

REPORT NUMBER: SNCAP-CAL-11-020

**NEW CAR ASSESSMENT PROGRAM (NCAP)
Moving Deformable Barrier Side Impact Test**

**Chrysler Group LLC
2011 Ram 1500 Quad Cab
4 Door Pickup**

NHTSA NUMBER: MB0304

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



December 13, 2010

FINAL REPORT

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

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FINAL REPORT ACCEPTANCE BY OCWS:

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

Date: _____

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

Date: _____

Technical Report Documentation Page

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15. Supplementary Notes																																														
16. Abstract A 55/28 kph 90° Moving Deformable Barrier NCAP Side Impact Test was conducted on the subject 2011 Ram 1500 Quad Cab 4 Door Pickup in accordance with the specifications of the Office of Crashworthiness Standards Test Procedure for the generation of consumer information on vehicle side crash protection. This test was conducted at the Calspan Corporation Crash Test Facility in Buffalo, New York, on 10/20/2010. The impact velocity of the Moving Deformable Barrier (MDB) was 62.2 km/h, and the ambient temperature at the struck side (driver side) of the vehicle was 22°C. The target vehicle's maximum post-test static crush was 266 mm at level 1. The test vehicle's performance was as follows: <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="4" style="text-align: center;">Driver ATD (ES-2re)</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 (HIC₃₆)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">11.957</td> </tr> <tr> <td>Maximum Chest Deflection</td> <td style="text-align: center;">mm</td> <td style="text-align: center;">44</td> <td style="text-align: center;">30.112</td> </tr> <tr> <td>Total Abdominal Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">2500</td> <td style="text-align: center;">574.574</td> </tr> <tr> <td>Pubic Symphysis Force</td> <td style="text-align: center;">N</td> <td style="text-align: center;">6000</td> <td style="text-align: center;">744.739</td> </tr> </tbody> </table> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 10px;"> <thead> <tr> <th colspan="4" style="text-align: center;">Passenger 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 (HIC₃₆)</td> <td style="text-align: center;">N/A</td> <td style="text-align: center;">1000</td> <td style="text-align: center;">26.044</td> </tr> <tr> <td>Lower Spine Resultant Acceleration</td> <td style="text-align: center;">G</td> <td style="text-align: center;">82</td> <td style="text-align: center;">21.169</td> </tr> <tr> <td>Total Pelvic Force (sum of acetabular and iliac forces)</td> <td style="text-align: center;">N</td> <td style="text-align: center;">5525</td> <td style="text-align: center;">546.862</td> </tr> </tbody> </table>			Driver ATD (ES-2re)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	11.957	Maximum Chest Deflection	mm	44	30.112	Total Abdominal Force	N	2500	574.574	Pubic Symphysis Force	N	6000	744.739	Passenger ATD (SID-IIs)				Measurement Description	Units	Threshold	Result	Head Injury Criteria (HIC ₃₆)	N/A	1000	26.044	Lower Spine Resultant Acceleration	G	82	21.169	Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	546.862
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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 MDB ES-2re 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 Room W43-410 Washington, D.C. 20590																																												

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TABLE OF CONTENTS

<u>Section</u>		<u>Page No.</u>
1	Purpose and Summary of the Test	1-1
2	Occupant and Vehicle Information/Data Sheets	2-1
<u>Data Sheet No.</u>		<u>Page No.</u>
1	General Test and Vehicle Parameter Data	2-2
2	Seat Adjustment, Fuel Systems, and Steering Wheel Data	2-5
3	Dummy Longitudinal Clearance Dimensions	2-7
4	Dummy Lateral Clearance Dimensions	2-8
5	Camera Locations and Data	2-9
6	Vehicle Accelerometer Locations	2-10
7	Moving Deformable Barrier Accelerometer Locations	2-11
8	Test Vehicle Summary of Results	2-12
9	Moving Deformable Barrier Summary of Results	2-13
10	Post Test Observations	2-14
11	Vehicle Profile Measurements	2-15
12	Vehicle Exterior Crush Measurements	2-16
13	Vehicle Damage Profile Distances	2-19
14	Exterior Static Crush for Impactor Face	2-20
15A	FMVSS No. 301 Fuel System Integrity Post-Impact Data	2-21
16	Dummy/Vehicle Temperature Stabilization	2-22
<u>Appendix</u>		<u>Page No.</u>
A	Photographs	A-1
B	Dummy Response Data	B-1
C	Dummy Calibration Data	C-1

PURPOSE

This moving deformable barrier side impact test is part of the MY 2011 New Car Assessment Program Side Impact Test Program, sponsored by the National Highway Traffic Safety Administration (NHTSA), under contract number DTNH22-09-D-00126. The purpose of this test is to generate comparative side impact performance in a 2011 Ram 1500 Quad Cab 4 Door Pickup. The side impact test was conducted in accordance with the Office of Crashworthiness Standard's Laboratory Test Procedure dated January 2010.

SUMMARY

A 2011 Ram 1500 Quad Cab 4 Door Pickup was impacted on the left (driver's) side by a Moving Deformable Barrier (MDB) which was moving forward in a 27° crabbed position to the tow road guidance system at a velocity of 62.2 km/h (39 mph). The target vehicle was stationary and was positioned at an angle of 63° to the line of forward motion. The side impact test was conducted by the Calspan Corporation Transportation Sciences Center on 10/20/2010. Pretest and post- test photographs of the test vehicle, the MDB and the dummies (ES-2re and SID-IIs) are included in this report.

Dummies were placed in the driver and left rear designated seating positions according to instructions specified in the OCWS Side Impact Laboratory Test Procedure, dated January 2010. The side impact event was documented by 11 high-speed cameras. Camera locations are included in this report.

The Dummies were instrumented in the following manner:

DRIVER ATD (ES-2re)

- Head Accelerometers
- Thorax Rib 1 to Rib 3 Potentiometers
- Abdomen Forward, Middle, and Rear Load Cells
- Pubic Load Cell
- Lower Spine Accelerometers

PASSENGER ATD (SID-IIs)

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

Dummy injury values were recorded as follows:

	Driver ATD (ES-2re)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	11.957
Maximum Chest Deflection	mm	44	30.112
Total Abdominal Force	N	2500	574.574
Pubic Symphysis Force	N	6000	744.739

	Passenger ATD (SID-IIs)		
Measurement Description	Units	Threshold	Result
Head Injury Criteria (HIC ₃₆)	N/A	1000	26.044
Lower Spine Resultant Acceleration	G	82	21.169
Total Pelvic Force (sum of acetabular and iliac forces)	N	5525	546.862

Supplemental restraint information is given below:

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	NA	NA		
Side Curtain Airbag	Yes	Yes	Curtain	Yes
Seat Belt Pretensioner	Yes	No	NA	NA
Seat Belt Load Limiter	NA	NA	NA	NA
Other	NA	NA	NA	NA

GENERAL COMMENTS

SECTION 2
DATA SHEETS

DATA SHEET NO. 1
GENERAL TEST AND VEHICLE PARAMETER DATA

Test Vehicle: 2011 Ram 1500 Quad Cab
Test Program: Side MDB NCAP

NHTSA No.: MB0304
Test Date: 10/20/2010

TEST VEHICLE INFORMATION AND OPTIONS

NHTSA No.	MB0304	Anti-Lock Brakes	Yes
Model Year	2011	All-Wheel Drive	No
Make	Ram	Power Steering	Yes
Model	1500 Quad Cab	Driver Front Airbag	Yes
Body Style	4 Door Pickup	Driver Curtain Airbag	Yes
VIN	1D7RB1GK8BS514805	Driver Head/Torso Airbag	No
Body Color	Light gray/silver	Driver Torso Airbag	No
Delivery Date	09/10/2010	Driver Torso/Pelvis Airbag	No
Odometer Reading (km/mi)	9	Driver Pelvis Airbag	No
Dealer	C. R. Motor Sales, INC	Driver Knee Airbag	No
Transmission	4-speed Automatic	Rear Pass. Curtain Airbag	Yes
Final Drive	Rear Wheel Drive	Rear Pass. Head/Torso Airbag	No
Type/No. Cylinders	v6	Rear Pass. Torso Airbag	No
Engine Displacement (L)	3.7	Rear Pass. Torso/Pelvis Airbag	No
Engine Placement	Transverse	Rear Pass. Pelvis Airbag	No
Roof Rack	No	Pretensioners	Yes
Sunroof/T-Top	No	Load Limiters	No
Tinted Glass	Yes	Automatic Door Locks	No
Traction Control	Yes	Bucket Seats	No
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	Chrysler Group LLC	GWR (kg)	3040
Date of Manufacture	8/10	GWR Front (kg)	1679
		GWR Rear (kg)	1770

VEHICLE SEATING AND CAPACITY WEIGHT INFORMATION

Measured Parameter	Front	Rear	Third	Total	
Designated Seating Capacity (DSC)	3	3		6	
Capacity Weight (VCW) (kg)				824.0	(A)
DSC x 68.04 (kg)				408.2	(B)
Cargo Weight (RCLW) (kg)				416	(A-B)

* Maximum allowable RCLW is 136 kg

VEHICLE SEAT TYPE

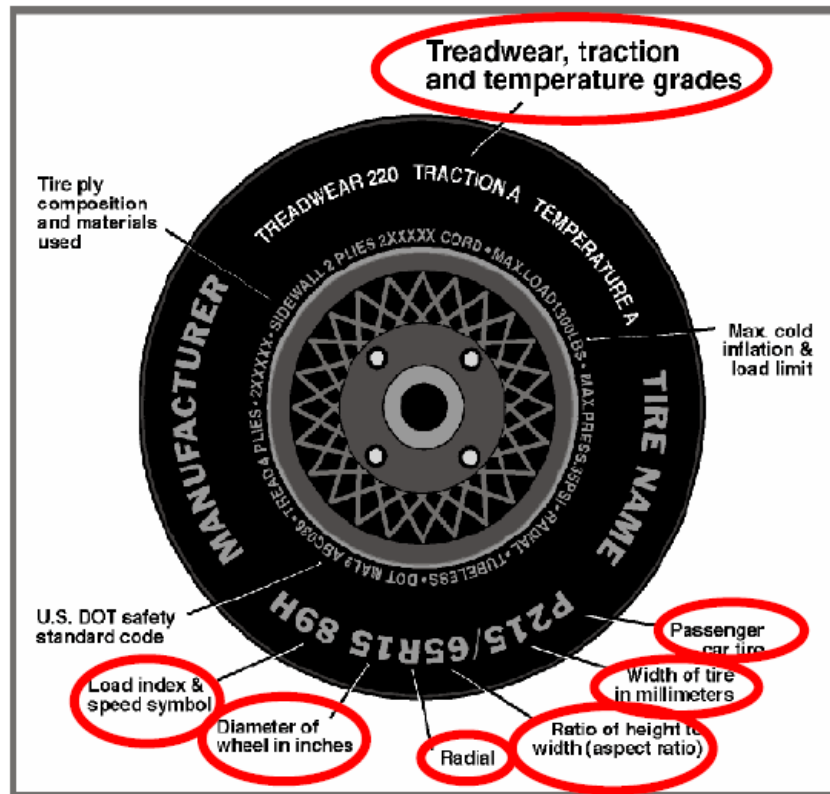
Seating Location	Type of Seat Pan				Type of Seat Back		
	Bucket	Bench	Split Bench	Contoured	Fixed	Adjustable	
						W/ Lever	W/ Knob
Front Seat			X			X	
Rear or Second Row Seat		X			X		
Third row seat							

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

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010

VEHICLE TIRE INFORMATION



	Front	Rear
Max. Tire Pressure (kPa)	300	300
Cold Pressure (kPa)	276	276
Recommended Tire Size	P265/70R17	P265/70/R17
Tire Size on Vehicle	P265/70R17	17"
Tire Manufacturer	Goodyear	Goodyear
Tire Model	Wrangler SRA	Wrangler SRA
Treadwear	500	500
Traction	A	a
Temperature Grades	B	b
Tire Plies Sidewall	2 polyester cord	2 polyester cord
Tire Plies Body	2 polyester cord + 2 steel cord	2 polyester cord + 2 steel cord
Load Index/Speed Symbol	113R	113R
Tire Material		
DOT Safety Code Right	4BT6EXWR2610	4BT6EXWR2610
DOT Safety Code Left	4BT6EXWR2610	4BT6EXWR2610

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

Test Vehicle: 2011 Ram 1500 Quad Cab
Test Program: Side MDB NCAP

NHTSA No.: MB0304
Test Date: 10/20/2010

TEST VEHICLE AXLE WEIGHTS

	Units	As Delivered (UVW)			As Tested (ATW)			Fully Loaded		
		Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total	Front Axle	Rear Axle	Total
Left	kg	642	500	1142	697	596	1293	702	611	1313
Right	kg	600	485	1085	618	581	1199	601	580	1181
Ratio	%	56	44		53	47		52	48	
Totals	kg	1242	985	2227	1315	1177	2492	1303	1191	2494

TARGET TEST WEIGHT CALCULATION

Measured Parameter	Units	Value	
Total Delivered Weight (UVW)	kg	2227	(A)
Sum of Actual Weight of 2 P572 ATDS Used	kg	136.8	(B)
Rated Cargo/Luggage Weight (RCLW)	kg	415.8	(C)
Calculated Target Vehicle Test Weight (TVTW)	kg	2780	(A+B+C)

TEST VEHICLE ATTITUDE AND CG

Measurement Description	Units	LF	RF	RR	LR	CG (aft of front axle)
Fully Loaded	mm	901	910	959	952	
As Tested (Fully Loaded $\pm$ 10 mm at each wheel well)	mm	904	909	956	961	1685

GENERAL TEST VEHICLE DATA

Measurement Description	Units	Value
Total Vehicle Wheel Base	mm	3567
Total Vehicle Length at Left Side	mm	5742
Total Vehicle Length at Centerline	mm	5825
Total Vehicle Length at Right Side	mm	5740
Weight of Ballast in Cargo Area	kg	291
Weight of Vehicle Components Removed	kg	0
Amount of Stoddard Solvent in Fuel Tank	L	24

Vehicle components removed to make Target Vehicle Test Weight:

None

TEST VEHICLE VERTICAL IMPACT LINE DATA

Measured Parameter	Units	Value
Target Impact Point Aft of Front Axle	mm	508
Actual Impact Point Aft of Front Axle	mm	536

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

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010

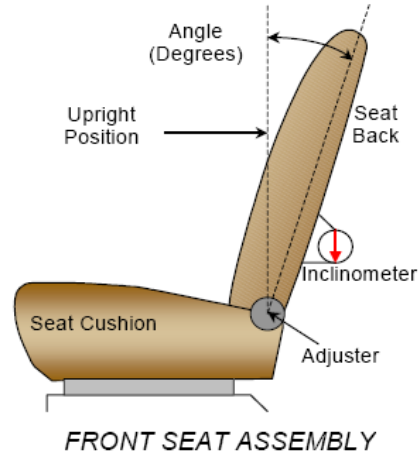
NORMAL DESIGN RIDING POSITION

Driver seat:

The driver's seat back was placed in the Nominal design position as specified in Form 1 provided by the manufacturer.

Passenger Seat:

The rear passenger seat back is fixed and is not adjustable.



SEAT BACK ANGLES

	Degrees
Driver w/ Seated Dummy	4.5
Passenger w/ Seated Dummy	0

SEAT FORE/AFT POSITIONS

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

Rear passenger seat was fixed

SEAT FORE/AFT POSITIONING

	Total Fore/Aft Travel	Placed in Position #
Driver Seat	240	12
Rear Seat	0	NA

SEAT BELT UPPER ANCHORAGES

The driver upper belt anchorage was placed in the midpoint of 5 positions.

The rear seat passenger's upper anchorage was fixed and not adjustable

SEAT BELT UPPER ANCHORAGES

	Total # of Positions	Placed in Position #
Driver Seat	5	2
Rear Seat	NA	NA

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

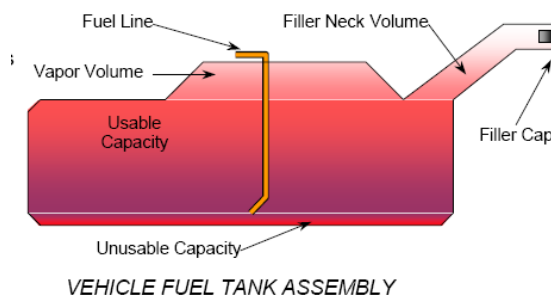
Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010

FUEL TANK CAPACITY

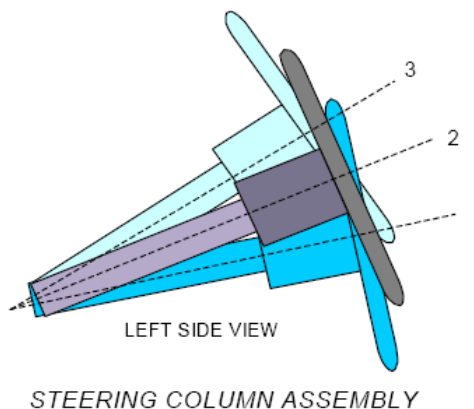
	Liters
Usable Capacity of "Standard Tank"	98.4
Usable Capacity of "Optional Tank"	121.1
Usable Capacity Used for FMVSS 301	93.5
Actual Amount of Solvent Used	90.8

The fuel was evacuated from the fuel tank using the specifications provided by the Manufacturer in FORM 1



STEERING COLUMN ADJUSTMENT

The steering wheel was positioned at the mid-point of the tilt adjustment range and the mid-point of the telescoping travel (if applicable)



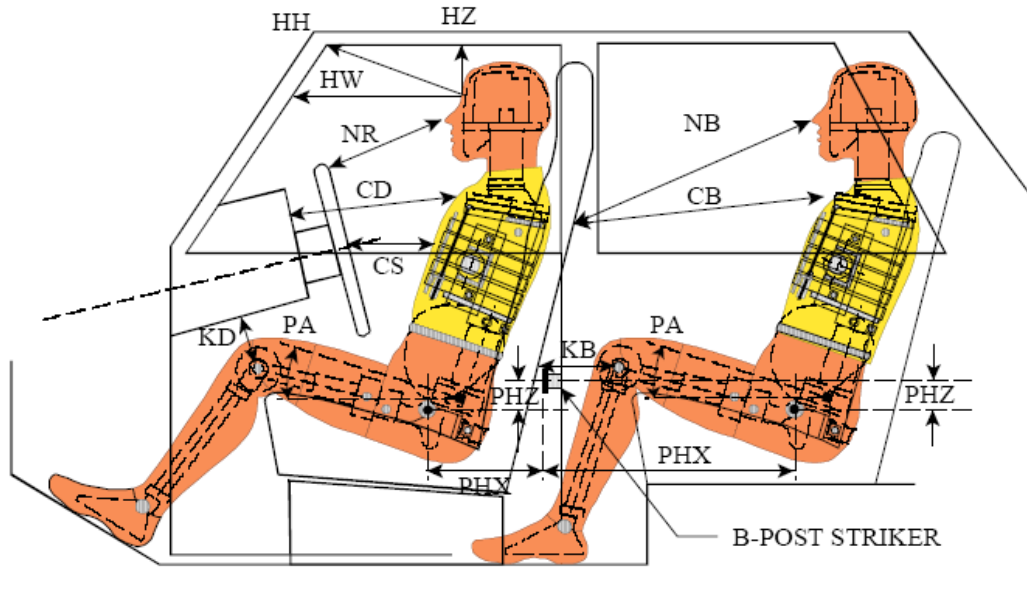
STEERING COLUMN POSITIONING

	Degrees	Fore/Aft Position (mm)
Lowermost - Position 1		
Geometric Center – Position 2	65	
Uppermost – Position 3		
Telescoping Steering Wheel Travel		NA
Test Position	65	NA

DATA SHEET NO. 3
DUMMY LONGITUDINAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010



LEFT SIDE VIEW

NOTE: 2-DOOR VEHICLE SHOWN.
 REAR DUMMY PHX & PHZ
 MEASUREMENTS FOR A 4-DOOR
 VEHICLE WOULD USE THE C-POST
 STRIKER AS A REFERENCE POINT

DUMMY LONGITUDINAL CLEARANCE DIMENSION INFORMATION

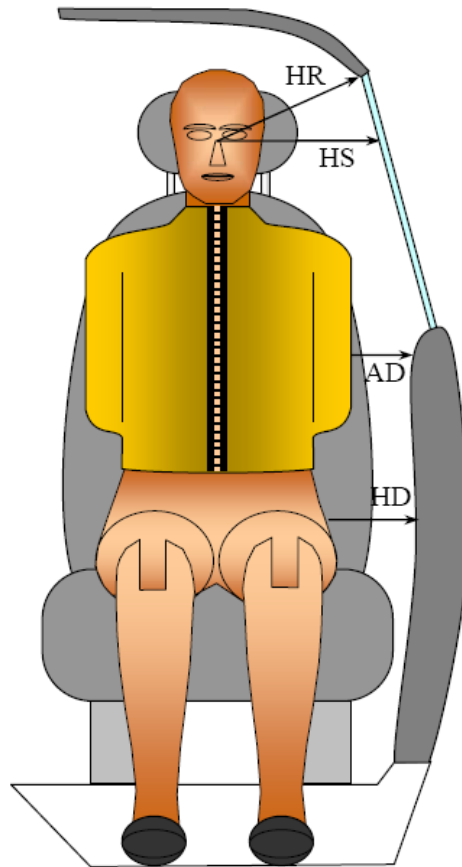
Driver Code	Pass. Code	Measurement Description	Driver S/N 033		Passenger S/N 304	
			Length (mm)	Angle	Length (mm)	Angle
HH		Header to Header	493	13		
HW		Header to Windshield	69	0		
HZ	HZ	Head to Roof	211	90	280	90
NR	NB	Nose to Rim/Seat Back	485	-17	403	-21
CD	CB	Chest to Dash/Seat Back	608	0	410	0
CS		Chest to Steering Wheel	319	0		
KDL	KBL	Left Knee to Dash/Seat Back	167	31	192	18
KDR	KBR	Right Knee to Dash/Seat Back	144	26	190	20
PA	PA	Pelvic Angle		22		15
PHX	PHX	H-Point to Striker (X-Axis)	184		170	
PHZ	PHZ	H-Point to Striker (Z-Axis)	10		201	
SA	SA	Seat Back Angle		4.5 *		0

* Measurement from the head restraint post

DATA SHEET NO. 4
DUMMY LATERAL CLEARANCE DIMENSIONS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010



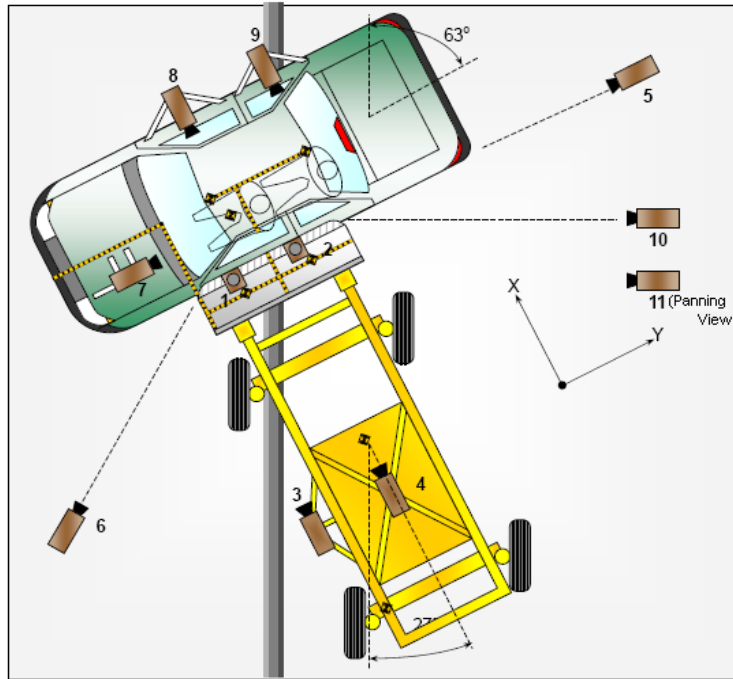
DUMMY LATERAL CLEARANCE DIMENSION INFORMATION

Code	Description	Units	Driver S/N 033	Passenger S/N 304
HR	Head to Side Header	mm	188	249
HS	Head to Side Window	mm	327	382
AD	Arm to Door	mm	105	153
HD	H-point to Door	mm	145	160

DATA SHEET NO. 5
CAMERA LOCATIONS AND DATA

Test Vehicle: 2011 Ram 1500 Quad Cab
Test Program: Side MDB NCAP

NHTSA No.: MB0304
Test Date: 10/20/2010



CAMERA LOCATIONS AND DATA

No.	Camera View	Location			Angle	Lens (mm)	Film Speed (fps)
		X	Y	Z			
1	Overhead Wide View	72	812	-4880	-90	20	1000
2	Overhead Close-up View	195	855	-4880	-90	28	1000
3	Impact Point	-1470	0	-847	0	25	500
4	Struck-Side View at Impact	-1140	838	-1587	-17	12.5	500
5	Rear Impact View of Struck Side	3860	310	940	-3	50	1000
6	Front Oblique Impact View of Struck Side	2801	295	930	-2	28	1000
7	Driver Dummy Front View (OB)	515	490	1610	-12	25	500
8	Driver Dummy Side View (OB)	1645	785	1120	-4	12.5	500
9	Rear Passenger Dummy Side View (OB)	1660	1590	1120	-1	12.5	500
10	Real-time Rear View of Impact				-	-	24
11	Real-time Pan View of Impact				-	-	24

Reference: Impact Point projected to Ground

+X = To Front of MDB,

+Y = To Right of MDB,

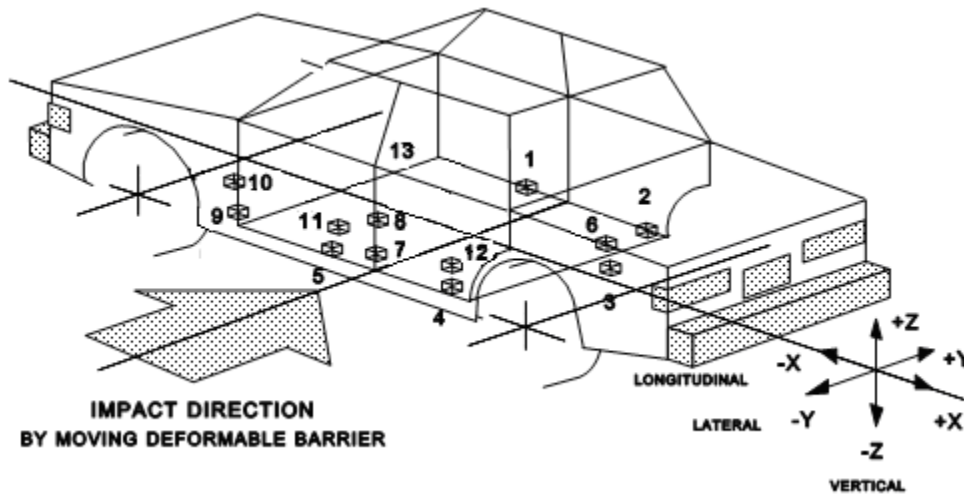
+Z = Down

**All measurements accurate to ± 6 mm.*

DATA SHEET NO. 6
VEHICLE ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Ram 1500 Quad Cab
Test Program: Side MDB NCAP

NHTSA No.: MB0304
Test Date: 10/20/2010



VEHICLE ACCELEROMETER PRE-TEST LOCATIONS

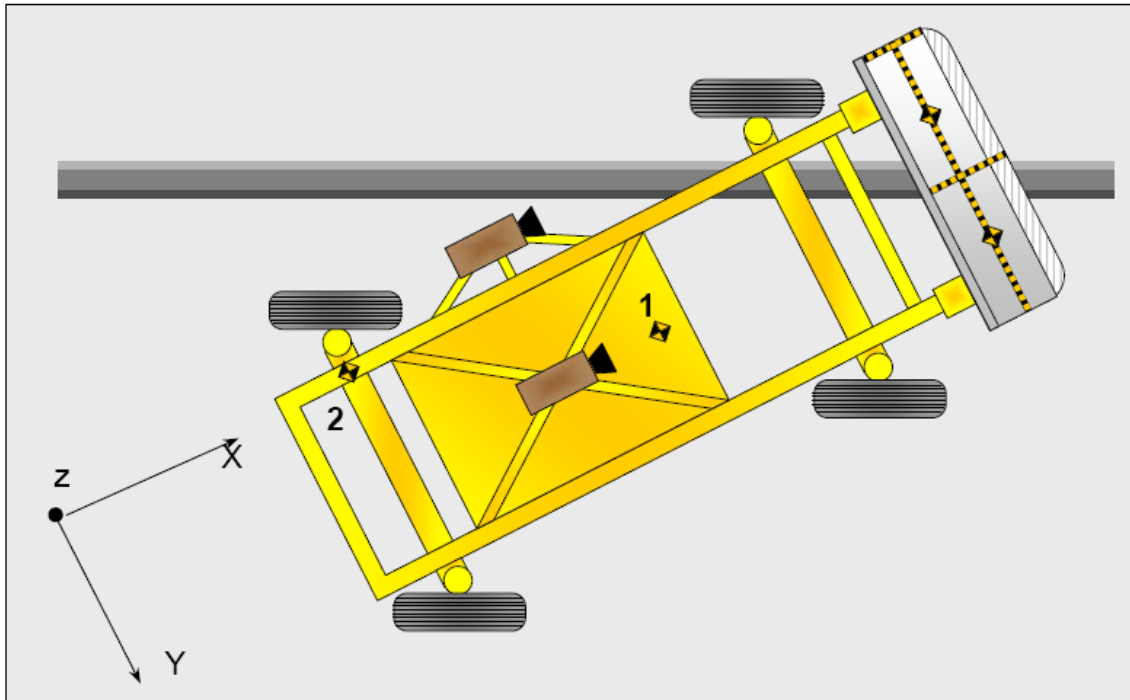
Loc. No.	Accelerometer Location	Measurements (mm)		
		X	Y	Z
1	Right Sill at Front Seat	3881.0	760.0	539.0
2	Right Sill at Rear Seat	2760.0	757.0	583.0
3	Rear Floorpan Above Axle	1171.0	1.0	802.0
4	Left Sill at Rear Door	2755.0	-752.0	579.0
5	Left Sill at Front Door	3794.0	-753.0	545.0
6	Rt. Rear Occ. Compartment	3017.0	475.0	577.0
7	B-Post Lower	3084.0	-762.0	634.0
8	B-Post Middle	3058.0	-793.0	1258.0
9	A-Post Lower	4151.0	-781.0	589.0
10	A-Post Middle	4088.0	-750.0	1370.0
11	Front Seat Track	3195.0	-647.0	630.0
12	Rear Seat Structure	2534.0	-762.0	769.0
13	Vehicle CG	3664.0	35.0	708.0

Reference: X – Rear surface of vehicle (+ forward)
Y – Vehicle centerline (+ to right)
Z – Ground plane (+ down)

DATA SHEET NO. 7
MDB ACCELEROMETER LOCATIONS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010



MDB ACCELEROMETER LOCATIONS

Loc No.	Accelerometer Locations	Measurements		
		X	Y	Z
1	MDB CG	1859	0	-330
2	MDB Rear	386	-660	-660

Reference: X – Face of MDB (+ forward)
 Y – MDB centerline (+ to right)
 Z – Ground plane (+ Down)

DATA SHEET NO. 8
TEST VEHICLE SUMMARY OF RESULTS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010

MAXIMUM EXTERIOR STATIC CRUSH

Level	Measured Parameter	Units	Maximum Crush	Above Ground
1	Sill Top Height	mm	266	376
2	Occupant H-Point	mm	201	716
3	Mid Door	mm	159	883
4	Window Sill	mm	72	1180
5	Window Top	mm	5	1805
	Maximum Penetration	mm	266	

INSTRUMENTATION

Driver Dummy Channels	16
Passenger Dummy Channels	16
Vehicle Structure Accelerometers	21
MDB Accelerometers	5
Total No. of Contact Switches	0 *
Total	58

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

CAMERA COVERAGE

High-Speed Vehicle Onboard	3
High-Speed Offboard	4
High-Speed MDB Onboard	2
Real-Time Panning	2
Total	11

DATA SHEET NO. 9
MOVING DEFORMABLE BARRIER (MDB) SUMMARY OF RESULTS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010

MDB SPECIFICATIONS

Measurement Description	Length (mm)
Overall Width of Framework Carriage	1250
Overall Length Including Honeycomb Frame	4120
Wheel Base of Framework Carriage	2590
CG Location of Front Axle	1104

MDB WEIGHTS

	Units	Front Axle	Rear Axle	Total
Left	kg	409.5	281.5	691.0
Right	kg	372.5	299.0	671.5
Ratio	%	57.4	42.6	-
Totals	kg	782.0	580.5	1362.5

SPEED AND IMPACT DATA

Measured Parameter	Units	Requirement	Value
Trap No. 1 Velocity (Primary)	km/h	61.1 to 62.7	62.2
Trap No. 2 Velocity (Redundant)	km/h	61.1 to 62.7	62.2
MDB CL to Target Vehicle CL	degrees	88.5 to 91.5	90

MAXIMUM STATIC CRUSH OF HONEYCOMB IMPACT FACE

Vertical Location			From Centerline		Maximum Crush
Row	Description	Height	Distance	Direction	
A	Center of Bumper	430	800	Left	81
B	Top of Bumper	542	800	Left	98
C	Mid-Level	682	800	Right	136
D	Top of Stack	811	800	Right	209

MDB INSTRUMENTATION

Accelerometers	5
Contact Switches	2

**DATA SHEET NO. 10
POST TEST OBSERVATIONS**

Test Vehicle: 2011 Ram 1500 Quad Cab
Test Program: Side MDB NCAP

NHTSA No.: MB0304
Test Date: 10/20/2010

TEST DUMMY INFORMATION AND CONTACT

Description	Front Seat Dummy (ES-2re)	Rear Seat Dummy (SID-IIs)
Dummy Type/Serial No.	033	304
Head Contact	Curtain Airbag	curtain airbag
Upper Torso Contact	seat bolster / door panel trim	c pillar trim / door panel trim
Lower Torso Contact	seat bolster/ door panel trim	c pillar trim / door panel trim
Left Knee Contact	door panel trim	door panel trim
Right Knee Contact		

POST TEST DOOR OPENING AND SEAT TRACK INFORMATION

Description	Front	Rear
Left Side Doors	Jammed Shut (0 mm)	Jammed Shut (0 mm)
Right Side Doors	Closed & Operational (0 mm)	Closed & Operational (0 mm)
Hatch and Other Doors	Latched, Off Hinge (0 mm)	
Seat Movement	No	No
Seat Back Failure	No	No

POST TEST STRUCTURAL OBSERVATIONS

Critical Areas of Performance	Observations and Conclusions
Pillar Performance	Intruded due to side impact
Sill Separation	None
Windshield Damage	None
Window Damage	None
Other Notable Effects	

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	NA	NA		
Curtain Airbag	Yes	Yes	Yes	Yes
Seat Belt Pretensioner	Yes	No	NA	NA
Seat Belt Load Limiter	NA	NA	NA	NA
Other	NA	NA	NA	NA

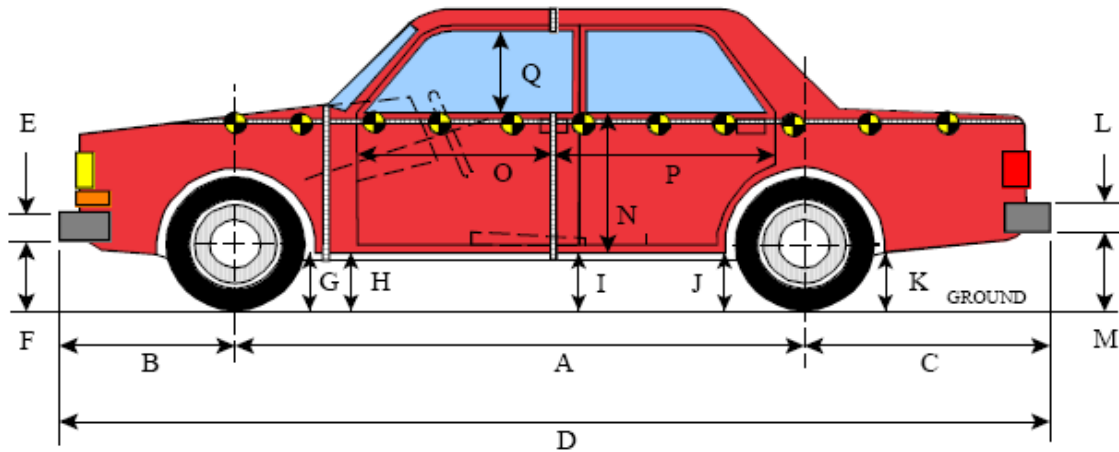
MDB LEFT EDGE IMPACT POINT DATA

Measured Parameter	Units	Requirement	Value
Horizontal Offset	mm	+/- 50	-17
Vertical Offset	mm	+/- 20	-28

DATA SHEET NO. 11
VEHICLE PROFILE MEASUREMENTS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010



LEFT SIDE VIEW

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

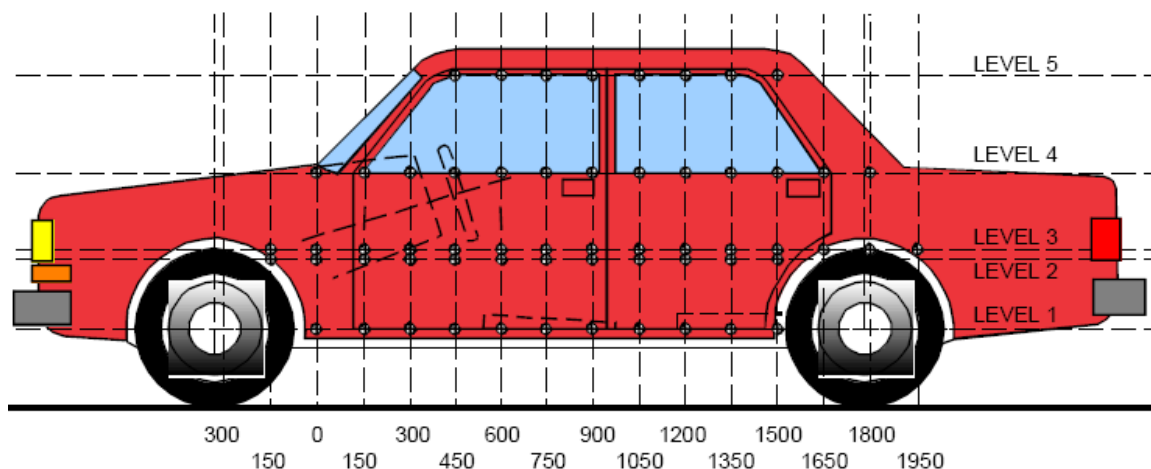
VEHICLE PRE- AND POST-TEST MEASUREMENT INFORMATION

Code	Description	Pre-Test	Post-Test	Difference
A	Wheelbase	3567	3537	-30
B	Front Axle to FSOV	1027	1043	16
C	Rear Axle to RSOV	1232	1241	9
D	Total Length at Centerline	5825	5820	-5
E	Front Bumper Thickness	364	364	0
F	Front Bumper Bottom to Ground	320	315	-5
G	Sill Height at Front Wheel Well	308	315	7
H	Sill Height at Front Door Leading Edge	314	321	7
I	Sill Height at B Pillar	330	347	17
J1	Sill Height at Rear Wheel Well	339	341	2
J2	Pinch Weld Height at Rear Wheel Well	365	315	-50
K	Sill Height Aft of Rear Wheel Well	415	421	6
L	Rear Bumper Thickness	590	590	0
M	Rear Bumper Bottom to Ground	495	486	-9
N	Sill Height to Window Bottom Sill	865	852	-13
O	Front Door Leading Edge to Impact CL	837	847	9
P	Rear Door Trailing Edge to Impact CL	1117	1091	-26
Q	Front Window Opening	507	504	-3
R	Right Side Length	5740	5753	12
S	Left Side Length	5742	5710	-32
T	Vehicle Width at B Post	2011	1878	-134

DATA SHEET NO. 12
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010



LEFT SIDE VIEW

Level	Measurement Description	Height Above Ground (mm)
1	Sill Top	376
2	Occupant H-Point	716
3	Mid-Door	883
4	Window Sill	1180
5	Window Top	1805

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. 12 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010

	Pre-Test					Post-Test					Difference				
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
-900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-750	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
-600	--	--	--	855	--	--	--	--	869	--	--	--	--	-14	--
-450	--	--	1007	878	--	--	--	990	891	--	--	--	17	-13	--
-300	--	--	1011	901	--	--	--	984	913	--	--	--	27	-12	--
-150	--	--	1014	920	--	--	--	979	914	--	--	--	35	6	--
0	--	1005	1005	935	--	--	945	970	920	--	--	60	35	15	--
150	930	1001	1010	946	--	766	890	938	939	--	164	111	72	7	--
300	930	1000	1008	953	--	741	857	914	943	--	189	143	94	10	--
450	931	999	1007	956	--	728	855	875	941	--	203	144	132	15	--
600	929	1000	1007	960	--	717	846	866	939	--	212	154	141	21	--
750	929	1001	1007	965	--	706	813	861	937	--	223	188	146	28	--
900	928	1002	1008	969	709	706	801	849	934	710	222	201	159	35	-1
1050	929	1003	1010	973	718	711	811	874	928	719	218	192	136	45	-1
1200	930	1002	1009	974	722	699	845	873	902	725	231	157	136	72	-3
1350	924	1002	1010	977	724	679	806	877	924	729	245	196	133	53	-5
1500	919	1001	1010	979	730	664	811	893	947	733	255	190	117	32	-3
1650	917	1000	1010	981	732	651	849	899	969	731	266	151	111	12	1
1800	916	1000	1009	982	735	666	863	921	990	730	250	137	88	-8	5
1950	900	993	1006	977	720	739	872	961	955	719	161	121	45	22	1
2100	904	990	1001	972	--	926	1018	1028	1005	--	-22	-28	-27	-33	--
2250	894	993	1006	978	--	925	1028	1043	1017	--	-31	-35	-37	-39	--
2400	886	994	1010	984	--	923	1036	1053	1030	--	-37	-42	-43	-46	--
2550	--	994	1011	989	--	--	1043	1062	1043	--	--	-49	-51	-54	--
2700	--	--	1010	994	--	--	--	1068	1054	--	--	--	-58	-60	--
2850	--	--	--	997	--	--	--	--	1065	--	--	--	--	-68	--

MAXIMUM CRUSH DATA

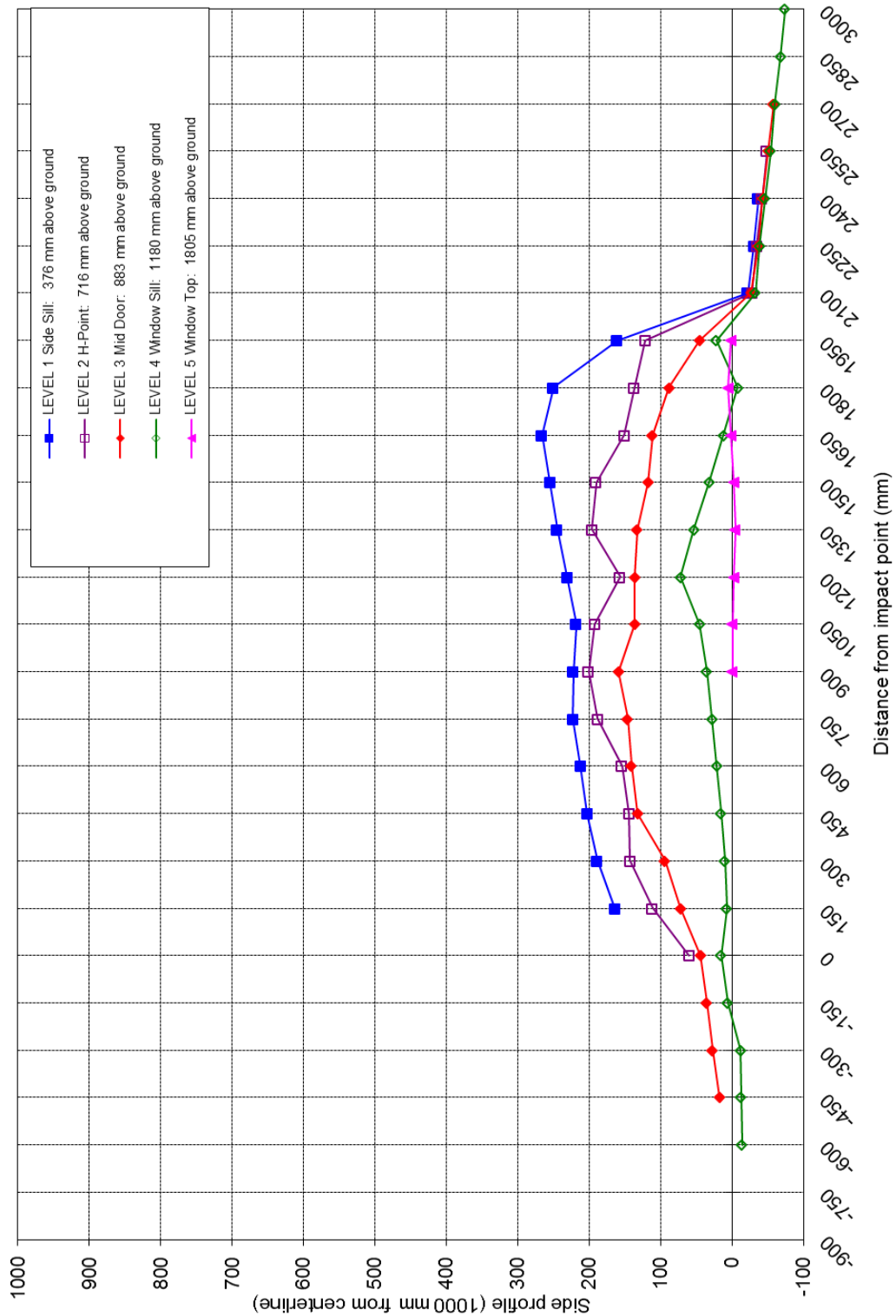
	Level 1	Level 2	Level 3	Level 4	Level 5
Maximum Crush (mm)	266	201	159	72	5
Distance From Impact (mm)	1650	900	900	1200	1800

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.

DATA SHEET NO. 12 (CONTINUED)
VEHICLE EXTERIOR CRUSH MEASUREMENTS

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

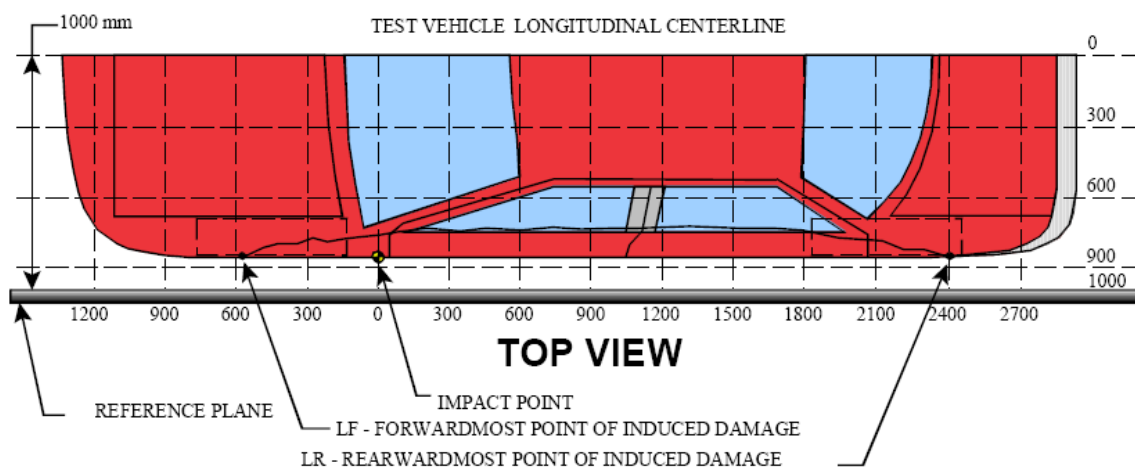
NHTSA No.: MB0304
 Test Date: 10/20/2010



DATA SHEET NO. 13
VEHICLE DAMAGE PROFILE DISTANCES

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010



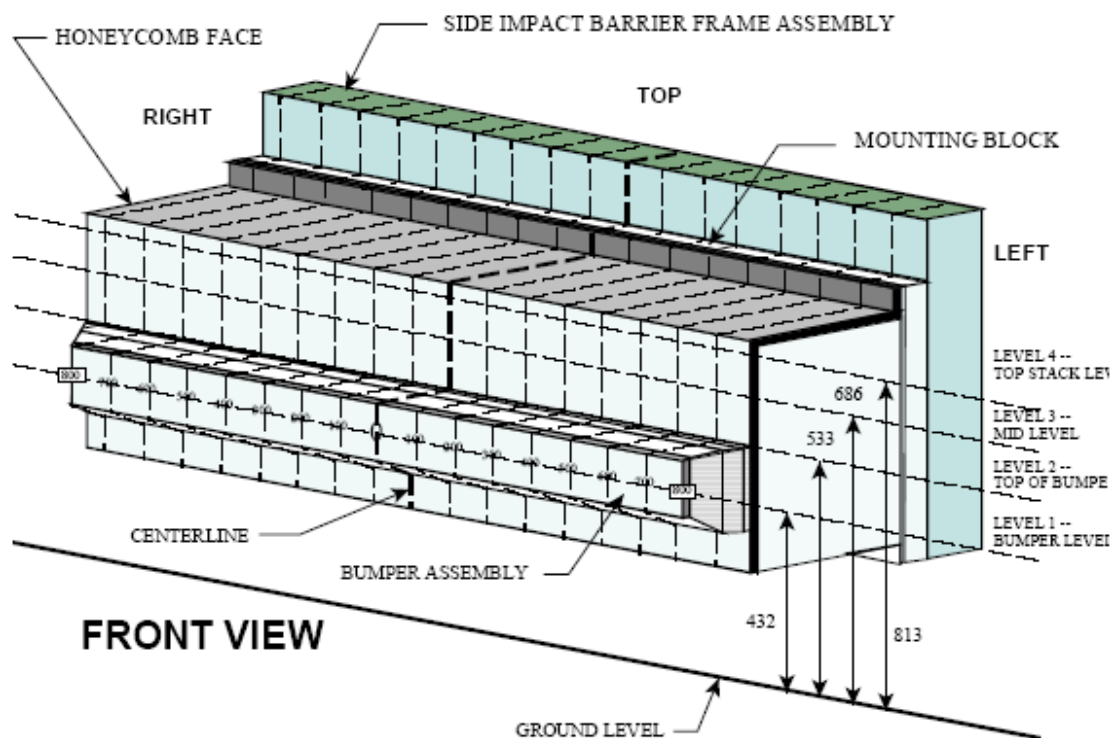
DAMAGE PROFILE DISTANCES

DPD	Distance From Impact Point (mm)	Level	Pre-Test (mm)	Post-Test (mm)	Maximum Static Crush (mm)
1	2550	3	-11	-62	-51
2	2010	1	98	186	88
3	1470	1	80	333	253
4	930	1	72	293	221
5	0	1	69	267	198
6	-150	3	-14	21	35

DATA SHEET NO. 14
EXTERIOR STATIC CRUSH FOR IMPACTOR FACE

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010



NOTE: Dimensions are shown in millimeters, mm

DEFORMABLE BARRIER STATIC CRUSH

Stack Level	Distance Right of Center								C/L	Distance Left of Center							
	800	700	600	500	400	300	200	100		100	200	300	400	500	600	700	800
1	76	51	42	45	49	55	59	65	70	66	56	59	64	67	72	77	81
2	74	67	65	68	72	73	66	60	59	55	58	63	84	88	91	95	98
3	136	102	77	51	38	35	52	62	56	47	40	37	38	40	41	46	61
4	209	178	141	102	79	81	111	120	82	66	70	74	73	67	75	87	108

DATA SHEET NO. 15A
FMVSS NO. 301 FUEL SYSTEM INTEGRITY POST-IMPACT DATA

Test Vehicle: 2011 Ram 1500 Quad Cab
 Test Program: Side MDB NCAP

NHTSA No.: MB0304
 Test Date: 10/20/2010

Test Time: _____ Temperature: 22° 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 NO. 301 STATIC ROLLOVER DATA



ROLLOVER SOLVENT COLLECTION TIME TABLE IN SECONDS

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

FMVSS NO. 301 ROLLOVER SPILLAGE TABLE

Test Phase	First 5 Minutes	Sixth Minute	Seventh Minute	Eighth Minute
0 to 90	None	NA	NA	NA
90 to 180	None	NA	NA	NA
180 to 270	None	NA	NA	NA
270 to 360	None	NA	NA	NA

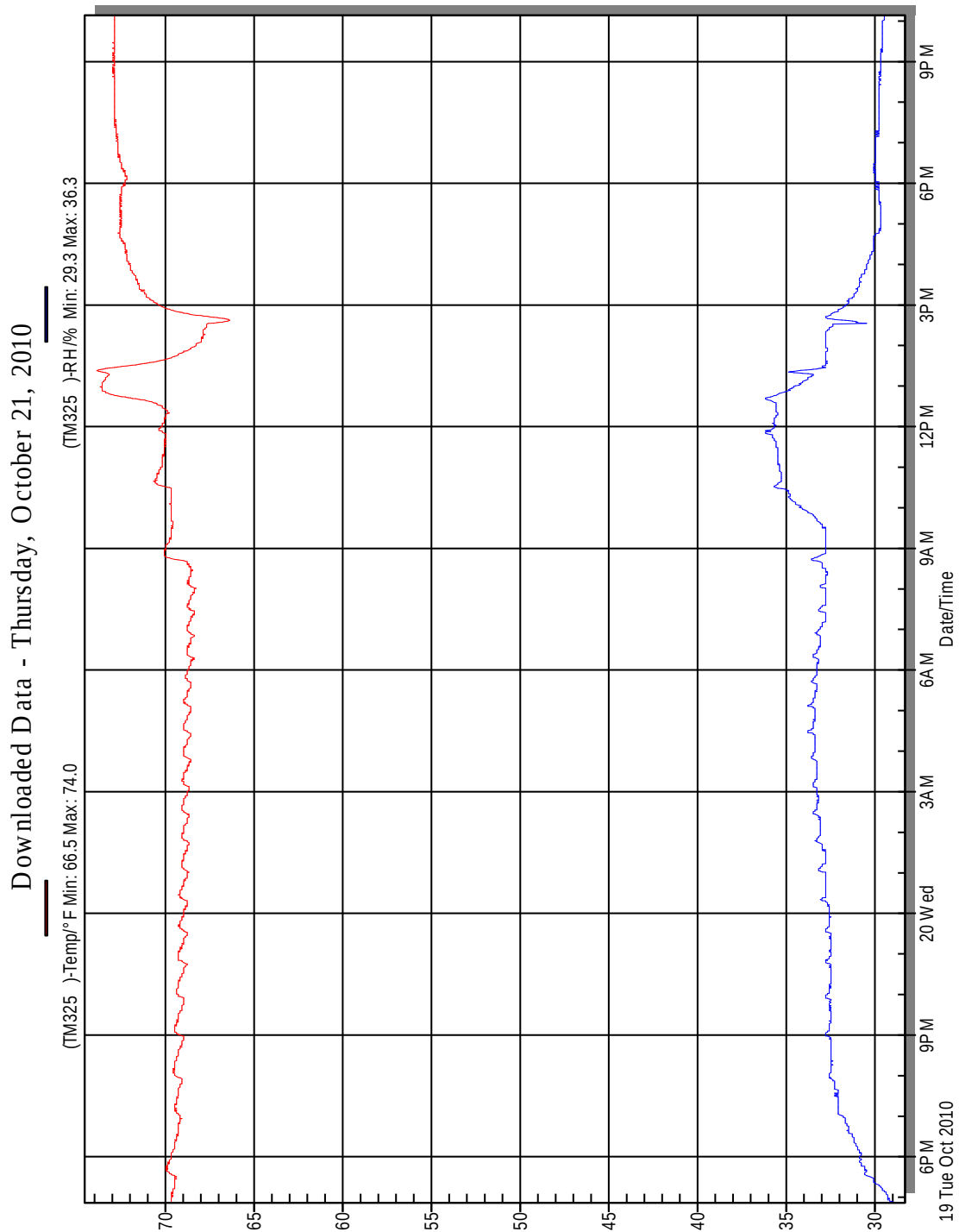
ROLLOVER SOLVENT SPILLAGE LOCATION TABLE

Test Phase	Spillage Location
0 to 90	NA
90 to 180	NA
180 to 270	NA
270 to 360	NA

DATA SHEET NO. 16
DUMMY/VEHICLE TEMPERATURE STABILIZATION

Test Vehicle: 2011 Ram 1500 Quad Cab
Test Program: Side MDB NCAP

NHTSA No.: MB0304
Test Date: 10/20/2010



APPENDIX A
PHOTOGRAPHS

TABLE OF PHOTOGRAPHS

No.	Description	Page
001	As-Delivered Right Front $\frac{3}{4}$ View of Test Vehicle	A-5
002	As-Delivered Left Rear $\frac{3}{4}$ View of Test Vehicle	A-5
003	Pre-test Frontal View of the Test Vehicle	A-6
004	Post-test Frontal View of Test Vehicle	A-6
005	Pre-test Left Front $\frac{3}{4}$ View of Test Vehicle	A-7
006	Post-test Left Front $\frac{3}{4}$ View of Test Vehicle	A-7
007	Pre-test Left Side View of Test Vehicle	A-8
008	Post-test Left Side View of Test Vehicle	A-8
009	Pre-test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-9
010	Post-test Left Rear $\frac{3}{4}$ View of Test Vehicle	A-9
011	Pre-test Rear View of Test Vehicle	A-10
012	Post-test Rear Side View of Test Vehicle	A-10
013	Pre-test Right Side View of Test Vehicle	A-11
014	Post-test Right Side View of Test Vehicle	A-11
015	Pre-test Overhead View of the Test Vehicle with MDB Positioned Against the Side of the Test Vehicle at Ideal Impact Point	A-12
016	Post-test Overhead View of Test Vehicle and MDB	A-12
017	Pre-test Left Side View of MDB Positioned Against Side of Test Vehicle at Ideal Impact Point	A-13
018	Pre-test Right Side View of MDB Positioned Against Side of Test Vehicle at Ideal Impact Point	A-13
019	Pre-test Close-up View of Impact Point Target	A-14
020	Post-test Close-up View of Impact Point Target Showing Impact Point Location	A-14
021	Pre-test Left Front Door Latch Close-up	A-15
022	Post-test Left Front Door Latch Close-up	A-15
023	Pre-test Left Rear Door Latch Close-up	A-16
024	Post-test Left Rear Door Latch Close-up	A-16
025	Pre-test Front Close-up View of Driver Dummy	A-17
026	Post-test Front Close-up View of Driver Dummy	A-17
027	Pre-test Left Side View of Driver Dummy Showing Belt, Chalking, and Contact Switches	A-18
028	Pre-test Left Side View of Driver Dummy Shoulder and Door Top View	A-18
029	Post-test Left Side View of Driver Dummy Shoulder and Door Top View	A-19
030	Pre-Test Frontal View of Driver Seat Back (Including Head Restraint) Prior to Dummy Positioning	A-19
031	Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint	A-20
032	Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning	A-20
033	Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan	A-21
034	Pre-Test Placement of Driver Dummy's Feet	A-21
035	Pre-Test View of Belt Anchorage for Driver Dummy to Show Position	A-22
036	Pre-Test Left Side View of Steering Wheel to Show Position	A-22
037	Pre-Test View of Parking Brake	A-23
038	Pre-test Close-up Left Side View of Driver Seat Track Showing Seat Positioning	A-23
039	Pre-test Close-up Left Side View of Driver Seat Back Showing Seat Back Positioning	A-24
040	Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position	A-24
041	Pre-test Driver Dummy and Door Clearance View	A-25

042	Post-test Driver Dummy and Door Clearance View	A-25
043	Pre-test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-26
044	Post-test Right Side View of Driver Dummy and Front Seat of Occupant Compartment	A-26
045	Pre-test Driver Inner Door Panel View	A-27
046	Post-test Driver Inner Door Panel View Showing Driver Dummy Contact Locations	A-27
047	Post-test Driver Dummy Close-Up Head Contact with Vehicle View, If Applicable	A-28
048	Post-test Driver Dummy Close-Up Head Contact with Side Airbag View, If Applicable	A-28
049	Post-Test Driver Dummy Close-Up Torso Contact with Vehicle Interior View, If Applicable	A-29
050	Post-Test Driver Dummy Close-Up Torso Contact with Side Airbag View, If Applicable	A-29
051	Post-Test Driver Dummy Close-Up Pelvis Contact View, If Applicable	A-30
052	Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View, If Applicable	A-30
053	Pre-test Left Side View of Passenger Dummy Showing Belt, Chalking, and Contact Switches	A-31
054	Pre-test Left Side View of Passenger Dummy Shoulder and Door Top View	A-31
055	Post-test Left Side View of Passenger Dummy Shoulder and Door Top View	A-32
056	Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning	A-32
057	Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint	A-33
058	Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning	A-33
059	Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan	A-34
060	Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket	A-34
061	Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level	A-35
062	Pre-Test Placement of Rear Passenger Dummy's Feet	A-35
063	Pre-Test View of Belt Anchorage for Rear Passenger Dummy to Show Position	A-36
064	Pre-test Close-Up Left Side View of Rear Passenger Seat Track Showing Test Position	A-36
065	Pre-test Close-Up Left Side View of Rear Passenger Seat Back Showing Test Position	A-37
066	Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint Showing Seat Back Test Position	A-37
067	Pre-Test Passenger Dummy and Door Clearance View	A-38
068	Post-Test Passenger Dummy and Door Clearance View	A-38
069	Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-39
070	Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment	A-39
071	Pre-test Passenger Inner Door Panel View	A-40
072	Post-test Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations	A-40
073	Post-test Rear Passenger Dummy Close-Up Head Contact with Vehicle View	A-41
074	Post-test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View	A-41
075	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View	A-42
076	Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View	A-42
077	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View	A-43
078	Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View	A-43
079	Pre-Test View of Fuel Filler Cap or Fuel Filler Neck	A-44
080	Post-Test View of Fuel Filler Cap or Fuel Filler Neck	A-44
081	Pre-Test Front View of MDB Impactor Face	A-45
082	Post-Test Front View of MDB Impactor Face	A-45
083	Pre-Test Top View of MDB Impactor Face	A-46
084	Post-Test Top View of MDB Impactor Face	A-46

085	Pre-Test Left Side View of MDB Impactor Face	A-47
086	Post-Test Left Side View of MDB Impactor Face	A-47
087	Pre-Test Right Side View of MDB Impactor Face	A-48
088	Post-Test Right Side View of MDB Impactor Face	A-48
089	Close-Up View of Vehicle's Certification Label	A-49
090	Close-Up View of Vehicle's Tire Information Placard or Label	A-49
091	Pre-Test Ballast View	A-50
092	Post-Test Primary and Redundant Speed Trap Read-Out	A-50
093	FMVSS No. 301/305 Rollover 0°	A-51
094	FMVSS No. 301/305 Rollover 90°	A-51
095	FMVSS No. 301/305 Rollover 180°	A-52
096	FMVSS No. 301/305 Rollover 270°	A-52
097	FMVSS No. 301/305 Rollover 360 °	A-53
098	Impact Event (Impact Side)	A-53
099	Monroney Label	A-54
100	Driver Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-54
101	Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual	A-55



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

Photo Not Available

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 the Test Vehicle and MDB



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



Figure A-17: Pre-Test Left Side View of MDB Positioned Against Side of Test Vehicle



Figure A-18: Pre-Test Right Side View of MDB Positioned Against Side of Test Vehicle



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



Figure A-20: Post-Test Close-up View of Impact Point Target



Figure A-21: Pre-Test Left Front Door Latch Close-up



Figure A-22: Post-Test Left Front Door Latch Close-up



Figure A-23: Pre-Test Left Rear Door Latch Close-up

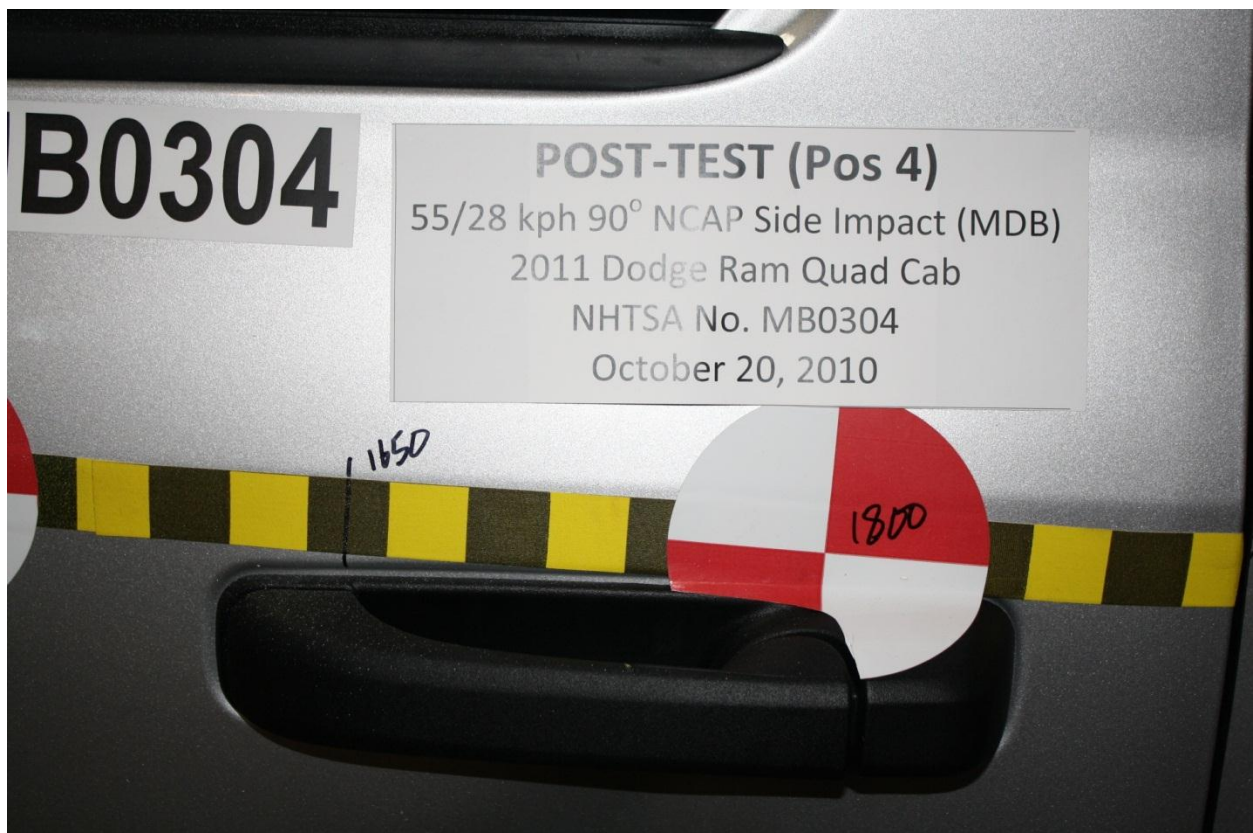


Figure A-24: Post-Test Left Rear Door Latch Close-up



Figure A-25: Pre-Test Front Close-up View of Driver Dummy



Figure A-26: Post-Test Front Close-up View of Driver Dummy



Figure A-27: Pre-Test Left Side View of Driver Dummy Showing Belt, Chalking, and Contact Switches



Figure A-28: Pre-Test Left Side View of Driver Dummy Shoulder and Door Top View



Figure A-29: Post-test Left Side View of Driver Dummy Shoulder and Door Top View



Figure A-30: Pre-Test Frontal View of Driver Seat Back Prior to Dummy Positioning



Figure A-31: Pre-Test Frontal View of Driver Dummy Head and Shoulders in Relation to Head Restraint



Figure A-32: Pre-Test Frontal View of Driver Seat Pan Prior to Dummy Positioning



Figure A-33: Pre-Test Overhead View of Driver Dummy Thighs on Seat Pan



Figure A-34: Pre-Test Placement of Driver Dummy's Feet

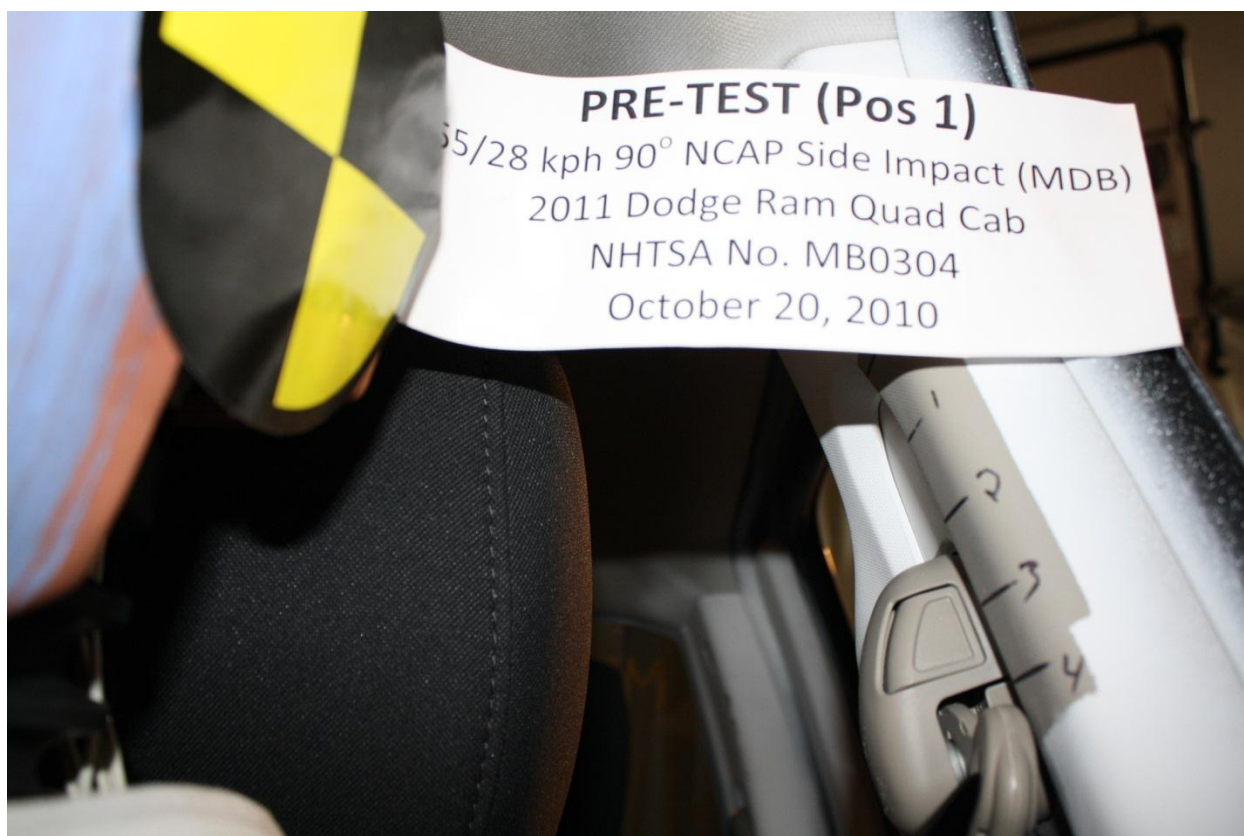


Figure A-35: Pre-Test View of Belt Anchorage for Driver Dummy to Show Position

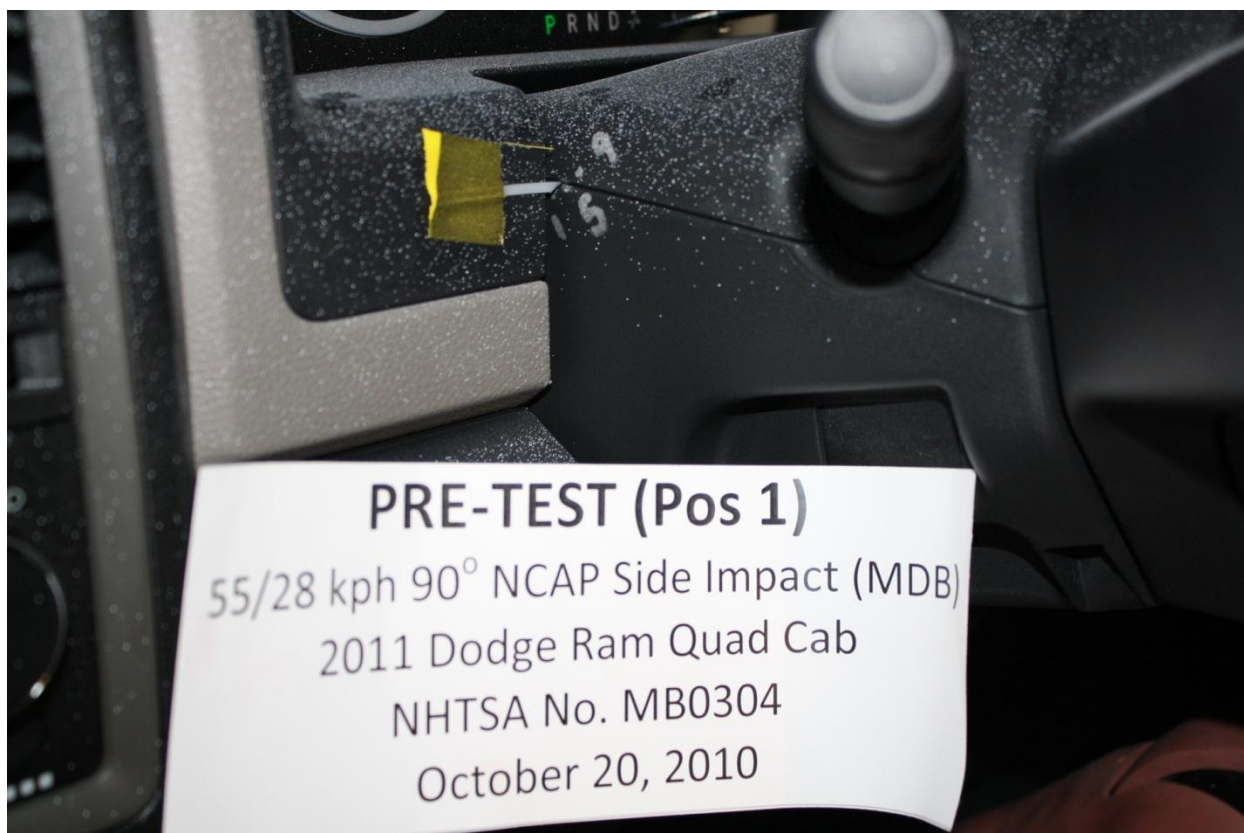


Figure A-36: Pre-Test Left Side View of Steering Wheel to Show Position



Figure A-37: Pre-Test View of Parking Brake



Figure A-38: Pre-test Close-up Left Side View of Driver Seat Track Showing Seat Positioning

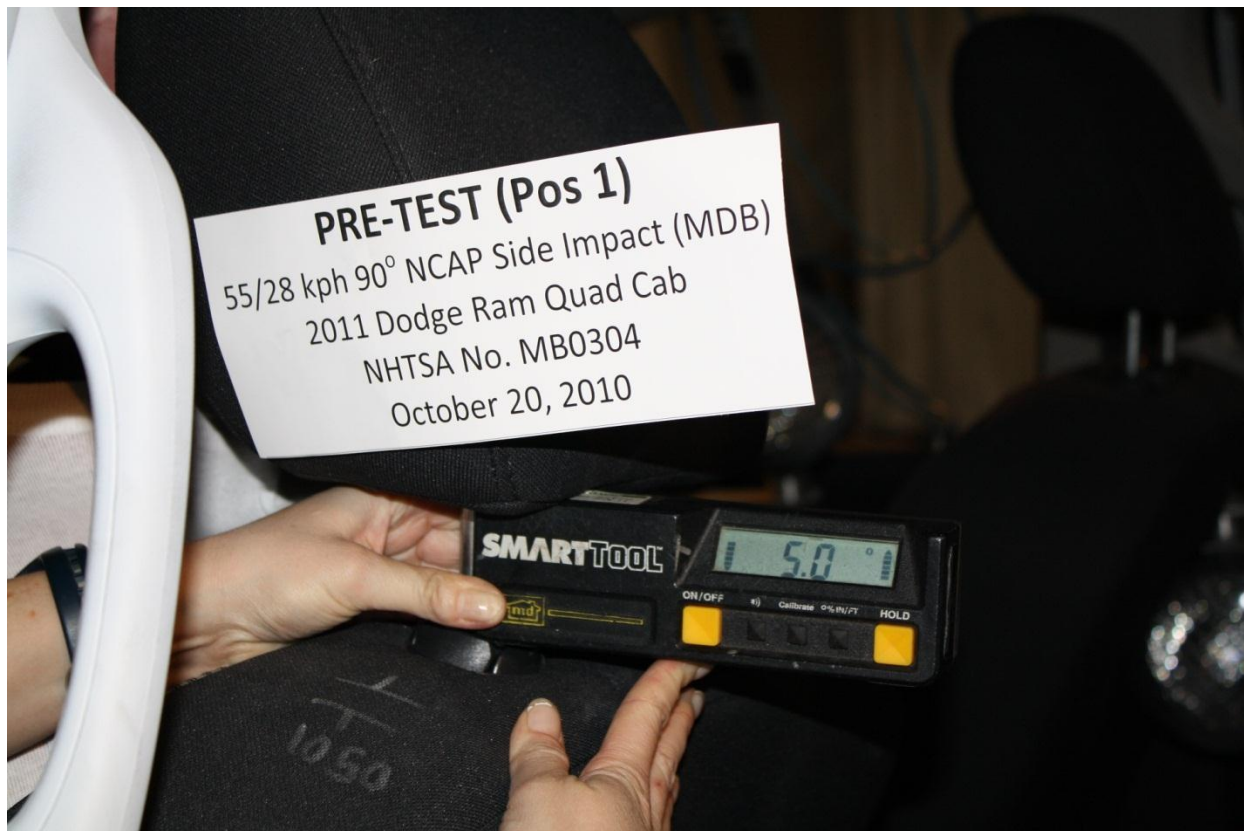


Figure A-39: Pre-test Close-up Left Side View of Driver Seat Back Showing Seat Back Positioning

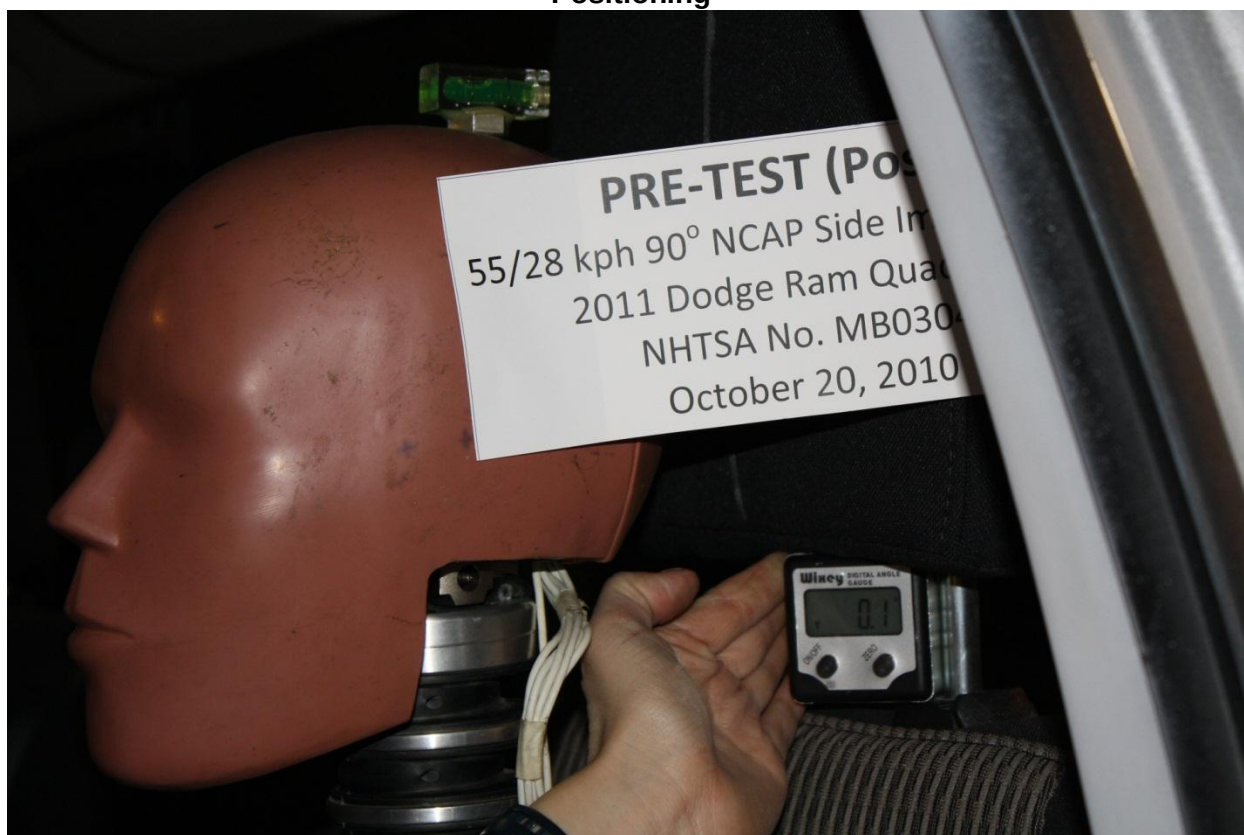


Figure A-40: Pre-Test Close-Up View of Driver Seat Back or Head Restraint Showing Seat Back Test Position



Figure A-41: Pre-test Driver Dummy and Door Clearance View



Figure A-42: Post-test Driver Dummy and Door Clearance View



Figure A-43: Pre-test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Figure A-44: Post-test Right Side View of Driver Dummy and Front Seat of Occupant Compartment



Figure A-45: Pre-test Driver Inner Door Panel View



Figure A-46: Post-test Driver Inner Door Panel View Showing Driver Dummy Contact Locations

Photo Not Applicable

Figure A-47: Post-test Driver Dummy Close-Up Head Contact with Vehicle View



Figure A-48: Post-test Driver Dummy Close-Up Head Contact with Side Airbag View



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

Photo Not Applicable

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

Photo Not Available

Figure A-51: Post-Test Driver Dummy Close-Up Pelvis Contact View

Photo Not Applicable

Figure A-52: Post-Test Driver Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-53: Pre-test Left Side View of Passenger Dummy Showing Belt, Chalking, and Contact Switches



Figure A-54: Pre-test Left Side View of Passenger Dummy Shoulder and Door Top View



Figure A-55: Post-test Left Side View of Passenger Dummy Shoulder and Door Top View



Figure A-56: Pre-Test Frontal View of Rear Passenger Seat Back Prior to Dummy Positioning

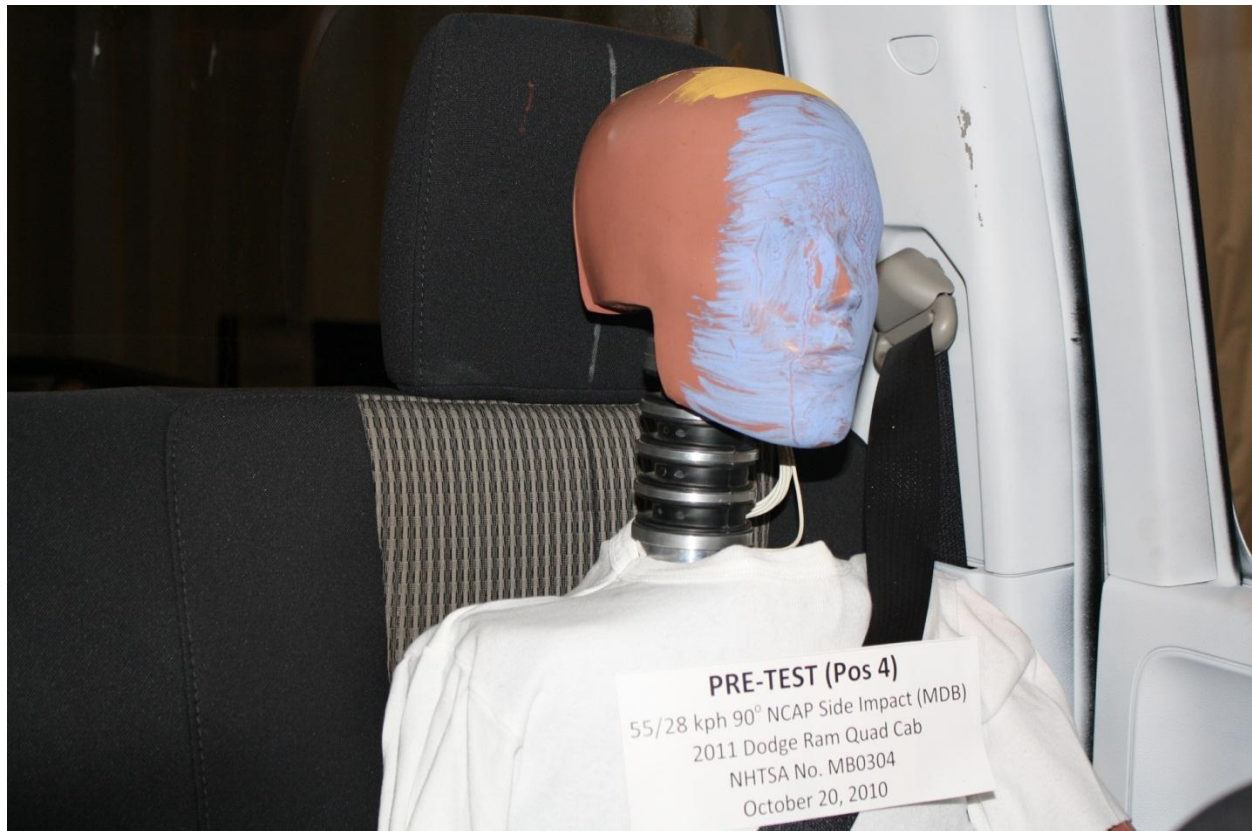


Figure A-57: Pre-Test Frontal View of Rear Passenger Dummy Head and Shoulders in Relation to Head Restraint



Figure A-58: Pre-Test Overhead View of Rear Passenger Seat Pan Prior to Dummy Positioning

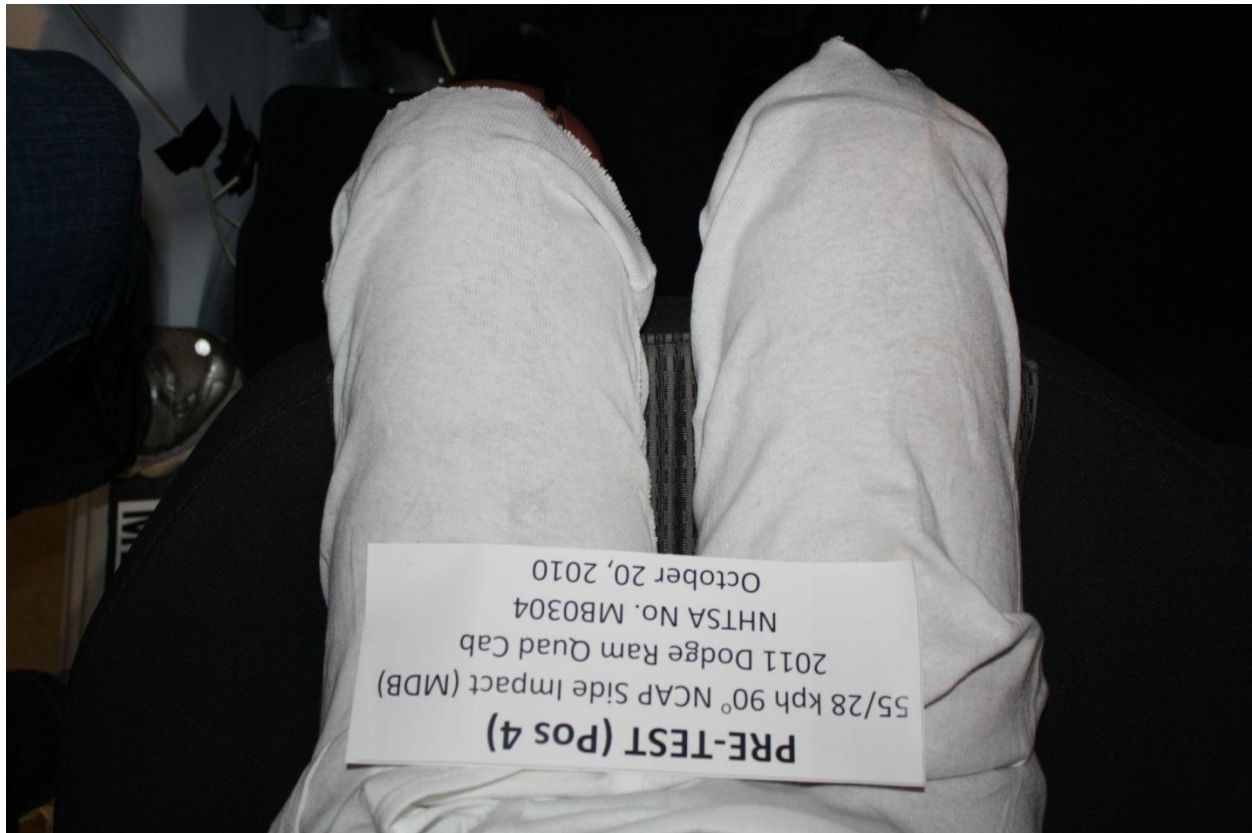


Figure A-59: Pre-Test Overhead View of Rear Passenger Dummy Thighs on Seat Pan

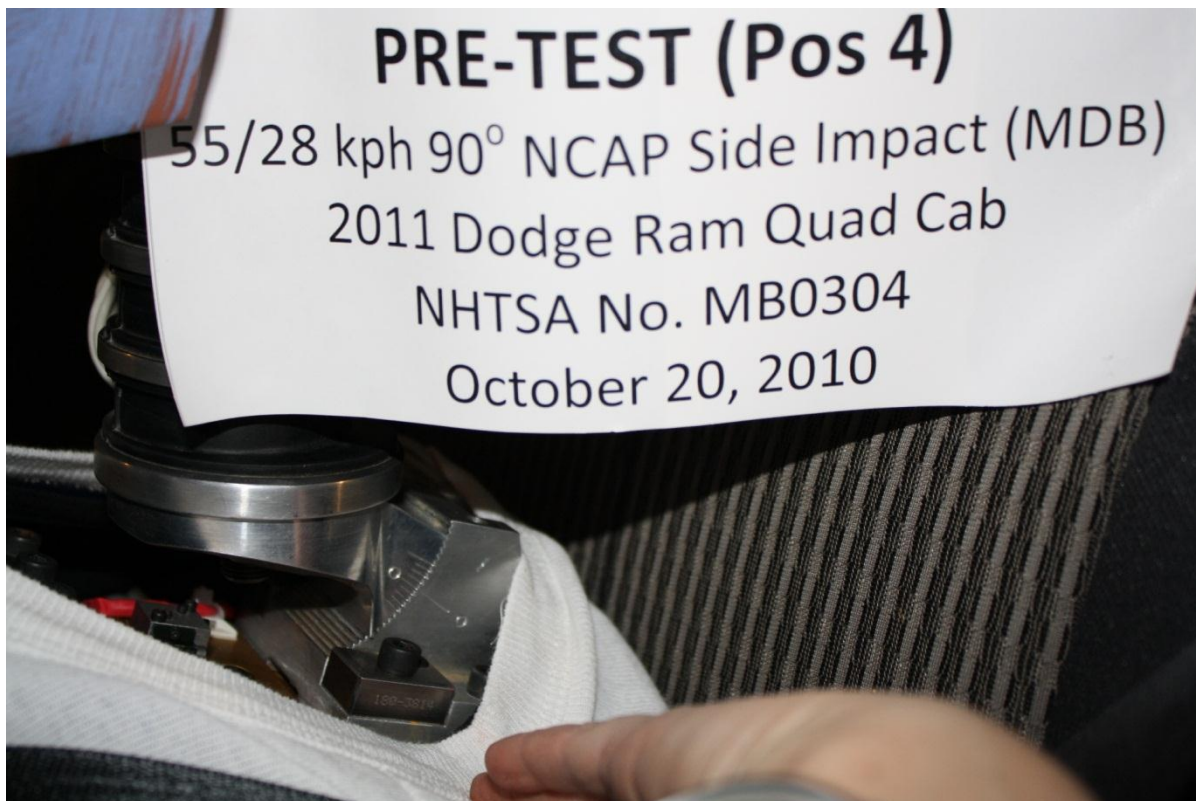


Figure A-60: Pre-Test View of Rear Passenger Dummy's Neck Showing Position of Adjustable Neck Bracket



Figure A-61: Pre-Test View of Rear Passenger Dummy's Head Showing Dummy's Head is Level



Figure A-62: Pre-Test Placement of Rear Passenger Dummy's Feet

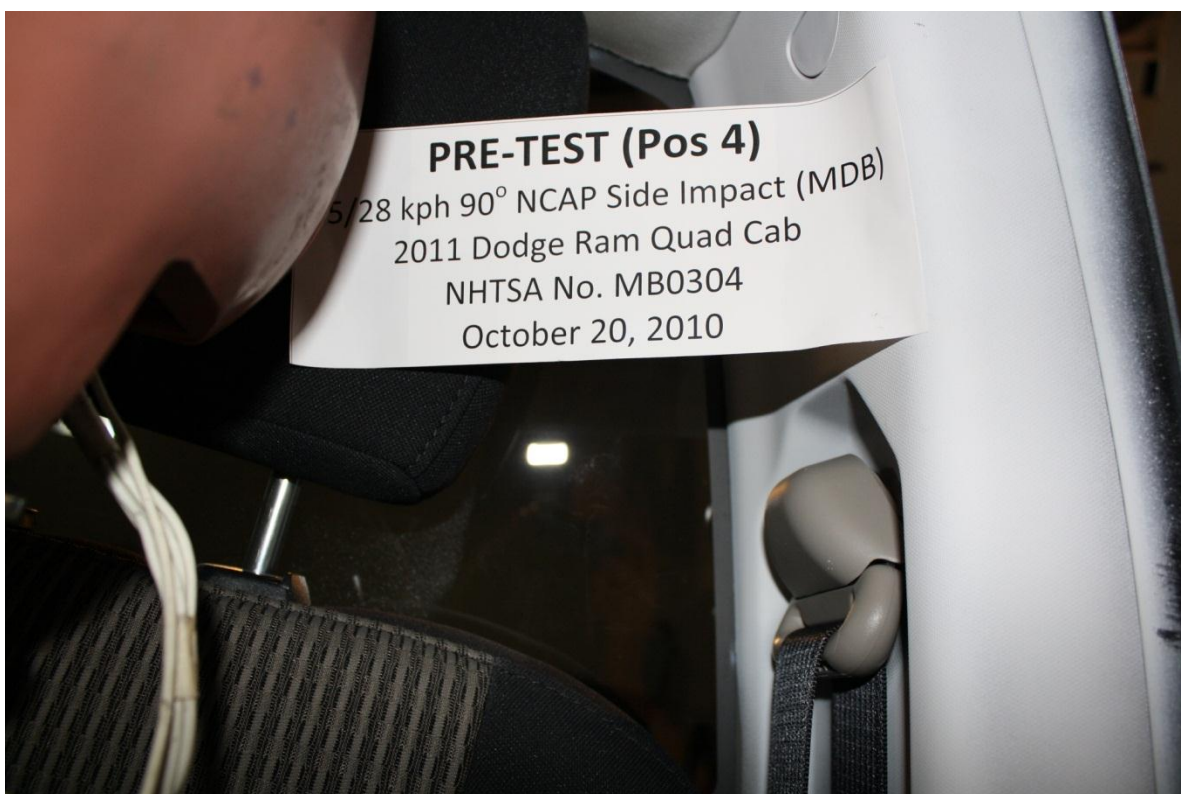


Figure A-63: Pre-Test View of Belt Anchorage for Rear Passenger Dummy to Show Position



Figure A-64: Pre-test Close-Up Left Side View of Rear Passenger Seat Track Showing Test Position

Photo Not Applicable

Figure A-65: Pre-test Close-Up Left Side View of Rear Passenger Seat Back Showing Test Position



Figure A-66: Pre-Test Close-Up View of Rear Passenger Seat Back or Head Restraint Showing Seat Back Test Position



Figure A-67: Pre-Test Passenger Dummy and Door Clearance View



Figure A-68: Post-Test Passenger Dummy and Door Clearance View



Figure A-69: Pre-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-70: Post-Test Right Side View of Rear Passenger Dummy and Rear Seat Occupant Compartment



Figure A-71: Pre-test Passenger Inner Door Panel View



Figure A-72: Post-test Passenger Inner Door Panel View Showing Rear Passenger Dummy Contact Locations



Figure A-73: Post-test Rear Passenger Dummy Close-Up Head Contact with Vehicle View



Figure A-74: Post-test Rear Passenger Dummy Close-Up Head Contact with Side Airbag View



Figure A-75: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Vehicle Interior View

Photo Not Applicable

Figure A-76: Post-Test Rear Passenger Dummy Close-Up Torso Contact with Side Airbag View

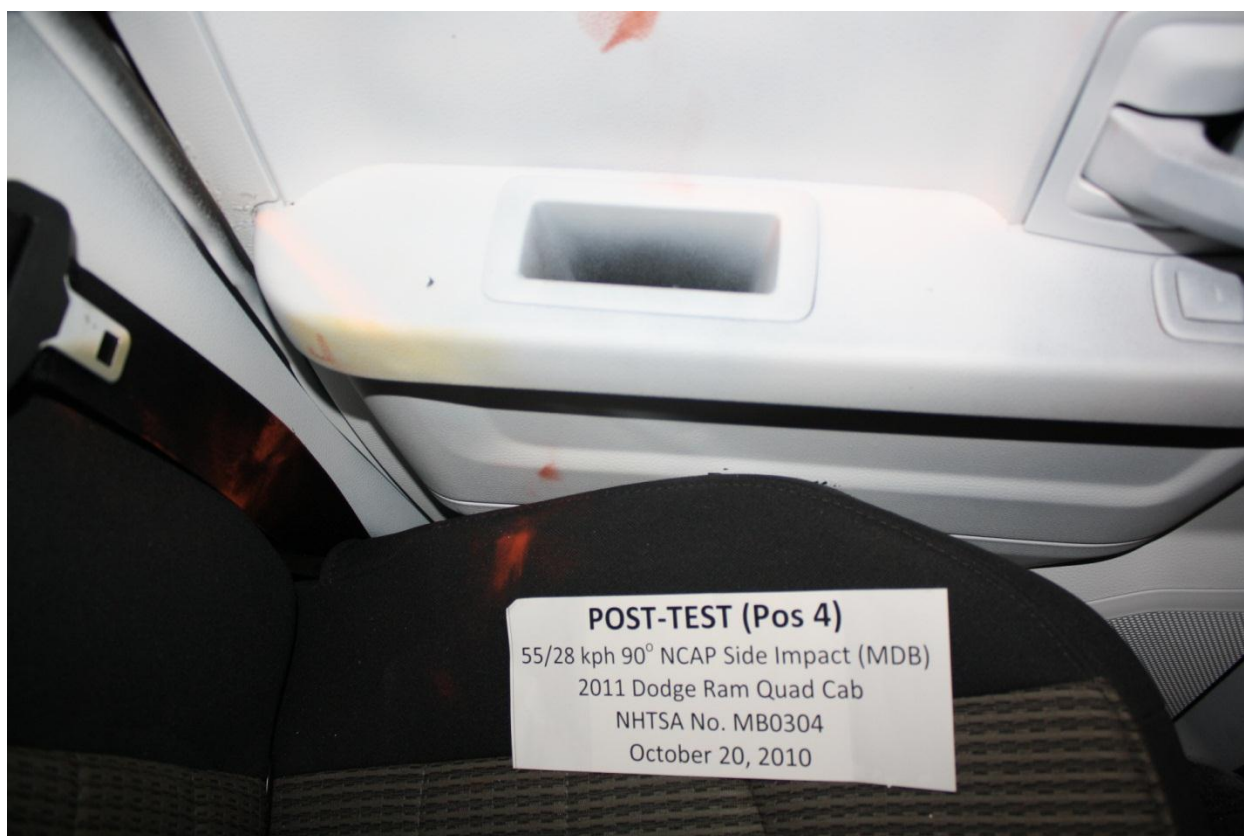


Figure A-77: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact View

Photo Not Applicable

Figure A-78: Post-Test Rear Passenger Dummy Close-Up Pelvis Contact with Side Airbag View



Figure A-79: Pre-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-80: Post-Test View of Fuel Filler Cap or Fuel Filler Neck



Figure A-81: Pre-Test Front View of MDB Impactor Face



Figure A-82: Post-Test Front View of MDB Impactor Face



Figure A-83: Pre-Test Top View of MDB Impactor Face



Figure A-84: Post-Test Top View of MDB Impactor Face



Figure A-85: Pre-Test Left Side View of MDB Impactor Face



Figure A-86: Post-Test Left Side View of MDB Impactor Face



Figure A-87: Pre-Test Right Side View of MDB Impactor Face

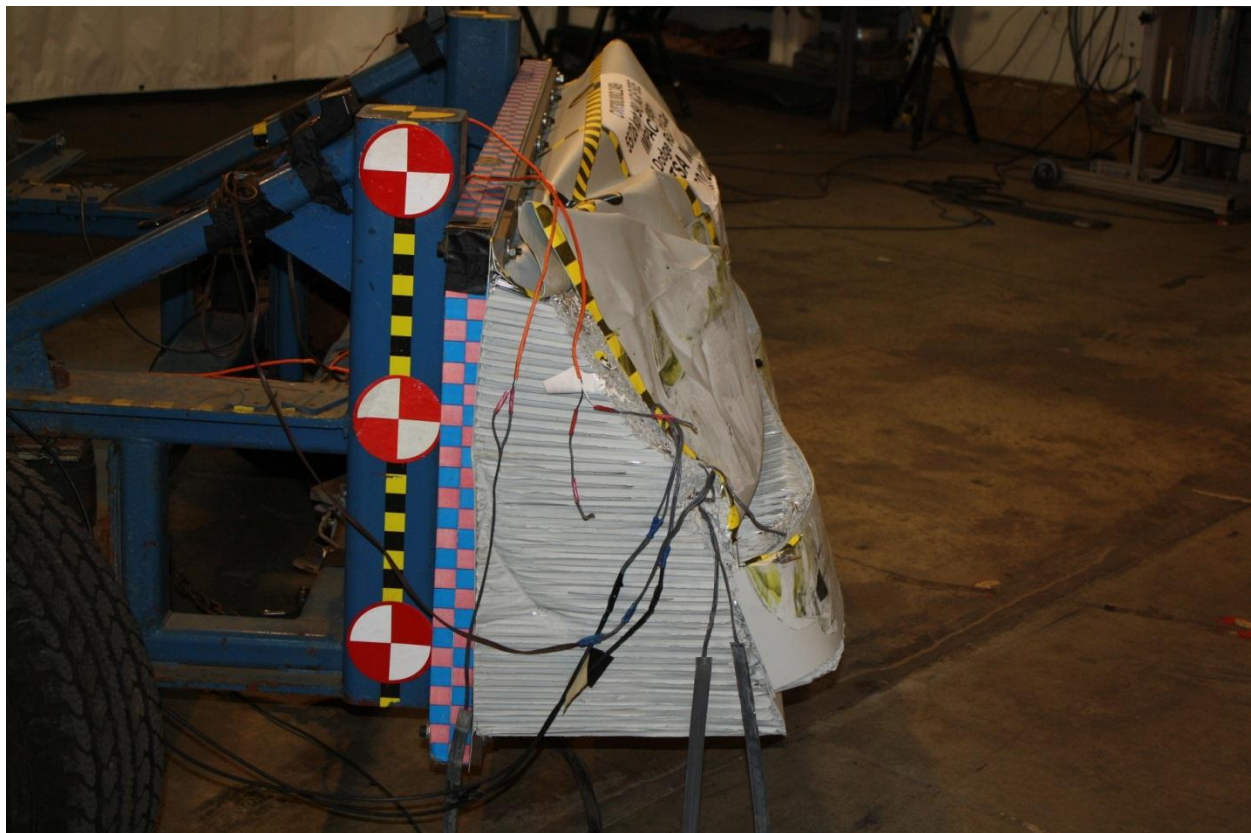


Figure A-88: Post-Test Right Side View of MDB Impactor Face



Figure A-89: Close-Up View of Vehicle's Certification Label



Figure A-90: Close-Up View of Vehicle's Tire Information Placard or Label

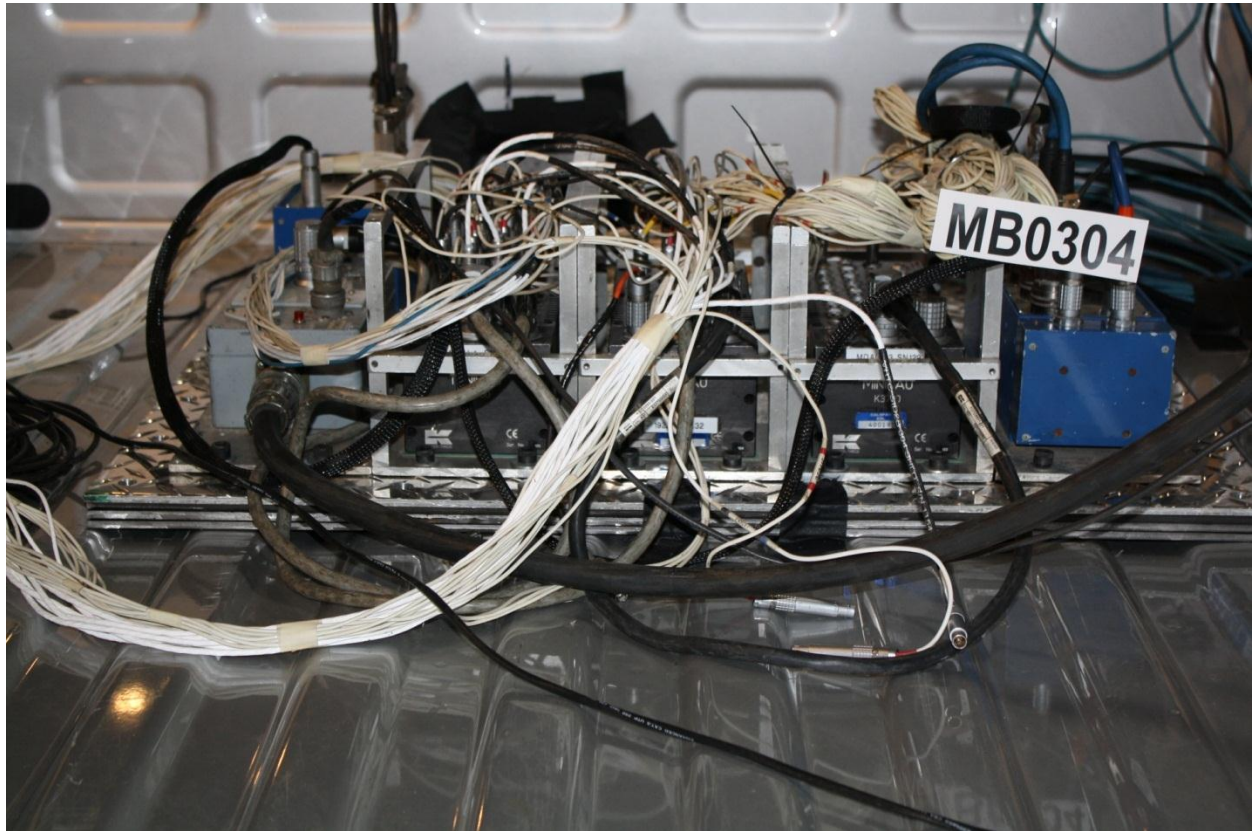


Figure A-91: Pre-Test Ballast View



Figure A-92: Post-Test Primary and Redundant Speed Trap Read-Out



Figure A-93: FMVSS No. 301 Rollover 0°



Figure A-94: FMVSS No. 301 Rollover 90°



Figure A-95: FMVSS No. 301 Rollover 180°



Figure A-96: FMVSS No. 301 Rollover 270°



Figure A-97: FMVSS No. 301 Rollover 360°

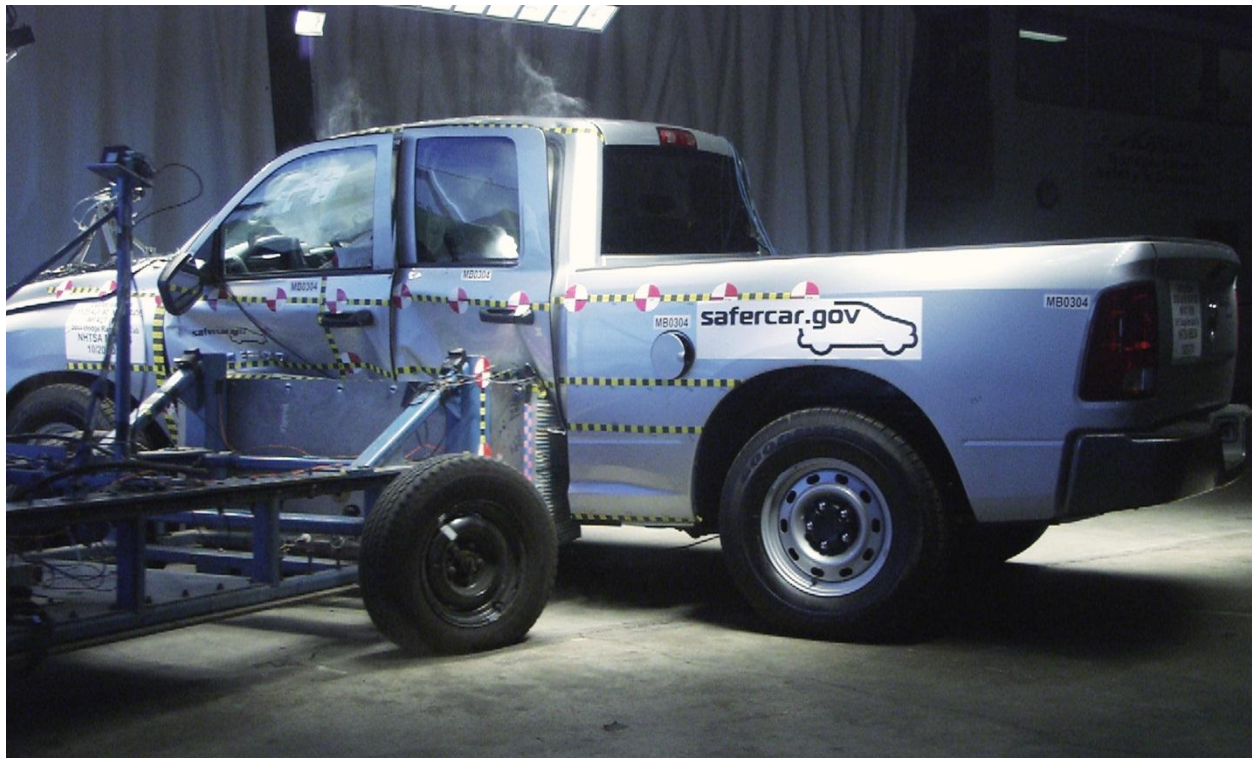


Figure A-98: Impact Event (Impact Side)

Photo Not Available

Figure A-101: Left Rear Passenger Head Restraint Use and Adjustment Information from Vehicle Owner's Manual

APPENDIX B
DUMMY RESPONSE DATA

The following data plots shall be included in this appendix:

TABLE OF DATA PLOTS
Driver & Passenger Dummy Instrumentation Plots
FILTERED DATA

No.	Description	Page
1	Driver Head Acceleration (X) Primary vs. Time	B-4
2	Driver Head Acceleration (Y) Primary vs. Time	B-4
3	Driver Head Acceleration (Z) Primary vs. Time	B-5
4	Driver Head Resultant Acceleration Primary vs. Time	B-5
5	Driver Upper Thorax Rib Deflection (Y) vs. Time	B-6
6	Driver Middle Thorax Rib Deflection (Y) vs. Time	B-6
7	Driver Lower Thorax Rib Deflection (Y) vs. Time	B-7
8	Driver Thorax Rib Deflection Maximum vs. Time	B-7
9	Driver Anterior Abdominal Force (Y) vs. Time	B-8
10	Driver Middle Abdominal Force (Y) vs. Time	B-8
11	Driver Posterior Abdominal Force (Y) vs. Time	B-9
12	Driver Total Abdominal Force (Y) vs. Time	B-9
13	Driver Pubic Symphysis Force (Y) vs. Time	B-10
14	Passenger Head Acceleration (X) vs. Time Primary	B-10
15	Passenger Head Acceleration (Y) vs. Time Primary	B-11
16	Passenger Head Acceleration (Z) vs. Time Primary	B-11
17	Passenger Head Resultant Acceleration Primary vs. Time	B-12
18	Passenger Lower Spine T12 Acceleration (X) vs. Time	B-12
19	Passenger Lower Spine T12 Acceleration (Y) vs. Time	B-13
20	Passenger Lower Spine T12 Acceleration (Z) vs. Time	B-13
21	Passenger Lower Spine T12 Resultant Acceleration vs. Time	B-14
22	Passenger Iliac Force on Impact Side (Y) vs. Time	B-14
23	Passenger Acetabulum Force on Impact Side (Y) vs. Time	B-15
24	Passenger Total Pelvic Force on Impact Side (Y) vs. Time	B-15

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.

Driver & Passenger Dummy Instrumentation Data

Driver Lower Spine T12 Acceleration (X)
Driver Lower Spine T12 Acceleration (Y)
Driver Lower Spine T12 Acceleration (Z)
Passenger Upper Thorax Rib Deflection (Y)
Passenger Middle Thorax Rib Deflection (Y)
Passenger Lower Thorax Rib Deflection (Y)
Passenger Upper Abdomen Rib Deflection (Y)
Passenger Lower Abdomen Rib Deflection (Y)
Driver Head Acceleration Redundant (X)
Driver Head Acceleration Redundant (Y)
Driver Head Acceleration Redundant (Z)
Driver Shoulder Contact Switch
Driver Torso Contact Switch
Driver Pelvis Contact Switch
Passenger Head Acceleration Redundant (X)
Passenger Head Acceleration Redundant (Y)
Passenger Head Acceleration Redundant (Z)
Passenger Shoulder Contact Switch
Passenger Torso Contact Switch
Passenger Pelvis Contact Switch

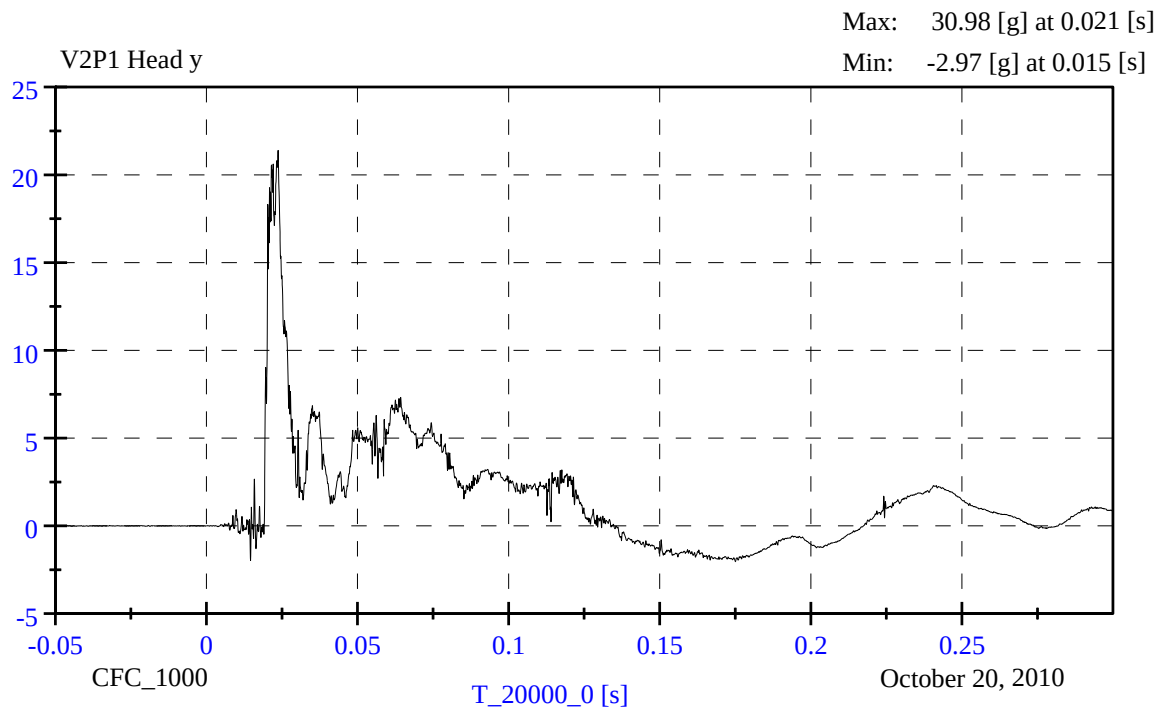
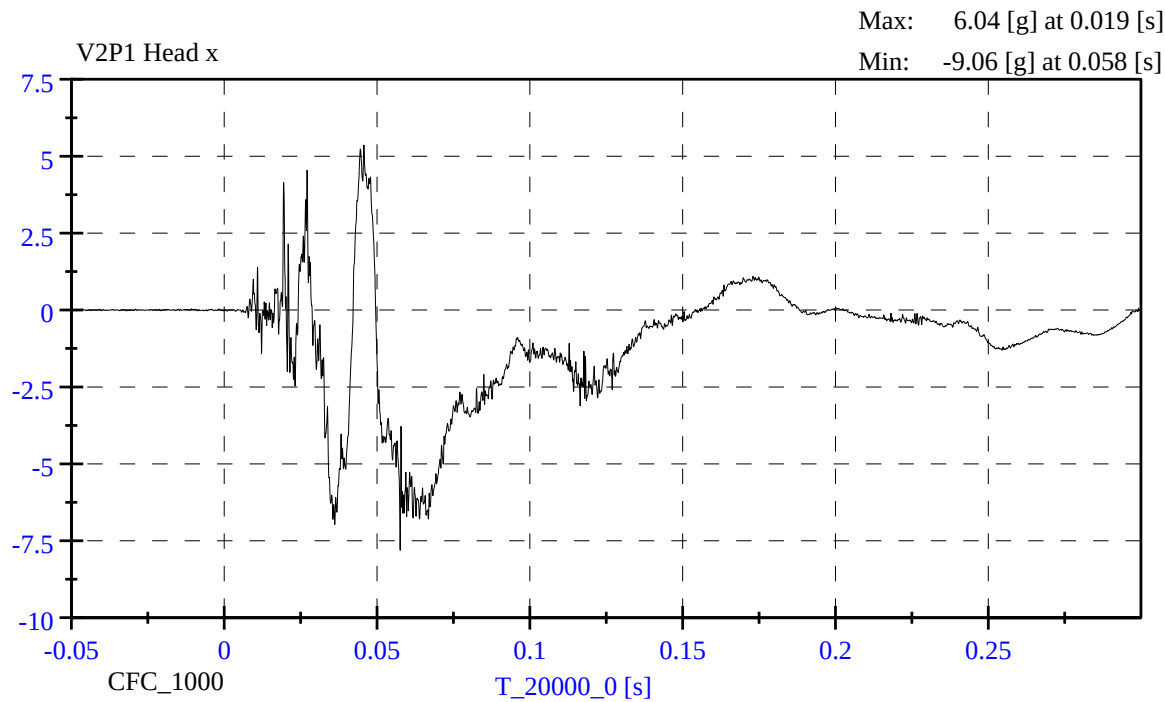
Vehicle Instrumentation Data

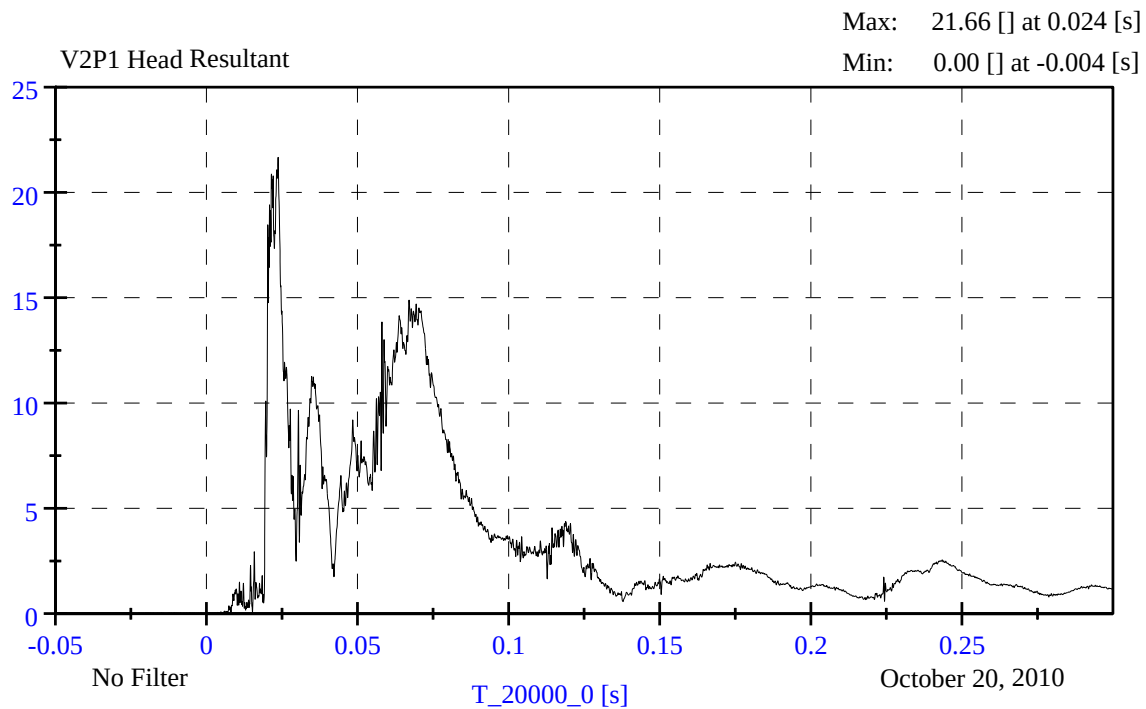
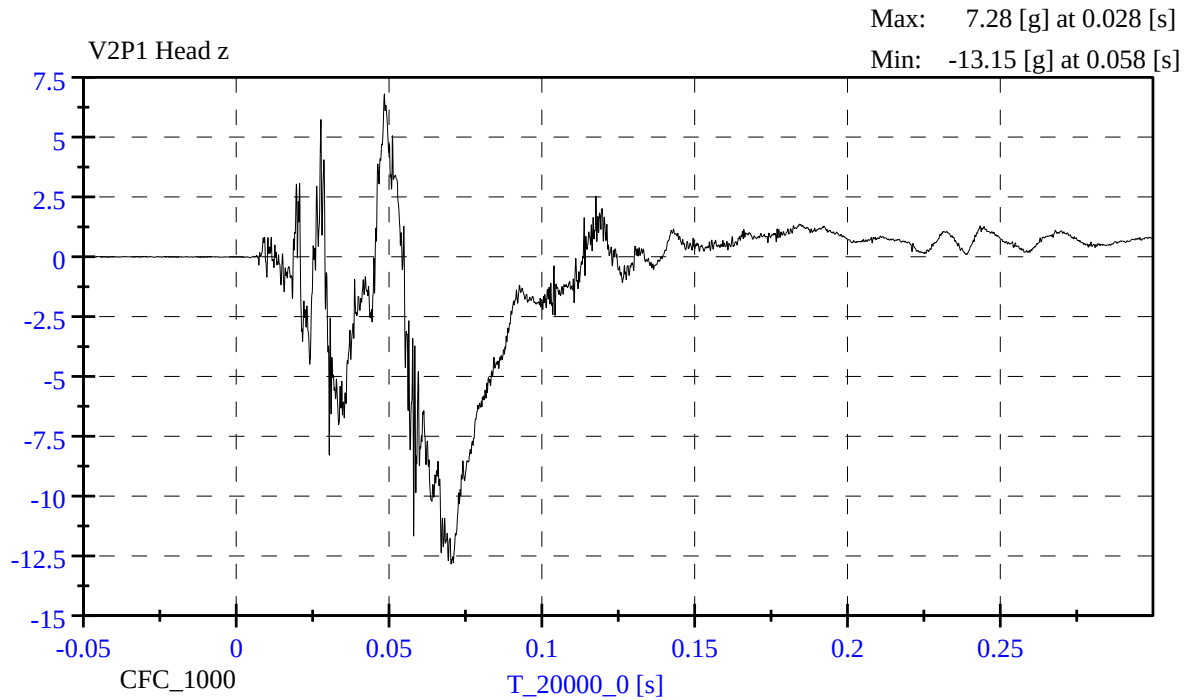
Driver Side Airbag Timing
Driver Side Curtain Airbag Timing
Passenger Side Airbag Timing (if applicable)
Passenger Side Curtain Airbag Timing (if different from Driver)
Right Side Sill at Front Seat Acceleration (X)
Right Side Sill at Front Seat Acceleration (Y)
Right Side Sill at Front Seat Acceleration (Z)
Right Side Sill at Rear Seat Acceleration (X)
Right Side Sill at Rear Seat Acceleration (Y)
Right Side Sill at Rear Seat Acceleration (Z)
Rear Floorpan Above Axle Acceleration (X)
Rear Floorpan Above Axle Acceleration (Y)
Rear Floorpan Above Axle Acceleration (Z)
Left Side Sill at Front Seat Acceleration (Y)
Left Side Sill at Rear Seat Acceleration (Y)
Right Rear Occupant Compartment Acceleration (Y)
Lower A-Post Acceleration (Y)
Upper A-Post Acceleration (Y)
Lower B-Post Acceleration (Y)
Upper B-Post Acceleration (Y)
Front Seat Track Acceleration (Y)

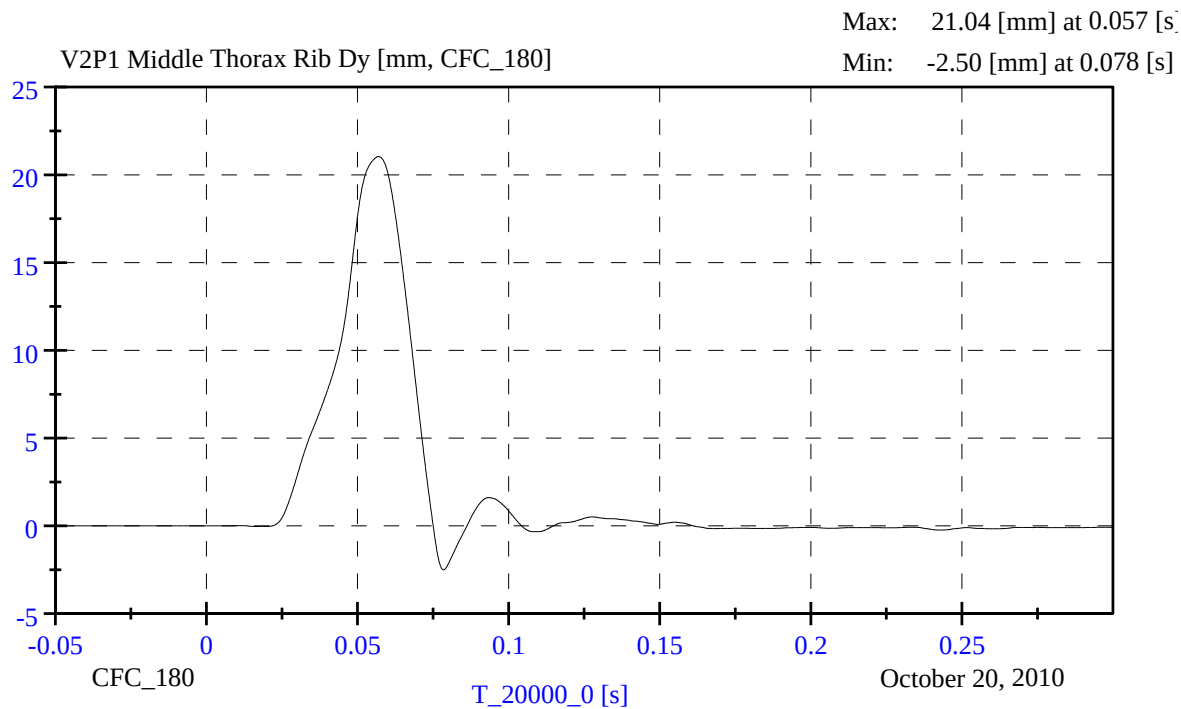
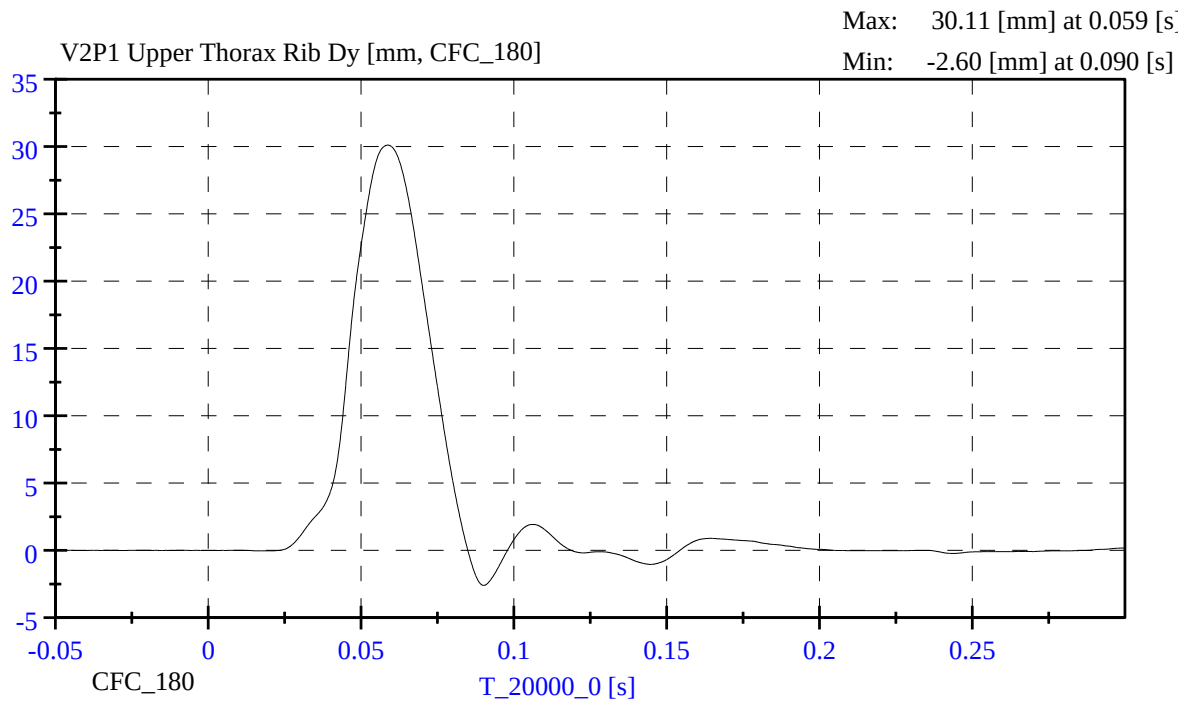
Rear Seat Track Acceleration (Y)
Vehicle Center of Gravity Acceleration (X)
Vehicle Center of Gravity Acceleration (Y)
Vehicle Center of Gravity Acceleration (Z)

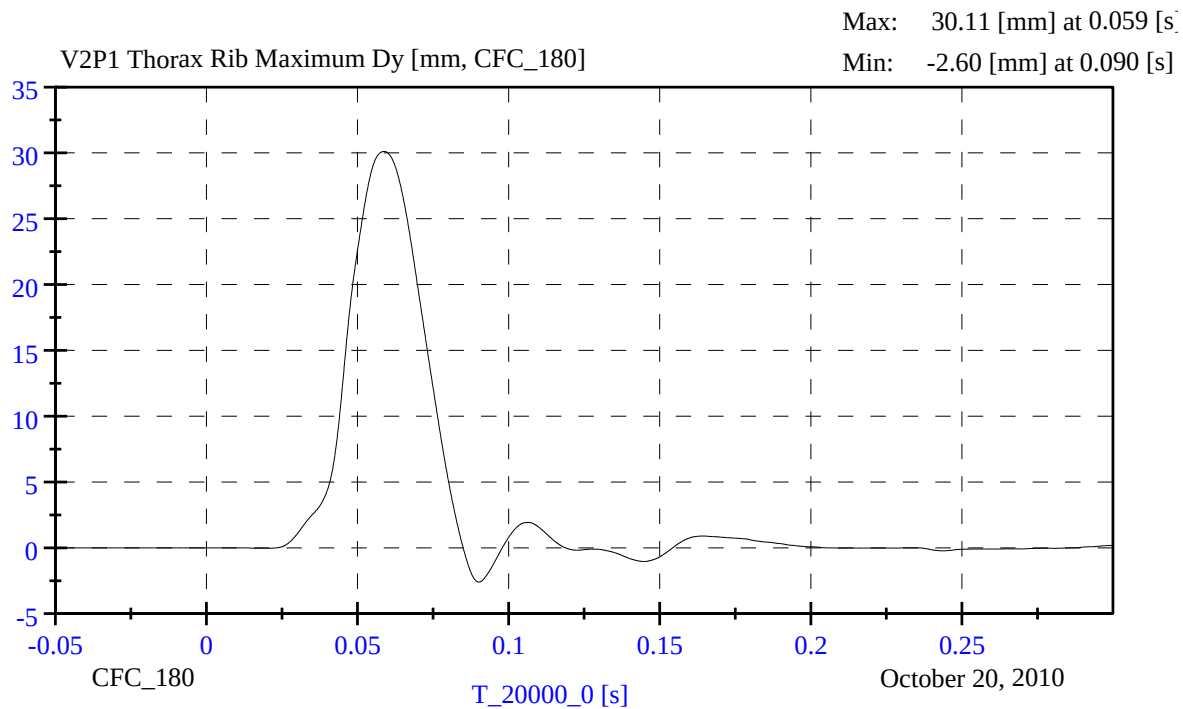
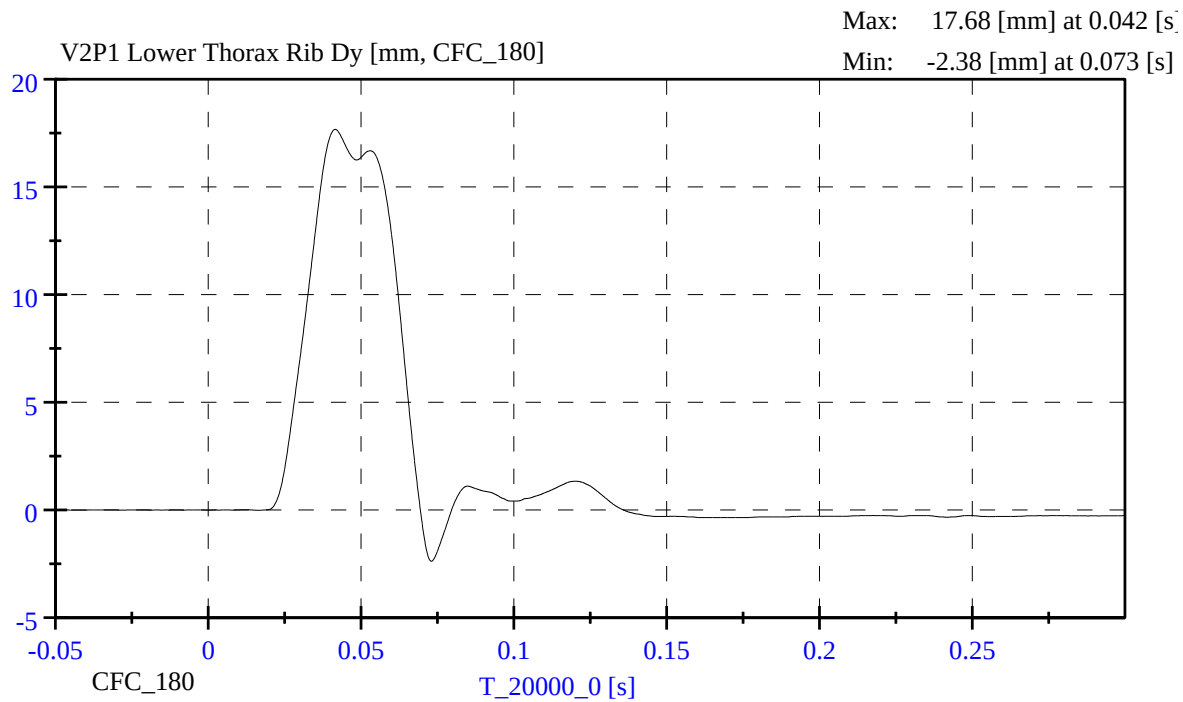
MDB Instrumentation Data

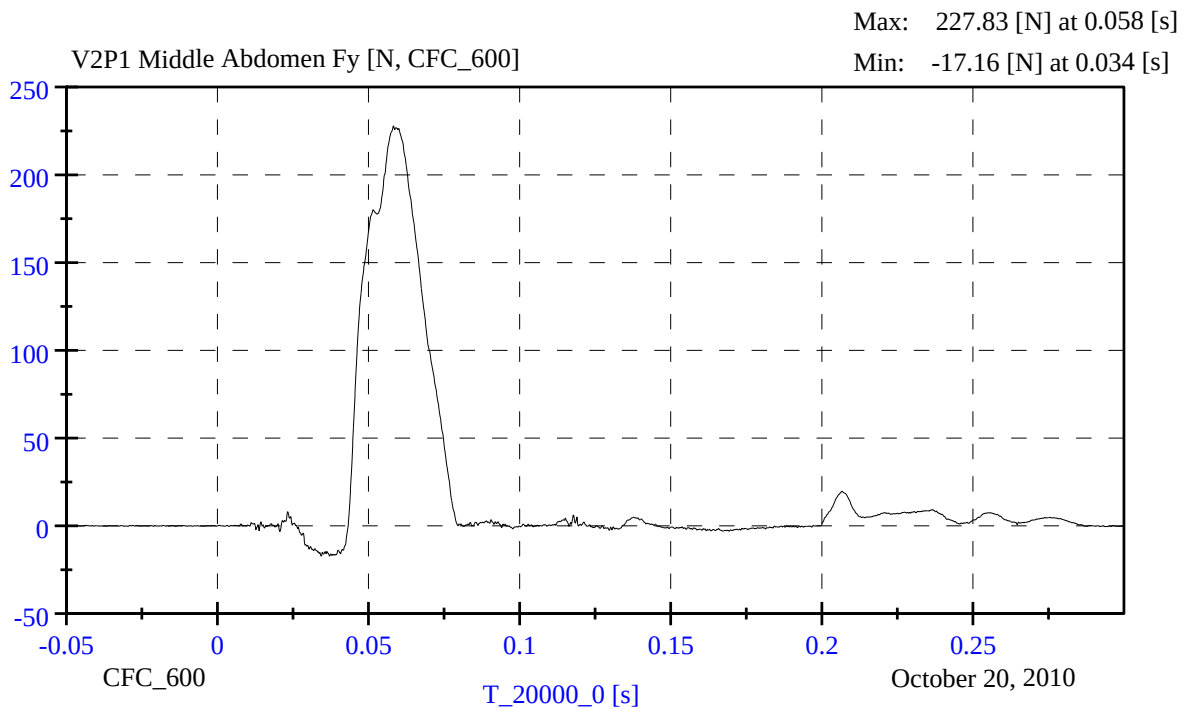
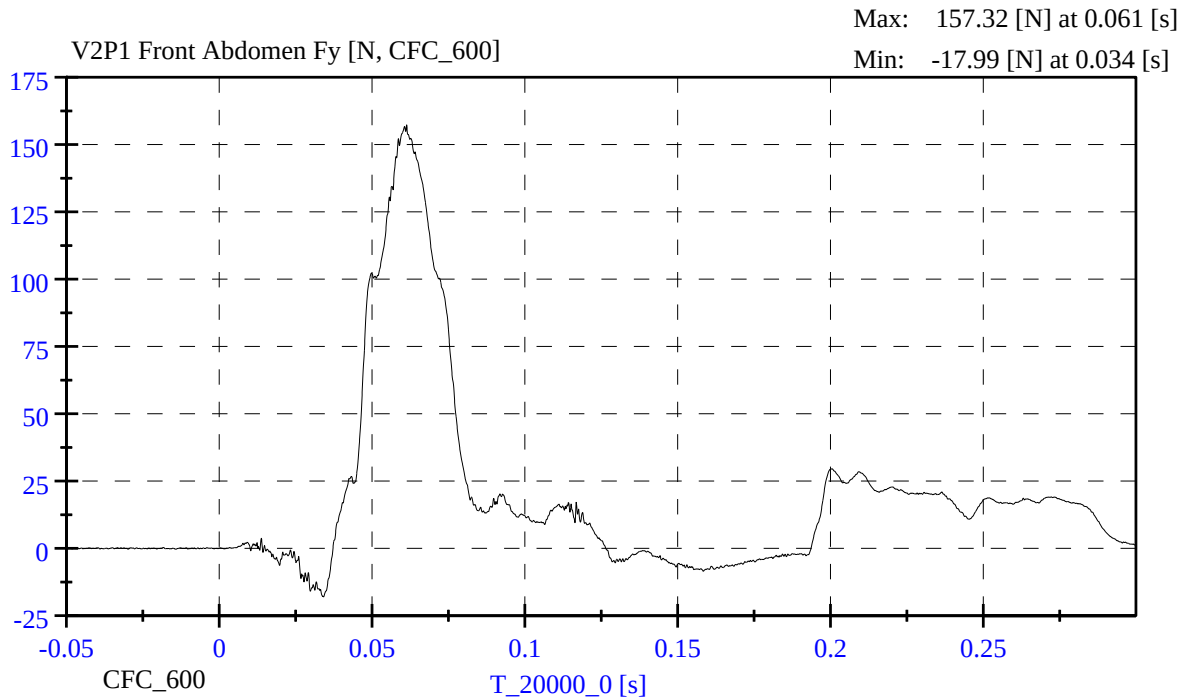
MDB Center of Gravity Acceleration (X)
MDB Center of Gravity Acceleration (Y)
MDB Center of Gravity Acceleration (Z)
MDB Rear Acceleration (X)
MDB Rear Acceleration (Y)
Left MDB Contact Switch
Right MDB Contact Switch

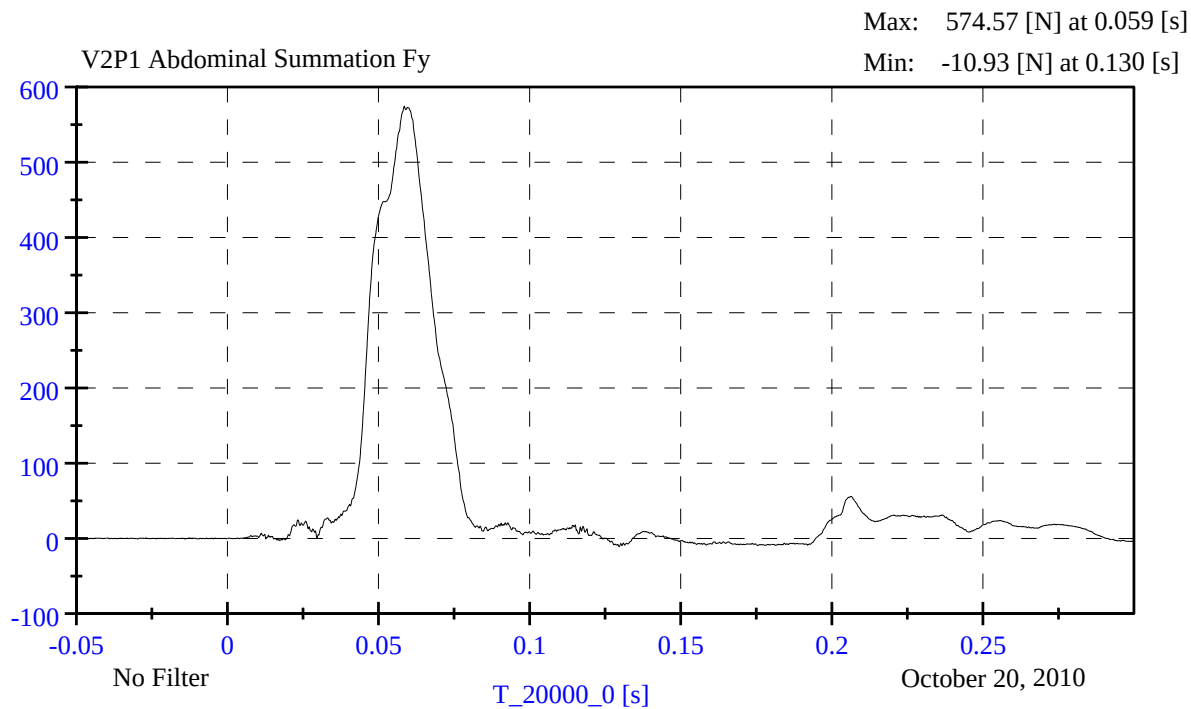
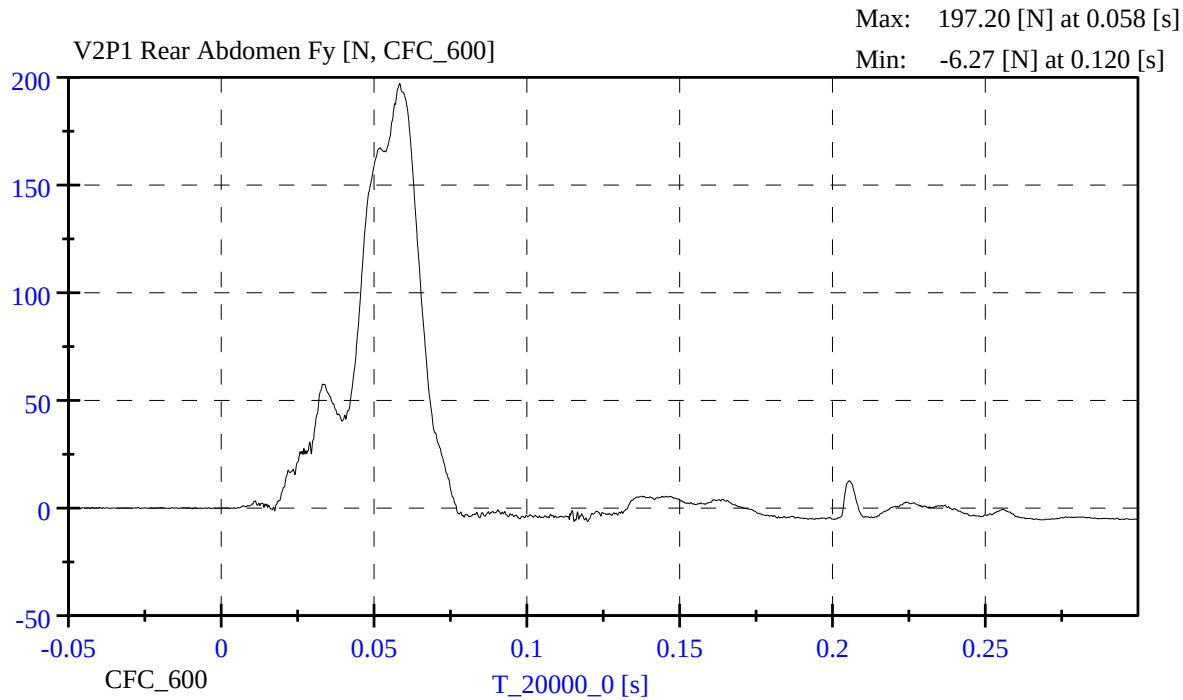


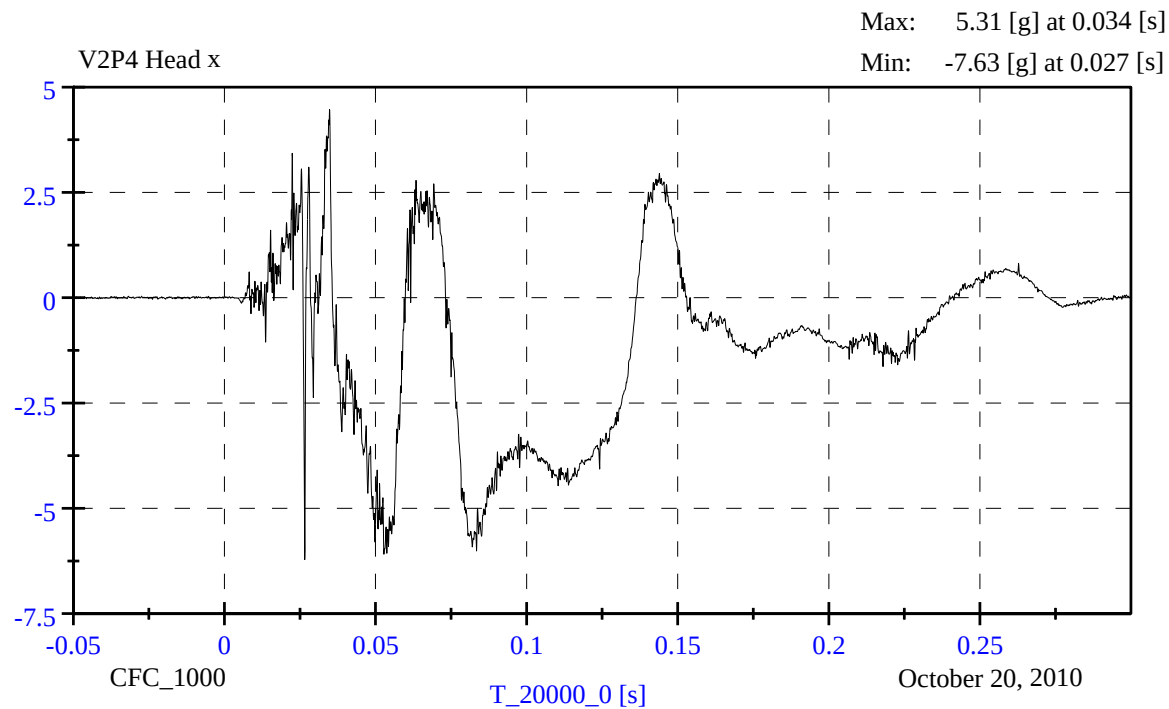
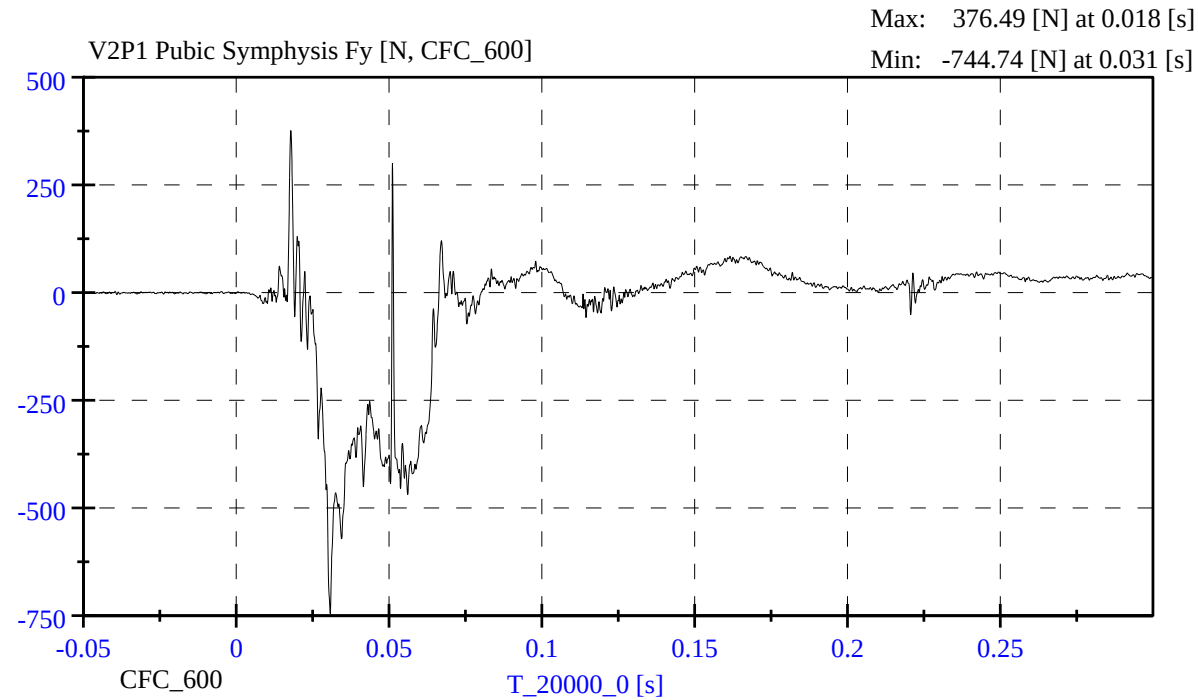


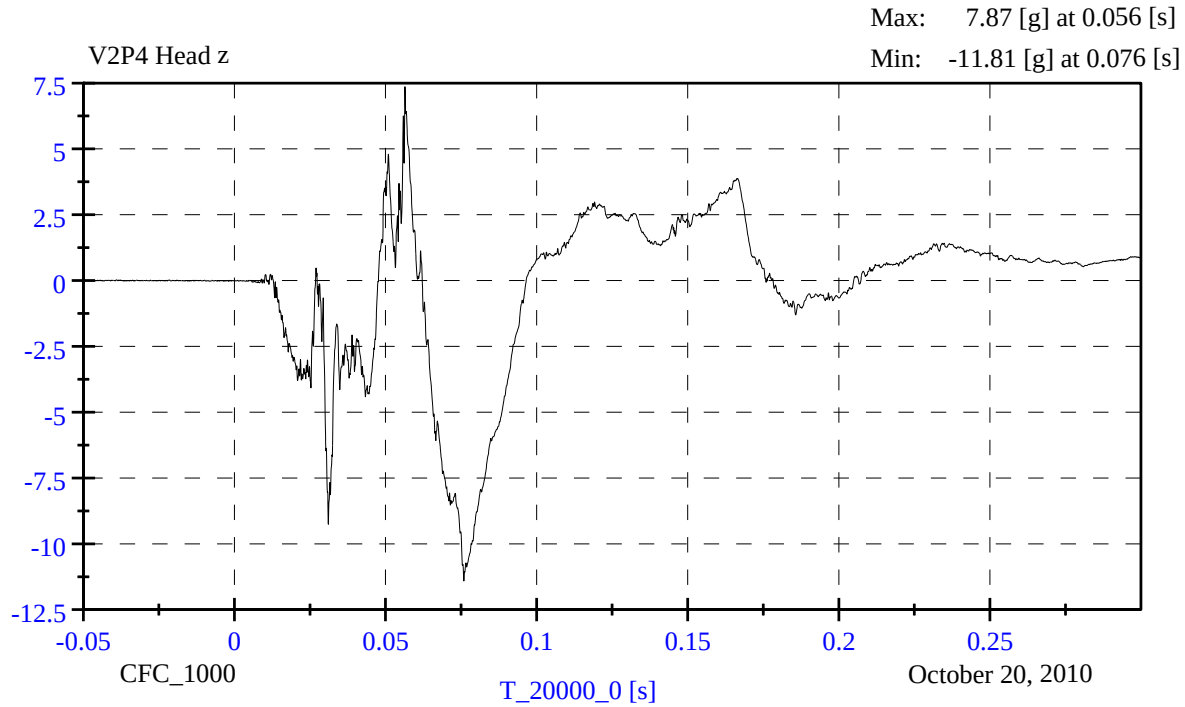
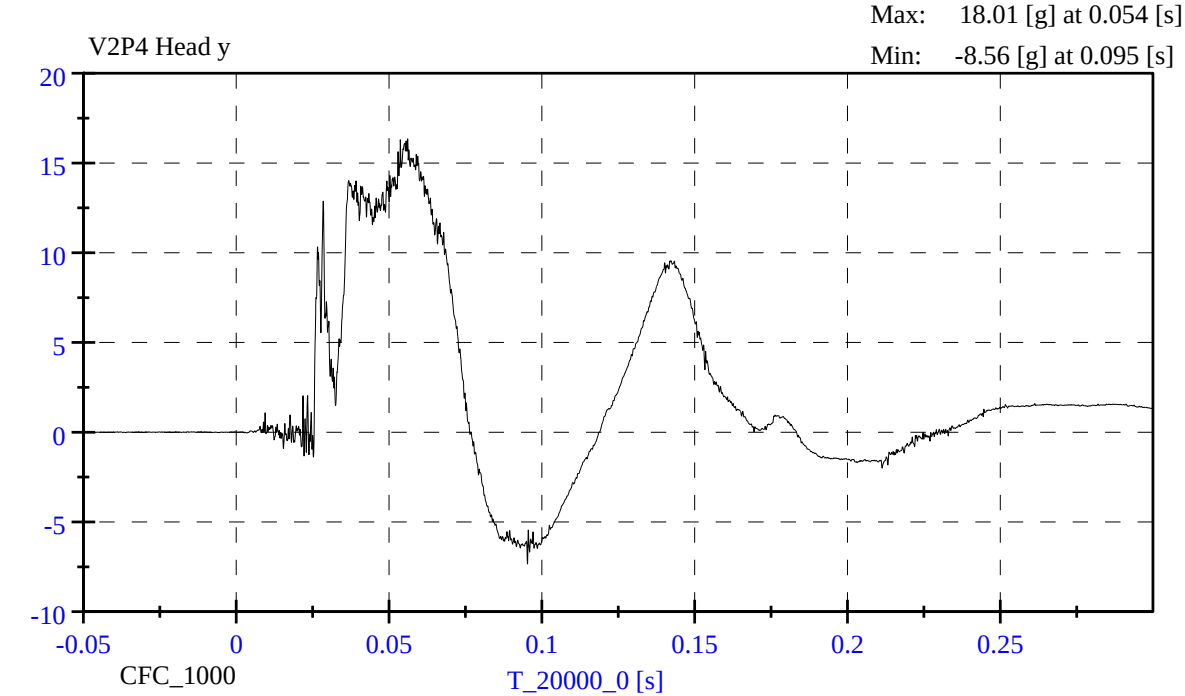


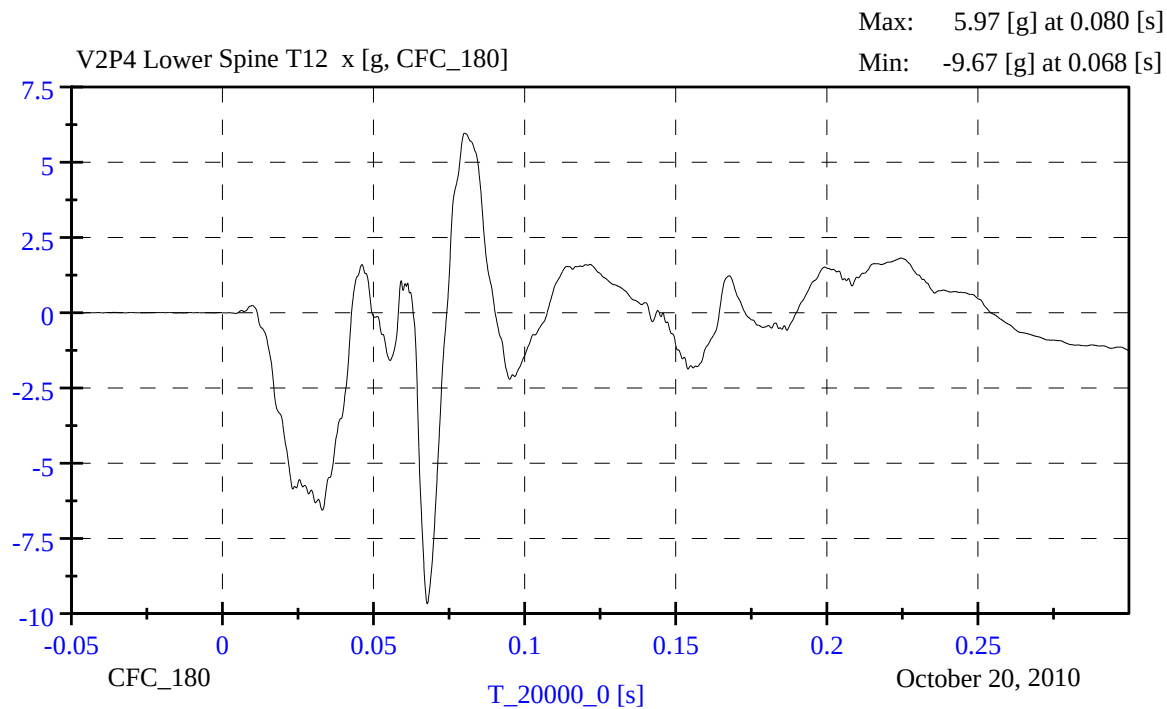
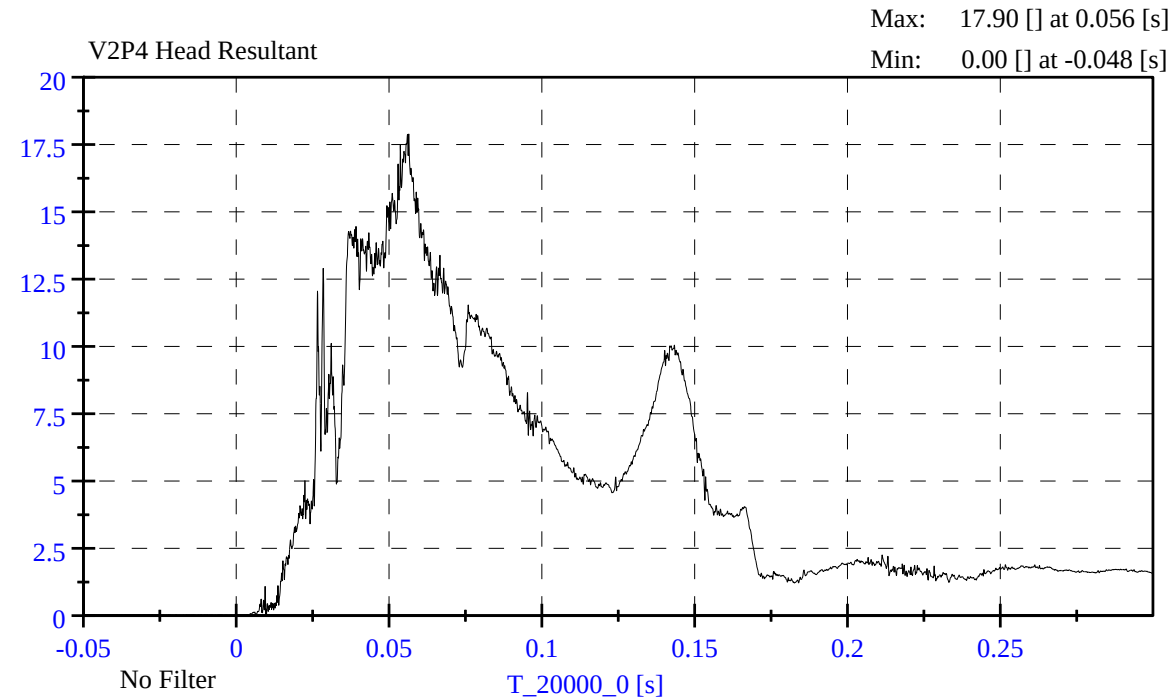


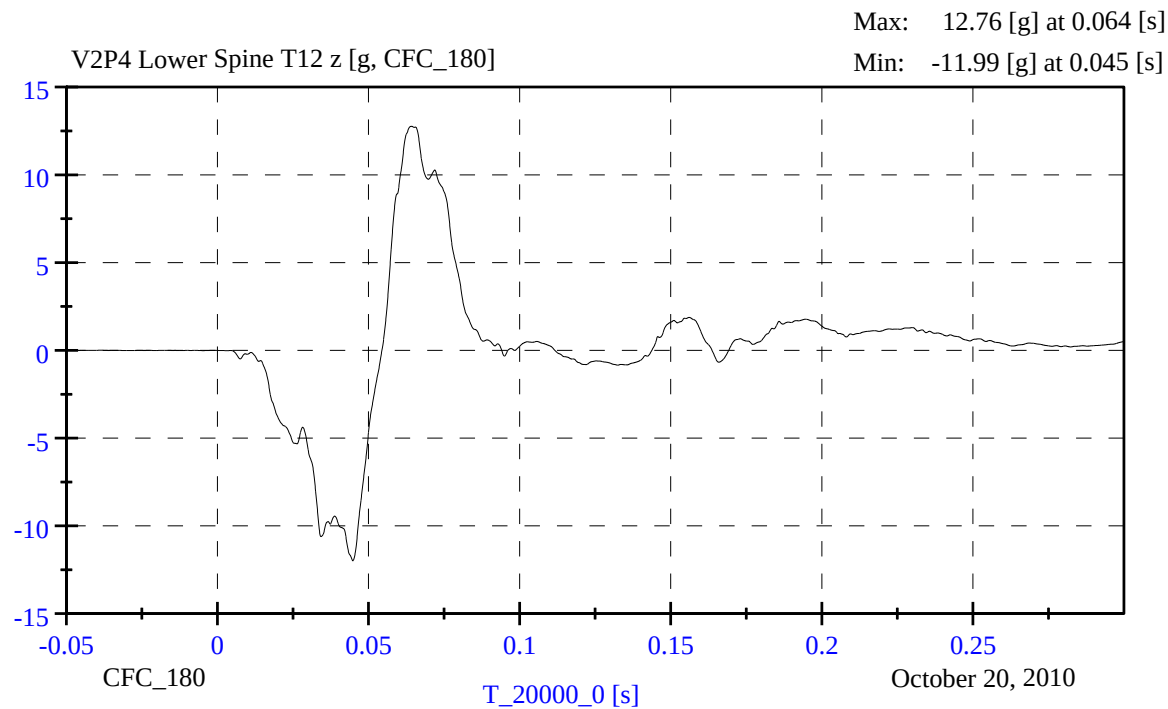
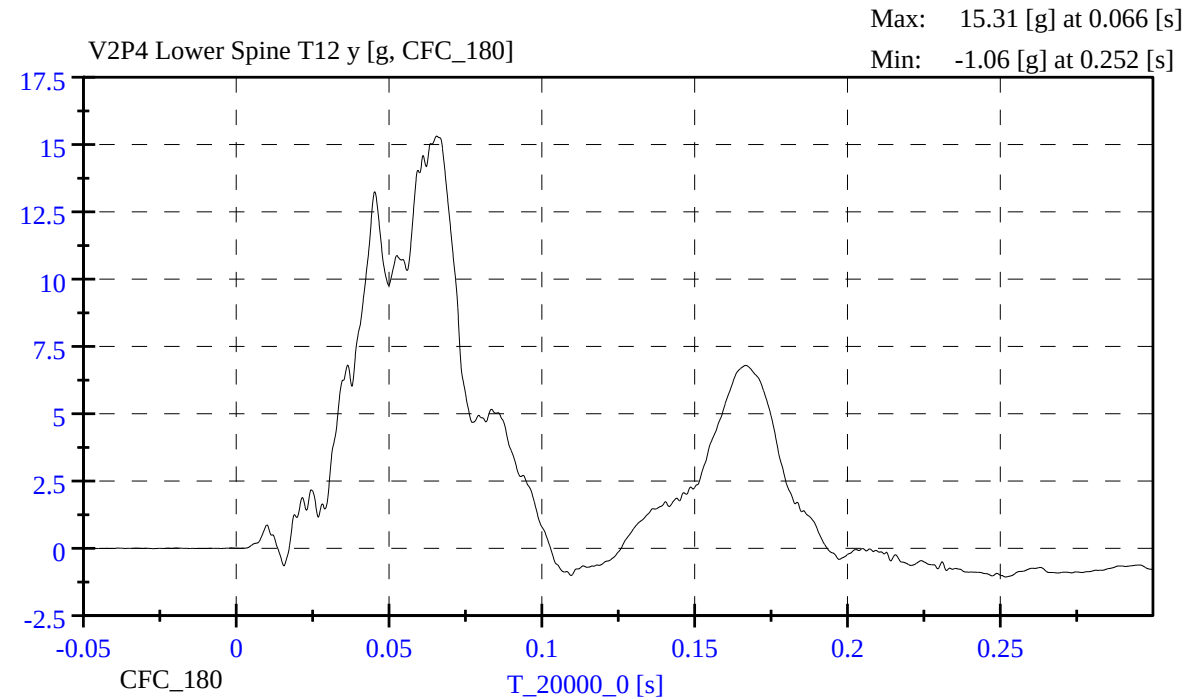


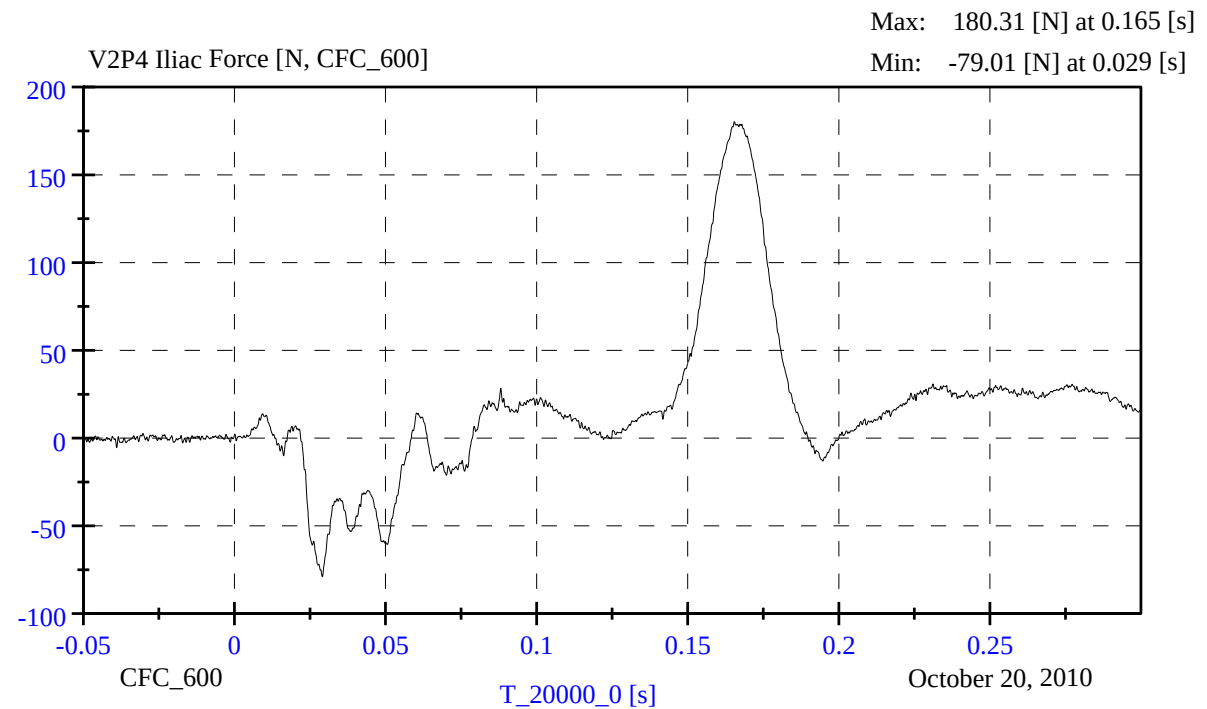
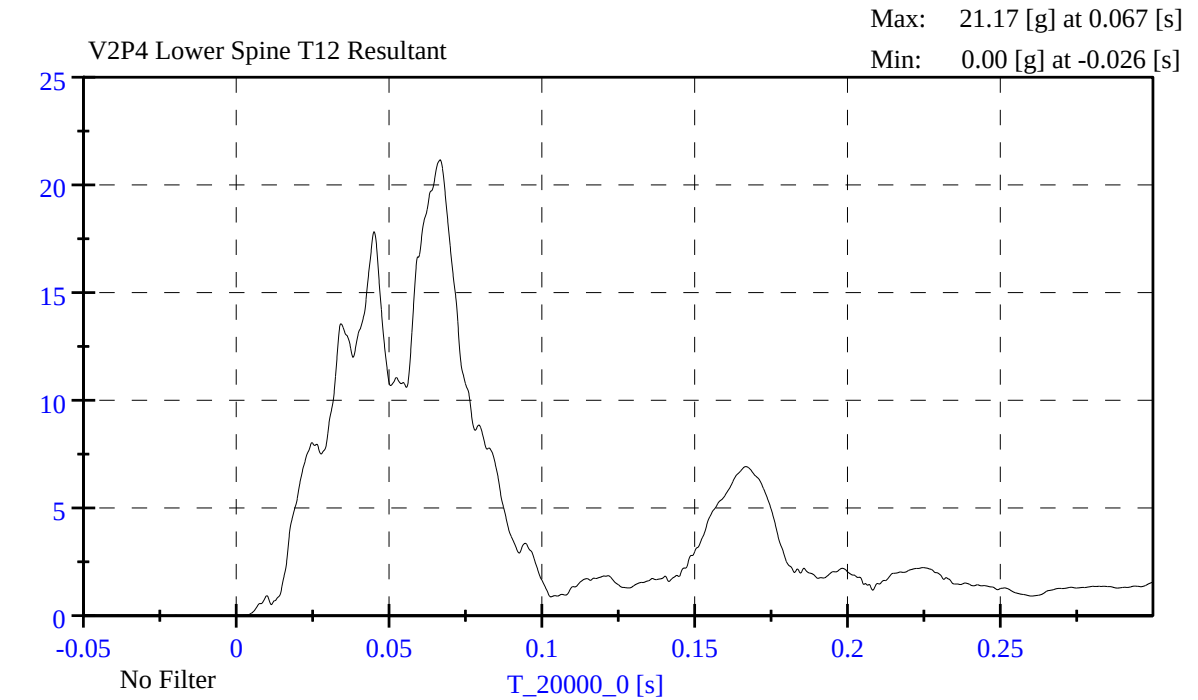


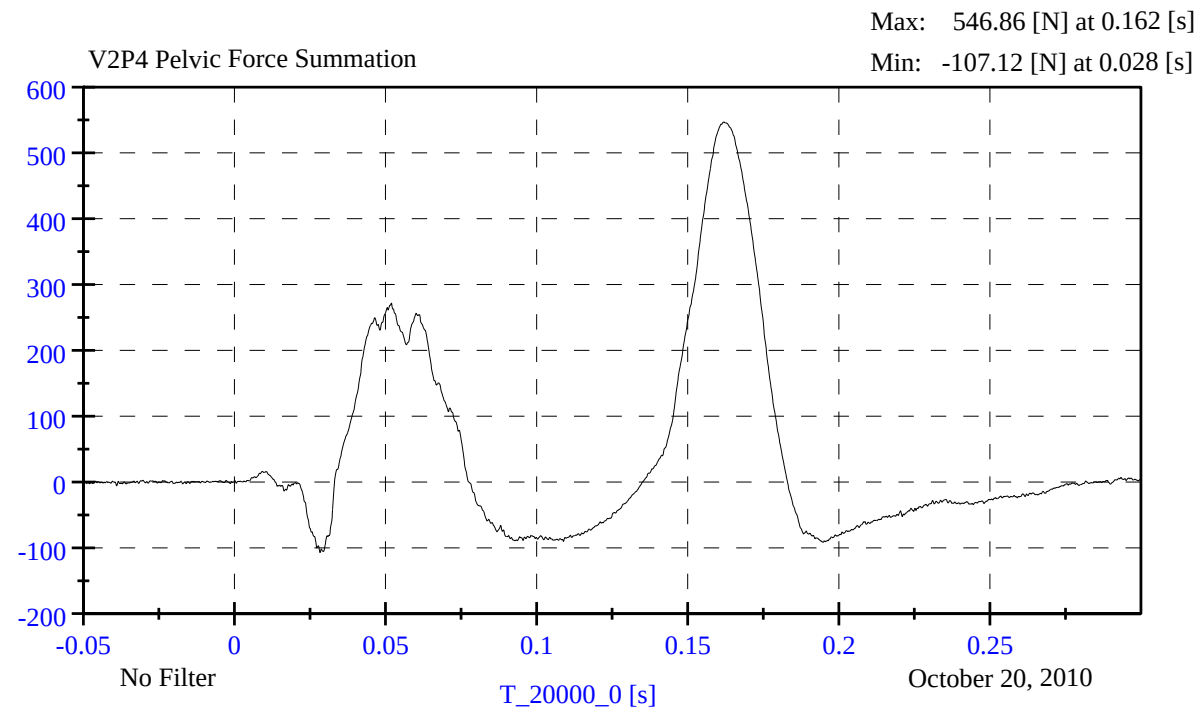
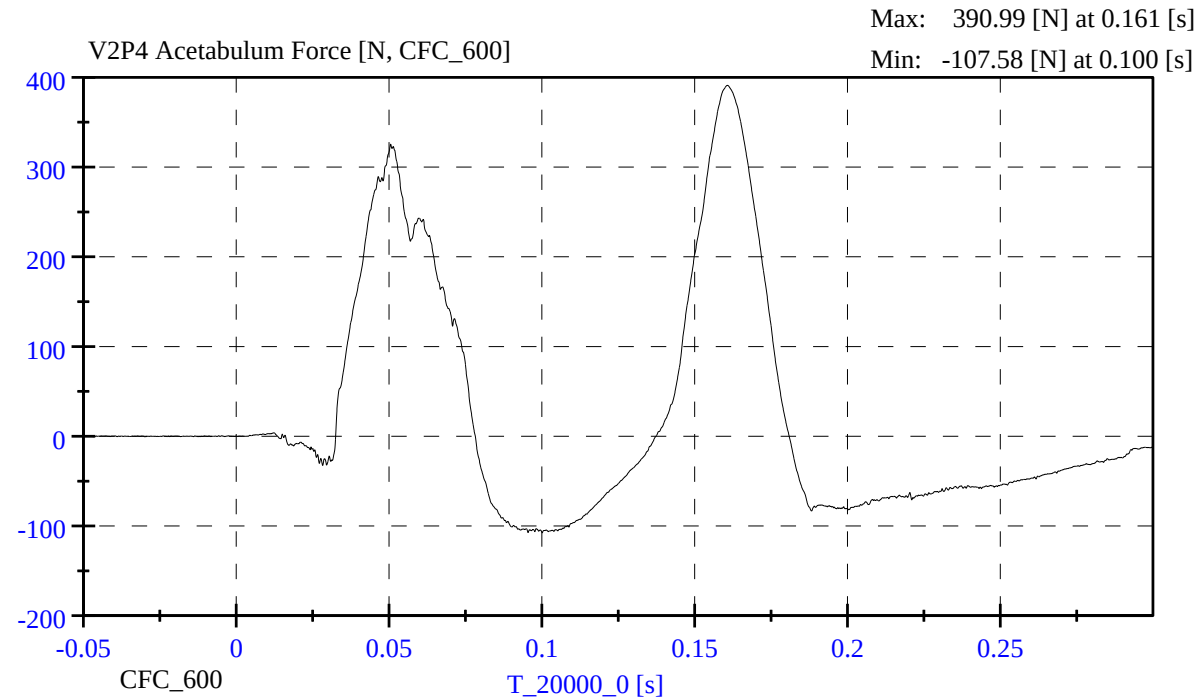












APPENDIX C
DUMMY CALIBRATION DATA

CALIBRATION TEST RESULTS

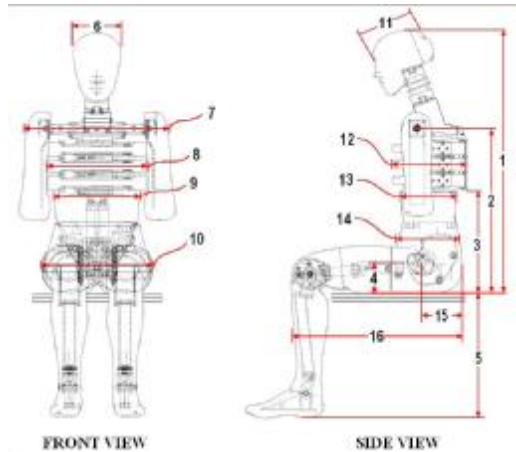
PRE-TEST

Es-2re No: 033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	909	Pass
2	Seat to Shoulder Joint	558-572	565	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	100	Pass
5	Sole to Seat, Sitting	433-451	444	Pass
6	Head Width	152-158	158	Pass
7	Shoulder/Arm Width	461-479	470	Pass
8	Thorax Width	322-332	323	Pass
9	Abdomen Width	273-287	282	Pass
10	Pelvis Lap Width	359-373	369	Pass
11	Head Depth	196-206	201	Pass
12	Thorax Depth	262-272	267	Pass
13	Abdomen Depth	194-204	199	Pass
14	Pelvis Depth	235-245	239	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	157	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician: SZ

Date: 10/19/2010



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

VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	10/18/2010
Test Number:	1	Test Time:	10:33:27 AM

Component Part Number	Component Serial Number
455-1007	8473

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	33 %RH P
Resultant Acceleration	125 -- 155	149 g P
Oscillation	0.0 -- 15.0	6.6 % P
Fore-Aft Acceleration	-15.00 -- 15.00	-4.51 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **10:33:27 AM**

Test Date: **10/18/2010**



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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	P51681	9/20/2010
Endevco	7264-2000	P51949	5/26/2010
Endevco	7264-2000	P51695	9/20/2010

Test ID: **Head Drop**

Test Time: **10:33:27 AM**

Test Date: **10/18/2010**

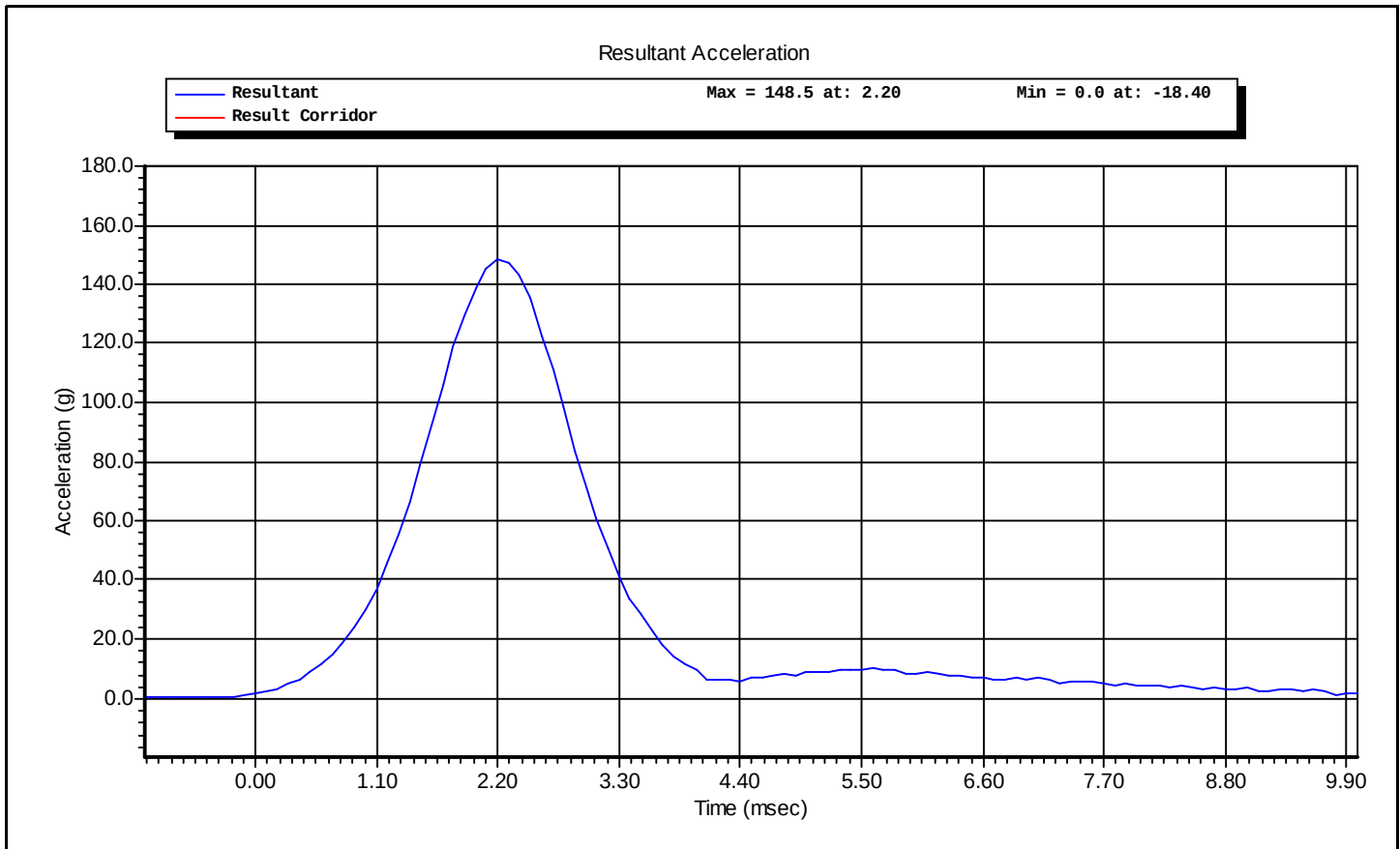


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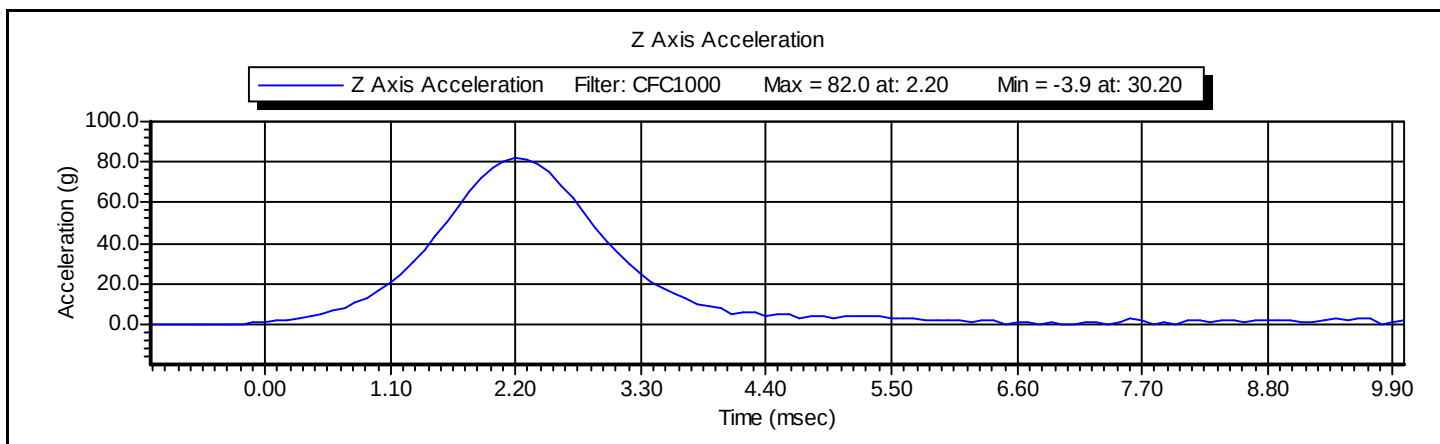
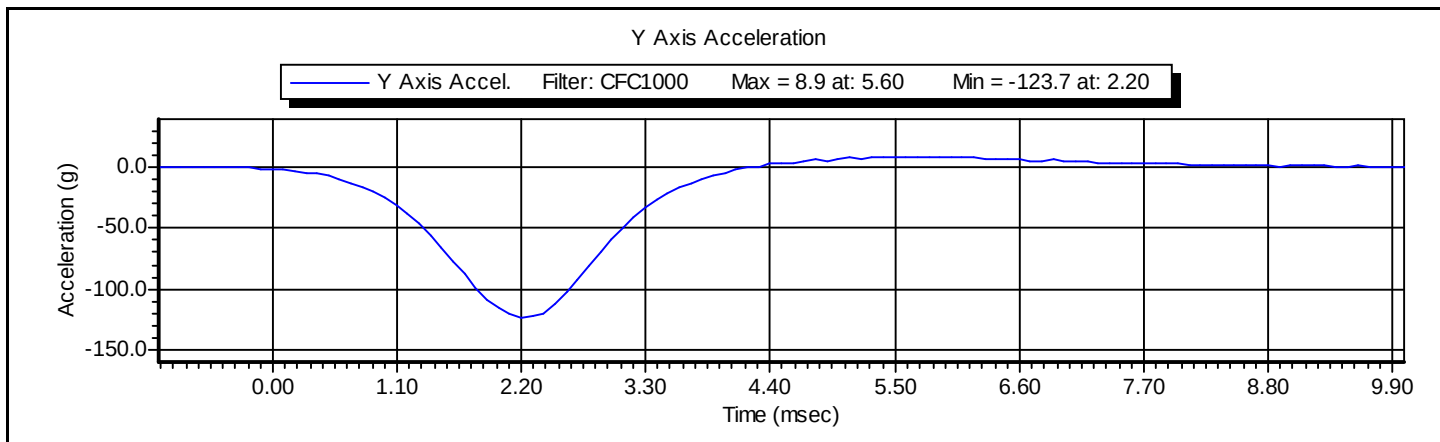
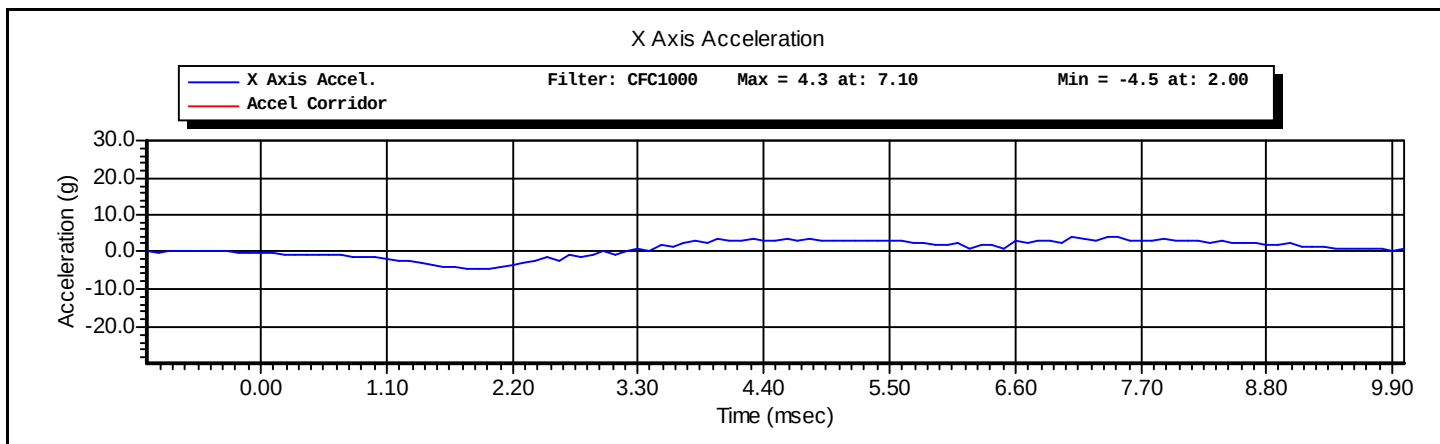
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	10/18/2010
Test Number:	1	Test Time:	10:33:27 AM



Test ID: **Head Drop**

Test Time: **10:33:27 AM**

Test Date: **10/18/2010**





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

VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	10/18/2010
Test Number:	1	Test Time:	11:38:39 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.0 deg C P
Humidity	10 -- 70	33 %RH P
Velocity	3.30 -- 3.50	3.45 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	52.5 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	58.7 ms P
Decay to Zero Degrees	53.0 -- 88.0	59.2 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **11:38:39 AM**

Test Date: **10/18/2010**



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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	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
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Test ID: **Neck Flexion**

Test Time: **11:38:39 AM**

Test Date: **10/18/2010**



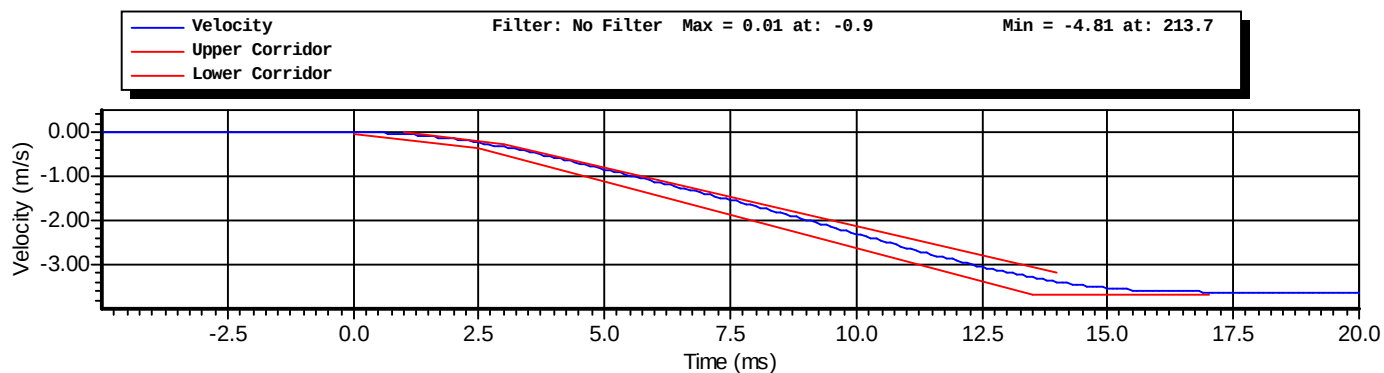
www.calspan.com

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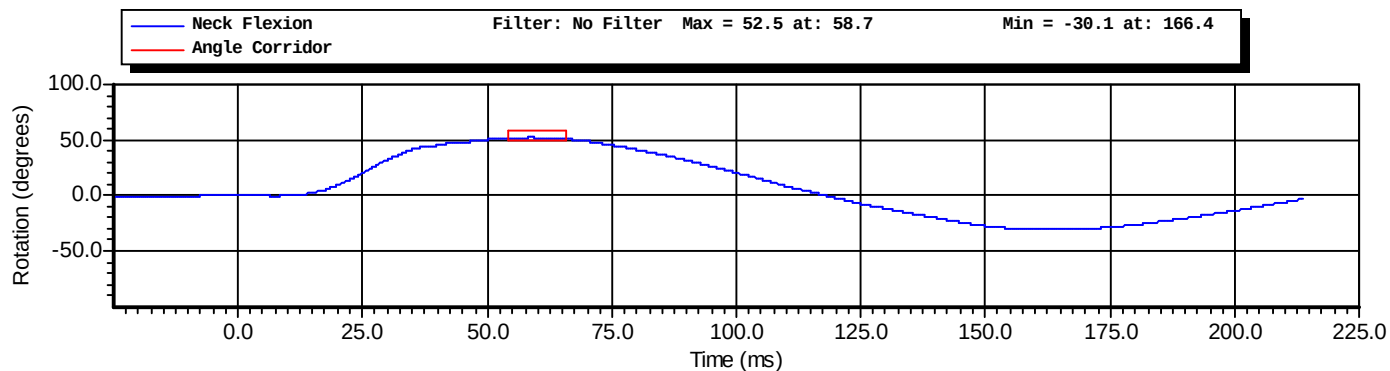
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	10/18/2010
Test Number:	1	Test Time:	11:38:39 AM

Pendulum Velocity



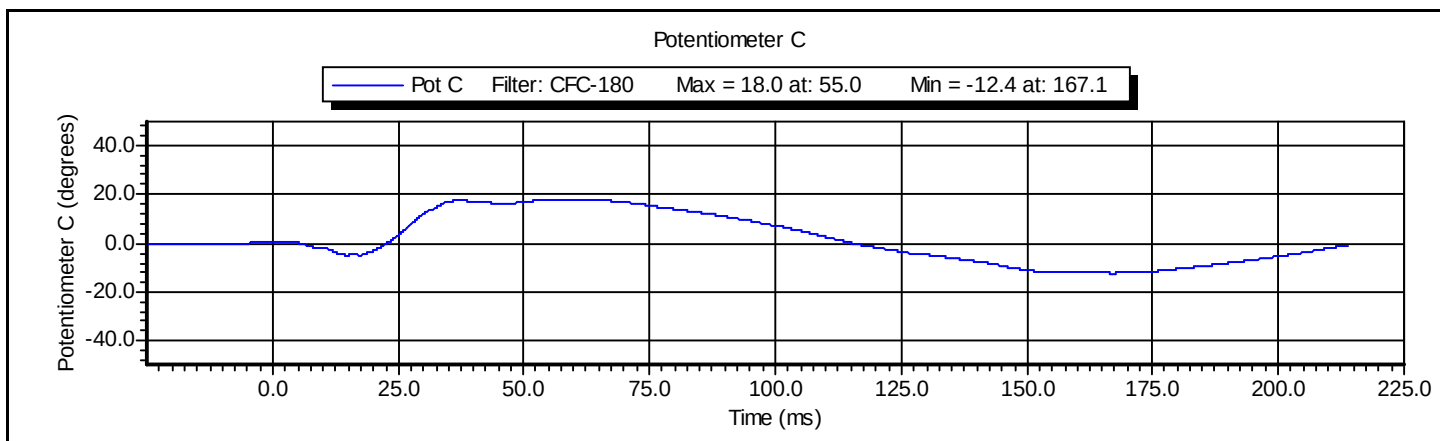
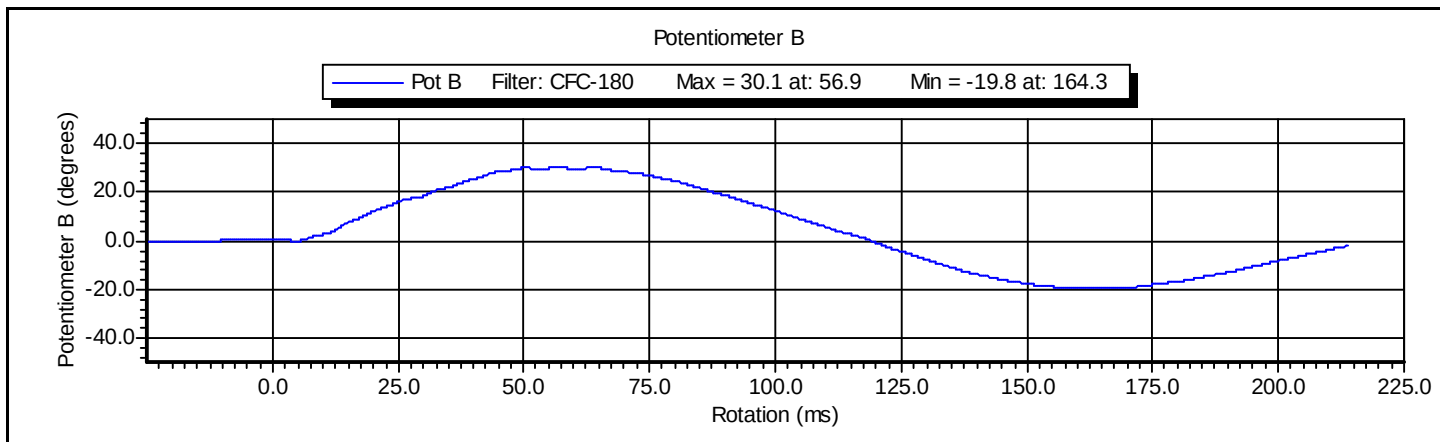
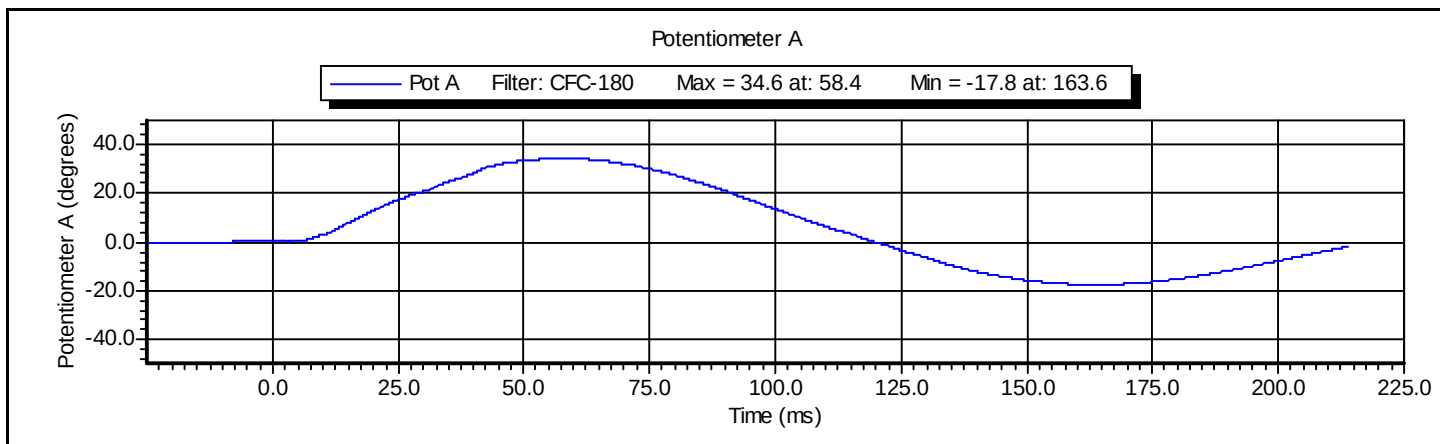
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 11:38:39 AM

Test Date: 10/18/2010





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder Impact	Test Date:	10/19/2010
Test Number:	1	Test Time:	9:39:10 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.3 deg C P
Humidity	10.0 -- 70.0	38.0 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.81 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder Impact**

Test Time: **9:39:10 AM**

Test Date: **10/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

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

Test ID: **Shoulder Impact**

Test Time: **9:39:10 AM**

Test Date: **10/19/2010**

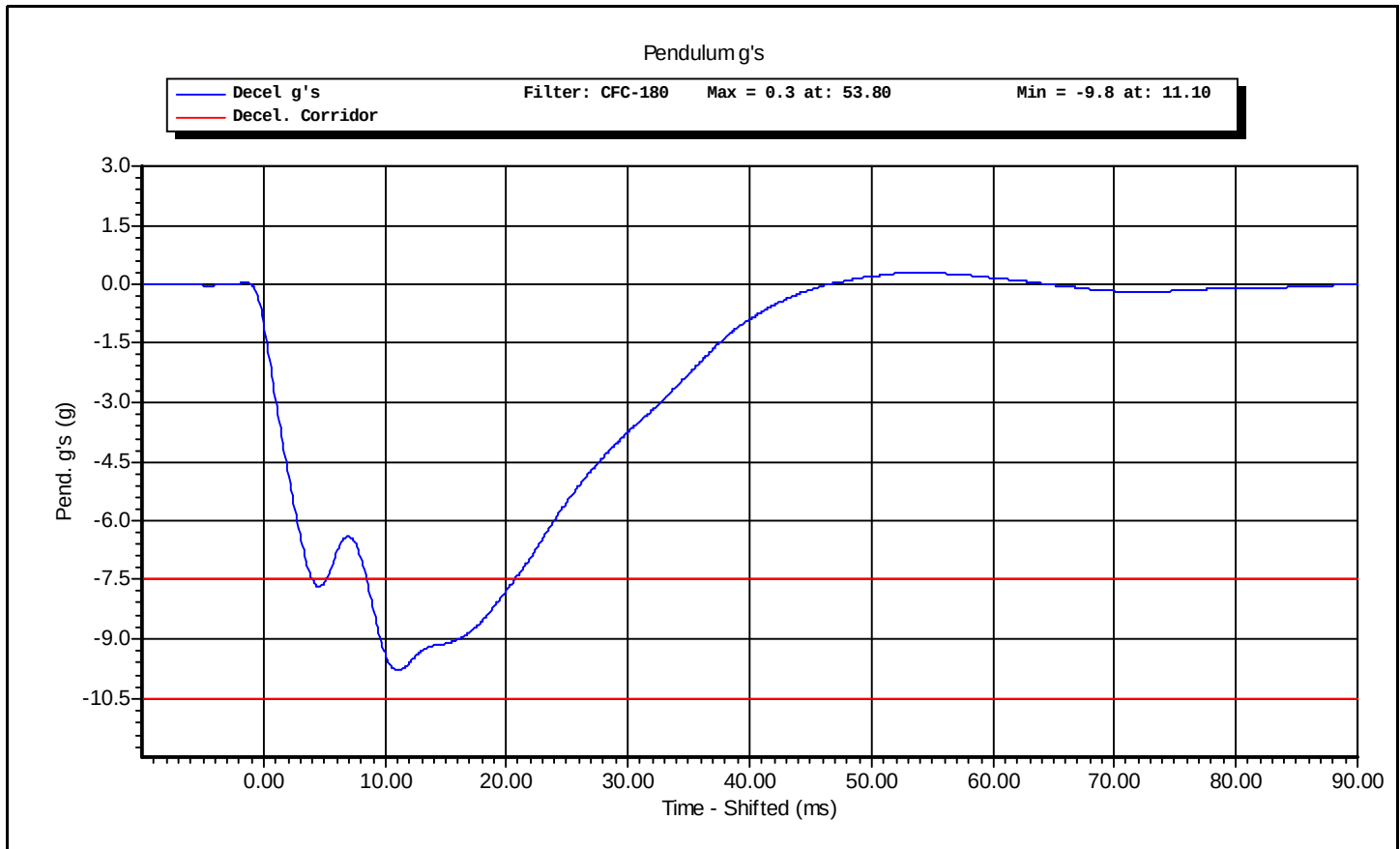


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder Impact	Test Date:	10/19/2010
Test Number:	1	Test Time:	9:39:10 AM



Test ID: **Shoulder Impact** Test Time: **9:39:10 AM**

Test Date: **10/19/2010**



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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	10/19/2010
Test Number:	1	Test Time:	8:38:47 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10.0 -- 70.0	38.0 %RH P
Velocity	5.40 -- 5.60	5.49 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.0 mm P
Middle Rib Displacement	37.0 -- 45.0	41.5 mm P
Lower Rib Displacement	37.0 -- 44.0	41.6 mm P
Impactor Force	5100 -- 6200	5433 N P

All test parameters are within specifications

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

Test ID: **Thorax**

Test Time: **8:38:47 AM**

Test Date: **10/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Honeywell	MLT-38000	DS-179	4/23/2010
Honeywell	MLT-38000	DS-185	4/23/2010
Honeywell	MLT-38000	DS-178	4/23/2010

Test ID: **Thorax**

Test Time: **8:38:47 AM**

Test Date: **10/19/2010**



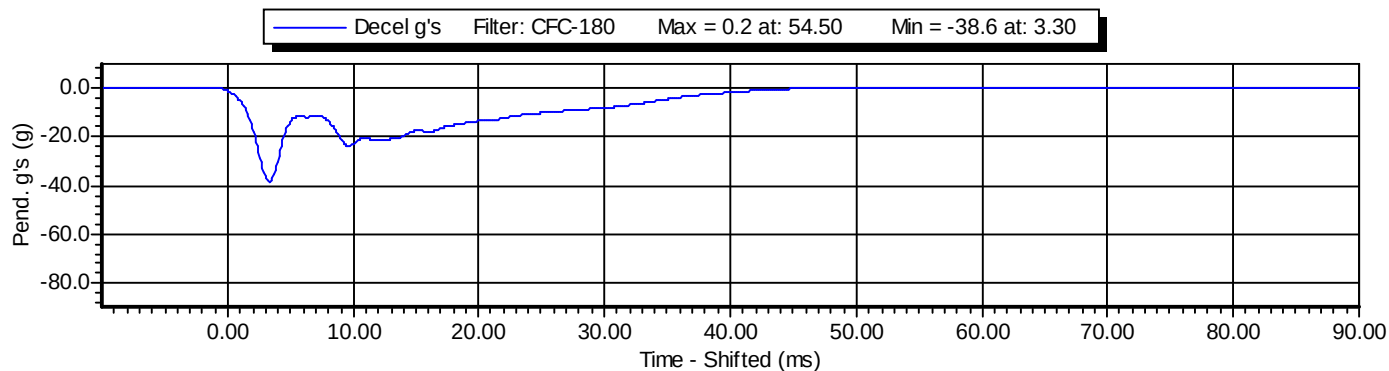
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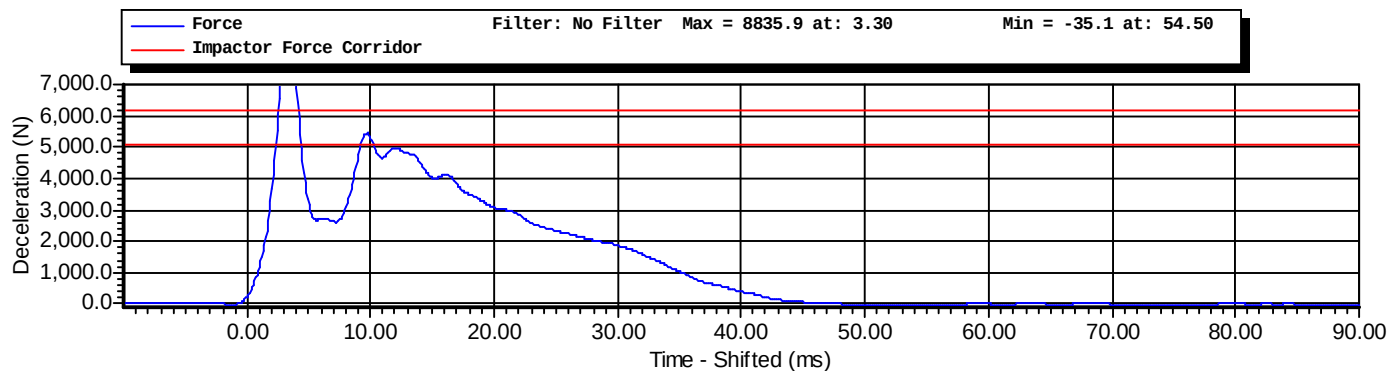
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	10/19/2010
Test Number:	1	Test Time:	8:38:47 AM

Pendulum g's



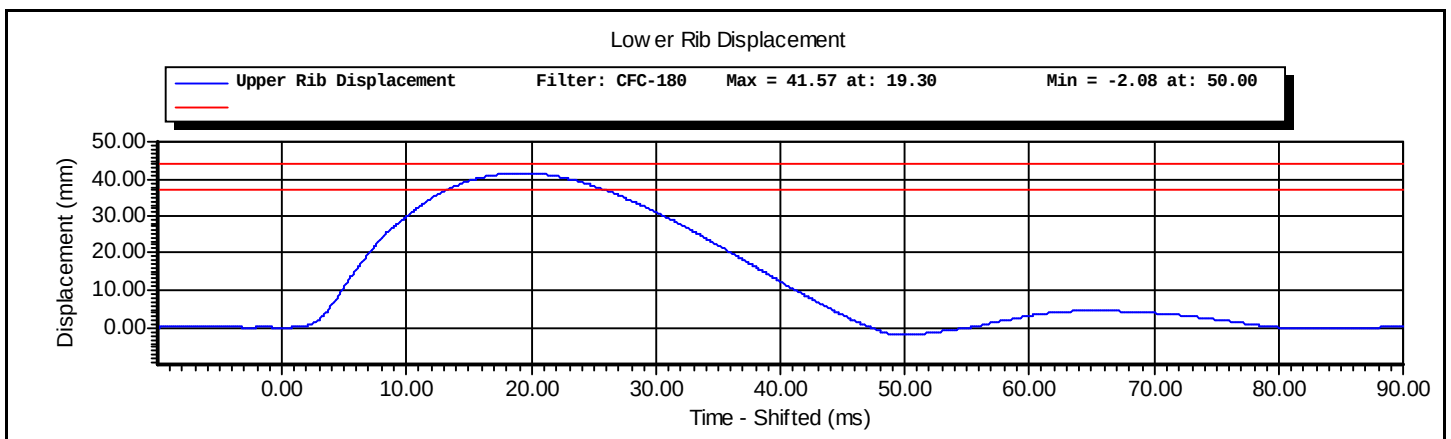
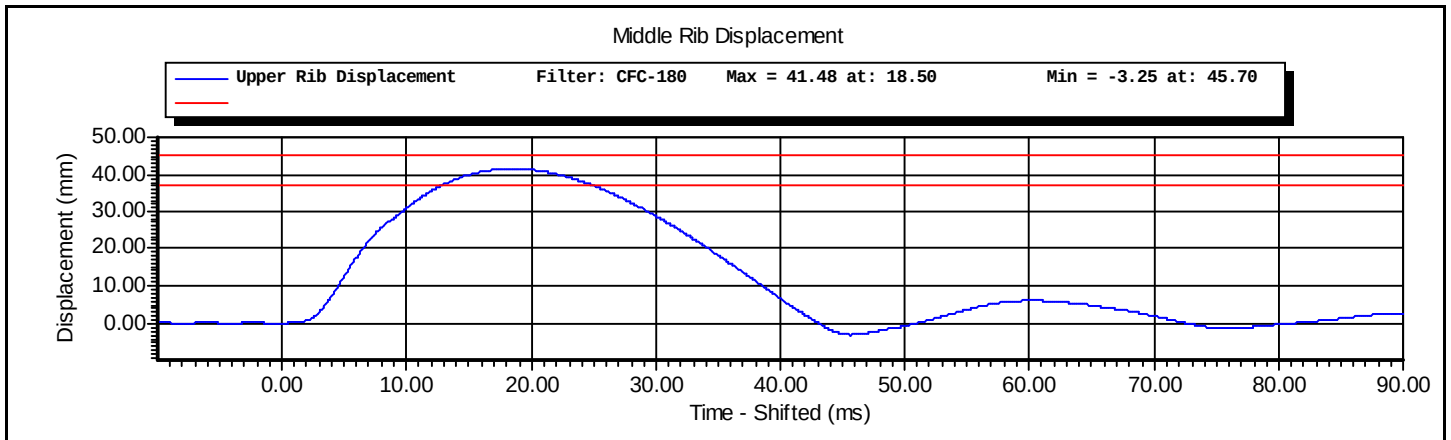
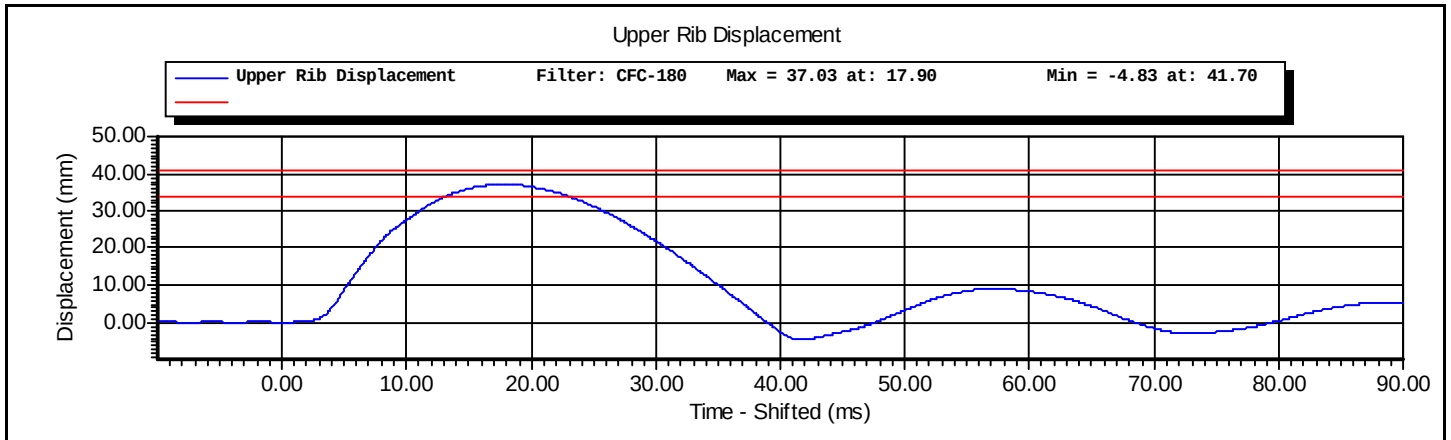
Impactor Force



Test ID: Thorax

Test Time: 8:38:47 AM

Test Date: 10/19/2010





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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	2:57:23 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	30.0 %RH P
Velocity	3.90 -- 4.10	3.99 m/s P
Rib Displacement	-51.00 -- -46.00	-48.80 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

Test ID: **Upper Rib 4 m/s**

Test Time: **2:57:23 PM**

Test Date: **10/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 4 m/s**

Test Time: **2:57:23 PM**

Test Date: **10/18/2010**

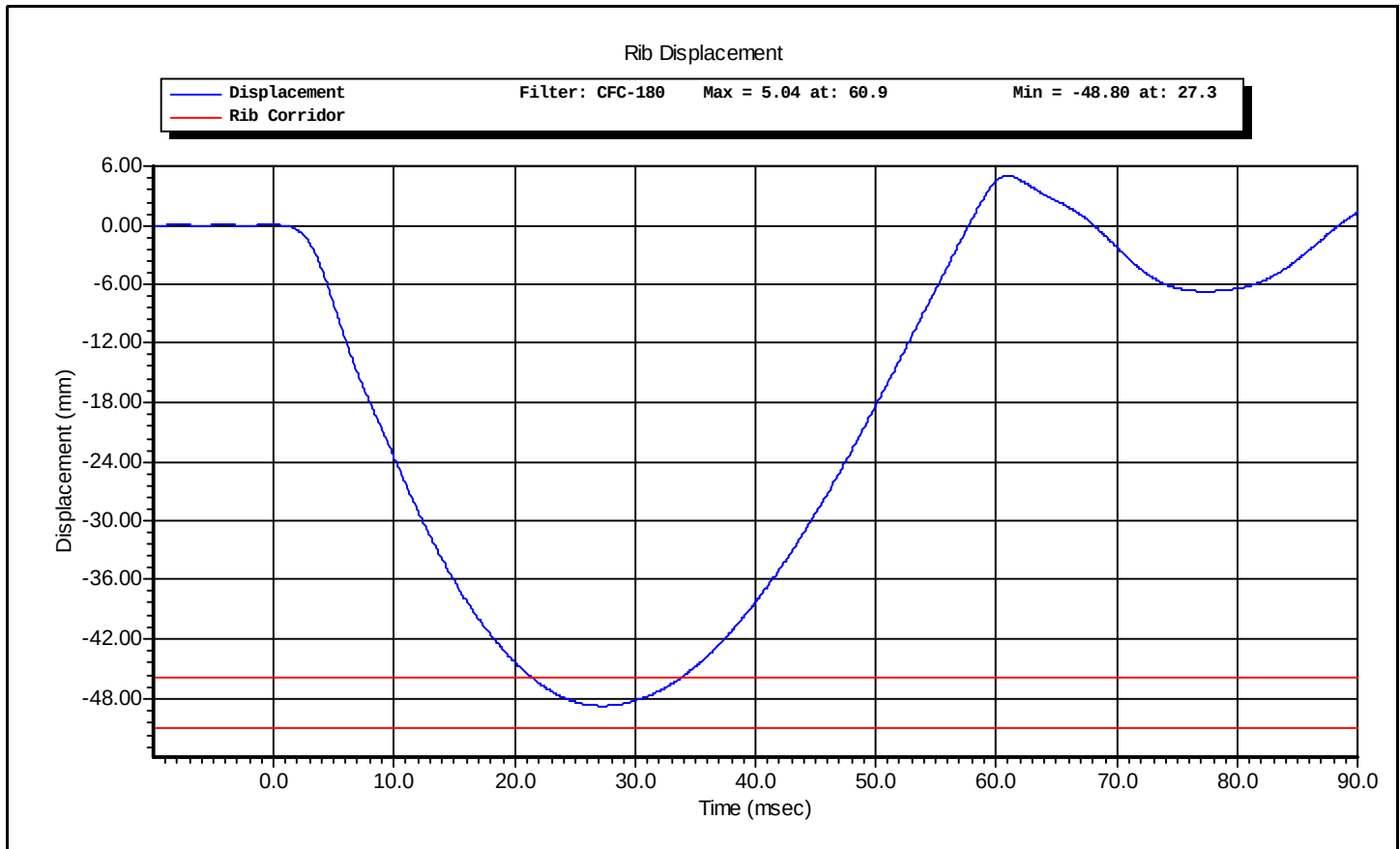


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	2:57:23 PM



Test ID: Upper Rib 4 m/s

Test Time: 2:57:23 PM

Test Date: 10/18/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:03:35 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	30.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.94 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

Test ID: **Upper Rib 3 m/s**

Test Time: **3:03:35 PM**

Test Date: **10/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 3 m/s**

Test Time: **3:03:35 PM**

Test Date: **10/18/2010**

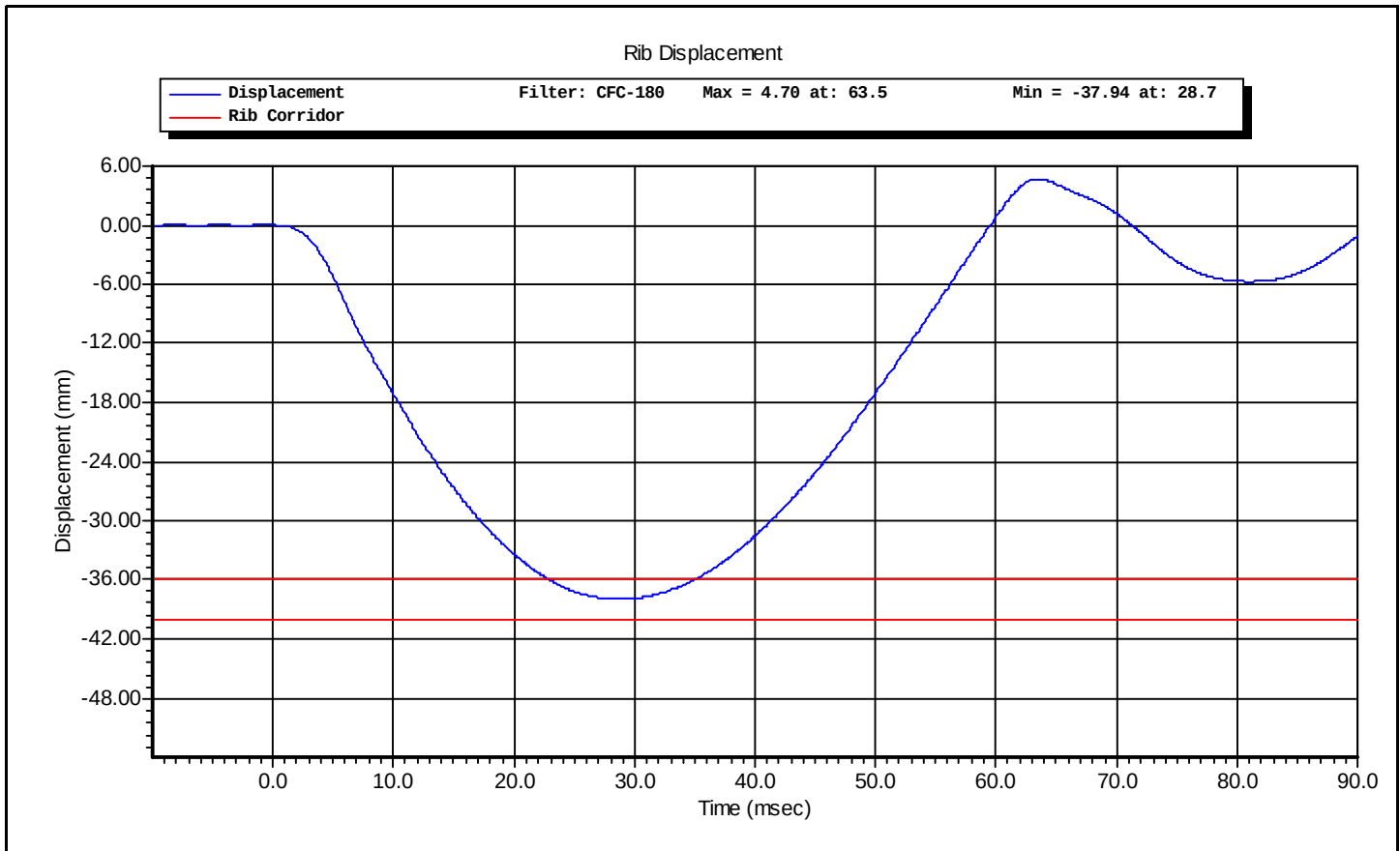


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:03:35 PM



Test ID: Upper Rib 3 m/s

Test Time: 3:03:35 PM

Test Date: 10/18/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:10:11 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-47.90 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

Test ID: **Middle Rib 4 m/s** Test Time: **3:10:11 PM**

Test Date: **10/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Middle Rib 4 m/s**

Test Time: **3:10:11 PM**

Test Date: **10/18/2010**

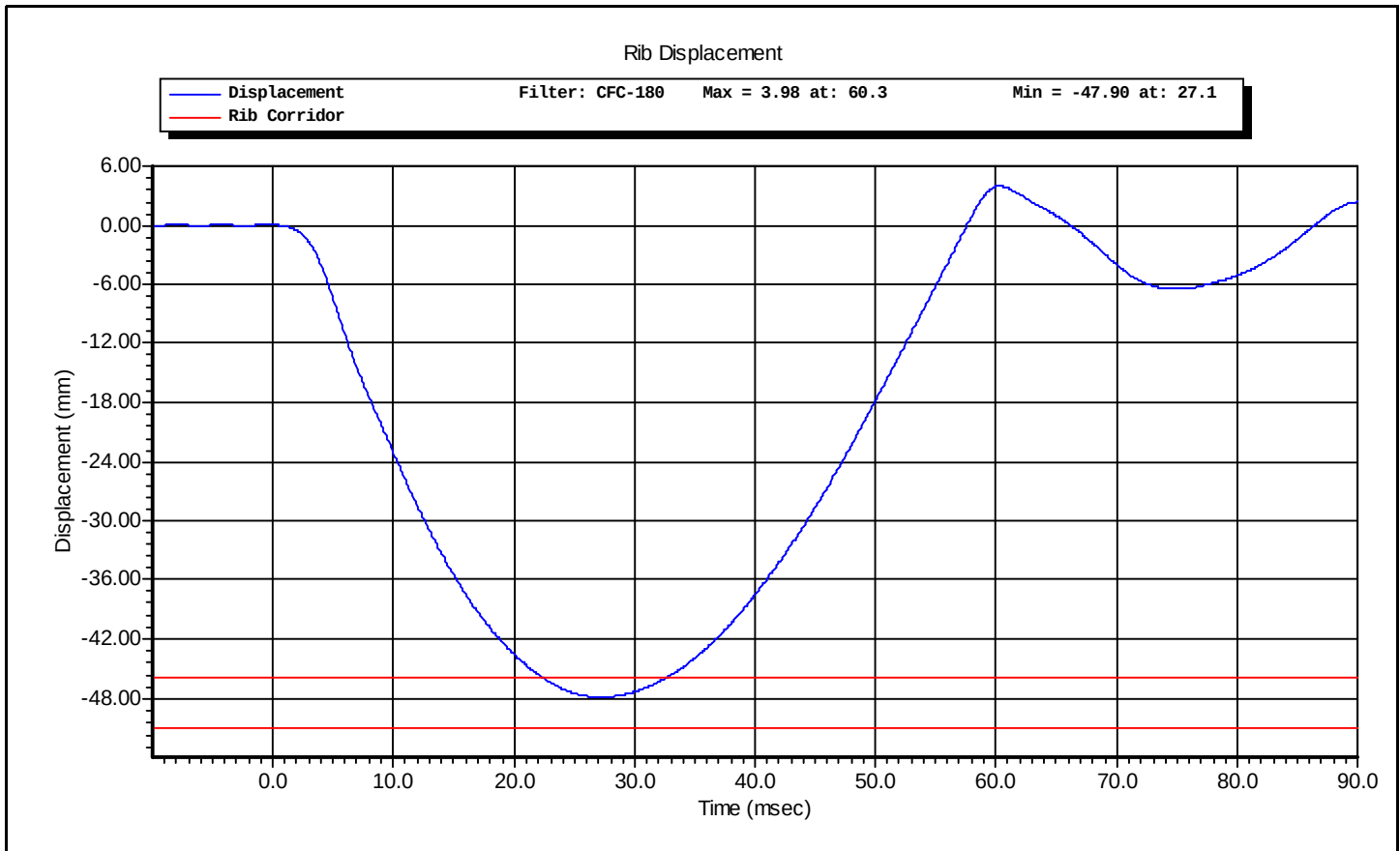


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 4 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:10:11 PM



Test ID: Middle Rib 4 m/s Test Time: 3:10:11 PM

Test Date: 10/18/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:16:33 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.57 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

Test ID: **Middle Rib 3 m/s** Test Time: **3:16:33 PM**

Test Date: **10/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Middle Rib 3 m/s**

Test Time: **3:16:33 PM**

Test Date: **10/18/2010**

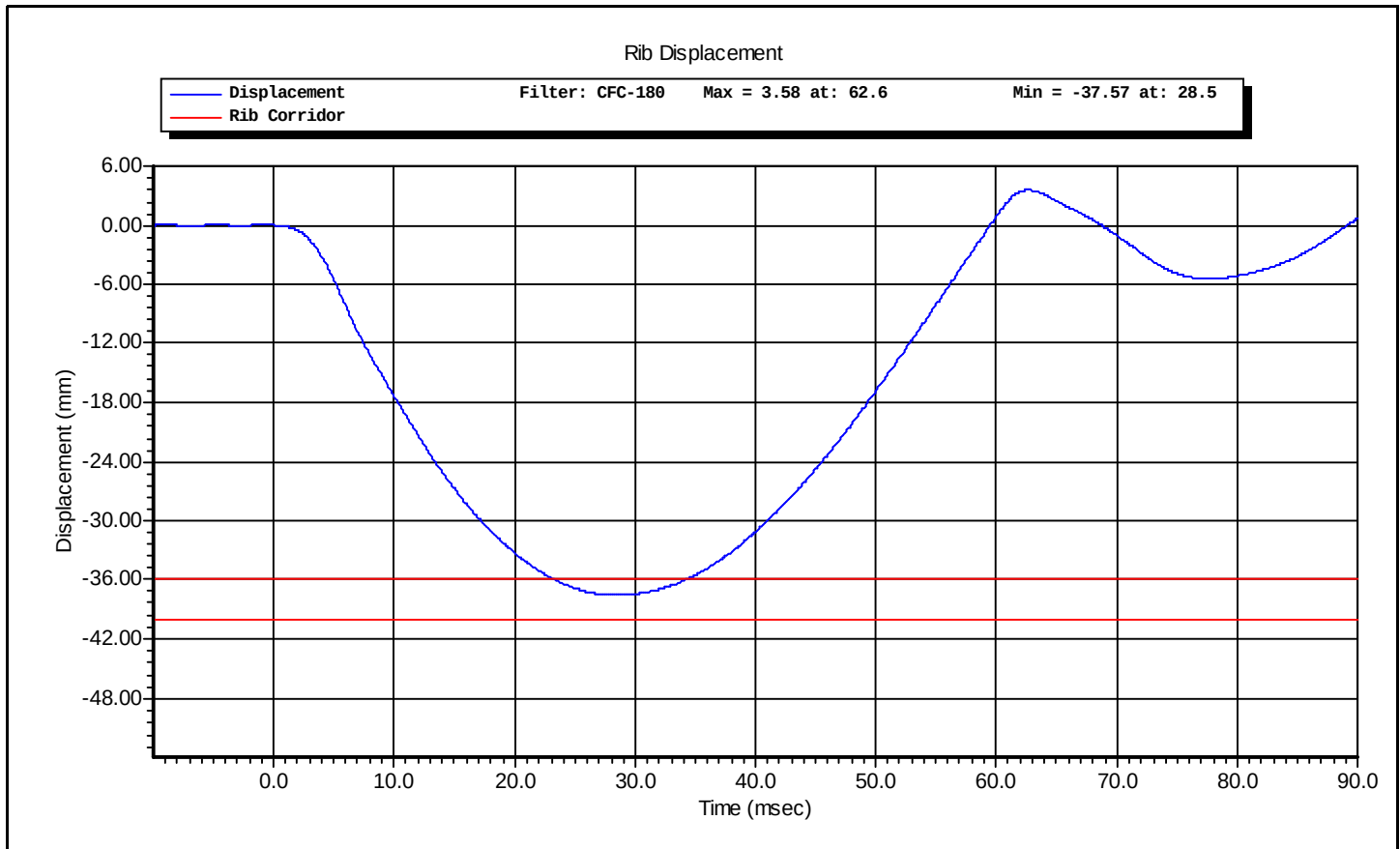


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:16:33 PM



Test ID: Middle Rib 3 m/s Test Time: 3:16:33 PM

Test Date: 10/18/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:20:37 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-48.37 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

Test ID: **Lower Rib 4 m/s**

Test Time: **3:20:37 PM**

Test Date: **10/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 4 m/s**

Test Time: **3:20:37 PM**

Test Date: **10/18/2010**

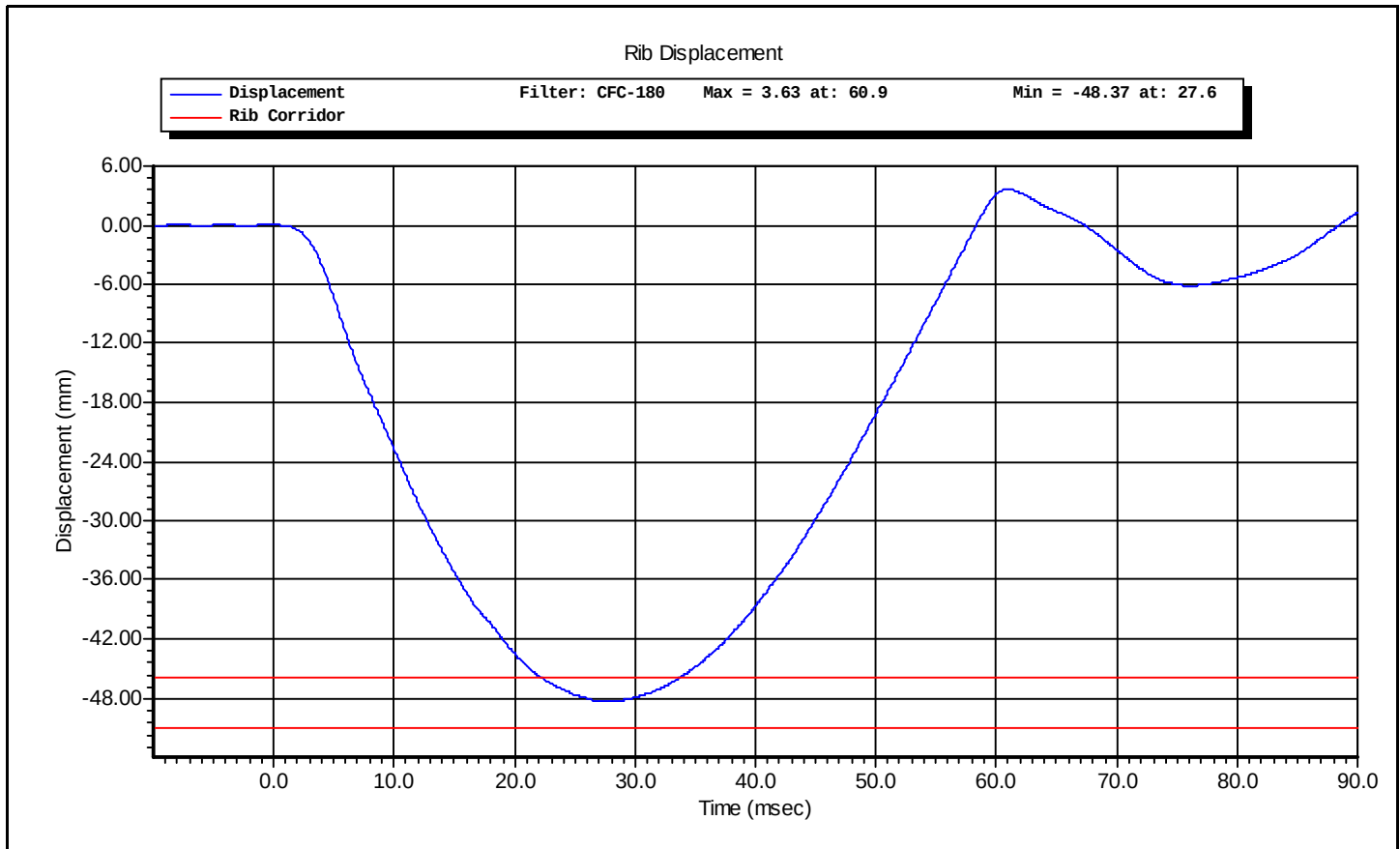


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:20:37 PM



Test ID: Lower Rib 4 m/s

Test Time: 3:20:37 PM

Test Date: 10/18/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:29:23 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	28.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.99 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

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

Test ID: **Lower Rib 3 m/s**

Test Time: **3:29:23 PM**

Test Date: **10/18/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 3 m/s**

Test Time: **3:29:23 PM**

Test Date: **10/18/2010**

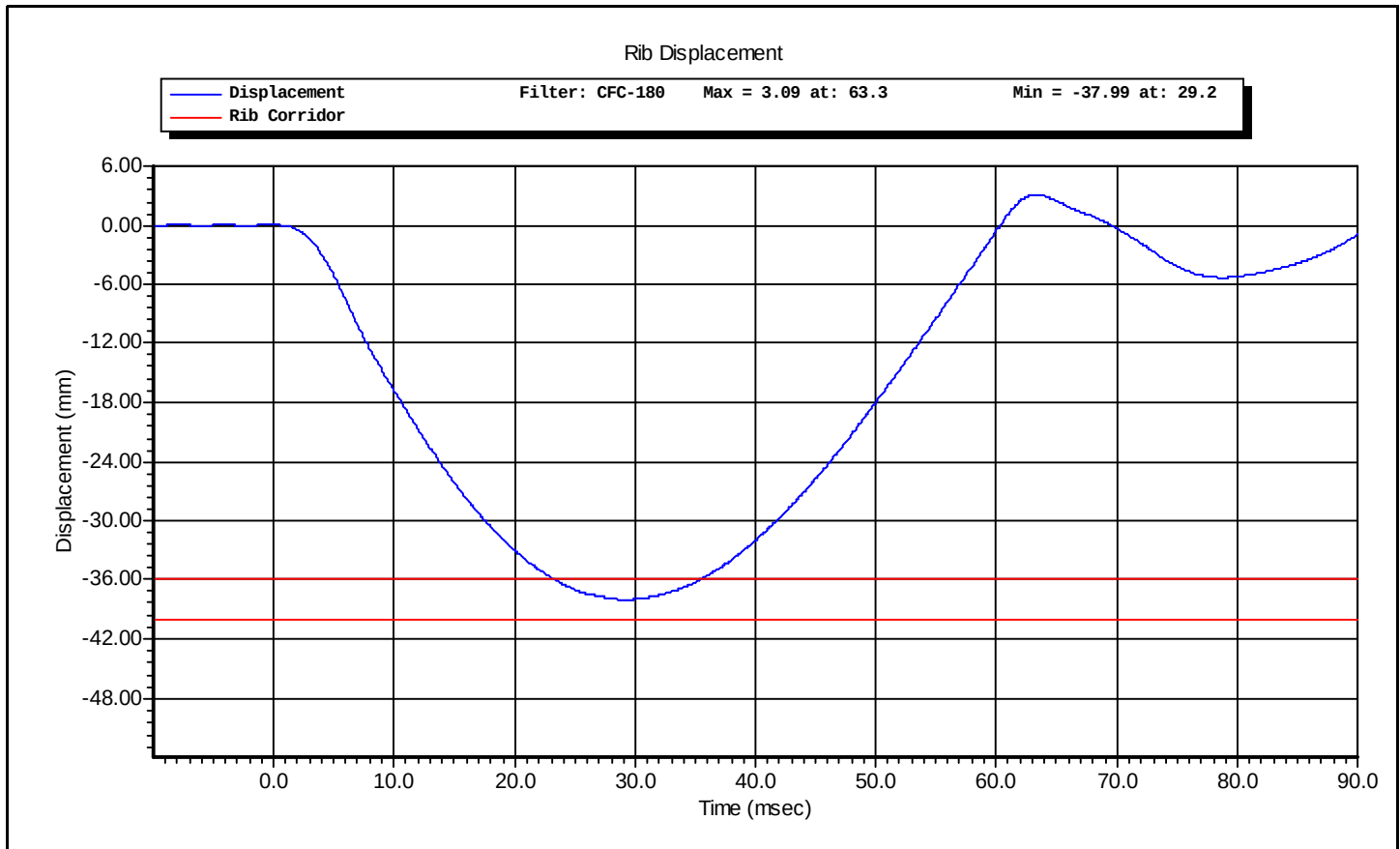


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3 m/s	Test Date:	10/18/2010
Test Number:	1	Test Time:	3:29:23 PM



Test ID: Lower Rib 3 m/s Test Time: 3:29:23 PM

Test Date: 10/18/2010



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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdmen	Test Date:	10/18/2010
Test Number:	1	Test Time:	4:11:28 PM

Component Part Number	Component Serial Number
455-4001	07/136

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	28 %RH P
Velocity	3.90 -- 4.10	4.03 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.37 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	10.8 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.42 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	11.3 ms P

All test parameters are within specifications

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

Test ID: **Abdmen**

Test Time: **4:11:28 PM**

Test Date: **10/18/2010**



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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
Denton	2631	LC-1524	4/22/2010
Denton	2631	LC-1523	4/22/2010
Denton	2631	LC-1530	4/22/2010

Test ID: **Abdmen**

Test Time: **4:11:28 PM**

Test Date: **10/18/2010**

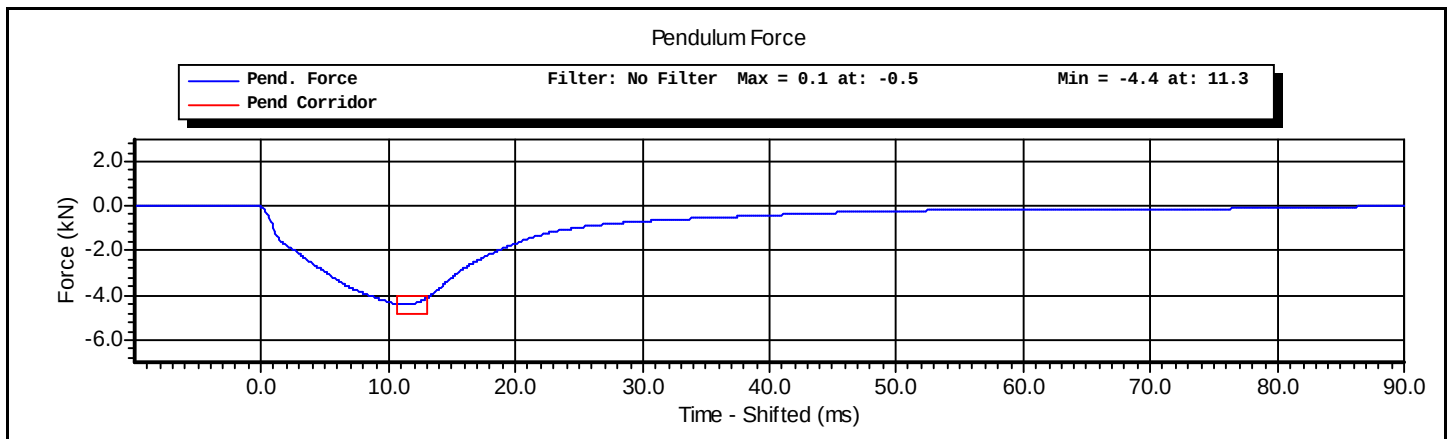
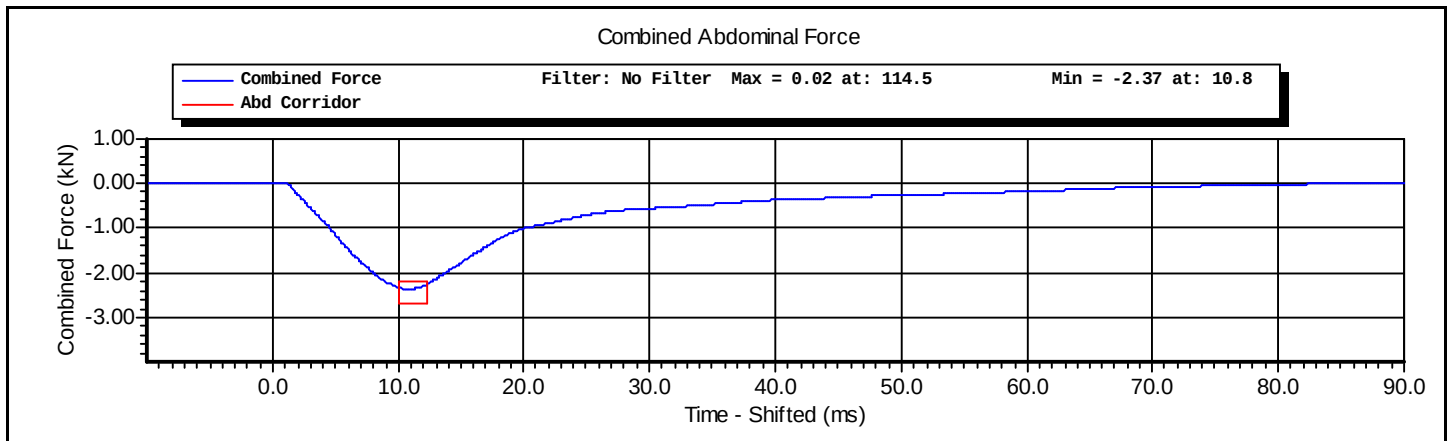


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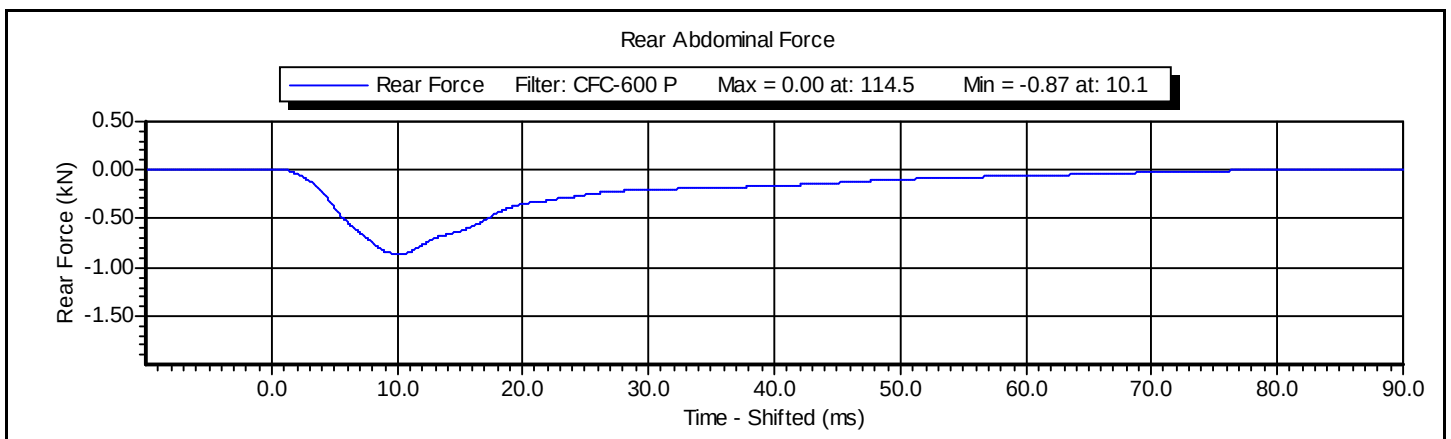
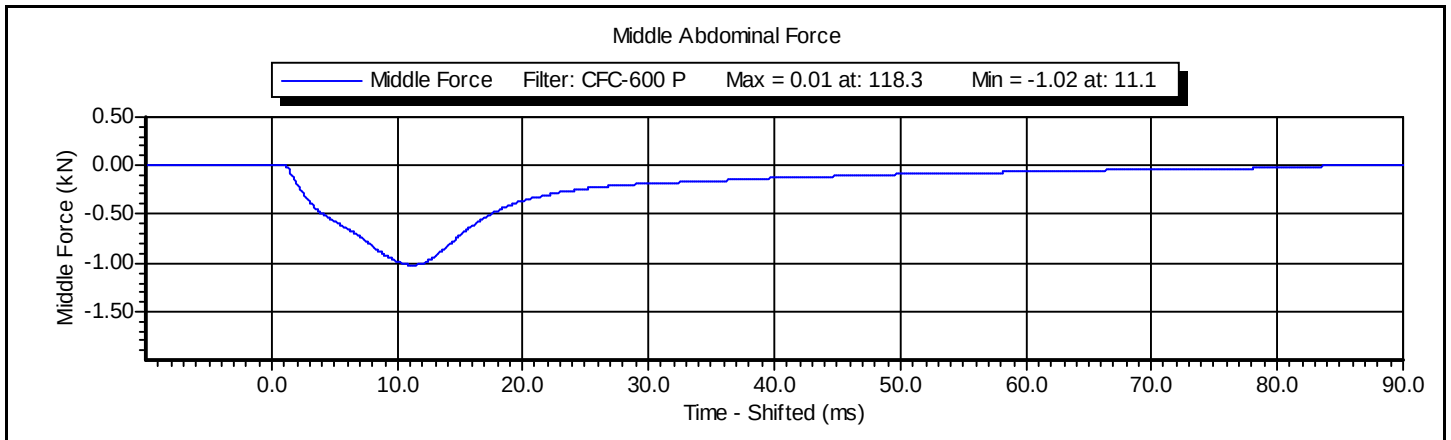
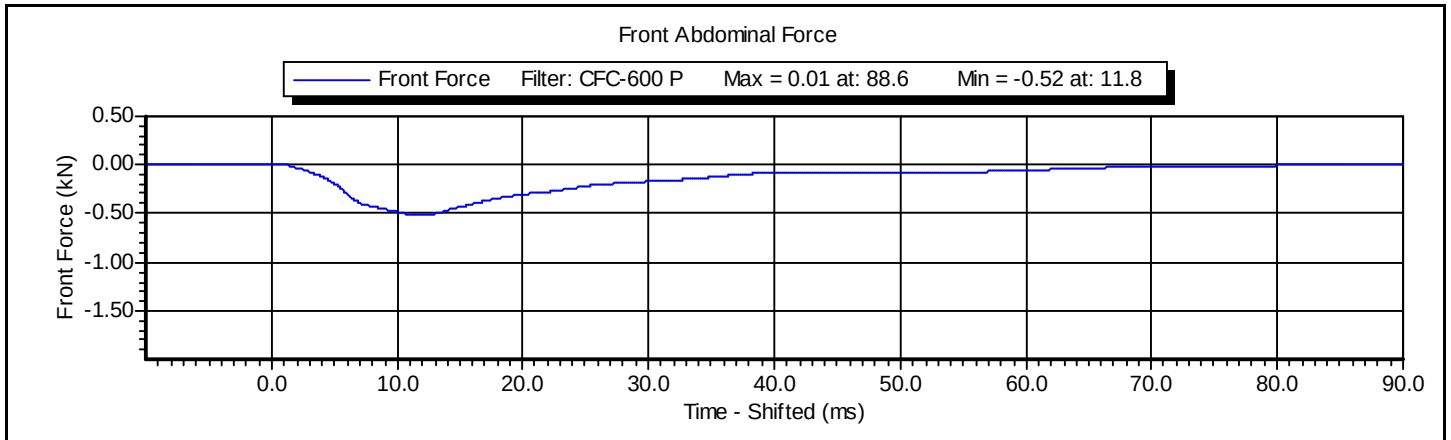
Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdmen	Test Date:	10/18/2010
Test Number:	1	Test Time:	4:11:28 PM



Test ID: **Abdmen**

Test Time: **4:11:28 PM**

Test Date: **10/18/2010**





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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Spine Flexion	Test Date:	10/18/2010
Test Number:	3	Test Time:	2:37:33 PM

Component Part Number	Component Serial Number
175-5501	15-0545

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	29 %RH P
Velocity	5.95 -- 6.15	6.12 m/s P
Maximum Headform Flexion Angle	45.0 -- 55.0	47.6 degrees P
Time at Maximum Headform Flexion Angle	39.0 -- 53.0	42.5 ms P
Decay to Zero Degrees	37.0 -- 57.0	39.1 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

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

Test ID: **Spine Flexion**

Test Time: **2:37:33 PM**

Test Date: **10/18/2010**



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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	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Spine Flexion**

Test Time: **2:37:33 PM**

Test Date: **10/18/2010**



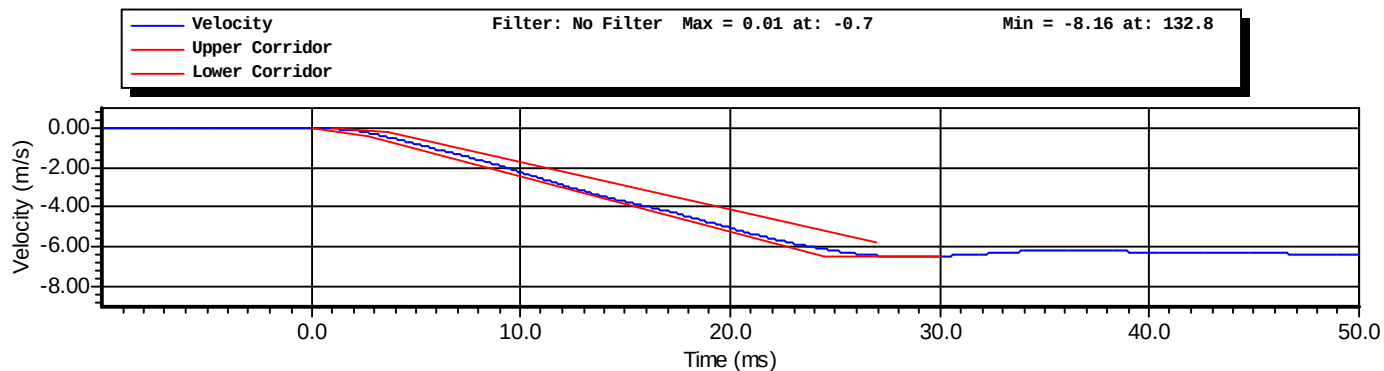
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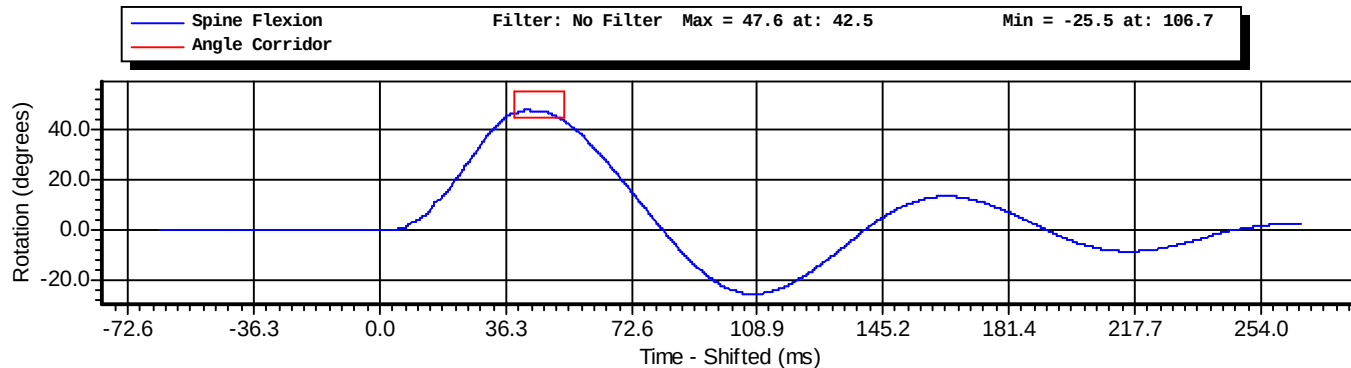
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Spine Flexion	Test Date:	10/18/2010
Test Number:	3	Test Time:	2:37:33 PM

Pendulum Velocity



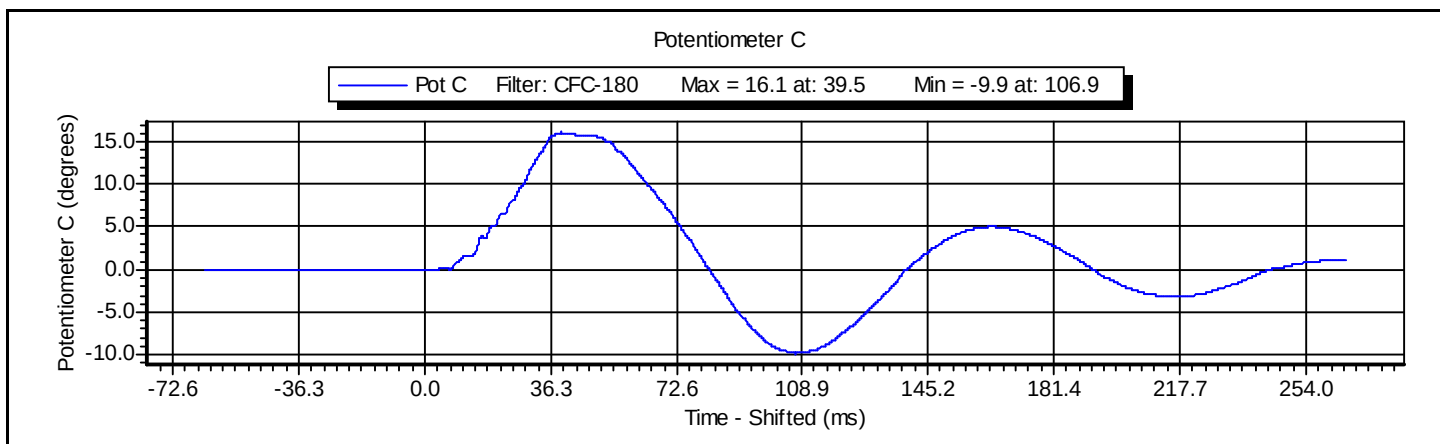
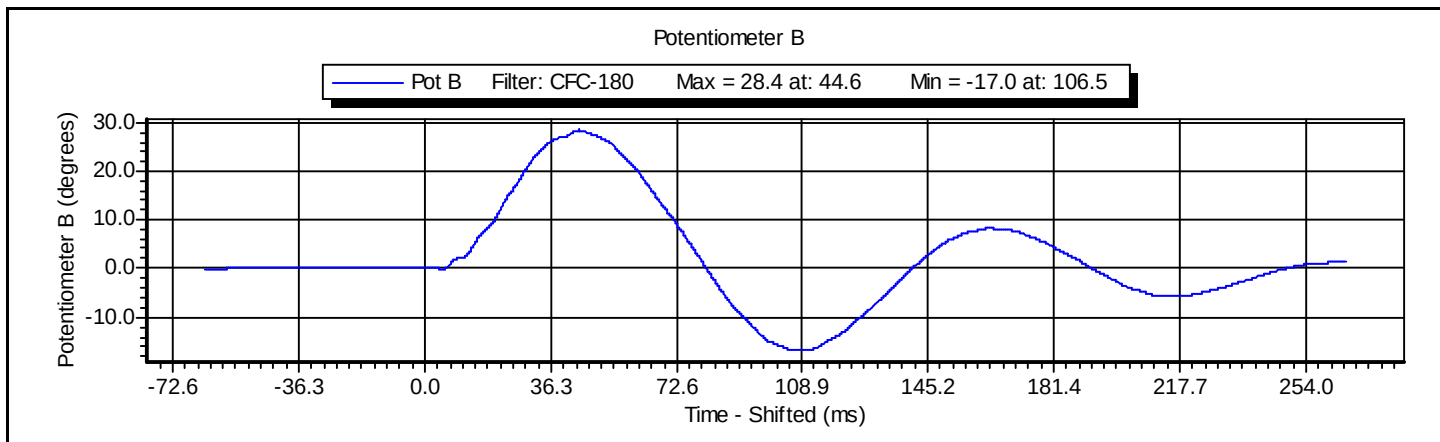
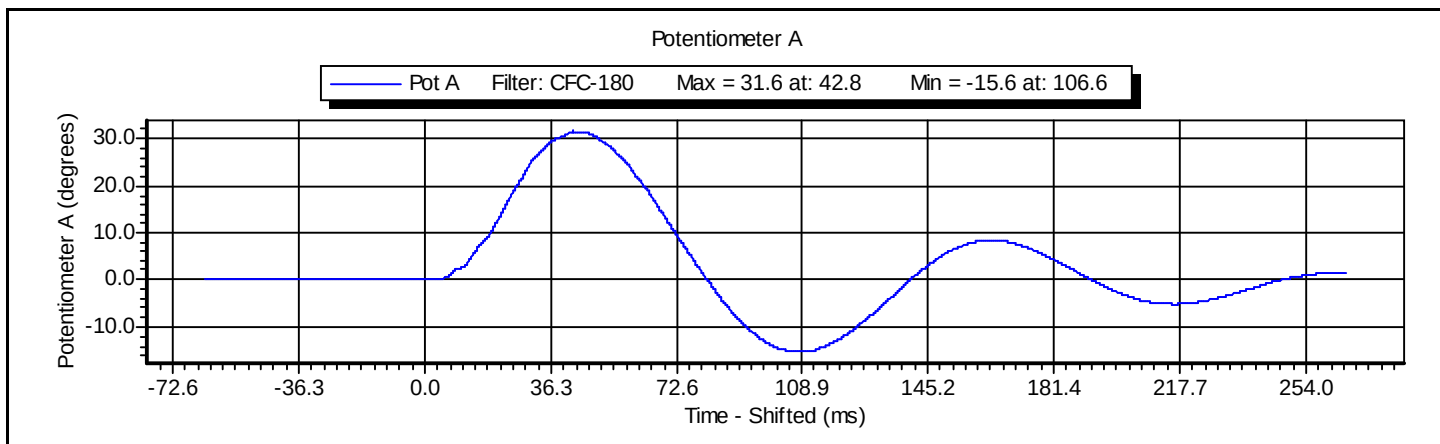
Spine Flexion Angle



Test ID: **Spine Flexion**

Test Time: **2:37:33 PM**

Test Date: **10/18/2010**





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VERIFICATION REPORT

Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	10/19/2010
Test Number:	1	Test Time:	8:52:29 AM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.7 deg C P
Humidity	10 -- 70	38 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Peak Pendulum Force	-5.40 -- -4.70	-4.94 kN P
Time at Peak Pendulum Force	11.80 -- 16.10	13.71 ms P
Peak Pubic Symphysis Force	-1.59 -- -1.23	-1.31 kN P
Time at Peak Pubic Symphysis Force	12.20 -- 17.00	14.51 ms P

All test parameters are within specifications

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

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

Test ID: **Pelvis**

Test Time: **8:52:29 AM**

Test Date: **10/19/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **8:52:29 AM**

Test Date: **10/19/2010**

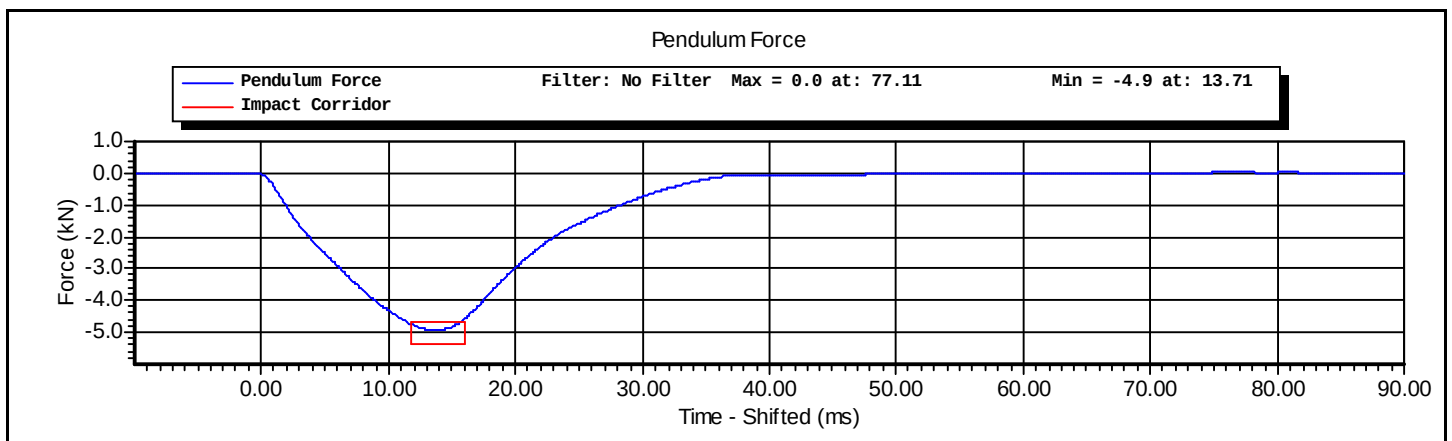
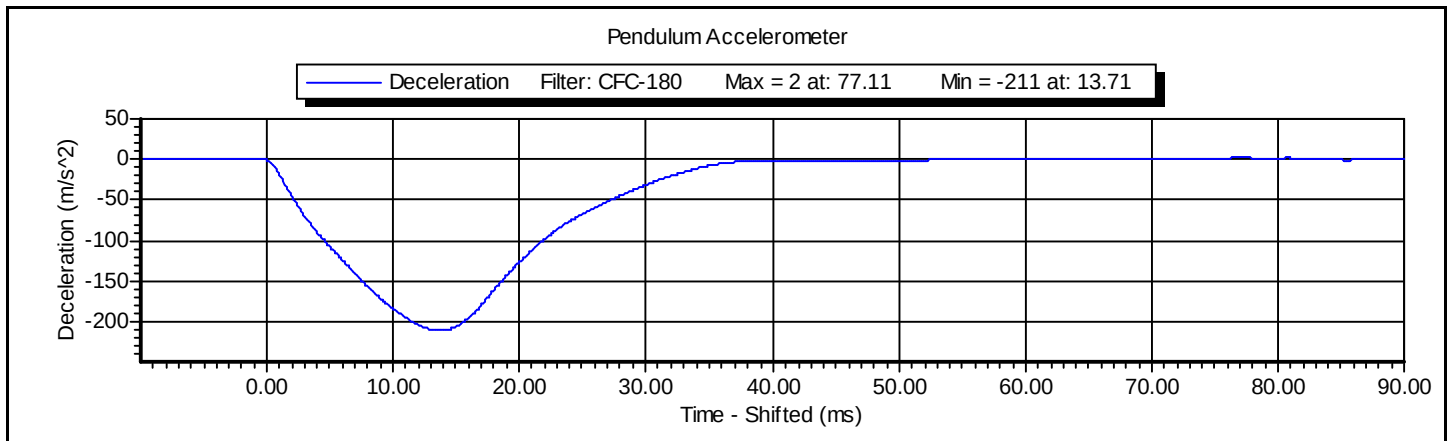


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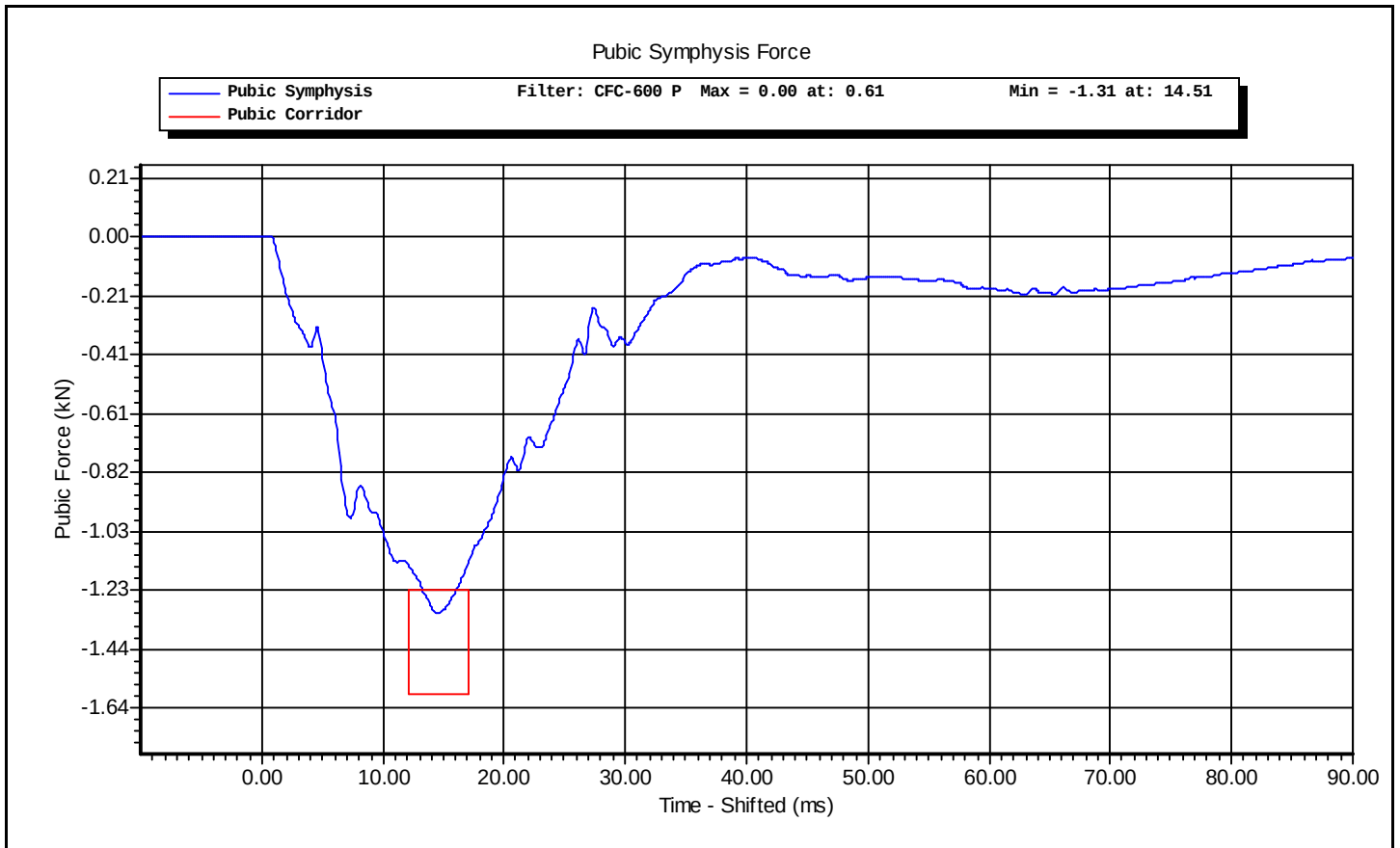
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	10/19/2010
Test Number:	1	Test Time:	8:52:29 AM



Test ID: **Pelvis**

Test Time: **8:52:29 AM**

Test Date: **10/19/2010**



CALIBRATION TEST RESULTS

PRE-TEST

SID-IIs No: 304

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

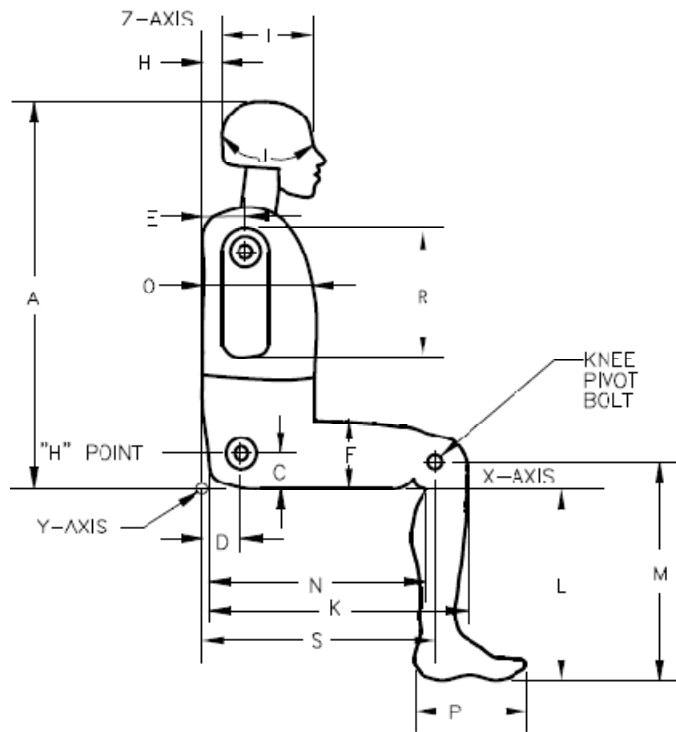
NHTSA ATD S/N 304

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

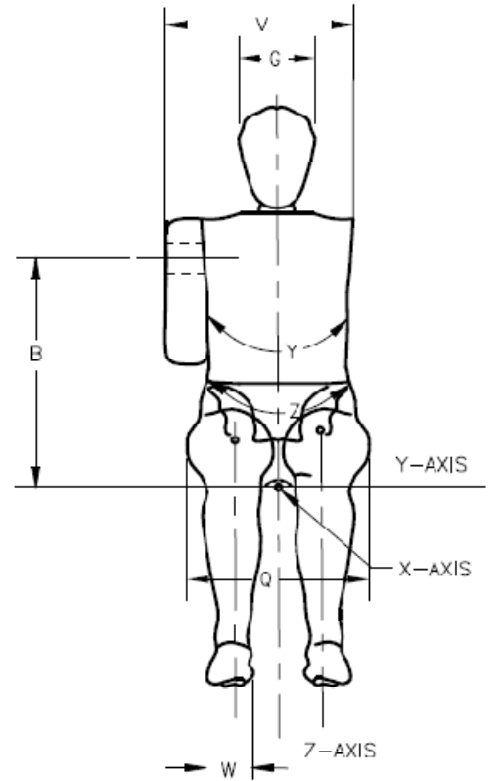
Technician: S. Zito

Date: 10/12/2010

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-II 304		
Test ID:	Head Drop	Test Date:	10/11/2010
Test Number:	1	Test Time:	3:30:58 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	48 %RH P
Resultant Acceleration	115.0 -- 137.0	122.5 g P
Oscillation	0.0 -- 15.0	13.4 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-4.9 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **3:30:58 PM**

Test Date: **10/11/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Endevco	7264-2000	P66943	7/27/2010
Endevco	7264-2000	P66931	4/20/2010
Endevco	7264-2000	P66926	4/20/2010

Test ID: **Head Drop**

Test Time: **3:30:58 PM**

Test Date: **10/11/2010**

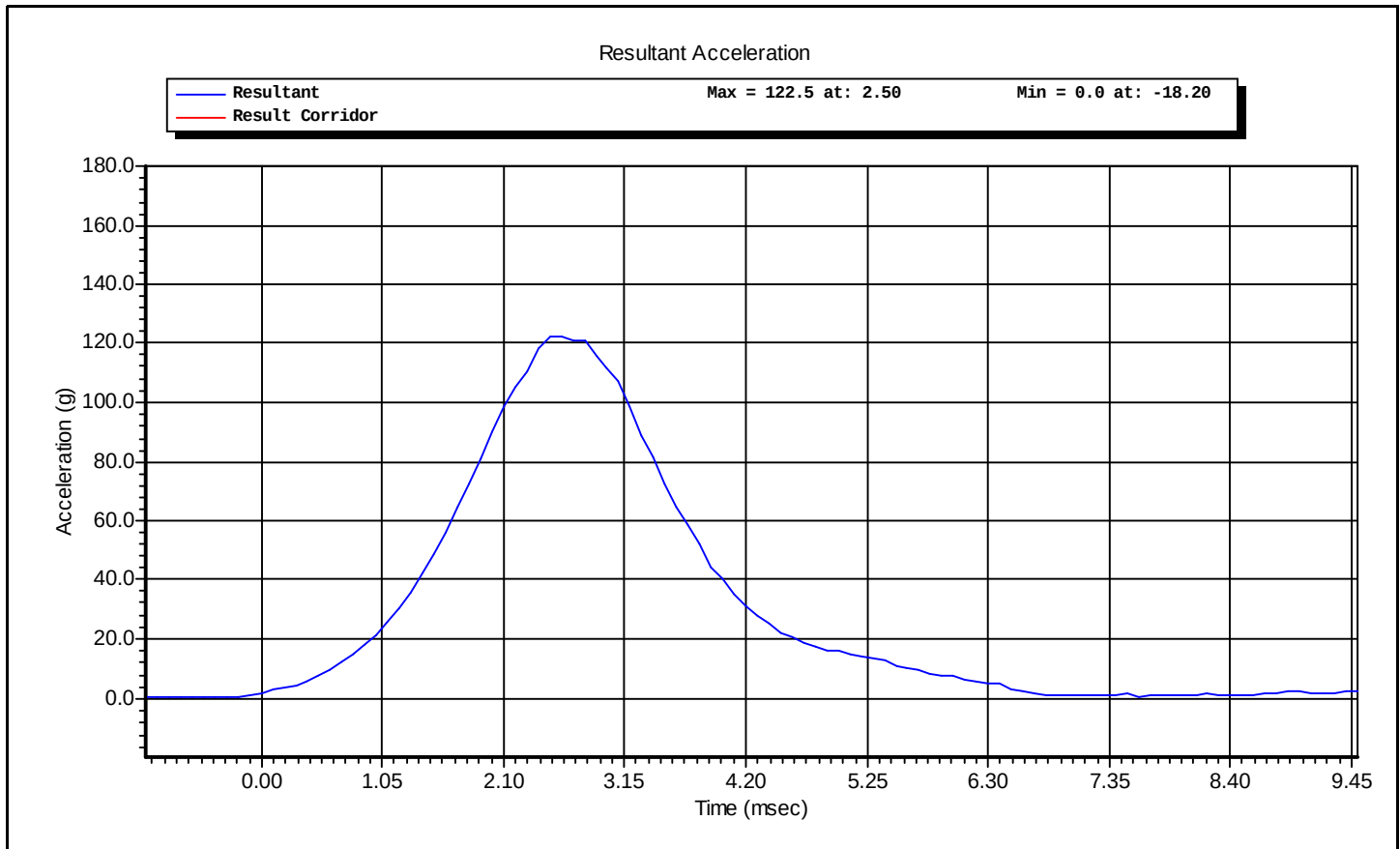


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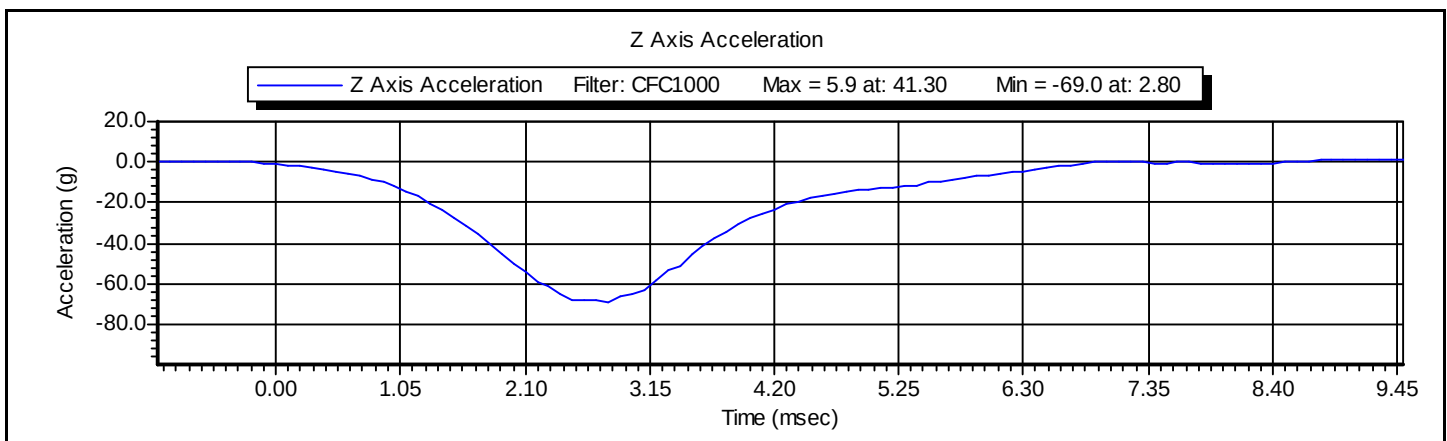
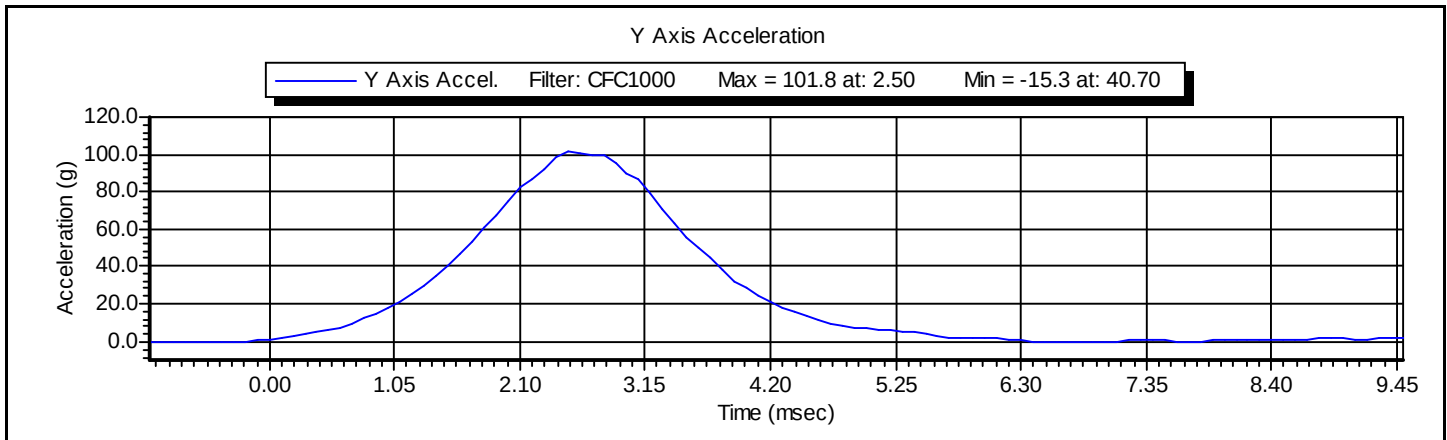
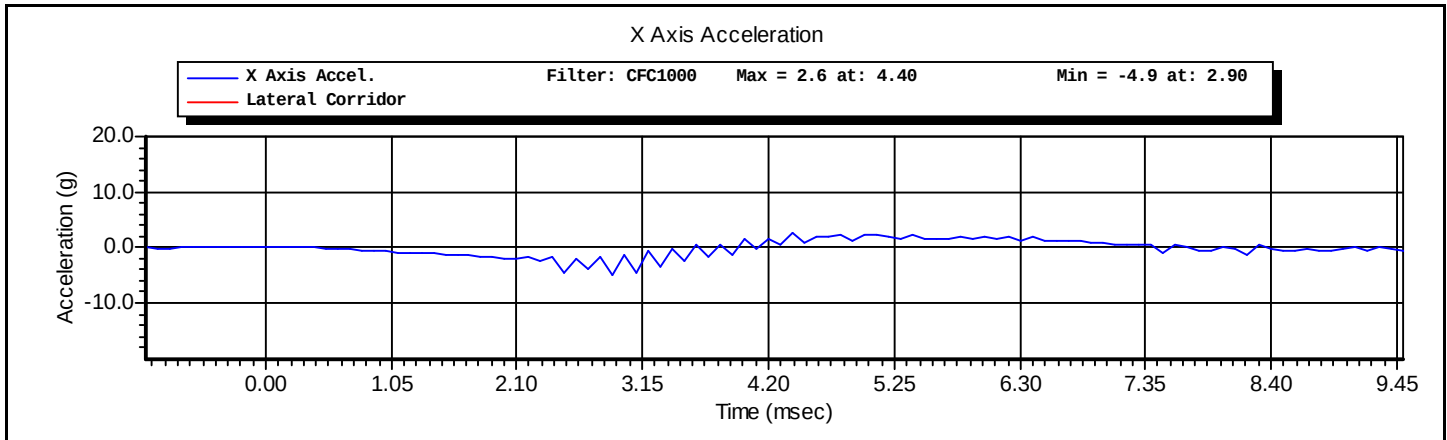
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID-II 304		
Test ID:	Head Drop	Test Date:	10/11/2010
Test Number:	1	Test Time:	3:30:58 PM



Test ID: **Head Drop**

Test Time: **3:30:58 PM**

Test Date: **10/11/2010**





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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:	10/12/2010
Test Number:	1	Test Time:	9:25:02 AM

Component Part Number	Component Serial Number
Neck - 180-2000	AB8329

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	44 %RH P
Velocity	5.51 -- 5.63	5.56 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.54 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.65 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.87 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.80 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	73.0 degrees P
Time at Max Rotation	50.0 -- 70.0	61.5 ms P
Moment about OC	-44.0 -- -36.0	-39.4 Nm P
Moment Decay to Zero	102.0 -- 126.0	115.8 ms P

All test parameters are within specifications

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

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

Test ID: **Neck Flexion**

Test Time: **9:25:02 AM**

Test Date: **10/12/2010**



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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: **9:25:02 AM**

Test Date: **10/12/2010**



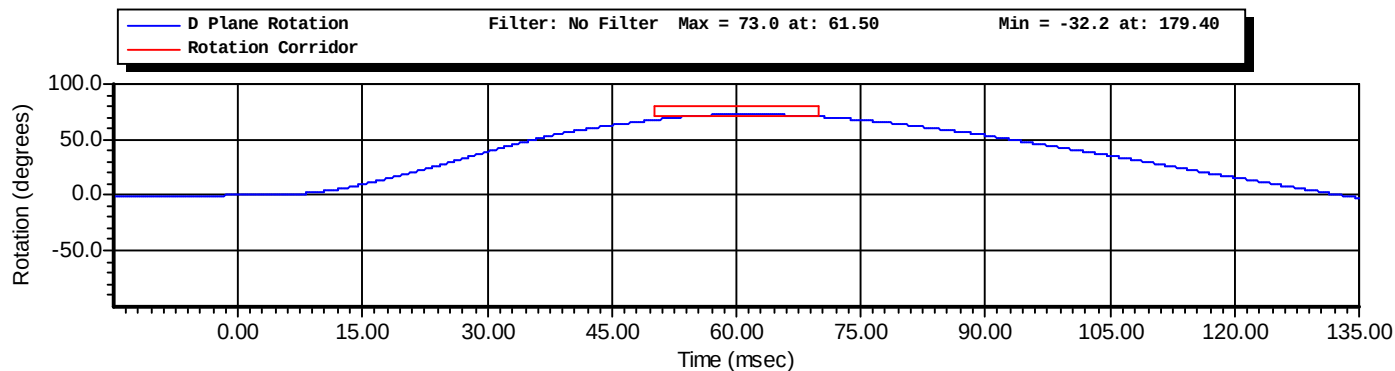
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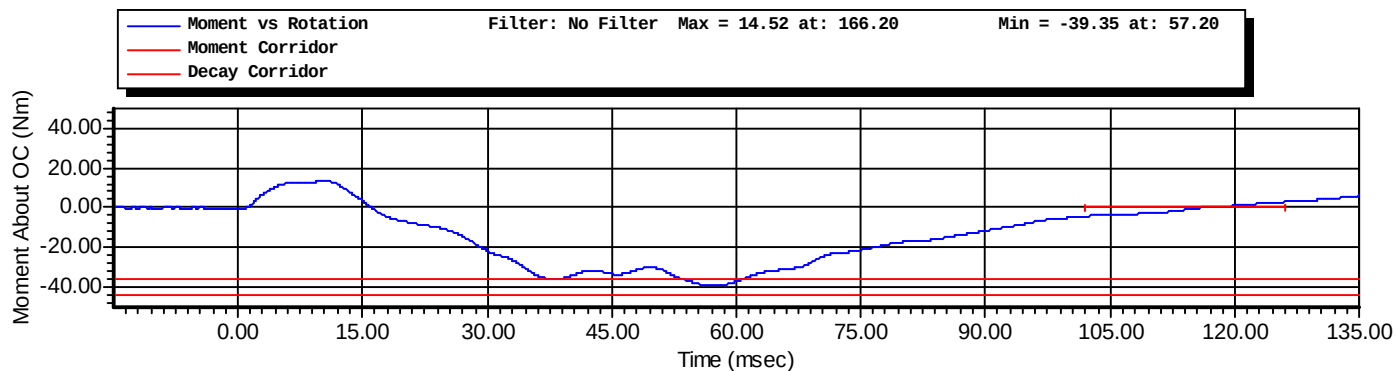
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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 304		
Test ID:	Neck Flexion	Test Date:	10/12/2010
Test Number:	1	Test Time:	9:25:02 AM

D Plane Rotation



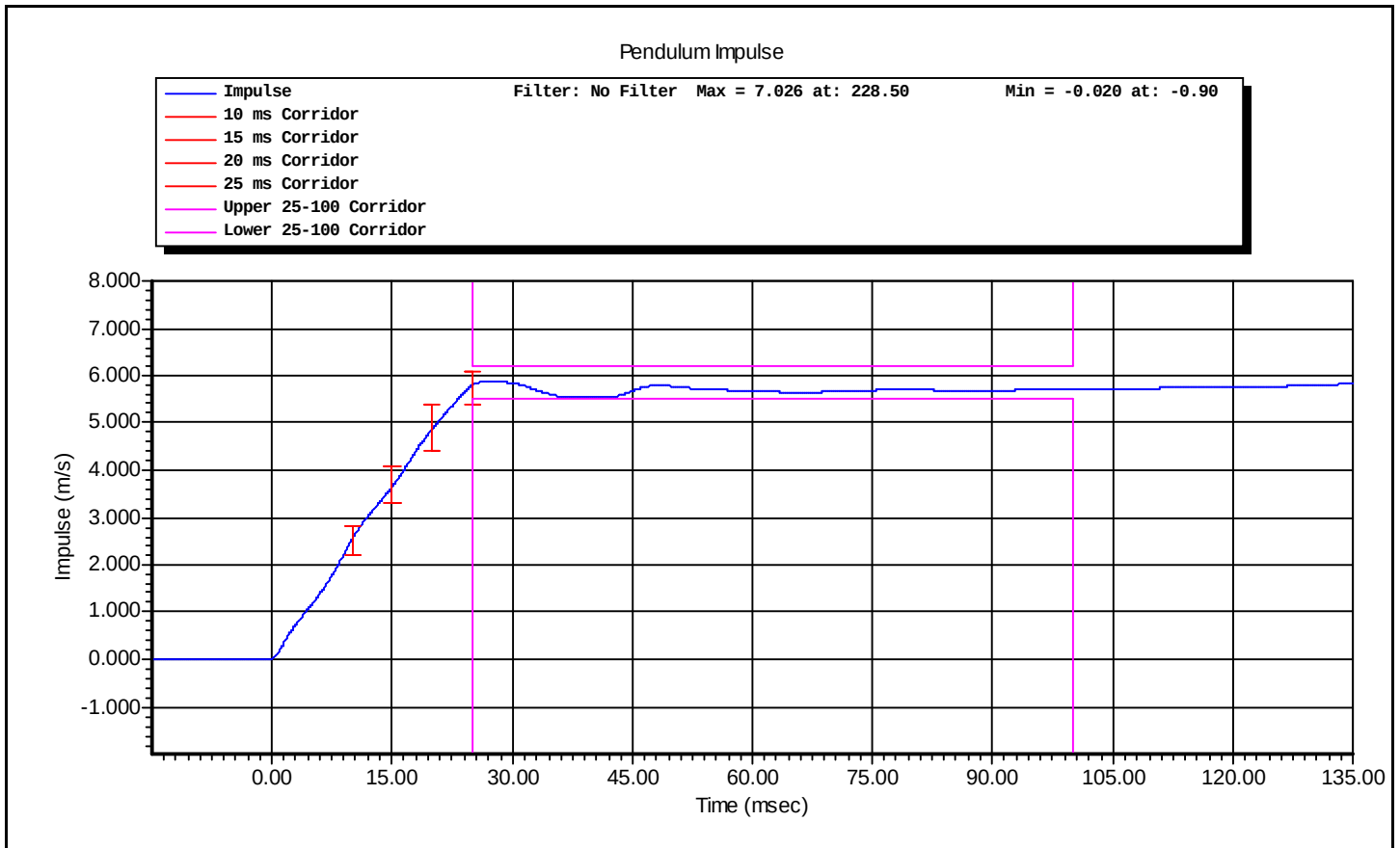
Moment About Occipital Condyle



Test ID: Neck Flexion

Test Time: 9:25:02 AM

Test Date: 10/12/2010





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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 3		
Test ID:	Shoulder	Test Date:	10/12/2010
Test Number:	1	Test Time:	1:48:40 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.20 deg C P
Humidity	10.0 -- 70.0	39.0 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Probe Acceleration	13.0 -- 18.0	15.9 g P
Shoulder Deflection	28.0 -- 37.0	31.9 mm P
T1 Acceleration	17.0 -- 22.0	19.9 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder**

Test Time: **1:48:40 PM**

Test Date: **10/12/2010**



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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-1154	3/26/2010
Endevco	7264-2000	P35758	10/5/2010

Test ID: **Shoulder**

Test Time: **1:48:40 PM**

Test Date: **10/12/2010**

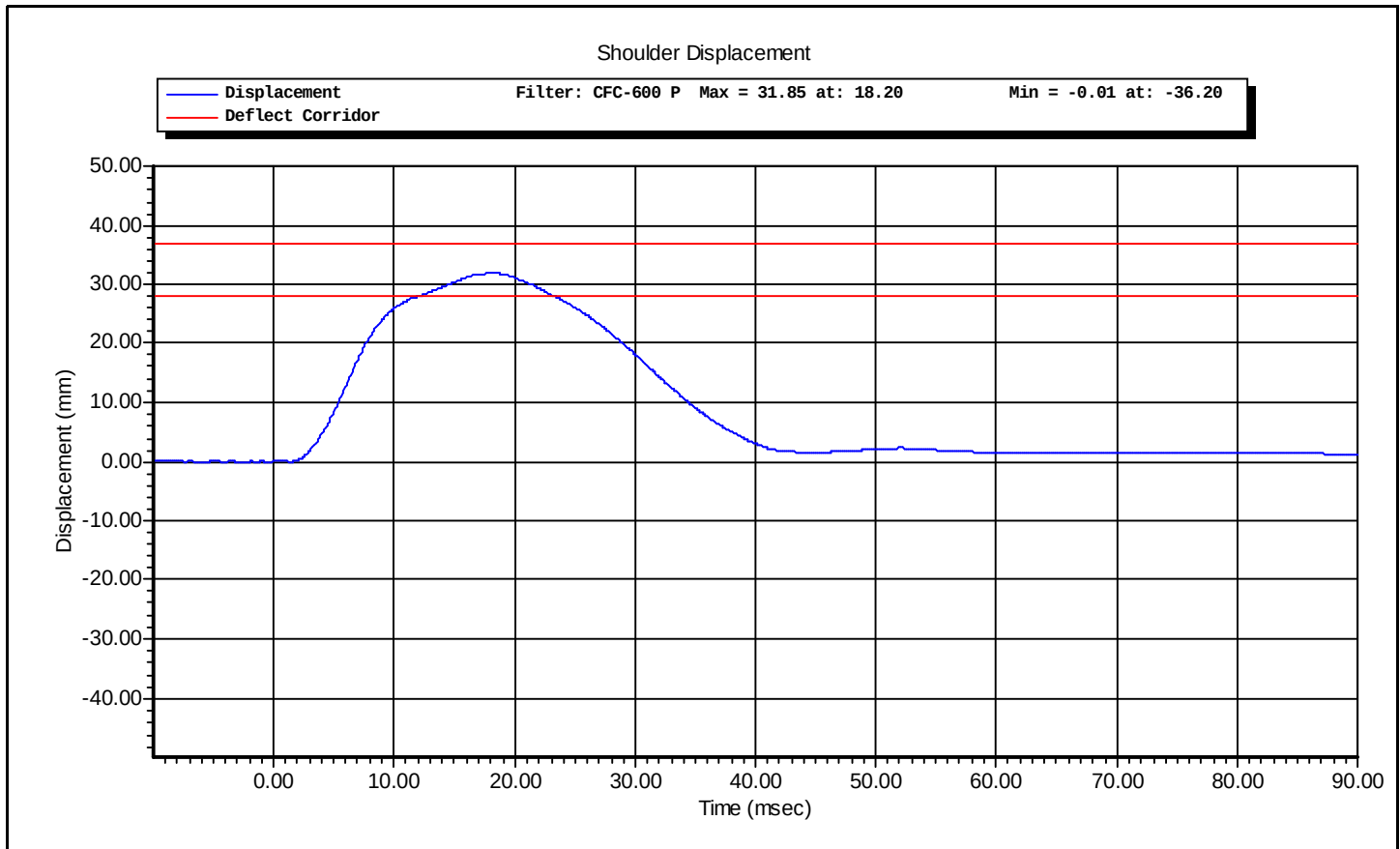


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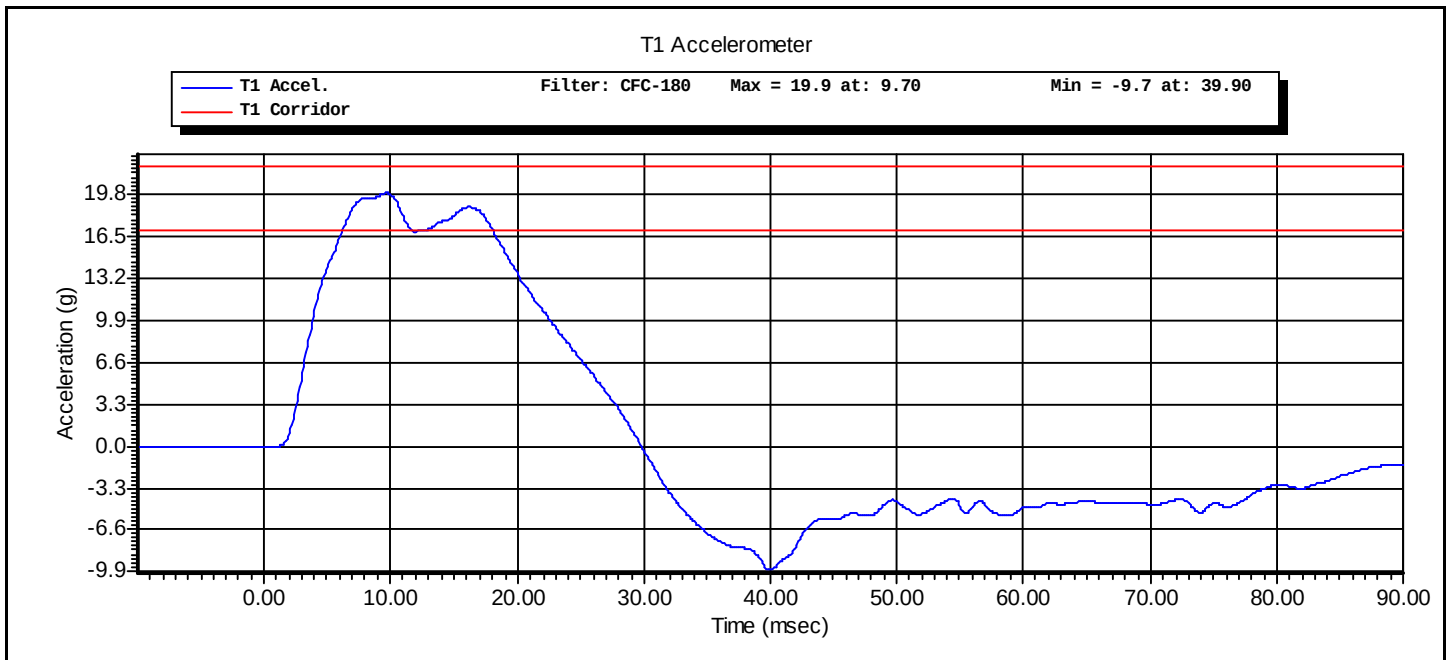
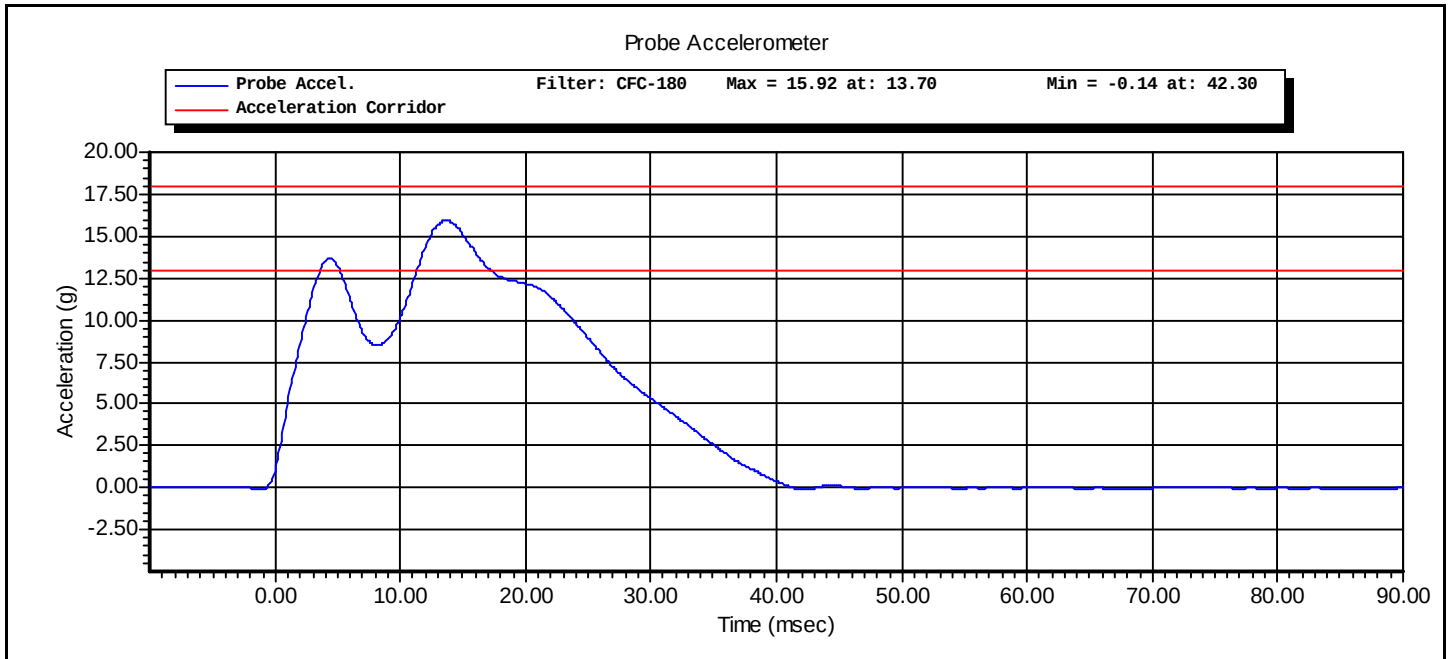
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 3		
Test ID:	Shoulder	Test Date:	10/12/2010
Test Number:	1	Test Time:	1:48:40 PM



Test ID: **Shoulder**

Test Time: **1:48:40 PM**

Test Date: **10/12/2010**





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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-II 304		
Test ID:	Thorax Without Arm	Test Date:	10/12/2010
Test Number:	1	Test Time:	11:24:46 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	42 %RH	P
Velocity	4.20	--	4.40	4.33 m/s	P
Probe Acceleration	14.0	--	18.0	17.0 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	36.7 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	41.4 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	37.6 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	17.0 g	P
Lower Spine Acceleration T12	7.0	--	11.0	10.5 g	P

All test parameters are within specifications

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

Test ID: **Thorax Without Arm** Test Time: **11:24:46 AM**

Test Date: **10/12/2010**



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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-1188	3/26/2010
Servo	180-3885	DS-1269	3/26/2010
Servo	180-3885	DS-1260	3/26/2010
Endevco	7264-2000	P35758	10/5/2010
Endevco	7264-2000	P58839	4/25/2010

Test ID: **Thorax Without Arm** Test Time: **11:24:46 AM**

Test Date: **10/12/2010**

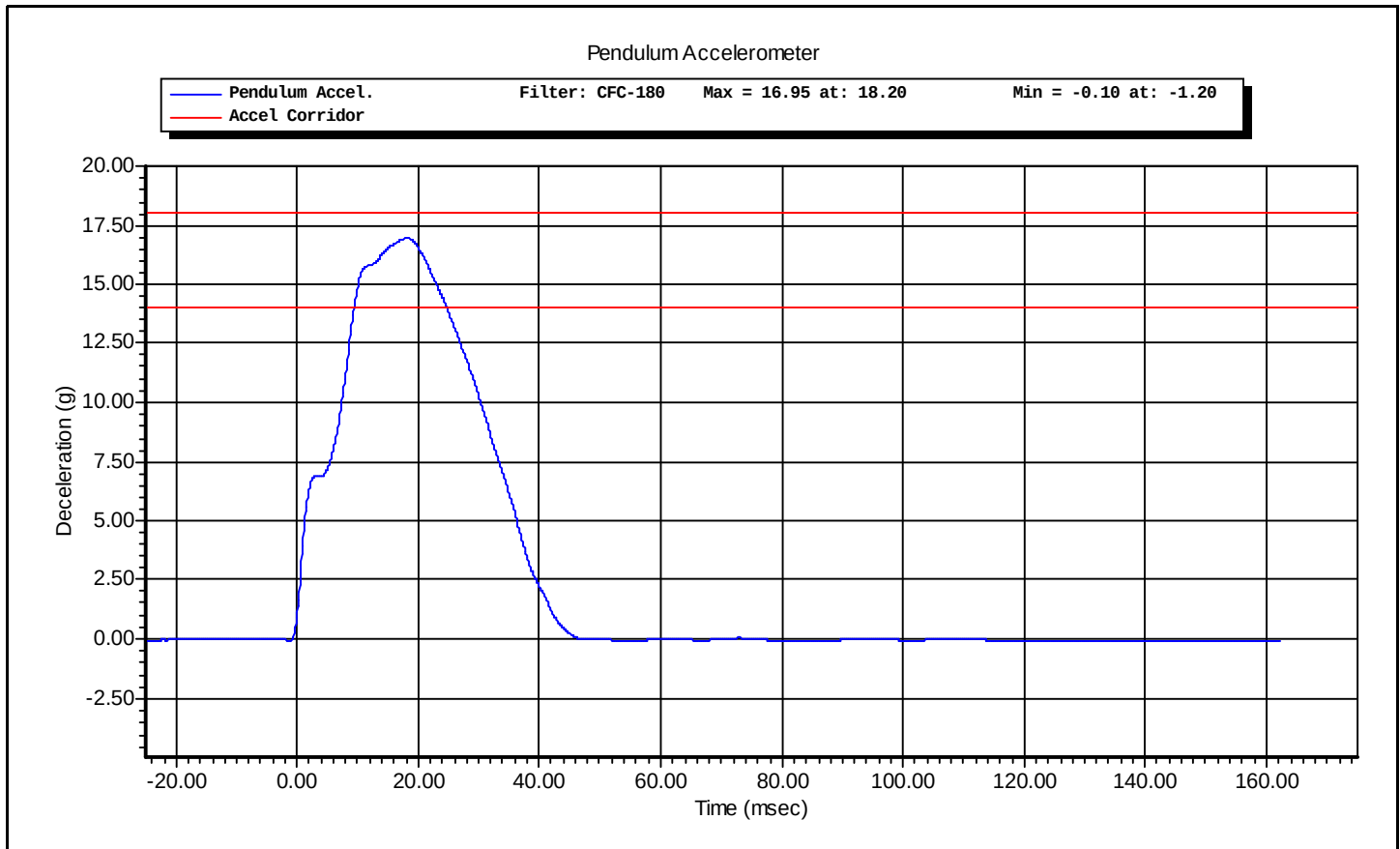


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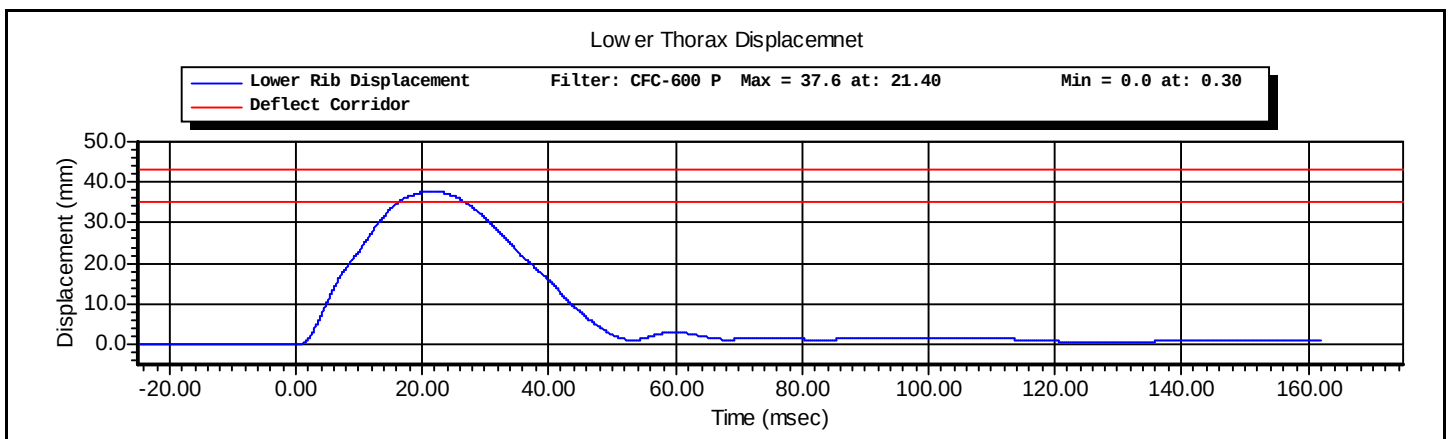
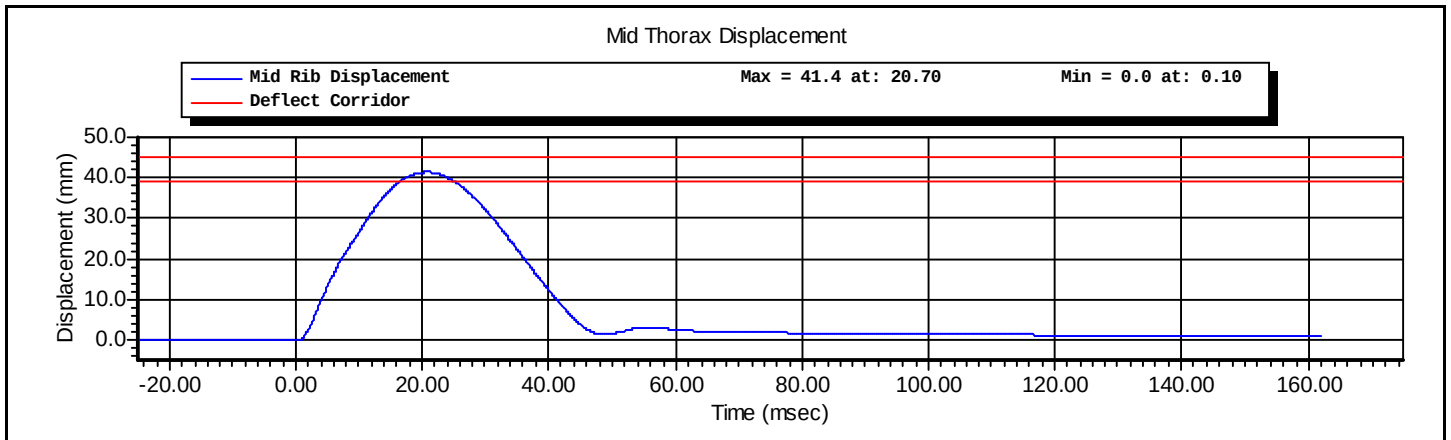
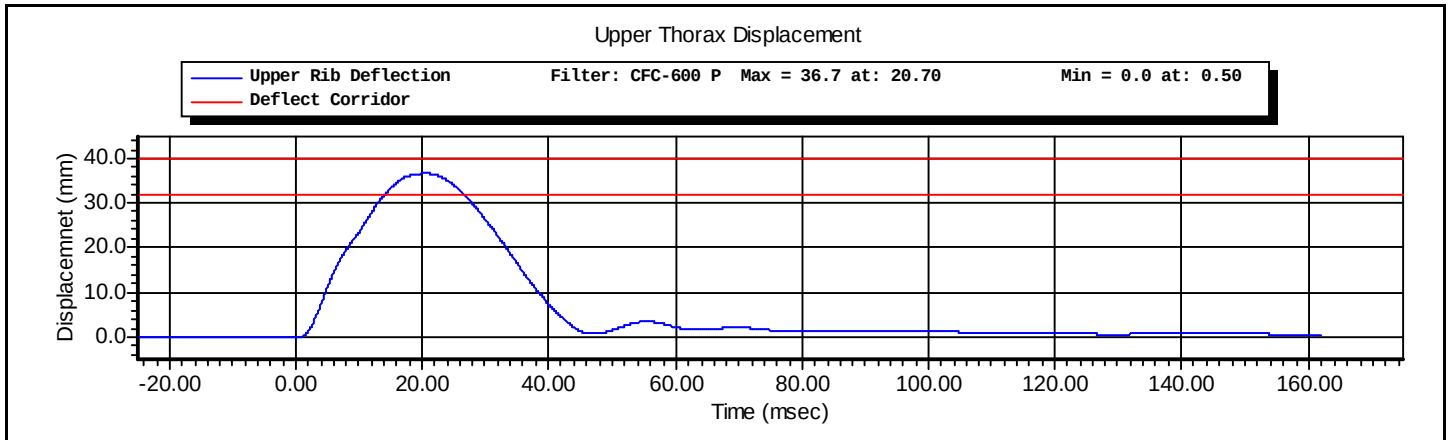
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID-II 304		
Test ID:	Thorax Without Arm	Test Date:	10/12/2010
Test Number:	1	Test Time:	11:24:46 AM

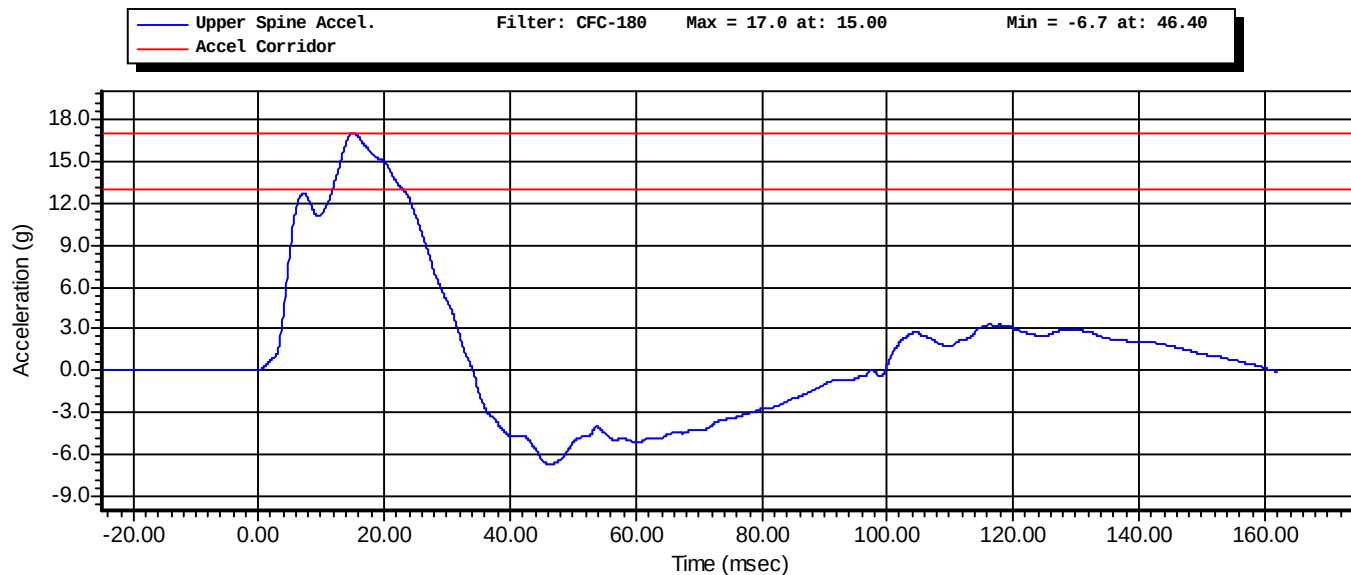


Test ID: Thorax Without Arm Test Time: 11:24:46 AM

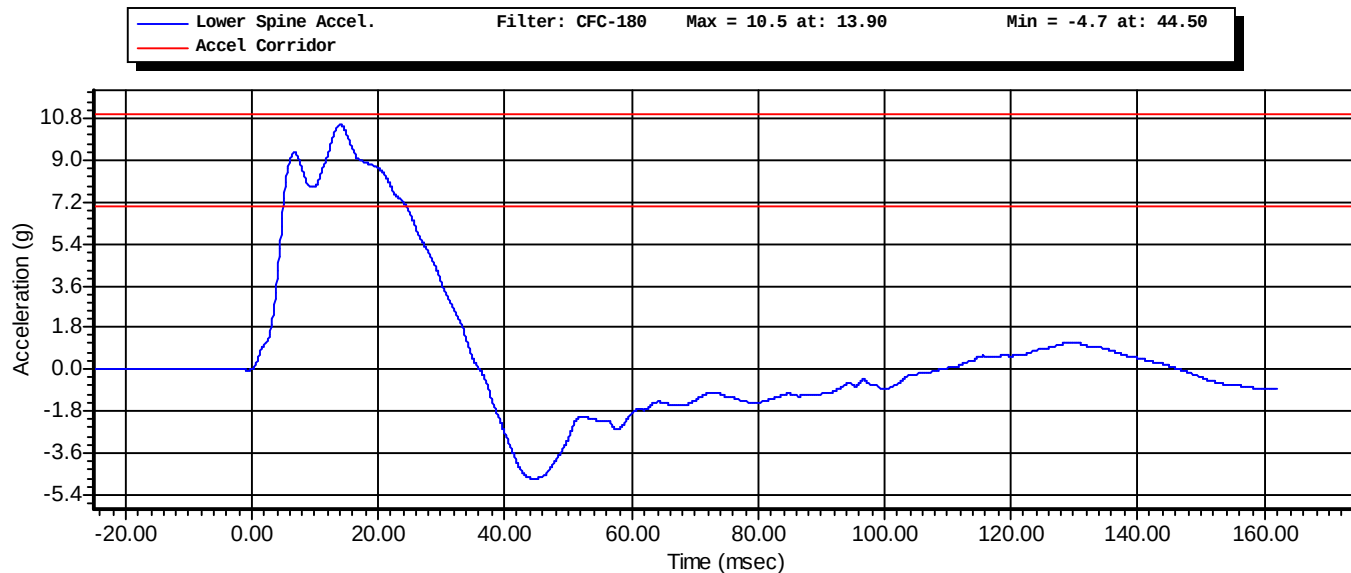
Test Date: 10/12/2010



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		
ATD Serial Number:	SID-II 304		
Test ID:	Thorax With Arm	Test Date:	10/12/2010
Test Number:	1	Test Time:	2:44:23 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	40 %RH	P
Velocity	6.60	--	6.80	6.66 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	33.8 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.5 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	31.5 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	33.7 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	40.2 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	33.9 g	P
Shoulder Deflection	31.0	--	40.0	35.2 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm** Test Time: **2:44:23 PM**

Test Date: **10/12/2010**



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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-1188	3/26/2010
Servo	180-3885	DS-1269	3/26/2010
Servo	180-3885	DS-1260	3/26/2010
Endevco	7264-2000	P35758	10/5/2010
Endevco	7264-2000	P58839	4/25/2010
Servo	180-3885	DS-1154	3/26/2010

Test ID: **Thorax With Arm** Test Time: **2:44:23 PM**

Test Date: **10/12/2010**

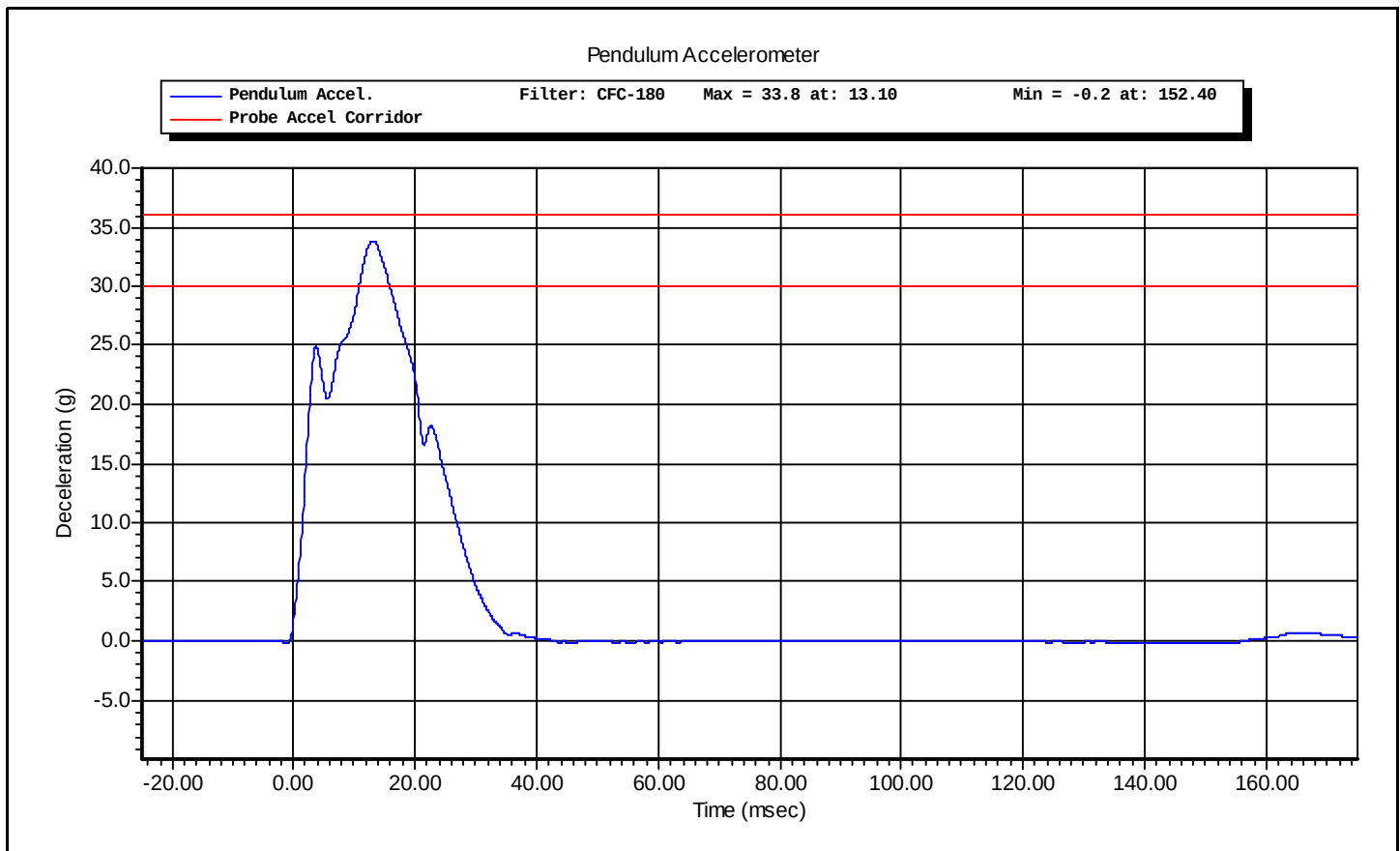


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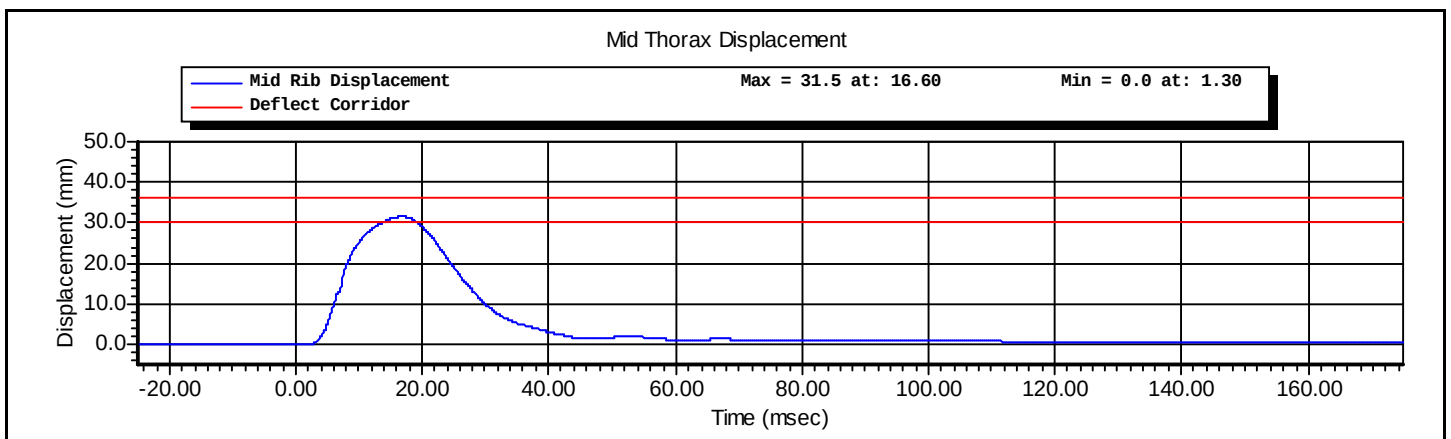
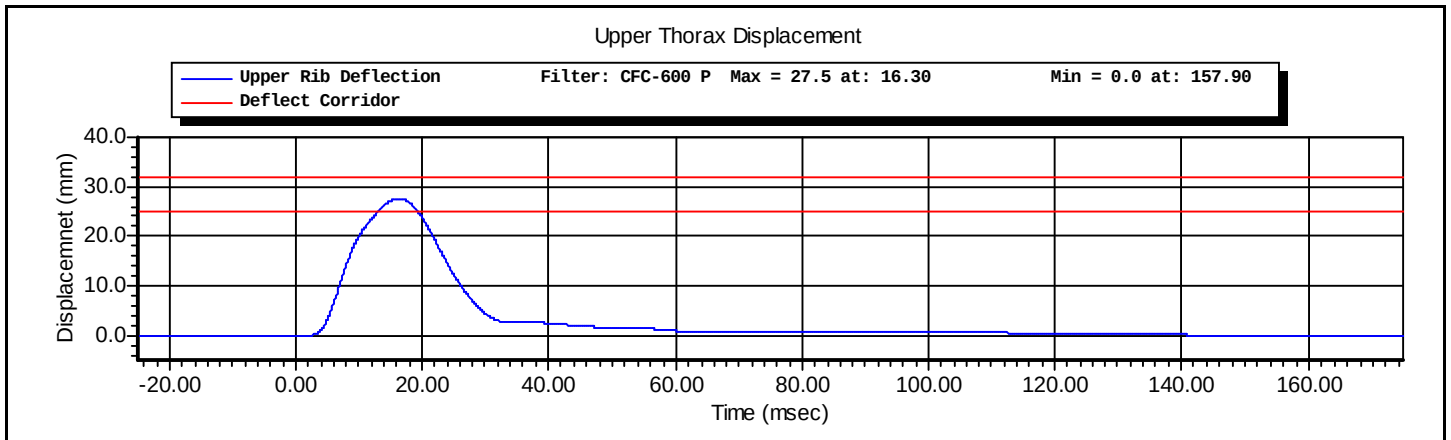
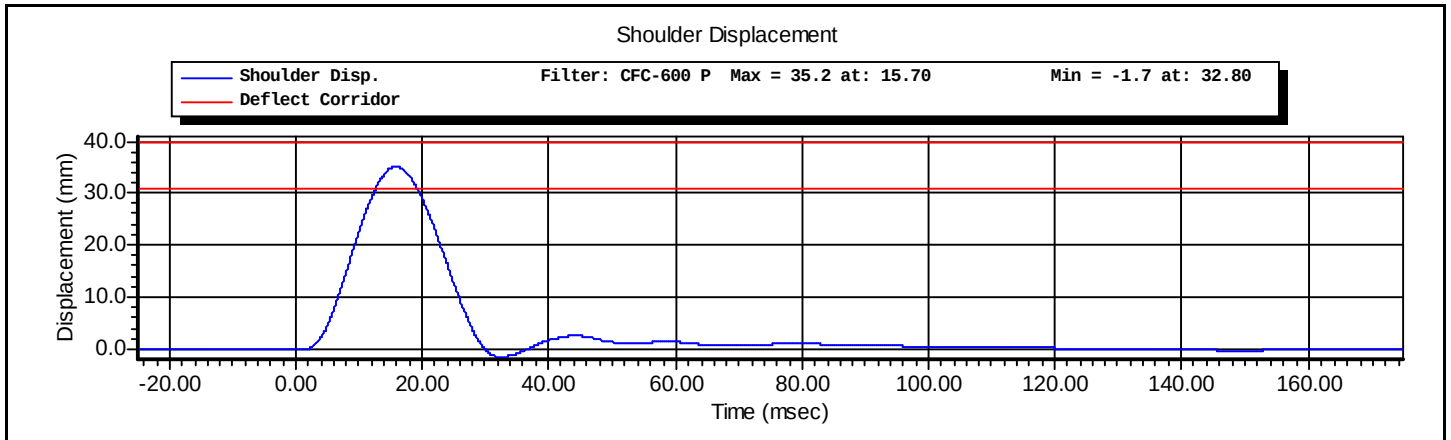
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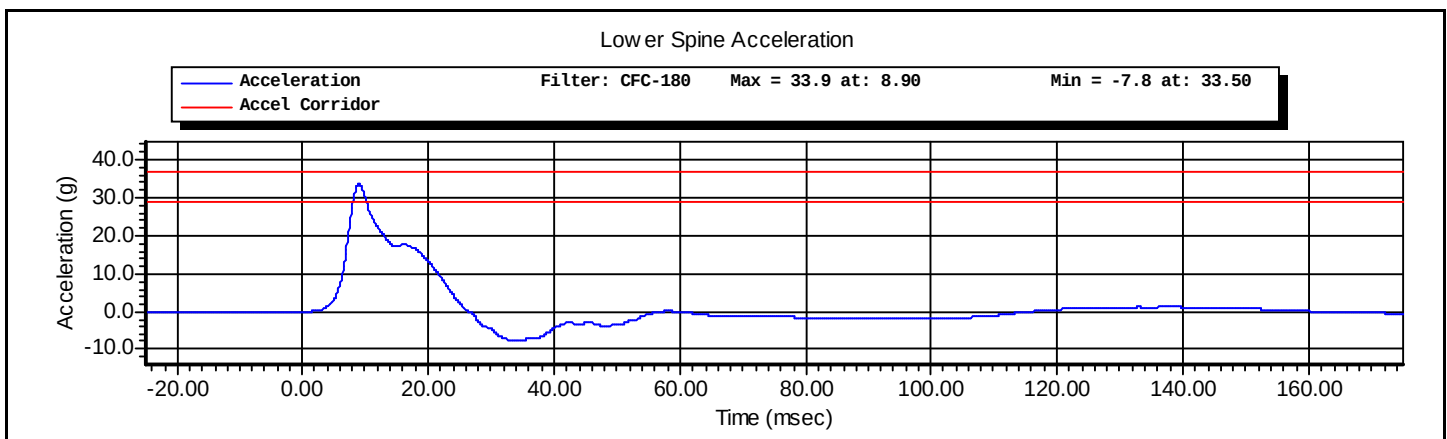
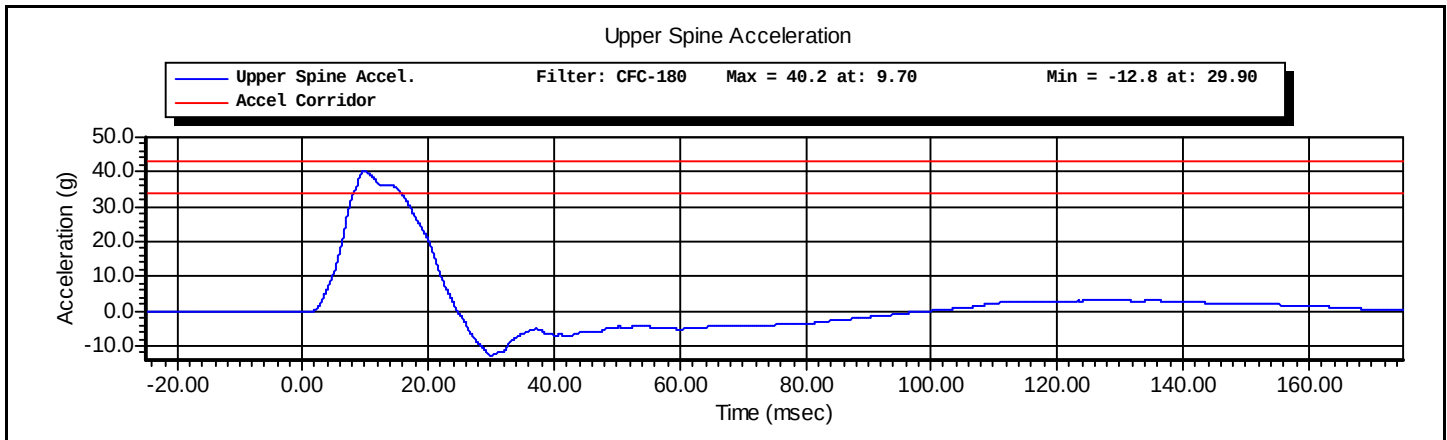
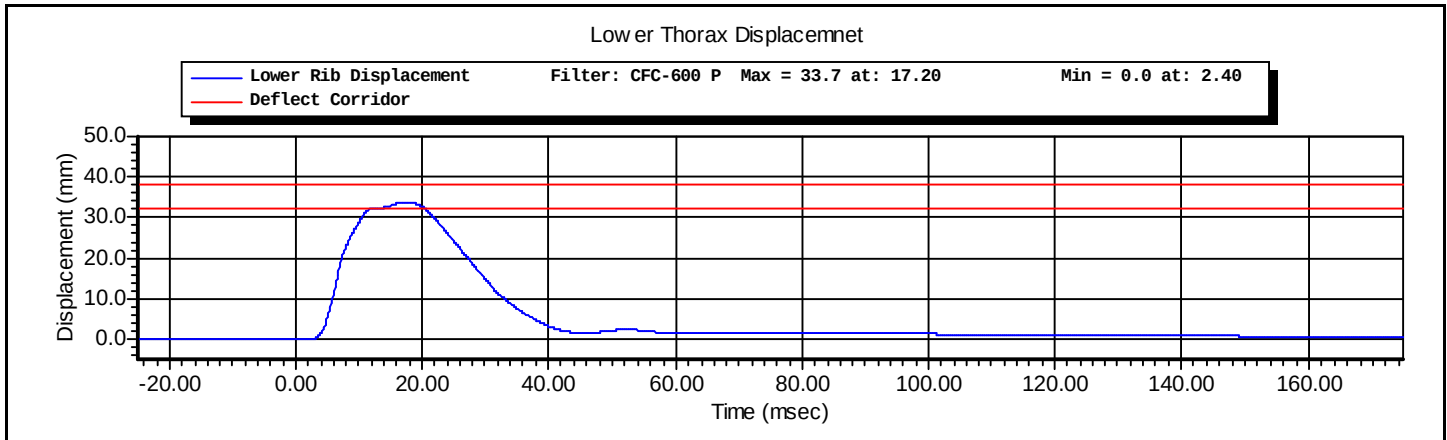
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID-II 304		
Test ID:	Thorax With Arm	Test Date:	10/12/2010
Test Number:	1	Test Time:	2:44:23 PM



Test ID: Thorax With Arm Test Time: 2:44:23 PM

Test Date: 10/12/2010







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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 304		
Test ID:	Abdomen	Test Date:	10/12/2010
Test Number:	1	Test Time:	1:26:52 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	39 %RH P
Velocity	4.20 -- 4.40	4.35 m/s P
Probe Acceleration	12.0 -- 16.0	15.8 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	40.0 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	38.9 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	11.9 g P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **1:26:52 PM**

Test Date: **10/12/2010**



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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-1207	3/26/2010
Servo	180-3885	DS-1204	3/26/2010
Endevco	7264-2000	P58839	4/25/2010

Test ID: **Abdomen**

Test Time: **1:26:52 PM**

Test Date: **10/12/2010**



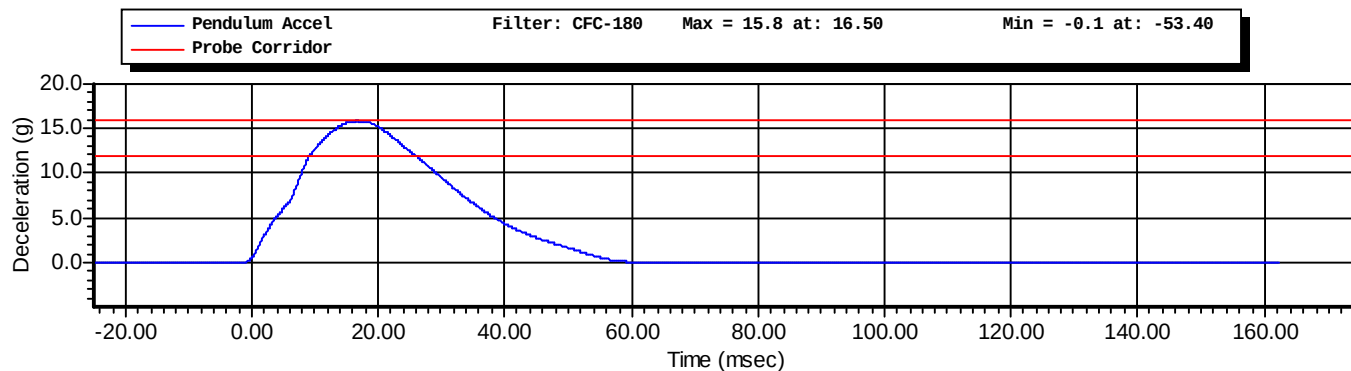
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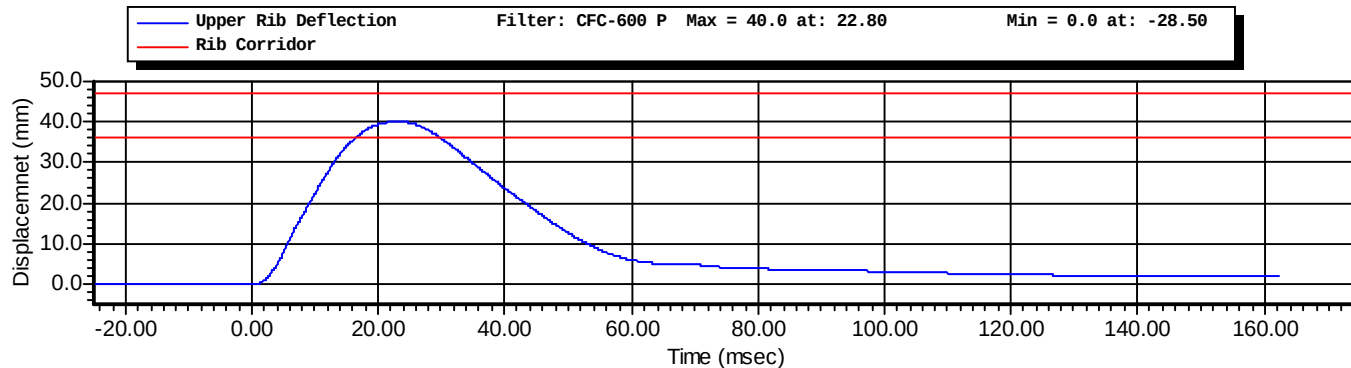
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	10/12/2010
Test Number:	1	Test Time:	1:26:52 PM

Pendulum Accelerometer



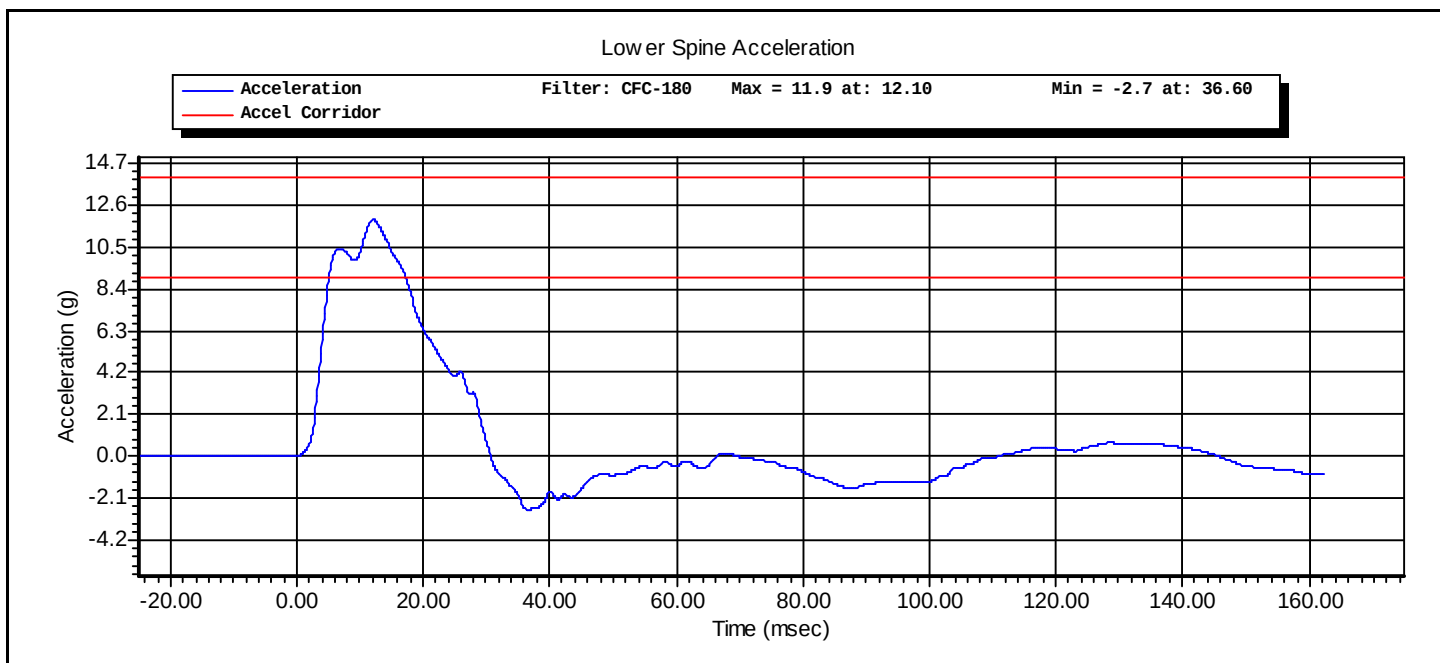
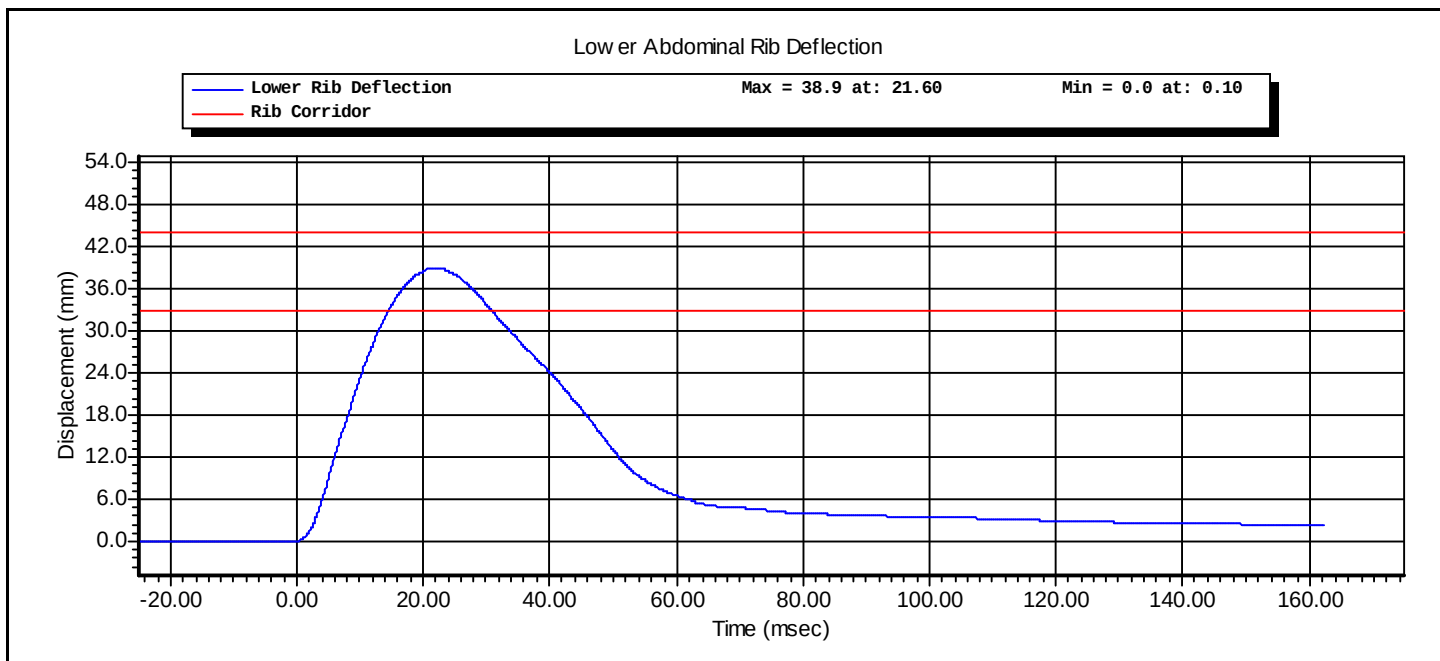
Upper Abdominal Rib Deflection



Test ID: **Abdomen**

Test Time: **1:26:52 PM**

Test Date: **10/12/2010**





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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:	Illiacc	Test Date:	10/8/2010
Test Number:	1	Test Time:	3:24:27 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	49 %RH P
Velocity	4.20 -- 4.40	4.35 m/s P
Peak Probe Acceleration	36.0 -- 45.0	43.5 g P
Peak Pelvis Acceleration	28.0 -- 39.0	37.4 g P
Peak Iliac Force	4.10 -- 5.10	5.05 kN P

All test parameters are within specifications

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

Test ID: **Illiacc**

Test Time: **3:24:27 PM**

Test Date: **10/8/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Endevco	7264-2000	P49217	4/12/2010
DentonATD	3228J	LC-281 Fy	4/9/2010

Test ID: **Illiac**

Test Time: **3:24:27 PM**

Test Date: **10/8/2010**

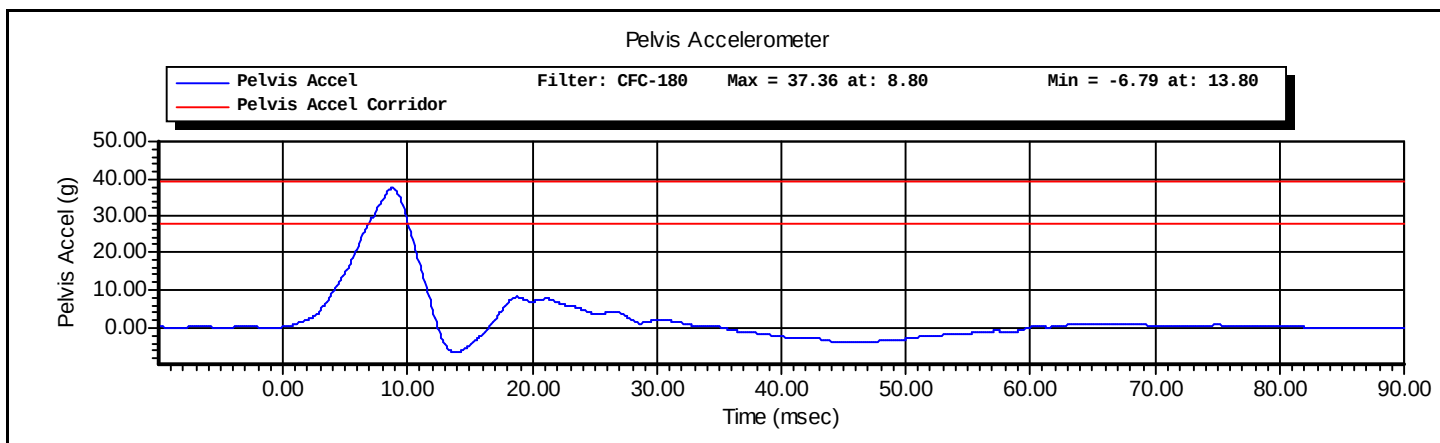
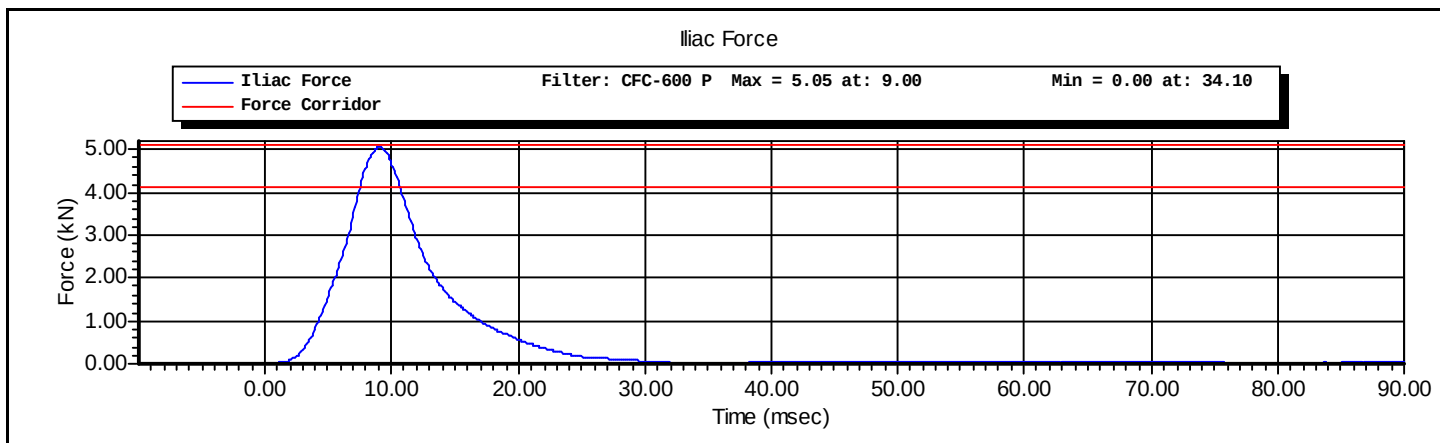


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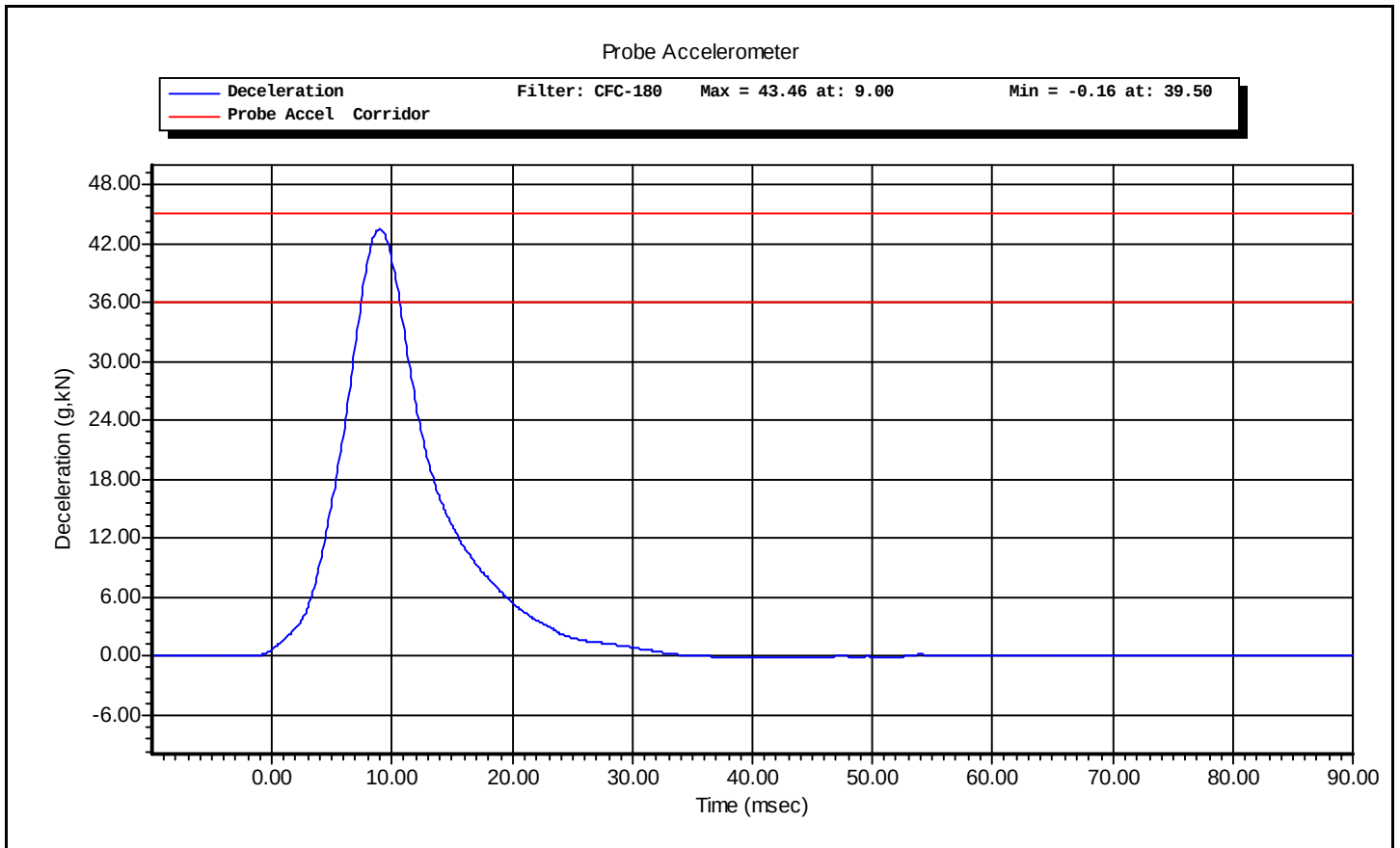
Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Illiic	Test Date:	10/8/2010
Test Number:	1	Test Time:	3:24:27 PM



Test ID: **Illiic**

Test Time: **3:24:27 PM**

Test Date: **10/8/2010**





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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-II 304		
Test ID:	Acetabulum Impact	Test Date:	10/11/2010
Test Number:	1	Test Time:	11:12:23 AM

Comments:

Pelvis Plug Used for Certification:
FTSS S/N 12593
Force @ 3mm = 1503N

Pelvis Plug Used for Full Scale Test:
FTSS S/N 11140
Force @ 3mm = 1505N

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	6.69 m/s	P
Peak Probe Acceleration	38.0	--	47.0	45.4 g	P
Peak Pelvis Acceleration	34.0	--	42.0	39.4 g	P
Peak Acetabulum Force	3.60	--	4.30	4.27 kN	P

All test parameters are within specifications

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

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

Test ID: **Acetabulum Impact** Test Time: **11:12:23 AM**

Test Date: **10/11/2010**



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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	P49217	4/12/2010
DentonATD	3249J	LC-267Fy	4/9/2010

Test ID: **Acetabulum Impact** Test Time: **11:12:23 AM**

Test Date: **10/11/2010**



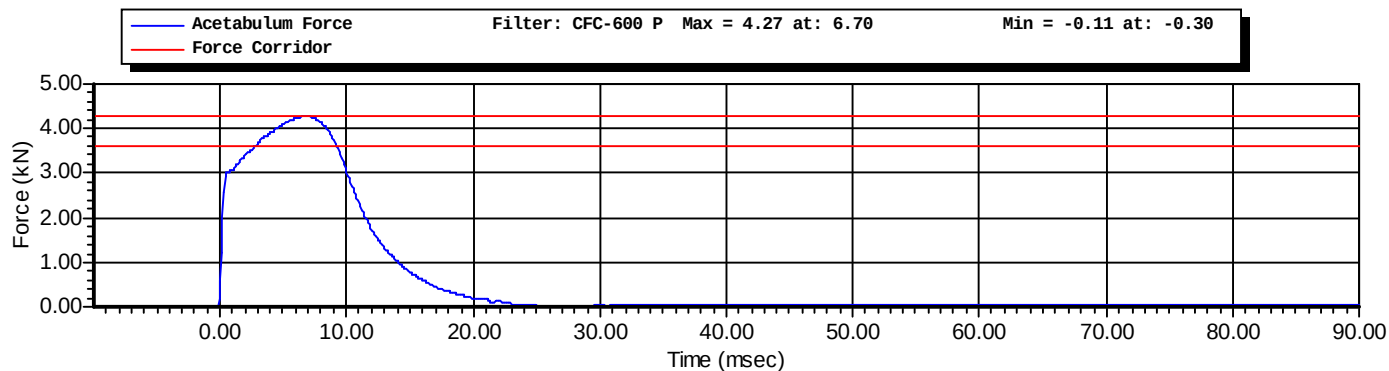
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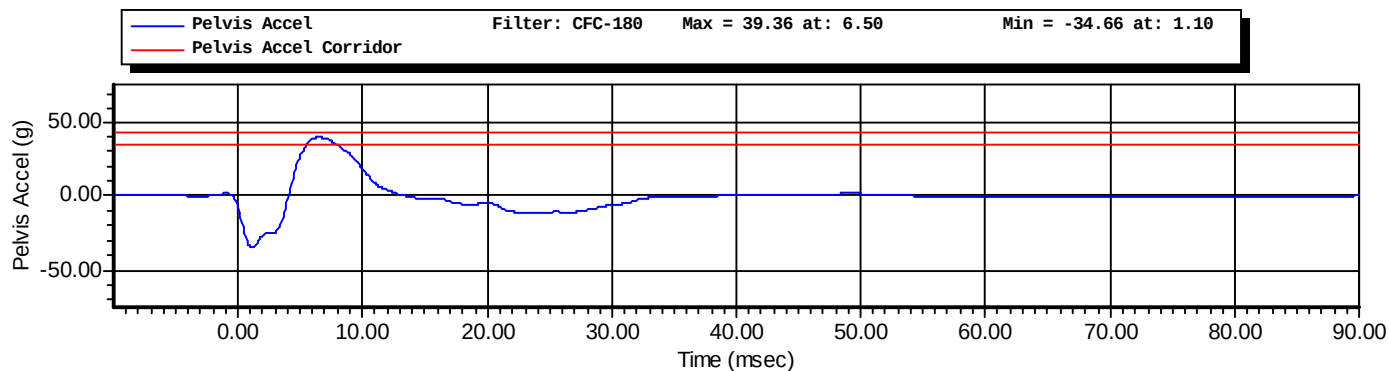
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

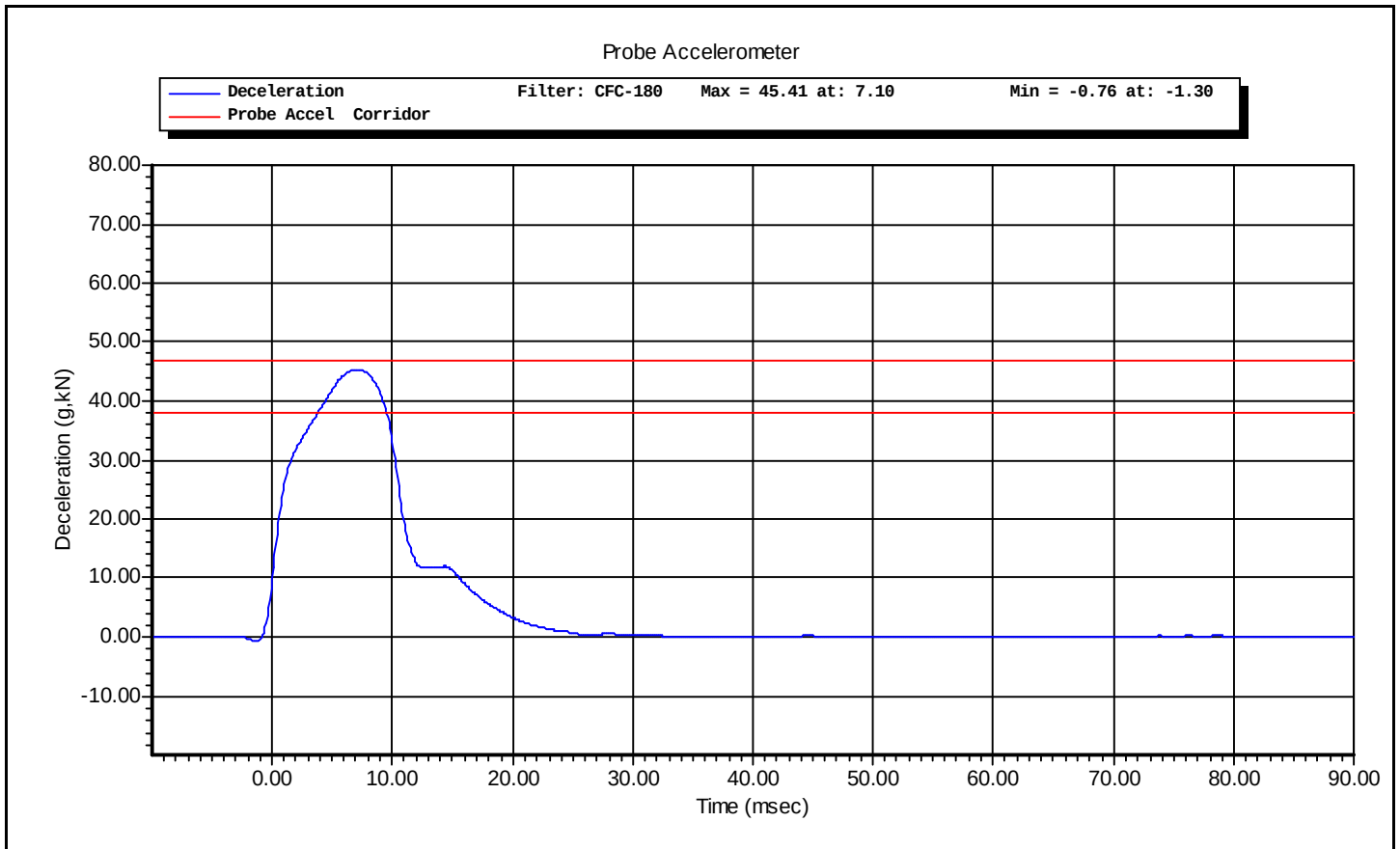
Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Acetabulum Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID-II 304		
Test ID:	Acetabulum Impact	Test Date:	10/11/2010
Test Number:	1	Test Time:	11:12:23 AM

Acetabulum Force

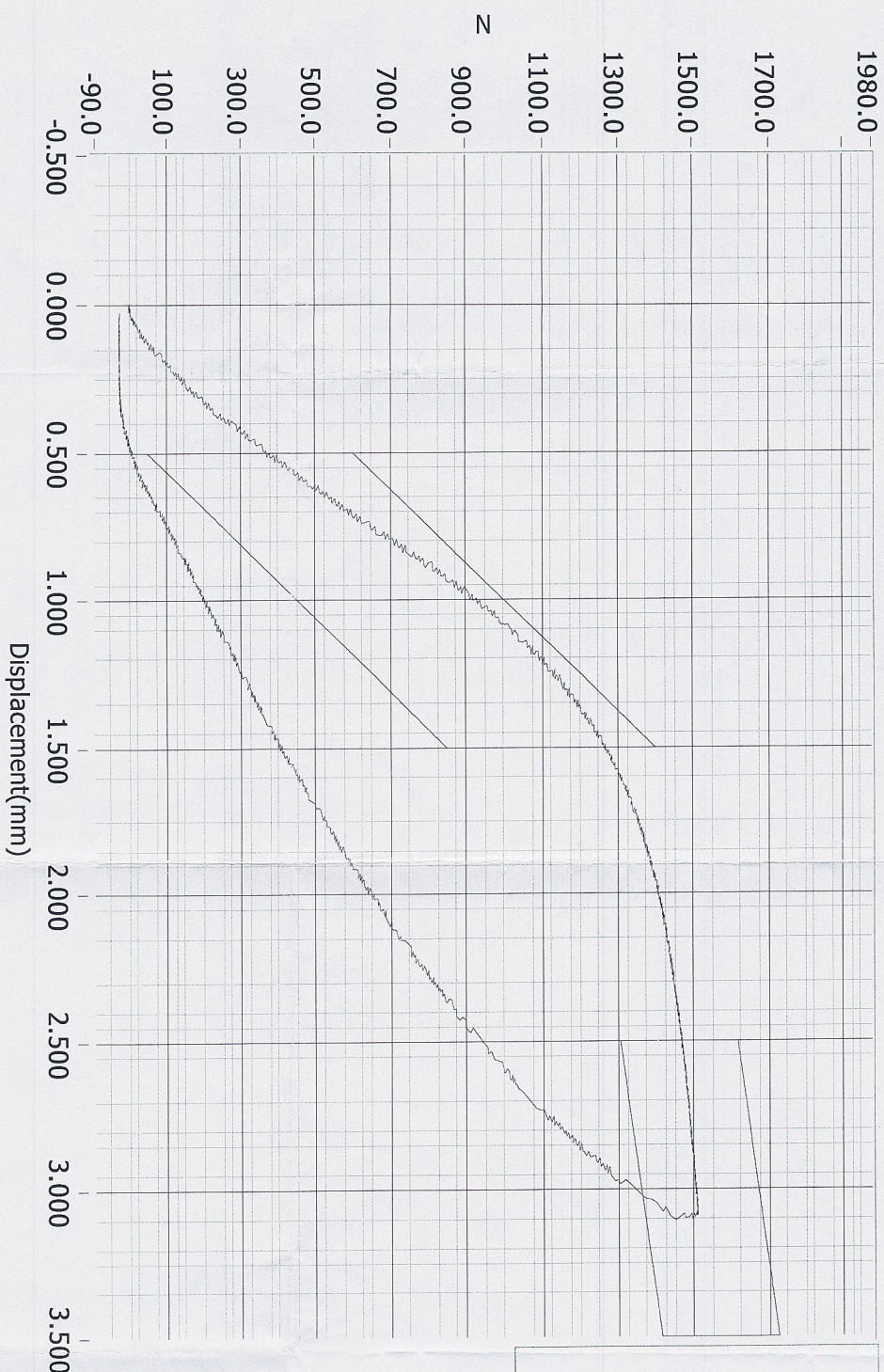


Pelvis Accelerometer





Resultant Data - SIDIIs Plug Compression



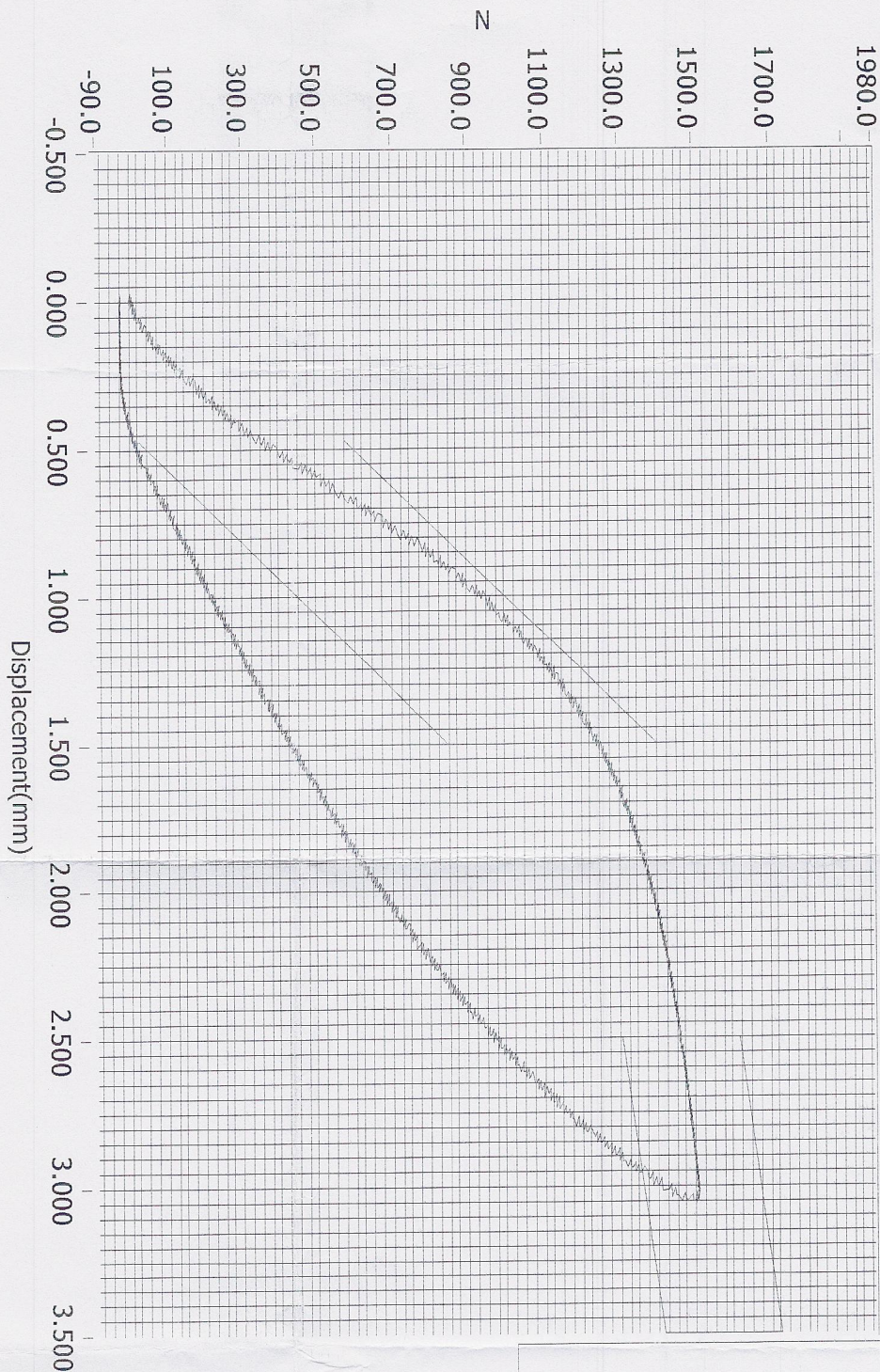
- Loading Curve
- Boundary Limit Upper
- Boundary Limit Lower
- Peak Load Upper
- Peak Load Lower
- Peak Defl Upper
- Peak Defl Lower

ATD Calibration Lab

Test ID	Part Serial Number	Test Date	Test Time
		5/24/2007	5:33 AM
Cert ID	ATD Serial Number	ATD Type	
	11140	SIDIIs	

Current Date : 5/24/2007 Current Time : 05:34:32

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

12593

SIDIIs

Current Date : 7/10/2007

Current Time : 15:32:48

CALIBRATION TEST RESULTS

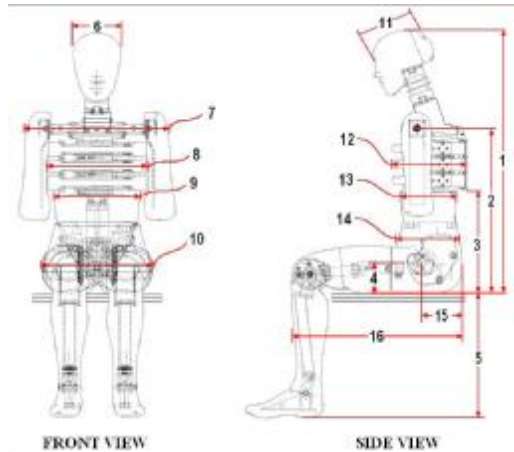
POST-TEST

ES2-re No: 033

CONFIGURED FOR LEFT SIDE IMPACT

ES-2re External Measurements

NHTSA SN F033



Dim. No.	Description	Specification (mm)	Result (mm)	Pass/Fail
1	Sitting Height	900-918	909	Pass
2	Seat to Shoulder Joint	558-572	565	Pass
3	Seat to Lower Face of Thoracic Spine Box	346-356	354	Pass
4	Seat to Hip Joint (center of bolt)	97-103	100	Pass
5	Sole to Seat, Sitting	433-451	444	Pass
6	Head Width	152-158	158	Pass
7	Shoulder/Arm Width	461-479	470	Pass
8	Thorax Width	322-332	323	Pass
9	Abdomen Width	273-287	282	Pass
10	Pelvis Lap Width	359-373	369	Pass
11	Head Depth	196-206	201	Pass
12	Thorax Depth	262-272	267	Pass
13	Abdomen Depth	194-204	199	Pass
14	Pelvis Depth	235-245	239	Pass
15	Back of Buttocks to Hip Joint (center of bolt)	150-160	157	Pass
16	Back of Buttocks to Front Knee	597-615	603	Pass

Technician: SZ

Date: 10/26/2010



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VERIFICATION REPORT

Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	10/25/2010
Test Number:	2	Test Time:	9:40:04 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	48 %RH P
Resultant Acceleration	125 -- 155	142 g P
Oscillation	0.0 -- 15.0	5.8 % P
Fore-Aft Acceleration	-15.00 -- 15.00	5.70 g P

All test parameters are within specifications

Technician: S. Zito Signature: _____

Supervisor: D. Travale Signature: _____

Test ID: **Head Drop**

Test Time: **9:40:04 AM**

Test Date: **10/25/2010**



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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	P51681	9/20/2010
Endevco	7264-2000	P51949	5/26/2010
Endevco	7264-2000	P51695	9/20/2010

Test ID: **Head Drop**

Test Time: **9:40:04 AM**

Test Date: **10/25/2010**

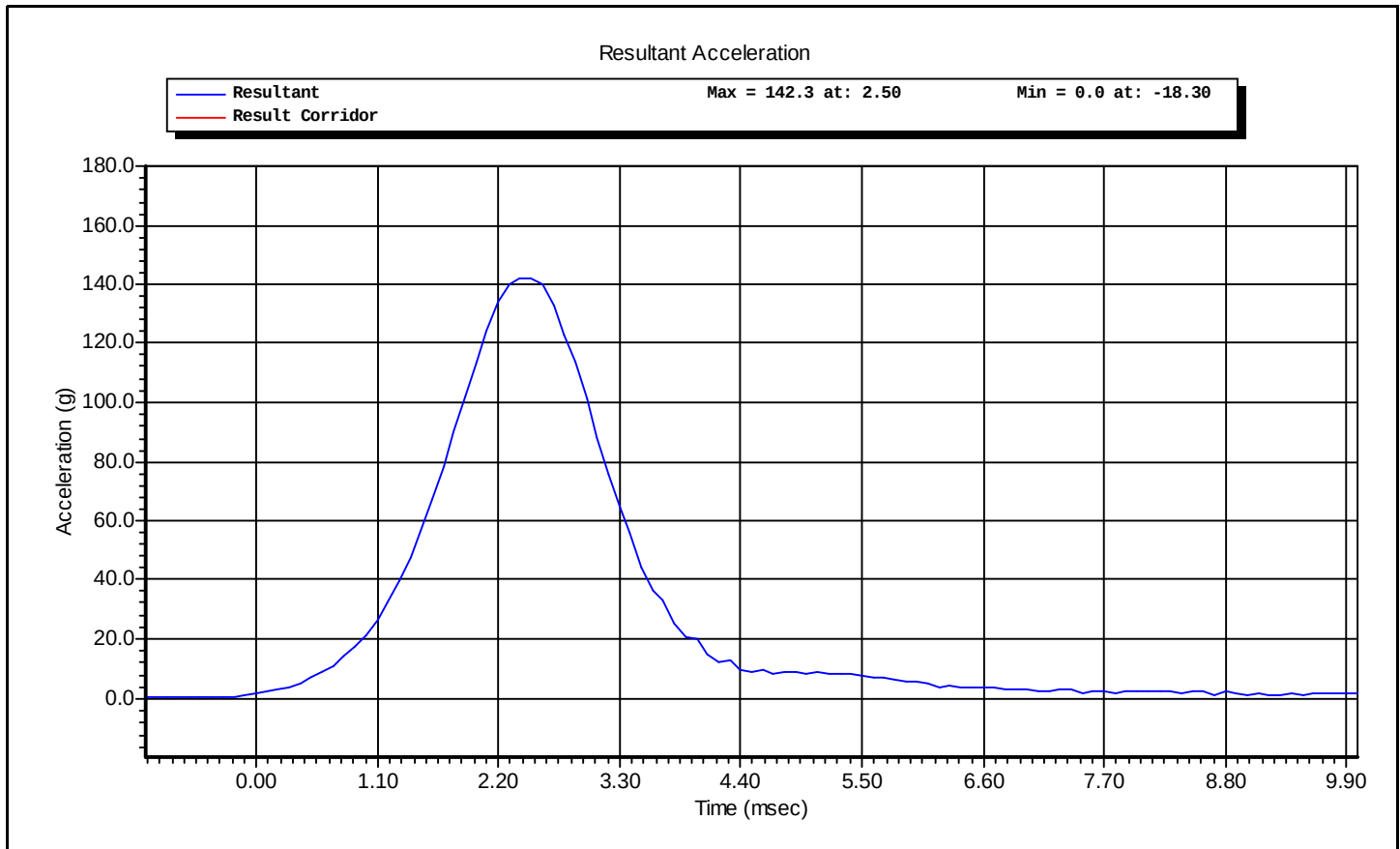


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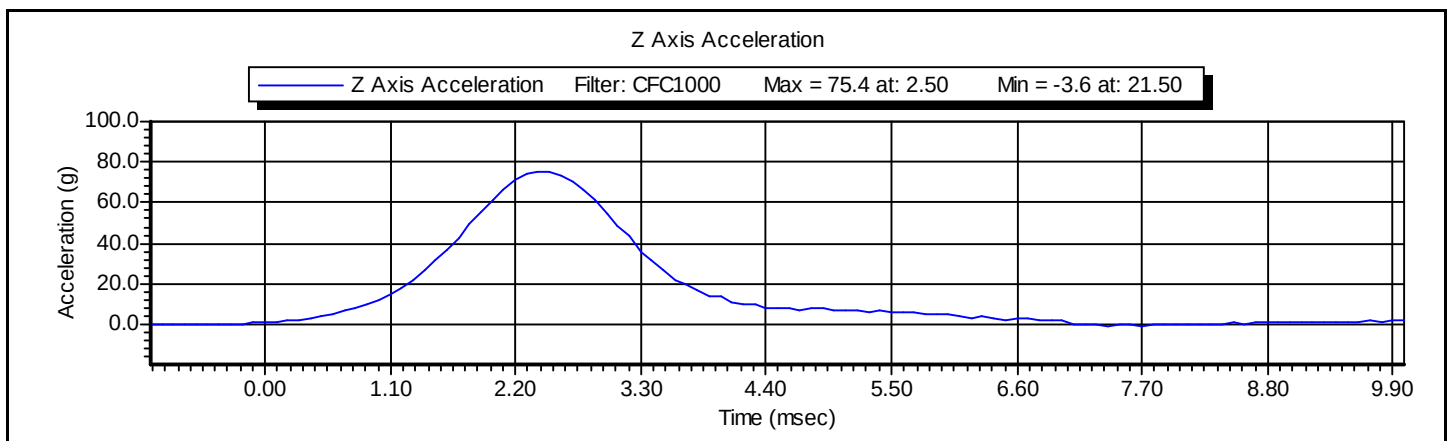
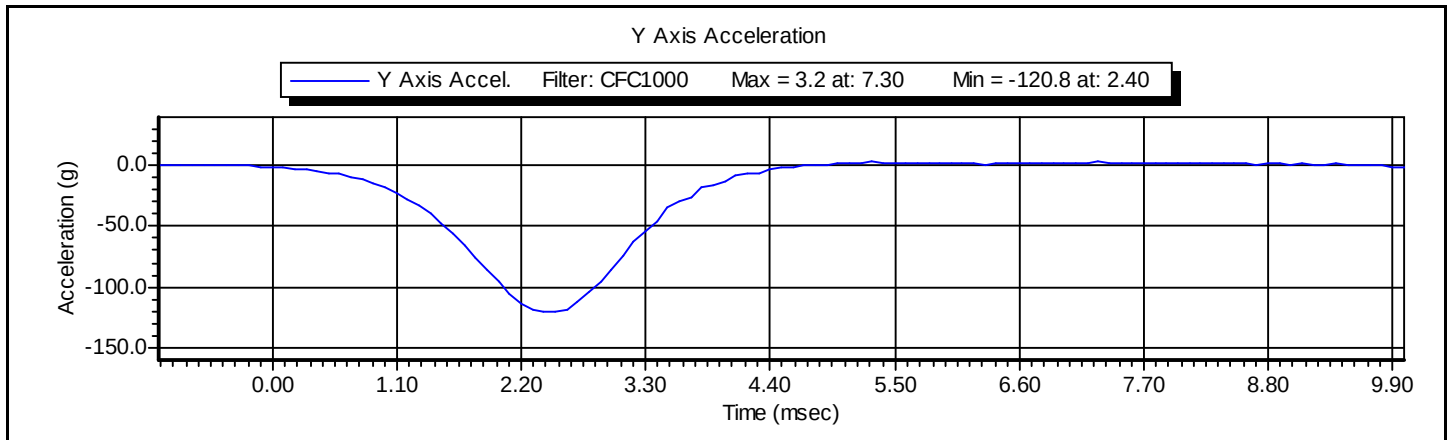
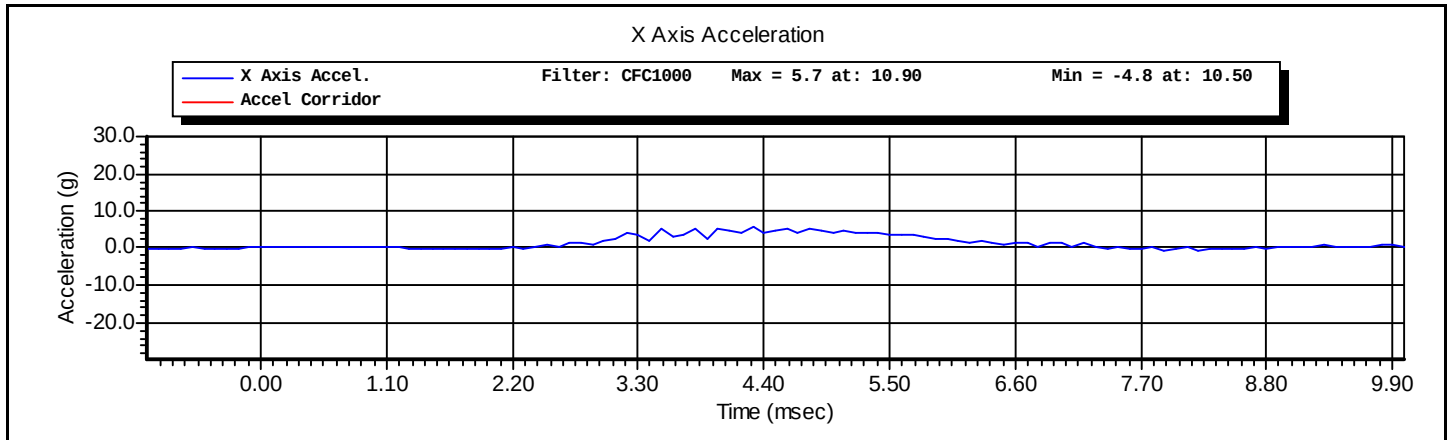
Test Name:	Head Drop	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Head Drop	Test Date:	10/25/2010
Test Number:	2	Test Time:	9:40:04 AM



Test ID: **Head Drop**

Test Time: **9:40:04 AM**

Test Date: **10/25/2010**





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VERIFICATION REPORT

Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	10/22/2010
Test Number:	2	Test Time:	12:01:05 PM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	28 %RH P
Velocity	3.30 -- 3.50	3.44 m/s P
Maximum Neck Flexion Angle	49.0 -- 59.0	51.0 degrees P
Time At Maximum Neck Flexion	54.0 -- 66.0	59.9 ms P
Decay to Zero Degrees	53.0 -- 88.0	57.8 ms P
Velocity Corridor	--	P

All test parameters are within specifications

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

Test ID: **Neck Flexion**

Test Time: **12:01:05 PM**

Test Date: **10/22/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Neck Flexion**

Test Time: **12:01:05 PM**

Test Date: **10/22/2010**



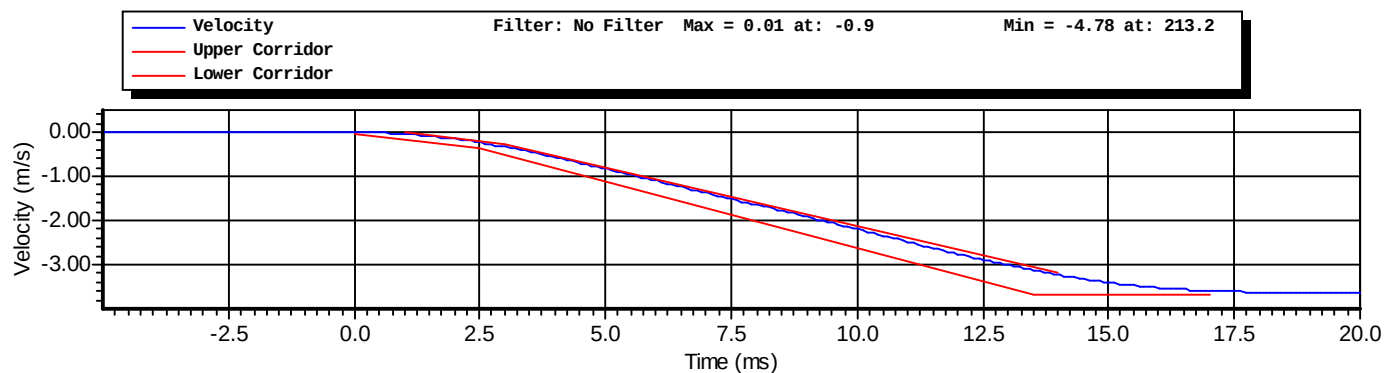
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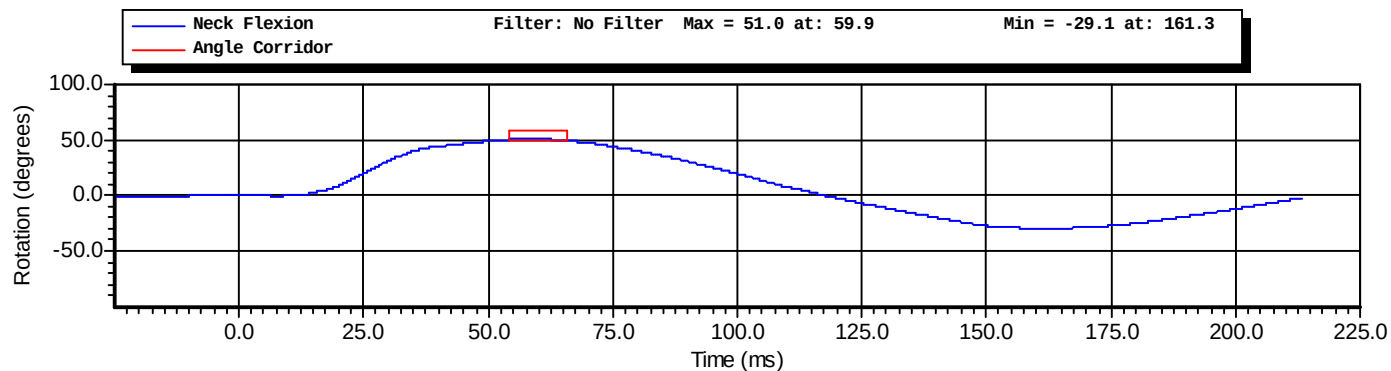
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Test Name:	Neck Flexion	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Neck Flexion	Test Date:	10/22/2010
Test Number:	2	Test Time:	12:01:05 PM

Pendulum Velocity



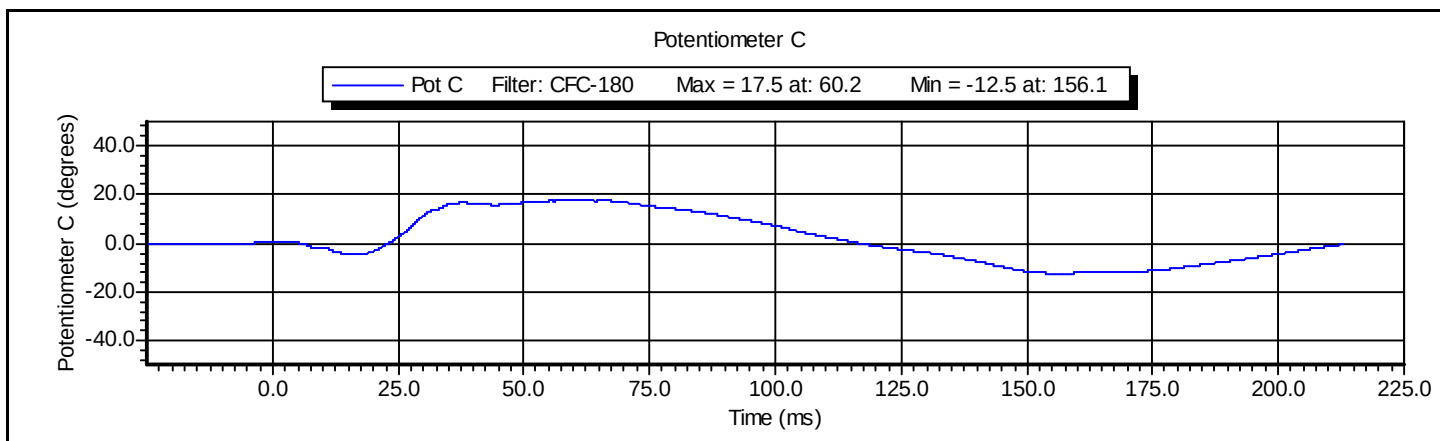
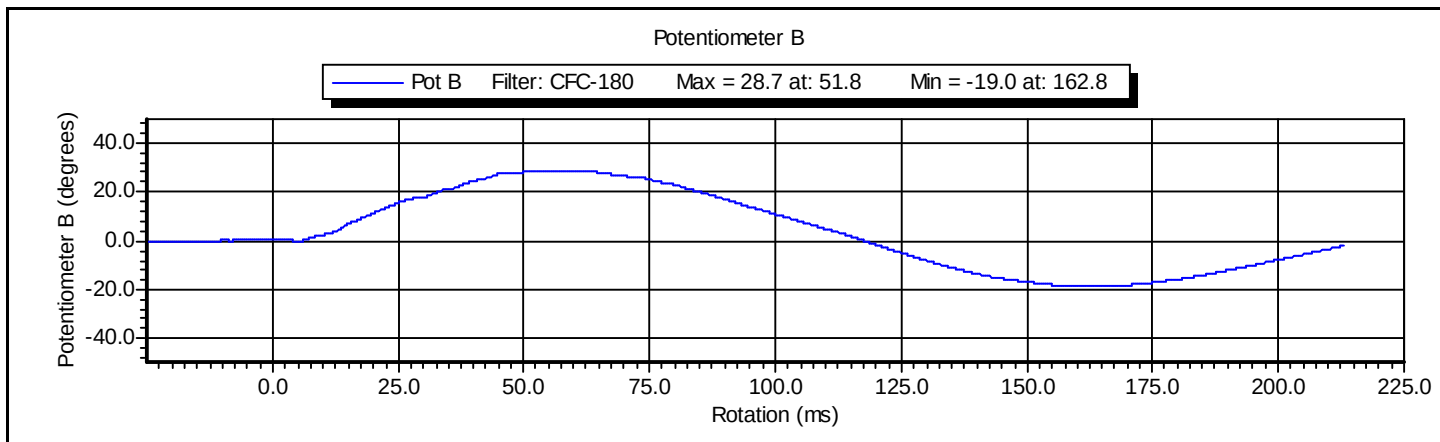
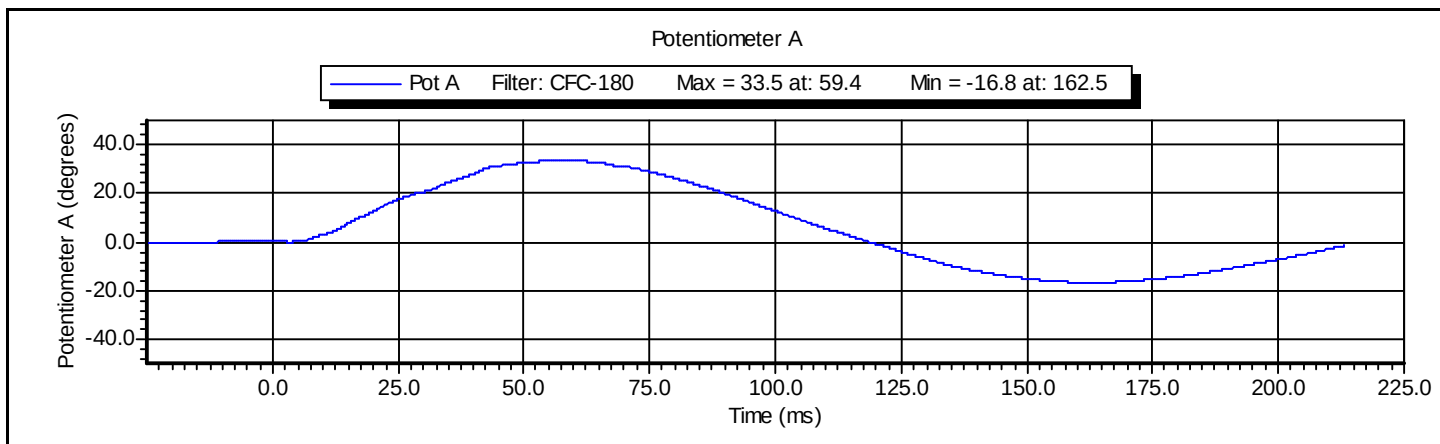
Neck Flexion Angle



Test ID: Neck Flexion

Test Time: 12:01:05 PM

Test Date: 10/22/2010





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VERIFICATION REPORT

Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder Impact	Test Date:	10/26/2010
Test Number:	1	Test Time:	9:37:51 AM

Component Part Number	Component Serial Number
960715-313	

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.6 deg C P
Humidity	10.0 -- 70.0	59.0 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Pendulum Acceleration	-10.50 -- -7.50	-9.61 g P

All test parameters are within specifications

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

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

Test ID: **Shoulder Impact**

Test Time: **9:37:51 AM**

Test Date: **10/26/2010**



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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

Test ID: **Shoulder Impact**

Test Time: **9:37:51 AM**

Test Date: **10/26/2010**

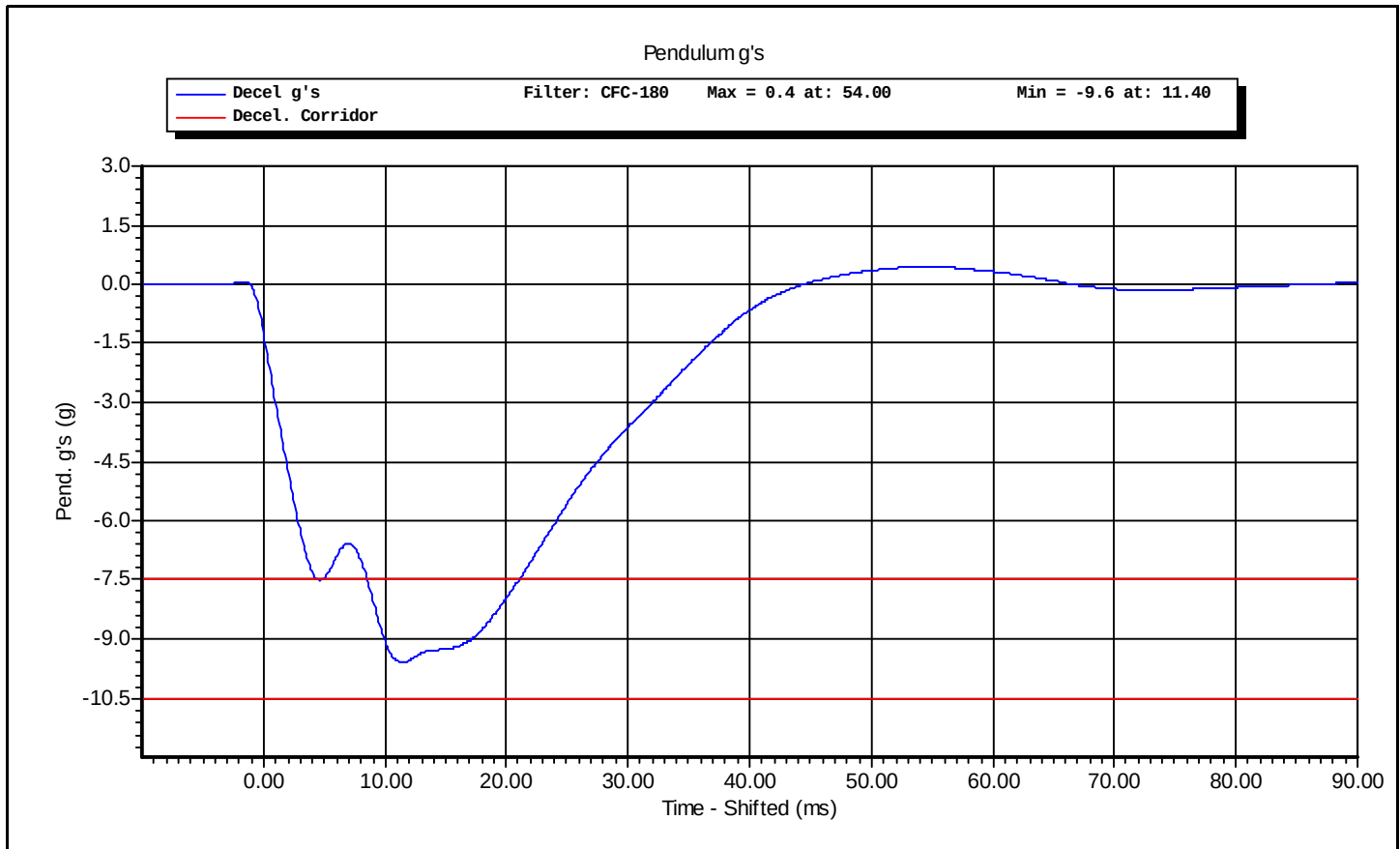


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Test Name:	Shoulder Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Shoulder Impact	Test Date:	10/26/2010
Test Number:	1	Test Time:	9:37:51 AM



Test ID: **Shoulder Impact** Test Time: **9:37:51 AM**

Test Date: **10/26/2010**



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VERIFICATION REPORT

Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	10/26/2010
Test Number:	1	Test Time:	9:48:42 AM

Component Part Number	Component Serial Number
Upper Rib - 175-4002	UPPER
Middle Rib - 175-4002	MIDDLE
Lower Rib - 175-4002	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.8 deg C P
Humidity	10.0 -- 70.0	59.0 %RH P
Velocity	5.40 -- 5.60	5.49 m/s P
Upper Rib Displacement	34.0 -- 41.0	37.5 mm P
Middle Rib Displacement	37.0 -- 45.0	41.2 mm P
Lower Rib Displacement	37.0 -- 44.0	41.0 mm P
Impactor Force	5100 -- 6200	5287 N P

All test parameters are within specifications

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

Test ID: **Thorax**

Test Time: **9:48:42 AM**

Test Date: **10/26/2010**



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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
Honeywell	MLT-38000	DS-179	4/23/2010
Honeywell	MLT-38000	DS-185	4/23/2010
Honeywell	MLT-38000	DS-178	4/23/2010

Test ID: **Thorax**

Test Time: **9:48:42 AM**

Test Date: **10/26/2010**

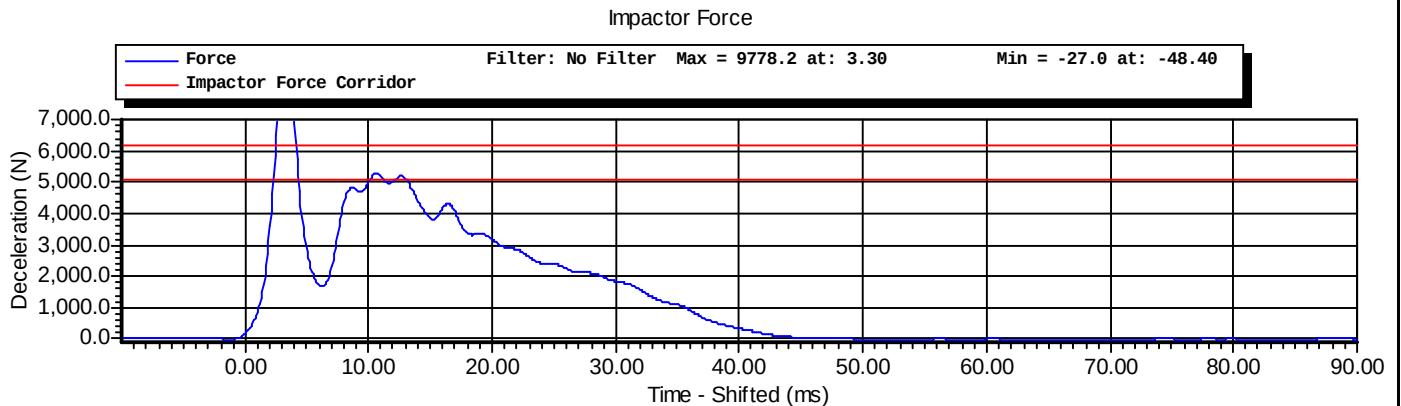
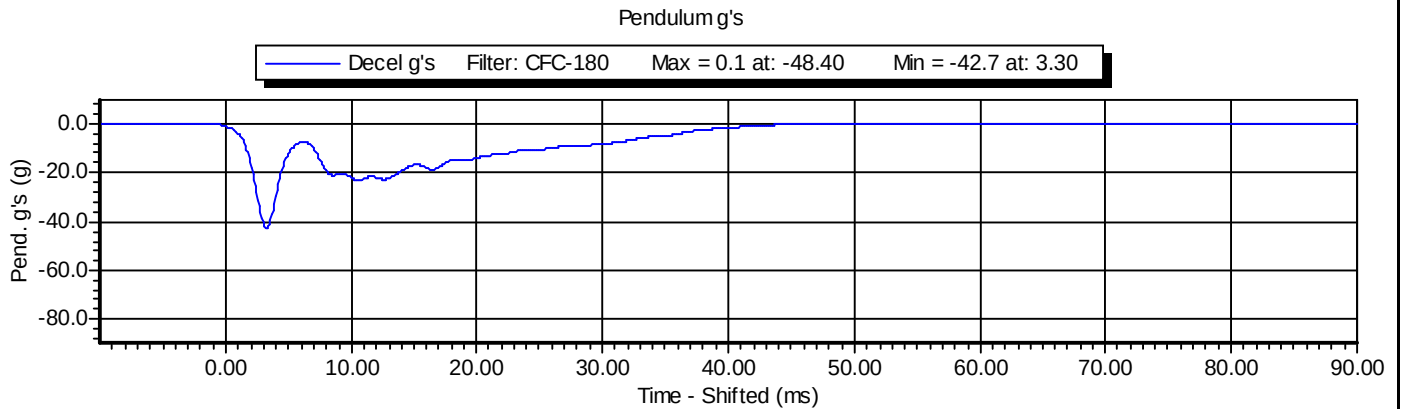


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Test Name:	Thorax Impact	Revision:	8/15/2008
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Thorax	Test Date:	10/26/2010
Test Number:	1	Test Time:	9:48:42 AM

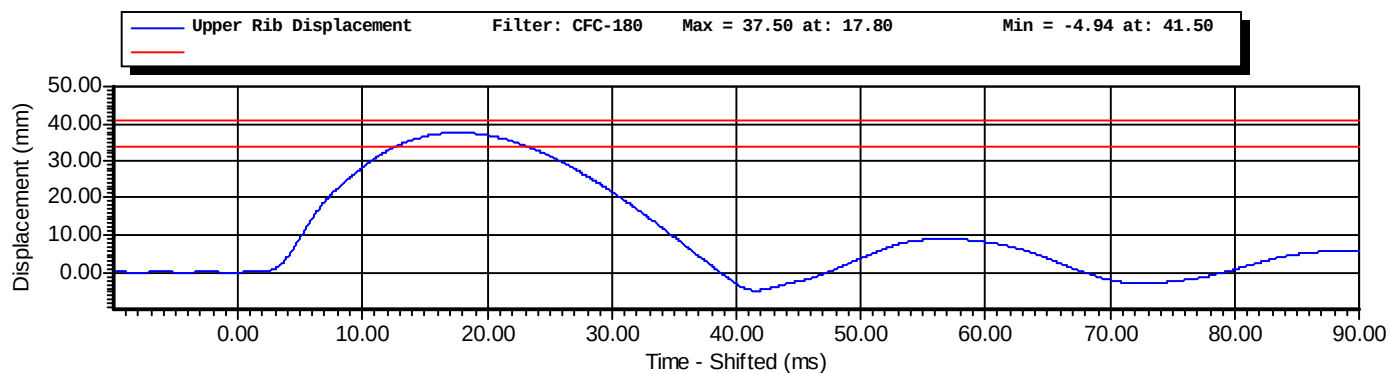


Test ID: Thorax

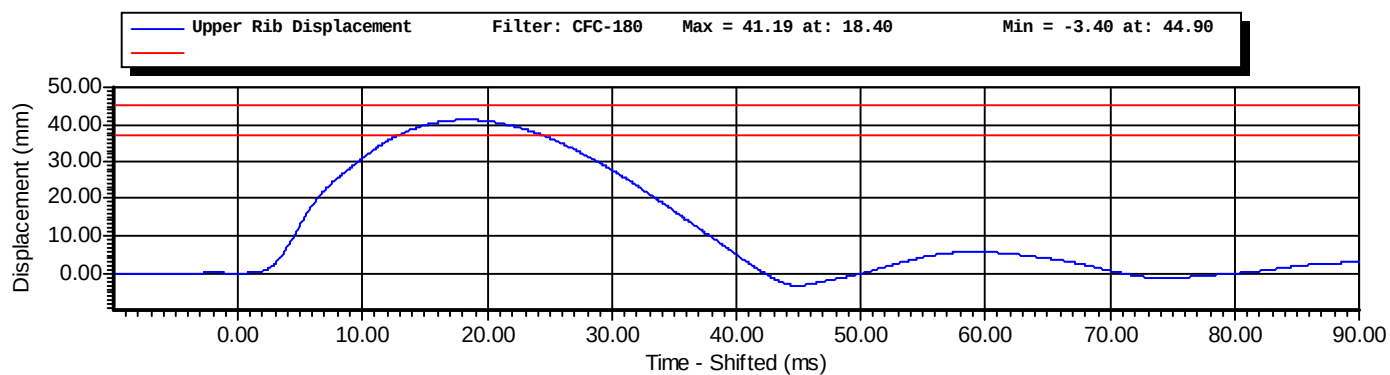
Test Time: 9:48:42 AM

Test Date: 10/26/2010

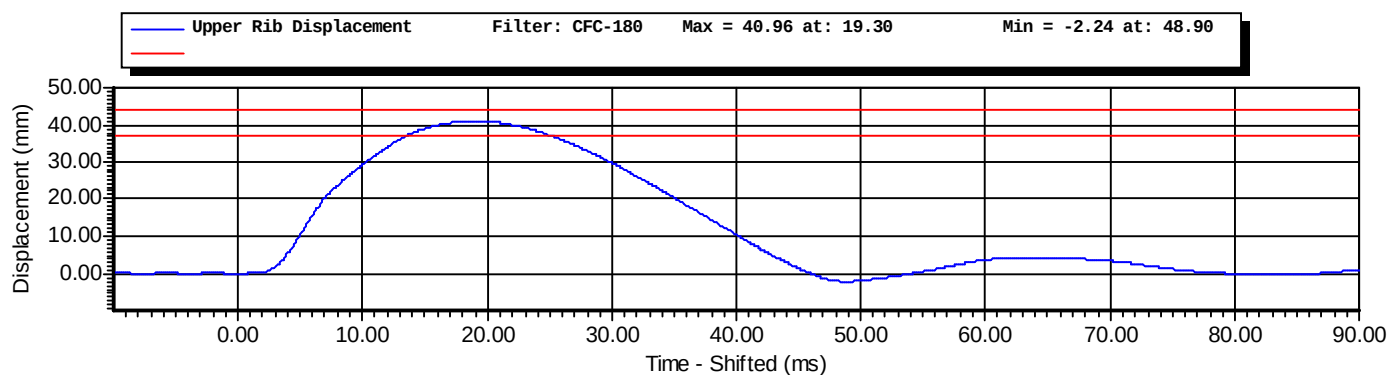
Upper Rib Displacement



Middle Rib Displacement



Lower Rib Displacement





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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	1:52:01 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	48.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-48.48 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

Test ID: **Upper Rib 4.0 m/s** Test Time: **1:52:01 PM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 4.0 m/s**

Test Time: **1:52:01 PM**

Test Date: **10/25/2010**

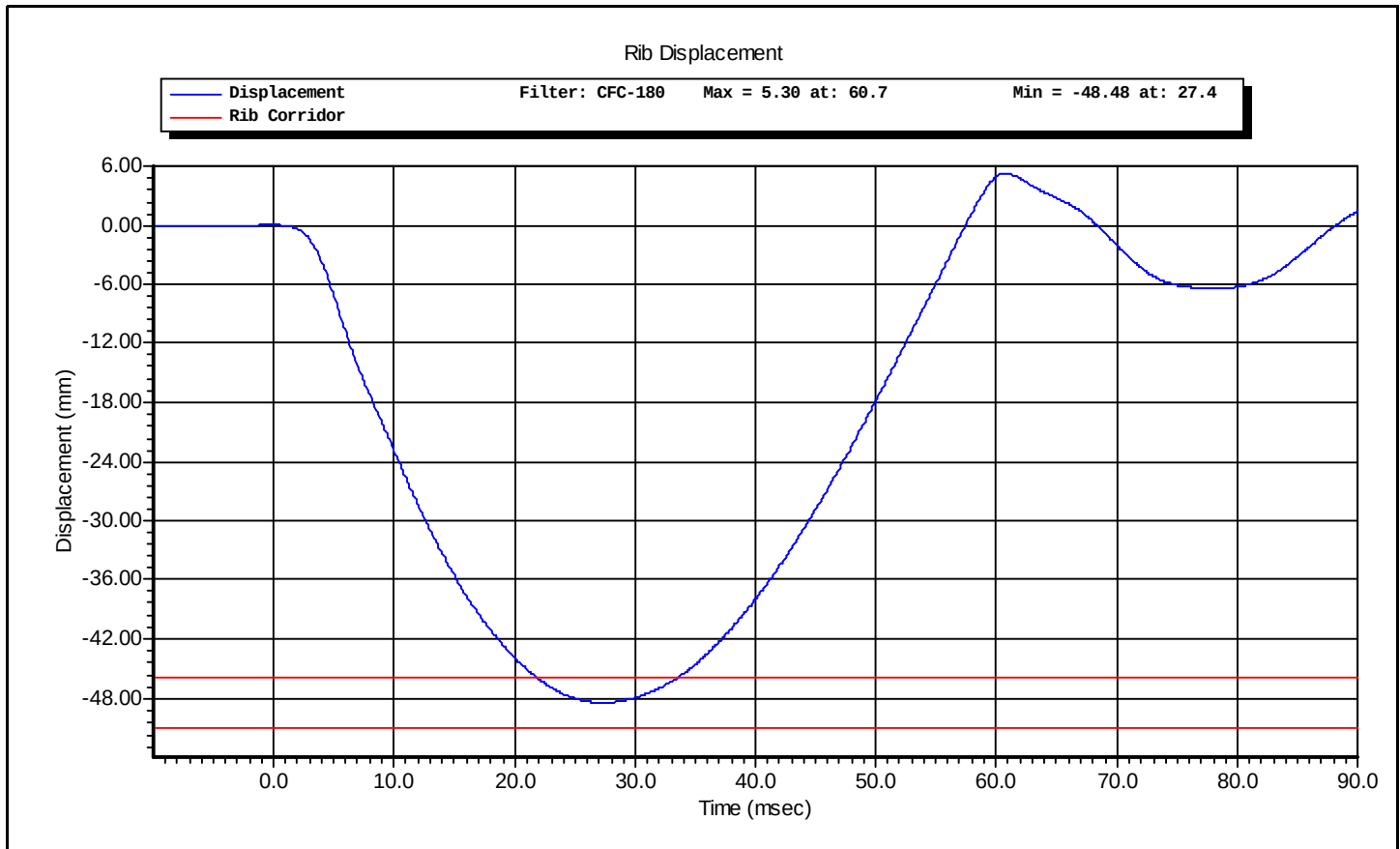


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	1:52:01 PM



Test ID: Upper Rib 4.0 m/s Test Time: 1:52:01 PM

Test Date: 10/25/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:01:46 PM

Component Part Number	Component Serial Number
455-3100	UPPER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	48.0 %RH P
Velocity	2.90 -- 3.10	2.96 m/s P
Rib Displacement	-40.00 -- -36.00	-37.66 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

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

Test ID: **Upper Rib 3.0 m/s** Test Time: **2:01:46 PM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-179	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 3.0 m/s** Test Time: **2:01:46 PM**

Test Date: **10/25/2010**

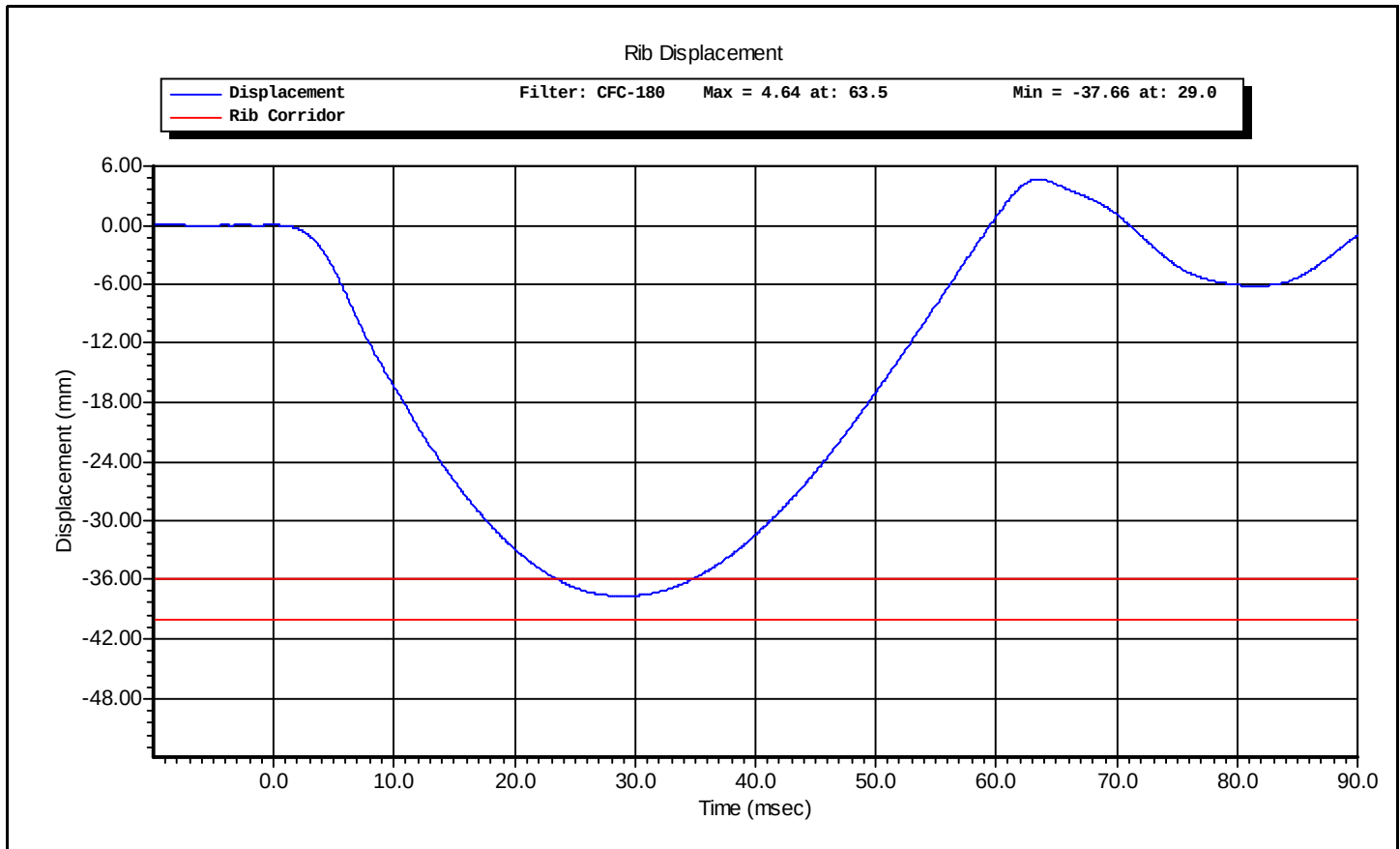


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 3.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:01:46 PM



Test ID: Upper Rib 3.0 m/s Test Time: 2:01:46 PM

Test Date: 10/25/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4.0m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:12:53 PM

Component Part Number	Component Serial Number
455-3100	MIDDLE

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	49.0 %RH P
Velocity	3.90 -- 4.10	3.97 m/s P
Rib Displacement	-51.00 -- -46.00	-47.43 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

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

Test ID: **Upper Rib 4.0m/s**

Test Time: **2:12:53 PM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Upper Rib 4.0m/s**

Test Time: **2:12:53 PM**

Test Date: **10/25/2010**

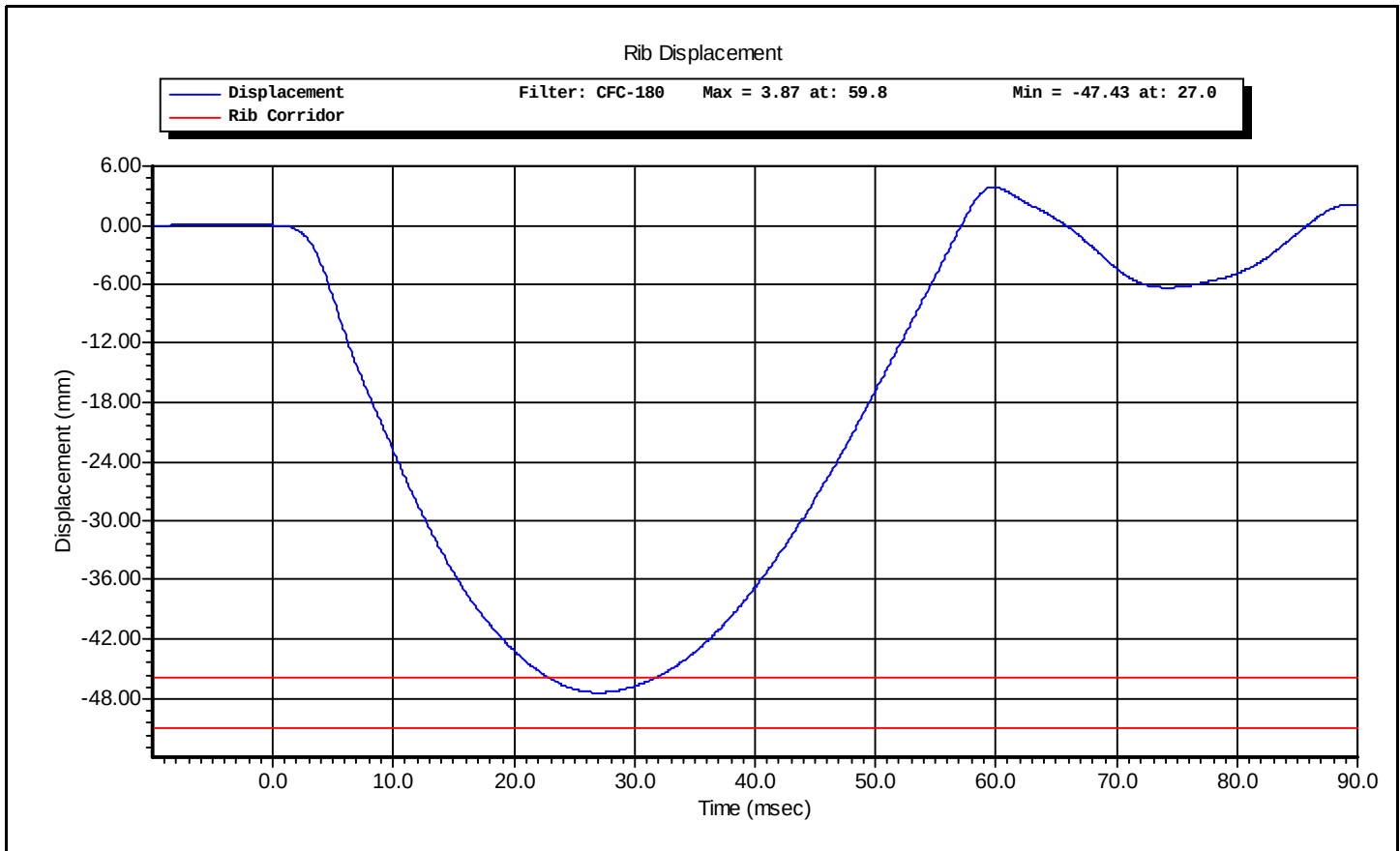


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Upper Rib 4.0m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:12:53 PM



Test ID: **Upper Rib 4.0m/s** Test Time: **2:12:53 PM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:23:55 PM

Component Part Number	Component Serial Number
455-3100	

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	49.0 %RH P
Velocity	2.90 -- 3.10	2.98 m/s P
Rib Displacement	-40.00 -- -36.00	-37.02 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

Test ID: **Middle Rib 3.0 m/s** Test Time: **2:23:55 PM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-185	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Middle Rib 3.0 m/s** Test Time: **2:23:55 PM**

Test Date: **10/25/2010**

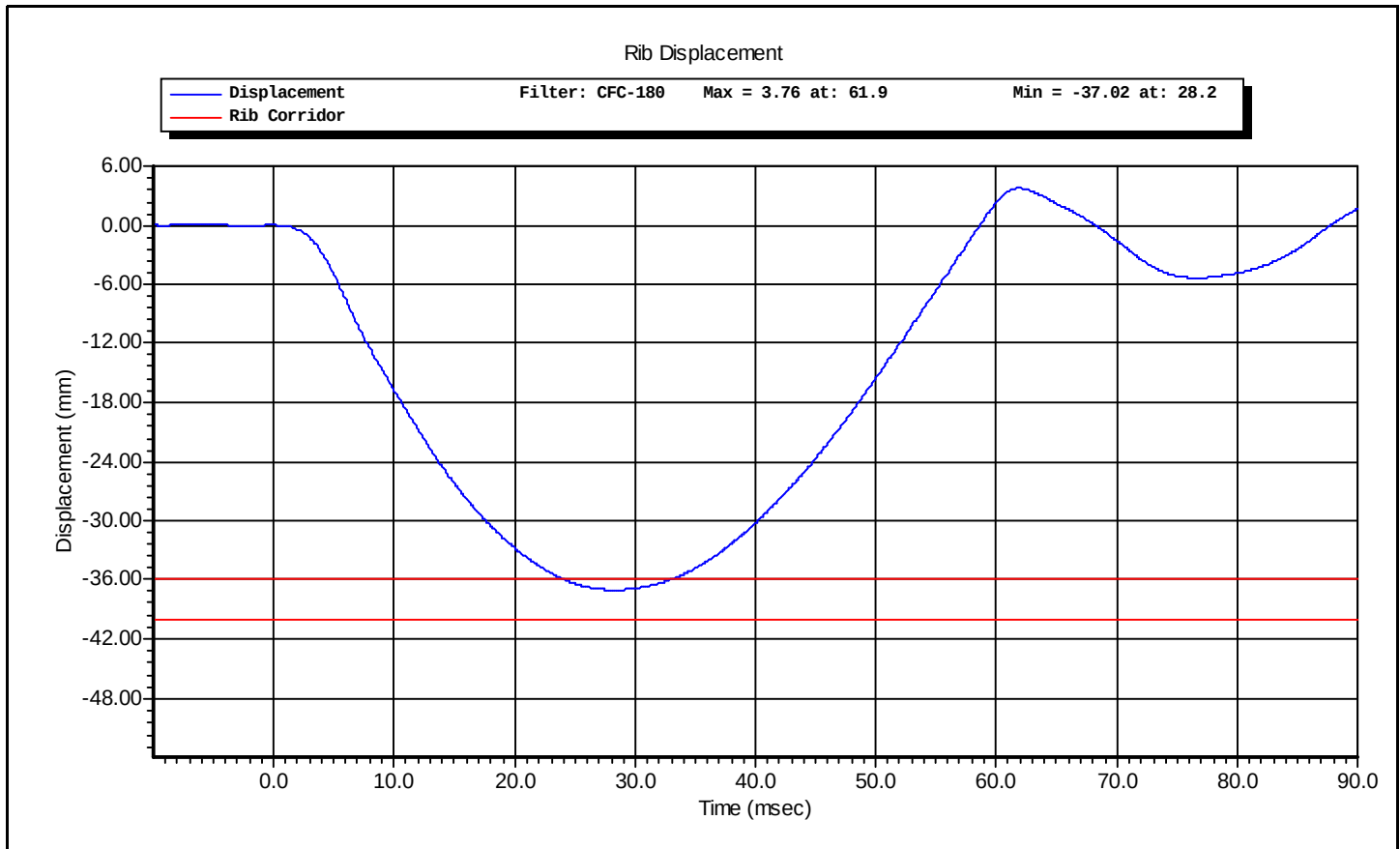


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Middle Rib 3.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:23:55 PM



Test ID: Middle Rib 3.0 m/s Test Time: 2:23:55 PM

Test Date: 10/25/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:30:21 PM

Component Part Number	Component Serial Number
455-3100	LOWER

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	49.0 %RH P
Velocity	3.90 -- 4.10	3.98 m/s P
Rib Displacement	-51.00 -- -46.00	-48.03 mm P
Drop Height	807.0 -- 823.0	815.0 mm P

All test parameters are within specifications

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

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

Test ID: **Lower Rib 4.0 m/s** Test Time: **2:30:21 PM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 4.0 m/s** Test Time: **2:30:21 PM**

Test Date: **10/25/2010**

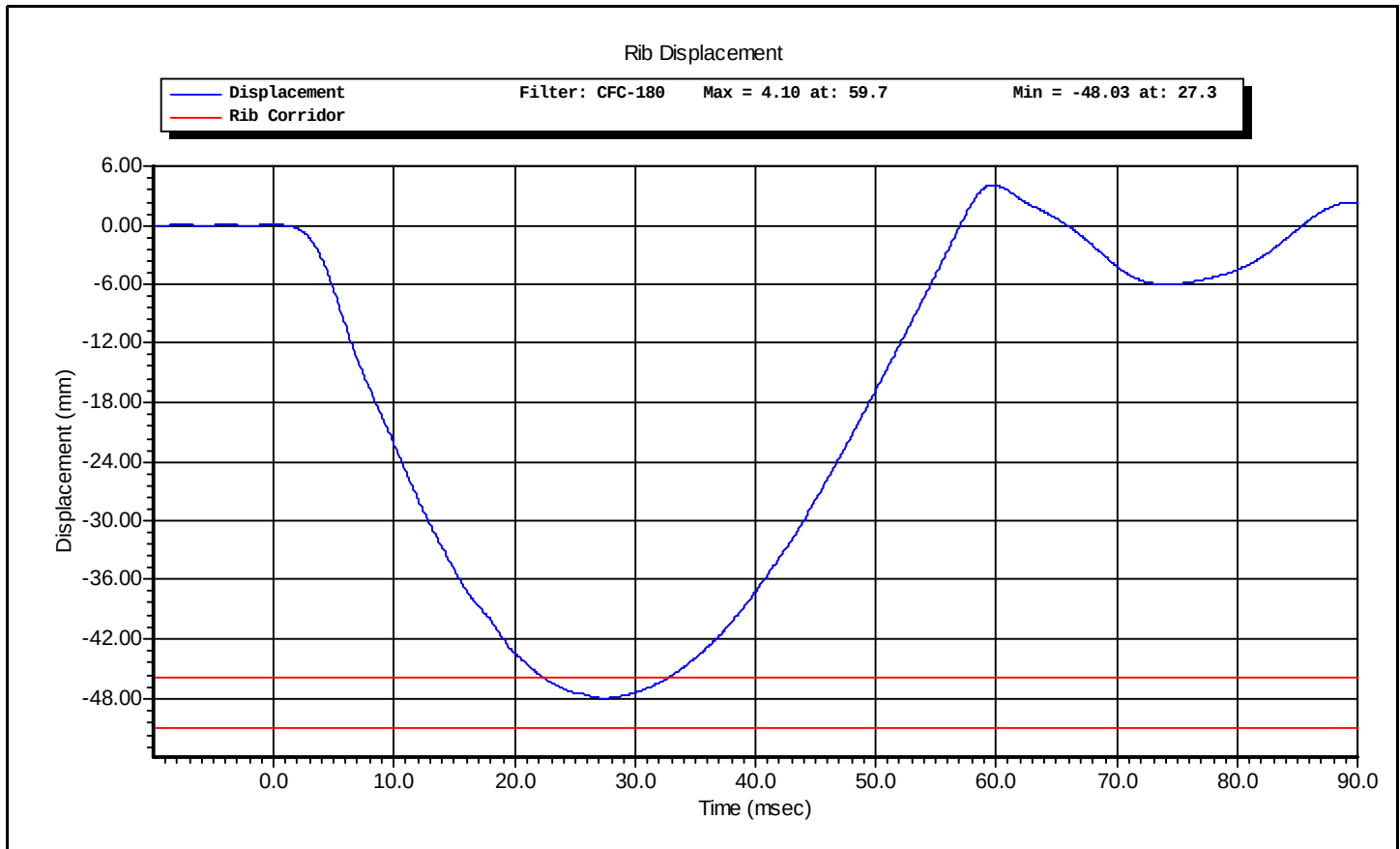


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	4.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 4.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:30:21 PM



Test ID: Lower Rib 4.0 m/s Test Time: 2:30:21 PM

Test Date: 10/25/2010



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VERIFICATION REPORT

Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:35:47 PM

Component Part Number	Component Serial Number
455-3100	

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10.0 -- 70.0	49.0 %RH P
Velocity	2.90 -- 3.10	2.97 m/s P
Rib Displacement	-40.00 -- -36.00	-37.34 mm P
Drop Height	454 -- 464	459 mm P

All test parameters are within specifications

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

Test ID: **Lower Rib 3.0 m/s** Test Time: **2:35:47 PM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
Honeywell	MLT-38000	DS-178	4/23/2010
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P38216	6/22/2010

Test ID: **Lower Rib 3.0 m/s** Test Time: **2:35:47 PM**

Test Date: **10/25/2010**

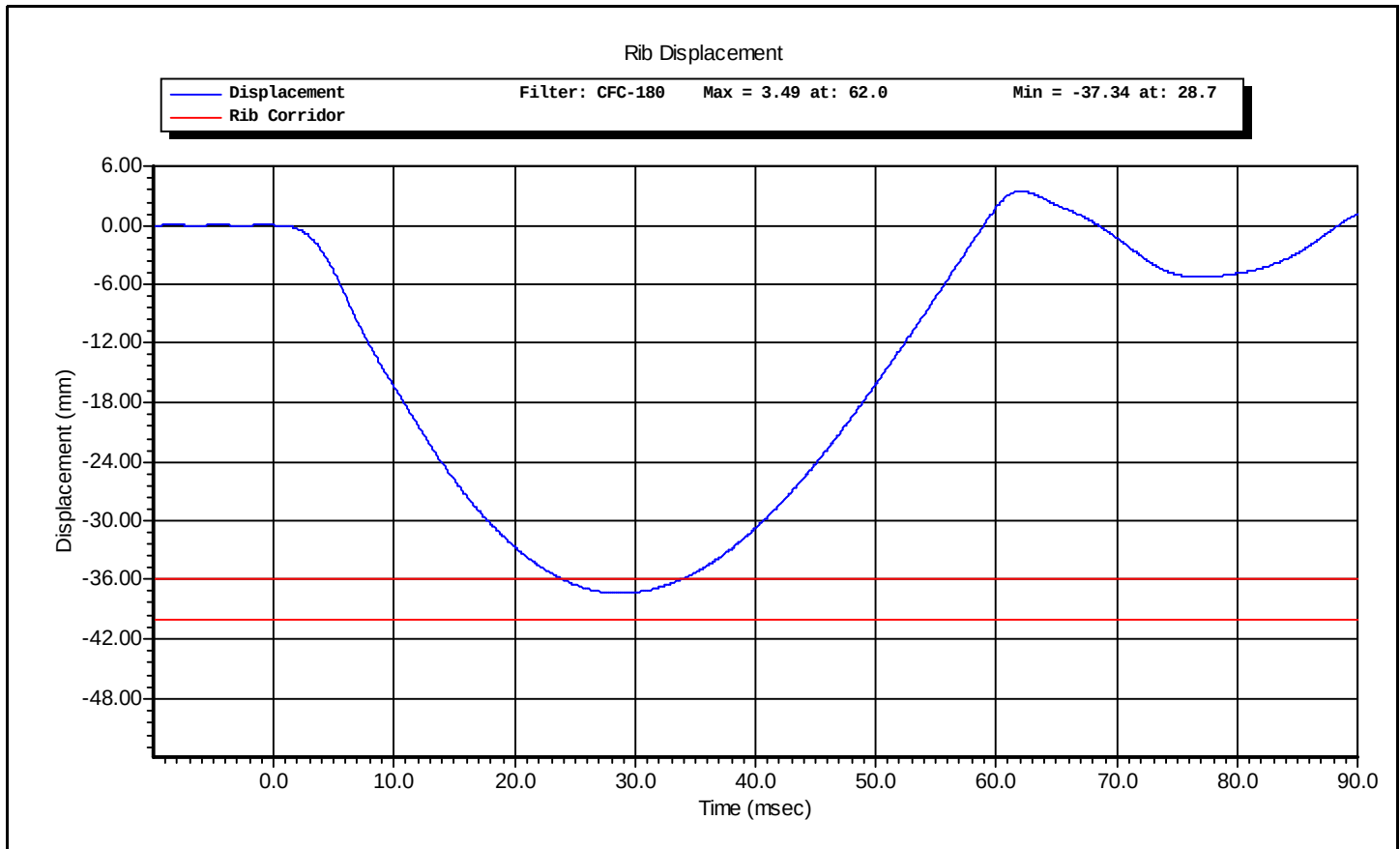


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Test Name:	Full Rib Module Impact	Revision:	12/14/2006
Sub Test Name:	3.0 Meters/Second	Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lower Rib 3.0 m/s	Test Date:	10/25/2010
Test Number:	1	Test Time:	2:35:47 PM



Test ID: Lower Rib 3.0 m/s Test Time: 2:35:47 PM

Test Date: 10/25/2010



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VERIFICATION REPORT

Test Name:	Abdominal Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	10/25/2010
Test Number:	1	Test Time:	4:02:48 PM

Component Part Number	Component Serial Number
455-4001	07/136

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	52 %RH P
Velocity	3.90 -- 4.10	4.04 m/s P
Peak Abdominal Force	-2.70 -- -2.20	-2.39 kN P
Time At Peak Abdominal Force	10.0 -- 12.3	11.2 ms P
Maximum Pendulum Force	-4.80 -- -4.00	-4.47 kN P
Time at Peak Pendulum Force	10.6 -- 13.0	12.0 ms P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **4:02:48 PM**

Test Date: **10/25/2010**



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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
Denton	2631	LC-1524	4/22/2010
Denton	2631	LC-1523	4/22/2010
Denton	2631	LC-1530	4/22/2010

Test ID: **Abdomen**

Test Time: **4:02:48 PM**

Test Date: **10/25/2010**

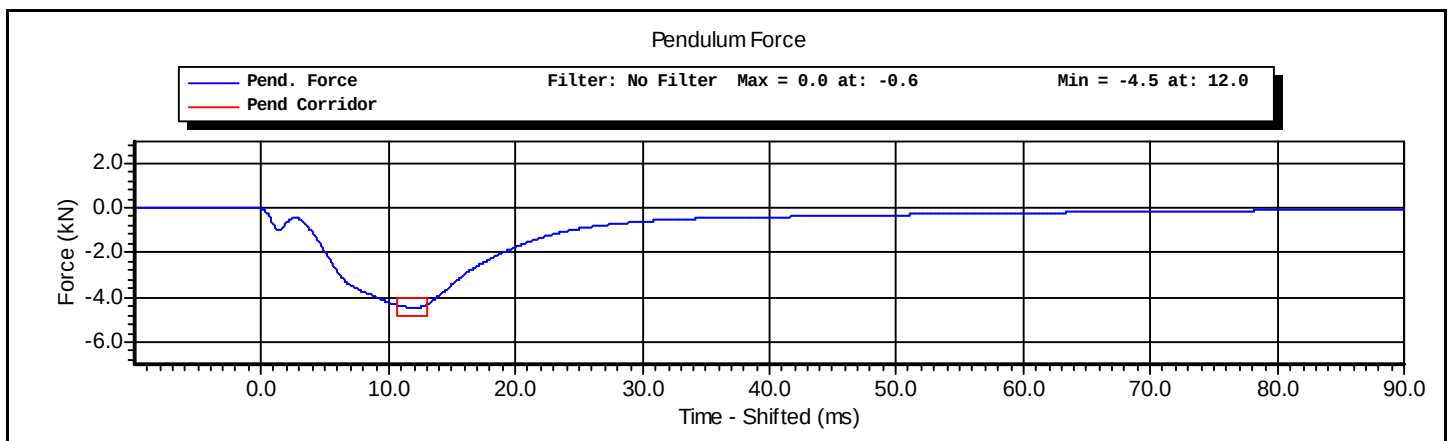
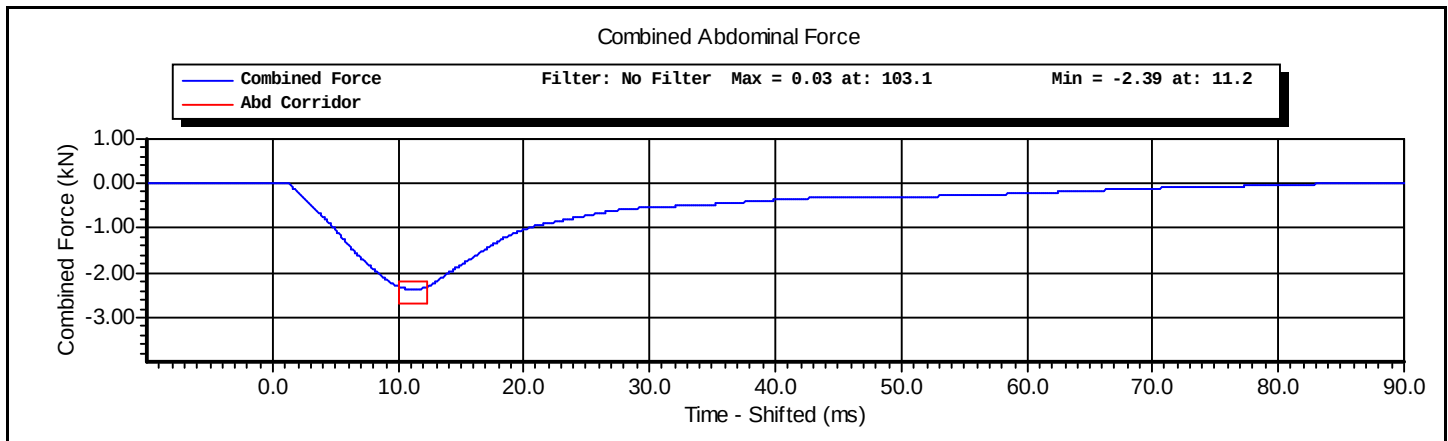


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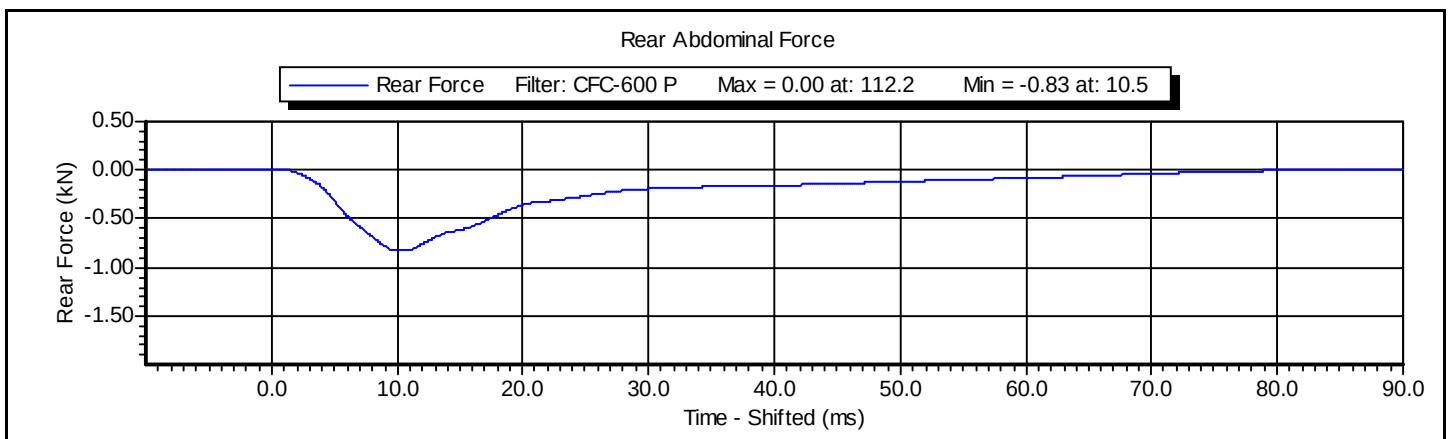
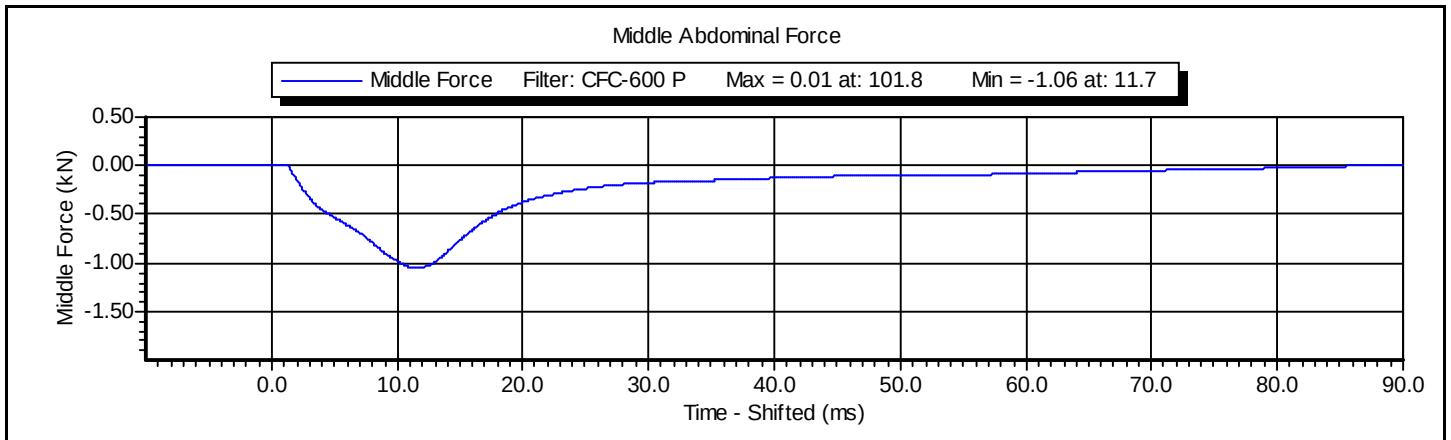
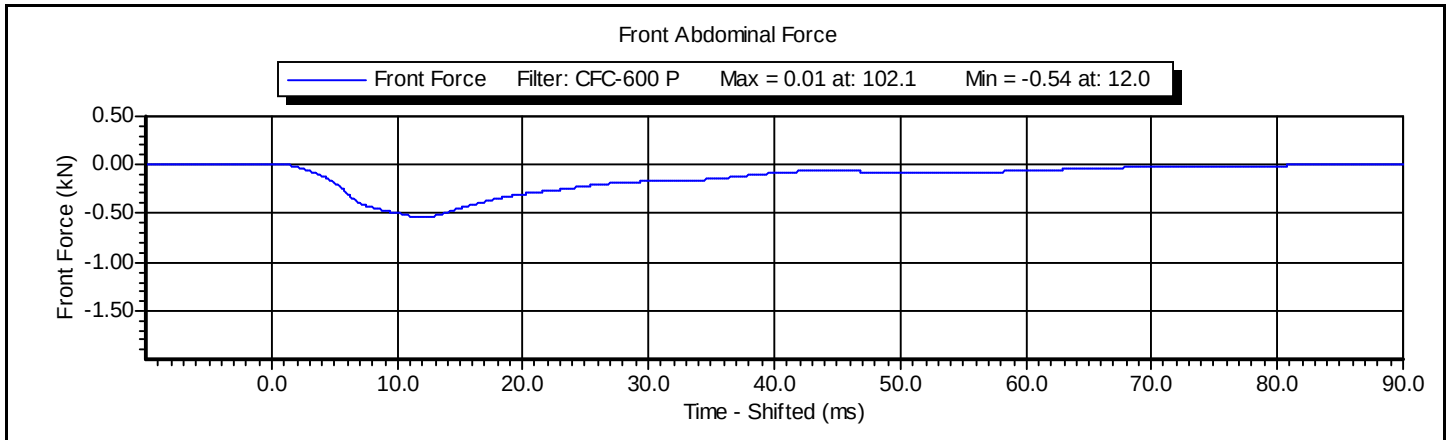
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Abdomen	Test Date:	10/25/2010
Test Number:	1	Test Time:	4:02:48 PM



Test ID: **Abdomen**

Test Time: **4:02:48 PM**

Test Date: **10/25/2010**





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VERIFICATION REPORT

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	10/25/2010
Test Number:	1	Test Time:	11:33:27 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	48 %RH	P
Velocity	5.95	--	6.15	6.15 m/s	P
Maximum Headform Flexion Angle	45.0	--	55.0	48.9 degrees	P
Time at Maximum Headform Flexion Angle	39.0	--	53.0	45.0 ms	P
Decay to Zero Degrees	37.0	--	57.0	37.4 ms	P
Velocity Corridor		--			P

All test parameters are within specifications

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

Test ID: **Lumbar Spine**

Test Time: **11:33:27 AM**

Test Date: **10/25/2010**



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7231CT	C16510	5/10/2010
DentonATD	7000428	094	4/27/2010
DentonATD	7000428	095	4/27/2010
DentonATD	7000428	093	4/27/2010

Test ID: **Lumbar Spine**

Test Time: **11:33:27 AM**

Test Date: **10/25/2010**



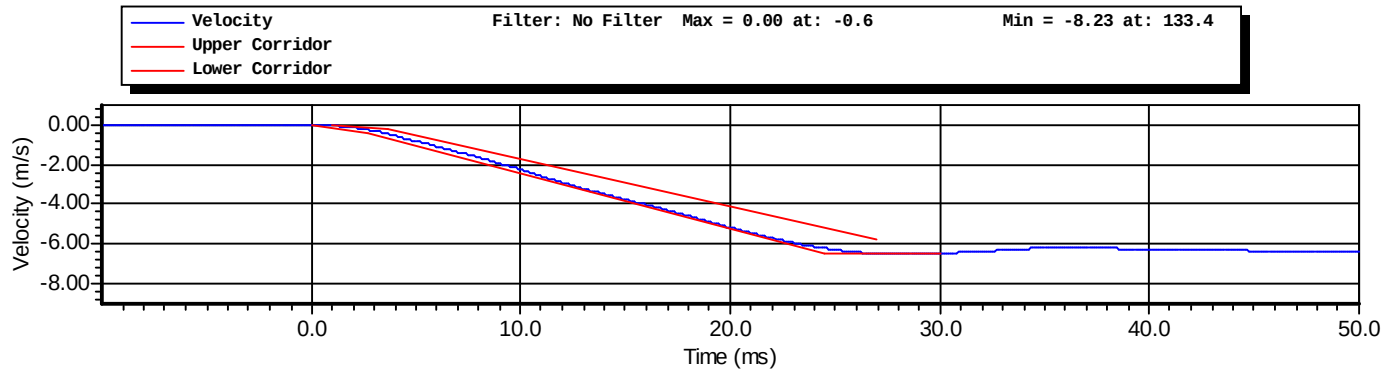
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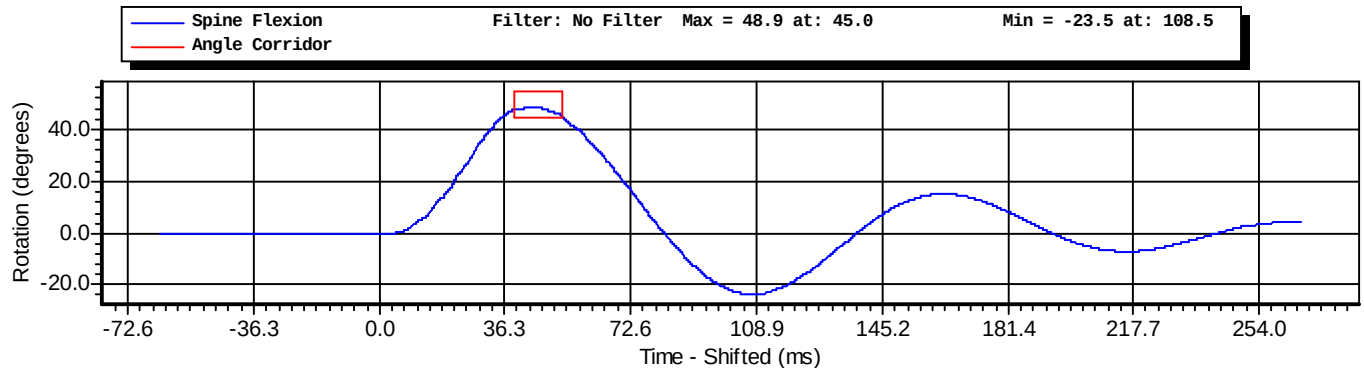
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Lumbar Spine	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Lumbar Spine	Test Date:	10/25/2010
Test Number:	1	Test Time:	11:33:27 AM

Pendulum Velocity



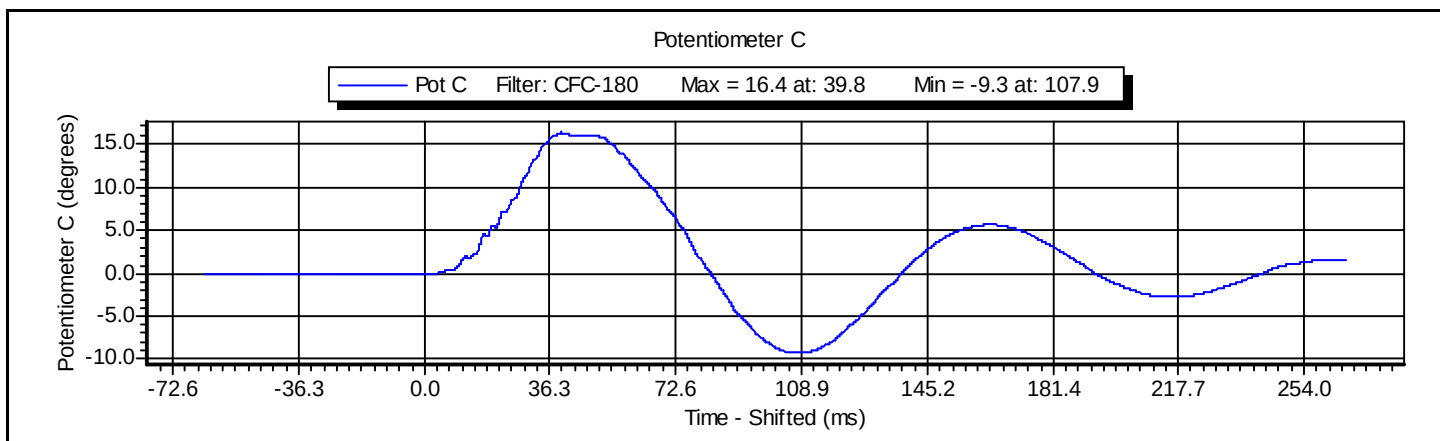
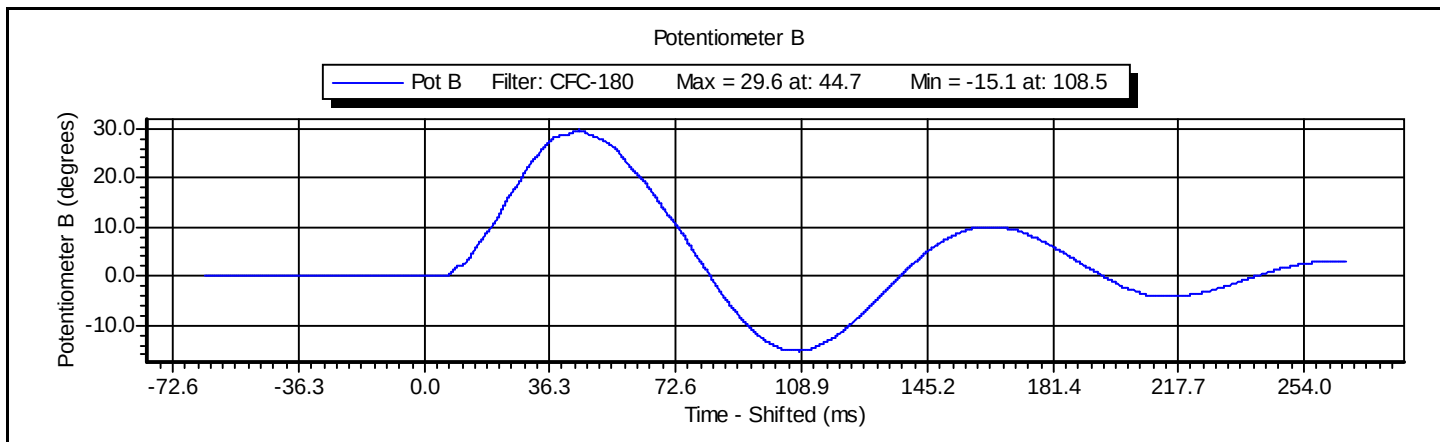
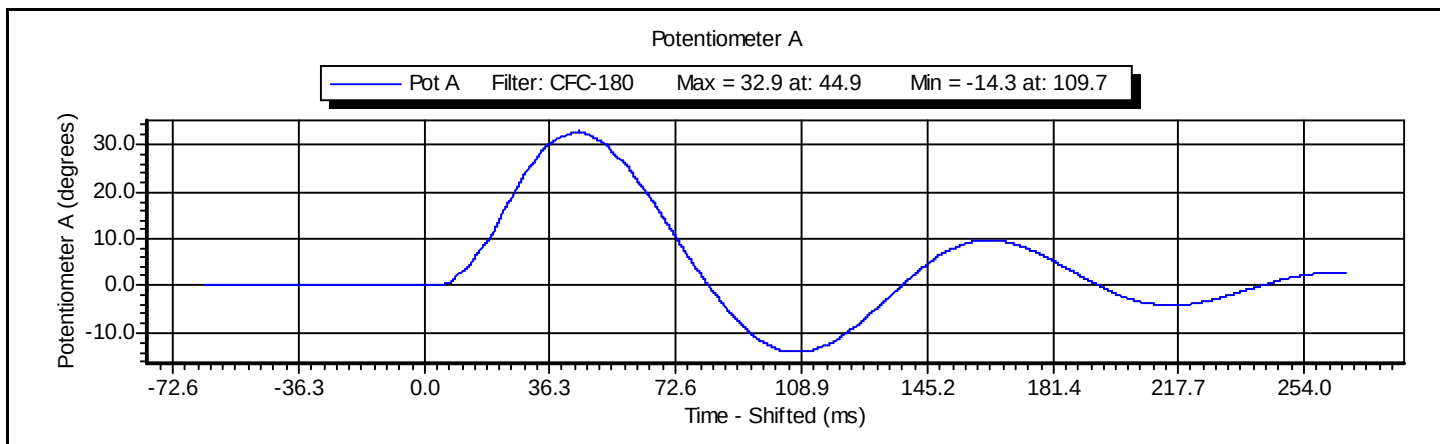
Spine Flexion Angle



Test ID: **Lumbar Spine**

Test Time: **11:33:27 AM**

Test Date: **10/25/2010**





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VERIFICATION REPORT

Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	10/25/2010
Test Number:	2	Test Time:	3:43:18 PM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	52 %RH	P
Velocity	4.20	--	4.40	4.34 m/s	P
Peak Pendulum Force	-5.40	--	-4.70	-5.12 kN	P
Time at Peak Pendulum Force	11.80	--	16.10	14.36 ms	P
Peak Pubic Symphysis Force	-1.59	--	-1.23	-1.34 kN	P
Time at Peak Pubic Symphysis Force	12.20	--	17.00	15.36 ms	P

All test parameters are within specifications

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

Test ID: **Pelvis**

Test Time: **3:43:18 PM**

Test Date: **10/25/2010**



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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
Denton	3096	LC-456Fy	4/22/2010

Test ID: **Pelvis**

Test Time: **3:43:18 PM**

Test Date: **10/25/2010**



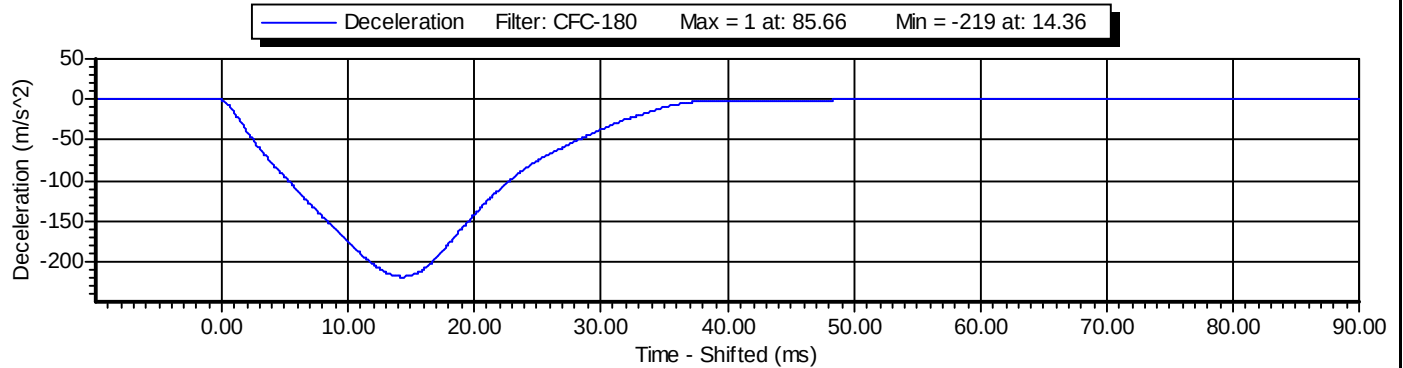
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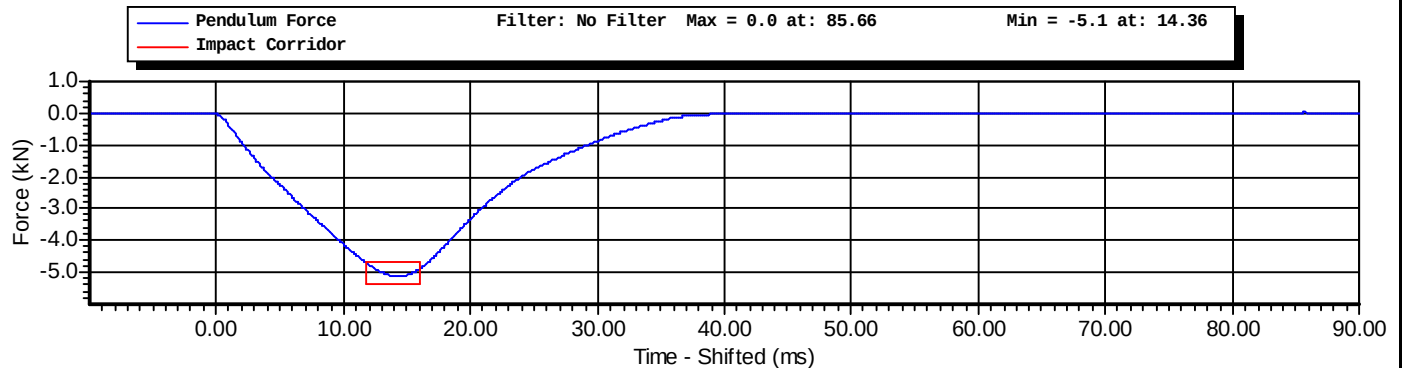
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Pelvis Impact	Revision:	12/14/2006
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	ES-2re		
ATD Serial Number:	F033		
Test ID:	Pelvis	Test Date:	10/25/2010
Test Number:	2	Test Time:	3:43:18 PM

Pendulum Accelerometer



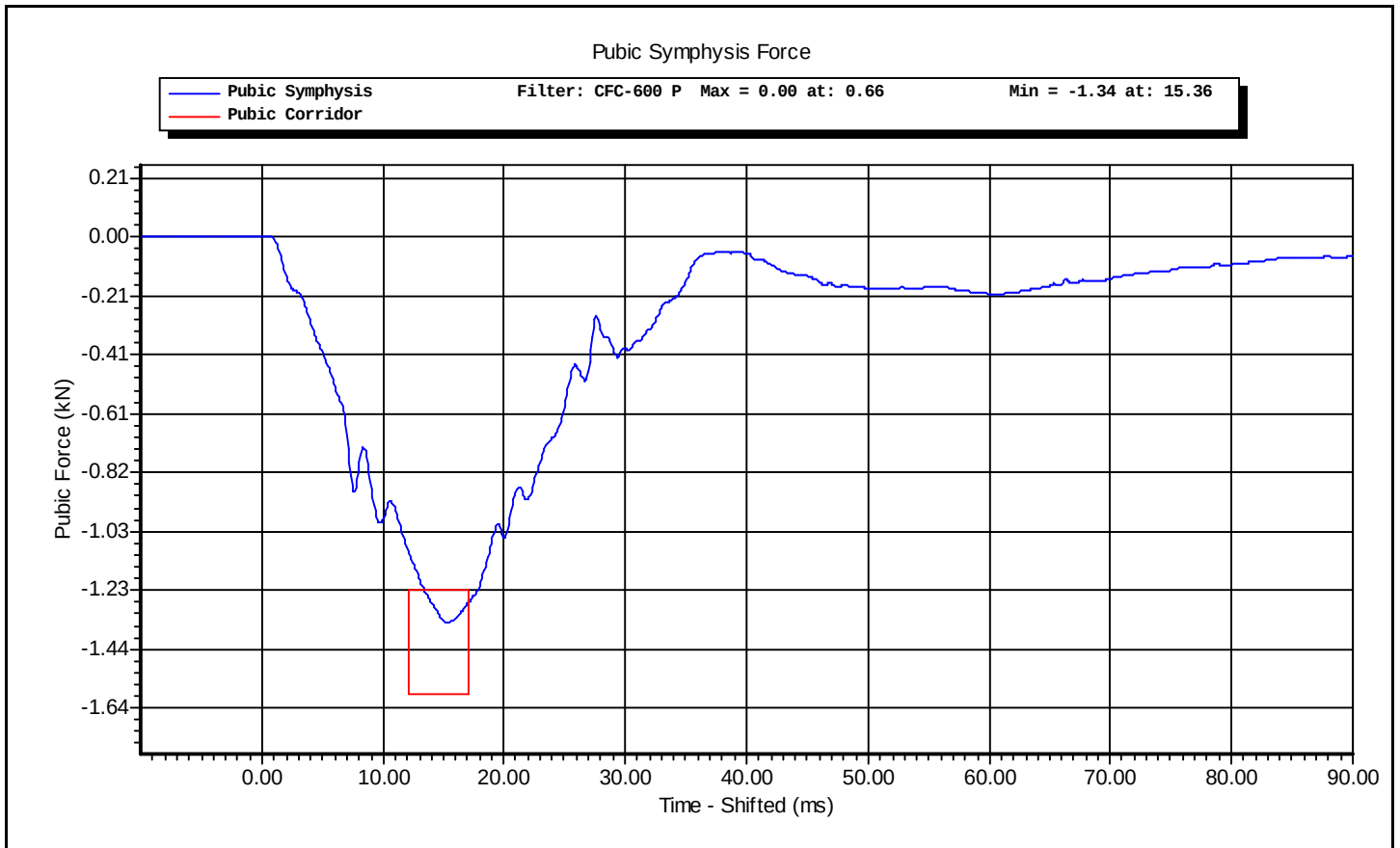
Pendulum Force



Test ID: **Pelvis**

Test Time: **3:43:18 PM**

Test Date: **10/25/2010**



CALIBRATION TEST RESULTS

POST-TEST

SID-IIs No: 304

CONFIGURED FOR LEFT SIDE IMPACT

SID-IIsD External Measurements

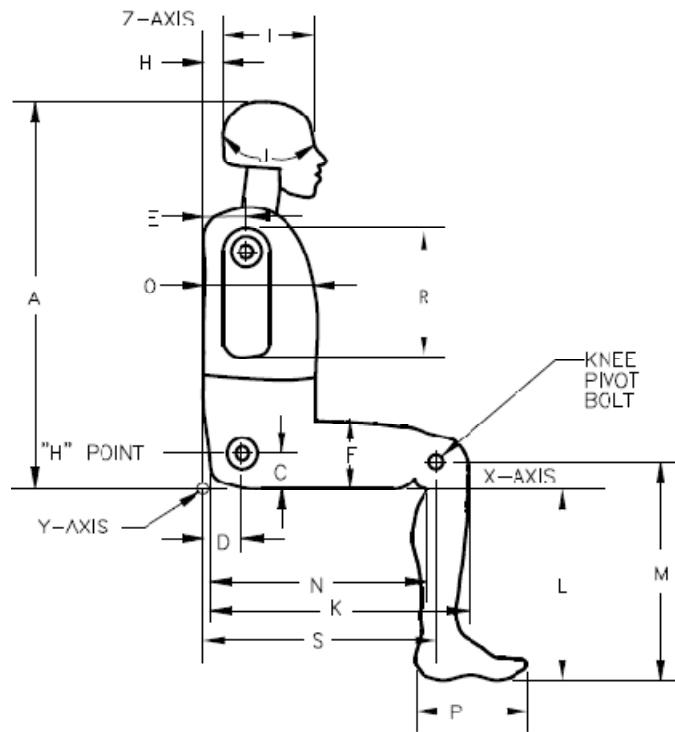
NHTSA ATD S/N 304

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

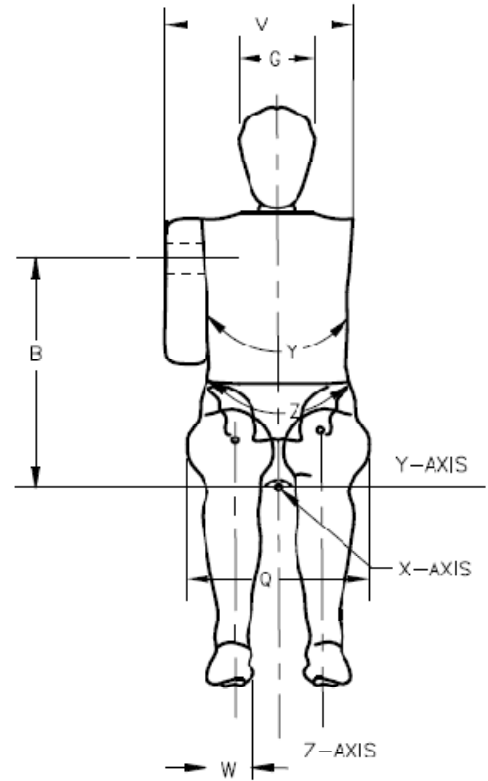
Technician: SZ

Date: 10/27/2010

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:	10/26/2010
Test Number:	1	Test Time:	12:00:27 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	55 %RH P
Resultant Acceleration	115.0 -- 137.0	122.4 g P
Oscillation	0.0 -- 15.0	3.4 % P
Fore-Aft Acceleration	-15.0 -- 15.0	-5.2 g P

All test parameters are within specifications

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

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

Test ID: **Head Drop**

Test Time: **12:00:27 PM**

Test Date: **10/26/2010**



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

Test ID: **Head Drop**

Test Time: **12:00:27 PM**

Test Date: **10/26/2010**

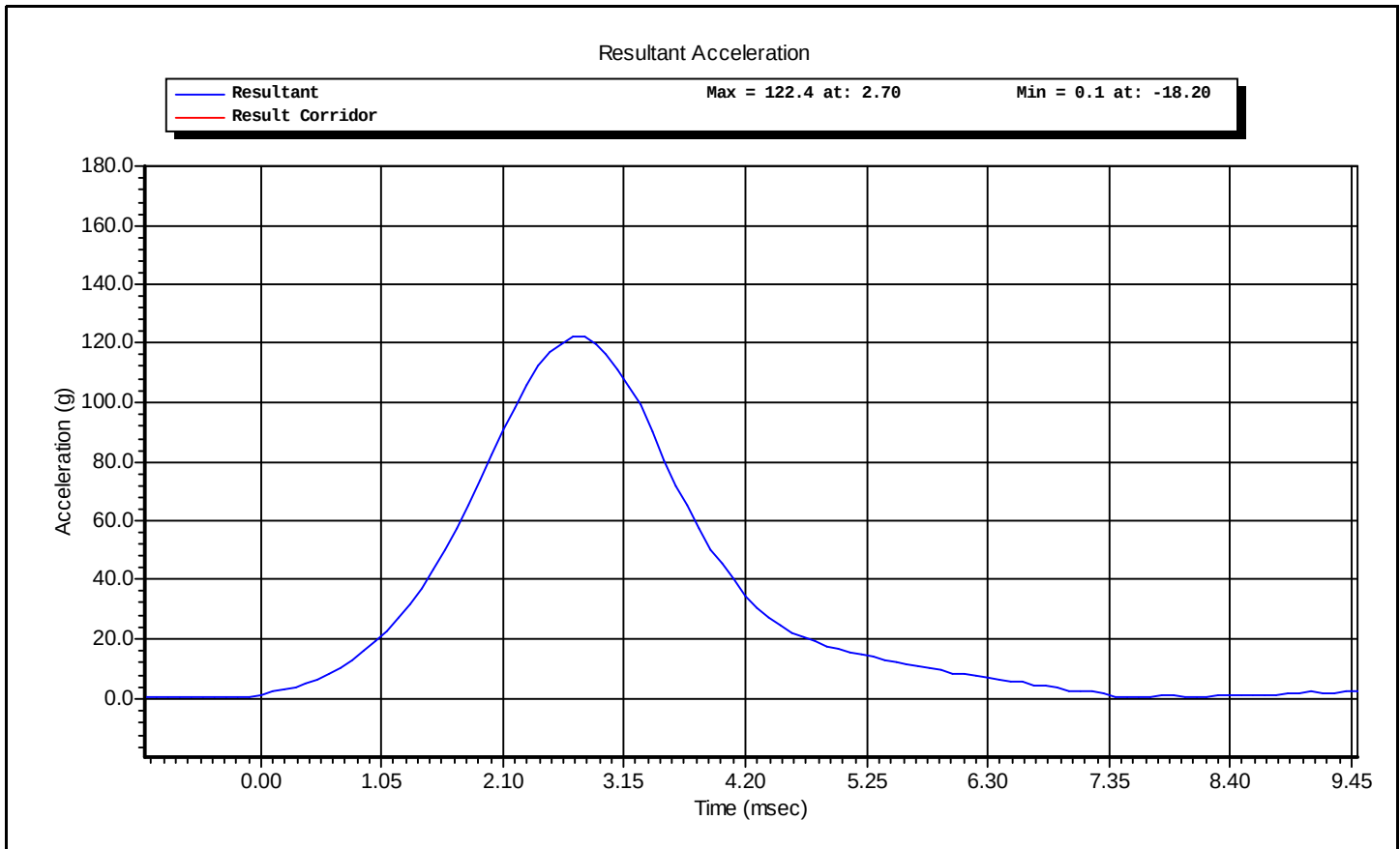


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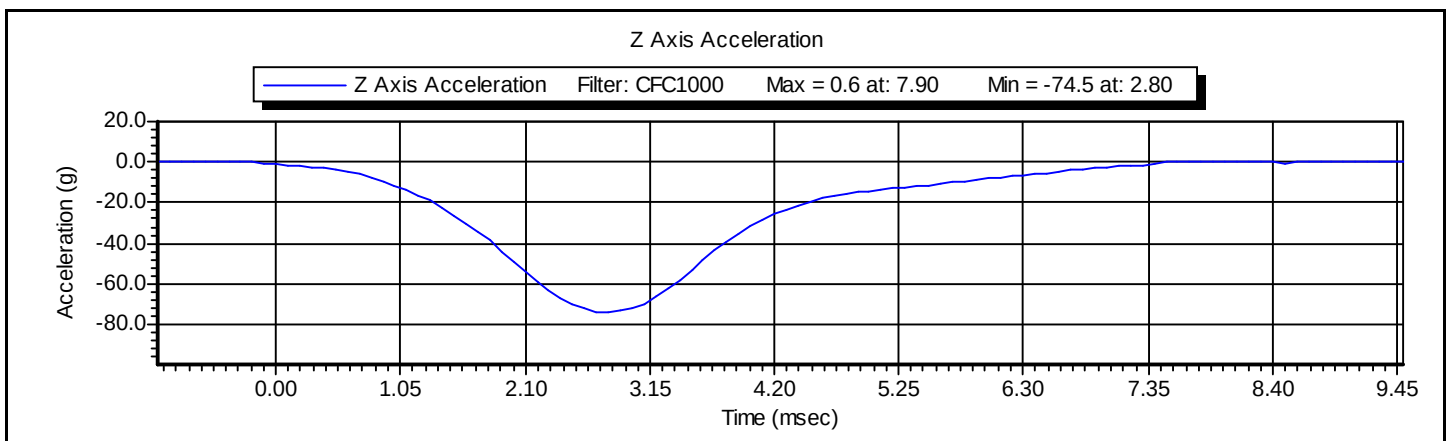
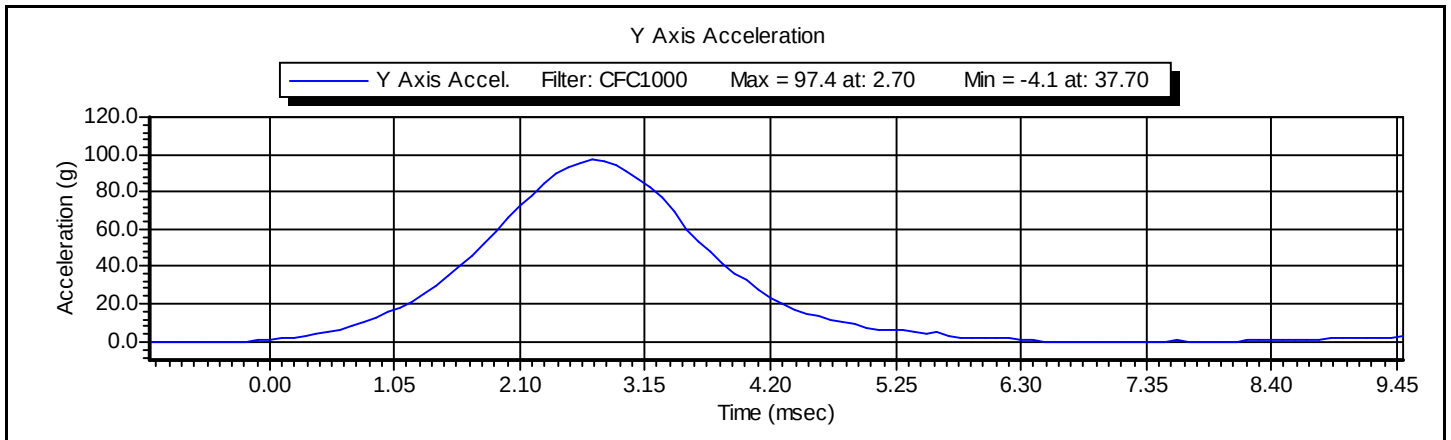
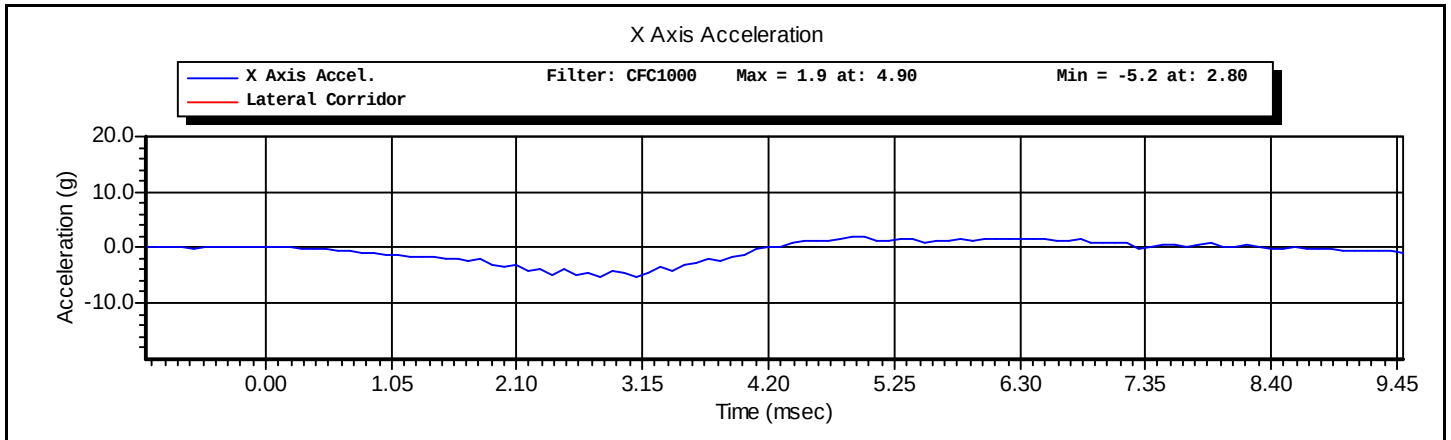
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Head Drop	Test Date:	10/26/2010
Test Number:	1	Test Time:	12:00:27 PM



Test ID: Head Drop

Test Time: 12:00:27 PM

Test Date: 10/26/2010





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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:	10/26/2010
Test Number:	1	Test Time:	1:32:29 PM

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

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	22.2 deg C P
Humidity	10 -- 70	52 %RH P
Velocity	5.51 -- 5.63	5.56 m/s P
Pendulum Impulse at 10 ms	2.20 -- 2.80	2.45 m/s P
Pendulum Impulse at 15 ms	3.30 -- 4.10	3.61 m/s P
Pendulum Impulse at 20 ms	4.40 -- 5.40	4.89 m/s P
Pendulum Impulse at 25 ms	5.40 -- 6.10	5.77 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	71.7 degrees P
Time at Max Rotation	50.0 -- 70.0	60.5 ms P
Moment about OC	-44.0 -- -36.0	-41.8 Nm P
Moment Decay to Zero	102.0 -- 126.0	114.3 ms P

All test parameters are within specifications

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

Test ID: **Neck Flexion**

Test Time: **1:32:29 PM**

Test Date: **10/26/2010**



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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: **1:32:29 PM**

Test Date: **10/26/2010**



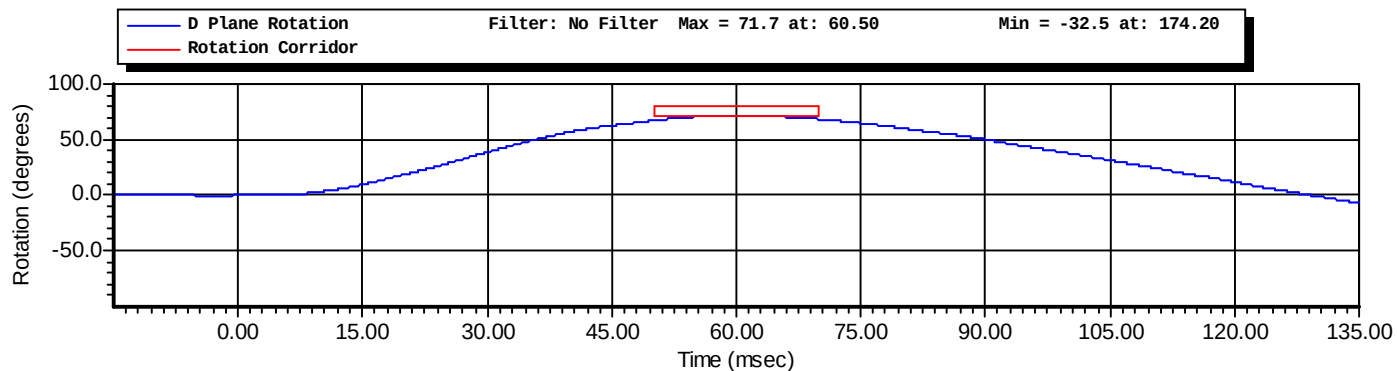
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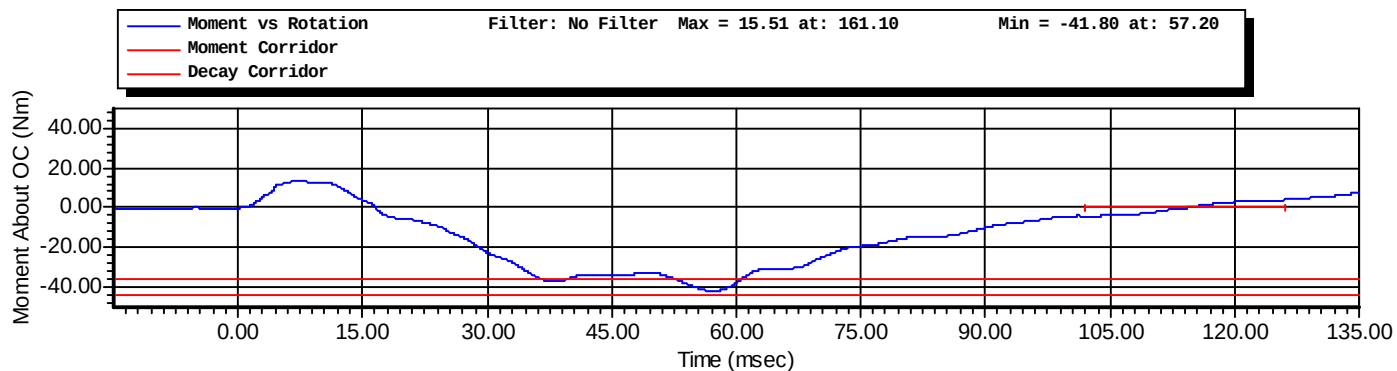
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Test Name:	Neck Pendulum	Revision:	8/24/2009
Sub Test Name:	Left Side	Spec Type:	NHTSA
ATD Type:	SID-IIIs		
ATD Serial Number:	SID 304		
Test ID:	Neck Flexion	Test Date:	10/26/2010
Test Number:	1	Test Time:	1:32:29 PM

D Plane Rotation



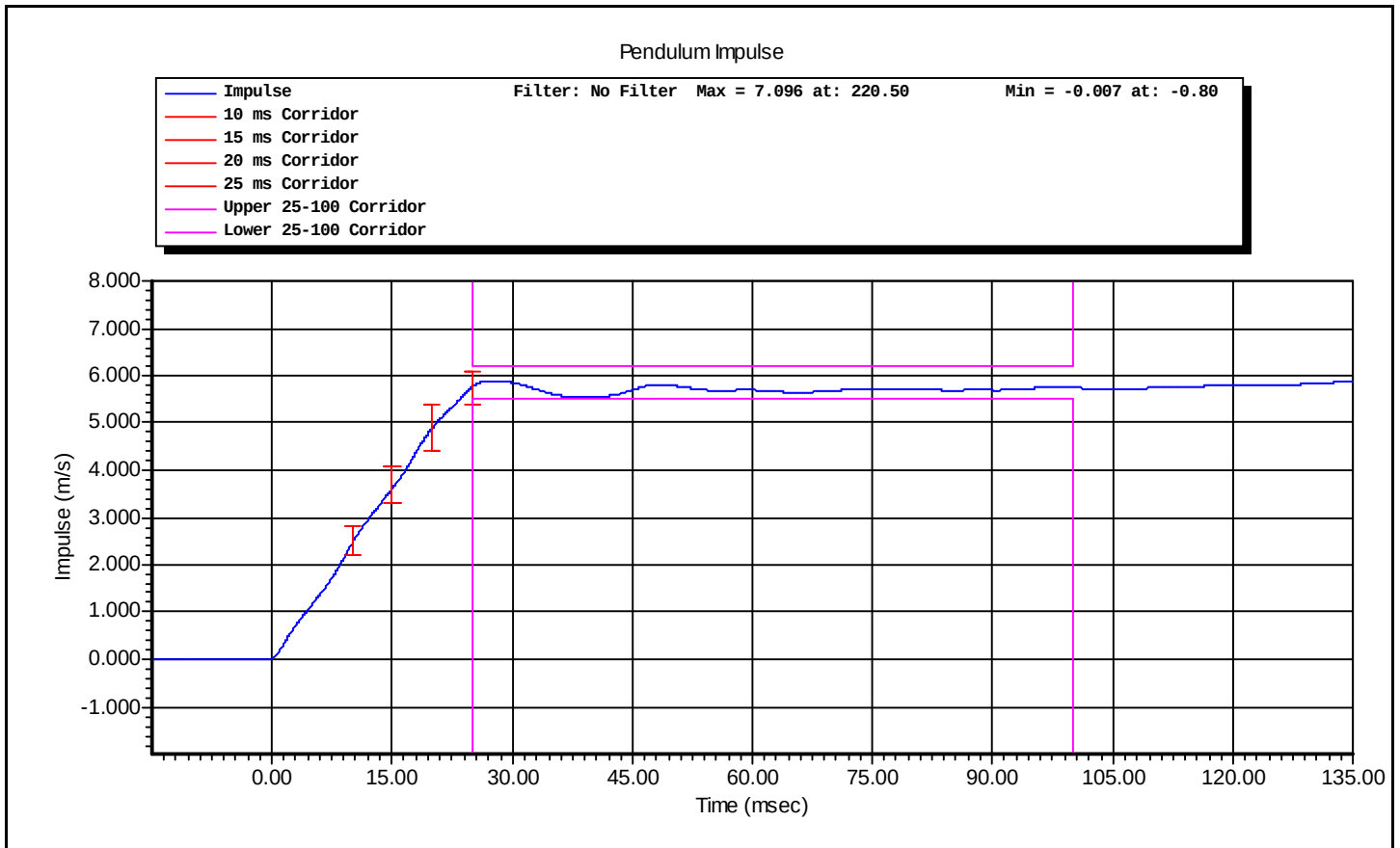
Moment About Occipital Condyle



Test ID: Neck Flexion

Test Time: 1:32:29 PM

Test Date: 10/26/2010





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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:	10/27/2010
Test Number:	1	Test Time:	11:37:45 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.40 deg C P
Humidity	10.0 -- 70.0	47.0 %RH P
Velocity	4.20 -- 4.40	4.33 m/s P
Probe Acceleration	13.0 -- 18.0	15.9 g P
Shoulder Deflection	28.0 -- 37.0	30.4 mm P
T1 Acceleration	17.0 -- 22.0	20.0 g P

All test parameters are within specifications

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

Test ID: **Shoulder**

Test Time: **11:37:45 AM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Servo	180-3885	DS-1154	3/26/2010
Endevco	7264-2000	P52415	10/12/2010

Test ID: **Shoulder**

Test Time: **11:37:45 AM**

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

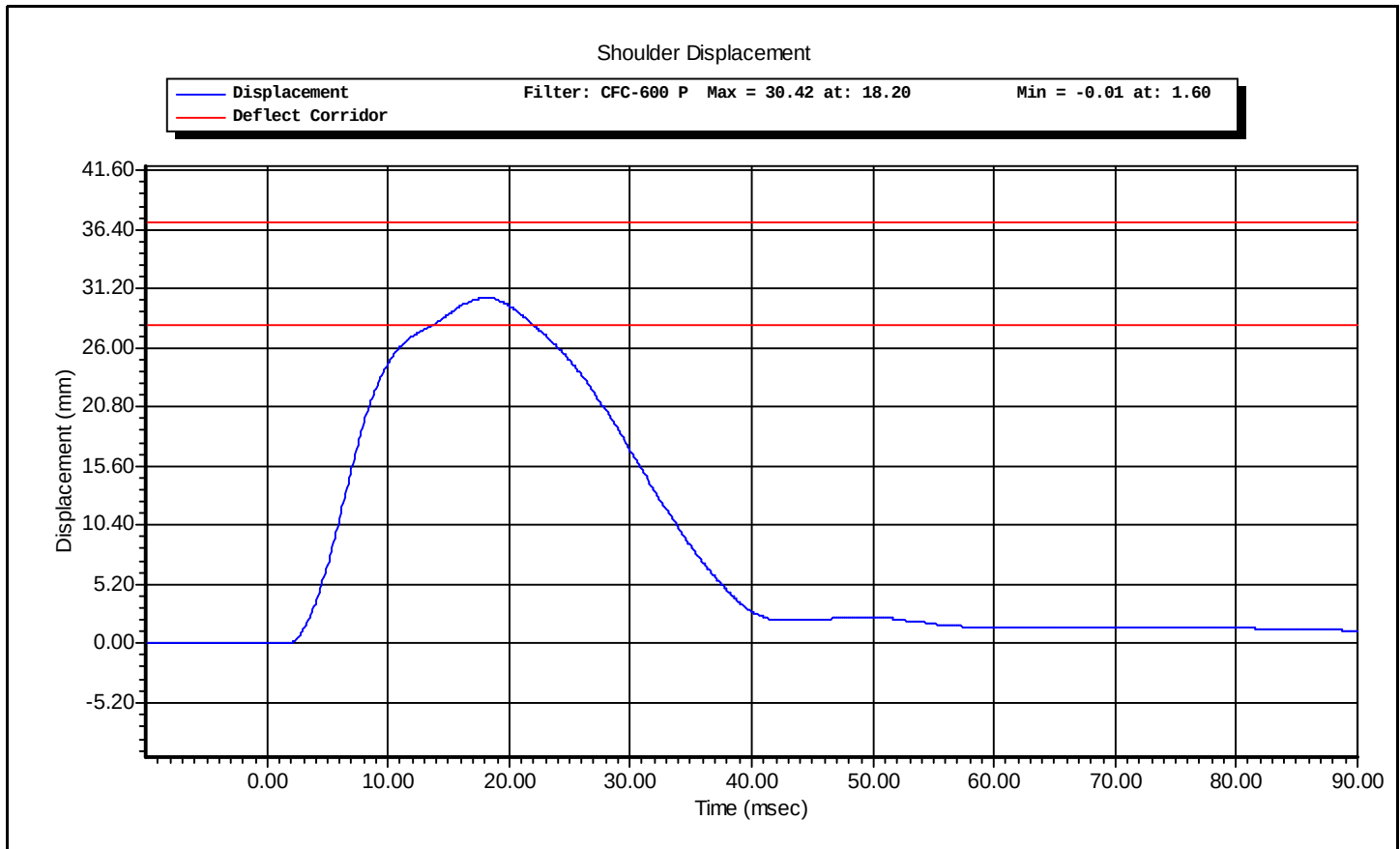


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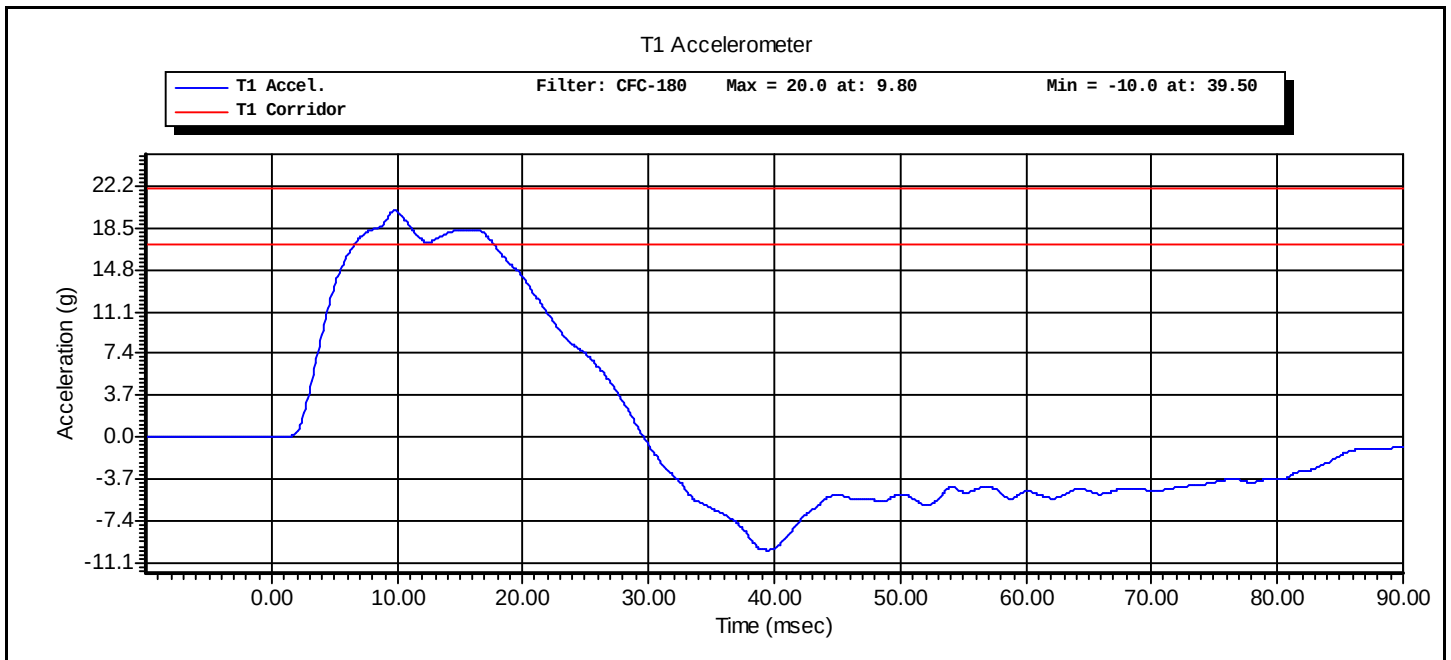
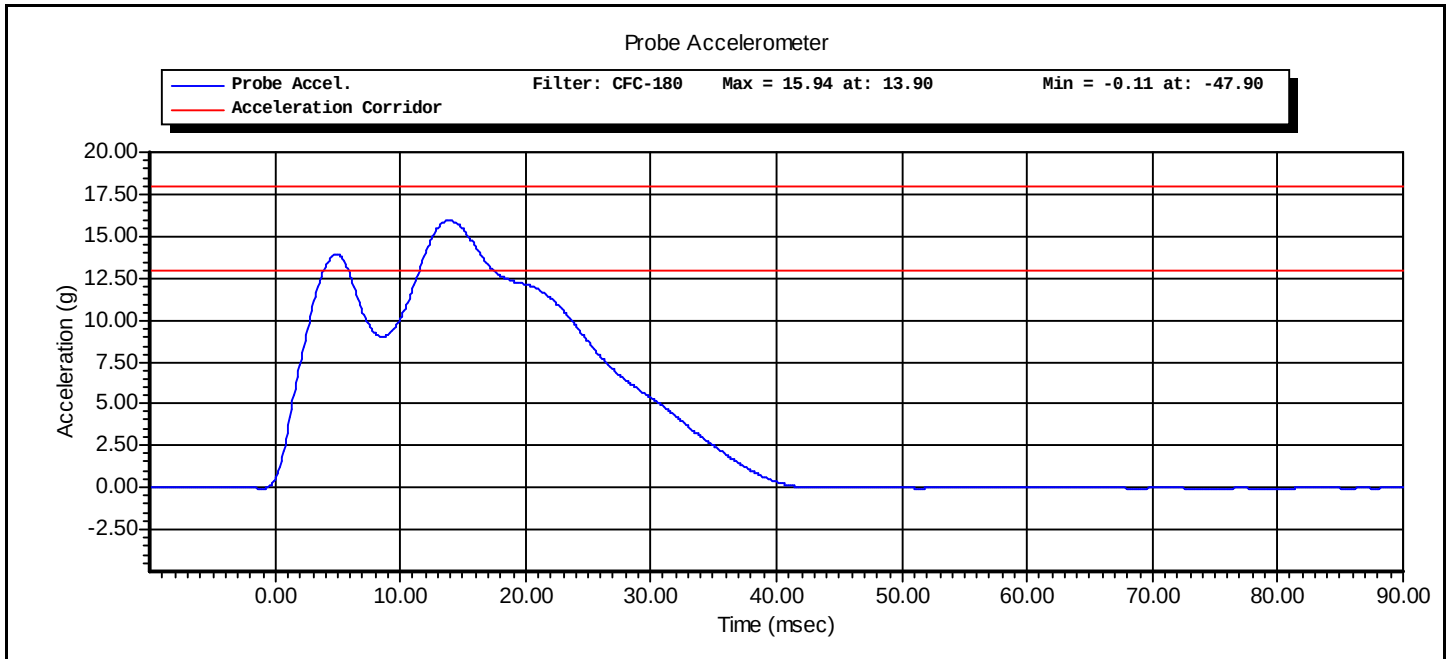
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Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Shoulder	Test Date:	10/27/2010
Test Number:	1	Test Time:	11:37:45 AM



Test ID: **Shoulder**

Test Time: **11:37:45 AM**

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





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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:	10/27/2010
Test Number:	1	Test Time:	10:38:22 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.4 deg C	P
Humidity	10	--	70	48 %RH	P
Velocity	4.20	--	4.40	4.30 m/s	P
Probe Acceleration	14.0	--	18.0	17.0 g	P
Upper Thorax Rib Deflection	32.0	--	40.0	35.5 mm	P
Mid Thorax Rib Deflection	39.0	--	45.0	40.6 mm	P
Lower Thorax Rib Deflection	35.0	--	43.0	37.8 mm	P
Upper Spine Acceleration T1	13.0	--	17.0	17.0 g	P
Lower Spine Acceleration T12	7.0	--	11.0	10.7 g	P

All test parameters are within specifications

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

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

Test ID: **Thorax Without Arm** Test Time: **10:38:22 AM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
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	P52415	10/12/2010
Endevco	7264-2000	P58839	10/14/2010

Test ID: **Thorax Without Arm** Test Time: **10:38:22 AM**

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

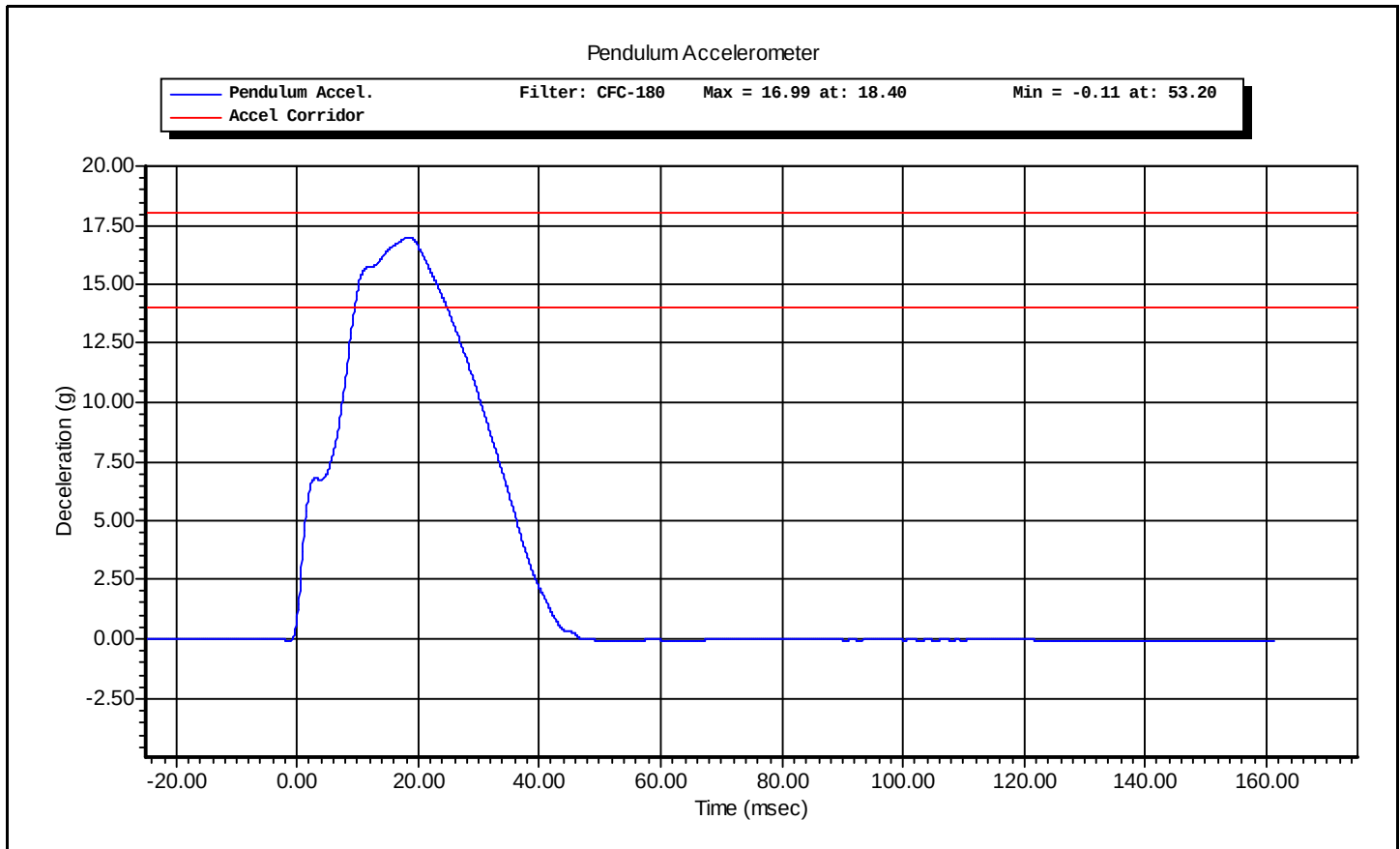


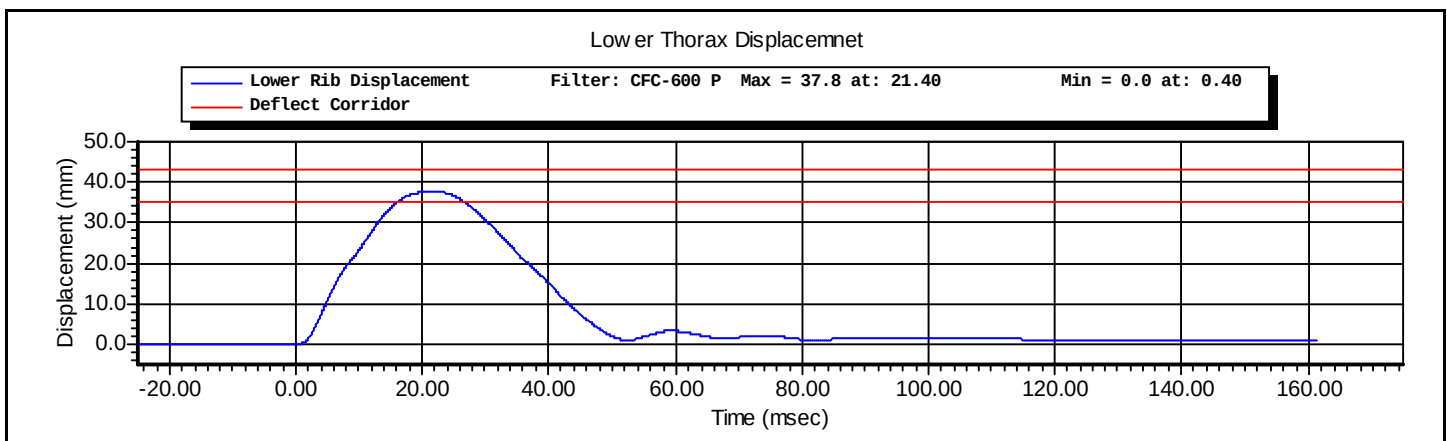
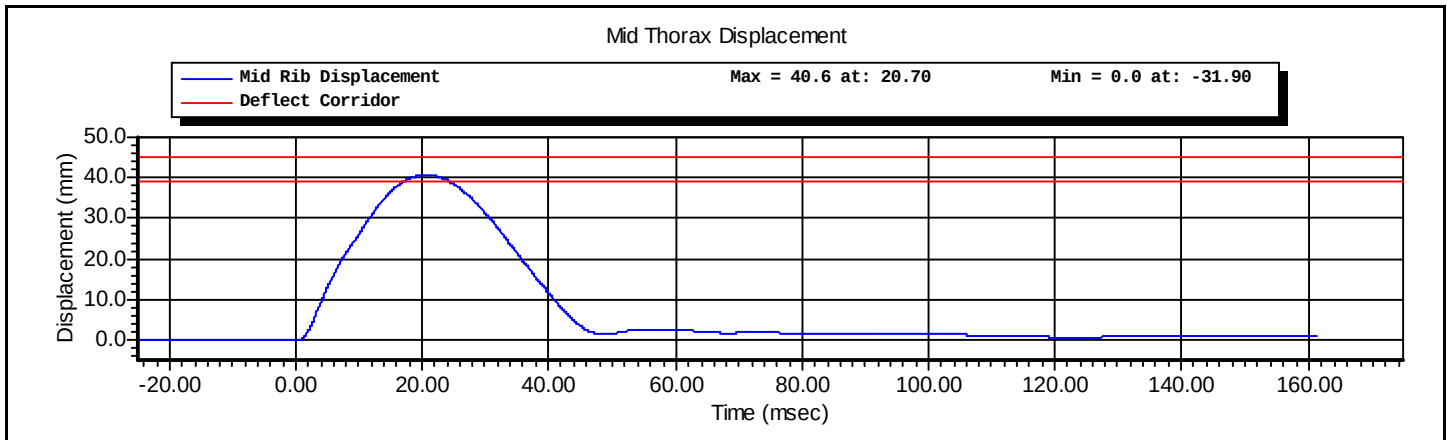
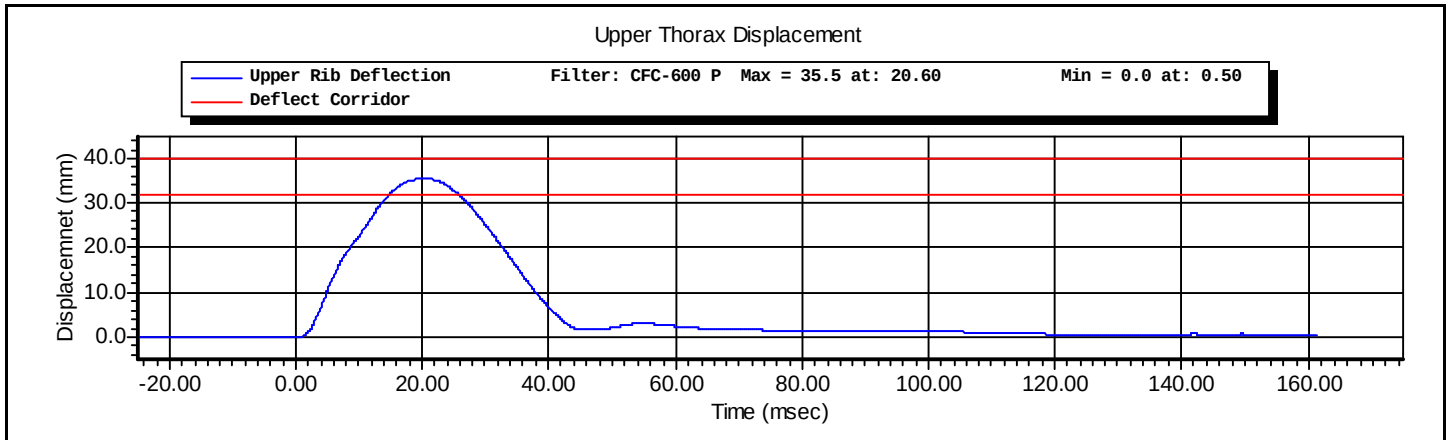
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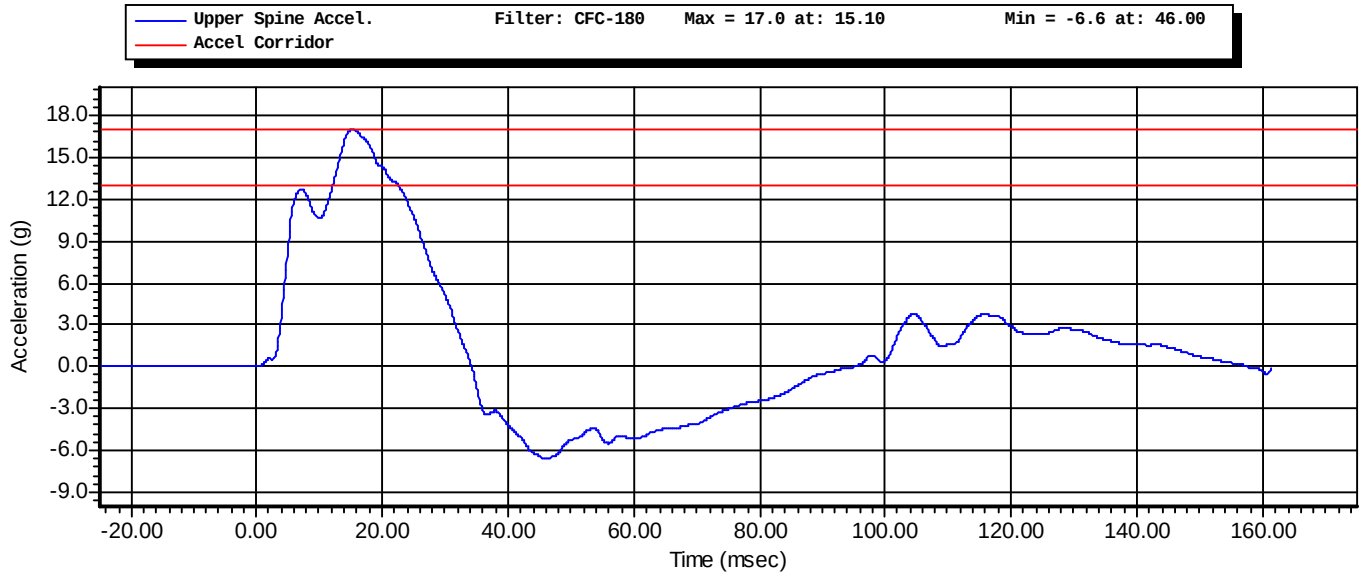
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Test Name:	Thorax Impact without Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Thorax Without Arm	Test Date:	10/27/2010
Test Number:	1	Test Time:	10:38:22 AM

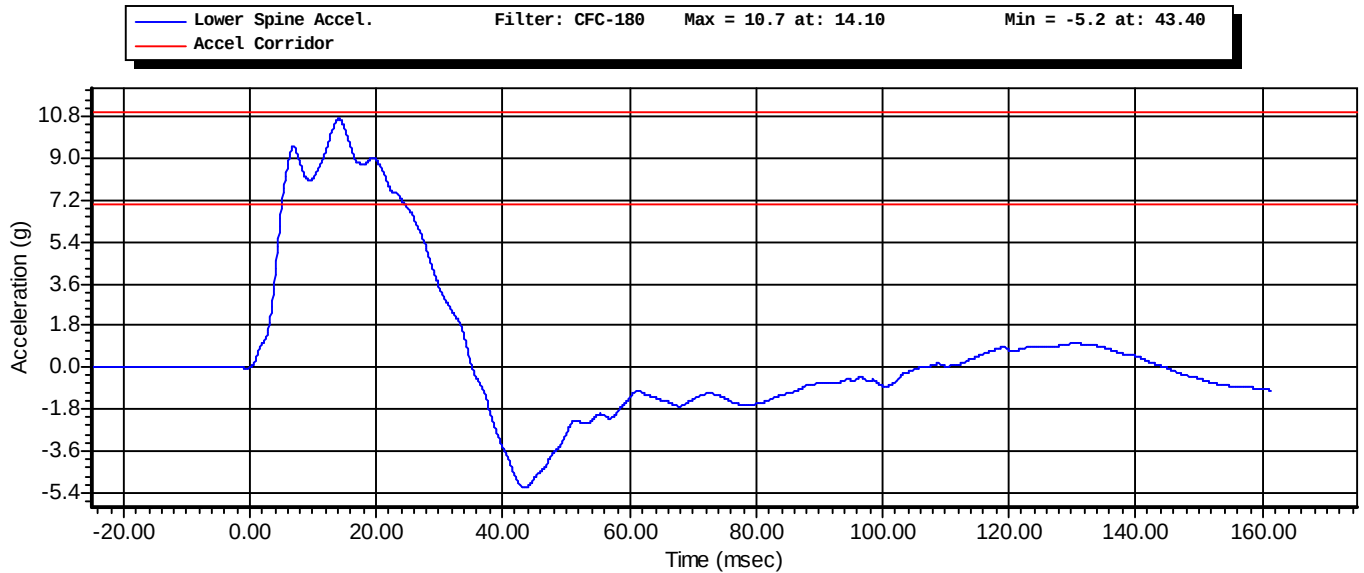




Upper Spine Acceleration



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 304		
Test ID:	Thorax With Arm	Test Date:	10/27/2010
Test Number:	1	Test Time:	11:09:54 AM

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	21.5 deg C	P
Humidity	10	--	70	47 %RH	P
Velocity	6.60	--	6.80	6.69 m/s	P
Probe Acceleration after 5ms	30.0	--	36.0	34.6 g	P
Upper Thorax Rib Deflection	25.0	--	32.0	27.6 mm	P
Mid Thorax Rib Deflection	30.0	--	36.0	30.8 mm	P
Lower Thorax Rib Deflection	32.0	--	38.0	32.5 mm	P
Upper Spine Acceleration ("y")	34.0	--	43.0	42.0 g	P
Lower Spine Acceleration ("y")	29.0	--	37.0	35.7 g	P
Shoulder Deflection	31.0	--	40.0	35.8 mm	P

All test parameters are within specifications

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

Test ID: **Thorax With Arm**

Test Time: **11:09:54 AM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
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	P52415	10/12/2010
Endevco	7264-2000	P58839	10/14/2010
Servo	180-3885	DS-1154	3/26/2010

Test ID: **Thorax With Arm** Test Time: **11:09:54 AM**

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

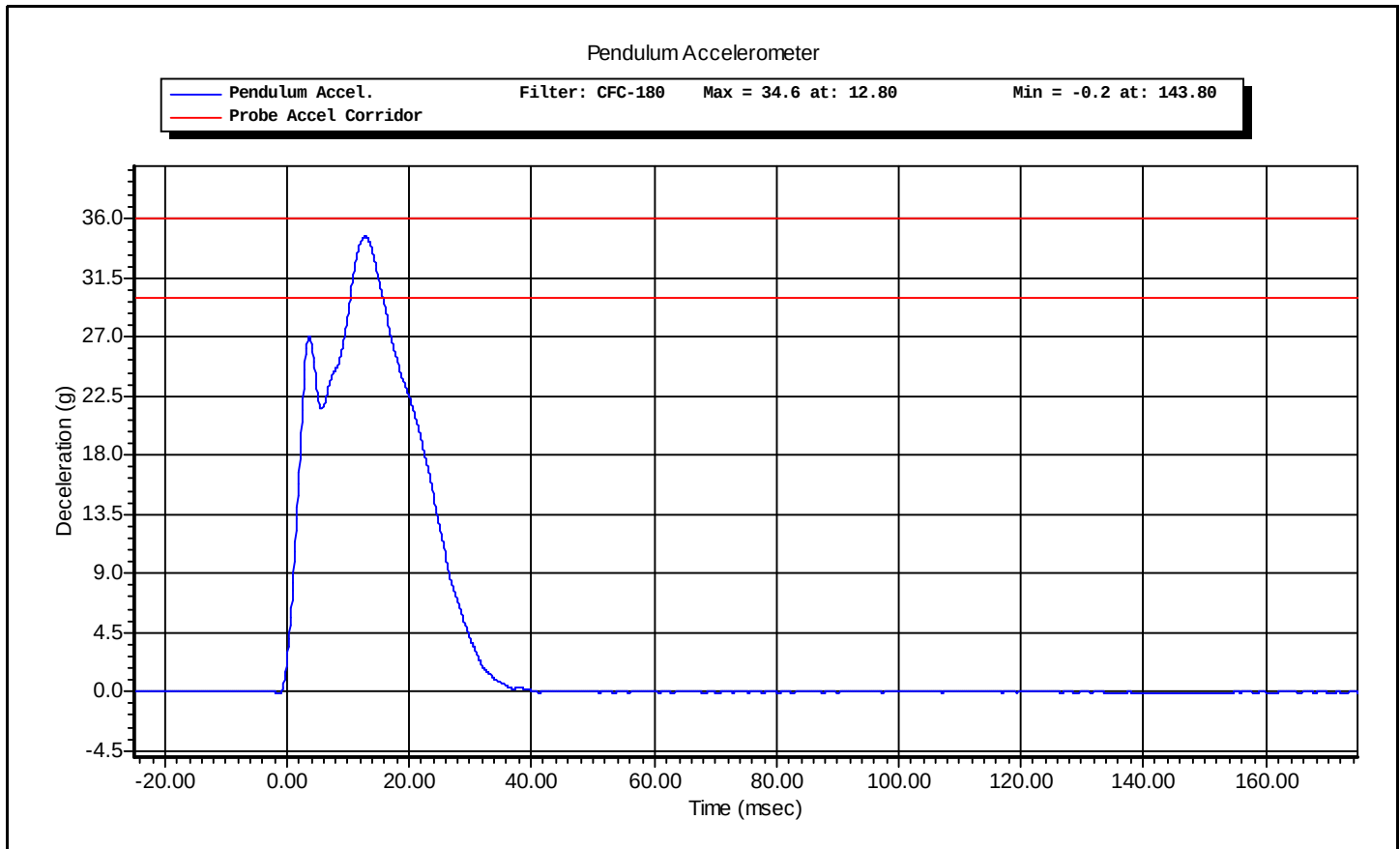


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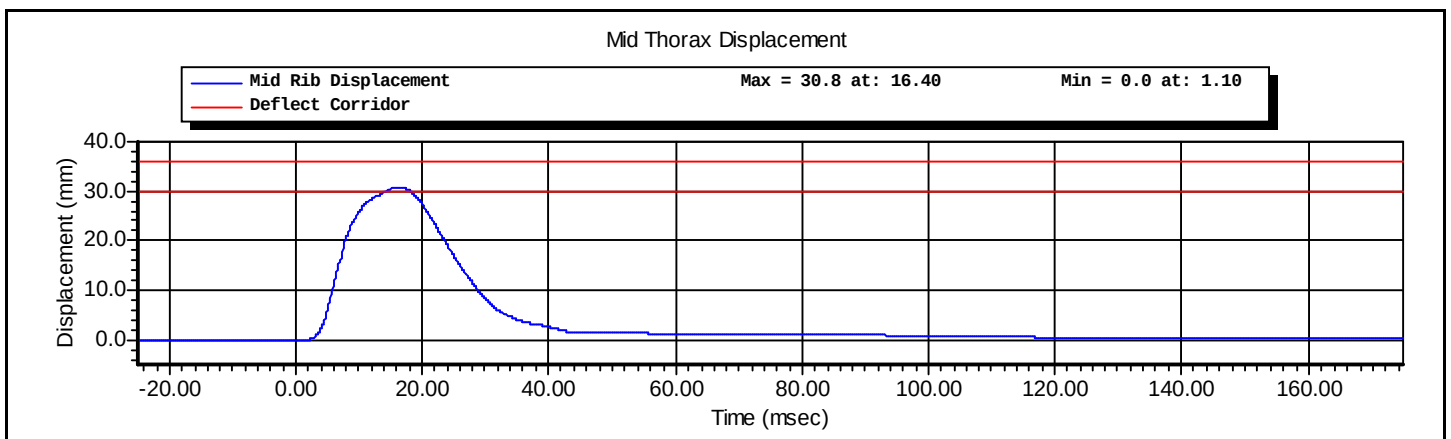
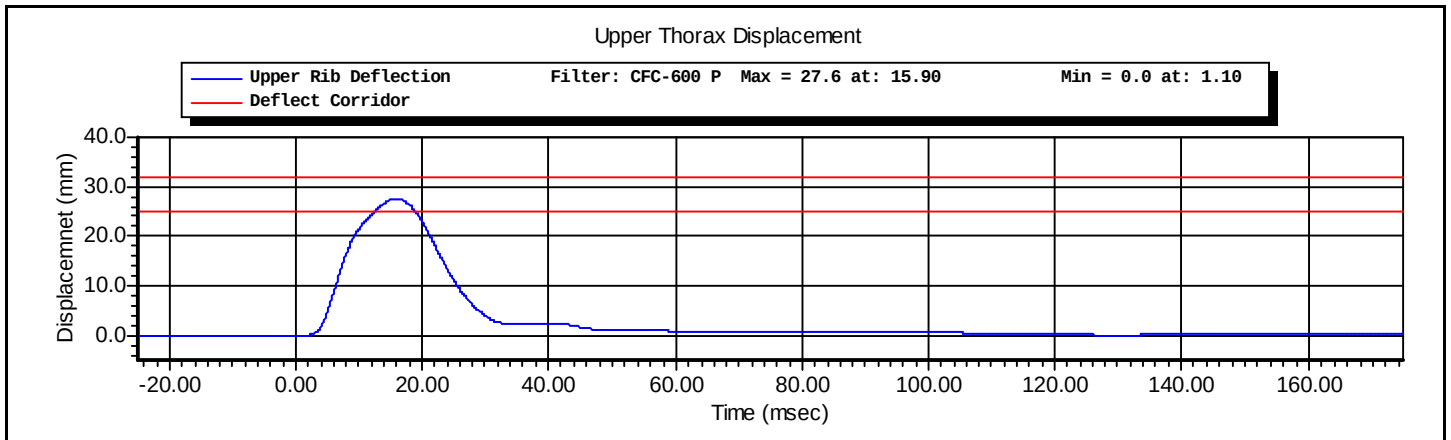
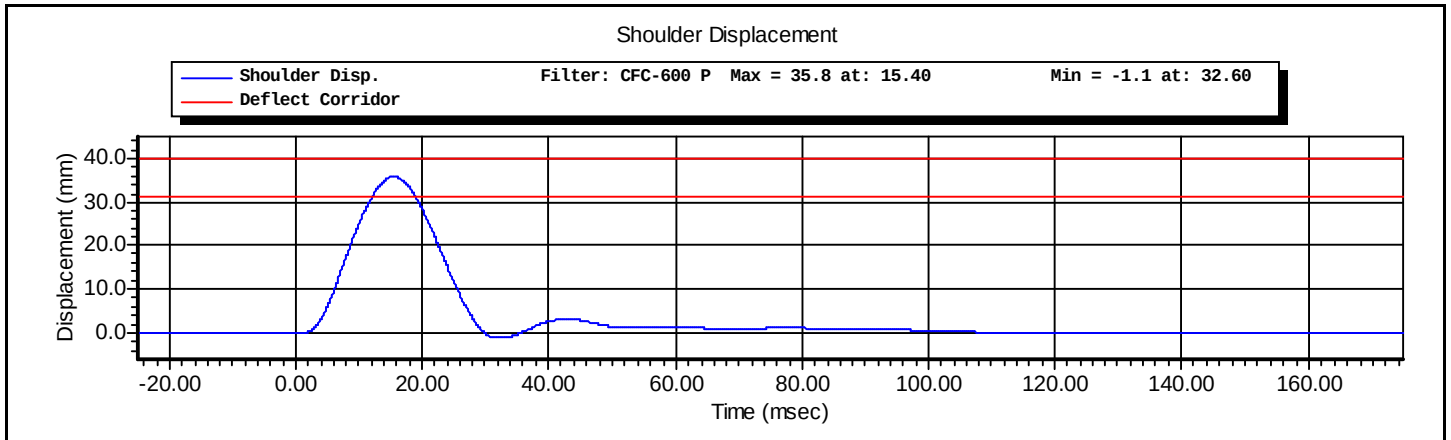
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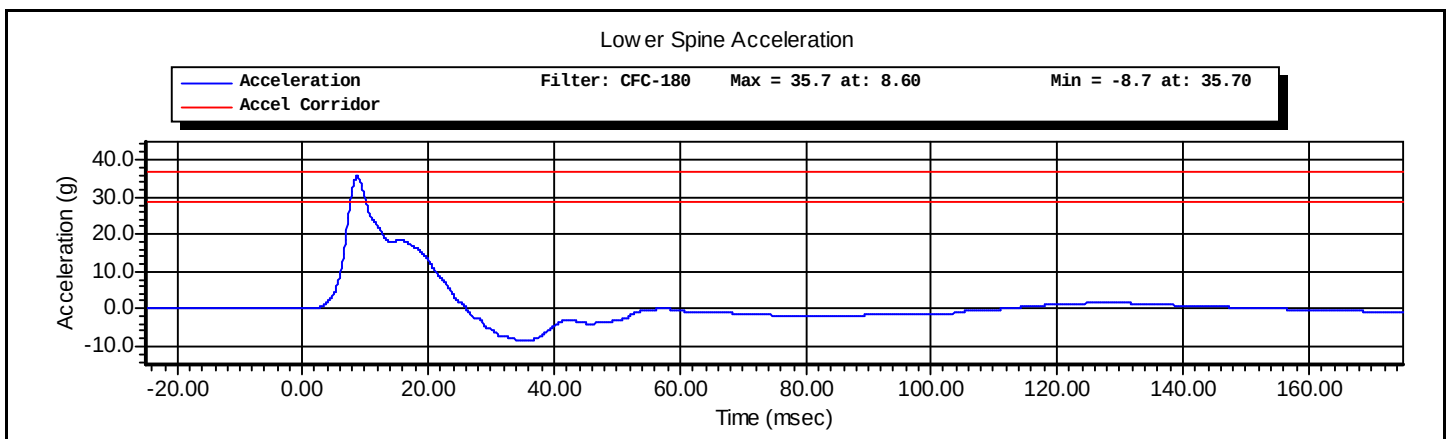
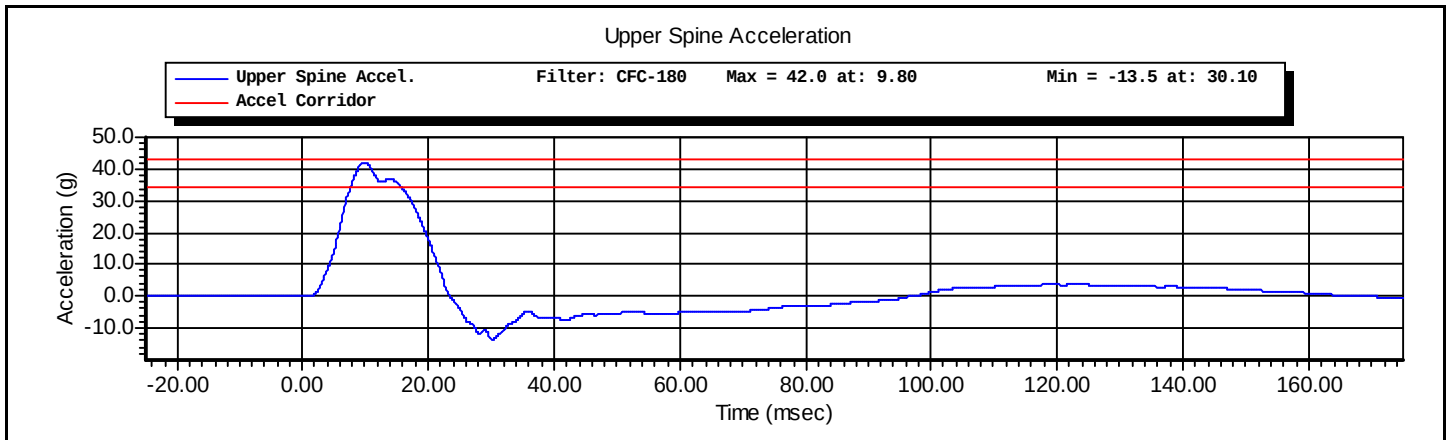
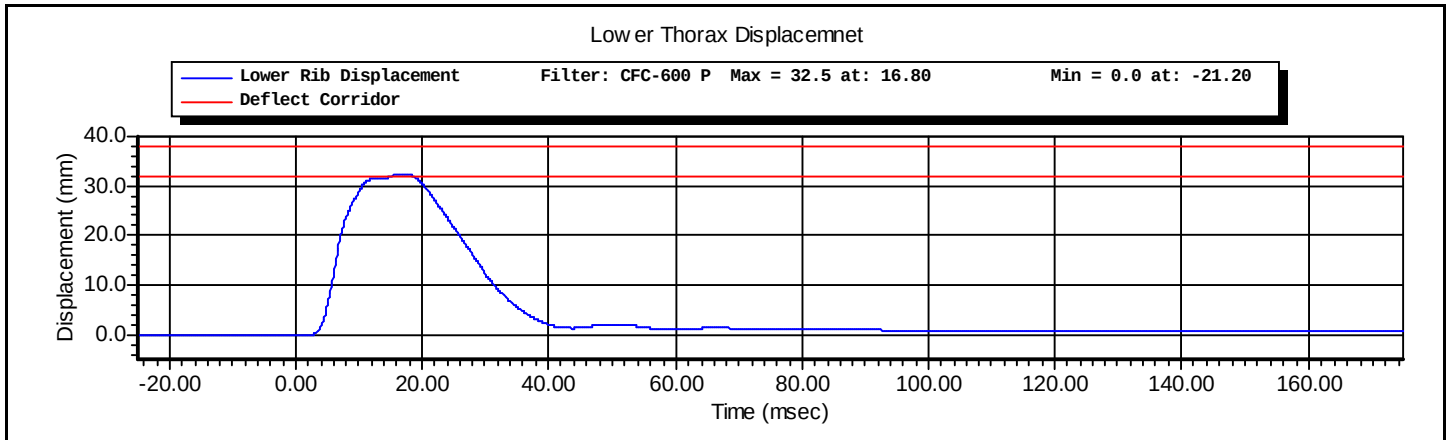
Test Name:	Thorax Impact with Arm	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Thorax With Arm	Test Date:	10/27/2010
Test Number:	1	Test Time:	11:09:54 AM



Test ID: **Thorax With Arm** Test Time: **11:09:54 AM**

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







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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 304		
Test ID:	Abdomen	Test Date:	10/27/2010
Test Number:	1	Test Time:	10:19:15 AM

Test Parameters	Test Specifications	Test Results
Temperature	20.6 -- 22.2	21.2 deg C P
Humidity	10 -- 70	47 %RH P
Velocity	4.20 -- 4.40	4.32 m/s P
Probe Acceleration	12.0 -- 16.0	16.0 g P
Upper Abdominal Rib Deflection	36.0 -- 47.0	38.9 mm P
Lower Abdominal Rib Deflection	33.0 -- 44.0	37.8 mm P
Lower Spine Acceleration - T12	9.0 -- 14.0	11.9 g P

All test parameters are within specifications

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

Test ID: **Abdomen**

Test Time: **10:19:15 AM**

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



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VERIFICATION REPORT

REFERENCE EQUIPMENT

<u>Manufacturer</u>	<u>Model</u>	<u>Serial Number</u>	<u>Calibration Date</u>
DentonATD	Velocity Trap	1	1/11/2010
Endevco	7264-2000	P66930	10/5/2010
Servo	180-3885	DS-1207	3/26/2010
Servo	180-3885	DS-1204	3/26/2010
Endevco	7264-2000	P58839	10/14/2010

Test ID: **Abdomen**

Test Time: **10:19:15 AM**

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

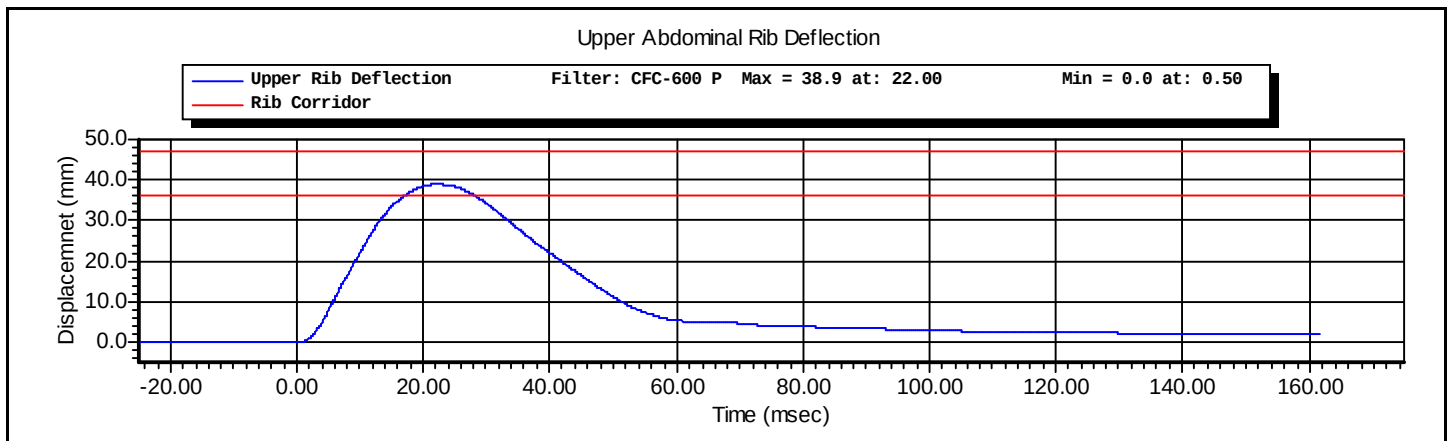
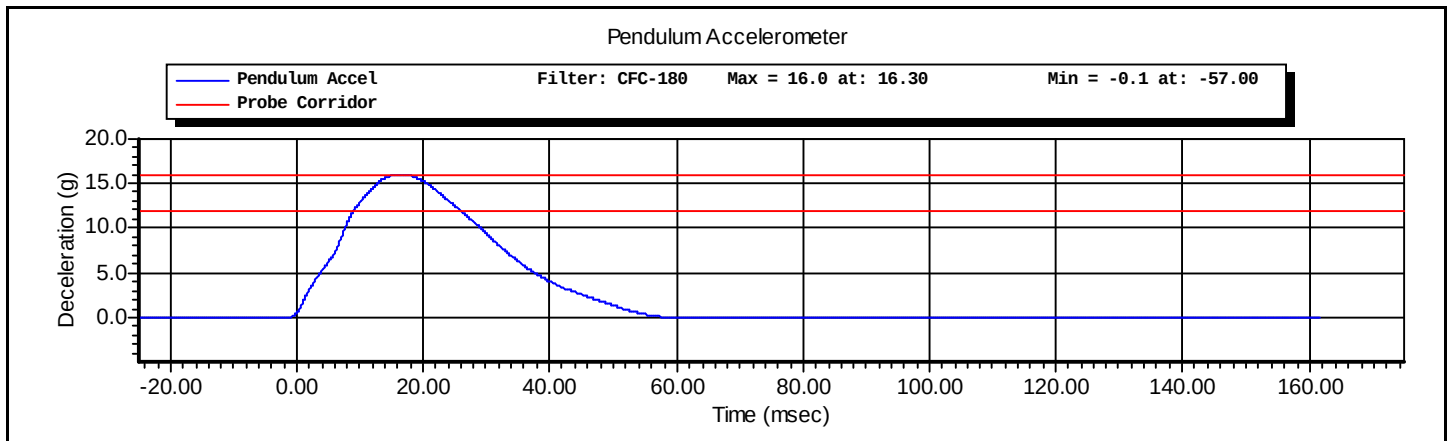


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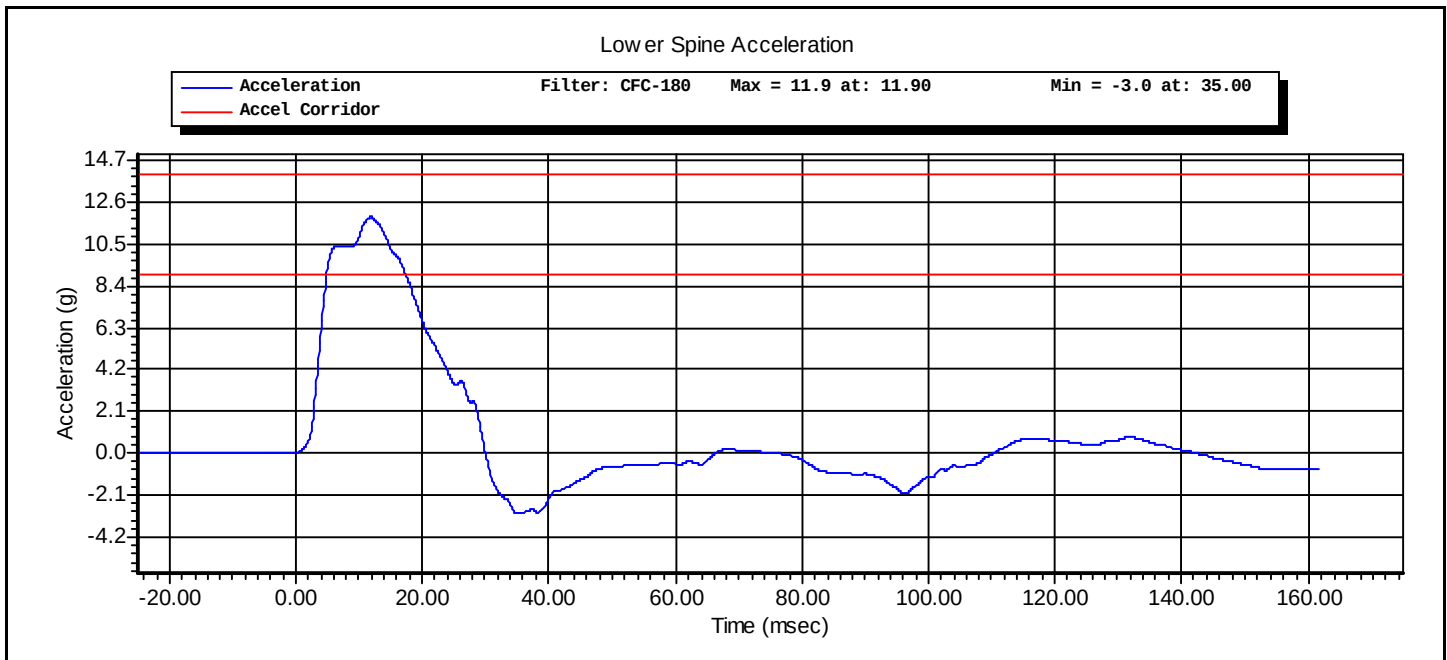
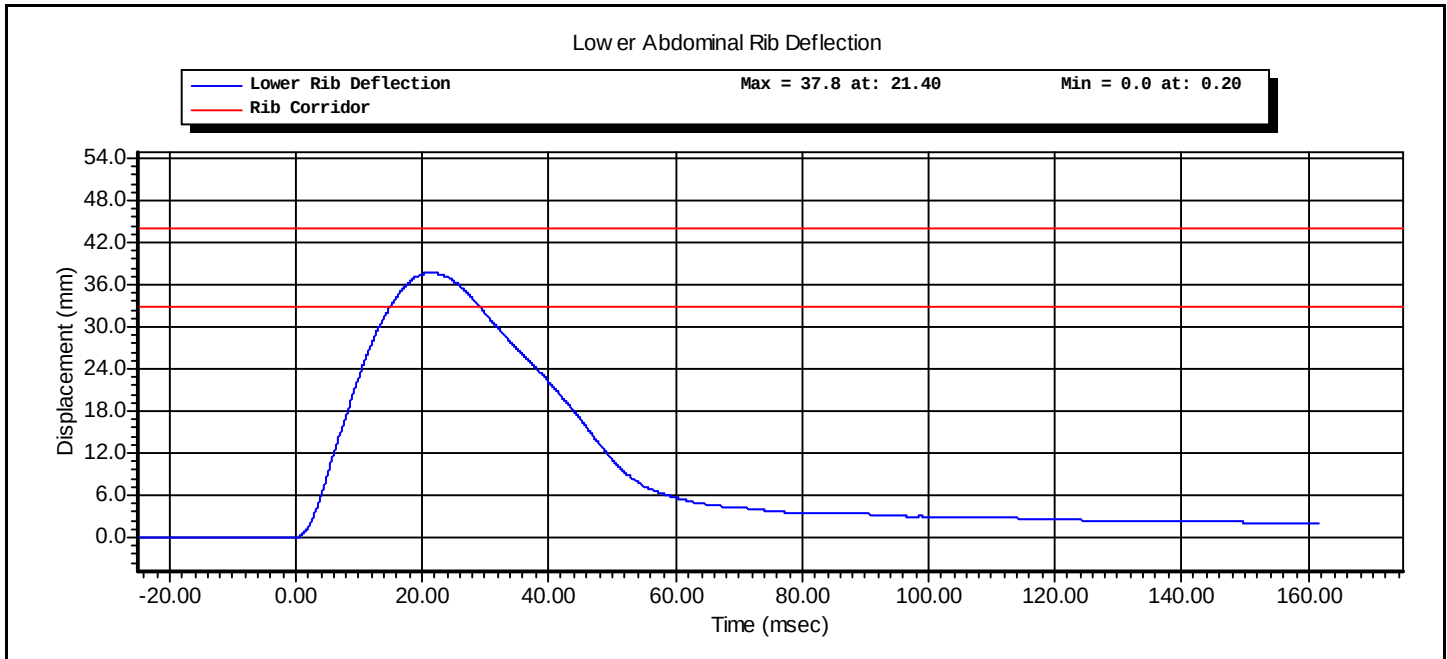
Test Name:	Abdominal Impact	Revision:	8/24/2009
Sub Test Name:		Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Abdomen	Test Date:	10/27/2010
Test Number:	1	Test Time:	10:19:15 AM



Test ID: **Abdomen**

Test Time: **10:19:15 AM**

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





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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 304		
Test ID:	Pelvis Acetabulum	Test Date:	10/26/2010
Test Number:	1	Test Time:	3:16:54 PM

Comments:

Pelvis Plug Used for Certification:
FTSS S/N 12820
Force @ 3mm = 1500N

Pelvis Plug Used for Full Scale Test:
FTSS S/N 12597
Force @ 3mm = 1505N

Test Parameters	Test Specifications			Test Results	
Temperature	20.6	--	22.2	22.2 deg C	P
Humidity	10	--	70	49 %RH	P
Velocity	6.60	--	6.80	6.63 m/s	P
Peak Probe Acceleration	38.0	--	47.0	43.1 g	P
Peak Pelvis Acceleration	34.0	--	42.0	36.1 g	P
Peak Acetabulum Force	3.60	--	4.30	3.90 kN	P

All test parameters are within specifications

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

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

Test ID: **Pelvis Acetabulum** Test Time: **3:16:54 PM**

Test Date: **10/26/2010**



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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	P49217	10/12/2010
DentonATD	3249J	LC-267Fy	4/9/2010

Test ID: **Pelvis Acetabulum** Test Time: **3:16:54 PM**

Test Date: **10/26/2010**



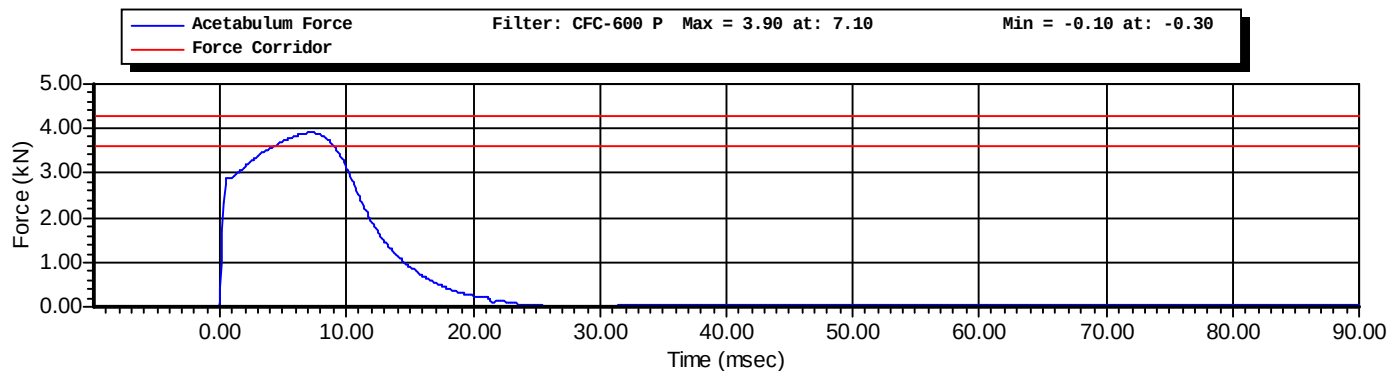
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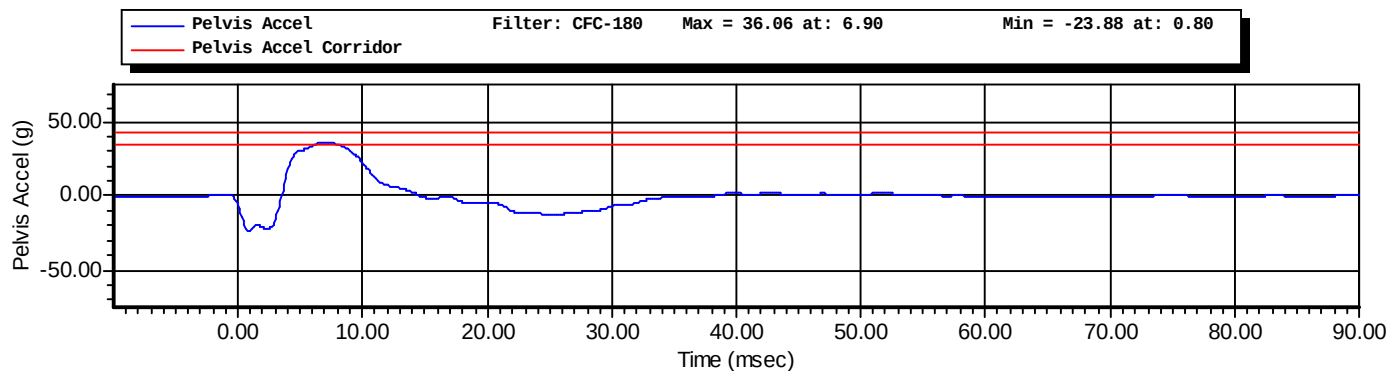
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

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:	10/26/2010
Test Number:	1	Test Time:	3:16:54 PM

Acetabulum Force

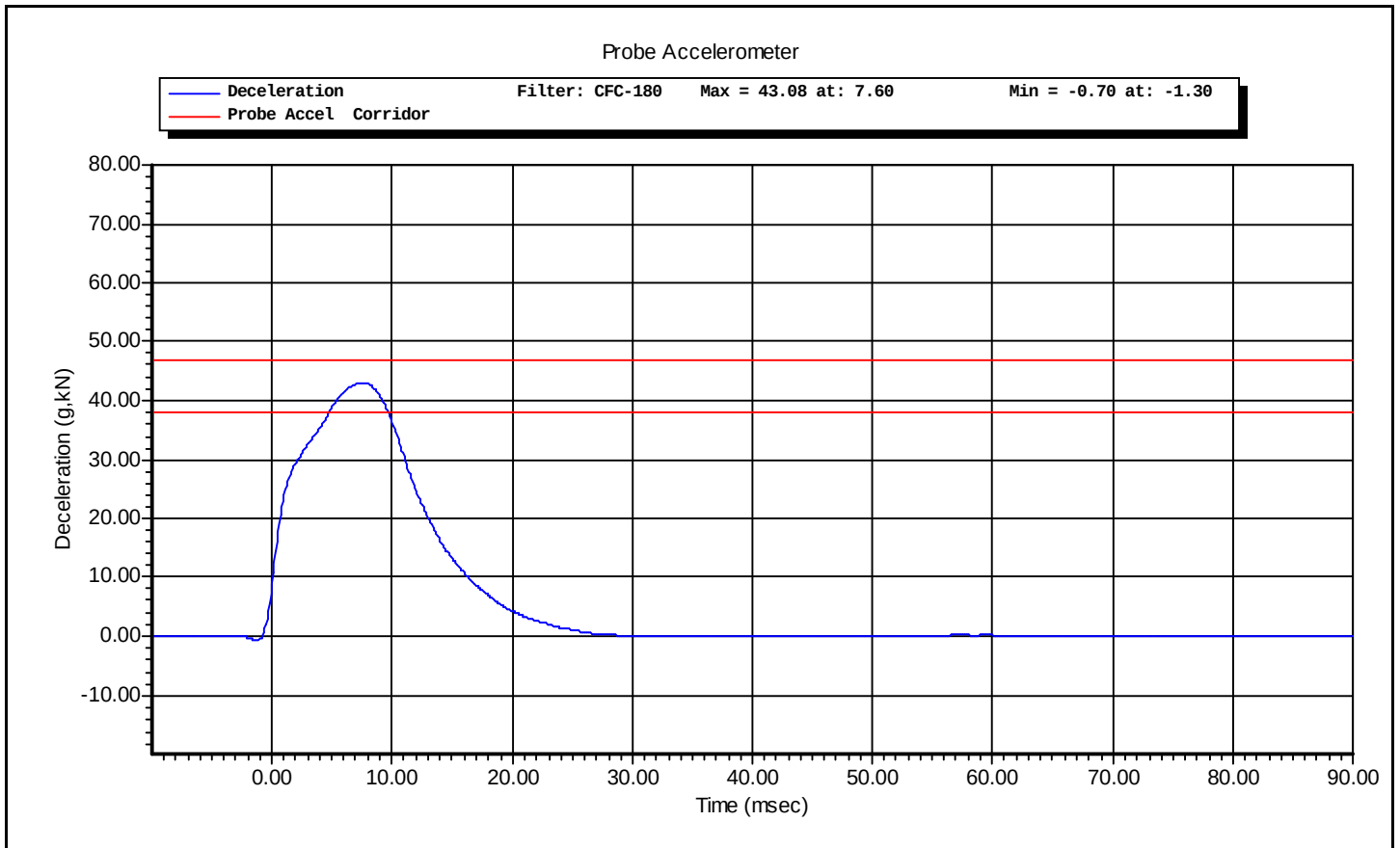


Pelvis Accelerometer



Test ID: **Pelvis Acetabulum** Test Time: **3:16:54 PM**

Test Date: **10/26/2010**





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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:	Iliac Pelvis	Test Date:	10/26/2010
Test Number:	1	Test Time:	2:27:34 PM

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	4.31 m/s P
Peak Probe Acceleration	36.0 -- 45.0	42.5 g P
Peak Pelvis Acceleration	28.0 -- 39.0	36.1 g P
Peak Iliac Force	4.10 -- 5.10	4.98 kN P

All test parameters are within specifications

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

Test ID: **Iliac Pelvis**

Test Time: **2:27:34 PM**

Test Date: **10/26/2010**



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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	P49217	10/12/2010
DentonATD	3228J	LC-281 Fy	4/9/2010

Test ID: **Iliac Pelvis**

Test Time: **2:27:34 PM**

Test Date: **10/26/2010**



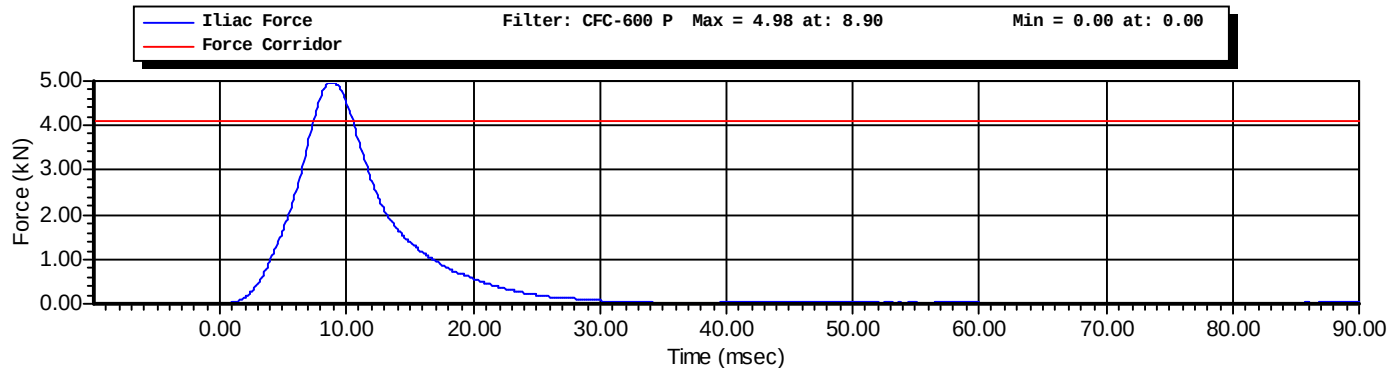
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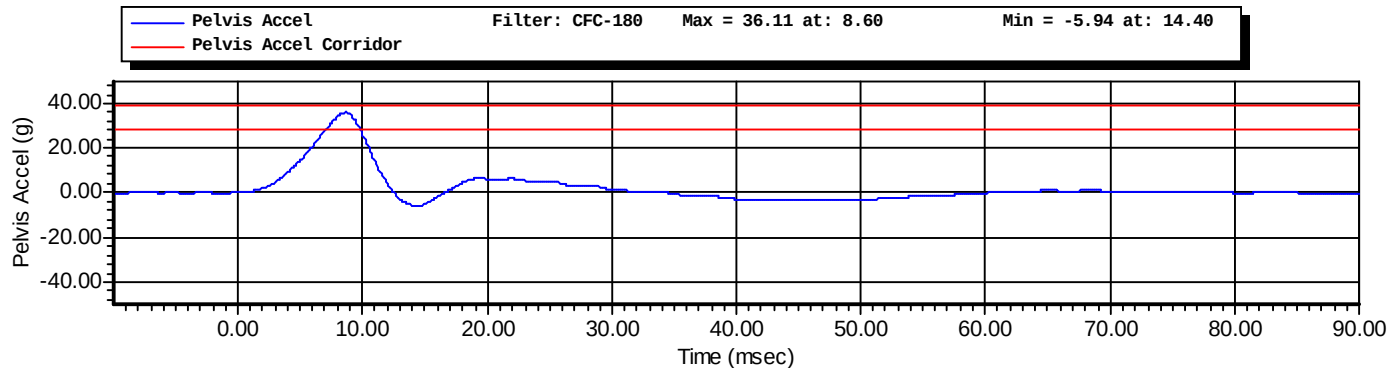
4455 Genesee Street, Buffalo, New York 14225 - Phone (716)632-7500

Test Name:	Pelvis	Revision:	8/24/2009
Sub Test Name:	Iliac Impact	Spec Type:	NHTSA
ATD Type:	SID-IIs		
ATD Serial Number:	SID 304		
Test ID:	Iliac Pelvis	Test Date:	10/26/2010
Test Number:	1	Test Time:	2:27:34 PM

Iliac Force



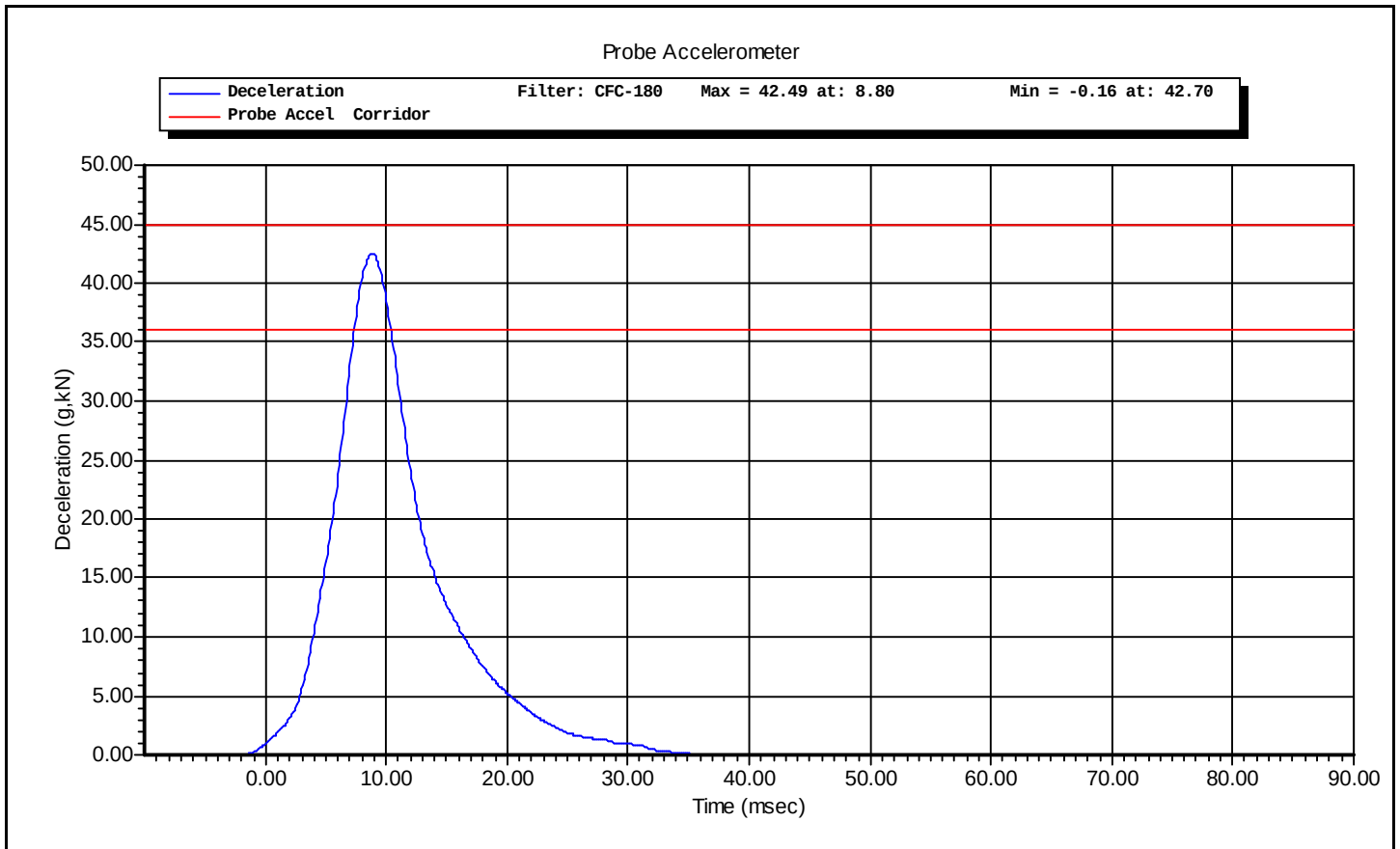
Pelvis Accelerometer



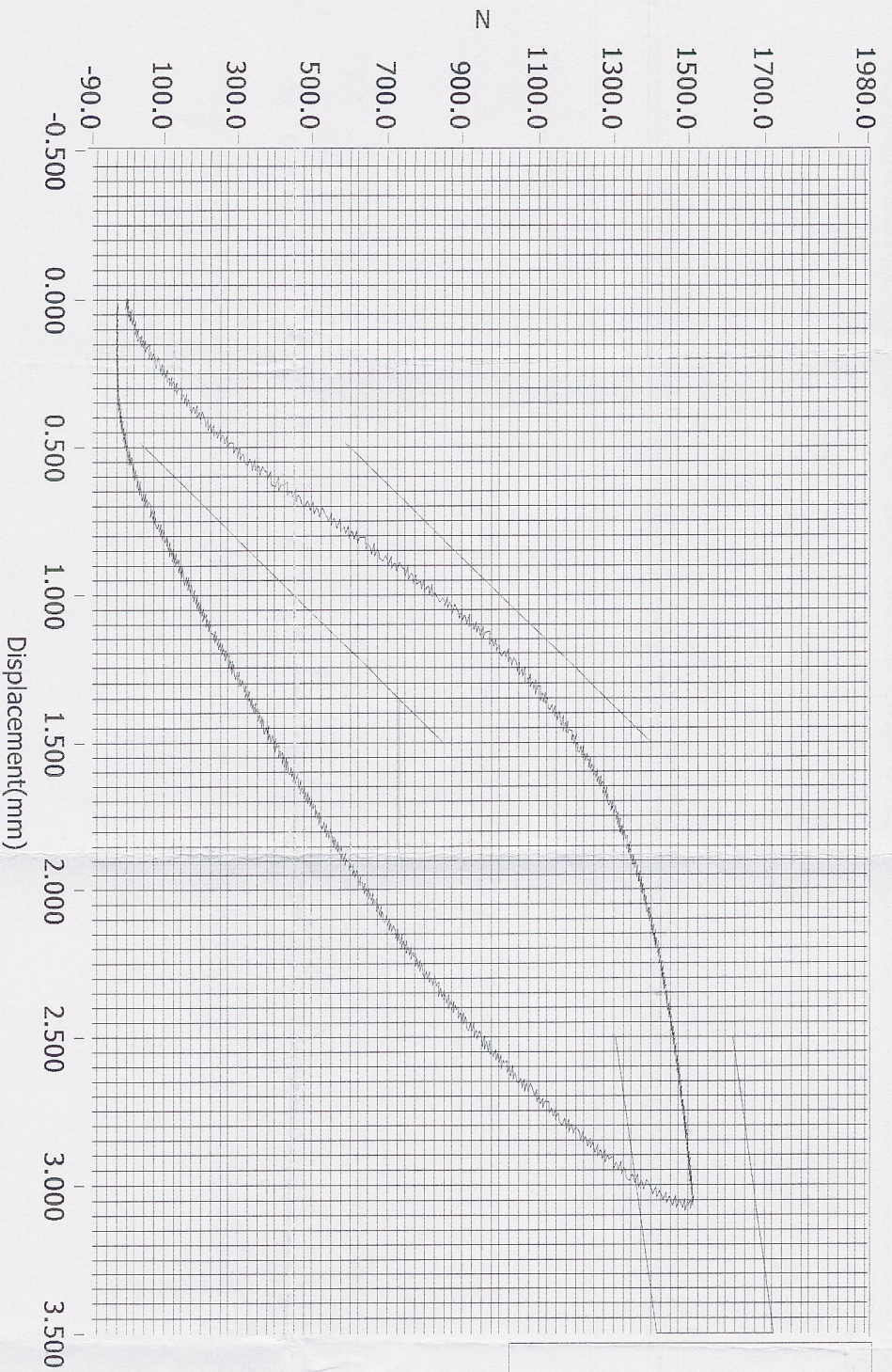
Test ID: **Iliac Pelvis**

Test Time: **2:27:34 PM**

Test Date: **10/26/2010**



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

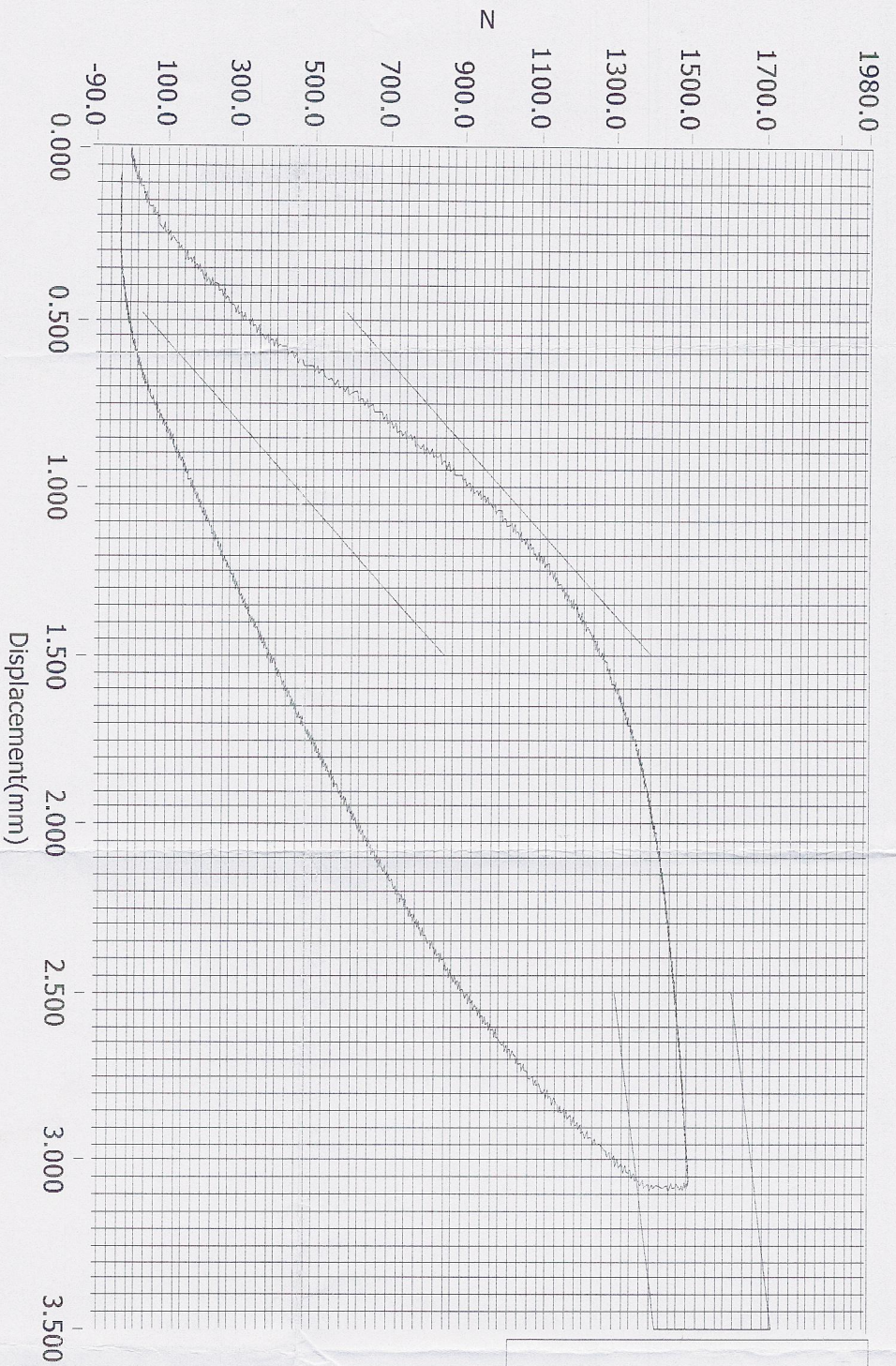
12597

SIDIIs

Current Date : 7/10/2007

Current Time : 15:41:12

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

12820

SIDIIs

Current Date : 7/17/2007

Current Time : 11:44:29

