

REPORT NUMBER: SPNCAP-CAL-11-007

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

**General Motors LLC
2011 Chevrolet Traverse LS
4-Door SUV**

NHTSA NUMBER: MB0121

**PREPARED BY:
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October 19, 2010

FINAL REPORT

**PREPARED FOR:
U.S. DEPARTMENT OF TRANSPORTATION
NATIONAL HIGHWAY TRAFFIC SAFETY ADMINISTRATION
OFFICE OF CRASHWORTHINESS STANDARDS
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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 Chevrolet Traverse LS 4-Door SUV 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 August 9, 2010. The impact velocity was 32.5 km/h, and the ambient temperature at the struck (driver's) side of the vehicle was 21.7°C. The test vehicle post-test maximum crush was 353 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></th> <th colspan="3">Driver ATD (SID-IIs)</th> </tr> <tr> <th>Measurement Description</th> <th>Units</th> <th>Threshold</th> <th>Result</th> </tr> </thead> <tbody> <tr> <td>Head Injury Criteria (HIC₃₈)</td> <td>N/A</td> <td>1000</td> <td>355.4</td> </tr> <tr> <td>Resultant Lower Spine Acceleration</td> <td>Gs</td> <td>82</td> <td>41.3</td> </tr> <tr> <td>Combined Ace tabular and Iliac Pelvic Force</td> <td>N</td> <td>5525</td> <td>3225</td> </tr> </tbody> </table>					Driver ATD (SID-IIs)			Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₈)	N/A	1000	355.4	Resultant Lower Spine Acceleration	Gs	82	41.3	Combined Ace tabular and Iliac Pelvic Force	N	5525	3225
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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.																							
17. Key Words New Car Assessment Program (NCAP) Side Impact Pole Part 572V SID-IIs		18. Distribution Statement Copies of this report are available from: National Highway Traffic Safety Adm. Technical Ref. Division, 1200 New Jersey Ave. SE Washington, D.C. 20590																					
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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-D-00126. The purpose of this test is to generate comparative side impact performance in a 2011 Chevrolet Traverse LS 4-Door SUV manufactured by General Motors LLC. 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 Chevrolet Traverse LS 4-Door SUV. The subject vehicle was towed into the rigid pole at an angle of 75° and a velocity of 32.5 km/h. The test was conducted by Calspan Corporation Transportation Research Group on August 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 vehicle and 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	355.4	41.3	Iliac Wing = 1310.2
			Acetabular = 1937.4
			Sum = 3225

SUPPLEMENTAL RESTRAINT INFORMATION

Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	NA		
Side Airbag 1 (Side Torso/Pelvis)	Yes	Yes	No	NA
Side Airbag 2 (Side Curtain)	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	Yes	Yes	No	NA
Other	NA	NA	NA	NA

GENERAL COMMENTS: None

SECTION 3
OCCUPANT AND VEHICLE INFORMATION

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

Test Vehicle: 2011 Chevrolet Traverse LS NHTSA No: MB0121
Test Program: Side Pole NCAP Test Date: August 9, 2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0121
Model Year	2011
Make	Chevrolet
Model	Traverse LS FWD
Body Style	4-Door SUV
VIN	1GNKRFED1BJ119418
Body Color	Dark Gray
Delivery Date	7/12/2010
Odometer Reading (km/mi)	15 mi
Dealer	Raymond Chevrolet
Transmission	6-Speed
Final Drive	Front Wheel
Type/No. Cylinders	V6
Engine Displacement (L)	3.6
Engine Placement	Lateral
Roof Rack	No
Sunroof/T-Top	No
Tinted Glass	No
Traction Control	Yes
Power Brakes	Yes
Front Disc	Yes
Rear Disc	Yes

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	Yes
Driver Pelvis Airbag	No
Driver Knee Airbag	No
Rear Pass. Curtain Airbag	Yes
Rear Pass. Head/Torso Airbag	No
Rear Pass. Torso Airbag	No
Rear Pass. Torso/Pelvis Airbag	No
Rear Pass. Pelvis Airbag	No
Pretensioners	Yes
Load Limiters	Yes
Automatic Door Locks	Yes
Bucket Seats	Yes
Tilt Steering	Yes
Other	-
Other	-

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

No

DATA FROM CERTIFICATION LABEL

Manufactured By	General Motors LLC
Date of Manufacture	6/10

GVWR (kg)	2908
GAWR Front (kg)	1450
GAWR Rear (kg)	1600

VEHICLE SEATING AND WEIGHT CAPACITY DATA

	Front	Rear	Third	Total
Designated Seating Capacity (DSC)	2	3	3	8.0
Vehicle Capacity Weight (VCW) (kg)				782.0
DSC X 68.04 kg				544.3
Rated Cargo and Luggage Weight (RCLW) (kg)				136.0

(A)

(B)

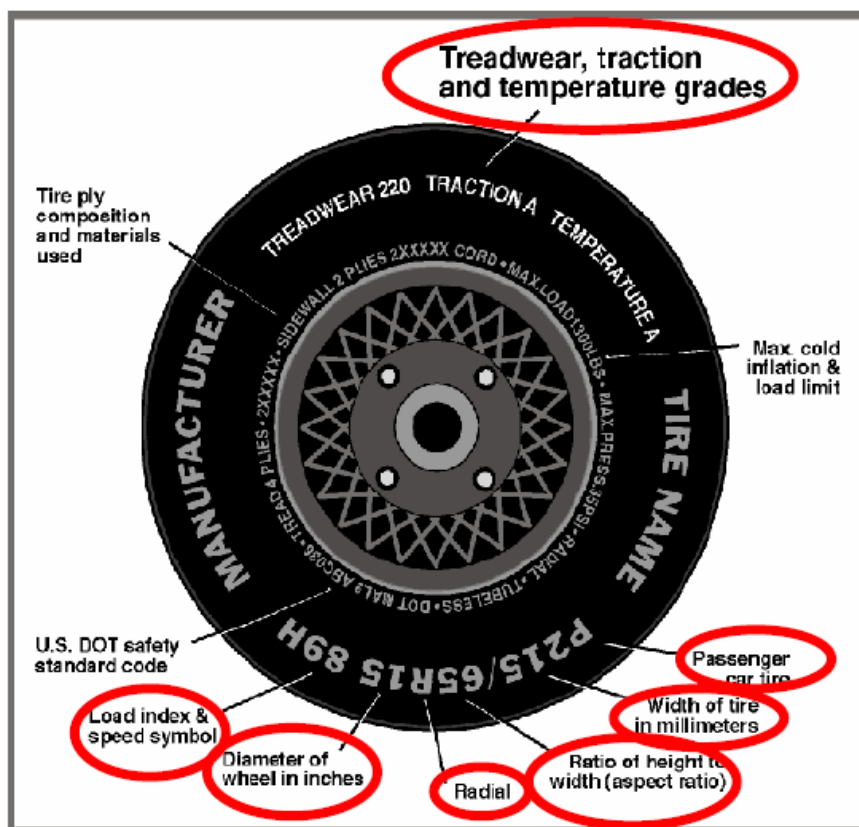
(A-B)

VEHICLE SEAT TYPE

Seating Location	Type of Seat Pan				Type of Seat Back		
	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		X			X		

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

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010



Measured Parameter	Front	Rear
Maximum Tire Pressure	300	300
Cold Pressure (kPa)	240 (35 psi)	240 (35 psi)
Recommended Tire Size	P245/70R17	P245/70R17
Tire Size on Vehicle	P245/70R17	P245/70R17
Tire Model	Grabber HTS	Grabber HTS
Tire Manufacturer	General	General
Treadwear	640	640
Traction	A	A
Temperature Grades	B	B
Tire Plies Sidewall	2 Ply Polyester	2 Ply Polyester
Tire Plies Body	2 Polyester + 2 Steel + 1 Polyamide	2 Polyester + 2 Steel + 1 Polyamide
Load Index/Speed Symbol	108S	108S
Tire Material	-	-
DOT Safety Code Right	A383 BMB 2310	A383 BMB 2310
DOT Safety Code Left	A383 BMB 2310	A383 BMB 2310

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

Test Vehicle: 2011 Chevrolet Traverse LS NHTSA No: MB0121
 Test Program: Side Pole NCAP Test Date: August 9, 2010

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front	Rear	Total	Front	Rear	Total	Front	Rear	Total
Left	kg	613.0	439.0		637.0	512.5		639.0	526.0	
Right	kg	635.0	405.0		624.0	498.0		638.0	481.0	
Ratio	%	59.7%	40.3%		55.5%	44.5%		55.9%	44.1%	
Totals	kg	1248.0	844.0	2092.0	1261.0	1010.5	2271.5	1277.0	1007.0	2284.0

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total As Delivered Weight (UVW)	kg	2092.0	(A)
Actual Weight of 1 P572V ATD (SID-IIs) Dummy Used	kg	51.3	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	136.0	(C)
Calculated Vehicle Target Weight (TVTW)	kg	2279.3	(A+B+C)

TEST VEHICLE ATTITUDES AND CG

	Units	As Delivered	As Tested	Fully Loaded
Driver Door Sill Angle (front-to-rear)*	Deg.	0.4	0.4	0.4
Front Passenger Sill Angle (front-to-rear)*	Deg.	0.5	0.4	0.4
Front Bumper Angle (left-to-right)**	Deg.	0.2	0.2	0.3
Rear Bumper Angle (left-to-right)**	Deg.	0.3	0.2	0.2
Vehicle CG (Aft of Front Axle)	mm	1219	1344	1332
Vehicle CG (Left (+) / Right (-) from Longitudinal Centerline)	mm	5	10	17

* Front up is positive

** Left up is positive

GENERAL VEHICLE TEST DATA

Measurement Description	Units	Value
Weight of Ballast in Cargo Area	kg	116.5
Weight of Vehicle Components Removed	kg	0.0

Vehicle parts removed to make Target Vehicle Test Weight:

None

TEST VEHICLE IMPACT POINT DATA

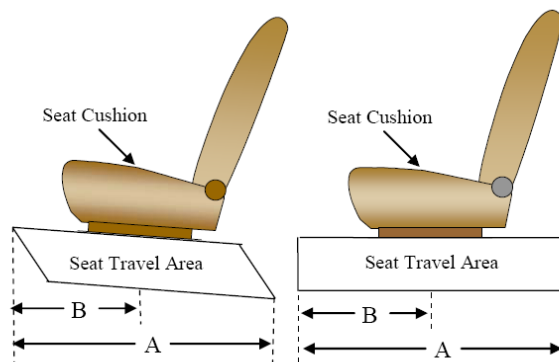
Measured Parameter	Units	Value
Vertical Impact Reference Line (Aft of Front Axle)	mm	1164.2
Actual Impact Point (Aft of Front Axle)	mm	1154.2
Impact Point Difference (- forward / + rearward)	mm	-10.0

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

Test Vehicle: 2011 Chevrolet Traverse LS NHTSA No: MB0121
 Test Program: Side Pole NCAP Test Date: August 9, 2010

SEAT FORE/AFT POSITIONS

The front outboard seat was placed in the most forward locking detent while maintaining the seat cushion mid-angle position (Cushion Angle = 11.0 deg)

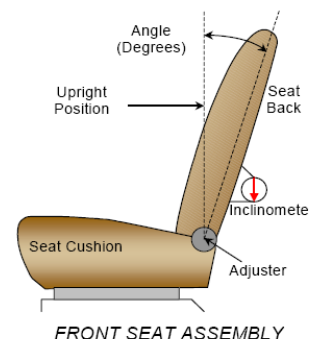


SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel (mm)	Placed in Detent # or Position (mm)
Driver Seat	240 mm (24 detents)	0 (Full forward)
Front Passenger Seat	240 mm (24 detents)	0 (Full forward)
Rear Seat – Struck Side	90 mm (9 detents)	9 (Full Rearward)
Rear-Seat – Non-Struck Side	90 mm (9 detents)	9 (Full Rearward)

SEAT BACK ANGLE POSITION

The seat back was set to the detent to achieve the head level requirement for the SID-IIs final position. The published driver seat back angle was found from the head restraint post with the ATD in the seat. The Front passenger seat back angle was found from the head restraint post without ATD in seat



SEAT BACK ANGLE

	Degrees	Detent
Driver Seat Back Angle with Seated Dummy	10 degrees	Detent 2 (0,1,2)
Front Passenger Seat Back Angle	10 degrees	Detent 2 (0,1,2)
Struck Side Rear Seat Back Angle	14 degrees	Most forward locking position (0)
Non-Struck Side Rear Passenger Seat Back Angle	14 degrees	Most forward locking position (0)

SEAT BELT UPPER ANCHORAGES

The left rear outboard seating position was placed in the highest position.

SEAT BELT UPPER ANCHORAGE POSITIONING

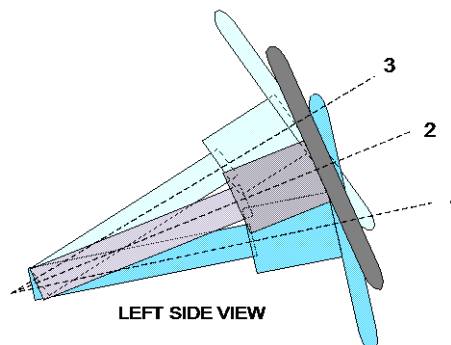
	Total # of Positions	Placed in Position #
Driver Seat	5	0 (highest)

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

Test Vehicle: 2011 Chevrolet Traverse LS NHTSA No: MB0121
 Test Program: Side Pole NCAP Test Date: August 9, 2010

STEERING COLUMN ADJUSTMENT

A flat plate was placed on the top and bottom of the steering wheel. The inclinometer was placed on the flat plate to measure the angle.



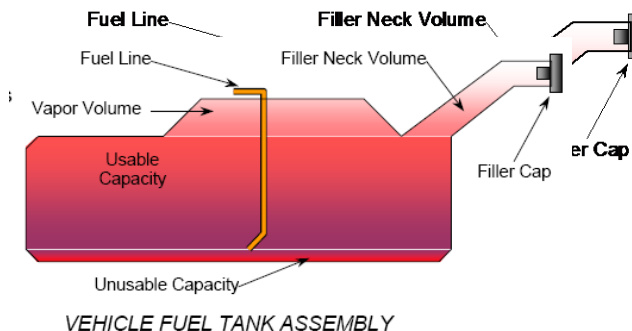
STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost, Position No. 1	25.0	
Geometric Center, Position No. 2	22.2	
Uppermost, Position No. 3	19.4	
Telescoping Steering Wheel Travel		50
Test Position	22.2	25

STEERING COLUMN ASSEMBLY

FUEL PUMP

The fuel pump will operate when the key is in the "ON" position.
 The fuel filler pipe is located on the left rear side of vehicle.

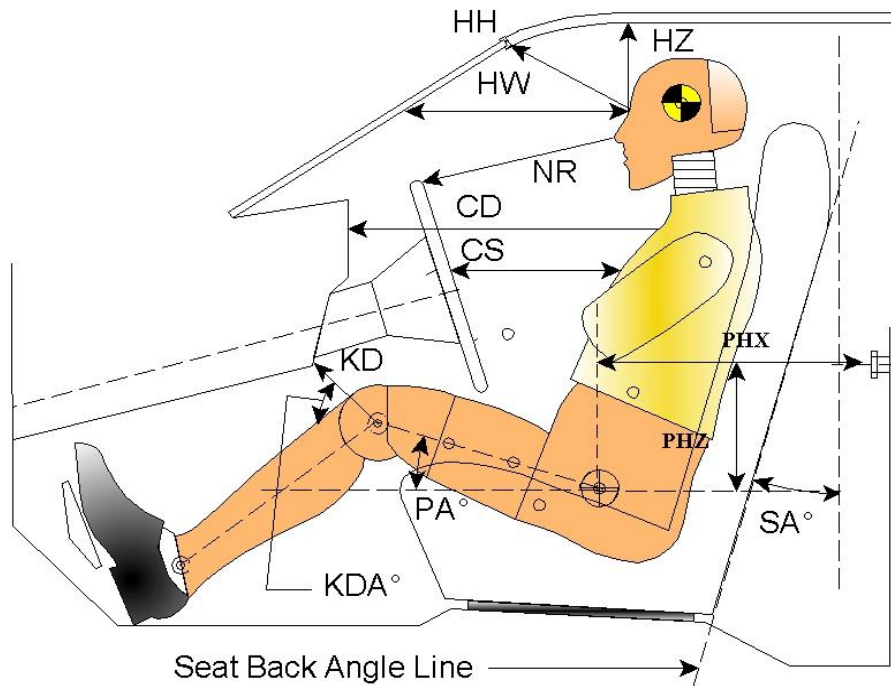


FUEL TANK CAPACITY DATA

	Liters
Usable Capacity of "Standard Tank"	82.1
Usable Capacity of "Optional Tank"	NA
Usable Capacity of Standard Tank as Specified in Owner's Manual	83.3
Usable Capacity of Optional Tank as Specified in Owner's Manual	NA
92-94% of Usable Capacity	75.6 - 77.2
Actual Amount of Solvent Used in Test	76.4
1/3 of Usable Capacity	27.4

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010



DUMMY ID# 304

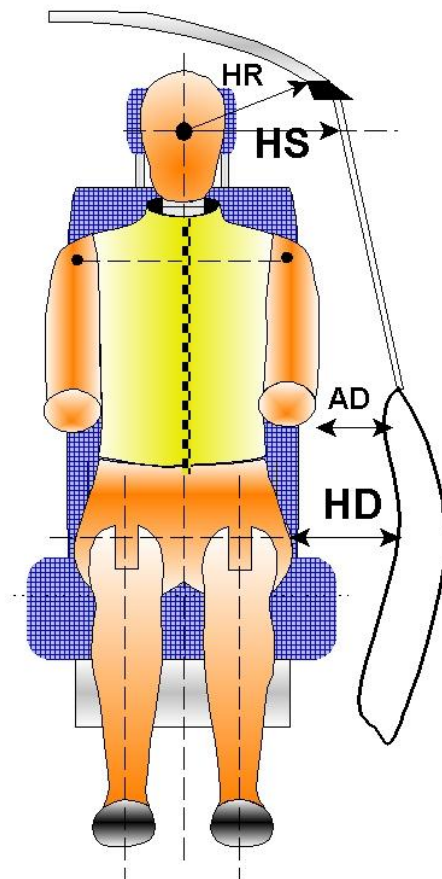
Code	Measurement Description	Driver	
		Length (mm)	Angle (°)
HH	Head to Header	319	
HW	Head to Windshield	648	
HZ	Head to Roof	240 *	
NR	Nose to Rim	211	
CD	Chest to Dash	441	
CS	Chest to Steering Wheel	180	
KDL/KDAL°	Left Knee to Dash	115	26
KDR/KDAR°	Right Knee to Dash	145	45
PA°	Pelvic Angle		13
PHX	H-Point to Striker (X-Axis)	325	
PHZ	H-Point to Striker (Z-Axis)	40	
SA°	Seat Back Angle		-10.0 **

* Measured to survivor

** Measured from Head-restraint post

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010

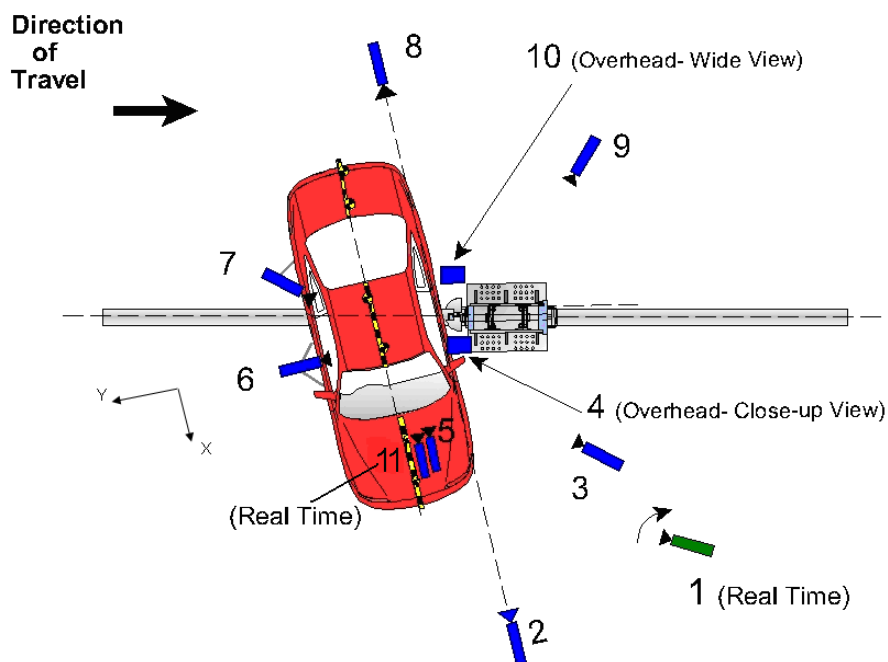


DUMMY ID# 304

Code	Measurement Description	Length (mm)
HR	Head To Side Header	280
HS	Head to Side Window	387
AD	Arm to Door	191
HD	H-Point to Door	192

DATA SHEET NO. 5
CAMERA AND INSTRUMENTATION DATA

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 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	6213	1920	1005	24	1000
3	Impact side 45° - forward pole view	1215	1930	2180	24	1000
4	Overhead Close-up view of impact	-40	210	4375	28	1000
5	Dummy front view				25	500
6	Dummy side view				12.5	500
7	Dummy rear oblique view				12.5	500
8	Rear ground level – impact view	-6256	2115	1085	28	1000
9	Impact side 45° - rearward pole view	-3160	2967	1467	24	1000
10	Overhead wide-view of impact	310	160	4375	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.

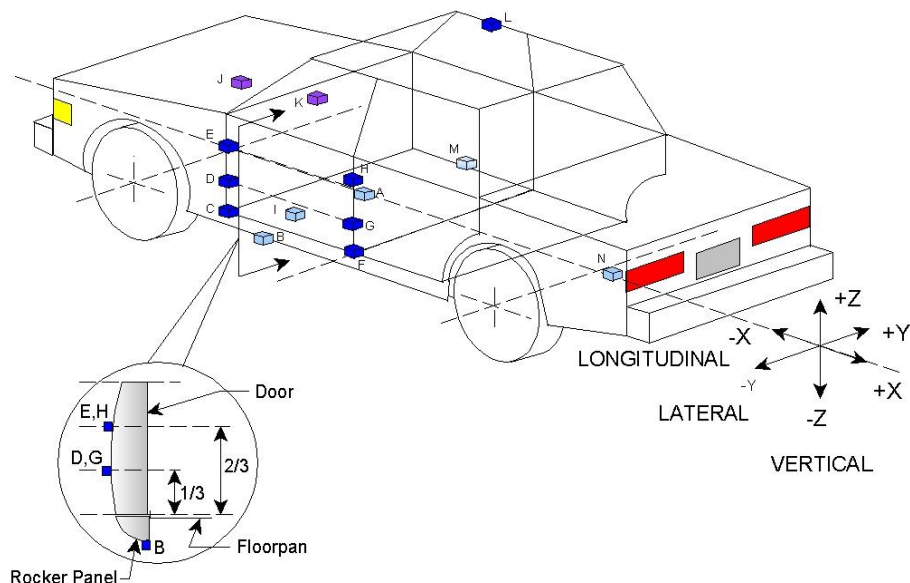
INSTRUMENTATION

	Number of Channels
Driver Dummy	16
Vehicle Structure	21
Pole Load Cells	6
Contact Switches	0 **
Total No. of Data Channels	43

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

DATA SHEET NO. 6
VEHICLE ACCELEROMETER DATA

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010

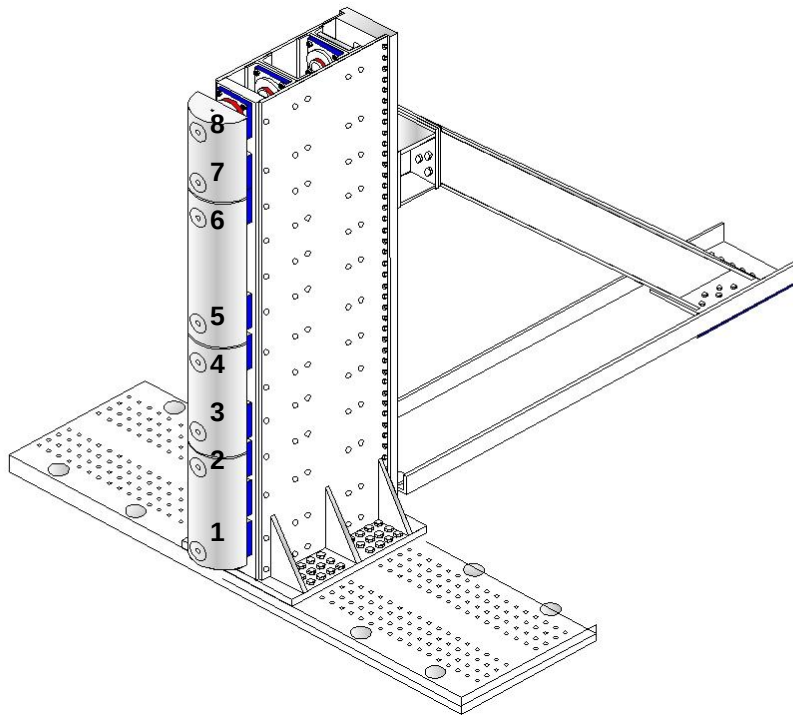


	Accelerometer/Sensor Location			
	ID	Coordinates (mm)		
		X	Y	Z
A	Vehicle CG Accel.	3135.0	48.0	709.0
	Vehicle CG Sensor	3135.0	48.0	709.0
B	Left Floor Sill	3353.0	-758.0	462.0
C	A Pillar Sill	3575.0	-709.0	507.0
D	A Pillar Low	3594.0	-708.0	642.0
E	A Pillar Mid	3598.0	-699.0	1220.0
F	B Pillar Sill	2603.0	-693.0	576.0
G	B Pillar Low	2584.0	-727.0	844.0
H	B Pillar Mid	2551.0	-715.0	1184.0
I	Driver Seat	2771.0	-585.0	519.0
L	Engine Top	4550.0	20.0	898.0
J	Firewall	4251.0	-163.0	987.0
K	Right Roof	2819.0	677.0	1650.0
M	Right Floor Sill	3362.0	771.0	462.0
N	Rear Floorpan	1350.0	-3.0	641.0

DATA SHEET NO. 7
RIGID POLE LOAD CELL DATA

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010

FOIL 300K RIGID POLE



Load Cell Locations	
ID	Height From Ground (mm)
1	172
2	659
3	850
4	1333
5	1525
6	2008
7	--
8	--

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

Test Vehicle: 2011 Chevrolet Traverse LS NHTSA No: MB0121
Test Program: Side Pole NCAP Test Date: August 9, 2010

TEST DUMMY INFORMATION AND CONTACT

Description	Driver Dummy
Dummy Type/Serial No.	SID-IIs/ 304
Head Contact	Side Curtain Airbag
Upper Torso Contact	Combo Torso/Pelvis Airbag, Shoulder with Door Trim
Lower Torso Contact	Combo Torso/Pelvis Airbag
Left Knee Contact	No Contact
Right Knee Contact	No Contact

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Jammed Shut	Closed and operational
Right Side Doors	Closed and operational	Closed and operational
Hatch and Other Doors	NA	Closed and operational
Seat Movement	None	None
Seat Back Failure	None	None

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	B-Pillar Intrusion caused by pole impact
Sill Separation	No separation
Windshield Damage	Severe cracking on left side of windshield
Window Damage	Left front window shattered during impact
Other Notable Effects	None

SUPPLEMENTAL RESTRAINT SYSTEM INFORMATION

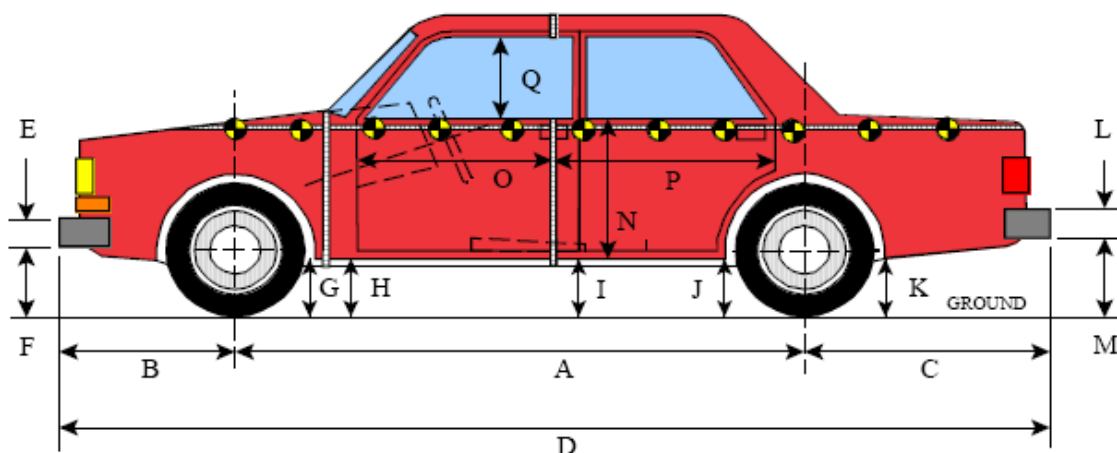
Restraint Type	Left Front (Driver) Occupant Location 1		Left Rear (Passenger) Occupant Location 4	
	Mounted	Deployed	Mounted	Deployed
Frontal Airbag	Yes	No		
Knee Airbag	No	NA		
Side Airbag 1 (Side Torso/Pelvis)	Yes	Yes	No	NA
Side Airbag 2 (Side Curtain)	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	Yes	No	NA
Seat Belt Load Limiter	Yes	Yes	No	NA
Other	NA	NA	NA	NA

VEHICLE SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset from Vertical Impact Reference Line	mm	+/- 38	-10
Trap No. 1 Velocity (Primary)	km/h	31.4 to 33.0	32.5
Trap No. 2 Velocity (Redundant)	km/h	31.4 to 33.0	32.6

DATA SHEET NO. 9
VEHICLE PROFILE MEASUREMENTS

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010



LEFT SIDE VIEW

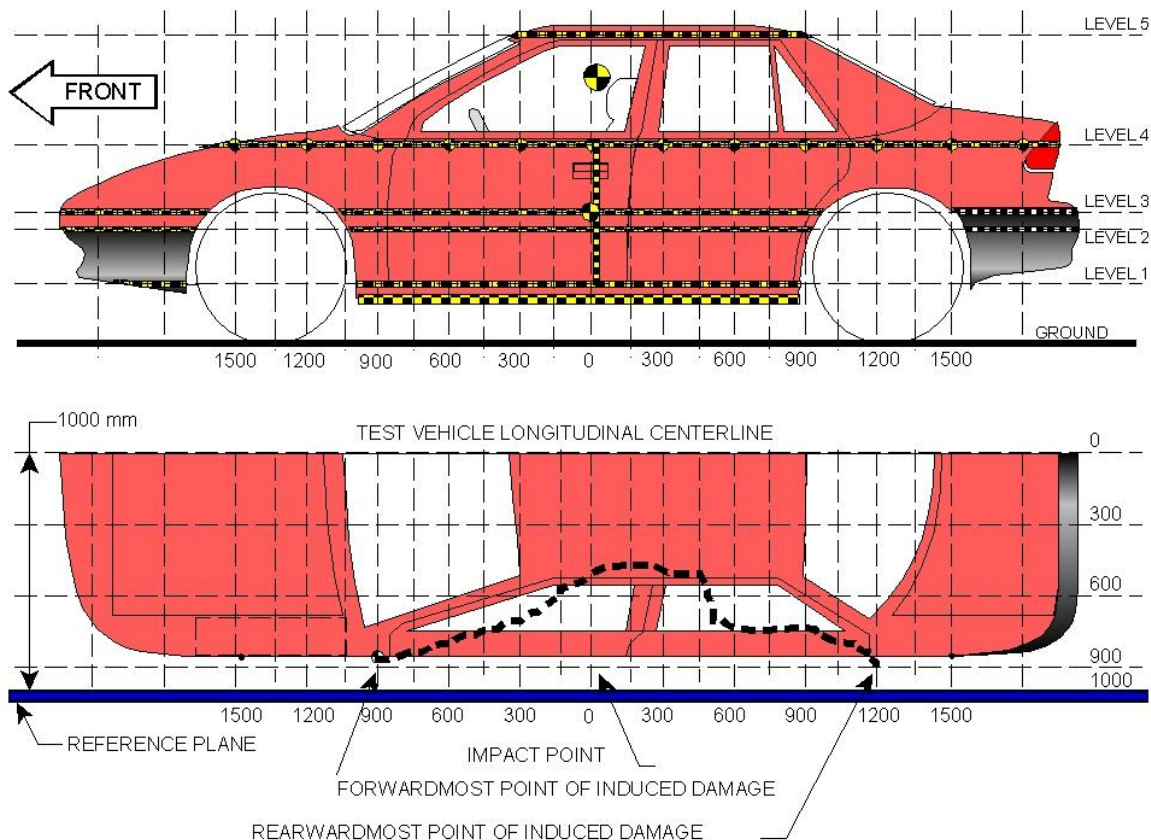
All MEASUREMENTS IN (mm) WITH TOLERANCE OF ± 3 mm

VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Vehicle Wheelbase	3022.0	2983.0	39.0
B	Front Axle to FSOV	1021.9	1040.3	-18.4
C	Rear Axle to RSOV	1150.7	1142.5	8.2
D1	Total Vehicle Length at Left Side	5008.7	4969.7	39.0
D2	Total Vehicle Length at Centerline	5194.6	5165.4	29.1
D3	Total Vehicle Length at Right Side	5011.6	5001.4	10.3
E	Front Bumper Thickness	110.0	110.0	0.0
F	Front Bumper Bottom to Ground	411.0	446.0	-35.0
G	Sill Height at Front Wheel Well	203.0	231.0	-28.0
H	Sill Height at Front Door Leading Edge	269.0	307.0	-38.0
I	Sill Height at B Pillar	298.0	324.0	-26.0
J1	Sill Height at Rear Wheel Well	314.0	330.0	-16.0
J2	Pinch Weld Height at Rear Wheel Well	315.0	331.0	-16.0
K	Sill Height Aft of Rear Wheel Well	274.0	295.0	-21.0
L	Rear Bumper Thickness	160.0	160.0	0.0
M	Rear Bumper Bottom to Ground	470.0	495.0	-25.0
N	Sill Height to Window Bottom Sill	716.4	716.8	-0.5
O	Front Door Leading Edge to Impact CL	670.8	651.8	19.0
P	Rear Door Trailing Edge to Impact CL	1402.6	1384.0	18.6
Q	Front Window Opening	489.0	445.7	43.3
R	Right Side Length	5011.6	5001.4	10.3
S	Left Side Length	5008.7	4969.7	39.0
T	Vehicle Width at B Post	1966.5	1643.3	323.2

DATA SHEET NO. 10
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010



Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	523.5
2	Occupant H-Point	751.8
3	Mid-Door	841.1
4	Window Sill	1077.5
5	Window Top	1694.7

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 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-1500	--	--	942	--	--	--	--	984	--	--	--	--	-42	--	--
-1350	--	--	987	825	--	--	--	1007	867	--	--	--	-20	-42	--
-1200	--	--	996	849	--	--	--	1005	879	--	--	--	-9	-30	--
-1050	--	--	997	868	--	--	--	1000	887	--	--	--	-3	-19	--
-900	--	--	990	891	--	--	--	988	900	--	--	--	2	-9	--
-750	--	975	970	904	--	--	970	967	903	--	--	5	3	1	--
-600	947	961	963	916	--	904	908	913	883	--	43	53	50	33	--
-450	952	963	965	920	--	826	839	839	818	--	126	124	126	102	--
-300	956	964	967	928	--	745	738	739	732	--	211	226	228	196	--
-150	958	965	968	934	--	648	645	645	638	--	310	320	323	296	--
0	957	964	967	938	595	631	616	614	612	495	326	348	353	326	100
150	957	964	968	942	630	748	729	721	708	545	209	235	247	234	85
300	956	963	968	946	639	873	845	819	816	566	83	118	149	130	73
450	952	962	967	947	643	916	917	919	893	585	36	45	48	54	58
600	950	963	966	949	646	923	927	927	905	603	27	36	39	44	43
750	948	963	964	950	647	930	937	936	916	619	18	26	28	34	28
900	945	962	963	950	646	937	945	944	926	636	8	17	19	24	10
1050	941	959	961	950	646	942	952	951	935	650	-1	7	10	15	-4
1200	937	955	959	974	643	947	957	957	969	649	-10	-2	2	5	-6
1350	947	967	967	960	638	949	980	978	964	643	-2	-13	-11	-4	-5
1500	--	987	987	947	631	--	986	987	950	634	--	1	0	-3	-3

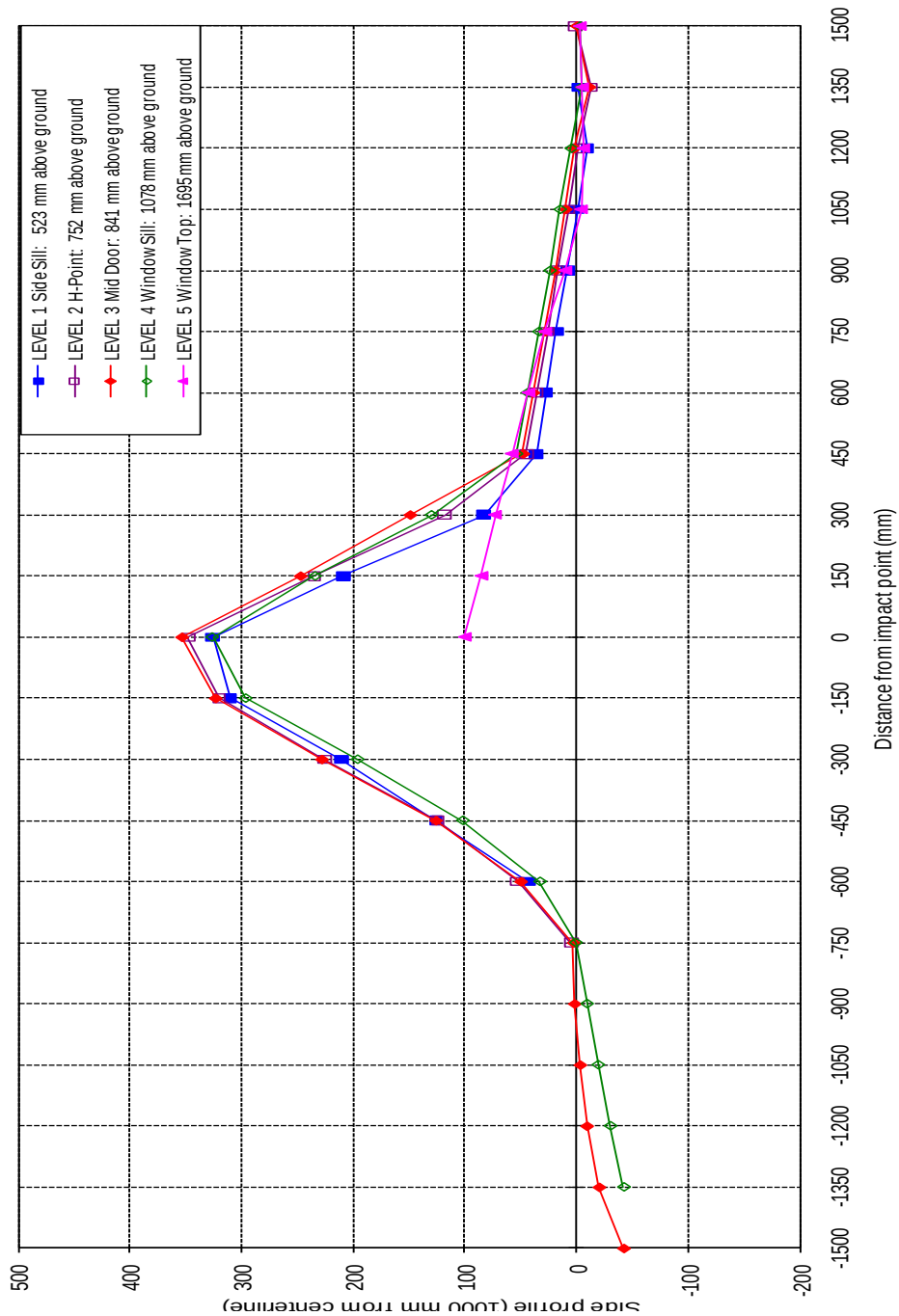
MAXIMUM CRUSH DATA

	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	326	348	353	326	100
Distance From Impact (mm)	0	0	0	0	0

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:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date:	August 9, 2010



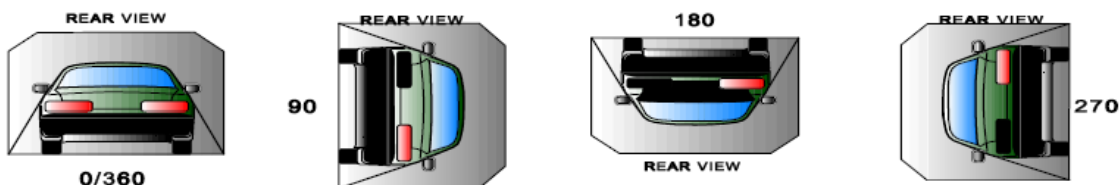
DATA SHEET NO. 11
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Chevrolet Traverse LS NHTSA No: MB0121
 Test Program: Side Pole NCAP Test Date: August 9, 2010

Test Time: 6:27 PM Temperature: 23.9° 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	1:06	5:00	6:06
90 to 180	1:02	5:00	6:02
180 to 270	1:06	5:00	6:06
270 to 360	1:04	5:00	6:04

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

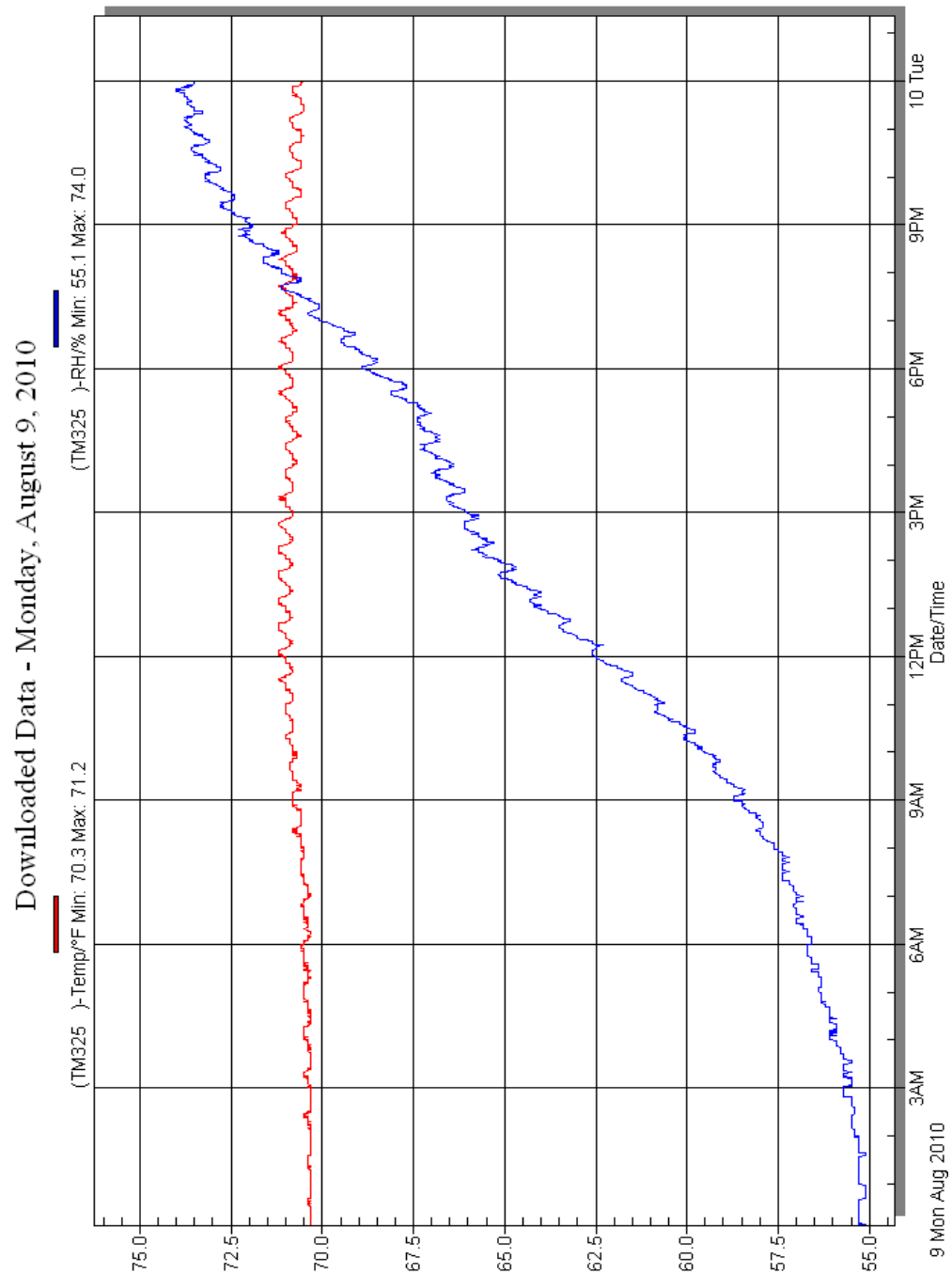
Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	0	0	0	0
90 to 180	0	0	0	0
180 to 270	0	0	0	0
270 to 360	0	0	0	0

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:	2011 Chevrolet Traverse LS	NHTSA No:	MB0121
Test Program:	Side Pole NCAP	Test Date	August 9, 2010



**APPENDIX A
PHOTOGRAPHS**

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Figure A-1: As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle



Figure A-2: As-Delivered Left Rear $\frac{3}{4}$ 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 Front $\frac{3}{4}$ View of Test Vehicle



Figure A-6: Post-Test Left Front $\frac{3}{4}$ View of 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 Rear $\frac{3}{4}$ 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 Right Side View of Pole Positioned Against Side of Vehicle at Ideal Impact Point

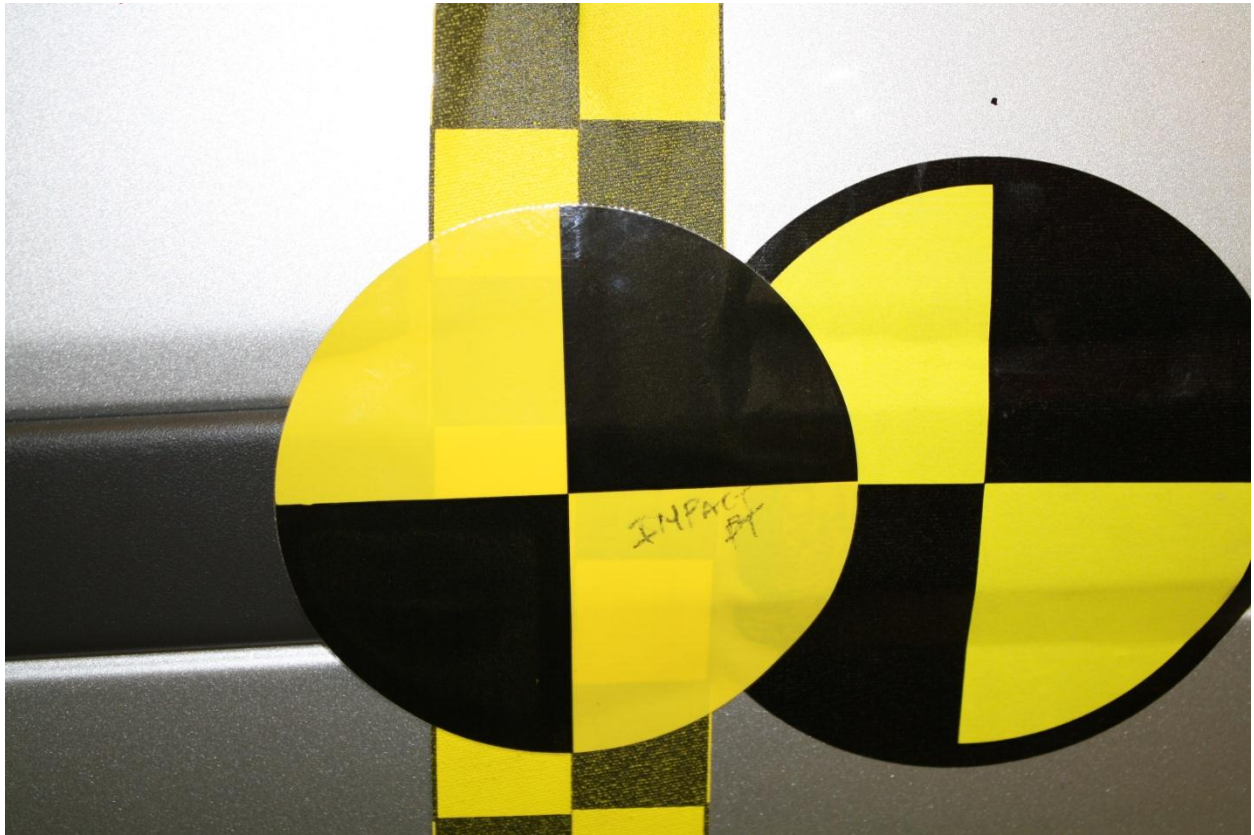


Figure A-19: Pre-Test Close-Up View of Impact Point Target

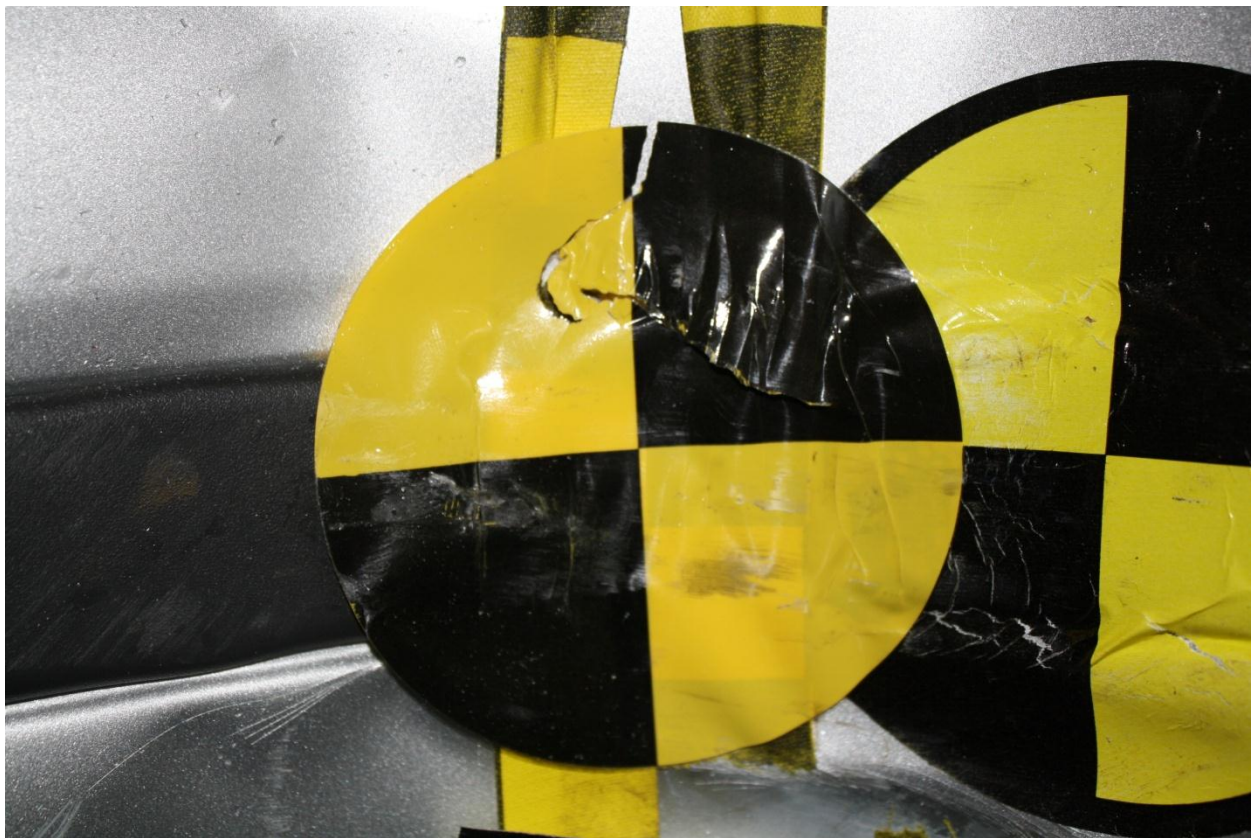


Figure A-20: Post-Test Close-Up View of Impact Point Target Showing Impact Location



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 (Door Open)



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

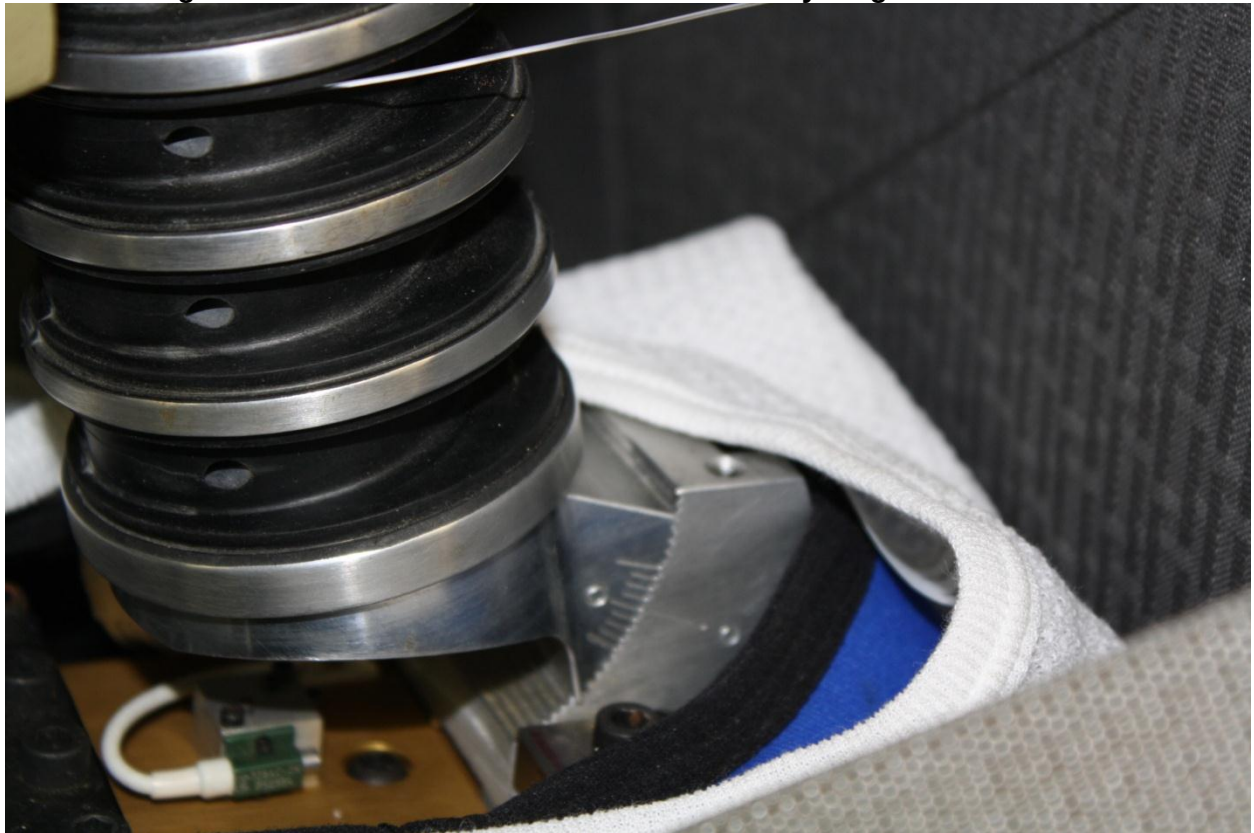


Figure A-30: Pre-Test View of Dummy's Neck Showing Position of Adjustable Neck Bracket

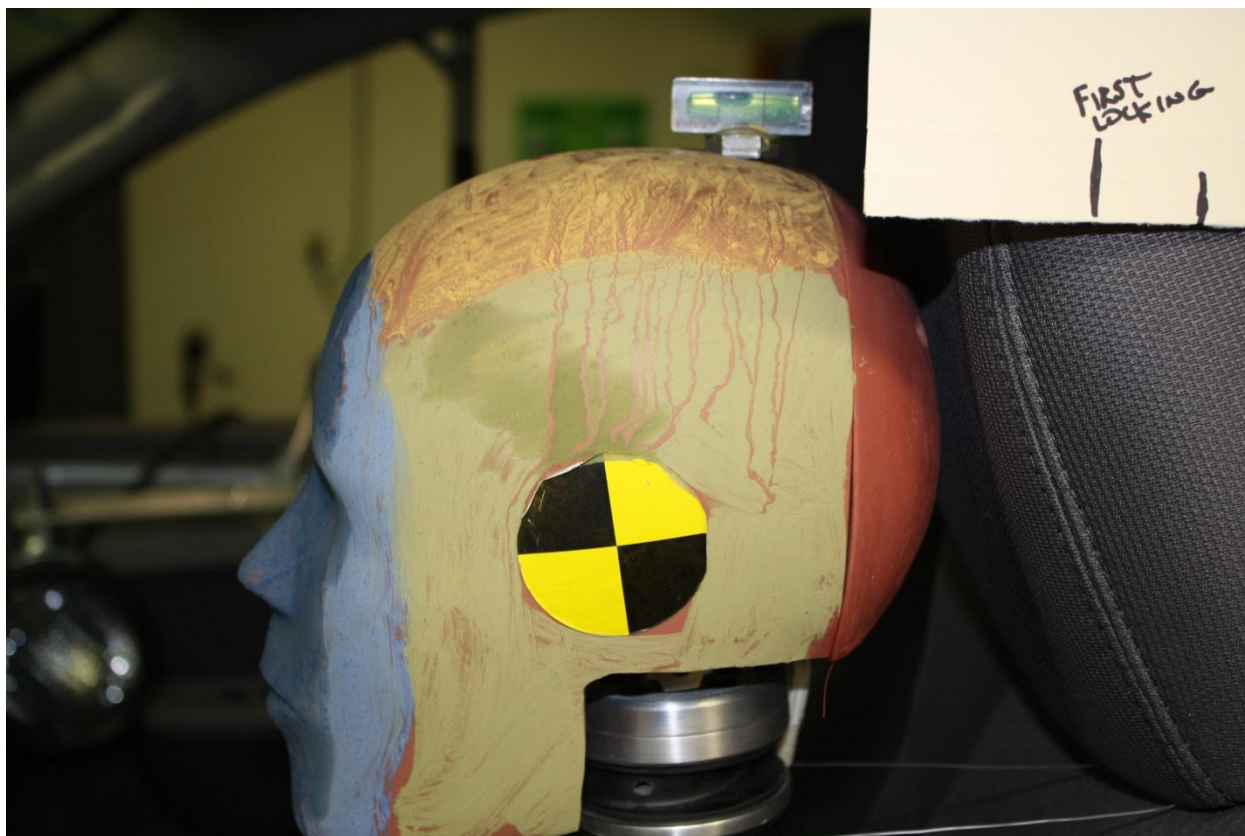


Figure A-31: Pre-Test View of Dummy's Head Showing Dummy's Head is Level



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

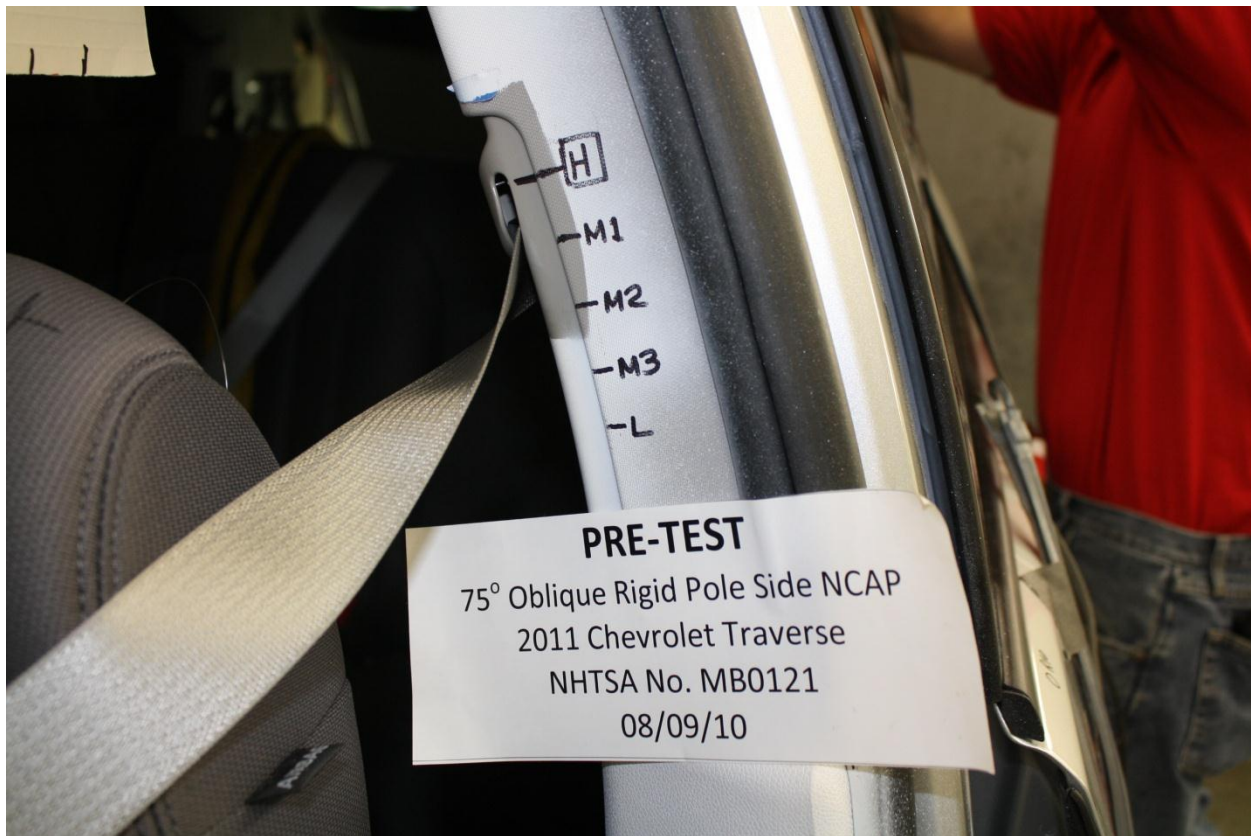


Figure A-33: Pre-Test View of Belt Anchorage for Dummy to Show Position

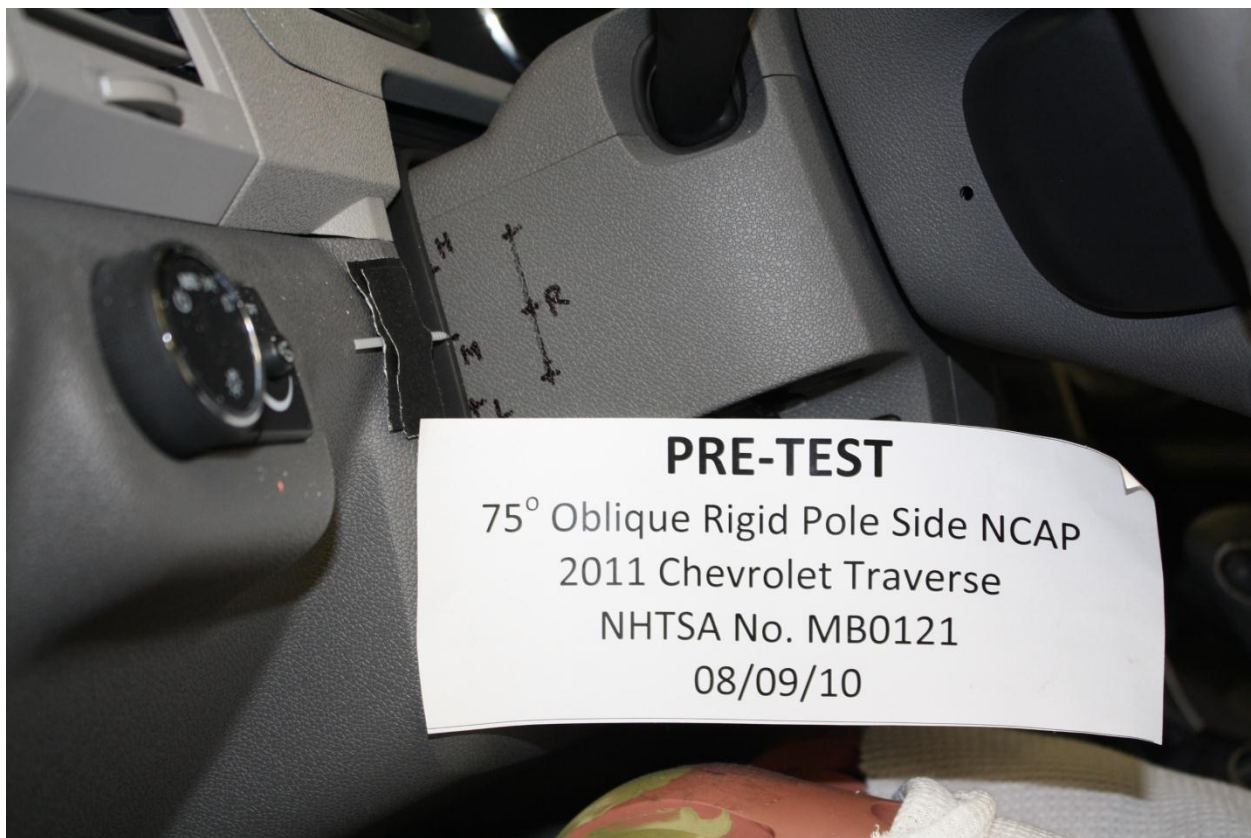


Figure A-34: Pre-Test Left Side View of Steering Wheel to Show Position

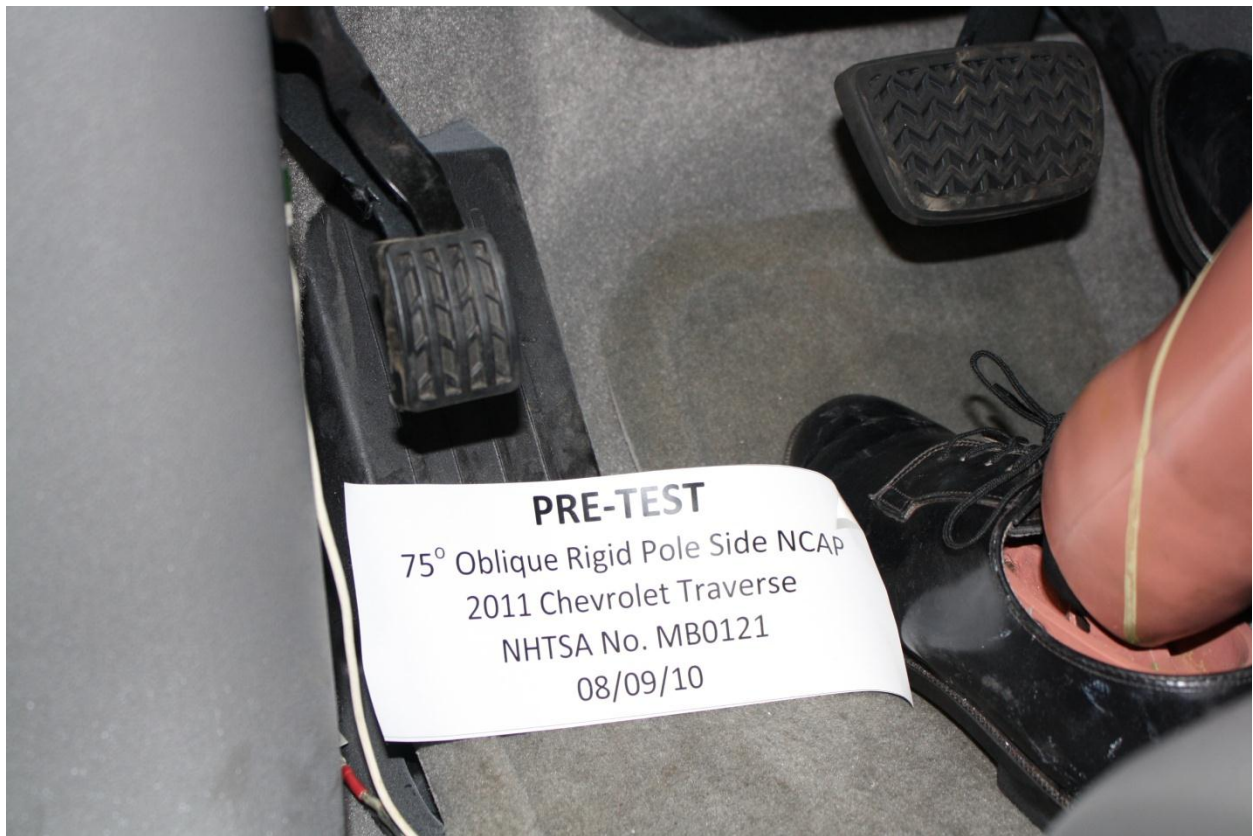


Figure A-35: Pre-Test View of Parking Brake



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

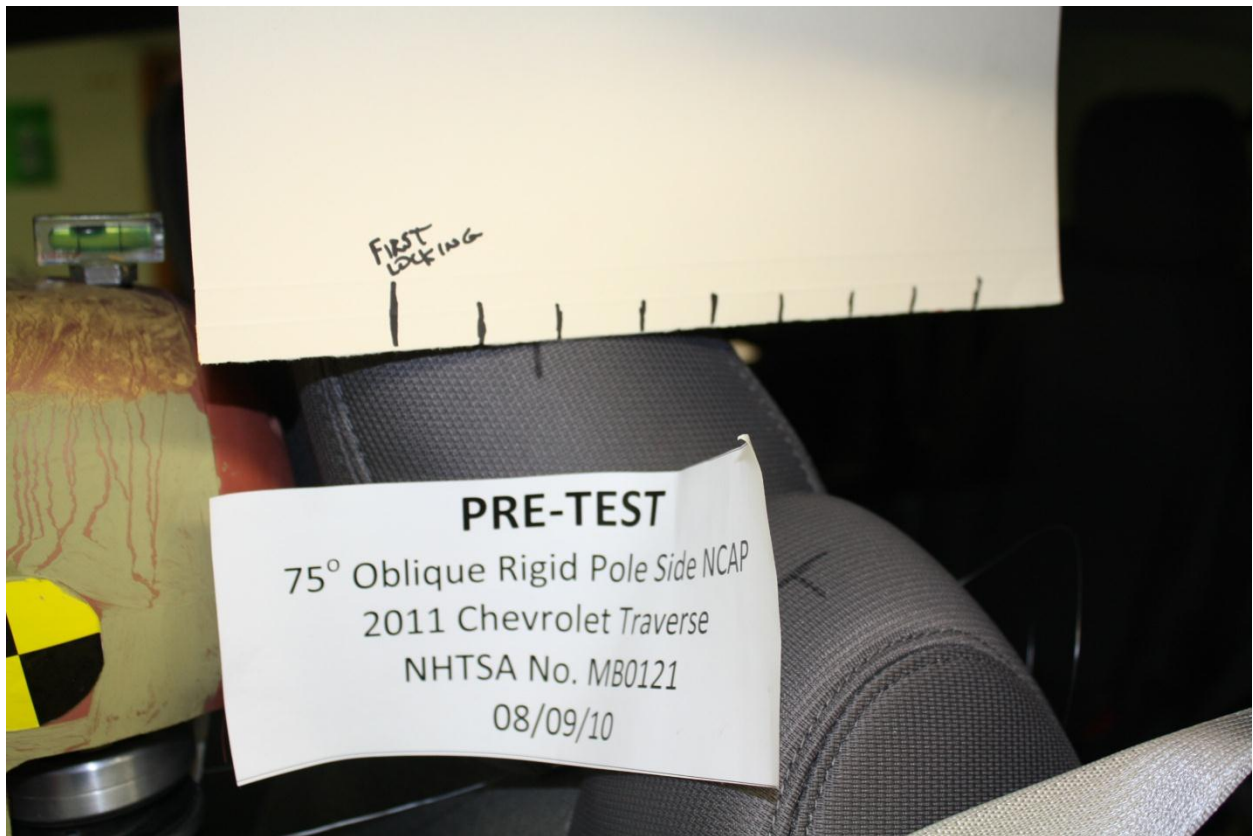


Figure A-37: Pre-Test Close-Up Left Side View of Driver Seat Back Showing Test Position



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

Photograph Not Available

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

Photograph Not Available

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

Photograph Not Available

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



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



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

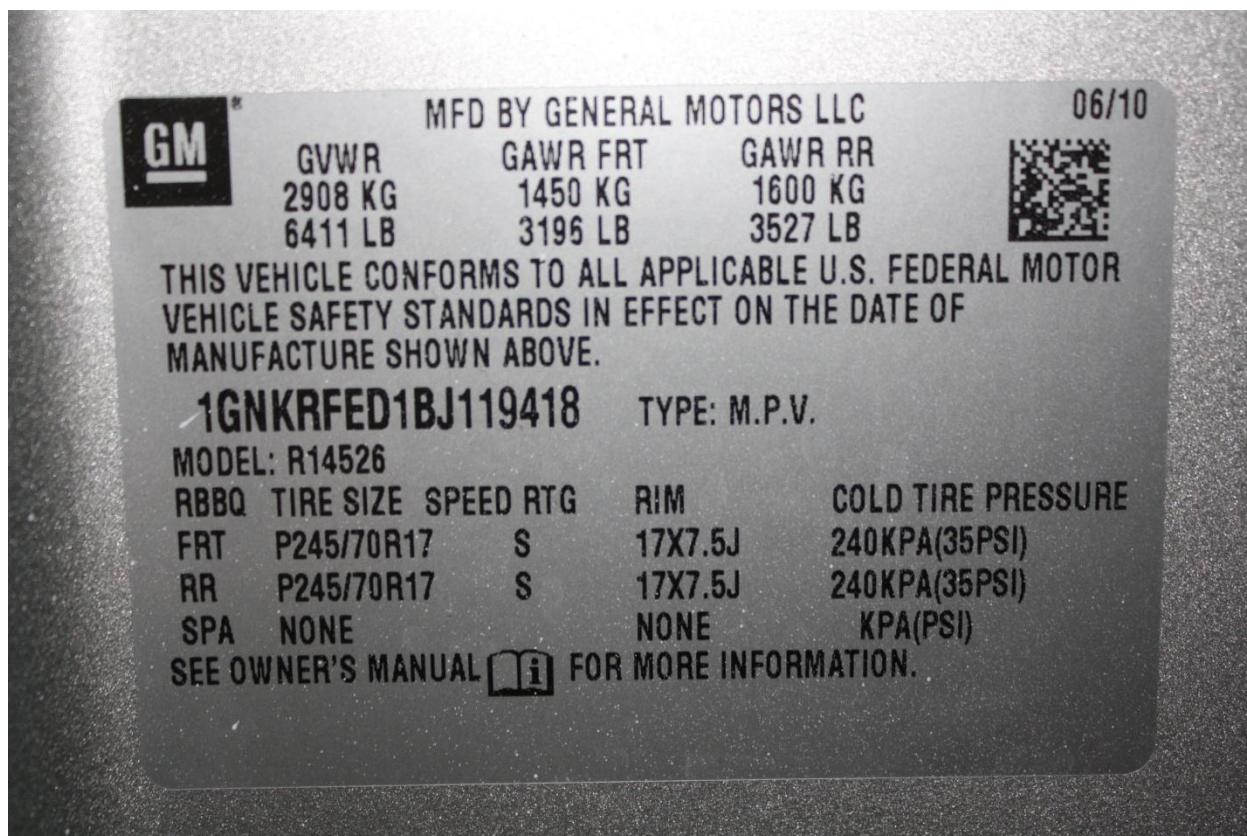


Figure A-53: Close-Up View of Vehicle's Certification Label



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

Photograph Not Available

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

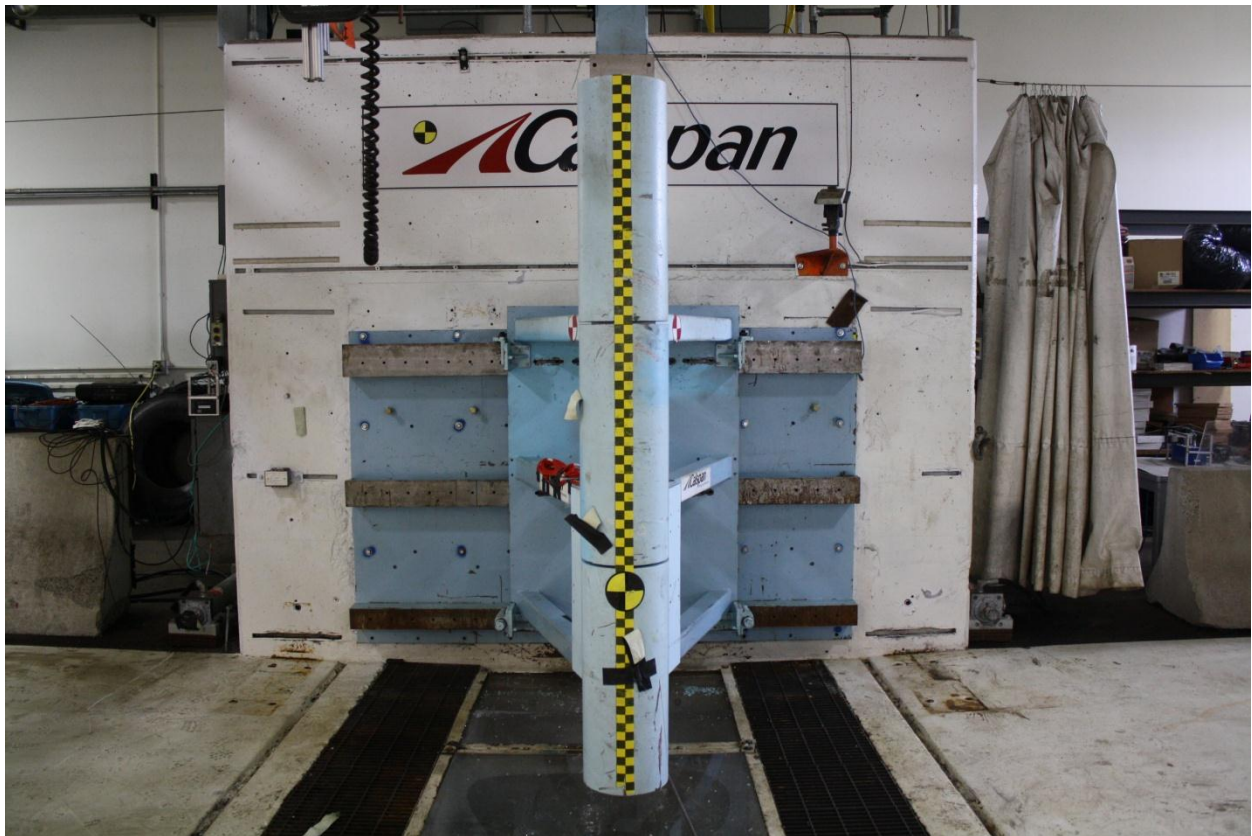


Figure A-56: Post-Test Pole Barrier Front View



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



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

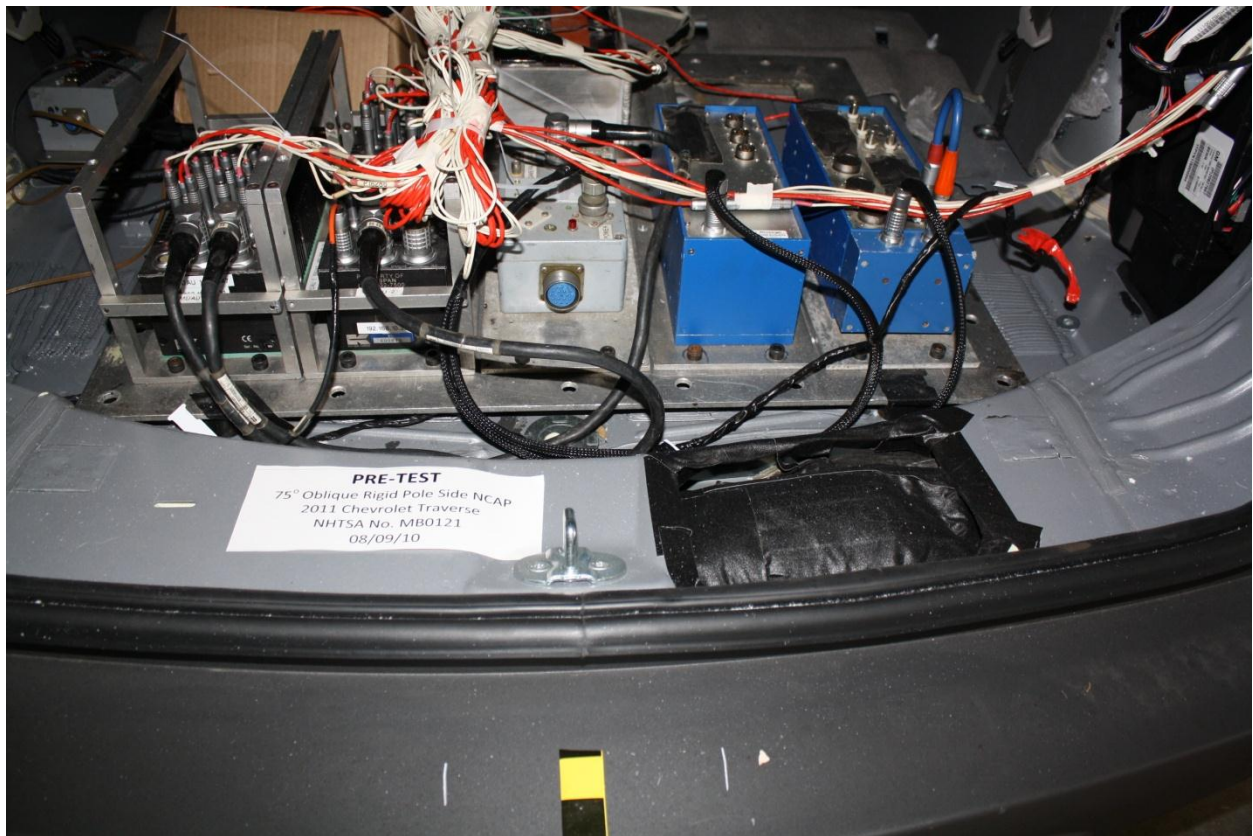


Figure A-59: Pre-Test Ballast View



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



2011 TRAVERSE FWD LS

EXTERIOR: SILVER ICE METALLIC
INTERIOR: DARK GRAY

ENGINE: 3.6L SIDI V6
TRANSMISSION 6-SPEED AUTO

Rec 7-12
15miles

STANDARD EQUIPMENT (ITEMS LISTED BELOW ARE INCLUDED AT NO EXTRA CHARGE IN THE STANDARD VEHICLE PRICE SHOWN) • 5 YEAR / 100,000 MILE POWERTRAIN LIMITED WARRANTY SEE DEALER FOR DETAILS MECHANICAL • ENGINE, 3.6L SIDI V6 • TRANSMISSION 6-SPEED AUTO FWD • OIL LIFE MONITORING SYSTEM • TIRE SEALANT & INFLATOR KIT IN PLACE OF SPARE TIRE SAFETY & SECURITY • ANTILOCK BRAKE SYSTEM • STABILITRAK-STABILITY CONTROL SYSTEM W/ TRACTION CONTROL • TIRE PRESSURE MONITORING SYS • AIR BAGS, DUAL FRONTAL • FRONT SIDE IMPACT AIR BAGS • HEAD CURTAIN SIDE AIR BAGS ALL ROWS • PASSENGER SENSING SYSTEM	• CHILD SAFETY LATCH SYSTEM • REMOTE KEYLESS ENTRY • THEFT DETERRENT SYSTEM • 8 MTHS ONSTAR DIRECTIONS & CONNECTIONS WITH AUTOMATIC CRASH RESPONSE AND TURN-BY-TURN NAVIGATION (ASK DEALER ABOUT GEOGRAPHIC COVERAGE) EXTERIOR • REAR LIFTGATE, MANUAL • POWER OUTSIDE MIRRORS • BODYSIDE MOLDING, BLACK • 17" STEEL WHEELS WITH COVERS INTERIOR • PREMIUM CLOTH SEATS • SEATS, FRONT BUCKET • 8 PASS SEATING W/ 2ND & 3RD ROW SPLIT BENCH SEAT • SMART SLIDE 2ND ROW FEATURE • FRONT & REAR AIR CONDITIONING • REAR CARGO STORAGE • STEERING, TILT & TELESCOPING	• CRUISE CONTROL • AM/FM STEREO CD PLAYER • XM RADIO - SERVICE SUBSCRIPTION SOLD SEPARATELY BY SIRIUS/XM AFTER 3 MONTHS OPTIONS & PRICING MANUFACTURER'S SUGGESTED RETAIL PRICE <table><tr><td>STANDARD VEHICLE PRICE</td><td>\$29,224.00</td></tr></table> OPTIONS INSTALLED BY THE MANUFACTURER (MAY REPLACE STANDARD EQUIPMENT SHOWN) <table><tr><td>BLUETOOTH CONNECTIVITY FOR PHONE PACKAGE</td><td>340.00</td></tr><tr><td>*BLUETOOTH FOR PHONE</td><td></td></tr><tr><td>*LEATHER WRAPPED STEERING WHEEL, W/ AUDIO CONTROLS</td><td></td></tr><tr><td>8 PASS SEATING W/ 2ND & 3RD ROW SPLIT BENCH SEAT</td><td>INC.</td></tr><tr><td>TOTAL OPTIONS</td><td>\$340.00</td></tr></table>	STANDARD VEHICLE PRICE	\$29,224.00	BLUETOOTH CONNECTIVITY FOR PHONE PACKAGE	340.00	*BLUETOOTH FOR PHONE		*LEATHER WRAPPED STEERING WHEEL, W/ AUDIO CONTROLS		8 PASS SEATING W/ 2ND & 3RD ROW SPLIT BENCH SEAT	INC.	TOTAL OPTIONS	\$340.00	Visit us at www.chevy.com <table><tr><td>TOTAL VEHICLE & OPTIONS</td><td>\$29,564.00</td></tr><tr><td>DESTINATION CHARGE</td><td>775.00</td></tr><tr><td>TOTAL VEHICLE PRICE*</td><td>\$30,339.00</td></tr></table>	TOTAL VEHICLE & OPTIONS	\$29,564.00	DESTINATION CHARGE	775.00	TOTAL VEHICLE PRICE*	\$30,339.00
STANDARD VEHICLE PRICE	\$29,224.00																				
BLUETOOTH CONNECTIVITY FOR PHONE PACKAGE	340.00																				
*BLUETOOTH FOR PHONE																					
*LEATHER WRAPPED STEERING WHEEL, W/ AUDIO CONTROLS																					
8 PASS SEATING W/ 2ND & 3RD ROW SPLIT BENCH SEAT	INC.																				
TOTAL OPTIONS	\$340.00																				
TOTAL VEHICLE & OPTIONS	\$29,564.00																				
DESTINATION CHARGE	775.00																				
TOTAL VEHICLE PRICE*	\$30,339.00																				

EPA Fuel Economy Estimates <table><tr><td>CITY MPG 17 Expected range for most drivers 14 to 20 MPG</td><td>Estimated Annual Fuel Cost \$2,051 based on 15,000 miles at \$2.60 per gallon Combined Fuel Economy This Vehicle 19 10 32 MPG</td><td>HIGHWAY MPG 24 Expected range for most drivers 19 to 29 MPG Your actual mileage will vary depending on how you drive and maintain your vehicle.</td></tr></table> See the FREE Fuel Economy Guide at dealers or www.fueleconomy.gov	CITY MPG 17 Expected range for most drivers 14 to 20 MPG	Estimated Annual Fuel Cost \$2,051 based on 15,000 miles at \$2.60 per gallon Combined Fuel Economy This Vehicle 19 10 32 MPG	HIGHWAY MPG 24 Expected range for most drivers 19 to 29 MPG Your actual mileage will vary depending on how you drive and maintain your vehicle.	GOVERNMENT SAFETY RATINGS This vehicle has not been rated by the government for frontal crash, side crash or rollover risk. Source: National Highway Traffic Safety Administration (NHTSA). www.safercar.gov or 1-888-327-4236	PARTS CONTENT INFORMATION FOR VEHICLES IN THIS CARLINE: U.S./CANADIAN PARTS CONTENT: 75% NOTE: PARTS CONTENT DOES NOT INCLUDE FINAL ASSEMBLY, DISTRIBUTION, OR OTHER NON-PARTS COSTS. FOR THIS VEHICLE: FINAL ASSEMBLY POINT: LANSING, MI U.S.A. COUNTRY OF ORIGIN: ENGINE: UNITED STATES TRANSMISSION: UNITED STATES ORDER NO. NHTXUB SALES CODE E SALES MODEL CODE CHVH DEALER NO. 11022 CHRYSLER FINANCIAL VIN 1GNKRFE1B1119418 DEALER TO WHOM DELIVERED RAYMOND CHEVROLET & OLDSMOBILE, INC. 119 RTE 173 ANTIOCH, IL 60002-1895 1QA0593967
CITY MPG 17 Expected range for most drivers 14 to 20 MPG	Estimated Annual Fuel Cost \$2,051 based on 15,000 miles at \$2.60 per gallon Combined Fuel Economy This Vehicle 19 10 32 MPG	HIGHWAY MPG 24 Expected range for most drivers 19 to 29 MPG Your actual mileage will vary depending on how you drive and maintain your vehicle.			

Figure A-67: Monroney Label

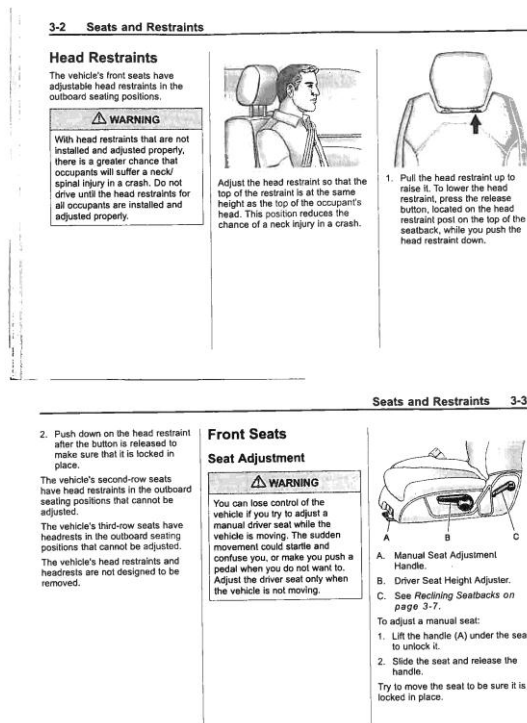


Figure A-68: Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

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-5
4	Driver Head Resultant Primary vs. Time	B-5
5	Driver Lower Spine T12 Acceleration (X) vs. Time	B-6
6	Driver Lower Spine T12 Acceleration (Y) vs. Time	B-6
7	Driver Lower Spine T12 Acceleration (Z) vs. Time	B-6
8	Driver Lower Spine Y12 Resultant Acceleration vs. Time	B-6
9	Driver Iliac Wing Force on Impact Side (Y) vs. Time	B-7
10	Driver Acetabulum Force on Impact Side (Y) vs. Time	B-7
11	Driver Total Pelvis Force on Impact Side (Y) vs. Time	B-7

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

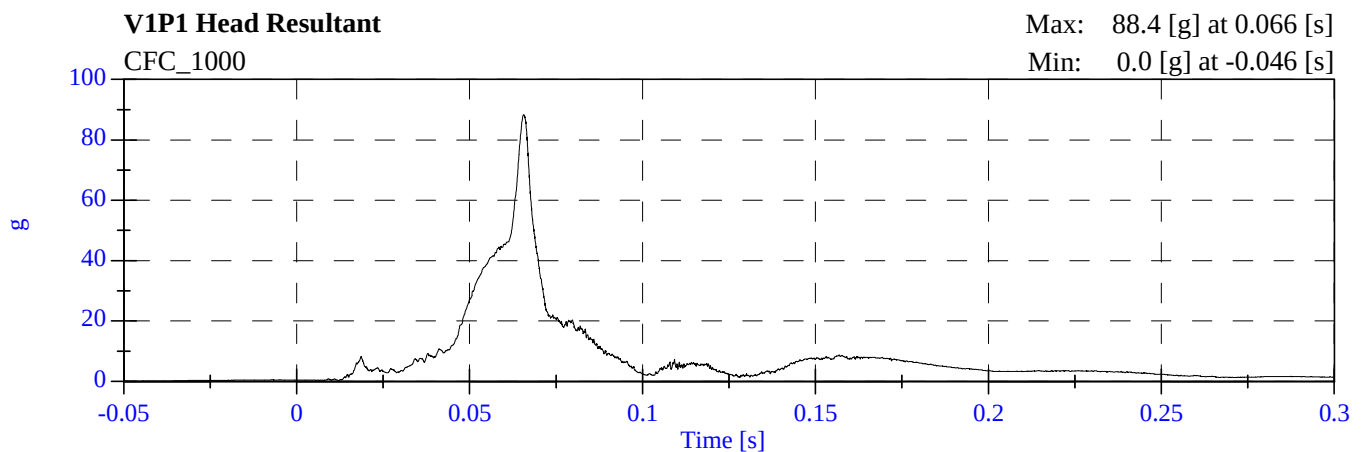
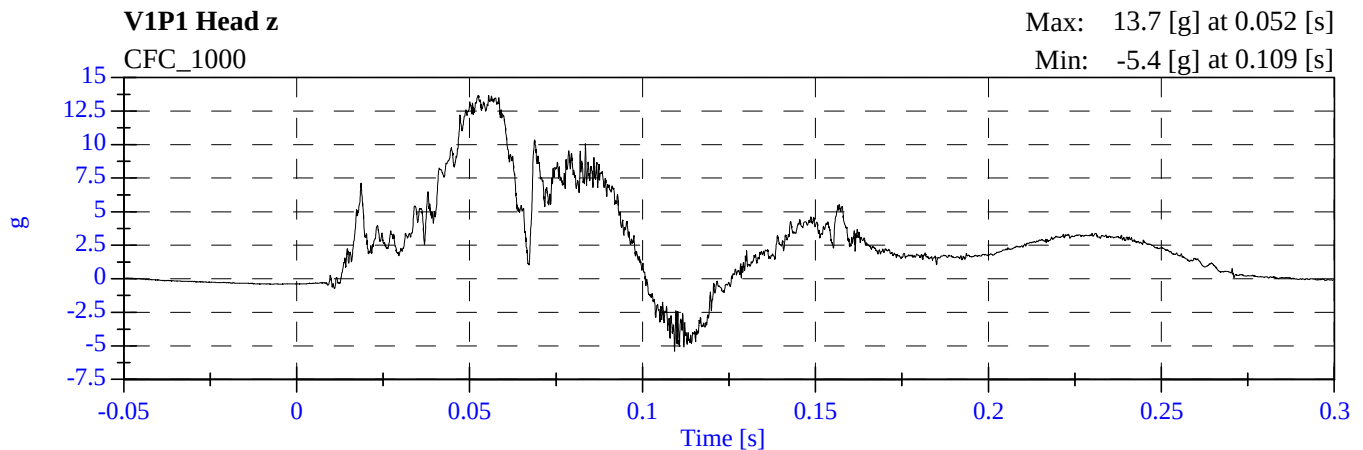
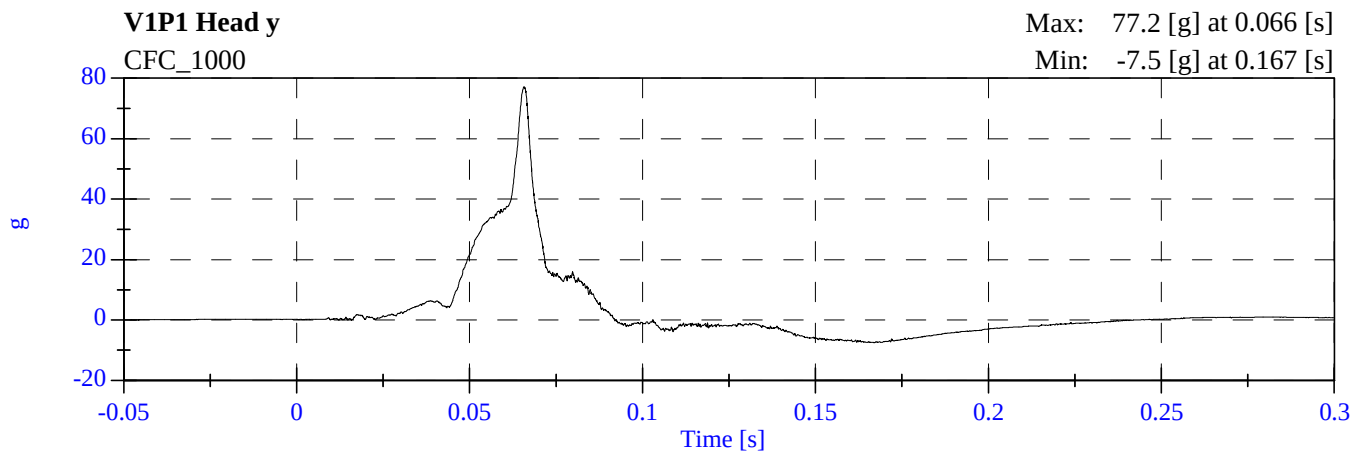
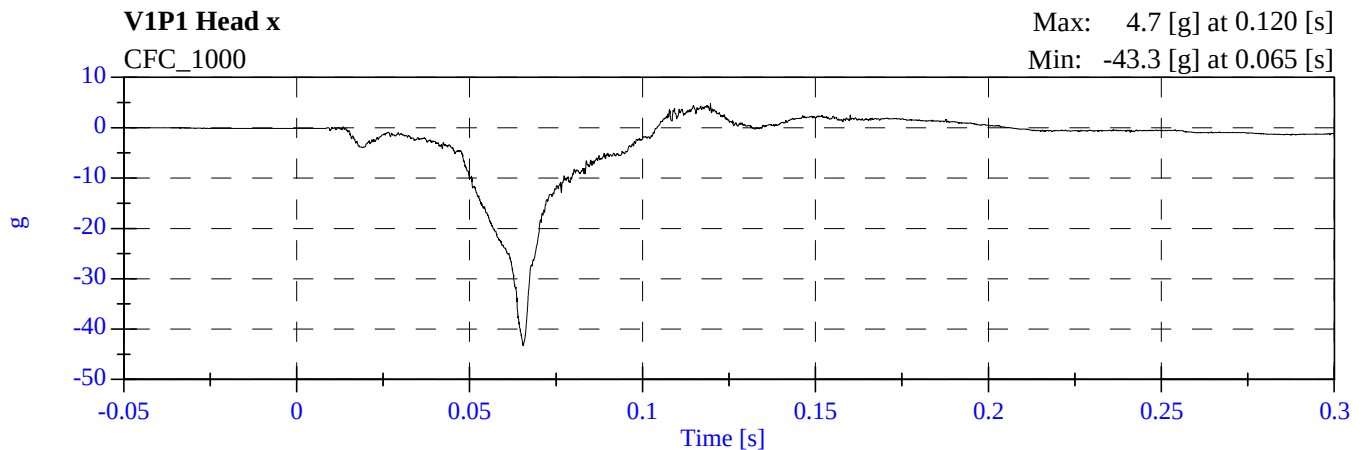
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)
Vehicle Center of Gravity Angular Rate About X (Roll)
Vehicle Center of Gravity Angular Rate About Y (Pitch)
Vehicle Center of Gravity Angular Rate About Z (Yaw)
Left Floor 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

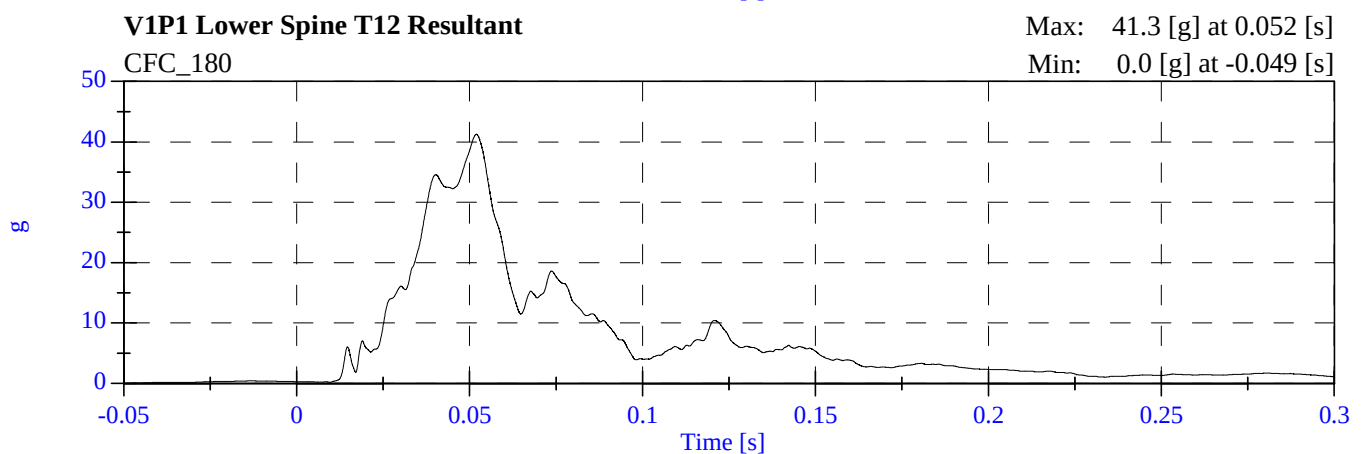
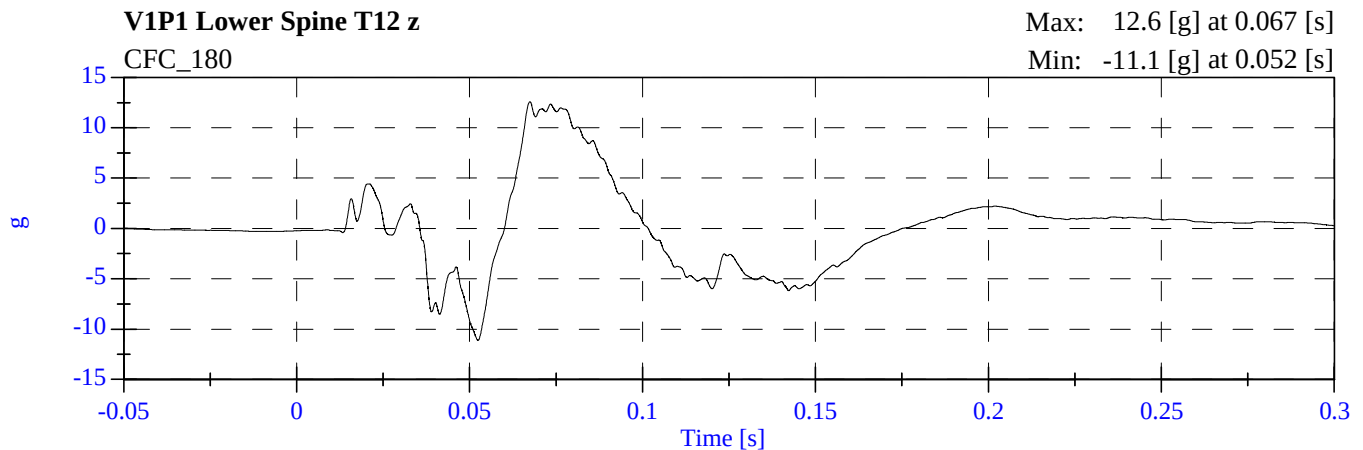
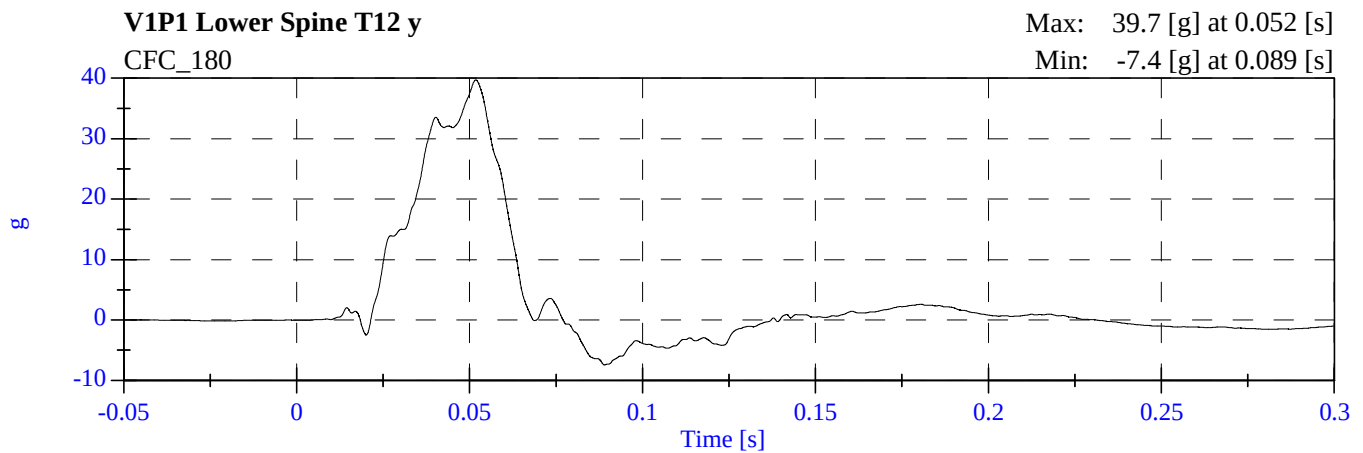
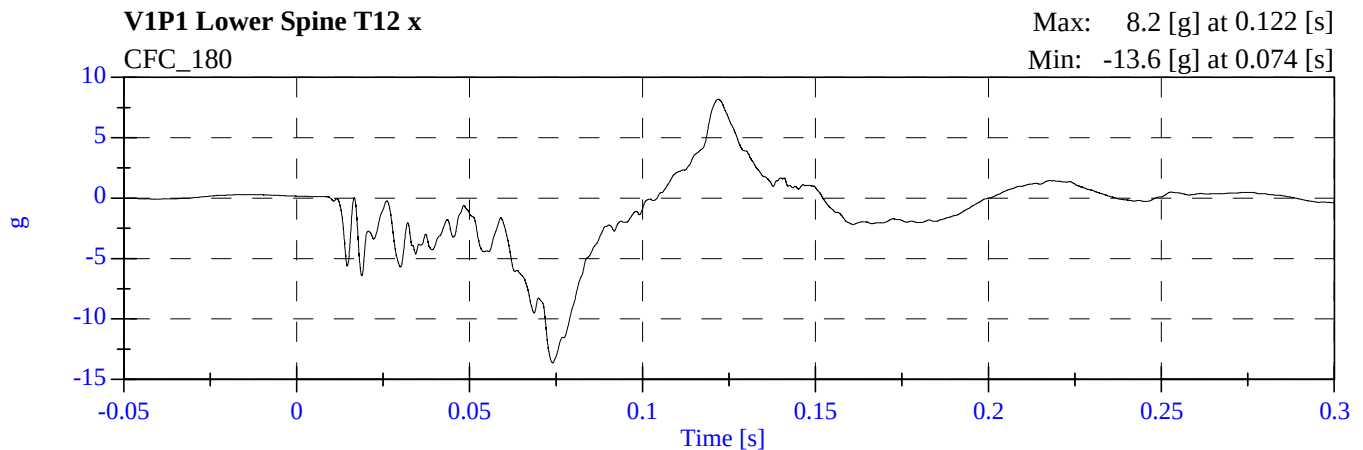
Load Cell Pole Barrier #1 Force (Y)
Load Cell Pole Barrier #2 Force (Y)
Load Cell Pole Barrier #3 Force (Y)
Load Cell Pole Barrier #4 Force (Y)
Load Cell Pole Barrier #5 Force (Y)
Load Cell Pole Barrier #6 Force (Y)
Load Cell Pole Barrier #7 Force (Y)
Load Cell Pole Barrier #8 Force (Y)

Side Pole NCAP 2011 Chevrolet Traverse

MB0121 - August 09, 2010

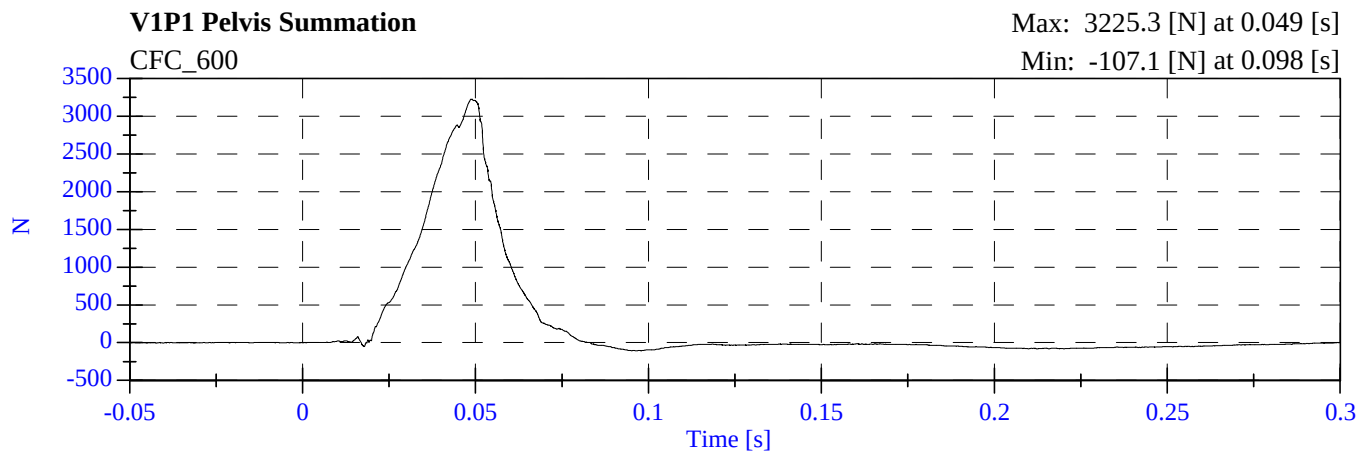
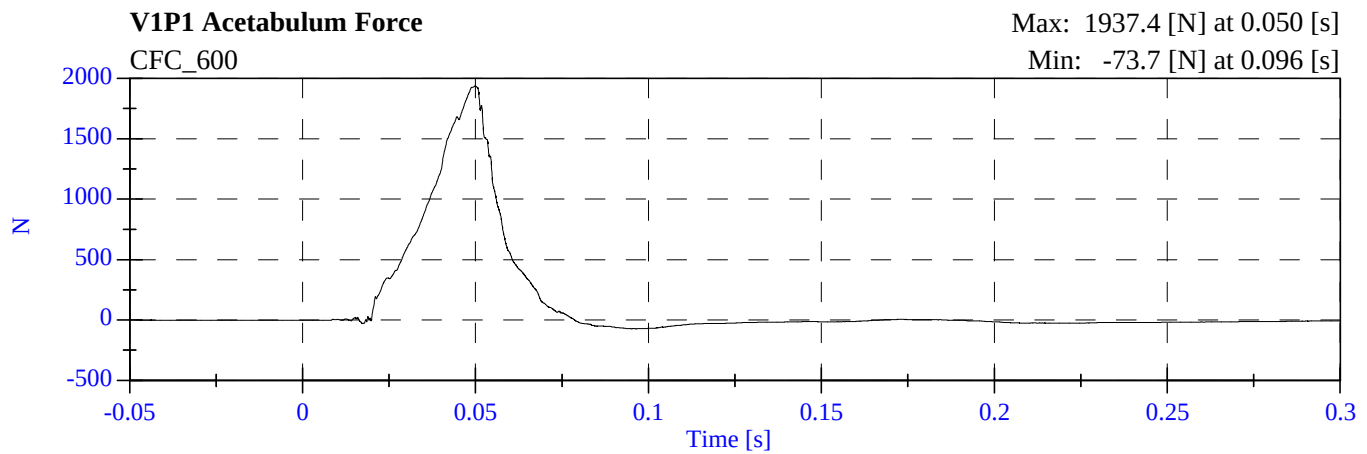
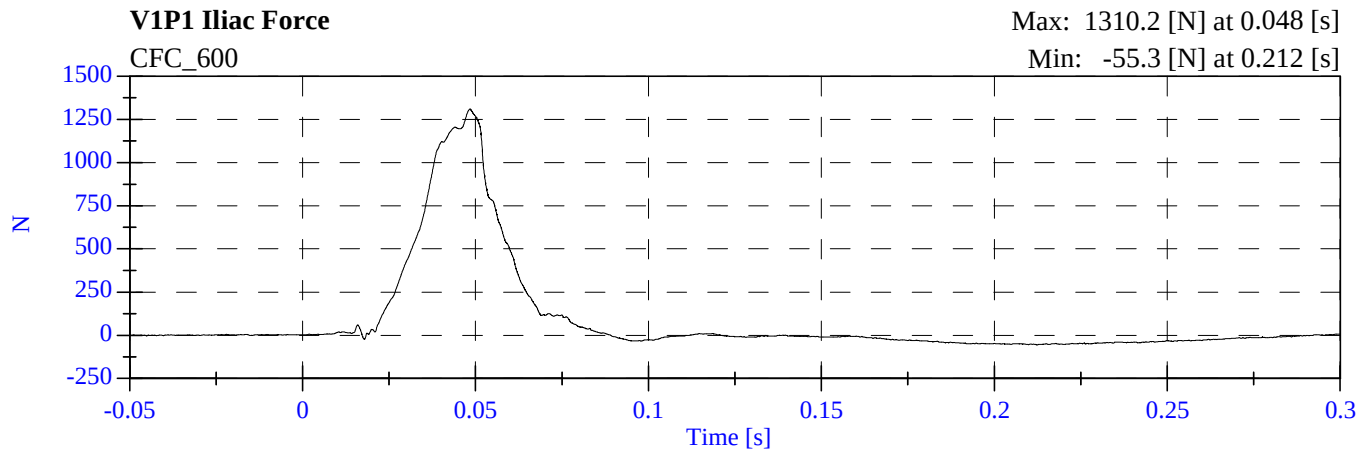


Side Pole NCAP 2011 Chevrolet Traverse MB0121 - August 09, 2010



Side Pole NCAP 2011 Chevrolet Traverse

MB0121 - August 09, 2010



APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 304

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

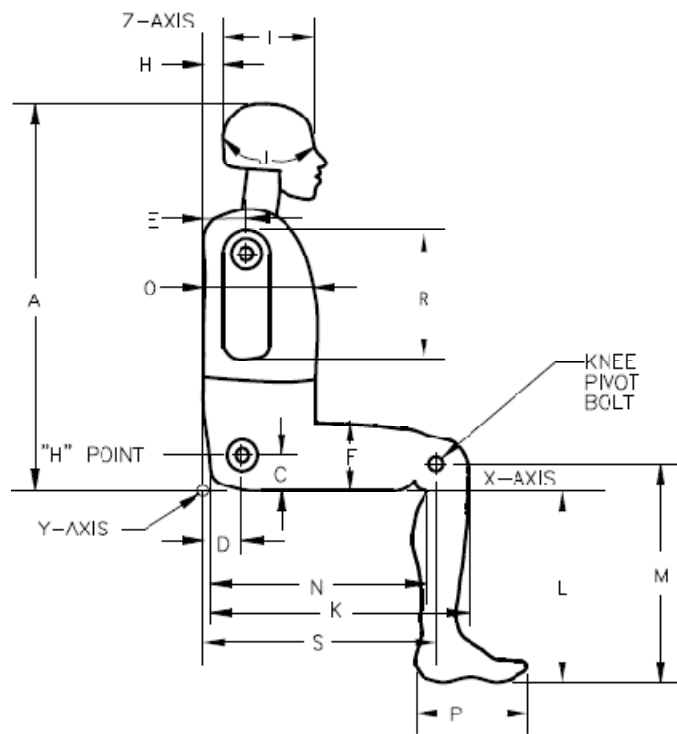
NHTSA ATD S/N 304

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	778	Yes
B	Shoulder Pivot Height	437.0 - 453.0	439	Yes
C	H-Point Height	79.0 - 89.0	83	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	104	Yes
F	Thigh Clearance	119.0 - 135.0	126	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	182	Yes
J	Head Circumference	541.0 - 551.0	546	Yes
K	Buttock to Knee Length	514.0 - 540.0	528	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	398	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	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	318	Yes
R	Arm Length	249.0 - 259.0	251	Yes
S	Knee Joint to Seat back	478.0 - 493.0	485	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	80	Yes
W	Foot Width (left)	78.0 - 94.0	80	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	782	Yes

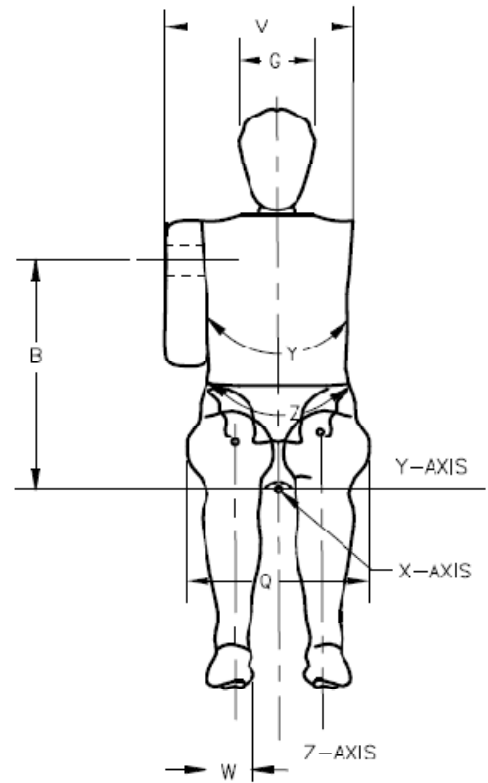
Technician : A. Rudniski

Date: 7/26/2010

SID-IIsD 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 304		
Test ID:	Head Drop	Test Date:	7/26/2010
Test Number:	1	Test Time:	10:51:48 AM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1371

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	59 %RH P
Resultant Acceleration	115.0 -- 137.0	117.8 g P
Oscillation	0.0 -- 15.0	11.0 % P
Fore-Aft Acceleration	-15.0 -- 15.0	5.9 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **10:51:48 AM**

Test Date: **7/26/2010**



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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	P58737	3/25/2010
Endevco	7264-2000	P52100	3/25/2010
Endevco	7264-2000	P52099	3/25/2010

Test ID: **Head Drop**

Test Time: **10:51:48 AM**

Test Date: **7/26/2010**



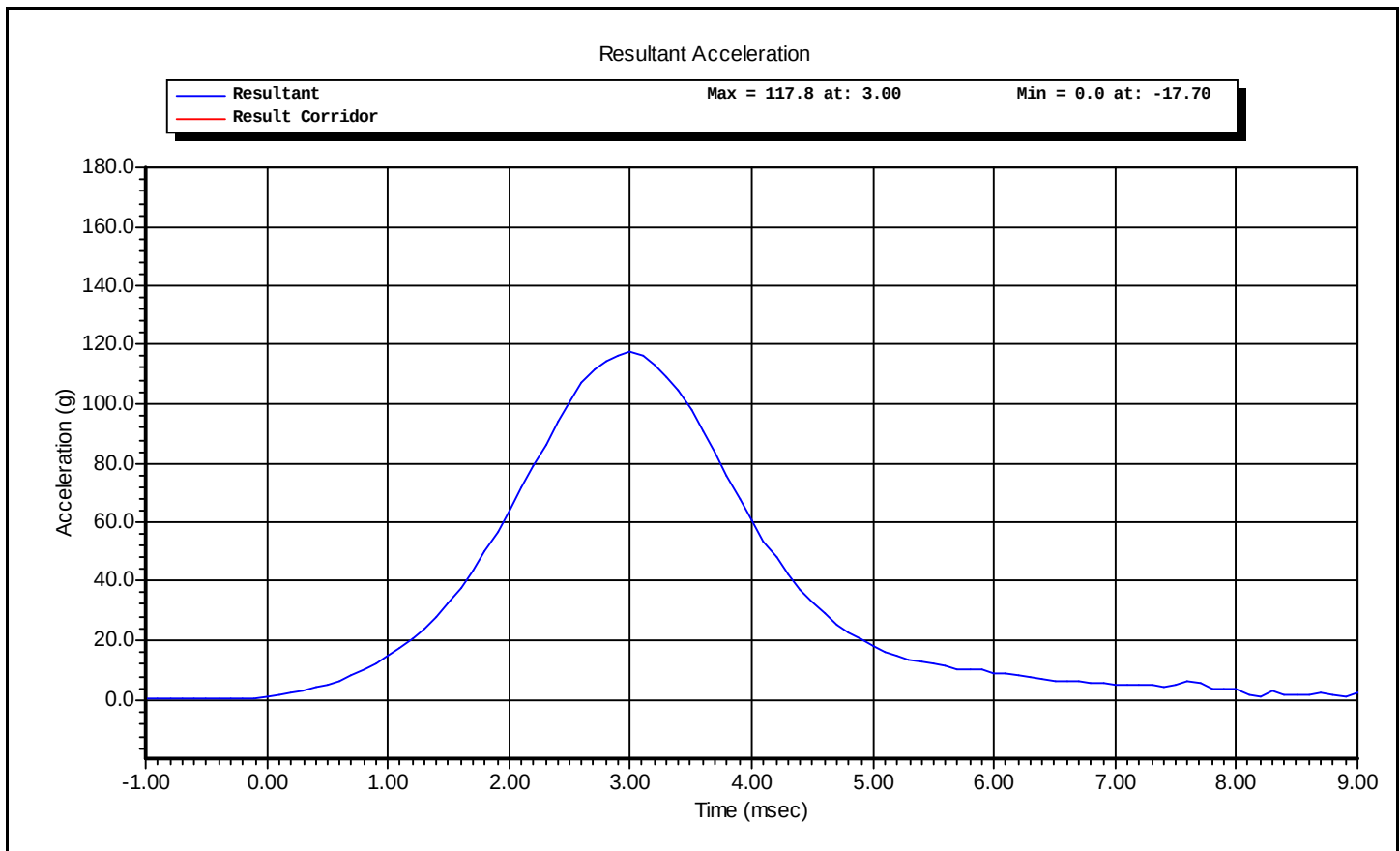
www.calspan.com

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Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Head Drop	Test Date:	7/26/2010
Test Number:	1	Test Time:	10:51:48 AM

Component Part Number	Component Serial Number
Head Skin - 180-1002	1371



Test ID: **Head Drop**

Test Time: **10:51:48 AM**

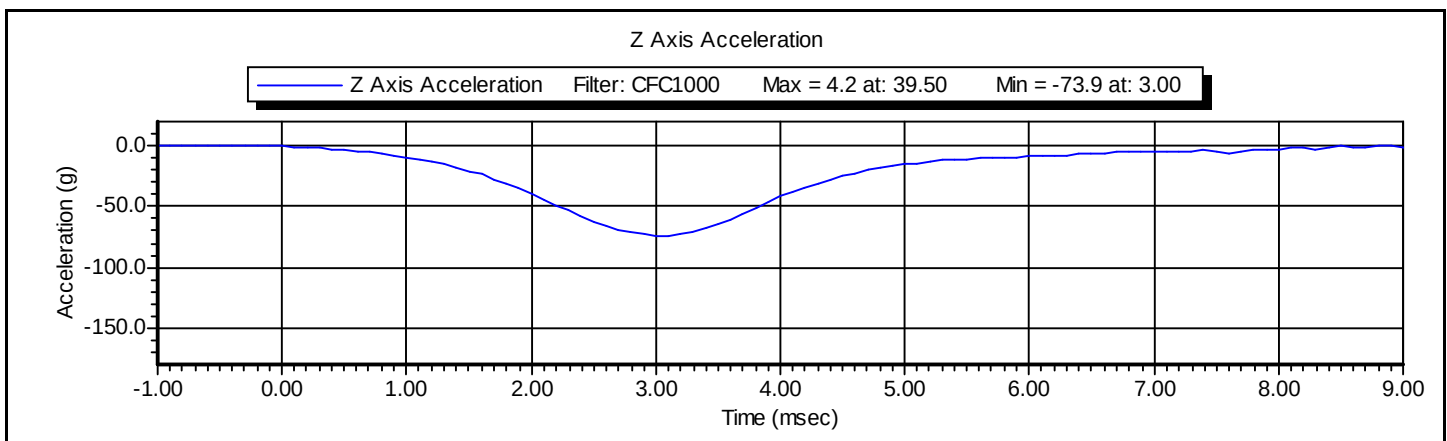
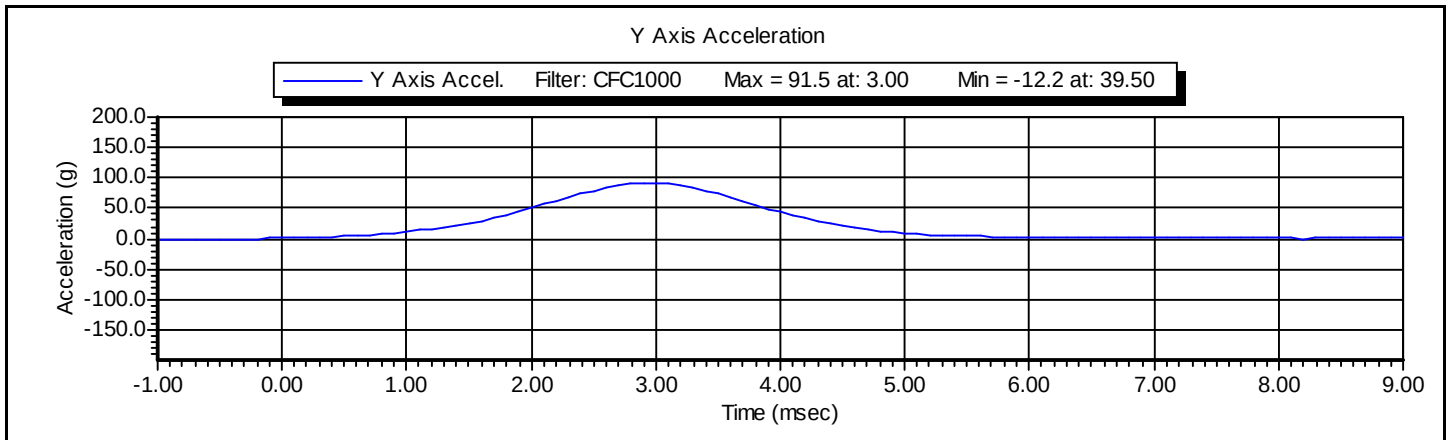
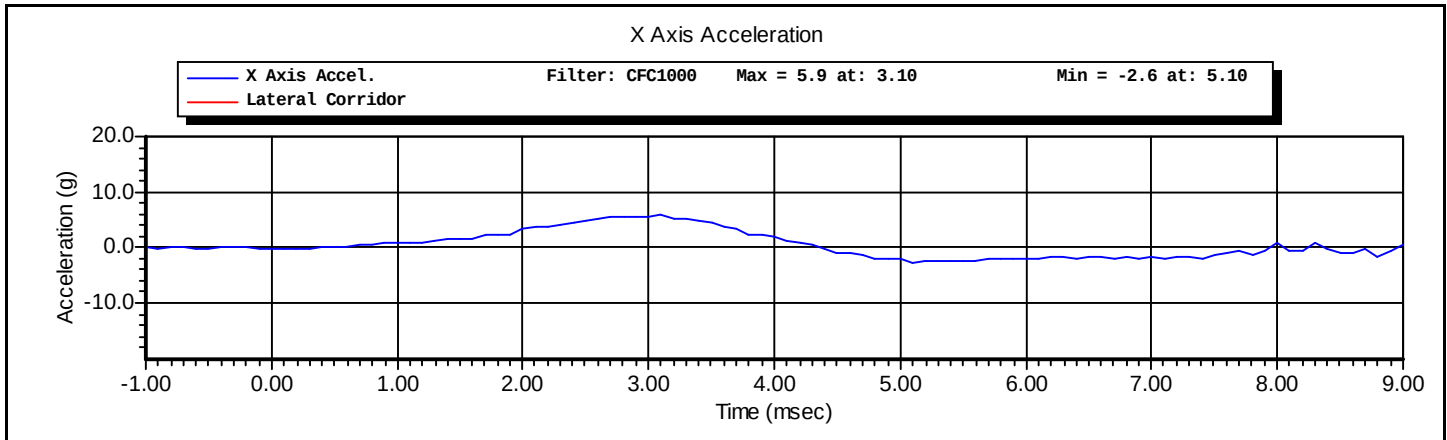
Test Date: **7/26/2010**



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Test ID: **Head Drop**

Test Time: **10:51:48 AM**

Test Date: **7/26/2010**



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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 304		
Test ID:	Neck Flexion	Test Date:	7/27/2010
Test Number:	2	Test Time:	12:19:35 PM

Component Part Number	Component Serial Number
Neck - 180-2000	AB8239

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	58 %RH P
Velocity	5.51 -- 5.63	5.54 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.36 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.48 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.75 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.70 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.87 m/s P
Max D Plane Rotation	71.0 -- 81.0	73.8 degrees P
Time at Max Rotation	50.0 -- 70.0	62.1 ms P
Moment about OC	-44.0 -- -36.0	-40.9 Nm P
Moment Decay to Zero	102.0 -- 126.0	115.8 ms P

All test parameters are within specifications

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

Test ID: **Neck Flexion**

Test Time: **12:19:35 PM**

Test Date: **7/27/2010**



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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	7231CT	C16510	5/10/2010
FTSS	IF-205	LC-283Fy	4/9/2010
FTSS	IF-205	LC-283Mx	4/9/2010
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: **12:19:35 PM**

Test Date: **7/27/2010**



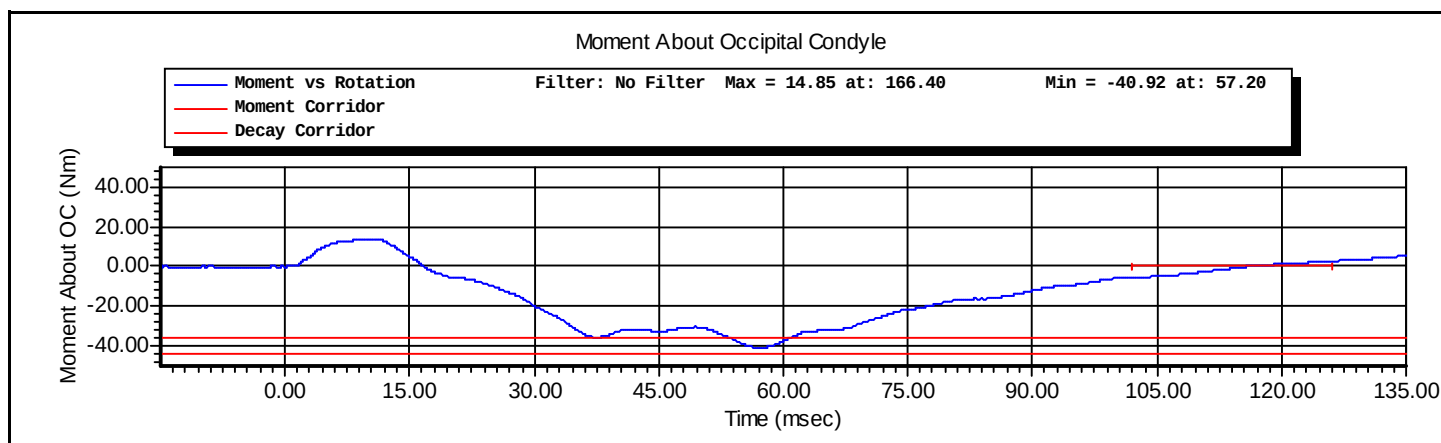
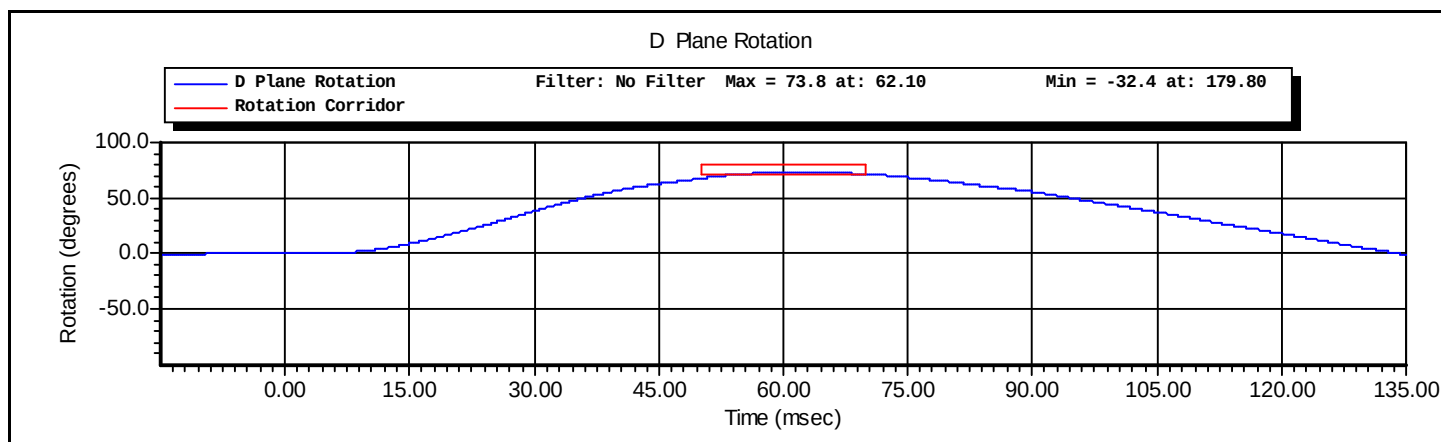
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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Neck Flexion	Test Date:	7/27/2010
Test Number:	2	Test Time:	12:19:35 PM

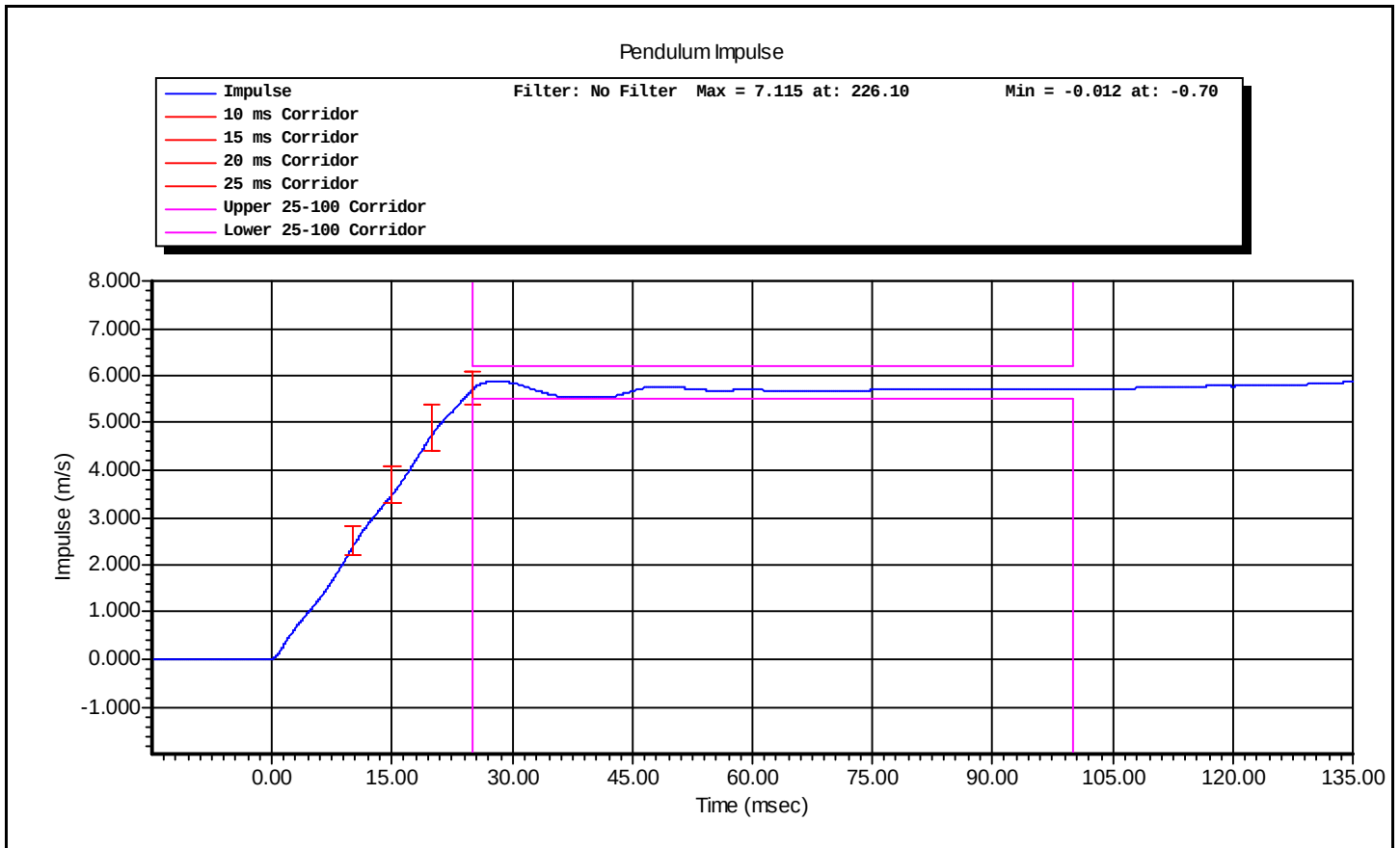
Component Part Number	Component Serial Number
Neck - 180-2000	AB8239



Test ID: Neck Flexion

Test Time: 12:19:35 PM

Test Date: 7/27/2010





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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 304		
Test ID:	Shoulder	Test Date:	7/27/2010
Test Number:	1	Test Time:	5:55:19 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	46.0 %RH P
Velocity	4.20 -- 4.40	4.36 m/s P
Probe Acceleration	13.0 -- 18.0	15.5 g P
Shoulder Deflection	28.0 -- 37.0	32.54 mm P
T1 Acceleration	17.0 -- 22.0	19.4 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **5:55:19 PM**

Test Date: **7/27/2010**



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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	P38216	6/22/2010
Servo	180-3885	DS-1154	3/26/2010
Endevco	7264-2000	P58884	3/29/2010

Test ID: **Shoulder**

Test Time: **5:55:19 PM**

Test Date: **7/27/2010**



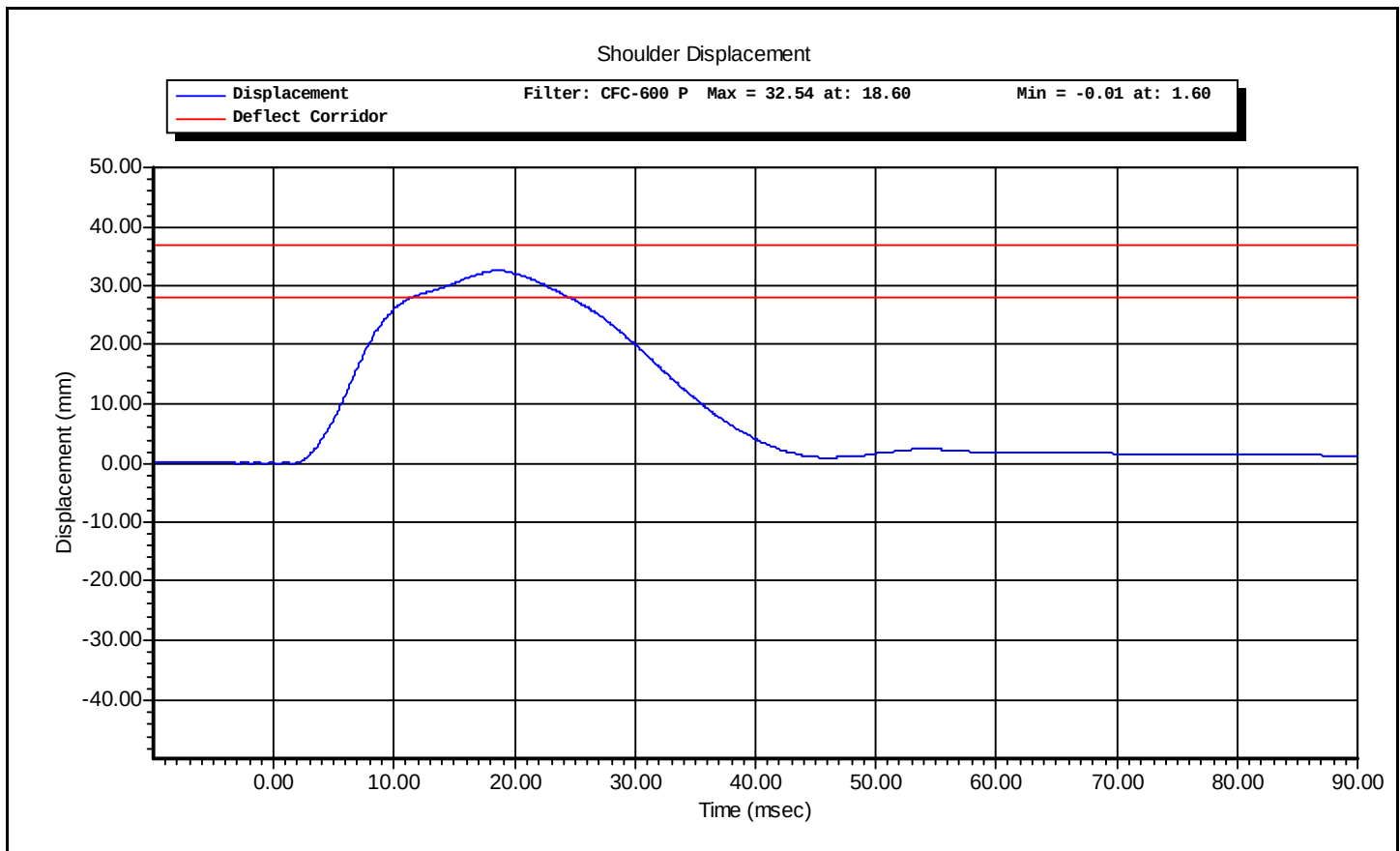
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Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Shoulder	Test Date:	7/27/2010
Test Number:	1	Test Time:	5:55:19 PM

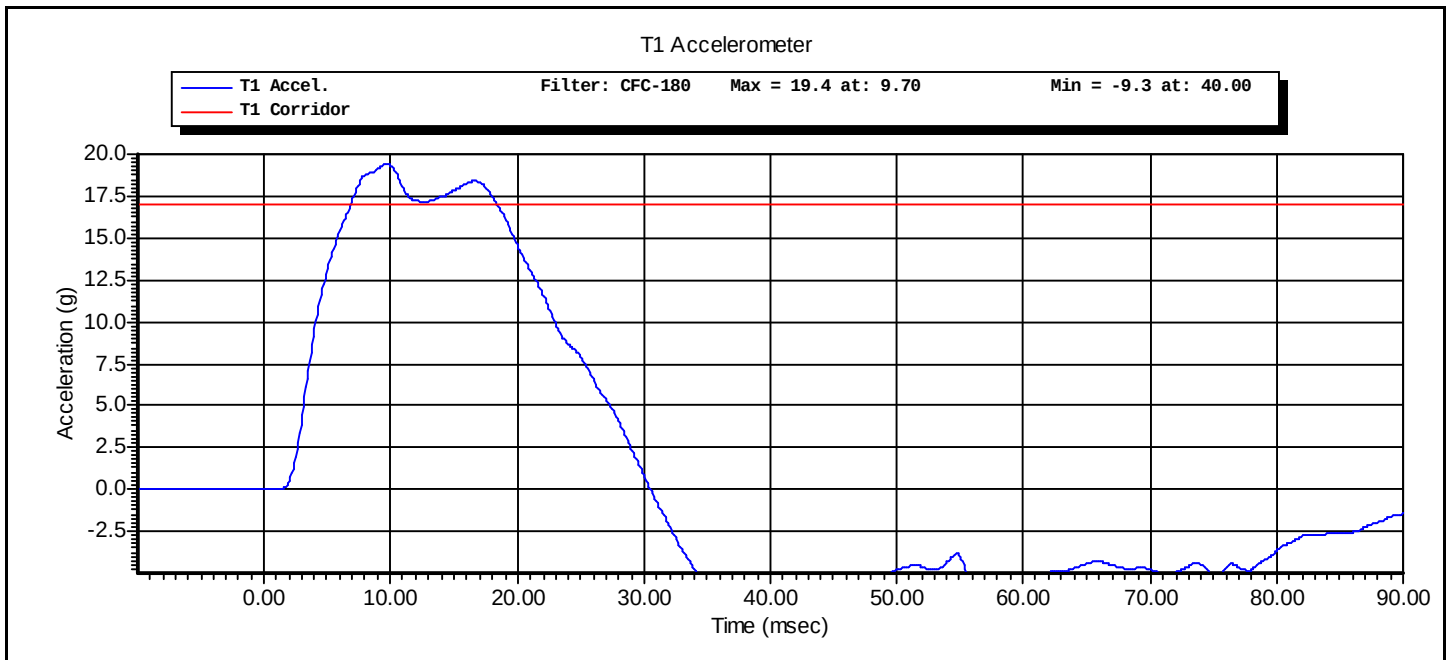
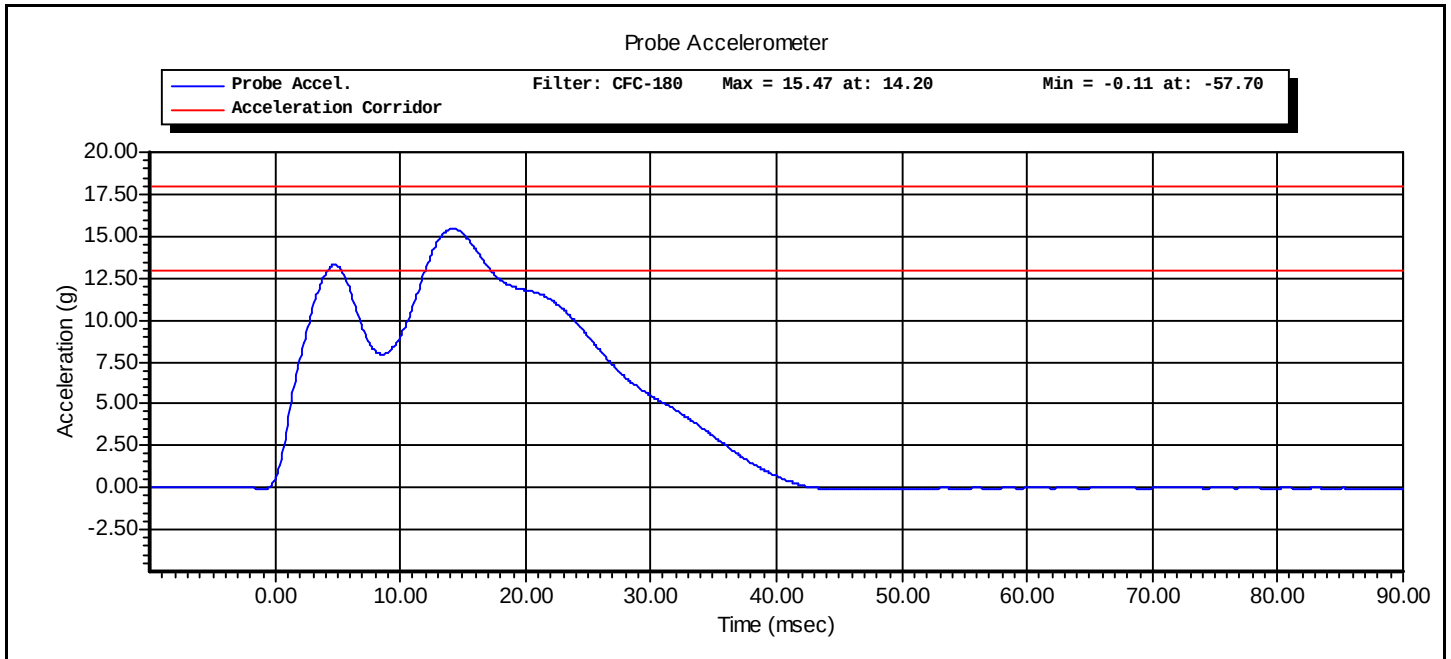
Component Part Number	Component Serial Number
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Test ID: **Shoulder**

Test Time: **5:55:19 PM**

Test Date: **7/27/2010**





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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 304		
Test ID:	Thorax With Arm	Test Date:	7/28/2010
Test Number:	1	Test Time:	9:29:19 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.7 deg C	P
Humidity	10	--	70	61 %RH	P
Velocity	6.60	--	6.80	6.69 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	33.4 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.2 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	30.8 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	32.9 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	42.7 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	34.9 g	P
Shoulder Deflection	31.0	--	40.0	35.2 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm** Test Time: **9:29:19 AM**

Test Date: **7/28/2010**



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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	P38216	6/22/2010
Servo	180-3885	DS-1188	3/26/2010
Servo	180-3885	DS-1269	3/26/2010
Servo	180-3885	DS-1260	3/26/2010
Endevco	7264-2000	P58884	3/29/2010
Endevco	7264-2000	P58839	3/29/2010
Servo	180-3885	DS-1154	3/26/2010

Test ID: **Thorax With Arm** Test Time: **9:29:19 AM**

Test Date: **7/28/2010**



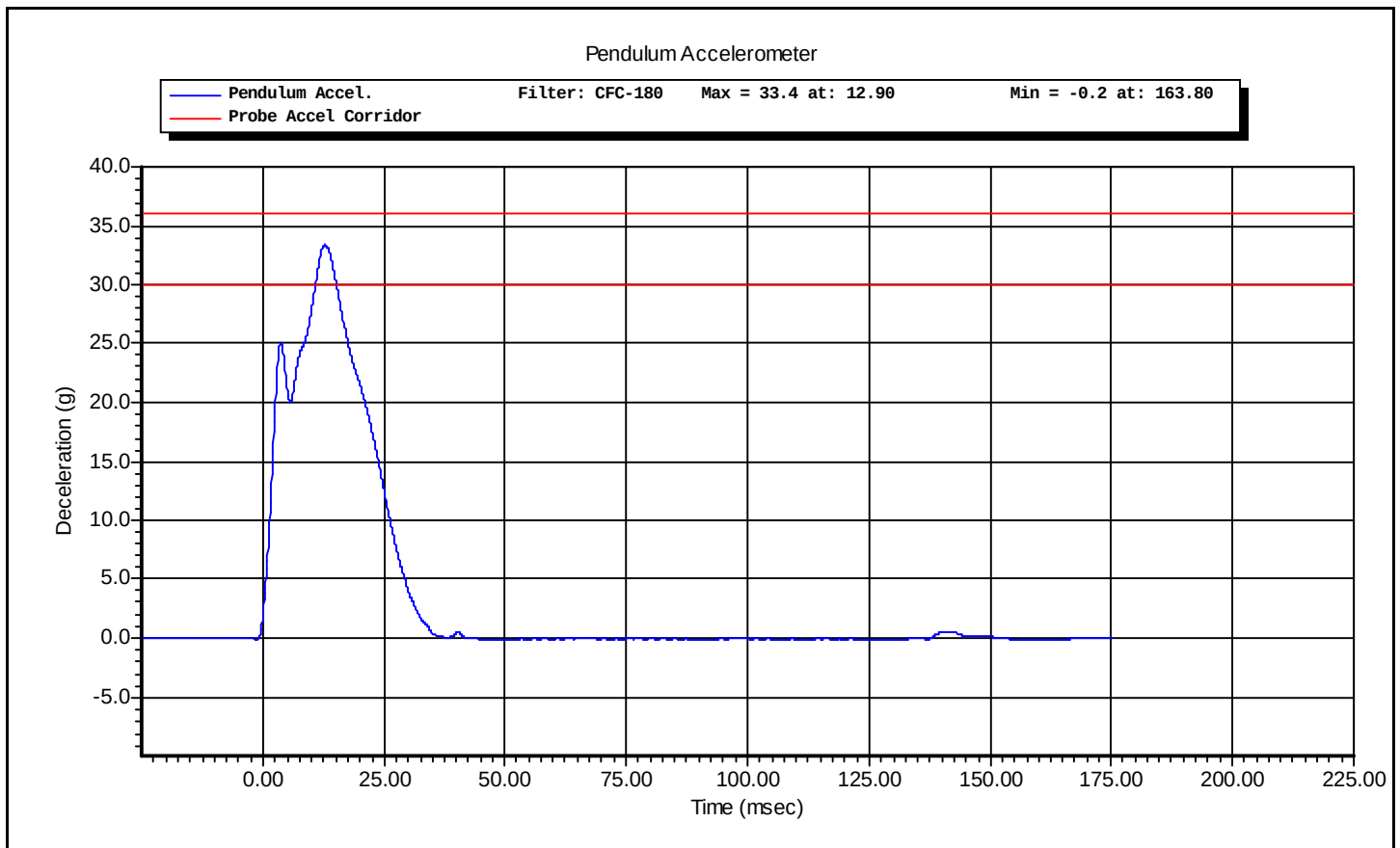
www.calspan.com

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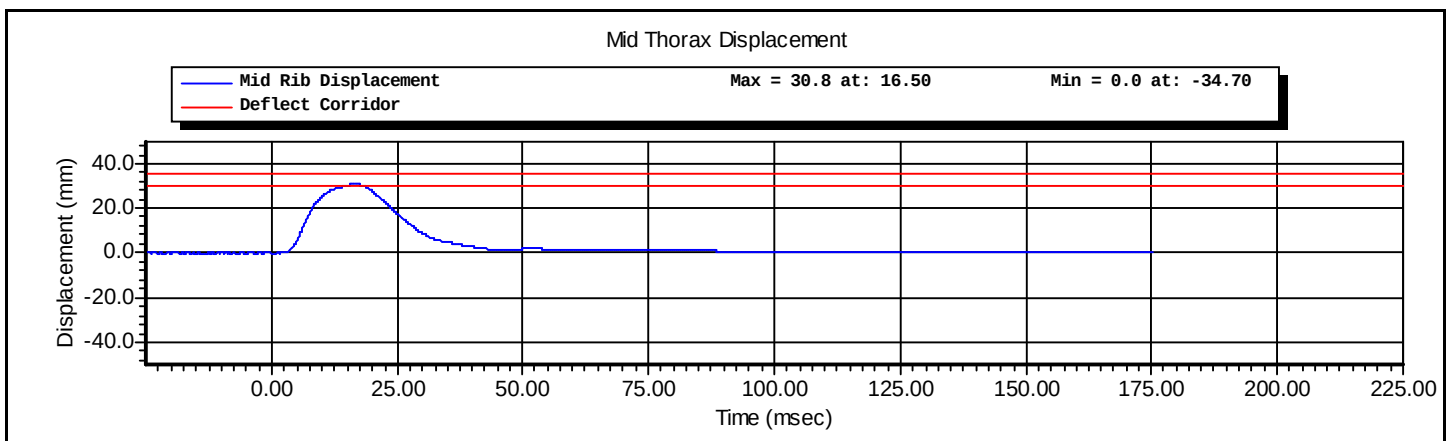
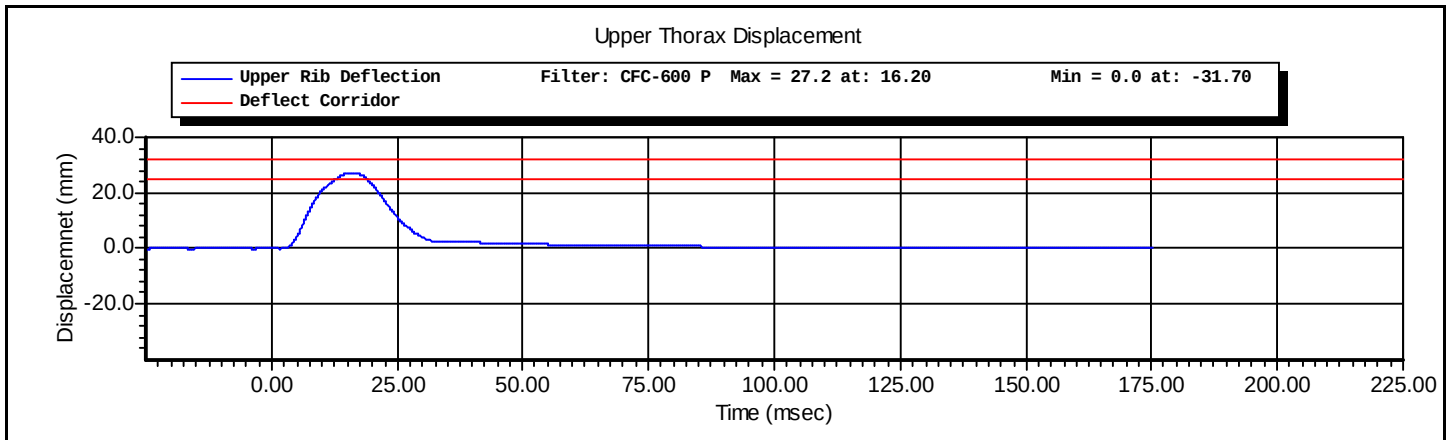
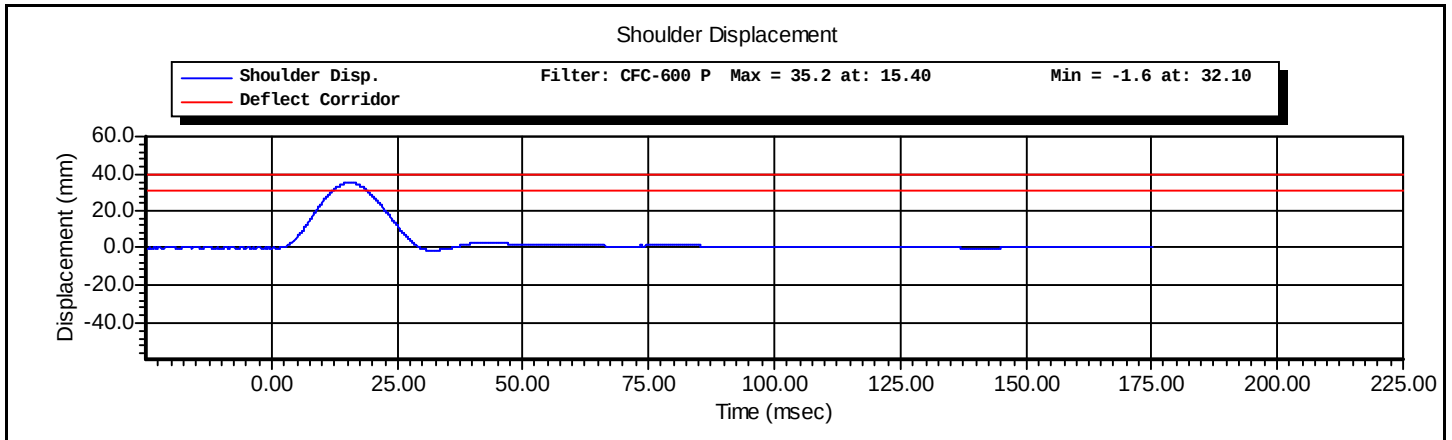
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Thorax With Arm	Test Date:	7/28/2010
Test Number:	1	Test Time:	9:29:19 AM

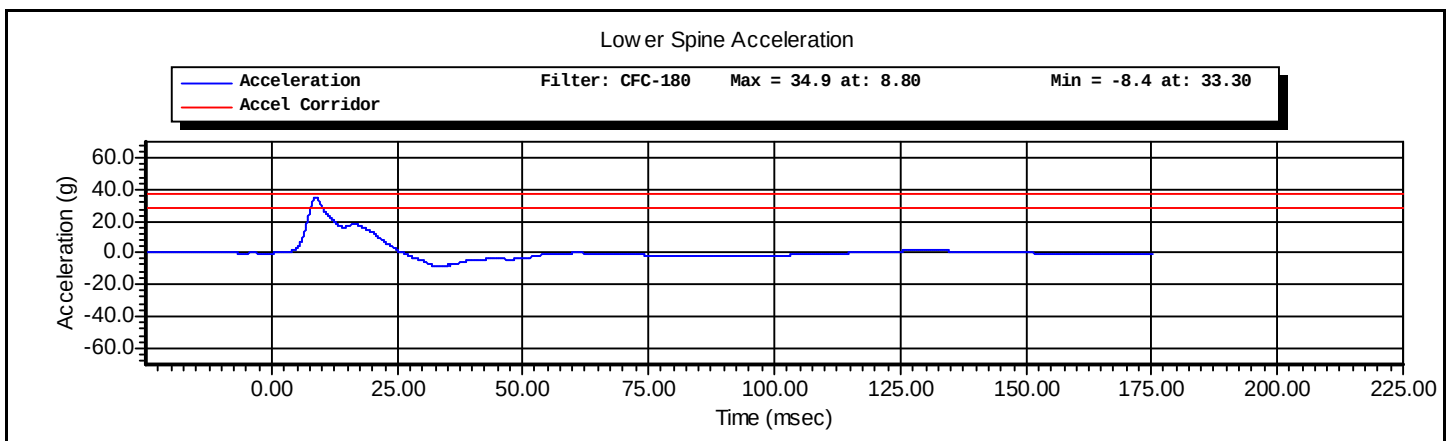
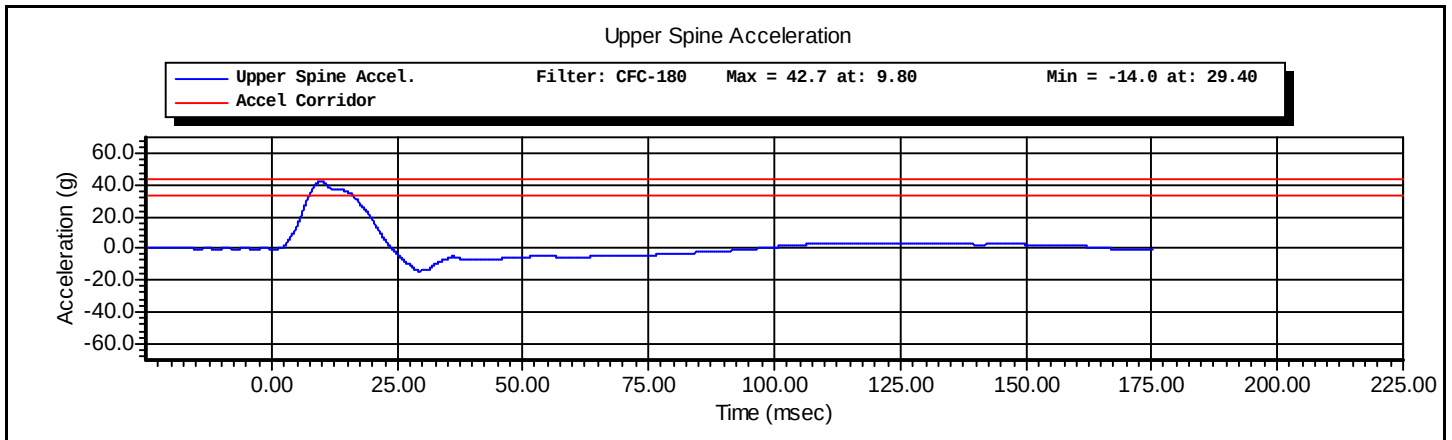
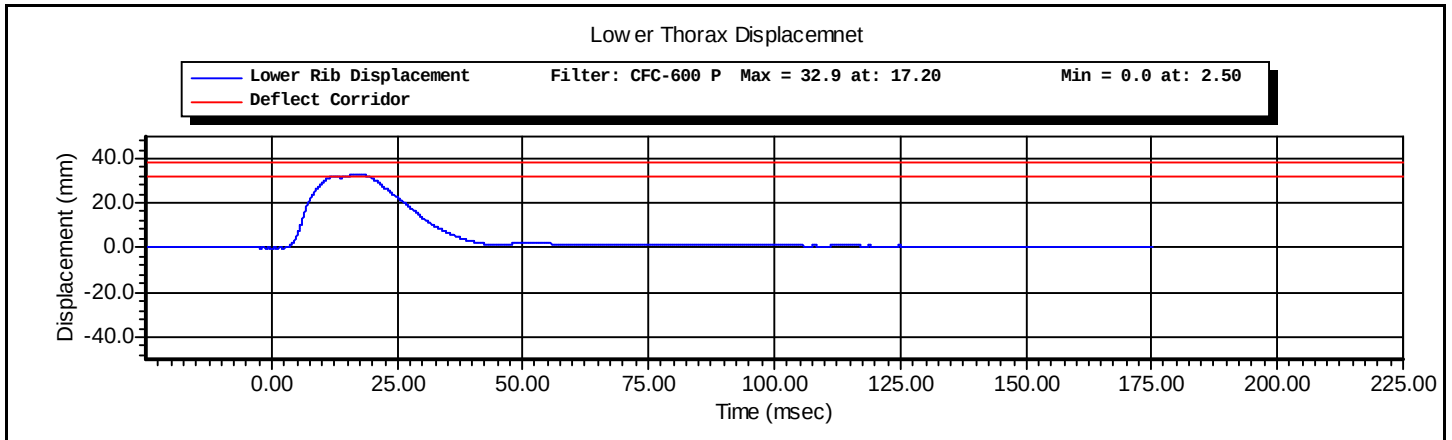
Component Part Number	Component Serial Number
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Test ID: **Thorax With Arm** Test Time: **9:29:19 AM**

Test Date: **7/28/2010**







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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 304		
Test ID:	Thorax Without Arm	Test Date:	7/27/2010
Test Number:	1	Test Time:	5:21:23 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	48 %RH	P
Velocity	4.20	--	4.40	4.28 m/s	P
Probe Acceleration	14.0	--	18.0	15.8 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	36.0 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.6 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	38.7 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	16.6 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: **5:21:23 PM**

Test Date: **7/27/2010**



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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	P38216	6/22/2010
Servo	180-3885	DS-1188	3/26/2010
Servo	180-3885	DS-1269	3/26/2010
Servo	180-3885	DS-1260	3/26/2010
Endevco	7264-2000	P58884	3/29/2010
Endevco	7264-2000	P58839	3/29/2010

Test ID: **Thorax Without Arm** Test Time: **5:21:23 PM**

Test Date: **7/27/2010**



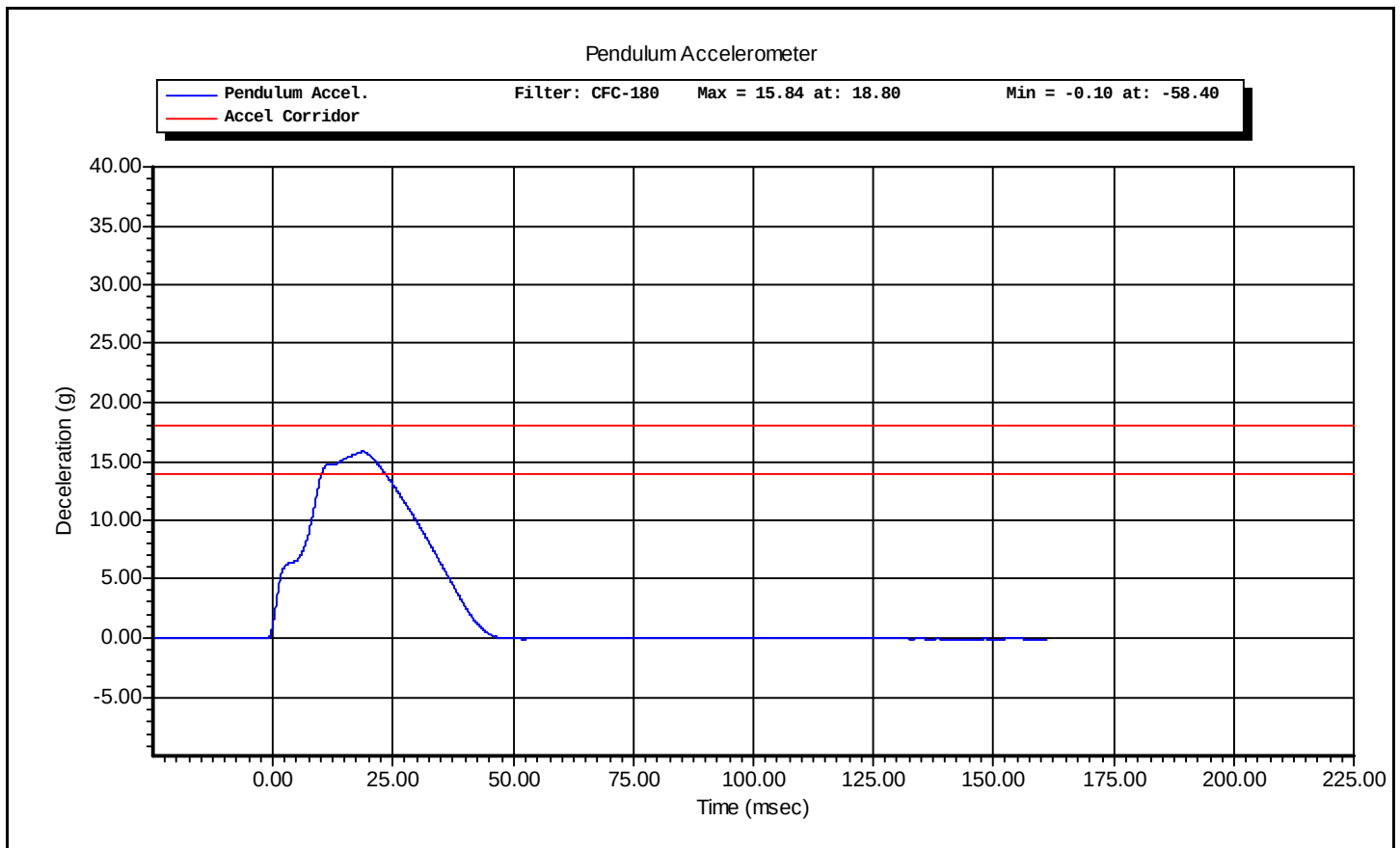
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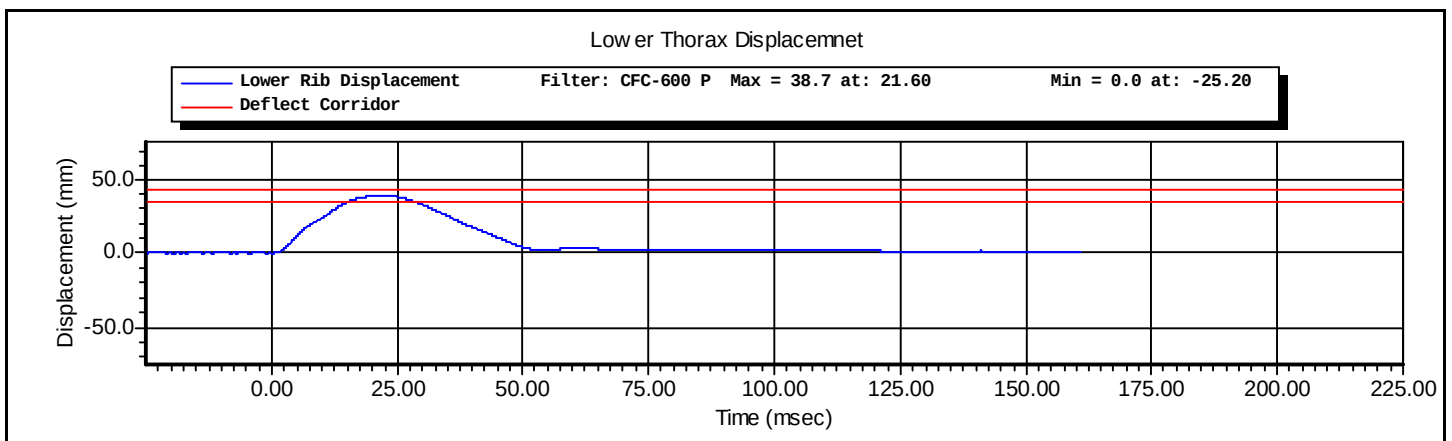
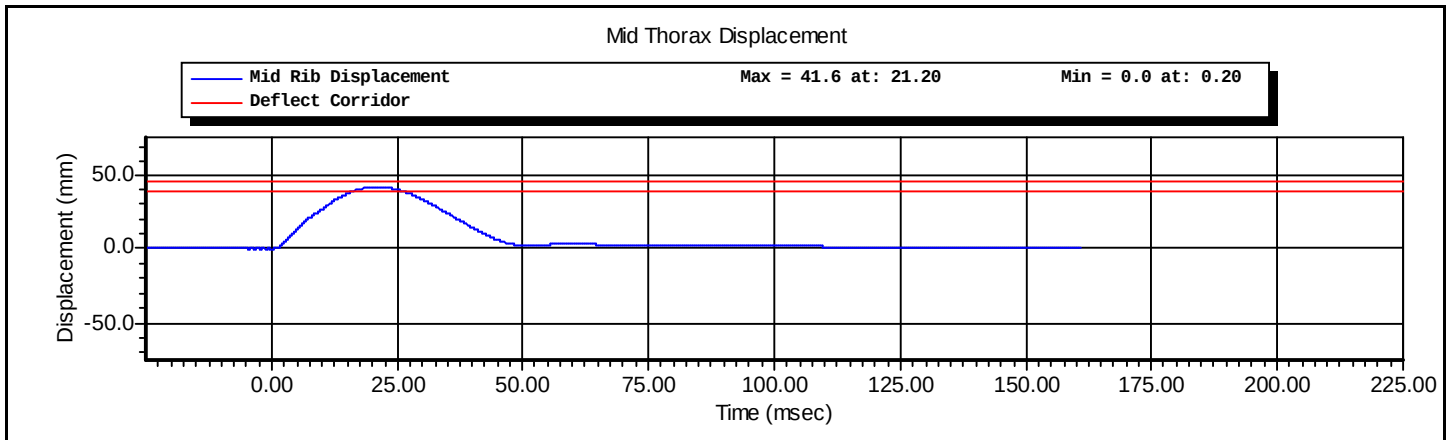
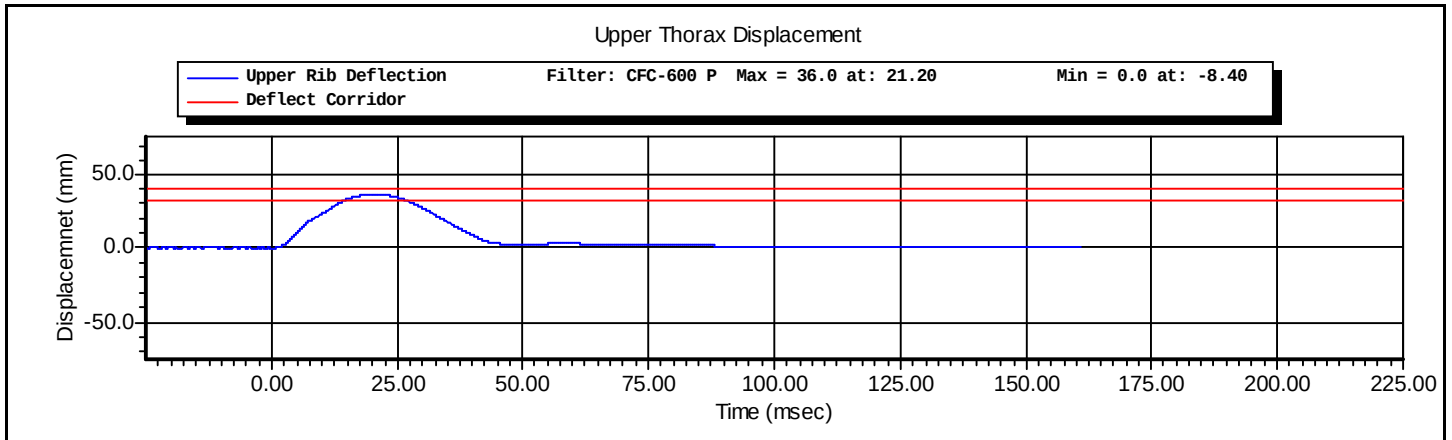
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Thorax Without Arm	Test Date:	7/27/2010
Test Number:	1	Test Time:	5:21:23 PM

Component Part Number	Component Serial Number
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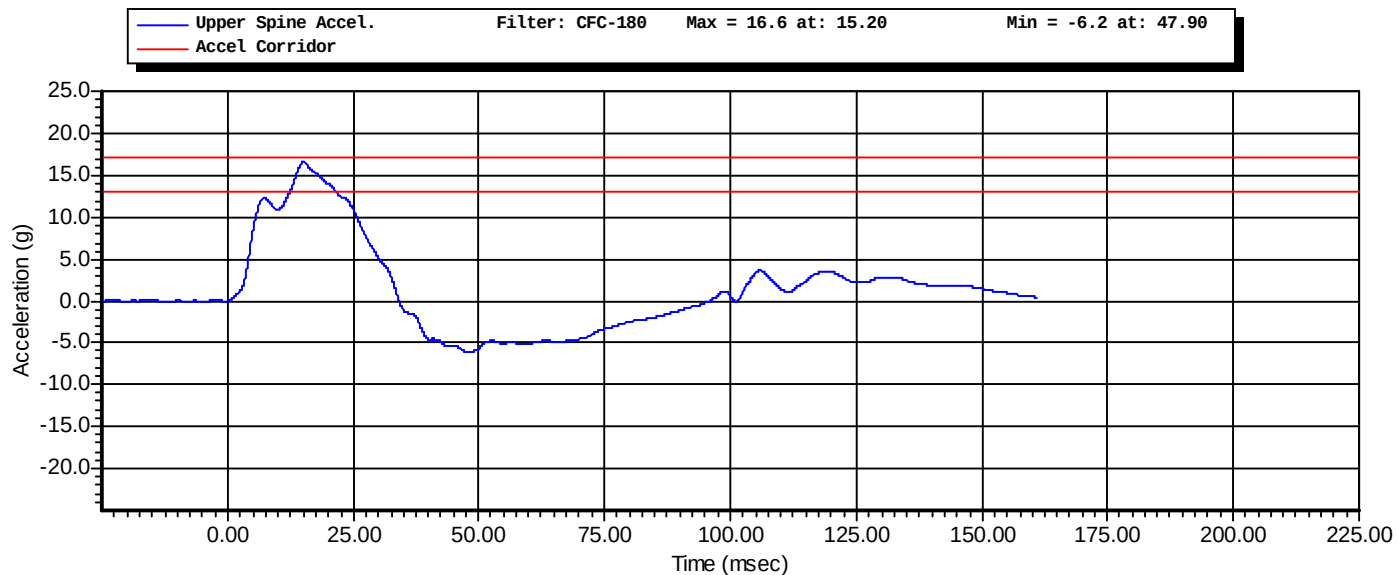


Test ID: Thorax Without Arm Test Time: 5:21:23 PM

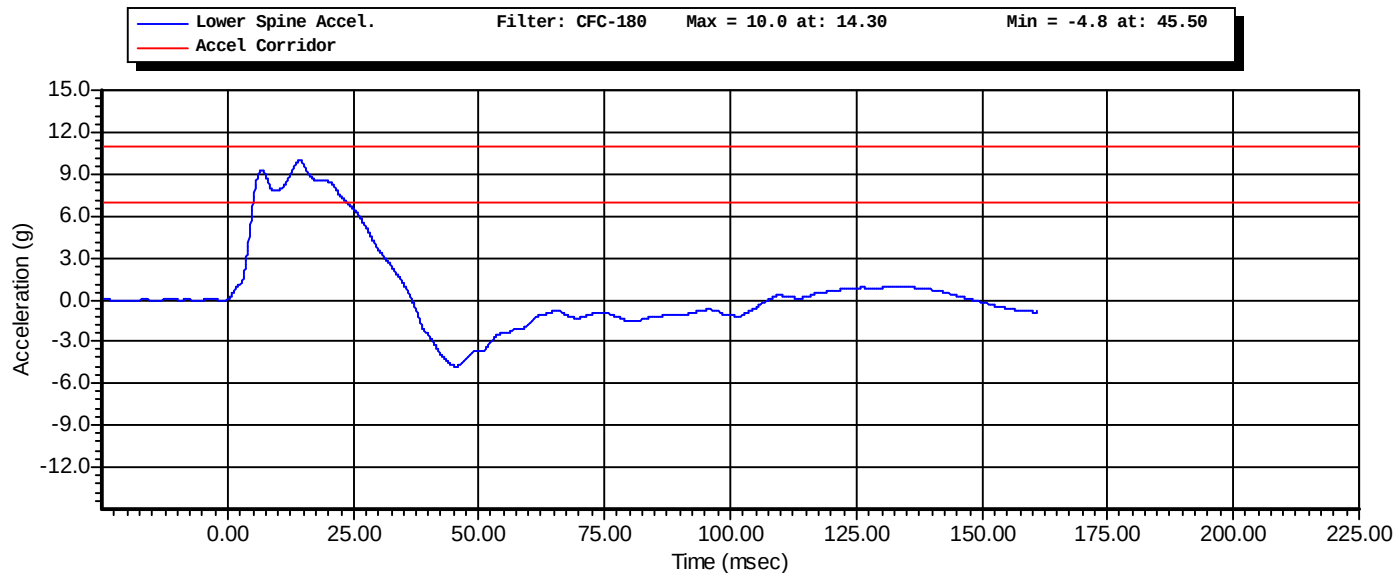
Test Date: 7/27/2010



Upper Spine Acceleration



Lower Spine Acceleration





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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 304		
Test ID:	Abdomen	Test Date:	7/27/2010
Test Number:	1	Test Time:	5:05:03 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	48 %RH P
Velocity	4.20 -- 4.40	4.35 m/s P
Probe Acceleration	12.0 -- 16.0	14.6 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	41.3 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	40.2 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	11.8 g P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **5:05:03 PM**

Test Date: **7/27/2010**



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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	P38216	6/22/2010
Servo	180-3885	DS-1207	3/26/2010
Servo	180-3885	DS-1204	3/26/2010
Endevco	7264-2000	P58839	3/29/2010

Test ID: **Abdomen**

Test Time: **5:05:03 PM**

Test Date: **7/27/2010**



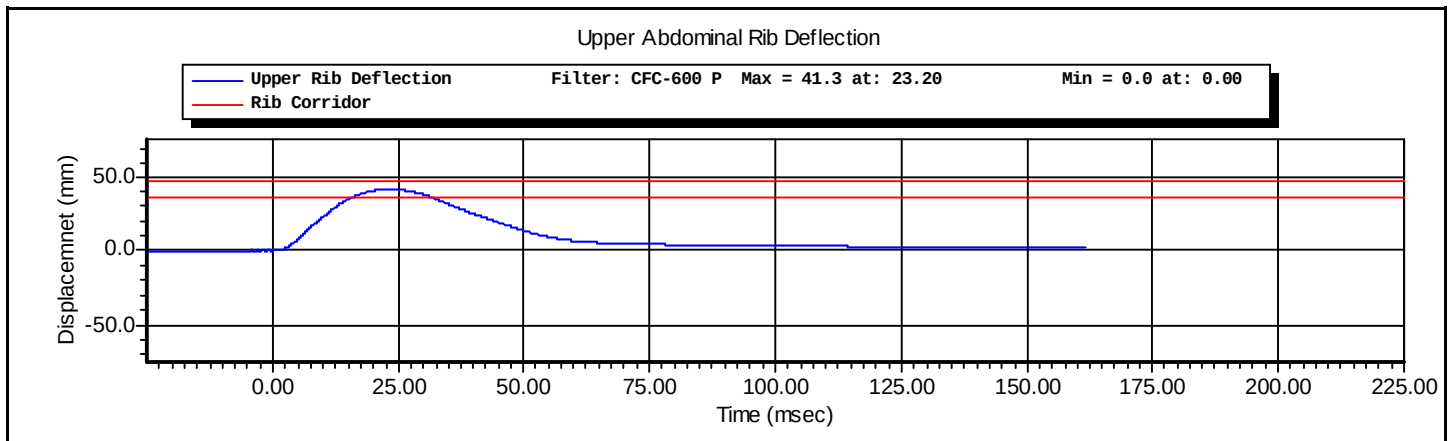
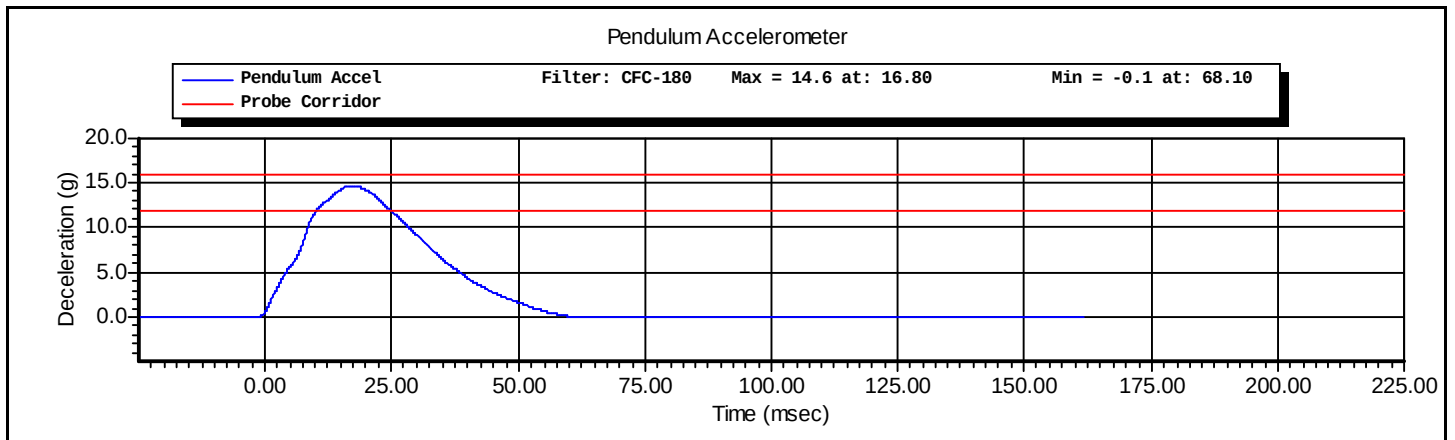
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Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Abdomen	Test Date:	7/27/2010
Test Number:	1	Test Time:	5:05:03 PM

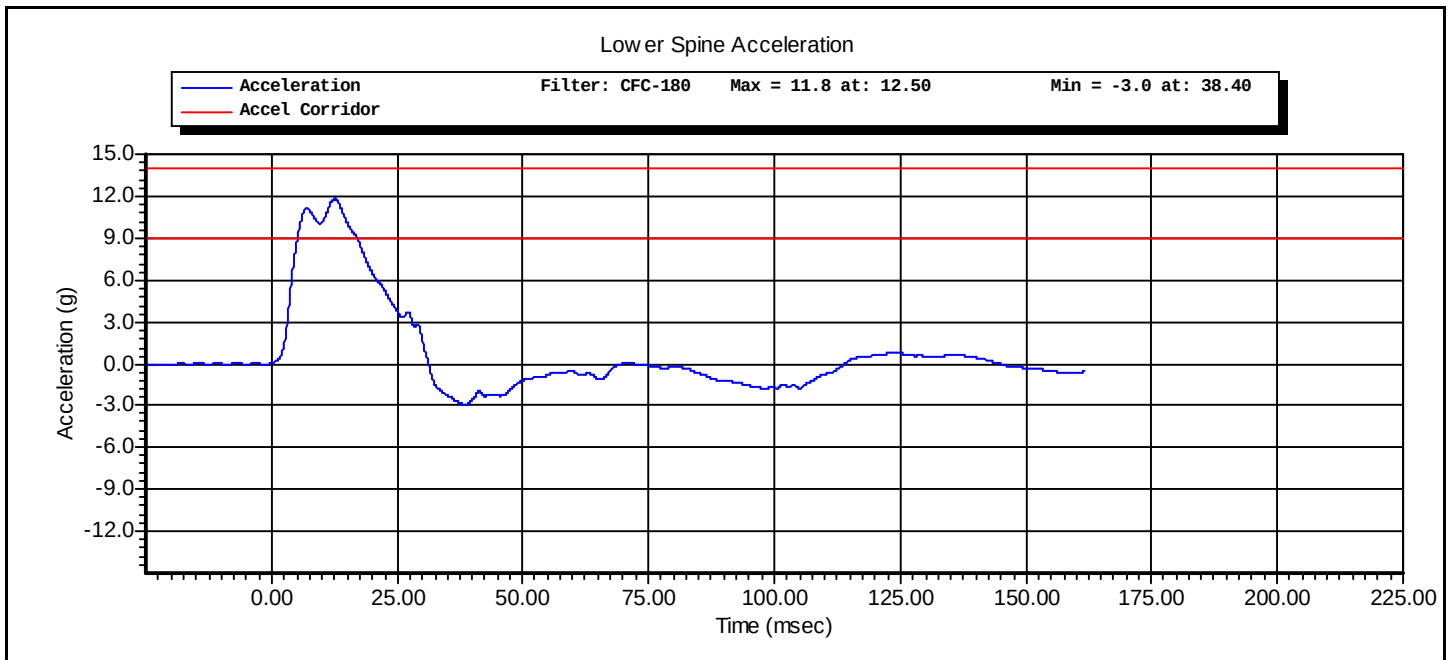
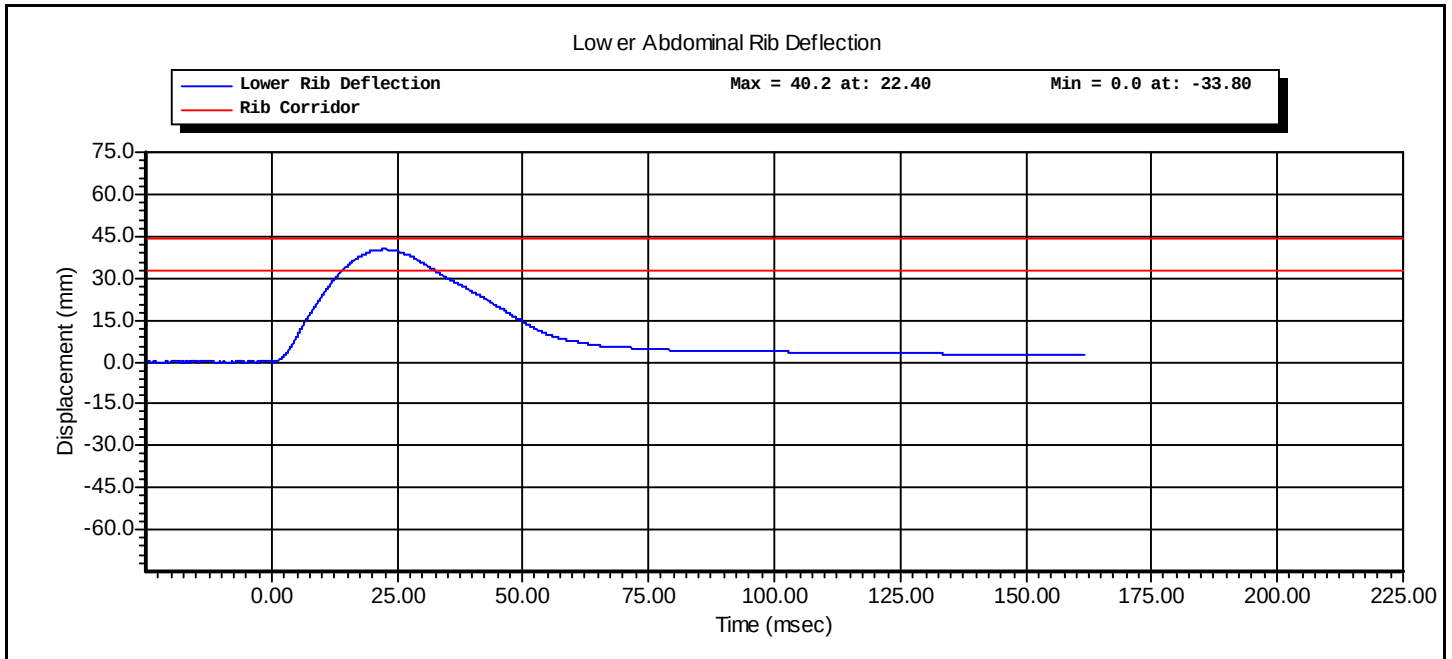
Component Part Number	Component Serial Number
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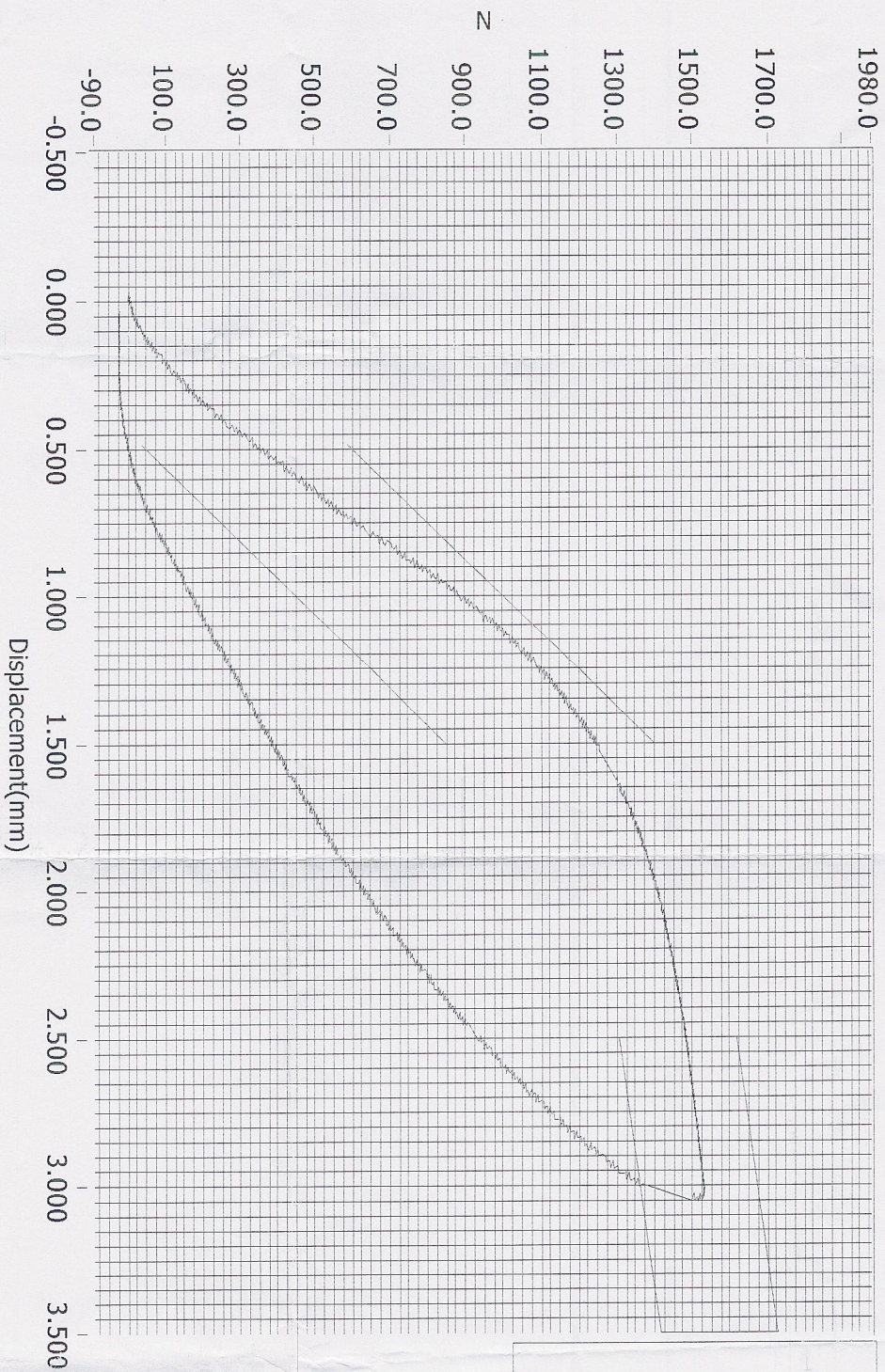
Test ID: **Abdomen**

Test Time: **5:05:03 PM**

Test Date: **7/27/2010**



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

12283

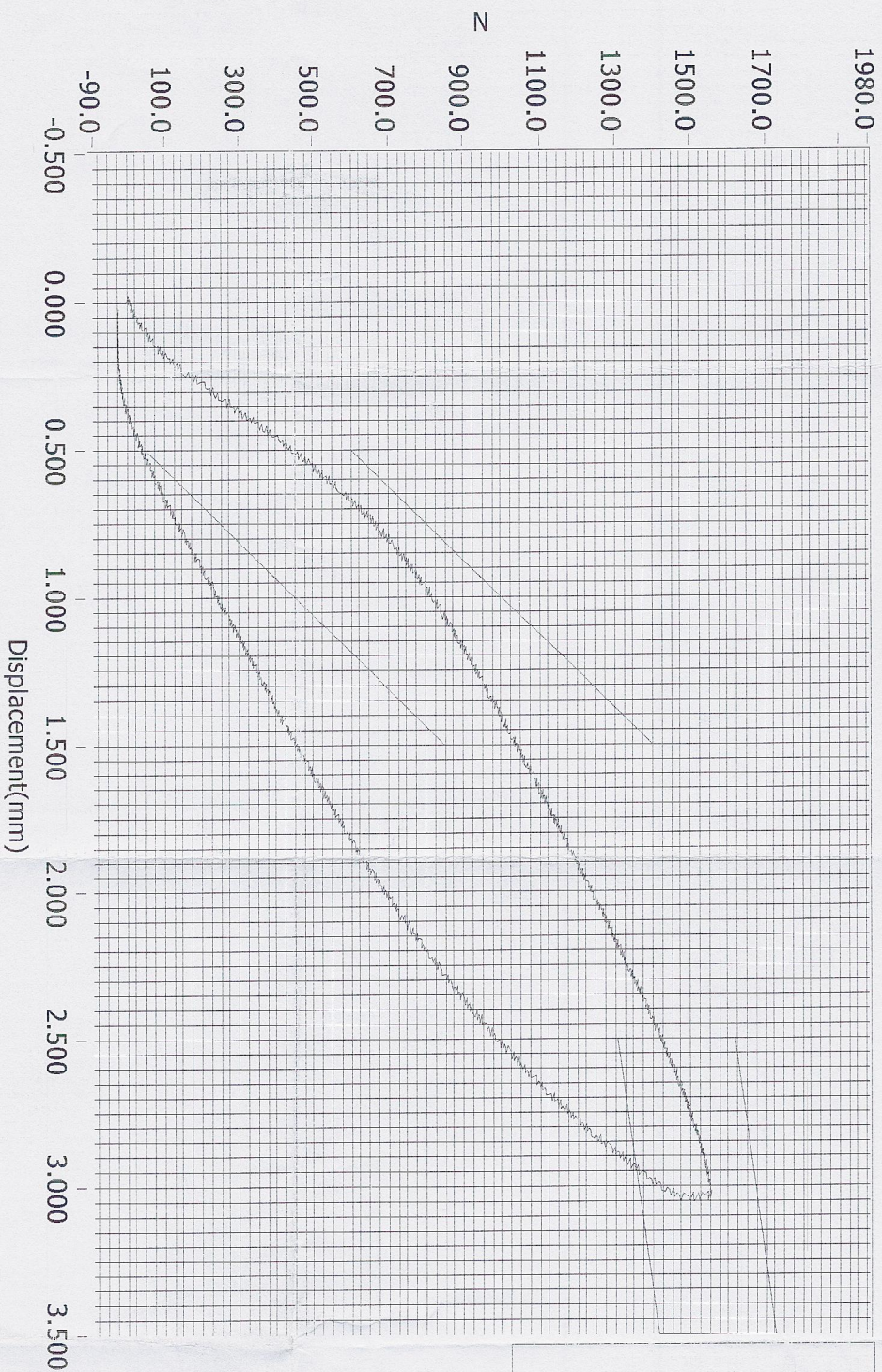
SIDIIs

Current Date : 7/6/2007

Current Time : 08:03:05

C

Resultant Data - SIDIIs Plug Compression



ATD Calibration Lab

Test ID

Part Serial Number

Test Date

Test Time

Cert ID

ATD Serial Number

ATD Type

13966

SIDIIs

Current Date : 8/29/2007

Current Time : 16:20:30

FS



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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 304		
Test ID:	Pelvis Acetabulum	Test Date:	7/27/2010
Test Number:	1	Test Time:	4:09:28 PM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Comments:

Pelvis Plug Used for Certification:
FTSS S/N 12283
Force @ 3mm = 1528N

Pelvis Plug Used for Full Scale Test:
FTSS S/N 13966
Force @ 3mm = 1549N

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	50 %RH	P
Velocity	6.60	--	6.80	6.67 m/s	P
Peak Probe Acceleration	38.0	--	47.0	42.0 g	P
Peak Pelvis Acceleration	34.0	--	42.0	36.3 g	P
Peak Acetabulum Force	3.60	--	4.30	4.08 kN	P

All test parameters are within specifications

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

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

Test ID: **Pelvis Acetabulum** Test Time: **4:09:28 PM**

Test Date: **7/27/2010**



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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	P38216	6/22/2010
Endevco	7264-2000	P49217	4/12/2010
DentonATD	3249J	LC-267Fy	4/9/2010

Test ID: **Pelvis Acetabulum** Test Time: **4:09:28 PM**

Test Date: **7/27/2010**



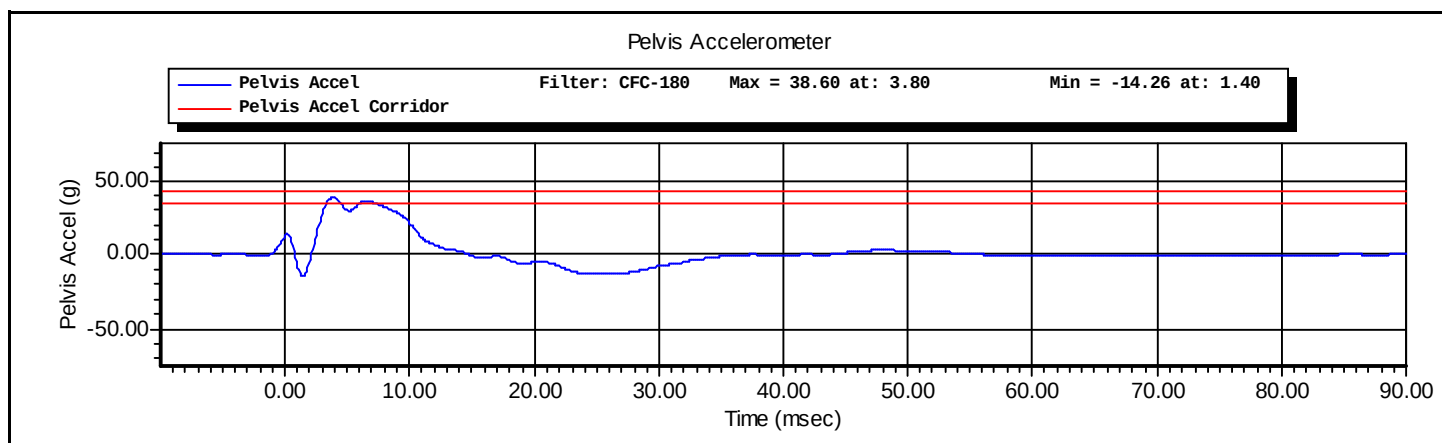
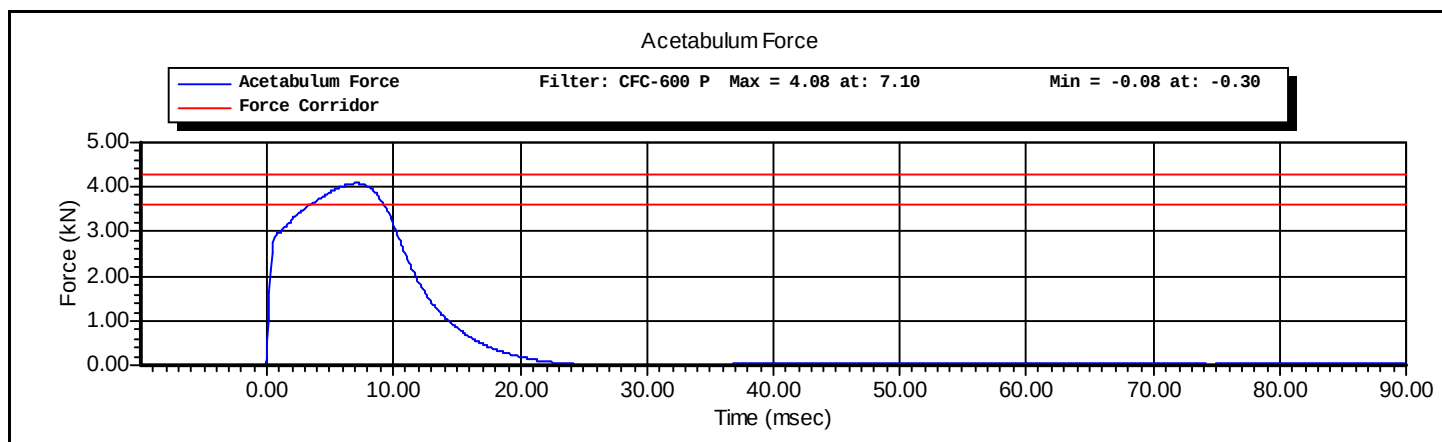
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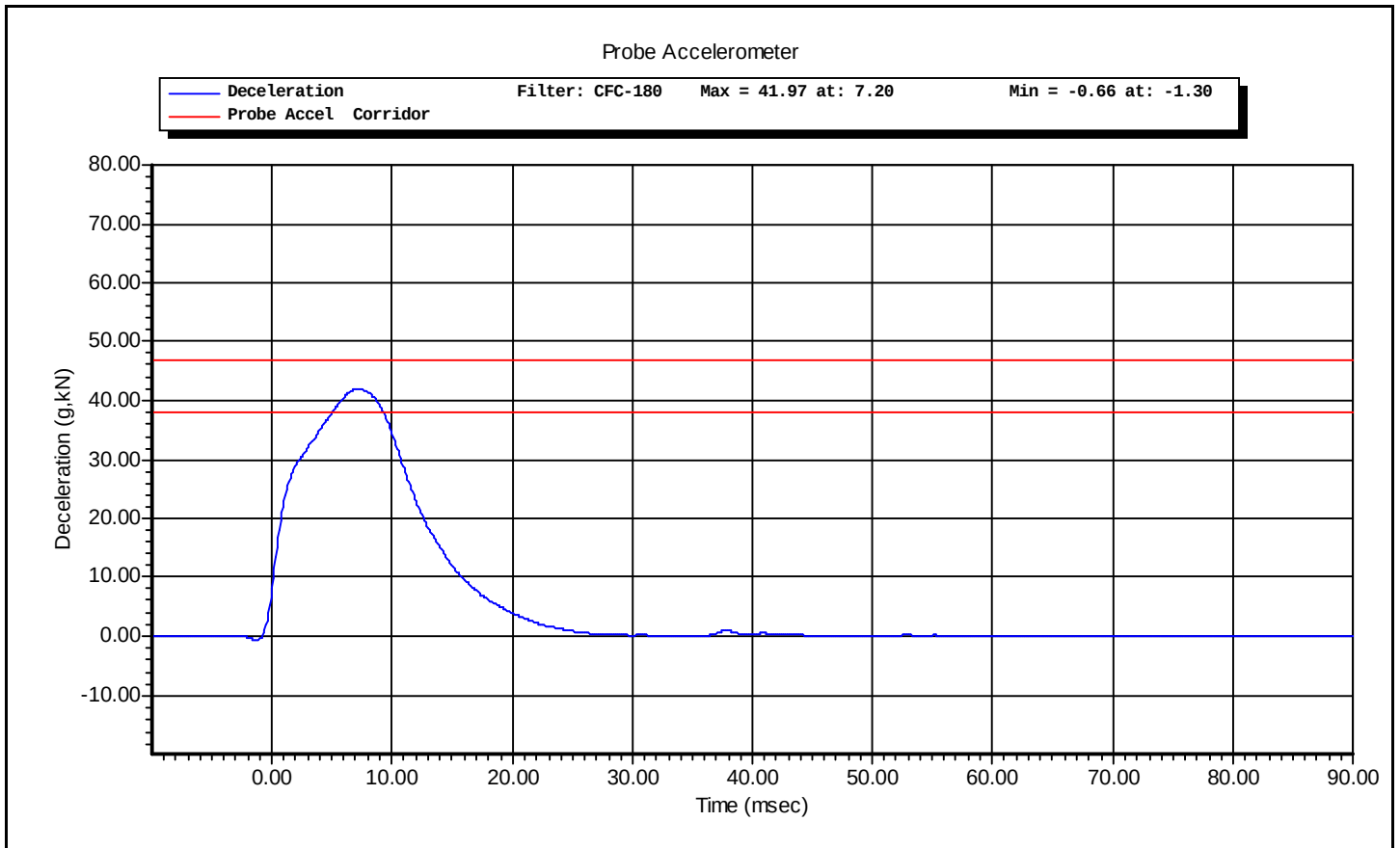
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Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Pelvis Acetabulum	Test Date:	7/27/2010
Test Number:	1	Test Time:	4:09:28 PM

Component Part Number	Component Serial Number
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Test ID: **Pelvis Acetabulum** Test Time: **4:09:28 PM**

Test Date: **7/27/2010**





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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 304		
Test ID:	Pelvis Iliac	Test Date:	7/27/2010
Test Number:	1	Test Time:	3:13:51 PM

Component Part Number	Component Serial Number
-----------------------	-------------------------

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	50 %RH P
Velocity	4.20 -- 4.40	4.22 m/s P
Peak Probe Acceleration	36.0 -- 45.0	38.6 g P
Peak Pelvis Acceleration	28.0 -- 39.0	32.0 g P
Peak Iliac Force	4.10 -- 5.10	4.58 kN P

All test parameters are within specifications

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

Test ID: **Pelvis Iliac**

Test Time: **3:13:51 PM**

Test Date: **7/27/2010**



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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	P38216	6/22/2010
Endevco	7264-2000	P49217	4/12/2010
DentonATD	3228J	LC-281 Fy	4/9/2010

Test ID: **Pelvis Iliac**

Test Time: **3:13:51 PM**

Test Date: **7/27/2010**



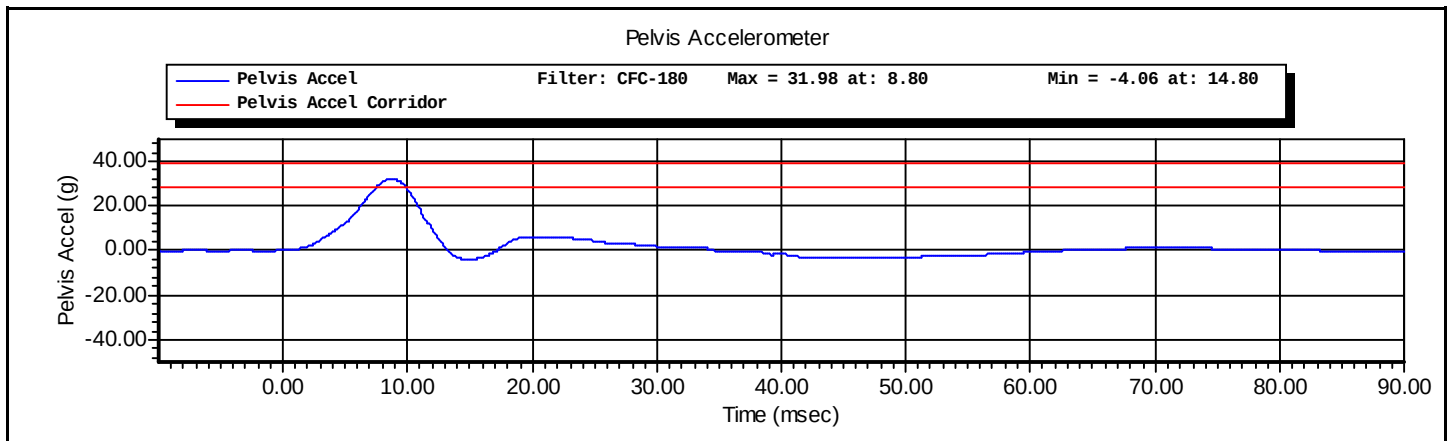
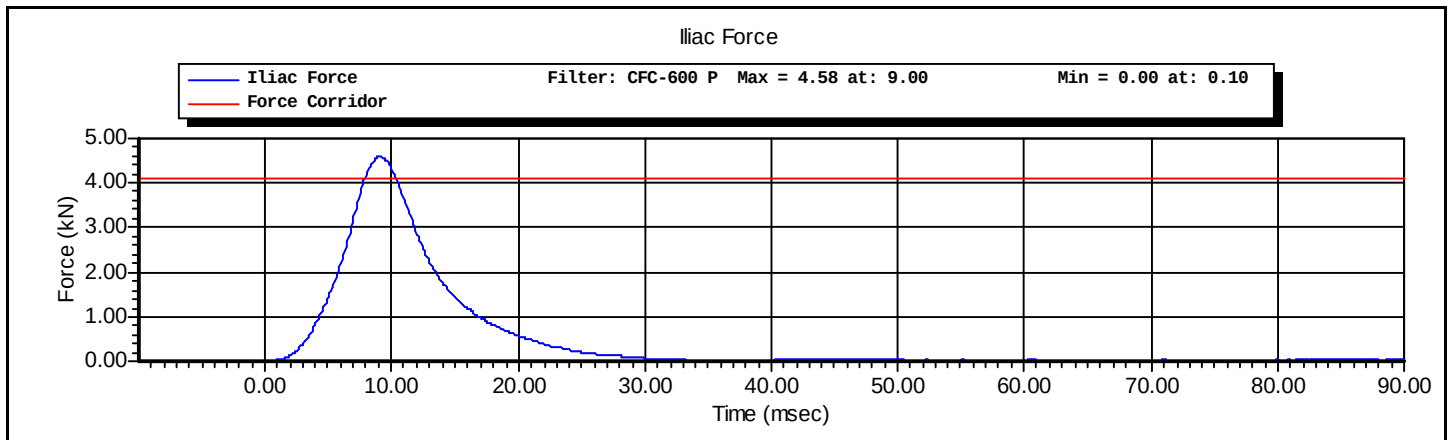
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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Pelvis Iliac	Test Date:	7/27/2010
Test Number:	1	Test Time:	3:13:51 PM

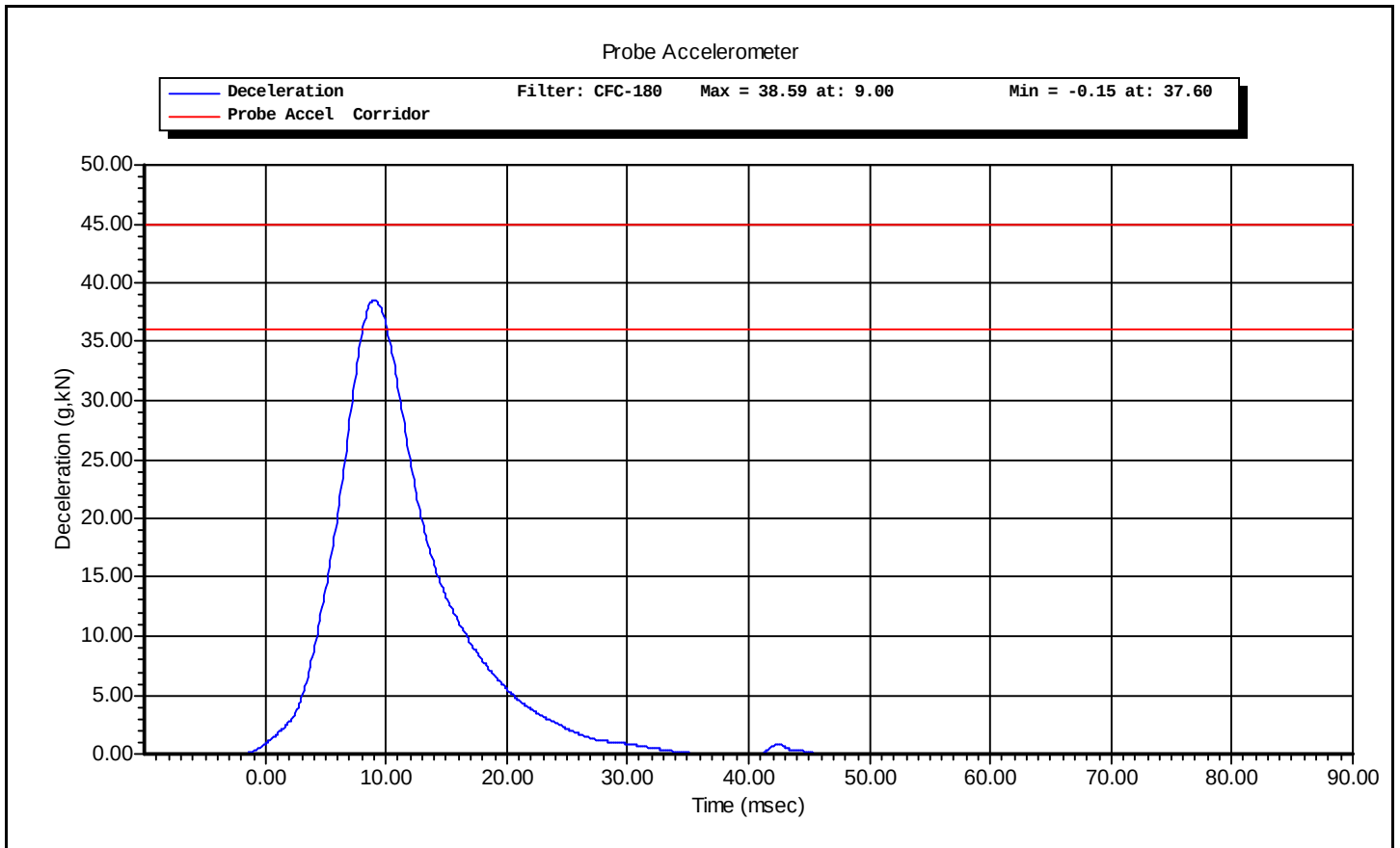
Component Part Number	Component Serial Number
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Test ID: **Pelvis Iliac**

Test Time: **3:13:51 PM**

Test Date: **7/27/2010**



CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 304

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

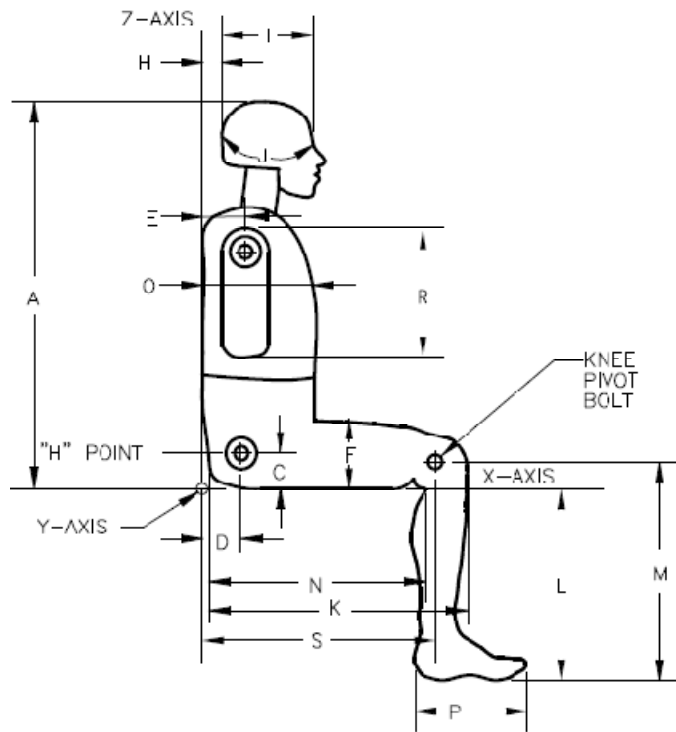
NHTSA ATD S/N 304

Symbol	Description	Specification	Results	Pass
		mm	mm	
A	Sitting Height	772.0 - 788.0	778	Yes
B	Shoulder Pivot Height	437.0 - 453.0	439	Yes
C	H-Point Height	79.0 - 89.0	83	Yes
D	H-Point from Seat Back	141.0 - 151.0	146	Yes
E	Shoulder Pivot from Backline	97.0 - 107.0	104	Yes
F	Thigh Clearance	119.0 - 135.0	126	Yes
G	Head Breadth	140.0 - 148.0	145	Yes
H	Head Back from Backline	40.0 - 46.0	43	Yes
I	Head Depth	178.0 - 188.0	182	Yes
J	Head Circumference	541.0 - 551.0	546	Yes
K	Buttock to Knee Length	514.0 - 540.0	528	Yes
L	Popliteal Height	343.0 - 369.0	353	Yes
M	Knee Pivot to Floor Height	393.0 - 409.0	398	Yes
N	Buttock Popliteal Length	416.0 - 442.0	428	Yes
O	Chest Depth without Jacket	195.0 - 211.0	204	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	318	Yes
R	Arm Length	249.0 - 259.0	251	Yes
S	Knee Joint to Seat back	478.0 - 493.0	485	Yes
V	Shoulder Width (only one arm installed)	341.0 - 357.0	353	Yes
W	Foot Width (right)	78.0 - 94.0	80	Yes
W	Foot Width (left)	78.0 - 94.0	80	Yes
Y	Chest Circumference with Jacket	851.0 - 881.0	870	Yes
Z	Waist Circumference	761.0 - 791.0	782	Yes

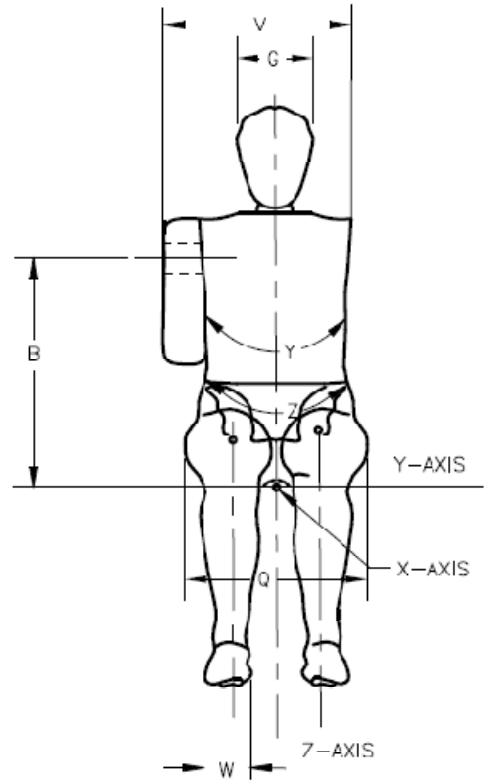
Technician: A. Rudniski

Date: 8/18/2010

SID-IIsD 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 304		
Test ID:	Head Drop	Test Date:	8/16/2010
Test Number:	1	Test Time:	5:44:10 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	53 %RH P
Resultant Acceleration	115.0 -- 137.0	121.6 g P
Oscillation	0.0 -- 15.0	6.3 % P
Fore-Aft Acceleration	-15.0 -- 15.0	6.8 g P

All test parameters are within specifications

Technician: A. Rudniski Signature: _____

Supervisor: D. Travale Signature: _____

Test ID: **Head Drop**

Test Time: **5:44:10 PM**

Test Date: **8/16/2010**



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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	P58737	3/25/2010
Endevco	7264-2000	P52100	3/25/2010
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Test ID: **Head Drop**

Test Time: **5:44:10 PM**

Test Date: **8/16/2010**

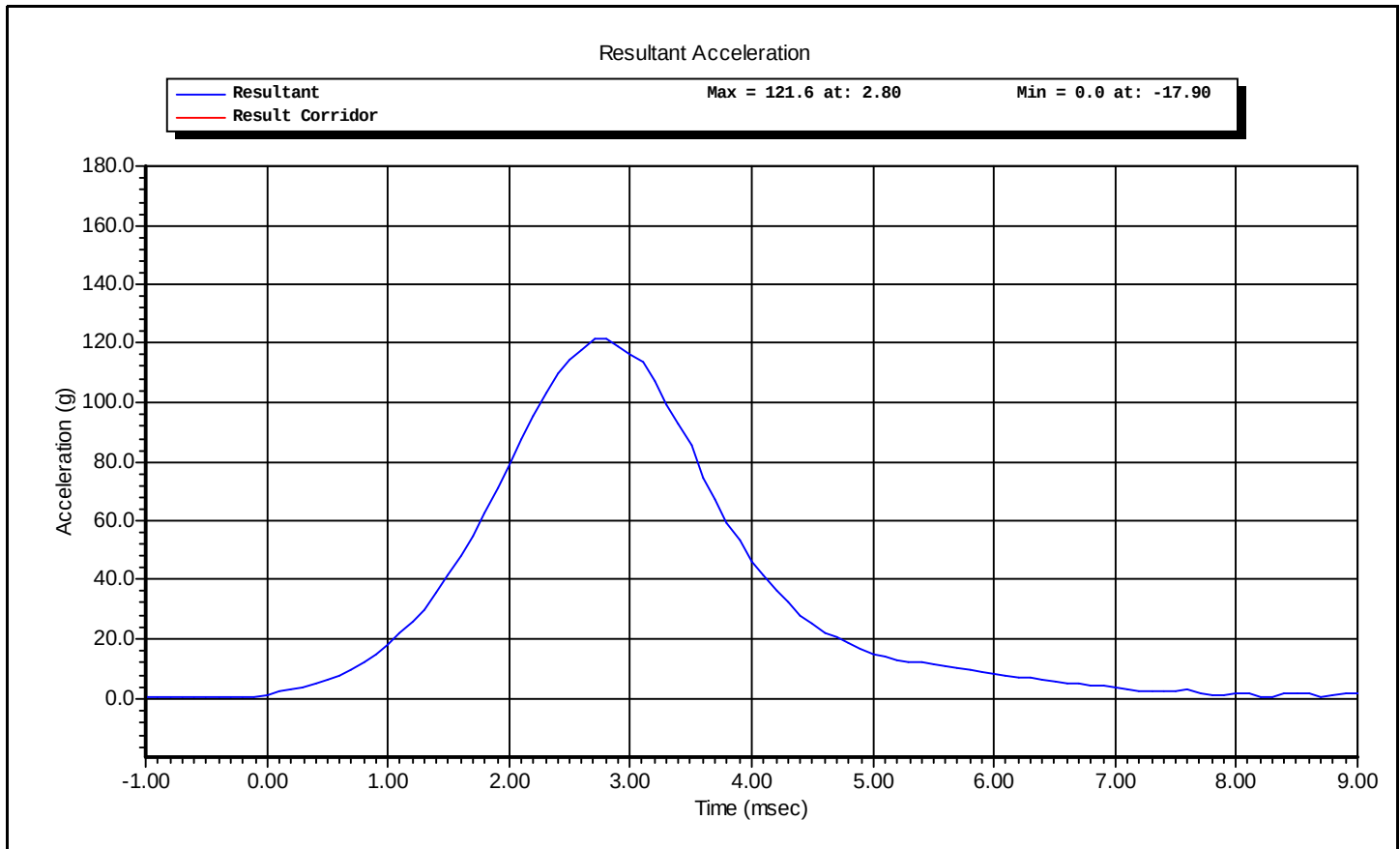


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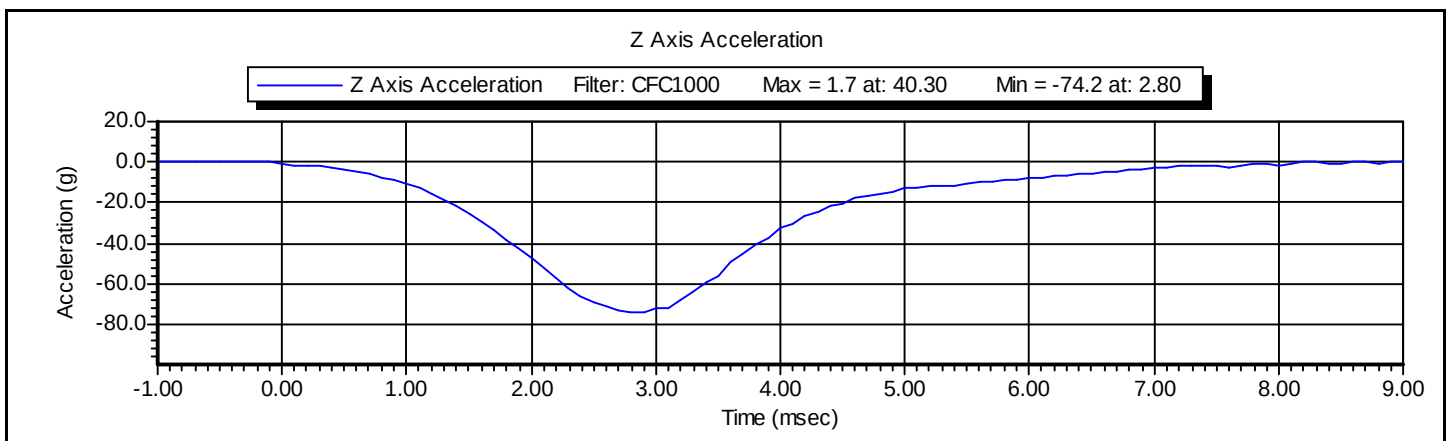
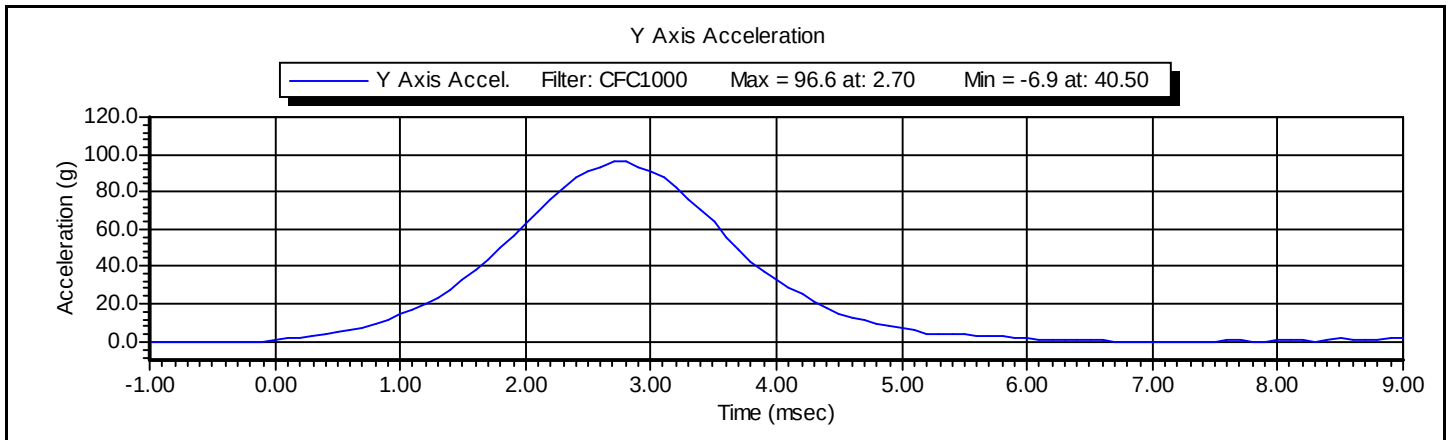
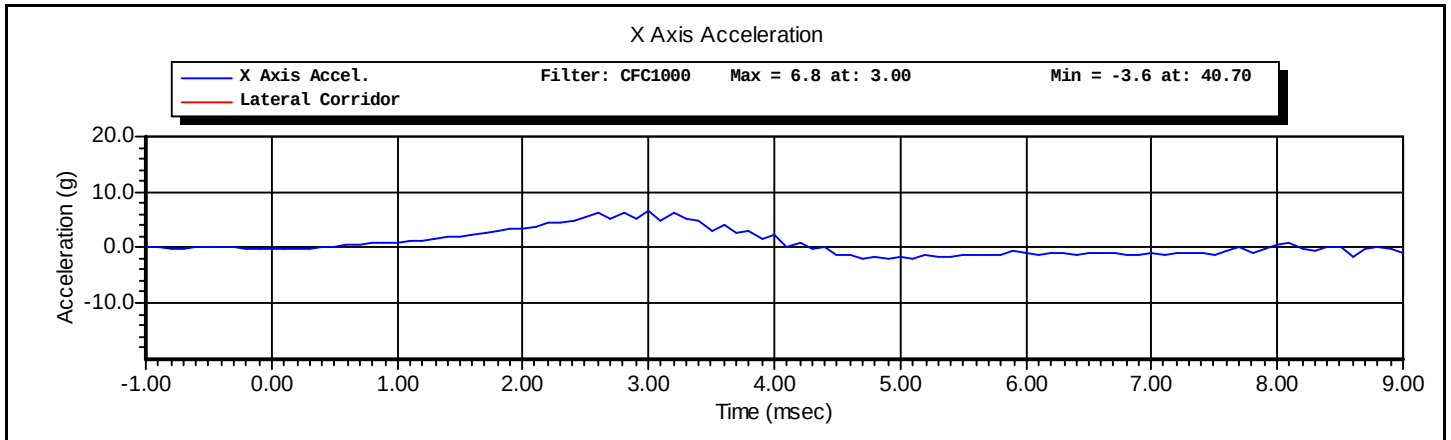
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Head Drop	Test Date:	8/16/2010
Test Number:	1	Test Time:	5:44:10 PM



Test ID: **Head Drop**

Test Time: **5:44:10 PM**

Test Date: **8/16/2010**





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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 304		
Test ID:	Neck Flexion	Test Date:	8/16/2010
Test Number:	2	Test Time:	6:25:39 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	50 %RH P
Velocity	5.51 -- 5.63	5.53 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.23 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.34 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.67 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.66 m/s P
Pendulum Impulse between 25 and 100 ms	5.50 -- 6.20	5.89 m/s P
Max D Plane Rotation	71.0 -- 81.0	73.2 degrees P
Time at Max Rotation	50.0 -- 70.0	62.9 ms P
Moment about OC	-44.0 -- -36.0	-40.0 Nm P
Moment Decay to Zero	102.0 -- 126.0	116.5 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **6:25:39 PM**

Test Date: **8/16/2010**



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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: **6:25:39 PM**

Test Date: **8/16/2010**



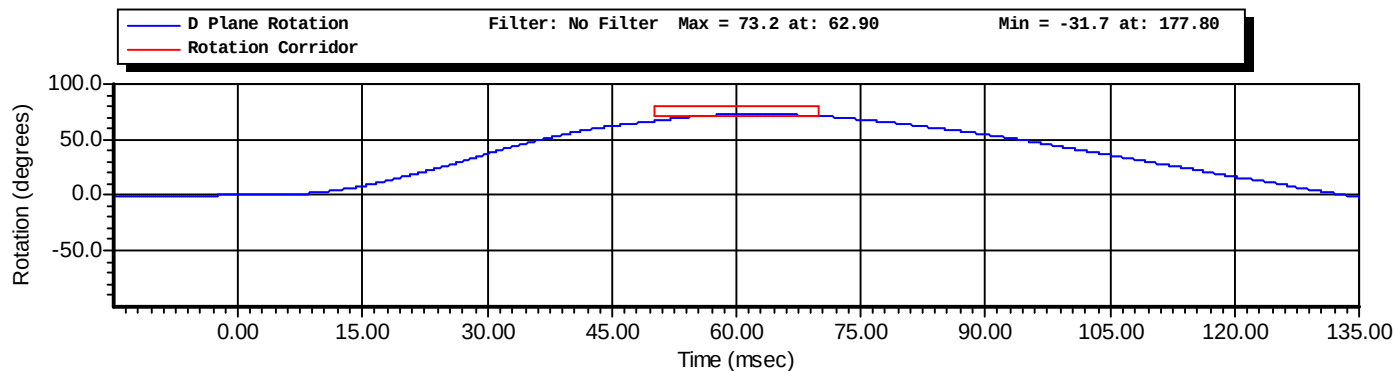
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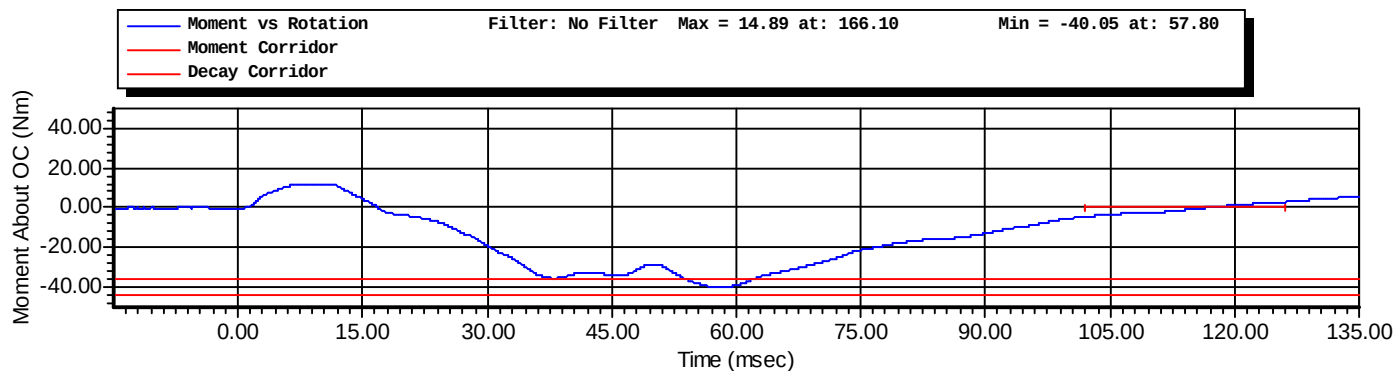
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 304		
Test ID:	Neck Flexion	Test Date:	8/16/2010
Test Number:	2	Test Time:	6:25:39 PM

D Plane Rotation



Moment About Occipital Condyle

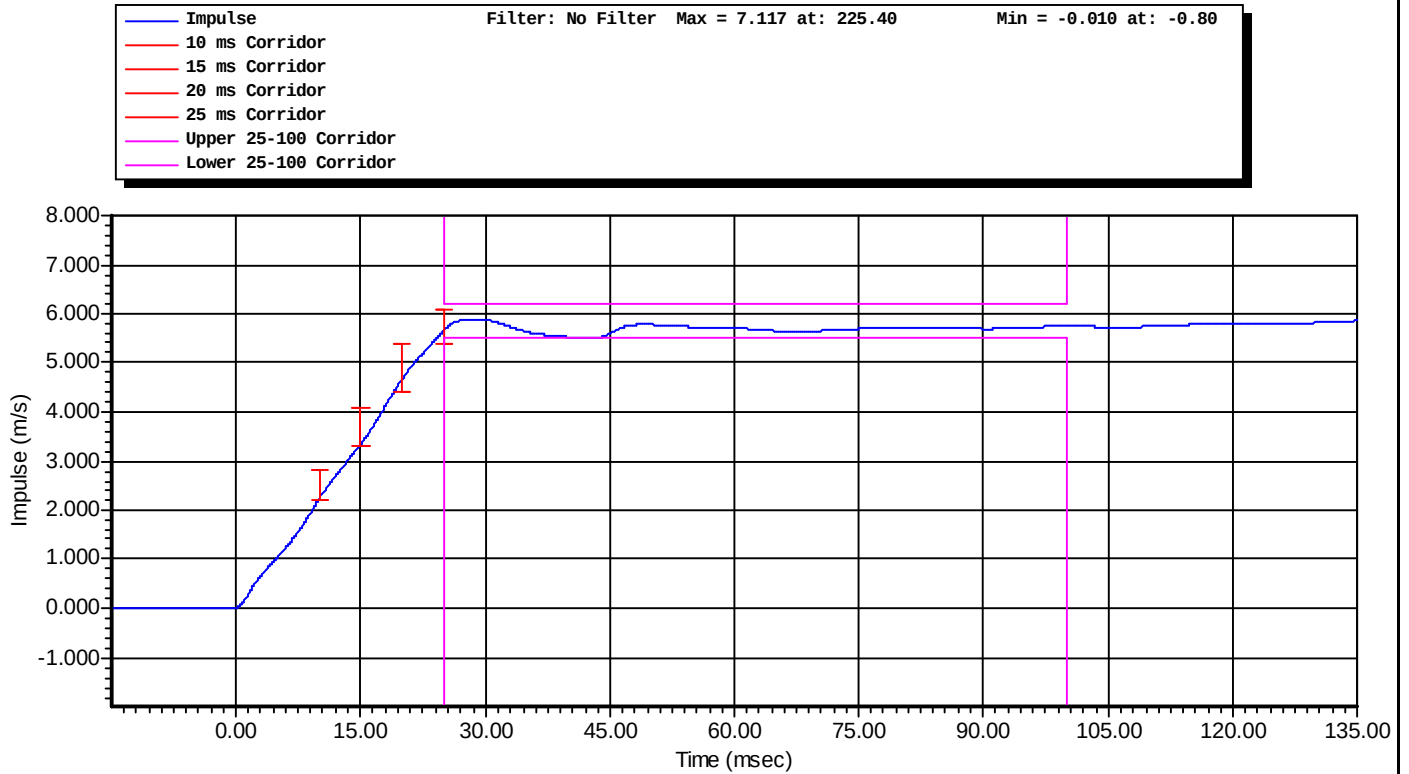


Test ID: Neck Flexion

Test Time: 6:25:39 PM

Test Date: 8/16/2010

Pendulum Impulse





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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 303		
Test ID:	Shoulder	Test Date:	8/18/2010
Test Number:	1	Test Time:	9:59:42 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	57.0 %RH P
Velocity	4.20 -- 4.40	4.35 m/s P
Probe Acceleration	13.0 -- 18.0	15.8 g P
Shoulder Deflection	28.0 -- 37.0	31.56 mm P
T1 Acceleration	17.0 -- 22.0	20.4 g P

All test parameters are within specifications

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

Test ID: **Shoulder**

Test Time: **9:59:42 AM**

Test Date: **8/18/2010**



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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	P66927	4/20/2010
Servo	180-3885	DS-1154	3/26/2010
Endevco	7264-2000	P58884	3/29/2010

Test ID: **Shoulder**

Test Time: **9:59:42 AM**

Test Date: **8/18/2010**

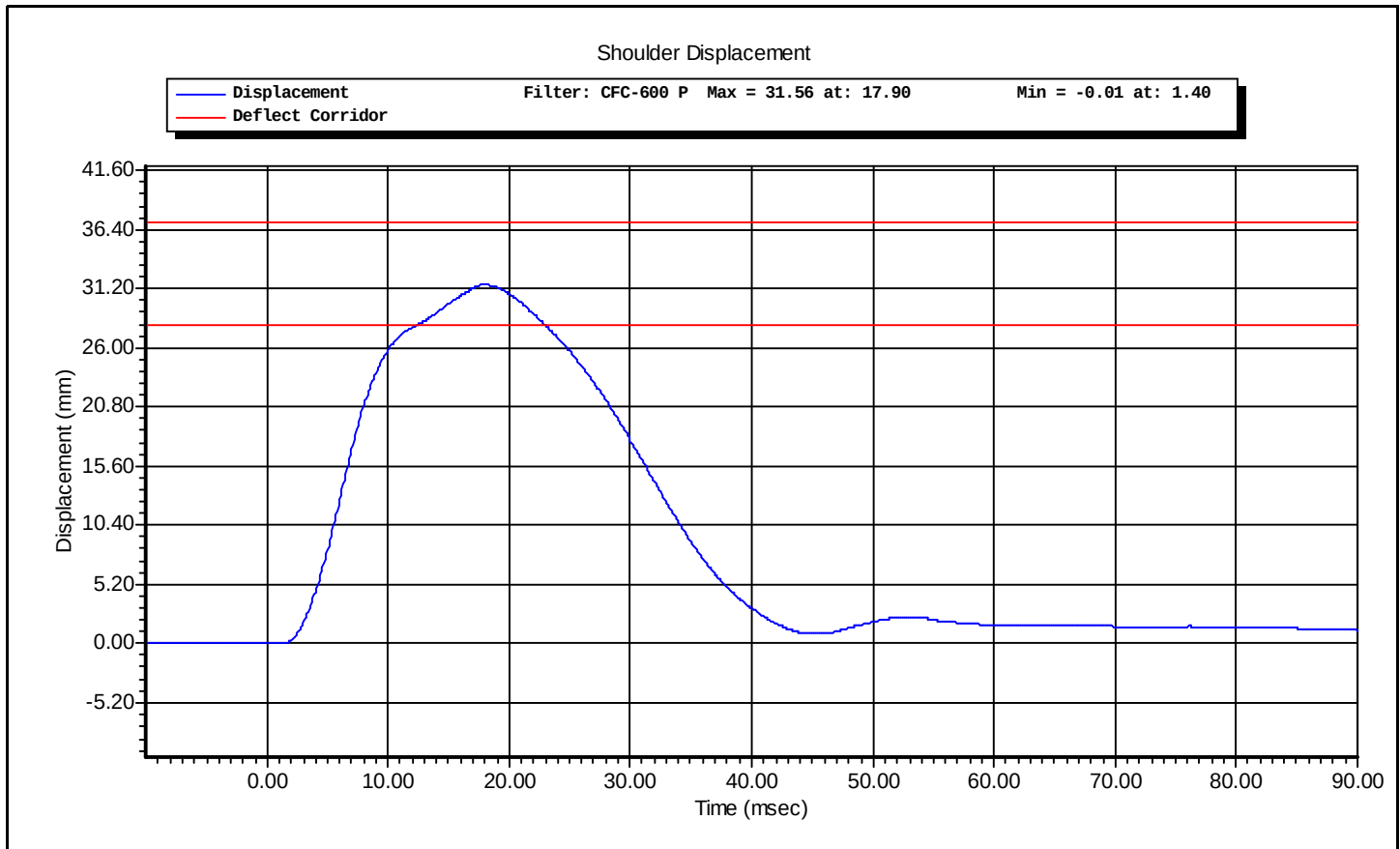


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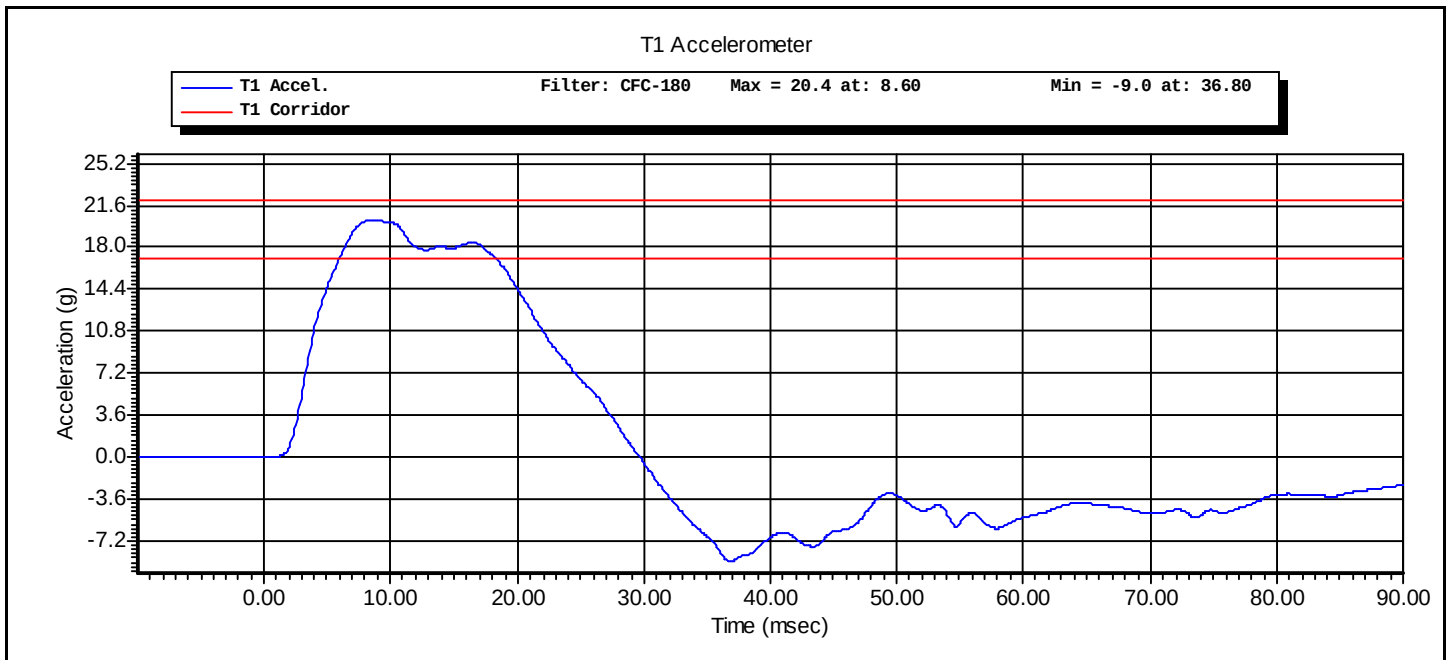
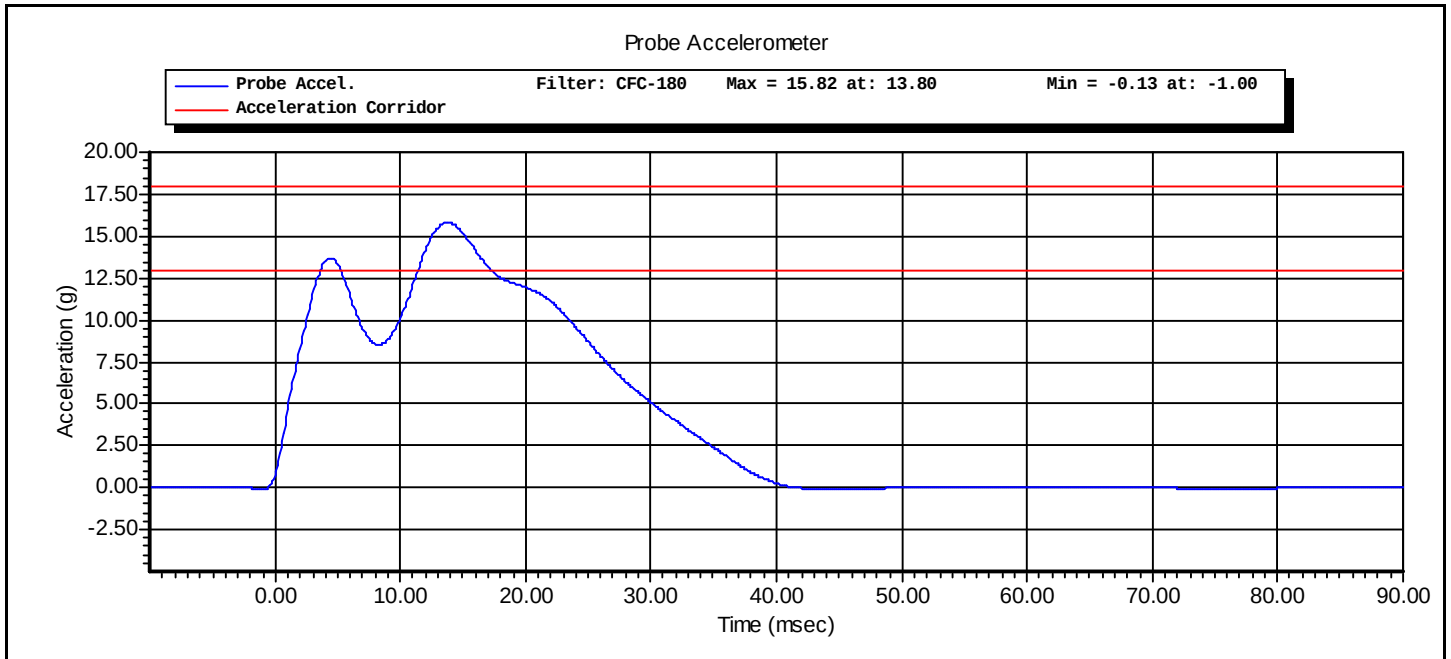
Test Name:	Shoulder Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 303		
Test ID:	Shoulder	Test Date:	8/18/2010
Test Number:	1	Test Time:	9:59:42 AM



Test ID: **Shoulder**

Test Time: **9:59:42 AM**

Test Date: **8/18/2010**





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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 304		
Test ID:	Thorax With Arm	Test Date:	8/18/2010
Test Number:	1	Test Time:	12:55:37 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	52 %RH	P
Velocity	6.60	--	6.80	6.68 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	33.6 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.8 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	31.6 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	33.4 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	42.3 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	34.2 g	P
Shoulder Deflection	31.0	--	40.0	36.6 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm** Test Time: **12:55:37 PM**

Test Date: **8/18/2010**



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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	P66927	4/20/2010
Servo	180-3885	DS-1188	3/26/2010
Servo	180-3885	DS-1269	3/26/2010
Servo	180-3885	DS-1260	3/26/2010
Endevco	7264-2000	P58884	3/29/2010
Endevco	7264-2000	P58839	3/29/2010
Servo	180-3885	DS-1154	3/26/2010

Test ID: **Thorax With Arm** Test Time: **12:55:37 PM**

Test Date: **8/18/2010**

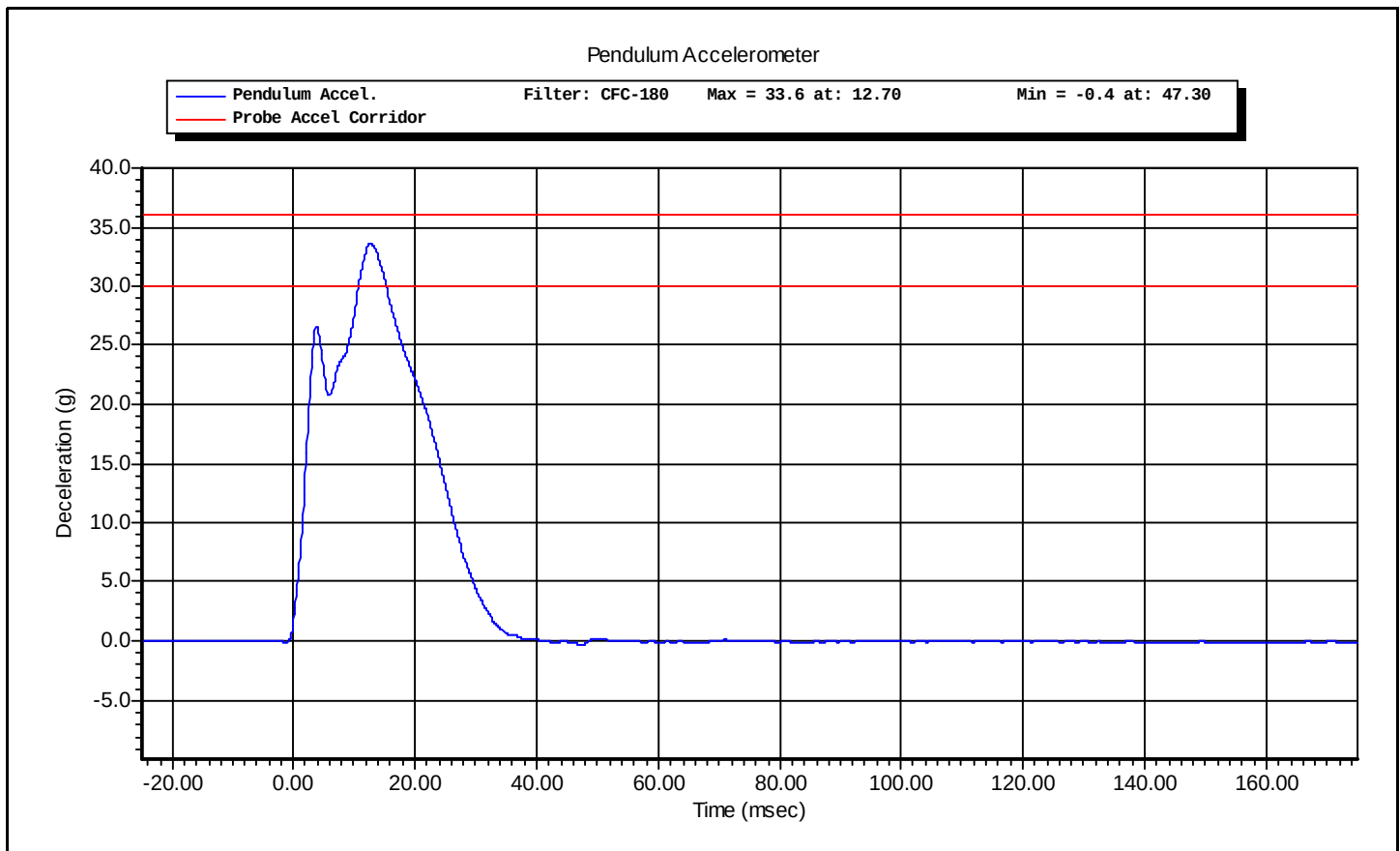


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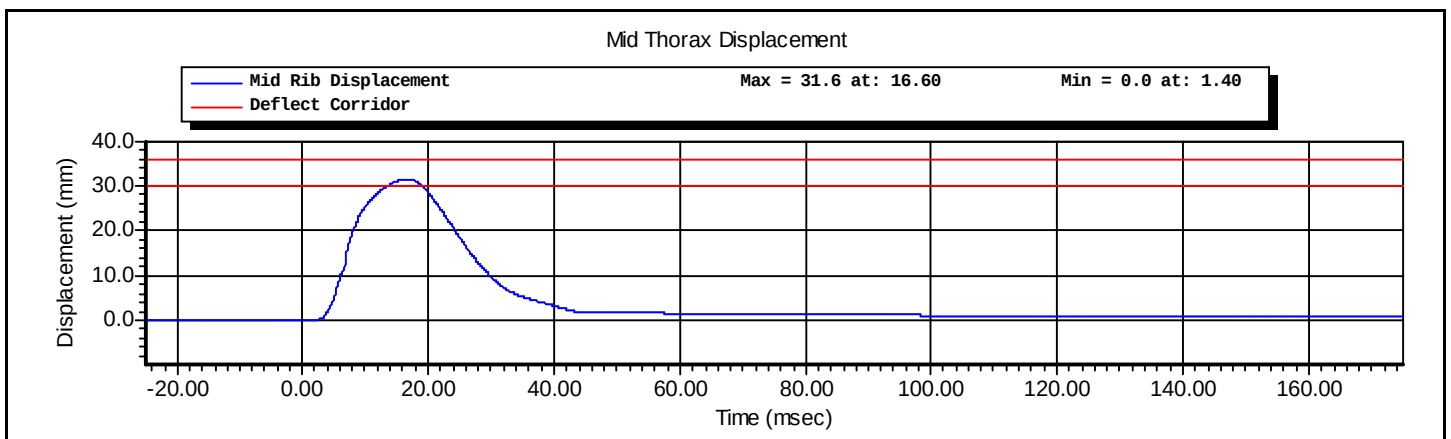
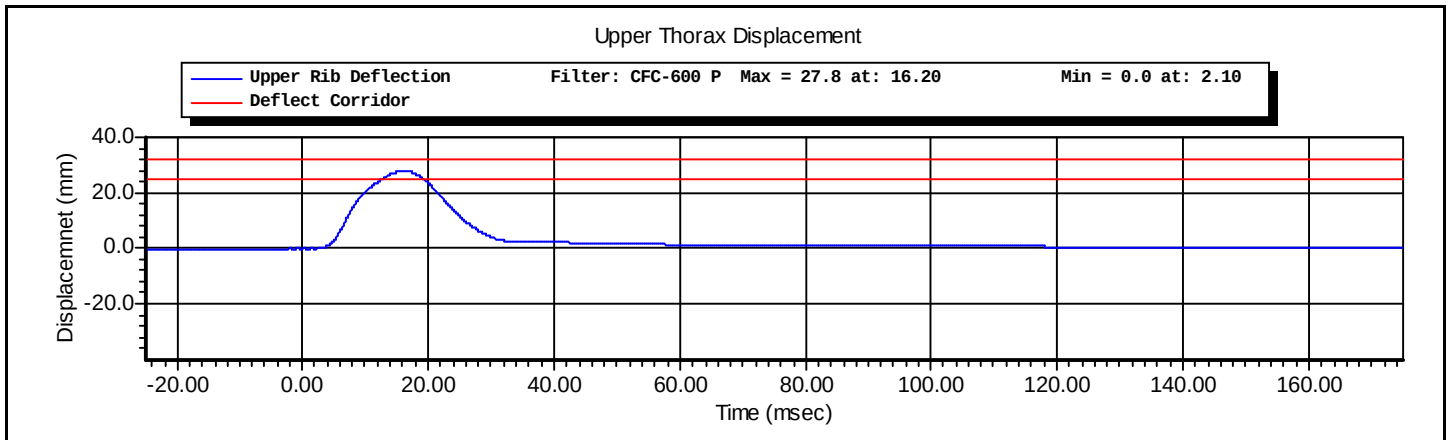
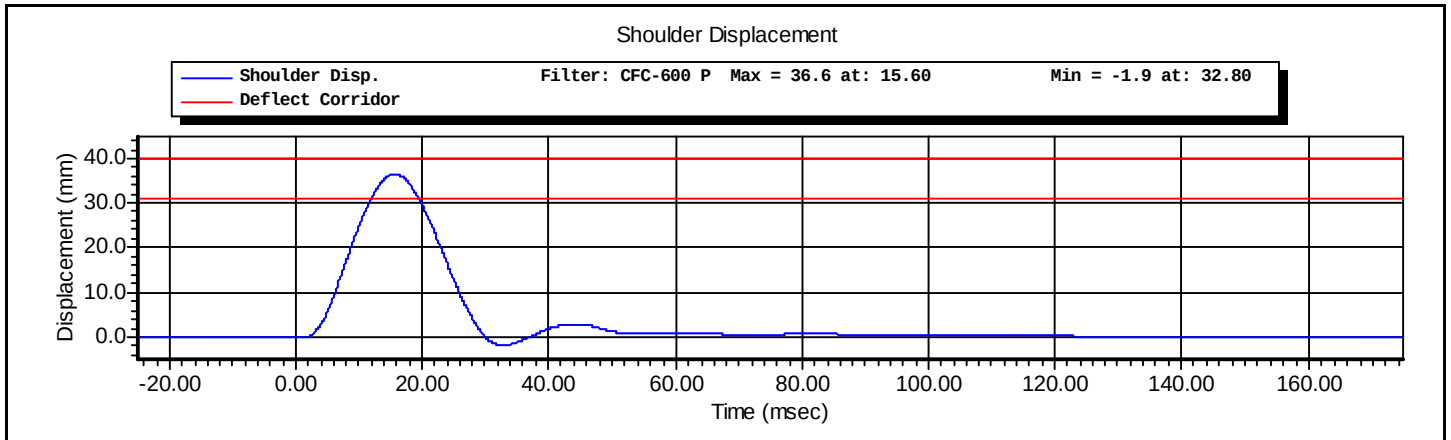
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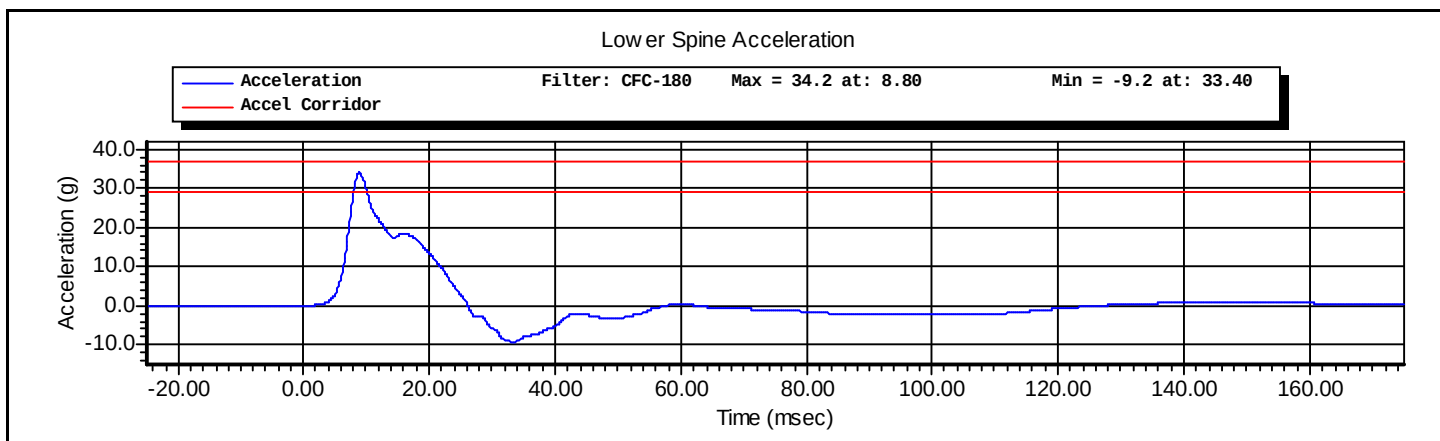
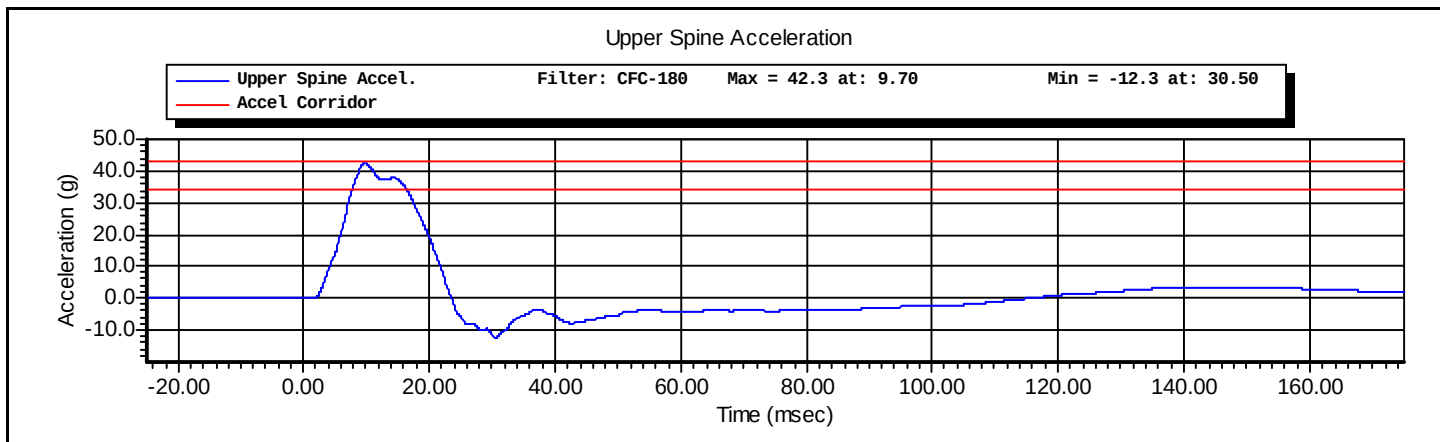
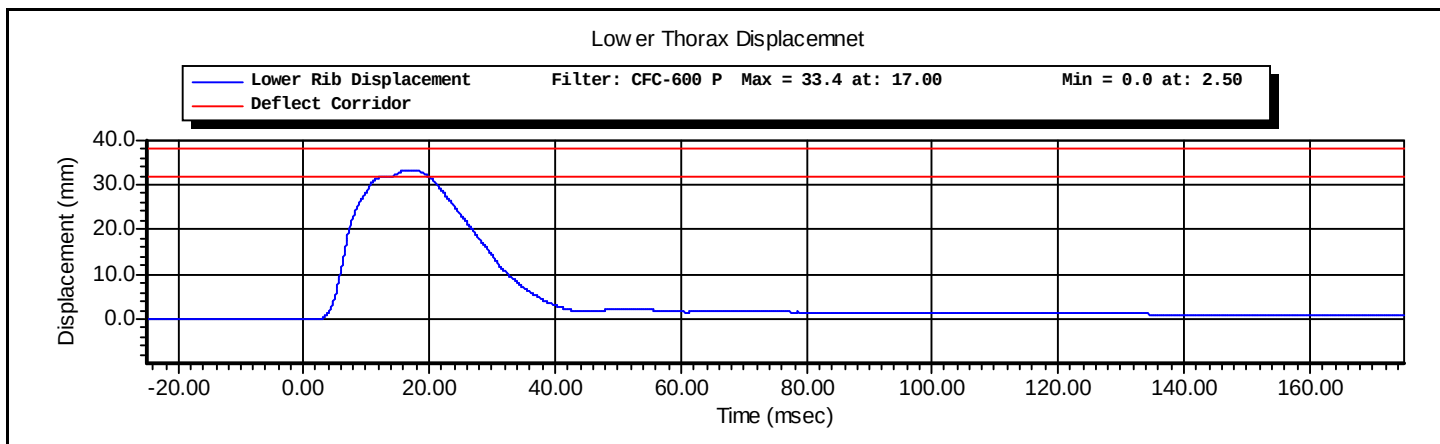
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Thorax With Arm	Test Date:	8/18/2010
Test Number:	1	Test Time:	12:55:37 PM



Test ID: **Thorax With Arm** Test Time: **12:55:37 PM**

Test Date: **8/18/2010**







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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 304		
Test ID:	Thorax Without Arm	Test Date:	8/18/2010
Test Number:	1	Test Time:	11:22:34 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	53 %RH	P
Velocity	4.20	--	4.40	4.32 m/s	P
Probe Acceleration	14.0	--	18.0	16.7 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	36.7 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.8 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	38.4 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	16.4 g	P
Lower Spine Acceleration T12	7.0	--	11.0	10.1 g	P

All test parameters are within specifications

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

Test ID: **Thorax Without Arm** Test Time: **11:22:34 AM**

Test Date: **8/18/2010**



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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	P66927	4/20/2010
Servo	180-3885	DS-1188	3/26/2010
Servo	180-3885	DS-1269	3/26/2010
Servo	180-3885	DS-1260	3/26/2010
Endevco	7264-2000	P58884	3/29/2010
Endevco	7264-2000	P58839	3/29/2010

Test ID: **Thorax Without Arm** Test Time: **11:22:34 AM**

Test Date: **8/18/2010**

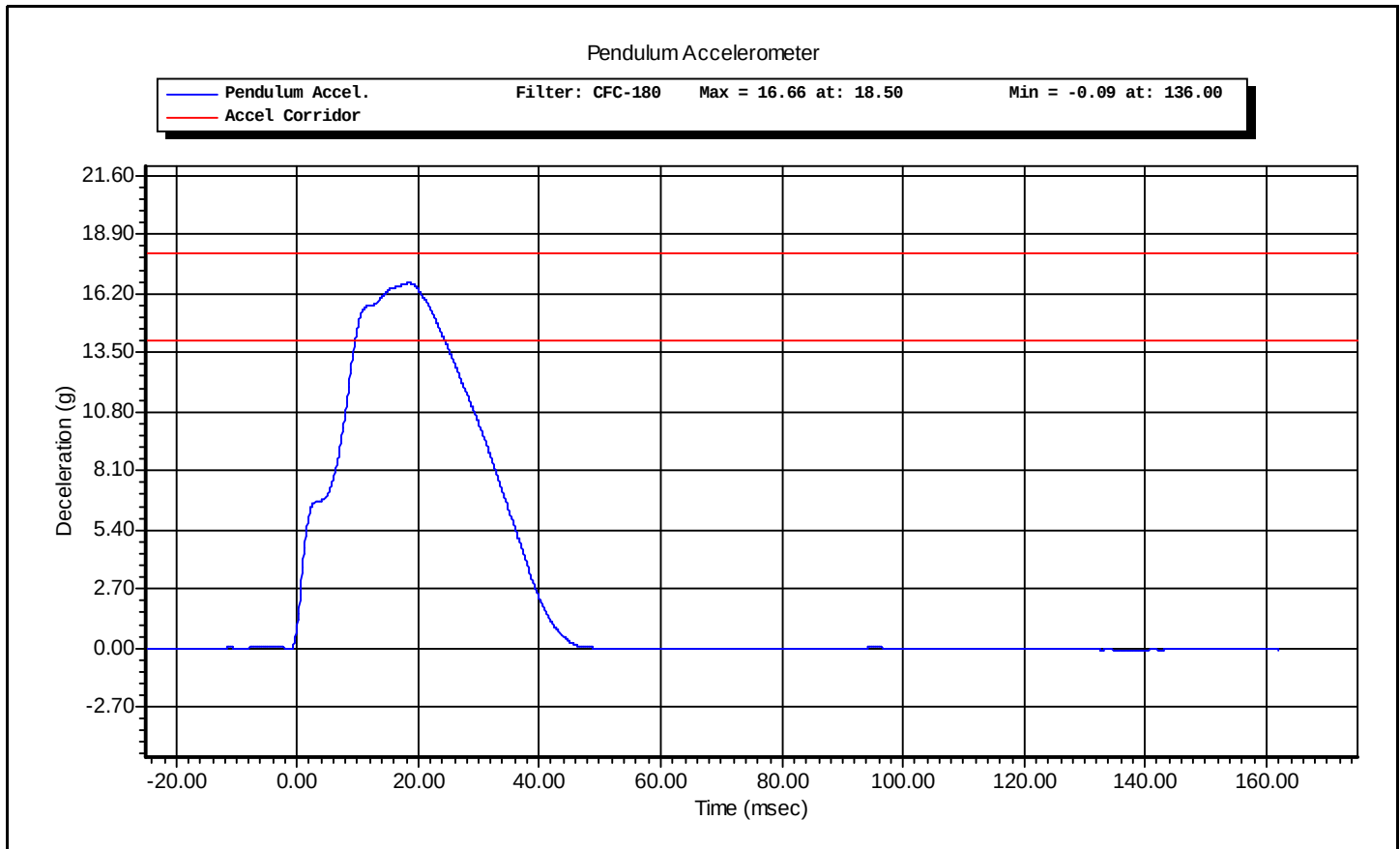


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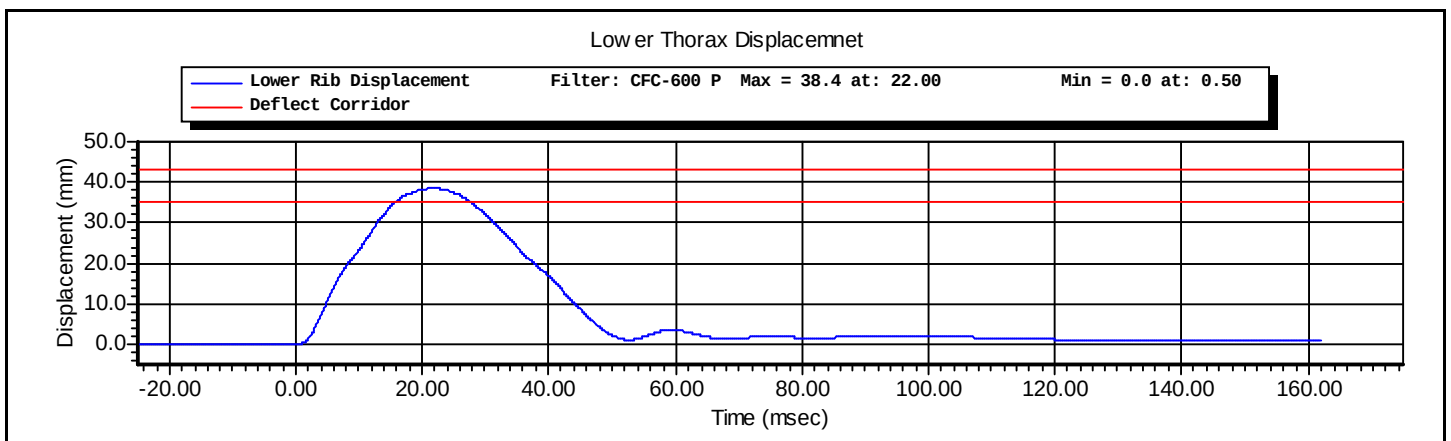
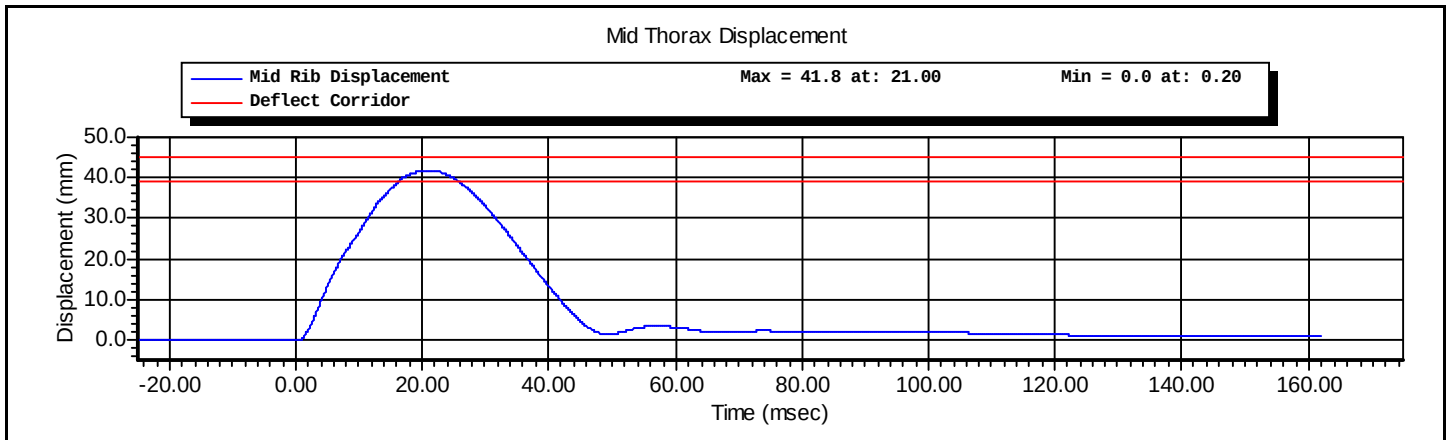
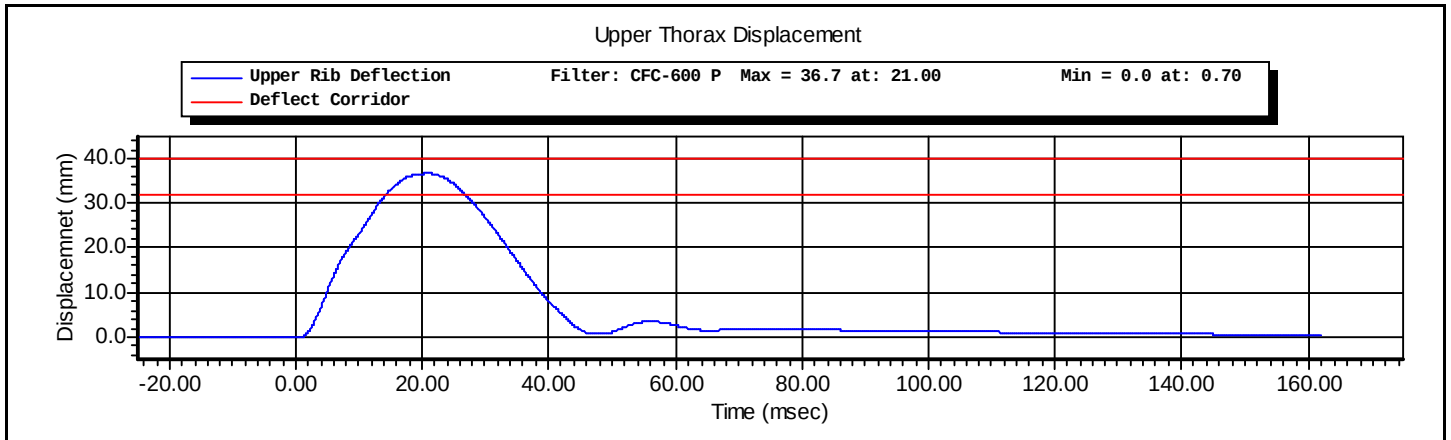
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Thorax Without Arm	Test Date:	8/18/2010
Test Number:	1	Test Time:	11:22:34 AM

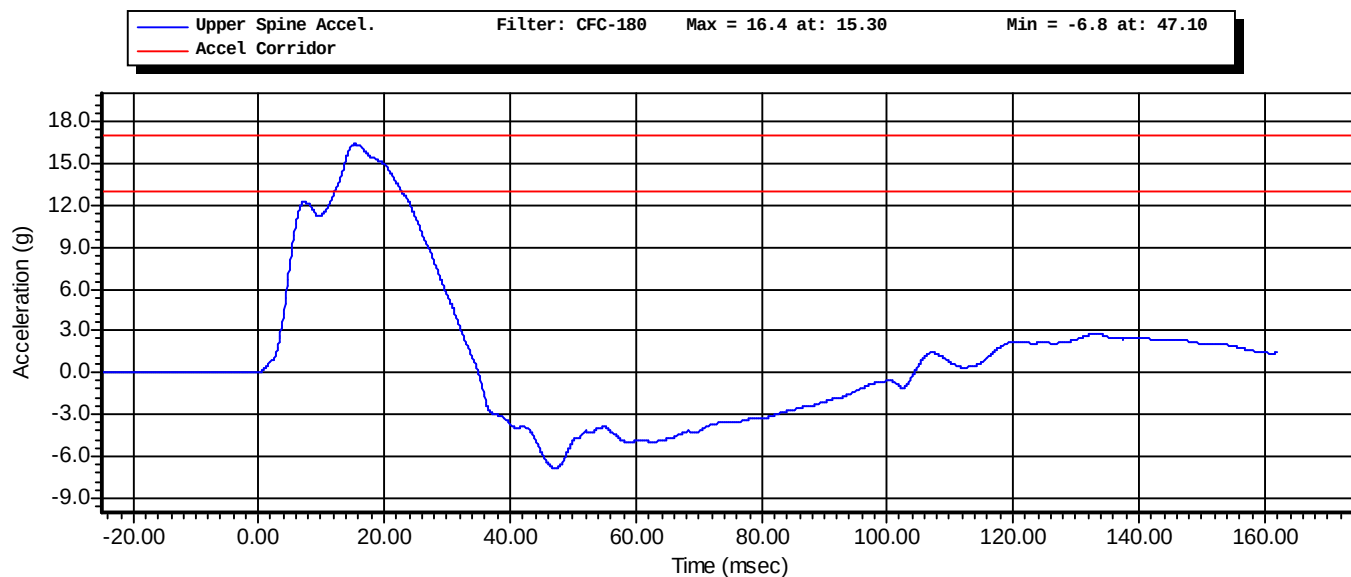


Test ID: **Thorax Without Arm** Test Time: **11:22:34 AM**

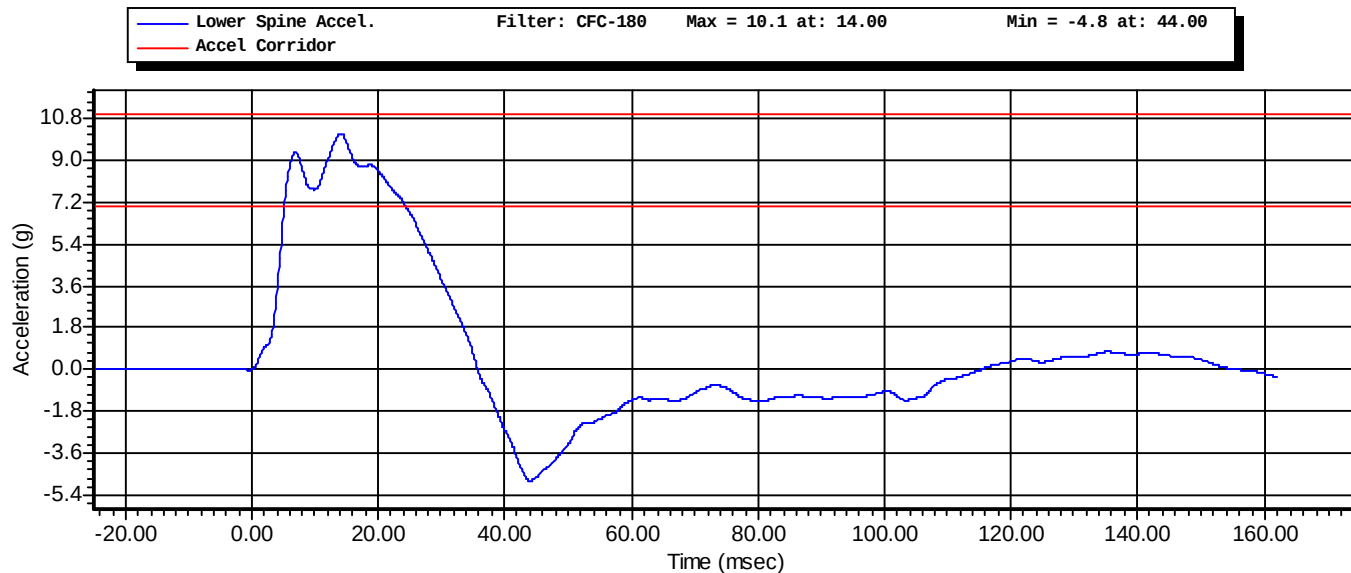
Test Date: **8/18/2010**



Upper Spine Acceleration



Lower Spine Acceleration





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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 304		
Test ID:	Abdomen	Test Date:	8/18/2010
Test Number:	1	Test Time:	9:30:10 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	58 %RH P
Velocity	4.20 -- 4.40	4.36 m/s P
Probe Acceleration	12.0 -- 16.0	15.8 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	39.7 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	39.0 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	12.2 g P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **9:30:10 AM**

Test Date: **8/18/2010**



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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	P66927	4/20/2010
Servo	180-3885	DS-1207	3/26/2010
Servo	180-3885	DS-1204	3/26/2010
Endevco	7264-2000	P58839	3/29/2010

Test ID: **Abdomen**

Test Time: **9:30:10 AM**

Test Date: **8/18/2010**



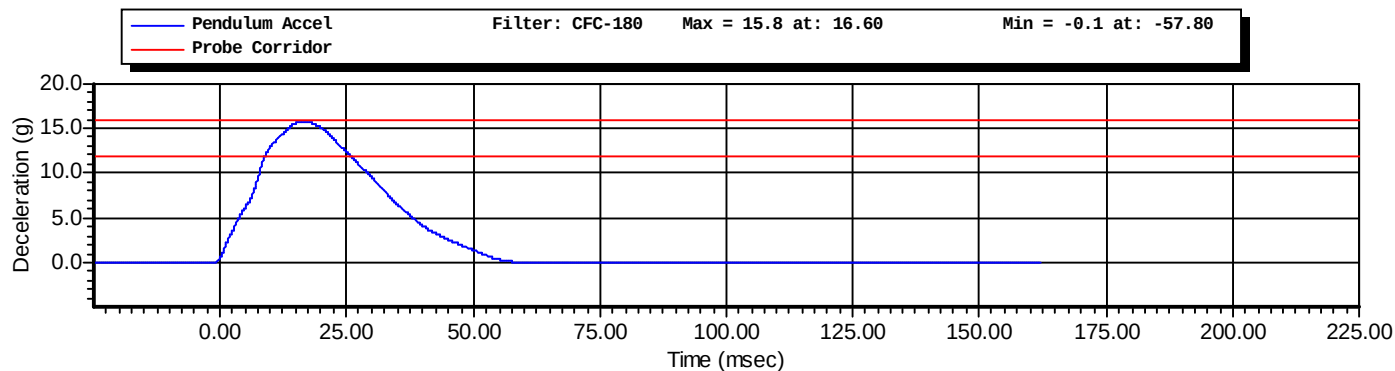
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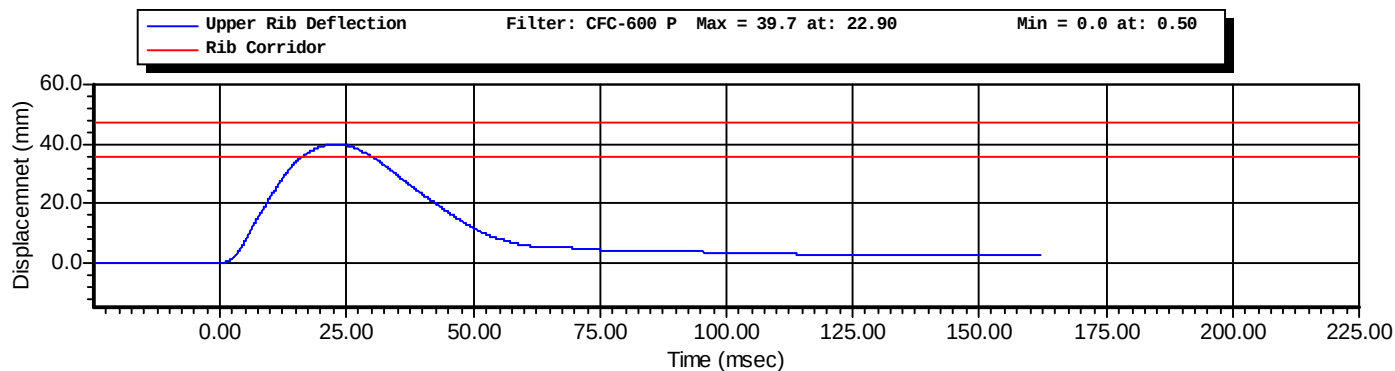
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Abdomen	Test Date:	8/18/2010
Test Number:	1	Test Time:	9:30:10 AM

Pendulum Accelerometer



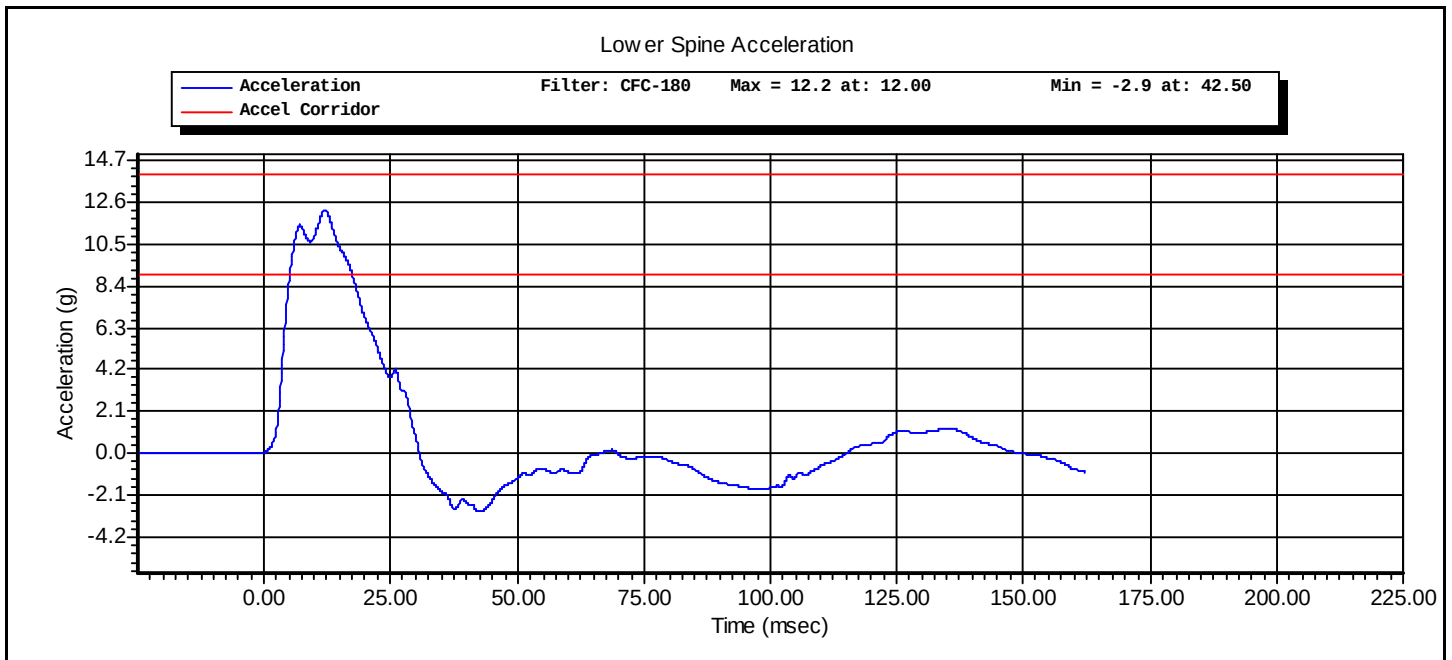
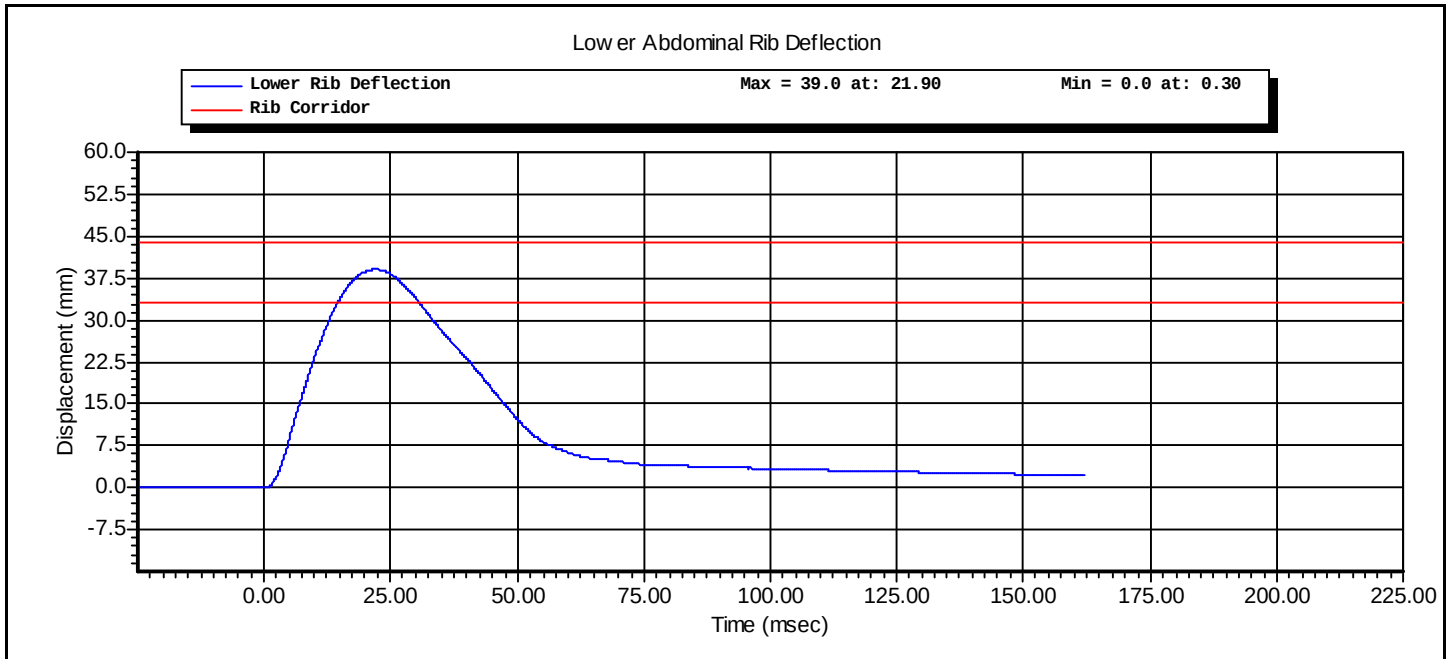
Upper Abdominal Rib Deflection



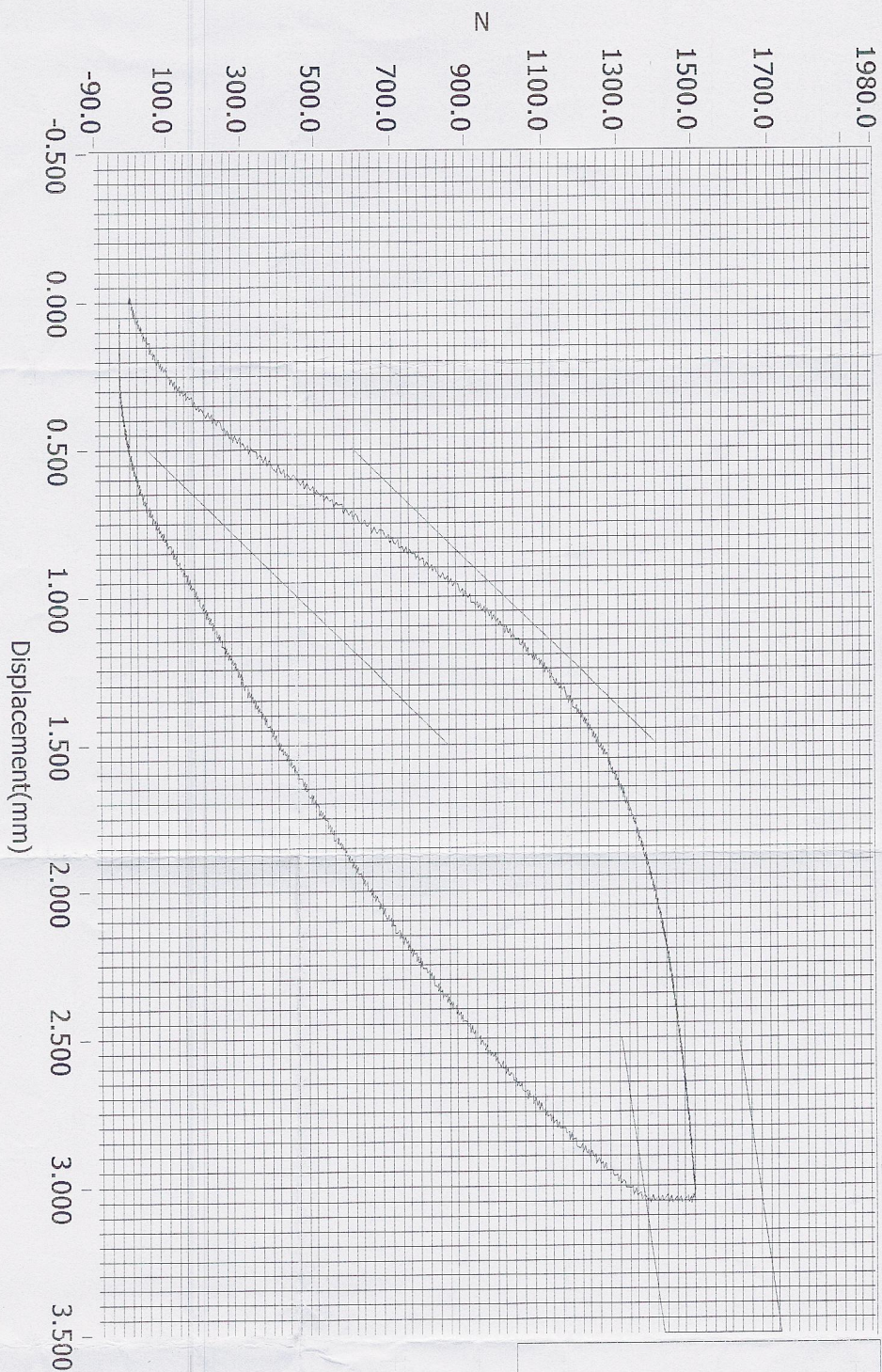
Test ID: **Abdomen**

Test Time: **9:30:10 AM**

Test Date: **8/18/2010**



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

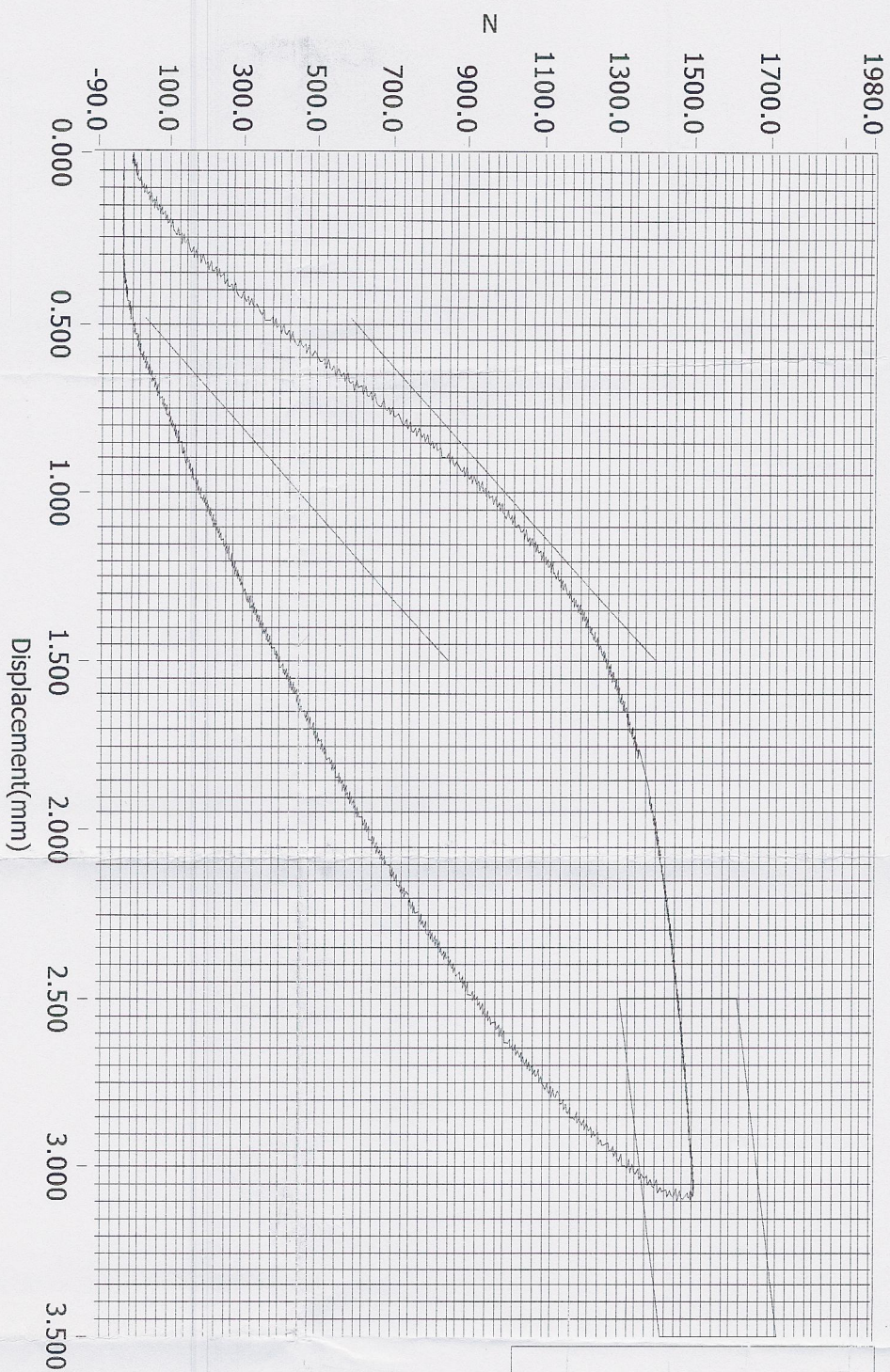
12896

SIDIIs

Current Date : 7/17/2007

Current Time : 15:02:37

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

11968

SIDIIs

Current Date : 6/26/2007

Current Time : 15:18:37



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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 304		
Test ID:	Pelvis Acetabulum	Test Date:	8/17/2010
Test Number:	1	Test Time:	11:37:54 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	55 %RH P
Velocity	6.60 -- 6.80	6.69 m/s P
Peak Probe Acceleration	38.0 -- 47.0	43.4 g P
Peak Pelvis Acceleration	34.0 -- 42.0	36.4 g P
Peak Acetabulum Force	3.60 -- 4.30	4.06 kN P

All test parameters are within specifications

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

Test ID: **Pelvis Acetabulum** Test Time: **11:37:54 AM**

Test Date: **8/17/2010**



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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	P66927	4/20/2010
Endevco	7264-2000	P49217	4/12/2010
DentonATD	3249J	LC-267Fy	4/9/2010

Test ID: **Pelvis Acetabulum** Test Time: **11:37:54 AM**

Test Date: **8/17/2010**



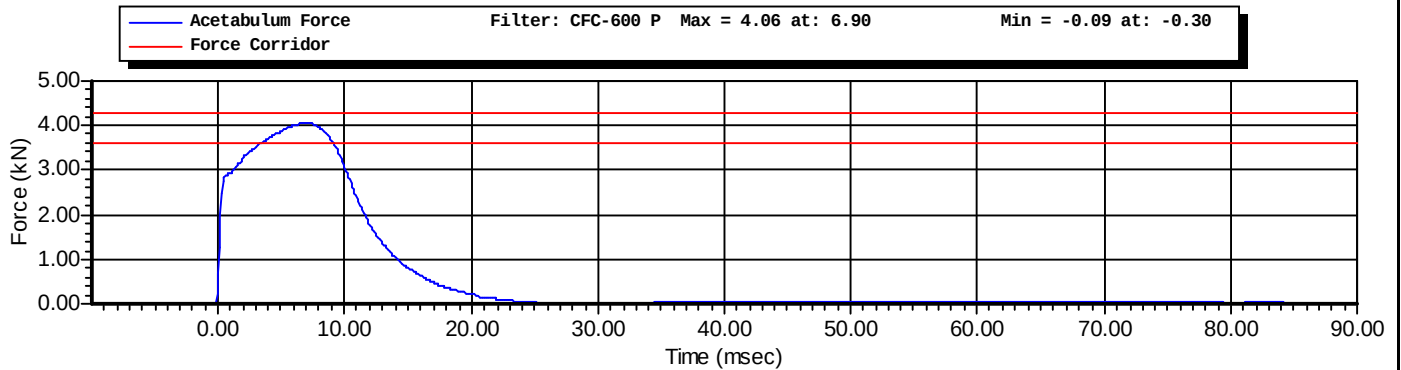
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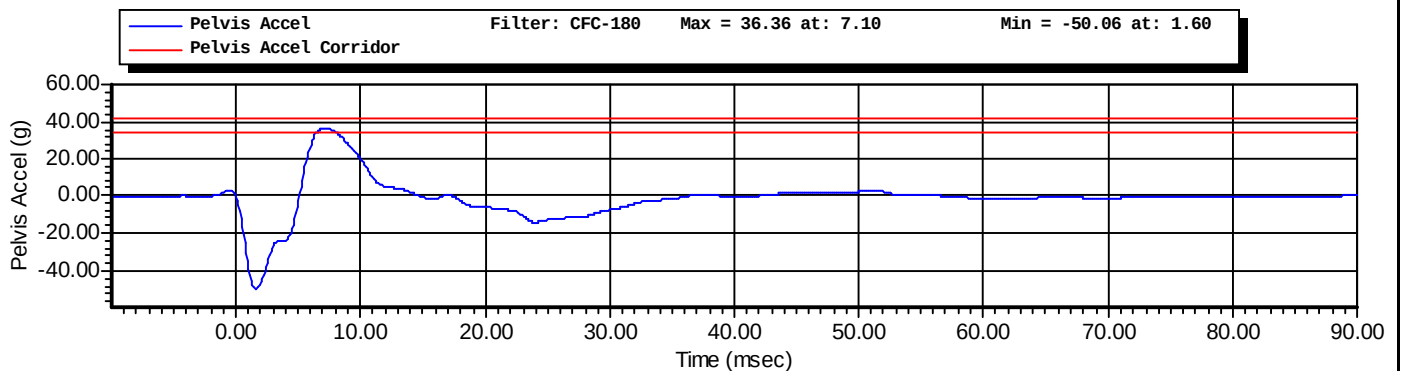
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Pelvis Acetabulum	Test Date:	8/17/2010
Test Number:	1	Test Time:	11:37:54 AM

Acetabulum Force

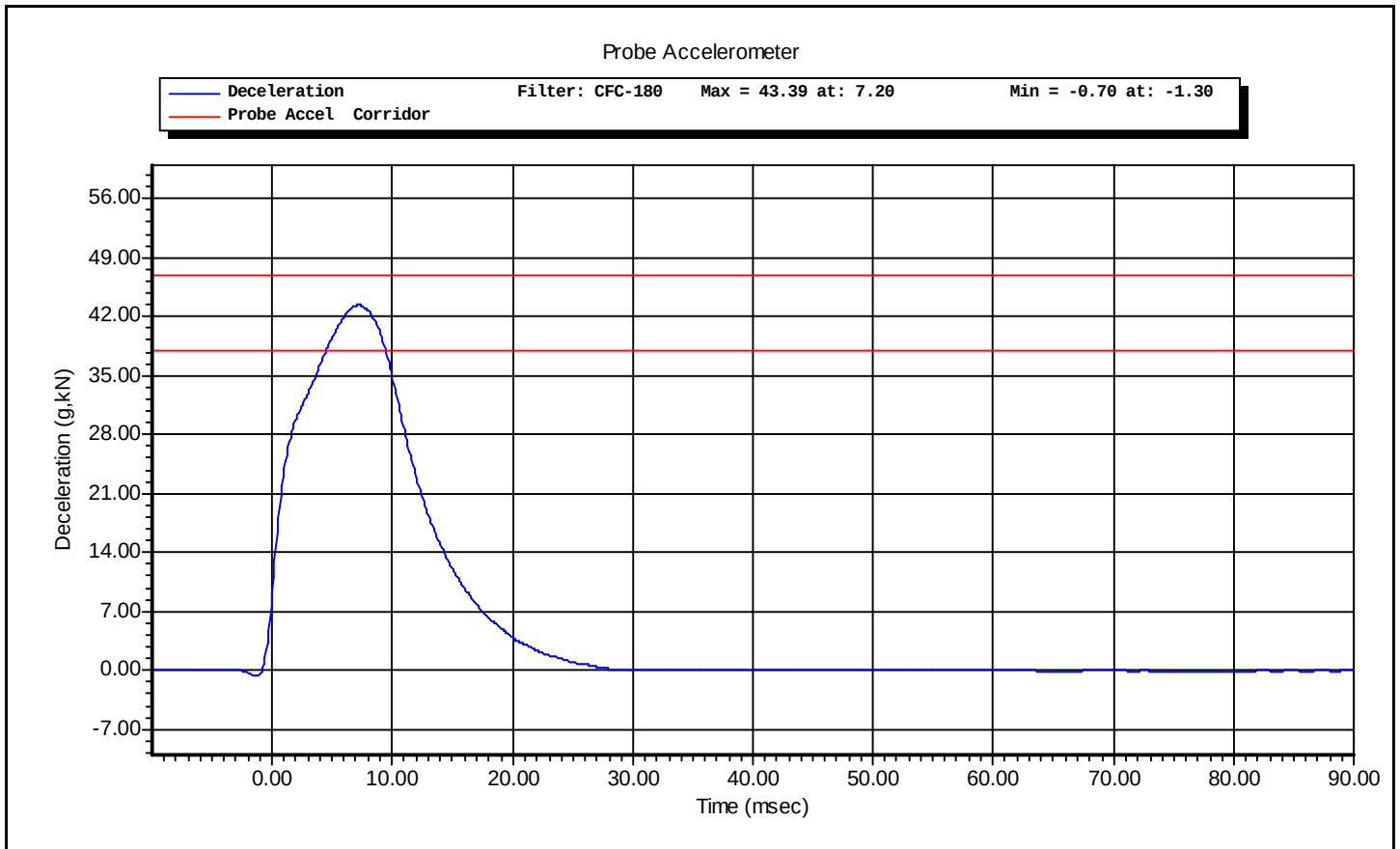


Pelvis Accelerometer



Test ID: **Pelvis Acetabulum** Test Time: **11:37:54 AM**

Test Date: **8/17/2010**





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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		
ATD Serial Number:	SID 304		
Test ID:	Pelvis Iliac	Test Date:	8/17/2010
Test Number:	1	Test Time:	11:03:29 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	53 %RH P
Velocity	4.20 -- 4.40	4.30 m/s P
Peak Probe Acceleration	36.0 -- 45.0	39.6 g P
Peak Pelvis Acceleration	28.0 -- 39.0	32.0 g P
Peak Iliac Force	4.10 -- 5.10	4.52 kN P

All test parameters are within specifications

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

Test ID: **Pelvis Iliac**

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

Test Date: **8/17/2010**



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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	P66927	4/20/2010
Endevco	7264-2000	P49217	4/12/2010
DentonATD	3228J	LC-281 Fy	4/9/2010

Test ID: **Pelvis Iliac**

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

Test Date: **8/17/2010**

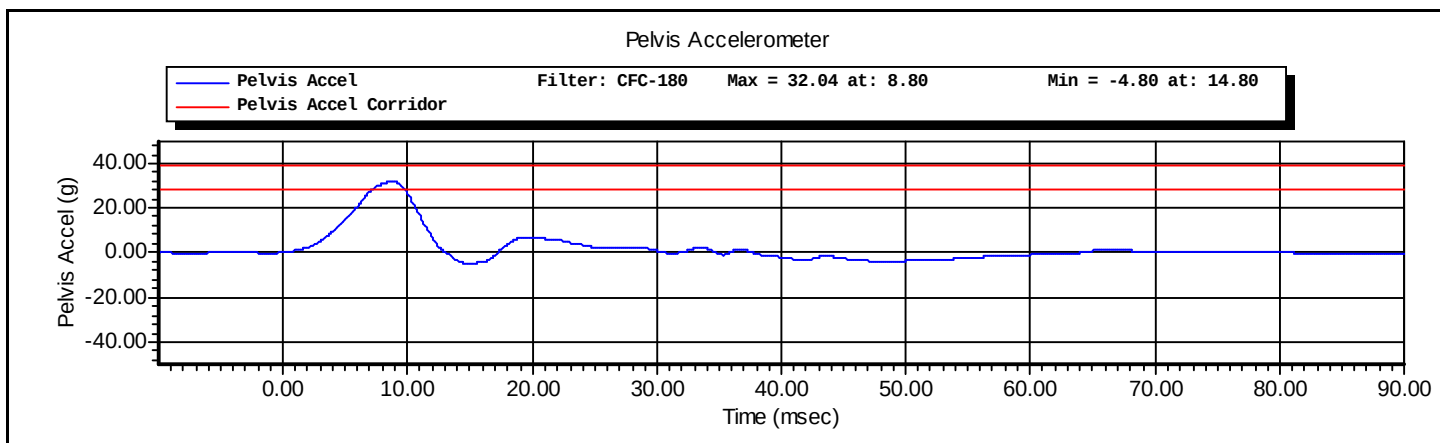
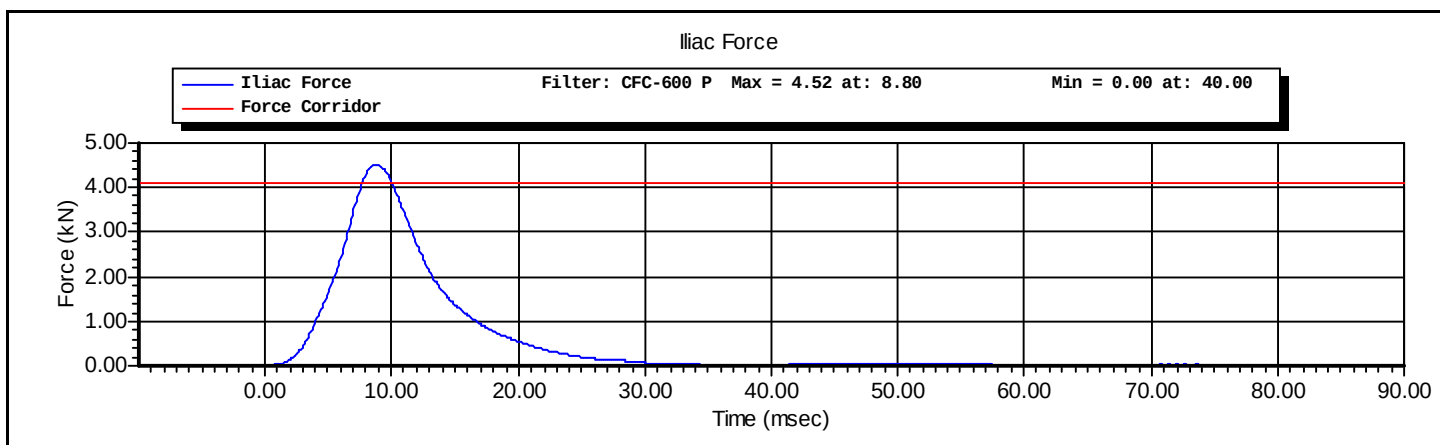


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Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Pelvis Iliac	Test Date:	8/17/2010
Test Number:	1	Test Time:	11:03:29 AM



Test ID: **Pelvis Iliac**

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

Test Date: **8/17/2010**

