
O	Chest Depth without Jacket	195.0 - 211.0	205	Yes
P	Foot Length (right)	216.0 - 232.0	220	Yes
P	Foot Length (left)	216.0 - 232.0	220	Yes
Q	Hip Breadth	313.0 - 323.0	315	Yes
R	Arm Length	249.0 - 259.0	253	Yes
S	Knee Joint to Seat back	478.0 - 493.0	475	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	85	Yes
W	Foot Width (left)	78.0 - 94.0	85	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	773	Yes

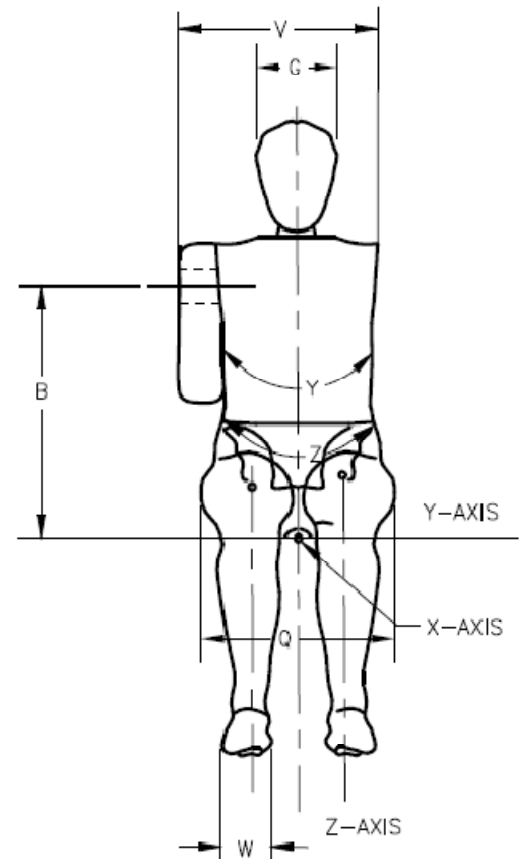
Technician: SZ

Date: 11/17/2010

SID-IIIsD External Dimension Reference Diagram



SIDE VIEW



FRONT VIEW



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	11/17/2010
Test Number:	1	Test Time:	8:50:47 AM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1355

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	42 %RH P
Resultant Acceleration	115.0 -- 137.0	129.8 g P
Oscillation	0.0 -- 15.0	1.7 % P
Fore-Aft Acceleration	-15.0 -- 15.0	2.9 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **8:50:47 AM**

Test Date: **11/17/2010**



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

Test ID: **Head Drop**

Test Time: **8:50:47 AM**

Test Date: **11/17/2010**

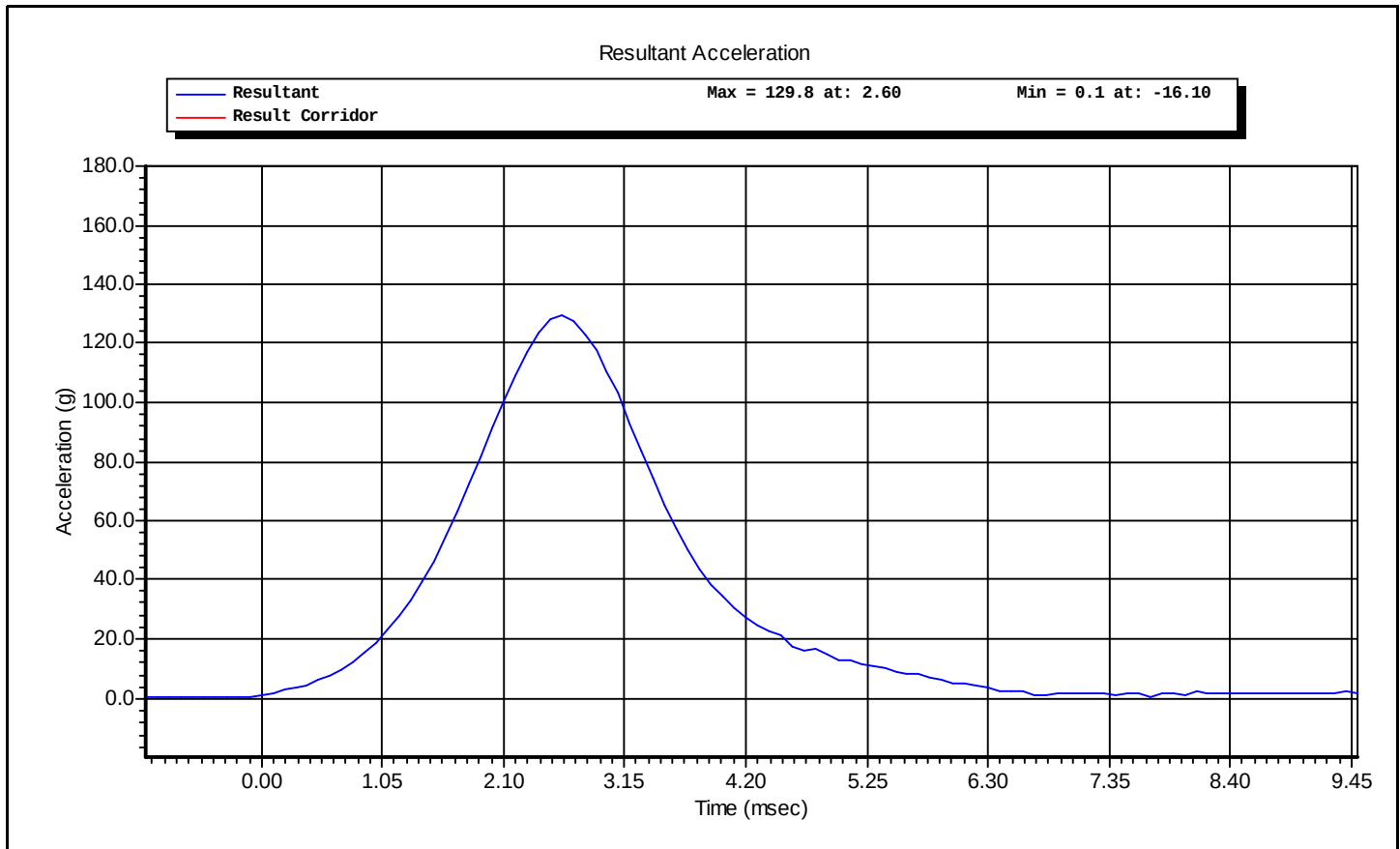


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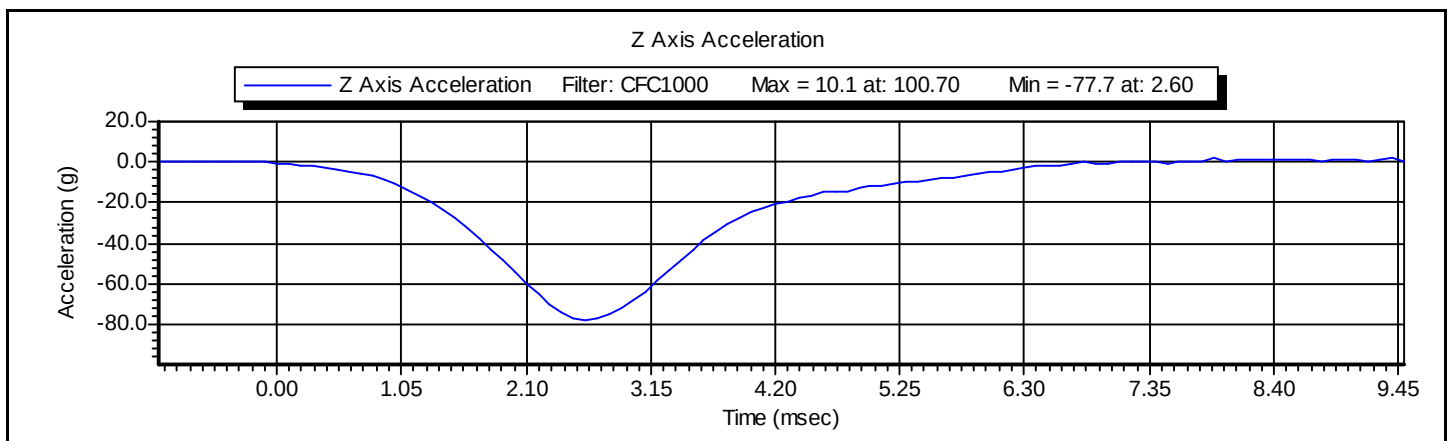
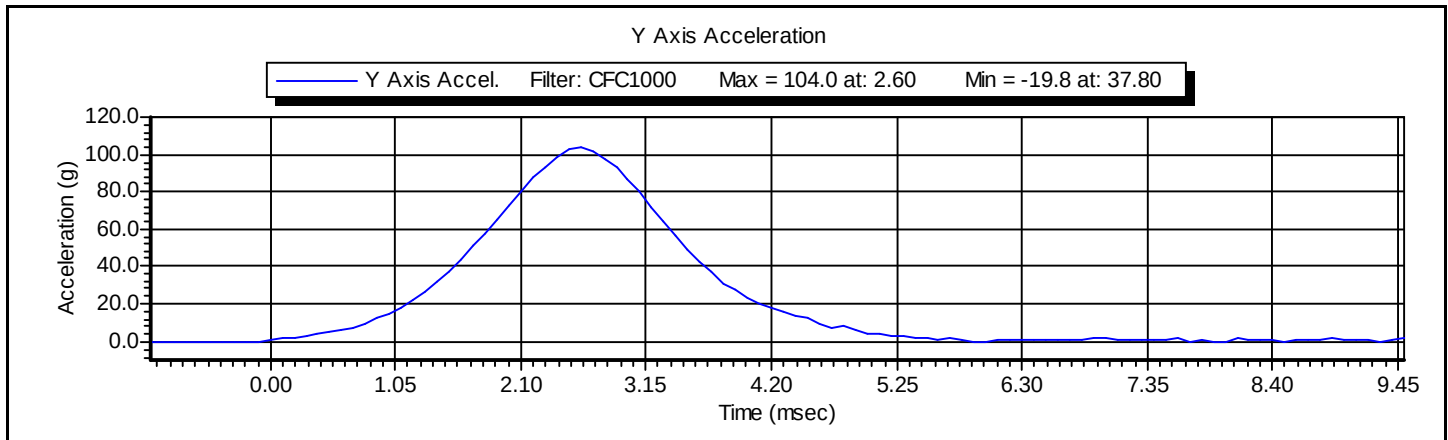
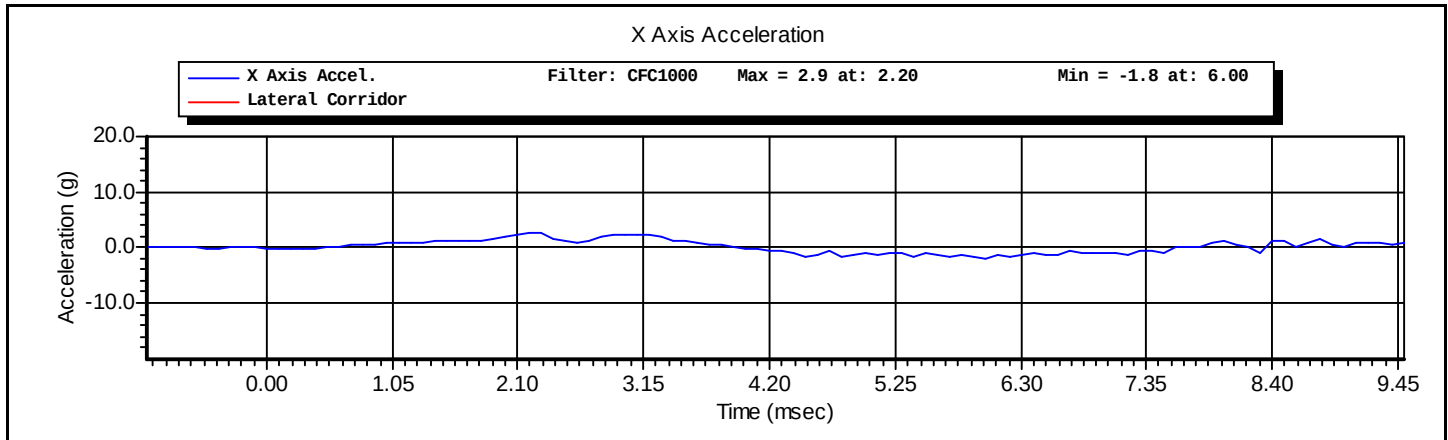
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Head Drop	Test Date:	11/17/2010
Test Number:	1	Test Time:	8:50:47 AM



Test ID: **Head Drop**

Test Time: **8:50:47 AM**

Test Date: **11/17/2010**





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VERIFICATION REPORT

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	11/17/2010
Test Number:	2	Test Time:	10:13:23 AM

Component Part Number	Component Serial Number
Neck - 180-2000	787

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10 -- 70	44 %RH P
Velocity	5.51 -- 5.63	5.53 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.58 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.72 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	5.04 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.84 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.88 m/s P
Max D Plane Rotation	71.0 -- 81.0	75.7 degrees P
Time at Max Rotation	50.0 -- 70.0	60.9 ms P
Moment about OC	-44.0 -- -36.0	-42.7 Nm P
Moment Decay to Zero	102.0 -- 126.0	114.2 ms P

All test parameters are within specifications

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

Test ID: **Neck Flexion**

Test Time: **10:13:23 AM**

Test Date: **11/17/2010**



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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
Denton	1716A	LC-576 Fy	2/15/2010
Denton	1716A	LC-576 Mx	2/15/2010
DentonATD	78051-342	184	4/30/2010
DentonATD	78051-342	174	4/30/2010
DentonATD	78051-342	185	4/30/2010

Test ID: **Neck Flexion**

Test Time: **10:13:23 AM**

Test Date: **11/17/2010**



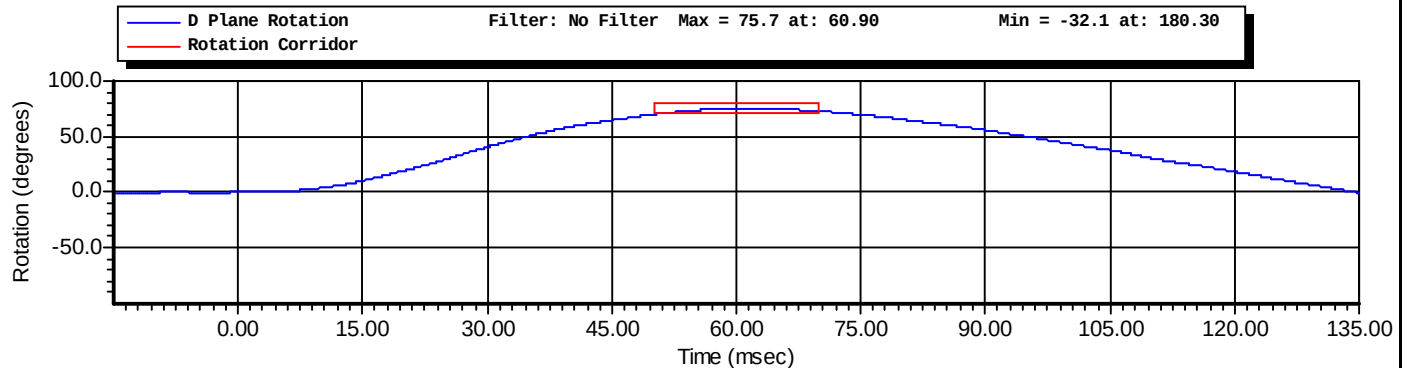
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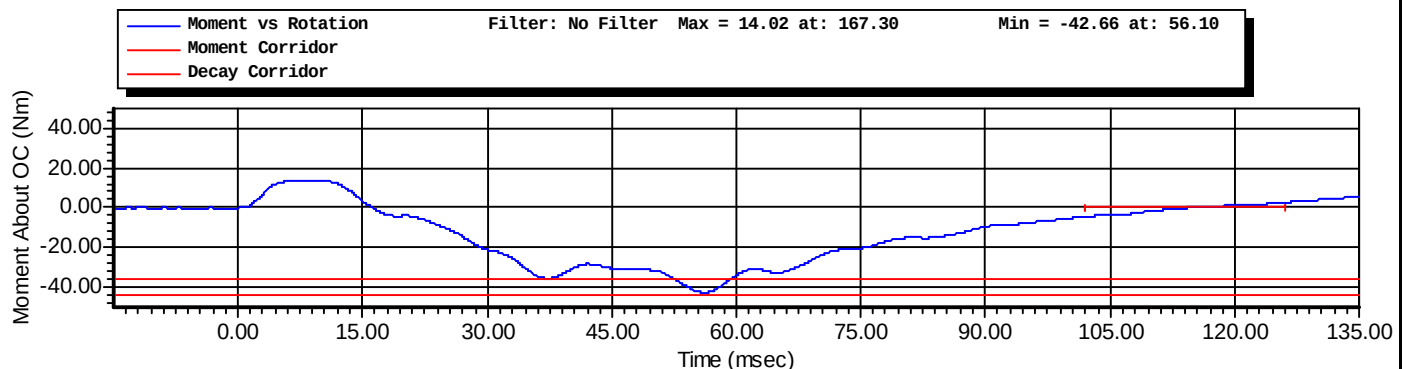
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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Neck Flexion	Test Date:	11/17/2010
Test Number:	2	Test Time:	10:13:23 AM

D Plane Rotation



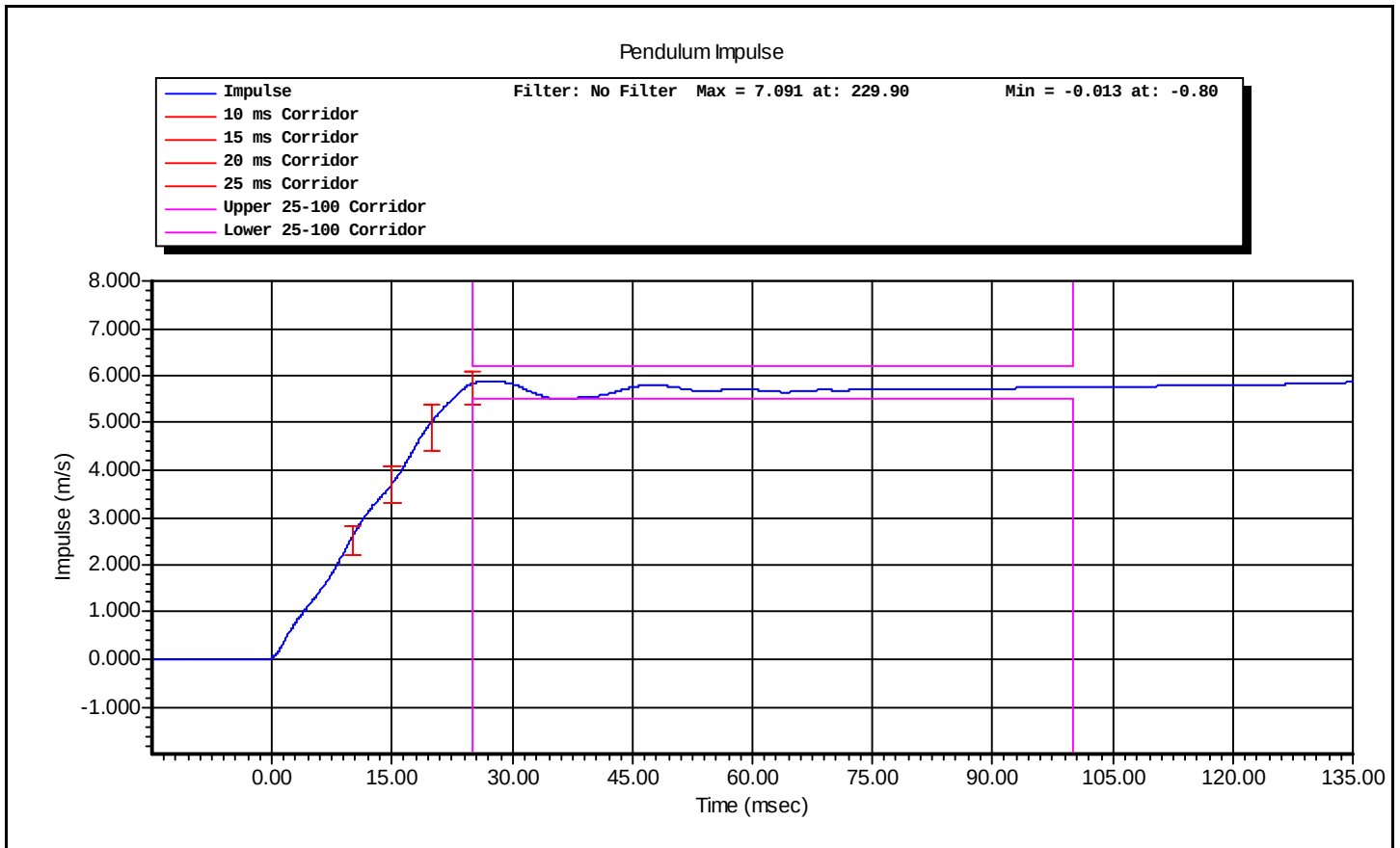
Moment About Occipital Condyle



Test ID: Neck Flexion

Test Time: 10:13:23 AM

Test Date: 11/17/2010





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
Test ID:	Shoulder	Test Date:	11/17/2010
Test Number:	1	Test Time:	2:05:32 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	20.80 deg C P
Humidity	10.0 -- 70.0	40.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	13.0 -- 18.0	16.7 g P
Shoulder Deflection	28.0 -- 37.0	31.8 mm P
T1 Acceleration	17.0 -- 22.0	20.0 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **2:05:32 PM**

Test Date: **11/17/2010**



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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
Servo	180-3885	DS-1063	4/7/2010
Endevco	7264-2000	P51927	10/8/2010

Test ID: **Shoulder**

Test Time: **2:05:32 PM**

Test Date: **11/17/2010**

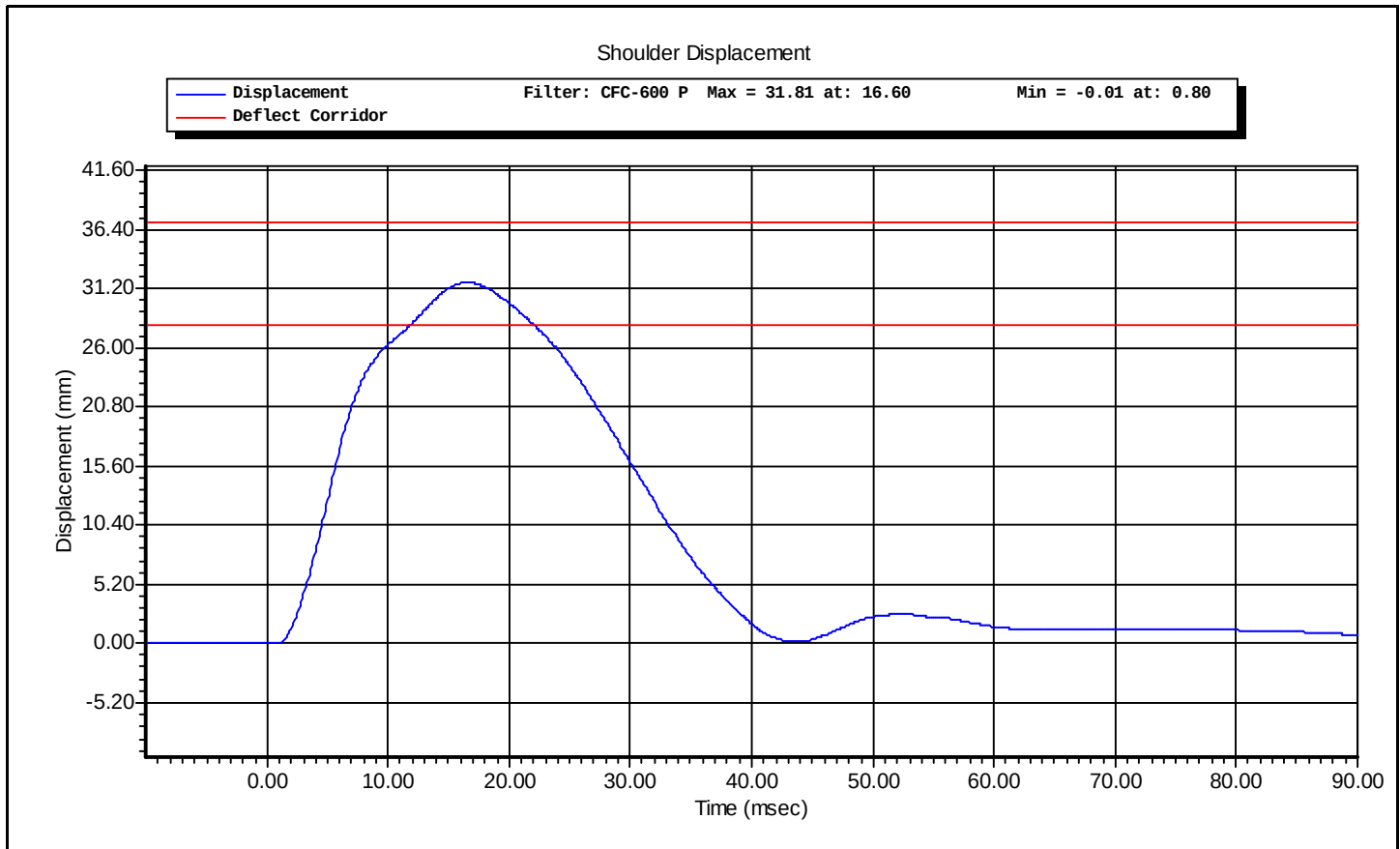


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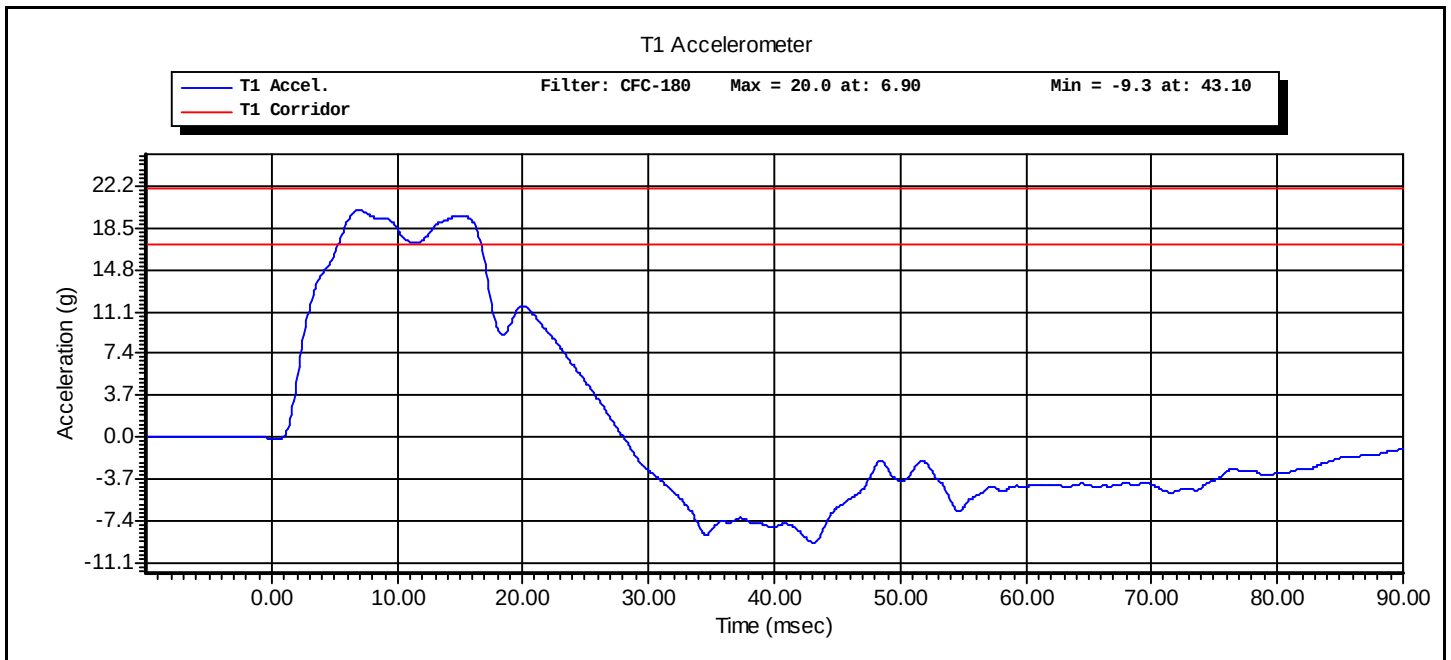
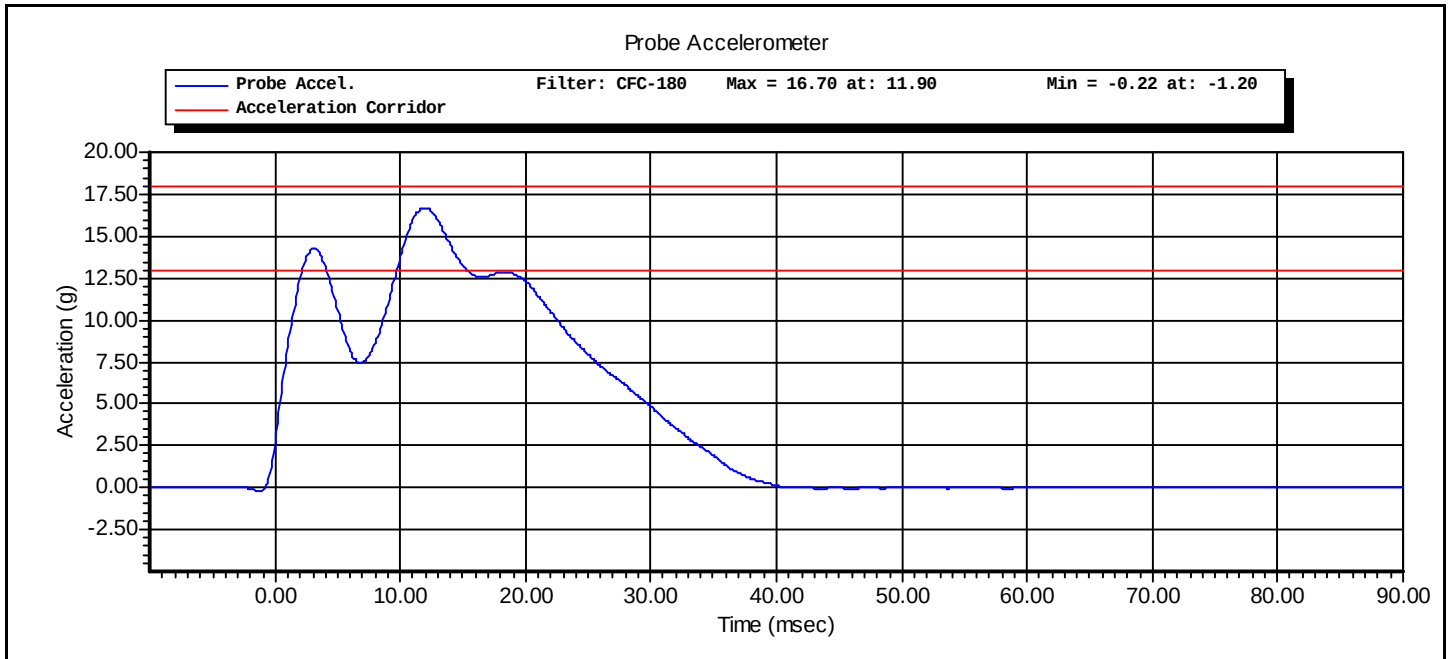
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Shoulder	Test Date:	11/17/2010
Test Number:	1	Test Time:	2:05:32 PM



Test ID: **Shoulder**

Test Time: **2:05:32 PM**

Test Date: **11/17/2010**





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VERIFICATION REPORT

Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
Test ID:	Thorax Without Arm	Test Date:	11/17/2010
Test Number:	2	Test Time:	3:27:29 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.1 deg C	P
Humidity	10	--	70	39 %RH	P
Velocity	4.20	--	4.40	4.32 m/s	P
Probe Acceleration	14.0	--	18.0	16.4 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	34.8 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.1 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	40.4 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	16.4 g	P
Lower Spine Acceleration T12	7.0	--	11.0	10.0 g	P

All test parameters are within specifications

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

Test ID: **Thorax Without Arm** Test Time: **3:27:29 PM**

Test Date: **11/17/2010**



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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
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P51927	10/8/2010
Endevco	7264-2000	P64147	9/20/2010

Test ID: **Thorax Without Arm** Test Time: **3:27:29 PM**

Test Date: **11/17/2010**



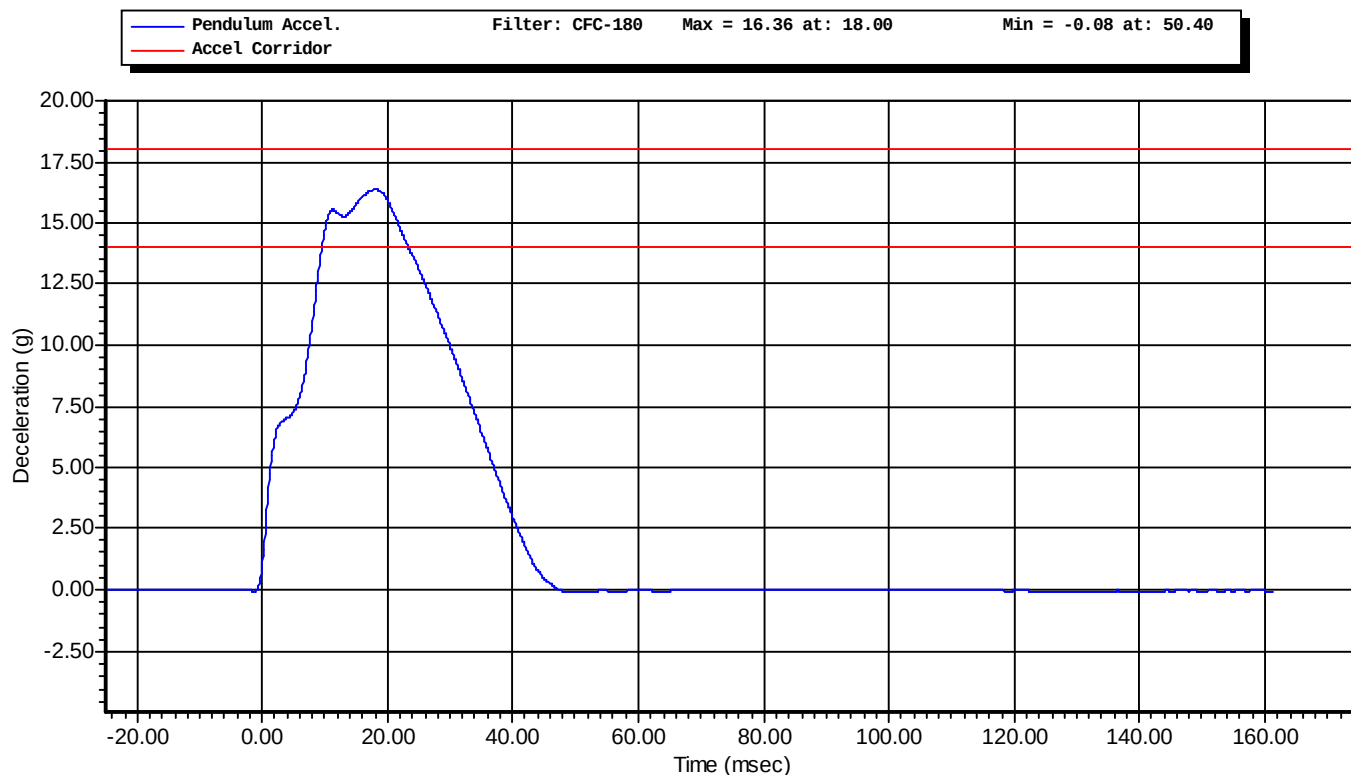
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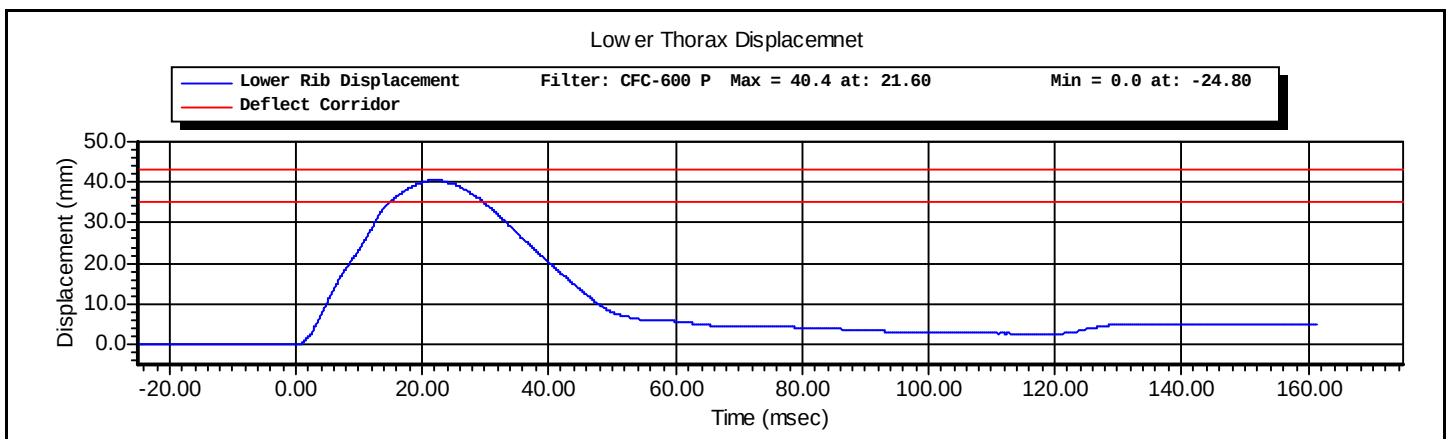
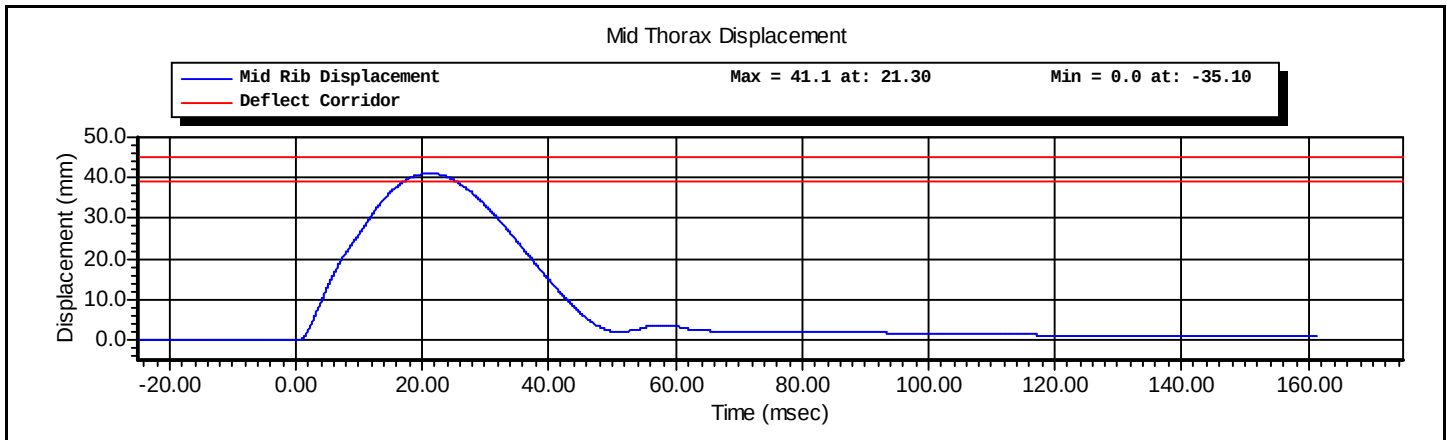
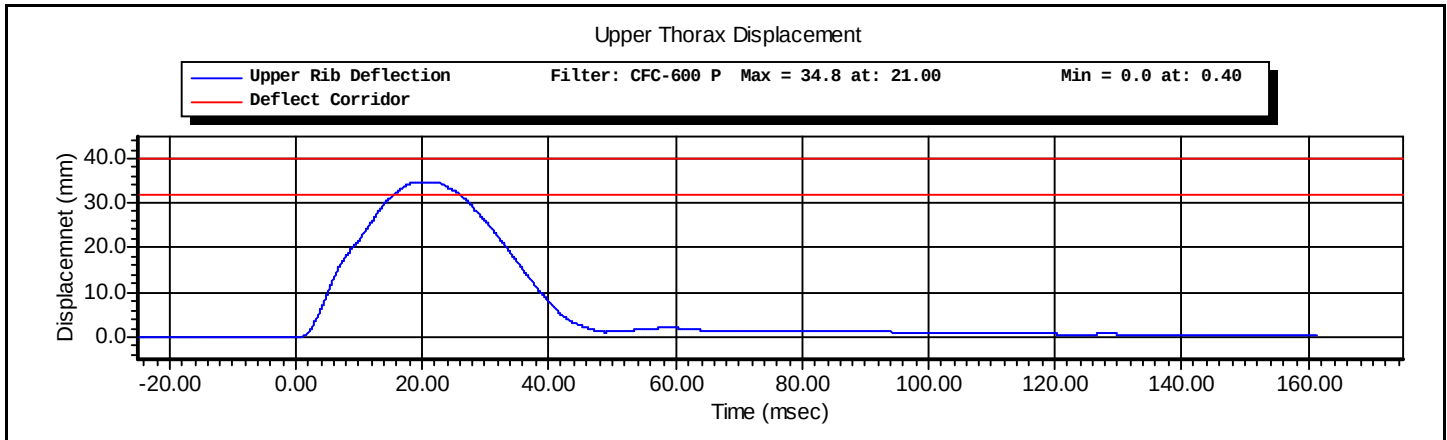
Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax Without Arm	Test Date:	11/17/2010
Test Number:	2	Test Time:	3:27:29 PM

Pendulum Accelerometer

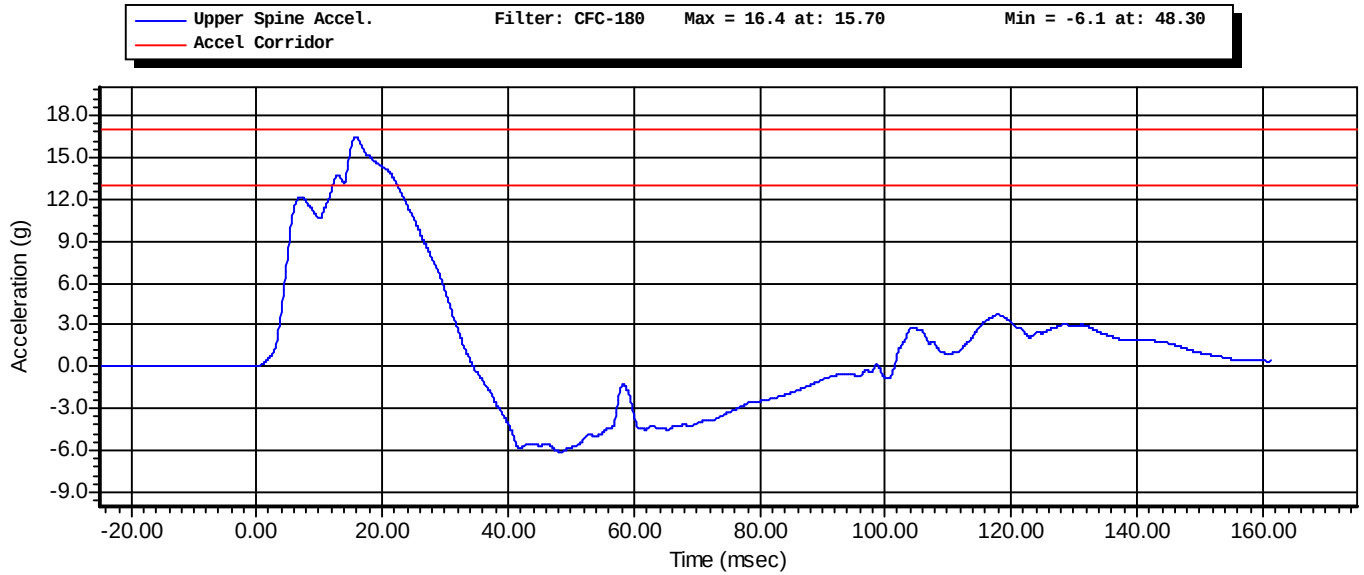


Test ID: Thorax Without Arm Test Time: 3:27:29 PM

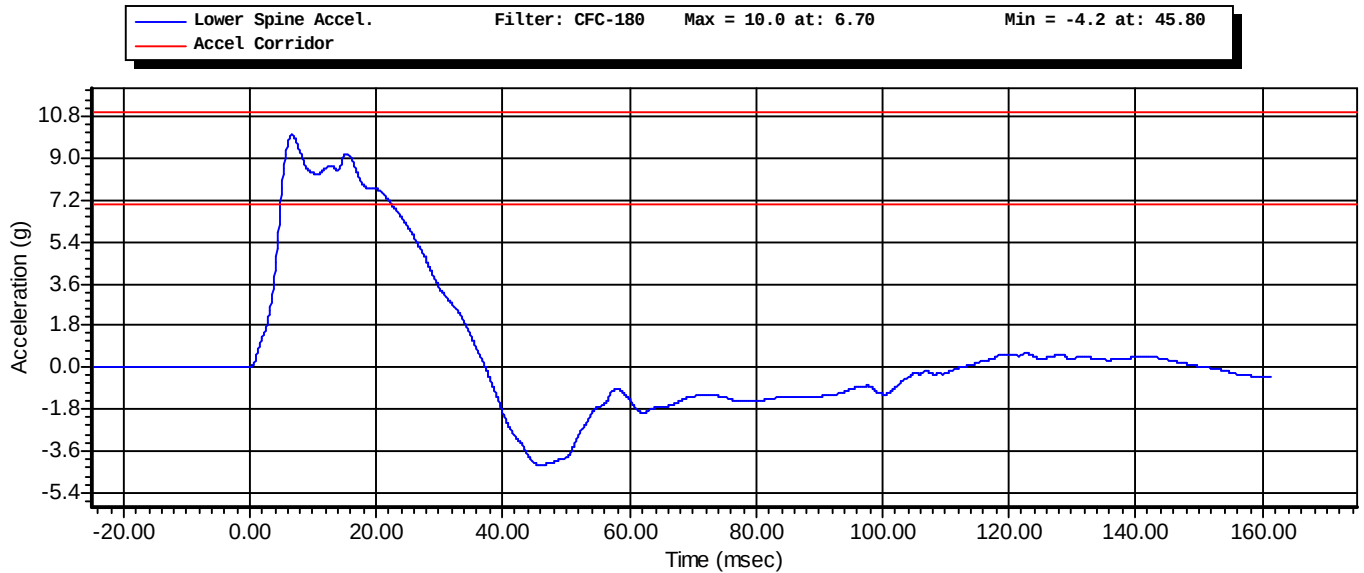
Test Date: 11/17/2010



Upper Spine Acceleration



Lower Spine Acceleration





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VERIFICATION REPORT

Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
Test ID:	Thorax With Arm	Test Date:	11/17/2010
Test Number:	1	Test Time:	4:09:33 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	20.7 deg C	P
Humidity	10	--	70	39 %RH	P
Velocity	6.60	--	6.80	6.69 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	35.0 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	26.2 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	31.2 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	34.7 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	39.9 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	36.2 g	P
Shoulder Deflection	31.0	--	40.0	36.1 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm** Test Time: **4:09:33 PM**

Test Date: **11/17/2010**



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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
Servo	180-3885	DS-1121	4/7/2010
Servo	180-3885	DS-1151	4/7/2010
Servo	180-3885	DS-1156	4/7/2010
Endevco	7264-2000	P51927	10/8/2010
Endevco	7264-2000	P64147	9/20/2010
Servo	180-3885	DS-1063	4/7/2010

Test ID: **Thorax With Arm** Test Time: **4:09:33 PM**

Test Date: **11/17/2010**



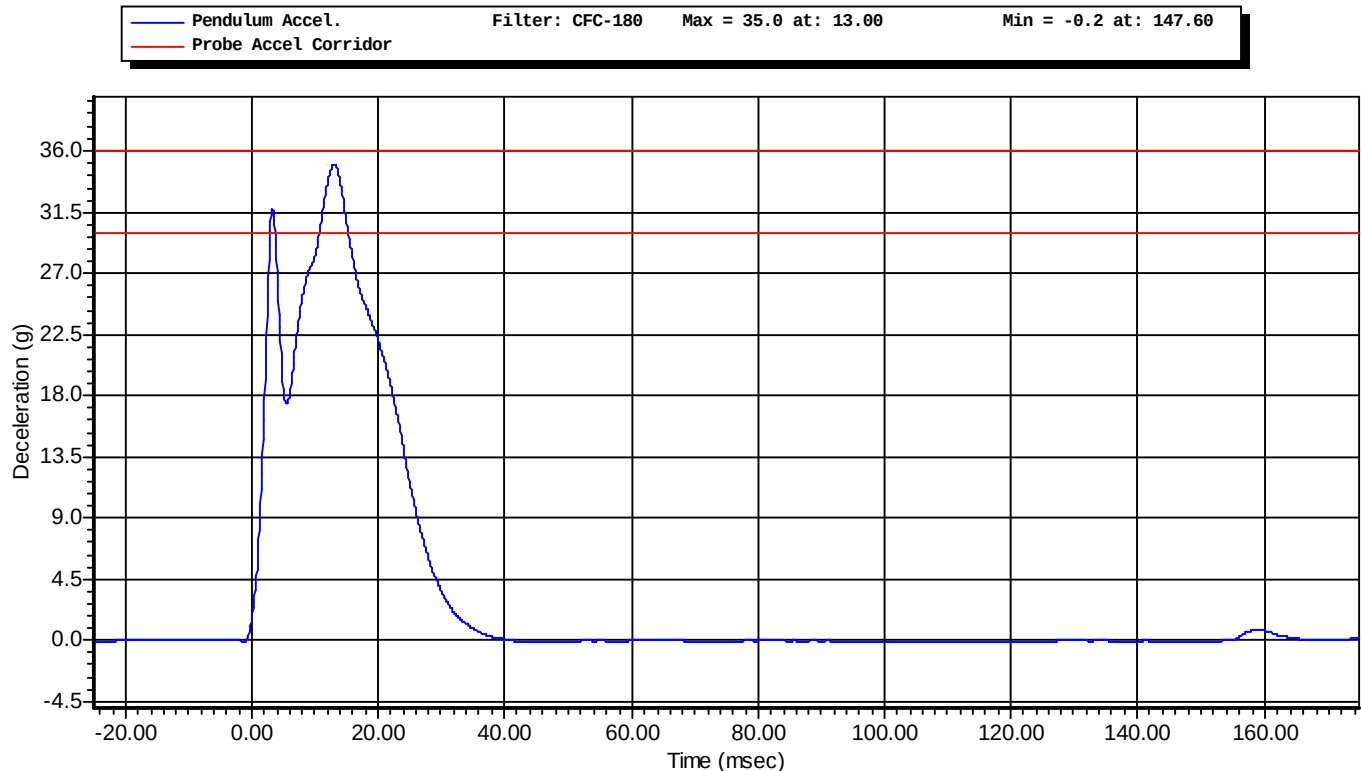
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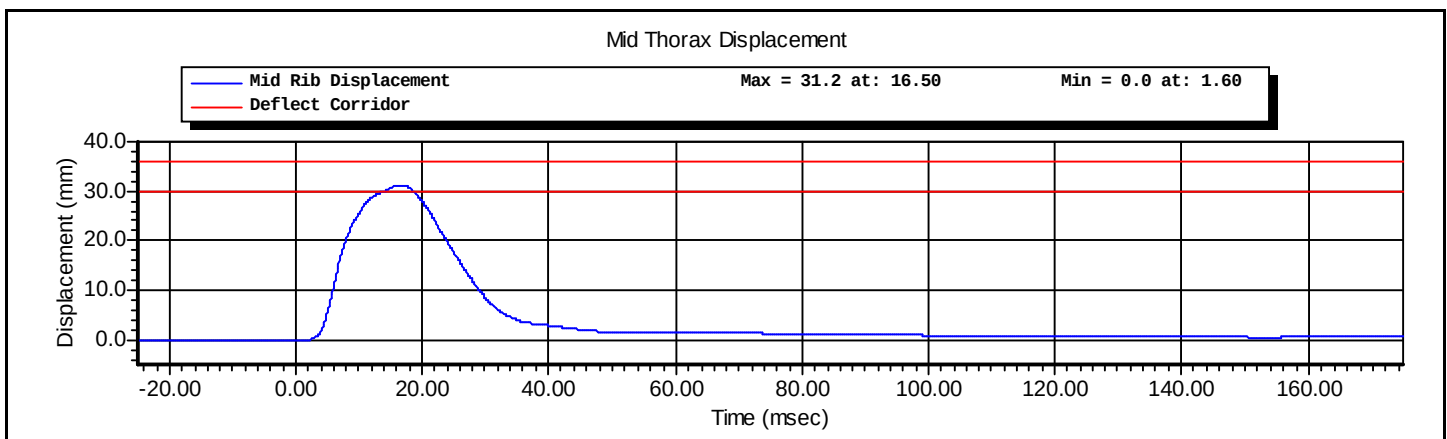
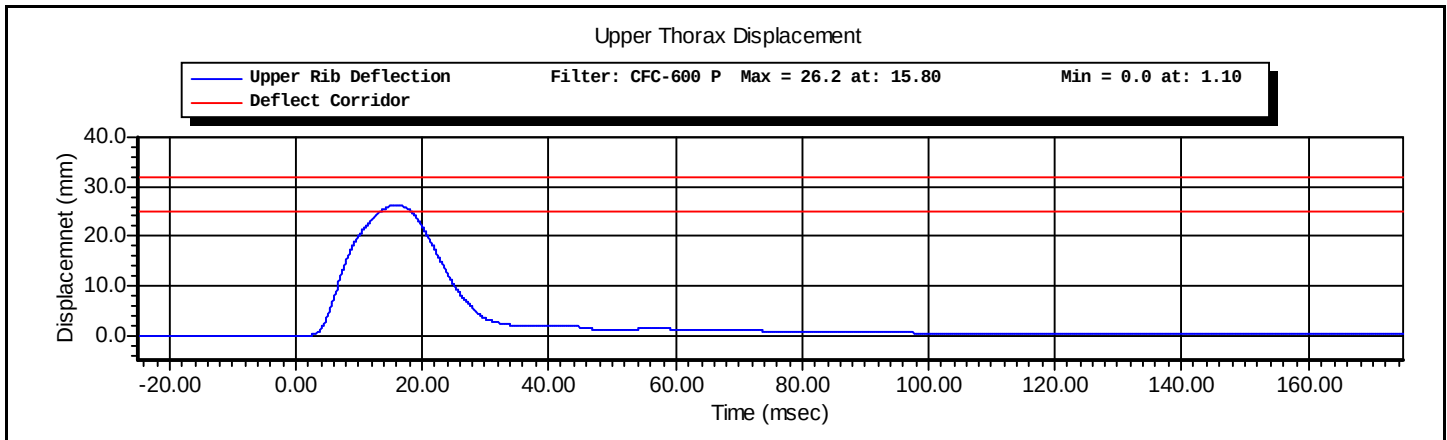
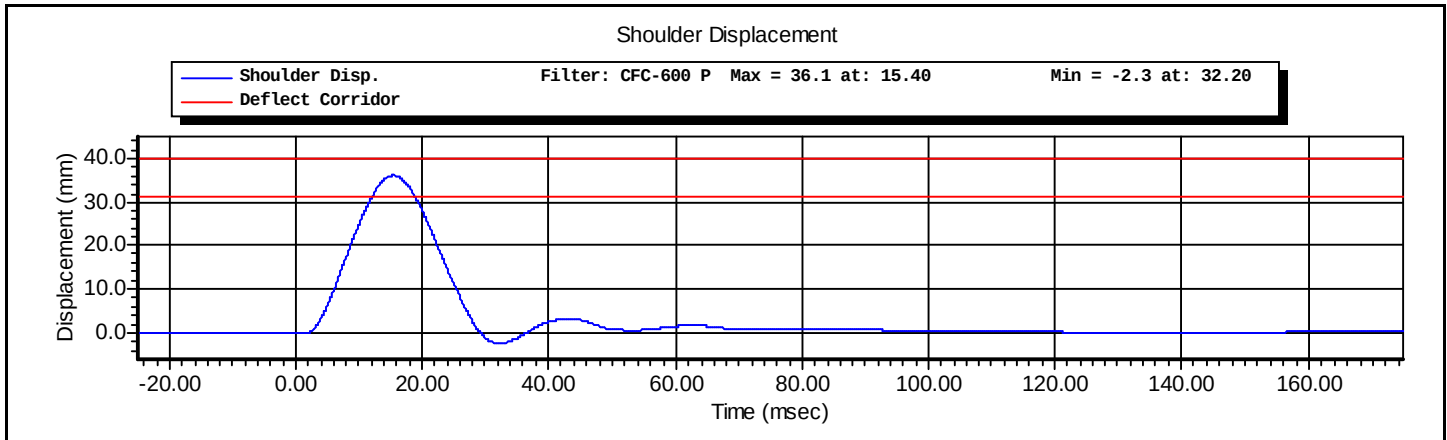
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Thorax With Arm	Test Date:	11/17/2010
Test Number:	1	Test Time:	4:09:33 PM

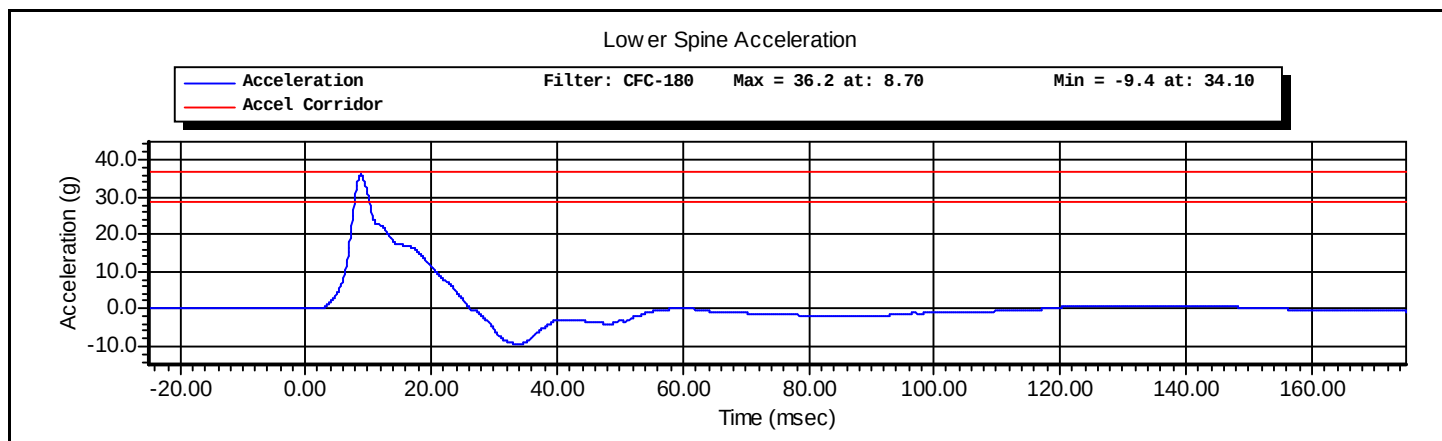
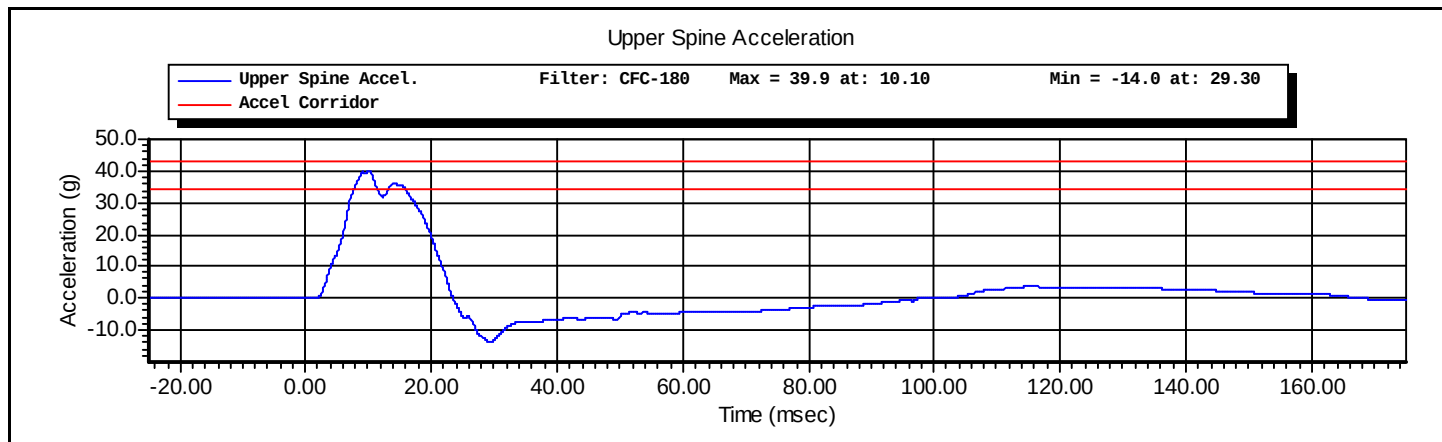
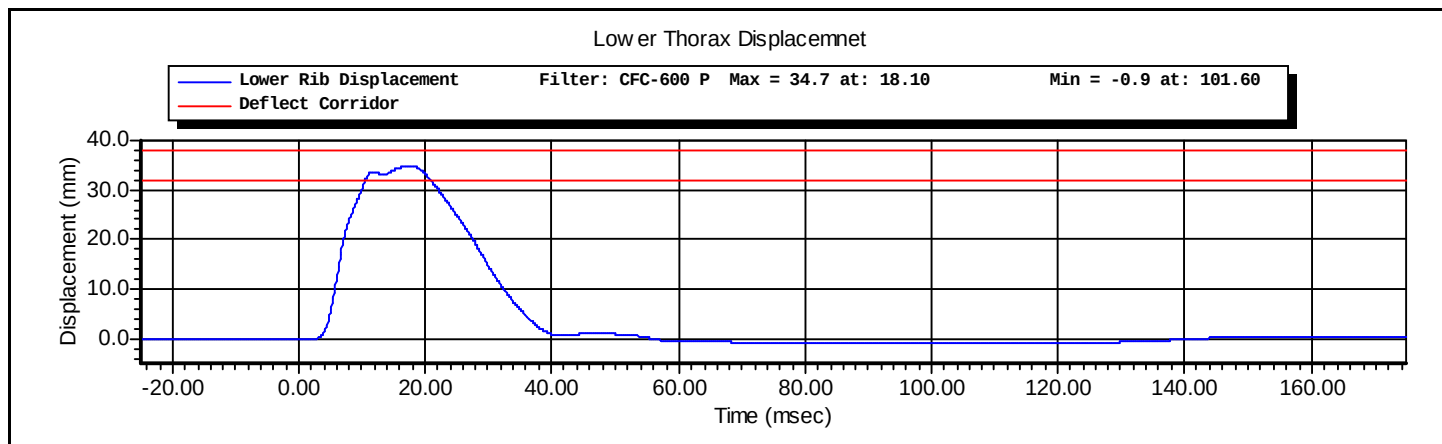
Pendulum Accelerometer



Test ID: Thorax With Arm Test Time: 4:09:33 PM

Test Date: 11/17/2010







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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
Test ID:	Abdomen	Test Date:	11/17/2010
Test Number:	1	Test Time:	3:06:35 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	39 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Probe Acceleration	12.0 -- 16.0	15.8 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	37.7 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	34.9 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.5 g P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **3:06:35 PM**

Test Date: **11/17/2010**



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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
Servo	180-3885	DS-1162	4/7/2010
Servo	180-3885	DS-1232	4/7/2010
Endevco	7264-2000	P64147	9/20/2010

Test ID: **Abdomen**

Test Time: **3:06:35 PM**

Test Date: **11/17/2010**



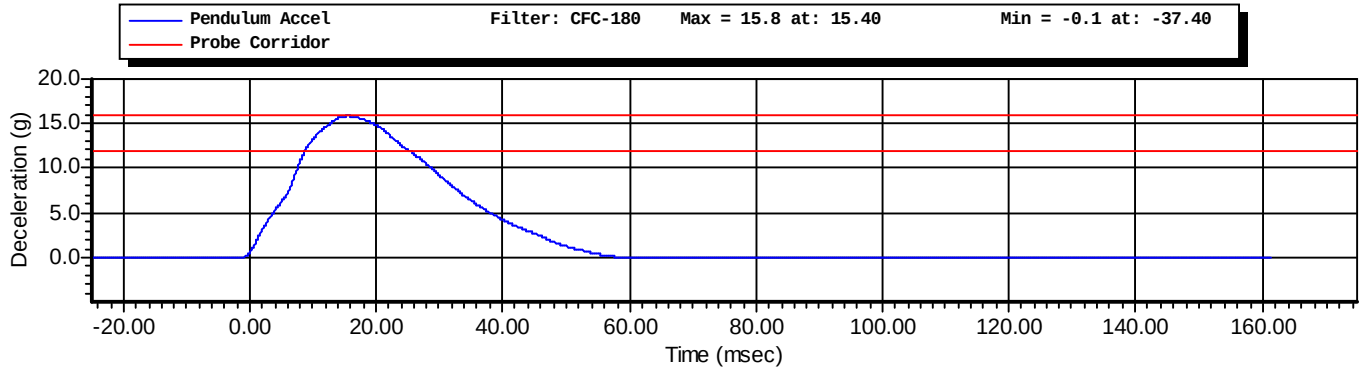
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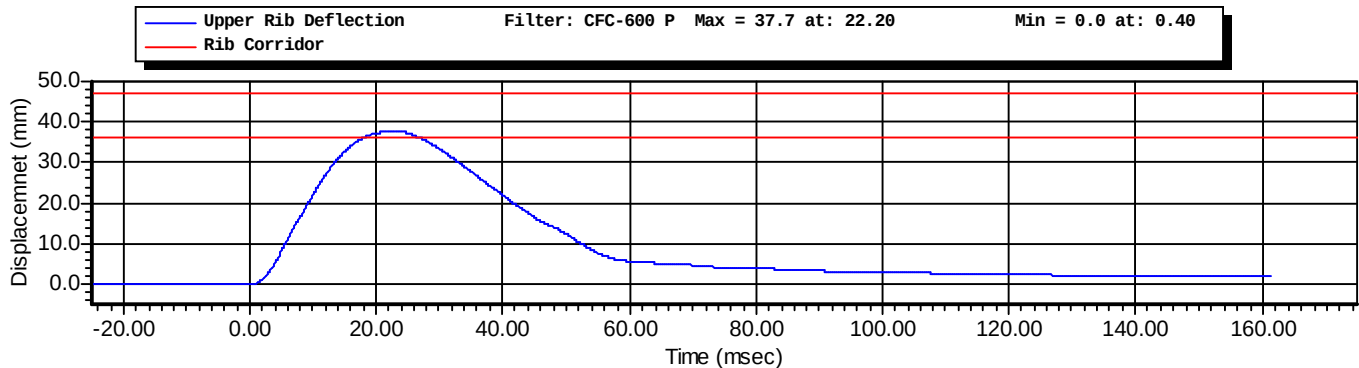
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Abdomen	Test Date:	11/17/2010
Test Number:	1	Test Time:	3:06:35 PM

Pendulum Accelerometer



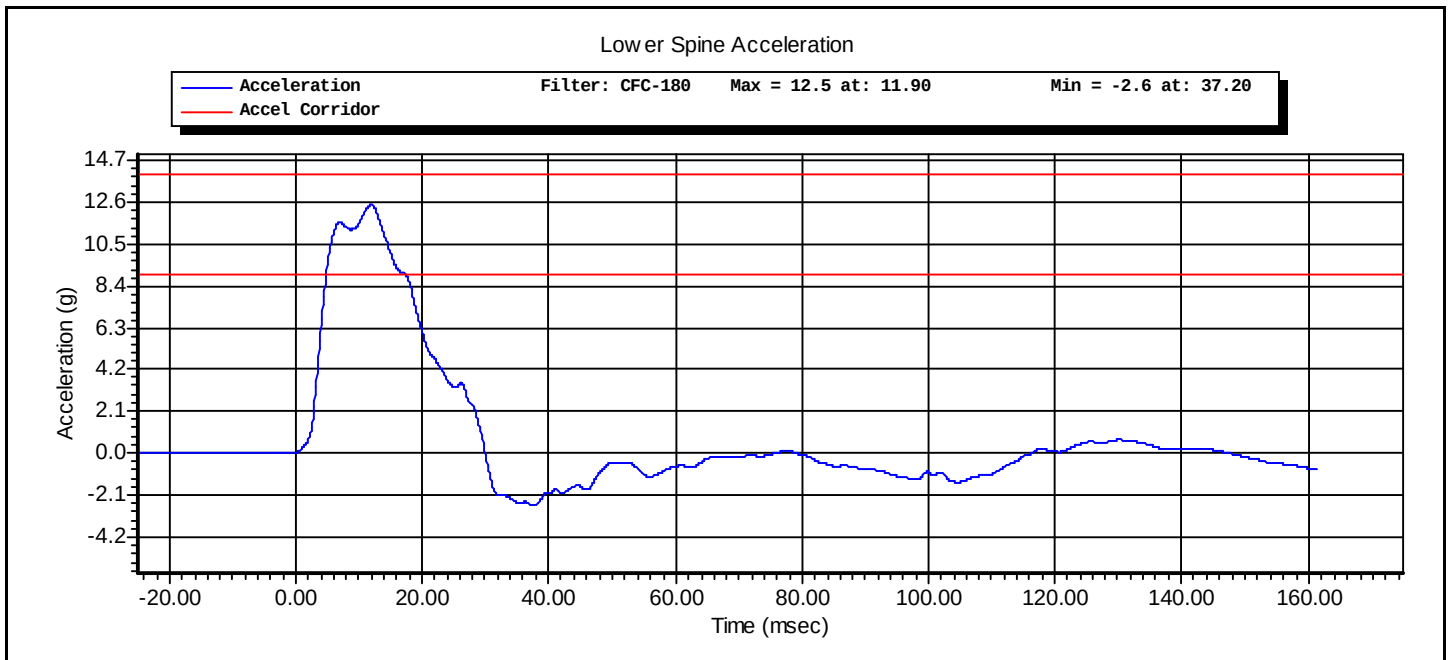
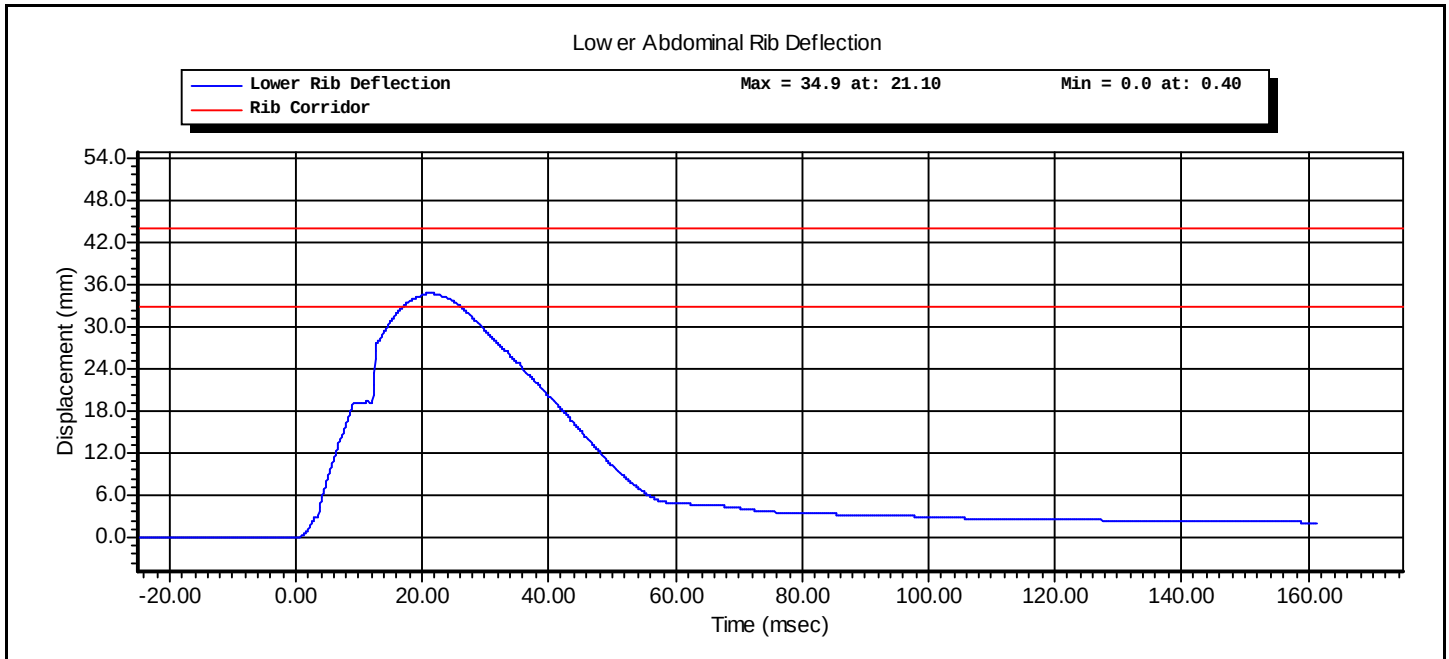
Upper Abdominal Rib Deflection



Test ID: **Abdomen**

Test Time: **3:06:35 PM**

Test Date: **11/17/2010**





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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
Test ID:	Iliac Pelvis	Test Date:	11/18/2010
Test Number:	2	Test Time:	11:42:52 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.1 deg C P
Humidity	10 -- 70	38 %RH P
Velocity	4.20 -- 4.40	4.24 m/s P
Peak Probe Acceleration	36.0 -- 45.0	41.5 g P
Peak Pelvis Acceleration	28.0 -- 39.0	34.9 g P
Peak Iliac Force	4.10 -- 5.10	4.49 kN P

All test parameters are within specifications

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

Test ID: **Iliac Pelvis**

Test Time: **11:42:52 AM**

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



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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
Endevco	7264-2000	P51671	10/12/2010
DentonATD	3228J	LC-279 Fy	4/12/2010

Test ID: **Iliac Pelvis**

Test Time: **11:42:52 AM**

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

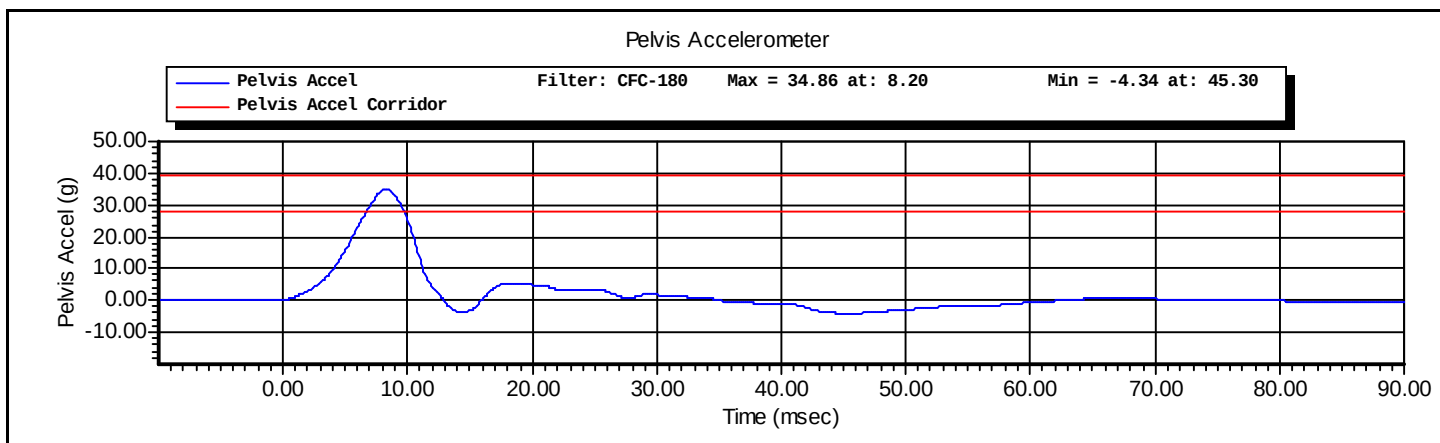
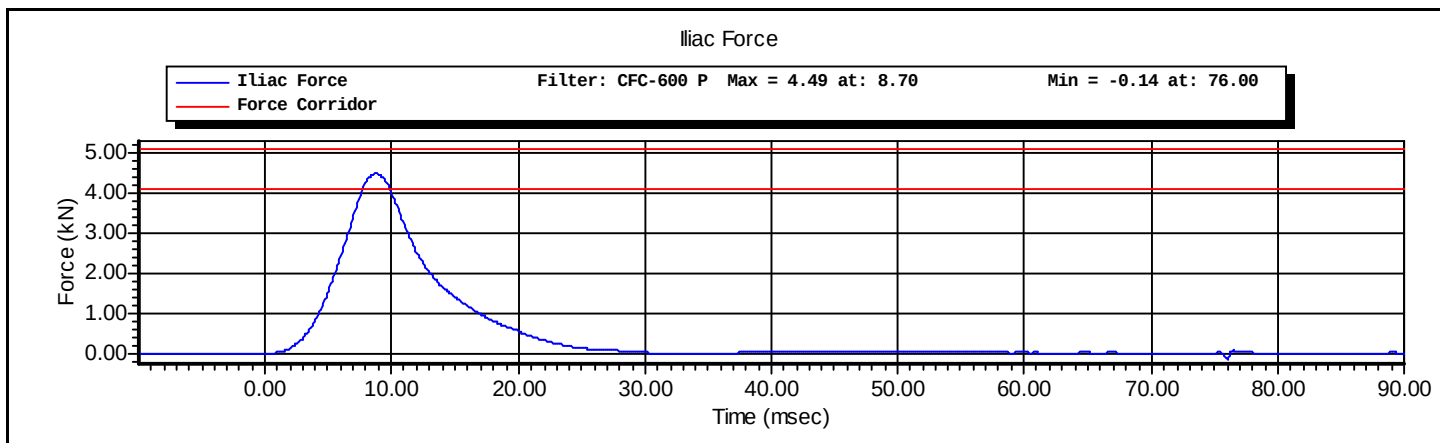


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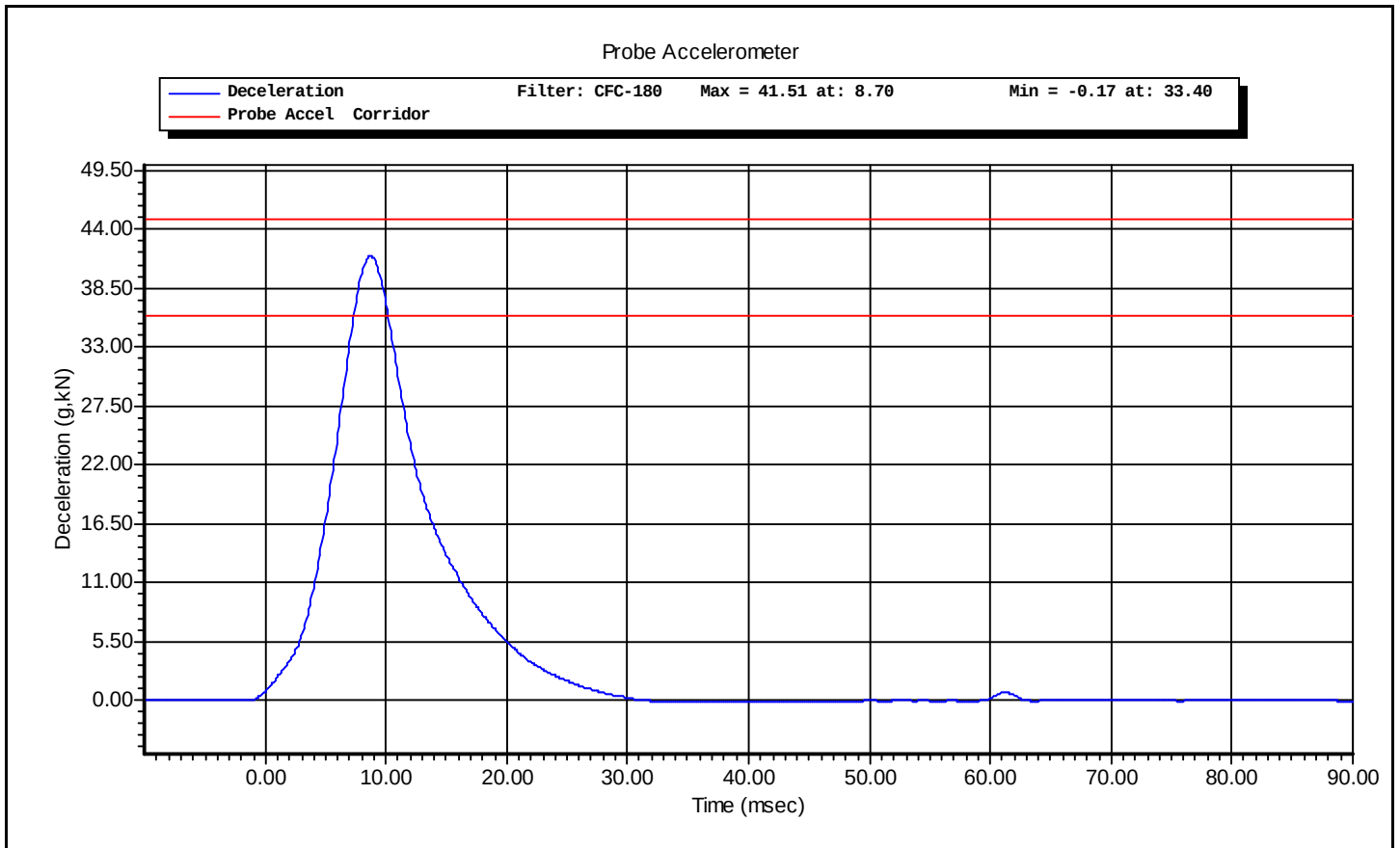
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Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 300		
Test ID:	Iliac Pelvis	Test Date:	11/18/2010
Test Number:	2	Test Time:	11:42:52 AM



Test ID: **Iliac Pelvis**

Test Time: **11:42:52 AM**

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





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VERIFICATION REPORT

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
Test ID:	Acetabulum	Test Date:	11/17/2010
Test Number:	1	Test Time:	11:23:20 AM

Comments:

Pelvis Plug Used For Certification:
FTSS S/N 12798
Force @ 3mm = 1567N

Pelvis Plug Used For Full Scale Test:
FTSS S/N 11845
Force @ 3mm = 1597N

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.9 deg C	P
Humidity	10	--	70	41 %RH	P
Velocity	6.60	--	6.80	6.64 m/s	P
Peak Probe Acceleration	38.0	--	47.0	45.9 g	P
Peak Pelvis Acceleration	34.0	--	42.0	40.5 g	P
Peak Acetabulum Force	3.60	--	4.30	4.10 kN	P

All test parameters are within specifications

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

Test ID: **Acetabulum**

Test Time: **11:23:20 AM**

Test Date: **11/17/2010**



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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
Endevco	7264-2000	P51671	10/12/2010
DentonATD	3249J	LC-275a	4/12/2010
Endevco	7264-2000	P51288	6/2/2010

Test ID: **Acetabulum**

Test Time: **11:23:20 AM**

Test Date: **11/17/2010**



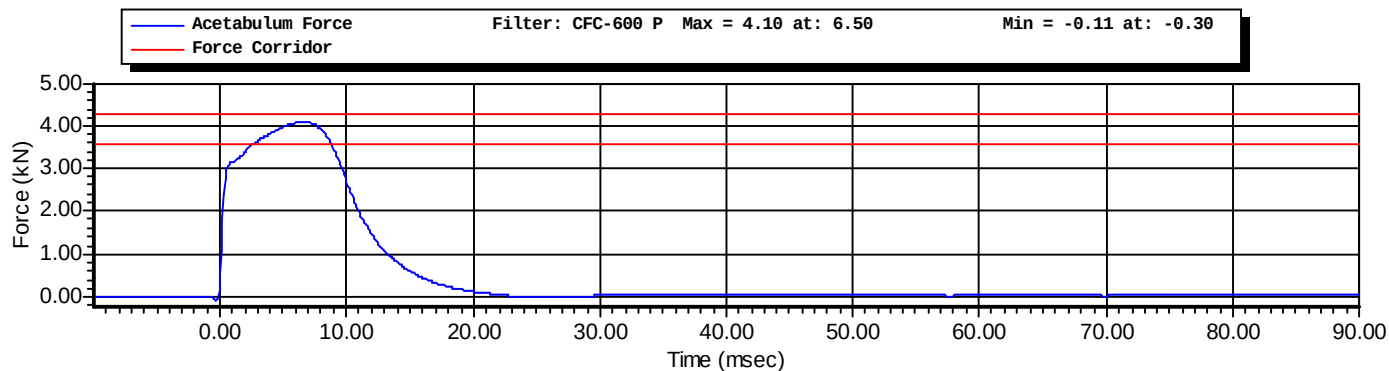
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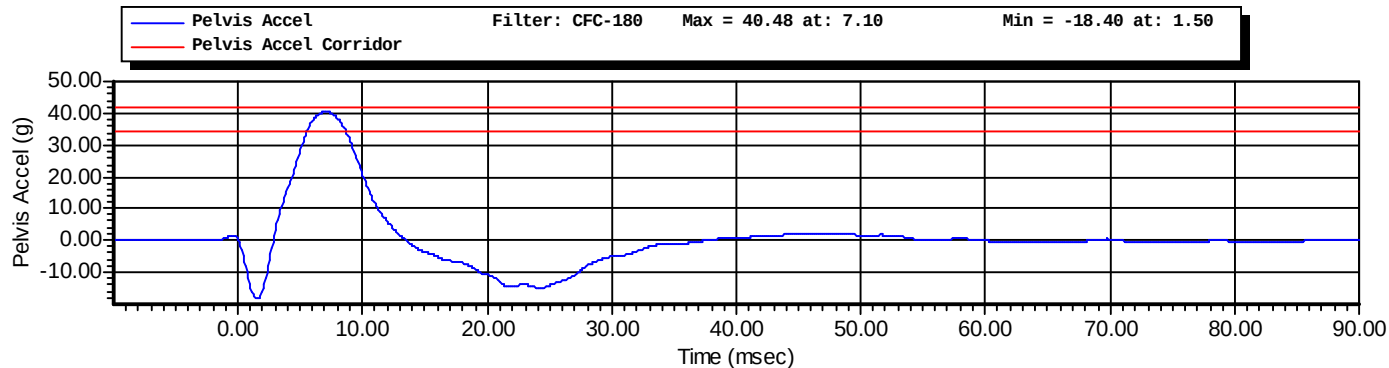
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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 300		
Test ID:	Acetabulum	Test Date:	11/17/2010
Test Number:	1	Test Time:	11:23:20 AM

Acetabulum Force



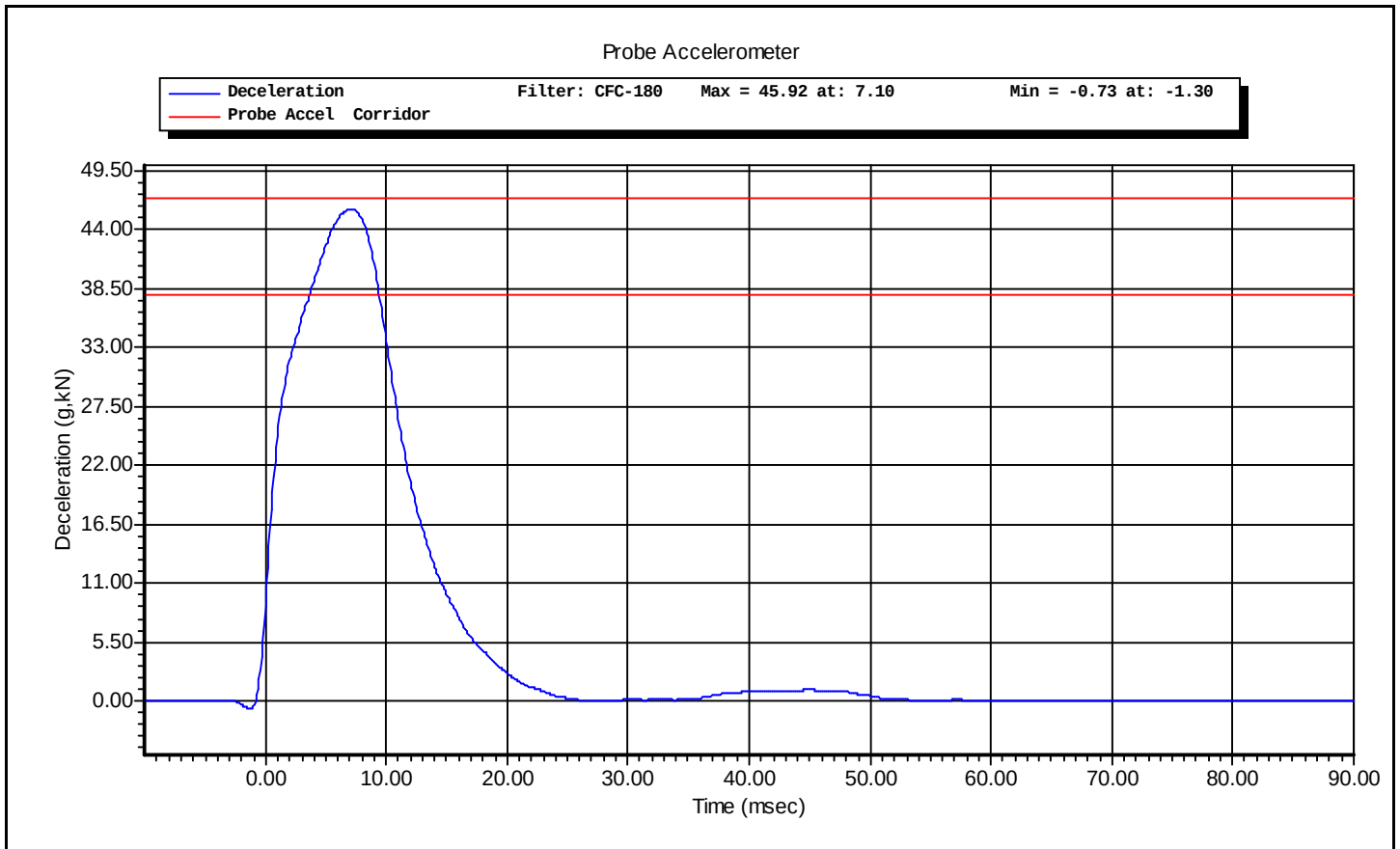
Pelvis Accelerometer



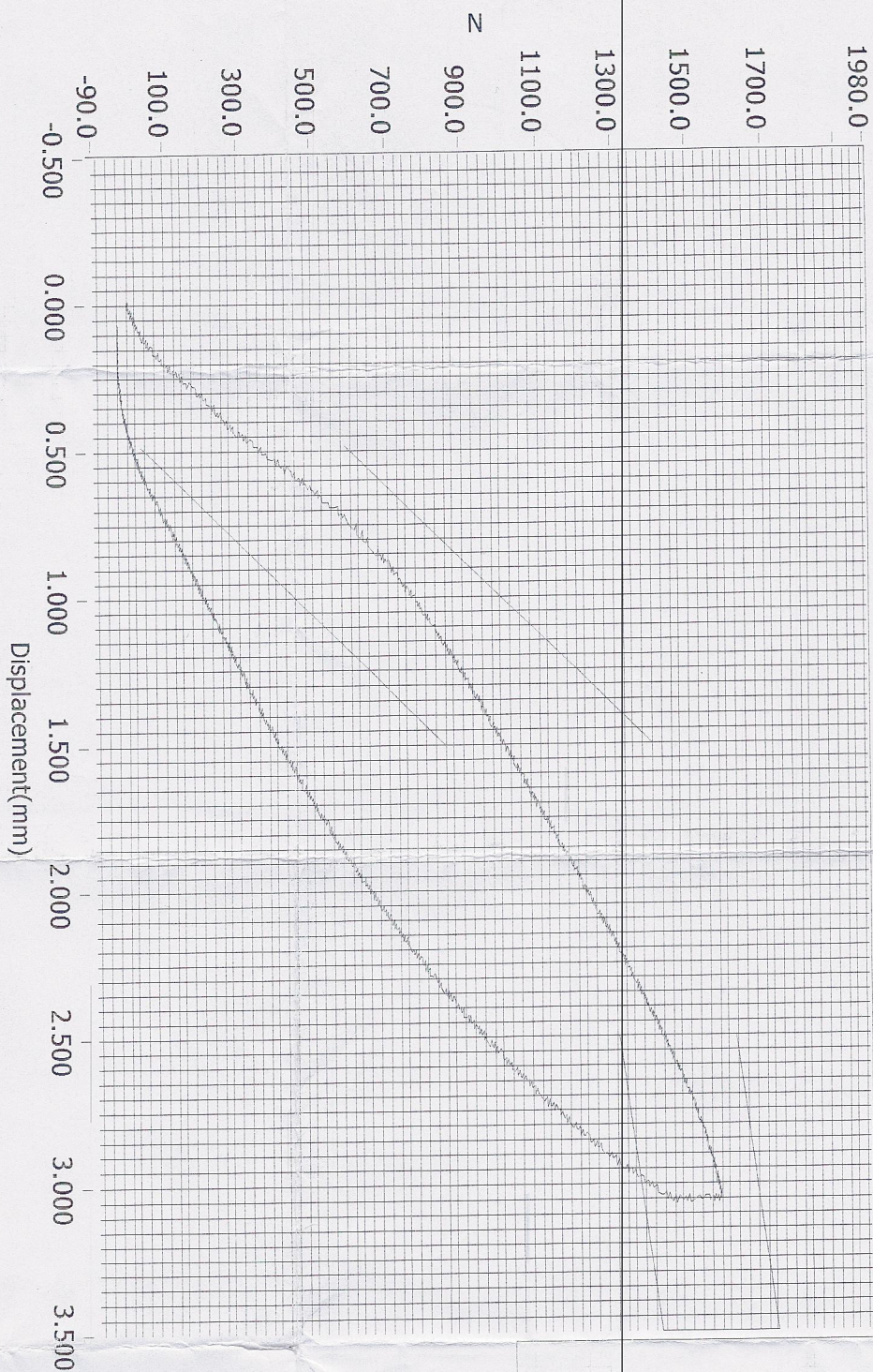
Test ID: **Acetabulum**

Test Time: **11:23:20 AM**

Test Date: **11/17/2010**



Resultant Data - SIDIIs Plug Compression



Loading Curve	<
Boundary Limit Upper	<
Boundary Limit Lower	<
Peak Load Upper	<
Peak Load Lower	<
Peak Defl Upper	<
Peak Defl Lower	<

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

12798

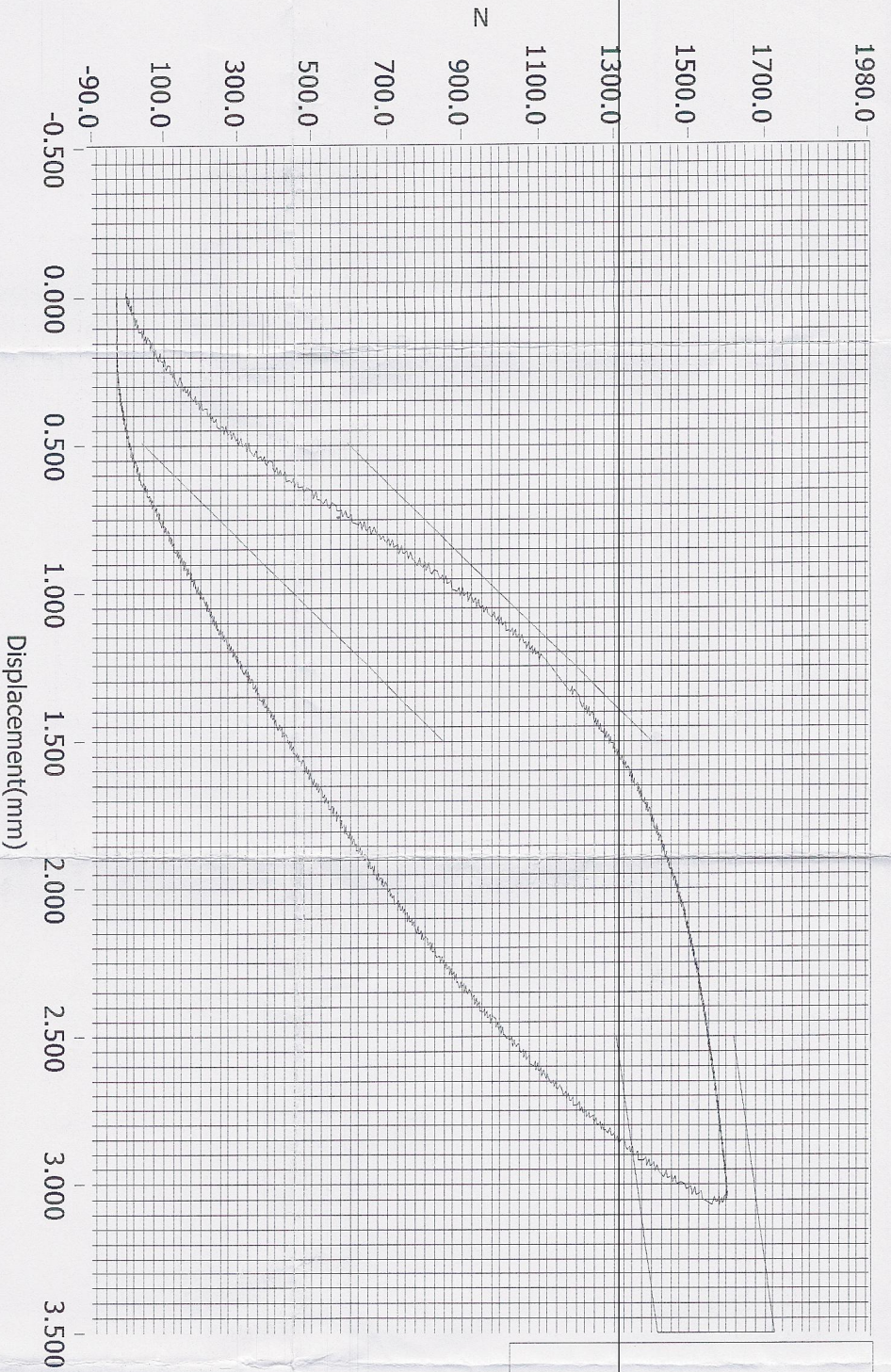
SIDIIs

Current Date : 7/17/2007

Current Time : 10:57:25

C

Resultant Data - SIDIIs Plug Compression



Loading Curve	<
Boundary Limit Upper	<
Boundary Limit Lower	<
Peak Load Upper	<
Peak Load Lower	<
Peak Defl Upper	<
Peak Defl Lower	<

ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

11845

SIDIIs

Current Date : 6/22/2007

Current Time : 13:17:11

FS

